# Monkeybread Xojo Plugin Documentation

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## 0.1 Introduction

This is the PDF version of the documentation for the Xojo Plug-in from Monkeybread Software Germany.

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    - 138.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer 19303
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    - 68.1.22 BlockBIIII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer) as boolean 12018
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- 79 **Encryption and Hash** 13295
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    - 79.4.4 Decrypt(key as string, data as string) as string 13318
    - 79.4.5 DecryptCBC(data as string, byref temp as memoryblock) as string 13319
    - 79.4.6 DecryptCBC(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock) 13319
    - 79.4.7 DecryptCFB64(data as string, byref temp as memoryblock) as string 13320
    - 79.4.8 DecryptCFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer) 13320
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- 138 **Pictures Import and Export** 19301
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    - 138.1.1 BitRotateMBS(Degree as Integer, InputData as Ptr, OutputData as Ptr, Width as Integer, Height as Integer, InputRowBytes as Integer = -1, OutputRowBytes as Integer = -1) as boolean 19301
    - 138.1.2 BMPStringtoPictureMBS(data as string) as picture 19302
    - 138.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer 19303
    - 138.1.4 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer 19304

- 51 **Controls** 8567
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    - 51.1.3 ImageDisabled as Picture 8567
    - 51.1.4 ImageMouseOver as Picture 8568
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    - 51.1.6 ImagePressed as Picture 8568
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    - 51.1.13 Toggle as Boolean 8569
    - 51.1.14 Value as Boolean 8570
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    - 51.1.18 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean 8570
    - 51.1.19 ContextualMenuAction(hitItem as MenuItem) as Boolean 8570
    - 51.1.20 EnableMenuItems 8571
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    - 51.1.22 MouseDrag(x as Integer, y as Integer) 8571
    - 51.1.23 MouseUp(x as Integer, y as Integer) 8571
    - 51.1.24 Open 8571
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- 48 **Compression** 8339
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    - 48.1.7 CompressLZWMBS(buf as string) as string 8342
    - 48.1.3 CompressZLibMBS(buf as string, level as Integer = 9) as string 8340
    - 48.1.4 CompressZLibMBS(buf as string, level as Integer, byref error as Integer) as string 8340
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    - 48.1.8 DecompressLZWMBS(buf as string, size as Integer) as string 8343
    - 48.1.5 DecompressZLibMBS(buf as string, size as Integer = 0) as string 8341
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- 48 **Compression** 8339
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    - 48.2.3 Close 8343
    - 48.2.4 Constructor(BufferSize as Integer=20000) 8343
    - 48.2.5 EndZip 8344
    - 48.2.6 GetOutput as string 8344
    - 48.2.7 InitZip(level as Integer) 8344
    - 48.2.8 InputAvail as Integer 8344
    - 48.2.9 OutputSize as Integer 8344
    - 48.2.10 ProcessZip(Flush as boolean=false) 8345
    - 48.2.11 SetInput(data as Memoryblock) as boolean 8345
    - 48.2.12 SetInput(data as string) as boolean 8345
    - 48.2.14 Error as Integer 8345
    - 48.2.15 OutputBufferSize as Integer 8346
    - 48.2.16 TotalInput as UInt64 8346
    - 48.2.17 TotalOutput as UInt64 8346
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    - 48.3.6 GetOutput as string 8348
    - 48.3.7 InitZip 8349
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* 48.4.16 Handle as Integer 8355
* 48.4.17 Lasterror as Integer 8356
* 48.4.18 LasterrorMessage as String 8356
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- 23 **Calendar** 4365
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    - 23.1.3 Constructor 4366
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    - 23.1.7 acknowledged as date 4367
    - 23.1.8 action as String 4367
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    - 23.1.10 relatedTo as String 4368
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- 52 **CoreAnimation** 8619
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    - 52.1.4 available as boolean 8621
    - 52.1.5 Constructor 8621
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    - 52.1.11 layoutIfNeeded 8622
    - 52.1.12 layoutSublayers 8622
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    - 52.1.20 sublayers as CALayerMBS() 8625
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    - 52.1.23 anchorPoint as CGRectMBS 8625
    - 52.1.24 anchorPointZ as Double 8625
    - 52.1.25 AutoresizingMask as Integer 8626
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    - 52.1.27 borderColor as Variant 8626
    - 52.1.28 borderWidth as Double 8627
    - 52.1.29 bounds as CGRectMBS 8627
    - 52.1.30 className as string 8627
    - 52.1.31 classPath as string 8627
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* 52.1.44 minificationFilterBias as Double 8631
* 52.1.45 modelLayer as CALayerMBS 8632
* 52.1.46 needsDisplay as boolean 8632
* 52.1.47 needsDisplayOnBoundsChange as boolean 8632
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* 52.1.49 opacity as Double 8633
* 52.1.50 Opaque as boolean 8633
* 52.1.51 position as CGRectMBS 8633
* 52.1.52 preferredFrameSize as CGSizeMBS 8633
* 52.1.53 presentationLayer as CALayerMBS 8634
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* 52.1.56 shadowOffset as CGSizeMBS 8635
* 52.1.57 shadowOpacity as Double 8635
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* 52.1.60 shouldRasterize as Boolean 8636
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- 79 **Encryption and Hash** 13295
  - **??** Globals **??**
    - 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
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    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.2 CalculateCRC16StringMBS(data as string, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32 13340
    - 79.5.7 CRC16MBS(data as string) as UInt16 13331
    - 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.6 CRC32StringMBS(crc as UInt32, buf as string) as UInt32 13331
    - 79.5.8 CRC_32InMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13332
    - 79.5.9 CRC_32InMemMBS(address as Ptr, length as Integer) as UInt32 13332
    - 79.5.10 CRC_32OfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13332
    - 79.5.11 CRC_32OfStrMBS(s as String) as UInt32 13332
    - 79.5.12 CRC_CCITTInMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13334
    - 79.5.13 CRC_CCITTInMemMBS(address as Ptr, length as Integer) as UInt32 13334
    - 79.5.14 CRC_CCITTOfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13334
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    - 79.5.19 CRC_DillonUInt64OfStrMBS(bitWidth as Integer, s as String) as UInt64 13335
    - 79.5.29 CurrentUnixTimeMBS as UInt64 13340
    - 79.5.30 DecodeFromBase32MBS(data as string) as String 13340
    - 79.5.31 EncodeToBase32MBS(data as string) as String 13341
    - 79.5.20 GetHash32MBS(s as string) as UInt32 13335
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    - 79.5.25 MD5MBS(data as string) as string 13338
    - 79.5.23 MD5StringMBS(data as memoryblock) as string 13337
    - 79.5.26 MD5StringMBS(data as string) as string 13339

* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

- 23 **Calendar** 4365
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    - 23.3.3 addAlarm(alarm as CalAlarmMBS) 4372
    - 23.3.4 addAlarms(alarms() as CalAlarmMBS) 4372
    - 23.3.5 alarms as CalAlarmMBS() 4372
    - 23.3.6 Constructor 4372
    - 23.3.7 hasAlarm as Boolean 4373
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    - 23.3.16 Handle as Integer 4374
    - 23.3.17 notes as String 4375
    - 23.3.18 title as String 4375
    - 23.3.19 uid as String 4376
    - 23.3.20 URL as String 4377
  - 23.4.1 class CalCalendarMBS 4378
    - 23.4.3 Constructor 4378
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    - 23.5.6 Constructor 4384
    - 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
    - 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
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* 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388
* 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388
* 23.5.13 eventsMT(StartDate as date, EndDate as date, calendars() as CalCalendarMBS = nil) as CalEventMBS() 4389
* 23.5.14 eventWithUID(UID as string, occurrence as date) as CalEventMBS 4389
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* 23.5.16 removeEvent(theEvent as CalEventMBS, span as Integer, byref error as NSErrorMBS) as boolean 4391
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* 23.5.19 saveEvent(theEvent as CalEventMBS, span as Integer, byref error as NSErrorMBS) as boolean 4393
* 23.5.20 saveTask(task as CalTaskMBS, byref error as NSErrorMBS) as boolean 4393
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- 142 **Process** 19505
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    - 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
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- 23 **Calendar** 4365
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* 28.25.4 addCustomAggregateLabel(dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5094
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* 28.25.6 addCustomDataLabel(dataSet as Integer, dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5095
* 28.25.7 addCustomGroupLabel(dataGroup as Integer, dataItem as Integer, label as string, font as string =”", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5095
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* 28.25.9 addDataGroup(name as string) 5096
* 28.25.10 addDataSet(data as CDArrayMBS, colorvalue as color, name as string = ”") as CDDataSetMBS 5097
* 28.25.11 addDataSet(data as CDArrayMBS, colorvalue as Integer = -1, name as string = ”") as CDDataSetMBS 5097
* 28.25.12 addDataSet(data() as Double, colorvalue as color, name as string = ”") as CDDataSetMBS 5098
* 28.25.13 addDataSet(data() as Double, colorvalue as Integer = -1, name as string = ”") as CDDataSetMBS 5098
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* 28.25.21 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string 5102
* 28.25.22 getImageCoor(dataSet as Integer, dataItem as Integer = &h80000001, offsetX as Integer = 0, offsetY as Integer = 0) as string 5102
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* 28.25.24 getLegendIcon(dataSetNo as Integer) as string 5104
* 28.25.25 getNearestXValue(target as Double) as Double 5104
* 28.25.26 getXCoor(value as Double) as Integer 5105
* 28.25.27 getXIndexOf(xValue as Double, tolerance as Double = 0) as Integer 5105
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* 28.25.29 getYCoor(value as Double, axis as boolean=true) as Integer 5106
* 28.25.30 getYCoor(value as Double, axis as CDAxisMBS) as Integer 5106
* 28.25.31 moveBack(layer as CDLayerMBS=nil) 5107
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* 28.25.33 set3D(d as Integer = -1, zGap as Integer = 0) 5108
* 28.25.34 setAggregateLabelFormat(formatString as string) 5108
* 28.25.35 setAggregateLabelStyle(font as string = """, fontSize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5108
* 28.25.36 setAggregateLabelStyle(font as string, fontSize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS 5109
* 28.25.37 setBaseLine(BaseLine as Double) 5109
* 28.25.38 setBorderColor(colorvalue as color, lightingEffect as Integer = 0) 5110
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* 28.25.44 setHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """) 5113
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* 28.25.47 setLineWidth(w as Integer) 5115
* 28.25.48 setUseYAxis(axis as CDAxisMBS) 5116
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* 28.25.51 setXData(data() as Double) 5117

* 28.25.52 setXData(dates() as date) 5118
* 28.25.53 setXData(dates() as dateTime) 5119
* 28.25.54 setXData(minValue as Double, maxValue as Double) 5119
* 28.25.55 xZoneColor(threshold as Double, belowColor as color, aboveColor as color) as Integer 5120
* 28.25.56 xZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer) as Integer 5120
* 28.25.57 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as boolean=true) as Integer 5121
* 28.25.58 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS) as Integer 5122
* 186.3.1 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as boolean=true) as Integer 22276
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– 28.26.1 class CDLegendBoxMBS 5124

* 28.26.3 addKey(pos as Integer, text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5124
* 28.26.4 addKey(pos as Integer, text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
* 28.26.5 addKey(text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
* 28.26.6 addKey(text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5126
* 28.26.7 addText(pos as Integer, text as string) 5126
* 28.26.8 addText(text as string) 5126
* 28.26.9 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string 5127
* 28.26.10 getImageCoor(dataItem as Integer, offsetX as Integer = 0, offsetY as Integer = 0) as string 5127
* 28.26.11 setCols(noOfCols as Integer) 5128
* 28.26.12 setKeyBorder(edgeColor as color, raisedEffect as Integer = 0) 5128
* 28.26.13 setKeyBorder(edgeColor as Integer, raisedEffect as Integer = 0) 5129
* 28.26.14 setKeySize(width as Integer = -1, height as Integer = -1, gap as Integer = -1) 5129
* 28.26.15 setKeySpacing(keySpacing as Integer, lineSpacing as Integer = -1) 5129
* 28.26.16 setLineStyleKey(b as boolean=true) 5130
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– 28.27.1 class CDLinearMeterMBS 5132

* 28.27.3 addBar(startValue as Double, endValue as Double, colorvalue as color, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS 5132
* 28.27.4 addBar(startValue as Double, endValue as Double, colorvalue as Integer, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS 5133
* 28.27.5 addZone(startValue as Double, endValue as Double, colorvalue as color, label as string = """) as CDTextBoxMBS 5133

* 28.27.6 addZone(startValue as Double, endValue as Double, colorvalue as Integer, label as string = "") as CDTextBoxMBS 5133
* 28.27.7 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5134
* 28.27.8 Constructor(width as Integer, height as Integer, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5134
* 28.27.9 setMeter(leftX as Integer, topY as Integer, width as Integer, height as Integer, axisPos as Integer = 4, isReversed as boolean=false) 5135
* 28.27.10 setRail(railColor as color, railWidth as Integer = 2, railOffset as Integer = 6) 5135
* 28.27.11 setRail(railColor as Integer, railWidth as Integer = 2, railOffset as Integer = 6) 5136

– 28.28.1 class CDLineLayerMBS 5138
* 28.28.3 getLine(dataSet as Integer = 0) as CDLineObjMBS 5138
* 28.28.4 setFastLineMode(b as boolean = true) 5138
* 28.28.5 setGapColor(lineColor as color, lineWidth as Integer = -1) 5139
* 28.28.6 setGapColor(lineColor as Integer, lineWidth as Integer = -1) 5139
* 28.28.7 setImageMapWidth(Width as Integer) 5140
* 28.28.8 setSymbolScale(zDataX() as Double, scaleTypeX as Integer = 0) 5140
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– 28.29.1 class CDLineMBS 5143
* 28.29.3 setColor(c as color) 5143
* 28.29.4 setColor(c as Integer) 5143
* 28.29.5 setPos(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer) 5143
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– 28.30.1 class CDLineObjMBS 5145
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– 28.31.1 class CDMarkMBS 5146
* 28.31.3 getLine as CDLineObjMBS 5146
* 28.31.4 setDrawOnTop(b as boolean) 5146
* 28.31.5 setLineWidth(width as Integer) 5146
* 28.31.6 setMarkColor(lineColor as color, textColor as color, tickColor as color) 5147
* 28.31.7 setMarkColor(lineColor as Integer, textColor as Integer = -1, tickColor as Integer = -1) 5147
* 28.31.8 setValue(value as Double) 5147

– 28.32.1 class CDMeterPointerMBS 5148
* 28.32.3 setColor(fillColor as color, edgeColor as color) 5148
* 28.32.4 setColor(fillColor as Integer, edgeColor as Integer = -1) 5148
* 28.32.5 setPos(value as Double) 5149
* 28.32.6 setShape(pointerCoor() as Integer) 5149
* 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
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* 28.32.9 setShape(pointerType as Integer) 5152
* 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153
* 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154
* 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
* 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
* 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
* 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
* 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
* 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
* 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
* 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162

– 28.33.1 class CDMLTableMBS 5164

* 28.33.3 appendCol as CDTextBoxMBS 5164
* 28.33.4 appendRow as CDTextBoxMBS 5164
* 28.33.5 getCell(col as Integer, row as Integer) as CDTextBoxMBS 5164
* 28.33.6 getColCount as Integer 5164
* 28.33.7 getColStyle(col as Integer) as CDTextBoxMBS 5165
* 28.33.8 getColWidth(col as Integer) as Integer 5165
* 28.33.9 getHeight as Integer 5165
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* 28.33.11 getRowHeight(row as Integer) as Integer 5165
* 28.33.12 getRowStyle(row as Integer) as CDTextBoxMBS 5165
* 28.33.13 getStyle as CDTextBoxMBS 5166
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* 28.33.17 layout 5166
* 28.33.18 setCell(col as Integer, row as Integer, width as Integer, height as Integer, text as string) as CDTextBoxMBS 5166
* 28.33.19 setPos(x as Integer, y as Integer, alignment as Integer = 7) 5167
* 28.33.20 setText(col as Integer, row as Integer, text as string) as CDTextBoxMBS 5167

– 28.34.1 class CDMultiChartMBS 5168

* 28.34.3 addChart(x as Integer, y as Integer, c as CDBaseChartMBS) 5168
* 28.34.4 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5168
* 28.34.5 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5169

* 28.34.6 getChart(index as Integer) as CDBaseChartMBS 5169
* 28.34.7 getChartCount as Integer 5169
* 28.34.8 setMainChart(c as CDBaseChartMBS) 5170

– 28.35.1 class CDMultiPagePDFMBS 5171

* 28.35.3 addPage(chart as CDBaseChartMBS) 5171
* 28.35.4 addPage(DrawArea as CDDrawAreaMBS) 5171
* 28.35.5 Constructor 5172
* 28.35.6 outPDF as String 5172
* 28.35.7 outPDF(file as FolderItem) as Boolean 5172
* 28.35.8 outPDF(path as String) as Boolean 5173

– 28.37.1 class CDPieChartMBS 5175

* 28.37.3 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0) 5175
* 28.37.4 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as Integer = &hFFFF0000, edgeColor as Integer = &hFF000000, raisedEffect as Integer = 0) 5175
* 28.37.5 sector(sectorNo as Integer) as CDSectorMBS 5176
* 28.37.6 set3D(depth as Integer = -1, angle as Double = -1, shadowMode as boolean=false) 5176
* 28.37.7 set3D(depths() as Double, angle as Double = 45, shadowMode as boolean=false) 5177
* 28.37.8 setData(data() as Double) 5177
* 28.37.9 setData(data() as Double, label() as string) 5178
* 28.37.10 setDonutSize(x as Integer, y as Integer, r as Integer, r2 as Integer) 5178
* 28.37.11 setExplode(sectorNo as Integer, distance as Integer = -1) 5178
* 28.37.12 setExplodeGroup(startSector as Integer, endSector as Integer, distance as Integer = -1) 5179
* 28.37.13 setJoinLine(joinLineColor as color, joinLineWidth as Integer = -1) 5179
* 28.37.14 setJoinLine(joinLineColor as Integer, joinLineWidth as Integer = -1) 5179
* 28.37.15 setLabelFormat(formatString as string) 5180
* 28.37.16 setLabelLayout(layoutMethod as Integer, pos as Integer = -1, topBound as Integer = -1, bottomBound as Integer = -1) 5181
* 28.37.17 setLabelPos(pos as Integer, joinLineColor as color) 5182
* 110.6.57 setLabelPos(pos as Integer, joinLineColor as Integer = -1) 16681
* 28.37.19 setLabelStyle(font as string = """, fontsize as Double = 8, fontColor as Integer = &hffff0002) as CDTextBoxMBS 5183
* 28.37.20 setLabelStyle(font as string, fontsize as Double, fontColor as color) as CDTextBoxMBS 5184
* 28.37.21 setLineColor(edgeColor as color, joinLineColor as color) 5184
* 28.37.22 setLineColor(edgeColor as Integer, joinLineColor as Integer = -1) 5184
* 28.37.23 setPieSize(x as Integer, y as Integer, r as Integer) 5185
* 28.37.24 setSectorStyle(shadingMethod as Integer, edgeColor as color, edgeWidth as Integer = -1) 5185
* 28.37.25 setSectorStyle(shadingMethod as Integer, edgeColor as Integer = -1, edgeWidth as Integer = -1) 5185

* 28.37.26 setStartAngle(startAngle as Double, clockWise as boolean=true) 5186

– 28.38.1 class CDPlotAreaMBS 5190

* 28.38.3 Constructor 5190
* 28.38.4 getBottomY as Integer 5190
* 28.38.5 getHeight as Integer 5190
* 28.38.6 getLeftX as Integer 5191
* 28.38.7 getRightX as Integer 5191
* 28.38.8 getTopY as Integer 5191
* 28.38.9 getWidth as Integer 5191
* 28.38.10 moveGridBefore(layer as CDLayerMBS=nil) 5191
* 28.38.11 set4QBgColor(Q1Color as color, Q2Color as color, Q3Color as color, Q4Color as color, edgeColor as color) 5192
* 28.38.12 set4QBgColor(Q1Color as Integer, Q2Color as Integer, Q3Color as Integer, Q4Color as Integer, edgeColor as Integer = -1) 5192
* 190.2.1 setAltBgColor(horizontal as Boolean, color1 as color, color2 as color, edgeColor as color) 22658
* 190.3.5 setAltBgColor(horizontal as Boolean, color1 as Integer, color2 as Integer, edgeColor as Integer = -1) 22661
* 28.38.15 setBackground(colorvalue as color, altBgColor as color, edgeColor as color) 5193
* 28.38.16 setBackground(colorvalue as Integer, altBgColor as Integer = -1, edgeColor as Integer = -1) 5194
* 28.38.17 setBackground(file as folderitem, align as Integer = 5) 5194
* 28.38.18 setGridAxis(xGridAxis as CDAxisMBS, yGridAxis as CDAxisMBS) 5195
* 28.38.19 setGridColor(hGridColor as color, vGridColor as color, minorHGridColor as color, minorVGridColor as color) 5195
* 28.38.20 setGridColor(hGridColor as Integer, vGridColor as Integer = &hff000000, minorHGridColor as Integer = -1, minorVGridColor as Integer = -1) 5195
* 28.38.21 setGridWidth(hGridWidth as Integer, vGridWidth as Integer = -1, minorHGridWidth as Integer = -1, minorVGridWidth as Integer = -1) 5196

– 28.40.1 class CDPolarChartMBS 5198

* 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198
* 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
* 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
* 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
* 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201
* 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201
* 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202

* 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
* 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203
* 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
* 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204
* 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205
* 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205
* 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
* 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
* 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
* 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208
* 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208
* 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209
* 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
* 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210
* 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
* 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211
* 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211
* 28.40.27 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDPolarVectorLayerMBS 5212
* 28.40.28 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDPolarVectorLayerMBS 5213
* 28.40.29 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5213
* 28.40.30 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5214
* 28.40.31 getXCoor(r as Double, a as Double) as Integer 5214

* 28.40.32 getYCoor(r as Double, a as Double) as Integer 5215
* 28.40.33 setGridColor(rGridColor as color, rGridWidth as Integer, aGridColor as color, aGridWidth as Integer = 1) 5215
* 28.40.34 setGridColor(rGridColor as Integer = &h80000000, rGridWidth as Integer = 1, aGridColor as Integer = &h80000000, aGridWidth as Integer = 1) 5215
* 28.40.35 setGridStyle(polygonGrid as boolean, gridOnTop as boolean=true) 5216
* 28.40.36 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as color, edgeColor as color, edgeWidth as Integer = 1) 5216
* 28.40.37 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000, edgeWidth as Integer = 1) 5216
* 28.40.38 setPlotAreaBg(bgColor1 as color, bgColor2 as color, altRings as boolean = true) 5217
* 28.40.39 setPlotAreaBg(bgColor1 as Integer, bgColor2 as Integer, altRings as boolean = true) 5217
* 28.40.40 setStartAngle(startAngle as Double, clockwise as boolean=true) 5217
* 28.40.42 angularAxis as CDAngularAxisMBS 5218
* 28.40.43 radialAxis as CDRadialAxisMBS 5218

– 28.41.1 class CDPolarLayerMBS 5222

* 28.41.3 addCustomDataLabel(i as Integer, label as string, font as string = """, fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5222
* 28.41.4 addCustomDataLabel(i as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5223
* 28.41.5 Constructor 5223
* 28.41.6 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string 5223
* 28.41.7 getImageCoor(dataItem as Integer, offsetX as Integer = 0, offsetY as Integer = 0) as string 5224
* 28.41.8 setAngles(data() as Double) 5225
* 28.41.9 setBorderColor(edgeColor as color) 5225
* 28.41.10 setBorderColor(edgeColor as Integer) 5225
* 28.41.11 setData(data() as Double, colorvalue as color, name as string = """) 5226
* 28.41.12 setData(data() as Double, colorvalue as Integer = -1, name as string = """) 5226
* 28.41.13 setDataLabelFormat(formatString as string) 5226
* 28.41.14 setDataLabelStyle(font as string = """, fontsize as Double = 8, fontcolor as Integer = 0, fontangle as Double = 0) as CDTextBoxMBS 5226
* 28.41.15 setDataLabelStyle(font as string, fontsize as Double, fontcolor as color, fontangle as Double = 0) as CDTextBoxMBS 5227
* 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
* 28.41.17 setDataSymbol(image as folderitem) 5228
* 28.41.18 setDataSymbol(pic as Picture) 5228
* 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229

* 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
* 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230
* 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231
* 28.41.23 setHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """) 5231
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* 28.66.13 getValueAtViewPort(id as string, ratio as Double, isLogScale as boolean = false) as Double 5374
* 28.66.14 getViewPortAtValue(id as string, ratio as Double, isLogScale as boolean = false) as Double 5374
* 28.66.15 getViewPortHeight as Double 5375
* 28.66.16 getViewPortLeft as Double 5375
* 28.66.17 getViewPortTop as Double 5375
* 28.66.18 getViewPortWidth as Double 5375
* 28.66.19 getZoomInHeightLimit as Double 5376
* 28.66.20 getZoomInWidthLimit as Double 5376
* 28.66.21 getZoomOutHeightLimit as Double 5376
* 28.66.22 getZoomOutWidthLimit as Double 5376
* 28.66.23 getZoomXYRatio as double 5376
* 28.66.24 inExtendedPlotArea(x as Integer, y as Integer) as boolean 5376
* 28.66.25 inPlotArea(x as double, y as double) as boolean 5377
* 28.66.26 setChartMetrics(metrics as string) 5377
* 28.66.27 setFullRange(ID as string, minValue as Double, maxValue as Double) 5377
* 28.66.28 setKeepAspectRatio(value as boolean) 5378
* 28.66.29 setPlotAreaMouseMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer) 5378
* 28.66.30 setViewPortHeight(value as Double) 5378
* 28.66.31 setViewPortLeft(value as Double) 5379

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* 28.66.36 setZoomOutHeightLimit(value as Double) 5380
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* 196.6.10 syncLinearAxisWithViewPort(id as string, axis as CDAxisMBS) 23449
* 28.66.41 syncLogAxisWithViewPort(id as string, axis as CDAxisMBS) 5382
* 28.66.42 updateFullRangeH(id as string, minValue as Double, maxValue as Double, updateType as Integer) as boolean 5383
* 28.66.43 updateFullRangeV(id as string, minValue as Double, maxValue as Double, updateType as Integer) as boolean 5383
* 28.66.44 validateViewPort 5383
* 28.66.45 zoomAround(x as double, y as double, xZoomRatio as double, yZoomRatio as double) as boolean 5384
* 28.66.46 zoomAt(zoomDirection as integer, x as double, y as double, zoomRatio as double) as boolean 5384
* 28.66.47 zoomTo(zoomDirection as integer, x1 as double, y1 as double, x2 as double, y2 as double) as boolean 5384

– 28.67.1 class CDXYChartMBS 5386

* 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5386
* 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5387
* 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
* 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
* 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
* 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390
* 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391
* 28.67.10 addAxis(align as Integer, offset as Integer) as CDAxisMBS 5391
* 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
* 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
* 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393

* 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
* 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5395
* 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5396
* 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396
* 28.67.18 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as color, name as string = """) as CDBoxWhiskerLayerMBS 5398
* 28.67.19 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as Integer = -1, name as string = """) as CDBoxWhiskerLayerMBS 5398
* 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5398
* 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5400
* 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5402
* 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS 5404
* 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS 5404
* 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
* 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
* 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
* 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410
* 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
* 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
* 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412
* 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

* 28.67.33 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as color, fallColor as color, edgeColor as color) as CDCandleStickLayerMBS 5415
* 28.67.34 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as Integer = -1, fallColor as Integer = 0, edgeColor as Integer = &hffff0001) as CDCandleStickLayerMBS 5415
* 28.67.35 addContourLayer(xData() as Double, yData() as Double, zData() as Double) as CDContourLayerMBS 5416
* 28.67.36 addDiscreteHeatMapLayer(xGrid() as double, yGrid() as Double, zData() as Double) as CDDiscreteHeatMapLayerMBS 5417
* 28.67.37 addDiscreteHeatMapLayer(zData() as Double, xCount as Integer) as CDDiscrete-HeatMapLayerMBS 5417
* 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
* 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
* 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
* 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
* 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
* 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
* 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
* 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
* 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426
* 28.67.47 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as color, color21 as color) as CDInterLineLayerMBS 5428
* 28.67.48 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as Integer, color21 as Integer = -1) as CDInterLineLayerMBS 5428
* 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5429
* 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5429
* 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5430
* 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5430

* 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431
* 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = "") as CDLineLayerMBS 5432
* 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
* 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
* 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
* 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
* 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
* 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
* 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
* 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
* 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
* 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
* 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
* 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
* 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
* 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447
* 28.67.69 addSplineLayer as CDSplineLayerMBS 5448

* 28.67.70 addSplineLayer(data() as Double, colorvalue as color, name as string = "") as CDSplineLayerMBS 5448
* 28.67.71 addSplineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDSplineLayerMBS 5449
* 28.67.72 addStepLineLayer as CDStepLineLayerMBS 5449
* 28.67.73 addStepLineLayer(data() as Double, colorvalue as color, name as string = "") as CDStepLineLayerMBS 5450
* 28.67.74 addStepLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDStepLineLayerMBS 5450
* 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
* 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
* 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
* 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
* 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
* 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
* 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
* 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
* 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
* 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
* 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
* 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
* 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461
* 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5463
* 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS 23551
* 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5464

* 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464
* 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466
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* 28.67.94 Constructor(width as Integer, height as Integer, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0) 5467
* 28.67.95 getLayer(i as Integer) as CDLayerMBS 5467
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* 28.67.103 getYValue(yCoor as Integer, axis as CDAxisMBS = nil) as Double 5471
* 28.67.104 layoutAxes 5471
* 28.67.105 packPlotArea(leftX as Integer, topY as Integer, rightX as Integer, bottomY as Integer, minWidth as Integer = 0, minHeight as Integer = 0) 5471
* 28.67.106 setAxisAtOrigin(originMode as Integer = 3, symmetryMode as Integer = 0) 5472
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* 28.67.108 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as color, altBgColor as color, edgeColor as color, hGridColor as color, vGridColor as color) as CDPlotAreaMBS 5474
* 28.67.109 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as Integer = &hff000000, altBgColor as Integer = -1, edgeColor as Integer = -1, hGridColor as Integer = &hc0c0c0, vGridColor as Integer = &hff000000) as CDPlotAreaMBS 5474
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* 28.67.119 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS=nil) as Integer 5479

* 28.67.120 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS=nil) as Integer 5479
* 28.67.122 xAxis as CDAxisMBS 5480
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- 55 **CoreFoundation Network** 8841
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- 54 **CoreFoundation** 8651
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- 55 **CoreFoundation Network** 8841
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- 54 **CoreFoundation** 8651
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- 55 **CoreFoundation Network** 8841
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- 54 **CoreFoundation** 8651
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- 55 **CoreFoundation Network** 8841
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- 54 **CoreFoundation** 8651
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    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
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    - 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32 13340
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    - 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
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    - 79.5.22 MD5MBS(data as memoryblock) as string 13337
    - 79.5.25 MD5MBS(data as string) as string 13338
    - 79.5.23 MD5StringMBS(data as memoryblock) as string 13337
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* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

- 48 **Compression** 8339
  - **??** Globals **??**
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    - 48.1.7 CompressLZWMBS(buf as string) as string 8342
    - 48.1.3 CompressZLibMBS(buf as string, level as Integer = 9) as string 8340
    - 48.1.4 CompressZLibMBS(buf as string, level as Integer, byref error as Integer) as string 8340
    - 48.1.2 DecompressBZip2MBS(buf as string,size as Integer) as string 8339
    - 48.1.8 DecompressLZWMBS(buf as string, size as Integer) as string 8343
    - 48.1.5 DecompressZLibMBS(buf as string, size as Integer = 0) as string 8341
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- 79 **Encryption and Hash** 13295
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    - 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.4 Adler32StringMBS(adler as UInt32, buf as string) as UInt32 13330
    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
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* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

- 48 **Compression** 8339
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    - 48.1.1 CompressBZip2MBS(buf as string,level as Integer) as string 8339
    - 48.1.7 CompressLZWMBS(buf as string) as string 8342
    - 48.1.3 CompressZLibMBS(buf as string, level as Integer = 9) as string 8340
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- 54 **CoreFoundation** 8651
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- 33 **Cocoa** 5817
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- 142 **Process** 19505
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- 162 **Shell** 20755
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- 35 **Cocoa Controls** 6603
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- 52 **CoreAnimation** 8619
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- 51 **Controls** 8567
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- 35 **Cocoa Controls** 6603
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- 51 **Controls** 8567
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* 14.4.60 kAudioDevicePropertyDeviceCanBeDefaultDevice as String 2995
* 14.4.61 kAudioDevicePropertyDeviceCanBeDefaultSystemDevice as String 2995
* 14.4.62 kAudioDevicePropertyDeviceIsAlive as String 2995
* 14.4.63 kAudioDevicePropertyDeviceIsRunning as String 2995
* 14.4.64 kAudioDevicePropertyDeviceIsRunningSomewhere as String 2995
* 14.4.65 kAudioDevicePropertyDeviceManufacturer as String 2996
* 14.4.66 kAudioDevicePropertyDeviceManufacturerCFString as String 2996
* 14.4.67 kAudioDevicePropertyDeviceName as String 2997
* 14.4.68 kAudioDevicePropertyDeviceNameCFString as String 2997
* 14.4.69 kAudioDevicePropertyDeviceUID as String 2997
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* 14.4.71 kAudioDevicePropertyHogMode as String 2998
* 14.4.72 kAudioDevicePropertyIOProcStreamUsage as String 2998
* 14.4.73 kAudioDevicePropertyJackIsConnected as String 2998
* 14.4.74 kAudioDevicePropertyLatency as String 2998
* 14.4.75 kAudioDevicePropertyMute as String 2999
* 14.4.76 kAudioDevicePropertyNominalSampleRate as String 2999
* 14.4.77 kAudioDevicePropertyPlayThru as String 2999
* 14.4.78 kAudioDevicePropertyPlugIn as String 2999
* 14.4.79 kAudioDevicePropertyPreferredChannelsForStereo as String 2999
* 14.4.80 kAudioDevicePropertyRegisterBufferList as String 2999
* 14.4.81 kAudioDevicePropertySafetyOffset as String 3000
* 14.4.82 kAudioDevicePropertyStreamConfiguration as String 3000
* 14.4.83 kAudioDevicePropertyStreamFormat as String 3000
* 14.4.84 kAudioDevicePropertyStreamFormatMatch as String 3000
* 14.4.85 kAudioDevicePropertyStreamFormats as String 3000
* 14.4.86 kAudioDevicePropertyStreamFormatSupported as String 3001

* 14.4.87 kAudioDevicePropertyStreams as String 3001
* 14.4.88 kAudioDevicePropertySubMute as String 3001
* 14.4.89 kAudioDevicePropertySubVolumeDecibels as String 3001
* 14.4.90 kAudioDevicePropertySubVolumeDecibelsToScalar as String 3001
* 14.4.91 kAudioDevicePropertySubVolumeRangeDecibels as String 3001
* 14.4.92 kAudioDevicePropertySubVolumeScalar as String 3002
* 14.4.93 kAudioDevicePropertySubVolumeScalarToDecibels as String 3002
* 14.4.94 kAudioDevicePropertySupportsMixing as String 3002
* 14.4.95 kAudioDevicePropertyTransportType as String 3002
* 14.4.96 kAudioDevicePropertyUsesVariableBufferFrameSizes as String 3002
* 14.4.97 kAudioDevicePropertyVolumeDecibels as String 3003
* 14.4.98 kAudioDevicePropertyVolumeDecibelsToScalar as String 3003
* 14.4.99 kAudioDevicePropertyVolumeRangeDecibels as String 3003
* 14.4.100 kAudioDevicePropertyVolumeScalar as String 3003
* 14.4.101 kAudioDevicePropertyVolumeScalarToDecibels as String 3004
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* 14.4.105 kAudioHardwarePropertyBootChimeVolumeScalar as String 3005
* 14.4.106 kAudioHardwarePropertyBootChimeVolumeScalarToDecibels as String 3005
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* 14.4.108 kAudioHardwarePropertyDefaultOutputDevice as String 3006
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* 14.4.110 kAudioHardwarePropertyDeviceForUID as String 3006
* 14.4.111 kAudioHardwarePropertyDevices as String 3006
* 14.4.112 kAudioHardwarePropertyRunLoop as String 3007
* 14.4.113 kAudioHardwarePropertySleepingIsAllowed as String 3007
* 14.4.114 kAudioHardwarePropertyUnloadingIsAllowed as String 3007
* 14.4.115 kAudioPropertyWildcardChannel as Integer 3007
* 14.4.116 kAudioPropertyWildcardPropertyID as String 3008
* 14.4.117 kAudioPropertyWildcardSection as Integer 3008
* 14.4.118 kAudioStreamPropertyDirection as String 3008
* 14.4.119 kAudioStreamPropertyOwningDevice as String 3008
* 14.4.120 kAudioStreamPropertyPhysicalFormat as String 3008
* 14.4.121 kAudioStreamPropertyPhysicalFormatMatch as String 3008
* 14.4.122 kAudioStreamPropertyPhysicalFormats as String 3009
* 14.4.123 kAudioStreamPropertyPhysicalFormatSupported as String 3009
* 14.4.124 kAudioStreamPropertyStartingChannel as String 3009
* 14.4.125 kAudioStreamPropertyTerminalType as String 3009
* 14.4.126 Lasterror as Integer 3009

– 14.5.1 class CoreAudioPlayerMBS 3010

* 14.5.3 AddAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean 3010
* 14.5.4 AddAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean 3011
* 14.5.5 AddFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean 3011
* 14.5.6 AddFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean 3012
* 14.5.7 Close 3012
* 14.5.8 FreeSpace as Integer 3013
* 14.5.9 HardwareNumberOfChannels as Integer 3013
* 14.5.10 HardwareSampleRate as single 3013
* 14.5.11 HasFreeSpace as boolean 3013
* 14.5.12 PlayAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean 3014
* 14.5.13 PlayAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean 3014
* 14.5.14 PlayFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean 3015
* 14.5.15 PlayFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean 3016
* 14.5.16 Start as boolean 3016
* 14.5.17 Stop 3016
* 14.5.19 HadUnderflow as Boolean 3017
* 14.5.20 IsRunning as Boolean 3017
* 14.5.21 NoUnderflow as Boolean 3017
* 14.5.22 NumberOfChannels as Integer 3017
* 14.5.23 OutputDeviceID as Integer 3017
* 14.5.24 OutputPosition as Double 3018
* 14.5.25 OutputPositionRelative as Double 3018
* 14.5.26 SampleRate as Single 3018

- 54 **CoreFoundation** 8651
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    - 54.1.9 CFShowMBS(cfobject as CFObjectMBS) 8654
    - 54.1.10 CreateBundleMBS(file as folderitem) as CFBundleMBS 8654
    - 54.1.11 CreateBundleMBS(url as CFURLMBS) as CFBundleMBS 8655
    - 54.1.12 CreateBundlesFromDirectoryMBS(url as CFURLMBS, type as CFStringMBS) as CFArrayMBS 8655
    - 54.1.13 CreateCFTimeZoneMBS(name as CFStringMBS, data as CFBinaryDataMBS) as CFTimeZoneMBS 8656
    - 54.1.14 CreateCFTimeZoneMBSwithName(name as CFStringMBS, TryAbbrev as boolean) as CFTimeZoneMBS 8656
    - 54.1.15 CreateCFTimeZoneMBSwithTimeIntervalFromGMT(time as CFTimeIntervalMBS) as CFTimeZoneMBS 8656
    - 54.1.16 CreateStringByAddingPercentEscapesMBS(original as CFStringMBS,charactersToLeaveEscaped as CFStringMBS,legalURLCharactersToBeEscaped as CFStringMBS,encoding as Integer) as CFStringMBS 8656
    - 54.1.17 CreateStringByReplacingPercentEscapesMBS(original as CFStringMBS,charactersToLeaveEscaped as CFStringMBS) as CFStringMBS 8657
    - 54.1.18 CurrentCFAbsoluteTimeMBS as CFAbsoluteTimeMBS 8657
    - 54.1.19 GetAllBundlesMBS as CFArrayMBS 8657
    - 54.1.20 GetBundleWithIdentifierMBS(id as CFStringMBS) as CFBundleMBS 8657
    - 54.1.21 GetDefaultCFTimeZoneMBS as CFTimeZoneMBS 8658
    - 54.1.22 kCFArrayMBSTypeID as Integer 8658
    - 54.1.23 kCFBagMBSTypeID as Integer 8658
    - 54.1.24 kCFBinaryDataMBSTypeID as Integer 8658
    - 54.1.25 kCFBooleanMBSTypeID as Integer 8659
    - 54.1.26 kCFBundleMBSTypeID as Integer 8659
    - 54.1.4 kCFCharacterSetMBSTypeID as Integer 8652
    - 54.1.27 kCFDateMBSTypeID as Integer 8659
    - 54.1.28 kCFDictionaryMBSTypeID as Integer 8659
    - 54.1.29 kCFNumberMBSNaN as CFNumberMBS 8659
    - 54.1.30 kCFNumberMBSNegativeInfinity as CFNumberMBS 8659
    - 54.1.31 kCFNumberMBSPositiveInfinity as CFNumberMBS 8660
    - 54.1.32 kCFNumberMBSTypeID as Integer 8660
    - 54.1.33 kCFSetMBSTypeID as Integer 8660
    - 54.1.34 kCFStringMBSTypeID as Integer 8660
    - 54.1.35 kCFTimeZoneMBSTypeID as Integer 8660
    - 54.1.36 kCFURLMBSTypeID as Integer 8660
    - 54.1.37 KnownTimeZoneNamesAsCFArrayMBS as CFArrayMBS 8661
    - 54.1.38 MacShowAboutBoxMBS(options as CFDictionaryMBS) as Integer 8661
    - 54.1.39 NewCFAbsoluteTimeMBS(time as Double) as CFAbsoluteTimeMBS 8662

* 54.1.40 NewCFBinaryDataMBSMem(mem as memoryblock,len as Integer) as CFBinaryDataMBS 8662
* 54.1.41 NewCFBinaryDataMBSStr(s as string) as CFBinaryDataMBS 8663
* 54.1.42 NewCFBooleanMBS(value as boolean) as CFBooleanMBS 8663
* 54.1.43 NewCFDateMBS as CFDateMBS 8664
* 54.1.44 NewCFMutableArrayMBS as CFMutableArrayMBS 8664
* 54.1.45 NewCFMutableBagMBS as CFMutableBagMBS 8664
* 54.1.46 NewCFMutableBinaryDataMBSMem(len as Integer) as CFMutableBinaryDataMBS 8664
* 54.1.47 NewCFMutableDictionaryMBS as CFMutableDictionaryMBS 8664
* 54.1.48 NewCFMutableSetMBS as CFMutableSetMBS 8665
* 54.1.49 NewCFNumberMBSDouble(doubleValue as Double) as CFNumberMBS 8665
* 54.1.50 NewCFNumberMBSInteger(integerValue as Integer) as CFNumberMBS 8665
* 54.1.51 NewCFNumberMBSSingle(singleValue as single) as CFNumberMBS 8665
* 54.1.52 NewCFObjectMBS(handle as Integer) as CFObjectMBS 8665
* 54.1.53 NewCFObjectMBSFromXML(XMLdata as CFBinaryDataMBS) as CFObjectMBS 8666
* 54.1.1 NewCFObjectMBSFromXML(XMLdata as MemoryBlock) as CFObjectMBS 8651
* 54.1.2 NewCFObjectMBSFromXML(XMLdata as String) as CFObjectMBS 8651
* 54.1.5 NewCFObjectMBSFromXMLMT(data as string) as CFObjectMBS 8652
* 54.1.6 NewCFObjectMBSFromXMLMT(file as folderitem) as CFObjectMBS 8652
* 54.1.7 NewCFObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CFObjectMBS 8653
* 54.1.54 NewCFStringMBS(s as string) as CFStringMBS 8667
* 54.1.3 NewCFStringMBS2(s as string) as CFStringMBS 8651
* 54.1.55 NewCFTimeIntervalMBS(time as Double) as CFTimeIntervalMBS 8667
* 54.1.56 NewCFURLMBSCFStringMBS(cfstr as CFStringMBS, baseurl as CFURLMBS) as CFURLMBS 8667
* 54.1.57 NewCFURLMBSFile(f as folderitem) as CFURLMBS 8667
* 54.1.58 NewCFURLMBSHFSPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS 8668
* 54.1.59 NewCFURLMBSMem(mem as memoryblock,len as Integer,encoding as Integer,baseurl as CFURLMBS) as CFURLMBS 8668
* 54.1.60 NewCFURLMBSPosixPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS 8668
* 54.1.61 NewCFURLMBSStr(str as string, baseurl as CFURLMBS) as CFURLMBS 8668
* 54.1.62 NewCFURLMBSWindowsPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS 8669
* 54.1.63 SetDefaultCFTimeZoneMBS(timezone as CFTimeZoneMBS) 8669
* 54.1.64 SystemCFTimeZoneMBS as CFTimeZoneMBS 8669
* 54.1.65 TypeIDDescriptionMBS(TypeID as Integer) as CFStringMBS 8669

- 56 **CoreGraphics** 8881
  - **??** Globals **??**
    - 56.1.4 CGBitmapContextCreateMBS(data as memoryblock, width as Integer, height as Integer, bitsPerComponent as Integer, bytesPerRow as Integer, colorspace as CGColorSpaceMBS, alphaInfo as Integer) as CGBitmapContextMBS 8883
    - 56.1.8 CGCreateImageFromJPEGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS 8887
    - 56.1.9 CGCreateImageFromPNGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS 8888
    - 56.1.10 CGCreateImageMBS(pic as picture) as CGImageMBS 8889
    - 56.1.11 CGCreateImageMBS(pic as picture, mask as picture) as CGImageMBS 8889
    - 56.1.12 CGMakePointMBS(x as Double, y as Double) as CGPointMBS 8890
    - 56.1.13 CGMakeRectMBS(left as Double, top as Double, width as Double, height as Double) as CGRectMBS 8890
    - 56.1.14 CGMakeSizeMBS(width as Double, height as Double) as CGSizeMBS 8890
    - 56.1.15 CGNewPDFDocumentMBS(consumer as CGDataConsumerMBS, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 8891
    - 56.1.16 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 8891
    - 56.1.1 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 8881
    - 56.1.2 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 8882
    - 56.1.5 CGOpenPDFDocumentMBS(dataprovider as CGDataProviderMBS) as CGPDFDocumentMBS 8884
    - 56.1.17 CGOpenPDFDocumentMBS(file as folderitem) as CGPDFDocumentMBS 8891
    - 56.1.18 CGSessionMBS as CGSessionMBS 8891
    - 56.1.6 CGShadingCreateAxialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, endPoint as CGPointMBS, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS 8885
    - 56.1.7 CGShadingCreateRadialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, startRadius as Double, endPoint as CGPointMBS, endRadius as Double, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS 8886
    - 56.1.3 GetCurrentCGContextMBS as CGContextMBS 8882

- 61 **CoreText** 10825
  - 61.1.1 class CoreTextMBS 10825
    - 61.1.3 AvailableFontFamilyNames as string() 10825
    - 61.1.4 AvailableFontURLs as string() 10825
    - 61.1.5 AvailablePostScriptNames as string() 10826
    - 61.1.6 CompareFontFamilyNames(name1 as string, name2 as string) as Integer 10826
    - 61.1.7 Constructor 10826
    - 61.1.8 CoreTextVersion as Integer 10826
    - 61.1.9 CreateFontDescriptorFromData(data as memoryblock) as CTFontDescriptorMBS 10827
    - 61.1.10 CreateFontDescriptorFromData(data as string) as CTFontDescriptorMBS 10827
    - 61.1.11 CreateFontDescriptorsFromFile(file as folderitem) as CTFontDescriptorMBS() 10827
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    - 61.1.13 Destructor 10828
    - 61.1.14 EnableFontDescriptors(descriptors() as CTFontDescriptorMBS, enable as boolean) 10828
    - 61.1.15 GetScopeForFile(file as folderitem) as Integer 10828
    - 61.1.16 GetScopeForURL(URL as string) as Integer 10829
    - 61.1.17 IsSupportedFontFile(file as folderitem) as boolean 10829
    - 61.1.18 IsSupportedFontURL(URL as string) as boolean 10829
    - 61.1.19 kCTBaselineClassAttributeName as string 10829
    - 61.1.20 kCTBaselineInfoAttributeName as string 10829
    - 61.1.21 kCTBaselineReferenceInfoAttributeName as string 10830
    - 61.1.22 kCTCharacterShapeAttributeName as string 10830
    - 61.1.23 kCTFontAttributeName as string 10830
    - 61.1.24 kCTFontManagerBundleIdentifier as string 10830
    - 61.1.25 kCTFontManagerErrorDomain as string 10831
    - 61.1.26 kCTFontManagerErrorFontURLsKey as string 10831
    - 61.1.27 kCTFontManagerRegisteredFontsChangedNotification as string 10831
    - 61.1.28 kCTFontSlantTrait as string 10831
    - 61.1.29 kCTFontSymbolicTrait as string 10831
    - 61.1.30 kCTFontWeightTrait as string 10832
    - 61.1.31 kCTFontWidthTrait as string 10832
    - 61.1.32 kCTForegroundColorAttributeName as string 10832
    - 61.1.33 kCTForegroundColorFromContextAttributeName as string 10832
    - 61.1.34 kCTGlyphInfoAttributeName as string 10833
    - 61.1.35 kCTKernAttributeName as string 10833
    - 61.1.36 kCTLanguageAttributeName as string 10833
    - 61.1.37 kCTLigatureAttributeName as string 10833
    - 61.1.38 kCTParagraphStyleAttributeName as string 10834
    - 61.1.39 kCTRunDelegateAttributeName as string 10834
    - 61.1.40 kCTStrokeColorAttributeName as string 10834

* 61.1.41 kCTStrokeWidthAttributeName as string 10835
* 61.1.42 kCTSuperscriptAttributeName as string 10835
* 61.1.43 kCTUnderlineColorAttributeName as string 10835
* 61.1.44 kCTUnderlineStyleAttributeName as string 10835
* 61.1.45 kCTVerticalFormsAttributeName as string 10835
* 61.1.46 kCTWritingDirectionAttributeName as string 10836
* 61.1.47 MatchFontDescriptorsWithProgressHandler(descriptors() as CTFontDescriptorMBS, mandatoryAttributes() as string, tag as Variant = nil) as boolean 10836
* 61.1.48 RegisterFontsForFile(file as folderitem, scope as Integer, byref error as CFErrorMBS) as boolean 10837
* 61.1.49 RegisterFontsForFiles(files() as folderitem, scope as Integer, errors() as CFErrorMBS) as boolean 10837
* 61.1.50 RegisterFontsForURL(URL as string, scope as Integer, byref error as CFErrorMBS) as boolean 10837
* 61.1.51 RegisterFontsForURL(URLs() as string, scope as Integer, errors() as CFErrorMBS) as boolean 10838
* 61.1.52 RegisterGraphicsFont(font as CGFontMBS, byref error as CFErrorMBS) as boolean 10838
* 61.1.53 UnregisterFontsForFile(file as folderitem, scope as Integer, byref error as CFErrorMBS) as boolean 10839
* 61.1.54 UnregisterFontsForFiles(files() as folderitem, scope as Integer, errors() as CFErrorMBS) as boolean 10839
* 61.1.55 UnregisterFontsForURL(URL as string, scope as Integer, byref error as CFErrorMBS) as boolean 10839
* 61.1.56 UnregisterFontsForURLs(URLs() as string, scope as Integer, errors() as CFErrorMBS) as boolean 10840
* 61.1.57 UnregisterGraphicsFont(font as CGFontMBS, byref error as CFErrorMBS) as boolean 10840
* 61.1.59 AutoActivationSetting(BundleID as string) as Integer 10840
* 61.1.61 FontCollectionSortDescriptors(first as CTFontDescriptorMBS, second as CTFontDescriptorMBS, tag as Variant) as Integer 10841
* 61.1.62 Progress(state as Integer, progressParameter as Dictionary, tag as Variant) as boolean 10841

- 141 **Printing** 19375
  - 141.2.1 class CPMLanguageInfoMBS 19377
    - 141.2.3 Level as String 19377
    - 141.2.4 Release as String 19377
    - 141.2.5 Version as String 19377
  - 141.3.1 class CPMPageFormatMBS 19379
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    - 141.3.4 AdjustedPaperSize as CPMRectMBS 19379
    - 141.3.5 Constructor 19379
    - 141.3.6 CopySettings(Destination as CPMPageFormatMBS) 19379
    - 141.3.7 CreateDataRepresentation(Format as Integer = 0) as String 19379
    - 141.3.8 CreateWithDataRepresentation(Data as String) as CPMPageFormatMBS 19380
    - 141.3.9 PrinterID as String 19380
    - 141.3.10 UnadjustedPageSize as CPMRectMBS 19381
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    - 141.3.13 handle as Integer 19381
    - 141.3.14 Lasterror as Integer 19381
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    - 141.4.14 IsDefault as boolean 19387
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* 141.4.24 SetDefault 19390
* 141.4.25 State as Integer 19390
* 141.4.27 handle as Integer 19390
* 141.4.28 Lasterror as Integer 19390
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– 141.5.1 class CPMPrintSessionMBS 19392

* 141.5.3 BeginDocument(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS) 19392
* 141.5.4 BeginDocumentNoDialog(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS) 19392
* 141.5.5 BeginPage(pageformat as CPMPageFormatMBS, rect as CPMRectMBS) 19392
* 141.5.6 BeginPageNoDialog(pageformat as CPMPageFormatMBS, rect as CPMRectMBS) 19393
* 141.5.7 Constructor 19393
* 141.5.8 CreatePrinterList(list() as string) 19393
* 141.5.9 CreatePrinterList(list() as string, byref index as Integer, byref currentprinter as CPMPrinterMBS) 19393
* 141.5.10 DefaultPageFormat(pageformat as CPMPageFormatMBS) 19394
* 141.5.11 DefaultPrintSettings(printsettings as CPMPrintSettingsMBS) 19394
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* 141.5.13 EndDocumentNoDialog 19395
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* 141.5.16 GetDestinationFormat(printsettings as CPMPrintSettingsMBS) as String 19395
* 141.5.17 GetDestinationLocation(printsettings as CPMPrintSettingsMBS) as String 19395
* 141.5.18 GetDestinationType(printsettings as CPMPrintSettingsMBS) as Integer 19396
* 141.5.19 kPMDocumentFormatDefault as String 19396
* 141.5.20 kPMDocumentFormatPDF as String 19396
* 141.5.21 kPMDocumentFormatPostScript as string 19396
* 141.5.22 kPMGraphicsContextCoreGraphics as string 19396
* 141.5.23 kPMGraphicsContextDefault as string 19396
* 141.5.24 PageContext as CGContextMBS 19397
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* 141.5.26 PrintDialog(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS) as boolean 19397
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* 141.5.29 ValidatePageFormat(pageformat as CPMPageFormatMBS) as boolean 19398
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* 141.5.36 CurrentPrinter as CPMPrinterMBS 19399
* 141.5.37 CurrentPrinterName as string 19399
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– 141.6.1 class CPMPrintSettingsMBS 19401
* 141.6.3 Constructor 19401
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* 141.6.5 CreateDataRepresentation(Format as Integer = 0) as String 19401
* 141.6.6 CreateWithDataRepresentation(Data as String) as CPMPrintSettingsMBS 19401
* 141.6.7 Dictionary as Dictionary 19402
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* 141.6.9 Keys as String() 19402
* 141.6.10 SetPageRange(minPage as UInt32, maxPage as UInt32) 19402
* 141.6.12 handle as Integer 19403
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* 141.6.16 Copies as Integer 19403
* 141.6.17 Duplex as Integer 19404
* 141.6.18 FirstPage as Integer 19404
* 141.6.19 JobName as String 19404
* 141.6.20 LastPage as Integer 19404
* 141.6.21 Value(key as String) as Variant 19406

– 141.7.1 class CPMRectMBS 19407
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* 141.7.5 Left as Double 19407
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* 35.9.44 resignFirstResponder as boolean 6655
* 35.9.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6656
* 35.9.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6656
* 35.9.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6656
* 35.9.48 rotateWithEvent(e as NSEventMBS) as boolean 6656
* 35.9.49 scrollWheel(e as NSEventMBS) as boolean 6656
* 35.9.50 swipeWithEvent(e as NSEventMBS) as boolean 6657
* 35.9.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6657
* 35.9.52 viewDidMoveToWindow 6657
* 35.9.53 wantsPeriodicDraggingUpdates as boolean 6658

– 35.10.1 class CustomNSTextViewMBS 6659
* 35.10.3 Constructor 6659
* 35.10.4 Constructor(Handle as Integer) 6659
* 35.10.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6659
* 35.10.6 Destructor 6660
* 35.10.8 acceptsFirstMouse(e as NSEventMBS) as boolean 6660
* 35.10.9 acceptsFirstResponder as boolean 6660
* 35.10.10 becomeFirstResponder as boolean 6660
* 35.10.11 beginGestureWithEvent(e as NSEventMBS) as boolean 6661
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* 35.10.15 draggingEnded(sender as NSDraggingInfoMBS) 6662
* 35.10.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer 6662
* 35.10.17 draggingExited(sender as NSDraggingInfoMBS) 6662
* 35.10.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6663
* 35.10.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6663
* 35.10.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6663
* 35.10.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6664
* 35.10.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6664
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* 35.10.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6665
* 35.10.25 isOpaque as boolean 6665
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* 35.10.27 keyUp(e as NSEventMBS) as boolean 6665
* 35.10.28 magnifyWithEvent(e as NSEventMBS) as boolean 6666
* 35.10.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS 6666
* 35.10.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6666
* 35.10.31 mouseDownCanMoveWindow as boolean 6666
* 35.10.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6667
* 35.10.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean 6667
* 35.10.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean 6667
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* 35.10.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6668
* 35.10.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6668
* 35.10.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean 6668
* 35.10.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean 6669
* 35.10.43 pressureChange(e as NSEventMBS) as boolean 6669
* 35.10.44 resignFirstResponder as boolean 6669
* 35.10.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6670
* 35.10.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6670
* 35.10.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6670
* 35.10.48 rotateWithEvent(e as NSEventMBS) as boolean 6670
* 35.10.49 scrollWheel(e as NSEventMBS) as boolean 6670

* 35.10.50 swipeWithEvent(e as NSEventMBS) as boolean 6671
* 35.10.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6671
* 35.10.52 viewDidMoveToWindow 6671
* 35.10.53 wantsPeriodicDraggingUpdates as boolean 6672

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- 33 **Cocoa** 5817
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    - 35.11.12 canBecomeKeyView as boolean 6675
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- 35 **Cocoa Controls** 6603
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    - 35.11.6 Destructor 6674
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    - 35.11.10 becomeFirstResponder as boolean 6674
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    - 35.11.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6677
    - 35.11.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6677
    - 35.11.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6677
    - 35.11.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6678
    - 35.11.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6678
    - 35.11.23 endGestureWithEvent(e as NSEventMBS) as boolean 6679
    - 35.11.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6679
    - 35.11.25 isOpaque as boolean 6679
    - 35.11.26 keyDown(e as NSEventMBS) as boolean 6679
    - 35.11.27 keyUp(e as NSEventMBS) as boolean 6679
    - 35.11.28 magnifyWithEvent(e as NSEventMBS) as boolean 6680
    - 35.11.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS 6680
    - 35.11.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6680
    - 35.11.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6681
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    - 35.11.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.37 Open 6682
    - 35.11.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6682

* 35.11.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean 6682
* 35.11.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean 6683
* 35.11.43 pressureChange(e as NSEventMBS) as boolean 6683
* 35.11.44 resignFirstResponder as boolean 6683
* 35.11.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.48 rotateWithEvent(e as NSEventMBS) as boolean 6684
* 35.11.49 scrollWheel(e as NSEventMBS) as boolean 6684
* 35.11.50 swipeWithEvent(e as NSEventMBS) as boolean 6685
* 35.11.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6685
* 35.11.53 wantsPeriodicDraggingUpdates as boolean 6686

- 33 **Cocoa** 5817
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.8 acceptsFirstMouse(e as NSEventMBS) as boolean 6674
    - 35.11.12 canBecomeKeyView as boolean 6675
    - 35.11.31 mouseDownCanMoveWindow as boolean 6680
    - 35.11.52 viewDidMoveToWindow 6685

- 35 **Cocoa Controls** 6603
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.3 Constructor 6673
    - 35.11.4 Constructor(Handle as Integer) 6673
    - 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6673
    - 35.11.6 Destructor 6674
    - 35.11.9 acceptsFirstResponder as boolean 6674
    - 35.11.10 becomeFirstResponder as boolean 6674
    - 35.11.11 beginGestureWithEvent(e as NSEventMBS) as boolean 6674
    - 35.11.13 Close 6675
    - 35.11.14 concludeDragOperation(sender as NSDraggingInfoMBS) 6675
    - 35.11.15 draggingEnded(sender as NSDraggingInfoMBS) 6676
    - 35.11.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer 6676
    - 35.11.17 draggingExited(sender as NSDraggingInfoMBS) 6676
    - 35.11.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6677
    - 35.11.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6677
    - 35.11.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6677
    - 35.11.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6678
    - 35.11.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6678
    - 35.11.23 endGestureWithEvent(e as NSEventMBS) as boolean 6679
    - 35.11.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6679
    - 35.11.25 isOpaque as boolean 6679
    - 35.11.26 keyDown(e as NSEventMBS) as boolean 6679
    - 35.11.27 keyUp(e as NSEventMBS) as boolean 6679
    - 35.11.28 magnifyWithEvent(e as NSEventMBS) as boolean 6680
    - 35.11.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS 6680
    - 35.11.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6680
    - 35.11.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.37 Open 6682
    - 35.11.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6682

* 35.11.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean 6682
* 35.11.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean 6683
* 35.11.43 pressureChange(e as NSEventMBS) as boolean 6683
* 35.11.44 resignFirstResponder as boolean 6683
* 35.11.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.48 rotateWithEvent(e as NSEventMBS) as boolean 6684
* 35.11.49 scrollWheel(e as NSEventMBS) as boolean 6684
* 35.11.50 swipeWithEvent(e as NSEventMBS) as boolean 6685
* 35.11.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6685
* 35.11.53 wantsPeriodicDraggingUpdates as boolean 6686

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- 33 **Cocoa** 5817
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.8 acceptsFirstMouse(e as NSEventMBS) as boolean 6674
    - 35.11.12 canBecomeKeyView as boolean 6675
    - 35.11.31 mouseDownCanMoveWindow as boolean 6680
    - 35.11.52 viewDidMoveToWindow 6685

- 35 **Cocoa Controls** 6603
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.3 Constructor 6673
    - 35.11.4 Constructor(Handle as Integer) 6673
    - 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6673
    - 35.11.6 Destructor 6674
    - 35.11.9 acceptsFirstResponder as boolean 6674
    - 35.11.10 becomeFirstResponder as boolean 6674
    - 35.11.11 beginGestureWithEvent(e as NSEventMBS) as boolean 6674
    - 35.11.13 Close 6675
    - 35.11.14 concludeDragOperation(sender as NSDraggingInfoMBS) 6675
    - 35.11.15 draggingEnded(sender as NSDraggingInfoMBS) 6676
    - 35.11.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer 6676
    - 35.11.17 draggingExited(sender as NSDraggingInfoMBS) 6676
    - 35.11.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6677
    - 35.11.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6677
    - 35.11.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6677
    - 35.11.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6678
    - 35.11.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6678
    - 35.11.23 endGestureWithEvent(e as NSEventMBS) as boolean 6679
    - 35.11.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6679
    - 35.11.25 isOpaque as boolean 6679
    - 35.11.26 keyDown(e as NSEventMBS) as boolean 6679
    - 35.11.27 keyUp(e as NSEventMBS) as boolean 6679
    - 35.11.28 magnifyWithEvent(e as NSEventMBS) as boolean 6680
    - 35.11.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS 6680
    - 35.11.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6680
    - 35.11.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.37 Open 6682
    - 35.11.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6682

* 35.11.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean 6682
* 35.11.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean 6683
* 35.11.43 pressureChange(e as NSEventMBS) as boolean 6683
* 35.11.44 resignFirstResponder as boolean 6683
* 35.11.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.48 rotateWithEvent(e as NSEventMBS) as boolean 6684
* 35.11.49 scrollWheel(e as NSEventMBS) as boolean 6684
* 35.11.50 swipeWithEvent(e as NSEventMBS) as boolean 6685
* 35.11.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6685
* 35.11.53 wantsPeriodicDraggingUpdates as boolean 6686

- 33 **Cocoa** 5817
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.8 acceptsFirstMouse(e as NSEventMBS) as boolean 6674
    - 35.11.12 canBecomeKeyView as boolean 6675
    - 35.11.31 mouseDownCanMoveWindow as boolean 6680
    - 35.11.52 viewDidMoveToWindow 6685

- 35 **Cocoa Controls** 6603
  - 35.11.1 class CustomNSTokenFieldMBS 6673
    - 35.11.3 Constructor 6673
    - 35.11.4 Constructor(Handle as Integer) 6673
    - 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6673
    - 35.11.6 Destructor 6674
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    - 35.11.10 becomeFirstResponder as boolean 6674
    - 35.11.11 beginGestureWithEvent(e as NSEventMBS) as boolean 6674
    - 35.11.13 Close 6675
    - 35.11.14 concludeDragOperation(sender as NSDraggingInfoMBS) 6675
    - 35.11.15 draggingEnded(sender as NSDraggingInfoMBS) 6676
    - 35.11.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer 6676
    - 35.11.17 draggingExited(sender as NSDraggingInfoMBS) 6676
    - 35.11.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6677
    - 35.11.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6677
    - 35.11.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6677
    - 35.11.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6678
    - 35.11.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6678
    - 35.11.23 endGestureWithEvent(e as NSEventMBS) as boolean 6679
    - 35.11.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6679
    - 35.11.25 isOpaque as boolean 6679
    - 35.11.26 keyDown(e as NSEventMBS) as boolean 6679
    - 35.11.27 keyUp(e as NSEventMBS) as boolean 6679
    - 35.11.28 magnifyWithEvent(e as NSEventMBS) as boolean 6680
    - 35.11.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS 6680
    - 35.11.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6680
    - 35.11.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6681
    - 35.11.37 Open 6682
    - 35.11.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6682
    - 35.11.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6682

* 35.11.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean 6682
* 35.11.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean 6683
* 35.11.43 pressureChange(e as NSEventMBS) as boolean 6683
* 35.11.44 resignFirstResponder as boolean 6683
* 35.11.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean 6684
* 35.11.48 rotateWithEvent(e as NSEventMBS) as boolean 6684
* 35.11.49 scrollWheel(e as NSEventMBS) as boolean 6684
* 35.11.50 swipeWithEvent(e as NSEventMBS) as boolean 6685
* 35.11.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS) 6685
* 35.11.53 wantsPeriodicDraggingUpdates as boolean 6686

- 44 **Cocoa Toolbar** 8219
  - 44.1.1 class CustomNSToolbarItemMBS 8219
    - 44.1.3 Constructor(itemIdentifier as string) 8219
    - 44.1.4 Destructor 8220
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    - 44.1.7 allowsDuplicatesInToolbar as boolean 8220
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  - 44.2.1 class CustomNSToolbarMBS 8221
    - 44.2.3 Constructor(Identifier as string) 8221
    - 44.2.4 Destructor 8221
    - 44.2.6 allowsSizeMode(mode as Integer, SuperAllows as boolean) as boolean 8221
    - 44.2.7 itemForItemIdentifier(identifier as string, willBeInsertedIntoToolbar as boolean) as NSToolbarItemMBS 8222
    - 44.2.8 toolbarAllowedItemIdentifiers as string() 8223
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    - 44.2.10 toolbarDidRemoveItem(item as NSToolbarItemMBS, notification as NSNotificationMBS) 8223
    - 44.2.11 toolbarItemAction(item as NSToolbarItemMBS) 8223
    - 44.2.12 toolbarItemAllowsDuplicatesInToolbar(item as NSToolbarItemMBS) as boolean 8224
    - 44.2.13 toolbarItemValidate(item as NSToolbarItemMBS) as boolean 8224
    - 44.2.14 toolbarSelectableItemIdentifiers as string() 8224
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- 35 **Cocoa Controls** 6603
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    - 35.12.4 Constructor(Handle as Integer) 6687
    - 35.12.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6688
    - 35.12.6 Destructor 6688
    - 35.12.8 acceptsFirstMouse(e as NSEventMBS) as boolean 6688
    - 35.12.9 acceptsFirstResponder as boolean 6688
    - 35.12.10 becomeFirstResponder as boolean 6689
    - 35.12.11 beginGestureWithEvent(e as NSEventMBS) as boolean 6689
    - 35.12.12 canBecomeKeyView as boolean 6689
    - 35.12.13 Close 6689
    - 35.12.14 concludeDragOperation(sender as NSDraggingInfoMBS) 6689
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    - 35.12.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer 6690
    - 35.12.17 draggingExited(sender as NSDraggingInfoMBS) 6691
    - 35.12.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer) 6691
    - 35.12.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6691
    - 35.12.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer 6692
    - 35.12.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS) 6692
    - 35.12.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer 6692
    - 35.12.23 drawFocusRingMask(g as NSGraphicsMBS) as boolean 6693
    - 35.12.24 DrawRect(g as NSGraphicsMBS, left as Double, top as Double, width as Double, height as Double) 6693
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    - 35.12.26 focusRingMaskBounds as NSRectMBS 6694
    - 35.12.27 ignoreModifierKeysForDraggingSession(session as NSDraggingSessionMBS) as boolean 6694
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* 83.8.4 chmod(path as string, mode as Integer) as Integer 13594
* 83.8.5 chown(path as string, uid as Integer, gid as Integer) as Integer 13596
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- 142 **Process** 19505
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- 83 **Files** 13559
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    - 83.9.4 Collisions as UInt64 13604
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    - 83.9.14 OutputPackets as UInt64 13608
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- 142 **Process** 19505
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    - 142.9.6 IntegralSharedTextMemorySize as Int64 19546
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    - 142.9.15 Swaps as Int64 19549
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    - 142.10.3 Update as boolean 19551
    - 142.10.5 ContextSwitches as Double 19551
    - 142.10.6 COWFaults as Double 19552
    - 142.10.7 Faults as Double 19552
    - 142.10.8 MessagesReceived as Double 19552
    - 142.10.9 MessagesSent as Double 19553
    - 142.10.10 PageIns as Double 19553
    - 142.10.11 ResidentSize as Double 19553
    - 142.10.12 SuspendCount as Double 19554
    - 142.10.13 SystemCallsMach as Double 19554
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    - 142.11.5 CurrentUserID as Integer 19558
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* 142.12.5 CurrentUserID as Integer 19561
* 142.12.6 LoadUserByID(userid as Integer) 19561
* 142.12.7 LoadUserByName(name as string) 19561
* 142.12.9 AccountExpireTime as Integer 19562
* 142.12.10 GroupID as Integer 19562
* 142.12.11 HomePath as string 19562
* 142.12.12 LastPasswordChangeTime as Integer 19562
* 142.12.13 LongName as string 19563
* 142.12.14 Name as string 19563
* 142.12.15 Ready as Boolean 19563
* 142.12.16 Shell as string 19564
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– 142.13.1 class DarwinVMStatisticsMBS 19565

* 142.13.3 ActivePages as Integer 19565
* 142.13.4 CowFaults as Integer 19565
* 142.13.5 CPUTicksIdle as Integer 19566
* 142.13.6 CPUTicksNice as Integer 19566
* 142.13.7 CPUTicksSystem as Integer 19566
* 142.13.8 CPUTicksUser as Integer 19567
* 142.13.9 Faults as Integer 19567
* 142.13.10 FreePages as Integer 19567
* 142.13.11 Hits as Integer 19568
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* 142.13.13 Lookups as Integer 19568
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* 142.13.15 PageOuts as Integer 19569
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* 142.13.17 Reactivations as Integer 19569
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* 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
* 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
* 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
* 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523
* 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524

* 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
* 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525
* 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526
* 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
* 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
* 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528
* 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528
* 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
* 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
* 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531
* 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532
* 142.5.20 CountProcessesMBS as Integer 19534
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* 142.5.17 GetDarwinVMStatisticsMBS as DarwinVMStatisticsMBS 19532
* 142.5.21 GetWindowsVMStatisticsMBS as WindowsVMStatisticsMBS 19534
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- 83 **Files** 13559
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    - 83.11.6 Mount(disk as DADiskMBS, path as string, options as Integer = 0) 13613
    - 83.11.7 MountWithArguments(disk as DADiskMBS, path as string, arguments() as string, options as Integer = 0) 13614
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    - 83.11.10 Unmount(disk as DADiskMBS, options as Integer = 0) 13614
    - 83.11.12 Handle as Integer 13615
    - 83.11.14 Appeared(disk as DADiskMBS) 13615
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- 173 **SQL** 21449
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    - 173.1.6 Commit 21450
    - 173.1.7 CommitTransaction 21450
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    - 173.1.11 ExecuteSQL(sql As String, values() As Variant) 21451
    - 173.1.12 InsertRecord(TableName as String, Data as DatabaseRecord) 21451
    - 173.1.13 Prepare(statement as String) as PreparedSQLStatement 21452
    - 173.1.14 Rollback 21452
    - 173.1.15 RollbackTransaction 21452
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    - 173.1.17 SelectSQL(sql As String, values() As Variant) as RowSet 21453
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    - 173.1.19 SQLSelect(SelectString as string) as RecordSet 21453
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    - 173.1.23 ErrorCode as Integer 21454
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    - 173.1.25 Host as String 21455
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- 129 **Network** 17937
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    - 129.15.4 Data as String 18018
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- 21 **Basic** 4061
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    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
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    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
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    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
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    - 21.2.13 EndHour as Integer 4073
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* 21.2.20 Minute as Integer 4074
* 21.2.21 Month as Integer 4074
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* 21.2.29 StartSecond as Integer 4076
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* 21.2.32 Swap as Boolean 4076
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* 21.2.34 TotalSeconds as Double 4077
* 21.2.35 Year as Integer 4077

- 35 **Cocoa Controls** 6603
  - 35.13.1 class DateTimePicker 6703
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- 173 **SQL** 21449
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    - 173.2.4 SQLRowCount(cmd as SQLCommandMBS) as Int64 21457
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- 178 **System** 21871
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- 67 **DDE** 11989
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    - 67.1.5 Str as string 11990
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    - 67.2.4 CountryID as Integer 11991
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    - 67.2.6 LangID as Integer 11991
    - 67.2.7 Security as Integer 11992
    - 67.2.8 Unicode as boolean 11992
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    - 67.3.3 clientTransaction(type as Integer,topic as DDEStringMBS) as DDEBinaryDataMBS 11995
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    - 67.3.11 InitClient as boolean 11999
    - 67.3.12 InitServer as boolean 11999
    - 67.3.13 NewDDEBinaryData(name as DDEStringMBS,data as memoryblock,offset as Integer,length as Integer,dataformat as Integer) as DDEBinaryDataMBS 11999
    - 67.3.14 NewDDEBinaryData(name as DDEStringMBS,data as string) as DDEBinaryDataMBS 12000
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    - 67.3.16 NewDDEString(ansistring as string) as DDEStringMBS 12000
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    - 67.3.18 RegisterService(name as DDEStringMBS) as boolean 12001
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    - 67.3.21 LastError as Integer 12002

* 67.3.22 Timeout as Integer 12002
* 67.3.24 AdviceData(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer,data as DDEBinaryDataMBS) as Integer 12003
* 67.3.25 AdviceRequest(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer,remaincount as Integer) as DDEBinaryDataMBS 12003
* 67.3.26 AdviceStart(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer) as Boolean 12004
* 67.3.27 AdviceStop(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer) 12004
* 67.3.28 ConfirmConnect(topic as DDEStringMBS, service as DDEStringMBS, myself as Boolean) 12004
* 67.3.29 Connect(topic as DDEStringMBS, service as DDEStringMBS, myself as Boolean,info as DDEContextInfoMBS) as Boolean 12004
* 67.3.30 Disconnect(myself as Boolean) 12004
* 67.3.31 Error(errorcode as Integer) 12005
* 67.3.32 Execute(topic as DDEStringMBS,data as DDEBinaryDataMBS) as Integer 12005
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* 67.3.34 Register(application as DDEStringMBS,service as DDEStringMBS) 12006
* 67.3.35 Request(topic as DDEStringMBS,item as DDEStringMBS,dataformat as Integer) as DDEBinaryDataMBS 12006
* 67.3.36 UnRegister(application as DDEStringMBS,service as DDEStringMBS) 12006
* 67.3.37 WildConnect(topic as DDEStringMBS,service as DDEStringMBS, myself as boolean,info as DDEContextInfoMBS) as DDEStringPairListMBS 12006

– 67.4.1 class DDEStringMBS 12009
* 67.4.3 Len as Integer 12009
* 67.4.4 Mem as memoryblock 12009
* 67.4.5 Str as string 12009
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– 67.5.1 class DDEStringPairListMBS 12011
* 67.5.3 Append(item as DDEStringPairMBS) 12011
* 67.5.4 Count as Integer 12011
* 67.5.5 Item(index as Integer) as DDEStringPairMBS 12011

– 67.6.1 class DDEStringPairMBS 12012
* 67.6.3 Service as DDEStringMBS 12012
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- 76 **DynamicDeclares** 12519
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* 35.34.63 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS 6815
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* 35.34.70 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as boolean 6818
* 35.34.71 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, row as Int64) as Boolean 6818
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* 193.1.55 IgnoreClicksMBS as Boolean 23009
* 193.1.56 IsIconicMBS as Boolean 23010
* 193.1.57 IsMetalWindowMBS as Boolean 23010
* 193.1.58 IsResizableMBS as Boolean 23011
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* 193.1.60 IsZoomedMBS as Boolean 23012
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    - 193.1.18 RefreshThreadSafeMBS(immediately As Boolean = False) 22992
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* 193.1.53 HasSystemMenuMBS as Boolean 23008
* 193.1.54 HasToolbarButtonMBS as Boolean 23009
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* 193.1.57 IsMetalWindowMBS as Boolean 23010
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* 193.1.60 IsZoomedMBS as Boolean 23012
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- 56 **CoreGraphics** 8881
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- 193 **Window** 22987
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* 193.1.53 HasSystemMenuMBS as Boolean 23008
* 193.1.54 HasToolbarButtonMBS as Boolean 23009
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    - 193.1.40 CanBeVisibleWithoutLoginMBS as Boolean 23003
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    - 193.1.47 HasCloseBoxMBS as Boolean 23006
    - 193.1.48 HasCollapseBoxMBS as Boolean 23006
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    - 193.1.50 HasMinimizeBoxMBS as Boolean 23007
    - 193.1.51 HasNoShadowMBS as Boolean 23007
    - 193.1.52 HasNoTitleBarMBS as Boolean 23008

* 193.1.53 HasSystemMenuMBS as Boolean 23008
* 193.1.54 HasToolbarButtonMBS as Boolean 23009
* 193.1.55 IgnoreClicksMBS as Boolean 23009
* 193.1.56 IsIconicMBS as Boolean 23010
* 193.1.57 IsMetalWindowMBS as Boolean 23010
* 193.1.58 IsResizableMBS as Boolean 23011
* 193.1.59 IsZoomedMacMBS as Boolean 23011
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* 193.1.61 ModifiedMBS as Boolean 23012
* 193.1.62 ToolbarVisibleMBS as Boolean 23012
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- 194 **Windows** 23079
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    - 193.1.26 SetWindowIconMBS(Type as integer, Icon as Picture, Mask as Picture) as Boolean 22996
    - 193.1.27 SetWindowMaskMBS(p as picture, redraw as Boolean, transparentColor as color) as Boolean 22997
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    - 193.1.66 WinMenuHandleMBS as integer 23014
    - 193.1.67 WinTopMostWindowMBS as boolean 23014

- 193 **Window** 22987
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    - 193.1.11 HideKeyboardMBS 22990
    - 193.1.12 InvalidateShadowMBS 22990
    - 193.1.13 IsFullScreenMBS as Boolean 22991
    - 193.1.14 MakeTransparentMBS as integer 22991
    - 193.1.17 NSWindowMBS as NSWindowMBS 22992
    - 193.1.18 RefreshThreadSafeMBS(immediately As Boolean = False) 22992
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    - 193.1.20 RemoveWindowProxyIconMBS 22993
    - 193.1.23 SetTransparencyMBS(value as integer) as boolean 22994
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    - 193.1.32 ToggleFullScreenMBS as Boolean 22999
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    - 193.1.34 UpdateNowRectMBS(left as integer, top as integer, width as integer, height as integer) 23000
    - 193.1.36 WindowFeedbackSettingMBS(Feedback as Integer, byref value as boolean, IncludeAncestors as Boolean = false) as Boolean 23002
    - 193.1.37 WinFlashWindowMBS(Invert as boolean) 23002
    - 193.1.40 CanBeVisibleWithoutLoginMBS as Boolean 23003
    - 193.1.42 CollapsedMBS as Boolean 23004
    - 193.1.43 FullScreenAuxiliaryMBS as Boolean 23005
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    - 193.1.45 HasBorderMBS as Boolean 23005
    - 193.1.46 HasCaptionMBS as Boolean 23005
    - 193.1.47 HasCloseBoxMBS as Boolean 23006
    - 193.1.48 HasCollapseBoxMBS as Boolean 23006
    - 193.1.49 HasMaximizeBoxMBS as Boolean 23007
    - 193.1.50 HasMinimizeBoxMBS as Boolean 23007
    - 193.1.51 HasNoShadowMBS as Boolean 23007
    - 193.1.52 HasNoTitleBarMBS as Boolean 23008

* 193.1.53 HasSystemMenuMBS as Boolean 23008
* 193.1.54 HasToolbarButtonMBS as Boolean 23009
* 193.1.55 IgnoreClicksMBS as Boolean 23009
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* 193.1.59 IsZoomedMacMBS as Boolean 23011
* 193.1.60 IsZoomedMBS as Boolean 23012
* 193.1.61 ModifiedMBS as Boolean 23012
* 193.1.62 ToolbarVisibleMBS as Boolean 23012
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- 194 **Windows** 23079
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    - 193.1.24 SetWindowFeedbackSettingMBS(Feedback as Integer, value as Variant) as Boolean 22995
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    - 193.1.26 SetWindowIconMBS(Type as integer, Icon as Picture, Mask as Picture) as Boolean 22996
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    - 193.1.35 WinAnimateWindowMBS(Flags as integer, Time as integer=200) as boolean 23000
    - 193.1.38 WinHideTooltipMBS as Integer 23003
    - 193.1.66 WinMenuHandleMBS as integer 23014
    - 193.1.67 WinTopMostWindowMBS as boolean 23014

- 193 **Window** 22987
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    - 193.1.36 WindowFeedbackSettingMBS(Feedback as Integer, byref value as boolean, IncludeAncestors as Boolean = false) as Boolean 23002
    - 193.1.37 WinFlashWindowMBS(Invert as boolean) 23002
    - 193.1.40 CanBeVisibleWithoutLoginMBS as Boolean 23003
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    - 193.1.46 HasCaptionMBS as Boolean 23005
    - 193.1.47 HasCloseBoxMBS as Boolean 23006
    - 193.1.48 HasCollapseBoxMBS as Boolean 23006
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* 193.1.58 IsResizableMBS as Boolean 23011
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* 193.1.63 TransparencyMBS as single 23013
* 193.1.64 UnifiedTitleAndToolbarMBS as Boolean 23013
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- 194 **Windows** 23079
  - 193.1.1 class DesktopWindow 22987
    - 193.1.24 SetWindowFeedbackSettingMBS(Feedback as Integer, value as Variant) as Boolean 22995
    - 193.1.25 SetWindowIconMBS(Type as integer, File as FolderItem, IconID as integer) as Boolean 22996
    - 193.1.26 SetWindowIconMBS(Type as integer, Icon as Picture, Mask as Picture) as Boolean 22996
    - 193.1.27 SetWindowMaskMBS(p as picture, redraw as Boolean, transparentColor as color) as Boolean 22997
    - 193.1.35 WinAnimateWindowMBS(Flags as integer, Time as integer=200) as boolean 23000
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* 77.40.70 CaretAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12736
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* 77.40.105 CloseAndSignPDFFile(OutputFile as FolderItem, CertificateData as String, Password as String, ContactInfo as String = """, Location as String = """, Reason as String = """) as boolean 12745
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* 77.40.131 CreateArticleThread(ThreadName as string) as Integer 12754
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* 77.40.134 CreateBarcodeField(Name as string, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, Barcode as DynaPDFBarcodeMBS) as Integer 12754
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* 77.40.138 CreateCIEColorSpace(Base as Integer, WhitePoint as memoryblock, BlackPoint as memoryblock, Gamma as memoryblock, Matrix as memoryblock) as Integer 12755

* 77.40.139 CreateColItemDate(EmbFile as Integer, Key as string, Value as Integer, Prefix as string) as boolean 12756
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* 77.40.148 CreateDeviceNColorSpaceAnsi(Colorants() as string, PostScriptFunc as string, AlternateColorSpace as Integer, Handle as Integer) as Integer 12758
* 77.40.149 CreateDPartRoot(NodeNameList() as String, RecordLevel as Integer) as Boolean 12758
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* 77.40.154 CreateGoToEAction(Location as Integer, Source as string, SrcPage as Integer, Target as string, DestName as string, DestPage as Integer, NewWindow as boolean) as Integer 12760
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* 77.40.199 CreateTraceFile(File as FolderItem) as Boolean 12772
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* 77.40.201 CreateViewport(Name as String, X1 as Double, Y1 as Double, X2 as Double, Y2 as Double) as Integer 12772
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* 77.40.221 DeleteOCGFromAppEvent(Handle as UInt32, Events as Integer, Categories as Integer, DelCategoryOnly as Boolean) as Boolean 12777
* 77.40.222 DeleteOCGFromDisplayTree(OCGHandle as UInt32, Recursive as Boolean) as Boolean 12778
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* 77.40.243 EncryptPDF(File as folderitem, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer 12786
* 77.40.244 EncryptPDFAnsi(Path as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer 12786
* 77.40.245 EndContinueText as Boolean 12786
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* 77.40.285 FreeTextAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Text as string, Align as Integer) as Integer 12797
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* 77.40.287 GetActionCount as Integer 12798
* 77.40.288 GetActionHandle(ObjType as Integer, ObjHandle as UInt32, ActIndex as UInt32) as Integer 12798
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* 77.40.325 GetDocInfoEx(index as Integer, byref DInfo as Integer, byref key as string, byref value as string) as Integer 12808
* 77.40.326 GetDocumentColorSpaces as DynaPDFColorSpaceMBS() 12808
* 77.40.327 GetDocUsesTransparency(Flags as UInt32 = 0) as boolean 12808
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* 77.40.345 GetFieldCount as Integer 12813
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* 77.40.347 GetFieldExpValCount(Field as Integer) as Integer 12814
* 77.40.348 GetFieldExpValue(Field as Integer) as string 12814
* 77.40.349 GetFieldExpValueEx(Field as Integer, ValIndex as Integer, byref Value as string, byref ExpValue as string, byref Selected as boolean) as Boolean 12814
* 77.40.350 GetFieldFlags(Field as Integer) as Integer 12814
* 77.40.351 GetFieldGroupType(Field as Integer) as Integer 12815
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* 77.40.353 GetFieldIndex(Field as Integer) as Integer 12815
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* 77.40.368 GetFontSelMode as Integer 12818
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* 77.40.372 GetFTextHeightEx(Width as Double, Align as Integer, aText as string) as Double 12819
* 77.40.373 GetFTextHeightExAnsi(Width as Double, Align as Integer, aText as string) as Double 12819
* 77.40.374 GetGlyphIndex(Index as UInt32) as Integer 12820
* 77.40.375 GetGlyphOutline(Index as UInt32) as DynaPDFGlyphOutlineMBS 12820
* 77.40.376 GetGoToAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFGoToActionMBS 12820
* 77.40.377 GetGoToRAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFGoToActionMBS 12821
* 77.40.378 GetGStateFlags as Integer 12821
* 77.40.379 GetHideAction(index as Integer) as DynaPDFHideActionMBS 12821
* 77.40.380 GetIconColor as Integer 12821
* 77.40.381 GetImageBuffer as string 12822
* 77.40.382 GetImageBufferMemory as memoryblock 12822
* 77.40.383 GetImageCount(File as folderitem) as Integer 12822
* 77.40.384 GetImageCount(Path as string) as Integer 12822
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* 77.40.386 GetImageCountEx(Buffer as string) as Integer 12823
* 77.40.387 GetImageHeight(Handle as Integer) as Integer 12823
* 77.40.388 GetImageObj(Handle as UInt32, Flags as Integer = 0) as DynaPDFImageMBS 12823
* 77.40.389 GetImageObjCount as Integer 12824
* 77.40.390 GetImageWidth(Handle as Integer) as Integer 12824
* 77.40.391 GetImportDataAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFImportDataActionMBS 12824
* 77.40.392 GetImportFlags as Integer 12824
* 77.40.393 GetImportFlags2 as Integer 12825
* 77.40.394 GetInBBox(PageNum as Integer, Boundary as Integer) as DynaPDFRectMBS 12825
* 77.40.395 GetInDocInfo(DInfo as Integer, byref value as string) as Integer 12825

* 77.40.396 GetInDocInfoCount as Integer 12825
* 77.40.397 GetInDocInfoEx(index as Integer, byref DInfo as Integer, byref key as string, byref value as string) as Integer 12826
* 77.40.398 GetInEncryptionFlags as Integer 12827
* 77.40.399 GetInFieldCount as Integer 12827
* 77.40.400 GetInIsCollection as Integer 12827
* 77.40.401 GetInIsEncrypted as Integer 12828
* 77.40.402 GetInIsSigned as Integer 12828
* 77.40.403 GetInIsTaggedPDF as integer 12829
* 77.40.404 GetInIsTrapped as Integer 12829
* 77.40.405 GetInIsXFAForm as Integer 12829
* 77.40.406 GetInMetadata(PageNum as Integer) as String 12829
* 77.40.407 GetInOrientation(PageNum as Integer) as Integer 12830
* 77.40.408 GetInPageCount as Integer 12830
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* 77.40.410 GetInPDFVersionEx as DynaPDFVersionInfoMBS 12830
* 77.40.411 GetInPrintSettings as DynaPDFPrintSettingsMBS 12830
* 77.40.412 GetInRepairMode as Integer 12830
* 77.40.413 GetIsFixedPitch as Integer 12831
* 77.40.414 GetIsTaggingEnabled as boolean 12831
* 77.40.415 GetItalicAngle as Double 12831
* 77.40.416 GetJavaScript(Handle as Integer) as string 12831
* 77.40.417 GetJavaScriptAction(Handle as Integer) as string 12832
* 77.40.418 GetJavaScriptAction(ObjType as Integer, ObjHandle as Integer, ActIndex as Integer, byref ObjEvent as Integer) as string 12832
* 77.40.419 GetJavaScriptActionEx(index as Integer) as DynaPDFJavaScriptActionMBS 12832
* 77.40.420 GetJavaScriptCount as Integer 12832
* 77.40.421 GetJavaScriptEx(Name as string) as string 12833
* 77.40.422 GetJavaScriptName(Handle as Integer) as string 12833
* 77.40.423 GetJPEGQuality as Integer 12833
* 77.40.424 GetJPEGVersion as String 12833
* 77.40.425 GetLanguage as string 12834
* 77.40.426 GetLastTextOffset as UInt32 12834
* 77.40.427 GetLastTextPosX as Double 12834
* 77.40.428 GetLastTextPosY as Double 12834
* 77.40.429 GetLaunchAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFLaunchActionMBS 12834
* 77.40.430 GetLayerConfig(Index as Integer) as DynaPDFOCLayerConfigMBS 12835
* 77.40.431 GetLayerConfigCount as Integer 12835
* 77.40.432 GetLeading as Double 12835
* 77.40.433 GetLineCapStyle as Integer 12835
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* 77.40.435 GetLineWidth as Double 12836
* 77.40.436 GetLinkHighlightMode as Integer 12836
* 77.40.437 GetLogMetafileSize(FileName as folderitem) as DynaPDFRectMBS 12836
* 77.40.438 GetLogMetafileSizeEx(Buffer as Memoryblock) as DynaPDFRectMBS 12836
* 77.40.439 GetLogMetafileSizeEx(Buffer as string) as DynaPDFRectMBS 12837
* 77.40.440 GetMatrix(byref Matrix as DynaPDFMatrixMBS) as Boolean 12837
* 77.40.441 GetMaxFieldLen(TxtField as Integer) as Integer 12837
* 77.40.442 GetMetaConvFlags as Integer 12837
* 77.40.443 GetMetadata(ObjType as Integer, Handle as Integer) as String 12837
* 77.40.444 GetMissingGlyphs as UInt32() 12838
* 77.40.445 GetMissingGlyphsString as String 12838
* 77.40.446 GetMiterLimit as Double 12838
* 77.40.447 GetMovieAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFFieldMBS 12838
* 77.40.448 GetNamedAction(index as Integer) as DynaPDFNamedActionMBS 12839
* 77.40.449 GetNamedDest(index as Integer) as DynaPDFNamedDestMBS 12839
* 77.40.450 GetNamedDestCount as Integer 12839
* 77.40.451 GetNeedAppearance as boolean 12839
* 77.40.452 GetObjActionCount(ObjType as Integer, ObjHandle as Integer) as Integer 12840
* 77.40.453 GetObjActions(ObjType as Integer, ObjHandle as Integer, byref Actions as DynaPDFObjActionsMBS) as Integer 12840
* 77.40.454 GetOCG(Handle as UInt32) as DynaPDFOCGMBS 12841
* 77.40.455 GetOCGContUsage(Handle as UInt32) as DynaPDFOCGContUsageMBS 12841
* 77.40.456 GetOCGCount as Integer 12841
* 77.40.457 GetOCGUsageUserName(Handle as UInt32, Index as UInt32, byref Name as String) as Boolean 12842
* 77.40.458 GetOCUINode(Node as Integer) as DynaPDFOCUINodeMBS 12842
* 77.40.459 GetOpacity as Double 12842
* 77.40.460 GetOrientation as Integer 12842
* 77.40.461 GetOutputIntent(Index as Integer) as DynaPDFOutputIntentMBS 12843
* 77.40.462 GetOutputIntentCount as Integer 12843
* 77.40.463 GetPage(PageNum as UInt32) as DynaPDFPageMBS 12843
* 77.40.464 GetPageAnnot(index as Integer) as DynaPDFAnnotationMBS 12843
* 77.40.465 GetPageAnnotCount as Integer 12844
* 77.40.466 GetPageAnnotEx(index as Integer) as DynaPDFAnnotationExMBS 12844
* 77.40.467 GetPageColorSpaces as DynaPDFColorSpaceMBS() 12844
* 77.40.468 GetPageCoords as Integer 12844
* 77.40.469 GetPageCount as Integer 12844
* 77.40.470 GetPageField(Index as Integer) as DynaPDFFieldMBS 12845
* 77.40.471 GetPageFieldCount as Integer 12845
* 77.40.472 GetPageFieldEx(Index as Integer) as DynaPDFFieldExMBS 12845
* 77.40.473 GetPageHeight as Double 12845

* 77.40.474 GetPageLabel(index as Integer, byref Label as DynaPDFPageLabelMBS) as boolean 12845
* 77.40.475 GetPageLabelCount as Integer 12846
* 77.40.476 GetPageLayout as Integer 12846
* 77.40.477 GetPageMode as Integer 12846
* 77.40.478 GetPageNum as Integer 12846
* 77.40.479 GetPageText(stack as DynaPDFStackMBS) as boolean 12846
* 77.40.480 GetPageWidth as Double 12847
* 77.40.481 GetPDFVersion as Integer 12847
* 77.40.482 GetPDFVersionEx as DynaPDFVersionInfoMBS 12847
* 77.40.483 GetPNGVersion as String 12848
* 77.40.484 GetPrintSettings as DynaPDFPrintSettingsMBS 12848
* 77.40.485 GetResetAction(Handle as UInt32) as DynaPDFResetFormActionMBS 12848
* 77.40.486 GetResolution as Integer 12848
* 77.40.487 GetSaveNewImageFormat as boolean 12848
* 77.40.488 GetSeparationInfo(byref Colorant as string, byref ColorSpace as Integer) as boolean 12849
* 77.40.489 GetSpaceWidth(FontHandle as Integer, FontSize as Double) as Double 12849
* 77.40.490 GetStrokeColor as Integer 12849
* 77.40.491 GetSubmitAction(Handle as UInt32) as DynaPDFSubmitFormActionMBS 12849
* 77.40.492 GetSysFontInfo as DynaPDFSysFontMBS 12850
* 77.40.493 GetSysFontInfo(PostscriptName as String) as DynaPDFSysFontMBS 12850
* 77.40.494 GetSysFontInfos as DynaPDFSysFontMBS() 12851
* 77.40.495 GetSysFontInfos(Name as String) as DynaPDFSysFontMBS() 12851
* 77.40.496 GetTabLen as Integer 12852
* 77.40.497 GetTemplCount as Integer 12852
* 77.40.498 GetTemplHandle as Integer 12852
* 77.40.499 GetTemplHeight(Handle as Integer) as Double 12853
* 77.40.500 GetTemplWidth(Handle as Integer) as Double 12853
* 77.40.501 GetTextDrawMode as Integer 12853
* 77.40.502 GetTextFieldValue(Field as Integer, byref Value as string, byref DefValue as string) as Boolean 12853
* 77.40.503 GetTextHeight(Align as Integer, aText as string) as Double 12854
* 77.40.504 GetTextHeightAnsi(Align as Integer, aText as string) as Double 12854
* 77.40.505 GetTextHeightEx(Width as Double, Align as Integer, aText as string) as Double 12854
* 77.40.506 GetTextHeightExAnsi(Width as Double, Align as Integer, aText as string) as Double 12855
* 77.40.507 GetTextRect(byref PosX as Double, byref PosY as Double, byref Width as Double, byref Height as Double) as Boolean 12855
* 77.40.508 GetTextRise as Double 12855
* 77.40.509 GetTextScaling as Double 12856
* 77.40.510 GetTextWidth(aText as string) as Double 12856

* 77.40.511 GetTextWidth(FontHandle as integer, Text as String, CharSpacing as Single, WordSpacing as Single, TextScale as Single) as double 12856
* 77.40.512 GetTextWidthAnsi(aText as string) as Double 12856
* 77.40.513 GetTIFFVersion as String 12857
* 77.40.514 GetTransparentColor as Integer 12857
* 77.40.515 GetTrapped as Boolean 12857
* 77.40.516 GetTypoLeading as double 12857
* 77.40.517 GetURIAction(index as Integer) as DynaPDFURIActionMBS 12858
* 77.40.518 GetUseExactPwd as Boolean 12858
* 77.40.519 GetUseGlobalImpFiles as Boolean 12858
* 77.40.520 GetUserRights as Integer 12858
* 77.40.521 GetUserUnit as single 12858
* 77.40.522 GetUseStdFonts as Boolean 12859
* 77.40.523 GetUsesTransparency(Page as Integer = -1) as Boolean 12859
* 77.40.524 GetUseSystemFonts as Boolean 12860
* 77.40.525 GetUseTransparency as Boolean 12860
* 77.40.526 GetUseVisibleCoords as Boolean 12860
* 77.40.527 GetViewerPreferences(byref Preference as Integer, byref AddVal as Integer) as Boolean 12860
* 77.40.528 GetViewport(Page as UInt32, index as Integer) as DynaPDFViewportMBS 12860
* 77.40.529 GetViewportCount(Page as UInt32) as Integer 12861
* 77.40.530 GetWMFDefExtent(byref width as Integer, byref height as Integer) as Boolean 12861
* 77.40.531 GetWMFPixelPerInch as Integer 12861
* 77.40.532 GetWordSpacing as Double 12861
* 77.40.533 GetXFAStream(Handle as UInt32) as DynaPDFXFAStreamMBS 12862
* 77.40.534 GetXFAStreamCount as Integer 12862
* 77.40.535 GetZlibVersion as String 12862
* 77.40.536 GofRGB(RGB as Integer) as Integer 12862
* 77.40.537 HaveDPartRoot as Boolean 12863
* 77.40.538 HaveOpenDoc as Boolean 12863
* 77.40.539 HaveOpenPage as Boolean 12863
* 77.40.540 HighlightAnnot(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as Integer, Author as string, Subject as string, Comment as string) as Integer 12863
* 77.40.541 HighlightAnnotAnsi(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as Integer, Author as string, Subject as string, Comment as string) as Integer 12864
* 77.40.542 HighlightOnAllPages(SearchText as string, ColorValue as Color, CaseInsenitive as boolean = false) as Integer 12864
* 77.40.543 HighlightOnCurrentPage(SearchText as string, ColorValue as Color, CaseInsenitive as boolean = false) as Integer 12864
* 77.40.544 ImportBookmarks as Integer 12864

* 77.40.545 ImportCatalogObjects as Boolean 12864
* 77.40.546 ImportDocInfo as Boolean 12865
* 77.40.547 ImportEncryptionSettings as Boolean 12865
* 77.40.548 ImportOCProperties as Boolean 12865
* 77.40.549 ImportPage(PageNum as Integer) as Integer 12866
* 77.40.550 ImportPageEx(PageNum as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer 12866
* 77.40.551 ImportPDFFile(DestPage as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer 12866
* 77.40.552 ImportPDFPage(PageNum as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer 12867
* 77.40.553 InitColorManagement(profiles as DynaPDFColorProfilesMBS, DestSpace as Integer, Flags as Integer) as boolean 12867
* 77.40.554 InitColorManagementEx(profiles as DynaPDFColorProfilesExMBS, DestSpace as Integer, Flags as Integer) as boolean 12868
* 77.40.555 InitStack(byref stack as DynaPDFStackMBS) as boolean 12868
* 77.40.556 InkAnnot(points() as DynaPDFPointMBS, LineWidth as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12869
* 77.40.557 InkAnnotAnsi(points() as DynaPDFPointMBS, LineWidth as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12869
* 77.40.558 InsertBarcode(PosX as double, PosY as double, Width as double, Height as double, HAlign as Integer, VAlign as Integer, Barcode as DynaPDFBarcode2MBS) as Integer 12870
* 77.40.559 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as memoryblock) as Integer 12870
* 77.40.560 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string) as Integer 12871
* 77.40.561 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, BufferAddress as Integer) as Integer 12871
* 77.40.562 InsertBMPFromHandle(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, hBitmap as Integer) as Integer 12871
* 77.40.563 InsertBookmark(title as String, parent as Integer, DestPage as Integer, Open as boolean, AddChildren as boolean) as Integer 12872
* 77.40.564 InsertBookmarkAnsi(title as String, parent as Integer, DestPage as Integer, Open as boolean, AddChildren as boolean) as Integer 12872
* 77.40.565 InsertBookmarkEx(title as String, parent as Integer, NamedDest as Integer, Open as boolean, AddChildren as boolean) as Integer 12872
* 77.40.566 InsertBookmarkExAnsi(title as String, parent as Integer, NamedDest as Integer, Open as boolean, AddChildren as boolean) as Integer 12872
* 77.40.567 InsertImage(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, File as folderitem) as Integer 12873
* 77.40.568 InsertImageEx(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, File as folderitem, index as Integer = 1) as Integer 12873

* 77.40.569 InsertImageEx(PosX as double, PosY as double, ScaleWidth as double, ScaleHeight as double, Path as String, index as integer = 1) as integer 12874
* 77.40.570 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as Memoryblock, index as Integer = 1) as Integer 12875
* 77.40.571 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string, index as Integer = 1) as Integer 12876
* 77.40.572 InsertMetafile(FileName as folderitem, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12876
* 77.40.573 InsertMetafileEx(Buffer as memoryblock, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12876
* 77.40.574 InsertMetafileEx(Buffer as string, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12877
* 77.40.575 InsertMetafileExt(FileName as folderitem, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12877
* 77.40.576 InsertMetafileExtEx(Buffer as Memoryblock, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12877
* 77.40.577 InsertMetafileExtEx(Buffer as String, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12878
* 77.40.578 InsertMetafileFromHandle(hEnhMetafileHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12878
* 77.40.579 InsertMetafileFromHandleEx(hEnhMetafileHandle as Integer, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12878
* 77.40.580 InsertPicture(pic as picture, mask as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12878
* 77.40.581 InsertPicture(pic as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12879
* 77.40.582 InsertRawImage(Data as String, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12880
* 77.40.583 InsertRawImage(Memory as MemoryBlock, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12880
* 77.40.584 InsertRawImageEx(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Image as DynaPDFRawImageMBS) as Integer 12881
* 77.40.585 IsBidiText(Text as string) as Integer 12881
* 77.40.586 IsColorPage(GrayIsColor as Boolean) as Integer 12881
* 77.40.587 IsEmptyPage as Integer 12881
* 77.40.588 IsWrongPwd(errCode as Integer) as boolean 12881
* 77.40.589 IterateAnnotations as DynaPDFIteratorMBS 12882
* 77.40.590 IterateBookmarks as DynaPDFIteratorMBS 12882
* 77.40.591 IterateCMaps as DynaPDFIteratorMBS 12883
* 77.40.592 IterateColorSpaces as DynaPDFIteratorMBS 12883
* 77.40.593 IterateEmbeddedFiles(Decompress as boolean = false) as DynaPDFIteratorMBS 12883

* 77.40.594 IterateErrLogMessages as DynaPDFIteratorMBS 12884
* 77.40.595 IterateFields as DynaPDFIteratorMBS 12884
* 77.40.596 IterateFonts as DynaPDFIteratorMBS 12885
* 77.40.597 IterateImages(ImageFlags as Integer = 0) as DynaPDFIteratorMBS 12885
* 77.40.598 IterateLayerConfigurations as DynaPDFIteratorMBS 12886
* 77.40.599 IterateNamedDestinations as DynaPDFIteratorMBS 12886
* 77.40.600 IterateOCGs as DynaPDFIteratorMBS 12887
* 77.40.601 IterateOutputIntents as DynaPDFIteratorMBS 12887
* 77.40.602 IteratePageAnnotations as DynaPDFIteratorMBS 12887
* 77.40.603 IteratePageLabels as DynaPDFIteratorMBS 12889
* 77.40.604 IterateSysFonts as DynaPDFIteratorMBS 12889
* 77.40.605 IterateXFAStreams as DynaPDFIteratorMBS 12889
* 77.40.606 KofCMYK(CMYK as UInt32) as Integer 12890
* 77.40.607 LAB(L as Integer, A as Integer, B as Integer) as Integer 12890
* 77.40.608 LineAnnot(x1 as Double, y1 as Double, x2 as Double, y2 as Double, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12891
* 77.40.609 LineAnnotAnsi(x1 as Double, y1 as Double, x2 as Double, y2 as Double, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12891
* 77.40.610 LineTo(PosX as Double, PosY as Double) as Boolean 12891
* 77.40.611 LoadCMap(CMapName as string, Embed as Boolean) as Integer 12892
* 77.40.612 LoadError as String 12892
* 77.40.613 LoadFDFData(FileName as folderitem, Password as string, Flags as Integer) as Boolean 12893
* 77.40.614 LoadFDFDataEx(Buffer as memoryblock, Password as string, Flags as Integer) as Boolean 12893
* 77.40.615 LoadFDFDataEx(Buffer as string, Password as string, Flags as Integer) as Boolean 12893
* 77.40.616 LoadFont(Buffer as memoryblock, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12893
* 77.40.617 LoadFont(Buffer as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894
* 77.40.618 LoadFontEx(File as folderitem, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894
* 77.40.619 LoadFontEx(Filepath as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894
* 77.40.620 LoadLayerConfig(Index as Integer) as Boolean 12895
* 77.40.621 LoadLibrary(File as FolderItem) as boolean 12895
* 77.40.622 LoadLibrary(Path as string) as boolean 12896
* 77.40.623 LockLayer(layer as UInt32) as boolean 12896

* 77.40.624 LofLAB(LAB as Integer) as Integer 12896
* 77.40.625 MarkTemplateAsWatermark(TemplateHandle as Integer) as Boolean 12896
* 77.40.626 MofCMYK(CMYK as UInt32) as Integer 12897
* 77.40.627 MovePage(source as Integer, dest as Integer) as Boolean 12897
* 77.40.628 MoveTo(PosX as Double, PosY as Double) as Boolean 12897
* 77.40.629 MultiplyMatrix(M1 as DynaPDFMatrixMBS, M2 as DynapdfMatrixMBS, NewMatrix as DynapdfMatrixMBS) as boolean 12898
* 77.40.630 OpenImportBuffer(Buffer as Memoryblock, PwdType as Integer = 0, Password as string = "") as Integer 12899
* 77.40.631 OpenImportBuffer(Buffer as string, PwdType as Integer = 0, Password as string = "") as Integer 12899
* 77.40.632 OpenImportFile(File as folderitem, PwdType as Integer = 0, Password as string = "") as Integer 12899
* 77.40.633 OpenImportFile(Path as String, PwdType as integer = 0, Password as string = "") as integer 12899
* 77.40.634 OpenOutputFile(File as folderitem) as Boolean 12900
* 77.40.635 OpenOutputFile(Path as String) as Boolean 12900
* 77.40.636 OpenOutputFileEncrypted(File as folderitem, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Boolean 12901
* 77.40.637 OpenOutputFileEncrypted(Path as String, OpenPwd as string, OwnerPwd as string, KeyLen as integer, Restrict as integer) as Boolean 12902
* 77.40.638 OpenTag(Tag as Integer, Lang as string, AltText as string, Expansion as string, BBox as DynaPDFRectMBS = nil) as boolean 12902
* 77.40.639 OpenTagAnsi(Tag as Integer, Lang as string, AltText as string, Expansion as string, BBox as DynaPDFRectMBS = nil) as boolean 12902
* 77.40.640 OpenTagEx(Tag as integer, Lang as string, AltText as string, Expansion as string, Attributes as String) as Boolean 12903
* 77.40.641 Optimize(Flags as Integer = 0, Params as DynaPDFOptimizeParamsMBS = nil) as boolean 12903
* 77.40.642 PageLink(PosX as Double, PosY as Double, Width as Double, Height as Double, DestPage as Integer) as Integer 12904
* 77.40.643 PageLink2(PosX as Double, PosY as Double, Width as Double, Height as Double, NamedDest as Integer) as Integer 12904
* 77.40.644 PageLink3(PosX as Double, PosY as Double, Width as Double, Height as Double, NamedDest as string) as Integer 12904
* 77.40.645 PageLinkEx(PosX as Double, PosY as Double, Width as Double, Height as Double, DestType as Integer, DestPage as Integer, a as Double = 0.0, b as Double = 0.0, c as Double = 0.0, d as Double = 0.0) as Integer 12905
* 77.40.646 PageStatistic(page as Integer = -1) as DynaPDFPageStatisticMBS 12905
* 77.40.647 ParseContent(ParseInterface as DynaPDFParseInterfaceMBS, flags as Integer) as boolean 12905
* 77.40.648 PlaceImage(ImgHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12905
* 77.40.649 PlaceSigFieldValidateIcon(SigField as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12906

* 77.40.650 PlaceTemplate(TmplHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12906
* 77.40.651 PlaceTemplateEx(TmplHandle as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Boolean 12906
* 77.40.652 PolygonAnnot(Vertices() as DynaPDFPointMBS, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12906
* 77.40.653 PolygonAnnotAnsi(Vertices() as DynaPDFPointMBS, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12907
* 77.40.654 PolyLineAnnot(Vertices() as DynaPDFPointMBS, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12907
* 77.40.655 PolyLineAnnotAnsi(Vertices() as DynaPDFPointMBS, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer 12908
* 77.40.656 PrintGetDevMode as String 12909
* 77.40.657 PrintGetDevNames(byref Driver as String, byref Device as String, byref Output as String, byref DefaultFlag as Integer) as Boolean 12909
* 77.40.658 PrintPDFFile(TempDir as FolderItem, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12909
* 77.40.659 PrintPDFFile(TempDir as FolderItem, DocName as string, PrinterName as String, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12910
* 77.40.660 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean 12910
* 77.40.661 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean 12911
* 77.40.662 PrintPDFPage(PageNumber as Integer, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12911
* 77.40.663 PrintPDFPage(PageNumber as Integer, DocName as string, PrinterName as String, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12912
* 77.40.664 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean 12912
* 77.40.665 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean 12912
* 77.40.666 PrintSetDevMode(data as MemoryBlock) as Boolean 12913

* 77.40.667 PrintSetDevMode(data as String) as Boolean 12913
* 77.40.668 PrintSetDevNames(Driver as String, Device as String, Output as String, DefaultFlag as Integer) as Boolean 12913
* 77.40.669 ReadImageFormat(FileName as folderitem, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12913
* 77.40.670 ReadImageFormat2(FileName as folderitem, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12914
* 77.40.671 ReadImageFormatEx(hBitmap as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12915
* 77.40.672 ReadImageFormatFromBuffer(Buffer as memoryblock, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12915
* 77.40.673 ReadImageFormatFromBuffer(Buffer as string, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12915
* 77.40.674 ReadImageResolution(FileName as folderitem, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean 12915
* 77.40.675 ReadImageResolutionEx(Buffer as Memoryblock, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean 12916
* 77.40.676 ReadImageResolutionEx(Buffer as string, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean 12917
* 77.40.677 Rectangle(PosX as Double, PosY as Double, Width as Double, Height as Double, FillMode as Integer) as Boolean 12917
* 77.40.678 ReEncryptPDF(File as folderitem, PwdType as Integer, InPwd as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer 12917
* 77.40.679 ReEncryptPDFAnsi(Path as string, PwdType as Integer, InPwd as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer 12917
* 77.40.680 RenameSpotColor(Colorant as string, NewName as string) as Integer 12918
* 77.40.681 RenderAnnotOrField(Handle as UInt32, IsAnnot as boolean, State as Integer, Matrix as DynaPDFMatrixMBS, Flags as Integer, PixFmt as Integer, Filter as Integer, byref Out as DynaPDFBitmapMBS) as Integer 12918
* 77.40.682 RenderPagePicture(PageNum as Integer) as picture 12918
* 77.40.683 RenderPagePicture(PageNum as Integer, Width as Integer, Height as Integer, DefScale as Integer = 2, matrix as DynaPDFMatrixMBS = nil) as picture 12920
* 77.40.684 RenderPageToImage(PageNumber as UInt32, OutFile as folderitem, Resolution as UInt32, Width as UInt32, Height as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12921
* 77.40.685 RenderPageToImageMT(PageNumber as UInt32, OutFile as folderitem, Resolution as UInt32, Width as UInt32, Height as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12922
* 77.40.686 RenderPageToPicture(PageNum as integer, pic as picture, DefScale as integer = 2, matrix as DynaPDFMatrixMBS = nil, RenderWithAlpha as boolean = false) as boolean 12923
* 77.40.687 RenderPDFFile(OutFile as folderitem, Resolution as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12925

* 77.40.688 RenderPDFFileEx(OutFile as folderitem, Resolution as UInt32, Width as Integer, Height as Integer, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12926
* 77.40.689 RenderPDFFileExMT(OutFile as folderitem, Resolution as UInt32, Width as Integer, Height as Integer, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12927
* 77.40.690 RenderPDFFileMT(OutFile as folderitem, Resolution as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean 12928
* 77.40.691 ReOpenImportFile(Handle as Integer) as boolean 12928
* 77.40.692 ReplaceFont(PDFFontRef as Integer, Name as string, Style as integer = 0, NameIsFamilyName as boolean = true) as integer 12929
* 77.40.693 ReplaceFontAnsi(PDFFontRef as Integer, Name as string, Style as integer = 0, NameIsFamilyName as boolean = true) as integer 12929
* 77.40.694 ReplaceFontEx(PDFFontRef as Integer, FontFile as FolderItem, Embed as boolean = true) as integer 12930
* 77.40.695 ReplaceFontEx(PDFFontRef as Integer, FontFilePath as string, Embed as boolean = true) as integer 12930
* 77.40.696 ReplaceFontExAnsi(PDFFontRef as Integer, FontFilePath as string, Embed as boolean = true) as integer 12930
* 77.40.697 ReplaceICCProfile(ColorSpace as Integer, ICCFile as folderitem) as Integer 12931
* 77.40.698 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as MemoryBlock) as integer 12931
* 77.40.699 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as String) as integer 12931
* 77.40.700 ReplaceImage(ImageToReplace as DynaPDFImageMBS, ImageFile as FolderItem, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean 12932
* 77.40.701 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as MemoryBlock, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean 12932
* 77.40.702 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as String, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean 12933
* 77.40.703 ReplacePageText(text as string, stack as DynaPDFStackMBS) as boolean 12934
* 77.40.704 ReplacePageTextEx(text as string, stack as DynaPDFStackMBS) as boolean 12934
* 77.40.705 ReplacePageTextExAnsi(text as string, stack as DynaPDFStackMBS) as boolean 12934
* 77.40.706 ResetAnnotAP(Handle as integer = -1) as Boolean 12935
* 77.40.707 ResetEncryptionSettings as Boolean 12935
* 77.40.708 ResetLineDashPattern as Boolean 12935
* 77.40.709 RestoreGraphicState as Boolean 12935
* 77.40.710 RGB(R as Integer, G as Integer, B as Integer) as Integer 12935
* 77.40.711 RofRGB(RGB as Integer) as Integer 12936
* 77.40.712 RotateCoords(alpha as Double, OriginX as Double, OriginY as Double) as Boolean 12936

* 77.40.713 RotateTemplate(OldTemplate as Integer, Rotation as Integer, RotateCoords as boolean = true) as Integer 12936
* 77.40.714 RoundRect(PosX as Double, PosY as Double, Width as Double, Height as Double, Radius as Double, FillMode as Integer) as Boolean 12937
* 77.40.715 RoundRectEx(PosX as Double, PosY as Double, Width as Double, Height as Double, rWidth as Double, rHeight as Double, FillMode as Integer) as Boolean 12937
* 77.40.716 SaveGraphicState as Boolean 12938
* 77.40.717 ScaleCoords(sx as Double, sy as Double) as Boolean 12938
* 77.40.718 SelfTest as Boolean 12939
* 77.40.719 Set3DAnnotProps(Annot as Integer, ActType as Integer, DeActType as Integer, InstType as Integer, DeInstType as Integer, DisplayToolbar as boolean, DisplayModelTree as boolean) as boolean 12939
* 77.40.720 Set3DAnnotScriptAnsi(Annot as Integer, Value as string) as boolean 12939
* 77.40.721 SetAllocBy(Value as Integer) as Integer 12939
* 77.40.722 SetAltFonts(FontListHandle as Integer, List() as String) as Boolean 12940
* 77.40.723 SetAnnotBorderEffect(Handle as Integer, BorderEffect as Integer) as Boolean 12940
* 77.40.724 SetAnnotBorderStyle(Handle as Integer, BorderStyle as Integer) as boolean 12940
* 77.40.725 SetAnnotBorderWidth(Handle as Integer, LineWidth as Double) as boolean 12941
* 77.40.726 SetAnnotColor(Handle as Integer, ColorType as Integer, PDFColorSpace as Integer, ColorValue as Integer) as boolean 12941
* 77.40.727 SetAnnotFlags(Flags as Integer) as Boolean 12941
* 77.40.728 SetAnnotFlagsEx(Handle as Integer, Flags as Integer) as boolean 12941
* 77.40.729 SetAnnotHighlightMode(Handle as Integer, HighlightMode as Integer) as boolean 12941
* 77.40.730 SetAnnotIcon(Handle as Integer, AnnotIcon as Integer) as boolean 12942
* 77.40.731 SetAnnotLineDashPattern(Handle as UInt32, dash as memoryblock, NumValues as integer) as Boolean 12942
* 77.40.732 SetAnnotLineDashPattern(Handle as UInt32, dash() as single) as Boolean 12942
* 77.40.733 SetAnnotLineEndStyle(Handle as UInt32, StartLineStyle as Integer, EndLineStyle as Integer) as boolean 12943
* 77.40.734 SetAnnotMigrationState(Handle as Integer, State as Integer, Name as string) as Integer 12943
* 77.40.735 SetAnnotMigrationStateAnsi(Handle as Integer, State as Integer, Name as string) as Integer 12944
* 77.40.736 SetAnnotOpacity(Handle as Integer, opacity as Double) as Boolean 12944
* 77.40.737 SetAnnotOpenState(Handle as Integer, Open as Boolean) as boolean 12945
* 77.40.738 SetAnnotOrFieldDate(CSHandle as UInt32, IsField as Boolean, Type as Integer, DateTime as UInt32) as boolean 12945
* 77.40.739 SetAnnotQuadPoints(Handle as UInt32, points() as DynaPDFPointMBS) as boolean 12946
* 77.40.740 SetAnnotString(Handle as Integer, StringType as Integer, Value as string) as boolean 12946
* 77.40.741 SetAnnotStringAnsi(Handle as Integer, StringType as Integer, Value as string) as boolean 12946

* 77.40.742 SetAnnotSubject(Handle as Integer, Value as string) as Boolean 12947
* 77.40.743 SetAnnotSubjectAnsi(Handle as Integer, Value as string) as Boolean 12947
* 77.40.744 SetBBox(Boundary as Integer, LeftX as Double, LeftY as Double, RightX as Double, RightY as Double) as Boolean 12947
* 77.40.745 SetBidiMode(BidiMode as Integer) as Boolean 12947
* 77.40.746 SetBlack(FillColor as Boolean, StrokeColor as Boolean) as Boolean 12947
* 77.40.747 SetBookmarkDest(ABmk as Integer, DestType as Integer, a as Double, b as Double, c as Double, d as Double) as Boolean 12948
* 77.40.748 SetBookmarkStyle(ABmk as Integer, Style as Integer, RGBColor as Integer) as Boolean 12948
* 77.40.749 SetBorderStyle(Style as Integer) as Boolean 12948
* 77.40.750 SetCharacterSpacing(value as Double) as Boolean 12948
* 77.40.751 SetCheckBoxChar(CheckBoxChar as Integer) as Boolean 12948
* 77.40.752 SetCheckBoxDefState(Field as Integer, Checked as Boolean) as Boolean 12949
* 77.40.753 SetCheckBoxState(Field as Integer, Checked as Boolean) as Boolean 12949
* 77.40.754 SetCIDFont(CMapHandle as Integer, Name as string, Style as Integer, Size as Double, Embed as boolean) as Integer 12949
* 77.40.755 SetCMapDir(path as folderitem, flags as Integer) as Integer 12949
* 77.40.756 SetCMapDir(path as string, flags as Integer) as Integer 12950
* 77.40.757 SetColDefFile(EmbFile as Integer) as boolean 12950
* 77.40.758 SetColorMask(ImageHandle as Integer, Mask as Ptr, Count as UInt32) as boolean 12950
* 77.40.759 SetColorMask(ImageHandle as Integer, Mask() as Integer) as boolean 12950
* 77.40.760 SetColors(ColorValue as Integer) as Boolean 12951
* 77.40.761 SetColorSpace(ColorSpace as Integer) as Boolean 12951
* 77.40.762 SetColSortField(ColField as Integer, AscendingOrder as boolean) as boolean 12952
* 77.40.763 SetCompressionFilter(Filter as Integer) as Boolean 12952
* 77.40.764 SetCompressionLevel(CompressLevel as Integer) as Boolean 12952
* 77.40.765 SetContent(buffer as memoryblock) as Boolean 12952
* 77.40.766 SetContent(buffer as string) as Boolean 12953
* 77.40.767 SetDateTimeFormat(TxtField as Integer, Fmt as Integer) as Boolean 12953
* 77.40.768 SetDefBitsPerPixel(value as Integer) as Boolean 12953
* 77.40.769 SetDocInfo(DInfo as Integer, Text as string) as Boolean 12953
* 77.40.770 SetDocInfoAnsi(DInfo as Integer, Text as string) as Boolean 12954
* 77.40.771 SetDocInfoEx(DInfo as Integer, Key as string, Text as string) as Boolean 12955
* 77.40.772 SetDocInfoExAnsi(DInfo as Integer, Key as string, Text as string) as Boolean 12955
* 77.40.773 SetDrawDirection(Direction as Integer) as Boolean 12955
* 77.40.774 SetEMFFrameDPI(DPIX as Integer, DPIY as Integer) as Boolean 12955
* 77.40.775 SetEMFPatternDistance(value as Double) as Boolean 12955
* 77.40.776 SetErrorMode(ErrMode as Integer) as Boolean 12956
* 77.40.777 SetExtColorSpace(Handle as Integer) as Integer 12956
* 77.40.778 SetExtFillColorSpace(Handle as UInt32) as boolean 12956

* 77.40.779 SetExtGState(Handle as Integer) as Boolean 12956
* 77.40.780 SetExtStrokeColorSpace(Handle as UInt32) as boolean 12956
* 77.40.781 SetFieldBackColor(ColorValue as Integer) as Boolean 12957
* 77.40.782 SetFieldBBox(Handle as Integer, rect as DynaPDFRectMBS) as Boolean 12957
* 77.40.783 SetFieldBorderColor(ColorValue as Integer) as Boolean 12957
* 77.40.784 SetFieldBorderStyle(Field as Integer, Style as Integer) as Boolean 12957
* 77.40.785 SetFieldBorderWidth(Field as Integer, LineWidth as Double) as Boolean 12957
* 77.40.786 SetFieldCalcOrder(CurrIndex as UInt32, NewIndex as UInt32) as Boolean 12958
* 77.40.787 SetFieldColor(Field as Integer, ColorType as Integer, ColorSpace as Integer, ColorValue as Integer) as Boolean 12958
* 77.40.788 SetFieldExpValue(Field as Integer, ValIndex as Integer, Value as string, ExpValue as string, Selected as boolean) as Boolean 12958
* 77.40.789 SetFieldExpValueAnsi(Field as Integer, ValIndex as Integer, Value as string, ExpValue as string, Selected as boolean) as Boolean 12958
* 77.40.790 SetFieldExpValueEx(Field as Integer, ValIndex as Integer, Selected as boolean, DefSelected as boolean) as Boolean 12959
* 77.40.791 SetFieldFlags(Field as Integer, Flags as Integer, Reset as boolean) as Boolean 12959
* 77.40.792 SetFieldFont(Field as Integer, Name as string, Style as Integer = 0, Size as double = 12, Embed as boolean = true, CodePage as integer = &h27) as Integer 12960
* 77.40.793 SetFieldFontAnsi(Field as Integer, Name as string, Style as Integer = 0, Size as Double = 12, Embed as boolean = true, CodePage as Integer = &h27) as Integer 12960
* 77.40.794 SetFieldFontEx(Field as UInt32, Handle as UInt32, FontSize as Double) as Boolean 12960
* 77.40.795 SetFieldFontSize(aField as Integer, FontSize as Double) as Boolean 12960
* 77.40.796 SetFieldHighlightMode(Field as Integer, HighlightMode as Integer) as Boolean 12961
* 77.40.797 SetFieldIndex(Field as Integer, Index as Integer) as Boolean 12961
* 77.40.798 SetFieldMapName(Field as Integer, Name as string) as Boolean 12961
* 77.40.799 SetFieldMapNameAnsi(Field as Integer, Name as string) as Boolean 12961
* 77.40.800 SetFieldName(Field as Integer, NewName as string) as Boolean 12961
* 77.40.801 SetFieldNameAnsi(Field as Integer, NewName as string) as Boolean 12962
* 77.40.802 SetFieldOrientation(Field as Integer, Value as Integer) as Boolean 12962
* 77.40.803 SetFieldTextAlign(Field as Integer, Align as Integer) as Boolean 12963
* 77.40.804 SetFieldTextColor(ColorValue as Integer) as Boolean 12963
* 77.40.805 SetFieldToolTip(Field as Integer, Value as string) as Boolean 12963
* 77.40.806 SetFieldToolTipAnsi(Field as Integer, Value as string) as Boolean 12963
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* 77.40.816 SetFontAnsi(Name as string, Style as integer = 0, Size as double = 12, Embed as boolean = true, CodePage as integer = &h27) as integer 12969
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* 77.77.4 AddRow(height as Double = 0.0) as Integer 13219
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* 77.77.22 HaveMore as boolean 13223
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* 77.77.25 SetBackColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13225
* 77.77.26 SetBackColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13225
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* 77.77.28 SetBorderColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13227
* 77.77.29 SetBorderColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13227
* 77.77.30 SetBorderColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13228
* 77.77.31 SetBorderColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13228
* 77.77.32 SetBorderColorValue(Row as Integer, Column as Integer, TPDFColorSpace as Integer, ColorValue as UInt32) as boolean 13229
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* 77.77.34 SetCellAction(Row as Integer, Column as Integer, ActionHandle as UInt32, Mode as Integer) as boolean 13230
* 77.77.35 SetCellDashPattern(Row as Integer, Column as Integer, CellSide as Integer, LineCapStyle as Integer, values() as Double, Phase as Double) as boolean 13230
* 77.77.36 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as FolderItem, index as Integer = 0) as boolean 13230
* 77.77.37 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as string, index as Integer = 0) as boolean 13231
* 77.77.38 SetCellImageAnsi(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as string, index as Integer = 0) as boolean 13231
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* 77.77.40 SetCellImageData(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, ImageData as string, index as Integer = 0) as boolean 13232
* 77.77.41 SetCellOrientation(Row as Integer, Column as Integer, Orientation as Integer) as boolean 13232
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* 77.77.43 SetCellPicture(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as double, Height as Double, Pic as Picture) as boolean 13233
* 77.77.44 SetCellSpacing(Row as Integer, Column as Integer, left as Double, top as Double, right as Double, bottom as Double) as boolean 13233
* 77.77.45 SetCellTable(Row as Integer, Column as Integer, HAlign as Integer, VAlign as Integer, SubTable as DynaPDFTableMBS) as boolean 13234
* 77.77.46 SetCellTemplate(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, TmplHandle as Integer, Width as Double = 0, Height as Double = 0) as boolean 13234
* 77.77.47 SetCellText(Row as Integer, Column as Integer, HTextAlign as Integer, VAlign as Integer, text as string) as boolean 13234
* 77.77.48 SetCellTextAnsi(Row as Integer, Column as Integer, HTextAlign as Integer, VAlign as Integer, text as string) as boolean 13235
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* 77.77.50 SetFlags(Row as Integer, Column as Integer, Flags as Integer) as boolean 13235
* 77.77.51 SetFont(Row as Integer, Column as Integer, name as string, Style as Integer = 0, Embed as Boolean = true, CodePage as Integer = &h27) as boolean 13235
* 77.77.52 SetFontAnsi(Row as Integer, Column as Integer, name as string, Style as Integer = 0, Embed as Boolean = true, CodePage as Integer = &h27) as boolean 13236
* 77.77.53 SetFontSelMode(Row as Integer, Column as Integer, value as Int32) as boolean 13236
* 77.77.54 SetFontSize(Row as Integer, Column as Integer, size as Double) as boolean 13236
* 77.77.55 SetGridHorizontalColor(channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13237
* 77.77.56 SetGridHorizontalColor(paramarray channels as Integer) as boolean 13237
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* 77.77.62 SetGridVerticalColorFloat(channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13239
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* 77.77.68 SetImageColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13241
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* 77.77.75 SetTextColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13243
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* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
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* 83.17.92 PhysicalFileResLengthMBS as int64 13725
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* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
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* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
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* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
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* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
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- 10 **Alias** 2739
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- 83 **Files** 13559
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    - 83.17.9 CompressedFileLengthMBS as int64 13679
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    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
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    - 83.17.28 GetFileFlagsMBS as Integer 13690
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    - 83.17.48 ItemsMBS as FolderItem() 13699
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    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

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* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
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* 83.17.124 TrueItemsMBS as FolderItem() 13744

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* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
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* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
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* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 56 **CoreGraphics** 8881
  - **??** Globals **??**
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    - 56.1.8 CGCreateImageFromJPEGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS 8887
    - 56.1.9 CGCreateImageFromPNGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS 8888
    - 56.1.10 CGCreateImageMBS(pic as picture) as CGImageMBS 8889
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    - 56.1.12 CGMakePointMBS(x as Double, y as Double) as CGPointMBS 8890
    - 56.1.13 CGMakeRectMBS(left as Double, top as Double, width as Double, height as Double) as CGRectMBS 8890
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    - 56.1.15 CGNewPDFDocumentMBS(consumer as CGDataConsumerMBS, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 8891
    - 56.1.16 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 8891
    - 56.1.1 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 8881
    - 56.1.2 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 8882
    - 56.1.5 CGOpenPDFDocumentMBS(dataprovider as CGDataProviderMBS) as CGPDFDocumentMBS 8884
    - 56.1.17 CGOpenPDFDocumentMBS(file as folderitem) as CGPDFDocumentMBS 8891
    - 56.1.18 CGSessionMBS as CGSessionMBS 8891
    - 56.1.6 CGShadingCreateAxialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, endPoint as CGPointMBS, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS 8885
    - 56.1.7 CGShadingCreateRadialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, startRadius as Double, endPoint as CGPointMBS, endRadius as Double, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS 8886
    - 56.1.3 GetCurrentCGContextMBS as CGContextMBS 8882

- 83 **Files** 13559
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    - 83.17.4 AbsolutePathMBS as string 13676
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* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
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* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
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* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 95 **Icon Service** 15061
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    - 83.17.32 IconImageMBS(width as Integer, WindowsFlags as Integer=0) as picture 13692
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- 83 **Files** 13559
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* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
* 83.17.92 PhysicalFileResLengthMBS as int64 13725
* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
* 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742
* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

– **??** Globals **??**

* 83.13.9 AdminToolsMBS(domain as Integer) as folderitem 13637
* 83.13.10 CookiesMBS as folderitem 13637
* 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer 13633
* 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
* 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
* 83.13.11 HistoryMBS as folderitem 13637
* 83.13.12 InternetCacheMBS as folderitem 13637
* 83.13.18 MountMBS(URL as String, Dest as string = ""), Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639

* 83.13.19 MountPathMBS(Path as String) as String 13640
* 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
* 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
* 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem 13634
* 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem 13635
* 83.13.6 PathToFolderItemMBS(path as string) as folderitem 13635
* 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean 13638
* 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean 13641
* 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean 13641
* 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 13635
* 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636
* 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64 13638
* 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
* 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
* 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem 13637

- 85 **Fonts** 13865
  - 83.17.1 class FolderItem 13676
    - 83.17.26 FontActivateMBS(OnlyLocal as boolean) as Integer 13688
    - 83.17.27 FontDeactivateMBS(OnlyLocal as boolean) as Integer 13690

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
    - 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean 13677
    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
    - 83.17.25 FoldersMBS as FolderItem() 13688
    - 83.17.28 GetFileFlagsMBS as Integer 13690
    - 83.17.29 GetFolderFlagsMBS as Integer 13691
    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
    - 83.17.48 ItemsMBS as FolderItem() 13699
    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
* 83.17.92 PhysicalFileResLengthMBS as int64 13725
* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
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* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 94 **iCloud** 14905
  - 83.17.1 class FolderItem 13676
    - 83.17.31 HasUnresolvedConflictsMBS as boolean 13692
    - 83.17.38 IsDownloadedMBS as boolean 13696
    - 83.17.39 IsDownloadingMBS as boolean 13696
    - 83.17.45 IsUbiquitousItemMBS as boolean 13698
    - 83.17.46 IsUploadedMBS as boolean 13699
    - 83.17.47 IsUploadingMBS as boolean 13699
    - 83.17.88 PercentDownloadedMBS as Double 13723
    - 83.17.89 PercentUploadedMBS as Double 13724

- 95 **Icon Service** 15061
  - 83.17.1 class FolderItem 13676
    - 83.17.23 FinderUpdateMBS as Integer 13687
    - 83.17.32 IconImageMBS(width as Integer, WindowsFlags as Integer=0) as picture 13692
    - 83.17.33 IconMaskMBS(width as Integer, WindowsFlags as Integer=0) as picture 13693
    - 83.17.34 IconMBS(width as Integer, WindowsFlags as Integer=0) as picture 13694

- 110 **Launch Services** 16647
  - 83.17.1 class FolderItem 13676
    - 83.17.35 isApplicationMBS as boolean 13695
    - 83.17.36 isBundleMBS as boolean 13695
    - 83.17.51 LaunchServicesApplicationForItemMBS(role as Integer) as folderitem 13700
    - 83.17.52 LaunchServicesApplicationsForItemMBS(role as Integer) as LaunchServicesApplicationListMBS 13701
    - 83.17.53 LaunchServicesCanApplicationAcceptItemMBS(TargetApp as folderitem, role as Integer, flags as Integer) as boolean 13702
    - 83.17.54 LaunchServicesDisplayNameMBS as string 13703
    - 83.17.55 LaunchServicesItemInfoMBS(WhichInfo as Integer) as LaunchServicesItemInfoMBS 13703
    - 83.17.56 LaunchServicesKindStringMBS as string 13704
    - 83.17.57 LaunchServicesOpenMBS as folderitem 13705
    - 83.17.58 LaunchServicesRegisterMBS(update as boolean) as Integer 13705

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
    - 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean 13677
    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
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    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
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    - 83.17.37 IsCompressedFileMBS as Boolean 13696
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    - 83.17.49 KindMBS as string 13699
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    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

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* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
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    - 83.17.47 IsUploadingMBS as boolean 13699
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    - 83.17.4 AbsolutePathMBS as string 13676
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* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
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* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
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* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
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* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
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* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
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* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
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* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
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* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
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- 94 **iCloud** 14905
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- 83 **Files** 13559
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    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
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    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
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    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
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    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
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    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
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    - 83.17.60 LogicalFileResLengthMBS as int64 13706
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* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
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* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
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* 83.17.87 ParentVolumeMBS as folderitem 13723
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* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
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* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
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* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
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* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
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* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 110 **Launch Services** 16647
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    - 83.17.36 isBundleMBS as boolean 13695
    - 83.17.51 LaunchServicesApplicationForItemMBS(role as Integer) as folderitem 13700
    - 83.17.52 LaunchServicesApplicationsForItemMBS(role as Integer) as LaunchServicesApplicationListMBS 13701
    - 83.17.53 LaunchServicesCanApplicationAcceptItemMBS(TargetApp as folderitem, role as Integer, flags as Integer) as boolean 13702
    - 83.17.54 LaunchServicesDisplayNameMBS as string 13703
    - 83.17.55 LaunchServicesItemInfoMBS(WhichInfo as Integer) as LaunchServicesItemInfoMBS 13703
    - 83.17.56 LaunchServicesKindStringMBS as string 13704
    - 83.17.57 LaunchServicesOpenMBS as folderitem 13705
    - 83.17.58 LaunchServicesRegisterMBS(update as boolean) as Integer 13705

- 83 **Files** 13559
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    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
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    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
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    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
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    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
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    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
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* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
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* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
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* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
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* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
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* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
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* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
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* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
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* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
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* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
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* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
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* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

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- 56 **CoreGraphics** 8881
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    - 83.17.74 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 13714
    - 83.17.75 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 13716
    - 83.17.76 NewCGPDFDocumentWithInfoMBS(MediaBox as CGRectMBS, info as object) as CGPDFContextMBS 13717
    - 83.17.77 OpenAsCGPDFDocumentMBS as CGPDFDocumentMBS 13719

- 83 **Files** 13559
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    - 83.13.10 CookiesMBS as folderitem 13637
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    - 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
    - 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
    - 83.13.11 HistoryMBS as folderitem 13637
    - 83.13.12 InternetCacheMBS as folderitem 13637
    - 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639
    - 83.13.19 MountPathMBS(Path as String) as String 13640
    - 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
    - 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
    - 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem 13634
    - 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem 13635
    - 83.13.6 PathToFolderItemMBS(path as string) as folderitem 13635
    - 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean 13638
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    - 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636
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    - 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
    - 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
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- 56 **CoreGraphics** 8881
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    - 83.17.73 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 13713
    - 83.17.74 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 13714
    - 83.17.75 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 13716
    - 83.17.76 NewCGPDFDocumentWithInfoMBS(MediaBox as CGRectMBS, info as object) as CGPDFContextMBS 13717
    - 83.17.77 OpenAsCGPDFDocumentMBS as CGPDFDocumentMBS 13719

- 87 **GIF** 14011
  - 83.17.1 class FolderItem 13676
    - 83.17.78 OpenAsGIFMBS as GIFMBS 13719
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- 107 **JPEG** 16383
  - 83.17.1 class FolderItem 13676
    - 83.17.79 OpenAsJPEGMBS as picture 13720
    - 83.17.80 OpenAsJPEGMBS(allowdamaged as Boolean) as picture 13720
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    - 83.17.103 SaveAsJPEGMBS(pic as picture, quality as Integer = 80) as boolean 13733

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
    - 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean 13677
    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
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    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
    - 83.17.25 FoldersMBS as FolderItem() 13688
    - 83.17.28 GetFileFlagsMBS as Integer 13690
    - 83.17.29 GetFolderFlagsMBS as Integer 13691
    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
    - 83.17.48 ItemsMBS as FolderItem() 13699
    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
* 83.17.92 PhysicalFileResLengthMBS as int64 13725
* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
* 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742
* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 139 **PNG** 19313
  - 83.17.1 class FolderItem 13676
    - 83.17.83 OpenAsPNGMBS(gamma as single = 0.0, AllowDamaged as Boolean = false) as PNGPictureMBS 13721
    - 83.17.98 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean 13730
    - 83.17.99 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13730
    - 83.17.100 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean 13731
    - 83.17.101 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13731
    - 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
    - 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
    - 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734
    - 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
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    - 83.17.4 AbsolutePathMBS as string 13676
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    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
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    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
    - 83.17.25 FoldersMBS as FolderItem() 13688
    - 83.17.28 GetFileFlagsMBS as Integer 13690
    - 83.17.29 GetFolderFlagsMBS as Integer 13691
    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
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    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
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* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
* 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742
* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

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- 182 **TIFF** 22119
  - 83.17.1 class FolderItem 13676
    - 83.17.85 OpenAsTiffMBS(HeaderOnly as boolean=false) as TiffPictureMBS 13722

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
    - 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean 13677
    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
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    - 83.17.9 CompressedFileLengthMBS as int64 13679
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    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
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    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
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    - 83.17.28 GetFileFlagsMBS as Integer 13690
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    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
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    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
    - 83.17.48 ItemsMBS as FolderItem() 13699
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    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
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* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
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* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
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* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
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* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
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* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
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* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
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* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
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* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
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* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

– **??** Globals **??**

* 83.13.9 AdminToolsMBS(domain as Integer) as folderitem 13637
* 83.13.10 CookiesMBS as folderitem 13637
* 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer 13633
* 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
* 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
* 83.13.11 HistoryMBS as folderitem 13637
* 83.13.12 InternetCacheMBS as folderitem 13637
* 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639

* 83.13.19 MountPathMBS(Path as String) as String 13640
* 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
* 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
* 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem 13634
* 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem 13635
* 83.13.6 PathToFolderItemMBS(path as string) as folderitem 13635
* 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean 13638
* 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean 13641
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* 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 13635
* 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636
* 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64 13638
* 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
* 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
* 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem 13637

- 94 **iCloud** 14905
  - 83.17.1 class FolderItem 13676
    - 83.17.31 HasUnresolvedConflictsMBS as boolean 13692
    - 83.17.38 IsDownloadedMBS as boolean 13696
    - 83.17.39 IsDownloadingMBS as boolean 13696
    - 83.17.45 IsUbiquitousItemMBS as boolean 13698
    - 83.17.46 IsUploadedMBS as boolean 13699
    - 83.17.47 IsUploadingMBS as boolean 13699
    - 83.17.88 PercentDownloadedMBS as Double 13723
    - 83.17.89 PercentUploadedMBS as Double 13724

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
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    - 83.17.4 AbsolutePathMBS as string 13676
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    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
    - 83.17.25 FoldersMBS as FolderItem() 13688
    - 83.17.28 GetFileFlagsMBS as Integer 13690
    - 83.17.29 GetFolderFlagsMBS as Integer 13691
    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
    - 83.17.48 ItemsMBS as FolderItem() 13699
    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
* 83.17.92 PhysicalFileResLengthMBS as int64 13725
* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
* 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742
* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 145 **QuickLook** 19715
  - 83.17.1 class FolderItem 13676
    - 83.17.94 QuickLookMBS(MaxWidth as Integer = 500, MaxHeight as Integer = 500, IconMode as Boolean = false, ScaleFactor as Double = 1.0) as picture 13726
    - 83.17.95 QuickLookMTMBS(MaxWidth as Integer = 500, MaxHeight as Integer = 500, IconMode as Boolean = false, ScaleFactor as Double = 1.0) as picture 13727

- 83 **Files** 13559
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    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
    - 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean 13677
    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
    - 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS 13678
    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
    - 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681
    - 83.17.15 DarwinMediaClassMBS as string 13681
    - 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS 13682
    - 83.17.17 DarwinVolumeNameMBS as string 13684
    - 83.17.18 DeleteDataForkMBS 13684
    - 83.17.19 DeleteResourceForkMBS 13684
    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
    - 83.17.24 FlushVolumeMBS as Integer 13688
    - 83.17.25 FoldersMBS as FolderItem() 13688
    - 83.17.28 GetFileFlagsMBS as Integer 13690
    - 83.17.29 GetFolderFlagsMBS as Integer 13691
    - 83.17.30 GetVolumeRefMBS as Integer 13692
    - 83.17.37 IsCompressedFileMBS as Boolean 13696
    - 83.17.40 IsEjectableVolumeMBS as Boolean 13697
    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
    - 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean 13698
    - 83.17.44 IsOnRemoteVolumeMBS as Boolean 13698
    - 83.17.48 ItemsMBS as FolderItem() 13699
    - 83.17.49 KindMBS as string 13699
    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
    - 83.17.60 LogicalFileResLengthMBS as int64 13706
    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

* 83.17.62 LongPathMBS as string 13707
* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
* 83.17.70 NameExtensionMBS as string 13712
* 83.17.71 NameWithoutExtensionMBS as string 13712
* 83.17.72 NativePath as string 13713
* 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS 13721
* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
* 83.17.87 ParentVolumeMBS as folderitem 13723
* 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS 13724
* 83.17.91 PhysicalFileDataLengthMBS as int64 13725
* 83.17.92 PhysicalFileResLengthMBS as int64 13725
* 83.17.93 PhysicalFileTotalLengthMBS as int64 13725
* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
* 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer 13736
* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
* 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738
* 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738
* 83.17.113 ShortPathMBS as string 13739
* 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13739
* 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem() 13740
* 83.17.120 TagNamesMBS as string() 13742
* 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742
* 83.17.122 TrueFilesMBS as FolderItem() 13743
* 83.17.123 TrueFoldersMBS as FolderItem() 13743
* 83.17.124 TrueItemsMBS as FolderItem() 13744

* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
* 83.17.150 CommentMBS as string 13757
* 83.17.151 CreationDateMBS(UTC as boolean = false) as date 13757
* 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime 13758
* 83.17.153 FinderLabelMBS as Integer 13758
* 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS 13759
* 83.17.155 ModificationDateMBS(UTC as boolean = false) as date 13759
* 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime 13760

- 139 **PNG** 19313
  - 83.17.1 class FolderItem 13676
    - 83.17.83 OpenAsPNGMBS(gamma as single = 0.0, AllowDamaged as Boolean = false) as PNGPictureMBS 13721
    - 83.17.98 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean 13730
    - 83.17.99 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13730
    - 83.17.100 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean 13731
    - 83.17.101 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13731
    - 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
    - 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
    - 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734
    - 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

- 87 **GIF** 14011
  - 83.17.1 class FolderItem 13676
    - 83.17.78 OpenAsGIFMBS as GIFMBS 13719
    - 83.17.102 SaveAsGIFMBS(data as GIFMBS) as boolean 13732

- 107 **JPEG** 16383
  - 83.17.1 class FolderItem 13676
    - 83.17.79 OpenAsJPEGMBS as picture 13720
    - 83.17.80 OpenAsJPEGMBS(allowdamaged as Boolean) as picture 13720
    - 83.17.81 OpenAsJPEGMBS(allowdamaged as Boolean,fileposition as Integer) as picture 13720
    - 83.17.103 SaveAsJPEGMBS(pic as picture, quality as Integer = 80) as boolean 13733

- 139 **PNG** 19313
  - 83.17.1 class FolderItem 13676
    - 83.17.83 OpenAsPNGMBS(gamma as single = 0.0, AllowDamaged as Boolean = false) as PNGPictureMBS 13721
    - 83.17.98 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean 13730
    - 83.17.99 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13730
    - 83.17.100 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean 13731
    - 83.17.101 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13731
    - 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
    - 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
    - 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734
    - 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

- 118 **Mac** 17063
  - 83.17.1 class FolderItem 13676
    - 83.17.108 SetDesktopPictureMBS as Integer 13736

- 83 **Files** 13559
  - 83.17.1 class FolderItem 13676
    - 83.17.3 AbsolutePath as string 13676
    - 83.17.4 AbsolutePathMBS as string 13676
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    - 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer 13678
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    - 83.17.9 CompressedFileLengthMBS as int64 13679
    - 83.17.10 CountMBS as Integer 13679
    - 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13680
    - 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS 13680
    - 83.17.13 CreatorAppMBS as FolderItem 13680
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    - 83.17.20 DisplayPathMBS(delimiter as string = "/") as string 13685
    - 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13685
    - 83.17.22 FilesMBS as FolderItem() 13687
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    - 83.17.41 IsEncryptedFileMBS as Boolean 13697
    - 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean 13697
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    - 83.17.48 ItemsMBS as FolderItem() 13699
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    - 83.17.50 LaunchMBS(inFront as Boolean) as Boolean 13700
    - 83.17.59 LogicalFileDataLengthMBS as int64 13706
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    - 83.17.61 LogicalFileTotalLengthMBS as int64 13707

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* 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13707
* 83.17.64 MacIsHardLinkedMBS as boolean 13708
* 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13708
* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
* 83.17.67 MacNodeIDMBS as UInt64 13710
* 83.17.68 MacParentDirectoryIDMBS as UInt64 13711
* 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem 13711
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* 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean 13723
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* 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728
* 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean 13729
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* 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer 13737
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* 83.17.125 UnixpathMBS as string 13744
* 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745
* 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746
* 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer 13748
* 83.17.130 VolumeFreeSizeKBMBS as Int64 13749
* 83.17.131 VolumeFreeSizeMBS as Int64 13749
* 83.17.132 VolumeInformationMBS as VolumeInformationMBS 13750
* 83.17.133 VolumeSizeKBMBS as Int64 13750
* 83.17.134 VolumeSizeMBS as Int64 13751
* 83.17.135 VolumeSupportsHugeFilesMBS as Integer 13752
* 83.17.136 VolumeUUIDMBS as string 13752
* 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture 13752
* 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753
* 83.17.139 WriteFileMBS(data as string) as boolean 13753
* 83.17.141 AccessDateMBS(UTC as boolean = false) as date 13754
* 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime 13754
* 83.17.143 AddedToDirectoryDateMBS as date 13755
* 83.17.144 AddedToDirectoryDateTimeMBS as DateTime 13755
* 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date 13755
* 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.147 BackupDateMBS(UTC as boolean = false) as date 13756
* 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime 13756
* 83.17.149 BackupItemExcludedMBS as boolean 13756
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* 83.17.153 FinderLabelMBS as Integer 13758
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* 83.13.18 MountMBS(URL as String, Dest as string = ""), Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639

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* 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer 13709
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* 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS 13722
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* 83.13.10 CookiesMBS as folderitem 13637
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* 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639

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* 97.19.29 CoalesceImages as IMImageQ16MBS 15461
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* 97.19.35 ContrastImage(sharpen as boolean) as Boolean 15464
* 97.19.36 CopyPicture as picture 15464
* 97.19.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15464
* 97.19.38 CopyPictureMask as picture 15465
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* 97.19.40 CopyPixel(x as Integer, y as Integer) as IMColorQ16MBS 15466
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* 97.19.42 Crop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS 15466
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* 97.19.44 CycleColormap(displace as Integer) as boolean 15466
* 97.19.45 DecipherImage(passkey as string) as boolean 15467
* 97.19.46 DeconstructImages as IMImageQ16MBS 15467
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* 97.19.50 DestroyImageAttributes 15468
* 97.19.51 DestroyImageList 15468
* 97.19.52 DestroyImageProfiles 15468
* 97.19.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS 15468

* 97.19.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS 15469
* 97.19.55 Edge(radius as Double) as IMImageQ16MBS 15471
* 97.19.56 Emboss(radius as Double, sigma as Double) as IMImageQ16MBS 15471
* 97.19.57 EncipherImage(passkey as string) as boolean 15471
* 97.19.58 EqualizeImage as Boolean 15471
* 97.19.59 EqualizeImageChannel(ChannelType as Integer) as Boolean 15472
* 97.19.60 ExcerptImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS 15472
* 97.19.61 ExtentImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS 15472
* 97.19.62 FlattenImages as IMImageQ16MBS 15473
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* 97.19.64 Flop as IMImageQ16MBS 15473
* 97.19.65 FrameImage(x as Integer, y as Integer, width as Integer, height as Integer, innerBevel as Integer, OuterBevel as Integer) as IMImageQ16MBS 15473
* 97.19.66 FxImage(expression as string) as IMImageQ16MBS 15474
* 97.19.67 GaussianBlurChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ16MBS 15474
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* 97.19.77 IsBlobExempt as boolean 15478
* 97.19.78 IsBlobSeekable as boolean 15478
* 97.19.79 IsBlobTemporary as boolean 15478
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* 97.19.81 MedianFilter(radius as Double) as IMImageQ16MBS 15479
* 97.19.82 MergeImageLayers(ImageLayerMethod as Integer) as IMImageQ16MBS 15479
* 97.19.83 Minify as IMImageQ16MBS 15479
* 97.19.84 MosaicImages as IMImageQ16MBS 15480
* 97.19.85 MotionBlur(radius as Double, sigma as Double, angle as Double) as IMImageQ16MBS 15480
* 97.19.86 NegateImage(gray as boolean = false) as Boolean 15480
* 97.19.87 NegateImageChannel(ChannelType as Integer, gray as boolean = false) as Boolean 15481
* 97.19.88 NewImage(info as IMImageInfoQ16MBS, width as Integer, height as Integer, background as IMMagickPixelPacketQ16MBS) as boolean 15481

* 97.19.89 NormalizeImage as Boolean 15482
* 97.19.90 NormalizeImageChannel(ChannelType as Integer) as Boolean 15482
* 97.19.91 OilPaint(radius as Double) as IMImageQ16MBS 15483
* 97.19.92 OptimizeImageLayers as IMImageQ16MBS 15483
* 97.19.93 OptimizeImageTransparency 15483
* 97.19.94 OptimizePlusImageLayers as IMImageQ16MBS 15484
* 97.19.95 ProfileImage(name as string, ProfileData as string) as boolean 15484
* 97.19.96 RadialBlur(angle as Double) as IMImageQ16MBS 15484
* 97.19.97 RaiseImage(x as Integer, y as Integer, width as Integer, height as Integer, raise as boolean) as boolean 15484
* 97.19.98 RandomThresholdChannel(channel as Integer, thresholds as string) as boolean 15485
* 97.19.99 ReduceNoise(radius as Double) as IMImageQ16MBS 15485
* 97.19.100 RemoveDuplicateLayers 15486
* 97.19.101 RemoveFirstImageFromList as IMImageQ16MBS 15486
* 97.19.102 RemoveImageProfile(name as string) as string 15486
* 97.19.103 RemoveZeroDelayLayers 15487
* 97.19.104 ResetImageAttributeIterator 15487
* 97.19.105 ResetImageProfileIterator 15487
* 97.19.106 Resize(width as Integer, height as Integer, FilterID as Integer, blur as Double) as IMImageQ16MBS 15487
* 97.19.107 RGBTransformImage(Colorspace as Integer) as boolean 15488
* 97.19.108 Roll(x as Integer, y as Integer) as IMImageQ16MBS 15488
* 97.19.109 Rotate(degrees as Double) as IMImageQ16MBS 15489
* 97.19.110 Sample(width as Integer, height as Integer) as IMImageQ16MBS 15490
* 97.19.111 Scale(width as Integer, height as Integer) as IMImageQ16MBS 15490
* 97.19.112 SetImageAttribute(key as string, value as string) as boolean 15490
* 97.19.113 SetImageColorspace(Colorspace as Integer) as boolean 15491
* 97.19.114 SetImageProfile(name as string, ProfileData as string) as boolean 15491
* 97.19.115 SetPicture(pic as picture, x as Integer, y as Integer) 15491
* 97.19.116 SetPictureMask(maskpic as picture, x as Integer, y as Integer) 15492
* 97.19.117 SetPixel(x as Integer, y as Integer, newPixel as IMColorQ16MBS) 15492
* 97.19.118 Shade(gray as boolean, azimuth as Double, elevation as Double) as IMImageQ16MBS 15493
* 97.19.119 SharpenChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ16MBS 15493
* 97.19.120 Shave(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS 15494
* 97.19.121 Shear(Xshear as Double, Yshear as Double) as IMImageQ16MBS 15494
* 97.19.122 Solarize(factor as Double) as boolean 15494
* 97.19.123 Splice(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS 15495
* 97.19.124 Spread(radius as Double) as IMImageQ16MBS 15495
* 97.19.125 Stegano(watermarkImage as IMImageQ16MBS) as IMImageQ16MBS 15495

* 97.19.126 Stereo(otherImage as IMImageQ16MBS) as IMImageQ16MBS 15495
* 97.19.127 Swirl(degrees as Double) as IMImageQ16MBS 15496
* 97.19.128 Thumbnail(width as Integer, height as Integer) as IMImageQ16MBS 15496
* 97.19.129 TransformImage(CropGeometry as string, ImageGeometry as string) as boolean 15496
* 97.19.130 TransformImages(CropGeometry as string, ImageGeometry as string) as boolean 15497
* 97.19.131 TransformRGBImage(Colorspace as Integer) as boolean 15497
* 97.19.132 TransposeImage as IMImageQ16MBS 15497
* 97.19.133 TransverseImage as IMImageQ16MBS 15497
* 97.19.134 Trim as IMImageQ16MBS 15498
* 97.19.135 UnsharpMaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double) as IMImageQ16MBS 15498
* 97.19.136 Wave(amplitude as Double, wavelength as Double) as IMImageQ16MBS 15499
* 97.19.137 WhiteThreshold(threshold as string) as boolean 15499
* 97.19.138 WriteImage(info as IMImageInfoQ16MBS) as boolean 15500
* 97.19.140 BackgroundColor as IMColorQ16MBS 15500
* 97.19.141 Bias as Double 15500
* 97.19.142 BlurFactor as Double 15500
* 97.19.143 BorderColor as IMColorQ16MBS 15500
* 97.19.144 Colors as Integer 15501
* 97.19.145 ColorSpace as Integer 15501
* 97.19.146 Compression as Integer 15502
* 97.19.147 Depth as Integer 15502
* 97.19.148 Directory as String 15502
* 97.19.149 Endian as Integer 15502
* 97.19.150 Filename as String 15503
* 97.19.151 Filter as Integer 15503
* 97.19.152 Fuzz as Double 15503
* 97.19.153 Gamma as Double 15504
* 97.19.154 Geometry as String 15504
* 97.19.155 Gravity as Integer 15504
* 97.19.156 Handle as Integer 15505
* 97.19.157 Height as Integer 15505
* 97.19.158 Interlace as Integer 15505
* 97.19.159 LastError as Integer 15506
* 97.19.160 LastException as IMExceptionQ16MBS 15506
* 97.19.161 Magick as String 15506
* 97.19.162 Matte as Boolean 15506
* 97.19.163 MatteColor as IMColorQ16MBS 15506
* 97.19.164 Montage as String 15507
* 97.19.165 Offset as Integer 15507

* 97.19.166 Orientation as Integer 15507
* 97.19.167 Quality as Integer 15507
* 97.19.168 Release as Boolean 15509
* 97.19.169 RenderingIntent as Integer 15509
* 97.19.170 ResolutionUnits as Integer 15509
* 97.19.171 ResolutionX as Double 15510
* 97.19.172 ResolutionY as Double 15510
* 97.19.173 Scene as Integer 15510
* 97.19.174 StorageClass as Integer 15510
* 97.19.175 Taint as Boolean 15511
* 97.19.176 Width as Integer 15511

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* 97.20.3 AdaptiveThreshold(width as Integer, height as Integer, offset as Integer) as IMImageQ32MBS 15515
* 97.20.4 AddNoise(NoiseType as Integer) as IMImageQ32MBS 15515
* 97.20.5 AffineTransformImage(matrix as IMImageAffineMatrixQ32MBS) as IMImageQ32MBS 15516
* 97.20.6 AppendImageToList(img as IMImageQ32MBS) 15516
* 97.20.7 AutoGammaImage as Boolean 15516
* 97.20.8 AutoGammaImageChannel(ChannelType as Integer) as Boolean 15516
* 97.20.9 AutoLevelImage as Boolean 15517
* 97.20.10 AutoLevelImageChannel(ChannelType as Integer) as Boolean 15517
* 97.20.11 Average as IMImageQ32MBS 15518
* 97.20.12 BilevelChannel(channel as Integer, threshold as Double) as boolean 15518
* 97.20.13 BlackThreshold(threshold as string) as boolean 15519
* 97.20.14 BlobSize as Integer 15519
* 97.20.15 Blur(radius as Double, sigma as Double) as IMImageQ32MBS 15519
* 97.20.16 BlurImageChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS 15520
* 97.20.17 BorderImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15520
* 97.20.18 BrightnessContrastImage(brightness as Double, contrast as Double) as Boolean 15521
* 97.20.19 BrightnessContrastImageChannel(ChannelType as Integer, brightness as Double, contrast as Double) as Boolean 15521
* 97.20.20 Charcoal(radius as Double, sigma as Double) as IMImageQ32MBS 15521
* 97.20.21 Chop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15522
* 97.20.22 ClipPath(path as string, inside as boolean) as boolean 15522
* 97.20.23 Clone as IMImageQ32MBS 15522
* 97.20.24 CloneImageAttributes(image as IMImageAttributeQ32MBS) as Boolean 15523
* 97.20.25 CloneImageProfiles(SourceImage as IMImageQ32MBS) as boolean 15523
* 97.20.26 Close 15523

* 97.20.27 ClutImage(clutImage as IMImageQ32MBS) as Boolean 15523
* 97.20.28 ClutImageChannel(ChannelType as Integer, clutImage as IMImageQ32MBS) as Boolean 15524
* 97.20.29 CoalesceImages as IMImageQ32MBS 15524
* 97.20.30 Colorize(opacity as string, PenColorRed as Integer, PenColorGreen as Integer, PenColorBlue as Integer, PenColorOpacity as Integer) as IMImageQ32MBS 15525
* 97.20.31 Combine(channel as Integer) as IMImageQ32MBS 15526
* 97.20.32 CompareImageLayers(ImageLayerMethod as Integer) as IMImageQ32MBS 15526
* 97.20.33 Composite(ComposeOperator as Integer, Image as IMImageQ32MBS, x as Integer, y as Integer) 15526
* 97.20.34 ConsolidateCMYKImages as IMImageQ32MBS 15527
* 97.20.35 ContrastImage(sharpen as boolean) as Boolean 15527
* 97.20.36 CopyPicture as picture 15527
* 97.20.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15527
* 97.20.38 CopyPictureMask as picture 15528
* 97.20.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15528
* 97.20.40 CopyPixel(x as Integer, y as Integer) as IMColorQ32MBS 15529
* 97.20.41 CreateHBITMAP as Ptr 15529
* 97.20.42 Crop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15529
* 97.20.43 CropImageToTiles(CropGeometry as string) as IMImageQ32MBS 15529
* 97.20.44 CycleColormap(displace as Integer) as boolean 15529
* 97.20.45 DecipherImage(passkey as string) as boolean 15530
* 97.20.46 DeconstructImages as IMImageQ32MBS 15530
* 97.20.47 DeleteImageAttribute(key as string) as Boolean 15530
* 97.20.48 Despeckle() as IMImageQ32MBS 15530
* 97.20.49 DestroyImage 15531
* 97.20.50 DestroyImageAttributes 15531
* 97.20.51 DestroyImageList 15531
* 97.20.52 DestroyImageProfiles 15531
* 97.20.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS 15531
* 97.20.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS 15532
* 97.20.55 Edge(radius as Double) as IMImageQ32MBS 15534
* 97.20.56 Emboss(radius as Double, sigma as Double) as IMImageQ32MBS 15534
* 97.20.57 EncipherImage(passkey as string) as boolean 15534
* 97.20.58 EqualizeImage as Boolean 15534
* 97.20.59 EqualizeImageChannel(ChannelType as Integer) as Boolean 15535
* 97.20.60 ExcerptImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15535

* 97.20.61 ExtentImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15535
* 97.20.62 FlattenImages as IMImageQ32MBS 15536
* 97.20.63 Flip as IMImageQ32MBS 15536
* 97.20.64 Flop as IMImageQ32MBS 15536
* 97.20.65 FrameImage(x as Integer, y as Integer, width as Integer, height as Integer, innerBevel as Integer, OuterBevel as Integer) as IMImageQ32MBS 15536
* 97.20.66 FxImage(expression as string) as IMImageQ32MBS 15537
* 97.20.67 GaussianBlurChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS 15537
* 97.20.68 GetImageAttribute(key as string) as IMImageAttributeQ32MBS 15538
* 97.20.69 GetImageClippingPathAttribute as IMImageAttributeQ32MBS 15538
* 97.20.70 GetImageProfile(name as string) as string 15538
* 97.20.71 GetNextImageAttribute as IMImageAttributeQ32MBS 15538
* 97.20.72 GetNextImageProfile as string 15538
* 97.20.73 HandleMemory as memoryblock 15538
* 97.20.74 ImagesToBlob(info as IMImageInfoQ32MBS) as String 15539
* 97.20.75 ImageToBlob(info as IMImageInfoQ32MBS) as String 15539
* 97.20.76 Implode(factor as Double) as IMImageQ32MBS 15541
* 97.20.77 IsBlobExempt as boolean 15541
* 97.20.78 IsBlobSeekable as boolean 15541
* 97.20.79 IsBlobTemporary as boolean 15541
* 97.20.80 Magnify as IMImageQ32MBS 15541
* 97.20.81 MedianFilter(radius as Double) as IMImageQ32MBS 15542
* 97.20.82 MergeImageLayers(ImageLayerMethod as Integer) as IMImageQ32MBS 15542
* 97.20.83 Minify as IMImageQ32MBS 15542
* 97.20.84 MosaicImages as IMImageQ32MBS 15543
* 97.20.85 MotionBlur(radius as Double, sigma as Double, angle as Double) as IMImageQ32MBS 15543
* 97.20.86 NegateImage(gray as boolean = false) as Boolean 15543
* 97.20.87 NegateImageChannel(ChannelType as Integer, gray as boolean = false) as Boolean 15544
* 97.20.88 NewImage(info as IMImageInfoQ32MBS, width as Integer, height as Integer, background as IMMagickPixelPacketQ32MBS) as boolean 15544
* 97.20.89 NormalizeImage as Boolean 15545
* 97.20.90 NormalizeImageChannel(ChannelType as Integer) as Boolean 15545
* 97.20.91 OilPaint(radius as Double) as IMImageQ32MBS 15546
* 97.20.92 OptimizeImageLayers as IMImageQ32MBS 15546
* 97.20.93 OptimizeImageTransparency 15546
* 97.20.94 OptimizePlusImageLayers as IMImageQ32MBS 15547
* 97.20.95 ProfileImage(name as string, ProfileData as string) as boolean 15547
* 97.20.96 RadialBlur(angle as Double) as IMImageQ32MBS 15547

* 97.20.97 RaiseImage(x as Integer, y as Integer, width as Integer, height as Integer, raise as boolean) as boolean 15547
* 97.20.98 RandomThresholdChannel(channel as Integer, thresholds as string) as boolean 15548
* 97.20.99 ReduceNoise(radius as Double) as IMImageQ32MBS 15548
* 97.20.100 RemoveDuplicateLayers 15549
* 97.20.101 RemoveFirstImageFromList as IMImageQ32MBS 15549
* 97.20.102 RemoveImageProfile(name as string) as string 15549
* 97.20.103 RemoveZeroDelayLayers 15550
* 97.20.104 ResetImageAttributeIterator 15550
* 97.20.105 ResetImageProfileIterator 15550
* 97.20.106 Resize(width as Integer, height as Integer, FilterID as Integer, blur as Double) as IMImageQ32MBS 15550
* 97.20.107 RGBTransformImage(Colorspace as Integer) as boolean 15551
* 97.20.108 Roll(x as Integer, y as Integer) as IMImageQ32MBS 15551
* 97.20.109 Rotate(degrees as Double) as IMImageQ32MBS 15552
* 97.20.110 Sample(width as Integer, height as Integer) as IMImageQ32MBS 15553
* 97.20.111 Scale(width as Integer, height as Integer) as IMImageQ32MBS 15553
* 97.20.112 SetImageAttribute(key as string, value as string) as boolean 15553
* 97.20.113 SetImageColorspace(Colorspace as Integer) as boolean 15554
* 97.20.114 SetImageProfile(name as string, ProfileData as string) as boolean 15554
* 97.20.115 SetPicture(pic as picture, x as Integer, y as Integer) 15554
* 97.20.116 SetPictureMask(maskpic as picture, x as Integer, y as Integer) 15555
* 97.20.117 SetPixel(x as Integer, y as Integer, newPixel as IMColorQ32MBS) 15555
* 97.20.118 Shade(gray as boolean, azimuth as Double, elevation as Double) as IMImageQ32MBS 15556
* 97.20.119 SharpenChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS 15556
* 97.20.120 Shave(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15557
* 97.20.121 Shear(Xshear as Double, Yshear as Double) as IMImageQ32MBS 15557
* 97.20.122 Solarize(factor as Double) as boolean 15557
* 97.20.123 Splice(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS 15558
* 97.20.124 Spread(radius as Double) as IMImageQ32MBS 15558
* 97.20.125 Stegano(watermarkImage as IMImageQ32MBS) as IMImageQ32MBS 15558
* 97.20.126 Stereo(otherImage as IMImageQ32MBS) as IMImageQ32MBS 15558
* 97.20.127 Swirl(degrees as Double) as IMImageQ32MBS 15559
* 97.20.128 Thumbnail(width as Integer, height as Integer) as IMImageQ32MBS 15559
* 97.20.129 TransformImage(CropGeometry as string, ImageGeometry as string) as boolean 15559
* 97.20.130 TransformImages(CropGeometry as string, ImageGeometry as string) as boolean 15560
* 97.20.131 TransformRGBImage(Colorspace as Integer) as boolean 15560

* 97.20.132 TransposeImage as IMImageQ32MBS 15560
* 97.20.133 TransverseImage as IMImageQ32MBS 15560
* 97.20.134 Trim as IMImageQ32MBS 15561
* 97.20.135 UnsharpMaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double) as IMImageQ32MBS 15561
* 97.20.136 Wave(amplitude as Double, wavelength as Double) as IMImageQ32MBS 15562
* 97.20.137 WhiteThreshold(threshold as string) as boolean 15562
* 97.20.138 WriteImage(info as IMImageInfoQ32MBS) as boolean 15563
* 97.20.140 BackgroundColor as IMColorQ32MBS 15563
* 97.20.141 Bias as Double 15563
* 97.20.142 BlurFactor as Double 15563
* 97.20.143 BorderColor as IMColorQ32MBS 15563
* 97.20.144 Colors as Integer 15564
* 97.20.145 ColorSpace as Integer 15564
* 97.20.146 Compression as Integer 15565
* 97.20.147 Depth as Integer 15565
* 97.20.148 Directory as String 15565
* 97.20.149 Endian as Integer 15565
* 97.20.150 Filename as String 15566
* 97.20.151 Filter as Integer 15566
* 97.20.152 Fuzz as Double 15566
* 97.20.153 Gamma as Double 15567
* 97.20.154 Geometry as String 15567
* 97.20.155 Gravity as Integer 15567
* 97.20.156 Handle as Integer 15568
* 97.20.157 Height as Integer 15568
* 97.20.158 Interlace as Integer 15568
* 97.20.159 LastError as Integer 15569
* 97.20.160 LastException as IMExceptionQ32MBS 15569
* 97.20.161 Magick as String 15569
* 97.20.162 Matte as Boolean 15569
* 97.20.163 MatteColor as IMColorQ32MBS 15569
* 97.20.164 Montage as String 15570
* 97.20.165 Offset as Integer 15570
* 97.20.166 Orientation as Integer 15570
* 97.20.167 Quality as Integer 15570
* 97.20.168 Release as Boolean 15572
* 97.20.169 RenderingIntent as Integer 15572
* 97.20.170 ResolutionUnits as Integer 15572
* 97.20.171 ResolutionX as Double 15573
* 97.20.172 ResolutionY as Double 15573
* 97.20.173 Scene as Integer 15573

* 97.20.174 StorageClass as Integer 15573
* 97.20.175 Taint as Boolean 15574
* 97.20.176 Width as Integer 15574

– 97.21.1 class IMImageQ8MBS 15578

* 97.21.3 AdaptiveThreshold(width as Integer, height as Integer, offset as Integer) as IMImageQ8MBS 15578
* 97.21.4 AddNoise(NoiseType as Integer) as IMImageQ8MBS 15578
* 97.21.5 AffineTransformImage(matrix as IMImageAffineMatrixQ8MBS) as IMImageQ8MBS 15579
* 97.21.6 AppendImageToList(img as IMImageQ8MBS) 15579
* 97.21.7 AutoGammaImage as Boolean 15579
* 97.21.8 AutoGammaImageChannel(ChannelType as Integer) as Boolean 15579
* 97.21.9 AutoLevelImage as Boolean 15580
* 97.21.10 AutoLevelImageChannel(ChannelType as Integer) as Boolean 15580
* 97.21.11 Average as IMImageQ8MBS 15581
* 97.21.12 BilevelChannel(channel as Integer, threshold as Double) as boolean 15581
* 97.21.13 BlackThreshold(threshold as string) as boolean 15582
* 97.21.14 BlobSize as Integer 15582
* 97.21.15 Blur(radius as Double, sigma as Double) as IMImageQ8MBS 15582
* 97.21.16 BlurImageChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ8MBS 15583
* 97.21.17 BorderImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS 15583
* 97.21.18 BrightnessContrastImage(brightness as Double, contrast as Double) as Boolean 15584
* 97.21.19 BrightnessContrastImageChannel(ChannelType as Integer, brightness as Double, contrast as Double) as Boolean 15584
* 97.21.20 Charcoal(radius as Double, sigma as Double) as IMImageQ8MBS 15584
* 97.21.21 Chop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS 15585
* 97.21.22 ClipPath(path as string, inside as boolean) as boolean 15585
* 97.21.23 Clone as IMImageQ8MBS 15585
* 97.21.24 CloneImageAttributes(image as IMImageAttributeQ8MBS) as Boolean 15586
* 97.21.25 CloneImageProfiles(SourceImage as IMImageQ8MBS) as boolean 15586
* 97.21.26 Close 15586
* 97.21.27 ClutImage(clutImage as IMImageQ8MBS) as Boolean 15586
* 97.21.28 ClutImageChannel(ChannelType as Integer, clutImage as IMImageQ8MBS) as Boolean 15587
* 97.21.29 CoalesceImages as IMImageQ8MBS 15587
* 97.21.30 Colorize(opacity as string, PenColorRed as Integer, PenColorGreen as Integer, PenColorBlue as Integer, PenColorOpacity as Integer) as IMImageQ8MBS 15588
* 97.21.31 Combine(channel as Integer) as IMImageQ8MBS 15589
* 97.21.32 CompareImageLayers(ImageLayerMethod as Integer) as IMImageQ8MBS 15589

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- 104 **Java Database** 16085
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- 104 **Java Database** 16085
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– 104.13.1 class JavaRuntimeMBS 16252

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- 105 **JavaScript** 16267
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- 103 **Java** 16001
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- 104 **Java Database** 16085
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- 103 **Java** 16001
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* 183.6.13 Months as Integer 22222
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- 48 **Compression** 8339
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    - 48.6.7 CompressFast(InputData as Ptr, Size as Integer, Acceleration as Integer = 1) as MemoryBlock 8368
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    - 48.6.10 CompressHC(InputData as Ptr, Size as Integer, compressionLevel as Integer = 9) as MemoryBlock 8369
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    - 48.6.13 Decompress(CompressedData as Ptr, Size as Integer, UncompressedSize as Integer = 0) as MemoryBlock 8371
    - 48.6.14 Decompress(CompressedData as string, UncompressedSize as Integer = 0) as string 8371
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- 193 **Window** 22987
  - 193.3.1 class MAAttachedWindowMBS 23022
    - 193.3.3 attachedWindow(view as NSViewMBS, point as NSPointMBS = nil, window as NSWindowMBS = nil, onSide as Integer = 12, distance as Double = 0.0) as MAAttachedWindowMBS 23023
    - 193.3.4 Constructor(view as NSViewMBS, point as NSPointMBS = nil, window as NSWindowMBS = nil, onSide as Integer = 12, distance as Double = 0.0) 23024
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    - 193.3.11 borderColor as NSColorMBS 23025
    - 193.3.12 borderWidth as Double 23025
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    - 193.3.14 drawsRoundCornerBesideArrow as boolean 23026
    - 193.3.15 hasArrow as boolean 23026
    - 193.3.16 viewMargin as Double 23026
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- 10 **Alias** 2739
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    - 10.3.4 close 2770
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    - 10.3.7 CreateFSRef(relPath as memoryblock, target as memoryblock) as Integer 2771
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- 83 **Files** 13559
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    - 83.19.4 CopyObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double) 13772
    - 83.19.5 CopyObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13773
    - 83.19.6 MoveObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double) 13773
    - 83.19.7 MoveObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer 13774
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    - 83.19.9 MoveObjectToTrashSync(SourceItem as folderitem, byref Result as folderitem, Options as Integer) as Integer 13775
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    - 83.19.13 LastError as Integer 13776
    - 83.19.15 StatusChanged(status as MacFileOperationStatusMBS) 13776
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    - 83.20.8 Handle as Integer 13779
    - 83.20.9 ObjectsComplete as Int64 13780
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    - 83.20.11 Stage as Integer 13780
    - 83.20.12 Throughput as Int64 13780
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- 187 **USB** 22305
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    - 187.17.3 Close 22393
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    - 187.17.7 FindNextDevice as boolean 22395
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    - 187.17.10 Manufacturer as string 22396
    - 187.17.11 Product as string 22396
    - 187.17.12 ProductID as Integer 22396
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    - 187.17.14 ReadMessageMemory(ReportID as Integer, reportType as Integer, length as Integer) as memoryblock 22397
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    - 187.17.16 SendMessage(ReportID as Integer, reportType as Integer, data as string) 22397
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- 193 **Window** 22987
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    - 193.4.2 EnableScreenUpdatesMBS 23028
    - 193.4.3 MenuBarHeightMBS as Integer 23028

- 178 **System** 21871
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    - 178.1.14 AbortMBS 21877
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    - 178.1.9 CrashUglyMBS 21874
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    - 178.1.11 DelayMBS(time as Double, mode as Integer) 21875
    - 178.1.15 ExitMBS(code as Integer) 21877
    - 178.1.23 ExitWindowsMBS(mode as Integer) as boolean 21881
    - 178.1.24 GetDoubleClickIntervalMBS as Integer 21882
    - 178.1.1 GetHelpTagDelayMBS as Integer 21871
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    - 178.1.26 GetSystemUIModeMBS as Integer 21883
    - 178.1.27 GetSystemUIModeOptionsMBS as Integer 21883
    - 178.1.5 GetWindowsColorProfileMBS as folderitem 21872
    - 178.1.6 GetWindowsDisplayColorProfileMBS(DisplayIndex as Integer) as folderitem 21873
    - 178.1.7 GetWindowsDisplayColorProfileMBS(DisplayName as String) as folderitem 21873
    - 178.1.16 GlobalIdleTimeMBS as Double 21877
    - 178.1.13 InstallSystemExceptionHandlerMBS(Message as string = "") 21876
    - 178.1.40 IsWindows95MBS as boolean 21890
    - 178.1.41 IsWindowsAdminUserMBS as boolean 21891
    - 178.1.42 IsWindowsNTMBS as boolean 21891
    - 178.1.28 MacCountryCodeMBS as string 21884
    - 178.1.17 MacGlobalIdleTimeMBS as UInt64 21878
    - 178.1.18 MacMountServerVolumeMBS(URL as string, MountDir as String, User as String, Password as String, byref Disk as FolderItem, flags as Integer) as Integer 21878
    - 178.1.19 MacUnmountVolumeMBS(volume as folderItem, Force as Boolean, byref dissenter as Integer) as Integer 21879
    - 178.1.22 MillisecondsMBS as Double 21881
    - 178.1.29 OpenMacOSXPreferencesPaneMBS(name as string) as Integer 21884
    - 178.1.30 RunningOnCarbonXMBS as boolean 21885
    - 178.1.3 SetHelpTagDelayMBS(value as Integer) 21872
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    - 178.1.31 SetMaximumOpenFileCountMacOSXMBS(Value as Integer) 21886
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    - 178.1.12 SleepMBS(time as Double) 21876
    - 178.1.20 StartDictationMBS 21880
    - 178.1.34 SystemControlByNameMBS(name as string) as memoryblock 21887

* 178.1.35 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock 21888
* 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock 21888
* 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 21889
* 178.1.38 SystemControlNameToMIBMBS(name as string) as memoryblock 21889
* 178.1.43 WindowsGetProcessIntegrityLevelMBS as Integer 21891
* 178.1.44 WindowsIsApplicationRunAsAdminMBS as boolean 21892
* 178.1.45 WindowsIsProcessElevatedMBS as boolean 21892
* 178.1.46 WindowsIsUserInAdminGroupMBS as boolean 21893
* 178.1.39 WindowsSystemMetricsMBS(what as Integer) as Integer 21890

- 83 **Files** 13559
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    - 83.13.10 CookiesMBS as folderitem 13637
    - 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer 13633
    - 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
    - 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
    - 83.13.11 HistoryMBS as folderitem 13637
    - 83.13.12 InternetCacheMBS as folderitem 13637
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    - 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
    - 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
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    - 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean 13641
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    - 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64 13638
    - 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
    - 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
    - 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem 13637

- 178 **System** 21871
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    - 178.1.21 BacktraceMBS(MaxFrames as Integer = 0, skip as Integer = 2) as string() 21881
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    - 178.1.9 CrashUglyMBS 21874
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    - 178.1.11 DelayMBS(time as Double, mode as Integer) 21875
    - 178.1.15 ExitMBS(code as Integer) 21877
    - 178.1.23 ExitWindowsMBS(mode as Integer) as boolean 21881
    - 178.1.24 GetDoubleClickIntervalMBS as Integer 21882
    - 178.1.1 GetHelpTagDelayMBS as Integer 21871
    - 178.1.2 GetHelpTagDisplayedMBS as boolean 21871
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    - 178.1.27 GetSystemUIModeOptionsMBS as Integer 21883
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    - 178.1.16 GlobalIdleTimeMBS as Double 21877
    - 178.1.13 InstallSystemExceptionHandlerMBS(Message as string = "") 21876
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    - 178.1.41 IsWindowsAdminUserMBS as boolean 21891
    - 178.1.42 IsWindowsNTMBS as boolean 21891
    - 178.1.28 MacCountryCodeMBS as string 21884
    - 178.1.17 MacGlobalIdleTimeMBS as UInt64 21878
    - 178.1.18 MacMountServerVolumeMBS(URL as string, MountDir as String, User as String, Password as String, byref Disk as FolderItem, flags as Integer) as Integer 21878
    - 178.1.19 MacUnmountVolumeMBS(volume as folderItem, Force as Boolean, byref dissenter as Integer) as Integer 21879
    - 178.1.22 MillisecondsMBS as Double 21881
    - 178.1.29 OpenMacOSXPreferencesPaneMBS(name as string) as Integer 21884
    - 178.1.30 RunningOnCarbonXMBS as boolean 21885
    - 178.1.3 SetHelpTagDelayMBS(value as Integer) 21872
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    - 178.1.20 StartDictationMBS 21880
    - 178.1.34 SystemControlByNameMBS(name as string) as memoryblock 21887

* 178.1.35 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock 21888
* 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock 21888
* 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 21889
* 178.1.38 SystemControlNameToMIBMBS(name as string) as memoryblock 21889
* 178.1.43 WindowsGetProcessIntegrityLevelMBS as Integer 21891
* 178.1.44 WindowsIsApplicationRunAsAdminMBS as boolean 21892
* 178.1.45 WindowsIsProcessElevatedMBS as boolean 21892
* 178.1.46 WindowsIsUserInAdminGroupMBS as boolean 21893
* 178.1.39 WindowsSystemMetricsMBS(what as Integer) as Integer 21890

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- 83 **Files** 13559
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    - 83.21.4 AgentName as String 13784
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    - 83.21.6 DateTime as DateTime 13784
    - 83.21.7 Dic as Variant 13785
    - 83.21.8 OriginURL as String 13785
    - 83.21.9 TimeStamp as Date 13785
    - 83.21.10 Type as String 13786

- 187 **USB** 22305
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    - 187.18.3 children as MacUSBDeviceMBS() 22404
    - 187.18.4 Constructor 22404
    - 187.18.5 root as MacUSBDeviceMBS 22404
    - 187.18.7 Address as Integer 22405
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    - 187.18.9 ClassName as String 22405
    - 187.18.10 DeviceClass as Integer 22405
    - 187.18.11 DeviceMaxPacketSize as Integer 22406
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    - 187.18.14 DeviceReleaseNumber as Integer 22406
    - 187.18.15 DeviceSpeed as Integer 22406
    - 187.18.16 DeviceSubClass as Integer 22406
    - 187.18.17 ExtraPowerForPorts as Integer 22407
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    - 187.18.23 ProductName as String 22408
    - 187.18.24 Properties as Dictionary 22408
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    - 187.18.28 VendorName as String 22409
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    - 187.19.3 AbortPipe(PipeRef as Integer) as boolean 22411
    - 187.19.4 ClearPipeStall(PipeRef as Integer) as boolean 22411
    - 187.19.5 Close 22412
    - 187.19.6 ConfigurationValue as Integer 22412
    - 187.19.7 Connect as boolean 22412
    - 187.19.8 DeviceProduct as Integer 22412
    - 187.19.9 DeviceReleaseNumber as Integer 22412
    - 187.19.10 DeviceVendor as Integer 22413
    - 187.19.11 InterfaceClass as Integer 22413
    - 187.19.12 InterfaceNumber as Integer 22413
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    - 187.19.14 InterfaceSubClass as Integer 22413
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* 187.19.16 NumEndpoints as Integer 22414
* 187.19.17 ReadPacket(PipeRef as Integer, MaxSize as Integer = 1024) as Memoryblock 22414
* 187.19.18 ReadRaw(PipeRef as Integer, MaxSize as Integer = 1024) as Memoryblock 22414
* 187.19.19 ResetPipe(PipeRef as Integer) as boolean 22414
* 187.19.20 WritePacket(PipeRef as Integer, Data as Memoryblock) as boolean 22415
* 187.19.21 WritePacket(PipeRef as Integer, Data as string) as boolean 22415
* 187.19.22 WriteRaw(PipeRef as Integer, Data as Memoryblock) as boolean 22415
* 187.19.23 WriteRaw(PipeRef as Integer, Data as string) as boolean 22415
* 187.19.25 completionTimeout as Integer 22416
* 187.19.26 LastError as Integer 22416
* 187.19.27 noDataTimeout as Integer 22416
* 187.19.28 ProductID as Integer 22416
* 187.19.29 VendorID as Integer 22417

– 187.20.1 class MacUSBNotificationMBS 22418

* 187.20.3 Constructor(vendor as Integer = 0, product as Integer = 0) 22418
* 187.20.4 GetUSBDeviceInfo(DeviceHandle as Integer, byref Vendor as string, byref Product as string, byref SerialNumber as string, byref Revision as Integer) as boolean 22418
* 187.20.5 QueryBSDName(DeviceHandle as Integer) as string 22419
* 187.20.6 Release(DeviceHandle as Integer) 22419
* 187.20.7 Retain(DeviceHandle as Integer) 22419
* 187.20.9 LastError as Integer 22419
* 187.20.11 DeviceAdded(properties as dictionary, NewDevice as boolean, ClassName as string, DeviceName as string, DeviceHandle as Integer) 22419
* 187.20.12 DeviceRemoved(properties as dictionary, NewDevice as boolean, ClassName as string, DeviceName as string, DeviceHandle as Integer) 22420

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
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    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
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    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
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    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
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    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
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    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
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- 178 **System** 21871
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* 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock 21888
* 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 21889
* 178.1.38 SystemControlNameToMIBMBS(name as string) as memoryblock 21889
* 178.1.43 WindowsGetProcessIntegrityLevelMBS as Integer 21891
* 178.1.44 WindowsIsApplicationRunAsAdminMBS as boolean 21892
* 178.1.45 WindowsIsProcessElevatedMBS as boolean 21892
* 178.1.46 WindowsIsUserInAdminGroupMBS as boolean 21893
* 178.1.39 WindowsSystemMetricsMBS(what as Integer) as Integer 21890

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- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
    - 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant() 24089
    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
    - 214.1.6 ArrayStringMBS(paramArray values as String) as String() 24092
    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
    - 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr 24094
    - 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer 24094
    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
    - 214.1.12 GetDelegateTargetMBS(del as variant) as Variant 24095
    - 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean 24096
    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
    - 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer 24096
    - 214.1.15 GetObjectReferenceCountMBS(o as object) as integer 24097
    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
    - 214.1.17 GetStringReferenceCountMBS(s as string) as integer 24098
    - 214.1.18 GetTextMemoryAddressMBS(s as text) as integer 24099
    - 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant() 24099
    - 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer 24100
    - 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant 24100
    - 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary() 24101
    - 214.1.23 GetVariantTypeMBS(va as variant) as Integer 24102
    - 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean 24103
    - 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32) 24105
    - 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant) 24103

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- 178 **System** 21871
  - **??** Globals **??**
    - 178.1.14 AbortMBS 21877
    - 178.1.21 BacktraceMBS(MaxFrames as Integer = 0, skip as Integer = 2) as string() 21881
    - 178.1.8 CrashNiceMBS 21873
    - 178.1.9 CrashUglyMBS 21874
    - 178.1.10 DelayMBS(time as Double) 21874
    - 178.1.11 DelayMBS(time as Double, mode as Integer) 21875
    - 178.1.15 ExitMBS(code as Integer) 21877
    - 178.1.23 ExitWindowsMBS(mode as Integer) as boolean 21881
    - 178.1.24 GetDoubleClickIntervalMBS as Integer 21882
    - 178.1.1 GetHelpTagDelayMBS as Integer 21871
    - 178.1.2 GetHelpTagDisplayedMBS as boolean 21871
    - 178.1.25 GetMaximumOpenFileCountMacOSXMBS as Integer 21883
    - 178.1.26 GetSystemUIModeMBS as Integer 21883
    - 178.1.27 GetSystemUIModeOptionsMBS as Integer 21883
    - 178.1.5 GetWindowsColorProfileMBS as folderitem 21872
    - 178.1.6 GetWindowsDisplayColorProfileMBS(DisplayIndex as Integer) as folderitem 21873
    - 178.1.7 GetWindowsDisplayColorProfileMBS(DisplayName as String) as folderitem 21873
    - 178.1.16 GlobalIdleTimeMBS as Double 21877
    - 178.1.13 InstallSystemExceptionHandlerMBS(Message as string = "") 21876
    - 178.1.40 IsWindows95MBS as boolean 21890
    - 178.1.41 IsWindowsAdminUserMBS as boolean 21891
    - 178.1.42 IsWindowsNTMBS as boolean 21891
    - 178.1.28 MacCountryCodeMBS as string 21884
    - 178.1.17 MacGlobalIdleTimeMBS as UInt64 21878
    - 178.1.18 MacMountServerVolumeMBS(URL as string, MountDir as String, User as String, Password as String, byref Disk as FolderItem, flags as Integer) as Integer 21878
    - 178.1.19 MacUnmountVolumeMBS(volume as folderItem, Force as Boolean, byref dissenter as Integer) as Integer 21879
    - 178.1.22 MillisecondsMBS as Double 21881
    - 178.1.29 OpenMacOSXPreferencesPaneMBS(name as string) as Integer 21884
    - 178.1.30 RunningOnCarbonXMBS as boolean 21885
    - 178.1.3 SetHelpTagDelayMBS(value as Integer) 21872
    - 178.1.4 SetHelpTagDisplayedMBS(value as boolean) 21872
    - 178.1.31 SetMaximumOpenFileCountMacOSXMBS(Value as Integer) 21886
    - 178.1.32 SetSystemUIModeMBS(mode as Integer, Options as Integer) 21886
    - 178.1.33 ShowCharacterPaletteMBS 21886
    - 178.1.12 SleepMBS(time as Double) 21876
    - 178.1.20 StartDictationMBS 21880
    - 178.1.34 SystemControlByNameMBS(name as string) as memoryblock 21887

* 178.1.35 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock 21888
* 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock 21888
* 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 21889
* 178.1.38 SystemControlNameToMIBMBS(name as string) as memoryblock 21889
* 178.1.43 WindowsGetProcessIntegrityLevelMBS as Integer 21891
* 178.1.44 WindowsIsApplicationRunAsAdminMBS as boolean 21892
* 178.1.45 WindowsIsProcessElevatedMBS as boolean 21892
* 178.1.46 WindowsIsUserInAdminGroupMBS as boolean 21893
* 178.1.39 WindowsSystemMetricsMBS(what as Integer) as Integer 21890

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
    - 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant() 24089
    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
    - 214.1.6 ArrayStringMBS(paramArray values as String) as String() 24092
    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
    - 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr 24094
    - 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer 24094
    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
    - 214.1.12 GetDelegateTargetMBS(del as variant) as Variant 24095
    - 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean 24096
    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
    - 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer 24096
    - 214.1.15 GetObjectReferenceCountMBS(o as object) as integer 24097
    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
    - 214.1.17 GetStringReferenceCountMBS(s as string) as integer 24098
    - 214.1.18 GetTextMemoryAddressMBS(s as text) as integer 24099
    - 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant() 24099
    - 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer 24100
    - 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant 24100
    - 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary() 24101
    - 214.1.23 GetVariantTypeMBS(va as variant) as Integer 24102
    - 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean 24103
    - 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32) 24105
    - 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant) 24103

- 83 **Files** 13559
  - **??** Globals **??**
    - 83.13.9 AdminToolsMBS(domain as Integer) as folderitem 13637
    - 83.13.10 CookiesMBS as folderitem 13637
    - 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer 13633
    - 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
    - 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
    - 83.13.11 HistoryMBS as folderitem 13637
    - 83.13.12 InternetCacheMBS as folderitem 13637
    - 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639
    - 83.13.19 MountPathMBS(Path as String) as String 13640
    - 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
    - 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
    - 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem 13634
    - 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem 13635
    - 83.13.6 PathToFolderItemMBS(path as string) as folderitem 13635
    - 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean 13638
    - 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean 13641
    - 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean 13641
    - 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 13635
    - 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636
    - 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64 13638
    - 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
    - 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
    - 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem 13637

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
    - 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant() 24089
    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
    - 214.1.6 ArrayStringMBS(paramArray values as String) as String() 24092
    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
    - 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr 24094
    - 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer 24094
    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
    - 214.1.12 GetDelegateTargetMBS(del as variant) as Variant 24095
    - 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean 24096
    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
    - 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer 24096
    - 214.1.15 GetObjectReferenceCountMBS(o as object) as integer 24097
    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
    - 214.1.17 GetStringReferenceCountMBS(s as string) as integer 24098
    - 214.1.18 GetTextMemoryAddressMBS(s as text) as integer 24099
    - 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant() 24099
    - 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer 24100
    - 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant 24100
    - 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary() 24101
    - 214.1.23 GetVariantTypeMBS(va as variant) as Integer 24102
    - 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean 24103
    - 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32) 24105
    - 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant) 24103

- 79 **Encryption and Hash** 13295
  - **??** Globals **??**
    - 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.4 Adler32StringMBS(adler as UInt32, buf as string) as UInt32 13330
    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.2 CalculateCRC16StringMBS(data as string, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32 13340
    - 79.5.7 CRC16MBS(data as string) as UInt16 13331
    - 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.6 CRC32StringMBS(crc as UInt32, buf as string) as UInt32 13331
    - 79.5.8 CRC_32InMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13332
    - 79.5.9 CRC_32InMemMBS(address as Ptr, length as Integer) as UInt32 13332
    - 79.5.10 CRC_32OfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13332
    - 79.5.11 CRC_32OfStrMBS(s as String) as UInt32 13332
    - 79.5.12 CRC_CCITTInMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13334
    - 79.5.13 CRC_CCITTInMemMBS(address as Ptr, length as Integer) as UInt32 13334
    - 79.5.14 CRC_CCITTOfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13334
    - 79.5.15 CRC_CCITTOfStrMBS(s as String) as UInt32 13334
    - 79.5.16 CRC_DillonInMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as String 13334
    - 79.5.17 CRC_DillonOfStrMBS(bitWidth as Integer, s as String) as String 13335
    - 79.5.18 CRC_DillonUInt64InMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as UInt64 13335
    - 79.5.27 CRC_DillonUInt64MBS(extends mem as memoryblock, bitWidth as Integer, offset as Integer, numBytes as Integer) as UInt64 13339
    - 79.5.19 CRC_DillonUInt64OfStrMBS(bitWidth as Integer, s as String) as UInt64 13335
    - 79.5.29 CurrentUnixTimeMBS as UInt64 13340
    - 79.5.30 DecodeFromBase32MBS(data as string) as String 13340
    - 79.5.31 EncodeToBase32MBS(data as string) as String 13341
    - 79.5.20 GetHash32MBS(s as string) as UInt32 13335
    - 79.5.22 MD5MBS(data as memoryblock) as string 13337
    - 79.5.25 MD5MBS(data as string) as string 13338
    - 79.5.23 MD5StringMBS(data as memoryblock) as string 13337
    - 79.5.26 MD5StringMBS(data as string) as string 13339

* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

- 83 **Files** 13559
  - **??** Globals **??**
    - 83.13.9 AdminToolsMBS(domain as Integer) as folderitem 13637
    - 83.13.10 CookiesMBS as folderitem 13637
    - 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer 13633
    - 83.13.3 FolderItemToPathMBS(file as folderitem) as string 13634
    - 83.13.23 GetDriveTypeMBS(path as string) as Integer 13642
    - 83.13.11 HistoryMBS as folderitem 13637
    - 83.13.12 InternetCacheMBS as folderitem 13637
    - 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String 13639
    - 83.13.19 MountPathMBS(Path as String) as String 13640
    - 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640
    - 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem 13638
    - 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem 13634
    - 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem 13635
    - 83.13.6 PathToFolderItemMBS(path as string) as folderitem 13635
    - 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean 13638
    - 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean 13641
    - 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean 13641
    - 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 13635
    - 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636
    - 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64 13638
    - 83.13.17 VolumeSizePathMBS(Path as String) as Int64 13639
    - 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean 13633
    - 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem 13637

- 194 **Windows** 23079
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    - 194.3.3 Filename as String 23097
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    - 121.5.13 BitExclMBS(value as UInt64, bitNumber as Integer) as UInt64 17462
    - 121.5.14 BitInclMBS(value as UInt64, bitNumber as Integer) as UInt64 17462
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* 121.5.47 LoWordMBS(i as Integer) as Integer 17475
* 121.5.48 NormInvMBS(p as Double, mu as double = 0.0, sigma as double = 1.0) as double 17475
* 121.5.49 PowMBS(x as Double, y as Double) as Double 17475
* 121.5.50 RandomExponentialDistributionMBS(lambda as Double) as double 17476
* 121.5.51 RandomNormalDistributionMBS(Mean as Double, StdDev as Double) as double 17476
* 121.5.52 RandomPoissonDistributionMBS(Mean as Integer) as Integer 17477
* 121.5.53 RoundMBS(x as Double, decimals as Integer = 0) as Double 17477
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* 121.5.58 TanMBS(x as Double) as Double 17479
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- 55 **CoreFoundation Network** 8841
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    - 55.3.4 CFHTTPMessageCreateRequestMBS(requestMethod as CFStringMBS, url as CFURLMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS 8847
    - 55.3.5 CFHTTPMessageCreateResponseMBS(statusCode as Integer, statusDescription as CFStringMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS 8848
    - 55.3.1 CFStreamCreatePairWithSocketMBS(TheSocket as CFSocketMBS, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS) 8847
    - 55.3.2 CFStreamCreatePairWithSocketToHostMBS(host as CFStringMBS, port as Integer, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS) 8847
    - 55.3.6 kCFHostMBSGetTypeID as Integer 8848
    - 55.3.7 kCFHTTPMessageMBSGetTypeID as Integer 8848
    - 55.3.8 kCFReadStreamMBSGetTypeID as Integer 8848
    - 55.3.9 kCFSocketMBSGetTypeID as Integer 8848
    - 55.3.10 kCFWriteStreamMBSGetTypeID as Integer 8848

- 142 **Process** 19505
  - **??** Globals **??**
    - 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
    - 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
    - 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
    - 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523
    - 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524
    - 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
    - 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525
    - 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526
    - 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
    - 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
    - 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528
    - 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528
    - 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
    - 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
    - 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531
    - 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532
    - 142.5.20 CountProcessesMBS as Integer 19534
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    - 142.5.17 GetDarwinVMStatisticsMBS as DarwinVMStatisticsMBS 19532
    - 142.5.21 GetWindowsVMStatisticsMBS as WindowsVMStatisticsMBS 19534
    - 142.5.19 SetThreadNameMBS(name as string) 19534

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- 79 **Encryption and Hash** 13295
  - **??** Globals **??**
    - 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.4 Adler32StringMBS(adler as UInt32, buf as string) as UInt32 13330
    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.2 CalculateCRC16StringMBS(data as string, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32 13340
    - 79.5.7 CRC16MBS(data as string) as UInt16 13331
    - 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.6 CRC32StringMBS(crc as UInt32, buf as string) as UInt32 13331
    - 79.5.8 CRC_32InMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13332
    - 79.5.9 CRC_32InMemMBS(address as Ptr, length as Integer) as UInt32 13332
    - 79.5.10 CRC_32OfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13332
    - 79.5.11 CRC_32OfStrMBS(s as String) as UInt32 13332
    - 79.5.12 CRC_CCITTInMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13334
    - 79.5.13 CRC_CCITTInMemMBS(address as Ptr, length as Integer) as UInt32 13334
    - 79.5.14 CRC_CCITTOfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13334
    - 79.5.15 CRC_CCITTOfStrMBS(s as String) as UInt32 13334
    - 79.5.16 CRC_DillonInMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as String 13334
    - 79.5.17 CRC_DillonOfStrMBS(bitWidth as Integer, s as String) as String 13335
    - 79.5.18 CRC_DillonUInt64InMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as UInt64 13335
    - 79.5.27 CRC_DillonUInt64MBS(extends mem as memoryblock, bitWidth as Integer, offset as Integer, numBytes as Integer) as UInt64 13339
    - 79.5.19 CRC_DillonUInt64OfStrMBS(bitWidth as Integer, s as String) as UInt64 13335
    - 79.5.29 CurrentUnixTimeMBS as UInt64 13340
    - 79.5.30 DecodeFromBase32MBS(data as string) as String 13340
    - 79.5.31 EncodeToBase32MBS(data as string) as String 13341
    - 79.5.20 GetHash32MBS(s as string) as UInt32 13335
    - 79.5.22 MD5MBS(data as memoryblock) as string 13337
    - 79.5.25 MD5MBS(data as string) as string 13338
    - 79.5.23 MD5StringMBS(data as memoryblock) as string 13337
    - 79.5.26 MD5StringMBS(data as string) as string 13339

* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

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- 110 **Launch Services** 16647
  - **??** Globals **??**
    - 110.5.1 LaunchServicesAllHandlersForURLSchemeMBS(URLScheme as string) as LaunchServicesStringListMBS 16660
    - 110.5.2 LaunchServicesAllRoleHandlersForContentTypeMBS(ContentType as string, role as Integer) as LaunchServicesStringListMBS 16660
    - 110.5.3 LaunchServicesApplicationForInfoMBS(type as string, creator as string, extension as string, role as Integer) as folderitem 16661
    - 110.5.4 LaunchServicesApplicationForItemMBS(file as folderitem, role as Integer) as folderitem 16662
    - 110.5.5 LaunchServicesCanApplicationAcceptItemMBS(item as folderitem, targetapp as folderitem, role as Integer, flags as Integer) as boolean 16663
    - 110.5.6 LaunchServicesDefaultHandlerForURLSchemeMBS(URLScheme as string) as string 16664
    - 110.5.7 LaunchServicesDefaultRoleHandlerForContentTypeMBS(ContentType as string, role as Integer) as string 16664
    - 110.5.8 LaunchServicesDisplayNameForCFURLMBS(cfurlhandle as Integer) as string 16665
    - 110.5.9 LaunchServicesFindApplicationForInfoMBS(creator as string, bundleID as string, name as string) as folderitem 16665
    - 110.5.10 LaunchServicesItemInfoForCFURLMBS(cfurlhandle as Integer, WhichInfo as Integer) as LaunchServicesItemInfoMBS 16666
    - 110.5.11 LaunchServicesKindStringForCFURLMBS(cfurlhandle as Integer) as string 16666
    - 110.5.12 LaunchServicesOpenMBS(item as folderitem) as folderitem 16666
    - 110.5.13 LaunchServicesOpenXMBS(documents() as folderitem, parameter as LaunchServicesLaunchParameterMBS) as folderitem 16667
    - 110.5.14 LaunchServicesSetDefaultHandlerForURLSchemeMBS(URLScheme as string, BundleID as string) as Integer 16668
    - 110.5.15 LaunchServicesSetDefaultRoleHandlerForContentTypeMBS(ContentType as string, role as Integer, BundleID as string) as Integer 16669

- 88 **Graphics & Pictures** 14031
  - **??** Globals **??**
    - 88.3.65 BinaryStringtoPictureMBS(data as String) as Picture 14102
    - 88.3.12 BlendPicturesMBS(result as picture, source as picture, sourcepercent as Double, dest as picture, destpercent as Double, x as Integer, y as Integer, width as Integer, height as Integer) as boolean 14055
    - 88.3.5 BlendPicturesMBS(source as picture, sourcepercent as Double, dest as picture, destpercent as Double) as picture 14051
    - 88.3.13 BlendPicturesWithMaskMBS(result as picture, source as picture, dest as picture, mask as picture, x as Integer, y as Integer, width as Integer, height as Integer) as boolean 14055
    - 88.3.6 BlendPicturesWithMaskMBS(source as picture, dest as picture, mask as picture) as picture 14051
    - 88.3.14 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer) as boolean 14056
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    - 124.2.17 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer) 17577
    - 124.2.18 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destOfs as Integer) 17578
    - 124.2.19 CopyBytesToMacHandleMBS(srcOfs as Integer, numBytes as Integer, destHandle as Integer) 17578
    - 124.2.20 CopyBytesToMacPtrMBS(srcOfs as Integer, numBytes as Integer, destPtr as Ptr) 17578
    - 124.2.21 CopyByteToUShortMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer) 17578
    - 124.2.22 CopyNthBitsMBS(source as memoryblock, SourceOffsetBits as Integer, DestinationOffsetBits as Integer, BitCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean 17579
    - 124.2.23 CopyNthBytesMBS(source as memoryblock, SourceOffsetBytes as Integer, DestinationOffsetBytes as Integer, ByteCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean 17579

* 124.2.24 CopyUShortToByteMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer) 17579
* 124.2.56 ExpandBitsMBS(dest as memoryblock, SourceByteCount as Integer, LowValue as Integer = 0, HighValue as Integer = 255) as boolean 17594
* 124.2.57 ExtractBitsMBS(Mask as Integer, Dest as memoryblock=nil) as memoryblock 17594
* 124.2.58 FillBytesMBS(offset as Integer, count as Integer, value as Integer) 17595
* 124.2.59 FindByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer 17595
* 124.2.60 FindByteMBS(values() as UInt8, StartByteOffset as Integer = 0) as Integer 17596
* 124.2.61 FindBytesMBS(srcOfs as Integer, maxBytes as Integer, target as memoryBlock, targOfs as Integer, targLen as Integer) as Integer 17596
* 124.2.62 FindNotByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer 17597
* 124.2.63 FindStringMBS(srcOfs as Integer, maxBytes as Integer, target as String) as Integer 17597
* 124.2.64 GetBitMBS(Bit as UInt64) as Integer 17597
* 124.2.65 GetStringMBS(offset as Integer, numBytes as Integer) as String 17598
* 124.2.66 InvertBytesMBS(offset as Integer, count as Integer) 17598
* 124.2.67 IsBitSetMBS(Bit as UInt64) as Boolean 17599
* 124.2.68 LeftMBS(length as Integer) as memoryblock 17599
* 124.2.69 MaxMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean 17599
* 124.2.70 MidMBS(offset as Integer) as memoryblock 17600
* 124.2.71 MidMBS(offset as Integer, length as Integer) as memoryblock 17600
* 124.2.72 MinMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean 17601
* 124.2.73 MirrorBitsInBytesMBS(offsetByte as Integer, lengthByte as Integer) 17602
* 124.2.74 MirrorBitsMBS(offsetBit as Integer, lengthBit as Integer) 17602
* 124.2.75 MirrorBytesMBS(offsetByte as Integer = 0, lengthByte as Integer = -1) 17603
* 124.2.76 MultiplyUInt16MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1) 17603
* 124.2.77 MultiplyUInt8MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1) 17603
* 124.2.78 RightMBS(length as Integer) as memoryblock 17604
* 124.2.79 SetBitMBS(Bit as UInt64) 17604
* 124.2.80 SetBitMBS(Bit as UInt64, Value as Boolean) 17605
* 124.2.81 SetBitMBS(Bit as UInt64, Value as Integer) 17605
* 124.2.82 SetStringMBS(str as String, offset as Integer) 17606
* 124.2.83 SwapBytes16MBS(offset as Integer, numBytes as Integer) 17606
* 124.2.84 SwapBytes32MBS(offset as Integer, numBytes as Integer) 17607
* 124.2.85 SwapBytesMBS(offset as Integer, numBytes as Integer) 17608
* 124.2.87 OSTypeMBS(offset as Integer) as String 17608

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- 79 **Encryption and Hash** 13295
  - 124.2.1 class Memoryblock 17568
    - 124.2.25 CRC_32ContMBS(offset as Integer, numBytes as Integer, prevCRC as UInt32) as UInt32 17580
    - 124.2.26 CRC_32MBS(offset as Integer, numBytes as Integer) as UInt32 17580
    - 124.2.27 CRC_CCITTContMBS(offset as Integer, numBytes as Integer, prevCRC as UInt32) as UInt32 17580
    - 124.2.28 CRC_CCITTMBS(offset as Integer, numBytes as Integer) as UInt32 17580
    - 124.2.29 CRC_DillonMBS(bitWidth as Integer, offset as Integer, numBytes as Integer) as String 17581
  - **??** Globals **??**
    - 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.4 Adler32StringMBS(adler as UInt32, buf as string) as UInt32 13330
    - 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.2 CalculateCRC16StringMBS(data as string, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16 13329
    - 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32 13340
    - 79.5.7 CRC16MBS(data as string) as UInt16 13331
    - 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32 13330
    - 79.5.6 CRC32StringMBS(crc as UInt32, buf as string) as UInt32 13331
    - 79.5.8 CRC_32InMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32 13332
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    - 79.5.10 CRC_32OfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13332
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    - 79.5.13 CRC_CCITTInMemMBS(address as Ptr, length as Integer) as UInt32 13334
    - 79.5.14 CRC_CCITTOfStrContMBS(s as String, prevCRC as UInt32) as UInt32 13334
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    - 79.5.16 CRC_DillonInMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as String 13334
    - 79.5.17 CRC_DillonOfStrMBS(bitWidth as Integer, s as String) as String 13335
    - 79.5.18 CRC_DillonUInt64InMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as UInt64 13335
    - 79.5.27 CRC_DillonUInt64MBS(extends mem as memoryblock, bitWidth as Integer, offset as Integer, numBytes as Integer) as UInt64 13339

* 79.5.19 CRC_DillonUInt64OfStrMBS(bitWidth as Integer, s as String) as UInt64 13335
* 79.5.29 CurrentUnixTimeMBS as UInt64 13340
* 79.5.30 DecodeFromBase32MBS(data as string) as String 13340
* 79.5.31 EncodeToBase32MBS(data as string) as String 13341
* 79.5.20 GetHash32MBS(s as string) as UInt32 13335
* 79.5.22 MD5MBS(data as memoryblock) as string 13337
* 79.5.25 MD5MBS(data as string) as string 13338
* 79.5.23 MD5StringMBS(data as memoryblock) as string 13337
* 79.5.26 MD5StringMBS(data as string) as string 13339
* 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16 13336
* 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string 13337

- 80 **Endian** 13519
  - 124.2.1 class Memoryblock 17568
    - 124.2.30 EndianS16_BtoLMBS(offset as Integer,count as Integer) 17581
    - 124.2.31 EndianS16_BtoNMBS(offset as Integer,count as Integer) 17581
    - 124.2.32 EndianS16_LtoBMBS(offset as Integer,count as Integer) 17582
    - 124.2.33 EndianS16_LtoNMBS(offset as Integer,count as Integer) 17582
    - 124.2.34 EndianS16_NtoBMBS(offset as Integer,count as Integer) 17583
    - 124.2.35 EndianS16_NtoLMBS(offset as Integer,count as Integer) 17583
    - 124.2.36 EndianS32_BtoLMBS(offset as Integer,count as Integer) 17584
    - 124.2.37 EndianS32_BtoNMBS(offset as Integer,count as Integer) 17584
    - 124.2.38 EndianS32_LtoBMBS(offset as Integer,count as Integer) 17585
    - 124.2.39 EndianS32_LtoNMBS(offset as Integer,count as Integer) 17586
    - 124.2.40 EndianS32_NtoBMBS(offset as Integer,count as Integer) 17586
    - 124.2.41 EndianS32_NtoLMBS(offset as Integer,count as Integer) 17587
    - 124.2.42 EndianSwap16MBS(offset as Integer,count as Integer) 17587
    - 124.2.43 EndianSwap32MBS(offset as Integer,count as Integer) 17587
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    - 124.2.45 EndianU16_BtoNMBS(offset as Integer,count as Integer) 17588
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    - 124.2.47 EndianU16_LtoNMBS(offset as Integer,count as Integer) 17589
    - 124.2.48 EndianU16_NtoBMBS(offset as Integer,count as Integer) 17590
    - 124.2.49 EndianU16_NtoLMBS(offset as Integer,count as Integer) 17590
    - 124.2.50 EndianU32_BtoLMBS(offset as Integer,count as Integer) 17591
    - 124.2.51 EndianU32_BtoNMBS(offset as Integer,count as Integer) 17591
    - 124.2.52 EndianU32_LtoBMBS(offset as Integer,count as Integer) 17592
    - 124.2.53 EndianU32_LtoNMBS(offset as Integer,count as Integer) 17592
    - 124.2.54 EndianU32_NtoBMBS(offset as Integer,count as Integer) 17593
    - 124.2.55 EndianU32_NtoLMBS(offset as Integer,count as Integer) 17593

- 124 **MemoryBlock** 17567
  - 124.2.1 class Memoryblock 17568
    - 124.2.3 AddressMBS(offset as Int64 = 0) as UInt64 17568
    - 124.2.4 AddressPtrMBS(offset as Int64 = 0) as Ptr 17568
    - 124.2.5 AndBitsMBS(Second as memoryblock, Dest as memoryblock=nil) as memoryblock 17568
    - 124.2.6 AndBitsMBS(Second as memoryblock, Mask as Integer, Dest as memoryblock=nil) as memoryblock 17569
    - 124.2.7 AppendMBS(other as memoryblock) as memoryblock 17570
    - 124.2.8 BitwiseAndMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock 17570
    - 124.2.9 BitwiseOrMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock 17572
    - 124.2.10 BitwiseXOrMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock 17573
    - 124.2.11 BytesEqualMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer) as Boolean 17574
    - 124.2.12 BytesZeroMBS(srcOfs as Integer, numBytes as Integer) as Boolean 17575
    - 124.2.13 ClearBitMBS(Bit as UInt64) 17576
    - 124.2.14 ConvertRGB12BitTo8BitMBS(Width as Integer) 17576
    - 124.2.15 CopyBytesFromMacHandleMBS(srcHandle as Integer, numBytes as Integer, destOfs as Integer) 17576
    - 124.2.16 CopyBytesFromMacPtrMBS(srcPtr as Ptr, numBytes as Integer, destOfs as Integer) 17577
    - 124.2.17 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer) 17577
    - 124.2.18 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destOfs as Integer) 17578
    - 124.2.19 CopyBytesToMacHandleMBS(srcOfs as Integer, numBytes as Integer, destHandle as Integer) 17578
    - 124.2.20 CopyBytesToMacPtrMBS(srcOfs as Integer, numBytes as Integer, destPtr as Ptr) 17578
    - 124.2.21 CopyByteToUShortMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer) 17578
    - 124.2.22 CopyNthBitsMBS(source as memoryblock, SourceOffsetBits as Integer, DestinationOffsetBits as Integer, BitCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean 17579
    - 124.2.23 CopyNthBytesMBS(source as memoryblock, SourceOffsetBytes as Integer, DestinationOffsetBytes as Integer, ByteCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean 17579
    - 124.2.24 CopyUShortToByteMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer) 17579
    - 124.2.56 ExpandBitsMBS(dest as memoryblock, SourceByteCount as Integer, LowValue as Integer = 0, HighValue as Integer = 255) as boolean 17594
    - 124.2.57 ExtractBitsMBS(Mask as Integer, Dest as memoryblock=nil) as memoryblock 17594

* 124.2.58 FillBytesMBS(offset as Integer, count as Integer, value as Integer) 17595
* 124.2.59 FindByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer 17595
* 124.2.60 FindByteMBS(values() as UInt8, StartByteOffset as Integer = 0) as Integer 17596
* 124.2.61 FindBytesMBS(srcOfs as Integer, maxBytes as Integer, target as memoryBlock, targOfs as Integer, targLen as Integer) as Integer 17596
* 124.2.62 FindNotByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer 17597
* 124.2.63 FindStringMBS(srcOfs as Integer, maxBytes as Integer, target as String) as Integer 17597
* 124.2.64 GetBitMBS(Bit as UInt64) as Integer 17597
* 124.2.65 GetStringMBS(offset as Integer, numBytes as Integer) as String 17598
* 124.2.66 InvertBytesMBS(offset as Integer, count as Integer) 17598
* 124.2.67 IsBitSetMBS(Bit as UInt64) as Boolean 17599
* 124.2.68 LeftMBS(length as Integer) as memoryblock 17599
* 124.2.69 MaxMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean 17599
* 124.2.70 MidMBS(offset as Integer) as memoryblock 17600
* 124.2.71 MidMBS(offset as Integer, length as Integer) as memoryblock 17600
* 124.2.72 MinMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean 17601
* 124.2.73 MirrorBitsInBytesMBS(offsetByte as Integer, lengthByte as Integer) 17602
* 124.2.74 MirrorBitsMBS(offsetBit as Integer, lengthBit as Integer) 17602
* 124.2.75 MirrorBytesMBS(offsetByte as Integer = 0, lengthByte as Integer = -1) 17603
* 124.2.76 MultiplyUInt16MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1) 17603
* 124.2.77 MultiplyUInt8MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1) 17603
* 124.2.78 RightMBS(length as Integer) as memoryblock 17604
* 124.2.79 SetBitMBS(Bit as UInt64) 17604
* 124.2.80 SetBitMBS(Bit as UInt64, Value as Boolean) 17605
* 124.2.81 SetBitMBS(Bit as UInt64, Value as Integer) 17605
* 124.2.82 SetStringMBS(str as String, offset as Integer) 17606
* 124.2.83 SwapBytes16MBS(offset as Integer, numBytes as Integer) 17606
* 124.2.84 SwapBytes32MBS(offset as Integer, numBytes as Integer) 17607
* 124.2.85 SwapBytesMBS(offset as Integer, numBytes as Integer) 17608
* 124.2.87 OSTypeMBS(offset as Integer) as String 17608

- 88 **Graphics & Pictures** 14031
  - **??** Globals **??**
    - 88.3.65 BinaryStringtoPictureMBS(data as String) as Picture 14102
    - 88.3.12 BlendPicturesMBS(result as picture, source as picture, sourcepercent as Double, dest as picture, destpercent as Double, x as Integer, y as Integer, width as Integer, height as Integer) as boolean 14055
    - 88.3.5 BlendPicturesMBS(source as picture, sourcepercent as Double, dest as picture, destpercent as Double) as picture 14051
    - 88.3.13 BlendPicturesWithMaskMBS(result as picture, source as picture, dest as picture, mask as picture, x as Integer, y as Integer, width as Integer, height as Integer) as boolean 14055
    - 88.3.6 BlendPicturesWithMaskMBS(source as picture, dest as picture, mask as picture) as picture 14051
    - 88.3.14 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer) as boolean 14056
    - 88.3.15 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackgroundColour As Color) as boolean 14056
    - 88.3.17 ColorizePictureMBS(Pict As Picture, Mask As Picture, foreR as Double, foreG as Double, foreB as Double, foreA as Double, backR as Double, backG as Double, backB as Double, backA as Double) as boolean 14058
    - 88.3.7 CombinePicturesMBS(red as picture, blue as picture, green as picture) as picture 14052
    - 88.3.16 DiffPicturesMBS(source as picture, dest as picture, square as boolean) as picture 14057
    - 88.3.32 GetMBfromPictureMBS(pic as picture, mask as picture, mode as string) as memoryblock 14079
    - 88.3.33 GetMBfromPictureMBS(pic as picture, mode as string) as memoryblock 14079
    - 88.3.64 MandelbrotSetMBS(Threaded as Integer, width as Integer, height as Integer, fx as Double = 4.0, fy as Double = 4.0, dx as Double = -2.0, dy as Double = -2.0, dest as picture = nil) as picture 14101
    - 88.3.34 MemoryblockABGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14080
    - 88.3.35 MemoryblockABGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14080
    - 88.3.36 MemoryblockARGBtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14081
    - 88.3.37 MemoryblockARGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14082
    - 88.3.3 MemoryblockARGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture 14049
    - 88.3.38 MemoryblockBGRAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14083
    - 88.3.39 MemoryblockBGRAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14084

* 88.3.40 MemoryblockBGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14085
* 88.3.41 MemoryblockBGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14086
* 88.3.42 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14087
* 88.3.43 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14088
* 88.3.44 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14089
* 88.3.45 MemoryblockRGBAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14089
* 88.3.46 MemoryblockRGBAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14090
* 88.3.47 MemoryblockRGBtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14091
* 88.3.4 MemoryblockRGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14050
* 88.3.8 MergePictureMBS(source1 as picture, source2 as picture) as picture 14052
* 88.3.29 NewPictureEditorMBS(pic as picture) as PictureEditorMBS 14077
* 88.3.30 NewPictureMBS(width as Integer, height as Integer, pixeltype as Integer, buffer as memoryblock, rowbytes as Integer) as picture 14078
* 88.3.1 NewPictureReaderMBS(pic as picture) as PictureReaderMBS 14046
* 88.3.9 NewPictureWithColorMBS(width as Integer, height as Integer, c as color) as picture 14053
* 88.3.31 NewPictureWriterMBS(pic as picture, width as Integer, height as Integer) as PictureWriterMBS 14078
* 88.3.2 NewPictureWriterMBS(width as Integer, height as Integer, AlphaChannel as boolean = false) as PictureWriterMBS 14047
* 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
* 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
* 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
* 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064

* 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
* 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
* 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
* 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
* 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
* 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075
* 88.3.28 PictureCopyPixelFastMBS(DestImage As Picture, Source As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer) as boolean 14076
* 88.3.66 PicturetoBinaryStringMBS(p as picture) as string 14103
* 88.3.48 PtrABGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14092
* 88.3.49 PtrABGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093
* 88.3.50 PtrARGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093
* 88.3.51 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14094
* 88.3.52 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture 14094
* 88.3.53 PtrBGRAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14095
* 88.3.54 PtrBGRAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096
* 88.3.55 PtrBGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096
* 88.3.56 PtrBGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14097

* 88.3.57 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14097
* 88.3.58 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14098
* 88.3.59 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14098
* 88.3.60 PtrRGBAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099
* 88.3.61 PtrRGBAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099
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- 36 **Cocoa Drawing** 7387
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- 33 **Cocoa** 5817
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- 39 **Cocoa Printing** 7917
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- 33 **Cocoa** 5817
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- 42 **Cocoa Text** 8041
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- 35 **Cocoa Controls** 6603
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    - 35.72.5 File as folderitem 7034
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- 36 **Cocoa Drawing** 7387
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- 32 **CloudKit** 5603
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    - 173.8.12 RecordCount(cmd as SQLCommandMBS) as Integer 21477
    - 173.8.13 TTY as string 21477
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- 152 **Remote Control** 19927
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    - 152.4.3 clear 19940
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    - 152.4.5 MouseClick(down as boolean, rightdown as boolean) 19940
    - 152.4.6 MouseMove(globalx as Integer,globaly as Integer) 19941
    - 152.4.7 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean) 19941
    - 152.4.8 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean, rightdown as boolean) 19942
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    - 152.4.10 pressraw(down as boolean) 19943
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    - 152.4.13 Command as boolean 19944
    - 152.4.14 Control as boolean 19945
    - 152.4.15 Keycode as Integer 19945
    - 152.4.16 Lasterror as Integer 19946
    - 152.4.17 Option as boolean 19946
    - 152.4.18 Shift as boolean 19946
    - 152.4.19 VirtualCode as Integer 19947

- 142 **Process** 19505
  - **??** Globals **??**
    - 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
    - 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
    - 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
    - 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523
    - 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524
    - 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
    - 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525
    - 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526
    - 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
    - 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
    - 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528
    - 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528
    - 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
    - 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
    - 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531
    - 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532
    - 142.5.20 CountProcessesMBS as Integer 19534
    - 142.5.18 GetDarwinResourceUsageMBS as DarwinResourceUsageMBS 19533
    - 142.5.17 GetDarwinVMStatisticsMBS as DarwinVMStatisticsMBS 19532
    - 142.5.21 GetWindowsVMStatisticsMBS as WindowsVMStatisticsMBS 19534
    - 142.5.19 SetThreadNameMBS(name as string) 19534
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    - 142.25.3 Bundle as folderitem 19627
    - 142.25.4 BundleID as string 19627
    - 142.25.5 CurrentProcessID as Integer 19627
    - 142.25.6 GetCurrentProcess 19627
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* 142.25.8 GetFrontProcess 19628
* 142.25.9 GetNextProcess as boolean 19628
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* 142.25.11 KillProcess as Integer 19629
* 142.25.12 KillProcess(ProcessID as Integer, timeout as Integer) as Integer 19629
* 142.25.13 KillProcess(timeoutms as Integer) as Integer 19630
* 142.25.14 MacProcessSerial as memoryblock 19631
* 142.25.15 ProcessInformationCFDictionary as object 19631
* 142.25.16 QuitProcess as Integer 19632
* 142.25.17 SameAs(other as ProcessMBS) as boolean 19632
* 142.25.18 SetFrontProcessWithOptions(options as Integer) 19633
* 142.25.19 SetServiceMode(ismode as boolean) as boolean 19633
* 142.25.20 TransformProcessType(mode as Integer) as Integer 19633
* 142.25.21 TransformToForegroundApplication as Integer 19634
* 142.25.22 Update 19634
* 142.25.23 WinFullProcessImagePath as string 19634
* 142.25.24 WinGetPriorityClass(ProcessID as Integer) as Integer 19635
* 142.25.25 WinModulePath as string 19636
* 142.25.26 WinProcessImagePath as string 19636
* 142.25.27 WinSetPriorityClass(ProcessID as Integer, PriorityClass as Integer) as Integer 19636
* 142.25.29 CPUTime as Integer 19637
* 142.25.30 CurrentProcess as boolean 19638
* 142.25.31 flags as Integer 19638
* 142.25.32 FrontProcess as boolean 19640
* 142.25.33 lasterror as Integer 19640
* 142.25.34 LaunchProcess as ProcessMBS 19640
* 142.25.35 MacCreator as string 19641
* 142.25.36 MacType as string 19641
* 142.25.37 MemoryFree as Integer 19641
* 142.25.38 MemorySize as Integer 19641
* 142.25.39 Name as string 19642
* 142.25.40 Path as folderitem 19642
* 142.25.41 ProcessID as Integer 19642
* 142.25.42 Visible as boolean 19643
* 142.25.43 Priority as Integer 19643
* 142.25.44 Priority(ProcessID as Integer) as Integer 19644

- 143 **ProgressView** 19659
  - 143.1.1 class ProgressBackgroundViewMBS 19659
    - 143.1.3 Constructor 19659
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    - 143.1.6 Color as Variant 19660
    - 143.1.7 ColorValue as Color 19660
    - 143.1.8 Handle as Integer 19660
    - 143.1.9 Style as Integer 19660

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- 51 **Controls** 8567
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    - 51.16.5 SetMinimumThreadSafeMBS(minimum as Integer) 8604
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- 35 **Cocoa Controls** 6603
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- 51 **Controls** 8567
  - 51.16.1 class ProgressBar 8603
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- 143 **ProgressView** 19659
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    - 143.2.3 Constructor 19662
    - 143.2.5 Handle as Integer 19662
    - 143.2.6 LineColor as Variant 19662
    - 143.2.7 LineColorValue as Color 19662
    - 143.2.8 Progress as Double 19663
    - 143.2.9 ProgressColor as Variant 19663
    - 143.2.10 ProgressColorValue as Color 19663
    - 143.2.11 ProgressRemainingColor as Variant 19663
    - 143.2.12 ProgressRemainingColorValue as Color 19664
  - 143.3.1 class ProgressHUDMBS 19665
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    - 143.3.5 Constructor(ViewHandle as Integer) 19666
    - 143.3.6 Destructor 19666
    - 143.3.7 hide(animated as boolean = true) 19666
    - 143.3.8 hide(animated as boolean, afterDelay as Double) 19667
    - 143.3.9 show(animated as boolean = true) 19667
    - 143.3.11 AnimationType as Integer 19667
    - 143.3.12 backgroundView as ProgressBackgroundViewMBS 19667
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    - 143.3.18 defaultMotionEffectsEnabled as Boolean 19669
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    - 143.3.21 graceTime as Double 19670
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    - 143.3.29 MinWidth as Double 19672
    - 143.3.30 Mode as Integer 19672
    - 143.3.31 offsetX as Double 19672
    - 143.3.32 offsetY as Double 19672

* 143.3.33 Progress as Double 19672
* 143.3.34 RemoveFromSuperViewOnHide as Boolean 19673
* 143.3.35 Square as Boolean 19673
* 143.3.36 userInteractionEnabled as Boolean 19673
* 143.3.37 View as Variant 19673
* 143.3.39 buttonAction 19674
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– 143.4.1 class ProgressRoundProgressViewMBS 19675

* 143.4.3 Constructor 19675
* 143.4.5 Annular as Boolean 19675
* 143.4.6 backgroundTintColor as Variant 19675
* 143.4.7 backgroundTintColorValue as Color 19675
* 143.4.8 Handle as Integer 19676
* 143.4.9 Progress as Double 19676
* 143.4.10 progressTintColor as Variant 19676
* 143.4.11 progressTintColorValue as Color 19676

- 35 **Cocoa Controls** 6603
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    - 35.113.3 NSProgressIndicatorMBS as NSProgressIndicatorMBS 7364
  - 35.114.1 class PushButton 7365
    - 35.114.3 NSButtonMBS as NSButtonMBS 7365

- 144 **Quartz Composer** 19677
  - 144.2.1 class QCCompositionMBS 19682
    - 144.2.3 compositionWithData(data as MemoryBlock) as QCCompositionMBS 19682
    - 144.2.4 compositionWithData(data as string) as QCCompositionMBS 19683
    - 144.2.5 compositionWithFile(file as folderitem) as QCCompositionMBS 19683
    - 144.2.6 compositionWithFile(path as string) as QCCompositionMBS 19684
    - 144.2.7 Constructor 19684
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    - 144.2.11 outputKeys as string() 19685
    - 144.2.12 protocols as string() 19685
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    - 144.2.14 QCCompositionAttributeCategoryKey as string 19685
    - 144.2.15 QCCompositionAttributeCopyrightKey as string 19686
    - 144.2.16 QCCompositionAttributeDescriptionKey as string 19686
    - 144.2.17 QCCompositionAttributeHasConsumersKey as string 19686
    - 144.2.18 QCCompositionAttributeIsTimeDependentKey as string 19687
    - 144.2.19 QCCompositionAttributeNameKey as string 19687
    - 144.2.20 QCCompositionCategoryDistortion as string 19687
    - 144.2.21 QCCompositionCategoryStylize as string 19687
    - 144.2.22 QCCompositionCategoryUtility as string 19688
    - 144.2.23 QCCompositionInputAudioPeakKey as string 19688
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    - 144.2.25 QCCompositionInputDestinationImageKey as string 19688
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    - 144.2.29 QCCompositionInputPrimaryColorKey as string 19689
    - 144.2.30 QCCompositionInputScreenImageKey as string 19689
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    - 144.2.38 QCCompositionOutputImageKey as string 19691
    - 144.2.39 QCCompositionOutputWebPageURLKey as string 19691
    - 144.2.40 QCCompositionProtocolGraphicAnimation as string 19691
    - 144.2.41 QCCompositionProtocolGraphicTransition as string 19691

* 144.2.42 QCCompositionProtocolImageFilter as string 19692
* 144.2.43 QCCompositionProtocolMusicVisualizer as string 19692
* 144.2.44 QCCompositionProtocolScreenSaver as string 19692
* 144.2.46 Description as String 19693
* 144.2.47 Handle as Integer 19693
* 144.2.48 identifier as String 19693
* 144.2.49 Name as String 19693

– 144.3.1 class QCCompositionRepositoryMBS 19695

* 144.3.3 allCompositions as QCCompositionMBS() 19695
* 144.3.4 Compositions(protocols() as String = nil, attributes as Dictionary = nil) as QCCompositionMBS() 19695
* 144.3.5 compositionWithIdentifier(identifier as string) as QCCompositionMBS 19696
* 144.3.6 Constructor 19696
* 144.3.7 loadPlugIn(file as folderitem) as Boolean 19697
* 144.3.8 loadPlugIn(path as string) as Boolean 19697
* 144.3.9 QCCompositionRepositoryDidUpdateNotification as string 19697
* 144.3.10 sharedCompositionRepository as QCCompositionRepositoryMBS 19698
* 144.3.12 Handle as Integer 19698

– 144.4.1 control QCViewControlMBS 19699

* 144.4.3 View as QCViewMBS 19699
* 144.4.5 BoundsChanged 19699
* 144.4.6 Close 19699
* 144.4.7 Closing 19700
* 144.4.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean 19700
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* 144.4.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS) 19700
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* 144.4.13 EnableMenuItems 19701
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* 144.4.16 FrameChanged 19701
* 144.4.17 GotFocus 19702
* 144.4.18 LostFocus 19702
* 144.4.19 MenuBarSelected 19702
* 144.4.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean 19702
* 144.4.21 MouseDrag(x as Integer, y as Integer) 19703
* 144.4.22 MouseUp(x as Integer, y as Integer) 19703
* 144.4.23 Open 19703
* 144.4.24 Opening 19703

* 144.4.25 ScaleFactorChanged(NewFactor as Double) 19704
* 144.4.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS) 19704

– 144.5.1 class QCViewMBS 19705

* 144.5.3 Constructor 19705
* 144.5.4 Constructor(Handle as Integer) 19706
* 144.5.5 Constructor(left as Double, top as Double, width as Double, height as Double) 19706
* 144.5.6 erase 19706
* 144.5.7 getAttributes as dictionary 19707
* 144.5.8 inputKeys as string() 19707
* 144.5.9 loadComposition(composition as QCCompositionMBS) as boolean 19707
* 144.5.10 loadCompositionFromData(data as MemoryBlock) as boolean 19707
* 144.5.11 loadCompositionFromData(data as string) as boolean 19708
* 144.5.12 loadCompositionFromFile(file as folderitem) as boolean 19708
* 144.5.13 loadCompositionFromFile(filepath as string) as boolean 19708
* 144.5.14 outputKeys as string() 19709
* 144.5.15 pauseRendering 19709
* 144.5.16 resumeRendering 19709
* 144.5.17 setValueForInputKey(value as Variant, key as string) as boolean 19709
* 144.5.18 startRendering as boolean 19709
* 144.5.19 stopRendering 19710
* 144.5.20 unloadComposition 19710
* 144.5.21 valueForInputKey(key as string) as Variant 19710
* 144.5.22 valueForOutputKey(key as string) as Variant 19710
* 144.5.24 autostartsRendering as boolean 19711
* 144.5.25 eraseColor as NSColorMBS 19711
* 144.5.26 eventForwardingMask as Integer 19711
* 144.5.27 isPausedRendering as boolean 19711
* 144.5.28 isRendering as boolean 19712
* 144.5.29 loadedComposition as QCCompositionMBS 19712
* 144.5.30 maxRenderingFrameRate as Double 19712
* 144.5.31 snapshotImage as NSImageMBS 19713

- 56 **CoreGraphics** 8881
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    - 56.54.3 Constructor(dataProvider as CGDataProviderMBS) 9280
    - 56.54.4 Constructor(file as folderitem) 9280
    - 56.54.5 Constructor(url as string) 9281
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    - 56.54.8 GetResolution(byref xRes as single, byref yRes as single) 9281
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    - 56.54.10 HorizontalResolution as Double 9282
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    - 56.54.12 Width as Double 9282
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- 145 **QuickLook** 19715
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    - 145.2.4 AddItems(items() as FolderItem) 19721
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  - 145.3.1 class QLPreviewPanelMBS 19726
    - 145.3.3 Available as boolean 19726
    - 145.3.4 Constructor 19726
    - 145.3.5 currentPreviewItem as folderitem 19726
    - 145.3.6 enterFullScreenMode(screen as NSScreenMBS) 19727
    - 145.3.7 exitFullScreenMode 19727
    - 145.3.8 refreshCurrentPreviewItem 19727
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    - 145.3.10 updateController 19727
    - 145.3.12 currentPreviewItemIndex as Integer 19728
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    - 145.3.17 handleEvent(e as NSEventMBS) as boolean 19728
    - 145.3.18 numberOfPreviewItems as Integer 19729
    - 145.3.19 previewItemAtIndex(index as Integer) as folderitem 19729
    - 145.3.20 sourceFrameOnScreenForPreviewItem(file as folderitem) as NSRectMBS 19729

* 145.3.21 transitionImageForPreviewItem(file as folderitem, byref contentRect as NSRectMBS) as NSImageMBS 19729
* 145.3.22 willLoadPreviewItem(file as folderitem) 19729

– 145.4.1 control QLPreviewViewControlMBS 19730

* 145.4.3 View as QLPreviewViewMBS 19730
* 145.4.5 BoundsChanged 19730
* 145.4.6 Close 19730
* 145.4.7 Closing 19731
* 145.4.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean 19731
* 145.4.9 ContextualMenuAction(hitItem as MenuItem) as Boolean 19731
* 145.4.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS) 19731
* 145.4.11 EnableMenuItems 19731
* 145.4.12 FocusLost 19732
* 145.4.13 FocusReceived 19732
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* 145.4.15 GotFocus 19732
* 145.4.16 LostFocus 19733
* 145.4.17 MenuBarSelected 19733
* 145.4.18 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean 19733
* 145.4.19 MouseDrag(x as Integer, y as Integer) 19733
* 145.4.20 MouseUp(x as Integer, y as Integer) 19734
* 145.4.21 Open 19734
* 145.4.22 Opening 19734
* 145.4.23 ScaleFactorChanged(NewFactor as Double) 19734
* 145.4.24 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS) 19735

– 145.5.1 class QLPreviewViewMBS 19736

* 145.5.3 Available as boolean 19736
* 145.5.4 close 19736
* 145.5.5 Constructor 19737
* 145.5.6 Constructor(Handle as Integer) 19737
* 145.5.7 Constructor(left as Double, top as Double, width as Double, height as Double) 19737
* 145.5.8 Constructor(left as Double, top as Double, width as Double, height as Double, style as Integer) 19738
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* 145.5.11 autostarts as boolean 19739
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- 146 **QuickTime** 19741
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    - 146.1.3 ChannelFlags as UInt32 19741
    - 146.1.4 ChannelLabel as UInt32 19741
    - 146.1.5 Coordinates(index as Integer) as Double 19742
  - 146.2.1 class QTAudioChannelLayoutMBS 19744
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    - 146.2.6 ChannelBitmap as UInt32 19745
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    - 146.3.5 AudioOutputUnitStart(componenthandle as Integer) as Integer 19751
    - 146.3.6 AudioUnitInitialize(componenthandle as Integer) as Integer 19752
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    - 146.3.13 IsOpen as Boolean 19753
    - 146.3.14 IsStreamActive as Boolean 19753
    - 146.3.15 PostsStatusNotifications as Boolean 19753
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- 58 **CoreImage** 9301
  - **??** Globals **??**
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    - 58.255.2 NewCIColorWithCGColorMBS(CGColor as Variant) as CIColorMBS 10686
    - 58.255.3 NewCIColorWithStringMBS(s as String) as CIColorMBS 10686
    - 58.255.4 NewCIContextMBS(cgcontext as CGContextMBS) as CIContextMBS 10686
    - 58.255.5 NewCIContextMBS(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) as CIContextMBS 10687
    - 58.255.6 NewCIImagewithBitmapDataMBS(data as memoryblock, BytesPerRow as Integer, Width as Integer, Height as Integer, Format as Integer, colorspace as CGColorSpaceMBS) as CIImageMBS 10687
    - 58.255.7 NewCIImagewithBitmapMemoryMBS(data as memoryblock, DataLength as Integer, BytesPerRow as Integer, Width as Integer, Height as Integer, Format as Integer, colorspace as CGColorSpaceMBS) as CIImageMBS 10688
    - 58.255.8 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10688
    - 58.255.9 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, options as dictionary = nil) as CIImageMBS 10688
    - 58.255.10 NewCIImagewithDataMBS(Data as memoryblock, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10689
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    - 58.255.17 NewCISamplerMBS(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS 10691
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* 147.3.23 ExchangeBind(channel as Integer, destination as String, source as String, routingKey as String, arguments as Dictionary) as Dictionary 19771
* 147.3.24 ExchangeDeclare(channel as Integer, exchange as String, type as String, passive as Boolean, durable as Boolean, autoDelete as Boolean, internal as Boolean, arguments as Dictionary) as Dictionary 19771
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* 147.3.27 LoginExternal(vhost as String, channelMax as Integer, frameMax as Integer, heartbeat as Integer, Identity as String, properties as Dictionary = nil) as RabbitMQRPCReplyMBS 19772
* 147.3.28 LoginPlain(vhost as String, channelMax as Integer, frameMax as Integer, heartbeat as Integer, Username as String, Password as String, properties as Dictionary = nil) as RabbitMQRPCReplyMBS 19773
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* 147.3.32 MethodName(constantNumber as Integer) as String 19774
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* 147.3.62 RPCTimeout as Double 19783
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– 147.6.1 class RabbitMQMessageMBS 19796

* 147.6.3 Constructor 19796
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– 147.7.1 class RabbitMQRPCReplyMBS 19798

* 147.7.3 Constructor 19798
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- 35 **Cocoa Controls** 6603
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- 148 **RAMStream** 19801
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- 129 **Network** 17937
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    - 129.37.7 CalcChecksum(data as ptr, ByteCount as Integer) as UInt16 18099
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- 79 **Encryption and Hash** 13295
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- 173 **SQL** 21449
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- 51 **Controls** 8567
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- 151 **Regular Expressions** 19843
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    - 151.8.32 StringNumber(name as string) as Integer 19904
    - 151.8.33 Study as boolean 19904
    - 151.8.34 Substring(index as Integer) as string 19904
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    - 151.8.36 Unescape(text as string) as string 19905
    - 151.8.37 Version as string 19905
    - 151.8.39 CompileOptionAnchored as Boolean 19905
    - 151.8.40 CompileOptionAutoCallOut as Boolean 19905

* 151.8.41 CompileOptionBSRAnyCRLF as Boolean 19906
* 151.8.42 CompileOptionBSRUnicode as Boolean 19906
* 151.8.43 CompileOptionCaseLess as Boolean 19906
* 151.8.44 CompileOptionDollarEndOnly as Boolean 19907
* 151.8.45 CompileOptionDotAll as Boolean 19907
* 151.8.46 CompileOptionDuplicateNames as Boolean 19908
* 151.8.47 CompileOptionExtended as Boolean 19908
* 151.8.48 CompileOptionFirstLine as Boolean 19908
* 151.8.49 CompileOptionJavaScriptCompat as Boolean 19909
* 151.8.50 CompileOptionMultiline as Boolean 19909
* 151.8.51 CompileOptionNewLineAny as Boolean 19910
* 151.8.52 CompileOptionNewLineAnyCRLF as Boolean 19910
* 151.8.53 CompileOptionNewLineCR as Boolean 19910
* 151.8.54 CompileOptionNewLineCRLF as Boolean 19911
* 151.8.55 CompileOptionNewLineLF as Boolean 19911
* 151.8.56 CompileOptionNoAutoCapture as Boolean 19911
* 151.8.57 CompileOptionNoStartOptimize as Boolean 19911
* 151.8.58 CompileOptionNoUTF8Check as Boolean 19911
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* 151.8.62 CompileOptionUTF8 as Boolean 19912
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* 151.8.72 ExecuteOptionNewLineCRLF as Boolean 19916
* 151.8.73 ExecuteOptionNewLineLF as Boolean 19916
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* 151.8.83 Handle as Integer 19919
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* 151.8.86 InfoSize as Integer 19920
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- 150 **Registration** 19831
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    - 150.2.2 MBSPluginCompileDate as string 19834
    - 150.2.3 MBSPluginCompileTime as string 19834
    - 150.2.4 MBSPluginVersion as string 19834
    - 150.2.5 RegisterMBSPlugin(name as string, product as string, enddate as Integer, serial as string) as boolean 19834
    - 150.2.6 SetRegistrationMessageMBS(ID as Integer, message as string) 19835
  - 150.3.1 class RegistrationEngineMBS 19836
    - 150.3.3 Calc as string 19837
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    - 150.3.6 Alphabet as String 19838
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    - 150.3.14 Seed as Integer 19841
    - 150.3.15 Suffix as String 19841
    - 150.3.16 Field(index as Integer) as string 19841

- 203 **Windows Registry** 23613
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    - 203.1.3 Create as Integer 23613
    - 203.1.4 Remove as Integer 23614
    - 203.1.6 AppFile as FolderItem 23615
    - 203.1.7 Description as string 23615
    - 203.1.8 Extension as string 23615
    - 203.1.9 FileType as string 23616
    - 203.1.10 Iconfile as FolderItem 23616
    - 203.1.11 IconID as Integer 23617
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    - 203.2.3 CopyTree(keyname as string, Dest as RegistryKeyMBS) as boolean 23618
    - 203.2.4 CreateKey(name as string, Use64bitRegistry as boolean = false) as RegistryKeyMBS 23618
    - 203.2.5 Delete(keyname as string) as boolean 23618
    - 203.2.6 DeleteTree(keyname as string) as boolean 23619
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    - 203.3.3 classesRoot as RegistryKeyMBS 23623
    - 203.3.4 CurrentConfig as RegistryKeyMBS 23623
    - 203.3.5 CurrentUser as RegistryKeyMBS 23623
    - 203.3.6 getBinaryValue(keypath as string,valuename as string, Use64bitRegistry as boolean = false) as Memoryblock 23623
    - 203.3.7 getStringValue(keypath as string,valuename as string, Use64bitRegistry as boolean = false) as String 23624
    - 203.3.8 Key(keypath as string, Use64bitRegistry as boolean = false) as RegistryKeyMBS 23624
    - 203.3.9 LocalMachine as RegistryKeyMBS 23625
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* 203.4.11 asString as string 23628
* 203.4.12 isBinary as boolean 23628
* 203.4.13 isLong32 as boolean 23629
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* 203.4.17 size as Integer 23629
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- 152 **Remote Control** 19927
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    - 152.5.3 LinuxConvertCase(keysymbol as Integer, byref lowerSymbol as Integer, byref upperSymbol as Integer) as boolean 19948
    - 152.5.4 LinuxKeyCodeToKeySymbol(keycode as Integer, index as Integer) as Integer 19949
    - 152.5.5 LinuxKeyNameToKeySymbol(keyname as string) as Integer 19949
    - 152.5.6 LinuxKeySymbolToKeyCode(keysymbol as Integer) as Integer 19949
    - 152.5.7 LinuxKeySymbolToKeyName(keysymbol as Integer) as string 19949
    - 152.5.8 LinuxMouseClick(ButtonID as Integer, ButtonDown as boolean) as boolean 19949
    - 152.5.9 LinuxMousePositionX as Integer 19950
    - 152.5.10 LinuxMousePositionY as Integer 19950
    - 152.5.11 LinuxMoveMouse(x as Integer, y as Integer) as boolean 19950
    - 152.5.12 LinuxPressControlKey(keydown as boolean) as boolean 19950
    - 152.5.13 LinuxPressKey(Keycode as Integer) as boolean 19950
    - 152.5.14 LinuxPressKey(Keycode as Integer, ButtonDown as boolean) as boolean 19951
    - 152.5.15 LinuxPressOptionKey(keydown as boolean) as boolean 19951
    - 152.5.16 LinuxPressShiftKey(keydown as boolean) as boolean 19951
    - 152.5.17 LinuxSupported as boolean 19951
    - 152.5.18 MacCurrentProcessID as Integer 19952
    - 152.5.19 MacCurrentProcessName as string 19952
    - 152.5.20 MacDescriptionForKeyCode(keycode as Integer) as string 19952
    - 152.5.21 MacDisplayNameForKeyCode(keycode as Integer) as string 19952
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    - 152.5.27 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19954
    - 152.5.28 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19955
    - 152.5.29 MacMousePositionX as Integer 19955
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    - 152.5.33 MacMoveMouse(x as Double, y as Double) as boolean 19956
    - 152.5.34 MacPressCommandKey(keydown as boolean) as boolean 19956
    - 152.5.35 MacPressControlKey(keydown as boolean) as boolean 19957
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* 152.5.37 MacPressKey(keychar as Integer, virtualkey as Integer, keydown as boolean) as boolean 19957
* 152.5.38 MacPressOptionKey(keydown as boolean) as boolean 19958
* 152.5.39 MacPressShiftKey(keydown as boolean) as boolean 19958
* 152.5.40 MacProcessCount as Integer 19958
* 152.5.41 MacProcessName(index as Integer) as string 19958
* 152.5.42 MacProcessVisible(index as Integer) as boolean 19959
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* 152.5.44 MouseClick(x as Integer, y as Integer, down as boolean) as boolean 19961
* 152.5.45 MousePositionX as Integer 19961
* 152.5.46 MousePositionY as Integer 19961
* 152.5.47 MoveMouse(x as Integer, y as Integer) as boolean 19962
* 152.5.48 PressControlKey(keydown as boolean) as boolean 19962
* 152.5.49 PressOptionKey(keydown as boolean) as boolean 19962
* 152.5.50 PressShiftKey(keydown as boolean) as boolean 19962
* 152.5.51 WinBringProcessToTop(ProcessID as Integer) as boolean 19962
* 152.5.52 WinBringWindowToTop(WindowHandle as Integer, SetFocus as boolean = true) as boolean 19963
* 152.5.53 WinCurrentProcessID as Integer 19963
* 152.5.54 WinFindWindow(ClassName as string, WindowName as string) as Integer 19963
* 152.5.55 WinForegroundProcessID as Integer 19964
* 152.5.56 WinFrontWindowTitle as string 19964
* 152.5.57 WinIsCapsLock as boolean 19964
* 152.5.58 WinIsNumLock as boolean 19964
* 152.5.59 WinIsScrollLock as boolean 19965
* 152.5.60 WinIsWindowMinimized(WindowHandle as Integer) as Boolean 19965
* 152.5.61 WinIsWindowVisible(WindowHandle as Integer) as Boolean 19965
* 152.5.62 WinKeyboardName as string 19966
* 152.5.63 WinKeyIsDown(virtualkey as Integer) as boolean 19966
* 152.5.64 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean) as boolean 19966
* 152.5.65 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19966
* 152.5.66 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19967
* 152.5.67 WinMouseClick(x as integer, y as integer, AbsolutePosition as boolean, MouseButton1 as Integer, MouseButton2 as Integer, MouseButton3 as Integer) as boolean 19968
* 152.5.68 WinMousePositionX as Integer 19968
* 152.5.69 WinMousePositionY as Integer 19969
* 152.5.70 WinMoveMouse(x as Integer, y as Integer) as boolean 19969
* 152.5.71 WinPressControlKey(keydown as boolean) as boolean 19969
* 152.5.72 WinPressKey(ScanCode as Integer) as boolean 19969

* 152.5.73 WinPressKey(ScanCode as Integer, keydown as boolean) as boolean 19970
* 152.5.74 WinPressKey(virtualkey as Integer, ScanCode as Integer) as boolean 19970
* 152.5.75 WinPressKey(virtualkey as Integer, ScanCode as Integer, keydown as boolean) as boolean 19970
* 152.5.76 WinPressOptionKey(keydown as boolean) as boolean 19971
* 152.5.77 WinPressShiftKey(keydown as boolean) as boolean 19971
* 152.5.78 WinScanCodeToVirtualKeyCode(ScanCode as Integer) as Integer 19971
* 152.5.79 WinSendMessage(Win as DesktopWindow, Msg as integer, lParam as integer, WParam as integer) as integer 19971
* 152.5.80 WinSendMessage(Win as window, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972
* 152.5.81 WinSendMessage(WindowHandle as Integer, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972
* 152.5.82 WinShowWindow(WindowHandle as Integer, CmdShow as Integer) as Boolean 19973
* 152.5.83 WinVirtualKeyCodeToCharCode(VirtualKeyCode as Integer) as Integer 19973
* 152.5.84 WinVirtualKeyCodeToScanCode(VirtualKeyCode as Integer) as Integer 19974
* 152.5.85 WinVirtualKeyForASCII(Character as Integer, byref VirtualKeyCode as Integer, Byref ShiftKey as boolean, byref ControlKey as Boolean, byref AltKey as boolean) as boolean 19974

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- 176 **String** 21777
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    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = """, quote as string = """) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = " ") as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 153 **Resolution** 19975
  - 153.3.1 class ResolutionMBS 19984
    - 153.3.3 Switch As Boolean 19984
    - 153.3.5 Depth as Integer 19984
    - 153.3.6 displaynum as Integer 19985
    - 153.3.7 Height as Integer 19985
    - 153.3.8 hz as Integer 19985
    - 153.3.9 issafe as boolean 19985
    - 153.3.10 Left as Integer 19985
    - 153.3.11 ResolutionNum as Integer 19986
    - 153.3.12 Top as Integer 19986
    - 153.3.13 Width as Integer 19986
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    - 153.2.1 DisplayCountMBS as Integer 19983
    - 153.2.2 GetDisplayMBS(num as Integer) As DisplayMBS 19983
    - 153.2.3 ResolutionLibraryPresentMBS as boolean 19983
    - 153.2.4 UpdateDisplayCountMBS 19984

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- 83 **Files** 13559
  - 83.24.1 class ResourceForkMBS 13796
    - 83.24.3 AddResource(Data as Memoryblock, ResourceType as String, ID as Integer, Name as String) 13796
    - 83.24.4 AddResource(Data as String, ResourceType as String, ID as Integer, Name as String) 13797
    - 83.24.5 Close 13797
    - 83.24.6 Constructor 13797
    - 83.24.7 Create(file as folderitem, UseDataFork as boolean = false) as ResourceForkMBS 13797
    - 83.24.8 GetIndResource(ResourceType as String, index as Integer) As String 13798
    - 83.24.9 GetNamedResource(ResourceType as String, Name as String) As String 13798
    - 83.24.10 GetResource(ResourceType as String, ID as Integer) As String 13799
    - 83.24.11 GetResourceMemory(ResourceType as String, ID as Integer) As Memoryblock 13799
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    - 83.24.13 RemoveResource(ResourceType as String, ID as Integer) 13800
    - 83.24.14 ResourceCount(ResourceType as String) as Integer 13800
    - 83.24.15 ResourceID(ResourceType as String, index as Integer) as Integer 13800
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    - 83.24.18 ResourceType(index as Integer) As String 13801
    - 83.24.19 UniqueID(ResourceType as String) as Integer 13802
    - 83.24.21 Handle as Integer 13802
    - 83.24.22 LastError as Integer 13802
    - 83.24.23 Modified as Boolean 13803
    - 83.24.24 TypeCount as Integer 13803
    - 83.24.25 Writable as Boolean 13803
    - 83.24.26 ResourceAttributes(ResourceType as String, ID as Integer) as Integer 13804
    - 83.24.27 ResourceLocked(ResourceType as String, ID as Integer) as boolean 13804
    - 83.24.28 ResourcePreload(ResourceType as String, ID as Integer) as boolean 13804
    - 83.24.29 ResourceProtected(ResourceType as String, ID as Integer) as boolean 13804
    - 83.24.30 ResourcePurgeable(ResourceType as String, ID as Integer) as boolean 13805
    - 83.24.31 ResourceSysHeap(ResourceType as String, ID as Integer) as boolean 13805

- 177 **SVG** 21859
  - 177.1.1 class ReSVGMBS 21859
    - 177.1.3 Constructor(data as MemoryBlock) 21860
    - 177.1.4 Constructor(data as String) 21860
    - 177.1.5 Constructor(file as FolderItem) 21861
    - 177.1.6 ImageBox(byref x as double, byref y as double, byref width as double, byref height as double) as Boolean 21861
    - 177.1.7 InitLog 21861
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    - 177.1.9 NodeBox(id as string, byref x as double, byref y as double, byref width as double, byref height as double) as Boolean 21862
    - 177.1.10 NodeExists(id as string) as Boolean 21863
    - 177.1.11 Render(width as Integer, Height as Integer, pixmap as Ptr, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil) 21863
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* 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
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* 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
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* 14.18.22 ReadSingleFrames(p as ptr, items as Int64) as Int64 3094
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    - 168.1.13 AudioAlertSoundsFolderMBS(domain as Integer) as folderitem 21025
    - 168.1.14 AudioComponentsFolderMBS(domain as Integer) as folderitem 21025
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* 168.1.41 CoreServicesFolderMBS(domain as Integer) as folderitem 21043
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* 168.1.43 CreateALMModulesFolderMBS(domain as Integer) as folderitem 21044
* 168.1.44 CreateALMPreferencesFolderMBS(domain as Integer) as folderitem 21045
* 168.1.45 CreateAppearanceFolderMBS(domain as Integer) as folderitem 21046
* 168.1.46 CreateAppleExtrasFolderMBS(domain as Integer) as folderitem 21047
* 168.1.47 CreateAppleMenuFolderMBS(domain as Integer) as folderitem 21047
* 168.1.48 CreateAppleShareAuthenticationFolderMBS(domain as Integer) as folderitem 21048
* 168.1.49 CreateAppleshareAutomountServerAliasesFolderMBS(domain as Integer) as folderitem 21049
* 168.1.50 CreateAppleShareSupportFolderMBS(domain as Integer) as folderitem 21050
* 168.1.51 CreateApplicationsFolderMBS(domain as Integer) as folderitem 21050
* 168.1.52 CreateApplicationSupportFolderMBS(domain as Integer) as folderitem 21051
* 168.1.53 CreateAssistantsFolderMBS(domain as Integer) as folderitem 21052
* 168.1.54 CreateAudioAlertSoundsFolderMBS(domain as Integer) as folderitem 21053
* 168.1.55 CreateAudioComponentsFolderMBS(domain as Integer) as folderitem 21053
* 168.1.56 CreateAudioDigidesignFolderMBS(domain as Integer) as folderitem 21054
* 168.1.57 CreateAudioPlugInsFolderMBS(domain as Integer) as folderitem 21054
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* 168.1.60 CreateAudioSoundsFolderMBS(domain as Integer) as folderitem 21057
* 168.1.61 CreateAudioSupportFolderMBS(domain as Integer) as folderitem 21057
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* 168.1.64 CreateAutosaveInformationFolderMBS(domain as Integer) as folderitem 21060
* 168.1.65 CreateBootTimeStartupItemsFolderMBS(domain as Integer) as folderitem 21060
* 168.1.66 CreateCachedDataFolderMBS(domain as Integer) as folderitem 21061
* 168.1.67 CreateCarbonLibraryFolderMBS(domain as Integer) as folderitem 21062
* 168.1.68 CreateChewableItemsFolderMBS(domain as Integer) as folderitem 21062
* 168.1.69 CreateClassicDesktopFolderMBS(domain as Integer) as folderitem 21063
* 168.1.70 CreateClassicPreferencesFolderMBS(domain as Integer) as folderitem 21063
* 168.1.71 CreateColorPickersFolderMBS(domain as Integer) as folderitem 21064
* 168.1.72 CreateColorSyncCMMFolderMBS(domain as Integer) as folderitem 21065
* 168.1.73 CreateColorSyncFolderMBS(domain as Integer) as folderitem 21066
* 168.1.74 CreateColorSyncProfilesFolderMBS(domain as Integer) as folderitem 21066
* 168.1.75 CreateColorSyncScriptingFolderMBS(domain as Integer) as folderitem 21067
* 168.1.76 CreateComponentsFolderMBS(domain as Integer) as folderitem 21068
* 168.1.77 CreateCompositionsFolderMBS(domain as Integer) as folderitem 21069
* 168.1.78 CreateContextualMenuItemsFolderMBS(domain as Integer) as folderitem 21069
* 168.1.79 CreateControlPanelDisabledFolderMBS(domain as Integer) as folderitem 21070
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* 168.1.81 CreateControlStripModulesFolderMBS(domain as Integer) as folderitem 21071
* 168.1.82 CreateCoreServicesFolderMBS(domain as Integer) as folderitem 21072
* 168.1.83 CreateCurrentUserFolderMBS(domain as Integer) as folderitem 21072
* 168.1.84 CreateCurrentUserRemoteFolderLocationFolderMBS(domain as Integer) as folderitem 21073
* 168.1.85 CreateCurrentUserRemoteFolderMBS(domain as Integer) as folderitem 21074
* 168.1.86 CreateDesktopFolderMBS(domain as Integer) as folderitem 21075
* 168.1.87 CreateDesktopPicturesFolderMBS(domain as Integer) as folderitem 21075
* 168.1.88 CreateDeveloperApplicationsFolderMBS(domain as Integer) as folderitem 21076
* 168.1.89 CreateDeveloperDocsFolderMBS(domain as Integer) as folderitem 21077
* 168.1.90 CreateDeveloperFolderMBS(domain as Integer) as folderitem 21078
* 168.1.91 CreateDeveloperHelpFolderMBS(domain as Integer) as folderitem 21078
* 168.1.92 CreateDictionariesFolderMBS(domain as Integer) as folderitem 21079
* 168.1.93 CreateDirectoryServicesFolderMBS(domain as Integer) as folderitem 21080
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* 168.1.95 CreateDisplayExtensionsFolderMBS(domain as Integer) as folderitem 21081
* 168.1.96 CreateDocumentationFolderMBS(domain as Integer) as folderitem 21081
* 168.1.97 CreateDocumentsFolderMBS(domain as Integer) as folderitem 21082
* 168.1.98 CreateDomainLibraryFolderMBS(domain as Integer) as folderitem 21083
* 168.1.99 CreateDomainTopLevelFolderMBS(domain as Integer) as folderitem 21084
* 168.1.100 CreateDownloadsFolderMBS(domain as Integer) as folderitem 21084
* 168.1.101 CreateEditorsFolderMBS(domain as Integer) as folderitem 21085
* 168.1.102 CreateExtensionDisabledFolderMBS(domain as Integer) as folderitem 21086
* 168.1.103 CreateExtensionFolderMBS(domain as Integer) as folderitem 21087
* 168.1.104 CreateFavoritesFolderMBS(domain as Integer) as folderitem 21087
* 168.1.105 CreateFileSystemSupportFolderMBS(domain as Integer) as folderitem 21088
* 168.1.106 CreateFindByContentFolderMBS(domain as Integer) as folderitem 21089
* 168.1.107 CreateFindByContentIndexesFolderMBS(domain as Integer) as folderitem 21089
* 168.1.108 CreateFindByContentPluginsFolderMBS(domain as Integer) as folderitem 21090
* 168.1.109 CreateFindSupportFolderMBS(domain as Integer) as folderitem 21090
* 168.1.110 CreateFolderActionsFolderMBS(domain as Integer) as folderitem 21091
* 168.1.111 CreateFontCollectionsFolderMBS(domain as Integer) as folderitem 21092
* 168.1.112 CreateFontsFolderMBS(domain as Integer) as folderitem 21093
* 168.1.113 CreateFrameworksFolderMBS(domain as Integer) as folderitem 21093
* 168.1.114 CreateGenEditorsFolderMBS(domain as Integer) as folderitem 21094
* 168.1.115 CreateHelpFolderMBS(domain as Integer) as folderitem 21095
* 168.1.116 CreateiMovieFolderMBS(domain as Integer) as folderitem 21096
* 168.1.117 CreateiMoviePlugInsFolderMBS(domain as Integer) as folderitem 21096
* 168.1.118 CreateiMovieSoundEffectsFolderMBS(domain as Integer) as folderitem 21097
* 168.1.119 CreateIndexFilesFolderMBS(domain as Integer) as folderitem 21098
* 168.1.120 CreateInputManagersFolderMBS(domain as Integer) as folderitem 21098
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* 168.1.122 CreateInstallerLogsFolderMBS(domain as Integer) as folderitem 21099
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* 168.1.160 CreateQuickTimeExtensionsFolderMBS(domain as Integer) as folderitem 21126
* 168.1.161 CreateRecentApplicationsFolderMBS(domain as Integer) as folderitem 21126
* 168.1.162 CreateRecentDocumentsFolderMBS(domain as Integer) as folderitem 21127
* 168.1.163 CreateRecentServersFolderMBS(domain as Integer) as folderitem 21128

* 168.1.164 CreateScriptingAdditionsFolderMBS(domain as Integer) as folderitem 21129
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* 168.1.167 CreateSharedUserDataFolderMBS(domain as Integer) as folderitem 21131
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* 168.1.170 CreateSoundSetsFolderMBS(domain as Integer) as folderitem 21133
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* 168.1.181 CreateSystemExtensionDisabledFolderMBS(domain as Integer) as folderitem 21141
* 168.1.182 CreateSystemFolderMBS(domain as Integer) as folderitem 21141
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* 168.1.185 CreateSystemTrashFolderMBS(domain as Integer) as folderitem 21143
* 168.1.186 CreateTemporaryFolderMBS(domain as Integer) as folderitem 21144
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* 168.1.192 CreateUsersFolderMBS(domain as Integer) as folderitem 21148
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* 168.1.199 CurrentUserFolderMBS(domain as Integer) as folderitem 21153
* 168.1.200 CurrentUserRemoteFolderLocationFolderMBS(domain as Integer) as folderitem 21154
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* 168.1.202 DesktopFolderMBS(domain as Integer) as folderitem 21155
* 168.1.203 DesktopPicturesFolderMBS(domain as Integer) as folderitem 21156

* 168.1.204 DeveloperApplicationsFolderMBS(domain as Integer) as folderitem 21156
* 168.1.205 DeveloperDocsFolderMBS(domain as Integer) as folderitem 21157
* 168.1.206 DeveloperFolderMBS(domain as Integer) as folderitem 21157
* 168.1.207 DeveloperHelpFolderMBS(domain as Integer) as folderitem 21158
* 168.1.208 DictionariesFolderMBS(domain as Integer) as folderitem 21158
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* 168.1.211 DisplayExtensionsFolderMBS(domain as Integer) as folderitem 21161
* 168.1.212 DocumentationFolderMBS(domain as Integer) as folderitem 21161
* 168.1.213 DocumentsFolderMBS(domain as Integer) as folderitem 21162
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* 168.1.215 DomainTopLevelFolderMBS(domain as Integer) as folderitem 21163
* 168.1.216 DownloadsFolderMBS(domain as Integer) as folderitem 21164
* 168.1.217 EditorsFolderMBS(domain as Integer) as folderitem 21165
* 168.1.218 ExtensionDisabledFolderMBS(domain as Integer) as folderitem 21165
* 168.1.219 ExtensionFolderMBS(domain as Integer) as folderitem 21166
* 168.1.220 FavoritesFolderMBS(domain as Integer) as folderitem 21166
* 168.1.221 FileSystemSupportFolderMBS(domain as Integer) as folderitem 21167
* 168.1.222 FindByContentFolderMBS(domain as Integer) as folderitem 21167
* 168.1.223 FindByContentIndexesFolderMBS(domain as Integer) as folderitem 21168
* 168.1.224 FindByContentPluginsFolderMBS(domain as Integer) as folderitem 21169
* 168.1.225 FindSupportFolderMBS(domain as Integer) as folderitem 21170
* 168.1.226 FolderActionsFolderMBS(domain as Integer) as folderitem 21170
* 168.1.227 FontCollectionsFolderMBS(domain as Integer) as folderitem 21171
* 168.1.228 FontsFolderMBS(domain as Integer) as folderitem 21172
* 168.1.229 FrameworksFolderMBS(domain as Integer) as folderitem 21172
* 168.1.230 GenEditorsFolderMBS(domain as Integer) as folderitem 21173
* 168.1.231 HelpFolderMBS(domain as Integer) as folderitem 21173
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* 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
* 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
* 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
* 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
* 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075
* 88.3.28 PictureCopyPixelFastMBS(DestImage As Picture, Source As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer) as boolean 14076
* 88.3.66 PicturetoBinaryStringMBS(p as picture) as string 14103
* 88.3.48 PtrABGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14092
* 88.3.49 PtrABGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093
* 88.3.50 PtrARGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093
* 88.3.51 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14094
* 88.3.52 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture 14094
* 88.3.53 PtrBGRAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14095
* 88.3.54 PtrBGRAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096
* 88.3.55 PtrBGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096
* 88.3.56 PtrBGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14097

* 88.3.57 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14097
* 88.3.58 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14098
* 88.3.59 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14098
* 88.3.60 PtrRGBAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099
* 88.3.61 PtrRGBAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099
* 88.3.62 PtrRGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14100
* 88.3.63 PtrRGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14101
* 88.3.10 RenderSamplesMBS(Samples as memoryblock, SampleCount as Integer, Smooth as Integer, Width as Integer, Height as Integer, outlinewidth as Integer, BackColor as color=&c88B5C4, ForeColor as color=&c274C5A, OutLineColor as color=&c203F4E, Bits as Integer = 8, AutoScale as boolean = false) as Picture 14053
* 88.3.11 TintPictureMBS(source as picture, GreyBase as color, SepiaBase as color) as picture 14054
* 88.3.67 WindowsDrawPictureIntoDeviceContextMBS(pic as picture, HDC as Integer, x as Integer, y as Integer, w as Integer, h as Integer, Transparent as boolean) 14104

- 107 **JPEG** 16383
  - **??** Globals **??**
    - 107.8.1 JPEGStringToPictureMBS(buf as string) as picture 16443
    - 107.8.2 JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture 16443
    - 107.8.3 PictureToJPEGStringMBS(pic as picture, quality as Integer = 80) as string 16444

- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 21 **Basic** 4061
  - **??** Globals **??**
    - 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string 4067
    - 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock 4064
    - 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock 4064
    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
    - 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062
    - 21.1.6 HideCursorMBS 4063
    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
    - 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string 4065
    - 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string 4065
    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
    - 21.1.3 ReturnErrPtrMBS as Integer 4063
    - 21.1.4 ReturnInPtrMBS as Integer 4063
    - 21.1.5 ReturnOutPtrMBS as Integer 4063
    - 21.1.7 ShowCursorMBS 4063
    - 21.1.14 StringFromOSTypeMBS(value as Integer) as string 4066
    - 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock 4066

- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
    - 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant() 24089
    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
    - 214.1.6 ArrayStringMBS(paramArray values as String) as String() 24092
    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
    - 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr 24094
    - 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer 24094
    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
    - 214.1.12 GetDelegateTargetMBS(del as variant) as Variant 24095
    - 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean 24096
    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
    - 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer 24096
    - 214.1.15 GetObjectReferenceCountMBS(o as object) as integer 24097
    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
    - 214.1.17 GetStringReferenceCountMBS(s as string) as integer 24098
    - 214.1.18 GetTextMemoryAddressMBS(s as text) as integer 24099
    - 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant() 24099
    - 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer 24100
    - 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant 24100
    - 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary() 24101
    - 214.1.23 GetVariantTypeMBS(va as variant) as Integer 24102
    - 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean 24103
    - 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32) 24105
    - 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant) 24103

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- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
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    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
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    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 21 **Basic** 4061
  - **??** Globals **??**
    - 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string 4067
    - 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock 4064
    - 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock 4064
    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
    - 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062
    - 21.1.6 HideCursorMBS 4063
    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
    - 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string 4065
    - 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string 4065
    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
    - 21.1.3 ReturnErrPtrMBS as Integer 4063
    - 21.1.4 ReturnInPtrMBS as Integer 4063
    - 21.1.5 ReturnOutPtrMBS as Integer 4063
    - 21.1.7 ShowCursorMBS 4063
    - 21.1.14 StringFromOSTypeMBS(value as Integer) as string 4066
    - 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock 4066

- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 21 **Basic** 4061
  - **??** Globals **??**
    - 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string 4067
    - 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock 4064
    - 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock 4064
    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
    - 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062
    - 21.1.6 HideCursorMBS 4063
    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
    - 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string 4065
    - 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string 4065
    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
    - 21.1.3 ReturnErrPtrMBS as Integer 4063
    - 21.1.4 ReturnInPtrMBS as Integer 4063
    - 21.1.5 ReturnOutPtrMBS as Integer 4063
    - 21.1.7 ShowCursorMBS 4063
    - 21.1.14 StringFromOSTypeMBS(value as Integer) as string 4066
    - 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock 4066

- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 214 **XojoRuntime** 24089
  - **??** Globals **??**
    - 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant() 24089
    - 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double() 24089
    - 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64() 24090
    - 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer() 24091
    - 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean 24091
    - 214.1.6 ArrayStringMBS(paramArray values as String) as String() 24092
    - 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant() 24092
    - 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer 24093
    - 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr 24094
    - 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer 24094
    - 214.1.11 GetDelegateParametersMBS(del as variant) as String 24095
    - 214.1.12 GetDelegateTargetMBS(del as variant) as Variant 24095
    - 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean 24096
    - 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32 24104
    - 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer 24096
    - 214.1.15 GetObjectReferenceCountMBS(o as object) as integer 24097
    - 214.1.16 GetStringMemoryAddressMBS(s as string) as integer 24097
    - 214.1.17 GetStringReferenceCountMBS(s as string) as integer 24098
    - 214.1.18 GetTextMemoryAddressMBS(s as text) as integer 24099
    - 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant() 24099
    - 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer 24100
    - 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant 24100
    - 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary() 24101
    - 214.1.23 GetVariantTypeMBS(va as variant) as Integer 24102
    - 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean 24103
    - 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32) 24105
    - 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant) 24103

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- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

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  - **??** Globals **??**
    - 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string 4067
    - 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock 4064
    - 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock 4064
    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
    - 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062
    - 21.1.6 HideCursorMBS 4063
    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
    - 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string 4065
    - 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string 4065
    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
    - 21.1.3 ReturnErrPtrMBS as Integer 4063
    - 21.1.4 ReturnInPtrMBS as Integer 4063
    - 21.1.5 ReturnOutPtrMBS as Integer 4063
    - 21.1.7 ShowCursorMBS 4063
    - 21.1.14 StringFromOSTypeMBS(value as Integer) as string 4066
    - 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock 4066

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- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
* 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean 21804
* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = ””, quote as string = ””) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = ” ”) as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

- 21 **Basic** 4061
  - **??** Globals **??**
    - 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string 4067
    - 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock 4064
    - 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock 4064
    - 21.1.10 cloneStringMBS(s as string) as string 4065
    - 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32 4067
    - 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061
    - 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062
    - 21.1.6 HideCursorMBS 4063
    - 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color 4068
    - 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string 4065
    - 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string 4065
    - 21.1.13 OSTypeFromStringMBS(str as string) as Integer 4066
    - 21.1.3 ReturnErrPtrMBS as Integer 4063
    - 21.1.4 ReturnInPtrMBS as Integer 4063
    - 21.1.5 ReturnOutPtrMBS as Integer 4063
    - 21.1.7 ShowCursorMBS 4063
    - 21.1.14 StringFromOSTypeMBS(value as Integer) as string 4066
    - 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock 4066

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- 176 **String** 21777
  - **??** Globals **??**
    - 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
    - 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
    - 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787
    - 176.1.14 ClearStringContentMBS(s as String) as Boolean 21788
    - 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
    - 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
    - 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
    - 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
    - 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790
    - 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean 21791
    - 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string 21816
    - 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string 21817
    - 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer 21792
    - 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string 21793
    - 176.1.68 DecodingFromCP1252MBS(s as string) as string 21817
    - 176.1.69 DecodingFromHexMBS(s as string) as string 21817
    - 176.1.23 DecodingFromHTMLMBS(s as string) as string 21793
    - 176.1.70 DecodingFromISO8859MBS(s as string) as string 21818
    - 176.1.24 DecodingFromMySQLMBS(s as string) as string 21794
    - 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string 21794
    - 176.1.26 DecodingFromURLMBS(s as string) as string 21795
    - 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795
    - 176.1.28 DecodingFromXMLMBS(s as string) as string 21796
    - 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer 21797
    - 176.1.30 EncodeEmailSubjectMBS(s as string) as string 21797
    - 176.1.8 EncodingNameMBS(extends Text as string) as string 21783
    - 176.1.71 EncodingToCP1252MBS(s as string) as string 21819
    - 176.1.72 EncodingToHexMBS(s as string) as string 21819
    - 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string 21797
    - 176.1.73 EncodingToISO8859MBS(s as string) as string 21819
    - 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string 21799
    - 176.1.33 EncodingToURLMBS(s as string) as string 21799
    - 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800
    - 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string 21801
    - 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801

* 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
* 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801
* 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string 21802
* 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean 21803
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* 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string 21805
* 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
* 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
* 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
* 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
* 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
* 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782
* 176.1.7 InStrBytesMBS(target as string, find as string) as Integer 21783
* 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805
* 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805
* 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double 21806
* 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
* 176.1.75 JoinDataMBS(strings() as string) as string 21821
* 176.1.76 JoinDataMBS(values() as Variant) as string 21821
* 176.1.77 JoinStringMBS(strings() as string) as string 21822
* 176.1.78 JoinStringMBS(values() as Variant) as string 21823
* 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double 21807
* 176.1.47 NativeStringMBS(s as string) as string 21808
* 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string 21808
* 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string 21784
* 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string 21809
* 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string 21809
* 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String 21809
* 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string 21810
* 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string 21810

* 176.1.10 SplitCommaSeparatedValuesMBS(text as string, delimiter as string = """, quote as string = """) as string() 21784
* 176.1.54 SplitMBS(value as String, delimiter as String = " ") as String() 21811
* 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string 21812
* 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer 21812
* 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer 21812
* 176.1.58 StringANDMBS(a as string,b as string) as string 21813
* 176.1.79 StringCodePointsMBS(text as string) as UInt32() 21824
* 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean 21813
* 176.1.60 StringIsXMLreadyMBS(s as string) as boolean 21814
* 176.1.61 StringORMBS(a as string,b as string) as string 21814
* 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21814
* 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string 21815
* 176.1.64 StrMBS(d as Double) as string 21815
* 176.1.65 UnicodeStringMBS(s as string) as string 21816

– 176.2.1 class StringHandleMBS 21824

* 176.2.3 Add(data as MemoryBlock) 21826
* 176.2.4 Add(data as Ptr, size as Integer) 21826
* 176.2.5 Add(data as string) 21826
* 176.2.6 Add(data as StringHandleMBS) 21827
* 176.2.7 AddByte(value as UInt8) 21827
* 176.2.8 AddInteger(value as Int64) 21827
* 176.2.9 Clear 21827
* 176.2.10 clone as StringHandleMBS 21828
* 176.2.11 Constructor 21828
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* 176.2.14 Copy as string 21829
* 176.2.15 CopyMemory as MemoryBlock 21829
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* 176.2.17 Extract(start as Integer, lengthBytes as Integer) as string 21829
* 176.2.18 FindByte(value as UInt8, StartByteOffset as Integer = 1) as Integer 21830
* 176.2.19 FindByte(values() as UInt8, StartByteOffset as Integer = 1) as Integer 21830
* 176.2.20 FirstNonWhiteSpace(StartByteOffset as Integer = 1) as Integer 21831
* 176.2.21 FirstWhiteSpace(StartByteOffset as Integer = 1) as Integer 21831
* 176.2.22 Insert(data as string, position as Integer) 21832
* 176.2.23 InStr(OffsetBytes as Integer = 1, target as String, EndOffsetBytes as Integer = -1) as Integer 21832
* 176.2.24 InStrUTF8(OffsetCharacters as Integer = 1, target as String, EndOffsetCharacters as Integer = -1) as Integer 21833

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* 181.13.10 Name as string 22110
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- 182 **TIFF** 22119
  - **??** Globals **??**
    - 182.1.5 CombineBitCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, CacheSizeRead as Integer) as Integer 22122
    - 182.1.1 CombineBitCMYKtoRGBMBS(CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, byref output as picture, CacheSizeRead as Integer) as Integer 22119
    - 182.1.4 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22121
    - 182.1.8 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, TiffData as TiffPictureMBS, scalex as Double, scaley as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22127
    - 182.1.9 CombineTiff8BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22127
    - 182.1.6 CombineTiffCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer 22122
    - 182.1.7 CombineTiffCMYKtoRGBMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer 22124
    - 182.1.2 TIFFStringToPictureMBS(data as string) as picture 22121
    - 182.1.3 TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS 22121

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- 138 **Pictures Import and Export** 19301
  - **??** Globals **??**
    - 138.1.1 BitRotateMBS(Degree as Integer, InputData as Ptr, OutputData as Ptr, Width as Integer, Height as Integer, InputRowBytes as Integer = -1, OutputRowBytes as Integer = -1) as boolean 19301
    - 138.1.2 BMPStringtoPictureMBS(data as string) as picture 19302
    - 138.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer 19303
    - 138.1.4 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer 19304

- 182 **TIFF** 22119
  - **??** Globals **??**
    - 182.1.5 CombineBitCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, CacheSizeRead as Integer) as Integer 22122
    - 182.1.1 CombineBitCMYKtoRGBMBS(CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, byref output as picture, CacheSizeRead as Integer) as Integer 22119
    - 182.1.4 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22121
    - 182.1.8 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, TiffData as TiffPictureMBS, scalex as Double, scaley as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22127
    - 182.1.9 CombineTiff8BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer 22127
    - 182.1.6 CombineTiffCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer 22122
    - 182.1.7 CombineTiffCMYKtoRGBMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer 22124
    - 182.1.2 TIFFStringToPictureMBS(data as string) as picture 22121
    - 182.1.3 TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS 22121
  - 182.2.1 class TiffPictureMBS 22127
    - 182.2.3 AddCustomTag(Tag as Integer, FieldReadCount as Integer, FieldWriteCount as Integer, FieldType as Integer, FieldBit as Integer, OkToChange as Integer, PassCount as Integer, FieldName as string) as boolean 22129
    - 182.2.4 AddImage as boolean 22130
    - 182.2.5 close 22130
    - 182.2.6 CombinePictureWithMask as picture 22131
    - 182.2.7 Create(file as folderitem) as boolean 22131
    - 182.2.8 Create(file as folderitem, endian as Integer) as boolean 22132
    - 182.2.9 Create(Path as String, endian as integer = 0) as boolean 22132
    - 182.2.10 CreateString(Size as Integer) as boolean 22133
    - 182.2.11 CreateString(Size as Integer, Mode as string) as boolean 22134
    - 182.2.12 Flush as boolean 22134

* 182.2.13 FlushData as boolean 22135
* 182.2.14 GetColorMap(byref red as memoryblock, byref green as memoryblock, byref blue as memoryblock) as boolean 22135
* 182.2.15 GetColorProfile as string 22135
* 182.2.16 GetData(Tag as Integer) as string 22136
* 182.2.17 GetField(Tag as Integer, mem as memoryblock) as boolean 22136
* 182.2.18 GetFieldByte(Tag as Integer, byref value as Integer) as boolean 22136
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- 124 **MemoryBlock** 17567
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- 129 **Network** 17937
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- 126 **Mobile Ads** 17737
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– 126.18.1 class UMPRequestParametersMBS 17798

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- 188 **User Notifications** 22459
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* 73.4.30 ModuleDecrease(Module as Integer) as Integer 12409
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- 188 **User Notifications** 22459
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- 188.9.9 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) 22498
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* 88.3.41 MemoryblockBGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14086
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- 83 **Files** 13559
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- 74 **Drag & Drop** 12423
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- 129 **Network** 17937
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- 194 **Windows** 23079
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    - 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
    - 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
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    - 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
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    - 194.16.15 FileOperationDelete(file as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23198
    - 194.16.16 FileOperationDelete(filepathes as string, Flags as Integer, ProgressTitle as string="") as boolean 23199
    - 194.16.17 FileOperationDelete(filepathes() as string, Flags as Integer, ProgressTitle as string="") as boolean 23199
    - 194.16.18 FileOperationDelete(files() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
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    - 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
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    - 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205

* 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
* 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
* 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208
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* 194.16.28 MoveFileSimple(ExistingFileName as String, NewFileName as String) as boolean 23210
* 194.16.29 MoveFileWithProgress(ExistingFileName as folderitem, NewFileName as folderitem, Flags as Integer) as boolean 23211
* 194.16.30 MoveFileWithProgress(ExistingFileName as String, NewFileName as String, Flags as Integer) as boolean 23212
* 194.16.32 Lasterror as Integer 23213
* 194.16.33 MultiThreaded as Boolean 23213
* 194.16.34 OperationsAborted as Boolean 23214
* 194.16.35 Parent as Variant 23214
* 194.16.37 Progress(TotalFileSize as int64, TotalBytesTransferred as int64, StreamSize as int64, StreamBytesTransferred as Int64, StreamNumber as Integer, Reason as Integer) as Integer 23214

- 74 **Drag & Drop** 12423
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- 194 **Windows** 23079
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* 194.19.21 FileSubtype as Integer 23232
* 194.19.22 FileType as Integer 23233
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- 84 **Folder Change Watching** 13835
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    - 129.63.7 GetDefaultProxyConfiguration as WinHTTPClientProxyInfoMBS 18205
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- 208 **WindowsML** 23695
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# Chapter 7

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- SparkleMBS **??**
- SparkleMBS **??**

# Chapter 8

# Accessibility

## 8.1 module AccessibilityMBS

### 8.1.1 module AccessibilityMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A class to handle all the global stuff of the Accessibility API.
**Notes:** This class has a lot of CFStringMBS functions to return you constants. Please check Apple's documentation about those constants.
If you miss a function or a constant, please email.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr7
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MBS Real Studio Plugins, version 13.0pr9
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr6

### 8.1.2 Methods

### 8.1.3 ApplicationAXUIElement(pid as Integer) as AXUIElementMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The AXUIElement for the current application.

### 8.1.4 Available as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the Accessibility API is available.
**Notes:** Should always be true on Mac OS X 10.2.

### 8.1.5 AXAPIEnabled as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the user permitts Accessibility services.

### 8.1.6 IsProcessTrusted(Prompt as Boolean = false) as boolean

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the current process is a trusted accessibility client.
**Notes:** Added prompt flag for version 18.1.

### 8.1.7 kAXAllowedValuesAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.8 kAXAMPMFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.9 kAXApplicationActivatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.10 kAXApplicationDeactivatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.11 kAXApplicationDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.12 kAXApplicationHiddenNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.13 kAXApplicationRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.14 kAXApplicationShownNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.15 kAXAscendingSortDirectionValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.16 kAXAttributedStringForRangeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.17 kAXBoundsForRangeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.18 kAXBrowserRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.19 kAXBusyIndicatorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.20 kAXButtonRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.21 kAXCancelAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.22 kAXCancelButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.23 kAXCellForColumnAndRowParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.24 kAXCellRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.25 kAXCheckBoxRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.26 kAXChildrenAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.27 kAXClearButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.28 kAXCloseButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.29 kAXCloseButtonSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.30 kAXColorWellRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.31 kAXColumnCountAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.32 kAXColumnHeaderUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.33 kAXColumnIndexRangeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.34 kAXColumnRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.35 kAXColumnsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.36 kAXColumnTitleAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.37 kAXColumnTitlesAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.38 kAXComboBoxRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.39 kAXConfirmAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.40 kAXContentListSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.41 kAXContentsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.42 kAXCreatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.43 kAXCriticalValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.44 kAXDateFieldRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.45 kAXDayFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.46 kAXDecrementAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.47 kAXDecrementArrowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.48 kAXDecrementButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.49 kAXDecrementPageSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.50 kAXDefaultButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.51 kAXDefinitionListSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.52 kAXDescendingSortDirectionValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.53 kAXDescription as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.54 kAXDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.55 kAXDialogSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.56 kAXDisclosedByRowAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.57 kAXDisclosedRowsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.58 kAXDisclosingAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.59 kAXDisclosureLevelAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.60 kAXDisclosureTriangleRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.61 kAXDockExtraDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.62 kAXDockItemRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.63 kAXDocumentAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.64 kAXDocumentDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.65 kAXDrawerCreatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.66 kAXDrawerRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.67 kAXEditedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.68 kAXEnabledAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.69 kAXExpandedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.70 kAXFilenameAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.71 kAXFloatingWindowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.72 kAXFocusedApplicationAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.73 kAXFocusedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.74 kAXFocusedUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.75 kAXFocusedUIElementChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.76 kAXFocusedWindowAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.77 kAXFocusedWindowChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.78 kAXFolderDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.79 kAXFrontmostAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.80 kAXGridRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.81 kAXGroupRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.82 kAXGrowAreaAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.83 kAXGrowAreaRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.84 kAXHandleRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.85 kAXHandlesAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.86 kAXHeaderAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.87 kAXHelpAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.88 kAXHelpTagCreatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.89 kAXHelpTagRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.90 kAXHiddenAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.91 kAXHorizontalOrientationValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.92 kAXHorizontalScrollBarAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.93 kAXHorizontalUnitDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.94 kAXHorizontalUnitsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.95 kAXHourFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.96 kAXImageRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.97 kAXIncrementAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.98 kAXIncrementArrowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.99 kAXIncrementButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.100 kAXIncrementorAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.101 kAXIncrementorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.102 kAXIncrementPageSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.103 kAXIndexAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.104 kAXInsertionPointLineNumberAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.105 kAXIsApplicationRunningAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.106 kAXIsEditableAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.107 kAXLabelUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.108 kAXLabelValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.109 kAXLayoutAreaRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.110 kAXLayoutItemRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.111 kAXLayoutPointForScreenPointParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.112 kAXLayoutSizeForScreenSizeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.113 kAXLevelIndicatorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.114 kAXLineForIndexParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.115 kAXLinkedUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.116 kAXListRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.117 kAXMainAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.118 kAXMainWindowAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.119 kAXMainWindowChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.120 kAXMarkerTypeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.121 kAXMarkerTypeDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.122 kAXMarkerUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.123 kAXMatteContentUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.124 kAXMatteHoleAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.125 kAXMatteRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.126 kAXMaxValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.127 kAXMenuBarAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.128 kAXMenuBarItemRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.129 kAXMenuBarRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.130 kAXMenuButtonRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.131 kAXMenuClosedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.132 kAXMenuItemCmdCharAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.133 kAXMenuItemCmdGlyphAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.134 kAXMenuItemCmdModifiersAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.135 kAXMenuItemCmdVirtualKeyAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.136 kAXMenuItemMarkCharAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.137 kAXMenuItemPrimaryUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.138 kAXMenuItemRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.139 kAXMenuItemSelectedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.140 kAXMenuOpenedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.141 kAXMenuRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.142 kAXMinimizeButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.143 kAXMinimizeButtonSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.144 kAXMinimizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.145 kAXMinimizedWindowDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.146 kAXMinuteFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.147 kAXMinValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.148 kAXModalAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.149 kAXMonthFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.150 kAXMovedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.151 kAXNextContentsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.152 kAXNumberOfCharactersAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.153 kAXOrderedByRowAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.154 kAXOrientationAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.155 kAXOutlineRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.156 kAXOutlineRowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.157 kAXOverflowButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.158 kAXParentAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.159 kAXPickAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.160 kAXPlaceholderValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.161 kAXPopUpButtonRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.162 kAXPositionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.163 kAXPressAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.164 kAXPreviousContentsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.165 kAXProcessSwitcherListSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.166 kAXProgressIndicatorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.167 kAXProxyAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.168 kAXRadioButtonRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.169 kAXRadioGroupRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.170 kAXRaiseAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.171 kAXRangeForIndexParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.172 kAXRangeForLineParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.173 kAXRangeForPositionParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.174 kAXRatingIndicatorSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.175 kAXRelevanceIndicatorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.176 kAXResizedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.177 kAXRoleAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.178 kAXRoleDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.179 kAXRowCollapsedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the outline notification constants.

### 8.1.180 kAXRowCountAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.181 kAXRowCountChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.182 kAXRowExpandedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the outline notification constants.

### 8.1.183 kAXRowHeaderUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.184 kAXRowIndexRangeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.185 kAXRowRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.186 kAXRowsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.187 kAXRTFForRangeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.188 kAXRulerMarkerRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.189 kAXRulerRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.190 kAXScreenPointForLayoutPointParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.191 kAXScreenSizeForLayoutSizeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.192 kAXScrollAreaRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.193 kAXScrollBarRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.194 kAXSearchButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.195 kAXSearchFieldSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.196 kAXSecondFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.197 kAXSecureTextFieldSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.198 kAXSelectedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.199 kAXSelectedCellsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.200 kAXSelectedCellsChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the cell-based table notification constants.

### 8.1.201 kAXSelectedChildrenAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.202 kAXSelectedChildrenChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.203 kAXSelectedChildrenMovedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layout area notification constants.

### 8.1.204 kAXSelectedColumnsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.205 kAXSelectedColumnsChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.206 kAXSelectedRowsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.207 kAXSelectedRowsChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.208 kAXSelectedTextAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.209 kAXSelectedTextChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.210 kAXSelectedTextRangeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.211 kAXSelectedTextRangesAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.212 kAXServesAsTitleForUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.213 kAXSharedCharacterRangeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.214 kAXSharedTextUIElementsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.215 kAXSheetCreatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.216 kAXSheetRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.217 kAXShowMenuAction as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the action names used for the AXUIElement class.

### 8.1.218 kAXShownMenuUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.219 kAXSizeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.220 kAXSliderRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.221 kAXSortButtonSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.222 kAXSortDirectionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.223 kAXSplitGroupRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.224 kAXSplitterRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.225 kAXSplittersAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.226 kAXStandardWindowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.227 kAXStaticTextRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.228 kAXStringForRangeParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.229 kAXStyleRangeForIndexParameterizedAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.230 kAXSubroleAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.231 kAXSystemDialogSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.232 kAXSystemFloatingWindowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.233 kAXSystemWideRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.234 kAXTabGroupRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.235 kAXTableRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.236 kAXTableRowSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.237 kAXTabsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.238 kAXTextAreaRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.239 kAXTextAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.240 kAXTextFieldRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.241 kAXTimeFieldRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.242 kAXTimelineSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.243 kAXTitleAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.244 kAXTitleChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants.

### 8.1.245 kAXTitleUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.246 kAXToolbarButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.247 kAXToolbarButtonSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.248 kAXToolbarRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.249 kAXTopLevelUIElementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.250 kAXTrashDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.251 kAXUIElementDestroyedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.252 kAXUIElementMBSTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the TypeID of the AXUIElement class.

### 8.1.253 kAXUnitDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.254 kAXUnitsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.255 kAXUnitsChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layout area notification constants.

### 8.1.256 kAXUnknownOrientationValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.257 kAXUnknownRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.258 kAXUnknownSortDirectionValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.259 kAXUnknownSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.260 kAXURLAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.261 kAXURLDockItemSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.262 kAXValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.263 kAXValueChangedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.264 kAXValueDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.265 kAXValueIncrementAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.266 kAXValueIndicatorRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.267 kAXValueWrapsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.268 kAXVerticalOrientationValue as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A constant used for the AXUIElement class.

### 8.1.269 kAXVerticalScrollBarAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.270 kAXVerticalUnitDescriptionAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.271 kAXVerticalUnitsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.272 kAXVisibleCellsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.273 kAXVisibleCharacterRangeAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.274 kAXVisibleChildrenAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.275 kAXVisibleColumnsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.276 kAXVisibleRowsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.277 kAXVisibleTextAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.278 kAXWarningValueAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.

### 8.1.279 kAXWindowAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.280 kAXWindowCreatedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.281 kAXWindowDeminiaturizedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.282 kAXWindowMiniaturizedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.283 kAXWindowMovedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.284 kAXWindowResizedNotification as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used for the axobserver class.

### 8.1.285 kAXWindowRole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.286 kAXWindowsAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.287 kAXYearFieldAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute constants.
**Notes:** Convenience attribute that yields the year field of a date field element.

### 8.1.288 kAXZoomButtonAttribute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the attribute names used for the AXUIElement class.

### 8.1.289 kAXZoomButtonSubrole as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the role names used for the AXUIElement class.

### 8.1.290 MakeAXValue(theCFObject as CFObjectMBS) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an AXValue object containing the CFObject.
**Notes:** Actually only the RB object around the cfobject handle is replaced.
You can't do this using a cast in RB, so this function was created.

### 8.1.291 MakeAXValueFromCFRange(location as Integer, length as Integer) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates an AXValue object for a CFRange structure with the given values.
**Example:**

```
// create with values and read them back
dim a as AXValueMBS = AccessibilityMBS.MakeAXValueFromCFRange(5, 9)

if a.AXIsCFRange then
dim lo, le as Integer

if a.AXGetCFRange(lo, le) then
```

```
MsgBox str(lo)+" "+str(le)
else
break // error
end if
else
break // error
end if
```

### 8.1.292 MakeAXValueFromCGPoint(x as single, y as single) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an AXValue object for a CGPoint structure with the given values.

### 8.1.293 MakeAXValueFromCGRect(x as single, y as single, width as single, height as single) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an AXValue object for a CGRect structure with the given values.

### 8.1.294 MakeAXValueFromCGSize(width as single, height as single) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an AXValue object for a CGSize structure with the given values.

### 8.1.295 MakeProcessTrusted(path as string) as Integer

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Attempts to make the process represented by the specified path a trusted accessibility client.
**Notes:** Use this function to make a process a trusted accessibility client.
Note: The caller must be running as root to successfully call this function. In addition, the caller should relaunch the process after this function returns successfully for the trusted status to take effect.

Path: The path to the executable of the process to make trusted.

Returns an error code that indicates success or failure.

### 8.1.296 SystemWideAXUIElement as AXUIElementMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a AXUIElement which covers the whole system.
**Example:**

```
// displays the current window title if accessibility is enabled in Mac OS X 10.2 or newer
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

// show a window so there is one which can be found
window1.show

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
msgbox cs.str
end if
end if
end if
end if
```

**Notes:** In the current implementation you can use this to get the AXUIElement for the frontmost application.

### 8.1.297 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAXErrorActionUnsupported | -25206 | One of the error values used for the lasterror property. |
| kAXErrorAPIDisabled | -25211 | One of the error values used for the lasterror property. |
| kAXErrorAttributeUnsupported | -25205 | One of the error values used for the lasterror property. |
| kAXErrorCannotComplete | -25204 | One of the error values used for the lasterror property. |
| kAXErrorFailure | -25200 | One of the error values used for the lasterror property. |
| kAXErrorIllegalArgument | -25201 | One of the error values used for the lasterror property. |
| kAXErrorInvalidUIElement | -25202 | One of the error values used for the lasterror property. |
| kAXErrorInvalidUIElementObserver | -25203 | One of the error values used for the lasterror property. |
| kAXErrorNotEnoughPrecision | -25214 | One of the error values used for the lasterror property. |
| kAXErrorNotificationAlreadyRegistered | -25209 | One of the error values used for the lasterror property. |
| kAXErrorNotificationNotRegistered | -25210 | One of the error values used for the lasterror property. |
| kAXErrorNotificationUnsupported | -25207 | One of the error values used for the lasterror property. |
| kAXErrorNotImplemented | -25208 | One of the error values used for the lasterror property. |
| kAXErrorNoValue | -25212 | One of the error values used for the lasterror property. |
| kAXErrorParameterizedAttributeUnsupported | -25213 | One of the error values used for the lasterror property. |
| kAXErrorSuccess | 0 | One of the error values used for the lasterror property. |

## 8.2 class AXObserverMBS

### 8.2.1 class AXObserverMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A class to observes notifications sent by the Accessibility services.
**Notes:** This class requires Mac OS X 10.2 to work.
Subclass of the CFObjectMBS class.

### 8.2.2 Methods

### 8.2.3 AddNotification(element as AXUIElementMBS, notification as CFStringMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a notification to the observer.
**Notes:** Returns an error code. (0 for no error and -1 if the function is not available)

### 8.2.4 Create(pid as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new observer for the given process.
**Notes:** You need a valid process ID to observe the target application. The ProcessMBS class can help you.

### 8.2.5 RemoveNotification(element as AXUIElementMBS, notification as CFStringMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes a notification from the observer.
**Notes:** Returns an error code. (0 for no error and -1 if the function is not available)

### 8.2.6 Events

### 8.2.7 Action(element as AXUIElementMBS, notification as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called whenever an action occurs.

## 8.3 class AXUIElementMBS

### 8.3.1 class AXUIElementMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** This class represents an element of the User Interface of an application.
**Example:**

```
// displays the current window title if accessibility is enabled in Mac OS X 10.2 or newer

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
msgbox cs.str
end if
end if
end if
end if
```

**Notes:** e.g. a window, a menuitem or a button.
This class requires Mac OS X 10.2 to work.
Subclass of the CFObjectMBS class.

### 8.3.2 Methods

### 8.3.3 ActionDescription(action as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the description of the action with the given name.
**Notes:** Returns nil on any error.

### 8.3.4 ActionNames as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** An CF array with all the possible action names.
**Notes:** Returns nil on any error.

### 8.3.5 AttributeNames as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a CF array with all the possible attribute names.

### 8.3.6 AttributeValue(attribute as CFStringMBS) as AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value of an attribute.

### 8.3.7 AttributeValues(attribute as CFStringMBS, minindex as Integer, maxindex as Integer) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the values of an attribute as a CF array.

### 8.3.8 ElementAtPosition(x as single, y as single) as AXUIElementMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the element which is on the given position.
**Notes:** e.g. on a window.

### 8.3.9 GetAttributeValueCount(attribute as CFStringMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Counts how much attributes of the given name exists.

### 8.3.10 IsAttributeSettable(attribute as CFStringMBS) as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the attribute with the given name is setable.
**Notes:** Returns false on any error.

### 8.3.11 PerformAction(action as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Performs a named action.

### 8.3.12 PostKeyboardEvent(keyChar as Integer, virtualKey as Integer, keydown as boolean)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Posts a keyboard event.
**Example:**

```
// For example, to produce a 'Z',
// the SHIFT key must be down,
// the 'z' key must go down,
// and then the SHIFT and 'z' key must be released:

dim a as AXUIElementMBS
// get the element
```

```
a.PostKeyboardEvent( 0, 56, true ) // shift down
a.PostKeyboardEvent( asc("Z"), 6, true ) // 'z' down
a.PostKeyboardEvent( asc("Z"), 6, false ) // 'z' up
a.PostKeyboardEvent( 0, 56, false ) // shift up
```

**Notes:** You can only pass the root or application uielement.
The KeyCodesMBS class may help you to find the correct codes.

Synthesize keyboard events. Based on the values entered, the appropriate key down, key up, and flags changed events are generated.
If keyChar is NUL (0), an appropriate value will be guessed at, based on the default keymapping.

All keystrokes needed to generate a character must be entered, including SHIFT, CONTROL, OPTION, and COMMAND keys.

To find the virtual keys, well check the RB documentation for the keyboard class.

### 8.3.13 ProcessID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The Process ID of an application.
**Notes:** The unix PID.

### 8.3.14 SetAttributeValue(attribute as CFStringMBS, value as CFObjectMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the value of an attribute.
**Notes:** Changed type of value to CFObject in plugin version 6.3. Before it was an AXValue.

## 8.4 class AXValueMBS

### 8.4.1 class AXValueMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** An AXValue is a CFObject but some extra data types are allowed.
**Notes:** Every AXValue is a CFObject. In case the CFObject contains unknown data or just binary data it can be a AXValue object.
This class requires Mac OS X 10.2 to work.
Subclass of the CFObjectMBS class.

### 8.4.2 Methods

### 8.4.3 AXGetCFRange(byref location as Integer, byref length as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the values of a CFRange in case the AXValue holds a CFRange.
**Notes:** Returns true if it's a CFRange.

### 8.4.4 AXGetCGPoint(byref x as single, byref y as single) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the values of the CGPoint structure inside the AXValue.
**Notes:** Returns true if successfull.

### 8.4.5 AXGetCGRect(byref x as single, byref y as single, byref width as single, byref height as single) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the values of the CGRect inside the AXValue in case there is one.
**Notes:** Returns true if successfull.

### 8.4.6 AXGetCGSize(byref width as single, byref height as single) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the values of the CGSize structure inside the AXValue in case there is one.
**Notes:** Returns true if successfull.

### 8.4.7 Properties

### 8.4.8 AXIsCFRange as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the AXValue contains a CFRange structure.
**Notes:** (Read only property)

### 8.4.9 AXIsCGPoint as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the AXValue contains a CGPoint structure.
**Notes:** (Read only property)

### 8.4.10 AXIsCGRect as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the AXValue contains a CGRect structure.
**Notes:** (Read only property)

### 8.4.11 AXIsCGSize as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the AXValue contains a CGSize structure.
**Notes:** (Read only property)

### 8.4.12 AXTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the Type ID of the AXValue.
**Notes:** Values:

Types from CoreGraphics:
kAXValueCGPointType = 1,
kAXValueCGSizeType = 2,
kAXValueCGRectType = 3,

Types from CFBase:
kAXValueCFRangeType = 4,

Other:
kAXValueIllegalType = 0

In case this function returns 0 the object may be a normal CFObject.
(Read only property)

## 8.5 Globals

### 8.5.1 InstallNSAccessibilityPatchMBS

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Patches crashes with [ NSMenuItem accessibilityIsAttributeSettable: ] .
**Notes:** The plugin adds a method [ NSMenuItem accessibilityIsAttributeSettable: ] if missing to make sure the app doesn't crash when some framework method from Apple calls it.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr6
- Fix for missing accessibilityIsAttributeSettable function

# Chapter 9

# Addressbook

## 9.1 class ABAccountMBS

### 9.1.1 class ABAccountMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContainerMBS class instead. **Function:** The class for an addressbook account.
**Example:**

```
dim a as new ABAddressBookMBS
dim accounts() as ABAccountMBS = a.allAccounts

for each c as ABAccountMBS in accounts
MsgBox c.Name + EndOfLine + c.Identifier + EndOfLine + c.BaseURL
next
```

**Notes:** The ABAccount functions are not documented by Apple, but work well on OS X version 10.8 to 10.10.
They may work in newer versions if Apple does not change them. They may work in past OS X versions if Apple hat the same features there, too.
If the functions are not available in a OS X version, you will see NSExceptionMBS being raised.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr10

### 9.1.2 Methods

### 9.1.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 9.1.4 Properties

### 9.1.5 BaseURL as String

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The base URL for this account.
**Notes:** (Read only property)

### 9.1.6 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 9.1.7 Identifier as String

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The identifier.
**Notes:** (Read only property)

### 9.1.8 isMainAccount as Boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether this account is the main account.
**Notes:** (Read only property)

### 9.1.9 Name as String

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Name of account.
**Example:**

```
dim a as new ABAddressBookMBS
dim accounts() as ABAccountMBS = a.allAccounts

dim c as ABAccountMBS = accounts(0)
MsgBox c.Name
```

**Notes:** (Read only property)

## 9.2 class ABAddressBookMBS

### 9.2.1 class ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactStoreMBS class instead. **Function:** The Addressbook class for Mac OS X 10.2 and newer.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- Saying goodbye to AddressBook framework
- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- Using dash if to reduce app size by referencing less plugins
- Multithreaded plugin functions can increase speed of Real Studio application
- MBS Real Studio Plugins, version 12.3pr15
- Addressbook Permission Dialog
- MBS Real Studio Plugins, version 12.3pr2
- Addressbook classes updated

### 9.2.2 Methods

### 9.2.3 ABAddressBookErrorDomain as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The error domain for Addressbook.

### 9.2.4 ABMultiValueIdentifiersErrorKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the error keys for the addressbook.

### 9.2.5 accountWithIdentifier(Identifier as string) as ABAccountMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Finds account with matching identifier.

### 9.2.6 addRecord(record as ABRecordMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds a record (ABPersonMBS or ABGroup) to the AddressBook Database
**Example:**

```
dim a as new ABAddressBookMBS
dim p as new ABPersonMBS

if not p.setValue("Miller",a.kABLastNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABLastNameProperty)
end if

if not p.setValue("Ben",a.kABFirstNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABFirstNameProperty)
end if

if a.addRecord(p) then
MsgBox "Record added"
else
MsgBox "Failed to add record"
end if

if a.save then
MsgBox "Changes saved"
else
MsgBox "Failed to save changes"
end if
```

**Notes:** Returns true if the addition was successful
See also:


- 9.2.7 addRecord(record as ABRecordMBS, Account as ABAccountMBS, byref error as NSErrorMBS) as boolean 2634
- 9.2.8 addRecord(record as ABRecordMBS, byref error as NSErrorMBS) as boolean 2634

### 9.2.7 addRecord(record as ABRecordMBS, Account as ABAccountMBS, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds a record (ABPersonMBS or ABGroup) to the AddressBook Database with given account.
**Notes:** Returns true if the addition was successful.
On Mac OS X 10.7 the error parameter is set to describe the error.
See also:

- 9.2.6 addRecord(record as ABRecordMBS) as boolean 2633
- 9.2.8 addRecord(record as ABRecordMBS, byref error as NSErrorMBS) as boolean 2634

### 9.2.8 addRecord(record as ABRecordMBS, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a record (ABPersonMBS or ABGroup) to the AddressBook Database.
**Notes:** Returns true if the addition was successful.
On Mac OS X 10.7 the error parameter is set to describe the error.
See also:

- 9.2.6 addRecord(record as ABRecordMBS) as boolean 2633
- 9.2.7 addRecord(record as ABRecordMBS, Account as ABAccountMBS, byref error as NSErrorMBS) as boolean 2634

### 9.2.9 addressBook as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new instance of ABAddressBook, or nil if the Address Book database can't be initialized.
**Notes:** If you're just making one-off lookups and edits, the sharedAddressBook method is probably more appropriate.
If the user denies your application access to the Address Book database, this method returns nil.

Available in OS X v10.5 and later.
You need to use this method if you want to get an addressbook for ABPersonViewMBS.

### 9.2.10 allAccounts as ABAccountMBS()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of all accounts.
**Example:**

```
dim a as new ABAddressBookMBS
dim accounts() as ABAccountMBS = a.allAccounts
Break // look in debugger
```

### 9.2.11 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 9.2.12 enabledAccounts as ABAccountMBS()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of enabled accounts.
**Example:**

```
dim a as new ABAddressBookMBS
dim accounts() as ABAccountMBS = a.enabledAccounts
Break // look in debugger
```

### 9.2.13 EnableEvent

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Activates the events in this class.
**Notes:** You only need to call this if you use AddHandler command in Xojo to add event handlers. The plugin automatically does that in the constructor, but that is too early for AddHandler. And plugin on enables events if you use them.

### 9.2.14 formattedAddressFromDictionary(address as Dictionary) as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an attributed string containing the formatted address.
**Notes:** The string's attributes match address dictionary keys (kABAddressStreetKey for example).

Each attribute value contains the localized description of the key. (For example, the value of a Canadian kABAddressZIPKey field would be Postal Code)

### 9.2.15 GotSharedAddressbook as boolean

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether some other part of your app queried the shared addressbook already.
**Notes:** sharedAddressbook asks for permissions the first time you call it.
So with this function you can check if some other application part already queried the sharedAddressbook function. If true, a call to sharedAddressbook should return quickly. Either with nil (no permissions) or the addressbook.

### 9.2.16 groupForName(name as string) as ABGroupMBS

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Searches the group with the given name.
**Example:**

```
dim a as new ABAddressBookMBS
dim name as string = "Some Group"
dim g as ABGroupMBS = a.groupForName(name)
MsgBox g.DisplayName+": "+str(g.members.Ubound+1)
```

### 9.2.17 groupForUniqueId(uniqueid as string) as ABGroupMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a ABGroupMBS matching a given unique ID.
**Example:**

```
dim a as new ABAddressBookMBS

// you have some uid
dim groups() as ABGroupMBS = a.groups
dim uid as string = groups(0).valueForProperty(a.kABUIDProperty)

// later you want to find the group
dim g as ABGroupMBS = a.groupForUniqueId(uid)

// shows the name
MsgBox g.valueForProperty(a.kABGroupNameProperty)
```

**Notes:** Returns nil if the record could not be found or matches to a person.
Available in Mac OS X 10.3 or newer.
see also recordForUniqueId.
See also:


- 9.2.18 groupForUniqueId(uniqueid as string, account as ABAccountMBS) as ABGroupMBS 2637


### 9.2.18 groupForUniqueId(uniqueid as string, account as ABAccountMBS) as ABGroupMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Finds a group for given unique ID for given account.
See also:


- 9.2.17 groupForUniqueId(uniqueid as string) as ABGroupMBS 2636


### 9.2.19 groups as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all the groups in the AddressBook database
**Example:**

```
// list all email addresses in one group

Dim book as ABAddressBookMBS
dim groups() as ABGroupMBS
dim person as ABPersonMBS
dim data as ABMultiValueMBS
dim s as string

book=new ABAddressBookMBS

groups=book.groups

for each group as ABGroupMBS in groups
If group.valueForProperty(book.kABGroupNameProperty)= "test" then // or any valid group
dim members() as ABPersonMBS = group.members

for each member as ABPersonMBS in members

data=person.valueForProperty(book.kABEmailProperty)
```

```
if data<>nil then
for k as Integer=data.count-1 downto 0
s=s+data.valueAtIndex(k)+EndOfLine
next
end if
next
end if
Next
msgBox s
```

**Notes:** Returns an empty array in case the DB doesn't contain any groups.
Returns nil on any error.

### 9.2.20 groupsForAccount(account as ABAccountMBS) as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all the groups for this account.
**Example:**

```
dim a as new ABAddressBookMBS
dim c as ABAccountMBS = a.defaultAccount
dim groups() as ABGroupMBS = a.groupsForAccount(c)

Break // look in debugger
```

**Notes:** Returns an empty array in case the DB doesn't contain any body.

### 9.2.21 kABAddressCityKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the address.

### 9.2.22 kABAddressCountryCodeKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The Country Code of an address.
**Notes:** kABAddressCountryCodeKey code must be one of the following:

iso country codes

ae = United Arab Emirates
ar = Argentina
at = Austria
au = Australia
ba = Bosnia and Herzegovina
be = Belgium
bg = Bulgaria
bh = Bahrain
br = Brazil
ca = Canada
ch = Switzerland
cn = China
cs = Czech
de = Germany
dk = Denmark
eg = Egypt
es = Spain
fi = Finland
fr = France
gr = Greece
gl = Greenland
hk = Hong Kong
hr = Croatia
hu = Hungary
ie = Ireland
il = Israel
id = Indonesia
in = India
is = Iceland
it = Italy
ja = Japan
jo = Jordan
kr = South Korea
kw = Kuwait
lb = Lebanon
lu = Luxembourg
mk = Macedonia
mx = Mexico
nl = Netherlands
no = Norway
nz = New Zealand
om = Oman
pl = Poland
pt = Portugal
qa = Qatar

ro = Romania
ru = Russian Federation
sa = Saudi Arabia
se = Sweden
sg = Singapore
si = Slovenia
sk = Slovakia
sy = Syrian Arab Republic
tw = Taiwan
tr = Turkey
ua = Ukraine
uk = United Kingdom
us = United States
ye = Yemen
yu = Serbia and Montenegro
za = South Africa

### 9.2.23 kABAddressCountryKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the address.
**Notes:** kABAddressCountryCodeKey code must be one of the following:
iso country codes

### 9.2.24 kABAddressHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home address.

### 9.2.25 kABAddressProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Street Addresses - kABMultiDictionaryProperty
**Notes:** This property is used for persons only.

### 9.2.26 kABAddressStateKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the address.

### 9.2.27 kABAddressStreetKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the address.

### 9.2.28 kABAddressWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work address.

### 9.2.29 kABAddressZIPKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the address.

### 9.2.30 kABAIMHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home AIM Instant Messaging account.

### 9.2.31 kABAIMInstantProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** AIM Instant Messaging - kABMultiStringProperty
**Notes:** This property is used for persons only.
Deprecated in Mac OS 10.7. You should use kABInstantMessageProperty.

### 9.2.32 kABAIMMobileMeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the multistring value for the kABAIMInstantProperty property.
**Notes:** Available on Mac OS X 10.7 or later.
none

### 9.2.33 kABAIMWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work AIM Instant Messaging account.

### 9.2.34 kABAlternateBirthdayComponentsProperty as string

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Alternate non-Gregorian birth date.

### 9.2.35 kABAnniversaryLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the anniversary date.

### 9.2.36 kABAssistantLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.37 kABBirthdayComponentsProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the property names for the addressbook records.
**Notes:** Available on Mac OS X 10.7 or later.
Birth date - kABDateComponentsProperty

### 9.2.38 kABBirthdayProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Birth date - kABDateProperty
**Notes:** This property is used for persons only.

### 9.2.39 kABBrotherLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.40 kABCalendarURIsProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The calendars associated to a person.
**Notes:** Calendar URIs - kABMultiStringProperty

### 9.2.41 kABChildLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.42 kABCreationDateProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creation Date (when first saved) - kABDateProperty
**Notes:** A property for all records.

### 9.2.43 kABDatabaseChangedExternallyNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The notification name to use with NSNotificationObserverMBS class.
**Notes:** Posted when a process other than the current one has changed the Address Book database.
Depending on the operation performed on the address book, one or more of the following keys may be

included in the user-info dictionary: kABInsertedRecords, kABUpdatedRecords, and kABDeletedRecords. The values for each of the keys are the unique IDs of the records that were inserted, updated, or deleted, respectively. If the values for all the keys are nil, every record has changes. For example, this happens when the Address Book database is restored from a backup copy.

The plugin implements this notification for you and calls the DatabaseChanged event in ABAddressBookMBS class.

### 9.2.44 kABDatabaseChangedNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The notification name to use with NSNotificationObserverMBS class.
**Notes:** Posted when this process has changed the Address Book database.
Depending on the operation performed on the address book, one or more of the following keys may be included in the user-info dictionary: kABInsertedRecords, kABUpdatedRecords, and kABDeletedRecords. The values for each of the keys are the unique IDs of the records that were inserted, updated, or deleted, respectively. If the values for all the keys are nil, every record has changes. For example, this happens when the Address Book database is restored from a backup copy.

The plugin implements this notification for you and calls the DatabaseChanged event in ABAddressBookMBS class.

### 9.2.45 kABDeletedRecords as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys contained by the user-info dictionary of the notifications posted by the Address Book framework.
**Notes:** Records that have been deleted.

### 9.2.46 kABDepartmentProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Department name - (Person)
**Notes:** This property is used for persons only.

### 9.2.47 kABEmailHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home email address.

### 9.2.48 kABEmailMobileMeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for emails.
**Notes:** Available on Mac OS X 10.7 or later.
MobileMe email

### 9.2.49 kABEmailProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Email(s) - kABMultiStringProperty
**Notes:** This property is used for persons only.

### 9.2.50 kABEmailWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work email address.

### 9.2.51 kABFatherLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.52 kABFirstNamePhoneticProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** First name Phonetic - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.53 kABFirstNameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** First name - kABStringProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as new ABPersonMBS

if not p.setValue("Ben",a.kABFirstNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABFirstNameProperty)
end if
```

**Notes:** This property is used for persons only.

### 9.2.54 kABFriendLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.55 kABGroupNameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Name of the group - kABStringProperty
**Example:**

```
dim theAB as new ABAddressBookMBS
dim result as new ABGroupMBS
dim error as NSErrorMBS
dim b as Boolean=result.SetValue("test",TheAB.kABGroupNameProperty,error)
if not b then
Msgbox("Failed to name group test."+error.description)
else
MsgBox "OK"
end if
```

**Notes:** This property is used for groups only.

### 9.2.56 kABHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A generic label.
**Notes:** All kABXXXXHomeLabel are equivalent to this label.

### 9.2.57 kABHomePageLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Homepage URL label for the kABURLsProperty.

### 9.2.58 kABHomePageProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Home Web page - kABStringProperty
**Notes:** This property is used for persons only.
Deprecated in Mac OS 10.4. You should use kABURLsProperty.

### 9.2.59 kABICQHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home ICQ Instant Messaging account.

### 9.2.60 kABICQInstantProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** ICQ Instant Messaging - kABMultiStringProperty
**Notes:** Deprecated in Mac OS 10.7. You should use kABInstantMessageProperty.
This property is used for persons only.

### 9.2.61 kABICQWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work ICQ Instant Messaging account.

### 9.2.62 kABInsertedRecords as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys contained by the user-info dictionary of the notifications posted by the Address Book framework.
**Notes:** Records that have been inserted.

### 9.2.63 kABInstantMessageProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the addressbook record properties.
**Notes:** Available on Mac OS X 10.7 or later.
Instant Messaging - kABMultiDictionaryProperty

### 9.2.64 kABInstantMessageServiceAIM as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
AIM

### 9.2.65 kABInstantMessageServiceFacebook as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Facebook

### 9.2.66 kABInstantMessageServiceGaduGadu as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.

Gadu-Gadu

### 9.2.67 kABInstantMessageServiceGoogleTalk as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Google Talk

### 9.2.68 kABInstantMessageServiceICQ as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
ICQ

### 9.2.69 kABInstantMessageServiceJabber as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Jabber

### 9.2.70 kABInstantMessageServiceKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the dictionary for an instant message.
**Notes:** Available on Mac OS X 10.7 or later.
Dictionary key for the service type, not guaranteed to be present; possible values follow.

### 9.2.71 kABInstantMessageServiceMSN as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.

MSN

### 9.2.72 kABInstantMessageServiceQQ as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
QQ

### 9.2.73 kABInstantMessageServiceSkype as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Skype

### 9.2.74 kABInstantMessageServiceYahoo as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the kABInstantMessageUsernameKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Yahoo!

### 9.2.75 kABInstantMessageUsernameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the dictionary for an instant message.
**Notes:** Available on Mac OS X 10.7 or later.
Dictionary key for the instant messaging handle/username

### 9.2.76 kABJabberHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home jabber Instant Messaging account.

### 9.2.77 kABJabberInstantProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Jabber Instant Messaging - kABMultiStringProperty
**Notes:** Deprecated in Mac OS 10.7. You should use kABInstantMessageProperty.
This property is used for persons only.

### 9.2.78 kABJabberWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work jabber Instant Messaging account.

### 9.2.79 kABJobTitleProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Job Title - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.80 kABLastNamePhoneticProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Last name Phonetic - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.81 kABLastNameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Last name - kABStringProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as new ABPersonMBS

if not p.setValue("Miller",a.kABLastNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABLastNameProperty)
end if
```

**Notes:** This property is used for persons only.

### 9.2.82 kABMaidenNameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The maiden name of the person - kABStringProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner // get my card
MsgBox p.valueForProperty(a.kABMaidenNameProperty) // show my maiden name
```

**Notes:** This property is used for persons only.

### 9.2.83 kABManagerLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.84 kABMiddleNamePhoneticProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The middle name phonic - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.85 kABMiddleNameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The middle name - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.86 kABMobileMeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the generic labels.
**Notes:** Available on Mac OS X 10.7 or later.
MobileMe - for AIM or email values

### 9.2.87 kABModificationDateProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Last saved date - kABDateProperty
**Notes:** A property for all records.

### 9.2.88 kABMotherLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.89 kABMSNHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home MSN Instant Messaging account.

### 9.2.90 kABMSNInstantProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** MSN Instant Messaging - kABMultiStringProperty
**Notes:** This property is used for persons only.
Deprecated in Mac OS 10.7. You should use kABInstantMessageProperty.

### 9.2.91 kABMSNWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work MSN Instant Messaging account.

### 9.2.92 kABNicknameProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The nick name of the person - kABStringProperty
**Notes:** This property is used for persons only.

### 9.2.93 kABNoteProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Note - kABStringProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner

// read
MsgBox p.valueForProperty(a.kABNoteProperty).StringValue

// write
if p.setValue("Hello World", a.kABNoteProperty) then
if a.save then
MsgBox "Changed."
end if
end if
```

**Notes:** This property is used for persons only.

### 9.2.94 kABOrganizationProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Company name - kABStringProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as new ABPersonMBS

if not p.setValue("My Company",a.kABOrganizationProperty) then
```

```
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABOrganizationProperty)
end if
```

**Notes:** This property is used for persons only.

### 9.2.95 kABOtherDateComponentsProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the properties for a addressbook records.
**Notes:** Available on Mac OS X 10.7 or later.
Dates associated with this person - kABMultiDateComponentsProperty - (Person)

### 9.2.96 kABOtherDatesProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Dates associated with this person - kABMultiDateProperty - (Person)
**Notes:** This property is used for persons only.

### 9.2.97 kABOtherLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A generic label.
**Notes:** Can be used with any multi-value property.

### 9.2.98 kABParentLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.99 kABPartnerLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.100 kABPersonFlags as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Various flags - kABIntegerProperty
**Example:**

```
dim a as new ABAddressBookMBS
dim p as new ABPersonMBS

if not p.setValue("Miller",a.kABLastNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABLastNameProperty)
end if

if not p.setValue("Ben",a.kABFirstNameProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABFirstNameProperty)
end if

if not p.setValue("My Company",a.kABOrganizationProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABOrganizationProperty)
end if

if not p.setValue(a.kABShowAsCompany,a.kABPersonFlags) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABPersonFlags)
end if


if a.addRecord(p) then
MsgBox "Record added"
else
MsgBox "Failed to add record"
end if

if a.save then
MsgBox "Changes saved"
else
MsgBox "Failed to save changes"
end if
```

**Notes:** This property is used for persons only.

### 9.2.101 kABPhoneHomeFAXLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the home fax number.

### 9.2.102 kABPhoneHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the home phone number.

ae = United Arab Emirates
ar = Argentina
at = Austria
au = Australia
ba = Bosnia and Herzegovina
be = Belgium
bg = Bulgaria
bh = Bahrain
br = Brazil
ca = Canada
ch = Switzerland
cn = China
cs = Czech
de = Germany
dk = Denmark
eg = Egypt
es = Spain
fi = Finland
fr = France
gr = Greece
gl = Greenland
hk = Hong Kong
hr = Croatia
hu = Hungary
ie = Ireland
il = Israel
id = Indonesia
in = India
is = Iceland
it = Italy
ja = Japan
jo = Jordan
kr = South Korea
kw = Kuwait
lb = Lebanon
lu = Luxembourg
mk = Macedonia
mx = Mexico
nl = Netherlands
no = Norway
nz = New Zealand
om = Oman
pl = Poland
pt = Portugal
qa = Qatar
ro = Romania
ru = Russian Federation
sa = Saudi Arabia

### 9.2.103 kABPhoneiPhoneLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the mobile phone number (for iPhone).

### 9.2.104 kABPhoneMainLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the main phone number.

### 9.2.105 kABPhoneMobileLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the mobile phone number.

### 9.2.106 kABPhonePagerLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the pager number.

### 9.2.107 kABPhoneProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Generic phone number - kABMultiStringProperty
**Notes:** This property is used for persons only.

### 9.2.108 kABPhoneWorkFAXLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the work fax number.

### 9.2.109 kABPhoneWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The label for the work phone number.

### 9.2.110 kABRelatedNamesProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** names related to this person - kABMultiStringProperty
**Notes:** This property is used for persons only.

### 9.2.111 kABSisterLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.112 kABSocialProfileProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Social Profiles - kABMultiDictionaryProperty
**Notes:** Available on Mac OS X 10.7 or later.
The multi dictionary contains dictionaries. Each has keys like kABSocialProfileURLKey, kABSocialProfileUsernameKey, kABSocialProfileUserIdentifierKey and kABSocialProfileServiceKey.

kABSocialProfileServiceKey has values like kABSocialProfileServiceTwitter, kABSocialProfileServiceFacebook, kABSocialProfileServiceLinkedIn, kABSocialProfileServiceFlickr and kABSocialProfileServiceMySpace.

### 9.2.113 kABSocialProfileServiceFacebook as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Facebook

### 9.2.114 kABSocialProfileServiceFlickr as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Flickr

### 9.2.115 kABSocialProfileServiceKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for addressbook record values.
**Notes:** Available on Mac OS X 10.7 or later.
The service for this social profile. Can be kABSocialProfileServiceTwitter, kABSocialProfileServiceFacebook, kABSocialProfileServiceLinkedIn, kABSocialProfileServiceFlickr or kABSocialProfileServiceMySpace.

### 9.2.116 kABSocialProfileServiceLinkedIn as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.7 or later.
LinkedIn

### 9.2.117 kABSocialProfileServiceMySpace as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** MySpace
Available on Mac OS X 10.7 or later.

### 9.2.118 kABSocialProfileServiceSinaWeibo as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** SinaWeibo
Available in Mac OS X 10.8 and newer.

### 9.2.119 kABSocialProfileServiceTencentWeibo as string

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.9 or later.
Tencent Weibo

### 9.2.120 kABSocialProfileServiceTwitter as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Twitter

### 9.2.121 kABSocialProfileServiceYelp as string

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for the social profile dictionary's kABSocialProfileServiceKey key.
**Notes:** Available on Mac OS X 10.7 or later.
Yelp

### 9.2.122 kABSocialProfileURLKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for addressbook record values.
**Notes:** Available on Mac OS X 10.7 or later.
Service name. Possible values follow.

### 9.2.123 kABSocialProfileUserIdentifierKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for addressbook record values.
**Notes:** Available on Mac OS X 10.7 or later.
Service-specific identifier.

### 9.2.124 kABSocialProfileUsernameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for addressbook record values.
**Notes:** Available on Mac OS X 10.7 or later.
User-visible profile name.

### 9.2.125 kABSpouseLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the labels for the related names.

### 9.2.126 kABSuffixProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The name suffix - kABStringProperty
**Notes:** e.g. "Sr." "Jr." "III"
This property is used for persons only.

### 9.2.127 kABTitleProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** the title of the person - kABStringProperty
**Notes:** e.g. "Sir" "Duke" "General" "Lord"
This property is used for persons only.

### 9.2.128 kABUIDProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The UID property - kABStringProperty
**Notes:** A property for all records.

### 9.2.129 kABUpdatedRecords as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys contained by the user-info dictionary of the notifications posted by the Address Book framework.
**Notes:** Records that have been updated.

### 9.2.130 kABURLsProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** URLs - kABMultiStringProperty
**Example:**

```
// shows all websites with labels

dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner
dim m as ABMultiValueMBS = p.valueForProperty(a.kABURLsProperty)

dim u as Integer = m.count-1
for i as Integer = 0 to u
dim label as string = m.labelAtIndex(i)
dim value as string = m.valueAtIndex(i)

MsgBox label+" ->"+value
next
```

**Notes:** This property is used for persons only.

### 9.2.131 kABWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A generic label.
**Notes:** All kABXXXXWorkLabel are equivalent to this label

### 9.2.132 kABYahooHomeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the home yahoo Instant Messaging account.

### 9.2.133 kABYahooInstantProperty as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Yahoo Instant Messaging - kABMultiStringProperty
**Notes:** This property is used for persons only.
Deprecated in Mac OS 10.7. You should use kABInstantMessageProperty.

### 9.2.134 kABYahooWorkLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A label for the work yahoo Instant Messaging account.

### 9.2.135 LocalizedPropertyOrLabel(propertyOrLabel as string) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the localized version of built in properties, labels or keys
**Notes:** Returns propertyOrLabel if not found (e.g. if not built in).

### 9.2.136 NewPersonWithVCardRepresentation(data as memoryblock) as ABPersonMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Create a person from a vCard.
**Notes:** Returns nil on failure.
Convenience function which cen be used instead of the ABPersonMBS constructor.

### 9.2.137 people as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all the people in the AddressBook database
**Example:**

```
dim a as new ABAddressBookMBS

// get all people
dim p(-1) as ABPersonMBS = a.people
```

```
// walk over people list
for each m as ABPersonMBS in p
try
// ask for image

dim j as NSImageMBS = m.image

// do something with image
if j<>nil then
Backdrop=j.CopyPictureWithMask
end if

catch x as NSExceptionMBS
// raises exception if there is no image
end try
next
```

**Notes:** Returns an empty array in case the DB doesn't contain any body.
Returns nil on any error.

### 9.2.138 peopleForAccount(account as ABAccountMBS) as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all the people for this account.
**Example:**

```
dim a as new ABAddressBookMBS
dim c as ABAccountMBS = a.defaultAccount
dim people() as ABPersonMBS = a.peopleForAccount(c)

Break // look in debugger
```

**Notes:** Returns an empty array in case the DB doesn't contain any body.

### 9.2.139 peopleForEmail(email as string) as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Searches a contact for the given email.
**Example:**

```
dim a as new ABAddressBookMBS
dim persons() as ABPersonMBS = a.peopleForEmail("support@monkeybreadsoftware.de")

if UBound(persons) >= 0 then
MsgBox persons(0).DisplayName
else
MsgBox "nothing found."
end if
```

### 9.2.140 persistentAccounts as ABAccountMBS()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of all persistent accounts.
**Example:**

```
dim a as new ABAddressBookMBS
dim accounts() as ABAccountMBS = a.persistentAccounts
Break // look in debugger
```

### 9.2.141 personForUniqueId(uniqueid as string) as ABPersonMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a ABPersonMBS matching a given unique ID.
**Example:**

```
dim a as new ABAddressBookMBS

// you have some uid
dim uid as string = a.owner.valueForProperty(a.kABUIDProperty)

// later you want to find the person
dim p as ABPersonMBS = a.personForUniqueId(uid)

// shows the name
MsgBox p.valueForProperty(a.kABFirstNameProperty)
```

**Notes:** Returns nil if the record could not be found or matches to a group.
Available in Mac OS X 10.3 or newer.
see also recordForUniqueId.
See also:

• 16.22.5 personForUniqueId(uniqueid as string, account as ABAccountMBS) as ABPersonMBS 3263

### 9.2.142 personForUniqueId(uniqueid as string, account as ABAccountMBS) as ABPersonMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Finds a person for given unique ID for given account.
See also:

• 9.2.141 personForUniqueId(uniqueid as string) as ABPersonMBS 2667

### 9.2.143 recordClassFromUniqueId(uniqueid as string) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Given a record uniqueId returns the record class name.
**Notes:** Return "ABPersonMBS" or "ABGroup" or "" for a given uniqueid.

### 9.2.144 recordForUniqueId(uniqueid as string) as ABRecordMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a record (ABPersonMBS or ABGroup) matching a given unique ID.
**Example:**

```
dim a as new ABAddressBookMBS

// you have some uid
dim uid as string = a.owner.valueForProperty(a.kABUIDProperty)

// later you want to find the person
dim r as ABRecordMBS = a.recordForUniqueId(uid)
if r isa ABPersonMBS then
dim p as ABPersonMBS = ABPersonMBS(r)

// shows the name
MsgBox p.valueForProperty(a.kABFirstNameProperty)
end if
```

**Notes:** Returns nil if the record could not be found.
Available in Mac OS X 10.3 or newer.
See also:

• 9.2.145 recordForUniqueId(uniqueid as string, account as ABAccountMBS) as ABRecordMBS 2669

### 9.2.145 recordForUniqueId(uniqueid as string, account as ABAccountMBS) as ABRecordMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Finds a record for given unique ID for given account.
See also:

• 9.2.144 recordForUniqueId(uniqueid as string) as ABRecordMBS 2668

### 9.2.146 recordsMatchingSearchElement(search as ABSearchElementMBS) as ABRecordMB

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of records matching the given search element
**Example:**

```
dim ab as new ABAddressBookMBS

// search for people with birthday, by searching for dates starting 1901.
dim searchDate as new date( 1901, 1, 1 )
dim search as ABSearchElementMBS = ab.SearchElementForPersonProperty( ab.kABBirthdayProperty, "",
"", searchDate, ab.kABGreaterThan )

// do the search
dim people() as ABRecordMBS = ab.RecordsMatchingSearchElement( search )


for each person as ABRecordMBS in people
dim p as ABPersonMBS = ABPersonMBS( person )
// now work on them
next
```

**Notes:** Returns an empty array if no matches or an error.

### 9.2.147 removeRecord(record as ABRecordMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes a record (ABPersonMBS or ABGroup) from the AddressBook Database
**Notes:** Returns true if the removal was successful.
See also:

• 9.2.148 removeRecord(record as ABRecordMBS, byref error as NSErrorMBS) as boolean 2670

### 9.2.148 removeRecord(record as ABRecordMBS, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes a record (ABPersonMBS or ABGroup) from the AddressBook Database.
**Notes:** Returns true if the removal was successful.
On Mac OS X 10.7 the error parameter is set to describe the error.
See also:

• 9.2.147 removeRecord(record as ABRecordMBS) as boolean 2669

### 9.2.149 save as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Saves changes made since the last save.
**Notes:** Return true if successful (or there was no change).
See also:

• 9.2.150 save(byref error as NSErrorMBS) as boolean 2670

### 9.2.150 save(byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Saves changes made since the last save.
**Notes:** Return true if successful (or there was no change).
On Mac OS X 10.5 the error object is returned. On Mac OS X 10.4 this error property is nil and you only can use the result.
See also:

• 9.2.149 save as boolean 2670

### 9.2.151 searchElementForConjunction(conjunction as Integer, children() as ABSearchElementMBS) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a search element combining several sub search elements.
**Notes:** Convenience function which can be used instead of ABSearchElementMBS.searchElementForConjunction.

### 9.2.152 searchElementForGroupProperty(PropertyName as string, Label as string, Key as string, value as Variant, comparison as Integer) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a search element that will search groups.
**Notes:** Convenience function to be used instead of the searchElementForProperty method in the ABGroupMBS class.

### 9.2.153 searchElementForPersonProperty(PropertyName as string, Label as string, Key as string, value as Variant, comparison as Integer) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a search element that will search people.
**Example:**

```
// search person by record's unique ID
// this is same as calling recordForUniqueId function directly
dim a as new ABAddressBookMBS
dim e as ABSearchElementMBS

dim PropertyName as string = a.kABUIDProperty
const Label = ""
const Key = ""
const value = "637FA922-7A2B-4F9A-BFA3-023253D4A3D5:ABPerson" // some person ID
const comparison = a.kABEqual

e = ABPersonMBS.searchElementForProperty(PropertyName, label, key, value, comparison)

dim records() as ABRecordMBS = a.recordsMatchingSearchElement(e)

for each r as ABRecordMBS in records
dim p as ABPersonMBS = ABPersonMBS(r)

MsgBox p.DisplayName
next
```

**Notes:** Convenience function to be used instead of the searchElementForProperty method in the ABPersonMBS class.

### 9.2.154 setMe(moi as ABPersonMBS)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets "Me" to moi.
**Notes:** Pass nil to clear "Me".

### 9.2.155 sharedAddressbook as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the shared addressbook object.
**Example:**

```
// quickly find the addressbook, locate me and display my name:
MsgBox ABAddressBookMBS.sharedAddressbook.owner.DisplayName
```

**Notes:** If you call this method several times, the object is cached, so it's only created the first time (singleton).
Returns nil on Windows or Linux or low memory or missing permissions.

### 9.2.156 sharedAddressbookMT as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the shared addressbook object.
**Notes:** On Mac OS X 10.8, the user will be asked to allow access to the addressbook for your application. As the call to sharedAddressbook blocks in this case, this method can be called on a thread to avoid the blocking of your app.

If you call this method several times, the object is cached, so it's only created the first time (singleton).
Returns nil on Windows or Linux or low memory or missing permissions.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 9.2.157 Properties

### 9.2.158 defaultAccount as ABAccountMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries default account.
**Example:**

```
dim a as new ABAddressBookMBS
MsgBox a.defaultAccount.Name
```

**Notes:** (Read only property)

### 9.2.159 defaultCountryCode as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default country code for records without specified codes.
**Notes:** Available in Mac OS X 10.3 or newer.
(Read only property)

### 9.2.160 defaultNameOrdering as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default name ordering defined by the user in the Address Book preferences.
**Notes:** Possible values: kABFirstNameFirst or kABLastNameFirst
Available in Mac OS X 10.3 or newer.
(Read only property)

### 9.2.161 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the used ABAddressbook object.
**Notes:** (Read and Write property)

### 9.2.162 hasUnsavedChanges as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if they are unsaved changes.
**Notes:** The unsaved changes flag is automatically set when changes are made.
(Read only property)

### 9.2.163 owner as ABPersonMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the person that represents the user.
**Notes:** Returns nil if "me" was never set.
(function is not named me as me is a reserved word in Xojo)
(Read only property)

### 9.2.164 Events

### 9.2.165 DatabaseChanged(Externally as boolean, InsertedRecords() as string, UpdatedRecords() as string, DeletedRecords() as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The database has changed.
**Notes:** Externally: true if changes were made by another application.
InsertedRecords: Record UIDs of records changed. (can be empty)
UpdatedRecords: Record UIDs of records updated. (can be empty)
DeletedRecords: Record UIDs of records deleted. (can be empty)

### 9.2.166 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kABArrayProperty | 5 | One of the property type constants.<br>Array object. |
| kABBitsInBitFieldMatch | 11 | One of the search comparison modes.<br>Supported in Mac OS X 10.3 and newer versions. |
| kABContainsSubString | 7 | One of the search comparison modes. |
| kABContainsSubStringCaseInsensitive | 8 | One of the search comparison modes. |
| kABDataProperty | 7 | One of the property type constants.<br>Data object. |
| kABDateComponentsProperty | 8 | One of the property type constants.<br>Available on Mac OS X 10.7 or later.<br>Date component. |
| kABDateProperty | 4 | One of the property type constants.<br>Date. |
| kABDefaultNameOrdering | 0 | One of the flags constants for the integer value stored in the prop<br>sonFlags. |
| kABDictionaryProperty | 6 | One of the property type constants.<br>Dictionary. |
| kABDoesNotContainSubString | 12 | One of the search comparison modes.<br>Supported in Mac OS X 10.4 and newer versions. |
| kABDoesNotContainSubStringCaseInsensitive | 13 | One of the search comparison modes.<br>Supported in Mac OS X 10.4 and newer versions. |
| kABEqual | 0 | One of the search comparison modes. |
| kABEqualCaseInsensitive | 6 | One of the search comparison modes. |
| kABErrorInProperty | 0 | One of the property type constants.<br>Invalid property. |
| kABFirstNameFirst | &h40 | One of the flags constants for the integer value stored in the prop<br>sonFlags. |
| kABGreaterThan | 4 | One of the search comparison modes. |
| kABGreaterThanOrEqual | 5 | One of the search comparison modes. |
| kABIntegerProperty | 2 | One of the property type constants.<br>Integer. |
| kABLastNameFirst | &h20 | One of the flags constants for the integer value stored in the prop<br>sonFlags. |
| kABLessThan | 2 | One of the search comparison modes. |
| kABLessThanOrEqual | 3 | One of the search comparison modes. |
| kABMultiArrayProperty | 261 | One of the property type constants.<br>Multiple arrays. |
| kABMultiDataProperty | 263 | One of the property type constants.<br>Multiple data values. |
| kABMultiDateComponentsProperty | 264 | One of the property type constants.<br>Available on Mac OS X 10.7 or later.<br>Date components. |
| kABMultiDateProperty | 260 | One of the property type constants.<br>Multiple date values. |
| kABMultiDictionaryProperty | 262 | One of the property type constants. |
| kABMultiIntegerProperty | 258 | One of the property type constants.<br>Multiple integer values. |
| kABMultiRealProperty | 259 | One of the property type constants.<br>Multiple floating point values. |
| kABMultiStringProperty | 257 | One of the property type constants.<br>Multiple strings |
| kABMultiValueMask | &h100 | One of the property type constants.<br>This value is combined with other values to define multi value c |
| kABNameOrderingMask | &h70 | One of the flags constants for the integer value stored in the prop<br>sonFlags. |
| kABNotEqual | 1 | One of the search comparison modes. |
| kABNotEqualCaseInsensitive | 14 | One of the search comparison modes.<br>Supported in Mac OS X 10.4 and newer versions. |

Error codes.

| Constant | Value | Description |
|---|---|---|
| ABAddRecordsError | 1001 | |
| ABPropertyReadOnlyError | 1014 | |
| ABPropertyUnsupportedBySourceError | 1013 | |
| ABPropertyValueValidationError | 1012 | |
| ABRemoveRecordsError | 1002 | |

## 9.3 class ABGroupMBS

### 9.3.1 class ABGroupMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNGroupMBS class instead. **Function:** ABGroup is a subclass of ABRecord.
**Example:**

```
dim a as new ABAddressBookMBS
dim g() as ABGroupMBS = a.groups
dim names() as string
for each gg as ABGroupMBS in g
names.append gg.DisplayName
next
MsgBox Join(names,EndOfLine)
```

**Notes:** It represents a group of people or other groups. No recursions allowed.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the ABRecordMBS class.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Real Studio Plugins, version 12.4pr1
- Addressbook classes updated

### 9.3.2 Methods

### 9.3.3 addMember(group as ABPersonMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds person to this group.
**Example:**

```
dim wbook As new ABAddressBookMBS
dim Group as new ABGroupMBS

if not Group.setValue("Test Group", wbook.kABGroupNameProperty) then
MsgBox "Failed to set group name."
```

```
Return
end if

if not wbook.addRecord(Group) then
MsgBox "Failed to add group to database."
return
end if

dim Person as new ABPersonMBS

if not person.setValue("John", wbook.kABFirstNameProperty) then
MsgBox "Failed to set first name."
Return
end if

if not person.setValue("Miller", wbook.kABLastNameProperty) then
MsgBox "Failed to set last name."
Return
end if

if not wbook.addRecord(person) then
MsgBox "Failed to add person to database."
return
end if

if not group.addMember(person) then
MsgBox "Failed to add person to group."
Return
end if

if not wbook.save then
MsgBox "Failed to save addressbook."
return
end if

MsgBox "Created test group with a person."
```

**Notes:** Does nothing if person is already part of this group (returns false)
Returns true if successful.

### 9.3.4 addProperty(propertyName as string, type as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds property to all group records.

**Example:**

```
call ABGroupMBS.addProperty "GroupWeight",1
```

**Notes:** Property name must be unique.
For types see typeOfProperty.
Returns the number of properties successfully added.

### 9.3.5 addSubgroup(group as ABGroupMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Add group to this group.
**Notes:** Does nothing if group is already part of this group (returns false)
Recursions are not allowed (returns false)
Returns true if successful

### 9.3.6 Constructor

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new ABGroup object.
**Notes:** Available in Mac OS X 10.5 or newer.
See also:

- 9.3.7 Constructor(addressBook as ABAddressBookMBS) 2679

### 9.3.7 Constructor(addressBook as ABAddressBookMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new ABGroup object in the given addressbook.
See also:

- 9.3.6 Constructor 2679

### 9.3.8 members as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of ABPersonMBS.
**Notes:** Returns an empty array if this group doesn't contain any people.

Returns an empty array on any error.

### 9.3.9 parentGroups as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of ABGroup this group belongs to.
**Notes:** Returns an empty array if this group doesn't belong to any groups.
Returns an empty array on any error.

### 9.3.10 properties as string()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of property names.
**Notes:** Returns nil on any error.

### 9.3.11 removeMember(group as ABPersonMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes group from this group.
**Notes:** Does nothing if group is not part of this group (returns false)
Returns true if successful.

### 9.3.12 removeProperties(properties() as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes properties from all groups.
**Notes:** Returns the number of properties successfully removed.

### 9.3.13 removeProperty(propertyName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes property from all groups
**Notes:** Returns the number of properties successfully removed.

### 9.3.14 removeSubgroup(group as ABGroupMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes group from this group.
**Notes:** Does nothing if group is not part of this group (returns false).
Returns true if successful.

### 9.3.15 searchElementForProperty(PropertyName as string, Label as string, Key as string, value as Variant, comparison as Integer) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a search element object that searches for records of this type.
**Notes:** property: The name of the property to search on. It cannot be "".
label: The label name for a multivalue list. If property does not have multiple values, pass "". If property does have multiple values, pass "" to search all the values. By default, ABGroup records don't contain any multivalue list properties.
key: The key name for a dictionary. Pass "" if property is not a dictionary. If property is a dictionary, pass "" to search all keys. By default, ABGroup records don't contain any properties that are dictionaries.
value: What you're searching for. If "", the only supported value for comparison is kABEqual or kABNotEqual.
comparison: The type of comparison to perform and is an ABSearchComparison, such as kABEqual or kABPrefixMatchCaseInsensitive.

### 9.3.16 subgroups as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of ABGroup
**Notes:** Returns an empty array if this group doesn't contain any other groups.
Returns an empty array on any error.

### 9.3.17 typeOfProperty(propertyName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of a given property.
**Notes:** Possible values:

const kABMultiValueMask = &h100

const kABErrorInProperty = &h0
const kABStringProperty = &h1
const kABIntegerProperty = &h2
const kABRealProperty = &h3
const kABDateProperty = &h4
const kABArrayProperty = &h5
const kABDictionaryProperty = &h6
const kABDataProperty = &h7
const kABMultiStringProperty = kABMultiValueMask + kABStringProperty
const kABMultiIntegerProperty = kABMultiValueMask + kABIntegerProperty
const kABMultiRealProperty = kABMultiValueMask + kABRealProperty
const kABMultiDateProperty = kABMultiValueMask + kABDateProperty
const kABMultiArrayProperty = kABMultiValueMask + kABArrayProperty
const kABMultiDictionaryProperty = kABMultiValueMask + kABDictionaryProperty
const kABMultiDataProperty = kABMultiValueMask + kABDataProperty

### 9.3.18 Properties

### 9.3.19 distributionIdentifierForProperty(propertyName as string, person as ABPersonMBS) as String

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the distribution identifier for a given property and person.
**Notes:** If not set then returns the property primary identifier.
Returns the distribution identifier or "" if not successful.
(Read and Write computed property)

## 9.4 class ABMultiValueMBS

### 9.4.1 class ABMultiValueMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNLabeledValueMBS class instead. **Function:** Represents values of type ABMultiXXXXXProperty.
**Example:**

```
// shows all websites with labels

dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner
dim m as ABMultiValueMBS = p.valueForProperty(a.kABURLsProperty)

dim u as Integer = m.count-1
for i as Integer = 0 to u
dim label as string = m.labelAtIndex(i)
dim value as string = m.valueAtIndex(i)

MsgBox label+" ->"+value
next
```

**Notes:** All values in an ABMultiValue must be of the same type (kABMultiStringProperty: all values must be strings....)

In case your application needs to store away a reference to a specific value/label pair, use the identifier. Index won't work in this case because any client can add/remove/reorder a multivalue making your index point to the wrong pair. Identifiers are unique Ids.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Xojo Plugins, version 18.2pr8
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- Using dash if to reduce app size by referencing less plugins

- MBS Real Studio Plugins, version 12.3pr2
- MBS Real Studio Plugins, version 11.3fc

**Xojo Developer Magazine**

- 13.2, page 8: News

### 9.4.2 Methods

### 9.4.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 9.4.4 copy as ABMultiValueMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an immutable copy of the data.
**Notes:** Returns nil on any error.

### 9.4.5 edit as ABMutableMultiValueMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a mutable copy of the data.
**Notes:** Returns nil on any error.

### 9.4.6 identifierAtIndex(index as UInt32) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an identifier at a given index
**Notes:** Returns "" on any error.
Index is zero based.

### 9.4.7 identifiers as string()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns list of identifiers.

### 9.4.8 indexForIdentifier(identifier as string) as UInt32

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of a given identifier
**Notes:** Returns NotFound (&h7fffffff) on any error.

### 9.4.9 indexForLabel(label as string) as UInt32

MBS MacCocoa Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of a given label
**Notes:** Returns NotFound (&h7fffffff) on any error.

### 9.4.10 labelAtIndex(index as UInt32) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a label at a given index.
**Example:**

```
// get an entry
dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner

// query all emails
dim e as ABMultiValueMBS = p.valueForProperty(a.kABEmailProperty)

// walk over all
dim u as Integer = e.count-1
for i as Integer = 0 to u
dim label as string = e.labelAtIndex(i)
dim value as string = e.valueAtIndex(i)

// show label and value for this entry
MsgBox str(i)+": "+label+", "+value

// is it home?
if label = a.kABEmailHomeLabel then
MsgBox "Home: "+value
end if
```

next

**Notes:** Returns "" on any error.
Index is zero based.

### 9.4.11 labelForIdentifier(identifier as string) as string

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the label with the given identifier.
**Example:**

```
// same as the following code, but with index bound checking:

dim s as string
dim identifier as string = "fill the identifier here"
dim a as ABMultiValueMBS
// get multivalue somehow

s=a.labelAtIndex(a.indexForIdentifier(identifier))
```

**Notes:** Returns "" if identifier is not found.
A convenience method.

### 9.4.12 labels as string()

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns list of labels.

### 9.4.13 valueAtIndex(index as UInt32) as Variant

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a value at a given index
**Example:**

```
// shows all websites with labels

dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner
```

```
dim m as ABMultiValueMBS = p.valueForProperty(a.kABURLsProperty)

dim u as Integer = m.count-1
for i as Integer = 0 to u
dim label as string = m.labelAtIndex(i)
dim value as string = m.valueAtIndex(i)

MsgBox label+" ->"+value
next
```

**Notes:** Returns nil on any error.
Index is zero based.

### 9.4.14 valueForIdentifier(identifier as string) as Variant

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value with the given identifier.
**Notes:** Returns nil if identifier is not found.
A convenience method.

### 9.4.15 valueForLabel(label as string) as Variant

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value for the value with the given label.
**Example:**

```
dim a as new ABAddressBookMBS
dim p as ABPersonMBS
dim m as ABMultiValueMBS

a=new ABAddressBookMBS
p=a.owner

m=p.valueForProperty(a.kABPhoneProperty)

MsgBox "Work phone: "+m.valueForLabel(a.kABPhoneWorkLabel)
MsgBox "Mobile phone: "+m.valueForLabel(a.kABPhoneMobileLabel)
```

**Notes:** Returns nil if not value exists for the label.
A convenience method.

### 9.4.16 values as Variant()

MBS MacCocoa Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns list of all values.
**Notes:** Returns nil on any error.
Useful to get all email addresses as array.

### 9.4.17 Properties

### 9.4.18 Addressbook as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Reference to parent addressbook.
**Notes:** Plugin sets this for most objects to keep reference to addressbook and avoid this addressbook from being closed too early.
(Read and Write property)

### 9.4.19 Content as Dictionary

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns content of multi value as dictionary.
**Notes:** This is more for inspection in debugger.
The plugin will add key and value for all values.
Values will be twice in the dictionary, once with label and once with identifier as key.
So if two items have same label, one will overwrite other in dictionary.
(Read only property)

### 9.4.20 count as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of value/label pairs.
**Notes:** Returns 0 on any error.
(Read only property)

### 9.4.21 Description as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The description for this multi value.
**Example:**

```
dim a as new ABAddressBookMBS
dim m as new ABMutableMultiValueMBS
call m.insertValue("Hello World", "Owner", 0)
MsgBox m.Description
```

**Notes:** (Read only property)

### 9.4.22 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle of the used ABMultiValue object.
**Notes:** (Read and Write property)

### 9.4.23 primaryIdentifier as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Identifier for the primary value.
**Notes:** Returns "" on any error.
(Read only property)

### 9.4.24 propertyType as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Type of this multivalue (kABMultiXXXXProperty)
**Notes:** Returns kABErrorInProperty if this multi-value is empty or not all values have the same type.

Possible values:

```
const kABMultiValueMask = &h100
const kABErrorInProperty = &h0
const kABStringProperty = &h1
```

const kABIntegerProperty = &h2
const kABRealProperty = &h3
const kABDateProperty = &h4
const kABArrayProperty = &h5
const kABDictionaryProperty = &h6
const kABDataProperty = &h7
const kABMultiStringProperty = kABMultiValueMask + kABStringProperty
const kABMultiIntegerProperty = kABMultiValueMask + kABIntegerProperty
const kABMultiRealProperty = kABMultiValueMask + kABRealProperty
const kABMultiDateProperty = kABMultiValueMask + kABDateProperty
const kABMultiArrayProperty = kABMultiValueMask + kABArrayProperty
const kABMultiDictionaryProperty = kABMultiValueMask + kABDictionaryProperty
const kABMultiDataProperty = kABMultiValueMask + kABDataProperty
(Read only property)

## 9.5 class ABMutableMultiValueMBS

### 9.5.1 class ABMutableMultiValueMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNLabeledValueMBS class instead. **Function:** Mutable variant of ABMultiValueMBS.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the ABMultiValueMBS class.
**Blog Entries**

- Saying goodbye to AddressBook framework

### 9.5.2 Methods

### 9.5.3 addValue(value as Variant, label as string) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds a value with its label.
**Notes:** Returns the identifier if successful, "" otherwise.

Note: No type checking is made when adding a value. But trying to set a multivalue property with a multivalue that doesn't have all its values of the same type will return an error.

Supported types: Date, Integer, String, Dictionary.

### 9.5.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new ABMutableMultiValue object.

### 9.5.5 insertValue(value as Variant, label as string, index as UInt32) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Insert a value/label pair at a given index.
**Notes:** Returns the identifier if successful. "" otherwise

Note: No type checking is made when adding a value. But trying to set a multivalue property with a multivalue that doesn't have all its values of the same type will return an error

Index is zero based.

### 9.5.6 removeValueAndLabelAtIndex(index as UInt32) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes a value/label pair at a given index
**Notes:** Returns true if successful.

Index is zero based.

### 9.5.7 replaceLabelAtIndex(index as UInt32, label as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Replaces a label at a given index.
**Notes:** Index is zero based.
Returns true on success.

### 9.5.8 replaceValueAtIndex(index as UInt32, value as Variant) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Replaces a value at a given index
**Notes:** Index is zero based.
Returns true on success.

### 9.5.9 setPrimaryIdentifier(identifier as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the primary value given its identifier.
**Notes:** Returns true if successful.

## 9.6 control ABPeoplePickerViewControlMBS

### 9.6.1 control ABPeoplePickerViewControlMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactPickerMBS class instead. **Function:** The control to host a people picker view.
**Notes:** Shows people and groups from Addressbook and allows picking them.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr9

**Xojo Developer Magazine**

- 13.2, page 8: News

### 9.6.2 Properties

### 9.6.3 View as ABPeoplePickerViewMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The view used.
**Notes:** Access properties of the view hosted in the control via this variable.
(Read only property)

### 9.6.4 Events

### 9.6.5 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 9.6.6 Close

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to close.

### 9.6.7 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 9.6.8 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 9.6.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 9.6.10 DisplayedPropertyDidChange

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the displayed property in the record list is changed.

### 9.6.11 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event where you can enable menu items.

### 9.6.12 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 9.6.13 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 9.6.14 GroupDoubleClick

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event to be invoked when a group is double-clicked.

### 9.6.15 GroupSelectionDidChange

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the selection in the group list is changed.

### 9.6.16 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 9.6.17 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.

Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 9.6.18 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 9.6.19 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 9.6.20 NameDoubleClick

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event to be invoked when a name is double-clicked.

### 9.6.21 NameSelectionDidChange

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the selection in the name list is changed.

### 9.6.22 Open

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 9.6.23 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 9.6.24 ValueSelectionDidChange

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the selection in a multivalue property is changed.

### 9.6.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 9.7 class ABPeoplePickerViewMBS

### 9.7.1 class ABPeoplePickerViewMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactViewControllerMBS class instead. **Function:** This is a view for Mac applications to select people from the addressbook.
**Notes:** The ABPeoplePickerView class allows you to customize the behavior of people-picker views in an application's user interface.

Use CocoaControlMBS control to put this view on a window.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Real Studio Plugins, version 13.0pr7
- MBS Real Studio Plugins, version 12.3pr10

### 9.7.2 Methods

### 9.7.3 ABPeoplePickerDisplayedPropertyDidChangeNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names.
**Notes:** Use this string with NSNotificationObserverMBS class. Or use the DisplayedPropertyDidChange event.
Posted when the displayed property in the record list is changed.

### 9.7.4 ABPeoplePickerGroupSelectionDidChangeNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names.
**Notes:** Use this string with NSNotificationObserverMBS class. Or use the GroupSelectionDidChange event.
Posted when the selection in the group list is changed.

### 9.7.5 ABPeoplePickerNameSelectionDidChangeNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names.
**Notes:** Use this string with NSNotificationObserverMBS class. Or use the NameSelectionDidChange event. Posted when the selection in the name list is changed.

### 9.7.6 ABPeoplePickerValueSelectionDidChangeNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names.
**Notes:** Use this string with NSNotificationObserverMBS class. Or use the ValueSelectionDidChange event. Posted when the selection in a multivalue property is changed.

### 9.7.7 addProperty(PropertyName as string)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a property to the group of properties whose values are shown in the record list.

### 9.7.8 clearSearchField

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Clears the search field and resets the list of displayed records.

### 9.7.9 Constructor

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
See also:


- 9.7.10 Constructor(Handle as Integer) 2700
- 9.7.11 Constructor(left as Double, top as Double, width as Double, height as Double) 2700

### 9.7.10 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
**Notes:** Pass a handle to a Cocoa ABPeoplePickerView object.
See also:


- 9.7.9 Constructor 2699
- 9.7.11 Constructor(left as Double, top as Double, width as Double, height as Double) 2700


### 9.7.11 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
**Notes:** Pass rectangle for new control.
See also:


- 9.7.9 Constructor 2699
- 9.7.10 Constructor(Handle as Integer) 2700


### 9.7.12 deselectAll

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Deselects all selected groups, records, and values in multivalue properties.

### 9.7.13 deselectGroup(group as ABGroupMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Deselects a group selected in the group list.

### 9.7.14 deselectIdentifier(identifier as string, person as ABPersonMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Deselects a value selected in a multivalue property.
**Notes:** identifier: The identifier of the value that will be deselected.
person: The person whose value will be deselected.

### 9.7.15 deselectRecord(record as ABRecordMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Deselects a record selected in the record list.
**Notes:** record: The record to deselect.

### 9.7.16 editInAddressBook

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Launches Address Book to edit the item selected in the people picker.

### 9.7.17 properties as string()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the properties whose values are shown in the record list.

### 9.7.18 removeProperty(PropertyName as string)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes a property from the group of properties whose values are shown in the record list.

### 9.7.19 selectedGroups as ABGroupMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The groups selected in the group list.
**Notes:** The selected groups are returned as an array of ABGroupMBS objects.
Available in Mac OS X v10.6 and later.

### 9.7.20 selectedIdentifiersForPerson(person as ABPersonMBS) as string()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the identifiers of the selected values in a multivalue property.
**Notes:** person: The person whose identifiers for selected values will be returned.

Returns nil if the property displayed is a single-value property.

### 9.7.21 selectedRecords as ABRecordMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The selection in the records list.
**Notes:** The selection is returned as an array of ABGroupMBS or ABPersonMBS objects.
Available in Mac OS X v10.6 and later.

### 9.7.22 selectedValues as Variant()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all the values selected in the displayed multivalue property.

### 9.7.23 selectGroup(group as ABGroupMBS, byExtendingSelection as boolean)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Selects a group or a set of groups in the group list.
**Notes:** group: The group to be selected, or to be added to the current selection.
byExtendingSelection: True to extend the current selection; otherwise, false.

### 9.7.24 selectIdentifier(identifier as string, person as ABPersonMBS, byExtendingSelection as boolean)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Selects a value or a set of values in a multivalue property.
**Notes:** identifier: The identifier to be selected, or to be added to the current selection.
person: The person that the value to be selected is associated with.
byExtendingSelection: True to extend the current selection; otherwise, false.

### 9.7.25 selectInAddressBook

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Launches Address Book and selects the item selected in the people picker.

### 9.7.26 selectRecord(group as ABRecordMBS, byExtendingSelection as boolean)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Selects a record or a set of records in the record list.
**Notes:** record: The record to be selected, or to be added to the current selection.
byExtendingSelection: True to extend the current selection; otherwise, false.

### 9.7.27 Properties

### 9.7.28 accessoryView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The view that is placed to the left of the search field.
**Notes:** Available in Mac OS X v10.6 and later.
If accessory is nil, the accessory view is removed.
(Read and Write property)

### 9.7.29 allowsGroupSelection as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that specifies whether the user can select entire groups in the group column.
**Notes:** If true, the user can to select entire groups. If false, the user is required to select at least one person in the group.

Available in Mac OS X v10.6 and later.
(Read and Write property)

### 9.7.30 allowsMultipleSelection as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that specifies whether multiple groups, records, or values of multivalue properties can be selected at a time.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 9.7.31 autosaveName as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The name under which the column positions and the filter selection are saved.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 9.7.32 displayedProperty as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The property currently displayed in the record list.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 9.7.33 valueSelectionBehavior as Integer

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The current selection behavior.
**Notes:** The default behavior is ABSingleValueSelection.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 9.7.34 columnTitleForProperty(propertyName as string) as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The title of a custom property.
**Notes:** (Read and Write computed property)

### 9.7.35 Events

### 9.7.36 DisplayedPropertyDidChange

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the displayed property in the record list is changed.

### 9.7.37 GroupDoubleClick

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event to be invoked when a group is double-clicked.

### 9.7.38 GroupSelectionDidChange

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the selection in the group list is changed.

### 9.7.39 NameDoubleClick

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event to be invoked when a name is double-clicked.

### 9.7.40 NameSelectionDidChange

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the selection in the name list is changed.

### 9.7.41 ValueSelectionDidChange

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the selection in a multivalue property is changed.

### 9.7.42 Constants

Constants for the Selection Behavior type.

| Constant | Value | Description |
|---|---|---|
| ABMultipleValueSelection | 2 | The user can select multiple values. |
| ABNoValueSelection | 0 | The user cannot select individual values. |
| ABSingleValueSelection | 1 | The user can select a single value. |

## 9.8 class ABPersonMBS

### 9.8.1 class ABPersonMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactMBS class instead. **Function:** ABPersonMBS is a subclass of ABRecord and represents a person.
**Example:**

```
dim a as new ABAddressBookMBS // get addressbook
dim p as ABPersonMBS = a.owner // and find me

// read note
MsgBox p.valueForProperty(a.kABNoteProperty).StringValue

// write note
if p.setValue("Hello World", a.kABNoteProperty) then
if a.save then
MsgBox "Changed."
end if
end if
```

**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the ABRecordMBS class.
**Blog Entries**

- Saying goodbye to AddressBook framework
- Using dash if to reduce app size by referencing less plugins
- MBS Real Studio Plugins, version 12.4pr1
- Tipp of the day: Jump to anchor in htmlviewer

### 9.8.2 Methods

### 9.8.3 addProperty(propertyName as string, type as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds property to all people records.
**Example:**

```
dim p as ABPersonMBS
// get a person

call p.addProperty "Distance",1
```

**Notes:** Property name must be unique.
For types see typeOfProperty.
Returns the number of properties successfully added.

### 9.8.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new ABPersonMBS object.
See also:


- 9.8.5 Constructor(addressBook as ABAddressBookMBS) 2707
- 9.8.6 Constructor(vCardData as Memoryblock) 2707


### 9.8.5 Constructor(addressBook as ABAddressBookMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new ABPersonMBS object in the given addressbook.
**Notes:** Available in Mac OS X 10.5 or newer.
See also:


- 9.8.4 Constructor 2707
- 9.8.6 Constructor(vCardData as Memoryblock) 2707


### 9.8.6 Constructor(vCardData as Memoryblock)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Create a person from a vCard
**Notes:** Handle is 0 on failure after constructor finished.
(e.g. because of invalid vCard data)

This gives a temporary ABPersonMBS object which is only useful in the same method.
At least we observed problems and crashes when this person is stored in a property of a window and used later.
See also:

- 9.8.4 Constructor 2707
- 9.8.5 Constructor(addressBook as ABAddressBookMBS) 2707


### 9.8.7 EditInAddressbook as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Opens addressbook entry in the addressbook for editing.
**Notes:** Returns true on success and false on failure.

### 9.8.8 linkedPeople as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of all linked people, including this person.
**Notes:** Returns an array of only this person if this person is not linked.
Available in Mac OS X 10.8 and newer.

### 9.8.9 parentGroups as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of ABGroup this group belongs to.
**Notes:** Returns an empty array if this person doesn't belong to any groups.
Returns an empty array on any error.

### 9.8.10 properties as string()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of property names.
**Notes:** Returns an empty array on any error.

### 9.8.11 removeProperties(properties() as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes properties from all people
**Notes:** Returns the number of properties successfully removed.

### 9.8.12 removeProperty(propertyName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes property from all people
**Notes:** Returns the number of properties successfully removed.

### 9.8.13 searchElementForProperty(PropertyName as string, Label as string, Key as string, value as Variant, comparison as Integer) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a search element object that specifies a query for records of this type.
**Notes:** property: The name of the property to search on, such as kABAddressProperty or kABLastNameProperty. This name cannot be "".
label: The label name for a multivalue list, such as kABAddressHomeLabel, kABPhoneWorkLabel, or a user-specified label, such as Summer Home. If the specified property does not have multiple values, pass "". If the specified property does have multiple values, pass "" to search all the values.
key: The key name for a dictionary, such as kABAddressCityKey or kABAddressStreetKey. If the specified property is not a dictionary, pass "". If the specified property is a dictionary, pass nil to search all keys.
value: What you're searching for. If nil, then the only supported value for comparison is kABEqual or kABNotEqual.
comparison: The type of comparison to perform, such as kABEqual or kABPrefixMatchCaseInsensitive.

### 9.8.14 setImageData(data as Memoryblock) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Set the image of a person to data. data should be in an NSImage/QuickTime compatible format.
**Notes:** Pass "" to clear the image.

### 9.8.15 ShowInAddressbook as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Shows addressbook entry in the addressbook.
**Example:**

```
// open addressbook
dim a as new ABAddressBookMBS

// pick a person, in this case me
```

```
dim p as ABPersonMBS = a.owner

// show in AddressBook
call p.ShowInAddressbook
```

**Notes:** Returns true on success and false on failure.

### 9.8.16 typeOfProperty(propertyName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of a given property.
**Notes:** Possible values:

```
const kABMultiValueMask = &h100
const kABErrorInProperty = &h0
const kABStringProperty = &h1
const kABIntegerProperty = &h2
const kABRealProperty = &h3
const kABDateProperty = &h4
const kABArrayProperty = &h5
const kABDictionaryProperty = &h6
const kABDataProperty = &h7
const kABMultiStringProperty = kABMultiValueMask + kABStringProperty
const kABMultiIntegerProperty = kABMultiValueMask + kABIntegerProperty
const kABMultiRealProperty = kABMultiValueMask + kABRealProperty
const kABMultiDateProperty = kABMultiValueMask + kABDateProperty
const kABMultiArrayProperty = kABMultiValueMask + kABArrayProperty
const kABMultiDictionaryProperty = kABMultiValueMask + kABDictionaryProperty
const kABMultiDataProperty = kABMultiValueMask + kABDataProperty
```

### 9.8.17 vCardRepresentation as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the vCard representation of a person
**Notes:** Returns nil on any error.

### 9.8.18 Properties

### 9.8.19 image as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Synchronously returns data containing an image for this person.
**Example:**

```
dim a as new ABAddressBookMBS
dim p as ABPersonMBS = a.owner

Backdrop=p.image.CopyPictureWithMask
```

**Notes:** Only does local file system searches.
Raises an exception if no image exists.

Convenience function which calls imageData and converts data to and from NSImage.
(Read and Write computed property)

### 9.8.20 imageData as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Synchronously returns data containing an image for this person.
**Example:**

```
dim a as new ABAddressBookMBS
dim owner as ABPersonMBS = a.owner
dim s as string = owner.imageData
dim p as Picture

p=JPEGStringToPictureMBS(s) // try jpeg
if p<>Nil then
Title="jpeg"
Backdrop=p
Return
end if

p=TIFFStringToPictureMBS(s) // try tiff
if p<>Nil then
Title="tiff"
Backdrop=p
Return
end if
```

**Notes:** Only does local file system searches. Data will be in an NSImage/QuickTime compatible format. Raises an exception if no image exists.
(Read and Write computed property)

## 9.9 control ABPersonViewControlMBS

### 9.9.1 control ABPersonViewControlMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactViewControllerMBS class instead. **Function:** The control to host a Person view.
**Notes:** Shows people from Addressbook and allows editing.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr9

### 9.9.2 Methods

### 9.9.3 retainObject

MBS MacControls Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop only.

**Function:** Retains the viewer object.
**Notes:** This method is to workaround a bug which your app may see in OS X 10.11.
So to avoid crashes with releasing an view, you can retain it an extra time.

### 9.9.4 Properties

### 9.9.5 View as ABPersonViewMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The view used.
**Notes:** Access properties of the view hosted in the control via this variable.
(Read only property)

### 9.9.6 Events

### 9.9.7 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 9.9.8 Close

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to close.

### 9.9.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 9.9.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 9.9.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 9.9.12 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event where you can enable menu items.

### 9.9.13 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 9.9.14 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 9.9.15 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 9.9.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 9.9.17 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 9.9.18 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 9.9.19 Open

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 9.9.20 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 9.9.21 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 9.10 class ABPersonViewMBS

### 9.10.1 class ABPersonViewMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactViewControllerMBS instead. **Function:** ABPersonViewMBS provides a view for displaying and editing ABPersonMBS objects in your user interface.
**Notes:** Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the ABPersonView class.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Xojo / Real Studio Plugins, version 15.0pr12
- MBS Real Studio Plugins, version 13.0pr7
- Lion features for Real Studio
- Lion arrived

### 9.10.2 Methods

### 9.10.3 available as Boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Example:**

msgbox "ABPersonView available: "+str(ABPersonViewMBS.available)

**Notes:** Returns true on Mac OS X 10.7 or later.

### 9.10.4 Constructor

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
See also:

- 9.10.5 Constructor(Handle as Integer) 2718
- 9.10.6 Constructor(left as Double, top as Double, width as Double, height as Double) 2718


### 9.10.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
**Notes:** Pass a handle to a Cocoa ABPersonView object.
See also:


- 9.10.4 Constructor 2717
- 9.10.6 Constructor(left as Double, top as Double, width as Double, height as Double) 2718


### 9.10.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new people picker view object.
**Notes:** Pass rectangle for new control.
See also:


- 9.10.4 Constructor 2717
- 9.10.5 Constructor(Handle as Integer) 2718


### 9.10.7 Properties

### 9.10.8 editing as Boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether the receiver is in editing mode.
**Notes:** When true, ABPersonView includes additional controls to manipulate person properties.
(Read and Write property)

### 9.10.9 person as ABPersonMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** An ABPersonMBS record for display.
**Notes:** Raises if person originates from ABAddressBook's sharedAddressBook. Use ABAddressBookMBS

constructor.
Person must be exist in an ABAddressBook created and manipulated on the main thread only.
When person is nil, displays an empty selection state.
(Read and Write property)

### 9.10.10 shouldShowLinkedPeople as Boolean

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the view should include information for linked contacts in addition to the set contact.
**Notes:** If true, information is included from linked contacts. If false, only the information on this person is shown.
Available in Mac OS X 10.8 and newer.
(Read and Write property)

## 9.11 class ABPickerMBS

### 9.11.1 class ABPickerMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactPickerMBS class instead. **Function:** A class to control a people picker window.
**Example:**

```
dim p as ABPickerMBS // a global property

p = new ABPickerMBS
p.Create
p.visible = True
```

**Notes:** Requires Mac OS X 10.3 or newer.

This class is for Carbon as event handling does not work on Cocoa.
For Cocoa better use ABPeoplePickerViewMBS.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Xojo Plugins, version 20.5pr9
- MBS Xojo / Real Studio Plugins, version 13.2pr6
- MBS Real Studio Plugins, version 12.3pr10

### 9.11.2 Methods

### 9.11.3 AddProperty(propertyname as String)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a property to the value column.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.4 ClearSearchField

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Clear the search field and reset the list of displayed names.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.5 Create

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new window.
**Example:**

```
dim p as ABPickerMBS // a global property

p = new ABPickerMBS
p.Create

p.visible = True
```

**Notes:** The window is created invisible.
Requires Mac OS X 10.3 or newer.
The handle property is not 0 if this call was successfull.

### 9.11.6 DeselectAll

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Remove selection.

### 9.11.7 DeselectGroup(group as ABGroupMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes selection.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.8 DeselectIdentifier(person as ABPersonMBS, Identifier as String)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes selection.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.9 DeselectPerson(person as ABPersonMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes selection.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.10 EditInAddressBook

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Launch AddressBook and edit the current selection
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.11 InstallEvents(targetwindow as window)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Installs the event handler.
**Notes:** Requires Mac OS X 10.3 or newer.
The target window is only used as an anchor to send and receive events. You can use any window for that.

### 9.11.12 Properties as string()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A list of all the properties shown in the value columns.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.13 RemoveEvents

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the event handler.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.14 RemoveProperty(propertyname as String)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes a property from the value column.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.15 SelectedDictionaries as Dictionary()

MBS MacCocoa Plugin, Plugin Version: 9.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing dictionaries for each item selected in the values column.
**Notes:** Use this method if you select single addresses.
Requires Mac OS X 10.3 or newer.

### 9.11.16 SelectedGroups as ABGroupMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns group column selection as an array of ABGroup object handles.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.17 SelectedIdentifiers(person as ABPersonMBS) as string()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of selected multi-value identifiers.
**Notes:** Requires Mac OS X 10.3 or newer.
Returns empty array if the displayed property is a single value type.

### 9.11.18 SelectedRecords as ABRecordMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns names column selection as an array of ABGroup or ABPersonMBS objects.
**Notes:** Requires Mac OS X 10.3 or newer.
You need to cast the objects from the array to ABGroupMBS or ABPersonMBS to use them better. And IsA can tell you whether an object is from the group or the person class.

### 9.11.19 SelectedStrings as String()

MBS MacCocoa Plugin, Plugin Version: 9.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing strings for each item selected in the values column.
**Notes:** Use this method if you select single strings like a phone number.
Requires Mac OS X 10.3 or newer.

### 9.11.20 SelectedValues as Variant()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing variants for each item selected in the values column.
**Notes:** Use this method if you select single strings like a phone number.
Requires Mac OS X 10.3 or newer.
Changed from string to variant in plugin version 13.2, so you don't need to use SelectedDictionaries.

### 9.11.21 SelectGroup(group as ABGroupMBS, ExtendSelection as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Select group programatically.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.22 SelectIdentifier(person as ABPersonMBS, Identifier as String, ExtendSelection as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Individual values contained within an multi-value property can be selected with this method.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.23 SelectInAddressBook

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Launch AddressBook and select the current selection
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.24 SelectPerson(person as ABPersonMBS, ExtendSelection as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Select person programatically.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.25 Properties

### 9.11.26 AllowGroupSelection as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Allow the user to select entire groups in the group column.
**Notes:** Requires Mac OS X 10.3 or newer.
If false, at least one person in the group will be selected. Defaults to false.
(Read and Write property)

### 9.11.27 AllowMultipleSelection as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Allow the user to select more than one group/record at a time.
**Notes:** Default is true.
Requires Mac OS X 10.3 or newer.
(Read and Write property)

### 9.11.28 AllowMultipleValueSelection as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Allow user to choose multiple values for a person.
**Notes:** Requires Mac OS X 10.3 or newer.
Choose the selection behavior for the value column. If multiple behaviors are selected, the most restrictive behavior will be used. Defaults to SingleValueSelection set.
(Read and Write property)

### 9.11.29 AllowSingleValueSelection as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Allow user to choose a single value for a person.
**Notes:** Requires Mac OS X 10.3 or newer.
Choose the selection behavior for the value column. If multiple behaviors are selected, the most restrictive behavior will be used. Defaults to SingleValueSelection set.
(Read and Write property)

### 9.11.30 Available as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** True if the picker is available.
**Notes:** Returns true on Mac OS X 10.3 or newer.
(Read only property)

### 9.11.31 DisplayedProperty as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Which property is displayed currently.
**Notes:** Returns nil on any error.
(Read and Write property)

### 9.11.32 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The handle of the ABPickerRef used internally.
**Notes:** (Read and Write property)

### 9.11.33 Height as Single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current height of the picker window.
**Notes:** Requires Mac OS X 10.3 or newer.
(Read and Write property)

### 9.11.34 Left as Single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current position of the picker window.
**Notes:** Requires Mac OS X 10.3 or newer.
(Read and Write property)

### 9.11.35 Top as Single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current position of the picker window.
**Notes:** Requires Mac OS X 10.3 or newer.

top=0 is on the bottom of the screen as this is the Cocoa coordinate system.
(Read and Write property)

### 9.11.36 Visible as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the picker window is visible.
**Notes:** The window is created invisible, so you must make it visible to show it to the user.
Requires Mac OS X 10.3 or newer.
(Read and Write property)

### 9.11.37 Width as Single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current width of the picker window.
**Notes:** Requires Mac OS X 10.3 or newer.
(Read and Write property)

### 9.11.38 ColumnTitle(columntitle as String) as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Localized titles for third party properties.
**Notes:** Requires Mac OS X 10.3 or newer.

(Read and Write computed property)

### 9.11.39 Events

### 9.11.40 DisplayedPropertyChanged

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.41 GroupDoubleClicked

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.42 GroupSelectionChanged

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.43 NameDoubleClicked

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.44 NameSelectionChanged

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

### 9.11.45 ValueSelectionChanged

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** One of the events of a People Picker.
**Notes:** Requires Mac OS X 10.3 or newer.

## 9.12 class ABRecordMBS

### 9.12.1 class ABRecordMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactMBS class instead. **Function:** A class to hold an Addressbook Record.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Real Studio Plugins, version 12.3pr2
- MBS Real Studio Plugins, version 11.4pr2

### 9.12.2 Methods

### 9.12.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 9.12.4 removeValueForProperty(propertyName as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Remove the value of a given property.
**Notes:** Subsequent calls to valueForProperty on the same property will return nil.
Returns true if the value was removed successfully and false on any error.

### 9.12.5 setValue(value as Variant, propertyName as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Set the value of a given property. The type of the value must match the property type.
**Example:**

```
dim a as ABAddressBookMBS
dim p as ABPersonMBS
```

```
// get a somehow
// get p somehow

if not p.setValue("My Company",a.kABOrganizationProperty) then
MsgBox "Failed to set field "+a.LocalizedPropertyOrLabel(a.kABOrganizationProperty)
end if
```

**Notes:** Value can be Date, Integer, Double, Dictionary, MultiValueMBS/MutableMultiValueMBS or String.
Returns true if the value was set successfully
See also:

- 9.12.6 setValue(value as Variant, propertyName as string, byref error as NSErrorMBS) as boolean 2731

### 9.12.6 setValue(value as Variant, propertyName as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Set the value of a given property. The type of the value must match the property type.
**Notes:** Value can be Date, Integer, Double, Dictionary, MultiValueMBS/MutableMultiValueMBS or String.
Returns true if the value was set successfully

On Mac OS X 10.7 or later, we set the error property on any error.
See also:

- 9.12.5 setValue(value as Variant, propertyName as string) as boolean 2730

### 9.12.7 valueForProperty(PropertyName as string) as Variant

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value of a given property.
**Example:**

```
dim a as new ABAddressBookMBS // get addressbook
dim p as ABPersonMBS = a.owner // and find me

// read note
MsgBox p.valueForProperty(a.kABNoteProperty).StringValue
```

**Notes:** The type of the value depends on the property type.
Returns nil on any error.

Tip: Put the result in a variant, so you can see the type in the debugger. Emails for example can be a ABMultiValueMBS object while name is normally a string.

### 9.12.8 Properties

### 9.12.9 account as ABAccountMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries account for this record.
**Notes:** (Read only property)

### 9.12.10 Addressbook as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Reference to parent addressbook.
**Notes:** Plugin sets this for most objects to keep reference to addressbook and avoid this addressbook from being closed too early.
(Read and Write property)

### 9.12.11 Description as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The description for this record.
**Example:**

```
dim a as new ABAddressBookMBS
dim m as ABPersonMBS = a.owner
MsgBox m.Description
```

**Notes:** (Read only property)

### 9.12.12 DisplayName as string

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The display name.
**Example:**

```
// quickly find the addressbook, locate me and display my name:
MsgBox ABAddressBookMBS.sharedAddressbook.owner.DisplayName
```

**Notes:** For a group, the group name, for an organization the organization name and for a normal person the first name, last name, prefix/suffix and middle name. Name order depends on the settings for person or addressbook.
(Read only property)

### 9.12.13 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle of the ABGroup or ABPersonMBS object being used.
**Notes:** (Read and Write property)

### 9.12.14 isReadOnly as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether or not the record is read only.
**Notes:** Available on Mac OS X 10.4.
Returns false on older systems or other errors.
(Read only property)

### 9.12.15 uniqueId as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Convenience method to return the unique ID of a record.
**Example:**

```
dim a as new ABAddressBookMBS
dim o as ABPersonMBS = a.owner

// the unique ID for this record including the type
dim u as string = o.uniqueId

// the raw ID as Apple stores it
dim i as string = o.valueForProperty("com.apple.uuid")

// show it
MsgBox u+EndOfLine+i
```

**Notes:** Equivalent to valueForProperty(kABUIDProperty).
(Read only property)

## 9.13 class ABSearchElementMBS

### 9.13.1 class ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CNContactFetchRequestMBS class instead. **Function:** A class for a search element.
**Example:**

```
// search and display all entries with a given name in a 2 column listbox with address

// Save reference to caller.
dim addr as new ABAddressBookMBS // Initialise the Address Book plugin
dim searchName as string = "Schmitz" // search on.

// Do the search
dim srch as ABSearchElementMBS = addr.searchElementForPersonProperty(addr.kABLastNameProperty,
"", "", searchName, addr.kABContainsSubStringCaseInsensitive)
dim srchRes() as ABRecordMBS = addr.recordsMatchingSearchElement(srch) // Get the results into an
array

for each rc as ABRecordMBS in srchRes
if rc isa ABPersonMBS then // Is it a person record?
dim pers as ABPersonMBS = ABPersonMBS(rc) // Get it into a personnel record

// Now get out the names and addresses.
listbox1.AddRow(pers.valueForProperty(addr.kABFirstNameProperty) + " " + pers.valueForProperty(addr.kABLast-
NameProperty))
listbox1.RowTag(listbox1.LastIndex) = pers.valueForProperty(addr.kABUIDProperty)

// Need to find the home address.
dim mlv as ABMultiValueMBS = pers.valueForProperty(addr.kABAddressProperty)
if mlv <>nil Then
// get home address
dim d as Dictionary = mlv.valueForLabel(addr.kABHomeLabel)

if d = nil then
// get primary
d = mlv.valueForIdentifier(mlv.primaryIdentifier)
end if

if d<>Nil then
// show address with street and city
listbox1.Cell(listbox1.LastIndex,1) = d.Lookup(addr.kABAddressStreetKey,"")+" "+d.Lookup(addr.kABAd-
dressCityKey,"")
end if
end if
```

```
end if
next
```

**Notes:** Use searchElementForProperty in ABPersonMBS and ABGroupMBS classes to create objects.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Saying goodbye to AddressBook framework
- MBS Real Studio Plugins, version 12.3pr2

### 9.13.2 Methods

### 9.13.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 9.13.4 matchesRecord(record as ABRecordMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether a record matches the search element.
**Notes:** Returns false if handle=0 or record=nil or record does not match. Else yes.

### 9.13.5 searchElementForConjunction(conjunction as Integer, children() as ABSearchElementMBS) as ABSearchElementMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a search element combining several sub search elements.
**Notes:** conjunction can be kABSearchAnd or kABSearchOr.
Returns nil on any error.

Pass kABSearchOr or kABSearchAnd for conjunction.

This is a class method. No need to have a valid handle.

### 9.13.6 Properties

### 9.13.7 Addressbook as ABAddressBookMBS

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Reference to parent addressbook.
**Notes:** Plugin sets this for most objects to keep reference to addressbook and avoid this addressbook from being closed too early.
(Read and Write property)

### 9.13.8 Description as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The description for this search element.
**Example:**

```
dim a as new ABAddressBookMBS
dim m as ABSearchElementMBS = a.searchElementForPersonProperty(a.kABFirstNameProperty, "", "",
"John", a.kABContainsSubStringCaseInsensitive)
MsgBox m.Description
```

**Notes:** (Read only property)

### 9.13.9 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the Cocoa object being used.
**Notes:** (Read and Write property)

### 9.13.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kABSearchAnd | 0 | A search conjunction. |
| kABSearchOr | 1 | A search conjunction. |

# Chapter 10

# Alias

## 10.1 class AliasInfoMBS

### 10.1.1 class AliasInfoMBS

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CFBookmarkMBS module instead. **Function:** A class for information about an alias.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Development")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "alias points to "+a.TargetName+" in path "+a.PathString+" of volume "+a.VolumeName
```

**Notes:** Only for Mac OS X.
This is for resource fork based alias files.
Newer OS X version use the newer bookmark format, so please use CFBookmarkMBS module there.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr3
- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.4pr8
- MBS Real Studio Plugins, version 13.1pr16

### 10.1.2 Methods

### 10.1.3 Constructor

MBS MacClassic Plugin, Plugin Version: 5.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A dummy constructor used only for automatic plugin testing.
See also:


- 10.1.4 Constructor(AliasHandle as Integer) 2740


### 10.1.4 Constructor(AliasHandle as Integer)

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor: Loads object properties with information about the alias inside the Alias Handle.
**Notes:** Check Lasterror code to see whether it was successfull.
See also:


- 10.1.3 Constructor 2740


### 10.1.5 InfoForAliasData(data as string) as AliasInfoMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Query information for alias data.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim m as new MacAliasMBS
dim error as Integer = m.Create(nil, folder)
if error = 0 then
dim data as string = m.GetRecord
dim info as AliasInfoMBS = AliasInfoMBS.InfoForAliasData(data)
MsgBox info.PathString
else
MsgBox "Failed to create the alias. Error "+str(error)
end if
```

**Notes:** Returns nil on any error.

### 10.1.6 InfoForSaveInfo(data as string) as AliasInfoMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Query information about alias in SaveInfo.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim SaveInfo as string = folder.GetSaveInfo(nil, FolderItem.SaveInfoDefaultMode)
dim info as AliasInfoMBS = AliasInfoMBS.InfoForSaveInfo(SaveInfo)
MsgBox info.PathString
```

**Notes:** This is for saveinfo data returns by GetSaveInfo function in folderitem class.
Returns nil on any error.

### 10.1.7 Properties

### 10.1.8 FileCreator as String

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file creator code.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "FileCreator: "+a.FileCreator // shows Mac OS creator code like GKON
```

**Notes:** (Read only property)

### 10.1.9 FilesystemID as Integer

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file system ID of the target file system.
**Notes:** (Read only property)

### 10.1.10 FileType as String

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file type code.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "FileType: "+a.FileType // shows Mac OS creator code like JPEG
```

**Notes:** (Read only property)

### 10.1.11 Flags as Integer

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Which properties do have valid content.
**Notes:** some contants:

| | | |
|---|---|---|
| AliasInfoNone | = &h00000000 | no valid info |
| AliasInfoVolumeCreateDate | = &h00000001 | volume creation date is valid |
| AliasInfoTargetCreateDate | = &h00000002 | target creation date is valid |
| AliasInfoFinderInfo | = &h00000004 | file type and creator are valid |
| AliasInfoIsDirectory | = &h00000008 | isDirectory boolean is valid |
| AliasInfoIDs | = &h00000010 | parentDirID and nodeID are valid |
| AliasInfoFSInfo | = &h00000020 | filesystemID and signature are valid |
| AliasInfoVolumeFlags | = &h00000040 | volumeIsBootVolume, volumeIsAutomounted, volumeIsEjectable and volumeHasPersistentFileIDs are valid |

(Read only property)

### 10.1.12 IsDirectory as Boolean

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the target item is a directory or not.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "IsDirectory: "+str(a.IsDirectory)
```

**Notes:** (Read only property)

### 10.1.13 LastError as Integer

MBS MacClassic Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read only property)

### 10.1.14 NodeID as Integer

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The node ID of the target file.
**Notes:** (Read only property)

### 10.1.15 ParentDirID as Integer

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The Directory ID of the parent directory.
**Notes:** (Read only property)

### 10.1.16 PathString as String

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The POSIX path to target.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
```

```
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "TargetName: "+a.PathString // shows target file path
```

**Notes:** (Read only property)

### 10.1.17 Signature as Integer

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The signature of the target file system.
**Notes:** (Read only property)

### 10.1.18 TargetCreateDate as Double

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Target file creation date.
**Notes:** Value should be in absolute seconds.
(Read only property)

### 10.1.19 TargetName as String

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the target item.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "TargetName: "+a.TargetName // shows target file name
```

**Notes:** (Read only property)

### 10.1.20 VolumeCreateDate as Double

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The creation date of the target volume.
**Notes:** (Read only property)

### 10.1.21 VolumeHasPersistentFileIDs as Boolean

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The target volume has persistent file IDs, so the NodeID and parentDirID are useable.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeHasPersistentFileIDs: "+str(a.VolumeHasPersistentFileIDs)
```

**Notes:** (Read only property)

### 10.1.22 VolumeIsAutomounted as Boolean

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the volume is automounted.
**Notes:** // select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsAutomounted: "+str(a.VolumeIsAutomounted)
(Read only property)

### 10.1.23 VolumeIsBootVolume as Boolean

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the target volume is bootable.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsBootVolume: "+str(a.VolumeIsBootVolume)
```

**Notes:** (Read only property)

### 10.1.24 VolumeIsEjectable as Boolean

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the target file is on an ejectable volume.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeIsEjectable: "+str(a.VolumeIsEjectable)
```

**Notes:** (Read only property)

### 10.1.25 VolumeName as String

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the volume the target resides on.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("IMG_0793.jpg")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "VolumeName: "+a.VolumeName // shows target volume name
```

**Notes:** (Read only property)

### 10.1.26 Constants

Info Flags

| Constant | Value | Description |
|---|---|---|
| kAliasInfoFinderInfo | 4 | File type and creator are valid. |
| kAliasInfoFSInfo | 32 | FilesystemID and signature are valid. |
| kAliasInfoIDs | 16 | ParentDirID and nodeID are valid. |
| kAliasInfoIsDirectory | 8 | IsDirectory boolean is valid. |
| kAliasInfoNone | 0 | No valid info. |
| kAliasInfoTargetCreateDate | 2 | Target creation date is valid. |
| kAliasInfoVolumeCreateDate | 1 | Volume creation date is valid. |
| kAliasInfoVolumeFlags | 64 | VolumeIsBootVolume, volumeIsAutomounted, volumeIsEjectable and volumeHasPersistentFileIDs are valid. |

## 10.2 module CFBookmarkMBS

### 10.2.1 module CFBookmarkMBS

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The module for Mac OS X bookmark/alias functions.
**Notes:** Bookmark data strings have no text encoding. If you use ConvertEncoding on them, you destroy them.
Available with Mac OS X 10.6 or newer.
For older systems, please use MacAliasMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr3
- MBS Xojo Plugins, version 17.1pr3
- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 14.1pr2
- MBS Real Studio Plugins, version 11.3pr12
- MBS Real Studio Plugins, version 11.3pr10

### 10.2.2 Methods

### 10.2.3 Available as boolean

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether bookmark functions are available.
**Notes:** Returns true on Mac OS X 10.6 or newer.

### 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a folderitem, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim Bookmark as string = CFBookmarkMBS.CreateBookmarkData(file, CFBookmarkMBS.kCreationSuitableForBookmarkFile)
```

MsgBox str(lenb(Bookmark))+" bytes"

**Notes:** file: the folderitem to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a folderitem, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** file: the folderitem to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.

relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748

- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753

- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754

### 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.

**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:


- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string 2754


### 10.2.11 CreateBookmarkData(URL as string, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as string = "") as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a string containing an externalizable representation from a URL, modified with the given options, including ( at the minimum ) any properties in the propertiesToInclude array which are retrievable from the given url.
**Notes:** URL: the URL to create a bookmark data from.
options: a set of options which control creation of the bookmark data
resourcePropertiesToInclude: Optional, If non-empty, an array of additional properties copied from the url to include in the created bookmark data.
relativeToURL: If non-nil, the created bookmark will be relative to the given url

Lasterror is set.
Returns a string containing an data, which can be later be passed to ResolveBookmarkData.
See also:

- 10.2.4 CreateBookmarkData(file as folderitem, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2748
- 10.2.5 CreateBookmarkData(file as folderitem, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2749
- 10.2.6 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as CFURLMBS = nil) as string 2750
- 10.2.7 CreateBookmarkData(URL as CFURLMBS, options as UInt32 = 1024, relativeToURL as folderitem = nil) as string 2751
- 10.2.8 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as CFURLMBS = nil) as string 2752
- 10.2.9 CreateBookmarkData(URL as CFURLMBS, options as UInt32, resourcePropertiesToInclude() as string, relativeToURL as folderitem = nil) as string 2753
- 10.2.10 CreateBookmarkData(URL as string, options as UInt32 = 1024, relativeToURL as string = "") as string 2753


### 10.2.12 CreateBookmarkDataFromAliasRecord(AliasRecordData as string) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a string containing bookmarkdata by converting the alias data in aliasRecordData which should be the contents of an AliasRecord copied into a string.
**Notes:** The created bookmarkdata can be passed into ResolveBookmarkData to resolve the item into a folderitem or URL, or a small set of information can be returned from ResourcePropertiesForKeysFromBookmarkData / ResourcePropertyForKeyFromBookmarkData.
AliasRecordData: the contents of an AliasRecord to create bookmark data for

Returns a string containing bookmark data.

### 10.2.13 LastError as CFErrorMBS

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The last error.
**Notes:** This ia CFErrorMBS object.

### 10.2.14 ReadBookmarkDataFromFile(file as folderitem) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a file which is a Finder "alias" file, return a string with the bookmark data from the file.
**Notes:** If file points to an alias file created before SnowLeopard which contains Alias Manager information and no bookmark data, then a bookmark data string will be synthesized which contains a approximation of the alias information in a format which can be used to resolve the bookmark. If an error prevents reading the data or if it is corrupt, nil will be returned and lasterror will be filled in if error object.

File: a folderitem to to the alias file to create the bookmark data from.

Returns a string containing bookmark data, or nil if there was an error creating bookmark data from the file, such as if the file is not an alias file.

### 10.2.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a folderitem of the item it was a bookmark to.
**Example:**

```
dim AliasFile as FolderItem = SpecialFolder.Desktop.trueChild("test.alias")
dim Bookmark as string = CFBookmarkMBS.ReadBookmarkDataFromFile(AliasFile)
dim isStale as Boolean
dim options as UInt32 = CFBookmarkMBS.kResolutionWithoutUIMask + CFBookmarkMBS.kResolution-
WithoutMountingMask
dim file as FolderItem = CFBookmarkMBS.ResolveBookmarkData(Bookmark, options, nil, isStale)

if file<>Nil then
MsgBox file.NativePath
else
dim e as CFErrorMBS = CFBookmarkMBS.LastError
if e = nil then
MsgBox "Failed to resolve."
else
MsgBox e.Description
end if
end if
```

**Notes:**

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller

| | |
|---|---|
| If in the process of resolving the bookmark into the folderitem | it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property ) |

would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.
See also:


- 10.2.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 2757
- 10.2.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 2758
- 10.2.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 2759


### 10.2.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a folderitem of the item it was a bookmark to.
**Notes:**

| | |
|---|---|
| If in the process of resolving the bookmark into the folderitem | it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property ) |

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it

relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.
See also:

- 10.2.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 2756
- 10.2.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 2758
- 10.2.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 2759

### 10.2.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a folderitem of the item it was a bookmark to.
**Notes:**

| | |
|---|---|
| If in the process of resolving the bookmark into the folderitem | it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property ) |

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may

want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.
See also:

- 10.2.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 2756
- 10.2.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 2757
- 10.2.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string 2759

### 10.2.18 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, resourcePropertiesToInclude() as string, byref isStale as boolean) as string

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a folderitem of the item it was a bookmark to.
**Notes:**

| | |
|---|---|
| If in the process of resolving the bookmark into the folderitem | it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property ) |

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a folderitem of a file which is the closest match to the file the bookmark data.

Raises an exception if bookmark is empty string.
See also:

- 10.2.15 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as folderitem 2756
- 10.2.16 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as folderitem 2757
- 10.2.17 ResolveBookmarkData(bookmark as string, options as UInt32, relativeToURL as string, byref isStale as boolean) as string 2758

### 10.2.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a CFURL of the item it was a bookmark to.
**Notes:**

| | |
|---|---|
| If in the process of resolving the bookmark into the folderitem | it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property ) |

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.
See also:

- 10.2.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL

as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2761

- 10.2.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 2762
- 10.2.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2762

### 10.2.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a CFURL of the item it was a bookmark to.
**Notes:**

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property )

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.
See also:

- 10.2.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 2760
- 10.2.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 2762
- 10.2.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2762

### 10.2.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a CFURL of the item it was a bookmark to.
**Notes:**

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property )

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.
See also:

- 10.2.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 2760
- 10.2.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2761
- 10.2.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2762

### 10.2.22 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a bookmark data string, returns a CFURL of the item it was a bookmark to.
**Notes:**

If in the process of resolving the bookmark into the folderitem it points to this determines that some properties in the bookmark are out of date or not correct for the item it resolves to, set isStale to true, which the client may want to use to decide to make a new bookmark from the returned item and replace the saved bookmark it has. If the bookmarked item cannot be found, return nil. If an error ( other than "original item can not be found" ) occurs during the process, return nil and fill in lasterror property )

bookmark: a string containing a bookmark data, created with CreateBookmarkData
options: options which affect the resolution
relativeToURL: If non-nil, and if the bookmark was created relative to another file/folder, then resolve it relative to this file/folder.
resourcePropertiesToInclude: Optional, if non-empty, an array containing those properties which the caller would like to already be cached on the given url.
isStale: On exit will be set to true if during resolution any of the properties in the bookmark no longer seemed to match the corresponding properties on the returned file. Clients, upon seeing a stale representation, may want to replace whatever stored bookmark data they have saved and create a new one.

Lasterror is set.

Returns a CFURLMBS of a file which is the closest match to the file the bookmark data.
See also:

- 10.2.19 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, byref isStale as boolean) as CFURLMBS 2760
- 10.2.20 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as CFURLMBS, resourcePropertiesToInclude() as string, byref isStale as boolean) as CFURLMBS 2761
- 10.2.21 ResolveBookmarkDataToCFURLMBS(bookmark as string, options as UInt32, relativeToURL as folderitem, byref isStale as boolean) as CFURLMBS 2762

### 10.2.23 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string) as dictionary

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark, return a dictionary of all properties.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Webseiten")

dim data as string = CFBookmarkMBS.ReadBookmarkDataFromFile(f)

if data.lenb >0 then
dim dic as Dictionary = CFBookmarkMBS.ResourcePropertiesForKeysFromBookmarkData(data)
```

```
Break // see in debugger
end if
```

**Notes:** This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.

BookmarkData: a string containing a bookmark data, created with CreateBookmarkData

Returns a dictionary containing the values for all properties passed in obtained from the bookmark data ( not by attempting to resolve it or do i/o in any way )

Version 17.1 of our plugin knows a list of keys, so it tries all keys and returns the dictionary with matching ones.
See also:

- 10.2.24 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string, resourcePropertiesToReturn() as string) as dictionary 2764

### 10.2.24 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string, resourcePropertiesToReturn() as string) as dictionary

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark, return a dictionary of properties.
**Notes:** This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.

BookmarkData: a string containing a bookmark data, created with CreateBookmarkData
resourcePropertiesToReturn: Optional an array of string of the properties of the bookmark data which the client would like returned.

Returns a dictionary containing the values for the properties passed in obtained from the bookmark data ( not by attempting to resolve it or do i/o in any way )
See also:

- 10.2.23 ResourcePropertiesForKeysFromBookmarkData(BookmarkData as string) as dictionary 2763

### 10.2.25 ResourcePropertyForKeyFromBookmarkData(BookmarkData as string, resourcePropertyKey as string) as Variant

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a bookmark, return the value for a given property from the bookmark data.
**Notes:** This returns only the properties stored within the bookmark and will not attempt to resolve the bookmark or do i/o.
BookmarkData: a string containing a bookmark data, created with CreateBookmarkData
resourcePropertyKey: the property key to return.

Returns a variant value for the property passed in obtained from the bookmark data ( not by attempting to resolve it or do i/o in any way )

### 10.2.26 StartAccessingSecurityScopedResource(URL as CFURLMBS) as boolean

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a file URL created by resolving a bookmark data created with security scope, make the resource referenced by the url accessible to the process.
**Notes:** When access to this resource is no longer needed the client should call StopAccessingSecurityScopedResource(). Each call to StartAccessingSecurityScopedResource() must be balanced with a call to StopAccessingSecurityScopedResource().
URL: the file URL for the resource returned by CreateByResolvingBookmarkData() using kResolutionWithSecurityScope.

Returns true if access was granted and false if the url does not reference a security scoped resource, or if some error occurred which didn't allow access to be granted.
Available on Mac OS X 10.7 or newer.

### 10.2.27 StopAccessingSecurityScopedResource(URL as CFURLMBS)

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Revokes the access granted to the url by a prior successful call toStartAccessingSecurityScopedResource().
**Notes:** Available on Mac OS X 10.7 or newer.

### 10.2.28 WriteBookmarkDataToFile(BookmarkData as string, file as folderitem, options as UInt32) as boolean

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Given a created bookmarkData object, create a new Finder "alias" file at file which contains the bookmark data.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.TrueChild("test.rtf")
dim Bookmark as string = CFBookmarkMBS.CreateBookmarkData(file, CFBookmarkMBS.kCreationSuitableForBookmarkFile)

dim AliasFile as FolderItem = SpecialFolder.Desktop.TrueChild("test.alias")
if CFBookmarkMBS.WriteBookmarkDataToFile(Bookmark, AliasFile, 0) then
MsgBox "OK"
else
dim e as CFErrorMBS = CFBookmarkMBS.lasterror
MsgBox "Failed: "+e.Description
end if
```

**Notes:** If file points to a directory, an alias file will be created with the same name as the bookmarked item and a ".alias" extension. If file points to a file and it exists it will be overwritten. If a .alias extension is not present it will be added. In addition to the bookmark data, sufficient pre-SnowLeopard alias data will added to the file to allow systems running something before SnowLeopard to resolve this file using Alias Manager routines and get back the same file as the bookmark routines.

The bookmark data must have been created with the kCFURLBookmarkCreationSuitableForBookmarkFile option and an error will be returned if not.

bookmark: A string containing a bookmark data, created with CreateBookmarkData
file: The file/folder to write the alias to.
options: options flags

Lasterror is set.

### 10.2.29 Constants

Creation options.

| Constant | Value | Description |
|---|---|---|
| kCreationMinimalBookmarkMask | 512 | Creates a bookmark with "less" information, which may be small able to resolve in certain ways. |
| kCreationPreferFileIDResolutionMask | 256 | At resolution time, this alias will prefer resolving by the embed the path. |
| kCreationSecurityScopeAllowOnlyReadAccess | 4096 | Mac OS X 10.7.3 and later, if used with kCFURLBookmarkCreat rityScope, at resolution time only read access to the resource wil |
| kCreationSuitableForBookmarkFile | 1024 | Includes in the created bookmark those properties which are neede mark/alias file. |
| kCreationWithSecurityScope | 2048 | Mac OS X 10.7.3 and later, include information in the bookmark o lows the same sandboxed process to access the resource after bein |

Resolving options.

| Constant | Value | Description |
|---|---|---|
| kResolutionWithoutMountingMask | 512 | Don't mount a volume during bookmark resolution. |
| kResolutionWithoutUIMask | 256 | Don't perform any UI during bookmark resolution. |
| kResolutionWithSecurityScope | 1024 | Mac OS X 10.7.3 and later, extract the security scope included at creation ti to provide the ability to access the resource. |

## 10.3 class MacAliasMBS

### 10.3.1 class MacAliasMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CFBookmarkMBS module instead. **Function:** Gives access to Aliases on Mac.
**Example:**

```
// Store the reference to a FolderItem in a Binary File

Dim alias as MacAliasMBS
dim t,f as FolderItem
Dim bf as BinaryStream, s as String
t=SpecialFolder.Desktop.Child("test")
bf = t.CreateBinaryFile("") // open your binary file here
f = SpecialFolder.Desktop // the FolderItem you want to save
alias = new MacAliasMBS
if alias.Create(nil, f) = 0 then
s = alias.GetRecord
bf.WriteLong LenB(s) // this saves the length of the record
bf.Write s // this saves the record itself
end
bf.Close

// Retrieve the reference to a FolderItem from a Binary File

dim l as Integer

t=SpecialFolder.Desktop.Child("test")
bf = t.OpenAsBinaryFile(false) // open your binary file here
alias = new MacAliasMBS
l = bf.ReadLong
alias.SetRecord bf.Read(l)
f = alias.Resolve(nil, alias.attemptMount)
if alias.needsUpdate then
if alias.Update(nil, f) = 1 then
// ... you might want to save the updated alias in your file here
end
end
// f now describes the FolderItem again.
// It may not be existing any more, however, so here's a check for that:
if not f.exists then
msgBox "oops! the file is not available any more. Select a new one, please"
//... let the user locate the file
end
```

**Notes:** This Plugin implements a new Class for handling Mac OS Alias Records.

AliasRecords are like FolderItems, but can be made persistent: You can convert a FolderItem into a AliasRecord and store that AliasRecord in a file (like your Preferences file). Later you can retrieve that information again and convert it back into a FolderItem.

AliasRecords also appear inside Alias Files, that are usually created by the Finder. The enclosed sample application (Alias Mgr Plugin Demo.œÄ) shows how to create and resolve such Alias Files.

Additional Background Information
The purpose of the class is to store paths to files and/or folders between runs of a RB application.
To store a path to a file/folder in an RB app, currently your only option is to get the abolute path as a string, and store that string in a file, usually your preferences file.
However, there is problem with using this technique: If, between runs of your app, the user changes the path of the file by moving it, or by renaming the file or any of its parent folders (including the volume name), your app will fail to locate the file next time
it is looking for it.
Fortunately, at least in Mac OS, there is a solution to this, which helps you to track your files in such a case. This is done by using Alias Records: they are the basic data structure that is also used in Alias Files as created and used in the Finder.
This class attempts to give the flexibility of Alias Records to your RB apps.

The meaning of the Relative path
When no relative path is specified, then the file is only located by its folder hierarchy down to the root of the volume. However, if a relative path is given, then the file is optionally located relative to that point.
So, if you locate files relatively to some folder, like the folder your application is in, you should specify your app's folder as the relative path so that the target is even found easily when the user moved the whole folder including your app and its related files. This is even more important when using this Alias class under Windows than under Mac OS (if files are moved in Mac OS, they often still can be found even without the help of the original folder hierarchy, while this is not possible under Windows 9x).

For Mac OS X 10.6 or newer, please also check CFBookmarkMBS module.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr3
- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.1pr12

### 10.3.2 Methods

### 10.3.3 AliasInfo as AliasInfoMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries alias info for the alias.
**Example:**

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
dim info as AliasInfoMBS = m.AliasInfo

MsgBox info.TargetName + EndOfLine + info.VolumeName + EndOfLine + info.PathString
end if
```

### 10.3.4 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 10.3.5 Create(relPath as FolderItem, target as FolderItem, isDirectory as boolean = false) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an AliasRecord for a given file or folder.
**Example:**

```
dim m as new MacAliasMBS

dim e as Integer = m.Create(nil, SpecialFolder.Desktop.Child("test.txt"), true)

// shows -43 as we created alias for non existing file
MsgBox str(e)
MsgBox m.AliasInfo.TargetName
```

**Notes:** Returns zero if successful, otherwise a negative Mac OS error code.

Version 16.0 can create alias for non existing files. In that case you can tell with function isDirectory whether the target should be a directory. Still returns fnfErr (-43) if file doesn't exist but the alias will still be created.

### 10.3.6 CreateAliasFromPath(targetPath as string, fromFilePath as String = "", isDirectory as boolean = false) as Integer

MBS MacClassic Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an alias given a POSIX style utf-8 path to the target.
**Example:**

```
dim m as new MacAliasMBS

dim e as Integer = m.CreateAliasFromPath("/Users/test", "", true)

// shows -43 as we created alias for non existing file
MsgBox str(e)
MsgBox m.AliasInfo.TargetName
```

**Notes:** Returns OS error code.

If the target file does not exist but the path up to the leaf does then fnfErr (-43) will be returned but the alias will still be created.

fromFilePath: The starting point for a relative search.
targetPath: POSIX style UTF-8 path to target.
IsDirectory: On input, if target does not exist, a flag to indicate whether or not the target is a directory.

### 10.3.7 CreateFSRef(relPath as memoryblock, target as memoryblock) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an AliasRecord for a given file or folder.
**Notes:** The two memoryblocks are FSRefs which you can get by FolderItem.FSRef.
Returns zero if successful, otherwise a negative Mac OS error code.

### 10.3.8 CreateMinimal(target as FolderItem, isDirectory as boolean = false) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an AliasRecord for a given file or folder. Returns zero if successful, otherwise a negative Mac OS error code.
**Notes:** Minimal creates an alias without path, so it is smaller.

Version 16.0 can create alias for non existing files. In that case you can tell with function isDirectory whether the target should be a directory. Still returns fnfErr (-43) if file doesn't exist but the alias will still be created.

### 10.3.9 CreateMinimalFSRef(target as memoryblock) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a minimal AliasRecord for a given file or folder.
**Notes:** The memoryblock is a FSRefs which you can get by FolderItem.FSRef.
Returns zero if successful, otherwise a negative Mac OS error code.

### 10.3.10 GetRecord as String

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the AliasRecord in a String so that you can store it in a file, and pass it SetRecord for re-creating the AliasRecord (this string might contain any byte values, including zeros, so you can not display it or store it in a text file - you have to store it in a binary file or in a resource, instead!).
**Notes:** Attention: The length of the String is not fixed! When the Alias changes, its length usually changes, too. If you want to save this string into a binary file, you must also save its current length so that you know how much bytes to retrieve if you read it back from the file later. An easier way to store Aliases in a file is by using the Resource Manager. The sample code "FolderItems in Preferences.rbp" shows how to accomplish this.

### 10.3.11 PathString as String

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries path of the alias.
**Example:**

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop
```

```
if m.Create(nil, f) = 0 then
MsgBox m.PathString
end if
```

### 10.3.12 Resolve(relPath as FolderItem, mode as Integer) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Converts an AliasRecord back into a FolderItem. For values to the mode parameter see the class constants or pass in 0 for default searching (will not attempt to mount unavailable volumes).
**Notes:** After calling this method, the property needsUpdate tells you whether the target has been renamed or moved, which suggests that you call Update in order to reflect the change in the AliasRecord. See the demo "FolderItems in Preferences.rbp" for an example.

### 10.3.13 SetRecord(record as String)

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Use this method to revive an AliasRecord with the string you inquired from GetRecord earlier.

### 10.3.14 TargetName as String

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries target name of the alias.
**Example:**

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
MsgBox m.TargetName
end if
```

### 10.3.15 Update(relPath as FolderItem, target as FolderItem) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates an already created AliasRecord. Returns either a negative Mac OS error code, zero if the update didn't actually change the AliasRecord, or one if the record was changed (in this case you might

want to update your record of the alias if you had stored it in a file).

### 10.3.16 VolumeName as String

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries volume name of the alias.
**Example:**

```
dim m as new MacAliasMBS
dim f as FolderItem = SpecialFolder.Desktop

if m.Create(nil, f) = 0 then
MsgBox m.VolumeName
end if
```

### 10.3.17 Properties

### 10.3.18 needsUpdate as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Does the Alias Record need no Update?
**Notes:** after having called Resolve successfullly, this property indicates whether the AliasRecord is still up to date:
true: the target of the Alias is still at the same location where it was last seen.
false: the target has been moved or renamed. The Update method should be invoked.
(Read only property)

### 10.3.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| allVols | 8 | One of the constants to use in Resolve.<br>search on multiple volumes<br>This is the old constant name used for compatibility to older Xojo code.<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| attemptMount | 1 | One of the constants to use in Resolve.<br>mount the volume automatically<br>This is the old constant name used for compatibility to older Xojo code.<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| exhaustive | &h200 | One of the constants to use in Resolve.<br>search further<br>This is the old constant name used for compatibility to older Xojo code.<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMMountVol | 1 | One of the constants to use in Resolve.<br>mount the volume automatically<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMMultVols | 8 | One of the constants to use in Resolve.<br>search on multiple volumes<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMNoUI | 2 | One of the constants to use in Resolve.<br>no user interface allowed during resolution<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMSearch | &h100 | One of the constants to use in Resolve.<br>search quickly<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMSearchMore | &h200 | One of the constants to use in Resolve.<br>search further<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMSearchRelFirst | &h400 | One of the constants to use in Resolve.<br>search target on a relative path first<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| kARMTryFileIDFirst | &h800 | One of the constants to use in Resolve.<br>search by file id before path<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| noDialogs | 2 | One of the constants to use in Resolve.<br>no user interface allowed during resolution<br>This is the old constant name used for compatibility to older Xojo code.<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |
| relFirst | &h400 | One of the constants to use in Resolve.<br>search target on a relative path first<br>This is the old constant name used for compatibility to older Xojo code.<br>Use BitwiseOr or Bitwise.Or to combine this constants values. |

# Chapter 11

# Apple Remote

## 11.1 class AppleRemoteMBS

### 11.1.1 class AppleRemoteMBS

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** A class to handle an Apple Remote device from Xojo.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.

With Mac OS X 10.6 Apple made changes to the behavior of the driver so the exclusive mode does no longer work.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr8
- Plugins 10.1

**Xojo Developer Magazine**

- 5.4, page 50: The Case of the Top 20, The mayor is caught in an explosive situation, and our boys are on the case by Toby Rush

### 11.1.2 Methods

### 11.1.3 startListening

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening to device.

### 11.1.4 stopListening

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Stops listening to device.

### 11.1.5 Properties

### 11.1.6 ClickCountEnabledButtons as Integer

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Which buttons to enable for click counting.
**Notes:** (Read and Write property)

### 11.1.7 ClickCountingEnabled as Boolean

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether to do click counting.
**Notes:** Click counting makes it possible to recognize if the user has pressed a button repeatedly click counting does delay each event as it has to wait if there is another event (second click) therefore there is a slight time difference (maximumClickCountTimeDifference) between a single click of the user and the call of your delegate method click counting can be enabled individually for specific buttons. Use the property clickCountEnableButtons to set the buttons for which click counting shall be enabled
(Read and Write property)

### 11.1.8 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the used AppleRemote Cocoa object.
**Notes:** (Read and Write property)

### 11.1.9 ListeningOnAppActivate as Boolean

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets an NSApplication delegate which starts listening when application is becoming active and stops listening when application resigns being active.
**Notes:** If an NSApplication delegate has been already set all method calls will be forwarded to this delegate, too.
(Read and Write property)

### 11.1.10 ListeningToRemote as boolean

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether object is currently listening to the devices.
**Notes:** True if yes and false if no.
(Read and Write property)

### 11.1.11 MaximumClickCountTimeDifference as Double

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The maximum time difference till which clicks are recognized as multi clicks.
**Notes:** (Read and Write property)

### 11.1.12 OpenInExclusiveMode as boolean

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether device should be opened in exclusive mode.
**Notes:** True if yes and False if no.
(Read and Write property)

### 11.1.13 ProcessesBacklog as Boolean

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** When your application needs to much time on the main thread when processing an event other events may already be received which are put on a backlog.
**Notes:** As soon as your main thread has some spare time this backlog is processed and may flood your delegate with calls. Backlog processing is turned off by default.
(Read and Write property)

### 11.1.14 RemoteAvailable as boolean

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the needed drivers are installed to handle the device.
**Notes:** True if driver was found.
(Read only property)

### 11.1.15 remoteId as Integer

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The device ID.
**Notes:** (Read only property)

### 11.1.16 SimulatesPlusMinusHold as Boolean

MBS MacExtras Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Simulating plus/minus hold does deactivate sending of individual requests for plus/minus pressed down/released.
**Notes:** Instead special hold events are being triggered when the user is pressing and holding plus/minus for a small period. With simulating enabled the plus/minus buttons do behave as the left/right buttons.
(Read and Write property)

### 11.1.17 Events

### 11.1.18 ButtonPressed(ButtonID as Integer, PressedDown as boolean, clickCount as Integer)

MBS MacExtras Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** The event being called whenever a button is pressed or released.
**Notes:** ButtonID is one of the kRemote* constants in this class.
PressedDown is true if the button was pressed down. If false the button is now no longer pressed after holding it.

### 11.1.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kRemoteButtonFullscreen2009 | 32768 | The constant for the fullscreen button (older modell). |
| kRemoteButtonLeft | 64 | The constant for the left button. |
| kRemoteButtonLeftHold | 256 | The constant for the left button being hold. |
| kRemoteButtonMenu | 8 | The constant for the menu button. |
| kRemoteButtonMenuHold | 512 | The constant for the menu button being hold. |
| kRemoteButtonPlay | 16 | The constant for the play button. |
| kRemoteButtonPlay2009 | 16384 | The constant for the play button (older model). |
| kRemoteButtonPlaySleep | 1024 | The constant for the play button being hold. |
| kRemoteButtonRight | 32 | The constant for the right button. |
| kRemoteButtonRightHold | 128 | The constant for the right button being hold. |
| kRemoteButtonVolumeMinus | 4 | The constant for the volume minus button. |
| kRemoteButtonVolumeMinus_Hold | 8192 | The constant for the volume minus button (hold). |
| kRemoteButtonVolumePlus | 2 | The constant for the volume plus button. |
| kRemoteButtonVolumePlus_Hold | 4096 | The constant for the volume plus button (hold). |
| kRemoteControlSwitched | 2048 | The constant for the device switch event. |

# Chapter 12

# Apple Script

## 12.1 class AppleScriptErrorMBS

### 12.1.1 class AppleScriptErrorMBS

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for detailed error information.
**Example:**

```
// a simply example using the AppleScriptErrorMBS class:

dim s As new AppleScriptMBS
dim ASErr As AppleScriptErrorMBS

dim text As string = "seet x to 1" // intentional error

s.Compile text

if s.LastError<>0 Then
dim errorMsg As String = "Compile error: " + str(s.Lasterror) + EndOfLine
ASErr = s.Error
MsgBox errorMsg + "Details: " + ASErr.BriefMessage
end if
```

### 12.1.2 Properties

### 12.1.3 AppName as String

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the application.
**Notes:** Value is "" if no application is used (e.g. on compiling).
(Read and Write property)

### 12.1.4 AppSerial as MemoryBlock

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The application serial number.
**Notes:** Nil if no application is used.
You can create a ProcessMBS class using this serial.s
(Read and Write property)

### 12.1.5 BriefMessage as String

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The brief error message.
**Example:**

```
dim ASErr as AppleScriptErrorMBS
MsgBox "Details: " + ASErr.BriefMessage
```

**Notes:** (Read and Write property)

### 12.1.6 Errorcode as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The error code.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute
```

```
MsgBox str(a.Error.Errorcode) // -2753
```

**Notes:** (Read and Write property)

### 12.1.7 ErrorCodeAvailable as Boolean

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** whether the error code is known in the ErrorCode property.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.Error.ErrorCodeAvailable)
```

**Notes:** The error code property may be 0, but still there may be an error.
(Read and Write property)

### 12.1.8 Message as String

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The error message.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox a.Error.Message
```

**Notes:** (Read and Write property)

### 12.1.9 RangeAvailable as Boolean

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** whether the rangestart and rangeend properties have valid values.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

**Notes:** (Read and Write property)

### 12.1.10 RangeEnd as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The end of the source text range.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute

MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

**Notes:** (Read and Write property)

### 12.1.11 RangeStart as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The start of the source text range.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "hello"
a.Execute
```

```
MsgBox str(a.error.RangeAvailable)+": "+str(a.error.RangeStart)+"-"+str(a.error.RangeEnd)
```

**Notes:** (Read and Write property)

## 12.2 class AppleScriptMBS

### 12.2.1 class AppleScriptMBS

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for compiling and executing Apple Scripts in RB.
**Example:**

```
dim a as new AppleScriptMBS
dim lines(-1) as string

lines.Append "tell application ""Finder"""
lines.Append " activate"
lines.Append " display dialog ""Now is "" & (current date)"
lines.Append "end tell"

a.Compile Join(lines, EndOfLine.Macintosh)
a.Execute
```

**Notes:** Your application may need the NSAppleEventsUsageDescription entry in info.plist to do any AppleScript usage:
https://developer.apple.com/documentation/bundleresources/information_property_list/nsappleeventsusagedescription

If you use hardened runtime, which you need for notarization, you may need the entitlement for Apple Events, too:
https://developer.apple.com/documentation/bundleresources/entitlements/com_apple_security_automation_apple-events
**Blog Entries**

- MBS Xojo Plugins, version 17.6pr2
- MBS Xojo Plugins, version 17.5pr5
- Tip of the day: AppleScript with Properties to pass file path
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 3.3, page 48: IPC Sockets, Part 2, Producing a usable IPC socket framework by Didier Barbas

### 12.2.2 Methods

### 12.2.3 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Example:**

```
dim a as new AppleScriptMBS
// later
a.close
```

**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 12.2.4 Compile(text as string)

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compiles the given source code.
**Example:**

```
// the code below workarounds a limitation in AppleScript on processing unicode strings

dim theScript as new AppleScriptMBS
dim scripttext as string
dim chars(-1) as string
dim n as string
dim i,c as Integer

const text="Hello World" // add unicode characters here!

c=len(text)
for i=1 to c
n=hex(asc(mid(text,i,1)))
while len(n)<4
n="0"+n
wend
chars.Append n
next

scripttext="display dialog (√Ösdata utxt"+join(chars,"")+"√Öt as Unicode text)"

MsgBox scripttext
```

```
// must use unicode to avoid error -1753
scripttext=ConvertEncoding(scripttext,encodings.UTF16)
theScript.UnicodeText=true
theScript.compile ScriptText
theScript.execute
```

**Notes:** Lasterror is set.
Text should be in MacRoman or UTF16 text encoding for best results.

### 12.2.5 CountScriptProperties as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of properties in the script.
**Example:**

```
dim s as String
dim a as AppleScriptMBS
dim i,c,cc as Integer
dim z,t as String

s=s+"property hello : ""Hallo Leute""""+chr(13)
s=s+"property just : ""Just a test""""+chr(13)
s=s+"display dialog hello"+chr(13)
s=s+"return just"+chr(13)

MsgBox "The script:"+chr(13)+s
a=new AppleScriptMBS

a.Compile s

MsgBox str(a.CountScriptProperties)+" properties"
```

**Notes:** Lasterror is set.

### 12.2.6 Error as AppleScriptErrorMBS

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an AppleScriptError object for details error information.
**Example:**

```
dim a as AppleScriptMBS
dim e as AppleScriptErrorMBS
a=new AppleScriptMBS

a.Compile "tell application ""Finder""+chr(13)+"open file ""test""+chr(13)+"end tell"+chr(13)

// You may check for errors here.

a.Execute

e=a.Error

// in a breakpoint you can see an error message here.
```

**Notes:** Returns nil on any error.
The returned object may be empty.
The error information is changed whenever you compile or execute.

### 12.2.7 Execute

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs the current script.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "beep"
a.Execute
```

**Notes:** Lasterror is set.
If you use this method, please make sure your own Application's HandleAppleEvent method doesn't block executing by returning true for unknown events.

### 12.2.8 ExecuteEvent(eventname as string, parameters() as string)

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Executes an event inside the current script with the given parameters.
**Example:**

```
dim a as new AppleScriptMBS
```

```
dim lines(-1) as string

lines.append "on test(a,b,c)"
lines.append "display dialog a"
lines.append "display dialog b"
lines.append "display dialog c"
lines.append "end test"

a.Compile join(lines,EndOfLine.Macintosh)
a.Execute

dim s(2) as string
s(0)="Hello"
s(1)="World"
s(2)="!"

a.ExecuteEvent("test",s)
```

**Notes:** The eventname must be the name of the event in pure ASCII or MacRoman encoding (and lowercase!).
The parameters can be unicode. The array is based on 0, so string in parameters(0) is the first parameter.

Lasterror is set.

### 12.2.9 Result as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The result of the executed script as a string.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "return ""hello"""
a.Execute

MsgBox a.Result
```

**Notes:** Returns "" on any error.

If unicode is enabled, this string is unicode (UTF16).

### 12.2.10 ResultAsStringArray as string()

MBS MacClassic Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The result of the executed script as a string array.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "return { ""Hello"", ""World"" } "
a.Execute

MsgBox join(a.ResultAsStringArray,EndOfLine) // Shows Hello World in two lines

a.Compile "tell application ""Mail""""+EndOfLine.Macintosh+"return name of every mailbox"+EndOfLine.Macintosh+"end tell"
a.Execute

MsgBox join(a.ResultAsStringArray,EndOfLine) // shows your Mailboxes
```

**Notes:** On any error the array is empty.
If unicode is enabled, this strings are unicode (UTF16).

### 12.2.11 ResultDisplayString as string

MBS MacClassic Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The result of the executed script as a string.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "return ""hello""""
a.Execute

MsgBox a.ResultDisplayString
```

**Notes:** This is the same as Result, but a flag is set to tell AppleScript that the string is for display to a human. So it may not be good for input to the AppleScript compiler.

Returns "" on any error.
If unicode is enabled, this string is unicode (UTF16).

### 12.2.12 ScriptProperty(index as Integer) as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the property with the given index.
**Example:**

```
dim s as String
dim a as AppleScriptMBS
dim i,c,cc as Integer
dim z,t as String

s=s+"property hello : ""Hallo Leute""""+chr(13)
s=s+"property just : ""Just a test""""+chr(13)
s=s+"display dialog hello"+chr(13)
s=s+"return just"+chr(13)

MsgBox "The script:"+chr(13)+s
a=new AppleScriptMBS

a.Compile s

c=a.CountScriptProperties

cc=c-1
for i=0 to cc
z=a.ScriptProperty(i)
if z<>"" then
if i=0 then
t=z
elseif i=cc then
t=t+" and "+z
else
t=t+", "+z
end if
end if
next

MsgBox str(c)+" properties in the script: "+t

t=a.ScriptProperty(0)
z=a.ScriptPropertyValue(t)
MsgBox "Value of the property named "+t+" is: "+z

a.ScriptPropertyValue(t)="Hello World!"

z=a.ScriptPropertyValue(t)
MsgBox "The new value of the property named "+t+" is: "+z
```

```
a.Execute

MsgBox "The result is: "+a.Result
```

**Notes:** Index is from 0 to CountScriptProperties-1.
Lasterror is set.

### 12.2.13 Source as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decompiles the current script and returns the source code.
**Example:**

```
dim a as new AppleScriptMBS

a.compile "beep"

MsgBox a.Source
```

### 12.2.14 SourceTextStyle as string

MBS MacClassic Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decompiles the current script and returns the source code text style.
**Example:**

```
dim a as new AppleScriptMBS

a.compile "beep"

EditField1.SetTextAndStyle a.Source, a.SourceTextStyle
```

**Notes:** Doesn't work for unicode text.

### 12.2.15 Properties

### 12.2.16 AllowInteraction as Boolean

MBS MacClassic Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether to allow user interaction.
**Notes:** Default is false to disallow.
You can set to true to allow GUI.
(Read and Write property)

### 12.2.17 CanUnicodeText as Boolean

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if AppleScript can handle Unicode text.
**Example:**

```
dim a as new AppleScriptMBS

MsgBox str(a.CanUnicodeText)
```

**Notes:** This property is set to true if AppleScript 1.3 or newer is installed.
(AppleScript 1.3 was introduced around the time of Mac OS 8.6)
(Read only property)

### 12.2.18 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle of the used AppleScript component.
**Example:**

```
dim a as new AppleScriptMBS
MsgBox str(a.Handle)
```

**Notes:** (Read and Write property)

### 12.2.19 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Example:**

```
dim a as new AppleScriptMBS
MsgBox str(a.Lasterror)
```

**Notes:** Value is 0 for successfull and -1 if function is not available.
All other values are normal Mac OS error codes.

Some common error codes for this class:

| | | |
|---|---|---|
| OSASystemError | -1750 | |
| OSAInvalidID | -1751 | |
| OSABadStorageType | -1752 | |
| OSAScriptError | -1753 | |
| OSABadSelector | -1754 | |
| OSASourceNotAvailable | -1756 | |
| OSANoSuchDialect | -1757 | |
| OSADataFormatObsolete | -1758 | |
| OSADataFormatTooNew | -1759 | |
| OSACorruptData | -1702 | |
| OSARecordingIsAlreadyOn | -1732 | |
| OSAComponentMismatch | -1761 | Parameters are from 2 different components |
| OSACantOpenComponent | -1762 | Can't connect to scripting system with that ID |
| OSACantCoerce | -1700 | Signaled when a value can't be coerced to the desired type. |
| OSACantAccess | -1728 | Signaled when an object is not found in a container |
| OSACantAssign | -10006 | Signaled when an object cannot be set in a container. |
| OSAGeneralError | -2700 | Signaled by user scripts or applications when no actual error code is to be returned. |
| OSADivideByZero | -2701 | Signaled when there is an attempt to divide by zero |
| OSANumericOverflow | -2702 | Signaled when integer or real value is too large to be represented |
| OSACantLaunch | -2703 | Signaled when application can't be launched or when it is remote and program linking is not enabled |
| OSAAppNotHighLevelEventAware | -2704 | Signaled when an application can't respond to AppleEvents |
| OSACorruptTerminology | -2705 | Signaled when an application's terminology resource is not readable |
| OSAStackOverflow | -2706 | Signaled when the runtime stack overflows |
| OSAInternalTableOverflow | -2707 | Signaled when a runtime internal data structure overflows |
| OSADataBlockTooLarge | -2708 | Signaled when an intrinsic limitation is exceeded for the size of a value or data structure. |
| OSACantGetTerminology | -2709 | |
| OSACantCreate | -2710 | |

(Read and Write property)

### 12.2.20 ResultID as Integer

MBS MacClassic Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal result ID for the current script.
**Example:**

```
dim a as new AppleScriptMBS

a.Compile "return ""hello"""
a.Execute

MsgBox str(a.ResultID)
```

**Notes:** May be useful for Toolbox calls.
(Read and Write property)

### 12.2.21 ScriptID as Integer

MBS MacClassic Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal script ID for the current script.
**Example:**

```
dim a as new AppleScriptMBS

a.compile "beep"

MsgBox str(a.ScriptID)
```

**Notes:** May be useful for Toolbox calls.
(Read and Write property)

### 12.2.22 UnicodeText as Boolean

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if you want to use unicode.
**Example:**

```
dim a as AppleScriptMBS

a=new AppleScriptMBS
```

```
a.UnicodeText=true

dim s as string="tell application ""iTunes""""+chr(13)+"set rating of (track ""Flintstones √°√©"") to 40"+chr(13)+"end tell"
a.compile ConvertEncoding(s,Encodings.UTF16)
MsgBox str(a.Lasterror)

a.Execute
MsgBox str(a.Lasterror)

MsgBox a.Result
```

**Notes:** If this property is true, all functions try to get strings as 16 bit Unicode strings.
Strings you pass which are in 16 bit Unicode are passed in Unicode to AppleScript.
You may get trouble if the strings you give this class are not in the system encoding (MacRoman?) or 16 bit Unicode. UTF8 will not work!
(Read and Write property)

### 12.2.23 Binary as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The binary representation of the current compiled script.
**Example:**

```
// create our own compiled AppleScript file

dim a as AppleScriptMBS
dim b as BinaryStream
dim f as FolderItem
dim r as ResourceFork

a=new AppleScriptMBS

// compile a simply applescript:
a.Compile "beep"

// Mac OS X format
f=GetFolderItem("My Apple Script X")

b=f.CreateBinaryFile("applescript")
b.Write a.Binary
b.Close
```

```
// Mac OS 9 format
f=GetFolderItem("My Apple Script 9")

r=f.CreateResourceFork("applescript")
r.AddResource a.Binary,"scpt",128,""
r.Close
```

**Notes:** You can save and load this value to store scripts.
Lasterror is set.
(Read and Write computed property)

### 12.2.24 ScriptPropertyValue(name as string) as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value of a script property.
**Example:**

```
Sub NewEmailinMail(subject as string, body as string, sender as string, receiver as string)
// make a new email in Apple Mail using AppleScript

dim lines(-1) as string


lines.append ""
lines.append "property MySubject : ""My Subject"""
lines.append "property MyBody : ""My Body"""
lines.append "property MyReceiver : ""test@test.test"""
lines.append "property MySender : ""test@test.test"""
lines.append ""
lines.append "tell application ""Mail"""
lines.append " activate"
lines.append " set NewMail to make new outgoing message with properties { visible:true, subject:MySubject,
content:MyBody } "
lines.append " "
lines.append " tell NewMail"
lines.append " make new to recipient at beginning of to recipients with properties { address:MyReceiver } "
lines.append " end tell"
lines.append " "
lines.append " set the sender of NewMail to MySender"
lines.append "end tell"

dim a as new AppleScriptMBS

a.Compile Join(lines,EndOfLine.Macintosh)
```

```
// Change encoding
subject = ConvertEncoding(subject, encodings.MacRoman)
body = ConvertEncoding(body, encodings.MacRoman)
sender = ConvertEncoding(sender, encodings.MacRoman)
receiver = ConvertEncoding(receiver, encodings.MacRoman)

// replace line endoings
subject = ReplaceLineEndings(subject, EndOfLine.Macintosh)
body = ReplaceLineEndings(body, EndOfLine.Macintosh)
sender = ReplaceLineEndings(sender, EndOfLine.Macintosh)
receiver = ReplaceLineEndings(receiver, EndOfLine.Macintosh)

// set properties in Script
a.ScriptPropertyValue("MySubject")=subject
a.ScriptPropertyValue("MyBody")=body
a.ScriptPropertyValue("MySender")=sender
a.ScriptPropertyValue("MyReceiver")=receiver

a.Execute
End Sub
```

**Notes:** If name or value are UTF16 encoding, than the plugin passes UTF16. Else it passes the bytes and AppleScript may assume MacRoman encoding.
(Read and Write computed property)

### 12.2.25 Events

### 12.2.26 Periodic as Integer

MBS MacClassic Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** This event is called periodical on long operations like Compile or Execute.
**Notes:** Return 0 to continue or some other value to report an error.

## 12.3 control DesktopOSAScriptControlMBS

### 12.3.1 control DesktopOSAScriptControlMBS

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a OSAScriptView.
**Notes:** This control embeds a special OSAScriptView subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls

### 12.3.2 Properties

### 12.3.3 AcceptTabs as Boolean

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 12.3.4 Scrollview as Variant

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview for this textview.
**Notes:** (Read only property)

### 12.3.5 View as OSAScriptViewMBS

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 12.3.6 Events

### 12.3.7 BoundsChanged

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 12.3.8 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 12.3.9 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 12.3.10 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 12.3.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacExtras Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 12.3.12 FocusLost

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 12.3.13 FocusReceived

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 12.3.14 FrameChanged

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 12.3.15 MenuBarSelected

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 12.3.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 12.3.17 MouseDrag(x as Integer, y as Integer)

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 12.3.18 MouseUp(x as Integer, y as Integer)

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 12.3.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 12.3.20 ScaleFactorChanged(NewFactor as Double)

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 12.3.21 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a text view needs to determine if text in a specified range should be changed.
**Notes:** affectedCharRange: The range of characters to be replaced.
replacementString: The characters that will replace the characters in affectedCharRange; nil if only text attributes are being changed.

Return true to allow the replacement, or false to reject the change.

### 12.3.22 textDidBeginEditing

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has begun editing (that the user has begun changing it).

### 12.3.23 textDidChange

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has changed its characters or formatting attributes.

### 12.3.24 textDidEndEditing

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has finished editing (that it has resigned first responder status).

### 12.3.25 textShouldBeginEditing as boolean

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a text object begins to change its text, this method requests permission to begin editing.

**Notes:** If the delegate returns false, the text object proceeds to make changes. If the delegate returns true, the text object abandons the editing operation. This method is also invoked when the user drags and drops a file onto the text object.

### 12.3.26 textShouldEndEditing as boolean

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked from a text object's implementation of resignFirstResponder, this method requests permission to end editing.
**Notes:** If the delegate returns false, the text object proceeds to finish editing and resign first responder status. If the delegate returns true, the text object selects all of its text and remains the first responder.

### 12.3.27 textViewDidChangeSelection

MBS MacExtras Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the selection changes in the text view.

### 12.3.28 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacExtras Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 12.4 class NSAppleEventDescriptorMBS

### 12.4.1 class NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An instance of NSAppleEventDescriptor represents a descriptor—the basic building block for Apple events.
**Notes:** This class is a wrapper for the underlying Apple event descriptor data type, AEDesc. Scriptable Cocoa applications frequently work with instances of NSAppleEventDescriptor, but should rarely need to work directly with the AEDesc data structure.

A descriptor is a data structure that stores data and an accompanying four-character code. A descriptor can store a value, or it can store a list of other descriptors (which may also be lists). All the information in an Apple event is stored in descriptors and lists of descriptors, and every Apple event is itself a descriptor list that matches certain criteria.

Important: An instance of NSAppleEventDescriptor can represent any kind of descriptor, from a simple value descriptor, to a descriptor list, to a full-fledged Apple event.
Descriptors can be used to build arbitrarily complex containers, so that one Apple event can represent a script statement such as tell application "TextEdit" to get word 3 of paragraph 6 of document 3.

In working with Apple event descriptors, it can be useful to understand some of the underlying data types. You'll find terms such as descriptor, descriptor list, Apple event record, and Apple event defined in Building an Apple Event in Apple Events Programming Guide. You'll also find information on the four-character codes used to identify information within a descriptor. Apple event data types are defined in Apple Event Manager Reference. The values of many four-character codes used by Apple (and in some cases reused by developers) can be found in AppleScript Terminology and Apple Event Codes.

The most common reason to construct an Apple event with an instance of NSAppleEventDescriptor is to supply information in a return Apple event. The most common situation where you might need to extract information from an Apple event (as an instance of NSAppleEventDescriptor) is when an Apple event handler installed by your application is invoked, as described in "Installing an Apple Event Handler" in How Cocoa Applications Handle Apple Events. In addition, if you execute an AppleScript script using the NSAppleScript class, you get an instance of NSAppleEventDescriptor as the return value, from which you can extract any required information.

When you work with an instance of NSAppleEventDescriptor, you can access the underlying descriptor directly, if necessary, with the aeDesc method. Other methods, including descriptorWithDescriptorType make it possible to create and initialize instances of NSAppleEventDescriptor without creating temporary instances of memoryblock.

Cocoa doesn't currently provide a mechanism for applications to directly send raw Apple events (though compiling and executing an AppleScript script with NSAppleScript may result in Apple events being sent).

However, Cocoa applications have full access to the Apple Event Manager C APIs for working with Apple events. So, for example, you might use an instance of NSAppleEventDescriptor to assemble an Apple event and call the Apple Event Manager function AESend to send it.

If you need to send Apple events, or if you need more information on some of the Apple event concepts described here, see Apple Events Programming Guide and Apple Event Manager Reference.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.0pr6
- MBS Xojo / Real Studio Plugins, version 16.2pr4
- MBS Xojo / Real Studio Plugins, version 15.5pr1
- MBS Real Studio Plugins, version 12.1pr5
- MBS Real Studio Plugins, version 11.3pr7
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

### 12.4.2 Methods

### 12.4.3 appleEventWithEventClass(eventClass as string, eventID as string, targetDescriptor as NSAppleEventDescriptorMBS, returnID as Int16, transactionID as UInt32) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor that represents an Apple event, initialized according to the specified information.
**Notes:** eventClass: The event class to be set in the returned descriptor.
eventID: The event ID to be set in the returned descriptor.
addressDescriptor: A pointer to a descriptor that identifies the target application for the Apple event. Passing nil results in an Apple event descriptor that has no keyAddressAttr attribute (it is valid for an Apple event to have no target address attribute).
returnID: The return ID to be set in the returned descriptor. If you pass a value of kAutoGenerateReturnID, the Apple Event Manager assigns the created Apple event a return ID that is unique to the current session. If you pass any other value, the Apple Event Manager assigns that value for the ID.
transactionID: The transaction ID to be set in the returned descriptor. A transaction is a sequence of Apple events that are sent back and forth between client and server applications, beginning with the client's initial request for a service. All Apple events that are part of a transaction must have the same transaction ID. You can specify kAnyTransactionID if the Apple event is not one of a series of interdependent Apple events.

Returns a descriptor for an Apple event, initialized according to the specified parameter values, or nil if an error occurs.

Constants such as kAutoGenerateReturnID and kAnyTransactionID are defined in AE.framework, a sub-framework of ApplicationServices.framework.

### 12.4.4 attributeDescriptorForKeyword(keyword as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a descriptor for the receiver's Apple event attribute identified by the specified keyword.
**Notes:** keyword: A keyword (a four-character code) that identifies the descriptor to obtain.

Returns the attribute descriptor for the specified keyword, or nil if an error occurs.

### 12.4.5 coerceToDescriptorType(descriptorType as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a descriptor obtained by coercing the receiver to the specified type.
**Notes:** descriptorType: The descriptor type to coerce the receiver to.

Returns a descriptor of the specified type, or nil if an error occurs.

### 12.4.6 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 12.4.7 copy as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the apple event descriptor.

### 12.4.8 currentProcessDescriptor as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create and return an application address descriptor using the current process.
**Example:**

```
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.currentProcessDescriptor
MsgBox "Process ID: "+str(d.processIDValue)
```

**Notes:** The result is suitable for use as the "targetDescriptor" parameter of appleEventWithEventClass.

### 12.4.9 descriptorAtIndex(index as Integer) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the descriptor at the specified (one-based) position in the receiving descriptor list.
**Example:**

```
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.listDescriptor
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("Hello")
dim e as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("World")

n.insertDescriptor(d,1)
n.insertDescriptor(e,2)

MsgBox str(n.numberOfItems)

dim x1 as NSAppleEventDescriptorMBS = n.descriptorAtIndex(1)
dim x2 as NSAppleEventDescriptorMBS = n.descriptorAtIndex(2)
MsgBox x1.stringValue+" "+x2.stringvalue
```

**Notes:** Index: The one-based descriptor list position of the descriptor to return.

Returns the descriptor from the specified position (one-based) in the descriptor list, or nil if the specified descriptor cannot be obtained.

### 12.4.10 descriptorForKeyword(keyword as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's descriptor for the specified keyword.

**Example:**

```
dim n as new NSAppleScriptMBS("return system info")
dim r as NSAppleEventDescriptorMBS = n.execute

dim lines(-1) as string

dim u as Integer = r.numberOfItems
for i as Integer = 1 to u
dim keyword as string = r.keywordForDescriptorAtIndex(i)
dim value as string
dim p as NSAppleEventDescriptorMBS = r.descriptorForKeyword(keyword)
if p<>Nil then value = p.stringValue
lines.Append keyword+": "+value
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** keyword: A keyword (a four-character code) that identifies the descriptor to obtain.

Returns a descriptor for the specified keyword, or nil if an error occurs.

### 12.4.11 descriptorWithAlias(item as folderitem) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with type typeAlias that stores the specified folderitem reference.
**Example:**

```
// pick a folderitem
dim folder as FolderItem = SpecialFolder.Desktop

// create value with file reference
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithAlias(folder)

// convert back to FolderItem
dim file as FolderItem = d.FSRefValue

// show path
MsgBox file.NativePath
```

**Notes:** This type can be converted internally to FSRef descriptor.

### 12.4.12 descriptorWithApplicationURL(fileURL as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create and return an application address descriptor using the file URL for an application.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim u as string = f.URLPath
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithApplicationURL(u)
MsgBox d.applicationURLValue
```

**Notes:** The result is suitable for use as the "targetDescriptor" parameter of appleEventWithEventClass.
See also:

- 12.4.13 descriptorWithApplicationURL(item as folderitem) as NSAppleEventDescriptorMBS 2813

### 12.4.13 descriptorWithApplicationURL(item as folderitem) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create and return an application address descriptor using the folderitem for an application.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithApplicationURL(f)
MsgBox d.applicationURLValue
```

**Notes:** The result is suitable for use as the "targetDescriptor" parameter of appleEventWithEventClass.
See also:

- 12.4.12 descriptorWithApplicationURL(fileURL as string) as NSAppleEventDescriptorMBS 2813

### 12.4.14 descriptorWithBoolean(value as Boolean) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with type typeBoolean that stores the specified Boolean value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithBoolean(true)
```

```
MsgBox a.stringValue // shows true
```

**Notes:** Returns a descriptor with the specified Boolean value, or nil if an error occurs.

### 12.4.15 descriptorWithBundleIdentifier(BundleID as String) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create and return an application address descriptor using the bundle identifier.
**Example:**

```
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithBundleIdentifier("com.apple.iCal")
MsgBox d.bundleIDValue
```

**Notes:** The result is suitable for use as the "targetDescriptor" parameter of appleEventWithEventClass.

### 12.4.16 descriptorWithCurrentProcessSerialNumber as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates descriptor with current process serial number.
**Example:**

```
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithCurrentProcessSerialNumber
MsgBox n.stringValue // shows app name
```

### 12.4.17 descriptorWithDate(value as date) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor with a date value.
**Example:**

```
dim d as new date
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithDate(d)
```

```
dim x as date = n.dateValue
MsgBox x.LongDate+" "+x.LongTime // shows today
```

### 12.4.18 descriptorWithDateTime(value as dateTime) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor with a date value.

### 12.4.19 descriptorWithDescriptorType(descriptorType as string, data as memoryblock) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with the specified event type that stores the specified data.
**Notes:** descriptorType: The descriptor type to be set in the returned descriptor.
data: The data, as a memoryblock, to be set in the returned descriptor.

Returns a descriptor with the specified type and data, or nil if an error occurs.

You can use this method to create a descriptor that you can build into a complete Apple event by calling methods such as setAttributeDescriptor, setDescriptor, and setParamDescriptor.
See also:

- 12.4.20 descriptorWithDescriptorType(descriptorType as string, data as memoryblock, offset as UInt32, length as UInt32) as NSAppleEventDescriptorMBS 2815

### 12.4.20 descriptorWithDescriptorType(descriptorType as string, data as memoryblock, offset as UInt32, length as UInt32) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with the specified event type that stores the specified data (from a series of bytes).
**Notes:** descriptorType: The descriptor type to be set in the returned descriptor.
bytes: The data, as a sequence of bytes, to be set in the returned descriptor.
offset: offset in memoryblock.
length: The length, in bytes, of the data to be set in the returned descriptor.

Returns a descriptor with the specified type and data, or nil if an error occurs.
See also:

- 12.4.19 descriptorWithDescriptorType(descriptorType as string, data as memoryblock) as NSAppleEventDescriptorMBS 2815

### 12.4.21 descriptorWithDouble(value as Double) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor with a double value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithDouble(5)
MsgBox a.stringValue // shows 5
```

### 12.4.22 descriptorWithEnumCode(enumerator as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with type typeEnumerated that stores the specified enumerator data type value.
**Notes:** enumerator: A type code that identifies the type of enumerated data to be stored in the returned descriptor.

Returns a descriptor with the specified enumerator data type value, or nil if an error occurs.

### 12.4.23 descriptorWithFileURL(fileURL as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor for a file URL.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim u as string = f.URLPath
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithFileURL(u)
MsgBox d.fileURLValue
```

See also:


- 12.4.24 descriptorWithFileURL(item as folderitem) as NSAppleEventDescriptorMBS 2817


### 12.4.24 descriptorWithFileURL(item as folderitem) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor for a file URL based on the folderitem.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithFileURL(f)
MsgBox d.fileURLValue
```

See also:


- 12.4.23 descriptorWithFileURL(fileURL as string) as NSAppleEventDescriptorMBS 2816


### 12.4.25 descriptorWithInt16(value as Int16) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with Apple event type typeSInt16 that stores the specified integer value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS

a = NSAppleEventDescriptorMBS.descriptorWithInt16(5)

MsgBox a.stringValue // shows 5
```

### 12.4.26 descriptorWithInt32(value as Int32) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with Apple event type typeSInt32 that stores the specified integer value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithInt32(5)
```

```
MsgBox a.stringValue // shows 5
```

**Notes:** Returns a descriptor containing the specified integer value, or nil if an error occurs.

### 12.4.27 descriptorWithProcessIdentifier(PID as Integer) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create and return an application address descriptor using the process identifier.
**Example:**

```
// get my PID
dim p as new ProcessMBS
p.GetCurrentProcess
dim pid as Integer = p.ProcessID

// make process ID descriptor
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithProcessIdentifier(pid)

// show it
MsgBox "ProcessID: "+str(n.processIDValue) + EndOfLine + n.stringValue
```

**Notes:** The result is suitable for use as the "targetDescriptor" parameter of appleEventWithEventClass.

### 12.4.28 descriptorWithSingle(value as single) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor with a single value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithSingle(5)
MsgBox a.stringValue // shows 5
```

### 12.4.29 descriptorWithString(text as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with type typeUnicodeText that stores the text from the specified string.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("Hello World")

MsgBox a.stringValue
```

**Notes:** Returns a descriptor that contains the text from the specified string, or nil if an error occurs.

### 12.4.30 descriptorWithTypeCode(typeCode as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor initialized with type typeType that stores the specified type value.
**Notes:** typeCode: The type value to be set in the returned descriptor.

Returns a descriptor with the specified type, or nil if an error occurs.

### 12.4.31 descriptorWithUInt32(value as UInt32) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a descriptor with an unsigned integer value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithUInt32(5)
MsgBox a.stringValue // shows 5
```

### 12.4.32 insertDescriptor(descriptor as NSAppleEventDescriptorMBS, index as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Inserts a descriptor at the specified (one-based) position in the receiving descriptor list, replacing the existing descriptor, if any, at that position.
**Notes:** descriptor: The descriptor to insert in the receiver. Specifying an index of 0 or count + 1 causes appending to the end of the list.
Index: The one-based descriptor list position at which to insert the descriptor.

Because it actually replaces the descriptor, if any, at the specified position, this method might better be called replaceDescriptor. The receiver must be a list descriptor. The indices are one-based. Currently provides no indication if an error occurs.

### 12.4.33 keywordForDescriptorAtIndex(index as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the keyword for the descriptor at the specified (one-based) position in the receiver.
**Example:**

```
dim n as new NSAppleScriptMBS("return system info")
dim r as NSAppleEventDescriptorMBS = n.execute

dim lines(-1) as string

dim u as Integer = r.numberOfItems
for i as Integer = 1 to u
dim keyword as string = r.keywordForDescriptorAtIndex(i)
dim value as string
dim p as NSAppleEventDescriptorMBS = r.descriptorForKeyword(keyword)
if p<>Nil then value = p.stringValue
lines.Append keyword+": "+value
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Index: The one-based descriptor list position of the descriptor to get the keyword for.

Returns the keyword (a four-character code) for the descriptor at the one-based location specified by anIndex, or 0 if an error occurs.

### 12.4.34 listDescriptor as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and initializes an empty list descriptor.
**Notes:** Returns an empty list descriptor, or nil if an error occurs.

A list descriptor is a descriptor whose data consists of one or more descriptors. You can add items to the list by calling insertDescriptor or remove them with removeDescriptorAtIndex.

### 12.4.35 nullDescriptor as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and initializes a descriptor with no parameter or attribute values set.
**Notes:** Returns a descriptor with no parameter or attribute values set, or nil if an error occurs.

You don't typically call this method, as most NSAppleEventDescriptor instance methods can't be safely called on the returned empty descriptor.

### 12.4.36 paramDescriptorForKeyword(keyword as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a descriptor for the receiver's Apple event parameter identified by the specified keyword.
**Notes:** keyword: A keyword (a four-character code) that identifies the parameter descriptor to obtain.

Returns a descriptor for the specified keyword, or nil if an error occurs.

### 12.4.37 print

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes description for this event descriptor to the console.
**Notes:** You can see result in Console.app.

### 12.4.38 recordDescriptor as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and initializes a descriptor for an Apple event record whose data has yet to be set.
**Notes:** Returns an Apple event descriptor whose data has yet to be set, or nil if an error occurs.

An Apple event record is a descriptor whose data is a set of descriptors keyed by four-character codes. You can add information to the descriptor with methods such as setAttributeDescriptor, setDescriptor, and setParamDescriptor.

### 12.4.39 removeDescriptorAtIndex(index as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the descriptor at the specified (one-based) position in the receiving descriptor list.
**Notes:** Index: The one-based position of the descriptor to remove.

The receiver must be a list descriptor. The indices are one-based. Currently provides no indication if an error occurs.

### 12.4.40 removeDescriptorWithKeyword(keyword as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the receiver's descriptor identified by the specified keyword.
**Notes:** keyword: A keyword (a four-character code) that identifies the descriptor to remove.

The receiver must be an Apple event or Apple event record. Currently provides no indication if an error occurs.

### 12.4.41 removeParamDescriptorWithKeyword(keyword as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the receiver's parameter descriptor identified by the specified keyword.
**Notes:** keyword: A keyword (a four-character code) that identifies the parameter descriptor to remove. Currently provides no indication if an error occurs.

The receiver must be an Apple event or Apple event record, both of which can contain parameters.

### 12.4.42 send(options as Integer, timeoutInSeconds as Double, byref error as NSErrorMBS) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends an Apple event.
**Example:**

```
// pick a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
// make a descriptor for file
dim fd as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithFSRef(f)
// make a descriptor for target app. here by bundle id
dim bd as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithBundleIdentifier("com.apple.finder")
// make a descriptor for apple event, here OpenDocument event
dim ad as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.appleEventWithEventClass("aevt",
"odoc", bd, fd.kAutoGenerateReturnID, fd.kAnyTransactionID)

// assign parameter
ad.setParamDescriptor(fd, "—-")

// now run
dim e as NSErrorMBS
dim rd as NSAppleEventDescriptorMBS = ad.send(ad.NSAppleEventSendDefaultOptions, 0.1, e)

// error sending?
if e <>nil then
MsgBox e.LocalizedDescription
end if

Break // inspect rd for success or failure of event?
```

### 12.4.43 setAttributeDescriptor(descriptor as NSAppleEventDescriptorMBS, keyword as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a descriptor to the receiver as an attribute identified by the specified keyword.
**Notes:** descriptor: The attribute descriptor to add to the receiver.
keyword: A keyword (a four-character code) that identifies the attribute descriptor to add. If a descriptor with that keyword already exists in the receiver, it is replaced.

The receiver must be an Apple event. Currently provides no indication if an error occurs.

### 12.4.44 setDescriptor(descriptor as NSAppleEventDescriptorMBS, keyword as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a descriptor, identified by a keyword, to the receiver.
**Notes:** descriptor: The descriptor to add to the receiver.
keyword: A keyword (a four-character code) that identifies the descriptor to add. If a descriptor with that keyword already exists in the receiver, it is replaced.

The receiver must be an Apple event or Apple event record. Currently provides no indication if an error occurs.

### 12.4.45 setParamDescriptor(descriptor as NSAppleEventDescriptorMBS, keyword as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a descriptor to the receiver as an Apple event parameter identified by the specified keyword.
**Notes:** descriptor: The parameter descriptor to add to the receiver.
keyword: A keyword (a four-character code) that identifies the parameter descriptor to add. If a descriptor with that keyword already exists in the receiver, it is replaced.

The receiver must be an Apple event or Apple event record, both of which can contain parameters.

### 12.4.46 Properties

### 12.4.47 aeDesc as Ptr

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a pointer to the AEDesc structure that is encapsulated by the receiver, if it has one.
**Notes:** If the receiver has a valid AEDesc structure, returns a pointer to it; otherwise returns nil.
(Read only property)

### 12.4.48 applicationURLValue as String

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The application URL.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim u as string = f.URLPath
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithApplicationURL(u)
MsgBox d.applicationURLValue
```

**Notes:** (Read only property)

### 12.4.49 booleanValue as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a Boolean value, coercing (to typeBoolean) if necessary.
**Example:**

```
dim lines(-1) as string

lines.Append "set a to 1"
lines.Append "set b to 1"
lines.Append "return a = b" // return a boolean result

// compile, run and show value
dim source as string = Join(lines,EndOfLine)
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
dim d as NSAppleEventDescriptorMBS = n.execute(Error)

MsgBox str(d.booleanValue)
```

**Notes:** Returns the contents of the descriptor, as a Boolean value, or false if an error occurs.
(Read only property)

### 12.4.50 bundleIDValue as String

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the bundle identifier.
**Example:**

```
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithBundleIdentifier("com.apple.iCal")
MsgBox d.bundleIDValue
```

**Notes:** (Read only property)

### 12.4.51 data as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's data as a memoryblock.
**Notes:** Returns an instance of memoryblock containing the receiver's data, or nil if an error occurs. (Read only property)

### 12.4.52 dateTimeValue as DateTime

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a date value.
**Notes:** (Read only property)

### 12.4.53 dateValue as date

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a date value.
**Example:**

```
dim d as new date
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithDate(d)

dim x as date = n.dateValue
MsgBox x.LongDate+" "+x.LongTime // shows today
```

**Notes:** (Read only property)

### 12.4.54 description as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The descriptor for this event.
**Example:**

```
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("Hello")
MsgBox n.description
```

**Notes:** This is a text representation for debugging.
(Read only property)

### 12.4.55 descriptorType as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the descriptor type of the receiver.
**Notes:** (Read only property)

### 12.4.56 doubleValue as Double

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a double.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("5")
MsgBox str(a.doubleValue) // shows 5
```

**Notes:** (Read only property)

### 12.4.57 enumCodeValue as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as an enumeration type, coercing (to typeEnumerated) if necessary.
**Notes:** Returns the contents of the descriptor, as an enumeration type, or 0 if an error occurs.
(Read only property)

### 12.4.58 eventClass as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the event class for the receiver.
**Notes:** Returns the event class (a four-character code) for the receiver, or 0 if an error occurs.

The receiver must be an Apple event. An Apple event is identified by its event class and event ID, a pair of four-character codes stored as 32-bit integers. For example, most events in the Standard suite have the four-character code 'core' (defined as the constant kAECoreSuite in AE.framework, a subframework of ApplicationServices.framework). For more information on event classes and event IDs, see Building an Apple Event in Apple Events in Apple Events Programming Guide.
(Read only property)

### 12.4.59 eventID as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the event ID for the receiver.
**Notes:** The event ID (a four-character code) for the receiver, or 0 if an error occurs.

The receiver must be an Apple event. An Apple event is identified by its event class and event ID, a pair of four-character codes stored as 32-bit integers. For example, the open Apple event from the Standard suite has the four-character code 'odoc' (defined as the constant kAEOpen in AE.framework, a subframework of ApplicationServices.framework).
(Read only property)

### 12.4.60 fileURLValue as String

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file URL.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Stickies.app")
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithFileURL(f)
MsgBox d.fileURLValue
```

**Notes:** (Read only property)

### 12.4.61 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the internal reference to the NSAppleEventDescriptor object.
**Notes:** (Read and Write property)

### 12.4.62 int16Value as Int16

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as an int16.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("5")
MsgBox str(a.int16Value) // shows 5
```

**Notes:** (Read only property)

### 12.4.63 int32Value as Int32

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as an integer, coercing (to typeSInt32) if necessary.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("5")
MsgBox str(a.int32Value) // shows 5
```

**Notes:** Returns the contents of the descriptor, as an integer value, or 0 if an error occurs.
(Read only property)

### 12.4.64 isRecordDescriptor as Boolean

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Return whether or not a descriptor is a record-like descriptor.
**Notes:** Record-like descriptors function as records, but may have a descriptorType other than AERecord, such as ObjectSpecifier.
(Read only property)

### 12.4.65 numberOfItems as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of descriptors in the receiver's descriptor list.
**Example:**

```
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.listDescriptor
dim d as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("Hello")
dim e as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("World")

n.insertDescriptor(d,1)
n.insertDescriptor(e,2)

MsgBox str(n.numberOfItems)

dim x1 as NSAppleEventDescriptorMBS = n.descriptorAtIndex(1)
dim x2 as NSAppleEventDescriptorMBS = n.descriptorAtIndex(2)
MsgBox x1.stringValue+" "+x2.stringvalue
```

**Notes:** Returns the number of descriptors in the receiver's descriptor list (possibly 0); returns 0 if an error occurs.
(Read only property)

### 12.4.66 processIDValue as Integer

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the process ID.
**Example:**

```
// get my PID
dim p as new ProcessMBS
p.GetCurrentProcess
dim pid as Integer = p.ProcessID

// make process ID descriptor
dim n as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithProcessIdentifier(pid)

// show it
MsgBox "ProcessID: "+str(n.processIDValue) + EndOfLine + n.stringValue
```

**Notes:** (Read only property)

### 12.4.67 returnID as Int16

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's return ID (the ID for a reply Apple event).
**Notes:** Returns the receiver's return ID (an integer value), or 0 if an error occurs.
(Read only property)

### 12.4.68 singleValue as single

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a single value.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("5")
MsgBox str(a.singleValue) // shows 5
```

**Notes:** (Read only property)

### 12.4.69 stringValue as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a Unicode text string, coercing (to typeUnicodeText) if necessary.
**Example:**

```
dim a as NSAppleEventDescriptorMBS

a = NSAppleEventDescriptorMBS.descriptorWithString("Hello World")

MsgBox a.stringValue
```

**Notes:** Returns the contents of the descriptor, as a string, or "" if an error occurs.
(Read only property)

### 12.4.70 transactionID as Int32

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's transaction ID, if any.
**Notes:** Returns the receiver's transaction ID (an integer value), or 0 if an error occurs.

The receiver must be an Apple event. Currently provides no indication if an error occurs. For more information on transactions, see the description for appleEventWithEventClass.
(Read only property)

### 12.4.71 typeCodeValue as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as a type, coercing (to typeType) if necessary.
**Notes:** (Read only property)

### 12.4.72 UInt32Value as UInt32

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the contents of the receiver as an UInt32.
**Example:**

```
dim a as NSAppleEventDescriptorMBS
a = NSAppleEventDescriptorMBS.descriptorWithString("5")
MsgBox str(a.UInt32Value) // shows 5
```

**Notes:** (Read only property)

### 12.4.73 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAnyTransactionID | 0 | Special constant for transaction ID.<br>no transaction is in use |
| kAutoGenerateReturnID | -1 | Special constant for return ID.<br>AECreateAppleEvent will generate a session-unique ID internally. |

Send Options

| Constant | Value | Description |
|---|---|---|
| NSAppleEventSendAlwaysInteract | &h30 | Server should always interact with user where appropriate. |
| NSAppleEventSendCanInteract | &h20 | Server may try to interact with user. |
| NSAppleEventSendCanSwitchLayer | &h40 | Interaction may switch layer. |
| NSAppleEventSendDefaultOptions | &h23 | Default options: WaitForReply with CanInteract. |
| NSAppleEventSendDontAnnotate | &h10000 | Don't automatically add any sandbox or other annotations to the event |
| NSAppleEventSendDontExecute | &h2000 | Don't execute this event; used for recording. |
| NSAppleEventSendDontRecord | &H1000 | Don't record this event. |
| NSAppleEventSendNeverInteract | &h10 | Server should not interact with user. |
| NSAppleEventSendNoReply | 1 | Sender doesn't want a reply to event. |
| NSAppleEventSendQueueReply | 2 | Sender wants a reply but won't wait. |
| NSAppleEventSendWaitForReply | 3 | Sender wants a reply and will wait. |

## 12.5 class NSAppleEventHandlerMBS

### 12.5.1 class NSAppleEventHandlerMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for an apple event handler.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr3

### 12.5.2 Methods

### 12.5.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 12.5.4 Destructor

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 12.5.5 Properties

### 12.5.6 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 12.5.7 Events

### 12.5.8 handleAppleEvent(theEvent as NSAppleEventDescriptorMBS, replyEvent as NSAppleEventDescriptorMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called when an event needs to be handled.

## 12.6 class NSAppleEventManagerMBS

### 12.6.1 class NSAppleEventManagerMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for the Apple Event Manager.
**Notes:** Provides a mechanism for registering handler routines for specific types of Apple events and dispatching events to those handlers.

Cocoa provides built-in scriptability support that uses scriptability information supplied by an application to automatically convert Apple events into script command objects that perform the desired operation. However, some applications may want to perform more basic Apple event handling, in which an application registers handlers for the Apple events it can process, then calls on the Apple Event Manager to dispatch received Apple events to the appropriate handler. NSAppleEventManager supports these mechanisms by providing methods to register and remove handlers and to dispatch Apple events to the appropriate handler, if one exists. For related information, see How Cocoa Applications Handle Apple Events (on Apple Developer Website).

For information about the Apple Event Manager, see Apple Event Manager Reference and Apple Events Programming Guide (on Apple Developer Website).
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr3

### 12.6.2 Methods

### 12.6.3 appleEventForSuspensionID(id as NSAppleEventManagerSuspensionIDMBS) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a suspensionID returned by an invocation of suspendCurrentAppleEvent, returns the descriptor for the event whose handling was suspended.

### 12.6.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 12.6.5 currentAppleEvent as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the descriptor for currentAppleEvent if an Apple event is being handled on the current thread.
**Notes:** An Apple event is being handled on the current thread if a handler that was registered with setEventHandler is being messaged at this instant or setCurrentAppleEventAndReplyEventWithSuspensionID has just been invoked. Returns nil otherwise. The effects of mutating or retaining the returned descriptor are undefined, although it may be copied.

### 12.6.6 currentReplyAppleEvent as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the corresponding reply event descriptor if an Apple event is being handled on the current thread.
**Notes:** An Apple event is being handled on the current thread if currentAppleEvent does not return nil. Returns nil otherwise. This descriptor, including any mutations, will be returned to the sender of the current event when all handling of the event has been completed, if the sender has requested a reply. The effects of retaining the descriptor are undefined; it may be copied, but mutations of the copy are not returned to the sender of the current event.

### 12.6.7 NSAppleEventManagerWillProcessFirstEventNotification as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names you can use with NSNotificationObserverMBS.
**Notes:** Posted by NSAppleEventManager before it first dispatches an Apple event. Your application can use this notification to avoid registering any Apple event handlers until the first time at which they may be needed. The notification object is the NSAppleEventManager. This notification does not contain a userInfo dictionary.

### 12.6.8 removeEventHandlerForEventClass(eventClass as string, eventID as string)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If an Apple event handler has been registered for the event specified by eventClass and eventID, removes it.

### 12.6.9 replyAppleEventForSuspensionID(id as NSAppleEventManagerSuspensionIDMBS) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a nonzero suspensionID returned by an invocation of suspendCurrentAppleEvent, returns the corresponding reply event descriptor.
**Notes:** This descriptor, including any mutations, will be returned to the sender of the suspended event when handling of the event is resumed, if the sender has requested a reply. The effects of retaining the descriptor are undefined; it may be copied, but mutations of the copy are returned to the sender of the suspended event. replyAppleEventForSuspensionID may be invoked in any thread, not just the one in which the corresponding invocation of suspendCurrentAppleEvent occurred.

### 12.6.10 resumeWithSuspensionID(id as NSAppleEventManagerSuspensionIDMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a suspensionID returned by an invocation of suspendCurrentAppleEvent, signal that handling of the suspended event may now continue.
**Notes:** This may result in the immediate sending of the reply event to the sender of the suspended event, if the sender has requested a reply. If suspensionID has been used in a previous invocation of setCurrentAppleEventAndReplyEventWithSuspensionID the effects of that invocation are completely undone. Redundant invocations of resumeWithSuspensionID are ignored. Subsequent invocations of other NSAppleEventManager methods using the same suspension ID are invalid. resumeWithSuspensionID may be invoked in any thread, not just the one in which the corresponding invocation of suspendCurrentAppleEvent occurred.

### 12.6.11 setCurrentAppleEventAndReplyEventWithSuspensionID(id as NSAppleEventManagerSuspensionIDMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a nonzero suspensionID returned by an invocation of suspendCurrentAppleEvent, sets the values that will be returned by subsequent invocations of currentAppleEvent and currentReplyAppleEvent to be the event whose handling was suspended and its corresponding reply event, respectively.
**Notes:** Redundant invocations of setCurrentAppleEventAndReplyEventWithSuspensionID are ignored.

### 12.6.12 setEventHandler(handler as NSAppleEventHandlerMBS, eventClass as string, eventID as string)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registers the Apple event handler specified by handler for the event specified by eventClass and eventID.

### 12.6.13 suspendCurrentAppleEvent as NSAppleEventManagerSuspensionIDMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Suspends the handling of the current event and returns an ID that must be used to resume the handling of the event if an Apple event is being handled on the current thread.
**Notes:** An Apple event is being handled on the current thread if currentAppleEvent does not return nil. Returns zero otherwise. The suspended event is no longer the current event after this method returns.

### 12.6.14 Properties

### 12.6.15 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 12.7 class NSAppleEventManagerSuspensionIDMBS

### 12.7.1 class NSAppleEventManagerSuspensionIDMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Identifies an Apple event whose handling has been suspended.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr3

### 12.7.2 Methods

### 12.7.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 12.7.4 Properties

### 12.7.5 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 12.8 class NSAppleScriptMBS

### 12.8.1 class NSAppleScriptMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSAppleScriptMBS class provides the ability to load, compile, and execute scripts.
**Example:**

```
dim source as string = "tell Application ""iTunes"" to pause"
dim n as new NSAppleScriptMBS(source)
call n.execute
```

**Notes:** Your application may need the NSAppleEventsUsageDescription entry in info.plist to do any AppleScript usage:
https://developer.apple.com/documentation/bundleresources/information_property_list/nsappleeventsusagedescription

If you use hardened runtime, which you need for notarization, you may need the entitlement for Apple Events, too:
https://developer.apple.com/documentation/bundleresources/entitlements/com_apple_security_automation_apple-events

Important: You should access NSAppleScriptMBS only from the main thread.

This class provides applications with the ability to

- load a script from a URL or from a text string
- compile or execute a script or an individual Apple event
- obtain an NSAppleEventDescriptorMBS containing the reply from an executed script or event
- obtain an attributed string for a compiled script, suitable for display in a script editor
- obtain various kinds of information about any errors that may occur

Important: NSAppleScriptMBS provides the execute method so that you can send an Apple event to invoke a handler in a script. (In an AppleScript script, a handler is the equivalent of a function.) However, you cannot use this method to send Apple events to other applications.

When you create an instance of NSAppleScriptMBS object, you can use a URL or a folderitem to specify a script that can be in either text or compiled form, or you can supply the script as a string. Should an error occur when compiling or executing the script, several of the methods return a dictionary containing error

information. The keys for obtaining error information, such as NSAppleScriptErrorMessage, are described in the Constants section.

**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr7
- MBS Xojo / Real Studio Plugins, version 15.5pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Real Studio Plugins, version 13.0pr5
- MBS Real Studio Plugins, version 12.3pr16
- MBS Real Studio Plugins, version 12.1pr10
- MBS Real Studio Plugins, version 11.3pr4
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

### 12.8.2 Methods

### 12.8.3 compile as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compiles the receiver, if it is not already compiled.
**Example:**

```
dim source as string = "tell application ""iTunes""""+EndOfLine+"pause"+EndOfLine+"end tell"
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
if n.compile then
MsgBox "OK"
else
MsgBox error.Value(n.NSAppleScriptErrorMessage)
end if
```

**Notes:** error: Optional, on return, if an error occurs, an error information dictionary.
Return Value
Returns true for success or if the script was already compiled, false otherwise.
See also:


- 12.8.4 compile(byref error as dictionary) as boolean 2843


### 12.8.4 compile(byref error as dictionary) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compiles the receiver, if it is not already compiled.
**Example:**

```
dim source as string = "tell application ""iTunes""""+EndOfLine+"pause"+EndOfLine+"end tell"
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
if n.compile(error) then
MsgBox "OK"
else
MsgBox error.Value(n.NSAppleScriptErrorMessage)
end if
```

**Notes:** error: Optional, on return, if an error occurs, an error information dictionary.
Return Value
Returns true for success or if the script was already compiled, false otherwise.
See also:


- 12.8.3 compile as boolean 2842


### 12.8.5 Constructor(file as folderitem, byref error as Dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated script instance from the source identified by the passed folderitem.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.scpt")
dim error as Dictionary
dim n as new NSAppleScriptMBS(file, error)

if n.handle = 0 then
dim err as Integer = error.lookup(n.NSAppleScriptErrorNumber,0)
if err = -43 then
MsgBox "File not found."
```

```
else
MsgBox "Some other error. "+str(n)
end if
else
MsgBox n.source
end if
```

**Notes:** file: A folderitem that locates a script, in either text or compiled form.
error: On return, if an error occurs, the error information dictionary.

Handle is zero in case of error.
See also:


- 12.8.6 Constructor(source as string) 2844
- 12.8.7 Constructor(sourceLines() as string) 2844
- 12.8.8 Constructor(URL as string, byref error as Dictionary) 2845


### 12.8.6 Constructor(source as string)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated script instance from the passed source.
**Example:**

```
dim source as string = "beep"
dim n as new NSAppleScriptMBS(source)
```

**Notes:** Handle is zero in case of error.
See also:


- 12.8.5 Constructor(file as folderitem, byref error as Dictionary) 2843
- 12.8.7 Constructor(sourceLines() as string) 2844
- 12.8.8 Constructor(URL as string, byref error as Dictionary) 2845


### 12.8.7 Constructor(sourceLines() as string)

MBS MacCocoa Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated script instance from the passed source.
**Example:**

```
dim lines() as string

lines.Append "property hello : ""Hallo Leute"""
lines.Append "property just : ""Just a test"""
lines.Append "display dialog hello"
lines.Append "return just"

dim a as new NSAppleScriptMBS(lines)

// compile
call a.Compile

// show names
dim names() as string = a.properties
MsgBox Join(names,EndOfLine)

// query value
MsgBox a.valueDescriptorForProperty("hello").stringValue

// change value
dim o as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("just a test")
call a.setValueDescriptorForProperty("hello", o)

// and query again
MsgBox a.valueDescriptorForProperty("hello").stringValue
```

**Notes:** Handle is zero in case of error.
See also:


- 12.8.5 Constructor(file as folderitem, byref error as Dictionary) 2843
- 12.8.6 Constructor(source as string) 2844
- 12.8.8 Constructor(URL as string, byref error as Dictionary) 2845


### 12.8.8 Constructor(URL as string, byref error as Dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated script instance from the source identified by the passed URL.
**Notes:** file: A folderitem that locates a script, in either text or compiled form.
error: On return, if an error occurs, the error information dictionary.

Handle is zero in case of error.
See also:

- 12.8.5 Constructor(file as folderitem, byref error as Dictionary) 2843
- 12.8.6 Constructor(source as string) 2844
- 12.8.7 Constructor(sourceLines() as string) 2844


### 12.8.9 copy as NSAppleScriptMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of this object.
**Example:**

```
dim source as string = "tell application ""iTunes""""+EndOfLine+"pause"+EndOfLine+"end tell"
dim n as new NSAppleScriptMBS(source)

dim copy as NSAppleScriptMBS = n.copy
call copy.execute
```

### 12.8.10 DeterminePermissionToAutomateTarget(target as NSAppleEventDescriptorMBS, theAEEventClass as string = "****", theAEEventID as String = "****", askUserIfNeeded as boolean) as Integer

MBS MacCocoa Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines whether the current application is able to send an AppleEvent with the given eventClass and eventID to the application described as target.
**Example:**

```
dim target as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithBundleIdentifier("com.apple.Safari")

// we ask for all apple events
dim e as integer = NSAppleScriptMBS.DeterminePermissionToAutomateTarget(target, "****", "****", true)

MsgBox str(e)
```

**Notes:** Mac OS 10.14 and later impose additional requirements on applications when they send AppleEvents to other applications in order to insure that users are aware of and consent to allowing such control or information exchange. Generally this involves the user being prompted in a secure fashion the first time an application attempts to send an AppleEvent to another application. If the user consents then this application can send events to the target. If the user does not consent then any future attempts to send AppleEvents will result in a failure with errAEEventNotPermitted (-1743) being returned.

Certain AppleEvents are allowed to be sent without prompting the user. Pass typeWildCard for the eventClass and eventID to determine if every event is allowed to be sent from this application to the target.

Applications can determine, without sending an AppleEvent to a target application, whether they are allowed to send AppleEvents to the target with this function. If askUserIfNeeded is true, and this application does not yet have permission to send AppleEvents to the target, then the user will be asked if permission can be granted; if askUserIfNeeded is false and permission has not been granted, then errAEEventWouldRequireUserConsent (-1744) will be returned.
The target must refer to an already running application.

If the current application is permitted to send the given AppleEvent to the target, then noErr (0) will be returned. If the current application is not permitted to send the event, errAEEventNotPermitted (-1743) will be returned. If the target application is not running, then procNotFound (-600) will be returned. If askUserIfNeeded is false, and this application is not yet permitted to send AppleEvents to the target, then errAEEventWouldRequireUserConsent (-1744) will be returned.

Mac OS X threading: Thread safe since version 10.14. Do not call this function on your main thread because it may take arbitrarily long to return if the user needs to be prompted for consent.

target: The address descriptor. Before calling AEDeterminePermissionToAutomateTarget, you set the descriptor to identify the target application for the Apple event. The target address descriptor must refer to a running application. If the target application is on another machine, then Remote AppleEvents must be enabled on that machine for the user.
theAEEventClass: The event class of the Apple event to determine permission for.
theAEEventID: The event ID of the Apple event to determine permission for.
askUserIfNeeded: a Boolean; if true, and if this application does not yet have permission to send events to the target application, then prompt the user to obtain permission. If false, do not prompt the user.

Plugin returns -1 if the function is not available, e.g. older MacOS versions.

### 12.8.11 execute as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Executes the receiver, compiling it first if it is not already compiled.
**Example:**

```
dim source as string = "tell Application ""iTunes"" to pause"
dim n as new NSAppleScriptMBS(source)
call n.execute
```

**Notes:** error: Optional, on return, if an error occurs, an error information dictionary.

Returns the result of executing the event, or nil if an error occurs.
Any changes to property values caused by executing the script do not persist.
See also:

- 12.8.12 execute(byref error as dictionary) as NSAppleEventDescriptorMBS 2848

### 12.8.12 execute(byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Executes the receiver, compiling it first if it is not already compiled.
**Example:**

```
dim source as string = "tello Application ""iTunes"" to play"
dim error as dictionary
dim n as new NSAppleScriptMBS(source)
dim p as NSAppleEventDescriptorMBS = n.execute(Error)
if p <>nil then
MsgBox "OK"
else
MsgBox error.Lookup(n.NSAppleScriptErrorMessage,"unknown error")
end if
```

**Notes:** error: Optional, on return, if an error occurs, an error information dictionary.
Returns the result of executing the event, or nil if an error occurs.
Any changes to property values caused by executing the script do not persist.
See also:

- 12.8.11 execute as NSAppleEventDescriptorMBS 2847

### 12.8.13 executeAppleEvent(event as NSAppleEventDescriptorMBS, byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Executes an Apple event in the context of the receiver, as a means of allowing the application to invoke a handler in the script.
**Notes:** event: The Apple event to execute.
error: On return, if an error occurs, an error information dictionary.

Returns the result of executing the event, or nil if an error occurs.

Compiles the receiver before executing it if it is not already compiled.

Important: You cannot use this method to send Apple events to other applications.

### 12.8.14 executeSubroutine(Name as String, parameters() as NSAppleEventDescriptorMBS, byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calls a subroutine in a script.
**Example:**

```
// our script

Dim CodeLines() as string

CodeLines.Append "on Add(Name1, Name2)"
CodeLines.Append "return Name1 & "" "" & Name2"
CodeLines.Append "end Add"

// now compile it
Dim a as new NSAppleScriptMBS(CodeLines)
Dim error as dictionary
Dim CompileOkay As Boolean = a.Compile(error)

if CompileOkay then

// script name and parameters
Dim ScriptFuncName As String = "Add"

Dim ScriptParams() As NSAppleEventDescriptorMBS
ScriptParams.Append NSAppleEventDescriptorMBS.descriptorWithString("Hello")
ScriptParams.Append NSAppleEventDescriptorMBS.descriptorWithString("World")

// bow run it
Dim p as NSAppleEventDescriptorMBS

p = a.executeSubroutine(ScriptFuncName, ScriptParams, Error)
if error = nil then
// show result
Dim ScriptResult As String = p.stringValue

MsgBox "ScriptResult:" + EndOfLine + EndOfLine + ScriptResult
else
MsgBox "Error running script." + _
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorMessage, "Unknown error") + _
```

```
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorBriefMessage, "Unknown error") + _
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorNumber, "Unknown error")
end if
else
// Compile Error
MsgBox "Error loading script." + _
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorMessage, "Unknown error") + _
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorBriefMessage, "Unknown error") + _
EndOfLine + EndOfLine + _
error.Lookup(a.NSAppleScriptErrorNumber, "Unknown error")
end if
```

**Notes:** Similar to executeAppleEvent, but creates the apple event for you.

Name: The name of the subroutine to execute.
parameters: The parameters for the subroutine.
error: On return, if an error occurs, an error information dictionary.

Returns the result of executing the event, or nil if an error occurs.
Compiles the receiver before executing it if it is not already compiled.
Important: You cannot use this method to send Apple events to other applications.

### 12.8.15 NSAppleScriptErrorAppName as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys in the error dictionary.
**Notes:** Value for this key is a string that specifies the name of the application that generated the error.

### 12.8.16 NSAppleScriptErrorBriefMessage as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys in the error dictionary.
**Example:**

```
dim source as string = "tell application ""iTunes""""+EndOfLine+"pause"+EndOfLine+"end if"
dim n as new NSAppleScriptMBS(source)
```

```
dim error as Dictionary
if not n.compile(error) then
// shows error about missing tell where it found an if.
MsgBox error.Value(n.NSAppleScriptErrorBriefMessage)
end if
```

**Notes:** Value for this key is a string that provides a brief description of the error.

### 12.8.17 NSAppleScriptErrorMessage as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys in the error dictionary.
**Example:**

```
dim source as string = "tell application ""iTunes""+EndOfLine+"pause"+EndOfLine+"end if"
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
if n.compile(error) then
MsgBox "OK"
else
// shows error about missing tell where it found an if.
MsgBox error.Value(n.NSAppleScriptErrorMessage)
end if
```

**Notes:** Value for this key is a NSRangeMBS object.

### 12.8.18 NSAppleScriptErrorNumber as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys in the error dictionary.
**Example:**

```
dim source as string = "tell application ""iTunes""+EndOfLine+"pause"+EndOfLine+"end if"
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
if not n.compile(error) then
// error about missing tell where it found an if.
```

```
MsgBox error.Value(n.NSAppleScriptErrorNumber) // shows -2741
end if
```

**Notes:** Value for this key is a number that specifies the error number.

### 12.8.19 NSAppleScriptErrorRange as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys in the error dictionary.
**Example:**

```
dim source as string = "tell application ""iTunes""""+EndOfLine+"pause"+EndOfLine+"end if"
dim n as new NSAppleScriptMBS(source)

dim error as Dictionary
if not n.compile(error) then
// error about missing tell where it found an if.
dim r as NSRangeMBS = error.Value(n.NSAppleScriptErrorRange)
MsgBox r.String // { 36,2 } , the position of the if
end if
```

**Notes:** Value for this key is a string that supplies a detailed description of the error condition.

### 12.8.20 properties as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the names of all properties in the script.
**Example:**

```
dim s as String
dim a as NSAppleScriptMBS
dim i,c,cc as Integer
dim z,t as String

s=s+"property hello : ""Hallo Leute""""+chr(13)
s=s+"property just : ""Just a test""""+chr(13)
s=s+"display dialog hello"+chr(13)
s=s+"return just"+chr(13)

MsgBox "The script:"+chr(13)+s
```

```
a=new NSAppleScriptMBS(s)

// compile
call a.Compile

// show names
dim names() as string = a.properties
MsgBox Join(names,EndOfLine)

// query value
MsgBox a.valueDescriptorForProperty("hello").stringValue

// change value
dim o as NSAppleEventDescriptorMBS = NSAppleEventDescriptorMBS.descriptorWithString("just a test")
call a.setValueDescriptorForProperty("hello", o)

// and query again
MsgBox a.valueDescriptorForProperty("hello").stringValue
```

### 12.8.21 setValueDescriptorForProperty(propertyName as string, value as NSAppleEventDescriptorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a property value.

### 12.8.22 valueDescriptorForProperty(propertyName as string) as NSAppleEventDescriptorMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries a property value.

### 12.8.23 Properties

### 12.8.24 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSAppleScript object.
**Notes:** (Read and Write property)

### 12.8.25 isCompiled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value that indicates whether the receiver's script has been compiled.
**Example:**

```
dim source as string = "tell Application ""iTunes"" to play"
dim n as new NSAppleScriptMBS(source)

MsgBox "isCompiled: "+str(n.isCompiled)

call n.compile

MsgBox "isCompiled: "+str(n.isCompiled)
```

**Notes:** (Read only property)

### 12.8.26 richTextSource as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the syntax-highlighted source code of the receiver if the receiver has been compiled and its source code is available.
**Example:**

```
// init with some source
dim source as string = "tell Application ""iTunes"" to play"
dim n as new NSAppleScriptMBS(source)

// compile
call n.compile

// format text
dim richtext as NSAttributedStringMBS = n.richTextSource

if richtext = nil then
MsgBox "Failed to format source."
else
// write to RTF file
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim b as BinaryStream = file.CreateBinaryFile("")
```

```
b.Write richtext.RTF
b.close

file.Launch
end if
```

**Notes:** Returns nil otherwise. It is possible for an instance of NSAppleScript that has been instantiated with Construtor to be a script for which the source code is not available, but is nonetheless executable.
(Read only property)

### 12.8.27 source as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the script source for the receiver.
**Notes:** Returns the script source code of the receiver if it is available, "" otherwise.

It is possible for an NSAppleScript that has been instantiated with Constructor to be a script for which the source code is not available but is nonetheless executable.
(Read only property)

## 12.9 class OSALanguageInstanceMBS

### 12.9.1 class OSALanguageInstanceMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a language instance.

### 12.9.2 Methods

### 12.9.3 Constructor(language as OSALanguageMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new language instance with given language.

### 12.9.4 languageInstanceWithLanguage(language as OSALanguageMBS) as OSALanguageInstanceMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new language instance with given language.

### 12.9.5 richTextFromDescriptor(descriptor as NSAppleEventDescriptorMBS) as NSAttributedStringMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Get source text for a descriptor using the language instance for context.

### 12.9.6 Properties

### 12.9.7 componentInstance as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The component instance handle.
**Notes:** If this is the shared instance for the language, this is the same as the language's component instance. (Read only property)

### 12.9.8 defaultTarget as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The default target application for Apple event sending.
**Notes:** It also establishes the default target from which terminologies come. It is effectively like having an AppleScript "tell" statement around the entire program. When nil, the default target is the current application.
(Read and Write property)

### 12.9.9 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 12.9.10 language as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The language for this instance.
**Notes:** (Read only property)

## 12.10 class OSALanguageMBS

### 12.10.1 class OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a language.

### 12.10.2 Methods

### 12.10.3 availableLanguages as OSALanguageMBS()

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries available languages.
**Notes:** For 32-bit apps this is just AppleScript, but 64-bit apps see more entries.

### 12.10.4 Constructor(ComponentHandle as Integer)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new object with given component handle.

### 12.10.5 defaultLanguage as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The default language.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.Name+EndOfLine+l.Manufacturer+EndOfLine+l.Info
```

### 12.10.6 languageForName(name as String) as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Finds language for given name.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.languageForName("AppleScript")
MsgBox l.Name
```

### 12.10.7 languageForScriptDataDescriptor(Descriptor as NSAppleEventDescriptorMBS) as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries language for an Apple Event descriptor.

### 12.10.8 setDefaultLanguage(Language as OSALanguageMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** sets the default language.

### 12.10.9 Properties

### 12.10.10 componentInstance as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries component instance handle.
**Notes:** (Read only property)

### 12.10.11 Features as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The language features.
**Notes:** (Read only property)

### 12.10.12 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 12.10.13 Info as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries info string.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.Name+EndOfLine+l.Manufacturer+EndOfLine+l.Info
```

**Notes:** (Read only property)

### 12.10.14 isThreadSafe as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this language is thread safe.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox str(l.isThreadSafe)
```

**Notes:** (Read only property)

### 12.10.15 Manufacturer as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The manufacturer of the language.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.Name+EndOfLine+l.Manufacturer+EndOfLine+l.Info
```

**Notes:** (Read only property)

### 12.10.16 Name as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the language.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.Name+EndOfLine+l.Manufacturer+EndOfLine+l.Info
```

**Notes:** (Read only property)

### 12.10.17 sharedLanguageInstance as OSALanguageInstanceMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The shared language instance if available.
**Notes:** (Read only property)

### 12.10.18 SubType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The subtype.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.type+EndOfLine+l.SubType
```

**Notes:** (Read only property)

### 12.10.19 Type as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The type code.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.defaultLanguage
MsgBox l.type+EndOfLine+l.SubType
```

**Notes:** (Read only property)

### 12.10.20 version as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The version of this language.
**Example:**

```
dim l as OSALanguageMBS = OSALanguageMBS.languageForName("AppleScript")
MsgBox l.version
```

**Notes:** (Read only property)

### 12.10.21 Constants

Features

| Constant | Value | Description |
|---|---|---|
| OSASupportsAECoercion | 8 | Supports Apple Event coercion |
| OSASupportsAESending | 16 | Supports Apple Event sending |
| OSASupportsCompiling | 2 | Supports Compiling |
| OSASupportsConvenience | 64 | Supports Convenience |
| OSASupportsDialects | 128 | Supports Dialects |
| OSASupportsEventHandling | 256 | Supports Event handling |
| OSASupportsGetSource | 4 | Supports getting source |
| OSASupportsRecording | 32 | Supports Recording |

## 12.11 class OSAScriptControllerMBS

### 12.11.1 class OSAScriptControllerMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The script controller.

### 12.11.2 Methods

### 12.11.3 compileScript

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Compiles the script.

### 12.11.4 Constructor

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 12.11.5 recordScript

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Records a script.

### 12.11.6 runScript

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs current script.

### 12.11.7 stopScript

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Stops the current script.

### 12.11.8 Properties

### 12.11.9 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 12.11.10 isCompiling as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view is currently compiling a script.
**Notes:** (Read only property)

### 12.11.11 language as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The language to use.
**Notes:** (Read and Write property)

### 12.11.12 resultView as NSTextViewMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The view to show result of script run.
**Notes:** (Read and Write property)

### 12.11.13 script as OSAScriptMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The current script.
**Notes:** (Read and Write property)

### 12.11.14 scriptState as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The current script state.
**Notes:** Can be OSAScriptStopped, OSAScriptRunning or OSAScriptRecording.
(Read only property)

### 12.11.15 scriptView as OSAScriptViewMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The script view for this controller.
**Notes:** (Read and Write property)

### 12.11.16 Constants

States

| Constant | Value | Description |
|---|---|---|
| OSAScriptRecording | 2 | Script is recording. |
| OSAScriptRunning | 1 | Script is running. |
| OSAScriptStopped | 0 | Script is stopped. |

## 12.12 control OSAScriptControlMBS

### 12.12.1 control OSAScriptControlMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a OSAScriptView.
**Notes:** This control embeds a special OSAScriptView subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls

### 12.12.2 Properties

### 12.12.3 AcceptTabs as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 12.12.4 Scrollview as Variant

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview for this textview.
**Notes:** (Read only property)

### 12.12.5 View as OSAScriptViewMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 12.12.6 Events

### 12.12.7 BoundsChanged

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 12.12.8 Close

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 12.12.9 Closing

Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 12.12.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacExtras Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 12.12.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 12.12.12 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacExtras Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 12.12.13 EnableMenuItems

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 12.12.14 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 12.12.15 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 12.12.16 FrameChanged

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 12.12.17 GotFocus

MBS MacExtras Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 12.12.18 LostFocus

MBS MacExtras Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 12.12.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 12.12.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 12.12.21 MouseDrag(x as Integer, y as Integer)

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 12.12.22 MouseUp(x as Integer, y as Integer)

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 12.12.23 Open

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 12.12.24 Opening

Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 12.12.25 ScaleFactorChanged(NewFactor as Double)

MBS MacExtras Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 12.12.26 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Sent when a text view needs to determine if text in a specified range should be changed.
**Notes:** affectedCharRange: The range of characters to be replaced.
replacementString: The characters that will replace the characters in affectedCharRange; nil if only text attributes are being changed.

Return true to allow the replacement, or false to reject the change.

### 12.12.27 textDidBeginEditing

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Informs you that the text object has begun editing (that the user has begun changing it).

### 12.12.28 textDidChange

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Informs you that the text object has changed its characters or formatting attributes.

### 12.12.29 textDidEndEditing

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Informs you that the text object has finished editing (that it has resigned first responder status).

### 12.12.30 textShouldBeginEditing as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Invoked when a text object begins to change its text, this method requests permission to begin editing.
**Notes:** If the delegate returns false, the text object proceeds to make changes. If the delegate returns true, the text object abandons the editing operation. This method is also invoked when the user drags and drops a file onto the text object.

### 12.12.31 textShouldEndEditing as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Invoked from a text object's implementation of resignFirstResponder, this method requests permission to end editing.
**Notes:** If the delegate returns false, the text object proceeds to finish editing and resign first responder status. If the delegate returns true, the text object selects all of its text and remains the first responder.

### 12.12.32 textViewDidChangeSelection

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Sent when the selection changes in the text view.

### 12.12.33 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacExtras Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 12.13 class OSAScriptMBS

### 12.13.1 class OSAScriptMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for Open Scripting Architecture.

### 12.13.2 Methods

### 12.13.3 compile(byref error as dictionary) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Compiles the script.

### 12.13.4 compiledDataForType(type as string, options as Integer, byref error as dictionary) as MemoryBlock

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Compile data for a given type and options.

### 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from compiled data.
See also:


- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878

- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from compiled data.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from data.
See also:

- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.8 Constructor(File as FolderItem, byref error as dictionary)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880

### 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876

- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.11 Constructor(Source as String)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from source code.
**Example:**

```
dim s as new OSAScriptMBS("display dialog ""Hello""")
MsgBox s.source
```

See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880

### 12.13.12 Constructor(Source as String, Language as OSALanguageMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from source code.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879


### 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from source code.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.11 Constructor(Source as String) 2877

- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.14 Constructor(URL as String, byref error as dictionary)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873

- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.14 Constructor(URL as String, byref error as dictionary) 2879
- 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2880


### 12.13.16 Constructor(URL as String, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new script from file.
See also:


- 12.13.5 Constructor(Data as MemoryBlock, byref error as dictionary) 2873
- 12.13.6 Constructor(Data as MemoryBlock, url as string, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.7 Constructor(Data as NSAppleEventDescriptorMBS, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2874
- 12.13.8 Constructor(File as FolderItem, byref error as dictionary) 2875
- 12.13.9 Constructor(File as FolderItem, language as OSALanguageMBS, byref error as dictionary) 2876
- 12.13.10 Constructor(File as FolderItem, languageInstance as OSALanguageInstanceMBS, storageOptions as Integer, byref error as NSErrorMBS) 2876
- 12.13.11 Constructor(Source as String) 2877
- 12.13.12 Constructor(Source as String, Language as OSALanguageMBS) 2878
- 12.13.13 Constructor(Source as String, URL as String, LanguageInstance as OSALanguageInstanceMBS, storageOptions as Integer) 2878
- 12.13.15 Constructor(URL as String, language as OSALanguageMBS, byref error as dictionary) 2879

### 12.13.17 copy as OSAScriptMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a copy of the script.

### 12.13.18 execute(byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Executes the script.
**Example:**

```
dim s as new OSAScriptMBS("display dialog ""Hello""")
dim d as Dictionary
call s.execute(d)
```

### 12.13.19 executeAndReturnDisplayValue(byref displayValue as NSAttributedStringMBS, byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Executes the script and returns the display value of result.

### 12.13.20 executeAppleEvent(event as NSAppleEventDescriptorMBS, byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Executes an apple event in the script.

### 12.13.21 executeHandlerWithName(Name as String, arguments() as String, byref error as dictionary) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Executes an event handler in the script.

### 12.13.22 OSAScriptErrorAppAddressKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Error Dictionary key for error app address.

### 12.13.23 OSAScriptErrorAppNameKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Notes:** String containing the target application name

### 12.13.24 OSAScriptErrorBriefMessageKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Example:**

```
dim s as new OSAScriptMBS("display dialXXX ""Hello""")
dim d as Dictionary
call s.compile(d)

MsgBox d.Value(OSAScriptMBS.OSAScriptErrorBriefMessageKey)
```

**Notes:** String containing just the failure; may or may not be the same value as NSLocalizedFailureReason-ErrorKey

### 12.13.25 OSAScriptErrorExpectedTypeKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Notes:** Should be NSAppleEventDescriptorMBS object in dictionary.

### 12.13.26 OSAScriptErrorMessageKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Example:**

```
dim s as new OSAScriptMBS("display dialXXX ""Hello""")
dim d as Dictionary
call s.compile(d)

MsgBox d.Value(OSAScriptMBS.OSAScriptErrorMessageKey)
```

**Notes:** String containing entire error message; may or may not be the same value as NSLocalizedDescriptionKey.

### 12.13.27 OSAScriptErrorNumberKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Example:**

```
dim s as new OSAScriptMBS("display dialXXX ""Hello""")
dim d as Dictionary
call s.compile(d)

// shows -2740
MsgBox d.Value(OSAScriptMBS.OSAScriptErrorNumberKey)
```

**Notes:** Number containing an OSAError; may or may not be the same value as the NSError code

### 12.13.28 OSAScriptErrorOffendingObjectKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Notes:** Should be NSAppleEventDescriptorMBS object in dictionary.

### 12.13.29 OSAScriptErrorPartialResultKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Notes:** Should be NSAppleEventDescriptorMBS object in dictionary.

### 12.13.30 OSAScriptErrorRangeKey as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the error dictionary.
**Example:**

```
dim s as new OSAScriptMBS("display dialXXX ""Hello""")
dim d as Dictionary
call s.compile(d)

// shows { 0, 15 }
MsgBox d.Value(OSAScriptMBS.OSAScriptErrorRangeKey)
```

**Notes:** Value containing an range indicating the range of source characters where the error occurred

### 12.13.31 OSAStorageApplicationBundleType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the storage types.
**Notes:** Application Bundle

### 12.13.32 OSAStorageApplicationType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the storage types.
**Notes:** Application file

### 12.13.33 OSAStorageScriptBundleType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the storage types.
**Notes:** Script bundle file

### 12.13.34 OSAStorageScriptType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the storage types.
**Notes:** Script file

### 12.13.35 OSAStorageTextType as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the storage types.
**Notes:** Text file

### 12.13.36 richTextFromDescriptor(descriptor as NSAppleEventDescriptorMBS) as NSAttributedStringMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries rich text for an Appleevent descriptor.

### 12.13.37 scriptDataDescriptorWithContentsOfFile(file as FolderItem) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Reads script from file into AppleEventDescriptor.

### 12.13.38 scriptDataDescriptorWithContentsOfURL(URL as String) as NSAppleEventDescriptorMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Reads script from file into AppleEventDescriptor.

### 12.13.39 writeToFile(File as FolderItem, type as String, byref error as dictionary) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Writes script to a file.
See also:

- 12.13.40 writeToFile(File as FolderItem, type as String, storageOptions as Integer, byref error as dictionary) as boolean 2886

### 12.13.40 writeToFile(File as FolderItem, type as String, storageOptions as Integer, byref error as dictionary) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Writes script to a file.
See also:

- 12.13.39 writeToFile(File as FolderItem, type as String, byref error as dictionary) as boolean 2885

### 12.13.41 writeToURL(URL as String, type as String, byref error as dictionary) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Writes script to a file.
See also:

- 12.13.42 writeToURL(URL as String, type as String, storageOptions as Integer, byref error as dictionary) as boolean 2886

### 12.13.42 writeToURL(URL as String, type as String, storageOptions as Integer, byref error as dictionary) as boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Writes script to a file.
See also:

- 12.13.41 writeToURL(URL as String, type as String, byref error as dictionary) as boolean 2886

### 12.13.43 Properties

### 12.13.44 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 12.13.45 isCompiled as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries if script is compiled.
**Notes:** (Read only property)

### 12.13.46 language as OSALanguageMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The language of script.
**Example:**

```
dim s as new OSAScriptMBS("display dialog ""Hello""")
MsgBox s.language.Name
```

**Notes:** (Read and Write property)

### 12.13.47 languageInstance as OSALanguageInstanceMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The language instance of script.
**Notes:** (Read and Write property)

### 12.13.48 richTextSource as NSAttributedStringMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries rich text of script.
**Notes:** (Read only property)

### 12.13.49 Source as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The source code of script.
**Example:**

```
dim s as new OSAScriptMBS("display dialog ""Hello""")
MsgBox s.Source
```

**Notes:** (Read only property)

### 12.13.50 URL as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The URL if script has a solution.
**Notes:** (Read only property)

### 12.13.51 Constants

Storage Options

| Constant | Value | Description |
|---|---|---|
| OSACompileIntoContext | 2 | Compile in context.<br>May be used when getting compiled data. |
| OSADontSetScriptLocation | &h01000000 | Set script location.<br>May be used when initing with a URL or fromURL. |
| OSANull | 0 | No option set. |
| OSAPreventGetSource | 1 | Prevent user from getting source.<br>May be used when initing with a compiled script, writing or getting compile data. |
| OSAShowStartupScreen | &h20000000 | Show startup screen.<br>May be used when writing |
| OSAStayOpenApplet | &h10000000 | Applet should stay open.<br>May be used when writing |

## 12.14 class OSAScriptViewMBS

### 12.14.1 class OSAScriptViewMBS

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a script view.
**Notes:** Subclass of the NSTextViewMBS class.

### 12.14.2 Methods

### 12.14.3 Constructor

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text field with size 100/100 and position 0/0
**Example:**

```
dim t as new OSAScriptViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 12.14.4 Constructor(Handle as Integer) 2889
- 12.14.5 Constructor(left as Double, top as Double, width as Double, height as Double) 2890


### 12.14.4 Constructor(Handle as Integer)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given OSAScriptView handle.
**Example:**

```
dim t as new OSAScriptViewMBS(0, 0, 100, 100)
dim v as new OSAScriptViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a OSAScriptView and the plugin retains this handle.
See also:


- 12.14.3 Constructor 2889

• 12.14.5 Constructor(left as Double, top as Double, width as Double, height as Double) 2890

### 12.14.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new script view with the given size and position.
**Example:**

```
dim x as new OSAScriptViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

• 12.14.3 Constructor 2889

• 12.14.4 Constructor(Handle as Integer) 2889

### 12.14.6 Properties

### 12.14.7 indentsWrappedLines as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether to indent wrapped lines.
**Notes:** (Read and Write property)

### 12.14.8 indentWidth as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The indention width.
**Notes:** (Read and Write property)

### 12.14.9 source as String

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The source text of current script.
**Notes:** (Read and Write property)

### 12.14.10 tabWidth as Integer

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The tab width.
**Notes:** (Read and Write property)

### 12.14.11 usesScriptAssistant as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether to use script assistant.
**Notes:** (Read and Write property)

### 12.14.12 usesTabs as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether to use tab character.
**Notes:** (Read and Write property)

### 12.14.13 wrapsLines as Boolean

MBS MacExtras Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether to wrap lines.
**Notes:** (Read and Write property)

# Chapter 13

# Archive

## 13.1 class ArchiveEntryMBS

### 13.1.1 class ArchiveEntryMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an archive entry.
**Example:**

```
dim data as string = "Hello World test file. Hello World again."

dim e as new ArchiveEntryMBS
e.PathName = "Hello World.txt"
e.Size = lenb(data)
e.Permissions = &o0644
e.FileType = e.kFileTypeRegular
```

#### Blog Entries

- MBS Xojo Plugins, version 20.5pr6
- MBS Xojo Plugins, version 19.2pr7
- New Archive classes for handling zip and tar archives

#### Xojo Developer Magazine

- 19.4, page 83: Archives in Xojo, How to Use Zip Archives by Stefanie Juchmes
- 19.4, page 81: Archives in Xojo, How to Use Zip Archives by Stefanie Juchmes

### 13.1.2 Methods

### 13.1.3 Clear

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears entry for later use.

### 13.1.4 ClearACL

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears access control lists.

### 13.1.5 ClearXAttr

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears extended attributes.

### 13.1.6 Clone as ArchiveEntryMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the entry.
**Notes:** Does a deep copy; all of the strings are copied too.

### 13.1.7 Constructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new archive entry.
See also:

- 13.1.8 Constructor(Archive as ArchiverMBS) 2894

### 13.1.8 Constructor(Archive as ArchiverMBS)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new archive entry for a given archive.
**Notes:** This will pick the character set from the archive.
See also:

- 13.1.7 Constructor 2894

### 13.1.9 Destructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 13.1.10 GetFFlags(byref FlagsSet as UInt64, byref FlagsClear as UInt64)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries file flags.

### 13.1.11 SetFFlags(FlagsSet as UInt64, FlagsClear as UInt64)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the file flags.

### 13.1.12 SetLink(link as string)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the link.
**Notes:** Update only. For a symlink, update the destination. Otherwise, make the entry a hardlink and alter the destination for that.

### 13.1.13 UnsetATime

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the last access timestamp.

### 13.1.14 UnsetBTime

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the birth timestamp.

### 13.1.15 UnsetCTime

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the last modification timestamp.

### 13.1.16 UnsetGName

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the group name.

### 13.1.17 UnsetHardLink

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unset the hard link field.

### 13.1.18 UnsetMTime

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the modification timestamp.

### 13.1.19 UnsetPathName

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the pathname field.

### 13.1.20 UnsetSize

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the size.

### 13.1.21 UnsetSymLink

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the symbolic link field.

### 13.1.22 UnsetUName

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unsets the user name field.

### 13.1.23 Properties

### 13.1.24 ADateTime as DateTime

MBS Compression Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last access timestamp.
**Notes:** For Xojo 2019r2 or newer.
(Read and Write property)

### 13.1.25 ATime as Date

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last access timestamp.
**Notes:** (Read and Write property)

### 13.1.26 ATimeSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether last access timestamp is set.
**Notes:** (Read only property)

### 13.1.27 BDateTime as DateTime

MBS Compression Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The birth timestamp.
**Notes:** This is the creation time.
For Xojo 2019r2 or newer.
(Read and Write property)

### 13.1.28 BTime as Date

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The birth timestamp.
**Notes:** This is the creation time.
(Read and Write property)

### 13.1.29 BTimeSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the birth timestamp field is set.
**Notes:** (Read only property)

### 13.1.30 CDateTime as DateTime

MBS Compression Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attribute modification timestamp.
**Notes:** Last time an inode property was changed.
For Xojo 2019r2 or newer.
(Read and Write property)

### 13.1.31 CTime as Date

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The attribute modification timestamp.
**Notes:** Last time an inode property was changed.
(Read and Write property)

### 13.1.32 CTimeSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether last modification timestamp is set.
**Notes:** (Read only property)

### 13.1.33 Dev as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device number.
**Notes:** (Read and Write property)

### 13.1.34 DevMajor as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minor part of the dev field.
**Notes:** (Read and Write property)

### 13.1.35 DevMinor as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The major part of the dev field.
**Notes:** (Read and Write property)

### 13.1.36 DevSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether dev is set.
**Notes:** (Read only property)

### 13.1.37 FFlags as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file flags.
**Notes:** (Read and Write property)

### 13.1.38 FileName as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name.
**Notes:** Taken from PathName property at runtime.
(Read only property)

### 13.1.39 FileType as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries file type.
**Example:**

```
dim e as new ArchiveEntryMBS
e.FileType = e.kFileTypeRegular
```

**Notes:** Check the kFileType* constants.
(Read and Write property)

### 13.1.40 GID as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group ID.
**Notes:** (Read and Write property)

### 13.1.41 GName as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group name.
**Notes:** (Read and Write property)

### 13.1.42 Handle as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 13.1.43 HardLink as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination of the hardlink.
**Notes:** (Read and Write property)

### 13.1.44 INo as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The inode number.
**Notes:** (Read and Write property)

### 13.1.45 INo64 as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The inode number.
**Notes:** (Read and Write property)

### 13.1.46 INoSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether inode number is set.
**Notes:** (Read only property)

### 13.1.47 IsDataEncrypted as Boolean

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether data is encrypted.
**Notes:** (Read and Write property)

### 13.1.48 IsMetaDataEncrypted as Boolean

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether metadata is encrypted.
**Notes:** (Read and Write property)

### 13.1.49 MacMetadata as MemoryBlock

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Mac Metadata.
**Notes:** Storage for Mac OS-specific AppleDouble metadata information. Apple-format tar files store a separate binary blob containing encoded metadata with ACL, extended attributes, etc. This provides a place to store that blob.
(Read and Write property)

### 13.1.50 MDateTime as DateTime

MBS Compression Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The modification timestamp.
**Notes:** For Xojo 2019r2 or newer.
(Read and Write property)

### 13.1.51 Mode as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The permissions mode.
**Notes:** (Read and Write property)

### 13.1.52 ModeString as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The permissions mode as string.
**Notes:** (Read only property)

### 13.1.53 MTime as Date

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The modification timestamp.
**Notes:** (Read and Write property)

### 13.1.54 MTimeSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the modification time stamp field is set.
**Notes:** (Read only property)

### 13.1.55 NLink as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of hardlinks.
**Notes:** (Read and Write property)

### 13.1.56 PathName as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Path in the archive.
**Example:**

```
dim e as new ArchiveEntryMBS
e.PathName = "Hello World.txt"
```

**Notes:** Text encoding works partly.
Best to use only ASCII file paths for compatibility.
If the archive is opened/created with UTF-8 support, you may use other characters.
On Windows text encoding conversion may require use of LoadIconvLibrary method to load iconv.dll.
(Read and Write property)

### 13.1.57 Permissions as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The permissions.
**Example:**

```
dim e as new ArchiveEntryMBS
e.Permissions = &o0644
```

**Notes:** (Read and Write property)

### 13.1.58 RDev as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device ID (if special file).
**Notes:** (Read and Write property)

### 13.1.59 RDevMajor as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The major part of RDev field.
**Notes:** (Read and Write property)

### 13.1.60 RDevMinor as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minor part of RDev field.
**Notes:** (Read and Write property)

### 13.1.61 Size as UInt64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the file.
**Notes:** (Read and Write property)

### 13.1.62 SizeSet as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether size field is set.
**Notes:** (Read only property)

### 13.1.63 SourcePath as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Path on the disk for use.
**Notes:** (Read and Write property)

### 13.1.64 Stat as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get and set stat structure.
**Notes:** Routines to bulk copy fields to/from a platform-native "struct stat."
Libarchive used to just store a struct stat inside of each archive entry object, but this created issues when trying to manipulate archives on systems different than the ones they were created on.
(Read and Write property)

### 13.1.65 SymLink as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination of the symbolic link..
**Notes:** (Read and Write property)

### 13.1.66 SymlinkType as Integer

MBS Compression Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of symlink for this entry.
**Notes:** (Read and Write property)

### 13.1.67 UID as UInt64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user ID.
**Notes:** (Read and Write property)

### 13.1.68 UName as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user name.
**Notes:** (Read and Write property)

### 13.1.69 XAttrCount as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of extended attributes for this entry.
**Notes:** (Read only property)

### 13.1.70 Constants

File Types

| Constant | Value | Description |
|---|---|---|
| kFileTypeBlock | &o0060000 | Block device. |
| kFileTypeCharacter | &o0020000 | Character device. |
| kFileTypeDirectory | &o0040000 | Directory |
| kFileTypeIFO | &o0010000 | Named pipe (fifo) |
| kFileTypeLink | &o0120000 | Symbolic link |
| kFileTypeMT | &o0170000 | MT? |
| kFileTypeRegular | &o0100000 | Regular file. |
| kFileTypeSOCK | &o0140000 | Socket |

Symlink Types

| Constant | Value | Description |
|---|---|---|
| kSymlinkTypeDirectory | 2 | Symlink is a directory. |
| kSymlinkTypeFile | 1 | Symlink is a file. |
| kSymlinkTypeUndefined | 0 | Symlink is of unknown type. |

## 13.2 class ArchiveReadDiskMBS

### 13.2.1 class ArchiveReadDiskMBS

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The archive subclass class for reading files from disk.
**Notes:** Subclass of the ArchiveReaderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr4
- MBS Xojo Plugins, version 18.6pr3

### 13.2.2 Methods

### 13.2.3 CanDescend as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you can descend into current item.
**Notes:** True if current item is a folder.

### 13.2.4 Constructor

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tbe constructor.

### 13.2.5 CurrentFileSystem as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries ID for current file system.
**Notes:** Lasterror is set.

### 13.2.6 CurrentFileSystemIsRemote as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether current file system is remote.
**Notes:** Lasterror is set.

### 13.2.7 CurrentFileSystemIsSynthetic as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether current file system is synthetic.
**Notes:** Lasterror is set.

### 13.2.8 Descend

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request that current entry be visited.
**Notes:** If you invoke it on every directory, you'll get a physical traversal. This is ignored if the current entry isn't a directory or a link to a directory. So, if you invoke this on every returned path, you'll get a full logical traversal.
Lasterror is set.

### 13.2.9 Destructor

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** Lasterror is set.

### 13.2.10 GroupName(ID as Int64) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries group name for given ID.
**Notes:** May invoke GroupLookup event.
Lasterror is set.

### 13.2.11 Open(Folder as FolderItem) as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a folderitem.
**Notes:** Returns true on success and false on errors.
Lasterror is set.
See also:


- 13.2.12 Open(Path as String) as Boolean 2910


### 13.2.12 Open(Path as String) as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file path.
**Notes:** Returns true on success and false on errors.
Lasterror is set.
See also:


- 13.2.11 Open(Folder as FolderItem) as Boolean 2909


### 13.2.13 SetAccessTimeRestored

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request that the access time of the entry visited by traversal be restored.
**Notes:** Lasterror is set.

### 13.2.14 SetStandardLookup

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets standard lookup for mapping user and group IDs to names.
**Notes:** "Standard" implementation uses getpwuid_r, getgrgid_r and caches the results for performance.
Lasterror is set.

### 13.2.15 SetSymlinkHybrid

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to follow symlink initially, then not.
**Notes:** Lasterror is set.

### 13.2.16 SetSymlinkLogical

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets to follow all symlinks.
**Notes:** Lasterror is set.

### 13.2.17 SetSymlinkPhysical

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets to follow no symlinks.
**Notes:** Lasterror is set.

### 13.2.18 UserName(ID as Int64) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries user name for given ID.
**Notes:** May invoke UserLookup event.
Lasterror is set.

### 13.2.19 Properties

### 13.2.20 BehaviorFlags as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Select optional behavior.
**Notes:** See kBehavior constants.
Setting the value sets Lasterror.

By default MBS Plugin sets kBehaviorRestoreAccessTime, kBehaviorRestoreHonorNoDump, kBehaviorRestoreMacCopyFile and kBehaviorRestoreNoTraverseMounts.
(Read and Write property)

### 13.2.21 Events

### 13.2.22 GroupLookup(ID as Int64) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to let you lookup manually the name for a group ID.

### 13.2.23 UserLookup(ID as Int64) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to let you lookup manually the name for a group ID.

### 13.2.24 Constants

Behavior Flags

| Constant | Value | Description |
|---|---|---|
| kBehaviorRestoreAccessTime | 1 | Request that the access time of the entry visited by traversal be restored. This is the same as SetAccessTimeRestored. |
| kBehaviorRestoreHonorNoDump | 2 | Default: Do not skip an entry which has nodump flags. |
| kBehaviorRestoreMacCopyFile | 4 | Default: Skip a mac resource fork file whose prefix is "._" because of us copyfile. |
| kBehaviorRestoreNoACL | 32 | Default: ACLs are read from disk. |
| kBehaviorRestoreNoFFlags | 64 | Default: File flags are read from disk. |
| kBehaviorRestoreNoTraverseMounts | 8 | Default: Traverse mount points. |
| kBehaviorRestoreNoXAttr | 16 | Default: Xattrs are read from disk. |

## 13.3 class ArchiveReaderMBS

### 13.3.1 class ArchiveReaderMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to read archive content.
**Example:**

```
dim a as new ArchiveReaderMBS
a.SupportFilterAll
a.SupportFormatAll
a.SetOptions "hdrcharset=UTF-8" // for unicode file names

// open file

dim f as FolderItem = SpecialFolder.Desktop.Child("test.zip")

if not a.OpenFile(f) then
Break // path invalid?
end if

dim e as ArchiveEntryMBS = a.NextHeader
while e <>nil

print e.PathName

e = a.NextHeader
wend
```

**Notes:** Can be used to read zip, tar and other image formats.
Subclass of the ArchiverMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.6pr3
- New Archive classes for handling zip and tar archives

### 13.3.2 Methods

### 13.3.3 AddPassphrase(passphrase as string)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a password to the archive.

### 13.3.4 AppendFilter(Filter as Integer)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a filter to the reader manually.
**Notes:** This is useful to bypass the bidding process when the format and filters to use is known in advance. Lasterror property is set.

### 13.3.5 AppendFilterProgram(Program as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a filter program.
**Notes:** Lasterror property is set.

### 13.3.6 Close

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the file and release most resources.
**Notes:** Lasterror property is set.

### 13.3.7 Constructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
dim a as new ArchiveReaderMBS
a.SupportFilterAll
a.SupportFormatAll
a.SetOptions "hdrcharset=UTF-8" // for unicode file names
```

**Notes:** To create an archive:
1) Ask Constructor for an archive writer object.
2) Set any global properties. In particular, you should set the compression and format to use.
3) Call one of the open methods to open the file (most people will use OpenFile, which provide convenient canned I/O callbacks for you).
4) For each entry, construct an appropriate ArchiveEntryMBS object, call WriteHeader to write the header, call WriteData methods to write the entry data.
5) call close method to close the output

### 13.3.8 Destructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 13.3.9 Extract(Entry as ArchiveEntryMBS, DestArchive as ArchiverMBS)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to recreate the current entry (whose header has just been read) on disk.
**Notes:** This does quite a bit more than just copy data to disk. It also:

- Creates intermediate directories as required.
- Manages directory permissions: non-writable directories will be initially created with write permission enabled; when the archive is closed, dir permissions are edited to the values specified in the archive.
- Checks hardlinks: hardlinks will not be extracted unless the linked-to file was also extracted within the same session. (TODO)

Lasterror property is set.
See also:

- 13.3.10 Extract(Entry as ArchiveEntryMBS, flags as Integer = &h123F7) 2915

### 13.3.10 Extract(Entry as ArchiveEntryMBS, flags as Integer = &h123F7)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to recreate the current entry (whose header has just been read) on disk.
**Notes:** This does quite a bit more than just copy data to disk. It also:

- Creates intermediate directories as required.
- Manages directory permissions: non-writable directories will be initially created with write permission enabled; when the archive is closed, dir permissions are edited to the values specified in the archive.
- Checks hardlinks: hardlinks will not be extracted unless the linked-to file was also extracted within the same session. (TODO)

The "flags" argument selects optional behavior, 'OR' the flags you want.
Lasterror property is set.
See also:

- 13.3.9 Extract(Entry as ArchiveEntryMBS, DestArchive as ArchiverMBS) 2915

### 13.3.11 NextHeader(entry as ArchiveEntryMBS = nil) as ArchiveEntryMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads next header.
**Notes:** If you pass in an existing entry, we can recycle the object.
Returns nil in case of error.
Lasterror property is set.

### 13.3.12 OpenData(Data as String) as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an archive from memory.
**Notes:** Returns true on success and false on failure.
Lasterror property is set.

### 13.3.13 OpenFile(File as FolderItem, BlockSize as Integer = 10240) as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an archive from a folderitem.
**Notes:** Returns true on success and false on failure.
Lasterror property is set.
See also:

- 13.3.14 OpenFile(Files() as FolderItem, BlockSize as Integer = 10240) as Boolean 2916

### 13.3.14 OpenFile(Files() as FolderItem, BlockSize as Integer = 10240) as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Use this for reading multivolume files by filenames.
**Notes:** Returns true on success and false on errors.
Lasterror property is set.
See also:

- 58.244.3 OpenFile(File as FolderItem, BlockSize as Integer = 10240) as Boolean 10614

### 13.3.15 OpenPath(Path as String, BlockSize as Integer = 10240) as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the file at the given path.
**Notes:** Lasterror property is set.
See also:


- 13.3.16 OpenPath(Paths() as String, BlockSize as Integer = 10240) as Boolean 2917


### 13.3.16 OpenPath(Paths() as String, BlockSize as Integer = 10240) as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Use this for reading multivolume files by filenames.
**Notes:** Returns true on success and false on errors.
Lasterror property is set.
See also:


- 13.3.15 OpenPath(Path as String, BlockSize as Integer = 10240) as Boolean 2916


### 13.3.17 ReadDataBlockMemory(byref offset as Int64) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads next block of data.
**Notes:** Size is given by archive reader used.
Offset is given so you know where you are in the file currently.
Data returned as new memory block.
Lasterror property is set.

A zero-copy version of archive_read_data that also exposes the file offset of each returned block. Note that the client has no way to specify the desired size of the block. The API does guarantee that offsets will be strictly increasing and that returned blocks will not overlap.

### 13.3.18 ReadDataBlockString(byref offset as Int64) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads next block of data.
**Notes:** Size is given by archive reader used.
Offset is given so you know where you are in the file currently.
Data returned as new string.
Lasterror property is set.

A zero-copy version of archive_read_data that also exposes the file offset of each returned block. Note that the client has no way to specify the desired size of the block. The API does guarantee that offsets will be

strictly increasing and that returned blocks will not overlap.

### 13.3.19 ReadDataMemory(ByteCount as Integer) as MemoryBlock

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data from current file into memoryblock.
**Notes:** Lasterror property is set.

### 13.3.20 ReadDataString(ByteCount as Integer) as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data from current file into string.
**Notes:** Lasterror property is set.

### 13.3.21 Seek(Position as Int64, Mode as Integer = 0) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Seek within the body of an entry.
**Notes:** See kSeekSet, kSeekCur or kSeekEnd constants.
Returns new position.
Lasterror property is set.

### 13.3.22 SetExtractSkipFile(DeviceID as Int64, FileNo as Int64)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Record the dev/ino of a file that will not be written.
**Notes:** This is generally set to the dev/ino of the archive being read.
Lasterror property is set.

### 13.3.23 SetFilterOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to the filter only.
**Notes:** Lasterror property is set.

### 13.3.24 SetFormat(Format as Integer)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format for the reader manually.
**Notes:** This is useful to bypass the bidding process when the format and filters to use is known in advance. Lasterror property is set.

### 13.3.25 SetFormatOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to the format only.
**Notes:** Lasterror property is set.

### 13.3.26 SetOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to both the format and the filter.
**Notes:** Lasterror property is set.

### 13.3.27 SetOptions(Options as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option string to both the format and the filter.
**Example:**

```
dim a as new ArchiveReaderMBS
a.SupportFilterAll
a.SupportFormatAll
a.SetOptions "hdrcharset=UTF-8" // for unicode file names
```

**Notes:** Lasterror property is set.

### 13.3.28 Skip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skips a file in the archive.

### 13.3.29 SupportFilterAll

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables all filters.
**Notes:** Lasterror property is set.

### 13.3.30 SupportFilterBZip2

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables bzip2 filter.
**Notes:** Lasterror property is set.

### 13.3.31 SupportFilterCompress

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables compress filter.
**Notes:** Lasterror property is set.

### 13.3.32 SupportFilterGRZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables GRZip filter.
**Notes:** Lasterror property is set.

### 13.3.33 SupportFilterGZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable gzip filter.
**Notes:** Lasterror property is set.

### 13.3.34 SupportFilterLRZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable LRZip filter.
**Notes:** Lasterror property is set.

### 13.3.35 SupportFilterLZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable LZip filter.
**Notes:** Lasterror property is set.

### 13.3.36 SupportFilterLzma

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable LZMA filter.
**Notes:** Lasterror property is set.

### 13.3.37 SupportFilterLzop

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable Lzop filter.
**Notes:** Lasterror property is set.

### 13.3.38 SupportFilterNone

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable none filter.
**Notes:** Lasterror property is set.

### 13.3.39 SupportFilterProgram(command as string)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable support for given filter program.
**Notes:** Lasterror property is set.

### 13.3.40 SupportFilterRpm

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable RPM filter.
**Notes:** Lasterror property is set.

### 13.3.41 SupportFilterUU

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable UU filter.
**Notes:** Lasterror property is set.

### 13.3.42 SupportFilterXz

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable XZ filter.
**Notes:** xz is a lossless data compression program and file format which incorporates the LZMA/LZMA2 compression algorithms.

### 13.3.43 SupportFormat7zip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable 7zip format.
**Notes:** Lasterror property is set.

### 13.3.44 SupportFormatAll

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable all formats.
**Notes:** Lasterror property is set.

### 13.3.45 SupportFormatAr

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables At format.
**Notes:** Lasterror property is set.

### 13.3.46 SupportFormatByCode(FilterCode as Integer)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables format with given code.
**Notes:** Lasterror property is set.

### 13.3.47 SupportFormatCab

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables cab format.
**Notes:** Lasterror property is set.

### 13.3.48 SupportFormatCpio

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables cpio format.
**Notes:** Lasterror property is set.

### 13.3.49 SupportFormatEmpty

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables empty format.
**Notes:** Lasterror property is set.

### 13.3.50 SupportFormatGnutar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables gnutar format.
**Notes:** Lasterror property is set.

### 13.3.51 SupportFormatIso9660

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables iso 9660 format.
**Notes:** Lasterror property is set.

### 13.3.52 SupportFormatLha

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables lha format.
**Notes:** Lasterror property is set.

### 13.3.53 SupportFormatLZ4

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables support for LZ4 format.
**Notes:** Lasterror property is set.

### 13.3.54 SupportFormatMTree

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables mtree format.
**Notes:** Lasterror property is set.

### 13.3.55 SupportFormatRar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables rar format.
**Notes:** Lasterror property is set.

### 13.3.56 SupportFormatRar5

MBS Compression Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables rar v5 format.
**Notes:** Lasterror property is set.

### 13.3.57 SupportFormatRaw

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables raw format.
**Notes:** Lasterror property is set.

### 13.3.58 SupportFormatTar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables tape archive files format.
**Notes:** Lasterror property is set.

### 13.3.59 SupportFormatWArc

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables support for WArc format.
**Notes:** Lasterror property is set.

### 13.3.60 SupportFormatXar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables xar format.
**Notes:** Lasterror property is set.

### 13.3.61 SupportFormatZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables zip format.
**Notes:** Enables both streamable and seekable zip readers.
Lasterror property is set.

### 13.3.62 SupportFormatZipSeekable

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows only support for seekable zip archives.
**Notes:** Reads starting from central directory; requires seekable input.
Lasterror property is set.

### 13.3.63 SupportFormatZipStreamable

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables support only for streamable zip archives.
**Notes:** Reads Zip archives as stream from beginning to end. Doesn't correctly handle SFX ZIP files or ZIP archives that have been modified in-place.
Lasterror property is set.

### 13.3.64 Properties

### 13.3.65 FormatCapabilities as Integer

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a bitmask of capabilities that are supported by the archive format reader.
**Notes:** If the reader has no special capabilities, kFormatCapabilitiesNone is returned.
See also kFormatCapabilitiesEncryptMetaData and kFormatCapabilitiesEncryptData.
(Read only property)

### 13.3.66 HasEncryptedEntries as Integer

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns 1 if the archive contains at least one encrypted entry.
**Notes:** If the archive format not support encryption at all kEncryptionUnsupported is returned. If for any other reason (e.g. not enough data read so far) we cannot say whether there are encrypted entries, then kEncryptionDontKnow is returned. In general, this function will return values below zero when the reader is uncertain or totally uncapable of encryption support. When this function returns 0 you can be sure that

the reader supports encryption detection but no encrypted entries have been found yet.

If the metadata/header of an archive is also encrypted, you cannot rely on the number of encrypted entries. That is why this function does not return the number of encrypted entries but# just shows that there are some.
(Read only property)

### 13.3.67 HeaderPosition as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current header position.
**Notes:** Retrieve the byte offset in uncompressed data where last-read header started.
(Read only property)

### 13.3.68 ReadDataBlockSupported as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this reader supports block operations.
**Notes:** Some do and if you call ReadDataBlock on a reader which can't, it will return only errors.
(Read only property)

### 13.3.69 Events

### 13.3.70 ExtractProgress(entry as ArchiveEntryMBS)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called regularly while extracting to report progress.
**Notes:** Check properties of archive on how many bytes have been processed.
Called only by Extract methods.

### 13.3.71 Constants

Encryption Status constants.

| Constant | Value | Description |
|---|---|---|
| kEncryptionDontKnow | -1 | If the reader for some other reason (e.g. not enough bytes read) cannot say if there are encrypted entries, kEncryptionDontKnow is returned. |
| kEncryptionUnsupported | -2 | In case the archive does not support encryption detection at all kEncryptionUnsupported is returned. |

Extract Flags

| Constant | Value | Description |
|---|---|---|
| kExtractACL | &h20 | Default: Do not restore ACLs. |
| kExtractClearNoChangeFFlags | &h20000 | Default: Do not clear no-change flags when unlinking object. |
| kExtractFileFlags | &h40 | Default: Do not restore fflags. |
| kExtractHFSCompressionForced | &h8000 | Default: Do not use HFS+ compression if it was not compressed. This has no effect except on Mac OS v10.6 or later. |
| kExtractMacMetadata | &h2000 | Default: Do not restore Mac extended metadata. This has no effect except on Mac OS. |
| kExtractNoAutoDir | &h400 | Default: Create parent directories as needed. |
| kExtractNoHFSCompression | &h4000 | Default: Use HFS+ compression if it was compressed. This has no effect except on Mac OS v10.6 or later. |
| kExtractNoOverwrite | 8 | Default: Replace existing files. |
| kExtractNoOverwriteNewer | &h800 | Default: Overwrite files, even if one on disk is newer. |
| kExtractOwner | 1 | Default: Do not try to set owner/group. |
| kExtractPermission | 2 | Default: Do obey umask, do not restore SUID/SGID/SVTX bits. |
| kExtractSecureNoAbsolutePath | &h10000 | Default: Do not reject entries with absolute paths |
| kExtractSecureNoDotDot | &h200 | Default: Do not reject entries with '..' as path elements. |
| kExtractSecureSymLinks | &h100 | Default: Do not try to guard against extracts redirected by symlinks. Note: With kExtractUnlink, will remove any intermediate symlink. |
| kExtractSparse | &h1000 | Detect blocks of 0 and write holes instead. |
| kExtractTime | 4 | Default: Do not restore mtime/atime. |
| kExtractUnlink | &h10 | Default: Try create first, unlink only if create fails with EEXIST. |
| kExtractXAttr | &h80 | Default: Do not restore xattrs. |

Encryption Capabilities

| Constant | Value | Description |
|---|---|---|
| kFormatCapabilitiesEncryptData | 1 | Reader can detect encrypted data. |
| kFormatCapabilitiesEncryptMetaData | 2 | Reader can detect encryptable metadata (pathname, mtime, etc.). |
| kFormatCapabilitiesNone | 0 | Current format supports no encryption. |

Seek Modes

| Constant | Value | Description |
|---|---|---|
| kSeekCur | 1 | Seek relative to current position. |
| kSeekEnd | 2 | Seek relative to end of file. |
| kSeekSet | 0 | Seek relative to begin of file. |

## 13.4 class ArchiverMBS

### 13.4.1 class ArchiverMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The abstract super class for common archiver methods.
**Notes:** Currently we build this library without lzma and lz4 support. That could be changed if needed.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr9
- MBS Xojo Plugins, version 18.6pr3

### 13.4.2 Methods

### 13.4.3 ClearError

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears error.

### 13.4.4 Constructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 13.4.5 CopyError(source as ArchiverMBS)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies error state from one archive object to other.

### 13.4.6 Destructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 13.4.7 FilterBytes(FilterIndex as Integer) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current byte count for the filter with given index.
**Notes:** Pass index of filter, e.g. 0 to FilterCount-1.
Pass -1 to query last filter.

### 13.4.8 FilterCode(FilterIndex as Integer) as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries ID of filter.
**Notes:** Pass index of filter, e.g. 0 to FilterCount-1.
Pass -1 to query last filter.

### 13.4.9 FilterName(FilterIndex as Integer) as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of filter.
**Notes:** Pass index of filter, e.g. 0 to FilterCount-1.
Pass -1 to query last filter.

### 13.4.10 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS Compression Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The Archive classes may use libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 13.4.11 NewReader as ArchiveReaderMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new archive reader.

### 13.4.12 NewWriter as ArchiveWriterMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new archive writer.

### 13.4.13 SetCurrentWorkingDirectory(path as folderitem) as boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets current working directory for the application.
**Notes:** Returns true on success or false on failure.
See also:

- 13.4.14 SetCurrentWorkingDirectory(path as String) as boolean 2931

### 13.4.14 SetCurrentWorkingDirectory(path as String) as boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets current working directory for the application.
**Notes:** Returns true on success or false on failure.
See also:

- 13.4.13 SetCurrentWorkingDirectory(path as folderitem) as boolean 2931

### 13.4.15 Properties

### 13.4.16 BZLibVersion as String

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bzlib version used in this plugin.
**Example:**

MsgBox ArchiverMBS.BZLibVersion

**Notes:** This is empty if we compiled plugin without this library.
(Read only property)

### 13.4.17 Compression as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ID of the compression algorithm.
**Notes:** This is an alias for FilterCode(0).
(Read only property)

### 13.4.18 CompressionName as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the compression algorithm.
**Notes:** This is an alias for FilterName(0).
(Read only property)

### 13.4.19 ErrNo as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last error's errno value.
**Notes:** The unix error code.
(Read only property)

### 13.4.20 ErrorString as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error string.
**Notes:** (Read only property)

### 13.4.21 FileCount as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file count.
**Notes:** May not be known before all files have been seen/processed.
(Read only property)

### 13.4.22 FilterCount as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of filters currently in use.
**Notes:** An archive may have several filters, e.g. tar to archive and gzip to compress.
(Read only property)

### 13.4.23 Format as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ID of the current format.
**Notes:** (Read only property)

### 13.4.24 FormatName as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the current format.
**Notes:** (Read only property)

### 13.4.25 Handle as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 13.4.26 Lasterror as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** See kArchive constants.
(Read only property)

### 13.4.27 LibVersion as Integer

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the archive C++ library.
**Example:**

MsgBox str(ArchiverMBS.LibVersion)

**Notes:** e.g. 3001002 for version 3.1.2.
(Read only property)

### 13.4.28 LibVersionDetails as String

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The detailed version string for libArchive.
**Example:**

MsgBox ArchiverMBS.LibVersionDetails

**Notes:** Detailed textual name/version of the library and its dependencies.

This has the form:
"libarchive x.y.z zlib/a.b.c liblzma/d.e.f ... etc ..."

the list of libraries described here will vary depending on how libarchive was compiled.
(Read only property)

### 13.4.29 LibVersionString as String

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the archive C++ library as text.
**Example:**

MsgBox ArchiverMBS.LibVersionString

**Notes:** e.g. "libarchive 3.1.2"
(Read only property)

### 13.4.30 LZ4Version as String

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The lz4 version used in this plugin.
**Example:**

MsgBox ArchiverMBS.LZ4Version

**Notes:** This is empty if we compiled plugin without this library.
(Read only property)

### 13.4.31 LzmaVersion as String

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The lzma version used in this plugin.
**Example:**

MsgBox ArchiverMBS.LzmaVersion

**Notes:** This is empty if we compiled plugin without this library.
(Read only property)

### 13.4.32 Open as Boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an archive is currently open.
**Notes:** (Read only property)

### 13.4.33 PositionCompressed as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position in the archive compressed.
**Notes:** This is an alias for FilterBytes(-1).
(Read only property)

### 13.4.34 PositionUncompressed as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position in the archive uncompressed.
**Notes:** This is an alias for FilterBytes(0).
(Read only property)

### 13.4.35 Yield as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to yield on extract methods.
**Notes:** Set true to pass CPU time to other Xojo threads.
(Read and Write property)

### 13.4.36 ZLibVersion as String

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The zlib version used in this plugin.
**Example:**

MsgBox ArchiverMBS.ZLibVersion

**Notes:** This is empty if we compiled plugin without this library.
(Read only property)

### 13.4.37 ZStdVersion as String

MBS Compression Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The zlib version used in this plugin.
**Example:**

MsgBox ArchiverMBS.ZStdVersion

**Notes:** This is empty if we compiled plugin without this library.
(Read only property)

### 13.4.38 Events

### 13.4.39 Passphrase(byref password as String) as Boolean

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to query for passphrase.
**Notes:** Please set password property and return true if you have one.

### 13.4.40 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kArchiveEOF | 1 | Found end of archive. |
| kArchiveFailed | -25 | Current operation cannot complete.<br>But if writeHeader is "fatal," then this archive is dead and useless. |
| kArchiveFatal | -30 | No more operations are possible. |
| kArchiveOK | 0 | Operation was successful. |
| kArchiveRetry | -10 | Retry might succeed. |
| kArchiveWarn | -20 | Partial success.<br>For example, if writeHeader "fails", then you can't push data. |

Filters

| Constant | Value | Description |
|---|---|---|
| kFilterBZip2 | 2 | bzip2 filter |
| kFilterCompress | 3 | compress filter. |
| kFilterGRZip | 12 | GRZip filter. |
| kFilterGZip | 1 | gzip filter. |
| kFilterLRZip | 10 | LRZip filter. |
| kFilterLZ4 | 13 | LZ4 Filter. |
| kFilterLZip | 9 | LZip filter. |
| kFilterLZMA | 5 | LZMA filter. |
| kFilterLZOP | 11 | Lzop filter. |
| kFilterNone | 0 | No filter. |
| kFilterProgram | 4 | Program filter. |
| kFilterRPM | 8 | RPM filter. |
| kFilterUU | 7 | UU filter. |
| kFilterXZ | 6 | XZ filter. |

Formats

| Constant | Value | Description |
|---|---|---|
| kFormat7Zip | &he0000 | 7Zip |
| kFormatAr | &h70000 | Unix Archive format, base type. |
| kFormatArBsd | &h70002 | Archive, BSD format. |
| kFormatArGnu | &h70001 | Archive, GNU format. |
| kFormatBaseMask | &hff0000 | Mask for Base Type. |
| kFormatCab | &hc0000 | Windows CAB format. |
| kFormatCpio | &h10000 | CPIO base format. |
| kFormatCpioAfioLarge | &h10006 | CPIO format, AFIO large variant. |
| kFormatCpioBinBe | &h10003 | CPIO format, BIN BE variant. |
| kFormatCpioBinLe | &h10002 | CPIO format, BIN LE variant. |
| kFormatCpioPosix | &h10001 | CPIO format, Posix variant. |
| kFormatCpioSvr4Crc | &h10005 | CPIO format, SVR4 CRC variant. |
| kFormatCpioSvr4Nocrc | &h10004 | CPIO format, SVR4 no CRC variant. |
| kFormatEmpty | &h60000 | Empty format. |
| kFormatIso9660 | &h40000 | IOS 9660 base type. |
| kFormatIso9660Rockridge | &h40001 | IOS 9660, Rockridge variant. |
| kFormatLha | &hb0000 | LHA format. |
| kFormatMtree | &h80000 | MTree format. |
| kFormatRar | &hd0000 | RAR format. |
| kFormatRARv5 | &h10000 | Rar v5 format |
| kFormatRaw | &h90000 | Raw format. |
| kFormatShar | &h20000 | SHAR base format. |
| kFormatSharBase | &h20001 | SHAR base format, base variant. |
| kFormatSharDump | &h20002 | SHAR base format, dump variant. |
| kFormatTar | &h30000 | Tar base format. |
| kFormatTarGnutar | &h30004 | Tar format, GNU variant. |
| kFormatTarPaxInterchange | &h30002 | Tar format, Pax Interchange variant. |
| kFormatTarPaxRestricted | &h30003 | Tar format, Pax Restricted variant. |
| kFormatTarUstar | &h30001 | Tar format, US variant. |
| kFormatWarc | &hf0000 | WArc format. |
| kFormatXar | &ha0000 | Xar format |
| kFormatZip | &h50000 | Zip format. |

## 13.5 class ArchiveWriteDiskMBS

### 13.5.1 class ArchiveWriteDiskMBS

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The archive subclass class for writing files to disk.
**Notes:** To create objects on disk:

1) Ask Constructor for a new ArchiveWriteDiskMBS object.
2) Set any global properties. In particular, you probably want to set the options.
3) For each entry: construct an appropriate ArchiveEntryMBS object, use WriteHeader to create the file/dir/etc on disk, use WriteData to write the entry data
4) Release object to cleanup the writer and release resources

In particular, you can use this in conjunction with ArchiveReaderMBS to pull entries out of an archive and create them on disk.
Subclass of the ArchiveWriterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.6pr3

### 13.5.2 Methods

### 13.5.3 Constructor

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Connects GroupLookup and UserLookup events if set.

### 13.5.4 Destructor

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 13.5.5 GID(GroupName as string, DefaultGID as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query ID of group.
**Notes:** Returns default ID if name not found.
This may invoke GroupLookup event.
Lasterror property is set.

### 13.5.6 SetSkipFile(DeviceID as Int64, FileNo as Int64)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Record the dev/ino of a file that will not be written.
**Notes:** This is generally set to the dev/ino of the archive being written.
Lasterror property is set.

### 13.5.7 SetStandardLookup

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets standard lookup for mapping user and group names to IDs.
**Notes:** Lasterror property is set.

The lookup functions are given uname/uid (or gname/gid) pairs and return a uid (gid) suitable for this system. These are used for restoring ownership and for setting ACLs. The default functions are naive, they just return the uid/gid. These are small, so reasonable for applications that don't need to preserve ownership; they are probably also appropriate for applications that are doing same-system backup and restore.

The "standard" lookup functions use common system calls to lookup the uname/gname, falling back to the uid/gid if the names can't be found. They cache lookups and are reasonably fast, but can be very large, so they are not used unless you ask for them. In particular, these match the specifications of POSIX "pax" and old POSIX "tar".

### 13.5.8 UID(UserName as string, DefaultUID as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query ID of user.
**Notes:** Returns default ID if name not found.
This may invoke UserLookup event.
Lasterror property is set.

### 13.5.9 WriteDataBlock(data as MemoryBlock, offset as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data block to file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:

- 13.5.10 WriteDataBlock(data as Ptr, Size as Int64, offset as Int64) as Int64 2941
- 13.5.11 WriteDataBlock(data as string, offset as Int64) as Int64 2941

### 13.5.10 WriteDataBlock(data as Ptr, Size as Int64, offset as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data block to file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:

- 13.5.9 WriteDataBlock(data as MemoryBlock, offset as Int64) as Int64 2941
- 13.5.11 WriteDataBlock(data as string, offset as Int64) as Int64 2941

### 13.5.11 WriteDataBlock(data as string, offset as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data block to file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:

- 13.5.9 WriteDataBlock(data as MemoryBlock, offset as Int64) as Int64 2941
- 13.5.10 WriteDataBlock(data as Ptr, Size as Int64, offset as Int64) as Int64 2941

### 13.5.12 Properties

### 13.5.13 Options as Integer

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The options flags set.
**Notes:** Setting options sets lasterror property.

See ArchiveReaderMBS.kExtract* constants.
(Read and Write property)

### 13.5.14 Events

### 13.5.15 GroupLookup(Name as String, GID as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to let you lookup manually the ID for a group name.
**Notes:** If you can't find the group, you can just pass through the given default ID.

If neither the default (naive) nor the standard (big) functions suit your needs, you can write your own in this event.

### 13.5.16 UserLookup(Name as String, GID as Int64) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to let you lookup manually the ID for a user name.
**Notes:** If you can't find the user, you can just pass through the given default ID.

If neither the default (naive) nor the standard (big) functions suit your needs, you can write your own in this event.

## 13.6 class ArchiveWriterMBS

### 13.6.1 class ArchiveWriterMBS

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to write archive content.
**Example:**

```
dim a as new ArchiveWriterMBS

a.SetFormatZip
a.ZipSetCompressionDeflate

dim f as FolderItem = SpecialFolder.Desktop.Child("test.zip")
if not a.CreateFile(f) then
break // failed

else

dim data as string = "Hello World test file. Hello World again."

dim e as new ArchiveEntryMBS
e.PathName = "Hello World.txt"
e.Size = lenb(data)
e.Permissions = &o0644
e.FileType = e.kFileTypeRegular

a.WriteHeader e
call a.WriteData data

a.FinishEntry

a.Close
end if
```

**Notes:** Can be used to write zip, tar and other image formats.
Subclass of the ArchiverMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr5
- MBS Xojo Plugins, version 18.6pr3
- MBS Xojo / Real Studio Plugins, version 16.4pr2
- New Archive classes for handling zip and tar archives

**Xojo Developer Magazine**

- 19.4, page 81: Archives in Xojo, How to Use Zip Archives by Stefanie Juchmes

### 13.6.2 Methods

### 13.6.3 AddFilter(FilterCode as Integer)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds filter by code number.
**Notes:** Lasterror property is set.

### 13.6.4 AddFilterB64encode

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds base 64 filter.
**Notes:** Lasterror property is set.

### 13.6.5 AddFilterByName(Name as String)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds filter by name.
**Notes:** Lasterror property is set.

### 13.6.6 AddFilterBZip2

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add bzip2 filter.
**Notes:** Lasterror property is set.

### 13.6.7 AddFilterCompress

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add compress filter.
**Notes:** Lasterror property is set.

### 13.6.8 AddFilterGRZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add grzip filter.
**Notes:** Lasterror property is set.

### 13.6.9 AddFilterGZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add gzip filter.
**Notes:** Lasterror property is set.

### 13.6.10 AddFilterLRZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add lrzip filter.
**Notes:** Lasterror property is set.

### 13.6.11 AddFilterLZ4

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add support for LZ4 compression.
**Notes:** Lasterror property is set.

### 13.6.12 AddFilterLZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add lzip filter.
**Notes:** Lasterror property is set.

### 13.6.13 AddFilterLZMA

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add lzma filter.
**Notes:** Lasterror property is set.

### 13.6.14 AddFilterLZOp

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add lzop filter.
**Notes:** Lasterror property is set.

### 13.6.15 AddFilterNone

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add none filter.
**Notes:** Lasterror property is set.

### 13.6.16 AddFilterProgram(Command as String)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a filter calling external application.
**Notes:** Lasterror property is set.

### 13.6.17 AddFilterUUEncode

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add uu filter.
**Notes:** Lasterror property is set.

### 13.6.18 AddFilterXZ

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add xy filter.
**Notes:** Lasterror property is set.

### 13.6.19 Close

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the archive.
**Notes:** Lasterror property is set.

### 13.6.20 Constructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 13.6.21 CreateFile(File as FolderItem) as boolean

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new archive file.
**Notes:** Returns true on success.

### 13.6.22 CreateMemoryFile as boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates in memory output file.
**Notes:** Please use later MemoryData, MemoryString, MemoryPointer, or MemorySize later to get data after closing archive.
Lasterror property is set.

### 13.6.23 Destructor

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 13.6.24 Fail

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Marks archive as failed.
**Notes:** We will not close the archive properly and you can delete file.

### 13.6.25 FinishEntry

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes an entry.
**Notes:** Lasterror property is set.

### 13.6.26 SetFilterOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to the filter only.
**Notes:** Lasterror property is set.

### 13.6.27 SetFormat(FormatCode as Integer)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format by code.
**Notes:** Lasterror property is set.

### 13.6.28 SetFormat7Zip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to 7zip.
**Notes:** Lasterror property is set.

### 13.6.29 SetFormatArBsd

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to ar bsd.
**Notes:** Lasterror property is set.

### 13.6.30 SetFormatArSvr4

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to ar svr4.
**Notes:** Lasterror property is set.

### 13.6.31 SetFormatByExtension(FileName as String, defaultExtension as String = "")

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set file format by extension of filename.
**Notes:** e.g. pass "test.zip" for file name and ".zip" for default extension (if filename has none).
Lasterror property is set.

### 13.6.32 SetFormatByName(Name as String)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format by name.
**Notes:** Lasterror property is set.

### 13.6.33 SetFormatCpio

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to cpio.
**Notes:** Lasterror property is set.

### 13.6.34 SetFormatCpioNewc

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to cpio newc.
**Notes:** Lasterror property is set.

### 13.6.35 SetFormatGnutar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to gnu tape archive files.
**Notes:** Lasterror property is set.

### 13.6.36 SetFormatIso9660

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to iso 9660.
**Notes:** Lasterror property is set.

### 13.6.37 SetFormatMTree

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to mtree.
**Notes:** Lasterror property is set.

### 13.6.38 SetFormatMTreeClassic

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to mtree classic.
**Notes:** Lasterror property is set.

### 13.6.39 SetFormatOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to the format only.
**Notes:** Lasterror property is set.

### 13.6.40 SetFormatPax

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to pax.
**Notes:** Lasterror property is set.

### 13.6.41 SetFormatPaxRestricted

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to pax restricted.
**Notes:** Lasterror property is set.

### 13.6.42 SetFormatRaw

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets raw format.
**Notes:** Lasterror property is set.

### 13.6.43 SetFormatShar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to shar.
**Notes:** Lasterror property is set.

### 13.6.44 SetFormatSharDump

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to shar dump.
**Notes:** Lasterror property is set.

### 13.6.45 SetFormatUstar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to Unix Standard TAR.
**Notes:** Lasterror property is set.

### 13.6.46 SetFormatV7tar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to v7 tape archive files.
**Notes:** Lasterror property is set.

### 13.6.47 SetFormatWArc

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to web archive.
**Notes:** Lasterror property is set.

### 13.6.48 SetFormatXar

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to xar.
**Notes:** Lasterror property is set.

### 13.6.49 SetFormatZip

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets format to zip.
**Example:**

```
dim a as new ArchiveWriterMBS

a.SetFormatZip
a.ZipSetCompressionDeflate

dim f as FolderItem = SpecialFolder.Desktop.Child("test.zip")
if not a.CreateFile(f) then
break // failed

else

dim data as string = "Hello World test file. Hello World again."

dim e as new ArchiveEntryMBS
e.PathName = "Hello World.txt"
e.Size = lenb(data)
e.Permissions = &o0644
e.FileType = e.kFileTypeRegular
```

```
a.WriteHeader e
call a.WriteData data

a.FinishEntry

a.Close
end if
```

**Notes:** Lasterror property is set.

### 13.6.50 SetOption(Module as String, Option as String, Value as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option to both the format and the filter.
**Notes:** Lasterror property is set.

### 13.6.51 SetOptions(Options as String)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply option string to both the format and the filter.
**Example:**

```
dim a as new ArchiveWriterMBS
a.SetOptions "hdrcharset=UTF-8" // for unicode file names
```

**Notes:** Lasterror property is set.

The options to pass to writer.
This is a comma-separated list of options. Option names can be prefixed with module name.

Sample options:
compression=9
zip:encryption=zipcrypt
zip:encryption=aes128
zip:encryption=aes256
zip64
gzip:compression-level=9
hdrcharset=UTF-8

### 13.6.52 SetPassphrase(Password as String)

MBS Compression Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the passphrase to use.
**Example:**

```
dim a as new ArchiveWriterMBS

a.SetFormatZip
a.ZipSetCompressionDeflate

a.SetOptions "zip:encryption=zipcrypt" // enable encryption
a.SetPassphrase "HelloWorld" // set password
```

**Notes:** Alternatively you can use the Passphrase event.
Lasterror property is set.

### 13.6.53 SetSkipFile(DeviceID as Int64, FileNo as Int64)

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Record the dev/ino of a file that will not be written.
**Notes:** This is generally set to the dev/ino of the archive being written.
Lasterror property is set.

### 13.6.54 WriteData(data as MemoryBlock) as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to current file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:


- 13.6.55 WriteData(data as Ptr, Size as Int64) as Int64 2954
- 13.6.56 WriteData(data as string) as Int64 2955
- 13.6.57 WriteData(SourceArchive as ArchiveReaderMBS) as Int64 2955


### 13.6.55 WriteData(data as Ptr, Size as Int64) as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to current file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:

- 13.6.54 WriteData(data as MemoryBlock) as Int64 2954
- 13.6.56 WriteData(data as string) as Int64 2955
- 13.6.57 WriteData(SourceArchive as ArchiveReaderMBS) as Int64 2955

### 13.6.56 WriteData(data as string) as Int64

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to current file.
**Notes:** Returns number of bytes written.
Lasterror property is set.
See also:

- 13.6.54 WriteData(data as MemoryBlock) as Int64 2954
- 13.6.55 WriteData(data as Ptr, Size as Int64) as Int64 2954
- 13.6.57 WriteData(SourceArchive as ArchiveReaderMBS) as Int64 2955

### 13.6.57 WriteData(SourceArchive as ArchiveReaderMBS) as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to current file.
**Notes:** Loops over blocks in source archive entry and copies them all to current archive.
Returns number of bytes written.
Lasterror property is set.
See also:

- 13.6.54 WriteData(data as MemoryBlock) as Int64 2954
- 13.6.55 WriteData(data as Ptr, Size as Int64) as Int64 2954
- 13.6.56 WriteData(data as string) as Int64 2955

### 13.6.58 WriteHeader(Entry as ArchiveEntryMBS)

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an archive item.
**Notes:** Lasterror property is set.

### 13.6.59 ZipSetCompressionDeflate

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets compression for zip to deflate.
**Notes:** Lasterror property is set.

### 13.6.60 ZipSetCompressionStore

MBS Compression Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets compression for zip to store.
**Notes:** Store is no compression.
Lasterror property is set.

### 13.6.61 Properties

### 13.6.62 MemoryData as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies data in memory buffer as MemoryBlock.
**Notes:** (Read only property)

### 13.6.63 MemoryPointer as Ptr

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries pointer for memory block.
**Notes:** Only valid till more data is added, which may reallocate the buffer to grow it.
(Read only property)

### 13.6.64 MemorySize as Int64

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memory size.
**Notes:** Current memory used for memory output in bytes.
(Read only property)

### 13.6.65 MemoryString as String

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies data in memory buffer as String.
**Notes:** (Read only property)

### 13.6.66 WriteDataBlockSupported as Boolean

MBS Compression Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this writer supports block operations.
**Notes:** Some do and if you call WriteDataBlock on a writer which can't, it will return only errors. (Read only property)

# Chapter 14

# Audio

## 14.1 class AUPlayerMBS

### 14.1.1 class AUPlayerMBS

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The audio unit player.
**Notes:** This is a better Core Audio based player which has a lot of features like pitch, rate, volume, equalizer and other features.
Beside playing audio you can also use this class to get sample data from audio files.

Currently only stereo is supported (2 channels maximum).
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr3
- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins, version 20.0pr5
- Problems with killing Xojo threads with plugin calls.
- MBS Xojo / Real Studio Plugins, version 15.1pr1
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0fc1
- MBS Xojo / Real Studio Plugins, version 15.0pr12
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- MBS Xojo / Real Studio plug-ins in version 14.2

**Xojo Developer Magazine**

- 13.2, page 8: News
- 13.1, page 10: News
- 12.4, page 9: News

### 14.1.2 Methods

### 14.1.3 ChannelMap as Integer()

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Queries current channel map.
**Notes:** The map should have an entry for each input channel and inside the number of the output channel or -1 to keep it silent.

### 14.1.4 Data as Memoryblock

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies the data to play.
**Notes:** The other data properties define what format this data has.
Typically 4 byte floats per sample interleaved for all channels.

### 14.1.5 LoadFile(file as folderitem, InputChannels as Integer = 2, OutputChannels as Integer = 2) as boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Loads an audio file.
**Notes:** InputChannels is the number of channels we want to get back from file reader.
OutputChannels is the number of channels we want to have for output.
Returns true on success or false on failure.

### 14.1.6 LoadFileMT(file as folderitem, InputChannels as Integer = 2, OutputChannels as Integer = 2) as boolean

MBS MacOSX Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Loads an audio file.
**Notes:** The work is performed on a preemptive thread, so this function does not block the application and

can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

InputChannels is the number of channels we want to get back from file reader.
OutputChannels is the number of channels we want to have for output.
Returns true on success or false on failure.

### 14.1.7 Pause

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Pauses playback.
**Notes:** Lasterror is set.

### 14.1.8 Play

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Starts playback.
**Notes:** Lasterror is set.

### 14.1.9 Reset

MBS MacOSX Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Resets audio units.
**Notes:** Useful after changing options.

### 14.1.10 setChannelMap(values() as Integer)

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets a new channel map.
**Notes:** The map should have an entry for each input channel and inside the number of the output channel or -1 to keep it silent.

### 14.1.11 updateEQ(eqBands() as Double)

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Updates equalizer.
**Notes:** Please pass array of 32 values from -12 to 12.
Lasterror is set.
See also:

- 61.8.8 updateEQ(eqBands() as single) 10913

### 14.1.12 updateEQ(eqBands() as single)

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Updates equalizer.
**Notes:** Please pass array of 32 values from -12 to 12.
Lasterror is set.
See also:

- 14.1.11 updateEQ(eqBands() as Double) 2961

### 14.1.13 Properties

### 14.1.14 ClientFormatString as String

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The input format description string.
**Notes:** (Read only property)

### 14.1.15 ConverterHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the converter audio unit.
**Notes:** (Read and Write property)

### 14.1.16 CurrentDeviceID as UInt32

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Get or set the current device.
**Notes:** Please check OutputDevices dictionary for which devices are available.
(Read and Write property)

### 14.1.17 CurrentTime as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The current time in seconds.
**Notes:** Lasterror is set.
(Read and Write property)

### 14.1.18 DataIsFloat as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether data is floating point.
**Notes:** (Read only property)

### 14.1.19 DataIsInterleaved as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether data is interleaved.
**Notes:** (Read only property)

### 14.1.20 DataIsNativeEndian as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether data is native endian.
**Notes:** (Read only property)

### 14.1.21 DataIsPCM as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether data is PCM format.
**Notes:** Linear PCM.
(Read only property)

### 14.1.22 DataIsSignedInteger as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether data is signed integers.
**Notes:** (Read only property)

### 14.1.23 DataNumberChannels as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Number of channels.
**Notes:** (Read only property)

### 14.1.24 DataNumberChannelStreams as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Number of channels.
**Notes:** (Read only property)

### 14.1.25 DataNumberInterleavedChannels as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Number of interleaved channels.
**Notes:** (Read only property)

### 14.1.26 DataSampleWordSize as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The size of a sample word.
**Notes:** (Read only property)

### 14.1.27 DefaultDeviceID as UInt32

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Queries the Core Audio ID of the default device.
**Notes:** (Read only property)

### 14.1.28 EnablePeakLocking as Boolean

MBS MacOSX Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Whether peak locking is enabled.
**Notes:** Default value is true.
Only if UseNewTimePitchUnit is set to true.
(Read and Write property)

### 14.1.29 EqualizerHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the equalizer audio unit.
**Notes:** (Read and Write property)

### 14.1.30 File as FolderItem

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The reference to the folderitem used to load audio file.
**Notes:** (Read only property)

### 14.1.31 GraphHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the audio graph.
**Notes:** (Read and Write property)

### 14.1.32 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** Zero is no error.
(Read and Write property)

### 14.1.33 LoopIn as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The position where loop starts.
**Notes:** (Read and Write property)

### 14.1.34 Looping as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether to loop.
**Notes:** (Read and Write property)

### 14.1.35 LoopOut as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The position where loop ends.
**Notes:** (Read and Write property)

### 14.1.36 MaximumFramesPerSlice as Integer

MBS MacOSX Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The maximum number of frames per slice.
**Notes:** Default seems to be 1156 by Core Audio.
(Read and Write property)

### 14.1.37 MeterLevel as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Queries meter level.
**Notes:** Lasterror is set.
Value is smaller than -120 if unknown.
(Read only property)

### 14.1.38 MixerHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the mixer audio unit.
**Notes:** (Read and Write property)

### 14.1.39 OutputDevices as Dictionary

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Queries a dictionary with output devices.
**Example:**

```
Dim a As New AUPlayerMBS
Dim d As Dictionary = a.OutputDevices

For Each key As String In d.keys
dim name as string = d.Value(key)

MsgBox key+": "+name
Next
```

**Notes:** Key is the ID and value is the name of the device.
e.g. ID 84 for a MacBook Pro Speaker, but the number is certainly different for your computer.

Changed from regular to shared property in version 22.3.
(Read only property)

### 14.1.40 OutputFormatString as String

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The output format description string.
**Notes:** (Read only property)

### 14.1.41 OutputHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the output audio unit.

**Notes:** (Read and Write property)

### 14.1.42 OutputUnit as Integer

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Which output unit to use.
**Notes:** Apple offer various output units and here you can decide which one to use.
Setting takes effect the next time you call LoadFile.
(Read and Write property)

### 14.1.43 OutputVolume as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The output volume.
**Notes:** Lasterror is set.
From 0.0 to 1.0.
(Read and Write property)

### 14.1.44 Overlap as Double

MBS MacOSX Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Defines the overlap.
**Notes:** Range is 3.0 to 32.0 and default is 8.0.
Only if UseNewTimePitchUnit is set to true.
(Read and Write property)

### 14.1.45 Pan as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The output pan.
**Notes:** From -1.0 to 1.0.
Lasterror is set.
(Read and Write property)

### 14.1.46 PitchRate as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The pitch rate.
**Notes:** Lasterror is set.
(Read and Write property)

### 14.1.47 Playing as Boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether the player is playing.
**Notes:** (Read and Write property)

### 14.1.48 SampleRate as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The sample rate of the audio file.
**Notes:** (Read only property)

### 14.1.49 Tag as Variant

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The tag value.
**Notes:** You can use this property to store whatever you like.
(Read and Write property)

### 14.1.50 TimePitchHandle as Integer

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The handle to the time audio unit.
**Notes:** (Read and Write property)

### 14.1.51 TimePitchUnit as Integer

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Which time pitch unit to use.
**Notes:** Apple offer various time pitch units and here you can decide which one to use.
Setting takes effect the next time you call LoadFile.
(Read and Write property)

### 14.1.52 TimeRate as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The time rate.
**Notes:** Lasterror is set.
(Read and Write property)

### 14.1.53 TrackLength as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Length of the audio track in seconds.
**Notes:** Lasterror is set.
(Read only property)

### 14.1.54 VariSpeedHandle as Integer

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The handle to the vari speed audio unit.
**Notes:** (Read and Write property)

### 14.1.55 InputEnabled(inputNum as UInt32) as boolean

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Enable or disable input.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 14.1.56 InputVolume(inputNum as UInt32) as Double

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The input volume.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 14.1.57 Constants

Output Units

| Constant | Value | Description |
|---|---|---|
| OutputUnitDefault | 0 | Plugin default, currently HALOutput. |
| OutputUnitDefaultOutput | 3 | A specialisation of AUHAL that is used to track the user's selection of the default device as set in the Sound Prefs |
| OutputUnitGenericOutput | 1 | A generic output unit provides the start/stop API, and provides the basic services to convert Linear PCM formats. |
| OutputUnitHALOutput | 2 | The audio unit that interfaces to any audio device. The user specifies which audio device to track. The audio unit can do input from the device as well as output to the device. Bus 0 is used for the output side, bus 1 is used to get audio input from the device. |
| OutputUnitSystemOutput | 4 | A specialisation of AUHAL that is used to track the user's selection of the device to use for sound effects, alerts and other UI sounds. |

Time Pitch Units

| Constant | Value | Description |
|---|---|---|
| TimePitchUnitDefault | 0 | Default, plugin chooses one. (normal TimePitch) |
| TimePitchUnitTimePitch | 1 | An audio unit that can be used to have independent control of both playback rate and pitch. |
| TimePitchUnitVarispeed | 2 | An audio unit that can be used to control playback rate (as the rate is faster, the pitch is higher). |

## 14.2 class CAPlayThroughMBS

### 14.2.1 class CAPlayThroughMBS

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to do active play through on Mac OS X using CoreAudio.
**Notes:** This class uses newer code than the AudioPlayThruMBS class and may work better for some people.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr3
- MBS Xojo Plugins, version 22.5pr1
- MBS Real Studio Plugins, version 13.0pr3
- MBS Real Studio Plugins, version 12.1pr7
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr10
- MBS Real Studio Plugins, version 11.1pr8

### 14.2.2 Methods

### 14.2.3 Constructor(InputDeviceID as Integer, OutputDeviceID as Integer)

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Lasterror is set.
Device IDs are the IDs you get in the CoreAudio classes.

### 14.2.4 IsRunning as boolean

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether playthrough is running.

### 14.2.5 Start

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Starts play through.
**Notes:** Lasterror is set.

### 14.2.6 Stop

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops play through.
**Notes:** Lasterror is set.

### 14.2.7 Properties

### 14.2.8 ExtraLatency as Integer

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Extra latency.
**Notes:** When the latency is calculated, we add this value.
Unit is bytes.

Calculation of the buffer size is like this:

if (UseMinimumLatency)
InToOutSampleOffset = ExtraLatency + InputDevice.SafetyOffset + OutputDevice.SafetyOffset
else
InToOutSampleOffset = ExtraLatency + InputDevice.SafetyOffset + InputDevice.BufferSizeFrames + OutputDevice.SafetyOffset + OutputDevice.BufferSizeFrames
(Read and Write property)

### 14.2.9 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 14.2.10 OutputUnitHandle as Integer

MBS MacOSX Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the handle for the output Audio Unit.
**Notes:** (Read only property)

### 14.2.11 UseMinimumLatency as Boolean

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether to reduce latency to the absolute minimum.
**Notes:** By default a large latency is used to ensure a smoother playthrough.
But you can have it set to the absolute minimum.

Calculation of the buffer size is like this:

if (UseMinimumLatency)
InToOutSampleOffset = ExtraLatency + InputDevice.SafetyOffset + OutputDevice.SafetyOffset
else
InToOutSampleOffset = ExtraLatency + InputDevice.SafetyOffset + InputDevice.BufferSizeFrames + OutputDevice.SafetyOffset + OutputDevice.BufferSizeFrames
(Read and Write property)

### 14.2.12 Volume as Double

MBS MacOSX Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get or set the volume of the output audio unit.
**Notes:** Lasterror is set.
Range is from 0.0 to 1.0.
(Read and Write computed property)

## 14.3 class CoreAudioListenerMBS

### 14.3.1 class CoreAudioListenerMBS

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The class to watch for changes to CoreAudio property.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr7

### 14.3.2 Methods

### 14.3.3 Constructor(ObjectID as UInt32, PropertySelector as UInt32, PropertyScope as UInt32, PropertyElement as UInt32)

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Please pass object ID and property selector values (see example project).
Lasterror is zero on success.

### 14.3.4 Destructor

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The destructor.

### 14.3.5 Properties

### 14.3.6 LastError as Integer

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read only property)

### 14.3.7 ObjectID as UInt32

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The object ID used in constructor.
**Notes:** (Read only property)

### 14.3.8 PropertyElement as UInt32

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The element ID used in constructor.
**Notes:** (Read only property)

### 14.3.9 PropertyScope as UInt32

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The scope value used in constructor.
**Notes:** (Read only property)

### 14.3.10 PropertySelector as UInt32

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The selector value used in constructor.
**Notes:** (Read only property)

### 14.3.11 Events

### 14.3.12 Changed

MBS MacOSX Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The watched property changed.

## 14.4 class CoreAudioMBS

### 14.4.1 class CoreAudioMBS

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** A class for low level CoreAudio calls.
**Notes:** Currently not finished for the 4.0 release.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr8
- MBS Real Studio Plugins, version 11.4pr2
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr11

### 14.4.2 Methods

### 14.4.3 AudioDeviceGetPropertyCFString(AudioDeviceID as Integer, channel as Integer, isinput as boolean, propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 10.2, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Device.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)
Dim DefaultInputDeviceCFName As CFStringMBS = c.AudioDeviceGetPropertyCFString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceNameCFString)
Dim DefaultInputDeviceName As String = DefaultInputDeviceCFName.Str

MessageBox DefaultInputDeviceName
```

**Notes:** Lasterror is set.
The property you query must be one of the CFString properties.

### 14.4.4 AudioDeviceGetPropertyInfo(AudioDeviceID as Integer, channel as Integer, isinput as boolean, propertyID as string, byref size as Integer, byref writeable as boolean)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets property information from an Audio Unit.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)

Dim size As Integer
Dim writeable As Boolean

c.AudioDeviceGetPropertyInfo(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceName, size, writeable)

If writeable Then
MessageBox "Writeable, "+size.ToString+" bytes"
Else
MessageBox "Read only, "+size.ToString+" bytes"
End If
```

**Notes:** Lasterror is set.

### 14.4.5 AudioDeviceGetPropertyMemory(AudioDeviceID as Integer, channel as Integer, isinput as boolean, propertyID as string) as memoryblock

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Device.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultOutputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultOutputDevice)
Dim DefaultOutputDeviceID As Integer = DefaultOutputDeviceMem.Long(0)

Dim mem1 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeDecibels)
Dim VolumeDecibels As Single = mem1.SingleValue(0)
```

Dim mem2 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeScalar)
Dim VolumeScalar As Single = mem2.SingleValue(0)

Break

**Notes:** Lasterror is set.

### 14.4.6 AudioDeviceGetPropertyString(AudioDeviceID as Integer, channel as Integer, isinput as boolean, propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Device.
**Example:**

Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)
Dim DefaultInputDeviceName As String = c.AudioDeviceGetPropertyString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceName)

MessageBox DefaultInputDeviceName

**Notes:** Lasterror is set.

### 14.4.7 AudioDeviceSetPropertyMemory(AudioDeviceID as Integer, when as memoryblock, channel as Integer, isinput as boolean, propertyID as string, data as memoryblock, offset as Integer, length as Integer)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Device.
**Example:**

Dim c As New CoreAudioMBS

Dim DefaultOutputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultOutputDevice)
Dim DefaultOutputDeviceID As Integer = DefaultOutputDeviceMem.Long(0)

```
Dim mem1 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeScalar)
Dim VolumeScalar As Single = mem1.SingleValue(0)

// set volume to 50%
Dim VolumeScalar2 As Single = 0.5
Dim mem2 As New MemoryBlock(4)
mem2.SingleValue(0) = VolumeScalar2

c.AudioDeviceSetPropertyMemory(DefaultOutputDeviceID, Nil, 0, False, c.kAudioDevicePropertyVolumeScalar, mem2, 0, mem2.Size)

// now query again
Dim mem3 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeScalar)
Dim VolumeScalar3 As Single = mem3.SingleValue(0)

Break
```

**Notes:** Lasterror is set.

### 14.4.8 AudioDeviceSetPropertyString(AudioDeviceID as Integer, when as memoryblock, channel as Integer, isinput as boolean, propertyID as string, data as string)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Device.
**Notes:** Lasterror is set.

### 14.4.9 AudioHardwareGetPropertyCFString(propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 10.2, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Hardware.
**Notes:** Lasterror is set.
The property you query must be one of the CFString properties.

### 14.4.10 AudioHardwareGetPropertyInfo(propertyID as string, byref size as Integer, byref writeable as boolean)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets property information from the Audio Hardware.
**Example:**

```
Dim c As New CoreAudioMBS

Dim writeable As Boolean
Dim size As Integer
c.AudioHardwareGetPropertyInfo(c.kAudioHardwarePropertyDefaultOutputDevice, size, writeable)

If writeable Then
MessageBox "Writeable, "+size.ToString+" bytes"
else
MessageBox "Read only, "+size.ToString+" bytes"
End If
```

**Notes:** Lasterror is set.

### 14.4.11 AudioHardwareGetPropertyMemory(propertyID as string) as memoryblock

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Hardware.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)
Dim DefaultInputDeviceName As String = c.AudioDeviceGetPropertyString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceName)

MessageBox DefaultInputDeviceName
```

**Notes:** Lasterror is set.

### 14.4.12 AudioHardwareGetPropertyString(propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Hardware.
**Notes:** Lasterror is set.

### 14.4.13 AudioHardwareSetPropertyMemory(propertyID as string, data as memoryblock, offset as Integer, length as Integer)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Hardware.
**Notes:** Lasterror is set.

### 14.4.14 AudioHardwareSetPropertyString(propertyID as string, data as string)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Hardware.
**Notes:** Lasterror is set.

### 14.4.15 AudioObjectGetPropertyData(inObjectID as Integer, AddressSelector as UInt32, AddressScope as UInt32, AddressElement as UInt32, QualifierData as memoryblock = nil, InputData as Memoryblock = nil) as memoryblock

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries an AudioObject to get the data of the given property and places it in the provided buffer.
**Notes:** The plugin queries size and creates a buffer for the result.

inObjectID: The AudioObject to query.
AddressSelector, AddressScope or AddressElement: An audio object property address indicating which property is being queried.
QualifierData: A buffer of data to be used in determining the data of the property being queried. Note that not all properties require qualification, in which case this value will be nil.

If InputData is nil, we query size and allocate buffer of required size.
If InputData is not nil, we use this memoryblock with its size. Result is InputData on success.

Lasterror is set.

### 14.4.16 AudioObjectGetPropertyDataSize(inObjectID as Integer, AddressSelector as UInt32, AddressScope as UInt32, AddressElement as UInt32, QualifierData as memoryblock = nil) as UInt32

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries an AudioObject to find the size of the data for the given property.
**Notes:** inObjectID: The AudioObject to query.
AddressSelector, AddressScope or AddressElement: An audio object property address indicating which property is being queried.
QualifierData: A buffer of data to be used in determining the data of the property being queried. Note that not all properties require qualification, in which case this value will be nil.

Returns an UInt32 indicating how many bytes the data for the given property occupies.
Lasterror is set.

### 14.4.17 AudioObjectSetPropertyData(inObjectID as Integer, AddressSelector as UInt32, AddressScope as UInt32, AddressElement as UInt32, Data as Memoryblock, QualifierData as memoryblock = nil)

MBS MacOSX Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Tells an AudioObject to change the value of the given property using the provided data.
**Notes:** inObjectID: The AudioObject to query.
AddressSelector, AddressScope or AddressElement: An audio object property address indicating which property is being queried.
QualifierData: A buffer of data to be used in determining the data of the property being queried. Note that not all properties require qualification, in which case this value will be nil.

Lasterror is set.

### 14.4.18 AudioOutputUnitStart(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Starts the Audio Unit.
**Notes:** Errorcode is returned.

### 14.4.19 AudioOutputUnitStop(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Stops the AudioUnit.
**Notes:** Errorcode is returned.

### 14.4.20 AudioStreamGetPropertyCFString(AudioStreamID as Integer, channel as Integer, propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 10.2, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Stream.
**Notes:** Lasterror is set.
The property you query must be one of the CFString properties.

### 14.4.21 AudioStreamGetPropertyInfo(AudioStreamID as Integer, channel as Integer, propertyID as string, byref size as Integer, byref writeable as boolean)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets property information from an Audio Stream.
**Notes:** Lasterror is set.

### 14.4.22 AudioStreamGetPropertyMemory(AudioStreamID as Integer, channel as Integer, propertyID as string) as memoryblock

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Stream.
**Notes:** Lasterror is set.

### 14.4.23 AudioStreamGetPropertyString(AudioStreamID as Integer, channel as Integer, propertyID as string) as string

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property value from the Audio Stream.
**Notes:** Lasterror is set.

### 14.4.24 AudioStreamSetPropertyMemory(AudioStreamID as Integer, when as memoryblock, channel as Integer, propertyID as string, data as memoryblock, offset as Integer, length as Integer)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Stream.
**Notes:** Lasterror is set.

### 14.4.25 AudioStreamSetPropertyString(AudioStreamID as Integer, when as memoryblock, channel as Integer, propertyID as string, data as string)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Stream.
**Notes:** Lasterror is set.

### 14.4.26 AudioUnitGetParameter(AudioUnit as Integer, ParameterID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer) as single

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Gets an audio unit parameter.

### 14.4.27 AudioUnitGetPropertyCFString(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer) as string

MBS MacOSX Plugin, Plugin Version: 10.2, Platform: macOS, Targets: All.

**Function:** Gets a property of an Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

The property you query must be one of the CFString properties.

### 14.4.28 AudioUnitGetPropertyInfo(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer, byref size as Integer, byref writeable as boolean)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets property information from the Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.29 AudioUnitGetPropertyMemory(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer) as memoryblock

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property of an Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.30 AudioUnitGetPropertyString(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer) as string

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Gets a property of an Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.31 AudioUnitInitialize(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the Audio Unit.
**Notes:** Errorcode is returned.

### 14.4.32 AudioUnitReset(componenthandle as Integer, scope as Integer, element as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets the Audio Unit.
**Notes:** Errorcode is returned.

Useful constants:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.33 AudioUnitSetParameter(AudioUnit as Integer, ParameterID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer, value as single, BufferOffsetInFrames as Integer)

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Sets an audio unit parameter.

### 14.4.34 AudioUnitSetPropertyMemory(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer, data as memoryblock, offset as Integer, length as Integer)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property of an Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.35 AudioUnitSetPropertyString(AudioUnit as Integer, propertyID as Integer, AudioUnitScope as Integer, AudioUnitElement as Integer, data as string)

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Sets a property value for the Audio Unit.
**Notes:** Lasterror is set.
Constants for AudioUnitScope:

| | |
|---|---|
| kAudioUnitScope_Global | = 0 |
| kAudioUnitScope_Input | = 1 |
| kAudioUnitScope_Output | = 2 |
| kAudioUnitScope_Group | = 3 |
| kAudioUnitScope_Part | = 4 |

### 14.4.36 AudioUnitUninitialize(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Uninitializes the Audio Unit.
**Notes:** Errorcode is returned.

### 14.4.37 CloseComponent(componenthandle as Integer)

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Closes a component.
**Notes:** Do not use the componenthandle any more after this call!

### 14.4.38 CoreAudioConvertHostTimeToNanosMBS(inHostTime as UInt64) as UInt64

MBS MacOSX Plugin, Plugin Version: 7.0, Platform: macOS, Targets: All.

**Function:** Convert the given host time to a time in Nanoseconds.
**Example:**

```
Dim value1 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS
Dim value2 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS
Dim value3 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS

Dim time1 As UInt64 = CoreAudioMBS.CoreAudioConvertHostTimeToNanosMBS(value1)
Dim time2 As UInt64 = CoreAudioMBS.CoreAudioConvertHostTimeToNanosMBS(value2)
Dim time3 As UInt64 = CoreAudioMBS.CoreAudioConvertHostTimeToNanosMBS(value3)

// HostTime and Nanoseconds can be same on Intel Macs
// on Apple Silicon they are not the same!

Break
```

**Notes:** Returns 0 on any error.

### 14.4.39 CoreAudioConvertNanosToHostTimeMBS(inNanos as UInt64) as UInt64

MBS MacOSX Plugin, Plugin Version: 7.0, Platform: macOS, Targets: All.

**Function:** Convert the given Nanoseconds time to a time in the host clock's time base.
**Notes:** Returns 0 on any error.

### 14.4.40 CoreAudioGetCurrentHostTimeMBS as UInt64

MBS MacOSX Plugin, Plugin Version: 7.0, Platform: macOS, Targets: All.

**Function:** Retrieve the current host time value.
**Example:**

```
Dim value1 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS
Dim value2 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS
Dim value3 As UInt64 = CoreAudioMBS.CoreAudioGetCurrentHostTimeMBS

Break // you see how it changes and how long a function call can take
```

**Notes:** Returns 0 on any error.

### 14.4.41 CoreAudioGetHostClockFrequencyMBS as Double

MBS MacOSX Plugin, Plugin Version: 7.0, Platform: macOS, Targets: All.

**Function:** Retrieve the number of ticks per second of the host clock.
**Example:**

```
Dim value As Double = CoreAudioMBS.CoreAudioGetHostClockFrequencyMBS
MessageBox value.ToString // 1 billion
```

### 14.4.42 GetHostClockMinimumTimeDeltaMBS as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Retrieve the smallest number of ticks difference between two succeeding values of the host clock.
**Example:**

```
Dim value As Integer = CoreAudioMBS.GetHostClockMinimumTimeDeltaMBS
MessageBox value.ToString // 1
```

**Notes:** For instance, if this value is 5 and the first value of the host clock is X then the next time after X will be at greater than or equal X+5.
Returns an unsigned integer value.

### 14.4.43 OpenDefaultComponent(type as string, subtype as string) as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Opens the default component for the given type and subtype string.
**Example:**

```
Dim c As New CoreAudioMBS

Const kAudioUnitComponentType = "aunt"
Const kAudioUnitSubType_Output = "out "
```

```
// open default output component
Dim n As Integer = c.OpenDefaultComponent(kAudioUnitComponentType, kAudioUnitSubType_Output)

If n = 0 Then
Break // failed
Else
Break
// okay, so close
c.CloseComponent(n)
End If
```

**Notes:** You can check the "QT Components list" example project for which components are installed.
Returns 0 on any error.
type and subtype must be 4 letter codes.

useful constans:

```
kAudioUnitComponentType                = "aunt"
kAudioUnitSubType_Output               = "out "
kAudioUnitID_HALOutput                 = "ahal"
kAudioUnitID_DefaultOutput             = "def "
kAudioUnitID_SystemOutput              = "sys "
kAudioUnitID_GenericOutput             = "genr"
kAudioUnitSubType_MusicDevice          = "musd"
kAudioUnitID_DLSSynth                  = "dls "
kAudioUnitSubType_SampleRateConverter  = "srcv"
kAudioUnitID_PolyphaseSRC              = "poly"
kAudioUnitSubType_FormatConverter      = "fmtc"
kAudioUnitID_Interleaver               = "inlv"
kAudioUnitID_Deinterleaver             = "dnlv"
kAudioUnitID_AUConverter               = "conv"
kAudioUnitSubType_Effect               = "efct"
kAudioUnitID_MatrixReverb              = "mrev"
kAudioUnitID_Delay                     = "dely"
kAudioUnitID_LowPassFilter             = "lpas"
kAudioUnitID_HighPassFilter            = "hpas"
kAudioUnitID_BandPassFilter            = "bpas"
kAudioUnitID_PeakLimiter               = "lmtr"
kAudioUnitID_DynamicsProcessor         = "dcmp"
kAudioUnitSubType_Mixer                = "mixr"
kAudioUnitID_StereoMixer               = "smxr"
kAudioUnitID_3DMixer                   = "3dmx"
```

### 14.4.44 Properties

### 14.4.45 kAudioDeviceProcessorOverload as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.46 kAudioDevicePropertyActualSampleRate as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

// find our default output device
Dim m As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultOutputDevice)
Dim deviceID As Integer = m.Int32Value(0)

// and grab sample rate
m = c.AudioDeviceGetPropertyMemory(deviceID, 0, False, c.kAudioDevicePropertyActualSampleRate)
Dim rate As Double = m.DoubleValue(0)

// e.g. 48000

Break
```

**Notes:** (Read only property)

### 14.4.47 kAudioDevicePropertyAvailableNominalSampleRates as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.48 kAudioDevicePropertyBufferFrameSize as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.49 kAudioDevicePropertyBufferFrameSizeRange as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.50 kAudioDevicePropertyBufferSize as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.51 kAudioDevicePropertyBufferSizeRange as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.52 kAudioDevicePropertyClockSource as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.53 kAudioDevicePropertyClockSourceNameForID as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.54 kAudioDevicePropertyClockSourceNameForIDCFString as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.55 kAudioDevicePropertyClockSources as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.56 kAudioDevicePropertyDataSource as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.57 kAudioDevicePropertyDataSourceNameForID as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.58 kAudioDevicePropertyDataSourceNameForIDCFString as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.59 kAudioDevicePropertyDataSources as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.60 kAudioDevicePropertyDeviceCanBeDefaultDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.61 kAudioDevicePropertyDeviceCanBeDefaultSystemDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.62 kAudioDevicePropertyDeviceIsAlive as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.63 kAudioDevicePropertyDeviceIsRunning as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.64 kAudioDevicePropertyDeviceIsRunningSomewhere as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.65 kAudioDevicePropertyDeviceManufacturer as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock
Dim DefaultInputDeviceID As Integer
Dim DefaultInputDeviceManufacturerMem As MemoryBlock
Dim DefaultInputDeviceManufacturerName As String

DefaultInputDeviceMem = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInput-
Device)
DefaultInputDeviceID = DefaultInputDeviceMem.Long(0)
DefaultInputDeviceManufacturerMem = c.AudioDeviceGetPropertyMemory(DefaultInputDeviceID, 0, True,
c.kAudioDevicePropertyDeviceManufacturer)
DefaultInputDeviceManufacturerName = DefaultInputDeviceManufacturerMem.CString(0)

If DefaultInputDeviceManufacturerName.Encoding = Nil Then // fix it, if it is not set
DefaultInputDeviceManufacturerName = DefineEncoding(DefaultInputDeviceManufacturerName, encodings.UTF8)
End If

MessageBox DefaultInputDeviceManufacturerName
```

**Notes:** (Read only property)

### 14.4.66 kAudioDevicePropertyDeviceManufacturerCFString as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock
Dim DefaultInputDeviceID As Integer
Dim DefaultInputDeviceManufacturerCFName As CFStringMBS
Dim DefaultInputDeviceManufacturerName As String
```

```
DefaultInputDeviceMem = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
DefaultInputDeviceID = DefaultInputDeviceMem.Long(0)
DefaultInputDeviceManufacturerCFName = c.AudioDeviceGetPropertyCFString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceManufacturerCFString)
DefaultInputDeviceManufacturerName = DefaultInputDeviceManufacturerCFName.Str

MessageBox DefaultInputDeviceManufacturerName
```

**Notes:** (Read only property)

### 14.4.67 kAudioDevicePropertyDeviceName as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.68 kAudioDevicePropertyDeviceNameCFString as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)
Dim DefaultInputDeviceCFName As CFStringMBS = c.AudioDeviceGetPropertyCFString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceNameCFString)
Dim DefaultInputDeviceName As String = DefaultInputDeviceCFName.Str

MessageBox DefaultInputDeviceName
```

**Notes:** (Read only property)

### 14.4.69 kAudioDevicePropertyDeviceUID as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.70 kAudioDevicePropertyDriverShouldOwniSub as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.71 kAudioDevicePropertyHogMode as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.72 kAudioDevicePropertyIOProcStreamUsage as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.73 kAudioDevicePropertyJackIsConnected as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.74 kAudioDevicePropertyLatency as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.75 kAudioDevicePropertyMute as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.76 kAudioDevicePropertyNominalSampleRate as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.77 kAudioDevicePropertyPlayThru as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.78 kAudioDevicePropertyPlugIn as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.79 kAudioDevicePropertyPreferredChannelsForStereo as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.80 kAudioDevicePropertyRegisterBufferList as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.81 kAudioDevicePropertySafetyOffset as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.82 kAudioDevicePropertyStreamConfiguration as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.83 kAudioDevicePropertyStreamFormat as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.84 kAudioDevicePropertyStreamFormatMatch as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.85 kAudioDevicePropertyStreamFormats as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.86 kAudioDevicePropertyStreamFormatSupported as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.87 kAudioDevicePropertyStreams as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.88 kAudioDevicePropertySubMute as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.89 kAudioDevicePropertySubVolumeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.90 kAudioDevicePropertySubVolumeDecibelsToScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.91 kAudioDevicePropertySubVolumeRangeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.92 kAudioDevicePropertySubVolumeScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.93 kAudioDevicePropertySubVolumeScalarToDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.94 kAudioDevicePropertySupportsMixing as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.95 kAudioDevicePropertyTransportType as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.96 kAudioDevicePropertyUsesVariableBufferFrameSizes as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.97 kAudioDevicePropertyVolumeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.98 kAudioDevicePropertyVolumeDecibelsToScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.99 kAudioDevicePropertyVolumeRangeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.100 kAudioDevicePropertyVolumeScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultOutputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultOutputDevice)
Dim DefaultOutputDeviceID As Integer = DefaultOutputDeviceMem.Long(0)

Dim mem1 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeScalar)
Dim VolumeScalar As Single = mem1.SingleValue(0)

// set volume to 50%
Dim VolumeScalar2 As Single = 0.5
Dim mem2 As New MemoryBlock(4)
mem2.SingleValue(0) = VolumeScalar2

c.AudioDeviceSetPropertyMemory(DefaultOutputDeviceID, Nil, 0, False, c.kAudioDevicePropertyVolumeScalar,
```

```
mem2, 0, mem2.Size)

// now query again
Dim mem3 As MemoryBlock = c.AudioDeviceGetPropertyMemory(DefaultOutputDeviceID, 0, False, c.kAudioDevicePropertyVolumeScalar)
Dim VolumeScalar3 As Single = mem3.SingleValue(0)

Break
```

**Notes:** (Read only property)

### 14.4.101 kAudioDevicePropertyVolumeScalarToDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.102 kAudioHardwarePropertyBootChimeVolumeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** A Float32 that represents the value of the boot chime volume control in dB. This property is implemented by an AudioControl object that is a subclass of AudioBootChimeVolumeControl.
(Read only property)

### 14.4.103 kAudioHardwarePropertyBootChimeVolumeDecibelsToScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.104 kAudioHardwarePropertyBootChimeVolumeRangeDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.105 kAudioHardwarePropertyBootChimeVolumeScalar as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.106 kAudioHardwarePropertyBootChimeVolumeScalarToDecibels as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.107 kAudioHardwarePropertyDefaultInputDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultInputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultInputDevice)
Dim DefaultInputDeviceID As Integer = DefaultInputDeviceMem.Long(0)
Dim DefaultInputDeviceName As String = c.AudioDeviceGetPropertyString(DefaultInputDeviceID, 0, True, c.kAudioDevicePropertyDeviceName)

MessageBox DefaultInputDeviceName
```

**Notes:** (Read only property)

### 14.4.108 kAudioHardwarePropertyDefaultOutputDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim DefaultOutputDeviceMem As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDefaultOutputDevice)
Dim DefaultOutputDeviceID As Integer = DefaultOutputDeviceMem.Long(0)
Dim DefaultOutputDeviceName As String = c.AudioDeviceGetPropertyString(DefaultOutputDeviceID, 0, True, c.kAudioDevicePropertyDeviceName)

MessageBox DefaultOutputDeviceName
```

**Notes:** (Read only property)

### 14.4.109 kAudioHardwarePropertyDefaultSystemOutputDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.110 kAudioHardwarePropertyDeviceForUID as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.111 kAudioHardwarePropertyDevices as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Example:**

```
Dim c As New CoreAudioMBS

Dim m As MemoryBlock = c.AudioHardwareGetPropertyMemory(c.kAudioHardwarePropertyDevices)
```

```
Dim count As Integer = m.Size / 4
Dim IDs() As String

For i As Integer = 0 To count-1
Ids.append m.Int32Value(i * 4).ToString
Next

MessageBox "Device IDs: "+string.FromArray(Ids)
```

**Notes:** (Read only property)

### 14.4.112 kAudioHardwarePropertyRunLoop as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.113 kAudioHardwarePropertySleepingIsAllowed as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.114 kAudioHardwarePropertyUnloadingIsAllowed as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.115 kAudioPropertyWildcardChannel as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.116 kAudioPropertyWildcardPropertyID as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.117 kAudioPropertyWildcardSection as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.118 kAudioStreamPropertyDirection as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.119 kAudioStreamPropertyOwningDevice as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.120 kAudioStreamPropertyPhysicalFormat as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.121 kAudioStreamPropertyPhysicalFormatMatch as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.122 kAudioStreamPropertyPhysicalFormats as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.123 kAudioStreamPropertyPhysicalFormatSupported as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.124 kAudioStreamPropertyStartingChannel as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.125 kAudioStreamPropertyTerminalType as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** One of the constants for CoreAudio.
**Notes:** (Read only property)

### 14.4.126 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The last error code returned.
**Notes:** 0 for success.
(Read and Write property)

## 14.5 class CoreAudioPlayerMBS

### 14.5.1 class CoreAudioPlayerMBS

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** A class to play sounds from a memoryblock using CoreAudio.
**Notes:** This class uses an internal buffer of around 100000 samples which when played with a samplerate of 8000 will play for 10 seconds.
The music stops playing after this object is destroyed.
Mac OS X is required.
**Blog Entries**

- MBS Real Studio Plugins, version 11.4pr2

### 14.5.2 Methods

### 14.5.3 AddAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds integer audio.
**Notes:** Data: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

You need to set NumberOfChannels before calling this method.
NumberOfChannels can be 1 or 2. For 2 channels, sound data must be interleaved.

Values for bitsize:

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.4 AddAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds integer audio.
**Notes:** This is a special version of PlayAudio which takes samples from both memoryblocks and interleaves them.

Data1: a memoryblock with the sound data
Data2: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

You need to set NumberOfChannels before calling this method.
NumberOfChannels must be 2 for this method.

Values for bitsize:

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.5 AddFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds float audio.
**Notes:** FloatData: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

The samples are stored in 32bit float values (memoryblock.SingleValue)

You need to set NumberOfChannels before calling this method.
NumberOfChannels can be 1 or 2. For 2 channels, sound data must be interleaved.

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.6 AddFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds float audio.
**Notes:** This is a special version of PlayFloatAudio which takes samples from both memoryblocks and interleaves them.

FloatData1: a memoryblock with the sound data filled with single values.
FloatData2: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

The samples are stored in 32bit float values (memoryblock.SingleValue)

You need to set NumberOfChannels before calling this method.
NumberOfChannels must be 2 for this method.

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.7 Close

MBS MacOSX Plugin, Plugin Version: 5.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 14.5.8 FreeSpace as Integer

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the number of buffer entries available in the queue.
**Notes:** The size of the buffers is not limited except your available memory.

### 14.5.9 HardwareNumberOfChannels as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Returns the actual number of channels in the default device; to set the number of channels being output, use numberOfChannels.
**Notes:** This class can only play stereo to 2 channel devices or mono to all channels.
Returns 0 on any error.

### 14.5.10 HardwareSampleRate as single

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The hardware sample rate.
**Notes:** Today this is normally 44100 Hz. Or 0 on any error.

### 14.5.11 HasFreeSpace as boolean

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Returns true if the internal sound buffer is not full.
**Notes:** Returns true if freespace returns a value greater than zero.

This function was named IsQueueEmpty in plugin version 7.4.

### 14.5.12 PlayAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds integer audio and starts playback.
**Notes:** Data: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

You need to set NumberOfChannels before calling this method.
NumberOfChannels can be 1 or 2. For 2 channels, sound data must be interleaved.

Values for bitsize:

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.13 PlayAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds integer audio and starts playback.
**Notes:** This is a special version of PlayAudio which takes samples from both memoryblocks and interleaves them.

Data1: a memoryblock with the sound data
Data2: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)

countBytes: the number of bytes to play from offset.

You need to set NumberOfChannels before calling this method.
NumberOfChannels must be 2 for this method.

Values for bitsize:

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.14 PlayFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds float audio and starts playback.
**Notes:** FloatData: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

The samples are stored in 32bit float values (memoryblock.SingleValue)

You need to set NumberOfChannels before calling this method.
NumberOfChannels can be 1 or 2. For 2 channels, sound data must be interleaved.

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.15 PlayFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Adds float audio and starts playback.
**Notes:** This is a special version of PlayFloatAudio which takes samples from both memoryblocks and interleaves them.

FloatData1: a memoryblock with the sound data filled with single values.
FloatData2: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset.

The samples are stored in 32bit float values (memoryblock.SingleValue)

You need to set NumberOfChannels before calling this method.
NumberOfChannels must be 2 for this method.

This method only copies the data to the internal queue. It returns directly.
If ClearBuffers is true the buffer list is cleared before this new data is added.

### 14.5.16 Start as boolean

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Starts playback.
**Notes:** use AddAudio, AddAudioStereo, AddFloatAudio and AddFloatAudioStereo first to fill buffers.

### 14.5.17 Stop

MBS MacOSX Plugin, Plugin Version: 5.1, Platform: macOS, Targets: All.

**Function:** Stops playback.

### 14.5.18 Properties

### 14.5.19 HadUnderflow as Boolean

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** A flag set if a data underflow was found while NoUnderflow is true.
**Notes:** You may want to set this to false after your application recovered from a data underflow.
(Read and Write property)

### 14.5.20 IsRunning as Boolean

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Whether the class is playing something.
**Notes:** Returns true while playing.
(Read only property)

### 14.5.21 NoUnderflow as Boolean

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Whether underflows should be prevented.
**Notes:** If no audio data is there and NoUnderflow=true, the flag HadUnderflow is set to true and 0 values (Silence) is played.

Switching from sound to no sound and back may add some noise.
(Read and Write property)

### 14.5.22 NumberOfChannels as Integer

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The number of output channels.
**Notes:** Currently only 1 (default) and 2 are supported.
(Read and Write property)

### 14.5.23 OutputDeviceID as Integer

MBS MacOSX Plugin, Plugin Version: 5.1, Platform: macOS, Targets: All.

**Function:** The output device to use.
**Notes:** 0 for the default output device.
If you set this property to a bad value you risk a crash.
(Read and Write property)

### 14.5.24 OutputPosition as Double

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The current position in the playing stream.
**Notes:** May point between samples.
(Read only property)

### 14.5.25 OutputPositionRelative as Double

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The current position in the playing buffer.
**Notes:** May point between samples.
Will reset to 0 when a new buffer is used.
(Read only property)

### 14.5.26 SampleRate as Single

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The sample rate to use.
**Notes:** You can use any value between 4000 and 100000.
Default is 44100 Hz.
(Read and Write property)

## 14.6 class PortAudioDeviceInfoMBS

### 14.6.1 class PortAudioDeviceInfoMBS

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class providing information and capabilities of PortAudio devices.
**Notes:** Devices may support input, output or both input and output.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 14.6.2 Methods

### 14.6.3 Constructor

MBS Audio Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.6.4 Properties

### 14.6.5 DefaultHighInputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default latency values for robust non-interactive applications (eg. playing sound files).
**Notes:** (Read only property)

### 14.6.6 DefaultHighOutputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default latency values for robust non-interactive applications (eg. playing sound files).
**Notes:** (Read only property)

### 14.6.7 DefaultLowInputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default latency values for interactive performance.
**Notes:** (Read only property)

### 14.6.8 DefaultLowOutputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default latency values for interactive performance.
**Notes:** (Read only property)

### 14.6.9 DefaultSampleRate as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default sample rate.
**Notes:** (Read only property)

### 14.6.10 HostApiIndex as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The host API index for this device.
**Notes:** (Read only property)

### 14.6.11 Index as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of this device.
**Notes:** (Read only property)

### 14.6.12 MaxInputChannels as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of input channels.
**Notes:** Returns 0 on any error.
(Read only property)

### 14.6.13 MaxOutputChannels as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of output channels for this device.
**Notes:** 0 on any error.

Seems like an iMac returns two here, but the internal microphone has only one channel. So be aware that the memoryblocks in the events do have the actual size of the data that is coming in. So stereo has there a larger buffer.
(Read only property)

### 14.6.14 Name as String

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of this device.
**Notes:** Returns "" on any error.
(Read only property)

## 14.7 class PortAudioHostApiInfoMBS

### 14.7.1 class PortAudioHostApiInfoMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class containing information about a particular host API.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 14.7.2 Methods

### 14.7.3 Constructor

MBS Audio Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.7.4 Properties

### 14.7.5 defaultInputDevice as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default input device for this host API.
**Notes:** The value will be a device index ranging from 0 to (PortAudioHostApiInfoMBS.deviceCount-1), or paNoDevice (-1) if no default input device is available.
(Read only property)

### 14.7.6 defaultOutputDevice as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default output device for this host API.
**Notes:** The value will be a device index ranging from 0 to (PortAudioHostApiInfoMBS.deviceCount-1), or paNoDevice (-1) if no default output device is available.
(Read only property)

### 14.7.7 deviceCount as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of devices belonging to this host API.
**Notes:** This field may be used in conjunction with HostApiDeviceIndexToDeviceIndex() to enumerate all devices for this host API.
(Read only property)

### 14.7.8 Index as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of this host API.
**Notes:** (Read only property)

### 14.7.9 Name as String

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A textual description of the host API for display on user interfaces.
**Notes:** (Read only property)

### 14.7.10 Type as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The well known unique identifier of this host API.
**Notes:** Useful constants for the different types:

(Read only property)

| | |
|---|---|
| paInDevelopment | =0 |
| paDirectSound | =1 |
| paMME | =2 |
| paASIO | =3 |
| paSoundManager | =4 |
| paCoreAudio | =5 |
| paOSS | =7 |
| paALSA | =8 |
| paAL | =9 |
| paBeOS | =10 |
| paWDMKS | =11 |
| paJACK | =12 |
| paWASAPI | =13 |
| paAudioScienceHPI | =14 |

## 14.8 class PortAudioHostErrorInfoMBS

### 14.8.1 class PortAudioHostErrorInfoMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class used to return information about a host error condition.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 14.8.2 Methods

### 14.8.3 Constructor

MBS Audio Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.8.4 Properties

### 14.8.5 ErrorCode as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** the error code returned.
**Notes:** (Read only property)

### 14.8.6 ErrorText as String

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A textual description of the error if available, otherwise a zero-length string.
**Notes:** (Read only property)

### 14.8.7 HostApiType as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The host API which returned the error code.
**Notes:** (Read only property)

## 14.9 class PortAudioMBS

### 14.9.1 class PortAudioMBS

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to run the opensource PortAudio library in Xojo.
**Notes:** Constants for error codes:

| | |
|---|---|
| paNoError | = 0 |
| Plugin parameter error | = -1 |
| paNotInitialized | = -10000, |
| paUnanticipatedHostError | = -9999 |
| paInvalidChannelCount | = -9998 |
| paInvalidSampleRate | = -9997 |
| paInvalidDevice | = -9996 |
| paInvalidFlag | = -9995 |
| paSampleFormatNotSupported | = -9994 |
| paBadIODeviceCombination | = -9993 |
| paInsufficientMemory | = -9992 |
| paBufferTooBig | = -9991 |
| paBufferTooSmall | = -9990 |
| paNullCallback | = -9989 |
| paBadStreamPtr | = -9988 |
| paTimedOut | = -9987 |
| paInternalError | = -9986 |
| paDeviceUnavailable | = -9985 |
| paIncompatibleHostApiSpecificStreamInfo | = -9984 |
| paStreamIsStopped | = -9983 |
| paStreamIsNotStopped | = -9982 |
| paInputOverflowed | = -9981 |
| paOutputUnderflowed | = -9980 |
| paHostApiNotFound | = -9979 |
| paInvalidHostApi | = -9978 |
| paCanNotReadFromACallbackStream | = -9977 |
| paCanNotWriteToACallbackStream | = -9976 |
| paCanNotReadFromAnOutputOnlyStream | = -9975 |
| paCanNotWriteToAnInputOnlyStream | = -9974 |
| paIncompatibleStreamHostApi | = -9973 |
| paBadBufferPtr | = -9972 |

Initialization and Termination of the PortAudio library are done in background automatically.

Requires libasound.so.2 on Linux to be installed.
**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 19.2pr1
- MBS Real Studio Plugins, version 12.1pr2

### 14.9.2 Methods

### 14.9.3 ASIOGetAvailableBufferSizes(DeviceIndex as Integer, byref minBufferSizeFrames as Integer, byref maxBufferSizeFrames as Integer, byref preferredBufferSizeFrames as Integer, byref granularity as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve legal native buffer sizes for the specificed device, in sample frames.
**Notes:** device: The global index of the device about which the query is being made.

minBufferSizeFrames: The minimum buffer size value.
maxBufferSizeFrames: The maximum buffer size value.
preferredBufferSizeFrames: The preferred buffer size value.
granularity: The "granularity". This value determines the step size used to compute the legal values between minBufferSizeFrames and maxBufferSizeFrames.

If granularity is -1 then available buffer size values are powers of two.

see ASIOGetBufferSize in the ASIO SDK.

### 14.9.4 ASIOGetInputChannelName(DeviceIndex as Integer, ChannelIndex as Integer) as String

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of input channel.
**Example:**

```
Dim po As New PortAudioMBS

// find ASIO device
Dim defaultASIOInputDevice As Integer

Dim hc As Integer = po.HostApiCount
For hi As Integer = 0 To hc
Dim host As PortAudioHostApiInfoMBS = po.HostApiInfo(hi)
If host<>Nil And host.Type = po.kHostApiASIO Then
defaultASIOInputDevice = host.defaultInputDevice
End If
Next

// show channel names
```

```
D2im names As String
Dim de As PortAudioDeviceInfoMBS = po.DeviceInfo(defaultASIOInputDevice)
For i As Integer = 0 To de.maxInputChannels-1
names.Append po.ASIOGetInputChannelName(defaultASIOInputDevice,i)
Next

MsgBox Join(names, EndOfLine)
```

**Notes:** The string will be no longer than 32 characters.

### 14.9.5 ASIOGetOutputChannelName(DeviceIndex as Integer, ChannelIndex as Integer) as String

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of output channel.
**Example:**

```
Dim po As New PortAudioMBS

// find ASIO device
Dim defaultASIOOutputDevice As Integer

Dim hc As Integer = po.HostApiCount
For hi As Integer = 0 To hc
Dim host As PortAudioHostApiInfoMBS = po.HostApiInfo(hi)
If host<>Nil And host.Type = po.kHostApiASIO Then
defaultASIOOutputDevice = host.defaultOutputDevice
End If
Next

// show channel names
D2im names As String
Dim de As PortAudioDeviceInfoMBS = po.DeviceInfo(defaultASIOOutputDevice)
For i As Integer = 0 To de.maxOutputChannels-1
names.Append po.ASIOGetOutputChannelName(defaultASIOOutputDevice,i)
Next

MsgBox Join(names, EndOfLine)
```

**Notes:** The string will be no longer than 32 characters.

### 14.9.6 ASIOGetSampleRate(byref rate as double) as Integer

MBS Audio Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current sample rate.
**Example:**

```
Dim d As Double
Dim n As Integer

n = PortAudioMBS.ASIOGetSampleRate(d)

If n = 0 Then
MsgBox Str(d)
Else
MsgBox "Error: "+Str(n)
End If
```

**Notes:** Rate will hold the current sample rate on return.
Returns error code.
If sample rate is unknown, sampleRate will be 0 and ASE_NoClock will be returned.
If no input/output is present ASE_NotPresent (-1000) will be returned.

### 14.9.7 ASIOShowControlPanel(device as integer, parentWindow as DesktopWindow) as Integer

MBS Audio Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Display the ASIO control panel for the specified device.
**Notes:** device: The global index of the device whose control panel is to be displayed.
parentWindow: On Windows, the calling application's main window handle or nil.
See also:

- 14.9.8 ASIOShowControlPanel(device as integer, parentWindow as window = nil) as Integer 3030

### 14.9.8 ASIOShowControlPanel(device as integer, parentWindow as window = nil) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Display the ASIO control panel for the specified device.
**Example:**

```
Dim po As New PortAudioMBS
```

```
// find ASIO device
Dim defaultASIOOutputDevice As Integer

Dim hc As Integer = po.HostApiCount
For hi As Integer = 0 To hc
Dim host As PortAudioHostApiInfoMBS = po.HostApiInfo(hi)
If host<>Nil And host.Type = po.kHostApiASIO Then
defaultASIOOutputDevice = host.defaultOutputDevice
End If
Next

// show dialog
Call po.ASIOShowControlPanel(defaultASIOOutputDevice, window1)
```

**Notes:** device: The global index of the device whose control panel is to be displayed.
parentWindow: On Windows, the calling application's main window handle or nil.
See also:

- 14.9.7 ASIOShowControlPanel(device as integer, parentWindow as DesktopWindow) as Integer 3030

### 14.9.9 CountDevices as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of available devices.
**Example:**

```
dim pa as new PortAudioMBS

Dim c as Integer = pa.CountDevices
msgbox str(c)+" devices found"

for i as Integer = 0 to c-1
MsgBox pa.DeviceInfo(i).Name
next
```

**Notes:** The number of available devices may be zero.

Returns a non-negative value indicating the number of available devices or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.

### 14.9.10 DefaultHostApiIndexd as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the index of the default host API.
**Example:**

```
dim pa as new PortAudioMBS

dim DefaultHostApiIndexd as Integer = pa.DefaultHostApiIndexd

if DefaultHostApiIndexd>=0 then
dim d as PortAudioHostApiInfoMBS = pa.HostApiInfo(DefaultHostApiIndexd)
MsgBox "Default host API is: "+d.Name
else
MsgBox "No default host API."
end if
```

**Notes:** The default host API will be the lowest common denominator host API on the current platform and is unlikely to provide the best performance.

Returns a non-negative value ranging from 0 to (HostApiCount-1)indicating the default host API index or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.

### 14.9.11 DefaultInputDeviceID as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the index of the default input device.
**Example:**

```
dim pa as new PortAudioMBS

dim DefaultInputDeviceID as Integer = pa.DefaultInputDeviceID

if DefaultInputDeviceID>=0 then
dim d as PortAudioDeviceInfoMBS = pa.DeviceInfo(DefaultInputDeviceID)
MsgBox "Default input device is: "+d.Name
else
MsgBox "No default input device."
end if
```

**Notes:** The result can be used in the inputDevice parameter to OpenStream().

Returns the default input device index for the default host API, or paNoDevice (-1) if no default input device is available or an error was encountered.

### 14.9.12 DefaultOutputDeviceID as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the index of the default output device.
**Example:**

```
dim pa as new PortAudioMBS

dim DefaultOutputDeviceID as Integer = pa.DefaultOutputDeviceID

if DefaultOutputDeviceID>=0 then
dim d as PortAudioDeviceInfoMBS = pa.DeviceInfo(DefaultOutputDeviceID)
MsgBox "Default output device is: "+d.Name
else
MsgBox "No default output device."
end if
```

**Notes:** The result can be used in the outputDevice parameter to OpenStream().

Returns the default output device index for the defualt host API, or paNoDevice (-1) if no default output device is available or an error was encountered.

On the PC, the user can specify a default device by setting an environment variable. For example, to use device #1.
set PA_RECOMMENDED_OUTPUT_DEVICE=1
The user should first determine the available device ids by using the supplied application "pa_devs".

### 14.9.13 DeviceInfo(DeviceIndex as Integer) as PortAudioDeviceInfoMBS

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve an object containing information about the specified device.
**Example:**

```
dim pa as new PortAudioMBS

Dim u as Integer = pa.CountDevices-1
```

```
for i as Integer = 0 to u
dim d as PortAudioDeviceInfoMBS = pa.DeviceInfo(i)
MsgBox d.Name+" with default "+str(D.DefaultSampleRate)+" Hz"
next
```

**Notes:** Returns an object of class PortAudioDeviceInfoMBS with the requested information. If the device parameter is out of range the function returns nil.

DeviceIndex: A valid device index in the range 0 to (PortAudioMBS.CountDevices-1)

### 14.9.14 DisableHostAPI(API as string) as boolean

MBS Audio Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disables a PortAudio Host API.
**Example:**

```
if PortAudioMBS.DisableHostAPI("Core Audio") then // for Mac
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** This must be called before using any PortAudio function.
It removes the API from the list of APIs to be used when PortAudio initializes. This way you can avoid loading interfaces you don't need.
API name can be "MME", "Windows DirectSound", "Windows WASAPI", "ASIO", "Core Audio", "ALSA", "OSS".
Returns true on success.

### 14.9.15 ErrorText(ErrorNumber as Integer) as string

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translate the error number into a human readable message.

### 14.9.16 GetSampleSize(Format as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the sample size in bytes of the given format.
**Example:**

```
dim pa as new PortAudioMBS

const paFloat32 = 1

MsgBox str(pa.GetSampleSize(paFloat32))+" bytes per sample"
```

### 14.9.17 HostApiCount as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of available host APIs.
**Example:**

```
dim pa as new PortAudioMBS

Dim c as Integer = pa.HostApiCount
msgbox str(c)+" host APIs found"
```

**Notes:** Even if a host API is available it may have no devices available.

Returns a non-negative value indicating the number of available host APIs or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.

### 14.9.18 HostApiDeviceIndexToDeviceIndex(hostApiIndex as Integer, hostApiDeviceIndex as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert a host-API-specific device index to standard PortAudio device index.
**Notes:** This function may be used in conjunction with the deviceCount field of PaHostApiInfo to enumerate all devices for the specified host API.

hostApiIndex: A valid host API index ranging from 0 to (HostApiCount-1)
hostApiDeviceIndex: A valid per-host device index in the range 0 to (HostApiInfo(hostApi).deviceCount-1)

Returns a non-negative device index ranging from 0 to (DeviceCount-1) or, an error code (which are always negative) if PortAudio is not initialized or an error is encountered.

A paInvalidHostApi (-9978) error code indicates that the host API index specified by the hostApi parameter is out of range.

A paInvalidDevice (-9996) error code indicates that the hostApiDeviceIndex parameter is out of range.

### 14.9.19 HostApiInfo(hostApiIndex as Integer) as PortAudioHostApiInfoMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve an PortAudioHostApiInfoMBS object containing information about a specific host Api.
**Example:**

```
dim pa as new PortAudioMBS
Dim u as Integer = pa.HostApiCount - 1

for i as Integer = 0 to u
dim d as PortAudioHostApiInfoMBS = pa.HostApiInfo(i)
MsgBox d.name
next
```

**Notes:** hostApiIndex: A valid host API index ranging from 0 to (HostApiCount-1)

Returns the information object. If the hostApi parameter is out of range or an error is encountered, the function returns nil.

### 14.9.20 HostApiTypeIdToHostApiIndex(type as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert a static host API unique identifier, into a runtime host API index.
**Example:**

```
dim IndexDirectSound as Integer
dim p as new PortAudioMBS
const paDirectSound=1
IndexDirectSound=p.HostApiTypeIdToHostApiIndex(paDirectSound)
```

**Notes:** type: A unique host API identifier. See PortAudioHostApiInfoMBS.Type for the list of constants.

Returns a valid PaHostApiIndex ranging from 0 to (HostApiCount-1) or, a PaErrorCode (which are always

negative) if PortAudio is not initialized or an error is encountered.

The paHostApiNotFound (-9979) error code indicates that the host API specified by the type parameter is not available.

### 14.9.21 HostError as PortAudioHostErrorInfoMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return information about the last host error encountered.
**Notes:** This function is provided as a last resort, primarily to enhance debugging by providing clients with access to all available error information.

Returns an object constaining information about the host error. The values in this structure will only be valid if a PortAudio function has previously returned the paUnanticipatedHostError.

### 14.9.22 IsFormatSupported(input as PortAudioStreamParametersMBS, output as PortAudioStreamParametersMBS, sampleRate as Double) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine whether it would be possible to open a stream with the specified parameters.
**Notes:** input: An object that describes the input parameters used to open a stream. The suggestedLatency field is ignored. inputParameters must be nil for output-only streams.

output: An object that describes the output parameters used to open a stream. The suggestedLatency field is ignored. outputParameters must be nil for input-only streams.

sampleRate: The required sampleRate. For full-duplex streams it is the sample rate for both input and output

Returns 0 if the format is supported, and an error code indicating why the format is not supported otherwise. The constant paFormatIsSupported (0) is provided to compare with the return value for success.

### 14.9.23 MacCoreAudioChannelName(DeviceIndex as Integer, ChannelIndex as Integer, Input as Boolean) as String

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries channel name.

### 14.9.24 MacCoreAudioGetBufferSizeRange(DeviceIndex as Integer, byref minBufferSizeFrames as Integer, byref maxBufferSizeFrames as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the range of legal native buffer sizes for the specificed device, in sample frames.
**Notes:** device: The global index of the PortAudio device about which the query is being made.
minBufferSizeFrames: The minimum buffer size value.
maxBufferSizeFrames: The maximum buffer size value.

see kAudioDevicePropertyBufferFrameSizeRange in the CoreAudio SDK.

### 14.9.25 SampleSize(theFormat as Integer) as Integer

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return size in bytes of a single sample in a given sample format or paSampleFormatNotSupported (-9994).
**Notes:** Returns 0 on any error.

Constants for sample format:

```
const paFloat32          = 1
const paInt32            = 2
const paInt24            = 4
const paInt16            = 8
const paInt8             = 16
const paUInt8            = 32
const paCustomFormat     = 65536
const paNonInterleaved   = negative sign
```

The standard formats paFloat32, paInt16, paInt32, paInt24, paInt8 and aUInt8 are usually implemented by all implementations.

The floating point representation (paFloat32) uses +1.0 and -1.0 as the maximum and minimum respectively.

paUInt8 is an unsigned 8 bit format where 128 is considered ”ground”

The paNonInterleaved flag indicates that a multichannel buffer is passed as a set of non-interleaved pointers.

### 14.9.26 SetDebugLogFile(File as FolderItem) as boolean

MBS Audio Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the debug file to log all PortAudio calls with parameters.
**Notes:** Pass nil to stop logging.
Returns true on success or false on failure.

### 14.9.27 Sleep(msec as Integer)

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Put the caller to sleep for at least 'msec' milliseconds.
**Notes:** This function is provided only as a convenience for authors of portable code (such as the tests and examples in the PortAudio distribution.)
The function may sleep longer than requested so don't rely on this for accurate musical timing.

### 14.9.28 Version as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the release number of the currently running PortAudio build.
**Notes:** e.g. 1900

### 14.9.29 VersionControlRevision as String

MBS Audio Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a version control revision text.

### 14.9.30 VersionText as String

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a textual description of the current PortAudio build.
**Notes:** e.g. "PortAudio V19-devel 13 October 2002"

### 14.9.31 WinDefaultChannelMask(numChannels as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Map a channel count to a speaker channel mask for Windows.

### 14.9.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kNoDevice | -1 | The constant for no device. |

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorBadBufferPtr | -9972 | Bad buffer pointer. |
| kErrorBadIODeviceCombination | -9993 | Bad IO Device combination |
| kErrorBadStreamPtr | -9988 | Bad stream pointer |
| kErrorBufferTooBig | -9991 | Buffer too big |
| kErrorBufferTooSmall | -9990 | Buffer too small |
| kErrorCanNotReadFromACallbackStream | -9977 | Can not read from a callback stream. |
| kErrorCanNotReadFromAnOutputOnlyStream | -9975 | Can not read from an output only stream. |
| kErrorCanNotWriteToACallbackStream | -9976 | Can not write to a callback stream. |
| kErrorCanNotWriteToAnInputOnlyStream | -9974 | Can not write to an input only stream. |
| kErrorDeviceUnavailable | -9985 | Device unavailable. |
| kErrorHostApiNotFound | -9979 | Host API not found. |
| kErrorIncompatibleHostApiSpecificStreamInfo | -9984 | Incompatible host api for specific stream info. |
| kErrorIncompatibleStreamHostApi | -9973 | Incompatible stream for host api. |
| kErrorInputOverflowed | -9981 | Input overflowed. |
| kErrorInsufficientMemory | -9992 | Insufficient memory |
| kErrorInternalError | -9986 | Internal error |
| kErrorInvalidChannelCount | -9998 | Invalid Channel Count |
| kErrorInvalidDevice | -9996 | Invalid Device |
| kErrorInvalidFlag | -9995 | Invalid flag |
| kErrorInvalidHostApi | -9978 | Invalid host API |
| kErrorInvalidSampleRate | -9997 | Invalid sample rate |
| kErrorNoError | 0 | No error |
| kErrorNotInitialized | -10000 | Not initialized. |
| kErrorNullCallback | -9989 | Null callback. |
| kErrorOutputUnderflowed | -9980 | Output underflowed. |
| kErrorSampleFormatNotSupported | -9994 | Sampleformat not supported. |
| kErrorStreamIsNotStopped | -9982 | Stream is not stopped. |
| kErrorStreamIsStopped | -9983 | Stream is stopped. |
| kErrorTimedOut | -9987 | Timed out |
| kErrorUnanticipatedHostError | -9999 | Unanticipated Host Error. See HostError function. |

Host APIs

| Constant | Value | Description |
|---|---|---|
| kHostApiAL | 9 | AL |
| kHostApiALSA | 8 | Linux ALSA |
| kHostApiASIO | 3 | ASIO |
| kHostApiAudioScienceHPI | 14 | AudioScienceHPI |
| kHostApiBeOS | 10 | BeOS, not used in MBS Plugin. |
| kHostApiCoreAudio | 5 | CoreAudio-specific PortAudio API extension |
| kHostApiDirectSound | 1 | Windows DirectSound-specific PortAudio API extension |
| kHostApiInDevelopment | 0 | Internally only. |
| kHostApiJACK | 12 | Linux Jack |
| kHostApiMME | 2 | Windos Multimedia Extension. |
| kHostApiOSS | 7 | OSS |
| kHostApiSoundManager | 4 | SoundManager (old MacOS Classic) |
| kHostApiWASAPI | 13 | WASAPI-specific PortAudio API extension |
| kHostApiWDMKS | 11 | WDM Kernel Streaming-specific PortAudio API extension |

## 14.10 class PortAudioStreamBaseMBS

### 14.10.1 class PortAudioStreamBaseMBS

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The base class for the portaudio streams.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr1
- New in the MBS Xojo Plugins 20.0

### 14.10.2 Methods

### 14.10.3 Abort as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminates audio processing immediately without waiting for pending buffers to complete.

### 14.10.4 AsioSetStreamSampleRate(sampleRate as double) as integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the sample rate of an open ASIO stream.
**Notes:** sampleRate: The new sample rate.

Note that this function may fail if the stream is alredy running and the ASIO driver does not support switching the sample rate of a running stream.

Returns kErrorIncompatibleStreamHostApi if stream is not a paASIO stream.

### 14.10.5 Close as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes an audio stream.
**Notes:** If the audio stream is active it discards any pending buffers as if Abort() had been called.

### 14.10.6 Constructor

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.10.7 HostError as PortAudioHostErrorInfoMBS

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return information about the last host error encountered.
**Notes:** This function is provided as a last resort, primarily to enhance debugging by providing clients with access to all available error information.

Returns an object constaining information about the host error. The values in this structure will only be valid if a PortAudio function has previously returned the paUnanticipatedHostError.

### 14.10.8 Info as PortAudioStreamInfoMBS

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a PortAudioStreamInfoMBS object containing information about the specified stream.
**Notes:** If the stream parameter invalid, or an error is encountered, the function returns nil.

### 14.10.9 Read(Buffer as Ptr, frameCount as integer) as integer

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read samples from an input stream.
**Notes:** The function doesn't return until the entire buffer has been filled - this may involve waiting for the operating system to supply the data.

buffer: A buffer of sample frames. The buffer contains samples in the format specified by the input.sampleFormat field used to open the stream, and the number of channels specified by input.numChannels. If non-interleaved samples were requested, buffer is a pointer to the first element of an array of non-interleaved buffer pointers, one for each channel.

frameCount: The number of frames to be read into buffer. This parameter is not constrained to a specific range, however high performance applications will want to match this parameter to the framesPerBuffer parameter used when opening the stream.

Returns on success PaNoError will be returned, or PaInputOverflowed (-9981) if input data was discarded by PortAudio after the previous call and before this call.

### 14.10.10 Start as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Commences audio processing.
**Notes:** Returns an error code.
(0 for success, -1 for no stream)

### 14.10.11 Stop as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminates audio processing.
**Notes:** It waits until all pending audio buffers have been played before it returns.

### 14.10.12 WinMMEStreamInputHandle(index as Integer) as Ptr

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a wave in handle used by a PortAudio WinMME stream.
**Notes:** handleIndex: The zero based index of the wave in handle to retrieve. This should be in the range [ 0, WinMMEStreamInputHandleCount-1 ] .

Returns a valid wave in handle, or nil if an error occurred.

### 14.10.13 WinMMEStreamInputHandleCount as integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of wave in handles used by a PortAudio WinMME stream.
**Notes:** Returns zero if the stream is output only.

A non-negative value indicating the number of wave in handles or, an error code (which are always negative) if PortAudio is not initialized or an error is encountered.

### 14.10.14 WinMMEStreamOutputHandle(index as Integer) as Ptr

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a wave out handle used by a PortAudio WinMME stream.
**Notes:** handleIndex: The zero based index of the wave out handle to retrieve.
This should be in the range [ 0, WinMMEStreamOutputHandleCount - 1 ] .

Returns a valid wave out handle, or nil if an error occurred.

### 14.10.15 WinMMEStreamOutputHandleCount as integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of wave out handles used by a PortAudio WinMME stream.
**Notes:** Returns zero if the stream is input only.

A non-negative value indicating the number of wave out handles or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.

### 14.10.16 Write(Buffer as Ptr, frameCount as integer) as integer

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write samples to an output stream.
**Notes:** This function doesn't return until the entire buffer has been consumed - this may involve waiting for the operating system to consume the data.

buffer: A buffer of sample frames. The buffer contains samples in the format specified by the outputParameters.sampleFormat field used to open the stream, and the number of channels specified by outputParameters.numChannels. If non-interleaved samples were requested, buffer is a pointer to the first element of an array of non-interleaved buffer pointers, one for each channel.

frameCount: The number of frames to be written from buffer. This parameter is not constrained to a specific range, however high performance applications will want to match this parameter to the framesPerBuffer parameter used when opening the stream.

On success PaNoError (0) will be returned, or paOutputUnderflowed (-9980) if additional output data was inserted after the previous call and before this call.

### 14.10.17 Properties

### 14.10.18 CPULoad as Double

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve CPU usage information for the specified stream.
**Notes:** The "CPU Load" is a fraction of total CPU time consumed by a callback stream's audio processing routines including, but not limited to the client supplied stream callback. This function does not work with blocking read/write streams.

This function may be called from the stream callback function or the application.

Returns a floating point value, typically between 0.0 and 1.0, where 1.0 indicates that the stream event is consuming the maximum number of CPU cycles possible to maintain real-time operation. A value of 0.5 would imply that PortAudio and the stream event was consuming roughly 50% of the available CPU time. The return value may exceed 1.0. A value of 0.0 will always be returned for a blocking read/write stream, or if an error occurrs.
(Read only property)

### 14.10.19 IsStreamActive as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine whether the stream is active.
**Notes:** A stream is active after a successful call to Start(), until it becomes inactive either as a result of a call to Stop() or Abort(), or as a result of a return value other than paContinue from the stream callback. In the latter case, the stream is considered inactive after the last buffer has finished playing.

Returns one (1) when the stream is active (ie playing or recording audio), zero (0) when not playing or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.
(Read only property)

### 14.10.20 IsStreamStopped as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine whether the stream is stopped.
**Notes:** A stream is considered to be stopped prior to a successful call to Start and after a successful call to

Stop or Abort.
If a stream value returns a value other than paContinue (0) the stream is NOT considered to be stopped.

Returns one (1) when the stream is stopped, zero (0) when the stream is running or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.
(Read only property)

### 14.10.21 MacCoreAudioStreamInputDevice as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the AudioDeviceID of the input device assigned to an open stream.
**Notes:** Returns a valid AudioDeviceID, or 0 if an error occurred.
(Read only property)

### 14.10.22 MacCoreAudioStreamOutputDevice as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the AudioDeviceID of the output device assigned to an open stream.
**Notes:** Returns a valid AudioDeviceID, or 0 if an error occurred.
(Read only property)

### 14.10.23 ReadAvailable as Integer

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of frames that can be read from the stream without waiting.
**Notes:** Returns a non-negative value representing the maximum number of frames that can be read from the stream without blocking or busy waiting or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.
(Read only property)

### 14.10.24 Time as Double

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine the current time for the stream according to the same clock used to generate buffer timestamps.
**Notes:** This time may be used for syncronising other events to the audio stream, for example synchronizing audio to MIDI.

Returns the stream's current time in seconds, or 0 if an error occurred.
(Read only property)

### 14.10.25 WriteAvailable as Integer

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve the number of frames that can be written to the stream without waiting.
**Notes:** Returns a non-negative value representing the maximum number of frames that can be written to the stream without blocking or busy waiting or, a PaErrorCode (which are always negative) if PortAudio is not initialized or an error is encountered.
(Read only property)

### 14.10.26 UseSafeThreading as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables or disables thread safe event handling.
**Notes:** Xojo works normally only on one preemptive thread as the framework is not reentrant and not in general preemptive thread safe.
Still newer Xojo versions get better so you can switch it off and get a better performance.
For most usages you need to turn it off. See the examples. A lot of pragma lines are needed to disable everything which can slow down processing. Also you are limited in a preemptive thread to do only math and no object creating/deleting.
(Read and Write computed property)

### 14.10.27 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsClipOff | 1 | Disable default clipping of out of range samples. |
| kFlagsDitherOff | 2 | Disable default dithering. |
| kFlagsNeverDropInput | 4 | Flag requests that where possible a full duplex strear flowed input samples without calling the stream callbac for full duplex callback streams and only when used i paFramesPerBufferUnspecified (0) framesPerBuffer pa incorrectly results in a paInvalidFlag error being retu and OpenDefaultStream. |
| kFlagsNoFlag | 0 | No flags. |
| kFlagsPlatformSpecificFlags | &hFFFF0000 | A mask specifying the platform specific bits. |
| kFlagsPrimeOutputBuffersUsingStreamCallback | 8 | Call the stream callback to fill initial output buffers, behavior of priming the buffers with zeros (silence). T input-only and blocking read/write streams. |

## 14.11 class PortAudioStreamBufferedMBS

### 14.11.1 class PortAudioStreamBufferedMBS

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A portaudio stream class to use an internal buffer to feed its callback.
**Notes:** Currently this class allows you to add 200 buffers to the internal playlist. The buffer size is not limited. FreeSpace returns you the number of buffers you have currently. Buffers are freed after they are played.
Subclass of the PortAudioStreamBaseMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr4
- MBS Xojo Plugins, version 20.0pr8
- MBS Xojo / Real Studio Plugins, version 15.2pr4

### 14.11.2 Methods

### 14.11.3 AddAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue.
**Notes:** Data: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

You need to set numOutputChannels to 1 or 2 when opening the stream. For 2 channels, sound data must be interleaved.

Values for bitsize:

This method copies the data to the internal queue. It returns directly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

7 signed byte
8 unsigned byte
15 signed short
16 unsigned short
24 unsigned medium
31 signed integer
32 unsigned integer

Returns true on success and false on failure (e.g. out of memory).

### 14.11.4 AddAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue.
**Notes:** This is a special version of AddAudio which takes samples from both memoryblocks and interleaves them.

Data1: a memoryblock with the sound data
Data2: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

The stream must use 2 channels for this method to work correctly.

Values for bitsize:

7 signed byte
8 unsigned byte
15 signed short
16 unsigned short
24 unsigned medium
31 signed integer
32 unsigned integer

This method copies the data to the internal queue. It returns directly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

Returns true on success and false on failure (e.g. out of memory).

### 14.11.5 AddFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue.
**Notes:** FloatData: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

You need to set numOutputChannels to 1 or 2 when opening the stream. For 2 channels, sound data must be interleaved.

The samples are stored in 32bit float values (memoryblock.SingleValue)

This method copies the data to the internal queue. It returns directly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

Returns true on success and false on failure (e.g. out of memory).

### 14.11.6 AddFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue.
**Notes:** This is a special version of AddFloatAudio which takes samples from both memoryblocks and interleaves them.

FloatData1: a memoryblock with the sound data filled with single values.
FloatData2: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

The samples are stored in 32bit float values (memoryblock.SingleValue)

This method copies the data to the internal queue. It returns directly.

The stream must use 2 channels for this method to work correctly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

Returns true on success and false on failure (e.g. out of memory).

### 14.11.7 Constructor

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 14.11.8 FreeSpace as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of buffer entries available in the queue.
**Notes:** The size of the buffers is not limited except your available memory.

### 14.11.9 HasFreeSpace as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the internal sound buffer has free space.
**Notes:** Returns true if freespace returns a value greater than zero.

This function was named IsQueueEmpty in plugin version 7.4.

### 14.11.10 OpenDefaultStream(numOutputChannels as Integer, sampleRate as Double) as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A simplified version of OpenStream() that opens the default input and/or output devices.
**Notes:** Sampleformat is always 32bit float in this class. All data you add the queue is converted to float internally.

numOutputChannels: The number of channels of sound to be delivered to the stream callback or passed to Write. It can range from 1 to the value of maxOutputChannels in the PortAudioDeviceInfoMBS object for the default output device. If 0 the stream is opened as an output-only stream.

sampleRate: Same as OpenStream parameter of the same name.

Returns an error code.

### 14.11.11 OpenStream(outputParameters as PortAudioStreamParametersMBS, sampleRate as Double, framesPerBuffer as Integer, streamFlags as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a stream for either input, output or both.
**Notes:** Sampleformat is always 32bit float in this class. All data you add the queue is converted to float internally.

outputParameters: A object that describes the output parameters used by the opened stream. See PortAudioStreamParametersMBS for a description of these parameters.

sampleRate: The desired sampleRate. For full-duplex streams it is the sample rate for both input and output

framesPerBuffer: The number of frames passed to the stream callback function, or the preferred block granularity for a blocking read/write stream. The special value paFramesPerBufferUnspecified (0) may be used to request that the stream callback will recieve an optimal (and possibly varying) number of frames based on host requirements and the requested latency settings.
Note: With some host APIs, the use of non-zero framesPerBuffer for a callback stream may introduce an additional layer of buffering which could introduce additional latency. PortAudio guarantees that the additional latency will be kept to the theoretical minimum however, it is strongly recommended that a non-zero framesPerBuffer value only be used when your algorithm requires a fixed number of frames per stream callback.

const paFramesPerBufferUnspecified=0

streamFlags: Flags which modify the behaviour of the streaming process. This parameter may contain a combination of flags ORed together. Some flags may only be relevant to certain buffer formats.

| | | |
|---|---|---|
| const paNoFlag | = 0 | no flags |
| const paClipOff | = 1 | Disable default clipping of out of range samples. |
| const paDitherOff | = 2 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paNeverDropInput | = 4 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paPrimeOutputBuffersUsingStreamCallback | = 8 | Call the stream callback to fill initial output buffers, rather than the default behavior of priming the buffers with zeros (silence). This flag has no effect for input-only and blocking read/write streams. |

Upon success OpenStream() returns paNoError and places a pointer to a valid PaStream in the stream argument. The stream is inactive (stopped).
If a call to OpenStream() fails, a non-zero error code is returned (see PaError for possible error codes) and the value of stream is invalid.

### 14.11.12 PlayAudio(Data as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue and starts playback.
**Notes:** Data: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

You need to set numOutputChannels to 1 or 2 when opening the stream. For 2 channels, sound data must be interleaved.

Values for bitsize:

This method copies the data to the internal queue. It returns directly.

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

### 14.11.13 PlayAudioStereo(Data1 as memoryblock, Data2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, BitSize as Integer=16, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue and starts playback.
**Notes:** This is a special version of AddAudio which takes samples from both memoryblocks and interleaves them.

Data1: a memoryblock with the sound data
Data2: a memoryblock with the sound data
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

The stream must use 2 channels for this method to work correctly.

Values for bitsize:

This method copies the data to the internal queue. It returns directly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.#

| | |
|---|---|
| 7 | signed byte |
| 8 | unsigned byte |
| 15 | signed short |
| 16 | unsigned short |
| 24 | unsigned medium |
| 31 | signed integer |
| 32 | unsigned integer |

### 14.11.14 PlayFloatAudio(FloatData as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue and starts playback.
**Notes:** FloatData: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

You need to set numOutputChannels to 1 or 2 when opening the stream. For 2 channels, sound data must be interleaved.

The samples are stored in 32bit float values (memoryblock.SingleValue)

This method copies the data to the internal queue. It returns directly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.#

### 14.11.15 PlayFloatAudioStereo(FloatData1 as memoryblock, FloatData2 as memoryblock, offsetBytes as Integer=0, countBytes as Integer=0, ClearBuffers as boolean=false) as boolean

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds audio to the queue and starts playback.
**Notes:** This is a special version of AddFloatAudio which takes samples from both memoryblocks and interleaves them.

FloatData1: a memoryblock with the sound data filled with single values.
FloatData2: a memoryblock with the sound data filled with single values.
offsetBytes: the number of the bytes to start playing (0=first)
countBytes: the number of bytes to play from offset. If countBytes is zero, the memoryblock's size property is used.

The samples are stored in 32bit float values (memoryblock.SingleValue)

This method copies the data to the internal queue. It returns directly.

The stream must use 2 channels for this method to work correctly.

If ClearBuffers is true, the buffer list will be cleared before this new data is added. This allows to have the next minute in the buffers and still do a change in the stream quick.

### 14.11.16 Properties

### 14.11.17 HadUnderflow as Boolean

MBS Audio Plugin, Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A flag set if a data underflow was found while NoUnderflow is true.
**Notes:** You may want to set this to false after your application recovered from a data underflow.
(Read and Write property)

### 14.11.18 NoUnderflow as Boolean

MBS Audio Plugin, Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether underflows should be prevented.
**Notes:** If no audio data is there and NoUnderflow=true, the flag HadUnderflow is set to true and 0 values (Silence) is played.

Switching from sound to no sound and back may add some noise.
(Read and Write property)

### 14.11.19 OutputPosition as Double

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current position in the playing stream.
**Notes:** May point between samples.
(Read only property)

### 14.11.20 OutputPositionRelative as Double

MBS Audio Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current position in the playing buffer.
**Notes:** May point between samples.
Will reset to 0 when a new buffer is used.
(Read only property)

### 14.11.21 Events

### 14.11.22 Finished

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is implemented by PortAudio clients.
**Notes:** Once registered they are called when the stream becomes inactive (ie once a call to Stop() will not block).
A stream will become inactive after the stream callback returns non-zero, or when Stop or Abort is called. For a stream providing audio output, if the stream callback returns paComplete, or Stop is called, the stream finished callback will not be called until all generated sample data has been played.

## 14.12 class PortAudioStreamInfoMBS

### 14.12.1 class PortAudioStreamInfoMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to hold time information of the current stream.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 14.12.2 Methods

### 14.12.3 Constructor

MBS Audio Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.12.4 Properties

### 14.12.5 InputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input latency of the stream in seconds.
**Notes:** This value provides the most accurate estimate of input latency available to the implementation. It may differ significantly from the suggestedLatency value passed to OpenStream().
The value of this field will be zero (0.) for output-only streams.
(Read only property)

### 14.12.6 OutputLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output latency of the stream in seconds.
**Notes:** This value provides the most accurate estimate of output latency available to the implementation. It may differ significantly from the suggestedLatency value passed to OpenStream().
The value of this field will be zero (0.) for input-only streams.
(Read only property)

### 14.12.7 SampleRate as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sample rate of the stream in Hertz (samples per second).
**Notes:** In cases where the hardware sample rate is inaccurate and PortAudio is aware of it, the value of this field may be different from the sampleRate parameter passed to OpenStream(). If information about the actual hardware sample rate is not available, this field will have the same value as the sampleRate parameter passed to OpenStream().
(Read only property)

## 14.13 class PortAudioStreamMBS

### 14.13.1 class PortAudioStreamMBS

MBS Audio Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A single PortAudioStreamMBS can provide multiple channels of real-time streaming audio input and output to a client application.
**Notes:** A stream provides access to audio hardware represented by one or more devices. Depending on the underlying Host API, it may be possible to open multiple streams using the same device, however this behavior is implementation defined. Portable applications should assume that a device may be simultaneously used by at most one PortAudioStreamMBS.

You can use this class in two ways:

- with Callback event: Get event call when new data is needed or received.
- without Callback event: Use read/write methods to access buffers and move samples.

Subclass of the PortAudioStreamBaseMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr4
- MBS Xojo Plugins, version 20.1pr1
- MBS Xojo Plugins, version 19.2pr3

### 14.13.2 Methods

### 14.13.3 Constructor

MBS Audio Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 14.13.4 OpenDefaultStream(numInputChannels as Integer, numOutputChannels as Integer, sampleFormat as Integer, sampleRate as Double, framesPerBuffer as Integer, Flags as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A simplified version of OpenStream() that opens the default input and/or output devices.
**Notes:** numInputChannels: The number of channels of sound that will be supplied to the stream callback

or returned by ReadStream. It can range from 1 to the value of maxInputChannels in the PaDeviceInfo record for the default input device. If 0 the stream is opened as an output-only stream.

numOutputChannels: The number of channels of sound to be delivered to the stream callback or passed to Write. It can range from 1 to the value of maxOutputChannels in the PaDeviceInfo record for the default output dvice. If 0 the stream is opened as an output-only stream.

sampleFormat: The sample format of both the input and output buffers provided to the callback or passed to and from Read and Write.
sampleFormat may be any of the formats described by the PaSampleFormat enumeration.

sampleRate: Same as OpenStream parameter of the same name.
framesPerBuffer: Same as OpenStream parameter of the same name.

constants for the flags value:

| | | |
|---|---|---|
| const paNoFlag | = 0 | no flags |
| const paClipOff | = 1 | Disable default clipping of out of range samples. |
| const paDitherOff | = 2 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paNeverDropInput | = 4 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paPrimeOutputBuffersUsingStreamCallback | = 8 | Call the stream callback to fill initial output buffers, rather than the default behavior of priming the buffers with zeros (silence). This flag has no effect for input-only and blocking read/write streams. |

Returns an error code.

### 14.13.5 OpenStream(inputParameters as PortAudioStreamParametersMBS, outputParameters as PortAudioStreamParametersMBS, sampleRate as Double, framesPerBuffer as Integer, streamFlags as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a stream for either input, output or both.
**Notes:** inputParameters: A object that describes the input parameters used by the opened stream. See PortAudioStreamParametersMBS for a description of these parameters. inputParameters must be nil for output-only streams.

outputParameters: A object that describes the output parameters used by the opened stream. See PortAudioStreamParametersMBS for a description of these parameters. outputParameters must be nil for input-only streams.

sampleRate: The desired sampleRate. For full-duplex streams it is the sample rate for both input and output

framesPerBuffer: The number of frames passed to the stream callback function, or the preferred block granularity for a blocking read/write stream. The special value paFramesPerBufferUnspecified (0) may be used to request that the stream callback will recieve an optimal (and possibly varying) number of frames based on host requirements and the requested latency settings.
Note: With some host APIs, the use of non-zero framesPerBuffer for a callback stream may introduce an additional layer of buffering which could introduce additional latency. PortAudio guarantees that the additional latency will be kept to the theoretical minimum however, it is strongly recommended that a non-zero framesPerBuffer value only be used when your algorithm requires a fixed number of frames per stream callback.

const paFramesPerBufferUnspecified=0

streamFlags: Flags which modify the behaviour of the streaming process. This parameter may contain a combination of flags ORed together. Some flags may only be relevant to certain buffer formats.

| | | |
|---|---|---|
| const paNoFlag | = 0 | no flags |
| const paClipOff | = 1 | Disable default clipping of out of range samples. |
| const paDitherOff | = 2 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paNeverDropInput | = 4 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paPrimeOutputBuffersUsingStreamCallback | = 8 | Call the stream callback to fill initial output buffers, rather than the default behavior of priming the buffers with zeros (silence). This flag has no effect for input-only and blocking read/write streams. |

If this the callback event is left empty the stream will be opened in 'blocking read/write' mode. In blocking mode, the client can receive sample data using Read and write sample data using Write, the number of samples that may be read or written without blocking is returned by ReadAvailable and WriteAvailable respectively.

Upon success OpenStream() returns paNoError and places a pointer to a valid PaStream in the stream

argument. The stream is inactive (stopped).
If a call to OpenStream() fails, a non-zero error code is returned (see PaError for possible error codes) and the value of stream is invalid.

### 14.13.6 Events

### 14.13.7 Callback(InputBuffer as memoryblock, outputBuffer as memoryblock, FrameCount as Integer, inputBufferAdcTime as Double, currentTime as Double, outputBufferDacTime as Double, statusFlags as Integer) as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when new data is needed or received.
**Notes:** This event is implemented by PortAudio clients. They consume, process or generate audio in response to requests from an active PortAudio stream.

InputBuffer and outputBuffer are arrays of interleaved samples, the format, packing and number of channels used by the buffers are determined by parameters to OpenStream().

frameCount: The number of sample frames to be processed by the stream callback.

inputBufferAdcTime, currentTimeTiming and outputBufferDacTime: The time in seconds when the first sample of the input buffer was received at the audio input, the time in seconds when the first sample of the output buffer will begin being played at the audio output, and the time in seconds when the stream callback was called.

statusFlags: Flags indicating whether input and/or output buffers have been inserted or will be dropped to overcome underflow or overflow conditions.

Returns the stream callback should return one of the values in the PaStreamCallbackResult enumeration. To ensure that the callback continues to be called, it should return paContinue (0). Either paComplete or paAbort can be returned to finish stream processing, after either of these values is returned the callback will not be called again. If paAbort is returned the stream will finish as soon as possible. If paComplete is returned, the stream will continue until all buffers generated by the callback have been played.
This may be useful in applications such as soundfile players where a specific duration of output is required. However, it is not necessary to utilise this mechanism as Stop(), Abort() or Close() can also be used to stop the stream. The callback must always fill the entire output buffer irrespective of its return value.

With the exception of CpuLoad() it is not permissable to call PortAudio API functions from within the stream callback.

Flag bit constants for the statusFlags to Callback:

paInputUnderflow = 1
In a stream opened with paFramesPerBufferUnspecified, indicates that input data is all silence (zeros) because no real data is available. In a stream opened without paFramesPerBufferUnspecified, it indicates that one or more zero samples have been inserted into the input buffer to compensate for an input underflow.

paInputOverflow = 2
In a stream opened with paFramesPerBufferUnspecified, indicates that data prior to the first sample of the input buffer was discarded due to an overflow, possibly because the stream callback is using too much CPU time. Otherwise indicates that data prior to one or more samples in the input buffer was discarded.

paOutputUnderflow = 4
Indicates that output data (or a gap) was inserted, possibly because the stream callback is using too much CPU time.

paOutputOverflow = 8
Indicates that output data will be discarded because no room is available.

paPrimingOutput = 16
Some of all of the output data will be used to prime the stream, input data may be zero.

Allowable return values for the callback: (PaStreamCallbackResult)

```
const paContinue    = 0
const paComplete    = 1
const paAbort       = 2
```

### 14.13.8 Finished

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is implemented by PortAudio clients.
**Notes:** Once registered they are called when the stream becomes inactive (ie once a call to Stop() will not block).
A stream will become inactive after the stream callback returns non-zero, or when Stop or Abort is called. For a stream providing audio output, if the stream callback returns paComplete, or Stop is called, the stream finished callback will not be called until all generated sample data has been played.

## 14.14 class PortAudioStreamParametersMBS

### 14.14.1 class PortAudioStreamParametersMBS

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameters for one direction (input or output) of a stream.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr6

### 14.14.2 Properties

### 14.14.3 ASIOFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags for ASIO stream.
**Notes:** Can include kAsioUseChannelSelectors constant.
(Read and Write property)

### 14.14.4 ChannelCount as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The requested channel count.
**Notes:** The number of channels of sound to be delivered to the stream callback or accessed by Read() or Write(). It can range from 1 to the value of maxInputChannels in the DeviceInfo object for the device specified by the device parameter.
(Read and Write property)

### 14.14.5 Device as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device ID to be used.
**Notes:** A valid device index in the range 0 to (PortAudioMBS.CountDevices-1) specifying the device to be used or the special constant paUseHostApiSpecificDeviceSpecification which indicates that the actual device(s) to use are specified in hostApiSpecificStreamInfo.
This field must not be set to paNoDevice (-1).
(Read and Write property)

### 14.14.6 MacCoreAudioChannelMapSize as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Channel map for HAL channel mapping.
**Notes:** Should be number of values.
(Read and Write property)

### 14.14.7 MacCoreAudioFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags for CoreAudio.
**Notes:** (Read and Write property)

### 14.14.8 SampleFormat as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sample format of the buffer provided to the stream callback, Read() or Write().
**Notes:** Constants for sample format:

```
const paFloat32          = 1
const paInt32            = 2
const paInt24            = 4
const paInt16            = 8
const paInt8             = 16
const paUInt8            = 32
const paCustomFormat     = 65536
const paNonInterleaved   = negative sign
```

The standard formats paFloat32, paInt16, paInt32, paInt24, paInt8 and aUInt8 are usually implemented by all implementations.

The floating point representation (paFloat32) uses +1.0 and -1.0 as the maximum and minimum respectively.

paUInt8 is an unsigned 8 bit format where 128 is considered ”ground”

The paNonInterleaved flag indicates that a multichannel buffer is passed as a set of non-interleaved pointers.
(Read and Write property)

### 14.14.9 SuggestedLatency as Double

MBS Audio Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The desired latency in seconds.
**Notes:** Where practical, implementations should configure their latency based on these parameters, otherwise they may choose the closest viable latency instead. Unless the suggested latency is greater than the absolute upper limit for the device implementations should round the suggestedLatency up to the next practial value - ie to provide an equal or higher latency than suggestedLatency wherever possibe.
Actual latency values for an open stream may be retrieved using the inputLatency and outputLatency fields of the PortAudioStreamInfoMBS object returned by PortAudioStreamMBS.Info().
(Read and Write property)

### 14.14.10 WASChannelMask as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Support for WAVEFORMATEXTENSIBLE channel masks.
**Notes:** If flags contains kWinWasapiUseChannelMask this allows you to specify which speakers to address in a multichannel stream. Will be used only if kWinWasapiUseChannelMask flag is specified.

See kWinChannelMask* constants.
(Read and Write property)

### 14.14.11 WASFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Can be e.g. kWinWasapiUseChannelMask to use channel mask.
(Read and Write property)

### 14.14.12 WASStreamCategory as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stream category.
**Notes:** See constants.
(Read and Write property)

### 14.14.13 WASStreamOption as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stream option.
**Notes:** See constants.
(Read and Write property)

### 14.14.14 WASThreadPriority as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies thread priority explicitly. Will be used only if paWinWasapiThreadPriority flag is specified.
**Notes:** Please note, if Input/Output streams are opened simultaniously (Full-Duplex mode) you shall specify same value for threadPriority or othervise one of the values will be used to setup thread priority.
(Read and Write property)

### 14.14.15 WinDirectSoundChannelMask as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel mask.
**Notes:** support for WAVEFORMATEXTENSIBLE channel masks. If flags contains kWinDirectSoundUseChannelMask this allows you to specify which speakers to address in a multichannel stream.

See kWinChannelMask* constants.
(Read and Write property)

### 14.14.16 WinDirectSoundFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags for Direct Sound.
**Notes:** Enable other features of this parameters.
(Read and Write property)

### 14.14.17 WinDirectSoundFramesPerBuffer as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Low-level latency setting support.
**Notes:** Sets the size of the DirectSound host buffer.
When flags contains the kWinDirectSoundUseLowLevelLatencyParameters this size will be used instead of interpreting the generic latency parameters to Pa_OpenStream(). If the flag is not set this value is ignored.

If the stream is a full duplex stream the implementation requires that the values of framesPerBuffer for input and output match (if both are specified).
(Read and Write property)

### 14.14.18 WinMMEBufferCount as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of buffers.
**Notes:** (Read and Write property)

### 14.14.19 WinMMEChannelMask as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel mask.
**Notes:** Support for WAVEFORMATEXTENSIBLE channel masks. If flags contains kWinMmeUseChannelMask this allows you to specify which speakers to address in a multichannel stream.

See kWinChannelMask* constants.
(Read and Write property)

### 14.14.20 WinMMEDeviceCount as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device count.
**Notes:** (Read and Write property)

### 14.14.21 WinMMEFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field for flags for Win MME.
**Notes:** (Read and Write property)

### 14.14.22 WinMMEFramesPerBuffer as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Low-level latency setting support.
**Notes:** These settings control the number and size of host buffers in order to set latency. They will be used instead of the generic parameters to OpenStream() if flags contains the kWinMmeUseLowLevelLatencyParameters flag.

If PortAudioStreamParametersMBS object with kWinMmeUseLowLevelLatencyParameters are supplied for both input and output in a full duplex stream, then the input and output framesPerBuffer must be the same, or the larger of the two must be a multiple of the smaller, otherwise a kErrorIncompatibleHostApiSpecificStreamInfo error will be returned from OpenStream().
(Read and Write property)

### 14.14.23 WinWDMKSChannelMask as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel mask for WDM/KS.
**Notes:** If kWinWDMKSUseGivenChannelMask bit is set in flags, use this as channelMask instead of default.

See kWinChannelMask* constants.
(Read and Write property)

### 14.14.24 WinWDMKSFlags as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flags indicate which fields are valid.
**Notes:** (Read and Write property)

### 14.14.25 WinWDMKSNoOfPackets as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of packets to use for WaveCyclic devices, range is [ 2, 8 ] .
**Notes:** Set to zero for default value of 2.

(Read and Write property)

### 14.14.26 ASIOChannelSelectors(Index as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Support for opening only specific channels of an ASIO device.
**Notes:** If the kAsioUseChannelSelectors flag is set, channelSelectors is a pointer to an array of integers specifying the device channels to use.
When used, the length of the channelSelectors array must match the corresponding channelCount parameter to OpenStream() otherwise a crash may result.
The values in the selectors array must specify channels within the range of supported channels for the device or kErrorInvalidChannelCount will result.
(Read and Write computed property)

### 14.14.27 MacCoreAudioChannelMap(Index as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Channel map size for HAL channel mapping.
**Example:**

```
Dim pasp As New PortAudioStreamParametersMBS
pasp.ChannelCount = 1 // we produce one channel
pasp.MacCoreAudioChannelMap(0) = 0 // put our mono channel on Left
pasp.MacCoreAudioChannelMap(1) = 0 // put our mono channel on Right
pasp.MacCoreAudioChannelMapSize = 2
```

**Notes:** This property is used to map input channels from an input (source) to a destination. The number of channels represented in the channel map is the number of channels of the destination. The channel map entries contain a channel number of the source that should be mapped to that destination channel. If -1 is specified, then that destination channel will not contain any channel from the source (so it will be silent)

Please set MacCoreAudioChannelMapSize to make this map to have effect.
(Read and Write computed property)

### 14.14.28 WinMMEDevicesChannelCount(Index as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiple devices per direction support.

**Notes:** If flags contains the PaWinMmeUseMultipleDevices flag, this functionality will be used, otherwise the device parameter to OpenStream() will be used instead.
If devices are specified here, the corresponding device parameter to OpenStream() should be set to kUseHostApiSpecificDeviceSpecification, otherwise an kErrorInvalidDevice error will result.
The total number of channels accross all specified devices must agree with the corresponding channelCount parameter to OpenStream() otherwise a kErrorInvalidChannelCount error will result.

Please always set WinMMEDevicesChannelCount and WinMMEDevicesDevice together.
(Read and Write computed property)

### 14.14.29 WinMMEDevicesDevice(Index as Integer) as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiple devices per direction support.
**Notes:** If flags contains the PaWinMmeUseMultipleDevices flag, this functionality will be used, otherwise the device parameter to OpenStream() will be used instead.
If devices are specified here, the corresponding device parameter to OpenStream() should be set to kUseHostApiSpecificDeviceSpecification, otherwise an kErrorInvalidDevice error will result.
The total number of channels accross all specified devices must agree with the corresponding channelCount parameter to OpenStream() otherwise a kErrorInvalidChannelCount error will result.

Please always set WinMMEDevicesChannelCount and WinMMEDevicesDevice together.
(Read and Write computed property)

### 14.14.30 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAsioUseChannelSelectors | 1 | One of the ASIO flags.<br>Set to enable channel selectors. |

Stream Category

| Constant | Value | Description |
|---|---|---|
| kWASAudioCategoryAlerts | 4 | Alert sounds. |
| kWASAudioCategoryCommunications | 3 | Real-time communications, such as VOIP or chat. |
| kWASAudioCategoryGameChat | 8 | Game chat audio. Similar to kWASAudioCategoryCommunications except kWASAudioCategoryGameChat will not attenuate other streams. |
| kWASAudioCategoryGameEffects | 6 | Game sound effects. |
| kWASAudioCategoryGameMedia | 7 | Background audio for games. |
| kWASAudioCategoryMedia | 11 | Stream that includes audio without dialog. |
| kWASAudioCategoryMovie | 10 | Stream that includes audio with dialog. |
| kWASAudioCategoryOther | 0 | Other audio stream. |
| kWASAudioCategorySoundEffects | 5 | Sound effects. |
| kWASAudioCategorySpeech | 9 | Speech. |

WAS Flags

| Constant | Value | Description |
|---|---|---|
| kWASFlagExclusive | 1 | Puts WASAPI into exclusive mode. |
| kWASFlagPolling | 8 | selects non-Event driven method of data read/write<br>Note: WASAPI Event driven core is capable of 2ms latency!!!, but Polling method can only provide 15-20ms latency. |
| kWASFlagRedirectHostProcessor | 2 | Allows to skip internal PA processing completely. |
| kWASFlagThreadPriority | 16 | forces custom thread priority setting, must be used if kWasapiStreamInfo::threadPriority is set to a custom value. |
| kWASFlagUseChannelMask | 4 | Assigns custom channel mask. |

Stream Options

| Constant | Value | Description |
|---|---|---|
| kWASStreamOptionMatchFormat | 2 | Force WASAPI Audio Engine into a stream format, supported since Windows 10 |
| kWASStreamOptionNone | 0 | Default |
| kWASStreamOptionRaw | 1 | Bypass WASAPI Audio Engine DSP effects, supported since Windows 8.1 |

Thread Priorities

| Constant | Value | Description |
|---|---|---|
| kWASThreadPriorityAudio | 1 | Audio. Default for Shared mode. |
| kWASThreadPriorityCapture | 2 | Capture |
| kWASThreadPriorityDistribution | 3 | Distribution |
| kWASThreadPriorityGames | 4 | Games |
| kWASThreadPriorityNone | 0 | |
| kWASThreadPriorityPlayback | 5 | Playback |
| kWASThreadPriorityProAudio | 6 | ProAudio. Default for Exclusive mode. |
| kWASThreadPriorityWindowManager | 7 | Window Manager |

Windows Channel Mask

| Constant | Value | Description |
|---|---|---|
| kWinChannelMask5Point1 | 63 | 5.1 Speakers without side speakers. |
| kWinChannelMask5Point1Surround | 1551 | 5.1 Speakers with side speakers. |
| kWinChannelMask7Point1 | 255 | 7.1 Speakers without side speakers. |
| kWinChannelMask7Point1Surround | 1599 | 7.1 Speakers with side speakers. |
| kWinChannelMaskAll | 2147483648 | Used to specify that any possible permutation of speaker configur |
| kWinChannelMaskBackCenter | 256 | Back Center. |
| kWinChannelMaskBackLeft | 16 | Back Left. |
| kWinChannelMaskBackRight | 32 | Back Right. |
| kWinChannelMaskDirectout | 0 | no speakers |
| kWinChannelMaskFrontCenter | 4 | Front center. |
| kWinChannelMaskFrontLeft | 1 | Front left |
| kWinChannelMaskFrontLeftOfCenter | 64 | Front Left or Center. |
| kWinChannelMaskFrontRight | 2 | Front right. |
| kWinChannelMaskFrontRightOfCenter | 128 | Front Right or Center. |
| kWinChannelMaskGroundFrontCenter | 4 | DVD Speaker Positions: Ground Front Center |
| kWinChannelMaskGroundFrontLeft | 1 | DVD Speaker Positions: Ground Front Left |
| kWinChannelMaskGroundFrontRight | 2 | DVD Speaker Positions: Ground Front Right |
| kWinChannelMaskGroundRearLeft | 16 | DVD Speaker Positions: Ground Rear Left |
| kWinChannelMaskGroundRearRight | 32 | DVD Speaker Positions: Ground Rear Right |
| kWinChannelMaskLowFrequency | 8 | Low frequency speaker (bass) |
| kWinChannelMaskMono | 4 | Mono goes to center speaker, or if not available to left and right. |
| kWinChannelMaskQuad | 51 | Left and right in front and back. |
| kWinChannelMaskReserved | 2147221504 | Bit mask locations reserved for future use. |
| kWinChannelMaskSideLeft | 512 | Side speaker on left |
| kWinChannelMaskSideRight | 1024 | Side speaker on right. |
| kWinChannelMaskStereo | 3 | Left and right speakers. |
| kWinChannelMaskSuperWoofer | 8 | DVD Speaker Positions: Super Woofer |
| kWinChannelMaskSurround | 263 | Front left and right, front and back center. |
| kWinChannelMaskTopBackCenter | 65536 | Top back center. |
| kWinChannelMaskTopBackLeft | 32768 | Top back left. |
| kWinChannelMaskTopBackRight | 131072 | Top back right. |
| kWinChannelMaskTopCenter | 2048 | Top center |
| kWinChannelMaskTopFrontCenter | 8192 | Top front center |
| kWinChannelMaskTopFrontLeft | 4096 | Top front left. |
| kWinChannelMaskTopFrontRight | 16384 | Top front right. |
| kWinChannelMaskTopMiddle | 2048 | DVD Speaker Positions: Top Middle |

Direct Sound Flags

| Constant | Value | Description |
|---|---|---|
| kWinDirectSoundUseChannelMask | 4 | The flag indicates that the WinDirectSoundChannelMask fie |
| kWinDirectSoundUseLowLevelLatencyParameters | 1 | Indicates WinDirectSoundFramesPerBuffer field is set. |

Win MME Flags

| Constant | Value | Description |
|---|---|---|
| kWinMmeDontThrottleOverloadedProcessingThread | 8 | By default, the mme implementation drops the processi to THREAD_PRIORITY_NORMAL and sleeps the thre exceeds 100% This flag disables any priority throttling. Th will always run at THREAD_PRIORITY_TIME_CRITI |
| kWinMmeUseChannelMask | 4 | Use channel mask. |
| kWinMmeUseLowLevelLatencyParameters | 1 | Use low level latency. |
| kWinMmeUseMultipleDevices | 2 | Use multiple devices. |
| kWinMmeWaveFormatDolbyAc3Spdif | 16 | Flags for non-PCM spdif passthrough. |
| kWinMmeWaveFormatWmaSpdif | 32 | Flags for non-PCM spdif passthrough. |

Flags for Win WDM/KS

| Constant | Value | Description |
|---|---|---|
| kWinWDMKSOverrideFramesize | 1 | Makes WDMKS use the supplied latency figures instead of relying on the f size reported by the WaveCyclic device. Use at own risk! |
| kWinWDMKSUseGivenChannelMask | 2 | Makes WDMKS (output stream) use the given channelMask instead o default. |

Sample Formats

| Constant | Value | Description |
|---|---|---|
| paCustomFormat | 65536 | Custom format. Not supported by plugin. |
| paFloat32 | 1 | Uses +1.0 and -1.0 as the maximum and minimum respectively. |
| paInt16 | 8 | Signed 16 bit. |
| paInt24 | 4 | Packed 24 bit format |
| paInt32 | 2 | Signed 32 bit. |
| paInt8 | 16 | 8 bit integer. |
| paNonInterleaved | &h80000000 | Non interleaved. The paNonInterleaved flag indicates that audio data is passed as an array of pointers to separate buffers, one buffer for each channel. Usually, when this flag is not used, audio data is passed as a single buffer with all channels interleaved. |
| paNonInterleavedFloat32 | &h80000001 | Non interleaved, Uses +1.0 and -1.0 as the maximum and minimum respectively. |
| paNonInterleavedInt16 | &h80000008 | Non interleaved, signed 16 bit. |
| paNonInterleavedInt24 | &h80000004 | Non interleaved, Packed 24 bit format |
| paNonInterleavedInt32 | &h80000002 | Non interleaved, signed 32 bit. |
| paNonInterleavedInt8 | &h80000010 | Non interleaved, 8 bit integer. |
| paNonInterleavedUInt8 | &h80000020 | Non interleaved, unsigned 8 bit format where 128 is considered ”ground”. |
| paUInt8 | 32 | unsigned 8 bit format where 128 is considered ”ground” |

## 14.15 class PortAudioStreamRecorderMBS

### 14.15.1 class PortAudioStreamRecorderMBS

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A portaudio stream class to use an internal buffer to record audio.
**Notes:** This class has a ring buffer to store the audio samples which they are being recorded. Your application can in a timer or thread process this samples.
Subclass of the PortAudioStreamBaseMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MBS Xojo / Real Studio Plugins, version 16.1pr2

### 14.15.2 Methods

### 14.15.3 Constructor(BufferSize as Integer)

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object using a buffer of the given size.
**Notes:** The buffer must be a power of 2. For example one Megabyte (2^20). This defines the ring buffer used to buffer samples between data coming from sound device and you call ReadFrames method.

Automatically we take paFloat32 as format for sample buffer.

At 44100 Hz, and 4 bytes per value and 2 channels, you will need 352800 bytes per second on storage.

### 14.15.4 Flush

MBS Audio Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the buffer and discards all current samples.

### 14.15.5 OpenDefaultStream(numInputChannels as Integer, sampleRate as Double) as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A simplified version of OpenStream() that opens the default input devices.
**Notes:** Sampleformat is always 32bit float in this class. (use memoryblock.singlevalue)

numInputChannels: The number of channels of sound to be delivered. It can range from 1 to the value of maxInputChannels in the PortAudioDeviceInfoMBS object for the default output device. If 0 the stream is opened as an output-only stream.

sampleRate: Same as OpenStream parameter of the same name.

Returns an error code.
Error -2 is from the plugin and reports that the buffer was not created before.

### 14.15.6 OpenStream(inputParameters as PortAudioStreamParametersMBS, sampleRate as Double, framesPerBuffer as Integer, streamFlags as Integer) as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a stream for input.
**Notes:** Sampleformat is always 32bit float in this class. (use memoryblock.singlevalue)

outputParameters: A object that describes the input parameters used by the opened stream. See PortAudioStreamParametersMBS for a description of these parameters.

sampleRate: The desired sampleRate.

framesPerBuffer: The number of frames passed to the stream callback function, or the preferred block granularity for a blocking read/write stream. The special value paFramesPerBufferUnspecified (0) may be used to request that the stream callback will recieve an optimal (and possibly varying) number of frames based on host requirements and the requested latency settings.
Note: With some host APIs, the use of non-zero framesPerBuffer for a callback stream may introduce an additional layer of buffering which could introduce additional latency. PortAudio guarantees that the additional latency will be kept to the theoretical minimum however, it is strongly recommended that a non-zero framesPerBuffer value only be used when your algorithm requires a fixed number of frames per stream callback.

const paFramesPerBufferUnspecified=0

streamFlags: Flags which modify the behaviour of the streaming process. This parameter may contain a combination of flags ORed together. Some flags may only be relevant to certain buffer formats.

| | | |
|---|---|---|
| const paNoFlag | = 0 | no flags |
| const paClipOff | = 1 | Disable default clipping of out of range samples. |
| const paDitherOff | = 2 | Flag requests that where possible a full duplex stream will not discard overflowed input samples without calling the stream callback. This flag is only valid for full duplex callback streams and only when used in combination with the paFramesPerBufferUnspecified (0) framesPerBuffer parameter. Using this flag incorrectly results in a paInvalidFlag error being returned from OpenStream and OpenDefaultStream. |
| const paNeverDropInput | = 4 | Call the stream callback to fill initial output buffers, rather than the default behavior of priming the buffers with zeros (silence). This flag has no effect for input-only and blocking read/write streams. |
| const paPrimeOutputBuffersUsingStreamCallback | = 8 | Call the stream callback to fill initial output buffers, rather than the default behavior of priming the buffers with zeros (silence). This flag has no effect for input-only and blocking read/write streams. |

Upon success OpenStream() returns paNoError and places a pointer to a valid PaStream in the stream argument. The stream is inactive (stopped).
If a call to OpenStream() fails, a non-zero error code is returned (see PaError for possible error codes) and the value of stream is invalid.

Error -2 is from the plugin and reports that the buffer was not created before.

### 14.15.7 ReadFrames(mem as memoryblock, SizeInBytes as Integer) as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads frames into the memoryblock.
**Example:**

```
dim s as PortAudioStreamRecorderMBS
dim m as memoryblock

m=newmemoryblock(1024*1024)
// initialize

dim frames as Integer

frames=s.ReadFrames(m,m.size)

msgbox "we got "+str(frames)+" frames."
```

**Notes:** You pass a memoryblock and the size of this memoryblock in bytes.
Values are stored in floats (memoryblock.singlevalue) so you get at maximum SizeInBytes/4 values. And if you use more than one channel, you will receive them interlaced.

ReadFrames uses a mutex to access share data, so this call is expensive. Use a big buffer.

### 14.15.8 ResizeBuffer(BufferSize as Integer)

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resizes the buffer.
**Notes:** Do not resize while you are recording (this can crash).

The buffer must be a power of 2. For example one Megabyte (2^20).

At 44100 Hz, and 4 bytes per value and 2 channels, you will need 352800 bytes per second on storage.

### 14.15.9 Properties

### 14.15.10 Buffer as Memoryblock

MBS Audio Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock which points to the ring buffer used in the recorder object.
**Notes:** This memoryblock has no size.
It is only for debugging and only valid as long as the PortAudioStreamRecorderMBS object is living.
(Read only property)

### 14.15.11 BufferReadIndex as Integer

MBS Audio Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The read index inside the ring buffer.
**Notes:** Only for debugging.
(Read only property)

### 14.15.12 BufferSize as Integer

MBS Audio Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the ring buffer in bytes.
**Notes:** (Read only property)

### 14.15.13 BufferWriteIndex as Integer

MBS Audio Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The write index inside the ring buffer.
**Notes:** Only for debugging.
(Read only property)

### 14.15.14 FramesAvailable as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of frames available in the buffer.
**Notes:** FramesAvailable uses a mutex to access share data, so this call is expensive. Do not call it to decide whether to call ReadFrames. ReadFrames calls FramesAvailable itself.
(Read only property)

### 14.15.15 NumInputChannels as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of input channels used with the OpenStream function.
**Notes:** (Read only property)

## 14.16 Globals

### 14.16.1 GetSoundMuteMBS as boolean

MBS Util Plugin, Plugin Version: 6.2, Platforms: macOS, Windows, Targets: All.

**Function:** Checks the mute state of the sound output.
**Example:**

```
if GetSoundMuteMBS then
Title="on"
else
Title="off"
end if
```

**Notes:** Returns false on any error.

### 14.16.2 GetSoundVolumeLeftMBS as Double

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Windows, Targets: All.

**Function:** Gets the current volume for the left channel.
**Notes:** Same as GetSoundVolumeMBS, but only for the left channel.

### 14.16.3 GetSoundVolumeMBS as Double

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** Gets the current volume.
**Example:**

```
dim d as Double

d=GetSoundVolumeMBS
```

**Notes:** Volume is from 0 to 1.0
Uses QuickTime on Mac OS Classic, CoreAudio on Mac OS X and the Mixer on Windows.

### 14.16.4 GetSoundVolumeRightMBS as Double

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Windows, Targets: All.

**Function:** Gets the current volume for the right channel.
**Notes:** Same as GetSoundVolumeMBS, but only for the right channel.

### 14.16.5 SetSoundMuteMBS(mute as boolean)

MBS Util Plugin, Plugin Version: 6.2, Platforms: macOS, Windows, Targets: All.

**Function:** Sets sound mute to the give state.
**Example:**

```
SetSoundMuteMBS true // set mute on
```

### 14.16.6 SetSoundVolumeLeftMBS(percent as Double)

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Windows, Targets: All.

**Function:** Sets the volume on the left channel.
**Notes:** Volume is from 0 to 1.0
Uses QuickTime on Mac OS Classic, CoreAudio on Mac OS X and the Mixer on Windows.

### 14.16.7 SetSoundVolumeMBS(percent as Double)

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** Sets the volume.
**Example:**

```
SetSoundVolumeMBS 1.0
```

**Notes:** Volume is from 0 to 1.0
Uses QuickTime on Mac OS Classic, CoreAudio on Mac OS X and the Mixer on Windows.

### 14.16.8 SetSoundVolumeRightMBS(percent as Double)

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Windows, Targets: All.

**Function:** Sets the volume on the right channel.
**Notes:** Volume is from 0 to 1.0
Uses QuickTime on Mac OS Classic, CoreAudio on Mac OS X and the Mixer on Windows.

## 14.17 class SoundFileInfoMBS

### 14.17.1 class SoundFileInfoMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the file info of a sound file.
**Notes:** When you open a sound file, the library will fill this and provide you the file format details.
When writing a sound file, you need to build valid format.

### 14.17.2 Properties

### 14.17.3 Channels as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of channels.
**Notes:** (Read and Write property)

### 14.17.4 Format as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The format ID.
**Notes:** See kFormat constants.
(Read and Write property)

### 14.17.5 FormatEndianName as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian description for the format.
**Notes:** (Read only property)

### 14.17.6 FormatName as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The format description for the format.
**Notes:** (Read only property)

### 14.17.7 FormatSubName as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sub format description for the format.
**Notes:** (Read only property)

### 14.17.8 Frames as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of frames.
**Notes:** (Read and Write property)

### 14.17.9 IsValid as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether format is valid.
**Notes:** Returns true if valid.
(Read only property)

### 14.17.10 SampleRate as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sample rate in Hz.
**Notes:** (Read and Write property)

### 14.17.11 Sections as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of sections.
**Notes:** (Read and Write property)

### 14.17.12 Seekable as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether format is seekable.
**Notes:** (Read and Write property)

### 14.17.13 Constants

Formats

| Constant | Value | Description |
|---|---|---|
| kFormatAIFF | &h020000 | Apple/SGI AIFF format (big endian). |
| kFormatAU | &h030000 | Sun/NeXT AU format (big endian). |
| kFormatAVR | &h120000 | Audio Visual Research |
| kFormatCAF | &h180000 | Core Audio File format |
| kFormatEndianMask | &h30000000 | Bitmask for the endian format. |
| kFormatFLAC | &h170000 | FLAC lossless file format |
| kFormatHTK | &h100000 | HMM Tool Kit format |
| kFormatIRCAM | &h0A0000 | Berkeley/IRCAM/CARL |
| kFormatMAT4 | &h0C0000 | Matlab (tm) V4.2 / GNU Octave 2.0 |
| kFormatMAT5 | &h0D0000 | Matlab (tm) V5.0 / GNU Octave 2.1 |
| kFormatMPC2K | &h210000 | Akai MPC 2000 sampler |
| kFormatNIST | &h070000 | Sphere NIST format. |
| kFormatOGG | &h200000 | Xiph OGG container |
| kFormatPAF | &h050000 | Ensoniq PARIS file format. |
| kFormatPVF | &h0E0000 | Portable Voice Format |
| kFormatRAW | &h040000 | RAW PCM data. |
| kFormatRF64 | &h220000 | RF64 WAV file |
| kFormatSD2 | &h160000 | Sound Designer 2 |
| kFormatSDS | &h110000 | Midi Sample Dump Standard |
| kFormatSubMask | &h0000FFFF | Bitmask for the sub format. |
| kFormatSVX | &h060000 | Amiga IFF / SVX8 / SV16 format. |
| kFormatTypeMask | &h0FFF0000 | Bitmask for the type format. |
| kFormatVOC | &h080000 | VOC files. |
| kFormatW64 | &h0B0000 | Sonic Foundry's 64 bit RIFF/WAV |
| kFormatWAV | &h010000 | Microsoft WAV format (little endian default). |
| kFormatWAVEX | &h130000 | MS WAVE with WAVEFORMATEX |
| kFormatWVE | &h190000 | Psion WVE format |
| kFormatXI | &h0F0000 | Fasttracker 2 Extended Instrument |

Sub Formats

| Constant | Value | Description |
|---|---|---|
| kFormatALAC16 | &h0070 | Apple Lossless Audio Codec (16 bit). |
| kFormatALAC20 | &h0071 | Apple Lossless Audio Codec (20 bit). |
| kFormatALAC24 | &h0072 | Apple Lossless Audio Codec (24 bit). |
| kFormatALAC32 | &h0073 | Apple Lossless Audio Codec (32 bit). |
| kFormatALAW | &h0011 | A-Law encoded. |
| kFormatDouble | &h0007 | 64 bit float data |
| kFormatDPCM_16 | &h0051 | 16 bit differential PCM (XI only) |
| kFormatDPCM_8 | &h0050 | 8 bit differential PCM (XI only) |
| kFormatDWVW_12 | &h0040 | 12 bit Delta Width Variable Word encoding. |
| kFormatDWVW_16 | &h0041 | 16 bit Delta Width Variable Word encoding. |
| kFormatDWVW_24 | &h0042 | 24 bit Delta Width Variable Word encoding. |
| kFormatDWVW_N | &h0043 | N bit Delta Width Variable Word encoding. |
| kFormatFloat | &h0006 | 32 bit float data |
| kFormatG721_32 | &h0030 | 32kbs G721 ADPCM encoding. |
| kFormatG723_24 | &h0031 | 24kbs G723 ADPCM encoding. |
| kFormatG723_40 | &h0032 | 40kbs G723 ADPCM encoding. |
| kFormatGSM610 | &h0020 | GSM 6.10 encoding. |
| kFormatIMA_ADPCM | &h0012 | IMA ADPCM. |
| kFormatMS_ADPCM | &h0013 | Microsoft ADPCM. |
| kFormatPCM16 | &h0002 | Signed 16 bit data |
| kFormatPCM24 | &h0003 | Signed 24 bit data |
| kFormatPCM32 | &h0004 | Signed 32 bit data |
| kFormatPCMS8 | &h0001 | Signed 8 bit data |
| kFormatPCMU8 | &h0005 | Unsigned 8 bit data (WAV and RAW only) |
| kFormatULAW | &h0010 | U-Law encoded. |
| kFormatVORBIS | &h0060 | Xiph Vorbis encoding. |
| kFormatVOX_ADPCM | &h0021 | OKI / Dialogix ADPCM |

Endian Formats

| Constant | Value | Description |
|---|---|---|
| kFormatEndianBig | &h20000000 | Force big endian-ness. |
| kFormatEndianCPU | &h30000000 | Force CPU endian-ness. |
| kFormatEndianFile | &h00000000 | Default file endian-ness. |
| kFormatEndianLittle | &h10000000 | Force little endian-ness. |

## 14.18 class SoundFileMBS

### 14.18.1 class SoundFileMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A cross platform class to use sndfile library to read/write audio samples.
**Notes:** As sndfile library is LGPL, you need to include library within your app folder and load it at runtime.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Write audio file with samples using AVFoundation
- MBS Xojo Plugins, version 17.4pr3
- LibSndfile and TagLib plugins for Xojo

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 14.18.2 Methods

### 14.18.3 Close

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes file now.
**Notes:** Same as destructor, but you can call it early.

### 14.18.4 Constructor

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private constructor.

### 14.18.5 Create(file as folderitem, Info as SoundFileInfoMBS) as SoundFileMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new audio file with given format.
**Notes:** On success returns new sound file object.

### 14.18.6 ErrorMessage(errorNumber as integer) as string

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries error message for error number.
See also:

- 14.18.38 ErrorMessage as String 3097

### 14.18.7 GetString(type as Integer) as string

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries one of the strings.
**Notes:** See kString* constants.
Returns "" in case of error.

### 14.18.8 Loaded as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether library is loaded.

### 14.18.9 LoadErrorMessage as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message from loading library.

### 14.18.10 LoadLibrary(file as folderitem) as boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads sndfile library.
**Notes:** Returns true on error.

### 14.18.11 Open(data as MemoryBlock) as SoundFileMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an audio file from in memory data.
**Notes:** On success returns the sound file object.
See also:


- 14.18.12 Open(data as String) as SoundFileMBS 3092
- 14.18.13 Open(file as folderitem, readwrite As Boolean = False) as SoundFileMBS 3092


### 14.18.12 Open(data as String) as SoundFileMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an audio file from in memory data.
**Notes:** On success returns the sound file object.
See also:


- 14.18.11 Open(data as MemoryBlock) as SoundFileMBS 3091
- 14.18.13 Open(file as folderitem, readwrite As Boolean = False) as SoundFileMBS 3092


### 14.18.13 Open(file as folderitem, readwrite As Boolean = False) as SoundFileMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an audio file.
**Notes:** On success returns the sound file object.
Pass readwrite = true to write to the file.
See also:


- 14.18.11 Open(data as MemoryBlock) as SoundFileMBS 3091
- 14.18.12 Open(data as String) as SoundFileMBS 3092


### 14.18.14 ReadDouble(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data as double values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 8 * Items in size.
Returns number of items read.

### 14.18.15 ReadDoubleFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads frames as double values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 8 * Items * Channels in size.
Returns number of items read.

### 14.18.16 ReadInt(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data as Int32 values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 4 * Items in size.
Returns number of items read.

### 14.18.17 ReadIntFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads frames as Int32 values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items read.

### 14.18.18 ReadRaw(p as ptr, bytes as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read raw data.
**Notes:** Pointer should point to memmoryblock with Bytes in size.
Returns number of bytes read.

### 14.18.19 ReadShort(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data as Int16 values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 2 * Items in size.
Returns number of items read.

### 14.18.20 ReadShortFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads frames as Int16 values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 2 * Items * Channels in size.
Returns number of items read.

### 14.18.21 ReadSingle(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data as single values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 4 * Items in size.
Returns number of items read.

### 14.18.22 ReadSingleFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads frames as single values, converts if necessary.
**Notes:** Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items read.

### 14.18.23 Seek(frames as Int64, whence as Integer) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Seeks within the audio file.
**Notes:** See kSeek* constants for whence parameter.

### 14.18.24 SetString(type as Integer, data as Memoryblock) as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets one of the strings.
**Notes:** See kString* constants.
Returns zero on success.
See also:

- 14.18.25 SetString(type as Integer, text as string) as Integer 

### 14.18.25 SetString(type as Integer, text as string) as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets one of the strings.
**Notes:** See kString* constants.
Returns zero on success.
See also:

- 14.18.24 SetString(type as Integer, data as Memoryblock) as Integer 3094

### 14.18.26 Version as string

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of the library.

### 14.18.27 WriteDouble(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to file in double format.
**Notes:** Pointer should point to memmoryblock with 8 * Items in size.
Returns number of items written.

### 14.18.28 WriteDoubleFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes frames to file in double format.
**Notes:** Pointer should point to memmoryblock with 8 * Items * Channels in size.
Returns number of items written.

### 14.18.29 WriteInt(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to file in Int32 format.
**Notes:** Pointer should point to memmoryblock with 4 * Items in size.
Returns number of items written.

### 14.18.30 WriteIntFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes frames to file in Int32 format.
**Notes:** Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items written.

### 14.18.31 WriteRaw(p as ptr, bytes as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes raw data to file.
**Notes:** Pointer should point to memmoryblock with Bytes in size.
Returns number of bytes written.

### 14.18.32 WriteShort(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to file in Int16 format.
**Notes:** Pointer should point to memmoryblock with 2 * Items in size.
Returns number of items written.

### 14.18.33 WriteShortFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes frames to file in Int16 format.
**Notes:** Pointer should point to memmoryblock with 2 * Items * Channels in size.
Returns number of items written.

### 14.18.34 WriteSingle(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to file in single format.
**Notes:** Pointer should point to memmoryblock with 4 * Items in size.
Returns number of items written.

### 14.18.35 WriteSingleFrames(p as ptr, items as Int64) as Int64

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes frames to file in single format.
**Notes:** Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items written.

### 14.18.36 WriteSync

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes recent changes in file to disk.

### 14.18.37 Properties

### 14.18.38 ErrorMessage as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.
**Notes:** (Read only property)
See also:

- 14.18.6 ErrorMessage(errorNumber as integer) as string 3091

### 14.18.39 ErrorNumber as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error number.
**Notes:** (Read only property)

### 14.18.40 Handle as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 14.18.41 Info as SoundFileInfoMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current format.
**Notes:** (Read only property)

### 14.18.42 Constants

Seek Mode

| Constant | Value | Description |
|---|---|---|
| kSeekCurrent | 1 | Seek relative to current position. |
| kSeekEnd | 2 | Seek relative to end. |
| kSeekSet | 0 | Seek relative to begin. |

Strings

| Constant | Value | Description |
|---|---|---|
| kStringAlbum | 7 | Album |
| kStringArtist | 4 | Artist |
| kStringComment | 5 | Comment |
| kStringCopyright | 2 | Copyright |
| kStringDate | 6 | Date |
| kStringGenre | 10 | Genre |
| kStringLicense | 8 | License |
| kStringSoftware | 3 | Software |
| kStringTitle | 1 | Title |
| kStringTrackNumber | 9 | Track Number. |

## 14.19 class TagLibAudioPropertiesMBS

### 14.19.1 class TagLibAudioPropertiesMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for audio properties.

### 14.19.2 Properties

### 14.19.3 Bitrate as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bit rate for the sound.
**Notes:** Returns the most appropriate bit rate for the file in kb/s. For constant bitrate formats this is simply the bitrate of the file. For variable bitrate formats this is either the average or nominal bitrate.
(Read and Write property)

### 14.19.4 Channels as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of channels.
**Notes:** (Read and Write property)

### 14.19.5 Length as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the file in second.
**Notes:** (Read and Write property)

### 14.19.6 SampleRate as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sample rate in Hz.
**Notes:** (Read and Write property)

## 14.20 class TagLibFileRefMBS

### 14.20.1 class TagLibFileRefMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for file loading in TagLib.
**Notes:** Uses TagLib, an open source library to read metadata from audio files, e.g. ID3 tags.
Currently it supports both ID3v1 and ID3v2 for MP3 files, Ogg Vorbis comments and ID3 tags and Vorbis comments in FLAC, MPC, Speex, WavPack, TrueAudio, WAV, AIFF, MP4 and ASF files.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr8
- TagLib to write ID3v2 Tags in Xojo
- MBS Xojo Plugins, version 19.3pr4
- MBS Xojo Plugins, version 19.3pr3
- MBS Xojo Plugins, version 17.5pr1

### 14.20.2 Methods

### 14.20.3 Constructor(file as folderitem)

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Please point to valid audio file.
May raise error exception.

Uses TagLib, an open source library to read metadata from audio files, e.g. ID3 tags.
Currently it supports both ID3v1 and ID3v2 for MP3 files, Ogg Vorbis comments and ID3 tags and Vorbis comments in FLAC, MPC, Speex, WavPack, TrueAudio, WAV, AIFF, MP4 and ASF files.

### 14.20.4 CoverArt as Memoryblock

MBS Tools Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns cover art.
**Example:**

```
// for testing a test file on desktop
dim ff as FolderItem = SpecialFolder.Desktop.Child("test.mp3")

Dim f As New TagLibFileRefMBS(ff)

// show cover art
Dim cover As MemoryBlock = f.CoverArt
If cover <>Nil Then
Dim p As Picture = picture.FromData(cover)

If p <>Nil Then
Dim pw As New PicWindow
pw.Backdrop = p
End If
End If
```

**Notes:** Should work for MP3, MP4 and FLAC files.
May return JPEG, PNG, GIF or BMP depending on what the file contains.
Result is nil, if there is no art found.

### 14.20.5 Save as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves changes to the file.

### 14.20.6 SetProperties(Dic as Dictionary)

MBS Tools Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets audio tags for audio file.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.mp3")

Dim tag As New TagLibFileRefMBS(file)
Dim dic As Dictionary = tag.Properties

Break // inspect dictionary

dic.Value("ARTIST") = "John Doe"
dic.Value("ALBUM") = Nil // clear this one
```

```
tag.SetProperties(dic)

If tag.Save Then
MsgBox "OK"
Else
MsgBox "Failed to save"
End If
```

**Notes:** Please provide dictionary with new tags.
If tags are nil values, we remove them. If they are text values, we update the text.

### 14.20.7 Properties

### 14.20.8 audioProperties as TagLibAudioPropertiesMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries audio properties of the audio file.
**Notes:** (Read only property)

### 14.20.9 Handle as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 14.20.10 Properties as Dictionary

MBS Tools Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries properties for this file.
**Notes:** Builds and returns a dictionary with all the properties found by the file handler.
This may include IDv3 tags.

List of ID3v2 tag names:
ALBUM, ALBUMARTIST, ALBUMARTISTSORT, ALBUMSORT, ARTIST, ARTISTSORT, ARTISTWEBPAGE, AUDIOSOURCEWEBPAGE, BPM, COMMENT, COMPOSER, CONDUCTOR, CONTENTGROUP, COPYRIGHT, COPYRIGHTURL, DATE, DISCNUMBER, ENCODEDBY, ENCODING, EN-

CODINGTIME, FILETYPE, FILEWEBPAGE, GENRE, INITIALKEY, INVOLVEDPEOPLE, ISRC, LABEL, LANGUAGE, LENGTH, LYRICIST, LYRICS, MEDIA, MOOD, MUSICIANCREDITS, ORIGINALALBUM, ORIGINALARTIST, ORIGINALDATE, ORIGINALFILENAME, ORIGINALLYRICIST, OWNER, PAYMENTWEBPAGE, PLAYLISTDELAY, PODCAST, PODCASTCATEGORY, PODCASTDESC, PODCASTID, PODCASTURL, PRODUCEDNOTICE, PUBLISHERWEBPAGE, RADIOSTATION, RADIOSTATIONOWNER, RADIOSTATIONWEBPAGE, RELEASEDATE, REMIXER, SUBTITLE, TAGGINGDATE, TITLE, TITLESORT, TRACKNUMBER, URL.
(Read only property)

### 14.20.11 tags as TagLibTagMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tags in that file.
**Notes:** (Read only property)

## 14.21 class TagLibTagMBS

### 14.21.1 class TagLibTagMBS

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for tags.
**Notes:** We do have common values in properties like title, comment and track.
Other properties can be found in tags dictionary.

Please use TagLibFileRefMBS to load file and query it for the tags.

This is an attempt to abstract away the difference in the meta data formats of various audio codecs and tagging schemes. As such it is generally a subset of what is available in the specific formats but should be suitable for most applications. This is meant to compliment the generic APIs found in TagLibAudioPropertiesMBS and TagLibFileRefMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.4pr3
- LibSndfile and TagLib plugins for Xojo

**Videos**

- XDC 2020 MBS Plugins Presentation
- Presentation from Munich conference about MBS Plugins.

### 14.21.2 Methods

### 14.21.3 Constructor

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 14.21.4 setTags(Values as Dictionary) as Dictionary

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tags.
**Notes:** Returns a new dictionary with values which are not supported.

### 14.21.5 Properties

### 14.21.6 Album as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the album.
**Notes:** (Read and Write property)

### 14.21.7 Artist as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the artist.
**Notes:** (Read and Write property)

### 14.21.8 Comment as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The comment field.
**Notes:** (Read and Write property)

### 14.21.9 Genre as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The genre.
**Notes:** (Read and Write property)

### 14.21.10 Handle as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 14.21.11 isEmpty as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this tag set is empty.
**Notes:** (Read only property)

### 14.21.12 Tags as Dictionary

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of properties.
**Notes:** You get a copy as a dictionary with all keys and values.
Values could be strings or array of strings.
(Read only property)

### 14.21.13 Title as String

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title.
**Notes:** (Read and Write property)

### 14.21.14 Track as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The track number.
**Notes:** (Read and Write property)

### 14.21.15 Year as Integer

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year.
**Notes:** (Read and Write property)

## 14.22 class WindowsAudioMixerMBS

### 14.22.1 class WindowsAudioMixerMBS

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** The Windows Audio Mixer is a device to control the volume and mute state of all attached audio devices.
**Notes:** Not all devices are present on all Windows machines.
What device is source and destination is a bit unlogic from Microsoft.

### 14.22.2 Methods

### 14.22.3 DeviceCount as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platform: Windows, Targets: All.

**Function:** Number of Mixer devices found in the system.

### 14.22.4 DeviceName(index as Integer) as string

MBS Audio Plugin, Plugin Version: 7.0, Platform: Windows, Targets: All.

**Function:** Name of the device with the given index.
**Notes:** Index goes from 0 to DeviceCount-1.
Returns "" on invalid index.

### 14.22.5 Properties

### 14.22.6 DeviceIndex as Integer

MBS Audio Plugin, Plugin Version: 7.0, Platform: Windows, Targets: All.

**Function:** The index of the current used device.
**Notes:** Default is 0.
(Read and Write property)

### 14.22.7 Lasterror as Integer

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 14.22.8 DestinationDigitalMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether digital device is muted.
**Notes:** Audio line is a digital destination (for example, digital input to a DAT or CD audio device).

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.9 DestinationDigitalVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of digital device.
**Notes:** Audio line is a digital destination (for example, digital input to a DAT or CD audio device).

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.10 DestinationHeadPhonesMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether head phones are muted.
**Notes:** Audio line is an adjustable (gain and/or attenuation) destination intended to drive headphones. Most audio cards use the same audio destination line for speakers and headphones, in which case the mixer device simply uses the DestinationSpeakers.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.11 DestinationHeadPhonesVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of head phones.
**Notes:** Audio line is an adjustable (gain and/or attenuation) destination intended to drive headphones. Most audio cards use the same audio destination line for speakers and headphones, in which case the mixer device simply uses the DestinationSpeakers.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.12 DestinationLineMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether line is muted.
**Notes:** Audio line is a line level destination (for example, line level input from a CD audio device) that will be the final recording source for the analog-to-digital converter (ADC). Because most audio cards for personal computers provide some sort of gain for the recording audio source line, the mixer device will use the DestinationWaveIn.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.13 DestinationLineVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of line.
**Notes:** Audio line is a line level destination (for example, line level input from a CD audio device) that will be the final recording source for the analog-to-digital converter (ADC). Because most audio cards for personal computers provide some sort of gain for the recording audio source line, the mixer device will use the DestinationWaveIn.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.14 DestinationMonitorMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether audio monitor is muted.
**Notes:** Audio line is a destination used for a monitor.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.15 DestinationMonitorVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of audio monitor.
**Notes:** Audio line is a destination used for a monitor.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.16 DestinationSpeakersMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether speakers are muted.
**Notes:** Audio line is an adjustable (gain and/or attenuation) destination intended to drive speakers. This is the typical component type for the audio output of audio cards for personal computers.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.17 DestinationSpeakersVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of speakers.
**Notes:** Audio line is an adjustable (gain and/or attenuation) destination intended to drive speakers. This is the typical component type for the audio output of audio cards for personal computers.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.18 DestinationTelephoneMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether telephone is muted.
**Notes:** Audio line is a destination that will be routed to a telephone line.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.19 DestinationTelephoneVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of telephone.
**Notes:** Audio line is a destination that will be routed to a telephone line.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.20 DestinationVoiceInMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether voice input is muted.
**Notes:** Audio line is a destination that will be the final recording source for voice input. This component type is exactly like DestinationWaveIn but is intended specifically for settings used during voice recording/recognition. Support for this line is optional for a mixer device. Many mixer devices provide only DestinationWaveIn.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.21 DestinationVoiceInVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of voice input.
**Notes:** Audio line is a destination that will be the final recording source for voice input. This component type is exactly like DestinationWaveIn but is intended specifically for settings used during voice recording/recognition. Support for this line is optional for a mixer device. Many mixer devices provide only DestinationWaveIn.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.22 DestinationWaveInMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether wave in is muted.
**Notes:** Audio line is a destination that will be the final recording source for the waveform-audio input (ADC). This line typically provides some sort of gain or attenuation. This is the typical component type for the recording line of most audio cards for personal computers.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.23 DestinationWaveInVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of wave input device.
**Notes:** Audio line is a destination that will be the final recording source for the waveform-audio input (ADC). This line typically provides some sort of gain or attenuation. This is the typical component type for the recording line of most audio cards for personal computers.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.24 SourceAnalogMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether analog device is muted.
**Notes:** Audio line is an analog source (for example, analog output from a video-cassette tape).

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.25 SourceAnalogVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of analog device.
**Notes:** Audio line is an analog source (for example, analog output from a video-cassette tape).

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.26 SourceAuxiliaryMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether auxiliary is muted.
**Notes:** Audio line is a source originating from the auxiliary audio line. This line type is intended as a source with gain or attenuation that can be routed to the DestinationSpeakers destination and/or recorded from the DestinationWaveIn destination.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.27 SourceAuxiliaryVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of auxiliary.
**Notes:** Audio line is a source originating from the auxiliary audio line. This line type is intended as a source with gain or attenuation that can be routed to the DestinationSpeakers destination and/or recorded from the DestinationWaveIn destination.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.28 SourceCompactDiscMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether the CD device is muted.
**Notes:** Audio line is a source originating from the output of an internal audio CD. This component type is provided for audio cards that provide an audio source line intended to be connected to an audio CD (or CD-ROM playing an audio CD).

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.29 SourceCompactDiscVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of CD device.
**Notes:** Audio line is a source originating from the output of an internal audio CD. This component type is provided for audio cards that provide an audio source line intended to be connected to an audio CD (or CD-ROM playing an audio CD).

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.30 SourceDigitalMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether digital is muted.
**Notes:** Audio line is a digital source (for example, digital output from a DAT or audio CD).

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.31 SourceDigitalVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of digital device.
**Notes:** Audio line is a digital source (for example, digital output from a DAT or audio CD).

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.32 SourceLineMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether line is muted.
**Notes:** Audio line is a line-level source (for example, line-level input from an external stereo) that can be used as an optional recording source. Because most audio cards for personal computers provide some sort

of gain for the recording source line, the mixer device will use the SourceAuxiliary type.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.33 SourceLineVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of line.
**Notes:** Audio line is a line-level source (for example, line-level input from an external stereo) that can be used as an optional recording source. Because most audio cards for personal computers provide some sort of gain for the recording source line, the mixer device will use the SourceAuxiliary type.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.34 SourceMicrophoneMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether microphone is muted.
**Notes:** Audio line is a microphone recording source. Most audio cards for personal computers provide at least two types of recording sources: an auxiliary audio line and microphone input. A microphone audio line typically provides some sort of gain. Audio cards that use a single input for use with a microphone or auxiliary audio line should use the SourceMicrophone component type.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.35 SourceMicrophoneVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of microphone.

**Notes:** Audio line is a microphone recording source. Most audio cards for personal computers provide at least two types of recording sources: an auxiliary audio line and microphone input. A microphone audio line typically provides some sort of gain. Audio cards that use a single input for use with a microphone or auxiliary audio line should use the SourceMicrophone component type.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.36 SourcePCSpeakerMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether PC Speaker is muted.
**Notes:** Audio line is a source originating from personal computer speaker. Several audio cards for personal computers provide the ability to mix what would typically be played on the internal speaker with the output of an audio card. Some audio cards support the ability to use this output as a recording source.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.37 SourcePCSpeakerVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of PC Speakers.
**Notes:** Audio line is a source originating from personal computer speaker. Several audio cards for personal computers provide the ability to mix what would typically be played on the internal speaker with the output of an audio card. Some audio cards support the ability to use this output as a recording source.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.38 SourceSynthesizerMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether synthesizer is muted.
**Notes:** Audio line is a source originating from the output of an internal synthesizer. Most audio cards for personal computers provide some sort of MIDI synthesizer (for example, an Adlib®-compatible or OPL/3 FM synthesizer).

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.39 SourceSynthesizerVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of synthesizer.
**Notes:** Audio line is a source originating from the output of an internal synthesizer. Most audio cards for personal computers provide some sort of MIDI synthesizer (for example, an Adlib®-compatible or OPL/3 FM synthesizer).

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.40 SourceTelephoneMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Whether telephone is muted.
**Notes:** Audio line is a source originating from an incoming telephone line.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.41 SourceTelephoneVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of telephone.

**Notes:** Audio line is a source originating from an incoming telephone line.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

### 14.22.42 SourceWaveOutMute as boolean

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of wave device.
**Notes:** Audio line is a source originating from the waveform-audio output digital-to-analog converter (DAC). Most audio cards for personal computers provide this component type as a source to the DestinationSpeakers destination. Some cards also allow this source to be routed to the DestinationWaveIn destination.

Lasterror is set.
Value is true if device is muted, else false.
On any error or non Windows platforms value is always false.
(Read and Write computed property)

### 14.22.43 SourceWaveOutVolume as Double

MBS Audio Plugin, Plugin Version: 6.2, Platform: Windows, Targets: All.

**Function:** Volume of wave out device.
**Notes:** Audio line is a source originating from the waveform-audio output digital-to-analog converter (DAC). Most audio cards for personal computers provide this component type as a source to the DestinationSpeakers destination. Some cards also allow this source to be routed to the DestinationWaveIn destination.

Lasterror is set.
Range is from 0 for no volume to 1.0 for maximum volume.
On any error or non Windows platforms the value is always 0.
(Read and Write computed property)

## 14.23 class WindowsMCIMBS

### 14.23.1 class WindowsMCIMBS

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** Access to the Video for Windows API.
**Example:**

```
// open the CD Device and set time format to Track:Minute:Second:Frame

dim v as new WindowsMCIMBS
v.Command="open cdaudio"
v.run

v.Command="set cdaudio time format TMSF"
v.run
```

**Notes:** Without QuickTime you can't play a movie in Windows with the Movieplayer control. This class allows you to play movies.

Possible devices:

vcr (ME, 98)
videodisc (ME, 98)
overlay
cdaudio (2000, ME, 98)
dat
scanner
animation
digitalvideo
waveaudio (2000, ME, 98)
sequencer (2000, ME, 98)
avivideo (2000, ME, 98)
mpegvideo (2000, ME, 98)

(I added on which OS I find the devices on my installation.)

On Windows 2000 we have this connection between devices and file extensions:

You can find this list in the Registry on Windows 2000 at "HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\Currentversion\MCI Extensions".

| | |
|---|---|
| vcr: | |
| videodisc: | |
| overlay: | |
| cdaudio: | cda. |
| dat: | |
| scanner: | |
| animation: | |
| digitalvideo: | |
| waveaudio: | wav. |
| sequencer: | mdi, midi, rmi. |
| avivideo: | avi. |
| mpegvideo: | aif*, asx, asf, au, dat, ivf, m1v, m3z, mov, mp*, qt, snd, wax, wm, wma, wmv, wvx. |

Possible states of a device:

not ready
stopped
playing
recording
seeking
paused
open

Possible time units:

milliseconds - Default
hms - Hour:Minute:Second
msf - Minute:Second:Frame
frames
smpte 24
smpte 25
smpte 30
smpte 30 drop
bytes
samples
tmsf - Track:Minute:Second:Frame ->use for CD

A list of all commands can be found on the Microsoft Website at:

http://msdn.microsoft.com/library/en-us/multimed/mmcmdstr_85uz.asp

### 14.23.2 Methods

### 14.23.3 Run

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** Executes a command.
**Example:**

```
dim v as new WindowsMCIMBS

v.command="pause cdaudio" // pauses the CD
v.run
```

### 14.23.4 Properties

### 14.23.5 Command as string

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** Here you can store the next Command for the MCI.
**Example:**

```
dim v as new WindowsMCIMBS

v.command="pause cdaudio" // pauses the CD
v.run
```

**Notes:** (Read and Write property)

### 14.23.6 Errorcode as Integer

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** The error code for the last error.
**Example:**

```
dim v as new WindowsMCIMBS

msgbox str(v.errorcode)+" "+v.errorstring
```

**Notes:** This property can be set to make a list of possible error messages like in the example "List MCI Errormessages".
(Read and Write property)

### 14.23.7 Errorstring as string

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** The error description for the last error.
**Example:**

```
dim v as new WindowsMCIMBS

msgbox str(v.errorcode)+" "+v.errorstring
```

**Notes:** Here is a list of some error messages:

(Read and Write property)

### 14.23.8 Result as string

MBS Audio Plugin, Platform: Windows, Targets: All.

**Function:** The result of the last operation.
**Example:**

```
dim v as WindowsMCIMBS

// get the current position, track and track count to display for the CD Audio.

v.Command="Status cdaudio Current Track"
v.run
MsgBox v.result

v.command="Status cdaudio Number of Tracks"
v.run
MsgBox v.result

v.command="Status cdaudio position"
v.run
MsgBox v.result
```

**Notes:** (Read and Write property)

0 The specified command was carried out.
1 Undefined external error.
2 A device ID has been used that is out of range for your system.
3 The driver was not enabled.
4 The specified device is already in use. Wait until it is free, and then try again.
5 The specified device handle is invalid.
6 There is no driver installed on your system.
7 There is not enough memory available for this task. Quit one or more applications to increase available memory, and then try again.
8 This function is not supported. Use the Capabilities function to determine which functions and messages the driver supports.
9 An error number was specified that is not defined in the system.
10 An invalid flag was passed to a system function.
11 An invalid parameter was passed to a system function.
12 Handle being used simultaneously on another thread (eg callback).
13 Specified alias not found in WIN.INI.
14 The registry database is corrupt.
15 The specified registry key was not found.
16 The registry could not be opened or could not be read.
17 The registry could not be written to.
18 The specified registry key could not be deleted.
19 The specified registry key value could not be found.
20 The driver did not generate a valid OPEN callback.
32 The specified format is not supported or cannot be translated. Use the Capabilities function to determine the supported formats.
33 Cannot perform this operation while media data is still playing. Reset the device, or wait until the data is finished playing.
34 The wave header was not prepared. Use the Prepare function to prepare the header, and then try again.
35 Cannot open the device without using the WAVE_ALLOWSYNC flag. Use the flag, and then try again.
64 The MIDI header was not prepared. Use the Prepare function to prepare the header, and then try again.
65 Cannot perform this operation while media data is still playing. Reset the device, or wait until the data is finished playing.
66 A MIDI map was not found. There may be a problem with the driver, or the MIDIMAP.CFG file may be corrupt or missing.
67 The port is transmitting data to the device. Wait until the data has been transmitted, and then try again.
68 The current MIDI Mapper setup refers to a MIDI device that is not installed on the system. Use MIDI Mapper to edit the setup.
69 The current MIDI setup is damaged. Copy the original MIDIMAP.CFG file to the Windows SYSTEM directory, and then try again.
70 A MIDI call was made which is invalid with the current open mode. Reopen the device with the correct mode.
71 Driver condition - do not callback this input event
257 Invalid MCI device ID. Use the ID returned when opening the MCI device.
259 The driver cannot recognize the specified command parameter.

## 14.24 class WindowsPlayerDeviceMBS

### 14.24.1 class WindowsPlayerDeviceMBS

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** This class describes the capabilities of a waveform-audio output device.
**Example:**

```
// fill devices into a popupmenu
Dim c As Integer = WindowsPlayerMBS.DeviceCount
For i As Integer = 0 To c-1
Dim d As WindowsPlayerDeviceMBS = WindowsPlayerMBS.Device(i)

PopupMenu1.AddRow d.Name+" "+Str(d.Channels)
PopupMenu1.RowTag(i) = d
Next
```

**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 20.0pr7

### 14.24.2 Properties

### 14.24.3 Channels as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Number specifying whether the device supports mono (1) or stereo (2) output.
**Notes:** (Read only property)

### 14.24.4 DriverVersion as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Version number of the device driver for the device.
**Notes:** The high-order byte is the major version number, and the low-order byte is the minor version number.
(Read only property)

### 14.24.5 Formats as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Standard formats that are supported.
**Notes:** Combination of kFormat* constants.
(Read only property)

### 14.24.6 Index as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** The device index.
**Notes:** (Read only property)

### 14.24.7 ManufacturerID as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Manufacturer identifier for the device driver for the device.
**Notes:** Manufacturer identifiers are defined in Manufacturer and Product Identifiers:
https://docs.microsoft.com/en-us/previous-versions/ms709440%28v%3dvs.85%29
(Read only property)

### 14.24.8 Name as String

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Product name.
**Notes:** (Read only property)

### 14.24.9 ProductID as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Product identifier for the device.
**Notes:** (Read only property)

### 14.24.10 Support as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Optional functionality supported by the device.
**Notes:** Combination of kSupport* constants.
(Read only property)

### 14.24.11 Constants

Format Constants

| Constant | Value | Description |
|---|---|---|
| kFormat1M08 | &h00000001 | 11.025 kHz, mono, 8-bit |
| kFormat1M16 | &h00000004 | 11.025 kHz, mono, 16-bit |
| kFormat1S08 | &h00000002 | 11.025 kHz, stereo, 8-bit |
| kFormat1S16 | &h00000008 | 11.025 kHz, stereo, 16-bit |
| kFormat2M08 | &h00000010 | 22.05 kHz, mono, 8-bit |
| kFormat2M16 | &h00000040 | 22.05 kHz, stereo, 8-bit |
| kFormat2S08 | &h00000020 | 22.05 kHz, mono, 16-bit |
| kFormat2S16 | &h00000080 | 22.05 kHz, stereo, 16-bit |
| kFormat44M08 | &h00000100 | 44.1 kHz, mono, 8-bit |
| kFormat44M16 | &h00000400 | 44.1 kHz, mono, 16-bit |
| kFormat44S08 | &h00000200 | 44.1 kHz, stereo, 8-bit |
| kFormat44S16 | &h00000800 | 44.1 kHz, stereo, 16-bit |
| kFormat48M08 | &h00001000 | 48 kHz, mono, 8-bit |
| kFormat48M16 | &h00004000 | 48 kHz, mono, 16-bit |
| kFormat48S08 | &h00002000 | 48 kHz, stereo, 8-bit |
| kFormat48S16 | &h00008000 | 48 kHz, stereo, 16-bit |
| kFormat96M08 | &h00010000 | 96 kHz, mono, 8-bit |
| kFormat96M16 | &h00040000 | 96 kHz, mono, 16-bit |
| kFormat96S08 | &h00020000 | 96 kHz, stereo, 8-bit |
| kFormat96S16 | &h00080000 | 96 kHz, stereo, 16-bit |
| kFormatInvalid | 0 | Invalid value. |

Support Flags

| Constant | Value | Description |
|---|---|---|
| kSupportLRVolume | 8 | Supports separate left and right volume control. |
| kSupportPitch | 1 | Supports pitch control. |
| kSupportPlaybackRate | 2 | Supports playback rate control. |
| kSupportSampleAccurate | 32 | Returns sample-accurate position information. |
| kSupportSync | 16 | The driver is synchronous and will block while playing a buffer. |
| kSupportVolume | 4 | Supports volume control. |

## 14.25 class WindowsPlayerMBS

### 14.25.1 class WindowsPlayerMBS

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** The Windows MP3 Player class.
**Notes:** This is a little class to play a MP3 file (or data in memory).
Written for 44100 Hz, 2 channel MP3 files.

With plugin version 16.1 this class should work fine with any sample rate, any channel count and other formats as long as Microsoft drivers support them.
**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 20.0pr7
- MBS Xojo Plugins, version 17.4pr3
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- MBS Xojo / Real Studio Plugins, version 16.1pr2
- MBS Xojo / Real Studio Plugins, version 15.2pr8
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS Xojo / Real Studio Plugins, version 15.0pr7

### 14.25.2 Methods

### 14.25.3 Constructor(data as MemoryBlock)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Initializes the class with given data.
See also:


- 14.25.4 Constructor(data as String) 3130
- 14.25.5 Constructor(file as folderitem) 3130

### 14.25.4 Constructor(data as String)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Initializes the class with given data.
See also:

- 14.25.3 Constructor(data as MemoryBlock) 3129
- 14.25.5 Constructor(file as folderitem) 3130

### 14.25.5 Constructor(file as folderitem)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Initializes the class with a given file.
See also:

- 14.25.3 Constructor(data as MemoryBlock) 3129
- 14.25.4 Constructor(data as String) 3130

### 14.25.6 Device(index as Integer) as WindowsPlayerDeviceMBS

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Retrieves the capabilities of a given audio output device.
**Example:**

```
// fill devices into a popupmenu
Dim c As Integer = WindowsPlayerMBS.DeviceCount
For i As Integer = 0 To c-1
Dim d As WindowsPlayerDeviceMBS = WindowsPlayerMBS.Device(i)

PopupMenu1.AddRow d.Name+" "+Str(d.Channels)
PopupMenu1.RowTag(i) = d
Next
```

**Notes:** Index in range from 0 to DeviceCount-1.
You can use index -1 for the wave mapper.

### 14.25.7 GetVolume(byref VolumeLeft as Double, byref VolumeRight as Double)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Queries left and right volume.
**Notes:** Range is from 0.0 for no sound to 1.0 for full sound.

### 14.25.8 Pause

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Pauses current playback.

### 14.25.9 Play(offset as Double = 0.0)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Starts playing the sound.
**Notes:** With offset you can define the start point in seconds from beginning of sound. Range from 0 seconds to duration-1.

### 14.25.10 Resume

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Resumes current playback.

### 14.25.11 SetVolume(VolumeLeft as Double, VolumeRight as Double)

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Sets the left and right volume independent.
**Notes:** Range is from 0.0 for no sound to 1.0 for full sound.

### 14.25.12 Stop

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Stops current playback.

### 14.25.13 Properties

### 14.25.14 Buffer as MemoryBlock

MBS Audio Plugin, Plugin Version: 16.1, Platform: Windows, Targets: All.

**Function:** The buffer with audio samples.
**Notes:** You get a copy of the buffer as memoryblock.
Please use BufferLength, SampleRate and ChannelCount to read it.
Data is always 16 bit with 2 * ChannelCount * SampleRate bytes per second.
(Read only property)

### 14.25.15 BufferLength as Integer

MBS Audio Plugin, Plugin Version: 16.1, Platform: Windows, Targets: All.

**Function:** The buffer length for audio samples.
**Notes:** (Read only property)

### 14.25.16 ChannelCount as Integer

MBS Audio Plugin, Plugin Version: 16.1, Platform: Windows, Targets: All.

**Function:** The channel count of the audio file.
**Notes:** (Read only property)

### 14.25.17 ChannelMask as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** The channel mask.
**Example:**

```
dim p as WindowsPlayerMBS // your player
p.DeviceID = 3 // 4th device
p.ChannelMask = 1 // left channel
```

**Notes:** 1 is left, 2 is right, 3 is center and so on.
Default is zero for automatic.

see list here:

https://docs.microsoft.com/en-us/previous-versions/ms713496%28v%3dvs.85%29
(Read and Write property)

### 14.25.18 DeviceCount as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** Retrieves the number of audio output devices present in the system.
**Notes:** A return value of zero means that no devices are present or that an error occurred.
(Read only property)

### 14.25.19 DeviceID as Integer

MBS Audio Plugin, Plugin Version: 20.0, Platform: Windows, Targets: All.

**Function:** The device ID to use.
**Example:**

```
dim p as WindowsPlayerMBS // your player
p.DeviceID = 3 // 4th device
p.ChannelMask = 1 // left channel
```

**Notes:** Please set before calling Play method.
Default is -1 to use WAVE MAPPER device.
(Read and Write property)

### 14.25.20 Duration as Double

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Returns duration of sound in seconds.
**Notes:** (Read only property)

### 14.25.21 Lasterror as Integer

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 14.25.22 Pitch as Double

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** The pitch for the waveform-audio output device.
**Notes:** Default 1.0.
pass e.g. 0.5 for half pitch or 2.0 to double pitch.
(Read and Write property)

### 14.25.23 Position as Double

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Returns current position.
**Notes:** (Read only property)

### 14.25.24 Rate as Double

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** The rate for the waveform-audio output device.
**Notes:** Default 1.0.
pass e.g. 0.5 for half speed or 2.0 to double speed.
(Read and Write property)

### 14.25.25 SampleRate as Integer

MBS Audio Plugin, Plugin Version: 16.1, Platform: Windows, Targets: All.

**Function:** The sample rate of the audio file.
**Notes:** (Read only property)

### 14.25.26 Volume as Double

MBS Audio Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** The volume setting.
**Notes:** Range is from 0.0 for no sound to 1.0 for full sound.
(Read and Write property)

# Chapter 15

# Authorization

## 15.1 class AuthorizationItemMBS

### 15.1.1 class AuthorizationItemMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** A class for an autorization right.

### 15.1.2 Properties

### 15.1.3 Flags as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Flags for this item.
**Notes:** Flags returned in the flags field of ItemSet Items when calling Authorize:

kAuthorizationFlagCanNotPreAuthorize 1

(Read and Write property)

### 15.1.4 Name as String

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** The name of the item.
**Notes:** (Read and Write property)

### 15.1.5 Value as String

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** The value of the item.
**Notes:** (Read and Write property)

## 15.2 class AuthorizationItemSetMBS

### 15.2.1 class AuthorizationItemSetMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** A class for a set of autorization rights.

### 15.2.2 Methods

### 15.2.3 Append(item as AuthorizationItemMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds a new item to the list.

### 15.2.4 Remove(index as Integer)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item with the given index.

### 15.2.5 Properties

### 15.2.6 Count as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in the list.
**Notes:** (Read and Write property)

### 15.2.7 Item(index as Integer) as AuthorizationItemMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an item from the list.
**Notes:** (Read and Write computed property)

## 15.3 class AuthorizationMBS

### 15.3.1 class AuthorizationMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** A class to run a root shell on Mac OS X.
**Notes:** Some notes from Ilija Injac on this usage of this class:

The main problem for the execution of the perl script was, that perl is not able to find the required perl-modules at execution with the option "-U" (this switch is set for security reasons).
It was also neccessary to include the perl-modules from inside the perl script wich has to be executed.
Inside the Xojo code i created a AuthorizationItemMBS with the value "/usr/bin/perl":
...
i = new AuthorizationItemMBS

```
i.name  = a.kAuthorizationItemRightExecute
i.value = "/usr/bin/perl"
```

...
Actually it is the same source as in Christians "Authorization 1" example within the "test1" function. And it works !
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr8
- MBS Xojo Plugins, version 17.3pr5
- MBS Xojo Plugins, version 17.3pr4
- MBS Xojo / Real Studio Plugins, version 14.2pr5

### 15.3.2 Methods

### 15.3.3 Authorize(rights as AuthorizationItemSetMBS, flags as Integer)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Short for Authorize without the resulting rights set.
**Example:**

```
dim a as AuthorizationMBS
dim s as AuthorizationItemSetMBS
dim i as AuthorizationItemMBS
dim Flags as Integer
```

```
// check whether use is admin

a=new AuthorizationMBS

s=new AuthorizationItemSetMBS
i=new AuthorizationItemMBS
i.Name="com.mycompany.myapplication.command1"
s.Append i

if a.NewAuthorization(nil,a.kAuthorizationFlagDefaults) then // create
Flags=BitwiseOr(a.kAuthorizationFlagExtendRights,a.kAuthorizationFlagInteractionAllowed)

a.Authorize(s,flags)
MsgBox str(a.LastError)
// -60006 for cancel = no admin
// 0 on success
end if
```

See also:

- 15.3.4 Authorize(rights as AuthorizationItemSetMBS, flags as Integer, byref outrights as AuthorizationItemSetMBS) 3139

### 15.3.4 Authorize(rights as AuthorizationItemSetMBS, flags as Integer, byref outrights as AuthorizationItemSetMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Tries to extend authorization to have root rights.
**Notes:** The Authorizated property is set if this function was successfull.
Lasterror is set.
outrights is on return a list of the rights which are authorized.

Extends the rights of the class.

When the kAuthorizationFlagInteractionAllowed flag is set, user interaction will happen when required. Failing to set this flag will result in this call failing with a errAuthorizationInteractionNotAllowed status when interaction is required.

Setting the kAuthorizationFlagExtendRights flag will extend the currently available rights.

Setting the kAuthorizationFlagPartialRights flag will cause this call to succeed if only some of the requested rights are being granted by the system. Unless this flag is set this API will fail if not all the requested rights could be obtained.

Setting the kAuthorizationFlagDestroyRights flag will prevent any additional rights obtained during this call from being preserved after returning from this API.

Setting the kAuthorizationFlagPreAuthorize flag will pre authorize the requested rights so that at a later time – by calling GetExternalForm() follow by NewAuthorizationFromExternalForm() – the obtained rights can be used in a different process. Rights that can't be preauthorized will be treated as if they were authorized for the sake of returning an error (in other words if all rights are either authorized or could not be preauthorized this call will still succeed).

The rights which could not be preauthorized are not currently authorized and may fail to authorize when a later call to Authorize() is made, unless the kAuthorizationFlagExtendRights and kAuthorizationFlagInteractionAllowed flags are set. Even then they might still fail if the user does not supply the correct credentials.

The reason for passing in this flag is to provide correct audit trail information and to avoid unnecessary user interaction.

Error codes:

| | | |
|---|---|---|
| errAuthorizationSuccess | 0 | No error. |
| errAuthorizationInvalidRef | -60002 | The authorization parameter is invalid. |
| errAuthorizationInvalidSet | -60001 | The rights parameter is invalid. |
| errAuthorizationInvalidPointer | -60004 | The authorizedRights parameter is invalid. |

See also:

- 15.3.3 Authorize(rights as AuthorizationItemSetMBS, flags as Integer) 3138

### 15.3.5 Available as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the Authorization Framework was loaded correctly.
**Notes:** Returns false on any error.

### 15.3.6 close

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** Strings made with the ExternalForm function will become invalid!

There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 15.3.7 closeStream

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Closes the stream.

### 15.3.8 EOFStream as boolean

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the Stream is at the end.

### 15.3.9 Execute(toolpath as string, parameters() as string)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Executes a command line application in the background.
**Notes:** You may make some small shell script which you launch in background. This script can change some other utility to run as root (Setuid), so you can do admin stuff using the normal shell class.
Lasterror is set.
Currently this function is not available to RB versions before 3.5.
Note that the parameters parameter is an array of strings and not just one.
toolpath should use an absolute path in unix style.

Lasterror is set to -1 if the path is empty or you are not using Mac OS X.
See also:

- 15.3.10 Execute(toolpath as string, parameters() as string, openstream as boolean) 3141

### 15.3.10 Execute(toolpath as string, parameters() as string, openstream as boolean)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Same as Execute, but you can specify if the stream to the command line application should be opened.

**Notes:** Currently this function is not available to RB versions before 3.5.
Note that the parameters parameter is an array of strings and not just one.
toolpath should use an absolute path in unix style.

Lasterror is set to -1 if the path is empty or you are not using Mac OS X.
See also:

- 15.3.9 Execute(toolpath as string, parameters() as string) 3141

### 15.3.11 ExternalForm as string

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns a string with binary data about this Authorization object.
**Notes:** This external representation depends on your process. You can't save it to disk or keep it longer than the Authorization object exists.
If the Authorization object is destroyed, your application quits or the authorization times out, this external form becomes invalid.

### 15.3.12 FlushStream

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Flushs the stream to the background application.

### 15.3.13 Info as AuthorizationItemSetMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of currently authorized rights.
**Notes:** Returns nil on any error.

### 15.3.14 MakeStreamAsyncron

MBS MacCF Plugin, Plugin Version: 6.3, Platform: macOS, Targets: Desktop only.

**Function:** Modifies the Stream created in the Execute method to run non blocking.

### 15.3.15 NewAuthorization(rights as AuthorizationItemSetMBS, flags as Integer) as Boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Authorization object.
**Notes:** Lasterror is set. Returns true if successfull.

Create a new autorization object which can be used in other authorization calls.

When the kAuthorizationFlagInteractionAllowed flag is set, user interaction will happen when required. Failing to set this flag will result in this call failing with a errAuthorizationInteractionNotAllowed status in the lasterror property when interaction is required.

Setting the kAuthorizationFlagExtendRights flag will extend the currently available rights. If this flag is set the class will grant all the rights requested when errAuthorizationSuccess is returned in the lasterror property. If this flag is not set the operation will almost certainly succeed, but no attempt will be made to make the requested rights availible.

Call the Info function to figure out which of the requested rights are granted by the system.

Setting the kAuthorizationFlagPartialRights flag will cause this call to succeed if only some of the requested rights are being granted by the system. Unless this flag is set this API will fail if not all the requested rights could be obtained.

Setting the kAuthorizationFlagPreAuthorize flag will pre authorize the requested rights so that at a later time – by calling GetExternalForm() follow by NewAuthorizationFromExternalForm() in a different object – the obtained rights can be used in a different process. Rights that can't be preauthorized will be treated as if they were authorized for the sake of returning an error (in other words if all rights are either authorized or could not be preauthorized this call will still succeed).

The rights which could not be preauthorized are not currently authorized and may fail to authorize when a later call to Authorize() is made, unless the kAuthorizationFlagExtendRights and kAuthorizationFlagInteractionAllowed flags are set. Even then they might still fail if the user does not supply the correct credentials.

The reason for passing in this flag is to provide correct audit trail information and to avoid unnecessary user interaction.

rights (input/optional):
An AuthorizationItemSet containing rights for which authorization is being requested. If nil are specified the class will authorize nothing at all.

flags (input) options specified using the different constants from this class.

Error codes:

| | | |
|---|---|---|
| errAuthorizationSuccess | 0 | Authorization or all requested rights succeeded. |
| errAuthorizationDenied | -60005 | The authorization for one or more of the requested rights was denied. |
| errAuthorizationCanceled | -60006 | The authorization was cancled by the user. |
| errAuthorizationInteractionNotAllowed | -60007 | The authorization was denied since no interaction with the user was allowed. |

### 15.3.16 NewAuthorizationFromExternalForm(s as string) as Boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Authorization object from data inside a string.
**Notes:** You can store an authorization in a string for use in a subprocess. For example your application can ask the user for Root rights and you pass this string to a launched terminal application which will use it without having it's own interface.
Lasterror is set. Returns true if successfull.

### 15.3.17 ReadStream(count as Integer) as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Reads bytes from the output stream of the executing app.
**Example:**

```
dim s(0) as String
dim a as AuthorizationMBS
dim e as Integer

s(0)="-show"

a=new AuthorizationMBS

if a.SimpleNewAuthorization then // create

a.Execute("/usr/sbin/dsconfigad",s,true) // and run it

if a.LastError<>0 then
MsgBox "Lasterror on Execute: "+str(a.LastError)
else
e=a.Wait // wait for process to terminate. Returns PID
if a.LastError<>0 then
MsgBox "Lasterror on Wait: "+str(a.LastError)
```

```
end if
end if
msgbox a.ReadStream(1024)
end if
```

**Notes:** Tries to read count bytes.

Lasterror is set.
The returned string will be as long as the number of strings read.

Lasterror is set to -1 by the plugin if the stream is not open, or you are not using Mac OS X or the memory allocation failed.

### 15.3.18 SimpleAuthorize

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Just asks for the Authorization.
**Notes:** This is the function from MBS Plugin 3.0.

### 15.3.19 SimpleNewAuthorization as Boolean

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new authorization handle.
**Example:**

```
// uses chmod on test.pdf on the desktop to make
// it read-, write- and executeable by everyone.

dim s(1) as String
dim a as AuthorizationMBS

a=new AuthorizationMBS

if a.SimpleNewAuthorization then
s(0)="777"
s(1)=SpecialFolder.Desktop.Child("test.pdf").NativePath

MsgBox s(1)
a.execute("/bin/chmod",s)
msgbox "Executed:"+str(a.lasterror)
```

```
end if
```

**Notes:** This is the function from MBS Plugin 3.0.

### 15.3.20 Wait as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Waits till the background application is done.
**Notes:** Returns the Process ID or -1 on an error.
Lasterror is set.

### 15.3.21 WriteStream(s as string) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Writes the given bytes in the string to the stream.

### 15.3.22 Properties

### 15.3.23 Authorized as Boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Set to true if the last call to Authorizate was successfull.
**Notes:** (Read and Write property)

### 15.3.24 Handle as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the Mac OS authorization object.
**Notes:** The C type is AuthorizationRef.
(Read and Write property)

### 15.3.25 KeepRights as Boolean

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** whether the destructor will keep the rights allive for the next use.
**Notes:** Normally the rights will be destroyed in the destructor so on the next use of the class the user has to reenter the password. If KeepRights=true the rights will not be destroyed.
(Read and Write property)

### 15.3.26 LastError as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** Lasterror is -1 if the function is not supported (e.g. on Windows).

Authorization error codes:

| | | |
|---|---|---|
| errAuthorizationSuccess | 0, | The operation completed successfully. |
| errAuthorizationInvalidSet | -60001, | The set parameter is invalid. |
| errAuthorizationInvalidRef | -60002, | The authorization parameter is invalid. |
| errAuthorizationInvalidTag | -60003, | The tag parameter is invalid. |
| errAuthorizationInvalidPointer | -60004, | The authorizedRights parameter is invalid. |
| errAuthorizationDenied | -60005, | The authorization was denied. |
| errAuthorizationCanceled | -60006, | The authorization was cancled by the user. |
| errAuthorizationInteractionNotAllowed | -60007, | The authorization was denied since no user interaction was possible. |
| errAuthorizationInternal | -60008, | something else went wrong |
| errAuthorizationExternalizeNotAllowed | -60009, | authorization externalization denied |
| errAuthorizationInternalizeNotAllowed | -60010, | authorization internalization denied |
| errAuthorizationInvalidFlags | -60011, | invalid option flag(s) |
| errAuthorizationToolExecuteFailure | -60031, | cannot execute privileged tool |
| errAuthorizationToolEnvironmentError | -60032 | privileged tool environment error |

Other Mac OS error codes like -50 for wrong parameters are also possible.
(Read and Write property)

### 15.3.27 StreamHandle as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the stream for the terminal running in the background with your command line application.
**Notes:** (Read and Write property)

### 15.3.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAuthorizationEmptyEnvironment | nil | Indicates an empty environment. You should pass this constant in functi with an environment parameter if you have no environment data to provid |
| kAuthorizationExternalFormLength | 32 | Indicates, in number of bytes, the length of the array in the Authorization ternalForm structure. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| errAuthorizationCanceled | -60006 | The authorization was cancelled by the user. |
| errAuthorizationDenied | -60005 | The authorization was denied. |
| errAuthorizationExternalizeNotAllowed | -60009 | The authorization is not allowed to be converted to an external forma |
| errAuthorizationInteractionNotAllowed | -60007 | The authorization was denied since no user interaction was possible. |
| errAuthorizationInternal | -60008 | Unable to obtain authorization for this operation. |
| errAuthorizationInternalizeNotAllowed | -60010 | The authorization is not allowed to be created from an external forma |
| errAuthorizationInvalidFlags | -60011 | The provided option flag(s) are invalid for this authorization operatio |
| errAuthorizationInvalidPointer | -60004 | The returned authorization is invalid. |
| errAuthorizationInvalidRef | -60002 | The authorization reference is invalid. |
| errAuthorizationInvalidSet | -60001 | The authorization rights are invalid. |
| errAuthorizationInvalidTag | -60003 | The authorization tag is invalid. |
| errAuthorizationSuccess | 0 | No error. |
| errAuthorizationToolEnvironmentError | -60032 | An invalid status was returned during execution of a privileged tool. |
| errAuthorizationToolExecuteFailure | -60031 | The specified program could not be executed. |

Flag values

| Constant | Value | Description |
|---|---|---|
| kAuthorizationFlagCanNotPreAuthorize | 1 | Indicates the Security Server could not preauthorize the right. |
| kAuthorizationFlagDefaults | 0 | If no bits are set, none of the following features are available. |
| kAuthorizationFlagDestroyRights | 8 | If the bit specified by this mask is set, the Security Server revokes au tion from the process as well as from any other process that is sha authorization. If the bit specified by this mask is not set, the Securit revokes authorization from the process but not from other processes th the authorization. |
| kAuthorizationFlagExtendRights | 2 | If the bit specified by this mask is set, the Security Server attempts the rights requested. Once the Security Server denies one right, it ign remaining requested rights. |
| kAuthorizationFlagInteractionAllowed | 1 | If the bit specified by this mask is set, you permit the Security Server to with the user when necessary. |
| kAuthorizationFlagPartialRights | 4 | If the bit specified by this mask and the kAuthorizationFlagExtendRigh are set, the Security Server grants or denies rights on an individual b all rights are checked. |
| kAuthorizationFlagPreAuthorize | 16 | If the bit specified by this mask is set, the Security Server preauthor rights requested. |

# Chapter 16

# AVFoundation

## 16.1 class AVAssetExportSessionMBS

### 16.1.1 class AVAssetExportSessionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The AVFoundation class for media export.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim p as string = AVAssetExportSessionMBS.AVAssetExportPresetAppleM4VCellular
dim e as new AVAssetExportSessionMBS(a, p)

dim FileTypes() as string = e.supportedFileTypes
e.outputFileType = FileTypes(0)
e.OutputFile = SpecialFolder.Desktop.Child("small.m4v")
e.exportAsynchronously

// instead of waiting for event, we simply wait for it to finish
do
app.YieldToNextThread
loop until e.status <>e.AVAssetExportSessionStatusExporting
```

**Notes:** An AVAssetExportSession object transcodes the contents of an AVAsset source object to create an output of the form described by a specified export preset.

Prior to initializing an instance of AVAssetExportSession, you can use allExportPresets to get the complete list of presets available. Use exportPresetsCompatibleWithAsset to get a list of presets that are compatible

with a specific asset.

After you have initialized an export session with the asset that contains the source media, the export preset name (presetName), and the output file type (outputFileType), you can start the export running by invoking exportAsynchronously. Because the export is performed asynchronously, this method returns immediately—you can use progress to check on the progress. Depending on the capabilities of the device, some exports may be queued when multiple exports are attempted. When this happens, the status of a queued export will indicate that it's waiting (AVAssetExportSessionStatusWaiting).

The exportAsynchronouslyCompleted event on AVFoundationMBS is called whether the export fails, completes, or is cancelled. Upon completion, the status property indicates whether the export has completed successfully. If it has failed, the value of the error property supplies additional information about the reason for the failure.
Available in OS X v10.7 and later.
**Blog Entries**

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- MBS Xojo Plugins, version 18.4pr1
- MBS Xojo Plugins, version 18.2pr5
- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 15.1pr1

### 16.1.2 Methods

### 16.1.3 allExportPresets as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns all available export preset names.
**Notes:** Returns an array containing a string constant for each of the available preset names.

### 16.1.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.1.5 AVAssetExportPreset1280x720 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** Specifies output at 1280x720 pixels.

### 16.1.6 AVAssetExportPreset1920x1080 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** Specifies output at 1920x1080 pixels.

### 16.1.7 AVAssetExportPreset3840x2160 as string

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** Specifies output at 3840x2160 pixels (4K video).

### 16.1.8 AVAssetExportPreset640x480 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** Specifies output at 640x480 pixels.

### 16.1.9 AVAssetExportPreset960x540 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** Specifies output at 960x540 pixels.

### 16.1.10 AVAssetExportPresetAppleM4A as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use this export option to produce an audio-only .m4a file with appropriate iTunes gapless playback data.
**Notes:** Specifies an audio-only .m4a file with appropriate iTunes gapless playback data.

### 16.1.11 AVAssetExportPresetAppleM4V1080pHD as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a 1080p High Definition format suitable for playing on Apple devices.

### 16.1.12 AVAssetExportPresetAppleM4V480pSD as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a 480p Standard Definition format suitable for playing on Apple devices.

### 16.1.13 AVAssetExportPresetAppleM4V720pHD as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a 720p High Definition format suitable for playing on Apple devices.

### 16.1.14 AVAssetExportPresetAppleM4VAppleTV as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a format suitable for playing on AppleTV.

### 16.1.15 AVAssetExportPresetAppleM4VCellular as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a format suitable for playing on Apple devices when streamed over a cellular network.

### 16.1.16 AVAssetExportPresetAppleM4ViPod as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a format suitable for playing on an iPod.

### 16.1.17 AVAssetExportPresetAppleM4VWiFi as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a format suitable for playing on Apple devices when streamed over a WiFi network.

### 16.1.18 AVAssetExportPresetAppleProRes422LPCM as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the export option presets to produce files that can be played on the specific Apple devices.
**Notes:** Specifies a QuickTime movie with Apple ProRes 422 video and LPCM audio.

### 16.1.19 AVAssetExportPresetHEVC1920x1080 as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with the specified video size.
The export will not scale the video up from a smaller size. The video will be compressed using HEVC and the audio will be compressed using AAC. Some devices cannot support some sizes.

### 16.1.20 AVAssetExportPresetHEVC3840x2160 as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with the specified video size.
The export will not scale the video up from a smaller size. The video will be compressed using HEVC and the audio will be compressed using AAC. Some devices cannot support some sizes.

### 16.1.21 AVAssetExportPresetHEVCHighestQuality as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with video size appropriate to the device. The export will not scale the video up from a smaller size. The video will be compressed using HEVC and the audio will be compressed using AAC.

### 16.1.22 AVAssetExportPresetHighestQuality as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with video size appropriate to the device. The export will not scale the video up from a smaller size. The video will be compressed using H.264 and the audio will be compressed using AAC.

### 16.1.23 AVAssetExportPresetLowQuality as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with video size appropriate to the device. The export will not scale the video up from a smaller size. The video will be compressed using H.264 and the audio will be compressed using AAC.

### 16.1.24 AVAssetExportPresetMediumQuality as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** You use these export options to produce QuickTime .mov files with a specified video size.
**Notes:** These export options can be used to produce movie files with video size appropriate to the device. The export will not scale the video up from a smaller size. The video will be compressed using H.264 and the audio will be compressed using AAC.

### 16.1.25 AVAssetExportPresetPassthrough as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use this export option to let all tracks pass through.
**Notes:** Specifies that all tracks pass through, unless it is not possible.

### 16.1.26 cancelExport

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels the execution of an export session.

### 16.1.27 Constructor(asset as AVAssetMBS, presetName as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset export session with a specified asset and preset.
**Notes:** asset: The asset you want to export.
presetName: A string constant specifying the name of the preset template for the export.

### 16.1.28 determineCompatibilityOfExportPreset(presetName as string, asset as AVAssetMBS, outputFileType as string, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Reports the compatibility of an export present, asset, and output file type to the event.
**Notes:** Calls later AVAssetExportSessionMBS.determineCompatibilityOfExportPresetCompleted event.

presetName: The name of the preset template for the export operation. For possible values, see "Export Preset Names for Device-Appropriate QuickTime Files," "Export Preset Names for QuickTime Files of a Given Size," AVAssetExportSessionStatusCancelled, "Export Preset Name for iTunes Audio," and "Export Preset Name for Pass-Through."
asset: The asset object that you are planning to export.
outputFileType: The UTI string corresponding to the file type. For example, to specify a QuickTime movie file format, you could specify the constant AVFileTypeQuickTimeMovie. For a list of constants specifying UTIs for standard file types, see AV Foundation Constants Reference.

Because not all export presets are compatible with all assets and file types, you can use this method to query the compatibility of specific combos before using them. To ensure that the export operation succeeds, you should not make any significant changes to the asset between the time of calling this method and performing the export operation.

This method performs its checks asynchronously on a secondary thread and returns immediately. The results are similarly reported to the event later.

Available in OS X v10.9 and later.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.1.29 determineCompatibleFileTypes(tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Reports the compatible file types for the current export session to the event.
**Notes:** calls later AVFoundationMBS.determineCompatibleFileTypesCompleted event.

This method operates on the asset object and preset information that was used to initialize the export session. It uses this information to determine the file types that the export session can write.

This method performs its checks asynchronously on a secondary thread and returns immediately. The results are similarly reported to the specified block on a secondary thread. Because this method actually inspects the asset's tracks, the tracks are loaded if they have not been already.
Available in OS X v10.9 and later.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.1.30 exportAsynchronously(tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Starts the asynchronous execution of an export session.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim p as string = AVAssetExportSessionMBS.AVAssetExportPresetAppleM4VCellular
dim e as new AVAssetExportSessionMBS(a, p)

dim FileTypes() as string = e.supportedFileTypes
e.outputFileType = FileTypes(0)
e.OutputFile = SpecialFolder.Desktop.Child("small.m4v")
e.exportAsynchronously

// instead of waiting for event, we simply wait for it to finish
```

```
do
app.YieldToNextThread
loop until e.status <>e.AVAssetExportSessionStatusExporting
```

**Notes:** This method starts an asynchronous export operation and returns immediately. status signals the terminal state of the export session, and if a failure occurs, error describes the problem.

This method calls AVFoundationMBS.exportAsynchronouslyCompleted event later. Tag is passed so you can pass information needed to finish work.

If internal preparation for export fails, event is invoked synchronously. The event may also be called asynchronously, after the method returns, in the following cases:

- If a failure occurs during the export, including failures of loading, re-encoding, or writing media data to the output.
- If cancelExport is invoked.
- After the export session succeeds, having completely written its output to the outputURL.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.1.31 exportMT

MBS AVFoundation Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Starts the synchronous execution of an export session.
**Notes:** Same as exportAsynchronously, but run synchronous, so the plugin waits.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 16.1.32 exportPresetsCompatibleWithAsset(asset as AVAssetMBS) as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the identifiers compatible with a given asset.
**Notes:** asset: An asset that is ready to be exported.

Returns an array of strings representing the identifiers compatible with asset.

The array is a complete list of the valid identifiers that can be used with exportSessionWithAsset with the specified asset.

Not all export presets are compatible with all assets. For example, a video-only asset is not compatible with an audio-only preset. This method returns only the identifiers for presets that are compatible with the given asset.

In order to ensure that the setup and running of an export operation will succeed using a given preset, you should not make significant changes to the asset (such as adding or deleting tracks) between retrieving compatible identifiers and performing the export operation.

If the asset's tracks are not currently loaded, they may be loaded by this method before any checks are performed.

### 16.1.33 exportSessionWithAsset(asset as AVAssetMBS, presetName as string) as AVAssetExportSessionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset export session configured with a specified asset and preset.
**Notes:** asset: The asset you want to export.
presetName: A string constant specifying the name of the preset template for the export.

Returns an asset export session initialized to export asset using preset presetName.

### 16.1.34 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the metadata to be written to the output file by the export session.

### 16.1.35 outputFileExtension as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Convenience method to query the preferred file extension for current output file type.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim p as string = AVAssetExportSessionMBS.AVAssetExportPresetAppleM4VCellular
dim e as new AVAssetExportSessionMBS(a, p)
dim filetypes() as string = e.supportedFileTypes
e.outputFileType = FileTypes(0)

// shows the output file extension
MsgBox "outputFileExtension: "+e.outputFileExtension
```

### 16.1.36 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the metadata to be written to the output file by the export session.
**Example:**

```
dim e as AVAssetExportSessionMBS // your export session
dim asset as AVAssetMBS // your asset

// query metadata
dim a() as AVMetadataItemMBS = asset.metadata

// make new
dim m as new AVMutableMetadataItemMBS

// add common key with author
m.keySpace = AVFoundationMBS.AVMetadataKeySpaceCommon
m.key = AVFoundationMBS.AVMetadataCommonKeyAuthor
m.Value = "Hello World"

// append to array and use as metadata:
a.Append m
e.setMetadata a
```

**Notes:** If the array is empty, any existing metadata in the exported asset will be translated as accurately as possible into the appropriate metadata key space for the output file and written to the output.

### 16.1.37 supportedFileTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The types of files the session can write. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim p as string = AVAssetExportSessionMBS.AVAssetExportPresetAppleM4VCellular
dim e as new AVAssetExportSessionMBS(a, p)
// shows supported file types
MsgBox join(e.supportedFileTypes, EndOfLine)
```

**Notes:** The types of files the session can write are determined by the asset and and export preset with which the session was initialized. If you need to determine the compatible file formats before initiating the export operation, use the determineCompatibleFileTypesWithCompletionHandler: method.

### 16.1.38 Properties

### 16.1.39 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset with which the export session was initialized. (read-only)
**Notes:** (Read only property)

### 16.1.40 audioMix as AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether non-default audio mixing is enabled for export, and supplies the parameters for audio mixing.
**Notes:** (Read and Write property)

### 16.1.41 audioTimePitchAlgorithm as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates the processing algorithm used to manage audio pitch for scaled audio edits.
**Notes:** An exception (NSInvalidArgumentException) is raised if this property is set to a value other than

the constants defined in Time_Pitch_Algorithm_Settings.

The default value is AVAudioTimePitchAlgorithmSpectral.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.1.42 canPerformMultiplePassesOverSourceMediaData as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Determines whether the export session can perform multiple passes over the source media to achieve better results.
**Notes:** When the value for this property is true, the export session can produce higher quality results at the expense of longer export times. Setting this property to true may also require the export session to write temporary data to disk during the export. To control the location of temporary data, use the property directoryForTemporaryFiles.

The default value is false. Not all export session configurations can benefit from performing multiple passes over the source media. In these cases, setting this property to true has no effect.

This property cannot be set after the export has started.

Available in Mac OS X 10.10 and newer.
(Read and Write property)

### 16.1.43 customVideoCompositor as AVVideoCompositingMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates the custom video compositor instance used, if any. (read-only)
**Notes:** The custom video compositor instance that is used during image generation is accessible via this property after the value of videoComposition is set to an AVVideoComposition instance that specifies a custom video compositor class. Any additional communication between the application and that instance of the custom video compositor, if any is required for configuration or other purposes, can only occur once that has happened.

If the value of videoComposition is changed from an AVVideoComposition that specifies a custom video compositor class to another instance of AVVideoComposition that specifies the same custom video compositor class, the instance of the custom video compositor that was previously created will receive the renderContextChanged: message and remain in use for subsequent image generation.

This property is nil if there is no video compositor, or if the internal video compositor is in use.
Available in OS X v10.9 and later.
(Read only property)

### 16.1.44 directoryForTemporaryFiles as FolderItem

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Specifies a directory that is suitable for containing temporary files generated during the export process.
**Notes:** AVAssetExportSession may need to write temporary files when configured in certain ways, such as when canPerformMultiplePassesOverSourceMediaData is set to true. This property can be used to control where in the filesystem those temporary files are created. All temporary files will be deleted when the export is completed, is canceled, or fails.

When the value of this property is nil, the export session will choose a suitable location when writing temporary files. The default value is nil.

This property cannot be set after the export has started. The export will fail if the URL points to a location that is not a directory, does not exist, is not on the local file system, or if a file cannot be created in this directory (for example, due to insufficient permissions or sandboxing restrictions).

Available in Mac OS X 10.10 and newer.
(Read and Write property)

### 16.1.45 directoryForTemporaryFilesURL as String

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Specifies a directory that is suitable for containing temporary files generated during the export process.
**Notes:** AVAssetExportSession may need to write temporary files when configured in certain ways, such as when canPerformMultiplePassesOverSourceMediaData is set to true. This property can be used to control where in the filesystem those temporary files are created. All temporary files will be deleted when the export is completed, is canceled, or fails.

When the value of this property is empty, the export session will choose a suitable location when writing temporary files. The default value is nil.

This property cannot be set after the export has started. The export will fail if the URL points to a location that is not a directory, does not exist, is not on the local file system, or if a file cannot be created in this

directory (for example, due to insufficient permissions or sandboxing restrictions).

Available in Mac OS X 10.10 and newer.
(Read and Write property)

### 16.1.46 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Describes the error that occurred if the export status is AVAssetExportSessionStatusFailed or AVAssetExportSessionStatusCancelled. (read-only)
**Notes:** If there is no error to report, the value of this property is nil.
(Read only property)

### 16.1.47 estimatedOutputFileLength as Int64

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates the estimated size in bytes of the exported file. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.1.48 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.1.49 metadataItemFilter as AVMetadataItemFilterMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Specifies a filter object to be used during export to determine which metadata items should be transferred from the source asset.
**Notes:** If the value of this key is nil, no filter will be applied. This is the default.

The filter will not be applied to metadata set with via the metadata property. To apply the filter to metadata before it is set on the metadata property, see AVMetadataItem.

Available in OS X v10.9 and later.
(Read and Write property)

### 16.1.50 OutputFile as folderitem

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The file of the export session's output.
**Notes:** (Read and Write property)

### 16.1.51 outputFileType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The type of file to be written by the session.
**Notes:** The value is a UTI string corresponding to the file type to use when writing the asset. For a list of constants specifying UTIs for standard file types, see AV Foundation Constants Reference.
(Read and Write property)

### 16.1.52 outputURL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL of the export session's output.
**Notes:** (Read and Write property)

### 16.1.53 presetName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The name of the preset with which the session was initialized. (read-only)
**Notes:** (Read only property)

### 16.1.54 progress as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The progress of the export on a scale from 0 to 1. (read-only)
**Notes:** A value of 0 means the export has not yet begun, 1 means the export is complete.

(Read only property)

### 16.1.55 shouldOptimizeForNetworkUse as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the movie should be optimized for network use.
**Notes:** (Read and Write property)

### 16.1.56 status as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The status of the export session. (read-only)
**Notes:** (Read only property)

### 16.1.57 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether video composition is enabled for export, and supplies the instructions for video composition.
**Notes:** (Read and Write property)

### 16.1.58 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range to be exported from the source.
**Example:**

```
dim a as AVAssetMBS // your asset to export
dim preset as string = AVAssetExportSessionMBS.AVAssetExportPresetPassthrough // your settings
dim e as new AVAssetExportSessionMBS(a, preset)

dim t as CMTimeMBS = CMTimeMBS.MakeWithSeconds(5) // start at 5
dim d as CMTimeMBS = CMTimeMBS.MakeWithSeconds(10) // duration 10
dim r as CMTimeRangeMBS = CMTimeRangeMBS.Make(t,d)

e.timeRange = r // or your time range!
e.shouldOptimizeForNetworkUse = true
```

```
dim filetypes() as string = e.supportedFileTypes
e.outputFileType = FileTypes(0)
e.OutputFile = SpecialFolder.Desktop.Child("test."+e.outputFileExtension)

e.exportAsynchronously(nil)

// keep e and check for events

// or instead of waiting for event, we simply wait for it to finish
do
app.YieldToNextThread
loop until e.status <>e.AVAssetExportSessionStatusExporting
```

**Notes:** The default time range of an export session is kCMTimeZero to kCMTimePositiveInfinity, meaning that (modulo a possible limit on file length) the full duration of the asset will be exported.
(Read and Write computed property)

### 16.1.59 Constants

Status Constants

| Constant | Value | Description |
|---|---|---|
| AVAssetExportSessionStatusCancelled | 5 | Indicates that the export session was cancelled. |
| AVAssetExportSessionStatusCompleted | 3 | Indicates that the export session completed successfully. |
| AVAssetExportSessionStatusExporting | 2 | Indicates that the export session is in progress. |
| AVAssetExportSessionStatusFailed | 4 | Indicates that the export session failed. |
| AVAssetExportSessionStatusUnknown | 0 | Indicates that the status is unknown. |
| AVAssetExportSessionStatusWaiting | 1 | Indicates that the session is waiting to export more data. |

## 16.2 class AVAssetImageGeneratorMBS

### 16.2.1 class AVAssetImageGeneratorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVAssetImageGenerator object provides thumbnail or preview images of assets independently of playback.
**Notes:** AVAssetImageGenerator uses the default enabled video track(s) to generate images. Generating a single image in isolation can require the decoding of a large number of video frames with complex interdependencies. If you require a series of images, you can achieve far greater efficiency using the asynchronous method, CGImageAtTime, which employs decoding efficiencies similar to those used during playback.

You create an asset generator using initWithAsset: or assetImageGeneratorWithAsset. These methods may succeed even if the asset possesses no visual tracks at the time of initialization. You can test whether an asset has any tracks with the visual characteristic using tracksWithMediaCharacteristic (AVAsset).

The actual time of a generated image is within the range [ requestedTime-requestedTimeToleranceBefore, requestedTime+requestedTimeToleranceAfter ] and may differ from the requested time for efficiency.

Assets that represent mutable compositions or mutable movies may gain visual tracks after initialization of an associated image generator.
**Xojo Developer Magazine**

- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.2.2 Methods

### 16.2.3 assetImageGeneratorWithAsset(asset as AVAssetMBS) as AVAssetImageGeneratorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an image generator for use with a specified asset.
**Notes:** asset: The asset from which images will be extracted.

Returns an image generator for use with asset.
This method may succeed even if the asset possesses no visual tracks at the time of initialization.

### 16.2.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.2.5 AVAssetImageGeneratorApertureModeCleanAperture as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the aperture mode.
**Notes:** Both pixel aspect ratio and clean aperture will be applied..

### 16.2.6 AVAssetImageGeneratorApertureModeEncodedPixels as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the aperture mode.
**Notes:** Neither pixel aspect ratio nor clean aperture will be applied.

### 16.2.7 AVAssetImageGeneratorApertureModeProductionAperture as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the aperture mode.
**Notes:** Only pixel aspect ratio will be applied.

### 16.2.8 cancelAllCGImageGeneration

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels all pending image generation requests.
**Notes:** This method calls the AVFoundationMBS.generateCGImagesAsynchronouslyForTimesCompleted event with AVAssetImageGeneratorCancelled for each image time in every previous invocation of generateCGImagesAsynchronouslyForTimes for which images have not yet been supplied.

### 16.2.9 CGImageAtTime(time as CMTimeMBS, byref actualTime as CMTimeMBS, byref error as NSErrorMBS) as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a CGImage for the asset at or near a specified time.
**Example:**

```
// open asset
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)

// prepare generator
dim g as new AVAssetImageGeneratorMBS(a)
dim timeRequested as CMTimeMBS = CMTimeMBS.MakeWithSeconds(5, 30)
dim actualTime as CMTimeMBS
dim error as NSErrorMBS
// ask for an image
dim c as CGImageMBS = g.CGImageAtTime(timeRequested, actualTime, error)
// and show it
dim p as Picture = c.Picture
window1.backdrop = p
```

**Notes:** requestedTime: The time at which the image of the asset is to be created.
actualTime: Upon return, contains the time at which the image was actually generated.
Error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns a CGImageMBS for the asset at or near a specified time, or nil if the image could not be created.
This method returns the image synchronously.

### 16.2.10 Constructor(asset as AVAssetMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an image generator for use with a specified asset.
**Notes:** asset: The asset from which images will be extracted.
This method may succeed even if the asset possesses no visual tracks at the time of initialization.

### 16.2.11 generateCGImagesAsynchronouslyForTimes(times() as CMTimeMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a series of CGImage objects for an asset at or near specified times.
**Notes:** requestedTimes: An array of CMTimeMBS, specifying the asset times at which an image is requested.

This method uses an efficient "batch mode" to get images in time order.

The client receives exactly one event call to AVFoundationMBS.generateCGImagesAsynchronouslyForTimesCompleted for each requested time in requestedTimes. Changes to the generator's properties (snap behavior, maximum size, and so on) do not affect pending asynchronous image generation requests.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.2.12 Properties

### 16.2.13 apertureMode as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies the aperture mode for the generated image.
**Notes:** (Read and Write property)

### 16.2.14 appliesPreferredTrackTransform as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies whether to apply the track matrix (or matrices) when extracting an image from the asset.
**Notes:** The default is false. AVAssetImageGenerator only supports rotation by 90, 180, or 270 degrees.
This property is ignored if you set a value for the videoComposition property.
(Read and Write property)

### 16.2.15 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The asset with which the export session was initialized. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 16.2.16 customVideoCompositor as AVVideoCompositingMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates the custom video compositor instance used, if any. (read-only)
**Notes:** The custom video compositor instance that is used during image generation is accessible via this

property after the value of videoComposition is set to an AVVideoComposition instance that specifies a custom video compositor class. Any additional communication between the application and that instance of the custom video compositor, if any is required for configuration or other purposes, can only occur once that has happened.

If the value of videoComposition is changed from an AVVideoComposition that specifies a custom video compositor class to another instance of AVVideoComposition that specifies the same custom video compositor class, the instance of the custom video compositor that was previously created will receive the renderContextChanged message and remain in use for subsequent image generation.

This property is nil if there is no video compositor, or if the internal video compositor is in use.
Available in OS X v10.9 and later.
(Read only property)

### 16.2.17 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.2.18 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video composition to use when extracting images from assets with multiple video tracks.
**Notes:** If no video composition is specified, only the first enabled video track will be used. If a video composition is specified, the appliesPreferredTrackTransform property is ignored.
(Read and Write property)

### 16.2.19 maximumSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies the maximum dimensions for generated image.
**Notes:** The default value is CGSizeZero, which specifies the asset's unscaled dimensions.

AVAssetImageGenerator scales images such that they fit within the defined bounding box. Images are never scaled up. The aspect ratio of the scaled image is defined by the apertureMode property.
(Read and Write computed property)

### 16.2.20 requestedTimeToleranceAfter as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The maximum length of time after a requested time for which an image may be generated.
**Notes:** The default value is kCMTimePositiveInfinity.

Set the values of requestedTimeToleranceBefore and requestedTimeToleranceAfter to kCMTimeZero to request frame-accurate image generation; this may incur additional decoding delay.
(Read and Write computed property)

### 16.2.21 requestedTimeToleranceBefore as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The maximum length of time before a requested time for which an image may be generated.
**Notes:** The default value is kCMTimePositiveInfinity.

Set the values of requestedTimeToleranceBefore and requestedTimeToleranceAfter to kCMTimeZero to request frame-accurate image generation; this may incur additional decoding delay.
(Read and Write computed property)

### 16.2.22 Constants

Result Constants

| Constant | Value | Description |
|---|---|---|
| AVAssetImageGeneratorCancelled | 2 | Indicates that generation was cancelled. |
| AVAssetImageGeneratorFailed | 1 | Indicates that generation failed. |
| AVAssetImageGeneratorSucceeded | 0 | Indicates that generation succeeded. |

## 16.3 class AVAssetMBS

### 16.3.1 class AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVAsset is an abstract class to represent timed audiovisual media such as videos and sounds.
**Notes:** Each asset contains a collection of tracks that are intended to be presented or processed together, each of a uniform media type, including but not limited to audio, video, text, closed captions, and subtitles.

An AVAsset object defines the collective properties of the tracks that comprise the asset. (You can access the instances of AVAssetTrack representing tracks of the collection, so you can examine each of these independently if you need to.) You often instantiate an asset using a concrete subclass of AVAsset; for example, you can initialize an instance of AVURLAsset using an URL that refers to an audiovisual media file, such as a QuickTime movie file or an MP3 files (amongst other types). You can also instantiate an asset using other concrete subclasses that extend the basic model for audiovisual media in useful ways, as AVComposition does for temporal editing. To assemble audiovisual constructs from one or more source assets, you can insert assets into instances of AVMutableComposition.

You often instantiate an asset using AVURLAsset—a concrete subclass of AVAsset—with URLs that refer to audiovisual media resources, such as streams (including HTTP live streams), QuickTime movie files, MP3 files, and files of other types. You can also instantiate an asset using other concrete subclasses that extend the basic model for audiovisual media in useful ways, as AVComposition does for temporal editing.

Properties of assets as a whole are defined by AVAsset. Additionally, references to instances of AVAssetTrack representing tracks of the collection can be obtained, so that each of these can be examined independently.

Because of the nature of timed audiovisual media, upon successful initialization of an asset some or all of the values for its keys may not be immediately available. The value of any key can be requested at any time, and asset will always return its value synchronously, although it may have to block the calling thread in order to do so. In order to avoid blocking, you can register your interest in particular keys and to become notified when their values become available. For further details, see AVAsynchronousKeyValueLoading.

To play an instance of AVAsset, initialize an instance of AVPlayerItem with it, use the player item tem to set up its presentation state (such as whether only a limited timeRange of the asset should be played, etc.), and provide the player item to an AVPlayer object according to whether the items is to be played by itself or together with a collection of other items.

You can insert AVAsset objects can also be inserted into an AVMutableComposition object in order to assemble audiovisual constructs from one or more source assets.

Subclassing Notes
It is not currently possible to subclass AVAsset to handle streaming protocols or file formats that are not

supported by the framework.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr9
- MBS Xojo / Real Studio plug-ins in version 16.5
- MBS Xojo / Real Studio Plugins, version 16.5pr6
- Automated video editing with Xojo

**Xojo Developer Magazine**

- 16.1, page 9: News
- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.3.2 Methods

### 16.3.3 assetWithData(Data as MemoryBlock, Options as Dictionary = nil) as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in an data parameter.
**Notes:** data: An Memoryblock/String containing a movie header. We make a copy of that.
options: Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
You can use this method to operate on movie headers that are not stored in files; this might include movie headers on the pasteboard (which do not contain media data). In general you should avoid loading an entire movie file with its media data into an instance of Memoryblock/String! By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 16.3.4 assetWithData(Data as String, Options as Dictionary = nil) as AVAssetMBS 3174

### 16.3.4 assetWithData(Data as String, Options as Dictionary = nil) as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in an data parameter.
**Example:**

```
// load movie in memory
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim b as BinaryStream = BinaryStream.Open(f)

// now open it from memory
dim s as string = b.Read(b.Length)
dim m as AVAssetMBS = AVAssetMBS.movieWithData(s)

MsgBox str(m.duration.Seconds)+" seconds."
```

**Notes:** data: An Memoryblock/String containing a movie header. We make a copy of that.
options: Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
You can use this method to operate on movie headers that are not stored in files; this might include movie headers on the pasteboard (which do not contain media data). In general you should avoid loading an entire movie file with its media data into an instance of Memoryblock/String! By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 16.3.3 assetWithData(Data as MemoryBlock, Options as Dictionary = nil) as AVAssetMBS 3174

### 16.3.5 assetWithFile(file as folderitem) as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset for inspection of a media resource.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)

MsgBox str(a.duration.Seconds)+" seconds"
```

### 16.3.6 assetWithURL(URL as string) as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset for inspection of a media resource.

### 16.3.7 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.3.8 availableChapterLocales as NSLocaleMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The locales available for chapters in the asset. (read-only)

### 16.3.9 availableMediaCharacteristicsWithMediaSelectionOptions as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of media characteristics for which a media selection option is available. (read-only)
**Notes:** The value of this property is an array of strings, each string indicating a media characteristic for which a media selection option is available.

### 16.3.10 availableMetadataFormats as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of strings, each representing a metadata format that's available to the asset. (read-only)
**Notes:** Metadata formats may include ID3, iTunes metadata, and so on. For more details, see AVMetadataItem.

### 16.3.11 cancelLoading

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels the loading of all values for all observers.
**Notes:** Deallocation of an instance of the asset will implicitly invoke this method if any loading requests are still outstanding.

### 16.3.12 chapterMetadataGroupsBestMatchingPreferredLanguages as AVTimedMetadataGroupMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of chapters whose locale best matches the the list of preferred languages.
**Notes:** preferredLanguages: Optional, an array of strings, each of which contains a canonicalized IETF BCP 47 language identifier. The order of the identifiers in the array reflects the preferred language order, with the most preferred language being first in the array. Typically, you pass the user's preferred languages by retrieving this array from the preferredLanguages class method of NSLocale. If you don't pass an array, the plugin automatically passes NSLocaleMBS.preferredLanguages.

Returns an array of AVTimedMetadataGroup objects.

Each object in the returned array contains an AVMetadataItem object representing the chapter title. The time range property of the AVTimedMetadataGroup object is equal to the time range of the chapter title item.

All of the available chapter metadata is included in the metadata groups, including items with the common key AVMetadataCommonKeyArtwork, if such items are present. Items not carrying chapter titles are added to an existing AVTimedMetadataGroup object if the time range (timestamp and duration) of the metadata item and that of the metadata group overlaps. The locale of such items need not match the locale of the chapter titles.

You can use the metadataItemsFromArray:filteredAndSortedAccordingToPreferredLanguages: method to further filter the metadata items in each group. You can also filter the returned items based on locale using the metadataItemsFromArray:withLocale: method.

Special Considerations
Becomes callable without blocking when the data in the availableChapterLocales property is already loaded.
See also:

- 16.3.13 chapterMetadataGroupsBestMatchingPreferredLanguages(preferredLanguages() as string) as AVTimedMetadataGroupMBS() 3177

### 16.3.13 chapterMetadataGroupsBestMatchingPreferredLanguages(preferredLanguages() as string) as AVTimedMetadataGroupMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of chapters whose locale best matches the the list of preferred languages.
**Notes:** preferredLanguages: Optional, an array of strings, each of which contains a canonicalized IETF BCP 47 language identifier. The order of the identifiers in the array reflects the preferred language order, with the most preferred language being first in the array. Typically, you pass the user's preferred languages

by retrieving this array from the preferredLanguages class method of NSLocale. If you don't pass an array, the plugin automatically passes NSLocaleMBS.preferredLanguages.

Returns an array of AVTimedMetadataGroup objects.

Each object in the returned array contains an AVMetadataItem object representing the chapter title. The time range property of the AVTimedMetadataGroup object is equal to the time range of the chapter title item.

All of the available chapter metadata is included in the metadata groups, including items with the common key AVMetadataCommonKeyArtwork, if such items are present. Items not carrying chapter titles are added to an existing AVTimedMetadataGroup object if the time range (timestamp and duration) of the metadata item and that of the metadata group overlaps. The locale of such items need not match the locale of the chapter titles.

You can use the metadataItemsFromArray:filteredAndSortedAccordingToPreferredLanguages: method to further filter the metadata items in each group. You can also filter the returned items based on locale using the metadataItemsFromArray:withLocale: method.

Special Considerations
Becomes callable without blocking when the data in the availableChapterLocales property is already loaded.
See also:

- 16.3.12 chapterMetadataGroupsBestMatchingPreferredLanguages as AVTimedMetadataGroupMBS() 3177

### 16.3.14 chapterMetadataGroupsWithTitleLocale(locale as NSLocaleMBS, commonKeys() as string) as AVTimedMetadataGroupMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of chapters with a given title locale and containing specified keys.
**Notes:** locale: The locale of the metadata items carrying chapter titles to be returned (the method supports the IETF BCP 47 specification of locales).
commonKeys: An array of common keys of AVMetadataItem to include in the returned array. AVMetadataCommonKeyArtwork is the only supported key.

Returns an array of AVTimedMetadataGroup objects.

Each object in the returned array contains an AVMetadataItem object representing the chapter title, and the time range property of the AVTimedMetadataGroup object is equal to the time range of the chapter title item.

An AVMetadataItem with the specified common key is added to an existing AVTimedMetadataGroup object if the time range (timestamp and duration) of the metadata item and the metadata group overlap.

The locale of items not carrying chapter titles need not match the specified locale parameter. You can filter the returned items based on locale using metadataItemsFromArray.

### 16.3.15 commonMetadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of metadata items for each common metadata key for which a value is available. (read-only)
**Notes:** The value is an array of AVMetadataItem objects, one for each common metadata key for which a value is available. You can filter the array by locale using metadataItemsFromArray (AVMetadataItem) or by key using metadataItemsFromArray (AVMetadataItem).

### 16.3.16 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.3.17 copy as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.3.18 duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The duration of the asset. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)

MsgBox str(a.duration.Seconds)+" seconds"
```

**Notes:** If providesPreciseDurationAndTiming is false, a best-available estimate of the duration is returned. You can set the degree of precision required for timing-related properties at initialization time for assets initialized with URLs (see AVURLAssetPreferPreciseDurationAndTimingKey in AVURLAsset).

### 16.3.19 loadValuesAsynchronouslyForKeys(keys() as string, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the asset to load the values of any of the specified keys that are not already loaded.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetmbs.assetWithFile(f)

if a = nil then
MsgBox "failed to read file at all"
Return
end if

// request duration property
a.loadValuesAsynchronouslyForKeys array("duration")

dim e as NSErrorMBS
dim Status as Integer = a.statusOfValueForKey("duration", e)
while status <a.AVKeyValueStatusLoaded
// wait for loading in background
status = a.statusOfValueForKey("duration", e)
wend

// got it?
if status <>a.AVKeyValueStatusLoaded then
MsgBox "Failed to load duration."
if e <>nil then
MsgBox e.LocalizedDescription
end if

else
MsgBox str(a.duration.Seconds)+" seconds long."
end if
```

**Notes:** keys: An array containing the required keys.

Calls AVFoundationMBS.AssetLoadValuesAsynchronouslyForKeysFinished on completion.

The completion event will be invoked exactly once per invocation of this method:

- Synchronously if an I/O error or other format-related error occurs immediately.
- Asynchronously at a subsequent time if a loading error occurs at a later stage of processing, or if cancelLoading is invoked on an AVAsset instance.

The completion states of the keys you specify in keys are not necessarily the same—some may be loaded, and others may have failed. You must check the status of each key individually.

If you want to receive error reporting for loading that's still pending, you can call this method at any time—even after an asset has begun to load data for operations in progress or already completed. If a fatal error has already occurred, the completion event is invoked synchronously.

### 16.3.20 mediaSelectionGroupForMediaCharacteristic(mediaCharacteristic as string) as AVMediaSelectionGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an AVMediaSelectionGroup object that contains one or more options with the specified media characteristic.
**Notes:** mediaCharacteristic: A media characteristic for which you wish to obtain the available media selection options.
Only AVMediaCharacteristicAudible and AVMediaCharacteristicLegible are currently supported.
Pass AVMediaCharacteristicAudible to obtain the group of available options for audio media in various languages and for various purposes, such as descriptive audio.
Pass AVMediaCharacteristicLegible to obtain the group of available options for subtitles in various languages and for various purposes.

Returns an AVMediaSelectionGroup object that contains one or more options with the media characteristic specified by mediaCharacteristic, or nil if none could be found.

You can invoke this method without blocking when the key availableMediaCharacteristicsWithMediaSelectionOptions has been loaded.
You can filter the options in the returned media selection group according to playability, locale, and additional media characteristics can be accomplished using the filtering methods defined in the AVMediaSelectionGroup class.

### 16.3.21 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Provides access to an array of AVMetadataItems for all metadata identifiers for which a value is available.
**Example:**

```
// load file and look for cover art

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.m4a")
Dim a As AVURLAssetMBS = AVURLAssetMBS.URLAssetWithFile(file)

Dim iTunesMetadataKeyCoverArtString As String = AVFoundationMBS.AVMetadataiTunesMetadataKeyCoverArt
Dim iTunesMetadataKeyCoverArtNumber As Integer = OSTypeFromStringMBS(iTunesMetadataKeyCoverArtString)

Dim items() As AVMetadataItemMBS = a.metadata

For Each item As AVMetadataItemMBS In items

Dim key As Variant = item.key
Dim Val As Variant = item.value

If key.IntegerValue = iTunesMetadataKeyCoverArtNumber Or key.StringValue = iTunesMetadataKeyCoverArtString Then

Dim v As MemoryBlock = Val
window1.Backdrop = picture.FromData(v)
End If

Next
```

**Notes:** Available in Mac OS X 10.10.

### 16.3.22 metadataForFormat(Format as string) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of AVMetadataItem objects, one for each metadata item in the container of the specified format.
**Notes:** format: The metadata format for which you want items.

Returns an array of AVMetadataItem objects, one for each metadata item in the container of the specified format, or nil if there is no metadata of the specified format.

You can filter the array by locale using metadataItemsFromArray (AVMetadataItem) or by key using meta-

dataItemsFromArray (AVMetadataItem).
Becomes callable without blocking when availableMetadataFormats has been loaded.

### 16.3.23 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The encoded or authored size of the visual portion of the asset.

### 16.3.24 preferredTransform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The preferred transform to apply to the visual content of the asset for presentation or processing. (read-only)
**Notes:** The value is often, but not always, the identity transform.

### 16.3.25 readTimeCodeObjects as AVTimeCodeMBS()

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** Reads time codes from asset.
**Notes:** Raises exception if not possible.
Returns empty array if nothing found.

Provides details on time codes.

### 16.3.26 readTimeCodes as String()

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Reads time codes from asset.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim timecodes() as string = a.readTimeCodes

break // see in debugger
```

**Notes:** Raises exception if not possible.
Returns empty array if nothing found.

Format is 2 digit hours, double colon, 2 digit minutes, double colon, 2 digit seconds, double colon, 2 digit frames.
e.g. "01:02:03:04"

Please use readTimeCodeObjects for more options.

### 16.3.27 statusOfValueForKey(key as string, byref error as NSErrorMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Reports whether the value for a given key is immediately available without blocking. (required)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetmbs.assetWithFile(f)

if a = nil then
MsgBox "failed to read file at all"
Return
end if

// request duration property
a.loadValuesAsynchronouslyForKeys array("duration")

dim e as NSErrorMBS
dim Status as Integer = a.statusOfValueForKey("duration", e)
while status <a.AVKeyValueStatusLoaded
// wait for loading in background
status = a.statusOfValueForKey("duration", e)
wend

// got it?
if status <>a.AVKeyValueStatusLoaded then
MsgBox "Failed to load duration."
if e <>nil then
MsgBox e.LocalizedDescription
end if

else
MsgBox str(a.duration.Seconds)+" seconds long."
end if
```

**Notes:** key: The key whose status you want.
error: If the status of the value for the key is AVKeyValueStatusFailed, upon return contains an NSError object that describes the failure that occurred.

Returns the current loading status of the value for key. For possible values, see "Protocol Methods."

You use this method to determine the availability of the value for a key. This method does not cause an asset to load the value of a key that's not yet available. To request values for keys that may not already be loaded without blocking, use loadValuesAsynchronouslyForKeys and wait for invocation of the completion handler to be informed of availability.

### 16.3.28 trackGroups as AVAssetTrackGroupMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array containing all of the track groups in the asset. (read-only)
**Notes:** This is an array of AVAssetTrackGroup instances, each representing a different grouping of tracks in the asset.
Available in OS X v10.9 and later.

### 16.3.29 tracks as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The tracks contained by the asset. (read-only)
**Notes:** Tracks are instances of AVAssetTrack.

### 16.3.30 tracksWithMediaCharacteristic(mediaCharacteristic as string) as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of AVAssetTrack objects of the asset that present media with a specified characteristic.
**Notes:** mediaCharacteristic: The media characteristic according to which receiver filters its asset tracks.
Return san array of AVAssetTrack objects that present media with mediaCharacteristic, or nil if no tracks with the specified characteristic are available.
You can call this method without blocking when tracks has been loaded.

### 16.3.31 tracksWithMediaType(mediaType as string) as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the asset tracks of the asset that present media of a specified type.
**Notes:** mediaType: The media type according to which the asset filters its tracks.
Media types are defined in AVAssetTrack.

Returns an array of AVAssetTrack objects of the asset that present media of mediaType.
You can call this method without blocking when tracks has been loaded.

### 16.3.32 trackWithTrackID(PersistentTrackID as Integer) as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the track with a specified track ID.
**Notes:** trackID: The trackID of the requested asset track.

Returns the track with track ID trackID, or nil if no track with the specified ID is available.
You can call this method without blocking when tracks has been loaded.

### 16.3.33 unusedTrackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an ID that is currently unused by any of the tracks in the asset.

### 16.3.34 Properties

### 16.3.35 ClassName as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns the class name for the Objective-C class.
**Notes:** Sometimes useful for debugging.
(Read only property)

### 16.3.36 creationDate as AVMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the creation date of the asset. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)

dim creationDate as date = a.creationDate.dateValue
MsgBox creationDate.LongDate + " " + creationDate.LongTime
```

**Notes:** The value of this property may be nil.

If a creation date has been stored by the asset in a form that can be converted to an Date object, the dateValue property of the metadata item will provide an instance of NSDate. Otherwise the creation date is available only as a string value, using the AVMetadataItem stringValue method.
(Read only property)

### 16.3.37 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.3.38 hasProtectedContent as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset has protected content. (read-only)
**Notes:** (Read only property)

### 16.3.39 isComposable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset can be used within a segment of an AVCompositionTrack object. (read-only)
**Notes:** (Read only property)

### 16.3.40 isExportable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset can be exported using AVAssetExportSession. (read-only)
**Notes:** (Read only property)

### 16.3.41 isPlayable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset, or its URL, can be used to initialize an instance of AVPlayerItem. (read-only)
**Notes:** (Read only property)

### 16.3.42 isReadable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset's media data can be extracted using AVAssetReader. (read-only)
**Notes:** (Read only property)

### 16.3.43 lyrics as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The lyrics of the asset suitable for the current locale. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)

MsgBox "Lyrics: "+a.lyrics
```

**Notes:** (Read only property)

### 16.3.44 preferredRate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The natural rate at which the asset is to be played. (read-only)
**Notes:** This value is often, but not always, 1.0.
(Read only property)

### 16.3.45 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The preferred volume at which the audible media of asset is to be played. (read-only)
**Notes:** This value is often, but not always, 1.0.
(Read only property)

### 16.3.46 providesPreciseDurationAndTiming as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset provides precise timing. (read-only)
**Example:**

```
dim options as new Dictionary
options.value(AVFoundationMBS.AVURLAssetPreferPreciseDurationAndTimingKey) = true
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVURLAssetMBS.URLAssetWithFile(f, options)

MsgBox str(a.duration.Seconds)+" seconds with precision: "+str(a.providesPreciseDurationAndTiming)
```

**Notes:** You can set the degree of precision required for timing-related properties at initialization time for assets initialized with URLs (see AVURLAssetPreferPreciseDurationAndTimingKey in AVURLAsset).
(Read only property)

### 16.3.47 referenceRestrictions as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The reference restrictions being used by the receiver. (read-only)
**Notes:** For AVURLAsset, this property reflects the value passed in for AVURLAssetReferenceRestrictionsKey, if any.

The default value for this property is AVAssetReferenceRestrictionForbidNone. See AVURLAssetReferenceRestrictionsKey for a full discussion of reference restrictions.

(Read only property)

### 16.3.48 Constants

Reference Restriction Modes

| Constant | Value | Description |
|---|---|---|
| AVAssetReferenceRestrictionForbidAll | &hFFFF | Indicates that only references to media data sto file should be allowed. |
| AVAssetReferenceRestrictionForbidCrossSiteReference | 4 | Indicates that references from a remote asset t a different site should not be followed. |
| AVAssetReferenceRestrictionForbidLocalReferenceToLocal | 8 | Indicates that references from a local asset to the asset's container file should not be followed |
| AVAssetReferenceRestrictionForbidLocalReferenceToRemote | 2 | Indicates that references from a local asset to be followed. |
| AVAssetReferenceRestrictionForbidNone | 0 | Indicates that all types of references should be |
| AVAssetReferenceRestrictionForbidRemoteReferenceToLocal | 1 | Indicates that references from a remote asset ( URL) to local media data (for example, store followed. |

Load Status Constants

| Constant | Value | Description |
|---|---|---|
| AVKeyValueStatusCancelled | 4 | Indicates that the attempt to load the property was cancelled. |
| AVKeyValueStatusFailed | 3 | Indicates that the attempt to load the property failed. |
| AVKeyValueStatusLoaded | 2 | Indicates that the property is ready for use. |
| AVKeyValueStatusLoading | 1 | Indicates that the property is not fully loaded. |
| AVKeyValueStatusUnknown | 0 | Indicates that the property status is unknown. |

## 16.4 class AVAssetReaderAudioMixOutputMBS

### 16.4.1 class AVAssetReaderAudioMixOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVAssetReaderAudioMixOutput is a concrete subclass of AVAssetReaderOutput that defines an interface for reading audio samples that result from mixing the audio from one or more tracks of an AVAssetReader object's asset.
**Notes:** You can read the audio data mixed from one or more asset tracks by adding an instance of AVAssetReaderAudioMixOutput to an asset reader using addOutput. The samples can be read in a default format or can be converted to a different format.
Subclass of the AVAssetReaderOutputMBS class.

### 16.4.2 Methods

### 16.4.3 assetReaderAudioMixOutputWithAudioTracks(audioTracks() as AVAssetTrackMBS, outputSettings as dictionary) as AVAssetReaderAudioMixOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVAssetReaderAudioMixOutput for reading mixed audio from the specified audio tracks, with optional audio settings.
**Notes:** audioTracks: An array of AVAssetTrack objects from which the created object should read sample buffers to be mixed.
Each track must be one of the tracks owned by the target AVAssetReader object's asset and must be of media type AVMediaTypeAudio.
audioSettings: The audio settings to be used for audio output; the dictionary must contain values for keys in AVAudioSettings.h (linear PCM only). Pass nil if you want to receive decoded samples in a convenient uncompressed format, with properties determined according to the properties of the specified audio tracks.

Returns an instance of AVAssetReaderAudioMixOutput for reading mixed audio from audioTracks, with audio settings specified by audioSettings.
Initialization will fail if audioSettings cannot be used with audioTracks.

### 16.4.4 audioSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The audio settings used for audio output. (read-only)
**Notes:** The dictionary must contain values for keys in AVAudioSettings.h (linear PCM only).
nil indicates that the samples will be returned in the default format.

### 16.4.5 audioTracks as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The tracks from which the receiver reads mixed audio. (read-only)
**Notes:** The value is an array of AVAssetTrack objects owned by the target AVAssetReader object's asset.

### 16.4.6 Constructor(audioTracks() as AVAssetTrackMBS, outputSettings as dictionary)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an instance of AVAssetReaderAudioMixOutput for reading mixed audio from the specified audio tracks, with optional audio settings.
**Notes:** audioTracks: An array of AVAssetTrack objects from which the created object should read sample buffers to be mixed.
Each track must be one of the tracks owned by the target AVAssetReader object's asset and must be of media type AVMediaTypeAudio.
audioSettings: The audio settings to be used for audio output; the dictionary must contain values for keys in AVAudioSettings.h (linear PCM only).
Pass nil if you want to receive decoded samples in a convenient uncompressed format, with properties determined according to the properties of the specified audio tracks.

Returns an instance of AVAssetReaderAudioMixOutput initialized for reading mixed audio from audioTracks, with audio settings specified by audioSettings.

Initialization will fail if audioSettings cannot be used with audioTracks. So please check handle property.

### 16.4.7 Properties

### 16.4.8 audioMix as AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The output's audio mix.
**Notes:** You use the audio mix to specify how the volume of audio samples read from each source track will change over the timeline of the source asset.
(Read and Write property)

### 16.4.9 audioTimePitchAlgorithm as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The processing algorithm used to manage audio pitch for scaled audio edits.
**Notes:** The supported constants are defined in Time Pitch Algorithm Settings.
An NSInvalidArgumentException will be raised if this property is set to a value other than the defined constants.
Available in OS X v10.9 and later.
(Read and Write property)

## 16.5 class AVAssetReaderMBS

### 16.5.1 class AVAssetReaderMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVAssetReader object to obtain media data of an asset, whether the asset is file-based or represents an assemblage of media data from multiple sources (as with an AVComposition object).
**Notes:** AVAssetReader lets you:

Read raw un-decoded media samples directly from storage, obtain samples decoded into renderable forms.
Mix multiple audio tracks of the asset and compose multiple video tracks (by using AVAssetReaderAudioMixOutput and AVAssetReaderVideoCompositionOutput).
AVAssetReader's pipelines are multithreaded internally. After you initiate reading with initWithAsset:error:, a reader loads and processes a reasonable amount of sample data ahead of use so that retrieval operations such as copyNextSampleBuffer (AVAssetReaderOutput) can have very low latency. Note, however, that AVAssetReader is not intended for use with real-time sources, and its performance is not guaranteed for real-time operations.

### 16.5.2 Methods

### 16.5.3 addOutput(output as AVAssetReaderOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds a given output to the receiver.
**Notes:** output: The reader output to add.

Outputs are created with a reference to one or more AVAssetTrack objects. Adding an output to an asset reader indicates to the reader that it should source from those tracks. The tracks must be owned by the asset returned by the reader's asset property.
You cannot add an output after reading has started.

### 16.5.4 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset with which the receiver was initialized. (read-only)
**Notes:** Concrete instances of AVAssetReader with specific AVAssetTrack instances must obtain those tracks from the asset returned by this property.

### 16.5.5 assetReaderWithAsset(item as AVAssetMBS, byref error as NSErrorMBS) as AVAssetReaderMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset reader for reading media data from a specified asset.
**Notes:** asset: The asset from which media data is to be read.
Error: If initialization of the reader fails, upon return contains an error that describes the problem.

Returns an asset reader, initialized for reading media data from asset.

### 16.5.6 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.5.7 canAddOutput(output as AVAssetReaderOutputMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given output can be added to the receiver.
**Notes:** output: The reader output to be tested.

Returns true if output can be added to the receiver, otherwise false.
You cannot add an output that reads from a track of an asset other than the asset used to initialize the receiver.

### 16.5.8 cancelReading

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels any background work and prevents the receiver's outputs from reading more samples.
**Notes:** If you want to stop reading samples from the receiver before reaching the end of its time range, you should call this method to stop any background read ahead operations that the may have been in progress.

### 16.5.9 Constructor(item as AVAssetMBS, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset reader for reading media data from a specified asset.
**Notes:** asset: The asset from which media data is to be read.
Error: If initialization of the reader fails, upon return contains an error that describes the problem.

### 16.5.10 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Describes the error that occurred if the status is AVAssetReaderStatusFailed. (read-only)
**Notes:** This property is thread safe.

The value of this property describes what caused the reader to no longer be able to read its asset. If the reader's status is not AVAssetReaderStatusFailed, the value of this property is nil.

### 16.5.11 outputs as AVAssetReaderOutputMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The outputs from which clients of reader can read media data. (read-only)
**Notes:** The array contains concrete instances of AVAssetReaderOutput associated with the reader.

### 16.5.12 startReading

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prepares the receiver for obtaining sample buffers from the asset.
**Notes:** Returns true if the reader is able to start reading, otherwise false.

This method validates the entire collection of settings for outputs for tracks, for audio mixdown, and for video composition and initiates reading of all outputs.

status signals the terminal state of the asset reader, and if a failure occurs, error describes the failure.

### 16.5.13 status as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The status of the reading of sample buffers from the asset. (read-only)
**Notes:** This property is thread safe. For possible values, see "Reader Status Constants."

The value of this property indicates whether reading is in progress, has completed successfully, has been canceled, or has failed. You should check the value of this property copyNextSampleBuffer (AVAssetReader-Output) returns nil to determine why no more samples could be read.

### 16.5.14 Properties

### 16.5.15 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.5.16 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range of the asset that should be read.
**Notes:** The intersection of the value of this property and CMTimeRangeMake(kCMTimeZero, asset.duration) determines the time range of the asset from which media data will be read.

The default value is CMTimeRangeMake(kCMTimeZero, kCMTimePositiveInfinity). You cannot change the value of this property after reading has started.
(Read and Write computed property)

### 16.5.17 Constants

Status Values

| Constant | Value | Description |
|---|---|---|
| AVAssetReaderStatusCancelled | 4 | Indicates that reading was cancelled using cancelReading. |
| AVAssetReaderStatusCompleted | 2 | Indicates that the reader has provided all available sample buffers to all of its outputs. |
| AVAssetReaderStatusFailed | 3 | Indicates that reading failed. |
| AVAssetReaderStatusReading | 1 | Indicates that the reader is ready to provide more sample buffers to its outputs. |
| AVAssetReaderStatusUnknown | 0 | Indicates that startReading has not yet been invoked. |

## 16.6 class AVAssetReaderOutputMBS

### 16.6.1 class AVAssetReaderOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVAssetReaderOutput is an abstract class that defines an interface for reading a single collection of samples of a common media type from an AVAssetReader object.
**Notes:** There are several subclasses of AVAssetReaderOutput for specific tasks, such as AVAssetReaderTrackOutput or AVAssetReaderVideoCompositionOutput.

You can read the media data of an asset by adding one or more concrete instances of AVAssetReaderOutput to an AVAssetReader object using addOutput.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.6.2 Methods

### 16.6.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.6.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.6.5 NextSampleBuffer as CMSampleBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Synchronously copies the next sample buffer for the output.
**Notes:** The output sample buffer, or nil if there are no more sample buffers available for the output within the time range specified by the asset reader's timeRange property.

If this method returns nil, you should check the value of the associated AVAssetReader object's status property to determine why no more samples could be read.

### 16.6.6 Properties

### 16.6.7 alwaysCopiesSampleData as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the data in buffers gets copied before being vended.
**Notes:** When the value of this property is true, the output always vends a buffer with copied data—you can freely modify data in such buffers.

When the value of this property is false, the buffers vended may not be copied—such buffers may still be referenced by other entities. The result of modifying a buffer whose data hasn't been copied is undefined. Requesting buffers whose data hasn't been copied when possible can lead to performance improvements.
The default value of this property is true.
Available in OS X v10.8 and later.
(Read and Write property)

### 16.6.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.6.9 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A string representing the media type of the track (or tracks) represented by the output. (read-only)
**Notes:** The value of this property is one of the media type strings defined in AVMediaFormat.h.
(Read only property)

### 16.6.10 supportsRandomAccess as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Indicates whether the asset reader output supports reconfiguration of the time ranges to read.
**Notes:** When the value of this property is true, the time ranges read by the asset reader output can be reconfigured during reading using the -resetForReadingTimeRanges method. This also prevents the attached AVAssetReader from progressing to AVAssetReaderStatusCompleted until markConfigurationAsFinal has

been invoked.

The default value is false, which means that the asset reader output may not be reconfigured once reading has begin. When the value of this property is false, AVAssetReader may be able to read media data more efficiently, particularly when multiple asset reader outputs are attached.

This property may not be set after startReading has been called on the attached asset reader.
(Read and Write property)

## 16.7 class AVAssetReaderOutputMetadataAdaptorMBS

### 16.7.1 class AVAssetReaderOutputMetadataAdaptorMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Creates a new timed metadata group adaptor for retrieving timed metadata group objects from an asset reader output.
**Notes:** assetReaderOutput: An instance of AVAssetReaderTrackOutput that vends sample buffers containing metadata, e.g. an AVAssetReaderTrackOutput object initialized with a track of media type AVMediaTypeMetadata and nil outputSettings.

Returns an instance of AVAssetReaderOutputMetadataAdaptor

It is an error to create a timed metadata group adaptor with an asset reader output that does not vend metadata. It is also an error to create a timed metadata group adaptor with an asset reader output whose asset reader has already started reading, or an asset reader output that already has been used to initialize another timed metadata group adaptor.

Clients should not mix calls to AVAssetReaderTrackOutput.NextSampleBuffer and AVAssetReaderOutputMetadataAdaptor.nextTimedMetadataGroup. Once an AVAssetReaderTrackOutput instance has been used to initialize an AVAssetReaderOutputMetadataAdaptor, calling NextSampleBuffer on that instance will result in an exception being thrown.

Available on Mac OS X 10.10 or newer.

### 16.7.2 Methods

### 16.7.3 assetReaderOutputMetadataAdaptorWithAssetReaderTrackOutput(trackOutput as AVAssetReaderTrackOutputMBS) as AVAssetReaderOutputMetadataAdaptorMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Creates a new timed metadata group adaptor for retrieving timed metadata group objects from an asset reader output.
**Notes:** Parameter: an instance of AVAssetReaderTrackOutput that vends sample buffers containing metadata, e.g. an AVAssetReaderTrackOutput object initialized with a track of media type AVMediaTypeMetadata and nil outputSettings.

Returns an instance of AVAssetReaderOutputMetadataAdaptor

It is an error to create a timed metadata group adaptor with an asset reader output that does not vend metadata. It is also an error to create a timed metadata group adaptor with an asset reader output whose asset reader has already started reading, or an asset reader output that already has been used to initialize another timed metadata group adaptor.

Clients should not mix calls to AVAssetReaderTrackOutput.NextSampleBuffer and AVAssetReaderOutputMetadataAdaptor.nextTimedMetadataGroup. Once an AVAssetReaderTrackOutput instance has been used to initialize an AVAssetReaderOutputMetadataAdaptor, calling NextSampleBuffer on that instance will result in an exception being thrown.

### 16.7.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true on Mac OS X 10.10 and newer.

### 16.7.5 Constructor(trackOutput as AVAssetReaderTrackOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Creates a new timed metadata group adaptor for retrieving timed metadata group objects from an asset reader output.
**Notes:** assetReaderOutput: An instance of AVAssetReaderTrackOutput that vends sample buffers containing metadata, e.g. an AVAssetReaderTrackOutput object initialized with a track of media type AVMediaTypeMetadata and nil outputSettings.

Returns an instance of AVAssetReaderTrackOutputTimedMetadataGroupAdaptor

It is an error to create a timed metadata group adaptor with an asset reader output that does not vend metadata. It is also an error to create a timed metadata group adaptor with an asset reader output whose asset reader has already started reading, or an asset reader output that already has been used to initialize another timed metadata group adaptor.

Clients should not mix calls to AVAssetReaderTrackOutput.NextSampleBuffer and AVAssetReaderOutputMetadataAdaptor.nextTimedMetadataGroup. Once an AVAssetReaderTrackOutput instance has been used to initialize an AVAssetReaderOutputMetadataAdaptor, calling NextSampleBuffer on that instance will result in an exception being thrown.

### 16.7.6 nextTimedMetadataGroup as AVTimedMetadataGroupMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Returns the next timed metadata group for the asset reader output, synchronously.
**Notes:** Returns an instance of AVTimedMetadataGroup, representing the next logical segment of metadata coming from the source asset reader output.

This method will return nil when all timed metadata groups have been read from the asset reader output, or if there is an error that prevents the timed metadata group adaptor from reading more timed metadata groups. When this method returns nil, clients should check the value of the associated AVAssetReader's status property to determine why no more samples could be read.

Before calling this method, you must ensure that the output which underlies the receiver is attached to an AVAssetReader via a prior call to addOutput and that startReading has been called on the asset reader.

### 16.7.7 Properties

### 16.7.8 assetReaderTrackOutput as AVAssetReaderTrackOutputMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** The asset reader track output from which the receiver pulls timed metadata groups.
**Notes:** (Read only property)

### 16.7.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.8 class AVAssetReaderSampleReferenceOutputMBS

### 16.8.1 class AVAssetReaderSampleReferenceOutputMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** AVAssetReaderSampleReferenceOutput is a concrete subclass of AVAssetReaderOutput that defines an interface for reading sample references from a single AVAssetTrack of an AVAssetReader's AVAsset.
**Notes:** Clients can extract information about the location (file URL and offset) of samples in a track by adding an instance of AVAssetReaderSampleReferenceOutput to an AVAssetReader using the AVAssetReader.addOutput method. No actual sample data can be extracted using this class. The location of the sample data is described by the kCMSampleBufferAttachmentKey_SampleReferenceURL and kCMSampleBufferAttachmentKey_SampleReferenceByteOffset attachments on the extracted sample buffers. More information about sample buffers describing sample references can be found in the CMSampleBuffer documentation.

Sample buffers extracted using this class can also be appended to an AVAssetWriterInput to create movie tracks that are not self-contained and reference data in the original file instead. Currently, only instances of AVAssetWriter configured to write files of type AVFileTypeQuickTimeMovie can be used to write tracks that are not self-contained.

Since no sample data is ever returned by instances of AVAssetReaderSampleReferenceOutput, the value of the alwaysCopiesSampleData property is ignored.

Available on Mac OS X 10.10 or newer.
Subclass of the AVAssetReaderOutputMBS class.

### 16.8.2 Methods

### 16.8.3 assetReaderSampleReferenceOutputWithTrack(track as AVAssetTrackMBS) as AVAssetReaderSampleReferenceOutputMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVAssetReaderSampleReferenceOutput for supplying sample references.
**Notes:** Track: The AVAssetTrack for which the resulting AVAssetReaderSampleReferenceOutput should provide sample references.

Returns an instance of AVAssetReaderSampleReferenceOutput.
The track must be one of the tracks contained by the target AVAssetReader's asset.

### 16.8.4 Constructor(Track as AVAssetTrackMBS)

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVAssetReaderSampleReferenceOutput for supplying sample references.
**Notes:** Track: The AVAssetTrack for which the resulting AVAssetReaderSampleReferenceOutput should provide sample references.

The track must be one of the tracks contained by the target AVAssetReader's asset.

### 16.8.5 Properties

### 16.8.6 track as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** The track from which the receiver extracts sample references.
**Notes:** The value of this property is an AVAssetTrack owned by the target AVAssetReader's asset.
(Read only property)

## 16.9 class AVAssetReaderTrackOutputMBS

### 16.9.1 class AVAssetReaderTrackOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVAssetReaderTrackOutput defines an interface for reading media data from a single AVAsset-Track object of an asset reader's asset.
**Notes:** You can read the media data of an asset track by adding an instance of AVAssetReaderTrackOutput to an asset reader using the AVAssetReader's addOutput method. The samples in the track can be read in read in the format in which they are stored in the asset, or can be converted to a different format.
Subclass of the AVAssetReaderOutputMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr5

### 16.9.2 Methods

### 16.9.3 assetReaderTrackOutputWithTrack(track as AVAssetTrackMBS, output-Settings as dictionary) as AVAssetReaderTrackOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset reader wrapping a specified track, with optional output settings.
**Notes:** track: The track from which the reader should source sample buffers.
outputSettings: A dictionary of output settings to be used for sample output. Pass nil to receive samples as stored in the track.
You use keys from one of AVAudioSettings.h, AVVideoSettings.h, or <CoreVideo/CVPixelBuffer.h>, depending on the media type and the output format you want.
Initialization fails if the output settings cannot be used with the specified track.
Those keys are available in AVFoundationMBS class.

### 16.9.4 Constructor(track as AVAssetTrackMBS, outputSettings as dictionary)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset reader to wrap a specified track, with optional output settings.
**Notes:** track: The track from which the reader should source sample buffers.
outputSettings: A dictionary of output settings to be used for sample output. Pass nil to receive samples as stored in the track.
You use keys from one of AVAudioSettings.h, AVVideoSettings.h, or <CoreVideo/CVPixelBuffer.h>, depending on the media type and the output format you want.
Initialization fails if the output settings cannot be used with the specified track.
Those keys are available in AVFoundationMBS class.

### 16.9.5 outputSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The output settings used by the output. (read-only)
**Notes:** The value is a dictionary that contains values for keys from either AVAudioSettings.h (linear PCM only) for audio tracks or <CoreVideo/CVPixelBuffer.h>for video tracks. A value of nil indicates that the output will return samples in their original format as stored in the target track.
Those keys are available in AVFoundationMBS class.

### 16.9.6 track as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The track from which the receiver reads sample buffers. (read-only)

### 16.9.7 Properties

### 16.9.8 audioTimePitchAlgorithm as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The processing algorithm used to manage audio pitch for scaled audio edits.
**Notes:** The supported constants are defined in Time Pitch Algorithm Settings.
An NSInvalidArgumentException will be raised if this property is set to a value other than the defined constants.
Available in OS X v10.9 and later.
(Read and Write computed property)

## 16.10 class AVAssetReaderVideoCompositionOutputMBS

### 16.10.1 class AVAssetReaderVideoCompositionOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVAssetReaderVideoCompositionOutput is a subclass of AVAssetReaderOutput you use to read video frames that have been composited together from the frames in one or more tracks of an AVAssetReader object's asset.
**Notes:** You can read the video frames composited from one or more asset tracks by adding an instance of AVAssetReaderVideoCompositionOutput to an AVAssetReader object using the addOutput method.
Subclass of the AVAssetReaderOutputMBS class.

### 16.10.2 Methods

### 16.10.3 assetReaderVideoCompositionOutputWithVideoTracks(videoTracks() as AVAssetTrackMBS, videoSettings as dictionary) as AVAssetReaderVideoCompositionOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVAssetReaderVideoCompositionOutput for reading composited video from the specified video tracks, using optional video settings.
**Notes:** videoTracks: An array of AVAssetTrack objects from which the created object should read video frames for compositing.
It is an error to include tracks of media types other than AVMediaTypeVideo.
videoSettings: A dictionary of video settings to be used for sample output, or nil if you want to receive decoded samples in a convenient uncompressed format, with properties determined according to the properties of the specified video tracks.
You use keys from <CoreVideo/CVPixelBuffer.h>, depending on the output format you want.
Initialization will fail if the video settings cannot be used with the specified video tracks.

Return san instance of AVAssetReaderVideoCompositionOutput wrapping videoTracks, using the settings specified by videoSettings, or nil if initialization failed.

### 16.10.4 Constructor(videoTracks() as AVAssetTrackMBS, videoSettings as dictionary)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVAssetReaderVideoCompositionOutput for reading composited video from the specified video tracks, using optional video settings.
**Notes:** videoTracks: An array of AVAssetTrack objects from which the created object should read video

frames for compositing.
It is an error to include tracks of media types other than AVMediaTypeVideo.
videoSettings: A dictionary of video settings to be used for sample output, or nil if you want to receive decoded samples in a convenient uncompressed format, with properties determined according to the properties of the specified video tracks.
You use keys from <CoreVideo/CVPixelBuffer.h>, depending on the output format you want.
Initialization will fail if the video settings cannot be used with the specified video tracks.
In that case handle property will be 0.

### 16.10.5 customVideoCompositor as AVVideoCompositingMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the custom video compositor instance used by the receiver, if any. (read-only)
**Notes:** The custom video compositor instance that is used during image generation is accessible via this property after the value of videoComposition is set to an AVVideoComposition instance that specifies a custom video compositor class. Any additional communication between the application and that instance of the custom video compositor, if any is required for configuration or other purposes, can only occur once that has happened.

If the value of videoComposition is changed from an AVVideoComposition that specifies a custom video compositor class to another instance of AVVideoComposition that specifies the same custom video compositor class, the instance of the custom video compositor that was previously created will receive the renderContextChanged message and remain in use for subsequent image generation.

This property is nil if there is no video compositor, or if the internal video compositor is in use.
Available in OS X v10.9 and later.

### 16.10.6 videoSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video settings used by the output. (read-only)
**Notes:** A value of nil indicates that the receiver will return video frames in a convenient uncompressed format, with properties determined according to the properties of the receiver's video tracks.

The dictionary's keys are from <CoreVideo/CVPixelBuffer.h>.

### 16.10.7 videoTracks as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The tracks from which the output reads composited video. (read-only)
**Notes:** The array contains AVAssetTrack objects owned by the target asset reader's asset.

### 16.10.8 Properties

### 16.10.9 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video composition to use for the output.
**Notes:** The value is an AVVideoComposition object that can be used to specify the visual arrangement of video frames read from each source track over the timeline of the source asset.

See AVVideoComposition for options for configuring a video composition.
(Read and Write computed property)

## 16.11 class AVAssetResourceLoaderMBS

### 16.11.1 class AVAssetResourceLoaderMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The asset resource loader class.
**Notes:** An AVAssetResourceLoader object mediates resource requests from an AVURLAsset object with a delegate object that you provide. When a request arrives, the resource loader asks your delegate if it is able to handle the request and reports the results back to the asset.

You do not create resource loader objects yourself. Instead, you retrieve a resource loader from the resourceLoader property of an AVURLAsset object and use it to assign your custom delegate object.

The delegate you associate with this object must adopt the AVAssetResourceLoaderDelegate protocol. For more information, see AVAssetResourceLoaderDelegate Protocol Reference.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.11.2 Methods

### 16.11.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 and newer.

### 16.11.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.11.5 Properties

### 16.11.6 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.12 class AVAssetResourceLoadingContentInformationRequestMBS

### 16.12.1 class AVAssetResourceLoadingContentInformationRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVAssetResourceLoadingContentInformationRequest class represents a query for essential information about a resource referenced by an asset resource loading request.
**Notes:** The event AVFoundationMBS.resourceLoaderShouldWaitForLoadingOfRequestedResource is invoked and accepts responsibility for loading the resource it must check whether the contentInformationRequest property of the AVAssetResourceLoadingRequest is not nil. Whenever the value is not nil, the request includes a query for the information that AVAssetResourceLoadingContentInformationRequest encapsulates. In response to such queries, the resource loading delegate should set the values of the content information request's properties appropriately before invoking the AVAssetResourceLoadingRequest method finishLoading.

When finishLoading is invoked, the values of the properties of its contentInformationRequest property will, in part, determine how the requested resource is processed. For example, if the requested resource's URL is the URL of an AVURLAsset and contentType is set by the resource loading delegate to a value that the underlying media system doesn't recognize as a supported media file type, operations on the AVURLAsset, such as playback, are likely to fail.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.12.2 Methods

### 16.12.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 and newer.

### 16.12.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.12.5 Properties

### 16.12.6 ByteRangeAccessSupported as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether random access to arbitrary ranges of bytes of the resource is supported.
**Notes:** Before finishing loading an AVAssetResourceLoadingRequest instance, if its contentInformationRequest property is not nil, set the value of this property to true if it supports random access to arbitrary ranges of bytes of the resource.

If this property is not true for resources that must be loaded incrementally, loading of the resource may fail. Such resources include anything that contains media data.

If byte range access is supported portions of the resource can be requested more than once.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.12.7 contentLength as Int64

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The length, in bytes, of the requested resource.
**Notes:** Before finishing loading an AVAssetResourceLoadingRequest instance, if its contentInformationRequest property is not nil, set the value of the contentLength property to the number of bytes contained by the requested resource.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.12.8 contentType as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The UTI that specifies the type of data contained by the requested resource.
**Notes:** Before finishing loading an AVAssetResourceLoadingRequest instance, if its contentInformationRequest property is not nil, set the value of this property to a UTI indicating the type of data contained by the requested resource.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.12.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.13 class AVAssetResourceLoadingDataRequestMBS

### 16.13.1 class AVAssetResourceLoadingDataRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Use the AVAssetResourceLoadingDataRequest class to request data from a resource referenced by an AVAssetResourceLoadingRequest instance.
**Notes:** The AVAssetResourceLoaderDelegate uses the AVAssetResourceLoadingDataRequest class to do the actual data reading, and its methods will be invoked, as necessary, to acquire data for the AVAssetResourceLoadingRequest instance.

When the resource loading delegate, which implements the AVAssetResourceLoaderDelegate protocol, receives an instance of AVAssetResourceLoadingRequest as the second parameter of the delegate's resourceLoader:shouldWaitForLoadingOfRequestedResource: method, it has the option of accepting responsibility for loading the referenced resource. If it accepts that responsibility, by returning YES, it must check whether the dataRequest property of the AVAssetResourceLoadingRequest instance is not nil. If it is not nil, the resource loading delegate is informed of the range of bytes within the resource that are required by the underlying media system. In response, the data is provided by one or more invocations of respondWithData: as required to provide the requested data. The data can be provided in increments determined by the resource loading delegate according to convenience or efficiency.

When the AVAssetResourceLoadingRequest method finishLoading is invoked, the data request is considered fully satisfied. If the entire range of bytes requested has not yet been provided, the underlying media system assumes that the resource's length is limited to the provided content.

Available in OS X v10.9 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.13.2 Methods

### 16.13.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 16.13.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.13.5 respondWithData(data as MemoryBlock)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Provides data to the loading request.
**Notes:** data: An instance of NSData containing some or all of the requested bytes.

This method may be invoked multiple times on the same instance of AVAssetResourceLoadingDataRequest to provide the full range of requested data incrementally. Upon each invocation, the value of the currentOffset property is updated to match the amount of data provided.

Available in OS X v10.9 and later.

### 16.13.6 Properties

### 16.13.7 currentOffset as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The position within the resource of the next byte. (read-only)
**Notes:** When incrementally loading data you should begin loading at this offset, returning the data by invoking the respondWithData: method. Bytes previous to this value have already been provided.

Available in OS X v10.9 and later.
(Read only property)

### 16.13.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.13.9 requestedLength as Int64

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The length, in bytes, of the data requested. (read-only)

**Notes:** If the content length of the resource is unknown, the sum of the requestedLength and requestedOffset properties may be greater than the actual content length. When this situation occurs, an application must attempt to provide as much of the requested data beginning at the requestedOffset property as the resource contains. The application must then invoke either the AVAssetResourceLoadingRequest instance's finishLoading method upon success, or the finishLoadingWithError: method if an error is encountered during the loading.
Available in OS X v10.9 and later.
(Read only property)

### 16.13.10 requestedOffset as Int64

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The position within the resource of the first byte requested. (read-only)
**Notes:** When all of the requested bytes that can be provided have been loaded—including the possible contentInformationRequest data in the AVAssetResourceLoadingRequest instance that contains the receiver—the delegate should respond by invoking finishLoading.

If the requestedOffset value is beyond the content length of the resource, the AVAssetResourceLoadingRequest instance is sent a finishLoading message without any prior invocations of respondWithData.
Available in OS X v10.9 and later.
(Read only property)

## 16.14 class AVAssetResourceLoadingRequestMBS

### 16.14.1 class AVAssetResourceLoadingRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An AVAssetResourceLoadingRequest object encapsulates information about a resource request issued from a resource loader object.
**Notes:** When an AVURLAsset object needs help loading a resource, it asks its AVAssetResourceLoader object to assist. The resource loader encapsulates the request information by creating an instance of this object, which it then hands to its delegate object for processing. The delegate uses the information in this object to perform the request and report on the success or failure of the operation.
Available on Mac OS X 10.9 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.14.2 Methods

### 16.14.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 16.14.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.14.5 finishLoading

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Causes the receiver to treat the processing of the request as complete.
**Notes:** If a dataRequest is present and the resource does not contain the full extent of the data that has been requested according to the values of the requestedOffset and requestedLength properties of the request, invoke finishLoading after providing as much of the requested data as the resource contains.

Available in OS X v10.9 and later.
See also:

- 16.14.6 finishLoading(error as NSErrorMBS) 3220

### 16.14.6 finishLoading(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Causes the receiver to handle the failure to load a resource for which a resource loader's delegate took responsibility.
**Notes:** error: An error object indicating the reason for the failure.
When a resource loader's delegate takes responsibility for loading a resource, it calls this method when a failure occurred when loading the resource. This method marks the loading request as finished and notifies the resource loader object that the resource could not be loaded.
Available in OS X v10.9 and later.
See also:

- 16.14.5 finishLoading 3219

### 16.14.7 streamingContentKeyRequestDataForApp(appIdentifier as Memoryblock, contentIdentifier as Memoryblock, options as Dictionary, byref error as NSErrorMBS) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Obtains key request data for a specific combination of application and content.
**Notes:** appIdentifier: An opaque content identifier for the application. The value of this identifier depends on the particular system used to provide the decryption key.
contentIdentifier: An opaque identifier for the content. The value of this identifier depends on the particular system used to provide the decryption key.
options: Additional information necessary to obtain the key, or nil if no additional information is required.
Error: If an error occurs while obtaining the streaming content key, the pointer is set to an appropriate error object on output.

Returns the key request data that must be transmitted to the key vendor to obtain the content key.
Available in OS X v10.9 and later.

### 16.14.8 Properties

### 16.14.9 contentInformationRequest as AVAssetResourceLoadingContentInformationRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Information about the requested resource. (read-only)
**Notes:** An instance of AVAssetResourceLoadingContentInformationRequest that you populate with information about the resource. The value of this property is nil if no such information is being requested.
Available in OS X v10.9 and later.

(Read only property)

### 16.14.10 dataRequest as AVAssetResourceLoadingDataRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The range of requested resource data. (read-only)
**Notes:** An instance of AVAssetResourceLoadingDataRequest that indicates the range of resource data that's being requested. The value of this property is nil if no data is being requested.
Available in OS X v10.9 and later.
(Read only property)

### 16.14.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.14.12 isCancelled as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the request has been cancelled. (read-only)
**Notes:** True when the resource loader cancels the loading of a request, just prior to sending the message resourceLoaderDidCancelLoadingRequest to the delegate.
(Read only property)

### 16.14.13 isFinished as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether loading of the resource has finished. (read-only)
**Notes:** The value of this property is NO initially. The value changes to YES when the delegate object handling the request calls the finishLoadingWithResponse or finishLoadingWithError method.
Available in OS X v10.9 and later.
(Read only property)

### 16.14.14 redirect as Variant

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An URL request instance if the loading request was redirected.
**Notes:** Value is NSURLRequestMBS.
Set this property to an instance of NSURLRequest indicating a redirection of the loading request to another URL.
If no redirection is needed, the value of this property must be nil, which is the default.
Available in OS X v10.9 and later.
(Read only property)

### 16.14.15 request as Variant

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The URL request object for the resource. (read-only)
**Notes:** Value is NSURLRequestMBS.
Use the value in this property to identify the requested resource and to formulate an appropriate response object.
Available in OS X v10.9 and later.
(Read only property)

### 16.14.16 response as Variant

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The URL response for the loading request.
**Notes:** Value is NSURLResponseMBS.
The value of this property to an instance of NSURLResponse, indicating a response to the loading request.
If no response is needed, the value of this property is nil.
Available in OS X v10.9 and later
(Read only property)

## 16.15 class AVAssetTrackGroupMBS

### 16.15.1 class AVAssetTrackGroupMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVAssetTrackGroup class encapsulates a single group of related tracks in an asset.
**Notes:** Instances of AVAssetTrackGroup describe a single group of related alternate tracks, only one of which should be played at a time. Groups of alternate tracks typically contain variations of the same content, such as subtitles in multiple translations.

Clients can inspect the track groups contained in an asset (AVAsset) instance by loading and obtaining the value of the asset's trackGroups property.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.15.2 Methods

### 16.15.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 and newer.

### 16.15.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.15.5 copy as AVAssetTrackGroupMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the track group.

### 16.15.6 trackIDs as Integer()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The IDs of the tracks in the group. (read-only)
**Notes:** The value of this property is an array of NSNumber instances that are interpreted as CMPersistentTrackID values, one for each track in the group.
Available in OS X v10.9 and later.

### 16.15.7 Properties

### 16.15.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.16 class AVAssetTrackMBS

### 16.16.1 class AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVAssetTrack object provides provides the track-level inspection interface for all assets.
**Notes:** AVAssetTrack adopts the AVAsynchronousKeyValueLoading protocol. You should use methods in the protocol to access a track's properties without blocking the current thread. To cancel load requests for all keys of AVAssetTrack you must message the parent AVAsset object (for example, [ track.asset cancelLoading ] ).
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 15.4pr1

### 16.16.2 Methods

### 16.16.3 associatedTracksOfType(trackAssociationType as string) as AVAssetTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array containing other tracks associated with the track using the specified association type.
**Notes:** trackAssociationType: The association type for which associated tracks are requested.

Returns an array of AVAssetTrack objects associated with the track by trackAssociationType. May be empty if no tracks are associated through the specified association type.

You can call this method without blocking after availableTrackAssociationTypes has been loaded.
Available in OS X v10.9 and later.

### 16.16.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.16.5 availableMetadataFormats as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array containing the metadata formats available for the track. (read-only)
**Notes:** The array contains String objects, one for each metadata format that's available for the track (such as QuickTime user data). For possible values, see AVMetadataItem.

### 16.16.6 availableTrackAssociationTypes as string()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array of association types used to associate other tracks with the track. (read-only)
**Notes:** The array contains strings, one for each type of association for which the track has associated tracks. For possible values, see "Track Association Types" in Apple's documentation.
Available in OS X v10.9 and later.

### 16.16.7 commonMetadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVMetadataItem objects for each common metadata key for which a value is available. (read-only)

### 16.16.8 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.16.9 copy as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.16.10 formatDescriptions as CMFormatDescriptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The formats of media samples referenced by the track. (read-only)
**Notes:** The array contains CMFormatDescriptions, each of which indicates the format of media samples referenced by the track. A track that presents uniform media (for example, encoded according to the same encoding settings) will provide an array with a count of 1.

### 16.16.11 hasMediaCharacteristic(mediaCharacteristic as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the track references media with the specified media characteristic.
**Notes:** mediaCharacteristic: The media characteristic of interest.
For possible values, see "Media Characteristics" in AV Foundation Constants Reference, for example AVMediaCharacteristicVisual, AVMediaCharacteristicAudible, or AVMediaCharacteristicLegible.

Returns true if the track references media with the specified characteristic, otherwise false.

### 16.16.12 loadValuesAsynchronouslyForKeys(keys() as string, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the asset to load the values of any of the specified keys that are not already loaded.
**Notes:** keys: An array containing the required keys.

Calls AVFoundationMBS.AssetTrackLoadValuesAsynchronouslyForKeysFinished on completion.
The completion event will be invoked exactly once per invocation of this method:

- Synchronously if an I/O error or other format-related error occurs immediately.
- Asynchronously at a subsequent time if a loading error occurs at a later stage of processing, or if cancelLoading is invoked on an AVAsset instance.

The completion states of the keys you specify in keys are not necessarily the same—some may be loaded, and others may have failed. You must check the status of each key individually.

If you want to receive error reporting for loading that's still pending, you can call this method at any time—even after an asset has begun to load data for operations in progress or already completed. If a fatal error has already occurred, the completion event is invoked synchronously.

### 16.16.13 metadataForFormat(Format as string) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of metadata items, one for each metadata item in the container of the specified format.
**Notes:** format: The metadata format for which items are requested.

Returns an array of AVMetadataItem objects, one for each metadata item in the container of the format specified by format, or empty array if there is no metadata of the specified format.

You can call this method without blocking after availableMetadataFormats has been loaded.

### 16.16.14 preferredTransform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The transform specified in the track's storage container as the preferred transformation of the visual media data for display purposes. (read-only)
**Notes:** The value of this property is often, but not always, CGAffineTransformIdentity.

### 16.16.15 samplePresentationTimeForTrackTime(trackTime as CMTimeMBS) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Maps the specified track time through the appropriate time mapping and returns the resulting sample presentation time.
**Notes:** trackTime: The track time for which a sample presentation time is requested.
Returns the sample presentation time corresponding to trackTime; the value will be invalid if trackTime is out of range.

### 16.16.16 segmentForTrackTime(trackTime as CMTimeMBS) as AVAssetTrackSegmentMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The track segment that corresponds to the specified track time.
**Notes:** trackTime: The track time for which you want the segment.
Returns the track segment from the segments array that corresponds to trackTime, or nil if trackTime is out of range.

### 16.16.17 segments as AVAssetTrackSegmentMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time mappings from the track's media samples to the timeline of the track. (read-only)
**Notes:** The array contains instances of AVAssetTrackSegment.

Empty edits (that is, time ranges for which no media data is available to be presented) have source.start and source.duration equal to kCMTimeInvalid.

### 16.16.18 statusOfValueForKey(key as string, byref error as NSErrorMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Reports whether the value for a given key is immediately available without blocking. (required)
**Notes:** key: The key whose status you want.
error: If the status of the value for the key is AVKeyValueStatusFailed, upon return contains an NSError object that describes the failure that occurred.

Returns the current loading status of the value for key. For possible values, see "Protocol Methods."

You use this method to determine the availability of the value for a key. This method does not cause an asset to load the value of a key that's not yet available. To request values for keys that may not already be loaded without blocking, use loadValuesAsynchronouslyForKeys and wait for invocation of the completion handler to be informed of availability.

### 16.16.19 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range of the track within the overall timeline of the asset. (read-only)
**Notes:** A track with CMTimeCompare(timeRange.start, kCMTimeZero) == 1 will initially present an empty time range.

### 16.16.20 trackSamples(formatOptions as Dictionary) as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries the track Samples
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim tracks() as AVAssetTrackMBS = a.tracksWithMediaType(AVFoundationMBS.AVMediaTypeAudio)
dim track as AVAssetTrackMBS = tracks(0)

dim d as new Dictionary
dim n as Integer = OSTypeFromStringMBS(AVFoundationMBS.kAudioFormatLinearPCM)
d.Value(AVFoundationMBS.AVFormatIDKey) = n
d.Value(AVFoundationMBS.AVLinearPCMBitDepthKey) = 16
d.Value(AVFoundationMBS.AVLinearPCMIsBigEndianKey) = false
d.Value(AVFoundationMBS.AVLinearPCMIsFloatKey) = false
d.Value(AVFoundationMBS.AVLinearPCMIsNonInterleaved) = false

dim SampleData as MemoryBlock = track.trackSamples(d)

window1.Backdrop = RenderSamplesMBS(SampleData, SampleData.Size / 2, 1, window1.Width, window1.Height,
1, &c88B5C4, &c274C5A, &c203F4E, 15)
```

**Notes:** Returns nil in case of errors.
Track should be an audio or muxed track.

### 16.16.21 Properties

### 16.16.22 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset of which the track is a part. (read-only)
**Notes:** (Read only property)

### 16.16.23 estimatedDataRate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The estimated data rate of the media data referenced by the track, in bits per second. (read-only)
**Notes:** (Read only property)

### 16.16.24 extendedLanguageTag as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The language tag associated with the track, as an RFC 4646 language tag. (read-only)
**Notes:** The value may be nil if no language tag is indicated.
(Read only property)

### 16.16.25 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.16.26 isEnabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the track is enabled according to state stored in its container or construct. (read-only)
**Notes:** (Read only property)

### 16.16.27 isPlayable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the track is playable in the current environment. (read-only)
**Notes:** If the value of this property is true, an AVPlayerItemTrack of an AVPlayerItem initialized with the the track's asset can be enabled for playback.
Available in OS X v10.8 and later.
(Read only property)

### 16.16.28 isSelfContained as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the track references sample data only within its storage container. (read-only)
**Notes:** The value is true if the track references sample data only within its storage container, otherwise it is false.
(Read only property)

### 16.16.29 languageCode as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The language associated with the track, as an ISO 639-2/T language code. (read-only)
**Notes:** The value may be "" if no language is indicated.
(Read only property)

### 16.16.30 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The media type for the track. (read-only)
**Notes:** For possible values, see "Media Types" in AV Foundation Constants Reference.
(Read only property)

### 16.16.31 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The natural dimensions of the media data referenced by the track. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim videotracks() as AVMovieTrackMBS = m.movieTracksWithMediaCharacteristic(AVFoundationMBS.AV-
MediaCharacteristicFrameBased)

for each videotrack as AVMovieTrackMBS in videotracks
dim s as CGSizeMBS = videotrack.naturalSize
MsgBox str(s.Width)+" x "+ str(s.Height)
next
```

**Notes:** (Read only property)

### 16.16.32 naturalTimeScale as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A timescale in which time values for the track can be operated upon without extraneous numerical conversion. (read-only)

**Notes:** (Read only property)

### 16.16.33 nominalFrameRate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The frame rate of the track, in frames per second. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp4")
dim a as AVAssetMBS = AVAssetMBS.assetWithFile(f)
dim tracks() as AVAssetTrackMBS = a.tracksWithMediaCharacteristic(AVFoundationMBS.AVMediaCharacteristicFrameBased)

for each t as AVAssetTrackMBS in tracks
MsgBox str(t.nominalFrameRate)
next
```

**Notes:** (Read only property)

### 16.16.34 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The volume specified in the track's storage container as the preferred volume of the audible media data. (read-only)
**Notes:** (Read only property)

### 16.16.35 totalSampleDataLength as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The total number of bytes of sample data required by the track. (read-only)
**Notes:** (Read only property)

### 16.16.36 trackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The persistent unique identifier for this track of the asset. (read-only)

**Notes:** (Read only property)

### 16.16.37 Constants

Load Status Constants

| Constant | Value | Description |
|---|---|---|
| AVKeyValueStatusCancelled | 4 | Indicates that the attempt to load the property was cancelled. |
| AVKeyValueStatusFailed | 3 | Indicates that the attempt to load the property failed. |
| AVKeyValueStatusLoaded | 2 | Indicates that the property is ready for use. |
| AVKeyValueStatusLoading | 1 | Indicates that the property is not fully loaded. |
| AVKeyValueStatusUnknown | 0 | Indicates that the property status is unknown. |

## 16.17 class AVAssetTrackSegmentMBS

### 16.17.1 class AVAssetTrackSegmentMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVAssetTrackSegment object represents a segment of an AVAssetTrack object, comprising of a time mapping from the source to the asset track timeline.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.17.2 Methods

### 16.17.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.17.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.17.5 isEmpty as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the segment is an empty segment (read-only)
**Notes:** True if the segment is empty, otherwise false.

### 16.17.6 timeMapping as CMTimeMappingMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range of the track of the container file of the media presented by the segment. (read-only)

### 16.17.7 Properties

### 16.17.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.18 class AVAssetWriterInputGroupMBS

### 16.18.1 class AVAssetWriterInputGroupMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVAssetWriterInputGroup class associates tracks corresponding to inputs with each other in a mutually exclusive relationship.
**Notes:** This class is used to associate tracks corresponding to multiple AVAssetWriterInput instances as mutually exclusive to each other for playback or other processing.

For example, if you are creating an asset with multiple audio tracks using different spoken languages–and only one track should be played at a time–group the inputs corresponding to those tracks into a single instance of AVAssetWriterInputGroup and add the group to the AVAssetWriter instance using the AVAssetWriter method addInputGroup:. If the output format supports mutually exclusive relationships among tracks, the AVAssetWriter marks the tracks as mutually exclusive to each other.

Because the AVAssetWriterInputGroup class is a subclass of the AVMediaSelectionGroup class, clients can examine the media selection options that are available on the output asset before the asset is written. The best results for examining the options of the AVAssetWriterInputGroup are obtained after associating the AVAssetWriterInput instances of the AVAssetTrack objects as appropriate using the AVAssetWriterInput method addTrackAssociationWithTrackOfInput and by initializing each AVAssetWriterInput with a source format hint, where appropriate.
Subclass of the AVMediaSelectionGroupMBS class.

### 16.18.2 Methods

### 16.18.3 assetWriterInputGroupWithInputs(inputs() as AVAssetWriterInputMBS, defaultInput as AVAssetWriterInputMBS) as AVAssetWriterInputGroupMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates and initializes an instance of an asset writer input group.
**Notes:** inputs: An array of AVAssetWriterInput instances to be grouped together.
defaultInput: The instance of AVAssetWriterInput to designate as the default input for the group.

Returns an initialized instance of AVAssetWriterInputGroup.
When the input group is added to an AVAssetWriter instance using the addInputGroup: method, the AVAssetWriterInput property marksOutputTrackAsEnabled is automatically set to true for defaultInput and false for all of the other inputs in the group.
Available in OS X v10.9 and later.

### 16.18.4 Constructor(inputs() as AVAssetWriterInputMBS, defaultInput as AVAssetWriterInputMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Initializes an instance of an asset writer input group.
**Notes:** inputs: An array of AVAssetWriterInput instances to be grouped together.
defaultInput: The instance of AVAssetWriterInput to designate as the default input for the group.

Returns an initialized instance of AVAssetWriterInputGroup.

When the input group is added to an AVAssetWriter instance using the addInputGroup method, the AVAssetWriterInput property marksOutputTrackAsEnabled is automatically set to true for defaultInput and false for all of the other inputs in the group.
Available in OS X v10.9 and later.

### 16.18.5 inputs as AVAssetWriterInputMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The the inputs array. (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.18.6 Properties

### 16.18.7 defaultInput as AVAssetWriterInputMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The the default input object. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

## 16.19 class AVAssetWriterInputMBS

### 16.19.1 class AVAssetWriterInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVAssetWriterInput to append media samples packaged as CMSampleBuffer objects, or collections of metadata, to a single track of the output file of an AVAssetWriter object.
**Notes:** When there are multiple inputs, AVAssetWriter tries to write media data in an ideal interleaving pattern for efficiency in storage and playback. Each of its inputs signals its readiness to receive media data for writing according to that pattern via the value of readyForMoreMediaData. If readyForMoreMediaData is true, an input can accept additional media data while maintaining appropriate interleaving. If media data is appended to an input after readyForMoreMediaData becomes false, AVAssetWriter may need to write media data to its output without regard for ideal interleaving.

You can only append media data to an input while its readyForMoreMediaData property is true.

- If you're writing media data from a non-real-time source, such as an instance of AVAssetReader, you should hold off on generating or obtaining more media data to append to an input when the value of readyForMoreMediaData is false. To help with control of the supply of non-real-time media data, you can use requestMediaDataWhenReadyOnQueue:usingBlock: to specify a block that the input should invoke whenever it's ready for input to be appended.
- If you're writing media data from a real-time source, you should set the input's expectsMediaDataInRealTime property to true to ensure that the value of readyForMoreMediaData is calculated appropriately. When expectsMediaDataInRealTime is true, readyForMoreMediaData will become false only when the input cannot process media samples as quickly as they are being provided by the client. If readyForMoreMediaData becomes false for a real-time source, the client may need to drop samples or consider reducing the data rate of appended samples.

The value of readyForMoreMediaData will often change from false to true asynchronously, as previously-supplied media data is processed and written to the output. It is possible for all of an asset writer's inputs temporarily to return false for readyForMoreMediaData.
**Xojo Developer Magazine**

- 12.2, page 47: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.19.2 Methods

### 16.19.3 addTrackAssociationWithTrackOfInput(input as AVAssetWriterInputMBS, trackAssociationType as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Associates the track corresponding to the specified input with the track corresponding with the receiver.
**Notes:** input: The instance of AVAssetWriterInput with a corresponding track to associate with track corresponding with the receiver.
trackAssociationType: The type of track association to add. Common track association types, such as AVTrackAssociationTypeTimecode are defined in Track Association Types.

If the type of association requires tracks of specific media types that don't match the media types of the inputs, or if the output file type does not support track associations, an NSInvalidArgumentException is raised.

Note: Track associations cannot be added after writing on the receiver's AVAssetWriter instance has started.
Available in OS X v10.9 and later.

### 16.19.4 appendSampleBuffer(sampleBuffer as CMSampleBufferMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Appends samples to the receiver.
**Notes:** sampleBuffer: The CMSampleBuffer to be appended.

Returns true if sampleBuffer as appended successfully, otherwise false.

The timing information in the sample buffer, considered relative to the time passed to the asset writer's startSessionAtSourceTime: will be used to determine the timing of those samples in the output file.

Do not modify sampleBuffer or its contents after you have passed it to this method.

### 16.19.5 assetWriterInputWithMediaType(MediaType as string, outputSettings as dictionary = nil) as AVAssetWriterInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new input of the specified media type to receive sample buffers for writing to the output file.
**Notes:** mediaType: The media type of samples that will be accepted by the input.
Media types are defined in AVMediaFormat.h.
outputSettings: The settings used for encoding the media appended to the output. Pass nil to specify that appended samples should not be re-encoded.
Audio output settings keys are defined in AVAudioSettings.h. Video output settings keys are defined in AVVideoSettings.h. Video output settings with keys from <CoreVideo/CVPixelBuffer.h>are not currently supported.

Returns a new input of the specified media type to receive sample buffers for writing to the output file.

Each new input accepts data for a new track of the asset writer's output file. You add an input to an asset writer using the AVAssetWriter method addInput:.

Passing nil for outputSettings instructs the input to pass through appended samples, doing no processing before they are written to the output file. This is useful if, for example, you are appending buffers that are already in a desirable compressed format. However, passthrough is currently supported only when writing to QuickTime Movie files (i.e. the AVAssetWriter was initialized with AVFileTypeQuickTimeMovie). For other file types, you must specify non-nil output settings.
See also:

- 16.19.6 assetWriterInputWithMediaType(MediaType as string, outputSettings as dictionary, sourceFormatHint as CMFormatDescriptionMBS) as AVAssetWriterInputMBS 3241

### 16.19.6 assetWriterInputWithMediaType(MediaType as string, outputSettings as dictionary, sourceFormatHint as CMFormatDescriptionMBS) as AVAssetWriterInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new input of the specified media type to receive sample buffers for writing to the output file.
See also:

- 16.19.5 assetWriterInputWithMediaType(MediaType as string, outputSettings as dictionary = nil) as AVAssetWriterInputMBS 3240

### 16.19.7 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.19.8 canAddTrackAssociationWithTrackOfInput(input as AVAssetWriterInputMBS, trackAssociationType as string) as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether an association between the tracks corresponding to a pair of inputs is valid.
**Notes:** input: The instance of AVAssetWriterInput with a corresponding track to associate with track cor-

responding with the receiver.
trackAssociationType: The type of track association to test. Common track association types, such as AVTrackAssociationTypeTimecode are defined in Track Association Types.

Returns true if the track association can be added; otherwise false.

If the type of association requires tracks of specific media types that don't match the media types of the inputs, or if the output file type does not support track associations, returns NO.
Available in OS X v10.9 and later.

### 16.19.9 Constructor(MediaType as string, outputSettings as dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initialized a new input of the specified media type to receive sample buffers for writing to the output file.
**Notes:** mediaType: The media type of samples that will be accepted by the input.
Media types are defined in AVMediaFormat.h.
outputSettings: The settings used for encoding the media appended to the output. Pass nil to specify that appended samples should not be re-encoded.
Audio output settings keys are defined in AVAudioSettings.h. Video output settings keys are defined in AVVideoSettings.h. Video output settings with keys from <CoreVideo/CVPixelBuffer.h>are not currently supported.

Returns an input of the specified media type initialized to receive sample buffers for writing to the output file.

Each new input accepts data for a new track of the asset writer's output file. You add an input to an asset writer using the AVAssetWriter method addInput:.

Passing nil for outputSettings instructs the input to pass through appended samples, doing no processing before they are written to the output file. This is useful if, for example, you are appending buffers that are already in a desirable compressed format. However, passthrough is currently supported only when writing to QuickTime Movie files (i.e. the AVAssetWriter was initialized with AVFileTypeQuickTimeMovie). For other file types, you must specify non-nil output settings.
See also:

- 16.19.10 Constructor(MediaType as string, outputSettings as dictionary, sourceFormatHint as CMFormatDescriptionMBS) 

### 16.19.10 Constructor(MediaType as string, outputSettings as dictionary, sourceFormatHint as CMFormatDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initialized a new input of the specified media type to receive sample buffers for writing to the output file.
See also:

- 16.19.9 Constructor(MediaType as string, outputSettings as dictionary = nil) 3242

### 16.19.11 markAsFinished

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the writer that no more buffers will be appended to this input.
**Notes:** If you are monitoring each input's expectsMediaDataInRealTime value to keep the output file well interleaved, it is important to call this method when you have finished adding buffers to a track. This is necessary to prevent other inputs from stalling, as they may otherwise wait forever for that input's media data, attempting to complete the ideal interleaving pattern.

### 16.19.12 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The collection of track-level metadata for association with the asset and for carriage in the output file.
**Notes:** The array contains AVMetadataItem objects representing the collection of track-level metadata to be written in the output file.
See also setMetadata method.

### 16.19.13 outputSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The settings used for encoding the media appended to the output. (read-only)
**Notes:** A value of nil specifies that appended samples should not be re-encoded.

### 16.19.14 requestMediaDataWhenReadyOnQueue(assetWriterInput as AVAssetWriterInputMBS, AssetReaderOutput as AVAssetReaderOutputMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the receiver to invoke an event repeatedly, at its convenience, in order to gather media data for writing to the output.
**Notes:** This is a special version of that method where the plugin does the required work.
The plugin provides the block to do the work to copy samples from input to output.
You receive AVFoundationMBS.requestMediaDataWhenReadyOnQueueProgress events and on the end an AVFoundationMBS.requestMediaDataWhenReadyOnQueueFinished event, when assetReaderOutput.NextSampleBuffer does not provide the next buffer.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.19.15 requestMediaDataWhenReadyOnQueue(tag as Variant = nil) 3244

### 16.19.15 requestMediaDataWhenReadyOnQueue(tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the receiver to invoke an event repeatedly, at its convenience, in order to gather media data for writing to the output.
**Notes:** Calls later AVFoundationMBS.requestMediaDataWhenReadyOnQueueCompleted event.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.19.14 requestMediaDataWhenReadyOnQueue(assetWriterInput as AVAssetWriterInputMBS, AssetReaderOutput as AVAssetReaderOutputMBS, tag as Variant = nil) 3244

### 16.19.16 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the collection of track-level metadata for association with the asset and for carriage in the output file.
**Notes:** The array contains AVMetadataItem objects representing the collection of track-level metadata to be written in the output file.

You cannot set this property after writing on the receiver's asset writer has started.

### 16.19.17 sourceFormatHint as CMFormatDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A hint about the format of buffers that will be appended.
**Notes:** An AVAssetWriterInput object may be able to use this hint to fill in missing output settings or perform more upfront validation. To guarantee successful file writing, if you set this property you should ensure that subsequently-appended buffers are of the specified format. An NSInvalidArgumentException will be thrown if the media type of the format description does not match the media type of the writer input.

### 16.19.18 Properties

### 16.19.19 expectsMediaDataInRealTime as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the input should tailor its processing of media data for real-time sources.
**Notes:** If you are appending media data to an input from a real-time source, such as an AVCaptureOutput, you should set expectsMediaDataInRealTime to true. This will ensure that readyForMoreMediaData is calculated appropriately for real-time usage.
(Read and Write property)

### 16.19.20 extendedLanguageTag as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Language tag to associate with the track corresponding to the receiver.
**Notes:** The value is specified as an RFC 4646 language tag; can be nil in which case no tag is written to the track.

Extended language tags are normally set only when an ISO 639-2/T language code by itself is ambiguous, as in cases in which media data should be distinguished not only by language but also by the regional dialect in use or the writing system employed.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.19.21 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.19.22 isReadyForMoreMediaData as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the readiness of the input to accept more media data. (read-only)
**Notes:** This property is observable using key-value observing (see Key-Value Observing Programming Guide). Observers should not assume that they will be notified of changes on a specific thread.
(Read only property)

### 16.19.23 languageCode as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Language to associate with the track corresponding to the receiver.
**Notes:** The value is specified as an ISO 639-2/T language code; can be nil in which case no language code is written to the track..
Available in OS X v10.9 and later.
(Read and Write property)

### 16.19.24 marksOutputTrackAsEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns whether the receiver's track is enabled.
**Notes:** For file types that support enabled and disabled tracks, such as QuickTime Movie files, specifies whether the track corresponding to the receiver should be enabled by default for playback and processing.

The default value is true.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.19.25 mediaTimeScale as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies the media time scale to be used.
**Notes:** For file types that support media time scales, such as QuickTime Movie files, specifies the media time scale to be used.
The default value is 0, which indicates that you should choose a convenient value, if applicable.
You cannot set this property after writing has started.
(Read and Write property)

### 16.19.26 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The media type of the samples that can be appended to the input. (read-only)
**Notes:** The value of this property is one of the media type strings defined in AVMediaFormat.
(Read only property)

### 16.19.27 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Size specified in the output file as the natural dimensions of the visual media data for display.
**Notes:** If the default value, (0,0), is specified, the naturalSize of the track corresponding to the receiver is set according to dimensions indicated by the format descriptions that are ultimately written to the output track.

Note: This property cannot be set after writing on the receiver's AVAssetWriter has started.
Available in OS X v10.9 and later.
(Read only property)

### 16.19.28 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Preferred volume level to be stored in the output file.
**Notes:** The value for this property should typically be in the range of 0.0 to 1.0.
The default value is 1.0, which is equivalent to a "normal" volume level.

Note: This property cannot be set after writing on the receiver's AVAssetWriter has started.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.19.29 transform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The transform specified in the output file as the preferred transformation of the visual media data for display purposes.
**Notes:** If no value is specified, the identity transform is used.
(Read and Write computed property)

## 16.20 class AVAssetWriterInputPixelBufferAdaptorMBS

### 16.20.1 class AVAssetWriterInputPixelBufferAdaptorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVAssetWriterInputPixelBufferAdaptor to append video samples packaged as CVPixelBuffer objects to a single AVAssetWriterInput object.
**Notes:** Instances of AVAssetWriterInputPixelBufferAdaptor provide a CVPixelBufferPool that you can use to allocate pixel buffers for writing to the output file. Using the provided pixel buffer pool for buffer allocation is typically more efficient than appending pixel buffers allocated using a separate pool.
**Blog Entries**

- JPEGs to Movie
- MBS Xojo / Real Studio Plugins, version 15.2pr9
- MBS Xojo / Real Studio Plugins, version 15.2pr2

**Xojo Developer Magazine**

- 12.2, page 47: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.20.2 Methods

### 16.20.3 appendPicture(pic as picture, presentationTime as CMTimeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Appends a picture to the receiver.
**Notes:** Internally creates a copy of the picture to create a PixelBuffer and calls appendPixelBuffer.
Works in Cocoa and Carbon. Using appendPixelBuffer directly with PixelBuffer objects may be more efficient depending on what your app does.

### 16.20.4 appendPixelBuffer(pixelBuffer as CVPixelBufferMBS, presentationTime as CMTimeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Appends a pixel buffer to the receiver.
**Notes:** pixelBuffer: The CVPixelBuffer to be appended.
presentationTime: The presentation time for the pixel buffer to be appended. This time will be considered relative to the time passed to AVAssetWriter.startSessionAtSourceTime to determine the timing of the frame

in the output file.

Returns true if the pixel buffer was successfully appended, otherwise false.

If the operation was unsuccessful, you might invoke the AVAssetWriter object's finishWriting method in order to save a partially completed asset.
Do not modify a CVPixelBuffer or its contents after you have passed it to this method.

### 16.20.5 assetWriterInput as AVAssetWriterInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset writer input to which the adaptor should append pixel buffers. (read-only)

### 16.20.6 assetWriterInputPixelBufferAdaptorWithAssetWriterInput(input as AVAssetWriterInputMBS, sourcePixelBufferAttributes as dictionary) as AVAssetWriterInputPixelBufferAdaptorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new pixel buffer adaptor to receive pixel buffers for writing to the output file.
**Notes:** input: The asset writer input to which the receiver should append pixel buffers.
Currently, only asset writer inputs that accept media data of type AVMediaTypeVideo can be used to initialize a pixel buffer adaptor.
It is an error to pass a sample buffer input that is already attached to another instance of AVAssetWriterInputPixelBufferAdaptor.

sourcePixelBufferAttributes: The attributes of pixel buffers that will be vended by the input's CVPixelBufferPool.
Pixel buffer attributes keys for the pixel buffer pool are defined in <CoreVideo/CVPixelBuffer.h>. To take advantage of the improved efficiency of appending buffers created from the adaptor's pixel buffer pool, you should specify pixel buffer attributes that most closely accommodate the source format of the video frames being appended.
Pass nil if you do not need a pixel buffer pool for allocating buffers.

Returns a new pixel buffer adaptor to receive pixel buffers for writing to the output file.

To specify the pixel format type, the pixelBufferAttributes dictionary should contain a value for kCVPixelBufferPixelFormatTypeKey. For example, use kCVPixelFormatType_32BGRA as Integer for 8-bit-per-channel BGRA, or use kCVPixelFormatType_420YpCbCr8BiPlanarVideoRange as Integer for 2-plane YCbCr.

### 16.20.7 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.20.8 Constructor(input as AVAssetWriterInputMBS, sourcePixelBufferAttributes as dictionary)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a new pixel buffer adaptor to receive pixel buffers for writing to the output file.
**Notes:** input: The asset writer input to which the receiver should append pixel buffers.
Currently, only asset writer inputs that accept media data of type AVMediaTypeVideo can be used to initialize a pixel buffer adaptor.
It is an error to pass a sample buffer input that is already attached to another instance of AVAssetWriterInputPixelBufferAdaptor.

sourcePixelBufferAttributes: The attributes of pixel buffers that will be vended by the input's CVPixelBufferPool.
Pixel buffer attributes keys for the pixel buffer pool are defined in <CoreVideo/CVPixelBuffer.h>. To take advantage of the improved efficiency of appending buffers created from the adaptor's pixel buffer pool, you should specify pixel buffer attributes that most closely accommodate the source format of the video frames being appended.
Pass nil if you do not need a pixel buffer pool for allocating buffers.

Returns a new pixel buffer adaptor to receive pixel buffers for writing to the output file.

To specify the pixel format type, the pixelBufferAttributes dictionary should contain a value for kCVPixelBufferPixelFormatTypeKey. For example, use kCVPixelFormatType_32BGRA as Integer for 8-bit-per-channel BGRA, or use kCVPixelFormatType_420YpCbCr8BiPlanarVideoRange as Integer for 2-plane YCbCr.

### 16.20.9 sourcePixelBufferAttributes as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The pixel buffer attributes of pixel buffers that will be vended by the adaptor's CVPixelBufferPool. (read-only)
**Notes:** The value of this property is a dictionary containing pixel buffer attributes keys defined in <CoreVideo/CVPixelBuffer.h>.

### 16.20.10 Properties

### 16.20.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.21 class AVAssetWriterMBS

### 16.21.1 class AVAssetWriterMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVAssetWriter object to write media data to a new file of a specified audiovisual container type, such as a QuickTime movie file or an MPEG-4 file, with support for automatic interleaving of media data for multiple concurrent tracks.
**Notes:** You can get the media data for one or more assets from instances of AVAssetReader or even from outside the AV Foundation API set. Media data is presented to AVAssetWriter for writing in the form of CMSampleBuffers. Sequences of sample data appended to the asset writer inputs are considered to fall within "sample-writing sessions." You must call startSessionAtSourceTime to begin one of these sessions.

Using AVAssetWriter, you can optionally re-encode media samples as they are written. You can also optionally write metadata collections to the output file.

You can only use a given instance of AVAssetWriter once to write to a single file. If you want to write to files multiple times, you must use a new instance of AVAssetWriter each time.
**Xojo Developer Magazine**

- 12.2, page 47: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.21.2 Methods

### 16.21.3 addInput(input as AVAssetWriterInputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds an input to the receiver.
**Notes:** input: The asset writer input to be added.

Inputs are created with a media type and output settings. These both must be compatible with the receiver. You cannot add inputs after writing has started.

### 16.21.4 addInputGroup(inputGroup as AVAssetWriterInputGroupMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Adds an asset writer input group instance to the asset writer.
**Notes:** inputGroup: The asset writer input group to be added.

The asset writer will mark the tracks associated with grouped inputs as mutually exclusive to each other for playback or other processing, if the output container format supports mutually exclusive relationships among tracks.
When an input group is added to an asset writer, the value of marksOutputTrackAsEnabled for the AVAssetWriterInput instance set as the default input will automatically be set to true and all other inputs in the group will be set to false.
Input groups cannot be added after writing has started.
Available in OS X v10.9 and later.

### 16.21.5 assetWriterWithFile(outputFile as folderitem, outputFileType as string, byref error as NSErrorMBS) as AVAssetWriterMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset writer for writing to the file identified by a given folderitem in a format specified by a given UTI.
**Notes:** outputFile: The location of the file to be written.
outputFileType: The UTI-identified format of the file to be written.
For example, AVFileTypeQuickTimeMovie for a QuickTime movie file, AVFileTypeMPEG4 for an MPEG-4 file, and AVFileTypeAMR for an adaptive multi-rate audio format file.
Error: If initialization of the asset writer fails, upon return contains an error object that describes the problem.

Returns an asset writer for writing to the file identified by URL in the format specified by outputFileType, or nil if the writer could not be initialized.
Writing will fail if a file already exists at URL. UTIs for container formats that can be written are declared in AVMediaFormat.h.

### 16.21.6 assetWriterWithURL(outputURL as string, outputFileType as string, byref error as NSErrorMBS) as AVAssetWriterMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset writer for writing to the file identified by a given URL in a format specified by a given UTI.
**Notes:** outputURL: The location of the file to be written. The URL must be a file URL.
outputFileType: The UTI-identified format of the file to be written.
For example, AVFileTypeQuickTimeMovie for a QuickTime movie file, AVFileTypeMPEG4 for an MPEG-4 file, and AVFileTypeAMR for an adaptive multi-rate audio format file.
Error: If initialization of the asset writer fails, upon return contains an error object that describes the problem.

Returns an asset writer for writing to the file identified by URL in the format specified by outputFileType,

or nil if the writer could not be initialized.
Writing will fail if a file already exists at URL. UTIs for container formats that can be written are declared in AVMediaFormat.h.

### 16.21.7 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.21.8 availableMediaTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The media types for which inputs can be added (read-only)
**Notes:** Some media types may not be accepted within the type of file with which the writer was initialized.

### 16.21.9 canAddInput(input as AVAssetWriterInputMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given input can be added to the receiver.
**Notes:** input: The asset writer input to be tested.

Returns true if input can be added, otherwise false.
You cannot add an input that accepts media data of a type that is not compatible with the receiver, or with output settings that are not compatible with the receiver.

### 16.21.10 canAddInputGroup(input as AVAssetWriterInputGroupMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns whether an input group can be added to the receiver.
**Notes:** inputGroup: The asset writer input group to be added.
Returns true if inputGroup can be added to the inputGroups, otherwise false.

If outputFileType specifies a container format that does not support mutually exclusive relationships among tracks, or if the specified instance of AVAssetWriterInputGroup contains inputs with media types that cannot be related, the group cannot be added.

Available in OS X v10.9 and later.

### 16.21.11 canApplyOutputSettings(outputSettings as dictionary, mediaType as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether give output settings are supported for a specified media type.
**Notes:** outputSettings: The output settings to validate.
mediaType: The media type for which the output settings are validated.

Returns true if the output settings in outputSettings are supported for mediaType, otherwise false.
You can use this method to test, for example, whether video output settings that specify H.264 compression will fail (as would be the case if the container format for which the writer was initialized does not support the carriage of H.264-compressed video).

### 16.21.12 cancelWriting

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the writer to cancel writing.
**Notes:** This method blocks until writing is canceled.

### 16.21.13 Constructor(outputFile as folderitem, outputFileType as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset writer for writing to the file identified by a given URL in a format specified by a given UTI.
**Notes:** outputFile: The location of the file to be written.
outputFileType: The UTI-identified format of the file to be written.
For example, AVFileTypeQuickTimeMovie for a QuickTime movie file, AVFileTypeMPEG4 for an MPEG-4 file, and AVFileTypeAMR for an adaptive multi-rate audio format file.
Error: If initialization of the asset writer fails, upon return contains an error object that describes the problem.

Returns an asset writer for writing to the file identified by URL in the format specified by outputFileType, or nil if the writer could not be initialized.

Writing will fail if a file already exists at URL. UTIs for container formats that can be written are declared in AVMediaFormat.h.
See also:

- 16.21.14 Constructor(outputURL as string, outputFileType as string, byref error as NSErrorMBS) 3257

### 16.21.14 Constructor(outputURL as string, outputFileType as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset writer for writing to the file identified by a given URL in a format specified by a given UTI.
**Notes:** outputURL: The location of the file to be written. The URL must be a file URL.
outputFileType: The UTI-identified format of the file to be written.
For example, AVFileTypeQuickTimeMovie for a QuickTime movie file, AVFileTypeMPEG4 for an MPEG-4 file, and AVFileTypeAMR for an adaptive multi-rate audio format file.
Error: If initialization of the asset writer fails, upon return contains an error object that describes the problem.

Returns an asset writer for writing to the file identified by URL in the format specified by outputFileType, or nil if the writer could not be initialized.

Writing will fail if a file already exists at URL. UTIs for container formats that can be written are declared in AVMediaFormat.h.
See also:

- 16.21.13 Constructor(outputFile as folderitem, outputFileType as string, byref error as NSErrorMBS) 3256

### 16.21.15 endSessionAtSourceTime(endTime as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Concludes an explicit sample-writing session.
**Notes:** endTime: The ending asset time for the sample-writing session, in the timeline of the source samples.

You may invoke this method to complete a session you began by invoking startSessionAtSourceTime.

You do not need to call this method; if you call finishWriting without calling this method, the session's effective end time will be the latest end timestamp of the session's samples (that is, no samples will be edited out at the end).

The endTime defines the moment on the timeline of source samples at which the session ends. In the case of the QuickTime movie file format, each sample-writing session's startTime,Ä¶endTime pair corresponds to a period of movie time into which the session's samples are inserted. Samples with later timestamps will be still be added to the media but will be edited out of the movie. So if the first session has duration D1 = endTime - startTime, it will be inserted into the movie at movie time 0 through D1; the second session would be inserted into the movie at movie time D1 through D1+D2, and so on.

It is legal to have a session with no samples; this will cause creation of an empty edit of the prescribed duration.

### 16.21.16 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** If the receiver's status is AVAssetWriterStatusFailed, describes the error that caused the failure. (read-only)
**Notes:** The value of this property is an error object that describes what caused the receiver to no longer be able to write to its output file. If the receiver's status is not AVAssetWriterStatusFailed, the value of this property is nil.

### 16.21.17 finishWriting as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Completes the writing of the output file.
**Notes:** Returns true if writing can be finished, otherwise false.

This method blocks until writing is finished. When this method returns successfully, the file being written by the receiver is complete and ready to use. You can check the values of the status and error properties for more information on why writing could not be finished.

### 16.21.18 finishWritingWithCompletionHandler(tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Marks all unfinished inputs as finished and completes the writing of the output file.
**Notes:** Calls later AVFoundationMBS.finishWritingCompleted event.

This method returns immediately and causes its work to be performed asynchronously. To determine whether the operation succeeded, you can check the value of the status property within the handler parameter. If the status is AVAssetWriterStatusFailed, then the error property will contain an instance of NSError that

describes the failure.

To guarantee that all sample buffers are successfully written, you must ensure that all calls to appendSampleBuffer and appendPixelBuffer have returned before invoking this method.

Available in OS X v10.9 and later.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.21.19 inputGroups as AVAssetWriterInputGroupMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array of asset writer input groups that have been added to the asset writer. (read-only)
**Notes:** The value of this property is an array containing concrete instances of AVAssetWriterInputGroup. Input groups are added to the receiver using the addInputGroup method.
Available in OS X v10.9 and later.

### 16.21.20 inputs as AVAssetWriterInputMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset writer inputs associated with the asset writer. (read-only)
**Notes:** The array contains AVAssetWriterInput objects.

### 16.21.21 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The collection of metadata for association with the asset and for carriage in the output file.
**Notes:** The array contains AVMetadataItem objects.
See also SetMetaData.

### 16.21.22 movieFragmentInterval as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time to elapse between writing movie fragments.
**Notes:** This property only applies to the QuickTime movie file type.

Sometimes a write operation may be unexpectedly interrupted (because a process crashes, for example). By using movie fragments, such a partially-written QuickTime movie file can be successfully opened and played up to the largest multiple of movieFragmentInterval smaller than the point at which the write operation was interrupted.

The default value is kCMTimeInvalid, which means that movie fragments should not be used, that only a movie atom describing all of the media in the file should be written.

You cannot set the value after writing has started.

### 16.21.23 movieTimeScale as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies the asset-level time scale to be used.
**Notes:** For file types that contain a moov atom, such as QuickTime Movie files, specifies the asset-level time scale to be used.
The default value is 0, which indicates that you should choose a convenient value, if applicable.
You cannot set the value after writing has started.

### 16.21.24 outputFileType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The file format of the writer's output. (read-only)
**Notes:** The format is identified by the UTI, specified when the writer is initialized.

### 16.21.25 outputURL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL to which output is directed. (read-only)
**Notes:** The URL is the same as that specified when the writer is initialized.

### 16.21.26 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Set the collection of metadata for association with the asset and for carriage in the output file.
**Notes:** The array contains AVMetadataItem objects.
You cannot set the value after writing has started.

### 16.21.27 shouldOptimizeForNetworkUse as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the output file should be written in way that makes it more suitable for playback over a network.
**Notes:** When the value of this property is true, the output file will be written in such a way that playback can start after only a small amount of the file is downloaded.

The default value is false.
You cannot set the value after writing has started.

### 16.21.28 startSessionAtSourceTime(startTime as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initiates a sample-writing session for the output asset.
**Notes:** startTime: The starting asset time for the sample-writing session, in the timeline of the source samples.

Sequences of sample data appended to the asset writer inputs are considered to fall within "sample-writing sessions." You must call this method to begin one of these sessions.

Each writing session has a start time which, where allowed by the file format being written, defines the mapping from the timeline of source samples onto the file's timeline. In the case of the QuickTime movie file format, the first session begins at movie time 0, so a sample appended with timestamp T will be played at movie time (T-startTime). Samples with timestamps before startTime will still be added to the output media but will be edited out of the movie. If the earliest buffer for an input is later than startTime, an empty edit will be inserted to preserve synchronization between tracks of the output asset.

It is an error to invoke this method twice in a row without invoking endSessionAtSourceTime in between.

### 16.21.29 startWriting as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the writer to start writing its output.
**Notes:** Returns true if writing can be started, otherwise false.

You must call this method after all inputs have added and other configuration properties have been set to tell the receiver to prepare for writing. After invoking this method, you can start writing sessions using startSessionAtSourceTime and can write media samples using the methods provided by each of the writer's inputs.

status signals the terminal state of the asset reader, and if a failure occurs, error describes the failure.

### 16.21.30 status as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The status of writing samples to the receiver's output file. (read-only)
**Notes:** The value of this property is an AVAssetWriterStatus constant that indicates whether writing is in progress, has completed successfully, has been canceled, or has failed. If an attempt to append samples fails, you can check the value of this property to determine why no more samples could be written.

### 16.21.31 Properties

### 16.21.32 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.21.33 Constants

Status Constants

| Constant | Value | Description |
|---|---|---|
| AVAssetWriterStatusCancelled | 4 | Cancelled |
| AVAssetWriterStatusCompleted | 2 | Completed |
| AVAssetWriterStatusFailed | 3 | Failed |
| AVAssetWriterStatusUnknown | 0 | Unknown |
| AVAssetWriterStatusWriting | 1 | Writing |

## 16.22 class AVAsynchronousVideoCompositionRequestMBS

### 16.22.1 class AVAsynchronousVideoCompositionRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An AVAsynchronousVideoCompositionRequest instance contains the information necessary for a video compositor to render an output pixel buffer.
**Notes:** The video compositor must implement the AVVideoCompositing protocol.
Available in OS X v10.9 and later.

### 16.22.2 Methods

### 16.22.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9.

### 16.22.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.22.5 copy as AVAsynchronousVideoCompositionRequestMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.22.6 finishCancelledRequest

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Invoked by the custom compositor when the composition request was canceled.
**Notes:** Available in OS X v10.9 and later.

### 16.22.7 finishWithComposedVideoFrame(composedVideoFrame as CVPixelBufferMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Invoked by the custom compositor when the composition request succeeded.
**Notes:** composedVideoFrame: The successfully composed pixel buffer.
Available in OS X v10.9 and later.

### 16.22.8 finishWithError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Invoked by the custom compositor when the composition request failed.
**Notes:** error: Returns the error encountered during the compositing.
Available in OS X v10.9 and later.

### 16.22.9 sourceFrameByTrackID(trackID as Integer) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the source pixel buffer for the specified track ID.
**Notes:** trackID: The track ID for the requested source frame.
Returns the source CVPixelBufferRef for trackID.
Available in OS X v10.9 and later.

### 16.22.10 sourceTrackIDs as Integer()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The track IDs of all the source buffers that are available to compose the frame. (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.22.11 Properties

### 16.22.12 compositionTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The time for which the frame should be composed. (read-only)
**Notes:** Available in OS X v10.9 and later.

(Read only property)

### 16.22.13 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.22.14 renderContext as AVVideoCompositionRenderContextMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The video composition render context making the request. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.22.15 videoCompositionInstruction as AVVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The video composition instruction to use to compose the frame. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

## 16.23 class AVAudioMixInputParametersMBS

### 16.23.1 class AVAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVAudioMixInputParameters object represents the parameters that should be applied to an audio track when it is added to a mix.
**Notes:** Audio volume is currently supported as a time-varying parameter. AVAudioMixInputParameters has a mutable subclass, AVMutableAudioMixInputParameters.

You use an instance AVAudioMixInputParameters to apply audio volume ramps for an input to an audio mix. Mix parameters are associated with audio tracks via the trackID property.

Before the first time at which a volume is set, a volume of 1.0 used; after the last time for which a volume has been set, the last volume is used. Within the time range of a volume ramp, the volume is interpolated between the start volume and end volume of the ramp. For example, setting the volume to 1.0 at time 0 and also setting a volume ramp from a volume of 0.5 to 0.2 with a timeRange of [ 4.0, 5.0 ] results in an audio volume parameters that hold the volume constant at 1.0 from 0.0 sec to 4.0 sec, then cause it to jump to 0.5 and descend to 0.2 from 4.0 sec to 9.0 sec, holding constant at 0.2 thereafter.

### 16.23.2 Methods

### 16.23.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.23.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.

### 16.23.5 copy as AVAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.23.6 getVolumeRampForTime(time as CMTimeMBS, byref startVolume as Double, byref endVolume as Double, byref timeRange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Obtains the volume ramp that includes the specified time.
**Notes:** time: If a ramp with a time range that contains the specified time has been set, information about the effective ramp for that time is supplied. Otherwise, information about the first ramp that starts after the specified time is supplied.
startVolume: A variable to receive the starting volume value for the volume ramp.
endVolume: A variable to receive the ending volume value for the volume ramp.
timeRange: A variable to a CMTimeRange to receive the time range of the volume ramp.

Returns true if the values were retrieved successfully, otherwise false. Returns false if time is beyond the duration of the last volume ramp that has been set.

### 16.23.7 mutableCopy as AVMutableAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the object.

### 16.23.8 trackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The ID of the audio track to which the parameters should be applied. (read-only)

### 16.23.9 Properties

### 16.23.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.24 class AVAudioMixMBS

### 16.24.1 class AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVAudioMix object manages the input parameters for mixing audio tracks.
**Notes:** It allows custom audio processing to be performed on audio tracks during playback or other operations.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr1

### 16.24.2 Methods

### 16.24.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.24.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.24.5 copy as AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.24.6 inputParameters as AVAudioMixInputParametersMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The parameters for inputs to the mix (read-only)
**Notes:** The array contains instances of AVAudioMixInputParameters. Note that an instance of AVAudioMixInputParameters is not required for each audio track that contributes to the mix; audio for those

without associated AVAudioMixInputParameters objects will be included in the mix, processed according to default behavior.

### 16.24.7 mutableCopy as AVMutableAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy.

### 16.24.8 Properties

### 16.24.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.25 class AVAudioPlayerMBS

### 16.25.1 class AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An instance of the AVAudioPlayer class, called an audio player, provides playback of audio data from a file or memory.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp3")
dim e as NSErrorMBS
dim u as new AVAudioPlayerMBS(f,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox str(u.duration)+" seconds"
end if
```

**Notes:** Apple recommends that you use this class for audio playback unless you are playing audio captured from a network stream or require very low I/O latency. For an overview of audio technologies, see Audio & Video Starting Point and "Using Audio" in Multimedia Programming Guide.

Using an audio player you can:

- Play sounds of any duration
- Play sounds from files or memory buffers
- Loop sounds
- Play multiple sounds simultaneously, one sound per audio player, with precise synchronization
- Control relative playback level, stereo positioning, and playback rate for each sound you are playing
- Seek to a particular point in a sound file, which supports such application features as fast forward and rewind
- Obtain data you can use for playback-level metering

The AVAudioPlayer class lets you play sound in any audio format available in OS X. The plugin provides the events for this audio player in AVFoundationMBS class.

To play, pause, or stop an audio player, call one of its playback control methods, described in "Configuring and Controlling Playback."

To configure an appropriate audio session for playback, refer to AVAudioSession Class Reference and AVAudioSessionDelegate Protocol Reference. To learn how your choice of file formats impacts the simultaneous playback of multiple sounds, refer to "iPhone Hardware and Software Audio Codecs" in Multimedia Programming Guide.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr6
- MBS Xojo Plugins, version 18.2pr8
- MBS Xojo / Real Studio Plugins, version 14.5pr4
- MBS Xojo / Real Studio Plugins, version 14.2pr4

**Xojo Developer Magazine**

- 16.5, page 9: News
- 12.2, page 46: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.25.2 Methods

### 16.25.3 audioPlayerWithData(Data as MemoryBlock, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated memory buffer.
**Notes:** data: A block of data containing a sound to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: Pass in the address of a nil-initialized NSError object. If an error occurs, upon return the NSError object describes the error. If you do not want error information, pass in NULL.

On success, you get an initialized AVAudioPlayer object. Else the handle property is 0 and the Error parameter contains a code that describes the problem.
See also:


- 16.25.4 audioPlayerWithData(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272
- 16.25.5 audioPlayerWithData(Data as String, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272
- 16.25.6 audioPlayerWithData(Data as String, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3273

### 16.25.4 audioPlayerWithData(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified data and file type hint.
**Notes:** data: The data object containing the audio.
fileTypeHintUtiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs.
error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that data that may possibly be corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without filetypehint on older versins.
See also:

- 16.25.3 audioPlayerWithData(Data as MemoryBlock, byref error as NSErrorMBS) as AVAudioPlayerMBS 3271
- 16.25.5 audioPlayerWithData(Data as String, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272
- 16.25.6 audioPlayerWithData(Data as String, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3273

### 16.25.5 audioPlayerWithData(Data as String, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated memory buffer.
**Notes:** data: A block of data containing a sound to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: Pass in the address of a nil-initialized NSError object. If an error occurs, upon return the NSError object describes the error. If you do not want error information, pass in NULL.

On success, you get an initialized AVAudioPlayer object. Else the handle property is 0 and the Error parameter contains a code that describes the problem.
See also:

- 16.25.3 audioPlayerWithData(Data as MemoryBlock, byref error as NSErrorMBS) as AVAudioPlayerMBS 3271
- 16.25.4 audioPlayerWithData(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272

- 16.25.6 audioPlayerWithData(Data as String, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3273


### 16.25.6 audioPlayerWithData(Data as String, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified data and file type hint.
**Notes:** data: The data object containing the audio.
fileTypeHintUtiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs.
error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that data that may possibly be corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without filetypehint on older versins.
See also:


- 16.25.3 audioPlayerWithData(Data as MemoryBlock, byref error as NSErrorMBS) as AVAudioPlayerMBS 3271
- 16.25.4 audioPlayerWithData(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272
- 16.25.5 audioPlayerWithData(Data as String, byref error as NSErrorMBS) as AVAudioPlayerMBS 3272


### 16.25.7 audioPlayerWithFile(File as folderitem, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated sound file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp3")
dim e as NSErrorMBS
dim u as AVAudioPlayerMBS.audioPlayerWithFile(f,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox str(u.duration)+" seconds"
end if
```

**Notes:** File: A folderitem identifying the sound file to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: If an error occurs, upon return the NSError object describes the error..

On success, you have an initialized AVAudioPlayer object. On failure, the Error parameter contains a code that describes the problem.
See also:

- 16.25.8 audioPlayerWithFile(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3274

### 16.25.8 audioPlayerWithFile(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified URL and file type hint.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio.
utiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs. See AVFileType* strings.
Error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that files which are not self identifying, or possibly even corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without hint for older versions.
See also:

- 16.25.7 audioPlayerWithFile(File as folderitem, byref error as NSErrorMBS) as AVAudioPlayerMBS 3273

### 16.25.9 audioPlayerWithURL(URL as string, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated sound file.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: If an error occurs, upon return the NSError object describes the error..

On success, you have an initialized AVAudioPlayer object. On failure, the Error parameter contains a code that describes the problem.
See also:

- 16.25.10 audioPlayerWithURL(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3275

### 16.25.10 audioPlayerWithURL(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified URL and file type hint.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio.
utiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs. See AVFileType* strings.
Error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that files which are not self identifying, or possibly even corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without hint for older versions.
See also:

- 16.25.9 audioPlayerWithURL(URL as string, byref error as NSErrorMBS) as AVAudioPlayerMBS 3274

### 16.25.11 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.25.12 averagePowerForChannel(channel as Integer) as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the average power for a given channel, in decibels, for the sound being played.
**Notes:** channelNumber: The audio channel whose average power value you want to obtain. Channel numbers are zero-indexed. A monaural signal, or the left channel of a stereo signal, has channel number 0.

Returns a floating-point representation, in decibels, of a given audio channel's current average power. A return value of 0 dB indicates full scale, or maximum power; a return value of -160 dB indicates minimum power (that is, near silence).

If the signal provided to the audio player exceeds ¬±full scale, then the return value may exceed 0 (that is, it may enter the positive range).

To obtain a current average power value, you must call the updateMeters method before calling this method.

### 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated memory buffer.
**Notes:** data: A block of data containing a sound to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: Pass in the address of a nil-initialized NSError object. If an error occurs, upon return the NSError object describes the error. If you do not want error information, pass in NULL.

On success, you get an initialized AVAudioPlayer object. Else the handle property is 0 and the Error parameter contains a code that describes the problem.
See also:


- 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3276
- 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS) 3277
- 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3278
- 16.25.17 Constructor(URL as string, byref error as NSErrorMBS) 3278
- 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3279


### 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified data and file type hint.
**Notes:** data: The data object containing the audio.
fileTypeHintUtiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs.

error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that data that may possibly be corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without filetypehint on older versins.
See also:


- 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS) 3276
- 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS) 3277
- 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3278
- 16.25.17 Constructor(URL as string, byref error as NSErrorMBS) 3278
- 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3279


### 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated sound file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp3")
dim e as NSErrorMBS
dim u as new AVAudioPlayerMBS(f,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox str(u.duration)+" seconds"
end if
```

**Notes:** File: A folderitem identifying the sound file to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: If an error occurs, upon return the NSError object describes the error..

On success, you have an initialized AVAudioPlayer object. On failure, the Error parameter contains a code that describes the problem.
See also:


- 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS) 3276

- 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3276
- 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3278
- 16.25.17 Constructor(URL as string, byref error as NSErrorMBS) 3278
- 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3279


### 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified URL and file type hint.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio.
utiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs. See AVFileType* strings.
Error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that files which are not self identifying, or possibly even corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without hint for older versions.
See also:


- 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS) 3276
- 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3276
- 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS) 3277
- 16.25.17 Constructor(URL as string, byref error as NSErrorMBS) 3278
- 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3279


### 16.25.17 Constructor(URL as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player for playing a designated sound file.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio. For a list of supported formats, see "Using Audio" in Multimedia Programming Guide.
Error: If an error occurs, upon return the NSError object describes the error..

On success, you have an initialized AVAudioPlayer object. On failure, the Error parameter contains a code that describes the problem.
See also:


- 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS) 3276
- 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3276
- 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS) 3277
- 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3278
- 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3279


### 16.25.18 Constructor(URL as string, fileTypeHintUtiString as string, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Initializes and returns an audio player using the specified URL and file type hint.
**Notes:** url: A URL identifying the sound file to play. The audio data must be in a format supported by Core Audio.
utiString: A UTI that is used as a file type hint. The supported UTIs are defined in File Format UTIs. See AVFileType* strings.
Error: If an error occurs, upon return the NSError object describes the error.

The utiString file type hint tells the parser what kind of sound data to expect so that files which are not self identifying, or possibly even corrupt, can be successfully parsed.

Available in OS X v10.9 and later, but plugin calls variant without hint for older versions.
See also:


- 16.25.13 Constructor(Data as MemoryBlock, byref error as NSErrorMBS) 3276
- 16.25.14 Constructor(Data as MemoryBlock, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3276
- 16.25.15 Constructor(File as folderitem, byref error as NSErrorMBS) 3277
- 16.25.16 Constructor(File as folderitem, fileTypeHintUtiString as string, byref error as NSErrorMBS) 3278
- 16.25.17 Constructor(URL as string, byref error as NSErrorMBS) 3278

### 16.25.19 pause

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Pauses playback; sound remains ready to resume playback from where it left off.
**Notes:** Calling pause leaves the audio player prepared to play; it does not release the audio hardware that was acquired upon calling play or prepareToPlay.

### 16.25.20 peakPowerForChannel(channel as Integer) as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the peak power for a given channel, in decibels, for the sound being played.
**Notes:** channelNumber: The audio channel whose peak power value you want to obtain. Channel numbers are zero-indexed. A monaural signal, or the left channel of a stereo signal, has channel number 0.

Returns a floating-point representation, in decibels, of a given audio channel's current peak power. A return value of 0 dB indicates full scale, or maximum power; a return value of -160 dB indicates minimum power (that is, near silence).

If the signal provided to the audio player exceeds ¬±full scale, then the return value may exceed 0 (that is, it may enter the positive range).

To obtain a current peak power value, you must call the updateMeters method before calling this method.

### 16.25.21 play as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Plays a sound asynchronously.
**Notes:** Returns true on success, or false on failure.
Calling this method implicitly calls the prepareToPlay method if the audio player is not already prepared to play.

### 16.25.22 playAtTime(time as Double = 0.0) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Plays a sound asynchronously, starting at a specified point in the audio output device's timeline.
**Example:**

```
dim p as AVAudioPlayerMBS // your player
```

```
if p.playAtTime(p.deviceCurrentTime + 5.0) then
// playing in 5 seconds
else
// failed
end if
```

**Notes:** time: The number of seconds to delay playback, relative to the audio output device's current time.

Returns true on success, or false on failure.

To learn about the virtual audio output device's timeline, read the description for the deviceCurrentTime property.
Calling this method implicitly calls the prepareToPlay method if the audio player is not already prepared to play.

### 16.25.23 prepareToPlay as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prepares the audio player for playback by preloading its buffers.
**Notes:** Returns true on success, or false on failure.

Calling this method preloads buffers and acquires the audio hardware needed for playback, which minimizes the lag between calling the play method and the start of sound output.
Calling the stop method, or allowing a sound to finish playing, undoes this setup.

### 16.25.24 stop

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Stops playback and undoes the setup needed for playback.
**Notes:** Calling this method, or allowing a sound to finish playing, undoes the setup performed upon calling the play or prepareToPlay methods.

The stop method does not reset the value of the currentTime property to 0. In other words, if you call stop during playback and then call play, playback resumes at the point where it left off.

### 16.25.25 updateMeters

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Refreshes the average and peak power values for all channels of an audio player.
**Notes:** To obtain current audio power values, you must call this method before calling averagePowerForChannel or peakPowerForChannel.

### 16.25.26 Properties

### 16.25.27 currentDevice as String

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The UID of the current audio device (as a string).
**Notes:** Available on MacOS 10.13 or newer.
Settable in v20.0 or newer.
(Read and Write property)

### 16.25.28 currentTime as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The playback point, in seconds, within the timeline of the sound associated with the audio player.
**Notes:** If the sound is playing, currentTime is the offset of the current playback position, measured in seconds from the start of the sound. If the sound is not playing, currentTime is the offset of where playing starts upon calling the play method, measured in seconds from the start of the sound.

By setting this property you can seek to a specific point in a sound file or implement audio fast-forward and rewind functions.
(Read and Write property)

### 16.25.29 data as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The data object containing the sound associated with the audio player. (read-only)
**Notes:** Returns nil if the audio player has no data (that is, if it was not initialized with an Memoryblock).
(Read only property)

### 16.25.30 deviceCurrentTime as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time value, in seconds, of the audio output device. (read-only)
**Notes:** The value of this property increases monotonically while an audio player is playing or paused.

If more than one audio player is connected to the audio output device, device time continues incrementing as long as at least one of the players is playing or paused.

If the audio output device has no connected audio players that are either playing or paused, device time reverts to 0.

Use this property to indicate "now" when calling the playAtTime instance method. By configuring multiple audio players to play at a specified offset from deviceCurrentTime, you can perform precise synchronization—as described in the discussion for that method.
(Read only property)

### 16.25.31 duration as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the total duration, in seconds, of the sound associated with the audio player. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp3")
dim e as NSErrorMBS
dim u as new AVAudioPlayerMBS(f,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox str(u.duration)+" seconds"
end if
```

**Notes:** (Read only property)

### 16.25.32 enableRate as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that specifies whether playback rate adjustment is enabled for an audio player.
**Notes:** To enable adjustable playback rate for an audio player, set this property to YES after you initialize

the player and before you call the prepareToPlay instance method for the player.
Available in OS X v10.8 and later.
(Read and Write property)

### 16.25.33 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.25.34 isPlaying as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the audio player is playing (true) or not (false). (read-only)
**Notes:** To find out when playback has stopped, use the AVFoundationMBS.audioPlayerDidFinishPlaying event.

Important: Do not poll this property (that is, do not use it inside of a loop) in an attempt to discover when playback has stopped.
(Read only property)

### 16.25.35 meteringEnabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that specifies the audio-level metering on/off state for the audio player.
**Notes:** The default value for the meteringEnabled property is off (Boolean false). Before using metering for an audio player, you need to enable it by setting this property to true.
(Read and Write property)

### 16.25.36 Name as String

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: All.

**Function:** The name of the audio file.
**Notes:** This uses the URL to pull the display name if possible, so you can show it to user or identify the player when debugging.

(Read only property)

### 16.25.37 numberOfChannels as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The number of audio channels in the sound associated with the audio player. (read-only)
**Notes:** (Read only property)

### 16.25.38 numberOfLoops as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The number of times a sound will return to the beginning, upon reaching the end, to repeat playback.
**Notes:** A value of 0, which is the default, means to play the sound once. Set a positive integer value to specify the number of times to return to the start and play again. For example, specifying a value of 1 results in a total of two plays of the sound. Set any negative integer value to loop the sound indefinitely until you call the stop method.
(Read and Write property)

### 16.25.39 pan as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The audio player's stereo pan position.
**Notes:** By setting this property you can position a sound in the stereo field. A value of –1.0 is full left, 0.0 is center, and 1.0 is full right.
(Read and Write property)

### 16.25.40 rate as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The audio player's playback rate.
**Example:**

```
dim s as sound // your sound
dim a as AVAudioPlayerMBS = s.AVAudioPlayerMBS
a.rate = 0.5
```

**Notes:** This property's default value of 1.0 provides normal playback rate. The available range is from 0.5 for half-speed playback through 2.0 for double-speed playback.

To set an audio player's playback rate, you must first enable rate adjustment as described in the enableRate property description.
Available in OS X v10.8 and later.
(Read and Write property)

### 16.25.41 settings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The audio player's settings dictionary, containing information about the sound associated with the player. (read-only)
**Notes:** An audio player's settings dictionary contains keys for the following information about the player's associated sound:

Channel layout (AVChannelLayoutKey)
Encoder bit rate (AVEncoderBitRateKey)
Audio data format (AVFormatIDKey)
Channel count (AVNumberOfChannelsKey)
Sample rate (AVSampleRateKey)

The settings keys are described in AV Foundation Audio Settings Constants.
(Read only property)

### 16.25.42 URL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL for the sound associated with the audio player. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp3")
dim e as NSErrorMBS
dim u as new AVAudioPlayerMBS(f,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox u.URL
end if
```

**Notes:** Returns "" if the audio player was not initialized with a URL.
(Read only property)

### 16.25.43 volume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The playback gain for the audio player, ranging from 0.0 through 1.0.
**Notes:** (Read and Write property)

## 16.26 class AVAudioRecorderMBS

### 16.26.1 class AVAudioRecorderMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An instance of the AVAudioRecorder class, called an audio recorder, provides audio recording capability in your application.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.caf")
dim recordSetting as new Dictionary

dim n as Integer = OSTypeFromStringMBS(AVFoundationMBS.kAudioFormatLinearPCM)
recordSetting.Value(AVFoundationMBS.AVFormatIDKey) = n
recordSetting.Value(AVFoundationMBS.AVSampleRateKey) = 44100.0
recordSetting.Value(AVFoundationMBS.AVNumberOfChannelsKey) = 2
recordSetting.Value(AVFoundationMBS.AVLinearPCMBitDepthKey) = 16
recordSetting.Value(AVFoundationMBS.AVLinearPCMIsBigEndianKey) = false
recordSetting.Value(AVFoundationMBS.AVLinearPCMIsFloatKey) = false


dim error as NSErrorMBS
dim recorder as new AVAudioRecorderMBS(f, recordSetting, error)

if error<>Nil then
MsgBox error.LocalizedDescription
Return
end if

if recorder.recordForDuration(10) then
// ok
else
MsgBox "Failed to start recording."
end if
```

**Notes:** Using an audio recorder you can:

- Record until the user stops the recording
- Record for a specified duration
- Pause and resume a recording
- Obtain input audio-level data that you can use to provide level metering

In OS X, the audio comes from the system's default audio input device as set by a user in System Preferences.

You can implement a subclass of AVFoundationMBS to respond to audio interruptions and audio decoding errors, and to the completion of a recording.

To configure a recording, including options such as bit depth, bit rate, and sample rate conversion quality, configure the audio recorder's settings dictionary. Use the settings keys described in AV Foundation Audio Settings Constants.

To configure an appropriate audio session for recording, refer to AVAudioSession Class Reference and AVAudioSessionDelegate Protocol Reference.

The AVAudioRecorder class is intended to allow you to make audio recordings with very little programming overhead. Other classes that can be used for recording audio in OS X include AVCaptureAudioDataOutput and the Audio Queue services described in the Audio Queue Services Programming Guide.

In OS X, you can also use the AVCaptureAudioFileOutput class to record audio.
Available in OS X v10.7 and later.

Calls audioRecorderEncodeErrorDidOccur and audioRecorderDidFinishRecording events on AVFoundationMBS class.

### 16.26.2 Methods

### 16.26.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.26.4 averagePowerForChannel(channelNumber as Integer) as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the average power for a given channel, in decibels, for the sound being recorded.
**Notes:** channelNumber: The number of the channel that you want the average power value for.
Returns the current average power, in decibels, for the sound being recorded. A return value of 0 dB indicates full scale, or maximum power; a return value of -160 dB indicates minimum power (that is, near silence).

If the signal provided to the audio recorder exceeds ¬±full scale, then the return value may exceed 0 (that is, it may enter the positive range).

To obtain a current average power value, you must call the updateMeters method before calling this method.

### 16.26.5 Constructor(file as folderitem, settings as Dictionary, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an audio recorder.
**Notes:** url: The file system location to record to. The file type to record to is inferred from the file extension included in this parameter's value.
settings: Settings for the recording session. For information on the settings available for an audio recorder, see AV Foundation Audio Settings Constants.
Error: Pass in the address of a nil-initialized NSError object. If an error occurs, upon return the NSError object describes the error. If you do not want error information, pass in NULL.
See also:

- 16.26.6 Constructor(URL as string, settings as Dictionary, byref error as NSErrorMBS) 3290

### 16.26.6 Constructor(URL as string, settings as Dictionary, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an audio recorder.
**Notes:** url: The file system location to record to. The file type to record to is inferred from the file extension included in this parameter's value.
settings: Settings for the recording session. For information on the settings available for an audio recorder, see AV Foundation Audio Settings Constants.
Error: Pass in the address of a nil-initialized NSError object. If an error occurs, upon return the NSError object describes the error. If you do not want error information, pass in NULL.
See also:

- 16.26.5 Constructor(file as folderitem, settings as Dictionary, byref error as NSErrorMBS) 3290

### 16.26.7 currentTime as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time, in seconds, since the beginning of the recording. (read-only)
**Notes:** When the audio recorder is stopped, calling this method returns a value of 0.

Available in OS X v10.7 and later.

### 16.26.8 deleteRecording as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Deletes a recorded audio file.
**Notes:** Returns true on success, or false on failure.
The audio recorder must be stopped before you call this method.

### 16.26.9 pause

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Pauses a recording.
**Notes:** Call record to resume recording.

### 16.26.10 peakPowerForChannel(channelNumber as Integer) as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the peak power for a given channel, in decibels, for the sound being recorded.
**Notes:** channelNumber: The number of the channel that you want the peak power value for.

Returns the current peak power, in decibels, for the sound being recorded. A return value of 0 dB indicates full scale, or maximum power; a return value of -160 dB indicates minimum power (that is, near silence).

If the signal provided to the audio recorder exceeds ¬±full scale, then the return value may exceed 0 (that is, it may enter the positive range).

To obtain a current peak power value, call the updateMeters method immediately before calling this method.

### 16.26.11 prepareToRecord as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an audio file and prepares the system for recording.
**Notes:** Returns true on success, or false on failure.

Creates an audio file at the location specified by the url parameter in the Constructor method. If a file already exists at that location, this method overwrites it.
The preparation invoked by this method takes place automatically when you call record. Use prepareToRecord when you want recording to start as quickly as possible upon calling record.

### 16.26.12 record as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Starts or resumes recording.
**Notes:** Returns true on success, or false on failure.
Calling this method implicitly calls prepareToRecord, which creates (or erases) an audio file and prepares the system for recording.

### 16.26.13 recordForDuration(duration as Double) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Records for a specified duration of time.
**Notes:** duration: The maximum duration, in seconds, for the recording.
Returns true on success, or false on failure.

The recorder stops when the duration of recorded audio reaches the value in the duration parameter.

Calling this method implicitly calls prepareToRecord, which creates (or erases) an audio file and prepares the system for recording.

### 16.26.14 Recording as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the audio recorder is recording (true), or not (false). (read-only)

### 16.26.15 settings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The audio settings for the audio recorder. (read-only)
**Notes:** Audio recorder settings are in effect only after you explicitly call the prepareToRecord method, or

after you call it implicitly by starting recording. The audio settings keys are described in AV Foundation Audio Settings Constants.

### 16.26.16 stop

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Stops recording and closes the audio file.

### 16.26.17 updateMeters

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Refreshes the average and peak power values for all channels of an audio recorder.
**Notes:** To obtain current audio power values, you must call this method before you call averagePowerForChannel or peakPowerForChannel.

### 16.26.18 url as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL for the audio file associated with the audio recorder. (read-only)

### 16.26.19 Properties

### 16.26.20 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.26.21 MeteringEnabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether audio-level metering is enabled (true), or not (false).
**Notes:** By default, audio level metering is off for an audio recorder. Because metering uses computing resources, turn it on only if you intend to use it.

Available in OS X v10.7 and later.
(Read and Write computed property)

## 16.27 class AVCaptureAudioChannelMBS

### 16.27.1 class AVCaptureAudioChannelMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVCaptureAudioChannel to monitor the average and peak power levels in an audio channel in a capture connection (see AVCaptureConnection).
**Notes:** An AVCaptureConnection object from an input producing audio to an output receiving audio exposes an array of AVCaptureAudioChannel objects, one for each channel of audio available. You can poll for audio levels by iterating through these audio channel objects.
You cannot create instances of AVCaptureAudioChannel directly.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.27.2 Methods

### 16.27.3 averagePowerLevel as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The instantaneous average power level, in dB. (read-only)

### 16.27.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.27.5 peakHoldLevel as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The peak hold power level, in dB. (read-only)

### 16.27.6 Properties

### 16.27.7 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.27.8 Enabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the channel is currently enabled for data capture.
**Notes:** By default, all AVCaptureAudioChannel objects exposed by a connection are enabled. You may set enabled to false to stop the flow of data for a particular channel.
(Read and Write computed property)

### 16.27.9 volume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current volume (gain) of the channel.
**Notes:** The volume property indicates the current volume or gain of the receiver as a floating point value between 0.0 and 1.0. If you want to boost the gain in software, you may specify a a value greater than 1.0.
(Read and Write computed property)

## 16.28 class AVCaptureAudioDataOutputMBS

### 16.28.1 class AVCaptureAudioDataOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureAudioDataOutput is a concrete sub-class of AVCaptureOutput that you use, via its delegate, to process audio sample buffers from the audio being captured.
**Notes:** Subclass of the AVCaptureOutputMBS class.

### 16.28.2 Methods

### 16.28.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Enables events on the new object.

### 16.28.4 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables the event for an existing audio data output object.
**Notes:** For the audio data output, the plugin will with enabled events call captureOutputDidOutputSampleBuffer event.

### 16.28.5 Properties

### 16.28.6 audioSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The settings used to decode or re-encode audio before it is output.
**Notes:** The value of this property is a dictionary containing values for audio settings keys defined in AVAudioSettings.h.
If the value of this property is nil, samples are output in their device native format.
(Read and Write computed property)

## 16.29 class AVCaptureAudioFileOutputMBS

### 16.29.1 class AVCaptureAudioFileOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** AVCaptureMovieFileOutput is a concrete sub-class of AVCaptureFileOutput that writes captured audio to any audio file type supported by CoreAudio.
**Notes:** AVCaptureAudioFileOutput implements the complete file recording interface declared by AVCaptureFileOutput for writing media data to audio files. In addition, you can configure options specific to the audio file formats, including writing metadata collections to each file and specifying audio encoding options. AVCaptureAudioFileOutput does not, however, support startRecordingToOutputFileURL use startRecordingToOutputFileURL with outputfiletype parameter instead.
Subclass of the AVCaptureFileOutputMBS class.

### 16.29.2 Methods

### 16.29.3 availableOutputFileTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns array containing UTIs identifying the file types AVCaptureAudioFileOutput can write.

### 16.29.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 16.29.5 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables the events for this output.
**Notes:** Those are normally handled automatically, but if you add event with AddHandler you need to call this method.

### 16.29.6 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A collection of metadata to be written to the receiver's output files.
**Notes:** The value of this property is an array of AVMetadataItem objects representing the collection of top-level metadata to be written in each output file. Only ID3 v2.2, v2.3, or v2.4 style metadata items are supported.

### 16.29.7 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the metadata array.

### 16.29.8 startRecordingToOutputFile(file as folderitem, outputFileType as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells the receiver to start recording to a new file of the specified format, and specifies a delegate that will be notified when recording is finished.
**Notes:** file: The output file. If a file already exists when capturing starts, recording to the new file will fail. fileType: A UTI indicating the format of the file to be written. UTIs for common audio file types are declared in AVMediaFormat.h.

You do not need not to call stopRecording before calling this method while another recording is in progress. If this method is invoked while an existing output file was already being recorded, no media samples will be discarded between the old file and the new file.

When recording is stopped—by calling stopRecording, by changing files using this method, or because of an error—the remaining data that needs to be included to the file will be written in the background. Therefore, you must specify a delegate that will be notified when all data has been written to the file using the captureOutputDidFinishRecordingToOutputFileAtURL method. The recording delegate can also optionally implement methods that inform it when data starts being written, when recording is paused and resumed, and when recording is about to be finished.

On OS X, if this method is called within the captureOutputDidOutputSampleBuffer event method, the first samples written to the new file are guaranteed to be those contained in the sample buffer passed to that method.

### 16.29.9 startRecordingToOutputFileURL(URL as string, outputFileType as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells the receiver to start recording to a new file of the specified format, and specifies a delegate

that will be notified when recording is finished.
**Notes:** URL: The URL of the output file. This method throws an NSInvalidArgumentException if the URL is not a valid file URL. If a file at the given URL already exists when capturing starts, recording to the new file will fail.
fileType: A UTI indicating the format of the file to be written. UTIs for common audio file types are declared in AVMediaFormat.h.

You do not need not to call stopRecording before calling this method while another recording is in progress. If this method is invoked while an existing output file was already being recorded, no media samples will be discarded between the old file and the new file.

When recording is stopped—by calling stopRecording, by changing files using this method, or because of an error—the remaining data that needs to be included to the file will be written in the background. Therefore, you must specify a delegate that will be notified when all data has been written to the file using the captureOutputDidFinishRecordingToOutputFileAtURL method. The recording delegate can also optionally implement methods that inform it when data starts being written, when recording is paused and resumed, and when recording is about to be finished.

On OS X, if this method is called within the captureOutputDidOutputSampleBuffer event method, the first samples written to the new file are guaranteed to be those contained in the sample buffer passed to that method.

### 16.29.10 Properties

### 16.29.11 audioSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The settings used to decode or re-encode audio before it is output by the receiver.
**Notes:** The value of this property is a dictionary containing values for audio settings keys defined in AVAudioSettings.h. If you set the value of this property to nil, the output vends samples in their device native format.
(Read and Write computed property)

# 16.30 class AVCaptureAudioPreviewOutputMBS

## 16.30.1 class AVCaptureAudioPreviewOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** AVCaptureAudioPreviewOutput is a concrete subclass of AVCaptureOutput that you use to preview audio being captured.
**Notes:** Instances of AVCaptureAudioPreviewOutput are associated with a Core Audio output device that can be used to play audio being captured by the capture session. You can obtain the unique ID of a Core Audio device using its kAudioDevicePropertyDeviceUID property.
Subclass of the AVCaptureOutputMBS class.

## 16.30.2 Methods

## 16.30.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The default constructor.

## 16.30.4 Properties

## 16.30.5 outputDeviceUniqueID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the unique ID of the Core Audio output device being used to play preview audio.
**Notes:** The value of this property is an string containing the unique ID of the Core Audio device to be used for output, or "" if the default system output should be used.
(Read and Write computed property)

## 16.30.6 volume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the preview volume of the output.
**Notes:** The value of this property is the preview volume of the receiver, where 1.0 is the maximum volume and 0.0 is muted.
(Read and Write computed property)

## 16.31 class AVCaptureConnectionMBS

### 16.31.1 class AVCaptureConnectionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVCaptureConnection object represents a connection between capture input and capture output objects associated with a capture session.
**Notes:** Capture inputs (instances of AVCaptureInput) have one or more input ports (instances of AVCaptureInputPort). Capture outputs (instances of AVCaptureOutput) can accept data from one or more sources (for example, an AVCaptureMovieFileOutput object accepts both video and audio data).

You can only add an AVCaptureConnection instance to a session using addConnection: if canAddConnection: returns true. When using addInput or addOutput, connections are formed automatically between all compatible inputs and outputs. You only need to add connections manually when adding an input or output with no connections. You can also use connections to enable or disable the flow of data from a given input or to a given output.

### 16.31.2 Methods

### 16.31.3 audioChannels as AVCaptureAudioChannelMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVCaptureAudioChannel objects. (read-only)
**Notes:** This property is only applicable to connections involving audio.

### 16.31.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.31.5 connectionWithInputPort(port as AVCaptureInputPortMBS, layer as AVCaptureVideoPreviewLayerMBS) as AVCaptureConnectionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a capture connection describing a connection between the specified input port and the specified video preview layer.
**Notes:** port: An AVCaptureInputPort object associated with an AVCaptureInput object.

layer: An AVCaptureVideoPreviewLayer object.

Returns a capture connection describing a connection between the port and layer.

You can add the connection returned by this method to an AVCaptureSession instance using addConnection:.

When using addInput or addOutput, connections are automatically formed between all compatible inputs and outputs. You do not need to manually create and add connections to the session unless you use the primitive addInputWithNoConnections or addOutputWithNoConnections methods.

### 16.31.6 connectionWithInputPorts(ports() as AVCaptureInputPortMBS, output as AVCaptureOutputMBS) as AVCaptureConnectionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a capture connection describing a connection between the specified input ports and the specified output.
**Notes:** ports: An array of AVCaptureInputPort objects associated with AVCaptureInput objects.
output: An AVCaptureOutput object.

Returns a capture connection describing a connection between inputPorts and the output.

You can add the connection returned by this method to an AVCaptureSession instance using addConnection.

When using addInput or addOutput, connections are automatically formed between all compatible inputs and outputs. You do not need to manually create and add connections to the session unless you use the primitive addInputWithNoConnections or addOutputWithNoConnections methods.

### 16.31.7 Constructor(port as AVCaptureInputPortMBS, layer as AVCaptureVideoPreviewLayerMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a capture connection to describe a connection between the specified input port and the specified video preview layer.
**Notes:** port: An AVCaptureInputPort object associated with an AVCaptureInput object.
layer: An AVCaptureVideoPreviewLayer object.

Returns a capture connection describing a connection between the port and layer.

You can add the connection returned by this method to an AVCaptureSession instance using addConnection.

When using addInput or addOutput, connections are automatically formed between all compatible inputs and outputs. You do not need to manually create and add connections to the session unless you use the primitive addInputWithNoConnections or addOutputWithNoConnections methods.
See also:

- 16.31.8 Constructor(ports() as AVCaptureInputPortMBS, output as AVCaptureOutputMBS) 3304

### 16.31.8 Constructor(ports() as AVCaptureInputPortMBS, output as AVCaptureOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a capture connection to describe a connection between the specified input ports and the specified output.
**Notes:** ports: An array of AVCaptureInputPort objects associated with AVCaptureInput objects.
output: An AVCaptureOutput object.

Returns acapture connection initialized to describe a connection between inputPorts and the output.

You can add the connection returned by this method to an AVCaptureSession instance using addConnection.

When using addInput or addOutput, connections are automatically formed between all compatible inputs and outputs. You do not need to manually create and add connections to the session unless you use the primitive addInputWithNoConnections or addOutputWithNoConnections methods.
See also:

- 16.31.7 Constructor(port as AVCaptureInputPortMBS, layer as AVCaptureVideoPreviewLayerMBS) 3303

### 16.31.9 inputPorts as AVCaptureInputPortMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The connection's input ports. (read-only)
**Notes:** Input ports are instances of AVCaptureInputPort.

### 16.31.10 Properties

### 16.31.11 Active as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the connection is active. (read-only)
**Notes:** (Read only property)

### 16.31.12 automaticallyAdjustsVideoMirroring as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the value of videoMirrored can change based on configuration of the session.
**Notes:** For some session configurations, video data flowing through the connection will be mirrored by default. When the value of this property is true, the value of videoMirrored may change depending on the configuration of the session, for example after switching to a different capture device input.

The default value is true.
(Read and Write property)

### 16.31.13 Enabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the connection is enabled.
**Notes:** (Read and Write property)

### 16.31.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.31.15 output as AVCaptureOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The connection's output port. (read-only)
**Notes:** (Read only property)

### 16.31.16 videoFieldMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An indicator of how interlaced video flowing through the connection should be treated.
**Notes:** This property is only applicable to connections involving video.
You can only set this value if supportsVideoFieldMode is true.
(Read and Write property)

### 16.31.17 VideoFieldModeSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value that indicates whether the connection supports setting the videoFieldMode property. (read-only)
**Notes:** This property is only applicable to connections involving video.
(Read only property)

### 16.31.18 videoMaxFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The maximum time interval between which the receiver should output consecutive video frames.
**Notes:** The value of this property specifies the maximum duration of each video frame output by the connection, placing an upper bound on the amount of time that should separate consecutive frames. The value is equivalent to the reciprocal of the minimum frame rate.
A value of kCMTimeZero or kCMTimeInvalid indicates an unlimited minimum frame rate.
The default value is kCMTimeInvalid.
You can only set this value if supportsVideoMaxFrameDuration is true.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.31.19 VideoMaxFrameDurationSupported as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection supports setting the videoMaxFrameDuration property. (read-only)

**Notes:** This property is only applicable to connections involving video.
Available in OS X v10.9 and later.
(Read only property)

### 16.31.20 videoMinFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The minimum time interval between which the receiver should output consecutive video frames.
**Notes:** The value of this property specifies the minimum duration of each video frame output by the connection, placing a lower bound on the amount of time that should separate consecutive frames. The value is equivalent to the reciprocal of the maximum frame rate.

A value of kCMTimeZero or kCMTimeInvalid indicates an unlimited maximum frame rate.

The default value is kCMTimeInvalid.

You can only set this value if supportsVideoMinFrameDuration is true.
(Read and Write property)

### 16.31.21 VideoMinFrameDurationSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection supports setting the videoMinFrameDuration property. (read-only)
**Notes:** This property is only applicable to connections involving video.
(Read only property)

### 16.31.22 VideoMirrored as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the video flowing through the connection should be mirrored about its vertical axis.
**Notes:** This property is only applicable to connections involving video.

if the value of supportsVideoMirroring is true, you can set videoMirrored to true to flip the video about its vertical axis and produce a mirror-image effect.
(Read and Write property)

### 16.31.23 VideoMirroringSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection supports video mirroring. (read-only)
**Notes:** (Read only property)

### 16.31.24 videoOrientation as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The orientation of the video.
**Notes:** This property is only applicable to connections involving video.

If the value of supportsVideoOrientation is true, you can set videoOrientation to rotate the video buffers being consumed by the connection's output. Setting videoOrientation does not necessarily result in a physical rotation of video buffers. For example, a video connection to an AVCaptureMovieFileOutput object handles orientation using a Quicktime track matrix; using an AVCaptureStillImageOutput object, orientation is handled using Exif tags.
(Read and Write property)

### 16.31.25 VideoOrientationSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection supports changing the orientation of the video. (read-only)
**Notes:** (Read only property)

### 16.31.26 videoPreviewLayer as AVCaptureVideoPreviewLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video preview layer associated with the connection. (read-only)
**Notes:** This property is the set if you initialized the connection using Constructor or connectionWithInputPort.
(Read only property)

### 16.31.27 Constants

Video Orientation Constants

| Constant | Value | Description |
|---|---|---|
| AVCaptureVideoOrientationLandscapeLeft | 4 | Indicates that video should be oriented horizontally, top on th |
| AVCaptureVideoOrientationLandscapeRight | 3 | Indicates that video should be oriented horizontally, top on th |
| AVCaptureVideoOrientationPortrait | 1 | Indicates that video should be oriented vertically, top at the t |
| AVCaptureVideoOrientationPortraitUpsideDown | 2 | Indicates that video should be oriented vertically, top at the b |

Video Field Modes

| Constant | Value | Description |
|---|---|---|
| AVVideoFieldModeBoth | 0 | Indicates that both top and bottom video fields in interlaced content should be passed through. |
| AVVideoFieldModeBottomOnly | 2 | Indicates that the bottom video field only in interlaced content should be passed through. |
| AVVideoFieldModeDeinterlace | 3 | Indicates that top and bottom video fields in interlaced content should be deinterlaced. |
| AVVideoFieldModeTopOnly | 1 | Indicates that only the top video field in interlaced content should be passed through. |

## 16.32 class AVCaptureDeviceFormatMBS

### 16.32.1 class AVCaptureDeviceFormatMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class for device format information.
**Notes:** An AVCaptureDeviceFormat object wraps a CMFormatDescription (see CMFormatDescriptionRef) and other format-related information, such as minimum and maximum frame rate.

An AVCaptureDeviceFormat object is immutable. AVCaptureDevice uses AVCaptureDeviceFormat objects to describe supported formats and the active format of an instance.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo / Real Studio Plugins, version 13.2pr4

### 16.32.2 Methods

### 16.32.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.32.4 DisplayName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The display text for this object.
**Notes:** The plugin formats a string with the device format for displaying.

### 16.32.5 formatDescription as CMFormatDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A CMFormatDescription describing an AVCaptureDevice active or supported format. (read-only).

### 16.32.6 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An string describing the media type of an AVCaptureDevice active or supported format. (read-only)
**Notes:** Supported media types are listed in AVMediaFormat.h.

### 16.32.7 videoSupportedFrameRateRanges as AVFrameRateRangeMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the format's supported frame rate ranges/ (read-only)
**Notes:** The value is an array of AVFrameRateRange objects, one for each of the format's supported video frame rate ranges.

### 16.32.8 Properties

### 16.32.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.32.10 videoMaxZoomFactor as Double

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: macOS, Targets: iOS only.

**Function:** Indicates the maximum zoom factor allowed for the format.
**Notes:** A maximum factor of 1.0 indicates that the format isn,Äôt capable of zooming.
(Read only property)

## 16.33 class AVCaptureDeviceInputMBS

### 16.33.1 class AVCaptureDeviceInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureDeviceInput is a concrete sub-class of AVCaptureInput you use to capture data from an AVCaptureDevice object.
**Notes:** Subclass of the AVCaptureInputMBS class.

### 16.33.2 Methods

### 16.33.3 Constructor(Device as AVCaptureDeviceMBS, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an input to use a specified device.
**Notes:** device: The device from which to capture input.
Error: If an error occurs during initialization, upon return contains an NSErrorMBS object describing the problem.

### 16.33.4 device as AVCaptureDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The device with which the input is associated. (read-only)

### 16.33.5 deviceInputWithDevice(device as AVCaptureDeviceMBS, byref error as NSErrorMBS) as AVCaptureDeviceInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an input initialized to use a specified device.
**Notes:** device: The device from which to capture input.
Error: If an error occurs during initialization, upon return contains an NSError object describing the problem.

Returns an input initialized to use device.

## 16.34 class AVCaptureDeviceInputSourceMBS

### 16.34.1 class AVCaptureDeviceInputSourceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An AVCaptureDeviceInputSource object represents a distinct input source on an AVCaptureDevice object.
**Notes:** An AVCaptureDevice object may optionally present an array of input sources, representing distinct mutually exclusive inputs to the device. For example, an audio capture device might have ADAT optical and analog input sources; a video capture device might have an HDMI input source, or a component input source.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.0pr6

### 16.34.2 Methods

### 16.34.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 16.34.4 inputSourceID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The input source ID. (read-only)
**Notes:** The ID is unique among the input sources exposed by a given AVCaptureDevice object.

### 16.34.5 localizedName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A localized, human-readable, name for the input source. (read-only)
**Notes:** You can use this property to display the name of the capture device input source in a user interface.

### 16.34.6 Properties

### 16.34.7 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 16.35 class AVCaptureDeviceMBS

## 16.35.1 class AVCaptureDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVCaptureDevice object represents a physical capture device and the properties associated with that device.
**Example:**

```
dim device as AVCaptureDeviceMBS = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox device.localizedName
```

**Notes:** You use a capture device to configure the properties of the underlying hardware. A capture device also provides input data (such as audio or video) to an AVCaptureSession object.

You use the methods of the AVCaptureDevice class to enumerate the available devices, query their capabilities, and be informed about when devices come and go. Before you attempt to set properties of a capture device (its focus mode, exposure mode, and so on), you must first acquire a lock on the device using the lockForConfiguration method. You can then set the properties and release the lock using the unlockForConfiguration method. You may hold the lock if you want all settable device properties to remain unchanged. However, holding the device lock unnecessarily may degrade capture quality in other applications sharing the device and is not recommended.

May work for all built-in cameras and microphones as well as external USB webcams, as far as Apple supports them.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr6
- MBS Xojo Plugins, version 22.2pr7
- MBS Xojo Plugins, version 20.2pr4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr7

**Xojo Developer Magazine**

- 22.1, page 9: News

- 17.1, page 10: News
- 16.6, page 9: News


### 16.35.2 Methods

### 16.35.3 authorizationStatusForMediaType(mediaType as string) as Integer

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Returns the client's authorization status for accessing the underlying hardware that supports a given media type.
**Notes:** Mediatype: The media type, either AVMediaTypeVideo or AVMediaTypeAudio.
Returns the authorization status of the client

This method returns the AVAuthorizationStatus of the client for accessing the underlying hardware supporting the media type. Media type constants are defined in AVFoundationMBS. If any media type other than AVMediaTypeVideo or AVMediaTypeAudio is supplied, an NSInvalidArgumentException will be thrown. If the status is AVAuthorizationStatusNotDetermined, you may use the requestAccessForMediaType method to request access by prompting the user.

see
https://developer.apple.com/documentation/avfoundation/cameras_and_media_capture/requesting_authorization_for_media_capture_on_macos?language=objc

### 16.35.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.35.5 availableReactionTypes as String()

MBS AVFoundation Plugin, Plugin Version: 23.5, Platform: macOS, Targets: All.

**Function:** Returns a list of reaction types which can be passed to performEffectForReaction.
**Example:**

```
dim device as AVCaptureDeviceMBS // your device

MessageBox Join(device.availableReactionTypes, EndOfLine)
```

**Notes:** The list may differ between devices, or be affected by changes to active format.

Requires macOS 14.0 or iOS 17.0.

List seen on macOS 14.0:

ReactionBalloons
ReactionFireworks
ReactionThumbsUp
ReactionRain
ReactionThumbsDown
ReactionLasers
ReactionConfetti
ReactionHeart

You may check AVCaptureReactionEffectStateMBS.available for whether this is available.

### 16.35.6 AVCaptureMaxAvailableTorchLevel as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The maximum torch level.
**Notes:** This constant always represents the maximum available torch level, independent of the actual maximum value currently supported by the device. Thus, pass this constant to the setTorchModeOnWithLevel:error: in situations where you want to specify the maximum torch level without having to worry about whether the device is overheating and might not accept a value of 1.0 as the maximum.
Available in OS X v10.9 and later.

### 16.35.7 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.35.8 defaultDeviceWithMediaType(mediaType as string) as AVCaptureDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the default device used to capture data of a given media type.

**Example:**

```
dim device as AVCaptureDeviceMBS = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeAudio)
MsgBox device.localizedName
```

**Notes:** mediaType: A media type identifier.
For possible values, see AV Foundation Constants Reference.

### 16.35.9 devices as AVCaptureDeviceMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the available capture devices on the system.
**Example:**

```
dim devices() as AVCaptureDeviceMBS = AVCaptureDeviceMBS.devices
dim names() as string

for each d as AVCaptureDeviceMBS in devices
names.Append d.localizedName
next

// show all names in a message dialog
MsgBox Join(names, EndOfLine)
```

### 16.35.10 devicesWithMediaType(mediaType as string) as AVCaptureDeviceMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the devices able to capture data of a given media type.
**Example:**

```
dim devices() as AVCaptureDeviceMBS = AVCaptureDeviceMBS.devicesWithMediaType(AVFoundationMBS.AVMediaTypeAudio)
dim names() as string

for each d as AVCaptureDeviceMBS in devices
names.Append d.localizedName
next

// show all names of audio devices in a message dialog
MsgBox Join(names, EndOfLine)
```

**Notes:** mediaType: A media type identifier.
For possible values, see AV Foundation Constants Reference.

### 16.35.11 deviceWithUniqueID(deviceUniqueID as string) as AVCaptureDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the device with a given ID.
**Notes:** deviceUniqueID: The ID of a capture device.

### 16.35.12 formats as AVCaptureDeviceFormatMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVCaptureDeviceFormat objects representing the formats supported by the device (read-only)
**Notes:** You can use this property to enumerate the formats natively supported by the receiver.
You can set modelID to any of the formats in this array.
You can observe changes to the value of this property using key-value observing.

### 16.35.13 hasMediaType(mediaType as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the device provides media with a given type.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.hasMediaType(AVFoundationMBS.AVMediaTypeVideo)) // true
MsgBox str(device.hasMediaType(AVFoundationMBS.AVMediaTypeAudio)) // false
```

**Notes:** mediaType: A media type, such as AVMediaTypeVideo, AVMediaTypeAudio, or AVMediaTypeMuxed. For a complete list of supported media type constants, see AV Foundation Constants Reference.

Returns true if the device provides media of type mediaType, otherwise false.

### 16.35.14 inputSources as AVCaptureDeviceInputSourceMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of AVCaptureDeviceInputSource objects representing the input sources supported by the device. (read-only)
**Notes:** Some devices can capture data from one of multiple data sources (different input jacks on the same audio device, for example). For devices with multiple possible data sources, you can use this property to enumerate the possible choices.

You can observe changes to the value of this property using key-value observing.

### 16.35.15 isExposureModeSupported(exposureMode as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the given exposure mode is supported.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isExposureModeSupported(device.AVCaptureExposureModeAutoExpose))
```

**Notes:** exposureMode: An exposure mode. See "AVCaptureExposureMode" for possible values.
Returns true if exposureMode is supported, otherwise false.

### 16.35.16 isFlashModeSupported(FlashMode as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the given flash mode is supported.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isFlashModeSupported(device.AVCaptureFlashModeAuto))
```

**Notes:** flashMode: A flash mode. See "AVCaptureFlashMode" for possible values.
Returns true if flashMode is supported, otherwise false.

### 16.35.17 isFocusModeSupported(focusMode as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the given focus mode is supported.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isFocusModeSupported(device.AVCaptureFocusModeContinuousAutoFocus))
```

**Notes:** focusMode: A focus mode. See "AVCaptureFocusMode" for possible values.

Returns true if focusMode is supported, otherwise false.

### 16.35.18 isTorchModeSupported(torchMode as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the device supports the specified torch mode.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isTorchModeSupported(device.AVCaptureTorchModeAuto))
```

**Notes:** torchMode: The desired torch mode. For a list of possible values, see "AVCaptureTorchMode."
Returns true if torchMode is supported, otherwise false.

### 16.35.19 isWhiteBalanceModeSupported(mode as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the given white balance mode is supported.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isWhiteBalanceModeSupported(device.AVCaptureWhiteBalanceModeAutoWhiteBalance))
```

**Notes:** whiteBalanceMode: A focus mode. See "AVCaptureWhiteBalanceMode" for possible values.

Returns true if whiteBalanceMode is supported, otherwise false.

### 16.35.20 linkedDevices as AVCaptureDeviceMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of AVCaptureDevice objects representing the devices physically linked to the receiver. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeAudio)

dim linkedDevices() as AVCaptureDeviceMBS
linkedDevices = device.linkedDevices

for each d as AVCaptureDeviceMBS in linkedDevices
MsgBox device.localizedName+" ,Üí "+d.localizedName
next
```

**Notes:** The value of this property is an array of AVCaptureDevice objects that are a part of the same physical device as the receiver. For example, for an external iSight camera, the array contains an AVCaptureDevice instance representing the external iSight microphone.

### 16.35.21 lockForConfiguration(byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Requests exclusive access to the device's hardware properties.
**Notes:** Error: If a lock cannot be acquired, this pointer contains an NSError object that describes the problem.

Returns true if a lock was acquired or false if it was not.

You must call this method before attempting to configure the hardware related properties of the device. This method returns true when it successfully locks the device for configuration by your code. After configuring the device properties, call unlockForConfiguration to release the configuration lock and allow other apps to make changes.

You may hold onto a lock (instead of releasing it) if you require the device properties to remain unchanged. However, holding the device lock unnecessarily may degrade capture quality in other apps sharing the device.

### 16.35.22 performEffectForReaction(reactionType as String)

MBS AVFoundation Plugin, Plugin Version: 23.5, Platform: macOS, Targets: All.

**Function:** Triggers a specified reaction on the video stream.
**Example:**

```
dim device as AVCaptureDeviceMBS // your device

device.performEffectForReaction AVCaptureReactionEffectStateMBS.AVCaptureReactionTypeBalloons
```

**Notes:** reactionType: Indicates which reaction to perform.

The entries in reactionEffectsInProgress may not reflect one-to-one against calls to this method. Depending on reaction style or resource limits, triggering multiple overlapping reactions of the same type may be coalesced into extending an existing reaction rather than overlaying a new one.

The reactionType requested must be one of those listed in availableReactionTypes or an exception will be thrown. Performing a reaction when canPerformReactionEffects is false is ignored, and VoIP applications are encouraged to transmit and display such reactions outside of the video feed.

Requires macOS 14.0 or iOS 17.0.
You may check AVCaptureReactionEffectStateMBS.available for whether this is available.

### 16.35.23 reactionEffectsInProgress as AVCaptureReactionEffectStateMBS()

MBS AVFoundation Plugin, Plugin Version: 23.5, Platform: macOS, Targets: All.

**Function:** Contains an array of reaction effects that are currently being performed by the device, sorted by timestamp.
**Example:**

```
dim device as AVCaptureDeviceMBS // your device

dim effects() as AVCaptureReactionEffectStateMBS = device.reactionEffectsInProgress

for each effect as AVCaptureReactionEffectStateMBS in effects
MessageBox effect.reactionType
next
```

**Notes:** If observing old and new values in the KVO callback, the reaction effects which are still running in the new array will have kCMTimeInvalid as their endTime property. Reaction effects which have ended will only be in the old array, and will have their endTime property set to the presentation time of the first frame where the reaction effect was no longer present.

Reaction effects which are triggered by either a call to performEffectForReaction or by the automatic gesture detection will be reflected in this array. It is key-value observable to be notified when reaction effects begin or end.

Requires macOS 14.0 or iOS 17.0.
You may check AVCaptureReactionEffectStateMBS.available for whether this is available.

### 16.35.24 requestAccessForMediaType(mediaType as string, tag as variant = nil)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Requests access to the underlying hardware for the media type, showing a dialog to the user if necessary.
**Notes:** mediaType: The media type, either AVMediaTypeVideo or AVMediaTypeAudio

Use this function to request access to the hardware for a given media type. Media type constants are defined in AVFoundationMBS
If any media type other than AVMediaTypeVideo or AVMediaTypeAudio is supplied, an NSInvalidArgumentException will be thrown.

This call will not block while the user is being asked for access, allowing the client to continue running. Until access has been granted, any AVCaptureDevices for the media type will vend silent audio samples or black video frames. The user is only asked for permission the first time the client requests access. Later calls use the permission granted by the user.

Note that the authorization dialog will automatically be shown if the status is AVAuthorizationStatusNotDetermined when creating an AVCaptureDeviceInput.

Invoking this method with AVMediaTypeAudio is equivalent to calling AVAudioSessionMBS.requestRecordPermission.

Call returns directly as request is performed on thread.
The requestAccessForMediaTypeCompleted event is called later in your AVFoundationMBS subclass with results on main thread.
The granted value will always true for MacOS 10.13 or older.

see
https://developer.apple.com/documentation/avfoundation/cameras_and_media_capture/requesting_authorization_for_media_capture_on_macos?language=objc

### 16.35.25 setTransportControlsPlaybackMode(mode as Integer, speed as Double)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the transport control's playback mode and speed.
**Notes:** mode: An AVCaptureDeviceTransportControlsPlaybackMode constant indicating whether the deck should be put into play mode.
speed: A float value indicating the speed at which to wind or play the tape.

Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, this method raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

### 16.35.26 supportsAVCaptureSessionPreset(preset as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver can be used in an capture session configured with the given preset.
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.supportsAVCaptureSessionPreset(AVFoundationMBS.AVCaptureSessionPreset1280x720))
```

**Notes:** preset: A capture session preset.

Returns true if the receiver can be used with preset, otherwise false.
An AVCaptureSession instance can be associated with a preset that configures its inputs and outputs to fulfill common use cases. You can use this method to determine if the receiver can be used in a capture session with the given preset. For a list of preset constants, see AVCaptureSession Class Reference.

### 16.35.27 unlockForConfiguration

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Relinquishes exclusive control over the device's configuration.
**Notes:** Call this method to release the lock acquired using the lockForConfiguration method when you are done configuring the device.

### 16.35.28 Properties

### 16.35.29 activeFormat as AVCaptureDeviceFormatMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The currently active format of the receiver.
**Notes:** You use this property to get or set the currently active device format.

To set the format, you must first obtain exclusive access to the receiver using focusMode. If you do not obtain exclusive access, setActiveFormat throws an NSGenericException.

The set method, setActiveFormat, throws an NSInvalidArgumentException if you pass a format not present in the supportsAVCaptureSessionPreset array.

You can observe changes to the value of this property using key-value observing.
(Read and Write property)

### 16.35.30 activeInputSource as AVCaptureDeviceInputSourceMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The currently active input source.
**Notes:** You use this property to get or set the currently active input source.

To set the format, you must first obtain exclusive access to the receiver using focusMode. If you do not obtain exclusive access, setActiveInputSource throws an NSGenericException.

The set method, setActiveInputSource, throws an NSInvalidArgumentException if you pass a format not present in the activeInputSource array.

You can observe changes to the value of this property using key-value observing.
(Read and Write property)

### 16.35.31 activeVideoMaxFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The currently active maximum frame duration.
**Notes:** A device's maximum frame duration is the reciprocal of its minimum frame rate. You can set the value of this property to limit the minimum frame rate during a capture session. The capture device auto-

matically chooses a default maximum frame duration based on its active format. After changing the value of this property, you can return to the default maximum frame duration by setting this property's value to kCMTimeInvalid. Choosing a new preset for the capture session also resets this property to its default value.

Attempting to set this property to a value not found in the active format's videoSupportedFrameRateRanges array raises an exception (NSInvalidArgumentException).

Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. Otherwise, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using Key-value observing.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.35.32 activeVideoMinFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The currently active minimum frame duration.
**Notes:** You use this property to get or set the currently active minimum frame duration.

The value of this property is the reciprocal of its maximum frame rate. To limit the maximum frame rate, you can set the value of this property to a value supported by the receiver's modelID (see videoSupported-FrameRateRanges).

Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

The device object throws NSInvalidArgumentException if you try to assign an unsupported value to this property.

You can observe changes to the value of this property using key-value observing.
(Read and Write property)

### 16.35.33 canPerformReactionEffects as Boolean

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Indicates whether reactions can be performed on a particular AVCaptureDevice.
**Example:**

```
dim device as AVCaptureDeviceMBS // your device
if device <>nil then
MessageBox "canPerformReactionEffects: "+device.canPerformReactionEffects.ToString
end if
```

**Notes:** This requires reactionEffectsEnabled to be true, as well as using a AVCaptureDeviceFormat with reactionEffectsSupported.

This readonly property returns YES when resources for reactions are available on the device instance. When true, calls to performEffectForReaction: will render on the video feed, otherwise those calls are ignored. It is key-value observable.

Requires macOS 14.0 or iOS 17.0.
You may check AVCaptureReactionEffectStateMBS.available for whether this is available.
(Read only property)

### 16.35.34 exposureMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The exposure mode for the device.
**Notes:** Before changing the value of this property, you must call lockForConfiguration: to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using key-value observing.
See "AVCaptureExposureMode" for possible values.
(Read and Write property)

### 16.35.35 exposurePointOfInterest as CGPointMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The point of interest for exposure.
**Notes:** Before changing the value of this property, you must call lockForConfiguration to acquire exclusive

access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.
(Read and Write property)

### 16.35.36 flashMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The current flash mode.
**Notes:** Before changing the value of this property, you must call lockForConfiguration: to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using key-value observing.

See "AVCaptureFlashMode" for possible values.
(Read and Write property)

### 16.35.37 focusMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The device's focus mode.
**Notes:** Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using key-value observing.

See "AVCaptureFocusMode" for possible values.
(Read and Write property)

### 16.35.38 focusPointOfInterest as CGPointMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The point of interest for focusing.
**Notes:** This property represents a CGPoint where { 0,0 } corresponds to the top left of the picture area,

and { 1,1 } corresponds to the bottom right in landscape mode with the home button on the right—this applies even if the device is in portrait mode.

Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.
(Read and Write property)

### 16.35.39 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.35.40 hasFlash as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the capture device has a flash. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.hasFlash)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.41 hasTorch as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that specifies whether the capture device has a torch. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.hasTorch)
```

**Notes:** A torch is a light source, such as an LED flash, that is available on the device and used for illuminating captured content or providing general illumination. This property reflects whether the current device has such illumination hardware built-in.

Even if the device has a torch, that torch might not be available for use. Thus, you should also check the value of the torchAvailable property before using it.

You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.42 isAdjustingExposure as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The transport type of the receiver. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isAdjustingExposure)
```

**Notes:** The value of this property represents the transport type of the device (USB, PCI, etc). Transport types are defined in <IOKit/audio/IOAudioTypes.h>as kIOAudioDeviceTransportType*.
(Read only property)

### 16.35.43 isAdjustingFocus as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the device is currently adjusting its focus setting. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isAdjustingFocus)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.44 isAdjustingWhiteBalance as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the devise is currently adjusting the white balance. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isAdjustingWhiteBalance)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.45 isConnected as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the device is currently connected. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isConnected)
```

**Notes:** The value of this property indicates whether the device represented by the receiver is connected and available for use as a capture device. When the value of this property becomes false for a given instance, however, it will not become true again. If the same physical device again becomes available to the system, it will be represented using a new instance of AVCaptureDevice.

You can observe the value of this property using key-value observing to be notified when a device is no longer available.
(Read only property)

### 16.35.46 isExposurePointOfInterestSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the device supports a point of interest for exposure. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
```

```
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isExposurePointOfInterestSupported)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.47 isFocusPointOfInterestSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the device supports a point of interest for focus. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isFocusPointOfInterestSupported)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.48 isInUseByAnotherApplication as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the device is in use by another application. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isInUseByAnotherApplication)
```

**Notes:** You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.49 isRampingVideoZoom as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that indicates whether a zoom transition is in progress.

**Notes:** (Read only property)

### 16.35.50 isSuspended as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the device is suspended. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.isSuspended)
```

**Notes:** Some devices disallow data capture due to a feature on the device.

For example, isSuspended returns true for an external iSight camera when its privacy iris is closed, or for the internal iSight camera on a notebook when the notebook's display is closed.

You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.51 localizedName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A localized human-readable name for the receiver. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeAudio)
MsgBox device.localizedName
```

**Notes:** You can use this property to display the name of a capture device in a user interface.
(Read only property)

### 16.35.52 manufacturer as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The human-readable manufacturer name for the receiver.
**Notes:** This property can be used to identify capture devices from a particular manufacturer. All Apple devices return "Apple Inc.". Devices from third party manufacturers may return an empty string.
Available on Mac OS X 10.9 or later.
(Read only property)

### 16.35.53 maxAvailableVideoZoomFactor as Double

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: iOS, Targets: iOS only.

**Function:** The maximum zoom factor allowed in the current capture configuration.
**Notes:** On single-camera devices, this value is always equal to the device format,Äôs videoMaxZoomFactor value. On a dual-camera device, the allowed range of video zoom factors can change if the device is delivering depth data to one or more capture outputs.
Setting the videoZoomFactor property to (or calling the rampToVideoZoomFactor:withRate method with) a value greater than the device format,Äôs videoMaxZoomFactor value always raises an exception. Setting the video zoom factor to a value between the maximum available zoom factor and the device format,Äôs maximum clamps the zoom setting to the maximum available value.
(Read only property)

### 16.35.54 minAvailableVideoZoomFactor as Double

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: iOS, Targets: iOS only.

**Function:** The minimum zoom factor allowed in the current capture configuration.
**Notes:** On single-camera devices, this value is always 1.0. On a dual-camera device, the allowed range of video zoom factors can change if the device is delivering depth data to one or more capture outputs.

Setting the videoZoomFactor property to (or calling the rampToVideoZoomFactor method with) a value less than 1.0 always raises an exception. Setting the video zoom factor to a value between 1.0 and the minimum available zoom factor clamps the zoom setting to the minimum.
(Read only property)

### 16.35.55 modelID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The model ID of the device. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
```

MsgBox "modelID: "+device.modelID

**Notes:** The value of this property is an identifier unique to all devices of the same model. The value is persistent across device connections and disconnections, and across different systems. For example, the model ID of the camera built in to two identical iPhone models will be the same even though they are different physical devices.
(Read only property)

### 16.35.56 position as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the physical position of the device hardware on the system. (read-only)
**Notes:** You can observe changes to the value of this property using key-value observing.
See "AVCaptureDevicePosition" for possible values.
(Read only property)

### 16.35.57 reactionEffectGesturesEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 23.5, Platform: macOS, Targets: All.

**Function:** A class property indicating whether gesture detection will trigger reaction effects on the video stream.
**Example:**

```
If AVCaptureDeviceMBS.reactionEffectGesturesEnabled Then
MessageBox "reaction effects enabled"
Else
MessageBox "reaction effects not enabled."
End If
```

**Notes:** Gesture detection will only run when the device's activeFormat.reactionEffectsSupported is also true, which will be reflected by canPerformReactionEffects.

This property changes to reflect the Gestures state in Control Center.
Clients can call performEffectForReaction independently of whether gesture detection is enabled, reaction effects from either source will be intermixed.

Requires macOS 14.0 or iOS 17.0.
You may check AVCaptureReactionEffectStateMBS.available for whether this is available.
(Read only property)

### 16.35.58 reactionEffectsEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 23.5, Platform: macOS, Targets: All.

**Function:** A class property indicating whether the application is suitable for reaction effects, either by automatic gesture detection, or by calls to performEffectForReaction().
**Example:**

```
If AVCaptureDeviceMBS.reactionEffectsEnabled Then
MessageBox "reaction effects enabled"
Else
MessageBox "reaction effects not enabled."
End If
```

**Notes:** Reactions are only rendered when the device's activeFormat.reactionEffectsSupported is also true, which will be reflected by canPerformReactionEffects when the feature is both enabled and supported.

On macOS, Reaction Effects are enabled by default for all applications. On iOS, Reaction Effects are enabled by default for video conferencing applications (apps that use "voip" as one of their UIBackgroundModes). Non video conferencing applications may opt in for Reaction Effects by adding the following key to their Info.plist:

```
<key>NSCameraReactionEffectsEnabled</key>
<true/>
```

Requires macOS 14.0 or iOS 17.0.
You may check AVCaptureReactionEffectStateMBS.available for whether this is available.
(Read only property)

### 16.35.59 torchMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The current torch mode.
**Notes:** Setting the value of this property also sets the torch level to its maximum current value.

Before setting the value of this property, call the isTorchModeSupported method to make sure the device supports the desired mode. Setting the device to an unsupported torch mode results in the raising of an exception. For a list of possible values for this property, see "AVCaptureTorchMode."

Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using key-value observing.
(Read and Write property)

### 16.35.60 transportControlsPlaybackMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The current playback mode. (read-only)
**Notes:** This property is only valid for devices that support transport control.
You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.61 transportControlsSpeed as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current playback speed. (read-only)
**Notes:** For devices that support transport control, the value of this property indicates the current playback speed of the deck. The following table gives examples of the meaning of values:

| Value | Meaning |
|---|---|
| 0.0 | Stopped |
| 1.0 | Forward at normal speed. |
| -1.0 | Reverse at normal speed. |
| 2.0 | Forward at 2x normal speed. |

You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.62 transportControlsSupported as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the device supports transport control commands. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
MsgBox str(device.transportControlsSupported)
```

**Notes:** For devices with transport controls, such as AVC tape-based camcorders or pro capture devices with RS422 deck control, the value of this property is true. If transport controls are not supported, none of the associated transport control methods and properties are available on the receiver.

You can observe changes to the value of this property using key-value observing.
(Read only property)

### 16.35.63 transportType as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The transport type of the receiver. (read-only)
**Notes:** The value of this property represents the transport type of the device (USB, PCI, etc). Transport types are defined in <IOKit/audio/IOAudioTypes.h>as kIOAudioDeviceTransportType*.
(Read only property)

### 16.35.64 uniqueID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An ID unique to the model of device corresponding to the receiver. (read-only)
**Example:**

```
dim device as AVCaptureDeviceMBS
device = AVCaptureDeviceMBS.defaultDeviceWithMediaType(AVFoundationMBS.AVMediaTypeVideo)
dim u as string = device.uniqueID
MsgBox "uniqueID: "+u
```

**Notes:** Every available capture device has a unique ID that persists on one system across device connections and disconnections, application restarts, and reboots of the system itself. You can store the value returned by this property to recall or track the status of a specific device in the future.
(Read only property)

### 16.35.65 videoZoomFactor as Double

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: iOS, Targets: iOS only.

**Function:** A value that controls the cropping and enlargement of images captured by the device.
**Notes:** This value is a multiplier. For example, a value of 2.0 doubles the size of an image,Äôs subject

(and halves the field of view). Allowed values range from 1.0 (full field of view) to the value of the active format,Äôs videoMaxZoomFactor property. Setting the value of this property jumps immediately to the new zoom factor. For a smooth transition, use the rampToVideoZoomFactor method.
(Read and Write property)

### 16.35.66 whiteBalanceMode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The current white balance mode.
**Notes:** Before changing the value of this property, you must call lockForConfiguration to acquire exclusive access to the device's configuration properties. If you do not, setting the value of this property raises an exception. When you are done configuring the device, call unlockForConfiguration to release the lock and allow other devices to configure the settings.

You can observe changes to the value of this property using key-value observing.
See "AVCaptureWhiteBalanceMode" for possible values.
(Read and Write property)

### 16.35.67 Constants

Authorization

| Constant | Value | Description |
|---|---|---|
| AVAuthorizationStatusAuthorized | 3 | The client is authorized to access the hardware supporting a media type is default for MacOS 10.13 or older. |
| AVAuthorizationStatusDenied | 2 | The user explicitly denied access to the hardware supporting a media ty the client. |
| AVAuthorizationStatusNotDetermined | 0 | Indicates that the user has not yet made a choice regarding whether the can access the hardware. |
| AVAuthorizationStatusRestricted | 1 | The client is not authorized to access the hardware for the media type user cannot change the client's status, possibly due to active restriction as parental controls being in place. |

Device Position Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureDevicePositionBack | 1 | The capture device is on the back of the unit. |
| AVCaptureDevicePositionFront | 2 | The capture device is on the front of the unit. |
| AVCaptureDevicePositionUnspecified | 0 | The capture device's position relative to the system hardware is unspecif |

Transport Control Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureDeviceTransportControlsNotPlayingMode | 0 | Indicates that the tape transport is not threaded through |
| AVCaptureDeviceTransportControlsPlayingMode | 1 | Indicates that the tape transport is threaded through the |

Exposure Mode Constants

| Constant | Value | Description |
|---|---|---|
| AVCaptureExposureModeAutoExpose | 1 | The device continuously monitors exposure levels and auto essary. |
| AVCaptureExposureModeContinuousAutoExposure | 2 | The device performs an auto-expose operation now. |
| AVCaptureExposureModeLocked | 0 | The exposure setting is locked. |

Flash Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureFlashModeAuto | 2 | The capture device continuously monitors light levels and uses the flash when necessary. |
| AVCaptureFlashModeOff | 0 | The capture device flash is always off. |
| AVCaptureFlashModeOn | 1 | The capture device flash is always on. |

Focus Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureFocusModeAutoFocus | 1 | The capture device performs an autofocus operation now. |
| AVCaptureFocusModeContinuousAutoFocus | 2 | The capture device continuously monitors focus and auto focuses sary. |
| AVCaptureFocusModeLocked | 0 | The focus is locked. |

Torch Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureTorchModeAuto | 2 | The capture device continuously monitors light levels and uses the torch when necessary. |
| AVCaptureTorchModeOff | 0 | The capture device torch is always off. |
| AVCaptureTorchModeOn | 1 | The capture device torch is always on. |

White Balance Modes

| Constant | Value | Description |
|---|---|---|
| AVCaptureWhiteBalanceModeAutoWhiteBalance | 1 | The device performs an auto white balance opera |
| AVCaptureWhiteBalanceModeContinuousAutoWhiteBalance | 2 | The device continuously monitors white balance a |
| AVCaptureWhiteBalanceModeLocked | 0 | The white balance setting is locked. |

## 16.36 class AVCaptureFileOutputMBS

### 16.36.1 class AVCaptureFileOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureFileOutput is an abstract sub-class of AVCaptureOutput that describes a file output destination to an AVCaptureSession.
**Notes:** For example, you use an instance of its concrete subclass, AVCaptureMovieFileOutput, to save capture output to a QuickTime movie file. The concrete subclasses of AVCaptureFileOutput are AVCaptureMovieFileOutput, which records media to a QuickTime movie file, and AVCaptureAudioFileOutput, which writes audio media to a variety of audio file formats.

This abstract superclass defines the interface for outputs that record media samples to files. File outputs can start recording to a new file using startRecordingToOutputFileURL method.

In OS X, on successive invocations of this method the output file can be changed dynamically without losing media samples. A file output can stop recording using the stopRecording method. Because files are recorded in the background, you need to specify a delegate for each new file to be notified when recorded files are finished.

In OS X, you can also set a delegate on the file output itself that can be used to control recording along exact media sample boundaries using the captureOutputDidOutputSampleBuffer event in AVFoundationMBS.
Subclass of the AVCaptureOutputMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.36.2 Methods

### 16.36.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.36.4 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables the events for this output.
**Notes:** Those are normally handled automatically, but if you add event with AddHandler you need to call this method.

### 16.36.5 isRecording as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether recording is in progress.
**Notes:** The value of this property is true when the file output currently has a file to which it is writing new samples, false otherwise.

### 16.36.6 isRecordingPaused as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether recording to the current output file is paused.
**Notes:** This property indicates recording to the file returned by outputFileURL has been previously paused using the pauseRecording method. When a recording is paused, captured samples are not written to the output file, but new samples can be written to the same file in the future by calling resumeRecording.

### 16.36.7 outputFileURL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL to which output is directed. (read-only)

### 16.36.8 pauseRecording

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Pauses recording to the current output file.
**Notes:** This method causes the receiver to stop writing captured samples to the current output file returned by outputFileURL, but leaves the file open so that samples can be written to it in the future, if resumeRecording is called. This allows you to record multiple media segments that are not contiguous in time to a single file.

In OS X, if this method is called within the AVFoundationMBS captureOutputDidFinishRecordingToOutputFileAtURL event, the last samples written to the current file are guaranteed to be those that were output immediately before those in the sample buffer passed to that method.

### 16.36.9 recordedDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the duration of the media recorded to the current output file. (read-only)
**Notes:** If recording is in progress, this property returns the total time recorded so far.

### 16.36.10 recordedFileSize as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the size, in bytes, of the data recorded to the current output file. (read-only)
**Notes:** If a recording is in progress, this property returns the size in bytes of the data recorded so far.

### 16.36.11 resumeRecording

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resumes recording to the current output file after it was previously paused using pauseRecording.
**Notes:** This method causes the receiver to resume writing captured samples to the current output file returned by outputFileURL, after recording was previously paused using pauseRecording. This allows you to record multiple media segments that are not contiguous in time to a single file.

In OS X, if this method is called within the AVFoundationMBS captureOutputDidFinishRecordingToOutputFileAtURL event, the first samples written to the current file are guaranteed to be those contained in the sample buffer passed to that method.

### 16.36.12 startRecordingToOutputFile(file as folderitem)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Starts recording to a given file.
**Notes:** Same as startRecordingToOutputFileURL, but with folderitem.

### 16.36.13 startRecordingToOutputFileURL(URL as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Starts recording to a given URL.
**Notes:** URL: The URL of the output file. This method throws an NSInvalidArgumentException if the URL is not a valid file URL.

The method sets the file URL to which the receiver is currently writing output media. If a file at the given

URL already exists when capturing starts, recording to the new file will fail.

In OS X, you do not need to call stopRecording before calling this method while another recording is in progress. If this method is invoked while an existing output file was already being recorded, no media samples will be discarded between the old file and the new file.

In iOS, this frame accurate file switching is not supported. You must call stopRecording before calling this method again to avoid any errors.

When recording is stopped either by calling stopRecording, by changing files using this method, or because of an error, the remaining data that needs to be included to the file will be written in the background. Therefore, you must specify a delegate that will be notified when all data has been written to the file using the AVFoundationMBS captureOutputDidFinishRecordingToOutputFileAtURL event. The recording delegate can also optionally implement methods that inform it when data starts being written, when recording is paused and resumed, and when recording is about to be finished.

In OS X, if this method is called within the AVFoundationMBS captureOutputDidOutputSampleBuffer event, the first samples written to the new file are guaranteed to be those contained in the sample buffer passed to that method.

Note: AVCaptureAudioFileOutput does not support startRecordingToOutputFileURL without filetype.

### 16.36.14 stopRecording

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the receiver to stop recording to the current file.
**Notes:** You can call this method when they want to stop recording new samples to the current file, and do not want to continue recording to another file. If you want to switch from one file to another, you should not call this method. Instead you should simply call startRecordingToOutputFileURL with the new file URL.

When recording is stopped either by calling this method, by changing files using startRecordingToOutputFileURL, or because of an error, the remaining data that needs to be included to the file will be written in the background. Therefore, before using the file, you must wait until the delegate that was specified in startRecordingToOutputFileURL is notified when all data has been written to the file using the AVFoundationMBS.captureOutputDidFinishRecordingToOutputFileAtURL method.

In OS X, if this method is called within the AVFoundationMBS captureOutputDidOutputSampleBuffer event, the last samples written to the current file are guaranteed to be those that were output immediately before those in the sample buffer passed to that method.

### 16.36.15 Properties

### 16.36.16 maxRecordedDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The longest duration allowed for the recording.
**Notes:** This property specifies a hard limit on the duration of recorded files. Recording is stopped when the limit is reached and the AVFoundationMBS.captureOutputDidFinishRecordingToOutputFileAtURL event is invoked with an appropriate error. The default value of this property is kCMTimeInvalid, which indicates no limit.
(Read and Write computed property)

### 16.36.17 maxRecordedFileSize as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The maximum size, in bytes, of the data that should be recorded by the receiver.
**Notes:** This property specifies a hard limit on the data size of recorded files. Recording is stopped when the limit is reached and the AVFoundationMBS captureOutputDidFinishRecordingToOutputFileAtURL event is invoked with an appropriate error. The default value of this property is 0, which indicates no limit.
(Read and Write computed property)

### 16.36.18 minFreeDiskSpaceLimit as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The minimum amount of free space, in bytes, required for recording to continue on a given volume.
**Notes:** This property specifies a hard lower limit on the amount of free space that must remain on a target volume for recording to continue. Recording is stopped when the limit is reached and the AVFoundationMBS captureOutputDidFinishRecordingToOutputFileAtURL event is invoked with an appropriate error.
(Read and Write computed property)

## 16.37 class AVCaptureInputMBS

### 16.37.1 class AVCaptureInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureInput is an abstract base-class describing an input data source to an AVCaptureSession object.
**Notes:** To associate an AVCaptureInput object with a session, call addInput on the session.

AVCaptureInput objects have one or more ports (instances of AVCaptureInputPort), one for each data stream they can produce. For example, an AVCaptureDevice object presenting one video data stream has one port.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.37.2 Methods

### 16.37.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.37.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.37.5 ports as AVCaptureInputPortMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture input's ports. (read-only)
**Notes:** The array contains one or more instances of AVCaptureInputPort.

Each individual AVCaptureInputPort instance posts an AVCaptureInputPortFormatDescriptionDidChangeNotification when the formatDescription of that port changes.

### 16.37.6 portWithMediaType(mediaType as string) as AVCaptureInputPortMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Finds the port in the ports array with given mediatype.
**Notes:** Returns nil if not found.

### 16.37.7 Properties

### 16.37.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.38 class AVCaptureInputPortMBS

### 16.38.1 class AVCaptureInputPortMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVCaptureInputPort represents a stream of data from a capture input.
**Notes:** Instances of AVCaptureInput have one or more input ports, one for each data stream they can produce. For example, an AVCaptureDeviceInput presenting one video data stream has one port.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.38.2 Methods

### 16.38.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.38.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.38.5 formatDescription as CMFormatDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A description of the port format. (read-only)

### 16.38.6 input as AVCaptureInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The port's input. (read-only)

### 16.38.7 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The port's media type. (read-only)

### 16.38.8 Properties

### 16.38.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.38.10 Enabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the port is enabled.
**Notes:** (Read and Write computed property)

## 16.39 class AVCaptureMetadataOutputMBS

### 16.39.1 class AVCaptureMetadataOutputMBS

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** A capture output for processing timed metadata produced by a capture session.
**Notes:** Available for iOS only!

An AVCaptureMetadataOutput object intercepts metadata objects emitted by its associated capture connection and forwards them to a delegate object for processing. You can use instances of this class to process specific types of metadata included with the input data. You use this class the way you do other output objects, typically by adding it as an output to an AVCaptureSessionMBS object.
Subclass of the AVCaptureOutputMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo Plugins, version 21.2pr7

### 16.39.2 Methods

### 16.39.3 availableMetadataObjectTypes as string()

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** An array of strings identifying the types of metadata objects that can be captured.
**Notes:** Each string in the array corresponds to a possible value in the type property of the AVMetadataObjectMBS objects reported by the receiver. The available types are dependent on the capabilities of the AVCaptureInputPortMBS to which the receiver,Äôs connection is attached.

### 16.39.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 16.39.5 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** Enables events, if you use addHandler to connect them.

### 16.39.6 metadataObjectTypes as String()

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** An array of strings identifying the types of metadata objects to process.
**Notes:** This property is used to filter the metadata objects reported by the receiver. Only metadata objects whose type matches one of the strings in this property are forwarded to the captureOutput:didOutputMetadataObjects event for processing.

When assigning a new array to this property, each of the type strings must be present in the array returned by the availableMetadataObjectTypes property; otherwise, the receiver raises an NSExceptionMBS.
The default is an empty array, and as a result, no metadata objects are forwarded to the event. The same result can be achieved by setting the property to nil. This default behavior maximizes both performance and battery life.

### 16.39.7 SetMetadataObjectTypes(items() as String = nil)

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** Sets the array of strings identifying the types of metadata objects to process.
**Example:**

```
Dim o As New AVCaptureMetadataOutputMBS
Dim types() As String

Dim availableTypes() As String = o.availableMetadataObjectTypes

// check if we can do EAN 13 and then add it
If availableTypes.IndexOf(AVMetadataObjectMBS.AVMetadataObjectTypeEAN13Code) >= 0 Then
types.append(AVMetadataObjectMBS.AVMetadataObjectTypeEAN13Code)
End If

o.SetMetadataObjectTypes types
```

**Notes:** This property is used to filter the metadata objects reported by the receiver. Only metadata objects whose type matches one of the strings in this property are forwarded to the captureOutput:didOutputMetadataObjects event for processing.

When assigning a new array to this property, each of the type strings must be present in the array returned by the availableMetadataObjectTypes property; otherwise, the receiver raises an NSExceptionMBS.

The default is an empty array, and as a result, no metadata objects are forwarded to the event. The same result can be achieved by setting the property to nil. This default behavior maximizes both performance and battery life.

### 16.39.8 Properties

### 16.39.9 rectOfInterest as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: iOS, Targets: iOS only.

**Function:** A rectangle of interest for limiting the search area for visual metadata.
**Notes:** The value of this property is a CGRect value that determines the object,Äôs rectangle of interest for each frame of video.
The rectangle's origin is top left and is relative to the coordinate space of the device providing the metadata.
Specifying a rectangle of interest may improve detection performance for certain types of metadata. Metadata objects whose bounds do not intersect with the rectOfInterest will not be returned.
The default value of this property is a rectangle of (0.0, 0.0, 1.0, 1.0).
(Read and Write property)

## 16.40 class AVCaptureMovieFileOutputMBS

### 16.40.1 class AVCaptureMovieFileOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureMovieFileOutput is a concrete sub-class of AVCaptureFileOutput you use to capture data to a QuickTime movie.
**Notes:** The timeMapping.target.start of the first track segment must be kCMTimeZero, and the timeMapping.target.start of each subsequent track segment must equal CMTimeRangeGetEnd(<#the previous AVCompositionTrackSegment's timeMapping.target#>). You can use validateTrackSegments to ensure that an array of track segments conforms to this rule.
Subclass of the AVCaptureFileOutputMBS class.

### 16.40.2 Methods

### 16.40.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.40.4 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables the events for this output.
**Notes:** Those are normally handled automatically, but if you add event with AddHandler you need to call this method.

### 16.40.5 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The metadata for the output file.
**Notes:** The array contains AVMetadataItem objects. You use this array to add metadata such as copyright, creation date, and so on, to the recorded movie file.

### 16.40.6 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the metadata for the output file.
**Notes:** The array contains AVMetadataItem objects. You use this array to add metadata such as copyright, creation date, and so on, to the recorded movie file.

### 16.40.7 Properties

### 16.40.8 movieFragmentInterval as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the number of seconds of output that are written per fragment.
**Notes:** The default is 10 seconds. Set to kCMTimeInvalid to disable movie fragment writing (not typically recommended).

A QuickTime movie is comprised of media samples and a sample table identifying their location in the file. A movie file without a sample table is unreadable.

In a processed file, the sample table typically appears at the beginning of the file. It may also appear at the end of the file, in which case the header contains a pointer to the sample table at the end. When a new movie file is being recorded, it is not possible to write the sample table since the size of the file is not yet known. Instead, the table is must be written when recording is complete. If no other action is taken, this means that if the recording does not complete successfully (for example, in the event of a crash), the file data is unusable (because there is no sample table). By periodically inserting "movie fragments" into the movie file, the sample table can be built up incrementally. This means that if the file is not written completely, the movie file is still usable (up to the point where the last fragment was written).
(Read and Write computed property)

### 16.40.9 outputSettingsForConnection(connection as AVCaptureConnectionMBS) as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the options the receiver uses to re-encode media from the given connection as it is being recorded.
**Notes:** connection: The connection delivering the media to be re-encoded.
Returns an Dictionary of output settings.

See AVAudioSettings.h for audio connections or AVVideoSettings.h for video connections for more information on how to construct an output settings dictionary. If the returned value is an empty dictionary (i.e.

new dictionary, the format of the media from the connection will not be changed before being written to the file. If setOutputSettings was called with a nil dictionary, this method returns a non-nil dictionary reflecting the settings used by the AVCaptureSession's current sessionPreset.
(Read and Write computed property)

## 16.41 class AVCaptureOutputMBS

### 16.41.1 class AVCaptureOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureOutput is an abstract base-class describing an output destination of an AVCaptureSession object.
**Notes:** AVCaptureOutput provides an abstract interface for connecting capture output destinations, such as files and video previews, to an capture session (an instance of AVCaptureSession). A capture output can have multiple connections represented by AVCaptureConnection objects, one for each stream of media that it receives from a capture input (an instance of AVCaptureInput). A capture output does not have any connections when it is first created. When you add an output to a capture session, connections are created that map media data from that session's inputs to its outputs.

You can add concrete AVCaptureOutput instances to an capture session using addOutput.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.41.2 Methods

### 16.41.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.41.4 connections as AVCaptureConnectionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture output object's connections. (read-only)
**Notes:** The value of this property is an array of AVCaptureConnection objects, each describing the mapping between the receiver and the capture input ports (see AVCaptureInputPort) of one or more capture inputs (see AVCaptureInput).

### 16.41.5 connectionWithMediaType(mediaType as string) as AVCaptureConnectionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the first connection in the connections array with an input port of a specified media type.
**Notes:** mediaType: An AVMediaType constant from AVMediaFormat.h, for example, AVMediaTypeVideo.

Returns the first capture connection in the connections array that has an AVCaptureInputPort with media type mediaType, or nil if no connection with the specified media type is found.

### 16.41.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.41.7 Properties

### 16.41.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.42 class AVCaptureReactionEffectStateMBS

### 16.42.1 class AVCaptureReactionEffectStateMBS

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Reports the state of a reaction performed on an AVCaptureDeviceMBS.
**Example:**

```
dim device as AVCaptureDeviceMBS // your device

dim effects() as AVCaptureReactionEffectStateMBS = device.reactionEffectsInProgress

for each effect as AVCaptureReactionEffectStateMBS in effects
MessageBox effect.reactionType
next
```

**Notes:** AVCaptureReactionEffectStateMBS may be obtained by calling reactionEffectsInProgress in AVCaptureDeviceMBS. When canPerformReactionEffects in AVCaptureDeviceMBS returns true, new entries are added either by calling performReactionEffect, or by gesture detection in the capture stream when AVCaptureDevice.reactionEffectGesturesEnabled. The effect rendering is done before frames are given to the capture client, and these status objects let you know when these effects are performed.

Requires macOS 14.0 or iOS 17.0.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr6

### 16.42.2 Methods

### 16.42.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
If AVCaptureReactionEffectStateMBS.available Then
MessageBox "available"
Else
MessageBox "not available."
```

End If

**Notes:** Returns true on macOS 14.0 or iOS 17.0.

### 16.42.4 AVCaptureReactionTypeBalloons as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features balloons rising through the scene.

### 16.42.5 AVCaptureReactionTypeConfetti as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features festive spots of color falling through the scene.

### 16.42.6 AVCaptureReactionTypeFireworks as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features fireworks bursting in the background.

### 16.42.7 AVCaptureReactionTypeHeart as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features one or more heart symbols.

### 16.42.8 AVCaptureReactionTypeLasers as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features a bright laser display projecting into the scene.

### 16.42.9 AVCaptureReactionTypeRain as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features a dark and stormy night.

### 16.42.10 AVCaptureReactionTypeThumbsDown as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features a thumbs-down symbol.

### 16.42.11 AVCaptureReactionTypeThumbsUp as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** One of the rection types that can be performed in an effect.
**Notes:** Indicates a reaction which features a thumbs-up symbol.

### 16.42.12 Constructor

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 16.42.13 ReactionSystemImageNameForType(reactionType as String) as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the name for NSImage systemImageNamed method to obtain the recommended iconography for a specified reaction type.
**Example:**

```
// loads image into canvas
dim effect as string = AVCaptureReactionEffectStateMBS.AVCaptureReactionTypeBalloons
dim name as string = AVCaptureReactionEffectStateMBS.ReactionSystemImageNameForType(effect)
dim image as NSImageMBS = NSImageMBS.imageWithSystemSymbolName(name)

// change size to match
image.setSize canvas1.Width, canvas1.Height
```

```
// and render picture
canvas1.Backdrop = image.CopyPictureWithAlpha
```

### 16.42.14 Properties

### 16.42.15 endTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Provides the presentation time of the frame following the last frame where the effect is seen.
**Notes:** Will be CMTimeMBS.kCMTimeInvalid while the effect is in progress, but will be updated to a valid time when the reaction effect completes and the AVCaptureReactionEffectState is removed from reactionEffectsInProgress array.
(Read only property)

### 16.42.16 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.42.17 reactionType as String

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Indicates the reaction which is running.
**Notes:** There may be multiple reactions of the same type at a given time.
Some may come from gesture detection, some may come from calls to performReactionEffect method in AVCaptureDeviceMBS class.
(Read only property)

### 16.42.18 startTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: All.

**Function:** Provides the presentation time of the first frame where the effect is being rendered.
**Notes:** (Read only property)

# 16.43 class AVCaptureScreenInputMBS

## 16.43.1 class AVCaptureScreenInputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** AVCaptureScreenInput is a concrete subclass of AVCaptureInput that provides an interface for capturing media from a screen or a portion of a screen.
**Notes:** Instances of AVCaptureScreenInput are input sources for AVCaptureSession objects that provide media data from one of the screens connected to the system, represented by CGDirectDisplayIDs.
Subclass of the AVCaptureInputMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr1

## 16.43.2 Methods

## 16.43.3 Constructor(CGDisplay as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a capture screen input that provides media data from a given display.
**Notes:** CGDisplay: The display from which to capture video. Must be CGDisplayMBS object.
Handle is non zero on success.

## 16.43.4 Properties

## 16.43.5 capturesCursor as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A property indicating whether the cursor should be rendered to the captured output.
**Notes:** By default, AVCaptureScreenInput draws the cursor in its captured output. If this property is set to false, the captured output contains only the windows on the screen. Cursor is omitted. Note that cursor position and mouse button state at the time of capture is preserved in CMSampleBuffers emitted from AVCaptureScreenInput. See the inline documentation for kCMIOSampleBufferAttachmentKey_MouseAndKeyboardModifiers in <CoreMediaIO/CMIOSampleBuffer.h>

Available in Mac OS X 10.8 and newer.
(Read and Write computed property)

### 16.43.6 capturesMouseClicks as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether mouse clicks should be highlighted in the captured output.
**Notes:** By default, AVCaptureScreenInput does not highlight mouse clicks in its captured output.

If you set this property is set to true, mouse clicks are highlighted (a circle is drawn around the mouse for the duration of the click) in the captured output.
(Read and Write computed property)

### 16.43.7 cropRect as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the bounding rectangle of the screen area to be captured, in pixels.
**Notes:** By default, AVCaptureScreenInput captures the entire area of the displayID with which it is associated.

Set the value of this property to limit the capture rectangle to a subsection of the screen.

The rectangle should define a smaller section of the screen in the screen's coordinate system. The origin (0,0) is the bottom-left corner of the screen.
(Read and Write computed property)

### 16.43.8 minFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The screen input's minimum frame duration.
**Notes:** The minFrameDuration is the reciprocal of its maximum frame rate.

You use this property to request a maximum frame rate at which the input produces video frames. The requested rate may not be achievable due to overall bandwidth, so actual frame rates may be lower.
(Read and Write computed property)

### 16.43.9 removesDuplicateFrames as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A property indicating whether duplicate frames should be removed by the input.

**Notes:** By default, AVCaptureScreenInput performs frame differencing and when it detects duplicate frames, it drops them. If this property is set to false, the captured output receives all frames from the input.

Available in Mac OS X 10.8 and newer.
(Read and Write computed property)

### 16.43.10 scaleFactor as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the factor by which video buffers captured from the screen are to be scaled.
**Notes:** By default, AVCaptureScreenInput captures the video buffers from the display at a scale factor of 1.0 (no scaling). Set this property to scale the buffers by a given factor; for example a 320x240 capture area with a scaleFactor of 2.0 produces video buffers at 640x480.
(Read and Write computed property)

## 16.44 class AVCaptureSessionMBS

### 16.44.1 class AVCaptureSessionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVCaptureConnection object represents a connection between capture input and capture output objects associated with a capture session.
**Notes:** Capture inputs (instances of AVCaptureInput) have one or more input ports (instances of AVCaptureInputPort). Capture outputs (instances of AVCaptureOutput) can accept data from one or more sources (for example, an AVCaptureMovieFileOutput object accepts both video and audio data).

You can only add an AVCaptureConnection instance to a session using addConnection if canAddConnection returns true. When using addInput or addOutput, connections are formed automatically between all compatible inputs and outputs. You only need to add connections manually when adding an input or output with no connections. You can also use connections to enable or disable the flow of data from a given input or to a given output.

### 16.44.2 Methods

### 16.44.3 addConnection(connection as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds a given capture connection to the session.
**Notes:** connection: The capture connection to add to the session.

You can only add an AVCaptureConnection instance to a session using this method if canAddConnection returns true.
When using addInput or addOutput, connections are formed automatically between all compatible inputs and outputs. Manually adding connections is only necessary when adding an input or output with no connections.

### 16.44.4 addInput(connection as AVCaptureInputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds a given input to the session.
**Notes:** input: An input to add to the session.

You can only add an input to a session using this method if canAddInput returns true.
You can invoke this method while the session is running.

### 16.44.5 addInputWithNoConnections(input as AVCaptureInputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds an capture input to the session without forming any connections.
**Notes:** input: The capture input to add to the session.
You can invoke this method while the session is running.
Typically you should use addInput to add an input to a session. You use this method if you need fine-grained control over which inputs are connected to which outputs.

### 16.44.6 addOutput(connection as AVCaptureOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds a given output to the session.
**Notes:** output: An output to add to the session.
You can only add an output to a session using this method if canAddOutput returns true.
You can invoke this method while the session is running.

### 16.44.7 addOutputWithNoConnections(output as AVCaptureOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds an capture output to the session without forming any connections.
**Notes:** output: The capture output to add to the session.

You can invoke this method while the session is running.
Typically you should use addOutput to add an output to a session. You use this method if you need fine-grained control over which inputs are connected to which outputs.

### 16.44.8 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.44.9 beginConfiguration

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the start of a set of configuration changes to be made atomically.
**Notes:** You use beginConfiguration and commitConfiguration to batch multiple configuration operations on a running session into an atomic update.

After calling beginConfiguration, you can for example add or remove outputs, alter the sessionPreset, or configure individual capture input or output properties. No changes are actually made until you invoke commitConfiguration, at which time they are applied together.

### 16.44.10 canAddConnection(connection as AVCaptureConnectionMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given connection can be added to the receiver.
**Notes:** connection: An AVCaptureConnection instance.
Returns true if connection can be added to the receiver, otherwise false.

### 16.44.11 canAddInput(input as AVCaptureInputMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given input can be added to the session.
**Notes:** input: An input that you want to add to the session.
Returns true if input can be added to the session, otherwise false.

### 16.44.12 canAddOutput(input as AVCaptureOutputMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given output can be added to the session.
**Notes:** output: An output that you want to add to the session.
Returns true if output can be added to the session, otherwise false.

### 16.44.13 canSetSessionPreset(preset as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver can use the given preset.
**Notes:** preset: A preset you would like to set for the receiver. For possible values, see AVFoundationMBS. Returns true if the receiver can use preset, otherwise false.

### 16.44.14 commitConfiguration

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Commits a set of configuration changes.
**Notes:** For discussion, see beginConfiguration.

### 16.44.15 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.44.16 inputs as AVCaptureInputMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture session's inputs. (read-only)
**Notes:** The array contains instances of subclasses of AVCaptureInput.

### 16.44.17 isRunning as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver is running. (read-only)
**Notes:** You can observe the value of this property using key-value observing.

### 16.44.18 outputs as AVCaptureOutputMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture session's outputs. (read-only)
**Notes:** The array contains instances of subclasses of AVCaptureOutput.

### 16.44.19 removeConnection(connection as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a capture connection from the session.
**Notes:** connection: The capture connection to remove from the session.
You can invoke this method while the session is running.

### 16.44.20 removeInput(connection as AVCaptureInputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a given input.
**Notes:** input: An input to remove from the receiver.
You can invoke this method while the session is running.

### 16.44.21 removeOutput(connection as AVCaptureOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a given output.
**Notes:** output: An output to remove from the receiver.
You can invoke this method while the session is running.

### 16.44.22 startRunning

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the receiver to start running.
**Notes:** startRunning and stopRunning are asynchronous operations. If an error occurs occur during a capture session, you receive an AVCaptureSessionRuntimeErrorNotification.

### 16.44.23 stopRunning

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the receiver to stop running.
**Notes:** startRunning and stopRunning are asynchronous operations. If an error occurs occur during a capture session, you receive an AVCaptureSessionRuntimeErrorNotification.

### 16.44.24 Properties

### 16.44.25 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.44.26 sessionPreset as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A constant value indicating the quality level or bitrate of the output.
**Notes:** You use this property to customize the quality level or bitrate of the output. For possible values of sessionPreset, see AVFoundationMBS. The default value is AVCaptureSessionPresetHigh.

You can set this value while the session is running.
You can only set a preset if canSetSessionPreset: returns true for that preset.
(Read and Write computed property)

## 16.45 class AVCaptureStillImageOutputMBS

### 16.45.1 class AVCaptureStillImageOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureStillImageOutput is a concrete sub-class of AVCaptureOutput that you use to capture a high-quality still image with accompanying metadata.
**Notes:** Subclass of the AVCaptureOutputMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr6

### 16.45.2 Methods

### 16.45.3 availableImageDataCodecTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The supported image codec formats that can be specified in outputSettings. (read-only)
**Example:**

```
dim a as new AVCaptureStillImageOutputMBS
MsgBox join(a.availableImageDataCodecTypes)
```

**Notes:** The value of this property is an array of Strings that you can use as values for the AVVideoCodecKey in the outputSettings property.

### 16.45.4 availableImageDataCVPixelFormatTypes as Integer()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The supported image pixel formats that can be specified in outputSettings. (read-only)
**Example:**

```
dim a as new AVCaptureStillImageOutputMBS
dim availableImageDataCVPixelFormatTypes() as Integer = a.availableImageDataCVPixelFormatTypes
break // check array in debugger
```

**Notes:** The value of this property is an array of numbers that you can use as values for the kCVPixelBuffer-PixelFormatTypeKey in the outputSettings property.
Currently only "jpeg".

Available in OS X v10.7 and later.

### 16.45.5 captureStillImageAsynchronously(connection as AVCaptureConnectionMBS, prepareJpegStillImage as boolean, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initiates a still image capture and returns immediately.
**Notes:** connection: The connection from which to capture the image.

Pass true for prepareJpegStillImage to have the plugin prepare jpeg data for you.

The buffer attachments may contain metadata appropriate to the image data format. For example, a buffer containing JPEG data may carry a kCGImagePropertyExifDictionary as an attachment. See ImageIO/CGImageProperties.h for a list of keys and value types.
error
If the request could not be completed, an NSError object that describes the problem; otherwise nil.

This method returns immediately after it is invoked, later calling the AVFoundationMBS.captureStillImageAsynchronouslyCompleted event when image data is ready. If the request could not be completed, the error parameter will contain an NSError object describing the failure.

Available in OS X v10.7 and later.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.45.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.45.7 jpegStillImageNSDataRepresentation(jpegSampleBuffer as CMSampleBufferMBS) as memoryblock

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an memoryblock representation of a still image data and metadata attachments in a

JPEG sample buffer.
**Notes:** jpegSampleBuffer: The sample buffer carrying JPEG image data, optionally with Exif metadata sample buffer attachments.
This method throws an NSInvalidArgumentException if jpegSampleBuffer is nil or not in the JPEG format.

Returns memoryblock representation of jpegSampleBuffer.

This method merges the image data and Exif metadata sample buffer attachments without re-compressing the image.
The returned memoryblock object is suitable for writing to disk.

Available in OS X v10.7 and later.

### 16.45.8 Properties

### 16.45.9 isCapturingStillImage as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A boolean value that becomes true when a still image is being captured.
**Notes:** The value of this property is a BOOL that becomes true when a still image is being captured, and false when no still image capture is underway. This property is key-value observable.
(Read only property)

### 16.45.10 outputSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The compression settings for the output.
**Notes:** You specify the compression settings using keys from AVVideoSettings.h, or a dictionary of pixel buffer attributes using keys from CVPixelBuffer.h.

Currently the only supported keys are AVVideoCodecKey and kCVPixelBufferPixelFormatTypeKey. The recommended values are kCMVideoCodecType_JPEG, kCVPixelFormatType_420YpCbCr8BiPlanarFullRange and kCVPixelFormatType_32BGRA.

Available in OS X v10.7 and later.
(Read and Write computed property)

# 16.46 class AVCaptureVideoDataOutputMBS

## 16.46.1 class AVCaptureVideoDataOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureVideoDataOutput is a concrete sub-class of AVCaptureOutput you use to process uncompressed frames from the video being captured, or to access compressed frames.
**Notes:** An instance of AVCaptureVideoDataOutput produces video frames you can process using other media APIs. You can access the frames with the AVFoundationMBS.captureOutputDidOutputSampleBuffer event.
Subclass of the AVCaptureOutputMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr6
- MBS Xojo Plugins, version 18.4pr3
- AVCaptureVideoDataOutput improvements

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

## 16.46.2 Methods

## 16.46.3 availableVideoCodecTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the supported video codec formats that can be specified in videoSettings. (read-only)
**Notes:** The value of this property is an array of String objects you can use as values for the AVVideoCodecKey in the videoSettings property. The first format in the returned list is the most efficient output format.

## 16.46.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.46.5 Constructor(CIDetector as Variant) 3376

### 16.46.5 Constructor(CIDetector as Variant)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** This allows you to use a CIDetectorMBS object with AVCaptureVideoDataOutputMBS.
The plugin will run the detector in a helper thread, so you have more time on the main thread for your application and better performance.
See also:

- 16.46.4 Constructor 3375

### 16.46.6 EnableEvents

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Enables the events for this output.
**Notes:** Those are normally handled automatically, but if you add event with AddHandler you need to call this method.

### 16.46.7 Properties

### 16.46.8 Detector as Variant

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The CIDetectorMBS object used here.
**Notes:** (Read only property)

### 16.46.9 PrepareCIImage as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Whether CIImageMBS should be created on preemptive thread.
**Notes:** If enabled, the plugin will do the work to create CIImage on the preemptive thread before calling AVFoundationMBS.captureOutputDidOutputSampleBuffer event on main thread. This may make your app more responsive on the main thread.
(Read and Write property)

### 16.46.10 PrepareJPEGData as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Whether JPEGData should be created on preemptive thread.
**Notes:** If enabled, the plugin will do the work to create JPEGData on the preemptive thread before calling AVFoundationMBS.captureOutputDidOutputSampleBuffer event on main thread. This may make your app more responsive on the main thread.
(Read and Write property)

### 16.46.11 PrepareNSImage as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Whether NSImageMBS should be created on preemptive thread.
**Notes:** If enabled, the plugin will do the work to create NSImage on the preemptive thread before calling AVFoundationMBS.captureOutputDidOutputSampleBuffer event on main thread. This may make your app more responsive on the main thread.
(Read and Write property)

### 16.46.12 alwaysDiscardsLateVideoFrames as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether video frames are dropped if they arrive late.
**Notes:** When the value of this property is true, the object immediately discards frames that are captured while the dispatch queue handling existing frames is blocked in the AVFoundationMBS.captureOutputDidOutputSampleBuffer event.

When the value of this property is false, delegates are allowed more time to process old frames before new frames are discarded, but application memory usage may increase significantly as a result.

The default is true.
(Read and Write computed property)

### 16.46.13 videoSettings as dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The compression settings for the output.
**Notes:** The dictionary contains values for compression settings keys defined in AVVideoSettings.h, or pixel buffer attributes keys defined in <CoreVideo/CVPixelBuffer.h>(see CVPixelBufferRef). The only key currently supported is the kCVPixelBufferPixelFormatTypeKey key.
(The plugin defines such keys in AVFoundationMBS)

To get possible values for the supported video pixel formats (kCVPixelBufferPixelFormatTypeKey) and video codec formats (AVVideoCodecKey), see availableVideoCVPixelFormatTypes and availableVideoCodecTypes respectively.

To receive samples in their device native format, set this property to nil:

If you set this property to nil and then subsequently query it, you will get a dictionary reflecting the settings used by the capture sessions's current sessionPreset.
(Read and Write computed property)

# 16.47 class AVCaptureVideoPreviewLayerMBS

## 16.47.1 class AVCaptureVideoPreviewLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVCaptureVideoPreviewLayer is a subclass of CALayer that you use to display video as it is being captured by an input device.
**Notes:** You use the videoGravity property to influence how content is viewed relative to the layer bounds. On some hardware configurations, you can manipulate the orientation of the layer using orientation and mirrored.
Subclass of the CALayerMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr7
- AVCaptureVideoDataOutput improvements

## 16.47.2 Methods

## 16.47.3 captureDevicePointOfInterestForPoint(pointInLayer as CGPointMBS) as CGPointMBS

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: macOS, Targets: All.

**Function:** Converts a point in layer coordinates to a point of interest in the coordinate space of the capture device providing input to the layer.
**Notes:** pointInLayer: A CGPoint in layer coordinates.

Returns a CGPoint in the coordinate space of the capture device providing input to the layer.

AVCaptureDevice pointOfInterest is expressed as a CGPoint where { 0,0 } represents the top left of the picture area, and { 1,1 } represents the bottom right on an unrotated picture. This convenience method converts a point in the coordinate space of the receiver to a point of interest in the coordinate space of the AVCaptureDevice providing input to the receiver. The conversion takes frameSize and videoGravity into consideration.

## 16.47.4 connection as AVCaptureConnectionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture connection describing the AVCaptureInputPort to which the preview layer is connected. (read-only)

**Notes:** If you invoke Constructor, layerWithSession, or set session with a valid AVCaptureSession instance, a connection is formed to the first eligible video AVCaptureInput object. If the preview layer is detached from a session, the connection property becomes nil.

### 16.47.5 Constructor(session as AVCaptureSessionMBS, WithConnection as boolean = true)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a preview layer with a given capture session.
**Notes:** Only pass WithConnection=false here if you intend to manually form a connection between a desired AVCaptureInputPort object and the receiver using addConnection.

### 16.47.6 layerWithSession(session as AVCaptureSessionMBS) as AVCaptureVideoPreviewLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a preview layer initialized with a given capture session.
**Notes:** session: The capture session from which to derive the preview.

Returns a preview layer initialized to use session.

### 16.47.7 layerWithSessionWithNoConnection(session as AVCaptureSessionMBS) as AVCaptureVideoPreviewLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a preview layer using a given capture session but without making any connections.
**Notes:** session: The capture session to be previewed.
Return a preview layer initialized with session but with no connections to any of the session's eligible video inputs

Only use this method if you intend to manually form a connection between a desired AVCaptureInputPort object and the receiver using addConnection.

### 16.47.8 metadataOutputRectOfInterestForRect(rectInLayerCoordinates as CGRectMBS) as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: macOS, Targets: All.

**Function:** Converts a rectangle in layer coordinates to a rectangle of interest in the coordinate space of an AVCaptureMetadataOutput whose capture device is providing input to the layer.
**Notes:** rectInLayerCoordinates: A CGRect in layer coordinates.

Returns a CGRect in the coordinate space of the metadata output whose capture device is providing input to the layer.

AVCaptureMetadataOutput rectOfInterest is expressed as a CGRect where { 0,0 } represents the top left of the picture area, and { 1,1 } represents the bottom right on an unrotated picture. This convenience method converts a rectangle in the coordinate space of the receiver to a rectangle of interest in the coordinate space of an AVCaptureMetadataOutput whose AVCaptureDevice is providing input to the receiver. The conversion takes frame size and videoGravity into consideration.

### 16.47.9 pointForCaptureDevicePointOfInterest(captureDevicePointOfInterest as CGPointMBS) as CGPointMBS

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: macOS, Targets: All.

**Function:** Converts a point of interest in the coordinate space of the capture device providing input to the layer to a point in layer coordinates.
**Notes:** captureDevicePointOfInterest: A CGPoint in the coordinate space of the capture device providing input to the layer.

Returns a CGPoint in layer coordinates.

AVCaptureDevice pointOfInterest is expressed as a CGPoint where { 0,0 } represents the top left of the picture area, and { 1,1 } represents the bottom right on an unrotated picture. This convenience method converts a point in the coordinate space of the AVCaptureDevice providing input to the coordinate space of the receiver. The conversion takes frame size and videoGravity into consideration.

### 16.47.10 rectForMetadataOutputRectOfInterest(rectInMetadataOutputCoordinates as CGRectMBS) as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 22.2, Platform: macOS, Targets: All.

**Function:** Converts a rectangle of interest in the coordinate space of an AVCaptureMetadataOutput whose capture device is providing input to the layer to a rectangle in layer coordinates.
**Notes:** rectInMetadataOutputCoordinates: A CGRect in the coordinate space of the metadata output

whose capture device is providing input to the layer.

Returns a CGRect in layer coordinates.

AVCaptureMetadataOutput rectOfInterest is expressed as a CGRect where { 0,0 } represents the top left of the picture area, and { 1,1 } represents the bottom right on an unrotated picture. This convenience method converts a rectangle in the coordinate space of an AVCaptureMetadataOutput whose AVCaptureDevice is providing input to the coordinate space of the receiver. The conversion takes frame size and videoGravity into consideration.

### 16.47.11 setSessionWithNoConnection(session as AVCaptureSessionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Attaches the receiver to a given session without implicitly forming a connection.
**Notes:** This method attaches the receiver to a given session without implicitly forming a connection to the first eligible video AVCaptureInputPort object. You should only use this method if you intend to manually form a connection between a desired AVCaptureInputPort object and the receiver using addConnection.

### 16.47.12 Properties

### 16.47.13 session as AVCaptureSessionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The capture session instance being previewed.
**Notes:** (Read and Write computed property)

### 16.47.14 videoGravity as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates how the video is displayed within a player layer's bounds rect.
**Notes:** Options are AVLayerVideoGravityResizeAspect, AVLayerVideoGravityResizeAspectFill and AVLayerVideoGravityResize. The default is AVLayerVideoGravityResizeAspect.

This property is animatable.
(Read and Write computed property)

## 16.48 control AVCaptureViewControlMBS

### 16.48.1 control AVCaptureViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The capture control for Mac.
**Notes:** AVCaptureView is a subclass of NSView that can be used to display standard user interface controls for capturing media data.
MBS Plugin wraps this as a control for Xojo.
Please notice this is 64-bit only and requires MacOS 10.9 or newer.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr8
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- AVCaptureVideoDataOutput improvements
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr2

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 16.5, page 9: News

### 16.48.2 Methods

### 16.48.3 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

### 16.48.4 setSession(session as AVCaptureSessionMBS, showVideoPreview as boolean, showAudioPreview as boolean)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the session represented by this view.
**Notes:** session: The session to be represented.
showVideoPreview: Whether or not video preview should be shown. If YES, capture inputs for video media data will be added, removed, or modified depending on device availability and user selection.
showAudioPreview: Whether or not audio preview should be shown. If YES, capture inputs for audio media data will be added, removed, or modified depending on device availability and user selection.

The view must either show audio preview or video preview or both. Furthermore, the view may modify the capture session, for example, to access media data for preview or when the user select a new capture source. Only the default session is started and stopped automatically. The provided session must be manually started and stopped.

### 16.48.5 Properties

### 16.48.6 controlsStyle as Integer

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The style of the capture controls pane associated with the view.
**Notes:** (Read and Write property)

### 16.48.7 fileOutput as AVCaptureFileOutputMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A capture file output used to record media data.
**Notes:** The value of this property is the first instance of AVCaptureFileOutput contained in the session's outputs array or nil if no such instance is found. In the latter case the capture view's start recording button will be disabled. However, the controls for choosing input sources may still be enabled.
(Read only property)

### 16.48.8 session as AVCaptureSessionMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A capture session represented by this view.
**Notes:** Modifying the capture session will impact its visual representation in the view. The default value is

a session configured for movie file recordings of audio and video media data. Use setSession() to change the value of this property.
(Read only property)

### 16.48.9 videoGravity as String

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A string defining how the video is displayed within the views bounds rect.
**Notes:** Options are AVLayerVideoGravityResize, AVLayerVideoGravityResizeAspect and AVLayerVideoGravityResizeAspectFill. AVLayerVideoGravityResizeAspect is default. See <AVFoundation/AVAnimation.h>for a description of these options.
(Read and Write property)

### 16.48.10 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the AVCaptureView object.
**Notes:** (Read only property)

### 16.48.11 Events

### 16.48.12 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.48.13 Close

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 16.48.14 Closing

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.48.15 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.48.16 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 16.48.17 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.48.18 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 16.48.19 FocusLost

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.48.20 FocusReceived

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.48.21 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.48.22 GotFocus

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.48.23 LostFocus

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.48.24 MenuBarSelected

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.48.25 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.48.26 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the

mouse has really moved.

### 16.48.27 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.48.28 Open

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 16.48.29 Opening

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.48.30 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.48.31 startRecordingToFileOutput(fileOutput as AVCaptureFileOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Informs you that a new media recording should be started.
**Notes:** If captureFileOutput is an instance of AVCaptureMovieFileOutput this can be achieved by calling

startRecordingToOutputFileURL on the captureFileOutput.

### 16.48.32 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.48.33 Constants

Constants Groups

| Constant | Value | Description |
|---|---|---|
| ControlsStyleDefault | 0 | The default controls pane is associated with the view. |
| ControlsStyleFloating | 1 | The floating controls pane for media recordings is associated with the view. |
| ControlsStyleInline | 0 | The inline controls pane for media recording is associated with the view. |
| ControlsStyleInlineDeviceSelection | 2 | The inline controls pane for selection capture devices is associated with tl view. |

## 16.49 class AVCompositionMBS

### 16.49.1 class AVCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVComposition object combines media data from multiple file-based sources in a custom temporal arrangement, in order to present or process media data from multiple sources together.
**Notes:** All file-based audiovisual assets are eligible to be combined, regardless of container type. The tracks in an AVComposition object are fixed; to change the tracks, you use an instance of its subclass, AVMutable-Composition.

At its top-level, AVComposition is a collection of tracks, each presenting media of a specific media type, e.g. audio or video, according to a timeline. Each track is represented by an instance of AVCompositionTrack. Each track is comprised of an array of track segments, represented by instances of AVCompositionTrackSegment. Each segment presents a portion of the media data stored in a source container, specified by URL, a track identifier, and a time mapping. The URL specifies the source container, and the track identifier indicates the track of the source container to be presented.

The time mapping specifies the temporal range of the source track that's to be presented and also specifies the temporal range of its presentation in the composition track. If the durations of the source and destination ranges of the time mapping are the same, the media data for the segment will be presented at its natural rate. Otherwise, the segment will be presented at a rate equal to the ratio source.duration / target.duration.

You can access the track segments of a track using the segments property (an array of AVCompositionTrackSegment objects) of AVCompositionTrack. The collection of tracks with media type information for each, and each with its array of track segments (URL, track identifier, and time mapping), form a complete low-level representation of a composition. This representation can be written out by clients in any convenient form, and subsequently the composition can be reconstituted by instantiating a new AVMutableComposition with AVMutableCompositionTrack objects of the appropriate media type, each with its segments property set according to the stored array of URL, track identifier, and time mapping.

A higher-level interface for constructing compositions is also presented by AVMutableComposition and AVMutableCompositionTrack, offering insertion, removal, and scaling operations without direct manipulation of the trackSegment arrays of composition tracks. This interface makes use of higher-level constructs such as AVAsset and AVAssetTrack, allowing the client to make use of the same references to candidate sources that it would have created in order to inspect or preview them prior to inclusion in a composition.
Subclass of the AVAssetMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.49.2 Methods

### 16.49.3 CompositionTracks as AVCompositionTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVCompositionTrack objects contained by the composition. (read-only)

### 16.49.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.49.5 mutableCopy as AVMutableCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the object.

### 16.49.6 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the authored size of the visual portion of the composition. (read-only)

# 16.50 class AVCompositionTrackMBS

## 16.50.1 class AVCompositionTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class for a composition track.
**Notes:** An AVCompositionTrack object provides the low-level representation of tracks a track in an AVComposition object, comprising a media type, a track identifier, and an array of AVCompositionTrackSegment objects, each comprising a URL, and track identifier, and a time mapping.

The timeMapping.target.start of the first track segment in a composition track is kCMTimeZero, and the timeMapping.target.start of each subsequent track segment equals CMTimeRangeGetEnd(<#previousTrackSegment#>.timeMapping.target).

The AVFoundation framework also provides a mutable subclass, AVMutableCompositionTrack.
Subclass of the AVAssetTrackMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 16.50.2 Methods

## 16.50.3 CompositionTrackSegments as AVCompositionTrackSegmentMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The composition track's track segments. (read-only)

## 16.50.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 16.51 class AVCompositionTrackSegmentMBS

### 16.51.1 class AVCompositionTrackSegmentMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVCompositionTrackSegment object represents a segment of an AVCompositionTrack object, comprising a URL, and track identifier, and a time mapping from the source track to the composition track.
**Notes:** You typically use this class to save the low-level representation of a composition to storage formats of your choosing and to reconstitute them from storage.
Subclass of the AVAssetTrackSegmentMBS class.

### 16.51.2 Methods

### 16.51.3 compositionTrackSegmentWithTimeRange(timeRange as CMTimeRangeMBS) as AVCompositionTrackSegmentMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a composition track segment that presents an empty track segment.
**Notes:** timeRange: The time range of the empty composition track segment.

Returns an composition track segment that presents an empty track segment.

This method invokes Constructor with an empty URL, a trackID of kCMPersistentTrackID_Invalid, a time mapping with source.start and source.duration equal to kCMTimeInvalid, and with a target equal to timeRange.

This is the standard low-level representation of an empty track segment.

### 16.51.4 Constructor(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a track segment that presents an empty track segment.
**Notes:** timeRange: The time range of the empty track segment.

This method invokes Constructor with an empty URL, a trackID of kCMPersistentTrackID_Invalid, a time mapping with source.start and source.duration equal to kCMTimeInvalid, and with a target equal to timeRange.

This is the standard low-level representation of an empty track segment.

### 16.51.5 isEmpty as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the segment is empty. (read-only)
**Notes:** An empty segment has a valid target time range but sourceURL is nil and the source start time is kCMTimeInvalid; all other fields are undefined.

### 16.51.6 sourceTrackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The track ID of the container file of the media presented by the track segment. (read-only)

### 16.51.7 sourceURL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The container file of the media presented by the track segment. (read-only)

## 16.52 class AVEdgeWidthsMBS

### 16.52.1 class AVEdgeWidthsMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Defines the thickness of the edge processing region, in pixels.

### 16.52.2 Properties

### 16.52.3 Bottom as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The thickness, in pixels, of the bottom-edge processing region of theedgeWidths property.
**Notes:** (Read only property)

### 16.52.4 Left as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The thickness, in pixels, of the left-edge processing region of theedgeWidths property.
**Notes:** (Read only property)

### 16.52.5 Right as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The thickness, in pixels, of the right-edge processing region of theedgeWidths property.
**Notes:** (Read only property)

### 16.52.6 Top as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The thickness, in pixels, of the top-edge processing region of theedgeWidths property.
**Notes:** (Read only property)

## 16.53 class AVFoundationMBS

### 16.53.1 class AVFoundationMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The central AVFoundation class for receiving events and getting constants.
**Notes:** All events from AVFoundation classes (delegates, notifications) are routed to your subclass of AVFoundationMBS.
Events received on a helper thread a routed to main thread in order to allow you to use Xojo code which is not thread safe.
Please use available property on classes to check if they are available. Some classes are only for Mac OS X 10.8 or future versions.

If you need some new methods/classes in AVFoundation from Mac OS X 10.10 or newer, please email us.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr7
- MBS Xojo Plugins, version 20.5pr7
- Write audio file with samples using AVFoundation
- MBS Xojo Plugins, version 19.0pr6
- MBS Xojo Plugins, version 18.3pr6
- MBS Xojo Plugins, version 17.3pr3
- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 14.3pr8
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr1

**Xojo Developer Magazine**

- 12.2, page 46: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz
- 12.2, page 44: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz
- 12.2, page 10: News

### 16.53.2 Methods

### 16.53.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether AVFoundation is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.53.4 AVAudioBitRateStrategy_Constant as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.5 AVAudioBitRateStrategy_LongTermAverage as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.6 AVAudioBitRateStrategy_Variable as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.7 AVAudioBitRateStrategy_VariableConstrained as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.8 AVAudioFileTypeKey as string

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The audio file type key.
**Notes:** Value is an integer (audio file type) from AudioFile.h
Available on MacOS 10.13 or newer.

### 16.53.9 AVAudioTimePitchAlgorithmSpectral as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the time pitch algorithms.
**Notes:** Highest quality, most computationally expensive. Suitable for music. Variable rate from 1/32 to 32.
Available in OS X v10.9 and later.
Default for Mac OS X.

### 16.53.10 AVAudioTimePitchAlgorithmTimeDomain as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the time pitch algorithms.
**Notes:** Modest quality pitch algorithm that is less computationally intensive. Suitable for voice. Variable rate from 1/32 to 32.
Available in OS X v10.9 and later.

### 16.53.11 AVAudioTimePitchAlgorithmVarispeed as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the values for the time pitch algorithms.
**Notes:** High quality, no pitch correction. Pitch varies with rate. Variable rate from 1/32 to 32.
Available in OS X v10.9 and later.

### 16.53.12 AVCaptureDeviceWasConnectedNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Notification that is posted when a new device becomes available.

### 16.53.13 AVCaptureDeviceWasDisconnectedNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Notification that is posted when an existing device becomes unavailable.

### 16.53.14 AVCaptureInputPortFormatDescriptionDidChangeNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted if the formatDescription of the capture input port changes.

### 16.53.15 AVCaptureSessionDidStartRunningNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when a capture session starts.

### 16.53.16 AVCaptureSessionDidStopRunningNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when a capture session stops.

### 16.53.17 AVCaptureSessionErrorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Key to retrieve information from a notification from a capture session.
**Notes:** Key to retrieve the error object from the user info dictionary of an AVCaptureSessionRuntimeErrorNotification.

### 16.53.18 AVCaptureSessionPreset1280x720 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for 720p quality (1280x720pixel) video output.

### 16.53.19 AVCaptureSessionPreset320x240 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for 320x240 pixel video output.

### 16.53.20 AVCaptureSessionPreset352x288 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for CIF quality (352x288 pixel) video output.

### 16.53.21 AVCaptureSessionPreset640x480 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for VGA quality (640x480 pixel) video output.

### 16.53.22 AVCaptureSessionPreset960x540 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for quarter HD quality (960x540 pixel) video output.

### 16.53.23 AVCaptureSessionPresetHigh as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for high quality video and audio output.

### 16.53.24 AVCaptureSessionPresetiFrame1280x720 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings to achieve 1280x720 quality iFrame H.264 video at about 40 Mbits/sec with AAC audio.
QuickTime movies captured in iFrame format are optimal for editing applications.
Available in OS X v10.9 and later.

### 16.53.25 AVCaptureSessionPresetiFrame960x540 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings to achieve 960x540 quality iFrame H.264 video at about 30 Mbits/sec with AAC audio.
QuickTime movies captured in iFrame format are optimal for editing applications.
Available in OS X v10.9 and later.

### 16.53.26 AVCaptureSessionPresetLow as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for output video and audio bitrates suitable for sharing over 3G.

### 16.53.27 AVCaptureSessionPresetMedium as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for output video and audio bitrates suitable for sharing over WiFi.

### 16.53.28 AVCaptureSessionPresetPhoto as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to define capture setting presets using the sessionPreset property.
**Notes:** Specifies capture settings suitable for high resolution photo quality output.

### 16.53.29 AVCaptureSessionRuntimeErrorNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted if an error occurred during a capture session.
**Notes:** You retrieve the underlying error from the notification's user info dictionary using the key AVCaptureSessionErrorKey.

### 16.53.30 AVChannelLayoutKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Key to retrieve channel layout information for playback.
**Example:**

```
const channels = 2
dim channelLayout as new QTAudioChannelLayoutMBS
channelLayout.ChannelLayoutTag = QTAudioChannelLayoutMBS.kAudioChannelLayoutTag_Stereo

dim outputSettings as new Dictionary

outputSettings.Value(AVFoundationMBS.AVSampleRateKey) = 44100.0
outputSettings.Value(AVFoundationMBS.AVNumberOfChannelsKey) = channels
outputSettings.Value(AVFoundationMBS.AVChannelLayoutKey) = channelLayout.Memory
```

**Notes:** The corresponding value is an Memoryblock containing an AudioChannelLayout structure.

### 16.53.31 AVCoreAnimationBeginTimeAtZero as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Support for integration with Core Animation.
**Notes:** Use this constant to set the CoreAnimation's animation beginTime property to be time 0.
The constant is a small, non-zero, positive value which prevents CoreAnimation from replacing 0.0 with CACurrentMediaTime.

### 16.53.32 AVEncoderAudioQualityForVBRKey as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the Sample rate converter audio quality settings.

### 16.53.33 AVEncoderAudioQualityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the audio encoder setting keys for the AVAudioRecorder class.
**Notes:** Value is a AVAudioQuality* constant.

### 16.53.34 AVEncoderBitDepthHintKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the audio encoder setting keys for the AVAudioRecorder class.
**Notes:** An integer ranging from 8 through 32.

### 16.53.35 AVEncoderBitRateKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the audio encoder setting keys for the AVAudioRecorder class.
**Notes:** An integer that identifies the audio bit rate.

### 16.53.36 AVEncoderBitRatePerChannelKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the audio encoder setting keys for the AVAudioRecorder class.
**Notes:** An integer that identifies the audio bit rate per channel.

### 16.53.37 AVEncoderBitRateStrategyKey as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the Sample rate converter audio quality settings.

### 16.53.38 AVErrorDeviceKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is a string with the name of the device.

### 16.53.39 AVErrorDiscontinuityFlagsKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.

### 16.53.40 AVErrorFileSizeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is a number containing the size of the file in bytes.

### 16.53.41 AVErrorMediaSubTypeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is an array of integers that specify media subtypes.
The types are represented by four character codes (4ccs), as defined in CoreAudioTypes.h for audio media and in CMFormatDescription.h for video media.

### 16.53.42 AVErrorMediaTypeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is a string that specified a media format.

### 16.53.43 AVErrorPIDKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** nThe corresponding value is a number containing a process ID number.one

### 16.53.44 AVErrorRecordingSuccessfullyFinishedKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is a Boolean value indicating whether recording finished successfully.

### 16.53.45 AVErrorTimeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys in the user info dictionary in errors AVFoundation creates.
**Notes:** The corresponding value is an NSValue object containing a CMTime.

### 16.53.46 AVFileType3GPP as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.3gpp".
Files are identified with the .3gp, .3gpp, and .sdv extensions.
Available in macOS 10.11 or newer.

### 16.53.47 AVFileType3GPP2 as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.3gpp2".
Files are identified with the .3g2, .3gp2 extensions.
Available in macOS 10.11 or newer.

### 16.53.48 AVFileTypeAC3 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the AC-3 audio file format.
The value of this UTI is public.ac3-audio. Files are identified with the .ac3 extension.
Available in OS X v10.9 and later.

### 16.53.49 AVFileTypeAIFC as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the AIFC audio file format.
The value of this UTI is public.aifc-audio. Files are identified with the .aifc and .cdda extensions.

### 16.53.50 AVFileTypeAIFF as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the AIFF audio file format.
The value of this UTI is public.aiff-audio. Files are identified with the .aif and .aiff extensions.

### 16.53.51 AVFileTypeAMR as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the adaptive multi-rate audio file format.
The value of this UTI is org.3gpp.adaptive-multi-rate-audio. Files are identified with the .amr extension.

### 16.53.52 AVFileTypeAppleM4A as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the Apple m4a audio file format.
The value of this UTI is com.apple.m4a-audio. Files are identified with the .m4a extension.

### 16.53.53 AVFileTypeAppleM4V as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the iTunes video file format.
The value of this UTI is com.apple.mpeg-4-video. Files are identified with the .m4v extension.

### 16.53.54 AVFileTypeAVCI as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.avci".
Files are identified with the .avci extension.
Available in macOS 10.13 or newer.

### 16.53.55 AVFileTypeCoreAudioFormat as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the CoreAudio file format.
The value of this UTI is com.apple.coreaudio-format. Files are identified with the .caf extension.

### 16.53.56 AVFileTypeDNG as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "com.adobe.raw-image".
Files are identified with the .dng extension.
Available in macOS 10.13 or newer.

### 16.53.57 AVFileTypeEnhancedAC3 as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.ac3-audio".
Files are identified with the .ac3 extension.
Available in macOS 10.9 or newer.

### 16.53.58 AVFileTypeHEIC as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.heic".
Files are identified with the .heic extension.

Available in macOS 10.13 or newer.

### 16.53.59 AVFileTypeHEIF as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.heif".
Files are identified with the .heif extension.
Available in macOS 10.13 or newer.

### 16.53.60 AVFileTypeJPEG as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.jpeg".
Files are identified with the .jpg or .jpeg extension.
Available in macOS 10.13 or newer.

### 16.53.61 AVFileTypeMPEG4 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the MPEG-4 file format.
The value of this UTI is public.mpeg-4. Files are identified with the .mp4 extension.

### 16.53.62 AVFileTypeMPEGLayer3 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the MPEG layer 3 audio file format.
The value of this UTI is public.mp3. Files are identified with the .mp3 extension.
Available in OS X v10.9 and later.

### 16.53.63 AVFileTypeQuickTimeMovie as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the QuickTime movie file format.
The value of this UTI is com.apple.quicktime-movie. Files are identified with the .mov and .qt extensions.

### 16.53.64 AVFileTypeSunAU as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** UTI for the Sun/NeXT audio file format.
The value of this UTI is public.au-audio. Files are identified with the .au and .snd extensions.
Available in OS X v10.9 and later.

### 16.53.65 AVFileTypeTIFF as string

MBS AVFoundation Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** The value of this UTI is "public.tiff".
Files are identified with the .tiff or .tif extension.
Available in macOS 10.13 or newer.

### 16.53.66 AVFileTypeWAVE as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the file format uniform type identifiers (UTIs).
**Notes:** A UTI for the WAVE audio file format.
The value of this UTI is com.microsoft.waveform-audio. Files are identified with the .wav, .wave, and .bwf extensions.

### 16.53.67 AVFormatIDKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to all audio formats handled by the AVAudioPlayer and AVAudioRecorder classes.
**Notes:** A format identifier. See the "Audio Data Format Identifiers" enumeration in Core Audio Data

Types Reference.

### 16.53.68 AVFoundationErrorDomain as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Domain for AVFoundation errors.

### 16.53.69 AVLayerVideoGravityResize as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constants define how the video is displayed within a layer's bounds rectangle.
**Notes:** Specifies that the video should be stretched to fill the layer's bounds.

### 16.53.70 AVLayerVideoGravityResizeAspect as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constants define how the video is displayed within a layer's bounds rectangle.
**Notes:** Specifies that the player should preserve the video's aspect ratio and fit the video within the layer's bounds.

### 16.53.71 AVLayerVideoGravityResizeAspectFill as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constants define how the video is displayed within a layer's bounds rectangle.
**Notes:** Specifies that the player should preserve the video's aspect ratio and fill the layer's bounds.

### 16.53.72 AVLinearPCMBitDepthKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to linear PCM audio formats.
**Notes:** An integer that indicates the bit depth for a linear PCM audio format—one of 8, 16, 24, or 32.

### 16.53.73 AVLinearPCMIsBigEndianKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to linear PCM audio formats.
**Notes:** A Boolean value that indicates whether the audio format is big endian (true) or little endian (false).

### 16.53.74 AVLinearPCMIsFloatKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to linear PCM audio formats.
**Notes:** A Boolean value that indicates that the audio format is floating point (true) or fixed point (false).

### 16.53.75 AVLinearPCMIsNonInterleaved as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to linear PCM audio formats.
**Notes:** A Boolean value that indicates that the audio format is non-interleaved (true) or interleaved (false).

### 16.53.76 AVMakeRectWithAspectRatioInsideRect(aspectRatio as CGSizeMBS, boundingRect as CGRectMBS) as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a scaled CGRect that maintains the aspect ratio specified by a CGSize within a bounding CGRect.
**Notes:** aspectRatio: The width and height ratio (aspect ratio) you want to maintain.
boundingRect: The bounding rectangle you want to fit into.

Returns a scaled CGRect that maintains the aspect ratio specified by aspectRatio that fits withinboundingRect.

This is useful when attempting to fit the naturalSize property of an AVPlayerItem object within the bounds of another CALayer. You would typically use the return value of this function as an AVPlayerLayer frame property value. For example:

```
myPlayerLayer.frame = AVMakeRectWithAspectRatioInsideRect(myPlayerItem.naturalSize, mySuperLayer.bounds)
```

### 16.53.77 AVMediaCharacteristicAudible as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the characteristics of media types.
**Notes:** Indicates that the media is audible.

### 16.53.78 AVMediaCharacteristicContainsAlphaChannel as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** To determine whether alpha is straight or pre-multiplied, look for the format description extension with key kCMFormatDescriptionExtension_AlphaChannelMode.

### 16.53.79 AVMediaCharacteristicContainsOnlyForcedSubtitles as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the options presents only forced subtitles.
Media options with forced-only subtitles are typically selected when 1) the user has not selected a legible option with an accessibility characteristic or an auxiliary purpose and 2) its locale matches the locale of the selected audible media selection option.
The value of this characteristic is "public.subtitles.forced-only".
The presence of this characteristic for a legible media option is inferred from the format description of the associated track that presents the subtitle media.
Available in OS X v10.8 and later.

### 16.53.80 AVMediaCharacteristicDescribesMusicAndSoundForAccessibility as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option includes legible content in the language of its specified locale that describes music and sound effects occurring in program audio.
It is possible for a legible media option to include both transcriptions of spoken dialog and descriptions of music and sound effects.
The value of this characteristic is "public.accessibility.describes-music-and-sound".
For QuickTime movie and .m4v files, a media option is considered to have the characteristic AVMediaCharacteristicDescribesMusicAndSoundForAccessibility only if it's explicitly tagged with that characteristic.
Available in OS X v10.8 and later.

### 16.53.81 AVMediaCharacteristicDescribesVideoForAccessibility as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option includes audible content that describes the visual portion of the presentation.
It is possible for a legible media option to include both transcriptions of spoken dialog and descriptions of music and sound effects.
The value of this characteristic is "public.accessibility.describes-video".
For QuickTime movie and .m4v files a media option is considered to have the characteristic AVMediaCharacteristicDescribesVideoForAccessibility only if it's explicitly tagged with that characteristic.
Available in OS X v10.8 and later.

### 16.53.82 AVMediaCharacteristicDubbedTranslation as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** The track or media selection option contains a language or dialect translation of originally or previously produced content.

### 16.53.83 AVMediaCharacteristicEasyToRead as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option provides legible content in the language of its specified locale and that the content has been edited for ease of reading.
Closed caption tracks that carry "easy reader" captions (per the CEA-608 specification) should be tagged with this characteristic. Subtitle tracks can also be tagged with this characteristic, where appropriate.
The value of this characteristic is "public.easy-to-read".
For QuickTime movie and .m4v files a media option is considered to have the characteristic AVMediaCharacteristicEasyToRead only if it's explicitly tagged with that characteristic.

### 16.53.84 AVMediaCharacteristicFrameBased as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the characteristics of media types.
**Notes:** Indicates that the media is frame-based.

### 16.53.85 AVMediaCharacteristicIsAuxiliaryContent as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option includes content that's marked by the content author as auxiliary to the presentation of the asset.
Example: an option that presents audio media containing commentary on the presentation would typically have this characteristic.
The value of this characteristic is "public.auxiliary-content".
For QuickTime movie and .m4v files, a media option is considered to have the characteristic AVMediaCharacteristicIsAuxiliaryContent if it's explicitly tagged with that characteristic or if, as a member of an alternate track group, its associated track is excluded from autoselection.
Available in OS X v10.8 and later.

### 16.53.86 AVMediaCharacteristicIsMainProgramContent as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option includes content that's marked by the content author as intrinsic to the presentation of the asset.
Example: an option that presents the main program audio for the presentation, regardless of locale, would typically have this characteristic.
The value of this characteristic is "public.main-program-content".
The presence of this characteristic for a media option is inferred; any option that does not have the characteristic AVMediaCharacteristicIsAuxiliaryContent is considered to have the characteristic.
Available in OS X v10.8 and later.

### 16.53.87 AVMediaCharacteristicIsOriginalContent as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** A media characteristic that indicates that a track or media selection option includes content that's marked by the content author as original to the principal production of the media, as opposed to supplementary or derivative content created by means of language translation or by other means.

The value of this characteristic is @"public.original-content".

Example: an option that presents audio media with dialog in the principal language of the production may be tagged with this characteristic; audio media containing dialog dubbed in a language other than the principal language of the production typically would not be tagged with this characteristic.

Note for content authors: for QuickTime movie and .m4v files and for HTTP Live Streaming, a media option is considered to have the characteristic AVMediaCharacteristicIsOriginalContent only if it's explicitly tagged with the characteristic.

See the discussion of the tagging of tracks with media characteristics below.

### 16.53.88 AVMediaCharacteristicLanguageTranslation as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** A media characteristic that indicates that a track or media selection option contains a language or dialect translation of originally or previously produced content, intended to be used as a substitute for that content by users who prefer its designated language.

The value of this characteristic is "public.translation".

Note for content authors: for QuickTime movie and .m4v files a media option is considered to have the characteristic AVMediaCharacteristicLanguageTranslation only if it's explicitly tagged with that characteristic.

### 16.53.89 AVMediaCharacteristicLegible as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the characteristics of media types.
**Notes:** Indicates that the media is legible.

### 16.53.90 AVMediaCharacteristicTranscribesSpokenDialogForAccessibility as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** Indicates that the option includes legible content in the language of its specified locale that transcribes spoken dialog.
It is possible for a legible media option to include both transcriptions of spoken dialog and descriptions of music and sound effects.
The value of this characteristic is "public.accessibility.transcribes-spoken-dialog".
For QuickTime movie and .m4v files, a media option is considered to have the characteristic AVMediaCharacteristicTranscribesSpokenDialogForAccessibility only if it's explicitly tagged with that characteristic.
Available in OS X v10.8 and later.

### 16.53.91 AVMediaCharacteristicUsesWideGamutColorSpace as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** A media characteristic that indicates that a track uses a wide gamut color space and therefore may make use of colors that cannot be accurately represented otherwise.

A wide color space such as AVVideo*_P3_D65 contains additional dynamic range that may benefit from special treatment when compositing. Care should be taken to avoid clamping. Non-wide spaces include AVVideo*_ITU_R_709_2 and AVVideo*_SMPTE_C.

### 16.53.92 AVMediaCharacteristicVisual as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the characteristics of media types.
**Notes:** Indicates that the media is visual.

### 16.53.93 AVMediaCharacteristicVoiceOverTranslation as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the media characteristic that may be present in an AVMediaSelectionOption object.
**Notes:** A media characteristic that indicates that a track or media selection option contains a language translation of originally or previously produced content, created by adding, in its designated language, a verbal interpretation of dialog and translations of other important information to a new mix of the audio content.

Tracks to which this characteristic is assigned should typically also be assigned the characteristic AVMediaCharacteristicLanguageTranslation.

The value of this characteristic is "public.translation.voice-over".

Note for content authors: for QuickTime movie and .m4v files a media option is considered to have the characteristic AVMediaCharacteristicVoiceOverTranslation only if it's explicitly tagged with that characteristic.

### 16.53.94 AVMediaTypeAudio as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.

**Notes:** Specifies audio.

### 16.53.95 AVMediaTypeClosedCaption as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies closed-caption content.

### 16.53.96 AVMediaTypeDepthData as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The key for media type depth data.

### 16.53.97 AVMediaTypeMetadata as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies metadata.

### 16.53.98 AVMediaTypeMetadataObject as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** mediaType of AVCaptureInputPorts that provide AVMetadataObjects.
**Notes:** Prior to iOS 9.0, camera AVCaptureDeviceInputs provide metadata (detected faces and barcodes) to an AVCaptureMetadataOutput through an AVCaptureInputPort whose mediaType is AVMediaTypeMetadata. The AVCaptureMetadataOutput presents metadata to the client as an array of AVMetadataObjects, which are defined by Apple and not externally subclassable. Starting in iOS 9.0, clients may record arbitrary metadata to a movie file using the AVCaptureMovieFileOutput. The movie file output consumes metadata in a different format than the AVCaptureMetadataOutput, namely it accepts CMSampleBuffers of type 'meta'.

### 16.53.99 AVMediaTypeMuxed as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies muxed media.

### 16.53.100 AVMediaTypeSubtitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies subtitles.

### 16.53.101 AVMediaTypeText as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies text.

### 16.53.102 AVMediaTypeTimecode as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies a time code.

### 16.53.103 AVMediaTypeVideo as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the media types.
**Notes:** Specifies video.

### 16.53.104 AVMetadata3GPUserDataKeyAlbumAndTrack as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.105 AVMetadata3GPUserDataKeyAuthor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.106 AVMetadata3GPUserDataKeyCollection as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.107 AVMetadata3GPUserDataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.108 AVMetadata3GPUserDataKeyDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.109 AVMetadata3GPUserDataKeyGenre as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.110 AVMetadata3GPUserDataKeyKeywordList as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.111 AVMetadata3GPUserDataKeyLocation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.112 AVMetadata3GPUserDataKeyMediaClassification as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.113 AVMetadata3GPUserDataKeyMediaRating as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.114 AVMetadata3GPUserDataKeyPerformer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.115 AVMetadata3GPUserDataKeyRecordingYear as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.116 AVMetadata3GPUserDataKeyThumbnail as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.117 AVMetadata3GPUserDataKeyTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.118 AVMetadata3GPUserDataKeyUserRating as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.119 AVMetadataCommonKeyAlbumName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.120 AVMetadataCommonKeyArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.121 AVMetadataCommonKeyArtwork as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.122 AVMetadataCommonKeyAuthor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.123 AVMetadataCommonKeyContributor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.124 AVMetadataCommonKeyCopyrights as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.125 AVMetadataCommonKeyCreationDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.126 AVMetadataCommonKeyCreator as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.127 AVMetadataCommonKeyDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.128 AVMetadataCommonKeyFormat as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.129 AVMetadataCommonKeyIdentifier as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.130 AVMetadataCommonKeyLanguage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.131 AVMetadataCommonKeyLastModifiedDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.132 AVMetadataCommonKeyLocation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.133 AVMetadataCommonKeyMake as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.134 AVMetadataCommonKeyModel as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.135 AVMetadataCommonKeyPublisher as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.136 AVMetadataCommonKeyRelation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.137 AVMetadataCommonKeySoftware as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.138 AVMetadataCommonKeySource as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.139 AVMetadataCommonKeySubject as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.140 AVMetadataCommonKeyTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.141 AVMetadataCommonKeyType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the common metadata keys.

### 16.53.142 AVMetadataFormatID3Metadata as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.
**Notes:** The asset has metadata in the ID3 format.

### 16.53.143 AVMetadataFormatISOUserData as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.

### 16.53.144 AVMetadataFormatiTunesMetadata as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.
**Notes:** The asset has metadata in the iTunes format.

### 16.53.145 AVMetadataFormatQuickTimeMetadata as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.
**Notes:** The asset has metadata in the QuickTime metadata format.

### 16.53.146 AVMetadataFormatQuickTimeUserData as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.
**Notes:** The asset has metadata in the QuickTime user data format.

### 16.53.147 AVMetadataID3MetadataKeyAlbumSortOrder as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSOA album sort order.

### 16.53.148 AVMetadataID3MetadataKeyAlbumTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TALB album/Movie/Show title.

### 16.53.149 AVMetadataID3MetadataKeyAttachedPicture as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** APIC attached picture.

### 16.53.150 AVMetadataID3MetadataKeyAudioEncryption as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** AENC audio encryption.

### 16.53.151 AVMetadataID3MetadataKeyAudioSeekPointIndex as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** ASPI audio seek point index.

### 16.53.152 AVMetadataID3MetadataKeyBand as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPE2 band/orchestra/accompaniment.

### 16.53.153 AVMetadataID3MetadataKeyBeatsPerMinute as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TBPM BPM (beats per minute).

### 16.53.154 AVMetadataID3MetadataKeyComments as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** COMM comments.

### 16.53.155 AVMetadataID3MetadataKeyCommercial as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** COMR commercial frame.

### 16.53.156 AVMetadataID3MetadataKeyCommercialInformation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WCOM commercial information.

### 16.53.157 AVMetadataID3MetadataKeyComposer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TCOM composer.

### 16.53.158 AVMetadataID3MetadataKeyConductor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPE3 conductor/performer refinement.

### 16.53.159 AVMetadataID3MetadataKeyContentGroupDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TIT1 content group description.

### 16.53.160 AVMetadataID3MetadataKeyContentType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TCON content type.

### 16.53.161 AVMetadataID3MetadataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TCOP copyright message.

### 16.53.162 AVMetadataID3MetadataKeyCopyrightInformation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WCOP copyright/legal information.

### 16.53.163 AVMetadataID3MetadataKeyDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDAT date.

### 16.53.164 AVMetadataID3MetadataKeyEncodedBy as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TENC encoded by.

### 16.53.165 AVMetadataID3MetadataKeyEncodedWith as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSSE software/hardware and settings used for encoding.

### 16.53.166 AVMetadataID3MetadataKeyEncodingTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDEN encoding time.

### 16.53.167 AVMetadataID3MetadataKeyEncryption as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** ENCR encryption method registration.

### 16.53.168 AVMetadataID3MetadataKeyEqualization as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** EQUA equalization.

### 16.53.169 AVMetadataID3MetadataKeyEqualization2 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** EQU2 equalization (2).

### 16.53.170 AVMetadataID3MetadataKeyEventTimingCodes as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** ETCO event timing codes.

### 16.53.171 AVMetadataID3MetadataKeyFileOwner as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TOWN file owner/licensee.

### 16.53.172 AVMetadataID3MetadataKeyFileType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TFLT file type.

### 16.53.173 AVMetadataID3MetadataKeyGeneralEncapsulatedObject as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** GEOB general encapsulated object.

### 16.53.174 AVMetadataID3MetadataKeyGroupIdentifier as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** GRID group identification registration.

### 16.53.175 AVMetadataID3MetadataKeyInitialKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TKEY initial key.

### 16.53.176 AVMetadataID3MetadataKeyInternationalStandardRecordingCode as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSRC ISRC (international standard recording code).

### 16.53.177 AVMetadataID3MetadataKeyInternetRadioStationName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TRSN internet radio station name.

### 16.53.178 AVMetadataID3MetadataKeyInternetRadioStationOwner as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TRSO internet radio station owner.

### 16.53.179 AVMetadataID3MetadataKeyInvolvedPeopleList_v23 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** IPLS involved people list.

### 16.53.180 AVMetadataID3MetadataKeyInvolvedPeopleList_v24 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TIPL involved people list.

### 16.53.181 AVMetadataID3MetadataKeyLanguage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TLAN language(s).

### 16.53.182 AVMetadataID3MetadataKeyLeadPerformer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPE1 lead performer(s)/Soloist(s).

### 16.53.183 AVMetadataID3MetadataKeyLength as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TLEN length.

### 16.53.184 AVMetadataID3MetadataKeyLink as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** LINK linked information.

### 16.53.185 AVMetadataID3MetadataKeyLyricist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TEXT lyricist/text writer.

### 16.53.186 AVMetadataID3MetadataKeyMediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TMED media type.

### 16.53.187 AVMetadataID3MetadataKeyModifiedBy as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPE4 interpreted, remixed, or otherwise modified by.

### 16.53.188 AVMetadataID3MetadataKeyMood as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TMOO mood.

### 16.53.189 AVMetadataID3MetadataKeyMPEGLocationLookupTable as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** MLLT MPEG location lookup table.

### 16.53.190 AVMetadataID3MetadataKeyMusicCDIdentifier as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** MCDI music CD identifier.

### 16.53.191 AVMetadataID3MetadataKeyMusicianCreditsList as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TMCL musician credits list.

### 16.53.192 AVMetadataID3MetadataKeyOfficialArtistWebpage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WOAR official artist/performer webpage.

### 16.53.193 AVMetadataID3MetadataKeyOfficialAudioFileWebpage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WOAF official audio file webpage.

### 16.53.194 AVMetadataID3MetadataKeyOfficialAudioSourceWebpage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WOAS official audio source webpage.

### 16.53.195 AVMetadataID3MetadataKeyOfficialInternetRadioStationHomepage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WORS official Internet radio station homepage.

### 16.53.196 AVMetadataID3MetadataKeyOfficialPublisherWebpage as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WPUB publishers official webpage.

### 16.53.197 AVMetadataID3MetadataKeyOriginalAlbumTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TOAL original album/movie/show title.

### 16.53.198 AVMetadataID3MetadataKeyOriginalArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TOPE original artist(s)/performer(s).

### 16.53.199 AVMetadataID3MetadataKeyOriginalFilename as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TOFN original filename.

### 16.53.200 AVMetadataID3MetadataKeyOriginalLyricist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TOLY original lyricist(s)/text writer(s).

### 16.53.201 AVMetadataID3MetadataKeyOriginalReleaseTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDOR original release time.

### 16.53.202 AVMetadataID3MetadataKeyOriginalReleaseYear as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TORY original release year.

### 16.53.203 AVMetadataID3MetadataKeyOwnership as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** OWNE ownership frame.

### 16.53.204 AVMetadataID3MetadataKeyPartOfASet as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPOS part of a set.

### 16.53.205 AVMetadataID3MetadataKeyPayment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WPAY payment.

### 16.53.206 AVMetadataID3MetadataKeyPerformerSortOrder as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSOP performer sort order.

### 16.53.207 AVMetadataID3MetadataKeyPlayCounter as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** PCNT play counter.

### 16.53.208 AVMetadataID3MetadataKeyPlaylistDelay as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDLY playlist delay.

### 16.53.209 AVMetadataID3MetadataKeyPopularimeter as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** POPM popularimeter.

### 16.53.210 AVMetadataID3MetadataKeyPositionSynchronization as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** POSS position synchronisation frame.

### 16.53.211 AVMetadataID3MetadataKeyPrivate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** PRIV private frame.

### 16.53.212 AVMetadataID3MetadataKeyProducedNotice as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPRO produced notice.

### 16.53.213 AVMetadataID3MetadataKeyPublisher as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TPUB publisher.

### 16.53.214 AVMetadataID3MetadataKeyRecommendedBufferSize as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** RBUF recommended buffer size.

### 16.53.215 AVMetadataID3MetadataKeyRecordingDates as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TRDA recording dates.

### 16.53.216 AVMetadataID3MetadataKeyRecordingTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDRC recording time.

### 16.53.217 AVMetadataID3MetadataKeyRelativeVolumeAdjustment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** RVAD relative volume adjustment.

### 16.53.218 AVMetadataID3MetadataKeyRelativeVolumeAdjustment2 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** RVA2 relative volume adjustment (2).

### 16.53.219 AVMetadataID3MetadataKeyReleaseTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDRL release time.

### 16.53.220 AVMetadataID3MetadataKeyReverb as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** RVRB reverb.

### 16.53.221 AVMetadataID3MetadataKeySeek as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** SEEK seek frame.

### 16.53.222 AVMetadataID3MetadataKeySetSubtitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSST set subtitle.

### 16.53.223 AVMetadataID3MetadataKeySignature as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** SIGN signature frame.

### 16.53.224 AVMetadataID3MetadataKeySize as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSIZ size.

### 16.53.225 AVMetadataID3MetadataKeySubTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TIT3 subtitle/description refinement.

### 16.53.226 AVMetadataID3MetadataKeySynchronizedLyric as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** SYLT synchronized lyric/text.

### 16.53.227 AVMetadataID3MetadataKeySynchronizedTempoCodes as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** SYTC synchronized tempo codes.

### 16.53.228 AVMetadataID3MetadataKeyTaggingTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TDTG tagging time.

### 16.53.229 AVMetadataID3MetadataKeyTermsOfUse as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** USER terms of use.

### 16.53.230 AVMetadataID3MetadataKeyTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TIME time.

### 16.53.231 AVMetadataID3MetadataKeyTitleDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TIT2 title/songname/content description.

### 16.53.232 AVMetadataID3MetadataKeyTitleSortOrder as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TSOT title sort order.

### 16.53.233 AVMetadataID3MetadataKeyTrackNumber as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TRCK track number/position in set.

### 16.53.234 AVMetadataID3MetadataKeyUniqueFileIdentifier as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** UFID unique file identifier.

### 16.53.235 AVMetadataID3MetadataKeyUnsynchronizedLyric as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** USLT unsynchronized lyric/text transcription.

### 16.53.236 AVMetadataID3MetadataKeyUserText as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TXXX user defined text information frame.

### 16.53.237 AVMetadataID3MetadataKeyUserURL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** WXXX user defined URL link frame.

### 16.53.238 AVMetadataID3MetadataKeyYear as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for ID3 Metadata.
**Notes:** TYER year.

### 16.53.239 AVMetadataISOUserDataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.240 AVMetadataiTunesMetadataKeyAccountKind as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.241 AVMetadataiTunesMetadataKeyAcknowledgement as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.242 AVMetadataiTunesMetadataKeyAlbum as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.243 AVMetadataiTunesMetadataKeyAlbumArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.244 AVMetadataiTunesMetadataKeyAppleID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.245 AVMetadataiTunesMetadataKeyArranger as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.246 AVMetadataiTunesMetadataKeyArtDirector as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.247 AVMetadataiTunesMetadataKeyArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.248 AVMetadataiTunesMetadataKeyArtistID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.249 AVMetadataiTunesMetadataKeyAuthor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.250 AVMetadataiTunesMetadataKeyBeatsPerMin as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.251 AVMetadataiTunesMetadataKeyComposer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.252 AVMetadataiTunesMetadataKeyConductor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.253 AVMetadataiTunesMetadataKeyContentRating as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.254 AVMetadataiTunesMetadataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.255 AVMetadataiTunesMetadataKeyCoverArt as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.
**Example:**

```
// load file and look for cover art

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.m4a")
Dim a As AVURLAssetMBS = AVURLAssetMBS.URLAssetWithFile(file)

Dim iTunesMetadataKeyCoverArtString As String = AVFoundationMBS.AVMetadataiTunesMetadataKeyCoverArt
Dim iTunesMetadataKeyCoverArtNumber As Integer = OSTypeFromStringMBS(iTunesMetadataKeyCoverArtString)

Dim items() As AVMetadataItemMBS = a.metadata

For Each item As AVMetadataItemMBS In items

Dim key As Variant = item.key
Dim Val As Variant = item.value

If key.IntegerValue = iTunesMetadataKeyCoverArtNumber Or key.StringValue = iTunesMetadataKeyCoverArtString Then

Dim v As MemoryBlock = Val
window1.Backdrop = picture.FromData(v)
End If

Next
```

### 16.53.256 AVMetadataiTunesMetadataKeyCredits as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.257 AVMetadataiTunesMetadataKeyDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.258 AVMetadataiTunesMetadataKeyDirector as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.259 AVMetadataiTunesMetadataKeyDiscCompilation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.260 AVMetadataiTunesMetadataKeyDiscNumber as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.261 AVMetadataiTunesMetadataKeyEncodedBy as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.262 AVMetadataiTunesMetadataKeyEncodingTool as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.263 AVMetadataiTunesMetadataKeyEQ as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.264 AVMetadataiTunesMetadataKeyExecProducer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.265 AVMetadataiTunesMetadataKeyGenreID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.266 AVMetadataiTunesMetadataKeyGrouping as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.267 AVMetadataiTunesMetadataKeyLinerNotes as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.268 AVMetadataiTunesMetadataKeyLyrics as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.269 AVMetadataiTunesMetadataKeyOnlineExtras as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.270 AVMetadataiTunesMetadataKeyOriginalArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.271 AVMetadataiTunesMetadataKeyPerformer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.272 AVMetadataiTunesMetadataKeyPhonogramRights as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.273 AVMetadataiTunesMetadataKeyPlaylistID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.274 AVMetadataiTunesMetadataKeyPredefinedGenre as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.275 AVMetadataiTunesMetadataKeyProducer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.276 AVMetadataiTunesMetadataKeyPublisher as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.277 AVMetadataiTunesMetadataKeyRecordCompany as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.278 AVMetadataiTunesMetadataKeyReleaseDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.279 AVMetadataiTunesMetadataKeySoloist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.280 AVMetadataiTunesMetadataKeySongID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.281 AVMetadataiTunesMetadataKeySongName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.282 AVMetadataiTunesMetadataKeySoundEngineer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.283 AVMetadataiTunesMetadataKeyThanks as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.284 AVMetadataiTunesMetadataKeyTrackNumber as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.285 AVMetadataiTunesMetadataKeyTrackSubTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.286 AVMetadataiTunesMetadataKeyUserComment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.287 AVMetadataiTunesMetadataKeyUserGenre as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for iTunes Metadata.

### 16.53.288 AVMetadataKeySpaceCommon as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the key spaces.
**Notes:** The common key space. Keys in this space represent standard versions of keys that are found in most or all other key spaces.

### 16.53.289 AVMetadataKeySpaceID3 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the key spaces.
**Notes:** The ID3 key space.

### 16.53.290 AVMetadataKeySpaceISOUserData as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the metadata formats.

### 16.53.291 AVMetadataKeySpaceiTunes as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the key spaces.
**Notes:** The iTunes key space.

### 16.53.292 AVMetadataKeySpaceQuickTimeMetadata as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the key spaces.
**Notes:** The QuickTime metadata key space.

### 16.53.293 AVMetadataKeySpaceQuickTimeUserData as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the key spaces.
**Notes:** The QuickTime user data key space.

### 16.53.294 AVMetadataQuickTimeMetadataKeyAlbum as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.295 AVMetadataQuickTimeMetadataKeyArranger as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.296 AVMetadataQuickTimeMetadataKeyArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.297 AVMetadataQuickTimeMetadataKeyArtwork as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.298 AVMetadataQuickTimeMetadataKeyAuthor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.299 AVMetadataQuickTimeMetadataKeyCameraFrameReadoutTime as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.300 AVMetadataQuickTimeMetadataKeyCameraIdentifier as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.301 AVMetadataQuickTimeMetadataKeyCollectionUser as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.302 AVMetadataQuickTimeMetadataKeyComment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.303 AVMetadataQuickTimeMetadataKeyComposer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.304 AVMetadataQuickTimeMetadataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.305 AVMetadataQuickTimeMetadataKeyCreationDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.306 AVMetadataQuickTimeMetadataKeyCredits as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.307 AVMetadataQuickTimeMetadataKeyDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.308 AVMetadataQuickTimeMetadataKeyDirectionFacing as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.309 AVMetadataQuickTimeMetadataKeyDirectionMotion as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.310 AVMetadataQuickTimeMetadataKeyDirector as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.311 AVMetadataQuickTimeMetadataKeyDisplayName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.312 AVMetadataQuickTimeMetadataKeyEncodedBy as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.313 AVMetadataQuickTimeMetadataKeyGenre as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.314 AVMetadataQuickTimeMetadataKeyInformation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.315 AVMetadataQuickTimeMetadataKeyiXML as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.316 AVMetadataQuickTimeMetadataKeyKeywords as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.317 AVMetadataQuickTimeMetadataKeyLocationBody as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.318 AVMetadataQuickTimeMetadataKeyLocationDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.319 AVMetadataQuickTimeMetadataKeyLocationISO6709 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.320 AVMetadataQuickTimeMetadataKeyLocationName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.321 AVMetadataQuickTimeMetadataKeyLocationNote as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.322 AVMetadataQuickTimeMetadataKeyLocationRole as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.323 AVMetadataQuickTimeMetadataKeyMake as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.324 AVMetadataQuickTimeMetadataKeyModel as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.325 AVMetadataQuickTimeMetadataKeyOriginalArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.326 AVMetadataQuickTimeMetadataKeyPerformer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.327 AVMetadataQuickTimeMetadataKeyPhonogramRights as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.328 AVMetadataQuickTimeMetadataKeyProducer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.329 AVMetadataQuickTimeMetadataKeyPublisher as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.330 AVMetadataQuickTimeMetadataKeyRatingUser as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.331 AVMetadataQuickTimeMetadataKeySoftware as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.332 AVMetadataQuickTimeMetadataKeyTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.333 AVMetadataQuickTimeMetadataKeyYear as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for QuickTime Metadata.

### 16.53.334 AVMetadataQuickTimeUserDataKeyAlbum as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.335 AVMetadataQuickTimeUserDataKeyArranger as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.336 AVMetadataQuickTimeUserDataKeyArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.337 AVMetadataQuickTimeUserDataKeyAuthor as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.338 AVMetadataQuickTimeUserDataKeyChapter as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.339 AVMetadataQuickTimeUserDataKeyComment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.340 AVMetadataQuickTimeUserDataKeyComposer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.341 AVMetadataQuickTimeUserDataKeyCopyright as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.342 AVMetadataQuickTimeUserDataKeyCreationDate as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.343 AVMetadataQuickTimeUserDataKeyCredits as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.344 AVMetadataQuickTimeUserDataKeyDescription as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.345 AVMetadataQuickTimeUserDataKeyDirector as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.346 AVMetadataQuickTimeUserDataKeyDisclaimer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.347 AVMetadataQuickTimeUserDataKeyEncodedBy as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.348 AVMetadataQuickTimeUserDataKeyFullName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.349 AVMetadataQuickTimeUserDataKeyGenre as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.350 AVMetadataQuickTimeUserDataKeyHostComputer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.351 AVMetadataQuickTimeUserDataKeyInformation as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.352 AVMetadataQuickTimeUserDataKeyKeywords as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.353 AVMetadataQuickTimeUserDataKeyLocationISO6709 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.354 AVMetadataQuickTimeUserDataKeyMake as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.355 AVMetadataQuickTimeUserDataKeyModel as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.356 AVMetadataQuickTimeUserDataKeyOriginalArtist as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.357 AVMetadataQuickTimeUserDataKeyOriginalFormat as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.358 AVMetadataQuickTimeUserDataKeyOriginalSource as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.359 AVMetadataQuickTimeUserDataKeyPerformers as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.360 AVMetadataQuickTimeUserDataKeyPhonogramRights as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.361 AVMetadataQuickTimeUserDataKeyProducer as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.362 AVMetadataQuickTimeUserDataKeyProduct as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.363 AVMetadataQuickTimeUserDataKeyPublisher as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.364 AVMetadataQuickTimeUserDataKeySoftware as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.365 AVMetadataQuickTimeUserDataKeySpecialPlaybackRequirements as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.366 AVMetadataQuickTimeUserDataKeyTaggedCharacteristic as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.367 AVMetadataQuickTimeUserDataKeyTrack as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.368 AVMetadataQuickTimeUserDataKeyTrackName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.369 AVMetadataQuickTimeUserDataKeyURLLink as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.370 AVMetadataQuickTimeUserDataKeyWarning as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.371 AVMetadataQuickTimeUserDataKeyWriter as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the possible metadata keys for QuickTime UserData.

### 16.53.372 AVNumberOfChannelsKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to all audio formats handled by the AVAudioPlayer and AVAudioRecorder classes.
**Notes:** The number of channels expressed as an integer value.

### 16.53.373 AVPlayerItemDidPlayToEndTimeNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when the item has played to its end time.
**Notes:** The notification's object is the item that finished playing.

### 16.53.374 AVPlayerItemFailedToPlayToEndTimeErrorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Key to retrieve information from a notification's user info dictionary.
**Notes:** The key to retrieve an error object (NSError) from the user info dictionary of an AVPlayerItem-

TimeJumpedNotification notification.

### 16.53.375 AVPlayerItemFailedToPlayToEndTimeNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when the item failed to play to its end time.
**Notes:** The notification's object is the item that finished playing.
The user info dictionary contains an error object that describes the problem—seeAVPlayerItemFailedToPlayToEndTimeErrorKey.

### 16.53.376 AVPlayerItemNewAccessLogEntryNotification as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The notification name to use with NSNotificationObserverMBS class.
**Notes:** Posted when a new access log entry has been added.
The notification's object is the player item. The new log entry is accessible via accessLog.
Available on Mac OS X 10.9 or later.

### 16.53.377 AVPlayerItemNewErrorLogEntryNotification as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The notification name to use with NSNotificationObserverMBS class.
**Notes:** Posted when a new error log entry has been added.
The notification's object is the player item. The new log entry is accessible via errorLog, respectively.
Available on Mac OS X 10.9 or later.

### 16.53.378 AVPlayerItemPlaybackStalledNotification as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The notification name to use with NSNotificationObserverMBS class.
**Notes:** Posted when some media did not arrive in time to continue playback.
The notification's object is the AVPlayerItem instance whose playback was unable to continue because the necessary media isn't available yet, usually because it didn't arrive in a timely fashion from its source over a network. Playback will continue once a sufficient amount of media has subsequently been delivered.
Available on Mac OS X 10.9 or later.

### 16.53.379 AVPlayerItemTimeJumpedNotification as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when the item's current time has changed discontinuously.
**Notes:** The notification's object is the item.

### 16.53.380 AVSampleRateConverterAlgorithmKey as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The algorithm for the rate conversion.
**Notes:** Can be AVSampleRateConverterAlgorithm_Mastering or AVSampleRateConverterAlgorithm_Normal.
Available in OS X v10.9 and later.

### 16.53.381 AVSampleRateConverterAlgorithm_Mastering as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the supported values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.382 AVSampleRateConverterAlgorithm_Normal as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the supported values for the AVEncoderBitRateStrategyKey encoder setting.
**Notes:** Available in OS X v10.9 and later.

### 16.53.383 AVSampleRateConverterAudioQualityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sample rate converter audio quality settings.
**Notes:** Value is an integer value. See AVAudioQuality* constants.

### 16.53.384 AVSampleRateKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the Audio setting keys that apply to all audio formats handled by the AVAudioPlayer and AVAudioRecorder classes.
**Notes:** A sample rate, in hertz, expressed as an floating point value.

### 16.53.385 AVStreamingKeyDeliveryContentKeyType as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** A UTI for streaming key delivery content keys.
**Notes:** The value of this UTI is "com.apple.streamingkeydelivery.contentkey".

### 16.53.386 AVStreamingKeyDeliveryPersistentContentKeyType as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** A UTI for persistent streaming key delivery content keys
**Notes:** The value of this UTI is "com.apple.streamingkeydelivery.persistentcontentkey".

### 16.53.387 AVTrackAssociationTypeAudioFallback as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Constants for identifying how other tracks are associated with a track.
**Notes:** An association from one audio track to another audio track. This constant indicates when one track contains the same content as another but in a more widely supported format. A player that does not support the format of the original track can use the "fallback" track instead.
For example, an asset may contain both stereo and a 5.1-channel audio tracks. In this case, marking the stereo track as the fallback for the 5.1-channel track would ensure that devices not capable of playing 5.1-channel audio can still play an equivalent track.
Available in OS X v10.9 and later.

### 16.53.388 AVTrackAssociationTypeChapterList as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Constants for identifying how other tracks are associated with a track.
**Notes:** An association from a track to another track containing chapter information, which may be a text track, a video track, or a timed metadata track.
Available in OS X v10.9 and later.

### 16.53.389 AVTrackAssociationTypeForcedSubtitlesOnly as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Constants for identifying how other tracks are associated with a track.
**Notes:** An association from one subtitle track, containing both forced and nonforced subtitles, to another subtitle track containing only forced subtitles for the same content.
Nonforced subtitles usually transcribe all "normal" dialogue in a media asset and are typically not presented by default. Forced subtitles are those that are essential for presentation even when normal subtitles are disabled (for example, when a character speaks in a language foreign to that of the audio track).
Available in OS X v10.9 and later.

### 16.53.390 AVTrackAssociationTypeSelectionFollower as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Constants for identifying how other tracks are associated with a track.
**Notes:** An association from one track to another specifying that when the user selects the first track, the second should be considered an appropriate default selection.
For example, a follower for an audio track could be a subtitle track in the same language. When the user chooses a language for audio, the subtitle language "follows" the audio language selection.
Available in OS X v10.9 and later.

### 16.53.391 AVTrackAssociationTypeTimecode as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Constants for identifying how other tracks are associated with a track.
**Notes:** An association from one track (of any type) to a timecode track containing timing information for the original track.
Available in OS X v10.9 and later.

### 16.53.392 AVURLAssetHTTPCookiesKey as string

MBS AVFoundation Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** HTTP cookies that the AVURLAsset may send with HTTP requests.
**Notes:** Standard cross-site policy still applies: cookies will only be sent to domains to which they apply.

By default, an AVURLAsset will only have access to cookies in the client's default cookie storage that apply to the AVURLAsset's URL. You can supplement the cookies available to the asset via use of this initialization option

HTTP cookies do not apply to non-HTTP(S) URLS.
In HLS, many HTTP requests (e.g., media, crypt key, variant index) might be issued to different paths or

hosts.
In both of these cases, HTTP requests will be missing any cookies that do not apply to the AVURLAsset's URL.
This init option allows the AVURLAsset to use additional HTTP cookies for those HTTP(S) requests.

### 16.53.393 AVURLAssetPreferPreciseDurationAndTimingKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys for AVAsset creations.
**Example:**

```
dim options as new Dictionary
options.value(AVFoundationMBS.AVURLAssetPreferPreciseDurationAndTimingKey) = true
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim a as AVAssetMBS = AVURLAssetMBS.URLAssetWithFile(f, options)

MsgBox str(a.duration.Seconds)+" seconds with precision: "+str(a.providesPreciseDurationAndTiming)
```

**Notes:** The corresponding value is a boolean, contained in an NSValue object, that indicates whether the asset should be prepared to indicate a precise duration and provide precise random access by time.
True indicates that longer loading times are acceptable in cases in which precise timing is required. Such precision, however, may require additional parsing of the resource in advance of operations that make use of any portion of it, depending on the specifics of its container format.
Many container formats provide sufficient summary information for precise timing and do not require additional parsing to prepare for it; QuickTime movie files and MPEG-4 files are examples of such formats. Other formats do not provide sufficient summary information, and precise random access for them is possible only after a preliminary examination of a file's contents.
If you only intend that the asset be played, the default value of false will suffice (because AVPlayer supports approximate random access by time when full precision isn't available). If you intend to insert the asset into an AVMutableComposition object, precise random access is typically desirable, and the value of true is recommended.

### 16.53.394 AVURLAssetReferenceRestrictionsKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the keys for AVAsset creations.
**Notes:** The corresponding value is a number wrapping an "AVAssetReferenceRestrictions" enum value—or the logical combination of multiple such values—that indicates the restrictions used by the asset when resolving references to external media data.
Some assets can contain references to media data stored outside the asset's container file, for example in another file. This key can be used to specify a policy to use when these references are encountered. If an

asset contains one or more references of a type that is forbidden by the reference restrictions, loading of asset properties will fail. In addition, such an asset cannot be used with other AVFoundation modules, such as AVPlayerItem or AVAssetExportSession.

### 16.53.395 AVVideoAverageBitRateKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the average bit rate (as bits per second) used in encoding.
The corresponding value is a number.
Apple documentation says H.264 only.

### 16.53.396 AVVideoCleanApertureHeightKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the clean aperture height.
The corresponding value is a number.

### 16.53.397 AVVideoCleanApertureHorizontalOffsetKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the clean aperture horizontal offset.
The corresponding value is a number.

### 16.53.398 AVVideoCleanApertureKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the clean aperture.
The corresponding value is a dictionary.

### 16.53.399 AVVideoCleanApertureVerticalOffsetKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the clean aperture vertical offset.
The corresponding value is a number.

### 16.53.400 AVVideoCleanApertureWidthKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the clean aperture width.
The corresponding value is a number.

### 16.53.401 AVVideoCodecAppleProRes422 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies that the video was encoded using the ProRes 422 Standard Definition encoder.
Files are identified with the .apcn extension.

### 16.53.402 AVVideoCodecAppleProRes4444 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies that the video was encoded using the Apple ProRes 4444 encoder.
Files are identified with the .ap4h extension.

### 16.53.403 AVVideoCodecH264 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies that the video was encoded using H264.

### 16.53.404 AVVideoCodecJPEG as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies that the video was encoded using the JPEG encoder.

### 16.53.405 AVVideoCodecKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the name of the codec used to encode the video. The corresponding value is a string; equivalent to CMVideoCodecType.

### 16.53.406 AVVideoCodecTypeAppleProRes422 as string

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** One of the values used to describe codecs for video capture.
**Notes:** The Apple ProRes422 video codec.

### 16.53.407 AVVideoCodecTypeAppleProRes4444 as string

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** One of the values used to describe codecs for video capture.
**Notes:** The Apple ProRes4444 video codec.

### 16.53.408 AVVideoCodecTypeH264 as string

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** One of the values used to describe codecs for video capture.
**Notes:** The H.264 video codec.

### 16.53.409 AVVideoCodecTypeHEVC as string

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** One of the values used to describe codecs for video capture.
**Notes:** The HEVC video codec.

### 16.53.410 AVVideoCodecTypeJPEG as string

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** One of the values used to describe codecs for video capture.
**Notes:** The JPEG video codec.

### 16.53.411 AVVideoColorPrimariesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key to identify color primaries in a color properties dictionary.

### 16.53.412 AVVideoColorPrimaries_EBU_3213 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoColorPrimariesKey.

### 16.53.413 AVVideoColorPrimaries_ITU_R_709_2 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoColorPrimariesKey.

### 16.53.414 AVVideoColorPrimaries_SMPTE_C as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoColorPrimariesKey.

### 16.53.415 AVVideoColorPropertiesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key for a dictionary that contains properties specifying video color.
**Notes:** The dictionary must contain the keys AVVideoColorPrimariesKey, AVVideoTransferFunctionKey, and AVVideoYCbCrMatrixKey.

### 16.53.416 AVVideoCompressionPropertiesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the compression properties.
The corresponding value is a Dictionary.

### 16.53.417 AVVideoHeightKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the height of the video in pixels.
The corresponding value is a number.

### 16.53.418 AVVideoMaxKeyFrameIntervalDurationKey as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Number (1 means key frames only, H.264 only)

### 16.53.419 AVVideoMaxKeyFrameIntervalKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the maximum interval between key frames.

The corresponding value is a number. 1 means key frames only.

### 16.53.420 AVVideoPixelAspectRatioHorizontalSpacingKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the pixel aspect ratio horizontal spacing.
The corresponding value is a number.

### 16.53.421 AVVideoPixelAspectRatioKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the pixel aspect ratio.
The corresponding value is a dictionary.

### 16.53.422 AVVideoPixelAspectRatioVerticalSpacingKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the pixel aspect ratio vertical spacing.
The corresponding value is a number.

### 16.53.423 AVVideoProfileLevelH264Baseline30 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a baseline level 3.0 profile.
Available in OS X v10.8 and later.

### 16.53.424 AVVideoProfileLevelH264Baseline31 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a baseline level 3.1 profile.

Available in OS X v10.8 and later.

### 16.53.425 AVVideoProfileLevelH264Baseline41 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a baseline level 4.1 profile.
Available in OS X v10.8 and later.

### 16.53.426 AVVideoProfileLevelH264BaselineAutoLevel as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Baseline Profile Auto Level.
Available on Mac OS X 10.9.

### 16.53.427 AVVideoProfileLevelH264High40 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** High Profile Level 4.0
Available on Mac OS X 10.9.

### 16.53.428 AVVideoProfileLevelH264High41 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** High Profile Level 4.1
Available on Mac OS X 10.9.

### 16.53.429 AVVideoProfileLevelH264HighAutoLevel as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** High Profile Auto Level

Available on Mac OS X 10.9.

### 16.53.430 AVVideoProfileLevelH264Main30 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a main level 3.0 profile.
Available in OS X v10.8 and later.

### 16.53.431 AVVideoProfileLevelH264Main31 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a main level 3.1 profile.
Available in OS X v10.8 and later.

### 16.53.432 AVVideoProfileLevelH264Main32 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a main level 3.2 profile.
Available in OS X v10.8 and later.

### 16.53.433 AVVideoProfileLevelH264Main41 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a main level 4.2 profile.
Available in OS X v10.8 and later.

### 16.53.434 AVVideoProfileLevelH264MainAutoLevel as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Main Profile Auto Level

Available on Mac OS X 10.9.

### 16.53.435 AVVideoProfileLevelKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the video profile.
Available in OS X v10.8 and later.

### 16.53.436 AVVideoQualityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the JPEG coded quality.
The corresponding value is a number 0.0-1.0.

JPEG and HEIC only. With HEIC, 1.0 indicates lossless compression

### 16.53.437 AVVideoScalingModeFit as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify how video should be scaled to fit a given area.
**Notes:** Crop to remove edge processing region; preserve aspect ratio of cropped source by reducing specified width or height if necessary.
This mode does not scale a small source up to larger dimensions.

### 16.53.438 AVVideoScalingModeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify how video should be scaled to fit a given area.
**Notes:** A key to retrieve the video scaling mode from a dictionary.

### 16.53.439 AVVideoScalingModeResize as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify how video should be scaled to fit a given area.
**Notes:** Crop to remove edge processing region; scale remainder to destination area.
This mode does not preserve the aspect ratio.

### 16.53.440 AVVideoScalingModeResizeAspect as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify how video should be scaled to fit a given area.
**Notes:** Preserve aspect ratio of the source, and fill remaining areas with black to fit destination dimensions.

### 16.53.441 AVVideoScalingModeResizeAspectFill as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants to specify how video should be scaled to fit a given area.
**Notes:** Preserve aspect ratio of the source, and crop picture to fit destination dimensions.

### 16.53.442 AVVideoTransferFunctionKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key to identify the transfer function in a color properties dictionary.

### 16.53.443 AVVideoTransferFunction_ITU_R_709_2 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoTransferFunctionKey.

### 16.53.444 AVVideoTransferFunction_SMPTE_240M_1995 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoTransferFunctionKey.

### 16.53.445 AVVideoWidthKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the constants for the dictionary with video settings.
**Notes:** Specifies a key to access the width of the video in pixels.
The corresponding value is a number.

### 16.53.446 AVVideoYCbCrMatrixKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key to identify the Y'CbCr matrix in a color properties dictionary.

### 16.53.447 AVVideoYCbCrMatrix_ITU_R_601_4 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoYCbCrMatrixKey.

### 16.53.448 AVVideoYCbCrMatrix_ITU_R_709_2 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoYCbCrMatrixKey.

### 16.53.449 AVVideoYCbCrMatrix_SMPTE_240M_1995 as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the values to use with AVVideoYCbCrMatrixKey.

### 16.53.450 WriteCGImageToFile(File as FolderItem, Type as String, Image as Variant, options as Dictionary = nil, tag as Variant = nil) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Writes a CGImage to a file on disk on another thread.
**Notes:** Image must be a CGImageMBS.

If this method returns true (parameters are correct), it starts the compression and writing of the image on a helper thread and later calls WriteCGImageToFileCompleted event to inform you about success or failure. Returns false in case of bad parameters.

Tag is the value you passed when calling the original method.

### 16.53.451 Events

### 16.53.452 AssetLoadValuesAsynchronouslyForKeysFinished(MetadataItem as AVMetadataItemMBS, keys() as string, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by AVAssetMBS.loadValuesAsynchronouslyForKeys method on completion.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.453 AssetTrackLoadValuesAsynchronouslyForKeysFinished(MetadataItem as AVMetadataItemMBS, keys() as string, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by AVAssetTrackMBS.loadValuesAsynchronouslyForKeys method on completion.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.454 audioPlayerDecodeErrorDidOccur(player as AVAudioPlayerMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when an audio player encounters a decoding error during playback.
**Notes:** player: The audio player that encountered the decoding error.
error: The decoding error.

### 16.53.455 audioPlayerDidFinishPlaying(player as AVAudioPlayerMBS, successful as boolean)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when a sound has finished playing.
**Notes:** player: The audio player that finished playing.

flag: True on successful completion of playback; false if playback stopped because the system could not decode the audio data.

This method is not called upon an audio interruption. Rather, an audio player is paused upon interruption—the sound has not finished playing.

### 16.53.456 audioRecorderDidFinishRecording(recorder as AVAudioRecorderMBS, successful as boolean)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by the system when a recording is stopped or has finished due to reaching its time limit.
**Notes:** recorder: The audio recorder that has finished recording.
flag: True on successful completion of recording; False if recording stopped because of an audio encoding error.

This method is not called by the system if the audio recorder stopped due to an interruption.

### 16.53.457 audioRecorderEncodeErrorDidOccur(recorder as AVAudioRecorderMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when an audio recorder encounters an encoding error during recording.
**Notes:** recorder: The audio recorder that encountered the encoding error.
error: The encoding error.

### 16.53.458 BoundaryTimeObserver(Player as AVPlayerMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by addBoundaryTimeObserverForTimes.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.459 CaptureDeviceSubjectAreaDidChange(device as AVCaptureDeviceMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Notification that is posted when the instance of AVCaptureDevice has detected a substantial change to the video subject area.
**Notes:** notification is a NSNotificationMBS object.
This notification is only sent if you first set subjectAreaChangeMonitoringEnabled to True.

### 16.53.460 CaptureDeviceWasConnected(device as AVCaptureDeviceMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Notification that is posted when a new device becomes available.
**Notes:** notification is a NSNotificationMBS object.

### 16.53.461 CaptureDeviceWasDisconnected(device as AVCaptureDeviceMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Notification that is posted when an existing device becomes unavailable.
**Notes:** notification is a NSNotificationMBS object.

### 16.53.462 CaptureInputPortFormatDescriptionDidChange(InputPort as AVCaptureInputPortMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted if the formatDescription of the capture input port changes.
**Notes:** notification is a NSNotificationMBS object.

### 16.53.463 captureOutputDidDropSampleBuffer(captureOutput as AVCaptureOutputMBS, OutputSampleBuffer as CMSampleBufferMBS, connection as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Notifies the delegate that a video frame was discarded.
**Notes:** captureOutput: The capture output object.
sampleBuffer: A CMSampleBuffer object containing information about the dropped frame, such as its format and presentation time. This sample buffer contains none of the original video data.
connection: The connection from which the video was received.

Delegates receive this message whenever a late video frame is dropped. This method is called once for each dropped frame. It is called on the main thread, so please make your event code run very fast.

### 16.53.464 captureOutputDidFinishRecordingToOutputFileAtURL(captureOutput as AVCaptureFileOutputMBS, outputFileURL as string, connections() as AVCaptureConnectionMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Informs the delegate when all pending data has been written to an output file.
**Notes:** captureOutput: The capture file output that has finished writing the file.
outputFileURL: The file URL of the file that is being written.
connections: An array of AVCaptureConnection objects attached to the file output that provided the data that is being written to the file.
error: If the file was not written successfully, an error object that describes the problem; otherwise nil.

This method is called whenever a file is finished. If the file was forced to be finished due to an error, the error is described in the error parameter—otherwise, the error parameter is nil.

This method is called when the file output has finished writing all data to a file whose recording was stopped, either because startRecordingToOutputFileURL or stopRecording were called, or because an error (described by the error parameter), occurred (if no error occurred, the error parameter is nil).

This method is always called for each recording request, even if no data is successfully written to the file.

### 16.53.465 captureOutputDidOutputMetadataObjects(captureOutput as AVCaptureOutputMBS, metadataObjects() as AVMetadataObjectMBS, connection as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: iOS, Targets: .

**Function:** Called by AVCaptureMetadataOutputMBS class if new metadata is available.
**Notes:** Only for iOS!

captureOutput: The AVCaptureMetadataOutputMBS object that captured and emitted the metadata objects.
metadataObjects: An array of AVMetadataObjectMBS instances representing the newly emitted metadata. Because AVMetadataObject is an abstract class, the objects in this array are always instances of a concrete subclass.
connection: The capture connection through which the objects were emitted.

The AVCaptureMetadataOutputMBS object emits only metadata objects whose types are included in its metadataObjectTypes property. The delegate implements this method to perform additional processing on metadata objects as they become available. If you plan to use metadata objects outside the scope of this method, you must store strong references to them and remove those references when the objects are no longer required.

### 16.53.466 captureOutputDidOutputSampleBuffer(captureOutput as AVCaptureOutputMBS, OutputSampleBuffer as CMSampleBufferMBS, connection as AVCaptureConnectionMBS, features as variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called for frames being outputted.
**Notes:** Called by AVCaptureFileOutputMBS, AVCaptureVideoDataOutputMBS and AVCaptureAudioDataOutputMBS.

features is an array of object, which contains detected CIFeatureMBS objects for AVCaptureVideoDataOutputMBS with CIDetector.

### 16.53.467 captureOutputDidPauseRecordingToOutputFileAtURL(captureOutput as AVCaptureFileOutputMBS, fileURL as string, connections() as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called whenever the output is recording to a file and successfully pauses the recording at the request of a client.
**Notes:** captureOutput: The capture file output that has paused its file recording.
fileURL: The file URL of the file that is being written.
connections: An array of AVCaptureConnection objects attached to the file output that provided the data that is being written to the file.

This method is called whenever a request to pause recording is actually respected.

It is safe for delegates to change what the file output is currently doing (starting a new file, for example) from within this method. If recording to a file is stopped, either manually or due to an error, this method is not guaranteed to be called, even if a previous call to pauseRecording was made.

### 16.53.468 captureOutputDidResumeRecordingToOutputFileAtURL(captureOutput as AVCaptureFileOutputMBS, fileURL as string, connections() as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called whenever the output, at the request of the client, successfully resumes a file recording that was paused.
**Notes:** captureOutput: The capture file output that has resumed its paused file recording.
fileURL: The file URL of the file that is being written.
connections: An array of AVCaptureConnection objects attached to the file output that provided the data that is being written to the file.

Delegates can use this method to be informed when a request to resume recording is actually respected.

It is safe for delegates to change what the file output is currently doing (starting a new file, for example) from within this method. If recording to a file is stopped, either manually or due to an error, this method is not guaranteed to be called, even if a previous call toresumeRecording was made.

### 16.53.469 captureOutputDidStartRecordingToOutputFileAtURL(captureOutput as AVCaptureFileOutputMBS, fileURL as string, connections() as AVCaptureConnectionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Informs the delegate when the output has started writing to a file.
**Notes:** captureOutput: The capture file output that started writing the file.
fileURL: The file URL of the file that is being written.
connections: An array of AVCaptureConnection objects attached to the file output that provided the data that is being written to the file.

If an error condition prevents any data from being written, this method may not be called. captureOutputwillFinishRecordingToOutputFileAtURL and captureOutputdidFinishRecordingToOutputFileAtURL are always called, even if no data is written.

### 16.53.470 captureOutputWillFinishRecordingToOutputFileAtURL(captureOutput as AVCaptureFileOutputMBS, fileURL as string, connections() as AVCaptureConnectionMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Informs the delegate when the output will stop writing new samples to a file.

**Notes:** captureOutput: The capture file output that will finish writing the file.
fileURL: The file URL of the file that is being written.
connections: An array of AVCaptureConnection objects attached to the file output that provided the data that is being written to the file.
error: An error describing what caused the file to stop recording, or nil if there was no error.

This method is called when the file output will stop recording new samples to the file at outputFileURL, either because startRecordingToOutputFileURL or stopRecording were called, or because an error (described by the error parameter), occurred (if no error occurred, the error parameter is nil).

This method is always called for each recording request, even if no data is successfully written to the file.

### 16.53.471 CaptureSessionDidStartRunning(session as AVCaptureSessionMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted when a capture session starts.
**Notes:** notification is a NSNotificationMBS object.

### 16.53.472 CaptureSessionDidStopRunning(session as AVCaptureSessionMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted when a capture session stops.
**Notes:** notification is a NSNotificationMBS object.

### 16.53.473 CaptureSessionRuntimeError(session as AVCaptureSessionMBS, error as NSErrorMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted if an error occurred during a capture session.
**Notes:** notification is a NSNotificationMBS object.
You retrieve the underlying error from the notification's user info dictionary using the key AVCaptureSessionErrorKey.

### 16.53.474 captureStillImageAsynchronouslyCompleted(CaptureStillImageOutput as AVCaptureStillImageOutputMBS, prepareJpegStillImage as boolean, tag as Variant, error as NSErrorMBS, imageDataSampleBuffer as CMSampleBufferMBS, JpegStillImage as memoryblock)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called when still image was captured.
**Notes:** If prepareJpegStillImage is true, the plugin will prepare the jpeg data and pass it as JpegStillImage, so the preparation is done on the capture thread.
imageDataSampleBuffer: The data that was captured.

The buffer attachments may contain metadata appropriate to the image data format. For example, a buffer containing JPEG data may carry a kCGImagePropertyExifDictionary as an attachment. See ImageIO/CGImageProperties.h for a list of keys and value types.
error
If the request could not be completed, an NSError object that describes the problem; otherwise nil.

Tag is the value you passed when calling the original method.

### 16.53.475 determineCompatibilityOfExportPresetCompleted(presetName as string, asset as AVAssetMBS, outputFileType as string, compatible as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called by AVAssetExportSessionMBS.determineCompatibilityOfExportPreset.
**Notes:** The event to execute with the results of your call to determineCompatibilityOfExportPreset.
The compatible parameter contains the value true if the combination of options is compatible or false if they are not.

Tag is the value you passed when calling the original method.

### 16.53.476 determineCompatibleFileTypesCompleted(exportsession as AVAssetExportSessionMBS, compatibleFileTypes() as string, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called when you call AVAssetExportSessionMBS.determineCompatibleFileTypes method.
**Notes:** The event to execute with the results.
You receive an array parameter and returns no result. The array contains zero or more strings with the UTIs of the compatible file types. The file types are in no particular order. For a list of constants specifying

UTIs for standard file types, see AV Foundation Constants Reference.

Tag is the value you passed when calling the original method.

### 16.53.477 exportAsynchronouslyCompleted(ExportSession as AVAssetExportSessionMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Export finished.
**Notes:** Called by AVAssetExportSessionMBS.exportAsynchronously when the export is done or failed.

Tag is the value you passed when calling the original method.

### 16.53.478 finishWritingCompleted(writer as AVAssetWriterMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Event called from AVAssetWriterMBS.finishWritingWithCompletionHandler.
**Notes:** The event is invoked once the writing of the output file is finished or if a failure or cancellation occurs in the meantime.

Tag is the value you passed when calling the original method.

### 16.53.479 generateCGImagesAsynchronouslyForTimesCompleted(generator as AVAssetImageGeneratorMBS, requestedTime as CMTimeMBS, image as Variant, actualTime as CMTimeMBS, result as Integer, error as NSErrorMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when image generation is completed or cancelled.
**Notes:** Image is a CGImageMBS object.
Called by AVAssetImageGeneratorMBS.generateCGImagesAsynchronouslyForTimes method.

Tag is the value you passed when calling the original method.

### 16.53.480 legibleOutputDidOutputAttributedStrings(output as AVPlayerItemLegibleOutputMBS, strings() as Variant, nativeSamples() as CMSampleBufferMBS, itemTime as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The legible output did output an attributed string.
**Notes:** Strings array contains NSAttributedStringMBS objects.

### 16.53.481 MetadataItemLoadValuesAsynchronouslyForKeysFinished(MetadataItem as AVMetadataItemMBS, keys() as string, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by AVMetadataItemMBS.loadValuesAsynchronouslyForKeys method on completion.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.482 outputMediaDataWillChange(output as AVPlayerItemOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Tells you that new samples are about to arrive.
**Notes:** You can use this method to prepare for any new sample data. This method is called at some point after a call to your video output object's requestNotificationOfMediaDataChangeWithAdvanceInterval method.

### 16.53.483 outputSequenceWasFlushed(output as AVPlayerItemOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that a new sample sequence is commencing.
**Notes:** output: The output object that sent the message.

This method is called after any attempt to seek or change the playback direction of the item's content. If you are maintaining any queued future samples, you can use your implementation of this method to discard those samples.

### 16.53.484 PeriodicTimeObserver(Player as AVPlayerMBS, time as CMTimeMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by addPeriodicTimeObserverForInterval.
**Notes:** time: The time at which the block is invoked.

Tag is the value you passed when calling the original method.

### 16.53.485 PlayerItemDidPlayToEndTime(PlayerItem as AVPlayerItemMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted when the item has played to its end time.
**Notes:** notification is a NSNotificationMBS object.
The notification's object is the item that finished playing.

### 16.53.486 PlayerItemFailedToPlayToEndTime(PlayerItem as AVPlayerItemMBS, error as NSErrorMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted when the item failed to play to its end time.
**Notes:** notification is a NSNotificationMBS object.
The notification's object is the item that finished playing.
The user info dictionary contains an error object that describes the problem—seeAVPlayerItemFailedToPlayToEndTimeErrorKey.

### 16.53.487 PlayerItemNewAccessLogEntry(PlayerItem as AVPlayerItemMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** A new access log entry is available to a player item.
**Notes:** notification is a NSNotificationMBS object.
Posted when a new access log entry has been added.
The notification's object is the player item. The new log entry is accessible via accessLog.

### 16.53.488 PlayerItemNewErrorLogEntry(PlayerItem as AVPlayerItemMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** A new error log entry is available to a player item.
**Notes:** notification is a NSNotificationMBS object.
Posted when a new error log entry has been added.
The notification's object is the player item. The new log entry is accessible via errorLog, respectively.

### 16.53.489 PlayerItemPlaybackStalled(PlayerItem as AVPlayerItemMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The player item playback is stalled.
**Notes:** notification is a NSNotificationMBS object.

Posted when some media did not arrive in time to continue playback.
The notification's object is the AVPlayerItem instance whose playback was unable to continue because the necessary media isn't available yet, usually because it didn't arrive in a timely fashion from its source over a network. Playback will continue once a sufficient amount of media has subsequently been delivered.

### 16.53.490 playerItemSeekToDateFinished(player as AVPlayerItemMBS, date as Variant, finished as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The seek operation to date finished.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.491 playerItemSeekToTimeFinished(player as AVPlayerItemMBS, time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, finished as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** A seek operation has finished.
**Notes:** finished: Indicates whether the seek operation completed.

Tag is the value you passed when calling the original method.

### 16.53.492 PlayerItemTimeJumped(PlayerItem as AVPlayerItemMBS, notification as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Posted when the item's current time has changed discontinuously.
**Notes:** notification is a NSNotificationMBS object.
The notification's object is the item.

### 16.53.493 playerSeekToDateFinished(player as AVPlayerMBS, date as Variant, finished as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Event called by AVPlayerMBS.seekToDate method when seeking is done.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.494 playerSeekToTimeFinished(player as AVPlayerMBS, time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, finished as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called by AVPlayerMBS.seekToTime when seeking is done.
**Notes:** finished: Indicates whether the seek operation completed.

Tag is the value you passed when calling the original method.

### 16.53.495 prerollAtRateFinished(player as AVAudioPlayerMBS, rate as Double, finished as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called when preroll is done.
**Notes:** Finished: True if the data was loaded or false if there was a problem.
The value might be false if the preroll was interrupted by a time change or incompatible rate change.

Tag is the value you passed when calling the original method.

### 16.53.496 requestAccessForMediaTypeCompleted(MediaType as String, granted as boolean, tag as variant)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The call to AVCaptureDeviceMBS.requestAccessForMediaType was decided.

### 16.53.497 requestContentAuthorizationCompleted(PlayerItem as AVPlayerItemMBS, timeoutInterval as Double, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called when a request started with AVPlayerItemMBS.requestContentAuthorizationAsynchronously completed.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.498 requestMediaDataWhenReadyOnQueueCompleted(assetWriterInput as AVAssetWriterInputMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when media is ready.
**Notes:** You called requestMediaDataWhenReadyOnQueue on an AVAssetWriterInputMBS before.

Tag is the value you passed when calling the original method.

### 16.53.499 requestMediaDataWhenReadyOnQueueFinished(assetWriterInput as AVAssetWriterInputMBS, assetReaderOutput as AVAssetReaderOutputMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when copying data from input to output by plugin is done.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.500 requestMediaDataWhenReadyOnQueueProgress(assetWriterInput as AVAssetWriterInputMBS, assetReaderOutput as AVAssetReaderOutputMBS, convertedByteCount as Int64, LastBuffer as CMSampleBufferMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called when media is processed from input to output from plugin.
**Notes:** LastBuffer: The last buffer processed.

Tag is the value you passed when calling the original method.

### 16.53.501 resourceLoaderDidCancelLoadingRequest(resourceLoader as AVAssetResourceLoaderMBS, loadingRequest as AVAssetResourceLoadingRequestMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Invoked to inform the delegate that a prior loading request has been cancelled.
**Notes:** resourceLoader: The resource loader.
loadingRequest: The loading request that has been cancelled.

Previously issued loading requests can be cancelled when data from the resource is no longer required or when a loading request is superseded by new requests for data from the same resource.

For example, if to complete a seek operation it becomes necessary to load a range of bytes that's different from a range previously requested, the prior request may be cancelled while the delegate is still handling it. Available in OS X v10.9 and later.

### 16.53.502 resourceLoaderShouldWaitForLoadingOfRequestedResource(resourceLoader as AVAssetResourceLoaderMBS, loadingRequest as AVAssetResourceLoadingRequestMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Asks the delegate if it wants to load the requested resource.
**Notes:** resourceLoader: The resource loader object that is making the request.
loadingRequest: The loading request object that contains information about the requested resource.

Returns true if your delegate can load the resource specified by the loadingRequest parameter or false if it cannot.

The resource loader object calls this method when assistance is required of your code to load the specified resource. For example, the resource loader might call this method to load decryption keys that have been specified using a custom URL scheme.

Returning true from this method, implies only that the receiver will load, or at least attempt to load, the resource. In some implementations, the actual work of loading the resource might be initiated on another thread, running asynchronously to the resource loading delegate; whether the work begins immediately or merely soon is an implementation detail of the client application.

You can load the resource synchronously or asynchronously. In both cases, you must indicate success or failure of the operation by calling the finishLoadingWithResponse or finishLoadingWithError: method of the request object when you finish. If you load the resource asynchronously, you must also store a strong reference to the object in the loadingRequest parameter before returning from this method.

If you return false from this method, the resource loader treats the loading of the resource as having failed. Available in OS X v10.9 and later.

### 16.53.503 SampleBufferDisplayLayerMediaDataWhenReady(tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Event called by AVSampleBufferDisplayLayerMBS.requestMediaDataWhenReady when media data is ready.
**Notes:** Tag is the value you passed when calling the original method.

### 16.53.504 videoCompositionShouldContinueValidatingAfterFindingEmptyTimeRange(videoComposition as AVVideoCompositionMBS, timeRange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Reports a time range that has no corresponding video composition instruction.
**Notes:** videoComposition: The video composition being validated.
timeRange: The time range that has no corresponding video composition instruction.

Return true if the video composition should continue validation in order to report additional problems that may exist, otherwise false.

### 16.53.505 videoCompositionShouldContinueValidatingAfterFindingInvalidTimeRangeInInstruction(videoComposition as AVVideoCompositionMBS, Instruction as AVVideoCompositionInstructionMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Reports a video composition instruction with a time range that is invalid, that overlaps with the time range of a prior instruction, or that contains times earlier than the time range of a prior instruction.
**Notes:** videoComposition: The video composition being validated.
videoCompositionInstruction: The video composition instruction.
Return true if the video composition should continue validation in order to report additional problems that may exist, otherwise false.

### 16.53.506 videoCompositionShouldContinueValidatingAfterFindingInvalidTrackIDInInstruction(videoComposition as AVVideoCompositionMBS, videoCompositionInstruction as AVVideoCompositionInstructionMBS, layerInstruction as AVVideoCompositionLayerInstructionMBS, asset as AVAssetMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Reports a video composition layer instruction with a track ID that does not correspond either to the track ID used for the composition's animation tool or to a track of the asset specified in isValidForAsset.
**Notes:** videoComposition: The video composition being validated.
videoCompositionInstruction: The video composition instruction.
layerInstruction: The layer instruction.
asset: The underlying asset.

Return true if the video composition should continue validation in order to report additional problems that

may exist, otherwise false.

### 16.53.507 videoCompositionShouldContinueValidatingAfterFindingInvalidValueForKey(videoComposition as AVVideoCompositionMBS, key as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Reports that a key that has an invalid value.
**Notes:** videoComposition: The video composition being validated.
key: The key being validated.

Return true if the video composition should continue validation in order to report additional problems that may exist, otherwise false.

### 16.53.508 WriteCGImageToFileCompleted(file as folderitem, type as string, image as Variant, options as dictionary, success as boolean, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The call to WriteCGImageToFile method finished.
**Notes:** Image is a CGImageMBS.
Success property tells you whether or not the write was successful.

Tag is the value you passed when calling the original method.

### 16.53.509 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAudioFormat60958AC3 | ”cac3” | One of the audio formats.<br>A key that specifies an AC-3 codec that provides data package<br>over an IEC 60958 compliant digital audio interface. Uses the st<br>flags in ”AudioStreamBasicDescription Flags”. |
| kAudioFormatAC3 | ”ac-3” | One of the audio formats.<br>A key that specifies an AC-3 codec. Uses no flags. |
| kAudioFormatAES3 | ”aes3” | One of the audio formats.<br>The format defined by the AES3-2003 standard. Adopted i<br>MPEG-2 containers and SDTI transport streams with SMPT<br>2002 and 331M-2000. Uses no flags. |
| kAudioFormatALaw | ”alaw” | One of the audio formats.<br>aLaw 2:1. Uses no flags. |
| kAudioFormatAMR | ”samr” | One of the audio formats.<br>The AMR (Adaptive Multi-Rate) narrow band speech codec. |
| kAudioFormatAppleIMA4 | ”ima4” | One of the audio formats.<br>A key that specifies Apple’s implementation of the IMA 4:1 A<br>Uses no flags. |
| kAudioFormatAppleLossless | ”alac” | One of the audio formats.<br>Apple Lossless. Uses no flags. |
| kAudioFormatAudible | ”AUDB” | One of the audio formats.<br>The codec used for Audible, Inc. audio books. Uses no flags. |
| kAudioFormatDVIIntelIMA | &h6D730011 | One of the audio formats.<br>DVI/Intel IMA ADPCM - ACM code 17. |
| kAudioFormatiLBC | ”ilbc” | One of the audio formats.<br>The iLBC (internet Low Bitrate Codec) narrow band speech c<br>flags. |
| kAudioFormatLinearPCM | ”lpcm” | One of the audio formats.<br>A key that specifies linear PCM, a noncompressed audio data fo<br>frame per packet. Uses the linear PCM format flags in ”AudioS<br>scription Flags”. |
| kAudioFormatMACE3 | ”MAC3” | One of the audio formats.<br>MACE 3:1. Uses no flags. |
| kAudioFormatMACE6 | ”MAC6” | One of the audio formats.<br>MACE 6:1. Uses no flags. |
| kAudioFormatMicrosoftGSM | &h6D730031 | One of the audio formats.<br>Microsoft GSM 6.10 - ACM code 49. |
| kAudioFormatMIDIStream | ”midi” | One of the audio formats.<br>A stream of MIDIPacketList structures where the time stamp<br>Packet structures are sample offsets in the stream. The mSa<br>in the AudioStreamBasicDescription structure is used to descri<br>passed in this kind of stream and an audio unit that receives or<br>stream can use this sample rate together with the number of fr<br>dering and the sample offsets within the MIDIPacketList to defi<br>any MIDI event within this list. Uses no flags. |
| kAudioFormatMPEG4AAC | ”aac ” | One of the audio formats.<br>A key that specifies an MPEG-4 AAC codec. The flags fiel<br>MPEG-4 audio object type constant listed in ”MPEG-4 Audi<br>Constants” indicating the specific kind of data. |
| kAudioFormatMPEG4AAC_ELD | ”aace” | One of the audio formats.<br>MPEG-4 AAC Enhanced Low Delay audio object. Uses no flag |
| kAudioFormatMPEG4AAC_ELD_SBR | ”aacf” | One of the audio formats.<br>MPEG-4 AAC Enhanced Low Delay audio object with SBR<br>replication) extension layer. Uses no flags. |
| kAudioFormatMPEG4AAC_ELD_V2 | ”aacg” | One of the audio formats. |
| kAudioFormatMPEG4AAC_HE | ”aach” | One of the audio formats.<br>MPEG-4 High Efficiency AAC audio object. Uses no flags. |
| kAudioFormatMPEG4AAC_HE_V2 | ”aacp” | One of the audio formats.<br>MPEG-4 High Efficiency AAC Version 2 audio object. Uses no |

Audio Quality Values

| Constant | Value | Description |
|---|---|---|
| AVAudioQualityHigh | &h60 | High quality sample rate conversion. |
| AVAudioQualityLow | &h20 | Low quality rate conversion. |
| AVAudioQualityMax | &h7F | Maximum quality sample rate conversion. |
| AVAudioQualityMedium | &h40 | Medium quality sample rate conversion. |
| AVAudioQualityMin | 0 | The minimum quality for sample rate conversion. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| AVErrorApplicationIsNotAuthorized | -11836 | The application is not authorized to play media. |
| AVErrorApplicationIsNotAuthorizedToUseDevice | -11852 | The user has denied this application permission fo<br>Available in OS X v10.9 and later. |
| AVErrorCompositionTrackSegmentsNotContiguous | -11824 | The source media can't be added because it conta |
| AVErrorContentIsNotAuthorized | -11835 | The user is not authorized to play the media. |
| AVErrorContentIsProtected | -11831 | The application is not authorized to open the med |
| AVErrorDecodeFailed | -11821 | The operation could not be completed because so<br>be decoded. |
| AVErrorDecoderNotFound | -11833 | The decoder for the given media was not found<br>The error's userInfo may contain values for the k<br>and AVErrorMediaSubTypeKey, if they are availa |
| AVErrorDecoderTemporarilyUnavailable | -11839 | The appropriate decoder is currently not available<br>The error's userInfo may contain AVErrorMediaT<br>SubTypeKey, if they are available. |
| AVErrorDeviceAlreadyUsedByAnotherSession | -11804 | Media could not be captured from the device beca<br>where in this application. |
| AVErrorDeviceInUseByAnotherApplication | -11815 | The device could not be opened because it is in u |
| AVErrorDeviceLockedForConfigurationByAnotherProcess | -11817 | Settings for the device could not be changed beca<br>trolled by another application. |
| AVErrorDeviceNotConnected | -11814 | The device could not be opened because it is not |
| AVErrorDeviceWasDisconnected | -11808 | Recording stopped because the device was turned |
| AVErrorDiskFull | -11807 | Recording stopped because the disk is getting full |
| AVErrorDisplayWasDisabled | -11845 | Screen capture failed because the display was inac |
| AVErrorEncoderNotFound | -11834 | The requested encoder was not found.<br>The error's userInfo may contain values for the k<br>and AVErrorMediaSubTypeKey, if they are availa |
| AVErrorEncoderTemporarilyUnavailable | -11840 | The appropriate encoder is currently not available<br>The error's userInfo may contain AVErrorMediaT<br>SubTypeKey, if they are available. |
| AVErrorExportFailed | -11820 | The export could not be completed. |
| AVErrorFailedToLoadMediaData | -11849 | The media resource does not contain all of the d<br>loaded.<br>Available in OS X v10.9 and later. |
| AVErrorFileAlreadyExists | -11823 | The file could not be created because a file with t<br>in the same location. |
| AVErrorFileFailedToParse | -11829 | The media could not be opened because the file is<br>nized format. |
| AVErrorFileFormatNotRecognized | -11828 | The media could not be opened because it is not |
| AVErrorIncompatibleAsset | -11848 | The media could not be displayed because the i<br>playing the content. This might occur if the devic<br>particular video profile level.<br>Available in OS X v10.9 and later. |
| AVErrorInvalidCompositionTrackSegmentDuration | -11825 | The source media can't be added because its du<br>invalid. |
| AVErrorInvalidCompositionTrackSegmentSourceDuration | -11827 | The source media can't be added because it has n |
| AVErrorInvalidCompositionTrackSegmentSourceStartTime | -11826 | The source media can't be added because its sta<br>invalid. |
| AVErrorInvalidOutputURLPathExtension | -11843 | The path extension of the URL was invalid. |
| AVErrorInvalidSourceMedia | -11822 | The operation could not be completed because so<br>be read. |
| AVErrorInvalidVideoComposition | -11841 | You attempted to perform an operation with the |
| AVErrorMaximumDurationReached | -11810 | Recording stopped because the maximum duratio |
| AVErrorMaximumFileSizeReached | -11811 | Recording stopped because the maximum size for |
| AVErrorMaximumNumberOfSamplesForFileFormatReached | -11813 | Recording stopped because the maximum numbe<br>reached. |
| AVErrorMaximumStillImageCaptureRequestsExceeded | -11830 | The photo could not be taken because there are to<br>haven't completed yet. |
| AVErrorMediaChanged | -11809 | Recording stopped because the format of the sour |

## 16.54 class AVFrameRateRangeMBS

### 16.54.1 class AVFrameRateRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVFrameRateRange object expresses a range of valid frame rates as minimum and maximum rate and minimum and maximum duration.
**Notes:** An AVFrameRateRange object is immutable.
An AVCaptureDeviceFormat object wraps a CMFormatDescription and expresses a range of valid video frame rates as an array of AVFrameRateRange objects.
An AVCaptureDevice object uses AVCaptureDeviceFormat to describe the formats it supports and the currently-active format.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr4

### 16.54.2 Methods

### 16.54.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.54.4 DisplayName as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The display text for this object.
**Notes:** The plugin formats a string with the frame rate range for displaying.

### 16.54.5 maxFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The maximum frame duration supported by the range. (read-only)
**Notes:** This value is the reciprocal of minFrameRate, and expresses the minimum frame rate as a duration.

### 16.54.6 maxFrameRate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The maximum frame rate supported by the range. (read-only)
**Notes:** The frame is given in frames per second.

### 16.54.7 minFrameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The minimum frame duration supported by the range. (read-only)
**Notes:** This value is the reciprocal of maxFrameRate, and expresses the maximum frame rate as a duration.

### 16.54.8 minFrameRate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The minimum frame rate supported by the range. (read-only)
**Notes:** The frame is given in frames per second.

### 16.54.9 Properties

### 16.54.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.55 class AVMediaSelectionGroupMBS

### 16.55.1 class AVMediaSelectionGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMediaSelectionGroup provides a collection of mutually exclusive options for the presentation of media within an asset.

### 16.55.2 Methods

### 16.55.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.55.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.55.5 copy as AVMediaSelectionGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.55.6 mediaSelectionOptionsFromArrayFilteredAndSortedAccordingToPreferredLanguages(mediaSelectionOptions() as AVMediaSelectionOptionMBS) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to whether their locales match any language identifier in the specified array of preferred languages. The returned array is sorted according to the order of preference of the language each matches.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOptions to be filtered and sorted.

preferredLanguages: An array of language identifiers in order of preference, each of which is an IETF BCP 47 (RFC 4646) language identifier. Use NSLocaleMBS.preferredLanguages to obtain the user's list of preferred languages. Plugins passes NSLocaleMBS.preferredLanguages if you don't provide an array of languages.

Returns an instance of NSArray containing media selection options of the specified NSArray that match a preferred language, sorted according to the order of preference of the language each matches.
See also:

- 16.55.7 mediaSelectionOptionsFromArrayFilteredAndSortedAccordingToPreferredLanguages(mediaSelectionOptions() as AVMediaSelectionOptionMBS, preferredLanguages() as string) as AVMediaSelectionOptionMBS() 3508

### 16.55.7 mediaSelectionOptionsFromArrayFilteredAndSortedAccordingToPreferredLanguages(mediaSelectionOptions() as AVMediaSelectionOptionMBS, preferredLanguages() as string) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to whether their locales match any language identifier in the specified array of preferred languages. The returned array is sorted according to the order of preference of the language each matches.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOptions to be filtered and sorted.
preferredLanguages: An array of language identifiers in order of preference, each of which is an IETF BCP 47 (RFC 4646) language identifier. Use NSLocaleMBS.preferredLanguages to obtain the user's list of preferred languages. Plugins passes NSLocaleMBS.preferredLanguages if you don't provide an array of languages.

Returns an instance of NSArray containing media selection options of the specified NSArray that match a preferred language, sorted according to the order of preference of the language each matches.
See also:

- 16.55.6 mediaSelectionOptionsFromArrayFilteredAndSortedAccordingToPreferredLanguages(mediaSelectionOptions() as AVMediaSelectionOptionMBS) as AVMediaSelectionOptionMBS() 3507

### 16.55.8 mediaSelectionOptionsFromArrayWithLocale(mediaSelectionOptions() as AVMediaSelectionOptionMBS, locale as NSLocaleMBS) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to locale.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOption to be filtered by locale.
locale: The NSLocale that must be matched for a media selection option to be copied to the output array.
Returns an instance of Array containing the media selection options of the specified Array that match the specified locale.

### 16.55.9 mediaSelectionOptionsFromArrayWithMediaCharacteristics(mediaSelectionOptions() as AVMediaSelectionOptionMBS, mediaCharacteristics() as string) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to one or more media characteristics.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOptions to be filtered by media characteristic.
mediaCharacteristics: The media characteristics that must be matched for a media selection option to be copied to the output array.

Returns an instance of NSArray containing the media selection options of the specified NSArray that match the specified media characteristics.

### 16.55.10 mediaSelectionOptionsFromArrayWithoutMediaCharacteristics(mediaSelectionOptions() as AVMediaSelectionOptionMBS, mediaCharacteristics() as string) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to whether they lack one or more media characteristics.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOptions to be filtered by media characteristic.
mediaCharacteristics: The media characteristics that must not be present for a media selection option to be copied to the output array.
Returns an instance of NSArray containing the media selection options of the specified NSArray that lack the specified media characteristics.

### 16.55.11 mediaSelectionOptionWithPropertyList(plist as Variant) as AVMediaSelectionOptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the instance of AVMediaSelectionOption with properties that match the specified property list.
**Notes:** plist: A property list previously obtained from an option in the group via AVMediaSelectionOption.propertyList.
If the specified properties match those of an option in the group, an instance of AVMediaSelectionOption. Otherwise nil.

### 16.55.12 options as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A collection of mutually exclusive media selection options.

### 16.55.13 playableMediaSelectionOptionsFromArray(mediaSelectionOptions() as AVMediaSelectionOptionMBS) as AVMediaSelectionOptionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Filters an array of AVMediaSelectionOptions according to whether they are playable.
**Notes:** mediaSelectionOptions: An array of AVMediaSelectionOption to be filtered according to whether they are playable.

Returns an instance of NSArray containing the media selection options of the specified NSArray that are playable.

### 16.55.14 Properties

### 16.55.15 allowsEmptySelection as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether it's possible to present none of the options in the group when an associated AVPlayerItem is played.
**Notes:** If allowsEmptySelection is true, all of the available media options in the group can be deselected by passing nil as the specified AVMediaSelectionOption to AVPlayerItem.selectMediaOption.
(Read only property)

### 16.55.16 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.56 class AVMediaSelectionOptionMBS

### 16.56.1 class AVMediaSelectionOptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMediaSelectionOption represents a specific option for the presentation of media within a group of options.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.56.2 Methods

### 16.56.3 associatedMediaSelectionOptionInMediaSelectionGroup(mediaSelectionGroup as AVMediaSelectionGroupMBS) as AVMediaSelectionOptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** If a media selection option in another group is associated with the specified option, returns a reference to the associated option.
**Notes:** mediaSelectionGroup: A media selection group in which an associated option is to be sought.

Returns an instance of AVMediaSelectionOption.

Audible media selection options often have associated legible media selection options; in particular, audible options are typically associated with forced-only subtitle options with the same locale. See AVMediaCharacteristicContainsOnlyForcedSubtitles in AVMediaFormat.h for a discussion of forced-only subtitles.

### 16.56.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.56.5 availableMetadataFormats as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Provides an NSArray of NSStrings, each representing a metadata format that contains metadata associated with the option (e.g. ID3, iTunes metadata, etc.).

### 16.56.6 commonMetadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Provides an array of AVMetadataItems for each common metadata key for which a value is available.

### 16.56.7 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private construtor.

### 16.56.8 copy as AVMediaSelectionOptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.56.9 displayNameWithLocale(locale as NSLocaleMBS) as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Provides an string suitable for display.
**Notes:** Available on Mac OS X 10.9 or newer.
Localize manufactured portions of the string using the specificed locale.
May use this option's common metadata, media characteristics and locale properties in addition to the provided locale to formulate an NSString intended for display.

### 16.56.10 hasMediaCharacteristic(mediaCharacteristic as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Reports whether the media selection option includes media with the specified media characteristic.
**Notes:** The media characteristic of interest, e.g. AVMediaCharacteristicVisual, AVMediaCharacteristicAudible, AVMediaCharacteristicLegible, etc.

Returns ture if the media selection option includes media with the specified characteristic, otherwise false.

### 16.56.11 mediaSubTypes as Integer()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The mediaSubTypes of the media data associated with the option.
**Notes:** An Array of numbers carrying four character codes as defined in CoreAudioTypes.h for audio media and in CMFormatDescription.h for video media. Also see CMFormatDescriptionGetMediaSubType in CMFormatDescription.h for more information about media subtypes.

Note that if no information is available about the encoding of the media presented when a media option is selected, the value of mediaSubTypes will be an empty array. This can occur, for example, with streaming media. In these cases the value of mediaSubTypes should simply not be used as a criteria for selection.

### 16.56.12 metadataForFormat(Format as string) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Provides an Array of AVMetadataItems, one for each metadata item in the container of the specified format.
**Notes:** format: The metadata format for which items are requested.
An Array containing AVMetadataItems; may be nil if there is no metadata of the specified format.

### 16.56.13 propertyList as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a serializable property list that can be used to obtain an instance of AVMediaSelectionOption representing the same option as the receiver via AVMediaSelectionGroup.mediaSelectionOptionWithPropertyList.
**Notes:** Returns a serializable property list that's sufficient to identify the option within its group. For serialization utilities, see NSPropertyList.h.

### 16.56.14 Properties

### 16.56.15 displayName as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Provides an String suitable for display using the current system locale.
**Notes:** Available on Mac OS X 10.9 or newer.
May use this option's common metadata, media characteristics and locale properties in addition to the current system locale to formulate an string intended for display. Equivalent to displayNameWithLocale(NSLocaleMBS.currentLocale).
(Read only property)

### 16.56.16 extendedLanguageTag as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates the RFC 4646 language tag associated with the option. May be nil.
**Notes:** Available on Mac OS X 10.9 or newer.
(Read only property)

### 16.56.17 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.56.18 isPlayable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether a media selection option is playable.
**Notes:** If the media data associated with the option cannot be decoded or otherwise rendered, playable is false.
(Read only property)

### 16.56.19 locale as NSLocaleMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the locale for which the media option was authored.
**Notes:** (Read only property)

### 16.56.20 mediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The media type of the media data, e.g. AVMediaTypeAudio, AVMediaTypeSubtitle, etc.
**Notes:** (Read only property)

## 16.57 class AVMetadataItemFilterMBS

### 16.57.1 class AVMetadataItemFilterMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** AVMetadataItemFilter is a tool used to filter AVMetadataItems.
**Notes:** Instances of AVMetadataItemFilter are used to filter AVMetadataItems. They are opaque, unmodifiable objects, created via AVMetadataItemFilter class methods.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr1

### 16.57.2 Methods

### 16.57.3 Add(keySpace as String, Key as String)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new key to the whitelist.
**Example:**

```
dim e as AVAssetExportSessionMBS // your export session

// make new filter
dim n as new AVMetadataItemFilterMBS

// add new keys
n.Add(AVFoundationMBS.AVMetadataKeySpaceCommon, AVFoundationMBS.AVMetadataCommonKeyAuthor)
n.Add(AVFoundationMBS.AVMetadataKeySpaceCommon, AVFoundationMBS.AVMetadataCommonKeyTitle)
n.Add(AVFoundationMBS.AVMetadataKeySpaceCommon, AVFoundationMBS.AVMetadataCommonKeySubject)

// now use the filter
e.metadataItemFilter = n
```

### 16.57.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 and newer.

### 16.57.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor for a new empty filter.

### 16.57.6 metadataItemFilterForSharing as AVMetadataItemFilterMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Provides an instance of an AVMetadataItemFilter useful for sharing assets.
**Notes:** Removes many user-identifying metadata items, such as location information, leaving only playback-, copyright- and commercial-related metadata (such as the purchaser's Apple ID), along with metadata either derivable from the media itself or necessary for its proper behavior.

### 16.57.7 Properties

### 16.57.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.57.9 whitelist as Dictionary

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries white list for this filter.
**Notes:** This is dictionary. Keys are key spaces and values are arrays of keys.
(Read only property)

## 16.58 class AVMetadataItemMBS

### 16.58.1 class AVMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVMetadataItem object represents an item of metadata associated with an audiovisual asset or with one of its tracks.
**Example:**

```
// load file and look for cover art

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.m4a")
Dim a As AVURLAssetMBS = AVURLAssetMBS.URLAssetWithFile(file)

Dim iTunesMetadataKeyCoverArtString As String = AVFoundationMBS.AVMetadataiTunesMetadataKeyCoverArt
Dim iTunesMetadataKeyCoverArtNumber As Integer = OSTypeFromStringMBS(iTunesMetadataKeyCoverArtString)

Dim items() As AVMetadataItemMBS = a.metadata

For Each item As AVMetadataItemMBS In items

Dim key As Variant = item.key
Dim Val As Variant = item.value

If key.IntegerValue = iTunesMetadataKeyCoverArtNumber Or key.StringValue = iTunesMetadataKeyCoverArtString Then

Dim v As MemoryBlock = Val
window1.Backdrop = picture.FromData(v)
End If

Next
```

**Notes:** To create metadata items for your own assets, you use the mutable subclass, AVMutableMetadataItem.

Metadata items have keys that accord with the specification of the container format from which they're drawn. Full details of the metadata formats, metadata keys, and metadata key spaces supported by AV Foundation are available among the defines in AVMetadataFormat.h.

You can load values of a metadata item "lazily" using the methods from the AVAsynchronousKeyValueLoading protocol (see "Asynchronous Loading"). The AVAsset class and other classes in turn provide

their metadata lazily so that you can obtain objects from those arrays without incurring overhead for items you don't ultimately inspect.

You can filter arrays of metadata items using the methods of this class. For example, you can filter by key and key space, by locale, and by preferred language.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr1
- MBS Xojo / Real Studio Plugins, version 14.0pr6

**Xojo Developer Magazine**

- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.58.2 Methods

### 16.58.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.58.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.58.5 copy as AVMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.58.6 loadValuesAsynchronouslyForKeys(keys() as string, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the asset to load the values of any of the specified keys that are not already loaded.
**Notes:** keys: An array containing the required keys.

Calls AVFoundationMBS.MetadataItemLoadValuesAsynchronouslyForKeysFinished on completion.
The completion event will be invoked exactly once per invocation of this method:

- Synchronously if an I/O error or other format-related error occurs immediately.
- Asynchronously at a subsequent time if a loading error occurs at a later stage of processing, or if cancelLoading is invoked on an AVAsset instance.

The completion states of the keys you specify in keys are not necessarily the same—some may be loaded, and others may have failed. You must check the status of each key individually.

If you want to receive error reporting for loading that's still pending, you can call this method at any time—even after an asset has begun to load data for operations in progress or already completed. If a fatal error has already occurred, the completion event is invoked synchronously.

### 16.58.7 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, key as Variant, keySpace as string) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns from a given array an array of metadata items that match a specified key or key space.
**Notes:** array: The array of AVMetadataItem objects to be filtered.
key: The key that must be matched for a metadata item to be included in the output array. The key is compared to the keys in the metadata in the array using isEqual. If you do not want to filter by key, pass nil.
keySpace: The key space that must be matched for a metadata item to be included in the output array. The key space is compared to the key spaces in the metadata in the array using isEqualToString:. If you do not want to filter by key space, pass nil.

Returns an array of the metadata items from array that match key or keySpace.

If the value in the keySpace parameter is AVMetadataKeySpaceCommon, the value of the metadata item's commonKey property must match the value in the key parameter for the item to be returned. If the key parameter is nil, then all metadata items in the common key space are returned.

If the value in the keySpace parameter is nil or is not the constant for the common key space, the value of the metadata item's key property must match the value in the key parameter for the item to be returned. If the key parameter itself is nil, then all metadata items in the specified key space are returned.
See also:

- 16.58.8 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, locale as NSLocaleMBS) as AVMetadataItemMBS() 3521
- 16.58.9 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, metadataItemFilter as AVMetadataItemFilterMBS) as AVMetadataItemMBS() 3521
- 16.58.10 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, preferredLanguages() as string) as AVMetadataItemMBS() 3522


### 16.58.8 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, locale as NSLocaleMBS) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns from a given array an array of metadata items that match a specified locale.
**Notes:** array: The array of AVMetadataItem objects to be filtered.
locale: The locale that must be matched for a metadata item to be included in the output array.

Returns an array containing the AVMetadataItem objects from the array parameter that match the specified locale.
See also:


- 16.58.7 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, key as Variant, keySpace as string) as AVMetadataItemMBS() 3520
- 16.58.9 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, metadataItemFilter as AVMetadataItemFilterMBS) as AVMetadataItemMBS() 3521
- 16.58.10 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, preferredLanguages() as string) as AVMetadataItemMBS() 3522


### 16.58.9 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, metadataItemFilter as AVMetadataItemFilterMBS) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Filters an array of metadata items using the metadata item filter.
**Notes:** metadataItems: An array of AVMetadataItems to be filtered.
metadataItemFilter: The AVMetadataItemFilter object for filtering the metadataItems.

Returns an instance of NSArray containing the metadata items in metadataItems that have not been removed by metadataItemFilter.
Available in OS X v10.9 and later.
See also:


- 16.58.7 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, key as Variant, keySpace as string) as AVMetadataItemMBS() 3520

- 16.58.8 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, locale as NSLocaleMBS) as AVMetadataItemMBS() 3521
- 16.58.10 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, preferredLanguages() as string) as AVMetadataItemMBS() 3522


### 16.58.10 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, preferredLanguages() as string) as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the subset of metadata items whose locales match one of the specified language identifiers.
**Notes:** metadataItems: An array of AVMetadataItem objects to be filtered and sorted.
preferredLanguages: An array of strings, each of which contains a canonicalized IETF BCP 47 language identifier. The order of the identifiers in the array reflects the preferred language order, with the most preferred language being first in the array. Typically, you pass the user's preferred languages by retrieving this array from the preferredLanguages class method of NSLocale.

Returns an array containing the AVMetadataItem objects from the metadataItems parameter that match one of the specified languages.
See also:


- 16.58.7 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, key as Variant, keySpace as string) as AVMetadataItemMBS() 3520
- 16.58.8 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, locale as NSLocaleMBS) as AVMetadataItemMBS() 3521
- 16.58.9 metadataItemsFromArray(metadataItems() as AVMetadataItemMBS, metadataItemFilter as AVMetadataItemFilterMBS) as AVMetadataItemMBS() 3521


### 16.58.11 mutableCopy as AVMutableMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy.

### 16.58.12 statusOfValueForKey(key as string, byref error as NSErrorMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Reports whether the value for a given key is immediately available without blocking. (required)
**Notes:** key: The key whose status you want.

error: If the status of the value for the key is AVKeyValueStatusFailed, upon return contains an NSError object that describes the failure that occurred.

Returns the current loading status of the value for key. For possible values, see "Protocol Methods."

You use this method to determine the availability of the value for a key. This method does not cause an asset to load the value of a key that's not yet available. To request values for keys that may not already be loaded without blocking, use loadValuesAsynchronouslyForKeys and wait for invocation of the completion handler to be informed of availability.

### 16.58.13 Properties

### 16.58.14 commonKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The common key of the metadata item. (read-only)
**Notes:** This property contains the key that most closely corresponds to the key in the key property but that belongs to the common key space (AVMetadataKeySpaceCommon) as opposed to a format-specific key space. You can use this key to locate metadata items irrespective of the underlying media format.

If the value of the keySpace property is AVMetadataKeySpaceCommon, this property contains the same key as the key property.
(Read only property)

### 16.58.15 dataValue as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Provides the raw bytes of the value of the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.16 dateTimeValue as DateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Provides the raw bytes of the value of the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.17 dateValue as date

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value of the metadata item formatted as a date. (read-only)
**Notes:** The value of this property is nil if the metadata value cannot be represented as a date.
(Read only property)

### 16.58.18 duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The duration of the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.19 extraAttributes as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The additional attributes supplied by the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.20 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.58.21 key as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key of the metadata item. (read-only)
**Notes:** The key property contains the true key used to identify the contents of the metadata item. This value is specific to the key space of the metadata item.
(Read only property)

### 16.58.22 keySpace as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The key space of metadata item's key. (read-only)
**Notes:** The key space specified by this property is typically the default key space for the metadata container in which the metadata item is stored.

AV Foundation uses key spaces to group related sets of keys. For example, the framework defines different key spaces for common keys, iTunes keys, ID3 keys, and QuickTime keys. Key spaces aid in filtering arrays of metadata items.
(Read only property)

### 16.58.23 locale as NSLocaleMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The locale of the metadata item. (read-only)
**Notes:** The locale may be nil if no locale information is available for the metadata item.
(Read only property)

### 16.58.24 numberValue as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The value of the metadata item formatted as a number. (read-only)
**Notes:** The value of this property is nil if the metadata value cannot be represented as a number.
(Read only property)

### 16.58.25 stringValue as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The value of the metadata item formatted as a string. (read-only)
**Notes:** The value of this property is nil if the metadata value cannot be represented as a string.
(Read only property)

### 16.58.26 time as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The timestamp of the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.27 value as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The value of the metadata item. (read-only)
**Notes:** (Read only property)

### 16.58.28 Constants

Load Status Constants

| Constant | Value | Description |
|---|---|---|
| AVKeyValueStatusCancelled | 4 | Indicates that the attempt to load the property was cancelled. |
| AVKeyValueStatusFailed | 3 | Indicates that the attempt to load the property failed. |
| AVKeyValueStatusLoaded | 2 | Indicates that the property is ready for use. |
| AVKeyValueStatusLoading | 1 | Indicates that the property is not fully loaded. |
| AVKeyValueStatusUnknown | 0 | Indicates that the property status is unknown. |

## 16.59 class AVMetadataObjectMBS

### 16.59.1 class AVMetadataObjectMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The class for a metadata object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2

### 16.59.2 Methods

### 16.59.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 16.59.4 AVMetadataObjectTypeAztecCode as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Aztec codes

### 16.59.5 AVMetadataObjectTypeCatBody as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** The type identifier for a metadata object representing a cat body in a picture.

### 16.59.6 AVMetadataObjectTypeCode128Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Code 128

### 16.59.7 AVMetadataObjectTypeCode39Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Code 39

### 16.59.8 AVMetadataObjectTypeCode39Mod43Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Code 39 mod 43

### 16.59.9 AVMetadataObjectTypeCode93Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Code 93

### 16.59.10 AVMetadataObjectTypeDataMatrixCode as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from DataMatrix

### 16.59.11 AVMetadataObjectTypeDogBody as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** The type identifier for a metadata object representing a dog body in a picture.

### 16.59.12 AVMetadataObjectTypeEAN13Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from EAN-13 (including UPC-A) codes

### 16.59.13 AVMetadataObjectTypeEAN8Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from EAN-8 codes

### 16.59.14 AVMetadataObjectTypeFace as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataFaceObject instances representing the features of a detected face

### 16.59.15 AVMetadataObjectTypeHumanBody as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** The type identifier for a metadata object representing a human body in a picture.

### 16.59.16 AVMetadataObjectTypeInterleaved2of5Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from Interleaved 2 of 5 codes

### 16.59.17 AVMetadataObjectTypeITF14Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from ITF14 codes

### 16.59.18 AVMetadataObjectTypePDF417Code as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from PDF417 codes

### 16.59.19 AVMetadataObjectTypeQRCode as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from QR codes

### 16.59.20 AVMetadataObjectTypeSalientObject as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** The type identifier for a metadata object representing a single salient area in a picture.

### 16.59.21 AVMetadataObjectTypeUPCECode as string

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the types of metadata.
**Notes:** AVMetadataMachineReadableCodeObject instances generated from UPC-E codes

### 16.59.22 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.59.23 corners as Dictionary()

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The points defining the (x, y) locations of the corners.
**Notes:** The value of this property is an array of Dictionary objects, each of which has been created from

a CGPoint struct using the CGPointCreateDictionaryRepresentation function, representing the coordinates of the corners of the object with respect to the image in which it resides.
If the metadata originates from video, the points may be expressed as scalar values from 0 to 1.
The points in the corners differ from the bounds rectangle in that bounds is axis aligned to orientation of the captured image, and the values of the corners reside within the bounds rectangle.
The points are arranged in counterclockwise order (clockwise if the code or image is mirrored), starting with the top left of the code in its canonical orientation.

For barcodes.

### 16.59.24 Properties

### 16.59.25 barcodeDescriptor as Variant

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** A barcode description for use in Core Image.
**Notes:** (Read only property)

### 16.59.26 bodyID as Integer

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** An integer value that defines the unique identifier of an object in a picture.
**Notes:** For bodys including human, dog or cat.
(Read only property)

### 16.59.27 Bounds as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The bounding rectangle associated with the metadata.
**Notes:** The bounding rectangle is specified relative to the picture or video of the corresponding media. The rectangle,Äôs origin is always specified in the top-left corner, and the x and y axis extend down and to the right.
If the metadata has no bounding rectangle, the value of this property should be CGRectZero.
For video content, the bounding rectangle may be expressed using scalar values in the range 0.0 to 1.0. Scalar values remain meaningful even when the original video has been scaled down.

Available on macOS 10.10 or later.
(Read only property)

### 16.59.28 Duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The duration of the media associated with this metadata object.
**Notes:** For metadata originating from a sample buffer (CMSampleBuffer), the duration reflects the duration of the sample buffer. If there is no valid duration value associated with the metadata, this property should contain invalid.

Available on macOS 10.10 or later.
(Read only property)

### 16.59.29 faceID as Integer

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The unique ID for this face metadata object.
**Notes:** Each time a face enters the picture, it is assigned a new unique identifier, which you can use to reference the face in your code. Face IDs are not reused, and the same face leaving and entering the picture again is assigned a new identifier.

For face objects only.
(Read only property)

### 16.59.30 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.59.31 hasRollAngle as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether there is a valid roll angle associated with the face.
**Notes:** If the value of this property is false, the value in the rollAngle property is invalid and must not be accessed.

For face objects only.
(Read only property)

### 16.59.32 hasYawAngle as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether there is a valid yaw angle associated with the face.
**Notes:** If the value of this property is false, the value in the yawAngle property is invalid and must not be accessed.

For face objects only.
(Read only property)

### 16.59.33 objectID as Integer

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** An integer value that defines the unique identifier of an object in a picture.
**Notes:** When an object enters the picture, it,Äôs assigned a new, unique identifier.

For salient objects only.
(Read only property)

### 16.59.34 rollAngle as Double

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The roll angle of the face specified in degrees.
**Notes:** The roll angle represents the side-to-side tilt of the face relative to the metadata,Äôs bounding rectangle. A value of 0.0 yields a face that is level relative to the picture, whereas a value of 90 yields a face that is perpendicular relative to the picture.

You must check the value of the hasRollAngle property before accessing this property. If the value in the hasRollAngle property is false, reading the value in this property raises an exception.

For face objects only.
(Read only property)

### 16.59.35 stringValue as String

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Returns the error-corrected data decoded into a human-readable string.
**Notes:** For barcodes.

The value of this property is a string created by decoding the binary payload according to the format of the machine-readable code, or "" if a string representation cannot be created.
(Read only property)

### 16.59.36 Time as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The media time value associated with the metadata object.
**Notes:** For captured media, this property represents the time when the metadata was captured. For metadata originating from a sample buffer (CMSampleBuffer), the time is the sample buffer,Äôs presentation time. If there is no valid time value associated with the metadata, this property should contain invalid.

Available on macOS 10.10 or later.
(Read only property)

### 16.59.37 Type as String

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The type of the metadata.
**Notes:** You use this property value to distinguish between different types of metadata. The possible values for this property are defined by subclasses, which can define constants for the type of metadata they represent.
(Read only property)

### 16.59.38 yawAngle as Double

MBS AVFoundation Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** The yaw angle of the face specified in degrees.
**Notes:** The yaw angle represents the rotation of the face around the vertical axis. A value of 0.0 yields a face that is looking directly at the camera, whereas a yaw angle of 90 degrees yields a face whose eye line is perpendicular to that of the camera.

You must check the value of the hasYawAngle property before accessing this property. If the value in the hasYawAngle property is NO, reading the value in this property raises an exception.

For face objects only.
(Read only property)

## 16.60 class AVMutableAudioMixInputParametersMBS

### 16.60.1 class AVMutableAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVMutableAudioMixInputParameters object represents the parameters that should be applied to an audio track when it is added to a mix.
**Notes:** Subclass of the AVAudioMixInputParametersMBS class.

### 16.60.2 Methods

### 16.60.3 audioMixInputParameters as AVMutableAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates and returns a mutable input parameters object with no volume ramps and trackID initialized to kCMPersistentTrackID_Invalid.

### 16.60.4 audioMixInputParametersWithTrack(track as AVAssetTrackMBS) as AVMutableAudioMixInputParametersMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates and returns a mutable input parameters object for a given track.
**Notes:** track: The track to associate with the input parameters object.

Returns a mutable input parameters object with no volume ramps and trackID set to track's ID.

### 16.60.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates and returns a mutable input parameters object with no volume ramps and trackID initialized to kCMPersistentTrackID_Invalid.
See also:


- 16.60.6 Constructor(other as AVAudioMixInputParametersMBS) 3537
- 16.60.7 Constructor(track as AVAssetTrackMBS) 3537

### 16.60.6 Constructor(other as AVAudioMixInputParametersMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:


- 16.60.5 Constructor 3536
- 16.60.7 Constructor(track as AVAssetTrackMBS) 3537


### 16.60.7 Constructor(track as AVAssetTrackMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates and returns a mutable input parameters object for a given track.
**Notes:** track: The track to associate with the input parameters object.
Initializes input parameters object with no volume ramps and trackID set to track's ID.
See also:


- 16.60.5 Constructor 3536
- 16.60.6 Constructor(other as AVAudioMixInputParametersMBS) 3537


### 16.60.8 setVolume(volume as Double, atTime as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the value of the audio volume starting at the specified time.
**Notes:** volume: The volume.
time: The start time at which to set the volume.

This method adds a volume ramp starting at time. This volume setting remains in effect until the end of the track unless you set a different volume level to start at a later time.

### 16.60.9 setVolumeRamp(startVolume as Double, endVolume as Double, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets a volume ramp to apply during a specified time range.
**Notes:** startVolume: The starting volume.
endVolume: The end volume.
timeRange: The time range over which to apply the ramp.

### 16.60.10 Properties

### 16.60.11 trackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The ID of the audio track to which the parameters should be applied.
**Notes:** (Read and Write computed property)

# 16.61 class AVMutableAudioMixMBS

## 16.61.1 class AVMutableAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVMutableAudioMix object manages the input parameters for mixing audio tracks.
**Notes:** It allows custom audio processing to be performed on audio tracks during playback or other operations.
Subclass of the AVAudioMixMBS class.

## 16.61.2 Methods

## 16.61.3 audioMix as AVMutableAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new mutable audio mix.

## 16.61.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.61.5 Constructor(other as AVAudioMixMBS) 3539

## 16.61.5 Constructor(other as AVAudioMixMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.61.4 Constructor 3539

## 16.61.6 setInputParameters(items() as AVAudioMixInputParametersMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the parameters for inputs to the mix.
**Notes:** The array contains instances of AVAudioMixInputParameters. Note that an instance of AVAudioMixInputParameters is not required for each audio track that contributes to the mix; audio for those without associated AVAudioMixInputParameters will be included in the mix, processed according to default behavior.

## 16.62 class AVMutableCompositionMBS

### 16.62.1 class AVMutableCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMutableComposition is a mutable subclass of AVComposition you use when you want to create a new composition from existing assets.
**Notes:** You can add and remove tracks, and you can add, remove, and scale time ranges.
You can make an immutable snapshot of a mutable composition for playback or inspection with the copy method.
Subclass of the AVCompositionMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr5
- Automated video editing with Xojo

### 16.62.2 Methods

### 16.62.3 addMutableTrackWithMediaType(mediaType as string, preferredTrackID as Integer) as AVMutableCompositionTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds an empty track to the receiver.
**Notes:** mediaType: The media type of the new track.
preferredTrackID: The preferred track ID for the new track. If you do not need to specify a preferred track ID, pass kCMPersistentTrackID_Invalid. The preferred track ID will be used for the new track provided that it is not currently in use and has not previously been used. If the preferred track ID you specify is not available, or if you pass in kCMPersistentTrackID_Invalid, a unique track ID is generated.

Returns an instance of AVMutableCompositionTrack representing the new track.
You can get the actual trackID of the new track through its "trackID" key.

### 16.62.4 append(asset as AVAssetMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Appends all the tracks to the receiver.
**Notes:** asset: An asset that contains the tracks to be inserted.
Error: If the insertion was not successful, on return contains an NSError object that describes the problem.

Return true if the insertion was successful, otherwise false.

This method may add new tracks to ensure that all tracks of the asset are represented in the inserted time range.
Existing content at the specified start time is pushed out by the duration of the time range.
Media data for the inserted time range is presented at its natural duration; you can scale it to a different duration using scaleTimeRange.

### 16.62.5 appendTimeRange(timeRange as CMTimeRangeMBS, asset as AVAssetMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Appends all the tracks within a given time range of a specified asset into the receiver.
**Notes:** timeRange: The time range of the asset to be inserted.
asset: An asset that contains the tracks to be inserted.
Error: If the insertion was not successful, on return contains an NSError object that describes the problem.

Return true if the insertion was successful, otherwise false.

This method may add new tracks to ensure that all tracks of the asset are represented in the inserted time range.
Existing content at the specified start time is pushed out by the duration of the time range.
Media data for the inserted time range is presented at its natural duration; you can scale it to a different duration using scaleTimeRange.

### 16.62.6 composition as AVMutableCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new, empty, mutable composition.

### 16.62.7 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.62.8 Constructor(other as AVCompositionMBS) 

### 16.62.8 Constructor(other as AVCompositionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.62.7 Constructor 3542

### 16.62.9 insert(asset as AVAssetMBS, startTime as CMTimeMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Inserts all the tracks of a specified asset into the receiver.
**Notes:** asset: An asset that contains the tracks to be inserted.
startTime: The time at which the inserted tracks should be presented by the receiver.
Error: If the insertion was not successful, on return contains an NSError object that describes the problem.

Return true if the insertion was successful, otherwise false.

This method may add new tracks to ensure that all tracks of the asset are represented in the inserted time range.
Existing content at the specified start time is pushed out by the duration of the time range.
Media data for the inserted time range is presented at its natural duration; you can scale it to a different duration using scaleTimeRange.

### 16.62.10 insertEmptyTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds or extends an empty timeRange within all tracks of the composition.
**Notes:** timeRange: The empty time range to insert.

If you insert an empty time range into the composition, any media that was presented during that interval prior to the insertion will be presented instead immediately afterward. You can use this method to reserve an interval in which you want a subsequently created track to present its media.

### 16.62.11 insertTimeRange(timeRange as CMTimeRangeMBS, asset as AVAssetMBS, startTime as CMTimeMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Inserts all the tracks within a given time range of a specified asset into the receiver.
**Notes:** timeRange: The time range of the asset to be inserted.
asset: An asset that contains the tracks to be inserted.
startTime: The time at which the inserted tracks should be presented by the receiver.
Error: If the insertion was not successful, on return contains an NSError object that describes the problem.

Return true if the insertion was successful, otherwise false.

This method may add new tracks to ensure that all tracks of the asset are represented in the inserted time range.
Existing content at the specified start time is pushed out by the duration of the time range.
Media data for the inserted time range is presented at its natural duration; you can scale it to a different duration using scaleTimeRange.

### 16.62.12 MutableCompositionTracks as AVMutableCompositionTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVMutableCompositionTrack objects contained by the composition. (read-only)

### 16.62.13 mutableTrackCompatibleWithTrack(track as AVAssetTrackMBS) as AVMutableCompositionTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a track in the receiver into which any time range of a given asset track can be inserted.
**Notes:** track: An AVAssetTrack from which a time range may be inserted.

Returns a mutable track in the receiver into which any time range of track can be inserted. If no such track is available, the returns nil.

For best performance, you should keep the number of tracks of a composition should be kept to a minimum, corresponding to the number for which media data must be presented in parallel. If you want to present media data of the same type serially, even from multiple assets, you should use a single track of that media type. You use this method to identify a suitable existing target track for an insertion.

If there is no compatible track available, you can create a new track of the same media type as track using addMutableTrackWithMediaType.

This method is similar to compatibleTrackForCompositionTrack (AVAsset).

### 16.62.14 removeTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a specified timeRange from all tracks of the composition.
**Notes:** timeRange: The time range to be removed.

After removing, existing content after the time range will be pulled in.
Removal of a time range does not cause any existing tracks to be removed from the composition, even if removing timeRange results in an empty track. Instead, it removes or truncates track segments that intersect with the time range.

### 16.62.15 removeTrack(track as AVCompositionTrackMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a specified track from the receiver.
**Notes:** track: The track to remove.

When it is removed track's @"composition" key is set to nil. The values of its other keys remain intact, for arbitrary use.

### 16.62.16 scaleTimeRange(timeRange as CMTimeRangeMBS, duration as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Changes the duration of all tracks in a given time range.
**Notes:** timeRange: The time range of the composition to be scaled.
duration: The new duration of timeRange.

Each track segment affected by the scaling operation will be presented at a rate equal to source.duration / target.duration of its resulting time mapping.

### 16.62.17 Properties

### 16.62.18 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The encoded or authored size of the visual portion of the asset.
**Notes:** If this value is not set, the default behavior is as defined by AVAsset; set the value to CGSizeZero to revert to the default behavior.
Available in OS X v10.7 and later.
Deprecated in OS X v10.8.
(Read and Write computed property)

# 16.63 class AVMutableCompositionTrackMBS

## 16.63.1 class AVMutableCompositionTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMutableCompositionTrack is a mutable subclass of AVCompositionTrack that lets you for insert, remove, and scale track segments without affecting their low-level representation (that is, the operations you perform are non-destructive on the original).
**Notes:** AVCompositionTrack defines constraints for the temporal alignment of the track segments. If you set the array of track segments in a mutable composition (see trackSegments), you can test whether the segments meet the constraints using validateTrackSegments.
Subclass of the AVCompositionTrackMBS class.

## 16.63.2 Methods

## 16.63.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 16.63.4 Constructor(other as AVCompositionTrackMBS) 3547

## 16.63.4 Constructor(other as AVCompositionTrackMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.63.3 Constructor 3547

## 16.63.5 insertEmptyTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds or extends an empty time range within the receiver.
**Notes:** timeRange: The empty time range to be inserted.

If you insert an empty time range into the track, any media that was presented during that interval prior to the insertion will be presented instead immediately afterward.

The nature of the data inserted depends upon the media type of the track. For example, an empty time range in a sound track presents silence.

### 16.63.6 insertTimeRange(timeRange as CMTimeRangeMBS, AssetTrack as AVAssetTrackMBS, startTime as CMTimeMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Inserts a time range of a source track.
**Notes:** timeRange: The time range of the track to be inserted.
track: The source track to be inserted.
startTime: The time at which track is to be presented by the composition track.
error: If track is not inserted successfully, contains an NSError object that describes the problem.

Returns true if track was inserted successfully, otherwise false.

By default, the inserted track's time range is presented at its natural duration and rate. You can scale it to a different duration (so that it is presented at a different rate) using scaleTimeRange:toDuration:.

Insertion might fail if, for example, the asset that you try to insert is restricted by copy-protection.

### 16.63.7 insertTimeRanges(timeRanges() as CMTimeRangeMBS, tracks() as AVAssetTrackMBS, startTime as CMTimeMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Inserts time ranges of source tracks.
**Notes:** Requires Mac OS X 10.8.

Inserts the timeRanges of multiple source tracks into a track of a composition.
timeRanges: Specifies the timeRanges to be inserted.
tracks: Specifies the source tracks to be inserted. Only AVAssetTracks of AVURLAssets are supported.
startTime: Specifies the time at which the inserted tracks are to be presented by the composition track. You may pass kCMTimeInvalid for startTime to indicate that the timeRanges should be appended to the end of the track.
error: Describes failures that may be reported to the user, e.g. the asset that was selected for insertion in the composition is restricted by copy-protection.
Returns a boolean value indicating the success of the insertion.

This method is equivalent to (but more efficient than) calling insertTimeRange for each timeRange/track pair.
If this method returns an error, none of the time ranges will be inserted into the composition track.
To specify an empty time range, pass NSNull for the track and a time range of starting at kCMTimeInvalid with a duration of the desired empty edit.

### 16.63.8 removeTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a specified time range from the receiver.
**Notes:** timeRange: The time range to be removed.

Removing a time range does not cause the track to be removed from the composition. Instead it removes or truncates track segments that intersect with the time range.

### 16.63.9 scaleTimeRange(timeRange as CMTimeRangeMBS, duration as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Changes the duration of a time range in the receiver.
**Notes:** timeRange: The time range of the track to be scaled.
duration: The new duration of timeRange.

Each track segment affected by the scaling operation will be presented at a rate equal to source.duration / target.duration of its resulting timeMapping.

### 16.63.10 setCompositionTrackSegments(segments() as AVCompositionTrackSegmentMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the composition track's array of track segments.
**Notes:** The timeMapping.target.start of the first track segment must be kCMTimeZero, and the timeMapping.target.start of each subsequent track segment must equal CMTimeRangeGetEnd(<#previousTrackSegment#>.timeMapping.target). You can use validateTrackSegments to ensure that an array of track segments conforms to this rule.

### 16.63.11 validateTrackSegments(trackSegments() as AVCompositionTrackSegmentMBS, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given array of track segments conform to the timing rules for a composition track.
**Notes:** trackSegments: An array of AVCompositionTrackSegment objects.
error: If validation fails, on return contains an NSError object that describes the problem.

Returns true if the track segments in trackSegments conform to the timing rules for a composition track, otherwise false.

You can use this method to ensure that an array of track segments is suitable for setting as the value of the trackSegments property. The timeMapping.target.start of the first track segment must be kCMTimeZero, and the timeMapping.target.start of each subsequent track segment must equal CMTimeRangeGetEnd(<#previousTrackSegment#>.timeMapping.target).

If you want to modify the existing trackSegments array, you can create a mutable copy of it, modify the mutable array, and then validate the mutable array using this method.

### 16.63.12 Properties

### 16.63.13 extendedLanguageTag as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The language tag associated with the track, as an RFC 4646 language tag.
**Notes:** If not set, the value is nil.
(Read and Write computed property)

### 16.63.14 languageCode as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The language associated with the track, as an ISO 639-2/T language code.
**Notes:** If not set, the value is nil.
(Read and Write computed property)

### 16.63.15 naturalTimeScale as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The timescale in which time values for the track can be operated upon without extraneous numerical conversion.
**Notes:** If not set, the value is the natural time scale of the first non-empty edit, or 600 if there are no non-empty edits.

Set the value to 0 to revert to the default behavior.
(Read and Write computed property)

### 16.63.16 preferredTransform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The preferred transformation of the visual media data for display purposes.
**Notes:** If not set, the value is CGAffineTransformIdentity.
(Read and Write computed property)

### 16.63.17 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The preferred volume of the audible media data.
**Notes:** If not set, the value is 1.0.
(Read and Write computed property)

## 16.64 class AVMutableMetadataItemMBS

### 16.64.1 class AVMutableMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMutableMetadataItem is a mutable subclass of AVMetadataItem that lets you build collections of metadata to be written to asset files using AVAssetExportSession.
**Notes:** You can initialize a mutable metadata item from an existing AVMetadataItem object or with a one or more of the basic properties of a metadata item: a key, a key space, a locale, and a value.
Subclass of the AVMetadataItemMBS class.

### 16.64.2 Methods

### 16.64.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim e as AVAssetExportSessionMBS // your export session
dim asset as AVAssetMBS // your asset

// query metadata
dim a() as AVMetadataItemMBS = asset.metadata

// make new
dim m as new AVMutableMetadataItemMBS

// add common key with author
m.keySpace = AVFoundationMBS.AVMetadataKeySpaceCommon
m.key = AVFoundationMBS.AVMetadataCommonKeyAuthor
m.Value = "Hello World"

// append to array and use as metadata:
a.Append m
e.setMetadata a
```

See also:

- 16.64.4 Constructor(other as AVMetadataItemMBS)

### 16.64.4 Constructor(other as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.64.3 Constructor 3552

### 16.64.5 metadataItem as AVMutableMetadataItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new mutable metadata item.

### 16.64.6 Properties

### 16.64.7 duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the metadata item's duration.
**Notes:** (Read and Write computed property)

### 16.64.8 extraAttributes as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Provides a dictionary of the metadata item's additional attributes.
**Notes:** (Read and Write computed property)

### 16.64.9 key as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the metadata item's key.
**Notes:** (Read and Write computed property)

### 16.64.10 keySpace as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the key space of the metadata item's key.
**Notes:** This is typically the default key space for the metadata container in which the metadata item is stored.
(Read and Write computed property)

### 16.64.11 locale as NSLocaleMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the metadata item's locale.
**Notes:** The locale may be nil if no locale information is available for the item.
(Read and Write computed property)

### 16.64.12 time as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the metadata item's timestamp.
**Notes:** (Read and Write computed property)

### 16.64.13 value as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the metadata item's value.
**Notes:** (Read and Write computed property)

# 16.65 class AVMutableTimedMetadataGroupMBS

## 16.65.1 class AVMutableTimedMetadataGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVMutableTimedMetadataGroup object to represent a mutable collection of metadata items.
**Notes:** Subclass of the AVTimedMetadataGroupMBS class.

## 16.65.2 Methods

## 16.65.3 Constructor(items() as AVMetadataItemMBS, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.65.4 Constructor(other as AVTimedMetadataGroupMBS) 3555

## 16.65.4 Constructor(other as AVTimedMetadataGroupMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.65.3 Constructor(items() as AVMetadataItemMBS, timeRange as CMTimeRangeMBS) 3555

## 16.65.5 items as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The metadata items in the group.

## 16.65.6 setItems(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the metadata items in the group.

### 16.65.7 Properties

### 16.65.8 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range of the metadata.
**Notes:** (Read and Write computed property)

# 16.66 class AVMutableVideoCompositionInstructionMBS

## 16.66.1 class AVMutableVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVMutableVideoCompositionInstruction object represents an operation to be performed by a compositor.
**Notes:** An AVVideoComposition object maintains an array of instructions to perform its composition.
Subclass of the AVVideoCompositionInstructionMBS class.
**Blog Entries**

- Automated video editing with Xojo

## 16.66.2 Methods

## 16.66.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.66.4 Constructor(other as AVVideoCompositionInstructionMBS) 3557

## 16.66.4 Constructor(other as AVVideoCompositionInstructionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.66.3 Constructor 3557

## 16.66.5 layerInstructions as AVVideoCompositionLayerInstructionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of instances of AVVideoCompositionLayerInstruction that specify how video frames from source tracks should be layered and composed.
**Notes:** Tracks are layered in the composition according to the top-to-bottom order of the layerInstructions array; the track with trackID of the first instruction in the array will be layered on top, with the track with the trackID of the second instruction immediately underneath, and so on.

If the property value is nil, the output is a fill of the background color.

### 16.66.6 setLayerInstructions(items() as AVVideoCompositionLayerInstructionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets an array of instances of AVVideoCompositionLayerInstruction that specify how video frames from source tracks should be layered and composed.
**Notes:** Tracks are layered in the composition according to the top-to-bottom order of the layerInstructions array; the track with trackID of the first instruction in the array will be layered on top, with the track with the trackID of the second instruction immediately underneath, and so on.

If the property value is nil, the output is a fill of the background color.

### 16.66.7 videoCompositionInstruction as AVMutableVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new mutable video composition instruction.

### 16.66.8 Properties

### 16.66.9 backgroundColor as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The background color of the composition.
**Notes:** Value must be CGColorMBS.
Only solid BGRA colors are supported; patterns and other supported colors are ignored. If the rendered pixel buffer does not have alpha, the alpha value of the background color is ignored.

If the background color is nil, the video compositor uses a default background color of opaque black.
(Read and Write computed property)

### 16.66.10 enablePostProcessing as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether post processing is required for the video composition instruction.
**Notes:** If no post processing is required for the whole duration of the video composition instruction, set this property to false to make the composition process more efficient.

The value is true by default.
(Read and Write computed property)

### 16.66.11 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range during which the instruction is effective.
**Notes:** If the time range is invalid, the video compositor will ignore it.
(Read and Write computed property)

## 16.67 class AVMutableVideoCompositionLayerInstructionMBS

### 16.67.1 class AVMutableVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVMutableVideoCompositionLayerInstruction is a mutable subclass of AVVideoCompositionLayerInstruction that you use to modify the transform and opacity ramps to apply to a given track in an AV composition.
**Notes:** Subclass of the AVVideoCompositionLayerInstructionMBS class.
**Blog Entries**

- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 15.0pr12

### 16.67.2 Methods

### 16.67.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 16.67.4 Constructor(other as AVMutableVideoCompositionLayerInstructionMBS) 3560

### 16.67.4 Constructor(other as AVMutableVideoCompositionLayerInstructionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.67.3 Constructor 3560

### 16.67.5 setCropRectangle(cropRectangle as CGRectMBS, time as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Sets a value of the crop rectangle at a time within the time range of the instruction.
**Notes:** cropRectangle: The crop rectangle to be applied at the specified time.
time: A time value within the timeRange of the composition instruction.

The origin of the crop rectangle is the top-left corner of the buffer clean aperture rectangle. The crop rectangle is defined in square pixel space, that is, without taking the pixel aspect ratio into account. Crop rectangles extending outside of the clean aperture, are cropped to the clean aperture.

Sets a fixed crop rectangle to apply from time until the next time at which a crop rectangle is set; this is the same as setting a flat ramp for that time range.

Before the first specified time for which a crop rectangle is set, the crop rectangle is held constant to CGRectInfinite and after the last time for which a crop rectangle is set, the crop rectangle is held constant at that last value.
Available in OS X v10.9 and later.

### 16.67.6 setCropRectangleRampFromStartCropRectangle(startCropRectangle as CGRectMBS, endCropRectangle as CGRectMBS, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Sets a crop rectangle ramp to apply during the specified time range.
**Notes:** startCropRectangle: The crop rectangle to be applied at the starting time of the timeRange.
endCropRectangle: The crop rectangle to be applied at the end time of the timeRange.
timeRange: The time range over which the value of the opacity is interpolated between startCropRectangle and endCropRectangle.

The origin of the crop rectangle is the top-left corner of the buffer clean aperture rectangle. The crop rectangle is defined in square pixel space, that is, without taking the pixel aspect ratio into account. Crop rectangles extending outside of the clean aperture, are cropped to the clean aperture.

During a crop rectangle ramp, the rectangle is interpolated between the values set at the ramp's start time and end time. When the starting or ending rectangle is empty, interpolations take into account the origin and size of the empty rectangle.

Before the first specified time for which a crop rectangle is set, the crop rectangle is held constant to CGRectInfinite and after the last time for which a crop rectangle is set, the crop rectangle is held constant at that last value.
Available in OS X v10.9 and later.

### 16.67.7 setOpacity(opacity as Double, time as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets a value of the opacity at a time within the time range of the instruction.
**Notes:** opacity: The opacity to be applied at time. The value must be between 0.0 and 1.0.
time: A time value within the time range of the composition instruction.

Sets a fixed opacity to apply from the specified time until the next time at which an opacity is set; this is the same as setting a flat ramp for that time range. Before the first time for which an opacity is set, the opacity is held constant at 1.0; after the last specified time, the opacity is held constant at the last value.
See also:

- 16.67.8 setOpacity(startOpacity as Double, endOpacity as Double, timeRange as CMTimeRangeMBS) 3562

### 16.67.8 setOpacity(startOpacity as Double, endOpacity as Double, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets an opacity ramp to apply during a specified time range.
**Notes:** startOpacity: The opacity to be applied at the start time of timeRange. The value must be between 0.0 and 1.0.
endOpacity: The opacity to be applied at the end time of timeRange. The value must be between 0.0 and 1.0.
timeRange: The time range over which the value of the opacity will be interpolated between startOpacity and endOpacity.

During an opacity ramp, opacity is computed using a linear interpolation. Before the first time for which an opacity is set, the opacity is held constant at 1.0; after the last specified time, the opacity is held constant at the last value.
See also:

- 16.67.7 setOpacity(opacity as Double, time as CMTimeMBS) 3561

### 16.67.9 setTransform(transform as CGAffineTransformMBS, time as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets a value of the transform at a time within the time range of the instruction.
**Notes:** transform: The transform to be applied at time.
time: A time value within the time range of the composition instruction.

Sets a fixed transform to apply from the specified time until the next time at which a transform is set. This is the same as setting a flat ramp for that time range. Before the first specified time for which a transform is set, the affine transform is held constant at the value of CGAffineTransformIdentity; after the last time for which a transform is set, the affine transform is held constant at that last value.

### 16.67.10 setTransformRamp(startTransform as CGAffineTransformMBS, endTransform as CGAffineTransformMBS, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Sets a transform ramp to apply during a given time range.
**Notes:** startTransform: The transform to be applied at the starting time of timeRange.
endTransform: The transform to be applied at the end time of timeRange.
timeRange: The time range over which the value of the transform is interpolated between startTransform and endTransform.

During a transform ramp, the affine transform is interpolated between the values set at the ramp's start time and end time. Before the first specified time for which a transform is set, the affine transform is held constant at the value of CGAffineTransformIdentity; after the last time for which a transform is set, the affine transform is held constant at that last value.

Available in OS X v10.7 and later.

### 16.67.11 videoCompositionLayerInstruction as AVMutableVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new mutable video composition layer instruction.
**Notes:** Returns a new mutable video composition layer instruction with no transform or opacity ramps and trackID initialized to kCMPersistentTrackID_Invalid.

### 16.67.12 videoCompositionLayerInstructionWithAssetTrack(track as AVAssetTrackMBS) as AVMutableVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new mutable video composition layer instruction for the given track.
**Notes:** track: The asset track to which to apply the instruction.

Returns a new mutable video composition layer instruction with no transform or opacity ramps and trackID initialized to the track ID of track.

### 16.67.13 Properties

### 16.67.14 trackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The trackID of the source track to which the compositor will apply the instruction.
**Notes:** (Read and Write computed property)

# 16.68 class AVMutableVideoCompositionMBS

## 16.68.1 class AVMutableVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVMutableVideoComposition object represents a mutable video composition.
**Notes:** Subclass of the AVVideoCompositionMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr1
- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 14.5pr2

## 16.68.2 Methods

## 16.68.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a new mutable video composition.
See also:

- 16.68.4 Constructor(other as AVVideoCompositionMBS) 3565

## 16.68.4 Constructor(other as AVVideoCompositionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The copy constructor to initialize with a mutable copy of the given object.
See also:

- 16.68.3 Constructor 3565

## 16.68.5 mutableVideoComposition as AVMutableVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Returns a new mutable video composition.

### 16.68.6 mutableVideoCompositionWithPropertiesOfAsset(asset as AVAssetMBS) as AVMutableVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Returns a new mutable video composition with the specified asset properties.
**Notes:** asset: An instance of AVAsset. Ensure that the duration and tracks properties of the asset are already loaded before invoking this method.
Returns a newly created and initialized instance of AVMutableVideoComposition.

The returned AVMutableVideoComposition has instructions that respect the spatial properties and time ranges of the specified asset's video tracks.

It also has the following values for its properties:

- A value for frameDuration short enough to accommodate the greatest nominalFrameRate among the asset's video tracks. If the nominalFrameRate of all of the asset's video tracks is 0, a default framerate of 30fps is used.
- If the specified asset is an instance of AVComposition, the renderSize is set to the naturalSize of the AVComposition; otherwise the renderSize will be set to a value that encompasses all of the asset's video tracks.
- A renderScale of 1.0.
- The animationTool property set to nil.

Available in OS X v10.9 and later.

### 16.68.7 setInstructions(items() as AVVideoCompositionInstructionMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the video composition instructions.

### 16.68.8 Properties

### 16.68.9 animationTool as AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A special video composition tool for use with Core Animation.
**Notes:** This attribute may be nil.

(Read and Write computed property)

### 16.68.10 frameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The interval for which the video composition should render composed video frames.
**Notes:** (Read and Write computed property)

### 16.68.11 renderSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The render size.
**Notes:** (Read and Write computed property)

## 16.69 class AVOutputSettingsAssistantMBS

### 16.69.1 class AVOutputSettingsAssistantMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The helper class to configure output settings.
**Notes:** A class, each instance of which specifies a set of parameters for configuring objects that use output settings dictionaries, for example AVAssetWriter & AVAssetWriterInput, so that the resulting media file conforms to some specific criteria.

Instances of AVOutputSettingsAssistant are typically created using a string constant representing a specific preset configuration, such as AVOutputSettingsPreset1280x720. Once you have an instance, its properties can be used as a guide for creating and configuring an AVAssetWriter object and one or more AVAssetWriterInput objects. If all the suggested properties are respected, the resulting media file will conform to the criteria implied by the preset. Alternatively, the properties of an instance can be used as a "base" configuration which can be customized to suit your individual needs.

The recommendations made by an instance get better as you tell it more about the format of your source data. For example, if you set the sourceVideoFormat property, the recommendation made by the videoSettings property will ensure that your video frames are not scaled up from a smaller size.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.69.2 Methods

### 16.69.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 or later.

### 16.69.4 AVOutputSettingsPreset1280x720 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the predefined presets.

### 16.69.5 AVOutputSettingsPreset1920x1080 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the predefined presets.

### 16.69.6 AVOutputSettingsPreset640x480 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the predefined presets.

### 16.69.7 AVOutputSettingsPreset960x540 as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the predefined presets.

### 16.69.8 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.69.9 outputSettingsAssistantWithPreset(presetIdentifier as string) as AVOutputSettingsAssistantMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVOutputSettingsAssistant corresponding to the given preset.
**Notes:** presetIdentifier: The string identifier, for example AVOutputSettingsPreset1280x720, for the desired preset.

Returns an instance of AVOutputSettingsAssistant with properties corresponding to the given preset, or nil if there is no such preset.

The properties of the returned object can be used as a guide for creating and configuring an AVAssetWriter object and one or more AVAssetWriterInput objects. If all the suggested properties are respected in creating the AVAssetWriter, the resulting media file will conform to the criteria implied by the preset.

### 16.69.10 Properties

### 16.69.11 audioSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A dictionary of key/value pairs, as specified in AVAudioSettings.h, to be used when e.g. creating an instance of AVAssetWriterInput.
**Notes:** The value of this property may change as a result of setting a new value for the sourceAudioFormat property.
(Read only property)

### 16.69.12 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.69.13 outputFileType as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A UTI indicating the type of file to be written, to be used when e.g. creating an instance of AVAssetWriter.
**Notes:** Use UTTypeCopyPreferredTagWithClass / kUTTagClassFilenameExtension to get a suitable file extension for a given file type.
(Read only property)

### 16.69.14 videoSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A dictionary of key/value pairs, as specified in AVVideoSettings.h, to be used when e.g. creating an instance of AVAssetWriterInput.
**Notes:** The value of this property may change as a result of setting a new value for the sourceVideoFormat property.
(Read only property)

## 16.70 class AVPixelAspectRatioMBS

### 16.70.1 class AVPixelAspectRatioMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The class for pixel aspect ratio.

### 16.70.2 Properties

### 16.70.3 horizontalSpacing as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The horizontal spacing of the pixelAspectRatio property.
**Notes:** (Read and Write property)

### 16.70.4 verticalSpacing as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The vertical spacing of the pixelAspectRatio property.
**Notes:** (Read and Write property)

## 16.71 class AVPlayerItemAccessLogEventMBS

### 16.71.1 class AVPlayerItemAccessLogEventMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVPlayerItemAccessLogEvent object represents a single item in an AVPlayerItem object's access log.
**Notes:** An AVPlayerItemAccessLog object provides named properties for accessing the data fields of each log event. None of the properties of this class are observable using key-value observing.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.71.2 Methods

### 16.71.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.71.4 Properties

### 16.71.5 downloadOverdue as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The total number of times the download of the segments took too long. (read-only)
**Notes:** The value of the property is negative if unknown.
This property corresponds to "c-overdue".
This property is not compatible with key-value observing.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.6 durationWatched as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The accumulated duration of the media played, in seconds. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.7 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.71.8 indicatedBitrate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The throughput required to play the stream, as advertised by the server, in bits per second. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.9 mediaRequestsWWAN as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Number of network read requests over WWAN. (read-only)
**Notes:** The value of the property is negative if unknown.
Corresponds to "sc-wwan-count".
This property is not compatible with key-value observing.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.10 numberOfBytesTransferred as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The accumulated number of bytes transferred by the item. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.11 numberOfDroppedVideoFrames as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The total number of dropped video frames (read-only)
**Notes:** The value of this property is negative if unknown.

(Read only property)

### 16.71.12 numberOfMediaRequests as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A count of media read requests from the server to this client. (read-only)
**Notes:** For HTTP live streaming, this property contains the count of media requests downloaded from the server. For progressive-style HTTP media downloads, it contains a count of HTTP GET (byte-range) requests for the resource.
The value of this property is negative if unknown.
Available in OS X v10.9 and later.#
(Read only property)

### 16.71.13 numberOfSegmentsDownloaded as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A count of the media segments downloaded from the server to this client. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.14 numberOfServerAddressChanges as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A count of changes to the server address over the last uninterrupted period of playback. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.15 numberOfStalls as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The total number of playback stalls encountered. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.16 observedBitrate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The empirical throughput across all media downloaded, in bits per second. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.17 observedBitrateStandardDeviation as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Standard deviation of observed segment download bit rates. (read-only)
**Notes:** The value of the property is negative if unknown.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.18 observedMaxBitrate as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Maximum observed segment download bit rate. (read-only)
**Notes:** The value of the property is negative if unknown.
Available in OS X v10.9 and later.#
(Read only property)

### 16.71.19 observedMinBitrate as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Minimum observed segment download bit rate. (read-only)
**Notes:** The value of the property is negative if unknown.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.20 playbackSessionID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A GUID that identifies the playback session. (read-only)
**Notes:** This value is used in HTTP requests.
The value of this property is nil if unknown.

(Read only property)

### 16.71.21 playbackStartDate as date

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time at which playback began for this event. (read-only)
**Notes:** The value of this property is nil if unknown.
(Read only property)

### 16.71.22 playbackStartDateTime as DateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date and time at which playback began for this event. (read-only)
**Notes:** The value of this property is nil if unknown.
(Read only property)

### 16.71.23 playbackStartOffset as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An offset into the playlist where the last uninterrupted period of playback began, in seconds (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.24 playbackType as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The playback type: live, VOD, or from a file. (read-only)
**Notes:** If nil is returned the playback type is unknown.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.25 segmentsDownloadedDuration as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The accumulated duration of the media downloaded, in seconds. (read-only)
**Notes:** The value of this property is negative if unknown.
(Read only property)

### 16.71.26 serverAddress as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The IP address of the server that was the source of the last delivered media segment. (read-only)
**Notes:** The value of this property is nil if unknown.
(Read only property)

### 16.71.27 startupTime as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The accumulated duration, in seconds, until player item is ready to play. (read-only)
**Notes:** The value of the property is negative if unknown.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.28 switchBitrate as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Bandwidth that caused a switch (up or down). (read-only)
**Notes:** The value of the property is negative if unknown.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.29 transferDuration as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The accumulated duration, in seconds, of active network transfer of bytes. (read-only)
**Notes:** The value of the property is negative if unknown.
Corresponds to "c-transfer-duration".
This property is not compatible with key-value observing.
Available in OS X v10.9 and later.
(Read only property)

### 16.71.30 URI as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URI of the playback item (read-only)
**Notes:** The value of this property may be nil if the URI is unknown.
(Read only property)

## 16.72 class AVPlayerItemAccessLogMBS

### 16.72.1 class AVPlayerItemAccessLogMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVPlayerItemAccessLog object to retrieve the access log associated with an AVPlayerItem object.
**Notes:** An AVPlayerItemAccessLog object accumulates key metrics about network playback and presents them as a collection of AVPlayerItemAccessLogEvent instances. Each event instance collates the data that relates to each uninterrupted period of playback.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.72.2 Methods

### 16.72.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.72.4 events as AVPlayerItemAccessLogEventMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A chronologically ordered array of AVPlayerItemAccessLogEvent objects. (read-only)
**Notes:** The array contains AVPlayerItemAccessLogEvent objects that represent the chronological sequence of events contained in the access log.

This property is not observable using key-value observing.

### 16.72.5 extendedLogData as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a serialized representation of the access log in the Extended Log File Format.
**Notes:** A serialized representation of the access log in the Extended Log File Format.

This method converts the web server access log into a textual format that conforms to the W3C Extended Log File Format for web server log files. For more information, see http://www.w3.org/pub/WWW/TR/WD-logfile.html.

### 16.72.6 extendedLogDataStringEncoding as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the string ecoding of the extended log data.
**Notes:** The string encoding of the data returned by extendedLogData.

### 16.72.7 Properties

### 16.72.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 16.73 class AVPlayerItemErrorLogEventMBS

## 16.73.1 class AVPlayerItemErrorLogEventMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVPlayerItemErrorLogEvent object represents a single item in an AVPlayerItem object's error log.
**Notes:** An AVPlayerItemErrorLogEvent object provides named properties for accessing the data fields of each log event. None of the properties of this class are observable using key-value observing.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 16.73.2 Methods

## 16.73.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 16.73.4 date as date

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when the error occurred. (read-only)
**Notes:** The property corresponds to "date".
The value of this property may be nil if the date is unknown.

## 16.73.5 dateTime as dateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date and time when the error occurred. (read-only)
**Notes:** The property corresponds to "date".
The value of this property may be nil if the date is unknown.

## 16.73.6 errorComment as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A description of the error encountered (read-only)
**Notes:** The value of this property may be nil if further information is not available.

### 16.73.7 errorDomain as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The domain of the error. (read-only)

### 16.73.8 errorStatusCode as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A unique error code identifier. (read-only)

### 16.73.9 playbackSessionID as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A GUID that identifies the playback session. (read-only)
**Notes:** The value of this property is used in HTTP requests, and may be nil if the GUID is unknown.

### 16.73.10 serverAddress as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The IP address of the server that was the source of the error. (read-only)
**Notes:** The value of this property can be either an IPv4 or IPv6 address, and may be nil if the address is unknown.

### 16.73.11 URI as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URI of the playback item (read-only)
**Notes:** The value of this property may be nil if the URI is unknown.

### 16.73.12 Properties

### 16.73.13 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.74 class AVPlayerItemErrorLogMBS

### 16.74.1 class AVPlayerItemErrorLogMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVPlayerItemErrorLog object to retrieve the error log associated with an AVPlayerItem object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.74.2 Methods

### 16.74.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.74.4 events as AVPlayerItemErrorLogEventMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A chronologically ordered array of AVPlayerItemErrorLogEvent objects. (read-only)
**Notes:** The array contains AVPlayerItemErrorLogEvent objects that represent the chronological sequence of events contained in the error log.

This property is not observable using key-value observing.

### 16.74.5 extendedLogData as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a serialized representation of the error log in the Extended Log File Format.
**Notes:** A serialized representation of the error log in the Extended Log File Format.

Discussion
This method converts the web server error log into a textual format that conforms to the W3C Extended Log File Format for web server log files. For more information, see http://www.w3.org/pub/WWW/TR/WD-logfile.html.

### 16.74.6 extendedLogDataStringEncoding as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the string ecoding of the extended log data.
**Notes:** The string encoding of the data returned by extendedLogData.

### 16.74.7 Properties

### 16.74.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.75 class AVPlayerItemLegibleOutputMBS

### 16.75.1 class AVPlayerItemLegibleOutputMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A subclass of AVPlayerItemOutput that can vend media with a legible characteristic as NSAttributedStrings.
**Notes:** Subclass of the AVPlayerItemOutputMBS class.

### 16.75.2 Methods

### 16.75.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 or later.

### 16.75.4 AVPlayerItemLegibleOutputTextStylingResolutionDefault as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the text styling mode.
**Notes:** Specify this level of text styling resolution to receive attributed strings from an AVPlayerItemLegibleOutput that include the same level of styling information that AVFoundation would use itself to render text within an AVPlayerLayer. The text styling will accommodate user-level Media Accessibility settings.

### 16.75.5 AVPlayerItemLegibleOutputTextStylingResolutionSourceAndRulesOnly as string

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** One of the text styling mode.
**Notes:** Specify this level of text styling resolution to receive only the styling present in the source media and the styling provided via AVPlayerItem.textStyleRules.
This level of resolution excludes styling provided by the user-level Media Accessibility settings. You would typically use it if you wish to override the styling specified in source media. If you do this, you are strongly encouraged to allow your custom styling in turn to be overriden by user preferences for text styling that are available as Media Accessibility settings.

### 16.75.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The standard constructor.
See also:


- 16.75.7 Constructor(subTypes() as string) 3587


### 16.75.7 Constructor(subTypes() as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Returns an instance of AVPlayerItemLegibleOutput with filtering enabled for AVPlayerItemLegibleOutputPushDelegate's legibleOutput:didOutputAttributedStrings:nativeSampleBuffers:forItemTime:.

subtypes: Array of strings with 4 letter codes.

Add media subtype FourCC number objects to the subtypes array to elect to receive that type as a CMSampleBuffer instead of an NSAttributedString. Initializing an AVPlayerItemLegibleOutput using the Constructor method is equivalent to calling Constructor with an empty array, which means that all legible data, regardless of media subtype, will be delivered using NSAttributedString in a common format.

If a media subtype for which there is no legible data in the current player item is included in the media subtypes array, no error will occur. AVPlayerItemLegibleOutput will not vend closed caption data as CMSampleBuffers, so it is an error to include 'c608' in the media subtypes array.
See also:


- 16.75.6 Constructor 3587


### 16.75.8 Properties

### 16.75.9 advanceIntervalForDelegateInvocation as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Permits advance invocation of the associated delegate, if any.
**Notes:** If it is possible, an AVPlayerItemLegibleOutput will message its delegate advanceIntervalForDelegateInvocation seconds earlier than otherwise. If the value you provide is large, effectively requesting provision of samples earlier than the AVPlayerItemLegibleOutput is prepared to act on them, the delegate will be invoked as soon as possible.
(Read and Write property)

### 16.75.10 textStylingResolution as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A string identifier indicating the degree of text styling to be applied to attributed strings vended by the receiver.
**Notes:** Valid values are AVPlayerItemLegibleOutputTextStylingResolutionDefault and AVPlayerItemLegibleOutputTextStylingResolutionSourceAndRulesOnly. An NSInvalidArgumentException is raised if this property is set to any other value. The default value is AVPlayerItemLegibleOutputTextStylingResolutionDefault, which indicates that attributed strings vended by the receiver will include the same level of styling information that would be used if AVFoundation were rendering the text via AVPlayerLayer.
(Read and Write property)

## 16.76 class AVPlayerItemMBS

### 16.76.1 class AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVPlayerItem represents the presentation state of an asset that's played by an AVPlayer object, and lets you observe that state.
**Notes:** A object carries a reference to an AVAsset object and presentation settings for that asset, including track enabled state. If you need to inspect the media assets themselves, you should message the AVAsset object itself.

You can initialize a player item using an URL (playerItemWithURL and Constructor); the resource types referenced by the URL may include, but aren't necessarily limited to, those with the following corresponding UTIs:

kUTTypeQuickTimeMovie, (.mov, .qt)
kUTTypeMPEG4 (.mp4)
"public.3gpp" (.3gp, .3gpp)
kUTTypeMPEG4Audio (.m4a)
"com.apple.coreaudio-format" (.caf)
"com.microsoft.waveform-audio" (.wav)
"public.aiff-audio" (.aif)
"public.aifc-audio" (also .aif)
"org.3gpp.adaptive-multi-rate-audio" (.amr)

If you want to play an asset more than once within a sequence of items, you must create independent instances of AVPlayerItem for each placement in the player's queue.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3

### 16.76.2 Methods

### 16.76.3 accessLog as AVPlayerItemAccessLogMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an object that represents a snapshot of the network access log.
**Notes:** An object that represents a snapshot of the network access log. The returned value can be nil.
If the method returns nil, there is no logging information currently available for the player item.

### 16.76.4 addOutput(output as AVPlayerItemOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Adds the specified player item output object to the receiver.
**Notes:** output: The player item output object to associate with the item.

When you add an AVPlayerItemOutput object to an item, the samples associated with that output object are processed according to the rules for mixing, composing, or excluding content that the AVPlayer object honors for the specific media type. For example, video media is composed according to the instructions provided by the player item's video composition object and audio media is mixed according to the parameters of its audio mix object.
Available in OS X v10.8 and later.

### 16.76.5 automaticallyLoadedAssetKeys as String()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array of property keys defined by the asset property. (read-only)
**Notes:** The value of each key in automaticallyLoadedAssetKeys will be automatically be loaded by the asset before the receiver achieves the status AVPlayerItemStatusReadyToPlay; i.e. when the item is ready to play, the value of invoking statusOfValueForKey on the asset property value will be AVKeyValueStatusLoaded. If loading of any of the values fails, the status property of the receiver will change to AVPlayerItemStatusFailed.
Available in OS X v10.9 and later.

### 16.76.6 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.76.7 cancelContentAuthorizationRequest

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Causes the currently outstanding content authorization request to be cancelled.
**Notes:** Calling this method while a content authorization request is pending will cause that request to be cancelled and its completion handler to be invoked with a status of AVContentAuthorizationCancelled.

This method does not block.

### 16.76.8 cancelPendingSeeks

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancel any pending seek requests and invoke the corresponding completion handlers if present.
**Notes:** Use this method to cancel and release the completion handlers of pending seeks.
The finished parameter of the completion handlers will be set to false.

### 16.76.9 Constructor(asset as AVAssetMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a new player item for a given asset.
See also:


- 16.76.10 Constructor(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string) 3591
- 16.76.11 Constructor(file as folderitem) 3592
- 16.76.12 Constructor(URL as string) 3592


### 16.76.10 Constructor(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Initializes a player item with an array of AVAsset keys.
**Notes:** asset: An instance of AVAsset.
automaticallyLoadedAssetKeys: An array of strings, each representing a property defined by AVAsset.

Returns an initialized instance of AVPlayerItem.

The value of each key in automaticallyLoadedAssetKeys will be automatically be loaded by the underlying AVAsset before the receiver achieves the status AVPlayerItemStatusReadyToPlay; i.e. when the item is ready to play, the value returned by invoking the asset property's statusOfValueForKey method will be one of the terminal status values, either AVKeyValueStatusLoaded, AVKeyValueStatusFailed, or AVKeyValueStatusCancelled.

Important: The asset property keys "playable" and "compatibleWithSavedPhotosAlbum" are not eligible for automatic loading by AVPlayerItem. You must use the AVAsset method loadValuesAsynchronously-

ForKeys:completionHandler: to load the values of those properties asynchronously.

Available in OS X v10.9 and later.
See also:


- 16.76.9 Constructor(asset as AVAssetMBS) 3591
- 16.76.11 Constructor(file as folderitem) 3592
- 16.76.12 Constructor(URL as string) 3592


### 16.76.11 Constructor(file as folderitem)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prepares a player item with a given file.
**Notes:** file: A folderitem.

This method immediately returns the item, but with the status AVPlayerItemStatusUnknown.
If the URL contains valid data that can be used by the player item, the status later changes to AVPlayerItemStatusReadyToPlay.
If the URL contains no valid data or otherwise can't be used by the player item, the status later changes to AVPlayerItemStatusFailed.
See also:


- 16.76.9 Constructor(asset as AVAssetMBS) 3591
- 16.76.10 Constructor(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string) 3591
- 16.76.12 Constructor(URL as string) 3592


### 16.76.12 Constructor(URL as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prepares a player item with a given URL.
**Notes:** URL: An URL.

This method immediately returns the item, but with the status AVPlayerItemStatusUnknown.
If the URL contains valid data that can be used by the player item, the status later changes to AVPlayerItemStatusReadyToPlay.
If the URL contains no valid data or otherwise can't be used by the player item, the status later changes to AVPlayerItemStatusFailed.
See also:


- 16.76.9 Constructor(asset as AVAssetMBS) 3591

- 16.76.10 Constructor(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string) 3591
- 16.76.11 Constructor(file as folderitem) 3592


### 16.76.13 copy as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.76.14 errorLog as AVPlayerItemErrorLogMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an object that represents a snapshot of the error log.
**Notes:** An object that represents a snapshot of the error log. The returned value can be nil.
If the method returns nil, there is no logging information currently available for the player item.

### 16.76.15 loadedTimeRanges as CMTimeRangeMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time ranges of the item that have been loaded. (read-only)

### 16.76.16 outputs as AVPlayerItemOutputMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The outputs associated with the item. (read-only)
**Notes:** This property contains the collection of AVPlayerItemOutput objects used to transfer media data to the player object.
Available in OS X v10.8 and later.

### 16.76.17 playerItemWithAsset(asset as AVAssetMBS) as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player item for a given asset.
See also:

- 16.76.18 playerItemWithAsset(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string) as AVPlayerItemMBS 3594

### 16.76.18 playerItemWithAsset(asset as AVAssetMBS, automaticallyLoadedAssetKeys() as string) as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates and initializes a player item with an array of AVAsset keys.
**Notes:** asset: An instance of AVAsset.
automaticallyLoadedAssetKeys: An array of strings, each representing a property key defined by AVAsset.
Returns an initialized instance of AVPlayerItem.

The value of each key in automaticallyLoadedAssetKeys will be automatically be loaded by the underlying AVAsset before the receiver achieves the status AVPlayerItemStatusReadyToPlay; i.e. when the item is ready to play, the value returned by invoking the asset property's statusOfValueForKey:error: method will be one of the terminal status values, either AVKeyValueStatusLoaded, AVKeyValueStatusFailed, or AVKeyValueStatusCancelled.

Important: The asset property keys "playable" and "compatibleWithSavedPhotosAlbum" are not eligible for automatic loading by AVPlayerItem. You must use the AVAsset method loadValuesAsynchronouslyForKeys:completionHandler: to load the values of those properties asynchronously.

Available in OS X v10.9 and later.
See also:

- 16.76.17 playerItemWithAsset(asset as AVAssetMBS) as AVPlayerItemMBS 3593

### 16.76.19 playerItemWithFile(file as folderitem) as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player item, prepared to use a given folderitem.
**Notes:** File: A folderitem.
Returns a new player item, prepared to use folderitem.

This method immediately returns the item, but with the status AVPlayerItemStatusUnknown.
If the URL contains valid data that can be used by the player item, the status later changes to AVPlayerItemStatusReadyToPlay.
If the URL contains no valid data or otherwise can't be used by the player item, the status later changes to AVPlayerItemStatusFailed.

### 16.76.20 playerItemWithURL(URL as string) as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player item, prepared to use a given URL.
**Notes:** URL: An URL.
Returns a new player item, prepared to use URL.

This method immediately returns the item, but with the status AVPlayerItemStatusUnknown.
If the URL contains valid data that can be used by the player item, the status later changes to AVPlayerItemStatusReadyToPlay.
If the URL contains no valid data or otherwise can't be used by the player item, the status later changes to AVPlayerItemStatusFailed.

### 16.76.21 removeOutput(output as AVPlayerItemOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes the specified player item output object from the receiver.
**Notes:** output: The player item output object to remove.
Available in OS X v10.8 and later.

### 16.76.22 requestContentAuthorizationAsynchronously(timeoutInterval as Double, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Causes appropriate action to be taken to allow the user to authorize the content for playback.
**Notes:** timeoutInterval: The maximum amount of time in seconds to wait for the user to authorize the content before calling the handler block with a timeout result.

Calling this method will present the user with the opportunity to authorize the content (for example, by launching iTunes and prompting the user to enter their Apple ID and password).

When the user has taken action (or the timeout has elapsed), the AVFoundationMBS.requestContentAuthorizationCompleted event is invoked. You determine the status of the authorization attempt by checking the value of the contentAuthorizationRequestStatus property.

Even if the status indicates a completed authorization, the content may still not be authorized (for example, if the user authorizes an Apple ID other than that associated with the content). You should re-check the value of contentAuthorizationRequestStatus to verify whether the content has actually been authorized before continuing. It is not necessary to call this method if the value of contentAuthorizationRequestStatus

is already true.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.76.23 seekableTimeRanges as CMTimeRangeMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of time ranges within which it is possible to seek. (read-only)

### 16.76.24 seekToDate(date as date, fireEvent as boolean = false, tag as Variant = nil) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the playback cursor to the time given by the specified date object.
**Notes:** date: The time to which to seek.

If fireEvent is true, the AVFoundationMBS.playerItemSeekToDateFinished event is called.

Use this method to seek to a specified time in the item item and be notified when the operation completes. If the seek request completes without being interrupted (either by another seek request or by any other operation), the completion handler you provide is executed with the finished parameter set to true.

If another seek request is already in progress when you call this method, the completion handler for the in-progress seek request is executed immediately with the finished parameter set to NO.
Available in OS X v10.9 and later.

### 16.76.25 seekToDateTime(date as dateTime, fireEvent as boolean = false, tag as variant = nil) as boolean

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor to the time given by the specified date object.
**Notes:** date: The time to which to seek.

If fireEvent is true, the AVFoundationMBS.playerItemSeekToDateFinished event is called.

Use this method to seek to a specified time in the item item and be notified when the operation completes. If the seek request completes without being interrupted (either by another seek request or by any other operation), the completion handler you provide is executed with the finished parameter set to true.

If another seek request is already in progress when you call this method, the completion handler for the in-progress seek request is executed immediately with the finished parameter set to NO.
Available in OS X v10.9 and later.

### 16.76.26 seekToTime(time as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor to a given time.
**Notes:** time: The time to which to move the playback cursor.
If fireEvent is true, the AVFoundationMBS.playerItemSeekToTimeFinished event will be called later.

Use this method to seek to a specified time in the item item and be notified when the operation completes. If the seek request completes without being interrupted (either by another seek request or by any other operation), the event is executed with the finished parameter set to true.

If another seek request is already in progress when you call this method, the completion handler for the in-progress seek request is executed immediately with the finished parameter set to false.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.76.27 seekToTime(time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil) 3597

### 16.76.27 seekToTime(time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor within a specified time bound.
**Notes:** time: The time to which you would like to move the playback cursor.
toleranceBefore: The tolerance allowed before time.
toleranceAfter: The tolerance allowed after time.

The time seeked to will be within the range [ time-beforeTolerance, time+afterTolerance ] , and may differ from the specified time for efficiency. If you pass kCMTimeZero for both toleranceBefore and toleranceAfter (to request sample accurate seeking), you may incur additional decoding delay.

Passing kCMTimePositiveInfinity for both toleranceBefore and toleranceAfter is the same as messaging seekToTime directly.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.76.26 seekToTime(time as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil) 3597

### 16.76.28 selectedMediaOptionInMediaSelectionGroup(mediaSelectionGroup as AVMediaSelectionGroupMBS) as AVMediaSelectionOptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the media selection option that's currently selected from the specified group.
**Notes:** mediaSelectionGroup: A media selection group obtained from the player item's asset.

Returns an instance of AVMediaSelectionOption that describes the currently selection option in the group.

If the value of the allowsEmptySelection property of mediaSelectionGroup is true, the currently selected option in the group may be nil.
Available in OS X v10.8 and later.

### 16.76.29 selectMediaOption(mediaSelectionOption as AVMediaSelectionOptionMBS, mediaSelectionGroup as AVMediaSelectionGroupMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Selects the media option described by a specified instance of AVMediaSelectionOption in a given media selection group and deselects all other options in that group.
**Notes:** mediaSelectionOption: The option to select.
If the value of the allowsEmptySelection property of mediaSelectionGroup is true, you can pass nil to deselect all media selection options in the group.
mediaSelectionGroup: The media selection group, obtained from the receiver's asset, that contains mediaSelectionOption.

If mediaSelectionOption isn't a member of the mediaSelectionGroup, no change in presentation state will

result.

If multiple options within a group meet your criteria for selection according to locale or other considerations, and if these options are otherwise indistinguishable to you according to media characteristics that are meaningful for your application, content is typically authored so that the first available option that meets your criteria is appropriate for selection.
Available in OS X v10.8 and later.

### 16.76.30 selectMediaOptionAutomaticallyInMediaSelectionGroup(mediaSelectionGroup as AVMediaSelectionGroupMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Selects the media option in the specified media selection group that best matches the receiver's automatic selection criteria.
**Notes:** mediaSelectionGroup: The media selection group, obtained from the receiver's asset, that contains the specified option.

This method has no effect unless the appliesMediaSelectionCriteriaAutomatically property of the associated AVPlayer is true and unless automatic media selection has previously been overridden by invoking sselectMediaOption:inMediaSelectionGroup.
Available in OS X v10.9 and later.

### 16.76.31 setTextStyleRules(rules() as AVTextStyleRuleMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Sets the textStyleRules array.

### 16.76.32 stepByCount(stepCount as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Moves the player's current item's current time forward or backward by a specified number of steps.
**Notes:** stepCount: The number of steps by which to move.
A positive number steps forward, a negative number steps backward.

The size of each step depends on the receiver's enabled AVPlayerItemTrack objects (see tracks).

### 16.76.33 textStyleRules as AVTextStyleRuleMBS()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array of text style rules to apply to subtitles and other legible text.
**Notes:** You can use this property to assign an array of AVTextStyleRule objects to the item. Each rule specifies both the style information and the range of text to which that styling should apply.
Available in OS X v10.9 and later.

### 16.76.34 timedMetadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The timed metadata played most recently by the media stream. (read-only)
**Notes:** The array contains instances of AVMetadataItem.

### 16.76.35 tracks as AVPlayerItemTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An array of AVPlayerItemTrack objects. (read-only)
**Notes:** This property can change dynamically during playback.
You can observe this property using key-value observing.

### 16.76.36 Properties

### 16.76.37 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The underlying asset provided during initialization. (read-only)
**Notes:** (Read only property)

### 16.76.38 audioMix as AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The audio mix parameters to be applied during playback.
**Notes:** (Read and Write property)

### 16.76.39 audioTimePitchAlgorithm as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The processing algorithm used to manage audio pitch for scaled audio edits.
**Notes:** The supported constants are defined in Time Pitch Algorithm Settings.
An NSInvalidArgumentException will be raised if this property is set to a value other than the defined constants.
Available in OS X v10.9 and later.
(Read and Write property)

### 16.76.40 canPlayFastForward as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item can be played at rates greater than 1.0. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 16.76.41 canPlayFastReverse as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item can be played at rates less than –1.0. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 16.76.42 canPlayReverse as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item can be played with a rate of -1.0. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 16.76.43 canPlaySlowForward as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item can be played at a rate between 0.0 and 1.0. (read-only)
**Notes:** Available in OS X v10.8 and later.

(Read only property)

### 16.76.44 canPlaySlowReverse as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item can be played at a rate between -1.0 and 0.0. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 16.76.45 canStepBackward as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item supports stepping backward. (read-only)
**Notes:** Once the item becomes ready to play, the value of this property does not change. This behavior applies even when boundary conditions, such as when the item's current time is kCMTimeZero, have been reached.
Available in OS X v10.8 and later.
(Read only property)

### 16.76.46 canStepForward as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item supports stepping forward. (read-only)
**Notes:** Once the item becomes ready to play, the value of this property does not change. This behavior applies even when boundary conditions, such as when the item's current time is equal to its end time, have been reached.
Available in OS X v10.8 and later.
(Read only property)

### 16.76.47 contentAuthorizationRequestStatus as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the status of the most recent call to requestContentAuthorizationAsynchronouslyWithTimeoutInterval. (read-only)
**Notes:** This property reports the authorization status as determined by the most recent call to requestContentAuthorizationAsynchronouslyWithTimeoutInterval.

The value will be AVContentAuthorizationUnknown before the first call and between the time a request call is made and just prior to the completion handler being executed (thus it is safe to query this property from the event).

This value is not key-value observable.
(Read only property)

### 16.76.48 currentDate as date

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current time of the item as a date object.
**Notes:** The current time of the item as a date object, or nil if playback is not mapped to any date.
(Read only property)

### 16.76.49 currentDateTime as DateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns the current time of the item as a date object.
**Notes:** The current time of the item as a date object, or nil if playback is not mapped to any date.
(Read only property)

### 16.76.50 currentTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the current time of the item.
**Notes:** (Read only property)

### 16.76.51 customVideoCompositor as AVVideoCompositingMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The custom video compositor, if any. (read-only)
**Notes:** The custom video compositor instance that is used during image generation is accessible via this property after the value of AVPlayerItemStatusFailed is set to an AVVideoComposition instance that specifies a custom video compositor class. Any additional communication between the application and that instance of the custom video compositor, if any is required for configuration or other purposes, can only

occur once that has happened.

If the value of AVPlayerItemStatusFailed is changed from an AVVideoComposition that specifies a custom video compositor class to another instance of AVVideoComposition that specifies the same custom video compositor class, the instance of the custom video compositor that was previously created will receive the renderContextChanged: message and remain in use for subsequent image generation.

This property is nil if there is no video compositor, or if the internal video compositor is in use.
Available in OS X v10.9 and later.
(Read only property)

### 16.76.52 duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the duration of the item. (read-only)
**Notes:** Indicates the duration of the item, not considering either its forwardPlaybackEndTime or reverse-PlaybackEndTime.
(Read only property)

### 16.76.53 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** If the receiver's status is AVPlayerItemStatusFailed, this describes the error that caused the failure. (read-only)
**Notes:** The value of this property is an error that describes what caused the receiver to no longer be able to be played.
If the receiver's status is not AVPlayerItemStatusFailed, the value of this property is nil.
(Read only property)

### 16.76.54 forwardPlaybackEndTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time at which forward playback ends.
**Notes:** The value indicated the time at which playback should end when the playback rate is positive (see AVPlayer's rate property).

The default value is kCMTimeInvalid, which indicates that no end time for forward playback is specified. In this case, the effective end time for forward playback is the item's duration.

The value of this property has no effect on playback when the rate is negative.
(Read and Write property)

### 16.76.55 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.76.56 isApplicationAuthorizedForPlayback as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the application can be used to play the content. (read-only)
**Notes:** This property reports whether or not the calling application is authorized to play the content associated with the item.

Application authorization is independent of content authorization (see contentAuthorizedForPlayback) and that both must be granted in order for an application to be allowed to play protected content. Also, unlike content authorization, application authorization is not dependent on user credentials (that is, if applicationAuthorizedForPlayback is false, there are no means to obtain authorization).

This property is not key-value observable.
(Read only property)

### 16.76.57 isAuthorizationRequiredForPlayback as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether or not authorization is required to play the content. (read-only)
**Notes:** This property reports whether authorization is required for the item's content to be played. If it does not require authorization, then none of the other authorization-related methods or properties apply (though they will return sensible values where possible).

This property is not key-value observable.
(Read only property)

### 16.76.58 isContentAuthorizedForPlayback as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the content has been authorized by the user (for example, by authorizing the content's associated account in iTunes). (read-only)
**Notes:** This property reports whether the user has provided the necessary credentials to the system in order for the content to be decrypted for playback.

Content authorization is independent of application authorization (see applicationAuthorizedForPlayback) and that both must be granted in order for an application to be allowed to play protected content.

This property is not key-value observable.
(Read only property)

### 16.76.59 isPlaybackBufferEmpty as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether playback has consumed all buffered media and that playback will stall or end. (read-only)
**Notes:** (Read only property)

### 16.76.60 isPlaybackBufferFull as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the internal media buffer is full and that further I/O is suspended. (read-only)
**Notes:** Despite the playback buffer reaching capacity there might not exist sufficient statistical data to support a playbackLikelyToKeepUp prediction of true.
(Read only property)

### 16.76.61 isPlaybackLikelyToKeepUp as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the item will likely play through without stalling (read-only)
**Notes:** This property communicates a prediction of playability. Factors considered in this prediction include I/O throughput and media decode performance. It is possible for playbackLikelyToKeepUp to indicate false while the property playbackBufferFull indicates true. In this event the playback buffer has reached capacity but there isn't the statistical data to support a prediction that playback is likely to keep up in the future. It is up to you to decide whether to continue media playback.

(Read only property)

### 16.76.62 presentationSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The size at which the visual portion of the item is presented by the player. (read-only)
**Notes:** You can scale the presentation size to fit within the bounds of a player layer using its videoGravity property. You can also scale the presentation size arbitrarily using the frame property of an AVPlayerLayer object.
(Read only property)

### 16.76.63 reversePlaybackEndTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time at which reverse playback ends.
**Notes:** The value indicated the time at which playback should end when the playback rate is negative (see AVPlayer's rate property).

The default value is kCMTimeInvalid, which indicates that no end time for reverse playback is specified. In this case, the effective end time for reverse playback is kCMTimeZero.

The value of this property has no effect on playback when the rate is positive.
(Read and Write property)

### 16.76.64 seekingWaitsForVideoCompositionRendering as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the item's timing follows the displayed video frame when seeking with a video composition.
**Notes:** By default, item timing is updated as quickly as possible during seeking. Specifically, the item does not wait for new frames to be rendered when seeking during normal playback. In most situations, the latency between the completion of a seek operation and the display of a video frame at the new time is negligible. However, when video compositions are in use, the processing of video may introduce noticeable latency. Setting the value of this property to true causes the item's timing to be updated only after the corresponding video frame has been displayed. For example, this allows an AVSynchronizedLayer object associated with the item to remain in sync with the displayed video.

This property has no effect on items whose videoComposition property is nil.

Available in OS X v10.9 and later.
(Read and Write property)

### 16.76.65 status as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The status of the player item. (read-only)
**Notes:** For example, whether the item is playable. For values: AVPlayerItemStatusUnknown, AVPlayerItem-StatusReadyToPlay and AVPlayerItemStatusFailed.
(Read only property)

### 16.76.66 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video composition settings to be applied during playback.
**Notes:** (Read and Write property)

### 16.76.67 Constants

Authorization Status

| Constant | Value | Description |
|---|---|---|
| AVContentAuthorizationBusy | 4 | The last call to request content authorization could not be completed be another asset is currently attempting authorization. |
| AVContentAuthorizationCancelled | 2 | The last call to request content authorization was cancelled by the user. |
| AVContentAuthorizationCompleted | 1 | The last completed call to request content authorization completed. |
| AVContentAuthorizationNotAvailable | 5 | The last call to request content authorization could not be completed be there was no known mechanism by which to attempt authorization. |
| AVContentAuthorizationNotPossible | 6 | The last call to request content authorization could not be completed non-recoverable way (for example, a newer version of iTunes is required). |
| AVContentAuthorizationTimedOut | 3 | The last call to request content authorization was cancelled because the tim interval was reached. |
| AVContentAuthorizationUnknown | 0 | No call to request content authorization has completed yet. |

Status Constants

| Constant | Value | Description |
|---|---|---|
| AVPlayerItemStatusFailed | 2 | The item cannot be played. |
| AVPlayerItemStatusReadyToPlay | 1 | The item is ready to play. |
| AVPlayerItemStatusUnknown | 0 | The item's status is unknown. |

## 16.77 class AVPlayerItemOutputMBS

### 16.77.1 class AVPlayerItemOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The AVPlayerItemOutput class is an abstract class that defines the common interface for moving samples from an asset to an AVPlayer object.
**Notes:** You do not create instances of this class directly but instead use one of the concrete subclasses that manage specific types of assets.

This class provides basic methods for converting time values to the timebase of the item. It also provides an option to suppress rendering of the output associated with the specific instance of this class.

Available in OS X v10.8 and later.

### 16.77.2 Methods

### 16.77.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.77.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.

### 16.77.5 itemTimeForHostTime(hostTimeInSeconds as Double) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Converts a host time (specified in seconds) to the item's timebase.
**Notes:** hostTimeInSeconds: A host time value, specified in seconds. For example, you might specify the time value returned by the CACurrentMediaTime function or the timestamp from a CADisplayLink object for this parameter.

Returns the equivalent time in the item's timebase.

The timestamp associated with a CADisplayLink object represents the time of the most recent screen refresh, which is usually a time in the past. If you want to find the time associated with the next screen refresh, you need to increment the timestamp by the value in the display link's duration property.

### 16.77.6 itemTimeForMachAbsoluteTime(machAbsoluteTime as Int64) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Converts a Mach host time to the item's timebase.
**Notes:** machAbsoluteTime: The Mach host time to convert. You typically retrieve this value using the mach_absolute_time function.

Returns the equivalent time in the item's timebase.
Available in OS X v10.8 and later.

### 16.77.7 Properties

### 16.77.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.77.9 suppressesPlayerRendering as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether the player object renders the receiver's output.
**Notes:** When the value of this property is false (the default), the player object handles the rendering of the receiver's associated output. You can change the value of this property to true if you want to suppress the rendering of the media data associated with this object.
Available in OS X v10.8 and later.
(Read and Write property)

## 16.78 class AVPlayerItemTrackMBS

### 16.78.1 class AVPlayerItemTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The track of a player item.
**Notes:** You use an AVPlayerItemTrack object to modify the presentation state of an asset track (AVAsset-Track) being presented by an AVPlayer object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.78.2 Methods

### 16.78.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.78.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.78.5 Properties

### 16.78.6 assetTrack as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The asset track for which the player item represents presentation state. (read-only)
**Notes:** (Read only property)

### 16.78.7 currentVideoFrameRate as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** For video media types, indicates the current frame rate of the track as it plays. (read-only)
**Notes:** If the media type of the assetTrack is AVMediaTypeVideo, the property indicates the current frame rate of the track as it plays, in units of frames per second.

If the item is not playing, or if the media type of the track is not video, the value of this property is 0.0.

This property is not key-value observable.
Available in OS X v10.9 and later.
(Read only property)

### 16.78.8 Enabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the track is enabled for presentation during playback.
**Notes:** (Read and Write property)

### 16.78.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.79 class AVPlayerItemVideoOutputMBS

### 16.79.1 class AVPlayerItemVideoOutputMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The AVPlayerItemVideoOutput lets you coordinate the output of content associated with a Core Video pixel buffer.
**Notes:** Available in OS X v10.8 and later.
This class can call the outputSequenceWasFlushed and outputMediaDataWillChange events in the AVFoundationMBS class.
Subclass of the AVPlayerItemOutputMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 16.79.2 Methods

### 16.79.3 Constructor(pixelBufferAttributes as dictionary)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns a video output object using the specified pixel buffer attributes.
**Notes:** pixelBufferAttributes; The pixel buffer attributes required for video output. For a list of pixel buffer attributes you can include in this dictionary, see the CVPixelBuffer.h header file in the Core Video framework.

### 16.79.4 copyCIImageForItemTime(time as CMTimeMBS) as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Acquires and returns an image that is appropriate to display at the specified time.
**Notes:** itemTime: The time at which you want to retrieve the image from the item.
outItemTimeForDisplay: Optional, the time by which you intend to use the returned pixel buffer.

Returns a pixel buffer containing the image data to display or nil if nothing should be displayed at the specified time. The caller is responsible for calling CVBufferRelease on the returned data when it is no longer needed.

Typically, you call this method in response to a CVDisplayLink callback or a CADisplayLink delegate method call when the hasNewPixelBufferForItemTime method also returns true.

After calling this method, the video output object marks the pixel buffer data as having been acquired. This causes the hasNewPixelBufferForItemTime method to return false unless newer data becomes available.

Returns CIImageMBS object.
Available in OS X v10.8 and later.
See also:

- 16.79.5 copyCIImageForItemTime(time as CMTimeMBS, byref outItemTimeForDisplay as CMTimeMBS) as Variant 3614

### 16.79.5 copyCIImageForItemTime(time as CMTimeMBS, byref outItemTimeForDisplay as CMTimeMBS) as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Acquires and returns an image that is appropriate to display at the specified time.
**Notes:** itemTime: The time at which you want to retrieve the image from the item.
outItemTimeForDisplay: Optional, the time by which you intend to use the returned pixel buffer.

Returns a pixel buffer containing the image data to display or nil if nothing should be displayed at the specified time. The caller is responsible for calling CVBufferRelease on the returned data when it is no longer needed.

Typically, you call this method in response to a CVDisplayLink callback or a CADisplayLink delegate method call when the hasNewPixelBufferForItemTime method also returns true.

After calling this method, the video output object marks the pixel buffer data as having been acquired. This causes the hasNewPixelBufferForItemTime method to return false unless newer data becomes available.

Returns CIImageMBS object.
Available in OS X v10.8 and later.
See also:

- 16.79.4 copyCIImageForItemTime(time as CMTimeMBS) as Variant 3613

### 16.79.6 copyPixelBufferForItemTime(time as CMTimeMBS) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Acquires and returns an image that is appropriate to display at the specified time.
**Notes:** itemTime: The time at which you want to retrieve the image from the item.
outItemTimeForDisplay: Optional, the time by which you intend to use the returned pixel buffer.

Returns a pixel buffer containing the image data to display or nil if nothing should be displayed at the specified time. The caller is responsible for calling CVBufferRelease on the returned data when it is no

longer needed.

Typically, you call this method in response to a CVDisplayLink callback or a CADisplayLink delegate method call when the hasNewPixelBufferForItemTime method also returns true.

After calling this method, the video output object marks the pixel buffer data as having been acquired. This causes the hasNewPixelBufferForItemTime method to return false unless newer data becomes available.

Returns CVPixelBufferMBS object.
Available in OS X v10.8 and later.
See also:

- 16.79.7 copyPixelBufferForItemTime(time as CMTimeMBS, byref outItemTimeForDisplay as CMTimeMBS) as CVPixelBufferMBS 3615

### 16.79.7 copyPixelBufferForItemTime(time as CMTimeMBS, byref outItemTimeForDisplay as CMTimeMBS) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Acquires and returns an image that is appropriate to display at the specified time.
**Notes:** itemTime: The time at which you want to retrieve the image from the item.
outItemTimeForDisplay: Optional, the time by which you intend to use the returned pixel buffer.

Returns a pixel buffer containing the image data to display or nil if nothing should be displayed at the specified time. The caller is responsible for calling CVBufferRelease on the returned data when it is no longer needed.

Typically, you call this method in response to a CVDisplayLink callback or a CADisplayLink delegate method call when the hasNewPixelBufferForItemTime method also returns true.

After calling this method, the video output object marks the pixel buffer data as having been acquired. This causes the hasNewPixelBufferForItemTime method to return false unless newer data becomes available.

Available in OS X v10.8 and later.
See also:

- 16.79.6 copyPixelBufferForItemTime(time as CMTimeMBS) as CVPixelBufferMBS 3614

### 16.79.8 hasNewPixelBufferForItemTime(time as CMTimeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether video output is available for the specified item time.
**Notes:** itemTime: The item time to query. The time value is relative to the AVPlayerItem object with which the receiver is associated.

Returns true if there is available video output that has not been previously acquired or false if there is not.

This method returns true if the video data at the specified time has not yet been acquired or is different from the video that was acquired previously. If you require multiple objects to acquire video output from the same AVPlayerItem object, you should create separate AVPlayerItemVideoOutput objects for each.
Available in OS X v10.8 and later.

### 16.79.9 requestNotificationOfMediaDataChangeWithAdvanceInterval(time as Double)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Informs the receiver that the video out put client is entering a quiescent state.
**Notes:** interval: The amount of time to wait before notifying the delegate of the media change.

Call this method before you suspend your use of a CVDisplayLinkRef type or a CADisplayLink object. After the interval expires, the video output object notifies its delegate that it should resume the display link. If the interval value you specify is large, the delegate is notified as soon as possible rather than waiting.

Do not call this method repeatedly to force the delegate to be notified for each sample.

### 16.79.10 setDelegate

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets the delegate so the events are called for this instance.
**Notes:** The constructor (if used) sets this for you automatically.

# 16.80 class AVPlayerLayerMBS

## 16.80.1 class AVPlayerLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVPlayerLayer is a subclass of CALayer to which an AVPlayer object can direct its visual output.
**Notes:** The videoGravity property defines how the video content is displayed within the player layer's bounds rect.

The value for the contents key of a player layer is opaque and effectively read-only.

During playback, AVPlayer may compensate for temporal drift between its visual output and its audible output to one or more independently-clocked audio output devices by adjusting the timing of its associated player layers. The effects of these adjustments are usually very small; however, clients that wish to remain entirely unaffected by such adjustments may wish to place other layers for which timing is important into independently timed subtrees of their layer trees.

You can create arbitrary numbers of player layers with the same AVPlayer object. Only the most-recently-created player layer will actually display the video content on-screen.
Subclass of the CALayerMBS class.

## 16.80.2 Methods

## 16.80.3 Constructor(player as AVPlayerMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a player layer to display the visual output of a specified player.
**Notes:** player: The player for which the player layer displays visual output.

## 16.80.4 isReadyForDisplay as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the first video frame has been made ready for display for the current item of the associated player. (read-only)
**Notes:** Use this property as an indicator of when best to show or animate-in a player layer into view. An player layer may be displayed, or made visible, while this property is false, however the layer will not have any user-visible content until the value becomes true.

This property remains false for a player's currentItem whose asset contains no enabled video tracks.

### 16.80.5 playerLayerWithPlayer(player as AVPlayerMBS) as AVPlayerLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a player layer to display the visual output of a specified player.
**Notes:** player: The player for which the player layer displays visual output.

Returns a player layer configured to display the visual output of player.

### 16.80.6 videoRect as CGRectMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The current size and position of the video image as displayed within the receiver's bounds. (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.80.7 Properties

### 16.80.8 player as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The player for which the player layer displays visual output.
**Notes:** (Read and Write computed property)

### 16.80.9 videoGravity as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Specifies how the video is displayed within a player layer's bounds.
**Notes:** Options are AVLayerVideoGravityResizeAspect, AVLayerVideoGravityResizeAspectFill, and AVLayerVideoGravityResize.
This property is animatable.
(Read and Write computed property)

## 16.81 class AVPlayerLooperMBS

### 16.81.1 class AVPlayerLooperMBS

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** AVPlayerLooperMBS is a helper object that repeatedly plays an AVPlayerItemMBS with an AVQueuePlayerMBS.
**Example:**

```
// Create player and configure
Dim player As New AVQueuePlayerMBS
Dim playerLayer As New AVPlayerLayerMBS(player)
player.pause

// Create looping item
Dim file As FolderItem = SpecialFolder.Desktop.Child("loop.mov")
Dim itemToLoop As New AVPlayerItemMBS(file)

// Create looping helper object. Loop item segment from 5sec to 7sec
Dim startTime As CMTimeMBS = CMTimeMBS.Make(5000, 1000)
Dim duration As CMTimeMBS = CMTimeMBS.Make(2000, 1000)
Dim timeRange As CMTimeRangeMBS = CMTimeRangeMBS.Make(startTime, duration)
Dim looper As New AVPlayerLooperMBS(player, itemToLoop, timeRange)

// Perform any other set up operations like setting AVPlayerItemDataOutputs on the looping item replicas
// Start playback
player.play

// itemToLoop between 5s and 7s plays repeatedly
'....
// To end the looping
looper.disableLooping
// Player will play through the end of the current looping item
```

**Notes:** The same result can be accomplished with AVQueuePlayer directly, but AVPlayerLooper provides a simpler interface to loop a single AVPlayerItem with an option to specify a time range. AVPlayerLooper only supports looping for forward playback (positive player rate). Behavior is undefined for negative player rate.

Note that the transition at the loop point is not guaranteed to be gapless.

Requires macOS 10.13, iOS 10.0 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

**Xojo Developer Magazine**

- 21.1, page 33: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 16.81.2 Methods

### 16.81.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on macOS 10.12 or newer as well as on iOS 10.0 or newer.

### 16.81.4 Constructor(player as AVQueuePlayerMBS, item as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an instance of AVPlayerLooper to loop specified AVPlayerItem with specified AVQueuePlayerMBS.
**Notes:** Equivalent to other constructor and passing in kCMTimeRangeInvalid for timeRange parameter.
See also:

- 16.81.5 Constructor(player as AVQueuePlayerMBS, item as AVPlayerItemMBS, loopRange as CMTimeRangeMBS) 3620

### 16.81.5 Constructor(player as AVQueuePlayerMBS, item as AVPlayerItemMBS, loopRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an instance of AVPlayerLooper to loop specified AVPlayerItem within the specified time range with specified AVQueuePlayerMBS.
**Notes:** loopRange: Playback time range in [ 0, itemToLoop's duration ] . kCMTimeRangeInvalid means [ 0, itemToLoop's duration ] .

The specified AVPlayerItem will be used as a template to generate at least 3 AVPlayerItem replicas and the replicas will be inserted into specified AVQueuePlayer's play queue to accomplish the looping playback. The specified AVPlayerItem should have its asset's duration property loaded beforehand so looping setup work would not be blocked until the duration value is known. Otherwise, AVPlayerLooper's status property is

AVPlayerLooperStatusUnknown until the duration property is loaded. The specified AVPlayerItem will not be used in the actual looping playback. Furthermore, AVPlayerItem replicas will be generated at initialization time so any changes made to the specified AVPlayerItem's property afterwards will not be reflected in the replicas used for looping playback. Specified CMTimeRange will limit each item loop iteration to playing within the specified time range. To play from beginning and the whole duration of the item, specify kCMTimeRangeInvalid for the range parameter. Time range will be accomplished by seeking to range start time and setting AVPlayerItem's forwardPlaybackEndTime property on the looping item replicas. Client should not modify AVQueuePlayer's play queue while AVPlayerLooper is performing the looping. AVPlayerLooper will insert the replica items before any existing items in the specified AVQueuePlayer's play queue and change the actionAtItemEnd to AVPlayerActionAtItemEndAdvance if required. AVQueuePlayer's play queue and actionAtItemEnd will be restored when disableLooping method is called and then current looping item replicas completes playback or when AVPlayerLooper is destroyed. While AVPlayerLooper is being initialized, the specified AVQueuePlayer will be paused (rate of 0.0) if necessary and the original player rate will be restored after initialization completes. The client shall set the specified AVQueuePlayer's rate to 0 beforehand if additional set-up work needs to be performed after AVPlayerLooper initialization and before starting looping playback. An NSInvalidArgumentException will be raised if the player and template item are not specified or the template item has a 0 duration. An NSInvalidArgumentException will be raised if a valid time range has a duration of 0 or is not contained within time 0 and duration of the templateItem.
See also:

- 16.81.4 Constructor(player as AVQueuePlayerMBS, item as AVPlayerItemMBS) 3620

### 16.81.6 disableLooping

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Disables the item looping.
**Notes:** AVPlayerLooper will stop performing player queue operations for looping and let the current looping item replica play to the end. The player's original actionAtItemEnd property will be restored afterwards. After this method is called, the value of the receiver's status property will be AVPlayerLooperStatusCancelled.

### 16.81.7 loopingPlayerItems as AVPlayerItemMBS()

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an array containing replicas of specified AVPlayerItem used to accomplish the looping.
**Notes:** AVPlayerLooper creates replicas of the template AVPlayerItem using -copyWithZone: and inserts the replicas in the specified AVQueuePlayer to accomplish the looping. The AVPlayerItem replicas are for informational purposes and to allow the client to apply properties that are not transferred from the template AVPlayerItem to the replicas. The client can determine the number of replicas created and can listen for notifications and property changes from the replicas if desired. AVPlayerItemOutputs and AVPlayerItemMediaDataCollectors are not transferred to the replicas so the client should add them to each replica if desired. The client shall not modify the properties on the replicas that would disrupt looping playback. Examples of such properties are playhead time/date, selected media option, and forward playback end time.

This property is key value observable.

Returns an array containing replicas of specified AVPlayerItem.

### 16.81.8 Properties

### 16.81.9 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** If the receiver's status is AVPlayerLooperStatusFailed, this describes the error that caused the failure.
**Notes:** The value of this property is a NSError that describes what caused the receiver to not be able to perform looping playback. If the receiver's status is not AVPlayerLooperStatusFailed, the value of this property is nil.
(Read only property)

### 16.81.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** The internal reference object.
**Notes:** (Read only property)

### 16.81.11 item as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** The item used.
**Notes:** (Read only property)

### 16.81.12 loopCount as Integer

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** Number of times the specified AVPlayerItem has been played.
**Notes:** Starts at 0 and increments when the player starts playback of the AVPlayerItem again.
(Read only property)

### 16.81.13 status as Integer

MBS AVFoundation Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: All.

**Function:** The ability of the receiver to be used for looping playback.
**Notes:** The value of this property is an AVPlayerLooperStatus that indicates whether the receiver is ready for looping playback. When the value of this property is AVPlayerStatusFailed, the receiver can no longer be used for playback and a new instance needs to be created in its place. When this happens, clients can check the value of the error property to determine the nature of the failure. This property is key value observable. (Read only property)

### 16.81.14 Constants

Status

| Constant | Value | Description |
|---|---|---|
| StatusCancelled | 3 | Indicates that the looper is no longer looping because -disableLooping was invoked. |
| StatusFailed | 2 | Indicates that the looper is not able to perform looping playback because of an error. The error is described by the value of the error property. |
| StatusReady | 1 | Indicates that the looper is ready for looping playback. |
| StatusUnknown | 0 | Indicates that the status of the looper is not yet known. |

## 16.82 class AVPlayerMBS

### 16.82.1 class AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVPlayer object to implement controllers and user interfaces for single- or multiple-item playback.
**Notes:** The multiple-item case supports advanced behaviors.

AVPlayer works equally well with local and remote media files, providing you with appropriate information about readiness to play or about the need to await additional data before continuing.

You can display the visual content of items played by an instance of AVPlayer in a CoreAnimation layer of class AVPlayerLayer; to synchronize real-time playback with other CoreAnimation layers, you can use AVSynchronizedLayer. You cannot use an instance of AVVideoCompositionCoreAnimationTool with an AVPlayer object; for offline rendering you should instead use AVAssetExportSession.

You can observe the status of a player using key-value observing. So that you can add and remove observers safely, AVPlayer serializes notifications of changes that occur dynamically during playback on a dispatch queue. By default, this queue is the main queue . To ensure safe access to a player's nonatomic properties while dynamic changes in playback state may be reported, you must serialize access with the receiver's notification queue. In the common case, such serialization is naturally achieved by invoking AVPlayer's various methods on the main thread or queue.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 19.0pr6
- MBS Xojo Plugins, version 18.4pr5
- Tip of the day: MoviePlayer.rate

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 56: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 16.82.2 Methods

### 16.82.3 addBoundaryTimeObserverForTime(time as CMTimeMBS, tag as variant = nil) as AVPlayerTimeObserverMBS

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Requests invocation of a event when specified time are traversed during normal playback.
**Notes:** time: A CMTimeMBS value representing the times at which to invoke event.
Returns an opaque object that you pass as the argument to removeTimeObserver to stop observation.

You must retain the returned value as long as you want the time observer to be invoked by the player. Each invocation of this method should be paired with a corresponding call to removeTimeObserver. This is done automatically for you by AVPlayerTimeObserverMBS class destructor.

Calls AVFoundationMBS.BoundaryTimeObserver event passing tag value.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.82.4 addBoundaryTimeObserverForTimes(times() as CMTimeMBS, tag as Variant = nil) as AVPlayerTimeObserverMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Requests invocation of a event when specified times are traversed during normal playback.
**Notes:** times: An array of NSValue objects containing CMTime values representing the times at which to invoke event.
Returns an opaque object that you pass as the argument to removeTimeObserver to stop observation.

You must retain the returned value as long as you want the time observer to be invoked by the player. Each invocation of this method should be paired with a corresponding call to removeTimeObserver. This is done automatically for you by AVPlayerTimeObserverMBS class destructor.

Calls AVFoundationMBS.BoundaryTimeObserver event passing tag value.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.82.5 addLoopTimeObserver(atTime as CMTimeMBS, jumpToTime as CMTimeMBS) as AVPlayerTimeObserverMBS

MBS AVFoundation Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Requests invocation of a code to jump in time to another position.
**Notes:** atTime: A CMTimeMBS value representing the times at which to invoke event.
jumpToTime: The CMTImeMBS where to jump to.

Returns an opaque object that you pass as the argument to removeTimeObserver to stop observation.

You must retain the returned value as long as you want the time observer to be invoked by the player. Each invocation of this method should be paired with a corresponding call to removeTimeObserver. This is done automatically for you by AVPlayerTimeObserverMBS class destructor.

### 16.82.6 addPeriodicTimeObserverForInterval(interval as CMTimeMBS, tag as Variant = nil) as AVPlayerTimeObserverMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Requests invocation of a given event during playback to report changing time.
**Notes:** interval: The interval of invocation of the event during normal playback, according to progress of the current time of the player.
The event takes a single parameter:

Returns an opaque object that you pass as the argument to removeTimeObserver to cancel observation.

You must retain the returned value as long as you want the time observer to be invoked by the player. Each invocation of this method should be paired with a corresponding call to removeTimeObserver. This is done automatically for you by AVPlayerTimeObserverMBS class destructor.

The AVFoundationMBS.PeriodicTimeObserver event is invoked periodically at the interval specified, interpreted according to the timeline of the current item. The event is also invoked whenever time jumps and whenever playback starts or stops. If the interval corresponds to a very short interval in real time, the player may invoke the event less frequently than requested. Even so, the player will invoke the event sufficiently often for the client to update indications of the current time appropriately in its end-user interface.

Special Considerations
Releasing the observer object without invoking removeTimeObserver: will result in undefined behavior.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can

cause memory reference cycles.

### 16.82.7 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.82.8 cancelPendingPrerolls

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels the preloading of media data.
**Notes:** This method cancels any pending operations to prepare the render pipeline for the current item.
Available in OS X v10.8 and later.

### 16.82.9 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.
See also:


- 16.82.10 Constructor(File as folderitem) 3627
- 16.82.11 Constructor(item as AVPlayerItemMBS) 3628
- 16.82.12 Constructor(URL as string) 3628


### 16.82.10 Constructor(File as folderitem)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a new player to play a single audiovisual resource referenced by a given file.
**Notes:** File: A folderitem that identifies an audiovisual resource.
This method implicitly creates an AVPlayerItem object. You can get the player item using currentItem.
See also:


- 16.82.9 Constructor 3627
- 16.82.11 Constructor(item as AVPlayerItemMBS) 3628
- 16.82.12 Constructor(URL as string) 3628

### 16.82.11 Constructor(item as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a new player to play a given single audiovisual item.
**Notes:** You can use this method to play items for which you have an existing AVAsset object (see Constructor in AVPlayerItem).
See also:


- 16.82.9 Constructor 3627
- 16.82.10 Constructor(File as folderitem) 3627
- 16.82.12 Constructor(URL as string) 3628


### 16.82.12 Constructor(URL as string)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes a new player to play a single audiovisual resource referenced by a given URL.
**Notes:** URL: An URL that identifies an audiovisual resource.
This method implicitly creates an AVPlayerItem object. You can get the player item using currentItem.
See also:


- 16.82.9 Constructor 3627
- 16.82.10 Constructor(File as folderitem) 3627
- 16.82.11 Constructor(item as AVPlayerItemMBS) 3628


### 16.82.13 mediaSelectionCriteriaForMediaCharacteristic(mediaCharacteristic as string) as AVPlayerMediaSelectionCriteriaMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the automatic selection criteria for media that has the specified media characteristic.
**Notes:** mediaCharacteristic: The media characteristic for which the selection criteria is to be returned. Supported values include AVMediaCharacteristicAudible, AVMediaCharacteristicLegible, and AVMediaCharacteristicVisual.

Returns the automatic media selection criteria for mediaCharacteristic.

Available in OS X v10.9 and later.

### 16.82.14 pause

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Pauses playback.
**Notes:** This is the same as setting rate to 0.0.

### 16.82.15 play

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Begins playback of the current item.
**Notes:** This is the same as setting rate to 1.0.

### 16.82.16 playerWithFile(File as folderitem) as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player to play a single audiovisual resource referenced by a given file.
**Notes:** File: A folderitem that identifies an audiovisual resource.
Returns a new player initialized to play the audiovisual resource specified by folderitem.
This method implicitly creates an AVPlayerItem object. You can get the player item using currentItem.

### 16.82.17 playerWithPlayerItem(item as AVPlayerItemMBS) as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player initialized to play a given single audiovisual item
**Notes:** item: A player item.
Returns a new player, initialized to play item.

You can use this method to play items for which an AVAsset object has previously been created (see Constructor in AVPlayerItem).

### 16.82.18 playerWithURL(URL as string) as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new player to play a single audiovisual resource referenced by a given URL.
**Notes:** URL: An URL that identifies an audiovisual resource.
Returns a new player initialized to play the audiovisual resource specified by URL.

This method implicitly creates an AVPlayerItem object. You can get the player item using currentItem.

### 16.82.19 prerollAtRate(rate as Double, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Begins loading media data to prime the media pipelines for playback.
**Notes:** rate: The playback rate to use when determining how much data to load.

Calls AVFoundationMBS.prerollAtRateFinished event when the player finishes the load attempt.

This method loads data starting at the item's current playback time. The current rate for the playback item should always be 0 prior to calling this method. After the method calls the completion handler, you can change the item's playback rate to begin playback.

If the player object is not ready to play (its status property is not AVPlayerStatusReadyToPlay), this method throws an exception.
Available in OS X v10.8 and later.

### 16.82.20 removeTimeObserver(observer as AVPlayerTimeObserverMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels a previously registered time observer.
**Notes:** observer: An object returned by a previous call to addPeriodicTimeObserverForInterval or addBoundaryTimeObserverForTimes.

Upon return, the caller is guaranteed that no new time observer event will begin executing. Depending on the calling thread and the queue used to add the time observer, an in-flight block may continue to execute after this method returns. You can guarantee synchronous time observer removal by enqueuing the call to removeTimeObserver on the main queue (do it in main event).

You should use this method to explicitly cancel each time observer added using addPeriodicTimeObserverForInterval and addBoundaryTimeObserverForTimes.

### 16.82.21 replaceCurrentItemWithPlayerItem(item as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Replaces the player item with a new player item.

**Notes:** item: A player item.

You can only use this method with players created without queues. If the player was not initialized with a single item and no queue, the method throws an exception.

The item replacement occurs asynchronously; observe the currentItem property to find out when the replacement will/did occur.

Special Considerations
The new item must have the same compositor as the item it replaces, or have no compositor.

### 16.82.22 seekToDate(date as date, fireEvent as boolean = false, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the playback cursor to the specified time.
**Notes:** If FireEvent is true, the AVFoundationMBS.playerSeekToDateFinished event is called.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.82.23 seekToDate(date as dateTime, fireEvent as boolean = false, tag as variant = nil) 3631

### 16.82.23 seekToDate(date as dateTime, fireEvent as boolean = false, tag as variant = nil)

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor to the specified time.
**Notes:** If FireEvent is true, the AVFoundationMBS.playerSeekToDateFinished event is called.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.82.22 seekToDate(date as date, fireEvent as boolean = false, tag as Variant = nil) 3631

### 16.82.24 seekToTime(time as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor to a given time.
**Notes:** time: The time to which to move the playback cursor.

Use this method to seek to a specified time for the current player item and be notified when the operation completes. If the seek request completes without being interrupted (either by another seek request or by any other operation), the AVFoundationMBS.playerSeekToTimeFinished is executed with the finished parameter set to true.

If another seek request is already in progress when you call this method, the event for the in-progress seek request is executed immediately with the finished parameter set to false.

If fireevent is true, the AVFoundationMBS.playerSeekToTimeFinished event is run later.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.82.25 seekToTime(time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil) 3632

### 16.82.25 seekToTime(time as CMTimeMBS, toleranceBefore as CMTimeMBS, toleranceAfter as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Moves the playback cursor within a specified time bound and invokes the event when the seek operation has either been completed or been interrupted.
**Notes:** If fireevent is true, the AVFoundationMBS.playerSeekToTimeFinished event is run later.

time: The time to which you would like to move the playback cursor.
toleranceBefore: The tolerance allowed before time.
toleranceAfter: The tolerance allowed after time.

Use this method to seek to a specified time for the current player item and to be notified when the seek operation is complete.

The time seeked to will be within the range [ time-beforeTolerance, time+afterTolerance ] , and may differ from the specified time for efficiency. If you pass kCMTimeZero for both toleranceBefore and toleranceAfter (to request sample accurate seeking), you may incur additional decoding delay.

Invoking this method with toleranceBefore set to kCMTimePositiveInfinity and toleranceAfter set to kCMTimePositiveInfinity is the same as invoking seekToTime:.

The completion handler for any prior seek request that is still in process will be invoked immediately with the finished parameter set to false. If the new request completes without being interrupted by another seek request or by any other operation the event will be invoked with the finished parameter set to true.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.
See also:

- 16.82.24 seekToTime(time as CMTimeMBS, fireEvent as boolean = false, tag as Variant = nil) 3632

### 16.82.26 setMediaSelectionCriteria(criteria as AVPlayerMediaSelectionCriteriaMBS, mediaCharacteristic as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Applies automatic selection criteria for media that has the specified media characteristic.
**Notes:** criteria: An instance of AVPlayerMediaSelectionCriteria that specifies the selection criteria.
mediaCharacteristic: The media characteristic for which the selection criteria are to be applied. Supported values include AVMediaCharacteristicAudible, AVMediaCharacteristicLegible, and AVMediaCharacteristicVisual.

Criteria will be applied to an AVPlayerItem instance when:

- It is made ready to play.
- Specific media selections are made by the AVPlayerItem instance using the method selectMediaOption in a different group. The automatic choice in one group may be influenced by a specific selection in another group.
- Underlying system preferences change, e.g. system language, accessibility captions.

Specific selections made by the AVPlayerItem instance using the method selectMediaOption method within any group will override automatic selection in that group until the player item receives a selectMediaOptionAutomaticallyInMediaSelectionGroup message.

Available in OS X v10.9 and later.

### 16.82.27 setRate(rate as Double, time as CMTimeMBS, HostTime as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Synchronizes the playback rate and time of the current item with an external source.
**Notes:** rate: The playback rate for the item.
itemTime: The precise time at which to match playback of the item. To use the current item's current time, specify kCMTimeInvalid.
hostClockTime: The host time at which to synchronize playback. If you specify kCMTimeInvalid, the rate and time are set together without any external synchronization.

This method adjusts the current item's timebase so that the time in itemTime is in sync with the time in hostClockTime. Thus, if hostClockTime specifies a time in the past, the item's timebase is adjusted to make it appear as if the item has been running at the specified rate since itemTime. And if hostClockTime specifies a time in the future, playback is adjusted backward (if possible) so that the value in itemTime occurs at the precise moment the host's clock reaches the value in hostClockTime. If there is no content to play before the time specified by itemTime, playback holds until the two times come into sync.

This method does not ensure that media data is loaded before the timebase starts moving. However, if you specify a host time in the near future, that would give you some time to load the media data and prepare for playback.

### 16.82.28 Properties

### 16.82.29 ActionAtItemEnd as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The action to perform when an item has finished playing.
**Notes:** (Read and Write property)

### 16.82.30 appliesMediaSelectionCriteriaAutomatically as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver should apply the current selection criteria automatically to AVPlayerItems.
**Notes:** By default, AVPlayer applies selection criteria based on system preferences. To override the default

criteria for any media selection group, use setMediaSelectionCriteria method.
(Read and Write property)

### 16.82.31 audioOutputDeviceUniqueID as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies the unique ID of the Core Audio output device used to play audio.
**Notes:** By default, the value of this property is nil, indicating that the default audio output device is used. Otherwise the value of this property is a string containing the unique ID of the Core Audio output device to be used for audio output.
Core Audio's kAudioDevicePropertyDeviceUID is a suitable source of audio output device unique IDs.
(Read and Write property)

### 16.82.32 ClosedCaptionDisplayEnabled as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the player uses closed captioning.
**Notes:** (Read and Write property)

### 16.82.33 currentItem as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The player's current item. (read-only)
**Notes:** (Read only property)

### 16.82.34 currentTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the current time of the current item.
**Notes:** (Read only property)

### 16.82.35 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** If the receiver's status is AVPlayerStatusFailed, this describes the error that caused the failure. (read-only)
**Notes:** The value of this property is an error object that describes what caused the receiver to no longer be able to play items. If the receiver's status is not AVPlayerStatusFailed, the value of this property is nil.
(Read only property)

### 16.82.36 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.82.37 Muted as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the audio output of the player is muted.
**Notes:** (Read and Write property)

### 16.82.38 Playing as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Whether asset is playing.
**Notes:** Returns true when playing.
(Read only property)

### 16.82.39 rate as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The current rate of playback.
**Notes:** 0.0 means "stopped", 1.0 means "play at the natural rate of the current item".
(Read and Write property)

### 16.82.40 status as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the player can be used for playback. (read-only)
**Notes:** When the value of this property is AVPlayerStatusFailed, you can no longer use the player for playback and you need to create a new instance to replace it. If this happens, you can check the value of the error property to determine the nature of the failure.

This property is key value observable using key-value observing.
(Read only property)

### 16.82.41 volume as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the current audio volume of the player.
**Notes:** 0.0 means "silence all audio," 1.0 means "play at the full volume of the current item."
(Read and Write property)

### 16.82.42 Constants

Actions for the item end Constants

| Constant | Value | Description |
|---|---|---|
| AVPlayerActionAtItemEndAdvance | 0 | Indicates that the player should advance to the next item, if there is one. |
| AVPlayerActionAtItemEndNone | 2 | Indicates that the player should do nothing. |
| AVPlayerActionAtItemEndPause | 1 | Indicates that the player should pause playing. |

Status Constants

| Constant | Value | Description |
|---|---|---|
| AVPlayerStatusFailed | 2 | Indicates that the player can no longer play AVPlayerItem instances because of an error.<br>The error is described by the value of the player's error property. |
| AVPlayerStatusReadyToPlay | 1 | Indicates that the player is ready to play AVPlayerItem instances. |
| AVPlayerStatusUnknown | 0 | Indicates that the status of the player is not yet known because it has not tried to load new media resources for playback. |

## 16.83 class AVPlayerMediaSelectionCriteriaMBS

### 16.83.1 class AVPlayerMediaSelectionCriteriaMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVPlayerMediaSelectionCriteria class specifies the preferred languages and media characteristics for an AVPlayer instance.
**Notes:** The languages and media characteristics of assets containing media selection options that an AVPlayer instance should attempt to select automatically when preparing and playing items. The languages and media characteristics are specified in the preferred order.

### 16.83.2 Methods

### 16.83.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 16.83.4 Constructor(preferredLanguages() as string, preferredMediaCharacteristics() as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns an initialized media selection criteria instance with the specified settings.
**Notes:** preferredLanguages: An array of strings containing language identifiers, in the preferred order. Can be nil.
preferredMediaCharacteristics: An array of strings indicating additional media characteristics, the preferred order. Can be nil.
Supported media characteristics are defined in AVMediaSelectionOption Constants and Media Characteristics.

Returns an initialized AVPlayerMediaSelectionCriteria instance.

When making selections, AVPlayer treats the preferredLanguages as the paramount criterion and the preference for preferredMediaCharacteristics as secondary.

The objects in the preferredLanguages array are indicated using BCP 47 language identifiers or ISO 639-2/T language codes.

If no option with any of the preferredLanguages is available, a selection is made according to the default enabling and disabling of media options as stored in the asset.

The preferredMediaCharacteristics are used when selecting media for the AVPlayer.

For example, desirable characteristics of legible media may include AVMediaCharacteristicTranscribesSpokenDialogForAccessibility and AVMediaCharacteristicDescribesMusicAndSoundForAccessibility.

Similarly, desirable characteristics of audible media may include AVMediaCharacteristicDescribesVideoForAccessibility.

If no option is found that possesses all of the desired characteristics, the option that best matches the desired characteristics will be selected.
Available in OS X v10.9 and later.

### 16.83.5 preferredLanguages as String()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The array of preferred languages in the order of desirability. (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.83.6 preferredMediaCharacteristics as String()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The array of preferred media characteristics in the order of desirability. (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.83.7 Properties

### 16.83.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.84 class AVPlayerTimeObserverMBS

### 16.84.1 class AVPlayerTimeObserverMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class for an observer.
**Notes:** You keep reference to this class, so you can cancel time observer later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.84.2 Methods

### 16.84.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.84.4 Destructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** Automatically cancels this observer if it was not cancelled.

## 16.85 control AVPlayerViewControlMBS

### 16.85.1 control AVPlayerViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The player control for Mac.
**Notes:** AVPlayerView is a subclass of NSView that can be used to display the visual content of an AVPlayer object and the standard playback controls.
MBS Plugin wraps this as a control for Xojo.
Please notice this is 64-bit only and requires MacOS 10.9 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr2

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 16.85.2 Methods

### 16.85.3 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

### 16.85.4 beginTrimming

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the controls panel into trimming mode and blocks until the user selects either the Trim or the Cancel button.
**Notes:** Triggers TrimmingCompleted later.

### 16.85.5 flashChapterNumber(chapterNumber as Integer, chapterTitle as String)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Display the provided chapter number and title momentarily.
**Notes:** chapterNumber: The chapter number (required).
chapterTitle: The chapter title (optional).

### 16.85.6 Properties

### 16.85.7 actionPopUpButtonMenu as NSMenuMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The action popup menu.
**Notes:** Clients can set this property in order to show an action pop up button. Default is nil.
(Read and Write property)

### 16.85.8 allowsPictureInPicturePlayback as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the receiver allows Picture in Picture playback.
**Notes:** Default is false.
Available in MacOS 10.15 or later.
(Read and Write property)

### 16.85.9 canBeginTrimming as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the current media can be trimmed.
**Notes:** (Read only property)

### 16.85.10 contentOverlayView as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Use the content overlay view to add additional custom views between the video content and the controls.

**Notes:** (Read only property)

### 16.85.11 controlsStyle as Integer

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The style of the playback controls pane currently associated with the view.
**Notes:** (Read and Write property)

### 16.85.12 player as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The player from which to source the media content for the view.
**Notes:** (Read and Write property)

### 16.85.13 readyForDisplay as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Boolean indicating that the first video frame has been made ready for display for the current item of the associated AVPlayer.
**Notes:** (Read only property)

### 16.85.14 showsFrameSteppingButtons as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Replace scanning controls in the playback UI with frame stepping buttons.
**Notes:** Default is false.
(Read and Write property)

### 16.85.15 showsFullScreenToggleButton as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the controls pane will show a full screen toggle button.
**Notes:** Default is false.
(Read and Write property)

### 16.85.16 showsSharingServiceButton as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the controls pane will show a sharing service button when the current player item can be shared.
**Notes:** Default is false.
(Read and Write property)

### 16.85.17 showsTimecodes as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** If timecodes are available, allow the AVPlayerView controls to enter timecode mode.
**Notes:** Default is false.
Available in MacOS 10.15 or later.
(Read and Write property)

### 16.85.18 updatesNowPlayingInfoCenter as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the now playing info center should be updated.
**Notes:** Default is true.
(Read and Write property)

### 16.85.19 videoBounds as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The current size and position of the video image as displayed within the receiver's view's bounds.
**Notes:** (Read only property)

### 16.85.20 videoGravity as String

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A string defining how the video is displayed within an AVPlayerLayer bounds rect.
**Notes:** Options are AVLayerVideoGravityResizeAspect, AVLayerVideoGravityResizeAspectFill and AVLayerVideoGravityResize. AVLayerVideoGravityResizeAspect is default.
See <AVFoundation/AVAnimation.h>for a description of these options.

(Read and Write property)

### 16.85.21 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the AVPlayerView object.
**Notes:** (Read only property)

### 16.85.22 Events

### 16.85.23 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.85.24 Close

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 16.85.25 Closing

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.85.26 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.85.27 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 16.85.28 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.85.29 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 16.85.30 FocusLost

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.85.31 FocusReceived

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.85.32 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.85.33 GotFocus

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.85.34 LostFocus

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.85.35 MenuBarSelected

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.85.36 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.85.37 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 16.85.38 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.85.39 Open

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 16.85.40 Opening

Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.85.41 playerViewDidStartPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture did start.

### 16.85.42 playerViewDidStopPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture did stop.

### 16.85.43 playerViewFailedToStartPictureInPicture(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture failed to start.
**Notes:** error: An error describing why it failed.

### 16.85.44 playerViewRestoreUserInterfaceForPictureInPictureStop as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to restore the user interface before Picture in Picture stops.
**Notes:** Please return true if you restored it or false if not, so we can call completion handler passing the value.
Default is to pass true if you don't implement this event.

### 16.85.45 playerViewShouldAutomaticallyDismissAtPictureInPictureStart as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this event and return false to prevent player view from automatically being miniaturized or losing focus when Picture in Picture starts.
**Notes:** If you implement this, please return true or false.
By default we return false if you don't

### 16.85.46 playerViewWillStartPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture will start.

### 16.85.47 playerViewWillStopPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture will stop.

### 16.85.48 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.85.49 TrimmingCompleted(result as Integer)

MBS AVFoundation Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event handler that is executed when the user selects either the Trim or Cancel button in the trimming UI.

### 16.85.50 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.85.51 Constants

Control Styles

| Constant | Value | Description |
|---|---|---|
| ControlsStyleDefault | 1 | The default controls pane is associated with the view. |
| ControlsStyleFloating | 2 | The floating controls pane is associated with the view. |
| ControlsStyleInline | 1 | The inline controls pane is associated with the view. |
| ControlsStyleMinimal | 3 | The minimal controls pane is associated with the view. |
| ControlsStyleNone | 0 | No controls pane is associated with the view. |

Trim Results

| Constant | Value | Description |
|---|---|---|
| TrimCancelButton | 1 | The user selected the Cancel button. |
| TrimOKButton | 0 | The user selected the Trim button. |

## 16.86 class AVQueuePlayerMBS

### 16.86.1 class AVQueuePlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVQueuePlayer is a subclass of AVPlayer you use to play a number of items in sequence.
**Notes:** Subclass of the AVPlayerMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 16.86.2 Methods

### 16.86.3 advanceToNextItem

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Ends playback of the current item and initiates playback of the next item in the player's queue.
**Notes:** This method also removes the current item from the play queue.

### 16.86.4 appendItem(item as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Places given player item in the queue.
**Notes:** item: The item to be inserted.

### 16.86.5 canAppendItem(item as AVPlayerItemMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given player item can be appended into the player's queue.
**Notes:** item: The AVPlayerItem object to test.

Returns true if item can be appended to the queue, otherwise false.
Adding the same item to a player at more than one position in the queue is not supported.

### 16.86.6 canInsertItem(item as AVPlayerItemMBS, afterItem as AVPlayerItemMBS = nil) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given player item can be inserted into the player's queue.
**Notes:** item: The AVPlayerItem object to test.
afterItem: The item that item is to follow in the queue. Pass nil to test whether item can be appended to the queue.

Returns true if item can be appended to the queue, otherwise false.
Adding the same item to a player at more than one position in the queue is not supported.

### 16.86.7 Constructor(items() as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an instance of AVQueuePlayer by enqueueing the player items from a given array.
**Notes:** items: An array of AVPlayerItem objects with which initially to populate the player's queue.
Creates an instance of AVQueuePlayer initialized to play the player items in items.

### 16.86.8 insertItem(item as AVPlayerItemMBS, afterItem as AVPlayerItemMBS = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Places given player item after a specified item in the queue.
**Notes:** item: The item to be inserted.
afterItem: The item that the newly inserted item should follow in the queue. Pass nil to append the item to the queue.

### 16.86.9 items as AVPlayerItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the currently enqueued items.
**Notes:** The array contains AVPlayerItem objects.

### 16.86.10 queuePlayerWithItems(items() as AVPlayerItemMBS) as AVQueuePlayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an instance of AVQueuePlayer initialized to play items from a given array.
**Notes:** items: An array of AVPlayerItem objects with which initially to populate the player's queue.

Returns an instance of AVQueuePlayer initialized to play the player items in items.

### 16.86.11 removeAllItems

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes all the items from the queue.
**Notes:** This has the side-effect of stopping playback by the player.

### 16.86.12 removeItem(item as AVPlayerItemMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Removes a given player item from the queue.
**Notes:** item: The item to be removed.

If item is currently playing, this has the same effect as advanceToNextItem.

# 16.87 class AVRouteDetectorMBS

## 16.87.1 class AVRouteDetectorMBS

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** An object that detects the presences of media playback routes.
**Notes:** When route detection is enabled, AVRouteDetector reports whether multiple playback routes have been detected. If this is the case, AVRoutePickerViewControlMBS can be used to allow users to pick from the set of available routes. By default, route detection is disabled.

Available on MacOS 10.13 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr2
- Airplay related classes for AVFoundation

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 56: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 18.3, page 10: News

## 16.87.2 Methods

## 16.87.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** Whether to class is available.
**Notes:** Returns true on MacOS 10.13 or newer.

## 16.87.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.87.5 Destructor

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** The destructor

### 16.87.6 Properties

### 16.87.7 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 16.87.8 MultipleRoutesDetected as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether more playback routes than the local playback route have been detected.
**Notes:** When the value of this property changes MultipleRoutesDetectedDidChange event is called.
(Read only property)

### 16.87.9 RouteDetectionEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether route detection is enabled.
**Notes:** The default value is false.
Route detection significantly increases power consumption and must be turned off when it's no longer needed.
(Read and Write property)

### 16.87.10 Events

### 16.87.11 MultipleRoutesDetectedDidChange

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The event called when MultipleRoutesDetected property changed.

## 16.88 control AVRoutePickerViewControlMBS

### 16.88.1 control AVRoutePickerViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** An object that displays controls for picking playback routes.
**Notes:** Available on MacOS 10.15 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr2
- Airplay related classes for AVFoundation

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 10: News

### 16.88.2 Properties

### 16.88.3 player as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** The player for which to perform routing operations.
**Notes:** (Read and Write property)

### 16.88.4 routePickerButtonBordered as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the picker button has a border.
**Notes:** Default is true.
(Read and Write property)

### 16.88.5 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** The view object.
**Notes:** (Read only property)

### 16.88.6 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.
**Notes:** (Read and Write computed property)

### 16.88.7 routePickerButtonColorForState(state as integer) as NSColorMBS

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** Defines the color for the button for a given state.
**Notes:** (Read and Write computed property)

### 16.88.8 Events

### 16.88.9 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.88.10 Close

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 16.88.11 Closing

Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.88.12 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.88.13 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 16.88.14 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.88.15 DidEndPresentingRoutes

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** Tells you that the route picker view has finished presenting routes to the user.

### 16.88.16 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 16.88.17 FocusLost

Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.88.18 FocusReceived

Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.88.19 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.88.20 GotFocus

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.88.21 LostFocus

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.88.22 MenuBarSelected

Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.88.23 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.88.24 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 16.88.25 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.88.26 Open

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 16.88.27 Opening

Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.88.28 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.88.29 WillBeginPresentingRoutes

MBS AVFoundation Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** Tells you that the route picker view will start presenting routes to the user.

### 16.88.30 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.88.31 Constants

Button States

| Constant | Value | Description |
|---|---|---|
| StateActive | 2 | Active state of the picker. The picker has this state when AirPlay is active. |
| StateActiveHighlighted | 3 | Highlighted state of the active picker. The picker has this state when it is highlighted and AirPlay is active. |
| StateNormal | 0 | Normal or default state of the picker. |
| StateNormalHighlighted | 1 | Highlighted state of the picker. The picker has this state when a mouse-down event occurs inside the button. It loses this highlight when a mouse-up event occurs. |

# 16.89 class AVSampleBufferDisplayLayerMBS

## 16.89.1 class AVSampleBufferDisplayLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVSampleBufferDisplayLayer is a subclass of CALayer that can decompress and display compressed or uncompressed video frames.
**Notes:** Subclass of the CALayerMBS class.

## 16.89.2 Methods

## 16.89.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.

## 16.89.4 enqueueSampleBuffer(sampleBuffer as CMSampleBufferMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sends a sample buffer for display.
**Notes:** If sampleBuffer has the kCMSampleAttachmentKey_DoNotDisplay attachment set to True, the frame will be decoded but not displayed. Otherwise, if sampleBuffer has the kCMSampleAttachmentKey_DisplayImmediately attachment set to True, the decoded image will be displayed as soon as possible, replacing all previously enqueued images regardless of their timestamps. Otherwise, the decoded image will be displayed at sampleBuffer's output presentation timestamp, as interpreted by the control timebase (or the mach_absolute_time timeline if there is no control timebase). To schedule the removal of previous images at a specific timestamp, enqueue a marker sample buffer containing no samples, with the kCMSampleBufferAttachmentKey_EmptyMedia attachment set to kCFBooleanTrue. IMPORTANT NOTE: attachments with the kCMSampleAttachmentKey_ prefix must be set via CMSampleBufferGetSampleAttachmentsArray and CFDictionarySetValue. Attachments with the kCMSampleBufferAttachmentKey_ prefix must be set via CMSetAttachment.

## 16.89.5 flush

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the layer to discard pending enqueued sample buffers.
**Notes:** It is not possible to determine which sample buffers have been decoded, so the next frame passed

to enqueueSampleBuffer should be an IDR frame (also known as a key frame or sync sample).

### 16.89.6 flushAndRemoveImage

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the layer to discard pending enqueued sample buffers and remove any currently displayed image.
**Notes:** It is not possible to determine which sample buffers have been decoded, so the next frame passed to enqueueSampleBuffer should be an IDR frame (also known as a key frame or sync sample).

### 16.89.7 requestMediaDataWhenReady(tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the target to invoke a client-supplied block repeatedly, at its convenience, in order to gather sample buffers for display.
**Notes:** The block should enqueue sample buffers to the layer either until the layer's readyForMoreMediaData property becomes false or until there is no more data to supply. When the layer has decoded enough of the media data it has received that it becomes ready for more media data again, it will invoke the block again in order to obtain more. If this function is called multiple times, only the last call is effective.
Call stopRequestingMediaData to cancel this request.
Each call to requestMediaDataWhenReady should be paired
with a corresponding call to stopRequestingMediaData. Releasing the
AVSampleBufferDisplayLayer without a call to stopRequestingMediaData will result in undefined behavior.
Calls SampleBufferDisplayLayerMediaDataWhenReady event on AVFoundationMBS class.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.89.8 stopRequestingMediaData

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Cancels any current requestMediaDataWhenReady call.
**Notes:** This method may be called from outside the block or from within the block.

### 16.89.9 Properties

### 16.89.10 isReadyForMoreMediaData as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates the readiness of the layer to accept more sample buffers.
**Notes:** AVSampleBufferDisplayLayer keeps track of the occupancy levels of its internal queues for the benefit of clients that enqueue sample buffers from non-real-time sources – i.e., clients that can supply sample buffers faster than they are consumed, and so need to decide when to hold back. Clients enqueueing sample buffers from non-real-time sources may hold off from generating or obtaining more sample buffers to enqueue when the value of readyForMoreMediaData is false. It is safe to call enqueueSampleBuffer when readyForMoreMediaData is false, but it is a bad idea to enqueue sample buffers without bound. To help with control of the non-real-time supply of sample buffers, such clients can use requestMediaDataWhenReady in order to specify a block that the layer should invoke whenever it's ready for sample buffers to be appended.
The value of readyForMoreMediaData will often change from false to true asynchronously, as previously supplied sample buffers are decoded and displayed.
This property is not key value observable.
(Read only property)

### 16.89.11 videoGravity as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A string defining how the video is displayed within an AVSampleBufferDisplayLayer bounds rect.
**Notes:** Options are AVLayerVideoGravityResizeAspect, AVLayerVideoGravityResizeAspectFill and AVLayerVideoGravityResize. AVLayerVideoGravityResizeAspect is default.
See AVFoundationMBS class for a description of these options.
(Read and Write property)

## 16.90 class AVSynchronizedLayerMBS

### 16.90.1 class AVSynchronizedLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVSynchronizedLayer a subclass of CALayer with layer timing that synchronizes with a specific AVPlayerItem.
**Notes:** You can create an arbitrary number of synchronized layers from the same AVPlayerItem object.

A synchronized layer is similar to a CATransformLayer object in that it doesn't display anything itself, it just confers state upon its layer subtree. AVSynchronizedLayer confers is timing state, synchronizing the timing of layers in its subtree with that of a player item.
Subclass of the CALayerMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.90.2 Methods

### 16.90.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.90.4 synchronizedLayerWithPlayerItem(playerItem as AVPlayerItemMBS) as AVSynchronizedLayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new synchronized layer with timing synchronized with a given player item.
**Notes:** playerItem: A player item.

Returns a new synchronized layer with timing synchronized with playerItem.

### 16.90.5 Properties

### 16.90.6 playerItem as AVPlayerItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The player item to which the timing of the layer is synchronized.
**Notes:** (Read and Write computed property)

## 16.91 class AVTextStyleRuleMBS

### 16.91.1 class AVTextStyleRuleMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** AVTextStyleRule represents a set of text styling attributes that can be applied to some or all of the text of legible media, such as subtitles and closed captions..

### 16.91.2 Methods

### 16.91.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9.

### 16.91.4 Constructor(textMarkupAttributes as dictionary)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates an instance of AVTextStyleRule with the specified text markup attributes.
**Notes:** textMarkupAttributes: A dictionary with keys representing text style attributes that are specifiable in text markup. Eligible keys are defined in <CoreMedia/CMTextMarkup.h>.
See also:

- 16.91.5 Constructor(textMarkupAttributes as dictionary, textSelector as string) 3670

### 16.91.5 Constructor(textMarkupAttributes as dictionary, textSelector as string)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates an instance of AVTextStyleRule with the specified text markup attributes and an identifier for the range or ranges of text to which the attributes should be applied.
**Notes:** textMarkupAttributes: A dictionary with keys representing text style attributes that are specifiable in text markup. Eligible keys are defined in <CoreMedia/CMTextMarkup.h>.
textSelector: An identifier for the range or ranges of text to which the attributes should be applied. Eligible identifiers are determined by the format and content of the legible media. A value of nil indicates that the textMarkupAttributes should be applied as default styles for all text unless overridden by content markup or other applicable text selectors.
Returns an instance of AVTextStyleRule
See also:

- 16.91.4 Constructor(textMarkupAttributes as dictionary) 3670

### 16.91.6 copy as AVTextStyleRuleMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the style rule.

### 16.91.7 textStyleRuleWithTextMarkupAttributes(textMarkupAttributes as Dictionary) as AVTextStyleRuleMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates an instance of AVTextStyleRule with the specified text markup attributes..
**Notes:** textMarkupAttributes: A dictionary with keys representing text style attributes that are specifiable in text markup. Eligible keys are defined in <CoreMedia/CMTextMarkup.h>.
Returns an instance of AVTextStyleRule
Equivalent to invoking textStyleRuleWithTextMarkupAttributes with a value of nil for textSelector.
See also:

- 16.91.8 textStyleRuleWithTextMarkupAttributes(textMarkupAttributes as Dictionary, textSelector as string) as AVTextStyleRuleMBS 3671

### 16.91.8 textStyleRuleWithTextMarkupAttributes(textMarkupAttributes as Dictionary, textSelector as string) as AVTextStyleRuleMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates an instance of AVTextStyleRule with the specified text markup attributes and an identifier for the range or ranges of text to which the attributes should be applied.
**Notes:** textMarkupAttributes: A dictionary with keys representing text style attributes that are specifiable in text markup. Eligible keys are defined in <CoreMedia/CMTextMarkup.h>.
textSelector: An identifier for the range or ranges of text to which the attributes should be applied. Eligible identifiers are determined by the format and content of the legible media. A value of nil indicates that the textMarkupAttributes should be applied as default styles for all text unless overridden by content markup or other applicable text selectors.
Returns an instance of AVTextStyleRule
See also:

- 16.91.7 textStyleRuleWithTextMarkupAttributes(textMarkupAttributes as Dictionary) as AVTextStyleRuleMBS 3671

### 16.91.9 Properties

### 16.91.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.91.11 textMarkupAttributes as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A dictionary with keys representing text style attributes that are specifiable in text markup.
**Notes:** Eligible keys and the expected types of their corresponding values are defined in <CoreMedia/CMTextMarkup.h>.
(Read only property)

### 16.91.12 textSelector as String

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A string that identifies the range or ranges of text to which the attributes should be applied.
**Notes:** A value of nil indicates that the textMarkupAttributes should be applied as default styles for all text unless overridden by content markup or other applicable text selectors.
The syntax of text selectors is determined by the format of the legible media. Eligible selectors may be determined by the content of the legible media (e.g. CSS selectors that are valid for a specific WebVTT document).
(Read only property)

## 16.92 class AVTimeCodeMBS

### 16.92.1 class AVTimeCodeMBS

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The class for a time code.
**Notes:** The data class used by AVAssetMBS.readTimeCodeObjects to store details on time codes.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr9

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 16.1, page 9: News

### 16.92.2 Methods

### 16.92.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** Private constructor.

### 16.92.4 Properties

### 16.92.5 duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The duration.
**Notes:** (Read only property)

### 16.92.6 frameNumber as Int64

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The frame number.
**Notes:** (Read only property)

### 16.92.7 frameQuanta as UInt32

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** Returns the frames/sec for timecode (eg. 30) OR frames/tick for counter mode
**Notes:** (Read only property)

### 16.92.8 presentationTimeStamp as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The earliest presentation timestamp.
**Notes:** (Read only property)

### 16.92.9 tcFlag as UInt32

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The time zone flags.
**Notes:** Can be combination of

| | |
|---|---|
| kDropFrame | 1 |
| k24HourMax | 2 |
| kNegTimesOK | 4 |

(Read only property)

### 16.92.10 timecode as String

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The timecode as formatted number.
**Notes:** Format is 2 digit hours, double colon, 2 digit minutes, double colon, 2 digit seconds, double colon, 2 digit frames.
e.g. "01:02:03:04"

(Read only property)

### 16.92.11 type as String

MBS AVFoundation Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** The type of timecode.
**Notes:** Can be tmcd for 32-bit time code or tc64 for 64-bit timecode.
(Read only property)

## 16.93 class AVTimedMetadataGroupMBS

### 16.93.1 class AVTimedMetadataGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVTimedMetadataGroup object to represent a collection of metadata items.
**Notes:** AV Foundation also provides a mutable subclass, AVMutableTimedMetadataGroup.

### 16.93.2 Methods

### 16.93.3 Constructor(items() as AVMetadataItemMBS, timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a metadata group initialized with given metadata items.
**Notes:** items: An array of AVMetadataItem objects.
timeRange: The time range of the metadata contained in items.

### 16.93.4 copy as AVTimedMetadataGroupMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.93.5 items as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The metadata items in the group. (read-only)
**Notes:** The array contains instances of AVMetadataItem.

### 16.93.6 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range of the metadata. (read-only)

### 16.93.7 Properties

### 16.93.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.94 class AVURLAssetMBS

### 16.94.1 class AVURLAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** AVURLAsset is a concrete subclass of AVAsset that you use to initialize an asset from an URL..
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim u as AVURLAssetMBS = AVURLAssetMBS.URLAssetWithFile(f)
dim a() as AVAssetTrackMBS = u.tracks

MsgBox str(UBound(a)+1)+" tracks."
```

**Notes:** Subclass of the AVAssetMBS class.

### 16.94.2 Methods

### 16.94.3 audiovisualMIMETypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the MIME types the AVURLAsset class understands.
**Example:**

```
MsgBox Join(AVURLAssetMBS.audiovisualMIMETypes, EndOfLine)
```

**Notes:** See also MimeTypeToFileExtensionMBS function.

### 16.94.4 audiovisualTypes as string()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array of the file types the AVURLAsset class understands.
**Example:**

```
MsgBox Join(AVURLAssetMBS.audiovisualTypes, EndOfLine)
```

### 16.94.5 compatibleTrackForCompositionTrack(compositionTrack as AVCompositionTrackMBS) as AVAssetTrackMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset track from which any time range can be inserted into a given composition track.
**Notes:** compositionTrack: The composition track for which a compatible AVAssetTrack object is requested.

Returns an asset track managed by the receiver from which any time range can be inserted into a given composition track.

You insert the track into using insertTimeRange (AVMutableCompositionTrack). This method is the logical complement of mutableTrackCompatibleWithTrack.

### 16.94.6 Constructor(File as folderitem, options as dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset for inspection of a resource referenced by a given file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim u as AVURLAssetMBS = new AVURLAssetMBS(f)
MsgBox str(U.duration.Seconds)+" seconds long"
```

**Notes:** file: A folderitem that references the container file to be represented by the asset.
options: A dictionary that contains options for the initialization of the asset.
See also:

- 16.94.7 Constructor(URL as string, options as dictionary = nil) 3679

### 16.94.7 Constructor(URL as string, options as dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes an asset for inspection of a resource referenced by a given URL.
**Notes:** URL: An URL that references the container file to be represented by the asset.
options: A dictionary that contains options for the initialization of the asset.
See also:

- 16.94.6 Constructor(File as folderitem, options as dictionary = nil) 3679

### 16.94.8 isPlayableExtendedMIMEType(extendedMIMEType as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether an asset is playable with the codec(s) and container type specified in a given extended MIME type.
**Notes:** Returns true if an asset is playable with the codec(s) and container type specified in extendedMIME-Type, otherwise false.
See also FileExtensionToMimeTypeMBS function.

### 16.94.9 URLAssetWithFile(File as folderitem, options as dictionary = nil) as AVURLAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset for inspection of a resource referenced by a given file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim u as AVURLAssetMBS = AVURLAssetMBS.URLAssetWithFile(f)

MsgBox str(u.duration.Seconds)+" seconds video."
```

**Notes:** File: A folderitem that references the container file to be represented by the asset.
options: A dictionary that contains options for the initialization of the asset.

Returns an asset initialized for inspection of a resource referenced by folderitem.

### 16.94.10 URLAssetWithURL(URL as string, options as dictionary = nil) as AVURLAssetMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an asset for inspection of a resource referenced by a given URL.
**Notes:** URL: An URL that references the container file to be represented by the asset.
options: A dictionary that contains options for the initialization of the asset.

Returns an asset initialized for inspection of a resource referenced by URL.

### 16.94.11 Properties

### 16.94.12 resourceLoader as AVAssetResourceLoaderMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The resource loader associated with the asset. (read-only)
**Notes:** During loading, the resource loader object may be asked to assist in the loading of a resource. For example, a resource that requires decryption might result in the resource loader being asked to provide the appropriate decryption keys. You can assign a delegate object to the resource loader object and use your delegate to intercept these requests and provide an appropriate response.
Available on Mac OS X 10.9 or later.
(Read only property)

### 16.94.13 URL as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The URL with which the asset was initialized. (read-only)
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim u as AVURLAssetMBS = new AVURLAssetMBS(f)
MsgBox u.URL
```

**Notes:** (Read only property)

## 16.95 class AVVideoCompositingMBS

### 16.95.1 class AVVideoCompositingMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVVideoCompositing protocol defines properties and methods that custom video compositors must implement.
**Notes:** For each AV Foundation object of class AVPlayerItem, AVAssetExportSession, AVAssetImageGenerator, or AVAssetReaderVideoCompositionOutput that has a non-nil value for its videoComposition property, and the value of the customVideoCompositorClass property of the AVVideoComposition is not nil, AV Foundation creates and uses an instance of that custom video compositor class to process the instructions contained in the AVVideoComposition.

The custom video compositor instance will be created when you assign videoComposition an instance of AVVideoComposition that's associated with a different custom video compositor class than the object was previously using.

When creating instances of custom video compositors, AV Foundation initializes them by calling init and then makes them available as the value of the customVideoCompositor property of the object to which it was assigned. You then can do any additional setup or configuration to the custom compositor.

Custom video compositor instances will then be retained by the AV Foundation object for as long as the value of its videoComposition property indicates that an instance of the same custom video compositor class should be used, even if the value is changed from one instance of AVVideoComposition to another instance that's associated with the same custom video compositor class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr3

### 16.95.2 Methods

### 16.95.3 cancelAllPendingVideoCompositionRequests

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Directs a custom video compositor object to cancel or finish all pending video composition requests.
**Notes:** Upon receiving this message, a custom video compositor must block until it has either cancelled all pending frame requests, and called the finishCancelledRequest method for each of them. If cancellation is not possible, the method must block until it has finished processing of all the frames and called the finishWithComposedVideoFrame method for each of them.
Available in OS X v10.9 and later.

### 16.95.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The private constructor.
**Notes:** Initializes an instance of the class that implements the video compositing protocol. (required)
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 16.95.5 renderContextChanged(newRenderContext as AVVideoCompositionRenderContextMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Invoked to notify the custom compositor that a composition will switch to a different render context. (required)
**Notes:** newRenderContext: The new render context that will be handling video composition.

Instances of classes implementing the AVVideoComposting protocol must implement this method to be notified when the AVVideoCompositionRenderContext instance handing a video composition changes. AVVideoCompositionRenderContext instances being immutable, such a change will occur every time there is a change in the video composition parameters.
Available in OS X v10.9 and later.

### 16.95.6 startVideoCompositionRequest(asyncVideoCompositionRequest as AVAsynchronousVideoCompositionRequestMBS)

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Directs a custom video compositor object to create a new pixel buffer composed asynchronously from a collection of sources. (required)
**Notes:** asyncVideoCompositionRequest: An instance of AVAsynchronousVideoCompositionRequest that provides context for the requested composition.

The custom compositor is expected to invoke, either subsequently or immediately, the asyncVideoCompositionRequest object's finishWithComposedVideoFrame or finishWithError methods.

If you intend to finish rendering the frame after handling of this message returns, you must retain asyncVideoCompositionRequest until after composition is finished.

Note that if the custom compositor's implementation of this method returns without finishing the composition immediately, it may be invoked again with another composition request before the prior request

is finished; in such cases the custom compositor should be prepared to manage multiple composition requests.

If the rendered frame is exactly the same as one of the source frames, with no letterboxing, pillboxing or cropping needed, then the appropriate source pixel buffer may be returned, after CFRetain has been called on it).
Available in OS X v10.9 and later.

### 16.95.7 Properties

### 16.95.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.95.9 requiredPixelBufferAttributesForRenderContext as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the pixel buffer attributes required by the video compositor for new buffers created for processing. (required) (read-only)
**Notes:** The property is required to provide a kCVPixelBufferPixelFormatTypeKey key in the dictionary, along with attributes for which the compositor needs specific values to work properly. Omitted attributes will be supplied by the composition engine to allow for the best performance. If the attribute kCVPixelBufferPixelFormatTypeKey key is not in the dictionary an exception will be raised. The value of the kCVPixelBufferPixelFormatTypeKey is an array of kCVPixelFormatType_* constants as defined in Pixel_Format_Types.

The value of requiredPixelBufferAttributesForRenderContext is retrieved prior to the creation of a new render context; the combination of the attributes in the returned value and the additional attributes supplied by the composition engine will be used in the creation of subsequent render context's pixelBuffers.

This property is queried once before any composition request is sent to the compositor. Changing required buffer attributes afterwards is not supported.
Available in OS X v10.9 and later.
(Read only property)

### 16.95.10 sourcePixelBufferAttributes as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the kinds of source frame pixel buffer attributes a video compositor can accept as input. (required) (read-only)
**Notes:** The property is required to provide a kCVPixelBufferPixelFormatTypeKey key in the dictionary, along with attributes for which the compositor needs specific values to work properly. Omitted attributes will be supplied by the composition engine to allow for the best performance. If the attribute kCVPixelBufferPixelFormatTypeKey key is not in the dictionary an exception will be raised. The value of the kCVPixelBufferPixelFormatTypeKey is an array of kCVPixelFormatType_* constants as defined in Pixel_Format_Types.

If the custom compositor is meant to be used with an AVVideoCompositionCoreAnimationTool created using the videoCompositionCoreAnimationToolWithAdditionalLayer:asTrackID: method, kCVPixelFormatType_32BGRA should be included as one of the supported pixel format types.

Missing attributes will be set by the composition engine to values allowing the best performance.

This property is queried once before any composition request is sent to the compositor. Changing source buffer attributes afterwards is not supported.
Available in OS X v10.9 and later.
(Read only property)

## 16.96 class AVVideoCompositionCoreAnimationToolMBS

### 16.96.1 class AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** You use an AVVideoCompositionCoreAnimationTool object to incorporate Core Animation in a video composition.
**Notes:** Any animations will be interpreted on the video's timeline, not real-time, so you should:

1. Set animations' beginTime property to 1e-100 rather than 0 (which CoreAnimation replaces with CACurrentMediaTime);
2. Set animations' removedOnCompletion property to false so they are not automatically removed.

### 16.96.2 Methods

### 16.96.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.96.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.

### 16.96.5 videoCompositionCoreAnimationToolWithAdditionalLayer(layer as CALayerMBS, trackID as Integer) as AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Add a Core Animation layer to the video composition.
**Notes:** layer: The Core Animation layer to add.
trackID: A track ID to identify the track.

trackID should not match any real trackID in the source.

Return a new animation tool for the layer.

You use this method to include a Core Animation layer as an individual track input in video composition. Video composition instructions should reference trackID where the rendered animation should be included.

### 16.96.6 videoCompositionCoreAnimationToolWithPostProcessingAsVideoLayer(videoLayer as CALayerMBS, animationLayer as CALayerMBS) as AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Composes the composited video frames with a Core Animation layer.
**Notes:** videoLayer: A video layer.
animationLayer: An animation layer.

Returns a new animation tool for the composition.
Place composited video frames in videoLayer and render animationLayer to produce the final frame.

### 16.96.7 videoCompositionCoreAnimationToolWithPostProcessingAsVideoLayers(videoLayers() as CALayerMBS, animationLayer as CALayerMBS) as AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Composes the composited video frames with the Core Animation layer.
**Notes:** videoLayers: An array containing the video layers
animationLayer: The animation layer.

Returns a new AVVideoCompositionCoreAnimationTool instance with the composited video frames and the rendered animation layer.

Duplicates the composited video frames in each videoLayer and renders animationLayer to produce the final frame. The videoLayers should be in animationLayer's sublayer tree.

The animationLayer should not come from, or be added to, another layer tree.
Available in OS X v10.9 and later.

### 16.96.8 Properties

### 16.96.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 16.97 class AVVideoCompositionInstructionMBS

## 16.97.1 class AVVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVVideoCompositionInstruction object represents an operation to be performed by a compositor.
**Notes:** An AVVideoComposition object maintains an array of instructions to perform its composition.

The is a specialty with the AVFoundation framework: There is a class and an interface with same name. The plugin only has one class for both.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr3

## 16.97.2 Methods

## 16.97.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

## 16.97.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 16.97.5 copy as AVVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

## 16.97.6 mutableCopy as AVMutableVideoCompositionInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the object.

### 16.97.7 requiredSourceTrackIDs as Integer()

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** An array of video track IDs required to compose frames for this instruction. (required) (read-only)
**Notes:** Available in OS X v10.9 and later.

### 16.97.8 Properties

### 16.97.9 containsTweening as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that returns whether the composition contains tweening. (required) (read-only)
**Notes:** If YES, rendering a frame from the same source buffers and the same composition instruction at two different compositionTime may yield different output frames. If NO, two such compositions will yield the same frame.

The media pipeline may be able to avoid some duplicate processing when this property is set to false.
Available in OS X v10.9 and later.
(Read only property)

### 16.97.10 enablePostProcessing as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether post processing is required for the video composition instruction. (read-only)
**Notes:** A value of false indicates that no post processing is required for the whole duration of the video composition instruction. The composition process is more efficient if the value is false.

The value is true by default.
(Read only property)

### 16.97.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.97.12 passthroughTrackID as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns the track ID if a single source frame should be displayed for the duration of the instruction. (required) (read-only)
**Notes:** If for the duration of the instruction, the video composition result is one of the source frames, this property returns the corresponding track ID. The compositor won't be run for the duration of the instruction and the proper source frame is used instead.

The dimensions, clean aperture and pixel aspect ratio of the source buffer are matched to the required values automatically.
Available in OS X v10.9 and later.
(Read only property)

### 16.97.13 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range during which the instruction is effective. (read-only)
**Notes:** If the time range is invalid, the video compositor will ignore it.
(Read only property)

## 16.98 class AVVideoCompositionLayerInstructionMBS

### 16.98.1 class AVVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVVideoCompositionLayerInstruction object represents the transform and opacity ramps to apply to a given track.

### 16.98.2 Methods

### 16.98.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.98.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The default constructor.

### 16.98.5 copy as AVVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.98.6 getCropRectangleRampForTime(time as CMTimeMBS, byref startCropRectangle as CGRectMBS, byref endCropRectangle as CGRectMBS, byref timeRange as CMTimeRangeMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Obtains the crop rectangle ramp that includes the specified time.
**Notes:** time: If a ramp with a time range that contains the specified time has been set, information about the effective ramp for that time is supplied. Otherwise, information about the first ramp that starts after the specified time is supplied.

startCropRectangle: A CGRect to receive the starting crop rectangle value for the crop rectangle ramp.
endCropRectangle: A CGRect to receive the ending crop rectangle value for the crop rectangle ramp.
timeRange: A CMTimeRange to receive the time range of the crop rectangle ramp.

Returns false will be returned if the specified time is beyond the duration of the last crop rectangle ramp that has been set.
Available in OS X v10.9 and later.

### 16.98.7 getOpacityRampForTime(time as CMTimeMBS, byref startOpacity as Double, byref endOpacity as Double, byref timeRange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Obtains the opacity ramp that includes a specified time.
**Notes:** time: If a ramp with a time range that contains the specified time has been set, information about the effective ramp for that time is supplied. Otherwise, information about the first ramp that starts after the specified time is supplied.
startOpacity: a float to receive the starting opacity value for the opacity ramp.
endOpacity: a float to receive the ending opacity value for the opacity ramp.
timeRange: a CMTimeRange to receive the time range of the opacity ramp.

Returns true if values are returned successfully, otherwise false. False is returned if time is beyond the duration of the last opacity ramp that has been set.

### 16.98.8 getTransformRampForTime(time as CMTimeMBS, byref startTransform as CGAffineTransformMBS, byref endOpacity as CGAffineTransformMBS, byref timeRange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Obtains the transform ramp that includes a specified time.
**Notes:** time
If a ramp with a time range that contains the specified time has been set, information about the effective ramp for that time is supplied. Otherwise, information about the first ramp that starts after the specified time is supplied.
startTransform: A float to receive the starting transform value for the transform ramp.
endTransform: A float to receive the ending transform value for the transform ramp.
timeRange: A CMTimeRange to receive the time range of the transform ramp.
Returns true if values are returned successfully, otherwise false. False is returned if time is beyond the duration of the last transform ramp that has been set.

### 16.98.9 mutableCopy as AVMutableVideoCompositionLayerInstructionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the object.

### 16.98.10 trackID as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The trackID of the source track to which the compositor will apply the instruction. (read-only)

### 16.98.11 Properties

### 16.98.12 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.99 class AVVideoCompositionMBS

### 16.99.1 class AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** An AVVideoComposition object represents an immutable video composition.
**Notes:** The AVFoundation framework also provides a mutable subclass, AVMutableVideoComposition, that you can use to create new videos.

### 16.99.2 Methods

### 16.99.3 animationTool as AVVideoCompositionCoreAnimationToolMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A video composition tool to use with Core Animation in offline rendering. (read-only)
**Notes:** This attribute may be nil.

You set an animation tool if you are using the composition in conjunction with AVAssetExportSession for offline rendering, rather than with AVPlayer.

### 16.99.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer.

### 16.99.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 16.99.6 copy as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.99.7 frameDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The interval for which the video composition should render composed video frames. (read-only)
**Notes:** This property only applies when the composition is enabled.

### 16.99.8 instructions as AVVideoCompositionInstructionMBS()

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The video composition instructions. (read-only)
**Notes:** The array contains of instances of AVVideoCompositionInstruction.

For the first instruction in the array, timeRange.start must be less than or equal to the earliest time for which playback or other processing will be attempted (typically kCMTimeZero). For subsequent instructions, timeRange.start must be equal to the prior instruction's end time. The end time of the last instruction must be greater than or equal to the latest time for which playback or other processing will be attempted (typically be the duration of the asset with which the instance of AVVideoComposition is associated).

### 16.99.9 isValidForAsset(asset as AVAssetMBS, timerange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the time ranges of the composition's instructions conform to validation requirements.
**Notes:** asset: An AVAsset object, if you wish to validate the time ranges of the instructions against the duration of the asset and the track IDs of the layer instructions against the asset's tracks. Pass nil to skip that validation.
timeRange: A time range.
Only those instructions with time ranges that overlap with this time range will be validated. To validate all instructions that may be used for playback or other processing, regardless of time range, pass CMTimeRangeMake(kCMTimeZero, kCMTimePositiveInfinity).

Returns true if the time ranges of the composition's instructions conform to validation requirements, otherwise false.

This method may call events videoCompositionShouldContinueValidatingAfterFindingInvalidValueForKey,

videoCompositionShouldContinueValidatingAfterFindingInvalidTrackIDInInstruction, videoCompositionShouldContinueValidatingAfterFindingInvalidTimeRangeInInstruction or videoCompositionShouldContinueValidatingAfterFindingEmptyTimeRange on AVFoundationMBS class.

In the course of validation, the receiver will invoke its events (if there is one) with reference to any trouble spots in the video composition.

This method raises an exception if the event modifies the receiver's array of instructions or the array of layer instructions of any AVVideoCompositionInstruction object contained therein during validation.

### 16.99.10 mutableCopy as AVMutableVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the object.

### 16.99.11 renderSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The size at which the video composition should render. (read-only)
**Notes:** This property only applies when the composition is enabled.

### 16.99.12 videoCompositionWithPropertiesOfAsset(asset as AVAssetMBS) as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates and returns a video composition object configured to present the video tracks of the specified asset.
**Notes:** asset: The asset whose configuration matches the intended use of the video composition.

Returns a new video composition object.

This method creates the video composition object and configures it with the values and instructions suitable for presenting the video tracks of the specified asset. The returned object contains instructions that respect the spatial properties and time ranges of the specified asset's video tracks. It also configures the object properties in the following way:

- The value of the frameDuration property is set to a value short enough to accommodate the greatest nominal frame rate value among the asset's video tracks, as indicated by the nominalFrameRate property of each track. If all of the asset tracks have a nominal frame rate of 0, a frame rate of 30 frames per second is used, with the frame duration set accordingly.
- The value assigned to the renderSize property depends on whether the asset is an AVComposition object. If it is, the value is set to the value of the naturalSize property of the composition. If it is not, the value is set to a value that encompasses all of the asset's video tracks.
- The value of the renderScale property is set to 1.0.
- The value of the animationTool property is set to nil.

Available in OS X v10.9 and later.

### 16.99.13 Properties

### 16.99.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 16.100 class AVVideoCompositionRenderContextMBS

## 16.100.1 class AVVideoCompositionRenderContextMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The AVVideoCompositionRenderContext class defines the context within which custom compositors render new output pixels buffers.
**Notes:** An instance of AVVideoCompositionRenderContext provides size and scaling information and offers a service for efficiently providing pixel buffers from a managed pool of buffers.
Available in OS X v10.9 and later.

## 16.100.2 Methods

## 16.100.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 or later.

## 16.100.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The constructor.

## 16.100.5 newPixelBuffer as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Returns a pixel buffer to use for rendering.
**Notes:** The buffer's kCVImageBufferCleanApertureKey and kCVImageBufferPixelAspectRatioKey attachments are set to match the current composition processor properties.
You are responsible for calling CVBufferRelease on the pixel buffer.
Available in OS X v10.9 and later.

### 16.100.6 Properties

### 16.100.7 edgeWidths as AVEdgeWidthsMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The thickness of the edge processing region on the left, top, right and bottom edges, in pixels. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.100.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.100.9 highQualityRendering as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The rendering quality to use. (read-only)
**Notes:** Specifies that the custom compositor should use higher quality, potentially slower algorithms.
Generally this property is true for non-real-time use cases.
Available in OS X v10.9 and later.
(Read only property)

### 16.100.10 pixelAspectRatio as AVPixelAspectRatioMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The pixel aspect ratio for rendered frames. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.100.11 renderScale as Double

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** A scaling ratio that is applied when rendering frames. (read-only)

**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.100.12 renderTransform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Transform to apply to the source image (read-only)
**Notes:** The transform to apply to the source image incorporating the renderScale, pixelAspectRatio, and edgeWidths.
The coordinate system origin is the top left corner of the buffer.
Available in OS X v10.9 and later.
(Read only property)

### 16.100.13 size as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The width and height for rendering frames. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 16.100.14 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The video composition being rendered.
**Notes:** Available in OS X v10.9 and later.
(Read only property)

## 16.101 class CMFormatDescriptionMBS

### 16.101.1 class CMFormatDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class for a format description.
**Notes:** CMFormatDescriptions are immutable Core Foundation objects that describe media data of various types, including audio, video, and muxed media data. There are two types of API: media-type-agnostic APIs (supported by all CMFormatDescriptions) and media-type-specific APIs. The media-type-agnostic APIs are prefixed with CMFormatDescription, and the media-type-specific APIs are prefixed with CMAudioFormat-Description CMVideoFormatDescription, and so on.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 16.101.2 Methods

### 16.101.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.101.4 Equal(other as CMFormatDescriptionMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Checks if two descriptions are equal.

### 16.101.5 Extensions as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Queries extensions to the description.

### 16.101.6 MediaSubType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Queries media sub type.

### 16.101.7 MediaType as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Queries media type.

### 16.101.8 Name as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Queries the name of this format description.

### 16.101.9 Properties

### 16.101.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 16.102 class CMSampleBufferMBS

### 16.102.1 class CMSampleBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** CMSampleBuffers are CF objects containing zero or more compressed (or uncompressed) samples of a particular media type (audio, video, muxed, etc), that are used to move media sample data through the media system.
**Notes:** A CMSampleBuffer can contain a CMBlockBuffer of one or more media samples or a CVImageBuffer, a reference to the format description for the stream of CMSampleBuffers, size and timing information for each of the contained media samples, and both buffer-level and sample-level attachments. The buffer-level attachments of a CMSampleBuffer are distinct from the attachments of its contained CMBlockBuffer. An example of a sample-level attachment is an annotation about video frame dependencies (eg. "droppable", "other frames depend on me", "I depend on other frames", etc). Each sample (video frame) in the CMSampleBuffer would need its own attachment in this case. Another sample-level attachment example is SMPTE timecode acquired during capture. To get and set a CMSampleBuffer's buffer-level attachments, use the APIs in in CMAttachmentBearer.h (CMGetAttachment et al).
It is possible for a CMSampleBuffer to describe samples it does not yet contain. For example, some media services may have access to sample size, timing and format information before the data is read. Such services may create CMSampleBuffers with that information and insert them into queues early, and attach (or fill) the CMBlockBuffers of media data later, when the data becomes ready. To this end, CMSampleBuffers have the concept of data-readiness, which can be tested, set, forced to become ready "now", etc. It is also possible for a CMSampleBuffer to contain nothing but a special buffer-level attachment that describes a media stream event (eg. "discontinuity: drain and reset decoder before processing the next CMSampleBuffer"). Such a special attachment can also be attached to regular CMSampleBuffers (ie. that contain media sample data), and if so, the event it describes is defined to occur after the samples in that CMSampleBuffer.

The MBS Plugin implements a subset of what's available. If you need more, please do not hesitate to contact us.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr3
- AVCaptureVideoDataOutput improvements
- MBS Xojo / Real Studio Plugins, version 15.4pr2
- MBS Xojo / Real Studio Plugins, version 14.5pr2

### 16.102.2 Methods

### 16.102.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.102.4 Copy as CMSampleBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 16.102.5 CopySampleBufferForRange(pos as Integer, len as Integer) as CMSampleBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a CMSampleBuffer containing a range of samples from an existing CMSampleBuffer.
**Notes:** Samples containing non-interleaved audio are currently not supported.

### 16.102.6 Invalidate

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Makes the sample buffer invalid, calling any installed invalidation callback.
**Notes:** An invalid sample buffer cannot be used – all accessors will return kCMSampleBufferError_Invalidated.
It is not a good idea to do this to a sample buffer that another module may be accessing concurrently.
Example of use: the invalidation callback could cancel pending I/O.

### 16.102.7 MakeDataReady

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Makes a CMSampleBuffer's data ready, by calling the client's MakeDataReadyCallback.
**Notes:** The CMSampleBufferMakeDataReadyCallback is passed in by the client during creation. It must return 0 if successful, and in that case, CMSampleBufferMakeDataReady will set the data readiness of the CMSampleBuffer to true. Example of usage: when it is time to actually use the data. Example of callback routine: a routine to force a scheduled read to complete. If the CMSampleBuffer is not ready, and there is no CMSampleBufferMakeDataReadyCallback to call, kCMSampleBufferError_BufferNotReady will be returned. Similarly, if the CMSampleBuffer is not ready, and the CMSampleBufferMakeDataReadyCallback fails and returns an error, kCMSampleBufferError_BufferNotReady will be returned.

### 16.102.8 SampleSize(index as Integer) as UInt64

MBS AVFoundation Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Returns the size in bytes of a specified sample in a CMSampleBuffer.
**Notes:** Size in bytes of the specified sample in the CMSampleBuffer.
If the sample index is not in the range 0 .. numSamples-1, a size of 0 will be returned. If there are no sample sizes in this CMSampleBuffer, a size of 0 will be returned. This will be true, for example, if the samples in the buffer are non-contiguous (eg. non-interleaved audio, where the channel values for a single sample are scattered through the buffer), or if this CMSampleBuffer contains a CVImageBuffer.

### 16.102.9 SetDataReady

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Marks a CMSampleBuffer's data as "ready".
**Notes:** There is no way to undo this operation. The only way to get an "unready" CMSampleBuffer is to call CMSampleBufferCreate with the dataReady parameter set to false. Example of usage: in a read completion routine.

### 16.102.10 Properties

### 16.102.11 DataIsReady as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns whether or not a CMSampleBuffer's data is ready.
**Notes:** Whether or not the CMSampleBuffer's data is ready. True is returned for special marker buffers, even though they have no data. False is returned if there is an error.
(Read only property)

### 16.102.12 DecodeTimeStamp as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the numerically earliest decode timestamp of all the samples in a CMSampleBuffer.
**Notes:** The returned decode timestamp is always the decode timestamp of the first sample in the buffer, since even out-of-presentation-order samples are expected to be in decode order in the buffer.
Numerically earliest sample decode timestamp in the CMSampleBuffer. kCMTimeInvalid is returned if there is an error.
(Read only property)

### 16.102.13 Duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the total duration of a CMSampleBuffer.
**Notes:** If the buffer contains out-of-presentation-order samples, any gaps in the presentation timeline are not represented in the returned duration.
The returned duration is simply the sum of all the individual sample durations.
Returns the duration of the CMSampleBuffer. kCMTimeInvalid is returned if there is an error.
(Read only property)

### 16.102.14 FormatDescription as CMFormatDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the format description of the samples in a CMSampleBuffer.
**Notes:** Nil is returned if there is an error.
(Read only property)

### 16.102.15 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 16.102.16 ImageBuffer as CVImageBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a CMSampleBuffer's CVImageBuffer of media data.
**Notes:** The result will be nil if the CMSampleBuffer does not contain a CVImageBuffer, if the CMSampleBuffer contains a CMBlockBuffer, or if there is some other error.
(Read only property)

### 16.102.17 IsValid as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Queries whether a sample buffer is still valid.
**Notes:** Returns false if buffer is nil or Invalidate was called, true otherwise.
Does not perform any kind of exhaustive validation of the sample buffer.

(Read only property)

### 16.102.18 Lasterror as Integer

MBS AVFoundation Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error code constants.
Looking with debugger on properties of this class will change the lasterror code!
(Read and Write property)

### 16.102.19 NumberOfSamples as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the number of media samples in a CMSampleBuffer.
**Notes:** The number of media samples in the CMSampleBuffer. 0 is returned if there is an error.
(Read only property)

### 16.102.20 OutputDecodeTimeStamp as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the output decode timestamp of the CMSampleBuffer.
**Notes:** For consistency with OutputPresentationTimeStamp, this is calculated as: OutputPresentationTimeStamp + ((DecodeTimeStamp - PresentationTimeStamp) / SpeedMultiplier).
CMInvalidTime is returned if there is an error.
(Read only property)

### 16.102.21 OutputDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the output duration of a CMSampleBuffer.
**Notes:** The OutputDuration is the duration minus any trimmed duration, all divided by the SpeedMultiplier: (Duration - TrimDurationAtStart - TrimDurationAtEnd) / SpeedMultiplier
Returns the output duration of the CMSampleBuffer. kCMTimeInvalid is returned if there is an error.
(Read only property)

### 16.102.22 OutputPresentationTimeStamp as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the output presentation timestamp of the CMSampleBuffer.
**Notes:** The output presentation timestamp is the time at which the decoded, trimmed, stretched and possibly reversed samples should commence being presented.
If CMSampleBufferSetOutputPresentationTimeStamp has been called to explicitly set the output PTS, CMSampleBufferGetOutputPresentationTimeStamp returns it.
If not, CMSampleBufferGetOutputPresentationTimeStamp calculates its result as (PresentationTimeStamp + TrimDurationAtStart) unless kCMSampleBufferAttachmentKey_Reverse is kCFBooleanTrue, in which case it calculates the result as (PresentationTimeStamp + Duration - TrimDurationAtEnd).
These are generally correct for un-stretched, un-shifted playback.
For general forward playback in a scaled edit, the OutputPresentationTimeStamp should be set to:
((PresentationTimeStamp + TrimDurationAtStart - EditStartMediaTime) / EditSpeedMultiplier) + EditStartTrackTime.
For general reversed playback:
((PresentationTimeStamp + Duration - TrimDurationAtEnd - EditStartMediaTime) / EditSpeedMultiplier) + EditStartTrackTime.
Returns kCMTimeInvalid is returned if there is an error.
(Read and Write property)

### 16.102.23 PresentationTimeStamp as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the numerically earliest presentation timestamp of all the samples in a CMSampleBuffer.
**Notes:** For in-presentation-order samples, this is the presentation timestamp of the first sample.
For out-of-presentation-order samples, this is the presentation timestamp of the sample that will be presented first, which is not necessarily the first sample in the buffer.
Returns numerically earliest sample presentation timestamp in the CMSampleBuffer. kCMTimeInvalid is returned if there is an error.
(Read only property)

### 16.102.24 Text as String

MBS AVFoundation Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** For text samples, provides the text.
**Notes:** (Read only property)

### 16.102.25 TotalSampleSize as UInt64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the total size in bytes of sample data in a CMSampleBuffer.
**Notes:** If there are no sample sizes in this CMSampleBuffer, a size of 0 will be returned.
(Read only property)

### 16.102.26 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kAllocationFailed | -12730 | An allocation failed. |
| kAlreadyHasDataBuffer | -12732 | Attempt was made to set a dataBuffer on a CMSampleBuffer that already ha one. |
| kArrayTooSmall | -12737 | Output array was not large enough for the array being requested. |
| kBufferHasNoSampleSizes | -12735 | Attempt to get sample size information when there was none. |
| kBufferHasNoSampleTimingInfo | -12736 | Attempt to get sample timing information when there was none. |
| kBufferNotReady | -12733 | Buffer could not be made ready. |
| kCannotSubdivide | -12739 | Sample buffer does not contain sample sizes. This can happen when the sample in the buffer are non-contiguous (eg. non-interleaved audio, where the channe values for a single sample are scattered through the buffer). |
| kInvalidated | -12744 | the sample buffer was invalidated. |
| kInvalidEntryCount | -12738 | Timing info or size array entry count was not 0, 1, or numSamples. |
| kInvalidMediaFormat | -12743 | The format of the given media does not match the given format descriptio (eg. a format description paired with a CVImageBuffer that fails CMVideo FormatDescriptionMatchesImageBuffer). |
| kInvalidMediaTypeForOperation | -12741 | The media type specified by a format description is not valid for the give operation (eg. a CMSampleBuffer with a non-audio format description passe to GetAudioStreamPacketDescriptions). |
| kInvalidSampleData | -12742 | Buffer contains bad data. Only returned by CMSampleBuffer functions tha inspect its sample data. |
| kRequiredParameterMissing | -12731 | Nil or 0 was passed for a required parameter. |
| kSampleIndexOutOfRange | -12734 | Sample index was not between 0 and numSamples-1, inclusive. |
| kSampleTimingInfoInvalid | -12740 | Buffer unexpectedly contains a non-numeric sample timing info. |

# 16.103 class CMTimeMappingMBS

## 16.103.1 class CMTimeMappingMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A class to specify the mapping of a segment of one time line into another.
**Notes:** A CMTimeMapping specifies the mapping of a segment of one time line (called the source) into another time line (called the target). When used for movie edit lists, the source time line is the media and the target time line is the track or movie.

## 16.103.2 Methods

## 16.103.3 Constructor(source as CMTimeRangeMBS, target as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes the time mapping object.

## 16.103.4 Properties

## 16.103.5 Source as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range on the source time line.
**Notes:** For an empty edit, source.start is an invalid CMTime, in which case source.duration is ignored. Otherwise, source.start is the starting time within the source, and source.duration is the duration of the source timeline to be mapped to the target time range.
(Read and Write property)

## 16.103.6 Target as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The time range on the target time line.
**Notes:** If target.duration and source.duration are different, then the source segment should be played at the rate source.duration /target.duration to fit.
(Read and Write property)

## 16.104 class CMTimeMBS

### 16.104.1 class CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** CMTime is a class representing times (either timestamps or durations).
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox t.Description
```

**Notes:** A CMTime is represented as a rational number, with a numerator (an int64 value), and a denominator (an int32 timescale). Conceptually, the timescale specifies the fraction of a second each unit in the numerator occupies. Thus if the timescale is 4, each unit represents a quarter of a second; if the timescale is 10, each unit represents a tenth of a second, and so on. In addition to a simple time value, a CMTime can represent non-numeric values: +infinity, -infinity, and indefinite. Using a flag CMTime indicates whether the time been rounded at some point.

CMTimes contain an epoch number, which is usually set to 0, but can be used to distinguish unrelated timelines: for example, it could be incremented each time through a presentation loop, to differentiate between time N in loop 0 from time N in loop 1.

Additional functions for managing dates and times are described in Time Utilities Reference. Note that CMTime is designed for media timelines whereas functions in Time Utilities Reference are designed for working with wall-clock time in Core Foundation framework; see also AV Foundation Constants Reference.
**Blog Entries**

- Automated video editing with Xojo

**Xojo Developer Magazine**

- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 16.104.2 Methods

### 16.104.3 AbsoluteValue as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the absolute value of a CMTime.
**Notes:** Same as the argument time, with sign inverted if negative.

### 16.104.4 Add(other as CMTimeMBS) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the sum of two CMTimes.
**Notes:** self: CMTime to be added.
other: Another CMTime to be added.
Returns the sum of the two CMTimes (addend1 + addend2).

If the operands both have the same timescale, the timescale of the result will be the same as the operands' timescale. If the operands have different timescales, the timescale of the result will be the least common multiple of the operands' timescales. If that LCM timescale is greater than kCMTimeMaxTimescale, the result timescale will be kCMTimeMaxTimescale, and default rounding will be applied when converting the result to this timescale. If the result value overflows, the result timescale will be repeatedly halved until the result value no longer overflows. Again, default rounding will be applied when converting the result to this timescale. If the result value still overflows when timescale == 1, then the result will be either positive or negative infinity, depending on the direction of the overflow.

If any rounding occurs for any reason, the result's kCMTimeFlags_HasBeenRounded flag will be set. This flag will also be set if either of the operands has kCMTimeFlags_HasBeenRounded set. If either of the operands is invalid, the result will be invalid. If the operands are valid, but just one operand is infinite, the result will be similarly infinite. If the operands are valid, and both are infinite, the results will be as follows:

+infinity + +infinity == +infinity
-infinity + -infinity == -infinity

+infinity + -infinity == invalid

-infinity + +infinity == invalid

If the operands are valid, not infinite, and either or both is indefinite, the result will be indefinite. If the two operands are numeric (i.e.. valid, not infinite, not indefinite), but have different nonzero epochs, the result will be invalid. If they have the same nonzero epoch, the result will have epoch zero (a duration). Times in different epochs cannot be added or subtracted, because epoch length is unknown. Times in epoch zero are considered to be durations and can be added to times in other epochs. Times in different epochs can be compared, however, because numerically greater epochs always occur after numerically lesser epochs.

### 16.104.5 Compare(other as CMTimeMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the numerical relationship of two CMTimes.
**Notes:** self: First CMTime in comparison.

other: Second CMTime in comparison.

Returns the numerical relationship of the two CMTimes.

-1 is returned if time1 is less than time2.
1 is returned if time1 is greater than time2.
0 is returned if time1 and time2 are equal.

If the two CMTimes are numeric (i.e.. not invalid, infinite, or indefinite), and have different epochs, it is considered that times in numerically larger epochs are always greater than times in numerically smaller epochs. Since this routine will be used to sort lists by time, it needs to give all values (even invalid and indefinite ones) a strict ordering to guarantee that sort algorithms terminate safely. The order chosen is somewhat arbitrary: -infinity <all finite values <indefinite <+infinity <invalid

Invalid CMTimes are considered to be equal to other invalid CMTimes, and greater than any other CMTime. Positive infinity is considered to be less than any invalid CMTime, equal to itself, and greater than any other CMTime. An indefinite CMTime is considered to be less than any invalid CMTime, less than positive infinity, equal to itself, and greater than any other CMTime. Negative infinity is considered to be equal to itself, and less than any other CMTime.

### 16.104.6 Constructor(Value as Int64, Timescale as Integer, Flags as Integer = 1, Epoch as Int64 = 0)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a new time object with the given field values.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox t.Description
```

### 16.104.7 ConvertScale(newTimescale as Integer, RoundingMethod as Integer = 1) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a new CMTime containing the source CMTime converted to a new timescale (rounding as requested).
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.MakeWithSeconds(123.4, 600)
dim u as CMTimeMBS = t.ConvertScale(300, t.kCMTimeRoundingMethod_Default)
```

```
MsgBox t.Description+EndOfLine+u.Description
```

**Notes:** self: Source CMTime.
newTimescale: The timescale to which the source CMTime is converted.
RoundingMethod: The requested rounding method.

Returns the converted CMTime.
If the value needs to be rounded, the kCMTimeFlags_HasBeenRounded flag will be set. See constants for a discussion of the various rounding methods available. If the source time is non-numeric (i.e.. infinite, indefinite, invalid), the result will be similarly non-numeric.

### 16.104.8 Description as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a description of the time.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox t.Description
```

### 16.104.9 kCMTimeIndefinite as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Predefined time.
**Notes:** Use this constant to initialize an indefinite CMTime (for example, the duration of a live broadcast). Do not test against this using (time = kCMTimeIndefinite), there are many CMTimes other than this that are also indefinite. Use time.IsIndefinite instead.

### 16.104.10 kCMTimeInvalid as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Predefined time.
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.kCMTimeInvalid
MsgBox "Invalid: "+str(t.IsInvalid)
```

**Notes:** Use this constant to initialize an invalid CMTime.
All fields are 0. Do not test against this using (time = kCMTimeInvalid), there are many CMTimes other than this that are also invalid. Use time.IsInvalid instead.

### 16.104.11 kCMTimeNegativeInfinity as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Predefined time.
**Notes:** Use this constant to initialize a CMTime to -infinity.
Do not test against this using (time = kCMTimeNegativeInfinity), there are many CMTimes other than this that are also -infinity. Use time.IsNegativeInfinity instead.

### 16.104.12 kCMTimePositiveInfinity as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Predefined time.
**Notes:** Use this constant to initialize a CMTime to +infinity.
Do not test against this using (time = kCMTimePositiveInfinity), there are many CMTimes other than this that are also +infinity. Use time.IsPositiveInfinity instead.

### 16.104.13 kCMTimeZero as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Predefined time.
**Notes:** Use this constant to initialize a CMTime to 0.
Do not test against this using (time = kCMTimeZero), there are many CMTimes other than this that are also 0. Use time.Compare(kCMTimeZero) instead.

### 16.104.14 Make(value as Int64, timescale as Integer) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Makes a valid CMTime with value and timescale.
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.Make(1234, 600)
MsgBox t.Description
```

**Notes:** Epoch is implied to be 0.

value: Initializes the value field of the resulting CMTime.
timescale: Initializes the timescale field of the resulting CMTime.

Returns the resulting CMTime

### 16.104.15 MakeWithEpoch(value as Int64, timescale as Integer, Epoch as Int64) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Makes a valid CMTime with value, scale and epoch.
**Notes:** value: Initializes the value field of the resulting CMTime.
timescale: Initializes the scale field of the resulting CMTime.
epoch: Initializes the epoch field of the resulting CMTime.

Returns the resulting CMTime.

### 16.104.16 MakeWithSeconds(seconds as Double, preferredTimeScale as Int32 = 600) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Makes a CMTime from a Float number of seconds, and a preferred timescale.
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.MakeWithSeconds(123.4, 600)
MsgBox t.Description
```

**Notes:** seconds: Initializes the seconds field of the resulting CMTime.
preferredTimeScale: Initializes the preferredTimeScale field of the resulting CMTime.

Returns the resulting CMTime.

The epoch of the result will be zero. If preferredTimeScale is <= 0, the result will be an invalid CMTime. If the preferred timescale will cause an overflow, the timescale will be halved repeatedly until the overflow goes away, or the timescale is 1. If it still overflows at that point, the result will be +/- infinity. The kCMTimeFlags_HasBeenRounded flag will be set if the result, when converted back to seconds, is not exactly equal to the original seconds value.

### 16.104.17 Maximum(t1 as CMTimeMBS, t2 as CMTimeMBS) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the greater of two CMTimes.
**Example:**

```
dim t1 as new CMTimeMBS(1200, 600)
dim t2 as new CMTimeMBS(70, 30)

dim mi as CMTimeMBS = CMTimeMBS.Minimum(t1,t2)
dim ma as CMTimeMBS = CMTimeMBS.Maximum(t1,t2)

MsgBox "with "+t1.Description+_
" and "+t2.description+_
" the minimum is "+mi.Description+_
" and maximum is "+ma.Description
```

### 16.104.18 Minimum(t1 as CMTimeMBS, t2 as CMTimeMBS) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the lesser of two CMTimes.
**Example:**

```
dim t1 as new CMTimeMBS(1200, 600)
dim t2 as new CMTimeMBS(70, 30)

dim mi as CMTimeMBS = CMTimeMBS.Minimum(t1,t2)
dim ma as CMTimeMBS = CMTimeMBS.Maximum(t1,t2)

MsgBox "with "+t1.Description+_
" and "+t2.description+_
" the minimum is "+mi.Description+_
" and maximum is "+ma.Description
```

### 16.104.19 Multiply(multiplier as Integer) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the product of a CMTime and a 32-bit integer.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox str(T.Seconds)+" seconds"
t = t.Multiply(2)
MsgBox str(T.Seconds)+" seconds"
```

**Notes:** self: The CMTime that will be multiplied.
multiplier: A 32-bit integer. CMTime time and multiplier will be multiplied.

Returns the product of the CMTime and the 32-bit integer.

The result will have the same timescale as the CMTime operand. If the result value overflows, the result timescale will be repeatedly halved until the result value no longer overflows. Again, default rounding will be applied when converting the result to this timescale. If the result value still overflows when timescale == 1, then the result will be either positive or negative infinity, depending on the direction of the overflow. If any rounding occurs for any reason, the result's kCMTimeFlags_HasBeenRounded flag will be set. This flag will also be set if the CMTime operand has kCMTimeFlags_HasBeenRounded set. If the CMTime operand is invalid, the result will be invalid. If the CMTime operand is valid, but infinite, the result will be infinite, and of an appropriate sign, give the signs of both operands. If the CMTime operand is valid, but indefinite, the result will be indefinite.

### 16.104.20 MultiplyByFloat(multiplier as Double) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the product of a CMTime and a 64-bit float.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox str(T.Seconds)+" seconds"
t = t.MultiplyByFloat(2.0)
MsgBox str(T.Seconds)+" seconds"
```

**Notes:** time: The CMTime that will be multiplied.
multiplier: A 64-bit float. CMTime time and multiplier will be multiplied.

Returns the product of the CMTime and the 64-bit float.

The result will initially have the same timescale as the CMTime operand. If the result timescale is less

than 65536, it will be repeatedly doubled until it is at least 65536. If the result value overflows, the result timescale will be repeatedly halved until the result value no longer overflows. Again, default rounding will be applied when converting the result to this timescale. If the result value still overflows when timescale == 1, then the result will be either positive or negative infinity, depending on the direction of the overflow. If any rounding occurs for any reason, the result's kCMTimeFlags_HasBeenRounded flag will be set. This flag will also be set if the CMTime operand has kCMTimeFlags_HasBeenRounded set. If the CMTime operand is invalid, the result will be invalid. If the CMTime operand is valid, but infinite, the result will be infinite, and of an appropriate sign, given the signs of both operands. If the CMTime operand is valid, but indefinite, the result will be indefinite.

### 16.104.21 Show

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prints a description of the CMTime.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
t.show
```

### 16.104.22 Subtract(other as CMTimeMBS) as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the difference of two CMTimes.
**Notes:** self: The CMTime from which the subtrahend will be subtracted.
other: The CMTime that will be subtracted from the minuend.

Returns the difference of the two CMTimes (minuend - subtrahend).

If the operands both have the same timescale, the timescale of the result will be the same as the operands' timescale. If the operands have different timescales, the timescale of the result will be the least common multiple of the operands' timescales. If that LCM timescale is greater than kCMTimeMaxTimescale, the result timescale will be kCMTimeMaxTimescale, and default rounding will be applied when converting the result to this timescale.

If the result value overflows, the result timescale will be repeatedly halved until the result value no longer overflows. Again, default rounding will be applied when converting the result to this timescale. If the result value still overflows when timescale = 1, then the result will be either positive or negative infinity, depending on the direction of the overflow.

If any rounding occurs for any reason, the result's kCMTimeFlags_HasBeenRounded flag will be set. This

flag will also be set if either of the operands has kCMTimeFlags_HasBeenRounded set. If either of the operands is invalid, the result will be invalid. If the operands are valid, but just one operand is infinite, the result will be similarly infinite. If the operands are valid, and both are infinite, the results will be as follows:

+infinity - +infinity == invalid
-infinity - -infinity == invalid
+infinity - -infinity == +infinity
-infinity - +infinity == -infinity

If the operands are valid, not infinite, and either or both is indefinite, the result will be indefinite. If the two operands are numeric (i.e.. valid, not infinite, not indefinite), but have different nonzero epochs, the result will be invalid. If they have the same nonzero epoch, the result will have epoch zero (a duration). Times in different epochs cannot be added or subtracted, because epoch length is unknown. Times in epoch zero are considered to be durations and can be subtracted from times in other epochs. Times in different epochs can be compared, however, because numerically greater epochs always occur after numerically lesser epochs.

### 16.104.23 Properties

### 16.104.24 Epoch as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The epoch of the CMTime.
**Notes:** You use the epoch to differentiate between equal timestamps that are actually different because of looping, multi-item sequencing, and so on.
The epoch is used during comparison: greater epochs happen after lesser ones. Addition or subtraction is only possible within a single epoch, however, since the epoch length may be unknown or variable.

The epoch is typically 0, but you might use a different value, for example, in a loop.
(Read and Write property)

### 16.104.25 Flags as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A bitfield representing the flags set for the CMTime.
**Notes:** For example, kCMTimeFlags_Valid. See constants for possible values.
(Read and Write property)

### 16.104.26 HasBeenRounded as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time has been rounded.
**Notes:** Returns true if the CMTime has been rounded, otherwise false (the time is completely accurate).
(Read only property)

### 16.104.27 IsIndefinite as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns whether a CMTime is indefinite.
**Notes:** Returns true if the CMTime is indefinite, false if it is not.
(Read only property)

### 16.104.28 IsInvalid as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time is invalid.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox "Invalid: "+str(t.IsInvalid)

t = CMTimeMBS.kCMTimeInvalid
MsgBox "Invalid: "+str(t.IsInvalid)
```

**Notes:** Returns true if the CMTime is invalid, otherwise false.
(Read only property)

### 16.104.29 IsNegativeInfinity as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time is negative infinity.
**Notes:** Returns true if the CMTime is negative infinity, otherwise false.

Use this instead of (myTime = kCMTimeNegativeInfinity), since there are many CMTime structs that represent positive infinity. This is because the non-flags fields are ignored, so they can contain anything.

(Read only property)

### 16.104.30 IsNumeric as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time is numeric.
**Notes:** Returns true if the CMTime is numeric, otherwise false. Returns false if the CMTime is invalid, indefinite, or +/- infinity.
A numeric time contains a usable value/timescale/epoch.
(Read only property)

### 16.104.31 IsPositiveInfinity as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time is positive infinity.
**Notes:** Returns true if the CMTime is positive infinity, otherwise false.

Use this instead of (myTime = kCMTimePositiveInfinity), since there are many CMTime structs that represent positive infinity. This is because the non-flags fields are ignored, so they can contain anything.
(Read only property)

### 16.104.32 IsValid as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given time is valid.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
MsgBox "valid: "+str(t.IsValid)
```

**Notes:** Return true if the CMTime is valid, otherwise false.
(Read only property)

### 16.104.33 Seconds as Double

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The number of seconds.
**Example:**

```
dim t as new CMTimeMBS(1200, 600)
t.show
```

**Notes:** If the CMTime is invalid or indefinite, NaN is returned. If the CMTime is infinite, +/- infinity is returned. If the CMTime is numeric, epoch is ignored, and time.value / time.timescale is returned. The division is done in Float64, so the fraction is not lost in the returned result.
(Read only property)

### 16.104.34 Timescale as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The timescale of the CMTime.
**Notes:** value/timescale = seconds.
(Read and Write property)

### 16.104.35 Value as Int64

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The value of the CMTime.
**Notes:** value/timescale = seconds.
(Read and Write property)

### 16.104.36 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCMTimeMaxTimescale | &h7fffffff | A constant to define the maximum timescale. |

Flags

| Constant | Value | Description |
|---|---|---|
| kCMTimeFlags_HasBeenRounded | 2 | Indicates that the time has been rounded. |
| kCMTimeFlags_ImpliedValueFlagsMask | 28 | Indicates that the time is +infinity, -infinity, or indefinite. Use this value with bitwiseAnd on the flags. |
| kCMTimeFlags_Indefinite | 16 | Indicates that the time is indefinite. |
| kCMTimeFlags_NegativeInfinity | 8 | Indicates that the time is -infinity. |
| kCMTimeFlags_PositiveInfinity | 4 | Indicates that the time is +infinity. |
| kCMTimeFlags_Valid | 1 | Indicates that the time is valid. |

Rounding Methods

| Constant | Value | Description |
|---|---|---|
| kCMTimeRoundingMethod_Default | 1 | Synonym for kCMTimeRoundingMethod_RoundH |
| kCMTimeRoundingMethod_QuickTime | 4 | Use kCMTimeRoundingMethod_RoundTowardZer to smaller scale (that is, from more precision to les TimeRoundingMethod_RoundAwayFromZero if c larger scale (i.e. from less precision to more precisio Also, never round a negative number down to 0; magnitude negative CMTime in this case (-1/newT |
| kCMTimeRoundingMethod_RoundAwayFromZero | 3 | Round away from zero if abs(fraction) is >0. |
| kCMTimeRoundingMethod_RoundHalfAwayFromZero | 1 | Round towards zero if abs(fraction) is <0.5, away fr 0.5. |
| kCMTimeRoundingMethod_RoundTowardNegativeInfinity | 6 | Round towards -infinity if fraction is not 0. |
| kCMTimeRoundingMethod_RoundTowardPositiveInfinity | 5 | Round towards +infinity if fraction is not 0. |
| kCMTimeRoundingMethod_RoundTowardZero | 2 | Round towards zero if fraction is not 0. |

## 16.105 class CMTimeRangeMBS

### 16.105.1 class CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class that represent time ranges.
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.MakeWithSeconds(5) // start at 5
dim d as CMTimeMBS = CMTimeMBS.MakeWithSeconds(10) // duration 10
dim r as CMTimeRangeMBS = CMTimeRangeMBS.Make(t,d)
```

**Notes:** A CMTimeRange is represented as two CMTime structs, one that specifies the start time of the range and another that specifies the duration of the range. A time range does not include the end time that would be calculated by adding the duration to the start time.
**Blog Entries**

- Automated video editing with Xojo

### 16.105.2 Methods

### 16.105.3 AllTimeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a special timerange to cover all times.
**Notes:** From zero to infinity.

### 16.105.4 Constructor(start as CMTimeMBS, duration as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a new range with given values.
**Example:**

```
dim t as CMTimeMBS = new CMTimeMBS( 5*600, 600, kCMTimeFlags_Valid) // start at 5
dim d as CMTimeMBS = new CMTimeMBS(10*600, 600, kCMTimeFlags_Valid) // duration 10
dim r as CMTimeRangeMBS = new CMTimeRangeMBS(t,d)
```

### 16.105.5 ContainsTime(time as CMTimeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Indicates whether a time is contained within a time range.
**Notes:** time: CMTime to be tested for inclusion.
Returns true if the specified time is contained within the specified time range, false if it is not.

This function returns a Boolean value that indicates whether the time specified by the time parameter is contained within the range specified by the range parameter.

### 16.105.6 ContainsTimeRange(timeRange as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean that indicates whether a given time range is contained within another time range.
**Notes:** range1: The CMTimeRange being interrogated.
range2: CMTimeRange to be tested for inclusion.

Returns true if the second time range is contained within the first time range, false if it is not.
This function returns a Boolean value that indicates whether the time range specified by the range1 parameter contains the range specified by the range2 parameter.

### 16.105.7 Description as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a String with a description of a CMTimeRange.

### 16.105.8 Equal(range1 as CMTimeRangeMBS, range2 as CMTimeRangeMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether two CMTimeRanges are identical.
**Notes:** range1: CMTimeRange to be compared for equality.
range2: Another CMTimeRange to be compared for equality.

Returns true if the two time ranges are identical, false if they differ.
This function returns a Boolean value that indicates whether the time ranges specified by the range1 and

range2 parameters are identical.

### 16.105.9 Intersection(range1 as CMTimeRangeMBS, range2 as CMTimeRangeMBS) as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the intersection of two CMTimeRanges.
**Notes:** range1: CMTimeRange to be intersected.
range2: Another CMTimeRange to be intersected.

Returns the intersection of the two CMTimeRanges.
This function returns a CMTimeRange structure that represents the intersection of the time ranges specified by the range1 and range2 parameters. This is the largest range that both ranges include.

### 16.105.10 kCMTimeRangeInvalid as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Use this constant to generate an invalid CMTimeRange.

### 16.105.11 kCMTimeRangeZero as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Use this constant to generate an empty CMTimeRange at 0.

### 16.105.12 Make(start as CMTimeMBS, duration as CMTimeMBS) as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a valid CMTimeRange with the given start time and duration.
**Example:**

```
dim t as CMTimeMBS = CMTimeMBS.MakeWithSeconds(5) // start at 5
dim d as CMTimeMBS = CMTimeMBS.MakeWithSeconds(10) // duration 10
dim r as CMTimeRangeMBS = CMTimeRangeMBS.Make(t,d)
```

**Notes:** start: CMTime for initializing the start field of the resulting CMTimeRange.
duration: CMTime for initializing the duration field of the resulting CMTimeRange.

Returns the resulting CMTimeRange.
The duration parameter must have an epoch of 0; otherwise an invalid time range will be returned.

### 16.105.13 Show

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Prints a description of the CMTimeRange to stderr (similar to CFShow).

### 16.105.14 TimeRangeFromTimeToTime(start as CMTimeMBS, EndTime as CMTimeMBS) as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a valid CMTimeRange from the given start and end time.
**Notes:** start: CMTime structure representing start time for creating the range.
EndTime: CMTime structure representing end time for creating the range.
Returns the resulting CMTimeRange.

### 16.105.15 Union(range1 as CMTimeRangeMBS, range2 as CMTimeRangeMBS) as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the union of two CMTimeRanges.
**Notes:** range1: CMTimeRange to be unified.
range2: Another CMTimeRange to be unified.

Returns the union of the two CMTimeRanges.

This function returns a CMTimeRange that represents the union of the time ranges specified by the range1 and range2 parameters. This is the smallest range that includes all times that are in either range.

### 16.105.16 Properties

### 16.105.17 Duration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The duration.
**Notes:** (Read and Write property)

### 16.105.18 EndTime as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a CMTime structure representing the end of a time range.
**Notes:** range: The CMTimeRange from which to find the end of time range.
Returns a CMTime representing the end of the specified time range.

This function returns a CMTime structure that indicates the end of the time range specified by the range parameter. ContainsTime(range, range.EndTime) is always false.
(Read only property)

### 16.105.19 IsEmpty as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given CMTimeRange has a duration of 0.
**Notes:** Returns true if range has a duration of 0; otherwise, false.
(Read only property)

### 16.105.20 IsIndefinite as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given CMTimeRange is indefinite.
**Notes:** Returns true if range is indefinite; otherwise, false.
An indefinite time range has either an indefinite start or an indefinite duration, or both.
(Read only property)

### 16.105.21 IsInvalid as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given CMTimeRange is invalid.
**Notes:** Returns true if range is invalid; otherwise, false.
(Read only property)

### 16.105.22 IsValid as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given CMTimeRange is valid.
**Notes:** Returns true if range is valid; otherwise, false.
(Read only property)

### 16.105.23 Start as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The start time.
**Notes:** (Read and Write property)

## 16.106 class CVImageBufferMBS

### 16.106.1 class CVImageBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Core Video image buffers provides a convenient interface for managing different types of image data.
**Example:**

```
dim p as new Picture(300, 200)
dim b as CVPixelBufferMBS = CVPixelBufferMBS.PixelBufferWithPicture(p)
MsgBox str(b.Width)+" x "+str(b.Height)
```

**Notes:** Pixel buffers and Core Video OpenGL buffers derive from the Core Video image buffer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 18.4pr3
- AVCaptureVideoDataOutput improvements
- MBS Xojo / Real Studio Plugins, version 15.2pr8

### 16.106.2 Methods

### 16.106.3 CIImage as Variant

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The CIImage object for drawing into picture.
**Notes:** Each time you call this function a new CIImage object is created, so cache it if possible.

### 16.106.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 16.106.5 JPEG(CompressionFactor as Double = 0.8) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns JPEG compressed image data.
**Notes:** Compression Factor is in range from 0 to 1.0.
Returns memoryblock with jpeg data or nil in case of error.

### 16.106.6 NSImage as Variant

MBS AVFoundation Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Queries image buffer as NSImageMBS object.
**Notes:** Result is NSImageMBS object or nil in case of error.

### 16.106.7 Properties

### 16.106.8 Context as CGContextMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The CGContext for this picture.
**Notes:** (Read only property)

### 16.106.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 16.106.10 IsFlipped as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns whether the image is flipped vertically or not.
**Notes:** True if 0,0 in the texture is upper left, false if 0,0 is lower left.
(Read only property)

### 16.106.11 Lasterror as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The last error.
**Notes:** (Read and Write property)

### 16.106.12 Picture as Picture

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The picture this image buffer references to.
**Notes:** (Read only property)

# 16.107 class CVPixelBufferMBS

## 16.107.1 class CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** A Core Video pixel buffer is an image buffer that holds pixels in main memory.
**Example:**

```
dim p as new Picture(300, 200)
dim b as CVPixelBufferMBS = CVPixelBufferMBS.PixelBufferWithPicture(p)
MsgBox str(b.Width)+" x "+str(b.Height)
```

**Notes:** Applications generating frames, compressing or decompressing video, or using Core Image can all make use of Core Video pixel buffers.
Subclass of the CVImageBufferMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr4
- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo Plugins, version 21.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr4
- MBS Xojo Plugins, version 19.4pr2
- MBS Xojo / Real Studio Plugins, version 14.5pr4

**Xojo Developer Magazine**

- 12.2, page 47: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

## 16.107.2 Methods

## 16.107.3 BaseAddressOfPlane(planeIndex as Integer) as Ptr

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the base address of the plane at the specified plane index.
**Notes:** planeIndex: The index of the plane.

Returns the base address of the plane, or NULL for nonplanar pixel buffers.
Retrieving the base address for a pixel buffer requires that the buffer base address be locked by a successful

call to LockBaseAddress.

### 16.107.4 BytesPerRowOfPlane(planeIndex as Integer) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the number of bytes per row for a plane at the specified index in the pixel buffer.
**Notes:** planeIndex: The index of the plane whose bytes-per-row value you want to obtain.

Returns the number of row bytes of the plane, or nil for nonplanar pixel buffers.

### 16.107.5 CIImage as Variant

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates CIImageMBS object for given pixel buffer.

### 16.107.6 Constructor(pic as picture)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a pixel buffer for a picture.
**Example:**

```
// Let's test the class:

// get a picture
Dim p As Picture = LogoMBS(500)

// load into CVPixelBufferMBS
Dim c As New CVPixelBufferMBS(p)

// ask back as JPEG
Dim JPEGData As MemoryBlock = c.JPEG(0.8)

// show it
ImageViewer1.Image = Picture.FromData(JPEGData)
```

**Notes:** Only for Cocoa target.
This function takes the existing picture and creates a pixelbuffer referencing it. Also we setup the CGContext object and stores it in Context property. Also picture property is set to the current picture.

Implemented for iOS in version 22.3 of MBS Plugin.
See also:


- 16.107.7 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3737
- 16.107.8 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.9 Constructor(Width as Integer, Height as Integer, PixelFormat as String, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.10 Constructor(Width as Integer, Height as Integer, PixelFormat as String, pixelBufferAttributes as Dictionary) 3739


### 16.107.7 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a pixel buffer for a given size and pixel format containing data specified by a memory location.
**Notes:** width: The width of the pixel buffer, in pixels.
height: The height of the pixel buffer, in pixels.
pixelFormatType: The pixel format identified by its respective four character code
baseAddress: The memoryblock referenced by the PixelBuffer with the data.
bytesPerRow: The row bytes of the pixel storage memory.
pixelBufferAttributes: A Core Foundation dictionary with additional attributes for a pixel buffer. This parameter is optional.

Returns a Core Video result code. See Core Video Constants for possible values.
Some of the parameters specified in this call override equivalent pixel buffer attributes. For example, if you define the kCVPixelBufferWidth and kCVPixelBufferHeight keys in the pixel buffer attributes parameter (pixelBufferAttributes), these values are overridden by the width and height parameters.
See also:


- 16.107.6 Constructor(pic as picture) 3736
- 16.107.8 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.9 Constructor(Width as Integer, Height as Integer, PixelFormat as String, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.10 Constructor(Width as Integer, Height as Integer, PixelFormat as String, pixelBufferAttributes as Dictionary) 3739

### 16.107.8 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, pixelBufferAttributes as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a single pixel buffer for a given size and pixel format.
**Notes:** width: Width of the pixel buffer, in pixels.
height: Height of the pixel buffer, in pixels.
pixelFormatType: The pixel format identified by its respective four-character code.
pixelBufferAttributes: A dictionary with additional attributes for a pixel buffer. This parameter is optional.

Raises exception on failure with error code included.

This function allocates the necessary memory based on the pixel dimensions, format, and extended pixels described in the pixel buffer,Äôs attributes.

Some of the parameters specified in this call override equivalent pixel buffer attributes. For example, if you define the kCVPixelBufferWidth and kCVPixelBufferHeight keys in the pixel buffer attributes parameter (pixelBufferAttributes), these values are overridden by the width and height parameters.
See also:


- 16.107.6 Constructor(pic as picture) 3736
- 16.107.7 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3737
- 16.107.9 Constructor(Width as Integer, Height as Integer, PixelFormat as String, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.10 Constructor(Width as Integer, Height as Integer, PixelFormat as String, pixelBufferAttributes as Dictionary) 3739


### 16.107.9 Constructor(Width as Integer, Height as Integer, PixelFormat as String, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a pixel buffer for a given size and pixel format containing data specified by a memory location.
**Notes:** width: The width of the pixel buffer, in pixels.
height: The height of the pixel buffer, in pixels.
pixelFormatType: The pixel format identified by its respective four character code
baseAddress: The memoryblock referenced by the PixelBuffer with the data.
bytesPerRow: The row bytes of the pixel storage memory.
pixelBufferAttributes: A Core Foundation dictionary with additional attributes for a pixel buffer. This

parameter is optional.

Returns a Core Video result code. See Core Video Constants for possible values.
Some of the parameters specified in this call override equivalent pixel buffer attributes. For example, if you define the kCVPixelBufferWidth and kCVPixelBufferHeight keys in the pixel buffer attributes parameter (pixelBufferAttributes), these values are overridden by the width and height parameters.
See also:


- 16.107.6 Constructor(pic as picture) 3736
- 16.107.7 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3737
- 16.107.8 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, pixelBufferAttributes as Dictionary) 3738
- 16.107.10 Constructor(Width as Integer, Height as Integer, PixelFormat as String, pixelBufferAttributes as Dictionary) 3739


### 16.107.10 Constructor(Width as Integer, Height as Integer, PixelFormat as String, pixelBufferAttributes as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a single pixel buffer for a given size and pixel format.
**Notes:** width: Width of the pixel buffer, in pixels.
height: Height of the pixel buffer, in pixels.
pixelFormatType: The pixel format identified by its respective four-character code.
pixelBufferAttributes: A dictionary with additional attributes for a pixel buffer. This parameter is optional.

Raises exception on failure with error code included.

This function allocates the necessary memory based on the pixel dimensions, format, and extended pixels described in the pixel buffer,Äôs attributes.

Some of the parameters specified in this call override equivalent pixel buffer attributes. For example, if you define the kCVPixelBufferWidth and kCVPixelBufferHeight keys in the pixel buffer attributes parameter (pixelBufferAttributes), these values are overridden by the width and height parameters.
See also:


- 16.107.6 Constructor(pic as picture) 3736
- 16.107.7 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3737
- 16.107.8 Constructor(Width as Integer, Height as Integer, PixelFormat as Integer, pixelBufferAttributes as Dictionary) 3738

- 16.107.9 Constructor(Width as Integer, Height as Integer, PixelFormat as String, data as MemoryBlock, bytesPerRow as Integer, pixelBufferAttributes as Dictionary) 3738

### 16.107.11 FillExtendedPixels

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Fills the extended pixels of the pixel buffer.
**Notes:** This function replicates edge pixels to fill the entire extended region of the image.

### 16.107.12 Flush

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Flushes output to the image buffer.
**Notes:** Anything not yet drawn is drawn now.

### 16.107.13 GetExtendedPixels(byref extraColumnsOnLeft as Integer, byref extraColumnsOnRight as Integer, byref extraRowsOnTop as Integer, byref extraRowsOnBottom as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the amount of extended pixel padding in the pixel buffer.
**Notes:** extraColumnsOnLeft: On output, the pixel row padding to the left.
extraColumnsOnRight: On output, the pixel row padding to the right.
extraRowsOnTop: On output, the pixel row padding to the top.
extraRowsOnBottom: On output, the pixel row padding to the bottom.

### 16.107.14 HeightOfPlane(planeIndex as Integer) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the height of the plane at planeIndex in the pixel buffer.
**Notes:** planeIndex: The index of the plane.
Returns the height of the buffer, in pixels, or 0 for nonplanar pixel buffers.

### 16.107.15 kCVPixelBufferBytesPerRowAlignmentKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Indicates the number of bytes per row in the pixel buffer (type Number).

### 16.107.16 kCVPixelBufferCGBitmapContextCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Indicates whether the pixel buffer is compatible with Core Graphics bitmap contexts (type Boolean).

### 16.107.17 kCVPixelBufferCGImageCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Indicates whether the pixel buffer is compatible with CGImage types (type Boolean).

### 16.107.18 kCVPixelBufferExtendedPixelsBottomKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The number of pixels padding the bottom of the image (type Number).

### 16.107.19 kCVPixelBufferExtendedPixelsLeftKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The number of pixels padding the left of the image (type Number).

### 16.107.20 kCVPixelBufferExtendedPixelsRightKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The number of pixels padding the right of the image (type Number).

### 16.107.21 kCVPixelBufferExtendedPixelsTopKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The number of pixels padding the top of the image (type Number).

### 16.107.22 kCVPixelBufferHeightKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The height of the pixel buffer (type Number).

### 16.107.23 kCVPixelBufferIOSurfaceCoreAnimationCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** A boolean value

### 16.107.24 kCVPixelBufferIOSurfaceOpenGLFBOCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Ensures that the CVPixelBuffer's IOSurfaceRef can be displayed in an CoreAnimation CALayer.

### 16.107.25 kCVPixelBufferIOSurfaceOpenGLTextureCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Ensures that CGLTexImageIOSurface2D() will succeed in creating a valid texture object from the CVPixelBuffer's IOSurface AND that the resulting texture may be used as a color buffer attachment to a OpenGL frame buffer object.

### 16.107.26 kCVPixelBufferIOSurfacePropertiesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Indicates optional properties in the IOSurface framework (type Dictionary). An empty dictionary indicates default values.
Presence of this key requests allocation via the IOSurface framework.

### 16.107.27 kCVPixelBufferMemoryAllocatorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The allocator used with this buffer (type CFAllocatorRef).

### 16.107.28 kCVPixelBufferOpenGLCompatibilityKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Indicates whether the pixel buffer is compatible with Core Graphics bitmap contexts (type Boolean).

### 16.107.29 kCVPixelBufferPixelFormatTypeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The pixel format for this buffer (type Number, or type Array containing an array of Number types (actually type OSType)). For a listing of common pixel formats, see the QuickTime Ice Floe Dispatch 20.

### 16.107.30 kCVPixelBufferPlaneAlignmentKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** Specifies the alignment of the planes within the buffer. Planes will start on a byte number which is a multiple of this value. (type Number).

### 16.107.31 kCVPixelBufferWidthKey as string

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** The width of the pixel buffer (type Number).

### 16.107.32 LockBaseAddress(flags as Integer = 0)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Locks the base address of the pixel buffer.
**Notes:** lockFlags: You can pass zero or kLockReadonly.

### 16.107.33 PixelBufferWithCGImage(CGImage as Variant) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a pixel buffer for a CGImage by making a copy of the picture.
**Notes:** Image parameter must be a CGImageMBS object.
For Carbon and Cocoa.
Returns nil on any error.

### 16.107.34 PixelBufferWithHandle(Handle as Integer) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates pixel buffer object with handle.
**Notes:** Handle must be a CVPixelBufferRef, which we retain.

### 16.107.35 PixelBufferWithPicture(pic as picture) as CVPixelBufferMBS

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a pixel buffer for a picture by making a copy of the picture.
**Example:**

```
dim p as new Picture(300, 200)
dim b as CVPixelBufferMBS = CVPixelBufferMBS.PixelBufferWithPicture(p)
MsgBox str(b.Width)+" x "+str(b.Height)
```

**Notes:** For Carbon and Cocoa.
Returns nil on any error.

### 16.107.36 PixelData as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Copies pixel data into MemoryBlock.
**Notes:** Returns nil in case of error.
Works only on non planar pixel buffers.

### 16.107.37 SetPixelData(data as MemoryBlock) as Boolean

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Copies pixel data from MemoryBlock into pixel buffer.
**Notes:** Returns false in case of error and true for success.
Works only on non planar pixel buffers.

### 16.107.38 UnlockBaseAddress(flags as Integer = 0)

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Unlocks the base address of the pixel buffer.

### 16.107.39 WidthOfPlane(planeIndex as Integer) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the width of the plane at a given index in the pixel buffer.
**Notes:** pixelBuffer: The pixel buffer whose plane width you want to obtain.
planeIndex: The plane index that contains the plane's width value.

Returns the width of the plane, in pixels, or 0 for nonplanar pixel buffers.

### 16.107.40 Properties

### 16.107.41 BaseAddress as Ptr

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the base address of the pixel buffer.
**Notes:** For chunky buffers, returns a pointer to the pixel at (0,0) in the buffer.

For planar buffers, returns a pointer to a PlanarComponentInfo structure (as defined by QuickTime in ImageCodec.h).

Retrieving the base address for a pixel buffer requires that the buffer base address be locked via a successful call to CVPixelBufferLockBaseAddress.
(Read only property)

### 16.107.42 BytesPerRow as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the number of bytes per row of the pixel buffer.
**Example:**

```
dim p as new Picture(300, 200)
dim b as new CVPixelBufferMBS(p)
MsgBox str(b.BytesPerRow)
```

**Notes:** The number of bytes per row of the image data. For planar buffers, this function returns a rowBytes value such that bytesPerRow * height covers the entire image, including all planes.
(Read only property)

### 16.107.43 DataSize as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the data size for contiguous planes of the pixel buffer.
**Example:**

```
dim p as new Picture(300, 200)
dim b as new CVPixelBufferMBS(p)
MsgBox str(b.DataSize)
```

**Notes:** (Read only property)

### 16.107.44 Height as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the height of the pixel buffer.

**Example:**

```
dim p as new Picture(300, 200)
dim b as CVPixelBufferMBS = CVPixelBufferMBS.PixelBufferWithPicture(p)
MsgBox str(b.Width)+" x "+str(b.Height)
```

**Notes:** (Read only property)

### 16.107.45 IsPlanar as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Determines whether the pixel buffer is planar.
**Notes:** Returns true if the pixel buffer was created using CVPixelBufferCreateWithPlanarBytes; otherwise, false.
(Read only property)

### 16.107.46 PixelFormatType as String

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the pixel format type of the pixel buffer.
**Notes:** Returns a four-character code OSType identifier for the pixel format.
(Read only property)

### 16.107.47 PlaneCount as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns number of planes of the pixel buffer.
**Notes:** Returns the number of planes. Returns 0 for nonplanar pixel buffers.
(Read only property)

### 16.107.48 Width as Integer

MBS AVFoundation Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the width of the pixel buffer.
**Example:**

```
dim p as new Picture(300, 200)
dim b as CVPixelBufferMBS = CVPixelBufferMBS.PixelBufferWithPicture(p)
MsgBox str(b.Width)+" x "+str(b.Height)
```

**Notes:** (Read only property)

### 16.107.49 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kLockReadonly | 1 | The flag for LockBaseAddress function.<br>If you are not going to modify the data while you hold the lock, you should set this flag to avoid potentially invalidating any existing caches of the buffer contents. This flag should be passed both to the lock and unlock functions. Non-symmetrical usage of this flag will result in undefined behavior. |

Pixel Formats

| Constant | Value | Description |
|---|---|---|
| kCVPixelFormatType_128RGBAFloat | "RGfA" | 128 bit RGBA IEEE float, 32-bit little-endian |
| kCVPixelFormatType_14Bayer_BGGR | "bgg4" | Bayer 14-bit Little-Endian, packed in 16-bits, with G R G R... |
| kCVPixelFormatType_14Bayer_GBRG | "gbr4" | Bayer 14-bit Little-Endian, packed in 16-bits, with R G R G... |
| kCVPixelFormatType_14Bayer_GRBG | "grb4" | Bayer 14-bit Little-Endian, packed in 16-bits, with B G B G... |
| kCVPixelFormatType_14Bayer_RGGB | "rgg4" | Bayer 14-bit Little-Endian, packed in 16-bits, with G B G B... |
| kCVPixelFormatType_16BE555 | &h00000010 | 16 bit BE RGB 555. Available in OS X v10.5 and later. |
| kCVPixelFormatType_16BE565 | "B565" | 16 bit BE RGB 565. Available in OS X v10.5 and later. |
| kCVPixelFormatType_16Gray | "b16g" | 16 bit Grayscale, 16-bit big-endian samples, b Available in OS X v10.5 and later. |
| kCVPixelFormatType_16LE555 | "L555" | 16 bit LE RGB 555. Available in OS X v10.5 and later. |
| kCVPixelFormatType_16LE5551 | "5551" | 16 bit LE RGB 5551. Available in OS X v10.5 and later. |
| kCVPixelFormatType_16LE565 | "L565" | 16 bit LE RGB 565. Available in OS X v10.5 and later. |
| kCVPixelFormatType_1IndexedGray_WhiteIsZero | &h00000021 | 1 bit indexed gray, white is zero. Available in OS X v10.5 and later. |
| kCVPixelFormatType_1Monochrome | &h00000001 | 1 bit indexed. Available in OS X v10.5 and later. |
| kCVPixelFormatType_24BGR | "24BG" | 24 bit BGR. Available in OS X v10.5 and later. |
| kCVPixelFormatType_24RGB | &h00000018 | 24 bit RGB. Available in OS X v10.5 and later. |
| kCVPixelFormatType_2Indexed | &h00000002 | 2 bit indexed. Available in OS X v10.5 and later. |
| kCVPixelFormatType_2IndexedGray_WhiteIsZero | &h00000022 | 2 bit indexed gray, white is zero. Available in OS X v10.5 and later. |
| kCVPixelFormatType_30RGB | "R10k" | 30 bit RGB, 10-bit big-endian samples, 2 unu cant end). |
| kCVPixelFormatType_30RGBLEPackedWideGamut | "w30r" | little-endian RGB101010, 2 MSB are zero, wi |
| kCVPixelFormatType_32ABGR | "ABGR" | 32 bit ABGR. Available in OS X v10.5 and later. |
| kCVPixelFormatType_32AlphaGray | "b32a" | 32 bit AlphaGray, 16-bit big-endian samples, Available in OS X v10.5 and later. |
| kCVPixelFormatType_32ARGB | &h00000020 | 32 bit ARGB. Available in OS X v10.5 and later. |
| kCVPixelFormatType_32BGRA | "BGRA" | 32 bit BGRA. Available in OS X v10.5 and later. |
| kCVPixelFormatType_32RGBA | "RGBA" | 32 bit RGBA. Available in OS X v10.5 and later. |
| kCVPixelFormatType_420YpCbCr10BiPlanarFullRange | "xf20" | 2 plane YCbCr10 4:2:0, each 10 bits in the MS 0-1023) |
| kCVPixelFormatType_420YpCbCr10BiPlanarVideoRange | "x420" | 2 plane YCbCr10 4:2:0, each 10 bits in the MS [ 64,940 ] chroma= [ 64,960 ] ) |
| kCVPixelFormatType_420YpCbCr8BiPlanarFullRange | "420f" | Bi-Planar Component Y'CbCr 8-bit 4:2:0, full [ 1,255 ] ). baseAddr points to a big-endian C BiPlanar structure. |
| kCVPixelFormatType_420YpCbCr8BiPlanarVideoRange | "420v" | Bi-Planar Component Y'CbCr 8-bit 4:2:0, chroma= [ 16,240 ] ). baseAddr points to a b Info_YCbCrBiPlanar structure. |
| kCVPixelFormatType_420YpCbCr8Planar | "y420" | Planar Component Y'CbCr 8-bit 4:2:0. base PlanarPixelBufferInfo_YCbCrPlanar struct. |

## 16.108 control DesktopAVCaptureViewControlMBS

### 16.108.1 control DesktopAVCaptureViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The capture control for Mac.
**Notes:** AVCaptureView is a subclass of NSView that can be used to display standard user interface controls for capturing media data.
MBS Plugin wraps this as a control for Xojo.
Please notice this is 64-bit only and requires MacOS 10.9 or newer.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr8
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- AVCaptureVideoDataOutput improvements
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr2

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 16.5, page 9: News

### 16.108.2 Methods

### 16.108.3 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

### 16.108.4 setSession(session as AVCaptureSessionMBS, showVideoPreview as boolean, showAudioPreview as boolean)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the session represented by this view.
**Notes:** session: The session to be represented.
showVideoPreview: Whether or not video preview should be shown. If YES, capture inputs for video media data will be added, removed, or modified depending on device availability and user selection.
showAudioPreview: Whether or not audio preview should be shown. If YES, capture inputs for audio media data will be added, removed, or modified depending on device availability and user selection.

The view must either show audio preview or video preview or both. Furthermore, the view may modify the capture session, for example, to access media data for preview or when the user select a new capture source. Only the default session is started and stopped automatically. The provided session must be manually started and stopped.

### 16.108.5 Properties

### 16.108.6 controlsStyle as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The style of the capture controls pane associated with the view.
**Notes:** (Read and Write property)

### 16.108.7 fileOutput as AVCaptureFileOutputMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A capture file output used to record media data.
**Notes:** The value of this property is the first instance of AVCaptureFileOutput contained in the session's outputs array or nil if no such instance is found. In the latter case the capture view's start recording button will be disabled. However, the controls for choosing input sources may still be enabled.
(Read only property)

### 16.108.8 session as AVCaptureSessionMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A capture session represented by this view.
**Notes:** Modifying the capture session will impact its visual representation in the view. The default value is

a session configured for movie file recordings of audio and video media data. Use setSession() to change the value of this property.
(Read only property)

### 16.108.9 videoGravity as String

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A string defining how the video is displayed within the views bounds rect.
**Notes:** Options are AVLayerVideoGravityResize, AVLayerVideoGravityResizeAspect and AVLayerVideoGravityResizeAspectFill. AVLayerVideoGravityResizeAspect is default. See <AVFoundation/AVAnimation.h>for a description of these options.
(Read and Write property)

### 16.108.10 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the AVCaptureView object.
**Notes:** (Read only property)

### 16.108.11 Events

### 16.108.12 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.108.13 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.108.14 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.108.15 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 16.108.16 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.108.17 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.108.18 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.108.19 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.108.20 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.108.21 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.108.22 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 16.108.23 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.108.24 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.108.25 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.108.26 startRecordingToFileOutput(fileOutput as AVCaptureFileOutputMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that a new media recording should be started.
**Notes:** If captureFileOutput is an instance of AVCaptureMovieFileOutput this can be achieved by calling startRecordingToOutputFileURL on the captureFileOutput.

### 16.108.27 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.108.28 Constants

Constants Groups

| Constant | Value | Description |
|---|---|---|
| ControlsStyleDefault | 0 | The default controls pane is associated with the view. |
| ControlsStyleFloating | 1 | The floating controls pane for media recordings is associated with the view. |
| ControlsStyleInline | 0 | The inline controls pane for media recording is associated with the view. |
| ControlsStyleInlineDeviceSelection | 2 | The inline controls pane for selection capture devices is associated with tl view. |

# 16.109 control DesktopAVPlayerViewControlMBS

## 16.109.1 control DesktopAVPlayerViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The player control for Mac.
**Notes:** AVPlayerView is a subclass of NSView that can be used to display the visual content of an AVPlayer object and the standard playback controls.
MBS Plugin wraps this as a control for Xojo.
Please notice this is 64-bit only and requires MacOS 10.9 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr2

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

## 16.109.2 Methods

## 16.109.3 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

## 16.109.4 beginTrimming

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the controls panel into trimming mode and blocks until the user selects either the Trim or the Cancel button.
**Notes:** Triggers TrimmingCompleted later.

### 16.109.5 flashChapterNumber(chapterNumber as Integer, chapterTitle as String)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Display the provided chapter number and title momentarily.
**Notes:** chapterNumber: The chapter number (required).
chapterTitle: The chapter title (optional).

### 16.109.6 Properties

### 16.109.7 actionPopUpButtonMenu as NSMenuMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The action popup menu.
**Notes:** Clients can set this property in order to show an action pop up button. Default is nil.
(Read and Write property)

### 16.109.8 allowsPictureInPicturePlayback as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the receiver allows Picture in Picture playback.
**Notes:** Default is false.
Available in MacOS 10.15 or later.
(Read and Write property)

### 16.109.9 canBeginTrimming as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the current media can be trimmed.
**Notes:** (Read only property)

### 16.109.10 contentOverlayView as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Use the content overlay view to add additional custom views between the video content and the controls.

**Notes:** (Read only property)

### 16.109.11 controlsStyle as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The style of the playback controls pane currently associated with the view.
**Notes:** (Read and Write property)

### 16.109.12 player as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The player from which to source the media content for the view.
**Notes:** (Read and Write property)

### 16.109.13 readyForDisplay as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Boolean indicating that the first video frame has been made ready for display for the current item of the associated AVPlayer.
**Notes:** (Read only property)

### 16.109.14 showsFrameSteppingButtons as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Replace scanning controls in the playback UI with frame stepping buttons.
**Notes:** Default is false.
(Read and Write property)

### 16.109.15 showsFullScreenToggleButton as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the controls pane will show a full screen toggle button.
**Notes:** Default is false.
(Read and Write property)

### 16.109.16 showsSharingServiceButton as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the controls pane will show a sharing service button when the current player item can be shared.
**Notes:** Default is false.
(Read and Write property)

### 16.109.17 showsTimecodes as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** If timecodes are available, allow the AVPlayerView controls to enter timecode mode.
**Notes:** Default is false.
Available in MacOS 10.15 or later.
(Read and Write property)

### 16.109.18 updatesNowPlayingInfoCenter as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the now playing info center should be updated.
**Notes:** Default is true.
(Read and Write property)

### 16.109.19 videoBounds as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The current size and position of the video image as displayed within the receiver's view's bounds.
**Notes:** (Read only property)

### 16.109.20 videoGravity as String

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A string defining how the video is displayed within an AVPlayerLayer bounds rect.
**Notes:** Options are AVLayerVideoGravityResizeAspect, AVLayerVideoGravityResizeAspectFill and AVLayerVideoGravityResize. AVLayerVideoGravityResizeAspect is default.
See <AVFoundation/AVAnimation.h>for a description of these options.

(Read and Write property)

### 16.109.21 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the AVPlayerView object.
**Notes:** (Read only property)

### 16.109.22 Events

### 16.109.23 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.109.24 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.109.25 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.109.26 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or

false to give others a chance.

### 16.109.27 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.109.28 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.109.29 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.109.30 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.109.31 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.109.32 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.109.33 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 16.109.34 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.109.35 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.109.36 playerViewDidStartPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture did start.

### 16.109.37 playerViewDidStopPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture did stop.

### 16.109.38 playerViewFailedToStartPictureInPicture(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture failed to start.
**Notes:** error: An error describing why it failed.

### 16.109.39 playerViewRestoreUserInterfaceForPictureInPictureStop as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to restore the user interface before Picture in Picture stops.
**Notes:** Please return true if you restored it or false if not, so we can call completion handler passing the value.
Default is to pass true if you don't implement this event.

### 16.109.40 playerViewShouldAutomaticallyDismissAtPictureInPictureStart as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this event and return false to prevent player view from automatically being miniaturized or losing focus when Picture in Picture starts.
**Notes:** If you implement this, please return true or false.
By default we return false if you don't

### 16.109.41 playerViewWillStartPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture will start.

### 16.109.42 playerViewWillStopPictureInPicture

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Control can implement this method to be notified when Picture in Picture will stop.

### 16.109.43 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.109.44 TrimmingCompleted(result as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event handler that is executed when the user selects either the Trim or Cancel button in the trimming UI.

### 16.109.45 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.109.46 Constants

Control Styles

| Constant | Value | Description |
|---|---|---|
| ControlsStyleDefault | 1 | The default controls pane is associated with the view. |
| ControlsStyleFloating | 2 | The floating controls pane is associated with the view. |
| ControlsStyleInline | 1 | The inline controls pane is associated with the view. |
| ControlsStyleMinimal | 3 | The minimal controls pane is associated with the view. |
| ControlsStyleNone | 0 | No controls pane is associated with the view. |

Trim Results

| Constant | Value | Description |
|---|---|---|
| TrimCancelButton | 1 | The user selected the Cancel button. |
| TrimOKButton | 0 | The user selected the Trim button. |

# 16.110 control DesktopAVRoutePickerViewControlMBS

## 16.110.1 control DesktopAVRoutePickerViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An object that displays controls for picking playback routes.
**Notes:** Available on MacOS 10.15 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr2
- Airplay related classes for AVFoundation

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 10: News

## 16.110.2 Properties

## 16.110.3 player as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The player for which to perform routing operations.
**Notes:** (Read and Write property)

## 16.110.4 routePickerButtonBordered as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the picker button has a border.
**Notes:** Default is true.
(Read and Write property)

### 16.110.5 View as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view object.
**Notes:** (Read only property)

### 16.110.6 Available as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.
**Notes:** (Read and Write computed property)

### 16.110.7 routePickerButtonColorForState(state as integer) as NSColorMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Defines the color for the button for a given state.
**Notes:** (Read and Write computed property)

### 16.110.8 Events

### 16.110.9 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 16.110.10 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 16.110.11 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 16.110.12 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 16.110.13 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 16.110.14 DidEndPresentingRoutes

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells you that the route picker view has finished presenting routes to the user.

### 16.110.15 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 16.110.16 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 16.110.17 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 16.110.18 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 16.110.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 16.110.20 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 16.110.21 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 16.110.22 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 16.110.23 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 16.110.24 WillBeginPresentingRoutes

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells you that the route picker view will start presenting routes to the user.

### 16.110.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 16.110.26 Constants

Button States

| Constant | Value | Description |
|---|---|---|
| StateActive | 2 | Active state of the picker. The picker has this state when AirPlay is active. |
| StateActiveHighlighted | 3 | Highlighted state of the active picker. The picker has this state when it is highlighted and AirPlay is active. |
| StateNormal | 0 | Normal or default state of the picker. |
| StateNormalHighlighted | 1 | Highlighted state of the picker. The picker has this state when a mouse-down event occurs inside the button. It loses this highlight when a mouse-up event occurs. |

# 16.111 class DesktopMoviePlayer

## 16.111.1 class DesktopMoviePlayer

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Extends the Movieplayer class inside Xojo.

## 16.111.2 Methods

## 16.111.3 AVAssetMBS as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVAsset for this movieplayer.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Der Hausbau.m4v")
dim m as movie = f.OpenAsMovie

MoviePlayer1.movie = m
MoviePlayer1.play

dim asset as AVAssetMBS = MoviePlayer1.AVAssetMBS
MsgBox str(asset.duration.Seconds)+" seconds"
```

**Notes:** Useful in order to use plugin functions on a movieplayer, e.g. query meta data.

## 16.111.4 AVPlayerLayerMBS as AVPlayerLayerMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVPlayerLayer for this movieplayer.
**Notes:** Only for Cocoa target in Xojo.

## 16.111.5 AVPlayerMBS as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVPlayer for this movieplayer.
**Notes:** Only for Cocoa target.

# 16.112 class Movie

## 16.112.1 class Movie

Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extends the Movie class inside Xojo.

## 16.112.2 Methods

## 16.112.3 AVAssetMBS as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVAsset for this movie.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as movie = f.OpenAsMovie
dim asset as AVAssetMBS = m.AVAssetMBS
MsgBox str(asset.duration.Seconds)+" seconds"
```

**Notes:** Useful in order to use plugin functions on a movie object, e.g. query meta data.
Only for Cocoa target in Xojo 2014.

## 16.113 class MoviePlayer

### 16.113.1 class MoviePlayer

Platform: macOS, Targets: Desktop only.

**Function:** Extends the Movieplayer class inside Xojo.

### 16.113.2 Methods

### 16.113.3 AVAssetMBS as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVAsset for this movieplayer.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Der Hausbau.m4v")
dim m as movie = f.OpenAsMovie

MoviePlayer1.movie = m
MoviePlayer1.play

dim asset as AVAssetMBS = MoviePlayer1.AVAssetMBS
MsgBox str(asset.duration.Seconds)+" seconds"
```

**Notes:** Useful in order to use plugin functions on a movieplayer, e.g. query meta data.
Only for Cocoa target.

### 16.113.4 AVPlayerLayerMBS as AVPlayerLayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVPlayerLayer for this movieplayer.
**Notes:** Only for Cocoa target in Xojo.

### 16.113.5 AVPlayerMBS as AVPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the AVPlayer for this movieplayer.

**Notes:** Only for Cocoa target.

## 16.114 class SDAVAssetExportSessionMBS

### 16.114.1 class SDAVAssetExportSessionMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The SDAVAssetExportSession class for media export.
**Notes:** Based on open source SDAVAssetExportSession class:
https://github.com/rs/SDAVAssetExportSession

AVAssetExportSessionMBS drop-in replacement with customizable audio & video settings.

An SDAVAssetExportSessionMBS object transcodes the contents of an AVAsset source object to create an output of the form described by a specified audio and video settings.

After you have initialized an export session with the asset that contains the source media, and the output file type (outputFileType), and various other settings you can start the export running by invoking exportAsynchronously. Because the export is performed asynchronously, this method returns immediately—you can use progress to check on the progress. Depending on the capabilities of the device, some exports may be queued when multiple exports are attempted. When this happens, the status of a queued export will indicate that it's waiting (StatusWaiting).

The exportAsynchronouslyCompleted event is called whether the export fails, completes, or is cancelled. Upon completion, the status property indicates whether the export has completed successfully. If it has failed, the value of the error property supplies additional information about the reason for the failure.
Available in OS X v10.9 and later in 64-bit.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- MBS Xojo Plugins, version 20.3pr5

### 16.114.2 Methods

### 16.114.3 available as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.7 and newer in 64-bit applications.

### 16.114.4 cancelExport

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Cancels the execution of an export session.

### 16.114.5 Constructor(asset as AVAssetMBS)

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Initializes an asset export session with a specified asset and preset.
**Notes:** asset: The asset you want to export.

### 16.114.6 exportAsynchronously

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Starts the asynchronous execution of an export session.
**Notes:** This method starts an asynchronous export operation and returns immediately. status signals the terminal state of the export session, and if a failure occurs, error describes the problem.

This method calls AVFoundationMBS.exportAsynchronouslyCompleted event later. Tag is passed so you can pass information needed to finish work.

If internal preparation for export fails, event is invoked synchronously. The event may also be called asynchronously, after the method returns, in the following cases:

- If a failure occurs during the export, including failures of loading, re-encoding, or writing media data to the output.
- If cancelExport is invoked.
- After the export session succeeds, having completely written its output to the outputURL.

With tag you can pass any value you like to the event later. This can be for example an object reference or a number in an array. Be aware that the reference to this tag value is kept until the event is called and can cause memory reference cycles.

### 16.114.7 exportMT

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Starts the synchronous execution of an export session.
**Notes:** Same as exportAsynchronously, but run synchronous, so the plugin waits.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 16.114.8 exportSessionWithAsset(asset as AVAssetMBS) as AVAssetExportSessionMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Returns an asset export session configured with a specified asset and preset.
**Notes:** asset: The asset you want to export.

Returns an asset export session initialized to export asset.

### 16.114.9 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Returns the metadata to be written to the output file by the export session.

### 16.114.10 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Sets the metadata to be written to the output file by the export session.
**Notes:** If the array is empty, any existing metadata in the exported asset will be translated as accurately as possible into the appropriate metadata key space for the output file and written to the output.

### 16.114.11 Properties

### 16.114.12 asset as AVAssetMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The asset with which the export session was initialized. (read-only)
**Notes:** (Read only property)

### 16.114.13 audioMix as AVAudioMixMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Indicates whether non-default audio mixing is enabled for export, and supplies the parameters for audio mixing.
**Notes:** (Read and Write property)

### 16.114.14 audioSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The audio settings to use.
**Example:**

```
dim encoder as SDAVAssetExportSessionMBS // your exporter instance

Dim audioSettings As New Dictionary

audioSettings.Value(AVFoundationMBS.AVFormatIDKey) = OSTypeFromStringMBS(AVFoundationMBS.kAudioFormatMPEG4AAC)
audioSettings.Value(AVFoundationMBS.AVNumberOfChannelsKey) = 2
audioSettings.Value(AVFoundationMBS.AVSampleRateKey) = 44100
audioSettings.Value(AVFoundationMBS.AVEncoderBitRateKey) = 128000
encoder.audioSettings = audioSettings
```

**Notes:** Please create new dictionary, set values and assign the final dictionary to this property.
If you query the settings, you get a copy of the dictionary.
(Read and Write property)

### 16.114.15 error as NSErrorMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Describes the error that occurred if the export status is AVAssetExportSessionStatusFailed or AVAssetExportSessionStatusCancelled. (read-only)
**Notes:** If there is no error to report, the value of this property is nil.
(Read only property)

### 16.114.16 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 16.114.17 outputFile as FolderItem

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The file of the export session's output.
**Example:**

```
dim encoder as SDAVAssetExportSessionMBS // your exporter instance

encoder.outputFile = SpecialFolder.Desktop.Child("output.mp4")
```

**Notes:** (Read and Write property)

### 16.114.18 outputFileType as String

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The type of file to be written by the session.
**Example:**

```
dim encoder as SDAVAssetExportSessionMBS // your exporter instance

encoder.outputFileType = AVFoundationMBS.AVFileTypeMPEG4
```

**Notes:** The value is a UTI string corresponding to the file type to use when writing the asset. For a list of constants specifying UTIs for standard file types, see AV Foundation Constants Reference.
(Read and Write property)

### 16.114.19 outputURL as String

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The URL of the export session's output.
**Notes:** (Read and Write property)

### 16.114.20 progress as Double

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The progress of the export on a scale from 0 to 1. (read-only)
**Notes:** A value of 0 means the export has not yet begun, 1 means the export is complete.
(Read only property)

### 16.114.21 shouldOptimizeForNetworkUse as Boolean

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Indicates whether the movie should be optimized for network use.
**Notes:** (Read and Write property)

### 16.114.22 Status as Integer

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The status of the export session. (read-only)
**Notes:** See status constants.
(Read only property)

### 16.114.23 timeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The time range to be exported from the source.
**Notes:** The default time range of an export session is kCMTimeZero to kCMTimePositiveInfinity, meaning that (modulo a possible limit on file length) the full duration of the asset will be exported.
(Read and Write property)

### 16.114.24 videoComposition as AVVideoCompositionMBS

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Indicates whether video composition is enabled for export, and supplies the instructions for video composition.
**Notes:** (Read and Write property)

### 16.114.25 videoInputSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The video input settings to use.
**Notes:** Please create new dictionary, set values and assign the final dictionary to this property.
If you query the settings, you get a copy of the dictionary.
(Read and Write property)

### 16.114.26 videoSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** The video settings to use.
**Example:**

```
dim encoder as SDAVAssetExportSessionMBS // your exporter instance

Dim CompressionProperties As New Dictionary
CompressionProperties.Value(AVFoundationMBS.AVVideoAverageBitRateKey) = 6000000
CompressionProperties.Value(AVFoundationMBS.AVVideoProfileLevelKey) = AVFoundationMBS.AVVideo-
ProfileLevelH264High40

Dim videoSettings As New Dictionary

videoSettings.Value(AVFoundationMBS.AVVideoCodecKey) = AVFoundationMBS.AVVideoCodecH264
videoSettings.Value(AVFoundationMBS.AVVideoWidthKey) = 1920
videoSettings.Value(AVFoundationMBS.AVVideoHeightKey) = 1080
videoSettings.Value(AVFoundationMBS.AVVideoCompressionPropertiesKey) = CompressionProperties
encoder.videoSettings = videoSettings
```

**Notes:** Please create new dictionary, set values and assign the final dictionary to this property.
If you query the settings, you get a copy of the dictionary.
(Read and Write property)

### 16.114.27 Events

### 16.114.28 exportAsynchronouslyCompleted

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Returns the identifiers compatible with a given asset.
**Notes:** asset: An asset that is ready to be exported.

Returns an array of strings representing the identifiers compatible with asset.

The array is a complete list of the valid identifiers that can be used with exportSessionWithAsset with the specified asset.

Not all export presets are compatible with all assets. For example, a video-only asset is not compatible with an audio-only preset. This method returns only the identifiers for presets that are compatible with the given asset.

In order to ensure that the setup and running of an export operation will succeed using a given preset, you should not make significant changes to the asset (such as adding or deleting tracks) between retrieving compatible identifiers and performing the export operation.

If the asset's tracks are not currently loaded, they may be loaded by this method before any checks are performed.

### 16.114.29 Constants

Status Constants

| Constant | Value | Description |
|---|---|---|
| StatusCancelled | 5 | Indicates that the export session was cancelled. |
| StatusCompleted | 3 | Indicates that the export session completed successfully. |
| StatusExporting | 2 | Indicates that the export session is in progress. |
| StatusFailed | 4 | Indicates that the export session failed. |
| StatusUnknown | 0 | Indicates that the status is unknown. |
| StatusWaiting | 1 | Indicates that the session is waiting to export more data. |

## 16.115 class Sound

### 16.115.1 class Sound

Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in sound class in Xojo.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp4")
dim s as sound = f.OpenAsSound
dim a as AVAudioPlayerMBS = s.AVAudioPlayerMBS
MsgBox str(a.duration)+" seconds long"
call a.play
```

### 16.115.2 Methods

### 16.115.3 AVAudioPlayerMBS as AVAudioPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The audio player for this sound.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mp4")
dim s as sound = f.OpenAsSound
dim a as AVAudioPlayerMBS = s.AVAudioPlayerMBS
MsgBox str(a.duration)+" seconds long"
call a.play
```

**Notes:** Xojo uses AVAudioPlayer for playing sounds in version 2013r4 and newer.
This function returns the player object, so you change more settings.

# Chapter 17

# AVFoundationNode

## 17.1 class AVAudio3DPointMBS

### 17.1.1 class AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Class representing a point in 3D space.
**Notes:** This class is used by classes dealing with 3D audio such as those that adopt the AVAudioMixing protocol and the AVAudioEnvironmentNode class and represents a point in 3D space, in meters.

### 17.1.2 Methods

### 17.1.3 Constructor(x as Double = 0.0, y as Double = 0.0, z as Double = 0.0)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.1.4 Properties

### 17.1.5 x as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location on the x-axis, in meters.
**Notes:** (Read and Write property)

### 17.1.6 y as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location on the y-axis, in meters.
**Notes:** (Read and Write property)

### 17.1.7 z as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location on the z-axis, in meters.
**Notes:** (Read and Write property)

## 17.2 class AVAudioBufferMBS

### 17.2.1 class AVAudioBufferMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioBuffer class represents a buffer of audio data and its format.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.2.2 Methods

### 17.2.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.2.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.2.5 copy as AVAudioBufferMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates a read only copy of the buffer.

### 17.2.6 mutableCopy as AVAudioBufferMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the buffer.

### 17.2.7 Properties

### 17.2.8 byteCapacity as UInt32

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The buffer's capacity in bytes.
**Notes:** Available on MacOS 10.13 or newer.
(Read and Write property)

### 17.2.9 byteLength as UInt32

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The current number of valid bytes in the buffer.
**Notes:** Can be changed as part of an operation that modifies the contents.

Available on MacOS 10.13 or newer.
(Read only property)

### 17.2.10 format as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The format of the audio in the buffer.
**Notes:** (Read only property)

### 17.2.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 17.3 class AVAudioChannelLayoutMBS

### 17.3.1 class AVAudioChannelLayoutMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioChannelLayout class describes the roles of a set of audio channels.
**Example:**

```
Function StereoLeftFormat() As AVAudioFormatMBS
// stereo format, left channel only

dim qlayout as new QTAudioChannelLayoutMBS

dim d1 as new QTAudioChannelDescriptionMBS
dim d2 as new QTAudioChannelDescriptionMBS

d1.ChannelFlags = QTAudioChannelDescriptionMBS.kAudioChannelFlags_AllOff
d1.ChannelLabel = QTAudioChannelDescriptionMBS.kAudioChannelLabel_Discrete_3

d2.ChannelFlags = QTAudioChannelDescriptionMBS.kAudioChannelFlags_AllOff
d2.ChannelLabel = QTAudioChannelDescriptionMBS.kAudioChannelLabel_Unused

qlayout.ChannelLayoutTag = QTAudioChannelLayoutMBS.kAudioChannelLayoutTag_UseChannelDescriptions

qlayout.NumberChannelDescriptions=2
qlayout.ChannelDescriptions(0)=d1
qlayout.ChannelDescriptions(1)=d2

dim layout as new AVAudioChannelLayoutMBS(qlayout)
dim pf as new AVAudioFormatMBS(44100, layout)

Return pf
End Function
```

**Notes:** This object is a thin wrapper for the AudioChannelLayout structure.

### 17.3.2 Methods

### 17.3.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.3.4 Constructor(Layout as QTAudioChannelLayoutMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initialize an audio channel layout object using an existing one.
**Example:**

```
Function StereoFormat() As AVAudioFormatMBS
// stereo format with standard layout tag
dim qlayout as new QTAudioChannelLayoutMBS

qlayout.ChannelLayoutTag = QTAudioChannelLayoutMBS.kAudioChannelLayoutTag_Stereo

dim layout as new AVAudioChannelLayoutMBS(qlayout)
dim pf as new AVAudioFormatMBS(44100, layout)

Return pf
End Function
```

**Notes:** If the provided audio channel layout object,Äôs tag is kAudioChannelLayoutTag_UseChannelDescriptions, this initializer attempts to convert it to a more specific tag.
See also:

- 17.3.5 Constructor(LayoutTag as Integer) 3792

### 17.3.5 Constructor(LayoutTag as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initialize an audio channel layout object using a layout tag.
**Example:**

```
Function StereoFormat() As AVAudioFormatMBS
// stereo format with standard layout tag

dim layout as new AVAudioChannelLayoutMBS(QTAudioChannelLayoutMBS.kAudioChannelLayoutTag_Stereo)
dim pf as new AVAudioFormatMBS(44100, layout)

Return pf
End Function
```

**Notes:** See QTAudioChannelLayoutMBS class for constants.
See also:

- 17.3.4 Constructor(Layout as QTAudioChannelLayoutMBS) 3792

### 17.3.6 isEqual(other as AVAudioChannelLayoutMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Determines whether another audio channel layout is exactly equal to this layout.
**Notes:** other: The AVAudioChannelLayout object to compare against.

Returns true if they are equal; otherwise false.

### 17.3.7 layoutWithLayout(Layout as QTAudioChannelLayoutMBS) as AVAudioChannelLayoutMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates a new audio channel layout object from an existing one.

### 17.3.8 layoutWithLayoutTag(LayoutTag as Integer) as AVAudioChannelLayoutMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates a new audio channel layout object using an audio channel layout tag.
**Notes:** If the provided audio channel layout object,Äôs tag is kAudioChannelLayoutTag_UseChannelDescriptions, this initializer attempts to convert it to a more specific tag.

### 17.3.9 Properties

### 17.3.10 channelCount as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The number of channels of audio data.
**Notes:** (Read only property)

### 17.3.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.3.12 layout as QTAudioChannelLayoutMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The underlying audio channel layout.
**Notes:** See QTAudioChannelLayoutMBS class for details.
(Read only property)

### 17.3.13 layoutTag as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio channel,Äôs underlying layout tag.
**Notes:** See QTAudioChannelLayoutMBS class for constants.
(Read only property)

## 17.4 class AVAudioComponentDescriptionMBS

### 17.4.1 class AVAudioComponentDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifying information for an audio component.

### 17.4.2 Methods

### 17.4.3 Constructor(componentType as string = """, componentSubType as string = """, componentManufacturer as string = """, componentFlags as UInt32 = 0, componentFlagsMask as UInt32 = 0)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.4.4 Properties

### 17.4.5 componentFlags as UInt32

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The flags.
**Notes:** Set this value to zero.
(Read and Write property)

### 17.4.6 componentFlagsMask as UInt32

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The mask of flags set.
**Notes:** Set this value to zero.
(Read and Write property)

### 17.4.7 componentManufacturer as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The unique vendor identifier, registered with Apple, for the audio component.
**Notes:** (Read and Write property)

### 17.4.8 componentSubType as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A 4-byte code that you can use to indicate the purpose of a component.
**Notes:** For example, you could use lpas or lowp as a mnemonic indication that an audio unit is a low-pass filter.
(Read and Write property)

### 17.4.9 componentType as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A unique 4-byte code identifying the interface for the component.
**Notes:** (Read and Write property)

## 17.5 class AVAudioEngineMBS

### 17.5.1 class AVAudioEngineMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioEngine class defines a group of connected AVAudioNode objects, known as audio nodes.
**Notes:** You use audio nodes to generate audio signals, process them, and perform audio input and output.

You create each audio node separately and attach it to the audio engine. You can perform all audio node operations during runtime—connecting them, disconnecting them, and removing them—with only minor limitations:

- Reconnect audio nodes only when they are upstream of a mixer..
- If you remove an audio node that has differing input and output channel counts, or which is a mixer, the result will likely be a broken graph.

**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 21.0pr6
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.3

**Xojo Developer Magazine**

- 19.2, page 10: News

### 17.5.2 Methods

### 17.5.3 attachedNodes as AVAudioNodeMBS()

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Set of all nodes attached to the engine.
**Notes:** Available in macOS 10.15 or newer.
Available in iOS 10.13 or newer.

### 17.5.4 attachNode(node as AVAudioNodeMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Attaches a new audio node to the audio engine.
**Notes:** node: The audio node to be attached to the audio engine.

To support the instantiation of arbitrary AVAudioNode subclasses, instances are created externally to the audio engine but are unusable until attached to the audio engine using this method.

### 17.5.5 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.5.6 AVAudioEngineConfigurationChangeNotification as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Posted when the audio engine configuration changes.
**Notes:** When the audio engine,Äôs I/O unit observes a change to the audio input or output hardware,Äôs channel count or sample rate, the audio engine stops, uninitializes itself, and issues this notification.

### 17.5.7 connect(node1 as AVAudioNodeMBS, node2 as AVAudioNodeMBS, bus1 as Integer, bus2 as Integer, format as AVAudioFormatMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Establish a connection between two audio nodes, specifying the input and output busses.
**Notes:** node1: The source audio node.
node2: The destination audio node.
bus1: The output bus of the source audio node.
bus2: The input bus of the destination audio node.
format: If not nil, the format of the source audio node,Äôs output bus is set to this AVAudioFormat object. In all cases, the format of the destination audio node,Äôs input bus is set to match that of the source audio node,Äôs output bus.

Audio nodes have input and output busses (AVAudioNodeBus). Use this method to establish connections between audio nodes. Connections are always one-to-one, never one-to-many or many-to-one.
See also:

- 17.5.8 connect(node1 as AVAudioNodeMBS, node2 as AVAudioNodeMBS, format as AVAudioFormatMBS) 3799


### 17.5.8 connect(node1 as AVAudioNodeMBS, node2 as AVAudioNodeMBS, format as AVAudioFormatMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Establishes a connection between two audio nodes.
**Notes:** node1: The source audio node.
node2: The destination audio node.

format: If not nil, the format of the source audio node,Äôs output bus is set to this AVAudioFormat object. In all cases, the format of the destination audio node,Äôs input bus is set to match that of the source audio node,Äôs output bus.

This method calls connect method using bus 0 for the source audio node, and bus 0 for the destination audio node, except in the case of a destination which is a mixer, in which case the destination is the mixer,Äôs nextAvailableInputBus.
See also:


- 17.5.7 connect(node1 as AVAudioNodeMBS, node2 as AVAudioNodeMBS, bus1 as Integer, bus2 as Integer, format as AVAudioFormatMBS) 3798


### 17.5.9 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.5.10 Destructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 17.5.11 detachNode(node as AVAudioNodeMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Detaches a audio node previously attached to the audio engine.
**Notes:** node: The audio node to be detached from the audio engine.

If necessary, the audio engine will safely disconnect the audio node before detaching it.

### 17.5.12 disableManualRenderingMode

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Sets the engine to render to or from an audio device.

### 17.5.13 disconnectNodeInput(node as AVAudioNodeMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Removes all input connections of the audio node.
**Notes:** node: The audio node whose inputs you want to disconnect.

Connections are broken on each of the audio node,Äôs input buses.
See also:

- 17.5.14 disconnectNodeInput(node as AVAudioNodeMBS, bus as Integer) 3800

### 17.5.14 disconnectNodeInput(node as AVAudioNodeMBS, bus as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Removes the input connection of an audio node on the specified bus.
**Notes:** node: The audio node whose input is to be disconnected.
bus: The destination,Äôs input bus to be disconnected.
See also:

- 17.5.13 disconnectNodeInput(node as AVAudioNodeMBS) 3800

### 17.5.15 disconnectNodeOutput(node as AVAudioNodeMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Remove all output connections of an audio node.
**Notes:** node: The audio node whose outputs are to be disconnected.
See also:

- 157.1.50 disconnectNodeOutput(node as AVAudioNodeMBS, bus as Integer) 20395

### 17.5.16 disconnectNodeOutput(node as AVAudioNodeMBS, bus as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Remove the output connection of an audio node on the specified bus.
**Notes:** node: The audio node whose output is to be disconnected.
bus: The destination,Äôs output bus to disconnect.
See also:

- 17.5.15 disconnectNodeOutput(node as AVAudioNodeMBS) 3800

### 17.5.17 enableManualRenderingMode(mode as Integer, pcmFormat as AVAudioFormatMBS, maximumFrameCount as UInt32, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Sets the engine to operate in manual rendering mode with the specified render format and maximum frame count.
**Notes:** Use this method to configure the engine to render in response to requests from the client. You must stop the engine before calling this method. The render format must be a PCM format and match the format of the rendering buffer.
The input data in manual rendering mode can be supplied through the source nodes. See AVAudioPlayerNode and AVAudioInputNode.

### 17.5.18 pause

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Pauses the audio engine.
**Notes:** Stops the flow of audio through the audio engine but does not deallocate the resources allocated by prepare.
You resume the audio engine by invoking startAndReturnError again.

### 17.5.19 prepare

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Prepares the audio engine for starting.
**Notes:** This method preallocates many of the resources that the audio engine requires in order to start.

Use it in order to start audio input or output more responsively.

### 17.5.20 renderOffline(numberOfFrames as UInt32, buffer as AVAudioPCMBufferMBS, byref error as NSErrorMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Makes a render call to the engine operating in the offline manual rendering mode.

### 17.5.21 reset

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Resets all of the audio nodes in the audio engine.
**Notes:** This methods resets all of the audio nodes in the audio engine. Use it, for example, to silence reverb and delay tails.

### 17.5.22 startAndReturnError(byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Starts the audio engine.
**Notes:** Error: Returns, by-reference, a description of the error.

Returns true if the audio engine started successfully; otherwise, false.
This method invokes the prepare method if it has not already been called since stop was invoked.
It then starts the audio hardware via the AVAudioInputNode and/or AVAudioOutputNode instances in the audio engine.

Errors can occur when:

- There is problem in the structure of the graph. Input can't be routed to output or to a recording tap through converter type nodes.
- An AVAudioSession error occurred
- The driver failed to start the hardware

### 17.5.23 stop

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Stop the audio engine.
**Notes:** Releases the resources allocated by the prepare method.

### 17.5.24 Properties

### 17.5.25 autoShutdownEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** When auto shutdown is enabled, the engine can start and stop the audio hardware dynamically, to conserve power. This is the enforced behavior on watchOS and can be optionally enabled on other platforms.
**Notes:** To conserve power, it is advised that the client pause/stop the engine when not in use.
But when auto shutdown is enabled, the engine will stop the audio hardware if it was running idle for a certain duration, and restart it later when required.
Note that, because this operation is dynamic, it may affect the start times of the source nodes (e.g. AVAudioPlayerNodeMBS), if the engine has to resume from its shutdown state.

On watchOS, auto shutdown is always enabled. On other platforms, it is disabled by default, but the client can enable it if needed.

This property is applicable only when the engine is rendering to/from an audio device. If the value is changed when the engine is in manual rendering mode, it will take effect whenever the engine is switched to render to/from the audio device.

Available on MacOS 10.13 or newer.
(Read and Write property)

### 17.5.26 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.5.27 InManualRenderingMode as Boolean

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Whether or not the engine is operating in manual rendering mode, i.e. not connected to an audio device and rendering in response to the requests from the client.

**Notes:** Manual rendering is currently not supported in MBS Plugins.

Available on MacOS 10.13 or newer.
(Read only property)

### 17.5.28 inputNode as AVAudioInputNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio engine,Äôs singleton input audio node.
**Notes:** The audio engine creates a singleton on demand when inputNode is first accessed. To receive input, connect another audio node from the output of the input audio node, or create a recording tap on it.

The AVAudioSesssion instance and/or the availability of hardware features determine whether an app can perform input. Check the input format of input node (specifically, the hardware format) for a non-zero sample rate and channel count to see if input is enabled.
(Read only property)

### 17.5.29 mainMixerNode as AVAudioMixerNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio engine,Äôs optional singleton main mixer node.
**Notes:** When the property is first accessed the audio engine constructs a singleton main mixer and connects it to the outputNode on demand. You can then connect additional audio nodes to the mixer.

By default, the mixer's output format (sample rate and channel count) will track the format of the output node. It is possible to make the connection explicitly with a different format.
(Read only property)

### 17.5.30 manualRenderingFormat as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** The render format of the engine in manual rendering mode.
**Notes:** (Read only property)

### 17.5.31 manualRenderingMaximumFrameCount as UInt32

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** The maximum number of PCM sample frames the engine can produce in any single render call in manual rendering mode.
**Notes:** If you get this property when the engine isn't in manual rendering mode, it returns zero.
(Read only property)

### 17.5.32 manualRenderingMode as Integer

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** The manual rendering mode configured on the engine.
**Notes:** Either ManualRenderingModeOffline or ManualRenderingModeRealtime.
(Read only property)

### 17.5.33 manualRenderingSampleTime as Int64

MBS AVFoundation Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** An indication of where the engine is on its render timeline in manual rendering mode.
**Notes:** (Read only property)

### 17.5.34 outputNode as AVAudioOutputNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio engine,Äôs singleton output audio node.
**Notes:** When this property is first accessed the audio engine creates a singleton on demand. Connect another audio node to the input of the output audio node, or obtain a mixer that is connected by default, using the mainMixerNode property.

The AVAudioSesssion instance and/or the availability of hardware features determine whether an app can perform output. Check the output format of output node (specifically, the hardware format) for a non-zero sample rate and channel count to see if output is enabled.
(Read only property)

### 17.5.35 running as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the audio engine,Äôs running state.
**Notes:** The value is true if the audio engine is running, otherwise, false.
(Read only property)

### 17.5.36 Events

### 17.5.37 ConfigurationChanged(notification as NSNotificationMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Posted when the audio engine configuration changes.
**Notes:** When the audio engine,Äôs I/O unit observes a change to the audio input or output hardware,Äôs channel count or sample rate, the audio engine stops, uninitializes itself, and issues this notification.

### 17.5.38 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| ManualRenderingErrorInitialized | -80801 | An operation that can,Äôt be performed because the engine hasn,Äôt stop running. |
| ManualRenderingErrorInvalidMode | -80800 | An operation that can,Äôt be performed because the engine is not in man rendering mode or the right variant of it. |
| ManualRenderingErrorNotRunning | -80802 | An operation that can,Äôt be performed because the engine hasn,Äôt star running. |

Rendering Modes

| Constant | Value | Description |
|---|---|---|
| ManualRenderingModeOffline | 0 | An engine that operates in an offline mode. |
| ManualRenderingModeRealtime | 1 | An engine that operates under real-time constraints and doesn't make blocking calls while rendering. |

Manual Rendering Status

| Constant | Value | Description |
|---|---|---|
| ManualRenderingStatusCannotDoInCurrentContext | 2 | An operation that can't be performed under current co try again later. |
| ManualRenderingStatusError | -1 | A problem that occurred during rendering, resulting in |
| ManualRenderingStatusInsufficientDataFromInputNode | 1 | A condition in which not enough input data was retur to satisfy the render request at the time of the request |
| ManualRenderingStatusSuccess | 0 | A status that indicates that all of the requested data wa |

## 17.6 class AVAudioEnvironmentDistanceAttenuationParametersMBS

### 17.6.1 class AVAudioEnvironmentDistanceAttenuationParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioEnvironmentDistanceAttenuationParameters class specifies the attenuation distance, the gradual loss in audio intensity, and characteristics.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.6.2 Methods

### 17.6.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.6.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.6.5 Properties

### 17.6.6 distanceAttenuationModel as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The distance attenuation model describing the drop-off in gain as the source moves away from the listener.
**Notes:** The default value is the AVAudioEnvironmentDistanceAttenuationModelInverse attenuation model.
(Read and Write property)

### 17.6.7 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.6.8 maximumDistance as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The distance, in meters, beyond which no further attenuation is applied.
**Notes:** The default value is 100000.0 meters.
This property is relevant for the AVAudioEnvironmentDistanceAttenuationModelInverse attenuation model.
(Read and Write property)

### 17.6.9 referenceDistance as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The minimum distance, in meters, at which attenuation is applied.
**Notes:** The default value is 1.0 meter.

This property is relevant for the AVAudioEnvironmentDistanceAttenuationModelInverse and AVAudioEnvironmentDistanceAttenuationModelLinear attenuation models.
(Read and Write property)

### 17.6.10 rolloffFactor as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Determines the attenuation curve.
**Notes:** A higher value results in a steeper attenuation curve. The default value is 1.0. The value must be greater than 0.0.

This property is relevant for the AVAudioEnvironmentDistanceAttenuationModelExponential, AVAudioEnvironmentDistanceAttenuationModelInverse, and AVAudioEnvironmentDistanceAttenuationModelLinear attenuation models.
(Read and Write property)

### 17.6.11 Constants

Distance attenuation models

| Constant | Value | Description |
|---|---|---|
| DistanceAttenuationModelExponential | 1 | Calculated as distanceGain = (distance / referenceDistance) ^(-rolloffFa |
| DistanceAttenuationModelInverse | 2 | Calculated as distanceGain = referenceDistance / (referenceDistance + r Factor * (distance –referenceDistance)). |
| DistanceAttenuationModelLinear | 3 | Calculated as distanceGain = (1 –rolloffFactor * (distance –referenceDis / (maximumDistance –referenceDistance)). |

## 17.7 class AVAudioEnvironmentNodeMBS

### 17.7.1 class AVAudioEnvironmentNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioEnvironmentNode class is a mixer node that simulates a 3D audio environment.
**Notes:** Any node that conforms to the AVAudioMixing protocol (for example, AVAudioPlayerNode) can act as a source in this environment.

The environment has an implicit ,Äúlistener,Äù. By controlling the listener,Äôs position and orientation, the application controls the way the user experiences the virtual world. In addition, this node also defines properties for distance attenuation and reverberation that help characterize the environment.

It is important to note that only inputs with a mono channel connection format to the environment node are spatialized. If the input is stereo, the audio is passed through without being spatialized. Currently inputs with connection formats of more than 2 channels are not supported.

In order to set the environment node,Äôs output to a multichannel format, use an AVAudioFormatMBS having one of the following Audio Channel Layout Tags.

- kAudioChannelLayoutTag_AudioUnit_4
- kAudioChannelLayoutTag_AudioUnit_5_0
- kAudioChannelLayoutTag_AudioUnit_6_0
- kAudioChannelLayoutTag_AudioUnit_7_0
- kAudioChannelLayoutTag_AudioUnit_7_0_Front
- kAudioChannelLayoutTag_AudioUnit_8

Subclass of the AVAudioNodeMBS class.

### 17.7.2 Methods

### 17.7.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.7.4 Properties

### 17.7.5 distanceAttenuationParameters as AVAudioEnvironmentDistanceAttenuationParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The distance attenuation parameters for the environment.
**Notes:** (Read only property)

### 17.7.6 nextAvailableInputBus as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Finds an unused input bus.
**Notes:** This method finds and returns the first input bus to which no other node is connected.
(Read only property)

### 17.7.7 obstruction as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct path of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Only the direct path of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.8 occlusion as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct and reverb paths of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Both the direct and reverb paths of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.9 outputVolume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The mixer's output volume.
**Notes:** This accesses the mixer's output volume (0.0-1.0, inclusive).
(Read and Write property)

### 17.7.10 pan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's stereo pan.
**Notes:** The default value is 0.0. A value in the range -1.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.11 position as AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location of the source in the 3D environment.
**Notes:** The coordinates are specified in meters. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.12 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Changes the playback rate of the input signal.
**Notes:** A value of 2.0 results in the output audio playing one octave higher. A value of 0.5, results in the output audio playing one octave lower.

The default value is 1.0. The range of valid values is 0.5 to 2.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.13 renderingAlgorithm as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Type of rendering algorithm used.
**Notes:** Depending on the current output format of the AVAudioEnvironmentNode instance, only a subset of the rendering algorithms may be supported. An array of valid rendering algorithms is retrieved by calling the applicableRenderingAlgorithms function of the AVAudioEnvironmentNode instance.

The default rendering algorithm is AVAudio3DMixingRenderingAlgorithmEqualPowerPanning. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.14 reverbBlend as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Controls the blend of dry and reverb processed audio.
**Notes:** This property controls the amount of the source,Äôs audio that will be processed by the reverb by the AVAudioEnvironmentNode instance. A value of 0.5 will result in an equal blend of dry and processed (wet) audio.

The default is 0.0. The range of valid values is 0.0 (completely dry) to 1.0 (completely wet). This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.7.15 reverbParameters as AVAudioEnvironmentReverbParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The reverb parameters for the environment.
**Notes:** (Read only property)

### 17.7.16 volume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's input volume.
**Notes:** The default value is 1.0. The range of valid values are 0.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode and AVAudioMixerNode class mixers.
(Read and Write property)

## 17.8 class AVAudioEnvironmentReverbParametersMBS

### 17.8.1 class AVAudioEnvironmentReverbParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioEnvironmentReverbParameters class encapsulates the parameters that you use to control the reverb of the AVAudioEnvironmentNode class.
**Notes:** Reverberation can be used to simulate the acoustic characteristics of an environment. The AVAudioEnvironmentNode class has a built-in reverb that describes the space that the listener is in.

The reverb also has a single filter that sits at the end of the chain. You can use this filter to shape the overall sound of the reverb. For instance, select one of the reverb presets to simulate the general space and then use the filter to brighten or darken the overall sound.

You cannot create a standalone instance of AVAudioEnvironmentReverbParameters. Only an instance vended by a source object, such as an AVAudioEnvironmentNode instance is valid.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.8.2 Methods

### 17.8.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.8.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.8.5 loadFactoryReverbPreset(preset as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Loads one of the reverbs factory presets.
**Notes:** Loading a factory reverb preset changes the sound of the reverb. This is independent of the filter

which follows the reverb in the signal chain.

### 17.8.6 Properties

### 17.8.7 enable as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Enables the reverberation.
**Notes:** The default value is false.
(Read and Write property)

### 17.8.8 filterParameters as AVAudioUnitEQFilterParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The filter that applies to the output of the reverb.
**Notes:** (Read only property)

### 17.8.9 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.8.10 level as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The master level, in decibels, of the reverb.
**Notes:** The default value is 0.0. The values must be within the range of -40 to 40 dB.
(Read and Write property)

## 17.9 class AVAudioFileMBS

### 17.9.1 class AVAudioFileMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioFile class represents an audio file that can be opened for reading or writing.
**Notes:** Regardless of the file,Äôs actual format, you read and write the file using AVAudioPCMBuffer objects, that contain samples in AVAudioCommonFormat, referred to as the file,Äôs processing format. Conversions are performed to and from the file,Äôs actual format.

Reads and writes are always sequential, but random access is possible by setting the framePosition property.
**Blog Entries**

- Write audio file with samples using AVFoundation
- MBS Xojo / Real Studio Plugins, version 15.4pr1

### 17.9.2 Methods

### 17.9.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.9.4 Constructor(File as FolderItem, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Opens a file for reading.
**Notes:** file: The path of the file to read.
Error: Returns, by-reference, a description of the error, if an error occurs.
See also:


- 17.9.5 Constructor(File as FolderItem, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3817
- 17.9.6 Constructor(File as FolderItem, settings as Dictionary, byref error as NSErrorMBS) 3817
- 17.9.7 Constructor(File as FolderItem, settings as Dictionary, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3818

### 17.9.5 Constructor(File as FolderItem, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Open a file for reading using a specified processing format.
**Notes:** file: The path of the file to read.
format: The processing format to use when reading from the file.
interleaved: Whether to use an interleaved processing format.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns an initialized audio file object for reading.

The file format me be is deinterleaved float, that is AVAudioPCMFormatFloat32. The processing format refers to the buffers read from the file. The content is read and converted from the file format to the processing format. The processing format must be at the same sample rate as the actual file contents and must be linear PCM, whether or not the processing buffer is interleaved float is determined by the interleaved parameter.
See also:


- 17.9.4 Constructor(File as FolderItem, byref error as NSErrorMBS) 3816
- 17.9.6 Constructor(File as FolderItem, settings as Dictionary, byref error as NSErrorMBS) 3817
- 17.9.7 Constructor(File as FolderItem, settings as Dictionary, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3818


### 17.9.6 Constructor(File as FolderItem, settings as Dictionary, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Open a file for writing.
**Notes:** file: The path of the file to create for writing.
settings: The format of the file to create. (See the settings property in the AVAudioRecorder class.)
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns an initialized audio file object for writing.

The file type to create is inferred from the file extension of fileURL. This method will overwrite a file at the specified URL if a file already exists.

The file is opened for writing using the standard format, AVAudioPCMFormatFloat32.
See also:

- 17.9.4 Constructor(File as FolderItem, byref error as NSErrorMBS) 3816
- 17.9.5 Constructor(File as FolderItem, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3817
- 17.9.7 Constructor(File as FolderItem, settings as Dictionary, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3818


### 17.9.7 Constructor(File as FolderItem, settings as Dictionary, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Open a file for writing using a specified processing format.
**Notes:** file: The path to write the file.
settings: The format of the file to create.
format: The processing format to use when writing to the file.
interleaved: Whether to use an interleaved processing format.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns an initialized audio file object for writing.

The file type to create is inferred from the file extension of file.
This method will overwrite a file at the specified URL if a file already exists.
See also:


- 17.9.4 Constructor(File as FolderItem, byref error as NSErrorMBS) 3816
- 17.9.5 Constructor(File as FolderItem, commonFormat as Integer, Interleaved as Boolean, byref error as NSErrorMBS) 3817
- 17.9.6 Constructor(File as FolderItem, settings as Dictionary, byref error as NSErrorMBS) 3817


### 17.9.8 fileDuration(file as folderItem) as Double

MBS AVFoundation Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries duration of an audio file.
**Notes:** This uses different AVAudioFile API than rest of AVAudioFileMBS class.
We discovered a bug in Apples frameworks to report wrong length for some MP3 files and this function seems to be closer to the real duration of the file.

### 17.9.9 readIntoBuffer(buffer as AVAudioPCMBufferMBS, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buffer from which to read into the file.
**Notes:** buffer: The buffer from which to read the file. Its format must match the file,Äôs processing format.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true, if the read was successful; otherwise false.

Reading sequentially from the framePosition property, attempts to fill the buffer to its capacity. On return, the buffer,Äôs length property indicates the number of sample frames successfully read.
See also:

- 17.9.10 readIntoBuffer(buffer as AVAudioPCMBufferMBS, frameCount as Integer, byref error as NSErrorMBS) as Boolean 3819

### 17.9.10 readIntoBuffer(buffer as AVAudioPCMBufferMBS, frameCount as Integer, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Read a portion of a buffer.
**Notes:** buffer: The buffer from which to read the file. Its format must match the file,Äôs processing format.
frames: The number of frames to read.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true, if the read was successful; otherwise false.

Like the read method, but can be used to read fewer frames than the buffer frameCapacity.
See also:

- 17.9.9 readIntoBuffer(buffer as AVAudioPCMBufferMBS, byref error as NSErrorMBS) as Boolean 3819

### 17.9.11 writeFromBuffer(buffer as AVAudioPCMBufferMBS, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Write a buffer.
**Notes:** buffer: The buffer from which to write to the file. Its format must match the file,Äôs processing format.

Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true, if the read was successful.

Writes sequentially. The buffer's frameLength signifies how much of the buffer is to be written.

### 17.9.12 Properties

### 17.9.13 fileFormat as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The on-disk format of the file.
**Notes:** (Read only property)

### 17.9.14 FramePosition as Int64

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The position in the file at which the next read or write operation will occur.
**Notes:** Set the framePosition property to perform a seek before a read or write. A read or write operation advances the frame position value by the number of frames read or written.
(Read and Write property)

### 17.9.15 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.9.16 Length as Int64

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The number of sample frames in the file.
**Notes:** This can be computationally expensive to compute for the first time.
(Read only property)

### 17.9.17 processingFormat as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The processing format of the file.
**Notes:** (Read only property)

### 17.9.18 URL as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The URL the file is reading or writing.
**Notes:** (Read only property)

## 17.10 class AVAudioFormatMBS

### 17.10.1 class AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioFormat class wraps a Core Audio AudioStreamBasicDescription struct, with convenience initializers and accessors for common formats, including Core Audio,Äôs standard deinterleaved 32-bit floating point format.
**Notes:** Instances of this class are immutable.
**Blog Entries**

- Write audio file with samples using AVFoundation

### 17.10.2 Methods

### 17.10.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.10.4 Constructor(format as Integer, sampleRate as Double, channels as Integer, interleaved as Boolean)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio format instance.
**Notes:** format: The audio format. See AVAudioCommonFormat for values.
sampleRate: The sample rate, in hertz.
channels: The channel count.
interleaved: True if the audio format is interleaved; otherwise false.
See also:


- 17.10.5 Constructor(format as Integer, sampleRate as Double, interleaved as Boolean, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.6 Constructor(sampleRate as Double, channels as Integer) 3823
- 17.10.7 Constructor(sampleRate as Double, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.8 Constructor(Settings as Dictionary) 3824

### 17.10.5 Constructor(format as Integer, sampleRate as Double, interleaved as Boolean, layout as AVAudioChannelLayoutMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio format instance with the specified auto format, sample rate, interleaved format and channel layout.
**Notes:** format: The audio format. See AVAudioCommonFormat for values.
sampleRate: The sample rate, in hertz.
interleaved: True if the audio format is interleaved; otherwise false.
layout: The channel layout. Must not be nil.
See also:

- 17.10.4 Constructor(format as Integer, sampleRate as Double, channels as Integer, interleaved as Boolean) 3822
- 17.10.6 Constructor(sampleRate as Double, channels as Integer) 3823
- 17.10.7 Constructor(sampleRate as Double, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.8 Constructor(Settings as Dictionary) 3824

### 17.10.6 Constructor(sampleRate as Double, channels as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio format instance with the specified sample rate and channel count.
**Notes:** sampleRate: The sample rate, in hertz.
channels: The channel count.

The returned AVAudioFormat instance uses the AVAudioPCMFormatFloat32 format.
See also:

- 17.10.4 Constructor(format as Integer, sampleRate as Double, channels as Integer, interleaved as Boolean) 3822
- 17.10.5 Constructor(format as Integer, sampleRate as Double, interleaved as Boolean, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.7 Constructor(sampleRate as Double, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.8 Constructor(Settings as Dictionary) 3824

### 17.10.7 Constructor(sampleRate as Double, layout as AVAudioChannelLayoutMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio format instance as a deinterleaved float with the specified sample rate and channel layout.
**Example:**

```
Function StereoFormat() As AVAudioFormatMBS
// stereo format with standard layout tag
dim qlayout as new QTAudioChannelLayoutMBS

qlayout.ChannelLayoutTag = QTAudioChannelLayoutMBS.kAudioChannelLayoutTag_Stereo

dim layout as new AVAudioChannelLayoutMBS(qlayout)
dim pf as new AVAudioFormatMBS(44100, layout)

Return pf
End Function
```

**Notes:** sampleRate: The sample rate, in hertz.
layout: The channel layout. Must not be nil.

The returned AVAudioFormat instance uses the AVAudioPCMFormatFloat32 format.
See also:


- 17.10.4 Constructor(format as Integer, sampleRate as Double, channels as Integer, interleaved as Boolean) 3822
- 17.10.5 Constructor(format as Integer, sampleRate as Double, interleaved as Boolean, layout as AVAudioChannelLayoutMBS) 3823
- 17.10.6 Constructor(sampleRate as Double, channels as Integer) 3823
- 17.10.8 Constructor(Settings as Dictionary) 3824


### 17.10.8 Constructor(Settings as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio format instance using a settings dictionary.
**Notes:** settings: The settings dictionary. See AV Foundation Audio Settings Constants for supported key/value pairs.
Many settings dictionary elements pertain to encoder settings, not the basic format, and will be ignored.
See also:


- 17.10.4 Constructor(format as Integer, sampleRate as Double, channels as Integer, interleaved as Boolean) 3822
- 17.10.5 Constructor(format as Integer, sampleRate as Double, interleaved as Boolean, layout as AVAudioChannelLayoutMBS) 3823

- 17.10.6 Constructor(sampleRate as Double, channels as Integer) 3823
- 17.10.7 Constructor(sampleRate as Double, layout as AVAudioChannelLayoutMBS) 3823


### 17.10.9 isEqual(other as AVAudioFormatMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the audo format instance and a given object have identical format settings.
**Notes:** object: The object to be compared.

Returns true if the receiver and object are equal, otherwise false.

This method defines what it means for instances to be equal. The two objects are considered equal if and only if they return identical values for all the settings.

### 17.10.10 Properties

### 17.10.11 channelCount as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The number of channels of audio data.
**Notes:** (Read only property)

### 17.10.12 channelLayout as AVAudioChannelLayoutMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The underlying audio channel layout.
**Notes:** The value is the underlying AVAudioChannelLayout instance.
(Read only property)

### 17.10.13 commonFormat as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the common format identifier.
**Notes:** (Read only property)

### 17.10.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.10.15 Interleaved as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Describes whether the samples are interleaved.
**Notes:** For non-PCM formats, this value is undefined.
(Read only property)

### 17.10.16 sampleRate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio format sampling rate in hertz.
**Notes:** (Read only property)

### 17.10.17 settings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The format represented as a dictionary with keys from AVAudioSettings.
**Notes:** Not all formats representable by an AudioStreamBasicDescription struct (the underlying implementation) can be represented in a settings dictionary; in that case, nil is returned.
(Read only property)

### 17.10.18 Standard as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Describes whether the format is deinterleaved native-endian float.
**Notes:** True if the format is deinterleaved native-endian float (AVAudioPCMFormatFloat32), otherwise false.
(Read only property)

### 17.10.19 Constants

Common audio formats

| Constant | Value | Description |
|---|---|---|
| AVAudioOtherFormat | 0 | A format which is not 16/32bit integer or 32/64bit float. |
| AVAudioPCMFormatFloat32 | 1 | Native-endian floats. This is the standard format. |
| AVAudioPCMFormatFloat64 | 2 | Native-endian doubles. |
| AVAudioPCMFormatInt16 | 3 | Signed 16-bit native-endian integers. |
| AVAudioPCMFormatInt32 | 4 | Signed 32-bit native-endian integers. |

## 17.11 class AVAudioInputNodeMBS

### 17.11.1 class AVAudioInputNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioInputNode class represents a node that connects to the system's audio input.
**Notes:** This node has one element. The format of the input scope reflects the audio hardware sample rate and channel count. The format of the output scope is initially the same as that of the input, but you may set it to a different format, in which case the node will convert.
Subclass of the AVAudioIONodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.11.2 Methods

### 17.11.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.11.4 Properties

### 17.11.5 obstruction as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct path of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Only the direct path of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.6 occlusion as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct and reverb paths of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Both the direct and reverb paths of sound between the

source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.7 pan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's stereo pan.
**Notes:** The default value is 0.0. A value in the range -1.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.8 position as AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location of the source in the 3D environment.
**Notes:** The coordinates are specified in meters. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.9 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Changes the playback rate of the input signal.
**Notes:** A value of 2.0 results in the output audio playing one octave higher. A value of 0.5, results in the output audio playing one octave lower.

The default value is 1.0. The range of valid values is 0.5 to 2.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.10 renderingAlgorithm as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Type of rendering algorithm used.
**Notes:** Depending on the current output format of the AVAudioEnvironmentNode instance, only a subset of the rendering algorithms may be supported. An array of valid rendering algorithms is retrieved by calling the applicableRenderingAlgorithms function of the AVAudioEnvironmentNode instance.

The default rendering algorithm is AVAudio3DMixingRenderingAlgorithmEqualPowerPanning. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.

The rendering algorithms differ in terms of quality and cpu cost. AVAudio3DMixingRenderingAlgorithmEqualPowerPanning is the simplest panning algorithm and also the least expensive computationally.

If the AVAudioEnvironmentNode instance is set to a multichannel output format, only certain rendering algorithms know how to render to all of the output channels (currently AVAudio3DMixingRenderingAlgorithmSoundField). If any of the other rendering algorithms are selected, the AVAudioEnvironmentNode instance will render to only the first two output channels.

With the exception of AVAudio3DMixingRenderingAlgorithmSoundField, while the mixer is rendering to multi channel hardware, audio data will only be rendered to channels 1 & 2.
(Read and Write property)

### 17.11.11 reverbBlend as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Controls the blend of dry and reverb processed audio.
**Notes:** This property controls the amount of the source,Äôs audio that will be processed by the reverb by the AVAudioEnvironmentNode instance. A value of 0.5 will result in an equal blend of dry and processed (wet) audio.

The default is 0.0. The range of valid values is 0.0 (completely dry) to 1.0 (completely wet). This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.11.12 volume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's input volume.
**Notes:** The default value is 1.0. The range of valid values are 0.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode and AVAudioMixerNode class mixers.
(Read and Write property)

### 17.11.13 Constants

Rendering Algorithms

| Constant | Value | Description |
|---|---|---|
| RenderingAlgorithmEqualPowerPanning | 0 | Pans the data of the mixer bus into a stereo field. This algorithm is ar to the pan knob found on a mixing board channel strip. |
| RenderingAlgorithmHRTF | 2 | The Head Related Transfer Function is a high quality algorithm usin ing to emulate 3 dimensional space in headphones. HRTF is a cpu i algorithm. |
| RenderingAlgorithmHRTFHQ | 6 | Higher quality HRTF rendering algorithm compared to AVAudio3DMix deringAlgorithmHRTF.<br>Improvements have been made to the overall frequency response and l tion of sources in a 3D space.<br>Available in MacOS 10.13 or newer. |
| RenderingAlgorithmSoundField | 3 | Designed for rendering to multi channel hardware. The mixer takes da rendered with SoundField and distributes it amongst all the output c with a weighting toward the location in which the sound derives. It effective for ambient sounds, which may derive from a specific location i yet should be heard through the listener,Äôs entire space. |
| RenderingAlgorithmSphericalHead | 1 | Designed to emulate 3 dimensional space in headphones by simulatin aural time delays and other spatial cues. This algorithm is slightly le intensive than AVAudio3DMixingRenderingAlgorithmHRTF. |
| RenderingAlgorithmStereoPassThrough | 5 | This algorithm should be used when no localization is desired for the data. Setting this algorithm tells the mixer to take mono/stereo input a it directly to channels 1 & 2 without localization. |

## 17.12 class AVAudioIONodeMBS

### 17.12.1 class AVAudioIONodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioIONode class is the base class for nodes that connects to the system's audio input or output.
**Notes:** Subclass of the AVAudioNodeMBS class.

### 17.12.2 Methods

### 17.12.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.12.4 Properties

### 17.12.5 audioUnit as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The node's underlying audio unit, if any.
**Notes:** Value is the handle.
(Read only property)

### 17.12.6 presentationLatency as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The presentation, or hardware, latency.
**Notes:** (Read only property)

## 17.13 class AVAudioMixerNodeMBS

### 17.13.1 class AVAudioMixerNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioMixerNode class represents a node that mixes its inputs to a single output.
**Notes:** Mixers may have any number of inputs. The mixer node accepts input at any sample rate and efficiently combines sample rate conversions. It also accepts any channel count and will correctly upmix or downmix to the output channel count.
Subclass of the AVAudioNodeMBS class.

### 17.13.2 Methods

### 17.13.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The construtor.

### 17.13.4 Properties

### 17.13.5 nextAvailableInputBus as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns an unused input bus.
**Notes:** This method finds and returns the first input bus to which no other node is connected.
(Read only property)

### 17.13.6 obstruction as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct path of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Only the direct path of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.

(Read and Write property)

### 17.13.7 occlusion as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct and reverb paths of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Both the direct and reverb paths of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.8 pan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's stereo pan.
**Notes:** The default value is 0.0. A value in the range -1.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.9 position as AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location of the source in the 3D environment.
**Notes:** The coordinates are specified in meters. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.10 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Changes the playback rate of the input signal.
**Notes:** A value of 2.0 results in the output audio playing one octave higher. A value of 0.5, results in the output audio playing one octave lower.

The default value is 1.0. The range of valid values is 0.5 to 2.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.11 renderingAlgorithm as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Type of rendering algorithm used.
**Notes:** Depending on the current output format of the AVAudioEnvironmentNode instance, only a subset of the rendering algorithms may be supported. An array of valid rendering algorithms is retrieved by calling the applicableRenderingAlgorithms function of the AVAudioEnvironmentNode instance.

The default rendering algorithm is AVAudio3DMixingRenderingAlgorithmEqualPowerPanning. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.12 reverbBlend as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Controls the blend of dry and reverb processed audio.
**Notes:** This property controls the amount of the source,Äôs audio that will be processed by the reverb by the AVAudioEnvironmentNode instance. A value of 0.5 will result in an equal blend of dry and processed (wet) audio.

The default is 0.0. The range of valid values is 0.0 (completely dry) to 1.0 (completely wet). This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.13.13 volume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's input volume.
**Notes:** The default value is 1.0. The range of valid values are 0.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode and AVAudioMixerNode class mixers.
(Read and Write property)

## 17.14 class AVAudioNodeMBS

### 17.14.1 class AVAudioNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioNode class is an abstract class for an audio generation, processing, or I/O block.
**Notes:** AVAudioEngine objects contain instances of various AVAudioNode subclasses. This base class provides certain common functionality.

Nodes have input and output busses, which can be thought of as connection points. For example, an effect typically has one input bus and one output bus. A mixer typically has multiple input busses and one output bus.

Busses have formats, expressed in terms of sample rate and channel count. When making connections between nodes, often the format must match exactly. However, there are exceptions such as the AVAudioMixerNode and AVAudioOutputNode classes.

Nodes do not currently provide useful functionality until attached to an engine.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.3

### 17.14.2 Methods

### 17.14.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.14.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.14.5 inputFormatForBus(busIndex as Integer) as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the input format for the specified bus.
**Notes:** Returns an AVAudioFormatMBS object representing the input format of the bus.

### 17.14.6 installTapOnBus(busIndex as Integer, bufferSize as UInt32 = 0, format as AVAudioFormatMBS = nil, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Installs an audio tap on the bus to record, monitor, and observe the output of the node.
**Notes:** bus: The node output bus to which to attach the tap.
bufferSize: The requested size of the incoming buffers. The implementation may choose another size.
format: If non-nil, attempts to apply this as the format of the specified output bus.

This should only be done when attaching to an output bus which is not connected to another node; an error will result otherwise. The tap and connection formats (if non-nil) on the specified bus should be identical. Otherwise, the latter operation will override any previously set format.

For AVAudioOutputNode, tap format must be specified as nil.

The plugin calls the Tap event with the data periodically.

Only one tap may be installed on any bus. Taps may be safely installed and removed while the engine is running.

### 17.14.7 nameForInputBus(busIndex as Integer) as string

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of an input bus.

### 17.14.8 nameForOutputBus(busIndex as Integer) as string

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of the output bus.

### 17.14.9 outputFormatForBus(busIndex as Integer) as AVAudioFormatMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the output format for the specified bus.
**Notes:** Returns an AVAudioFormatMBS object representing the input format of the bus.

### 17.14.10 removeTapOnBus(busIndex as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Removes an audio tap on a bus.
**Notes:** bus: The node output bus whose tap is to be removed.

### 17.14.11 reset

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Clear a unit's previous processing state.

### 17.14.12 Properties

### 17.14.13 AUAudioUnitHandle as Integer

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** An AUAudioUnit wrapping or underlying the implementation's AudioUnit.
**Notes:** This provides an AUAudioUnit which either wraps or underlies the implementation's AudioUnit, depending on how that audio unit is packaged. Applications can interact with this AUAudioUnit to control custom properties, select presets, change parameters, etc.

No operations that may conflict with state maintained by the engine should be performed directly on the audio unit. These include changing initialization state, stream formats, channel layouts or connections to other audio units.

Available on MacOS 10.13 or newer.
(Read only property)

### 17.14.14 engine as AVAudioEngineMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio engine of the node.
**Notes:** Returns nil if the node is not attached to an audio engine.
(Read only property)

### 17.14.15 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.14.16 lastRenderTime as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The time for which the node most recently rendered.
**Notes:** Return nil if the engine is not running or if the node is not connected to an input or output node.
(Read only property)

### 17.14.17 latency as Double

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The processing latency of the node, in seconds.
**Notes:** This property reflects the delay between when an impulse in the audio stream arrives at the input vs. output of the node. This should reflect the delay due to signal processing (e.g. filters, FFT's, etc.), not delay or reverberation which is being applied as an effect. A value of zero indicates either no latency or an unknown latency.

Available on MacOS 10.13 or newer.
(Read only property)

### 17.14.18 numberOfInputs as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The number of input busses for the node.
**Notes:** (Read only property)

### 17.14.19 numberOfOutputs as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The number of output busses for the node.
**Notes:** (Read only property)

### 17.14.20 outputPresentationLatency as Double

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The maximum render pipeline latency downstream of the node, in seconds.
**Notes:** This describes the maximum time it will take for the audio at the output of a node to be presented. For instance, the output presentation latency of the output node in the engine is:

- zero in manual rendering mode
- the presentation latency of the device itself when rendering to an audio device (see AVAudioIONodeMBS.presentationLatency)

The output presentation latency of a node connected directly to the output node is the output node's presentation latency plus the output node's processing latency (see latency).

For a node which is exclusively in the input node chain (i.e. not connected to engine's output node), this property reflects the latency for the output of this node to be presented at the output of the terminating node in the input chain.

A value of zero indicates either an unknown or no latency.

Note that this latency value can change as the engine is reconfigured (started/stopped, connections made/altered downstream of this node etc.). So it is recommended not to cache this value and fetch it whenever it's needed.

Available on MacOS 10.13 or newer.
(Read only property)

### 17.14.21 Events

### 17.14.22 Tap(bus as Integer, bufferSize as UInt32, format as AVAudioFormatMBS, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The tap event.
**Notes:** Called after using installTapOnBus periodically.

## 17.15 class AVAudioOutputNodeMBS

### 17.15.1 class AVAudioOutputNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioOutputNode class represents a audio node that connects to the system's audio output.
**Notes:** This audio node has one element. The format of the output scope reflects the audio hardware sample rate and channel count. The format of the input scope is initially the same as that of the output, but you may set it to a different format, in which case the audio node will convert.
Subclass of the AVAudioIONodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5

### 17.15.2 Methods

### 17.15.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.15.4 Properties

### 17.15.5 CurrentDeviceID as UInt32

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Get or set the current device.
**Notes:** Please check OutputDevices dictionary for which devices are available.
(Read and Write property)

### 17.15.6 DefaultDeviceID as UInt32

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the Core Audio ID of the default device.
**Notes:** (Read only property)

### 17.15.7 OutputDevices as Dictionary

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries a dictionary with output devices.
**Example:**

```
Dim e As New AVAudioEngineMBS
Dim a As AVAudioOutputNodeMBS = e.outputNode
Dim d As Dictionary = a.OutputDevices

For Each key As Variant In d.keys
dim name as string = d.Value(key)

MsgBox key+": "+name
Next
```

**Notes:** Key is the ID and value is the name of the device.
(Read only property)

## 17.16 class AVAudioPCMBufferMBS

### 17.16.1 class AVAudioPCMBufferMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioPCMBuffer class is a subclass of AVAudioBuffer for use with PCM audio formats.
**Notes:** The PCM buffer class also provides methods useful for manipulating buffers of audio in PCM format.
Subclass of the AVAudioBufferMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- Write audio file with samples using AVFoundation

### 17.16.2 Methods

### 17.16.3 Constructor(format as AVAudioFormatMBS, frameCapacity as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated PCM audio buffer instance for PCM audio data.
**Notes:** format: The format of the PCM audio to be contained in the buffer.
frameCapacity: The capacity of the buffer in PCM sample frames.

### 17.16.4 floatChannelDataCopy(ChannelIndex as Integer) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Copies buffer's audio samples as floating point values.
**Notes:** Returns memoryblock with samples only for the given channel.
Handles stride automatically for you.

### 17.16.5 int16ChannelDataCopy(ChannelIndex as Integer) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Copies buffer's audio samples as 16-bit integer point values.
**Notes:** Returns memoryblock with samples only for the given channel.
Handles stride automatically for you.

### 17.16.6 int32ChannelDataCopy(ChannelIndex as Integer) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Copies buffer's audio samples as 32-bit integer point values.
**Notes:** Returns memoryblock with samples only for the given channel.
Handles stride automatically for you.

### 17.16.7 level(ChannelIndex as Integer) as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Calculates level for a channel.
**Notes:** Value returned is between around 0.0 (nothing) to 1.0 (maximum).
Negative values are for errors.

### 17.16.8 setFloatChannelData(ChannelIndex as Integer, Data as Memoryblock) as boolean

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Writes channel to the buffer.
**Notes:** Please set frameLength to a matching value.
Data.size should be frameLength * 4.

Returns true on success or false on failure.
Handles stride automatically for you.

### 17.16.9 setInt16ChannelData(ChannelIndex as Integer, Data as Memoryblock) as boolean

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Writes channel to the buffer.
**Notes:** Please set frameLength to a matching value.
Data.size should be frameLength * 2.

Returns true on success or false on failure.
Handles stride automatically for you.

### 17.16.10 setInt32ChannelData(ChannelIndex as Integer, Data as Memoryblock) as boolean

MBS AVFoundation Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Writes channel to the buffer.
**Notes:** Please set frameLength to a matching value.
Data.size should be frameLength * 4.

Returns true on success or false on failure.
Handles stride automatically for you.

### 17.16.11 Properties

### 17.16.12 floatChannelData as Ptr

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buffer's audio samples as floating point values.
**Notes:** The floatChannelData property returns pointers to the buffer,Äôs audio samples, if the buffer,Äôs format is 32-bit float. It returns nil if it is another format.

The returned pointer is to format.channelCount pointers to float. Each of these pointers is to frameLength valid samples, which are spaced by stride samples.

If the format is not interleaved, as with the standard deinterleaved float format, then the pointers will be to separate chunks of memory and the stride property value is 1.

If the format is interleaved, then the pointers will refer to the same buffer of interleaved samples, each offset by 1 frame, and the stride property value is the number of interleaved channels.
(Read only property)

### 17.16.13 frameCapacity as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buffer's capacity, in audio sample frames.
**Notes:** (Read only property)

### 17.16.14 frameLength as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The current number of valid sample frames in the buffer.
**Notes:** You may modify the length of the buffer as part of an operation that modifies its contents. The length must be less than or equal to the frameCapacity. Modifying frameLength will update the mDataByteSize field in each of the underlying AudioBufferList struct,Äôs AudioBuffer struct correspondingly, and vice versa. Note that in the case of deinterleaved formats, the mDataByteSize field will refers the size of one channel,Äôs worth of audio samples.

The length must be less than or equal to the frameCapacity. In the case of deinterleaved formats, frameCapacity will refer to the size of one channel,Äôs worth of audio samples.
(Read and Write property)

### 17.16.15 int16ChannelData as Ptr

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Access the buffer's 16bit integer audio samples.
**Notes:** The int16ChannelData property returns the buffer's audio samples if the buffer's format has 2-byte integer samples, or nil if it is another format.

See floatChannelData for more information.
(Read only property)

### 17.16.16 int32ChannelData as Ptr

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Access the buffer's 32-bit integer audio samples.
**Notes:** The int32ChannelData property returns the buffer's audio samples if the buffer's format has 4-byte integer samples, or nil if it is another format.

See floatChannelData for more information.
(Read only property)

### 17.16.17 stride as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buffer's number of interleaved channels.
**Notes:** (Read only property)

## 17.17 class AVAudioPlayerNodeMBS

### 17.17.1 class AVAudioPlayerNodeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioPlayerNode class plays buffers or segments of audio files.
**Notes:** AVAudioPlayerNode supports scheduling the playback of AVAudioBuffer instances, or segments of audio files opened via AVAudioFile. Buffers and segments may be scheduled at specific points in time, or to play immediately following preceding segments.

Normally, you will want to configure the node,Äôs output format with the same number of channels as are in the files and buffers to be played. Otherwise, channels will be dropped or added as required. It is usually better to use an AVAudioMixerNode to do this.

Similarly, when playing file segments, the node will sample rate convert if necessary, but it is often preferable to configure the node,Äôs output sample rate to match that of the file(s) and use a mixer to perform the rate conversion.

When playing buffers, there is an implicit assumption that the buffers are at the same sample rate as the node,Äôs output format.

This class overrides the AVAudioNode method reset and unschedules all previously scheduled buffers and file segments, and also returns the player timeline to sample time 0.

Player Timeline
The usual AVAudioNode sample times (as observed by lastRenderTime ) have an arbitrary zero point. AVAudioPlayerNode superimposes a second ,Äúplayer timeline,Äù on top of this, to reflect when the player was started, and intervals during which it was paused. The methods nodeTimeForPlayerTime and playerTimeForNodeTime convert between the two.

Scheduling Playback Time
The scheduleBuffer, scheduleFile, and scheduleSegment methods take an AVAudioTime when parameter. This is interpreted as follows:

- If the when parameter is nil:
  - If there have been previous commands, the new one is played immediately following the last one.
  - Otherwise, if the node is playing, the event is played in the very near future.
  - Otherwise, the command is played at sample time 0.
- If the when parameter is a sample time, the parameter is interpreted as such.
- If the when parameter is a host time it is ignored unless sample time not valid.

The scheduling methods will fail if:

- A buffer's channel count does not match that of the node's output format.
- A file can't be accessed.
- An AVAudioTime specifies neither a valid sample time or host time.
- A segment's start frame or frame count is negative.

Subclass of the AVAudioNodeMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr4

### 17.17.2 Methods

### 17.17.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.17.4 nodeTimeForPlayerTime(playerTime as AVAudioTimeMBS) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Convert from player time to node time.
**Notes:** playerTime: A time relative to the player,Äôs start time.

Returns a node time.

This method and its inverse playerTimeForNodeTime are discussed in The Player Timeline. If the player is not playing when this method is called, nil is returned.

### 17.17.5 pause

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Pause playback.
**Notes:** The player's sample time does not advance while the node is paused.

### 17.17.6 play

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Start or resume playback immediately.
**Notes:** This is equivalent to playAtTime with a value of nil.

### 17.17.7 playAtTime(time as AVAudioTimeMBS = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Start or resume playback at a specific time.
**Example:**

```
Dim p As AVAudioPlayerNodeMBS // your player node
Dim t As AVAudioTimeMBS = AVAudioTimeMBS.timeWithSampleTime(60000, 1000) // 60s

p.playAtTime(t)
```

**Notes:** when: The node time at which to start or resume playback. Passing nil starts playback immediately.

This node is initially paused. Requests to play buffers or file segments are enqueued, and any necessary decoding begins immediately. Playback does not begin, however, until the player has started playing, via this method.

### 17.17.8 playerTimeForNodeTime(nodeTime as AVAudioTimeMBS) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Convert from node time to player time.
**Notes:** nodeTime: The node time.

Returns a time relative to the player,Äôs start time.

This method and its inverse nodeTimeForPlayerTime are discussed in The Player Timeline. If the player is not playing when this method is called, nil is returned.

### 17.17.9 prepareWithFrameCount(frameCount as UInt32)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Prepares previously scheduled file regions or buffers for playback.
**Notes:** frameCount: The number of sample frames of data to be prepared before returning.

### 17.17.10 scheduleBuffer(buffer as AVAudioPCMBufferMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Schedule playing samples from an audio buffer.
**Notes:** buffer: The buffer to play.

Calls scheduleBufferCompleted event later when playback is done.
time will be nil and options be zero in that case.

Schedules the buffer to be played following any previously scheduled commands.
See also:

- 17.17.11 scheduleBuffer(buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3852
- 17.17.12 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3853
- 17.17.13 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3853

### 17.17.11 scheduleBuffer(buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Schedule playing samples from an audio buffer at the specified time and with the specified playback options.
**Notes:** buffer: The buffer to play.
when: The time at which to play the buffer.
options: Playback options.

Calls later scheduleBufferCompleted event after the buffer has completely played or the player is stopped.
See also:

- 17.17.10 scheduleBuffer(buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3852

- 17.17.12 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3853
- 17.17.13 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3853


### 17.17.12 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Schedule playing samples from an AVAudioBuffer.
**Notes:** buffer: the buffer to play
callbackType: option to specify when the completion handler must be called

The scheduleBufferCompleted event is called after the buffer has been consumed by the player or has finished playing back or the player is stopped.

Schedules the buffer to be played following any previously scheduled commands.

Available in MacOS 10.13 or newer.
See also:


- 17.17.10 scheduleBuffer(buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3852
- 17.17.11 scheduleBuffer(buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3852
- 17.17.13 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3853


### 17.17.13 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Schedule playing samples from an AVAudioBuffer.
**Notes:** buffer: the buffer to play
time: the time at which to play the buffer. see the discussion of timestamps, above.
options: options for looping, interrupting other buffers, etc.
callbackType: option to specify when the completion handler must be called.

The scheduleBufferCompleted event is called after the buffer has been consumed by the player or has finished playing back or the player is stopped.

Available in MacOS 10.13 or newer.
See also:

- 17.17.10 scheduleBuffer(buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3852
- 17.17.11 scheduleBuffer(buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant = nil) 3852
- 17.17.12 scheduleBuffer(callbackType as Integer, buffer as AVAudioPCMBufferMBS, tag as Variant = nil) 3853

### 17.17.14 scheduleFile(callbackType as Integer, file as AVAudioFileMBS, time as AVAudioTimeMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Schedule playing of an entire audio file.
**Notes:** file: the file to play
time: the time at which to play the file. see the discussion of timestamps, above.
callbackType: option to specify when the completion handler must be called

The scheduleFileCompleted event is called after the file has been consumed by the player or has finished playing back or the player is stopped.

Available in MacOS 10.13 or newer.
See also:

- 17.17.15 scheduleFile(file as AVAudioFileMBS, time as AVAudioTimeMBS, tag as Variant = nil) 3854

### 17.17.15 scheduleFile(file as AVAudioFileMBS, time as AVAudioTimeMBS, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Schedule playing of an entire audio file.
**Notes:** file: The file to play.
when: The time at which to play the buffer.

Calls later scheduleFileCompleted event when playback is done.
See also:

- 17.17.14 scheduleFile(callbackType as Integer, file as AVAudioFileMBS, time as AVAudioTimeMBS, tag as Variant = nil) 3854

### 17.17.16 scheduleSegment(callbackType as Integer, file as AVAudioFileMBS, time as AVAudioTimeMBS, startFrame as Int64, frameCount as Int64, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Schedule playing a segment of an audio file.
**Notes:** file: the file to play
startFrame: the starting frame position in the stream
frameCount: the number of frames to play
time: the time at which to play the region. see the discussion of timestamps, above.
callbackType: option to specify when the completion handler must be called

The scheduleSegmentCompleted event is called after the segment has been consumed by the player or has finished playing back or the player is stopped.

Available in MacOS 10.13 or newer.
See also:

- 17.17.17 scheduleSegment(file as AVAudioFileMBS, time as AVAudioTimeMBS, startFrame as Int64, frameCount as Int64, tag as Variant = nil) 3855

### 17.17.17 scheduleSegment(file as AVAudioFileMBS, time as AVAudioTimeMBS, startFrame as Int64, frameCount as Int64, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Schedule playing a segment of an audio file.
**Notes:** file: The audio file of the file to play.
startFrame: The starting frame position in the stream.
frameCount: The number of frames to play.
when: The time at which to play the buffer.

Calls later scheduleSegmentCompleted event.
See also:

- 17.17.16 scheduleSegment(callbackType as Integer, file as AVAudioFileMBS, time as AVAudioTimeMBS, startFrame as Int64, frameCount as Int64, tag as Variant = nil) 3855

### 17.17.18 stop

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Clear all of the node's previously scheduled events and stop playback.
**Notes:** All of the node,Äôs previously scheduled events are cleared, including any that are in the middle

of playing. The node,Äôs sample time (and therefore the times to which new events are to be scheduled) is reset to 0, and will not proceed until the node is started again by sending a play or playAtTime message.

### 17.17.19 Properties

### 17.17.20 obstruction as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct path of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Only the direct path of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.21 occlusion as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct and reverb paths of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Both the direct and reverb paths of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.22 pan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's stereo pan.
**Notes:** The default value is 0.0. A value in the range -1.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.23 Playing as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Indicates whether or not the player is playing.
**Notes:** (Read only property)

### 17.17.24 position as AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location of the source in the 3D environment.
**Notes:** The coordinates are specified in meters. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.25 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Changes the playback rate of the input signal.
**Notes:** A value of 2.0 results in the output audio playing one octave higher. A value of 0.5, results in the output audio playing one octave lower.

The default value is 1.0. The range of valid values is 0.5 to 2.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.26 renderingAlgorithm as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Type of rendering algorithm used.
**Notes:** Depending on the current output format of the AVAudioEnvironmentNode instance, only a subset of the rendering algorithms may be supported. An array of valid rendering algorithms is retrieved by calling the applicableRenderingAlgorithms function of the AVAudioEnvironmentNode instance.

The default rendering algorithm is AVAudio3DMixingRenderingAlgorithmEqualPowerPanning. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.27 reverbBlend as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Controls the blend of dry and reverb processed audio.
**Notes:** This property controls the amount of the source,Äôs audio that will be processed by the reverb by the AVAudioEnvironmentNode instance. A value of 0.5 will result in an equal blend of dry and processed (wet) audio.

The default is 0.0. The range of valid values is 0.0 (completely dry) to 1.0 (completely wet). This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.17.28 volume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's input volume.
**Notes:** The default value is 1.0. The range of valid values are 0.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode and AVAudioMixerNode class mixers.
(Read and Write property)

### 17.17.29 Events

### 17.17.30 scheduleBufferCompleted(callbackType as Integer, buffer as AVAudioPCMBufferMBS, time as AVAudioTimeMBS, options as Integer, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Called after the buffer has completely played or the player is stopped.
**Notes:** callbackType: The requested callback type or -1 for older APIs.

### 17.17.31 scheduleFileCompleted(callbackType as Integer, file as AVAudioFileMBS, time as AVAudioTimeMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Called after the file has completely played or the player is stopped.
**Notes:** callbackType: The requested callback type or -1 for older APIs.

### 17.17.32 scheduleSegmentCompleted(callbackType as Integer, file as AVAudioFileMBS, startFrame as Int64, frameCount as Int64, time as AVAudioTimeMBS, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Called after the segment has completely played or the player is stopped.
**Notes:** callbackType: The requested callback type or -1 for older APIs.

### 17.17.33 Constants

Options controlling buffer scheduling

| Constant | Value | Description |
|---|---|---|
| BufferInterrupts | 2 | The buffer interrupts any buffer already playing. |
| BufferInterruptsAtLoop | 4 | The buffer interrupts any buffer already playing, at its loop point. |
| BufferLoops | 1 | The buffer loops indefinitely. |

Completion Handler Modes

| Constant | Value | Description |
|---|---|---|
| CompletionDataConsumed | 0 | The buffer or file data has been consumed by the player. |
| CompletionDataPlayedBack | 2 | Applicable only when the engine is rendering to/from an audio device. The buffer or file has finished playing. This accounts for both (small) signal processing latencies downstream of the player in the engine, as well as (possibly significant) latency in the audio playback device. |
| CompletionDataRendered | 1 | The buffer or file data has been rendered (i.e. output) by the player. This does not account for any signal processing latencies downstream of the player in the engine (see AVAudioNodeMBS.outputPresentationLatency). |

## 17.18 class AVAudioTimeMBS

### 17.18.1 class AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioTime class is used by AVAudioEngine to represent time.
**Example:**

```
Dim t As AVAudioTimeMBS = AVAudioTimeMBS.timeWithSampleTime(60000, 1000) // 60s
```

**Notes:** Instances of the class are immutable.
A single moment in time may be represented in two different ways:

- Using mach_absolute_time(), the system's basic clock. Referred to as ‚Äúhost time.‚Äù
- Audio samples at a particular sample rate.

A single AVAudioTime instance may contain either or both representations; it might represent only a sample time, only a host time, or both.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.18.2 Methods

### 17.18.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.18.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.18.5 extrapolateTimeFromAnchor(anchorTime as AVAudioTimeMBS) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates an audio time object by converting between host and sample time.
**Notes:** anchorTime: An AVAudioTime instance with a more complete AudioTimeStamp than that of the receiver.

Returns a newly created and initialized AVAudioTime instance with the extrapolated time.

If anchorTime is an AVAudioTime instance where both host time and sample time are valid, and the receiver is another timestamp where only one of the two is valid, this method returns a new AVAudioTime instance copied from the receiver and where any additional valid fields provided by the anchor are also valid.

### 17.18.6 hostTimeForSeconds(Seconds as Double) as UInt64

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Converts seconds to host time.
**Notes:** seconds: The number of seconds.
Returns the seconds represented as host time.

### 17.18.7 secondsForHostTime(HostTime as UInt64) as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Converts host time to seconds.
**Notes:** hostTime: The host time.
Returns the host time represented as seconds.

### 17.18.8 timeWithHostTime(HostTime as UInt64) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates an audio time object with the specified host time.
**Notes:** hostTime: The host time.
Returns a newly created and initialized AVAudioTime instance with the extrapolated time.
See also:

- 17.18.9 timeWithHostTime(hostTime as UInt64, SampleTime as Int64, sampleRate as Double) as AVAudioTimeMBS 3862

### 17.18.9 timeWithHostTime(hostTime as UInt64, SampleTime as Int64, sampleRate as Double) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates an audio time object with the specified host time, sample time, and sample rate.
**Notes:** hostTime: The host time.
sampleTime: The sample time.
sampleRate: The sample rate.

Returns a newly created and initialized AVAudioTime instance with the specified host time, sample time, and sample rate.
See also:

- 17.18.8 timeWithHostTime(HostTime as UInt64) as AVAudioTimeMBS 3861

### 17.18.10 timeWithSampleTime(SampleTime as Int64, sampleRate as Double) as AVAudioTimeMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Creates an audio time object with the specified sample time and sample rate.
**Example:**

```
Dim t As AVAudioTimeMBS = AVAudioTimeMBS.timeWithSampleTime(60000, 1000) // 60s
```

**Notes:** sampleTime: The sample time.
sampleRate: The sample rate.

Returns a newly created and initialized AVAudioTime instance with the specified sample time and sample rate.

### 17.18.11 Properties

### 17.18.12 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.18.13 hostTime as UInt64

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The host time.
**Notes:** (Read only property)

### 17.18.14 hostTimeValid as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the host time value is valid.
**Notes:** True if the hostTime property is valid, otherwise false.
(Read only property)

### 17.18.15 sampleRate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The sample rate at which the sample time is being expressed.
**Notes:** (Read only property)

### 17.18.16 sampleTime as Int64

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The time as a number of audio samples, as tracked by the current audio device.
**Notes:** (Read only property)

### 17.18.17 sampleTimeValid as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the sample time and sample rate properties are valid.
**Notes:** (Read only property)

## 17.19 class AVAudioUnitComponentManagerMBS

### 17.19.1 class AVAudioUnitComponentManagerMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitComponentManager class is a singleton object that provides a way to find audio components that are registered with the system.
**Notes:** It provides methods to search and query various information about the audio components without opening them. Currently, only audio components that are audio units can only be searched.

The class also supports predefined system tags and arbitrary user tags. Each audio unit can be tagged as part of its definition. AudioUnit Hosts such as Logic or GarageBand can present groupings of audio units based on the tags.

Searching for audio units can be done in various ways:

- Using a NSPredicate instance that contains search strings for tags or descriptions
- Using a block to match on a custom criteria.
- Using an AudioComponentDescription.

Available in OS X v10.10 and later.

### 17.19.2 Methods

### 17.19.3 allComponents as AVAudioUnitComponentMBS()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Finds all components.
**Example:**

```
// Needs OS X 10.10 or newer
dim m as new AVAudioUnitComponentManagerMBS

dim a() as AVAudioUnitComponentMBS = m.allComponents

for each c as AVAudioUnitComponentMBS in a
dim d as AVAudioComponentDescriptionMBS = c.audioComponentDescription
'List.AddRow c.Name, c.ManufacturerName, c.LlocalizedTypeName, c.VersionString, d.componentType+"
"+d.componentSubType
```

```
// we look for the mixer
// AUMixer Apple Mixer 1.6.0 aumx smxr

if d.componentType = "aumx" and d.componentSubType = "smxr" then
dim aa as new AVAudioUnitMBS(d)
MsgBox aa.Name
end if

next
```

### 17.19.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.19.5 AVAudioUnitComponentTagsDidChangeNotification as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The notification name for the notification sent when tags changed.

### 17.19.6 componentsMatchingDescription(Description as AVAudioComponentDescriptionMBS) as AVAudioUnitComponentMBS()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of audio component objects that matches the description.
**Notes:** description: The AudioComponentDescription struct to match. The type, subtype and manufacturer fields are used to search for matching audio units. A value of "" or 0 for any of these fields is a wildcard and returns the first match found.

### 17.19.7 componentsPassingTest(tag as Variant = nil) as AVAudioUnitComponentMBS()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of audio components that pass the Test event.
**Notes:** For each AudioComponent found by the manager, the Test event will be called. If the block returns

true then the AVAudioComponent instance is added to the array.

### 17.19.8 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.19.9 Destructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 17.19.10 sharedAudioUnitComponentManager as AVAudioUnitComponentManagerMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the shared component manager.

### 17.19.11 standardLocalizedTagNames as string()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of the the localized standard system tags defined by the audio units.

### 17.19.12 tagNames as string()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of all tags associated with the current user, as well as all system tags defined by the audio units.

### 17.19.13 Properties

### 17.19.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.19.15 Events

### 17.19.16 TagsDidChange(notification as NSNotificationMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The event called when tags changed.

### 17.19.17 Test(component as AVAudioUnitComponentMBS, byref stop as Boolean, tag as Variant) as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The event to apply to the audio unit components.
**Notes:** Component: The component to test.
stop: A reference to a Boolean value. The block can set the value to true to stop further processing of the search. The stop argument is an out-only argument. You should only ever set this Boolean to true within the event.

The event returns a Boolean value that indicates whether comp passed the test.

## 17.20 class AVAudioUnitComponentMBS

### 17.20.1 class AVAudioUnitComponentMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitComponent class provides details about an audio unit such as: type, subtype, manufacturer, and location.
**Example:**

```
// Needs OS X 10.10 or newer
dim m as new AVAudioUnitComponentManagerMBS

dim a() as AVAudioUnitComponentMBS = m.allComponents

for each c as AVAudioUnitComponentMBS in a
dim d as AVAudioComponentDescriptionMBS = c.audioComponentDescription
'List.AddRow c.Name, c.ManufacturerName, c.LlocalizedTypeName, c.VersionString, d.componentType+"
"+d.componentSubType

// we look for the mixer
// AUMixer Apple Mixer 1.6.0 aumx smxr

if d.componentType = "aumx" and d.componentSubType = "smxr" then
dim aa as new AVAudioUnitMBS(d)
MsgBox aa.Name
end if

next
```

**Notes:** User tags can be added to the AVAudioUnitComponent which can be queried later for display.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.20.2 Methods

### 17.20.3 allTagNames as string()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of tag names for the audio unit component.

### 17.20.4 available as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Should return true on OS X 10.10 and newer.

### 17.20.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.20.6 SetUserTagNames(tags() as string)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets an array of tags created by the user.

### 17.20.7 supportsNumberOfChannels(numInputChannels as Integer, numOutputChannels as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the audio unit component supports the specified number of input and output channels.
**Notes:** numInputChannels: The number of input channels.
numOutputChannels: The number of output channels.

Returns true if the audio unit component supports the specified number of input and output channels, otherwise false.

### 17.20.8 userTagNames as string()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of tags created by the user.

### 17.20.9 Properties

### 17.20.10 audioComponentDescription as AVAudioComponentDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AudioComponentDescription of the audio unit component.
**Notes:** (Read only property)

### 17.20.11 componentFile as FolderItem

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The folderitem of the audio unit component.
**Notes:** (Read only property)

### 17.20.12 componentURL as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL of the audio unit component.
**Notes:** (Read only property)

### 17.20.13 configurationDictionary as Dictionary

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The audio unit component,Äôs configuration dictionary.
**Notes:** (Read only property)

### 17.20.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 17.20.15 hasCustomView as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the audio unit component has a custom view.
**Notes:** True if the component has a custom view, otherwise false.
(Read only property)

### 17.20.16 hasMIDIInput as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the audio unit component has midi input.
**Notes:** (Read only property)

### 17.20.17 hasMIDIOutput as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the audio unit component has midi output.
**Notes:** (Read only property)

### 17.20.18 iconFile as FolderItem

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The folderitem of an icon the represents the audio unit component.
**Notes:** (Read only property)

### 17.20.19 iconURL as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL of an icon the represents the audio unit component.
**Notes:** (Read only property)

### 17.20.20 LocalizedTypeName as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The localized type name of the component.
**Notes:** (Read only property)

### 17.20.21 ManufacturerName as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of the manufacturer of the audio unit component.
**Notes:** (Read only property)

### 17.20.22 Name as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of the audio unit component.
**Notes:** (Read only property)

### 17.20.23 passesAUVal as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the audio unit component passes the AUVal.
**Notes:** True if the component passes the AUVal, otherwise false.
(Read only property)

### 17.20.24 SandboxSafe as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether the audio unit component is safe for sandboxing.
**Notes:** True if the component is safe for sandboxing, otherwise false. This only applies to the current process.
(Read only property)

### 17.20.25 TypeName as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio unit component type.
**Notes:** (Read only property)

### 17.20.26 Version as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio unit component version number.
**Notes:** The version number is an NSNumber comprised of a hexadecimal number with major, minor, and a dot-release format: 0xMMMMmmDD.
(Read only property)

### 17.20.27 VersionString as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string representing the audio unit component version number.
**Notes:** (Read only property)

## 17.21 class AVAudioUnitDelayMBS

### 17.21.1 class AVAudioUnitDelayMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitDelay class is an AVAudioUnitEffect subclass that implements a delay effect.
**Notes:** A delay unit delays the input signal by the specified time interval and then blends it with the input signal. The amount of high frequency roll-off can also be controlled in order to simulate the effect of a tape delay.
Subclass of the AVAudioUnitEffectMBS class.

### 17.21.2 Methods

### 17.21.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.21.4 Properties

### 17.21.5 delayTime as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The time taken by the delayed input signal to reach the output.
**Notes:** The delay is specified in seconds. The default value is 1. The valid range of values is 0 to 2 seconds.
(Read and Write property)

### 17.21.6 feedback as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The amount of the output signal fed back into the delay line.
**Notes:** The feedback is specified as a percentage. The default value is 50%. The valid range of values is -100% to 100%.
(Read and Write property)

### 17.21.7 lowPassCutoff as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The cutoff frequency, in Hz, above which high frequency content is rolled off.
**Notes:** The default value is 15000 Hz. The valid range of values is 10 Hz through (sampleRate/2).
(Read and Write property)

### 17.21.8 wetDryMix as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The blend of the wet and dry signals.
**Notes:** The blend is specified as a percentage. The default value is 100%. The valid range of values is 0% (all dry) through 100% (all wet).
(Read and Write property)

## 17.22 class AVAudioUnitDistortionMBS

### 17.22.1 class AVAudioUnitDistortionMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitDistortion class is an AVAudioUnitEffect subclass that implements a multi-stage distortion effect.
**Notes:** Subclass of the AVAudioUnitEffectMBS class.

### 17.22.2 Methods

### 17.22.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.22.4 loadFactoryPreset(preset as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the audio distortion unit by loading a distortion preset.
**Notes:** preset: The distortion preset. See AVAudioUnitDistortionPreset for possible values.

### 17.22.5 Properties

### 17.22.6 preGain as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The gain, in decibels, applied to the signal before being distorted.
**Notes:** The default value is -6 db. The valid range of values is -80 db to 20 db.
(Read and Write property)

### 17.22.7 wetDryMix as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The blend of the distorted and dry signals.
**Notes:** The blend is specified as a percentage. The default value is 50%. The range is 0% (all dry) through 100% (all wet).
(Read and Write property)

### 17.22.8 Constants

Preset Audio Distortions

| Constant | Value | Description |
|---|---|---|
| PresetDrumsBitBrush | 0 | Preset that provides a ,ÄúDrumsBitBrush,Äù distortion. |
| PresetDrumsBufferBeats | 1 | Preset that provides a ,ÄúDrumsBuffersBitBrush,Äù distortion. |
| PresetDrumsLoFi | 2 | Preset that provides a ,ÄúDrumsLoFi,Äù distortion. |
| PresetMultiBrokenSpeaker | 3 | Preset that provides a ,ÄúMultiBrokenSpeaker,Äù distortion. |
| PresetMultiCellphoneConcert | 4 | Preset that provides a ,ÄúMultiCellphoneConcert,Äù distortion. |
| PresetMultiDecimated1 | 5 | Preset that provides a ,ÄúMultiDecimated1,Äù distortion. |
| PresetMultiDecimated2 | 6 | Preset that provides a ,ÄúMultiDecimated2,Äù distortion. |
| PresetMultiDecimated3 | 7 | Preset that provides a ,ÄúMultiDecimated3,Äù distortion. |
| PresetMultiDecimated4 | 8 | Preset that provides a ,ÄúMultiDecimated4,Äù distortion. |
| PresetMultiDistortedCubed | 10 | Preset that provides a ,ÄúMultiDistortedCubed,Äù distortion. |
| PresetMultiDistortedFunk | 9 | Preset that provides a ,ÄúMultiDistortedFunk,Äù distortion. |
| PresetMultiDistortedSquared | 11 | Preset that provides a ,ÄúMultiDistortedSquared,Äù distortion. |
| PresetMultiEcho1 | 12 | Preset that provides a ,ÄúMultiEcho1,Äù distortion. |
| PresetMultiEcho2 | 13 | Preset that provides a ,ÄúMultiEcho2,Äù distortion. |
| PresetMultiEchoTight1 | 14 | Preset that provides a ,ÄúMultiEchoTight1,Äù distortion. |
| PresetMultiEchoTight2 | 15 | Preset that provides a ,ÄúMultiEchoTight2,Äù distortion. |
| PresetMultiEverythingIsBroken | 16 | Preset that provides a ,ÄúMultiEverythingIsBroken,Äù distortion. |
| PresetSpeechAlienChatter | 17 | Preset that provides a ,ÄúSpeechAlienChatter,Äù distortion. |
| PresetSpeechCosmicInterference | 18 | Preset that provides a ,ÄúSpeechCosmicInterference,Äù distortion. |
| PresetSpeechGoldenPi | 19 | Preset that provides a ,ÄúSpeechGoldenPi,Äù distortion. |
| PresetSpeechRadioTower | 20 | Preset that provides a ,ÄúSpeechRadioTower,Äù distortion. |
| PresetSpeechWaves | 21 | Preset that provides a ,ÄúSpeechWaves,Äù distortion. |

## 17.23 class AVAudioUnitEffectMBS

### 17.23.1 class AVAudioUnitEffectMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An AVAudioUnitEffect class that processes audio in real-time using AudioUnits of type: effect, music effect, panner, remote effect or remote music effect.
**Notes:** These effects run in real-time and process some number of audio input samples to produce number of audio output samples. A delay unit is an example of an effect unit.
Subclass of the AVAudioUnitMBS class.

### 17.23.2 Methods

### 17.23.3 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes an AVAudioUnitEffect object.
**Notes:** audioComponentDescription: AudioComponentDescription of the AudioUnit to be instantiated.

The audioComponentDescription must be one of these types kAudioUnitType_Effect, kAudioUnitType_MusicEffect, kAudioUnitType_Panner, kAudioUnitType_RemoteEffect, or kAudioUnitType_RemoteMusicEffect.

### 17.23.4 Properties

### 17.23.5 bypass as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Bypass state of the AudioUnit.
**Notes:** (Read and Write property)

## 17.24 class AVAudioUnitEQFilterParametersMBS

### 17.24.1 class AVAudioUnitEQFilterParametersMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitEQFilterParameters class encapsulates the parameters used by an AVAudioUnitEQ instance.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 17.24.2 Methods

### 17.24.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 17.24.4 Properties

### 17.24.5 bandwidth as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The bandwidth of the EQ filter, in octaves.
**Notes:** The value range of values is 0.05 to 5.0 octaves.
(Read and Write property)

### 17.24.6 bypass as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The bypass state of the EQ filter band.
**Notes:** True if the bypass is active, otherwise false.
(Read and Write property)

### 17.24.7 filterType as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The EQ filter type.
**Notes:** The default value is AVAudioUnitEQFilterTypeParametric.
(Read and Write property)

### 17.24.8 frequency as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The frequency of the EQ filter, in hertz.
**Notes:** The valid range of values is 20 Hz through (SampleRate/2).
(Read and Write property)

### 17.24.9 gain as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The gain of the EQ filter, in decibels.
**Notes:** The default value is 0 db. The valid range of values is -96 db through 24 db.
(Read and Write property)

### 17.24.10 Constants

Filter Types

| Constant | Value | Description |
|---|---|---|
| FilterTypeBandPass | 5 | Band pass filter. The required parameters are: frequency (center) and bandwidth. |
| FilterTypeBandStop | 6 | Band stop filter (,Äúnotch filter,Äù). The required parameters are: frequency (center) and bandwidth. |
| FilterTypeHighPass | 2 | Simple Butterworth 2nd order high pass filter. The required parameters are: frequency (-3 dB cutoff at specified frequency). |
| FilterTypeHighShelf | 8 | High shelf filter. The required parameters are: frequency (center) and gain. |
| FilterTypeLowPass | 1 | Simple Butterworth 2nd order low pass filter. The required parameters are: frequency (-3 dB cutoff at specified frequency). |
| FilterTypeLowShelf | 7 | Low shelf filter. The required parameters are: frequency (center) and gain. |
| FilterTypeParametric | 0 | Parametric filter based on Butterworth analog prototype. The required parameters are: frequency (center), bandwidth, and gain. |
| FilterTypeResonantHighPass | 4 | High pass filter with resonance support (using the bandwidth parameter). The required parameters are: frequency (-3 dB cutoff at specified frequency) and bandwidth. |
| FilterTypeResonantHighShelf | 10 | High shelf filter with resonance support (using the bandwidth parameter). The required parameters are: frequency (center), bandwidth, and gain. |
| FilterTypeResonantLowPass | 3 | Low pass filter with resonance support (using the bandwidth parameter). The required parameters are: frequency (-3 dB cutoff at specified frequency) and bandwidth. |
| FilterTypeResonantLowShelf | 9 | Low shelf filter with resonance support (using the bandwidth parameter). The required parameters are: frequency (center), bandwidth, and gain. |

## 17.25 class AVAudioUnitEQMBS

### 17.25.1 class AVAudioUnitEQMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitEQ class is an AVAudioUnitEffect subclass that implements a multi-band equalizer.
**Notes:** The AVAudioUnitEQFilterParameters class encapsulates the filter parameters that are returned in the bands property array.
Subclass of the AVAudioUnitEffectMBS class.

### 17.25.2 Methods

### 17.25.3 bands as AVAudioUnitEQFilterParametersMBS()

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of AVAudioUnitEQFilterParameters objects.
**Notes:** The number of elements in the array is equal to the number of bands.

### 17.25.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 17.25.5 Constructor(bands as Integer) 3882

### 17.25.5 Constructor(bands as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated AVAudioUnitEQ instance.
**Notes:** Bands: The number of bands created by the EQ.
See also:

- 17.25.4 Constructor 3882

### 17.25.6 Properties

### 17.25.7 globalGain as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The overall gain adjustment applied to the signal, in decibels.
**Notes:** The default value is 0 db. The valid range of values is -96 db to 24 db.
(Read and Write property)

## 17.26 class AVAudioUnitGeneratorMBS

### 17.26.1 class AVAudioUnitGeneratorMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitGenerator is an AVAudioUnit subclass that generates audio output.
**Notes:** An AVAudioUnitGenerator represents an AudioUnit of type kAudioUnitType_Generator or kAudioUnitType_RemoteGenerator. A generator will have no audio input, but will produce audio output. An example is a tone generator.
Subclass of the AVAudioUnitMBS class.

### 17.26.2 Methods

### 17.26.3 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated AVAudioUnitGenerator instance.
**Notes:** audioComponentDescription: The audio component description.

The AudioComponentDescription struct componentType field must be kAudioUnitType_Generator or kAudioUnitType_RemoteGenerator.

### 17.26.4 Properties

### 17.26.5 bypass as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The bypass state of the audio unit.
**Notes:** True if the bypass state is enabled, otherwise false.
(Read and Write property)

### 17.26.6 obstruction as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct path of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Only the direct path of sound between the source and listener

are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.7 occlusion as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Simulates filtering of the direct and reverb paths of sound due to an obstacle.
**Notes:** The value of obstruction is in decibels. Both the direct and reverb paths of sound between the source and listener are blocked.

The default value is 0.0. The range of valid values is -100 to 0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.8 pan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's stereo pan.
**Notes:** The default value is 0.0. A value in the range -1.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.9 position as AVAudio3DPointMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The location of the source in the 3D environment.
**Notes:** The coordinates are specified in meters. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.10 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Changes the playback rate of the input signal.
**Notes:** A value of 2.0 results in the output audio playing one octave higher. A value of 0.5, results in the output audio playing one octave lower.

The default value is 1.0. The range of valid values is 0.5 to 2.0. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.11 renderingAlgorithm as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Type of rendering algorithm used.
**Notes:** Depending on the current output format of the AVAudioEnvironmentNode instance, only a subset of the rendering algorithms may be supported. An array of valid rendering algorithms is retrieved by calling the applicableRenderingAlgorithms function of the AVAudioEnvironmentNode instance.

The default rendering algorithm is AVAudio3DMixingRenderingAlgorithmEqualPowerPanning. This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.12 reverbBlend as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Controls the blend of dry and reverb processed audio.
**Notes:** This property controls the amount of the source,Äôs audio that will be processed by the reverb by the AVAudioEnvironmentNode instance. A value of 0.5 will result in an equal blend of dry and processed (wet) audio.

The default is 0.0. The range of valid values is 0.0 (completely dry) to 1.0 (completely wet). This property is currently implemented only by the AVAudioEnvironmentNode class mixer.
(Read and Write property)

### 17.26.13 volume as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The buss's input volume.
**Notes:** The default value is 1.0. The range of valid values are 0.0 to 1.0. This property is currently implemented only by the AVAudioEnvironmentNode and AVAudioMixerNode class mixers.

(Read and Write property)

## 17.27 class AVAudioUnitMBS

### 17.27.1 class AVAudioUnitMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnit class is a subclass of the AVAudioNode class that, depending on the type of the audio unit, processes audio either in real-time or non real-time.
**Notes:** Subclass of the AVAudioNodeMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.3pr3

### 17.27.2 Methods

### 17.27.3 AddPropertyListener(ID as UInt32)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Registeres to receive notifications for when a property changes.
**Notes:** When an audio unit property value changes, a PropertyListener event can be called by the audio unit to inform interested parties that this event has occurred.

You must call RemovePropertyListener when you are done with the audio unit.

Lasterror is set.

### 17.27.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 17.27.5 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS) 3888

### 17.27.5 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Private constructor. Initializes a newly allocated audio component specified by the description.
**Example:**

```
// Needs OS X 10.10 or newer
dim m as new AVAudioUnitComponentManagerMBS

dim a() as AVAudioUnitComponentMBS = m.allComponents

for each c as AVAudioUnitComponentMBS in a
dim d as AVAudioComponentDescriptionMBS = c.audioComponentDescription
'List.AddRow c.Name, c.ManufacturerName, c.LlocalizedTypeName, c.VersionString, d.componentType+"
"+d.componentSubType

// we look for the mixer
// AUMixer Apple Mixer 1.6.0 aumx smxr

if d.componentType = "aumx" and d.componentSubType = "smxr" then
dim aa as new AVAudioUnitMBS(d)
MsgBox aa.Name
end if

next
```

**Notes:** audioComponentDescription: The description of the audio unit to be initialized.
See also:

- 17.27.4 Constructor 3888

### 17.27.6 CreateView(PreferredSize as NSSizeMBS) as NSViewMBS

MBS AVFoundation Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates view if possible for the audio unit.
**Example:**

```
// audiounit is property of window
dim audiounit as new AVAudioUnitTimePitchMBS

dim preferredSize as new NSSizeMBS(200,100)
// view is property of window
dim view as NSViewMBS = audiounit.CreateView(preferredSize)

dim w as new NSWindowMBS(self)

// set position
view.setFrameOrigin(new NSPointMBS(100, 100))

// add to window
w.contentView.addSubview view
```

**Notes:** Returns nil in case of error.
PreferredSize is the preferred size of the control.

### 17.27.7 Destructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 17.27.8 GetParameter(ID as UInt32, Scope as UInt32, Element as UInt32) as Single

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Get the value of a parameter as specified by its ID, scope and element.
**Notes:** Lasterror is set.
If no error occurs, the result is the parameter value.
Please check Apples documentation for possible parameters.

### 17.27.9 GetProperty(ID as UInt32, Scope as UInt32, Element as UInt32) as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Retrieves the value of a specified property.
**Notes:** The plugin queries the data size, creates a memoryblock, queries the value and returns it.
Lasterror is set.

### 17.27.10 GetPropertyInfo(ID as UInt32, Scope as UInt32, Element as UInt32, byref WriteAble as Boolean) as UInt32

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Retrieves information about a specified property.
**Notes:** The API can be used to retrieve both the size of the property, and whether it is writable or not. In order to get a general answer on the capability of an audio unit, this function should be called before the audio unit is initialized (as some properties are writable when the audio unit is initialized, and others not)

Lasterror is set.

### 17.27.11 installLevelMonitor(CallsPerSecond as Integer, tag as Variant = nil)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Installs the handler to call LevelMonitor event regularly.
**Notes:** CallsPerSecond can be between 5 and 50. Tag is stored and passed to the event.

### 17.27.12 RemovePropertyListener(ID as UInt32)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Remove a previously registered property listener.

### 17.27.13 SetParameter(ID as UInt32, Scope as UInt32, Element as UInt32, Value as Single, inBufferOffsetInFrames as UInt32 = 0)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Set the value of a parameter as specified by its ID, scope and element.
**Notes:** Parameter IDs are consistent across all of the elements in a scope - so for a mixer, the "input volume" parameter can be applied on any input, and the particular input is specified by the elementID.

Lasterror is set.
Please check Apples documentation for possible parameters.

### 17.27.14 SetProperty(ID as UInt32, Scope as UInt32, Element as UInt32, data as Memoryblock)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sets the value of a specified property.
**Notes:** Some properties can be cleared by passing data = nil.
Lasterror is set.

### 17.27.15 Properties

### 17.27.16 audioComponentDescription as AVAudioComponentDescriptionMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio compression description of the underlying Core Audio audio unit.
**Notes:** (Read only property)

### 17.27.17 audioUnitHandle as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal handle for the audio unit.
**Notes:** (Read only property)

### 17.27.18 lastError as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The last error code for the property/parameter functions.
**Notes:** Zero means no error.
(Read and Write property)

### 17.27.19 ManufacturerName as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of the manufacturer of the audio unit.
**Notes:** (Read only property)

### 17.27.20 Name as String

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The name of the audio unit.
**Notes:** (Read only property)

### 17.27.21 Version as Integer

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The version number of the audio unit.
**Notes:** (Read only property)

### 17.27.22 Events

### 17.27.23 LevelMonitor(Level0 as Double, Level1 as Double, Level2 as Double, Level3 as Double, Level4 as Double, Level5 as Double, Level6 as Double, Level7 as Double, tag as Variant)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Reports level values.
**Notes:** We pass 8 level parameters for up to 8 channels.

### 17.27.24 PropertyListener(ID as UInt32, Scope as UInt32, Element as UInt32)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The property listener event.
**Notes:** When you listen for changes on a property, this event can be called.
Either synchronous on main thread or when received on other threads, the plugin will run it asynchronously on main thread.

## 17.28 class AVAudioUnitMIDIInstrumentMBS

### 17.28.1 class AVAudioUnitMIDIInstrumentMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitMIDIInstrument class is an abstract class representing music devices or remote instruments.
**Notes:** An AVAudioUnitMIDIInstrument subclass can be used in a chain that processes realtime input (live) and has general concept of music events, for example, notes.

Available in OS X v10.10 and later.
Subclass of the AVAudioUnitMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr1

### 17.28.2 Methods

### 17.28.3 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a MIDI instrument audio unit with the specified component description.
**Notes:** description: The AudioComponentDescription struct. The component of type must be kAudioUnitType_MusicDevice or kAudioUnitType_RemoteInstrument.

### 17.28.4 sendController(Controller as Integer, Value as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Send a MIDI ,Äúcontroller,Äù event to the instrument.
**Notes:** controller: Specifies a standard MIDI controller number. The valid range is 0 to 127.
value: Value for the controller. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

### 17.28.5 sendMIDIEvent(midiStatus as Integer, data1 as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI event which contains one data byte to the instrument.
**Notes:** midiStatus: The STATUS value of the MIDI event.
data1: The data byte of the MIDI event.
See also:

- 17.28.6 sendMIDIEvent(midiStatus as Integer, data1 as Integer, data2 as Integer) 3895

### 17.28.6 sendMIDIEvent(midiStatus as Integer, data1 as Integer, data2 as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI event which contains two data bytes to the instrument.
**Notes:** midiStatus: The STATUS value of the MIDI event.
data1: The first data byte of the MIDI event.
data2: The first data byte of the MIDI event.
See also:

- 17.28.5 sendMIDIEvent(midiStatus as Integer, data1 as Integer) 3894

### 17.28.7 sendMIDISysExEvent(data as MemoryBlock)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI ,ÄúSystem Exclusive,Äù event to the instrument.
**Notes:** midiData: A memoryblock object containing the complete SysEx data including start(F0) and termination(F7) bytes.

### 17.28.8 sendPitchBend(pitchbend as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends MIDI ,ÄúPitch Bend,Äù event to the instrument.
**Notes:** pitchbend: Value of the pitchbend. The valid range of values is 0 to 16383.
channel: The channel number to which the event is sent.

If this method is not invoked, then the pitch bend is the default value of 8192 (no pitch).

### 17.28.9 sendPressure(pressure as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends MIDI ‚Äúchannel pressure‚Äù event to the instrument.
**Notes:** pressure: The value of the pressure. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

### 17.28.10 sendPressureForKey(Key as Integer, value as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends MIDI ‚ÄúPolyphonic key pressure‚Äù event to the instrument.
**Notes:** key: The key (note) number to which the pressure event applies. The valid range is 0 to 127.
value: The value of the pressure. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

### 17.28.11 sendProgramChange(program as Integer, bankMSB as Integer, bankLSB as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI ‚ÄúProgram Change‚Äù and ‚ÄúBank Select‚Äù events to the instrument.
**Notes:** program: Specifies the program (preset) number within the bank to load. The valid range is 0 to 127.
bankMSB: Specifies the most significant byte value for the bank to select. The valid range is 0 to 127.
bankLSB: Specifies the least significant byte value for the bank to select. The valid range is 0 to 127.
channel: The channel number to which the event is sent.
See also:

- 17.28.12 sendProgramChange(program as Integer, Channel as Integer) 3896

### 17.28.12 sendProgramChange(program as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI ‚ÄúProgram Change‚Äù and ‚ÄúBank Select‚Äù events to the instrument.
**Notes:** program: Specifies the program. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

The instrument will be loaded from the bank that has been previous set by MIDI ‚ÄúBank Select‚Äù controller messages (0 and 31). If none has been set, bank 0 will be used.
See also:

- 17.28.11 sendProgramChange(program as Integer, bankMSB as Integer, bankLSB as Integer, Channel as Integer) 3896

### 17.28.13 startNote(note as Integer, Velocity as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI ,ÄúNote On,Äù event to the instrument.
**Notes:** note: The note number (key) to play. The valid range is 0 to 127.
velocity: Specifies the volume at which the note is played. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

### 17.28.14 stopNote(note as Integer, Channel as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Sends a MIDI ,ÄúNote Off,Äù event to the instrument
**Notes:** note: The note number (key) to stop. The valid range is 0 to 127.
channel: The channel number to which the event is sent.

## 17.29 class AVAudioUnitReverbMBS

### 17.29.1 class AVAudioUnitReverbMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitReverb class is an AVAudioUnitEffect subclass that implements a reverb effect.
**Notes:** A reverb simulates the acoustic characteristics of a particular environment. Use the different presets to simulate a particular space and blend it in with the original signal using the wetDryMix property.
Subclass of the AVAudioUnitEffectMBS class.

### 17.29.2 Methods

### 17.29.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 17.29.4 loadFactoryPreset(preset as Integer)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the audio unit a reverb preset.
**Notes:** preset: The reverb preset. See AVAudioUnitReverbPreset for the supported values.

The default value is AVAudioUnitReverbPresetMediumHall.

### 17.29.5 Properties

### 17.29.6 wetDryMix as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The blend of the wet and dry signals.
**Notes:** The blend is specified as a percentage. The range is 0% (all dry) through 100% (all wet).
(Read and Write property)

### 17.29.7 Constants

Reverb presets

| Constant | Value | Description |
|---|---|---|
| PresetCathedral | 8 | The reverb preset with the acoustic characteristics of a cathedral environment. |
| PresetLargeChamber | 7 | The reverb preset with the acoustic characteristics of a large-sized chamber environment. |
| PresetLargeHall | 4 | The reverb preset with the acoustic characteristics of a large-sized hall environment. |
| PresetLargeHall2 | 12 | The reverb preset with the acoustic characteristics of an alternate large-sized hall environment. |
| PresetLargeRoom | 2 | The reverb preset with the acoustic characteristics of a large-sized room environment. |
| PresetLargeRoom2 | 9 | The reverb preset with the acoustic characteristics of an alternate large-sized room environment. |
| PresetMediumChamber | 6 | The reverb preset with the acoustic characteristics of a medium-sized chamber environment. |
| PresetMediumHall | 3 | The reverb preset with the acoustic characteristics of a medium-sized hall environment. This is the default value for the audio unit. |
| PresetMediumHall2 | 10 | The reverb preset with the acoustic characteristics of an alternate medium-sized hall environment. |
| PresetMediumHall3 | 11 | The reverb preset with the acoustic characteristics of an alternate medium-sized hall environment. |
| PresetMediumRoom | 1 | The reverb preset with the acoustic characteristics of a medium-sized room environment. |
| PresetPlate | 5 | The reverb preset with the acoustic characteristics of a plate environment. |
| PresetSmallRoom | 0 | The reverb preset with the acoustic characteristics of a small-sized room environment. |

## 17.30 class AVAudioUnitSamplerMBS

### 17.30.1 class AVAudioUnitSamplerMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitSampler class encapsulates Apple's Sampler Audio Unit.
**Notes:** The sampler audio unit can be configured by loading different types of instruments such as an ,Äú.aupreset,Äù file, a DLS or SF2 sound bank, an EXS24 instrument, a single audio file or with an array of audio files. The output is a single stereo bus.
Subclass of the AVAudioUnitMIDIInstrumentMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr1

### 17.30.2 Methods

### 17.30.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 17.30.4 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS) 3900

### 17.30.4 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a MIDI instrument audio unit with the specified component description.
See also:

- 17.30.3 Constructor 3900

### 17.30.5 loadAudioFilesAtFiles(Files() as folderitem, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the sampler by loading the specified audio files.
**Notes:** Files: An array of files for the audio files.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true if the sampler was configured with the audio file(s); otherwise false.

The audio files are loaded into a new instrument with each audio file placed into its own sampler zone. Any information contained in the audio file regarding their placement in the instrument, for example, root key, key range, will be used.

### 17.30.6 loadAudioFilesAtURLs(URLs() as string, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the sampler by loading the specified audio files.
**Notes:** URLs: An array of URLs for the audio files.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true if the sampler was configured with the audio file(s); otherwise false.

The audio files are loaded into a new instrument with each audio file placed into its own sampler zone. Any information contained in the audio file regarding their placement in the instrument, for example, root key, key range, will be used.

### 17.30.7 loadInstrumentAtFile(File as folderitem, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the sampler with the specified instrument file.
**Notes:** File: The file containing the instrument.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true if the sampler was configured with the instrument file; otherwise false.

The instrument can be of one of the following types: Logic or GarageBand EXS24, sampler,Äôs native .aupreset file or an audio file, for example, ,Äú.caf,Äù, ,Äú.aiff,Äù, ,Äú.wav,Äù, or ,Äú.mp3,Äù.

In the case of single audio file, it is loaded into a new default instrument and any information contained in the audio file regarding its placement in the instrument, for example, root key, key range, will be used.

### 17.30.8 loadInstrumentAtURL(URL as string, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Configures the sampler with the specified instrument file.
**Notes:** URL: The URL of the file containing the instrument.
Error: Returns, by-reference, a description of the error, if an error occurs.

Returns true if the sampler was configured with the instrument file; otherwise false.

The instrument can be of one of the following types: Logic or GarageBand EXS24, sampler,Äôs native .aupreset file or an audio file, for example, ,Äú.caf,Äù, ,Äú.aiff,Äù, ,Äú.wav,Äù, or ,Äú.mp3,Äù.

In the case of single audio file, it is loaded into a new default instrument and any information contained in the audio file regarding its placement in the instrument, for example, root key, key range, will be used.

### 17.30.9 loadSoundBankInstrumentAtFile(bankFile as folderitem, program as Integer, bankMSB as Integer, bankLSB as Integer, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** loads a specific instrument from the specified sound bank.
**Notes:** bankFile: Soundbank file. The file can be either a DLS bank (.dls) or a SoundFont bank (.sf2).
program: program number for the instrument to load
bankMSB: MSB for the bank number for the instrument to load. This is usually 0x79 for melodic instruments and 0x78 for percussion instruments.
bankLSB: LSB for the bank number for the instrument to load. This is often 0, and represents the "bank variation".
Error: the status of the operation

This method reads from file and allocates memory, so it should not be called on a real time thread.

### 17.30.10 loadSoundBankInstrumentAtURL(bankURL as string, program as Integer, bankMSB as Integer, bankLSB as Integer, byref error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** loads a specific instrument from the specified sound bank.
**Notes:** bankURL: URL for a Soundbank file. The file can be either a DLS bank (.dls) or a SoundFont bank

(.sf2).
program: program number for the instrument to load
bankMSB: MSB for the bank number for the instrument to load. This is usually 0x79 for melodic instruments and 0x78 for percussion instruments.
bankLSB: LSB for the bank number for the instrument to load. This is often 0, and represents the "bank variation".
Error: the status of the operation

This method reads from file and allocates memory, so it should not be called on a real time thread.

### 17.30.11 Properties

### 17.30.12 globalTuning as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Adjusts the tuning of all the notes played.
**Notes:** The tuning unit is cents. The default value is 0.0. The range of valid values is -2400 to 2400 cents.
(Read and Write property)

### 17.30.13 masterGain as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Adjusts the gain, in decibels, of all the notes played.
**Notes:** The default value is 0.0 db. The range of valid values is -90.0 db to 12.0 db.
(Read and Write property)

### 17.30.14 stereoPan as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Adjusts the stereo panning for all the notes played.
**Notes:** The default value is 0.0. The range of valid values is -1.0 to 1.0.
(Read and Write property)

## 17.31 class AVAudioUnitTimeEffectMBS

### 17.31.1 class AVAudioUnitTimeEffectMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitTimeEffect class is an AVAudioUnit subclass that processes audio in non-realtime.
**Notes:** An AVAudioUnitTimeEffect instance represents an AVAudioUnit of type ,Äúaufc,Äù (kAudioUnitType_FormatConverter). These effects do not process audio in real-time. The AVAudioUnitVarispeed class is an example of a time effect unit.
Subclass of the AVAudioUnitMBS class.

### 17.31.2 Methods

### 17.31.3 Constructor(audioComponentDescription as AVAudioComponentDescriptionMBS)

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated audio component specified by the description.
**Notes:** audioComponentDescription: The description of the audio unit to be initialized. The componentType field of the description struct must be kAudioUnitType_FormatConverter (,Äúaufc,Äù).

If the componentType field of the audioComponentDescription struct is not kAudioUnitType_FormatConverter an exception is raised.

### 17.31.4 Properties

### 17.31.5 bypass as Boolean

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the bypass state of the audio unit.
**Notes:** If true then the audio unit processing is being bypassed.
(Read and Write property)

# 17.32 class AVAudioUnitTimePitchMBS

## 17.32.1 class AVAudioUnitTimePitchMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitTimePitch class is an AVAudioUnitTimeEffect subclass that provides good quality playback rate and pitch shifting independent of each other.
**Notes:** Subclass of the AVAudioUnitTimeEffectMBS class.

## 17.32.2 Methods

## 17.32.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

## 17.32.4 Properties

## 17.32.5 overlap as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The amount of overlap between segments of the input audio signal.
**Notes:** A higher value results in fewer artifacts in the output signal.

The default value is 8.0. The range of values is 3.0 to 32.0.
(Read and Write property)

## 17.32.6 pitch as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The amount by which the input signal is pitch shifted.
**Notes:** The pitch is measured in ,Äúcents,Äù, a logarithmic value used for measuring musical intervals. One octave is equal to 1200 cents. One musical semitone is equal to 100 cents.

The default value is 1.0. The range of values is -2400 to 2400.
(Read and Write property)

### 17.32.7 rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The playback rate of the input signal.
**Notes:** The default value is 1.0. The range of supported values is 1/32 to 32.0.
(Read and Write property)

# 17.33 class AVAudioUnitVarispeedMBS

## 17.33.1 class AVAudioUnitVarispeedMBS

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The AVAudioUnitVarispeed class is an AVAudioUnitTimeEffect subclass that allows control of the playback rate.
**Notes:** Subclass of the AVAudioUnitTimeEffectMBS class.

## 17.33.2 Methods

## 17.33.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

## 17.33.4 Properties

## 17.33.5 Rate as Double

MBS AVFoundation Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The audio playback rate.
**Notes:** The varispeed audio unit resamples the input signal, as a result changing the playback rate also changes the pitch. For example, changing the rate to 2.0 results in the output audio playing one octave higher. Similarly changing the rate to 0.5, results in the output audio playing one octave lower.

The pitch is measured in ,Äúcents,Äù, a logarithmic value used for measuring musical intervals. One octave is equal to 1200 cents. One musical semitone is equal to 100 cents.

Using the rate value you calculate the pitch (in cents) using the formula pitch = 1200.0 * log2(rate). Conversely, you calculate the appropriate rate for a desired pitch with the formula rate = pow(2, cents/1200.0).

The default value is 1.0. The range of values is 0.25 to 4.0. The unit of rate is unspecified.
(Read and Write property)

# Chapter 18

# AVMovie

## 18.1 class AVFragmentedMovieMBS

### 18.1.1 class AVFragmentedMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The movie class for fragmented movies.
**Notes:** A subclass of AVMovie for handling fragmented movie files. An AVFragmentedMovie is capable of changing the values of certain of its properties and those of its tracks, if it's associated with an instance of AVFragmentedMovieMinder when one or more movie fragments are appended to the movie file.
Subclass of the AVMovieMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.1.2 Methods

### 18.1.3 AVFragmentedMovieContainsMovieFragmentsDidChangeNotification as string

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted after the value of @"containsMovieFragments" has already been loaded and the AVFragmentedMovie is added to an AVFragmentedMovieMinder, either when 1) movie fragments are detected in the movie file on disk after it had previously contained none or when 2) no movie fragments are detected in the movie file on disk after it had previously contained one or more.

### 18.1.4 AVFragmentedMovieDurationDidChangeNotification as string

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted when the duration of an AVFragmentedMovie changes while it's being minded by an AVFragmentedMovieMinder, but only for changes that occur after the status of the value of @"duration" has reached AVKeyValueStatusLoaded.

### 18.1.5 AVFragmentedMovieWasDefragmentedNotification as string

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted when the movie file on disk is defragmented while an AVFragmentedMovie is being minded by an AVFragmentedMovieMinder, but only if the defragmentation occurs after the status of the value of @"canContainMovieFragments" has reached AVKeyValueStatusLoaded.

### 18.1.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 18.1.7 fragmentedMovieTracks as AVFragmentedMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The tracks in a movie.
**Notes:** The value of this property is an array of tracks the movie contains; the tracks are of type AVFragmentedMovieTrack.

### 18.1.8 fragmentedMovieTracksWithMediaCharacteristic(mediaCharacteristic as string) as AVFragmentedMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVFragmentedMovieTracks of the asset that present media with the specified characteristic.
**Notes:** mediaCharacteristic: The media characteristic according to which the receiver filters its AVFragmentedMovieTracks. (Media characteristics are defined in AVMediaFormat.h)

An array of AVFragmentedMovieTracks; may be empty if no tracks with the specified characteristic are available.
Becomes callable without blocking when the key "tracks" has been loaded

### 18.1.9 fragmentedMovieTracksWithMediaType(mediaType as string) as AVFragmentedMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVFragmentedMovieTracks of the asset that present media of the specified media type.
**Notes:** mediaType: The media type according to which the receiver filters its AVFragmentedMovieTracks. (Media types are defined in AVMediaFormat.h)
An array of AVFragmentedMovieTracks; may be empty if no tracks of the specified media type are available.
Becomes callable without blocking when the key "tracks" has been loaded

### 18.1.10 fragmentedMovieTrackWithTrackID(ID as Integer) as AVFragmentedMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an instance of AVFragmentedMovieTrack that represents the track of the specified trackID.
**Notes:** ID: The trackID of the requested AVFragmentedMovieTrack.

An instance of AVFragmentedMovieTrack; may be nil if no track of the specified trackID is available.
Becomes callable without blocking when the key "tracks" has been loaded

## 18.2 class AVFragmentedMovieTrackMBS

### 18.2.1 class AVFragmentedMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The class for a movie track from a fragmented movie.
**Notes:** A subclass of AVMovieTrack for handling tracks of fragmented movie files. An AVFragmentedMovieTrack is capable of changing the values of certain of its properties, if its parent movie is associated with an instance of AVFragmentedMovieMinder when one or more movie fragments are appended to the movie file. Subclass of the AVMovieTrackMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.2.2 Methods

### 18.2.3 AVFragmentedMovieTrackSegmentsDidChangeNotification as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names for fragmented movies.
**Notes:** Posted when the array of segments of an AVFragmentedMovieTrack changes while the associated instance of AVFragmentedMovie is being minded by an AVFragmentedMovieMinder, but only for changes that occur after the status of the value of @"segments" has reached AVKeyValueStatusLoaded.

### 18.2.4 AVFragmentedMovieTrackTimeRangeDidChangeNotification as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names for fragmented movies.
**Notes:** Posted when the timeRange of an AVFragmentedMovieTrack changes while the associated instance of AVFragmentedMovie is being minded by an AVFragmentedMovieMinder, but only for changes that occur after the status of the value of "timeRange" has reached AVKeyValueStatusLoaded.

### 18.2.5 AVFragmentedMovieTrackTotalSampleDataLengthDidChangeNotification as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the notification names for fragmented movies.
**Notes:** This notification name has been deprecated. Use either AVFragmentedMovieTrackTimeRange-

DidChangeNotification or AVFragmentedMovieTrackSegmentsDidChangeNotification instead; in either case, you can assume that timing changes to fragmented tracks result in changes to the total length of the sample data used by the track.

### 18.2.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 18.3 class AVMediaDataStorageMBS

### 18.3.1 class AVMediaDataStorageMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The class for media storage.
**Notes:** Available on OS X 10.11 and newer.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.3.2 Methods

### 18.3.3 available as boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
if not AVMediaDataStorageMBS.available then
MsgBox "This application requires a newer OS X version."
end if
```

**Notes:** Returns true on OS X 10.11.

### 18.3.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 18.3.5 Constructor(File as FolderItem, Options as Dictionary = nil) 3914
- 18.3.6 Constructor(URL as String, Options as Dictionary = nil) 3915


### 18.3.5 Constructor(File as FolderItem, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMediaDataStorage object associated with a folderitem.
**Notes:** File: A folderitem that specifies a file where sample data that is added to a movie or track should

be written.
options: A dictionary object that contains keys for specifying options for the initialization of the AVMediaDataStorage object. Currently no keys are defined.

Raises exception if things go wrong.
See also:


- 18.3.4 Constructor 3914
- 18.3.6 Constructor(URL as String, Options as Dictionary = nil) 3915


### 18.3.6 Constructor(URL as String, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMediaDataStorage object associated with a file URL.
**Notes:** URL: An URL that specifies a file where sample data that is added to a movie or track should be written.
options: A dictionary object that contains keys for specifying options for the initialization of the AVMediaDataStorage object. Currently no keys are defined.

Raises exception if things go wrong.
See also:


- 18.3.4 Constructor 3914
- 18.3.5 Constructor(File as FolderItem, Options as Dictionary = nil) 3914


### 18.3.7 Properties

### 18.3.8 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 18.3.9 URL as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The URL from which the receiver was initialized; may be "".
**Notes:** (Read only property)

## 18.4 class AVMovieMBS

### 18.4.1 class AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** AVMovie represents the audiovisual containers in a file that conforms to the QuickTime movie file format or to one of the related ISO base media file formats (such as MPEG-4).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

MsgBox str(m.duration.Seconds)+" seconds."
```

**Notes:** AVMovie supports operations involving the format-specific portions of the QuickTime Movie model that are not supported by AVAsset. For instance, you can retrieve the movie header from an existing QuickTime movie file. You can also use AVMovie to write a movie header into a new file, thereby creating a reference movie.

A mutable subclass of AVMovie, AVMutableMovie, provides methods that support the familiar Movie editing model; for instance, you can use AVMutableMovie to copy media data from one track and paste that data into another track. You can also use AVMutableMovie to establish track references from one track to another (for example, to set one track as a chapter track of another track). If you want to perform editing operations on individual tracks, you can use the associated classes AVMovieTrack and AVMutableMovieTrack.

You need to use AVMovie and AVMutableMovie only when operating on format-specific features of a QuickTime or ISO base media file. You generally do not need to use these classes just to open and play QuickTime movie files or ISO base media files. Instead, you can use the classes AVURLAsset and AVPlayerItem. If however you already have an AVMutableMovie and want to play it or inspect it, you can make an immutable snapshot of the AVMutableMovie.
Subclass of the AVAssetMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.4.2 Methods

### 18.4.3 available as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
if not AVMovieMBS.available then
MsgBox "This application requires a newer OS X version."
end if
```

**Notes:** Returns true on OS X 10.10.

### 18.4.4 AVMovieReferenceRestrictionsKey as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Indicates the restrictions used by the movie when resolving references to external media data.
**Notes:** The value of this key is an NSNumber wrapping an AVAssetReferenceRestrictions enum value or the logical combination of multiple such values. See AVAsset.h for the declaration of the AVAssetReferenceRestrictions enum.
Some movies can contain references to media data stored outside the movie's container, for example in another file. This key can be used to specify a policy to use when these references are encountered. If a movie contains one or more references of a type that is forbidden by the reference restrictions, loading of movie properties will fail. In addition, such a movie cannot be used with other AVFoundation modules, such as AVPlayerItem or AVAssetExportSession.

### 18.4.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 18.4.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3917
- 18.4.7 Constructor(File as FolderItem, Options as Dictionary = nil) 3918
- 18.4.8 Constructor(URL as String, Options as Dictionary = nil) 3919


### 18.4.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in an data parameter.
**Notes:** data: An Memoryblock containing a movie header. We make a copy of that.
options: Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.

You can use this method to operate on movie headers that are not stored in files; this might include movie headers on the pasteboard (which do not contain media data). In general you should avoid loading an entire movie file with its media data into an instance of Memoryblock/String! By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

In case of error raises an exception.

Available on OS X 10.11.
See also:


- 18.4.5 Constructor 3917
- 18.4.7 Constructor(File as FolderItem, Options as Dictionary = nil) 3918
- 18.4.8 Constructor(URL as String, Options as Dictionary = nil) 3919


### 18.4.7 Constructor(File as FolderItem, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

MsgBox str(m.duration.Seconds)+" seconds."
```

**Notes:** File: A folderitem that specifies a file containing a movie header.
options: A Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.

By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

Raises exception if something goes wrong.
See also:


- 18.4.5 Constructor 3917

- 18.4.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3917
- 18.4.8 Constructor(URL as String, Options as Dictionary = nil) 3919


### 18.4.8 Constructor(URL as String, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** URL: An URL that specifies a file containing a movie header.
options: A Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

Raises exception if something goes wrong.
See also:


- 18.4.5 Constructor 3917
- 18.4.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3917
- 18.4.7 Constructor(File as FolderItem, Options as Dictionary = nil) 3918


### 18.4.9 copy as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the movie.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim c as AVMutableMovieMBS = m.mutableCopy

Break // now edit

dim k as AVMovieMBS = c.copy

break // now we have k with snapshot and can still edit c
```

### 18.4.10 movieHeaderWithFileType(fileType as String, byref error as NSErrorMBS) as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a memoryblock object containing the movie header of the AVMovie object.
**Notes:** fileType: A UTI indicating the specific file format of the movie header (e.g. AVFileTypeQuickTimeMovie for a QuickTime movie).
Error: If an error occurs reading the movie header, describes the nature of the failure.

The movie header will be a pure reference movie, with no base URL, suitable for use on the pasteboard.
Returns memoryblock in case of success or nil in case of error.

Available on OS X 10.11 or newer.

### 18.4.11 movieTracks as AVMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The tracks in a movie.
**Notes:** The value of this property is an array of tracks the movie contains; the tracks are of type AVMovieTrack.

### 18.4.12 movieTracksWithMediaCharacteristic(mediaCharacteristic as string) as AVMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVMovieTracks of the asset that present media with the specified characteristic.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim videotracks() as AVMovieTrackMBS = m.movieTracksWithMediaCharacteristic(AVFoundationMBS.AVMediaCharacteristicVisual)

MsgBox str(UBound(videotracks)+1)+" visual tracks"
```

**Notes:** mediaCharacteristic: The media characteristic according to which the receiver filters its AVMovieTracks. (Media characteristics are defined in AVMediaFormat.h)

An array of AVMovieTracks; may be empty if no tracks with the specified characteristic are available.
Becomes callable without blocking when the key "tracks" has been loaded.

### 18.4.13 movieTracksWithMediaType(mediaType as string) as AVMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVMovieTracks of the asset that present media of the specified media type.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim videotracks() as AVMovieTrackMBS = m.movieTracksWithMediaType(AVFoundationMBS.AVMediaTypeVideo)

MsgBox str(UBound(videotracks)+1)+" video tracks"
```

**Notes:** mediaType: The media type according to which the receiver filters its AVMovieTracks. (Media types are defined in AVMediaFormat.h)
An array of AVMovieTracks; may be empty if no tracks of the specified media type are available.
Becomes callable without blocking when the key "tracks" has been loaded.

### 18.4.14 movieTrackWithTrackID(ID as Integer) as AVMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an instance of AVMovieTrack that represents the track of the specified trackID.
**Notes:** ID: The trackID of the requested AVMovieTrack.

Returns n instance of AVMovieTrack; may be nil if no track of the specified trackID is available.
Becomes callable without blocking when the key "tracks" has been loaded

### 18.4.15 movieTypes as String()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides the file types the AVMovie class understands.
**Example:**

```
MsgBox join(AVMovieMBS.movieTypes, EndOfLine)
```

**Notes:** Returns an array of UTIs identifying the file types the AVMovie class understands.

### 18.4.16 movieWithData(Data as MemoryBlock, Options as Dictionary = nil) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in an data parameter.
**Notes:** data: An Memoryblock/String containing a movie header. We make a copy of that.
options: Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
You can use this method to operate on movie headers that are not stored in files; this might include movie headers on the pasteboard (which do not contain media data). In general you should avoid loading an entire movie file with its media data into an instance of Memoryblock/String! By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 18.4.17 movieWithData(Data as String, Options as Dictionary = nil) as AVMovieMBS 3922

### 18.4.17 movieWithData(Data as String, Options as Dictionary = nil) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in an data parameter.
**Example:**

```
// load movie in memory
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim b as BinaryStream = BinaryStream.Open(f)

// now open it from memory
dim s as string = b.Read(b.Length)
dim m as AVMovieMBS = AVMovieMBS.movieWithData(s)

MsgBox str(m.duration.Seconds)+" seconds."
```

**Notes:** data: An Memoryblock/String containing a movie header. We make a copy of that.
options: Dictionary object that contains keys for specifying options for the initialization of the AVMovie

object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
You can use this method to operate on movie headers that are not stored in files; this might include movie headers on the pasteboard (which do not contain media data). In general you should avoid loading an entire movie file with its media data into an instance of Memoryblock/String! By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 18.4.16 movieWithData(Data as MemoryBlock, Options as Dictionary = nil) as AVMovieMBS 3922

### 18.4.18 movieWithFile(File as FolderItem, Options as Dictionary = nil) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as AVMovieMBS = AVMovieMBS.movieWithFile(f)

MsgBox str(m.duration.Seconds)+" seconds."
```

**Notes:** File: A folderitem that specifies a file containing a movie header.
options: A Dictionary object that contains keys for specifying options for the initialization of the AVMovie object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

### 18.4.19 movieWithURL(URL as String, Options as Dictionary = nil) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** URL: An URL that specifies a file containing a movie header.
options: A Dictionary object that contains keys for specifying options for the initialization of the AVMovie

object. Currently no keys are defined.
Returns An AVMovie object or nil in case of error.
By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

### 18.4.20 mutableCopy as AVMutableMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the movie.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim c as AVMutableMovieMBS = m.mutableCopy

Break // now edit

dim k as AVMovieMBS = c.copy

break // now we have k with snapshot and can still edit c
```

### 18.4.21 writeMovieHeaderToFile(File as FolderItem, fileType as String, options as Integer, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Writes the movie header to a destination file.
**Notes:** File: A folderitem indicating where to write the movie header.
fileType: A UTI indicating the specific file format (e.g. AVFileTypeQuickTimeMovie for a QuickTime movie).
options: An integer whose bits specify options for the writing of the movie header. Can be AVMovieWritingTruncateDestinationToMovieHeaderOnly.
Error: If an error occurs writing the movie header, describes the nature of the failure.

Data references in the output movie header are adjusted to be relative to the destination URL. Note that modifications to instances of AVMutableMovie, to their constituent AVMutableMovieTracks, or to their collections of metadata are committed to storage when their movie headers are written.

### 18.4.22 writeMovieHeaderToURL(URL as String, fileType as String, options as Integer, byref error as NSErrorMBS) as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Writes the movie header to a destination URL.
**Notes:** URL: An URL indicating where to write the movie header.
fileType: A UTI indicating the specific file format (e.g. AVFileTypeQuickTimeMovie for a QuickTime movie).
options: An integer whose bits specify options for the writing of the movie header. Can be AVMovieWritingTruncateDestinationToMovieHeaderOnly.
Error: If an error occurs writing the movie header, describes the nature of the failure.

Data references in the output movie header are adjusted to be relative to the destination URL. Note that modifications to instances of AVMutableMovie, to their constituent AVMutableMovieTracks, or to their collections of metadata are committed to storage when their movie headers are written.

### 18.4.23 Properties

### 18.4.24 canContainMovieFragments as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Indicates whether the movie file is capable of being extended by fragments.
**Notes:** The value of this property is true if an 'mvex' box is present in the 'moov' box. The 'mvex' box is necessary in order to signal the possible presence of later 'moof' boxes.
(Read only property)

### 18.4.25 containsMovieFragments as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Indicates whether the movie file is extended by at least one movie fragment.
**Notes:** The value of this property is YES if canContainMovieFragments is YES and at least one 'moof' box is present after the 'moov' box.
Available on OS X 10.11 or newer.
(Read only property)

### 18.4.26 Data as MemoryBlock

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The data block with which the instance of AVMovie was initialized; may be nil.
**Notes:** Available on OS X 10.11 or newer.
(Read only property)

### 18.4.27 defaultMediaDataStorage as AVMediaDataStorageMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The default storage container for media data added to a movie.
**Notes:** The value of this property is an AVMediaDataStorage object that indicates where sample data that is added to a movie should be written by default.
(Read only property)

### 18.4.28 URL as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The URL with which the instance of AVMovie was initialized; may be "".
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

MsgBox m.URL
```

**Notes:** (Read only property)

### 18.4.29 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AVMovieWritingTruncateDestinationToMovieHeaderOnly | 1 | One of the options for writeMovieHeaderToURL.<br>If set, writing the movie header will truncate all existi file and write a new movie header, thereby creating a A file type box will be written at the beginning of tl the movie header will remove any existing movie hea and write a new movie header, preserving any othe destination file was empty, a file type box will be wr the file.<br>You would not want to use the AVMovieWritin MovieHeaderOnly option if you had written sample file using (for example) insertTimeRange with copy since that data would be lost. |

## 18.5 class AVMovieTrackMBS

### 18.5.1 class AVMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** AVMovieTrack represents the tracks of audiovisual containers in a file that conforms to the QuickTime movie file format or to one of the related ISO base media file formats (such as MPEG-4).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.m4v")
dim m as new AVMovieMBS(f, nil)

dim videotracks() as AVMovieTrackMBS = m.movieTracksWithMediaCharacteristic(AVFoundationMBS.AV-
MediaCharacteristicFrameBased)

for each videotrack as AVMovieTrackMBS in videotracks
dim s as CGSizeMBS = videotrack.naturalSize
MsgBox str(s.Width)+" x "+ str(s.Height)
next
```

**Notes:** Subclass of the AVAssetTrackMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.5.2 Methods

### 18.5.3 available as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
if not AVMovieTrackMBS.available then
MsgBox "This application requires a newer OS X version."
end if
```

**Notes:** Returns true on OS X 10.10.

### 18.5.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 18.5.5 Properties

### 18.5.6 alternateGroupID as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** An integer indicating the track as a member of a particular alternate group.
**Notes:** (Read only property)

### 18.5.7 mediaDataStorage as AVMediaDataStorageMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The storage container for media data added to a track.
**Notes:** The value of this property is an AVMediaDataStorage object that indicates the location at which media data inserted or appended to the track will be written.
(Read only property)

### 18.5.8 mediaDecodeTimeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CMTimeRange indicating the range of decode times for the track's media.
**Notes:** (Read only property)

### 18.5.9 mediaPresentationTimeRange as CMTimeRangeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CMTimeRange indicating the range of presentation times for the track's media.
**Notes:** (Read only property)

## 18.6 class AVMutableMovieMBS

### 18.6.1 class AVMutableMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** AVMutableMovie adds to its immutable superclass, AVMovie, several categories of methods for editing QuickTime movie files, e.g. inserting and removing time ranges of media, adding and removing tracks, and modifying the metadata collections stored therein.
**Notes:** By default, after creating an AVMutableMovie the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

Available in OS X 10.11.
Subclass of the AVMovieMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.6.2 Methods

### 18.6.3 addMutableTracksCopyingSettingsFromTracks(existingTracks() as AVMovieTrackMBS, options as Dictionary) as AVMutableMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Adds one or more empty tracks to the target movie, copying track settings from the source tracks.
**Notes:** existingTracks: An array of AVMovieTrack objects.
options: An dictionary object that contains keys for specifying options for the initialization of the new AVMutableMovieTrack objects. Currently no keys are defined; pass nil for default initialization behavior.
Returns An array of AVMutableMovieTrack objects; the index of a track in this array is the same as the index of its source track in the existingTracks array.
This method creates one or more empty tracks in the target movie and configures those tracks with settings (such as track userdata and metadata, width, height, and preferred volume) copied from the source tracks in the existingTracks array. Also, properties involving pairs of tracks (such as track references) are copied from the source tracks to the target tracks.

### 18.6.4 addMutableTrackWithMediaType(mediaType as String, track as AVMovieTrackMBS, options as Dictionary) as AVMutableMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Adds an empty track to the target movie.
**Notes:**

| | |
|---|---|
| mediaType: | The media type of the new track (e.g. AVMediaTypeVideo for a video track). |
| track: | If you wish to transfer settings from an existing track, including track userdata and metadata, width, height, preferred volume, etc., pass a reference to an AVMovieTrack representing that track. Otherwise pass nil. |

options: An Dictionary object that contains keys for specifying options for the initialization of the new AVMutableMovieTrack object. Currently no keys are defined; pass nil for default initialization behavior.
Returns An AVMutableMovieTrack object or nil in case of error.
The trackID of the newly added track is a property of the returned instance of AVMutableMovieTrack.

### 18.6.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The constructor to create blank new movie.
See also:


- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a Memoryblock/string.
**Notes:** data: A memoryblock containing a movie header.
options: An dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Raises exception in case of error.

You can use this method to operate on movie headers that are not stored in files. In general you should avoid loading an entire movie file with its media data into an instance of memoryblock!

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an memoryblock and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a Memoryblock/string.
**Notes:** data: A memoryblock containing a movie header.
options: An dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Raises exception in case of error.

You can use this method to operate on movie headers that are not stored in files. In general you should avoid loading an entire movie file with its media data into an instance of memoryblock!

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an memoryblock and then append sample buffers to any of its tracks, you must first set one of these properties to indicate

where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** File: An folderitem that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

Raises exception in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934

- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** File: An folderitem that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

Raises exception in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936

### 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object without tracks (and therefore without media).
**Notes:** movie: If you wish to transfer settings from an existing movie (including movie userdata and metadata, preferred rate, preferred volume, etc.), pass a reference to an AVMovie object representing that movie. Otherwise pass nil. The userdata and metadata from the source movie may need to be converted if the format of that movie differs from fileType; you may wish to inspect the userdata or metadata of the receiver to ensure that important data was copied.
options: A dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined; pass nil for default initialization behavior.
Error: If an error occurs creating a movie, describes the nature of the failure.

Raises exception in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.11 Constructor(URL as String, Options as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** URL: An URL that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.

Error: If an error occurs creating a movie, describes the nature of the failure. Optional.

Raises exception in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931
- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS) 3936


### 18.6.12 Constructor(URL as String, Options as Dictionary = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** URL: An URL that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure. Optional.

Raises exception in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:


- 18.6.5 Constructor 3931

- 18.6.6 Constructor(Data as MemoryBlock, Options as Dictionary = nil) 3931
- 18.6.7 Constructor(Data as MemoryBlock, Options as Dictionary = nil, byref error as NSErrorMBS) 3932
- 18.6.8 Constructor(File as FolderItem, Options as Dictionary = nil) 3933
- 18.6.9 Constructor(File as FolderItem, Options as Dictionary = nil, byref error as NSErrorMBS) 3934
- 18.6.10 Constructor(Movie as AVMovieMBS = nil, Options as Dictionary = nil, byref error as NSErrorMBS) 3935
- 18.6.11 Constructor(URL as String, Options as Dictionary = nil) 3935


### 18.6.13 insertEmptyTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Adds an empty time range to the target movie.
**Notes:** timeRange: The time range to be made empty. Note that you cannot add empty time ranges to the end of a movie.

### 18.6.14 insertTimeRange(timeRange as CMTimeRangeMBS, asset as AVAssetMBS, atTime as CMTimeMBS, copySampleData as Boolean, byref Error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Inserts all the tracks of a timeRange of an asset into a movie.
**Notes:**

| | |
|---|---|
| timeRange: | The time range of the asset to be inserted. |
| asset: | An AVAsset object indicating the source of the inserted media. Only instances of AVURLAsset and AVComposition are supported. Must not be nil. |

startTime: The time in the target movie at which the media is to be inserted.
copySampleData: A boolean value that indicates whether sample data is to be copied from the source to the destination during edits. If true, the sample data is written to the location specified by the track property mediaDataStorage if non-nil, or else by the movie property defaultMediaDataStorage if non-nil; if both are nil, the method will fail and return false. If false, sample data will not be written and sample references to the samples in their original container will be added as necessary.
Note that in this case, this method will fail if the source AVAsset is not able to provide sample reference information for the original container.
Error: If the insertion fails, an error object that describes the nature of the failure.

Returns A boolean value that indicates the success of the insertion.

This method may add new tracks to the target movie to ensure that all tracks of the asset are represented in the inserted timeRange.
Existing content at the specified startTime will be pushed out by the duration of timeRange.

### 18.6.15 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A collection of metadata stored by the movie.
**Notes:** The value of this property is an array of AVMetadataItem objects representing the collection of metadata stored by the movie.

### 18.6.16 movieWithData(Data as MemoryBlock, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a Memoryblock/string.
**Notes:** data: A memoryblock/string containing a movie header.
options: An dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

You can use this method to operate on movie headers that are not stored in files. In general you should avoid loading an entire movie file with its media data into an instance of memoryblock!

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an memoryblock and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 18.6.17 movieWithData(Data as String, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

### 18.6.17 movieWithData(Data as String, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a Memoryblock/string.
**Notes:** data: A memoryblock/string containing a movie header.
options: An dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

You can use this method to operate on movie headers that are not stored in files. In general you should avoid loading an entire movie file with its media data into an instance of memoryblock!

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an memoryblock and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.
See also:

- 18.6.16 movieWithData(Data as MemoryBlock, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS 3938

### 18.6.18 movieWithFile(File as FolderItem, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** File: An folderitem that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

### 18.6.19 movieWithSettingsFromMovie(Movie as AVMovieMBS, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object without tracks (and therefore without media).
**Notes:** movie: If you wish to transfer settings from an existing movie (including movie userdata and metadata, preferred rate, preferred volume, etc.), pass a reference to an AVMovie object representing that movie. Otherwise pass nil. The userdata and metadata from the source movie may need to be converted if the format of that movie differs from fileType; you may wish to inspect the userdata or metadata of the receiver to ensure that important data was copied.
options: A dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined; pass nil for default initialization behavior.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMovieTrack's mediaDataStorage property will be nil. If you want to create an AVMutableMovie from an NSData object and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

### 18.6.20 movieWithURL(URL as String, Options as Dictionary = nil, byref Error as NSErrorMBS) as AVMovieMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates an AVMutableMovie object from a movie header stored in a QuickTime movie file or ISO base media file.
**Notes:** URL: An URL that specifies a file containing a movie header.
options: An Dictionary object that contains keys for specifying options for the initialization of the AVMutableMovie object. Currently no keys are defined.
Error: If an error occurs creating a movie, describes the nature of the failure.

Returns An AVMutableMovie object or nil in case of error.

By default, the defaultMediaDataStorage property will be nil and each associated AVMutableMovieTrack's mediaDataStorage property will be nil.
If you want to create an AVMutableMovie from a file and then append sample buffers to any of its tracks, you must first set one of these properties to indicate where the sample data should be written.

### 18.6.21 mutableMovieTracks as AVMutableMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The tracks in a mutable movie.
**Notes:** The value of this property is an array of tracks the mutable movie contains; the tracks are of type AVMutableMovieTrack.

### 18.6.22 mutableMovieTracksWithMediaCharacteristic(mediaCharacteristic as string) as AVMutableMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVMutableMovieTracks of the asset that present media with the specified characteristic.
**Notes:** mediaCharacteristic: The media characteristic according to which the receiver filters its AVMutableMovieTracks. (Media characteristics are defined in AVMediaFormat.h)
An array of AVMutableMovieTracks; may be empty if no tracks with the specified characteristic are available.
Becomes callable without blocking when the key "tracks" has been loaded.

### 18.6.23 mutableMovieTracksWithMediaType(mediaType as string) as AVMutableMovieTrackMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an array of AVMutableMovieTracks of the asset that present media of the specified media type.
**Notes:** mediaType: The media type according to which the receiver filters its AVMutableMovieTracks. (Media types are defined in AVMediaFormat.h)
An array of AVMutableMovieTracks; may be empty if no tracks of the specified media type are available.
Becomes callable without blocking when the key "tracks" has been loaded.

### 18.6.24 mutableMovieTrackWithTrackID(ID as Integer) as AVMutableMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides an instance of AVMutableMovieTrack that represents the track of the specified trackID.
**Notes:** ID: The trackID of the requested AVMutableMovieTrack.

An instance of AVMutableMovieTrack; may be nil if no track of the specified trackID is available.

Becomes callable without blocking when the key ”tracks” has been loaded.

### 18.6.25 mutableTrackCompatibleWithTrack(track as AVAssetTrackMBS) as AVMutableMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Provides a reference to a track of a mutable movie into which any time range of an AVAssetTrack can be inserted (via insertTimeRange:ofTrack).
**Notes:** track: A reference to the AVAssetTrack from which a time range may be inserted.
Returns An AVMutableMovieTrack that can accommodate the insertion.
If no such track is available, the result is nil. A new track of the same media type as the AVAssetTrack can be created via addMutableTrackWithMediaType, and this new track will be compatible.

For best performance, the number of tracks in a movie should be kept to a minimum, corresponding to the number for which media data must be presented in parallel. If media data of the same type is to be presented serially, even from multiple assets, a single track of that media type should be used. This method, mutableTrackCompatibleWithTrack, can help the client to identify an existing target track for an insertion.

### 18.6.26 removeTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Removes a specified time range from a movie.
**Notes:** timeRange: The time range to be removed.

### 18.6.27 removeTrack(track as AVMovieTrackMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Removes a track from the target movie.
**Notes:** track: The track to be removed.

### 18.6.28 scaleTimeRange(timeRange as CMTimeRangeMBS, duration as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Changes the duration of a time range of a movie.
**Notes:** timeRange: The time range to be scaled.

duration: The new duration of the time range.

### 18.6.29 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Sets the metadata.

### 18.6.30 Properties

### 18.6.31 defaultMediaDataStorage as AVMediaDataStorageMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The default storage container for media data added to a movie.
**Notes:** The value of this property is an AVMediaDataStorage object that indicates where sample data that is added to a movie should be written, for any track for whose mediaDataStorage property is nil.
(Read and Write property)

### 18.6.32 interleavingPeriod as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CMTime that indicates the duration for interleaving runs of samples of each track.
**Notes:** The default interleaving period is 0.5 seconds.
(Read and Write property)

### 18.6.33 modified as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether a movie has been modified.
**Notes:** The value of this property is a boolean that indicates whether the AVMutableMovie object has been modified since it was created, was last written, or had its modified state cleared via assignment Modified = false.
(Read and Write property)

### 18.6.34 preferredRate as Double

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The natural rate at which the movie is to be played; often but not always 1.0.
**Notes:** (Read and Write property)

### 18.6.35 preferredTransform as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGAffineTransform indicating the transform specified in the movie's storage container as the preferred transformation of the visual media data for display purposes; the value is often but not always CGAffineTransformIdentity.
**Notes:** (Read and Write property)

### 18.6.36 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The preferred volume of the audible media data of the movie; often but not always 1.0.
**Notes:** (Read and Write property)

### 18.6.37 timescale as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that contain a 'moov' atom, such as QuickTime Movie files, specifies the time scale of the movie.
**Notes:** The default movie time scale is 600. In certain cases, you may want to set this to a different value. For instance, a movie that contains a single audio track should typically have the movie time scale set to the media time scale of that track.

This property should be set on a new empty movie before any edits are performed on the movie.
(Read and Write property)

## 18.7 class AVMutableMovieTrackMBS

### 18.7.1 class AVMutableMovieTrackMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** AVMutableMovieTrack provides the track-level editing interface of an AVMutableMovie.
**Notes:** Media can be inserted into a movie track and other editing operations performed via an instance of this class.
Available on OS X 10.11.
Subclass of the AVMovieTrackMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr5

### 18.7.2 Methods

### 18.7.3 addTrackAssociationToTrack(movieTrack as AVMovieTrackMBS, trackAssociationType as String)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Establishes a track association of a specific type between two tracks.
**Notes:** movieTrack: An AVMovieTrack object that is to be associated with the receiver.
trackAssociationType: The type of track association to add between the receiver and the specified movieTrack (for instance, AVTrackAssociationTypeChapterList).

### 18.7.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 18.7.5 insertEmptyTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Adds an empty time range to the target track.
**Notes:** timeRange: The time range to be made empty. Note that you cannot add empty time ranges to the end of a track.

### 18.7.6 insertTimeRange(timeRange as CMTimeRangeMBS, assetTrack as AVAssetTrackMBS, atTime as CMTimeMBS, copySampleData as Boolean, byref Error as NSErrorMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Inserts a portion of an AVAssetTrack object into the target movie.
**Notes:** timeRange: The time range from the track from which media is to be inserted.
track: An AVAssetTrack object indicating the source of the inserted media. Only AVAssetTracks of AVURLAssets and AVCompositions are supported. Must not be nil.
startTime: The time in the target track at which the media is to be inserted.
copySampleData: A boolean value that indicates whether sample data is to be copied form the source to the destination during edits.

If true, the sample data is written to the file specified by the track property mediaDataStorage if non-nil, or else by the movie property defaultMediaDataStorage if non-nil; if both are nil, the method will fail and return NO.
If false, sample data will not be written and sample references to the samples in their original container will be added
as necessary. Note that in this case, this method will fail if the original samples are fragmented.

Error: If the insertion fails, describes the nature of the failure.

Returns a boolean value that indicates the success of the insertion.

### 18.7.7 metadata as AVMetadataItemMBS()

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A collection of metadata stored by the track.
**Notes:** The value of this property is an array of AVMetadataItem objects representing the collection of metadata stored by the track.

### 18.7.8 removeTimeRange(timeRange as CMTimeRangeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Removes a specified time range from a track.
**Notes:** timeRange: The time range to be removed.

### 18.7.9 removeTrackAssociationToTrack(movieTrack as AVMovieTrackMBS, trackAssociationType as String)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Removes a track association of a specific type between two tracks.
**Notes:** movieTrack: An AVMovieTrack object that is associated with the receiver.
trackAssociationType: The type of track association to remove between the receiver and the specified movieTrack (for instance, AVTrackAssociationTypeChapterList).

### 18.7.10 scaleTimeRange(timeRange as CMTimeRangeMBS, duration as CMTimeMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Changes the duration of a time range of a track.
**Notes:** timeRange: The time range to be scaled.
duration: The new duration of the time range.

### 18.7.11 setMetadata(items() as AVMetadataItemMBS)

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Sets the metadata items.

### 18.7.12 Properties

### 18.7.13 alternateGroupID as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** An integer indicating the track as a member of a particular alternate group.
**Notes:** (Read and Write property)

### 18.7.14 cleanApertureDimensions as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGSize indicating the clean aperture dimensions of the track.
**Notes:** (Read and Write property)

### 18.7.15 Enabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A boolean value indicating whether the track is enabled by default for presentation.
**Notes:** (Read and Write property)

### 18.7.16 encodedPixelsDimensions as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGSize indicating the dimensions encoded pixels dimensions of the track.
**Notes:** (Read and Write property)

### 18.7.17 extendedLanguageTag as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The language tag associated with the track.
**Notes:** The value of this property is an IETF BCP 47 (RFC 4646) language identifier indicating the language tag associated with the track; may be "" if no language tag is indicated.
(Read and Write property)

### 18.7.18 hasProtectedContent as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether a track contains protected content.
**Notes:** The value of this property is a boolean that indicates whether the track contains protected content.
(Read only property)

### 18.7.19 languageCode as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The language associated with the track.
**Notes:** The value of this property is an ISO 639-2/T language code indicating the language associated with the track; may be "" if no language is indicated.
(Read and Write property)

### 18.7.20 layer as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The layer level of the visual media data of the track.
**Notes:** (Read and Write property)

### 18.7.21 mediaDataStorage as AVMediaDataStorageMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The storage container for media data added to a track.
**Notes:** The value of this property is an AVMediaDataStorage object that indicates the location at which media data inserted or appended to the track will be written.
(Read and Write property)

### 18.7.22 Modified as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether a track has been modified.
**Notes:** The value of this property is a boolean that indicates whether the AVMutableMovieTrack object has been modified since it was created, was last written, or had its modified state cleared via an assignment: Modified = false.
(Read and Write property)

### 18.7.23 naturalSize as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGSize indicating the dimensions at which the visual media data of the track should be displayed.
**Notes:** (Read and Write property)

### 18.7.24 preferredMediaChunkAlignment as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that support media chunk alignment, the boundary for media chunk alignment (in bytes).
**Notes:** The default value is 0, which means that the receiver will choose an appropriate default value.
A value of 1 implies that no padding should be used to achieve a particular chunk alignment. It is an error

to set a negative value for chunk alignment.
(Read and Write property)

### 18.7.25 preferredMediaChunkDuration as CMTimeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that support media chunk durations, the maximum duration to be used for each chunk of sample data written to the file.
**Notes:** The total duration of the samples in a chunk will be no greater than this preferred chunk duration, or the duration of a single sample if the sample's duration is greater than this preferred chunk duration.

The default value is kCMTimeInvalid, which means that the receiver will choose an appropriate default chunk duration. It is an error to set a chunk duration that is negative or non-numeric.

This property and preferredMediaChunkSize, which also specifies the size of a chunk, are mutually exclusive. Thus, if both properties are set, the last setting is honored.
(Read and Write property)

### 18.7.26 preferredMediaChunkSize as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that support media chunk sizes, the maximum size (in bytes) to be used for each chunk of sample data written to the file.
**Notes:** The total size of the samples in a chunk will be no larger than this preferred chunk size, or the size of a single sample if the sample is larger than this preferred chunk size.

The default value is 0, which means that the receiver will choose an appropriate default chunk size. It is an error to set a negative chunk size.

This property and preferredMediaChunkDuration, which also specifies the size of a chunk, are mutually exclusive.
Thus, if both properties are set, the last setting is honored.
(Read and Write property)

### 18.7.27 preferredTransform as CGAffineTransformMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGAffineTransform indicating the transform specified in the track's storage container as the preferred transformation of the visual media data for display purposes; the value is often but not always CGAffineTransformIdentity.
**Notes:** (Read and Write property)

### 18.7.28 preferredVolume as Double

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The preferred volume of the audible media data of the track; often but not always 1.0.
**Notes:** (Read and Write property)

### 18.7.29 productionApertureDimensions as CGSizeMBS

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CGSize indicating the production aperture dimensions of the track.
**Notes:** (Read and Write property)

### 18.7.30 sampleReferenceBaseURL as String

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that support writing sample references, such as QuickTime Movie files, specifies the base URL that sample references are relative to; may be nil.
**Notes:** If the value of this property can be resolved as an absolute URL, the sample locations written to the file when appending sample references to this track will be relative to this URL. The URL must point to a location contained by any common parent directory of the locations that will be referenced. For example, setting the sampleReferenceBaseURL property to "file:///Users/johnappleseed/Movies/" and appending sample buffers that refer to "file:///Users/johnappleseed/Movies/data/movie1.mov" will cause the sample reference "data/movie1.mov" to be written to the movie file.

If the value of the property cannot be resolved as an absolute URL or if it points to a location that is not contained by any common parent directory of the locations that will be referenced, the location will be written unmodified.

The default value is "", which means that the location will be written unmodified.
(Read and Write property)

### 18.7.31 timescale as Integer

MBS AVFoundation Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** For file types that contain a 'moov' atom, such as QuickTime Movie files, specifies the time scale of the track's media.
**Notes:** The default media time scale is 0.
This property should be set on a new empty track before any edits are performed on the track.
(Read and Write property)

# Chapter 19

# Barcode

## 19.1 class BarcodeGeneratorMBS

### 19.1.1 class BarcodeGeneratorMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to generate barcodes.
**Example:**

```
dim b as new BarcodeGeneratorMBS
b.Symbology = b.BarcodeQrcode
b.Scale = 2
b.BorderWidth = 4
b.Encode "Hello Xojo Developer!"
Backdrop = b.Picture
```

**Notes:** The MBS Plugin uses the zint library (BSD license).
Please also see the manual for Zint (included in examples) for special options for individual barcodes.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- Barcodes supported by MBS Plugins
- BKS Shorts Version 2.0
- MBS Xojo / Real Studio plug-ins in version 16.5
- MBS Xojo / Real Studio plug-ins version 16.2

- MBS Xojo / Real Studio plug-ins in version 14.2
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- MBS Xojo / Real Studio plug-ins in version 13.5
- Barcode Generation or Recognition

**Videos**

- MBS Plugin Installation on Windows
- MBS Plugin Installation on macOS
- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 21.4, pages 66 to 67: Create a Barcode in Xojo, Using the MBS plugins to create barcodes by Stefanie Juchmes
- 21.4, page 64: Create a Barcode in Xojo, Using the MBS plugins to create barcodes by Stefanie Juchmes
- 21.3, page 10: News
- 21.2, page 9: News
- 20.2, page 82: Wifi QR Code, Embedding your Wifi password in a QR code by Stefanie Juchmes
- 17.5, page 10: News
- 17.4, pages 36 to 40: Creating Barcodes in Xojo, How you can create more than 80 different types of barcodes in Xojo by Stefanie Juchmes
- 17.2, pages 29 to 30: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich
- 17.1, page 43: Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Tim Dietrich
- 17.1, pages 36 to 39: Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Tim Dietrich

### 19.1.2 Methods

### 19.1.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.1.4 Destructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 19.1.5 EANChecksum(text as string) as string

MBS Barcode Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates checksums for EAN.
**Example:**

```
// returns "3" for 12 digit EAN:
MsgBox BarcodeGeneratorMBS.EANChecksum("425098421626")
```

**Notes:** Returns checksum character.

For EAN 8, please use UPCChecksum function.

### 19.1.6 Encode(text as string, width as single = 0, height as single = 0, RotationAngle as Integer = 0)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a barcode.
**Example:**

```
dim b as new BarcodeGeneratorMBS
b.Symbology = b.BarcodeQrcode
b.Scale = 2
b.BorderWidth = 4
b.Encode "Hello Xojo Developer!"
Backdrop = b.Picture
```

**Notes:** If width is zero, we use automatic width.
If height is zero, we use automatic height. Default height for some 2D bars is 30 units.
RotationAngle can be 0, 90, 180 or 270.
You can set options before calling and query other properties (like picture after this)

### 19.1.7 ISBNChecksum(text as string) as string

MBS Barcode Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates checksums for ISBN 10 and 13.
**Example:**

```
// returns 6 for 9 digit ISBN:
MsgBox BarcodeGeneratorMBS.ISBNChecksum("074755100")
```

**Notes:** Returns checksum character.

### 19.1.8 LibVersion as string

MBS Barcode Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries zint library version.
**Notes:** e.g. "2.6.3"

### 19.1.9 SVG as String

MBS Barcode Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates SVG as text.
**Example:**

```
dim z as new BarcodeGeneratorMBS

// try QR Code
z.Symbology = BarcodeGeneratorMBS.BarcodeQrcode
z.Encode "Hello World"

dim s1 as string = z.SVG

// try SVG
z.Symbology = BarcodeGeneratorMBS.BarcodeEanX
z.Encode "123456789012"

dim s2 as string = z.SVG

break // check SVG
```

**Notes:** Lasterror and ErrorText are set.

### 19.1.10 UPCChecksum(text as string) as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates UPC checksum.
**Example:**

```
dim s as string = "24796"
MsgBox BarcodeGeneratorMBS.UPCChecksum(s)
```

**Notes:** String must contain numbers.

### 19.1.11 ValidSymbologyID(ID as Integer) as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this Symbology ID is valid.
**Notes:** Returns true on success or false on failure.

### 19.1.12 WritePS(path as string) as Integer

MBS Barcode Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write PS file.
**Example:**

```
dim z as new BarcodeGeneratorMBS

z.Symbology = BarcodeGeneratorMBS.BarcodeUpca
z.Encode "72527270270"

dim f as FolderItem = SpecialFolder.Desktop.Child("barcode.eps")
dim e as Integer = z.WritePS(f.NativePath)
if z.ErrorText.len >0 then
MsgBox z.ErrorText
else
MsgBox "OK"
end if
```

**Notes:** Returns error code. Lasterror and ErrorText is also set.
File path should be ASCII only (other characters not guaranteed) and maybe point to temp file somewhere.

### 19.1.13 WriteSVG(path as string) as Integer

MBS Barcode Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write SVG file.
**Example:**

```
dim z as new BarcodeGeneratorMBS

z.Symbology = BarcodeGeneratorMBS.BarcodeUpca
z.Encode "72527270270"

dim f as FolderItem = SpecialFolder.Desktop.Child("barcode.svg")
dim e as Integer = z.WriteSVG(f.NativePath)
if z.ErrorText.len >0 then
MsgBox z.ErrorText
else
MsgBox "OK"
end if
```

**Notes:** Returns error code. Lasterror is set.
ErrorText is also set.
File path should be ASCII only (other characters not guaranteed) and maybe point to temp file somewhere.

### 19.1.14 Properties

### 19.1.15 BackColor as Color

MBS Barcode Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The background color.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.BackColor = &cFFCCFF
```

**Notes:** By default white.
Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.16 BitmapByteLength as Integer

MBS Barcode Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The byte length of a bitmap.
**Notes:** (Read only property)

### 19.1.17 BitmapHeight as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height of stored bitmap image (in pixels).
**Notes:** (Read only property)

### 19.1.18 BitmapWidth as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of stored bitmap image (in pixels).
**Notes:** (Read only property)

### 19.1.19 BorderWidth as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border width.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.ForeColor = &c8888FF
z.BackColor = &c000000

// add 20 pixel border around
z.BorderWidth = 20
z.OutputOptions = z.OutputOptionBox
```

**Notes:** Default 0.
Please set before Encode to take effect while encoding barcode.
Only used if OutputOptions includes flag OutputOptionBox or flag OutputOptionBind.

(Read and Write property)

### 19.1.20 DotSize as Single

MBS Barcode Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dot size.
**Notes:** (Read and Write property)

### 19.1.21 ECI as Integer

MBS Barcode Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ECI field.
**Notes:** (Read and Write property)

### 19.1.22 ErrorText as String

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Error message in the event that an error occurred.
**Notes:** (Read only property)

### 19.1.23 FontSize as Integer

MBS Barcode Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font size.
**Notes:** (Read and Write property)

### 19.1.24 ForeColor as Color

MBS Barcode Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The foreground color.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.ForeColor = &c88FFFF
```

z.BackColor = &c000000

**Notes:** By default black.
Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.25 GuardDescent as Single

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height in X-dimensions that EAN/UPC guard bars descend.
**Notes:** Default is 5.
(Read and Write property)

### 19.1.26 Height as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbol height.
**Notes:** Default 50.
(Read and Write property)

### 19.1.27 InputMode as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set encoding of input data.
**Notes:** Default binary mode.
Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.28 LastError as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

// do something and then check error:
```

```
dim e as integer = z.LastError
dim error as string

Select case e
case z.ErrorTooLong
error = "ErrorTooLong"
case z.ErrorInvalidData
error = "ErrorInvalidData"
case z.ErrorInvalidCheck
error = "ErrorInvalidCheck"
case z.ErrorInvalidOption
error = "ErrorInvalidOption"
case z.ErrorEncodingProblem
error = "ErrorEncodingProblem"
case z.ErrorFileAccess
error = "ErrorFileAccess"
case z.ErrorMemory
error = "ErrorMemory"
end Select
```

**Notes:** (Read and Write property)

### 19.1.29 Option1 as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbology specific options.
**Notes:** Please set before Encode to take effect while encoding barcode.
See zint_manual_242.pdf coming with examples for details.

For QRCode:
The ECC Level with values from 1 = low, 2 = middle, 3 = better, 4 high. Default is low.

For MaxiCode:
The mode for the maxi code.

For PDF 417:
Optional a number between 0 and 8 where the number of codewords used for check information is determined by 2^(value + 1).
(Read and Write property)

### 19.1.30 Option2 as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbology specific options.
**Notes:** Please set before Encode to take effect while encoding barcode.
See zint_manual_242.pdf coming with examples for details.

For QRCode:
Version code from 1 to 40. Default is 0 to auto select.

For Data Matrix:
Size from 1 to 30. 0 is auto. See table in zint manual pdf.

For Code 39:
You can set Option2 to 1 to add module 43 checksum.

For PDF 417:
The number of columns between 1 and 30.
(Read and Write property)

### 19.1.31 Option3 as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbology specific options.
**Notes:** Please set before Encode to take effect while encoding barcode.
See zint_manual_242.pdf coming with examples for details.
(Read and Write property)

### 19.1.32 OutputOptions as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Binding or box parameters.
**Example:**

```
dim b as new BarcodeGeneratorMBS
b.OutputOptions = b.OutputOptionBoldText
```

**Notes:** Use OutputOptionBind, OutputOptionBox or OutputOptionNone.
Please set before Encode to take effect while encoding barcode.

(Read and Write property)

### 19.1.33 Picture as Picture

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode picture.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.Symbology = BarcodeGeneratorMBS.BarcodeQrcode
z.Encode "MBS Plugin"

Dim pic As Picture = z.picture
If z.LastError <>0 Then
MessageBox "LastError: "+Str(z.LastError)
Else
window1.Backdrop = pic
End If
```

**Notes:** (Read and Write property)

### 19.1.34 Rows as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of rows used by the symbol or, if using barcode stacking, the row to be used by the next symbol.
**Notes:** (Read only property)

### 19.1.35 Scale as Single

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scale factor for adjusting size of image.
**Example:**

```
dim b as new BarcodeGeneratorMBS
b.Symbology = b.BarcodeQrcode
b.Scale = 4
b.BorderWidth = 4
```

```
b.Encode "Hello Xojo Developer!"
Backdrop = b.Picture
```

**Notes:** Default is 1.0
Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.36 ShowText as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to show the text below the barcode.
**Notes:** Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.37 Symbology as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbology to use.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.Symbology = BarcodeGeneratorMBS.BarcodeEanx
z.Encode "54321"

Dim pic As Picture = z.picture
Dim e As Integer = z.LastError
break
```

**Notes:** e.g. BarcodeEANX.
Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.38 Text as String

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Human readable text, which usually consists of the input data plus one or more check digits.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.Symbology = BarcodeGeneratorMBS.BarcodeEanx
z.Encode "54321"

Dim pic As Picture = z.picture
Dim e As Integer = z.LastError
break
```

**Notes:** Uses UTF-8 formatting.
(Read only property)

### 19.1.39 Vector as ZintVectorMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vector information.
**Notes:** You can check this classes and draw the barcode yourself.
For Example with DynaPDF as vector graphics.

Only available after you called Encode method.
(Read and Write property)

### 19.1.40 WarnLevel as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The warning level.
**Notes:** Affects error/warning value returned by Zint API.
(Read and Write property)

### 19.1.41 WhitespaceHeight as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height in X-dimensions of whitespace above & below the barcode.
**Example:**

```
Dim z As New BarcodeGeneratorMBS

z.WhitespaceHeight = 20
```

z.WhitespaceWidth = 20

**Notes:** (Read and Write property)

### 19.1.42 WhitespaceWidth as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the whitespace.
**Example:**

Dim z As New BarcodeGeneratorMBS

z.WhitespaceHeight = 20
z.WhitespaceWidth = 20

**Notes:** Please set before Encode to take effect while encoding barcode.
(Read and Write property)

### 19.1.43 Width as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of the generated symbol.
**Notes:** (Read only property)

### 19.1.44 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| OptionSquare | 100 | One of the options.<br>An extra feature is available for Data Matrix symbols which allows Zint to automatically resize the symbol as required but also prevents Zint from using rectangular symbols. To set this mode set the value Option3 = OptionSquare. |

Symbology constants

| Constant | Value | Description |
|---|---|---|
| BarcodeAuspost | 63 | Australia Post Standard Customer |
| BarcodeAusredirect | 68 | Australia Post Redirection |
| BarcodeAusreply | 66 | Australia Post Reply Paid |
| BarcodeAusroute | 67 | Australia Post Routing |
| BarcodeAzrune | 128 | Aztec Runes |
| BarcodeAztec | 92 | Aztec Code |
| BarcodeC25Iata | 4 | Code 2 of 5 IATA |
| BarcodeC25Ind | 7 | Code 2 of 5 Industrial |
| BarcodeC25Inter | 3 | Interleaved 2 of 5 |
| BarcodeC25Logic | 6 | Code 2 of 5 Data Logic |
| BarcodeC25Matrix | 2 | Standard Code 2 of 5 |
| BarcodeChannel | 140 | Channel Code |
| BarcodeCodabar | 18 | Codabar |
| BarcodeCodablockf | 74 | Coda Block F |
| BarcodeCode11 | 1 | Code 11 |
| BarcodeCode128 | 20 | Code 128 (automatic subset switching) |
| BarcodeCode128B | 60 | Code 128 (Subset B) |
| BarcodeCode16K | 23 | Code 16K |
| BarcodeCode32 | 129 | Code 32 |
| BarcodeCode39 | 8 | Code 3 of 9 (Code 39) |
| BarcodeCode49 | 24 | Code 49 |
| BarcodeCode93 | 25 | Code 93 |
| BarcodeCodeone | 141 | Code One |
| BarcodeDaft | 93 | DAFT Code |
| BarcodeDatamatrix | 71 | Data Matrix |
| BarcodeDotCode | 115 | DotCode |
| BarcodeDPD | 96 | DPD Code. |
| BarcodeDpident | 22 | Deutsche Post Identcode |
| BarcodeDpleit | 21 | Deutsche Post Leitcode |
| BarcodeEan128 | 16 | GS1-128 |
| BarcodeEan128Cc | 131 | Composite Symbol with GS1-128 linear component |
| BarcodeEan13 | 13 | |
| BarcodeEan14 | 72 | EAN-14 |
| BarcodeEan8 | 13 | |
| BarcodeEANCheck | 14 | EAN Checks |
| BarcodeEanx | 13 | EAN |
| BarcodeEanxCc | 130 | Composite Symbol with EAN linear component |
| BarcodeExcode39 | 9 | Extended Code 3 of 9 (Code 39+) |
| BarcodeFim | 49 | FIM |
| BarcodeFlat | 28 | Flattermarken |
| BarcodeGridmatrix | 142 | Grid Matrix |
| BarcodeHanXin | 116 | HanXin |
| BarcodeHibc128 | 98 | HIBC Code 128 |
| BarcodeHibc39 | 99 | HIBC Code 39 |
| BarcodeHibcAztec | 112 | HIBC Aztec Code |
| BarcodeHibcBlockf | 110 | HIBC Block F |
| BarcodeHibcDm | 102 | HIBC Data Matrix |
| BarcodeHibcMicpdf | 108 | HIBC MicroPDF417 |
| BarcodeHibcPdf | 106 | HIBC PDF417 |
| BarcodeHibcQr | 104 | HIBC QR Code |
| BarcodeIsbnx | 69 | ISBN (EAN-13 with verification stage) |
| BarcodeItf14 | 89 | ITF-14 |
| BarcodeJapanpost | 76 | Japanese Post |
| BarcodeKix | 90 | Dutch Post KIX Code |
| BarcodeKoreapost | 77 | Korea Post |
| BarcodeLogmars | 50 | LOGMARS |
| BarcodeMailMark | 121 | Mailmark |
| BarcodeMaxicode | 57 | Maxicode |

Error Constants

| Constant | Value | Description |
|---|---|---|
| ErrorEncodingProblem | 9 | A problem has occurred during encoding of the data. This should never happen. Please contact the developer if you encounter this error. |
| ErrorFileAccess | 10 | Zint was unable to open the requested output file. This is usually a file permissions problem. |
| ErrorFileWrite | 12 | Error writing to output file. |
| ErrorInvalidCheck | 7 | An ISBN with an incorrect check digit has been entered. No symbol has been generated. |
| ErrorInvalidData | 6 | The data to be encoded includes characters which are not permitted by the selected symbology (e.g. alphabetic characters in an EAN symbol). No symbol has been generated. |
| ErrorInvalidOption | 8 | One of the values in zint_struct was set incorrectly and Zint was unable to guess what it should have been. No symbol has been generated. |
| ErrorMemory | 11 | Zint ran out of memory. This should only be a problem with legacy systems. |
| ErrorNonComppilant | 14 | Error reporting that symbol created is not compliant with standards. |
| ErrorTooLong | 5 | The input data is too long or too short for the selected symbology. No symbol has been generated. |
| ErrorUsesECI | 13 | Error reporting that ECI is needed. |
| WarnInvalidOption | 2 | One of the values was set incorrectly but Zint has made a guess at what it should have been and generated a barcode accordingly. |
| WarnUseECI | 3 | The warning to use ECI. |

Input Modes

| Constant | Value | Description |
|---|---|---|
| InputModeData | 0 | Uses full ASCII range interpreted as Latin-1 or binary data. |
| InputModeEscape | 8 | Additional flag to escape. |
| InputModeGS1 | 2 | Encodes GS1 data using FNC1 characters. |
| InputModeKanji | 3 | Kanji |
| InputModeSJIS | 4 | SJJS |
| InputModeUnicode | 1 | Uses pre-formatted UTF-8 input. |

Output Options

| Constant | Value | Description |
|---|---|---|
| OptionDMRE | 101 | |
| OutputOptionBind | 2 | Boundary bars above and below the symbol and between rows if stacking mu tiple symbols.<br>You can set BorderWidth for the size of the bind. |
| OutputOptionBoldText | 64 | Use bold text. |
| OutputOptionBox | 4 | Add a box surrounding the symbol and whitespace.<br>You can set BorderWidth for the size of the box. |
| OutputOptionCMYKColors | 128 | use CMYK colors for Postscript output.<br>For images, you can use plugin functions to convert RGB to CMYK if neede |
| OutputOptionDottyMode | 256 | Raster in dotty mode. |
| OutputOptionGS1_GS_Separator | 512 | Use GS Separator for DataMatrix. |
| OutputOptionNoASCII | 1 | No longer used. |
| OutputOptionNone | 0 | No box or boundary bars. |
| OutputOptionNoQuietZones | 4096 | Disable quiet zones, notably those with defaults as listed above. |
| OutputOptionQuietZones | 2048 | Add compliant quiet zones (additional to any specified whitespace)<br>Note: CODE16K, CODE49, CODABLOCKF, ITF14, EAN/UPC have defau quiet zones |
| OutputOptionReaderInit | 16 | Include reader initialize sequence in barcode. |
| OutputOptionSmallText | 32 | Use small text. |
| OutputOptionStdOut | 8 | Write to stdout. |

## 19.2 class BarcodeScannerMBS

### 19.2.1 class BarcodeScannerMBS

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use zxing classes instead.
**Function:** A class to read a barcode from a given picture.
**Notes:** Deprecated in favor of new zxing classes.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1
- MBS Real Studio Plugins, version 13.1pr11

### 19.2.2 Methods

### 19.2.3 Scan(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scans for a barcode on the picture.
**Notes:** The barcode is searched on the middle vertical line from the left to right.

So the picture you pass can be as small as just one pixel height.
The barcode should be horizontal centered in that picture for best results.

Returns true on success and false on failure.
See also:

- 19.2.4 Scan(p as picture, lines() as Integer) as boolean 3971

### 19.2.4 Scan(p as picture, lines() as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scans for a barcode on the picture.
**Example:**

```
dim i as Integer
dim lines(-1) as Integer
dim b as BarcodeScannerMBS
dim p as Picture
// set b to your scanner and p to your picture
```

```
for i=0 to 99
lines.append i*10 // search every 10th line on a 1000 pixel high image.
next

if b.scan(p,lines) then
// ok
end if
```

**Notes:** The barcode is searched on the lines with the given offsets from the left to right.

The lines array must have at least one entry specifying the lines to search on.
If the values in the lines array are out of bounds, they are ignored. The first line has the value 0.

So the picture you pass can be as small as just one pixel height.
The barcode should be horizontal centered in that picture for best results.

Returns true on success and false on failure.
See also:

- 19.2.3 Scan(p as picture) as boolean 3971

### 19.2.5 Properties

### 19.2.6 Barcode as String

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode result of the last scan.
**Notes:** If the last scan was successful, this property has a value.
If the last scan failed, this property is empty.
(Read and Write property)

### 19.2.7 CheckDigits as Boolean

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to calculate the checksum.
**Notes:** Normal 12 or 13 digit barcodes have the last number being a checksum.
If it does not match, the barcode is declined.

Default is false.

(Read and Write property)

### 19.2.8 LastBarcode as String

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode result of the last successful scan.
**Notes:** If a scan fails, this value still has the value of the last successful scan.
(Read and Write property)

### 19.2.9 LastPicture as Picture

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last picture used for the scan.
**Notes:** (Read and Write property)

### 19.2.10 MinimumLength as Integer

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum length of barcodes.
**Notes:** Set to 0 to disable.

To avoid false barcodes, any barcode is rejected which does not have the sufficient length.

Default is 13.
(Read and Write property)

### 19.2.11 Mode as Integer

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mode of the scanner.
**Notes:** Mode 0 is to scan EANs.
Mode 1 is to scan 2/5 family barcodes.
(Read and Write property)

## 19.3 class ZBarMBS

### 19.3.1 class ZBarMBS

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for scanning barcodes with zbar.
**Example:**

```
// get some picture
Dim p As Picture = Picture.Open(file)
If p <>Nil Then

// scan it
Dim symbols() As ZBarMBS = ZBarMBS.Scan(p)

// show results
For Each symbol As ZBarMBS In symbols
MsgBox symbol.Name+": "+symbol.Text
Next
End If
```

**Notes:** We can use the zbar library to scan pictures for barcodes in Xojo:

ZBar is an open source software suite for reading bar codes from various sources, such as video streams, image files and raw intensity sensors. It supports many popular symbologies (types of bar codes) including EAN-13/UPC-A, UPC-E, EAN-8, Code 128, Code 39, Interleaved 2 of 5 and QR Code.

ZBar is licensed under the GNU LGPL 2.1 to enable development of both open source and commercial projects.

Since the library is under LGPL license, we can't embed it within the plugin and you need to provide a DLL/dylib/so file to the plugin to load library

zbar Homepage:
http://zbar.sourceforge.net
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr4
- News from the MBS Xojo Plugins Version 21.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3

- MBS Xojo Plugins, version 21.3pr5
- Using zbar library with Xojo
- MBS Xojo Plugins, version 21.3pr2
- MBS Xojo Plugins, version 21.3pr1

**Xojo Developer Magazine**

- 19.5, page 9: News

### 19.3.2 Methods

### 19.3.3 Components as ZBarMBS()

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Components of a barcode.
**Notes:** If this is a composed barcode, you may get the individual parts here.
Maybe nil if no components are available.

### 19.3.4 Constructor

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 19.3.5 LibraryLoaded as Boolean

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the library is loaded.

### 19.3.6 LibraryLoadError as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last error code from loading the zlib library.

### 19.3.7 LibraryLoadErrorMessage as String

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last error message from loading the zlib library.

### 19.3.8 LoadLibrary(file as folderitem) as boolean

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the zbar library.
**Example:**

```
#If TargetMacOS Then

Const libname = "libzbar.0.dylib"

Dim LibFile As FolderItem = GetFolderItem(libname)

If ZBarMBS.LoadLibrary(LibFile) Then
'MsgBox "ZBar loaded."
Else
MsgBox "Failed to load ZBar library: "+ZBarMBS.LibraryLoadErrorMessage
End If
#EndIf
```

**Notes:** Please pass path to zbar.dll on Windows, libzbar.dylib on macOS and libzbar.so on Linux.
Returns true on success and false on failure.

See LibraryLoadErrorMessage and LibraryLoadError properties for error details.

We have libraries for you here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
See also:

- 19.3.9 LoadLibrary(path as string) as boolean 3976

### 19.3.9 LoadLibrary(path as string) as boolean

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the zbar library.
**Example:**

```
#If TargetLinux Then

Const libname = "libzbar.so.0"
// /usr/lib/x86_64-linux-gnu/libzbar.so.0

If ZBarMBS.LoadLibrary(libname) Then

'MsgBox "ZBar loaded."

Else

MsgBox "Failed to load ZBar library: "+ZBarMBS.LibraryLoadErrorMessage

End If
#endif
```

**Notes:** Please pass path to zbar.dll on Windows, libzbar.dylib on macOS and libzbar.so on Linux.
Returns true on success and false on failure.

See LibraryLoadErrorMessage and LibraryLoadError properties for error details.

We have libraries for you here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
See also:

- 19.3.8 LoadLibrary(file as folderitem) as boolean 3976

### 19.3.10 Scan(pic as Picture, AllowedTypes as Integer = 0) as ZBarMBS()

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Performs barcode detection.
**Example:**

```
// get some picture
Dim p As Picture = Picture.Open(file)
If p <>Nil Then

// scan it
Dim symbols() As ZBarMBS = ZBarMBS.Scan(p)

// show results
For Each symbol As ZBarMBS In symbols
MsgBox symbol.Name+": "+symbol.Text
Next
```

```
End If
```

**Notes:** Returns an array of detected barcodes.

Works best with black & white picture, so you may enhance contrast.
If AllowedTypes is zero, all types are enabled.
Otherwise use bitwiseOr() to combine types you like and pass them as AllowedTypes.

### 19.3.11 Properties

### 19.3.12 BoundsBottom as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Bottom of bounding rectangle.
**Notes:** (Read only property)

### 19.3.13 BoundsLeft as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Left of bounding rectangle.
**Notes:** (Read only property)

### 19.3.14 BoundsRight as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Right of bounding rectangle.
**Notes:** (Read only property)

### 19.3.15 BoundsTop as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Top of bounding rectangle.
**Notes:** (Read only property)

### 19.3.16 Data as MemoryBlock

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The RAW data from the barcode.
**Notes:** (Read and Write property)

### 19.3.17 HasComponents as Boolean

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether we have an array of components.
**Notes:** (Read only property)

### 19.3.18 Name as String

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of the barcode type.
**Notes:** (Read and Write property)

### 19.3.19 Picture as Picture

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The picture scanned.
**Notes:** (Read only property)

### 19.3.20 Quality as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The quality rating.
**Notes:** Value depends on what barcode type is used.
But in general if you get two barcodes detected, you may pick the higher one.
(Read only property)

### 19.3.21 Text as String

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The barcode content.
**Notes:** If data is valid UTF-8, this will be a string with UTF-8 text of the barcode.
Otherwise we default to Windows ANSI encoding.
(Read only property)

### 19.3.22 Type as Integer

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The type of the barcode.
**Notes:** See constants.
Maybe a combination of a flag for add-ons and the type, e.g. kSymbolTypeEAN13 + kSymbolTypeAddOn5
(Read only property)

### 19.3.23 Version as String

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries version number of zbar library.
**Notes:** Returns for example "0.10".
(Read only property)

### 19.3.24 XML as String

MBS Barcode Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries XML of the barcode.
**Notes:** (Read only property)

### 19.3.25 Constants

Symbol Types

| Constant | Value | Description |
|---|---|---|
| kSymbolTypeAddOn | &h0700 | add-on flag mask |
| kSymbolTypeAddOn2 | &h0200 | 2-digit add-on flag |
| kSymbolTypeAddOn5 | &h0500 | 5-digit add-on flag |
| kSymbolTypeCODE128 | 128 | Code 128 |
| kSymbolTypeCODE39 | 39 | Code 39. |
| kSymbolTypeEAN13 | 13 | EAN-13 |
| kSymbolTypeEAN8 | 8 | EAN-8 |
| kSymbolTypeI25 | 25 | Interleaved 2 of 5. |
| kSymbolTypeISBN10 | 10 | ISBN-10 (from EAN-13). |
| kSymbolTypeISBN13 | 14 | ISBN-13 (from EAN-13). |
| kSymbolTypeNone | 0 | no symbol decoded. |
| kSymbolTypePartial | 1 | intermediate status |
| kSymbolTypePDF417 | 57 | PDF417. |
| kSymbolTypeQRCode | 64 | QR Code. |
| kSymbolTypeSymbol | &h00ff | mask for base symbol type |
| kSymbolTypeUPCA | 12 | UPC-A |
| kSymbolTypeUPCE | 9 | UPC-E |

## 19.4 class ZintVectorCircleMBS

### 19.4.1 class ZintVectorCircleMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a circle to draw.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr6
- MBS Xojo Plugins, version 22.6pr1
- MBS Xojo Plugins, version 19.6pr4

### 19.4.2 Methods

### 19.4.3 Constructor

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.4.4 Properties

### 19.4.5 ColorNumber as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value as integer.
**Notes:** Non-zero for draw with background colour (else draw with foreground colour)
(Read only property)

### 19.4.6 ColorValue as Color

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value.
**Notes:** (Read only property)

### 19.4.7 Diameter as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The diameter for this circle.
**Notes:** (Read only property)

### 19.4.8 NextObject as ZintVectorCircleMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next circle object in the chain.
**Notes:** This is nil on the last object in the chain.
(Read and Write property)

### 19.4.9 Width as Single

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of circle perimeter (circumference). 0 for fill (disc)
**Notes:** (Read only property)

### 19.4.10 X as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X coordinate.
**Notes:** (Read only property)

### 19.4.11 Y as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y coordinate.
**Notes:** (Read only property)

## 19.5 class ZintVectorHexagonMBS

### 19.5.1 class ZintVectorHexagonMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a hexagon to draw.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr1
- MBS Xojo Plugins, version 19.6pr4

### 19.5.2 Methods

### 19.5.3 Constructor

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.5.4 Properties

### 19.5.5 Diameter as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The diameter of the hexagon.
**Notes:** (Read only property)

### 19.5.6 NextObject as ZintVectorHexagonMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next hexagon object in the chain.
**Notes:** This is nil on the last object in the chain.
(Read and Write property)

### 19.5.7 Rotation as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotation of the hexagon.
**Notes:** Can be 0, 90, 180, 270 degrees.
(Read and Write property)

### 19.5.8 X as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X coordinate.
**Notes:** (Read only property)

### 19.5.9 Y as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y coordinate.
**Notes:** (Read only property)

## 19.6 class ZintVectorMBS

### 19.6.1 class ZintVectorMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for vector information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 19.6pr4

### 19.6.2 Methods

### 19.6.3 Circles as ZintVectorCircleMBS()

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all the cirlce objects.

### 19.6.4 Constructor

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.6.5 Hexagons as ZintVectorHexagonMBS()

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all the hexagon objects.

### 19.6.6 Rectangles as ZintVectorRectMBS()

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all the rectangle objects.

### 19.6.7 Strings as ZintVectorStringMBS()

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all the string objects.

### 19.6.8 Properties

### 19.6.9 FirstCircle as ZintVectorCircleMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ring object in the chain of circle objects.
**Notes:** (Read and Write property)

### 19.6.10 FirstHexagon as ZintVectorHexagonMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first hexagon object in the chain of hexagon objects.
**Notes:** (Read and Write property)

### 19.6.11 FirstRectangle as ZintVectorRectMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first line object in the chain of rectangle objects.
**Notes:** (Read and Write property)

### 19.6.12 FirstString as ZintVectorStringMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first string object in the chain of string objects.
**Notes:** (Read and Write property)

### 19.6.13 Height as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the barcode.
**Notes:** (Read only property)

### 19.6.14 Width as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the barcode.
**Notes:** (Read only property)

## 19.7 class ZintVectorRectMBS

### 19.7.1 class ZintVectorRectMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a rectangle to draw.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr6
- MBS Xojo Plugins, version 19.6pr4

### 19.7.2 Methods

### 19.7.3 Constructor

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.7.4 Properties

### 19.7.5 ColorNumber as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value as integer.
**Notes:** -1 for foreground, 1-8 for Cyan, Blue, Magenta, Red, Yellow, Green, Black, White
(Read only property)

### 19.7.6 ColorValue as Color

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value.
**Notes:** (Read only property)

### 19.7.7 Height as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the line.
**Notes:** (Read only property)

### 19.7.8 NextObject as ZintVectorRectMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next rectangle object in the chain.
**Notes:** This is nil on the last object in the chain.
(Read and Write property)

### 19.7.9 Width as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the line.
**Notes:** You need to know the orientation of the barcode to know how to draw it
(Read only property)

### 19.7.10 X as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X coordinate.
**Notes:** (Read only property)

### 19.7.11 Y as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y coordinate.
**Notes:** (Read only property)

## 19.8 class ZintVectorStringMBS

### 19.8.1 class ZintVectorStringMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a string to draw.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr6
- MBS Xojo Plugins, version 22.6pr1
- MBS Xojo Plugins, version 21.5pr1
- MBS Xojo Plugins, version 19.6pr4

### 19.8.2 Methods

### 19.8.3 Constructor

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.8.4 Properties

### 19.8.5 FontSize as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font size.
**Notes:** (Read only property)

### 19.8.6 HAlign as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Horizontal alignment.
**Notes:** Value is 0 for centre, 1 for left, 2 for right.
(Read and Write property)

### 19.8.7 Length as Integer

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the text in characters.
**Notes:** (Read and Write property)

### 19.8.8 NextObject as ZintVectorStringMBS

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next string object in the chain.
**Notes:** This is nil on the last object in the chain.
(Read and Write property)

### 19.8.9 Rotation as Integer

MBS Barcode Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotation of the hexagon.
**Notes:** Can be 0, 90, 180, 270 degrees.
(Read and Write property)

### 19.8.10 Text as String

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text.
**Notes:** Plugin assumes string is in UTF-8.
(Read and Write property)

### 19.8.11 Width as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the string.
**Notes:** (Read only property)

### 19.8.12 X as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X coordinate.
**Notes:** (Read only property)

### 19.8.13 Y as Single

MBS Barcode Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y coordinate.
**Notes:** (Read only property)

### 19.8.14 Constants

Horizontal Alignments

| Constant | Value | Description |
|---|---|---|
| HAlignCenter | 0 | Center |
| HAlignLeft | 1 | Left |
| HAlignRight | 2 | Right |

## 19.9 class zxingAztecReaderMBS

### 19.9.1 class zxingAztecReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** The reader for Aztec.
**Notes:** Subclass of the zxingReaderMBS class.

### 19.9.2 Methods

### 19.9.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 19.10 class zxingBarcodeFormatMBS

### 19.10.1 class zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** The class for a barcode format.
**Blog Entries**

- Barcode Generation or Recognition

**Xojo Developer Magazine**

- 17.4, page 42: Creating Barcodes in Xojo, How you can create more than 80 different types of barcodes in Xojo by Stefanie Juchmes

### 19.10.2 Methods

### 19.10.3 Constructor(value as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.10.4 Properties

### 19.10.5 Name as String

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the barcode for display.
**Notes:** (Read only property)

### 19.10.6 Value as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The numeric value for this barcode.
**Notes:** (Read and Write property)

### 19.10.7 Constants

Barcode Formats

| Constant | Value | Description |
|---|---|---|
| kFormatAzTec | 1 | Aztec |
| kFormatCoda128 | 5 | Code 128 1D format. |
| kFormatCoda39 | 3 | Coda 39 |
| kFormatCoda93 | 4 | Code 39 1D format. |
| kFormatCodaBar | 2 | Coabar |
| kFormatCodaEAN13 | 8 | EAN-13 1D format. |
| kFormatCodaEAN8 | 7 | EAN-8 1D format |
| kFormatCodaITF | 9 | ITF (Interleaved Two of Five) 1D format. |
| kFormatCodaPDF417 | 11 | PDF417 format. |
| kFormatCodaQRCode | 12 | QR Code 2D barcode format. |
| kFormatCodaRSSExpanded | 14 | Coda RSS Expanded |
| kFormatCodaUPCA | 15 | UPC-A 1D format. |
| kFormatCodaUPCE | 16 | UPC-E 1D format. |
| kFormatCodaUPCEANExtension | 17 | UPC EAN Extension |
| kFormatCodeRSS14 | 13 | RSS 14 |
| kFormatDataMatrix | 6 | DataMatrix 2D barcode format. |

## 19.11 class zxingBinarizerMBS

### 19.11.1 class zxingBinarizerMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** The binarazer class.
**Notes:** This class provides binary values for luminance values.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 19.11.2 Methods

### 19.11.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.11.4 createBinarizer(source as zxingLuminanceSourceMBS) as zxingBinarizerMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new binarizer for the given luminance source.

### 19.11.5 Properties

### 19.11.6 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.11.7 Height as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries height of the image.
**Notes:** (Read only property)

### 19.11.8 LuminanceSource as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The luminance source used.
**Notes:** (Read only property)

### 19.11.9 Width as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries width of the image.
**Notes:** (Read only property)

## 19.12 class zxingBinaryBitmapMBS

### 19.12.1 class zxingBinaryBitmapMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** This class is the core bitmap class used by ZXing to represent 1 bit data.
**Notes:** Reader objects accept a BinaryBitmap and attempt to decode it.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2
- MBS Xojo / Real Studio Plugins, version 15.2pr1
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Barcode Generation or Recognition

**Xojo Developer Magazine**

- 17.4, pages 41 to 42: Creating Barcodes in Xojo, How you can create more than 80 different types of barcodes in Xojo by Stefanie Juchmes

### 19.12.2 Methods

### 19.12.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.12.4 CreateWithPicture(pic as picture, hybrid as boolean = false) as zxingBinaryBitmapMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new binary bitmap using a given picture.
**Notes:** if hybrid is true, we use internally the HybridBinarizer, else the GlobalHistogramBinarizer.

### 19.12.5 crop(left as Integer, top as Integer, width as Integer, height as Integer) as zxingBinaryBitmapMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new object with cropped image data.

### 19.12.6 rotateCounterClockwise as zxingBinaryBitmapMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new object with rotated image data by 90 degrees counterclockwise.

### 19.12.7 string as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image as text string.

### 19.12.8 Properties

### 19.12.9 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.12.10 Height as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries height of the image.
**Notes:** (Read only property)

### 19.12.11 isCropSupported as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this bitmap can be cropped.
**Notes:** (Read only property)

### 19.12.12 isRotateSupported as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this bitmap supports counter-clockwise rotation.
**Notes:** (Read only property)

### 19.12.13 LuminanceSource as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the luminance source for this bitmap.
**Notes:** (Read only property)

### 19.12.14 Picture as Picture

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a picture with content of the binary bitmap.
**Notes:** This is made to help debugging barcode detection.
(Read only property)

### 19.12.15 Width as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries width of the image.
**Notes:** (Read only property)

## 19.13 class zxingBitArrayMBS

### 19.13.1 class zxingBitArrayMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** A simple, fast array of bits, represented compactly by an array of ints internally.

### 19.13.2 Methods

### 19.13.3 clear

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the array.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
b.set(2)
// show
MsgBox b.Text
// clear the bits
b.clear
// and show again
MsgBox b.Text
```

### 19.13.4 Constructor(size as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.13.5 get(index as Integer) as boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value of an item in array.

### 19.13.6 getNextSet(fromIndex as Integer) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries next set bit.

### 19.13.7 getNextUnset(fromIndex as Integer) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds next unset array index.

### 19.13.8 isRange(start as Integer, ende as Integer, value as boolean) as boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Efficient method to check if a range of bits is set, or not set.

### 19.13.9 PictureColumn(pic as picture, Column as Integer) as zxingBitArrayMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a column of a picture as bit array.

### 19.13.10 PictureRow(pic as picture, row as Integer) as zxingBitArrayMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a row of a picture as bit array.

### 19.13.11 reverse

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the bit array.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
b.set(2)
// show
```

```
MsgBox b.Text
// reverse the bits
b.reverse
// and show again
MsgBox b.Text
```

**Notes:** This does reverse order, not inverse the values.

### 19.13.12 set(index as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a bit.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
// show
MsgBox b.Text
// set a bit
b.set(5)
// and show again
MsgBox b.Text
```

### 19.13.13 setBulk(index as Integer, newBits as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets bits from integer.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
// show
MsgBox b.Text
// set the bits
b.setBulk(2, &b101010101)
// and show again
MsgBox b.Text
```

### 19.13.14 Properties

### 19.13.15 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.13.16 Size as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns size of the array.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
MsgBox str(b.size)
```

**Notes:** (Read only property)

### 19.13.17 Text as String

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns text representation.
**Example:**

```
dim b as new zxingBitArrayMBS(10)
// show
MsgBox b.Text
// set a bit
b.set(5)
// and show again
MsgBox b.Text
```

**Notes:** (Read only property)

## 19.14 class zxingByQuadrantReaderMBS

### 19.14.1 class zxingByQuadrantReaderMBS

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** This class attempts to decode a barcode from an image, not by scanning the whole image, but by scanning subsets of the image.
**Notes:** This is important when there may be multiple barcodes in an image, and detecting a barcode may find parts of multiple barcode and fail to decode (e.g. QR Codes). Instead this scans the four quadrants of the image – and also the center 'quadrant' to cover the case where a barcode is found in the center.
Subclass of the zxingReaderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2

### 19.14.2 Methods

### 19.14.3 Constructor(Reader as zxingReaderMBS)

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Pass the reader to use by the quadrant reader.

### 19.14.4 Properties

### 19.14.5 Reader as zxingReaderMBS

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the reader used by the quadrant reader.
**Notes:** (Read only property)

## 19.15 class zxingChecksumExceptionMBS

### 19.15.1 class zxingChecksumExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingReaderExceptionMBS class.

## 19.16 class zxingCodaBarReaderMBS

### 19.16.1 class zxingCodaBarReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes Codabar barcodes.
**Notes:** Subclass of the zxingOneDReaderMBS class.

### 19.16.2 Methods

### 19.16.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.16.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

### 19.16.5 validatePattern(start as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates the pattern.

## 19.17 class zxingCode128ReaderMBS

### 19.17.1 class zxingCode128ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** The reader for code 128.
**Notes:** Subclass of the zxingOneDReaderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.6pr5

### 19.17.2 Methods

### 19.17.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.17.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The public constructor.
**Notes:** Was private until version 17.5.

### 19.17.5 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.18 class zxingCode39ReaderMBS

### 19.18.1 class zxingCode39ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes Code 39 barcodes.
**Notes:** Subclass of the zxingOneDReaderMBS class.

### 19.18.2 Methods

### 19.18.3 Constructor(usingCheckDigit as boolean = false, extendedMode as boolean = false)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.18.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.19 class zxingCode93ReaderMBS

### 19.19.1 class zxingCode93ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes Code 93 barcodes.
**Notes:** Subclass of the zxingOneDReaderMBS class.

### 19.19.2 Methods

### 19.19.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.19.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.20 class zxingDataMatrixReaderMBS

### 19.20.1 class zxingDataMatrixReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Detects and decodes Data Matrix codes in an image.
**Notes:** Subclass of the zxingReaderMBS class.

### 19.20.2 Methods

### 19.20.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 19.21 class zxingDecodeHintsMBS

### 19.21.1 class zxingDecodeHintsMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** The class for hints to the scanner.
**Notes:** This gives an idea to decoder on what you may expect.

### 19.21.2 Methods

### 19.21.3 addFormat(format as zxingBarcodeFormatMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a barcode format.
**Notes:** The class will set the corresponding hint for this format.

### 19.21.4 clear

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the hints.

### 19.21.5 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
See also:


- 19.21.6 Constructor(other as zxingDecodeHintsMBS) 4013
- 19.21.7 Constructor(value as Integer) 4014


### 19.21.6 Constructor(other as zxingDecodeHintsMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copy constructor.
See also:

- 19.21.5 Constructor 4013
- 19.21.7 Constructor(value as Integer) 4014


### 19.21.7 Constructor(value as Integer)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to use a given hint.
See also:


- 19.21.5 Constructor 4013
- 19.21.6 Constructor(other as zxingDecodeHintsMBS) 4013


### 19.21.8 containsFormat(format as zxingBarcodeFormatMBS) as boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a given hint is set in this hints set.

### 19.21.9 DefaultHint as zxingDecodeHintsMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default hint set.
**Notes:** This is combination: ONED_HINT, QR_CODE_HINT, DATA_MATRIX_HINT, AZTEC_HINT and PDF_417_HINT.

### 19.21.10 Destructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 19.21.11 OneDHint as zxingDecodeHintsMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The 1D hint set.
**Notes:** This is combination: CODE_39_HINT, CODE_93_HINT, CODE_128_HINT, ITF_HINT, CODABAR_HINT and PRODUCT_HINT.

### 19.21.12 ProductHint as zxingDecodeHintsMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The product barcode hint set.
**Notes:** This is combination: UPC_A_HINT, UPC_E_HINT, EAN_13_HINT, EAN_8_HINT and RSS_14_HINT.

### 19.21.13 Properties

### 19.21.14 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 19.21.15 isEmpty as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this hints set is empty.
**Notes:** (Read only property)

### 19.21.16 TryHarder as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether try harder flag is set.
**Notes:** (Read and Write property)

### 19.21.17 Constants

Hints

| Constant | Value | Description |
|---|---|---|
| ASSUME_GS1 | &h0800000 | Assume GS1 |
| AZTEC_HINT | 2 | Aztec |
| CHARACTER_SET | &h4000000 | Character Set |
| CODABAR_HINT | 4 | Codabar |
| CODE_128_HINT | &h020 | Code 128 |
| CODE_39_HINT | 8 | Code 39 |
| CODE_93_HINT | &h010 | Code 93 |
| DATA_MATRIX_HINT | &h0040 | Data Matrix |
| EAN_13_HINT | &h000100 | EAN 13 |
| EAN_8_HINT | &h000080 | EAN 8 |
| ITF_HINT | &h000200 | ITF |
| PDF_417_HINT | &h000800 | PDF 317 |
| QR_CODE_HINT | &h001000 | QR Code |
| RSS_14_HINT | &h002000 | RSS 14 |
| RSS_EXPANDED_HINT | &h004000 | RSS Expanded |
| TRYHARDER_HINT | &h8000000 | Whether to spend more CPU time to get better result. |
| UPC_A_HINT | &h008000 | UPC A |
| UPC_EAN_EXTENSION_HINT | &h020000 | UPC EAN with extension |
| UPC_E_HINT | &h010000 | UPC E |

## 19.22 class zxingDetectorExceptionMBS

### 19.22.1 class zxingDetectorExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingExceptionMBS class.

## 19.23 class zxingEAN13ReaderMBS

### 19.23.1 class zxingEAN13ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** Decodes of the EAN-13 format.
**Example:**

```
dim g as new BarcodeGeneratorMBS
g.Symbology = g.BarcodeEanx
g.BorderWidth = 5
g.Scale = 2
g.Encode "036000291452"
g.Height = 100
dim p as Picture = g.Picture

window1.Backdrop = p

dim b as zxingBinaryBitmapMBS = zxingBinaryBitmapMBS.CreateWithPicture(p)
dim x as new zxingEAN13ReaderMBS
dim result as zxingResultMBS = x.decode(b)
dim bf as zxingBarcodeFormatMBS = result.BarcodeFormat

MsgBox bf.Name+": "+result.Text

Exception r as zxingExceptionMBS
MsgBox r.message
```

**Notes:** Subclass of the zxingUPCEANReaderMBS class.

### 19.23.2 Methods

### 19.23.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.23.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.23.5 decodeMiddle(row as zxingBitArrayMBS, start as Integer, byref resultString as string) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.24 class zxingEAN8ReaderMBS

### 19.24.1 class zxingEAN8ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decoding of the EAN-8 format.
**Notes:** Subclass of the zxingUPCEANReaderMBS class.

### 19.24.2 Methods

### 19.24.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.24.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.24.5 decodeMiddle(row as zxingBitArrayMBS, start as Integer, byref resultString as string) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.25 class zxingExceptionMBS

### 19.25.1 class zxingExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** One of the exceptions from zxing.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- Barcode Generation or Recognition

## 19.26 class zxingFormatExceptionMBS

### 19.26.1 class zxingFormatExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingReaderExceptionMBS class.

# 19.27 class zxingGenericMultipleBarcodeReaderMBS

## 19.27.1 class zxingGenericMultipleBarcodeReaderMBS

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Attempts to locate multiple barcodes in an image by repeatedly decoding portion of the image.
**Notes:** After one barcode is found, the areas left, above, right and below the barcode's ResultPoints are scanned, recursively.

A caller may want to also employ ByQuadrantReader when attempting to find multiple 2D barcodes, like QR Codes, in an image, where the presence of multiple barcodes might prevent detecting any one of them.

That is, instead of passing a Reader a caller might pass new zxingByQuadrantReaderMBS(reader).

As far we see, the ITF Reader doesn't work with the multi reader here. It has problems to find barcodes if multiple barcodes are horizontally next to each other.
Subclass of the zxingMultipleBarcodeReaderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2

## 19.27.2 Methods

## 19.27.3 Constructor(Reader as zxingReaderMBS)

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Pass the reader to use by the multi barcode reader.

## 19.27.4 Properties

## 19.27.5 Reader as zxingReaderMBS

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the reader used by the multiple barcode reader.
**Notes:** (Read only property)

## 19.28 class zxingGlobalHistogramBinarizerMBS

### 19.28.1 class zxingGlobalHistogramBinarizerMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the binarizer.
**Notes:** This Binarizer implementation uses the old ZXing global histogram approach. It is suitable for low-end mobile devices which don't have enough CPU or memory to use a local thresholding algorithm. However, because it picks a global black point, it cannot handle difficult shadows and gradients.

Faster mobile devices and all desktop applications should probably use HybridBinarizer instead.
Subclass of the zxingBinarizerMBS class.

### 19.28.2 Methods

### 19.28.3 Constructor(LuminanceSource as zxingLuminanceSourceMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

# 19.29 class zxingHybridBinarizerMBS

## 19.29.1 class zxingHybridBinarizerMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the binarizer.
**Notes:** This class implements a local thresholding algorithm, which while slower than the GlobalHistogramBinarizer, is fairly efficient for what it does. It is designed for high frequency images of barcodes with black data on white backgrounds. For this application, it does a much better job than a global blackpoint with severe shadows and gradients. However it tends to produce artifacts on lower frequency images and is therefore not a good general purpose binarizer for uses outside ZXing.

This class extends GlobalHistogramBinarizer, using the older histogram approach for 1D readers, and the newer local approach for 2D readers. 1D decoding using a per-row histogram is already inherently local, and only fails for horizontal gradients. We can revisit that problem later, but for now it was not a win to use local blocks for 1D.

This Binarizer is the default for the unit tests and the recommended class for library users.
Subclass of the zxingGlobalHistogramBinarizerMBS class.

## 19.29.2 Methods

## 19.29.3 Constructor(LuminanceSource as zxingLuminanceSourceMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 19.30 class zxingIllegalArgumentExceptionMBS

### 19.30.1 class zxingIllegalArgumentExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingExceptionMBS class.

## 19.31 class zxingIllegalStateExceptionMBS

### 19.31.1 class zxingIllegalStateExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingReaderExceptionMBS class.

## 19.32 class zxingITFReaderMBS

### 19.32.1 class zxingITFReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes an ITF barcode.
**Notes:** Subclass of the zxingOneDReaderMBS class.

### 19.32.2 Methods

### 19.32.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.32.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

# 19.33 class zxingLuminanceSourceMBS

## 19.33.1 class zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** The class for an image source.
**Notes:** The purpose of this class hierarchy is to abstract different bitmap implementations across platforms into a standard interface for requesting greyscale luminance values. The interface only provides immutable methods; therefore crop and rotation create copies. This is to ensure that one Reader does not modify the original luminance source and leave it in an unknown state for other Readers in the chain.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2

## 19.33.2 Methods

## 19.33.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 19.33.4 CreateWithPicture(pic as picture) as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new luminance source for this picture.
**Notes:** Returns nil on error like low memory.

## 19.33.5 crop(left as Integer, top as Integer, width as Integer, height as Integer) as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new object with cropped image data.
**Notes:** Implementations may keep a reference to the original data rather than a copy. Only callable if isCropSupported() is true.

left: The left coordinate, 0 <= left <Width.
top: The top coordinate, 0 <= top <= Height.

width: The width of the rectangle to crop.
height: The height of the rectangle to crop.
Returns A cropped version of this object.

### 19.33.6 invert as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the bitmap.

### 19.33.7 rotateCounterClockwise as zxingLuminanceSourceMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new object with rotated image data by 90 degrees counterclockwise.

### 19.33.8 string as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image as text string.

### 19.33.9 Properties

### 19.33.10 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.33.11 Height as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the bitmap.
**Notes:** (Read only property)

### 19.33.12 isCropSupported as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this bitmap can be cropped.
**Notes:** (Read only property)

### 19.33.13 isRotateSupported as Boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this bitmap supports counter-clockwise rotation.
**Notes:** (Read only property)

### 19.33.14 Picture as Picture

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a picture with content of the luminance source.
**Notes:** This is made to help debugging barcode detection.
(Read only property)

### 19.33.15 Width as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the bitmap.
**Notes:** (Read only property)

## 19.34 class zxingMultiFormatOneDReaderMBS

### 19.34.1 class zxingMultiFormatOneDReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** A reader for multiple 1D formats.
**Notes:** Subclass of the zxingOneDReaderMBS class.
**Blog Entries**

- Using zbar library with Xojo

### 19.34.2 Methods

### 19.34.3 Constructor(hints as zxingDecodeHintsMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.34.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.35 class zxingMultiFormatReaderMBS

### 19.35.1 class zxingMultiFormatReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** This interface attempt to read several barcodes from one image.
**Notes:** Subclass of the zxingReaderMBS class.
**Blog Entries**

- Live barcode detection with Xojo for MacOS

**Xojo Developer Magazine**

- 17.4, pages 41 to 42: Creating Barcodes in Xojo, How you can create more than 80 different types of barcodes in Xojo by Stefanie Juchmes

### 19.35.2 Methods

### 19.35.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.35.4 decodeWithState(image as zxingBinaryBitmapMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes an image.

### 19.35.5 setHints(hints as zxingDecodeHintsMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the hint to use for decoding.

## 19.36 class zxingMultiFormatUPCEANReaderMBS

### 19.36.1 class zxingMultiFormatUPCEANReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** A reader that can read all available UPC/EAN formats.
**Notes:** If a caller wants to try to read all such formats, it is most efficient to use this implementation rather than invoke individual readers.
Subclass of the zxingOneDReaderMBS class.
**Blog Entries**

- Using zbar library with Xojo

### 19.36.2 Methods

### 19.36.3 Constructor(hints as zxingDecodeHintsMBS)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.36.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.37 class zxingMultipleBarcodeReaderMBS

### 19.37.1 class zxingMultipleBarcodeReaderMBS

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** Implementation of this interface attempt to read several barcodes from one image.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2

### 19.37.2 Methods

### 19.37.3 Constructor

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.37.4 decodeMultiple(image as zxingBinaryBitmapMBS) as zxingResultMBS()

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes multiple barcodes.
**Notes:** Returns array with results.
See also:

- 19.37.5 decodeMultiple(image as zxingBinaryBitmapMBS, hints as zxingDecodeHintsMBS) as zxingResultMBS() 4035

### 19.37.5 decodeMultiple(image as zxingBinaryBitmapMBS, hints as zxingDecodeHintsMBS) as zxingResultMBS()

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes multiple barcodes.
**Notes:** Returns array with results.
See also:

- 19.37.4 decodeMultiple(image as zxingBinaryBitmapMBS) as zxingResultMBS() 4035

### 19.37.6 Properties

### 19.37.7 Handle as Integer

MBS Barcode Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 19.38 class zxingNotFoundExceptionMBS

### 19.38.1 class zxingNotFoundExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingExceptionMBS class.

## 19.39 class zxingOneDReaderMBS

### 19.39.1 class zxingOneDReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Encapsulates functionality and implementation that is common to all families of one-dimensional barcodes.
**Notes:** Subclass of the zxingReaderMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 19.39.2 Methods

### 19.39.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.39.4 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

## 19.40 class zxingPDF417ReaderMBS

### 19.40.1 class zxingPDF417ReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** This class can detect and decode PDF417 codes in an image.
**Notes:** Subclass of the zxingReaderMBS class.

### 19.40.2 Methods

### 19.40.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.40.4 reset

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the decoder.

## 19.41 class zxingQRCodeReaderMBS

### 19.41.1 class zxingQRCodeReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** This class can detect and decode QR Codes in an image.
**Example:**

```
dim g as new BarcodeGeneratorMBS
g.Symbology = g.BarcodeQrcode
g.BorderWidth = 5
g.Scale = 2
g.Encode "Hello World"

dim p as Picture = g.Picture
window1.Backdrop = p

dim b as zxingBinaryBitmapMBS = zxingBinaryBitmapMBS.CreateWithPicture(p)
dim x as new zxingQRCodeReaderMBS
dim result as zxingResultMBS = x.decode(b)
dim bf as zxingBarcodeFormatMBS = result.BarcodeFormat

MsgBox bf.Name+": "+result.Text

Exception r as zxingExceptionMBS
MsgBox r.message
```

**Notes:** Subclass of the zxingReaderMBS class.
**Blog Entries**

- Using zbar library with Xojo
- MBS Xojo Plugins, version 18.2pr9
- MBS Xojo Plugins, version 18.0pr8
- Barcode Generation or Recognition

### 19.41.2 Methods

### 19.41.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 19.42 class zxingReaderExceptionMBS

### 19.42.1 class zxingReaderExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** The general exception class throw when something goes wrong during decoding of a barcode.
**Notes:** This includes, but is not limited to, failing checksums / error correction algorithms, being unable to locate finder timing patterns, and so on.
Subclass of the zxingExceptionMBS class.

## 19.43 class zxingReaderMBS

### 19.43.1 class zxingReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** The base reader class.
**Notes:** Please use ZBarMBS class instead for new project.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr9

### 19.43.2 Methods

### 19.43.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.43.4 decode(image as zxingBinaryBitmapMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a barcode from an image.
See also:

- 19.43.5 decode(image as zxingBinaryBitmapMBS, hints as zxingDecodeHintsMBS) as zxingResultMBS 4043

### 19.43.5 decode(image as zxingBinaryBitmapMBS, hints as zxingDecodeHintsMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a barcode from an image.
**Notes:** Hints may help to limit what to expect and makes it faster.
See also:

- 19.43.4 decode(image as zxingBinaryBitmapMBS) as zxingResultMBS 4043

### 19.43.6 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS Barcode Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The zxing classes may use libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 19.43.7 Properties

### 19.43.8 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 19.44 class zxingReedSolomonExceptionMBS

### 19.44.1 class zxingReedSolomonExceptionMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** One of the exceptions from zxing.
**Notes:** Subclass of the zxingExceptionMBS class.

## 19.45 class zxingResultMBS

### 19.45.1 class zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** Encapsulates the result of decoding a barcode within an image.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr6
- MBS Xojo / Real Studio Plugins, version 14.2pr4
- Barcode Generation or Recognition

**Xojo Developer Magazine**

- 17.4, page 42: Creating Barcodes in Xojo, How you can create more than 80 different types of barcodes in Xojo by Stefanie Juchmes

### 19.45.2 Methods

### 19.45.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Representing the format of the barcode that was decoded.

### 19.45.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.45.5 Data as Memoryblock

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text encoded by the barcode, if applicable, otherwise nil.

### 19.45.6 ResultPoint(index as integer) as zxingResultPointMBS

MBS Barcode Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries point with given index.
**Notes:** Index from 0 to PointCount-1.

### 19.45.7 ResultPoints as zxingResultPointMBS()

MBS Barcode Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of points.

### 19.45.8 Text as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text encoded by the barcode, if applicable, otherwise "".

### 19.45.9 Properties

### 19.45.10 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.45.11 PointCount as Integer

MBS Barcode Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of points.
**Notes:** (Read only property)

## 19.46 class zxingResultPointMBS

### 19.46.1 class zxingResultPointMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Encapsulates a point of interest in an image containing a barcode.
**Notes:** Typically, this would be the location of a finder pattern or the corner of the barcode, for example.

### 19.46.2 Methods

### 19.46.3 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
See also:


- 19.46.4 Constructor(x as single, y as single) 4048


### 19.46.4 Constructor(x as single, y as single)

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
See also:


- 19.46.3 Constructor 4048


### 19.46.5 distance(p1 as zxingResultPointMBS, p2 as zxingResultPointMBS) as single

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the distance between two points.
See also:


- 19.46.6 distance(x1 as single, y1 as single, x2 as single, y2 as single) as single 4048


### 19.46.6 distance(x1 as single, y1 as single, x2 as single, y2 as single) as single

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the distance between two points.
See also:

- 19.46.5 distance(p1 as zxingResultPointMBS, p2 as zxingResultPointMBS) as single 4048

### 19.46.7 equals(other as zxingResultPointMBS) as boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether two result points are equal.

### 19.46.8 Properties

### 19.46.9 Handle as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 19.46.10 X as Single

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Notes:** (Read only property)

### 19.46.11 Y as Single

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Notes:** (Read only property)

## 19.47 class zxingUPCAReaderMBS

### 19.47.1 class zxingUPCAReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes of the UPC-A format.
**Notes:** Subclass of the zxingUPCEANReaderMBS class.

### 19.47.2 Methods

### 19.47.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.47.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.47.5 decodeMiddle(row as zxingBitArrayMBS, start as Integer, byref resultString as string) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

### 19.47.6 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.
See also:

- 19.47.7 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS, startGuardBegin as Integer, startGuardEnd as Integer) as zxingResultMBS 4051

### 19.47.7 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS, startGuardBegin as Integer, startGuardEnd as Integer) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.
See also:

- 19.47.6 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS 4050

## 19.48 class zxingUPCEANReaderMBS

### 19.48.1 class zxingUPCEANReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead.
**Function:** Encapsulates functionality and implementation that is common to UPC and EAN families of one-dimensional barcodes.
**Notes:** Subclass of the zxingOneDReaderMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 19.48.2 Methods

### 19.48.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.48.4 BarcodeFormatName(BarcodeFormat as Integer) as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the barcode format name for a number.

### 19.48.5 checkChecksum(s as string) as boolean

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks the checksum of a barcode.
**Example:**

```
dim s as string = "036000291452"
dim r as new zxingUPCAReaderMBS

dim testOK as Boolean = r.checkChecksum("036000291452")
dim testFail as Boolean = r.checkChecksum("036000291453")

break // see values in debugger
```

**Notes:** Computes the UPC/EAN checksum on a string of digits, and reports whether the checksum is correct or not.

### 19.48.6 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 19.48.7 decodeMiddle(row as zxingBitArrayMBS, start as Integer, byref resultString as string) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

### 19.48.8 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.
See also:

- 19.48.9 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS, rangeStart as Integer, rangeLength as Integer) as zxingResultMBS 4053

### 19.48.9 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS, rangeStart as Integer, rangeLength as Integer) as zxingResultMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.
See also:

- 19.48.8 decodeRow(rowNumber as Integer, row as zxingBitArrayMBS) as zxingResultMBS 4053

## 19.49 class zxingUPCEReaderMBS

### 19.49.1 class zxingUPCEReaderMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use ZBarMBS instead. **Function:** Decodes of the UPC-E format.
**Notes:** Subclass of the zxingUPCEANReaderMBS class.

### 19.49.2 Methods

### 19.49.3 BarcodeFormat as zxingBarcodeFormatMBS

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The barcode format.

### 19.49.4 Constructor

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 19.49.5 convertUPCEtoUPCA(upce as string) as string

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Expands a UPC-E value back into its full, equivalent UPC-A code value.
**Notes:** upce: UPC-E code as string of digits.
Returns equivalent UPC-A code as string of digits.

### 19.49.6 decodeMiddle(row as zxingBitArrayMBS, start as Integer, byref resultString as string) as Integer

MBS Barcode Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trys to decode a barcode from one row of pixels.

# Chapter 20

# Base 64

## 20.1 Globals

### 20.1.1 DecodeBase64MBS(s as string) as string

MBS Encryption Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes the base 64 text string into its original binary data.
**Notes:** Improved in MBS Plugin 2.7. Memory needed is around lenb(s)*2.
Text returned has chr(13) as newline character. If you need different one, you can use ReplaceLineEndings() function in Xojo.

If you need yielding for better threading, please use method in Base64MBS class.

### 20.1.2 EncodeBase64MBS(s as string, breakposition as integer = 0, breakstring as string = "") as string

MBS Encryption Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes the binary data in the string into a base64 text string.
**Notes:** Improved in MBS Plugin 2.7 to support breakposition and breakstring. If you don't need them, just pass 0 and "". Memory needed is around lenb(s)*2.8.

If you need yielding for better threading, please use method in Base64MBS class.

### 20.1.3 DecodeBase64URLMBS(s as string) as string

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes Base64URL encoded data.
**Example:**

```
Dim s As String = "Hello World. Just a test!"

TextArea1.Text = EncodeBase64URLMBS(s)
TextArea2.Text = DecodeBase64URLMBS(TextArea1.Text)
```

**Blog Entries**

- MBS Xojo Plugins, version 20.3pr9
- JWT RS256 authentication in Xojo

### 20.1.4 EncodeBase64URLMBS(s as string, breakposition as integer = 0, breakstring as string = "") as string

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base64 encodes some data with URL safe encoding.
**Example:**

```
Dim s As String = "Hello World. Just a test!"

TextArea1.Text = EncodeBase64URLMBS(s)
TextArea2.Text = DecodeBase64URLMBS(TextArea1.Text)
```

**Notes:** Similar to normal Base64, but + replaced by - and / by _ and the = on the end are omitted.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr9
- JWT RS256 authentication in Xojo

### 20.1.5 uuDecodeMBS(data as string, byref name as string, byref mode as Integer) as string

MBS Encryption Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** UU Decoding.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.uu")
dim b as BinaryStream = BinaryStream.Open(f)

dim name as string
dim mode as Integer

dim s as String = b.Read(b.Length)
dim d as string = uuDecodeMBS(s, name, mode)

dim p as Picture = Picture.FromData(d)

Backdrop = p
```

**Notes:** Decodes UU encoded data. name and mode properties are filled.
Returns empty text if something goes wrong.
Raises out of memory exception in case of low memory situation.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.5pr4

### 20.1.6 uuEncodeMBS(data as string, name as string, mode as Integer = &o755) as string

MBS Encryption Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** UU Encoding.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

dim d as string = uuEncodeMBS(s, "test")

f = SpecialFolder.Desktop.Child("test.txt")
b = BinaryStream.Create(f, true)

b.Write d
```

**Notes:** Encodes binary data as text similar to Base64.
The data is prefixed with file name and mode.

Returns empty text if something goes wrong.
Raises out of memory exception in case of low memory situation.

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.5pr4

## 20.2 class Base64MBS

### 20.2.1 class Base64MBS

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes and decodes Base64 with events.
**Notes:** The global functions may be faster as they don't use events.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8

### 20.2.2 Methods

### 20.2.3 DecodeBase64(s as string) as string

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes the base 64 text string into its original binary data.
**Notes:** Memory needed is around lenb(s)*2.

### 20.2.4 EncodeBase64(s as string, breakposition as Integer, breakstring as string) as string

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes the binary data in the string into a base64 text string.
**Notes:** Improved in MBS Plugin 2.7 to support breakposition and breakstring. If you don't need them, just pass 0 and "". Memory needed is around lenb(s)*2.8.

### 20.2.5 Properties

### 20.2.6 Yield as Boolean

MBS Encryption Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the class should give CPU time to Xojo so windows can be updated and other threads go on.
**Notes:** Default is false.
(Read and Write property)

### 20.2.7 Events

### 20.2.8 Finished(wascanceled as boolean)

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when the encoding function returns.
**Notes:** wascanceled is true if the Working Event got a true returned.

### 20.2.9 Start

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when encoding or decoding is started.

### 20.2.10 Working(percent as Double) as boolean

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called after each 4 KB chunk.
**Notes:** You can return true to cancel the process.

# Chapter 21

# Basic

## 21.1 Globals

### 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calculates the difference between two dates.
**Example:**

```
dim d as date
dim e as date
dim r as DateDifferenceMBS
dim s as string

d=new date
d.Year=2008
d.Month=7
d.Day=2
d.Hour=10
d.Minute=48
d.Second=22

e=new date
e.Year=2010
e.Month=7
e.Day=1
e.Hour=10
e.Minute=36
e.Second=0
```

```
r=d.DifferenceMBS(e)

s= "Years: "+str(r.Year)+EndOfLine
s=s+"Months: "+str(r.month)+EndOfLine
s=s+"Days: "+str(r.day)+EndOfLine
s=s+"Hours: "+str(r.hour)+EndOfLine
s=s+"Minutes: "+str(r.Minute)+EndOfLine
s=s+"Seconds: "+str(r.Second)+EndOfLine

MsgBox s

// shows: "Years: 1 Months: 11 Days: 29 Hours: 22 Minutes: 47 Seconds: 38"
```

**Notes:** Returns nil on any errors. (one of the dates is nil or property getter don't work)
Valid only for dates from the gregorian calendar.

Calculates the difference between the older and newer date. The dates are sorted, so the difference is always a positive.
You can see Swap property to see if first date is after second date.
See also:

- 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS 4062

### 21.1.2 DifferenceMBS(extends StartDate as dateTime, EndDate as dateTime) as DateDifferenceMBS

MBS Util Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the difference between two dates.
**Notes:** Returns nil on any errors. (one of the dates is nil or property getter don't work)
Valid only for dates from the gregorian calendar.

Calculates the difference between the older and newer date. The dates are sorted, so the difference is always a positive.
You can see Swap property to see if first date is after second date.
Please make sure both dates are in the same timezone.
See also:

- 21.1.1 DifferenceMBS(extends StartDate as date, EndDate as date) as DateDifferenceMBS 4061

### 21.1.3 ReturnErrPtrMBS as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A callback to use for GS8.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 21.1.4 ReturnInPtrMBS as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A callback to use for GS8.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 21.1.5 ReturnOutPtrMBS as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A callback to use for GS8.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 21.1.6 HideCursorMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Hides the mouse Cursor.
**Example:**

HideCursorMBS

### 21.1.7 ShowCursorMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Shows the mouse Cursor.
**Example:**

ShowCursorMBS

### 21.1.8 cloneMemoryBlockMBS(s as memoryblock) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the memoryblock.
**Example:**

```
dim m as MemoryBlock = "Hello"
dim n as MemoryBlock = cloneMemoryBlockMBS(m)

m.Byte(1)=asc("a")
n.Byte(1)=asc("u")

dim a as string = m
dim b as string = n

MsgBox a+" "+b
```

**Notes:** May return nil on low memory conditions.

### 21.1.9 cloneMemoryBlockWithLengthMBS(s as memoryblock,len as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the memoryblock.
**Example:**

```
dim m as MemoryBlock = "Hello"
dim n as MemoryBlock = cloneMemoryBlockWithLengthMBS(m,5)

m.Byte(1)=asc("a")
n.Byte(1)=asc("u")

dim a as string = m
dim b as string = n

MsgBox a+" "+b
```

**Notes:** May return nil on low memory conditions.

### 21.1.10 cloneStringMBS(s as string) as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the string.
**Notes:** May return "" on low memory conditions.
The encoding of the string is copied in RB 4.5 or newer.

### 21.1.11 MemoryBlockToStringMBS(s as memoryblock) as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the content of the memoryblock as a string.
**Example:**

```
dim m as MemoryBlock = NewMemoryBlock(6)

m.CString(0)="Hello"

MsgBox MemoryBlockToStringMBS(m)
```

**Notes:** May return "" on low memory conditions.
As some memoryblocks don't have a known length, you can provide one as a second parameter.

### 21.1.12 MemoryBlockToStringWithLengthMBS(s as memoryblock,len as Integer) as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the content of the memoryblock as a string.
**Example:**

```
dim m as MemoryBlock = NewMemoryBlock(6)

m.CString(0)="Hello"

MsgBox MemoryBlockToStringWithLengthMBS(m,5)
```

**Notes:** May return "" on low memory conditions.
As some memoryblocks don't have a known length, you can provide one as a second parameter.

### 21.1.13 OSTypeFromStringMBS(str as string) as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer representing a 4 byte String.
**Example:**

```
MsgBox str(OSTypeFromStringMBS("MBSP"))
```

**Notes:** This OSType datatype is used on Mac OS for 4 letter codes.
e.g. the type and creator code for a file.
**Blog Entries**

- Write audio file with samples using AVFoundation

### 21.1.14 StringFromOSTypeMBS(value as Integer) as string

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a 4 byte string for the given integer.
**Example:**

```
MsgBox StringFromOSTypeMBS(1296192336) // shows MBSP
```

**Notes:** This OSType datatype is used on Mac OS for 4 letter codes.
e.g. the type and creator code for a file.

### 21.1.15 StringToMemoryBlockMBS(s as string) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the content of the string as a memoryblock.
**Example:**

```
dim m as MemoryBlock = StringToMemoryBlockMBS("Hello")

MsgBox m.StringValue(0,5)
```

**Notes:** May return nil on low memory conditions.

### 21.1.16 BitwiseXORStringBytesMBS(s as string, v as Integer) as string

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitwise XOR with a string's bytes.
**Example:**

```
dim a as string = "Hello"
dim b as string = BitwiseXORStringBytesMBS(a,1) // encode
dim c as string = BitwiseXORStringBytesMBS(b,1) // decode
MsgBox b
MsgBox c
```

**Notes:** Memory usage is around lenb(s)*2.
Returns nil on low memory.
v should be in range of 0 to 255.
If you use this function two times on a string, you get the original back.
Any encoding information is lost.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr1

### 21.1.17 Color2IntegerMBS(colorValue as Color) as UInt32

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the RGB value of the color as an integer.
**Example:**

```
dim c as color
dim i as UInt32

c=rgb(255,255,255)
i=Color2IntegerMBS(c)

MsgBox hex(i) // FFFFFF

c=rgb(&h12,&H34,&h56)
i=Color2IntegerMBS(c)

MsgBox hex(i) // 123456
```

**Notes:** Same as:
i=c.red*65536+c.green*256+c.blue
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr14

### 21.1.18 Integer2ColorMBS(intValue as UInt32) as Color

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the integer as if it is a color.
**Example:**

```
dim c as color
dim i as UInt32
c=Integer2ColorMBS(i)
```

**Notes:** Same as:
c=rgb(i\65536 mod 256, i\256 mod 256, i mod 256)
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr14

## 21.2 class DateDifferenceMBS

### 21.2.1 class DateDifferenceMBS

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to calculate the difference between two dates.
**Example:**

```
// calculate difference between now and a date in 2008.

dim d as date
dim r as DateDifferenceMBS
dim s as string
dim c as Clipboard

d=new date
d.Year=2008
d.Month=7
d.Day=2
d.Hour=10
d.Minute=48
```

```
d.Second=22

dim e as new date // today

r=new DateDifferenceMBS(d, e)

s= "Years: "+str(r.Year)+EndOfLine
s=s+"Months: "+str(r.month)+EndOfLine
s=s+"Days: "+str(r.day)+EndOfLine
s=s+"Hours: "+str(r.hour)+EndOfLine
s=s+"Minutes: "+str(r.Minute)+EndOfLine
s=s+"Seconds: "+str(r.Second)+EndOfLine

MsgBox s
```

**Notes:** Calculates the difference between the older and newer date. The dates are sorted, so the difference is always a positive.
You can see Swap property to see if first date is after second date.

This class allows you to know exactly how many months/years are between two dates. Something that TotalSeconds calculations will not give you!
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr3
- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 20.3pr5
- MBS Xojo Plugins, version 19.5pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr6
- MBS Real Studio Plugins, version 12.4pr9
- MonkeyBread Software Releases the MBS Plugins 8.3

### 21.2.2 Methods

### 21.2.3 Calc(StartDate as date, EndDate as date) as boolean

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calculates the difference between two dates.
**Example:**

```
dim d as date
dim e as date
dim r as DateDifferenceMBS
dim s as string
dim c as Clipboard

d=new date
d.Year=2008
d.Month=7
d.Day=2
d.Hour=10
d.Minute=48
d.Second=22

e=new date
e.Year=2010
e.Month=7
e.Day=1
e.Hour=10
e.Minute=36
e.Second=0

r=new DateDifferenceMBS

if r.Calc(d,e) then

s= "Years: "+str(r.Year)+EndOfLine
s=s+"Months: "+str(r.month)+EndOfLine
s=s+"Days: "+str(r.day)+EndOfLine
s=s+"Hours: "+str(r.hour)+EndOfLine
s=s+"Minutes: "+str(r.Minute)+EndOfLine
s=s+"Seconds: "+str(r.Second)+EndOfLine

MsgBox s

// shows: "Years: 1 Months: 11 Days: 29 Hours: 22 Minutes: 47 Seconds: 38"
end if
```

**Notes:** Returns false on any errors and true on success.
Valid only for dates from the gregorian calendar.
Sets ready property.

Calculates the difference between the older and newer date. The dates are sorted, so the difference is always a positive.
You can see Swap property to see if first date is after second date.
See also:

- 21.2.4 Calc(StartDate as dateTime, EndDate as dateTime) as boolean 4071

### 21.2.4 Calc(StartDate as dateTime, EndDate as dateTime) as boolean

MBS Util Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the difference between two dates.
**Notes:** Returns false on any errors and true on success.
Valid only for dates from the gregorian calendar.
Sets ready property.

Calculates the difference between the older and newer date. The dates are sorted, so the difference is always a positive.
You can see Swap property to see if first date is after second date.

Please make sure both dates are in the same timezone.
See also:

- 21.2.3 Calc(StartDate as date, EndDate as date) as boolean 4069

### 21.2.5 Constructor

MBS Util Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dummy constructor doing nothing.
See also:

- 21.2.6 Constructor(StartDate as date, EndDate as date) 4071
- 21.2.7 Constructor(StartDate as dateTime, EndDate as dateTime) 4072

### 21.2.6 Constructor(StartDate as date, EndDate as date)

MBS Util Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calculates the difference between two dates.
**Notes:** Internally calls Calc and sets ready property.
See also:

- 21.2.5 Constructor 4071
- 21.2.7 Constructor(StartDate as dateTime, EndDate as dateTime) 4072

### 21.2.7 Constructor(StartDate as dateTime, EndDate as dateTime)

MBS Util Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the difference between two dates.
**Notes:** Internally calls Calc and sets ready property.
Please make sure both dates are in the same timezone.
See also:


- 21.2.5 Constructor 4071
- 21.2.6 Constructor(StartDate as date, EndDate as date) 4071


### 21.2.8 isLeapYear(year as Integer) as boolean

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether a year is a leap year.
**Example:**

```
if DateDifferenceMBS.isLeapYear(2004) then
msgbox "2004 is a leap year"
else
msgbox "2004 is not a leap year"
end if
```

**Notes:** Valid only for dates from the gregorian calendar.

### 21.2.9 Properties

### 21.2.10 Day as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the date difference.
**Notes:** (Read only property)

### 21.2.11 EndDate as Variant

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The end date used to do the calculation.
**Notes:** Value can be DateTime or Date depending of method used.

(Read only property)

### 21.2.12 EndDay as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the end date.
**Notes:** (Read only property)

### 21.2.13 EndHour as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour of the end date.
**Notes:** (Read only property)

### 21.2.14 EndMinute as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minute of the end date.
**Notes:** (Read only property)

### 21.2.15 EndMonth as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month of the end date.
**Notes:** (Read only property)

### 21.2.16 EndSecond as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second of the end date.
**Notes:** (Read only property)

### 21.2.17 EndTotalSeconds as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total seconds value of the end date.
**Notes:** (Read and Write property)

### 21.2.18 EndYear as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year of the end date.
**Notes:** (Read only property)

### 21.2.19 Hour as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour of the date difference.
**Notes:** (Read only property)

### 21.2.20 Minute as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minute of the date difference.
**Notes:** (Read only property)

### 21.2.21 Month as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month of the date difference.
**Notes:** (Read only property)

### 21.2.22 Ready as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the date calculation has been performed.
**Notes:** Using the constructor with nil dates can lead into an invalid state in which ready is false.
(Read only property)

### 21.2.23 Second as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second of the date difference.
**Notes:** (Read only property)

### 21.2.24 StartDate as Variant

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The start date of the date used.
**Notes:** Value can be DateTime or Date depending of method used.
(Read only property)

### 21.2.25 StartDay as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the start date.
**Notes:** (Read only property)

### 21.2.26 StartHour as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour of the start date.
**Notes:** (Read only property)

### 21.2.27 StartMinute as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minute of the start date.
**Notes:** (Read only property)

### 21.2.28 StartMonth as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month of the start date.
**Notes:** (Read only property)

### 21.2.29 StartSecond as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second of the start date.
**Notes:** (Read only property)

### 21.2.30 StartTotalSeconds as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total seconds value of the start date.
**Notes:** (Read and Write property)

### 21.2.31 StartYear as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year of the start date.
**Notes:** (Read only property)

### 21.2.32 Swap as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether dates have been swapped.
**Notes:** Dates are swapped if enddate is before startdate.
(Read only property)

### 21.2.33 TotalDay as Integer

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of days between
**Example:**

```
dim d as new date(2011, 9, 25)
dim e as new date(2012, 1, 1)

dim diff as new DateDifferenceMBS

if diff.Calc(d, e) then
MsgBox str(diff.TotalDay)+" days between dates." // should be 98
end if
```

**Notes:** Our day, month and year properties are about how many days, months and years are between start and end dates.
This property gives you the total number of days.
So day may be 6 and month be 3 and totaldays could be 98 if there are two months with 31 days included and one with 30 days.
(Read only property)

### 21.2.34 TotalSeconds as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total seconds value of the difference between the dates.
**Notes:** (Read and Write property)

### 21.2.35 Year as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year of the date difference.
**Notes:** (Read only property)

## 21.3 class UniversalCharacterDetectionMBS

### 21.3.1 class UniversalCharacterDetectionMBS

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for univeral character encoding detection.
**Notes:** Based on the Mozilla project.

You can pass a string with bytes to this class and receive an encoding as answer. Similar to the GuessJapaneseEncoding function built into Xojo.

Possible encoding names used by this class: Big5, EUC-JP, EUC-KR, x-euc-tw, gb18030, windows-1252, UTF-8, UTF-16BE, X-ISO-10646-UCS-4-3412, UTF-32BE, X-ISO-10646-UCS-4-2143, UTF-32LE, UTF-16LE.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3
- Cleanup Xojo Plugins
- MBS REALbasic plug-ins version 10.0

### 21.3.2 Methods

### 21.3.3 AddData(data as string)

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Passes more data to the engine for analysis.
**Notes:** The string encoding from Xojo is ignored. Only the raw data bytes are examined.

### 21.3.4 Constructor(filter as Integer)

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** filter: which languages to detect or ignore. Use the filter* constants.

### 21.3.5 Finish

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Notify the engine that data no more data will come.
**Notes:** This method can fire the Report event.

### 21.3.6 Properties

### 21.3.7 LastCharSet as String

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last character set reported in the report event.
**Notes:** (Read and Write property)

### 21.3.8 Events

### 21.3.9 Report(Charset as string)

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when an encoding was detected.
**Notes:** This event allows you to pass more and more data and as soon as the event fires you can decide to stop probing.

### 21.3.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| FilterAll | 31 | One of the language filter constants.<br>All languages. |
| FilterChinese | 3 | One of the language filter constants.<br>Traditional and Simplified Chinese together. |
| FilterChineseSimplified | 1 | One of the language filter constants.<br>Simplified Chinese. |
| FilterChineseTraditional | 2 | One of the language filter constants.<br>Traditional Chinese. |
| FilterCJK | 15 | One of the language filter constants.<br>Chinese, Japanese and Korean together. |
| FilterJapanese | 4 | One of the language filter constants.<br>Japanese |
| FilterKorean | 8 | One of the language filter constants.<br>Korean |
| FilterNonCJK | 16 | One of the language filter constants.<br>Non Chineses/Japanes/Korean languages. |

# Chapter 22

# Bluetooth

## 22.1 class CBATTRequestMBS

### 22.1.1 class CBATTRequestMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CBATTRequest class represents Attribute Protocol (ATT) read and write requests from remote central devices (represented by CBCentral objects).
**Notes:** Remote centrals use these ATT requests to read and write characteristic values on local peripherals (represented by CBPeripheralManager objects). Local peripherals, on the other hand, use the properties of CBATTRequest objects to respond to the read and write requests appropriately, using the respondToRequest:withResult: method of the CBPeripheralManager class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.1.2 Methods

### 22.1.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.9 or newer.

### 22.1.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.1.5 Properties

### 22.1.6 central as CBCentralMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The remote central device that originated the request.
**Notes:** (Read only property)

### 22.1.7 characteristic as CBCharacteristicMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The characteristic whose value is to be read or written.
**Notes:** (Read only property)

### 22.1.8 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.1.9 offset as UInt64

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The zero-based index of the first byte for the read or write request.
**Notes:** You can use the value of this property to ensure that the ATT request is attempting to read or write within the proper bounds of the characteristic,Äôs value. For an example of how to take a request,Äôs offset property into account when responding to a read or write request, see Responding to Read and Write Requests from a Central in Apple documentation.
(Read only property)

### 22.1.10 value as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The data being read or written.
**Notes:** The value of this property differs according to the type of request. For read requests, the property of this value is nil and should be set before responding to the remote central through the respondToRequest method. For write requests, the value of this property is the data that is to be written to the characteristic,Äôs value.
(Read and Write property)

## 22.2 class CBAttributeMBS

### 22.2.1 class CBAttributeMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** CBAttribute is an abstract base class that defines behavior common to the collection of objects that represent aspects of services offered by a peripheral.
**Notes:** Concrete subclasses of CBAttribute (and their mutable counterparts) are used to represent the services a peripheral offers, the characteristics of those services, and the descriptors attached to those characteristics. The concrete subclasses are:

- CBService
- CBCharacteristic
- CBDescriptor

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.2.2 Methods

### 22.2.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.13 or newer.

### 22.2.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.2.5 Properties

### 22.2.6 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.2.7 UUID as CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The Bluetooth-specific UUID of the attribute.
**Notes:** This property is a 128-bit UUID that identifies the attribute.
(Read only property)

## 22.3 class CBCentralManagerMBS

### 22.3.1 class CBCentralManagerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** CBCentralManager objects are used to manage discovered or connected remote peripheral devices (represented by CBPeripheral objects), including scanning for, discovering, and connecting to advertising peripherals.
**Notes:** Before you call CBCentralManager methods, the state of the central manager object must be powered on, as indicated by the CBCentralManagerStatePoweredOn constant. This state indicates that the central device (your iPhone or iPad, for instance) supports Bluetooth low energy and that Bluetooth is on and available to use.

Please build as 64-bit as 32-bit is no longer supported well by Apple.
Subclass of the CBManagerMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3

### 22.3.2 Methods

### 22.3.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.7 or later.

### 22.3.4 cancelPeripheralConnection(Peripheral as CBPeripheralMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Cancels an active or pending local connection to a peripheral.
**Notes:** peripheral: The peripheral to which the central manager is either trying to connect or has already connected.

This method is nonblocking, and any CBPeripheral class commands that are still pending to peripheral may or may not complete. Because other apps may still have a connection to the peripheral, canceling a local connection does not guarantee that the underlying physical link is immediately disconnected. From the app,Äôs perspective, however, the peripheral is considered disconnected, and the central manager object calls the didDisconnectPeripheral event.

### 22.3.5 CBATTErrorDomain as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The domain for Core Bluetooth ATT errors.
**Notes:** This value is used in the NSError class.

### 22.3.6 CBCentralManagerOptionRestoreIdentifierKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the CBCentralManager method.
**Notes:** A string containing a unique identifier (UID) for the central manager that is being instantiated. The system uses this UID to identify a specific central manager. As a result, the UID must remain the same for subsequent executions of the app in order for the central manager to be successfully restored.

### 22.3.7 CBCentralManagerOptionShowPowerAlertKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the CBCentralManager method.
**Notes:** A Boolean value that specifies whether the system should display a warning dialog to the user if Bluetooth is powered off when the central manager is instantiated.
The value for this key is a number. If the key is not specified, the default value is false.

### 22.3.8 CBCentralManagerRestoredStatePeripheralsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the options keys.
**Notes:** See connectPeripheral method.
An array of CBPeripheral objects containing all peripherals that were connected or pending connection at the time the application was terminated by the system. When possible, all known information for each peripheral will be restored, including any discovered services, characteristics and descriptors, as well as characteristic notification states.

### 22.3.9 CBCentralManagerRestoredStateScanOptionsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the options keys.
**Notes:** A dictionary containing the scan options at the time the application was terminated by the system.

See also scanForPeripheralsWithServices method.

### 22.3.10 CBCentralManagerRestoredStateScanServicesKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the options keys.
**Notes:** An array of CBUUID objects containing the service(s) being scanned for at the time the application was terminated by the system.
See also scanForPeripheralsWithServices method.

### 22.3.11 CBCentralManagerScanOptionAllowDuplicatesKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the scanForPeripheralsWithServices method.
**Notes:** A Boolean value that specifies whether the scan should run without duplicate filtering.
The value for this key is a number. If true, filtering is disabled and a discovery event is generated each time the central receives an advertising packet from the peripheral. Disabling this filtering can have an adverse effect on battery life and should be used only if necessary. If false, multiple discoveries of the same peripheral are coalesced into a single discovery event. If the key is not specified, the default value is false.

### 22.3.12 CBCentralManagerScanOptionSolicitedServiceUUIDsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the scanForPeripheralsWithServices method.
**Notes:** An array of service UUIDs (represented by CBUUID objects) that you want to scan for.
Specifying this scan option causes the central manager to also scan for peripherals soliciting any of the services contained in the array.

### 22.3.13 CBConnectPeripheralOptionNotifyOnConnectionKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the connectPeripheral method.
**Notes:** A Boolean value that specifies whether the system should display an alert for a given peripheral if the app is suspended when a successful connection is made.
The value for this key is a number. This key is useful for apps that have not specified the bluetooth-central background mode and cannot display their own alert. If more than one app has requested notification for a given peripheral, the one that was most recently in the foreground receives the alert. If the key is not

specified, the default value is false.

### 22.3.14 CBConnectPeripheralOptionNotifyOnDisconnectionKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the connectPeripheral method.
**Notes:** A Boolean value that specifies whether the system should display a disconnection alert for a given peripheral if the app is suspended at the time of the disconnection.
The value for this key is a number. This key is useful for apps that have not specified the bluetooth-central background mode and cannot display their own alert. If more than one app has requested notification for a given peripheral, the one that was most recently in the foreground receives the alert. If the key is not specified, the default value is false.

### 22.3.15 CBConnectPeripheralOptionNotifyOnNotificationKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the connectPeripheral method.
**Notes:** A Boolean value that specifies whether the system should display an alert for all notifications received from a given peripheral if the app is suspended at the time.
The value for this key is a number. This key is useful for apps that have not specified the bluetooth-central background mode and cannot display their own alert. If more than one app has requested notification for a given peripheral, the one that was most recently in the foreground receives the alert. If the key is not specified, the default value is false.

### 22.3.16 CBErrorDomain as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The domain for Core Bluetooth errors.
**Notes:** This value is used in the NSError class.

### 22.3.17 connectPeripheral(peripheral as CBPeripheralMBS, options as Dictionary = nil)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Establishes a local connection to a peripheral.
**Notes:** peripheral: The peripheral to which the central is attempting to connect.
options: A dictionary to customize the behavior of the connection. For available options, see Peripheral

Connection Options.

If a local connection to a peripheral is successfully established, the central manager object calls the centralManager:didConnectPeripheral: method of its delegate object. If the connection attempt fails, the central manager object calls the didFailToConnectPeripheral event. Attempts to connect to a peripheral do not time out. To explicitly cancel a pending connection to a peripheral, call the cancelPeripheralConnection method. The cancelPeripheralConnection method is implicitly called when peripheral is deallocated.

### 22.3.18 Constructor(options as dictionary = nil)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes the central manager.
**Notes:** options: An optional dictionary containing initialization options for a central manager.

### 22.3.19 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 22.3.20 retrieveConnectedPeripheralsWithServices(serviceUUIDs() as CBUUIDMBS) as CBPeripheralMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns a list of the peripherals (containing any of the specified services) currently connected to the system.
**Notes:** serviceUUIDs: A list of service UUIDs (represented by CBUUID objects).

Returns a list of the peripherals that are currently connected to the system and that contain any of the services specified in the serviceUUID parameter.

The list of connected peripherals can include those that are connected by other apps and that will need to be connected locally using the connectPeripheral method before they can be used.

### 22.3.21 retrievePeripheralsWithIdentifiers(identifiers() as NSUUIDMBS) as CBPeripheralMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns a list of known peripherals by their identifiers.
**Notes:** identifiers: A list of peripheral identifiers (represented by NSUUID objects) from which CBPeripheral objects can be retrieved.

Returns a list of peripherals that the central manager is able to match to the provided identifiers.

### 22.3.22 scanForPeripheralsWithServices(serviceUUIDs() as CBUUIDMBS = nil, options as Dictionary = nil)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Scans for peripherals that are advertising services.
**Notes:** serviceUUIDs: An array of CBUUID objects that the app is interested in. In this case, each CBUUID object represents the UUID of a service that a peripheral is advertising.
options: An optional dictionary specifying options to customize the scan. For available options, see Peripheral Scanning Options.

You can provide an array of CBUUID objects—representing service UUIDs—in the serviceUUIDs parameter. When you do, the central manager returns only peripherals that advertise the services you specify (recommended). If the serviceUUIDs parameter is nil, all discovered peripherals are returned regardless of their supported services (not recommended). If the central manager is already scanning with different parameters, the provided parameters replace them. When the central manager object discovers a peripheral, it calls the didDiscoverPeripheral event.
Apps that have specified the bluetooth-central background mode are allowed to scan while in the background. That said, they must explicitly scan for one or more services by specifying them in the serviceUUIDs parameter. The CBCentralManager scan option is ignored while scanning in the background.

### 22.3.23 stopScan

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Asks the central manager to stop scanning for peripherals.

### 22.3.24 Properties

### 22.3.25 isScanning as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether or not the central is currently scanning.
**Notes:** (Read only property)

### 22.3.26 Events

### 22.3.27 DidConnectPeripheral(peripheral as CBPeripheralMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a connection is successfully created with a peripheral.
**Notes:** peripheral: The peripheral that has been connected to the system.

This method is invoked when a call to connectPeripheral is successful. You typically implement this method to set the peripheral,Äôs delegate and to discover its services.

### 22.3.28 DidDisconnectPeripheral(peripheral as CBPeripheralMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when an existing connection with a peripheral is torn down.
**Notes:** peripheral: The peripheral that has been disconnected.
error: If an error occurred, the cause of the failure.

This method is invoked when a peripheral connected via the connectPeripheral method is disconnected. If the disconnection was not initiated by cancelPeripheralConnection, the cause is detailed in error. After this method is called, no more methods are invoked on the peripheral device,Äôs CBPeripheralDelegate object. Note that when a peripheral is disconnected, all of its services, characteristics, and characteristic descriptors are invalidated.

### 22.3.29 DidDiscoverPeripheral(peripheral as CBPeripheralMBS, advertisementData as Dictionary, RSSI as String)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the central manager discovers a peripheral while scanning.
**Notes:** peripheral: The discovered peripheral.
advertisementData: A dictionary containing any advertisement data.
RSSI: The current received signal strength indicator (RSSI) of the peripheral, in decibels.

The advertisement data can be accessed through the keys listed in Advertisement Data Retrieval Keys. You must retain a local copy of the peripheral if any command is to be performed on it. In use cases where it makes sense for your app to automatically connect to a peripheral that is located within a certain range, you can use RSSI data to determine the proximity of a discovered peripheral device.

### 22.3.30 DidFailToConnectPeripheral(peripheral as CBPeripheralMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the central manager fails to create a connection with a peripheral.
**Notes:** peripheral: The peripheral that failed to connect.
error: The cause of the failure.

This method is invoked when a connection initiated via the connectPeripheral method fails to complete. Because connection attempts do not time out, a failed connection usually indicates a transient issue, in which case you may attempt to connect to the peripheral again.

### 22.3.31 DidUpdateState

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the central manager,Äôs state is updated.
**Notes:** You implement this required method to ensure that Bluetooth low energy is supported and available to use on the central device. You should issue commands to the central manager only when the state of the central manager is powered on, as indicated by the CBCentralManagerStatePoweredOn constant. A state with a value lower than CBCentralManagerStatePoweredOn implies that scanning has stopped and that any connected peripherals have been disconnected. If the state moves below CBCentralManagerStatePoweredOff, all CBPeripheral objects obtained from this central manager become invalid and must be retrieved or discovered again. For a complete list and discussion of the possible values representing the state of the central manager, see the CBCentralManagerState enumeration in CBCentralManager.

### 22.3.32 WillRestoreState(dict as dictionary)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the central manager is about to be restored by the system.

**Notes:** dict: A dictionary containing information about the central manager that was preserved by the system at the time the app was terminated. For the available keys to this dictionary, see Central Manager State Restoration Options.

For apps that opt in to the state preservation and restoration feature of Core Bluetooth, this is the first method invoked when your app is relaunched into the background to complete some Bluetooth-related task. Use this method to synchronize the state of your app with the state of the Bluetooth system.

### 22.3.33 Constants

Att Errors

| Constant | Value | Description |
|---|---|---|
| CBATTErrorAttributeNotFound | &h0A | The attribute is not found within the specified attribute handle ra |
| CBATTErrorAttributeNotLong | &h0B | The attribute cannot be read or written using the ATT read blob |
| CBATTErrorInsufficientAuthentication | 5 | The attribute requires authentication before its value can be read |
| CBATTErrorInsufficientAuthorization | 8 | The attribute requires authorization before its value can be read o |
| CBATTErrorInsufficientEncryption | &h0F | The attribute requires encryption before its value can be read or w |
| CBATTErrorInsufficientEncryptionKeySize | &h0C | The encryption key size used for encrypting this link is insufficient |
| CBATTErrorInsufficientResources | &h11 | Resources are insufficient to complete the ATT request. |
| CBATTErrorInvalidAttributeValueLength | &h0D | The length of the attribute,Äôs value is invalid for the intended op |
| CBATTErrorInvalidHandle | 1 | The attribute handle is invalid on this peripheral. |
| CBATTErrorInvalidOffset | 7 | The specified offset value was past the end of the attribute,Äôs val |
| CBATTErrorInvalidPdu | 4 | The attribute Protocol Data Unit (PDU) or ,Äúmessage,Äù is inva |
| CBATTErrorPrepareQueueFull | 9 | The prepare queue is full, because too many prepare write requests queued. |
| CBATTErrorReadNotPermitted | 2 | The attribute,Äôs value cannot be read. |
| CBATTErrorRequestNotSupported | 6 | The attribute server does not support the request received by the |
| CBATTErrorSuccess | 0 | The ATT command or request successfully completed. |
| CBATTErrorUnlikelyError | &h0E | The ATT request has encountered an unlikely error and therefore c completed. |
| CBATTErrorUnsupportedGroupType | &h10 | The attribute type is not a supported grouping attribute as defined b layer specification. |
| CBATTErrorWriteNotPermitted | 3 | The attribute,Äôs value cannot be written. |

States

| Constant | Value | Description |
|---|---|---|
| CBCentralManagerStatePoweredOff | 4 | Bluetooth is currently powered off. |
| CBCentralManagerStatePoweredOn | 5 | Bluetooth is currently powered on and is available to use. |
| CBCentralManagerStateResetting | 1 | The connection with the system service was momentarily lost; an upd imminent. |
| CBCentralManagerStateUnauthorized | 3 | The app is not authorized to use the Bluetooth low energy peripheral/s role. |
| CBCentralManagerStateUnknown | 0 | The current state of the peripheral manager is unknown; an update is imm |
| CBCentralManagerStateUnsupported | 2 | The platform doesn't support the Bluetooth low energy peripheral/serve |

Errors

| Constant | Value | Description |
|---|---|---|
| CBErrorAlreadyAdvertising | 9 | The peripheral is already advertising. |
| CBErrorConnectionFailed | 10 | The connection failed. |
| CBErrorConnectionLimitReached | 11 | The device already has the maximum number of connections. |
| CBErrorConnectionTimeout | 6 | The connection timed out. |
| CBErrorEncryptionTimedOut | 15 | Timeout in encryption. |
| CBErrorInvalidHandle | 2 | The specified attribute handle is invalid. |
| CBErrorInvalidParameters | 1 | The specified parameters are invalid. |
| CBErrorNotConnected | 3 | The device is not currently connected. |
| CBErrorOperationCancelled | 5 | The operation is canceled. |
| CBErrorOperationNotSupported | 13 | Operation not supported. |
| CBErrorOutOfSpace | 4 | The device has run out of space to complete the intended operation. |
| CBErrorPeerRemovedPairingInformation | 14 | Peer removed pairing information, e.g. pairing was reset on the other |
| CBErrorPeripheralDisconnected | 7 | The peripheral disconnected. |
| CBErrorTooManyLEPairedDevices | 16 | Too many paired devices for Bluetooth LE. |
| CBErrorUnknown | 0 | An unknown error occurred. |
| CBErrorUnkownDevice | 12 | Unknown device. |
| CBErrorUUIDNotAllowed | 8 | The specified UUID is not permitted. |

## 22.4 class CBCentralMBS

### 22.4.1 class CBCentralMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The central CoreBluetooth class.
**Notes:** The CBCentral class represents remote central devices that have connected to an app implementing the peripheral role on a local device. That is, when you are implementing the peripheral role using the CBPeripheralManager class, centrals that connect to your local peripheral are represented as CBCentral objects. Remote centrals are identified by universally unique identifiers (UUIDs), represented by NSUUID objects.
Subclass of the CBPeerMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.4.2 Methods

### 22.4.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.9 or newer.

### 22.4.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.4.5 Properties

### 22.4.6 maximumUpdateValueLength as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The maximum amount of data, in bytes, that the central can receive in a single notification or indication.
**Notes:** (Read only property)

## 22.5 class CBCharacteristicMBS

### 22.5.1 class CBCharacteristicMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The class for a service characteristic.
**Notes:** CBCharacteristic and its subclass CBMutableCharacteristic represent further information about a peripheral,Äôs service. CBCharacteristic objects in particular represent the characteristics of a remote peripheral,Äôs service (remote peripheral devices are represented by CBPeripheral objects). A characteristic contains a single value and any number of descriptors describing that value. The properties of a characteristic determine how the value of the characteristic can be used and how the descriptors can be accessed.
Subclass of the CBAttributeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.5.2 Methods

### 22.5.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.5.4 descriptors as CBDescriptorMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A list of the descriptors that have been discovered in this characteristic.
**Notes:** The value of this property is an array of CBDescriptor objects that represent a characteristic,Äôs descriptors. Characteristic descriptors provide more information about a characteristic,Äôs value. For example, they may describe the value in human-readable form and describe how the value should be formatted for presentation purposes. For more information about characteristic descriptors, see CBDescriptor.

### 22.5.5 Properties

### 22.5.6 isBroadcasted as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Whether the characteristic is currently broadcasted or not.
**Notes:** Available in MacOS 10.9 or newer.

(Read only property)

### 22.5.7 isNotifying as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the characteristic is currently notifying a subscribed central of its value.
**Notes:** True if you have enabled notifications or indications for the characteristic by successfully calling the setNotifyValue method of the CBPeripheral class. If the value of this property is true, the peripheral updates the subscribed central that it is connected to whenever the characteristic,Äôs value has changed. If the value of the property is false, notifications (or indications) have not been enabled for the characteristic, and the peripheral does not update the central that it is connected to whenever the characteristic,Äôs value has changed.
(Read only property)

### 22.5.8 properties as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The properties of the characteristic.
**Notes:** The properties of a characteristic determine how the characteristic,Äôs value and descriptors can be used and accessed. For a list of the possible values representing the properties of a characteristic, see constants.
(Read only property)

### 22.5.9 service as CBServiceMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The service that this characteristic belongs to.
**Notes:** (Read only property)

### 22.5.10 value as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The value of the characteristic.
**Notes:** This property contains the value of the characteristic. For example, a temperature measurement characteristic of a health thermometer service may have a value that indicates a temperature in Celsius.

(Read only property)

### 22.5.11 Constants

Property Constants

| Constant | Value | Description |
|---|---|---|
| kPropertyAuthenticatedSignedWrites | &h40 | Signed writes of the characteristic,Äôs value are permitted, without a re from the peripheral to indicate that the write was successful. |
| kPropertyBroadcast | 1 | The characteristic,Äôs value can be broadcast using a characteristic con tion descriptor. |
| kPropertyExtendedProperties | &h80 | Additional characteristic properties are defined in the characteristic ex properties descriptor. |
| kPropertyIndicate | &h20 | Indications of the characteristic,Äôs value are permitted, with a respons the central to indicate that the indication was received. |
| kPropertyIndicateEncryptionRequired | &h200 | Only trusted devices can enable indications of the characteristic,Äôs va |
| kPropertyNotify | &h10 | Notifications of the characteristic,Äôs value are permitted, without a re from the central to indicate that the notification was received. |
| kPropertyNotifyEncryptionRequired | &h100 | Only trusted devices can enable notifications of the characteristic,Äôs v |
| kPropertyRead | 2 | The characteristic,Äôs value can be read. |
| kPropertyWrite | 8 | The characteristic,Äôs value can be written, with a response from the peri to indicate that the write was successful. |
| kPropertyWriteWithoutResponse | 4 | The characteristic,Äôs value can be written, without a response from t ripheral to indicate that the write was successful. |

## 22.6 class CBDescriptorMBS

### 22.6.1 class CBDescriptorMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CoreBluetooth class for a characteristic description.
**Notes:** CBDescriptor and it subclass CBMutableDescriptor represent a descriptor of a peripheral,Äôs characteristic. CBDescriptor objects in particular represent the descriptors of a remote peripheral,Äôs characteristic (remote peripheral devices are represented by CBPeripheral objects). Descriptors provide further information about a characteristic,Äôs value. For example, they may describe the value in human-readable form and describe how the value should be formatted for presentation purposes. Characteristic descriptors also indicate whether a characteristic,Äôs value is configured on a server (a peripheral) to indicate or notify a client (a central) when the value of the characteristic changes.

There are six predefined types of descriptors that—along with their corresponding value types—are detailed in CBUUID. CBDescriptor lists the predefined types of descriptors and the CBUUIDMBS constants that are used to represent them.

| Descriptor type | Descriptor constant |
|---|---|
| Characteristic extended properties | CBUUIDMBS.CBUUIDCharacteristicExtendedPropertiesString |
| Characteristic user description | CBUUIDMBS.CBUUIDCharacteristicUserDescriptionString |
| Client characteristic configuration | CBUUIDMBS.CBUUIDClientCharacteristicConfigurationString |
| Server characteristic configuration | CBUUIDMBS.CBUUIDServerCharacteristicConfigurationString |
| Characteristic format | CBUUIDMBS.CBUUIDCharacteristicFormatString |
| Characteristic aggregate format | CBUUIDMBS.CBUUIDCharacteristicAggregateFormatString |

Subclass of the CBAttributeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.6.2 Methods

### 22.6.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.7 or newer.

### 22.6.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.6.5 Properties

### 22.6.6 Characteristic as CBCharacteristicMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The characteristic that this descriptor belongs to.
**Notes:** (Read only property)

### 22.6.7 Value as Variant

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The value of the descriptor.
**Notes:** The value types for the various types of descriptors are detailed in CBUUID.
You can read the value of a descriptor by calling the readValueForDescriptor: method of the CBPeripheral class. You can write the value of a descriptor by calling the writeValue method of the CBPeripheral class. That said, you cannot use the writeValue method to write the value of a client configuration descriptor (CBUUIDClientCharacteristicConfigurationString); instead, you should use the setNotifyValue method of the CBPeripheral class to configure client indications or notifications of a characteristic,Äôs value on a server.
(Read only property)

## 22.7 class CBL2CAPChannelMBS

### 22.7.1 class CBL2CAPChannelMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A CBL2CAPChannel represents a live L2CAP connection to a remote device.

### 22.7.2 Methods

### 22.7.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on MacOS 10.13.

### 22.7.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The constructor.

### 22.7.5 Properties

### 22.7.6 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.7.7 inputStream as NSInputStreamMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** An NSStream used for reading data from the remote peer.
**Notes:** (Read only property)

### 22.7.8 outputStream as NSOutputStreamMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** An NSStream used for writing data to the peer.
**Notes:** (Read only property)

### 22.7.9 peer as CBPeerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The peer connected to the channel.
**Notes:** (Read only property)

### 22.7.10 PSM as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The PSM (Protocol/Service Multiplexer) of the channel.
**Notes:** (Read only property)

## 22.8 class CBManagerMBS

### 22.8.1 class CBManagerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The abstract base class for Core Bluetooth manager objects (central and peripheral).
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr3

### 22.8.2 Methods

### 22.8.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on MacOS 10.13 or newer.

### 22.8.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.8.5 Properties

### 22.8.6 authorization as Integer

MBS Bluetooth Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries the authorization state.
**Notes:** Requires MacOS 10.15 or newer.
(Read only property)

### 22.8.7 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.8.8 State as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The state of the manager.
**Notes:** (Read only property)

### 22.8.9 Constants

Authorization States

| Constant | Value | Description |
|---|---|---|
| kAuthorizationStatusAuthorized | 3 | This app is authorized to share data using Bluetooth services while in background state. |
| kAuthorizationStatusDenied | 2 | The user explicitly denied this app from sharing data using Bluetooth serv while in the background state. |
| kAuthorizationStatusNotDetermined | 0 | The user has not yet made a choice regarding whether this app can share using Bluetooth services while in the background state. |
| kAuthorizationStatusRestricted | 1 | This app is not authorized to share data using Bluetooth services while in background state. The user cannot change this app,Äôs status, possibly to active restrictions such as parental controls being in place. |

States

| Constant | Value | Description |
|---|---|---|
| kStatePoweredOff | 4 | Bluetooth is currently powered off. |
| kStatePoweredOn | 5 | Bluetooth is currently powered on and available to use. |
| kStateResetting | 1 | The connection with the system service was momentarily lost, update imminent. |
| kStateUnauthorized | 3 | The application is not authorized to use the Bluetooth Low Energy role. |
| kStateUnknown | 0 | State unknown, update imminent. |
| kStateUnsupported | 2 | The platform doesn't support the Bluetooth Low Energy Central/Client role. |

## 22.9 class CBMutableCharacteristicMBS

### 22.9.1 class CBMutableCharacteristicMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** CBMutableCharacteristic objects represent the characteristics of a local peripheral,Äôs service (local peripheral devices are represented by CBPeripheralManager objects).
**Notes:** This class adds write access to many of the properties in the CBCharacteristic class it inherits from.

You use this class to create a characteristic and to set its properties and permissions as desired. After you create a characteristic and add it to a local service, you can publish it (and the service) to the peripheral,Äôs local database using the addService method of the CBPeripheralManager class. After you publish a characteristic, the characteristic is cached and you can no longer make changes to it.
Subclass of the CBCharacteristicMBS class.

### 22.9.2 Methods

### 22.9.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on MacOS 10.9 or later.

### 22.9.4 Constructor(UUID as CBUUIDMBS, properties as Integer, value as MemoryBlock, permissions as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns a newly initialized mutable characteristic with specified permissions, properties, and value.
**Notes:** UUID: A 128-bit UUID that identifies the characteristic.
properties: The properties of the characteristic.
value: The characteristic value to be cached. If nil, the value is dynamic and will be requested on demand.
permissions: The permissions of the characteristic value.

Returns a newly initialized mutable characteristic.

If you specify a value for the characteristic, the value is cached and its properties and permissions are set to CBCharacteristicPropertyRead and CBAttributePermissionsReadable, respectively. Therefore, if you need the value of a characteristic to be writeable, or if you expect the value to change during the lifetime of the pub-

lished service to which the characteristic belongs, you must specify the value to be nil. So doing ensures that the value is treated dynamically and requested by the peripheral manager whenever the peripheral manager receives a read or write request from a central. When the peripheral manager receives a read or write request from a central, it calls the didReceiveReadRequest or the didReceiveWriteRequests event, respectively.

### 22.9.5 setDescriptors(Descriptors() as CBDescriptorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Set the list of descriptors that describe the characteristic.
**Notes:** The value of this property is an array of CBDescriptor objects that represent a characteristic,Äôs descriptors. Characteristic descriptors provide more information about a characteristic,Äôs value. For example, they may describe the value in human-readable form and describe how the value should be formatted for presentation purposes. For more information about characteristic descriptors, see CBDescriptor.

### 22.9.6 subscribedCentrals as CBDescriptorMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A list of centrals currently subscribed to the characteristic,Äôs value.
**Notes:** The value of this property is an array of CBCentral objects that are currently subscribed to the characteristic,Äôs value. The array is empty if the characteristic is not configured to support notifications or indications. Even if the characteristic is configured to support notifications or indications, the array is empty if no centrals are currently subscribing to the characteristic,Äôs value.

### 22.9.7 Properties

### 22.9.8 permissions as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The permissions of the characteristic value.
**Notes:** Characteristic permissions represent the read, write, and encryption permissions for a characteristic,Äôs value. For a complete list and discussion of the characteristic permissions that may be set, see constants.
(Read and Write property)

### 22.9.9 properties as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The properties of the characteristic.
**Notes:** The properties of a characteristic determine how the characteristic,Äôs value and descriptors can be used and accessed. The characteristic properties CBCharacteristicPropertyBroadcast and CBCharacteristicPropertyExtendedProperties are not allowed for mutable characteristics. That is, you cannot set these properties when you initialize a CBMutableCharacteristic object using the Constructor method. For a list of the possible values representing the properties of a characteristic, see the CBCharacteristicProperties enumeration in CBCharacteristic.
(Read and Write property)

### 22.9.10 value as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The value of the characteristic.
**Notes:** This property contains the value of the characteristic. For example, a temperature measurement characteristic of a health thermometer service may have a value that indicates a temperature in Celsius.
(Read and Write property)

### 22.9.11 Constants

Permissions Flags

| Constant | Value | Description |
|---|---|---|
| kReadable | 1 | The characteristic,Äôs value has read-only permission. |
| kReadEncryptionRequired | 4 | The characteristic,Äôs value is readable only by trusted devices. |
| kWriteable | 2 | The characteristic,Äôs value has write-only permission. |
| kWriteEncryptionRequired | 8 | The characteristic,Äôs value is writeable only by trusted devices. |

## 22.10 class CBMutableDescriptorMBS

### 22.10.1 class CBMutableDescriptorMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** CBMutableDescriptor objects represent the descriptors of a local peripheral,Äôs characteristic (local peripheral devices are represented by CBPeripheralManager objects).
**Notes:** You use the CBMutableDescriptor class to create a local characteristic descriptor. After you create a descriptor and associate it with a local characteristic, you can publish it (along with the characteristic and local service to which it belongs) to the peripheral,Äôs local database via the addService: method of the CBPeripheralManager class. After you publish a local descriptor, the descriptor is cached and you can no longer make changes to it.
There are six predefined types of descriptors that—along with their corresponding value types—are detailed in CBUUID. That said, only two of these are currently supported when creating local, mutable descriptors: the characteristic user description descriptor and the characteristic format descriptor, represented by the CBUUID constants CBUUIDCharacteristicUserDescriptionString and CBUUIDCharacteristicFormatString, respectively. The system automatically creates the characteristic extended properties descriptor and the client characteristic configuration descriptor, depending on the properties of the characteristic to which the descriptor belongs.
Subclass of the CBDescriptorMBS class.

### 22.10.2 Methods

### 22.10.3 Constructor(UUID as CBUUIDMBS, value as variant)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns a newly initialized mutable descriptor with a specified value.
**Notes:** UUID: A 128-bit UUID that identifies the characteristic. You must use only one of the two currently supported descriptor types: CBUUIDCharacteristicUserDescriptionString or CBUUIDCharacteristicFormatString. For more details about these descriptor types, see CBUUID.

value: The descriptor value to be cached. This value is required (that is, it must not be nil) and cannot be updated dynamically after the descriptor has been published.

Returns a newly initialized mutable descriptor.

The value type of value depends on the type of descriptor.

- The value type of a characteristic user description descriptor (CBUUIDCharacteristicUserDescriptionString) is a string that can be used to provide a human-readable description of the characteristic,Äôs value.

- The value type of a characteristic format descriptor (CBUUIDCharacteristicFormatString) is a memoryblock that can be used to specify how the characteristic,Äôs value should be formatted for presentation purposes.

If you want to create a local characteristic format descriptor, the descriptor,Äôs value must conform to the attribute value of the characteristic format descriptor as defined in the Bluetooth 4.0 specification, Volume 3, Part G, Section 3.3.3.5 (for more information, see Bluetooth 4.0 Characteristic Presentation Format).

## 22.11 class CBMutableServiceMBS

### 22.11.1 class CBMutableServiceMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CBMutableService class adds write access to all of the properties in the CBService class it inherits from.
**Notes:** You use this class to create a service or an included service on a local peripheral device (represented by a CBPeripheralManager object). After you create a service, you can add it to the peripheral,Äôs local database using the addService method of the CBPeripheralManager class. After you add a service to the peripheral,Äôs local database, the service is cached and you can no longer make changes to it.
Subclass of the CBServiceMBS class.

### 22.11.2 Methods

### 22.11.3 Constructor(UUID as CBUUIDMBS, isPrimary as Boolean)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns a newly initialized mutable service specified by UUID and service type.
**Notes:** UUID: A 128-bit UUID that identifies the service.
isPrimary: A Boolean value indicating whether the type of service is primary or secondary. If the value is true, the type of service is primary. If the value is false, the type of service is secondary.

### 22.11.4 setCharacteristics(characteristics() as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sets list of characteristics of a service.
**Notes:** An array containing CBCharacteristic objects that represent a service,Äôs characteristics. Characteristics provide further details about a peripheral,Äôs service. For example, a heart rate service may contain one characteristic that describes the intended body location of the device,Äôs heart rate sensor and another characteristic that transmits heart rate measurement data.

### 22.11.5 setIncludedServices(includedServices() as CBServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sets the list of included services.
**Notes:** A service of a peripheral may contain a reference to other services that are available on the peripheral. These other services are the included services of the service.

## 22.12 class CBPeerMBS

### 22.12.1 class CBPeerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CBPeer class is an abstract base class that defines common behavior for objects representing remote devices.
**Notes:** You typically do not create instances of either CBPeer or its concrete subclasses. Instead, the system creates them for you during the process of peer discovery.

Your app running on the local device takes the role of either a central (by creating an instance of CBCentralManager) or a peripheral (by creating an instance of CBPeripheralManager), and interacts through the manager with remote devices in the opposite role. During the process of peer discovery, where a central device scans for peripherals advertising services, the system creates objects from the concrete subclasses of CBPeer to represent discovered remote devices.

The concrete subclasses of CBPeer are:

- CBPeripheralMBS
- CBCentralMBS

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.12.2 Methods

### 22.12.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS 10.13 or newer.

### 22.12.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.12.5 copy as CBPeerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates a copy.

### 22.12.6 Properties

### 22.12.7 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.12.8 identifier as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The UUID associated with the peer.
**Notes:** The value of this property represents the unique identifier of the peer. The first time a local manager encounters a peer, the system assigns the peer a UUID, represented by a new NSUUID object. Peers are identified by NSUUID UUIDs instead of by the CBUUID objects that identify a peripheral,Äôs services, characteristics, and characteristic descriptors.
(Read only property)

## 22.13 class CBPeripheralManagerMBS

### 22.13.1 class CBPeripheralManagerMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CoreBluetooth peripheral manager class.
**Notes:** CBPeripheralManager objects are used to manage published services within the local peripheral device,Äôs Generic Attribute Profile (GATT) database and to advertise these services to central devices (represented by CBCentral objects). While a service is in the database, it is visible to, and can be accessed by, any connected central. That said, if your app has not specified the bluetooth-peripheral background mode, the contents of its services become disabled when it is in the background or in a suspended state; any remote central trying to access the service,Äôs characteristic value or characteristic descriptors receives an error.

Before you call CBPeripheralManager methods, the state of the peripheral manager object must be powered on, as indicated by the kStatePoweredOn. This state indicates that the peripheral device (your iPhone or iPad, for instance) supports Bluetooth low energy and that its Bluetooth is on and available to use.
Subclass of the CBManagerMBS class.

### 22.13.2 Methods

### 22.13.3 addService(service as CBMutableServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Publishes a service and any of its associated characteristics and characteristic descriptors to the local GATT database.
**Notes:** service: The service you want to publish.

When you add a service to the database, the peripheral manager calls the didAddService:error event. If the service contains any included services, you must publish them first.

### 22.13.4 authorizationStatus as integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns the app,Äôs authorization status for sharing data while in the background state.
**Notes:** A value indicating whether the app is authorized to share data using Bluetooth services while in the background. For a list of the possible values, see constants.

The authorization status of a given app is managed by the system and determined by several factors. Apps

must be explicitly authorized to share data using Bluetooth services while in the background state. The system automatically displays a request for user authorization when your app first attempts to use Bluetooth services to share data.
Calling this method does not prompt the user for access. Instead, you use this method to detect restricted access and simply hide any affected UI features from the user.

Deprecated in MacOS 10.15 in favor of CBManagerMBS' authorization property.

### 22.13.5 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Checks whether this class is available.
**Notes:** Returns true for MacOS 10.9 or newer.

### 22.13.6 CBPeripheralManagerOptionRestoreIdentifierKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the Constructor.
**Notes:** A string containing a unique identifier (UID) for the peripheral manager that is being instantiated. The system uses this UID to identify a specific peripheral manager. As a result, the UID must remain the same for subsequent executions of the app in order for the peripheral manager to be successfully restored.

### 22.13.7 CBPeripheralManagerOptionShowPowerAlertKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the Constructor.
**Notes:** A Boolean value that specifies whether the system should display a warning dialog to the user if Bluetooth is powered off when the peripheral manager is instantiated.
The value for this key is a boolean. If the key is not specified, the default value is false.

### 22.13.8 CBPeripheralManagerRestoredStateAdvertisementDataKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the constructor.
**Notes:** A dictionary containing the data that the peripheral manager was advertising at the time the app was terminated by the system.

### 22.13.9 CBPeripheralManagerRestoredStateServicesKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used to pass options to the constructor.
**Notes:** An array of CBMutableService objects that contains all of the services that were published to the local peripheral,Äôs database at the time the app was terminated by the system.

### 22.13.10 Constructor(options as Dictionary = nil)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes the peripheral manager.

### 22.13.11 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 22.13.12 removeAllServices

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Removes all published services from the local GATT database.
**Notes:** Because the GATT database is shared among apps on the local peripheral device, this method removes only the services that you have added using the addService method. Any services that have been published by other apps on the local peripheral device are not removed from the GATT database.

### 22.13.13 removeService(service as CBMutableServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Removes a specified published service from the local GATT database.
**Notes:** service: The service you want to remove.

Because the GATT database is shared among apps on the local peripheral device, more than one instance of a service may exist in the database. As a result, this method removes only the instance of the service that your app added to the database (using the addService method). If the service is included by any other services, you must remove them first.

### 22.13.14 respondToRequest(request as CBATTRequestMBS, error as integer)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Responds to a read or write request from a connected central.
**Notes:** request: The read or write request that was received from the connected central. For more information about read and write requests, see CBATTRequest.
result: The result of attempting to fulfill the request. For a list of possible results, see Core Bluetooth Constants.

When the peripheral manager receives a request (represented as a CBATTRequest object) from a connected central to read or write a characteristic,Äôs value, it calls the didReceiveReadRequest or didReceiveWriteRequests event. Each time one of these events is called, you call this method to respond to the corresponding read or write request.

### 22.13.15 setDesiredConnectionLatency(latency as integer, central as CBCentralMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sets the desired connection latency for an existing connection to a central device.
**Notes:** latency: The desired connection latency. For a list of the possible connection latency values that you may set for the peripheral manager, see CBPeripheralManagerConnectionLatency.
central: The central that the peripheral manager is currently connected to.

The latency of a peripheral-central connection controls how frequently messages can be exchanged between the peripheral and the central to which the peripheral is connected. By setting a desired connection latency, you manage the relationship between the frequency with which data is exchanged and the resulting battery performance of the peripheral device. When you call this method to set the connection latency, note that connection latency changes are not guaranteed. And so, the resultant latency may vary. If you do not explicitly set a latency, the connection latency is set to the latency that was chosen by the central device when the connection was first established. Typically, it is not necessary to change the connection latency.

### 22.13.16 startAdvertising(advertisementData as Dictionary)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Invoked when you start advertising the local peripheral device,Äôs data.
**Notes:** error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the startAdvertising method to begin advertising the local peripheral device,Äôs data. If successful, the error parameter is nil. If there is a problem advertising the data, the error parameter returns the cause of the failure.

### 22.13.17 stopAdvertising

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Stops advertising peripheral manager data.
**Notes:** Call this method when you no longer want to advertise peripheral manager data.

### 22.13.18 updateValue(value as MemoryBlock, characteristic as CBMutableCharacteristicMBS, onSubscribedCentrals() as CBCentralMBS = nil) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sends an updated characteristic value to one or more subscribed centrals, via a notification or indication.
**Notes:** value: The characteristic value you want to send via a notification or indication.
characteristic: The characteristic whose value has changed.
centrals: A list of centrals (represented by CBCentral objects) that have subscribed to receive updates of the characteristic,Äôs value. If nil, all subscribed centrals are updated. Centrals that have not subscribed to a characteristic,Äôs value are ignored.

Returns true if the update is successfully sent to the subscribed central or centrals. false if the update is not successfully sent because the underlying transmit queue is full.

You use this method to send updates of a characteristic,Äôs value—through a notification or indication—to selected centrals that have subscribed to that characteristic,Äôs value. If the method returns false because the underlying transmit queue is full, the peripheral manager calls the peripheralManagerIsReadyToUpdateSubscribers event when more space in the transmit queue becomes available. After this delegate method is called, you may resend the update.
If the length of the value parameter exceeds the length of the maximumUpdateValueLength property of a subscribed CBCentral, the value parameter is truncated accordingly.

### 22.13.19 Properties

### 22.13.20 isAdvertising as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the peripheral is currently advertising data.
**Notes:** true if the peripheral is currently advertising data as a result of you successfully calling the star-

tAdvertising method. false if the peripheral is not currently advertising data.
(Read only property)

### 22.13.21 Events

### 22.13.22 DidAddService(service as CBServiceMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you publish a service, and any of its associated characteristics and characteristic descriptors, to the local Generic Attribute Profile (GATT) database.
**Notes:** service: The service that was added to the local GATT database.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the addService method to publish a service to the local peripheral,Äôs GATT database. If the service is successfully published to the local database, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.13.23 DidOpenL2CAPChannel(channel as CBL2CAPChannelMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Did open L2CAP channel.

### 22.13.24 DidPublishL2CAPChannel(PSM as Integer, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** This event is the response to a publishL2CAPChannel call.
**Notes:** PSM: The PSM of the channel that was published.
error: If an error occurred, the cause of the failure.

The PSM will contain the PSM that was assigned for the published channel

### 22.13.25 DidReceiveReadRequest(Request as CBATTRequestMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a local peripheral device receives an Attribute Protocol (ATT) read request for a characteristic that has a dynamic value.
**Notes:** request: A CBATTRequest object that represents a request to read a characteristic,Äôs value.

Each time this method is invoked, you call the respondToRequest method of the CBPeripheralManager class exactly once to respond to the read request.

### 22.13.26 DidReceiveWriteRequests(requests() as CBATTRequestMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a local peripheral device receives an Attribute Protocol (ATT) write request for a characteristic that has a dynamic value.
**Notes:** requests: A list of one or more CBATTRequest objects, each representing a request to write the value of a characteristic.

In the same way that you respond to a read request, each time this method is invoked, you call the respondToRequest:withResult: method of the CBPeripheralManager class exactly once. If the requests parameter contains multiple requests, treat them as you would a single request—if any individual request cannot be fulfilled, you should not fulfill any of them. Instead, call the respondToRequest method immediately, and provide a result that indicates the cause of the failure.

When you respond to a write request, note that the first parameter of the respondToRequest method expects a single CBATTRequest object, even though you received an array of them from the didReceiveWriteRequests event. To respond properly, pass in the first request of the requests array.

### 22.13.27 DidStartAdvertising(error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Adverising did start.
**Notes:** error: If an error occurred, the cause of the failure.

This event returns the result of a startAdvertising call. If advertisement could not be started, the cause will be detailed in the error parameter.

### 22.13.28 DidSubscribeToCharacteristic(central as CBCentralMBS, characteristic as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a remote central device subscribes to a characteristic,Äôs value.
**Notes:** central: The remote central device that subscribed to the characteristic,Äôs value.
characteristic: The characteristic whose value has been subscribed to.

This method is invoked when a remote central device subscribes to the value of one of the local peripheral,Äôs characteristics, by enabling notifications or indications on the characteristic,Äôs value. You should use the invocation of this method as a cue to start sending the subscribed central updates as the characteristic,Äôs value changes. To send updated characteristic values to subscribed centrals, use the updateValue method of the CBPeripheralManager class.

### 22.13.29 DidUnpublishL2CAPChannel(PSM as Integer, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** This event is the response to a unpublishL2CAPChannel call.
**Notes:** PSM: The PSM of the channel that was published.
error: If an error occurred, the cause of the failure.

### 22.13.30 DidUnsubscribeFromCharacteristic(central as CBCentralMBS, characteristic as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a remote central device unsubscribes from a characteristic,Äôs value.
**Notes:** central: The remote central device that subscribed to the characteristic,Äôs value.
characteristic: The characteristic whose value has been unsubscribed from.

This method is invoked when a remote central device unsubscribes from the value of one of the local peripheral,Äôs characteristics, by disabling notifications or indications on the characteristic,Äôs value. You should use the invocation of this method as a cue to stop sending the subscribed central updates as the characteristic,Äôs value changes.

### 22.13.31 DidUpdateState

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the peripheral manager's state is updated.
**Notes:** You implement this required method to ensure that Bluetooth low energy is supported and available to use on the local peripheral device. Issue commands to the peripheral manager only when the state of the peripheral manager is powered on, as indicated by the kStatePoweredOn constant. A state with a value lower than CBPeripheralManagerStatePoweredOn implies that advertising has stopped and that any connected

centrals have been disconnected. If the state moves below CBPeripheralManagerStatePoweredOff, advertising has stopped and must be explicitly restarted. In addition, the local database is cleared and all services must be explicitly added again. For a complete list and discussion of the possible values representing the state of the peripheral manager, see the CBPeripheralManagerState enumeration in CBPeripheralManager.

### 22.13.32 IsReadyToUpdateSubscribers

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a local peripheral device is again ready to send characteristic value updates.
**Notes:** When a call to the updateValue method fails because the underlying queue used to transmit the updated characteristic value is full, the peripheralManagerIsReadyToUpdateSubscribers: method is invoked when more space in the transmit queue becomes available. You can then implement this event to resend the value.

### 22.13.33 WillRestoreState(dic as dictionary)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the peripheral manager is about to be restored by the system.
**Notes:** dict: A dictionary containing information about the peripheral manager that was preserved by the system at the time the app was terminated. For the available keys to this dictionary, see Peripheral Manager State Restoration Options.

For apps that opt in to the state preservation and restoration feature of Core Bluetooth, this is the first method invoked when your app is relaunched into the background to complete some Bluetooth-related task. Use this method to synchronize the state of your app with the state of the Bluetooth system.

### 22.13.34 Constants

Authorization States

| Constant | Value | Description |
|---|---|---|
| kAuthorizationStatusAuthorized | 3 | This app is authorized to share data using Bluetooth services while in background state. |
| kAuthorizationStatusDenied | 2 | The user explicitly denied this app from sharing data using Bluetooth serv while in the background state. |
| kAuthorizationStatusNotDetermined | 0 | The user has not yet made a choice regarding whether this app can share using Bluetooth services while in the background state. |
| kAuthorizationStatusRestricted | 1 | This app is not authorized to share data using Bluetooth services while in background state. The user cannot change this app,Äôs status, possibly to active restrictions such as parental controls being in place. |

Latencies

| Constant | Value | Description |
|---|---|---|
| kConnectionLatencyHigh | 2 | Extending battery life has priority over rapid communication. |
| kConnectionLatencyLow | 0 | Rapid communication has priority over battery life. |
| kConnectionLatencyMedium | 1 | A balance exits between communication frequency and battery life. |

States

| Constant | Value | Description |
|---|---|---|
| kStatePoweredOff | 4 | Bluetooth is currently powered off. |
| kStatePoweredOn | 5 | Bluetooth is currently powered on and is available to use. |
| kStateResetting | 1 | The connection with the system service was momentarily lost; an update is imminent. |
| kStateUnauthorized | 3 | The app is not authorized to use the Bluetooth low energy peripheral/server role. |
| kStateUnknown | 0 | The current state of the peripheral manager is unknown; an update is imminent. |
| kStateUnsupported | 2 | The platform doesn't support the Bluetooth low energy peripheral/server role. |

## 22.14 class CBPeripheralMBS

### 22.14.1 class CBPeripheralMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The CBPeripheral class represents remote peripheral devices that your app—by means of a central manager (an instance of CBCentralManager)—has discovered advertising or is currently connected to.
**Notes:** Peripherals are identified by universally unique identifiers (UUIDs), represented by NSUUID objects. Peripherals may contain one or more services or provide useful information about their connected signal strength.

You use this class to discover, explore, and interact with the services available on a remote peripheral that supports Bluetooth low energy. A service encapsulates the way part of the device behaves. For example, one service of a heart rate monitor may be to expose heart rate data from the monitor,Äôs heart rate sensor. Services themselves are made up of characteristics or included services (references to other services). Characteristics provide further details about a peripheral,Äôs service. For example, the heart rate service just described may contain one characteristic that describes the intended body location of the device,Äôs heart rate sensor and another characteristic that transmits heart rate measurement data. Finally, characteristics contain any number of descriptors that provide more information about the characteristic,Äôs value, such as a human-readable description and a way to format the value.
Subclass of the CBPeerMBS class.
**Blog Entries**

- Bluetooth for Xojo

### 22.14.2 Methods

### 22.14.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS 10.7 and newer.

### 22.14.4 Constructor(Peripheral as CBPeripheralMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** You can subclass this class and fill events. Than when you get a Peripheral, you can call this constructor to make a new object of your subclass with the given Peripheral and connect the event.

### 22.14.5 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 22.14.6 discoverCharacteristics(characteristicUUIDs() as CBUUIDMBS = nil, service as CBServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Discovers the specified characteristics of a service.
**Notes:** characteristicUUIDs: An array of CBUUID objects that you are interested in. Here, each CBUUID object represents a UUID that identifies the type of a characteristic you want to discover.
service: The service whose characteristics you want to discover.

An array of CBUUID objects—representing characteristic UUIDs—can be provided in the characteristicUUIDs parameter. As a result, the peripheral returns only the characteristics of the service that your app is interested in (recommended). If the characteristicUUIDs parameter is nil, all the characteristics of the service are returned; setting the parameter to nil is considerably slower and is not recommended. When the peripheral discovers one or more characteristics of the specified service, it calls the didDiscoverCharacteristicsForService event. If the characteristics of a service are successfully discovered, you can access them through the service,Äôs characteristics property.

### 22.14.7 discoverDescriptorsForCharacteristic(Characteristic as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Discovers the descriptors of a characteristic.
**Notes:** characteristic: The characteristic whose descriptors you want to discover.

When the peripheral discovers one or more descriptors of the specified characteristic, it calls the didDiscoverDescriptorsForCharacteristic event. If the descriptors of a characteristic are successfully discovered, you can access them through the characteristic,Äôs descriptors property.

### 22.14.8 discoverIncludedServices(includedServiceUUIDs() as CBUUIDMBS = nil, service as CBServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Discovers the specified included services of a service.
**Notes:** includedServiceUUIDs: An array of CBUUID objects that you are interested in. Here, each CBUUID object represents a UUID that identifies the type of included service you want to discover.
service: The service whose included services you want to discover.

You can provide an array of CBUUID objects—representing included service UUIDs—in the includedServiceUUIDs parameter. When you do, the peripheral returns only the included services of the service that your app is interested in (recommended). If the includedServicesUUIDs parameter is nil, all the included services of the service are returned; setting the parameter to nil is considerably slower and is not recommended. When the peripheral discovers one or more included services of the specified service, it calls the didDiscoverIncludedServicesForService event. If the included services of a service are successfully discovered, you can access them through the service's includedServices property.

### 22.14.9 discoverServices(serviceUUIDs() as CBUUIDMBS = nil)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Discovers the specified services of the peripheral.
**Notes:** serviceUUIDs: An array of CBUUID objects that you are interested in. Here, each CBUUID object represents a UUID that identifies the type of service you want to discover.

You can provide an array of CBUUID objects—representing service UUIDs—in the serviceUUIDs parameter. When you do, the peripheral returns only the services of the peripheral that your app is interested in (recommended). If the servicesUUIDs parameter is nil, all the available services of the peripheral are returned; setting the parameter to nil is considerably slower and is not recommended. When the peripheral discovers one or more services, it calls the didDiscoverServices event. If the services of the peripheral are successfully discovered, you can access them through the peripheral,Äôs services property.

### 22.14.10 maximumWriteValueLengthForType(Type as Integer) as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The maximum amount of data, in bytes, that can be sent to a characteristic in a single write type.
**Notes:** Type can be kWriteWithResponse or kWriteWithoutResponse.

### 22.14.11 readRSSI

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Retrieves the current RSSI value for the peripheral while it is connected to the central manager.
**Notes:** In macOS, when you call this method to retrieve the RSSI of the peripheral while it is currently

connected to the central manager, the peripheral calls the peripheralDidUpdateRSSI event. If the RSSI value of the peripheral is successfully retrieved, you can access it through the peripheral,Äôs RSSI property.

### 22.14.12 readValueForCharacteristic(Characteristic as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Retrieves the value of a specified characteristic.
**Notes:** characteristic: The characteristic whose value you want to read.

When you call this method to read the value of a characteristic, the peripheral calls the peripheral:didUpdateValueForCharacteristic:error: method of its delegate object. If the value of the characteristic is successfully retrieved, you can access it through the characteristic,Äôs value property.
Not all characteristics are guaranteed to have a readable value. You can determine whether a characteristic,Äôs value is readable by accessing the relevant properties of the CBCharacteristicProperties enumeration, which are detailed in CBCharacteristic.

### 22.14.13 readValueForDescriptor(descriptor as CBDescriptorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Retrieves the value of a specified characteristic descriptor.
**Notes:** descriptor: The characteristic descriptor whose value you want to read.

When you call this method to read the value of a characteristic descriptor, the peripheral calls the didUpdateValueForDescriptor event. If the value of the characteristic descriptor is successfully retrieved, you can access it through the characteristic descriptor,Äôs value property.

### 22.14.14 services as CBServiceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A list of services on the peripheral that have been discovered.
**Notes:** Returns an array of services (represented by CBService objects) that were discovered on the peripheral through a successful call to the discoverServices method. If you have yet to call the discoverServices method to discover the services of the peripheral, or if there was an error in doing so, the value of this property is nil.

### 22.14.15 setNotifyValue(enabled as Boolean, Characteristic as CBCharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sets notifications or indications for the value of a specified characteristic.
**Notes:** enabled: A Boolean value indicating whether you wish to receive notifications or indications whenever the characteristic,Äôs value changes. true if you want to enable notifications or indications for the characteristic,Äôs value. false if you do not want to receive notifications or indications whenever the characteristic,Äôs value changes.

characteristic: The specified characteristic.

When you enable notifications for the characteristic,Äôs value, the peripheral calls the didUpdateNotificationStateForCharacteristic event to indicate whether or not the action succeeded. If successful, the peripheral then calls the didUpdateValueForCharacteristic event whenever the characteristic value changes. Because it is the peripheral that chooses when to send an update, your app should be prepared to handle them as long as notifications or indications remain enabled. If the specified characteristic is configured to allow both notifications and indications, calling this method enables notifications only. You can disable notifications and indications for a characteristic,Äôs value by calling this method with the enabled parameter set to false.

### 22.14.16 writeValue(data as MemoryBlock, Characteristic as CBCharacteristicMBS, Type as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Writes the value of a characteristic.
**Notes:** data: The value to be written.
characteristic: The characteristic whose value is to be written.
type: The type of write to be executed. For a list of the possible types of writes to a characteristic,Äôs value, see CBCharacteristicWriteType.

When you call this method to write the value of a characteristic, the peripheral calls the didWriteValueForCharacteristic event only if you specified the write type as CBPeripheralMBS.kWriteWithResponse. The response you receive through the didWriteValueForCharacteristic event indicates whether the write was successful; if the write failed, it details the cause of the failure in an error. If you specify the write type as CBCharacteristicWriteWithoutResponse, the write is best-effort and not guaranteed. If the write does not succeed in this case, you are not notified nor do you receive an error indicating the cause of the failure. The data passed into the data parameter is copied, and you can dispose of it after the method returns.
Characteristics may allow only certain type of writes to be performed on their value. To determine which types of writes are permitted to a characteristic,Äôs value, you access the relevant properties of the CBCharacteristicProperties enumeration, which are detailed in CBCharacteristic.
See also:

• 22.14.17 writeValue(data as MemoryBlock, Descriptor as CBDescriptorMBS) 4130

### 22.14.17 writeValue(data as MemoryBlock, Descriptor as CBDescriptorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Writes the value of a characteristic descriptor.
**Notes:** data: The value to be written.
descriptor: The descriptor whose value is to be written.

When you call this method to write the value of a characteristic descriptor, the peripheral calls the peripheral:didWriteValueForDescriptor:error: method of its delegate object. The data passed into the data parameter is copied, and you can dispose of it after the method returns.
You cannot use this method to write the value of a client configuration descriptor (represented by the CBUUIDClientCharacteristicConfigurationString constant), which describes how notification or indications are configured for a characteristic,Äôs value with respect to a client. If you want to manage notifications or indications for a characteristic,Äôs value, you must use the setNotifyValue method instead.
See also:

- 22.14.16 writeValue(data as MemoryBlock, Characteristic as CBCharacteristicMBS, Type as Integer) 4129

### 22.14.18 Properties

### 22.14.19 CanSendWriteWithoutResponse as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** True if the remote device has space to send a write without response.
**Notes:** If this value is false, the value will be set to true after the current writes have been flushed, and IsReadyToSendWriteWithoutResponse event will be called.
(Read only property)

### 22.14.20 Name as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The name of the peripheral.
**Notes:** The value of this property is a string containing the device name of the peripheral. You can access this property to retrieve a human-readable name of the peripheral. There may be two types of names associated with a peripheral: one that the device advertises and another that the device publishes in its database as its Bluetooth low energy Generic Access Profile (GAP) device name. Although this property may contain either type of name, the GAP device name takes priority. This means that if a peripheral has both types of names associated with it, this property returns its GAP device name.

(Read only property)

### 22.14.21 RSSI as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The RSSI, in decibels, of the peripheral.
**Notes:** Returns a number, in decibels, that indicates the RSSI of the peripheral while it is currently connected to the central manager. You can use a connected peripheral,Äôs RSSI property to determine the peripheral,Äôs proximity. The default value of this property is nil and is set the first time you successfully call the readRSSI method.
(Read only property)

### 22.14.22 State as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The current connection state of the peripheral.
**Notes:** The value of this property represents the current connection state of the peripheral. For a list of the possible values of this property, see CBPeripheralState.
(Read only property)

### 22.14.23 Events

### 22.14.24 DidDiscoverCharacteristicsForService(service as CBServiceMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you discover the characteristics of a specified service.
**Notes:** peripheral: The peripheral providing this information.
service: The service that the characteristics belong to.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the discoverCharacteristics method. If the characteristics of the specified service are successfully discovered, you can access them through the service's characteristics property. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.25 DidDiscoverDescriptorsForCharacteristic(characteristic as CBCharacteristicMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you discover the descriptors of a specified characteristic.
**Notes:** peripheral: The peripheral providing this information.
characteristic: The characteristic that the characteristic descriptors belong to.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the discoverDescriptorsForCharacteristic method. If the characteristic descriptors of the specified characteristic are successfully discovered, you can access them through the characteristic,Äôs descriptors property. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.26 DidDiscoverIncludedServicesForService(service as CBServiceMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you discover the included services of a specified service.
**Notes:** peripheral: The peripheral providing this information.
service: The CBService object containing the included service.
error: If an error occurred, the cause of the failure.

This event is invoked when you app calls the discoverIncludedServices method. If the included services of the specified service are successfully discovered, you can access them through the service,Äôs includedServices property. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.27 DidDiscoverServices(error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you discover the peripheral,Äôs available services.
**Notes:** peripheral: The peripheral that the services belong to.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the discoverServices method. If the services of the peripheral are successfully discovered, you can access them through the peripheral,Äôs services property. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.28 DidModifyServices(invalidatedServices() as CBServiceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a peripheral,Äôs services have changed.
**Notes:** invalidatedServices: A list of services that have been invalidated.

This method is invoked whenever one or more services of a peripheral have changed. A peripheral,Äôs services have changed if:

- A service is removed from the peripheral,Äôs database
- A new service is added to the peripheral,Äôs database
- A service that was previously removed from the peripheral,Äôs database is readded to the database at a different location

If you previously discovered any of the services that have changed, they are provided in the invalidatedServices parameter and can no longer be used. You can use the discoverServices method to discover any new services that have been added to the peripheral,Äôs database or to find out whether any of the invalidated services that you were using (and want to continue using) have been added back to a different location in the peripheral,Äôs database.

### 22.14.29 DidOpenL2CAPChannel(channel as CBL2CAPChannelMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Called when channel is opened.

### 22.14.30 DidReadRSSI(RSSI as String, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked after you call readRSSI to retrieve the value of the peripheral,Äôs current RSSI while it is connected to the central manager.
**Notes:** peripheral: The peripheral providing this information.
RSSI: The RSSI, in decibels, of the peripheral.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the readRSSI method. If successful, the error parameter is nil and the parameter RSSI reports the receiver,Äôs signal strength, in decibels. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.31 DidUpdateName

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when a peripheral,Äôs name changes.
**Notes:** The event is invoked whenever the peripheral device,Äôs Generic Access Profile (GAP) device name has changed. Since a peripheral device can change its GAP device name, you can implement this method if your app needs to display the current name of the peripheral device.

### 22.14.32 DidUpdateNotificationStateForCharacteristic(characteristic as CBCharacteristicMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when the peripheral receives a request to start or stop providing notifications for a specified characteristic,Äôs value.
**Notes:** characteristic: The characteristic for which notifications of its value are to be configured.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the setNotifyValue method. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.33 DidUpdateRSSI(error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you retrieve the value of the peripheral,Äôs current RSSI while it is connected to the central manager.
**Notes:** error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the readRSSI method. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.34 DidUpdateValueForCharacteristic(characteristic as CBCharacteristicMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you retrieve a specified characteristic,Äôs value, or when the peripheral device notifies your app that the characteristic,Äôs value has changed.
**Notes:** peripheral: The peripheral providing this information.
characteristic: The characteristic whose value has been retrieved.

error: If an error occurred, the cause of the failure.

This method is invoked when your app calls the readValueForCharacteristic: method, or when the peripheral notifies your app that the value of the characteristic for which notifications and indications are enabled (via a successful call to setNotifyValue for Characteristic) has changed. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.35 DidUpdateValueForDescriptor(descriptor as CBDescriptorMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you retrieve a specified characteristic descriptor,Äôs value.
**Notes:** peripheral: The peripheral providing this information.
descriptor: The characteristic descriptor whose value has been retrieved.
error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the readValueForDescriptor method. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.36 DidWriteValueForCharacteristic(characteristic as CBCharacteristicMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you write data to a characteristic,Äôs value.
**Notes:** peripheral: The peripheral providing this information.
characteristic: The characteristic whose value has been written.
error: If an error occurred, the cause of the failure.

This event is invoked only when your app calls the writeValue for Characteristic method with the CBCharacteristicWriteWithResponse constant specified as the write type. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.37 DidWriteValueForDescriptor(descriptor as CBDescriptorMBS, error as NSErrorMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** Invoked when you write data to a characteristic descriptor,Äôs value.
**Notes:** descriptor: The characteristic descriptor whose value has been written.

error: If an error occurred, the cause of the failure.

This event is invoked when your app calls the writeValue for Descriptor method. If successful, the error parameter is nil. If unsuccessful, the error parameter returns the cause of the failure.

### 22.14.38 IsReadyToSendWriteWithoutResponse

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: .

**Function:** The peripheral providing this update..
**Notes:** This event is invoked after a failed call to writeValue for Characteristic, when peripheral is again ready to send characteristic value updates.

### 22.14.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kWriteWithoutResponse | 1 | One of the constants to specify which type of write is to be performed on a CBCharacteristic.<br>Writes without response. |
| kWriteWithResponse | 0 | One of the constants to specify which type of write is to be performed on a CBCharacteristic.<br>Write with Response. |

States

| Constant | Value | Description |
|---|---|---|
| kStateConnected | 2 | The peripheral is currently connected to the central manager. |
| kStateConnecting | 1 | The peripheral is currently in the process of connecting to the central manager. |
| kStateDisconnected | 0 | The peripheral is currently not connected to the central manager. |
| kStateDisconnecting | 3 | The peripheral is currently in the process of disconnecting from the central manager. |

## 22.15 class CBServiceMBS

### 22.15.1 class CBServiceMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The class for a service.
**Notes:** CBService and its subclass CBMutableService represent a peripheral,Äôs service—a collection of data and associated behaviors for accomplishing a function or feature of a device (or portions of that device). CBService objects in particular represent services of a remote peripheral device (represented by a CBPeripheral object). Services are either primary or secondary and may contain a number of characteristics or included services (references to other services).
Subclass of the CBAttributeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.15.2 Methods

### 22.15.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.7 or newer.

### 22.15.4 characteristics as CBCharacteristicMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A list of characteristics that have been discovered in this service.
**Notes:** This array contains CBCharacteristic objects that represent a service,Äôs characteristics. Characteristics provide further details about a peripheral,Äôs service. For example, a heart rate service may contain one characteristic that describes the intended body location of the device,Äôs heart rate sensor and another characteristic that transmits heart rate measurement data.

### 22.15.5 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.15.6 includedServices as CBServiceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A list of included services that have been discovered in this service.
**Notes:** This array contains CBService objects that represent the included services of a service. A service of a peripheral may contain a reference to other services that are available on the peripheral. These other services are the included services of the service and can be discovered using the discoverIncludedServices method of the CBPeripheral class.

### 22.15.7 Properties

### 22.15.8 isPrimary as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the type of service is primary or secondary.
**Notes:** A peripheral,Äôs service is either primary or secondary. A primary service describes the primary function of a device and can be included by another service. A secondary service describes a service that is relevant only in the context of another service that has referenced it. For example, the primary service of a heart rate monitor may be to expose heart rate data from the monitor,Äôs heart rate sensor, whereas a secondary service may be to expose the sensor,Äôs battery data. If the value of this property is true, the type of service is primary. If the value of this property is false, the type of service is secondary.
(Read only property)

### 22.15.9 peripheral as CBPeripheralMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The peripheral to which this service belongs.
**Notes:** (Read only property)

## 22.16 class CBUUIDMBS

### 22.16.1 class CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The class for UUIDs in CoreBluetooth.
**Notes:** Instances of the CBUUID class represent the 128-bit universally unique identifiers (UUIDs) of attributes used in Bluetooth low energy communication, such as a peripheral,Äôs services, characteristics, and characteristic descriptors. This class provides a number of factory methods for dealing with long UUIDs when developing your app. For example, instead of passing around the string representation of a 128-bit Bluetooth low energy attribute in your code, you can create a CBUUID object that represents it, and pass that around instead.

Though not all UUIDs that identify Bluetooth-specific attributes are predefined by the Bluetooth Special Interest Group (SIG), Bluetooth SIG has defined and published a number of commonly used UUIDs that have been shortened to 16-bits or 32-bits for convenience. The CBUUID class provides methods that automatically transform these predefined shorter UUIDs into their 128-bit equivalent UUIDs. When you create a CBUUID object from a predefined 16-bit or 32-bit UUID, Core Bluetooth pre-fills the rest of the 128-bit UUID with the Bluetooth base UUID, which is defined in the Bluetooth 4.0 specification, Volume 3, Part F, Section 3.2.1.
In addition to providing methods for creating CBUUID objects, this class defines constants that represent the UUIDs of the Bluetooth-defined characteristic descriptors, which are defined in the Bluetooth 4.0 specification, Volume 3, Part G, Section 3.3.3.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.16.2 Methods

### 22.16.3 Available as boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns treu on macOS 10.7 or newer.

### 22.16.4 CBAdvertisementDataIsConnectable as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** A Boolean value that indicates whether the advertising event type is connectable.
The value for this key is a boolean. You can use this value to determine whether a peripheral is connectable at a particular moment.

### 22.16.5 CBAdvertisementDataLocalNameKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** A string containing the local name of a peripheral.

### 22.16.6 CBAdvertisementDataManufacturerDataKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** A memoryblock containing the manufacturer data of a peripheral.

### 22.16.7 CBAdvertisementDataOverflowServiceUUIDsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** An array of one or more CBUUID objects, representing CBService UUIDs that were found in the ‚Äúoverflow‚Äù area of the advertisement data.
Due to the nature of the data stored in this area, UUIDs listed here are ‚Äúbest effort‚Äù and may not always be accurate. For details about the overflow area of advertisement data, see the startAdvertising: method in CBPeripheralManager.

### 22.16.8 CBAdvertisementDataServiceDataKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** A dictionary containing service-specific advertisement data.
The keys are CBUUID objects, representing CBService UUIDs. The values are NSData objects, representing service-specific data.

### 22.16.9 CBAdvertisementDataServiceUUIDsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** An array of service UUIDs.

### 22.16.10 CBAdvertisementDataSolicitedServiceUUIDsKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** An array of one or more CBUUID objects, representing CBService UUIDs.

### 22.16.11 CBAdvertisementDataTxPowerLevelKey as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the keys used in an advertisementData dictionary.
**Notes:** A number containing the transmit power of a peripheral.
This key and value are available if the broadcaster (peripheral) provides its Tx power level in its advertising packet. Using the RSSI value and the Tx power level, it is possible to calculate path loss.

### 22.16.12 CBUUIDCharacteristicAggregateFormatString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the aggregate descriptor.

### 22.16.13 CBUUIDCharacteristicExtendedPropertiesString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the extended properties descriptor.
**Notes:** The corresponding value for this descriptor is a number.

### 22.16.14 CBUUIDCharacteristicFormatString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the presentation format descriptor.
**Notes:** The corresponding value for this descriptor is a memoryblock.

### 22.16.15 CBUUIDCharacteristicUserDescriptionString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the user description descriptor.
**Notes:** The corresponding value for this descriptor is a string.

### 22.16.16 CBUUIDCharacteristicValidRangeString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the valid range descriptor.

### 22.16.17 CBUUIDClientCharacteristicConfigurationString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the client configuration descriptor.
**Notes:** The corresponding value for this descriptor is a number.

### 22.16.18 CBUUIDL2CAPPSMCharacteristicString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** One of the characteristics keys.
**Notes:** The PSM (a little endian uint16_t) of an L2CAP Channel associated with the GATT service containing this characteristic. Servers can publish this characteristic with the UUID ABDD3056-28FA-441D-A470-55A75A52553A

### 22.16.19 CBUUIDServerCharacteristicConfigurationString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The string representation of the UUID for the server configuration descriptor.
**Notes:** The corresponding value for this descriptor is a number.

### 22.16.20 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 22.16.21 copy as CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 22.16.22 isEqual(other as CBUUIDMBS) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Checks whether two UUIDs are equal.
**Notes:** Returns true if both are equal.

### 22.16.23 Operator_Compare(other as CBUUIDMBS) as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Compares two objects for Xojo's comparison operators.

### 22.16.24 UUIDWithData(mem as MemoryBlock) as CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a CBUUID object from a 16-bit, 32-bit, or 128-bit UUID data container.
**Notes:** This method is useful when the UUID of a Bluetooth attribute is formatted in raw bytes.

### 22.16.25 UUIDWithNSUUID(uuid as NSUUIDMBS) as CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a CBUUID object from an NSUUID object.

### 22.16.26 UUIDWithString(s as string) as CBUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a CBUUID object from a 16-bit, 32-bit, or 128-bit UUID string.
**Notes:** Specify 128-bit UUIDs as a string of hexadecimal digits punctuated by hyphens, for example, 68753A44-4D6F-1226-9C60-0050E4C00067. Specify 16-bit or 32-bit UUIDs as a string of 4 or 8 hexadecimal digits, respectively.

### 22.16.27 Properties

### 22.16.28 data as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The data of the UUID.
**Notes:** (Read only property)

### 22.16.29 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.16.30 UUIDString as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The UUID represented as a string.
**Notes:** (Read only property)

## 22.17 class IOBluetoothDeviceInquiryMBS

### 22.17.1 class IOBluetoothDeviceInquiryMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Object representing a device inquiry that finds Bluetooth devices in-range of the computer, and (optionally) retrieves name information for them.
**Notes:** You should only use this object if your application needs to know about in-range devices and cannot use the GUI provided by the IOBluetoothUI framework. It will not let you perform unlimited back-to-back inquiries, but will instead throttle the number of attempted inquiries if too many are attempted within a small window of time.

Important Note: DO NOT perform remote name requests on devices from events or while this object is in use. If you wish to do your own remote name requests on devices, do them after you have stopped this object. If you do not heed this warning, you could potentially deadlock your process.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.17.2 Methods

### 22.17.3 clearFoundDevices

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes all found devices from the inquiry object.

### 22.17.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an inquiry object.
**Notes:** The inquiry is not automatically started. You musts call start on it to start the search for in-range devices.

### 22.17.5 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.17.6 foundDevices as IOBluetoothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns found IOBluetoothDevice objects as an array.
**Notes:** Will not return nil. If there are no devices found, returns an array with length of 0.

### 22.17.7 setSearchCriteria(ServiceClassMajor as Integer, MajorDeviceClass as Integer, MinorDeviceClass as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Use this method to set the criteria for the device search.
**Notes:** inServiceClassMajor: Set the major service class for found devices. Set to kBluetoothServiceClassMajorAny for all devices. See BluetoothAssignedNumbers.h for possible values.
inMajorDeviceClass: Set the major device class for found devices. Set to kBluetoothDeviceClassMajorAny for all devices. See BluetoothAssignedNumbers.h for possible values.
inMinorDeviceClass: Set the minor device class for found devices. Set to kBluetoothDeviceClassMinorAny for all devices. See BluetoothAssignedNumbers.h for possible values.

The default inquiry object will search for all types of devices. If you wish to find only keyboards, for example, you might use this method like this:

setSearchCriteria(kBluetoothServiceClassMajorAny, kBluetoothDeviceClassMajorPeripheral, kBluetoothDeviceClassMinorPeripheral1Keyboard)

However, we recommend only using this if you are certain of the device class you are looking for, as some devices may report a different/unexpected device class, and the search may miss the device you are interested in.

### 22.17.8 Start

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells inquiry object to begin the inquiry and name updating process, if specified.
**Notes:** Sets lasterror to kIOReturnSuccess if start was successful. Returns kIOReturnBusy if the object is already in process. May return other IOReturn values, as appropriate.

Calling start multiple times in rapid succession or back-to-back will probably not produce the intended results. Inquiries are throttled if they are called too quickly in succession.

### 22.17.9 Stop

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Halts the inquiry object.
**Notes:** Could either stop the search for new devices, or the updating of found device names.

Lasterorr is set to kIOReturnSuccess if the inquiry is successfully stopped. Or set to kIOReturnNotPermitted if the inquiry object is already stopped. May set other IOReturn values, as appropriate.

### 22.17.10 Properties

### 22.17.11 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.17.12 inquiryLength as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The length of the inquiry that is performed each time start is used on an inquiry object.
**Notes:** seconds: Number of seconds the inquiry will search for in-range devices before refreshing device names, if specified.

Returns number of seconds the search will be performed.

A default of 10 seconds is used, unless a different value is specified using this method. Note that if you have called -start again too quickly, your inquiry may actually take much longer than what length you specify, as inquiries are throttled in the system. Also note that if you have the inquiry object updating device names for you, the whole inquiry process could be much longer than the specified length, depending on the number of devices found and how responsive to name requests they are. If you -must- have a strict inquiry length, disable name updates. In other words, this ”length” only refers to the actual device discovery portion of the whole inquiry process.
(Read and Write property)

### 22.17.13 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 22.17.14 searchType as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The devices that are found.
**Notes:** searchType: Bluetooth versions the search will discover.

A default of kIOBluetoothDeviceSearchClassic is used, unless a different value is specified using this property.
(Read and Write property)

### 22.17.15 updateNewDeviceNames as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether or not the inquiry object will retrieve the names of devices found during the search.
**Notes:** Pass true if names are to be updated, otherwise pass false.
The default value for the inquiry object is true, unless this property is used to change it.
(Read and Write property)

### 22.17.16 Events

### 22.17.17 Complete(error as Integer, aborted as Boolean)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Inquiry is stopped.
**Notes:** error: Error code. kIOReturnSuccess if the inquiry completed without incident.
aborted: True if user called stop on the inquiry.

When the inquiry is completely stopped, this delegate method will be invoked. It will supply an error code value, kIOReturnSuccess if the inquiry stopped without problem, otherwise a non-kIOReturnSuccess error code will be supplied.

### 22.17.18 DeviceFound(device as IOBluetoothDeviceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** A new device has been found.
**Notes:** You do not need to retain the device - it will be held in the internal storage of the inquiry, and can be accessed later using foundDevices.

### 22.17.19 DeviceNameUpdated(device as IOBluetoothDeviceMBS, devicesRemaining as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** A device name has been retrieved.
**Notes:** Also indicates how many devices are left to be updated.

device: IOBluetoothDevice that was updated.
devicesRemaining: Number of devices remaining to update.

### 22.17.20 Started

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** This event will be delivered when the inquiry actually starts.
**Notes:** Since the inquiry could be throttled, this message may not be received immediately after called -start.

### 22.17.21 UpdatingDeviceNamesStarted(devicesRemaining as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The inquiry has begun updating device names that were found during the search.
**Notes:** devicesRemaining: Number of devices remaining to update.

### 22.17.22 Constants

Search Types

| Constant | Value | Description |
|---|---|---|
| kIOBluetoothDeviceSearchClassic | 1 | Normal Bluetooth |
| kIOBluetoothDeviceSearchLE | 2 | Bluetooth LE |

## 22.18 class IOBluetoothDeviceMBS

### 22.18.1 class IOBluetoothDeviceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An instance of IOBluetoothDevice represents a single remote Bluetooth device.
**Notes:** An IOBluetoothDevice object may exist independent of the existence of a baseband connection with the target device. Using this object, a client can request creation and destruction of baseband connections, and request the opening of L2CAP and RFCOMM channels on the remote device. Many of the other APIs in the IOBluetooth framework will return this object, or it's C counterpart (IOBluetoothDeviceRef).
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.18.2 Methods

### 22.18.3 addToFavorites

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds the target device to the user's favorite devices list.
**Notes:** Lasterror is set to kIOReturnSuccess if the device was successfully added to the user's list of favorite devices.

### 22.18.4 closeConnection

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Close down the baseband connection to the device.
**Notes:** Lasterror is set to kIOReturnSuccess if the connection has successfully been closed.

This method is synchronous and will not return until the connection has been closed (or the command failed). In the future this API will be changed to allow asynchronous operation.

### 22.18.5 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.18.6 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.18.7 deviceWithAddressString(Address as String) as IOBluetoothDeviceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the IOBluetoothDevice object for the given BluetoothDeviceAddress.
**Notes:** Within a single application, there will be only one instance of IOBluetoothDevice for a given remote device address.
The string should be of the form xx:xx:xx:xx:xx:xx

### 22.18.8 favoriteDevices as IOBluetoothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets an array of the user's favorite devices.
**Notes:** Returns an array of device objects representing the user's favorite devices. If the user has no favorites, nil is returned.

### 22.18.9 openConnection

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create a baseband connection to the device.
**Notes:** Lasterror is set to kIOReturnSuccess if the connection was successfully created.

This method is synchronous and will not return until either a connection has been established or the create connection has failed (perhaps timed out).

If authentication or a non-default page timeout is required the method openConnectionAsync() should be used instead.

As of OS X 10.7, this method will no longer mask out "Connection Exists" 'errors' with a success result

code; your code must account for the cases where the baseband connection is already open.

### 22.18.10 openConnectionAsync

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create a baseband connection to the device.
**Notes:** Sets lasterror to kIOReturnSuccess if the connection was successfully created (or if asynchronous, if the CREATE_CONNECTION command was successfully issued).

The open connection call is asynchronous and on completion of the CREATE_CONNECTION command, the connectionCompleted event will be called on the specified target. If no target is specified, the call is synchronous and will not return until the connection is open or the CREATE_CONNECTION call has failed. This call with proceed without authentication required, and using the default page timeout value. If authentication or a non-default page timeout is required the method openConnectionAsync() with timeout should be used instead.

As of OS X 10.7, this method will no longer mask out "Connection Exists" 'errors' with a success result code; your code must account for the cases where the baseband connection is already open.
See also:

- 22.18.11 openConnectionAsync(timeout as integer, authenticationRequired as boolean) 4152

### 22.18.11 openConnectionAsync(timeout as integer, authenticationRequired as boolean)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create a baseband connection to the device with timeout.
**Notes:** Sets lasterror to kIOReturnSuccess if the connection was successfully created (or if asynchronous, if the CREATE_CONNECTION command was successfully issued).

The open connection call is asynchronous and on completion of the CREATE_CONNECTION command, the connectionCompleted event will be called on the specified target. If no target is specified, the call is synchronous and will not return until the connection is open or the CREATE_CONNECTION call has failed.

As of OS X 10.7, this method will no longer mask out "Connection Exists" 'errors' with a success result code; your code must account for the cases where the baseband connection is already open.
See also:

- 22.18.10 openConnectionAsync 4152

### 22.18.12 pairedDevices as IOBluetoothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets an array of all of the paired devices on the system.
**Notes:** Returns an array of device objects for all of the paired devices on the system. If there are no paired devices, nil is returned.

The paired devices are currently NOT stored per user, so this is all devices paired by any user.

### 22.18.13 performSDPQuery

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs an SDP query on the target device.
**Notes:** Lasterror is set to kIOReturnSuccess if the SDP query was successfully started.

As a result of this call, a baseband connection will be built to the device (if not already connected). Then, an L2CAP channel will be opened to the SDP server on the device. At that point, a Service Search Attribute request will be issued with a UUID of 0x0100 (L2CAP) and an attribute range of 0 - &hffff specified. This will cause the SDP server to return all attributes of all L2CAP-derived services on the device. The results essentially encompass all services on the device. This function is always asynchronous.

When the SDP query is complete (or an error is encountered), the SDPQueryCompleted event will be called.

### 22.18.14 recentDevices(numDevices as Integer = 0) as IOBluetoothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets an array of recently used Bluetooth devices.
**Notes:** numDevices: The number of devices to return.

Returns an array of device objects recently used by the system. If no devices have been accessed, nil is returned.

The resulting array contains IOBluetoothDevice objects sorted in reverse chronological order. The most recently accessed devices are first. If the numDevices parameter is 0, all devices accessed by the system are returned. If numDevices is non-zero, only the most recent devices are returned.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.18.15 remoteNameRequest

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Issues a remote name request to the target device.
**Notes:** Lasterror is set to kIOReturnSuccess if the remote name request was successfully issued (and if synchronous, if the request completed successfully).

Later remoteNameRequestCompleted is called with result.

This call with operate with the default page timeout value. If a different page timeout value is desired, please pass pageTimeoutValue parameter.
See also:

- 22.18.16 remoteNameRequest(pageTimeoutValue as Integer) 4154

### 22.18.16 remoteNameRequest(pageTimeoutValue as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Issues a remote name request to the target device.
**Notes:** Lasterror is set to kIOReturnSuccess if the remote name request was successfully issued (and if synchronous, if the request completed successfully).

Later remoteNameRequestCompleted is called with result.

This call with operate with the default page timeout value. If a different page timeout value is desired, please pass pageTimeoutValue parameter.
See also:

- 22.18.15 remoteNameRequest 4154

### 22.18.17 removeFromFavorites

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the target device from the user's favorite devices list.
**Notes:** Lasterror is set to kIOReturnSuccess if the device was successfully removed from the user's list of favorite devices.

This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.18.18 requestAuthentication

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requests that the existing baseband connection be authenticated.
**Notes:** Returns kIOReturnSuccess if the connection has been successfully been authenticated. Returns an error if authentication fails or no baseband connection exists.

In order to authenticate a baseband connection, a link key needs to be generated as a result of the pairing process. This call will synchronously initiate the pairing process with the target device and not return until the authentication process is complete. This API will be updated to allow for asynchronous operation.

### 22.18.19 SendL2CAPEchoRequest(Data as MemoryBlock)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Send an echo request over the L2CAP connection to a remote device.
**Notes:** data: Buffer to send.

Lasterror is set to kIOReturnSuccess if the echo request was able to be sent.

The current implementation returns when the request has been sent, but does not indicate when a response is received. Also, the baseband connection must be up for the echo request to be sent. In the future, this method will also open the connection if necessary. The API will be updated to allow the client to be informed when the echo response has been received (both synchronously and asynchronously).

### 22.18.20 ServiceRecordForUUID(sdpUUID as IOBluetoothSDPUUIDMBS) as IOBluetoothSDPServiceRecordMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Search for a service record containing the given UUID.
**Notes:** sdpUUID: UUID value to search for.

Returns the first service record that contains the given uuid. If no service record is found, nil is returned.

This method searches through the device's services to find a service that contains the given UUID. Only the first service record will be returned. This method only operates on services that have already been queried. It will not initiate a new query. This method should probably be updated to return an array of service records if more than one contains the UUID.

### 22.18.21 services as IOBluetoothSDPServiceRecordMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets an array of service records for the device.
**Notes:** Returns an array of service records for the device if an SDP query has been performed. If no SDP query has been performed, nil is returned.

The resulting array contains IOBluetoothSDPServiceRecord objects. The service records are only present if an SDP query has been done on the target object. This can be determined by calling LastServicesUpdate. It will return the last date/time of the SDP query. To initiate an SDP query on a device, use performSDP-Query: as defined above.
Instead of allowing individual clients to query for different services and service attributes, the system request all of the device's services and service attributes.

### 22.18.22 setSupervisionTimeout(timeout as integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the connection supervision timeout.
**Notes:** timeout: A client-supplied link supervision timeout value to use to monitor the connection. The timeout value should be specified in slots, so you can use the BluetoothGetSlotsFromSeconds macro to get the proper value. e.g. BluetoothGetSlotsFromSeconds( 5.0 ) will give yield the proper number of slots (8000) for 5 seconds.

Sets lasterror to kIOReturnSuccess if it was possible to set the connection supervision timeout.

This method is only available in macOS 10.5 (Bluetooth v2.0) or later.

### 22.18.23 Properties

### 22.18.24 addressString as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the Bluetooth device address for the target device.
**Notes:** (Read only property)

### 22.18.25 classOfDevice as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the full class of device value for the remote device.
**Notes:** This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.26 ClockOffset as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the clock offset value of the device.
**Notes:** This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.27 deviceClassMajor as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the major device class of the device.
**Notes:** This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.28 deviceClassMinor as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the minor service class of the device.
**Notes:** This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.29 EncryptionMode as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the encryption mode for the baseband connection.
**Notes:** Returns the encryption mode for the baseband connection. If no baseband connection is present, kEncryptionDisabled is returned.

This method only returns a valid result if a baseband connection is present (isConnected returns true).
(Read only property)

### 22.18.30 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.18.31 isConnected as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether a baseband connection to the device exists.
**Notes:** Returns true if a baseband connection to the device exists.
(Read only property)

### 22.18.32 isFavorite as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reports whether the target device is a favorite for the user.
**Notes:** Returns true if the target device is a favorite for the user, false if not.
(Read only property)

### 22.18.33 isIncoming as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the device connection was generated by the remote host.
**Notes:** Returns true if the device connection was generated by the remote host. False if the connection was generated by some other device that connected to the local host.
(Read only property)

### 22.18.34 isPaired as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the target device is paired.
**Notes:** Returns true if the target device is paired, false if not.
(Read only property)

### 22.18.35 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 22.18.36 LastInquiryUpdate as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last time the device was returned during an inquiry.
**Notes:** Returns the date/time of the last time the device was seen during an inquiry. If the device has never been seen during an inquiry, nil is returned.
(Read only property)

### 22.18.37 LastInquiryUpdateDateTime as DateTime

MBS Bluetooth Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last time the device was returned during an inquiry.
**Notes:** Returns the date/time of the last time the device was seen during an inquiry. If the device has never been seen during an inquiry, nil is returned.
(Read only property)

### 22.18.38 lastNameUpdate as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last successful remote name request.
**Notes:** (Read only property)

### 22.18.39 lastNameUpdateDateTime as DateTime

MBS Bluetooth Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last successful remote name request.
**Notes:** (Read only property)

### 22.18.40 LastServicesUpdate as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last SDP query.
**Notes:** Returns the date/time of the last SDP query. If an SDP query has never been performed on the device, nil is returned.
(Read only property)

### 22.18.41 LastServicesUpdateDateTime as DateTime

MBS Bluetooth Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the date/time of the last SDP query.
**Notes:** Returns the date/time of the last SDP query. If an SDP query has never been performed on the device, nil is returned.
(Read only property)

### 22.18.42 LinkType as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the link type for the baseband connection.
**Notes:** Returns the link type for the baseband connection. If no baseband connection is present, kBluetoothLinkTypeNone is returned.
(Read only property)

### 22.18.43 name as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the human readable name of the remote device.
**Notes:** This only returns a value if a remote name request has been performed on the target device. If a successful remote name request has not been completed, nil is returned. To perform a remote name request, call remoteNameRequest. If a remote name request has been successfully completed, the method LastNameUpdate will return the date/time of the last successful request.
(Read only property)

### 22.18.44 nameOrAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the human readable name of the remote device.
**Notes:** If the name is not present, it will return a string containing the device's address.

If a remote name request has been successfully completed, the device name will be returned. If not, a string containg the device address in the format of "XX-XX-XX-XX-XX-XX" will be returned.
(Read only property)

### 22.18.45 PageScanMode as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the page scan mode for the device.
**Notes:** Returns the value for the page scan mode for the device.

This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.46 PageScanPeriodMode as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the value of the page scan period mode for the device.
**Notes:** Returns page scan period mode value for the device.

This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of getLastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.47 PageScanRepetitionMode as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the value of the page scan repetition mode for the device.
**Notes:** Returns the page scan repetition mode value for this device.

This value is only meaningful if the target device has been seen during an inquiry. This can be by checking

the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.48 rawRSSI as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the raw RSSI device (if connected).
**Notes:** This value is the perceived RSSI value, not relative the the golden range (see RSSI for that value). This value will not available on all Bluetooth modules. If the value cannot be read (e.g. the device is disconnected) or is not available on a module, a value of +127 will be returned.
(Read only property)

### 22.18.49 RecentAccessDate as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the date/time of the most recent access of the target device.
**Notes:** Returns the date/time of the most recent access of the target device. If the device has not been accessed, nil is returned.

This is the date that recentDevices uses to sort its list of the most recently accessed devices.
This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read only property)

### 22.18.50 RecentAccessDateTime as DateTime

MBS Bluetooth Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the date/time of the most recent access of the target device.
**Notes:** Returns the date/time of the most recent access of the target device. If the device has not been accessed, nil is returned.

This is the date that recentDevices uses to sort its list of the most recently accessed devices.
This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read only property)

### 22.18.51 RSSI as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the RSSI device (if connected), above or below the golden range.
**Notes:** If the RSSI is within the golden range, a value of 0 is returned. For the actual RSSI value, use getRawRSSI. For more information, see the Bluetooth 4.0 Core Specification.

Returns the RSSI of the device. If the value cannot be read (e.g. the device is disconnected), a value of +127 will be returned.
(Read only property)

### 22.18.52 serviceClassMajor as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the major service class of the device.
**Notes:** This value is only meaningful if the target device has been seen during an inquiry. This can be by checking the result of LastInquiryUpdate. If nil is returned, then the device hasn't been seen.
(Read only property)

### 22.18.53 Events

### 22.18.54 connectionCompleted(status as integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Event called when openConnectionAsync completes.

### 22.18.55 remoteNameRequestCompleted(status as integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when remoteNameRequest completes.

### 22.18.56 SDPQueryCompleted(status as integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when performSDPQuery completes.

### 22.18.57 Constants

Link Types

| Constant | Value | Description |
|---|---|---|
| kBluetoothACLConnection | 1 | ACL Connection |
| kBluetoothESCOConnection | 2 | ESCO Connection |
| kBluetoothLinkTypeNone | 255 | None set |
| kBluetoothSCOConnection | 0 | SCO Connection |

Bluetooth Page Scan Modes

| Constant | Value | Description |
|---|---|---|
| kBluetoothPageScanModeMandatory | 0 | Mandatory |
| kBluetoothPageScanModeOptional1 | 1 | Optional 1 |
| kBluetoothPageScanModeOptional2 | 2 | Optional 2 |
| kBluetoothPageScanModeOptional3 | 3 | Optional 3 |

Bluetooth Page Scan Period Modes

| Constant | Value | Description |
|---|---|---|
| kBluetoothPageScanPeriodModeP0 | 0 | P0 |
| kBluetoothPageScanPeriodModeP1 | 1 | P1 |
| kBluetoothPageScanPeriodModeP2 | 2 | P2 |

Bluetooth Page Scan Repetition Modes

| Constant | Value | Description |
|---|---|---|
| kBluetoothPageScanRepetitionModeR0 | 0 | R0 |
| kBluetoothPageScanRepetitionModeR1 | 1 | R1 |
| kBluetoothPageScanRepetitionModeR2 | 2 | R2 |

Encryption Modes

| Constant | Value | Description |
|---|---|---|
| kEncryptionDisabled | 0 | Encryption Disabled |
| kEncryptionForBothPointToPointAndBroadcastPackets | 2 | Encryption for both point to point and broadcast pack |
| kEncryptionOnlyForPointToPointPackets | 1 | Encryption only to point to point packets. |

## 22.19 class IOBluetoothDeviceSelectorControllerMBS

### 22.19.1 class IOBluetoothDeviceSelectorControllerMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A NSWindowController subclass to display a window to initiate pairing to other bluetooth devices.
**Notes:** Implementation of a window controller to return an array of selected bluetooth devices. This class will handle connecting to the Bluetooth Daemon for the purposes of searches, and displaying the results. This controller will return an array of IOBluetoothDevice objects to the user.
Subclass of the NSWindowControllerMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.19.2 Methods

### 22.19.3 addAllowedUUID(allowedUUID as IOBluetoothSDPUUIDMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a UUID to the list of UUIDs that are used to validate the user's selection.
**Notes:** allowedUUID: UUID that a device may contain to be selected

The user's device selection gets validated against the UUIDs passed to addAllowedUUID or addAllowedUUIDArray. Each call to those methods essentially adds a filter that the selected device gets validated with. If any of the filters match, the device is considered valid. If they all fail, the device is not valid and the user is presented with an error code that the device does not support the required services. The UUID passed to addAllowedUUID is the only UUID that must be present in the device's SDP service records. Alternatively, all of the UUIDs in the UUID array passed to addAllowedUUIDArray must be present.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.19.4 addAllowedUUIDArray(allowedUUIDs() as IOBluetoothSDPUUIDMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of UUIDs to the list of UUIDs that are used to validate the user's selection.
**Notes:** allowedUUIDArray: An NSArray of UUIDs that all must be present in a device for it to be selectable.

The user's device selection gets validated against the UUIDs passed to addAllowedUUID or addAllowedUUIDArray. Each call to those methods essentially adds a filter that the selected device gets validated with. If any of the filters match, the device is considered valid. If they all fail, the device is not valid and the user is presented with an error code that the device does not support the required services. The UUID passed to addAllowedUUID is the only UUID that must be present in the device's SDP service records. Alternatively, all of the UUIDs in the UUID array passed to addAllowedUUIDArray must be present.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.19.5 beginSheetModalForWindow(win as DesktopWindow, tag as variant = nil)

MBS Bluetooth Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Runs the device selector panel as a sheet on the target window.
**Notes:** win: Window to attach the device selector panel to as a sheet.

Returns kIOReturnSuccess if the sheet modal session was started.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
See also:

- 22.19.6 beginSheetModalForWindow(win as window, tag as variant = nil) 4166

### 22.19.6 beginSheetModalForWindow(win as window, tag as variant = nil)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the device selector panel as a sheet on the target window.
**Notes:** win: Window to attach the device selector panel to as a sheet.

Returns kIOReturnSuccess if the sheet modal session was started.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
See also:

- 22.19.5 beginSheetModalForWindow(win as DesktopWindow, tag as variant = nil) 4166

### 22.19.7 clearAllowedUUIDs

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets the controller back to the default state where it will accept any device the user selects.
**Notes:** This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.19.8 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new device selector controller.

### 22.19.9 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 22.19.10 Results as IOBluetoothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the result of the user's selection.
**Notes:** Returns an array of IOBluetoothDevice objects corresponding to the user's selection. If the user cancelled the panel, nil will be returned.

There will only be results if the panel has been run, the user has successfully made a selection and that selection has been validated. If kIOBluetoothUISuccess was returned for the session, there should be valid results. Currently only a single device is allowed to be selected, so the results array will only contain one object. However in the future multiple selection will be supported.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.19.11 runModal as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the device selector panel in a modal session to allow the user to select a Bluetooth device.
**Notes:** Returns kIOBluetoothUISuccess if a successful, validated device selection was made by the user. Returns kIOBluetoothUIUserCanceledErr if the user cancelled the panel. These return values are the same as NSRunStoppedResponse and NSRunAbortedResponse respectively. They are the standard values used in a modal session.

The controller will use the panel attributes to filter what devices the user sees. The allowed UUIDs will be used to validate the selection the user makes. Only when a selection has been validated (or the panel cancelled), will this method return.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.19.12 Properties

### 22.19.13 Cancel as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the default/cancel button in the device selector panel.
**Notes:** String that appears in the default/cancel button in the device selector panel.
The prompt text should be localized for best user experience.
NOTE: This method is only available in macOS 10.9 or later.
(Read and Write property)

### 22.19.14 Description as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The description text that appears in the device selector panel.
**Notes:** String that appears in the description section of the device selector panel.
The description text should be localized for best user experience.
NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read and Write property)

### 22.19.15 Header as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The header text that appears in the device selector panel.
**Notes:** String that appears in the description section of the device selector panel.
The description text should be localized for best user experience.
NOTE: This method is only available in macOS 10.9 or later.
(Read and Write property)

### 22.19.16 Options as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The option bits that control the panel's behavior.
**Notes:** The service browser controller options control the behavior of the panel. Currently kIOBluetooth-ServiceBrowserControllerOptionsAutoStartInquiry is the only supported option. In the future more options will be added to control things like whether the connection to the device is closed when the controller is finished or if multiple selection is allowed.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read and Write property)

### 22.19.17 Prompt as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the default/select button in the device selector panel.
**Notes:** String that appears in the default/select button in the device selector panel.
The prompt text should be localized for best user experience.
NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read and Write property)

### 22.19.18 Title as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the device selector panel.
**Notes:** (Read and Write property)

### 22.19.19 Events

### 22.19.20 SheetDone(returnCode as Integer, tag as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Event called when sheet is done.

### 22.19.21 Constants

Result Codes

| Constant | Value | Description |
|---|---|---|
| kIOBluetoothUISuccess | -1000 | Return code for success. |
| kIOBluetoothUIUserCanceledErr | -1001 | Return code for Cancelled. |

Options

| Constant | Value | Description |
|---|---|---|
| kOptionsAutoStartInquiry | 1 | Automatically start an inquiry when the panel is displayed. This has been deprecated in 10.5. |
| kOptionsDisconnectWhenDone | 2 | Disconnect from the device when UI operations are finished. |
| kOptionsNone | 0 | No options set. |

## 22.20 class IOBluetoothHostControllerMBS

### 22.20.1 class IOBluetoothHostControllerMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This class is a representation of a Bluetooth Host Controller Interface that is present on the local computer (either plugged in externally or available internally).
**Notes:** This object can be used to ask a Bluetooth HCI for certain pieces of information, and be used to make it perform certain functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.20.2 Methods

### 22.20.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the default HCI controller object.

### 22.20.4 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.20.5 setClassOfDevice(classOfDevice as Integer, seconds as double)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the current class of device value, for the specified amount of time.
**Notes:** Note that the time interval *must* be set and valid. The range of acceptable values is 30-120 seconds. Anything above or below will be rounded up, or down, as appropriate.

Lasterror is set to 0 on success.

### 22.20.6 Properties

### 22.20.7 addressAsString as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience routine to get the HCI controller's Bluetooth address as an NSString object.
**Notes:** Returns empty string if the address could not be retrieved.
(Read only property)

### 22.20.8 classOfDevice as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the current class of device value.
**Notes:** (Read only property)

### 22.20.9 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.20.10 nameAsString as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the "friendly" name of HCI controller.
**Notes:** Returns string with the device name, nil if there is not one or it cannot be read.
(Read only property)

### 22.20.11 powerState as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the controller power state
**Notes:** The current controller's power state. This will be 1 for on, or 0 for off. Only Apple Bluetooth adapters support power off
(Read only property)

### 22.20.12 Events

### 22.20.13 PoweredOff

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Event for power change and new state is off.

### 22.20.14 PoweredOn

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Event for power change and new state is on.

### 22.20.15 readLinkQualityForDeviceCompleted(device as IOBluetoothDeviceMBS, HCILinkQuality as Integer, error as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** This event gets invoked when an read link quality command complete event occurs.
**Notes:** This could occur because you invoked it by issuing an readLinkQualityForDevice command, or someone else did from another app on the same controller.

### 22.20.16 readRSSIForDeviceCompleted(device as IOBluetoothDeviceMBS, HCIRSSIValue as Integer, error as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** This event gets invoked when an RSSI command complete event occurs.
**Notes:** This could occur because you invoked it by issuing an readRSSIForDevice command, or someone else did from another app on the same controller.

## 22.21 class IOBluetoothRFCOMMChannelMBS

### 22.21.1 class IOBluetoothRFCOMMChannelMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An instance of this class represents an rfcomm channel as defined by the Bluetooth SDP spec.
**Notes:** An RFCOMM channel object can be obtained by opening an rfcomm channel in a device, or by requesting a notification when a channel is created (this is commonly used to provide services).
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.21.2 Methods

### 22.21.3 closeChannel

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Close the channel.
**Notes:** Lasterror is set to error code value. 0 if successful.

### 22.21.4 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 22.21.5 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.21.6 openRFCOMMChannelAsync(device as IOBluetoothDeviceMBS, channelID as Integer) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens a new RFCOMM channel to the target device. Returns immediately.
**Notes:** channelID: The RFCOMM channel ID for the new channel.

Lasterror is set tokIOReturnSuccess if the open process was successfully started (or if an existing RFCOMM channel was found). The channel must be released when the caller is done with it.

This method will begin the process of opening a new RFCOMM channel to the target device. The baseband connection to the device will be opened if it is not open already. The RFCOMM channel open process will not complete until the client has registered an incoming data listener on the new channel. The RFCOMM channel object is already retained when this function returns success; the channel must be released when the caller is done with it.
You should verify that the channel you wish to open exists on the remote device before attempting to open it, by performing an SDP query. This is recommended because the service might have been removed from the, remote device or the channel assignments for the service could have changed (this is rare, but it does happen frequently on some devices). This also works around a bug that existed in early Leopard versions in certain situations where the method would return an error; in these instances, the desired RFCOMM channel could not be opened again until the calling app was restarted.

NOTE: This method is only available in macOS 10.2.5 (Bluetooth v1.2) or later.

### 22.21.7 openRFCOMMChannelSync(device as IOBluetoothDeviceMBS, channelID as Integer) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens a new RFCOMM channel to the target device.
**Notes:** Returns only once the channel is open or failed to open.

channelID: The RFCOMM channel ID for the new channel.

Returns kIOReturnSuccess if the open process was successfully started (or if an existing RFCOMM channel was found). The channel must be released when the caller is done with it.

This method will begin the process of opening a new RFCOMM channel to the target device. The baseband connection to the device will be opened if it is not open already. The RFCOMM channel open process will not complete until the client has registered an incoming data listener on the new channel. The RFCOMM channel object is already retained when this function returns success; the channel must be released when the caller is done with it.
You should verify that the channel you wish to open exists on the remote device before attempting to open it, by performing an SDP query. This is recommended because the service might have been removed from the, remote device or the channel assignments for the service could have changed (this is rare, but it does happen frequently on some devices). This also works around a bug that existed in early Leopard versions

in certain situations where the method would return an error; in these instances, the desired RFCOMM channel could not be opened again until the calling app was restarted.

NOTE: This method is only available in macOS 10.2.5 (Bluetooth v1.2) or later.

### 22.21.8 sendRemoteLineStatus(lineStatus as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends an error to the remote side.
**Notes:** lineStatus: the error type. The error code can be NoError, OverrunError, ParityError or FramingError.

Lasterror is set to an error code value. 0 if successful.

### 22.21.9 setSerialParameters(speed as Integer, dataBits as Integer, parity as Integer, stopBits as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changes the parameters of the serial connection.
**Notes:** speed: the baudrate.
nBits: number of data bits.
parity: the type of parity can be NoParity, OddParity, EvenParity or MaxParity.
bitStop: number of stop bits.

See kParityType* constants.
Lasterror is set to error code value. 0 if successful.

### 22.21.10 writeAsync(data as MemoryBlock, tag as Variant = nil)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a block of data in the channel asynchronously.
**Notes:** data: The data buffer to be sent.

Lasterror is set to kIOReturnSuccess if the data was buffered successfully.

The number of bytes to be sent must not exceed the channel MTU. If the return value is an error condition none of the data was sent. Once the data has been successfully passed to the hardware to be transmitted,

the WriteCompleted event will be called with the tag that was passed to this method.

NOTE: This method is only available in macOS 10.2.5 (Bluetooth v1.2) or later.

### 22.21.11 writeSync(data as MemoryBlock)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a block of data in the channel synchronously.
**Notes:** data The data buffer to be sent.

Lasterror is set to kIOReturnSuccess if the data was written successfully.

Sends data through the channel. The number of bytes to be sent must not exceed the channel MTU. If the return value is an error condition none of the data was sent. This method will block until the data has been successfully sent to the hardware for transmission (or until an error occurs).

NOTE: This method is only available in macOS 10.2.5 (Bluetooth v1.2) or later.

### 22.21.12 Properties

### 22.21.13 ChannelID as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the object rfcomm channel ID.
**Notes:** (Read only property)

### 22.21.14 Device as IOBluetoothDeviceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Bluetooth Device that carries the rfcomm data.
**Notes:** (Read only property)

### 22.21.15 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.21.16 isIncoming as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the direction of the channel. An incoming channel is one that was opened by the remote device.
**Notes:** Returns true if the channel was opened by the remote device, false if the channel was opened by this object.
(Read only property)

### 22.21.17 isOpen as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the state of the channel.
**Notes:** True if the channel state is open, false otherwise.

note that "not open" means closed, opening and closing.
(Read only property)

### 22.21.18 isTransmissionPaused as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if flow control is off.
**Notes:** True if the action of sending data will block the current thread, false otherwise.

Returns true if the remote device flow control is stopping out transmission. This is useful because we do not buffer data, we stop the transmitting actor. With this method the transmitter can check if sending data is going to be successful or is going to block.
(Read only property)

### 22.21.19 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.

**Notes:** (Read and Write property)

### 22.21.20 MTU as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the channel maximum transfer unit.
**Notes:** Returns the length of the largest chunk of data that this channel can carry. If the caller wishes to use the write:length:sleep: api the length of the data can not be bigger than the channel MTU (maximum transfer unit).
(Read only property)

### 22.21.21 Events

### 22.21.22 Closed

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Channel closed.

### 22.21.23 ControlSignalsChanged

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The control signals changed.

### 22.21.24 DataReceived(data as MemoryBlock, dataLength as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Data received.
**Notes:** If you receive text, please use DefineEncoding to tell Xojo about the text encoding you used.

### 22.21.25 FlowControlChanged

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The flow control changed.

### 22.21.26 OpenCompleted(status as Integer)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The open command finished.
**Notes:** Status is zero for success.

### 22.21.27 QueueSpaceAvailable

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Space is available on queue.

### 22.21.28 WriteCompleted(status as integer, tag as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** Asynchronous write sent.

### 22.21.29 Constants

Line States

| Constant | Value | Description |
|---|---|---|
| kLineStatusFramingError | 3 | Framing Error |
| kLineStatusNoError | 0 | No Error |
| kLineStatusOverrunError | 1 | Overrun Error |
| kLineStatusParityError | 2 | Parity Error |

Parity Types

| Constant | Value | Description |
|---|---|---|
| kParityTypeEvenParity | 2 | Even Parity |
| kParityTypeMaxParity | 3 | Max Parity |
| kParityTypeNoParity | 0 | No Parity |
| kParityTypeOddParity | 1 | Odd Parity |

## 22.22 class IOBluetoothSDPDataElementMBS

### 22.22.1 class IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An instance of this class represents a single SDP data element as defined by the Bluetooth SDP spec.
**Notes:** The data types described by the spec have been mapped onto the base Xojo classes and data types double, Array, Memoryblock as well as IOBluetoothSDPUUID. The number and boolean types (type descriptor 1, 2 and 5) are represented as booleans with the exception of 128-bit numbers which are represented as memoryblock objects in their raw format. The UUID type (type descriptor 3) is represented by IOBluetoothSDPUUID. The string and URL types (type descriptor 4 and 8) are represented by string. The sequence types (type descriptor 6 and 7) are represented by array.

Typically, you will not need to create an IOBluetoothSDPDataElement directly, the system will do that automatically for both client and server operations. However, the current API for adding SDP services to the system does allow the use of an Dictionary based format for creating new services. The purpose for that is to allow a service to be built up completely in a text file (a plist for example) and then easily imported into an app and added to the system without a lot of tedious code to build up the entire SDP service record.

The basis for that dictionary comes from the IOBluetoothSDPDataElement. At its simplest, a data element is made up of three parts: the type descriptor, the size (from which the size descriptor is generated) and the actual value. To provide a complete representation of a data element, an dictionary with three entries can be used. Each of the three entries has a key/value pair representing one of the three attributes of a data element. The first key/value pair has a key 'DataElementType' that contains a number value with the actual type descriptor for the data element. The second pair has a key 'DataElementSize' that contains the actual size of the element in bytes. The size descriptor will be calculated based on the size and type of the element. The third pair is the value itself whose key is 'DataElementValue' and whose type corresponds to the type mapping above.
In addition to this complete description of a data element, their are some shortcuts that can be used for some of the common types and sizes.
If the 'DataElementType' value is one of the numeric types (1, 2), the 'DataElementValue' can be an memoryblock instead of an number. In that case, the numeric data is taken in network byte order (MSB first). Additionally, the 'DataElementSize' parameter may be omitted and the size will be taken from the length of the data object.
If the 'DataElementType' value is the nil type (0), no 'DataElementSize' or 'DataElementValue' entries are needed.
If the 'DataElementType' value is any of the other types, the 'DataElementSize' entry is not needed since the size will be taken directly from the value (data, array, string).
In the case where the element is an unsigned, 32-bit integer (type descriptor 1, size descriptor 4), the value itself may simply be a number (instead of a dictionary as in the previous examples). In the case where the element is a UUID (type descriptor 3), the value itself may be a data object. The UUID type will be inferred and the size taken from the length of the data object.

In the case where the element is a text string (type descriptor 4), the value may be a string object. The text

string type will be inferred and the size taken from the length of the string.
In the case where the element is a data element sequence, the value may be an array object. The type will be inferred and the size taken from the length of the array. Additionally, the array must contain sub-elements that will be parsed out individually.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.22.2 Methods

### 22.22.3 Constructor(type as Integer, SizeDescriptor as Integer, Size as Integer, value as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new IOBluetoothSDPDataElement with the given attributes.
**Notes:** type: The type descriptor for the data element.
sizeDescriptor: The size descriptor for the data element (verify it matches the size parameter).
size: The size of the data element in bytes (make sure it is a valid size for the given size descriptor).
value: The raw value itself. This must be the base string, number, Array or Memoryblock objects. It may not be Dictionary. If a dictionary format is present, use other Constructor.

Warning - be careful using this method. There is next to no error checking done on the attributes. It is entirely possible to construct an invalid data element. It is recommended that other Constructor be used instead of this one.
See also:

- 22.22.4 Constructor(value as Variant) 4182

### 22.22.4 Constructor(value as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new IOBluetoothSDPDataElement with the given value.
**Notes:** value: The data element value of one of the specified types.

The value must follow the format listed above and must be an instance of Memoryblock, string, number, array, dictionary, IOBluetoothSDPUUID.
See also:

- 22.22.3 Constructor(type as Integer, SizeDescriptor as Integer, Size as Integer, value as Variant) 4182

### 22.22.5 containsDataElement(value as IOBluetoothSDPDataElementMBS) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Checks to see if the target data element is the same as the dataElement parameter or if it contains the dataElement parameter (if its a sequence type).
**Notes:** dataElement: The data element to compare with (and search for).

Returns true if the target either matches the given data element or if it contains the given data element.

If the target data element is not a sequence type, this method simply compares the two data elements. If it is a sequence type, it will search through the sequence (and sub-sequences) for the dataElement parameter.

### 22.22.6 containsValue(value as variant) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Checks to see if the target data element's value is the same as the value parameter or if it contains the value parameter.
**Notes:** value: The value to compare with (and search for).

Returns true if the target's value either matches the given value or if it contains the given value.

This method works just like containsDataElement except that it is comparing the value objects directly.

### 22.22.7 withElementValue(value as variant) as IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new IOBluetoothSDPDataElement with the given value.
**Notes:** element: The data element value of one of the specified types.

Returns the newly allocated data element object. Returns nil if there was an error parsing the element value. The returned IOBluetoothSDPDataElement object has been autoreleased, so it is not necessary for the caller to release it. If the object is to be referenced and kept around, retain should be called.

The value must follow the format listed above and must be an instance of memory block, String, number, Array, Dictionary, IOBluetoothSDPUUID.

### 22.22.8 withType(type as Integer, SizeDescriptor as Integer, Size as Integer, Value as variant) as IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new IOBluetoothSDPDataElement with the given attributes.
**Notes:** typeDescriptor: The type descriptor for the data element.
sizeDescriptor: The size descriptor for the data element (verify it matches the size parameter).
size: The size of the data element in bytes (make sure it is a valid size for the given size descriptor).
value: The raw value itself. This must be the base string, number, array or memoryblock objects. It may not be Dictionary. If a dictionary format is present, use other Constructor.

Returns the newly allocated data element object. Returns nil if an error is encountered (not likely due to the limited error checking currently done).

Warning - be careful using this method. There is next to no error checking done on the attributes. It is entirely possible to construct an invalid data element. It is recommended that Constructor be used instead of this one.

### 22.22.9 Properties

### 22.22.10 DataValue as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the data element is represented by a data object, it returns the value as an MemoryBlock.
**Notes:** Returns an MemoryBlock representation of the data element if it is a 128-bit number.
The data types represented by a data object are 128-bit versions of 1 (unsigned int) and 2 (signed int).
(Read only property)

### 22.22.11 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.22.12 NumberValue as Double

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the data element is represented by a number, it returns the value as a double.
**Notes:** The data types represented by a number are 1 (unsigned int), 2 (signed int) and 5 (boolean) except for 128-bit versions of 1 and 2.
(Read only property)

### 22.22.13 Size as UInt32

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the size in bytes of the target data element.
**Notes:** The size is valid whether the data element has a fixed or variable size descriptor.
(Read only property)

### 22.22.14 SizeDescriptor as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the SDP spec defined data element size descriptor for the target data element.
**Notes:** Returns the size descriptor for the target data element.
(Read only property)

### 22.22.15 StringValue as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the data element is represented by a string object, it returns the value as a string.
**Notes:** Returns an String representation of the data element if it is a text or URL type.
The data types represented by a string object are 4 (text string) and 8 (URL).
(Read only property)

### 22.22.16 TypeDescriptor as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the SDP spec defined data element type descriptor for the target data element.
**Notes:** Returns the type descriptor for the target data element.
(Read only property)

### 22.22.17 UUIDValue as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the data element is a UUID (type 3), it returns the value as an IOBluetoothSDPUUID.
**Notes:** Returns an IOBluetoothSDPUUID representation of the data element if it is a UUID.
(Read only property)

### 22.22.18 Value as Variant

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the object value of the data element.
**Notes:** The value returned may be an Number, String, Data, Array or IOBluetoothSDPDataElement depending on the type of the data element.
(Read only property)

### 22.22.19 Constants

Types

| Constant | Value | Description |
|---|---|---|
| kTypeBoolean | 5 | Boolean |
| kTypeNil | 0 | Nil |
| kTypeReservedEnd | 31 | End of reserved numbers |
| kTypeReservedStart | 9 | Begin of reserved numbers. |
| kTypeSignedInt | 2 | Signed integer |
| kTypeString | 4 | String |
| kTypeUnsignedInt | 1 | Unsigned integer |
| kTypeURL | 8 | URL |
| kTypeUUID | 3 | UUID |

DataElement Types

| Constant | Value | Description |
|---|---|---|
| kTypeDataElementAlternative | 7 | Alternative |
| kTypeDataElementSequence | 6 | Sequence |

## 22.23 class IOBluetoothSDPServiceAttributeMBS

### 22.23.1 class IOBluetoothSDPServiceAttributeMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** IOBluetoothSDPServiceAttribute represents a single SDP service attribute.
**Notes:** A service attribute contains two components: an attribute ID and a data element.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.23.2 Methods

### 22.23.3 Constructor(AttributeID as Integer, value as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new service attribute with the given ID and data element.
**Notes:** attributeID: The attribute ID of the new service attribute.
attributeElement: The data element value of the new service attribute.

Returns self if successful. Returns nil if there was an error.

### 22.23.4 withID(AttributeID as Integer, value as Variant) as IOBluetoothSDPServiceAttributeMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new service attribute with the given ID and element value.
**Notes:** attributeID: The attribute ID of the new service attribute.
attributeElementValue: The data element value of the new service attribute

Returns the newly allocated service attribute object. Returns nil if there was an error parsing the element value. The returned IOBluetoothSDPDataElement object has been autoreleased, so it is not necessary for the caller to release it. If the object is to be referenced and kept around, retain should be called.

### 22.23.5 Properties

### 22.23.6 AttributeID as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the attribute ID for the target service attribute.
**Notes:** (Read only property)

### 22.23.7 DataElement as IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the data element for the target service attribute.
**Notes:** (Read only property)

### 22.23.8 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.23.9 IDDataElement as IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the data element representing the attribute ID for the target service attribute.
**Notes:** (Read only property)

## 22.24 class IOBluetoothSDPServiceRecordMBS

### 22.24.1 class IOBluetoothSDPServiceRecordMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An instance of this class represents a single SDP service record.
**Notes:** As a service record, an instance of this class has an NSDictionary of service attributes. It also has a link to the IOBluetoothDevice that the service belongs to. The service dictionary is keyed off of the attribute ID of each attribute represented as a number.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.24.2 Methods

### 22.24.3 AttributeDataElement(attributeID as Integer) as IOBluetoothSDPDataElementMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the data element for the given attribute ID in the target service.
**Notes:** attributeID: The attribute ID of the desired attribute.

Returns the data element for the given attribute ID in the target service. If the service does not contain an attribute with the given ID, then nil is returned.

### 22.24.4 Constructor(dic as Dictionary, device as IOBluetoothDeviceMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an initialized IOBluetoothSDPServiceRecord with the attributes specified in the provided service dictionary.
**Notes:** Provide a pointer to an IOBlueotothDevice if you wish to associate the record to a specific IOBluetoothDevice.

### 22.24.5 hasServiceFromArray(uuids() as IOBluetoothSDPUUIDMBS) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if any one of the UUIDs in the given array is found in the target service.
**Notes:** array: An array of IOBluetoothSDPUUID objects to search for in the target service.

Returns true if any of the given UUIDs are present in the service.

The given array should contain IOBluetoothSDPUUID objects. It is currently implemented such that it returns TRUE if any of the UUIDs are found. However in the future, it is likely that this will change to more closely match the functionality in the SDP spec so that it only returns TRUE if all of the given UUIDs are present. That way, both AND and OR comparisons can be implemented. Please make a note of this potential change.

### 22.24.6 matchesSearchArray(uuids() as IOBluetoothSDPUUIDMBS) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true any of the UUID arrays in the search array match the target service.
**Notes:** array: An Array of NSArrays of IOBluetoothSDPUUID objects.

Returns true if any of the UUID arrays match.

The given array should contain NSArray objects. Each sub-NSArray should contain IOBluetoothSDPUUID objects. In turn, each sub-NSArray gets passed to matchesUUIDArray If any of those returns true, then the search stops and true is returned. Essentially the master array contains the OR operations and each sub-array contains the AND operations.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.24.7 matchesUUID16(uuid16 as UInt16) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true the UUID16 is found in the target service.
**Notes:** uuid16: A BluetoothSDPUUID16 to search for in the target service.

Returns true if the UUID16 is present in the service.

NOTE: This method is only available in macOS 10.7 or later.

### 22.24.8 matchesUUIDArray(uuids() as IOBluetoothSDPUUIDMBS) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if ALL of the UUIDs in the given array is found in the target service.
**Notes:** array: An Array of IOBluetoothSDPUUID objects to search for in the target service.

Returns true if all of the given UUIDs are present in the service.

The given array should contain IOBluetoothSDPUUID objects. It only returns true if all of the UUIDs are found. This method is like hasServiceFromArray: except that it requires that all UUIDs match instead of any of them matching.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.24.9 publishedServiceRecordWithDictionary(dic as Dictionary) as IOBluetoothSDPServiceRecordMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a service to the local SDP server.
**Notes:** serviceDict: A dictionary containing the attributes for the new service

Returns an IOBluetoothSDPServiceRecord * with the attributes specified in the provided dictionary.

Each entry in the dictionary representing the service contains the individual attributes. Each attribute in the dict is keyed by a string that must begin with a hex number representing the attribute ID. The key string may contain additional characters if desired as long as they follow a space after the ID hex string. The attribute value must follow the dictionary format described by IOBluetoothSDPDataElement. This dictionary format allows a service dict to be created as a plist file and then loaded into the system rather than built up in code. See the example code for an example of how can be done.
If the service record handle, L2CAP PSM or RFCOMM channel ID specified in the dictionary are in use, an alternate one will be assigned.
In addition to attributes that represent the service itself, additional attributes may be specified that control the local behavior of the service. To specify these local attributes, an additional property titled "LocalAttributes" may be added to the root of the service dict. The value of this property must be a dictionary that contains the individual local attributes.
Currently, only two local attributes are supported: "Persistent" and "TargetApplication".
The "Persistent" local attribute must be either a boolean or number representing whether the service should be persistent. A persistent service will be saved off and restored any time the Bluetooth hardware is present. It will persist through reboots and can only be removed by calling IOBluetoothRemoveServiceWithRecordHandle(). This attribute is optional. By default, if no "Persistent" local property is present, the service will only exist temporarily. It will be removed either when IOBluetoothRemoveServiceWithRecordHandle() is called or when the client application exits.
The "TargetApplication" local attribute is used to specify an application to be launched when a remote device attempts to connect to the service (by opening either an L2CAP or RFCOMM channel of the type specified in the service). This value must be a string representing the absolute path to the target executable (not just

the .app wrapper - i.e. /System/Library/CoreServices/OBEXAgent.app/Contents/MacOS/OBEXAgent). This attribute is optional. If no "TargetApplication" local attribute is specified, no special action will take place when an incoming connection to the service is created. It is up to the client to be monitoring for the connection and to do the right thing when one appears.
The "LocalAttributes" property is optional. If it is not specified, by default the created service is transient and will be removed when the client exits.
Additional local attributes to further control incoming services will be added in the future.

### 22.24.10 removeServiceRecord

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the service from the local SDP server.
**Notes:** Lasterror is set.

### 22.24.11 RFCOMMChannelID as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Allows the discovery of the RFCOMM channel ID assigned to the service.
**Notes:** Returns the location that will get the found RFCOMM channel ID.

Lasterror is set to kIOReturnSuccess if the channel ID is found.

This method will search through the ProtoclDescriptorList attribute to find an entry with the RFCOMM UUID (UUID16: 0x0003). If one is found, it gets the second element of the data element sequence and sets the rfcommChannelID pointer to it. The channel ID only gets set when kIOReturnSuccess is returned.

### 22.24.12 sortedAttributes as IOBluetoothSDPServiceAttributeMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a sorted array of SDP attributes.
**Notes:** This method will walk all the elements of the service record and return an array of IOBluetoothSDPServiceAttribute objects sorted by attributeID.

### 22.24.13 withServiceDictionary(dic as Dictionary, device as IOBluetoothDeviceMBS) as IOBluetoothSDPServiceRecordMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an IOBluetoothSDPServiceRecord * with the attributes specified in the provided service dictionary.
**Notes:** Provide an IOBlueotothDevice if you wish to associate the record to a specific IOBluetoothDevice.

### 22.24.14 Properties

### 22.24.15 Device as IOBluetoothDeviceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the IOBluetoothDevice that the target service belongs to.
**Notes:** Returns the IOBluetoothDevice that the target service belongs to. If the service is one the local host is vending, then nil is returned.
If the service is a local service (i.e. one the current host is vending out), then nil is returned.
(Read only property)

### 22.24.16 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.24.17 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The lasterror code.
**Notes:** (Read and Write property)

### 22.24.18 Properties as Dictionary

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSDictionary containing the attributes for the service.
**Notes:** The attribute dictionary is keyed off of the attribute id represented as an NSNumber. The values in the NSDictionary are IOBluetoothSDPDataElement objects representing the data element for the given attribute.
(Read only property)

### 22.24.19 ServiceName as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name of the service.
**Notes:** This is currently implemented to simply return the attribute with an id of 0x0100. In the future, it will be extended to allow name localization based on the user's chosen language or other languages.
(Read only property)

## 22.25 class IOBluetoothSDPUUIDMBS

### 22.25.1 class IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Represents a UUID as defined in the Bluetooth SDP spec.
**Notes:** The IOBluetoothSDPUUID class can represent a UUID of any valid size (16, 32 or 128 bits). It provides the ability to compare two UUIDs no matter what their size as well as the ability to promote the size of a UUID to a larger one.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.25.2 Methods

### 22.25.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Private constructor.

### 22.25.4 isEqualToUUID(other as IOBluetoothSDPUUIDMBS) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares the target IOBluetoothSDPUUID object with the given otherUUID object.
**Notes:** other: The UUID object to be compared with the target.

Returns true if the UUID values of each object are equal. This includes the case where the sizes are different but the data itself is the same when the Bluetooth UUID base is applied.

This method will compare the two UUID values independent of their length.

### 22.25.5 uuid16(value as UInt16) as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new 16-bit IOBluetoothSDPUUID with the given UUID16.

### 22.25.6 uuid32(value as UInt32) as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new 32-bit IOBluetoothSDPUUID with the given UUID32.

### 22.25.7 uuidWithData(mem as MemoryBlock) as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new IOBluetoothSDPUUID object from the given memoryblock.
**Notes:** Returns the new IOBluetoothSDPUUID object or nil on failure.
If the length of the memoryblock is invalid for a UUID, nil is returned.

### 22.25.8 UUIDWithLength(length as Integer) as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an IOBluetoothSDPUUID object matching the target UUID, but with the given number of bytes.
**Notes:** Returns an IOBluetoothSDPUUID object with the same data as the target but with the given length if it is possible to do so. Otherwise, nil is returned.

If the target object is the same length as newLength, it returns itself. If newLength is greater it creates a new IOBluetoothSDPUUID object with the correct value for the given length. If newLength is smaller, it will attempt to create a new IOBluetoothSDPUUID that is smaller if the data matches the Bluetooth UUID base. This downconversion is currently unimplemented.

### 22.25.9 uuidWithUUID(UUID as String) as IOBluetoothSDPUUIDMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new IOBluetoothSDPUUID with the given UUID

### 22.25.10 Properties

### 22.25.11 Data as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries data as memoryblock.
**Notes:** (Read only property)

### 22.25.12 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.25.13 Length as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries length of data.
**Notes:** (Read only property)

## 22.26 class IOBluetoothServiceBrowserControllerMBS

### 22.26.1 class IOBluetoothServiceBrowserControllerMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** A NSWindowController subclass to display a window to search for and perform SDP queries on bluetooth devices within range.
**Notes:** This NSWindowController subclass will bring up a generic Bluetooth search and SDP browsing window allowing the user to find devices within range, perform SDP queries on a particular device, and select a SDP service to connect to. The client application can provide NSArrays of valid service UUIDs to allow, and an NSArray of valid device types to allow. The device type filter is not yet implemented.
Subclass of the NSWindowControllerMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.26.2 Methods

### 22.26.3 addAllowedUUID(allowedUUID as IOBluetoothSDPUUIDMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a UUID to the list of UUIDs that are used to validate the user's selection.
**Notes:** allowedUUID: UUID that a device may contain to be selected

The user's device selection gets validated against the UUIDs passed to addAllowedUUID or addAllowedUUIDArray. Each call to those methods essentially adds a filter that the selected device gets validated with. If any of the filters match, the device is considered valid. If they all fail, the device is not valid and the user is presented with an error code that the device does not support the required services. The UUID passed to addAllowedUUID is the only UUID that must be present in the device's SDP service records. Alternatively, all of the UUIDs in the UUID array passed to addAllowedUUIDArray must be present.
NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.26.4 addAllowedUUIDArray(allowedUUIDs() as IOBluetoothSDPUUIDMBS)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of UUIDs to the list of UUIDs that are used to validate the user's selection.
**Notes:** allowedUUIDArray: An NSArray of UUIDs that all must be present in a device for it to be selectable.

The user's device selection gets validated against the UUIDs passed to addAllowedUUID or addAllowedUUIDArray. Each call to those methods essentially adds a filter that the selected device gets validated with. If any of the filters match, the device is considered valid. If they all fail, the device is not valid and the user is presented with an error code that the device does not support the required services. The UUID passed to addAllowedUUID is the only UUID that must be present in the device's SDP service records. Alternatively, all of the UUIDs in the UUID array passed to addAllowedUUIDArray must be present.
NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.26.5 beginSheetModalForWindow(win as DesktopWindow, tag as variant = nil)

MBS Bluetooth Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Runs the service browser panel as a sheet on the target window.
**Notes:** sheetWindow: NSWindow to attach the service browser panel to as a sheet.
Tag is passed to event.

Sets lasterror to kIOReturnSuccess if the sheet modal session was started.
See also:

- 22.26.6 beginSheetModalForWindow(win as window, tag as variant = nil) 4199

### 22.26.6 beginSheetModalForWindow(win as window, tag as variant = nil)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the service browser panel as a sheet on the target window.
**Notes:** sheetWindow: NSWindow to attach the service browser panel to as a sheet.
Tag is passed to event.

Sets lasterror to kIOReturnSuccess if the sheet modal session was started.
See also:

- 22.26.5 beginSheetModalForWindow(win as DesktopWindow, tag as variant = nil) 4199

### 22.26.7 clearAllowedUUIDs

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets the controller back to the default state where it will accept any device the user selects.
**Notes:** This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.26.8 Constructor(options as Integer = 0)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Allocator work Bluetooth Service Browser window controller.
**Notes:** Options: Bit field for options to set in the newly allocated controller. Currently no options are available.

### 22.26.9 Destructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 22.26.10 Results as IOBluetoothSDPServiceRecordMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the result of the user's selection.
**Notes:** Returns an NSArray of IOBluetoothSDPServiceRecord objects corresponding to the user's selection. If the user cancelled the panel, nil will be returned.

There will only be results if the panel has been run, the user has successfully made a selection and that selection has been validated. If kIOBluetoothUISuccess was returned for the session, there should be valid results. Currently only a single device is allowed to be selected, so the results array will only contain one object. However in the future multiple selection will be supported.

This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.26.11 runModal as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the service browser panel in a modal session to allow the user to select a service on a Bluetooth device.
**Notes:** Returns kIOBluetoothUISuccess if a successful, validated service selection was made by the user. Returns kIOBluetoothUIUserCanceledErr if the user cancelled the panel. These return values are the same as NSRunStoppedResponse and NSRunAbortedResponse respectively. They are the standard values used in a modal session.

The controller will use the panel attributes to filter what devices the user sees. The allowed UUIDs will be

used to validate the selection the user makes. The user will only be able to select services that match the allowed UUIDs. Only when a selection has been validated (or the panel cancelled), will this method return.

NOTE: This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

### 22.26.12 Properties

### 22.26.13 Description as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The description text that appears in the device selector panel.
**Notes:** The description text should be localized for best user experience.
This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read and Write property)

### 22.26.14 Options as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The options for the window controller.
**Notes:** This method will set the options for the browser to new values.
(Read and Write property)

### 22.26.15 Prompt as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the default/select button in the device selector panel.
**Notes:** The prompt text should be localized for best user experience.
This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.
(Read and Write property)

### 22.26.16 Title as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the device selector panel
**Notes:** The panel title should be localized for best user experience.
This method is only available in macOS 10.2.4 (Bluetooth v1.1) or later.

(Read and Write property)

### 22.26.17 Events

### 22.26.18 SheetDone(returnCode as Integer, tag as Variant)

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when sheet is dismissed.
**Notes:** The returnCode parameter will either be kIOBluetoothUISuccess or kIOBluetoothUIUserCancelled-Err as described.

### 22.26.19 Constants

Result Codes

| Constant | Value | Description |
|---|---|---|
| kIOBluetoothUISuccess | -1000 | |
| kIOBluetoothUIUserCanceledErr | -1001 | |

Options

| Constant | Value | Description |
|---|---|---|
| kOptionsAutoStartInquiry | 1 | Automatically start an inquiry when the panel is displayed. This has been deprecated in 10.5 |
| kOptionsDisconnectWhenDone | 2 | Disconnect from the device when UI operations are finished. |
| kOptionsNone | 0 | No options set. |

## 22.27 class WindowsBluetoothDeviceIdMBS

### 22.27.1 class WindowsBluetoothDeviceIdMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a bluetooth device ID.
**Notes:** Requires Windows 10 Fall Creators Update (introduced in 10.0.16299.0)
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr2
- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

### 22.27.2 Methods

### 22.27.3 Constructor(ID as String)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a BluetoothDeviceId object from the device ID.

### 22.27.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.27.5 FromID(ID as String) as WindowsBluetoothDeviceIdMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a BluetoothDeviceId object from the device ID.
**Notes:** Returns nil in case of an error.

### 22.27.6 Properties

### 22.27.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.27.8 Id as String

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the bluetooth device ID.
**Notes:** (Read only property)

### 22.27.9 IsClassicDevice as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a boolean indicating if this is a classic device.
**Notes:** (Read only property)

### 22.27.10 IsLowEnergyDevice as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a boolean indicating if this is a LowEnergy device.
**Notes:** (Read only property)

## 22.28 class WindowsBlueToothDeviceInfoMBS

### 22.28.1 class WindowsBlueToothDeviceInfoMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This class provides information about a Bluetooth device.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.28.2 Methods

### 22.28.3 Devices(SearchParameters as WindowsBlueToothDeviceSearchParameterMBS) as WindowsBlueToothDeviceInfoMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Enumerates Bluetooth devices.
**Example:**

```
dim p as new WindowsBlueToothDeviceSearchParameterMBS
p.ReturnAuthenticated = true
p.ReturnConnected = true
p.ReturnRemembered = true
p.ReturnUnknown = true
p.TimeoutMultiplier = 10
p.IssueInquiry = true

dim devices() as WindowsBlueToothDeviceInfoMBS = WindowsBlueToothDeviceInfoMBS.Devices(p)

Break // see in debugger
```

**Notes:** SearchParameters can define search parameters.

see also:
https://msdn.microsoft.com/en-us/library/windows/desktop/aa362784(v=vs.85).aspx

### 22.28.4 DisplayDeviceProperties(parentWindow as DesktopWindow) as boolean

MBS Bluetooth Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Starts Control Panel device information property sheet.
**Notes:** parentWindow: The parent window of the property sheet.

Returns true if the property sheet is successfully displayed. Returns false if the property sheet was not displayed successfully.
See also:


- 22.28.5 DisplayDeviceProperties(parentWindow as window) as boolean 4206


### 22.28.5 DisplayDeviceProperties(parentWindow as window) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop only.

**Function:** Starts Control Panel device information property sheet.
**Notes:** parentWindow: The parent window of the property sheet.

Returns true if the property sheet is successfully displayed. Returns false if the property sheet was not displayed successfully.
See also:


- 22.28.4 DisplayDeviceProperties(parentWindow as DesktopWindow) as boolean 4205


### 22.28.6 FirstDevice(SearchParameters as WindowsBlueToothDeviceSearchParameterMBS) as WindowsBlueToothDeviceInfoMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries first device.
**Example:**

```
dim p as new WindowsBlueToothDeviceSearchParameterMBS
p.ReturnAuthenticated = true
p.ReturnConnected = true
p.ReturnRemembered = true
p.ReturnUnknown = true
p.TimeoutMultiplier = 10
p.IssueInquiry = true

dim device as WindowsBlueToothDeviceInfoMBS = WindowsBlueToothDeviceInfoMBS.FirstDevice(p)

Break // see in debugger
```

**Notes:** SearchParameters can define search parameters.

see also:
https://msdn.microsoft.com/en-us/library/windows/desktop/aa362784(v=vs.85).aspx

### 22.28.7 Properties

### 22.28.8 Address as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Address of the device.
**Notes:** (Read only property)

### 22.28.9 Authenticated as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Specifies whether the device is authenticated, paired, or bonded.
**Notes:** All authenticated devices are remembered.
(Read only property)

### 22.28.10 ClassofDevice as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Class of the device.
**Notes:** (Read only property)

### 22.28.11 Connected as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Specifies whether the device is connected.
**Notes:** (Read only property)

### 22.28.12 LastSeen as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Last time the device was seen, in the form of a date.
**Notes:** Can be before year 2000 to indicate never seen.
(Read only property)

### 22.28.13 LastUsed as Date

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Last time the device was used, in the form of a date.
**Notes:** Can be before year 2000 to indicate never used.
(Read only property)

### 22.28.14 Name as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Name of the device.
**Notes:** (Read only property)

### 22.28.15 Remembered as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Specifies whether the device is a remembered device.
**Notes:** Not all remembered devices are authenticated.
(Read only property)

## 22.29 class WindowsBlueToothDeviceMBS

### 22.29.1 class WindowsBlueToothDeviceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This class stores information about a Bluetooth device.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.29.2 Methods

### 22.29.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.29.4 Devices as WindowsBlueToothDeviceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries list of devices.

### 22.29.5 Services as WindowsBlueToothServiceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The list of services for this device.

### 22.29.6 Properties

### 22.29.7 Comment as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The comment.
**Notes:** (Read only property)

### 22.29.8 LocalAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The Windows Sockets local address.
**Notes:** In a client application, pass this address to the bind function to obtain access to a network service. In a network service, pass this address to the bind function so that the service is bound to the appropriate local address.

e.g. "(78:4F:12:34:56:78)"
(Read only property)

### 22.29.9 Name as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The name.
**Notes:** e.g. "Christian Schmitz iPhone"
(Read only property)

### 22.29.10 RemoteAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Windows Sockets remote address.
**Notes:** There are several uses for this remote address:

- You can use this remote address to connect to the service through the connect function. This is useful if an application performs send/receive operations that involve connection-oriented protocols.
- You can use this remote address with the sendto function when you are communicating over a connectionless (datagram) protocol. If you are using a connectionless protocol, such as UDP, sendto is typically the way you pass data to the remote system.

e.g. "(44:00:12:34:56:78)"
(Read only property)

### 22.29.11 SocketProtocol as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The protocol used.
**Notes:** The possible options for the protocol parameter are specific to the address family and socket type specified.

| Name | Value | Meaning |
|---|---|---|
| IPPROTO_TCP | 6 | The Transmission Control Protocol (TCP). This is a possible value when the address family is AF_INET or AF_INET6 and the iSocketType member is SOCK_STREAM. |
| IPPROTO_UDP | 17 | The User Datagram Protocol (UDP). This is a possible value when the address family is AF_INET or AF_INET6 and the iSocketType member is SOCK_DGRAM. |
| IPPROTO_RM | 113 | The PGM protocol for reliable multicast. This is a possible value when the address family is AF_INET and the iSocketType member is SOCK_RDM. On the Windows SDK released for Windows Vista and later, this value is also called IPPROTO_PGM. |

(Read only property)

### 22.29.12 SocketType as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The type of Windows socket.
**Notes:**

| Name | Value | Meaning |
|---|---|---|
| SOCK_STREAM | 1 | A stream socket. This is a protocol that sends data as a stream of bytes, with no message boundaries. This socket type provides sequenced, reliable, two-way, connection-based byte streams with an OOB data transmission mechanism. This socket type uses the Transmission Control Protocol (TCP) for the Internet address family (AF_INET or AF_INET6). |
| SOCK_DGRAM | 2 | A datagram socket. This socket type supports datagrams, which are connectionless, unreliable buffers of a fixed (typically small) maximum length. This socket type uses the User Datagram Protocol (UDP) for the Internet address family (AF_INET or AF_INET6). |

Services use recvfrom function to obtain datagrams. The listen and accept functions do not work with datagrams.

(Read only property)

| | | |
|---|---|---|
| SOCK_RDM | 4 | A reliable message datagram socket. This socket type preserves message boundaries in data. An example of this type is the Pragmatic General Multicast (PGM) multicast protocol implementation in Windows, often referred to as reliable multicast programming. |
| SOCK_SEQPACKET | 5 | A sequenced packet stream socket. This socket type provides a pseudo-stream packet based on datagrams. |

## 22.30 class WindowsBlueToothDeviceSearchParameterMBS

### 22.30.1 class WindowsBlueToothDeviceSearchParameterMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This class specifies search criteria for Bluetooth device searches.
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr3
- MBS Xojo Plugins, version 18.3pr4

### 22.30.2 Methods

### 22.30.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The constructor.

### 22.30.4 Properties

### 22.30.5 IssueInquiry as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that specifies that a new inquiry should be issued.
**Notes:** (Read and Write property)

### 22.30.6 Radio as WindowsBlueToothRadioMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A handle for the radio on which to perform the inquiry.
**Notes:** Set to nil to perform the inquiry on all local Bluetooth radios.
(Read and Write property)

### 22.30.7 ReturnAuthenticated as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that specifies that the search should return authenticated Bluetooth devices.
**Notes:** (Read and Write property)

### 22.30.8 ReturnConnected as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that specifies that the search should return connected Bluetooth devices.
**Notes:** (Read and Write property)

### 22.30.9 ReturnRemembered as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that specifies that the search should return remembered Bluetooth devices.
**Notes:** (Read and Write property)

### 22.30.10 ReturnUnknown as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that specifies that the search should return unknown Bluetooth devices.
**Notes:** (Read and Write property)

### 22.30.11 TimeoutMultiplier as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** A value that indicates the time out for the inquiry, expressed in increments of 1.28 seconds.
**Notes:** For example, an inquiry of 12.8 seconds has a cTimeoutMultiplier value of 10. The maximum value for this member is 48. When a value greater than 48 is used, the calling function immediately fails and returns E_INVALIDARG.
(Read and Write property)

## 22.31 class WindowsBluetoothLEAdvertisementMBS

### 22.31.1 class WindowsBluetoothLEAdvertisementMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a bluetooth LE advertisement.
**Notes:** This class is used to represent an advertisement received by the system, an advertisement pattern to filter for, or an advertisement payload that needs to be published. In the case it is generated by the system to represent an advertisement received, certain properties are automatically populated.

For more information about its usage, refer to WindowsBluetoothLEAdvertisementWatcherMBS class for receiving advertisements and the WindowsBluetoothLEAdvertisementPublisherMBS class for sending advertisements.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

### 22.31.2 Methods

### 22.31.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.31.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.31.5 ManufacturerData as WindowsBluetoothLEManufacturerDataMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The list of manufacturer-specific data sections.

### 22.31.6 ServiceUuids as String()

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the list of service UUIDs (in 128-bit GUID format) in a BluetoothLEAdvertisement.
**Notes:** An array of GUID, representing the list of service UUIDs in 128-bit GUID format. This property aggregates all the 16-bit, 32-bit, and 128-bit service UUIDs into a single list.
We convert this list to strings for Xojo.

### 22.31.7 Properties

### 22.31.8 Flags as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bluetooth LE advertisement flags.
**Notes:** (Read only property)

### 22.31.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.31.10 LocalName as String

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The local name contained within the advertisement.
**Notes:** The local name contained within the advertisement. This property can be either the shortened or complete local name defined by the Bluetooth LE specifications.
(Read only property)

### 22.31.11 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| AdvertisementFlagsClassicNotSupported | 4 | Specifies Bluetooth BR/EDR not supported. |
| AdvertisementFlagsDualModeControllerCapable | 8 | Specifies simultaneous Bluetooth LE and BR/EDR to same (controller). |
| AdvertisementFlagsDualModeHostCapable | 16 | Specifies simultaneous Bluetooth LE and BR/EDR to same (host) |
| AdvertisementFlagsGeneralDiscoverableMode | 2 | Specifies Bluetooth LE General Discoverable Mode. |
| AdvertisementFlagsLimitedDiscoverableMode | 1 | Specifies Bluetooth LE Limited Discoverable Mode. |
| AdvertisementFlagsNone | 0 | Specifies no flag. |

## 22.32 class WindowsBluetoothLEAdvertisementReceivedEventArgsMBS

### 22.32.1 class WindowsBluetoothLEAdvertisementReceivedEventArgsMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides data for a Received event on a WindowsBluetoothLEAdvertisementWatcherMBS.
**Notes:** A WindowsBluetoothLEAdvertisementReceivedEventArgsMBS instance is created when the Received event occurs on a WindowsBluetoothLEAdvertisementWatcherMBS object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- Bluetooth LE on Windows
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

### 22.32.2 Methods

### 22.32.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.32.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.32.5 Properties

### 22.32.6 Advertisement as WindowsBluetoothLEAdvertisementMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth LE advertisement payload data received.
**Notes:** (Read only property)

### 22.32.7 AdvertisementType as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the type of the received Bluetooth LE advertisement packet.
**Notes:** (Read only property)

### 22.32.8 BluetoothAddress as UInt64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth address of the device sending the Bluetooth LE advertisement.
**Notes:** the Bluetooth address of the device sending the Bluetooth LE advertisement as an UInt64.
(Read only property)

### 22.32.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.32.10 RawSignalStrengthInDBm as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The received signal strength indicator (RSSI) value, in dBm, for this event.
**Notes:** Gets the received signal strength indicator (RSSI) value, in dBm, for this received Bluetooth LE advertisement event. This value could be the raw RSSI or a filtered RSSI depending on filtering settings configured through BluetoothSignalStrengthFilter.
(Read only property)

### 22.32.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AdvertisementTypeConnectableDirected | 1 | Specifies the different types of Bluetooth LE advertisement pay<br>The advertisement is directed and indicates that the device is co<br>not scannable. This advertisement type cannot carry data.<br>This corresponds with the ADV_DIRECT_IND type defined in<br>LE specifications. |
| AdvertisementTypeConnectableUndirected | 0 | Specifies the different types of Bluetooth LE advertisement pay<br>The advertisement is undirected and indicates that the device<br>and scannable. This advertisement type can carry data.<br>This corresponds with the ADV_IND type defined in the Bluet<br>fications. |
| AdvertisementTypeNonConnectableUndirected | 3 | Specifies the different types of Bluetooth LE advertisement pay<br>The advertisement is undirected and indicates that the device is n<br>nor scannable. This advertisement type can carry data.<br>This corresponds with the ADV_NONCONN_IND type define<br>tooth LE specifications. |
| AdvertisementTypeScannableUndirected | 2 | Specifies the different types of Bluetooth LE advertisement pay<br>The advertisement is undirected and indicates that the device is<br>not connectable. This advertisement type can carry data.<br>This corresponds with the ADV_SCAN_IND type defined in<br>LE specifications. |
| AdvertisementTypeScanResponse | 4 | Specifies the different types of Bluetooth LE advertisement pay<br>This advertisement is a scan response to a scan request issued f<br>advertisement. This advertisement type can carry data.<br>This corresponds with the SCAN_RSP type defined in the Bluet<br>ifications. |

## 22.33 class WindowsBluetoothLEAdvertisementWatcherMBS

### 22.33.1 class WindowsBluetoothLEAdvertisementWatcherMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An object to receive Bluetooth Low Energy (LE) advertisements.
**Example:**

```
// use your own subclass
Watcher = New BLEAdvertisementWatcher
// e.g. output to some listbox
Watcher.list = listWatcher

// active scanning
watcher.ScanningMode = Watcher.ScanningModeActive

// start it
Watcher.Start
```

**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- Bluetooth LE on Windows
- BluetoothLE Watcher on Windows
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

### 22.33.2 Methods

### 22.33.3 Available as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this class is available.
**Notes:** Returns true on Windows and false otherwise.

### 22.33.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 22.33.5 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.33.6 Start

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Start the BluetoothLEAdvertisementWatcher to scan for Bluetooth LE advertisements.
**Example:**

```
// use your own subclass
Watcher = New BLEAdvertisementWatcher
// e.g. output to some listbox
Watcher.list = listWatcher

// active scanning
watcher.ScanningMode = Watcher.ScanningModeActive

// start it
Watcher.Start
```

**Notes:** This method will transition the WindowsBluetoothLEAdvertisementWatcherMBS to the Started state immediately with a pending scan request or to the Aborted state if the request failed immediately due to error.
If this method is called in the Stopping state, the request will be pended and the state will remain in the Stopping state until the request completes, at which time a new request will be sent and the state will transition to the Started state.
The WindowsBluetoothLEAdvertisementWatcherMBS will be automatically stopped when an app is suspended.

### 22.33.7 Stop

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stop the BluetoothLEAdvertisementWatcher and disable the scanning for Bluetooth LE advertisements.
**Notes:** This method will transition the WindowsBluetoothLEAdvertisementWatcherMBS to the Stopping state until the scan is cancelled in which the state will transition to the Stopped state. Calling this method in the Stopped or Aborted state has no effect. Calling this method in the Stopping state will overwrite any advertisements received in the last Start method call during that state.
The WindowsBluetoothLEAdvertisementWatcherMBS will be automatically stopped when an app is suspended.

### 22.33.8 Properties

### 22.33.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.33.10 MaxOutOfRangeTimeout as Int64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum out of range timeout.
**Notes:** (Read only property)

### 22.33.11 MaxSamplingInterval as Int64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum sampling interval.
**Notes:** (Read only property)

### 22.33.12 MinOutOfRangeTimeout as Int64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum out of range timeout.
**Notes:** (Read only property)

### 22.33.13 MinSamplingInterval as Int64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum sampling interval.
**Notes:** (Read only property)

### 22.33.14 ScanningMode as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the Bluetooth LE scanning mode.
**Notes:** (Read and Write property)

### 22.33.15 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current status of the WindowsBluetoothLEAdvertisementWatcherMBS.
**Notes:** (Read only property)

### 22.33.16 Events

### 22.33.17 Received(Args as WindowsBluetoothLEAdvertisementReceivedEventArgsMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: .

**Function:** Notification for new Bluetooth LE advertisement events received.

### 22.33.18 Stopped(Error as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: .

**Function:** Notification to the app that the Bluetooth LE scanning for advertisements has been cancelled or aborted either by the app or due to an error.

### 22.33.19 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| ErrorConsentRequired | 8 | The operation requires consent. |
| ErrorDeviceNotConnected | 3 | The operation cannot be completed because the remote device is not connected. |
| ErrorDisabledByPolicy | 5 | The operation is disabled by policy. |
| ErrorDisabledByUser | 7 | The operation is disabled by the user. |
| ErrorNotSupported | 6 | The operation is not supported on the current Bluetooth radio hardware. |
| ErrorOtherError | 4 | An unexpected error has occurred. |
| ErrorRadioNotAvailable | 1 | The Bluetooth radio was not available. This error occurs when the Bluetooth radio has been turned off. |
| ErrorResourceInUse | 2 | The operation cannot be serviced because the necessary resources are currently in use. |
| ErrorSuccess | 0 | The operation was successfully completed or serviced. |
| ErrorTransportNotSupported | 9 | The transport is not supported. |

Scan modes

| Constant | Value | Description |
|---|---|---|
| ScanningModeActive | 1 | Specifies an active scanning mode. This indicates that scan request packets will be sent from the platform to actively query for more advertisement data of type ScanResponse. |
| ScanningModePassive | 0 | Specifies a passive scanning mode. This is the default scanning mode. |

Status

| Constant | Value | Description |
|---|---|---|
| StatusAborted | 4 | An error occurred during transition or scanning that stopped the watcher due to an error. |
| StatusCreated | 0 | The initial status of the watcher. |
| StatusStarted | 1 | The watcher is started. |
| StatusStopped | 3 | The watcher is stopped. |
| StatusStopping | 2 | The watcher stop command was issued. |

## 22.34 class WindowsBluetoothLEAppearanceMBS

### 22.34.1 class WindowsBluetoothLEAppearanceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides functionality to determine the Bluetooth Low Energy (LE) Appearance information for a device.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

### 22.34.2 Methods

### 22.34.3 CategoryBarcodeScanner as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the barcode scanner appearance category code.

### 22.34.4 CategoryBloodPressure as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the blood pressure appearance category code.

### 22.34.5 CategoryClock as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the clock appearance category code.

### 22.34.6 CategoryComputer as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the computer appearance category code.

### 22.34.7 CategoryCycling as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling appearance category code.

### 22.34.8 CategoryDisplay as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the display appearance category code.

### 22.34.9 CategoryEyeGlasses as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the eye glasses appearance category code.

### 22.34.10 CategoryGlucoseMeter as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the glucose meter appearance category code.

### 22.34.11 CategoryHeartRate as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the heart rate appearance category code.

### 22.34.12 CategoryHumanInterfaceDevice as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the human interface device appearance category code.

### 22.34.13 CategoryKeyring as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the key ring appearance category code.

### 22.34.14 CategoryMediaPlayer as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the media player appearance category code.

### 22.34.15 CategoryOutdoorSportActivity as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the outdoor sport activity appearance category code.

### 22.34.16 CategoryPhone as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the phone appearance category code.

### 22.34.17 CategoryPulseOximeter as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the pulse oximeter appearance category code.

### 22.34.18 CategoryRemoteControl as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the remote control appearance category code.

### 22.34.19 CategoryRunningWalking as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the running or walking appearance category code.

### 22.34.20 CategoryTag as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the tag appearance category code.

### 22.34.21 CategoryThermometer as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the thermometer appearance category code.

### 22.34.22 CategoryUncategorized as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the uncategorized appearance category code.

### 22.34.23 CategoryWatch as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the watch appearance category code.

### 22.34.24 CategoryWeightScale as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the weight scale appearance category code.

### 22.34.25 Constructor(appearanceCategory as UInt16, appearanceSubCategory as UInt16)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a BluetoothLEAppearance object by supplying values for Category and Subcategory of the Bluetooth LE device.
See also:

- 22.34.26 Constructor(RawValue as UInt16) 4230

### 22.34.26 Constructor(RawValue as UInt16)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a BluetoothLEAppearance object by supplying for raw integer values representing the Category and Subcategory of the Bluetooth LE device.
See also:

- 22.34.25 Constructor(appearanceCategory as UInt16, appearanceSubCategory as UInt16) 4230

### 22.34.27 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.34.28 SubcategoryBarcodeScanner as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the pulse barcode scanner appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.29 SubcategoryBloodPressureArm as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the blood pressure arm appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the BloodPressure appearance category.

### 22.34.30 SubcategoryBloodPressureWrist as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the blood pressure wrist appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the BloodPressure appearance category.

### 22.34.31 SubcategoryCardReader as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the card reader appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.32 SubcategoryCyclingCadenceSensor as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling cadence sensor appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the Cycling appearance category.

### 22.34.33 SubcategoryCyclingComputer as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling computer appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the Cycling appearance category.

### 22.34.34 SubcategoryCyclingPowerSensor as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling power sensor appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the Cycling appearance category.

### 22.34.35 SubcategoryCyclingSpeedCadenceSensor as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling speed cadence sensor appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the Cycling appearance category.

### 22.34.36 SubcategoryCyclingSpeedSensor as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the cycling speed sensor appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the Cycling appearance category.

### 22.34.37 SubcategoryDigitalPen as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the digital pen appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.38 SubcategoryDigitizerTablet as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the digitizer tablet appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.39 SubcategoryGamepad as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the gamepad appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.40 SubcategoryGeneric as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the generic appearance subcategory code.

### 22.34.41 SubcategoryHeartRateBelt as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the heart rate belt appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HeartRate appearance category.

### 22.34.42 SubcategoryJoystick as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the joystick appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.43 SubcategoryKeyboard as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the keyboard appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.44 SubcategoryLocationDisplay as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the location display appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the OutdoorSportActivity appearance category.

### 22.34.45 SubcategoryLocationNavigationDisplay as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the location navigation display appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the OutdoorSportActivity appearance category.

### 22.34.46 SubcategoryLocationNavigationPod as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the location navigation pod appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the OutdoorSportActivity appearance category.

### 22.34.47 SubcategoryLocationPod as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the location pod appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the OutdoorSportActivity appearance category.

### 22.34.48 SubcategoryMouse as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the mouse appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the HumanInterfaceDevice appearance category.

### 22.34.49 SubcategoryOximeterFingertip as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the oximeter fingertip appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the PulseOximeter appearance category.

### 22.34.50 SubcategoryOximeterWristWorn as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the oximeter wrist worn appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the PulseOximeter appearance category.

### 22.34.51 SubcategoryRunningWalkingInShoe as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the running or walking in shoe appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the RunningWalking appearance category.

### 22.34.52 SubcategoryRunningWalkingOnHip as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the running or walking on hip appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the RunningWalking appearance category.

### 22.34.53 SubcategoryRunningWalkingOnShoe as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the running or walking on shoe appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the RunningWalking appearance category.

### 22.34.54 SubcategorySportsWatch as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the sports watch appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the RunningWalking appearance category.

### 22.34.55 SubcategoryThermometerEar as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the ear thermometer appearance subcategory code.
**Notes:** This is only applicable for Bluetooth LE devices that are part of the RunningWalking appearance category.

### 22.34.56 Properties

### 22.34.57 Category as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the appearance category value of the Bluetooth LE device.
**Notes:** (Read only property)

### 22.34.58 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.34.59 RawValue as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The appearance raw value of the Bluetooth LE device.
**Notes:** (Read only property)

### 22.34.60 SubCategory as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the appearance subcategory value of the Bluetooth LE device.
**Notes:** (Read only property)

## 22.35 class WindowsBlueToothLECharacteristicMBS

### 22.35.1 class WindowsBlueToothLECharacteristicMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Describes a Bluetooth Low Energy (LE) generic attribute (GATT) profile characteristic.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.35.2 Methods

### 22.35.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.35.4 Properties

### 22.35.5 AttributeHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile attributes.
**Notes:** (Read only property)

### 22.35.6 CharacteristicUuid as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The Universally Unique ID (UUID) of the characteristic.
**Notes:** (Read only property)

### 22.35.7 CharacteristicValueHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile characteristic value.
**Notes:** (Read only property)

### 22.35.8 HasExtendedProperties as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic has extended properties, which will be presented through a Characteristic Extended Properties descriptor.
**Notes:** (Read only property)

### 22.35.9 IsBroadcastable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be broadcast.
**Notes:** (Read only property)

### 22.35.10 IsIndicatable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be updated by the device through Handle Value Indications, and the new value will be returned through the ChangeEvent event.
**Notes:** (Read only property)

### 22.35.11 IsNotifiable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be updated by the device through Handle Value Notifications, and the new value will be returned through the ChangeEvent event.
**Notes:** (Read only property)

### 22.35.12 IsReadable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be read.
**Notes:** (Read only property)

### 22.35.13 IsSignedWritable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be signed writable.
**Notes:** (Read only property)

### 22.35.14 IsWritable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be written to.
**Notes:** (Read only property)

### 22.35.15 IsWritableWithoutResponse as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic can be written to without requiring a response.
**Notes:** (Read only property)

### 22.35.16 ServiceHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile service.
**Notes:** (Read only property)

## 22.36 class WindowsBlueToothLEDescriptorMBS

### 22.36.1 class WindowsBlueToothLEDescriptorMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Describes a Bluetooth Low Energy (LE) generic attribute (GATT) profile descriptor.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.36.2 Methods

### 22.36.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.36.4 Properties

### 22.36.5 AttributeHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile attributes.
**Notes:** (Read only property)

### 22.36.6 CharacteristicHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile characteristic.
**Notes:** (Read only property)

### 22.36.7 DescriptorType as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The type of the Bluetooth LE GATT descriptor.
**Notes:** See WindowsBlueToothLEDescriptorValueMBS.kDescriptorType* constants.

(Read only property)

### 22.36.8 DescriptorUuid as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The Universally Unique ID (UUID) of the Bluetooth LE GATT descriptor.
**Notes:** (Read only property)

### 22.36.9 ServiceHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile service.
**Notes:** (Read only property)

## 22.37 class WindowsBlueToothLEDescriptorValueMBS

### 22.37.1 class WindowsBlueToothLEDescriptorValueMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Describes a parent characteristic.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.37.2 Methods

### 22.37.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.37.4 Properties

### 22.37.5 Data as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The descriptor value data.
**Notes:** (Read and Write property)

### 22.37.6 DataSize as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The size, in bytes, of the descriptor value.
**Notes:** (Read only property)

### 22.37.7 Description as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The Universally Unique ID (UUID) that describes the format of the parent characteristic value.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicFormat.

(Read and Write property)

### 22.37.8 DescriptorType as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The type of the descriptor value.
**Notes:** See WindowsBlueToothLEDescriptorValueMBS.kDescriptorType* constants.
(Read and Write property)

### 22.37.9 DescriptorUuid as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The Universally Unique ID (UUID) of the descriptor value.
**Notes:** (Read and Write property)

### 22.37.10 Exponent as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The exponent value to use to determine how the value of the characteristic value is further formatted.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicFormat.
(Read and Write property)

### 22.37.11 Format as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The format of the parent characteristic value.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicFormat.
(Read and Write property)

### 22.37.12 IsAuxiliariesWritable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The characteristic user description descriptor is writable.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicExtendedProperties.

(Read and Write property)

### 22.37.13 IsBroadcast as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The parent characteristic value can be broadcast.
**Notes:** Only set if DescriptorType is kDescriptorTypeServerCharacteristicConfiguration.
(Read and Write property)

### 22.37.14 IsReliableWriteEnabled as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The parent characteristic value is reliable write enabled.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicExtendedProperties.
(Read and Write property)

### 22.37.15 IsSubscribeToIndication as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether the characteristic has been registered with the device to receive Handle Value Indications.
**Notes:** True if the characteristic has been registered. Otherwise, false.
Only set if DescriptorType is kDescriptorTypeClientCharacteristicConfiguration.
(Read and Write property)

### 22.37.16 IsSubscribeToNotification as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether the characteristic has been registered with the device to receive Handle Value Notifications.
**Notes:** True if the characteristic has been registered. Otherwise, false.
Only set if DescriptorType is kDescriptorTypeClientCharacteristicConfiguration.
(Read and Write property)

### 22.37.17 NameSpaceValue as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The name-space where the unit is defined in the Assigned Numbers specification.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicFormat.
(Read and Write property)

### 22.37.18 Unit as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The unit of the characteristic value as defined in the Assigned Numbers specification.
**Notes:** Only set if DescriptorType is kDescriptorTypeCharacteristicFormat.
(Read and Write property)

### 22.37.19 Constants

Descriptor Types

| Constant | Value | Description |
|---|---|---|
| kDescriptorTypeCharacteristicAggregateFormat | 5 | The format of an aggregated characteristic value. |
| kDescriptorTypeCharacteristicExtendedProperties | 0 | The characteristic value has additional properties that desc used, or how it can be accessed. |
| kDescriptorTypeCharacteristicFormat | 4 | The format of the characteristic value. |
| kDescriptorTypeCharacteristicUserDescription | 1 | The characteristic value contains a UTF-8 string of variable textual description. |
| kDescriptorTypeClientCharacteristicConfiguration | 2 | The characteristic value may be configured by the client. |
| kDescriptorTypeCustomDescriptor | 6 | The characteristic value is customized. |
| kDescriptorTypeServerCharacteristicConfiguration | 3 | The characteristic value may be configured for the server. |

## 22.38 class WindowsBluetoothLEDeviceMBS

### 22.38.1 class WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a Bluetooth LE device.
**Notes:** Requires Windows 10 (introduced in 10.0.10240.0)
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MBS Xojo Plugins, version 23.6pr3
- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- The Top 10 from the MBS Xojo Plugins in 2022
- Bluetooth LE on Windows
- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- News from the MBS Xojo Plugins Version 22.3
- News from the MBS Xojo Plugins Version 22.2

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 22.38.2 Methods

### 22.38.3 Close

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes this Bluetooth LE device.
**Notes:** This may close the connection to the device if this is the only app with a connection.

### 22.38.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.38.5 Constructor(other as WindowsBluetoothLEDeviceMBS) 4247

### 22.38.5 Constructor(other as WindowsBluetoothLEDeviceMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy constructor.
**Notes:** To get a new Xojo object pointing to the same device object.
See also:

- 22.38.4 Constructor 4247

### 22.38.6 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.38.7 FromBluetoothAddress(bluetoothAddress as UInt64) as WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a BluetoothLEDevice object representing the peer Bluetooth LE device with the given address.
**Notes:** Synchronous version, which may blocks the application until the function finished.
See also:

- 22.38.8 FromBluetoothAddress(bluetoothAddress as UInt64, BluetoothAddressType as Integer) as WindowsBluetoothLEDeviceMBS 4247

### 22.38.8 FromBluetoothAddress(bluetoothAddress as UInt64, BluetoothAddressType as Integer) as WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a BluetoothLEDevice object representing the peer Bluetooth LE device with the given address.
**Notes:** Synchronous version, which may blocks the application until the function finished.
See also:

- 22.38.7 FromBluetoothAddress(bluetoothAddress as UInt64) as WindowsBluetoothLEDeviceMBS 4247

### 22.38.9 FromBluetoothAddressAsync(bluetoothAddress as UInt64, BluetoothAddressType as Integer, delegateHandler as DeviceFromBluetoothAddressAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a BluetoothLEDevice object representing the peer device with the given address and address type.
**Notes:** bluetoothAddress: A BluetoothAddress value containing the 64-bit address of the peer Bluetooth LE device.

bluetoothAddressType: A BluetoothAddressType value containing the address type of the peer Bluetooth LE device.

The returned BluetoothLEDevice is set to nil if FromBluetoothAddressAsync can't find the device identified by bluetoothAddress. Specifically, if the device isn't paired and it isn't found in the system cache. You can populate the cache for a non-paired device using either the LE advertisement watcher APIs (BluetoothLEAdvertisementWatcher) or the device enumeration APIs (GetDeviceSelectorFromPairingState) to scan for the Bluetooth devices before the FromBluetoothAddressAsync can be successfully used.

Calls delegate later when we have a result.

Creating a BluetoothLEDevice object by calling this method alone doesn't (necessarily) initiate a connection. To initiate a connection, set GattSession.MaintainConnection to true, or call an uncached service discovery method on BluetoothLEDevice, or perform a read/write operation against the device.
If GattSession.MaintainConnection is set to true, then the system waits indefinitely for a connection, and it will connect when the device is available. There's nothing for your application to wait on, since GattSession.MaintainConnection is a property.
For service discovery and read/write operations in GATT, the system waits a finite but variable time. Anything from instantaneous to a matter of minutes. Factors include the traffic on the stack, and how queued up the request is. If there are no other pending request, and the remote device is unreachable, then the system will wait for 7 seconds before it times out. If there are other pending requests, then each of the requests in the queue can take 7 seconds to process, so the further yours is toward the back of the queue, the longer you'll wait.
You can't cancel the connection process.
See also:

- 22.38.10 FromBluetoothAddressAsync(bluetoothAddress as UInt64, delegateHandler as DeviceFromBlue-

toothAddressAsyncCompletedMBS) 4249

### 22.38.10 FromBluetoothAddressAsync(bluetoothAddress as UInt64, delegateHandler as DeviceFromBluetoothAddressAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a BluetoothLEDevice object representing the peer Bluetooth LE device with the given address.
**Notes:** bluetoothAddress: A BluetoothAddress value containing the 64-bit address of the peer Bluetooth LE device.

The returned BluetoothLEDevice is set to nil if FromBluetoothAddressAsync can't find the device identified by bluetoothAddress. Specifically, if the device isn't paired and it isn't found in the system cache. You can populate the cache for a non-paired device using either the LE advertisement watcher APIs (BluetoothLEAdvertisementWatcher) or the device enumeration APIs (GetDeviceSelectorFromPairingState) to scan for the Bluetooth devices before the FromBluetoothAddressAsync can be successfully used.

Calls delegate later when we have a result.

Creating a BluetoothLEDevice object by calling this method alone doesn't (necessarily) initiate a connection. To initiate a connection, set GattSession.MaintainConnection to true, or call an uncached service discovery method on BluetoothLEDevice, or perform a read/write operation against the device.
If GattSession.MaintainConnection is set to true, then the system waits indefinitely for a connection, and it will connect when the device is available. There's nothing for your application to wait on, since GattSession.MaintainConnection is a property.
For service discovery and read/write operations in GATT, the system waits a finite but variable time. Anything from instantaneous to a matter of minutes. Factors include the traffic on the stack, and how queued up the request is. If there are no other pending request, and the remote device is unreachable, then the system will wait for 7 seconds before it times out. If there are other pending requests, then each of the requests in the queue can take 7 seconds to process, so the further yours is toward the back of the queue, the longer you'll wait.
You can't cancel the connection process.
See also:

- 22.38.9 FromBluetoothAddressAsync(bluetoothAddress as UInt64, BluetoothAddressType as Integer, delegateHandler as DeviceFromBluetoothAddressAsyncCompletedMBS) 4248

### 22.38.11 FromId(Id as String) as WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries a BluetoothLEDeviceMBS object for the given Id.
**Notes:** Id: The Id of the Bluetooth LE device.

Synchronous version, which may blocks the application until the function finished.

### 22.38.12 FromIdAsync(Id as String, delegateHandler as DeviceFromIdAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries a BluetoothLEDeviceMBS object for the given Id.
**Notes:** Id: The Id of the Bluetooth LE device.
Calls delegate later when we have a result.

### 22.38.13 GetDeviceSelector as String

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets an Advanced Query Syntax (AQS) string for identifying all Bluetooth Low Energy (LE) devices.
**Notes:** This string is passed to the FindAllAsync or CreateWatcher method in order to get a list of Bluetooth LE devices.

### 22.38.14 GetDeviceSelectorFromAppearance(Appearance as WindowsBluetoothLEAppearanceMBS) as String

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an Advanced Query Syntax (AQS) filter string from a BluetoothLEAppearance object.
**Notes:** The AQS string is passed into the CreateWatcher method to return a collection of DeviceInformation objects with the specified appearance.

### 22.38.15 GetGattService(serviceUUID as String) as WindowsGattDeviceServiceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the GATT service with the given service Id.
**Notes:** serviceUUID: The service Id of the GATT service.

### 22.38.16 GetGattServicesAsync

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries available GATT services for this device.
**Notes:** Calls GetGattServicesCompleted event later with results.
See also:

- 22.38.17 GetGattServicesAsync(BluetoothCacheMode as Integer) 4251

### 22.38.17 GetGattServicesAsync(BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries available GATT services for this device.
**Notes:** Calls GetGattServicesCompleted event later with results.

For cache mode, see CacheModeCached and CacheModeUncached constants in WindowsGattDeviceServiceMBS class.
See also:

- 22.38.16 GetGattServicesAsync 4251

### 22.38.18 GetGattServicesForUuidAsync(serviceUuid as String)

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries available GATT services for this device with given UUID.
**Notes:** Calls GetGattServicesCompleted event later with results.
See also:

- 22.38.19 GetGattServicesForUuidAsync(serviceUuid as String, BluetoothCacheMode as Integer) 4251

### 22.38.19 GetGattServicesForUuidAsync(serviceUuid as String, BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries available GATT services for this device with given UUID.
**Notes:** Calls GetGattServicesCompleted event later with results.

For cache mode, see CacheModeCached and CacheModeUncached constants in WindowsGattDeviceServiceMBS class.
See also:

• 22.38.18 GetGattServicesForUuidAsync(serviceUuid as String) 4251

### 22.38.20 RequestAccessAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Requests access to the Bluetooth LowEnergy device.
**Notes:** Calls RequestAccessAsyncCompleted event later.

### 22.38.21 Properties

### 22.38.22 Appearance as WindowsBluetoothLEAppearanceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the BluetoothLEAppearance object for the Bluetooth LE device.
**Notes:** (Read only property)

### 22.38.23 BluetoothAddress as UInt64

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the device address.
**Notes:** (Read only property)

### 22.38.24 BluetoothAddressType as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the address type for the Bluetooth LE device.
**Notes:** (Read only property)

### 22.38.25 BluetoothDeviceId as WindowsBluetoothDeviceIdMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the bluetooth device ID.
**Notes:** (Read only property)

### 22.38.26 ConnectionStatus as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the connection status of the device.
**Notes:** Either ConnectionStatusConnected or ConnectionStatusDisconnected.
(Read only property)

### 22.38.27 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.38.28 Name as String

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the Bluetooth LE device.
**Notes:** (Read only property)

### 22.38.29 Pairing as WindowsDeviceInformationPairingMBS

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries pairing object for the bluetooth device.
**Notes:** (Read only property)

### 22.38.30 WasSecureConnectionUsedForPairing as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a boolean indicating whether the BluetoothLEDevice was paired using a Secure Connection.
**Notes:** (Read only property)

### 22.38.31 Events

### 22.38.32 ConnectionStatusChanged

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: .

**Function:** The connection status changed.

### 22.38.33 GattServicesChanged

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: .

**Function:** The services changed.

### 22.38.34 GetGattServicesCompleted(asyncStatus as Integer, Result as WindowsGattDeviceServicesResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: .

**Function:** The event called by GetGattServicesForUuidAsync or GetGattServicesAsync methods on completion.

### 22.38.35 NameChanged

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: .

**Function:** The name changed.

### 22.38.36 PairAsyncCompleted(asyncStatus as Integer, PairingStatus as Integer, ProtectionLevelUsed as Integer)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: .

**Function:** Called when PairAsync method finishes.
**Notes:** ProtectionLevelUsed: Gets the level of protection used to pair the device.
Status: Gets the paired status of the device after the pairing action completed.

### 22.38.37 RequestAccessCompleted(asyncStatus as Integer, DeviceAccessStatus as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.5, Platform: Windows, Targets: .

**Function:** The request for access completed.

### 22.38.38 UnpairAsyncCompleted(asyncStatus as Integer, UnpairingStatus as Integer)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: .

**Function:** Called when the UnpairAsync method finished.
**Notes:** Status: Gets the paired status of the device after the unpairing action completed.

### 22.38.39 Constants

Address Type

| Constant | Value | Description |
|---|---|---|
| AddressTypePublic | 0 | Public address. |
| AddressTypeRandom | 1 | Random address. |
| AddressTypeUnspecified | 2 | Unspecified address. |

Asynchronous Status

| Constant | Value | Description |
|---|---|---|
| AsyncStatusCanceled | 2 | The operation was canceled. |
| AsyncStatusCompleted | 1 | The operation has completed. |
| AsyncStatusError | 3 | The operation has encountered an error. |
| AsyncStatusStarted | 0 | The operation has started. |

ConnectionStatus

| Constant | Value | Description |
|---|---|---|
| ConnectionStatusConnected | 1 | The device is connected. |
| ConnectionStatusDisconnected | 0 | The device is disconnected. |

Device Access Status

| Constant | Value | Description |
|---|---|---|
| DeviceAccessStatusAllowed | 1 | Access to the device is allowed. |
| DeviceAccessStatusDeniedBySystem | 3 | Access to the device has been disallowed by the system. |
| DeviceAccessStatusDeniedByUser | 2 | Access to the device has been disallowed by the user. |
| DeviceAccessStatusUnspecified | 0 | The device access is not specified. |

### 22.38.40 Delegates

### 22.38.41 DeviceFromBluetoothAddressAsyncCompletedMBS(AsyncStatus as Integer, Device as WindowsBluetoothLEDeviceMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate for FromBluetoothAddressAsync results.

### 22.38.42 DeviceFromIdAsyncCompletedMBS(AsyncStatus as Integer, Device as WindowsBluetoothLEDeviceMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate for FromIdAsync results.

## 22.39 class WindowsBluetoothLEExceptionMBS

### 22.39.1 class WindowsBluetoothLEExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** The exception for errors reported by WindowsBluetoothLE classes.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr6

## 22.40 class WindowsBluetoothLEManufacturerDataMBS

### 22.40.1 class WindowsBluetoothLEManufacturerDataMBS

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for manufacturer-specific data.
**Notes:** A Bluetooth LE manufacturer-specific data section (one particular type of LE advertisement section).
A Bluetooth LE advertisement packet can contain multiple instances of these BluetoothLEManufacturerData objects.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr6

### 22.40.2 Methods

### 22.40.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.40.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.40.5 Properties

### 22.40.6 CompanyId as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Bluetooth LE company identifier code.
**Notes:** The Bluetooth LE company identifier code as defined by the Bluetooth Special Interest Group (SIG).
(Read only property)

### 22.40.7 Data as MemoryBlock

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bluetooth LE manufacturer-specific section data.
**Notes:** (Read only property)

### 22.40.8 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 22.41 class WindowsBlueToothLEMBS

### 22.41.1 class WindowsBlueToothLEMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The class for using Bluetooth LE functions on Windows 8 or newer.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr7
- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.41.2 Methods

### 22.41.3 AbortReliableWrite(ReliableWriteContextID as UInt64)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Specifies the end of reliable write procedures, and the writes should be aborted.
**Notes:** ReliableWriteContextID: The context describing the reliable write operation returned from a previous call to BeginReliableWrite.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450791(v=vs.85).aspx

### 22.41.4 Available as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether this classes are available.
**Notes:** Should return true on Windows 8 and later versions of Windows.

### 22.41.5 BeginReliableWrite as UInt64

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Specifies that reliable writes are about to begin.
**Notes:** Returns the ID for the context describing the reliable write operation.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450792(v=vs.85).aspx

### 22.41.6 Characteristics(ParentService as WindowsBlueToothLEServiceMBS, Flags as Integer = 0) as WindowsBlueToothLECharacteristicMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets all the characteristics available for the specified service.
**Notes:** Service: Address of a WindowsBlueToothLEServiceMBS containing the parent service of the included services to be retrieved. This parameter is optional if a service handle was passed to Device, in which case the service specified by the service handle will be treated as the parent.
Flags: Optional flags, currently non defined.

Returned characteristics are cached upon successful retrieval of characteristics from the device directly. Unless a service-change event is received, the list of returned characteristics is not expected to change.

The parent service must be present in the cache, otherwise the function will fail. The parent service must be a service returned by either Services or IncludedServices methods.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450795(v=vs.85).aspx

### 22.41.7 Constructor(DevicePath as String)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The constructor.
**Notes:** Takes path to device or service on device to connect.

### 22.41.8 Descriptors(Characteristic as WindowsBlueToothLECharacteristicMBS, Flags as Integer = 0) as WindowsBlueToothLEDescriptorMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets all the descriptors available for the specified characteristic.
**Notes:** Characteristic: The parent characteristic of the descriptors to be retrieved.

Returned characteristics are cached upon successful retrieval of characteristics from the device directly. Unless a service-change event is received, the list of returned characteristics is not expected to change.

The parent characteristic must be present in the cache, otherwise the function will fail. The parent service must be a service returned by either Services or IncludedServices.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450797(v=vs.85).aspx

### 22.41.9 DevicePathsForClassGUID(GUID as string) as String()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries installation database for devices.
**Example:**

```
dim paths() as String = WindowsBlueToothLEMBS.DevicePathsForClassGUID(" { 0000180D-0000-1000-8000-00805F9B34FB } ")

List.DeleteAllRows
if paths = nil then
list.AddRow "Failed."
else
for each path as string in paths
List.AddRow path
next
end if
```

**Notes:** This is a helper method in MBS Plugin to query setup database to find the paths to devices with a given GUID.

Pass in the GUID of the device, e.g. " { 0000180D-0000-1000-8000-00805F9B34FB } "

### 22.41.10 EndReliableWrite(ReliableWriteContextID as UInt64)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Specifies the end of reliable writes, and the writes should be committed.
**Notes:** ReliableWriteContextID: The context describing the reliable write operation returned from a previous call to BeginReliableWrite.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450794(v=vs.85).aspx

### 22.41.11 GetCharacteristicValue(Characteristic as WindowsBlueToothLECharacteristicMBS, Flags as Integer = 0) as MemoryBlock

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets the value of the specified characteristic.
**Notes:** Characteristic: the parent characteristic of the characteristic value to be retrieved.
Flags: Flags to modify the behavior of GetCharacteristicValue.

| Flag | Description |
|---|---|
| kFlagNone | The client does not have specific GATT requirements (default). |
| kFlagConnectionEncrypted | The client requests the data to be transmitted over an encrypted channel. |
| kFlagConnectionAuthenticated | The client requests the data to be transmitted over an authenticated channel. |
| kFlagForceReadFromDevice | The characteristic value is to be read directly from the device. This overwrites the one in the cache if one is already present. |
| kFlagForceReadFromCache | The characteristic value is to be read from the cache (regardless of whether it is present in the cache or not). |

The characteristic value is returned from the cache if one is already present. This would be the case most of the time, as all the device attributes are cached at the time of pairing or association. However, if it is not present, the characteristic value is read directly from the device, and will be cached upon successfully reading it from the device. If kFlagForceReadFromCache or kFlagForceReadFromDevice is present, the characteristic value is read using the specified method.
Returned characteristics are cached upon successful retrieval of characteristics from the device directly. Unless a service-change event is received, the list of returned characteristics is not expected to change.

The parent service must be present in the cache, otherwise the function will fail. The parent service must

be a service returned by either Services or IncludedServices.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450795(v=vs.85).aspx

### 22.41.12 GetDescriptorValue(Descriptor as WindowsBlueToothLEDescriptorMBS, Flags as Integer = 0) as WindowsBlueToothLEDescriptorValueMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets the value of the specified descriptor.
**Notes:** Descriptor: The parent descriptor of the descriptor value to be retrieved.
Flags: Flags to modify the behavior of GetDescriptorValue.

| Flag | Description |
|---|---|
| kFlagNone | The client does not have specific GATT requirements (default). |
| kFlagConnectionEncrypted | The client requests the data to be transmitted over an encrypted channel. |
| kFlagConnectionAuthenticated | The client requests the data to be transmitted over an authenticated channel. |
| kFlagForceReadFromDevice | The descriptor value is to be read directly from the device. This overwrites the one in the cache if one is already present. |
| kFlagForceReadFromCache | The descriptor value is to be read from the cache (regardless of whether it is present in the cache or not). |

Lasterror and LastErrorMessage properties are set.

The descriptor value is returned from the cache if one is already present. This would be the case most of the time, as all the device attributes are cached at the time of pairing or association. However, if it is not present, the descriptor value is read directly from the device, and will be cached upon successfully reading it from the device. If kFlagForceReadFromCache or kFlagForceReadFromDevice is present, the descriptor value is read using the specified method.

Returned descriptor values are cached upon successful retrieval of descriptor values from the device directly. Unless a service-change event is received, the descriptor values is not expected to change.

The parent service must be present in the cache, otherwise the function will fail. The parent service must be a service returned by either Services or IncludedServices.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450798(v=vs.85).aspx

### 22.41.13 IncludedServices(ParentService as WindowsBlueToothLEServiceMBS, Flags as Integer = 0) as WindowsBlueToothLEServiceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets all the included services available for a given service.
**Notes:** ParentService: Address of a WindowsBlueToothLEServiceMBS object that contains the parent service of the included services to be retrieved. This parameter is optional if a service handle was passed to hDevice, in which case the service specified by the service handle will be treated as the parent.
Flags: Optional flags, currently none defined.

Returned services are cached upon successful retrieval of services from the device directly. Unless a service-change event is received, the list of returned services is not expected to change.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450800(v=vs.85).aspx

### 22.41.14 RegisterChangeEvent(Characteristics() as WindowsBlueToothLECharacteristicMBS)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Registers a ChangedEvent event to be called back during a characteristic value change event on the given characteristic identified by its characteristic handle.
**Notes:** Characteristics: List of characteristics to watch for changes.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450804(v=vs.85).aspx

### 22.41.15 Services(Flags as Integer = 0) as WindowsBlueToothLEServiceMBS()

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Gets all the primary services available for a server.
**Notes:** Flags: Currently not used.

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450795(v=vs.85).aspx

### 22.41.16 SetCharacteristicValue(Characteristic as WindowsBlueToothLECharacteristicMBS, data as MemoryBlock, ReliableWriteContextID as UInt64, Flags as Integer = 0) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Writes the specified characteristic value to the Bluetooth device.
**Notes:** Characteristic: The object containing the parent characteristic.
CharacteristicValue: The object containing the characteristic value.
ReliableWriteContext: Optionally the context describing the reliable write operation returned from a previous call to BeginReliableWrite.
Flags: Flags to modify the behavior of SetCharacteristicValue.

| Flag | Description |
|---|---|
| kFlagNone | The client does not have specific GATT requirements (default). |
| kFlagConnectionEncrypted | The client requests the data to be transmitted over an encrypted channel. |
| kFlagConnectionAuthenticated | The client requests the data to be transmitted over an authenticated channel. |
| kFlagWriteWithoutResponse | Write without response. |
| kFlagSignedWrite | Signed write. Profile drivers must use with BLUETOOTH_GATT_FLAG_WRITE_WITHOUT_RESPONSE in order to produce signed write without a response. |

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450806(v=vs.85).aspx

### 22.41.17 SetDescriptorValue(Descriptor as WindowsBlueToothLEDescriptorMBS, DescriptorValue as WindowsBlueToothLEDescriptorValueMBS, Flags as Integer = 0) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Writes the specified descriptor value to the Bluetooth device.
**Notes:** Descriptor: Tthe parent descriptor.

DescriptorValue: The descriptor's value.
Flags: Flags to modify the behavior of SetDescriptorValue:

| Flag | Description |
|---|---|
| kFlagNone | The client does not have specific GATT requirements (default). |
| kFlagConnectionEncrypted | The client requests the data to be transmitted over an encrypted channel. |
| kFlagConnectionAuthenticated | The client requests the data to be transmitted over an authenticated channel. |

Lasterror and LastErrorMessage properties are set.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/hh450807(v=vs.85).aspx

### 22.41.18 Properties

### 22.41.19 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** Either handle for device or service on a device.
(Read and Write property)

### 22.41.20 LastError as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 22.41.21 LastErrorMessage as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The text message for last error.
**Notes:** (Read and Write property)

### 22.41.22 Path as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The path used to open device.
**Notes:** (Read and Write property)

### 22.41.23 Events

### 22.41.24 ChangeEvent(ChangedAttributeHandle as Integer, CharacteristicValue as MemoryBlock)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: .

**Function:** The event called when a value changed.
**Notes:** Only called if you used RegisterChangeEvent before.

### 22.41.25 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagConnectionAuthenticated | &h00000002 | The client requests the data to be transmitted over an authenticated cha |
| kFlagConnectionEncrypted | &h00000001 | The client requests the data to be transmitted over an encrypted channel |
| kFlagForceReadFromCache | &h00000008 | The descriptor value is to be read from the cache (regardless of whether present in the cache or not). |
| kFlagForceReadFromDevice | &h00000004 | The descriptor value is to be read directly from the device. This overwrite one in the cache if one is already present. |
| kFlagNone | &h00000000 | No flag. |
| kFlagReturnAll | &h00000040 | |
| kFlagSignedWrite | &h00000010 | Signed write. Profile drivers must use with kFlagWriteWithoutRespon order to produce signed write without a response. |
| kFlagWriteWithoutResponse | &h00000020 | Write without response. |

## 22.42 class WindowsBlueToothLEServiceMBS

### 22.42.1 class WindowsBlueToothLEServiceMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The WindowsBlueToothLEServiceMBS class describes a Bluetooth Low Energy (LE) generic attribute (GATT) profile service.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 22.42.2 Methods

### 22.42.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.42.4 Properties

### 22.42.5 AttributeHandle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The handle to the Bluetooth LE GATT profile attributes.
**Notes:** (Read and Write property)

### 22.42.6 ServiceUUID as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The Universally Unique ID (UUID) of the Bluetooth LE GATT profile service.
**Notes:** (Read and Write property)

## 22.43 class WindowsBlueToothRadioInfoMBS

### 22.43.1 class WindowsBlueToothRadioInfoMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This class contains information about a Bluetooth radio.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr1
- MBS Xojo Plugins, version 18.3pr4

### 22.43.2 Methods

### 22.43.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.43.4 Properties

### 22.43.5 Address as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Address of the local Bluetooth radio.
**Notes:** (Read only property)

### 22.43.6 ClassofDevice as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Device class for the local Bluetooth radio.
**Notes:** (Read only property)

### 22.43.7 Manufacturer as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Manufacturer of the Bluetooth radio, expressed as a BTH_MFG_Xxx value.
**Notes:** For more information about the Bluetooth assigned numbers document and a current list of values, see the Bluetooth specification at www.bluetooth.com.
(Read only property)

### 22.43.8 Name as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Name of the local Bluetooth radio.
**Notes:** (Read only property)

### 22.43.9 Subversion as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This member contains data specific to individual Bluetooth device manufacturers.
**Notes:** (Read only property)

## 22.44 class WindowsBlueToothRadioMBS

### 22.44.1 class WindowsBlueToothRadioMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The class for a bluetooth radio.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.44.2 Methods

### 22.44.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.44.4 DeviceInfo(Address as String) as WindowsBlueToothDeviceInfoMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Retrieves information about a remote Bluetooth device.
**Notes:** The Bluetooth device must have been previously identified through a successful device inquiry function call.
Lasterror is set.

### 22.44.5 EnableDiscovery(radio as WindowsBlueToothRadioMBS = nil, enable as boolean = true) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Changes the discovery state of a local Bluetooth radio or radios.
**Notes:** Enabled: Flag specifying whether discovery is to be enabled or disabled. Set to TRUE to enable discovery, set to FALSE to disable discovery.

Returns true if the discovery state was successfully changed.
Returns false if discovery state was not changed.

Use the IsDiscoverable function to determine the current state of a Bluetooth radio. Windows ensures that a discoverable system is connectable, and as such, the radio must allow incoming connections prior to making a radio discoverable. Failure to allow incoming connections results in the BluetoothEnableDiscovery function call failing.
When EnableDiscovery changes the discovery state, the new state is valid for the lifetime of the calling application. Additionally, if a Bluetooth radio previously made discoverable with this function is disabled and re-enabled via the application, discoverability will not persist. Once the calling application terminates, the discovery state of the specified Bluetooth radio reverts to the state it was in before EnableDiscovery was called.

### 22.44.6 EnableIncomingConnections(radio as WindowsBlueToothRadioMBS = nil, enable as boolean = true) as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Modifies whether a local Bluetooth radio accepts incoming connections.
**Notes:** Flag specifying whether incoming connection acceptance is to be enabled or disabled. Set to true to enable incoming connections, set to false to disable incoming connections.

Returns true if the incoming connection state was successfully changed.
Returns false if incoming connection state was not changed.

A radio that is non-connectable is non-discoverable. The radio must be made non-discoverable prior to making a radio non-connectable. Failure to make a radio non-discoverable prior to making it non-connectable will result in failure of the EnableIncomingConnections function call.

### 22.44.7 FirstRadio as WindowsBlueToothRadioMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries first radio.
**Notes:** Lasterror is set.

### 22.44.8 Radios as WindowsBlueToothRadioMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries radios.
**Notes:** Lasterror is set.

### 22.44.9 RemoveDevice(Address as string) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Removes authentication between a Bluetooth device and the computer and clears cached service information for the device.
**Notes:** Lasterror is set.

### 22.44.10 UpdateDeviceRecord(Address as string, Name as String) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Updates the local computer cache about a Bluetooth device.
**Notes:** Lasterror is set.

When updating a Bluetooth device record, please pass:

Address: Must be a previously found radio address.
Name: Must contain the new name to be stored.

### 22.44.11 Properties

### 22.44.12 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 22.44.13 Info as WindowsBlueToothRadioInfoMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Obtains information about a Bluetooth radio.
**Notes:** Lasterror is set.
(Read only property)

### 22.44.14 IsConnectable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Determines whether a Bluetooth radio or radios is connectable.
**Notes:** Returns true if at least one Bluetooth radio is accepting incoming connections. Returns false if no radios are accepting incoming connections.

If multiple Bluetooth radios exist, the first radio to return that it is connectable causes the IsConnectable function to succeed.
(Read only property)

### 22.44.15 IsDiscoverable as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Determines whether a Bluetooth radio or radios is discoverable.
**Notes:** Returns true if at least one Bluetooth radio is discoverable.
Returns false if no Bluetooth radios are discoverable.
(Read only property)

### 22.44.16 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 22.44.17 Constants

Manufacturer Constants

| Constant | Value | Description |
|---|---|---|
| kManufacturer3Com | 5 | 3Com |
| kManufacturerAlcatel | 36 | Alcatel |
| kManufacturerAtmel | 19 | Atmel |
| kManufacturerAvmBerlin | 31 | AVM Berlin |
| kManufacturerBandspeed | 32 | Bandspeed |
| kManufacturerBroadcom | 15 | Broadcom |
| kManufacturerConexant | 28 | Conexant |
| kManufacturerCsr | 10 | Csr |
| kManufacturerCTechnologies | 38 | CTechnologies |
| kManufacturerDigianswer | 12 | Digianswer |
| kManufacturerEricsson | 0 | Ericsson |
| kManufacturerHitachi | 41 | Hitachi |
| kManufacturerIBM | 3 | IBM |
| kManufacturerInfineon | 9 | Infineon |
| kManufacturerIntel | 2 | Intel |
| kManufacturerInternalUse | 65535 | InternalUse |
| kManufacturerInventel | 30 | Inventel |
| kManufacturerKcTechnology | 22 | KcTechnology |
| kManufacturerLucent | 7 | Lucent |
| kManufacturerMacronixInternational | 44 | MacronixInternational |
| kManufacturerMansella | 33 | Mansella |
| kManufacturerMicrosoft | 6 | Microsoft |
| kManufacturerMitel | 16 | Mitel |
| kManufacturerMitsibushi | 20 | Mitsibushi |
| kManufacturerMotorola | 8 | Motorola |
| kManufacturerNEC | 34 | NEC |
| kManufacturerNewlogic | 23 | Newlogic |
| kManufacturerNokia | 1 | Nokia |
| kManufacturerOpenInterface | 39 | OpenInterface |
| kManufacturerParthus | 14 | Parthus |
| kManufacturerPhilipsSemiconductor | 37 | PhilipsSemiconductor |
| kManufacturerQualcomm | 29 | Qualcomm |
| kManufacturerRfMicroDevices | 40 | RfMicroDevices |
| kManufacturerRohdeSchwarz | 25 | RohdeSchwarz |
| kManufacturerRtxTelecom | 21 | RtxTelecom |
| kManufacturerSignia | 27 | Signia |
| kManufacturerSiliconwave | 11 | Siliconwave |
| kManufacturerSymbolTechnologies | 42 | SymbolTechnologies |
| kManufacturerTenovis | 43 | Tenovis |
| kManufacturerTi | 13 | Ti |
| kManufacturerToshiba | 4 | Toshiba |
| kManufacturerTransilica | 24 | Transilica |
| kManufacturerTtpcom | 26 | Ttpcom |
| kManufacturerWaveplusTechnologyCo | 35 | WaveplusTechnologyCo |
| kManufacturerWidcomm | 17 | Widcomm |
| kManufacturerZeevo | 18 | Zeevo |

## 22.45 class WindowsBlueToothSelectDeviceDialogMBS

### 22.45.1 class WindowsBlueToothSelectDeviceDialogMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** This class facilitates and manages the visibility, authentication, and selection of Bluetooth devices and services.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.45.2 Methods

### 22.45.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The constructor.

### 22.45.4 Devices as WindowsBlueToothDeviceInfoMBS()

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries list of devices.
**Notes:** The list of selected devices after calling ShowDialog method.

### 22.45.5 ShowDialog as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Enables Bluetooth device selection.
**Notes:** Sets Cancelled and Devices property.
Returns true if a user selected a device.

The ShowDialog function opens a common dialog box for selecting Bluetooth devices. The list of devices displayed to the user is determined by the flags and settings the caller specifies in the WindowsBlueTooth-SelectDeviceDialogMBS object.

If BluetoothSelectDevices returns true, the Devices member contains selected object. The caller should verify that the Authenticated and Remembered flags in the WindowsBlueToothDeviceInfoMBS objects to determine which devices were successfully authenticated, and which devices are valid selections for the user.

see also
https://msdn.microsoft.com/en-us/library/windows/desktop/aa362891(v=vs.85).aspx

### 22.45.6 Properties

### 22.45.7 AddNewDeviceWizard as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, starts the Add New Device wizard.
**Notes:** (Read and Write property)

### 22.45.8 Cancelled as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Set to true, if dialog was cancelled.
**Notes:** (Read and Write property)

### 22.45.9 ClassOfDevices as Dictionary

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The dictionary to select classes of devices.
**Notes:** Provided for specification and retrieval of Bluetooth Class Of Device (COD) information.

Key is COD mask and value is description text.

CODMask: A mask to compare to determine the class of device. The major and minor codes of ulCODMask are used to compare the class of device found. If a major code is provided it must match the major code returned by the remote device, such that GET_COD_MAJOR(ulCODMask) is equal to GET_COD_MAJOR( [ class of device of the remote device ] ).
(Read and Write property)

### 22.45.10 ForceAuthentication as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, forces authentication before returning.
**Notes:** (Read and Write property)

### 22.45.11 Info as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Sets the information text when not "".
**Notes:** (Read and Write property)

### 22.45.12 Parent as Variant

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop only.

**Function:** Handle to the parent window.
**Notes:** Set to nil for no parent.
Can reference a Window or DesktopWindow object.
(Read and Write property)

### 22.45.13 ShowAuthenticated as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, authenticated devices are shown in the picker.
**Notes:** (Read and Write property)

### 22.45.14 ShowRemembered as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, remembered devices are shown in the picker.
**Notes:** (Read and Write property)

### 22.45.15 ShowUnknown as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, unknown devices that are not authenticated or remembered are shown in the picker.
**Notes:** (Read and Write property)

### 22.45.16 SkipServicesPage as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** If true, skips the Services page in the Add New Device wizard.
**Notes:** (Read and Write property)

### 22.45.17 Events

### 22.45.18 DeviceFilter(device as WindowsBlueToothDeviceInfoMBS) as boolean

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: .

**Function:** An event to filter devices.
**Notes:** Return true to skip device.

## 22.46 class WindowsBlueToothServiceMBS

### 22.46.1 class WindowsBlueToothServiceMBS

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The class for details on a bluetooth service.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr4

### 22.46.2 Methods

### 22.46.3 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The private constructor.

### 22.46.4 Properties

### 22.46.5 Comment as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The comment for the service.
**Notes:** (Read only property)

### 22.46.6 Name as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The name of the service.
**Notes:** (Read only property)

### 22.46.7 Port as Integer

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The network port.
**Notes:** e.g. 13
Range from 1 to 31.
(Read only property)

### 22.46.8 Properties as Dictionary

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Queries properties for the service.
**Notes:** (Read only property)

### 22.46.9 RemoteAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The remote address.
**Notes:** e.g. "(44:00:10:12:56:78):13"
(Read only property)

## 22.47 class WindowsBlueToothSocketMBS

### 22.47.1 class WindowsBlueToothSocketMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The class for connecting via bluetooth to a device.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr2
- MBS Xojo Plugins, version 18.4pr9
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr4
- Bluetooth for Xojo

### 22.47.2 Methods

### 22.47.3 Accept(byref RemoteAddress as String, byref RemotePort as Integer, NewSocket as WindowsBlueToothSocketMBS) as WindowsBlueToothSocketMBS

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Accepts a new incoming connection.
**Notes:** Bluetooth uses the accept function to enable incoming connection attempts on a socket.
RemoteAddress and RemotePort are set to address of remote peer.

If you like to pass in your own subclass object for NewSocket, we can use that socket object. Otherwise, we make a new WindowsBlueToothSocketMBS object.

Lasterror is set.

### 22.47.4 Bind(Port as Integer = -1, BluetoothAddress as string = "")

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Binds to a port and optional address.
**Notes:** Lasterror is set.
BindAddress and BindPort are set.
BluetoothAddress: When used with the bind function, must be "" or a valid local radio address.

Port: Must be -1 for automatic or valid port from 1 to 30.

On client applications, the port member must be zero to enable an appropriate local endpoint to be assigned. On server applications, the port member must be a valid port number or kPortAny; ports automatically assigned using kPortAny may be queried subsequently with a call to the getsockname function. The valid range for requesting a specific RFCOMM port is 1 through 30. Server channels are global resource, and only 30 server channels are available for RFCOMM on any Bluetooth device, which must be shared by all Windows Sockets that belong to the Bluetooth address family. If no server channel is available, or if the specified server channel is already reserved, the bind call fails.

Upon successful return from bind, the server channel is reserved until the socket is closed. Use the getsockname function to retrieve the channel number for SDP registration.

Applications should use auto-allocation for the server channel.
The bind function does not automatically advertise the server application using the Bluetooth SDP; applications must call the Publish function.

### 22.47.5 Close

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** Closes socket.
**Notes:** Called by destructor.
Does also UnpublishRecord if needed.

### 22.47.6 Connect(BluetoothAddress as string, Port as Integer, ServiceClassGUID as String = """, Blocking as boolean = true)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Connects to a bluetooth device.
**Notes:** Valid ports in range 1 to 31.
Lasterror is set.

BluetoothAddress: Address of the target Bluetooth device. If zero, a valid local Bluetooth device address is assigned when the connect or accept function is called. When used with the connect function, a valid remote radio address must be specified.
serviceClassId

Service Class Identifier of the socket. When used with the bind function, serviceClassId is ignored. Also ignored if the port is specified. For the connect function, specifies the unique Bluetooth service class ID of

the service to which it wants to connect. If the peer device has more than one port that corresponds to the service class identifier, the connect function attempts to connect to the first valid service; this mechanism can be used without prior SDP queries.
port: RFCOMM channel associated with the socket.

Added Blocking parameter in v23.4. If true, we block, so connect returns after connection is done. Pass false to return directly and check status later.

### 22.47.7 Constructor

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Creates a new socket.
**Notes:** Socket address type is always AF_BTH, type is SOCK_STREAM and protocol is BTHPROTO_RFCOMM.

### 22.47.8 Listen(BackLog as Integer = 2)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Listens for connections on this socket.
**Notes:** Lasterror is set.

### 22.47.9 Poll

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Polls for new events.
**Notes:** May call NewConnection or DataAvailable event if data is available.
Calls SendComplete when sending is done.
Calls Error event when an error occurred.

This is normally called automatically by a timer for you.
But if you are in a tight loop, you can call it manually.

### 22.47.10 PublishRecord(SDPRecord as MemoryBlock)

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Publish service record.

**Notes:** Lasterror is set.
Sets the SDPRecordID property.

### 22.47.11 Read(size as integer, peek as boolean = false) as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Reads data.
**Notes:** Please pass in size of desired data length to read.
Lasterror is set.
New data is returned (maybe shorter).
If peek is true, data is not removed from buffers.

### 22.47.12 ReadAll(peek as boolean = false) as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Reads all available data.
**Notes:** Lasterror is set.
New data is returned.
If peek is true, data is not removed from buffers.

### 22.47.13 RegisterService(ServiceClassGUID as String, InstanceName as String, Comment as String = "")

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Registers service.
**Notes:** Lasterror is set.

### 22.47.14 Send(data as MemoryBlock) as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Sends data.
**Notes:** Lasterror is set.
Returns number of bytes sent.
Later raises SendComplete event when sending is done.
See also:

- 22.47.15 Send(data as String) as Integer

### 22.47.15 Send(data as String) as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Sends data.
**Notes:** Lasterror is set.
Returns number of bytes sent.
Later raises SendComplete event when sending is done.
See also:

- 22.47.14 Send(data as MemoryBlock) as Integer 4286

### 22.47.16 UnpublishRecord

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Unpublish service record.
**Notes:** Lasterror is set.
Clears SDPRecordID property.

### 22.47.17 Properties

### 22.47.18 Authenticate as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether to autheticate connection.
**Notes:** For disconnected sockets, the Authenticate options specifies whether authentication is required for a connect or accept operation to complete successfully. Setting this socket option actively initiates authentication during connection establishment, if the two Bluetooth devices were not previously authenticated. The user interface for passkey exchange, if necessary, is provided by the operating system outside the application context.

For outgoing connections that require authentication, the connect operation fails with WSAEACCES if authentication is not successful. In response, the application may prompt the user to authenticate the two Bluetooth devices before connection.
For incoming connections, the connection is rejected if authentication cannot be established and returns a WSAEHOSTDOWN error. For more information about authenticating Bluetooth devices, see BluetoothAuthenticateDevice function.

Lasterror is set.
(Read and Write property)

### 22.47.19 AvailableBytes as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries available bytes in input buffer.
**Notes:** Lasterror is set.
Returns -1 if unknown.
(Read only property)

### 22.47.20 BindAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The address the socket is bound to.
**Notes:** (Read only property)

### 22.47.21 BindPort as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The port the socket is bound to.
**Notes:** (Read only property)

### 22.47.22 Encrypt as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether to encrypt connection.
**Notes:** On unconnected sockets, the Encrypt socket option enforces encryption to establish a connection. Encryption is only available for authenticated connections. For incoming connections, a connection for which encryption cannot be established is automatically rejected and returns WSAEHOSTDOWN as the error. For outgoing connections, the connect function fails with WSAEACCES if encryption cannot be established. In response, the application may prompt the user to authenticate the two Bluetooth devices before connection. For more information about authenticating Bluetooth devices, see BluetoothAuthenticateDevice.

Windows XP with SP2: For a socket that is connected and authenticated, SO_BTH_ENCRYPT starts encryption.
(Read and Write property)

### 22.47.23 Handle as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The internal socket reference number.
**Notes:** (Read only property)

### 22.47.24 Lasterror as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read only property)

### 22.47.25 LastErrorMessage as String

MBS Bluetooth Plugin, Plugin Version: 18.3, Platform: Windows, Targets: All.

**Function:** The last error message.
**Notes:** (Read only property)

### 22.47.26 Listening as Boolean

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Whether we are listening.
**Notes:** Set to true on success by Bind method.
(Read only property)

### 22.47.27 LocalAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries local bluetooth address.
**Notes:** Lasterror is set.
Value is empty if not known.
(Read only property)

### 22.47.28 LocalPort as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries local port.
**Notes:** Value is -1 if not set.
Lasterror is set.
(Read only property)

### 22.47.29 MTU as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The MTU property.
**Notes:** The MTU socket option is an advanced option used primarily for validation. The MTU option obtains or sets default RFCOMM MTU (maximum transmission unit) for connection negotiation to a value different than the RFCOMM protocol-default value.
Because MTU is affected by the underlying L2CAP MTU, and protocol and application minimums and maximums, the default value for SO_BTH_MTU is only a starting point for negotiation with the remote peer, and the final negotiated MTU is likely to vary from the default. Setting the MTU value may negatively affect throughput, and as such, any modification should be performed with knowledge of the underlying Bluetooth protocol.

The MTU socket option can be performed on connected sockets, but has no effect if the negotiation has already completed. Setting it on the listening (server) socket has no effect.

The amount of data that an application can send or receive in a single socket call is not affected by the MTU; MTU only affects how the underlying Windows Sockets service provider segments packets for transport. Both the proposed MTU and the MTU ultimately negotiated must be between RFCOMM_MIN_MTU (&h17) and RFCOMM_MAX_MTU (&3F3), as defined in the Ws2bth.h header file.
(Read and Write property)

### 22.47.30 MTUMax as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The MTU max property.
**Notes:** The MTUMax socket option is an advanced option used primarily for validation. The MTUMax socket option sets the maximum RFCOMM MTU (maximum transmission unit) for connection negotiation. Connections with an RFCOMM MTU equal to or greater than this value fail during the connect/accept process. While setting this socket option is allowed for a connected socket, it has no effect if the negotiation has completed. Setting this socket option on a listening socket propagates the value for all incoming connections. The MAX MTU value must be between RFCOMM_MIN_MTU (&h17) and RFCOMM_MAX_MTU (&3F3), as defined in the Ws2bth.h header file.

(Read and Write property)

### 22.47.31 MTUMin as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The MTU min property.
**Notes:** The MTUMin socket option is an advanced option used primarily for validation. The MTUMin socket option sets the minimum RFCOMM MTU (maximum transmission unit) for connection negotiation. Connections with an RFCOMM MTU smaller than this value fail during the connect/accept process. While setting this socket option is allowed for a connected socket, it has no effect if the negotiation has completed. Setting this socket option on a listening socket propagates the value for all incoming connections.
Only a listening socket can revise the MTU downward, therefore if the value proposed by the connecting socket is less than the value set for MTUMin on the listening socket, the connection is refused. The minimum MTU must be between RFCOMM_MIN_MTU (&h17) and RFCOMM_MAX_MTU (&3F3), as defined in the Ws2bth.h header file.
(Read and Write property)

### 22.47.32 RemoteAddress as String

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries remote address.
**Notes:** Lasterror is set.
Value is empty if not known.
(Read only property)

### 22.47.33 RemotePort as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** Queries remote port.
**Notes:** Lasterror is set.
Value is -1 if not set.
(Read only property)

### 22.47.34 SDPRecordID as Integer

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: All.

**Function:** The SPF record ID for published service.

**Notes:** (Read only property)

### 22.47.35 Events

### 22.47.36 DataAvailable

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: .

**Function:** The data available event.
**Notes:** Called when data is coming in.

### 22.47.37 Error

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: .

**Function:** The event called when an error occurred.

### 22.47.38 NewConnection

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: .

**Function:** A new connection is needed.
**Notes:** Please call Accept method to accept the new connection and link it to a socket.

### 22.47.39 SendComplete

MBS Bluetooth Plugin, Plugin Version: 18.1, Platform: Windows, Targets: .

**Function:** Sending data is complete.

### 22.47.40 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPortAny | -1 | Any port. |

# 22.48 class WindowsDeviceInformationPairingMBS

## 22.48.1 class WindowsDeviceInformationPairingMBS

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains information and enables pairing for a device.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr3
- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr1

## 22.48.2 Methods

## 22.48.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.48.4 Constructor(other as WindowsDeviceInformationPairingMBS) 4293

## 22.48.4 Constructor(other as WindowsDeviceInformationPairingMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
See also:

- 22.48.3 Constructor 4293

## 22.48.5 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.48.6 PairAsync

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to pair the device.
**Notes:** Calls PairAsyncCompleted later.
See also:

- 28.57.17 PairAsync(minProtectionLevel as Integer) 5320

### 22.48.7 PairAsync(minProtectionLevel as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to pair the device using a provided level of protection.
**Notes:** minProtectionLevel: The required level of protection to use for the pairing action.

Calls PairAsyncCompleted later.
See also:

- 22.48.6 PairAsync 4294

### 22.48.8 TryRegisterForAllInboundPairingRequests(pairingKindsSupported as Integer) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers the application to handle all inbound pairing requests.
**Notes:** pairingKindsSupported: The pairing kinds your app supports.

Returns true whether or not the attempt was successful.

### 22.48.9 TryRegisterForAllInboundPairingRequestsWithProtectionLevel(pairingKindsSupported as Integer, minProtectionLevel as Integer) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers the application to handle all inbound pairing requests with the specified minimum level of protection.
**Notes:** pairingKindsSupported: The pairing kinds your app supports.
minProtectionLevel: The required minimum level of protection to accept for the pairing requests.

Returns true whether or not the attempt was successful.

### 22.48.10 UnpairAsync

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to unpair the device.

### 22.48.11 Properties

### 22.48.12 CanPair as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value that indicates whether the device can be paired.
**Notes:** True if the device can be paired, otherwise false.
(Read only property)

### 22.48.13 Device as WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device to pair.
**Notes:** (Read only property)

### 22.48.14 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.48.15 IsPaired as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value that indicates whether the device is currently paired.
**Notes:** True if the device is currently paired, otherwise false.
(Read only property)

### 22.48.16 ProtectionLevel as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the level of protection used to pair the device.
**Notes:** The protection level, e.g. ProtectionLevelEncryptionAndAuthenticationRequired constant.
(Read only property)

### 22.48.17 Events

### 22.48.18 PairAsyncCompleted(asyncStatus as Integer, PairingStatus as Integer, ProtectionLevelUsed as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** Called when PairAsync method finishes.
**Notes:** ProtectionLevelUsed: Gets the level of protection used to pair the device.
Status: Gets the paired status of the device after the pairing action completed.

### 22.48.19 UnpairAsyncCompleted(asyncStatus as Integer, UnpairingStatus as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** Called when the UnpairAsync method finished.
**Notes:** Status: Gets the paired status of the device after the unpairing action completed.

### 22.48.20 Constants

Pairing Kinds

| Constant | Value | Description |
|---|---|---|
| DevicePairingKindsConfirmOnly | 1 | The application must confirm they wish to perform the pairing<br>You can present an optional confirmation dialog to the user. W<br>ConfirmOnly, call Accept from the event args of the PairingRe<br>handler if you want the pairing to complete. |
| DevicePairingKindsConfirmPinMatch | 8 | The application must display the given PIN to the user and a<br>confirm that the PIN matches the one show on the target devic<br>With a value of ConfirmPinMatch, call Accept from the eve<br>PairingRequested event handler if you want the pairing to comp |
| DevicePairingKindsDisplayPin | 2 | The application must display the given PIN to the user.<br>The user will then need to enter or confirm that PIN on the<br>being paired. With a value of DisplayPin, call Accept from the<br>the PairingRequested event handler if you want the pairing to co<br>application cancels the pairing at this point, the device might<br>This is because the system and the target device don't need an<br>for this DevicePairingKinds value. |
| DevicePairingKindsNone | 0 | No pairing is supported. |
| DevicePairingKindsProvidePasswordCredential | 16 | The application must request a user name and password from t<br>With a value of ProvidePasswordCredential, call AcceptWithPa<br>tial from the event args of the PairingRequested event handler<br>pairing. Pass in the PasswordCredential that encapsulates the<br>password as a parameter. |
| DevicePairingKindsProvidePin | 4 | The application must request a PIN from the user.<br>The PIN will typically be displayed on the target device. W<br>ProvidePin, call Accept from the event args of the PairingRe<br>handler if you want the pairing to complete. Pass in the PIN as |

Protection Levels

| Constant | Value | Description |
|---|---|---|
| DevicePairingProtectionLevelDefault | 0 | The default value. This should not be used. |
| DevicePairingProtectionLevelEncryption | 2 | Pair the device using encryption. |
| DevicePairingProtectionLevelEncryptionAndAuthentication | 3 | Pair the device using encryption and authenticatio |
| DevicePairingProtectionLevelNone | 1 | Pair the device using no levels of protection. |
| ProtectionLevelAuthenticationRequired | 1 | Require the link to be authenticated. |
| ProtectionLevelEncryptionAndAuthenticationRequired | 3 | Require the link to be encrypted and authenticate |
| ProtectionLevelEncryptionRequired | 2 | Require the link to be encrypted. |
| ProtectionLevelPlain | 0 | Uses the default protection level. |

Pairing Status

| Constant | Value | Description |
|---|---|---|
| DevicePairingResultStatusAccessDenied | 12 | Your application does not have the appropriate per device object. |
| DevicePairingResultStatusAlreadyPaired | 3 | The device object has already been paired. |
| DevicePairingResultStatusAuthenticationFailure | 9 | Authentication failed, so the device is not paired. F the application rejected the authentication. |
| DevicePairingResultStatusAuthenticationNotAllowed | 8 | The authentication protocol is not supported, so the |
| DevicePairingResultStatusAuthenticationTimeout | 7 | The authentication process timed out before it coul |
| DevicePairingResultStatusConnectionRejected | 4 | The device object rejected the connection. |
| DevicePairingResultStatusFailed | 19 | An unknown failure occurred. |
| DevicePairingResultStatusHardwareFailure | 6 | The device object indicated there was a hardware fa |
| DevicePairingResultStatusInvalidCeremonyData | 13 | The ceremony data was incorrect. |
| DevicePairingResultStatusNoSupportedProfiles | 10 | There are no network profiles for this device object |
| DevicePairingResultStatusNotPaired | 2 | The device object is not currently paired. |
| DevicePairingResultStatusNotReadyToPair | 1 | The device object is not in a state where it can be p |
| DevicePairingResultStatusOperationAlreadyInProgress | 15 | The device object is already attempting to pair or u |
| DevicePairingResultStatusPaired | 0 | The device object is now paired. |
| DevicePairingResultStatusPairingCanceled | 14 | The pairing action was canceled before completion. |
| DevicePairingResultStatusProtectionLevelCouldNotBeMet | 11 | The minimum level of protection is not supported b application. |
| DevicePairingResultStatusRejectedByHandler | 17 | The application handler rejected the pairing. |
| DevicePairingResultStatusRemoteDeviceHasAssociation | 18 | The remove device already has an association. |
| DevicePairingResultStatusRequiredHandlerNotRegistered | 16 | Either the event handler wasn't registered or a req was not supported. |
| DevicePairingResultStatusTooManyConnections | 5 | The device object indicated it cannot accept any mo |

Unpairing Status

| Constant | Value | Description |
|---|---|---|
| DeviceUnpairingResultStatusAccessDenied | 3 | The caller does not have sufficient permissions to unp |
| DeviceUnpairingResultStatusAlreadyUnpaired | 1 | The device object was already unpaired. |
| DeviceUnpairingResultStatusFailed | 4 | An unknown failure occurred. |
| DeviceUnpairingResultStatusOperationAlreadyInProgress | 2 | The device object is currently in the middle of eith action. |
| DeviceUnpairingResultStatusUnpaired | 0 | The device object is successfully unpaired. |

## 22.49 class WindowsGattCharacteristicMBS

### 22.49.1 class WindowsGattCharacteristicMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a Characteristic of a GATT service.
**Notes:** The GattCharacteristic object represents a GATT Characteristic of a particular service, and is obtained from the Characteristics property of the GattDeviceService object.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- The Top 10 from the MBS Xojo Plugins in 2022
- Bluetooth LE on Windows
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr6
- MBS Xojo Plugins, version 22.3pr5
- MBS Xojo Plugins, version 22.3pr1

**Xojo Developer Magazine**

- 21.2, page 9: News

### 22.49.2 Methods

### 22.49.3 AlertCategoryId as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined AlertCategoryId characteristic UUID.

### 22.49.4 AlertCategoryIdBitMask as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-Defined AlertCategoryIdBitMask characteristic UUID.

### 22.49.5 AlertLevel as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined AlertLevel characteristic UUID.

### 22.49.6 AlertNotificationControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined AlertNotificationControlPoint characteristic UUID.

### 22.49.7 AlertStatus as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined AlertStatus characteristic UUID.

### 22.49.8 AllDescriptors as WindowsGattDescriptorMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the collection of all descriptors belonging to this GattCharacteristic instance.

### 22.49.9 BatteryLevel as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Battery Level Characteristic UUID.

### 22.49.10 BloodPressureFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Blood Pressure Feature Characteristic UUID.

### 22.49.11 BloodPressureMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Blood Pressure Measurement Characteristic UUID.

### 22.49.12 BodySensorLocation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Body Sensor Location Characteristic UUID.

### 22.49.13 BootKeyboardInputReport as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined BootKeyboardInputReport characteristic UUID.

### 22.49.14 BootKeyboardOutputReport as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined BootKeyboardOutputReport characteristic UUID.

### 22.49.15 BootMouseInputReport as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined BootMouseInputReport characteristic UUID.

### 22.49.16 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.49.17 Constructor(other as WindowsGattCharacteristicMBS) 4302

### 22.49.17 Constructor(other as WindowsGattCharacteristicMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
See also:

- 22.49.16 Constructor 4301

### 22.49.18 ConvertShortIdToUuid(ID as UInt16) as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts a Bluetooth SIG defined short Id to a full GATT UUID.
**Notes:** ID: A 16-bit Bluetooth GATT Service UUID.

### 22.49.19 CscFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Csc Feature Characteristic UUID.

### 22.49.20 CscMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Csc Measurement Characteristic UUID.

### 22.49.21 CurrentTime as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CurrentTime characteristic UUID.

### 22.49.22 CyclingPowerControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CyclingPowerControlPoint characteristic UUID.

### 22.49.23 CyclingPowerFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CyclingPowerFeature characteristic UUID.

### 22.49.24 CyclingPowerMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CyclingPowerMeasurement characteristic UUID.

### 22.49.25 CyclingPowerVector as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CyclingPowerVector characteristic UUID.

### 22.49.26 DateTime as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined DateTime characteristic UUID.

### 22.49.27 DayDateTime as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined DayDateTime characteristic UUID.

### 22.49.28 DayOfWeek as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined DayOfWeek characteristic UUID.

### 22.49.29 Descriptors(characteristicUUID as String) as WindowsGattDescriptorMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns descriptors, that are identified by the specified UUID, and belong to this GattCharacteristic instance.

### 22.49.30 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.49.31 DstOffset as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined DstOffset characteristic UUID.

### 22.49.32 ExactTime256 as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ExactTime256 characteristic UUID.

### 22.49.33 FirmwareRevisionString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined FirmwareRevisionString characteristic UUID.

### 22.49.34 GapAppearance as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined GapAppearance characteristic UUID.

### 22.49.35 GapDeviceName as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined GapDeviceName characteristic UUID.

### 22.49.36 GapPeripheralPreferredConnectionParameters as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined GapPeripheralPreferredConnectionParameters characteristic UUID.

### 22.49.37 GapPeripheralPrivacyFlag as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth GapPeripheralPrivacyFlag characterisitc UUID.

### 22.49.38 GapReconnectionAddress as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined GapReconnectionAddress characteristic UUID.

### 22.49.39 GattServiceChanged as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined GattServiceChanged characteristic UUID.

### 22.49.40 GetDescriptorsAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the descriptors for this GattCharacteristic instance.
**Notes:** Calls DescriptorsCompleted event later when finished.
See also:

- 22.49.41 GetDescriptorsAsync(BluetoothCacheMode as Integer) 4306

### 22.49.41 GetDescriptorsAsync(BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the descriptors with the specified cache mode for this GattCharacteristic instance.
**Notes:** Calls DescriptorsCompleted event later when finished.
See also:

- 22.49.40 GetDescriptorsAsync 4305

### 22.49.42 GetDescriptorsForUuidAsync(characteristicUuid as String)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the descriptors whose UUIDs match descriptorUuid.
**Notes:** Calls DescriptorsCompleted event later when finished.
See also:

- 22.49.43 GetDescriptorsForUuidAsync(characteristicUuid as String, BluetoothCacheMode as Integer) 4306

### 22.49.43 GetDescriptorsForUuidAsync(characteristicUuid as String, BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the descriptors whose UUIDs match descriptorUuid with the specified cacheMode.
**Notes:** Calls DescriptorsCompleted event later when finished.
See also:

- 22.49.42 GetDescriptorsForUuidAsync(characteristicUuid as String) 4306

### 22.49.44 GlucoseFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Glucose Feature Characteristic UUID.

### 22.49.45 GlucoseMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Glucose Measurement Characteristic UUID.

### 22.49.46 GlucoseMeasurementContext as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Glucose Measurement Context Characteristic UUID.

### 22.49.47 HardwareRevisionString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined HardwareRevisionString characterisitc UUID.

### 22.49.48 HeartRateControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Heart Rate Control Point Characteristic UUID.

### 22.49.49 HeartRateMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Heart Rate Measurement Characteristic UUID.

### 22.49.50 HidControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined HidControlPoint characteristic UUID.

### 22.49.51 HidInformation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined HidInformation characteristic UUID.

### 22.49.52 Ieee1107320601RegulatoryCertificationDataList as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Ieee1107320601RegulatoryCertificationDataList characteristic UUID.

### 22.49.53 IntermediateCuffPressure as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Intermediate Cuff Pressure Characteristic UUID.

### 22.49.54 IntermediateTemperature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Intermediate Temperature Characteristic UUID.

### 22.49.55 LnControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LnControlPoint characteristic UUID.

### 22.49.56 LnFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LnFeature characteristic UUID.

### 22.49.57 LocalTimeInformation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LocalTimeInformation characteristic UUID.

### 22.49.58 LocationAndSpeed as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LocationAndSpeed characteristic UUID.

### 22.49.59 ManufacturerNameString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ManufacturerNameString characteristic UUID.

### 22.49.60 MeasurementInterval as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Measurement Interval Characteristic UUID.

### 22.49.61 ModelNumberString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ModelNumberString UUID.

### 22.49.62 Navigation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Navigation characteristic UUID.

### 22.49.63 NewAlert as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined NewAlert characteristic UUID.

### 22.49.64 PnpId as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined PnpId characteristic UUID.

### 22.49.65 PositionQuality as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined PositionQuality characteristic UUID.

### 22.49.66 ProtocolMode as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ProtocolMode characteristic UUID.

### 22.49.67 ReadClientCharacteristicConfigurationDescriptorAsync

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads the current value of the ClientCharacteristicConfigurationDescriptor.
**Notes:** Calls ReadClientCharacteristicConfigurationDescriptorAsyncCompleted event later.

### 22.49.68 ReadValueAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value read from the value cache maintained by Windows.
**Notes:** Calls ReadValueAsyncCompleted event later.
See also:


- 22.49.69 ReadValueAsync(CacheMode as Integer) 4310


### 22.49.69 ReadValueAsync(CacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value read either from the value cache maintained by Windows, or directly from the device.

**Notes:** Calls ReadValueAsyncCompleted event later.
See also:

- 22.49.68 ReadValueAsync 4310

### 22.49.70 RecordAccessControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Record Access Control Point Characteristic UUID.

### 22.49.71 ReferenceTimeInformation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ReferenceTimeInformation characteristic UUID.

### 22.49.72 Report as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Report characteristic UUID.

### 22.49.73 ReportMap as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ReportMap characteristic UUID.

### 22.49.74 RingerControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined RingerControlPoint characteristic UUID.

### 22.49.75 RingerSetting as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined RingerSetting characteristic UUID.

### 22.49.76 RscFeature as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Rsc Feature Characteristic UUID.

### 22.49.77 RscMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Rsc Measurement Characteristic UUID.

### 22.49.78 ScanIntervalWindow as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ScanIntervalWindow characteristic UUID.

### 22.49.79 ScanRefresh as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ScanRefresh characteristic UUID.

### 22.49.80 SCControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SC Control Point Characteristic UUID.

### 22.49.81 SensorLocation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Sensor Location Characteristic UUID.

### 22.49.82 SerialNumberString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SerialNumberString characteristic UUID.

### 22.49.83 SoftwareRevisionString as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SoftwareRevisionString characteristic UUID.

### 22.49.84 SupportedNewAlertCategory as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SupportedNewAlertCategory characteristic UUID.

### 22.49.85 SupportUnreadAlertCategory as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SupportUnreadAlertCategory characteristic UUID.

### 22.49.86 SystemId as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined SystemId characteristic UUID.

### 22.49.87 TemperatureMeasurement as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Temperature Measurement Characteristic UUID.

### 22.49.88 TemperatureType as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Temperature Type Characteristic UUID.

### 22.49.89 TimeAccuracy as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeAccuracy characteristic UUID.

### 22.49.90 TimeSource as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeSource characteristic UUID.

### 22.49.91 TimeUpdateControlPoint as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeUpdateControlPoint characteristic UUID.

### 22.49.92 TimeUpdateState as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeUpdateState characteristic UUID.

### 22.49.93 TimeWithDst as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeWithDst characteristic UUID.

### 22.49.94 TimeZone as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TimeZone characteristic UUID.

### 22.49.95 TxPowerLevel as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TxPowerLevel characteristic UUID.

### 22.49.96 UnreadAlertStatus as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined UnreadAlertStatus characteristic UUID.

### 22.49.97 WriteClientCharacteristicConfigurationDescriptorAsync(ClientCharacteristicConfigurationDescriptorValue as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes client characteristic configuration descriptor.
**Example:**

```
Dim Characteristic As WindowsGattCharacteristicMBS // your characteristic

dim Mode as integer = _
WindowsGattReadClientCharacteristicConfigurationDescriptorResultMBS.ConfigurationDescriptorValueNotify + _
WindowsGattReadClientCharacteristicConfigurationDescriptorResultMBS.ConfigurationDescriptorValueIndicate
Characteristic.WriteClientCharacteristicConfigurationDescriptorAsync Mode
```

**Notes:** Writes the ClientCharacteristicConfigurationDescriptor to the Bluetooth LE device, and if the value to be written represents an indication or a notification and a ValueChanged event handler is registered, enables receiving ValueChanged events from the device.

Pass the new value for the ClientCharacteristicConfigurationDescriptor of this Characteristic object.

Calls WriteClientCharacteristicConfigurationDescriptorAsyncCompleted later.

### 22.49.98 WriteClientCharacteristicConfigurationDescriptorWithResultAsync(ClientCharacteristicConfigurationDescriptorValue as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes client characteristic configuration descriptor.
**Example:**

```
dim Characteristic as WindowsGattCharacteristicMBS
// your characteristic from e.g. CharacteristicsCompleted event

Characteristic.WriteClientCharacteristicConfigurationDescriptorAsync(1)
```

**Notes:** Writes the ClientCharacteristicConfigurationDescriptor to the Bluetooth LE device, and if the value to be written represents an indication or a notification and a ValueChanged event handler is registered, enables receiving ValueChanged events from the device.

Please pass the new value for the ClientCharacteristicConfigurationDescriptor of this WindowsGattCharacteristicMBS object.

Calls WriteClientCharacteristicConfigurationDescriptorWithResultAsyncCompleted event later.

### 22.49.99 WriteValueAsync(buffer as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value write to a Bluetooth LE device.
**Notes:** Calls WriteValueAsyncCompleted event later.
See also:

- 22.49.100 WriteValueAsync(buffer as MemoryBlock, WriteOption as Integer) 4316

### 22.49.100 WriteValueAsync(buffer as MemoryBlock, WriteOption as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value write to a Bluetooth LE device.
**Example:**

```
Var mb As New MemoryBlock(6)
mb.Byte(0) = &H01 // Data Byte
```

mb.Byte(1) = &HAA
mb.Byte(2) = &H55
mb.Byte(3) = &HAA
mb.Byte(4) = &H55
mb.Byte(5) = &HAA

Characteristics(0).WriteValueAsync(mb, GattCharacteristic.WriteWithResponse)

**Notes:** WriteOption is either WriteWithResponse or WriteWithoutResponse.
Calls WriteValueAsyncCompleted event later.
See also:

- 22.49.99 WriteValueAsync(buffer as MemoryBlock) 4316

### 22.49.101 WriteValueWithResultAsync(buffer as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value write to a Bluetooth LE device.
**Notes:** Calls WriteValueWithResultAsyncCompleted event later.
See also:

- 22.49.102 WriteValueWithResultAsync(buffer as MemoryBlock, WriteOption as Integer) 4317

### 22.49.102 WriteValueWithResultAsync(buffer as MemoryBlock, WriteOption as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Characteristic Value write to a Bluetooth LE device.
**Notes:** Calls WriteValueWithResultAsyncCompleted event later.
See also:

- 22.49.101 WriteValueWithResultAsync(buffer as MemoryBlock) 4317

### 22.49.103 Properties

### 22.49.104 AttributeHandle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the handle used to uniquely identify GATT-based characteristic attributes as declared on the Bluetooth LE device.
**Notes:** (Read only property)

### 22.49.105 CharacteristicProperties as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the GATT characteristic properties, as defined by the GATT profile.
**Notes:** If the ExtendedProperties flag is present it also represents the properties of the Extended Characteristic Properties Descriptor.
(Read only property)

### 22.49.106 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.49.107 ProtectionLevel as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the desired GATT security options for over the air communication with the device.
**Notes:** Windows will negotiate the maximum security possible with the device as part of the pairing process, and specifying a lower level of security won,Äôt degrade the existing security level.
(Read and Write property)

### 22.49.108 Service as WindowsGattDeviceServiceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GattDeviceService of which this characteristic is a member.
**Notes:** (Read only property)

### 22.49.109 UserDescription as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get the user friendly description for this GattCharacteristic, if the User Description Descriptor is present, otherwise this will be an empty string.
**Notes:** (Read only property)

### 22.49.110 UUID as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the GATT Characteristic UUID for this GattCharacteristic.
**Notes:** (Read only property)

### 22.49.111 Events

### 22.49.112 DescriptorsCompleted(asyncStatus as Integer, Result as WindowsGattDescriptorsResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by GetDescriptorsForUuidAsync or GetDescriptorsAsync methods when completed.
**Example:**

```
Sub DescriptorsCompleted(asyncStatus as Integer, Result as WindowsGattDescriptorsResultMBS) Handles
DescriptorsCompleted
Log CurrentMethodName

If result <>Nil Then
Dim Descriptors() As WindowsGattDescriptorMBS = result.Descriptors

For Each Descriptor As WindowsGattDescriptorMBS In Descriptors
Log "Descriptor for attribute "+Descriptor.AttributeHandle.ToString+" has "+Descriptor.UUID
Next

End If
End Sub
```

### 22.49.113 ReadClientCharacteristicConfigurationDescriptorAsyncCompleted(asyncStatus as Integer, Result as WindowsGattReadClientCharacteristicConfigurationDescriptorResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** The event called by ReadClientCharacteristicConfigurationDescriptorAsync method.

### 22.49.114 ReadValueAsyncCompleted(asyncStatus as Integer, Result as WindowsGattReadResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called when ReadValueAsync methods finished.

### 22.49.115 ValueChanged(args as WindowsGattValueChangedEventArgsMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** The event called when value changed.
**Notes:** An App can register an event handler in order to receive events when notification or indications are received from a device, after setting the Client Characteristic Configuration Descriptor.

The WindowsGattValueChangedEventArgsMBS object represents the arguments received by a ValueChanged event handler used to process characteristic value change notification and indication events sent by a Bluetooth LE device.

To get this event working, you need to use the copy constructor to create a new instance of your WindowsGattCharacteristicMBS subclass.

### 22.49.116 WriteClientCharacteristicConfigurationDescriptorAsyncCompleted(asyncStatus as Integer, Status as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** The event called by WriteClientCharacteristicConfigurationDescriptorAsync method.

### 22.49.117 WriteClientCharacteristicConfigurationDescriptorWithResultAsyncCompleted(asyncStatus as Integer, Result as WindowsGattWriteResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** The event called by WriteClientCharacteristicConfigurationDescriptorWithResultAsync method.

### 22.49.118 WriteValueAsyncCompleted(asyncStatus as Integer, Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by WriteValueAsync methods when completed.

### 22.49.119 WriteValueWithResultAsyncCompleted(asyncStatus as Integer, Result as WindowsGattWriteResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by WriteValueWithResultAsync methods when completed.

### 22.49.120 Constants

Cache Modes

| Constant | Value | Description |
|---|---|---|
| CacheModeCached | 0 | Cached data. |
| CacheModeUncached | 1 | Uncached data. |

GATT characteristic properties

| Constant | Value | Description |
|---|---|---|
| PropertiesAuthenticatedSignedWrites | &h40 | The characteristic supports signed writes. |
| PropertiesBroadcast | 1 | The characteristic supports broadcasting. |
| PropertiesExtendedProperties | &h80 | The ExtendedProperties Descriptor is present. |
| PropertiesIndicate | &h20 | The characteristic is indicatable. |
| PropertiesNone | 0 | The characteristic doesn,Äôt have any properties that apply. |
| PropertiesNotify | &h10 | The characteristic is notifiable. |
| PropertiesRead | 2 | The characteristic is readable. |
| PropertiesReliableWrites | &h100 | The characteristic supports reliable writes. |
| PropertiesWritableAuxiliaries | &h200 | The characteristic has writable auxiliaries. |
| PropertiesWrite | 8 | The characteristic is writable. |
| PropertiesWriteWithoutResponse | 4 | The characteristic supports Write Without Response. |

Protection Levels

| Constant | Value | Description |
|---|---|---|
| ProtectionLevelAuthenticationRequired | 1 | Require the link to be authenticated. |
| ProtectionLevelEncryptionAndAuthenticationRequired | 3 | Require the link to be encrypted and authenticated. |
| ProtectionLevelEncryptionRequired | 2 | Require the link to be encrypted. |
| ProtectionLevelPlain | 0 | Uses the default protection level. |

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

Write Options

| Constant | Value | Description |
|---|---|---|
| WriteWithoutResponse | 1 | The Write Without Response procedure shall be used. |
| WriteWithResponse | 0 | The default GATT write procedure shall be used. |

## 22.50 class WindowsGattCharacteristicsResultMBS

### 22.50.1 class WindowsGattCharacteristicsResultMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the result of GetCharacteristicsForUuidAsync and GetCharacteristicsAsync.
**Notes:** See WindowsGattDeviceServiceMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr3

### 22.50.2 Methods

### 22.50.3 Characteristics as WindowsGattCharacteristicMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the characterisitics.

### 22.50.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.50.5 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.50.6 Properties

### 22.50.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.50.8 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.50.9 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** (Read only property)

### 22.50.10 Constants

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

# 22.51 class WindowsGattDescriptorMBS

## 22.51.1 class WindowsGattDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a Descriptor of a GATT Characteristic.
**Notes:** The GattDescriptor object represents a GATT Descriptor of a particular characteristic, and is obtained from the Descriptors property of the GattCharacteristic object.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr6
- MBS Xojo Plugins, version 22.3pr5

## 22.51.2 Methods

## 22.51.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.51.4 Constructor(other as WindowsGattDescriptorMBS) 4325

## 22.51.4 Constructor(other as WindowsGattDescriptorMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy constructor.
See also:

- 22.51.3 Constructor 4325

## 22.51.5 ConvertShortIdToUuid(ID as UInt16) as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts a Bluetooth SIG defined short Id to a full GATT UUID.

### 22.51.6 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.51.7 ReadValueAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Descriptor Value read from a value cache maintained by Windows.
**Notes:** Calls ReadValueAsyncCompleted event later when done.

### 22.51.8 WriteValueAsync(buffer as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Descriptor Value write to a Bluetooth LE device.
**Notes:** Buffer: the data to be written to the Bluetooth LE device.

Calls WriteValueAsyncCompleted event later.

### 22.51.9 WriteValueWithResultAsync(buffer as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a Descriptor Value write to a Bluetooth LE device.
**Notes:** Buffer: the data to be written to the Bluetooth LE device.

Calls WriteValueWithResultAsyncCompleted event later.

### 22.51.10 Properties

### 22.51.11 AttributeHandle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the GATT Attribute handle used to uniquely identify this attribute on the GATT Server Device.

**Notes:** (Read only property)

### 22.51.12 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.51.13 ProtectionLevel as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the desired GATT security options for over the air communication with the device.
**Notes:** Windows will negotiate the maximum security possible with the device as part of the pairing process, and specifying a lower level of security won,Äôt degrade the existing security level.

(Read only property)

### 22.51.14 UUID as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the GATT Descriptor UUID for this GattDescriptor.
**Notes:** (Read only property)

### 22.51.15 Events

### 22.51.16 ReadValueAsyncCompleted(asyncStatus as Integer, Result as WindowsGattReadResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by ReadValueAsync method when completed.

### 22.51.17 WriteValueAsyncCompleted(asyncStatus as Integer, Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by WriteValueAsync method when completed.

### 22.51.18 WriteValueWithResultAsyncCompleted(asyncStatus as Integer, Result as WindowsGattWriteResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event called by WriteValueWithResultAsync method when completed.

### 22.51.19 Constants

Protection Levels

| Constant | Value | Description |
|---|---|---|
| ProtectionLevelAuthenticationRequired | 1 | Require the link to be authenticated. |
| ProtectionLevelEncryptionAndAuthenticationRequired | 3 | Require the link to be encrypted and authenticated. |
| ProtectionLevelEncryptionRequired | 2 | Require the link to be encrypted. |
| ProtectionLevelPlain | 0 | Uses the default protection level. |

## 22.52 class WindowsGattDescriptorsResultMBS

### 22.52.1 class WindowsGattDescriptorsResultMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The status of GetDescriptorsForUuidAsync and GetDescriptorsAsync.
**Notes:** See WindowsGattCharacteristicMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr6
- MBS Xojo Plugins, version 22.3pr5

### 22.52.2 Methods

### 22.52.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.52.4 Descriptors as WindowsGattDescriptorMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the descriptors.
**Notes:** See WindowsGattDescriptorMBS class.

### 22.52.5 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.52.6 Properties

### 22.52.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.52.8 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.52.9 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** (Read only property)

### 22.52.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | One of the status values.<br>Access is denied. |
| StatusProtocolError | 2 | One of the status values.<br>There was a GATT communication protocol error. |
| StatusSuccess | 0 | One of the status values.<br>The operation completed successfully. |
| StatusUnreachable | 1 | One of the status values.<br>No communication can be performed with the device, at this time. |

# 22.53 class WindowsGattDeviceServiceMBS

## 22.53.1 class WindowsGattDeviceServiceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a GATT Primary Service on a Bluetooth device.
**Notes:** The GattDeviceService class represents a GATT service on a Bluetooth LE device. It is instantiated by using a device service instance path, obtained by finding a device using the Windows.Devices.Enumeration API.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr2
- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- The Top 10 from the MBS Xojo Plugins in 2022
- Bluetooth LE on Windows
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.5
- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

## 22.53.2 Methods

## 22.53.3 AlertNotification as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined AlertNotification Service UUID.

### 22.53.4 Battery as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Battery Service UUID.

### 22.53.5 BloodPressure as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Blood Pressure Service UUID.

### 22.53.6 Characteristics(characteristicUUID as String) as WindowsGattDeviceServiceMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a vector of characteristics, that are identified by the specified UUID and belong to this GattDeviceService instance.

### 22.53.7 Close

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Releases the resources associated with the GattDeviceService class.
**Notes:** This allows other apps to access the resources of the GattDeviceService in question. A GattDeviceService object should not be used after Close is invoked, instead a new GattDeviceService object should be instantiated using the FromIdAsync method.

### 22.53.8 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.53.9 Constructor(other as WindowsGattDeviceServiceMBS) 4332

### 22.53.9 Constructor(other as WindowsGattDeviceServiceMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
**Notes:** Creates a new Xojo object pointing to same device service.
See also:

- 22.53.8 Constructor 4332

### 22.53.10 CurrentTime as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CurrentTime service UUID.

### 22.53.11 CyclingPower as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined CyclingPower service UUID.

### 22.53.12 CyclingSpeedAndCadence as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Cycling Speed And Cadence Service UUID.

### 22.53.13 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.53.14 DeviceInformation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined DeviceInformation service UUID.

### 22.53.15 FromId(Id as String) as WindowsGattDeviceServiceMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Instantiates a new GattDeviceService from the device ID.
**Notes:** Synchronous version, which may blocks the application until the function finished.
See also:

- 22.53.16 FromId(Id as String, sharingMode as Integer) as WindowsGattDeviceServiceMBS 4334

### 22.53.16 FromId(Id as String, sharingMode as Integer) as WindowsGattDeviceServiceMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Instantiates a new GattDeviceService from the device ID.
**Notes:** Synchronous version, which may blocks the application until the function finished.
See also:

- 22.53.15 FromId(Id as String) as WindowsGattDeviceServiceMBS 4333

### 22.53.17 FromIdAsync(Id as String, delegateHandler as ServiceFromIdAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Instantiates a new GattDeviceService from the device ID.
**Notes:** Id: The GATT device ID.
See also:

- 22.53.18 FromIdAsync(Id as String, sharingMode as Integer, delegateHandler as ServiceFromIdAsyncCompletedMBS) 4334

### 22.53.18 FromIdAsync(Id as String, sharingMode as Integer, delegateHandler as ServiceFromIdAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Instantiates a new GattDeviceService object from the device ID.
**Notes:** deviceId: The GATT device ID.
sharingMode: The sharing mode of the GATT device.
See also:

- 22.53.17 FromIdAsync(Id as String, delegateHandler as ServiceFromIdAsyncCompletedMBS) 4334

### 22.53.19 GenericAccess as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined UUID for the Generic Access Service.

### 22.53.20 GenericAttribute as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined UUID for the Generic Attribute Service.

### 22.53.21 GetAllCharacteristics as WindowsGattCharacteristicMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the collection of all characteristics belonging to this GattDeviceService instance.

### 22.53.22 GetAllIncludedServices as WindowsGattDeviceServiceMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the collection of all included services belonging to this GattDeviceService instance.

### 22.53.23 GetCharacteristicsAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the characteristics that are part of this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattCharacteristicsResultMBS object and calls CharacteristicsCompleted event later.

An asynchronous operation that completes with a GattCharacteristicsResult object and calls CharacteristicsCompleted event later.
See also:

- 22.53.24 GetCharacteristicsAsync(BluetoothCacheMode as Integer) 4335

### 22.53.24 GetCharacteristicsAsync(BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the characteristics that are part of this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattCharacteristicsResultMBS

object and calls CharacteristicsCompleted event later.

For BluetoothCacheMode pass CacheModeUncached or CacheModeCached.
See also:

- 22.53.23 GetCharacteristicsAsync 4335

### 22.53.25 GetCharacteristicsForUuidAsync(characteristicUuid as String)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the characterisitics that are part of this GattDeviceService instance and associated with the characteristicUuid.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattCharacteristicsResultMBS object and calls CharacteristicsCompleted event later.

For BluetoothCacheMode pass CacheModeUncached or CacheModeCached.
See also:

- 22.53.26 GetCharacteristicsForUuidAsync(characteristicUuid as String, BluetoothCacheMode as Integer) 4336

### 22.53.26 GetCharacteristicsForUuidAsync(characteristicUuid as String, BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the characterisitics that are part of this GattDeviceService instance and associated with the characteristicUuid.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattCharacteristicsResultMBS object and calls CharacteristicsCompleted event later.

For BluetoothCacheMode pass CacheModeUncached or CacheModeCached.
See also:

- 22.53.25 GetCharacteristicsForUuidAsync(characteristicUuid as String) 4336

### 22.53.27 GetDeviceSelectorFromShortId(serviceShortId as UInt16) as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a suitable AQS Filter string for use with the CreateWatcher method, from a 16-bit Bluetooth GATT Service UUID.

**Notes:** serviceShortId: A 16-bit Bluetooth GATT Service UUID.

### 22.53.28 GetDeviceSelectorFromUuid(serviceUuid as String) as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a suitable AQS Filter string for use with the CreateWatcher method, from a Bluetooth service UUID.
**Notes:** serviceUuid: A 128-bit Bluetooth GATT Service UUID, represented as a standard GUID object.

### 22.53.29 GetIncludedServicesAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the included services that are associated with this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattDeviceServicesResultMBS object.
See also:


- 22.53.30 GetIncludedServicesAsync(BluetoothCacheMode as Integer) 4337


### 22.53.30 GetIncludedServicesAsync(BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the included services that are associated with this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattDeviceServicesResultMBS object.

For BluetoothCacheMode pass CacheModeUncached or CacheModeCached.
See also:


- 22.53.29 GetIncludedServicesAsync 4337


### 22.53.31 GetIncludedServicesForUuidAsync(serviceUuid as String)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the included services from the serviceUuid that is associated with this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattDeviceServicesResultMBS object.

serviceUuid: A 128-bit Bluetooth GATT Service UUID, represented as a standard GUID object.
See also:

- 22.53.32 GetIncludedServicesForUuidAsync(serviceUuid as String, BluetoothCacheMode as Integer) 4338

### 22.53.32 GetIncludedServicesForUuidAsync(serviceUuid as String, BluetoothCacheMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the included services from the serviceUuid that is associated with this GattDeviceService instance.
**Notes:** Creates an asynchronous operation that completes with a WindowsGattDeviceServicesResultMBS object.

serviceUuid: A 128-bit Bluetooth GATT Service UUID, represented as a standard GUID object.
See also:

- 22.53.31 GetIncludedServicesForUuidAsync(serviceUuid as String) 4337

### 22.53.33 Glucose as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Glucose Service UUID.

### 22.53.34 HealthThermometer as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Health Thermometer Service UUID.

### 22.53.35 HeartRate as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Heart Rate Service UUID.

### 22.53.36 HumanInterfaceDevice as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined HumanInterfaceDevice service UUID.

### 22.53.37 ImmediateAlert as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ImmediateAlert service UUID.

### 22.53.38 LinkLoss as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LinkLoss service UUID.

### 22.53.39 LocationAndNavigation as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined LocationAndNavigation service UUID.

### 22.53.40 NextDstChange as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined NextDstChange service UUID.

### 22.53.41 OpenAsync(SharingMode as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens the GATT device service with the specified sharingMode.
**Notes:** Calls OpenAsyncCompleted later with result.

### 22.53.42 ParentServices as WindowsGattDeviceServiceMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the read-only list of parent services for this service.
**Notes:** A read-only list of parent services from which this object is derived, if this GattDeviceService is an included service; Otherwise, nil.

### 22.53.43 PhoneAlertStatus as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined PhoneAlertStatus service UUID.

### 22.53.44 ReferenceTimeUpdate as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ReferenceTimeUpdate service UUID.

### 22.53.45 RequestAccessAsync

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Requests access to the GattDeviceService.
**Notes:** An asynchronous operation that completes with RequestAccessCompleted event.

### 22.53.46 RunningSpeedAndCadence as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined Running Speed And Cadence Service UUID.

### 22.53.47 ScanParameters as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined ScanParameters service UUID.

### 22.53.48 TxPower as String

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Bluetooth SIG-defined TxPower service UUID.

### 22.53.49 Properties

### 22.53.50 AttributeHandle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the handle used to uniquely identify GATT-based service attributes as declared on the Bluetooth LE device.
**Notes:** Handle to uniquely identify GATT-based service attributes.
(Read only property)

### 22.53.51 Device as WindowsBluetoothLEDeviceMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the BluetoothLEDevice object describing the device associated with the current GattDeviceService object.
**Notes:** (Read only property)

### 22.53.52 DeviceId as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get the string that represents the GATT service instance path used to instantiate the GattDeviceService.
**Notes:** (Read only property)

### 22.53.53 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.53.54 Session as WindowsGattSessionMBS

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the session for this GATT device service instance.
**Notes:** (Read only property)

### 22.53.55 SharingMode as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the sharing mode for this GATT device service instance.
**Notes:** (Read only property)

### 22.53.56 UUID as String

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the GATT Service UUID associated with this GattDeviceService.
**Notes:** A 128-bit Bluetooth GATT Service UUID, represented as a standard GUID object.
(Read only property)

### 22.53.57 Events

### 22.53.58 CharacteristicsCompleted(asyncStatus as Integer, Result as WindowsGattCharacteristicsResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The GetCharacteristicsAsync* functions completed.

### 22.53.59 IncludedServicesCompleted(asyncStatus as Integer, Result as WindowsGattDeviceServicesResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** Event called when GetIncludedServices*Async method completes.
**Example:**

```
Sub IncludedServicesCompleted(asyncStatus as Integer, Result as WindowsGattDeviceServicesResultMBS)
Handles IncludedServicesCompleted
```

```
Log CurrentMethodName

if Result <>nil then
dim services() as WindowsGattDeviceServiceMBS = Result.Services

For Each Service As WindowsGattDeviceServiceMBS In Services
Log "Found service: "+Service.UUID+" Sharing Mode:"+Service.SharingMode.toText
next
end If
End Sub
```

### 22.53.60 OpenAsyncCompleted(asyncStatus as Integer, OpenStatus as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event for completed OpenAsync call.

### 22.53.61 RequestAccessCompleted(asyncStatus as Integer, DeviceAccessStatus as Integer)

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: .

**Function:** The event for RequestAccessAsync method completion.

### 22.53.62 Constants

Cache Modes

| Constant | Value | Description |
|---|---|---|
| CacheModeCached | 0 | Cached data. |
| CacheModeUncached | 1 | Uncached data. |

Open Status Codes

| Constant | Value | Description |
|---|---|---|
| OpenStatusAccessDenied | 5 | Access is denied. |
| OpenStatusAlreadyOpened | 2 | The GATT device service is already opened. |
| OpenStatusNotFound | 3 | The GATT device service was not found. |
| OpenStatusSharingViolation | 4 | There was a sharing violation. |
| OpenStatusSuccess | 1 | The GATT device service was successfully opened. |
| OpenStatusUnspecified | 0 | Unspecified error. |

Sharing Modes

| Constant | Value | Description |
|---|---|---|
| SharingModeExclusive | 1 | The sharing mode is exclusive. |
| SharingModeSharedReadAndWrite | 3 | The sharing mode is read and write. |
| SharingModeSharedReadOnly | 2 | The sharing mode is read only. |
| SharingModeUnspecified | 0 | The sharing mode is unspecified. |

### 22.53.63 Delegates

### 22.53.64 ServiceFromIdAsyncCompletedMBS(AsyncStatus as Integer, Device as WindowsGattDeviceServiceMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate to be called by one of the FromIdAsync methods.

## 22.54 class WindowsGattDeviceServicesResultMBS

### 22.54.1 class WindowsGattDeviceServicesResultMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The status of GetIncludedServicesForUuidAsync and GetIncludedServicesForUuidAsync.
**Notes:** See WindowsGattDeviceServiceMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Bluetooth LE on Windows
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr3

### 22.54.2 Methods

### 22.54.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.54.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.54.5 Services as WindowsGattDeviceServiceMBS()

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the services.
**Notes:** See WindowsGattDeviceServiceMBS class.

### 22.54.6 Properties

### 22.54.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.54.8 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.54.9 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** (Read only property)

### 22.54.10 Constants

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

## 22.55 class WindowsGattReadClientCharacteristicConfigurationDescriptorResultMBS

### 22.55.1 class WindowsGattReadClientCharacteristicConfigurationDescriptorResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents the result of reading a GATT Client CharacteristicConfigurationClientDescriptor value.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0

### 22.55.2 Methods

### 22.55.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.55.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.55.5 Properties

### 22.55.6 ClientCharacteristicConfigurationDescriptor as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents the value of the GATT ClientCharacteristicConfigurationDescriptor.
**Notes:** (Read only property)

### 22.55.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.55.8 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.55.9 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** See Status* constants in WindowsGattCharacteristicMBS class.
(Read only property)

### 22.55.10 Constants

Client Characteristic Configuration descriptor

| Constant | Value | Description |
|---|---|---|
| ConfigurationDescriptorValueIndicate | 2 | Characteristic indications are enabled. |
| ConfigurationDescriptorValueNone | 0 | Neither notification nor indications are enabled. |
| ConfigurationDescriptorValueNotify | 1 | Characteristic notifications are enabled. |

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

## 22.56 class WindowsGattReadRequestMBS

### 22.56.1 class WindowsGattReadRequestMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class represents a Bluetooth GATT read request.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 22.56.2 Methods

### 22.56.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.56.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.56.5 Properties

### 22.56.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.56.7 Length as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the buffer length of the read request.
**Notes:** (Read only property)

### 22.56.8 Offset as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The read request offset.
**Notes:** (Read only property)

### 22.56.9 State as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The read request state.
**Notes:** (Read only property)

### 22.56.10 Constants

GATT request state

| Constant | Value | Description |
|---|---|---|
| StateCanceled | 2 | The request is canceled. |
| StateCompleted | 1 | The request if completed. |
| StatePending | 0 | The request is pending. |

## 22.57 class WindowsGattReadResultMBS

### 22.57.1 class WindowsGattReadResultMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents the result of an asynchronous read operation of a GATT Characteristic or Descriptor value.
**Notes:** One of the ReadValueAsync methods is used to retrieve a GattReadResult object.
The Status property on the GattReadResult returned indicates if the result of the operation was successful.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 22.57.2 Methods

### 22.57.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.57.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.57.5 Properties

### 22.57.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.57.7 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.57.8 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** (Read only property)

### 22.57.9 Value as MemoryBlock

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value read from the device.
**Notes:** (Read only property)

### 22.57.10 Constants

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

# 22.58 class WindowsGattSessionMBS

## 22.58.1 class WindowsGattSessionMBS

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a Generic Attribute Profile (GATT) session.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr2
- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

## 22.58.2 Methods

## 22.58.3 Close

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the GattSession.

## 22.58.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 22.58.5 Constructor(other as WindowsGattSessionMBS) 4353

## 22.58.5 Constructor(other as WindowsGattSessionMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
See also:

- 22.58.4 Constructor 4353

### 22.58.6 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.58.7 FromDeviceId(deviceId as WindowsBluetoothDeviceIdMBS) as WindowsGattSessionMBS

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new GattSession object from the specified deviceId.
**Notes:** Synchronous version, which may blocks the application until the function finished.

### 22.58.8 FromDeviceIdAsync(deviceId as WindowsBluetoothDeviceIdMBS, delegateHandler as FromDeviceIdAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new GattSession object from the specified deviceId.
**Example:**

```
// you got a device ID as string
Dim WinDeviceID As New WindowsBluetoothDeviceIdMBS(DeviceID)

// and now wait for callback
WindowsGattSessionMBS.FromDeviceIdAsync(WinDeviceID, AddressOf FromIDAsyncCompleted)
```

**Notes:** Later calls FromDeviceIdAsyncCompletedMBS event.

### 22.58.9 Properties

### 22.58.10 CanMaintainConnection as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a Boolean value that indicates whether the connection can be maintained.
**Notes:** (Read only property)

### 22.58.11 DeviceId as WindowsBluetoothDeviceIdMBS

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the device ID.
**Notes:** (Read only property)

### 22.58.12 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.58.13 MaintainConnection as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets a Boolean value that indicates whether the connection should be maintained.
**Notes:** Value is true if the connection should be maintained, otherwise false. false by default.

If GattSession.MaintainConnection is set to true, then the system waits indefinitely for a connection, and it will connect when the device is available. There's nothing for your application to wait on, since GattSession.MaintainConnection is a property.
(Read and Write property)

### 22.58.14 MaxPduSize as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum protocol data unit (PDU) size.
**Notes:** This metric is also known as the maximum transmission unit (MTU) size.

The Windows operating system automatically fragments down larger protocol data unit (PDU) sizes sent to a remote device (wherever supported by the Bluetooth GATT/ATT spec). So under normal circumstances, there's no need for you to know the maximum transmission unit (MTU) size at the application layer if your application's goal is just to send data efficiently.

You can send large amounts of data, and it will be fragmented automatically by the OS using the MTU. Your application is not limited by the MTU size as to the data transfer of each packet.
If you want your application to customize the data sent based on the MTU (for example, encoding/codec), or to communicate the MTU size information out-of-band, then you can access the the MTU value using MaxPduSize and GattSession.MaxPduSizeChanged.
(Read only property)

### 22.58.15 SessionStatus as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the session status.
**Notes:** (Read only property)

### 22.58.16 Events

### 22.58.17 MaxPduSizeChanged

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** An event that is raised when the maximum protocol data unit (PDU) size changes.
**Notes:** The PDU is also known as the maximum transmission unit (MTU).

MaxPduSizeChanged is raised whenever the negotiated MTU for the Attribute Protocol (ATT) is changed. And that can be changed or negotiated by a remote Bluetooth peripheral. As a developer, you can't change the value used by Windows itself, since that's fully managed by the operating system.
Also see the GattSession.MaxPduSize property which, as mentioned, is read-only.

### 22.58.18 SessionStatusChanged

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: .

**Function:** An event that is triggered when the GATT session status has changed.

### 22.58.19 Constants

Status

| Constant | Value | Description |
|---|---|---|
| StatusActive | 1 | The GATT session is active. |
| StatusClosed | 0 | The GATT session is closed. |

### 22.58.20 Delegates

### 22.58.21 FromDeviceIdAsyncCompletedMBS(AsyncStatus as Integer, session as WindowsGattSessionMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Event called when a session was created.

## 22.59 class WindowsGattValueChangedEventArgsMBS

### 22.59.1 class WindowsGattValueChangedEventArgsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value changed event arguments.
**Notes:** Represents the arguments received by a WindowsGattCharacteristicMBS.ValueChanged event handler used to process characteristic value change notification and indication events sent by a Bluetooth LE device.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0

### 22.59.2 Methods

### 22.59.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.59.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.59.5 Properties

### 22.59.6 CharacteristicValue as MemoryBlock

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the new Characteristic Value.
**Notes:** (Read only property)

### 22.59.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.59.8 Timestamp as UInt64

MBS WinFrameworks Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time at which the system was notified of the Characteristic Value change.
**Example:**

```
// convert value to time.
Dim e as WindowsGattValueChangedEventArgsMBS // your object
Dim value As Double = e.Timestamp / 10000000.0
Dim d As New DateTime(1601, 1, 1, 0, 0, 0, 0)

d = New DateTime(d.SecondsFrom1970 + value)

MessageBox d.ToString
```

**Notes:** (Read only property)

## 22.60 class WindowsGattWriteRequestMBS

### 22.60.1 class WindowsGattWriteRequestMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class represents a GATT write request.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 22.60.2 Methods

### 22.60.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.60.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.60.5 Properties

### 22.60.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.60.7 Offset as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the offset.
**Notes:** (Read only property)

### 22.60.8 Option as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the write request option.
**Notes:** See OptionWriteWithResponse and OptionWriteWithoutResponse.
(Read only property)

### 22.60.9 State as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of the write request.
**Notes:** (Read only property)

### 22.60.10 Value as MemoryBlock

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the buffer value of the write request.
**Notes:** (Read only property)

### 22.60.11 Constants

Options

| Constant | Value | Description |
|---|---|---|
| OptionWriteWithoutResponse | 1 | The Write Without Response procedure shall be used. |
| OptionWriteWithResponse | 0 | The default GATT write procedure shall be used. |

GATT request state

| Constant | Value | Description |
|---|---|---|
| StateCanceled | 2 | The request is canceled. |
| StateCompleted | 1 | The request if completed. |
| StatePending | 0 | The request is pending. |

## 22.61 class WindowsGattWriteResultMBS

### 22.61.1 class WindowsGattWriteResultMBS

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the result of GATT write operations like WriteValueWithResultAsync.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 22.61.2 Methods

### 22.61.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 22.61.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 22.61.5 Properties

### 22.61.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 22.61.7 ProtocolError as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the protocol error.
**Notes:** The plugin returns value if this property is not set.
(Read only property)

### 22.61.8 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the status of an asynchronous operation.
**Notes:** (Read only property)

### 22.61.9 Constants

Status Values

| Constant | Value | Description |
|---|---|---|
| StatusAccessDenied | 3 | Access is denied. |
| StatusProtocolError | 2 | There was a GATT communication protocol error. |
| StatusSuccess | 0 | The operation completed successfully. |
| StatusUnreachable | 1 | No communication can be performed with the device, at this time. |

# Chapter 23

# Calendar

## 23.1 class CalAlarmMBS

### 23.1.1 class CalAlarmMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKAlarmMBS instead.
**Function:** The class for an Alarm in iCal.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new calendar
dim c as new CalEventMBS

dim StartDate as date = new date
StartDate.day = StartDate.day +1 // start tomorrow

dim calendars() as CalCalendarMBS = s.calendars

// set properties
c.Title="new Event"
c.startDate=StartDate
c.calendar=calendars(0) // add to first calendar

dim EndDate as new date(StartDate) // one hour after start
EndDate.hour = EndDate.hour + 1
```

```
c.endDate=EndDate

dim a as new CalAlarmMBS // Send email one hour earlier
a.action = a.CalAlarmActionEmail
a.relativeTrigger = -3600
a.emailAddress="some@email.address"

c.addAlarm a // attach an alarm

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

**Notes:** Requires Mac OS X 10.5 to work.

### 23.1.2 Methods

### 23.1.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** This constructor creates a new empty alarm object.
**Example:**

```
dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before
```

### 23.1.4 triggerDateRelativeTo(currentdate as date) as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the date of the trigger relative to the given date.

### 23.1.5 Properties

### 23.1.6 absoluteTrigger as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The absolute trigger value.
**Notes:** The time that an alarm goes off is referred to as the trigger. Alarms have either a relative trigger, which means the alarm fires a certain number of seconds before an alarm occurs, or an absolute trigger, which specifies the exact time the alarm will trigger off.

Setting an absoluteTrigger will also set the relativeTrigger to 0.
(Read and Write property)

### 23.1.7 acknowledged as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The acknowledged date for the alarm.
**Notes:** (Read and Write property)

### 23.1.8 action as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The action used for this alarm.
**Notes:** See the CalAlarmAction* constants.
(Read and Write property)

### 23.1.9 emailAddress as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The email address to notify.
**Notes:** Setting an emailAddress will also set the action to CalAlarmEmail as well as set the sound and URL to nil.
(Read and Write property)

### 23.1.10 relatedTo as String

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Related to text.
**Notes:** (Read and Write property)

### 23.1.11 relativeTrigger as Double

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The absolute relative value.
**Notes:** The time that an alarm goes off is referred to as the trigger. Alarms have either a relative trigger, which means the alarm fires a certain number of seconds before an alarm occurs, or an absolute trigger, which specifies the exact time the alarm will trigger off.

Setting a relativeTrigger will also set the absoluteTrigger to 0.
(Read and Write property)

### 23.1.12 sound as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The sound file to play.
**Notes:** Setting a sound will also set the action to CalAlarmSound as well as set the emailAddress and URL to nil. Expects the name of a system alert. See NSSound.
(Read and Write property)

### 23.1.13 url as string

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The URL to launch when the alarm comes.
**Notes:** Setting a URL will also set the action to CalAlarmProcedure as well as set the emailAddress and sound to nil. The URL must be a file URL.
(Read and Write property)

### 23.1.14 Constants

Alarm Action Constants

| Constant | Value | Description |
|---|---|---|
| CalAlarmActionDisplay | "DISPLAY" | Display the event. |
| CalAlarmActionEmail | "EMAIL" | Send an email. |
| CalAlarmActionProcedure | "PROCEDURE" | |
| CalAlarmActionSound | "AUDIO" | Play a sound. |

## 23.2 class CalAttendeeMBS

### 23.2.1 class CalAttendeeMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKParticipantMBS instead. **Function:** The class for an Attendee.
**Notes:** Requires Mac OS X 10.5 to work.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.2.2 Methods

### 23.2.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 23.2.4 Properties

### 23.2.5 address as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The address of this attendee.
**Notes:** (Read only property)

### 23.2.6 commonName as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The user-entered name of the attendee.
**Notes:** (Read only property)

### 23.2.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The internal used CalAttendee reference.
**Notes:** (Read and Write property)

### 23.2.8 status as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The attendee status.
**Notes:** Use the CalAttendeeStatus* constants.

For now (Mac OS X 10.5), it is not possible to modify an event's attendees or the attendees themselves.
(Read only property)

### 23.2.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CalAttendeeStatusAccepted | "ACCEPTED" | These constants are used to describe the user's confirmation stat tendee. |
| CalAttendeeStatusDeclined | "DECLINED" | These constants are used to describe the user's confirmation stat tendee. |
| CalAttendeeStatusNeedsAction | "NEEDS-ACTION" | These constants are used to describe the user's confirmation stat tendee.<br>This is the default status for an attendee. |
| CalAttendeeStatusTentative | "TENTATIVE" | These constants are used to describe the user's confirmation stat tendee. |

## 23.3 class CalCalendarItemMBS

### 23.3.1 class CalCalendarItemMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKCalendarItemMBS instead. **Function:** The class for a calendar item in iCal.
**Notes:** This class and its subclasses should be used to get information about CalEvent and CalTasks. Accessors for properties common to both of these classes are included here.

Requires Mac OS X 10.5 to work.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr2

### 23.3.2 Methods

### 23.3.3 addAlarm(alarm as CalAlarmMBS)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Adds one alarm.

### 23.3.4 addAlarms(alarms() as CalAlarmMBS)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of alarms.

### 23.3.5 alarms as CalAlarmMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** An array of CalAlarms associated with the calendar item.

### 23.3.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 23.3.7 hasAlarm as Boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether this item has an alarm associated.

### 23.3.8 nextAlarmDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the next alaram date.

### 23.3.9 removeAlarm(alarm as CalAlarmMBS)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Removes one alarm.

### 23.3.10 removeAlarms(alarms() as CalAlarmMBS)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Removes the alarms.

### 23.3.11 setalarms(alarms() as CalAlarmMBS)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the alarms for this item.

### 23.3.12 Show

MBS MacFrameworks Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Shows the item in iCal.
**Example:**

```
dim c as new CalCalendarStoreMBS

// search for some events within last year
dim d as new date
dim e as new date

d.Year = d.Year -1

dim events() as CalEventMBS = c.events(d, e)

// pick one, show title and show in iCal
MsgBox Events(30).Title
events(30).show
```

### 23.3.13 Properties

### 23.3.14 calendar as CalCalendarMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The calendar of this item.
**Notes:** (Read and Write property)

### 23.3.15 dateStamp as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The datestamp of this calendar item.
**Notes:** This value is read only.
(Read only property)

### 23.3.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The internal used CalCalendarItem reference.
**Notes:** (Read and Write property)

### 23.3.17 notes as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The notes text for this item.
**Example:**

```
dim c as new CalCalendarStoreMBS

// set the date range where we look for event
dim sd as new date(2016,6,7,0,0,0)
dim ed as new date(2016,6,7,23,59,59)

// look for an event on that date
dim a() as CalEventMBS = c.events(sd,ed, c.calendars)
dim e as CalEventMBS = a(1)

// show notes
MsgBox e.notes

// change it
e.notes = "Just a test"

// check again
MsgBox e.notes

// Save
dim error as NSErrorMBS
dim ok as Boolean = c.saveEvent(e, c.CalSpanThisEvent, error)

if ok then
MsgBox "OK"
elseif error <>nil then
MsgBox error.LocalizedDescription
else
MsgBox "Failed."
end if
```

**Notes:** (Read and Write property)

### 23.3.18 title as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The title for this calendar item.

**Example:**

```
// init
dim s as new CalCalendarStoreMBS

// Get date range for today
dim Startdate as new date
dim Enddate as new date

Startdate.hour = 0
Startdate.Minute = 0
Startdate.Second = 0

Enddate.hour = 23
Enddate.minute = 59
Enddate.second = 59

// Query events on all calendars
dim events() as CalEventMBS = s.events(Startdate,Enddate)

// Display result
dim lines(-1) as string
for each e as CalEventMBS in events
lines.Append e.Title
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

### 23.3.19 uid as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The unique ID for this item.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new calendar event
dim c as new CalEventMBS
```

```
dim calendars() as CalCalendarMBS = s.calendars

// set properties
c.Title="new Event"
c.startDate=new date
c.calendar=calendars(0) // add to first calendar

dim d as new date
d.hour=d.hour+1
c.endDate=d

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
// show the UID
MsgBox "New event was created with UID: "+c.uid
end if
```

**Notes:** This value is read only.
(Read only property)

### 23.3.20 URL as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The URL for this calendar item.
**Notes:** (Read and Write property)

## 23.4 class CalCalendarMBS

### 23.4.1 class CalCalendarMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKCalendarMBS instead.
**Function:** A class for the iCal calendars.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new calendar
dim c as new CalCalendarMBS

// set properties
c.Title="New Calendar"
c.notes="Just a test"

// save calendar
call s.saveCalendar(c,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New calendar was created."
end if
```

**Notes:** Requires Mac OS X 10.5 to work.
This class can be used to get attributes of a calendar, but cannot be used to get the list of events or tasks in a calendar.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr1

### 23.4.2 Methods

### 23.4.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The iCal class for a calendar.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new calendar
dim c as new CalCalendarMBS

// set properties
c.Title="New Calendar"
c.notes="Just a test"

// save calendar
call s.saveCalendar(c,e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New calendar was created."
end if
```

**Notes:** All calendars created with this API will be of type CalCalendarTypeLocal.

### 23.4.4 Properties

### 23.4.5 Color as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The color for this calendar.
**Notes:** (Read and Write property)

### 23.4.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 23.4.7 isEditable as Boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether this calendar is editable.
**Notes:** This property is read only.
(Read only property)

### 23.4.8 notes as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The notes for this calendar.
**Notes:** (Read and Write property)

### 23.4.9 title as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The title of this calendar.
**Example:**

```
dim c as new CalCalendarStoreMBS
dim ca() as CalCalendarMBS = c.calendars
for each cc as CalCalendarMBS in ca
MsgBox cc.Title+EndOfLine+cc.type+EndOfLine+cc.notes
next
```

**Notes:** (Read and Write property)

### 23.4.10 type as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The type of this calendar.
**Notes:** This property is read only.

use the CalCalendarType* constants.
(Read only property)

### 23.4.11 uid as String

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The unique ID for this calendar.
**Notes:** This property is read only.
(Read only property)

### 23.4.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CalCalendarTypeBirthday | "Birthday" | One of the calendar types. |
| CalCalendarTypeCalDAV | "CalDAV" | One of the calendar types. |
| CalCalendarTypeExchange | "Exchange" | One of the calendar types. New in Mac OS X 10.6. |
| CalCalendarTypeIMAP | "IMAP" | One of the calendar types. |
| CalCalendarTypeLocal | "Local" | One of the calendar types. |
| CalCalendarTypeSubscription | "Subscription" | One of the calendar types. |

## 23.5 class CalCalendarStoreMBS

### 23.5.1 class CalCalendarStoreMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKEventStoreMBS instead. **Function:** The class for the calendar storage.
**Example:**

```
// init
dim s as new CalCalendarStoreMBS

// find calendar by name
dim myCalendar as CalCalendarMBS
dim calendars() as CalCalendarMBS = s.calendars

for each ca as CalCalendarMBS in calendars
if ca.Title = "Private Events" then
myCalendar=ca
exit
end if
next

// Get date range for today
dim Startdate as new date
dim Enddate as new date

Startdate.hour = 0
Startdate.Minute = 0
Startdate.Second = 0

Enddate.hour = 23
Enddate.minute = 59
Enddate.second = 59

// Query events on this calendar
dim events() as CalEventMBS = s.events(Startdate,Enddate, myCalendar)

// Display result
dim lines(-1) as string
for each e as CalEventMBS in events
lines.Append e.Title
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Requires Mac OS X 10.5 to work.

Calendar saving and modification errors:

| | | |
|---|---|---|
| CalCalendarNotEditableError | = 1025 | Events and tasks cannot be added to an uneditable calendar |
| CalDateInvalidError | = 1026 | The start date of an event must be earlier than its end date |
| CalCalendarNotInRepository | = 1027 | Events' and tasks' calendar property must be a calendar in the user's calendar store |
| CalCalendarTitleNotUniqueError | = 1028 | Calendar titles must be unique |

And the domain for the errors is: CalCalendarStoreErrorDomain
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.
- MBS Xojo Plugins, version 17.2pr4
- MBS Xojo / Real Studio Plugins, version 16.5pr5
- MBS Xojo / Real Studio Plugins, version 14.2pr6

### 23.5.2 Methods

### 23.5.3 calendars as CalCalendarMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** An array of all the user's calendars, represented as CalCalendars.
**Example:**

```
dim c as new CalCalendarStoreMBS
dim ca() as CalCalendarMBS

ca=c.calendars
for each cc as CalCalendarMBS in ca
MsgBox cc.Title+EndOfLine+cc.type+EndOfLine+cc.notes
next
```

**Notes:** If the user has iCal data from a previous version of Mac OS X, but has not launched iCal in 10.5, this will return an array of empty calendars. iCal needs to be launched at least once in order to migrate the user's calendar data.

If no calendar data from any version of Mac OS X exists, then this method will create and return two default calendars, named Home and Work.

### 23.5.4 calendarWithTitle(Title as string) as CalCalendarMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries all calendars and searches for one with the given title.
**Example:**

```
dim cs as new CalCalendarStoreMBS

// delete one
dim c as CalCalendarMBS = cs.calendarWithTitle("Just Testing")
dim e as NSErrorMBS
if cs.removeCalendar(c, e) then
MsgBox "deleted"
else
MsgBox "Failed to remove: "+e.LocalizedDescription
end if
```

**Notes:** Title comparison is case insensitive.
Returns nil on any error.

### 23.5.5 calendarWithUID(UID as string) as CalCalendarMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The calendar associated with the specific UID.
**Notes:** If no record with this UID exists, nil is returned.

### 23.5.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The class for the calendar storage.
**Notes:** This is the main class. Keep an object of it around as long as you use the calendar classes.

### 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Example:**

```
dim c as new CalCalendarStoreMBS

dim i,count as Integer
dim ta() as CalEventMBS
dim ct as CalEventMBS

dim sd as new date
dim ed as new date

ed.day=ed.day+1
// events within the next 24 hours

ta=c.events(sd,ed)
for each ct in ta
msgbox ct.Title+EndOfLine+ct.location+EndOfLine+ct.startDate.LongDate+" "+ct.startDate.LongTime
next
```

**Notes:** This is the function which uses all calendars.

For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
- 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS() 4387
- 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS() 4387
- 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388
- 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388

### 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Example:**

```
// init
dim s as new CalCalendarStoreMBS

// find calendar by name
dim myCalendar as CalCalendarMBS
dim calendars() as CalCalendarMBS = s.calendars

for each ca as CalCalendarMBS in calendars
if ca.Title = "Private Events" then
myCalendar=ca
exit
end if
next

// Get date range for today
dim Startdate as new date
dim Enddate as new date

Startdate.hour = 0
Startdate.Minute = 0
Startdate.Second = 0

Enddate.hour = 23
Enddate.minute = 59
Enddate.second = 59

// Query events on this calendar
dim events() as CalEventMBS = s.events(Startdate,Enddate, myCalendar)

// Display result
dim lines(-1) as string
for each e as CalEventMBS in events
lines.Append e.Title
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than

four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
- 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS() 4387
- 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS() 4387
- 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388
- 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388


### 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Notes:** For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
- 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
- 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS() 4387
- 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388
- 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388


### 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Notes:** This is the function which uses all calendars.

For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
- 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
- 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS() 4387
- 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388
- 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388


### 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Notes:** For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
- 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
- 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS() 4387
- 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS() 4387
- 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS() 4388


### 23.5.12 events(StartDate as date, EndDate as date, eventUID as string, calendars() as CalCalendarMBS) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Notes:** For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.
See also:


- 23.5.7 events(StartDate as date, EndDate as date) as CalEventMBS() 4385
- 23.5.8 events(StartDate as date, EndDate as date, calendar as CalCalendarMBS) as CalEventMBS() 4386
- 23.5.9 events(StartDate as date, EndDate as date, calendars() as CalCalendarMBS) as CalEventMBS() 4387
- 23.5.10 events(StartDate as date, EndDate as date, eventUID as string) as CalEventMBS() 4387
- 23.5.11 events(StartDate as date, EndDate as date, eventUID as string, calendar as CalCalendarMBS) as CalEventMBS() 4388


### 23.5.13 eventsMT(StartDate as date, EndDate as date, calendars() as CalCalendarMBS = nil) as CalEventMBS()

MBS MacFrameworks Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalEvents which match the condition.
**Notes:** For performance reasons, this method will only return occurrences of repeating events that fall within a specific four year timespan. If the date range between the startDate and endDate is greater than four years, then the timespan containing recurrences is always the first four years of date range.

If calendars array is nil, we use all calendars.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 23.5.14 eventWithUID(UID as string, occurrence as date) as CalEventMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Searches the event with the given unique ID.
**Example:**

```
// connect to calendar storage
dim c as new CalCalendarStoreMBS

// find event with given UID
```

```
dim e as CalEventMBS = c.eventWithUID("M2CD-6-1-EEB42862-8BD6-4880-AF91-4AEEADD900B6", nil)

// and display title
MsgBox e.Title
```

**Notes:** Returns nil on any error.

uid: The unique identifier of an event.
date: The date of a recurring event. Pass nil if the event is not recurring.

Returns a CalEvent object that matches the specified unique identifier and date. Returns nil if the event is not found, or the event is recurring and date is not specified.

Available in Mac OS X v10.5 and later.

### 23.5.15 removeCalendar(calendar as CalCalendarMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Deletes a calendar.
**Example:**

```
dim cs as new CalCalendarStoreMBS

// before

dim calendars1() as CalCalendarMBS = cs.calendars
dim list1() as string

for each c1 as CalCalendarMBS in calendars1
list1.Append c1.Title
next

MsgBox Join(list1, EndOfLine)

// delete one
dim c as CalCalendarMBS = cs.calendarWithTitle("Just Testing")
dim e as NSErrorMBS
if cs.removeCalendar(c, e) then
MsgBox "deleted"
else
MsgBox "Failed to remove: "+e.LocalizedDescription
```

```
end if

// after
dim calendars2() as CalCalendarMBS = cs.calendars
dim list2() as string

for each c2 as CalCalendarMBS in calendars2
list2.Append c2.Title
next

MsgBox Join(list2, EndOfLine)
```

**Notes:** Return

### 23.5.16 removeEvent(theEvent as CalEventMBS, span as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Removes the event from the calendar.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new calendar event
dim c as new CalEventMBS

dim calendars() as CalCalendarMBS = s.calendars

// set properties
c.Title="new Event"
c.startDate=new date
c.calendar=calendars(0) // add to first calendar

dim d as new date
d.hour=d.hour+1
c.endDate=d

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
```

```
MsgBox e.localizedDescription
else
MsgBox "New event was created with UID: "+c.uid

e = nil

// and delete it
if s.removeEvent(c, s.CalSpanAllEvents, e) then
MsgBox "Event deleted."
else
MsgBox e.localizedDescription
end if

end if
```

**Notes:** Returns true on success and false on failure.
Error is stored in the error object.

### 23.5.17 removeTask(task as CalTaskMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Removes the task from the calendar.
**Notes:** Returns true on success and false on failure.
Error is stored in the error object.

### 23.5.18 saveCalendar(calendar as CalCalendarMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Writes changes to calendar.
**Example:**

```
dim cs as new CalCalendarStoreMBS
dim c as new CalCalendarMBS

c.Title = "Just Testing"

dim e as NSErrorMBS
if cs.saveCalendar(c, e) then
MsgBox "OK"
else
```

```
MsgBox "Failed "+e.LocalizedDescription
end if
```

**Notes:** The saveCalendar and the removeCalendar calendars allow the client to add, modify, and remove calendars in the user's calendar store. saveCalendar should be used both to add a new calendar to the calendar store, and to modify a calendar already in the store.

The only calendars that can be added with this API are local calendars; it is not possible to add subscribed or CalDAV calendars, or the birthday calendar.

Changes made to a CalCalendar are not persisted until that calendar has been passed to saveCalendar. If saveCalendar is not called, the changes will be lost.

### 23.5.19 saveEvent(theEvent as CalEventMBS, span as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** This method allows the client to add or modify events in the user's calendar store.
**Notes:** This method should be used both to add a new event to the calendar store, and to modify an event already in the calendar store.
If the event being saved is a repeating event, the second argument is used to describe whether the change being made should apply to future occurrences of that event, all occurrences, or only this instance. This is analogous to options on the dialog iCal presents when a user modifies a recurring event (though iCal's UI does not provide a way to change all events, past and present).

Changes made to a CalEvent are not persisted until that event has been passed to saveEvent. If saveEvent is not called, the changes will be lost.

Applying changes to all events or all future events may cause the UID or the occurrence date of the event to change.

### 23.5.20 saveTask(task as CalTaskMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Saves the specified task to the calendar store.
**Example:**

```
dim s as new CalCalendarStoreMBS
dim t as new CalTaskMBS
```

```
dim a() as CalCalendarMBS = s.calendars
dim d as new date

d.Month = d.Month + 1

t.calendar = a(0)
t.Title = "Test"
t.URL = "http://www.mbsplugins.de/"
t.priority = t.CalPriorityMedium
t.dueDate = d
t.notes = "just a test"
t.isCompleted = false

dim e as NSErrorMBS
if s.saveTask(t, e) then
MsgBox "saved"
else
MsgBox "failed to save"
end if
```

**Notes:** task: The task to save.
error: If this method returns false, an NSError object describing the error.

Returns true on success; otherwise, returns false and sets the error argument to an NSError object describing the error.

Use this method to save new task objects and modifications to existing task objects. Changes to task objects are not persistent until this method is invoked. The calendar property needs to be set before attempting to save a task.

Available in Mac OS X v10.5 and later.

### 23.5.21 tasks as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks.
**Notes:** This is the function which uses all calendars.
See also:


- 23.5.22 tasks(calendar as CalCalendarMBS) as CalTaskMBS() 4395
- 23.5.23 tasks(calendars() as CalCalendarMBS) as CalTaskMBS() 4395

### 23.5.22 tasks(calendar as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.21 tasks as CalTaskMBS() 4394
- 23.5.23 tasks(calendars() as CalCalendarMBS) as CalTaskMBS() 4395

### 23.5.23 tasks(calendars() as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.21 tasks as CalTaskMBS() 4394
- 23.5.22 tasks(calendar as CalCalendarMBS) as CalTaskMBS() 4395

### 23.5.24 TasksCompletedSince(completedSince as date) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
**Notes:** This is the function which uses all calendars.
See also:

- 23.5.25 TasksCompletedSince(completedSince as date, calendar as CalCalendarMBS) as CalTaskMBS() 4395
- 23.5.26 TasksCompletedSince(completedSince as date, calendars() as CalCalendarMBS) as CalTaskMBS() 4396

### 23.5.25 TasksCompletedSince(completedSince as date, calendar as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.24 TasksCompletedSince(completedSince as date) as CalTaskMBS() 4395
- 23.5.26 TasksCompletedSince(completedSince as date, calendars() as CalCalendarMBS) as CalTaskMBS() 4396

### 23.5.26 TasksCompletedSince(completedSince as date, calendars() as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:


- 23.5.24 TasksCompletedSince(completedSince as date) as CalTaskMBS() 4395
- 23.5.25 TasksCompletedSince(completedSince as date, calendar as CalCalendarMBS) as CalTaskMBS() 4395


### 23.5.27 taskWithUID(UID as string) as CalTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Searches the task with the given unique ID.
**Notes:** Returns nil on any error.

### 23.5.28 UncompletedTasks as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
**Example:**

```
dim c as new CalCalendarStoreMBS

dim ta() as CalTaskMBS = c.UncompletedTasks

for each ct as CalTaskMBS in ta
msgbox ct.Title+EndOfLine+str(ct.priority)+EndOfLine+ct.dueDate.LongDate
next
```

**Notes:** This is the function which uses all calendars.
See also:


- 23.5.29 UncompletedTasks(calendar as CalCalendarMBS) as CalTaskMBS() 4396
- 23.5.30 UncompletedTasks(calendars() as CalCalendarMBS) as CalTaskMBS() 4397


### 23.5.29 UncompletedTasks(calendar as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.28 UncompletedTasks as CalTaskMBS() 4396
- 23.5.30 UncompletedTasks(calendars() as CalCalendarMBS) as CalTaskMBS() 4397

### 23.5.30 UncompletedTasks(calendars() as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.28 UncompletedTasks as CalTaskMBS() 4396
- 23.5.29 UncompletedTasks(calendar as CalCalendarMBS) as CalTaskMBS() 4396

### 23.5.31 UncompletedTasksDueBefore(dueDate as date) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
**Notes:** This is the function which uses all calendars.
See also:

- 23.5.32 UncompletedTasksDueBefore(dueDate as date, calendar as CalCalendarMBS) as CalTaskMBS() 4397
- 94.12.3 UncompletedTasksDueBefore(dueDate as date, calendars() as CalCalendarMBS) as CalTaskMBS() 15041

### 23.5.32 UncompletedTasksDueBefore(dueDate as date, calendar as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.31 UncompletedTasksDueBefore(dueDate as date) as CalTaskMBS() 4397
- 94.12.3 UncompletedTasksDueBefore(dueDate as date, calendars() as CalCalendarMBS) as CalTaskMBS() 15041

### 23.5.33 UncompletedTasksDueBefore(dueDate as date, calendars() as CalCalendarMBS) as CalTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of all the CalTasks which match the condition.
See also:

- 23.5.31 UncompletedTasksDueBefore(dueDate as date) as CalTaskMBS() 4397
- 23.5.32 UncompletedTasksDueBefore(dueDate as date, calendar as CalCalendarMBS) as CalTaskMBS() 4397

### 23.5.34 Properties

### 23.5.35 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The internal used CalCalendarStore reference.
**Notes:** (Read and Write property)

### 23.5.36 Events

### 23.5.37 CalendarsChanged(Externally as boolean, InsertedRecords() as string, UpdatedRecords() as string, DeletedRecords() as string)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event being called when some calendars changed.
**Notes:** The Calendar Store frameworks posts notifications when any application, including yours, makes changes to the user's calendar data.

Externally is true if this changes are not made by your application.

The three events give you the unique IDs of the calendars which have been inserted, updated or modified.

If all three arrays are nil/empty, that indicates everything has changed, and the client should refresh the calendar, event, and task information currently being used. Since this tends to be an expensive and inconvenient operation, it will only occur under unusual circumstances, such as when restoring from backup.

### 23.5.38 EventsChanged(Externally as boolean, InsertedRecords() as string, UpdatedRecords() as string, DeletedRecords() as string)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event being called when some events changed.
**Notes:** The Calendar Store frameworks posts notifications when any application, including yours, makes changes to the user's calendar data.

Externally is true if this changes are not made by your application.

The three events give you the unique IDs of the events which have been inserted, updated or modified.

If all three arrays are nil/empty, that indicates everything has changed, and the client should refresh the calendar, event, and task information currently being used. Since this tends to be an expensive and inconvenient operation, it will only occur under unusual circumstances, such as when restoring from backup.

### 23.5.39 TasksChanged(Externally as boolean, InsertedRecords() as string, UpdatedRecords() as string, DeletedRecords() as string)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event being called when some tasks changed.
**Notes:** The Calendar Store frameworks posts notifications when any application, including yours, makes changes to the user's calendar data.

Externally is true if this changes are not made by your application.

The three events give you the unique IDs of the tasks which have been inserted, updated or modified.

If all three arrays are nil/empty, that indicates everything has changed, and the client should refresh the calendar, event, and task information currently being used. Since this tends to be an expensive and inconvenient operation, it will only occur under unusual circumstances, such as when restoring from backup.

### 23.5.40 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CalSpanAllEvents | 2 | One of the Calendar Span constants. |
| CalSpanFutureEvents | 1 | One of the Calendar Span constants. |
| CalSpanThisEvent | 0 | One of the Calendar Span constants. |

## 23.6 class CalEventMBS

### 23.6.1 class CalEventMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKEventMBS instead.
**Function:** The class to handle events in iCal.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new event
dim c as new CalEventMBS

// set properties
dim calendars() as CalCalendarMBS = s.calendars
c.Title="new Event"
c.startDate=new date
c.calendar=calendars(0) // add to first calendar

dim d as new date
d.hour=d.hour+1
c.endDate=d

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

**Notes:** Requires Mac OS X 10.5 to work.
Subclass of the CalCalendarItemMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr4

- MBS Xojo Plugins, version 19.4pr7

### 23.6.2 Methods

### 23.6.3 attendees as CalAttendeeMBS()

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The attendees for this event.
**Notes:** It is not possible to modify an event's attendees in Mac OS X 10.5.

### 23.6.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to which creates a new event.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

// create a new event
dim c as new CalEventMBS

// set properties
dim calendars() as CalCalendarMBS = s.calendars
c.Title="new Event"
c.startDate=new date
c.calendar=calendars(0) // add to first calendar

dim d as new date
d.hour=d.hour+1
c.endDate=d

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

**Notes:** The calendar property must be set before calling saveTask on a new task.

### 23.6.5 setEndDate(d as date, tz as NSTimeZoneMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the end date with given time zone.
**Example:**

```
Dim d As new date
Dim tz As NSTimeZoneMBS = NSTimeZoneMBS.localTimeZone
Dim e As New CalEventMBS

e.setEndDate d, tz
```

**Notes:** The client is responsible for making sure they never attempt to save an event with a start date that occurs after the endDate, or an endDate that occurs before the startDate. Calling saveEvent: on an improperly configured event will fail.

### 23.6.6 setStartDate(d as date, tz as NSTimeZoneMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the start date with given time zone.
**Example:**

```
Dim Today As New date

Dim cal As New CalCalendarStoreMBS
Dim e As New CalEventMBS
Dim error As NSErrorMBS

Dim sDate As New Date
Dim eDate As New Date

sDate.Year=Today.Year
sDate.Month=Today.Month
sDate.Day=Today.Day
sDate.Hour=8
sDate.Minute=0
sDate.Second=0

eDate.Year=Today.Year
eDate.Month=Today.Month
eDate.Day=Today.Day
eDate.Hour=8
eDate.Minute=15
eDate.Second=0
```

```
Dim tz As NSTimeZoneMBS = NSTimeZoneMBS.systemTimeZone
e.setStartDate(sDate, tz)
e.setEndDate(eDate, tz)
e.Title = "Hello World"
e.calendar = cal.calendarWithTitle("Private") // put valid calendar name here

If cal.saveEvent(e,cal.CalSpanAllEvents,error) Then
'MainWindow.NotePlayer1.Instrument=Globals.RDV_SOUND
'MainWindow.NotePlayer1.PlayNote(60,60)
MsgBox "OK"
Else
MsgBox "Failed: "+error.localizedDescription
End If
```

**Notes:** The client is responsible for making sure they never attempt to save an event with a start date that occurs after the endDate, or an endDate that occurs before the startDate. Calling saveEvent: on an improperly configured event will fail.

### 23.6.7 Properties

### 23.6.8 endDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The end date.
**Example:**

```
dim e as CalEventMBS
msgbox e.endDate.longdate+" "+e.endDate.longtime
```

**Notes:** The client is responsible for making sure they never attempt to save an event with a start date that occurs after the endDate, or an endDate that occurs before the startDate. Calling saveEvent: on an improperly configured event will fail.
(Read and Write property)

### 23.6.9 isAllDay as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether this event is all day.

**Notes:** True for all day events.
(Read and Write property)

### 23.6.10 isDetached as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether this event is detached.
**Notes:** These properties are only meaningful for CalEvents which are instances of a repeating event.

If this CalEvent is an instance of a repeating event, and an attribute of this CalEvent has been changed to from the default value generated by the repeating event, isDetached will return true. If the CalEvent is unchanged from its default state, or is not a repeating event, isDetached returns false.
(Read only property)

### 23.6.11 location as string

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The location of this event.
**Example:**

```
dim c as new CalCalendarStoreMBS

// set the date range where we look for event
dim sd as new date(2016,6,7,0,0,0)
dim ed as new date(2016,6,7,23,59,59)

// look for an event on that date
dim a() as CalEventMBS = c.events(sd,ed, c.calendars)
dim e as CalEventMBS = a(1)

// show location
MsgBox e.location

// change it
e.location = "Hamburg"

// check again
MsgBox e.location

// Save
dim error as NSErrorMBS
dim ok as Boolean = c.saveEvent(e, c.CalSpanThisEvent, error)
```

```
if ok then
MsgBox "OK"
elseif error <>nil then
MsgBox error.LocalizedDescription
else
MsgBox "Failed."
end if
```

**Notes:** (Read and Write property)

### 23.6.12 occurrence as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The ocurrences of this event.
**Notes:** These properties are only meaningful for CalEvents which are instances of a repeating event.

Returns the occurrence date of a CalEvent. Since all instances of a repeating event have the same UID, we need another way to differentiate between those CalEvents. This method returns the NSDate on which this event was originally scheduled to occur. This value will remain the same even if the event has been detached and its start date has changed. For CalEvents not part of a repeating pattern, this method will return the same value as startDate.
(Read only property)

### 23.6.13 recurrenceRule as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The recurrence rule for this event.
**Example:**

```
// create a recurrence event:

dim c as new CalCalendarStoreMBS
dim e as new CalEventMBS
dim error as NSErrorMBS
dim s as string
dim ed as new date
dim rule as CalRecurrenceRuleMBS
dim rend as CalRecurrenceEndMBS

ed.day=21
```

```
ed.Month=7
ed.Year=2008

e.endDate=ed

dim sd as new date

sd.day=18
sd.Month=7
sd.Year=2008

e.startDate=sd
e.isAllDay=true
e.location="Example Location"

rule=CalRecurrenceRuleMBS.initYearlyRecurrence(1,nil)

dim calendars() as CalCalendarMBS = c.calendars
e.Title="Example Title"
e.calendar=calendars(0) // pick first calendar
e.notes="Example Notes"
e.URL="http://www.monkeybreadsoftware.de"
e.recurrenceRule=rule


if c.saveEvent(e, c.CalSpanAllEvents, error) then
if error<>Nil then s=error.localizedDescription
MsgBox "OK"+EndOfLine+s
else
if error<>Nil then s=error.localizedDescription
MsgBox "Failed"+EndOfLine+s
end if
```

**Notes:** Set to nil to remove recurrence rule.
(Read and Write property)

### 23.6.14 startDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The start date.
**Example:**

```
dim e as CalEventMBS
msgbox e.startDate.longdate+" "+e.startDate.longtime
```

**Notes:** The client is responsible for making sure they never attempt to save an event with a start date that occurs after the endDate, or an endDate that occurs before the startDate. Calling saveEvent: on an improperly configured event will fail.
(Read and Write property)

## 23.7 class CalNthWeekDayMBS

### 23.7.1 class CalNthWeekDayMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKRecurrenceDayOfWeekMBS instead. **Function:** CalNthWeekDay specifies the nth instance of a particular day of the week, such as the third Tuesday of every month.
**Notes:** Requires Mac OS X 10.5 to work.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.7.2 Methods

### 23.7.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 23.7.4 Properties

### 23.7.5 dayOfTheWeek as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The day of the week.
**Notes:** Valid values for dayOfTheWeek are integers 1-7, which correspond to days of the week with Sunday = 1.
(Read only property)

### 23.7.6 weekNumber as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The week number.
**Notes:** Valid values for weekNumber portion are 1, 2, 3, 4, or -1, where a value of -1 indicates the last week.
(Read only property)

## 23.8 class CalRecurrenceEndMBS

### 23.8.1 class CalRecurrenceEndMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKRecurrenceEndMBS instead. **Function:** The class to specify the end of a recurring calendar event.
**Notes:** CalRecurrenceEnd is an attribute of CalRecurrenceRule that defines how long the recurrence is scheduled to repeat.

The recurrence can be defined either with an integer that indicates the total number times it repeats, or with a date, after which it no longer repeats. An event which is set to never end should have its CalRecurrenceEnd set to nil.

If the end of the pattern is defines with a date, the client must pass a valid date, nil cannot be passed. If the end of the pattern is defined as terms of a number of occurrences, the occurrenceCount passed to the initializer must be positive, it cannot be 0. If the client attempts to initialize a CalRecurrenceEnd with a nil date or OccurrenceCount of 0, an exception is raised.

A CalRecurrenceEnd initialized with an end date will return 0 for occurrenceCount. One initialized with a number of occurrences will return nil for its endDate.

Requires Mac OS X 10.5 to work.

### 23.8.2 Methods

### 23.8.3 Constructor(endDate as date)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new recurrence end based on an end date.
See also:

- 23.8.4 Constructor(occurrenceCount as Integer) 4410

### 23.8.4 Constructor(occurrenceCount as Integer)

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new recurrence end based on an occurrence count.
See also:

• 23.8.3 Constructor(endDate as date) 4410

### 23.8.5 Properties

### 23.8.6 endDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The end date.
**Notes:** This property is read only.
(Read only property)

### 23.8.7 occurrenceCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The occurrence count.
**Notes:** This property is read only.
(Read only property)

### 23.8.8 usesEndDate as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether the end date is used.
**Notes:** This property is read only.
(Read only property)

## 23.9 class CalRecurrenceRuleMBS

### 23.9.1 class CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKRecurrenceRuleMBS instead. **Function:** The class for the recurrence rules.
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

// set properties
dim calendars() as CalCalendarMBS = s.calendars
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(1) // add to second calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

**Notes:** Requires Mac OS X 10.5 to work.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.9.2 Methods

### 23.9.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 23.9.4 daysOfTheMonth as Integer()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This property can be accessed as an array containing one or more integers corresponding to the days of the month the event recurs.
**Notes:** This property is valid for rules whose CalRecurrenceType is CalMonthlyRecurrence, and that were initialized with one or more specific days of the month (not with a day of the week and week of the month).

For all other CalRecurrenceRules, this property is empty.

### 23.9.5 daysOfTheWeek as Integer()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This property can be accessed as an array containing one or more integers corresponding to the days of the week the event recurs.
**Notes:** This property is valid for rules whose CalRecurrenceType is CalWeeklyRecurrence. For all other CalRecurrenceRules, this property is empty.

### 23.9.6 initDailyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Daily Recurrence initializer.
**Notes:** Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every

week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.

### 23.9.7 initMonthlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Monthly Recurrence initializer.
**Notes:** This initializer allows the client to specify a repeating monthly pattern in terms of a day of the week and a week of the month that the even repeats. An example is an event that recurs the first Monday of every month.

Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.

Valid values for days of the week are integers 1-7, which correspond to days of the week with Sunday = 1.
Valid values for weeks of the month are integers 1-4 and -1, which is used to indicate the last week of the month.
See also:


- 23.9.8 initMonthlyRecurrence(interval as Integer, DaysOfTheMonth() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4414
- 23.9.9 initMonthlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4415


### 23.9.8 initMonthlyRecurrence(interval as Integer, DaysOfTheMonth() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Monthly Recurrence initializer.
**Notes:** This initializer allows the client to specify multiple days of the month that an event will recur. This method should be used to initialize events that occur more than once a month, in a set monthly pattern.

Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every

week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.

Valid values for days of the month are integers 1-31.
See also:

- 23.9.7 initMonthlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4414
- 23.9.9 initMonthlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4415

### 23.9.9 initMonthlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Monthly Recurrence initializer.
**Notes:** Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.
See also:

- 23.9.7 initMonthlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4414
- 23.9.8 initMonthlyRecurrence(interval as Integer, DaysOfTheMonth() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4414

### 23.9.10 initWeeklyRecurrence(interval as Integer, DaysOfTheWeek() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Weekly Recurrence initializers.
**Notes:** This initializer allows the client to specify multiple days of the week that an event will recur. This initializer should be used to initialize events that occur more than once a week, in a set weekly pattern.

Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple

initializers for each CalRecurrenceType which take only these two parameters.

Valid values for days of the week are integers 1-7, which correspond to days of the week with Sunday = 1.
See also:

- 23.9.11 initWeeklyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4416

### 23.9.11 initWeeklyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Weekly Recurrence initializers.
**Notes:** Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.
See also:

- 23.9.10 initWeeklyRecurrence(interval as Integer, DaysOfTheWeek() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4415

### 23.9.12 initYearlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Yearly Recurrence initializer.
**Notes:** This initializer allows the client to specify multiple months of the year that an event will recur. This method should be used to initialize events that recur on the same day of the week, in the same week of a month, of possibly more than one month a year, in a set yearly pattern. An example is an event that occurs every year on the last Friday of sixth and twelfth months.

Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.

Valid values for days of the week are integers 1-7, which correspond to days of the week with Sunday = 1.
Valid values for weeks of the month are integers 1-4 and -1, which is used to indicate the last week of the

month.
Valid values for months of the year are integers 1-12, which correspond to months of the year with January = 1.
See also:


- 23.9.13 initYearlyRecurrence(interval as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4417
- 23.9.14 initYearlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4417


### 23.9.13 initYearlyRecurrence(interval as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Yearly Recurrence initializer.
**Notes:** This initializer allows the client to specify multiple months of the year that an event will recur. This method should be used to initialize events that occur on the same date, in more than month a year, in a set monthly pattern. An example is an event that occurs every year on the first day of the first and seventh months.

Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.

Valid values for months of the year are integers 1-12, which correspond to months of the year with January = 1.
See also:


- 23.9.12 initYearlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4416
- 23.9.14 initYearlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4417


### 23.9.14 initYearlyRecurrence(interval as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Yearly Recurrence initializer.
**Example:**

```
// create a recurrence event:

dim c as new CalCalendarStoreMBS
dim e as new CalEventMBS
dim error as NSErrorMBS
dim s as string
dim ed as new date
dim rule as CalRecurrenceRuleMBS
dim rend as CalRecurrenceEndMBS

ed.day=21
ed.Month=7
ed.Year=2008

e.endDate=ed

dim sd as new date

sd.day=18
sd.Month=7
sd.Year=2008

e.startDate=sd
e.isAllDay=true
e.location="Example Location"

rule=CalRecurrenceRuleMBS.initYearlyRecurrence(1,nil)

dim calendars() as CalCalendarMBS = c.calendars
e.Title="Example Title"
e.calendar=calendars(0) // pick first calendar
e.notes="Example Notes"
e.URL="http://www.monkeybreadsoftware.de"
e.recurrenceRule=rule


if c.saveEvent(e, c.CalSpanAllEvents, error) then
if error<>Nil then s=error.localizedDescription
MsgBox "OK"+EndOfLine+s
else
if error<>Nil then s=error.localizedDescription
MsgBox "Failed"+EndOfLine+s
end if
```

**Notes:** Two parameters are included in every CalRecurrenceRule initializer. The first is the interval, which is described above and indicates how many CalRecurrenceTypes make up the period of the recurrence (every

week, every other week, etc.). The second is a CalRecurrenceEnd, which describes when the CalRecurrenceRule ends. If valid values for these two parameters are not included, nil is returned. There are simple initializers for each CalRecurrenceType which take only these two parameters.
See also:


- 23.9.12 initYearlyRecurrence(interval as Integer, DayOfTheWeek as Integer, WeekOfTheMonth as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4416
- 23.9.13 initYearlyRecurrence(interval as Integer, MonthsOfTheYear() as Integer, RecurrenceEnd as CalRecurrenceEndMBS) as CalRecurrenceRuleMBS 4417


### 23.9.15 monthsOfTheYear as Integer()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This property can be accessed as an array containing one or more integer corresponding to the months of the year the event recurs.
**Notes:** This property is valid for rules whose CalRecurrenceType is CalYearlyRecurrence. For all other CalRecurrenceRules, this property is empty.

### 23.9.16 nthWeekDaysOfTheMonth as CalNthWeekDayMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This property can be accessed as an array containing exactly one CalNthWeekDay corresponding to the week of the month the event recurs.
**Notes:** This property is valid for rules whose CalRecurrenceType is CalMonthlyRecurrence or CalYearlyRecurrence, and that were initialized with a day of the week and week of the month. For all other CalRecurrenceRules, this property is empty.

### 23.9.17 Properties

### 23.9.18 firstDayOfTheWeek as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The first day of the week.
**Notes:** Recurrence patterns can specify which day of the week should be treated as the first day. Possible values for this property are integers 0 and 1-7, which correspond to days of the week with Sunday = 1. Zero indicates that the property is not set for this recurrence. he first day of the week only affects the way the recurrence is expanded for weekly recurrence patterns with an interval greater than 1. For those types of recurrence patterns, the CalendarStore framework will set firstDayOfTheWeek to be 2 (Monday). In all other cases, this property will be set to zero. The iCalendar spec stipulates that the default value is Monday

if this property is not set.
(Read only property)

### 23.9.19 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The internal used CalRecurrenceRule reference.
**Notes:** (Read and Write property)

### 23.9.20 recurrenceEnd as CalRecurrenceEndMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** This property defines when the the repeating event is scheduled to end.
**Notes:** The end date can be specified by a number of occurrences, or with an end date.
Value can be nil.
This is a read only property.
(Read only property)

### 23.9.21 recurrenceInterval as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Specifies how often the rule repeats over the given recurrence type.
**Notes:** An interval of 1 indicates that the event repeats every time unit, while an interval of 2 indicates that the repetition occurs in every other unit, etc.

This is a read only property.
(Read only property)

### 23.9.22 recurrenceType as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** This property designates the unit of time used to describe the recurrence pattern.
**Notes:** CalRecurrenceType designates the unit of time used to describe the recurrence. It has four possible values, which correspond to recurrence rules that are defined in terms of days, weeks, months, and years.

The interval of a CalRecurrenceRule is an Integer which specifies how often the recurrence rule repeats over

the unit of time described by the CalRecurrenceType. For example, if the CalRecurrenceType is CalWeeklyRecurrence, then an interval of 1 means the pattern is repeated every week. A NSUInteger of 2 indicates it is repeated every other week, 3 means every third week, and so on. The Integer must be a positive integer; 0 is not a valid value, and nil will be returned if the client attempts to initialize a rule with a negative or zero interval.

Together, CalRecurrenceType and interval define how often the CalRecurrenceRule's pattern repeats.
This is a read only property.
(Read only property)

### 23.9.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CalRecurrenceDaily | 0 | One of the recurrence type constants. |
| CalRecurrenceMonthly | 2 | One of the recurrence type constants. |
| CalRecurrenceWeekly | 1 | One of the recurrence type constants. |
| CalRecurrenceYearly | 3 | One of the recurrence type constants. |

## 23.10 class CalTaskMBS

### 23.10.1 class CalTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use EKReminderMBS instead.
**Function:** The class for tasks in iCal.
**Example:**

```
dim calStore as new CalCalendarStoreMBS
dim err as NSErrorMBS ' needed for the error details
dim newTask as new CalTaskMBS ' create a new reminder

// find existign tasks
dim tasks() as CalTaskMBS = calStore.tasks

// set properties
newTask.Title="new reminder"
newTask.Priority=9
newTask.DueDate=new date
//

newTask.calendar = tasks(0).calendar ' add to first List of reminders

call calStore.saveTask(newTask,err) ' save reminder
if err<>nil then
MsgBox err.localizedDescription
else
MsgBox "New reminder was created."
end if
```

**Notes:** Requires Mac OS X 10.5 to work.
Subclass of the CalCalendarItemMBS class.

### 23.10.2 Methods

### 23.10.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new empty task.
**Example:**

```
dim s as new CalCalendarStoreMBS
```

```
dim t as new CalTaskMBS
dim a() as CalCalendarMBS = s.calendars
dim d as new date

d.Month = d.Month + 1

t.calendar = a(0)
t.Title = "Test"
t.URL = "http://www.mbsplugins.de/"
t.priority = t.CalPriorityMedium
t.dueDate = d
t.notes = "just a test"
t.isCompleted = false

dim e as NSErrorMBS
if s.saveTask(t, e) then
MsgBox "saved"
else
MsgBox "failed to save"
end if
```

**Notes:** The calendar property must be set before calling saveTask on a new task.

### 23.10.4 Properties

### 23.10.5 completedDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The date the task was completed.
**Notes:** The properties isCompleted and CompletedDate are inextricably linked. Setting isCompleted to be true, will set the completedDate to be now, and setting any completedDate will change isCompleted to be true. Similarly, setting isCompleted to be false will set the completedDate to be nil, and setting the completedDate changes isCompleted to false.
(Read and Write property)

### 23.10.6 dueDate as date

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The date the task is due.
**Example:**

```
dim c as new CalCalendarStoreMBS

dim i,count as Integer
dim ta() as CalTaskMBS
dim ct as CalTaskMBS

ta=c.UncompletedTasks
for each ct in ta
msgbox ct.Title+EndOfLine+str(ct.priority)+EndOfLine+ct.dueDate.LongDate
next
```

**Notes:** (Read and Write property)

### 23.10.7 isCompleted as Boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether the task has been completed.
**Notes:** The properties isCompleted and CompletedDate are inextricably linked. Setting isCompleted to be true, will set the completedDate to be now, and setting any completedDate will change isCompleted to be true. Similarly, setting isCompleted to be false will set the completedDate to be nil, and setting the completedDate changes isCompleted to false.
(Read and Write property)

### 23.10.8 priority as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The priority of this task.
**Notes:** The iCalendar specification allows priority to be specified with an integer in the range of 0-9, with 0 representing an undefined priority, 1 the highest priority, and 9 the lowest priority. When a user sets the priority to high, medium or low in iCal saves the priority as 1, 5, or 9 respectively. Clients are encouraged to use these values when setting a task's priority, but is is possible to specify any integer value from 0 to 9. In iCal, a task with a priority in the range of 1-4 will show up as high priority, a task with a priority of 5 will be displayed as having medium priority, and 6-9 will be displayed as having a low priority.
(Read and Write property)

### 23.10.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CalPriorityHigh | 1 | One of the constants for the priority property. |
| CalPriorityLow | 9 | One of the constants for the priority property. |
| CalPriorityMedium | 5 | One of the constants for the priority property. |
| CalPriorityNone | 0 | One of the constants for the priority property. |

## 23.11 class EKAlarmMBS

### 23.11.1 class EKAlarmMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An EKAlarm object represents an alarm in Event Kit.
**Notes:** Use the alarmWithAbsoluteDate: and alarmWithRelativeOffset class methods to create an alarm and use the properties to set information about an alarm. In OS X Mountain Lion, you can specify an action to trigger when the alarm fires via the emailAddress, soundName, or url property.
Subclass of the EKObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr6

### 23.11.2 Methods

### 23.11.3 alarmWithAbsoluteDate(d as date) as EKAlarmMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an alarm with an absolute date.

### 23.11.4 alarmWithAbsoluteDateTime(d as dateTime) as EKAlarmMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an alarm with an absolute date.

### 23.11.5 alarmWithRelativeOffset(offset as Double) as EKAlarmMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an alarm with a relative offset.
**Notes:** offset: The offset from the start of an event, at which the alarm fires.

Negative offset values fire before the start of the event, while positive values fire after the start.

### 23.11.6 Constructor(date as date)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an alarm with an absolute date.
See also:


- 23.11.7 Constructor(date as dateTime) 4427
- 23.11.8 Constructor(offset as Double) 4427


### 23.11.7 Constructor(date as dateTime)

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an alarm with an absolute date.
See also:


- 23.11.6 Constructor(date as date) 4426
- 23.11.8 Constructor(offset as Double) 4427


### 23.11.8 Constructor(offset as Double)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an alarm with a relative offset.
**Notes:** offset: The offset from the start of an event, at which the alarm fires.

Negative offset values fire before the start of the event, while positive values fire after the start.
See also:


- 23.11.6 Constructor(date as date) 4426
- 23.11.7 Constructor(date as dateTime) 4427


### 23.11.9 copy as EKAlarmMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of an alarm.

### 23.11.10 Properties

### 23.11.11 absoluteDate as date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The absolute date for the alarm.
**Notes:** If you set this property for a relative offset alarm, it loses the relative offset and becomes an absolute alarm.
(Read and Write property)

### 23.11.12 absoluteDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The absolute date for the alarm.
**Notes:** If you set this property for a relative offset alarm, it loses the relative offset and becomes an absolute alarm.
(Read and Write property)

### 23.11.13 emailAddress as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The recipient of an email to send when the alarm triggers.
**Notes:** Assigning this property a value will set the soundName and url properties to nil.
(Read and Write property)

### 23.11.14 proximity as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A value indicating how a location-based alarm is triggered.
**Notes:** Alarms can be set to trigger when entering or exiting a location specified by structuredLocation. By default, alarms are not affected by location.
(Read and Write property)

### 23.11.15 relativeOffset as Double

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset from the start of an event, at which the alarm fires.
**Notes:** If you set this value for an absolute alarm, it loses its absolute date and becomes a relative offset alarm.
(Read and Write property)

### 23.11.16 soundName as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the sound to play when the alarm triggers.
**Notes:** The value of this property is the name of a system sound that can be used with the soundNamed class method to create an NSSound object. Assigning this property a value will set the emailAddress and url properties to nil.
(Read and Write property)

### 23.11.17 structuredLocation as EKStructuredLocationMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The location to trigger an alarm.
**Notes:** This property is used in conjunction with proximity to perform geofence-based triggering of reminders.
(Read and Write property)

### 23.11.18 type as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The type of action to trigger when the alarm fires.
**Notes:** To set the type of alarm, define one of emailAddress, soundName, or url.
(Read only property)

### 23.11.19 url as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The URL to open when the alarm triggers.
**Notes:** Assigning this property a value will set the emailAddress and soundName properties to nil.

Available in OS X v10.8 and later.
Deprecated in OS X v10.9.
(Read and Write property)

### 23.11.20 Constants

Proximity Values

| Constant | Value | Description |
|---|---|---|
| kProximityEnter | 1 | The alarm is set to fire when entering a region. |
| kProximityLeave | 2 | The alarm is set to fire when leaving a region. |
| kProximityNone | 0 | The alarm has no proximity trigger. |

Types

| Constant | Value | Description |
|---|---|---|
| kTypeAudio | 1 | Play audio |
| kTypeDisplay | 0 | Display alert |
| kTypeEmail | 3 | Email |
| kTypeProcedure | 2 | Procedure |

## 23.12 class EKCalendarItemMBS

### 23.12.1 class EKCalendarItemMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a calendar item.
**Notes:** The EKCalendarItem class is a an abstract superclass for calendar events and reminders. This class provides common properties and methods for accessing properties of calendar items such as the ability to set the calendar, title, and location as well as support for attaching notes, displaying attendees, setting multiple alarms, and specifying recurrence rules.
Subclass of the EKObjectMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.12.2 Methods

### 23.12.3 addAlarm(alarm as EKAlarmMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an alarm to the receiver.

### 23.12.4 addRecurrenceRule(rule as EKRecurrenceRuleMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a recurrence rule to the recurrence rule array.
**Notes:** The implementation only supports a single recurrence rule. Adding a recurrence rule replaces the single recurrence rule.

### 23.12.5 alarms as EKAlarmMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The alarms associated with the calendar item, as an array of EKAlarm objects.
**Notes:** This property is empty if the calendar item has no alarms.

### 23.12.6 attendees as EKParticipantMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The attendees associated with the calendar item, as an array of EKParticipant objects.
**Notes:** This property is read-only; it is not possible to add attendees with Event Kit. This property is nil if the calendar item has no attendees.

### 23.12.7 recurrenceRules as EKRecurrenceRuleMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The recurrence rules for the calendar item.
**Notes:** The implementation only supports a single recurrence rule.

### 23.12.8 removeAlarm(alarm as EKAlarmMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes an alarm from the calendar item.

### 23.12.9 removeRecurrenceRule(rule as EKRecurrenceRuleMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a recurrence rule from the recurrence rule array.
**Notes:** The implementation only supports a single recurrence rule.

### 23.12.10 setAlarms(alarms() as EKAlarmMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the alarms array.

### 23.12.11 setRecurrenceRules(rules() as EKRecurrenceRuleMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the recurrences rules array.

### 23.12.12 Properties

### 23.12.13 calendar as EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar for the calendar item.
**Notes:** (Read and Write property)

### 23.12.14 calendarItemExternalIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar item,Äôs external identifier as provided by the calendar server.
**Notes:** This identifier allows you to access the same event or reminder across multiple devices.

There are some cases where duplicate copies of a calendar item can exist in the same database:

- A calendar item was imported from an ICS file into multiple calendars
- An event was created in a calendar shared with the user and the user was also invited to the event
- The user is a delegate of a calendar that also has this event
- A subscribed calendar was added to multiple accounts

In such cases, you should choose between calendar items based on other factors, such as the calendar or source.

Recurring event identifiers are the same for all occurrences. If you wish to differentiate between occurrences, you may want to use the start date.

For Exchange servers, the identifier is different between iOS and OS X and different between devices for reminders.
(Read only property)

### 23.12.15 calendarItemIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar item,Äôs unique identifier.
**Notes:** This property is set when the calendar item is created and can be used as a local identifier. Use calendarItemWithIdentifier to look up the item by this value.

A full sync with the calendar will lose this identifier. You should have a plan for dealing with a calendar whose identifier is no longer fetch-able by caching its other properties.
(Read only property)

### 23.12.16 creationDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The date that this calendar item was created.
**Notes:** If nil, this property was not set or was synced in this state.
(Read only property)

### 23.12.17 creationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date that this calendar item was created.
**Notes:** If nil, this property was not set or was synced in this state.
(Read only property)

### 23.12.18 hasAlarms as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the calendar item has alarms.
**Notes:** If true, the calendar item has alarms; otherwise it does not.
(Read only property)

### 23.12.19 hasAttendees as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the calendar item has attendees.
**Notes:** If true, the calendar item has attendees; otherwise it does not.
(Read only property)

### 23.12.20 hasNotes as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the calendar item has notes.
**Notes:** If true, the calendar item has notes; otherwise it does not.
(Read only property)

### 23.12.21 hasRecurrenceRules as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the calendar item has recurrence rules.
**Notes:** If true, the calendar item has recurrence rules; otherwise it does not.

The implementation only supports a single recurrence rule. Adding a recurrence rule replaces the single recurrence rule.
(Read only property)

### 23.12.22 lastModifiedDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The date that the calendar item was last modified.
**Notes:** (Read only property)

### 23.12.23 lastModifiedDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date that the calendar item was last modified.
**Notes:** (Read only property)

### 23.12.24 location as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The location associated with the calendar item.
**Notes:** This property is "" if the calendar item has no location.
(Read and Write property)

### 23.12.25 notes as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The notes associated with the calendar item.
**Notes:** (Read and Write property)

### 23.12.26 timeZone as NSTimeZoneMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The time zone for the calendar item.
**Notes:** If nil, the calendar item is a floating event. A floating event is not tied to a particular time zone. It occurs at a given time regardless of the time zone —for example, ,Äúlunch at noon.,Äù The start and end times of a floating event should be set as if they were in the system time zone.
(Read and Write property)

### 23.12.27 title as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title for the calendar item.
**Notes:** (Read and Write property)

### 23.12.28 URL as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL for the calendar item.
**Notes:** (Read and Write property)

## 23.13 class EKCalendarMBS

### 23.13.1 class EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An instance of the EKCalendar class represents a calendar in Event Kit.
**Notes:** Use the properties in this class to get attributes about a calendar, such as its title and type. Use the calendarForEntityType method to create a calendar object.
Subclass of the EKObjectMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 19.5pr1

### 23.13.2 Methods

### 23.13.3 calendarForEntityType(entityType as Integer, eventStore as EKEventStoreMBS) as EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new calendar that can contain the given entity type.
**Notes:** entityType: The entity type that this calendar may support.
eventStore: The event store in which to create this calendar.

Returns the created calendar.

You can only create calendars that accept either reminders or events. Some servers might allow mixing the two, although it is not common.

### 23.13.4 Constructor(entityType as Integer, eventStore as EKEventStoreMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new calendar that can contain the given entity type.
**Notes:** entityType: The entity type that this calendar may support.
eventStore: The event store in which to create this calendar.

Returns the created calendar.

You can only create calendars that accept either reminders or events. Some servers might allow mixing the two, although it is not common.

### 23.13.5 Properties

### 23.13.6 allowedEntityTypes as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The entity types this calendar can contain.
**Notes:** While Event Kit only allows creation of single-entity calendars, other servers might allow mixed-entity calendars.
(Read only property)

### 23.13.7 allowsContentModifications as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether you can add, edit, and delete items in the calendar.
**Notes:** (Read only property)

### 23.13.8 calendarIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A unique identifier for the calendar.
**Notes:** This property is set when the calendar is created and can be used as a local identifier. Use calendarWithIdentifier to get a calendar with the specified identifier.

A full sync with the calendar will lose this identifier. You should have a plan for dealing with a calendar whose identifier is no longer fetch-able by caching its other properties.
(Read only property)

### 23.13.9 CGColor as Variant

MBS Mac64bit Plugin, Plugin Version: 21.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The calendar,Äôs color.
**Notes:** This property is the equivalent of the color property in macOS.
(Read and Write property)

### 23.13.10 color as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar,Äôs color.
**Notes:** (Read and Write property)

### 23.13.11 Immutable as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the calendar,Äôs properties can be edited or deleted.
**Notes:** If true, the calendar is immutable; otherwise it is not. Events and reminders can still be added to an immutable calendar.
(Read only property)

### 23.13.12 source as EKSourceMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The source object representing the account to which this calendar belongs.
**Notes:** This property can only be set for newly created calendar objects. This property is read-only after the first time it is set; setting a value to this property after the first time it is set will result in an error. Therefore, moving a calendar from one source to another is not supported.
(Read and Write property)

### 23.13.13 Subscribed as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the calendar is a subscribed calendar.
**Notes:** If true, the calendar is a subscribed calendar; otherwise it is not.
(Read only property)

### 23.13.14 supportedEventAvailabilities as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The event availability settings supported by this calendar, as indicated by a bitmask.
**Notes:** If the calendar doesn,Äôt support event availability settings, this value is EKCalendarEventAvailabilityNone.

(Read only property)

### 23.13.15 title as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar,Äôs title.
**Notes:** (Read and Write property)

### 23.13.16 type as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar,Äôs type.
**Notes:** CalDAV-subscribed calendars are of type EKCalendarTypeCalDAV with Subscribed set to true.
(Read only property)

### 23.13.17 Constants

Entity Mask

| Constant | Value | Description |
|---|---|---|
| kEntityMaskEvent | 1 | Event |
| kEntityMaskReminder | 2 | Reminder |

Types

| Constant | Value | Description |
|---|---|---|
| kEntityTypeEvent | 0 | Entity Event |
| kEntityTypeReminder | 1 | Entity Reminder |

Event Availabilities

| Constant | Value | Description |
|---|---|---|
| kEventAvailabilityBusy | 1 | Busy |
| kEventAvailabilityFree | 2 | Free |
| kEventAvailabilityNone | 0 | Not available |
| kEventAvailabilityTentative | 4 | Tentative |
| kEventAvailabilityUnavailable | 8 | Unavailable |

Calendar Types

| Constant | Value | Description |
|---|---|---|
| kTypeBirthday | 4 | A birthday calendar. |
| kTypeCalDAV | 1 | A CalDAV or iCloud calendar. |
| kTypeExchange | 2 | An Exchange calendar. |
| kTypeLocal | 0 | A local calendar. |
| kTypeSubscription | 3 | A locally subscribed calendar. |

## 23.14 class EKEventMBS

### 23.14.1 class EKEventMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An instance of the EKEvent class represents an event added to a calendar in the Event Kit framework.
**Notes:** Use the eventWithEventStore method to create a new event. Use the properties in the class to get and modify certain information about an event. Other properties, such as the event,Äôs title and calendar, are inherited from the parent class EKCalendarItem.
Subclass of the EKCalendarItemMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 20.5pr6
- MBS Xojo Plugins, version 19.4pr7

**Xojo Developer Magazine**

- 21.1, page 29: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 23.14.2 Methods

### 23.14.3 compareStartDateWithEvent(other as EKEventMBS) as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Compares the start date of the receiving event with the start date of another event.
**Notes:** other: The event to compare against.

| | | |
|---|---|---|
| NSOrderedAscending | -1 | if the start date of the receiver precedes the start date of other. |
| NSOrderedSame | 0 | if the start dates of the two events are identical. |
| NSOrderedDescending | 1 | if the start date of the receiver comes after the start date of other. |

### 23.14.4 Constructor(eventStore as EKEventStoreMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a new event belonging to a specified event store.
**Notes:** eventStore: The event store to which the event belongs.

### 23.14.5 eventWithEventStore(eventStore as EKEventStoreMBS) as EKEventMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a new event belonging to a specified event store.
**Notes:** eventStore: The event store to which the event belongs.

### 23.14.6 refresh as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates the event,Äôs data with the current information in the Calendar database.
**Notes:** If the event was successfully refreshed, true; otherwise, false.

You should call this method only on events that your application is editing, and only when your application receives the EKEventStoreChangedNotification notification. If this method returns false, the event has been deleted or otherwise invalidated, and you should not continue to use it.

This method does not replace the values of any properties that you have modified.

### 23.14.7 setEndDate(d as date, tz as NSTimeZoneMBS)

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the end date with given time zone.

### 23.14.8 setStartDate(d as date, tz as NSTimeZoneMBS)

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the start date with given time zone.
**Example:**

```
Dim es As New EKEventStoreMBS
Dim e As New EKEventMBS(es)

Dim d As New date
```

```
d.day = 2
d.Month = d.Month + 6

// sets with time zone in the date object
e.startDate = d

Dim d1 As date = e.startDate

// sets with the time zone local to that date for current user
e.setStartDate(d, NSTimeZoneMBS.localTimeZone)

Dim d2 As date = e.startDate


MsgBox d1.SQLDateTime + EndOfLine + d2.SQLDateTime

Break // you may see a difference due to summer/winter time switching
```

### 23.14.9 Properties

### 23.14.10 AllDay as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the event is an all-day event.
**Notes:** (Read and Write property)

### 23.14.11 availability as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The availability setting for the event.
**Notes:** This setting is used by CalDAV and Exchange servers to indicate how the event should be treated for scheduling purposes.

If the event,Äôs calendar does not support availability settings, this property,Äôs value is EKEventAvailabilityNotSupported.
(Read and Write property)

### 23.14.12 birthdayContactIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The contact identifier of the person for this birthday event.
**Notes:** This property only applies to events in the built-in Birthdays calendar. It specifies the contact identifier (for use with the Contacts classes) of the person for whom the system created this event. For any other type of event, this property returns nil.
Requires macOS 10.11 or newer.
(Read only property)

### 23.14.13 birthdayPersonUniqueID as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The Address Book framework record identifier of the person for this birthday event.
**Notes:** This property is only set if this is a birthday event; otherwise the property is "".
(Read only property)

### 23.14.14 endDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The end date for the event.
**Notes:** (Read and Write property)

### 23.14.15 endDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The end date for the event.
**Notes:** (Read and Write property)

### 23.14.16 eventIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A unique identifier for the event.
**Notes:** You can use this identifier to look up an event with the EKEventStore method eventWithIdentifier. If the calendar of an event changes, its identifier most likely changes as well.
(Read only property)

### 23.14.17 isDetached as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether an event is a detached instance of a repeating event.
**Notes:** This value is true if and only if the event is part of a repeating event and one or more of its attributes have been modified from the repeating event,Äôs default attributes.
(Read only property)

### 23.14.18 occurrenceDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The original occurrence date of an event if it is part of a recurring series.
**Notes:** This value will remain the same even if the event has been detached and its start date has changed. Floating events (such as all-day events) are returned in the default time zone.
(Read only property)

### 23.14.19 occurrenceDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The original occurrence date of an event if it is part of a recurring series.
**Notes:** This value will remain the same even if the event has been detached and its start date has changed. Floating events (such as all-day events) are returned in the default time zone.
(Read only property)

### 23.14.20 organizer as EKParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The organizer associated with the event.
**Notes:** This property is nil if the event has no organizer.
(Read only property)

### 23.14.21 startDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The start date of the event.
**Notes:** Floating events such as all-day events are returned in the default time zone.

(Read and Write property)

### 23.14.22 startDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The start date of the event.
**Notes:** Floating events such as all-day events are returned in the default time zone.
(Read and Write property)

### 23.14.23 status as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The status of the event.
**Notes:** You should act based on an event,Äôs status only if the status is EKEventStatusCanceled, which indicates that the event has been canceled. Other statuses should be considered informational.
(Read only property)

### 23.14.24 structuredLocation as EKStructuredLocationMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The event's location with a potential geocoordinate.
**Notes:** (Read and Write property)

### 23.14.25 Constants

Events Availability

| Constant | Value | Description |
|---|---|---|
| kAvailabilityBusy | 0 | The event has a busy availability setting. |
| kAvailabilityFree | 1 | The event has a free availability setting. |
| kAvailabilityNotSupported | -1 | Availability settings are not supported by the event,Äôs calendar. |
| kAvailabilityTentative | 2 | The event has a tentative availability setting. |
| kAvailabilityUnavailable | 3 | The event has an unavailable availability setting. |

Status Constants

| Constant | Value | Description |
|---|---|---|
| kStatusCanceled | 3 | The event has no status. |
| kStatusConfirmed | 1 | The event has no status. |
| kStatusNone | 0 | The event has no status. |
| kStatusTentative | 2 | The event has no status. |

## 23.15 class EKEventStoreMBS

### 23.15.1 class EKEventStoreMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An instance of the EKEventStore class represents the Calendar database.
**Notes:** It is an application,Äôs point of contact for accessing calendar and reminder data.

You must request access to an entity type after the event store is initialized with requestAccessToEntityType for data to return.

Acceptable entity types are EKEntityMaskEvent for events and EKEntityMaskReminder for reminders.
Create a predicate, or a search query for events, with the predicateForEventsWithStartDate method.
Fetch and process events that match a given predicate with the eventsMatchingPredicate: and enumerateEventsMatchingPredicate methods.
Save and delete events from the event store with the saveEvent and removeEvent methods.
Subclass of the EKObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 18.1pr5

### 23.15.2 Methods

### 23.15.3 authorizationStatusForEntityType(entityType as Integer) as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the authorization status for the given entity type.
**Notes:** Available in OS X v10.9 and later.

### 23.15.4 Available as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.8 and newer with 64-bit.

### 23.15.5 calendarItemsWithExternalIdentifier(identifier as string) as EKCalendarItemMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns either the event,Äôs first occurrences or the reminders with the specified external identifier.
**Notes:** externalIdentifier: The calendar item,Äôs external identifier.

Returns an array of calendar items with the specified identifier.

The external identifier can be obtained from the calendarItemExternalIdentifier property. There may be more than one matching calendar item due to reasons discussed in calendarItemExternalIdentifier.

### 23.15.6 calendarItemWithIdentifier(identifier as string) as EKCalendarItemMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns either the event,Äôs first occurrence or the reminder with the specified identifier.
**Notes:** Returs the reminder or the first occurrence of an event with the specified identifier.

### 23.15.7 calendarsForEntityType(types as Integer) as EKCalendarMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns calendars that support a given entity type, such as reminders or events.

### 23.15.8 calendarWithIdentifier(identifier as string) as EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the calendar with the specified identifier.

### 23.15.9 cancelFetchRequest(request as EKFetchRequestMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels the request to fetch reminders.
**Notes:** Pass the request you got from fetchRemindersMatchingPredicate method.

The fetchRemindersMatchingPredicateCompleted event will not fire.

### 23.15.10 commit(byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Commits all unsaved changes to the event store.
**Notes:** error: The error variable to be filled with an error object.

If the commit operation succeeded, true is returned; otherwise, false. Returns true even when there are no changes to commit.

This method allows you to save batched changes to the event store. For example, if you pass false as the commit parameter to the saveCalendar, removeCalendar, saveEvent, or removeEvent methods, the changes are not saved until this method is invoked. Likewise, if you pass true as the commit parameter to the aforementioned methods, there is no need to call this method.

### 23.15.11 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The default constructor.
See also:


- 23.15.12 Constructor(sources() as EKSourceMBS) 4451
- 23.15.13 Constructor(types as Integer) 4452


### 23.15.12 Constructor(sources() as EKSourceMBS)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates an event store that contains data for the specified sources.
**Notes:** sources: An array of sources the event source should contain. This array may include delegate sources.

An event store that contains data for a specific collection of event sources.
See also:


- 23.15.11 Constructor 4451
- 23.15.13 Constructor(types as Integer) 4452

### 23.15.13 Constructor(types as Integer)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes access to the event store with support for the given entity type.
**Notes:** Available in OS X v10.8 and later.
Deprecated in OS X v10.9.
See also:

- 23.15.11 Constructor 4451
- 23.15.12 Constructor(sources() as EKSourceMBS) 4451

### 23.15.14 delegateSources as EKSourceMBS()

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Deprecated:** This item is deprecated and should no longer be used. You can use sources instead. **Function:** The event sources delegated to the user.
**Notes:** By default, delegate event sources aren,Äôt included in an event store,Äôs sources. To access events and reminders in a delegate source:

- Initialize an EKEventStore using init.
- Use requestAccessToEntityType:completion: to request access to the desired entity types.
- Get the delegate sources from the event store using delegateSources.
- After the request is granted, initialize another EKEventStoreMBS using Constructor, passing the delegate stores.

### 23.15.15 Destructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 23.15.16 EKErrorDomain as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EventKit error domain.

### 23.15.17 EKEventStoreChangedNotification as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The changed notification name.
**Notes:** Posted whenever changes are made to the Calendar database, including adding, removing, and changing events or reminders. Individual changes are not described. When you receive this notification, you should refetch all EKEvent and EKReminder objects you have accessed, as they are considered stale. If you are actively editing an event and do not wish to refetch it unless it is absolutely necessary to do so, you can call the refresh method on it. If the method returns true, you do not need to refetch the event.

### 23.15.18 enumerateEventsMatchingPredicate(predicate as NSPredicateMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Finds all events that match a given predicate and calls enumerateEventsMatchingPredicateUpdate event for each event found.
**Notes:** predicate: The search predicate. Must be created with the predicateForEventsWithStartDate:endDate:calendars method.

Only events that have been committed are included in enumeration.
Events saved using saveEvent with the commit parameter set to NO must call commit beforehand to be included.

This method is synchronous.

### 23.15.19 eventsMatchingPredicate(predicate as NSPredicateMBS) as EKEventMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns all events that match a given predicate.
**Notes:** Returns all events that match predicate, as an array of EKEvent objects.

Only events that have been committed are included in the results. Events saved using saveEvent with the commit parameter set to false must call commit beforehand to be included.

This method is synchronous.

### 23.15.20 eventsMatchingPredicateAsync(predicate as NSPredicateMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns all events that match a given predicate.
**Notes:** Calls later eventsMatchingPredicateAsyncCompleted event with all events that match predicate, as an array of EKEvent objects.

Only events that have been committed are included in the results. Events saved using saveEvent with the commit parameter set to false must call commit beforehand to be included.

This method is asynchronous.

### 23.15.21 eventsWithExternalIdentifier(identifier as string) as EKCalendarItemMBS()

MBS Mac64bit Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns events with the specified external identifier.
**Notes:** Same as calendarItemsWithExternalIdentifier, but only returning events.

### 23.15.22 eventWithIdentifier(identifier as string) as EKEventMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the first occurrence of an event with a given identifier.
**Notes:** The event corresponding to identifier, or nil if no event is found.

### 23.15.23 fetchRemindersMatchingPredicate(predicate as NSPredicateMBS, tag as Variant = nil) as EKFetchRequestMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches reminders matching a given predicate asynchronously.
**Notes:** predicate: The search predicate.

Returns a value to be used in cancelFetchRequest to cancel the request later if desired.

Only reminders that have been committed are included in the results. Reminders saved using saveReminder with the commit parameter set to NO must call commit beforehand to be included.

This method fetches reminders asynchronously.
Calls FetchedReminders event later on success.

### 23.15.24 fetchRemindersMatchingPredicateSync(predicate as NSPredicateMBS) as EKReminderMBS()

MBS Mac64bit Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches reminders matching a given predicate synchronously.
**Notes:** Same as fetchRemindersMatchingPredicate, except that we wait for result and return it without calling an event.

Only reminders that have been committed are included in the results. Reminders saved using saveReminder with the commit parameter set to NO must call commit beforehand to be included.

### 23.15.25 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Fetches completed reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate methods.

Pass nil for startDate to find all reminders completed before endDate. Similarly, pass nil for both startDate and endDate to get all complete reminders in the specified calendars.
See also:


- 23.15.26 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4456
- 23.15.27 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4456
- 23.15.28 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4457

### 23.15.26 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Fetches completed reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate methods.

Pass nil for startDate to find all reminders completed before endDate. Similarly, pass nil for both startDate and endDate to get all complete reminders in the specified calendars.
See also:


- 23.15.25 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date) as NSPredicateMBS 4455
- 23.15.27 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4456
- 23.15.28 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4457


### 23.15.27 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches completed reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate methods.

Pass nil for startDate to find all reminders completed before endDate. Similarly, pass nil for both startDate and endDate to get all complete reminders in the specified calendars.
See also:


- 23.15.25 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date) as NSPredicateMBS 4455
- 23.15.26 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4456

- 23.15.28 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4457


### 23.15.28 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches completed reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate methods.

Pass nil for startDate to find all reminders completed before endDate. Similarly, pass nil for both startDate and endDate to get all complete reminders in the specified calendars.
See also:


- 23.15.25 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date) as NSPredicateMBS 4455
- 23.15.26 predicateForCompletedRemindersWithCompletionDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4456
- 23.15.27 predicateForCompletedRemindersWithCompletionDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4456


### 23.15.29 predicateForEvents(startDate as date, endDate as date) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a predicate for finding events in the event store that fall within a given date range.
**Notes:** startDate: The start date of the range of events fetched.
endDate: The end date of the range of events fetched.
calendars: Optional. The calendars to search, as an array of EKCalendarMBS objects. Passing nil indicates to search all calendars.
See also:


- 23.15.30 predicateForEvents(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4458
- 23.15.31 predicateForEvents(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4458

- 23.15.32 predicateForEvents(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4459


### 23.15.30 predicateForEvents(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a predicate for finding events in the event store that fall within a given date range.
**Notes:** startDate: The start date of the range of events fetched.
endDate: The end date of the range of events fetched.
calendars: Optional. The calendars to search, as an array of EKCalendarMBS objects. Passing nil indicates to search all calendars.
See also:


- 23.15.29 predicateForEvents(startDate as date, endDate as date) as NSPredicateMBS 4457
- 23.15.31 predicateForEvents(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4458
- 23.15.32 predicateForEvents(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4459


### 23.15.31 predicateForEvents(startDate as dateTime, endDate as dateTime) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a predicate for finding events in the event store that fall within a given date range.
**Notes:** startDate: The start date of the range of events fetched.
endDate: The end date of the range of events fetched.
calendars: Optional. The calendars to search, as an array of EKCalendarMBS objects. Passing nil indicates to search all calendars.
See also:


- 23.15.29 predicateForEvents(startDate as date, endDate as date) as NSPredicateMBS 4457
- 23.15.30 predicateForEvents(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4458
- 23.15.32 predicateForEvents(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4459

### 23.15.32 predicateForEvents(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a predicate for finding events in the event store that fall within a given date range.
**Notes:** startDate: The start date of the range of events fetched.
endDate: The end date of the range of events fetched.
calendars: Optional. The calendars to search, as an array of EKCalendarMBS objects. Passing nil indicates to search all calendars.
See also:


- 23.15.29 predicateForEvents(startDate as date, endDate as date) as NSPredicateMBS 4457
- 23.15.30 predicateForEvents(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4458
- 23.15.31 predicateForEvents(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4458


### 23.15.33 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Fetches incomplete reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate:completion:.

Pass nil for startDate to find all reminders due before endDate. Similarly, pass nil for both startDate and endDate to get all incomplete reminders in the specified calendars.
See also:


- 23.15.34 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4460
- 23.15.35 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4460
- 23.15.36 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4461

### 23.15.34 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Fetches incomplete reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate:completion:.

Pass nil for startDate to find all reminders due before endDate. Similarly, pass nil for both startDate and endDate to get all incomplete reminders in the specified calendars.
See also:

- 23.15.33 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date) as NSPredicateMBS 4459
- 23.15.35 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4460
- 23.15.36 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4461

### 23.15.35 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches incomplete reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate:completion:.

Pass nil for startDate to find all reminders due before endDate. Similarly, pass nil for both startDate and endDate to get all incomplete reminders in the specified calendars.
See also:

- 23.15.33 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date) as NSPredicateMBS 4459
- 23.15.34 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4460

- 23.15.36 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS 4461


### 23.15.36 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime, calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches incomplete reminders in a set of calendars within an optional range.
**Notes:** startDate: The starting bound of the range to search.
endDate: The ending bound of the range to search.
calendars: Optional. An array of calendars to search.

The created predicate to be used for fetchRemindersMatchingPredicate:completion:.

Pass nil for startDate to find all reminders due before endDate. Similarly, pass nil for both startDate and endDate to get all incomplete reminders in the specified calendars.
See also:


- 23.15.33 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date) as NSPredicateMBS 4459
- 23.15.34 predicateForIncompleteRemindersWithDueDate(startDate as date, endDate as date, calendars() as EKCalendarMBS) as NSPredicateMBS 4460
- 23.15.35 predicateForIncompleteRemindersWithDueDate(startDate as dateTime, endDate as dateTime) as NSPredicateMBS 4460


### 23.15.37 predicateForRemindersInCalendar(calendar as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all reminders in a calendar.
**Notes:** The created predicate to be used for fetchRemindersMatchingPredicate methods.

### 23.15.38 predicateForRemindersInCalendars(calendars() as EKCalendarMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all reminders in a set of calendars.
**Notes:** The created predicate to be used for fetchRemindersMatchingPredicate methods.

### 23.15.39 refreshSourcesIfNecessary

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pulls new data from remote sources if necessary.
**Notes:** Use this method to pull new data from remote sources if the local data is out of date.

### 23.15.40 remindersWithExternalIdentifier(identifier as string) as EKCalendarItemMBS()

MBS Mac64bit Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns reminders with the specified external identifier.
**Notes:** Same as calendarItemsWithExternalIdentifier, but only returning reminders.

### 23.15.41 reminderWithIdentifier(identifier as string) as EKCalendarItemMBS

MBS Mac64bit Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the reminder with the specified identifier.
**Notes:** Same as calendarItemWithIdentifier, but for reminders only.

### 23.15.42 removeCalendar(calendar as EKCalendarMBS, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a calendar from the event store by either batching or committing the changes.
**Notes:** calendar: The calendar to be removed.
commit: True to remove the calendar immediately; otherwise, the change is batched until the commit: method is invoked.
error: The error that occurred, if any; otherwise, nil.

Returns ture if successful; otherwise, false.
This method raises an exception if calendar belongs to another event store.

### 23.15.43 removeEvent(event as EKEventMBS, span as integer, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes an event from the event store.
**Notes:** event: The event to remove.
span: The span that indicates whether to remove a single event or all future instances of the event in the case of a recurring event.
error: A pointer to an error object. If an error occurs, this pointer provides access to the error. If you don,Äôt need the error information, pass nil.

Return true if the event store successfully removes the event; otherwise, NO. This method also returns false if event isn,Äôt in the event store.

This method raises an exception if the event belongs to another event store.

Same as other saveEvent, but with commit = false.
See also:

- 23.15.44 removeEvent(event as EKEventMBS, span as Integer, commit as boolean, byref error as NSErrorMBS) as boolean 4463

### 23.15.44 removeEvent(event as EKEventMBS, span as Integer, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes an event or recurring events from the event store by either batching or committing the changes.
**Notes:** event: The event to remove.
span: The span to use. Indicates whether the remove affects future instances of the event in the case of a recurring event.
commit: True to remove the event immediately; otherwise, the change is batched until the commit: method is invoked.
error: The error that occurred, if any did. Otherwise, nil.

If the event has successfully removed, true; otherwise, false. Also returns false if event cannot be removed because it is not in the event store.

This method raises an exception if it is passed an event from another event store.
See also:

- 23.15.43 removeEvent(event as EKEventMBS, span as integer, byref error as NSErrorMBS) as boolean

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### 23.15.45 removeReminder(reminder as EKReminderMBS, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a reminder from the event store by either committing or batching the changes.
**Notes:** reminder: The reminder to be removed.
commit: A Boolean value indicating whether to remove the reminder immediately or to batch the removals; passing NO will not commit the removal from the event store until the commit: method is invoked.
error: The error that occurred, if any; otherwise, nil.

If successful, true; otherwise, false.
This method raises an exception if reminder belongs to another event store.

### 23.15.46 requestAccessToEntityType(entityType as Integer, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Prompts the user to grant or deny access to event or reminder data.
**Notes:** entityType: The event or reminder entity type.

Requesting access to an event store asynchronously prompts your users for permission to use their data. The user is only prompted the first time your app requests access to an entity type; any subsequent instantiations of EKEventStore uses existing permissions. When the user taps to grant or deny access, the requestAccessToEntityTypeCompleted event will be called on an arbitrary queue. Your app is not blocked while the user decides to grant or deny permission.

After users choose their permission level, the event store either calls the event.
Available in OS X v10.9 and later.

### 23.15.47 requestFullAccessToEvents(tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Prompts people to grant or deny read and write access to event data.
**Notes:** Requesting access to an event store asynchronously prompts people for permission to use their data. The operating system only prompts them the first time your app requests full access to events; any subsequent instantiations of EKEventStore uses existing permissions. When they grant or deny access, EventKit

calls the requestAccessToEntityTypeCompleted event.

Your app isn,Äôt blocked while the person decides to grant or deny permission. Because they may deny permission, your app should handle cases where it doesn,Äôt receive access to the event store.

### 23.15.48 requestFullAccessToReminders(tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Prompts people to grant or deny read and write access to reminders.
**Notes:** Requesting access to an event store asynchronously prompts people for permission to use their data. The operating system only prompts them the first time your app requests access to reminders; any subsequent instantiations of EKEventStore uses existing permissions. When they grant or deny access, EventKit calls the requestAccessToEntityTypeCompleted event.

Your app isn,Äôt blocked while the person decides to grant or deny permission. Because they may deny permission, your app should handle cases where it doesn,Äôt receive access to the event store.

### 23.15.49 requestWriteOnlyAccessToEvents(tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Prompts the person using your app to grant or deny write access to event data.
**Notes:** Requesting access to an event store asynchronously prompts people for permission to use their data. The operating system only prompts them the first time your app requests write-only event access; any subsequent instantiations of EKEventStore uses existing permissions. When they grant or deny access, EventKit calls the requestAccessToEntityTypeCompleted event.

Your app isn,Äôt blocked while the person decides to grant or deny permission. Because they may deny permission, your app should handle cases where it doesn,Äôt receive access to the event store.

### 23.15.50 reset

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the event store to its saved state.
**Notes:** This method updates all the properties of all the objects with their corresponding values in the event store. Any local changes that were not saved before invoking this method will be lost. All objects that were created or retrieved using this store are disassociated from it and should be considered invalid.

### 23.15.51 saveCalendar(calendar as EKCalendarMBS, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Saves a calendar to the event store by either committing or batching the changes.
**Notes:** calendar: The calendar to be saved.
commit: True to save the calendar immediately; otherwise, the change is batched until the commit method is invoked.
error: The error that occurred, if any; otherwise, nil.

Returns true if successful; otherwise, false.

This method raises an exception if calendar belongs to another event store.

### 23.15.52 saveEvent(event as EKEventMBS, span as integer, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Saves changes to an event permanently.
**Notes:** event: The event to save.
span: The span that indicates whether to remove a single event or all future instances of the event in the case of a recurring event.
error: A pointer to an error object. If an error occurs, this pointer provides access to the error. If you don,Äôt need the error information, pass nil.

Returns true if the event store saves the event successfully; otherwise, NO. This method also returns false if event wasn,Äôt modified.

This method raises an exception if it,Äôs passed an event from another event store.
When an event is saved, it,Äôs updated in the Calendar database. Any fields you didn,Äôt modify are updated to reflect the most recent value in the database. If the event has been deleted from the database, it,Äôs recreated as a new event.

Same as other saveEvent, but with commit = false.
See also:

- 23.15.53 saveEvent(event as EKEventMBS, span as Integer, commit as boolean, byref error as NSErrorMBS) as boolean

### 23.15.53 saveEvent(event as EKEventMBS, span as Integer, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Saves an event or recurring events to the event store by either batching or committing the changes.
**Notes:** event: The event to be saved.
span: The span to use. Indicates whether the save affects future instances of the event in the case of a recurring event.
commit: To save the event immediately, pass true; otherwise, the change is batched until the commit: method is invoked.
error: The error that occurred, if any; otherwise, nil.

Returns if successful, true; otherwise, false. Also returns false if event does not need to be saved because it has not been modified.

This method raises an exception if it is passed an event from another event store.

When an event is saved, it is updated in the Calendar database. Any fields you did not modify are updated to reflect the most recent value in the database. If the event has been deleted from the database, it is re-created as a new event.
See also:

- 23.15.52 saveEvent(event as EKEventMBS, span as integer, byref error as NSErrorMBS) as boolean 4466

### 23.15.54 saveReminder(reminder as EKReminderMBS, commit as boolean, byref error as NSErrorMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Saves changes to a reminder by either committing or batching the changes.
**Notes:** reminder: The reminder to be saved.
commit: A Boolean value indicating whether to save the reminder immediately or to batch the changes; passing NO will not commit changes to the event store until the commit: method is invoked.
error: The error that occurred, if any; otherwise, nil.

If successful, true; otherwise, false.
This method raises an exception if reminder belongs to another event store.

### 23.15.55 sources as EKSourceMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an unordered array of source objects.
**Notes:** An EKSource object represents an account that contains calendars.

### 23.15.56 sourceWithIdentifier(identifier as string) as EKSourceMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a source with the specified identifier.

### 23.15.57 Properties

### 23.15.58 defaultCalendarForNewEvents as EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar that events are added to by default, as specified by user settings.
**Notes:** (Read only property)

### 23.15.59 defaultCalendarForNewReminders as EKCalendarMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The calendar that events are added to by default, as specified by user settings.
**Notes:** (Read only property)

### 23.15.60 eventStoreIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unique identifier for the event store.
**Notes:** If the store is damaged, it is re-created and given a new identifier. If this value is different from a fetched value, you should take the appropriate action.
(Read only property)

### 23.15.61 Events

### 23.15.62 Changed

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The changed event.
**Notes:** Posted whenever changes are made to the Calendar database, including adding, removing, and changing events or reminders. Individual changes are not described. When you receive this notification, you should refetch all EKEvent and EKReminder objects you have accessed, as they are considered stale. If you are actively editing an event and do not wish to refetch it unless it is absolutely necessary to do so, you can call the refresh method on it. If the method returns true, you do not need to refetch the event.

### 23.15.63 enumerateEventsMatchingPredicateUpdate(e as EKEventMBS, byref stop as boolean, predicate as NSPredicateMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The method enumerateEventsMatchingPredicate found another event.

### 23.15.64 eventsMatchingPredicateAsyncCompleted(events() as EKEventMBS, predicate as NSPredicateMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The async call to eventsMatchingPredicate completed.

### 23.15.65 fetchRemindersMatchingPredicateCompleted(reminders() as EKReminderMBS, predicate as NSPredicateMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The call to fetchRemindersMatchingPredicate completed.

### 23.15.66 requestAccessToEntityTypeCompleted(entityType as Integer, granted as Boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The event called by requestAccessToEntityType once decision is made.

### 23.15.67 Constants

Authorization Status

| Constant | Value | Description |
|---|---|---|
| kAuthorizationStatusAuthorized | 3 | The app is authorized to access the service. |
| kAuthorizationStatusDenied | 2 | The user explicitly denied access to the service for the app. |
| kAuthorizationStatusNotDetermined | 0 | The user has not yet made a choice regarding whether the app may access service. |
| kAuthorizationStatusRestricted | 1 | The app is not authorized to access the service. The user cannot cha this app,Äôs authorization status, possibly due to active restrictions suc parental controls being in place. |

Entity Mask

| Constant | Value | Description |
|---|---|---|
| kEntityMaskEvent | 1 | Event |
| kEntityMaskReminder | 2 | Reminder |

Types

| Constant | Value | Description |
|---|---|---|
| kEntityTypeEvent | 0 | Entity Event |
| kEntityTypeReminder | 1 | Entity Reminder |

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorAlarmGreaterThanRecurrence | 8 | The alarm interval is greater than the recurrence interval. |
| kErrorAlarmProximityNotSupported | 21 | The source does not allow geofences on alarms. |
| kErrorCalendarDoesNotAllowEvents | 22 | The calendar does not allow events to be added. |
| kErrorCalendarDoesNotAllowReminders | 23 | The calendar does not allow reminders to be added. |
| kErrorCalendarHasNoSource | 14 | The calendar cannot be saved with no source set. |
| kErrorCalendarIsImmutable | 16 | The calendar is immutable and cannot be modified or deleted. |
| kErrorCalendarReadOnly | 6 | The calendar is read-only and cannot have events added to it. |
| kErrorCalendarSourceCannotBeModified | 15 | The calendar cannot be moved to another source. |
| kErrorDatesInverted | 4 | The event,Äôs end date occurs before its start date. |
| kErrorDurationGreaterThanRecurrence | 7 | The duration of an event is greater than its recurrence interval. |
| kErrorEventNotMutable | 0 | The event is not mutable and cannot be saved or deleted. |
| kErrorInternalFailure | 5 | An internal error occurred. |
| kErrorInvalidSpan | 13 | An invalid span was passed when saving or deleting. |
| kErrorInvitesCannotBeMoved | 12 | The event cannot be moved because it is an invite. |
| kErrorNoCalendar | 1 | The event is not associated with a calendar. |
| kErrorNoEndDate | 3 | The event has no end date set. |
| kErrorNoStartDate | 2 | The event has no start date set. |
| kErrorObjectBelongsToDifferentStore | 11 | The object belongs to a different calendar store. |
| kErrorRecurringReminderRequiresDueDate | 18 | The recurring reminder requires a due date. |
| kErrorReminderLocationsNotSupported | 20 | The source doesn't support locations on reminders. |
| kErrorSourceDoesNotAllowCalendarAddDelete | 17 | The source doesn,Äôt allow calendars to be added or deleted. |
| kErrorSourceDoesNotAllowEvents | 25 | The source does not allow calendars supporting event entity typ |
| kErrorSourceDoesNotAllowReminders | 24 | The source does not allow calendars supporting reminder entity |
| kErrorStartDateCollidesWithOtherOccurrence | 10 | The event,Äôs start date collides with another occurrence of the |
| kErrorStartDateTooFarInFuture | 9 | The start date is further into the future than the calendar can |
| kErrorStructuredLocationsNotSupported | 19 | The source to which this calendar belongs does not support st tions. |

Event Span

| Constant | Value | Description |
|---|---|---|
| kSpanFutureEvents | 1 | Modifications to this event instance should also affect future instances of this event. |
| kSpanThisEvent | 0 | Modifications to this event instance should affect only this instance. |

Week Days

| Constant | Value | Description |
|---|---|---|
| kWeekDayFriday | 6 | Friday |
| kWeekDayMonday | 2 | Monday |
| kWeekDaySaturday | 7 | Saturday |
| kWeekDaySunday | 1 | Sunday |
| kWeekDayThursday | 5 | Thursday |
| kWeekDayTuesday | 3 | Tuesday |
| kWeekDayWednesday | 4 | Wednesday |

## 23.16 class EKFetchRequestMBS

### 23.16.1 class EKFetchRequestMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for an ongoing fetch report.
**Notes:** If request object is destroyed, the request is cancelled, if it is not yet finished.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.16.2 Methods

### 23.16.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 23.16.4 Properties

### 23.16.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 23.17 class EKObjectMBS

### 23.17.1 class EKObjectMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EKObject class is an abstract superclass for all Event Kit classes whose instances are persistent.
**Notes:** It provides fine control when saving and restoring property settings. For example, you can find out if a persistent object was modified locally and whether it needs to be saved. If the object has changed in the event store since it was fetched, you can refresh the local copy by keeping local changes or by removing local changes. You can also roll back the object to the state when it was first fetched.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.17.2 Methods

### 23.17.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 23.17.4 hasChanges as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether this object or any of the objects it contains has uncommitted changes.
**Notes:** Returns true if there are uncommitted changes; otherwise, false.

### 23.17.5 isNew as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether this object has ever been saved.
**Notes:** Returns true if the object has not been saved; otherwise, false.

### 23.17.6 refresh as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Merges changes to this object with the latest saved values.
**Notes:** If the operation is successful, YES; if the object was deleted in the event store, false. If this method returns false, the object should be released.

This method merges the local changes to properties of this object with the latest values in the event store. This method updates only properties that have not been modified locally, so you do not lose any changes by invoking this method. You can also use this method to see whether an object was deleted from the event store.

### 23.17.7 reset

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns this object to its saved state.
**Notes:** This method updates all the properties of this object with the corresponding values in the event store. Any local changes that were not saved before invoking this method are lost. This method does nothing if the object was never saved.

### 23.17.8 rollback

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Rolls back the property values of this object to its original state when it was first fetched.
**Notes:** Any local changes to this object are lost when invoking this method. This method does not refetch property values from the event store. This method does nothing if the object was never changed.

### 23.17.9 Properties

### 23.17.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 23.18 class EKParticipantMBS

### 23.18.1 class EKParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An EKParticipant object represents a participant in a calendar event.
**Notes:** A participant can be a person, group, room, or other resource.

Do not create EKParticipant objects directly. Instead, use the property attendees on EKCalendarItem to return an array of EKParticipant objects.

Event Kit cannot add participants to an event nor change participant information. Use the properties in this class to get information about a participant.
Subclass of the EKObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr7

### 23.18.2 Methods

### 23.18.3 ABPersonInAddressBook(addressBook as Variant) as Variant

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the address book record that represents the participant.
**Notes:** Please pass a ABAddressbookMBS object for the addressBook parameter. You get back a ABPersonMBS object.
The address book record for the participant, or nil if the record is not found.
This method searches for a record match based on the participant,Äôs email address.

### 23.18.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 23.18.5 copy as EKParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the participant.

### 23.18.6 Properties

### 23.18.7 contactPredicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A predicate to use with the Contacts framework to retrieve the corresponding contact instance.
**Notes:** Use this property to get a predicate that you can use with a CNContactStoreMBS to fetch a CNContactMBS instance for this participant, if one exists.
(Read only property)

### 23.18.8 isCurrentUser as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether this participant represents the owner of this account.
**Notes:** (Read only property)

### 23.18.9 name as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The participant,Äôs name.
**Notes:** (Read only property)

### 23.18.10 participantRole as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The participant,Äôs role in the event.
**Notes:** (Read only property)

### 23.18.11 participantStatus as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The participant,Äôs attendance status.
**Notes:** (Read only property)

### 23.18.12 participantType as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The participant,Äôs type.
**Notes:** (Read only property)

### 23.18.13 person as Variant

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The person in the shared addressbook instance.
**Notes:** Value is an ABPersonMBS object.
(Read only property)

### 23.18.14 URL as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL representing this participant.
**Notes:** (Read only property)

### 23.18.15 Constants

Roles

| Constant | Value | Description |
|---|---|---|
| kRoleChair | 3 | The participant is the chair of the event. |
| kRoleNonParticipant | 4 | The participant does not have an active role in the event. |
| kRoleOptional | 2 | The participant,Äôs attendance is optional. |
| kRoleRequired | 1 | The participant,Äôs attendance is required. |
| kRoleUnknown | 0 | The participant,Äôs role is unknown. |

Status Constants

| Constant | Value | Description |
|---|---|---|
| kStatusAccepted | 2 | The participant has accepted the event. |
| kStatusCompleted | 6 | The participant,Äôs event has completed. |
| kStatusDeclined | 3 | The participant has declined the event. |
| kStatusDelegated | 5 | The participant has delegated attendance to another participant. |
| kStatusInProcess | 7 | The participant,Äôs event is currently in process. |
| kStatusPending | 1 | The participant has yet to respond to the event. |
| kStatusTentative | 4 | The participant,Äôs attendance status is tentative. |
| kStatusUnknown | 0 | The participant,Äôs attendance status is unknown. |

Participant Types

| Constant | Value | Description |
|---|---|---|
| kTypeGroup | 4 | The participant is a group. |
| kTypePerson | 1 | The participant is a person. |
| kTypeResource | 3 | The participant is a resource. |
| kTypeRoom | 2 | The participant is a room. |
| kTypeUnknown | 0 | The participant,Äôs type is unknown. |

## 23.19 class EKRecurrenceDayOfWeekMBS

### 23.19.1 class EKRecurrenceDayOfWeekMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EKRecurrenceDayOfWeek class represents a day of the week for use with an EKRecurrenceRule object.
**Notes:** A day of the week can optionally have a week number, indicating a specific day in the recurrence rule,Äôs frequency. For example, a day of the week with a day value of Tuesday and a week number of 2 would represent the second Tuesday of every month in a monthly recurrence rule, and the second Tuesday of every year in a yearly recurrence rule. A day of the week with a week number of 0 ignores its week number.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1

### 23.19.2 Methods

### 23.19.3 Constructor(dayOfTheWeek as Integer)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a day of the week with a given day and week number.
**Notes:** dayOfTheWeek: The day of the week. Values range from 1 to 7, with Sunday being 1.
weekNumber: Optional, the week number.
See also:

- 23.19.4 Constructor(dayOfTheWeek as Integer, weekNumber as Integer) 4479

### 23.19.4 Constructor(dayOfTheWeek as Integer, weekNumber as Integer)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a day of the week with a given day and week number.
**Notes:** dayOfTheWeek: The day of the week. Values range from 1 to 7, with Sunday being 1.
weekNumber: Optional, the week number.
See also:

- 23.19.3 Constructor(dayOfTheWeek as Integer) 4479

### 23.19.5 copy as EKRecurrenceDayOfWeekMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of this object.

### 23.19.6 dayOfWeek(dayOfTheWeek as Integer) as EKRecurrenceDayOfWeekMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a day of the week with a given day.
**Notes:** The week number of the returned day of the week is 0.
Values range from 1 to 7, with Sunday being 1.
See also:

- 23.19.7 dayOfWeek(dayOfTheWeek as Integer, weekNumber as Integer) as EKRecurrenceDayOfWeekMBS 4480

### 23.19.7 dayOfWeek(dayOfTheWeek as Integer, weekNumber as Integer) as EKRecurrenceDayOfWeekMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an autoreleased day of the week with a given day and week number.
**Notes:** dayOfTheWeek: The day of the week. Values range from 1 to 7, with Sunday being 1.
weekNumber: The week number.
See also:

- 23.19.6 dayOfWeek(dayOfTheWeek as Integer) as EKRecurrenceDayOfWeekMBS 4480

### 23.19.8 Properties

### 23.19.9 dayOfTheWeek as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The day of the week.
**Notes:** Values are from 1 to 7, with Sunday being 1.
(Read only property)

### 23.19.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 23.19.11 weekNumber as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The week number of the day of the week.
**Notes:** Values range from –53 to 53. A negative value indicates a value from the end of the range. 0 indicates the week number is irrelevant.
(Read only property)

### 23.19.12 Constants

Days

| Constant | Value | Description |
|---|---|---|
| kFriday | 6 | Friday |
| kMonday | 2 | Monday |
| kSaturday | 7 | Saturday |
| kSunday | 1 | Sunday |
| kThursday | 5 | Thursday |
| kTuesday | 3 | Tuesday |
| kWednesday | 4 | Wednesday |

## 23.20 class EKRecurrenceEndMBS

### 23.20.1 class EKRecurrenceEndMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EKRecurrenceEnd class defines the end of a recurrence rule defined by an EKRecurrenceRule object.
**Notes:** The recurrence end can be specified by a date (date-based) or by a maximum count of occurrences (count-based). An event which is set to never end should have its EKRecurrenceEnd set to nil.

### 23.20.2 Methods

### 23.20.3 Constructor(endDate as date)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes and returns a date-based recurrence end with a given end date.
**Notes:** The end date argument must be a valid NSDate and not nil; otherwise an exception will be raised.
See also:


- 23.20.4 Constructor(endDate as dateTime) 4482
- 23.20.5 Constructor(occurrenceCount as Integer) 4482


### 23.20.4 Constructor(endDate as dateTime)

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a date-based recurrence end with a given end date.
**Notes:** The end date argument must be a valid NSDate and not nil; otherwise an exception will be raised.
See also:


- 23.20.3 Constructor(endDate as date) 4482
- 23.20.5 Constructor(occurrenceCount as Integer) 4482


### 23.20.5 Constructor(occurrenceCount as Integer)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a count-based recurrence end with a given maximum occurrence count.
**Notes:** The maximum occurrence count argument must be a positive integer and not 0; otherwise an exception will be raised.
See also:

- 23.20.3 Constructor(endDate as date) 4482
- 23.20.4 Constructor(endDate as dateTime) 4482


### 23.20.6 copy as EKRecurrenceEndMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 23.20.7 recurrenceEndWithEndDate(endDate as date) as EKRecurrenceEndMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes and returns a date-based recurrence end with a given end date.
**Notes:** The end date argument must be a valid NSDate and not nil; otherwise an exception will be raised.

### 23.20.8 recurrenceEndWithOccurrenceCount(occurrenceCount as Integer) as EKRecurrenceEndMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes and returns a count-based recurrence end with a given maximum occurrence count.
**Notes:** The maximum occurrence count argument must be a positive integer and not 0; otherwise an exception will be raised.

### 23.20.9 Properties

### 23.20.10 endDate as Date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The end date of the recurrence end, or nil if the recurrence end is count-based.
**Notes:** (Read only property)

### 23.20.11 endDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The end date of the recurrence end, or nil if the recurrence end is count-based.
**Notes:** (Read only property)

### 23.20.12 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 23.20.13 occurrenceCount as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The occurrence count of the recurrence end, or 0 if the recurrence end is date-based.
**Notes:** (Read only property)

## 23.21 class EKRecurrenceRuleMBS

### 23.21.1 class EKRecurrenceRuleMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EKRecurrenceRule class is used to describe the recurrence pattern for a recurring event.
**Notes:** After you create a recurrence rule, assign it to an event with the recurrenceRule method of EKEvent.

Recurrence rules can have an end, represented by an EKRecurrenceEnd object. The end can be based on a specific date or a maximum number of occurrences.
Subclass of the EKObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1

### 23.21.2 Methods

### 23.21.3 Constructor(type as Integer, interval as Integer, days() as EKRecurrenceDayOfWeekMBS, monthDays() as Integer, months() as Integer, weeksOfTheYear() as Integer, daysOfTheYear() as Integer, setPositions() as Integer, end as EKRecurrenceEndMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a recurrence rule with a given frequency and additional scheduling information.
**Notes:** type: The frequency of the recurrence rule. Can be daily, weekly, monthly, or yearly.
interval: The interval between instances of this recurrence. For example, a weekly recurrence rule with an interval of 2 occurs every other week. Must be greater than 0.
days: The days of the week that the event occurs, as an array of EKRecurrenceDayOfWeek objects.
monthDays: The days of the month that the event occurs, as an array of integers. Values can be from 1 to 31 and from -1 to -31. This parameter is only valid for recurrence rules of type EKRecurrenceFrequencyMonthly.
months: the months of the year that the event occurs, as an array of integers. Values can be from 1 to 12. This parameter is only valid for recurrence rules of type EKRecurrenceFrequencyYearly.
weeksOfTheYear: The weeks of the year that the event occurs, as an array of integers. Values can be from 1 to 53 and from -1 to -53. This parameter is only valid for recurrence rules of type EKRecurrenceFrequencyYearly.
daysOfTheYear: The days of the year that the event occurs, as an array of integers. Values can be from 1 to 366 and from -1 to -366. This parameter is only valid for recurrence rules of type EKRecurrenceFrequencyYearly.
setPositions: An array of ordinal numbers that filters which recurrences to include in the recurrence rule,Äôs frequency. See setPositions for more information.
end: The end of the recurrence rule.

Handle is zero if invalid values are provided.

Negative values indicate counting backwards from the end of the recurrence rule,Äôs frequency.
See also:

- 23.21.4 Constructor(type as Integer, interval as Integer, end as EKRecurrenceEndMBS = nil) 4486

### 23.21.4 Constructor(type as Integer, interval as Integer, end as EKRecurrenceEndMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a simple recurrence rule with a given frequency, interval, and end.
**Notes:** type: The frequency of the recurrence rule. Can be daily, weekly, monthly, or yearly.
interval: The interval between instances of this recurrence. For example, a weekly recurrence rule with an interval of 2 occurs every other week. Must be greater than 0.
end: The end of the recurrence rule.

Handle is zero if invalid values are provided.
See also:

- 23.21.3 Constructor(type as Integer, interval as Integer, days() as EKRecurrenceDayOfWeekMBS, monthDays() as Integer, months() as Integer, weeksOfTheYear() as Integer, daysOfTheYear() as Integer, setPositions() as Integer, end as EKRecurrenceEndMBS = nil) 4485

### 23.21.5 copy as EKRecurrenceRuleMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the recurrence rule.

### 23.21.6 daysOfTheMonth as Integer()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The days of the month associated with the recurrence rule, as an array of integers.
**Notes:** Values can be from 1 to 31 and from -1 to -31.This property value is valid only for recurrence rules that were initialized with specific days of the month and a frequency type of EKRecurrenceFrequency-Monthly.
Negative values indicate counting backwards from the end of the month.

### 23.21.7 daysOfTheWeek as EKRecurrenceDayOfWeekMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The days of the week associated with the recurrence rule, as an array of EKRecurrenceDayOfWeek objects.
**Notes:** This property value is valid only for recurrence rules that were initialized with specific days of the week and a frequency type of EKRecurrenceFrequencyWeekly, EKRecurrenceFrequencyMonthly, or EKRecurrenceFrequencyYearly.

### 23.21.8 daysOfTheYear as Integer()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The days of the year associated with the recurrence rule, as an array of integers.
**Notes:** Values can be from 1 to 366 and from -1 to -366. This property value is valid only for recurrence rules initialized with a frequency type of EKRecurrenceFrequencyYearly.

Negative values indicate counting backwards from the end of the year.

### 23.21.9 monthsOfTheYear as Integer()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The months of the year associated with the recurrence rule, as an array of integers.
**Notes:** Values can be from 1 to 12. This property value is valid only for recurrence rules initialized with specific months of the year and a frequency type of EKRecurrenceFrequencyYearly.

### 23.21.10 setPositions as Integer()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of ordinal numbers that filters which recurrences to include in the recurrence rule,Äôs frequency.
**Notes:** For example, a yearly recurrence rule that has a daysOfTheWeek value that specifies Monday through Friday, and a setPositions array containing 2 and -1, occurs only on the second weekday and last weekday of every year.

Values can be from 1 to 366 and from -1 to -366.

Negative values indicate counting backwards from the end of the recurrence rule,Äôs frequency (week, month,

or year).

### 23.21.11 weeksOfTheYear as Integer()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The weeks of the year associated with the recurrence rule, as an array of integers.
**Notes:** Values can be from 1 to 53 and from -1 to -53. This property value is valid only for recurrence rules initialized with specific weeks of the year and a frequency type of EKRecurrenceFrequencyYearly.
Negative values indicate counting backwards from the end of the year.

### 23.21.12 Properties

### 23.21.13 calendarIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The identifier for the recurrence rule,Äôs calendar.
**Notes:** (Read only property)

### 23.21.14 firstDayOfTheWeek as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates which day of the week the recurrence rule treats as the first day of the week.
**Notes:** Values of 1 to 7 correspond to Sunday through Saturday. A value of 0 indicates that this property is not set for the recurrence rule.
(Read only property)

### 23.21.15 frequency as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The frequency of the recurrence rule.
**Notes:** (Read only property)

### 23.21.16 interval as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies how often the recurrence rule repeats over the unit of time indicated by its frequency.
**Notes:** For example, a recurrence rule with a frequency type of EKRecurrenceFrequencyWeekly and an interval of 2 repeats every two weeks.
(Read only property)

### 23.21.17 recurrenceEnd as EKRecurrenceEndMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates when the recurrence rule ends.
**Notes:** This can be represented by an end date or a number of occurrences.
(Read and Write property)

### 23.21.18 Constants

Frequencies for recurrence rules.

| Constant | Value | Description |
|---|---|---|
| kRecurrenceFrequencyDaily | 0 | Indicates a daily recurrence rule. |
| kRecurrenceFrequencyMonthly | 2 | Indicates a monthly recurrence rule. |
| kRecurrenceFrequencyWeekly | 1 | Indicates a weekly recurrence rule. |
| kRecurrenceFrequencyYearly | 3 | Indicates a yearly recurrence rule. |

## 23.22 class EKReminderMBS

### 23.22.1 class EKReminderMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An instance of the EKReminder class represents a reminder added to a calendar in the Event Kit framework.
**Notes:** Use the reminderWithEventStore: method to create a new reminder. Use the properties in the class to get and modify certain information about a reminder.
Subclass of the EKCalendarItemMBS class.

### 23.22.2 Methods

### 23.22.3 Constructor(eventStore as EKEventStoreMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a new reminder in the given event store.

### 23.22.4 reminderWithEventStore(eventStore as EKEventStoreMBS) as EKReminderMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new reminder in the given event store.

### 23.22.5 Properties

### 23.22.6 completed as Boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value determining whether or not the reminder is marked completed.
**Notes:** Setting this property to true will set completionDate to the current date; setting this property to false will set completionDate to nil.

If the reminder was completed using a different client, you may encounter the case where this property is true, but completionDate is nil.
(Read and Write property)

### 23.22.7 completionDate as date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The completion date as a date.
**Notes:** (Read and Write property)

### 23.22.8 completionDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The completion date as a date.
**Notes:** (Read and Write property)

### 23.22.9 dueDate as date

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The due date.
**Notes:** (Read only property)

### 23.22.10 dueDateComponents as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date by which the reminder should be completed.
**Notes:** The use of date components allows the due date and its time zone to be represented in a single property. A nil time zone represents a floating date. Setting a date component without an hour, minute and second component will set the reminder to be an all-day reminder. If this property is set, the calendar must be set to NSGregorianCalendar; otherwise an exception is raised.

This components,Äôs timeZone property is independent of time zone properties on startDateComponents and its super EKCalendarItem object. By default, the due date is set to the system time zone.

On iOS, Event Kit requires that a start date is set if the due date is set, however this is not a requirement on OS X.
(Read and Write property)

### 23.22.11 dueDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The due date.
**Notes:** (Read only property)

### 23.22.12 priority as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The priority of the reminder.
**Notes:** Priorities run from 1 (highest) to 9 (lowest). A priority of 0 means no priority.
Saving a reminder with any other priority will fail.
Per RFC 5545, priorities of 1-4 are considered "high," a priority of 5 is "medium," and priorities of 6-9 are "low."
(Read and Write property)

### 23.22.13 startDateComponents as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The start date of the task.
**Notes:** The use of date components allows the start date and its time zone to be represented in a single property. A nil time zone represents a floating date. Setting a date component without an hour, minute and second component will set the reminder to be an all-day reminder. If this property is set, the calendar must be set to NSGregorianCalendar; otherwise an exception is raised.

The start date components,Äôs timeZone property corresponds to the timeZone property on EKCalendarItem. A change in one value will cause a change in the other. Setting the time zone directly on the components does not guarantee that your changes will be saved; instead, pull this property from the reminder, set the time zone on it, and assign it back to the reminder:
(Read and Write property)

### 23.22.14 Constants

Priorities

| Constant | Value | Description |
|---|---|---|
| kPriorityHigh | 1 | High |
| kPriorityLow | 9 | Low |
| kPriorityMedium | 5 | Medium |
| kPriorityNone | 0 | No priority |

## 23.23 class EKSourceMBS

### 23.23.1 class EKSourceMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An instance of the EKSource class represents the account that a calendar belongs to.
**Notes:** You do not create instances of this class. You retrieve EKSource objects from an EKEventStore object. Use the sources property to get all the EKSource objects for an event store, and use the methods in this class to access properties of the source object.
Subclass of the EKObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 23.23.2 Methods

### 23.23.3 calendarsForEntityType(types as Integer) as EKCalendarMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the calendars that belong to this source object that support a particular entity type.
**Notes:** entityType: The entity type of either an event or a reminder.

### 23.23.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 23.23.5 Properties

### 23.23.6 sourceIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A unique identifier for the source object.
**Notes:** (Read only property)

### 23.23.7 sourceType as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of this source object.
**Notes:** (Read only property)

### 23.23.8 title as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of this source object.
**Notes:** (Read only property)

### 23.23.9 Constants

Types

| Constant | Value | Description |
|---|---|---|
| kTypeBirthdays | 5 | Represents a birthday source. |
| kTypeCalDAV | 2 | Represents a CalDAV or iCloud source. |
| kTypeExchange | 1 | Represents an Exchange source. |
| kTypeLocal | 0 | Represents a local source. |
| kTypeMobileMe | 3 | Represents a MobileMe source. |
| kTypeSubscribed | 4 | Represents a subscribed source. |

## 23.24 class EKStructuredLocationMBS

### 23.24.1 class EKStructuredLocationMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The EKStructuredLocation class specifies a geofence that can be used to trigger the alarm of a calendar item.
**Notes:** Use locationWithTitle to create a new structured location, then set it to the structuredLocation property of an EKAlarm object.
Subclass of the EKObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr7

**Xojo Developer Magazine**

- 21.1, page 29: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 23.24.2 Methods

### 23.24.3 Constructor(title as string)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new structured location.
**Notes:** title: The title of the location.

### 23.24.4 copy as EKObjectMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the location.

### 23.24.5 locationWithMapItem(MapItem as Variant) as EKStructuredLocationMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new structured location with the specified map item.
**Notes:** mapItem: The MKMapItemMBS object that represents the location.

### 23.24.6 locationWithTitle(title as string) as EKStructuredLocationMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new structured location.
**Notes:** title: The title of the location.

### 23.24.7 Properties

### 23.24.8 geoLocation as Variant

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The core location.
**Notes:** Value is a CLLocationMBS object.
(Read and Write property)

### 23.24.9 radius as Double

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A minimum distance from the core location that would trigger the alarm or reminder.
**Notes:** To use the default radius, set this property to 0.
(Read and Write property)

### 23.24.10 title as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the location.
**Notes:** (Read and Write property)

# Chapter 24

# CallKit

## 24.1 class CXCallDirectoryManagerMBS

### 24.1.1 class CXCallDirectoryManagerMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The programmatic interface to an object that manages a Call Directory app extension.
**Notes:** You may need to write your call extension in Xcode.
**Blog Entries**

- CallKit extension for Xojo iOS application
- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr1

**Xojo Developer Magazine**

- 21.1, page 34: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 24.1.2 Methods

### 24.1.3 available as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on iOS 10.0 or newer.

### 24.1.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The constructor.

### 24.1.5 getEnabledStatusForExtension(Identifier as String)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Asynchronously returns the enabled status of the extension with the specified identifier.
**Notes:** identifier: The identifier for the call extension.

Calls getEnabledStatusForExtensionCompleted event later.

### 24.1.6 openSettings

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Opens the iOS Settings app and shows the Call Blocking & Identification settings.
**Notes:** Before a Call Directory extension can operate on incoming calls, the user must explicitly enable the extension in the iOS Settings app.
Use this method to open the Settings app and show the Call Blocking & Identification settings directly.

Calls openSettingsCompleted event later.

### 24.1.7 reloadExtension(Identifier as String)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Asynchronously reloads the extension with the specified identifier.
**Notes:** identifier: The identifier for the call extension.

Calls reloadExtensionCompleted event later.

### 24.1.8 sharedInstance as CXCallDirectoryManagerMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Returns the shared call directory manager instance for the app.
**Notes:** You may prefer to subclass this class to fill events and then keep an instance of your own class around. But at any point you can use this method to get the instance you created or if needed the plugin creates one.

### 24.1.9 Properties

### 24.1.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 24.1.11 Events

### 24.1.12 getEnabledStatusForExtensionCompleted(identifier as string, enabledStatus as Integer, error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event to be executed when the manager is finished determining the enabled status of the specified extension.
**Notes:** enabledStatus: The enabled status of the extension. For possible values, see status constants.
error: If an error occurred, an error object indicating how the check failed, otherwise nil.

### 24.1.13 openSettingsCompleted(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event executed when the manager finishes opening the Call Directory panel.
**Notes:** error: If an error occurred, an error object indicating how the operation failed; otherwise, nil.

### 24.1.14 reloadExtensionCompleted(identifier as string, error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event to be executed when the manager is finished reloading the specified extension.
**Notes:** error: If an error occurred, an error object indicating how reloading failed, otherwise nil.

### 24.1.15 Constants

Status

| Constant | Value | Description |
|---|---|---|
| EnabledStatusDisabled | 1 | Indicates that the extension is disabled. |
| EnabledStatusEnabled | 2 | Indicates that the extension is enabled. |
| EnabledStatusUnknown | 0 | Indicates that the enabled status for the extension is unknown. |

# Chapter 25

# Canon EOS Digital

## 25.1 class EdsBaseMBS

### 25.1.1 class EdsBaseMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The base object class.

### 25.1.2 Methods

### 25.1.3 ChildCount as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the number of child objects of the designated object.
**Notes:** Example: Number of files in a directory.
Lasterror is set.

### 25.1.4 GetPropertyData(PropertyID as UInt32, Param as Int32 = 0) as Memoryblock

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.

Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.5 GetPropertyDataBool(PropertyID as UInt32, Param as Int32 = 0) as Boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.6 GetPropertyDataInt32(PropertyID as UInt32, Param as Int32 = 0) as Int32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.7 GetPropertyDataInt32Array(PropertyID as UInt32, Param as Int32 = 0) as Integer()

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.8 GetPropertyDataPoint(PropertyID as UInt32, Param as Int32 = 0) as EdsPointMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.9 GetPropertyDataRational(PropertyID as UInt32, Param as Int32 = 0) as EdsRationalMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.10 GetPropertyDataRationalArray(PropertyID as UInt32, Param as Int32 = 0) as EdsRationalMBS()

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.11 GetPropertyDataRect(PropertyID as UInt32, Param as Int32 = 0) as EdsRectMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.12 GetPropertyDataSize(PropertyID as UInt32, Param as Int32 = 0) as EdsSizeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.13 GetPropertyDataString(PropertyID as UInt32, Param as Int32 = 0) as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.14 GetPropertyDataType(PropertyID as UInt32, Param as Int32 = 0) as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So

please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.15 GetPropertyDataUInt32(PropertyID as UInt32, Param as Int32 = 0) as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Example:**

```
// we set bit for redirecting output to PC, leave other bits as they are.
dim device as UInt32 = camera.GetPropertyDataUInt32(camera.kEdsPropID_Evf_OutputDevice)
if camera.lasterror = EDSModuleMBS.EDS_ERR_OK then

device = Bitwise.BitOr(device, EDSModuleMBS.kEdsEvfOutputDevice_PC)
camera.SetPropertyDataUInt32 camera.kEdsPropID_Evf_OutputDevice, 0, device
end if
```

**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.16 GetPropertyDataUInt32Array(PropertyID as UInt32, Param as Int32 = 0) as UInt32()

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.17 GetPropertyDataUInt8(PropertyID as UInt32, Param as Int32 = 0) as UInt8

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets property information from the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property.
Values that can be designated for each property are as follows.

Lasterror is set.

The plugin queries size first, allocates storage and queries value and returns it to you as function result. So please check Lasterror after calling so you know whether an error occurred.
Returns EDS_ERR_OK on normal completion. Otherwise, see the EDS Error Lists for error codes. See Also

Regarding retrieval of the camera property data in particular, the conditions that can be retrieved vary depending on the values of other property data. For further information, see Properties in SDK Manual.

### 25.1.18 GetPropertyDesc(PropertyID as UInt32) as Memoryblock

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets a list of property data that can be set for the object, as well as maximum and minimum values.

**Notes:** PropertyID: Designate a property ID.

Lasterror is set.
Returns a memoryblock with EdsPropertyDesc structure data.
This structure has:

| | | |
|---|---|---|
| form | Int32(0) | Reserved (currently, always 0) |
| access | Int32(4) | Reserved (currently, always 0) |
| numElements | Int32(8) | Indicates the number of property data list elements stored in the PropDesc array. |
| propDesc | Int32(12+n*4) | A property data array. The meaning of PropDesc array elements varies depending on the property type. |

For details on properties and the meaning of array elements that can be set in the data list, see the Properties section in SDK manual.

### 25.1.19 GetPropertyElementCount(PropertyID as UInt32) as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries property description and returns the number of items for a property.

### 25.1.20 GetPropertySize(PropertyID as UInt32, Param as Int32 = 0) as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the byte size and data type of a designated property from a camera object or image object.
**Notes:** PropertyID: Designate the property ID.
Param: Additional information of the property. Used to designate multiple additional items of information, if the property has such information that can be set or retrieved. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData.

Returns the property size. The data type and value returned varies depending on the property ID. See "Property Details" for further information in the SDK manual.
Lasterror is set.

### 25.1.21 SetProgress(progress as EdsProgressMBS, options as Integer)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets progress events.
**Notes:** An event is received as notification of progress during processing that takes a relatively long time, such as downloading files from a remote camera. If you register the callback function, the EDSDK calls the callback function during execution or on completion of the following APIs. This timing can be used in updating on-screen progress bars, for example.

### 25.1.22 SetPropertyData(PropertyID as UInt32, Param as Int32, data as Memoryblock)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically taken from data.size by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.23 SetPropertyDataBool(PropertyID as UInt32, Param as Int32, data as Boolean)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.24 SetPropertyDataInt32(PropertyID as UInt32, Param as Int32, data as Int32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.25 SetPropertyDataInt32Array(PropertyID as UInt32, Param as Int32, data() as Integer)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.26 SetPropertyDataPoint(PropertyID as UInt32, Param as Int32, data as EdsPointMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.27 SetPropertyDataRational(PropertyID as UInt32, Param as Int32, data as EdsRationalMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.28 SetPropertyDataRationalArray(PropertyID as UInt32, Param as Int32, data() as EdsRationalMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.29 SetPropertyDataRect(PropertyID as UInt32, Param as Int32, data as EdsRectMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.30 SetPropertyDataSize(PropertyID as UInt32, Param as Int32, data as EdsSizeMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.31 SetPropertyDataString(PropertyID as UInt32, Param as Int32, data as String)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.32 SetPropertyDataUInt32(PropertyID as UInt32, Param as Int32, data as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Example:**

```
// we set bit for redirecting output to PC, leave other bits as they are.
dim device as UInt32 = camera.GetPropertyDataUInt32(camera.kEdsPropID_Evf_OutputDevice)
if camera.lasterror = EDSModuleMBS.EDS_ERR_OK then

device = Bitwise.BitOr(device, EDSModuleMBS.kEdsEvfOutputDevice_PC)
camera.SetPropertyDataUInt32 camera.kEdsPropID_Evf_OutputDevice, 0, device
end if
```

**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.33 SetPropertyDataUInt32Array(PropertyID as UInt32, Param as Int32, data() as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can

be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.34 SetPropertyDataUInt8(PropertyID as UInt32, Param as Int32, data as UInt8)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets property data for the object.
**Notes:** PropertyID: Designate the property ID.
Param: Designate additional property information. Use additional property information if multiple items of information such as picture styles can be set or retrieved for a property. For descriptions of values that can be designated for each property, see the description of Param for GetPropertyData in the manual SDK.

Property size is automatically calculated by plugin and passed for you.
Lasterror is set.

Note: When you set properties of an image object (EdsImageRef), this API maintains the change internally.

### 25.1.35 Properties

### 25.1.36 DataRef as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The reference to stream data.
**Notes:** (Read only property)

### 25.1.37 Handle as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 25.1.38 Lasterror as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The last error code of last command.
**Notes:** See EDS_ERR_* constants in EDSModuleMBS.
(Read and Write property)

### 25.1.39 MemoryRef as Memoryblock

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The reference to stream data.
**Notes:** (Read only property)

### 25.1.40 Progress as EdsProgressMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Register a progress event.
**Notes:** (Read only property)

### 25.1.41 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kEdsPropID_AEBracket | &h0000040e | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_AEMode | &h00000400 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_AEModeSelect | &h00000436 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta New in 2.11 SDK. |
| kEdsPropID_AFMode | &h00000404 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Artist | &h00000418 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_AtCapture_Flag | &h80000000 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Av | &h00000405 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_AvailableShots | &h0000040a | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_BatteryLevel | &h00000008 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_BatteryQuality | &h00000010 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_BodyIDEx | &h00000015 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Bracket | &h0000040b | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_CFn | &h00000009 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ClickWBPoint | &h00000301 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ColorMatrix | &h00000113 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ColorSaturation | &h0000010a | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ColorSpace | &h0000010d | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ColorTemperature | &h00000107 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_ColorTone | &h0000010b | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Contrast | &h00000109 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Copyright | &h00000419 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_CurrentFolder | &h0000000d | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_CurrentStorage | &h0000000c | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_DateTime | &h00000006 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_DepthOfField | &h0000041b | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_DigitalExposure | &h00000105 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_DriveMode | &h00000401 | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_EFCompensation | &h0000041e | One of the proeperty constants. Please check the EDSDK API Programming Reference for deta |
| kEdsPropID_Evf_AFMode | &h0000050E | One of the proeperty constants. |

Data Type Constants

| Constant | Value | Description |
|---|---|---|
| kEdsDataType_Bool | 1 | Boolean |
| kEdsDataType_Bool_Array | 30 | Array of Boolean |
| kEdsDataType_ByteBlock | 14 | Bytes (use memoryblock) |
| kEdsDataType_Double | 13 | Double |
| kEdsDataType_Float | 12 | Float |
| kEdsDataType_FocusInfo | 101 | Focus info. Use EdsFocusInfoMBS. |
| kEdsDataType_Int16 | 4 | Int16 |
| kEdsDataType_Int16_Array | 32 | Array of Int16 |
| kEdsDataType_Int32 | 8 | Int32 |
| kEdsDataType_Int32_Array | 33 | Array of Int32 |
| kEdsDataType_Int64 | 10 | Int64 |
| kEdsDataType_Int8 | 3 | Int8 |
| kEdsDataType_Int8_Array | 31 | Array of Int8 |
| kEdsDataType_PictureStyleDesc | 102 | A Picture style description. Use EdsPictureStyleDescMBS. |
| kEdsDataType_Point | 21 | Point (use EdsPointMBS) |
| kEdsDataType_Rational | 20 | Rational value |
| kEdsDataType_Rational_Array | 37 | Array of rational numbers (Use EdsRationalMBS) |
| kEdsDataType_Rect | 22 | Rectangle (use EdsRectMBS) |
| kEdsDataType_String | 2 | String value |
| kEdsDataType_Time | 23 | Time (use EdsTimeMBS) |
| kEdsDataType_UInt16 | 7 | UInt16 |
| kEdsDataType_UInt16_Array | 35 | Array of UInt16 |
| kEdsDataType_UInt32 | 9 | UInt32 |
| kEdsDataType_UInt32_Array | 36 | Array of UInt32 |
| kEdsDataType_UInt64 | 11 | UInt64 |
| kEdsDataType_UInt8 | 6 | UInt8 |
| kEdsDataType_UInt8_Array | 34 | Array of UInt8 |
| kEdsDataType_Unknown | 0 | Unknown |

Progress Option Constants

| Constant | Value | Description |
|---|---|---|
| kEdsProgressOption_Done | 1 | Call a progress callback function when the progress reaches 100%. |
| kEdsProgressOption_NoReport | 0 | Do not call a progress callback function. |
| kEdsProgressOption_Periodically | 2 | Call a progress callback function periodically. |

## 25.2 class EdsCameraAddedHandlerMBS

### 25.2.1 class EdsCameraAddedHandlerMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class is to monitor for cameras being added.
**Notes:** Constructor registers callback for event and sets lasterror code.

### 25.2.2 Events

### 25.2.3 CameraAdded as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when a new camera is added.
**Notes:** Returns EDS_ERR_OK if successful. Otherwise, ensure the implementation returns an appropriate error code.

## 25.3 class EdsCameraListMBS

### 25.3.1 class EdsCameraListMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The object for a list of cameras.
**Notes:** This object represents an enumeration of the cameras remotely connected to the host PC by USB interface. This object can be used to select the camera to be controlled from among the cameras currently connected with EDSDK client application. This object can also be used when getting an EdsCameraMBS child object.
Subclass of the EdsBaseMBS class.

### 25.3.2 Methods

### 25.3.3 Child(index as UInt32) as EdsCameraMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets an indexed child object of the designated object.
**Notes:** Index is 0 based and range from 0 to ChildCount-1.
Lasterror is set.

## 25.4 class EdsCameraMBS

### 25.4.1 class EdsCameraMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This object represents a remotely connected camera.
**Notes:** This object is used to control the camera or to get an EdsVolumeMBS object when accessing the memory card, which is a child object of the camera.
Subclass of the EdsBaseMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr5

### 25.4.2 Methods

### 25.4.3 Child(index as UInt32) as EdsVolumeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets an indexed child object of the designated object.
**Notes:** Index is 0 based and range from 0 to ChildCount-1.
Lasterror is set.

### 25.4.4 CloseSession

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Closes a logical connection with a remote camera.
**Notes:** Lasterror is set.

### 25.4.5 DateTime as EdsTimeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query date and time values.
**Notes:** Calls GetPropertyData for you with kEdsPropID_DateTime.
Lasterror is set.

### 25.4.6 DeviceInfo as EdsDeviceInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets device information, such as the device name.
**Notes:** Because device information of remote cameras is stored on the host computer, you can use this API before the camera object initiates communication (that is, before a session is opened).
Lasterror is set.
Returns nil on any error.

### 25.4.7 DownloadEvfImage(image as EdsEvfImageMBS, OldSDK as boolean)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Downloads the live view image data set for a camera currently in live view mode.
**Notes:** Live view can be started by using the property ID:kEdsPropertyID_Evf_OutputDevice and data:EdsOutputDevice_PC to call SetPropertyData.
In addition to image data, information such as zoom, focus position, and histogram data is included in the image data set. Image data is saved in a stream maintained by EdsEvfImageMBS. GetPropertyData can be used to get information such as the zoom, focus position, etc.
Although the information of the zoom and focus position can be obtained from EdsEvfImageMBS, settings are applied to EdsCameraMBS.
Lasterror is set.

If you use 2.11 SDK, please pass OldSDK=false. If you use 2.10 SDK, please pass OldSDK=true. The two SDKs handle this function differently, so you need to tell the plugin which SDK you use. Using wrong value will liekly lead to a crash.

### 25.4.8 FocusInfo as EdsFocusInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query focus information.
**Notes:** Lasterror is set.
This queries kEdsPropID_FocusInfo with GetPropertyData for you and returns an EdsFocusInfoMBS object.

### 25.4.9 OpenSession

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Establishes a logical connection with a remote camera.
**Notes:** Use this API after getting the camera's EdsCamera object.

Lasterror is set.

### 25.4.10 Parent as EdsCameraListMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the parent object of the designated object.
**Notes:** Lasterror is set.

### 25.4.11 PictureStyleDesc as EdsPictureStyleDescMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query Picture Style Description information.
**Notes:** Calls GetPropertyData for you with kEdsPropID_PictureStyleDesc and returns object with values.
Lasterror is set.

### 25.4.12 SendCommand(command as Integer, param as Integer = 0)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sends a command such as "Shoot" to a remote camera.
**Example:**

```
dim camera as EdsCameraMBS // your camera object

camera.SendCommand camera.kEdsCameraCommand_TakePicture
```

**Notes:** Command: The command ID to send to the object. See kEdsCameraCommand* constants.
Param: Specify the x-coordinate in the upper 16 bit and the y-coordinate in the lower 16 bit for kEdsCameraCommand_DoClickWBEvf only.
Lasterror is set.

Please check SDK manual for details.

### 25.4.13 SendStatusCommand(command as Integer, param as Integer = 0)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the remote camera state or mode.
**Notes:** command: Designate the particular mode ID to set the camera to. See kEdsCameraStatusCommand* constants.
Param: Currently unused. Designate 0.
Lasterror is set.

Please check SDK manual for details.

### 25.4.14 SetCapacity(numberOfFreeClusters as Integer, bytesPerSector as Integer, reset as boolean)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the remaining HDD capacity on the host computer(excluding the portion from image transfer),as calculated by subtracting the portion from the previous time.
**Notes:** Set a reset flag initially and designate the cluster length and number of free clusters.
Some cameras can display the number of shots left on the camera based on the available disk capacity of the host computer.
For these cameras, after the storage destination is set to the computer,use this API to notify the camera of the available disk capacity of the host computer.

Lasterror is set.

### 25.4.15 Constants

Camera Command Constants

| Constant | Value | Description |
|---|---|---|
| kEdsCameraCommand_BulbEnd | 3 | Lock the UI before bulb shooting. An exposure time event is generated at th teEvent_BulbExposureTime) |
| kEdsCameraCommand_BulbStart | 2 | Starts bulb shooting/ Ends bulb shooting |
| kEdsCameraCommand_DoClickWBEvf | &h00000104 | Adjusts the white balance of the live view This command is supported only in live vi |
| kEdsCameraCommand_DoEvfAf | &h00000102 | Controls auto focus in live view mode. This command is supported by the EOS cameras, and only in live view mode. |
| kEdsCameraCommand_DriveLensEvf | &h00000103 | Drives the lens and adjusts focus This command is supported only in live vi |
| kEdsCameraCommand_EvfAf_OFF | 0 | |
| kEdsCameraCommand_EvfAf_ON | 1 | |
| kEdsCameraCommand_ExtendShutDownTimer | 1 | Requests to extend the time for the auto s |
| kEdsCameraCommand_PressShutterButton | 4 | Controls shutter button operations. This command is supproted by the EOS cameras. |
| kEdsCameraCommand_ShutterButton_Completely | 3 | |
| kEdsCameraCommand_ShutterButton_Completely_NonAF | &h00010003 | |
| kEdsCameraCommand_ShutterButton_Halfway | 1 | |
| kEdsCameraCommand_ShutterButton_Halfway_NonAF | &h00010001 | |
| kEdsCameraCommand_ShutterButton_OFF | 0 | |
| kEdsCameraCommand_TakePicture | 0 | Requests the camera to shoot. |

Camera Status Command Constants

| Constant | Value | Description |
|---|---|---|
| kEdsCameraStatusCommand_EnterDirectTransfer | 2 | |
| kEdsCameraStatusCommand_ExitDirectTransfer | 3 | |
| kEdsCameraStatusCommand_UILock | 0 | |
| kEdsCameraStatusCommand_UIUnLock | 1 | |

Progress Option Constants

| Constant | Value | Description |
|---|---|---|
| kEdsProgressOption_Done | 1 | Call a progress callback function when the progress reaches 100%. |
| kEdsProgressOption_NoReport | 0 | Do not call a progress callback function. |
| kEdsProgressOption_Periodically | 2 | Call a progress callback function periodically. |

## 25.5 class EdsCameraStateEventHandlerMBS

### 25.5.1 class EdsCameraStateEventHandlerMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class to receive camera state events.

### 25.5.2 Methods

### 25.5.3 Add(camera as EdsCameraMBS, CameraStateEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Designate event for receiving events related to camera object states.
**Notes:** Lasterror is set.

### 25.5.4 Constructor

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates an event handler object.
**Notes:** You can later add objects to it.
See also:

- 25.5.5 Constructor(camera as EdsCameraMBS, CameraStateEvent as UInt32) 4528

### 25.5.5 Constructor(camera as EdsCameraMBS, CameraStateEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Designate event for receiving events related to camera object states.
**Notes:** Lasterror is set.
See also:

- 25.5.4 Constructor 4528

### 25.5.6 Events

### 25.5.7 StateChanged(StateEvent as UInt32, EventData as UInt32) as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when the state changed.
**Notes:** StateEvent: Indicate the event type supplemented. Designate one of the event types subject to supplementation, as designated by Constructor/Add. Events that occur can be determined based on the event type.

Returns EDS_ERR_OK if successful. In other cases, see the EDS Error Lists.

## 25.6 class EdsDeviceInfoMBS

### 25.6.1 class EdsDeviceInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for device information.

### 25.6.2 Properties

### 25.6.3 DeviceDescription as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The device name.
**Notes:** (Read and Write property)

### 25.6.4 deviceSubType as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The device subtype.
**Notes:** Canon PTP cameras: 1
Canon PTP-IP cameras: 2

If the camera involved in PTP communication is connected to a Windows computer on which WIA is installed, 0 is specified in DeviceSubType, representing standard Windows PTP.
(Read and Write property)

### 25.6.5 PortName as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The port name.
**Notes:** (Read and Write property)

### 25.6.6 reserved as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reserved for the future.
**Notes:** (Read and Write property)

## 25.7 class EdsDirectoryItemInfoMBS

### 25.7.1 class EdsDirectoryItemInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class represents directory item information for the memory card in the camera.

### 25.7.2 Properties

### 25.7.3 DateTime as UInt32

MBS Cameras Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The date and time value.
**Notes:** New in 2.11 SDK.
(Read and Write property)

### 25.7.4 FileName as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the directory name or file name if successful.
**Notes:** Example: "_MG_0060.JPG"
(Read and Write property)

### 25.7.5 Format as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the directory item type.
**Notes:** See kEdsImageType* constants.
(Read and Write property)

### 25.7.6 GroupID as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The group ID for this file.
**Notes:** A non-zero integer. The same group ID is assigned to files that belong to the same group, such as RAW+JPEG images or RAW+AVI images.

(Read and Write property)

### 25.7.7 IsFolder as Boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether this is a folder.
**Notes:** If a folder: True
If not a folder: False
(Read and Write property)

### 25.7.8 Option as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The option property.
**Notes:** An option when a direct transfer request is received (a kEdsObjectEvent_DirItemRequestTransferDT event). kEdsTransferOptionToDesktop is set when [ Wallpaper ] in the direct transfer is executed by means of camera operations.
Prohibit it under other timing conditions.
(Read and Write property)

### 25.7.9 Size as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The file size.
**Notes:** For folders, the file size is indicated as 0.
(Read and Write property)

### 25.7.10 Constants

Image Type constants.

| Constant | Value | Description |
|---|---|---|
| kEdsImageType_CR2 | 6 | CR2 |
| kEdsImageType_CRW | 2 | CRW |
| kEdsImageType_Jpeg | 1 | JPEG |
| kEdsImageType_RAW | 4 | RAW |
| kEdsImageType_Unknown | 0 | Unknown |

## 25.8 class EdsDirectoryItemMBS

### 25.8.1 class EdsDirectoryItemMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This object represents a file or folder on the camera.
**Notes:** When files are downloaded from the camera, each file to be downloaded is treated as one of these objects.
Subclass of the EdsBaseMBS class.

### 25.8.2 Methods

### 25.8.3 Child(index as UInt32) as EdsDirectoryItemMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets an indexed child object of the designated object.
**Notes:** Index is 0 based and range from 0 to ChildCount-1.
Lasterror is set.

### 25.8.4 DeleteDirectoryItem

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Deletes a camera folder or file.
**Notes:** If folders with subdirectories are designated, all files are deleted except protected files.

Don't use the object after you deleted it.
Lasterror is set.

### 25.8.5 DirectoryItemInfo as EdsDirectoryItemInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets information about the directory or file objects on the memory card (volume) in a remote camera.
**Notes:** Lasterror is set.
Returns nil on any error.

### 25.8.6 Download(ReadSize as UInt64, stream as EdsStreamMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Downloads a file on a remote camera (in the camera memory or on a memory card) to the host computer.
**Notes:** The downloaded file is sent directly to a file stream created in advance.
When dividing the file being retrieved, call this API repeatedly. Also in this case, make the data block size a multiple of 512 (bytes), excluding the final block.

ReadSize: Designate the size in bytes to download.
stream: Specifies the destination stream.

Lasterror is set.

### 25.8.7 DownloadCancel

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Must be executed when downloading of a directory item is canceled.
**Notes:** Calling this API makes the camera cancel file transmission. It also releases resources.
This operation need not be executed when using DownloadThumbnail.
Lasterror is set.
In applications that take locally released images on the camera and load them on host computer, if the application receives a file transfer request from the camera when the file is not needed (by means of kEdsObjectEvent_DirItemRequestTransfer or kEdsObjectEvent_DirItemRequestTransferDT), this API must be called to notify the camera that transmission has been canceled.
Normally, delete callback function registration at the moment an event is not needed.

### 25.8.8 DownloadComplete

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Must be called when downloading of directory items is complete.
**Notes:** Executing this API makes the camera recognize that file transmission is complete.
This operation need not be executed when using DownloadThumbnail.
Lasterror is set.

If transfer of a file that was divided is canceled, call DownloadCancel instead of this API to notify the camera that downloading of the directory item has been canceled.

### 25.8.9 DownloadThumbnail(stream as EdsStreamMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extracts and downloads thumbnail information from image files in a camera.
**Notes:** Thumbnail information in the camera's image files is downloaded to the host computer. Downloaded thumbnails are sent directly to a file stream created in advance.

stream: Designate the stream for saving extracted thumbnails.
Lasterror is set.

### 25.8.10 Parent as EdsDirectoryItemMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the parent object of the designated object.
**Notes:** Lasterror is set.

### 25.8.11 Properties

### 25.8.12 FileAttributes as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets attributes of files on a camera.
**Example:**

```
dim d as EdsDirectoryItemMBS // your directory item
dim a as Integer = d.FileAttributes
if bitwiseAnd(a, d.kEdsFileAttribute_ReadOnly)<>0 then
msgbox "Readonly."
end if
```

**Notes:** Returns the file attributes.
As for the file attributes, OR values of the value defined by kEdsFileAttribute* constants can be retrieved. Thus, when determining the file attributes, you must check if an attribute flag is set for target attributes. Use BitwiseAnd to check for different flags.
Lasterror is set.

If you assign value, this property changes attributes of files on a camera.
(Read and Write computed property)

### 25.8.13 Constants

File Attribute Constants

| Constant | Value | Description |
|---|---|---|
| kEdsFileAttribute_Archive | &h20 | Archive attribute |
| kEdsFileAttribute_Hidden | 2 | Hidden attribute |
| kEdsFileAttribute_Normal | 0 | A standard file |
| kEdsFileAttribute_ReadOnly | 1 | Read-only |
| kEdsFileAttribute_System | 4 | System attribute |

## 25.9 class EdsEvfImageMBS

### 25.9.1 class EdsEvfImageMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This object represents PC live view image data.
**Notes:** When using a camera model that supports live view, live view image data set can be downloaded from the camera. Information such as zoom and histogram data is included with image data.
Subclass of the EdsBaseMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr5

### 25.9.2 Methods

### 25.9.3 Constructor(stream as EdsStreamMBS, OldSDK as boolean = false)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates an object used to get the live view image data set.
**Notes:** Lasterror is set.
See EdsCreateEvfImageRef in the SDK documentation.

If you use 2.11 SDK, please pass OldSDK=false. If you use 2.10 SDK, please pass OldSDK=true. The two SDKs handle this function differently, so you need to tell the plugin which SDK you use. Using wrong value will liekly lead to a crash.

## 25.10 class EdsFocusInfoMBS

### 25.10.1 class EdsFocusInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class represents focus information.
**Notes:** It stores kEdsPropID_FocusInfo property data.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr1

### 25.10.2 Methods

### 25.10.3 FocusPoint(index as Integer) as EdsFocusPointMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The array of focus points.
**Notes:** Index from 0 to 127, but of course lower than PointNumber.

### 25.10.4 Properties

### 25.10.5 ExecuteMode as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The execute mode.
**Notes:** (Read and Write property)

### 25.10.6 ImageRect as EdsRectMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The rectangle of the image.
**Notes:** (Read and Write property)

### 25.10.7 PointNumber as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Number of frames.
**Notes:** (Read and Write property)

## 25.11 class EdsFocusPointMBS

### 25.11.1 class EdsFocusPointMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class represents the AF frame information of focus information.
**Notes:** It stores AF frame information of the kEdsPropID_FocusInfo property.

### 25.11.2 Properties

### 25.11.3 JustFocus as Boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the frame is just focus.
**Notes:** (Read and Write property)

### 25.11.4 Rect as EdsRectMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The rectangle of the frame.
**Notes:** (Read and Write property)

### 25.11.5 Reserved as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reserved.
**Notes:** (Read and Write property)

### 25.11.6 Selected as Boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the point is selected.
**Notes:** (Read and Write property)

### 25.11.7 Valid as Boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** True if the frame is valid.
**Notes:** (Read and Write property)

## 25.12 class EdsImageInfoMBS

### 25.12.1 class EdsImageInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class represents various information found in image data.

### 25.12.2 Properties

### 25.12.3 componentDepth as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Bits per sample.
**Notes:** Either 8 or 16.
Note: Image files may contain image data of mixed resolutions.
(Read and Write property)

### 25.12.4 effectiveRect as EdsRectMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The effective image rectangle.
**Notes:** This means the area excluding the black bands on the top and bottom of the thumbnail image.
(Read and Write property)

### 25.12.5 height as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image height in pixels.
**Notes:** (Read and Write property)

### 25.12.6 numOfComponents as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Number of color components in image.
**Notes:** (Read and Write property)

### 25.12.7 reserved1 as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reserved.
**Notes:** (Read and Write property)

### 25.12.8 reserved2 as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reserved.
**Notes:** (Read and Write property)

### 25.12.9 width as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image width in pixels.
**Notes:** (Read and Write property)

## 25.13 class EdsImageMBS

### 25.13.1 class EdsImageMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This object represents image data.
**Notes:** This data is obtained from image files. This object is used to retrieve and control information included with an image such as thumbnails and parameters.
Subclass of the EdsBaseMBS class.

### 25.13.2 Methods

### 25.13.3 CacheImage(UseCache as boolean)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Switches a setting on and off for creation of an image cache in the SDK for a designated image object during extraction (processing) of the image data.
**Notes:** Creating the cache increases the processing speed, starting from the second time.
UseCache: Image Cache on/off.
Lasterror is set.

### 25.13.4 Constructor(stream as EdsImageMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates an image object from an image file.
**Notes:** Without modification, stream objects cannot be worked with as images. Thus, when extracting images from image files, you must use this API to create image objects.
The image object created this way can be used to get image information (such as the height and width, number of color components, and resolution), thumbnail image data, and the image data itself.
Lasterror is set.

### 25.13.5 DateTime as EdsTimeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query date and time values.
**Notes:** Calls GetPropertyData for you with kEdsPropID_DateTime.
Lasterror is set.

### 25.13.6 FocusInfo as EdsFocusInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query focus information.
**Notes:** Lasterror is set.
This queries kEdsPropID_FocusInfo with GetPropertyData for you and returns an EdsFocusInfoMBS object.

### 25.13.7 Image(ImageSource as Integer, TargetImageType as Integer, Source as EdsRectMBS, Dest as EdsSizeMBS, DestStream as EdsStreamMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets designated image data from an image file, in the form of a designated rectangle.
**Notes:** Returns uncompressed results for JPEG compressed images and processed results in the designated pixel order (RGB, Top-down BGR, and so on) for RAW images. Additionally, by designating the input/output rectangle, it is possible to get reduced, enlarged, or partial images. However, because images corresponding to the designated output rectangle are always returned by the SDK, the SDK does not take the aspect ratio into account. To maintain the aspect ratio, you must keep the aspect ratio in mind when designating the rectangle.
Lasterror is set.

ImageSource: Designate the type of image data to get from the image file (thumbnail, preview, and so on). Designate values as defined in kEdsImageSrc* constants.
TargetImageType: Designate the output image type. Because the output format of EdsGetImage may only be RGB, only kEdsTargetImageType_RGB or kEdsTargetImageType_RGB16 can be designated.

However, image types exceeding the resolution of ImageSource cannot be designated.
Example: Suppose the source image resolution (componentDepth) retrieved by means of ImageInfo() is 8 bits
->The resolution that can be retrieved by means of Image () is also 8 bits
->Thus, only kEdsTargetImageType_RGB is available.
Source: Designate the coordinates and size of the rectangle to be retrieved (processed) from the source image.
Dest: Designate the rectangle size for output.
DestStream: Designate the memory or file stream for output of the image.

Lasterror is set.

- To maintain the aspect ratio, you must keep the aspect ratio in mind when designating a rectangle.
- In calculating the data size of the output file, the original image data resolution is not used.

Instead, the resolution of the image type designated by inImageType is used. For example, the calculation

for kEdsTargetImageType_RGB is 3 (R, G, and B) x 8 (resolution) x width x height √ 8 (bytes). Similarly, kEdsTargetImageType_RGB16 is calculated by 3 x 16 x width x height √ 8 (bytes).

### 25.13.8 ImageInfo(ImageSource as Integer) as EdsImageInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets image information from a designated image object.
**Notes:** Here, image information means the image width and height, number of color components, resolution, and effective image area.
Lasterror is set.

### 25.13.9 PictureStyleDesc as EdsPictureStyleDescMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Convenience function to query Picture Style Description information.
**Notes:** Calls GetPropertyData for you with kEdsPropID_PictureStyleDesc and returns object with values.
Lasterror is set.

### 25.13.10 ReflectImageProperty

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Incorporates image object property changes (effected by means of EdsSetPropertyData) in the stream.
**Notes:** Lasterror is set.

### 25.13.11 SaveImage(TargetImageType as Integer, DestStream as EdsStreamMBS, JPEGQuality as Integer = 0, iccProfileStream as EdsStreamMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Saves as a designated image type after RAW processing.
**Notes:** TargetImageType: Designate the image type to produce. Designate the following image types. See kEdsTargetImageType* constants.
JPEGQuality: Image quality for JPEG compression
iccProfileStream: ICC profile stream.

Lasterror is set.

### 25.13.12 Constants

Image Source Constants

| Constant | Value | Description |
|---|---|---|
| kEdsImageSrc_FullView | 0 | The image itself (a full-sized image) |
| kEdsImageSrc_Preview | 2 | A preview image |
| kEdsImageSrc_RAWFullView | 4 | A RAW full-sized image |
| kEdsImageSrc_RAWThumbnail | 3 | A RAW thumbnail image |
| kEdsImageSrc_Thumbnail | 1 | A thumbnail image |

Image Target Type Constants

| Constant | Value | Description |
|---|---|---|
| kEdsTargetImageType_DIB | 11 | Device Independent Bitmap |
| kEdsTargetImageType_JPEG | 1 | JPEG |
| kEdsTargetImageType_RGB | 9 | 8-bit RGB, chunky format |
| kEdsTargetImageType_RGB16 | 10 | 16-bit RGB, chunky format |
| kEdsTargetImageType_TIFF | 7 | 8-bit TIFF |
| kEdsTargetImageType_TIFF16 | 8 | 16-bit TIFF |
| kEdsTargetImageType_Unknown | 0 | Folder, or unknown image type |

## 25.14 module EDSModuleMBS

### 25.14.1 module EDSModuleMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The main module for the EDS SDK.
**Notes:** Please get a copy of the SDK with the manual, so you can lookup some details.
The documentation coming with the plugin shows the classes and some specifics for Xojo, but not all the details.

Typically SDK functions return a EdsError value. The plugin gives you that value by lasterror properties.

### 25.14.2 Methods

### 25.14.3 GetCameraList as EdsCameraListMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets camera list objects.
**Notes:** Lasterror is set.
Returns the camera list object or nil.

### 25.14.4 GetEvent

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This function acquires an event.
**Notes:** In console application, please call this function regularly to acquire the event from a camera.
Lasterror is set.

### 25.14.5 Initialize

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Initializes the libraries.
**Notes:** When using the EDSDK libraries, you must call this API once before using EDSDK APIs.
Lasterror is set.

### 25.14.6 Lasterror as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The last error code of any EDS function in all the classes.

### 25.14.7 LoadLibrary(file as folderitem, IsVersion2 as Boolean) as boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the SDK.
**Example:**

```
dim file as FolderItem

// find DLL in application folder
if TargetWin32 then
file = GetFolderItem("EDSDK.dll")
elseif TargetMacOS then
// find Framework in inside frameworks folder in app bundle
dim frameworks as FolderItem = app.ExecutableFile.Parent.parent.Child("Frameworks")

file = frameworks.Child("EDSDK.framework")
else
MsgBox "not supported."
end if

// load framework or DLL
if EDSModuleMBS.LoadLibrary(file) then
// continue
end if
```

**Notes:** Pass folderitem for framework on Mac or DLL on Windows.
Returns true on success.
After loading, you need to call Initialize method.

If you use 2.x SDK, please set IsVersion2 to true.
For 3.x SDK, please set IsVersion2 to false.
The 3.x SDK uses 64-bit integer, while the older one uses 32-bit integers.
Using wrong switch, you get wrong numbers.
See also:

- 25.14.8 LoadLibrary(path as string, IsVersion2 as Boolean) as boolean 

### 25.14.8 LoadLibrary(path as string, IsVersion2 as Boolean) as boolean

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the SDK.
**Notes:** Pass path for framework on Mac or DLL on Windows.
Returns true on success.
After loading, you need to call Initialize method.

If you use 2.x SDK, please set IsVersion2 to true.
For 3.x SDK, please set IsVersion2 to false.
The 3.x SDK uses 64-bit integer, while the older one uses 32-bit integers.
Using wrong switch, you get wrong numbers.
See also:

- 25.14.7 LoadLibrary(file as folderitem, IsVersion2 as Boolean) as boolean 4550

### 25.14.9 Terminate

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Terminates use of the libraries.
**Notes:** Calling this function releases all resources allocated by the libraries.
Lasterror is set.

### 25.14.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| EDS_CMP_ID_CLIENT_COMPONENTID | &h01000000 | One of the ED-SDK Base Component IDs. |
| EDS_CMP_ID_HLSDK_COMPONENTID | &h03000000 | One of the ED-SDK Base Component IDs. |
| EDS_CMP_ID_LLSDK_COMPONENTID | &h02000000 | One of the ED-SDK Base Component IDs. |
| EDS_MAX_NAME | 256 | The maximum file name length is limited to EDS_MAX_ |
| EDS_TRANSFER_BLOCK_SIZE | 512 | The transfer block size. |
| kEdsETTL2ModeAverage | 1 | One of the ETTL2 Mode evaluative constants. Average |
| kEdsETTL2ModeEvaluative | 0 | One of the ETTL2 Mode evaluative constants. Evaluative |
| kEdsPropertyEvent_All | &h00000100 | One of the property event constants. One of the state events for EdsPropertyEventHandlerMBS EDSDK API Programming Reference for details. |
| kEdsPropertyEvent_PropertyChanged | &h00000101 | One of the property event constants. One of the state events for EdsPropertyEventHandlerMBS EDSDK API Programming Reference for details. |
| kEdsPropertyEvent_PropertyDescChanged | &h00000102 | One of the property event constants. One of the state events for EdsPropertyEventHandlerMBS EDSDK API Programming Reference for details. |
| kEdsStateEvent_AfResult | &h00000309 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_All | &h00000300 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_BulbExposureTime | &h00000310 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_CaptureError | &h00000305 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_InternalError | &h00000306 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_JobStatusChanged | &h00000302 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_Shutdown | &h00000301 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_ShutDownTimerUpdate | &h00000304 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |
| kEdsStateEvent_WillSoonShutDown | &h00000303 | One of the state event constants. One of the state events for EdsCameraStateEventHandle check EDSDK API Programming Reference for details. |

Image Quality Constants

| Constant | Value | Description |
|---|---|---|
| EdsImageQuality_CR | &h0063ff0f | CRAW |
| EdsImageQuality_CRLJ | &h00630010 | CRAW + Jpeg Large |
| EdsImageQuality_CRLJF | &h00630013 | CRAW + Jpeg Large Fine |
| EdsImageQuality_CRLJN | &h00630012 | CRAW + Jpeg Large Normal |
| EdsImageQuality_CRM1J | &h00630510 | CRAW + Jpeg Middle1 |
| EdsImageQuality_CRM1JF | &h00630513 | CRAW + Jpeg Middle1 Fine |
| EdsImageQuality_CRM1JN | &h00630512 | CRAW + Jpeg Middle1 Normal |
| EdsImageQuality_CRM2J | &h00630610 | CRAW + Jpeg Middle2 |
| EdsImageQuality_CRM2JF | &h00630613 | CRAW + Jpeg Middle2 Fine |
| EdsImageQuality_CRM2JN | &h00630612 | CRAW + Jpeg Middle2 Normal |
| EdsImageQuality_CRMJF | &h00630113 | CRAW + Jpeg Middle Fine |
| EdsImageQuality_CRMJN | &h00630112 | CRAW + Jpeg Middle Normal |
| EdsImageQuality_CRS1JF | &h00630E13 | CRAW + Jpeg Small1 Fine |
| EdsImageQuality_CRS1JN | &h00630E12 | CRAW + Jpeg Small1 Normal |
| EdsImageQuality_CRS2JF | &h00630F13 | CRAW + Jpeg Small2 Fine |
| EdsImageQuality_CRS3JF | &h00631013 | CRAW + Jpeg Small3 Fine |
| EdsImageQuality_CRSJ | &h00630210 | CRAW + Jpeg Small |
| EdsImageQuality_CRSJF | &h00630213 | CRAW + Jpeg Small Fine |
| EdsImageQuality_CRSJN | &h00630212 | CRAW + Jpeg Small Normal |
| EdsImageQuality_LJ | &h0010ff0f | Jpeg Large |
| EdsImageQuality_LJF | &h0013ff0f | Jpeg Large Fine |
| EdsImageQuality_LJN | &h0012ff0f | Jpeg Large Normal |
| EdsImageQuality_LR | &h0064ff0f | RAW |
| EdsImageQuality_LRLJ | &h00640010 | RAW + Jpeg Large |
| EdsImageQuality_LRLJF | &h00640013 | RAW + Jpeg Large Fine |
| EdsImageQuality_LRLJN | &h00640012 | RAW + Jpeg Large Normal |
| EdsImageQuality_LRM1J | &h00640510 | RAW + Jpeg Middle1 |
| EdsImageQuality_LRM2J | &h00640610 | RAW + Jpeg Middle2 |
| EdsImageQuality_LRMJF | &h00640113 | RAW + Jpeg Middle Fine |
| EdsImageQuality_LRMJN | &h00640112 | RAW + Jpeg Middle Normal |
| EdsImageQuality_LRS1JF | &h00640E13 | RAW + Jpeg Small1 Fine |
| EdsImageQuality_LRS1JN | &h00640E12 | RAW + Jpeg Small1 Normal |
| EdsImageQuality_LRS2JF | &h00640F13 | RAW + Jpeg Small2 |
| EdsImageQuality_LRS3JF | &h00641013 | RAW + Jpeg Small3 |
| EdsImageQuality_LRSJ | &h00640210 | RAW + Jpeg Small |
| EdsImageQuality_LRSJF | &h00640213 | RAW + Jpeg Small Fine |
| EdsImageQuality_LRSJN | &h00640212 | RAW + Jpeg Small Normal |
| EdsImageQuality_M1J | &h0510ff0f | Jpeg Middle1 |
| EdsImageQuality_M2J | &h0610ff0f | Jpeg Middle2 |
| EdsImageQuality_MJF | &h0113ff0f | Jpeg Middle Fine |
| EdsImageQuality_MJN | &h0112ff0f | Jpeg Middle Normal |
| EdsImageQuality_MR | &h0164ff0f | MRAW(SRAW1) |
| EdsImageQuality_MRLJ | &h01640010 | MRAW(SRAW1) + Jpeg Large |
| EdsImageQuality_MRLJF | &h01640013 | MRAW(SRAW1) + Jpeg Large Fine |
| EdsImageQuality_MRLJN | &h01640012 | MRAW(SRAW1) + Jpeg Large Normal |
| EdsImageQuality_MRM1J | &h01640510 | MRAW(SRAW1) + Jpeg Middle1 |
| EdsImageQuality_MRM2J | &h01640610 | MRAW(SRAW1) + Jpeg Middle2 |
| EdsImageQuality_MRMJF | &h01640113 | MRAW(SRAW1) + Jpeg Middle Fine |
| EdsImageQuality_MRMJN | &h01640112 | MRAW(SRAW1) + Jpeg Middle Normal |
| EdsImageQuality_MRS1JF | &h01640E13 | MRAW(SRAW1) + Jpeg Small1 Fine |
| EdsImageQuality_MRS1JN | &h01640E12 | MRAW(SRAW1) + Jpeg Small1 Normal |
| EdsImageQuality_MRS2JF | &h01640F13 | MRAW(SRAW1) + Jpeg Small2 |
| EdsImageQuality_MRS3JF | &h01641013 | MRAW(SRAW1) + Jpeg Small3 |
| EdsImageQuality_MRSJ | &h01640210 | MRAW(SRAW1) + Jpeg Small |
| EdsImageQuality_MRSJF | &h01640213 | MRAW(SRAW1) + Jpeg Small Fine |
| EdsImageQuality_MRSJN | &h01640212 | MRAW(SRAW1) + Jpeg Small Normal |
| EdsImageQuality_S1JF | &h0E13ff0f | Jpeg Small1 Fine |
| EdsImageQuality_S1JN | &h0E12ff0f | Jpeg Small1 Normal |

Error Code Masks Constants

| Constant | Value | Description |
|---|---|---|
| EDS_COMPONENTID_MASK | &h7F000000 | |
| EDS_ERRORID_MASK | &h0000FFFF | |
| EDS_ISSPECIFIC_MASK | &h80000000 | |
| EDS_RESERVED_MASK | &h00FF0000 | |

Error Constants

| Constant | Value | Description |
|---|---|---|
| EDS_ERR_CANNOT_MAKE_OBJECT | &h0000A104 | |
| EDS_ERR_CAPTURE_ALREADY_TERMINATED | &h00002018 | |
| EDS_ERR_COMM_BUFFER_FULL | &h000000C3 | |
| EDS_ERR_COMM_DEVICE_INCOMPATIBLE | &h000000C2 | |
| EDS_ERR_COMM_DISCONNECTED | &h000000C1 | |
| EDS_ERR_COMM_PORT_IS_IN_USE | &h000000C0 | |
| EDS_ERR_COMM_USB_BUS_ERR | &h000000C4 | |
| EDS_ERR_DEVICEPROP_NOT_SUPPORTED | &h0000200A | |
| EDS_ERR_DEVICE_BUSY | &h00000081 | |
| EDS_ERR_DEVICE_CF_GATE_CHANGED | &h00000089 | |
| EDS_ERR_DEVICE_DIAL_CHANGED | &h0000008A | |
| EDS_ERR_DEVICE_DISK_ERROR | &h00000088 | |
| EDS_ERR_DEVICE_EMERGENCY | &h00000083 | |
| EDS_ERR_DEVICE_INTERNAL_ERROR | &h00000085 | |
| EDS_ERR_DEVICE_INVALID | &h00000082 | |
| EDS_ERR_DEVICE_INVALID_PARAMETER | &h00000086 | |
| EDS_ERR_DEVICE_MEMORY_FULL | &h00000084 | |
| EDS_ERR_DEVICE_NOT_FOUND | &h00000080 | |
| EDS_ERR_DEVICE_NOT_INSTALLED | &h0000008B | |
| EDS_ERR_DEVICE_NOT_LAUNCHED | &h000000E4 | |
| EDS_ERR_DEVICE_NOT_RELEASED | &h0000008D | |
| EDS_ERR_DEVICE_NO_DISK | &h00000087 | |
| EDS_ERR_DEVICE_STAY_AWAKE | &h0000008C | |
| EDS_ERR_DIR_ENTRY_EXISTS | &h00000043 | |
| EDS_ERR_DIR_ENTRY_NOT_FOUND | &h00000042 | |
| EDS_ERR_DIR_IO_ERROR | &h00000041 | |
| EDS_ERR_DIR_NOT_EMPTY | &h00000044 | |
| EDS_ERR_DIR_NOT_FOUND | &h00000040 | |
| EDS_ERR_ENUM_NA | &h000000F0 | |
| EDS_ERR_FILE_ALREADY_EXISTS | &h0000002B | |
| EDS_ERR_FILE_CLOSE_ERROR | &h00000024 | |
| EDS_ERR_FILE_DATA_CORRUPT | &h0000002D | |
| EDS_ERR_FILE_DISK_FULL_ERROR | &h0000002A | |
| EDS_ERR_FILE_FORMAT_UNRECOGNIZED | &h0000002C | |
| EDS_ERR_FILE_IO_ERROR | &h00000020 | |
| EDS_ERR_FILE_NAMING_NA | &h0000002E | |
| EDS_ERR_FILE_NOT_FOUND | &h00000022 | |
| EDS_ERR_FILE_OPEN_ERROR | &h00000023 | |
| EDS_ERR_FILE_PERMISSION_ERROR | &h00000029 | |
| EDS_ERR_FILE_READ_ERROR | &h00000027 | |
| EDS_ERR_FILE_SEEK_ERROR | &h00000025 | |
| EDS_ERR_FILE_TELL_ERROR | &h00000026 | |
| EDS_ERR_FILE_TOO_MANY_OPEN | &h00000021 | |
| EDS_ERR_FILE_WRITE_ERROR | &h00000028 | |
| EDS_ERR_HANDLE_NOT_FOUND | &h000000F2 | |
| EDS_ERR_INCOMPATIBLE_VERSION | 6 | |
| EDS_ERR_INCOMPLETE_TRANSFER | &h00002007 | |
| EDS_ERR_INTERNAL_ERROR | 2 | |
| EDS_ERR_INVALID_CODE_FORMAT | &h00002016 | |
| EDS_ERR_INVALID_DEVICEPROP_FORMAT | &h0000201B | |
| EDS_ERR_INVALID_DEVICEPROP_VALUE | &h0000201C | |
| EDS_ERR_INVALID_FN_CALL | &h000000F1 | |
| EDS_ERR_INVALID_FN_POINTER | &h00000065 | |
| EDS_ERR_INVALID_HANDLE | &h00000061 | |
| EDS_ERR_INVALID_ID | &h000000F3 | |
| EDS_ERR_INVALID_INDEX | &h00000063 | |
| EDS_ERR_INVALID_LENGTH | &h00000064 | |
| EDS_ERR_INVALID_OBJECTFORMATCODE | &h0000200B | |

AF Mode Constants

| Constant | Value | Description |
|---|---|---|
| Evf_AFMode_Live | 1 | Live Mode |
| Evf_AFMode_LiveFace | 2 | Live Face Mode |
| Evf_AFMode_Quick | 0 | Quick Mode |

Shooting mode Constants

| Constant | Value | Description |
|---|---|---|
| kEdsAEMode_Av | 2 | Aperture Priority AE |
| kEdsAEMode_A_DEP | 5 | Auto Depth-of-Field AE |
| kEdsAEMode_BacklitScenes | 24 | Backlit Scenes |
| kEdsAEMode_Bulb | 4 | Bulb |
| kEdsAEMode_CandlelightPortraits | 28 | Candlelight Portraits |
| kEdsAEMode_Children | 26 | Children |
| kEdsAEMode_Closeup | 14 | Close-Up |
| kEdsAEMode_CreativeAuto | 19 | Creative Auto |
| kEdsAEMode_CreativeFilter | 29 | Creative Filter |
| kEdsAEMode_Custom | 7 | Camera settings registered |
| kEdsAEMode_DEP | 6 | Depth-of-Field AE |
| kEdsAEMode_Fisheye | 33 | Fisheye |
| kEdsAEMode_FlashOff | 15 | Flash Off |
| kEdsAEMode_Food | 27 | Food |
| kEdsAEMode_Green | 9 | Auto |
| kEdsAEMode_GroupPhoto | 46 | Group Photo |
| kEdsAEMode_Hdr_Bold | 38 | HDR Bold |
| kEdsAEMode_Hdr_Embossed | 39 | HDR Embossed |
| kEdsAEMode_Hdr_Standard | 36 | HDR Standard |
| kEdsAEMode_Hdr_Vivid | 37 | HDR Vivid |
| kEdsAEMode_Landscape | 13 | Landscape |
| kEdsAEMode_Lock | 8 | Lock |
| kEdsAEMode_Manual | 3 | Manual Exposure |
| kEdsAEMode_Miniature | 35 | Miniature |
| kEdsAEMode_Movie | 20 | Not documented. |
| kEdsAEMode_Movie_DirectMono | 43 | Movie Direct Mono |
| kEdsAEMode_Movie_Fantasy | 40 | Movie Fantasy |
| kEdsAEMode_Movie_Memory | 42 | Movie Memory |
| kEdsAEMode_Movie_Mini | 44 | Movie Mini |
| kEdsAEMode_Movie_Old | 41 | Movie Old |
| kEdsAEMode_Myself | 50 | Myself |
| kEdsAEMode_NightPortrait | 10 | Night Scene Portrait |
| kEdsAEMode_NightScenes | 23 | NightScenes |
| kEdsAEMode_PanningAssist | 45 | PanningAssist |
| kEdsAEMode_PhotoInMovie | 21 | Photo In Movie (This value is valid for only Image.) |
| kEdsAEMode_Portrait | 12 | Portrait |
| kEdsAEMode_Program | 0 | Program AE |
| kEdsAEMode_RoughMonoChrome | 30 | RoughMonoChrome |
| kEdsAEMode_SceneIntelligentAuto | 22 | Auto<br>New in 2.11 SDK. |
| kEdsAEMode_SCN | 25 | SCN |
| kEdsAEMode_SmoothSkin | 52 | SmoothSkin |
| kEdsAEMode_SoftFocus | 31 | Soft Focus |
| kEdsAEMode_Sports | 11 | Sports |
| kEdsAEMode_ToyCamera | 32 | Toy Camera |
| kEdsAEMode_Tv | 1 | Shutter-Speed Priority AE |
| kEdsAEMode_Unknown | &hffffffff | Not valid/no settings changes |
| kEdsAEMode_WaterColor | 34 | Water Color |

Battery level Constants

| Constant | Value | Description |
|---|---|---|
| kEdsBatteryLevel2_AC | &hFFFFFFFF | AC |
| kEdsBatteryLevel2_BCLevel | 0 | BCLevel |
| kEdsBatteryLevel2_Empty | 0 | Empty |
| kEdsBatteryLevel2_Error | 0 | Error |
| kEdsBatteryLevel2_Half | 49 | Half |
| kEdsBatteryLevel2_Hi | 69 | Hi |
| kEdsBatteryLevel2_Low | 9 | Low |
| kEdsBatteryLevel2_Normal | 80 | Normal |
| kEdsBatteryLevel2_Quarter | 19 | Quarter |
| kEdsBatteryLevel2_Unknown | &hFFFFFFFE | Unknown |

Bracket Constants

| Constant | Value | Description |
|---|---|---|
| kEdsBracket_AEB | &h01 | AE bracket |
| kEdsBracket_FEB | &h08 | FE bracket |
| kEdsBracket_ISOB | &h02 | ISO bracket |
| kEdsBracket_Unknown | &hffffffff | Bracket off |
| kEdsBracket_WBB | &h04 | WB bracket |

Color Matrix Constants

| Constant | Value | Description |
|---|---|---|
| kEdsColorMatrix_1 | 1 | |
| kEdsColorMatrix_2 | 2 | |
| kEdsColorMatrix_3 | 3 | |
| kEdsColorMatrix_4 | 4 | |
| kEdsColorMatrix_5 | 5 | |
| kEdsColorMatrix_6 | 6 | |
| kEdsColorMatrix_7 | 7 | |
| kEdsColorMatrix_Custom | 0 | |

Colorspace Constants

| Constant | Value | Description |
|---|---|---|
| kEdsColorSpace_AdobeRGB | 2 | |
| kEdsColorSpace_sRGB | 1 | |
| kEdsColorSpace_Unknown | &hffffffff | |

Depth of Field Preview Constants

| Constant | Value | Description |
|---|---|---|
| kEdsEvfDepthOfFieldPreview_OFF | &h00000000 | Off |
| kEdsEvfDepthOfFieldPreview_ON | &h00000001 | On |

Drive Lens Constants

| Constant | Value | Description |
|---|---|---|
| kEdsEvfDriveLens_Far1 | &h00008001 | |
| kEdsEvfDriveLens_Far2 | &h00008002 | |
| kEdsEvfDriveLens_Far3 | &h00008003 | |
| kEdsEvfDriveLens_Near1 | &h00000001 | |
| kEdsEvfDriveLens_Near2 | &h00000002 | |
| kEdsEvfDriveLens_Near3 | &h00000003 | |

Output Device Constants

| Constant | Value | Description |
|---|---|---|
| kEdsEvfOutputDevice_PC | 2 | The live view image can be transferred to the PC.ÔøºÔøºÔøº |
| kEdsEvfOutputDevice_TFT | 1 | Live view is displayed on the camera's TFT. |

Zoom Constants

| Constant | Value | Description |
|---|---|---|
| kEdsEvfZoom_Fit | 1 | Entire screen |
| kEdsEvfZoom_x10 | 10 | 10 times. |
| kEdsEvfZoom_x5 | 5 | 5 times |

Filter Effect Constants

| Constant | Value | Description |
|---|---|---|
| kEdsFilterEffect_Green | 4 | Green |
| kEdsFilterEffect_None | 0 | No effect |
| kEdsFilterEffect_Orange | 2 | Orange |
| kEdsFilterEffect_Red | 3 | Red |
| kEdsFilterEffect_Yellow | 1 | Yellow |

Legacy Image Quality Constants

| Constant | Value | Description |
|---|---|---|
| kEdsImageQualityForLegacy_LJ | &h001f000f | Jpeg Large |
| kEdsImageQualityForLegacy_LJF | &h00130000 | Jpeg Large Fine |
| kEdsImageQualityForLegacy_LJN | &h00120000 | Jpeg Large Normal |
| kEdsImageQualityForLegacy_LR | &h00240000 | RAW |
| kEdsImageQualityForLegacy_LR2 | &h002f000f | RAW |
| kEdsImageQualityForLegacy_LR2LJ | &h002f001f | RAW + Jpeg Large |
| kEdsImageQualityForLegacy_LR2M1J | &h002f051f | RAW + Jpeg Middle1 |
| kEdsImageQualityForLegacy_LR2M2J | &h002f061f | RAW + Jpeg Middle2 |
| kEdsImageQualityForLegacy_LR2SJ | &h002f021f | RAW + Jpeg Small |
| kEdsImageQualityForLegacy_LRLJF | &h00240013 | RAW + Jpeg Large Fine |
| kEdsImageQualityForLegacy_LRLJN | &h00240012 | RAW + Jpeg Large Normal |
| kEdsImageQualityForLegacy_LRMJF | &h00240113 | RAW + Jpeg Middle Fine |
| kEdsImageQualityForLegacy_LRMJN | &h00240112 | RAW + Jpeg Middle Normal |
| kEdsImageQualityForLegacy_LRSJF | &h00240213 | RAW + Jpeg Small Fine |
| kEdsImageQualityForLegacy_LRSJN | &h00240212 | RAW + Jpeg Small Normal |
| kEdsImageQualityForLegacy_M1J | &h051f000f | Jpeg Middle1 |
| kEdsImageQualityForLegacy_M2J | &h061f000f | Jpeg Middle2 |
| kEdsImageQualityForLegacy_MJF | &h01130000 | Jpeg Middle Fine |
| kEdsImageQualityForLegacy_MJN | &h01120000 | Jpeg Middle Normal |
| kEdsImageQualityForLegacy_SJ | &h021f000f | Jpeg Small |
| kEdsImageQualityForLegacy_SJF | &h02130000 | Jpeg Small Fine |
| kEdsImageQualityForLegacy_SJN | &h02120000 | Jpeg Small Normal |
| kEdsImageQualityForLegacy_Unknown | &hffffffff | Unknown |

Image Size Constants

| Constant | Value | Description |
|---|---|---|
| kEdsImageSize_Large | 0 | Large |
| kEdsImageSize_Middle | 1 | Middle |
| kEdsImageSize_Middle1 | 5 | Middle |
| kEdsImageSize_Middle2 | 6 | Middle |
| kEdsImageSize_Small | 2 | Small |
| kEdsImageSize_Small1 | 14 | Small |
| kEdsImageSize_Small2 | 15 | Small |
| kEdsImageSize_Small3 | 16 | Small |
| kEdsImageSize_Unknown | &hffffffff | Unknown |

Object event Constants

| Constant | Value | Description |
|---|---|---|
| kEdsObjectEvent_All | &h00000200 | |
| kEdsObjectEvent_DirItemCancelTransferDT | &h0000020a | |
| kEdsObjectEvent_DirItemContentChanged | &h00000207 | |
| kEdsObjectEvent_DirItemCreated | &h00000204 | |
| kEdsObjectEvent_DirItemInfoChanged | &h00000206 | |
| kEdsObjectEvent_DirItemRemoved | &h00000205 | |
| kEdsObjectEvent_DirItemRequestTransfer | &h00000208 | |
| kEdsObjectEvent_DirItemRequestTransferDT | &h00000209 | |
| kEdsObjectEvent_FolderUpdateItems | &h00000203 | |
| kEdsObjectEvent_VolumeAdded | &h0000020c | |
| kEdsObjectEvent_VolumeInfoChanged | &h00000201 | |
| kEdsObjectEvent_VolumeRemoved | &h0000020d | |
| kEdsObjectEvent_VolumeUpdateItems | &h00000202 | |

Photo Effect Constants

| Constant | Value | Description |
|---|---|---|
| kEdsPhotoEffect_Monochrome | 5 | Black and white |
| kEdsPhotoEffect_Off | 0 | Off (Color Effect deactivated. Normal shooting.) |

Picture Style Constants

| Constant | Value | Description |
|---|---|---|
| kEdsPictureStyle_Auto | &h0087 | Auto |
| kEdsPictureStyle_Faithful | &h0085 | Faithful |
| kEdsPictureStyle_Landscape | &h0083 | Landscape |
| kEdsPictureStyle_Monochrome | &h0086 | Monochrome |
| kEdsPictureStyle_Neutral | &h0084 | Neutral |
| kEdsPictureStyle_PC1 | &h0041 | PC1 |
| kEdsPictureStyle_PC2 | &h0042 | PC2 |
| kEdsPictureStyle_PC3 | &h0043 | PC3 |
| kEdsPictureStyle_Portrait | &h0082 | Portrait |
| kEdsPictureStyle_Standard | &h0081 | Standard |
| kEdsPictureStyle_User1 | &h0021 | User defined |
| kEdsPictureStyle_User2 | &h0022 | User defined |
| kEdsPictureStyle_User3 | &h0023 | User defined |

SaveTo Constants

| Constant | Value | Description |
|---|---|---|
| kEdsSaveTo_Both | 3 | Save both ways (memory card of a remote camera and by downloading to a host computer) |
| kEdsSaveTo_Camera | 1 | Save on a memory card of a remote camera. |
| kEdsSaveTo_Host | 2 | Save by downloading to a host computer. |

Strobo Mode Constants

| Constant | Value | Description |
|---|---|---|
| kEdsStroboModeExternalATTL | 2 | |
| kEdsStroboModeExternalAuto | 4 | |
| kEdsStroboModeExternalETTL | 1 | |
| kEdsStroboModeExternalManual | 5 | |
| kEdsStroboModeExternalTTL | 3 | |
| kEdsStroboModeInternal | 0 | |
| kEdsStroboModeManual | 6 | |

Toning Effect Constants

| Constant | Value | Description |
|---|---|---|
| kEdsToningEffect_Blue | 2 | |
| kEdsToningEffect_Green | 4 | |
| kEdsToningEffect_None | 0 | |
| kEdsToningEffect_Purple | 3 | |
| kEdsToningEffect_Sepia | 1 | |

Transfer Option Constants

| Constant | Value | Description |
|---|---|---|
| kEdsTransferOption_ByDirectTransfer | 1 | |
| kEdsTransferOption_ByRelease | 2 | |
| kEdsTransferOption_ToDesktop | &h00000100 | |

White Balance Constants

| Constant | Value | Description |
|---|---|---|
| kEdsWhiteBalance_Auto | 0 | Auto |
| kEdsWhiteBalance_Click | -1 | Setting the white balance by clicking image coordinates. |
| kEdsWhiteBalance_Cloudy | 2 | Cloudy |
| kEdsWhiteBalance_ColorTemp | 9 | Color temperature |
| kEdsWhiteBalance_Daylight | 1 | Daylight |
| kEdsWhiteBalance_Fluorescent | 4 | Fluorescent |
| kEdsWhiteBalance_Pasted | -2 | White balance copied from another image. |
| kEdsWhiteBalance_PCSet1 | 10 | Custom white balance: PC-1 |
| kEdsWhiteBalance_PCSet2 | 11 | Custom white balance: PC-2 |
| kEdsWhiteBalance_PCSet3 | 12 | Custom white balance: PC-3 |
| kEdsWhiteBalance_PCSet4 | 20 | Custom white balance: PC-4 |
| kEdsWhiteBalance_PCSet5 | 21 | Custom white balance: PC-5 |
| kEdsWhiteBalance_Shade | 8 | Shade |
| kEdsWhiteBalance_Strobe | 5 | Flash |
| kEdsWhiteBalance_Tangsten | 3 | Tungsten |
| kEdsWhiteBalance_WhitePaper | 6 | Manual (set by shooting a white card or paper) |
| kEdsWhiteBalance_WhitePaper2 | 15 | Manual 2 |
| kEdsWhiteBalance_WhitePaper3 | 16 | Manual 3 |
| kEdsWhiteBalance_WhitePaper4 | 18 | Manual 4 |
| kEdsWhiteBalance_WhitePaper5 | 19 | Manual 5 |

## 25.15 class EdsObjectEventHandlerMBS

### 25.15.1 class EdsObjectEventHandlerMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class to watch for object events.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr7

### 25.15.2 Methods

### 25.15.3 Add(camera as EdsBaseMBS, ObjectEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Registers event handler to listen for object events.
**Notes:** Lasterror is set.

### 25.15.4 Constructor

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Constructor to create object event handler.
**Notes:** You can add objects to watch for events later.
See also:

- 25.15.5 Constructor(camera as EdsBaseMBS, ObjectEvent as UInt32) 4565

### 25.15.5 Constructor(camera as EdsBaseMBS, ObjectEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates object event handler and registers it to listen object events.
**Notes:** Lasterror is set.
See also:

- 25.15.4 Constructor 4565

### 25.15.6 Events

### 25.15.7 ObjectChanged(EventCode as Integer, obj as EdsBaseMBS) as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when an object changed.
**Notes:** obj: The target object.

Return EDS_ERR_OK if successful. In other cases, see the EDS Error Lists.

## 25.16 class EdsPictureStyleDescMBS

### 25.16.1 class EdsPictureStyleDescMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use this class when retrieving picture styles.

### 25.16.2 Properties

### 25.16.3 ColorTone as Int32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Color tone.
**Notes:** An integer from –4 to 4
(Read and Write property)

### 25.16.4 Contrast as Int32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Contrast setting.
**Notes:** An integer from –4 to 4.
(Read and Write property)

### 25.16.5 FilterEffect as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Monochrome filter effect
**Notes:** 0: None
1: Yellow
2: Orange
3: Red
4: Green
&hFFFFFFFF: Unknown
(Read and Write property)

### 25.16.6 Saturation as Int32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The saturation value.
**Notes:** An integer from –4 to 4
(Read and Write property)

### 25.16.7 sharpFineness as UInt32

MBS Cameras Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The sharp fineness value.
**Notes:** Only for 3.x SDK.
(Read and Write property)

### 25.16.8 Sharpness as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Sharpness value.
**Notes:** An integer from 0 to 7.
(Read and Write property)

### 25.16.9 sharpThreshold as UInt32

MBS Cameras Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The sharp threshold value.
**Notes:** Only for 3.x SDK.
(Read and Write property)

### 25.16.10 ToningEffect as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Monochrome tone.
**Notes:** 0: None
1: Sepia
2: Blue
3: Violet

(Read and Write property)

## 25.17 class EdsPointMBS

### 25.17.1 class EdsPointMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class is generally used to represent a set of coordinates.

### 25.17.2 Properties

### 25.17.3 X as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The x value.
**Notes:** (Read and Write property)

### 25.17.4 Y as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The y value.
**Notes:** (Read and Write property)

## 25.18 class EdsProgressMBS

### 25.18.1 class EdsProgressMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for progress event.
**Notes:** Please make subclass or put it on a window to receive events.

### 25.18.2 Events

### 25.18.3 Progress(Percent as UInt32, byref Cancel as boolean) as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The progress event.
**Notes:** Percent: Indicates the progress in a range of 0 - 100%.
Cancel: To cancel processing in progress, set this variable to true.

For example, if this argument is set to true during file transfer from the camera, the EDSDK notifies the camera that file transfer has been canceled, and transfer of those files is canceled.

Return EDS_ERR_OK (0) if everything is okay.

### 25.18.4 Constants

Progress Option Constants

| Constant | Value | Description |
|---|---|---|
| kEdsProgressOption_Done | 1 | Call a progress callback function when the progress reaches 100%. |
| kEdsProgressOption_NoReport | 0 | Do not call a progress callback function. |
| kEdsProgressOption_Periodically | 2 | Call a progress callback function periodically. |

## 25.19 class EdsPropertyEventHandlerMBS

### 25.19.1 class EdsPropertyEventHandlerMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a property event handler.

### 25.19.2 Methods

### 25.19.3 Add(camera as EdsCameraMBS, PropertyEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Registers this event handler to report property events for the given camera.
**Notes:** Lasterror is set.

### 25.19.4 Constructor

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Constructor to create property event handler.
**Notes:** You can add cameras to watch for properties later.
See also:

- 25.19.5 Constructor(camera as EdsCameraMBS, PropertyEvent as UInt32) 4572

### 25.19.5 Constructor(camera as EdsCameraMBS, PropertyEvent as UInt32)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Constructor to create property event handler and registers this event handler to report property events for the given camera.
**Notes:** Lasterror is set.
See also:

- 25.19.4 Constructor 4572

### 25.19.6 Events

### 25.19.7 PropertyChanged(PropertyEvent as UInt32, PropertyID as UInt32, Param as UInt32) as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event for receiving property-related camera events.
**Notes:** PropertyEvent: Indicate the event type supplemented. Designate one of the event types subject to supplementation, as designated by EdsSetPropertyEventHandler. Events that occur can be determined based on the event type.
PropertyID: Returns the property ID created by the event.
Param: Used to identify information created by the event for custom function (CF) properties or other properties that have multiple items of information.

Returns EDS_ERR_OK if successful. In other cases, see the EDS Error Lists.

## 25.20 class EdsRationalMBS

### 25.20.1 class EdsRationalMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class is generally used to represent fractions.
**Notes:** It is used with many properties such as kEdsPropID_Av and kEdsPropID_Tv.

### 25.20.2 Properties

### 25.20.3 denominator as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The denominator part of the fraction.
**Notes:** (Read and Write property)

### 25.20.4 numerator as Int32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The numerator part of the fraction.
**Notes:** (Read and Write property)

## 25.21 class EdsRectMBS

### 25.21.1 class EdsRectMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class is generally used to indicate the coordinates of a rectangle.

### 25.21.2 Properties

### 25.21.3 Height as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The height of the rectangle.
**Notes:** (Read and Write property)

### 25.21.4 Point as EdsPointMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the location of the rectangle.
**Notes:** (Read and Write property)

### 25.21.5 Size as EdsSizeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the size of the rectangle.
**Notes:** (Read and Write property)

### 25.21.6 Width as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the rectangle.
**Notes:** (Read and Write property)

### 25.21.7 X as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The x position.
**Notes:** (Read and Write property)

### 25.21.8 Y as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The y position.
**Notes:** (Read and Write property)

## 25.22 class EdsSizeMBS

### 25.22.1 class EdsSizeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class generally represents the width and height of a rectangle.

### 25.22.2 Properties

### 25.22.3 Height as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The height value.
**Notes:** (Read and Write property)

### 25.22.4 Width as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width value.
**Notes:** (Read and Write property)

## 25.23 class EdsStreamMBS

### 25.23.1 class EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a file/data stream.
**Notes:** Use it to specify a destination for downloading image data or as source for reading data.
Subclass of the EdsBaseMBS class.

### 25.23.2 Methods

### 25.23.3 Constructor(data as string)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream from the memory buffer you prepared.
**Notes:** Unlike the buffer size of streams created by means of EdsCreateMemoryStream, the buffer size you prepare for streams created this way does not expand.
Lasterror is set.
See also:


- 25.23.4 Constructor(Memory as Memoryblock, size as Int64 = -1, offset as Integer = 0) 4578
- 25.23.5 Constructor(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.6 Constructor(path as string, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.7 Constructor(size as UInt64) 4580


### 25.23.4 Constructor(Memory as Memoryblock, size as Int64 = -1, offset as Integer = 0)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream from the memory buffer you prepare.
**Notes:** Unlike the buffer size of streams created by means of CreateMemoryStream, the buffer size you prepare for streams created this way does not expand.
Lasterror is set.
See also:


- 25.23.3 Constructor(data as string) 4578
- 25.23.5 Constructor(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.6 Constructor(path as string, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.7 Constructor(size as UInt64) 4580

### 25.23.5 Constructor(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a new file on a host computer (or opens an existing file) and creates a file stream for access to the file.
**Notes:** If a new file is designated before executing this API, the file is actually created following the timing of writing by means of EdsWrite or the like with respect to an open stream.

path: Designate the file name of a new file or a file to open.
CreateDisposition: Designate how the file is handled (that is, its disposition) if it exists or does not exist. Designate a value defined in kEdsFileCreateDisposition*.
DesiredAccess: Pass kEdsAccess_Read, kEdsAccess_Write or kEdsAccess_ReadWrite.
Lasterror is set.
See also:


- 25.23.3 Constructor(data as string) 4578
- 25.23.4 Constructor(Memory as Memoryblock, size as Int64 = -1, offset as Integer = 0) 4578
- 25.23.6 Constructor(path as string, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.7 Constructor(size as UInt64) 4580


### 25.23.6 Constructor(path as string, CreateDisposition as Integer, DesiredAccess as Integer)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a new file on a host computer (or opens an existing file) and creates a file stream for access to the file.
**Notes:** If a new file is designated before executing this API, the file is actually created following the timing of writing by means of EdsWrite or the like with respect to an open stream.

path: Designate the file name of a new file or a file to open.
CreateDisposition: Designate how the file is handled (that is, its disposition) if it exists or does not exist. Designate a value defined in kEdsFileCreateDisposition*.
DesiredAccess: Pass kEdsAccess_Read, kEdsAccess_Write or kEdsAccess_ReadWrite.
Lasterror is set.
See also:


- 25.23.3 Constructor(data as string) 4578
- 25.23.4 Constructor(Memory as Memoryblock, size as Int64 = -1, offset as Integer = 0) 4578
- 25.23.5 Constructor(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.7 Constructor(size as UInt64) 4580

### 25.23.7 Constructor(size as UInt64)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream in the memory of a host computer.
**Notes:** In the case of writing in excess of the allocated buffer size, the memory is automatically extended.
Lasterror is set.
See also:


- 25.23.3 Constructor(data as string) 4578
- 25.23.4 Constructor(Memory as Memoryblock, size as Int64 = -1, offset as Integer = 0) 4578
- 25.23.5 Constructor(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) 4579
- 25.23.6 Constructor(path as string, CreateDisposition as Integer, DesiredAccess as Integer) 4579


### 25.23.8 CopyData(WriteSize as UInt64, outStream as EdsStreamMBS)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies data from the copy source stream to the copy destination stream.
**Notes:** The read or write position of the data to copy is determined from the current file read or write position of the respective stream.
After this API is executed, the read or write positions of the copy source and copy destination streams are moved an amount corresponding to WriteSize in the positive direction.
Lasterror is set.

### 25.23.9 CreateEvfImageRef as EdsEvfImageMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates an object used to get the live view image data set.
**Notes:** Lasterror is set.
See EdsCreateEvfImageRef in the SDK documentation.

### 25.23.10 CreateFileStream(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) as EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a new file on a host computer (or opens an existing file) and creates a file stream for access to the file.
**Notes:** If a new file is designated before executing this API, the file is actually created following the timing

of writing by means of EdsWrite or the like with respect to an open stream.

path: Designate the file name of a new file or a file to open.
CreateDisposition: Designate how the file is handled (that is, its disposition) if it exists or does not exist. Designate a value defined in kEdsFileCreateDisposition*.
DesiredAccess: Pass kEdsAccess_Read, kEdsAccess_Write or kEdsAccess_ReadWrite.
Lasterror is set.
See also:


- 25.23.11 CreateFileStream(path as string, CreateDisposition as Integer, DesiredAccess as Integer) as EdsStreamMBS 4581


### 25.23.11 CreateFileStream(path as string, CreateDisposition as Integer, DesiredAccess as Integer) as EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a new file on a host computer (or opens an existing file) and creates a file stream for access to the file.
**Notes:** If a new file is designated before executing this API, the file is actually created following the timing of writing by means of EdsWrite or the like with respect to an open stream.

path: Designate the file name of a new file or a file to open.
CreateDisposition: Designate how the file is handled (that is, its disposition) if it exists or does not exist. Designate a value defined in kEdsFileCreateDisposition*.
DesiredAccess: Pass kEdsAccess_Read, kEdsAccess_Write or kEdsAccess_ReadWrite.
Lasterror is set.
See also:


- 25.23.10 CreateFileStream(path as folderitem, CreateDisposition as Integer, DesiredAccess as Integer) as EdsStreamMBS 4580


### 25.23.12 CreateImage as EdsImageMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates an image object from an image file.
**Notes:** Without modification, stream objects cannot be worked with as images. Thus, when extracting images from image files, you must use this API to create image objects.
The image object created this way can be used to get image information (such as the height and width, number of color components, and resolution), thumbnail image data, and the image data itself.
Lasterror is set.

### 25.23.13 CreateMemoryStream(size as UInt32) as EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream in the memory of a host computer.
**Notes:** In the case of writing in excess of the allocated buffer size, the memory is automatically extended.
Lasterror is set.

### 25.23.14 CreateMemoryStreamFromMemoryblock(Memory as Memoryblock, size as Integer = -1, offset as Integer = 0) as EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream from the memory buffer you prepare.
**Notes:** Unlike the buffer size of streams created by means of CreateMemoryStream, the buffer size you prepare for streams created this way does not expand.
Lasterror is set.

### 25.23.15 CreateMemoryStreamFromstring(data as string) as EdsStreamMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a stream from the memory buffer you prepared.
**Notes:** Unlike the buffer size of streams created by means of CreateMemoryStream, the buffer size you prepare for streams created this way does not expand.
Lasterror is set.

### 25.23.16 Length as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the stream size.
**Notes:** Returns the number of bytes of the stream.
Lasterror is set.

### 25.23.17 Pointer as Ptr

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the pointer to the start address of memory managed by the memory stream.
**Notes:** As the EDSDK automatically resizes the buffer, the memory stream provides you with the same

access methods as for the file stream. If access is attempted that is excessive with regard to the buffer size for the stream, data before the required buffer size is allocated is copied internally, and new writing occurs. Thus, the buffer pointer might be switched on an unknown timing. Caution in use is therefore advised.

Lasterror is set.

### 25.23.18 Position as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the current read or write position of the stream (that is, the file position indicator).
**Notes:** Returns the current read or write position of the stream (that is, to the offset position from the beginning of the stream). (The beginning of the stream is 0.)
Lasterror is set.

The stream's initial read or write position is 0. If Write or Read is used to write or read from the stream, the indicator is moved an amount corresponding to that size in the positive direction.
When intentionally changing the read or write position of the stream, use Seek.

### 25.23.19 Read(size as UInt64) as string

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reads data with given maximum lenegth into the buffer, starting at the current read or write position of the stream.
**Notes:** The size of data actually read can be slower.
Lasterror is set.

### 25.23.20 Seek(Offset as Int64, origin as Integer)

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Moves the read or write position of the stream (that is, the file position indicator).
**Notes:** Offset: Designate the number of bytes to move the file position indicator.
Origin: Designate the origin for moving from the read or write position. Designate any of the following, as defined in constant kEdsSeek*.
Lasterror is set.

### 25.23.21 Write(Data as string) as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Writes data of a designated buffer to the current read or write position of the stream.
**Notes:** Lasterror is set.
Returns number of bytes written.

### 25.23.22 Constants

File Access Constants

| Constant | Value | Description |
|---|---|---|
| kEdsAccess_Error | -1 | Error |
| kEdsAccess_Read | 0 | Open a read-only stream. |
| kEdsAccess_ReadWrite | 2 | Allow reading and writing. |
| kEdsAccess_Write | 1 | Open a write-only stream. |

File Create Disposition Constants

| Constant | Value | Description |
|---|---|---|
| kEdsFileCreateDisposition_CreateAlways | 1 | Creates a new file. If the designated file already exists, that file and existing attributes is erased. |
| kEdsFileCreateDisposition_CreateNew | 0 | Creates a new file. An error occurs if the designated file already |
| kEdsFileCreateDisposition_OpenAlways | 3 | If the file exists, it is opened. If the designated file does not exist created. |
| kEdsFileCreateDisposition_OpenExisting | 2 | Opens a file. An error occurs if the designated file does not exist |
| kEdsFileCreateDisposition_TruncateExsisting | 4 | Opens a file and sets the file size to 0 bytes. |

Seek Origin Constants

| Constant | Value | Description |
|---|---|---|
| kEdsSeek_Begin | 1 | Moves the file position indicator from the beginning of the stream forward by inOffset bytes. |
| kEdsSeek_Cur | 0 | Moves the file position indicator from the current position in the stream forward by inOffset bytes. |
| kEdsSeek_End | 2 | Moves the file position indicator from the end of the stream by offset bytes. To move toward the beginning, designate a negative value. Positive values will move the indicator beyond the end of the file. |

## 25.24 class EdsTimeMBS

### 25.24.1 class EdsTimeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class represents the camera time or the shooting date of an image.
**Notes:** It is used to store kEdsPropID_DateTime property data.

### 25.24.2 Methods

### 25.24.3 Date as Date

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to return the same date as a Xojo date object.

### 25.24.4 Properties

### 25.24.5 Day as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The day value.
**Notes:** Value from 1 to 31.
(Read and Write property)

### 25.24.6 Hour as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The hour value.
**Notes:** Value from 0 to 23.
(Read and Write property)

### 25.24.7 Milliseconds as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The millisecond value.
**Notes:** (Read and Write property)

### 25.24.8 Minute as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The minute value.
**Notes:** Value from 0 to 59.
(Read and Write property)

### 25.24.9 Month as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The month value.
**Notes:** 1=January, 2=February, ...
Value from 1 to 12.
(Read and Write property)

### 25.24.10 Second as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The second value.
**Notes:** Value from 0 to 59.
(Read and Write property)

### 25.24.11 Year as UInt32

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The year value.
**Notes:** This is a 4 digit year number.
(Read and Write property)

## 25.25 class EdsVolumeInfoMBS

### 25.25.1 class EdsVolumeInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for volume information.

### 25.25.2 Properties

### 25.25.3 Access as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The access rights.
**Notes:** See kEdsAccess* constants.
(Read and Write property)

### 25.25.4 FreeSpaceInBytes as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Available capacity (in bytes)
**Notes:** (Read and Write property)

### 25.25.5 MaxCapacity as UInt64

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Maximum size (in bytes)
**Notes:** (Read and Write property)

### 25.25.6 StorageType as Integer

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The storage type.
**Notes:** See kEdsStorage* constants.
(Read and Write property)

### 25.25.7 VolumeLabel as String

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Volume name.
**Notes:** (Read and Write property)

### 25.25.8 Constants

Access Mode

| Constant | Value | Description |
|---|---|---|
| kEdsAccess_Error | -1 | |
| kEdsAccess_Read | 0 | |
| kEdsAccess_ReadWrite | 2 | |
| kEdsAccess_Write | 1 | |

Storage Type Constants

| Constant | Value | Description |
|---|---|---|
| kEdsStorageType_CF | 1 | Compact flash |
| kEdsStorageType_HD | 4 | HD card |
| kEdsStorageType_Non | 0 | No memory card inserted |
| kEdsStorageType_SD | 2 | SD card |

## 25.26 class EdsVolumeMBS

### 25.26.1 class EdsVolumeMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a volume on the camera's recording media
**Notes:** This object represents the memory card inside the camera. If the camera model allows two memory cards to be installed at once, the EdsVolumeRef object represents one memory card each. This object is used to get an EdsDirectoryItemRef object, which is a child object, when performing operations on a file or folder on the memory card.
Subclass of the EdsBaseMBS class.

### 25.26.2 Methods

### 25.26.3 Child(index as UInt32) as EdsDirectoryItemMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets an indexed child object of the designated object.
**Notes:** Index is 0 based and range from 0 to ChildCount-1.
Lasterror is set.

### 25.26.4 FormatVolume

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Formats volumes of memory cards in a camera.
**Notes:** Lasterror is set.
Be careful to avoid doing this when the camera is not in the right mode. Lock the UI, for example.

### 25.26.5 Parent as EdsCameraMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the parent object of the designated object.
**Notes:** Lasterror is set.

### 25.26.6 VolumeInfo as EdsVolumeInfoMBS

MBS Cameras Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets volume information for a memory card in the camera.
**Notes:** Lasterror is set.
Returns nil on any error.

# Chapter 26

# Carbon Events

## 26.1 class CarbonApplicationEventsMBS

### 26.1.1 class CarbonApplicationEventsMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSApplicationDelegateMBS for Cocoa instead. **Function:** A class for receiving events sent to the application.
**Notes:** Even if the name of the class includes Carbon, it works fine with Cocoa applications for most events.

Apple deprecated the carbon framework, but still in a Cocoa application, some features are only available through this class due to missing replacements. So we use CarbonApplicationEventsMBS class until a future MacOS update breaks it.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 19.4pr1
- MBS Xojo / Real Studio Plugins, version 16.1pr3
- Tip of the day: Carbon events for Cocoa app
- Gestures on Mac OS X
- Dock Menu for Cocoa in Real Studio
- Magic Mouse in REALbasic

### 26.1.2 Methods

### 26.1.3 CreateTypeStringWithOSType(ostype as string) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a type string object for the use in the ServiceGetTypes event.

### 26.1.4 Listen

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening for events send to your application.

### 26.1.5 Properties

### 26.1.6 Available as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether this events are fireing.
**Notes:** Still each event may have it's own requirement.
(Read only property)

### 26.1.7 EventCount as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse event counter.
**Notes:** Increases whenever one of the following events occurs:
MouseUp, MouseMoved, MouseDragged and MouseDown.
(Read and Write property)

### 26.1.8 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The last reported Mac OS error code.
**Notes:** 0 if successfull, -1 if function is not available.
(Read and Write property)

### 26.1.9 MouseButton as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse buttons used at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.1.10 MouseChord as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse chord state at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.1.11 MouseClickCount as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse click count at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.1.12 MouseDeltaX as Single

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.1.13 MouseDeltaY as Single

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.1.14 MouseModifierKeys as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The modifier key state at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

| | | |
|---|---|---|
| activeFlag | 1 | set if window being activated or if mouse-down event caused foreground switch |
| btnState | 128 | set if mouse button up |
| cmdKey | 256 | set if Command key down |
| shiftKey | 512 | set if Shift key down |
| alphaLock | 1024 | set if Caps Lock key down |
| optionKey | 2048 | set if Option key down |
| controlKey | 4096 | set if Control key down |
| rightshiftKey | 8192 | set if right Shift key down |
| rightoptionKey | 16384 | set if right Option key down |
| rightcontrolKey | 32768 | set if right Control key down |

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.
(Read and Write property)

### 26.1.15 MouseX as Single

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.1.16 MouseY as Single

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.1.17 Tablet as Boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether you want to get the tablet event data.
**Notes:** As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.1.18 TabletPoint as CarbonEventsTabletPointMBS

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet point object.
**Notes:** Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.1.19 TabletProximity as CarbonEventsTabletProximityMBS

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet proximity object.
**Notes:** Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.1.20 Events

### 26.1.21 ApplicationActivated

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever your application is actived.
**Notes:** In older versions this event was misspelled: ApplicationActived

### 26.1.22 ApplicationDeactivated

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever your application is deactivated.
**Notes:** In older versions this event was misspelled: ApplicationDeactived

### 26.1.23 ApplicationGetDockTileMenu as Integer

MBS MacCF Plugin, Plugin Version: 3.0, Platform: macOS, Targets: .

**Function:** Called whenever the system likes to know which menu to display in the dock tile.
**Notes:** Create a menu using the MenuMBS class and return the handle property to this event as the result.

### 26.1.24 ApplicationHidden

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** The application was hidden.
**Notes:** Only used on Mac OS X 10.2 and newer.

### 26.1.25 ApplicationLaunched(ProcessSerial as memoryblock)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever an application is launched.
**Notes:** ProcessSerial is a memoryblock to 8 bytes defining the process serial number.
ProcessSerial may be nil on very low memory.

### 26.1.26 ApplicationQuit

MBS MacCF Plugin, Plugin Version: 5.3, Platform: macOS, Targets: .

**Function:** The application is requested to quit.
**Notes:** Current Xojo versions seems to handle this event before the plugin can get it, so currently this event does not fire. (tested with RB 5.5 and 2005r2)

### 26.1.27 ApplicationShown

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** The application was shown.
**Notes:** Only used on Mac OS X 10.2 and newer.

### 26.1.28 ApplicationSwitched(ProcessSerial as memoryblock)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the frontmost application is changed.
**Example:**

```
sub ApplicationSwitched(ProcessSerial as memoryblock)
' This even works in built applications.
dim s as String
dim p as ProcessMBS
```

```
if ProcessSerial<>nil then
p=new ProcessMBS

p.GetProcess(ProcessSerial)
p.Update
s=p.Name
end if
List.InsertRow 0,"Application switched to "+s+"."
end sub
```

**Notes:** ProcessSerial is a memoryblock to 8 bytes defining the process serial number.
ProcessSerial may be nil on very low memory.

### 26.1.29 ApplicationSystemUIModeChanged(SystemUIMode as Integer)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** The system UI mode changed.
**Notes:** Only used on Mac OS X 10.2 and newer.

### 26.1.30 ApplicationTerminated(ProcessSerial as memoryblock)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever an application quits.
**Notes:** ProcessSerial is a memoryblock to 8 bytes defining the process serial number.
ProcessSerial may be nil on very low memory.

Note that the process serial number may no longer be valid when this event is called.

### 26.1.31 GestureEnded(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called when the gesture ends.
**Notes:** GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the

window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.1.32 GestureMagnify(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, MagnificationAmount as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called several times while the magnify gesture is performed.
**Notes:** MagnificationAmount the magnification amount.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.1.33 GestureRotate(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, RotationAmount as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called several times while the rotation gesture is performed.
**Notes:** The RotationAmount in polar coordinates.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.1.34 GestureStarted(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called when a gesture starts.
**Notes:** GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.

If not supported with the current hardware, this event is never called.

### 26.1.35 GestureSwipe(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, SwipeDirectionX as Double, SwipeDirectionY as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called for a swipe gesture.
**Notes:** SwipeDirectionX and SwipeDirectionY specify the swipe direction.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.1.36 HotKeyPressed(signature as Integer, id as Integer)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** The hotkey was pressed.

### 26.1.37 HotKeyReleased(signature as Integer, id as Integer)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** The hotkey was released.
**Notes:** Works not on Carbon inside Mac OS 9!

### 26.1.38 KeyboardRawKeyDown(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: .

**Function:** A key was pressed.
**Notes:** Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead.
If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.1.39 KeyboardRawKeyModifiersChanged(modifierkeys as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: .

**Function:** The state of the modifier keys changed.
**Notes:** Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead.
If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.1.40 KeyboardRawKeyRepeat(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: .

**Function:** A key is still down.
**Notes:** Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead.
If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.1.41 KeyboardRawKeyUp(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: .

**Function:** A key was released.
**Notes:** Does only work in Carbon target, not in Cocoa. Please use NSEventMonitorMBS class instead.
If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.1.42 MenuPopulate(MenuHandle as Integer)

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** The system asks the application to update the menu bar.
**Notes:** The application can change the menubar just a second before the user sees it.
This event is also sent whenever a command key is searched.
Works on CarbonLib 1.6 or newer.
Added MenuHandle parameter in v5.2.

### 26.1.43 MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebuton is down.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.1.44 MouseDragged(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is dragged.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.1.45 MouseMoved(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single) as boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is moved.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.1.46 MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebutton is released.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.1.47 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the mouse wheel is moved.
**Example:**

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer

const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768

const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0

if axis=kEventMouseWheelAxisY then
d=delta

if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if

List.ScrollPosition=List.ScrollPosition-d
end if

List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

**Notes:** Currently axis is only 0 or 1, but in future new input devices may have up to 32 axises.

Added a boolean function result in version 3.2. If you return true the event is handled by you. Else it's passed to the next receiver of events.

### 26.1.48 ProcessCommand(AttributeFlags as Integer, CommandId as Integer, Handle as Integer, Index as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.0, Platform: macOS, Targets: .

**Function:** Called whenever a command is to process.
**Notes:** Called for example when the DockTileMenu is used.
It seems like handle and index are optional.

Renamed Attributes parameter to AttributeFlags in plugin version 8.2.

### 26.1.49 ServiceCopy(Scrap as CarbonEventsScrapMBS) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever a service needs something from you.
**Notes:** You have to fill the scrap.
Return true if you handled the event.

### 26.1.50 ServiceGetTypes(copytypes as CFMutableArrayMBS, pastetypes as CFMutableArrayMBS) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the Mac OS needs to know what types you can process.
**Example:**

```
function ServiceGetTypes(copytypes as CFMutableArrayMBS, pastetypes as CFMutableArrayMBS) as boolean
pastetypes.Append me.CreateTypeStringWithOSType("TEXT") // Speak text
pastetypes.Append me.CreateTypeStringWithOSType("TIFF") // for Grab

copytypes.Append me.CreateTypeStringWithOSType("TEXT")
end function
```

**Notes:** Fill the arrays with your content type codes.
Use the CreateTypeStringWithOSType function to make strings with the type codes.
Return true if you handled the event.

### 26.1.51 ServicePaste(Scrap as CarbonEventsScrapMBS) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever a service gives something to you.
**Notes:** You have to do something with the content of the scrap.
Return true if you handled the event.

### 26.1.52 ServicePerform(Scrap as CarbonEventsScrapMBS, MessageName as CFStringMBS, UserData as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever you should perform a service.
**Notes:** You have to do something with the content of the scrap.
Return true if you handled the event.

### 26.1.53 VolumeMounted(VolumeRefNum as Integer, VolumeRoot as FolderItem)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever a volume is mounted.
**Example:**

```
sub VolumeMounted(VolumeRefNum as Integer)
dim s as String
dim f as FolderItem

f=NewVolumeFolderitemMBS(VolumeRefNum)
if f<>nil then
s=f.DisplayName
end if

List.InsertRow 0,"A volume was mounted: "+s
end sub
```

**Notes:** VolumeRefNum is the number of the mounted volume. You may keep a list of mounted volumes if you need to know which was is unmounted later.

### 26.1.54 VolumeUnmounted(VolumeRefNum as Integer)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever a volume is unmounted.
**Example:**

```
sub VolumeUnmounted(VolumeRefNum as Integer)
// If you keep a list you can identify the volume...
List.InsertRow 0,"A volume was unmounted."
end sub
```

**Notes:** VolumeRefNum is the number of the mounted volume. You may keep a list of mounted volumes if you need to know which was is unmounted later.

## 26.2 class CarbonEventsIdleTimerMBS

### 26.2.1 class CarbonEventsIdleTimerMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for an idle timer.
**Notes:** An idle timer is called whenever the user didn't use the mouse or the keyboard for a given time period.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7
- MBS Xojo Plugins, version 19.1pr2

### 26.2.2 Methods

### 26.2.3 Constructor(delay as Double, interval as Double)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Installs an idle timer.
**Notes:** Idle timers are only called when there is no user activity occuring in the application. This means that the user is not actively clicking/typing, and is also not in the middle of tracking a control, menu, or window. TrackMouseLocation actually disables all idle timers automatically for you.

Parameters:

delay:
The delay before firing this timer after a user input event has come in. For example, if you want to start your timer 2 seconds after the user stops typing, etc. you would pass 2.0 into this parameter. Each time the user types a key (or whatever), this timer is reset. If we are considered to be idle when an idle timer is installed, the first time it fires will be inDelay seconds from the time it is installed. So if you installed it in the middle of control tracking, say, it wouldn't fire until the user stopped tracking. But if you installed it at app startup and the user hasn't typed/clicked, it would fire in delay seconds.

interval:
The timer interval (pass 0 for a one-shot timer, which executes once but does not repeat). You may also pass kEventDurationForever (-1) to create a one-shot timer.

In older plugins this was called Create, but later changed to Constructor to make usage easier.

### 26.2.4 Properties

### 26.2.5 Available as Boolean

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** True if this timer can work.
**Notes:** Should always be true on Mac OS X and false on Windows or Mac OS Classic.
Changed in 19.1 from regular to shared property.
(Read only property)

### 26.2.6 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** 0 for successfull.
-1 for function not available.
else a Mac OS error code.
(Read and Write property)

### 26.2.7 Events

### 26.2.8 Action(state as Integer)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called when an idle timer fires.
**Notes:** Constants for state:

The user has gone idle (not touched an input device) for the duration specified in your idle timer. This is the first message you will receive. Start your engines!

kEventLoopIdleTimerStarted = 1

If you specified an interval on your idle timer, your idle timer proc will be called with this message, letting you know it is merely firing at the interval specified. If you did not specify an interval, this message is not sent.

kEventLoopIdleTimerIdling = 2

The user is back! Stop everything! This is your cue to stop any processing if you need to.

kEventLoopIdleTimerStopped = 3

## 26.3 class CarbonEventsScrapMBS

### 26.3.1 class CarbonEventsScrapMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSPasteboardMBS for Cocoa instead. **Function:** A class for a clipboard used for the carbon service events.
**Notes:** This is Carbon API. You may want to prefer NSPasteboardMBS class for new projects.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 19.4pr1
- MBS Real Studio Plugins, version 12.4pr1
- Teaser: Clipboard classes

### 26.3.2 Methods

### 26.3.3 AddData(FlavorType as string,data as string)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Adds data to the scrap.

### 26.3.4 AddText(Text as string)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Adds plain text to the scrap.

### 26.3.5 AddUnicodeText(Text as string)

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds 16bit unicode text to the scrap.
**Notes:** Your string must be in 16 bit unicode. Else you may run into crashes.

### 26.3.6 clear

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Clears the scrap.

### 26.3.7 DataAvailable(FlavorType as string) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Looks whether data is available or not for this type.
**Notes:** This function is much faster then if you use datasize.
Returns false on any error.

### 26.3.8 DataSize(FlavorType as string) as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the data size of an item in the scrap.
**Notes:** Some data provider generate the data for the scrap only if you read it, so this function may be slower than just DataAvailable.
Returns 0 on any error.

### 26.3.9 FlavorCount as Integer

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The number of flavor in the clipboard.
**Notes:** Calling this function recreates the internal flavor list.

### 26.3.10 FlavorFlags(index as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the flags of the given flavor.
**Notes:** Index goes from 0 to count-1.
Returns 0 on any error.

Flags are a combination of type values:
1 - private data (Sender only)
2 - translated data

### 26.3.11 FlavorType(index as Integer) as string

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of the given flavor.
**Notes:** Index goes from 0 to count-1.
Returns "" on any error.

### 26.3.12 GetData(FlavorType as string) as string

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the data of an item in the scrap.
**Notes:** Some data provider generate the data for the scrap only if you read it, so this function may be slower than just DataAvailable.
Returns "" on any error.

### 26.3.13 GetFile(byref file as folderitem) as boolean

MBS MacCF Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Trys to get a file reference from the scrap.
**Notes:** Returns true on success and false on failure.
On newer Mac OS X versions with 12.4 plugin, we fixed this function. But there we can't provide type, creator and flags.
See also:

- 26.3.14 GetFile(byref file as folderitem, byref type as string, byref creator as string, byref flags as Integer) as boolean 4616

### 26.3.14 GetFile(byref file as folderitem, byref type as string, byref creator as string, byref flags as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Trys to get a file reference from the scrap.
**Notes:** Returns true on success and false on failure.
Type and Creator are the Mac OS 9 file types.
flags are the normal Finderflags as you get them if using GetFileFlagsMBS(file).

On newer Mac OS X versions with 12.4 plugin, we fixed this function. But there we can't provide type, creator and flags.
See also:

• 26.3.13 GetFile(byref file as folderitem) as boolean 4616

### 26.3.15 GetText as string

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the plain text from the scrap.
**Notes:** Some data provider generate the data for the scrap only if you read it, so this function may be slower than just TextAvailable.
Returns "" on any error.

### 26.3.16 GetUnicodeText as string

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the unicode text from the scrap.
**Notes:** Some data provider generate the data for the scrap only if you read it, so this function may be slower than just TextAvailable.
Returns "" on any error.

### 26.3.17 PictAvailable as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Looks whether Mac PICT data is available.
**Notes:** Returns false on any error.

### 26.3.18 TextAvailable as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Like Dataavailable, but just for text.
**Notes:** This function is much faster then if you use Textsize.
Checks only for plain TEXT, not for unicode or styled text.
Returns false on any error.

### 26.3.19 TextSize as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Like DataSize, but just for text.
**Notes:** Checks only for plain TEXT, not for unicode or styled text.
Returns 0 on any error.

### 26.3.20 UnicodeTextAvailable as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** True if unicode text is available.
**Notes:** This function is much faster then if you use UnicodeTextsize.
Returns false on any error.

### 26.3.21 UnicodeTextSize as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of available characters in the unicode string part of the scrap.
**Notes:** Returns 0 on any error.

### 26.3.22 Properties

### 26.3.23 Handle as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the scrap.
**Notes:** (Read and Write property)

### 26.3.24 Release as Boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the destructor should destroy the handle later.
**Notes:** (Read and Write property)

## 26.4 class CarbonEventsTabletPointMBS

### 26.4.1 class CarbonEventsTabletPointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for details about the current point information.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7

### 26.4.2 Properties

### 26.4.3 AbsX as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Absolute x coordinate in tablet space at full tablet resolution.
**Notes:** (Read and Write property)

### 26.4.4 AbsY as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Absolute y coordinate in tablet space at full tablet resolution.
**Notes:** (Read and Write property)

### 26.4.5 AbsZ as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Absolute z coordinate in tablet space at full tablet resolution.
**Notes:** (Read and Write property)

### 26.4.6 Buttons as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Which buttons are pressed.
**Notes:** One bit per button - bit 0 is first button - 1 = closed.

(Read and Write property)

### 26.4.7 DeviceID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** System-assigned unique device ID - matches to deviceID field in proximity event.
**Notes:** (Read and Write property)

### 26.4.8 Pressure as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Scaled pressure value.
**Notes:** MAXPRESSURE=(2^16)-1, MINPRESSURE=0.
(Read and Write property)

### 26.4.9 Rotation as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Fixed-point representation of device rotation in a 10.6 format.
**Notes:** (Read and Write property)

### 26.4.10 TangentialPressure as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Tangential pressure on the device; range same as tilt.
**Notes:** (Read and Write property)

### 26.4.11 TiltX as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Scaled tilt x value.
**Notes:** range is -((2^15)-1) to (2^15)-1 (-32767 to 32767)
(Read and Write property)

### 26.4.12 TiltY as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Scaled tilt y value.
**Notes:** range is -((2^15)-1) to (2^15)-1 (-32767 to 32767).
(Read and Write property)

### 26.4.13 Vendor1 as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined signed 16-bit integer.
**Notes:** (Read and Write property)

### 26.4.14 Vendor2 as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined signed 16-bit integer.
**Notes:** (Read and Write property)

### 26.4.15 Vendor3 as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined signed 16-bit integer.
**Notes:** (Read and Write property)

## 26.5 class CarbonEventsTabletProximityMBS

### 26.5.1 class CarbonEventsTabletProximityMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for the tablet proximity details.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7

### 26.5.2 Properties

### 26.5.3 CapabilityMask as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Mask representing the capabilities of the device.
**Notes:** Unsigned 32 bit integer.
(Read and Write property)

### 26.5.4 DeviceID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** System-assigned unique device ID - matches to deviceID field in tablet event.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

### 26.5.5 EnterProximity as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the pen entered or was leaving.
**Notes:** non-zero = entering; zero = leaving
(Read and Write property)

### 26.5.6 PointerID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined ID of the specific pointing device.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

### 26.5.7 PointerSerialNumber as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined serial number of the specific pointing device.
**Notes:** Unsigned 32 bit integer.
(Read and Write property)

### 26.5.8 PointerType as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Type of pointing device.
**Notes:** No values defined for this function by Apple.
Unsigned 8 bit integer.
(Read and Write property)

### 26.5.9 SystemTabletID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** System-assigned unique tablet ID.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

### 26.5.10 TabletID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined tablet ID - typically will be USB product ID for the tablet.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

### 26.5.11 UniqueID as Memoryblock

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined unique ID for this pointer.
**Notes:** A 64bit integer value stored in an eight byte memoryblock.
(Read and Write property)

### 26.5.12 VendorID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined ID - typically will be USB vendor ID.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

### 26.5.13 VendorPointerType as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Vendor-defined pointer type.
**Notes:** Unsigned 16 bit integer.
(Read and Write property)

## 26.6 class CarbonEventsTimerMBS

### 26.6.1 class CarbonEventsTimerMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for a Carbon timer. **Notes:** Compare to a Xojo timer, the CarbonEventsTimerMBS will fire more often, for example if a menu is open.

### 26.6.2 Methods

### 26.6.3 Constructor

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new timer.
**Notes:** Lasterror is set.
In older plugins this was called Create, but later changed to Constructor to make usage easier.

### 26.6.4 Properties

### 26.6.5 Available as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the time can fire.
**Notes:** Should be true in Carbon applications.
(Read only property)

### 26.6.6 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** 0 for successfull.
-1 for function not available.
else a Mac OS error code.
(Read and Write property)

### 26.6.7 Mode as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The timer mode.
**Notes:** Like a RB timer: 0 - off, 1 - single, 2 - multiple.
The timer may fire directly when set.
(Read and Write property)

### 26.6.8 Period as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The period of the timer in milliseconds.
**Notes:** Added to make it compatible to normal RB code.
(Read and Write property)

### 26.6.9 PeriodSeconds as Double

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The period of the timer in seconds.
**Notes:** Set to 1 to fire the timer every second.
If you set this to 0.000001, you can get something like 13500 events per second. See Timer Benchmark example project.
(Read and Write property)

### 26.6.10 Events

### 26.6.11 Action

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called whenever the timer fires.
**Notes:** There seems to be a bug in some RB versions:
If you draw into a window in this timer's action event, you may draw not in the window graphics port, but in the current graphics port. If you click on the menubar to open a menu, you draw over this menu.
To work around this you can add a line before drawing: TheWindow.Show

## 26.7 class CarbonHotKeyMBS

### 26.7.1 class CarbonHotKeyMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use HotKeyMBS instead.
**Function:** A class for creating hot keys.
**Example:**

```
const activeFlag = 1
const btnState = 128
const cmdKey = 256
const shiftKey = 512
const alphaLock = 1024
const optionKey = 2048
const controlKey = 4096
const rightShiftKey = 8192
const rightOptionKey = 16384
const rightControlKey = 32768

dim MyEvents1 as CarbonApplicationEventsMBS
// use a global property to store your instance of your subclass
dim p as CarbonHotKeyMBS // this should also be global

MyEvents1.Listen

p=new CarbonHotKeyMBS
p.AddKey(&h24, optionKey, OSTypeFromStringMBS("MBSG"), 5)

if p.LastError<>0 then
MsgBox "The Hotkey could not be registered!"
end if

// key will be released when p is destroyed on closing the window.
```

**Notes:** The CarbonHotKeyMBS has carbon in the name, but works fine with Cocoa, too. The Cocoa event handling system is based internally on the Carbon event handling. If you need to catch NSEvents, please use NSEventMonitorMBS class.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2

**Xojo Developer Magazine**

- 13.5, page 8: News

### 26.7.2 Methods

### 26.7.3 AddKey(keycode as Integer, keymodifier as Integer, hotkeysignature as Integer, hotkeyid as Integer)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a hot key binding.
**Notes:** Please use only one CarbonHotKeyMBS object for each hotkey you want to use.

Keycode is the same keycode as for the sprite surface.

Possible values for the key modifier:
activeFlag = 1
btnState = 128
cmdKey = 256
shiftKey = 512
alphaLock = 1024
optionKey = 2048
controlKey = 4096
rightShiftKey = 8192
rightOptionKey = 16384
rightControlKey = 32768

The Signature should be unique. Best if you use your application's creator code.
The ID is for your application to check which hot key was pressed in the HotKey events of the CarbonApplicationEventsMBS class.

Some keycode values:

### 26.7.4 RemoveKey

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Removes the hot key binding.
**Notes:** Called by the destructor if you don't call it.

### 26.7.5 Properties

### 26.7.6 HotKeyID as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The ID used for this hotkey.
**Notes:** (Read only property)

### 26.7.7 HotKeyRef as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The handle for this hotkey.
**Notes:** Used internally for releasing it later.
(Read only property)

### 26.7.8 HotKeySignature as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The Signature used for this hotkey.
**Notes:** The signature should be the creator code of your application to make it unique.
(Read only property)

### 26.7.9 KeyCode as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The keycode used for this hotkey.
**Notes:** (Read only property)

### 26.7.10 KeyModifier as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The KeyModifier used for this hotkey.
**Notes:** (Read only property)

### 26.7.11 LastError as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The last Mac OS error code reported from one of the functions.
**Notes:** (Read only property)

```
kVK_A                = &h00
kVK_S                = &h01
kVK_D                = &h02
kVK_F                = &h03
kVK_H                = &h04
kVK_G                = &h05
kVK_Z                = &h06
kVK_X                = &h07
kVK_C                = &h08
kVK_V                = &h09
kVK_B                = &h0B
kVK_Q                = &h0C
kVK_W                = &h0D
kVK_E                = &h0E
kVK_R                = &h0F
kVK_Y                = &h10
kVK_T                = &h11
kVK_1                = &h12
kVK_2                = &h13
kVK_3                = &h14
kVK_4                = &h15
kVK_6                = &h16
kVK_5                = &h17
kVK_Equal            = &h18
kVK_9                = &h19
kVK_7                = &h1A
kVK_Minus            = &h1B
kVK_8                = &h1C
kVK_0                = &h1D
kVK_RightBracket     = &h1E
kVK_O                = &h1F
kVK_U                = &h20
kVK_LeftBracket      = &h21
kVK_I                = &h22
kVK_P                = &h23
kVK_L                = &h25
kVK_J                = &h26
kVK_Quote            = &h27
kVK_K                = &h28
kVK_Semicolon        = &h29
kVK_Backslash        = &h2A
kVK_Comma            = &h2B
kVK_Slash            = &h2C
kVK_N                = &h2D
kVK_M                = &h2E
kVK_Period           = &h2F
kVK_Grave            = &h32
kVK_KeypadDecimal    = &h41
kVK_KeypadMultiply   = &h43
kVK_KeypadPlus       = &h45
kVK_KeypadClear      = &h47
kVK_KeypadDivide     = &h4B
kVK_KeypadEnter      = &h4C
kVK_KeypadMinus      = &h4E
kVK_KeypadEquals     = &h51
kVK_Keypad0          = &h52
kVK_Keypad1          = &h53
kVK_Keypad2          = &h54
kVK_Keypad3          = &h55
```

## 26.8 class CarbonMonitorEventsMBS

### 26.8.1 class CarbonMonitorEventsMBS

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for receiving events sent to the application while monitoring events.
**Notes:** The CarbonMonitorEventsMBS class is a special class used to monitor user input events across all processes. When such a class is listening, the Carbon Event Manager examines the event type for user input event types, such as mouse-down, mouse-up, key-down, and so forth. It then requests that the WindowServer make copies of any of these events that are sent to any process, and deliver them to the current process also. These events are queued into the main thread's event queue, and during normal event dispatching are sent directly to the event handlers installed on the event monitor class. Monitored events are not sent through the normal event dispatching path for the current process; they will pass through the event dispatcher target, and will then be sent directly to the event monitor target.

Handlers installed on the event monitor class will only receive events when the current application is inactive. When the current application is active, all event flow occurs through the event dispatcher target, and no events are sent to the event monitor target.

Currently, the event monitor supports the following event kinds: kEventRawKeyDown, kEventRawKeyUp, kEventRawKeyRepeat, kEventRawKeyModifiersChanged, kEventMouseDown, kEventMouseUp, kEventMouseMoved, kEventMouseDragged, kEventMouseWheelMoved, kEventTabletPoint, and kEventTabletProximity.

Note that both Carbon and Cocoa password edit text controls enable a secure input mode while the focus is on the control, which prevents keyboard events from being passed to other applications. This prevents the monitoring event target from being used to sniff password keystrokes.

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

Accessibility made need to be turned on. On Mac OS X 10.9 this may not work in debug apps, but only in build apps after second launch.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7

### 26.8.2 Methods

### 26.8.3 Listen

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening for events send to your application.

### 26.8.4 Properties

### 26.8.5 Available as Boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this events are fireing.
**Notes:** Still each event may have it's own requirement.
(Read only property)

### 26.8.6 EventCount as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse event counter.
**Notes:** Increases whenever one of the following events occurs:
MouseUp, MouseMoved, MouseDragged and MouseDown.
(Read and Write property)

### 26.8.7 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The last reported Mac OS error code.
**Notes:** 0 if successfull, -1 if function is not available.
(Read and Write property)

### 26.8.8 MouseButton as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse buttons used at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.

(Read and Write property)

### 26.8.9 MouseChord as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse chord state at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.8.10 MouseClickCount as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse click count at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.8.11 MouseDeltaX as Single

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.8.12 MouseDeltaY as Single

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.8.13 MouseModifierKeys as Integer

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The modifier key state at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

| | | |
|---|---|---|
| activeFlag | 1 | set if window being activated or if mouse-down event caused foreground switch |
| btnState | 128 | set if mouse button up |
| cmdKey | 256 | set if Command key down |
| shiftKey | 512 | set if Shift key down |
| alphaLock | 1024 | set if Caps Lock key down |
| optionKey | 2048 | set if Option key down |
| controlKey | 4096 | set if Control key down |
| rightshiftKey | 8192 | set if right Shift key down |
| rightoptionKey | 16384 | set if right Option key down |
| rightcontrolKey | 32768 | set if right Control key down |

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.
(Read and Write property)

### 26.8.14 MouseX as Single

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.8.15 MouseY as Single

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.8.16 Tablet as Boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether you want to get the tablet event data.
**Notes:** As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.8.17 TabletPoint as CarbonEventsTabletPointMBS

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet point object.
**Notes:** Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.8.18 TabletProximity as CarbonEventsTabletProximityMBS

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet proximity object.
**Notes:** Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.8.19 Events

### 26.8.20 KeyboardRawKeyDown(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** A key was pressed.
**Notes:** If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

### 26.8.21 KeyboardRawKeyModifiersChanged(modifierkeys as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** The state of the modifier keys changed.
**Notes:** If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

### 26.8.22 KeyboardRawKeyRepeat(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** A key is still down.
**Notes:** If you return true you tell the system that you handled the event.

Possible values for the key modifier:

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.8.23 KeyboardRawKeyUp(maccharcode as Integer, keycode as Integer, modifiers as Integer, keyboardtype as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** A key was released.
**Notes:** If you return true you tell the system that you handled the event.

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

For added security, GetEventMonitorTarget requires that "Enable access for assistive devices" be checked in the Universal Access preference pane in order to monitor RawKeyDown, RawKeyUp, and RawKeyRepeat events. If this control is not checked, you can still install handlers for these events on the event monitor class, but no events of these types will be sent to your handler. Administrator privileges are required to enable this feature.

### 26.8.24 MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebuton is down.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.8.25 MouseDragged(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is dragged.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.8.26 MouseMoved(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is moved.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.8.27 MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebutton is released.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with

an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.8.28 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called whenever the mouse wheel is moved.
**Example:**

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer

const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768

const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0

if axis=kEventMouseWheelAxisY then
d=delta

if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if

List.ScrollPosition=List.ScrollPosition-d
end if

List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

**Notes:** Currently axis is only 0 or 1, but in future new input devices may have up to 32 axises.

Added a boolean function result in version 3.2. If you return true the event is handled by you. Else it's passed to the next receiver of events.

## 26.9 class CarbonSystemEventsMBS

### 26.9.1 class CarbonSystemEventsMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for receiving system events sent to the application.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 26.9.2 Methods

### 26.9.3 Listen

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening for events send to your application.

### 26.9.4 Properties

### 26.9.5 Available as Boolean

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether this events are fireing.
**Notes:** Still each event may have it's own requirement.
(Read only property)

### 26.9.6 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** The last reported Mac OS error code.
**Notes:** 0 if successfull, -1 if function is not available.
(Read and Write property)

### 26.9.7 Events

### 26.9.8 DisplayReconfigured

MBS MacCF Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** Notification that the Display configuration has changed.
**Notes:** This event is sent to all handlers registered for it on the application event target. When this event is received, applications may wish to update geometry and color depth usage or perform a redraw based on the new configuration.

Sent in Mac OS X 10.5 and newer.

### 26.9.9 DisplaysAsleep

MBS MacCF Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** All connected displays have gone to sleep.
**Notes:** Sent in Mac OS X 10.4 and newer.

### 26.9.10 DisplaysAwake

MBS MacCF Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** All connected displays have awoken.
**Notes:** Sent in Mac OS X 10.4 and newer.

### 26.9.11 TimeDateChanged

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** The system time and/or date has changed via the preferences panel.
**Notes:** Requires Mac OS X 10.3 or newer.
The RB date class may not recognize the case when just the time zone changed.

### 26.9.12 UserSessionActivated

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** The current user login session has been activated.
**Notes:** Requires Mac OS X 10.3 or newer.

From Apple's documentation:

When a user switch occurs, Mac OS X generates events for all interested applications. Events are sent to applications in a login session whenever the login session is activated or deactivated. If a login session is not being activated or deactivated, it receives no events. You can use the activation events to perform the following kinds of tasks:

- Halt or restart sound playback
- Halt or restart animations
- Give up or acquire shared resources
- Put your application into a quiescent state to improve overall system performance

Event Timing

User switch notifications are sent to applications at the same time the switch occurs. Because the switch occurs relatively quickly, this is normally not a problem. However, it is possible for an application to receive its activation event before other applications have received their deactivation events. This could lead to potential race conditions between applications releasing and acquiring shared resources.
To avoid race conditions, applications in the session being deactivated should continue to release any shared resources as soon as possible. Applications in the session being activated should delay the acquisition of any shared resources until those resources are actually used. Not only can this help avoid potential race conditions, it can also improve overall system performance. If your application needs a particular resource right away but encounters errors while trying to acquire it, set a timer and try to acquire the resource again a short time later.

### 26.9.13 UserSessionDeactivated

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** The current user login session has been deactivated.
**Notes:** Requires Mac OS X 10.3 or newer.

From Apple's documentation:

When a user switch occurs, Mac OS X generates events for all interested applications. Events are sent to applications in a login session whenever the login session is activated or deactivated. If a login session is not being activated or deactivated, it receives no events. You can use the activation events to perform the following kinds of tasks:

- Halt or restart sound playback
- Halt or restart animations
- Give up or acquire shared resources
- Put your application into a quiescent state to improve overall system performance

Event Timing

User switch notifications are sent to applications at the same time the switch occurs. Because the switch occurs relatively quickly, this is normally not a problem. However, it is possible for an application to receive its activation event before other applications have received their deactivation events. This could lead to potential race conditions between applications releasing and acquiring shared resources.
To avoid race conditions, applications in the session being deactivated should continue to release any shared resources as soon as possible. Applications in the session being activated should delay the acquisition of any shared resources until those resources are actually used. Not only can this help avoid potential race conditions, it can also improve overall system performance. If your application needs a particular resource right away but encounters errors while trying to acquire it, set a timer and try to acquire the resource again a short time later.

## 26.10 class CarbonWindowsEventsMBS

### 26.10.1 class CarbonWindowsEventsMBS

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSWindowDelegateMBS for Cocoa instead. **Function:** A class for receiving events sent to a window.
**Notes:** Only for Carbon target. Will not work with Cocoa windows.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 19.4pr1
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- Gestures on Mac OS X
- MBS REALbasic Plugins, version 10.6pr4
- Magic Mouse in REALbasic

### 26.10.2 Methods

### 26.10.3 Listen(win as window)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening for events send to the given window.

### 26.10.4 ListenOnWindowsHandle(windowHandle as Integer)

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Starts listening for events send to the given window.
**Notes:** You can use the WindowHandle from the CocoaColorPanel class.

### 26.10.5 Properties

### 26.10.6 Available as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** whether this events are fireing.
**Notes:** (Read only property)

### 26.10.7 EventCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse event counter.
**Notes:** Increases whenever one of the following events occurs:
MouseUp, MouseMoved, MouseDragged and MouseDown.
(Read and Write property)

### 26.10.8 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** The last reported Mac OS error code.
**Notes:** 0 if successfull, -1 if function is not available.
(Read and Write property)

### 26.10.9 MouseButton as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse buttons used at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.10.10 MouseChord as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse chord state at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.10.11 MouseClickCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse click count at the time of the last mouse event.
**Notes:** Set by the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.10.12 MouseDeltaX as Single

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.10.13 MouseDeltaY as Single

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse movement at the time of the last mouse event.
**Notes:** Set by the MouseMoved and the MouseDragged event.
(Read and Write property)

### 26.10.14 MouseModifierKeys as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The modifier key state at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.

The modifiers field contains information about the state of the modifier keys and the mouse button at the time the event was posted.

Each of the modifier keys is represented by a specific bit in the modifiers field. You can use these constants as masks to test the setting of various bits in the modifiers field:

If your application attaches special meaning to any of these keys in combination with other keys or when the mouse button is down, you can test the state of the modifiers field to determine the action your application should take. For example, you can use this information to determine whether the user pressed the Command key and another key to make a menu choice.

Some keyboards do not distinguish between the right or left Control, Shift, and Option keys; for example, the virtual key code for the right Shift key and left Shift key might be the same. For these keyboards, if the user presses the Control, Shift, or Option key, the Event Manager sets only the bits corresponding to

| | | |
|---|---|---|
| activeFlag | 1 | set if window being activated or if mouse-down event caused foreground switch |
| btnState | 128 | set if mouse button up |
| cmdKey | 256 | set if Command key down |
| shiftKey | 512 | set if Shift key down |
| alphaLock | 1024 | set if Caps Lock key down |
| optionKey | 2048 | set if Option key down |
| controlKey | 4096 | set if Control key down |
| rightshiftKey | 8192 | set if right Shift key down |
| rightoptionKey | 16384 | set if right Option key down |
| rightcontrolKey | 32768 | set if right Control key down |

the shiftKey, optionKey, and controlKey constants. For keyboards that do distinguish between these keys, the Event Manager sets the bits in the modifiers field to indicate whether the right or left Control, Shift, or Option keys were pressed. For example, the Event Manager sets bit 13 in the modifiers field if the user presses the right Shift key and sets bit 9 if the user presses the left Shift key. In most cases your application should not need to distinguish between the left and right Control, Shift, and Option keys.
(Read and Write property)

### 26.10.15 MouseX as Single

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.10.16 MouseY as Single

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The mouse position at the time of the last mouse event.
**Notes:** Set by the MouseMoved, the MouseDragged, the MouseDown and the MouseUp event.
(Read and Write property)

### 26.10.17 Tablet as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether you want to get the tablet event data.
**Notes:** As not every application needs tablet event information, this is optional.
Set to true to get the TabletPoint and TabletProximity parameters filled in the events.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.10.18 TabletPoint as CarbonEventsTabletPointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet point object.
**Notes:** Whenever an event is received and the tablet property is true and there is point information available, a reference to the CarbonEventsTabletPointMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.10.19 TabletProximity as CarbonEventsTabletProximityMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Saves the current tablet proximity object.
**Notes:** Whenever an event is received and the tablet property is true and there is proximity information available, a reference to the CarbonEventsTabletProximityMBS object (from the event) is stored in this property.

So this property enables you to access the current state information of the tablet by just looking on the last state reported.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).
(Read and Write property)

### 26.10.20 Events

### 26.10.21 GestureEnded(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called when the gesture ends.
**Notes:** GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.10.22 GestureMagnify(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, MagnificationAmount as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called several times while the magnify gesture is performed.

**Notes:** MagnificationAmount the magnification amount.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.10.23 GestureRotate(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, RotationAmount as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called several times while the rotation gesture is performed.
**Notes:** The RotationAmount in polar coordinates.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.10.24 GestureStarted(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called when a gesture starts.
**Notes:** GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

### 26.10.25 GestureSwipe(GlobalMouseX as Double, GlobalMouseY as Double, WindowHandle as Integer, WindowMouseX as Double, WindowMouseY as Double, WindowPartCode as Integer, KeyModifiers as Integer, SwipeDirectionX as Double, SwipeDirectionY as Double) as boolean

MBS MacCF Plugin, Plugin Version: 9.0, Platform: macOS, Targets: .

**Function:** This event is called for a swipe gesture.
**Notes:** SwipeDirectionX and SwipeDirectionY specify the swipe direction.

GlobalMouseX and GlobalMouseY specify the mouse position. If WindowHandle is not 0, it contains the handle for the current window on that mouse position and WindowMouseX/WindowMouseY specify the window relative position. The WindowPartCode specifies which part of the window was hit. (See WindowPartCode definition in Apple documentation.)

Possible values for the key modifier:

| | | |
|---|---|---|
| activeFlag | = 1 | = &h000001 |
| btnState | = 128 | = &h000080 |
| cmdKey | = 256 | = &h000100 |
| shiftKey | = 512 | = &h000200 |
| alphaLock | = 1024 | = &h000400 |
| optionKey | = 2048 | = &h000800 |
| controlKey | = 4096 | = &h001000 |
| rightShiftKey | = 8192 | = &h002000 |
| rightOptionKey | = 16384 | = &h004000 |
| rightControlKey | = 32768 | = &h008000 |
| NumLock | = 65536 | = &h010000 |
| Fn | = 131072 | = &h020000 |

Return true if you handled the event.

Supported on Mac OS X 10.5.5 and newer.
If not supported with the current hardware, this event is never called.

### 26.10.26 MouseDown(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebuton is down.

### 26.10.27 MouseDragged(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is dragged.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.10.28 MouseMoved(x as single, y as single, modifierKeys as Integer, deltax as single, deltay as single) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** An event which fires when the mouse is moved.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.10.29 MouseUp(x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** An event which fires when a mousebutton is released.
**Notes:** In case the tablet property is true, the TabletPoint or the TabletProximity property is filled with an object.

Tablet functions may or may not work in Xojo's debug mode (some RB versions work and some not).

### 26.10.30 MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the mouse wheel is moved with the mouse cursor within your window.
**Example:**

```
function MouseWheelMoved(modifierKeys as Integer, axis as Integer, delta as Integer) as boolean
dim d as Integer

const cmdKey=256
const shiftKey=512
const alphaLock=1024
const optionKey=2048
const controlKey=4096
const rightShiftKey=8192
const rightOptionKey=16384
const rightControlKey=32768

const kEventMouseWheelAxisY=1
const kEventMouseWheelAxisX=0

if axis=kEventMouseWheelAxisY then
d=delta

if BitwiseAnd(modifierKeys,optionkey)<>0 then
d=d*4 // scroll faster with option
end if

List.ScrollPosition=List.ScrollPosition-d
end if

List.InsertRow 0,"MouseWheelMoved "+str(delta)
end function
```

**Notes:** Currently axis is only 0 or 1, but in future new input devices may have up to 32 axises.

### 26.10.31 WindowBoundsChanging(original as object, previous as object, current as object, flags as Integer)

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window changes its bounds.
**Notes:** You may need to cast the objects to IntegerRectMBS objects.

### 26.10.32 WindowClickCloseRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the close button area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.33 WindowClickCollapseRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the collapse button area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.34 WindowClickContentRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the content area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.35 WindowClickDragRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the drag area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.36 WindowClickProxyIconRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the proxy icon area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.37 WindowClickResizeRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the resize widget area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.38 WindowClickStructureRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the window structure area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.39 WindowClickToolbarButtonRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the toolbar button area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.40 WindowClickZoomRgn(ClickedWindowHandle as Integer, UnderMouseWindowHandle as Integer, globalX as single, globalY as single, x as single, y as single, modifierKeys as Integer, button as Integer, clickcount as Integer, MouseChord as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 11.0, Platform: macOS, Targets: .

**Function:** This event is called when the zoom button area of the window was clicked.
**Notes:** ClickedWindowHandle: The handle of the window that was clicked. 0 if not available.
UnderMouseWindowHandle: The handle of the window under the mouse. 0 if not available.
globalX and globalY: global mouse coordinates.
X and Y: mouse coordinates relative to window.
modifierkeys: which keys are pressed. (see CarbonWindowsEventsMBS.MouseModifierKeys for details)
button: Which mouse button was pressed.
clickcount: Whether this is a single click, double click, etc.
MouseChord: Which other mouse buttons were pressed when the event was generated.

Return true if you handled the event and false if not.

### 26.10.41 WindowClose as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window should close.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.42 WindowCloseAll as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever all windows should close.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.43 WindowCollapse as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called when the window is going to collapse.
**Notes:** Return false to run the default handler.

Return true to tell the system that you handled this event.

### 26.10.44 WindowCollapseAll as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called when all windows are going to collapse.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.45 WindowCollapsed as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window is collapsed.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.46 WindowCollapsing as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called while the window is collapsing.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.47 WindowExpand as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window should expand.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.48 WindowExpandAll as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever all windows should expand.
**Notes:** Return false to run the default handler.

Return true to tell the system that you handled this event.

### 26.10.49 WindowExpanded as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window is expanded.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.50 WindowExpanding as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called while the window is expanding.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.51 WindowHidden as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window is hidden.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.52 WindowHiding as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called while the window is hiding.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.53 WindowRestoreFromDock as boolean

MBS MacCF Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Called when the minimized window is clicked to be restored.
**Notes:** Return true to block this or return false to allow the restore to go on.

### 26.10.54 WindowShowing as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called while the window is showing.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.55 WindowShown as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window is shown.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.56 WindowToolbarButtonClicked as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the toolbar button is pressed.
**Notes:** Return true to tell the system that you handled this event. Else you may get this event two tims on a metal window. (Boolean result added in plugin version 4.1)

### 26.10.57 WindowTransitionCompleted(TransitionAction as Integer, TransactionEffect as Integer)

MBS MacCF Plugin, Plugin Version: 6.5, Platform: macOS, Targets: .

**Function:** Called when a window transition completed.

### 26.10.58 WindowTransitionStarted(TransitionAction as Integer, TransactionEffect as Integer)

MBS MacCF Plugin, Plugin Version: 6.5, Platform: macOS, Targets: .

**Function:** Called when a window transition started.

### 26.10.59 WindowZoom as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window should zoom.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.60 WindowZoomAll as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever all windows should zoom.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

### 26.10.61 WindowZoomed as boolean

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: .

**Function:** Called whenever the window was zoomed.
**Notes:** Return false to run the default handler.
Return true to tell the system that you handled this event.

# Chapter 27

# Catalog Search

## 27.1 class CatSearchMBS

### 27.1.1 class CatSearchMBS

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Allows you to search fast on your harddisk.
**Example:**

```
dim cs as new CatSearchMBS

if cs.Search(volume(0), true) then

// set search params

cs.Name = "Xojo"
cs.PartialName = true

dim response as Integer
do
response = cs.SearchNext
if response = 0 then // still searching

if cs.Result<>nil then // did we find something?
Listbox1.AddRow cs.Result.Name

if Listbox1.ListCount = 100 then
Return // stop after 100 entries
end if
end if
```

```
end
loop until response <0
end if
```

**Notes:** Depending on what and how you want to search, you can decide whether MDQueryMBS or CatSearchMBS is the better choice.

This class implements the PBCatSearch function of the Mac OS File Manager. This is a very fast routine to find specific types of files on a volume. The MacOS tool Sherlock (aka Find File) uses this function to its quick search on local volumes.

There are some restrictions to CatSearchMBS: Is it not supported on every volume! Whether it is supported or not depents on the File System format used on the Volume: HFS, HFS+ and most File Servers support it, while Floppy Disks, ISO 9660 and UDF formatted disks, used on some CDs and on most DVD-ROMs, might not support it.

This version of this plugin can now handle those cases where CatSearchMBS is not supported, too: If a volume does not support CatSearchMBS, you can choose to fall back to the classic recursive directory search, which is much slower, but gives you the same results.

(This new feature is achieved by using a C library called "MoreFiles", written by Jim Luther, one of Apple's File System "gurus".)
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 14.4pr3

### 27.1.2 Methods

### 27.1.3 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 27.1.4 Search(volume as FolderItem, allowRecursiveSearch as Boolean) as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Initializes the Search engine.
**Notes:** Call this to initiate a search a volume. If the returned value is false, then an error has occured (either there is not enough free memory or the volume wasn't valid). If the returned value is true, everything is okay.

The volume parameter can be anything that identifies the volume, including any file or folder on it.

If allowRecursiveSearch is true and the volume is a folder you search only the folder on this volume, but using recursive directory search.

The allowRecursiveSearch parameter determines whether the search shall use the slower recursive directory scan method if the volume does not support CatSearchMBS. If you pass false for a volume that does not support CatSearchMBS, this method will fail, and return false.

Update: Newer plugin versions (4.x?) allow to search folders if allowRecursiveSearch=true.

### 27.1.5 SearchNext as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Searches for the next machting file
**Example:**

```
// Here's an example of a proper search loop:

dim cs as CatSearchMBS
// ....

dim response as Integer
do
If UserCancelled then
exit
end
response = cs.SearchNext
if response = 0 then
// ... read cs.result and process the found item
end
loop until response <0
```

**Notes:** Once the search criteria has been set, call this function repeatedly as long as it returns non-negative values.
Once the result is negative, the search is finished and CatSearchClose should be called.

These are the possible non-negative return values:

| | |
|---|---|
| 0 | a match has been found, and the found item can be inquired by calling Result. |
| 1 | a certain amount of time has passed (see ResponseTimeout). You can ignore this result and continue to search. |
| 2 | files or folders were added or removed to the volume. You may ignore this error by simply continuing the search. |
| -39 (eofErr) | end of search, no more matches |

### 27.1.6 Properties

### 27.1.7 BackupDateEnd as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The end of the backup date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.8 BackupDateStart as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The start of the backup date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.9 CreationDateEnd as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The end of the creation date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.10 CreationDateStart as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The start of the creation date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.11 creator as String

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:**

dim c as CatSearchMBS
c.Creator="ttxt"
' will look for files created by the SimpleText application.
**Notes:**

The above Creator property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.
(Read and Write property)

### 27.1.12 FileFlags as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The file flags to search for.
**Example:**

```
dim c as CatSearchMBS
c.FileFlags=&H4000 // Invisible
c.FileFlagsMask=&H4000 // only look on the invisible flag
```

**Notes:** The above FileFlags property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

There is a FileFlags and a FileFlagsMask property which must be used together: bits set in FileFlagsMask

specifiy which bits of FileFlags shall be tested. Those bits will then be compared to the corresponding bits of the files' (and folders') flags on the searched volume. If they are identical, you have a match.

The meaning of the flags are as follows (you can use BitwiseOr or + to combine them):

| | | |
|---|---|---|
| bit 15, | value &H8000: | isAlias |
| bit 14 | value &H4000: | isInvisible |
| bit 13, | value &H2000: | hasBundle (has a BNDL resource) |
| bit 12, | value &H1000: | nameLocked |
| bit 11, | value &H0800: | isStationary |
| bit 10, | value &H0400: | hasCustomIcon |
| bit 8, | value &H0100: | hasBeenInited (Finder has seen the file since it has been created) |
| bit 7, | value &H0080: | hasNoINITs (there is no INIT rsrc in the Extension file) |
| bit 6, | value &H0040: | isShared |
| bits 1-3, | value &H000E: | color (as a 3-bit value from 0-7) |

For example, to find only invisible files, use &H4000 for the FileFlagsMask and the same value for the FileFlags, or to find only visible files, use the same FileFlagsMask, but 0 for the FileFlags. To find stationaries that do not have a custom icon, use &H0C00 (=&H0800+&H0400) for the FileFlagsMask and &H0800 for the FileFlags.
(Read and Write property)

### 27.1.13 FileFlagsMask as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The file flags mask to search for.
**Example:**

```
dim c as CatSearchMBS
c.FileFlags=&H4000 // Invisible
c.FileFlagsMask=&H4000 // only look on the invisible flag
```

**Notes:** The above FileFlagsMask property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

There is a FileFlags and a FileFlagsMask property which must be used together: bits set in FileFlagsMask specifiy which bits of FileFlags shall be tested. Those bits will then be compared to the corresponding bits of the files' (and folders') flags on the searched volume. If they are identical, you have a match.

The meaning of the flags are as follows (you can use BitwiseOr or + to combine them):

| | | |
|---|---|---|
| bit 15, | value &H8000: | isAlias |
| bit 14 | value &H4000: | isInvisible |
| bit 13, | value &H2000: | hasBundle (has a BNDL resource) |
| bit 12, | value &H1000: | nameLocked |
| bit 11, | value &H0800: | isStationary |
| bit 10, | value &H0400: | hasCustomIcon |
| bit 8, | value &H0100: | hasBeenInited (Finder has seen the file since it has been created) |
| bit 7, | value &H0080: | hasNoINITs (there is no INIT rsrc in the Extension file) |
| bit 6, | value &H0040: | isShared |
| bits 1-3, | value &H000E: | color (as a 3-bit value from 0-7) |

For example, to find only invisible files, use &H4000 for the FileFlagsMask and the same value for the FileFlags, or to find only visible files, use the same FileFlagsMask, but 0 for the FileFlags. To find stationaries that do not have a custom icon, use &H0C00 (=&H0800+&H0400) for the FileFlagsMask and &H0800 for the FileFlags.
(Read and Write property)

### 27.1.14 FileType as String

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The file type to look for.
**Example:**

```
dim c as CatSearchMBS
c.FileType="TEXT"
' will look for plain Text files.
```

**Notes:** The above Creator property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.
(Read and Write property)

### 27.1.15 LogicalDataForkSizeEnd as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The maximum logical data fork file size.

**Example:**

```
dim c as CatSearchMBS
c.LogicalDataForkSizeStart=0
c.LogicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** You can assign -1 to have no upper limit.
(Read and Write property)

### 27.1.16 LogicalDataForkSizeStart as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The minimum logical data fork file size.
**Example:**

```
dim c as CatSearchMBS
c.LogicalDataForkSizeStart=0
c.LogicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** (Read and Write property)

### 27.1.17 LogicalResForkSizeEnd as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The maximum logical resource fork file size.
**Example:**

```
dim c as CatSearchMBS
c.LogicalResForkSizeStart=0
c.LogicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** You can assign -1 to have no upper limit.
(Read and Write property)

### 27.1.18 LogicalResForkSizeStart as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The minimum logical resource fork file size.
**Example:**

```
dim c as CatSearchMBS
c.LogicalResForkSizeStart=0
c.LogicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** (Read and Write property)

### 27.1.19 ModificationDateEnd as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The end of the modification date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.20 ModificationDateStart as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The start of the modification date search range.
**Notes:** This value is an unsigned integer. If you assign a double from a date totalseconds property, please move it to the matching range like in the example project "Find stuff from today".
(Read and Write property)

### 27.1.21 name as String

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Set's the name for the search.
**Example:**

```
dim c as CatSearchMBS
c.Name="Apple"
c.partialname=true
```

**Notes:** The above name property allows you to specifiy the search criteria. Without setting any property from this class, a search will find nothing.

Note: If you set one of this properties, all criterias must match to get a match back from a call to SearchNext.

If you pass true to the partialname property, you'll get a match any time the item's name contains the searched name. Otherwise, the intire name must match.

This property is encoded with system encoding. You need to convert strings from an editfield in RB 5 to match the system encoding which is not UTF8.
(Read and Write property)

### 27.1.22 PartialName as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** whether or not the name property contains only a partial file name.
**Example:**

```
dim c as CatSearchMBS
c.Name="Apple"
c.partialname=true
```

**Notes:** If you pass true to the partialname property, you'll get a match any time the item's name contains the searched name. Otherwise, the intire name must match.
(Read and Write property)

### 27.1.23 PhysicalDataForkSizeEnd as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The maximum physical data fork file size.
**Example:**

```
dim c as CatSearchMBS
c.PhysicalDataForkSizeStart=0
c.PhysicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** You can assign -1 to have no upper limit.
(Read and Write property)

### 27.1.24 PhysicalDataForkSizeStart as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The minimum physical data fork file size.
**Example:**

```
dim c as CatSearchMBS
c.PhysicalDataForkSizeStart=0
c.PhysicalDataForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** (Read and Write property)

### 27.1.25 PhysicalResForkSizeEnd as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The maximum physical resource fork file size.
**Example:**

```
dim c as CatSearchMBS
c.PhysicalResForkSizeStart=0
c.PhysicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** You can assign -1 to have no upper limit.
(Read and Write property)

### 27.1.26 PhysicalResForkSizeStart as UInt64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The minimum physical resource fork file size.
**Example:**

```
dim c as CatSearchMBS
c.PhysicalResForkSizeStart=0
c.PhysicalResForkSizeEnd=102400 // search for files <= 100 KB.
```

**Notes:** (Read and Write property)

### 27.1.27 ResponseTimeout as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Sets the timeout for the search.
**Example:**

```
dim c as CatSearchMBS
c.ResponseTimeout=1000 // one second
```

**Notes:** Sets the maximum time that may pass before SearchNext shall return even if no item has been found yet. The default is 15ms.

If you set the timeout to 0, then SearchNext will only return if an item has been found or if the search is finished.

Background:

Searching for a file or folder, especially if the volume does not support CatSearchMBS, can take a lot of time. While the search is in progress, you might want the user to give still access to your app's user interface. If SearchNext would only return once an item is found, the user interface might not be responsive for several seconds, up to minutes. RB's threads would not help here. To solve this, SearchNext returns in timely intervals even when it has nothing found yet. At that time, RB can respond to any user interaction, if necessary. This happens then automatically. All you have to do is to call SearchNext again.
(Read and Write property)

### 27.1.28 Result as folderitem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns the current file and returns nil if none was found.
**Notes:** After CatSearchNext has returned zero, this functions returns the found item else nil.
(Read and Write property)

### 27.1.29 UsedCatSearchForLastSearch as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** whether the last search used the fast catalog search or the slow directory search.
**Notes:** (Read and Write property)

### 27.1.30 UseIndexedSearch as Boolean

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Forces the class to use indexed search.
**Notes:** (Read and Write property)

# Chapter 28

# ChartDirector

## 28.1 class CDAngularAxisMBS

### 28.1.1 class CDAngularAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AngularAxis class represents angular axes in polar charts. The angular axis is the axis representing the angular component of a polar coordinate.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.1.2 Methods

### 28.1.3 addLabel(pos as Double, label as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an extra label on the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| pos | (Mandatory) | The position on the axis to add the label. |
| label | (Mandatory) | The text label to add. |

### 28.1.4 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:

- 28.1.5 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 4682
- 28.1.6 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as color, edgeColor as color) 4683
- 28.1.7 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as Integer, edgeColor as Integer) 4683

### 28.1.5 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an angular zone to the polar chart.
**Notes:** This method is just a short cut to AngularAxis.addZone, in which the starting radius is always 0, and ending radius is the radius of the polar plot region. In other words, the angular zone is a sector on the polar chart.

Parameters:

| | | |
|---|---|---|
| startValue | (Mandatory) | The data value that marks the start angular position of the zone. |
| endValue | (Mandatory) | The data value that marks the end angular position of the zone. |
| fillColor | (Mandatory) | The fill color of the zone. |
| edgeColor | -1 | The edge color of the zone. The default is the same as the fill color. |

See also:

- 28.1.4 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4682
- 28.1.6 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as color, edgeColor as color) 4683
- 28.1.7 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as Integer, edgeColor as Integer) 4683

### 28.1.6 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:

- 28.1.4 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4682
- 28.1.5 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 4682
- 28.1.7 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as Integer, edgeColor as Integer) 4683

### 28.1.7 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as Integer, edgeColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an angular zone to the polar chart.
**Notes:** An angular zone marks an angular region that spans from a start angle to an end angle, where the angles are specified as data values on the angular axis scale. The addZone method allows you to specify a starting and ending radius in pixels for drawing the zone.

| Parameter | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The data value that marks the start angular position of the zone. |
| endValue | (Mandatory) | The data value that marks the end angular position of the zone. |
| startRadius | (Mandatory) | The starting radius of the zone in pixels. |
| endRadius | (Mandatory) | The ending radius of the zone in pixels. |
| fillColor | (Mandatory) | The fill color of the zone. |
| edgeColor | -1 | The edge color of the zone. The default is the same as the fill color. |

See also:

- 28.1.4 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4682
- 28.1.5 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 4682
- 28.1.6 addZone(startValue as Double, endValue as Double, startRadius as Double, endRadius as Double, fillColor as color, edgeColor as color) 4683

### 28.1.8 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.1.9 getAxisImageMap(noOfSegments as Integer, mapWidth as Integer, url as string, queryFormat as string = "", extraAttr as string = "", offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the axis itself.
**Notes:** This method is similar to AngularAxis.getHTMLImageMap. The difference is instead of generating an image map for the labels, it generates an image map for the axis itself. The axis will be divided into a number of segments, with an image map entry created for each segment.

| | | |
|---|---|---|
| noOfSegments | (Mandatory) | The number of segments to divide the axis into. |
| mapWidth | (Mandatory) | The width of the axis used for the purpose of generating the image map. |
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default. Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character. |
| extraAttr | "" | A text string to specify additional attributes to add to the <area>tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string containing the image map generated.

### 28.1.10 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the axis labels.
**Notes:** This method should be called only after creating the chart image (eg. using BaseChart.makeChart). The image map cannot be determined without creating the chart image first.
This method accepts a URL as its argument. When generating an image map, it appends query parameters to the URL to indicate which legend entry the user has clicked.

The following is an example image map generated for an axis with 3 labels.

<area shape="rect" coords="30,220,70,239" href="handler.asp?value=0&label=John">
<area shape="rect" coords="70,220,110,239" href="handler.asp?value=1&label=Mary">
<area shape="rect" coords="110,220,150,239" href="handler.asp?value=2&label=Peter">

The image map consists of multiple <area>tags, one for each label. In the "href" attributes, query parameters are appended to the URL to provide information on the label clicked.
The image map produces by ChartDirector does not include the <map>and </map>tag. This is intentional so that you can add additional custom <area>tags to the image map, or append multiple image maps together.
The format of the appended URL parameters is determined using the queryFormat argument, which by default is:

value= { value } &label= { label }

The texts in curly brackets (i.e. { value } , { label } ) will be replaced by the actual values when generating the image map. For example, { label } will be replaced by the label text.
Please refer to Parameter Substitution and Formatting on all available parameters and how to format them.
In addition to customizing the query parameters, ChartDirector supports additional HTML attributes in the <area>tags using the extraAttr argument.
For example, the following extraAttr will add a "title" HTML attribute to every <area>tag. The "title" attribute will be displayed as "tool tip" when the mouse moves over the image map.

title='Click me for details on { label } '

Another common usage of the extraAttr argument is to add "onmouseover" and "onmouseout" HTML attributes to handle user interaction using Javascript on the browser.

Return Value
A text string containing the image map generated.

| | | |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default. Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character. |
| extraAttr | "" | A text string to specify additional attributes to add to the <area>tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

### 28.1.11 setLabelGap(d as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the distance between the axis labels and the axis.
**Notes:** Parameters:

| | | |
|---|---|---|
| d | (Mandatory) | The distance between the axis label and axis in pixels. |

### 28.1.12 setLabels(labels() as Double, formatString as string = "") as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the numeric labels to be used on the axis.
**Notes:** This method is typically used to set the angular axis to enumerated scale. For more details on what is enumerated axis scale, please refer to AngularAxis.setLabels. In some cases, it may be desirable to skip some labels. If you want to leave a label position empty, use kNoValue as the axis label.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.
See also:

- 28.1.13 setLabels(labels() as string) as CDTextBoxMBS 

| Parameter | Default | Description |
|---|---|---|
| labels | (Mandatory) | An array of numbers to be used as the axis labels. |
| formatString | "" | A format string to specified how to format the labels into human readable form. Please refer to Axis.setLabelFormatfor the syntax of the format string. An empty string means the format will be automatically determined. |

### 28.1.13 setLabels(labels() as string) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text labels to be used on the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the axis. ChartDirector will distribute the labels evenly on the axis. |

This method is typically used in radar charts to set the angular axis to enumerated scale.
In enumerated scale, the labels are laid out evenly on the perimeter of the polar plot area. It is like the labels are at on the vertices of an n-side polygon, where n is the number of labels. Radial grid lines are drawn from the center to the vertices.
The angular coordinates of the data points are determined based on their position in the data array. The first data point will be at the same angular coordinate as the first vertex, the second data point at the second vertex, and so on.
Internally, ChartDirector will assign a value of 0 to the first axis label, 1 to the second axis label, and so on. These values are not visible. Only the axis labels are visible. However, these values may be useful for some ChartDirector features that need to reference the axis position by value, such as adding extra labels using AngularAxis.addLabel.

| Parameter | Default | Description |
|---|---|---|
| text | (Mandatory) | An array of strings containing the text of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.
See also:

- 28.1.12 setLabels(labels() as Double, formatString as string = "") as CDTextBoxMBS 4686

### 28.1.14 setLabelStyle(font as string = "bold", fontsize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font style used to for the axis labels.
**Notes:** See Font Specification for details on various font attributes.

| Parameter | Default | Description |
|---|---|---|
| font | "bold" | The font used to draw the labels. |
| fontSize | 10 | The font size used to draw the labels in points. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.1.15 setLinearScale(lowerLimit as Double, upperLimit as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given linear scale and the given labels.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the axis. ChartDirector will distribute the labels evenly on the axis. |

See also:

- 28.1.16 setLinearScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0)

### 28.1.16 setLinearScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given linear scale.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| majorTickInc | 0 | Adds major ticks to the axis, where the major ticks are separated by majorTickInc in value. Each major tick will have an associated text label for the value if the axis at the tick. The default value of 0 means no major tick is used. |
| minorTickInc | 0 | Adds minor ticks to the axis, where the minor ticks are separated by minorTickInc in value. The default value of 0 means no minor tick is used. |

See also:

- 28.1.15 setLinearScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4688

## 28.2 class CDAngularMeterMBS

### 28.2.1 class CDAngularMeterMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AngularMeter class represents angular meters.
**Example:**

```
// The value to display on the meter
const value = 27.48

// Create an AngularMeter object of size 200 x 115 pixels, with silver background
// color, black border, 2 pixel 3D border border and rounded corners
dim m as new CDAngularMeterMBS(200, 115, CDBaseChartMBS.silverColor, &h000000, 2)
m.setRoundedFrame

// Set the meter center at (100, 100), with radius 85 pixels, and span from -90
// to +90 degress (semi-circle)
m.setMeter(100, 100, 85, -90, 90)

// Meter scale is 0 - 100, with major tick every 20 units, minor tick every 10
// units, and micro tick every 5 units
m.setScale(0, 100, 20, 10, 5)

// Set 0 - 60 as green (66FF66) zone
m.addZone(0, 60, 0, 85, &h66ff66)

// Set 60 - 80 as yellow (FFFF33) zone
m.addZone(60, 80, 0, 85, &hffff33)

// Set 80 - 100 as red (FF6666) zone
m.addZone(80, 100, 0, 85, &hff6666)

// Add a text label centered at (100, 60) with 12 pts Arial Bold font
call m.addText(100, 60, "PSI", "arialbd.ttf", 12, CDBaseChartMBS.kTextColor, CDBaseChartMBS.kCen-
ter)

// Add a text box at the top right corner of the meter showing the value
// formatted to 2 decimal places, using white text on a black background, and
// with 1 pixel 3D depressed border
m.addText(156, 8, m.formatValue(value, "2"), "arial.ttf", 8, &hffffff).setBackground(&h000000, 0, -1)

// Add a semi-transparent blue (40666699) pointer with black border at the
// specified value
call m.addPointer(value, &h40666699, &h000000)

// Output the chart
```

Backdrop=m.makeChartPicture

**Notes:** Subclass of the CDBaseMeterMBS class.
**Blog Entries**

- ChartDirector Meters and Gauges
- MBS Xojo Plugins, version 20.4pr2
- Chart Diagrams with Xojo
- MBS Xojo / Real Studio Plugins, version 15.2pr4
- Dock Meter Example

**Xojo Developer Magazine**

- 7.4, page 35: Easy Charts and Graphs, Using the ChartDirector Plugin
- 21.6, pages 81 to 82: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes

### 28.2.2 Methods

### 28.2.3 addGlare

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds glare effect to the meter.
**Notes:** The glare effect is created by brightening part of the meter face.
The face is divided by an arc, of which one part is brightened. The glare effect works best for meters with dark background.
All parameters are optional.

See also:


- 28.2.4 addGlare(radius as Double, span as Double = 135, rotate as Double = 0.0) 4691
- 28.2.5 addGlare(radius as Double, span as Double, rotate as Double, glareRadius as Double, intensity as Double = 0.13) 4693


### 28.2.4 addGlare(radius as Double, span as Double = 135, rotate as Double = 0.0)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| radius | NoValue | The radius of the face of the meter. The default is the meter scale radius as set by AngularMeter.setMeter. |
| span | 135 | The angular span of the arc that divides the face into two parts. The dividing arc intersects with the face border at two points. The angular span is defined as center angle of these two points (that is, the angle subtended at the meter center by these two points). |
| rotate | 0 | By default, the glare will be symmetrically with respect to the vertical axis. This argument can be used to rotate the glare clockwise in degrees. |
| glareRadius | NoValue | The radius of the arc that divides the face into two parts. A positive value means the arc will result in a convex glare, while a negative means concave glare. The default is equal to 1.5 times of the face radius. |
| intensity | 0.13 | The intensity of the glare, which must be from 0 to 1. A value of 0 means no glare, while a value of 1 means the glare will be 100% white. |

**Function:** Adds glare effect to the meter.
**Notes:** The glare effect is created by brightening part of the meter face.
The face is divided by an arc, of which one part is brightened. The glare effect works best for meters with dark background.
All parameters are optional.

| Argument | Default | Description |
|---|---|---|
| radius | NoValue | The radius of the face of the meter. The default is the meter scale radius as set by AngularMeter.setMeter. |
| span | 135 | The angular span of the arc that divides the face into two parts. The dividing arc intersects with the face border at two points. The angular span is defined as center angle of these two points (that is, the angle subtended at the meter center by these two points). |
| rotate | 0 | By default, the glare will be symmetrically with respect to the vertical axis. This argument can be used to rotate the glare clockwise in degrees. |
| glareRadius | NoValue | The radius of the arc that divides the face into two parts. A positive value means the arc will result in a convex glare, while a negative means concave glare. The default is equal to 1.5 times of the face radius. |
| intensity | 0.13 | The intensity of the glare, which must be from 0 to 1. A value of 0 means no glare, while a value of 1 means the glare will be 100% white. |

See also:


- 28.2.3 addGlare 4691
- 28.2.5 addGlare(radius as Double, span as Double, rotate as Double, glareRadius as Double, intensity as Double = 0.13) 4693

### 28.2.5 addGlare(radius as Double, span as Double, rotate as Double, glareRadius as Double, intensity as Double = 0.13)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds glare effect to the meter.
**Notes:** The glare effect is created by brightening part of the meter face.
The face is divided by an arc, of which one part is brightened. The glare effect works best for meters with dark background.
All parameters are optional.

| Argument | Default | Description |
|---|---|---|
| radius | NoValue | The radius of the face of the meter. The default is the meter scale radius as set by AngularMeter.setMeter. |
| span | 135 | The angular span of the arc that divides the face into two parts. The dividing arc intersects with the face border at two points. The angular span is defined as center angle of these two points (that is, the angle subtended at the meter center by these two points). |
| rotate | 0 | By default, the glare will be symmetrically with respect to the vertical axis. This argument can be used to rotate the glare clockwise in degrees. |
| glareRadius | NoValue | The radius of the arc that divides the face into two parts. A positive value means the arc will result in a convex glare, while a negative means concave glare. The default is equal to 1.5 times of the face radius. |
| intensity | 0.13 | The intensity of the glare, which must be from 0 to 1. A value of 0 means no glare, while a value of 1 means the glare will be 100% white. |

See also:


- 28.2.3 addGlare 4691
- 28.2.4 addGlare(radius as Double, span as Double = 135, rotate as Double = 0.0) 4691


### 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

of the pointer.
See also:


- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers

are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:

- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701

### 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:


- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693
- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699

- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700

- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:


- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693

- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694

- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:

- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693
- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:


- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693
- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |


- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:


- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |


- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4701


### 28.2.13 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new style pointer to the meter.
**Notes:** When compared to classical pointers (added by CDBaseMeterMBS.addPointer), new style pointers are thinner. They are designed to be used with the new style meter cap (see CDAngularMeterMBS.setCap2). They are also designed to have their base and tip movable in the radial direction, which means they can be detached from the center, and can even points from the outside inwards.
Parameters are optional and colors can be passed as Integer or color values.

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer points to. |
| fillColor | (Mandatory) | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. -1 means the edge color is the same as the fill color. |
| pointerType | TriangularPointer2 | The pointer shape. Please refer to MeterPointer.setShapeAndOffset for the available shapes. |
| startOffset | NoValue | The distance between the starting point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| endOffset | NoValue | The distance between the ending point of the pointer with the meter center, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. Please refer to MeterPointer.setShapeAndOffset for more information about this argument. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

Return a MeterPointer object representing the pointer. You may use this object to fine-tune the appearance of the pointer.
See also:

- 28.2.6 addPointer(value as Double, fillColor as color, edgeColor as color = &cFFFFFFFF, pointerType as Integer = 6) as CDMeterPointerMBS 4693
- 28.2.7 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4694
- 28.2.8 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4696
- 28.2.9 addPointer(value as Double, fillColor as color, edgeColor as color, pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) as CDMeterPointerMBS 4697
- 28.2.10 addPointer(value as Double, fillColor as Integer, edgeColor as Integer = -1, pointerType as Integer = 6) as CDMeterPointerMBS 4698
- 28.2.11 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double) as CDMeterPointerMBS 4699
- 28.2.12 addPointer(value as Double, fillColor as Integer, edgeColor as Integer, pointerType as Integer, startOffset as Double, endOffset as Double) as CDMeterPointerMBS 4700

### 28.2.14 addRing(startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addRing method, but uses color instead of integer data type for passing color values.
See also:

- 28.2.15 addRing(startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1) 4703

### 28.2.15 addRing(startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a circular ring or a circle to the meter.
**Notes:** A ring is the region between two concentric circles. This method is most often used for adding circular borders and backgrounds for the meter, and for some other decorative purposes. For example, one can add a circle with a metallic background color as the 'face' of the meter meter using this method.

| Parameter | Default | Description |
|---|---|---|
| startRadius | (Mandatory) | The starting radius of the ring in pixels. To add a circle, set the start radius to 0. |
| endRadius | (Mandatory) | The ending radius of the ring in pixels. |
| fillColor | (Mandatory) | The fill color of the ring. |
| edgeColor | -1 | The edge color of the ring. The default is the same as the fill color. |

See also:

- 28.2.14 addRing(startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color) 4702

### 28.2.16 addRingSector(startRadius as Integer, endRadius as Integer, a1 as Double, a2 as Double, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addRingSector method, but uses color instead of integer data type for passing color values.
See also:

- 28.2.17 addRingSector(startRadius as Integer, endRadius as Integer, a1 as Double, a2 as Double, fillColor as Integer, edgeColor as Integer = -1) 4704

### 28.2.17 addRingSector(startRadius as Integer, endRadius as Integer, a1 as Double, a2 as Double, fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a ring sector or a sector to the meter.
**Notes:** This method is similar to the AngularMeter.addRing method, except that the ring it adds does not span the complete circle, but just part of the circle.

| Parameter | Default | Description |
|---|---|---|
| startRadius | (Mandatory) | The starting radius of the ring sector in pixels. To add a sector, set the starting radius to 0. |
| endRadius | (Mandatory) | The ending radius of the ring sector in pixels. |
| a1 | (Mandatory) | The starting angle of the ring sector in degrees. The angle is measured in degrees clockwise, with 0 being the upward pointing direction. |
| a2 | (Mandatory) | The ending angle of the ring sector in degrees. The angle is measured in degrees clockwise, with 0 being the upward pointing direction. |
| fillColor | (Mandatory) | The fill color of the ring sector. |
| edgeColor | -1 | The edge color of the ring sector. The default is the same as the fill color. |

See also:

- 28.2.16 addRingSector(startRadius as Integer, endRadius as Integer, a1 as Double, a2 as Double, fillColor as color, edgeColor as color) 4703

### 28.2.18 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer = 0, edgeColor as color = &cFFFFFFFF, scaleRadius as Integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a background to the meter scale.
**Notes:** The scale background is a circle segment (a circle with a part cut-off by a chord). Its radius is usually configured as larger than that of the meter scale. In this case, its angular span will also be larger than that of the meter scale. In the above sample, the meter scale spans 180 degrees. The scale background spans more than 180 degrees so that it can maintain a margin at the bottom side (the chord side).
Most arguments are optional and colors can be passed as Integer or color value.

See also:

- 28.2.19 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer, edgeColor as color, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4705
- 28.2.20 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer = 0, edgeColor as Integer = -1, scaleRadius as Integer = -2147483647) 4706

| Argument | Default | Description |
|---|---|---|
| bgRadius | (Mandatory) | The radius of the circle segment to be used as the scale background. |
| fillColor | (Mandatory) | The fill color of the circle segment (the background color). |
| edgeWidth | 0 | The edge width of the circle segment. A positive width means the edge is internal to the circle segment. A negative width means the edge is external to the circle segment. |
| edgeColor | -1 | The edge color. The default value of -1 means the edge color is the same as the fill color. |
| scaleRadius | -0x7fffffff | The radius of the meter scale. ChartDirector uses this value to compute the extra angular span the circle segment must have in order to maintain proper margin at the chord side. This argument is usually not necessary as ChartDirector already know the scale radius from the meter configuration. This argument can be used if you would like to use a "fake" scale radius to draw the scale background for special effects. |
| startAngle | NoValue | The start angle of the meter scale. ChartDirector uses this value to compute start angle of the circle segment. This argument is usually not necessary as ChartDirector already know the start angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |
| endAngle | NoValue | The end angle of the meter scale. ChartDirector uses this value to compute end angle of the circle segment. This argument is usually not necessary as ChartDirector already know the end angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |

- 28.2.21 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer, edgeColor as Integer, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4707

### 28.2.19 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer, edgeColor as color, scaleRadius as Integer, startAngle as Double, endAngle as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a background to the meter scale.
**Notes:** The scale background is a circle segment (a circle with a part cut-off by a chord). Its radius is usually configured as larger than that of the meter scale. In this case, its angular span will also be larger than that of the meter scale. In the above sample, the meter scale spans 180 degrees. The scale background spans more than 180 degrees so that it can maintain a margin at the bottom side (the chord side).
Most arguments are optional and colors can be passed as Integer or color value.

See also:

- 28.2.18 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer = 0, edgeColor as color = &cFFFFFFFF, scaleRadius as Integer = -2147483647) 4704

| Argument | Default | Description |
|---|---|---|
| bgRadius | (Mandatory) | The radius of the circle segment to be used as the scale background. |
| fillColor | (Mandatory) | The fill color of the circle segment (the background color). |
| edgeWidth | 0 | The edge width of the circle segment. A positive width means the edge is internal to the circle segment. A negative width means the edge is external to the circle segment. |
| edgeColor | -1 | The edge color. The default value of -1 means the edge color is the same as the fill color. |
| scaleRadius | -0x7fffffff | The radius of the meter scale. ChartDirector uses this value to compute the extra angular span the circle segment must have in order to maintain proper margin at the chord side. This argument is usually not necessary as ChartDirector already know the scale radius from the meter configuration. This argument can be used if you would like to use a "fake" scale radius to draw the scale background for special effects. |
| startAngle | NoValue | The start angle of the meter scale. ChartDirector uses this value to compute start angle of the circle segment. This argument is usually not necessary as ChartDirector already know the start angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |
| endAngle | NoValue | The end angle of the meter scale. ChartDirector uses this value to compute end angle of the circle segment. This argument is usually not necessary as ChartDirector already know the end angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |


- 28.2.20 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer = 0, edgeColor as Integer = -1, scaleRadius as Integer = -2147483647) 4706
- 28.2.21 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer, edgeColor as Integer, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4707


### 28.2.20 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer = 0, edgeColor as Integer = -1, scaleRadius as Integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a background to the meter scale.
**Notes:** The scale background is a circle segment (a circle with a part cut-off by a chord). Its radius is usually configured as larger than that of the meter scale. In this case, its angular span will also be larger than that of the meter scale. In the above sample, the meter scale spans 180 degrees. The scale background spans more than 180 degrees so that it can maintain a margin at the bottom side (the chord side).
Most arguments are optional and colors can be passed as Integer or color value.

See also:

| Argument | Default | Description |
|---|---|---|
| bgRadius | (Mandatory) | The radius of the circle segment to be used as the scale background. |
| fillColor | (Mandatory) | The fill color of the circle segment (the background color). |
| edgeWidth | 0 | The edge width of the circle segment. A positive width means the edge is internal to the circle segment. A negative width means the edge is external to the circle segment. |
| edgeColor | -1 | The edge color. The default value of -1 means the edge color is the same as the fill color. |
| scaleRadius | -0x7fffffff | The radius of the meter scale. ChartDirector uses this value to compute the extra angular span the circle segment must have in order to maintain proper margin at the chord side. This argument is usually not necessary as ChartDirector already know the scale radius from the meter configuration. This argument can be used if you would like to use a "fake" scale radius to draw the scale background for special effects. |
| startAngle | NoValue | The start angle of the meter scale. ChartDirector uses this value to compute start angle of the circle segment. This argument is usually not necessary as ChartDirector already know the start angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |
| endAngle | NoValue | The end angle of the meter scale. ChartDirector uses this value to compute end angle of the circle segment. This argument is usually not necessary as ChartDirector already know the end angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |


- 28.2.18 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer = 0, edgeColor as color = &cFFFFFFFF, scaleRadius as Integer = -2147483647) 4704
- 28.2.19 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer, edgeColor as color, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4705
- 28.2.21 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer, edgeColor as Integer, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4707


### 28.2.21 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer, edgeColor as Integer, scaleRadius as Integer, startAngle as Double, endAngle as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a background to the meter scale.
**Notes:** The scale background is a circle segment (a circle with a part cut-off by a chord). Its radius is usually configured as larger than that of the meter scale. In this case, its angular span will also be larger than that of the meter scale. In the above sample, the meter scale spans 180 degrees. The scale background spans more than 180 degrees so that it can maintain a margin at the bottom side (the chord side).
Most arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| bgRadius | (Mandatory) | The radius of the circle segment to be used as the scale background. |
| fillColor | (Mandatory) | The fill color of the circle segment (the background color). |
| edgeWidth | 0 | The edge width of the circle segment. A positive width means the edge is internal to the circle segment. A negative width means the edge is external to the circle segment. |
| edgeColor | -1 | The edge color. The default value of -1 means the edge color is the same as the fill color. |
| scaleRadius | -0x7fffffff | The radius of the meter scale. ChartDirector uses this value to compute the extra angular span the circle segment must have in order to maintain proper margin at the chord side. This argument is usually not necessary as ChartDirector already know the scale radius from the meter configuration. This argument can be used if you would like to use a "fake" scale radius to draw the scale background for special effects. |
| startAngle | NoValue | The start angle of the meter scale. ChartDirector uses this value to compute start angle of the circle segment. This argument is usually not necessary as ChartDirector already know the start angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |
| endAngle | NoValue | The end angle of the meter scale. ChartDirector uses this value to compute end angle of the circle segment. This argument is usually not necessary as ChartDirector already know the end angle from the meter configuration. This argument can be used if you would like to use a "fake" angle to draw the scale background for special effects. |

See also:

- 28.2.18 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer = 0, edgeColor as color = &cFFFFFFFF, scaleRadius as Integer = -2147483647) 4704
- 28.2.19 addScaleBackground(bgRadius as Integer, fillColor as color, edgeWidth as Integer, edgeColor as color, scaleRadius as Integer, startAngle as Double, endAngle as Double) 4705
- 28.2.20 addScaleBackground(bgRadius as Integer, fillColor as Integer, edgeWidth as Integer = 0, edgeColor as Integer = -1, scaleRadius as Integer = -2147483647) 4706

### 28.2.22 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:

- 88.3.28 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 14076

- 28.2.24 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color) 4709
- 28.2.25 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1) 4710


### 28.2.23 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a colored zone to the meter.
**Notes:** This method is just a short cut to AngularMeter.addZone, in which the starting radius is always 0, and ending radius is the radius of the meter scale. In other words, the zone is a sector on the meter.

| Parameter | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The data value that marks the start position of the zone. |
| endValue | (Mandatory) | The data value that marks the end position of the zone. |
| fillColor | (Mandatory) | The fill color of the zone. |
| edgeColor | -1 | The edge color of the zone. The default is the same as the fill color. |

See also:


- 28.2.22 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4708
- 28.2.24 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color) 4709
- 28.2.25 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1) 4710


### 28.2.24 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:


- 28.2.22 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4708
- 88.3.28 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 14076
- 28.2.25 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1) 4710

### 28.2.25 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a colored zone to the meter.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The data value that marks the start position of the zone. |
| endValue | (Mandatory) | The data value that marks the end position of the zone. |
| startRadius | (Mandatory) | The starting radius of the zone in pixels. |
| endRadius | (Mandatory) | The ending radius of the zone in pixels. |
| fillColor | (Mandatory) | The fill color of the zone. |
| edgeColor | -1 | The edge color of the zone. The default is the same as the fill color. |

See also:

- 28.2.22 addZone(startValue as Double, endValue as Double, fillColor as color, edgeColor as color) 4708
- 88.3.28 addZone(startValue as Double, endValue as Double, fillColor as Integer, edgeColor as Integer = -1) 14076
- 28.2.24 addZone(startValue as Double, endValue as Double, startRadius as Integer, endRadius as Integer, fillColor as color, edgeColor as color) 4709

### 28.2.26 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.2.27 Constructor(width as Integer, height as Integer, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 4710

### 28.2.27 Constructor(width as Integer, height as Integer, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Parameter | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

**Function:** Creates a new AngularMeter object.
**Notes:**

See also:

- 28.2.26 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 4710

### 28.2.28 relativeLinearGradient(gradient() as Double, angle as Double = 0.0, radius as Double = -1.0) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a linear gradient color relative to the meter center and radius.
**Notes:** A general linear gradient color can be created by CDBaseChartMBS.linearGradientColor, which involves specifying the x and y coordinates of the starting and ending points and the color stops. The relativeLinearGradient simplifies creating a linear gradient by assuming the gradient line passes through the meter center at an configurable angle.

The linear gradient is defined using an array of numbers, in which each pair of numbers represents the relative distance and its associated color. The relative distance is the ratio of the absolute distance to the reference radius, which defaults to the meter scale radius (set by AngularMeter.setMeter).

For example, to define a linear gradient with blue (0000FF) at the bottom-left of reference radius, green (00FF00) at the center, and red (FF0000) at the top-right of the reference radius, the angle should be set to 45 degrees, and the array of numbers should be:

-1.0, &H0000ff, 0.0, &H00ff00, 1.0, &Hff0000

The relative distances in the array should be arranged in increasing order. It is possible to define a relative linear gradient shorter or longer than the reference radius by using a relative distance of magnitude smaller or greater than 1. A negative relative distance means the distance is measured at the opposite side of center.

Returns a 32-bit integer representing the linear gradient color.

| Argument | Default | Description |
|---|---|---|
| gradient | (Mandatory) | An numeric array defining the color stops. Please refer to the description above for details. |
| angle | 0 | The direction of the linear gradient line. It is specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |
| radius | -1 | The reference radius to define the relative distance. The default is the meter scale radius (set by CDAngularMeterMBS.setMeter). |

### 28.2.29 relativeRadialGradient(gradient() as Double, radius as Double = -1.0) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a radial gradient color relative to the meter center and radius.
**Notes:** A general radial gradient color can be created by CDBaseChartMBS.radialGradientColor, which involves specifying the center x and y coordinates, horizontal and vertical radii, and the color stops. The relativeRadialGradient simplifies creating a radial gradient by assuming the center of the radial gradient to be the meter center, and the radial pattern is circular (so that the vertical and horizontal radii are the same), and default to using the meter scale radius (set by AngularMeter.setMeter) as the reference radius.

The radial gradient is defined using an array of numbers, in which each pair of numbers represents the relative radius and its associated color. The relative radius is the ratio of the absolute radius to the reference radius.

For example, to define a radial gradient with blue (0000FF) at the center, green (00FF00) at the mid-point between the center and the reference radius, and red at the reference radius, the numbers should be:

0.0, &H0000ff, 0.5, &H00ff00, 1.0, &Hff0000

The relative radii in the array must be arranged in increasing order. It is possible to define a relative radial gradient smaller or larger than the reference radius by using a relative radius smaller or greater than 1.

| Argument | Default | Description |
|---|---|---|
| gradient | (Mandatory) | An numeric array defining the color stops. Please refer to the description above for details. |
| radius | -1 | The reference radius of the radial gradient. The default is the meter scale radius (set by CDAngularMeterMBS.setMeter). |

Returns a 32-bit integer representing the radial gradient color.

### 28.2.30 setCap(radius as Integer, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the radius and color of the pointer cap.
**Notes:** The pointer cap is a circle at the center of the meter above the meter pointer. By default, it is a small circle 3 pixels in radius, so it looks like a "pivot" for the pointer for it to rotate about the center.

You may change the radius and colors of this circle using this method to achieve other visual effects.

| Parameter | Default | Description |
|---|---|---|
| radius | (Mandatory) | The radius of pointer cap circle in pixels. |
| fillColor | (Mandatory) | The fill color of the pointer cap circle. |
| edgeColor | LineColor | The edge color of the pointer cap circle. |

See also:

- 28.2.31 setCap(radius as Integer, fillColor as Integer, edgeColor as Integer = &hffff0001) 4713

### 28.2.31 setCap(radius as Integer, fillColor as Integer, edgeColor as Integer = &hffff0001)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the radius and color of the pointer cap.
**Notes:** The pointer cap is a circle at the center of the meter above the meter pointer. By default, it is a small circle 3 pixels in radius, so it looks like a "pivot" for the pointer for it to rotate about the center.

You may change the radius and colors of this circle using this method to achieve other visual effects.

| Parameter | Default | Description |
|---|---|---|
| radius | (Mandatory) | The radius of pointer cap circle in pixels. |
| fillColor | (Mandatory) | The fill color of the pointer cap circle. |
| edgeColor | LineColor | The edge color of the pointer cap circle. |

See also:

- 28.2.30 setCap(radius as Integer, fillColor as color, edgeColor as color) 4713

### 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721

- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717

- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:

- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |


- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be

sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724

### 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721

- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716

- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:

- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |


- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4724


### 28.2.41 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the meter to use new style pointer cap.
**Notes:** The new style pointer cap is a circular object covering the the center of the meter. If is designed to be used with new style pointers (added with AngularMeter.addPointer2). The cap consists of two circles, one at the background below the pointer, and one covering the pointer. The pointer will appear to be

sandwiched between these two circles.
Arguments are optional and colors can be passed as Integer or color value.

| Argument | Default | Description |
|---|---|---|
| backColor | 0x888888 | The fill color of the back circle. |
| frontColor | 0x000000 | The fill color of the front circle. |
| frontEdgeColor | 0x888888 | The edge color of the front circle. |
| lightingRatio | NoValue | By default, lighting effect is applied to the back circle and the edge of the front circle, such that the bottom-right side will appear to be darkened. This argument configures how bright the bottom-right side is. The default value is 0.2, which means the bottom-right side is 20% as bright as the top-left side. Setting this argument to 1 disables the lighting effect. |
| backRadiusRatio | NoValue | The radius of the back circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.15. |
| frontRadiusRatio | NoValue | The radius of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.11. |
| frontEdgeWidthRatio | NoValue | The edge width of the front circle, expressed as a ratio to the meter scale radius (set with AngularMeter.setMeter). The default is 0.01. |

See also:


- 28.2.32 setCap2(backcolor as Color = &c888888, frontColor as Color = &c000000, frontEdgeColor as Color = &c888888) 4714
- 28.2.33 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double) 4715
- 28.2.34 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double) 4716
- 28.2.35 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4717
- 28.2.36 setCap2(backcolor as Color, frontColor as Color, frontEdgeColor as Color, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double, frontEdgeWidthRatio as Double) 4718
- 28.2.37 setCap2(backcolor as Integer = &h888888, frontColor as Integer = &h000000, frontEdgeColor as Integer = &h888888) 4720
- 28.2.38 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double) 4721
- 28.2.39 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double) 4722
- 28.2.40 setCap2(backcolor as Integer, frontColor as Integer, frontEdgeColor as Integer, lightingRatio as Double, backRadiusRatio as Double, frontRadiusRatio as Double) 4723

### 28.2.42 setMeter(cx as Integer, cy as Integer, radius as Integer, startAngle as Double, endAngle as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and angle range of the meter.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x-coordinate of the center of the meter. |
| cy | (Mandatory) | The y-coordinate of the center of the meter. |
| radius | (Mandatory) | The radius of the meter. |
| startAngle | (Mandatory) | The start angle of the meter. The angle is measured in degrees clockwise, with 0 being the upward pointing direction. |
| endAngle | (Mandatory) | The end angle of the meter. The angle is measured in degrees clockwise, with 0 being the upward pointing direction. |

### 28.2.43 Screenshots

### 28.2.44 squareameter.jpg

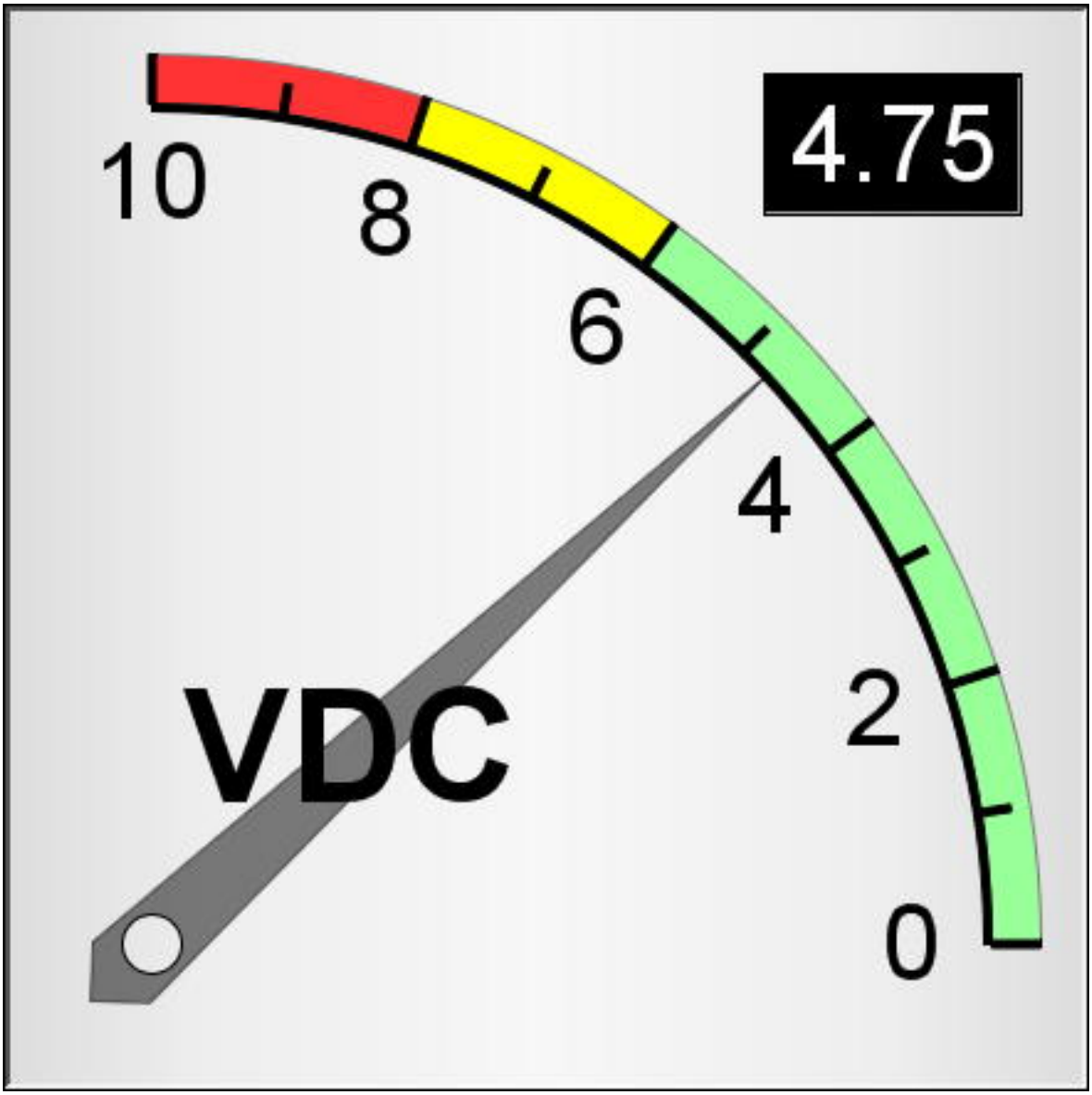


**Function:** A meter created using ChartDirector with the CDAngularMeterMBS class.

## 28.3 class CDAreaLayerMBS

### 28.3.1 class CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AreaLayer class represents area layers.
**Example:**

```
// The data for the area chart
dim data0(-1) as Double = array(42, 49, 33, 38, 51, 46, 29, 41, 44, 57, 59, 52, 37, 34, 51, 56, 56, 60, 70, 76,
63, 67, 75, 64, 51.0)
dim data1(-1) as Double = array(50, 45, 47, 34, 42, 49, 63, 62, 73, 59, 56, 50, 64, 60, 67, 67, 58, 59, 73, 77,
84, 82, 80, 84, 89.0)
dim data2(-1) as Double = array(61, 79, 85, 66, 53, 39, 24, 21, 37, 56, 37, 22, 21, 33, 13, 17, 4, 23, 16, 25, 9,
10, 5, 7, 16.0)
dim labels(-1) as string = array("0", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "11", "12", "13", "14",
"15", "16", "17", "18", "19", "20", "21", "22", "23", "24")

// Create a XYChart object of size 500 x 300 pixels
dim c as new CDXYChartMBS(500, 300)

// Set the plotarea at (90, 30) and of size 300 x 240 pixels.
call c.setPlotArea(90, 30, 300, 240)

// Add a legend box at (405, 100)
call c.addLegend(405, 100)

// Add a title to the chart
call c.addTitle("Daily System Load")

// Add a title to the y axis. Draw the title upright (font angle = 0)
c.yAxis.setTitle("Database"+endofline.unix+"Queries"+endofline.unix+"(per sec)").setFontAngle(0)

// Set the labels on the x axis.
call c.xAxis.setLabels(labels)

// Display 1 out of 2 labels on the x-axis. Show minor ticks for remaining
// labels.
c.xAxis.setLabelStep(2, 1)

// Add an area layer
dim layer as CDAreaLayerMBS
layer = c.addAreaLayer

// Draw the area layer in 3D
layer.set3D
```

```
// Add the three data sets to the area layer
call layer.addDataSet(data0, -1, "Server # 1")
call layer.addDataSet(data1, -1, "Server # 2")
call layer.addDataSet(data2, -1, "Server # 3")

// Output the chart
Backdrop=c.makeChartPicture
```

**Notes:** Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.3.2 Methods

### 28.3.3 setGapColor(fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGapColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.3.4 setGapColor(fillColor as Integer) 4729

### 28.3.4 setGapColor(fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color used to fill the area under kNoValue data points.
**Notes:** By default, if there are kNoValue data points, ChartDirector will interpolate using the remaining data points. The area will remain continuous.

This method can be used to set up an alternative color to represent the area at kNoValue data point positions. In particular, if the fillColor argument is set to Transparent, the kNoValue data points will result in gaps in the area.

| Parameter | Default | Description |
|---|---|---|
| fillColor | (Mandatory) | The color used to fill the area region at kNoValue data point positions. |

See also:

- 28.3.3 setGapColor(fillColor as color) 4729

### 28.3.5 setMinLabelSize(s as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum height (or width if x and y axes are swapped) of an area below which data labels will be hidden.
**Notes:** In ChartDirector, for an area layer, data labels (Layer.setDataLabelStyle) are drawn internal to the area, while the aggregate labels (Layer.setAggregateLabelStyle) are drawn external to the area.

ChartDirector will disable data labels if the area height (or width if x and y axes are swapped) is too small to contain the data label.

By default, ChartDirector will automatically determine what is meant by "too small". The setMinLabelSize method can be used to manually defined the threshold for "too small".

Sometimes it may be desirable to display the data label even though it cannot be contained within the area. In this case, the setMinLabelSize can be used to set the threshold to 0.

| Parameter | Default | Description |
|---|---|---|
| s | (Mandatory) | The minimum height (or width if x and y axes are swapped) of an area below which data labels will be hidden. |

## 28.4 class CDArrayMBS

### 28.4.1 class CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CDArrayMBS class is a utility class used to perform array computations.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr5
- MBS Real Studio Plugins, version 13.1pr16

### 28.4.2 Methods

### 28.4.3 abs

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its absolute value.

### 28.4.4 acc

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by the accumulated total of its previous element (including itself).

### 28.4.5 addArray(value as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array will be added by adding the each array element to the corresponding element of the CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| Values | (Mandatory) | A CDArrayMBS with numbers to be added to the CDArrayMBS object. |

This method does not append a new value to the array.
See also:

- 28.4.6 addArray(value() as Double) 4732

### 28.4.6 addArray(value() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array will be added by adding the each array element to the corresponding element of the CDArrayMBS object.
**Example:**

```
dim src(-1) as Double = Array( 63.1, 10.15, 6.15, 2.88 )
dim data As New CDArrayMBS(array(1.0, 1.0, 1.0, 1.0))

data.addArray( src )

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:**

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers to be added to the CDArrayMBS object. |

This method does not append a new value to the array.
See also:

- 28.4.5 addArray(value as CDArrayMBS) 4731

### 28.4.7 addValue(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number to every element of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))

data.addValue(5)

dim lines(-1) as string
```

```
lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:**

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | A number to be added to every element of the CDArrayMBS object. |

This method does not append a new value to the array.

### 28.4.8 aggregate(srcArray() as Double, aggregateMethod as Integer, param as Double = 50.0) as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Aggregates a data array by merging groups of elements, similar to the GROUP BY clause in SQL statements.
**Notes:** This primary usage of this method is for changing data resolution, such as to convert a daily data into weekly data.

If the data is from a database, aggregation can often be more efficiently and conveniently performed by using the GROUP BY clause of SQL. This method should only be used when the data are not coming from a database, or the aggregation method are not supported by the database used.

In this method, the CDArrayMBS object represents the delimiters used to group elements in the srcArray. The positions of all non-kNoValue elements in the CDArrayMBS object will be used as delimiters positions.

For example, if the CDArrayMBS object consists of an array of 50 elements, and only the elements at 0, 10, 20, 30, 40 are not NoValue, then the groups will be defined as positions 0 - 9, 10 - 19, 20 - 29, 30 - 39 and 40 - 49.

Note that a group includes the starting delimiter position but excludes the ending delimiter position.

The CDArrayMBS object is typically created by applying CDArrayMBS.selectStartOfHour, CDArrayMBS.se-

lectStartOfDay, CDArrayMBS.selectStartOfWeek, CDArrayMBS.selectStartOfMonth, CDArrayMBS.select-StartOfYear or CDArrayMBS.selectRegularSpacing to a data array.

For example, to group daily data into weekly data, one may create an CDArrayMBS object with the dates of the daily data, then CDArrayMBS.selectStartOfWeek to select only the elements representing the start of a week. The resulting CDArrayMBS object can then be used to aggregate daily data into weekly data.

Due to aggregation, the length of the output array will usually be shorter than, and never be longer than, the length of the input array.

| Parameter | Default | Description |
|---|---|---|
| srcArray | (Mandatory) | The array to be aggregated. |
| aggregateMethod | (Mandatory) | The method to aggregate the data, which must be one of AggregateSum, AggregateAvg, AggregateStdDev, AggregateMin, AggregateMed, AggregateMax, AggregatePercentile, AggregateFirst, AggregateLast, AggregateCount. |
| param | 50 | The aggregation parameter, if needed. Currently, only AggregatePercentile needs a parameter to specify the percentile used. |

### 28.4.9 aggregateValues(srcArray() as Double, aggregateMethod as Integer, param as Double = 50.0) as Double()

MBS ChartDirector Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Aggregates a data array by merging groups of elements, similar to the GROUP BY clause in SQL statements.
**Notes:** This primary usage of this method is for changing data resolution, such as to convert a daily data into weekly data.

If the data is from a database, aggregation can often be more efficiently and conveniently performed by using the GROUP BY clause of SQL. This method should only be used when the data are not coming from a database, or the aggregation method are not supported by the database used.

In this method, the CDArrayMBS object represents the delimiters used to group elements in the srcArray. The positions of all non-kNoValue elements in the CDArrayMBS object will be used as delimiters positions.

For example, if the CDArrayMBS object consists of an array of 50 elements, and only the elements at 0, 10, 20, 30, 40 are not NoValue, then the groups will be defined as positions 0 - 9, 10 - 19, 20 - 29, 30 - 39 and 40 - 49.

Note that a group includes the starting delimiter position but excludes the ending delimiter position.

The CDArrayMBS object is typically created by applying CDArrayMBS.selectStartOfHour, CDArrayMBS.selectStartOfDay, CDArrayMBS.selectStartOfWeek, CDArrayMBS.selectStartOfMonth, CDArrayMBS.selectStartOfYear or CDArrayMBS.selectRegularSpacing to a data array.

For example, to group daily data into weekly data, one may create an CDArrayMBS object with the dates of the daily data, then CDArrayMBS.selectStartOfWeek to select only the elements representing the start of a week. The resulting CDArrayMBS object can then be used to aggregate daily data into weekly data.

Due to aggregation, the length of the output array will usually be shorter than, and never be longer than, the length of the input array.

| Parameter | Default | Description |
|---|---|---|
| srcArray | (Mandatory) | The array to be aggregated. |
| aggregateMethod | (Mandatory) | The method to aggregate the data, which must be one of AggregateSum, AggregateAvg, AggregateStdDev, AggregateMin, AggregateMed, AggregateMax, AggregatePercentile, AggregateFirst, AggregateLast, AggregateCount. |
| param | 50 | The aggregation parameter, if needed. Currently, only AggregatePercentile needs a parameter to specify the percentile used. |

### 28.4.10 avg as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the avg value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.avg) // shows 2.5
```

### 28.4.11 Constructor

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dummy constructor doing nothing.
See also:

- 28.4.12 Constructor(a as CDArrayMBS) 4736
- 88.3.57 Constructor(data() as Double) 14097

### 28.4.12 Constructor(a as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an CDArrayMBS object and initialize it with the given array.
See also:


- 28.4.11 Constructor 4735
- 88.3.57 Constructor(data() as Double) 14097


### 28.4.13 Constructor(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an CDArrayMBS object and initialize it with the given array.
See also:


- 28.4.11 Constructor 4735
- 28.4.12 Constructor(a as CDArrayMBS) 4736


### 28.4.14 count as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of elements in this array object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.count) // shows 4
```

### 28.4.15 delta(offset as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts each element of the CDArrayMBS object by an earlier element in the same CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| offset | 1 | The difference in position between an element and the earlier element to be subtracted from it. |

### 28.4.16 divArray(value as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides the CDArrayMBS object by the given array.
**Notes:** The CDArrayMBS object will be divided by dividing each of its elements by the corresponding element in the given array.

| Parameter | Default | Description |
|---|---|---|
| Values | (Mandatory) | A CDArrayMBS with numbers used as divisors to divide the CDArrayMBS object. |

See also:


- 28.4.17 divArray(value() as Double) 4737


### 28.4.17 divArray(value() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides the CDArrayMBS object by the given array.
**Example:**

```
dim src(-1) as Double = Array( 63.1, 10.15, 6.15, 2.88 )
dim data As New CDArrayMBS(array(2.0, 2.0, 2.0, 2.0))

data.divArray( src )

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:** The CDArrayMBS object will be divided by dividing each of its elements by the corresponding element in the given array.

See also:

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers used as divisors to divide the CDArrayMBS object. |

• 28.4.16 divArray(value as CDArrayMBS) 4737

### 28.4.18 divValue(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides every element of the CDArrayMBS object by the given number.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))

data.divValue(5)

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:**

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | A number to be used as divisor to divide every element of the CDArrayMBS object. |

### 28.4.19 expAvg(smoothingFactor as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its exponential average.
**Notes:** The exponential average is computed by :

avg(n) = value(n) * smoothingFactor + avg(n - 1) * (1 - smoothingFactor)

where avg(n) is the exponential average of the nth element, and value(n) is the value of the nth element.

For the first element (n = 0), its exponential average is assumed to be equal to its original value.

| Parameter | Default | Description |
|---|---|---|
| smoothingFactor | (Mandatory) | The smoothing factor used for computing exponential average. It should be between 0 - 1. |

### 28.4.20 financeDiv(values() as Double, zeroByZeroValue as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides the CDArrayMBS object by the given array, with special handling of the case of zero divided by zero.
**Notes:** In many financial formulas, it is possible to have cases of zero divided by zero. For example, the Relative Strength Index is defined as the ratio between positive price changes and absolute value of all price changes over a period of time. In case the price does not change at all during that period, and the RSI will become zero divided by zero.

Traditionally, under the above case, the RSI will be consider as 50%.

To handle these special cases, the financeDiv method has an argument specifying what value to assume in case the division is zero divided by zero.

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers used as divisors to divide the CDArrayMBS object. |
| zeroByZeroValue | (Mandatory) | The value to use if the division is zero divided by zero. |

### 28.4.21 getvalue(index as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the vaue with the given index.
**Notes:** Returns zero if the value does not exist.

### 28.4.22 insert(value as Double, len as Integer, insertPoint as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts some constant elements to the CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| c | (Mandatory) | The value of the constant element. |
| len | (Mandatory) | The number of elements to insert. |
| insertPoint | -1 | The position of the insertion point. The new elements will be inserted just before the insertion point. -1 means inserting elements at the end of the array. |

See also:

- 79.24.5 insert(value() as Double, insertPoint as Integer = -1) 13469

### 28.4.23 insert(value() as Double, insertPoint as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts the elements of an array to the CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| a | (Mandatory) | An array to be inserted to the CDArrayMBS object. |
| insertPoint | -1 | The position of the insertion point. The new elements will be inserted just before the insertion point. -1 means inserting elements at the end of the array. |

See also:

- 28.4.22 insert(value as Double, len as Integer, insertPoint as Integer = -1) 4739

### 28.4.24 lowess(smoothness as Double = 0.25, iteration as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fits a curve through the data points in the CDArrayMBS object using the LOWESS algorithm.
**Example:**

```
// generate some values
dim values() as Double
dim x as Double

for i as Integer = 1 to 10
x = x + rnd - 0.5
values.Append x
next
```

```
// make array
dim c as new CDArrayMBS(values)
dim oldValues() as Double = c.Values

// now run Algorithm
c.lowess(1.0) // 1.0 so we see it

// now get new values
dim newValues() as Double = c.Values

// the rest is for displaying in MsgBox:
dim oldValueStrings() as string
dim newValueStrings() as string

for each v as Double in oldValues
oldValueStrings.Append str(v)
next

for each v as Double in newValues
newValueStrings.Append str(v)
next

MsgBox join(oldValueStrings, " ")+EndOfLine+EndOfLine+join(newValueStrings, " ")
```

**Notes:** The full name of LOWESS is "Robust locally weighted regression and smoothing scatterplots". It is a commonly used algorithm for drawing a smooth curve through a number of points.

LOWESS works by assuming a small segment of any curve can be approximated by a straight line. For each data point, LOWESS finds the n nearest points to that data point (n is configurable), and performs weighted linear regression using a tricube weighting function. It then adjust the coordinates of the data point based on the result of the weighted linear regression.

LOWESS can run in multiple iterations, in which case it should converge to a stable curve - thus it is called "robust".

In most cases, LOWESS behaves better than many other smoothing algorithms, such as moving average, moving median, exponential average. Curves draw using LOWESS look smoother, yet they track the data points better. Also, LOWESS behaves well at the end points. On the other hand, methods based on moving windows (e.g. moving averages) do not work on the first few data points, because they need sufficient data points to fill the moving window first.

In this method, each element of the CDArrayMBS object will be replaced by the corresponding value computed using the LOWESS algorithm.

| Parameter | Default | Description |
|---|---|---|
| smoothness | 0.25 | The smoothness factor. It must be between 0 - 1. It is the portion of points used in finding the n nearest points. In other words, n = smoothness * no_of_points. A larger value will result in a smoother the curve. A smaller value will result in the curve tracking the data points better. |

For LOWESS to have any smoothing effect at all, n must be at least 3. You may need to use a large smoothness factor if you only have a few data points.

| | | |
|---|---|---|
| iteration | 0 | The number of additional iteration used in the LOWESS algorithm. Unless your data is extremely noisy, in most case no additional iteration is necessary. |

See also:

- 28.4.25 lowess(values() as Double, smoothness as Double = 0.25, iteration as Integer = 0) 4742

### 28.4.25 lowess(values() as Double, smoothness as Double = 0.25, iteration as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fits a curve through the data points in the CDArrayMBS object using the LOWESS algorithm, where the spacing of the data points is supplied by the given array.
**Notes:** Please refer to CDArrayMBS.lowess for a brief description of the LOWESS algorithm.

In this method, each element of the CDArrayMBS object will be replaced by the corresponding value computed using the LOWESS algorithm.

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers providing the x coordinates of the data points in the CDArrayMBS object. |
| smoothness | 0.25 | The smoothness factor. It must be between 0 - 1. It is the portion of points used in finding the n nearest points. In other words, n = smoothness * no_of_points. A larger value will result in a smoother the curve. A smaller value will result in the curve tracking the data points better. |

For LOWESS to have any smoothing effect at all, n must be at least 3. You may need to use a large smoothness factor if you only have a few data points.

See also:

| | | |
|---|---|---|
| iteration | 0 | The number of additional iteration used in the LOWESS algorithm. Unless your data is extremely noisy, in most case no additional iteration is necessary. |

- 139.1.2 lowess(smoothness as Double = 0.25, iteration as Integer = 0) 19313

### 28.4.26 max as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the maximum value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.max) // shows 4.0
```

### 28.4.27 maxIndex as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the index of the maximum value element of the CDArrayMBS object.

### 28.4.28 med as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the med value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0, 1.0))
MsgBox str(data.med) // shows 2.0
MsgBox str(data.avg) // shows 2.2
```

### 28.4.29 min as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the minimum value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.min) // shows 1.0
```

### 28.4.30 minIndex as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the index of the minimum value element of the CDArrayMBS object.

### 28.4.31 movAvg(interval as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving average.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the average of the current element with the previous (interval - 1) elements. No moving average can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |

### 28.4.32 movCorr(interval as Integer, value() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by the moving correlation with another array or with itself.
**Notes:** The interval parameter specifies the window size for computing moving correlation. The moving correlation is computed as the correlation coefficient between the CDArrayMBS object and the other array, where only the current element and the previous (interval - 1) elements are considered in the computation.

If the other array is not provided, it is assumed to be the sequence of numbers 0, 1, 2, 3, 4.... This is equivalent to checking if the elements of the CDArrayMBS object is linear.

No moving correlation can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| | | | | |
|---|---|---|---|---|
| interval | (Mandatory) | The window size.b | [ Empty_Array ] | The array to be correlated with the CDArrayMBS object. If this argument is an empty array, the sequence of numbers 0, 1, 2, 3, 4 .... will be used instead. |

### 28.4.33 movMax(interval as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving maximum.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the maximum of the current element with the previous (interval - 1) elements. No moving maximum can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |

### 28.4.34 movMed(interval as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving median.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the median of the current element with the previous (interval - 1) elements. No moving median can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |

### 28.4.35 movMin(interval as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving minimum.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the minimum of the current element with the previous (interval - 1) elements. No moving minimum can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |

### 28.4.36 movPercentile(interval as Integer, percentile as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving percentile.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the percentile of the current element with the previous (interval - 1) elements. No moving percentile can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |
| percentile | (Mandatory) | The percentile to be computed. It should be between 0 - 100. |

### 28.4.37 movStdDev(interval as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each element of the CDArrayMBS object by its moving standard deviation.
**Notes:** The interval parameter specifies the window size for computing moving average. The moving average is computed as the standard deviation of the current element with the previous (interval - 1) elements. No moving standard deviation can be computed for the first (interval - 1) elements, because there are insufficient previous elements. So the first (interval - 1) elements will be replaced with kNoValue.

| Parameter | Default | Description |
|---|---|---|
| interval | (Mandatory) | The window size. |

### 28.4.38 mulArray(value as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies an array to the CDArrayMBS object.
**Notes:** The array will be multiplied by multiplying each array element with the corresponding element of the CDArrayMBS object.

See also:

- 28.4.39 mulArray(value() as Double) 

| Parameter | Default | Description |
|---|---|---|
| Values | (Mandatory) | A CDArrayMBS with numbers to be multiplied to the CDArrayMBS object. |

### 28.4.39 mulArray(value() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies an array to the CDArrayMBS object.
**Example:**

```
dim src(-1) as Double = Array( 63.1, 10.15, 6.15, 2.88 )
dim data As New CDArrayMBS(array(2.0, 2.0, 2.0, 2.0))

data.mulArray( src )

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:** The array will be multiplied by multiplying each array element with the corresponding element of the CDArrayMBS object.

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers to be multiplied to the CDArrayMBS object. |

See also:

- 28.4.38 mulArray(value as CDArrayMBS) 4746

### 28.4.40 mulValue(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies a number to every element of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))

data.mulValue(5)

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:**

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | A number to be multiplied to every element of the CDArrayMBS object. |

### 28.4.41 percentile(p as Double) as double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the required percentile value of the elements of the CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| p | (Mandatory) | The percentile to get. It should be between 0 - 100. |

### 28.4.42 rate(offset as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides each element of the CDArrayMBS object by an earlier element in the same CDArrayMBS object.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| offset | 1 | The difference in position between an element and the earlier element to divide it. |

### 28.4.43 replace(a as Double, b as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds elements that are equal to a given value and replace it with another value.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| a | (Mandatory) | The value to be replaced. |
| b | (Mandatory) | The replacing value. |

### 28.4.44 result as memoryblock

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the content of the CDArrayMBS object as a memoryblock.

### 28.4.45 selectEQZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is equal to zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

- 28.4.46 selectEQZ(decisionArray() as Double, fillValue as Double = 0) 4749

### 28.4.46 selectEQZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is equal to zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

- 28.4.45 selectEQZ 4749

### 28.4.47 selectGEZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is greater than or equal to zero.
**Notes:** If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

- 28.4.48 selectGEZ(decisionArray() as Double, fillValue as Double = 0) 4750

### 28.4.48 selectGEZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is greater than or equal to zero.
**Notes:** If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

See also:

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |


- 28.4.47 selectGEZ 4750


### 28.4.49 selectGTZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is greater than zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:


- 28.4.50 selectGTZ(decisionArray() as Double, fillValue as Double = 0) 4751


### 28.4.50 selectGTZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is greater than zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

See also:


- 28.4.49 selectGTZ 4751

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

### 28.4.51 selectLEZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is less than or equal to zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

- 28.4.52 selectLEZ(decisionArray() as Double, fillValue as Double = 0) 4752

### 28.4.52 selectLEZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is less than or equal to zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

• 28.4.51 selectLEZ 4752

### 28.4.53 selectLTZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is less than zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

• 28.4.54 selectLTZ(decisionArray() as Double, fillValue as Double = 0) 4753

### 28.4.54 selectLTZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object by checking if the elements of the given decisionArray is less than zero.
**Notes:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.

If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:

• 28.4.53 selectLTZ 4753

### 28.4.55 selectNEZ

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.
**Notes:** If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:


- 28.4.56 selectNEZ(decisionArray() as Double, fillValue as Double = 0) 4754


### 28.4.56 selectNEZ(decisionArray() as Double, fillValue as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The selected elements will be left unchanged. The remaining elements will be replaced by the given fillValue.
**Notes:** If the decisionArray is empty, the CDArrayMBS object itself will function as the decision array.

| Parameter | Default | Description |
|---|---|---|
| decisionArray | [ Empty_Array ] | An array of numbers used to decide whether the corresponding elements in the CDArrayMBS object is selected or not. |
| fillValue | 0 | The value used to replace the elements that are not selected. |

See also:


- 28.4.55 selectNEZ 4754


### 28.4.57 selectRegularSpacing(majorTickStep as Integer, minorTickStep as Integer = 0, initialMargin as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects an evenly spaced subset of elements of the CDArrayMBS object.
**Notes:** The primary purpose of this method is to select the regularly spaced elements as ticks on an enumerated axis.

For example, if the majorTickStep is 10, and minorTickStep is 5, this method will select one out of 10 elements as major tick elements, and one of out of 5 elements as minor tick elements.

Major tick elements will remain intact. The remaining minor ticks elements will have their values replaced with MinorTickOnly. Non-selected elements will have their values replaced with kNoValue, so they will not appear on the axis. The resulting array can be used directly in Axis.setLabels.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | (Mandatory) | The spacing between major ticks. |
| minorTickStep | 0 | The spacing between minor ticks. The default value of 0 means no minor tick will be used. |
| initialMargin | 0 | The position of the first tick. |

### 28.4.58 selectStartOfDay(majorTickStep as Integer = 1, initialMargin as Double = 10800.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object that represents a different day from the previous element.
**Notes:** This method assumes the elements of the CDArrayMBS object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see
Axis.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per day (or one tick per multiple days). This is by selecting the dates/times in the data array only if it is not the same day as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in Axis.setLabels.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the day it represents. By default, near means within 3 hours (10800 seconds). This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using Layer.setXData and Axis.setDateScale.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. The default value of 1 means one tick per day. A value of n means one tick per n days. |
| initialMargin | 10800 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the day it represents. The default is 3 hours (10800 seconds). |

### 28.4.59 selectStartOfHour(majorTickStep as Integer = 1, initialMargin as Double = 300.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object that represents a different hour from the previous element.
**Notes:** This method assumes the elements of the CDArrayMBS object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see
Axis.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per hour (or one tick per multiple hours). This is by selecting the dates/times in the data array only if it is not the same hour as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in Axis.setLabels2.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the hour it represents. By default, near means within 300 seconds. This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using Layer.setXData and Axis.setDateScale.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. The default value of 1 means one tick per hour. A value of n means one tick per n hours. |
| initialMargin | 300 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the hour it represents. The default is 300 seconds. |

### 28.4.60 selectStartOfMinute(majorTickStep as Integer = 1, initialMargin as Double = 5.0)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the array that represents a different minute from the previous element.
**Notes:** This method assumes the elements of the ArrayMath object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see CDAxisMBS.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per minute (or one tick per multiple minutes). This is by selecting the dates/times in the data array only if it is not the same minute as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in CDAxisMBS.setLabels2.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the minute it represents. By default, near means within 5 seconds. This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using CDLayerMBS.setXData and CDAxisMBS.setDateScale3 (or CDAxisMBS.setDateScale or CDAxisMBS.setDateScale2).

| Argument | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. A value of n means one tick per n minutes. |
| initialMargin | 5 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the minute it represents. The default is 5 seconds. |

### 28.4.61 selectStartOfMonth(majorTickStep as Integer = 1, initialMargin as Double = 432000.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object that represents a different month from the previous element.
**Notes:** This method assumes the elements of the CDArrayMBS object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see
Axis.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per month (or one tick per multiple months). This is by selecting the dates/times in the data array only if it is not the same month as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in
Axis.setLabels.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the month it represents. By default, near means within 5 days (432000 seconds). This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using Layer.setXData and Axis.setDateScale.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. The default value of 1 means one tick per month. A value of n means one tick per n months. |
| initialMargin | 432000 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the month it represents. The default is 5 days (432000 seconds). |

### 28.4.62 selectStartOfSecond(majorTickStep as Integer = 1, initialMargin as Double = 0.1)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the ArrayMath object that represents a different second from the previous element.
**Notes:** This method assumes the elements of the ArrayMath object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see CDAxisMBS.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per second (or one tick per multiple seconds). This is by selecting the dates/times in the data array only if it is not the same second as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by NoValue. The resulting array can be used directly in CDAxisMBS.setLabels2.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the second it represents. By default, near means within 0.1 second. This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using CDLayerMBS.setXData and CDAxisMBS.setDateScale3 (or CDAxisMBS.setDateScale or CDAxisMBS.setDateScale2).

| Argument | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. A value of n means one tick per n seconds. |
| initialMargin | 0.1 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the second it represents. The default is 0.1 second. |

### 28.4.63 selectStartOfWeek(majorTickStep as Integer = 1, initialMargin as Double = 172800.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object that represents a different week from the previous element.
**Notes:** This method assumes the elements of the CDArrayMBS object are dates/times.

The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see
Axis.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per week (or one tick per multiple weeks). This is by selecting the dates/times in the data array only if it is not the same week as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in Axis.setLabels.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the week it represents. By default, near means within 2 days (172800 seconds). This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using Layer.setXData and Axis.setDateScale.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. The default value of 1 means one tick per week. A value of n means one tick per n weeks. |
| initialMargin | 172800 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the week it represents. The default is 2 days (172800 seconds). |

### 28.4.64 selectStartOfYear(majorTickStep as Integer = 1, initialMargin as Double = 5184000.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the elements of the CDArrayMBS object that represents a different year from the previous element.
**Notes:** This method assumes the elements of the CDArrayMBS object are
dates/times. The primary purpose of this method is to select the appropriate elements as ticks on an enumerated axis.

Suppose you want to plot a variable against time. The x-values of the data points will be an array of dates/times. If an enumerated x-axis is used (see
Axis.setLabels), there will be a tick at every data point, which may be too dense if there are too many data points.

This method can be used to reduce the ticks to one tick per year (or one tick per multiple years). This is by selecting the dates/times in the data array only if it is not the same year as the previous element in the array. The selected elements will be left unchanged, while the elements not select will be replaced by kNoValue. The resulting array can be used directly in Axis.setLabels.

For the first data point, there is no previous data point to compare, so it is handled differently. The first data point will be selected if it is near the beginning of the year it represents. By default, near means within 60 days (5184000 seconds). This is configurable using the initialMargin argument.

Note that if the data points does not have data in a certain time range, no element can be selected in that time range, and so there will be no tick for that time range. This is appropriate for many chart types, such as finance charts, in which missing time ranges (non-trading hours, holidays, etc) are traditionally skipped.

However, if the data points may contain missing time ranges, but the ticks cannot be skipped, it may be more appropriate to use a non-enumerated x-axis by using Layer.setXData and Axis.setDateScale.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | 1 | The tick step. The default value of 1 means one tick per year. A value of n means one tick per n years. |
| initialMargin | 5184000 | The margin for the first data point. The first data point will be selected if it is within initialMargin number of seconds from beginning of the year it represents. The default is 60 days (5184000 seconds). |

### 28.4.65 shift(offset as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the array "rightwards".
**Notes:** If the array does not have any kNoValue data points, this method will shift the point at position "n" to "n + offset". On the "right" side of the array (the side with the largest index), points that are shifted outside the array will be discarded. On the "left" side of the array, fillValue data points will be shifted in.

If the array contains kNoValue data points, these points are not shifted. Conceptually, one can imagine the non-NoValue points being shifted to the next non-NoValue positions, and the process repeats offset number of times.

| Parameter | Default | Description |
|---|---|---|
| offset | 1 | The number of positions to shift the array "rightwards." |
| fillValue | kNoValue | The new value to be shifted into the array. |

See also:

- 28.4.66 shift(offset as Integer, fillValue as Double) 4762

### 28.4.66 shift(offset as Integer, fillValue as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the array "rightwards".
**Notes:** If the array does not have any kNoValue data points, this method will shift the point at position "n" to "n + offset". On the "right" side of the array (the side with the largest index), points that are shifted outside the array will be discarded. On the "left" side of the array, fillValue data points will be shifted in.

If the array contains kNoValue data points, these points are not shifted. Conceptually, one can imagine the non-NoValue points being shifted to the next non-NoValue positions, and the process repeats offset number of times.

See also:

| Parameter | Default | Description |
|---|---|---|
| offset | 1 | The number of positions to shift the array "rightwards." |
| fillValue | kNoValue | The new value to be shifted into the array. |


- 28.4.65 shift(offset as Integer = 1) 4762


### 28.4.67 stdDev as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the stdDev value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.stdDev) // shows 1.118034
```

### 28.4.68 subArray(value as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts an array from the CDArrayMBS object.
**Notes:** The array will be subtracted by subtracting each array element from the corresponding element of the CDArrayMBS object.

| Parameter | Default | Description |
|---|---|---|
| Values | (Mandatory) | A CDArrayMBS with numbers to be subtracted from the CDArrayMBS object. |

See also:


- 28.4.69 subArray(value() as Double) 4763


### 28.4.69 subArray(value() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts an array from the CDArrayMBS object.
**Example:**

```
dim src(-1) as Double = Array( 63.1, 10.15, 6.15, 2.88 )
dim data As New CDArrayMBS(array(1.0, 1.0, 1.0, 1.0))
```

```
data.subArray( src )

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:** The array will be subtracted by subtracting each array element from the corresponding element of the CDArrayMBS object.

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | An array of numbers to be subtracted from the CDArrayMBS object. |

See also:

- 28.4.68 subArray(value as CDArrayMBS) 4763

### 28.4.70 subValue(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts a number from every element of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))

data.subValue(5)

dim lines(-1) as string

lines.Append str(data.count)+" values:"
lines.Append ""
lines.Append str(Data.getvalue(0))
lines.Append str(Data.getvalue(1))
lines.Append str(Data.getvalue(2))
lines.Append str(Data.getvalue(3))

MsgBox Join(lines,EndOfLine)
```

**Notes:**

| Parameter | Default | Description |
|---|---|---|
| b | (Mandatory) | A number to be subtracted from every element of the CDArrayMBS object. |

### 28.4.71 sum as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the sum value of the elements of the CDArrayMBS object.
**Example:**

```
dim data As New CDArrayMBS(array(1.0, 2.0, 3.0, 4.0))
MsgBox str(data.sum) // shows 10.0
```

### 28.4.72 trim(startIndex as Integer = 0, len as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trims the CDArrayMBS object by keeping only some elements in the middle.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| startIndex | 0 | The index for the first element to keep. |
| len | -1 | The number of elements to keep. -1 means keeping all elements from the |

startIndex to the end of the array.

### 28.4.73 Values as Double()

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies all the values of this array object into a Xojo array.
**Notes:** On error the array returned is empty.

## 28.5 class CDAxisMBS

### 28.5.1 class CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Axis class represents x and y axes in XY charts.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Charts with more than one x or y axis
- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 17.3pr3
- MBS Xojo / Real Studio Plugins, version 15.3pr1
- Exceptions and Private Constructors

### 28.5.2 Methods

### 28.5.3 addLabel(pos as Double, label as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an extra label on the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| pos | (Mandatory) | The position on the axis to add the label. |
| label | (Mandatory) | The text label to add. |

### 28.5.4 addMark(value as Double, lineColor as color, text as string = "", font as string = "", fontsize as Double = 8) as CDMarkMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMark method, but uses color instead of integer data type for passing color values.
See also:

- 28.5.5 addMark(value as Double, lineColor as Integer, text as string = "", font as string = "", fontsize as Double = 8) as CDMarkMBS

### 28.5.5 addMark(value as Double, lineColor as Integer, text as string = """, font as string = """, fontsize as Double = 8) as CDMarkMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a mark line to the chart.
**Notes:** A mark line is a line drawn on the plot area. This line is usually used to indicate some special values, such as a "target value", "threshold value", "target date", etc.

A mark line attached to the horizontal axis will be vertical across the plot area. A mark line drawn using the vertical axis will be horizontal across the plot area. In either case, the mark line label will be added to the axis at the mark line position.

The location of the mark line label can be changed by using
TextBox.setAlignment. For example, by setting the alignment to TopCenter, the mark line label will be drawn on the top center of the mark line.

By default, the mark line is drawn at the front of the chart layers. You may change it to draw at the back of the plot area (that is, like grid lines) using
Mark.setDrawOnTop.

| Parameter | Default | Description |
|---|---|---|
| value | (Mandatory) | The value on the axis to draw the mark line. |
| lineColor | (Mandatory) | The color of the mark line. |
| text | "" | The text label for the mark line. An empty string means there is no text label. By default, the text label and the tick on the axis will be drawn using the same color as the mark line. You can modify the colors by using the Mark.setMarkColor method. |
| font | "" | The font used to draw the text label. |
| fontSize | 8 | The font size used to draw the text label in points. |

See also:

- 28.5.4 addMark(value as Double, lineColor as color, text as string = "", font as string = "", fontsize as Double = 8) as CDMarkMBS 4766

### 28.5.6 addZone(startValue as Double, endValue as Double, colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:

• 28.5.7 addZone(startValue as Double, endValue as Double, colorvalue as Integer) 4768

### 28.5.7 addZone(startValue as Double, endValue as Double, colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a zone to the chart.
**Notes:** A zone is a range of values. For example, "10 to 20" is a zone. Typically, a zones are used to classify data ranges. For example, you may classify 0 - 60 as the normal zone, 60 - 90 as the warning zone, and 90 - 100 as the critical zone.

A zone based on a horizontal axis will be drawn as a vertical band. A zone based on a vertical axis will be drawn as a horizontal band. Zones are always drawn at the back of the plot area.

| Parameter | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The start value (the lower bound) for the zone. |
| endValue | (Mandatory) | The end value (the upper bound) for the zone. |
| color | (Mandatory) | The color of the zone. |

See also:

• 28.5.6 addZone(startValue as Double, endValue as Double, colorvalue as color) 4767

### 28.5.8 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.5.9 copyAxis(axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the scale and labels from another axis.
**Notes:** This method is typically used to ensure the axes on different charts are identical. For example, if multiple charts are draw and are stacked up, and you want the x-axes of the charts to be the same for easy comparison, you may copy the x-axis from one chart to the other charts.

The differences between copyAxis and Axis.syncAxis are:

Axis.syncAxis relates the axes with a linear relationship, so the axes may not be exact copies of one another.

Axis.syncAxis synchronizes axis scale and copies only scale related labels, such as the labels generated by auto-scaling, Axis.setLinearScale, Axis.setLogScale or Axis.setDateScale.

copyAxis copies all labels, including labels created using
Axis.setLabels, which may be arbitrary text.

| Parameter | Default | Description |
|---|---|---|
| axis | (Mandatory) | The axis to copy from. |

### 28.5.10 getAlignment as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the side of the plot area that the axis is associated with.
**Notes:** This method is only applicable to XYChart objects.

### 28.5.11 getAxisImageMap(noOfSegments as Integer, mapWidth as Integer, url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the axis itself.
**Notes:** This method is similar to Axis.getHTMLImageMap. The difference is instead of generating an image map for the labels, it generates an image map for the axis itself. The axis will be divided into a number of segments, with an image map entry created for each segment.

### 28.5.12 getCoor(value as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the geometric coordinates given the data value.

### 28.5.13 getFormattedLabel(v as Double, options as string = """) as string

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

| Parameter | Default | Description |
|---|---|---|
| noOfSegments | (Mandatory) | The number of segments to divide the axis into. |
| mapWidth | (Mandatory) | The width of the axis used for the purpose of generating the image map. |
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported.The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default. Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character. |
| extraAttr | "" | A text string to specify additional attributes to add to the <area>tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

**Function:** Gets the label at the specified position on the axis, formatting one if necessary.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| v | (Mandatory) | The position specified as a value on the axis scale. |
| formatString | "" | The format string used to format a label if necessary. Please refer to Axis.setLabelFormat for the syntax of the format string. An empty string means the format will be automatically determined. |

### 28.5.14 getHTMLImageMap(url as string, queryFormat as string = "", extraAttr as string = "", offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the axis labels.
**Notes:** This method should be called only after creating the chart image (eg. using BaseChart.makeChart). The image map cannot be determined without creating the chart image first.

This method accepts a URL as its argument. When generating an image map, it appends query parameters to the URL to indicate which legend entry the user has clicked.

The following is an example image map generated for an axis with 3 labels.

<area shape="rect" coords="30,220,70,239" href="handler.asp?value=0&label=John">
<area shape="rect" coords="70,220,110,239" href="handler.asp?value=1&label=Mary">
<area shape="rect" coords="110,220,150,239" href="handler.asp?value=2&label=Peter">

The image map consists of multiple <area>tags, one for each label. In the "href" attributes, query parameters are appended to the URL to provide information on the label clicked.

The image map produces by ChartDirector does not include the <map>and </map>tag. This is intentional so that you can add additional custom <area>tags to the image map, or append multiple image maps together.

The format of the appended URL parameters is determined using the queryFormat argument, which by default is:

value= { value } &label= { label }

The texts in curly brackets (i.e. { value } , { label } ) will be replaced by the actual values when generating the image map. For example, { label } will be replaced by the label text.

Please refer to Parameter Substitution and Formatting on all available parameters and how to format them.

In addition to customizing the query parameters, ChartDirector supports additional HTML attributes in the <area>tags using the extraAttr argument.

For example, the following extraAttr will add a "title" HTML attribute to every <area>tag. The "title" attribute will be displayed as "tool tip" when the mouse moves over the image map.

title='Click me for details on { label } '

Another common usage of the extraAttr argument is to add "onmouseover" and "onmouseout" HTML attributes to handle user interaction using Javascript on the browser.

| Parameter | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. |

Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed.

| | | |
|---|---|---|
| queryFormat | ”” | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. The special keyword ” { default } ” represents the default query parameters. This is useful for specifying appending to the default. Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character. |
| extraAttr | ”” | A text string to specify additional attributes to add to the <area>tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

### 28.5.15 getLabel(i as Double) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the label at the specified position on the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| i | (Mandatory) | The position specified as a value on the axis scale. |

Return Value
Returns the label at the specified position, or a ”” string if there is no label at that position.

### 28.5.16 getLabelTable as CDMLTableMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the CDML table created by CDAxisMBS.makeLabelTable.

### 28.5.17 getMaxValue as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the upper bound of the axis.
**Notes:** The upper bound of an axis is known only after auto-scaling. So this method should be called only after ChartDirector has finished auto-scaling (e.g. after calling BaseChart.layout to explicitly auto-scale the axis).

### 28.5.18 getMinValue as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the lower bound of the axis.
**Notes:** The lower bound of an axis is known only after auto-scaling. So this method should be called only after ChartDirector has finished auto-scaling (e.g. after calling BaseChart.layout to explicitly auto-scale the axis).

### 28.5.19 getThickness as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the thickness of the axis.
**Notes:** The axis can be considered as a line, with one side facing the internal of the plot area, and the other side not facing the plot area. By default, the latter side includes the axis labels and axis title (although ChartDirector allows the axis to be configured so that the labels and titles are internal to the plot area).

The thickness of an axis only refers to the thickness of the side not facing the plot area. For a vertical axis, it is the width of the bounding box of that side, including the axis ticks, labels and title if they are on that side. For a horizontal axis, it is the height of the bounding box.

The intention of this method is to allow the chart to be adjusted to leave enough space for the axis labels and title.

This method should be called only after axis layout (after calling CDXYChartMBS.layoutAxes, CDBaseChartMBS.layout or CDXYChartMBS.packPlotArea).

Arguments:
None

Return Value
The thickness of the axis in pixels.

### 28.5.20 getTicks as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the values of the ticks.
**Notes:** Return Value
An array of numbers representing the values of the ticks.

### 28.5.21 getX as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x-coordinate of starting point of the axis.
**Notes:** For an XYChart object, the starting point of a horizontal axis is its left end point, and the starting point of a vertical axis is its bottom end point. For a PolarChart object, the starting point of a radial axis is the origin. For other types of charts, the starting point of an axis is undefined.

### 28.5.22 getY as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y-coordinate of starting point of the axis.
**Notes:** For an XYChart object, the starting point of a horizontal axis is its left end point, and the starting point of a vertical axis is its bottom end point. For a PolarChart object, the starting point of a radial axis is the origin. For other types of charts, the starting point of an axis is undefined.

### 28.5.23 makeLabelTable as CDMLTableMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a CDML table and docks it to the axis, with one row (for horizontal axis) or column (for vertical axis) containing the axis labels.
**Notes:** Before calling this method, it is necessarily to set the labels on the axis first using CDAxisMBS.setLabels. You should only use this method on a label based axis with no label stepping.

This method will automatically indent the axis (see CDAxisMBS.setIndent), and set the tick offset to 0.5 (see CDAxisMBS.setTickOffset). This is to ensure the plot area grid lines align with the table grid lines (instead of align with the labels).

You may use the returned CDMLTableMBS object to insert additional rows and/or columns to the table. A common application of this method is to insert the data values to the table, so the chart will have a data table docked to the axis, aligned with the chart contents.

Arguments:
None

Return Value
A CDMLTable object containing the axis labels.

### 28.5.24 setAngle(angle as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the angular coordinates of the data points.

### 28.5.25 setAutoScale(topExtension as Double = 0.1, bottomExtension as Double = 0.1, zeroAffinity as Double = 0.8)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins at the two ends of the axis during auto-scaling, and whether to start the axis from zero.
**Notes:** During auto-scaling, it is often desirable to leave some margins at the ends of the axis. For example, suppose in a bar chart, the longest bar is 10 units. If auto-scaling chooses 0 - 10 as the scale, the longest bar will touch the top edge of the plot area. In many cases, the chart will look better if there is some margin so that the longest bar does not touch the top edge.

The setAutoScale can be used to reserve some margins at the ends of the axis by using a scale that is larger than necessary. For example, in the above case, if a scale of 0 - 12 is used, then the longest bar will not touch the top edge.

Other common reasons for reserving margins at the ends of the axis include making sure the data labels (which may be drawn on top of the data points) will not go outside the plot area, and that objects put at the top or bottom of the plot area (such as legend box and custom text box) will not overlap with the data points.

Note that there is an alternative way to reserve space at the ends of the axis - the Axis.setMargin method.

In the setAutoScale method, the amount of margins reserved is controlled by the topExtension and bottomExtension arguments. These arguments determine the portion of the axis where no data point can reach. For example, a topExtension of 0.2 will ensure no data point can fall within the top 20% of the axis.

Note that ChartDirector will not extend the scale across the 0 point.

For example, suppose the data range is 0.1 - 9.9. If 10% margin is added to the bottom end of the axis, the bottom end may become negative. In this case, ChartDirector will extend the bottom end to 0 at most.

In other words, if the data range is completely positive, ChartDirector will not extend the axis to negative, as it would be undesirable in most applications. The same applies if the data range is completely negative.

For a purely positive axis, the bottom end has "zero affinity". That means ChartDirector will tend to choose 0 as the bottom end because zero is a natural starting point for the axis. However, if the data range is too

extreme (e.g. the data is in the range 10000 - 10005), it may be "unreasonable" to choose 0 as the axis starting point. In this case, ChartDirector will not use 0 as the axis starting point.

ChartDirector will determine that it is "unreasonable" to use 0 as the axis starting point if the data fluctuation (the difference between the maximum and minimum data values) is too small compare with the data value. ChartDirector test the "too small" condition using the formula:

maxDataValue * zeroAffinity <minDataValue

where zeroAffinity by default is 0.8.

Similar "zero affinity" mechanism applies to the top end of the axis for a purely negative axis. If the data range contains both positive and negative values, the zero point is always included.

The zeroAffinity argument of the setAutoScale method allows you to modify the zero affinity when performing auto-scaling. Zero affinity should be between 0 and 1. A large value encourages ChartDirector to start the axis from zero.

A zero affinity of 1 means the axis always includes the zero point. A zero affinity of 0 means that the axis is scaled purely according to the data range, without any preference for the zero point.

Note that zero affinity is ignored for log scale axis as log scale axis cannot contain 0.

| Parameter | Default | Description |
|---|---|---|
| topExtension | 0.1 | The top portion of the axis that no data point should fall into. For example, a value of 0.2 means no data value will fall within the top 20% of the axis. The topExtension must be between 0 to 1. |
| bottomExtension | 0.1 | The bottom portion of the axis that no data point should fall into. For example, a value of 0.2 means no data value will fall within the bottom 20% of the axis. The bottomExtension must be between 0 to 1. |
| zeroAffinity | 0.8 | The tendency of ChartDirector to include zero in the axis during auto-scaling. The value must be between 0 and 1. A large value encourages ChartDirector to start the axis from zero. A value of 1 means the axis always includes the zero point. A value of 0 means there is no preference for the zero point during auto-scaling. |

### 28.5.26 setColors(axisColor as color, labelColor as color, titleColor as color, tickColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColors method, but uses color instead of integer data type for passing color values.
See also:

- 28.5.27 setColors(axisColor as Integer, labelColor as Integer = &hffff0002, titleColor as Integer = -1, tickColor as Integer = -1) 4777

### 28.5.27 setColors(axisColor as Integer, labelColor as Integer = &hffff0002, titleColor as Integer = -1, tickColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the axis itself, axis label, axis title and axis ticks.
**Notes:** By default, the axis and axis ticks are drawn using the LineColor, while the axis label and axis title are drawn using the TextColor. You may use this method to change their colors.

| Parameter | Default | Description |
|---|---|---|
| axisColor | (Mandatory) | The color of the axis itself. |
| labelColor | TextColor | The color of the axis labels. |
| titleColor | -1 | The color of the axis title. -1 means the axis title color is the same as the axis label color. |
| tickColor | -1 | The color of the axis ticks. -1 means the axis ticks color is the same as the axis color. |

See also:

- 28.5.26 setColors(axisColor as color, labelColor as color, titleColor as color, tickColor as color) 4776

### 28.5.28 setDateScale(formatString as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use date auto-scale.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| formatString | "" | The format used for the labels on the axis. Please refer to Axis.setLabelFormat for the syntax of the format string. An empty string means the format will be automatically determined. |

See also:

- 28.5.29 setDateScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4778

- 28.5.30 setDateScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4778


### 28.5.29 setDateScale(lowerLimit as Double, upperLimit as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given date scale and the given labels.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis, representing using one of the ChartDirector supported date format. |
| upperLimit | (Mandatory) | The upper bound of the axis, representing using one of the ChartDirector supported date format. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the axis. ChartDirector will distribute the labels evenly on the axis. By default, all labels are associated with major ticks. These can be modified by using '-' or ' |

textasciitilde ' as the first character. Please refer to Axis.setLabels for details.

See also:


- 28.5.28 setDateScale(formatString as string = "") 4777
- 28.5.30 setDateScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4778


### 28.5.30 setDateScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given date scale.
**Notes:**

The value 30 * 86400 will be assume to mean one month (which actually contains a variable number of seconds), and 60 * 86400 will be assumed to mean 2 months and so on. The value 360 * 86400 therefore means 12 months, or 1 year.

The default value of 0 means no minor tick is used.
See also:


- 28.5.28 setDateScale(formatString as string = "") 4777
- 28.5.29 setDateScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4778

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis, representing using one of the ChartDirector supported date format. |
| upperLimit | (Mandatory) | The upper bound of the axis, representing using one of the ChartDirector supported date format. |
| majorTickInc | 0 | Adds major ticks to the axis, where the major ticks are separated by majorTickInc seconds. Each major tick will have an associated text label for the value if the axis at the tick. The value 30 * 86400 will be assume to mean one month (which actually contains a variable number of seconds), and 60 * 86400 will be assumed to mean 2 months and so on. The value 360 * 86400 therefore means 12 months, or 1 year. The default value of 0 means the major ticks will be automatically determined. In this case, the lowerLimit and upperLimit may be automatically adjusted to align with the ticks. Use kNoValue to disable major ticks. |
| minorTickInc | 0 | Adds minor ticks to the x-axis, where the minor ticks are separated by minorTickInc seconds. |

### 28.5.31 setFormatCondition(condition as string, operand as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the condition that subsequent Axis.setLabelFormat and Axis.setMultiFormat will become applicable.
**Notes:** In some applications, the axis range can vary greatly. For example, for a date/time axis, the ticks on the axis can be hourly ticks if the duration is short, or daily ticks (or even monthly or yearly) if the duration is long. One can always use a universal axis format that is applicable in all cases (such as "mmm dd, yyyy<*br*>hh:nn:ss"), or one can leave ChartDirector to automatically come up with a suitable axis format.

Sometimes it may be desirable to explicitly specify different axis formats depending on tick types. For example, one may want to specify a certain format if the ticks are hourly, and another format if the ticks are daily.

If it is possible to predict which kind of ticks will be on the axis, one can always use "if" statements to specify different axis formats for various cases.

The setFormatCondition method is for cases in which it is difficult to predict which type of ticks would appear on the axis. For example, in an auto-scaled axis in which the duration can vary continuously, in some marginal cases, it is difficult to predict if auto-scaling will choose hourly or daily ticks.

The setFormatCondition method allows you to specify a condition to be tested against the auto-scaling result, so that subsequent
Axis.setLabelFormat or Axis.setMultiFormat will be applicable only if the condition is true.

The types of condition supported are:

| Condition | Description |
|---|---|
| "align" | Test if all the ticks are aligned to the operand. Use 3600 for testing hourly alignment, 86400 (1 day = 86400) for daily alignment, 30 * 86400 for monthly alignment and 360 * 86400 for yearly alignment. (Note: The values for monthly and yearly alignments are special values recognized by ChartDirector. They works even if a month or year is not exactly 30 or 360 days.) |
| ">" | Test if the maximum absolute value of the ticks are larger than the operand. This is useful when one needs to apply different formats to large numbers (eg. use scientific formats if the axis range exceed certain values). |
| ">=" | Test if the maximum absolute value of the ticks is larger than or equal to the operand. |
| "<" | Test if the maximum absolute value of the ticks is less than the operand. |
| "<=" | Test if the maximum absolute value of the ticks is less than or equal to the operand. |
| "==" | Test if the maximum absolute value of the ticks is equal to the operand. |
| "=" | Same as "==" above. |
| "!=" | Test if the maximum absolute value of the ticks is not equal to the operand. |
| "<>" | Same as "!=" above. |
| "else" | This condition is true if and only if the previous condition is false. |
| "true" | This condition is always true. It is useful as a "catch all" condition. |
| "false" | This condition is always false. |

| Parameter | Default | Description |
|---|---|---|
| condition | (Mandatory) | The type of condition to test. Must be one of the condition types in the above table. This text string is case sensitive. |
| operand | 0 | The operand for condition types that need an operand. |

### 28.5.32 setIndent(indent as boolean)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies if the axis should be "indented" or not.
**Notes:** Normally, the x-axis is automatically scaled so that x coordinate of first data point is at the beginning of the x-axis, and the x coordinate last data point is at the end of the axis. If a line layer is drawn, the line will span from the left border of the plot area to the right border of the plot area.

However, for bar layer, if the x-axis is scaled as above, half of the first bar and half of the last bar will be outside the plot area. The same applies to HLOC layers, candlestick layers and box-whisker layers.

When the axis ”indented”, some margins will be reserved at the ends of the axis, so that all data representation are within the plot area.

By default, ”indented” mode is automatically used in x-axis for charts that contain bar, HLOC, candlestick or box-whisker layers.

The setIndent method allows you to manually configure whether ”indented” mode is used or not. One common usage is to align the x-axes in different charts.

For example, suppose a web page contains a bar chart and a line chart. The bar chart will be using ”indented” mode x-axis, while the line chart will be using ”non-indented” mode. If the two charts are on top of one another for ease of comparison (common for finance style charts), it is desirable that their x-axes should align. In this case, the setIndent method can be used to force the line chart to use indented mode x-axis.

| Parameter | Default | Description |
|---|---|---|
| indent | (Mandatory) | A true value sets the axis to indented mode. A false value sets the axis to non-indented mode. |

### 28.5.33 setLabelAlignment(alignment as Integer, minLabelSpace as Integer = 3)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the label alignment.

### 28.5.34 setLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format for numeric or date/time axis labels.
**Example:**

```
dim c as CDAxisMBS

// you can use label formats like this:

c.setLabelFormat("<*block,halign=left*><*font=timesbi.ttf,size=12,underline=1*>{ label } <*/font*><*br*>US$
{ value } K ( { percent } %)")
```

// we can reduce that to this:

c.setLabelFormat(" { label } { value } { percent } %")

// and it shows 3 numbers. With | 1 after the variable name, we define the decimals after dot:

c.setLabelFormat(" { label } { value | 1 } { percent | 1 } %")

// and

c.setLabelFormat(" { label } { value | 1., } { percent | 1., } %")

// uses dot for thousands and comma for decimal separator.

**Notes:** By default, ChartDirector will try to guess if the axis represents numbers or dates. If the axis represents numbers, it will use " { value } " as the default format. If the axis represents dates, it will guess the format based on resolution of the dates (e.g. whether the dates contain hourly data or monthly data, etc). It may use formats such as { value | mm/dd/yy<*br*>hh:nn:ss } , { value | mm/dd/yy hh:nn:ss } , { value | mm/dd/yyyy } , { value | mm/yyyy } or { value | yyyy } .

Please refer to Parameter Substitution and Formatting on all available parameters and how to format them.

| Parameter | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.5.35 setLabelGap(d as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the distance between the axis labels and the ticks on the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| d | (Mandatory) | The distance between the axis label and the tick in pixels. |

### 28.5.36 setLabelOffset(offset as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the axis labels from its default position along the axis.

**Notes:** This method expects the offset along the axis being a value on the axis scale. The Box.setPos method of the axis label prototype (obtained using Axis.setLabelStyle) can also be used to shift the labels, with the offsets specified in pixel units.

| Parameter | Default | Description |
|---|---|---|
| offset | (Mandatory) | The distance to shift the labels along the axis as a value on the axis scale. |

### 28.5.37 setLabels(labels() as Double, formatString as string = "") as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the numeric/date/time labels to be used on the axis.
**Notes:** This method is typically used to set the x-axis to enumerated scale. For more details on what is enumerated axis scale, please refer to
Axis.setLabels.

This method assumes the labels are in their "native" form (that is, not formatted). Please refer to Date Representation for the native date/time formats supported in ChartDirector.

If the labels are already formatted into human readable form (that is, they are text strings), use Axis.setLabels instead.

One common issue is that there may be too many labels on the axis. In this case, the Axis.setLabelStep method may be used show only a regularly spaced subset of labels on the axis.

For date/time labels, another alternative is to use Axis.setMultiFormat, which uses filters to select important dates/times (such as dates/times representing the start of a month) for display as labels.

A third method to avoid too many labels is to remove some labels by replacing them with kNoValue before passing them to ChartDirector. If you want to remove the label text but leave a minor tick, use MinorTickOnly as the label value.

| | | |
|---|---|---|
| labels | (Mandatory) | An array of numbers/dates to be used as the axis labels. |
| formatString | "" | A format string to specified how to format the labels into human readable form. Please refer to Axis.setLabelFormat for the syntax of the format string. An empty string means the format will be automatically determined. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.
See also:

• 28.5.38 setLabels(labels() as string) as CDTextBoxMBS 4784

### 28.5.38 setLabels(labels() as string) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text labels to be used on the axis.
**Notes:** This method is typically used to set the x-axis to enumerated scale. In enumerated scale, the data points are associated with the x-axis by position. The first data point will be plotted at the first label position on the x-axis, the second data point at the second label position, and so on.

Enumerated axis is a very flexible axis type. It is most suitable for chart types where the data points are evenly spaced on the x-axis. The axis labels can be any text. They do not need to be numbers or dates. If they are numbers or dates, you can format them in any way you like before calling this method.

Internally, ChartDirector will assign a value of 0 to the first axis label, 1 to the second axis label, and so on. These values are not visible. Only the axis labels are visible. However, these values may be useful for some ChartDirector features that need to reference the axis position by value, such as adding mark lines using Axis.addMark.

By default, all axis labels will be associated major ticks. To associate a label with a minor tick, use '-' as the first character of the label. To draw a label without any tick at all, use '
textasciitilde ' as the first character of the label.

Leading '-' or '
textasciitilde ' characters are tick specification characters and will not appear on the labels. They just specify the the tick style to be associated with the labels. If you want have a label that actually begins these characters, add '\' as the first character as the escape character.

One common issue is that there may be too many labels on the axis. In this case, the Axis.setLabelStep method may be used show only a regularly spaced subset of labels on the axis.

Another method is to remove some labels is to replace them with empty strings before passing them to ChartDirector. If you want to remove the label text but leave a major tick, use a space character " " as the label text. If you want to remove the label text but leave a major tick, use "-" as the label text.

| Parameter | Default | Description |
|---|---|---|
| text | (Mandatory) | An array of strings containing the text of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See also:

- 28.5.37 setLabels(labels() as Double, formatString as string = "") as CDTextBoxMBS 4783

### 28.5.39 setLabelStep(majorTickStep as Integer, minorTickStep as Integer = 0, majorTickOffset as Integer = 0, minorTickOffset as Integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows a regularly spaced subset of the axis labels on the axis.
**Notes:** This method is typically used in conjunction with
Axis.setLabels. These two methods define the full set of labels on the axis, one for each data point in a data set. In many cases, there may be too many labels and the axis may become overcrowded with labels. The setLabelStep method will cause the axis to show a regularly spaced subset of labels instead all labels.

| Parameter | Default | Description |
|---|---|---|
| majorTickStep | (Mandatory) | The spacing between visible labels (major ticks). For example, a value of 10 means displaying 1 label for every 10 labels. |
| minorTickStep | 0 | For labels that are not displayed, ChartDirector can optionally put a minor tick in its place. The argument specifies the spacing between minor ticks. For example, a value of 5 means displaying 1 minor tick for every 5 labels. The default value of 0 means no minor tick is used. |
| majorTickOffset | 0 | The offset used for selecting the labels. For example, if majorTickStep is set to 10, by default, ChartDirector will select the labels with index 0, 10, 20, 30 and so on. If the majorTickOffset argument is set to 3, then ChartDirector will select labels with index 3, 13, 23, 33 and so on. |
| minorTickOffset | -7fffffff | The offset used for selecting minor tick points. The usage is the same as the majorTickOffset argument, except it applies to minor tick points. The default is to use the same value as majorTickOffset. |

### 28.5.40 setLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font style used to for the axis labels.
**Notes:** See Font Specification for details on various font attributes.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

| Parameter | Default | Description |
|---|---|---|
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels in points. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.5.41 setLabelStyle(font as string, fontsize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS 4786

### 28.5.41 setLabelStyle(font as string, fontsize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.5.40 setLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 4785

### 28.5.42 setLength(length as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the length of the axis.

### 28.5.43 setLinearScale(formatString as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use linear auto-scale.
**Notes:**

See also:

- 28.5.44 setLinearScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4787
- 28.5.45 setLinearScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4787

| Parameter | Default | Description |
|---|---|---|
| formatString | "" | The format used for the labels on the axis. Please refer to Axis.setLabelFormat for the syntax of the format string. An empty string means the format will be automatically determined. |

### 28.5.44 setLinearScale(lowerLimit as Double, upperLimit as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given linear scale and the given labels.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the axis. ChartDirector will distribute the labels evenly on the axis. By default, all labels are associated with major ticks. These can be modified by using '-' or ' textasciitilde ' as the first character. Please refer to Axis.setLabels for details. |

See also:

- 28.5.43 setLinearScale(formatString as string = "") 4786
- 28.5.45 setLinearScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4787

### 28.5.45 setLinearScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given linear scale.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| majorTickInc | 0 | Adds major ticks to the axis, where the major ticks are separated by majorTickInc in value. Each major tick will have an associated text label for the value if the axis at the tick. The default value of 0 means the major ticks will be automatically determined. In this case, the lowerLimit and upperLimit may be automatically adjusted to align with the ticks. Use kNoValue to disable major ticks. |
| minorTickInc | 0 | Adds minor ticks to the axis, where the minor ticks are separated by minorTickInc in value. The default value of 0 means no minor tick is used. |

See also:


- 28.5.43 setLinearScale(formatString as string = "") 4786
- 28.5.44 setLinearScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4787


### 28.5.46 setLogScale(formatString as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use logarithmic auto-scale.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| formatString | "" | The format used for the labels on the axis. Please refer to Axis.setLabelFormat for the syntax of the format string. An empty string means the format will be automatically determined. |

See also:


- 28.5.47 setLogScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4788
- 28.5.48 setLogScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4789


### 28.5.47 setLogScale(lowerLimit as Double, upperLimit as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given logarithmic scale and the given labels.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the axis. ChartDirector will distribute the labels evenly on the axis. By default, all labels are associated with major ticks. These can be modified by using '-' or ' |

textasciitilde ' as the first character. Please refer to Axis.setLabels for details.

See also:


- 28.5.46 setLogScale(formatString as string = "") 4788
- 28.5.48 setLogScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0) 4789

### 28.5.48 setLogScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis to use the given logarithmic scale.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower bound of the axis. |
| upperLimit | (Mandatory) | The upper bound of the axis. |
| majorTickInc | 0 | Adds major ticks to the axis, where the major ticks are separated by majorTickInc in ratio. For example, a value of 10 means each tick will be 10 times the value of the previous tick. Each major tick will have an associated text label for the value if the axis at the tick. The special predefined constant LogTick ( = 1.6e308) means the tick increment will be using the non-regular ratio 1, 2, 5, 10, 20, 50, 100, .... The default value of 0 means the major ticks will be automatically determined. In this case, the lowerLimit and upperLimit may be automatically adjusted to align with the ticks. Use kNoValue to disable major ticks. |
| minorTickInc | 0 | Adds minor ticks to the axis, where the minor ticks are separated by minorTickInc in ratio. |

The special constant LogTick means the tick increment will be using the non- regular ratio 1, 2, 5, 10, 20, 50, 100, ....

The default value of 0 means no minor tick is used.
See also:

- 28.5.46 setLogScale(formatString as string = "") 4788
- 28.5.47 setLogScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4788

### 28.5.49 setMargin(topMargin as Integer, bottomMargin as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reserve margins at the ends of the axis.
**Notes:** This method is usually used to reserve space in the plot area. For example, if some margin is reserved at the top of the vertical y-axis, the top of the plot area will contain no data points. It is because this region would be outside the active range of the y-axis. If anything is put at the top of the plot area (such as a legend box or custom text), it will not overlap with the data points.

Note if auto-scaling is used, there is an alternative way to reserve space at the top and/or bottom of the plot area - the Axis.setAutoScale method.

| Parameter | Default | Description |
|---|---|---|
| topMargin | (Mandatory) | The margin reserved at the top end (or right end for horizontal axis) of the axis in pixels. |
| bottomMargin | 0 | The margin reserved at the bottom end (or left end for horizontal axis) of the axis in pixels. |

### 28.5.50 setMinTickInc(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum distance between two ticks on the axis for auto-scaled axis.
**Notes:** The most common use of this method is to ensure the ticks are of integer values (the minimum distance set to 1).

ChartDirector auto-scaling will automatically determine the optimal number of ticks and labels on the axis. However, in some cases, the nature of the data may be such that the ticks should assume only certain discrete values (such as must be integers). This method will inform ChartDirector for this constraint when performing auto-scaling.

For a log scale axis, because the axis ticks are unevenly spaced, the minimum distance will be handled as the minimum value allowed for the axis scale.

| Parameter | Default | Description |
|---|---|---|
| inc | (Mandatory) | The minimum distance between two ticks on the axis as a data value. |

### 28.5.51 setMultiFormat(filter as Integer, format as string, labelSpan as Integer = 1, promoteFirst as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds one filter and format string to the multi-format lists.
**Notes:** Please refer to Axis.setMultiFormat on how to use this method.

| Parameter | Default | Description |
|---|---|---|
| filterId | (Mandatory) | The filter that defines a subset of labels. |
| formatString | (Mandatory) | The format string for formatting the subset defined by the above filter. |
| labelSpan | 1 | The number of label positions that are claimed by one label. If a label occupies more than 1 position, ChartDirector will not put labels on nearby positions, even if they meet the filter criteria. |
| promoteFirst | true | If set to true, the first label will be promoted to a higher filter category in the multi-format list. |

See also:


- 28.5.52 setMultiFormat(filter1 as Integer, format1 as string, filter2 as Integer, format2 as string, labelSpan as Integer = 1, promoteFirst as boolean=true) 4791


### 28.5.52 setMultiFormat(filter1 as Integer, format1 as string, filter2 as Integer, format2 as string, labelSpan as Integer = 1, promoteFirst as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets multiple formats for numeric or date/time axis labels.
**Notes:** This method is typically used to format date/time labels. For example, for an axis that spans 90 days, this method can be used to format the first labels of each month in bold as "mmm-dd", while other labels are shown in normal font as "dd".

The multiple formats are defined as a list of filters and format strings. If the label value satisfies the first filter, it will be formatted using the first format string. Otherwise if the label value satisfies the second filter, it will be formatted using the second format string, and so on. If a label value does not satisfy any filter, it will be discarded.

In the above example, the first filter can be a "start of month" filter (created using Chart::StartOfMonthFilter), and the first format string can be " { value | mmm-dd } ". The second filter can be the "all pass" filter (created using Chart::AllPassFilter), and the format string can be " { value | dd } ".

Supported filters in ChartDirector include:

| Filter | Description |
|---|---|
| Chart::StartOfHourFilter | Creates a data filter that matches date/times that represent the start of a new hour in a date/time series. |
| Chart::StartOfDayFilter | Creates a data filter that matches date/times that represent the start of a new day in a date/time series. |
| Chart::StartOfWeekFilter | Creates a data filter that matches date/times that represent the start of a new week in a date/time series. |
| Chart::StartOfMonthFilter | Creates a data filter that matches date/times that represent the start of a new month in a date/time series. |
| Chart::StartOfYearFilter | Creates a data filter that matches date/times that represent the start of a new year in a date/time series. |
| Chart::RegularSpacingFilter | Creates a data filter that matches 1 out of every N elements. |
| Chart::AllPassFilter | Creates a data filter that matches every element. |
| Chart::NonePassFilter | Creates a data filter that matches no element. |
| Chart::SelectItemFilter | Creates a data filter that matches one specified item. |

For the format strings, please refer to Parameter Substitution and Formatting on their syntax.

A single setMultiFormat method supports two filters and two format strings. You can use multiple setMultiFormat methods to add more filters and format strings.

One common issue in putting labels on the axis is that there may be too many labels on the axis. The setMultiFormat method supports a labelSpan argument that specifies how many label positions a single label will occupy. If a label occupies more than 1 position, ChartDirector will not put labels on nearby positions, even if they meet the filter criteria.

The setMultiFormat method supports special handling of the first label on the axis. For example, in the above example, we may want to show the the first label as "mmm-dd", even if it is not actually the "start of month". The promoteFirst argument, if set to true, will cause the first label to be promoted to a higher filter category in the multi-format list. For example, if the first label satisfies only the second filter, it will be formatted as if it satisfies the first filter.

| Parameter | Default | Description |
|---|---|---|
| filter1 | (Mandatory) | The filter that defines the first kind of labels. |
| format1 | (Mandatory) | The format string for the first kind of labels. |
| filter2 | (Mandatory) | The filter that defines the second kind of labels. |
| format2 | (Mandatory) | The format string for the second kind of labels. |
| labelSpan | 1 | The number of label positions that are claimed by one label. If a label occupies more than 1 position, ChartDirector will not put labels on nearby positions, even if they meet the filter criteria. |
| promoteFirst | true | If set to true, the first label will be promoted to a higher filter category in the multi-format list. |

See also:

- 28.5.51 setMultiFormat(filter as Integer, format as string, labelSpan as Integer = 1, promoteFirst as boolean=true) 4790

### 28.5.53 setOffset(x as Integer, y as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the positional offset of the axis.
**Notes:** By default, ChartDirector draws horizontal axes at the top/bottom borders of the plot area, and vertical axes at the left/right borders of the plot area.

This method can be used to shift an axis from its standard position.

Arguments:

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x offset in pixels. |
| y | (Mandatory) | The y offset in pixels. |

### 28.5.54 setReverse(value as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverse the axis.
**Notes:** For a normal vertical axis, the axis starts from the bottom and increase its value towards the top. For a normal horizontal axis, the axis starts from the left and increase its value towards the right. The setReverse method can be used to reverse the direction of the axis.

| Parameter | Default | Description |
|---|---|---|
| b | true | A true value means the axis is reversed. A false value means the axis is not reversed. |

### 28.5.55 setRounding(roundMin as boolean, roundMax as boolean)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Controls whether to round the ends of the axis to align with tick positions.
**Notes:** For example, if the axis is from 0.33 - 9.7, ChartDirector may round it to 0 - 10 so that the ends 0 and 10 are properly aligned with the ticks.

By default, ChartDirector will round the axis ends for the y-axis, but not for the x-axis. An exception is a chart containing a scatter layer, where both x and y axes will be rounded.

| Parameter | Default | Description |
|---|---|---|
| roundMin | (Mandatory) | A true value means the lesser end of the axis should be rounded to align with tick positions. A false value means no rounding. |
| roundMax | (Mandatory) | A true value means the greater end of the axis should be rounded to align with tick positions. A false value means no rounding. |

### 28.5.56 setTickColor(majorTickColor as color, minorTickColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setTickColor method, but uses color instead of integer data type for passing color values.
See also:

• 28.5.57 setTickColor(majorTickColor as Integer, minorTickColor as Integer = -1) 4794

### 28.5.57 setTickColor(majorTickColor as Integer, minorTickColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the axis ticks.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| majorTickColor | (Mandatory) | The color of the major ticks. |
| minorTickColor | -1 | The color of the major ticks. -1 means the color is the same as majorTickColor |

See also:

• 28.5.56 setTickColor(majorTickColor as color, minorTickColor as color) 4793

### 28.5.58 setTickDensity(majorTickSpacing as Integer, minorTickSpacing as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the density of the axis ticks.
**Notes:** Tick density is the desired distance between two ticks in pixels. When ChartDirector performs auto-scaling, it will decide how many ticks to put on the axis based on tick density.

Note that the actual tick density chosen in auto-scaling may not be exactly the same as the desired tick density. It is because ChartDirector may have other constraints in choosing the ticks, such as the ticks and axis range should be neat numbers, and the axis must contain an integral number of ticks, etc. ChartDirector may use a tick distance that is larger than suggested, but never smaller.

| Parameter | Default | Description |
|---|---|---|
| majorTickSpacing | (Mandatory) | Specify the desired distance between two major ticks in pixels. |
| minorTickSpacing | -1 | Specify the desired distance between two minor ticks in pixels. -1 means minor ticks are not used. |

### 28.5.59 setTickLength(majorTickLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the length of the axis ticks.
**Notes:** A positive tick length means the ticks are drawn outside the plot area. A negative tick length means

the ticks are drawn inside the plot area.

| Parameter | Default | Description |
|---|---|---|
| majorTickLen | (Mandatory) | The length of the major ticks in pixels. The length of the minor ticks will automatically be set to half the length of the major ticks. |

See also:

- 28.5.60 setTickLength(majorTickLen as Integer, minorTickLen as Integer) 4795

### 28.5.60 setTickLength(majorTickLen as Integer, minorTickLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the length of the major and minor axis ticks.
**Notes:** A positive tick length means the ticks are drawn outside the plot area. A negative tick length means the ticks are drawn inside the plot area.

| Parameter | Default | Description |
|---|---|---|
| majorTickLen | (Mandatory) | The length of the major ticks in pixels. |
| minorTickLen | (Mandatory) | The length of the minor ticks in pixels. |

See also:

- 28.5.59 setTickLength(majorTickLen as Integer) 4794

### 28.5.61 setTickOffset(offset as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the position of the ticks along the axis.
**Notes:** By default, ChartDirector draws the ticks at the label position. This method is typically used to shift the ticks so that the ticks are between two labels, rather than aligned with the label.

The offset is specified as a value on the axis scale. For a label based axis (configured using Axis.setLabels), shifting with an offset of 0.5 means shifting half the label interval. This will achieve the effect of putting the ticks in between the labels.

| Parameter | Default | Description |
|---|---|---|
| offset | (Mandatory) | The distance to shift the ticks along the axis as a value on the axis scale. |

### 28.5.62 setTickWidth(majorTickWidth as Integer, minorTickWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width of the axis ticks.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| majorTickWidth | (Mandatory) | The width of the major ticks in pixels. |
| minorTickWidth | -1 | The width of the minor ticks in pixels. -1 means the width is the same as majorTickWidth. |

### 28.5.63 setTitle(text as string, font as string = """, fontsize as Double = 8, fontcolor as Integer = &hffff0002) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a title to the axis.
**Notes:** See Font Specification for details on various font attributes.

| Parameter | Default | Description |
|---|---|---|
| text | (Mandatory) | The title text. |
| font | "" | The font used to draw the title. If no font is specified, the default is "bold". |
| fontSize | 8 | The size of the font in points. |
| fontColor | TextColor | The color used to draw the title text. |

Return Value
A TextBox object representing the axis title. This may be used to fine-tune the appearance of the axis title.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.5.64 setTitle(text as string, font as string, fontsize as Double, fontcolor as color) as CDTextBoxMBS 4796

### 28.5.64 setTitle(text as string, font as string, fontsize as Double, fontcolor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setTitle method, but uses color instead of integer data type for passing color values.
See also:

- 28.5.63 setTitle(text as string, font as string = """, fontsize as Double = 8, fontcolor as Integer = &hffff0002) as CDTextBoxMBS 4796

### 28.5.65 setTitlePos(alignment as Integer, titleGap as Integer = 3)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the axis title relative to the axis.
**Notes:** By default, the axis title will be drawn at the middle of the axis outside the plot area. You may change the location of the title. For example, instead of drawing the y-axis title at the middle of the axis, you may want draw it at the top of the axis.

| Parameter | Default | Description |
|---|---|---|
| alignment | (Mandatory) | The position of the title relative to the axis. |
| titleGap | 3 | The distance between the axis title and the axis in pixels. |

### 28.5.66 setWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line width of the axis.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| width | (Mandatory) | The line width of the axis in pixels. |

### 28.5.67 syncAxis(axis as CDAxisMBS, slope as Double = 1.0, intercept as Double = 0.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes this axis with another axis using a linear formula.
**Notes:** This method is typically used if the two axes represent the same quantity but in different units. For example, one axis may represent temperature in Celsius, and the other in Fahrenheit, or they may represent lengths in meters and feet.

The scale of this axis (value) will be related to the scale of the another axis (value2) using the following formula:

value = value2 * slope + intercept

Typically, one of the axis will be for actual charting, and its scale will be determined in the standard way using auto or manual scaling. Then the second axis is set to synchronize with the first axis.

| Parameter | Default | Description |
|---|---|---|
| axis | (Mandatory) | The axis to synchronize to. |
| slope | 1 | The slope for synchronizing this axis to the other axis. |
| intercept | 0 | The intercept parameter for synchronizing this axis to the other axis. |

### 28.5.68 syncScale(axis as CDAxisMBS = nil, slope as double = 1.0, intercept as double = 0.0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes the scale of this axis with another axis using a linear formula.
**Notes:** The scale of this axis (value) will be related to the scale of the source axis (value2) using the following formula:

value = value2 * slope + intercept

The differences between syncScale and Axis.syncAxis are:

- Axis.syncAxis assumes the two axes are of the same length. In addition to the scale, it will also synchronize the ticks and labels, and configurations that may affect the positions of ticks and labels, such as axis margins and axis indentation. This ensures the two axes scale align properly.
- syncScale does not assume the two axes are of the same length. For example, the y-axis of one chart can be synchronized with the CDColorAxisMBS of a different chart. The two axes can have different labels to fit their different lengths.

| Argument | Default | Description |
|---|---|---|
| axis | (Mandatory) | The axis to synchronize to. A value of null means not to synchronize to any axis. |
| slope | 1 | The slope for synchronizing this axis to the other axis. |
| intercept | 0 | The intercept parameter for synchronizing this axis to the other axis. |

## 28.6 class CDBarLayerMBS

### 28.6.1 class CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The BarLayer class represents bar layers. BarLayer is a subclass of Layer.
**Notes:** Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Create a Bar Chart in Xojo with the ChartDirector
- Chart Diagrams with Xojo
- Beware of the plugin limit in Real Studio

**Xojo Developer Magazine**

- 7.4, page 31: Easy Charts and Graphs, Using the ChartDirector Plugin
- 17.2, page 37: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich
- 17.2, page 35: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich
- 17.2, page 33: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich

### 28.6.2 Methods

### 28.6.3 setBarGap(barGap as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gap between the bars in a bar chart layer.
**Notes:** In the setBarGap method, the gap between the bars is expressed as the portion of the space between the bars. For example, a bar gap of 0.2 means 20% of the distance between two adjacent bars is the gap between the bars.

A bar gap of 0 means there is no gap in between the bars. The bar gap can be negative. In this case, the bars will overlap. The predefined constant TouchBar ( = -1.7E-100) means the bars will "touch", that is, the bar borders overlap, so two adjacent bars will share the same border.

For multi-bar layers (bar layers using the Side data combine method, or for stacked bar layers with multiple data groups), barGap refers to the portion of the space between bar groups, while subBarGap refers to the portion of the space between bars within the bar group.

| Parameter | Default | Description |
|---|---|---|
| barGap | (Mandatory) | The portion of the space between the bars (or between bar groups for multi-bar layers). |
| subBarGap | 0.2 | This argument only applies to multi-bar charts. It is the portion of the space between the bars in a bar group. |

See also:


- 28.6.4 setBarGap(barGap as Double, subBarGap as Double) 4800


### 28.6.4 setBarGap(barGap as Double, subBarGap as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gap between the bars in a bar chart layer.
**Notes:** In the setBarGap method, the gap between the bars is expressed as the portion of the space between the bars. For example, a bar gap of 0.2 means 20% of the distance between two adjacent bars is the gap between the bars.

A bar gap of 0 means there is no gap in between the bars. The bar gap can be negative. In this case, the bars will overlap. The predefined constant TouchBar ( = -1.7E-100) means the bars will "touch", that is, the bar borders overlap, so two adjacent bars will share the same border.

For multi-bar layers (bar layers using the Side data combine method, or for stacked bar layers with multiple data groups), barGap refers to the portion of the space between bar groups, while subBarGap refers to the portion of the space between bars within the bar group.

| Parameter | Default | Description |
|---|---|---|
| barGap | (Mandatory) | The portion of the space between the bars (or between bar groups for multi-bar layers). |
| subBarGap | 0.2 | This argument only applies to multi-bar charts. It is the portion of the space between the bars in a bar group. |

See also:


- 28.6.3 setBarGap(barGap as Double) 4799

### 28.6.5 setBarShape(shape as Integer, dataGroup as Integer = -1, dataItem as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the bar(s) using built-in shapes.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| shape | (Mandatory) | The bar shape to use. Please refer to Shape Specification on how shapes are specified. |
| dataGroup | -1 | The index of the data group that the shape applies to. In a multi-stacked bar, the data sets that are stacked up into a single bar forms a data group. In a multi-bar chart, each data set is a data group by itself. The default value of -1 means the shape applies to all data groups. |
| dataItem | -1 | The index of the data points that the shape applies to. For example, if set to 3, the shape will only apply to the 4th bar (index starts from 0) in each data series. The default value of -1 means the shape applies to all data points. |

See also:

- 28.6.6 setBarShape(shape() as Integer, dataGroup as Integer = -1, dataItem as Integer = -1) 4801

### 28.6.6 setBarShape(shape() as Integer, dataGroup as Integer = -1, dataItem as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the bar(s) to a custom shape defined using an array of (x, y) coordinates.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| shape | (Mandatory) | The bar shape to use. Please refer to Shape Specification on how shapes are specified. |
| dataGroup | -1 | The index of the data group that the shape applies to. In a multi-stacked bar, the data sets that are stacked up into a single bar forms a data group. In a multi-bar chart, each data set is a data group by itself. The default value of -1 means the shape applies to all data groups. |
| dataItem | -1 | The index of the data points that the shape applies to. For example, if set to 3, the shape will only apply to the 4th bar (index starts from 0) in each data series. The default value of -1 means the shape applies to all data points. |

See also:

- 28.6.5 setBarShape(shape as Integer, dataGroup as Integer = -1, dataItem as Integer = -1) 4801

### 28.6.7 setBarWidth(barWidth as Integer, subBarWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width of the bars.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| barWidth | (Mandatory) | The width of the bars (or bar groups for multi-bar layers) in pixels. |
| subBarWidth | -1 | This argument only applies to multi-bar charts. It is the width of the bars in a bar group in pixels. |

### 28.6.8 setIconSize(height as Integer, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the icon(s) to be used in legend box.
**Notes:** By default, if a legend box is available on the chart, ChartDirector will insert an legend entry for any named data sets in the legend box. The icons for the data sets will be the shape of the bars. The size of the icons will be determined using the key size settings of the legend box (see LegendBox.setKeySize).

This method can be used to override the legend box settings to specify a custom width/height for the icons of the current BarLayer.

If the icon size is set to 0, a square color box will be used as the icon without regarding the shape of the bar.

| Parameter | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the icon in pixels. |
| width | -1 | The width of the icon in pixels. The default value of -1 means the width is the same as the height. |

### 28.6.9 setMinImageMapSize(s as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum height (or width if the x-axis and y-axis are swapped with CDXYChartMBS.swapXY) of the hot spots defined by the image map.
**Notes:** By default, the hot spots defined by image map exactly cover the bars. For very short bars, the hot spots may be very small, and it may become difficult to move the mouse over the hot spots.
This method ensures the hot spots are at least of certain size, even if the bars are shorter. The default is 5 pixels.

Arguments:

| Argument | Default | Description |
|---|---|---|
| size | (Mandatory) | The minimum height (or width if the x-axis and y-axis are swapped with CDXYChartMBS.swapXY) of the hot spots defined by the image map. |

### 28.6.10 setMinLabelSize(s as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum height (or width for horizontal bars) of the bar segments below which data labels will be hidden.
**Notes:** In ChartDirector, for a bar layer, data labels (Layer.setDataLabelStyle) are drawn internal to the bar segment, while the aggregate labels (Layer.setAggregateLabelStyle) are drawn external to the bar.

ChartDirector will disable data labels for a bar segment if the bar segment is too short to contain the data label.

By default, ChartDirector will automatically determine what is meant by "too short". The setMinLabelSize method can be used to manually defined the threshold for "too short".

Sometimes it may be desirable to display the data label even though it cannot be contained within the bar segment. In this case, the setMinLabelSize can be used to set the threshold to 0.

| Parameter | Default | Description |
|---|---|---|
| s | (Mandatory) | The minimum length of the bar segments in pixels, below which data labels will be hidden. |

### 28.6.11 setOverlapRatio(overlapRatio as Double, firstOnTop as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets overlapping among bars in within a bar group in a multi-bar chart.
**Notes:** By default, in a multi-bar chart, the bars are not overlapped, but are separated with a gap in between. This method can be used to set an alternative style, where the bars partially overlap.

### 28.6.12 setRoundedCorners

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

| Parameter | Default | Description |
|---|---|---|
| overlapRatio | (Mandatory) | The overlapping ratio between adjacent bars in a bar group. Should be between 0 to 1. |
| firstOnTop | true | If this value is true, the first data set will be on top of the second data during overlapping, and the second data set will be on top of the third data set, and so on. If this value is false, then the overlapping order will be reversed. |

**Function:** Configures rounded corners for rectangular bars.
**Notes:** A rectangular bar has 4 corners. Two of them are at the base of the bar, while the other two are at the "data end" of the bar. Note that the base of the bar can be any side of the bar, depending on whether the bar is positive or negative, vertical or horizontal.

For the 2 base corners, one of them is at the negative x direction while the other is at the positive x direction. The same applies to the two data end corners.

This method accepts 0, 1, 2 or 4 radius values. The usage of these values depend how many values are provided as follows.

| Values Provided | Description |
|---|---|
| 0 | The radii of the data end corners are automatically determined. The radii of the base corners are set to 0. |
| 1 | The radii of the data end corners are set to the specified value. The radii of the base corners are set to 0. |
| 2 | The radii of the data end corners are set to the first value. The radii of the base corners are set to the second value. |
| 4 | The radius of the data end corner at the negative x direction is set to the first value. The radius of the data end corner at the positive x direction is set to the second value. The radius of the base corner at the negative x direction is set to the third value. The radius of the base corner at the positive x direction is set to the fourth value. |

| Argument | Default | Description |
|---|---|---|
| r1 | -&h7fffffff | The first radius. See description above on how this radius value is used. |
| r2 | -&h7fffffff | The second radius. See description above on how this radius value is used. |
| r3 | -&h7fffffff | The third radius. See description above on how this radius value is used. |
| r4 | -&h7fffffff | The fourth radius. See description above on how this radius value is used. |

See also:

- 28.6.13 setRoundedCorners(r1 as Integer, r2 as Integer = -2147483647, r3 as Integer = -2147483647, r4 as Integer = -2147483647)

### 28.6.13 setRoundedCorners(r1 as Integer, r2 as Integer = -2147483647, r3 as Integer = -2147483647, r4 as Integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures rounded corners for rectangular bars.
**Notes:** A rectangular bar has 4 corners. Two of them are at the base of the bar, while the other two are at the "data end" of the bar. Note that the base of the bar can be any side of the bar, depending on whether the bar is positive or negative, vertical or horizontal.

For the 2 base corners, one of them is at the negative x direction while the other is at the positive x direction. The same applies to the two data end corners.

This method accepts 0, 1, 2 or 4 radius values. The usage of these values depend how many values are provided as follows.

| Values Provided | Description |
|---|---|
| 0 | The radii of the data end corners are automatically determined. The radii of the base corners are set to 0. |
| 1 | The radii of the data end corners are set to the specified value. The radii of the base corners are set to 0. |
| 2 | The radii of the data end corners are set to the first value. The radii of the base corners are set to the second value. |
| 4 | The radius of the data end corner at the negative x direction is set to the first value. The radius of the data end corner at the positive x direction is set to the second value. The radius of the base corner at the negative x direction is set to the third value. The radius of the base corner at the positive x direction is set to the fourth value. |

| Argument | Default | Description |
|---|---|---|
| r1 | -&h7fffffff | The first radius. See description above on how this radius value is used. |
| r2 | -&h7fffffff | The second radius. See description above on how this radius value is used. |
| r3 | -&h7fffffff | The third radius. See description above on how this radius value is used. |
| r4 | -&h7fffffff | The fourth radius. See description above on how this radius value is used. |

See also:

- 28.6.12 setRoundedCorners 4803

## 28.7 class CDBaseBoxLayerMBS

### 28.7.1 class CDBaseBoxLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

The BaseBoxLayer class is the base class for layers that uses isolated symbols to represent multiple data sets. These include BoxWhiskerLayer, HLOCLayer and
CandleStickLayer.
**Notes:**

Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.7.2 Methods

### 28.7.3 setDataGap(gap as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the symbol width by specifying the gap ratio between adjacent symbols.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| gap | (Mandatory) | The gap between two adjacent symbols as the portion of the space between the midpoints of the elements. The gap must be in the range 0 - 1. A value of 0 (the default) means there is no gap between two adjacent symbols. |

### 28.7.4 setDataWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the symbol width by specifying the pixel width of the symbols.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the symbols in pixels. |

### 28.7.5 setMinImageMapSize(size as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum height (or width if the x-axis and y-axis are swapped with CDXYChartMBS.swapXY) of the hot spots defined by the image map.
**Notes:** By default, the hot spots defined by image map exactly cover the bars. For very short bars, the hot spots may be very small, and it may become difficult to move the mouse over the hot spots.
This method ensures the hot spots are at least of certain size, even if the bars are shorter. The default is 5 pixels.

Arguments:

| Argument | Default | Description |
|---|---|---|
| size | (Mandatory) | The minimum height (or width if the x-axis and y-axis are swapped with CDXYChartMBS.swapXY) of the hot spots defined by the image map. |

### 28.7.6 setRoundedCorners(r1 as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures rounded corners for the boxes.
**Notes:** This method currently is only supported by the BoxWhiskerLayer.

A box has 4 corners, two of them are at "box-top", and two of them are at "box-bottom". Note that "box-top" and "bottom-bottom" refer to the sides of the box representing the boxTop and boxBottom parameters in CDXYChartMBS.addBoxWhiskerLayer or CDXYChartMBS.addBoxLayer. Note that they are not necessarily the geometric top or bottom of the box. For example, if the y-axis is reversed (such as configured using CDAxisMBS.setReverse), the top and bottom side may be reversed. For horizontal boxes (with CDXYChartMBS.swapXY in effect), the box-top and box-bottom sides may actually be the right and left sides.

Of the 2 box-top corners, one of them is at the negative x direction while the other is at the positive x direction. The same applies to the box-bottom corners.

This method accepts 0, 1, 2 or 4 radius values. The usage of these values depend how many values are provided as follows.

See also:

- 28.7.7 setRoundedCorners(r1 as Integer, r2 as Integer, r3 as Integer = -2147483647, r4 as Integer = -2147483647) 

| Values Provided | Description |
|---|---|
| 0 | The radii of all the box corners are automatically determined. |
| 1 | The radii of all the box corners are set to the specified value. |
| 2 | The radii of the box-top corners are set to the first value. The radii of the box-bottom corners are set to the second value. |
| 4 | The radius of the box-top corner at the negative x direction is set to the first value. The radius of the box-top corner at the positive x direction is set to the second value. The radius of the box-bottom corner at the negative x direction is set to the third value. The radius of the box-bottom corner at the positive x direction is set to the fourth value. |

| Argument | Default | Description |
|---|---|---|
| r1 | -0x7fffffff | The first radius. See description above on how this radius value is used. |
| r2 | -0x7fffffff | The second radius. See description above on how this radius value is used. |
| r3 | -0x7fffffff | The third radius. See description above on how this radius value is used. |
| r4 | -0x7fffffff | The fourth radius. See description above on how this radius value is used. |

### 28.7.7 setRoundedCorners(r1 as Integer, r2 as Integer, r3 as Integer = -2147483647, r4 as Integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures rounded corners for the boxes.
**Notes:** This method currently is only supported by the BoxWhiskerLayer.

A box has 4 corners, two of them are at "box-top", and two of them are at "box-bottom". Note that "box-top" and "bottom-bottom" refer to the sides of the box representing the boxTop and boxBottom parameters in CDXYChartMBS.addBoxWhiskerLayer or CDXYChartMBS.addBoxLayer. Note that they are not necessarily the geometric top or bottom of the box. For example, if the y-axis is reversed (such as configured using CDAxisMBS.setReverse), the top and bottom side may be reversed. For horizontal boxes (with CDXYChartMBS.swapXY in effect), the box-top and box-bottom sides may actually be the right and left sides.

Of the 2 box-top corners, one of them is at the negative x direction while the other is at the positive x direction. The same applies to the box-bottom corners.

This method accepts 0, 1, 2 or 4 radius values. The usage of these values depend how many values are provided as follows.

See also:

- 28.7.6 setRoundedCorners(r1 as Integer) 4807

| Values Provided | Description |
|---|---|
| 0 | The radii of all the box corners are automatically determined. |
| 1 | The radii of all the box corners are set to the specified value. |
| 2 | The radii of the box-top corners are set to the first value. The radii of the box-bottom corners are set to the second value. |
| 4 | The radius of the box-top corner at the negative x direction is set to the first value. The radius of the box-top corner at the positive x direction is set to the second value. The radius of the box-bottom corner at the negative x direction is set to the third value. The radius of the box-bottom corner at the positive x direction is set to the fourth value. |

| Argument | Default | Description |
|---|---|---|
| r1 | -0x7fffffff | The first radius. See description above on how this radius value is used. |
| r2 | -0x7fffffff | The second radius. See description above on how this radius value is used. |
| r3 | -0x7fffffff | The third radius. See description above on how this radius value is used. |
| r4 | -0x7fffffff | The fourth radius. See description above on how this radius value is used. |

## 28.8 class CDBaseChartMBS

### 28.8.1 class CDBaseChartMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The BaseChart class is an abstract class containing methods that are common to all chart types.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- HiDPI for ChartDirector
- Scintilla in Xojo for Linux 64-bit on ARM
- News from the MBS Xojo Plugins Version 21.2
- Track Line with Data Labels Retina
- Register MBS Xojo Plugins
- Tip of Day: ChartTime back to date object
- YZoneColor
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### 28.8.2 Methods

### 28.8.3 addExtraField(numbers() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of numbers/dates to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the chart object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| numbers | (Mandatory) | An array of numbers/dates to be stored inside the chart object. |

See also:


- 28.8.4 addExtraField(paths() as folderitem) 4811
- 28.8.5 addExtraField(texts() as string) 4812


### 28.8.4 addExtraField(paths() as folderitem)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of file paths to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the chart object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| texts | (Mandatory) | An array of text to be stored inside the chart object. |

See also:


- 28.8.3 addExtraField(numbers() as Double) 4811

• 28.8.5 addExtraField(texts() as string) 4812

### 28.8.5 addExtraField(texts() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of text to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the chart object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| texts | (Mandatory) | An array of text to be stored inside the chart object. |

Great to add point labels to the chart.
See also:

• 28.8.3 addExtraField(numbers() as Double) 4811

• 28.8.4 addExtraField(paths() as folderitem) 4811

### 28.8.6 addLegend(x as Integer, y as Integer, noOfCols as Integer, font as string = """, fontsize as Double = 10) as CDLegendBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a legend box to the chart with grid layout.
**Notes:** In grid layout, the legend box will be divided into a table in which all cells are of of same width. The legend entries will fill the cells from left to right, top to bottom.

The number of columns can be specified using the noOfCols argument. If this argument is set to the special constant AutoGrid (= -2), the number of columns will be automatically determined based on the longest legend entry. If this argument is 0, the legend box will use a flow layout (from left to right and then top to bottom, in which the entries may not be vertically aligned).

In any case, the number of rows in the table is automatically determined so as to have enough cells for all legend entries.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the reference point of the legend box. By default, the reference point is the top-left corner of the box, but can be configured by using TextBox.setAlignment. |
| y | (Mandatory) | The y coordinate of the reference point of the legend box. By default, the reference point is the top-left corner of the box, but can be configured by using TextBox.setAlignment. |
| noOfCols | (Mandatory) | The number of columns in the legend box. The special value AutoGrid (= -2) means the number of columns is automatically determined. If this argument is 0, the legend box will use a flow layout (from left to right and then top to bottom, in which the entries may not be vertically aligned). |
| font | "" | The font name of the font for drawing the legend text. The default is "normal". See Font Specification for details on various font attributes. |
| fontSize | 10 | The font size of the legend text. |

Return Value
A LegendBox object representing the legend box. You may use this object to fine-tune the appearance of the legend box.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.8.7 addLegend(x as Integer, y as Integer, vertical as boolean=true, font as string = "", fontsize as Double = 10) as CDLegendBoxMBS 4813

### 28.8.7 addLegend(x as Integer, y as Integer, vertical as boolean=true, font as string = "", fontsize as Double = 10) as CDLegendBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a legend box to the chart.
**Notes:** The entries in the legend box will flow from top to bottom (one line per entry), or from left to right and then top to bottom (like flowing text), depending on the vertical argument. For grid layout, use BaseChart.addLegend2.

Return Value
A LegendBox object representing the legend box. You may use this object to fine-tune the appearance of the legend box.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the reference point of the legend box. By default, the reference point is the top-left corner of the box, but can be configured by using TextBox.setAlignment. |
| y | (Mandatory) | The y coordinate of the reference point of the legend box. By default, the reference point is the top-left corner of the box, but can be configured by using TextBox.setAlignment. |
| vertical | true | A true value means the legend keys are laid out vertically (one line per entry). A false value means the legend keys are laid out horizontal and flow like text (from left to right, top to bottom). |
| font | "" | The font name of the font for drawing the legend text. The default is "normal". See Font Specification for details on various font attributes. |
| fontSize | 10 | The font size of the legend text. |

- 28.8.6 addLegend(x as Integer, y as Integer, noOfCols as Integer, font as string = "", fontsize as Double = 10) as CDLegendBoxMBS 4812

### 28.8.8 addLine(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, colorvalue as color, lineWidth as Integer = 1) as CDLineMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLine method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.9 addLine(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, colorvalue as Integer = &hffff0001, lineWidth as Integer = 1) as CDLineMBS 4814

### 28.8.9 addLine(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, colorvalue as Integer = &hffff0001, lineWidth as Integer = 1) as CDLineMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line to the chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first endpoint of the line. |
| y1 | (Mandatory) | The y coordinate of the first endpoint of the line. |
| x2 | (Mandatory) | The x coordinate of the second endpoint of the line. |
| y2 | (Mandatory) | The y coordinate of the second endpoint of the line. |
| color | LineColor | The color of the line. |
| lineWidth | 1 | The width of the line. |

Return Value
A Line object representing the line added. You may use this object to fine- tune the appearance of the line.
See also:

- 28.8.8 addLine(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, colorvalue as color, lineWidth as Integer = 1) as CDLineMBS 4814

### 28.8.10 addTable(x as Integer, y as Integer, alignment as Integer, col as Integer, row as Integer) as CDMLTableMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a CDML table to the chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x-coordinate of the reference point used to position the table. |
| y | (Mandatory) | The y-coordinate of the reference point used to position the table. |
| alignment | (Mandatory) | The alignment of the table with respect to the reference point. For example, a value of kTopLeft means the reference point is the top- left corner of the table. See Alignment Specification for supported alignment types.. |
| col | (Mandatory) | The number of columns in the table. |
| row | (Mandatory) | The number of rows in the table. |

Returns a CDMLTableMBS object representing the CDML table added.

### 28.8.11 addText(x as Integer, y as Integer, text as string, font as string = "", fontsize as Double = 8, fontcolor as Integer = &hffff0002, alignment as Integer = 7, angle as Double = 0, vertical as boolean=false) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a text box to the chart.
**Notes:** By default, only the text is visible, the box is transparent. This method returns a TextBox object that can be used to change the appearance of the text box.

Return Value
A TextBox object representing the text box. This may be used to fine-tune the appearance of the text box.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the left of the text box. |
| y | (Mandatory) | The y coordinate of the top of the text box. |
| text | (Mandatory) | The text to shown in the text box. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | "" | The font used to draw the text. See Font Specification for details on various font attributes. |
| fontSize | 8 | The font size used to draw the text. |
| fontColor | TextColor | The color used to draw the text. |
| alignment | TopLeft | The alignment of the text within the text box. See Alignment Specification for supported alignment types. |
| angle | 0 | The rotation angle of the text within the text box. |
| vertical | false | Indicate whether the text should be laid out vertically (from top to bottom) or horizontally (from left to right). |

See also:

- 28.8.12 addText(x as Integer, y as Integer, text as string, font as string, fontsize as Double, fontcolor as color, alignment as Integer = 7, angle as Double = 0, vertical as boolean=false) as CDTextBoxMBS 4816

### 28.8.12 addText(x as Integer, y as Integer, text as string, font as string, fontsize as Double, fontcolor as color, alignment as Integer = 7, angle as Double = 0, vertical as boolean=false) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addText method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.11 addText(x as Integer, y as Integer, text as string, font as string = "", fontsize as Double = 8, fontcolor as Integer = &hffff0002, alignment as Integer = 7, angle as Double = 0, vertical as boolean=false) as CDTextBoxMBS 4815

### 28.8.13 addTitle(alignment as Integer, text as string, font as string = "", fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a title to the chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| alignment | (Mandatory) | The position on the title on the chart. See Alignment Specification for supported alignment types. |
| text | (Mandatory) | The text for the title. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | "" | The font used to draw the title text. The default is "bold". See Font Specification for details on various font attributes. |
| fontSize | 12 | The font size in points for the title text. |
| fontColor | TextColor | The color of the title text. |
| bgColor | Transparent | The background color of the title box. |
| edgeColor | Transparent | The border color of the title box. |

Return Value
A TextBox object representing the title box. This may be used to fine-tune the appearance of the title box.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.8.14 addTitle(alignment as Integer, text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4817
- 28.8.15 addTitle(text as string, font as string = "", fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4818
- 28.8.16 addTitle(text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4818

### 28.8.14 addTitle(alignment as Integer, text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTitle method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.13 addTitle(alignment as Integer, text as string, font as string = "", fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4816
- 28.8.15 addTitle(text as string, font as string = "", fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4818

- 28.8.16 addTitle(text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4818


### 28.8.15 addTitle(text as string, font as string = """, fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a title at the top center of the chart.
**Notes:** The title is contained within a box, of which the width is the same as the width of the chart, and the height is automatically adjusted to fit the text. The box is initially invisible, but can be made visible by setting the bgColor and edgeColor.

| Argument | Default | Description |
|---|---|---|
| text | (Mandatory) | The text for the title. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | "" | The font used to draw the title text. The default is "bold". See Font Specification for details on various font attributes. |
| fontSize | 12 | The font size in points for the title text. |
| fontColor | TextColor | The color of the title text. |
| bgColor | Transparent | The background color of the title box. |
| edgeColor | Transparent | The border color of the title box. |

Return Value
A TextBox object representing the title box. This may be used to fine-tune the appearance of the title box.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:


- 28.8.13 addTitle(alignment as Integer, text as string, font as string = "", fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4816
- 28.8.14 addTitle(alignment as Integer, text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4817
- 28.8.16 addTitle(text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4818


### 28.8.16 addTitle(text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTitle method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.13 addTitle(alignment as Integer, text as string, font as string = ""), fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4816
- 28.8.14 addTitle(alignment as Integer, text as string, font as string, fontsize as Double, fontColor as color, bgColor as color, edgeColor as color) as CDTextBoxMBS 4817
- 28.8.15 addTitle(text as string, font as string = ""), fontsize as Double = 12, fontColor as Integer = &hffff0002, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000) as CDTextBoxMBS 4818

### 28.8.17 adjustBrightness(ColorValue as color, brightness as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other adjustBrightness method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.18 adjustBrightness(ColorValue as Integer, brightness as Double) as Integer 4819

### 28.8.18 adjustBrightness(ColorValue as Integer, brightness as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color that is a darkened or brightened version of the given color.
**Notes:** A brightness less than 1 means the color is darkened, while a brightness greater than 1 means the color is brightened. For example, a brightness of 0.5 means the color is half as bright as the original color. If the original color is red, the color will become dark red. Conversely, a brightness of 2 means the color is twice as bright as the original color. If the original color is red, the color will become light red.

Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The given color. |
| brightness | (Mandatory) | A non-negative number represent the factor to darken or brighten the color. |

Return Value
A 32-bit integer representing the darkened or brightened color.
See also:

• 28.8.17 adjustBrightness(ColorValue as color, brightness as Double) as Integer 4819

### 28.8.19 AllPassFilter as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches every element.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 as a "catch all" filter.
Return Value
An integer filter id representing the filter.

### 28.8.20 ArrowShape(angle as Double = 0.0, widthRatio as Double = 1, stemWidthRatio as Double = 0.5, stemLengthRatio as Double = 0.5) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents an arrow shape.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| angle | 0 | The clockwise angle of the arrow relative to the upward pointing position. |
| widthRatio | 1 | The width of the base of the arrow head as a ratio to the height of the entire arrow. Must be between 0 and 1. |
| stemWidthRatio | 0.5 | The width of the arrow stem as a ratio to the width of the base of the arrow head. Must be between 0 and 1. |
| stemLengthRatio | 0.5 | The length of the arrow stem as a ratio to the height of the entire arrow. Must be between 0 and 1. |

Returns an integer shape id representing the arrow shape.

### 28.8.21 barLighting(startBrightness as Double = 0.75, endBrightness as Double = 1.5) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A special shading effect for rectangular and polygonal bars on a CDBarLayerMBS.
**Notes:** It shades all surfaces of a 2D or 3D bar with gradient colors.

For the front surface of a bar, the gradient is from base line of the bar to the end of the bar. For example, for a vertical bar pointing upwards, the gradient is from bottom to the top. Similarly, for a horizontal bar

pointing rightwards, the gradient is from left to right.

For a 3D bar, the gradient for the top surface of a vertical bar or the right surface of a horizontal bar is from front to back. The gradients for the side surfaces are the same as for the front surface.

The gradient is specified with two brightness values at the gradient end points. A brightness less than 1 means the color is darkened, while a brightness greater than 1 means the color is brightened. For example, a brightness of 0.5 means the color is half as bright as the original color. If the original color is red, the color will become dark red. Conversely, a brightness of 2 means the color is twice as bright as the original color. If the original color is red, the color will become light red.

The followings are some examples demonstrating this effect.

The barLighting method returns an integer representing this effect. The integer can be used as the second argument to CDLayerMBS.setBorderColor for CDBarLayerMBS objects to apply the effect to bars.

Arguments:

| Argument | Default | Description |
|---|---|---|
| startBrightness | 0.75 | The brightness at the starting point. |
| endBrightness | 1.5 | The brightness at the ending point. |

Return Value
An integer representing the bar lighting effect.

### 28.8.22 blueMetalGradient as Integer()

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant array of integers to represent a gradient that looks like a blue metallic color.
**Notes:** The array is in a format that can be directly used in BaseChart.gradientColor2 and DrawArea.gradientColor2. Its contents (in hex) is:

00 9898E0 60 F0F0FF B0 D8D8F0 100 9898E0
See Color Specification on how colors are represented in ChartDirector.

### 28.8.23 brushedGoldColor(texture as Integer = 2, angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a brushed golden color, most commonly used as a background color.
**Notes:** This method is a short cut to the CDBaseChartMBS.brushedMetalColor method, using yellow (FFEE44 in hex) as the base color.

Arguments:

| Argument | Default | Description |
|---|---|---|
| texture | 2 | The strength of the brushed texture. Must be 0, 1, 2 or 3 for no texture, light texture, medium texture and strong texture. |
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value:
A 32-bit integer representing the brushed golden color.

### 28.8.24 brushedMetalColor(c as Integer, texture as Integer = 2, angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color by modulates the brightness of another color to create brushed metallic shiny effects.
**Notes:** The brightness of the color will vary smoothly across the image in a given a direction, so as to produce a shiny effect. The color will then be modulated with a horizontal texture to create the brushed effect. The modulation period will be the same as the size of the image, so this method is best use to create background colors.

Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color to be modulated. |
| texture | 2 | The strength of the brushed texture. Must be 0, 1, 2 or 3 for no texture, light texture, medium texture and strong texture. |
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value:
A 32-bit integer representing the brushed metallic color.

### 28.8.25 brushedSilverColor(texture as Integer = 2, angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a brushed silver color, most commonly used as a background color.
**Notes:** This method is a short cut to the CDBaseChartMBS.brushedMetalColor method, using grey (DDDDDD in hex) as the base color.

Arguments:

| Argument | Default | Description |
|---|---|---|
| texture | 2 | The strength of the brushed texture. Must be 0, 1, 2 or 3 for no texture, light texture, medium texture and strong texture. |
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value
A 32-bit integer representing the brushed silver color.

### 28.8.26 bSearch(values() as Double, value as Double) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses binary search to search for a value in an array.
**Notes:** This method returns the array index of the value in the array, which must be sorted in ascending order.

If the value is in between two elements of the array, this method returns a non-integer that interpolates the indexes of the two elements. For example, suppose the array consists of 3 elements [ 4, 6, 10 ] . If this method is used to search for the value 7, it will return 1.25.

If the value is smaller or larger than all the elements in the array, this method returns the nearest index, which must be either 0 or the index of the last element of the array.

Returns the index of the value within the array. If the value is in between two elements of the array, this method returns a non-integer that interpolates the indexes of the two elements. If the value is smaller or

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The array to be searched. |
| v | (Mandatory) | The value to search for. |

larger than all the elements in the array, thie method returns the nearest index.

### 28.8.27 chartTime(t as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a UNIX time (seconds elapsed since 01-01-1970 00:00:00 GMT) to the date/time format used by ChartDirector.
**Notes:** The UNIX time will be converted assuming based on local time zone (the time zone settings of the operating system).

| Argument | Default | Description |
|---|---|---|
| t | (Mandatory) | A time represented as seconds elapsed since 01-01-1970 00:00:00 GMT. |

Return Value
The second elapsed since 01-01-0001 00:00:00 to the given time.
See also:

- 28.8.28 chartTime(year as Integer, month as Integer, day as Integer, hour as Integer = 0, minute as Integer = 0, second as Integer = 0) as Double 4824

### 28.8.28 chartTime(year as Integer, month as Integer, day as Integer, hour as Integer = 0, minute as Integer = 0, second as Integer = 0) as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain the second elapsed since 01-01-0001 00:00:00 to the given time, which is the date/time format used by ChartDirector.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| y | (Mandatory) | The year component of the given time. |
| m | (Mandatory) | The month component of the given time |
| d | (Mandatory) | The day of month component of the given time. |
| h | 0 | The hour component of the given time. |
| n | 0 | The minute component of the given time. |
| s | 0 | The second component of the given time. |

Return Value
The second elapsed since 01-01-0001 00:00:00 to the given time.
See also:

- 28.8.27 chartTime(t as Integer) as Double 4824

### 28.8.29 ClearTypeColor(gamma as Double = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a value to represent that standard ClearType or a similar technology be used for font rendering.
**Notes:** This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias.

ClearType is a Microsoft font rendering technology that renders text more accurately with subpixel rendering. Similar technologies include Quartz in Mac OS X, Adobe CoolType and other unnamed algorithms. Although this API uses ClearType in its name, ChartDirector may use ClearType or a similar technology depending on the operating system and programming language.

In most modern flat panel displays, a pixel is consisted of 3 sub-pixels R, G and B for the red, green and blue colors, typically arranged horizontally. So a row of pixels is actually a sequence of subpixels like RGBRGBRGBRGB... To display a white pixel, the display hardware turns on the RGB subpixels.

It happens a white dot can also be made by turning on the GB subpixels of one pixel, and the R subpixel of the next pixel to the right. This will result in 3 consecutive subpixels GBR, which is also white. This white dot will be in between the two pixels, with 2/3 on the left pixel, and 1/3 on the right pixel. In other words, it is possible to position a white dot in between two pixels without blurring it. ClearType uses this effect to render text with subpixel accuracy.

Apart from subpixel rendering, ClearType may adjust the glyph shapes to fit the pixel grid (technically called hinting) differently from classical rendering. As a result, the glyph shapes and sizes in ClearType may be different from classical rendering.

One issue with ClearType is that it is hardware dependent. To work perfectly, it needs to know the subpixels ordering of the display. In many applications, the charts are rendered on one computer, but viewed using another computer. For example, in a web application, the charts can be rendered on the server but displayed on the browser computer. The chart generating computer may not know the subpixel configuration of the viewing computer. If ClearType is used, there is a risk that the text may look suboptimal on the viewing computer.

To address the above issues, ChartDirector supports a hardware independent ClearType method, represented by ClearTypeMono. This is basically ClearType with subpixel rendering disabled. The resulting text has no color distortion. Black and white text will not be as sharp as standard ClearType, but is still better than classical anti-alias. The charts rendered can be viewed equally well with different types of displays. This is

especially useful for applications in which the charts are rendered and viewed by different computers.

| Argument | Default | Description |
|---|---|---|
| gamma | 0 | Specifies the level of gamma correction used for ClearType font rendering. This is usually a number between 1 to 2.5. A value of 0 means the default gamma level. |

### 28.8.30 ClearTypeMono(gamma as Double = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a value to represent that hardware independent ClearType or a similar technology be used for font rendering.
**Notes:** This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias.

Please refer to ClearTypeColor on the detail explanation of what is standard ClearType and hardware independent ClearType.

| Argument | Default | Description |
|---|---|---|
| gamma | 0 | Specifies the level of gamma correction used for ClearType font rendering. This is usually a number between 1 to 2.5. A value of 0 means the default gamma level. |

### 28.8.31 ColorToInteger(c as color, alpha as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a Xojo color object to an integer for ChartDirector.

### 28.8.32 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.8.33 Cross2Shape(width as Double = 0.5) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents a 'X' shape.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The percentage width of the arms of the a 'X' relative to the entire shape. Must be between 0 and 1. |

Return Value
An integer shape id representing the a 'X' shape.

### 28.8.34 CrossShape(width as Double = 0.5) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents a '+' shape.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The percentage width of the arms of the a '+' relative to the entire shape. Must be between 0 and 1. |

Return Value
An integer shape id representing the a '+' shape.

### 28.8.35 cylinderEffect(orientation as Integer = 5, ambientIntensity as Double = 0.5, diffuseIntensity as Double = 0.5, specularIntensity as Double = 0.75, shininess as Integer = 8) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A special shading effect that emulates the lighting of a cylinder surface.
**Notes:** This effect adjusts the brightness of the color of a rectangular box to make it look like cylindrical. The brightness is adjusted as according to the Phong lighting model, in which the light source is from the viewer direction and is far away.

The cylinderEffect method returns an integer representing this effect. The integer can be used as the third argument to CDBoxMBS.setBackground to apply the effect to Box objects (including derived objects such

as CDTextBoxMBS objects).

This effect is automatically used for cylindrical bars in a CDBarLayerMBS. You may use this method to adjust the lighting parameters by using its return value as the second argument to CDLayerMBS.setBorderColor.

Arguments:

| Argument | Default | Description |
|---|---|---|
| orientation | kCenter | The orientation of the cylinder. A value of kTop or kBottom means the cylinder is vertical. A value of kLeft or kRight means the cylinder is horizontal. A value of kCenter means the orientation is automatically determined. For a CDBarLayerMBS, the orientation will be the same as the orientation of the bars. For other objects (eg. CDTextBoxMBS objects), if the object height is bigger than its width, the cylinder will be treated as vertical, otherwise it will be treated as horizontal. |
| ambientIntensity | 0.5 | The ambient reflection coefficient of the Phong lighting model. |
| diffuseIntensity | 0.5 | The diffuse reflection coefficient of the Phong lighting model. |
| specularIntensity | 0.75 | The specular reflection coefficient of the Phong lighting model. |
| shininess | 8 | The shininess coefficient of the Phong lighting model. |

Return Value
An integer representing the cylinder effect.

### 28.8.36 dashLineColor(colorvalue as color, patternCode as Integer = &h0505) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other dashLineColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.37 dashLineColor(colorvalue as Integer, patternCode as Integer = &h0505) as Integer 4828

### 28.8.37 dashLineColor(colorvalue as Integer, patternCode as Integer = &h0505) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant equals to 0505 (in hex) to represent a dash line pattern for use in dash colors.
**Notes:** See Color Specification on how colors are represented in ChartDirector.
See also:

• 28.8.36 dashLineColor(colorvalue as color, patternCode as Integer = &h0505) as Integer 4828

### 28.8.38 defaultPalette as Integer()

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the default palette.

### 28.8.39 Destructor

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor for the base chart.

### 28.8.40 enableVectorOutput

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Enables true vector graphics output.
**Notes:** By default, when creating the output image, ChartDirector draws directly onto an output buffer representing the bitmap of the image. For example, for a chart 800 x 600 pixels in size, the output buffer may represent a 800 x 600 bitmap. The output buffer size is unchanged no matter how many items are drawn onto it. Even if the output contains 1 million elements (eg. 1 million symbols), the size of the output buffer is still the same.

On the other hand, a true vector output is indefinitely scalable and can be considered as having infinite resolution. To produce a true vector output, it is necessary to remember the graphics operations for every element in the output buffer. The output buffer size is therefore proportional to the number of elements to draw.

This method tells ChartDirector that it needs to remember the graphics operations to prepare for true vector output. If true vector output is needed, this method should be called immediately after creating the BaseChart object.

If this method is not called, and a vector graphics output format is used (such as SVG), instead of a true vector output, ChartDirector will output a raster image using the vector graphics format. (Most vector graphics formats support embedded raster images.)

### 28.8.41 flatBorder(thickness as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a flat border of a given width.
**Example:**

```
// set edge to be 2 pixel wide line
Dim table As CDMLTableMBS
Dim t As CDTextBoxMBS = table.getStyle
Dim x As Integer = c.flatBorder(2)
t.setBackground(&heeeeee, CDXYChartMBS.kLineColor, x)
```

**Notes:** The flatBorder method returns an integer representing this effect. The integer can be used as the third argument to Box.setBackground to apply the effect to Box objects (including derived objects such as TextBox objects). It may also be used as the second argument to Layer.setBorderColor for BarLayer or BoxWhiskerLayer objects to apply the effect to bars or boxes.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The border width. A positive value means the border is drawn inside the box or bar. A negative value means the border is outside the box or bar. |

Returns an integer representing using flat border of the specified width.

### 28.8.42 formatValue(value as Double, formatstring as string) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Formats a number/date using the ChartDirector formatting syntax as is in Parameter Substitution and Formatting.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value to be formatted. |
| formatString | (Mandatory) | The format string, using { value } to denote the value. For example, $ { value \| 2, } can be used to format the value to 2 decimal points, using "," as the thousand separator, and with a '$ ' sign in front. |

### 28.8.43 getAbsOffsetX as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x offset of the chart relative to the outermost MultiChart container.
**Notes:** Returns an integer representing the x offset in pixels relative to the outermost MultiChart container, or 0 if the chart is not within a MultiChart container.

### 28.8.44 getAbsOffsetY as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y offset of the chart relative to the outermost MultiChart container.
**Notes:** Returns an integer representing the y offset in pixels relative to the outermost MultiChart container, or 0 if the chart is not within a MultiChart container.

### 28.8.45 getChartMetrics as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the chart metrics for passing to CChartViewer to support view ports.
**Notes:** The format of the chart metrics is not published.
Return Value
A text string representing the chart metrics.

### 28.8.46 getChartWeekDay(t as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the weekday represented by a ChartDirector date/time.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| t | (Mandatory) | A ChartDirector date/time, that is, a number representing seconds elapsed since 01-01-0001 00:00:00. |

Return Value
An integer from 0 - 6 representing Sun - Sat.

### 28.8.47 getChartYMD(t as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the year, month and day represented by a ChartDirector date/time.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| t | (Mandatory) | A ChartDirector date/time, that is, a number representing seconds elapsed since 01-01-0001 00:00:00. |

Return Value
An integer which when represented in decimal notation is yyyymmdd, where yyyy is the year, mm is the month (1 - 12), and dd is the day (1 - 31).

### 28.8.48 getColor(index as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the color at the specified position of the palette.
**Notes:** See Color Specification on how colors are represented in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| paletteEntry | (Mandatory) | An index to the palette. |

Return Value
The requested color.

### 28.8.49 getCopyright as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the copyright string of the ChartDirector library.
**Example:**

```
MsgBox CDBaseChartMBS.getCopyright
// displays "Copyright (c) 2006 Advanced Software Engineering Limited"
```

### 28.8.50 getDescription as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the library description.
**Example:**

```
MsgBox CDBaseChartMBS.getDescription // displays "ChartDirector"
```

### 28.8.51 getDrawArea as CDDrawAreaMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the internal DrawArea object that is used to draw the chart.
**Notes:** The most common reason of accessing the internal DrawArea object is to add custom drawings (lines, texts, shapes, etc) to the chart.

If the custom drawings are drawn before drawing the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart or BaseChart.makeChart3), the custom drawings will be at the background of the chart.
Return Value
A DrawArea object that can be used to add custom text and shapes to the chart.

### 28.8.52 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the chart.

### 28.8.53 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the chart.
**Notes:** This method generates an image map to represent all data points on the chart. It does not include legend box, title box or custom text box. Please use LegendBox.getHTMLImageMap or Box.getImageCoor to produce image maps for these objects.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

This method accepts a URL as its argument. When generating an image map, it appends query parameters to the URL to indicate which data point the user has clicked.

The following is an example image map generated for a bar chart with 3 bars.

<area shape="rect" coords="34,219,63,139" href="myurl.cpp?x=0&xLabel=Mon&dataSet=0&dataSetName=Revenue&value=100">
<area shape="rect" coords="74,219,103,119" href="myurl.cpp?x=1&xLabel=Tue&dataSet=0&dataSetName=Revenue&value=125">
<area shape="rect" coords="114,219,143,22" href="myurl.cpp?x=2&xLabel=Wed&dataSet=0&dataSetName=Revenue&value=245.78">

The image map consists of multiple <area>tags, one for each bar in the chart. In the "href" attributes, query parameters are appended to the URL to provide information on the bar clicked.

The image map produces by ChartDirector does not include the <map>and </map>tag. This is intentional so that you can add additional custom <area>tags to the image map, or append multiple image maps together.

The type of query parameters to append to the URL depends on the chart type and layer type. The default query parameters are as follows.

| Chart/Layer Type | Default Query Format |
|---|---|
| Pie chart | sector= { sector } &label= { label } &value= { value } &percent= { percent } |
| Bar, Line, Spline, Step Line, Area and Scatter layers | x= { x } &xLabel= { xLabel } &dataSet= { dataSet } &dataSetName= { dataSetName } &value= { value } |
| Percentage Bar and Percentage Area layers | x= { x } &xLabel= { xLabel } &dataSet= { dataSet } &dataSetName= { dataSetName } &value= { value } &percent= { percent } |
| HLOC and CandleStick layers | x= { x } &xLabel= { xLabel } &high= { high } &low= { low } &open= { open } &close= { close } |
| Box-Whisker layer | x= { x } &xLabel= { xLabel } &top= { top } &bottom= { bottom } &max= { max } &min= { min } &med= { med } |
| Trend layer | dataSetName= { dataSetName } |
| Vector layer and Polar Vector layer | x= { x } &xLabel= { xLabel } &dataSetName= { dataSetName } &value= { value } &dir= { dir } &len= { len } |
| Polar Line, Area, Spline Line and Spline Area layers | "x= { x } &label= { label } &name= { name } &value= { value } " |

The texts in curly brackets (e.g. { sector } , { dataSet } , etc.) will be replaced by the actual values when generating the image map. For example, { sector } will be replaced by the sector number of the sector.

ChartDirector allows developers to modify the query parameters by using the queryFormat argument. For example, if "x= { x } &v= { value } " is used as the queryFormat for a XYChart, only the x position and the value of the data point will be included in query parameters.

Please refer to Parameter Substitution and Formatting on all available parameters and their meanings.

In addition to customizing the query parameters, ChartDirector supports additional HTML attributes in the <area>tags by using the extraAttr argument.

For example, the following extraAttr will add an "title" HTML attribute to every <area>tag. The attribute which will contain the x-axis label and the value of the data point. The "title" attribute will be displayed as "tool tip" when the mouse moves over the image map.

title=' { xlabel } : { value } '
Another common usage of the extraAttr argument is to add "onmouseover" and "onmouseout" HTML attributes to handle user interaction using Javascript on the browser.

| Argument | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default.

Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character.

| | | |
|---|---|---|
| extraAttr | "" | A text string to specify additional attributes to add to the <area>tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string containing the image map generated.

### 28.8.54 getLegend as CDLegendBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the LegendBox object representing the legend box in the chart.
**Notes:** The LegendBox obtains using this method is not fixed. This allows you to add more keys to the legend box, and change the legend box fonts, etc. However, this also means that the legend box size (Box.getWidth and Box.getHeight) is undefined.

To obtain the width and height of the legend box, use BaseChart.layoutLegend.
Return Value
The LegendBox object representing the legend box in the chart.

### 28.8.55 GetPath(path as folderitem) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a path string for a folderitem.
**Notes:** Returns the path in the UTF8 format as ChartDirector needs them.

### 28.8.56 getVersion as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets ChartDirector version information.
**Example:**

```
dim v as Integer = CDBaseChartMBS.getVersion

dim v1 as Integer = Bitwise.BitAnd( Bitwise.ShiftRight(v, 24), 255)
dim v2 as Integer = Bitwise.BitAnd( Bitwise.ShiftRight(v, 16), 255)
dim v3 as Integer = Bitwise.BitAnd( v, 65535)

MsgBox str(v1)+"."+str(V2)+"."+str(V3)
```

**Notes:** The version number is encoded as a 32-bit integer. The most significant 8 bits is the major version number. The next 8 bits are the minor version number. The least significant 16 bits are the build number.
Return Value
The version information encoded in a 32-bit integer.

### 28.8.57 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the chart.

### 28.8.58 glassEffect(glareSize as Integer = 3, glareDirection as Integer = 8, raisedEffect as Integer = 5) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A complex shading effect that emulates tinted glass or semi-transparent plastic material.
**Notes:** This effect involves glare and variation of lighting caused by reflection and refraction inside the material. It is best explained by viewing the examples.

ExampleLocation of lighting effect

| | |
|---|---|
| Error Line Chart | The title is shaded using glass effect, with NormalGlare, lighting from Top, and raised effect of 5 pixels. |
| Donut Chart | Both the title and the sector labels are shaded using glass effect with ReducedGlare, lighting from Top, and raised effect of 5 pixels. |
| Glass Multi-Bar Chart | The bars are shaded using glass effect, with NormalGlare, lighting from Left, and raised effect of 5 pixels. |

Currently, this effect only works well for long, thin objects, such as title bars, text boxes and bars in bar charts.

The glassEffect method returns an integer representing this effect. The integer can be used as the third argument to Box.setBackground to apply the effect it objects derived from Box (such as labels and titles represented by TextBox). It may also be used as the second argument to Layer.setBorderColor for BarLayer objects to apply the effect to bars.

| Argument | Default | Description |
|---|---|---|
| glareSize | NormalGlare | The amount of glare. Must be one of the predefined constants NormalGlare, ReducedGlare or NoGlare. With NormalGlare and ReducedGlare, the glare will cover around 50% and 35% of the object. If NoGlare is used, there will be no glare and the effect will not look like glass at all, but is equivalent to the CDBaseChartMBS.softLighting effect. |

Usually, NormalGlare is best for thin objects with lightly colored background, while ReducedGlare is best for dark background objects or not-so-thin objects (eg. text boxes using white text on a dark background, or with more than 1 line of text).

| | | |
|---|---|---|
| glareDirection | Top | The direction of the glare, which must be one of the predefined constants Top, Right, Bottom, Left. |
| raisedEffect | 5 | With glass shading effect, the object will appear to have some 3D depth. The raisedEffect argument controls the amount of 3D depth in pixels. |

Return Value

An integer representing the glass effect.

### 28.8.59 goldColor(angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a golden color, most commonly used as a background color.
**Notes:** This method is a short cut to the CDBaseChartMBS.metalColor method, using yellow (FFEE44 in hex) as the base color.

| Argument | Default | Description |
|---|---|---|
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value
A 32-bit integer representing the golden color.

### 28.8.60 goldGradient as Integer()

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant array of integers to represent a gradient that looks like a golden color.
**Notes:** The array is in a format that can be directly used in BaseChart.gradientColor and DrawArea.gradientColor. Its contents (in hex) is:

00 FFE743 60 FFFFE0 B0 FFF0B0 100 FFE743
See Color Specification on how colors are represented in ChartDirector.

### 28.8.61 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other gradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.62 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer

- 28.8.63 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4839
- 28.8.64 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4840


### 28.8.62 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point linear gradient color.
**Notes:** This method is for backward compatibility. Use BaseChart.linearGradientColor2 instead.

| Argument | Default | Description |
|---|---|---|
| colorArray | (Mandatory) | An array defining the positions and colors of the pixels along the reference gradient line segment. |
| angle | 90 | The direction of the reference gradient line segment in degrees, measured clockwise, with 0 degree as the upward pointing direction. The default direction is horizontal from left to right (90 degrees). |
| scale | 1.0 | The scaling factor for the reference gradient line segment. By default, the reference gradient line segment is 256 pixels in length. The scaling factor can be use to stretch or compress the gradient line segment. |
| startX | 0 | The x coordinate of the starting point of the reference gradient line segment. |
| startY | 0 | The y coordinate of the starting point of the reference gradient line segment. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:


- 28.8.61 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4838
- 28.8.63 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4839
- 28.8.64 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4840


### 28.8.63 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other gradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.61 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4838
- 28.8.62 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4839
- 28.8.64 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4840


### 28.8.64 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point linear gradient color.
**Notes:** This method is for backward compatibility. Use BaseChart.linearGradientColor instead.

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| startColor | (Mandatory) | The color at the starting point of the reference gradient line segment. |
| endColor | (Mandatory) | The color at the ending point of the reference gradient line segment. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:


- 28.8.61 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4838
- 28.8.62 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4839
- 28.8.63 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4839


### 28.8.65 greenMetalGradient as Integer()

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant array of integers to represent a gradient that looks like a green metallic color.
**Notes:** The array is in a format that can be directly used in BaseChart.gradientColor2 and DrawArea.gradientColor2. Its contents (in hex) is:

00 98E098 60 F0FFF0 B0 D8F0D8 100 98E098
See Color Specification on how colors are represented in ChartDirector.

### 28.8.66 halfColor(c as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color that is half the intensity of the given color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The given color. |

Return Value
A 32-bit integer representing the half intensity color.

### 28.8.67 initDynamicLayer as CDDrawAreaMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a dynamic layer for drawing text and shapes.
**Notes:** This method clears the existing dynamic layer, or creates a new one if there is no existing dynamic layer. This method returned a DrawArea object that can be used to draw on the dynamic layer. The dynamic layer can later be removed using BaseChart.removeDynamicLayer.

The design of the dynamic layer is for drawing small, rapidly updatable contents for desktop applications. For example, the dynamic layer can be used to implement a cross-hair mouse cursor, with text showing the location of the mouse cursor. To do this, in the mouse move event handler, BaseChart.initDynamicLayer can be used to create or clear the dynamic layer. The returned DrawArea object can then be used to draw the cross hair cursor (as two straight lines) and the text. When the mouse cursor leaves the chart, BaseChart.removeDynamicLayer can be used in the mouse out event handler to remove the cross-hair cursor and the text.

Note that as long as the dynamic layer is not removed with BaseChart.removeDynamicLayer, only the returned DrawArea object should be used to draw things on the dynamic layer. No other objects should be used to draw on the chart.

Returns a DrawArea object that can be used to add text and shapes to the dynamic layer.

### 28.8.68 kDataBound as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to -1.7E-100 to represent that the interpolated z values should not exceed the minimum or maximum values of the original data.
This constant is used in ContourLayer.setZBounds.

### 28.8.69 kLinearTick as Double

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to +1.5E+308 to represent that the ticks in a log scale axis should be 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 style increments.

### 28.8.70 kLogTick as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to +1.6e308 to represent that the ticks in a log scale axis should be 1 - 2 - 5 - 10 style increments.
This constant is used in Axis.setLogScale.

### 28.8.71 kMicroTickOnly as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to -1.6e308 to represent that the label position should contain a micro tick only.
This constant is used in Axis.setLabels and BaseMeter.setScale.

### 28.8.72 kMinorTickOnly as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to -1.7e308 to represent that the label position should contain a minor tick only.
This constant is used in Axis.setLabels.

### 28.8.73 kNoValue as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to 1.7E+308 to represent missing values in ChartDirector.
Please refer to No Value Specification for more details.

### 28.8.74 kTickInc as Double

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to +1E+200 to represent the distance between major ticks.
This constant is used in CDAxisMBS.setLogScale.

### 28.8.75 kTouchBar as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the special constants.
**Notes:** A constant equals to -1.7e-100 to represent that the bars in a bar layer should touch each others with no gap in between.
This constant is used in BarLayer.setBarGap.

### 28.8.76 layout

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform auto-scaling of the axis and compute the positions of the various objects in the chart.
**Notes:** BaseChart.layout is automatically called when drawing the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart or BaseChart.makeChart3). There is usually no need to call BaseChart.layout explicitly.

However, if you would like to add custom objects to the chart whose positions depend on the axis scales or position of other objects, you may need to call BaseChart.layout explicit to auto-scaling the axis. An example is to draw a custom label at the maximum value point of a data line.

### 28.8.77 layoutLegend as CDLegendBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lays out and gets the LegendBox object representing the legend box in the chart.
**Notes:** Once the legend box has been laid out, the width and height is known and can be obtained using Box.getWidth and Box.getHeight. However, you may not perform actions that may affect the legend box sizes, such as changing the fonts or adding more data. You may still move the legend box around by using Box.setPos.

The most common use of this method is to position the legend box based on its actual size.
Return Value
The LegendBox object representing the legend box in the chart.

### 28.8.78 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other linearGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.79 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4844
- 28.8.80 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4846
- 28.8.81 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4846

### 28.8.79 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point linear gradient color.
**Notes:** In this method, the color points are defined as an array of positions and colors along a reference line segment, in the following format:

position0, color0, position1, color1, .... positionN, colorN
The positions are specified as a number from 0 - 256 (0 - 100 in hex), in which 0 represents the starting point of the reference line segment, and 256 (100 in hex) represents the ending point of the reference line segment.

For example, the array (in hex):

000000, FF0000, 000080, FFFF00, 000100, 00FF00
means the starting point (000000) is red (FF0000), the mid-point (000080 in hex) is yellow (FFFF00), and the ending point (000100 in hex) is green (00FF00).

One common usage of multi-point gradient colors is to define colors that have metallic look and feel. ChartDirector comes from several predefined gradient color arrays as follows.

NameValue (in Hex)

| | |
|---|---|
| goldGradient | 000000, FFE743, 000060, FFFFE0, 0000B0, FFF0B0, 000100, FFE743 |
| silverGradient | 000000, C8C8C8, 000060, F8F8F8, 0000B0, E0E0E0, 000100, C8C8C8 |
| redMetalGradient | 000000, E09898, 000060, FFF0F0, 0000B0, F0D8D8, 000100, E09898 |
| greenMetalGradient | 000000, 98E098, 000060, F0FFF0, 0000B0, D8F0D8, 000100, 98E098 |
| blueMetalGradient | 000000, 9898E0, 000060, F0F0FF, 0000B0, D8D8F0, 000100, 9898E0 |

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| colorArray | (Mandatory) | An array defining the positions and colors of the pixels along the reference gradient line segment. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie beyond the end points of the gradient line segment will assume the colors of the end points. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.8.78 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4844
- 28.8.80 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4846
- 28.8.81 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4846

### 28.8.80 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other linearGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.78 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4844
- 28.8.79 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4844
- 28.8.81 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4846

### 28.8.81 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point linear gradient color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| startColor | (Mandatory) | The color at the starting point of the reference gradient line segment. |
| endColor | (Mandatory) | The color at the ending point of the reference gradient line segment. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie beyond the end points of the gradient line segment will assume the colors of the end points. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.8.78 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4844
- 28.8.79 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4844

- 28.8.80 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4846


### 28.8.82 makeChart as CDDrawAreaMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates the chart in internal format and return a DrawArea object to allow adding custom drawings on top of the chart.
**Notes:** If you want to add custom drawings at the background of the chart, use the BaseChart.getDrawArea method to obtain the DrawArea instead.

After finish adding custom drawings, the resulting chart can then be output using other chart output methods.
Return Value
A DrawArea object that can be used to add custom text and shapes to the chart.
See also:


- 28.8.83 makeChart(format as Integer) as string 4847
- 28.8.84 makeChart(path as folderitem) as boolean 4848


### 28.8.83 makeChart(format as Integer) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates the chart as an image in memory.
**Notes:** This method is most often used to output the chart directly to an HTTP stream.

ChartDirector supports PNG, JPG, GIF, WBMP and BMP formats, denoted by the following predefined constants:

| Constant | Value | Description |
|---|---|---|
| kPNG | 0 | The PNG format. |
| kGIF | 1 | The GIF format. |
| kJPG | 2 | The JPEG format. |
| kWMP | 3 | The WAP bitmap format. |
| kBMP | 4 | The BMP format. |
| kSVG | 5 | Normal SVG. |
| kSVGZ | 6 | Compressed SVG |
| kPDF | 7 | PDF format |

For vector output (SVG), please call enableVectorOutput early.

| Argument | Default | Description |
|---|---|---|
| format | (Mandatory) | A constant representing the format of the image. |

Return Value
A memory block containing the binary image of the chart in the requested format.
See also:


- 28.8.82 makeChart as CDDrawAreaMBS 4847
- 28.8.84 makeChart(path as folderitem) as boolean 4848


### 28.8.84 makeChart(path as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates the chart image and save it into a file.
**Notes:** ChartDirector supports PNG, JPG, GIF, WBMP, SVG, PDF and BMP. The format used are selected based on file extension, which should be png, jpg, jpeg, gif, wbmp, wmp, pdf, svg or bmp.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The name of the file to save the image. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:


- 28.8.82 makeChart as CDDrawAreaMBS 4847
- 28.8.83 makeChart(format as Integer) as string 4847


### 28.8.85 makeChartPicture as picture

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates the chart as a picture.
**Notes:** Returns nil on any error.

### 28.8.86 metalColor(c as Integer, angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color by modulates the brightness of another color to create metallic shiny effects.
**Notes:** The brightness of the color will vary smoothly across the image in a given a direction, so as to produce a shiny effect. The modulation period will be the same as the size of the image, so this method is best use to create background colors.

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color to be modulated. |
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value
A 32-bit integer representing the metallic color.

### 28.8.87 NonePassFilter as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches no element.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 as a "deny all" filter.
Return Value
An integer filter id representing the filter.

### 28.8.88 patternColor(colorvalues() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other patternColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.89 patternColor(colorvalues() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4850
- 156.36.7 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 20281
- 28.8.91 patternColor(path as string, startX as integer = 0, startY as integer = 0) as integer 4851
- 28.8.92 patternColor(pic as picture, startX as Integer = 0, startY as Integer = 0) as Integer 4851

### 28.8.89 patternColor(colorvalues() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a pattern color using an array of colors as the bitmap pattern.
**Notes:** A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

| Argument | Default | Description |
|---|---|---|
| colorArray | (Mandatory) | An array of colors representing the colors of the bitmap pixels. The color of the pixel at (x, y) should correspond to index (x + y * width - 1) of the array. |
| height | (Mandatory) | The height of the bitmap in pixels. (The width is automatically computed as the size of the color array divided by the height.) |
| startX | 0 | The x coordinate of a reference point to align with the top-left corner the pattern. |
| startY | 0 | The y coordinate of a reference point to align with the top-left corner the pattern. |

Return Value
A 32-bit integer representing the pattern color.
See also:

- 28.8.88 patternColor(colorvalues() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4849
- 156.36.7 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 20281
- 28.8.91 patternColor(path as string, startX as integer = 0, startY as integer = 0) as integer 4851
- 28.8.92 patternColor(pic as picture, startX as Integer = 0, startY as Integer = 0) as Integer 4851

### 28.8.90 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a pattern color by loading the pattern from an image file.
**Notes:** A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | An image file providing the pattern. |
| startX | 0 | The x coordinate of a reference point to align with the top-left corner the pattern. |
| startY | 0 | The y coordinate of a reference point to align with the top-left corner the pattern. |

Return Value
A 32-bit integer representing the pattern color.
See also:

- 28.8.88 patternColor(colorvalues() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4849
- 28.8.89 patternColor(colorvalues() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4850
- 28.8.91 patternColor(path as string, startX as integer = 0, startY as integer = 0) as integer 4851
- 28.8.92 patternColor(pic as picture, startX as Integer = 0, startY as Integer = 0) as Integer 4851

### 28.8.91 patternColor(path as string, startX as integer = 0, startY as integer = 0) as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates pattern color with named item.
See also:

- 28.8.88 patternColor(colorvalues() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4849
- 28.8.89 patternColor(colorvalues() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4850
- 156.36.7 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 20281
- 28.8.92 patternColor(pic as picture, startX as Integer = 0, startY as Integer = 0) as Integer 4851

### 28.8.92 patternColor(pic as picture, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a pattern color using a picture.
**Notes:** A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used

| Argument | Default | Description |
|---|---|---|
| pic | (Mandatory) | A picture. The color of the pixel at (x, y) should correspond to index (x + y * width - 1) of the array. |
| startX | 0 | The x coordinate of a reference point to align with the top-left corner the pattern. |
| startY | 0 | The y coordinate of a reference point to align with the top-left corner the pattern. |

to fill an area, the area will look like being tiled with a wallpaper pattern.

Return Value
A 32-bit integer representing the pattern color.
See also:

- 28.8.88 patternColor(colorvalues() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4849
- 28.8.89 patternColor(colorvalues() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4850
- 156.36.7 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 20281
- 28.8.91 patternColor(path as string, startX as integer = 0, startY as integer = 0) as integer 4851

### 28.8.93 phongLighting(ambientIntensity as Double = 0.5, diffuseIntensity as Double = 0.5, specularIntensity as Double = 0.75, shininess as Integer = 8) as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the parameters for the phong lighting effect.
**Notes:** The return value of this method can be used as the second argument to Layer.setBorderColor to configure phong lighting effect for the layer.

| Argument | Default | Description |
|---|---|---|
| ambientIntensity | 0.5 | The ambient reflection coefficient of the Phong lighting model. |
| diffuseIntensity | 0.5 | The diffuse reflection coefficient of the Phong lighting model. |
| specularIntensity | 0.75 | The specular reflection coefficient of the Phong lighting model. |
| shininess | 8 | The shininess coefficient of the Phong lighting model. |

### 28.8.94 Polygon2Shape(slide as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents a polygon in an alternative orientation.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| side | (Mandatory) | The number of sides the polygon has. |

Return Value
An integer shape id representing the polygon in an alternative orientation.

### 28.8.95 PolygonShape(slide as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents a polygon.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| side | (Mandatory) | The number of sides the polygon has. |

Return Value
An integer shape id representing the polygon.

### 28.8.96 PolynomialRegression(n as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the degree of the polynomial regression to be used in a trend layer.
**Notes:** This method is used to specify the polynomial regression type in CDTrendLayerMBS.setRegressionType.

Arguments:

| Argument | Default | Description |
|---|---|---|
| n | (Mandatory) | The degree of the polynomial. |

Return Value
An integer representing a polynomial regression of degree n to be used as an argument to CDTrendLay-

erMBS.setRegressionType.

### 28.8.97 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point radial gradient color.
**Notes:** In this method, the color points are defined as an array of radial distances and colors, in the following format:

distance0, color0, distance1, color1, .... distanceN, colorN
The distances are specified as a number from 0 - 256 (0 - 100 in hex), in which 0 represents the center of the gradient defining ellipse, and 256 (100 in hex) represents the perimeter of the gradient defining ellipse.

For example, the array (in hex):

000000, FF0000, 000080, FFFF00, 000100, 00FF00
means the center (000000) is red (FF0000), the mid-point (000080 in hex) is yellow (FFFF00), and the perimeter (000100 in hex) is green (00FF00).

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the radial gradient. |
| cy | (Mandatory) | The y coordinate of the center of the radial gradient. |
| rx | (Mandatory) | The horizontal radius of the radial gradient defining ellipse. |
| ry | (Mandatory) | The vertical radius of the radial gradient defining ellipse. |
| colorArray | (Mandatory) | An array defining the radial distances and colors. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie outside the gradient defining ellipse will assume the color at the perimeter of the gradient defining ellipse. |

Return Value
A 32-bit integer representing the radial gradient color.
See also:

- 28.8.98 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4855

- 28.8.99 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4855

### 28.8.98 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other radialGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.97 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer 4854
- 28.8.99 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4855

### 28.8.99 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point radial gradient color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the radial gradient. |
| cy | (Mandatory) | The y coordinate of the center of the radial gradient. |
| rx | (Mandatory) | The horizontal radius of the radial gradient defining ellipse. |
| ry | (Mandatory) | The vertical radius of the radial gradient defining ellipse. |
| startColor | (Mandatory) | The color at the center of the gradient defining ellipse. |
| endColor | (Mandatory) | The color at the perimeter of the gradient defining ellipse. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie outside the gradient defining ellipse will assume the color at the perimeter of the gradient defining ellipse. |

Return Value
A 32-bit integer representing the radial gradient color.
See also:

- 28.8.97 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer 4854
- 28.8.98 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4855

### 28.8.100 redMetalGradient as Integer()

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant array of integers to represent a gradient that looks like a red metallic color.
**Notes:** The array is in a format that can be directly used in BaseChart.gradientColor and DrawArea.gradientColor. Its contents (in hex) is:

00 E09898 60 FFF0F0 B0 F0D8D8 100 E09898
See Color Specification on how colors are represented in ChartDirector.

### 28.8.101 RegularSpacingFilter(labelStep as Integer = 1, initialMargin as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches 1 out of every N elements.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific elements for formatting as axis labels.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | Picks 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements will be selected. |
| initialMargin | 0 | Adds an offset when determining the elements to be selected. For example, if the labelStep is 3, the selected indexes should be 0, 3, 6, 9, .... If initialMargin is set to 1, the indexes becomes 1, 4, 7, 10, .... |

Return Value
An integer filter id representing the filter.

### 28.8.102 removeDynamicLayer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the dynamic layer if any.

### 28.8.103 RGB(r as Integer, g as Integer, b as Integer, a as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a RGB color.

### 28.8.104 SelectItemFilter(item as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches the specified item.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select a specific element for special formatting.

| Argument | Default | Description |
|---|---|---|
| item | (Mandatory) | The index of the specified item. |

Return Value
An integer filter id representing the filter.

### 28.8.105 setAMPM(am as string, pm as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the names to be used to denote morning and afternoon.
**Notes:** The default is to use "am" and "pm".

| Argument | Default | Description |
|---|---|---|
| am | (Mandatory) | The name used to denote morning. |
| pm | (Mandatory) | The name used to denote afternoon. |

### 28.8.106 setAntiAlias(shapeAntiAlias as Boolean, textAntiAlias as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Controls whether anti-alias is used when drawing lines, shapes and text.
**Notes:** For anti-aliasing text, ChartDirector supports the following modes.

ConstantValueDescription

| | | |
|---|---|---|
| NoAntiAlias | 0 | Disable anti-alias when drawing text |
| AntiAlias | 1 | Always use anti-alias when drawing text |
| AutoAntiAlias | 2 | Automatically determine if anti-alias should be used for the text. This is the default. |

Currently, ChartDirector will anti-alias only large or bold fonts. For small fonts, assuming it is of high quality, anti-alias is unnecessary. It is because high quality fonts are normally designed to be sharp and clear at low resolution. Anti-aliasing will blur the fonts and make them look worse.

However, for complicated fonts (e.g. some fonts with oriental characters), or for lower quality fonts (e.g. some freeware fonts), anti-alias may be necessary. In this case, it may be needed to force anti-aliasing of all fonts using AntiAlias mode.

| Argument | Default | Description |
|---|---|---|
| shapeAntiAlias | true | A true value enables anti-alias when drawing lines and shapes. A false value disables anti-alias when drawing lines and shapes |
| textAntiAlias | AutoAntiAlias | The text anti-alias mode, which must be one of AutoAntiAlias, AntiAlias or NoAntiAlias. |

### 28.8.107 setBackground(colorvalue as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBackground method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.108 setBackground(colorvalue as Integer, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 4858

### 28.8.108 setBackground(colorvalue as Integer, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the background color, border color and 3D border effect of the chart.
**Notes:**

See also:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The background color of the chart. |
| edgeColor | Transparent | The border color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

- 28.8.107 setBackground(colorvalue as color, edgeColor as color, raisedEffect as Integer = 0) 4858

### 28.8.109 setBgImage(img as string, align as Integer = 5)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses the image from the specified file as the background image of the chart.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| img | (Mandatory) | The image file that is used as the background image of the chart. |
| align | Center | The alignment of the background image relative to the chart. See Alignment Specification for supported alignment types. |

### 28.8.110 setBorder(colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBorder method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.111 setBorder(colorvalue as Integer) 4859

### 28.8.111 setBorder(colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deprecated. Use SetBackground instead.
See also:

- 28.8.110 setBorder(colorvalue as color) 4859

### 28.8.112 setColor(paletteEntry as Integer, colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.113 setColor(paletteEntry as Integer, colorvalue as Integer) 4860

### 28.8.113 setColor(paletteEntry as Integer, colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the color at the specified position in the palette.
**Notes:** See Color Specification on how colors are represented in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| paletteEntry | (Mandatory) | An index to the palette. |
| color | (Mandatory) | The color to change to. |

See also:

- 28.8.112 setColor(paletteEntry as Integer, colorvalue as color) 4860

### 28.8.114 setColors(numbers() as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColors method, but uses color instead of integer data type for passing color values.
See also:

- 28.8.115 setColors(numbers() as Integer) 4860
- 28.8.116 setColors(paletteEntry as Integer, numbers() as color) 4861
- 28.8.117 setColors(paletteEntry as Integer, numbers() as Integer) 4861

### 28.8.115 setColors(numbers() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the colors in the palette.
**Notes:** See Color Specification on how colors are represented in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| colors | (Mandatory) | An array of colors to change to. |

See also:


- 28.8.114 setColors(numbers() as color) 4860
- 28.8.116 setColors(paletteEntry as Integer, numbers() as color) 4861
- 28.8.117 setColors(paletteEntry as Integer, numbers() as Integer) 4861


### 28.8.116 setColors(paletteEntry as Integer, numbers() as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColors method, but uses color instead of integer data type for passing color values.
See also:


- 28.8.114 setColors(numbers() as color) 4860
- 28.8.115 setColors(numbers() as Integer) 4860
- 28.8.117 setColors(paletteEntry as Integer, numbers() as Integer) 4861


### 28.8.117 setColors(paletteEntry as Integer, numbers() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the colors in the palette, starting from the specified position in the palette.
**Notes:** See Color Specification on how colors are represented in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| paletteEntry | (Mandatory) | An index to the palette to start changing the colors. |
| colors | (Mandatory) | An array of colors to change to. |

See also:


- 28.8.114 setColors(numbers() as color) 4860
- 28.8.115 setColors(numbers() as Integer) 4860
- 28.8.116 setColors(paletteEntry as Integer, numbers() as color) 4861

### 28.8.118 setDefaultColors(paletteEntry as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the default colors.

### 28.8.119 setDefaultFonts(normal as string, bold as string, italic as string, boldItalic as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the defaults for normal, bold, italic and bold-italic fonts.
**Example:**

```
dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf","/usr/share/fonts/truetype/piboto/Pi
#EndIf
```

**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| normal | (Mandatory) | The default normal font. This is the same as the first font in the font table. |
| bold | "" | The default bold font. This is the same as the second font in the font table. An empty string means the default is unchanged. |
| italic | "" | The default italic font. This is the same as the third font in the font table. An empty string means the default is unchanged. |
| boldItalic | "" | The default bold-italic font. This is the same as the fourth font in the font table. An empty string means the default is unchanged. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.8.120 setDropShadow(ColorValue as color, OffsetX as Integer = 5, OffsetY as Integer = &h7ffffff, blurRadius as Integer = 5)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDropShadow method, but uses color instead of integer data type for passing color values.

See also:

- 28.8.121 setDropShadow(ColorValue as Integer = &hAAAAAA, OffsetX as Integer = 5, OffsetY as Integer = &h7fffffff, blurRadius as Integer = 5) 4863

### 28.8.121 setDropShadow(ColorValue as Integer = &hAAAAAA, OffsetX as Integer = 5, OffsetY as Integer = &h7fffffff, blurRadius as Integer = 5)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a drop shadow to the chart.
**Notes:** The drop shadow effect is created using a single color representation of the non-transparent part of the chart, offsetted by an amount, and put under the chart. The drop shadow can be blurred to create a soft drop shadow effect.

Note that adding a drop shadow will increase the width and height of the chart image so as to accommodate the drop shadow.

Because the drop shadow is located exterior to the original chart, it uses an exterior background color different from the background color of the original chart. The exterior background color is by default white, and can be configured with CDBaseChartMBS.setRoundedFrame.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | AAAAAA | The color of the drop shadow. |
| offsetX | 5 | The x offset of the drop shadow. |
| offsetY | 7fffffff | The y offset of the drop shadow. 7fffffff means it is the same as the x offset. |
| blurRadius | 5 | The blur radius of the drop shadow. |

See also:

- 28.8.120 setDropShadow(ColorValue as color, OffsetX as Integer = 5, OffsetY as Integer = &h7fffffff, blurRadius as Integer = 5) 4862

### 28.8.122 SetFontSearchPath(path as folderitem)

MBS ChartDirector Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font search path.
**Example:**

```
dim FontFolder as folderitem = SpecialFolder.Desktop.Child("fonts")
CDBaseChartMBS.SetFontSearchPath FontFolder
```

**Notes:** This method can be used to configure the font search path. You may set your own font search path, or add additional search path before or after the default search path. The usage us like:

CDBaseChartMBS.setFontSearchPath("myPath1;myPath2;%PATH%;myPath3;myPath4");

In the above %PATH% (case sensitive) represents the default search path. This method must be called before the ChartDirector font system is used. It is suggested it be called before any ChartDirector methods. Once ChartDirector tries to look for the fonts (eg. to get font metrics so as to layout a chart), the search path cannot be changed without restarting the process.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.
See also:


- 28.8.123 SetFontSearchPath(path as string) 4864


### 28.8.123 SetFontSearchPath(path as string)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font search path.
**Example:**

```
if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if
```

**Notes:** This method can be used to configure the font search path. You may set your own font search path, or add additional search path before or after the default search path. The usage us like:

CDBaseChartMBS.setFontSearchPath("myPath1;myPath2;%PATH%;myPath3;myPath4");

In the above %PATH% (case sensitive) represents the default search path. This method must be called before the ChartDirector font system is used. It is suggested it be called before any ChartDirector methods. Once ChartDirector tries to look for the fonts (eg. to get font metrics so as to layout a chart), the search path cannot be changed without restarting the process.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with

"/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.
See also:

- 35.116.1 SetFontSearchPath(path as folderitem) 7367

### 28.8.124 setFontTable(index as Integer, font as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an entry in the font table to the specified font name.
**Notes:** The first 4 fonts in the font table have special significance. They are the defaults for normal, bold, italic and bold-italic fonts.

See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| index | (Mandatory) | An index to the font table, starting from 0. |
| font | (Mandatory) | The font name to be put into the font table. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.8.125 setLicenseCode(n as string, enddate as Integer, v1 as Integer, v2 as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registeres the chartdirector plugin and library.

### 28.8.126 setMonthNames(names() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the names of the months for date/time formatting purposes.
**Notes:** The default is to use the first 3 characters of the English month names (Jan, Feb, Mar ...).

| Argument | Default | Description |
|---|---|---|
| names | (Mandatory) | An array of 12 text strings to be used as the month names. |

### 28.8.127 setNumberFormat(thousandSeparator as string = " textasciitilde ", decimalPointChar as string = ".", signChar as string = "-")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the characters used for thousand separator, decimal point, and negative sign.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| thousandSeparator | ' | |
| textasciitilde ' | The thousand separator. Use ' | |
| textasciitilde ' to mean no thousand separator. | | |
| decimalPointChar | '.' | The decimal point character. |
| signChar | '-' | The negative sign character. |

### 28.8.128 setOutputOptions(options as string)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets output format options for the next chart output. Currently, only SVG, SVGZ and PDF output formats support output options.
**Example:**

```
dim c as CDBaseChartMBS // your chart object

// 2x for higher DPI displays
c.setOutputOptions("bmpscale=2")
```

**Notes:** An output option can be a flag (such as "compress") or an attribute-value pair (such as "width=800"). Multiple output options can be joined using semicolons as delimiters.

Raster Image Options (PNG, JPG, GIF, BMP or desktop display output)

| Raster Image Option | Type | Description |
|---|---|---|
| bmpScale | Attribute | Render the chart with a scale factor. For example, "bmpScale=1.5" means the chart size will be 1.5 times of the original. The supported bmpScale is 0.1 to 4. |
| dpi | Attribute | Specify the factor for conversion from pixel to physical unit. e.g. 196 for double size. |

SVG Options

PDF Options

| SVG Option | Type | Description |
|---|---|---|
| compress | Flag | Compressed the SVG, that is, output SVGZ. |
| bitmap | Flag | Render the chart as a bitmap and output the bitmap as SVG. |
| noxmldecl | Flag | Do not include the xml declaration line "<?xml version="1.0" .... >" in the SVG. |
| nodoctype | Flag | Do not include the document type declaration line "<!DOCTYPE svg PUBLIC .... >" in the SVG. |
| width | Flag / Attribute | Specifies the width attribute of the SVG. By default, ChartDirector will not include the width or height attribute in the SVG output. In this case, the SVG is variable in size and would assume the size of its container. For example, if the SVG is inside a <DIV>block in a web page, it will assume the size of the DIV block. If the "width" option is used as a flag, ChartDirector will include the width attribute in the SVG and set it to the chart width. If the "width" option is used as an attribute (such as "width=800"), ChartDirector will include the width attribute in the SVG and set it to the specified value. The specified value should be some text that is valid as SVG width. Examples are "100" and "75%". |
| height | Flag / Attribute | Specifies the height attribute of the SVG. See the description on "width" above on how to use it. |

### 28.8.129 setResource(id as string, data as MemoryBlock)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

The assigned resource ID is only valid for the DrawArea object of which this method is called. Use setResourceGlobal to assign a resource ID that is valid for all ChartDirector objects.

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.8.130 setResource(id as string, data as string) 4868
- 28.8.131 setResource(id as string, DataArea as CDDrawAreaMBS) 4869

| PDF Option | Type | Description |
|---|---|---|
| bitmap | Flag | Render the chart as a bitmap and output the bitmap as PDF. |
| width | Attribute | The width of the chart in the PDF in pixel unit. By default, ChartDirector will use the pixel width of the chart as the width of the chart in PDF. The "width" attribute can be used to specify an alternative value. The value must be a number. |
| height | Attribute | The width of the chart in the PDF in pixel unit. See the description on "width" above for how to use it. |
| pagewidth | Attribute | The page width in pixel unit. By default, ChartDirector will set the page width to the same width as the chart. The "pagewidth" attribute can be used to specify an alternative value. The value must be a number. |
| pageheight | Attribute | The page height in pixel unit. By default, ChartDirector will set the page height to the same height as the chart. The "pageheight" attribute can be used to specify an alternative value. The value must be a number. |
| leftx | Attribute | The x coordinate of the left side of the chart within the page in pixel unit. By default, ChartDirector will center the chart in the page. The "leftx" attribute can be used to specify an alternative horizontal position. The coordinate must be a number. |
| topy | Attribute | The y coordinate of the top side of the chart within the page in pixel unit. By default, ChartDirector will center the chart in the page. The "topy" attribute can be used to specify an alternative vertical position. The coordinate must be a number. |
| dpi | Attribute | Specify the factor for conversion from pixel to physical unit. The PDF viewer will convert the pixel unit into physical unit (eg. inches) so that it can be layout on paper or other physical media. The default conversion factor for the chart is 96 pixels per inch. The "dpi" attribute can be used to specify an alternative value. The value must be a number. |

| Argument | Default | Description |
|---|---|---|
| options | (Mandatory) | A list of options delimited by semicolons. |

### 28.8.130 setResource(id as string, data as string)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

The assigned resource ID is only valid for the DrawArea object of which this method is called. Use setResourceGlobal to assign a resource ID that is valid for all ChartDirector objects.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| data | (Mandatory) | The memory that the image occupies. |

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| data | (Mandatory) | The memory that the image occupies. |

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.8.129 setResource(id as string, data as MemoryBlock) 4867
- 28.8.131 setResource(id as string, DataArea as CDDrawAreaMBS) 4869


### 28.8.131 setResource(id as string, DataArea as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a DrawArea object to allow it to be referenced using a resource path.
**Notes:** This method is the same DrawArea.setResource, except that it assigns the resource ID to a CDBaseChartMBS object instead of a memory image. This allows the CDBaseChartMBS object to be reference as an image resource using "@/res_id".

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the DrawArea object. |
| drawArea | (Mandatory) | The CDDrawAreaMBS object to be used as a resource. |

While ChartDirector does not copy the draw area, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.8.129 setResource(id as string, data as MemoryBlock) 4867
- 28.8.130 setResource(id as string, data as string) 4868


### 28.8.132 setResourceGlobal(id as string, data as MemoryBlock)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| data | (Mandatory) | The memory that the image occupies. |

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.8.133 setResourceGlobal(id as string, data as string) 4870
- 28.8.134 setResourceGlobal(id as string, DrawArea as CDDrawAreaMBS) 4871


### 28.8.133 setResourceGlobal(id as string, data as string)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| data | (Mandatory) | The memory that the image occupies. |

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.8.132 setResourceGlobal(id as string, data as MemoryBlock) 4869

• 28.8.134 setResourceGlobal(id as string, DrawArea as CDDrawAreaMBS) 4871

### 28.8.134 setResourceGlobal(id as string, DrawArea as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a DrawArea object to allow it to be referenced using a resource path.
**Notes:** This method is the same DrawArea.setResource, except that it assigns the resource ID to a CDBaseChartMBS object instead of a memory image. This allows the CDBaseChartMBS object to be reference as an image resource using "@/res_id".

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the DrawArea object. |
| drawArea | (Mandatory) | The CDDrawAreaMBS object to be used as a resource. |

While ChartDirector does not copy the draw area, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:

• 28.8.132 setResourceGlobal(id as string, data as MemoryBlock) 4869

• 28.8.133 setResourceGlobal(id as string, data as string) 4870

### 28.8.135 setRoundedFrame(extColor as color, r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setRoundedFrame method, but uses color instead of integer data type for passing color values.
See also:

• 28.8.136 setRoundedFrame(extColor as Integer = &hFFFFFF, r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1) 4871

### 28.8.136 setRoundedFrame(extColor as Integer = &hFFFFFF, r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border style of the chart to rounded corners.
**Notes:** The underlying drawing surface for a chart is always rectangular. When rounded corners are used, part of the drawing surface (the regions external to the rounded corners) will be outside the chart border. The extColor argument specifies the color to be used for the external regions. Typically, it is set to the same

color as the background the container that will be hosting the chart.

For example, in a web page, the extColor may be set to the same color as the web page background.

| Argument | Default | Description |
|---|---|---|
| extColor | FFFFFF | The exterior background color. |
| r1 | 10 | The radius of the top-left rounded corner in pixels. |
| r2 | -1 | The radius of the top-right rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |
| r3 | -1 | The radius of the bottom-right rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |
| r4 | -1 | The radius of the bottom-left rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |

See also:

- 28.8.135 setRoundedFrame(extColor as color, r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1) 4871

### 28.8.137 setSearchPath(path as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the file system search path for loading image files.
**Notes:** The plugin uses folderitems for most file operations, so this method is not needed for most operations.

Several ChartDirector operations involve loading image files. Examples are wallpapers (BaseChart.setWallpaper), background images (BaseChart.setBgImage and PlotArea.setBackground2), user-defined symbols (DataSet.setDataSymbol2) or for embedding images in text using ChartDirector Mark Up Language.

| Argument | Default | Description |
|---|---|---|
| path | (Mandatory) | A list of directories, separated with the path separator of your operating system (";" for Windows, ":" for Linux/UNIX). |

### 28.8.138 setSize(width as Integer, height as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |

### 28.8.139 setThickFrame(thickness as Integer, frameColor as Integer = -1, outerEdgeColor as Integer = -1, innerEdgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a thick frame around the chart.
**Notes:** The thick frame can have 3 colors for the frame itself, the outer edge and the inner edge.

In some applications, the frame color may be similar to the external background color. An common example is a "silver" frame (which is actually a light grey gradient) against a white background. In this case, the frame effect may look less than optimal. An outer edge of different color (such as darker grey) can often help to highlight the frame. Similarly, if the frame color is similar to the chart background, an inner edge of different color may help to improve the frame effect.

| Argument | Default | Description |
|---|---|---|
| thickness | (Mandatory) | The frame thickness. |
| frameColor | -1 | The frame color. The default value of -1 means the frame color is the same as the outer edge color. |
| outerEdgeColor | -1 | The outer edge color. The default value of -1 means the outer edge color is the same as the current edge color, which can be set in the chart constructor or in BaseChart.setBackground. |
| innerEdgeColor | -1 | The inner edge color. The default value of -1 means the inner edge color is the same as the frame color. |

### 28.8.140 setTransparentColor(c as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setTransparentColor method, but uses color instead of integer data type for passing color values.
See also:

- 170.9.7 setTransparentColor(c as Integer) 21344

### 28.8.141 setTransparentColor(c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a certain color to mean transparent when creating the image output, or to include alpha transparency channel in the output.
**Notes:** Alpha transparency: In addition to red, green and blue levels, there is a transparency level associated with each pixel, which can range from completely transparent to completely opaque. The data associated with the transparency information is called the alpha channel.

Single color transparency: The image itself has no alpha channel, but a certain color is used to mean completely transparent. For internal drawing, ChartDirector always use alpha transparency. However, when outputting the image as an image file, ChartDirector by default will remove the alpha channel to reduce image size. It is because many image displaying software do not support alpha transparency. For example, the IE browser only supports single color transparency but not alpha transparency.

If you want to use single color transparency in the output, you may specify the transparent color as the argument to the setTransparentColor method. Note that only GIF and PNG can support single color transparency. JPEG, BMP and WBMP cannot support transparency at all.

If you do want to keep the alpha channel in final output, you may pass -1 as the argument to setTransparentColor. Note that the only image format that can support alpha transparency is PNG.

One important thing to note is that the IE browser (and possibly many image displaying software) only supports single color transparency for palette based images with up to 256 colors, but not for true color images. For this reason, if single color transparency is used, ChartDirector will automatically reduce the image to 256 colors if it has more than 256 colors. This may result in lost of image quality, especially if the image contains gradient colors.

Therefore, due to the limitations of the current generations of image displaying software, for highest image quality, sometimes it may be beneficial to not using transparency in image output, but to set the image background color to the same color as the container background.

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color that is designated as the transparent color. If -1 is used, the full alpha transparency channel will be included in the final output. |

See also:

- 28.8.140 setTransparentColor(c as color) 4873

### 28.8.142 setTransparentColors(paletteEntry as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color palette to transparent colors.

### 28.8.143 setWallpaper(img as folderitem)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses the image from the specified file as the wallpaper to repetitively fill the background of the chart.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| img | (Mandatory) | The image file that is used as the background wallpaper of the chart. |

### 28.8.144 setWeekDayNames(names() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the names of the week days for date/time formatting purposes.
**Notes:** The default is to use the first 3 characters of the English week day names (Sun, Mon, Tue, ...).

| Argument | Default | Description |
|---|---|---|
| names | (Mandatory) | An array of 7 text strings to be used as the week day names. |

### 28.8.145 setWhiteOnBlackColors(paletteEntry as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color palette to white on black colors.

### 28.8.146 silverColor(angle as Integer = 90) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a silver color, most commonly used as a background color.
**Notes:** This method is a short cut to the CDBaseChartMBS.metalColor method, using grey (CCCCCC in hex) as the base color.

| Argument | Default | Description |
|---|---|---|
| angle | 90 | The direction for brightness modulation, specified as a clockwise angle in degrees, with 0 being the upward pointing direction. |

Return Value
A 32-bit integer representing the silver color.

### 28.8.147 silverGradient as Integer()

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A constant array of integers to represent a gradient that looks like a silver color.
**Notes:** The array is in a format that can be directly used in BaseChart.gradientColor2 and DrawArea.gradientColor2. Its contents (in hex) is:

00 C8C8C8 60 F8F8F8 B0 E0E0E0 100 C8C8C8
See Color Specification on how colors are represented in ChartDirector.

### 28.8.148 softLighting(direction as Integer = 8, raisedEffect as Integer = 4) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A special shading effect that looks like gradient coloring.
**Notes:** This effect is best explained by viewing the examples.

ExampleLocation of lighting effect

| | |
|---|---|
| Soft Multi-Bar Chart | The bars are shaded using soft lighting effect, with light direction from Top, and raised effect of 4 pixels. |
| Soft Bar Shading | The bars are shaded using soft lighting effect, with light direction from Left, and raised effect of 4 pixels. |
| Spline Line Chart | The title is shaded using soft lighting effect, with light direction from Right, and raised effect of 4 pixels. |

The softLighting method returns an integer representing this effect. The integer can be used as the third argument to Box.setBackground to apply the effect it objects derived from Box (such as labels and titles represented by TextBox). It may also be used as the second argument to Layer.setBorderColor for BarLayer objects to apply the effect to bars.

| Argument | Default | Description |
|---|---|---|
| direction | Top | The direction of the lighting, which must be one of the predefined constants Top, Bottom, Right or Left. |
| raisedEffect | 4 | With soft lighting effect, the object will appear to have some 3D depth. The raisedEffect argument controls the amount of 3D depth in pixels. |

Return Value
An integer representing the soft lighting effect.

### 28.8.149 StarShape(slide as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the shape id that represents a star shape.
**Notes:** Please refer to Shape Specification for samples and more information on using shapes in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| side | (Mandatory) | The number of points the polygon has. |

Return Value
An integer shape id representing the star shape.

### 28.8.150 StartOfDayFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new day in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new day if it is of a different day than the previous element. It does not need to be at exactly the starting instance of the day.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new day if it is "near" the exact starting instance of the current day, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the day duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of day criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of day will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current day to within the ratio specified in the initial margin, it will be considered to have matched the start of day criteria. |

Return Value
An integer filter id representing the filter.

### 28.8.151 StartOfHourFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new hour in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new hour if it is of a different hour than the previous element. It does not need to be at exactly the starting instance of the hour.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new hour if it is "near" the exact starting instance of the current hour, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the hour duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of hour criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of hour will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current hour to within the ratio specified in the initial margin, it will be considered to have matched the start of hour criteria. |

Return Value
An integer filter id representing the filter.

### 28.8.152 StartOfMinuteFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new minute in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new minute if it is of a different minute than the previous element. It does not need to be at exactly the starting instance of the minute.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new minute if it is "near" the exact starting instance of the current minute, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the minute duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of minute criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of minute will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current minute to within the ratio specified in the initial margin, it will be considered to have matched the start of minute criteria. |

Returns an integer filter id representing the filter.

### 28.8.153 StartOfMonthFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new month in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new month if it is of a different month than the previous element. It does not need to be at exactly the starting instance of the month.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new month if it is "near" the exact starting instance of the current month, in

which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the month duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of month criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of month will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current month to within the ratio specified in the initial margin, it will be considered to have matched the start of month criteria. |

Return Value
An integer filter id representing the filter.

### 28.8.154 StartOfSecondFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new second in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new second if it is of a different second than the previous element. It does not need to be at exactly the starting instance of the second.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new second if it is "near" the exact starting instance of the current second, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the second duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of second criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of second will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current second to within the ratio specified in the initial margin, it will be considered to have matched the start of second criteria. |

Returns an integer filter id representing the filter.

### 28.8.155 StartOfWeekFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new week in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new week if it is of a different week than the previous element. It does not need to be at exactly the starting instance of the week.

For the first element of the date/time series, because there is no previous element to compare with, it will be considered as the start of a new week if it is "near" the exact starting instance of the current week, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the week duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of week criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of week will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current week to within the ratio specified in the initial margin, it will be considered to have matched the start of week criteria. |

Return Value
An integer filter id representing the filter.

### 28.8.156 StartOfYearFilter(labelStep as Integer = 1, initialMargin as Double = 0.05) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data filter that matches date/times that represent the start of a new year in a date/time series.
**Notes:** This method is typically used in Axis.setMultiFormat and Axis.setMultiFormat2 to select specific dates/times for formatting as axis labels.

In a date/time series, an element is considered that start of a new year if it is of a different year than the previous element. It does not need to be at exactly the starting instance of the year.

For the first element of the date/time series, because there is no previous element to compare with, it

will be considered as the start of a new year if it is "near" the exact starting instance of the current year, in which "near" is defined using the initialMargin argument, expressed as a ratio (0 to 1) of the year duration.

| Argument | Default | Description |
|---|---|---|
| labelStep | 1 | For dates/times that matches the start of year criteria, picks only 1 out of every "labelStep" number of elements. For example, if this argument is 3, only 1 of every 3 elements that at at the start of year will be selected. |
| initialMargin | 0.05 | If the first label is "near" the exact starting instance of the current year to within the ratio specified in the initial margin, it will be considered to have matched the start of year criteria. |

Return Value
An integer filter id representing the filter.

### 28.8.157 testFont(font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, byref buffer as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A diagnostic function to perform a font loading test.
**Example:**

```
dim buffer as string
call CDBaseChartMBS.testFont("arial.ttf", 0, 12, 12, 0, buffer)
MsgBox buffer
```

**Notes:** From experience, the most common issue for font loading is unable to access server side fonts using anonymous user account for a web application, probably due to security restrictions. This diagnostic function can return the cause of problem to aid trouble-shooting.

Other uses of this function is to trace out where does ChartDirector search for the fonts, and the substitution font in case the request font is not available.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.8.158 transparentPalette as Integer()

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| font | (Mandatory) | The font name. See Font Specification for details on various font attributes. |
| fontIndex | (Mandatory) | The font index if the font name refers to a font collection. An index of 0 means the first font. |
| fontHeight | (Mandatory) | The font height in points. This parameter will not affect font loading if the exact font exists, but will affect which substitution font to use if the font does not exist. |
| fontWidth | (Mandatory) | The font width in points. This parameter will not affect font loading if the exact font exists, but will affect which substitution font to use if the font does not exist. |
| angle | (Mandatory) | The rotation angle of the text. The angle is measured in degrees in clockwise direction. This parameter will not affect font loading if the exact font exists, but will affect which substitution font to use if the font does not exist. |
| buffer | (Mandatory) | A string to hold the result of the font loading test. |

**Function:** Returns the default transparent palette.

### 28.8.159 whiteOnBlackPalette as Integer()

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the default white on black palette.

### 28.8.160 xySize(x as Integer, y as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encode width and height into a single number to be used as size.
**Notes:** This is intended to be used in certain ChartDirector API that that supports the encoded value.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | An integer between 0 and 30000. |
| height | (Mandatory) | An integer between 0 and 30000. |

Returns a number that encodes the width and height.

### 28.8.161 Properties

### 28.8.162 Handle as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 28.8.163 Resources as Dictionary

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal resource dictionary.
**Notes:** Stores references for registered resources.
Just for debugging.
(Read only property)

### 28.8.164 ScaleFactor as Double

MBS ChartDirector Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scale factor for charts.
**Example:**

```
dim c as CDBaseChartMBS // your chart object

// 2x for higher DPI displays
c.setOutputOptions("bmpscale=2")
' better than c.ScaleFactor = 2
```

**Notes:** When the plugin internally passes a pixel number to ChartDirector library, we multiply by this factor.
When numbers come back we divide by factor.
Default is 1.

You may better do use setOutputOptions function to set scale factor.
(Read and Write property)

### 28.8.165 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCircleLayout | 1 | A constant equals to 1 to represent the circular label layout method for pie/donut charts.<br>Circle Layout<br>This constant is used in PieChart.setLabelLayout. |
| kKeepAspectRatio | 3 | A constant equals to 3 to represent can be both horizontal and vertical and the zoom level will be kept the same in both directions.<br>This constant is used in CChartViewer.setZoomDirection and QChartViewer.setZoomDirection . |
| kNewShape | -1342177279 | A constant equals to &h4fffffff in hexadecimal to represent a shape separator in custom shape definition.<br>This constant is used in custom shape definition in DrawArea.polyShape, DataSet.setDataSymbol4 and PolarLayer.setDataSymbol4. |
| kSideLayout | 0 | A constant equals to 0 to represent the side label layout method for pie/donut charts.<br>Side Layout<br>This constant is used in PieChart.setLabelLayout. |

Aggregate Modes

| Constant | Value | Description |
|---|---|---|
| kAggregateAvg | 1 | A constant equals to 1 to represent using the average as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateCount | 9 | A constant equals to 9 to represent using the item count as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateFirst | 7 | A constant equals to 7 to represent using the first value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateLast | 8 | A constant equals to 8 to represent using the last value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateMax | 5 | A constant equals to 5 to represent using the maximum value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateMed | 4 | A constant equals to 4 to represent using the median value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateMin | 3 | A constant equals to 3 to represent using the minimum value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregatePercentile | 6 | A constant equals to 6 to represent using the percentile value as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateStdDev | 2 | A constant equals to 2 to represent using the standard deviation as the aggregated value in CDArrayMBS.aggregate. |
| kAggregateSum | 0 | A constant equals to 0 to represent using the sum as the aggregated value in CDArrayMBS.aggregate. |

Line Modes

| Constant | Value | Description |
|---|---|---|
| kAltDashLine | &h0A050505 | A constant equals to 0A050505 (in hex) to represent a alternating long/short dash line pattern for use in dash colors.<br>See Color Specification on how colors are represented in ChartDirector. |
| kDashLine | &h0505 | A constant equals to 00000505 (in hex) to represent a dash line pattern for use in dash colors.<br>See Color Specification on how colors are represented in ChartDirector. |
| kDotDashLine | &h05050205 | A constant equals to 05050205 (in hex) to represent a dot-dash line pattern for use in dash colors.<br>See Color Specification on how colors are represented in ChartDirector. |
| kDotLine | &h0202 | A constant equals to 00000202 (in hex) to represent a dot-line pattern for use in dash colors.<br>See Color Specification on how colors are represented in ChartDirector. |

Scale Modes

| Constant | Value | Description |
|---|---|---|
| kAngularAxisScale | 1 | A constant equals to 1 to represent that the size is measured using the angular-axis scale.<br>This constant is used in PolarLayer.setSymbolScale. |
| kEndPoints | 3 | A constant equals to 3 to represent that the vector lengths and directions are measured by specifying the end points. |
| kPixelScale | 0 | A constant equals to 0 to represent that the size is measured in pixels.<br>This constant is used in LineLayer.setSymbolScale, PolarLayer.setSymbolScale, XYChart.addVectorLayer, PolarChart.addVectorLayer, VectorLayer.setVector and PolarVectorLayer.setVector. |
| kRadialAxisScale | 2 | A constant equals to 2 to represent that the size is measured using the radial-axis scale.<br>This constant is used in PolarLayer.setSymbolScale, PolarChart.addVector-Layer and PolarVectorLayer.setVector. |
| kXAxisScale | 1 | A constant equals to 1 to represent that the size is measured using the x-axis scale.<br>This constant is used in LineLayer.setSymbolScale, XYChart.addVectorLayer and VectorLayer.setVector. |
| kYAxisScale | 2 | A constant equals to 2 to represent that the size is measured using y-axis scale.<br>This constant is used in LineLayer.setSymbolScale, XYChart.addVectorLayer and VectorLayer.setVector. |

Anti Alias Modes

| Constant | Value | Description |
|---|---|---|
| kAntiAlias | 1 | Anti-Aliasing<br>This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias. |
| kAutoAntiAlias | 2 | Auto Anti-Aliasing<br>This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias. |
| kClearType | 3 | Clear Type |
| kCompatAntiAlias | 6 | Compat Anti-Aliasing<br>This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias. |
| kNoAntiAlias | 0 | No Anti-Aliasing<br>This constant is used in BaseChart.setAntiAlias and DrawArea.setAntiAlias. |

Pointers

| Constant | Value | Description |
|---|---|---|
| kArrowPointer | 2 | A constant equals to 2 to represent the arrow style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kArrowPointer2 | 3 | A constant equals to 3 to represent the alternative arrow style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kDiamondPointer | 0 | A constant equals to 0 to represent the diamond style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kLinePointer | 4 | A constant equals to 4 to represent the line style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kLinePointer2 | 7 | A constant equals to 7 to represent the line style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kPencilPointer | 5 | A constant equals to 5 to represent the pencil style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kTriangularPointer | 1 | A constant equals to 1 to represent the triangular style meter pointer.<br>This constant is used in MeterPointer.setShape. |
| kTriangularPointer2 | 6 | A constant equals to 6 to represent the new triangular style meter pointer. |

Special Values

| Constant | Value | Description |
|---|---|---|
| kAutoGrid | -2 | A constant equals to -2 to represent that the number of columns in the legend box with grid layout is automatically determine.<br>This constant is used in BaseChart.addLegend and LegendBox.setCols. |

Special Colors

| Constant | Value | Description |
|---|---|---|
| kBackgroundColor | &hFFFF0000 | A constant equals to FFFF0000 (in hex) to represent the background color.<br>See Color Specification on how colors are represented in ChartDirector. |
| kDataColor | &hFFFF0008 | A constant equals to FFFF0008 (in hex) to represent the starting index of automatic data color.<br>The array is in a format that can be directly used in BaseChart.setColors and DrawArea.setColorTable.<br>See Color Specification on how colors are represented in ChartDirector. |
| kLineColor | &hFFFF0001 | A constant equals to FFFF0001 (in hex) to represent the default line color.<br>See Color Specification on how colors are represented in ChartDirector. |
| kPalette | &hFFFF0000 | A constant equals to FFFF0000 (in hex) to represent the starting index of the color palette.<br>See Color Specification on how colors are represented in ChartDirector. |
| kSameAsMainColor | &hFFFF0007 | A constant equals to FFFF0007 (in hex) to represent the current main color.<br>See Color Specification on how colors are represented in ChartDirector. |
| kTextColor | &hFFFF0002 | A constant equals to FFFF0002 (in hex) to represent the default text color.<br>See Color Specification on how colors are represented in ChartDirector. |
| kTransparent | &hFF000000 | A constant equals to FF000000 (in hex) to represent the transparent color.<br>See Color Specification on how colors are represented in ChartDirector. |

Filter Modes

| Constant | Value | Description |
|---|---|---|
| kBesselFilter | 13 | A constant equals to 13 to represent a Bessel graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kBlackmanFilter | 12 | A constant equals to 12 to represent a Blackman graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kBoxFilter | 0 | A constant equals to 0 to represent a Box graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kBSplineFilter | 3 | A constant equals to 3 to represent a B-spline graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kCatromFilter | 5 | A constant equals to 5 to represent a Catrom graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kGaussianFilter | 9 | A constant equals to 9 to represent a Gaussian graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kHammingFilter | 11 | A constant equals to 11 to represent a Hamming graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kHanningFilter | 10 | A constant equals to 10 to represent a Hanning graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kHermiteFilter | 4 | A constant equals to 4 to represent a Hermite graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kLanczosFilter | 8 | A constant equals to 8 to represent a Lanczos graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kLinearFilter | 1 | A constant equals to 1 to represent a Linear graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kMitchellFilter | 6 | A constant equals to 6 to represent a Mitchell graphical re-sampling filter. Please refer to Re-Sampling Filters for more information graphical filters in ChartDirector. |
| kQuadraticFilter | 2 | |
| kSincFilter | 7 | |

Image Formats

| Constant | Value | Description |
|---|---|---|
| kBMP | 4 | The BMP format.<br>This constant is used in BaseChart.makeChart. |
| kGIF | 1 | The GIF format.<br>This constant is used in BaseChart.makeChart. |
| kJPG | 2 | The JPEG format.<br>This constant is used in BaseChart.makeChart. |
| kPDF | 7 | The PDF format. |
| kPNG | 0 | The PNG format.<br>This constant is used in BaseChart.makeChart. |
| kQTIMG | 9 | The QT Image format. |
| kSVG | 5 | The SVG format. |
| kSVGZ | 6 | The compressed SVG format. |
| kWMP | 3 | The WAP bitmap format.<br>This constant is used in BaseChart.makeChart. |

Alignment

| Constant | Value | Description |
|---|---|---|
| kBottom | 2 | A constant equals to 2 to represent the bottom position.<br>See Alignment Specification for supported alignment types. |
| kBottomCenter | 2 | A constant equals to 2 to represent the bottom center position.<br>See Alignment Specification for supported alignment types. |
| kBottomLeft | 1 | A constant equals to 1 to represent the bottom left position.<br>See Alignment Specification for supported alignment types. |
| kBottomLeft2 | 12 | A constant equals to 12 to represent the alternative exterior bottom left position.<br>See Alignment Specification for supported alignment types. |
| kBottomRight | 3 | A constant equals to 3 to represent the bottom right position.<br>See Alignment Specification for supported alignment types. |
| kBottomRight2 | 13 | A constant equals to 13 to represent the alternative exterior bottom right position.<br>See Alignment Specification for supported alignment types. |
| kCenter | 5 | A constant equals to 5 to represent the center position.<br>See Alignment Specification for supported alignment types. |
| kLeft | 4 | A constant equals to 4 to represent the left position.<br>See Alignment Specification for supported alignment types. |
| kRight | 6 | A constant equals to 6 to represent the right position.<br>See Alignment Specification for supported alignment types. |
| kTop | 8 | A constant equals to 8 to represent the top position.<br>See Alignment Specification for supported alignment types. |
| kTopCenter | 8 | A constant equals to 8 to represent the top center position.<br>See Alignment Specification for supported alignment types. |
| kTopLeft | 7 | A constant equals to 7 to represent the top left position.<br>See Alignment Specification for supported alignment types. |
| kTopLeft2 | 10 | A constant equals to 10 to represent the alternative exterior top left position.<br>See Alignment Specification for supported alignment types. |
| kTopRight | 9 | A constant equals to 9 to represent the top right position.<br>See Alignment Specification for supported alignment types. |
| kTopRight2 | 11 | A constant equals to 11 to represent the alternative exterior top right position.<br>See Alignment Specification for supported alignment types. |

Z-Level

| Constant | Value | Description |
|---|---|---|
| kChartBackZ | &h100 | A constant equals to 100 (in hex) to represent the z-order of the back surface of the chart.<br>This constant is used in Box.setZOrder, Line.setZOrder and MeterPointer.setZOrder. |
| kChartFrontZ | &hffff | A constant equals to ffff (in hex) to represent the z-order of the front surface of the chart.<br>This constant is used in Box.setZOrder, Line.setZOrder and MeterPointer.setZOrder. |
| kGridLinesZ | &h2000 | A constant equals to 2000 (in hex) to represent the z-order of the grid lines of the chart.<br>This constant is used in Box.setZOrder, Line.setZOrder and MeterPointer.setZOrder. |
| kPlotAreaZ | &h1000 | A constant equals to 1000 (in hex) to represent the z-order of the plot area back surface of the chart.<br>This constant is used in Box.setZOrder, Line.setZOrder and MeterPointer.setZOrder. |

Filter Tags

| Constant | Value | Description |
|---|---|---|
| kChartDir_AllPassFilterTag | 7 | All pass filter |
| kChartDir_NonePassFilterTag | 8 | None pass |
| kChartDir_RegularSpacingFilterTag | 6 | Regular Spacing |
| kChartDir_SelectItemFilterTag | 9 | Select Item |
| kChartDir_StartOfDayFilterTag | 2 | Start of Day |
| kChartDir_StartOfHourFilterTag | 1 | Start of Hour |
| kChartDir_StartOfMinuteFilterTag | 10 | Start of minute |
| kChartDir_StartOfMonthFilterTag | 4 | Start of month |
| kChartDir_StartOfSecondFilterTag | 11 | Start of second |
| kChartDir_StartOfWeekFilterTag | 3 | Start of week |
| kChartDir_StartOfYearFilterTag | 5 | Start of year |

Symbols

| Constant | Value | Description |
|---|---|---|
| kChartDir_ArrowSymbol | 18 | Arrow |
| kChartDir_CustomSymbol | 14 | Custom |
| kChartDir_Polygon2Symbol | 12 | Polygon 2 |
| kChartDir_PolygonSymbol | 11 | Polygon |
| kChartDir_StarSymbol | 13 | Star |
| kCircleSymbol | 7 | Circle |
| kCross2Symbol | 9 | Cross 2 |
| kCrossSymbol | 8 | Cross |
| kDiamondSymbol | 2 | Diamond |
| kInvertedTriangleSymbol | 6 | Inverted Triangle |
| kLeftTriangleSymbol | 5 | Left Triangle |
| kNoSymbol | 0 | No symbol |
| kRightTriangleSymbol | 4 | Right Triangle |
| kSquareSymbol | 1 | Square |
| kTriangleSymbol | 3 | Triangle |

Shapes

| Constant | Value | Description |
|---|---|---|
| kCircleShape | 7 | Circle<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kCircleShapeNoShading | 10 | Circle without shading.<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kDiamondShape | 2 | Diamond<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kGlassSphere2Shape | 16 | Glas Sphere 2 |
| kGlassSphereShape | 15 | Glas Sphere |
| kInvertedTriangleShape | 6 | Inverted Triangle<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kLeftTriangleShape | 5 | Left Triangle<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kNoShape | 0 | No shape |
| kRightTriangleShape | 4 | Triangle<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kSolidSphereShape | 17 | Solid shape |
| kSquareShape | 1 | Square shape<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |
| kTriangleShape | 3 | Triangle<br>Please refer to Shape Specification for samples and more information on using shapes in ChartDirector. |

Shadings

| Constant | Value | Description |
|---|---|---|
| kConcaveShading | 4 | Concave shading |
| kDefaultShading | 0 | Default shading |
| kFlatShading | 1 | Flat shading |
| kGlobalGradientShading | 3 | Global gradient shading |
| kLocalGradientShading | 2 | Local gradient shading |
| kRadialShading | 7 | Radial shading |
| kRingShading | 8 | Ring shading |
| kRoundedEdgeNoGlareShading | 5 | Rounded edge and no glare |
| kRoundedEdgeShading | 6 | Rounded Edge |

Regression Modes

| Constant | Value | Description |
|---|---|---|
| kConstrainedLinearRegression | 0 | A constant equals to 0 to represent that constrained linear regression be used to draw a trend line. |
| kExponentialRegression | -1 | A constant equals to -1 to represent that exponential regression be used to draw a trend line. |
| kLinearRegression | 1 | A constant equals to 1 to represent that linear regression be used to draw a trend line. |
| kLogarithmicRegression | -2 | A constant equals to -2 to represent that logarithmic regression be used to draw a trend line.<br>This constant is used in CDTrendLayerMBS.setRegressionType. |

Data Combine Methods

| Constant | Value | Description |
|---|---|---|
| kDepth | 2 | A constant equals to 2 to represent the "Depth" data representation method for multiple data sets.<br>This constant is used in XYChart.addBarLayer, XYChart.addAreaLayer, and Layer.setDataCombineMethod. |
| kOverlay | 0 | A constant equals to 0 to represent the "Overlay" data representation method for multiple data sets.<br>This constant is used in XYChart.addBarLayer, XYChart.addAreaLayer, and Layer.setDataCombineMethod. |
| kPercentage | 4 | A constant equals to 4 to represent the "Percentage" data representation method for multiple data sets.<br>This constant is used in XYChart.addBarLayer, XYChart.addAreaLayer and Layer.setDataCombineMethod. |
| kSide | 3 | A constant equals to 3 to represent the "Side" data representation method for multiple data sets.<br>This constant is used in XYChart.addBarLayer, XYChart.addAreaLayer and Layer.setDataCombineMethod. |
| kStack | 1 | A constant equals to 1 to represent the "Stack" data representation method for multiple data sets.<br>This constant is used in XYChart.addBarLayer, XYChart.addAreaLayer and Layer.setDataCombineMethod. |

Directions

| Constant | Value | Description |
|---|---|---|
| kDirectionHorizontal | 0 | A constant equals to 0 to represent that the zoom and/or scroll orientation is horizontal.<br>This constant is used in CChartViewer.setZoomDirection and CChartViewer.setScrollDirection. |
| kDirectionHorizontalVertical | 2 | A constant equals to 2 to represent that the zoom and/or scroll orientation can be both horizontal and vertical.<br>This constant is used in CChartViewer.setZoomDirection and CChartViewer.setScrollDirection. |
| kDirectionVertical | 1 | A constant equals to 1 to represent that the zoom and/or scroll orientation is vertical.<br>This constant is used in CChartViewer.setZoomDirection and CChartViewer.setScrollDirection. |

Dithering Modes

| Constant | Value | Description |
|---|---|---|
| kErrorDiffusion | 2 | Error Diffusion<br>This constant is used in DrawArea.setDitherMethod. |
| kOrderedDither | 1 | Ordered Dither<br>This constant is used in DrawArea.setDitherMethod. |
| kQuantize | 0 | Quantize<br>This constant is used in DrawArea.setDitherMethod. |

Palette Modes

| Constant | Value | Description |
|---|---|---|
| kForcePalette | 1 | Force palette.<br>This constant is used in DrawArea.setPaletteMode. |
| kNoPalette | 2 | No palette.<br>This constant is used in DrawArea.setPaletteMode. |
| kTryPalette | 0 | Try palette.<br>This constant is used in DrawArea.setPaletteMode. |

HLOC

| Constant | Value | Description |
|---|---|---|
| kHLOCDefault | 0 | A constant equals to 0 to represent that the HLOC symbols should be drawn using the same color.<br>This constant is used in XYChart.addHLOCLayer and HLOCLayer.setColorMethod. |
| kHLOCOpenClose | 1 | A constant equals to 1 to represent that the HLOC symbols should be drawn using two alternative colors based on whether the closing price is higher than the opening price.<br>This constant is used in XYChart.addHLOCLayer and HLOCLayer.setColorMethod. |
| kHLOCUpDown | 2 | A constant equals to 2 to represent that the HLOC symbols should be drawn using two alternative colors based on whether the closing price is higher than the previous closing price.<br>This constant is used in XYChart.addHLOCLayer and HLOCLayer.setColorMethod. |

Monotonic Modes

| Constant | Value | Description |
|---|---|---|
| kMonotonicAuto | 4 | A constant equals to 4 to represent that the system will automatically determine whether to constrained a spline curve to not overshooting or undershooting in the x-axis direction and/or the y-axis direction. |
| kMonotonicNone | 0 | A constant equals to 0 to represent that a spline curve is not constraint to flow in any direction. |
| kMonotonicX | 1 | A constant equals to 1 to represent that a spline curve is constrained to not overshooting or undershooting in the x-axis direction. |
| kMonotonicXY | 3 | A constant equals to 3 to represent that a spline curve is constrained to not overshooting or undershooting in both the x-axis direction and the y-axis direction. |
| kMonotonicY | 2 | A constant equals to 2 to represent that a spline curve is constrained to not overshooting or undershooting in the y-axis direction. |

Glare Modes

| Constant | Value | Description |
|---|---|---|
| kNoGlare | 1 | A constant equals to 1 to represent disabling the glare in CDBaseChartMBS.glassEffect shading style. |
| kNormalGlare | 3 | A constant equals to 3 to represent using normal glare strength in CDBaseChartMBS.glassEffect shading style. |
| kReducedGlare | 2 | A constant equals to 2 to represent using reduced glare strength in CDBaseChartMBS.glassEffect shading style. |

Legend Modes

| Constant | Value | Description |
|---|---|---|
| kNoLegend | 2 | A constant equals to 2 to represent that no legend keys should be added to the legend box.<br>This constant is used in Layer.setLegendOrder. |
| kNormalLegend | 0 | A constant equals to 0 to represent that the legend keys order should follow the creation order of the data sets.<br>This constant is used in Layer.setLegendOrder. |
| kReverseLegend | 1 | A constant equals to 1 to represent that the legend keys order is the reverse of the creation order of the data sets.<br>This constant is used in Layer.setLegendOrder. |

Surface Shading Style

| Constant | Value | Description |
|---|---|---|
| kRectangularFrame | 4 | |
| kRectangularShading | 2 | Rectangular sharing |
| kSmoothShading | 0 | Smooth |
| kTriangularFrame | 3 | |
| kTriangularShading | 1 | Triangular |

Layout Methods

| Constant | Value | Description |
|---|---|---|
| kTreeMapBinaryByMid | 5 | Same as TreeMapBinaryBySize except that the nodes will be partitioned so that the count of nodes are as equal as possible. |
| kTreeMapBinaryBySize | 4 | Without changing the ordering of the nodes, the nodes will be partitioned into two groups so that their sizes are as equal as possible. The two groups will then become two rectangular region. If the width of the plot area is not smaller than its height, the two groups will be placed at the left and right sides of plot area, otherwise they will be placed at the top and bottom sides of the plot area. The splitting then recursively apply to each group to partition them, until each subgroup contains only one node and can no longer be partitioned. |
| kTreeMapNoLayout | 6 | No layout. |
| kTreeMapSliceAndDice | 1 | This method is intended for multi-level tree maps. Assume the layout direction is TopLeft, the first level nodes will flow from left to right. The second level nodes will flow from top to bottom. If there are more levels, they will alternate between left/right and top/bottom flow directions. The layoutDirection argument can be used to specify other layout directions. |
| kTreeMapSquarify | 2 | The nodes will be layout so that they are as close to a square as possible. This method may sort the nodes, so the ordering of the nodes on the chart may be different from the ordering in the data array. |
| kTreeMapStrip | 3 | The nodes will flow according to the layoutDirection argument. The default is TopLeft, which means the nodes will flow from left to right and top to bottom like text. The number of nodes in each row will be such that on average, they are as close to squares as possible. |

At Origin

| Constant | Value | Description |
|---|---|---|
| kXAxisAtOrigin | 1 | A constant equals to 1 to represent that the x-axis should intersect with the zero point of the y-axis if it exists on the chart.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kXYAxisAtOrigin | 3 | A constant equals to 3 to represent that the x-axis and y-axis should intersect at the origin if it exists on the chart.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kYAxisAtOrigin | 2 | A constant equals to 2 to represent that the y-axis should intersect with the zero point of the x-axis if it exists on the chart.<br>This constant is used in XYChart.setAxisAtOrigin. |

Symmetric Modes

| Constant | Value | Description |
|---|---|---|
| kXAxisSymmetric | 1 | A constant equals to 1 to represent that the x-axis should be symmetrical about the origin.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kXAxisSymmetricIfNeeded | 2 | A constant equals to 2 to represent that the x-axis should be symmetrical about the origin if the data contain both positive and negative values.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kXYAxisSymmetric | 16 | A constant equals to 16 to represent that the the x-axis and y-axis should be symmetrical about the origin.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kXYAxisSymmetricIfNeeded | 32 | A constant equals to 32 to represent that the x-axis and y-axis should be symmetrical about the origin if the data contain both positive and negative values.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kYAxisSymmetric | 4 | A constant equals to 4 to represent that the y-axis should be symmetrical about the origin.<br>This constant is used in XYChart.setAxisAtOrigin. |
| kYAxisSymmetricIfNeeded | 8 | A constant equals to 8 to represent that the y-axis should be symmetrical about the origin if the data contain both positive and negative values.<br>This constant is used in XYChart.setAxisAtOrigin. |

## 28.9 class CDBaseMeterMBS

### 28.9.1 class CDBaseMeterMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The BaseMeter class represents a generic meter.
**Notes:** Subclass of the CDBaseChartMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- ChartDirector Meters and Gauges

### 28.9.2 Methods

### 28.9.3 addColorScale(colorStops() as Double, startPos as Integer = -2147483647, startWidth as Integer = -2147483647, endPos as Integer = -2147483647, endWidth as Integer = -2147483647, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a color scale to the meter.
**Notes:** A color scale is similar to a meter scale. Instead of using labels to denote the values, a color scale uses different colors for different values. The colors can vary continuously or in discrete steps. The width of the color scale can also vary based on the value. There can be multiple more than one color scale in a meter.

A color scale is defined with an array of numbers. For a continuous color scale, each pair of numbers represents a value and its associated color. For example, to define a continuous color scale in which 0 is blue (0000FF), 50 is yellow (FFFF00) and 100 is red (FF0000), the numbers should be:

0.0, &h0000ff, 50.0, &hffff00, 100.0, &hff0000

For a step color scale, the number of colors would be one less than the number of values. For example, to define a step color scale in which 0 to 50 is red (FF0000), and 50 to 100 is green (00FF00), the numbers will be:

0.0, &hff000, 50.0, &h00ff00, 100.0

See also:

- 28.9.4 addColorScale(colorStops() as Double, startPos as Integer, startWidth as Integer, endPos as Integer, endWidth as Integer, edgeColor as color)

| Argument | Default | Description |
|---|---|---|
| colorStops | (Mandatory) | An array of numbers alternating between values and colors. If the number count is even, the array will define a continuous color scale, otherwise it will define a step color scale. |
| startPos | -&h7fffffff | The position of the starting point of the color scale. For an angular meter, the position refers to the radius, and the default is the meter scale radius (see AngularMeter.setMeter). For a linear meter, the position refers to the x or y coordinate depending on whether the meter is vertical or horizontal, and the default is the leftX or topY coordinate of the meter scale (see LinearMeter.setMeter). |
| startWidth | -&h7fffffff | The width at the starting point of the color scale. A positive value means the width is in the direction of increasing "position", while a negative value means decreasing "position". Please refer to the description of startPos on the meaning of "position" for various types of meters. The default is the length of the major tick (see BaseMeter.setTickLength). |
| endPos | -&h7fffffff | The position of the ending point of the color scale. Please refer to the description of startPos above on how the position parameter is interpreted. The default is for the ending position to be equal to the starting position. |
| endWidth | -&h7fffffff | The width at the ending point of the color scale. Please refer to the description of startWidth above on how the width parameter is interpreted. The default is for the ending width to be equal to the starting width. |
| edgeColor | -1 | The edge color of the color scale. The default is to have no edge. |

### 28.9.4 addColorScale(colorStops() as Double, startPos as Integer, startWidth as Integer, endPos as Integer, endWidth as Integer, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a color scale to the meter.
**Notes:** A color scale is similar to a meter scale. Instead of using labels to denote the values, a color scale uses different colors for different values. The colors can vary continuously or in discrete steps. The width of the color scale can also vary based on the value. There can be multiple more than one color scale in a meter.

A color scale is defined with an array of numbers. For a continuous color scale, each pair of numbers represents a value and its associated color. For example, to define a continuous color scale in which 0 is blue (0000FF), 50 is yellow (FFFF00) and 100 is red (FF0000), the numbers should be:

0.0, &h0000ff, 50.0, &hffff00, 100.0, &hff0000

For a step color scale, the number of colors would be one less than the number of values. For example, to define a step color scale in which 0 to 50 is red (FF0000), and 50 to 100 is green (00FF00), the numbers will be:

0.0, &hff000, 50.0, &h00ff00, 100.0

| Argument | Default | Description |
|---|---|---|
| colorStops | (Mandatory) | An array of numbers alternating between values and colors. If the number count is even, the array will define a continuous color scale, otherwise it will define a step color scale. |
| startPos | -&h7fffffff | The position of the starting point of the color scale. For an angular meter, the position refers to the radius, and the default is the meter scale radius (see AngularMeter.setMeter). For a linear meter, the position refers to the x or y coordinate depending on whether the meter is vertical or horizontal, and the default is the leftX or topY coordinate of the meter scale (see LinearMeter.setMeter). |
| startWidth | -&h7fffffff | The width at the starting point of the color scale. A positive value means the width is in the direction of increasing "position", while a negative value means decreasing "position". Please refer to the description of startPos on the meaning of "position" for various types of meters. The default is the length of the major tick (see BaseMeter.setTickLength). |
| endPos | -&h7fffffff | The position of the ending point of the color scale. Please refer to the description of startPos above on how the position parameter is interpreted. The default is for the ending position to be equal to the starting position. |
| endWidth | -&h7fffffff | The width at the ending point of the color scale. Please refer to the description of startWidth above on how the width parameter is interpreted. The default is for the ending width to be equal to the starting width. |
| edgeColor | -1 | The edge color of the color scale. The default is to have no edge. |

See also:

- 28.9.3 addColorScale(colorStops() as Double, startPos as Integer = -2147483647, startWidth as Integer = -2147483647, endPos as Integer = -2147483647, endWidth as Integer = -2147483647, edgeColor as Integer = -1) 4900

### 28.9.5 addLabel(v as Double, label as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a label to a specific position on the meter scale.
**Notes:** By default, all labels will be associated major ticks on the scale. To associate a label with a minor tick instead , use '-' as the first character of the label. To associate a label with a micro tick instead, use ':' as the first character of the label. To draw the label without any tick at all, use '
textasciitilde ' as the first character of the label.

Leading '-', '
textasciitilde ' or ':' characters are tick specification characters and will not appear on the labels. They just specify the the tick style to be associated with the labels. If you want have a label that actually begins these characters, add '\' as the first character as the escape character.

In some cases, it may be desirable to skip some labels. If you want to draw a major, minor or micro tick

without any label, use ' ' (a space character), '-' or ':' as the only character in the label text. If you want leave a label position empty without a tick or a label, use an empty string.

| Argument | Default | Description |
|---|---|---|
| pos | (Mandatory) | The position to add the label to in meter scale unit. |
| label | (Mandatory) | The label to add to the meter scale. |

### 28.9.6 addPointer(value as Double, fillColor as color, edgeColor as color) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPointer method, but uses color instead of integer data type for passing color values.
See also:

- 28.9.7 addPointer(value as Double, fillColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDMeterPointerMBS 4903

### 28.9.7 addPointer(value as Double, fillColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a pointer to the meter.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value that the pointer will point to. |
| fillColor | LineColor | The fill color of the pointer. |
| edgeColor | -1 | The edge color of the pointer. The default value of -1 means the edge color is the same as the fill color. |

See also:

- 28.9.6 addPointer(value as Double, fillColor as color, edgeColor as color) as CDMeterPointerMBS 4903

### 28.9.8 getCoor(v as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the geometric coordinates given the data value.
**Notes:** For an angular meter, this method returns the angular position of the pointer for the given data

value in degrees. The angle is measure in the clockwise direction, with 0 being the upward pointing direction.

For a linear meter, this method returns the linear pixel offset of the pointer for the given data value.

| Argument | Default | Description |
|---|---|---|
| v | (Mandatory) | The input data value. |

Return Value
The geometric representation of the data value, which is an angle in degrees for an angular meter, and a linear pixel offset for a linear meter.

### 28.9.9 getLabel(v as Double) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the label at the specified position on the meter scale.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The position specified as a value on the meter scale. |

Return Value
Returns the label at the specified position, or a null string if there is no label at that position.

### 28.9.10 getTicks as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the positions of all ticks as values on the meter scale.
**Notes:** Return Value
All array of numbers representing the positions of the ticks as values on the meter scale.

### 28.9.11 setLabelFormat(mainLabelFormat as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format of the labels computed by ChartDirector.
**Example:**

```
dim c as CDBaseMeterMBS
```

```
// you can use label formats like this:

c.setLabelFormat("<*block,halign=left*><*font=timesbi.ttf,size=12,underline=1*>{ label } <*/font*><*br*>US$
{ value } K ( { percent } %)")

// we can reduce that to this:

c.setLabelFormat(" { label } { value } { percent } %")

// and it shows 3 numbers. With | 1 after the variable name, we define the decimals after dot:

c.setLabelFormat(" { label } { value | 1 } { percent | 1 } %")

// and

c.setLabelFormat(" { label } { value | 1., } { percent | 1., } %")

// uses dot for thousands and comma for decimal separator.
```

**Notes:** The method is mainly used when BaseMeter.setScale is used, in which case the label values are not directly specified but are computed by ChartDirector. For example, a format string of " { value | 2 } " will format the values with 2 decimal places.

Please refer to Parameter Substitution and Formatting on all available format parameters.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.9.12 setLabelPos(labelInside as boolean, labelOffset as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the positions of the meter scale labels.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| labelInside | (Mandatory) | A true value means that the labels are on the 'inward' side of the meter scale.<br>A false value means the labels are on the 'outward' side of the meter scale. |

For an angular meter, the default is for the labels on the 'inward' side. For a linear meter, the default is for the labels on the 'outward' side.

| | | |
|---|---|---|
| labelOffset | 0 | The offset, in pixels, of the labels position relative to the standard position. If the major tick is at the same side as the label, the standard starting position of the label is at the end point of the major tick. Otherwise, the standard starting position is on the meter scale. |

A positive labelOffset means the labels should move more towards the 'inward' or 'outward' side, depending on the first parameter. A negative labelOffset means moving the labels towards the opposite direction.

### 28.9.13 setLabelStyle(font as string = "", fontsize as Double = -1, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font style used to for the meter labels.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | "bold" | The font used to draw the labels. |
| fontSize | -1 | The font size used to draw the labels in points. A value of -1 means the font size is not changed. The default font size is 10 points for angular meters, and 8 points for linear meters. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.9.14 setLabelStyle(font as string, fontsize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS 4906

### 28.9.14 setLabelStyle(font as string, fontsize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 175.11.10 setLabelStyle(font as string = """, fontsize as Double = -1, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 21767

### 28.9.15 setLineWidth(axisWidth as Integer, majorTickWidth as Integer = 1, minorTickWidth as Integer = 1, microTickWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line widths of the scale line and the ticks on the meter.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| axisWidth | (Mandatory) | The line width for drawing the meter scale line in pixels. For an angular meter, the default is 1 pixel. For a linear meter, the default is 2 pixels. |
| majorTickWidth | 1 | The line width of the major ticks in pixels. For a linear meter, if this method is not called, the initial major tick width is set to 2 pixels. |
| minorTickWidth | 1 | The line width of the minor ticks in pixels. |
| microTickWidth | 1 | The line width of the micro ticks in pixels. |

### 28.9.16 setMeterColors(axisColor as color, labelColor as color, tickColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setMeterColors method, but uses color instead of integer data type for passing color values.
See also:

- 28.9.17 setMeterColors(axisColor as Integer, labelColor as Integer = -1, tickColor as Integer = -1) 4907

### 28.9.17 setMeterColors(axisColor as Integer, labelColor as Integer = -1, tickColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the meter scale line, scale label and tick.
**Notes:**

See also:

- 28.9.16 setMeterColors(axisColor as color, labelColor as color, tickColor as color) 4907

| Argument | Default | Description |
|---|---|---|
| axisColor | (Mandatory) | The color for drawing the meter scale line. The default is LineColor. |
| labelColor | -1 | The color for drawing the scale labels. Passing -1 in this argument means the label color is not changed. The default label color is TextColor. |
| tickColor | -1 | The color for drawing the ticks. Passing -1 in this argument means the tick color is not changed. The default tick color is LineColor. |

### 28.9.18 setScale(lowerLimit as Double, upperLimit as Double, labels() as Double, formatstring as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the meter to use the given scale with the given numeric labels and tick positions.
**Notes:** ChartDirector will distribute the labels evenly on the scale. By default, all labels are associated with major ticks. If you want certain positions to show a minor or micro ticks only, use MinorTickOnly or MicroTickOnly as the label values for those positions.

| Argument | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower limit of the meter scale. |
| upperLimit | (Mandatory) | The upper limit of the meter scale. |
| labels | (Mandatory) | An array of numbers to be used as the labels on the meter scale. |
| formatString | "" | The format string for formatting the numbers. An empty string means the format will be automatically determined. |

See also:

- 28.9.19 setScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4908
- 28.9.20 setScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0, microTickInc as Double = 0) 4909

### 28.9.19 setScale(lowerLimit as Double, upperLimit as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the meter to use the given scale with the given text labels and tick positions.
**Notes:** ChartDirector will distribute the labels evenly on the scale. By default, all labels are associated with major ticks. These can be modified by using '-', '
textasciitilde ' or ':' as the first character. Please refer to BaseMeter.addLabel for details.

See also:

- 28.9.18 setScale(lowerLimit as Double, upperLimit as Double, labels() as Double, formatstring as string = "") 4908

| Argument | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower limit of the meter scale. |
| upperLimit | (Mandatory) | The upper limit of the meter scale. |
| labels | (Mandatory) | An array of text strings to be used as the labels on the meter scale. |


- 28.9.20 setScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0, microTickInc as Double = 0) 4909


### 28.9.20 setScale(lowerLimit as Double, upperLimit as Double, majorTickInc as Double = 0, minorTickInc as Double = 0, microTickInc as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the meter to use the given scale.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| lowerLimit | (Mandatory) | The lower limit of the meter scale. |
| upperLimit | (Mandatory) | The upper limit of the meter scale. |
| majorTickInc | 0 | The interval between major ticks. For example, a value of 10 means a major tick every 10 units in the meter scale. Each major tick will have an associated label for the value at the tick. A value of 0 disables major ticks. |
| minorTickInc | 0 | The interval between minor ticks. For example, a value of 5 means a minor tick every 5 units in the meter scale. A value of 0 disables minor ticks. |
| microTickInc | 0 | The interval between minor ticks. For example, a value of 1 means a minor tick every 1 units in the meter scale. A value of 0 disables micro ticks. |

See also:


- 28.9.18 setScale(lowerLimit as Double, upperLimit as Double, labels() as Double, formatstring as string = "") 4908
- 28.9.19 setScale(lowerLimit as Double, upperLimit as Double, labels() as string) 4908


### 28.9.21 setTickLength(majorLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the lengths of the ticks.
**Notes:**

For an angular meter, the default is -10 (10 pixels at the inward direction). For a horizontal linear meter, the default is the same height as the meter scale region in the inward direction. For a vertical linear meter,

| Argument | Default | Description |
|---|---|---|
| majorLen | (Mandatory) | The length of the major ticks in pixels. A positive value means the tick is at the 'outward' direction of the meter. A negative value means the tick is at the 'inward' direction. |
| minorLen | -7fffffff | The length of the minor ticks in pixels. The default is 60% of the length of the major ticks. |
| microLen | -7fffffff | The length of the micro ticks in pixels. The default is 50% of the length of the minor ticks. |

the default is the same width as the meter scale region in the inward direction.

See also:

- 28.9.22 setTickLength(majorLen as Integer, minorLen as Integer) 4910
- 28.9.23 setTickLength(majorLen as Integer, minorLen as Integer, microLen as Integer) 4911

### 28.9.22 setTickLength(majorLen as Integer, minorLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the lengths of the ticks.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| majorLen | (Mandatory) | The length of the major ticks in pixels. A positive value means the tick is at the 'outward' direction of the meter. A negative value means the tick is at the 'inward' direction. |

For an angular meter, the default is -10 (10 pixels at the inward direction). For a horizontal linear meter, the default is the same height as the meter scale region in the inward direction. For a vertical linear meter, the default is the same width as the meter scale region in the inward direction.

See also:

- 28.9.21 setTickLength(majorLen as Integer) 4909
- 28.9.23 setTickLength(majorLen as Integer, minorLen as Integer, microLen as Integer) 4911

| | | |
|---|---|---|
| minorLen | -7fffffff | The length of the minor ticks in pixels. The default is 60% of the length of the major ticks. |
| microLen | -7fffffff | The length of the micro ticks in pixels. The default is 50% of the length of the minor ticks. |

### 28.9.23 setTickLength(majorLen as Integer, minorLen as Integer, microLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the lengths of the ticks.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| majorLen | (Mandatory) | The length of the major ticks in pixels. A positive value means the tick is at the 'outward' direction of the meter. A negative value means the tick is at the 'inward' direction. |

For an angular meter, the default is -10 (10 pixels at the inward direction). For a horizontal linear meter, the default is the same height as the meter scale region in the inward direction. For a vertical linear meter, the default is the same width as the meter scale region in the inward direction.

| | | |
|---|---|---|
| minorLen | -7fffffff | The length of the minor ticks in pixels. The default is 60% of the length of the major ticks. |
| microLen | -7fffffff | The length of the micro ticks in pixels. The default is 50% of the length of the minor ticks. |

See also:


- 28.9.21 setTickLength(majorLen as Integer) 4909
- 28.9.22 setTickLength(majorLen as Integer, minorLen as Integer) 4910

## 28.10 class CDBoxMBS

### 28.10.1 class CDBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Box class represents boxes.
**Notes:** It is used as the base class for more complex classes (such as the TextBox class).
Subclass of the CDDrawObjMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.10.2 Methods

### 28.10.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.10.4 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the box.
**Notes:** In some usages, the height of a box may be dynamically determined. An example is the height of an LegendBox, which cannot be known until all data are available. In these cases, the height is undefined until the chart or at least the legend box has been laid out (using BaseChart.layout or BaseChart.layoutLegend), or the chart image has been drawn (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3).
Return Value
The height of the box in pixels.

### 28.10.5 getImageCoor(OffsetX as Integer = 0, OffsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of the box as HTML image map attributes.
**Notes:** The image map coordinates will be in the following format:

shape="rect" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] "
where (x1, y1) and (x2, y2) are opposite corners of the box. The format is designed so that it can easily be

incorporated into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the coordinates of the box in HTML image map attribute format.

### 28.10.6 getLeftX as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the left x pixel coordinate of the box.
**Notes:** In some cases, the left x coordinate of a box may be dynamically determined. An example is the left x coordinate of an CDLegendBoxMBS with alignment set to Center. To determine the left x coordinate, the size of the box must be known first. For these cases, the left x coordinate is undefined until the legend box or the entire chart has been laid out (using CDBaseChartMBS.layout or CDBaseChartMBS.layoutLegend), or the chart image has been drawn (eg. using CDBaseChartMBS.makeChart).

Arguments:
None

Return Value
The the left x pixel coordinate of the box.

### 28.10.7 getTopY as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the top y pixel coordinate of the box.
**Notes:** In some cases, the top y coordinate of a box may be dynamically determined. An example is the top y coordinate of an CDLegendBoxMBS with alignment set to Center. To determine the top y coordinate, the size of the box must be known first. For these cases, the top y coordinate is undefined until the legend box or the entire chart has been laid out (using CDBaseChartMBS.layout or CDBaseChartMBS.layoutLegend),

or the chart image has been drawn (eg. using CDBaseChartMBS.makeChart).

Arguments:
None

Return Value
The top y pixel coordinate of the box.

### 28.10.8 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the box.
**Notes:** In some usages, the width of a box may be dynamically determined. An example is the width of an LegendBox, which cannot be known until all data are available. In these cases, the width is undefined until the chart or at least the legend box has been laid out (using BaseChart.layout or BaseChart.layoutLegend), or the chart image has been drawn (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3).
Return Value
The width of the box in pixels.

### 28.10.9 setBackground(colorvalue as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBackground method, but uses color instead of integer data type for passing color values.
**Example:**

```
// set edge to be 2 pixel wide line
Dim table As CDMLTableMBS
Dim t As CDTextBoxMBS = table.getStyle
Dim x As Integer = c.flatBorder(2)
t.setBackground(&heeeeee, CDXYChartMBS.kLineColor, x)
```

See also:

- 28.10.10 setBackground(colorvalue as Integer, edgeColor as Integer = -1, raisedEffect as Integer = 0) 4915

### 28.10.10 setBackground(colorvalue as Integer, edgeColor as Integer = -1, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the background color, border color and 3D border effect of the box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The background color of the box. |
| edgeColor | -1 | The border color of the box. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support Chart::glassEffect and Chart::softLighting effects. |

See also:

- 28.10.9 setBackground(colorvalue as color, edgeColor as color, raisedEffect as Integer = 0) 4914

### 28.10.11 setPos(x as Integer, y as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the coordinates of the top-left corner of the box.
**Example:**

```
// Create a XYChart object of size 250 x 250 pixels
dim c as new CDXYChartMBS(250, 250)

// Add a bar chart layer using the given data
dim t as CDTextBoxMBS = c.addBarLayer(data)
t.setPos(0, -10) // move 10 up
```

**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the left of the box. |
| y | (Mandatory) | The y coordinate of the top of the box. |

### 28.10.12 setRoundedCorners(r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border style to use rounded corners.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| r1 | 10 | The radius of the top-left rounded corner in pixels. |
| r2 | -1 | The radius of the top-right rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |
| r3 | -1 | The radius of the bottom-right rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |
| r4 | -1 | The radius of the bottom-left rounded corner in pixels. The default value of -1 means it is the same as the radius of the top-left corner. |

### 28.10.13 setSize(w as Integer, h as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width and height of the box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The width of the box in pixels. |
| h | (Mandatory) | The height of the box in pixels. |

## 28.11 class CDBoxWhiskerLayerMBS

### 28.11.1 class CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The BoxWhiskerLayer class represents box-whisker layers.
**Notes:** Subclass of the CDBaseBoxLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.11.2 Methods

### 28.11.3 setBoxColor(item as Integer, boxColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBoxColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.11.4 setBoxColor(item as Integer, boxColor as Integer) 4917

### 28.11.4 setBoxColor(item as Integer, boxColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color for a single box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| item | (Mandatory) | The index of the box to change color. The first box is 0, while the Nth box is N - 1. |
| boxColor | (Mandatory) | The color to use to fill the box. |

See also:

- 28.11.3 setBoxColor(item as Integer, boxColor as color) 4917

### 28.11.5 setBoxColors(colors() as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBoxColors method, but uses color instead of integer data type for passing color values.
See also:


- 28.11.6 setBoxColors(colors() as color, names() as string) 4918
- 28.11.7 setBoxColors(colors() as Integer) 4918
- 28.11.8 setBoxColors(colors() as Integer, names() as string) 4919


### 28.11.6 setBoxColors(colors() as color, names() as string)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBoxColors method, but uses color instead of integer data type for passing color values.
See also:


- 28.11.5 setBoxColors(colors() as color) 4917
- 28.11.7 setBoxColors(colors() as Integer) 4918
- 28.11.8 setBoxColors(colors() as Integer, names() as string) 4919


### 28.11.7 setBoxColors(colors() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors for all boxes.
**Notes:** The method will set the BoxWhiskerLayer into multi-color mode. The colors of each box will be obtained from the given colors array. If there are insufficient colors in the array, the remaining boxes will be auto-colored.

If the names argument is given, the names will appear in the legend box if one is configured for the chart.

| Argument | Default | Description |
|---|---|---|
| colors | (Mandatory) | An array of colors to be used as the color of the boxes. |
| names | [ Empty_Array ] | An array of names to be used in the legend box, if one is configured for the chart. |

See also:


- 28.11.5 setBoxColors(colors() as color) 4917
- 28.11.6 setBoxColors(colors() as color, names() as string) 4918
- 28.11.8 setBoxColors(colors() as Integer, names() as string) 4919

### 28.11.8 setBoxColors(colors() as Integer, names() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors for all boxes.
**Notes:** The method will set the BoxWhiskerLayer into multi-color mode. The colors of each box will be obtained from the given colors array. If there are insufficient colors in the array, the remaining boxes will be auto-colored.

If the names argument is given, the names will appear in the legend box if one is configured for the chart.

| Argument | Default | Description |
|---|---|---|
| colors | (Mandatory) | An array of colors to be used as the color of the boxes. |
| names | [ Empty_Array ] | An array of names to be used in the legend box, if one is configured for the chart. |

See also:


- 28.11.5 setBoxColors(colors() as color) 4917
- 28.11.6 setBoxColors(colors() as color, names() as string) 4918
- 28.11.7 setBoxColors(colors() as Integer) 4918


### 28.11.9 setWhiskerBrightness(whiskerBrightness as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the whisker colors as darken or brightened fill colors of the boxes for BoxWhiskerLayer in multi-color mode.
**Notes:** In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. Instead of specifying a single whisker color for all boxes, ChartDirector supports deriving the whisker colors by darkening or brightening the corresponding fill colors.

| Argument | Default | Description |
|---|---|---|
| whiskerBrightness | (Mandatory) | The brightness factor. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |

## 28.12 class CDCandleStickLayerMBS

### 28.12.1 class CDCandleStickLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CandleStickLayer class represents candlestick layers.
**Notes:** Subclass of the CDBaseBoxLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 18.5, page 64: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.12.2 Methods

### 28.12.3 setColors(upFillColor as color, upLineColor as color, downFillColor as color, downLineColor as color)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the colors for candlesticks.
**Notes:** The standard way to color a candlestick is to color it based on whether it is on an "up" or "down" trading session, in which "up" is defined as the closing price higher than or equal to the opening price, otherwise it is "down".

| Argument | Default | Description |
|---|---|---|
| upFillColor | (Mandatory) | The fill color for "up" trading sessions. |
| upLineColor | (Mandatory) | The line color for "up" trading sessions. |
| downFillColor | (Mandatory) | The fill color for "down" trading sessions. |
| downLineColor | (Mandatory) | The line color for "down" trading sessions. |

See also:

- 28.12.4 setColors(upFillColor as Integer, upLineColor as Integer, downFillColor as Integer, downLineColor as Integer) 4920

### 28.12.4 setColors(upFillColor as Integer, upLineColor as Integer, downFillColor as Integer, downLineColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures the colors for candlesticks.
**Notes:** The standard way to color a candlestick is to color it based on whether it is on an "up" or "down" trading session, in which "up" is defined as the closing price higher than or equal to the opening price, otherwise it is "down".

| Argument | Default | Description |
|---|---|---|
| upFillColor | (Mandatory) | The fill color for "up" trading sessions. |
| upLineColor | (Mandatory) | The line color for "up" trading sessions. |
| downFillColor | (Mandatory) | The fill color for "down" trading sessions. |
| downLineColor | (Mandatory) | The line color for "down" trading sessions. |

See also:

- 28.12.3 setColors(upFillColor as color, upLineColor as color, downFillColor as color, downLineColor as color) 4920

### 28.12.5 setExtraColors(upDownFillColor as color, upDownLineColor as color, downDownFillColor as color, downDownLineColor as color, leadValue as Double = -1.7E308)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures additional colors for candlesticks.
**Notes:** The standard way to color a candlestick is to color it using the method as mentioned in CandleStickLayer.setColors, in which "up" is defined as the closing price higher than or equal to the opening price.

In some applications, it may be desirable to vary the candlestick colors based on an alternative definition of "up" and "down", in which "up" is defined as the closing price higher than or equal to that of the previous trading session.

With these two definitions of "up" and "down", a candlestick can have 4 states. It can be "up/up" ("up" as according to both the standard and alternative definitions), "up/down" ("up" according to the standard definition, "down" according to the alternative definition), "down/up" or "down/down".

The setExtraColors method can be used to configure the "up/down" and "down/down" colors. If this method is used, the colors configured with CandleStickLayer.setColors will be considered as the "up/up" and "down/up" colors.

See also:

- 28.12.6 setExtraColors(upDownFillColor as Integer, upDownLineColor as Integer, downDownFillColor as Integer, downDownLineColor as Integer, leadValue as Double = -1.7E308) 4922

| Argument | Default | Description |
|---|---|---|
| upDownFillColor | (Mandatory) | The fill color for "up/down" days. |
| upDownLineColor | (Mandatory) | The line color for "up/down" days. |
| downDownFillColor | (Mandatory) | The fill color for "down/down" days. |
| downDownLineColor | (Mandatory) | The line color for "down/down" days. |
| leadValue | [ -Infinity ] | The closing price before the first trading session, which is used to determine if the first trading session is "up" or "down" according to the alternative definition. |

### 28.12.6 setExtraColors(upDownFillColor as Integer, upDownLineColor as Integer, downDownFillColor as Integer, downDownLineColor as Integer, leadValue as Double = -1.7E308)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures additional colors for candlesticks.
**Notes:** The standard way to color a candlestick is to color it using the method as mentioned in CandleStickLayer.setColors, in which "up" is defined as the closing price higher than or equal to the opening price.

In some applications, it may be desirable to vary the candlestick colors based on an alternative definition of "up" and "down", in which "up" is defined as the closing price higher than or equal to that of the previous trading session.

With these two definitions of "up" and "down", a candlestick can have 4 states. It can be "up/up" ("up" as according to both the standard and alternative definitions), "up/down" ("up" according to the standard definition, "down" according to the alternative definition), "down/up" or "down/down".

The setExtraColors method can be used to configure the "up/down" and "down/down" colors. If this method is used, the colors configured with CandleStickLayer.setColors will be considered as the "up/up" and "down/up" colors.

| Argument | Default | Description |
|---|---|---|
| upDownFillColor | (Mandatory) | The fill color for "up/down" days. |
| upDownLineColor | (Mandatory) | The line color for "up/down" days. |
| downDownFillColor | (Mandatory) | The fill color for "down/down" days. |
| downDownLineColor | (Mandatory) | The line color for "down/down" days. |
| leadValue | [ -Infinity ] | The closing price before the first trading session, which is used to determine if the first trading session is "up" or "down" according to the alternative definition. |

See also:

- 28.12.5 setExtraColors(upDownFillColor as color, upDownLineColor as color, downDownFillColor as color, downDownLineColor as color, leadValue as Double = -1.7E308) 4921

## 28.13 class CDColorAxisMBS

### 28.13.1 class CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ColorAxis class represents color axes.
**Notes:** It is a subclass of Axis.

A color axis is similar to an x or y axis. However, instead of mapping data values to positions, a color axis maps data values to colors. Color axes are used in CDContourLayerMBS and in CDSurfaceChartMBS objects.

Similar to an x or y axis, a color axis is visually represented as a thin bar that can be horizontal or vertical, and has a scale along its length. The scale can be set explicitly or can be determined by auto-scaling.

If you are using the color axis on a surface chart, please note that by default, the color axis scale is synchronized to the z axis. You need to use CDAxisMBS.syncAxis to cancel the synchronization before you can independently set the color axis scale.

In addition to the scale, a color axis is colored with a continuous color gradient or discrete color steps along its length. This maps the values on the axis with colors.

For an x or y axis, the major and minor ticks correspond to major and minor grid lines on the chart. For a color axis, these ticks correspond to major and minor contour lines on the chart.

Like an x or y axis, you can add marks to the color axis using Axis.addMark. They will become mark contour lines on the chart.

The color axis, if visible, acts as a color legend. The axis stem is a thin rectangle 15 pixels in width, configurable with CDAxisMBS.setWidth. A bounding box can be added to surround the color axis using CDColorAxisMBS.setBoundingBox.

A color axis works normally (determines color mapping and contour levels) even if it is not displayed.
Subclass of the CDAxisMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr1

**Xojo Developer Magazine**

- 7.5, page 34: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin
- 7.4, page 33: Easy Charts and Graphs, Using the ChartDirector Plugin

### 28.13.2 Methods

### 28.13.3 getBoxHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the color axis inclusive of the bounding box.
**Notes:** This method should be called only after axis layout (after calling CDXYChartMBS.layoutAxes, CDBaseChartMBS.layout or CDXYChartMBS.packPlotArea).

### 28.13.4 getBoxWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the color axis inclusive of the bounding box.
**Notes:** This method should be called only after axis layout (after calling CDXYChartMBS.layoutAxes, CDBaseChartMBS.layout or CDXYChartMBS.packPlotArea).

### 28.13.5 getColor(z as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the color given the data value.
**Notes:** You must call CDXYChartMBS.layoutAxes, CDBaseChartMBS.layout or CDXYChartMBS.packPlotArea first before calling this method. ChartDirector needs to perform auto-scaling and layout the axis before it can compute the color.

Arguments:

| Argument | Default | Description |
|---|---|---|
| z | (Mandatory) | The data value. |

Return Value
The color that corresponds to the data value.

### 28.13.6 getColorScale as Double()

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the color stops defining the axis scale and the associated colors.
**Notes:** Returns an array of numbers representing the color stops.
Please refer to ColorAxis.setColorScale on how to interpret this array.

### 28.13.7 setAxisBorder(edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setAxisBorder method, but uses color instead of integer data type for passing color values.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| edgeColor | (Mandatory) | The edge color of the axis stem. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify glassEffect, softLighting, :cylinderEffect or flatBorder effects. |

See also:

- 28.13.8 setAxisBorder(edgeColor as Integer, raisedEffect as Integer = 0) 4925

### 28.13.8 setAxisBorder(edgeColor as Integer, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color and 3D border effect of the axis stem.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| edgeColor | (Mandatory) | The edge color of the axis stem. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify glassEffect, softLighting, :cylinderEffect or flatBorder effects. |

See also:

- 28.13.7 setAxisBorder(edgeColor as color, raisedEffect as Integer = 0) 4925

### 28.13.9 setAxisPos(x as Integer, y as Integer, alignment as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and alignment of the color axis.

### 28.13.10 setBoundingBox(fillColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBoundingBox method, but uses color instead of integer data type for passing color values.
See also:

- 28.13.11 setBoundingBox(fillColor as Integer, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 4926

### 28.13.11 setBoundingBox(fillColor as Integer, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the background color, border color and 3D border effect of the bounding box.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| fillColor | (Mandatory) | The background color of the bounding box. |
| edgeColor | kTransparent | The border color of the bounding box. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support CDBaseChartMBS.glassEffect, CDBaseChartMBS.softLighting and CDBaseChartMBS.cylinderEffect effects. |

See also:

- 28.13.10 setBoundingBox(fillColor as color, edgeColor as color, raisedEffect as Integer = 0) 4926

### 28.13.12 setBoxMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins of the bounding box in pixels.
**Notes:** The margins of a bounding box refer to the distances between the borders of the bounding box to the color axis inside.

Arguments:

| Argument | Default | Description |
|---|---|---|
| leftMargin | (Mandatory) | The left margin in pixels. |
| rightMargin | (Mandatory) | The right margin in pixels. |
| topMargin | (Mandatory) | The top margin in pixels. |
| bottomMargin | (Mandatory) | The bottom margin in pixels. |

See also:

- 28.13.13 setBoxMargin(m as Integer) 4927

### 28.13.13 setBoxMargin(m as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets all margins (left, right, top, and bottom) of the bounding box to the same value.
**Notes:** The margins of a bounding box refer to the distances between the borders of the bounding box to the color axis inside.

Arguments:

| Argument | Default | Description |
|---|---|---|
| m | (Mandatory) | The left, right, top and bottom margins in pixels. |

See also:

- 28.13.12 setBoxMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer) 4926

### 28.13.14 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as color, overflowColor as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the continuous color gradient or discrete color steps for the color axis.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| isContinuous | true | True ti set to continuous color gradient. False to set to discrete color steps. |
| colors | [ Empty_Array ] | An array of colors used to define the continuous color gradient. If an empty array is used, the colors are automatically determined. |

ChartDirector will interpolate between the colors to create the continuous gradient. If discrete color steps are used, ChartDirector will take samples along the continuous color gradient. The number of samples is determined by the number of ticks on the axis, and may not equal the number of colors in the colors array.

| | | |
|---|---|---|
| overflowColor | -1 | The color to use if a value exceeds the maximum value of the axis scale. -1 means the overflowColor is the same color at the maximum value. |
| underflowColor | -1 | The color to use if a value falls below the minimum value of the axis scale. -1 means the underflowColor is the same color at the minimum value. |

See also:


- 28.13.15 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as Integer, overflowColor as Integer = -1) 4928
- 28.13.16 setColorGradient(isContinuous as boolean, Colors() as Integer, underflowColor as Integer = -1, overflowColor as Integer = -1) 4929
- 28.13.17 setColorGradient(isContinuous as boolean=true) 4930


### 28.13.15 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as Integer, overflowColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the continuous color gradient or discrete color steps for the color axis.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| isContinuous | true | True ti set to continuous color gradient. False to set to discrete color steps. |
| colors | [ Empty_Array ] | An array of colors used to define the continuous color gradient. If an empty array is used, the colors are automatically determined. |

ChartDirector will interpolate between the colors to create the continuous gradient. If discrete color steps are used, ChartDirector will take samples along the continuous color gradient. The number of samples is determined by the number of ticks on the axis, and may not equal the number of colors in the colors array.

See also:

| | | |
|---|---|---|
| overflowColor | -1 | The color to use if a value exceeds the maximum value of the axis scale. -1 means the overflowColor is the same color at the maximum value. |
| underflowColor | -1 | The color to use if a value falls below the minimum value of the axis scale. -1 means the underflowColor is the same color at the minimum value. |


- 28.13.14 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as color, overflowColor as color) 4927
- 28.13.16 setColorGradient(isContinuous as boolean, Colors() as Integer, underflowColor as Integer = -1, overflowColor as Integer = -1) 4929
- 28.13.17 setColorGradient(isContinuous as boolean=true) 4930


### 28.13.16 setColorGradient(isContinuous as boolean, Colors() as Integer, underflowColor as Integer = -1, overflowColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the continuous color gradient or discrete color steps for the color axis.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| isContinuous | true | True ti set to continuous color gradient. False to set to discrete color steps. |
| colors | [ Empty_Array ] | An array of colors used to define the continuous color gradient. If an empty array is used, the colors are automatically determined. |

ChartDirector will interpolate between the colors to create the continuous gradient. If discrete color steps are used, ChartDirector will take samples along the continuous color gradient. The number of samples is determined by the number of ticks on the axis, and may not equal the number of colors in the colors array.

| | | |
|---|---|---|
| overflowColor | -1 | The color to use if a value exceeds the maximum value of the axis scale. -1 means the overflowColor is the same color at the maximum value. |
| underflowColor | -1 | The color to use if a value falls below the minimum value of the axis scale. -1 means the underflowColor is the same color at the minimum value. |

See also:


- 28.13.14 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as color, overflowColor as color) 4927
- 28.13.15 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as Integer, overflowColor as Integer = -1) 4928
- 28.13.17 setColorGradient(isContinuous as boolean=true) 4930

### 28.13.17 setColorGradient(isContinuous as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the continuous color gradient or discrete color steps for the color axis.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| isContinuous | true | True ti set to continuous color gradient. False to set to discrete color steps. |
| colors | [ Empty_Array ] | An array of colors used to define the continuous color gradient. If an empty array is used, the colors are automatically determined. |

ChartDirector will interpolate between the colors to create the continuous gradient. If discrete color steps are used, ChartDirector will take samples along the continuous color gradient. The number of samples is determined by the number of ticks on the axis, and may not equal the number of colors in the colors array.

| | | |
|---|---|---|
| overflowColor | -1 | The color to use if a value exceeds the maximum value of the axis scale. -1 means the overflowColor is the same color at the maximum value. |
| underflowColor | -1 | The color to use if a value falls below the minimum value of the axis scale. -1 means the underflowColor is the same color at the minimum value. |

See also:

- 28.13.14 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as color, overflowColor as color) 4927
- 28.13.15 setColorGradient(isContinuous as boolean, Colors() as color, underflowColor as Integer, overflowColor as Integer = -1) 4928
- 28.13.16 setColorGradient(isContinuous as boolean, Colors() as Integer, underflowColor as Integer = -1, overflowColor as Integer = -1) 4929

### 28.13.18 setColorScale(colorStops() as Double, underflowColor as Integer = -1, overflowColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis scale and the associated colors.
**Notes:** The axis scale and the associated colors are defined with an array of numbers. For a color scale with continuous color gradient, each pair of numbers represents a value and its associated color. For example, for a continuous color scale in which 0 is blue (0000FF), 50 is yellow (FFFF00) and 100 is red (FF0000), the numbers should be:

0.0, &h0000ff, 50.0, &hffff00, 100.0, &hff0000

For a color scale with discrete color steps, the number of colors would be one less than the number of values. For example, to define a step color scale in which 0 to 50 is red (FF0000), and 50 to 100 is green (00FF00), the numbers will be:

0.0, &hff000, 50.0, &h00ff00, 100.0

| Argument | Default | Description |
|---|---|---|
| colorStops | (Mandatory) | An array of numbers alternating between values and colors. If the number count is even, the array will define a continuous color scale, otherwise it will define a step color scale. |
| underflowColor | -1 | The color to use if a value falls below the minimum value of the axis scale. -1 means the underflowColor is the same color at the minimum value. |
| overflowColor | -1 | The color to use if a value exceeds the maximum value of the axis scale. -1 means the overflowColor is the same color at the maximum value. |

### 28.13.19 setCompactAxis(b as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to compact the axis or not.
**Notes:** For a color axis, the axis can assume any length. Typically, an initial length is specified so that ChartDirector can determine how many labels can be fitted on the axis, and auto-scale the axis accordingly.

After the labels are determined, ChartDirector can compact the axis by setting its length to the minimum length compatible with the major tick density (see CDAxisMBS.setTickDensity).

For example, suppose ChartDirector auto-scaling has set the axis labels to be [ 0, 1, 2, 3, 4, 5 ] , and the major tick density is 20 pixels, ChartDirector will set the axis length to 100 pixels, irrespective of its original length.

If this method is never called, the default is not to compact the axis.

Arguments:

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means to compact the axis. A false value means not to compact the axis. |

### 28.13.20 setLevels(maxLevels as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the maximum number of contour intervals on the axis.
**Notes:** If discrete color steps are used, the number of contour intervals is the number of color steps on the axis.

For a general color axis, the number of contour intervals is equal to the number of ticks minus 1. For example, an axis with 6 ticks at [ 0, 2, 4, 6, 8, 10 ] has 6 contour lines and 5 contour intervals.

The main usage of this method is to limit the number of contour lines and/or color steps on the contour layer.

If this method is never called, the default maximum number of contour intervals is 16.

Arguments:

| Argument | Default | Description |
|---|---|---|
| maxLevels | (Mandatory) | An integer representing the maximum number of contour intervals. |

### 28.13.21 setRoundedCorners(r1 as Integer = 10, r2 as Integer = -1, r3 as Integer = -1, r4 as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border style of the bounding box to rounded corners.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| r1 | 10 | The radius of the top-left rounded corner in pixels. |
| r2 | -1 | The radius of the top-right rounded corner in pixels. -1 means it is the same as the radius of the top-left corner. |
| r3 | -1 | The radius of the bottom-right rounded corner in pixels. -1 means it is the same as the radius of the top-left corner. |
| r4 | -1 | The radius of the bottom-left rounded corner in pixels. -1 means it is the same as the radius of the top-left corner. |

## 28.14 class CDContourLayerMBS

### 28.14.1 class CDContourLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ContourLayer class represents contour layers
**Notes:** CDContourLayerMBS is a subclass of CDLayerMBS.

CDContourLayerMBS objects are created by using CDXYChartMBS.addContourLayer.

The data for the CDContourLayerMBS are the z values at some points in the xy plane. Both gridded and scattered data points are supported.

Using the data, the ContourLayer computes the z values of all pixels in the xy plane. The computation can be based on spline or bilinear/line surface fitting, configurable using CDContourLayerMBS.setSmoothInterpolation.

The ContourLayer then colors the pixels based on the z values, and draws contour lines to join positions with the same z values. The color mapping and contour levels are controlled by the ColorAxis object of the ContourLayer, obtainable using CDContourLayerMBS.colorAxis.

If you need to change colors for the contour layer, please use ColorAxis.setColorGradient:

Call myContourLayer.colorAxis().setColorGradient(True, anArrayOfColors)

ChartDirector will then use the array of colors, and interpolate among them, to fill the contour layer. For example, if the array of colors contain 3 colors red, green and blue, ChartDirector will interpolate from red to green for half of the z-levels, and green to blue for the other half.
Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 7.4, page 33: Easy Charts and Graphs, Using the ChartDirector Plugin

### 28.14.2 Methods

### 28.14.3 addCustomContour(z as double, contourColor as Integer, contourWidth as Integer, contourLabel as string, font as string = "normal", fontsize as double = 12, fontColor as integer = &hffff0002) as CDMarkMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom contour to the layer.
**Notes:** You can also add a custom contour by using Axis.addMark on the ColorAxis, in which case a label will also be added to the color axis. The addCustomContour method adds the label to the contour without affecting the color axis.

| Argument | Default | Description |
|---|---|---|
| z | (Mandatory) | The z value of the contour. |
| contourColor | (Mandatory) | The contour line color. |
| contourWidth | (Mandatory) | The contour line width in pixels. |
| contourLabel | (Mandatory) | The text of the contour label. |
| font | "normal" | The font used to draw the label. |
| fontSize | 8 | The font size used to draw the label. |
| fontColor | TextColor | The color used to draw the labels. |

### 28.14.4 colorAxis as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the ColorAxis object representing the color axis (color legend).

### 28.14.5 getCrossSection(x0 as Integer, y0 as Integer, x1 as Integer, y1 as Integer) as Double()

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the cross section between two points on a contour layer.
**Notes:** Note: This method should be used only after ChartDirector has output the chart image, or after BaseChart.layout has been called.

This method will return an array of numbers representing the z values of evenly spaced samples along a straight line joining the two end-points. The end-points are specified in pixel coordinates. If the input are data values, they can be converted to pixel coordinates using XYChart.getXCoor and XYChart.getYCoor.

Return Value

| Argument | Default | Description |
|---|---|---|
| x0 | (Mandatory) | The x pixel coordinate of the first end-point. |
| y0 | (Mandatory) | The y pixel coordinate of the first end-point. |
| x1 | (Mandatory) | The x pixel coordinate of the second end-point. |
| y1 | (Mandatory) | The y pixel coordinate of the second end-point. |

An array of numbers epresenting the z values of evenly spaced samples along a straight line joining the two end-points. The array can contain NoValue if.

### 28.14.6 getZAtPixel(x as Integer, y as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the z value at the specify (x, y) pixel coordinate.
**Notes:** This method should be used only after ChartDirector has output the chart image, or after BaseChart.layout has been called.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate. |
| y | (Mandatory) | The y pixel coordinate. |

Return Value
The z value at the sepcified (x, y) pixel coordinate, or NoValue if the point lie outside the contour region.

### 28.14.7 getZAtValue(x as double, y as double) as Double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the z value at the specify (x, y) data values.
**Notes:** This method should be used only after ChartDirector has output the chart image, or after BaseChart.layout has been called.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x data value. |
| y | (Mandatory) | The y data value. |

Return Value
The z value at the sepcified (x, y) data coordinate, or NoValue if the point lie outside the contour region.

### 28.14.8 setColorAxis(x as Integer, y as Integer, alignment as Integer, length as Integer, orientation as Integer) as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position, length and orientation of the color axis (color legend).
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x-coordinate of the reference point used to position the color axis. |
| y | (Mandatory) | The y-coordinate of the reference point used to position the color axis. |
| alignment | (Mandatory) | The alignment of the color axis with respect to the reference point. For example, a value of kTopLeft means the reference point is the top- left corner of the color axis. See Alignment Specification for supported alignment types. |
| length | (Mandatory) | The length of the color axis in pixels. |
| orientation | (Mandatory) | The orientation of the color axis. A value of kTop/kBottom means the axis is horizontal, and the axis labels are at top/bottom side of the axis. A value of kLeft/kRight means the axis is vertical, and the axis labels are at the left/right side of the axis. |

### 28.14.9 setContourColor(contourColor as color, minorContourColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setContourColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.14.10 setContourColor(contourColor as Integer, minorContourColor as Integer = -1) 4936

### 28.14.10 setContourColor(contourColor as Integer, minorContourColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets contour line colors.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| contourColor | (Mandatory) | The major contour line color. If this method is never called, the default contour line color is semi-transparent black (&h80000000). |
| minorContourColor | -1 | The minor contour line color. -1 means the minor contour line color is the same as the major contour line color. |

See also:

• 28.14.9 setContourColor(contourColor as color, minorContourColor as color) 4936

### 28.14.11 setContourLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data label format.
**Notes:** By default, the data label format is " { label } ". Please refer to Parameter Substitution and Formatting on available parameters and how to format them.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.14.12 setContourLabelSpacing(labelSpacing as Integer, minContourLen as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the spacing between contour labels.
**Notes:** ChartDirector will try to place labels at relative straight segments along the contour while ensuring the labels are not too close together. The default target label spacing is 300 pixels.

If the contour is short relative to the label length, all or a large part of the contour may become the label, and the contour line may become hard to see. By default, ChartDirector will not put a label on a contour if the contour length is less than 3 times that of the label length. This allows the contour on either side of the label to be as least as long as the label.

This method can be used to adjust what is the target label spacing and contour length for positioning labels.

| Argument | Default | Description |
|---|---|---|
| labelSpacing | (Mandatory) | The target label spacing in pixels. The actual spacing may be different as the labels can only be placed on relatively straight segments along the contour. |
| minContourLen | (Mandatory) | The minimum contour length in pixels below which there will be no contour label. |

### 28.14.13 setContourLabelStyle(font as string = "normal", fontsize as double = 12, fontColor as integer = &hffff0002) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables contour labels and sets their styles.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| font | "normal" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |

Returns a TextBox object representing the prototype of the contour labels. This may be used to fine-tune the appearance of the contour labels.

### 28.14.14 setContourWidth(contourWidth as Integer, minorContourWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets contour line widths.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| contourWidth | (Mandatory) | The major contour line width in pixels. If this method is never called, the default contour line width is 1 pixel. |
| minorContourWidth | -1 | The minor contour line width. -1 means the minor contour line width is the same as the major contour line width. |

### 28.14.15 setExactContour(contour as boolean = true)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to use exact contours or boundary contours.
**Notes:** In exact contour mode, the contour at z = N refers to all points at z = N. For example, the contour at z = 10 refers to all points at z = 10. These points normally constitute lines. However, in case there is an exactly flat region at z = 10, the entire region will be the contour and will be colored using the contour color. In other words, instead of lines, a contour can become a region.

In boundary contour mode, the contour at z = N refers to the boundary between z <N and z >= N, except for the highest contour in which case the contour is the boundary between z <= N and z >N. With this method, if there is a flat region, the contour will occur at the boundary of the region.

If this method is never called, the default is to use boundary contour mode.

| Argument | Default | Description |
|---|---|---|
| contour | true | A true value specifies exact contour mode for standard contours, otherwise boundary contour mode will be used. |
| markContour | [ Same_As_Contour ] | A true value specifies exact contour mode for mark contours. A false value specifies boundary contour mode for mark contours. A mark contour is an extra contour added using Axis.addMark on the color axis (obtained using ContourLayer.colorAxis). If this parameter is not specified, the default is to use the same contour mode as standard contours. |

See also:

- 28.14.16 setExactContour(contour as boolean, markContour as boolean) 4939

### 28.14.16 setExactContour(contour as boolean, markContour as boolean)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to use exact contours or boundary contours.
**Notes:** In exact contour mode, the contour at z = N refers to all points at z = N. For example, the contour at z = 10 refers to all points at z = 10. These points normally constitute lines. However, in case there is an exactly flat region at z = 10, the entire region will be the contour and will be colored using the contour color. In other words, instead of lines, a contour can become a region.

In boundary contour mode, the contour at z = N refers to the boundary between z <N and z >= N, except for the highest contour in which case the contour is the boundary between z <= N and z >N. With this method, if there is a flat region, the contour will occur at the boundary of the region.

If this method is never called, the default is to use boundary contour mode.

| Argument | Default | Description |
|---|---|---|
| contour | true | A true value specifies exact contour mode for standard contours, otherwise boundary contour mode will be used. |
| markContour | [ Same_As_Contour ] | A true value specifies exact contour mode for mark contours. A false value specifies boundary contour mode for mark contours. A mark contour is an extra contour added using Axis.addMark on the color axis (obtained using ContourLayer.colorAxis). If this parameter is not specified, the default is to use the same contour mode as standard contours. |

See also:

- 28.14.15 setExactContour(contour as boolean = true) 4938

### 28.14.17 setSmoothInterpolation(b as boolean)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to use spline or bilinear/linear surface interpolation.
**Notes:** The data points for the contour layer are samples of the z values at certain gridded or scattered (x, y) points. However, to draw the contour and to color the layer, it is necessarily to know the z values at all pixels in the xy plane. ChartDirector uses surface interpolation to compute the z values at all pixels from the given data points.

In spline surface interpolation, ChartDirector will compute a smooth surface that passes through all data points. In bilinear/linear surface interpolation, ChartDirector will use the data points to partition the (x, y) plane into rectangular or triangular regions, and will fit bilinear or linear surfaces to the regions.

Spline surface interpolation generally produces smoother contours and is the default.

Arguments:

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value means to use spline surface interpolation. A false value means to use bilinear/linear surface interpolation. |

### 28.14.18 setZBounds(minZ as Double, maxZ as Double)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clips the z values to the given bounds.
**Notes:** In spline surface interpolation (see ContourLayer.setSmoothInterpolation), it is possible that the interpolated surface contains regions that are higher than the highest data point, or lower than the lowest data point.

As an example, consider a linear sequence of points with z values [ 10, 20, 30, 40, 40, 30, 20, 10 ] . The first 4 points represent an upward slope, while the last 4 points represent a download slope. If these points are to be joined with a smooth spline, the peak will naturally fall somewhere between the middle two points and exceed 40. So there will be a region in the spline higher than the highest data point.

In some applications, it may be desirable to limit the z values to certain bounds. For example, if the data are about rainfall, it is not desirable if the interpolated surface falls below 0, as there cannot be negative rainfall. The setZBounds method can be used to clip the interpolated surface to the desired bounds.

| Argument | Default | Description |
|---|---|---|
| minZ | DataBound | The minimum z value to clip to. Use NoValue if there is no minimum z bound. The special constant DataBound means that the minimum z value is the minimum data value. |
| maxZ | DataBound | The maximum z value to clip to. Use NoValue if there is no maximum z bound. The special constant DataBound means that the maximum z value is the maximum data value. |

### 28.14.19 setZData(zData() as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the z data used for the contour chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| zData | (Mandatory) | An array of numbers as the z data for the contour chart. |

### 28.14.20 Screenshots

### 28.14.21 contour.jpg

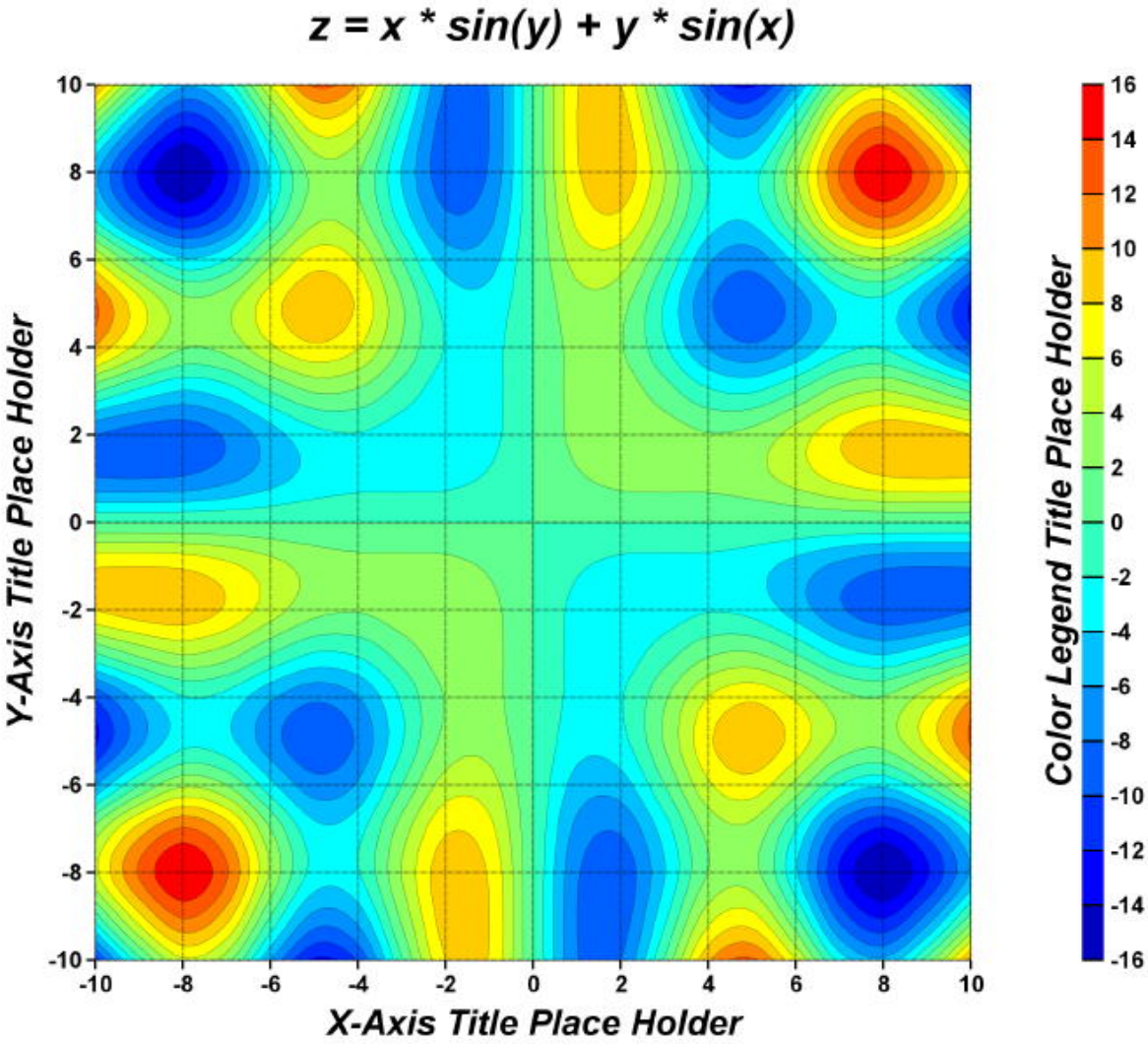


**Function:** A XY chart showing a contour layer created using ChartDirector with the CDXYChartMBS class.

## 28.15 class CDDataAcceleratorMBS

### 28.15.1 class CDDataAcceleratorMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The DataAccelerator class is for speeding up processing of huge data series.
**Notes:** With the DataAccelerator, it is possible to plot a chart with 1 billion data points with programmable track cursor support. The chart can smoothly zoom out to display all data points and zoom in 100,000,000X to see individual data points. At the same time, the chart can update in real time with thousands of data points per second.

Even if DataAccelerator is not used, ChartDirector can often achieve adequate performance for up to a few million data points depending on chart complexity. That means you do not need to use DataAccelerator if you have less than 100000 data points.

Each DataAccelerator can support one x data series shared by multiple y data series. Multi-threading can be used to process the series in parallel. You can use multiple DataAccelerator objects if you have multiple x data series.

The DataAccelerator needs around 12 bytes of RAM per data value. Since the application must store the data in RAM before passing it to DataAccelerator, it needs at least 8 bytes per double precision number. That means the application would consume around 20 bytes per value, or 20G of RAM for 1 billion values.

In the current version of ChartDirector, only XY chart line layers can support DataAccelerator with the CDXYChartMBS.addLineLayer3 method. Area charts can be created from line layers with CDXY-ChartMBS.addInterLineLayer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr5
- ChartDirector 7 update

### 28.15.2 Methods

### 28.15.3 addDataSeries(id as string, yData as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a data series.
**Notes:** The yData is an array for storing the y data values, and yDataLen is the number of valid values in the array.

To conserve memory, DataAccelerator will only keep a reference to the array and not copy it. The caller must ensure the array remains valid for as long as the DataAccelerator is in use.

For real time chart usage, the array acts as a buffer to store real time data. Initially the number of valid values can be 0. As new data come in, the values can be stored in the array and CDDataAcceleratorMBS.extendLength can be called to update the number of valid values.

This method is specially designed to allow multiple data series to be updated concurrently with multiple threads.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | Name of the data series. Each data series in a CDDataAcceleratorMBS object must have a unique name. |
| yData | (Mandatory) | The array to store the data values. |

See also:

- 28.15.4 addDataSeries(id as string, yData() as double) 4944

### 28.15.4 addDataSeries(id as string, yData() as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a data series.
**Notes:** The yData is an array for storing the y data values, and yDataLen is the number of valid values in the array.

To conserve memory, DataAccelerator will only keep a reference to the array and not copy it. The caller must ensure the array remains valid for as long as the DataAccelerator is in use.

For real time chart usage, the array acts as a buffer to store real time data. Initially the number of valid values can be 0. As new data come in, the values can be stored in the array and CDDataAcceleratorMBS.extendLength can be called to update the number of valid values.

This method is specially designed to allow multiple data series to be updated concurrently with multiple threads.

See also:

- 28.15.3 addDataSeries(id as string, yData as CDArrayMBS) 4943

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | Name of the data series. Each data series in a CDDataAcceleratorMBS object must have a unique name. |
| yData | (Mandatory) | The array to store the data values. |

### 28.15.5 Constructor

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DataAccelerator object.
**Notes:** The xData is an array for storing the x data values, and xDataLen is number of valid values in the array.

To conserve memory, DataAccelerator will only keep a reference to the array and not copy it. The caller must ensure the array remains valid for as long as the DataAccelerator is in use.

For real time chart usage, the array acts as a buffer to store real time data. Initially the number of valid values can be 0. As new data come in, the values can be stored in the array and DataAccelerator.extendLength can be called to update the number of valid values.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | The array to store the x values. |
| xDataLen | (Mandatory) | The number of valid values. |

See also:


- 28.15.6 Constructor(xData as CDArrayMBS) 4945
- 28.15.7 Constructor(xData() as double) 4946


### 28.15.6 Constructor(xData as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DataAccelerator object.
**Notes:** The xData is an array for storing the x data values, and xDataLen is number of valid values in the array.

To conserve memory, DataAccelerator will only keep a reference to the array and not copy it. The caller must ensure the array remains valid for as long as the DataAccelerator is in use.

For real time chart usage, the array acts as a buffer to store real time data. Initially the number of valid values can be 0. As new data come in, the values can be stored in the array and DataAccelerator.extendLength can be called to update the number of valid values.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | The array to store the x values. |
| xDataLen | (Mandatory) | The number of valid values. |

See also:


- 28.15.5 Constructor 4945
- 28.15.7 Constructor(xData() as double) 4946


### 28.15.7 Constructor(xData() as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DataAccelerator object.
**Notes:** The xData is an array for storing the x data values, and xDataLen is number of valid values in the array.

To conserve memory, DataAccelerator will only keep a reference to the array and not copy it. The caller must ensure the array remains valid for as long as the DataAccelerator is in use.

For real time chart usage, the array acts as a buffer to store real time data. Initially the number of valid values can be 0. As new data come in, the values can be stored in the array and DataAccelerator.extendLength can be called to update the number of valid values.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | The array to store the x values. |
| xDataLen | (Mandatory) | The number of valid values. |

See also:


- 28.15.5 Constructor 4945
- 28.15.6 Constructor(xData as CDArrayMBS) 4945


### 28.15.8 extendLength(len as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Extends the number of valid values in the arrays.
**Notes:** This method is usually used by real time charts. After storing the real time data into the data arrays, the extendLength method should be used to notify the DataAccelerator of the new data. You must ensure all data arrays in the DataAccelerator are updated to contain valid data before calling this method.

You can only increase the number of valid values, but not decrease it.

| Argument | Default | Description |
|---|---|---|
| length | (Mandatory) | The number of valid values in the arrays. |

### 28.15.9 setSubsetRange(xStart as double, xEnd as double, resolution as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the data range used for chart plotting.
**Notes:** For zoomable and scrollable chart, depending on the zoom level, only part of the data may be visible. The setSubsetRange method should be used to set the visible x range so that the DataAccelerator can supply the chart with the necessary data only.

The resolution argument is a hint of the number of pixels available in the x direction for plotting the data. This argument avoids the DataAccelerator from providing too much data to the chart. For example, if only 600 pixels are available in the x direction, it is not necessary to provide 10 million points to the chart, as they will overlap and block each others and the vast majority would not be visible. The DataAccelerator employs a special algorithm that can reduce the data to match the resolution without noticeably affecting the shape of the plotted chart.

| Argument | Default | Description |
|---|---|---|
| xStart | (Mandatory) | The x value at the start of the visible range. |
| xEnd | (Mandatory) | The x value at the end of the visible range. |
| resolution | 0 | The approximate number of pixels available in the x direction for plotting the chart. In the most common case that the x-axis is horizontal, this is the plot area width. If this argument is not provided, ChartDirector will automatically choose the resolution to use. |

## 28.16 class CDDataSetMBS

### 28.16.1 class CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The DataSet class represents data sets.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr7
- MBS Real Studio Plugins, version 12.4pr3
- MBS Real Studio Plugins, version 12.3pr9

**Xojo Developer Magazine**

- 18.5, page 77: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.16.2 Methods

### 28.16.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.16.4 getDataColor as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the main color used to draw the data set.
**Notes:** Returns the main color used to draw the data set.

### 28.16.5 getDataName as string

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the name of the data set.
**Notes:** Return the name of the data set.

### 28.16.6 getLegendIcon as string

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the CDML representation of the legend icon for the data set.
**Notes:** The CDML representation can be used in any ChartDirector API that supports CDML. Note that the CDML representation is only valid in the BaseChart object that contains the data set. It is not allowed to use the CDML representation obtained from one chart in a different chart.

The legend icon is the same icon that would appear in the LegendBox. If you modify the icon using methods of the LegendBox object (such as using LegendBox.setKeyBorder to set the legend icon border), the modification will also apply to the icon returned by this method.

Returns the CDML representation of the legend icon for the data set.

### 28.16.7 getPosition(i as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the positional value of a data point.
**Notes:** The positional value is the value used to position the data point. Usually, the positional value is equal to the data value. However, for chart types in which the data sets are combined using the Stack or Percentage method, the positional value can be different from the data value. For example, for stacked charts, the positional value of a data point is equal to the accumulative value of the corresponding data points from data sets added before the target data set.

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The data point index of the data point. The first data point is 0; the nth data point is (n - 1). |

Returns the positional value of the data point.

### 28.16.8 getUseYAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y-axis to use when drawing the data set.
**Notes:** Returns an Axis object representing the y-axis to use when drawing the data set.

### 28.16.9 getValue(i as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the value of a data point.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The data point index of the data point. The first data point is 0; the nth data point is (n - 1). |

Returns the value of the data point.

### 28.16.10 setData(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data for this dataset.

### 28.16.11 setDataColor(dataColor as color, edgeColor as color, shadowColor as color, shadowEdgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.16.12 setDataColor(dataColor as Integer, edgeColor as Integer = -1, shadowColor as Integer = -1, shadowEdgeColor as Integer = -1) 4950

### 28.16.12 setDataColor(dataColor as Integer, edgeColor as Integer = -1, shadowColor as Integer = -1, shadowEdgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors used to draw the data set.
**Notes:** The usage of the colors depend on the layer type. For example, in a bar layer, the dataColor and edgeColor are used as the fill and border color of the bar. In a line layer, the dataColor is used as the color of the line, while the edgeColor is used as the border of the line for 3D lines, and is ignored for 2D lines..

See also:

| Argument | Default | Description |
|---|---|---|
| dataColor | (Mandatory) | The main color used to draw the data set. |
| edgeColor | -1 | The color used to draw the edges or borders of the data set, if any. -1 means that the edges are drawn using the default border color of the layer (defined using Layer.setBorderColor). |
| shadowColor | -1 | The color to use to draw 3D shadows of the data set, if any. -1 means the shadow color will be a "darker" version of the dataColor, created by reducing the RGB intensities of the dataColor in half. |
| shadowEdgeColor | -1 | The color to use to draw edges of the 3D shadows of the data set, if any. -1 means the shadow color will be a "darker" version of the edgeColor, created by by reducing the RGB intensities of the edgeColor in half. |


- 28.16.11 setDataColor(dataColor as color, edgeColor as color, shadowColor as color, shadowEdgeColor as color) 4950


### 28.16.13 setDataLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data label format for the data set.
**Notes:** To set the label format for all data sets in a layer, use Layer.setDataLabelFormat.

For details description of data label format, please refer to Layer.setDataLabelFormat.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.16.14 setDataLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = 0, fontangle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables data labels and sets their styles.
**Notes:** To set the data label styles for all data sets in a layer, use Layer.setDataLabelStyle.

For details description of data labels, please refer to :Layer.setDataLabelStyle.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.
See also:

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |


- 28.16.15 setDataLabelStyle(font as string, fontsize as Double, fontcolor as color, fontangle as Double = 0) as CDTextBoxMBS 4952


### 28.16.15 setDataLabelStyle(font as string, fontsize as Double, fontcolor as color, fontangle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.16.14 setDataLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = 0, fontangle as Double = 0) as CDTextBoxMBS 4951

### 28.16.16 setDataName(name as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the name of the data set.
**Notes:** The name will be used in the legend box, if one is available for the chart.

| Argument | Default | Description |
|---|---|---|
| name | (Mandatory) | The name of the data set. |

### 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a DrawArea object as the graphics symbol to plot the data points.
**Notes:** In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

See also:

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A DrawArea object to be used as the symbol. |


- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957


### 28.16.18 setDataSymbol(file as folderitem)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image from a file and use it as the graphics symbol to plot the data points.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

| Argument | Default | Description |
|---|---|---|
| image | (Mandatory) | The filename of the image file. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp. |

See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.20 setDataSymbol(pic as Picture) 4955

- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957


### 28.16.19 setDataSymbol(ImageFilePath as string)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image from a file and use it as the graphics symbol to plot the data points.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

| Argument | Default | Description |
|---|---|---|
| image | (Mandatory) | The filename of the image file. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp. |

See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957

### 28.16.20 setDataSymbol(pic as Picture)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a picture object as the graphics symbol to plot the data points.
**Notes:** In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A picture object to be used as the symbol. |

See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957


### 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:** In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means the color of the data set will be used. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means the edge color of the data set will be used. |


- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957


### 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataSymbol method, but uses color instead of integer data type for passing color values.
See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957

### 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses one of the built-in symbols as the graphics symbol to plot the data points.
**Notes:** In the current version of ChartDirector, data symbols are supported only in LineLayer, SplineLayer, StepLineLayer and ScatterLayer. To use data symbols in other layer types, add a ScatterLayer on top of that layer.

| Argument | Default | Description |
|---|---|---|
| symbol | (Mandatory) | One of the predefined shape constants representing the symbol shape. See Shape Specification for the available built-in shapes. |
| size | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means the color of the data set will be used. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means the edge color of the data set will be used. |
| lineWidth | 1 | The line width used for drawing the symbols. |

See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952
- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 4957


### 28.16.24 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataSymbol method, but uses color instead of integer data type for passing color values.
See also:


- 28.16.17 setDataSymbol(drawobj as CDDrawAreaMBS) 4952

- 28.16.18 setDataSymbol(file as folderitem) 4953
- 28.16.19 setDataSymbol(ImageFilePath as string) 4954
- 28.16.20 setDataSymbol(pic as Picture) 4955
- 28.16.21 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgeColor as Integer = -1) 4955
- 28.16.22 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgeColor as color) 4956
- 28.16.23 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 4957


### 28.16.25 setLineWidth(w as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line width of lines when drawing the data set.
**Notes:** This method only applies to layers that employ lines to represent data (e.g. line layer).

If this method is not called, the default line width for the layer will be used (set using Layer.setLineWidth).

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The width of the line in pixels. |

### 28.16.26 setSymbolOffset(offsetX as Integer, offsetY as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offset the symbols in the x and y directions in pixel unit.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xOffset | (Mandatory) | The x offset in pixels. A positive value mean shifting to the right. |
| yOffset | (Mandatory) | The y offset in pixels. A positive value mean shifting to the bottom. |

### 28.16.27 setUseYAxis(axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine if the primary or secondary y-axis should be used when drawing the data set.
**Notes:** To set the y-axis to use for all data sets within a layer, use Layer.setUseYAxis2.

Note: DataSet.setUseYAxis is a more general method that can support more than 2 y-axes.

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means the secondary y-axis will be used. A false value means the primary y-axis will be used. |

See also:

- 28.16.28 setUseYAxis(b as boolean=true) 4959

### 28.16.28 setUseYAxis(b as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine the y-axis to use when drawing the data set.
**Notes:** To set the y-axis to use for all data sets within a layer, use Layer.setUseYAxis.

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The y-axis to use when drawing the data set. |

See also:

- 28.16.27 setUseYAxis(axis as CDAxisMBS) 4958

## 28.17 class CDDiscreteHeatMapLayerMBS

### 28.17.1 class CDDiscreteHeatMapLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The DiscreteHeatMapLayer class represents discrete heat map layers. DiscreteHeatMapLayer is a subclass of Layer.
**Notes:** DiscreteHeatMapLayer objects are created by using XYChart.addDiscreteHeatMapLayer.

A discrete heat map consists of rectangular cells on a rectangular grid. The data values of the cells determine their colors. The data value to color mapping is controlled by the ColorAxis object of the DiscreteHeatMapLayer, obtainable using DiscreteHeatMapLayer.colorAxis.
Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr5
- ChartDirector 7 update

**Xojo Developer Magazine**

- 20.1, page 44: Cool Charts and Heatmaps, Using Monkeybread Software's ChartDirector Plugin by Stefanie Juchmes

### 28.17.2 Methods

### 28.17.3 colorAxis as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the ColorAxis object representing the color axis (color legend).

### 28.17.4 setCellGap(gap as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the gap between cells.
**Notes:** By default, the cells will touch each others with no gap in between.

| Argument | Default | Description |
|---|---|---|
| gap | (Mandatory) | The gap between cells in pixels. |

### 28.17.5 setColorAxis(x as integer, y as integer, alignment as integer, length as integer, orientation as integer) as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the position, length and orientation of the color axis (color legend).
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x-coordinate of the reference point used to position the color axis. |
| y | (Mandatory) | The y-coordinate of the reference point used to position the color axis. |
| alignment | (Mandatory) | The alignment of the color axis with respect to the reference point. For example, a value of TopLeft means the reference point is the top- left corner of the color axis. See Alignment Specification for supported alignment types. |
| length | (Mandatory) | The length of the color axis in pixels. |
| orientation | (Mandatory) | The orientation of the color axis. A value of Top/Bottom means the axis is horizontal, and the axis labels are at top/bottom side of the axis. A value of Left/Right means the axis is vertical, and the axis labels are at the left/right side of the axis. |

### 28.17.6 setDirectColoring(b as boolean = true)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets whether the data values are the colors themselves or if a CDColorAxisMBS will be used to map the data values to colors.
**Notes:** By default, a ColorAxis will be used to map the data values to colors. The setDirectColoring method allows directly specifying the colors of the cells without going through the CDColorAxisMBS.

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means the data values of the cells are their colors. A false value means a CDColorAxisMBS will be used to map the data values to colors. |

## 28.18 class CDDrawAreaMBS

### 28.18.1 class CDDrawAreaMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The DrawArea class represents drawing surfaces, with methods for performing graphics primitives (such as drawing lines, shapes and texts) and the surfaces.
**Notes:** All ChartDirector chart objects contains an internal DrawArea object for drawing the charts. This DrawArea object is accessible via BaseChart.getDrawArea or BaseChart.makeChart. This allows developers to apply custom graphics operations on the charts.

ChartDirector also supports creating standalone DrawArea objects by calling the DrawArea.DrawArea constructor. One common application is to use ChartDirector as a general purpose graphics library (e.g. adding text annotations to existing images, creating GIF buttons on the fly, etc).
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 18.5pr7
- MBS Xojo Plugins, version 18.5pr6
- A chart similar to the one on Apple Watch
- MBS Real Studio Plugins, version 12.3pr9

**Xojo Developer Magazine**

- 21.6, page 90: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes
- 21.6, page 85: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes
- 18.5, page 74: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.18.2 Methods

### 28.18.3 adjustBrightness(c as Integer, brightness as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color that is a darkened or brightened version of the given color.
**Notes:** A brightness less than 1 means the color is darkened, while a brightness greater than 1 means the color is brightened. For example, a brightness of 0.5 means the color is half as bright as the original color. If the original color is red, the color will become dark red. Conversely, a brightness of 2 means the color is

twice as bright as the original color. If the original color is red, the color will become light red.

Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The given color. |
| brightness | (Mandatory) | A non-negative number represent the factor to darken or brighten the color. |

Return Value
A 32-bit integer representing the darkened or brightened color.

### 28.18.4 affineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other affineTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.5 affineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 4963

### 28.18.5 affineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform affine transformation on the drawing surface.
**Notes:** An affine transformation is an operation where every pixel is copied to another pixel according to the formula.

xDest = a * xSrc + b * ySrc + cyDest = d * xSrc + e * ySrc + f
where (xSrc, ySrc) is a source pixel, and (xDest, yDest) is where it should go to.

Many graphics operation, such as translation, rotation, and resizing, can be considered as a special case of affine transformation.

See also:

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The parameter 'a' in the coordinate transformation formula "xDest = a * xSrc + b * ySrc + c". |
| b | (Mandatory) | The parameter 'b' in the coordinate transformation formula "xDest = a * xSrc + b * ySrc + c". |
| c | (Mandatory) | The parameter 'c' in the coordinate transformation formula "xDest = a * xSrc + b * ySrc + c". |
| d | (Mandatory) | The parameter 'd' in the coordinate transformation formula "yDest = d * xSrc + e * ySrc + f". |
| e | (Mandatory) | The parameter 'e' in the coordinate transformation formula "yDest = d * xSrc + e * ySrc + f". |
| f | (Mandatory) | The parameter 'f' in the coordinate transformation formula "yDest = d * xSrc + e * ySrc + f". |
| bgColor | FFFFFF | The background color used to fill destination pixels that are not mapped to any source pixels. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

- 28.18.4 affineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 4963

### 28.18.6 angleGradientColor(cx as double, cy as double, a1 as double, a2 as double, r1 as double, r2 as double, c() as integer) as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an angle gradient color.
**Notes:** An angle gradient color is a color that depends on the compass bearing of the pixel relative to the center point. The north (upward) direction is zero degree, and the angle is the clockwise angle from the north direction.

ChartDirector supports "smooth angle gradient" and "step angle gradient". For a smooth angle gradient, the color changes smoothly from one color stop to the next color stop. For a step angle gradient, the color remains unchanged between the color stops, but change abruptly once it reaches the next color stop.

The color stops are defined as an array of offsets and colors. For a smooth angle gradient, the offsets and colors should be in the following format:

offset0, color0, offset1, color1, .... offsetN, colorN

The first offset (offset0) should be 0, which represents the start angle of the gradient, and color0 is the color at that offset. The last offset (offsetN) can be any number not greater than 100000. It represents the end angle of the gradient, and colorN represents the color at the that offset. The other offsets and colors

represent the angles and colors of the color stops in between.

For a step angle gradient, the offsets and colors should be in the following format:

offset0, color0, offset1, color1, ...., offsetP, colorP, offsetN

Note that for a step color gradient, there is one more offset than colors. If there are 10 color steps, it will have 10 colors and 11 offsets. The offsets represent angles and are interpreted the same as in smooth angle gradient. The colors are applied between the offsets. For example, color0 is the color between offset0 and offset1, and color1 is the color between offset1 and offset2.

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center point. |
| cy | (Mandatory) | The y coordinate of the center point. |
| a1 | (Mandatory) | The start angle of the gradient. |
| a2 | (Mandatory) | The end angle of the gradient. |
| r1 | (Mandatory) | The minimum radius for which the gradient is applicable. |
| r2 | (Mandatory) | The maximum radius for which the gradient is applicable. |
| colorArray | (Mandatory) | An array defining the offsets and colors of the color stops along the gradient. |

Returns a 32-bit integer representing the angle gradient color.

### 28.18.7 arc(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a circular or elliptical arc.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the circle or ellipse. |
| cy | (Mandatory) | The y coordinate of the center of the circle or ellipse. |
| rx | (Mandatory) | The horizontal radius of the circle or ellipse. |
| ry | (Mandatory) | The vertical radius of the circle or ellipse. |
| a1 | (Mandatory) | The start angle of the arc in degrees. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| a2 | (Mandatory) | The end angle of the arc in degrees. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| c | (Mandatory) | The color of the arc. |

### 28.18.8 circle(cx as Integer, cy as Integer, rx as Integer, ry as Integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other circle method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.9 circle(cx as Integer, cy as Integer, rx as Integer, ry as Integer, edgeColor as Integer, fillColor as Integer) 4966

### 28.18.9 circle(cx as Integer, cy as Integer, rx as Integer, ry as Integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a circle or an ellipse.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the circle or ellipse. |
| cy | (Mandatory) | The y coordinate of the center of the circle or ellipse. |
| rx | (Mandatory) | The horizontal radius of the circle or ellipse. |
| ry | (Mandatory) | The vertical radius of the circle or ellipse. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:

- 28.18.8 circle(cx as Integer, cy as Integer, rx as Integer, ry as Integer, edgeColor as color, fillColor as color) 4966

### 28.18.10 clone(d as CDDrawAreaMBS, x as Integer, y as Integer, align as Integer, newWidth as Integer = -1, newHeight as Integer = -1, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the current DrawArea object to another DrawArea object, with optional resizing.
**Notes:**

### 28.18.11 Constructor

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| d | (Mandatory) | The destination DrawArea object where the current DrawArea is copied to. |
| x | (Mandatory) | The x coordinate of a reference point in the destination DrawArea object. |
| y | (Mandatory) | The y coordinate of a reference point in the destination DrawArea object. |
| align | (Mandatory) | The alignment of the current DrawArea relative to the reference point. See Alignment Specification for supported alignment types. |
| newWidth | -1 | The new width to which the current DrawArea will be resized to before copying. The default value -1 means no resizing. |
| newHeight | -1 | The new height to which the current DrawArea will be resized to before copying. The default value -1 means no resizing. |
| filter | LinearFilter | The filter to use for re-sampling. (Only applies if there is resizing.) |
| blur | 1 | The blur factor to use for re-sampling. (Only applies if there is resizing.) |

**Function:** Creates a DrawArea object.

### 28.18.12 cylinder(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, depthX as Integer, depthY as Integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other cylinder method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.13 cylinder(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, depthX as Integer, depthY as Integer, edgeColor as Integer, fillColor as Integer) 4967

### 28.18.13 cylinder(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, depthX as Integer, depthY as Integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cylinder surface as the area spanned by moving an arc.
**Notes:**

See also:

- 28.18.12 cylinder(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, depthX as Integer, depthY as Integer, edgeColor as color, fillColor as color) 4967

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the circle or ellipse for the arc. |
| cy | (Mandatory) | The y coordinate of the center of the circle or ellipse for the arc. |
| rx | (Mandatory) | The horizontal radius of the circle or ellipse. |
| ry | (Mandatory) | The vertical radius of the circle or ellipse. |
| a1 | (Mandatory) | The start angle of the arc. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| a2 | (Mandatory) | The end angle of the arc. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| depthX | (Mandatory) | The x displacement representing the motion of the arc to span the cylinder. |
| depthY | (Mandatory) | The y displacement representing the motion of the arc to span the cylinder. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

### 28.18.14 dashLineColor(colorvalue as color, patternCode as Integer = &h0505) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other dashLineColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.15 dashLineColor(colorvalue as Integer, patternCode as Integer = &h0505) as Integer 4968

### 28.18.15 dashLineColor(colorvalue as Integer, patternCode as Integer = &h0505) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a dash line color.
**Notes:** A dash line color is a dynamic color that switches on and off periodically. When it is used to draw a line, the line will appear as a dash line.

The style of the dash line is defined by a pattern code, which is a 4-byte integer. A value of PPQQRRSS (in hex) means the first PP pixels are turned on, followed by QQ pixels turned off, followed by RR pixels turned on, followed by SS pixels turned off, and then restart from PP again.

ChartDirector comes from several predefined constants for common dash line patterns.

ConstantValue (in Hex)Dash Line Style

Return Value

| | |
|---|---|
| DashLine | 00000505 |
| DotLine | 00000202 |
| DotDashLine | 05050205 |
| AltDashLine | 0A050505 |

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color to draw the dash line. |
| patternCode | DashLine | A 4-byte integer representing the style of the dash line. |

A 32-bit integer representing the dash line color.
See also:

- 173.22.8 dashLineColor(colorvalue as color, patternCode as Integer = &h0505) as Integer 21596

### 28.18.16 enableVectorOutput

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Enables true vector graphics output.
**Notes:** By default, when creating the output image, ChartDirector draws directly onto an output buffer representing the bitmap of the image. For example, for a chart 800 x 600 pixels in size, the output buffer may represent a 800 x 600 bitmap. The output buffer size is unchanged no matter how many items are drawn onto it. Even if the output contains 1 million elements (eg. 1 million symbols), the size of the output buffer is still the same.

On the other hand, a true vector output is indefinitely scalable and can be considered as having infinite resolution. To produce a true vector output, it is necessary to remember the graphics operations for every element in the output buffer. The output buffer size is therefore proportional to the number of elements to draw.

This method tells ChartDirector that it needs to remember the graphics operations to prepare for true vector output. If true vector output is needed, this method should be called immediately after creating the DrawArea object.

If this method is not called, and a vector graphics output format is used (such as SVG), instead of a true vector output, ChartDirector will output a raster image using the vector graphics format. (Most vector graphics formats support embedded raster images.)

### 28.18.17 fill(x as Integer, y as Integer, colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other fill method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.18 fill(x as Integer, y as Integer, colorvalue as color, borderColor as color) 4970
- 28.18.19 fill(x as Integer, y as Integer, colorvalue as Integer) 4970
- 28.18.20 fill(x as Integer, y as Integer, colorvalue as Integer, borderColor as Integer) 4971


### 28.18.18 fill(x as Integer, y as Integer, colorvalue as color, borderColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other fill method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.17 fill(x as Integer, y as Integer, colorvalue as color) 4970
- 28.18.19 fill(x as Integer, y as Integer, colorvalue as Integer) 4970
- 28.18.20 fill(x as Integer, y as Integer, colorvalue as Integer, borderColor as Integer) 4971


### 28.18.19 fill(x as Integer, y as Integer, colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood fill a region using the specified color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate one pixel inside the region to be filled. |
| y | (Mandatory) | The y coordinate one pixel inside the region to be filled. |
| color | (Mandatory) | The color used to fill the region. |

See also:


- 28.18.17 fill(x as Integer, y as Integer, colorvalue as color) 4970
- 28.18.18 fill(x as Integer, y as Integer, colorvalue as color, borderColor as color) 4970
- 28.18.20 fill(x as Integer, y as Integer, colorvalue as Integer, borderColor as Integer) 4971

### 28.18.20 fill(x as Integer, y as Integer, colorvalue as Integer, borderColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill a region using the specified color, where the region is bounded by a given border color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate one pixel inside the region to be filled. |
| y | (Mandatory) | The y coordinate one pixel inside the region to be filled. |
| color | (Mandatory) | The color used to fill the region. |
| borderColor | (Mandatory) | The color of the border that bounds the region. |

See also:


- 28.18.17 fill(x as Integer, y as Integer, colorvalue as color) 4970
- 28.18.18 fill(x as Integer, y as Integer, colorvalue as color, borderColor as color) 4970
- 28.18.19 fill(x as Integer, y as Integer, colorvalue as Integer) 4970


### 28.18.21 getARGBColor(c as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain the ARGB color given a palette color.
**Notes:** If the given color is already in ARGB format, the same value is returned.

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color to be changed to ARGB format. |

Return Value
The ARGB color converted from the given color.

### 28.18.22 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the drawing surface.

### 28.18.23 getPixel(x as Integer, y as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the color of a pixel.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the pixel. |
| y | (Mandatory) | The y coordinate of the pixel. |

Return Value
The color of the pixel.

### 28.18.24 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the drawing surface.

### 28.18.25 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other gradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.26 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.27 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4973
- 28.18.28 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4974

### 28.18.26 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point linear gradient color.
**Notes:** This method is for backward compatibility. Use DrawArea.linearGradientColor2 instead.

| Argument | Default | Description |
|---|---|---|
| colorArray | (Mandatory) | An array defining the positions and colors of the pixels along the reference gradient line segment. |
| angle | 90 | The direction of the reference gradient line segment in degrees, measured clockwise, with 0 degree as the upward pointing direction. The default direction is horizontal from left to right (90 degrees). |
| scale | 1.0 | The scaling factor for the reference gradient line segment. By default, the reference gradient line segment is 256 pixels in length. The scaling factor can be use to stretch or compress the gradient line segment. |
| startX | 0 | The x coordinate of the starting point of the reference gradient line segment. |
| startY | 0 | The y coordinate of the starting point of the reference gradient line segment. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.18.25 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.27 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4973
- 28.18.28 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4974

### 28.18.27 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other gradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.25 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.26 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.28 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer 4974

### 28.18.28 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point linear gradient color.
**Notes:** This method is for backward compatibility. Use DrawArea.linearGradientColor instead.

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| startColor | (Mandatory) | The color at the starting point of the reference gradient line segment. |
| endColor | (Mandatory) | The color at the ending point of the reference gradient line segment. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.18.25 gradientColor(colors() as color, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.26 gradientColor(colors() as Integer, angle as Double = 90, scale as Double = 1.0, startX as Integer = 0, startY as Integer = 0) as Integer 4972
- 28.18.27 gradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color) as Integer 4973

### 28.18.29 halfColor(c as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color that is half the intensity of the given color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The given color. |

Return Value
A 32-bit integer representing the half intensity color.

### 28.18.30 hCylinderTransform(yDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other hCylinderTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.31 hCylinderTransform(yDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 4975

### 28.18.31 hCylinderTransform(yDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wraps the drawing surface onto a horizontal cylinder.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| yDiameter | (Mandatory) | The diameter of the cylinder in pixels. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.30 hCylinderTransform(yDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 4975

### 28.18.32 hFlip

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip the drawing surface along the central horizontal line.

### 28.18.33 hline(x1 as Integer, x2 as Integer, y as Integer, c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a horizontal line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first end-point of the line. |
| x2 | (Mandatory) | The x coordinate of the second end-point of the line. |
| y | (Mandatory) | The y coordinate of the line. |
| c | (Mandatory) | The color of the line. |

### 28.18.34 hTriangleTransform(tWidth as Integer = -1, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wraps the drawing surface onto a horizontal triangle pointing leftwards.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| tWidth | -1 | The width of the triangle in pixels. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.35 hTriangleTransform(tWidth as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 4976

### 28.18.35 hTriangleTransform(tWidth as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other hTriangleTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.34 hTriangleTransform(tWidth as Integer = -1, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 4976

### 28.18.36 initDynamicLayer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a dynamic layer for drawing text and shapes.
**Notes:** This method clears the existing dynamic layer, or creates a new one if there is no existing dynamic layer. This method returned a DrawArea object that can be used to draw on the dynamic layer. The

dynamic layer can later be removed using BaseChart.removeDynamicLayer.

The design of the dynamic layer is for drawing small, rapidly updatable contents for desktop applications. For example, the dynamic layer can be used to implement a cross-hair mouse cursor, with text showing the location of the mouse cursor. To do this, in the mouse move event handler, BaseChart.initDynamicLayer can be used to create or clear the dynamic layer. The returned DrawArea object can then be used to draw the cross hair cursor (as two straight lines) and the text. When the mouse cursor leaves the chart, BaseChart.removeDynamicLayer can be used in the mouse out event handler to remove the cross-hair cursor and the text.

Note that as long as the dynamic layer is not removed with BaseChart.removeDynamicLayer, only the returned DrawArea object should be used to draw things on the dynamic layer. No other objects should be used to draw on the chart.

Returns a DrawArea object that can be used to add text and shapes to the dynamic layer.

### 28.18.37 line(x1 as Double, y1 as Double, x2 as Double, y2 as Double, colorValue as color, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a straight line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first end-point of the line. |
| y1 | (Mandatory) | The y coordinate of the first end-point of the line. |
| x2 | (Mandatory) | The x coordinate of the second end-point of the line. |
| y2 | (Mandatory) | The y coordinate of the second end-point of the line. |
| c | (Mandatory) | The color of the line. |
| lineWidth | 1 | The line width (thickness). |

See also:

- 28.18.38 line(x1 as Double, y1 as Double, x2 as Double, y2 as Double, colorValue as Integer, lineWidth as Integer = 1) 4977

### 28.18.38 line(x1 as Double, y1 as Double, x2 as Double, y2 as Double, colorValue as Integer, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a straight line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first end-point of the line. |
| y1 | (Mandatory) | The y coordinate of the first end-point of the line. |
| x2 | (Mandatory) | The x coordinate of the second end-point of the line. |
| y2 | (Mandatory) | The y coordinate of the second end-point of the line. |
| c | (Mandatory) | The color of the line. |
| lineWidth | 1 | The line width (thickness). |

See also:

- 28.18.37 line(x1 as Double, y1 as Double, x2 as Double, y2 as Double, colorValue as color, lineWidth as Integer = 1) 4977

### 28.18.39 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other linearGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.40 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4978
- 28.18.41 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4980
- 28.18.42 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4980

### 28.18.40 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point linear gradient color.
**Notes:** In this method, the color points are defined as an array of positions and colors along a reference line segment, in the following format:

position0, color0, position1, color1, .... positionN, colorN
The positions are specified as a number from 0 - 256 (0 - 100 in hex), in which 0 represents the starting point

of the reference line segment, and 256 (100 in hex) represents the ending point of the reference line segment.

For example, the array (in hex):

000000, FF0000, 000080, FFFF00, 000100, 00FF00
means the starting point (000000) is red (FF0000), the mid-point (000080 in hex) is yellow (FFFF00), and the ending point (000100 in hex) is green (00FF00).

One common usage of multi-point gradient colors is to define colors that have metallic look and feel. ChartDirector comes from several predefined gradient color arrays as follows.

NameValue (in Hex)

| | |
|---|---|
| goldGradient | 000000, FFE743, 000060, FFFFE0, 0000B0, FFF0B0, 000100, FFE743 |
| silverGradient | 000000, C8C8C8, 000060, F8F8F8, 0000B0, E0E0E0, 000100, C8C8C8 |
| redMetalGradient | 000000, E09898, 000060, FFF0F0, 0000B0, F0D8D8, 000100, E09898 |
| greenMetalGradient | 000000, 98E098, 000060, F0FFF0, 0000B0, D8F0D8, 000100, 98E098 |
| blueMetalGradient | 000000, 9898E0, 000060, F0F0FF, 0000B0, D8D8F0, 000100, 9898E0 |

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| colorArray | (Mandatory) | An array defining the positions and colors of the pixels along the reference gradient line segment. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie beyond the end points of the gradient line segment will assume the colors of the end points. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.18.39 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4978
- 28.18.41 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4980
- 28.18.42 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4980

### 28.18.41 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other linearGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.39 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4978
- 28.18.40 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4978
- 28.18.42 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 4980

### 28.18.42 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point linear gradient color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| startX | (Mandatory) | The x coordinate of the starting point of the reference gradient line segment. |
| startY | (Mandatory) | The y coordinate of the starting point of the reference gradient line segment. |
| endX | (Mandatory) | The x coordinate of the ending point of the reference gradient line segment. |
| endY | (Mandatory) | The y coordinate of the ending point of the reference gradient line segment. |
| startColor | (Mandatory) | The color at the starting point of the reference gradient line segment. |
| endColor | (Mandatory) | The color at the ending point of the reference gradient line segment. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie beyond the end points of the gradient line segment will assume the colors of the end points. |

Return Value
A 32-bit integer representing the linear gradient color.
See also:

- 28.18.39 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as color, periodic as boolean=false) as Integer 4978
- 28.18.40 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, colors() as Integer, periodic as boolean=false) as Integer 4978

- 28.18.41 linearGradientColor(startX as Integer, startY as Integer, endX as Integer, endY as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4980


### 28.18.43 load(path as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image file into the current DrawArea.
**Notes:** This method will overwrite the current DrawArea. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the image to be loaded. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.44 loadData(data as MemoryBlock, ImgType as Integer = -1) as boolean

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads image from data in MemoryBlock.
**Notes:** Optionally provide image type.
Returns true on success or false on failure.
See also:


- 28.18.45 loadData(data as string, ImgType as Integer = -1) as boolean 4981


### 28.18.45 loadData(data as string, ImgType as Integer = -1) as boolean

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads image from data in String.
**Notes:** Optionally provide image type.
Returns true on success or false on failure.
See also:


- 28.18.44 loadData(data as MemoryBlock, ImgType as Integer = -1) as boolean 4981


### 28.18.46 loadGIF(path as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load a GIF image into the current DrawArea.
**Notes:** This method will overwrite the current DrawArea.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the image to be loaded. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.47 loadJPG(path as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load a JPG image into the current DrawArea.
**Notes:** This method will overwrite the current DrawArea.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the image to be loaded. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.48 loadPNG(path as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load a PNG image into the current DrawArea.
**Notes:** This method will overwrite the current DrawArea.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the image to be loaded. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.49 loadWMP(path as string) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load a WAP bitmap image into the current DrawArea.
**Notes:** This method will overwrite the current DrawArea.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the image to be loaded. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.50 merge(d as CDDrawAreaMBS, x as Integer, y as Integer, align as Integer, transparency as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy another DrawArea to the current DrawArea.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| d | (Mandatory) | A DrawArea object representing the source. |
| x | (Mandatory) | The x coordinate of a reference point in the current DrawArea. |
| y | (Mandatory) | The y coordinate of a reference point in the current DrawArea. |
| align | (Mandatory) | The alignment of the source DrawArea relative to the reference point. See Alignment Specification for supported alignment types. |
| transparency | (Mandatory) | Specify the transparency level when copying the other DrawArea to the current DrawArea. A value of 0 means non-transparent. A value of 255 means totally transparent. |

### 28.18.51 move(xOffset as Double, yOffset as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other move method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.52 move(xOffset as Double, yOffset as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 

### 28.18.52 move(xOffset as Double, yOffset as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the drawing surface.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xOffset | (Mandatory) | The pixel offset to move towards the left. |
| yOffset | (Mandatory) | The pixel offset to move towards the bottom. |
| bgColor | FFFFFF | The background color used to fill the space left after moving. |
| filter | LinearFilter | The filter to use for re-sampling. (Only applies for fractional pixel offsets.) |
| blur | 1 | The blur factor to use for re-sampling. (Only applies for fractional pixel offsets.) |

See also:

- 28.18.51 move(xOffset as Double, yOffset as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 4983

### 28.18.53 out(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to an image file.
**Notes:** The file format is determined based on file extension, which must be png, jpg/jpeg, gif, wbmp/wmp or bmp.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.

### 28.18.54 outBMP as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a BMP image to memory.
See also:

- 28.18.55 outBMP(file as folderitem) as boolean 4985

### 28.18.55 outBMP(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a BMP image file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

- 28.18.54 outBMP as string 4984

### 28.18.56 outGIF as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a GIF image to memory.
See also:

- 28.18.57 outGIF(file as folderitem) as boolean 4985

### 28.18.57 outGIF(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a GIF image file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

- 28.18.56 outGIF as string 4985

### 28.18.58 outJPG(file as folderitem, quality as Integer = 80) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a JPEG image file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |
| quality | 80 | The quality of the image. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

- 28.18.59 outJPG(quality as Integer = 80) as string 4986

### 28.18.59 outJPG(quality as Integer = 80) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a JPEG image to memory.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| quality | 80 | The quality of the image. |

Return Value
A binary string containing the JPEG image.
See also:

- 28.18.58 outJPG(file as folderitem, quality as Integer = 80) as boolean 4985

### 28.18.60 outPDF as string

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a PDF image to memory.
See also:

- 28.18.61 outPDF(file as folderitem) as boolean 4986

### 28.18.61 outPDF(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a PDF image file.
**Notes:** A return value being true indicates no error. A false value indicates the operation is unsuccessful.
See also:

• 28.18.60 outPDF as string 4986

### 28.18.62 outPicture as picture

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea into a picture.
**Notes:** Returns nil on any error.

### 28.18.63 outPNG as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a PNG image to memory.
See also:

• 129.41.10 outPNG(file as folderitem) as boolean 18138

### 28.18.64 outPNG(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a PNG image file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

• 28.18.63 outPNG as string 4987

### 28.18.65 outSVG(file as folderitem, options as string = "") as boolean

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a SVG or SVGZ image file.
**Notes:** To output true vector graphics in SVG or SVGZ format, please ensure DrawArea.enableVectorOutput is called immediately after creating the DrawArea object. Otherwise the output will be a bitmap image embedded in SVG or SVGZ.

Arguments:

| Argument | Default | Description |
|---|---|---|
| file | (Mandatory) | The file of the output image file. |
| options | "" | A text string specifying optional parameters for the SVG output. Currently, the only supported text string is "compress", which means to create a SVGZ (compressed SVG) instead of a regular SVG. |

See also:

- 28.18.66 outSVG(options as string = "") as string 4988

### 28.18.66 outSVG(options as string = "") as string

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a SVG or SVGZ image to memory.
**Notes:** To output true vector graphics in SVG or SVGZ format, please ensure DrawArea.enableVectorOutput is called immediately after creating the DrawArea object. Otherwise the output will be a bitmap image embedded in SVG or SVGZ.

Arguments:

| Argument | Default | Description |
|---|---|---|
| options | "" | A text string specifying optional parameters for the SVG output. Currently, the only supported text string is "compress", which means to create a SVGZ (compressed SVG) instead of a regular SVG. |

Return Value
A memory block containing the SVG or SVGZ image.
See also:

- 28.18.65 outSVG(file as folderitem, options as string = "") as boolean 4987

### 28.18.67 outWMP as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea as a WAP bitmap image to memory.
See also:

- 28.18.68 outWMP(file as folderitem) as boolean 4989

### 28.18.68 outWMP(file as folderitem) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the DrawArea to a WAP bitmap image file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the output image file. |

Return Value
A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

- 66.20.9 outWMP as string 11850

### 28.18.69 patternColor(colors() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other patternColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.70 patternColor(colors() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4989
- 28.18.71 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 4990

### 28.18.70 patternColor(colors() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a pattern color using an array of colors as the bitmap pattern.
**Notes:** A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Return Value
A 32-bit integer representing the pattern color.
See also:

- 28.18.69 patternColor(colors() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4989
- 28.18.71 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer 4990

| Argument | Default | Description |
|---|---|---|
| colorArray | (Mandatory) | An array of colors representing the colors of the bitmap pixels. The color of the pixel at (x, y) should correspond to index (x + y * width - 1) of the array. |
| height | (Mandatory) | The height of the bitmap in pixels. (The width is automatically computed as the size of the color array divided by the height.) |
| startX | 0 | The x coordinate of a reference point to align with the top-left corner the pattern. |
| startY | 0 | The y coordinate of a reference point to align with the top-left corner the pattern. |

### 28.18.71 patternColor(file as folderitem, startX as Integer = 0, startY as Integer = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a pattern color by loading the pattern from an image file.
**Notes:** A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to DrawArea.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | An image file providing the pattern. |
| startX | 0 | The x coordinate of a reference point to align with the top-left corner the pattern. |
| startY | 0 | The y coordinate of a reference point to align with the top-left corner the pattern. |

Return Value
A 32-bit integer representing the pattern color.
See also:

- 28.18.69 patternColor(colors() as color, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4989

- 28.18.70 patternColor(colors() as Integer, height as Integer, startX as Integer = 0, startY as Integer = 0) as Integer 4989

### 28.18.72 Pixel(x as Integer, y as Integer, c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a pixel.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the pixel. |
| y | (Mandatory) | The y coordinate of the pixel. |
| c | (Mandatory) | The color of the pixel. |

### 28.18.73 polygon(x() as Double, y() as Double, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other polygon method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.74 polygon(x() as Double, y() as Double, edgeColor as Integer, fillColor as Integer) 4991
- 28.18.75 polygon(x() as Integer, y() as Integer, edgeColor as color, fillColor as color) 4992
- 28.18.76 polygon(x() as Integer, y() as Integer, edgeColor as Integer, fillColor as Integer) 4992


### 28.18.74 polygon(x() as Double, y() as Double, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a polygon.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | An array of numbers representing the x coordinates of the vertices of a polygon. |
| y | (Mandatory) | An array of numbers representing the y coordinates of the vertices of a polygon. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:


- 28.18.73 polygon(x() as Double, y() as Double, edgeColor as color, fillColor as color) 4991

- 28.18.75 polygon(x() as Integer, y() as Integer, edgeColor as color, fillColor as color) 4992
- 28.18.76 polygon(x() as Integer, y() as Integer, edgeColor as Integer, fillColor as Integer) 4992


### 28.18.75 polygon(x() as Integer, y() as Integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other polygon method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.73 polygon(x() as Double, y() as Double, edgeColor as color, fillColor as color) 4991
- 28.18.74 polygon(x() as Double, y() as Double, edgeColor as Integer, fillColor as Integer) 4991
- 28.18.76 polygon(x() as Integer, y() as Integer, edgeColor as Integer, fillColor as Integer) 4992


### 28.18.76 polygon(x() as Integer, y() as Integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a polygon.
**Notes:**

| | | |
|---|---|---|
| x | (Mandatory) | An array of numbers representing the x coordinates of the vertices of a polygon. |
| y | (Mandatory) | An array of numbers representing the y coordinates of the vertices of a polygon. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

none
See also:


- 28.18.73 polygon(x() as Double, y() as Double, edgeColor as color, fillColor as color) 4991
- 28.18.74 polygon(x() as Double, y() as Double, edgeColor as Integer, fillColor as Integer) 4991
- 28.18.75 polygon(x() as Integer, y() as Integer, edgeColor as color, fillColor as color) 4992


### 28.18.77 polyShape(xy() as integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a shape.
**Notes:** A simple shape can be a polygon or an ellipse. A polygon an be specified as an array of numbers

(x0, y0, x1, y1, .....) representing the coordinates of the polygon vertices. As a polygon must have at least 3 vertices, the array must contain at least 6 numbers. If it contains only 4 numbers, it is will considered as an ellipse, with the numbers (x, y, rx, ry) interpreted as the coordinates of the center and the horizontal and vertical radii.

A complex shape is composed of multiple simple shapes. For example, a donut is a complex shape composed of two concentric circles. The shape is filled using the even-odd rule. (The web should have a lot of explanation on what is the even-odd rule in graphics.) A complex shape can be specified by including multiple simple shapes in the array, using the NewShape constant to separate them.

| Argument | Default | Description |
|---|---|---|
| xy | (Mandatory) | An array of integers specifying the shape. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:


- 28.18.78 polyShape(xy() as integer, edgeColor as Integer, fillColor as Integer) 4993


### 28.18.78 polyShape(xy() as integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a shape.
**Notes:** A simple shape can be a polygon or an ellipse. A polygon an be specified as an array of numbers (x0, y0, x1, y1, .....) representing the coordinates of the polygon vertices. As a polygon must have at least 3 vertices, the array must contain at least 6 numbers. If it contains only 4 numbers, it is will considered as an ellipse, with the numbers (x, y, rx, ry) interpreted as the coordinates of the center and the horizontal and vertical radii.

A complex shape is composed of multiple simple shapes. For example, a donut is a complex shape composed of two concentric circles. The shape is filled using the even-odd rule. (The web should have a lot of explanation on what is the even-odd rule in graphics.) A complex shape can be specified by including multiple simple shapes in the array, using the NewShape constant to separate them.

| Argument | Default | Description |
|---|---|---|
| xy | (Mandatory) | An array of integers specifying the shape. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:


- 28.18.77 polyShape(xy() as integer, edgeColor as color, fillColor as color) 4992

### 28.18.79 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi-point radial gradient color.
**Notes:** In this method, the color points are defined as an array of radial distances and colors, in the following format:

distance0, color0, distance1, color1, .... distanceN, colorN
The distances are specified as a number from 0 - 256 (0 - 100 in hex), in which 0 represents the center of the gradient defining ellipse, and 256 (100 in hex) represents the perimeter of the gradient defining ellipse.

For example, the array (in hex):

000000, FF0000, 000080, FFFF00, 000100, 00FF00
means the center (000000) is red (FF0000), the mid-point (000080 in hex) is yellow (FFFF00), and the perimeter (000100 in hex) is green (00FF00).

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the radial gradient. |
| cy | (Mandatory) | The y coordinate of the center of the radial gradient. |
| rx | (Mandatory) | The horizontal radius of the radial gradient defining ellipse. |
| ry | (Mandatory) | The vertical radius of the radial gradient defining ellipse. |
| colorArray | (Mandatory) | An array defining the radial distances and colors. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie outside the gradient defining ellipse will assume the color at the perimeter of the gradient defining ellipse. |

Return Value
A 32-bit integer representing the radial gradient color.
See also:

- 28.18.80 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4994
- 214.1.27 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 24105

### 28.18.80 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other radialGradientColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.79 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer 4994
- 214.1.27 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer 24105

### 28.18.81 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as Integer, endColor as Integer, periodic as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a two-point radial gradient color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the radial gradient. |
| cy | (Mandatory) | The y coordinate of the center of the radial gradient. |
| rx | (Mandatory) | The horizontal radius of the radial gradient defining ellipse. |
| ry | (Mandatory) | The vertical radius of the radial gradient defining ellipse. |
| startColor | (Mandatory) | The color at the center of the gradient defining ellipse. |
| endColor | (Mandatory) | The color at the perimeter of the gradient defining ellipse. |
| periodic | false | Specifies whether the gradient will repeat itself periodically. If the gradient does not repeat itself, the points that lie outside the gradient defining ellipse will assume the color at the perimeter of the gradient defining ellipse. |

Return Value
A 32-bit integer representing the radial gradient color.
See also:

- 28.18.79 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, data() as Integer, periodic as boolean=false) as Integer 4994
- 28.18.80 radialGradientColor(cx as Integer, cy as Integer, rx as Integer, ry as Integer, startColor as color, endColor as color, periodic as boolean=false) as Integer 4994

### 28.18.82 rAffineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other rAffineTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.83 rAffineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 4996

### 28.18.83 rAffineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform reverse affine transformation on the drawing surface.
**Notes:** A reverse affine transformation is an operation where every pixel is copied from another pixel according to the formula.

xSrc = a * xDest + b * yDest + cySrc = d * xDest + e * yDest + f
where (xDest, yDest) is a destination pixel, and (xSrc, ySrc) is where it should come from.

Many graphics operation, such as translation, rotation, and resizing, can be considered as a special case of reverse affine transformation.

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The parameter 'a' in the coordinate transformation formula "xSrc = a * xDest + b * yDest + c". |
| b | (Mandatory) | The parameter 'b' in the coordinate transformation formula "xSrc = a * xDest + b * yDest + c". |
| c | (Mandatory) | The parameter 'c' in the coordinate transformation formula "xSrc = a * xDest + b * yDest + c". |
| d | (Mandatory) | The parameter 'd' in the coordinate transformation formula "ySrc = d * xDest + e * yDest + f". |
| e | (Mandatory) | The parameter 'e' in the coordinate transformation formula "ySrc = d * xDest + e * yDest + f". |
| f | (Mandatory) | The parameter 'f' in the coordinate transformation formula "ySrc = d * xDest + e * yDest + f". |
| bgColor | FFFFFF | The background color used to fill destination pixels that are not mapped to any source pixels. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.82 rAffineTransform(a as Double, b as Double, c as Double, d as Double, e as Double, f as Double,

bgColor as color, filter as Integer = 2, blur as Double = 1.0) 4995

### 28.18.84 rect(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, edgeColor as color, fillColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other rect method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.85 rect(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, edgeColor as Integer, fillColor as Integer, raisedEffect as Integer = 0) 4997

### 28.18.85 rect(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, edgeColor as Integer, fillColor as Integer, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a rectangle.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of one corner of the rectangle. |
| y1 | (Mandatory) | The y coordinate of one corner of the rectangle. |
| x2 | (Mandatory) | The x coordinate of the opposite corner of the rectangle. |
| y2 | (Mandatory) | The y coordinate of the opposite corner of the rectangle. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support CDBaseChartMBS.glassEffect and CDBaseChartMBS.softLighting effects. |

See also:

- 28.18.84 rect(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, edgeColor as color, fillColor as color, raisedEffect as Integer = 0) 4997

### 28.18.86 reduceColors(colorCount as Integer, blackAndWhite as boolean=false) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the number of colors in the image.
**Notes:** The colors in the image will be reduced to at most the number of colors specified, which should be 16 - 256. You may also set the image to black and white. In this case, the color count means number of grey levels.

The colors will be reduced by computing an optimal palette for the image. The image will then be converted using the palette based on the current dithering settings (see DrawArea.setDitherMethod).

| Argument | Default | Description |
|---|---|---|
| colorCount | (Mandatory) | The maximum number of colors that image should have after after reduction. Must be between 16 - 256. |
| blackAndWhite | false | A true value means the image will be converted to black and white (with grey levels). A false value means the image will not be converted to black and white. |

Return Value
The actual number of colors the converted image has.

### 28.18.87 removeDynamicLayer(keepOriginal as boolean = false)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the dynamic layer if any.

### 28.18.88 resize(newWidth as Integer, newHeight as Integer, filter as Integer = 1, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize the drawing surface.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| newWidth | (Mandatory) | The new width of the drawing surface in pixels. |
| newHeight | (Mandatory) | The new height of the drawing surface in pixels. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

### 28.18.89 ring(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other ring method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.90 ring(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, edgeColor as Integer, fillColor as Integer) 4999

### 28.18.90 ring(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a ring.
See also:

- 28.18.89 ring(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, edgeColor as color, fillColor as color) 4998

### 28.18.91 ringSector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, a1 as Double, a2 as Double, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other ringSector method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.92 ringSector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, a1 as Double, a2 as Double, edgeColor as Integer, fillColor as Integer) 4999

### 28.18.92 ringSector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, a1 as Double, a2 as Double, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a ring sector.
See also:

- 28.18.91 ringSector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, rx2 as Integer, ry2 as Integer, a1 as Double, a2 as Double, edgeColor as color, fillColor as color) 4999

### 28.18.93 rotate(angle as Double, bgColor as color, cx as Double = -1, cy as Double = -1, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other rotate method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.94 rotate(angle as Double, bgColor as Integer = &hFFFFFF, cx as Double = -1, cy as Double = -1, filter as Integer = 2, blur as Double = 1.0) 5000

### 28.18.94 rotate(angle as Double, bgColor as Integer = &hFFFFFF, cx as Double = -1, cy as Double = -1, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotate the drawing surface.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| angle | (Mandatory) | The rotation angle measured clockwise in degrees. |
| bgColor | FFFFFF | The background color used to fill the space left after rotation. |
| cx | -1 | The x coordinate of the center of rotation. -1 means rotating about the center of the drawing surface. |
| cy | -1 | The y coordinate of the center of rotation. -1 means rotating about the center of the drawing surface. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.93 rotate(angle as Double, bgColor as color, cx as Double = -1, cy as Double = -1, filter as Integer = 2, blur as Double = 1.0) 5000

### 28.18.95 sector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other sector method, but uses color instead of integer data type for passing color values.
See also:

- 66.31.28 sector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, edgeColor as Integer, fillColor as Integer) 11906

### 28.18.96 sector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a circular or elliptical sector.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x coordinate of the center of the circle or ellipse. |
| cy | (Mandatory) | The y coordinate of the center of the circle or ellipse. |
| rx | (Mandatory) | The horizontal radius of the circle or ellipse. |
| ry | (Mandatory) | The vertical radius of the circle or ellipse. |
| a1 | (Mandatory) | The start angle of the sector in degrees. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| a2 | (Mandatory) | The end angle of the sector in degrees. The angle is measured clockwise, with 0 degree being the upward pointing direction. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:

- 66.31.4 sector(cx as Integer, cy as Integer, rx as Integer, ry as Integer, a1 as Double, a2 as Double, edgeColor as color, fillColor as color) 11898

### 28.18.97 setAntiAlias(shapeAntiAlias as boolean=true, textAntiAlias as Integer = 2)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Controls whether anti-alias is used when drawing lines, shapes and text.
**Notes:** For anti-aliasing text, ChartDirector supports the following modes.

ConstantValueDescription

| | | |
|---|---|---|
| NoAntiAlias | 0 | Disable anti-alias when drawing text |
| AntiAlias | 1 | Always use anti-alias when drawing text |
| AutoAntiAlias | 2 | Automatically determine if anti-alias should be used for the text. This is the default. |

Currently, ChartDirector will anti-alias only large or bold fonts. For small fonts, assuming it is of high quality, anti-alias is unnecessary. It is because high quality fonts are normally designed to be sharp and clear at low resolution. Anti-aliasing will blur the fonts and make them look worse.

However, for complicated fonts (e.g. some fonts with oriental characters), or for lower quality fonts (e.g. some freeware fonts), anti-alias may be necessary. In this case, it may be needed to force anti-aliasing of all fonts using AntiAlias mode.

| Argument | Default | Description |
|---|---|---|
| shapeAntiAlias | true | A true value enables anti-alias when drawing lines and shapes. A false value disables anti-alias when drawing lines and shapes |
| textAntiAlias | AutoAntiAlias | The text anti-alias mode, which must be one of AutoAntiAlias, AntiAlias or NoAntiAlias. |

### 28.18.98 setAntiAliasText(value as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set how text is antialiased.

### 28.18.99 setBgColor(c as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBgColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.100 setBgColor(c as Integer) 5002

### 28.18.100 setBgColor(c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the background color of the image.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The background color of the image. |

See also:

• 28.18.99 setBgColor(c as color) 5002

### 28.18.101 setClipRect(left as Integer, top as Integer, right as Integer, bottom as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the clip rectangle.
**Notes:** When performing graphics operation, only regions inside the clip rectangle will be affected. Regions outside will be unaffected.

| Argument | Default | Description |
|---|---|---|
| left | (Mandatory) | The x coordinate of the left side of the clip rectangle. |
| top | (Mandatory) | The y coordinate of the top side of the clip rectangle. |
| right | (Mandatory) | The x coordinate of the right side of the clip rectangle. |
| bottom | (Mandatory) | The y coordinate of the bottom side of the clip rectangle. |

### 28.18.102 setColorTable(colors() as color, offset as Integer)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColorTable method, but uses color instead of integer data type for passing color values.
See also:

• 28.18.103 setColorTable(colors() as Integer, offset as Integer) 5004

### 28.18.103 setColorTable(colors() as Integer, offset as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the colors in the palette starting with the specified offset position.
**Notes:** See Color Specification on how colors are represented in ChartDirector.

| Argument | Default | Description |
|---|---|---|
| colors | (Mandatory) | An array of colors to replace the colors in the palette. |
| offset | (Mandatory) | The position in the palette to start the replacement. |

See also:

- 28.18.102 setColorTable(colors() as color, offset as Integer) 5003

### 28.18.104 setDefaultFonts(normal as string, bold as string, italic as string, boldItalic as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the defaults for normal, bold, italic and bold-italic fonts.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| normal | (Mandatory) | The default normal font. This is the same as the first font in the font table. |
| bold | "" | The default bold font. This is the same as the second font in the font table. An empty string means the default is unchanged. |
| italic | "" | The default italic font. This is the same as the third font in the font table. An empty string means the default is unchanged. |
| boldItalic | "" | The default bold-italic font. This is the same as the fourth font in the font table. An empty string means the default is unchanged. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.18.105 setDitherMethod(value as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the dithering method in case dithering is necessary.
**Notes:** Dithering is a process of reducing the colors of an image. It is required if an image has more colors than can be supported by the image format. For example, a GIF image can only have 256 colors. If the

actual image contains more than 256 colors, dithering is needed to reduce the colors to less than 256.

The dithering method must be one of the following predefined constants.

| Constant | Value | Description |
|---|---|---|
| Quantize | 0 | ChartDirector will first compute an optimal 256-color palette based on colors on the actual image. It then replaces the color of each pixel with the nearest color in the palette. This is the default method and produces the best result in most cases. |
| OrderedDither | 1 | Use the ordered dithering algorithm with a 4 x 4 matrix, and with the standard web-safe palette. The web-safe palette is a palette compatible with very old browsers (e.g. Netscape 1.x and 2.x browsers) on 256-color displays. |

Web-safe palette is not an optimal palette. In most cases, this method is not as good as the Quantize method. Use this method only if you have to use the web-safe palette.

| | | |
|---|---|---|
| ErrorDiffusion | 2 | Similar to OrderedDither but use the Floyd and Steinberg error diffusion algorithm. |

| Argument | Default | Description |
|---|---|---|
| m | (Mandatory) | The dithering method to use in case dithering is necessary. |

### 28.18.106 setFontTable(index as Integer, font as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an entry in the font table to the specified font name.
**Notes:** The first 4 fonts in the font table have special significance. They are the defaults for normal, bold, italic and bold-italic fonts.

See Font Specification for details on various font attributes.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

| Argument | Default | Description |
|---|---|---|
| index | (Mandatory) | An index to the font table, starting from 0. |
| font | (Mandatory) | The font name to be put into the font table. |

### 28.18.107 setInterlace(value as boolean)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the interlace mode when creating the image.
**Notes:** Note that in many case an interlaced image is less compressible, and may have a large image size. The default is non-interlace.

Note that this method only applies to image formats that support interlacing (GIF and PNG). It is ignored for image formats that does not support interlacing.

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | A true value means the image is interlaced. A false value means the image is non-interlaced. |

### 28.18.108 setOutputOptions(options as string)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets output format options for the next chart output. Currently, only SVG, SVGZ and PDF output formats support output options.
**Notes:** An output option can be a flag (such as "compress") or an attribute-value pair (such as "width=800"). Multiple output options can be joined using semicolons as delimiters.

SVG Options

PDF Options

The PDF viewer will convert the pixel unit into physical unit (eg. inches) so that it can be layout on paper or other physical media. The default conversion factor for the chart is 96 pixels per inch. The "dpi" attribute can be used to specify an alternative value. The value must be a number.

### 28.18.109 setPaletteMode(value as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| SVG Option | Type | Description |
|---|---|---|
| compress | Flag | Compressed the SVG, that is, output SVGZ. |
| bitmap | Flag | Render the chart as a bitmap and output the bitmap as SVG. |
| noxmldecl | Flag | Do not include the xml declaration line "<?xml version="1.0" .... >" in the SVG. |
| nodoctype | Flag | Do not include the document type declaration line "<!DOCTYPE svg PUBLIC .... >" in the SVG. |
| width | Flag / Attribute | Specifies the width attribute of the SVG. By default, ChartDirector will not include the width or height attribute in the SVG output. In this case, the SVG is variable in size and would assume the size of its container. For example, if the SVG is inside a <DIV>block in a web page, it will assume the size of the DIV block. If the "width" option is used as a flag, ChartDirector will include the width attribute in the SVG and set it to the chart width. If the "width" option is used as an attribute (such as "width=800"), ChartDirector will include the width attribute in the SVG and set it to the specified value. The specified value should be some text that is valid as SVG width. Examples are "100" and "75%". |
| height | Flag / Attribute | Specifies the height attribute of the SVG. See the description on "width" above on how to use it. |

**Function:** Sets the palette mode to use when writing the image in PNG format.
**Notes:** The PNG format supports both palette based images and true color images. Palette based images can only have 256 colors, but is smaller in size.

The palette mode must be one of the following predefined constants.

ConstantValueDescription

### 28.18.110 setResource(id as string, data as MemoryBlock)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

The assigned resource ID is only valid for the DrawArea object of which this method is called. Use CDBaseChartMBS.setResourceGlobal to assign a resource ID that is valid for all ChartDirector objects.

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

| PDF Option | Type | Description |
|---|---|---|
| bitmap | Flag | Render the chart as a bitmap and output the bitmap as PDF. |
| width | Attribute | The width of the chart in the PDF in pixel unit. By default, ChartDirector will use the pixel width of the chart as the width of the chart in PDF. The "width" attribute can be used to specify an alternative value. The value must be a number. |
| height | Attribute | The width of the chart in the PDF in pixel unit. See the description on "width" above for how to use it. |
| pagewidth | Attribute | The page width in pixel unit. By default, ChartDirector will set the page width to the same width as the chart. The "pagewidth" attribute can be used to specify an alternative value. The value must be a number. |
| pageheight | Attribute | The page height in pixel unit. By default, ChartDirector will set the page height to the same height as the chart. The "pageheight" attribute can be used to specify an alternative value. The value must be a number. |
| leftx | Attribute | The x coordinate of the left side of the chart within the page in pixel unit. By default, ChartDirector will center the chart in the page. The "leftx" attribute can be used to specify an alternative horizontal position. The coordinate must be a number. |
| topy | Attribute | The y coordinate of the top side of the chart within the page in pixel unit. By default, ChartDirector will center the chart in the page. The "topy" attribute can be used to specify an alternative vertical position. The coordinate must be a number. |
| dpi | Attribute | Specify the factor for conversion from pixel to physical unit. |

| Argument | Default | Description |
|---|---|---|
| options | (Mandatory) | A list of options delimited by semicolons. |

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.18.111 setResource(id as string, data as string) 5008
- 28.18.112 setResource(id as string, drawArea as CDDrawAreaMBS) 5009


## 28.18.111 setResource(id as string, data as string)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a memory block to allow it to be referenced using a resource path.
**Notes:** Many ChartDirector features, such as BaseChart.setBgImage and the <*img*>tag in CDML, expect a file or resource path for loading an image. If the image happens to be in memory, such as if the image is retrieved from a database, setResource can be used to assign a resource ID to the memory. It can then be referenced using "@/res_id", in which res_id is the resource ID.

| | | |
|---|---|---|
| TryPalette | 0 | Use palette mode if the image contains less than 256 colors, otherwise use true color mode. This is the default. |
| ForcePalette | 1 | Use palette mode. If the image contains more than 256 colors, reduce it to 256 colors using dithering (see DrawArea.setDitherMethod). |
| NoPalette | 2 | Use true color mode. |

| Argument | Default | Description |
|---|---|---|
| p | (Mandatory) | The palette mode for PNG images. |

The assigned resource ID is only valid for the DrawArea object of which this method is called. Use CDBaseChartMBS.setResourceGlobal to assign a resource ID that is valid for all ChartDirector objects.

This method stores only a pointer to the memory. It does not copy the memory. You must ensure the memory contains valid content for as long as the resource is being used.

While ChartDirector does not copy the data, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.18.110 setResource(id as string, data as MemoryBlock) 5007
- 28.18.112 setResource(id as string, drawArea as CDDrawAreaMBS) 5009


### 28.18.112 setResource(id as string, drawArea as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns a resource ID to a DrawArea object to allow it to be referenced using a resource path.
**Notes:** This method is the same DrawArea.setResource, except that it assigns the resource ID to a DrawArea object instead of a memory image. This allows the DrawArea object to be reference as an image resource using "@/res_id".

While ChartDirector does not copy the draw area, the MBS Plugin will put the resources in a dictionary to make sure they stay available till the chart is destroyed and avoid a crash.
See also:


- 28.18.110 setResource(id as string, data as MemoryBlock) 5007
- 28.18.111 setResource(id as string, data as string) 5008


### 28.18.113 setSearchPath(path as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| img | (Mandatory) | The memory that the image occupies. |


| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the memory image. |
| img | (Mandatory) | The memory that the image occupies. |


**Function:** Sets the file system search path for loading image files.
**Notes:** Several ChartDirector operations involve loading image files. Examples are wallpapers (BaseChart.setWallpaper), background images (BaseChart.setBgImage and PlotArea.setBackground2), user-defined symbols (DataSet.setDataSymbol2) or for embedding images in text using ChartDirector Mark Up Language.

### 28.18.114 setSize(width as Integer, height as Integer, bgColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setSize method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.115 setSize(width as Integer, height as Integer, bgColor as Integer = &hFFFFFF) 5010

### 28.18.115 setSize(width as Integer, height as Integer, bgColor as Integer = &hFFFFFF)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size and background color of the drawing surface.
**Notes:**

See also:

- 28.18.114 setSize(width as Integer, height as Integer, bgColor as color) 5010

### 28.18.116 setTransparentColor(value as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setTransparentColor method, but uses color instead of integer data type for passing color values.
See also:

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The resource ID to be used to reference the DrawArea object. |
| drawArea | (Mandatory) | The DrawArea object to be used as a resource. |

| Argument | Default | Description |
|---|---|---|
| path | (Mandatory) | A list of directories, separated with the path separator of your operating system (";" for Windows, ":" for Linux/UNIX). |


- 28.18.117 setTransparentColor(value as Integer) 5011


### 28.18.117 setTransparentColor(value as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a certain color to mean transparent when creating the image output, or to include alpha transparency channel in the output.
**Notes:** There are two types of transparency:

Alpha transparency: In addition to red, green and blue levels, there is a transparency level associated with each pixel, which can range from completely transparent to completely opaque. The data associated with the transparency information is called the alpha channel.

Single color transparency: The image itself has no alpha channel, but a certain color is used to mean completely transparent. For internal drawing, ChartDirector always use alpha transparency. However, when outputting the image as an image file, ChartDirector by default will remove the alpha channel to reduce image size. It is because many image displaying software do not support alpha transparency. For example, the IE browser only supports single color transparency but not alpha transparency.

If you want to use single color transparency in the output, you may specify the transparent color as the argument to the setTransparentColor method. Note that only GIF and PNG can support single color transparency. JPEG, BMP and WBMP cannot support transparency at all.

If you do want to keep the alpha channel in final output, you may pass -1 as the argument to setTransparentColor. Note that the only image format that can support alpha transparency is PNG.

One important thing to note is that the IE browser (and possibly many image displaying software) only supports single color transparency for palette based images with up to 256 colors, but not for true color images. For this reason, if single color transparency is used, ChartDirector will automatically reduce the image to 256 colors if it has more than 256 colors. This may result in lost of image quality, especially if the image contains gradient colors.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the drawing surface in pixels. |
| height | (Mandatory) | The height of the drawing surface in pixels. |
| bgColor | FFFFFF | The background color of the drawing surface. |

Therefore, due to the limitations of the current generations of image displaying software, for highest image quality, sometimes it may be beneficial to not using transparency in image output, but to set the image background color to the same color as the container background.

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color that is designated as the transparent color. If -1 is used, the full alpha transparency channel will be included in the final output. |

See also:

- 28.18.116 setTransparentColor(value as color) 5010

### 28.18.118 shearTransform(xShear as Double, yShear as Double = 0, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shear the drawing surface.
**Notes:** Shearing can be applied along the horizontal direction and/or vertical direction. A rectangle, after shearing, will become a parallelogram.

| Argument | Default | Description |
|---|---|---|
| xShear | (Mandatory) | The number of pixels to shear leftwards. |
| yShear | 0 | The number of pixels to shear downwards. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.119 shearTransform(xShear as Double, yShear as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 5013

### 28.18.119 shearTransform(xShear as Double, yShear as Double, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other shearTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.118 shearTransform(xShear as Double, yShear as Double = 0, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 5012

### 28.18.120 sphereTransform(xDiameter as Integer, yDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other sphereTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.121 sphereTransform(xDiameter as Integer, yDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 5013

### 28.18.121 sphereTransform(xDiameter as Integer, yDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wraps the drawing surface onto a sphere or ellipsoid.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xDiameter | (Mandatory) | The horizontal diameter of the sphere or ellipsoid in pixels. |
| yDiameter | (Mandatory) | The vertical diameter of the sphere or ellipsoid in pixels. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.120 sphereTransform(xDiameter as Integer, yDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 5013

### 28.18.122 surface(cx1 as Double, y1 as Double, x2 as Double, y2 as Double, depthX as Integer, depthY as Integer, edgeColor as color, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other surface method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.123 surface(cx1 as Double, y1 as Double, x2 as Double, y2 as Double, depthX as Integer, depthY as Integer, edgeColor as Integer, fillColor as Integer) 5014

### 28.18.123 surface(cx1 as Double, y1 as Double, x2 as Double, y2 as Double, depthX as Integer, depthY as Integer, edgeColor as Integer, fillColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a parallelogram.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first end-point of one line of the parallelogram. |
| y1 | (Mandatory) | The y coordinate of the first end-point of one line of the parallelogram. |
| x2 | (Mandatory) | The x coordinate of the second end-point of one line of the parallelogram. |
| y2 | (Mandatory) | The y coordinate of the second end-point of one line of the parallelogram. |
| depthX | (Mandatory) | The x displacement of the line segment that is parallel to the line segment above. |
| depthY | (Mandatory) | The y displacement of the line segment that is parallel to the line segment above. |
| edgeColor | (Mandatory) | The border color. To disable border, set the edgeColor the same as the fillColor. |
| fillColor | (Mandatory) | The fill color. To disable filling, set the fillColor to Transparent. |

See also:

- 28.18.122 surface(cx1 as Double, y1 as Double, x2 as Double, y2 as Double, depthX as Integer, depthY as Integer, edgeColor as color, fillColor as color) 5014

### 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a TTFText object representing a text block.
**Notes:** The TTFText object contains methods to measure and draw the text. This method is useful if the size of the text is needed before deciding where the draw it.

| Argument | Default | Description |
|---|---|---|
| text | (Mandatory) | A string representing the text to be drawn. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | (Mandatory) | The font name. See Font Specification for details on various font attributes. |
| fontIndex | (Mandatory) | The font index in case the font name refers to a font collection. An index of 0 means the first font. |
| fontHeight | (Mandatory) | The font height in points. |
| fontWidth | (Mandatory) | The font width in points. |
| angle | (Mandatory) | The rotation angle of the text. |
| vertical | (Mandatory) | A true value means the text is layout vertically (from top to bottom). A false value means the is layout horizontally (from left to right). |

Return Value
The TTFText object created.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:


- 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5015
- 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5016
- 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS 5017
- 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color) 5018
- 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer) 5018


### 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other text method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS 5014
- 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5016
- 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS 5017
- 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color) 5018
- 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer) 5018


### 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws text.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| str | (Mandatory) | A string representing the text to be drawn. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | (Mandatory) | The font name. See Font Specification for details on various font attributes. |
| fontIndex | (Mandatory) | The font index in case the font name refers to a font collection. An index of 0 means the first font. |
| fontHeight | (Mandatory) | The font height in points. |
| fontWidth | (Mandatory) | The font width in points. |
| angle | (Mandatory) | The rotation angle of the text. The angle is measured in degrees in clockwise direction. |
| vertical | (Mandatory) | A true value means the text is layout vertically (from top to bottom). A false value means the is layout horizontally (from left to right). |
| x | (Mandatory) | The x coordinate of a reference point to align the text. |
| y | (Mandatory) | The y coordinate of a reference point to align the text. |
| color | (Mandatory) | The color of the text. |
| alignment | TopLeft | The position of the text relative to the reference point. See Alignment Specification for supported alignment types. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS 5014
- 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5015
- 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS 5017
- 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color) 5018
- 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer) 5018

### 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a TTFText object representing a text block.
**Notes:** The TTFText object contains methods to measure and draw the text. This method is useful if the size of the text is needed before deciding where the draw it.

| Argument | Default | Description |
|---|---|---|
| str | (Mandatory) | A string representing the text to be drawn. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | (Mandatory) | The font name. See Font Specification for details on various font attributes. |
| fontSize | (Mandatory) | The font size in points. |

Return Value
The TTFText object created.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS 5014
- 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5015

- 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5016
- 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color) 5018
- 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer) 5018


### 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other text method, but uses color instead of integer data type for passing color values.
See also:


- 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS 5014
- 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5015
- 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5016
- 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS 5017
- 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer) 5018


### 28.18.129 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws text.
**Notes:**

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:


- 28.18.124 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean) as CDTTFTextMBS 5014

| Argument | Default | Description |
|---|---|---|
| str | (Mandatory) | A string representing the text to be drawn. See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting. |
| font | (Mandatory) | The font name. See Font Specification for details on various font attributes. |
| fontSize | (Mandatory) | The font size in points. |
| x | (Mandatory) | The x coordinate of the top-left corner of the text. |
| y | (Mandatory) | The y coordinate of the top-left corner of the text. |
| color | (Mandatory) | The color of the text. |


- 28.18.125 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5015
- 28.18.126 text(str as string, font as string, fontIndex as Integer, fontHeight as Double, fontWidth as Double, angle as Double, vertical as boolean, x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5016
- 28.18.127 text(str as string, font as string, fontsize as Double) as CDTTFTextMBS 5017
- 28.18.128 text(str as string, font as string, fontsize as Double, x as Integer, y as Integer, colorvalue as color) 5018


### 28.18.130 tile(d as CDDrawAreaMBS, transparency as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy another DrawArea to the current DrawArea as a wallpaper.
**Notes:** The wallpaper image will be tiled repeatedly on the current DrawArea until the entire DrawArea is covered.

| Argument | Default | Description |
|---|---|---|
| d | (Mandatory) | A DrawArea object representing the source. |
| transparency | (Mandatory) | Specify the transparency level when copying the other DrawArea to the current DrawArea. A value of 0 means non-transparent. A value of 255 means totally transparent. |

### 28.18.131 vCylinderTransform(xDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other vCylinderTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.132 vCylinderTransform(xDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 5020


### 28.18.132 vCylinderTransform(xDiameter as Integer, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wraps the drawing surface onto a vertical cylinder.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xDiameter | (Mandatory) | The diameter of the cylinder in pixels. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:


- 28.18.131 vCylinderTransform(xDiameter as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 5019


### 28.18.133 vFlip

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip the drawing surface along the central vertical line.

### 28.18.134 vline(y1 as Integer, y2 as Integer, x as Integer, c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a vertical line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| y1 | (Mandatory) | The y coordinate of the first end-point of the line. |
| y2 | (Mandatory) | The y coordinate of the second end-point of the line. |
| x | (Mandatory) | The x coordinate of the line. |
| c | (Mandatory) | The color of the line. |

### 28.18.135 vTriangleTransform(tHeight as Integer = -1, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wraps the drawing surface onto a vertical triangle pointing upwards.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| tHeight | -1 | The height of the triangle in pixels. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

See also:

- 28.18.136 vTriangleTransform(tHeight as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 5021

### 28.18.136 vTriangleTransform(tHeight as Integer, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other vTriangleTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.135 vTriangleTransform(tHeight as Integer = -1, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 5021

### 28.18.137 waveTransform(period as Integer, amplitude as Double, direction as Double = 0, startAngle as Double = 0, longitudinal as boolean=false, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the pixels on the drawing surface according to a sinusoidal function to achieve a wave effect.
**Notes:**

See also:

- 28.18.138 waveTransform(period as Integer, amplitude as Double, direction as Double, startAngle as Double, longitudinal as boolean, bgColor as color, filter as Integer = 2, blur as Double = 1.0) 5022

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The period of the wave in pixels. |
| amplitude | (Mandatory) | The amplitude of the wave in pixels. |
| direction | 0 | The propagation direction of the wave. The upward pointing direction is 0 degree, and the angle is measured clockwise. |
| startAngle | 0 | The initial phase angle of the wave in degrees. |
| longitudinal | false | Determine if the wave is transversal or longitudinal. true means transversal. false means longitudinal. |
| bgColor | FFFFFF | The background color used to fill the space left after transformation. |
| filter | LinearFilter | The filter to use for re-sampling. |
| blur | 1 | The blur factor to use for re-sampling. |

### 28.18.138 waveTransform(period as Integer, amplitude as Double, direction as Double, startAngle as Double, longitudinal as boolean, bgColor as color, filter as Integer = 2, blur as Double = 1.0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other waveTransform method, but uses color instead of integer data type for passing color values.
See also:

- 28.18.137 waveTransform(period as Integer, amplitude as Double, direction as Double = 0, startAngle as Double = 0, longitudinal as boolean=false, bgColor as Integer = &hFFFFFF, filter as Integer = 2, blur as Double = 1.0) 5021

### 28.18.139 Properties

### 28.18.140 Handle as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 28.18.141 Resources as Dictionary

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal resource dictionary.
**Notes:** Stores references for registered resources.
Just for debugging.
(Read only property)

## 28.19 class CDDrawObjMBS

### 28.19.1 class CDDrawObjMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the base class for several drawing related subclasses.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.19.2 Methods

### 28.19.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.19.4 paint(d as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the content to this object into a drawarea.

### 28.19.5 setZOrder(z as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the z-order.

## 28.20 class CDFinanceChartMBS

### 28.20.1 class CDFinanceChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FinanceChart is a financial charting library built on top of the main ChartDirector library.
**Notes:** It extends CDMultiChartMBS by implementing many financial indicators, and allowing complex financial charts to be composed easily.

Key Features:

- Arbitrary Financial Chart Composition: Allows a complex financial chart to be constructed by stacking a main financial chart with arbitrary number of indicator charts in any order.
- Main Chart Layers: The main chart can show information in Candlestick or OHLC, and/or various price lines, such as closing price line, weighted close line, typical price line or median price line.
- Moving Averages: Chart can include arbitrary number of moving average lines of configurable types and periods. Supports simple, exponential, triangular and weighted moving averages.
- Parabolic SAR: A parabolic SAR indicator can be added to the main price chart.
- Bands and Envelops: Built-in Bollinger Band layer, Donchian Channel layer, and moving average envelops. Also supports custom-defined bands.
- Volume Bars: Volume Bars can be displayed as part of the main chart, or as a separate indicator chart.
- Axis Styles: Axis can be log or linear scale, and can display on left or right side of the chart.
- Built-In Indicators: Accumulation/Distribution, Aroon Up/Down, Aroon Oscillator, Average Directional Index, Average True Range (including raw True Range), Bollinger Band Width, Commodity Channel Index, Chaikin Money Flow, Chaikin Oscillator, Chaikin Volatility, Close Location Value, Detrended Price Oscillator, Donchian Channel Width, Ease of Movement, Fast Stochastic, MACD, Mass Index, Money Flow Index, Momentum, Negative Volume Index, On Balance Volume, Performance, Percentage Price Oscillator, Positive Volume Index, Percentage Volume Oscillator, Price Volume Trend, Rate of Change, Relative Strength Index, Slow Stochastic, Standard Deviation, Stochastic RSI, TRIX, Ultimate Oscillator, Volume, William %R.
- Custom Lines and Indicators: Extensible design allows developers to implement additional lines and indicator types.
- Customizable Look and Feel: Preserves the flexibility and power of the ChartDirector API. Background images, custom text boxes, logos, fonts and colors, etc., are all customizable.

Using FinanceChart:
You create an instance of FinanceChart. Next, you may add data to it using setData. After that, you may add the main chart (addMainChart) and other indicator charts to display the data graphically. These charts

may be added in any order.

For the main chart, you may:

- Display price information using Candlesticks (addCandleStick) or HLOC (addHLOC) symbols
- Add various price lines (addCloseLine, addWeightedClose, addTypicalPrice, addMedianPrice)
- Add moving average lines of different types and periods (addSimpleMovingAvg, addExpMovingAvg, addTriMovingAvg, addWeightedMovingAvg)
- Add Parabolic SAR (addParabolicSAR)
- Add price bands or envelops: (addBollingerBand, addDonchianChannel, addEnvelop)
- Add custom lines or bands (addLineIndicator2, addBand)
- Add volume bars (addVolBars)

For indicator charts, FinanceChart includes a wide variety of indicators. Please refer to the table below for details. You may also add your own custom indicator chart using addLineIndicator and addBarIndicator.

In addition to chart building methods, FinanceChart also has a number of chart formatting methods, such as addPlotAreaTitle to add chart title, setPlotAreaStyle to control background color and grid lines, setDateLabelFormat to control date/time formatting, etc.

Furthermore, as FinanceChart is a subclass of CDMultiChartMBS, and the main and indicator charts are implemented as XYChart objects, they can use the powerful ChartDirector API for formatting (eg. background images, custom logos, custom text boxes, metallic colors, etc).
Subclass of the CDMultiChartMBS class.
**Blog Entries**

- Chart Diagrams with Xojo
- MBS Real Studio Plugins, version 12.1pr1
- MBS Real Studio Plugins, version 12.0pr7

**Xojo Developer Magazine**

- 7.5, pages 34 to 35: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin
- 18.5, page 60: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.20.2 Methods

### 28.20.3 addAccDist(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addAccDist method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.4 addAccDist(height as Integer, ColorValue as Integer) as CDXYChartMBS 5026

### 28.20.4 addAccDist(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Accumulation/Distribution indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.3 addAccDist(height as Integer, ColorValue as color) as CDXYChartMBS 5026

### 28.20.5 addADX(height as Integer, period as Integer, posColor as color, negColor as color, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addADX method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.6 addADX(height as Integer, period as Integer, posColor as Integer, negColor as Integer, ColorValue as Integer) as CDXYChartMBS 5027

### 28.20.6 addADX(height as Integer, period as Integer, posColor as Integer, negColor as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Average Directional Index indicators chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| posColor | (Mandatory) | The color of the Positive Directional Index line. |
| negColor | (Mandatory) | The color of the Negative Directional Index line. |
| color | (Mandatory) | The color of the Average Directional Index line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.5 addADX(height as Integer, period as Integer, posColor as color, negColor as color, ColorValue as color) as CDXYChartMBS 5026

### 28.20.7 addAroon(height as Integer, period as Integer, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addAroon method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.8 addAroon(height as Integer, period as Integer, upColor as Integer, downColor as Integer) as CDXYChartMBS 5027

### 28.20.8 addAroon(height as Integer, period as Integer, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Aroon Up/Down indicators chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicators. |
| upColor | (Mandatory) | The color of the Aroon Up indicator line. |
| downColor | (Mandatory) | The color of the Aroon Down indicator line. |

See also:

- 28.20.7 addAroon(height as Integer, period as Integer, upColor as color, downColor as color) as CDXYChartMBS 5027

### 28.20.9 addAroonOsc(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addAroonOsc method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.10 addAroonOsc(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5028

### 28.20.10 addAroonOsc(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Aroon Oscillator indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.9 addAroonOsc(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5028

### 28.20.11 addATR(height as Integer, period as Integer, color1 as color, color2 as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addATR method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.12 addATR(height as Integer, period as Integer, color1 as Integer, color2 as Integer) as CDXYChartMBS 5029

### 28.20.12 addATR(height as Integer, period as Integer, color1 as Integer, color2 as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Average True Range indicators chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color1 | (Mandatory) | The color of the True Range line. |
| color2 | (Mandatory) | The color of the Average True Range line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.11 addATR(height as Integer, period as Integer, color1 as color, color2 as color) as CDXYChartMBS 5029

### 28.20.13 addBand(upperLine() as Double, lowerLine() as Double, LineColor as color, FillColor as color, Name as string) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBand method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.14 addBand(upperLine() as Double, lowerLine() as Double, LineColor as Integer, FillColor as Integer, Name as string) as CDInterLineLayerMBS 5030

### 28.20.14 addBand(upperLine() as Double, lowerLine() as Double, LineColor as Integer, FillColor as Integer, Name as string) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a generic band to the main finance chart.
**Notes:** This method is used internally by other methods to add various bands (eg. Bollinger band, Donchian channels, etc).

Arguments:

| Argument | Default | Description |
|---|---|---|
| upperLine | (Mandatory) | The data series for the upper band line. |
| lowerLine | (Mandatory) | The data series for the lower band line. |
| lineColor | (Mandatory) | The color of the upper and lower band line. |
| fillColor | (Mandatory) | The color to fill the region between the upper and lower band lines. |
| name | (Mandatory) | The name of the band. |

Return Value
An CDInterLineLayerMBS object representing the filled region.
See also:

- 178.7.47 addBand(upperLine() as Double, lowerLine() as Double, LineColor as color, FillColor as color, Name as string) as CDInterLineLayerMBS 21929

### 28.20.15 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBarIndicator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.16 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDBarLayerMBS 5031
- 28.20.17 addBarIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5031
- 28.20.18 addBarIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5032

### 28.20.16 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bar layer to an existing indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The indicator chart to add the bar layer to. |
| data | (Mandatory) | The data series of the indicator bars. |
| color | (Mandatory) | The color of the indicator bars. |
| name | (Mandatory) | The name of the indicator. |

Return Value
A CDBarLayerMBS object representing the bar layer created.
See also:

- 28.20.15 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDBarLayerMBS 5030
- 28.20.17 addBarIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5031
- 28.20.18 addBarIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5032

### 28.20.17 addBarIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBarIndicator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.15 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDBarLayerMBS 5030
- 28.20.16 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDBarLayerMBS 5031
- 28.20.18 addBarIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5032

### 28.20.18 addBarIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a generic bar indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| data | (Mandatory) | The data series of the indicator bars. |
| color | (Mandatory) | The color of the indicator bars. |
| name | (Mandatory) | The name of the indicator. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.15 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDBarLayerMBS 5030
- 28.20.16 addBarIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDBarLayerMBS 5031
- 28.20.17 addBarIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5031

### 28.20.19 addBollingerBand(period as Integer, bandWidth as Double, lineColor as color, FillColor as color) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBollingerBand method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.20 addBollingerBand(period as Integer, bandWidth as Double, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS 5032

### 28.20.20 addBollingerBand(period as Integer, bandWidth as Double, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Bollinger band to the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The period to compute the band. |
| bandWidth | (Mandatory) | The half-width of the band in terms multiples of standard deviation. Typically 2 is used. |
| lineColor | (Mandatory) | The color of the lines defining the upper and lower limits. |
| fillColor | (Mandatory) | The color to fill the regional within the band. |

Return Value
An CDInterLineLayerMBS object representing the band created.
See also:

- 28.20.19 addBollingerBand(period as Integer, bandWidth as Double, lineColor as color, FillColor as color) as CDInterLineLayerMBS 5032

### 28.20.21 addBollingerWidth(height as Integer, period as Integer, width as Double, colorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBollingerWidth method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.22 addBollingerWidth(height as Integer, period as Integer, width as Double, colorValue as Integer) as CDXYChartMBS 5033

### 28.20.22 addBollingerWidth(height as Integer, period as Integer, width as Double, colorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Bollinger Band Width indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| width | (Mandatory) | The band width to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.21 addBollingerWidth(height as Integer, period as Integer, width as Double, colorValue as color) as CDXYChartMBS 5033

### 28.20.23 addCandleStick(upColor as color, downColor as color) as CDCandleStickLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCandleStick method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.24 addCandleStick(upColor as Integer, downColor as Integer) as CDCandleStickLayerMBS 5034

### 28.20.24 addCandleStick(upColor as Integer, downColor as Integer) as CDCandleStickLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a candlestick layer to the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| upColor | (Mandatory) | The candle color for a up day. |
| downColor | (Mandatory) | The candle color for a down day. |

Return Value
A CDCandleStickLayerMBS object representing the candlestick layer created.
See also:

- 194.6.1 addCandleStick(upColor as color, downColor as color) as CDCandleStickLayerMBS 23110

### 28.20.25 addCCI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCCI method, but uses color instead of integer data type for passing color values.
See also:


- 28.20.26 addCCI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 5035


### 28.20.26 addCCI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Community Channel Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:


- 28.20.25 addCCI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5034


### 28.20.27 addChaikinMoneyFlow(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addChaikinMoneyFlow method, but uses color instead of integer data type for passing color values.
See also:


- 28.20.28 addChaikinMoneyFlow(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5036

### 28.20.28 addChaikinMoneyFlow(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Chaikin Money Flow indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.27 addChaikinMoneyFlow(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5035

### 28.20.29 addChaikinOscillator(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addChaikinOscillator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.30 addChaikinOscillator(height as Integer, ColorValue as Integer) as CDXYChartMBS 5036

### 28.20.30 addChaikinOscillator(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Chaikin Oscillator indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.29 addChaikinOscillator(height as Integer, ColorValue as color) as CDXYChartMBS 5036

### 28.20.31 addChaikinVolatility(height as Integer, period1 as Integer, period2 as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addChaikinVolatility method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.32 addChaikinVolatility(height as Integer, period1 as Integer, period2 as Integer, ColorValue as Integer) as CDXYChartMBS 5037

### 28.20.32 addChaikinVolatility(height as Integer, period1 as Integer, period2 as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Chaikin Volatility indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The period to smooth the range. |
| period2 | (Mandatory) | The period to compute the rate of change of the smoothed range. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.31 addChaikinVolatility(height as Integer, period1 as Integer, period2 as Integer, ColorValue as color) as CDXYChartMBS 5037

### 28.20.33 addCloseLine(ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCloseLine method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.34 addCloseLine(ColorValue as Integer) as CDLineLayerMBS 5038

### 28.20.34 addCloseLine(ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a closing price line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.33 addCloseLine(ColorValue as color) as CDLineLayerMBS 5037

### 28.20.35 addCLV(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCLV method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.36 addCLV(height as Integer, ColorValue as Integer) as CDXYChartMBS 5038

### 28.20.36 addCLV(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Close Location Value indicator chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.35 addCLV(height as Integer, ColorValue as color) as CDXYChartMBS 5038

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

### 28.20.37 addComparison(data() as Double, ColorValue as color, Name as string) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addComparison method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.38 addComparison(data() as Double, ColorValue as Integer, Name as string) as CDLineLayerMBS 5039

### 28.20.38 addComparison(data() as Double, ColorValue as Integer, Name as string) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data series to the main chart for comparison with the closing price.
**Notes:** The data series added will be scaled so that the first visible point in the data series will coincide the first visible point of the main closing price. This facilitate comparing the performance of the closing price with the data series. The data series typically is the closing price of another stock, or the value of a market index.

Arguments:

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data series. |
| color | (Mandatory) | The color of the line. |
| name | (Mandatory) | The name of the data series. |

Return Value:
A LineLayer object representing the comparison line created.
See also:

- 28.20.37 addComparison(data() as Double, ColorValue as color, Name as string) as CDLineLayerMBS 5039

### 28.20.39 addDonchianChannel(period as Integer, lineColor as color, FillColor as color) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addDonchianChannel method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.40 addDonchianChannel(period as Integer, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS 5040

### 28.20.40 addDonchianChannel(period as Integer, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Donchian channel to the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The period to compute the band. |
| lineColor | (Mandatory) | The color of the lines defining the upper and lower limits. |
| fillColor | (Mandatory) | The color to fill the regional within the band. |

Return Value
An CDInterLineLayerMBS object representing the band created.
See also:

- 28.20.39 addDonchianChannel(period as Integer, lineColor as color, FillColor as color) as CDInterLineLayerMBS 5040

### 28.20.41 addDonchianWidth(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addDonchianWidth method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.42 addDonchianWidth(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5041

### 28.20.42 addDonchianWidth(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Donchian Channel Width indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.41 addDonchianWidth(height as Integer, period as Integer, ColorValue as color) as CDXY-ChartMBS 5040

### 28.20.43 addDPO(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addDPO method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.44 addDPO(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5041

### 28.20.44 addDPO(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Detrended Price Oscillator indicator chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.
See also:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

- 28.20.43 addDPO(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5041

### 28.20.45 addEaseOfMovement(height as Integer, period as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addEaseOfMovement method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.46 addEaseOfMovement(height as Integer, period as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS 5042

### 28.20.46 addEaseOfMovement(height as Integer, period as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Ease of Movement indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to smooth the indicator. |
| color1 | (Mandatory) | The color of the indicator line. |
| color2 | (Mandatory) | The color of the smoothed indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.45 addEaseOfMovement(height as Integer, period as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS 5042

### 28.20.47 addEnvelop(period as Integer, range as Double, lineColor as color, FillColor as color) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addEnvelop method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.48 addEnvelop(period as Integer, range as Double, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS 5043

### 28.20.48 addEnvelop(period as Integer, range as Double, lineColor as Integer, FillColor as Integer) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a price envelop to the main chart.
**Notes:** The price envelop is a defined as a ratio around a moving average. For example, a ratio of 0.2 means 20% above and below the moving average.

Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The period for the moving average. |
| range | (Mandatory) | The ratio above and below the moving average. |
| lineColor | (Mandatory) | The color of the lines defining the upper and lower limits. |
| fillColor | (Mandatory) | The color to fill the regional within the band. |

Return Value
An CDInterLineLayerMBS object representing the band created.
See also:

- 28.20.47 addEnvelop(period as Integer, range as Double, lineColor as color, FillColor as color) as CDInterLineLayerMBS 5043

### 28.20.49 addExpMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addExpMovingAvg method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.50 addExpMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS 5044


### 28.20.50 addExpMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an exponential moving average line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The moving average period |
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:


- 28.20.49 addExpMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS 5043


### 28.20.51 addFastStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addFastStochastic method, but uses color instead of integer data type for passing color values.
See also:


- 28.20.52 addFastStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS 5044


### 28.20.52 addFastStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Fast Stochastic indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The period to compute the %K line. |
| period2 | (Mandatory) | The period to compute the %D line. |
| color1 | (Mandatory) | The color of the %K line. |
| color2 | (Mandatory) | The color of the %D line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.51 addFastStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS 5044

### 28.20.53 addHLOC(upColor as color, downColor as color) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addHLOC method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.54 addHLOC(upColor as Integer, downColor as Integer) as CDHLOCLayerMBS 5045

### 28.20.54 addHLOC(upColor as Integer, downColor as Integer) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a HLOC layer to the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| upColor | (Mandatory) | The candle color for a up day. |
| downColor | (Mandatory) | The candle color for a down day. |

Return Value
A CDHLOCLayerMBS object representing the HLOC layer created.
See also:

- 28.20.53 addHLOC(upColor as color, downColor as color) as CDHLOCLayerMBS 5045

### 28.20.55 addIndicator(height as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a blank indicator chart to the finance chart.
**Notes:** Used internally to add other indicators. Override to change the default formatting (eg. axis fonts, etc.) of the various indicators.

Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the chart in pixels. |

Return Value
A CDXYChartMBS object representing the chart created.

### 28.20.56 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLineIndicator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.57 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDLineLayerMBS 5046
- 28.20.58 addLineIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5047
- 28.20.59 addLineIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5047

### 28.20.57 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line to an existing indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The indicator chart to add the line to. |
| data | (Mandatory) | The data series of the indicator line. |
| color | (Mandatory) | The color of the indicator line. |
| name | (Mandatory) | The name of the indicator. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.56 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDLineLayerMBS 5046
- 28.20.58 addLineIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5047
- 28.20.59 addLineIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5047

### 28.20.58 addLineIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLineIndicator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.56 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDLineLayerMBS 5046
- 28.20.57 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDLineLayerMBS 5046
- 28.20.59 addLineIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS 5047

### 28.20.59 addLineIndicator(height as Integer, data() as Double, ColorValue as Integer, name as string) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a generic line indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| data | (Mandatory) | The data series of the indicator line. |
| color | (Mandatory) | The color of the indicator line. |
| name | (Mandatory) | The name of the indicator. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.56 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as color, name as string) as CDLineLayerMBS 5046
- 28.20.57 addLineIndicator(chart as CDXYChartMBS, data() as Double, ColorValue as Integer, name as string) as CDLineLayerMBS 5046
- 28.20.58 addLineIndicator(height as Integer, data() as Double, ColorValue as color, name as string) as CDXYChartMBS 5047

### 28.20.60 addMACD(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMACD method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.61 addMACD(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS 5048

### 28.20.61 addMACD(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a MACD indicator chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.
See also:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The first moving average period to compute the indicator. |
| period2 | (Mandatory) | The second moving average period to compute the indicator. |
| period3 | (Mandatory) | The moving average period of the signal line. |
| color | (Mandatory) | The color of the indicator line. |
| signalColor | (Mandatory) | The color of the signal line. |
| divColor | (Mandatory) | The color of the divergent bars. |

- 28.20.60 addMACD(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS 5048

### 28.20.62 addMainChart(height as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the main chart - the chart that shows the data for the prices.
**Notes:** The chart added is initially empty. Other methods, such as CDFinanceChartMBS.addCandleStick and CDFinanceChartMBS.addSimpleMovingAvg, may be used to add various layers to the chart.

Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the main chart in pixels. |

Return Value
A CDXYChartMBS object representing the main chart created.

### 28.20.63 addMassIndex(height as Integer, ColorValue as color, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMassIndex method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.64 addMassIndex(height as Integer, ColorValue as Integer, upColor as Integer, downColor as Integer) as CDXYChartMBS 5050

### 28.20.64 addMassIndex(height as Integer, ColorValue as Integer, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Mass Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.63 addMassIndex(height as Integer, ColorValue as color, upColor as color, downColor as color) as CDXYChartMBS 5049

### 28.20.65 addMedianPrice(ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMedianPrice method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.66 addMedianPrice(ColorValue as Integer) as CDLineLayerMBS 5050

### 28.20.66 addMedianPrice(ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a median price line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

• 28.20.65 addMedianPrice(ColorValue as color) as CDLineLayerMBS 5050

### 28.20.67 addMFI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMFI method, but uses color instead of integer data type for passing color values.
See also:

• 28.20.68 addMFI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 5051

### 28.20.68 addMFI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Money Flow Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

• 28.20.67 addMFI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5051

### 28.20.69 addMomentum(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addMomentum method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.70 addMomentum(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5052

### 28.20.70 addMomentum(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Momentum indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.69 addMomentum(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5051

### 28.20.71 addNVI(height as Integer, period as Integer, ColorValue as color, signalColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addNVI method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.72 addNVI(height as Integer, period as Integer, ColorValue as Integer, signalColor as Integer) as CDXYChartMBS 5052

### 28.20.72 addNVI(height as Integer, period as Integer, ColorValue as Integer, signalColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Negative Volume Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the signal line. |
| color | (Mandatory) | The color of the indicator line. |
| signalColor | (Mandatory) | The color of the signal line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.71 addNVI(height as Integer, period as Integer, ColorValue as color, signalColor as color) as CDXYChartMBS 5052

### 28.20.73 addOBV(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addOBV method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.74 addOBV(height as Integer, ColorValue as Integer) as CDXYChartMBS 5053

### 28.20.74 addOBV(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an On Balance Volume indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.73 addOBV(height as Integer, ColorValue as color) as CDXYChartMBS 5053

### 28.20.75 addParabolicSAR(accInitial as Double, accIncrement as Double, accMaximum as Double, symbolType as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addParabolicSAR method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.76 addParabolicSAR(accInitial as Double, accIncrement as Double, accMaximum as Double, symbolType as Integer, symbolSize as Integer, fillColor as Integer, edgeColor as Integer) as CDLineLayerMBS 5054

### 28.20.76 addParabolicSAR(accInitial as Double, accIncrement as Double, accMaximum as Double, symbolType as Integer, symbolSize as Integer, fillColor as Integer, edgeColor as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a parabolic SAR indicator to the main chart.
**Notes:** Arguments

| Argument | Default | Description |
|---|---|---|
| accInitial | (Mandatory) | The initial acceleration. A common value to use is 0.02. |
| accIncrement | (Mandatory) | The incremental acceleration. A common value to use is 0.02. |
| accMaximum | (Mandatory) | The maximum acceleration. A common value to use is 0.2. |
| symbolType | (Mandatory) | The symbol used to plot the parabolic SAR. One of the predefined shape constants representing the symbol shape. See Shape Specification for the available built-in shapes. |
| symbolSize | (Mandatory) | The width and height of the symbol in pixels |
| fillColor | (Mandatory) | The color used to fill the symbol. |
| edgeColor | (Mandatory) | The edge color used to draw the edge of the symbol. |

Return Value
A CDLineLayerMBS object representing the parabolic SAR created.
See also:

- 28.20.75 addParabolicSAR(accInitial as Double, accIncrement as Double, accMaximum as Double, symbolType as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDLineLayerMBS 5054

### 28.20.77 addPerformance(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPerformance method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.78 addPerformance(height as Integer, ColorValue as Integer) as CDXYChartMBS 5055

### 28.20.78 addPerformance(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Performance indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.77 addPerformance(height as Integer, ColorValue as color) as CDXYChartMBS 5055

### 28.20.79 addPlotAreaTitle(alignment as Integer, text as string) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a text title above the plot area.
**Notes:** You may add multiple title above the plot area by calling this method multiple times.

Arguments:

Return Value
The CDTextBoxMBS object representing the text box above the plot area, which may be used to fine-tune the appearance of the text.

| Argument | Default | Description |
|---|---|---|
| alignment | (Mandatory) | The alignment with respect to the region that is on top of the plot area. See Alignment Specification for supported alignment types. |
| text | (Mandatory) | The text to add. |

### 28.20.80 addPPO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPPO method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.81 addPPO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS 5056

### 28.20.81 addPPO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Percentage Price Oscillator indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The first moving average period to compute the indicator. |
| period2 | (Mandatory) | The second moving average period to compute the indicator. |
| period3 | (Mandatory) | The moving average period of the signal line. |
| color | (Mandatory) | The color of the indicator line. |
| signalColor | (Mandatory) | The color of the signal line. |
| divColor | (Mandatory) | The color of the divergent bars. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.80 addPPO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS 5056

### 28.20.82 addPVI(height as Integer, period as Integer, ColorValue as color, signalColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPVI method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.83 addPVI(height as Integer, period as Integer, ColorValue as Integer, signalColor as Integer) as CDXYChartMBS 5057

### 28.20.83 addPVI(height as Integer, period as Integer, ColorValue as Integer, signalColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Positive Volume Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the signal line. |
| color | (Mandatory) | The color of the indicator line. |
| signalColor | (Mandatory) | The color of the signal line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.82 addPVI(height as Integer, period as Integer, ColorValue as color, signalColor as color) as CDXYChartMBS 5057

### 28.20.84 addPVO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPVO method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.85 addPVO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS 5058

### 28.20.85 addPVO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, signalColor as Integer, divColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Percentage Volume Oscillator indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The first moving average period to compute the indicator. |
| period2 | (Mandatory) | The second moving average period to compute the indicator. |
| period3 | (Mandatory) | The moving average period of the signal line. |
| color | (Mandatory) | The color of the indicator line. |
| signalColor | (Mandatory) | The color of the signal line. |
| divColor | (Mandatory) | The color of the divergent bars. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.84 addPVO(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, signalColor as color, divColor as color) as CDXYChartMBS 5057

### 28.20.86 addPVT(height as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPVT method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.87 addPVT(height as Integer, ColorValue as Integer) as CDXYChartMBS 5058

### 28.20.87 addPVT(height as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Price Volume Trend indicator chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.
See also:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| color | (Mandatory) | The color of the indicator line. |

- 28.20.86 addPVT(height as Integer, ColorValue as color) as CDXYChartMBS 5058

### 28.20.88 addROC(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addROC method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.89 addROC(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5059

### 28.20.89 addROC(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Rate of Change indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.88 addROC(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5059

### 28.20.90 addRSI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addRSI method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.91 addRSI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 5060

### 28.20.91 addRSI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Relative Strength Index indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.90 addRSI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5059

### 28.20.92 addSimpleMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addSimpleMovingAvg method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.93 addSimpleMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS 5061

### 28.20.93 addSimpleMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a simple moving average line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The moving average period |
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.92 addSimpleMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS 5060

### 28.20.94 addSlowStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addSlowStochastic method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.95 addSlowStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS 5061

### 28.20.95 addSlowStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as Integer, ColorValue2 as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Slow Stochastic indicator chart.
**Notes:** Arguments:

Return Value
A CDXYChartMBS object representing the chart created.
See also:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The period to compute the %K line. |
| period2 | (Mandatory) | The period to compute the %D line. |
| color1 | (Mandatory) | The color of the %K line. |
| color2 | (Mandatory) | The color of the %D line. |

- 28.20.94 addSlowStochastic(height as Integer, period1 as Integer, period2 as Integer, ColorValue1 as color, ColorValue2 as color) as CDXYChartMBS 5061

### 28.20.96 addStdDev(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addStdDev method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.97 addStdDev(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS 5062

### 28.20.97 addStdDev(height as Integer, period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Moving Standard Deviation indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.96 addStdDev(height as Integer, period as Integer, ColorValue as color) as CDXYChartMBS 5062

### 28.20.98 addStochRSI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addStochRSI method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.99 addStochRSI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 5063

### 28.20.99 addStochRSI(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Stochastic RSI indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.98 addStochRSI(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5063

### 28.20.100 addThreshold(chart as CDXYChartMBS, layer as CDLineLayerMBS, topRange as Double, topColor as color, bottomRange as Double, bottomColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addThreshold method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.101 addThreshold(chart as CDXYChartMBS, layer as CDLineLayerMBS, topRange as Double, topColor as Integer, bottomRange as Double, bottomColor as Integer) 5064

### 28.20.101 addThreshold(chart as CDXYChartMBS, layer as CDLineLayerMBS, topRange as Double, topColor as Integer, bottomRange as Double, bottomColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an upper/lower threshold range to an existing indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The indicator chart to add the threshold range to. |
| layer | (Mandatory) | The line layer that the threshold range applies to. |
| topRange | (Mandatory) | The upper threshold. |
| topColor | (Mandatory) | The color to fill the region of the line that is above the upper threshold. |
| bottomRange | (Mandatory) | The lower threshold. |
| bottomColor | (Mandatory) | The color to fill the region of the line that is below the lower threshold. |

See also:

- 28.20.100 addThreshold(chart as CDXYChartMBS, layer as CDLineLayerMBS, topRange as Double, topColor as color, bottomRange as Double, bottomColor as color) 5063

### 28.20.102 addTriMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTriMovingAvg method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.103 addTriMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS 5065

### 28.20.103 addTriMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a triangular moving average line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The moving average period |
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.102 addTriMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS 5064

### 28.20.104 addTRIX(height as Integer, Period as Integer, ColorValue as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTRIX method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.105 addTRIX(height as Integer, Period as Integer, ColorValue as Integer) as CDXYChartMBS 5065

### 28.20.105 addTRIX(height as Integer, Period as Integer, ColorValue as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a TRIX indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.104 addTRIX(height as Integer, Period as Integer, ColorValue as color) as CDXYChartMBS 5065

### 28.20.106 addTypicalPrice(ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTypicalPrice method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.107 addTypicalPrice(ColorValue as Integer) as CDLineLayerMBS 5066

### 28.20.107 addTypicalPrice(ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a typical price line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.106 addTypicalPrice(ColorValue as color) as CDLineLayerMBS 5066

### 28.20.108 addUltimateOscillator(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addUltimateOscillator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.109 addUltimateOscillator(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 5067


### 28.20.109 addUltimateOscillator(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Ultimate Oscillator indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period1 | (Mandatory) | The first moving average period to compute the indicator. |
| period2 | (Mandatory) | The second moving average period to compute the indicator. |
| period3 | (Mandatory) | The third moving average period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.108 addUltimateOscillator(height as Integer, period1 as Integer, period2 as Integer, period3 as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5066

### 28.20.110 addVolBars(height as Integer, upColor as color, downColor as color, flatColor as color) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addVolBars method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.111 addVolBars(height as Integer, upColor as Integer, downColor as Integer, flatColor as Integer) as CDBarLayerMBS 5068

### 28.20.111 addVolBars(height as Integer, upColor as Integer, downColor as Integer, flatColor as Integer) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a volume bar chart layer on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the bar chart layer in pixels. |
| upColor | (Mandatory) | The color to used on an 'up' day. An 'up' day is a day where the closing price is higher than that of the previous day. |
| downColor | (Mandatory) | The color to used on a 'down' day. A 'down' day is a day where the closing price is lower than that of the previous day. |
| flatColor | (Mandatory) | The color to used on a 'flat' day. A 'flat' day is a day where the closing price is the same as that of the previous day. |

Return Value
A CDBarLayerMBS object representing the bar layer created.
See also:

- 28.20.110 addVolBars(height as Integer, upColor as color, downColor as color, flatColor as color) as CDBarLayerMBS 5067

### 28.20.112 addVolIndicator(height as Integer, upColor as color, downColor as color, flatColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addVolIndicator method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.113 addVolIndicator(height as Integer, upColor as Integer, downColor as Integer, flatColor as Integer) as CDXYChartMBS 5068

### 28.20.113 addVolIndicator(height as Integer, upColor as Integer, downColor as Integer, flatColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Volume indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| upColor | (Mandatory) | The color to used on an 'up' day. An 'up' day is a day where the closing price is higher than that of the previous day. |
| downColor | (Mandatory) | The color to used on a 'down' day. A 'down' day is a day where the closing price is lower than that of the previous day. |
| flatColor | (Mandatory) | The color to used on a 'flat' day. A 'flat' day is a day where the closing price is the same as that of the previous day. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.112 addVolIndicator(height as Integer, upColor as color, downColor as color, flatColor as color) as CDXYChartMBS 5068

### 28.20.114 addWeightedClose(ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addWeightedClose method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.115 addWeightedClose(ColorValue as Integer) as CDLineLayerMBS 5069

### 28.20.115 addWeightedClose(ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a weighted close line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.114 addWeightedClose(ColorValue as color) as CDLineLayerMBS 5069

### 28.20.116 addWeightedMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addWeightedMovingAvg method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.117 addWeightedMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS 5070

### 28.20.117 addWeightedMovingAvg(period as Integer, ColorValue as Integer) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a weighted moving average line on the main chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| period | (Mandatory) | The moving average period |
| color | (Mandatory) | The color of the line. |

Return Value
A CDLineLayerMBS object representing the line created.
See also:

- 28.20.116 addWeightedMovingAvg(period as Integer, ColorValue as color) as CDLineLayerMBS 5070

### 28.20.118 addWilliamR(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addWilliamR method, but uses color instead of integer data type for passing color values.
See also:

- 181.5.167 addWilliamR(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS 22065

### 28.20.119 addWilliamR(height as Integer, period as Integer, ColorValue as Integer, range as Double, upColor as Integer, downColor as Integer) as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a William %R indicator chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the indicator chart in pixels. |
| period | (Mandatory) | The period to compute the indicator. |
| color | (Mandatory) | The color of the indicator line. |
| range | (Mandatory) | The distance between the middle line and the upper and lower threshold lines. |
| upColor | (Mandatory) | The fill color when the indicator exceeds the upper threshold line. |
| downColor | (Mandatory) | The fill color when the indicator falls below the lower threshold line. |

Return Value
A CDXYChartMBS object representing the chart created.
See also:

- 28.20.118 addWilliamR(height as Integer, period as Integer, ColorValue as color, range as Double, upColor as color, downColor as color) as CDXYChartMBS 5070

### 28.20.120 Constructor(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new FinanceChart object.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. The height will be automatically determined as the chart is built. |

### 28.20.121 currentChart as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current chart of this finance chart.
**Notes:** While you add parts to the finance chart, you can access the last one here.

### 28.20.122 enableAntiAlias(antiAlias as boolean)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables/Disables anti-alias.
**Notes:** Enabling anti-alias makes the line smoother. Disabling anti-alias make the chart file size smaller, and so can be downloaded faster through the Internet. The default is to enable anti-alias.

Arguments:

| Argument | Default | Description |
|---|---|---|
| antiAlias | (Mandatory) | True to enable anti-alias. False to disable anti-alias. |

### 28.20.123 getToolTipDateFormat as string

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the date/time format string to use for tool tips.
**Notes:** The format string returned will be one of the format strings specified when calling CDFinanceChartMBS.setToolTipDateFormat based on data point spacing, or the equivalent default value. The format string may then be used in other ChartDirector functions such as CDBaseChartMBS.getHTMLImageMap for producing image maps.

Returns the date/time format string to use for tool tips.

### 28.20.124 mainChart as CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the main chart of this finance chart.

### 28.20.125 setAxisOnRight(b as Boolean)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether the main y-axis is on right of left side of the plot area.
**Notes:** The default is on right.

Arguments:

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value means the y-axis is on right. A false value means the y-axis is on left. |

### 28.20.126 setData(timeStamps() as Double, highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, volData() as Double, extraPoints as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data to be used in the chart.
**Notes:** If some of the data are not available, some artificial values should be used. For example, if the high and low values are not available, you may use closeData as highData and lowData.

Arguments:

| Argument | Default | Description |
|---|---|---|
| timeStamps | (Mandatory) | An array of dates/times for the time intervals. |
| highData | (Mandatory) | The high values in the time intervals. |
| lowData | (Mandatory) | The low values in the time intervals. |
| openData | (Mandatory) | The open values in the time intervals. |
| closeData | (Mandatory) | The close values in the time intervals. |
| volData | (Mandatory) | The volume values in the time intervals. |
| extraPoints | (Mandatory) | The number of leading time intervals that are not displayed in the chart. These intervals are typically used for computing indicators that require extra leading data, such as moving averages. |

### 28.20.127 setDateLabelFormat(yearFormat as string, firstMonthFormat as string, otherMonthFormat as string, firstDayFormat as string, otherDayFormat as string, firstHourFormat as string, otherHourFormat as string)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the date/time formats to use for the x-axis labels under various cases.
**Notes:** See Parameter Substitution and Formatting on the syntax of ChartDirector format strings.

Arguments:

| Argument | Default | Description |
|---|---|---|
| yearFormat | (Mandatory) | The format for displaying labels on an axis with yearly ticks. The default is " { value \| yyyy } ". |
| firstMonthFormat | (Mandatory) | The format for displaying labels on an axis with monthly ticks. This parameter applies to the first available month of a year (usually January) only, so it can be formatted differently from the other labels. The default is "<*font=bold*>{ value \| mmm yy } ". |
| otherMonthFormat | (Mandatory) | The format for displaying labels on an axis with monthly ticks. This parameter applies to months other than the first available month of a year. The default is " { value \| mmm } ". |
| firstDayFormat | (Mandatory) | The format for displaying labels on an axis with daily ticks. This parameter applies to the first available day of a month only, so it can be formatted differently from the other labels. The default is "<*font=bold*>{ value \| d mmm } ". |
| otherDayFormat | (Mandatory) | The format for displaying labels on an axis with daily ticks. This parameter applies to days other than the first available day of a month. The default is " { value \| d } ". |
| firstHourFormat | (Mandatory) | The format for displaying labels on an axis with hourly resolution. This parameter applies to the first tick of a day only, so it can be formatted differently from the other labels. The default is "<*font=bold*>{ value \| d mmm<*br*>h:nna } ". |
| otherHourFormat | (Mandatory) | The format for displaying labels on an axis with hourly. resolution. This parameter applies to ticks at hourly boundaries, except the first tick of a day. The default is " { value \| h:nna } ". |

### 28.20.128 setDateLabelSpacing(labelSpacing as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the minimum label spacing between two labels on the time axis.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| labelSpacing | (Mandatory) | The label spacing in pixels. The default is 50 pixels. |

### 28.20.129 setLegendStyle(font as string, fontSize as Double, fontColor as color, bgColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLegendStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.130 setLegendStyle(font as string, fontSize as Double, fontColor as Integer, bgColor as Integer) 5075

### 28.20.130 setLegendStyle(font as string, fontSize as Double, fontColor as Integer, bgColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets legend font style and background color.
**Notes:** The default is Arial 8 pt black font on a semi-transparent light grey (80CCCCCC) background.

Arguments:

| Argument | Default | Description |
|---|---|---|
| font | (Mandatory) | The font of the legend text. |
| fontSize | (Mandatory) | The font size of the legend text in points. |
| fontColor | (Mandatory) | The color of the legend text. |
| bgColor | (Mandatory) | The background color of the legend box. |

See also:

- 28.20.129 setLegendStyle(font as string, fontSize as Double, fontColor as color, bgColor as color) 5074

### 28.20.131 setLogScale(b as Boolean)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determines if log scale should be used for the main chart.
**Notes:** The default is to use linear scale.

Arguments:

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value means using log scale. A false value means using linear scale. |

### 28.20.132 setMargins(leftMargin as Integer, topMargin as Integer, rightMargin as Integer, bottomMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins around the plot area.
**Notes:** The default is 40 pixels for the left and right margins, and 30 pixels for the top margin and 35 pixels for the bottom margin.

Arguments:

| Argument | Default | Description |
|---|---|---|
| leftMargin | (Mandatory) | The distance from the left side of the plot area to the left side of the chart. |
| topMargin | (Mandatory) | The distance from the top of the plot area to the top of the chart. |
| rightMargin | (Mandatory) | The distance from the right side of the plot area to the right side of the chart. |
| bottomMargin | (Mandatory) | The distance from the bottom of the plot area to the bottom of the chart. |

### 28.20.133 setNumberLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the number format to use.
**Notes:** The default number format in FinanceChart is "P3". See Parameter Substitution and Formatting on the syntax of ChartDirector format strings.

Arguments:

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format for displaying numbers. |

### 28.20.134 setPercentageAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Label the axis of the main chart in percentage unit.
**Notes:** By default, the axis of the main chart will be labelled in price unit. If a percentage axis is used, the axis will be labelled in percentage unit, with the first visible point of the closing price being 100%.

### 28.20.135 setPlotAreaBorder(borderColor as color, borderGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setPlotAreaBorder method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.136 setPlotAreaBorder(borderColor as Integer, borderGap as Integer) 5077

### 28.20.136 setPlotAreaBorder(borderColor as Integer, borderGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the plot area border color and the gap distance between charts.
**Notes:** The default is a grey (888888) border with two 2 pixels gap between charts.

Arguments:

| Argument | Default | Description |
|---|---|---|
| borderColor | (Mandatory) | The plot area border color. |
| borderGap | (Mandatory) | The distance between charts. |

See also:

- 28.20.135 setPlotAreaBorder(borderColor as color, borderGap as Integer) 5076

### 28.20.137 setPlotAreaStyle(bgColor as color, majorHGridColor as color, majorVGridColor as color, minorHGridColor as color, minorVGridColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setPlotAreaStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.138 setPlotAreaStyle(bgColor as Integer, majorHGridColor as Integer, majorVGridColor as Integer, minorHGridColor as Integer, minorVGridColor as Integer) 5077

### 28.20.138 setPlotAreaStyle(bgColor as Integer, majorHGridColor as Integer, majorVGridColor as Integer, minorHGridColor as Integer, minorVGridColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the plot area background and grid colors.
**Notes:** The default is a white background with light grey (DDDDDD) grid lines.

Arguments:

See also:

| Argument | Default | Description |
|---|---|---|
| bgColor | (Mandatory) | The plot area background color. |
| majorHGridColor | (Mandatory) | Major horizontal grid color. |
| majorVGridColor | (Mandatory) | Major vertical grid color. |
| minorHGridColor | (Mandatory) | Minor horizontal grid color. In current version, minor horizontal grid is not used. |
| minorVGridColor | (Mandatory) | Minor vertical grid color. |

- 28.20.137 setPlotAreaStyle(bgColor as color, majorHGridColor as color, majorVGridColor as color, minorHGridColor as color, minorVGridColor as color) 5077

### 28.20.139 setToolTipDateFormat(monthFormat as string, dayFormat as string, hourFormat as string)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the date/time formats to use for the tool tips under various cases.
**Notes:** See Parameter Substitution and Formatting on the syntax of ChartDirector format strings.

Arguments:

| Argument | Default | Description |
|---|---|---|
| monthFormat | (Mandatory) | The tool tip format to use if the data point spacing is one or more months (more than 30 days). The default is " [ { xLabel \| mmm yyyy } ] ". |
| dayFormat | (Mandatory) | The tool tip format to use if the data point spacing is 1 day to less than 30 days. The default is " [ { xLabel \| mmm d, yyyy } ] ". |
| hourFormat | (Mandatory) | The tool tip format to use if the data point spacing is less than 1 day. The default is " [ { xLabel \| mmm d, yyyy hh:nn:ss } ] ". |

### 28.20.140 setXAxisStyle(font as string, fontSize as Double, fontColor as color, fontAngle as Double)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setXAxisStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.141 setXAxisStyle(font as string, fontSize as Double, fontColor as Integer, fontAngle as Double) 5079

### 28.20.141 setXAxisStyle(font as string, fontSize as Double, fontColor as Integer, fontAngle as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets x-axis label style.
**Notes:** The default is Arial 8 pt black color as font with no text rotation.

Arguments:

| Argument | Default | Description |
|---|---|---|
| font | (Mandatory) | The font of the axis labels. |
| fontSize | (Mandatory) | The font size of the axis labels in points. |
| fontColor | (Mandatory) | The color of the axis labels. |
| fontAngle | (Mandatory) | The rotation of the axis labels. |

See also:

- 28.20.140 setXAxisStyle(font as string, fontSize as Double, fontColor as color, fontAngle as Double) 5078

### 28.20.142 setYAxisStyle(font as string, fontSize as Double, fontColor as color, bgColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setYAxisStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.20.143 setYAxisStyle(font as string, fontSize as Double, fontColor as Integer, bgColor as Integer) 5079

### 28.20.143 setYAxisStyle(font as string, fontSize as Double, fontColor as Integer, bgColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets y-axis label style.
**Notes:** The default is Arial 8 pt black color, with 14 pixels margin.

Arguments:

| Argument | Default | Description |
|---|---|---|
| font | (Mandatory) | The font of the axis labels. |
| fontSize | (Mandatory) | The font size of the axis labels in points. |
| fontColor | (Mandatory) | The color of the axis labels. |
| axisMargin | (Mandatory) | The margin at the top of the y-axis in pixels (to leave space for the legend box). |

See also:

- 28.20.142 setYAxisStyle(font as string, fontSize as Double, fontColor as color, bgColor as color) 5079

### 28.20.144 Screenshots

### 28.20.145 finance.jpg

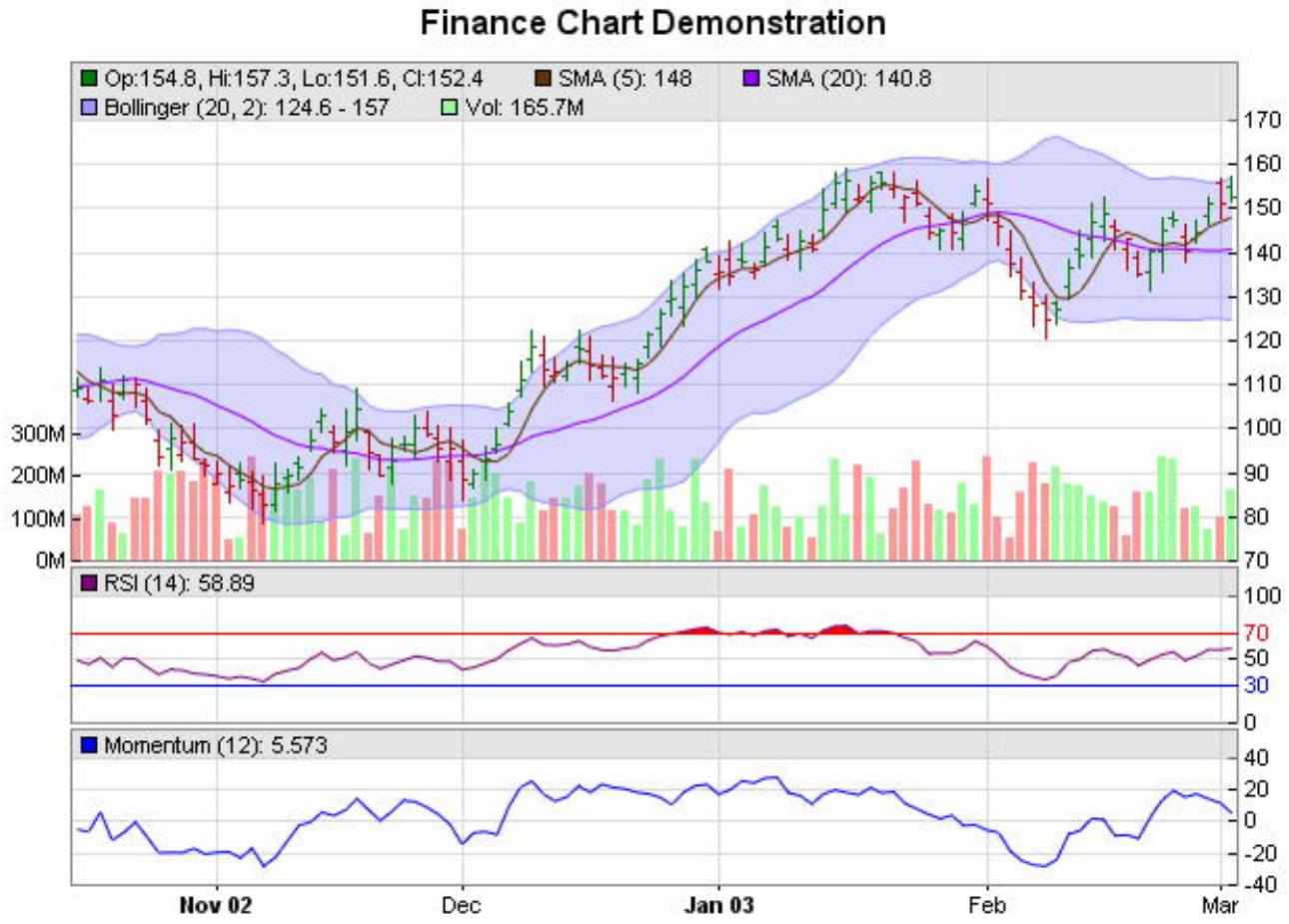


**Function:** A finance chart created using ChartDirector with the CDFinanceChartMBS class.

### 28.20.146 finance2.jpg

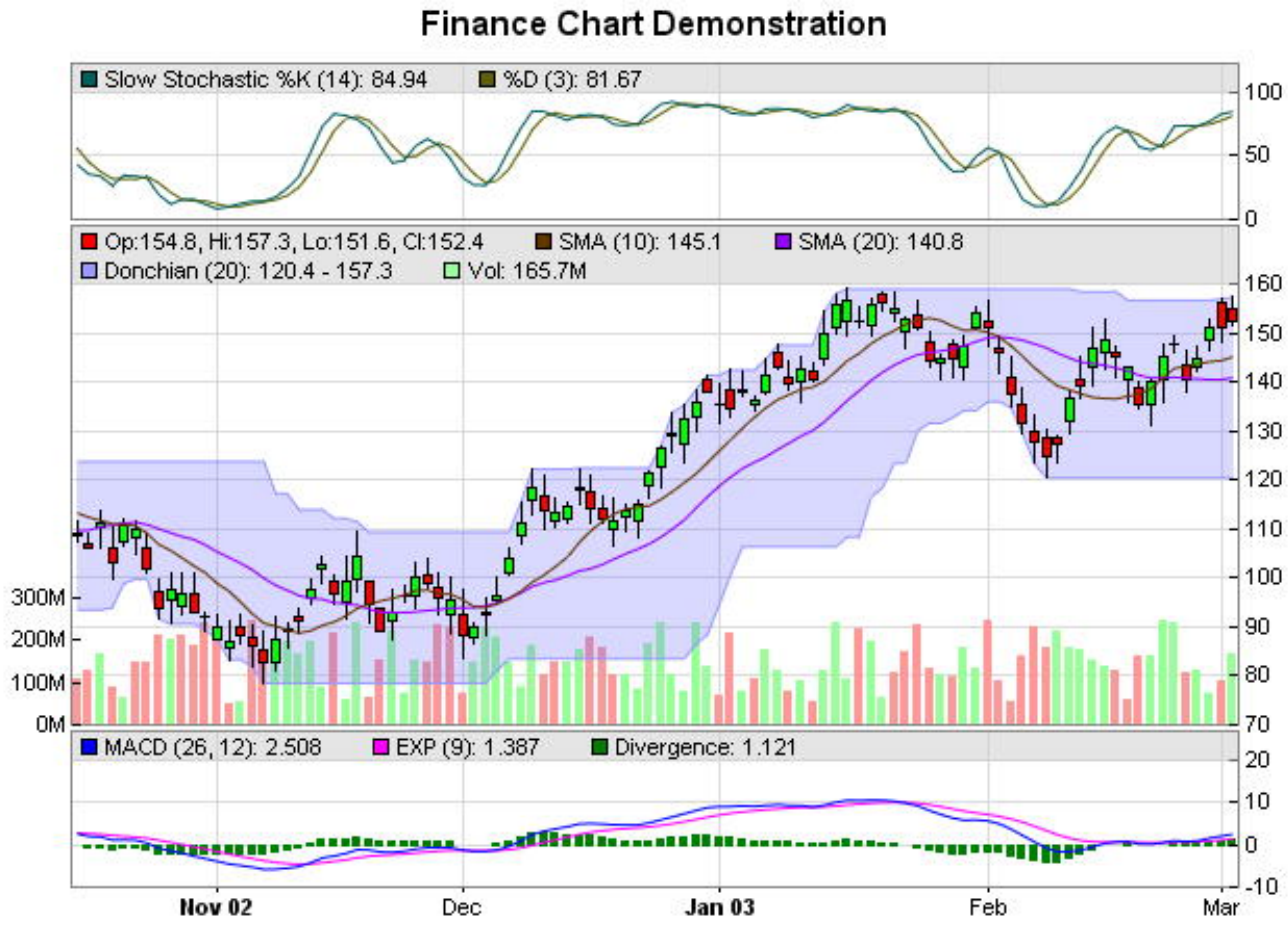


**Function:** A finance chart created using ChartDirector with the CDFinanceChartMBS class.

## 28.21 class CDFinanceSimulatorMBS

### 28.21.1 class CDFinanceSimulatorMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FinanceSimulator is a utility class to produce tables with random numbers that look like valid financial data series.
**Notes:** It facilitates testing and demonstrating ChartDirector financial charts without needing a real database table.

### 28.21.2 Methods

### 28.21.3 Constructor(seed as Integer, startTime as Double, endTime as Double, resolution as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a FinanceSimulator object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| seed | (Mandatory) | The seed to be used in the random number generator. |
| startTime | (Mandatory) | The start date/time of the financial date series. |
| endTime | (Mandatory) | The end date/time of the financial date series. |
| resolution | (Mandatory) | The resolution of the financial data series in seconds. For example, a value of 86400 means daily data (1 day = 86400 seconds). A value of 7 * 86400 means weekly data. A value of 30 * 86400 means monthly data. |

See also:

- 28.21.4 Constructor(seed as string, startTime as Double, endTime as Double, resolution as Integer) 5083

### 28.21.4 Constructor(seed as string, startTime as Double, endTime as Double, resolution as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a FinanceSimulator object.
**Notes:**

See also:

| Argument | Default | Description |
|---|---|---|
| seed | (Mandatory) | The seed to be used in the random number generator. |
| startTime | (Mandatory) | The start date/time of the financial date series. |
| endTime | (Mandatory) | The end date/time of the financial date series. |
| resolution | (Mandatory) | The resolution of the financial data series in seconds. For example, a value of 86400 means daily data (1 day = 86400 seconds). A value of 7 * 86400 means weekly data. A value of 30 * 86400 means monthly data. |

- 28.21.3 Constructor(seed as Integer, startTime as Double, endTime as Double, resolution as Integer) 5083

### 28.21.5 getCloseData as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the close data series.

### 28.21.6 getHighData as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the high data series.

### 28.21.7 getLowData as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the low data series.

### 28.21.8 getOpenData as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the open data series.

### 28.21.9 getTimeStamps as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the timestamps of the data series.

### 28.21.10 getVolData as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the volume data series.

## 28.22 class CDHLOCLayerMBS

### 28.22.1 class CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The HLOCLayer class represents high-low-open-close layers.
**Notes:** Subclass of the CDBaseBoxLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.22.2 Methods

### 28.22.3 setColorMethod(colorMethod as Integer, riseColor as color, fallColor as color, leadValue as Double = -1.7E308)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColorMethod method, but uses color instead of integer data type for passing color values.
See also:

- 28.22.4 setColorMethod(colorMethod as Integer, riseColor as Integer, fallColor as Integer = -1, leadValue as Double = -1.7E308) 5086

### 28.22.4 setColorMethod(colorMethod as Integer, riseColor as Integer, fallColor as Integer = -1, leadValue as Double = -1.7E308)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the coloring method for the HLOC symbols.
**Notes:** See XYChart.addHLOCLayer for the supported coloring methods for HLOC symbols.

| Argument | Default | Description |
|---|---|---|
| colorMethod | (Mandatory) | The method to color the HLOC layer. Please refer to XYChart.addHLOCLayer3 for the supported coloring methods. |
| riseColor | (Mandatory) | The color to be used on an "up" day. |
| fallColor | -1 | The color to be used on a "down" day. The default value of -1 means it is the same as the riseColor. |
| leadValue | [ -Infinity ] | The lead value to act as the closing pricing before the first day, so as to determine if the first day is an "up" or "down" day. |

See also:

- 28.22.3 setColorMethod(colorMethod as Integer, riseColor as color, fallColor as color, leadValue as Double = -1.7E308) 5086

## 28.23 class CDImageMapHandlerMBS

### 28.23.1 class CDImageMapHandlerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImageMapHandler is a utility class to handle image maps in HTML format (that is, as <AREA>tags).
**Notes:** It determines if a given point is on a hot spot as defined by the image map, and retrieves the hot spot parameters.

The BaseChart.getHTMLImageMap method can be used to automatically generate image maps for charts automatically.

The advantages of using HTML image map format is that it is easy for developers to customize the hot spots. For example, one can create custom buttons in the chart image by drawing custom text boxes, and then create custom image maps to define the text boxes as hot spots. These custom image maps can be appended to the image maps generated by BaseChart.getHTMLImageMap using simple string concatenation.

ImageMapHandler will process the various attributes of the HTML <AREA> tags as follows:

AttributeDescription

| | |
|---|---|
| coords | This attribute defines the position and shape of the hot spot. |
| href | The URL specified in this attribute will become the attributes of the hot spot. The path portion of the URL will become the path attribute, while the query parameters will become the attributes of the hot spot as is. |
| title | This attribute defines the tool tip text to display when the mouse moves over and stops on the hot spot. |

### 28.23.2 Methods

### 28.23.3 Constructor(ImageMap as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Constructs an image map handler object for the given image map.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| imageMap | (Mandatory) | A text string representing the image map in HTML format. |

### 28.23.4 getHotSpot(xCoordinate as double, yCoordinate as double) as integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the hot spot under the given point as the current hot spot.
**Notes:** This method will retrieve the hot spot under the given point as the "current hot spot". Its attributes can then be retrieved using ImageMapHandler.getKey, ImageMapHandler.getValue and ImageMapHandler.getValue2.

This method returns an integer representing the hot spot, or -1 if the point is not over any hot spot. Each hot spot region is represented by a unique integer, which can be any arbitrary number. The number is mainly used to determine if the cursor has changed from one hot spot to another hot spot.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of a point of which the hot spot is to be retrieved. |
| y | (Mandatory) | The y coordinate of a point of which the hot spot is to be retrieved. |

Return Value
An integer representing the hot spot, or -1 if the given point is not over any hot spot.

### 28.23.5 getKey(i as Integer) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the key of an attribute of the current hot spot.
**Notes:** Each hot spot is associated with an arbitrary number of attributes, in which each attribute consists of a key and a value. This method returns the key of the (i + 1)th attribute. (The first attribute is 0, while the nth attribute is n - 1.)

If the argument i is equal or larger than the number of attributes, an null string will be returned. This behaviour can be used to enumerate the attributes and to determine how many attributes are associated for the hot spot.

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The index of the attribute to retrieve (index of first attribute is 0). |

Return Value

A string representing the key of the attribute, or null if there is no such attribute.

### 28.23.6 getValue(i as Integer) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the value of an attribute of the current hot spot by using its numeric index.
**Notes:** Each hot spot is associated with an arbitrary number of attributes, in which each attribute consists of a key and a value. This method returns the value of the (i + 1)th attribute. (The first attribute is 0, while the nth attribute is n - 1.)

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The index of the attribute to retrieve (index of first attribute is 0). |

Return Value
A string representing the value of the attribute, or null if there is no such attribute.
See also:

- 28.23.7 getValue(key as string) as string 5090

### 28.23.7 getValue(key as string) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the value of an attribute of the current hot spot by using its key.
**Notes:** Each hot spot is associated with an arbitrary number of attributes, in which each attribute consists of a key and a value. This method returns the value of the attribute given the key.

| Argument | Default | Description |
|---|---|---|
| key | (Mandatory) | A text string representing the key of the attribute. |

Return Value
A string representing the value of the attribute, or null if there is no such attribute.
See also:

- 28.23.6 getValue(i as Integer) as string 5090

# 28.24 class CDInterLineLayerMBS

## 28.24.1 class CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The InterLineLayer class represents interline layers.
**Notes:** Interline layers are used to color the region between two lines. The lines can come from a variety of layer types, such as line layers, spline layers, step line layers, trend layers or axis mark lines.
Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.24.2 Methods

## 28.24.3 setGapColor(gapColor12 as Color, gapColor21 as Color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGapColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.24.4 setGapColor(gapColor12 as Integer, gapColor21 as Integer = -1) 5091

## 28.24.4 setGapColor(gapColor12 as Integer, gapColor21 as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color used to fill the area under NoValue data points.
**Notes:** By default, if there are NoValue data points on the lines, ChartDirector will interpolate across the points. The region will remain continuous.

This method can be used to set up an alternative colors to represent the regions at NoValue data point positions. In particular, if the colors are set to Transparent, the NoValue data points will result in gaps in the fill region.

See also:

- 28.24.3 setGapColor(gapColor12 as Color, gapColor21 as Color) 5091

| Argument | Default | Description |
|---|---|---|
| gapColor12 | (Mandatory) | The color used to fill the region under NoValue positions when value of the first line is greater of the value of the second line. |
| gapColor21 | -1 | The color used to fill the region under NoValue positions when value of the second line is greater of the value of the first line. The default value of -1 means it is the same as gapColor12. |

## 28.25 class CDLayerMBS

### 28.25.1 class CDLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Layer class is the base class for all XYChart layer classes.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Release notes for SQL or ChartDirector?
- MBS Real Studio Plugins, version 11.3pr5

**Xojo Developer Magazine**

- 18.5, page 76: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.25.2 Methods

### 28.25.3 addCustomAggregateLabel(dataItem as Integer, label as string, font as string = """, fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom aggregate label to an aggregated object.
**Notes:** Aggregate data labels applies to layer types that contains "aggregated data", such as stacked bar layer and stacked area layer. In these layer types, data labels (see Layer.setDataLabelStyle) represents a single data item, while aggregate labels represents the stacked object.

See Font Specification for details on various font attributes.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.25.4 addCustomAggregateLabel(dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5094

| Argument | Default | Description |
|---|---|---|
| dataItem | (Mandatory) | The index of the aggregated object. The first aggregated object is 0, while the nth aggregated object is (n - 1). |
| label | (Mandatory) | A text string representing the custom aggregate label. Parameter Substitution and Formatting is supported. |
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

### 28.25.4 addCustomAggregateLabel(dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCustomAggregateLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.3 addCustomAggregateLabel(dataItem as Integer, label as string, font as string = "", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5093

### 28.25.5 addCustomDataLabel(dataSet as Integer, dataItem as Integer, label as string, font as string = "", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom data label to a data point.
**Notes:** Data labels are text used label data points in the layer. Please refer to Layer.setDataLabelStyle for a more detail description.

See Font Specification for details on various font attributes.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.25.6 addCustomDataLabel(dataSet as Integer, dataItem as Integer, label as string, font as string,

| Argument | Default | Description |
|---|---|---|
| dataSet | (Mandatory) | The data set number for the data point. The first data set is 0, while the nth data set is (n - 1). |
| dataItem | (Mandatory) | The data point number for the data point within the data set. The first data point is 0, while the nth data point is (n - 1). |
| label | (Mandatory) | A text string representing the data label. Parameter Substitution and Formatting is supported. |
| font | "" | The font used to draw the label. |
| fontSize | 8 | The font size used to draw the label. |
| fontColor | TextColor | The color used to draw the label. |
| fontAngle | 0 | The rotation angle of the label. |

fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5095

### 28.25.6 addCustomDataLabel(dataSet as Integer, dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCustomDataLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.5 addCustomDataLabel(dataSet as Integer, dataItem as Integer, label as string, font as string = "", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5094

### 28.25.7 addCustomGroupLabel(dataGroup as Integer, dataItem as Integer, label as string, font as string ="", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom data group label to object representing the group.
**Notes:** Data group label applies to layer types that may represent data groups. See Layer.addDataGroup on how data groups are created and the layer types that support data groups.

See Font Specification for details on various font attributes.

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

| Argument | Default | Description |
|---|---|---|
| dataGroup | (Mandatory) | The data group number for the data point. The first data group is 0, while the nth data group is (n - 1). |
| dataItem | (Mandatory) | The data point number for the data point within the data group. The first data point is 0, while the nth data point is (n - 1). |
| label | (Mandatory) | A text string representing the data label. Parameter Substitution and Formatting is supported. |
| font | "" | The font used to draw the label. |
| fontSize | 8 | The font size used to draw the label. |
| fontColor | TextColor | The color used to draw the label. |
| fontAngle | 0 | The rotation angle of the label. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.25.8 addCustomGroupLabel(dataGroup as Integer, dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5096

### 28.25.8 addCustomGroupLabel(dataGroup as Integer, dataItem as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCustomGroupLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.7 addCustomGroupLabel(dataGroup as Integer, dataItem as Integer, label as string, font as string ="", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5095

### 28.25.9 addDataGroup(name as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a new data group.
**Notes:** Currently, only stacked bar layers support data groups for creating "multi-stacked" bars.

In a normal stacked bar layer, all data sets are stacked on top of one another, creating one stacked bar per x-axis position. If data grouping is used, data sets within the same data group with be stacked up. So there

may be multiple stacked bars in each x-axis position. These stacked bars are drawn side by side.

When you add a data set using Layer.addDataSet, the data set will belong to the current data group. The addDataGroup method can be used to open a new data group, so that subsequent data sets will belong to that new group.

You may associate a name with a data group. The name can then be used in data labels or image maps to identify the data group.

| Argument | Default | Description |
|---|---|---|
| name | "" | Name of the data group. |

### 28.25.10 addDataSet(data as CDArrayMBS, colorvalue as color, name as string = "") as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addDataSet method, but uses color instead of integer data type for passing color values.
See also:


- 28.25.11 addDataSet(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5097
- 28.25.12 addDataSet(data() as Double, colorvalue as color, name as string = "") as CDDataSetMBS 5098
- 28.25.13 addDataSet(data() as Double, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5098


### 28.25.11 addDataSet(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data set to the chart layer.
**Notes:**

Return Value
A DataSet object representing the data set added. You may use the methods of this object to fine-tune how the data set is drawn on the chart.
See also:

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the data item. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |


- 28.25.10 addDataSet(data as CDArrayMBS, colorvalue as color, name as string = "") as CDDataSetMBS 5097
- 28.25.12 addDataSet(data() as Double, colorvalue as color, name as string = "") as CDDataSetMBS 5098
- 28.25.13 addDataSet(data() as Double, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5098


### 28.25.12 addDataSet(data() as Double, colorvalue as color, name as string = "") as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addDataSet method, but uses color instead of integer data type for passing color values.
See also:


- 28.25.10 addDataSet(data as CDArrayMBS, colorvalue as color, name as string = "") as CDDataSetMBS 5097
- 28.25.11 addDataSet(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5097
- 28.25.13 addDataSet(data() as Double, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5098


### 28.25.13 addDataSet(data() as Double, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data set to the chart layer.
**Notes:**

Return Value
A DataSet object representing the data set added. You may use the methods of this object to fine-tune how the data set is drawn on the chart.
See also:

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the data item. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |


- 28.25.10 addDataSet(data as CDArrayMBS, colorvalue as color, name as string = "") as CDDataSetMBS 5097
- 28.25.11 addDataSet(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "") as CDDataSetMBS 5097
- 28.25.12 addDataSet(data() as Double, colorvalue as color, name as string = "") as CDDataSetMBS 5098


### 28.25.14 addExtraField(numbers() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of numbers/dates to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the layer object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| numbers | (Mandatory) | An array of numbers/dates to be stored inside the layer object. |

See also:


- 28.25.15 addExtraField(texts() as string) 5099


### 28.25.15 addExtraField(texts() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of text to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the layer object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| texts | (Mandatory) | An array of text to be stored inside the layer object. |

See also:

- 28.25.14 addExtraField(numbers() as Double) 5099

### 28.25.16 alignLayer(layer as CDLayerMBS, dataSet as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Aligns the layer with a data set of another bar chart layer in Side layout.
**Notes:** The Side layout is a layout method specific to the bar chart layer. In this layout method, multiple bars belonging to the same x-position are laid out side by side. Thus the bars are not centered exactly on the x-position, but are shifted. The shift amount depends on the data set numbers of the bars.

In some cases, it may be necessary to overlay another layer (eg. a line chart layer, or a box-whisker chart layer) on top of the bars. The alignLayer method ensures the data points are shifted by the same amount as a given data set on a given BarLayer.

| Argument | Default | Description |
|---|---|---|
| layer | (Mandatory) | The BarLayer which contains the bars to synchronize with. |
| dataSet | (Mandatory) | The data set of the bars to synchronize with. |

### 28.25.17 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.25.18 getDataSet(dataSet as Integer) as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the requested DataSet object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| dataSet | (Mandatory) | A data set number, starting from 0. The first data set object is 0, and the nth data set is (n-1). |

Return Value
The requested DataSet object.

### 28.25.19 getDataSetByZ(z as Integer) as CDDataSetMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a DataSet object based on the order in which it is being drawn.
**Notes:** In certain layer types, the data sets are drawn in a certain order. For example, in a line layer, the data sets represent lines and they are drawn one by one. In contrast, for a candlestick layer, the high, low, open and close data sets are combined into candlestick symbols, and there is no specific order on which data sets are drawn.

This method can be used to get the data set based on the order it is being drawn. If the data sets are not drawn in any specific order, this method will return the data sets in the reverse order to which it is added to the layer.

| Argument | Default | Description |
|---|---|---|
| zIndex | (Mandatory) | The z-index of the required data set. The z-index of the first data set drawn is 0. The z-index for the Nth data set drawn is N - 1. |

Returns the DataSet object at the specified z-order.

### 28.25.20 getDataSetCount as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the number of data sets in the layer.
**Notes:** Returns the number of data sets in the layer.

### 28.25.21 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for all data points as represented on the layer.
**Notes:** Please refer to BaseChart.getHTMLImageMap for the detail description of this method.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default.

Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character.

| | | |
|---|---|---|
| extraAttr | "" | A text string to specify additional attributes to add to the <area> tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string containing the image map generated.

### 28.25.22 getImageCoor(dataSet as Integer, dataItem as Integer = &h80000001, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of a data point as represented in the layer as HTML image map attributes.
**Notes:** The image map coordinates will be in the following format:

shape=" [ shape ] " cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] ..."
This format is specially designed so that it can easily be incorporated into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| dataSet | (Mandatory) | The data set number for the data point. The first data set is 0, while the nth data set is (n-1). |
| dataItem | (Mandatory) | The index of the data point within the data set. The first data point is 0, while the nth data point is (n-1). |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the coordinates of the data point as represented in the layer in HTML image map attribute format.

### 28.25.23 getImageCoor2(dataItem as Integer, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of a region containing all data points at the given x-position as HTML image map attributes.
**Notes:** For example, in a stacked bar chart, this method will obtain the image map coordinates of the whole stacked bar, which contains multiple data points at the same x-position.

The image map coordinates will be in the following format:

shape="" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] ..."
This format is specially designed so that it can easily be included into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| dataItem | (Mandatory) | The x-position of the data points. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the image map coordinates of a region containing all data points at the given x-position as HTML image map attributes.

### 28.25.24 getLegendIcon(dataSetNo as Integer) as string

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the textual representation of the legend icon for a data set.
**Notes:** The textual representation can be used in any ChartDirector API that supports the ChartDirector Mark Up Language. A common usage is to insert the icon to a cell in a CDMLTable to label the data series in the table, or to create a custom legend table.

The legend icon is the same legend icon that would be used in the CDLegendBoxMBS. If you modify the icon appearance using the methods of the CDLegendBoxMBS object (such as using CDLegendBoxMBS.setKeyBorder to configure the legend key border), the modification will also apply to the icon returned this method.

Arguments:

| Argument | Default | Description |
|---|---|---|
| dataSetNo | (Mandatory) | The data set for which the legend icon represents. |

Return Value
The textual representation of the legend icon for the data set.

### 28.25.25 getNearestXValue(target as Double) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x data value that is nearest to the specified x pixel coordinate.
**Notes:** This method will search all x data values in the Layer to look for the x data value that is nearest to

the given x coordinate. If there are two x data values equally near to the specified x pixel coordinate, this method will arbitrarily return one of the values.

| Argument | Default | Description |
|---|---|---|
| xCoor | (Mandatory) | The x pixel coordinate to search for. |

Returns the x data value that is nearest to the specified x coordinate.

### 28.25.26 getXCoor(value as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x pixel coordinate of a point given the x data value.
**Notes:** Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

| Argument | Default | Description |
|---|---|---|
| v | (Mandatory) | The x data value. |

Return Value
The x coordinate of the x data value.

### 28.25.27 getXIndexOf(xValue as Double, tolerance as Double = 0) as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the data point index at the specified x data value.
**Notes:** The index can be used in DataSet.getValue and DataSet.getPosition to obtain the y values and positions of the data points for all data sets in the layer.

The tolerance argument is to allow this method to consider data points that are not exactly at xValue, but are within tolerance from it.

If multiple data points at within tolerance, this method will return the index of the data point nearest to xValue. If multiple data points are equally near to xValue, this method will choose one arbitrarily and return its data point index. If no data points are found, this method will return -1.

Returns the data point index of the data point nearest to the specified x data value up to the specified tolerance, or -1 if no data points are found.

| Argument | Default | Description |
|---|---|---|
| xValue | (Mandatory) | The x data value used to look for the data points in order to get the data point index of the nearest data point. |
| tolerance | 0 | The tolerance allowed for for data points that are not exactly at the specified xValue. |

### 28.25.28 getXPosition(i as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x positional value of a data point, as measured on the primary x-axis.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The data point index of the data point. The first data point is 0; the nth data point is (n - 1). |

### 28.25.29 getYCoor(value as Double, axis as boolean=true) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y pixel coordinate of a point given the y data value.
**Notes:** Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

| Argument | Default | Description |
|---|---|---|
| v | (Mandatory) | The y data value. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

For backward compatibility, the axis argument can also be a boolean value. A true value means the primary y-axis. A false value means the secondary y-axis.
Return Value
The y coordinate of the y data value.
See also:

- 28.25.30 getYCoor(value as Double, axis as CDAxisMBS) as Integer 5106

### 28.25.30 getYCoor(value as Double, axis as CDAxisMBS) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y pixel coordinate of a point given the y data value.
**Notes:** Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

| Argument | Default | Description |
|---|---|---|
| v | (Mandatory) | The y data value. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

For backward compatibility, the axis argument can also be a boolean value. A true value means the primary y-axis. A false value means the secondary y-axis.
Return Value
The y coordinate of the y data value.
See also:

- 28.25.29 getYCoor(value as Double, axis as boolean=true) as Integer 5106

### 28.25.31 moveBack(layer as CDLayerMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the layer in front of another layer.
**Notes:** By default, the front to back ordering of the Layer objects are the same as the order in which they are added to the chart. For example, a layer added first will be in front of a layer added last.

This method can be used to move the layer behind another layer.

Arguments:

| Argument | Default | Description |
|---|---|---|
| layer | nil | The Layer for this layer to move behind. A nil object means the layer will be moved behind all current layers. |

### 28.25.32 moveFront(layer as CDLayerMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the layer in front of another layer.
**Notes:** By default, the front to back ordering of the CDLayerMBS objects are the same as the order in

which they are added to the chart. For example, a layer added first will be in front of a layer added last.

This method can be used to move the layer in front of another layer.

Arguments:

| Argument | Default | Description |
|---|---|---|
| layer | nil | The Layer for this layer to move in front of. The default value of null means the layer will be moved in front of all current layers. |

### 28.25.33 set3D(d as Integer = -1, zGap as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the 3D depth of the layer, and the 3D gap between the current layer and the next layer.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| d | -1 | The 3D depth of the layer in pixels. -1 means the 3D depth is automatically calculated. |
| zGap | 0 | The 3D gap between the current layer and the next layer in pixels. |

### 28.25.34 setAggregateLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the aggregate label format.
**Notes:** By default, the aggregate label format is " { value } ". Please refer to Parameter Substitution and Formatting on available parameters and how to format them.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.25.35 setAggregateLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables aggregate labels and sets their styles.
**Notes:** Aggregate data labels applies to layer types that contains "aggregated data", such as stacked bar layer and stacked area layer. In these layer types, data labels (see Layer.setDataLabelStyle) represents a single data item, while aggregate labels represents the stacked object.

See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.25.36 setAggregateLabelStyle(font as string, fontSize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS 5109

### 28.25.36 setAggregateLabelStyle(font as string, fontSize as Double, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setAggregateLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.35 setAggregateLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5108

### 28.25.37 setBaseLine(BaseLine as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the baseline for the data representation.
**Notes:** Certain data representation, such as bars in bar layers and area in area layers, are drawn from a

base line. The base line by default is y = 0.

For example, for a vertical bar layer, the bars start from y = 0 and grow upwards for positive data (assuming the y-axis is not reversed), and downwards for negative data.

This method can be used to modify the base line to other values.

Arguments:

| Argument | Default | Description |
|---|---|---|
| baseLine | (Mandatory) | The value of the base line. |

### 28.25.38 setBorderColor(colorvalue as color, lightingEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the default border color and 3D raised effect when drawing data sets on the layer.
**Notes:** This method only applies to layers that represents data with elements that have borders (e.g. bar layer).

This method affect all data sets. To set the color of one particular data set, use DataSet.setDataColor.

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The border color. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support glassEffect and softLighting effects. |

See also:

- 28.25.39 setBorderColor(colorvalue as Integer, lightingEffect as Integer = 0) 5110

### 28.25.39 setBorderColor(colorvalue as Integer, lightingEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the default border color and 3D raised effect when drawing data sets on the layer.
**Notes:** This method only applies to layers that represents data with elements that have borders (e.g. bar layer).

This method affect all data sets. To set the color of one particular data set, use DataSet.setDataColor.

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The border color. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support glassEffect and softLighting effects. |

See also:

- 28.25.38 setBorderColor(colorvalue as color, lightingEffect as Integer = 0) 5110

### 28.25.40 setDataCombineMethod(m as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the method used to combine multiple data sets in a layer.
**Notes:** This method is used only for layers that can combine multiple data sets in different ways. Some layers can only support a subset of the data combine methods defined below.

ConstantValueDescription

| | | |
|---|---|---|
| Side | 3 | The data sets are combined by plotting the data representation side by side. |
| Stack | 1 | The data sets are combined by stacking up their data representations. |
| Overlay | 0 | The data sets are combined by drawing them independently, overlapping each others. |
| Percentage | 4 | The data sets are combined similar to the Stack method, except that the data is scaled so that each stack always summed up to 100. In other words, the region that a data item occupies in a stack represents the percentage of the data item relative to sum of all the data items in the stack. |

| Argument | Default | Description |
|---|---|---|
| m | (Mandatory) | one of the predefined constants representing the data combine method to use. |

### 28.25.41 setDataLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data label format.
**Notes:** This method affects all data labels in the layer. To set the label format for one particular data set only, use DataSet.setDataLabelFormat.

Data labels are text used label data points in the layer. Please refer to Layer.setDataLabelStyle for a more detail description.

By default, the data label format is " { value } ". Please refer to Parameter Substitution and Formatting on available parameters and how to format them.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.25.42 setDataLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.43 setDataLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5112

### 28.25.43 setDataLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables data labels and sets their styles.
**Notes:** This method affects all data labels in the layer. To set the style for one particular data set only, use DataSet.setDataLabelStyle.

Data labels are text used label data points in the layer. Different layer types put data labels in different positions. For example, in a bar chart, data labels are put at the internal end of the bar. For a line chart, data labels are put above the data points.

For some chart types, the position of the data labels can be manipulated by calling the TextBox.setAlignment method of the TextBox object returned by the setDataLabelStyle method.

See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.25.42 setDataLabelStyle(font as string = "", fontSize as Double = 8, fontcolor as color, fontAngle as Double = 0) as CDTextBoxMBS 5112

### 28.25.44 setHTMLImageMap(url as string, queryFormat as string = "", extraAttr as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Override the default arguments used when generating HTML image map for the layer.
**Notes:** BaseChart.getHTMLImageMap can be used to generate HTML image map for the whole chart. When BaseChart.getHTMLImageMap is used, the image map for all layers will be generated based on the arguments supplied to BaseChart.getHTMLImageMap.

The setHTMLImageMap method can be used to override those arguments for a chart layer, so the image map for that layer can be different.

For a detail description of image maps, please refer to BaseChart.getHTMLImageMap.

| Argument | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global URL as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global URL.

Note that an empty string also means to use the global URL. To specify no URL, use the special keyword " { none } ".

To disable the entire image map, use the special keyword " { disable } ".

| | | |
|---|---|---|
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global query parameters as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global query parameters.

Note that an empty string also means to use the global query parameters. To specify no query parameters, use the special keyword " { none } ".

| | | |
|---|---|---|
| extraAttr | "" | A text string to specify additional attributes to add to the <area> tag. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global additional attributes as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global additional attributes.

Note that an empty string also means to use the global additional attributes. To specify no additional attributes, use the special keyword " { none } ".

### 28.25.45 setLegend(m as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the order of the data set names as appeared in the legend box.
**Notes:** This method is for backward compatibility. It is equivalent to Layer.setLegendOrder(m).

| Argument | Default | Description |
|---|---|---|
| m | (Mandatory) | One of the predefined constants representing the legend entry ordering method for data sets within the layer. |

### 28.25.46 setLegendOrder(dataSetOrder as Integer, layerOrder as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the order of the data set names as appeared in the legend box.
**Notes:** By default, ChartDirector will add named data sets to the the legend box. The ordering of the entries follows the order in which the layers are created. For data sets within the same layer, the ordering follows the order in which the data sets are added.

To support flexible ordering of the legend entries, ChartDirector employs a legend entry priority system. Please refer to LegendBox for details of the legend entry priority system.

The base priority of the layer can be specified using the layerOrder argument. The priority of the data sets within a layer can be modified by using the dataSetOrder argument, which must be one of the following predefined constant.

ConstantValueDescription

| | | |
|---|---|---|
| NormalLegend | 0 | The data set priority is 10 x (data_set_index + 1). Legend entries are ordered in the order with which the data sets are created. |
| ReverseLegend | 1 | The data sets priority is the reverse of the normal data set priority. Legend entries are ordered in the reverse order with which the data sets are created. |
| NoLegend | 2 | The data set names are not added to the legend box at all. |

| Argument | Default | Description |
|---|---|---|
| dataSetOrder | (Mandatory) | One of the predefined constants representing the legend entry ordering method for data sets within the layer. |
| layerOrder | -1 | The base legend entry priority of the layer. The default value of -1 means the priority is 10000 x (layer_index + 1). |

### 28.25.47 setLineWidth(w as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the default line width of lines when drawing data sets on the layer.
**Notes:** This method only applies to layers that employ lines to represent data (e.g. line layer).

This method affect all data sets. To set the line width of one particular data set, use DataSet.setLineWidth.

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The width of the line in pixels. |

### 28.25.48 setUseYAxis(axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine the y-axis to use when drawing the data sets.
**Notes:** This method affects all data sets in the layer. To set the y-axis to use for a particular data set, use DataSet.setUseYAxis.

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The y-axis to use when drawing the data sets. |

### 28.25.49 setUseYAxis2(b as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine if the primary or secondary y-axis should be used when drawing the data sets.
**Notes:** This method affects all data sets in the layer. To set the y-axis to use for a particular data set, use DataSet.setUseYAxis2.

Note: Layer.setUseYAxis is a more general method that can support more than 2 y-axes.

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means the secondary y-axis will be used. A false value means the primary y-axis will be used. |

### 28.25.50 setXData(data as CDArrayMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the x values of the data points in the data sets.
**Notes:** In most ChartDirector XY chart layers, when a data set is added, only the y Values for the data points are needed. For example, in a bar layer, you just need to specify the values of the bars (y values). ChartDirector will automatically layout the bars evenly on the x-axis. You can then specify the labels on the x-axis using Axis.setLabels.

In ChartDirector, this type of x-axis scaling is called ”enumerated” scale. Please refer to Axis.setLabels for a more detail explanation of ”enumerated” scale.

However, in some cases, it may be necessary to specify the x values explicitly. For example, if a chart contains data points that are not evenly distributed on the x-axis, it is necessary to specify the x values explicitly.

It is because enumerated scale always assume the data points are distributed evenly on the x- axis. In this case, the setXData method can be used to specify the x values for the data points.

In general, if the data points are evenly distributed on the x-axis, it is recommended enumerated x-scale be used and no x values are necessary. Even the data points are evenly distributed, except that some data points are missing, it is still possible to use enumerated x-scale by using the NoValue constant to represent missing data points.

On the other hand, if the data points are by its nature not evenly distributed, the x values should be provided explicitly using the setXData method.

Each layer only supports one x values series. All data sets in the layer will use the same x value series. If two data sets have different x values, they should be put in two separate layers.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x value series. |

See also:


- 28.25.51 setXData(data() as Double) 5117
- 28.25.52 setXData(dates() as date) 5118
- 28.25.53 setXData(dates() as dateTime) 5119
- 28.25.54 setXData(minValue as Double, maxValue as Double) 5119


### 28.25.51 setXData(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the x values of the data points in the data sets.
**Notes:** In most ChartDirector XY chart layers, when a data set is added, only the y Values for the data points are needed. For example, in a bar layer, you just need to specify the values of the bars (y values). ChartDirector will automatically layout the bars evenly on the x-axis. You can then specify the labels on the x-axis using Axis.setLabels.

In ChartDirector, this type of x-axis scaling is called ”enumerated” scale. Please refer to Axis.setLabels for a more detail explanation of ”enumerated” scale.

However, in some cases, it may be necessary to specify the x values explicitly. For example, if a chart contains data points that are not evenly distributed on the x-axis, it is necessary to specify the x values explicitly. It is because enumerated scale always assume the data points are distributed evenly on the x- axis. In this

case, the setXData method can be used to specify the x values for the data points.

In general, if the data points are evenly distributed on the x-axis, it is recommended enumerated x-scale be used and no x values are necessary. Even the data points are evenly distributed, except that some data points are missing, it is still possible to use enumerated x-scale by using the NoValue constant to represent missing data points.

On the other hand, if the data points are by its nature not evenly distributed, the x values should be provided explicitly using the setXData method.

Each layer only supports one x values series. All data sets in the layer will use the same x value series. If two data sets have different x values, they should be put in two separate layers.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x value series. |

See also:


- 28.25.50 setXData(data as CDArrayMBS) 5116
- 28.25.52 setXData(dates() as date) 5118
- 28.25.53 setXData(dates() as dateTime) 5119
- 28.25.54 setXData(minValue as Double, maxValue as Double) 5119


### 28.25.52 setXData(dates() as date)

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the x values of the data points in the data sets.
**Notes:** In most ChartDirector XY chart layers, when a data set is added, only the y Values for the data points are needed. For example, in a bar layer, you just need to specify the values of the bars (y values). ChartDirector will automatically layout the bars evenly on the x-axis. You can then specify the labels on the x-axis using Axis.setLabels.

In ChartDirector, this type of x-axis scaling is called ”enumerated” scale. Please refer to Axis.setLabels for a more detail explanation of ”enumerated” scale.

However, in some cases, it may be necessary to specify the x values explicitly. For example, if a chart contains data points that are not evenly distributed on the x-axis, it is necessary to specify the x values explicitly. It is because enumerated scale always assume the data points are distributed evenly on the x- axis. In this

case, the setXData method can be used to specify the x values for the data points.

In general, if the data points are evenly distributed on the x-axis, it is recommended enumerated x-scale be used and no x values are necessary. Even the data points are evenly distributed, except that some data points are missing, it is still possible to use enumerated x-scale by using the NoValue constant to represent missing data points.

On the other hand, if the data points are by its nature not evenly distributed, the x values should be provided explicitly using the setXData method.

Each layer only supports one x values series. All data sets in the layer will use the same x value series. If two data sets have different x values, they should be put in two separate layers.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x value series. |

See also:


- 28.25.50 setXData(data as CDArrayMBS) 5116
- 28.25.51 setXData(data() as Double) 5117
- 28.25.53 setXData(dates() as dateTime) 5119
- 28.25.54 setXData(minValue as Double, maxValue as Double) 5119


### 28.25.53 setXData(dates() as dateTime)

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the x values of the data points in the data sets.
See also:


- 28.25.50 setXData(data as CDArrayMBS) 5116
- 28.25.51 setXData(data() as Double) 5117
- 28.25.52 setXData(dates() as date) 5118
- 28.25.54 setXData(minValue as Double, maxValue as Double) 5119


### 28.25.54 setXData(minValue as Double, maxValue as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the x values of the data points in the data sets as evenly distributed in a range.
**Notes:** This method is most useful when two layers contain data at different x axis scale. An example is a line layer with one data point per minute, and another line layer with one data point per 5 minutes.

In the above example, in one hour, the first layer will have 60 data points, while the second layer will have 12 data points. If enumerated x-scale is used, the x-axis will contain 60 positions evenly distributed. The 60 data points in the first layer will corresponds to the 60 positions in the x-axis, which is correct. However, the 12 data points in the second layer will corresponds to the first 12 positions on the x-axis, which is not the desired result.

Instead, the 12 data points in the second layer should corresponds to positions 0, 5, 10, 15, .... A little thought will review that the 12 data points in the second layer should be distributed evenly among positions 0 - 55. The setXData2 method can be used to inform ChartDirector about the scaling used in the second layer.

| Argument | Default | Description |
|---|---|---|
| minValue | (Mandatory) | The x value of the first point in a data set. |
| maxValue | (Mandatory) | The x value of the last point in the data set. |

See also:

- 28.25.50 setXData(data as CDArrayMBS) 5116
- 28.25.51 setXData(data() as Double) 5117
- 28.25.52 setXData(dates() as date) 5118
- 28.25.53 setXData(dates() as dateTime) 5119

### 28.25.55 xZoneColor(threshold as Double, belowColor as color, aboveColor as color) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other xZoneColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.56 xZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer) as Integer 5120

### 28.25.56 xZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a x-zone color. A x-zone will change from one color to another depending on a threshold value on the x-axis.
**Notes:** For example, if a x-zone color is used as the line color in a line layer, the line will switch from one color to another when its passes through a certain value on the x-axis. Similarly, if a x-zone color is used as the fill color in an area layer, the area will switch from one color to another when it passes through a certain value on the x-axis.

The two colors used in a x-zone color can be other dynamic colors. For example, one color could be a solid color, while the other color could be a dash line color (see !BaseChart.dashLineColor). When this x-zone color is as the line color, the line will change from a solid style to a dash line style when the line passes through a certain value on the x-axis

You may create x-zone colors with more than 2 zones by cascading multiple x-zone colors.

| Argument | Default | Description |
|---|---|---|
| threshold | (Mandatory) | The x value serving as the threshold for switching between two colors. |
| belowColor | (Mandatory) | The color to use when the x-axis value of the pixel is smaller than the threshold. |
| aboveColor | (Mandatory) | The color to use when the x-axis value of the pixel is greater than the threshold. |

Return Value
A 32-bit integer representing the x-zone color.
See also:

- 28.25.55 xZoneColor(threshold as Double, belowColor as color, aboveColor as color) as Integer 5120

### 28.25.57 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as boolean=true) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other yZoneColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.58 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS) as Integer 5122
- 186.3.1 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as boolean=true) as Integer 22276
- 28.25.60 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS) as Integer 5123

### 28.25.58 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other yZoneColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.25.57 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as boolean=true) as Integer 5121
- 186.3.1 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as boolean=true) as Integer 22276
- 28.25.60 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS) as Integer 5123

### 28.25.59 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as boolean=true) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a y-zone color. A y-zone will change from one color to another depending on a threshold value on the y-axis.
**Notes:** For example, if a y-zone color is used as the fill color in an area layer, the area will switch from one color to another when its value is higher than a certain value on the y-axis.

The two colors used in a y-zone color can be other dynamic colors. You may create y-zone colors with more than 2 zones by cascading multiple y-zone colors.

| Argument | Default | Description |
|---|---|---|
| threshold | (Mandatory) | The y value serving as the threshold for switching between two colors. |
| belowColor | (Mandatory) | The color to use when the y-axis value of the pixel is smaller than the threshold. |
| aboveColor | (Mandatory) | The color to use when the y-axis value of the pixel is greater than the threshold. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

For backward compatibility, the axis argument can also be a boolean value. A true value means the primary y-axis. A false value means the secondary y-axis.
Return Value
A 32-bit integer representing the y-zone color.
See also:

- 28.25.57 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as boolean=true) as Integer 5121
- 28.25.58 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS) as Integer 5122
- 28.25.60 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS) as Integer 5123


### 28.25.60 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a y-zone color. A y-zone will change from one color to another depending on a threshold value on the y-axis.
**Notes:** For example, if a y-zone color is used as the fill color in an area layer, the area will switch from one color to another when its value is higher than a certain value on the y-axis.

The two colors used in a y-zone color can be other dynamic colors. You may create y-zone colors with more than 2 zones by cascading multiple y-zone colors.

| Argument | Default | Description |
|---|---|---|
| threshold | (Mandatory) | The y value serving as the threshold for switching between two colors. |
| belowColor | (Mandatory) | The color to use when the y-axis value of the pixel is smaller than the threshold. |
| aboveColor | (Mandatory) | The color to use when the y-axis value of the pixel is greater than the threshold. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

For backward compatibility, the axis argument can also be a boolean value. A true value means the primary y-axis. A false value means the secondary y-axis.
Return Value
A 32-bit integer representing the y-zone color.
See also:


- 28.25.57 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as boolean=true) as Integer 5121
- 28.25.58 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS) as Integer 5122
- 186.3.1 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as boolean=true) as Integer 22276

## 28.26 class CDLegendBoxMBS

### 28.26.1 class CDLegendBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class LegendBox represents legend boxes.
**Notes:** Subclass of the CDTextBoxMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Chart Diagrams with Xojo

**Xojo Developer Magazine**

- 7.5, page 32: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin
- 7.4, page 34: Easy Charts and Graphs, Using the ChartDirector Plugin
- 20.4, page 40: PDF Pie Charts, Adding Xojo Charts to Your PDFs by Stefanie Juchmes
- 20.1, page 46: Cool Charts and Heatmaps, Using Monkeybread Software's ChartDirector Plugin by Stefanie Juchmes
- 18.5, page 71: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.26.2 Methods

### 28.26.3 addKey(pos as Integer, text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addKey method, but uses color instead of integer data type for passing color values.
See also:

- 28.26.4 addKey(pos as Integer, text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
- 28.26.5 addKey(text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
- 28.26.6 addKey(text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5126

### 28.26.4 addKey(pos as Integer, text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom entry to the legend box with a given legend entry priority.
**Notes:** See LegendBox for more information on legend entry priority system.

| Argument | Default | Description |
|---|---|---|
| pos | (Mandatory) | The legend entry priority |
| text | (Mandatory) | The text of the legend entry. |
| color | (Mandatory) | The icon color of the legend entry. |
| lineWidth | 0 | The line width for legend entry that represents lines in line charts. |
| drawarea | nil | A DrawArea containing the data symbol represents the legend entry. This is primarily used for legend entries in line charts with data symbols, or in scatter charts. |

See also:


- 28.26.3 addKey(pos as Integer, text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5124
- 28.26.5 addKey(text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
- 28.26.6 addKey(text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5126


### 28.26.5 addKey(text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addKey method, but uses color instead of integer data type for passing color values.
See also:


- 28.26.3 addKey(pos as Integer, text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5124
- 28.26.4 addKey(pos as Integer, text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
- 28.26.6 addKey(text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5126

### 28.26.6 addKey(text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom entry to the legend box.
**Notes:** This method adds an entry within a legend entry priority of 1 (followed by 2, 3, 4, ... for repeated calls). This has higher priority than entries added automatically by ChartDirector for representing data sets. As a result, by default, the custom entry will appear before the automatic entries.

To control the order of the custom entry relative to the automatic entries, use LegendBox.addKey2.

See LegendBox for more information on legend entry priority system.

| Argument | Default | Description |
|---|---|---|
| text | (Mandatory) | The text of the legend entry. |
| color | (Mandatory) | The icon color of the legend entry. |
| lineWidth | 0 | The line width for legend entry that represents lines in line charts. |
| drawarea | nil | A DrawArea containing the data symbol represents the legend entry. This is primarily used for legend entries in line charts with data symbols, or in scatter charts. |

See also:

- 28.26.3 addKey(pos as Integer, text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5124
- 28.26.4 addKey(pos as Integer, text as string, colorvalue as Integer, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125
- 28.26.5 addKey(text as string, colorvalue as color, lineWidth as Integer = -1, drawarea as CDDrawAreaMBS=nil) 5125

### 28.26.7 addText(pos as Integer, text as string)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom text to the legend box.
See also:

- 28.26.8 addText(text as string) 5126

### 28.26.8 addText(text as string)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom text to the legend box.
See also:

- 28.26.7 addText(pos as Integer, text as string) 5126

### 28.26.9 getHTMLImageMap(url as string, queryFormat as string = "", extraAttr as string = "", offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for the legend.
**Notes:** By default, ChartDirector will add named data representation to the legend box. For pie charts, named sectors (sectors that have text labels) will be added. For xy charts, named data sets will be added. For polar charts, named layers will be added.

You may add custom entries to the legend box by using LegendBox.addKey.

To control the ordering of the legend entries, ChartDirector employs a legend entry priority system. Each entry is given a priority number, and the entries are ordered according to ascending priority (unless reversed by using LegendBox.setReverse).

For a PieChart, the legend entry priority of a sector is 10000 x (sector_index + 1). The Nth sector has sector_index (N - 1). That means the ordering of the sectors in the legend box is the same as the data array.

For an XYChart, the base legend entry priority for a layer is 10000 x (layer_index + 1). Within a layer, the data set priority is 10 x (data_set_index + 1). For example, the legend entry priority for the 5th dataset in the 3rd layer will be 30050. That means the ordering of the data sets in the legend box follows the order in which the layers are created. For data sets within the same layer, the ordering follows the order in which the data sets are added. The ordering can be modified by using Layer.setLegendOrder.

For an PolarChart, the legend entry priority of a layer is 10000 x (layer_index + 1). That means the ordering of the layers in the legend box follows the order in which the layers are created.

For custom entries added using LegendBox.addKey2, you may control the legend entry priority. That means you may insert custom entries anywhere relative to the automatic entries added by ChartDirector.

### 28.26.10 getImageCoor(dataItem as Integer, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of an legend entry as HTML image map attributes.
**Notes:** The image map coordinates will be of the following format:

shape="rect" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] "
where (x1, y1) and (x2, y2) are opposite corners of the box that enclosed the legend entry. The format is specially designed so that it can easily be included into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| dataItem | (Mandatory) | The legend entry number, starting from 0. The first legend entry is 0. The nth legend entry is (n-1). |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the coordinates of the legend entry in HTML image map attribute format.

### 28.26.11 setCols(noOfCols as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the number of columns in the legend box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| noOfCols | (Mandatory) | The number of columns in the legend box. The special value AutoGrid (= -2) means the number of columns is automatically determined. If this argument is 0, the legend box will use a flow layout (from left to right and then top to bottom, in which the entries may not be vertically aligned). |

### 28.26.12 setKeyBorder(edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setKeyBorder method, but uses color instead of integer data type for passing color values.
See also:

• 28.26.13 setKeyBorder(edgeColor as Integer, raisedEffect as Integer = 0) 5129

### 28.26.13 setKeyBorder(edgeColor as Integer, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the default border color of the legend icon.
**Notes:** This method applies only to data sets of which the icons are rectangles showing the colors of the data sets. If the icon is a shape or symbol (such as for a line with data point symbols), the border color of the original shape or symbol is always used.

| Argument | Default | Description |
|---|---|---|
| edgeColor | (Mandatory) | The border color. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument is also used to support Chart::glassEffect and Chart::softLighting effects. |

See also:

• 28.26.12 setKeyBorder(edgeColor as color, raisedEffect as Integer = 0) 5128

### 28.26.14 setKeySize(width as Integer = -1, height as Integer = -1, gap as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the legend icon and its distance from the legend text.
**Notes:** Each legend entry consists of an icon and a text description. By default, the size of the icon and its distance from the text is determined automatically based on font size. This method can be used to override the default.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the legend icon in pixels. |
| height | -1 | The height of the legend icon in pixels. -1 means the height is automatically determined. |
| gap | -1 | The distance between the legend icon and the legend text in pixels. -1 means the distance is automatically determined. |

### 28.26.15 setKeySpacing(keySpacing as Integer, lineSpacing as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the distance between two legend entries.
**Notes:** In horizontal legend layout, the legend entries will flow from left to right, top to bottom, with a horizontal gap between two legend entries. In vertical legend layout, the legend entries will flow from top to bottom, with one entry per line.

By default, the horizontal gap and the line spacing is automatically determined based on font size. This method can be used to set the horizontal gap and line spacing in pixels.

| Argument | Default | Description |
|---|---|---|
| keySpacing | (Mandatory) | The horizontal gap between two legend entries for horizontal legend layout, expressed in pixels. |
| lineSpacing | -1 | The line spacing between two lines in the legend box, expressed in pixels. -1 means the line spacing is automatically determined. |

### 28.26.16 setLineStyleKey(b as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determines whether to always use "line style legend keys" or not.
**Notes:** By default, ChartDirector will use a small colored square box as the legend key icon. This allows people to determine the colors for the data representations.

In some cases, colors alone cannot distinguish the data representations. For example, in a line chart with multiple lines, it is possible all lines are of the same color, and are distinguished by line styles (solid, dash, dotted, etc), etc), or the lines may be distinguished by data symbols (small circles, squares, etc) on the lines.

For charts with non-solid lines (eg. dash, dotted, etc) or lines with data symbols, ChartDirector will use "line style legend keys" for the lines. A line style legend key consist a of line with an optional data symbol, which reflects the line style and data symbol representing the data series.

This method can be used to force ChartDirector to always use the "line style legend keys".

Arguments:

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means to always use "line style legend keys". A false value means to automatically determined if "line style legend keys" should be used. |

### 28.26.17 setReverse(b as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the ordering of the legend entries.
**Notes:** By default, the legend entries are ordered based on ascending legend entry priority number. This method can be used to change the ordering to following descending legend entry priority number instead.

See LegendBox for more information on legend entry priority system.

| Argument | Default | Description |
|---|---|---|
| b | true | A true value means the legend entries are ordered based on descending legend entry priority number. false value means the legend entries are ordered based on ascending legend entry priority number. |

## 28.27 class CDLinearMeterMBS

### 28.27.1 class CDLinearMeterMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The LinearMeter class represents linear meters.
**Notes:** Subclass of the CDBaseMeterMBS class.
**Blog Entries**

- ChartDirector Meters and Gauges

**Xojo Developer Magazine**

- 21.6, page 92: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes
- 21.6, page 89: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes

### 28.27.2 Methods

### 28.27.3 addBar(startValue as Double, endValue as Double, colorvalue as color, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bar to the meter.
**Notes:** This method adds an empty TextBox to the meter. It configures the textbox position, size and color so that it looks like a bar on the meter scale.

| Argument | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The start value of the bar. |
| endValue | (Mandatory) | The end value of the bar. |
| color | (Mandatory) | The color of the bar. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify Chart::glassEffect, Chart::softLighting, Chart::cylinderEffect or Chart::flatBorder effects. |
| roundedCorners | 0 | The radius for the two corners at the end position of the bar. |

Returns a CDTextBoxMBS object representing the bar. This may be used to fine-tune the appearance of the bar.
See also:

- 28.27.4 addBar(startValue as Double, endValue as Double, colorvalue as Integer, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS 

### 28.27.4 addBar(startValue as Double, endValue as Double, colorvalue as Integer, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bar to the meter.
**Notes:** This method adds an empty TextBox to the meter. It configures the textbox position, size and color so that it looks like a bar on the meter scale.

| Argument | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The start value of the bar. |
| endValue | (Mandatory) | The end value of the bar. |
| color | (Mandatory) | The color of the bar. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify Chart::glassEffect, Chart::softLighting, Chart::cylinderEffect or Chart::flatBorder effects. |
| roundedCorners | 0 | The radius for the two corners at the end position of the bar. |

Returns a CDTextBoxMBS object representing the bar. This may be used to fine-tune the appearance of the bar.
See also:

- 28.27.3 addBar(startValue as Double, endValue as Double, colorvalue as color, effect as Integer = 0, roundedCorner as Integer = 0) as CDTextBoxMBS 5132

### 28.27.5 addZone(startValue as Double, endValue as Double, colorvalue as color, label as string = "") as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addZone method, but uses color instead of integer data type for passing color values.
See also:

- 28.27.6 addZone(startValue as Double, endValue as Double, colorvalue as Integer, label as string = "") as CDTextBoxMBS 5133

### 28.27.6 addZone(startValue as Double, endValue as Double, colorvalue as Integer, label as string = "") as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a zone to the meter.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| startValue | (Mandatory) | The start value (the lower bound) for the zone. |
| endValue | (Mandatory) | The end value (the upper bound) for the zone. |
| color | (Mandatory) | The color of the zone. |
| label | "" | The text to be put at the center of the zone. |

Return Value
A TextBox object representing the label. This may be used to fine-tune the appearance of the label.
See also:

- 28.27.5 addZone(startValue as Double, endValue as Double, colorvalue as color, label as string = "") as CDTextBoxMBS 5133

### 28.27.7 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.27.8 Constructor(width as Integer, height as Integer, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5134

### 28.27.8 Constructor(width as Integer, height as Integer, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new LinearMeter object.
**Notes:**

See also:

- 28.27.7 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5134

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

### 28.27.9 setMeter(leftX as Integer, topY as Integer, width as Integer, height as Integer, axisPos as Integer = 4, isReversed as boolean=false)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the orientation and position of the meter plot area.
**Notes:** The plot area is a rectangular region of the linear meter. The meter scale (the labels showing the values) will be on one external side of the plot area (say on the left side). The pointer start on the opposite side and points towards the meter scale.

This method defines the position and size of the rectangular region, as well as which side the meter scale is on. If the scale is on the left or right side, the meter is assumed to be a horizontal linear meter. If the scale is on the top or bottom side, the meter is assumed to be a vertical linear meter.

| Argument | Default | Description |
|---|---|---|
| leftX | (Mandatory) | The x-coordinate of the top-left corner of the meter plot area. |
| topY | (Mandatory) | The y-coordinate of the top-left corner of the meter plot area. |
| width | (Mandatory) | The horizontal width of the meter plot area. |
| height | (Mandatory) | The vertical height of the meter plot area. |
| axisPos | Left | The position of the meter scale. The scale should be on one of the 4 sides of the plot area border, specified by Left, Top, Right and Bottom. |
| isReversed | false | By default, if the meter is horizontal, the meter scale will run from left to right. If the meter is vertical, the meter scale will run from bottom to top. If this argument is set to true, the meter scale will be reversed. |

### 28.27.10 setRail(railColor as color, railWidth as Integer = 2, railOffset as Integer = 6)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setRail method, but uses color instead of integer data type for passing color values.
See also:

- 28.27.11 setRail(railColor as Integer, railWidth as Integer = 2, railOffset as Integer = 6) 5136

### 28.27.11 setRail(railColor as Integer, railWidth as Integer = 2, railOffset as Integer = 6)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position, width and color of the pointer rail.
**Notes:** The pointer rail is the locus traced out by the starting point of the meter pointer as the pointer slides on the meter. The pointer rail is on the opposite side of the meter scale.

| Argument | Default | Description |
|---|---|---|
| railColor | (Mandatory) | The color of the pointer rail. |
| railWidth | 2 | The line width of the the pointer rail in pixels. |
| railOffset | 6 | The gap between the pointer rail and the plot area in pixels. A negative value will mean the pointer rail may move within the plot area. |

See also:

- 28.27.10 setRail(railColor as color, railWidth as Integer = 2, railOffset as Integer = 6) 5135

### 28.27.12 Screenshots

### 28.27.13 mutlivmeter.jpg

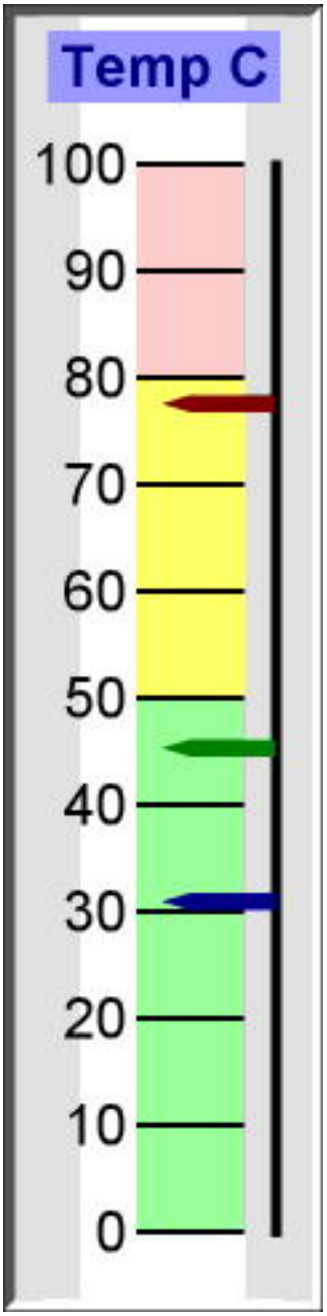


**Function:** A meter with three pointers created using ChartDirector with the CDLinearMeterMBS class.

## 28.28 class CDLineLayerMBS

### 28.28.1 class CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The LineLayer class represents line layers.
**Notes:** Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Charts with more than one x or y axis
- A special chart with our MBS REALbasic ChartDirector Plugin

**Xojo Developer Magazine**

- 7.4, page 34: Easy Charts and Graphs, Using the ChartDirector Plugin
- 18.5, page 72: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.28.2 Methods

### 28.28.3 getLine(dataSet as Integer = 0) as CDLineObjMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves an opaque LineObj representing a line in the line layer. The opaque LineObj is to be used in XYChart.addInterLineLayer for adding coloring between lines.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| dataSet | 0 | The data set number for the line. The first data set is 0. The nth data set is (n - 1). |

Return Value
An opaque LineObj representing the requested line.

### 28.28.4 setFastLineMode(b as boolean = true)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables or disables fast line mode.
**Notes:** In a chart, the plot area width is usually a few hundred to around 2000 pixels. For a line chart that "flows" horizontally (eg. from left to right), if there are a lot more data points (eg. 100000 data points than the plot area pixel width, many of the points would be at the same x-pixel coordinates. The line segments joining the data points at the same x-pixel coordinates would just be oscillating up and down, overlapping themselves. What is visible at each x-pixel position is essentially a line joining the minimum point and the maximum point.

In fast line mode, ChartDirector will automatically detect that there are too many points in the same x-pixel coordinate, and draws only a line segment joining the extreme points at that coordinate. The resulting line is visually indistinguishable from a line in which the line segments join all data points. The fast line mode can significantly reduce the number of points drawn without affecting the chart appearance.

The fast line mode has no effect if there are not significantly more data points than the pixel width of the plot area. For charts with evenly spaced data points, the fast line mode would only act on x-pixel positions with too many data points. Thus the fast line mode can be enabled on line charts regardless of the number of data points.

The fast line mode should not be used if the data points are not flowing horizontally (or vertically if XYChart.swapXY is in effect), but are flowing in random directions.

| Argument | Default | Description |
|---|---|---|
| b | true | A true value enables fast line mode. A false value disables fast line mode. |

### 28.28.5 setGapColor(lineColor as color, lineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGapColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.28.6 setGapColor(lineColor as Integer, lineWidth as Integer = -1) 5139

### 28.28.6 setGapColor(lineColor as Integer, lineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and style of the line used for jumping across NoValue data points.
**Notes:** By default, the color of the line for jumping across NoValue data points is Transparent, which means the line will become discontinuous.

| Argument | Default | Description |
|---|---|---|
| lineColor | (Mandatory) | The line color of the line used for jumping across NoValue data points |
| lineWidth | -1 | The line width of the line used for jumping across NoValue data points. -1 means the width will be the same as the line width of the line for drawing normal data points. |

See also:

- 28.28.5 setGapColor(lineColor as color, lineWidth as Integer = -1) 5139

### 28.28.7 setImageMapWidth(Width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the effective width of the line used for producing image maps.
**Notes:** For thin lines, it is hard to click on the lines. So for the purpose of producing image maps for a line chart, ChartDirector can assume the line is very thick. The default is 10 pixels.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The effective width of the line used for producing image maps. |

### 28.28.8 setSymbolScale(zDataX() as Double, scaleTypeX as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the symbol for each data point (for creating bubble charts).
**Notes:** One common usage for this method is to draw circle symbols of different sizes at each data points, creating a bubble chart.

This method supports any valid data symbols. You can create bubble charts with square bubbles, or even custom data symbols. Also, this method supports independent x and y direction sizing, so you can create bubbles elliptical in shape, and use the horizontal and vertical radius to represent different data.

ChartDirector supports specifying sizes as pixels or in axis scale. The unit is specified by using the following predefined constants.

ConstantValueDescription

See also:

| | | |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| XAxisScale | 1 | The unit is measured in x-axis scale. |
| YAxisScale | 2 | The unit is measured in y-axis scale. |

| Argument | Default | Description |
|---|---|---|
| zDataX | (Mandatory) | The sizes of the symbols at the x-axis direction, expressed using the unit defined by the scaleTypeX argument. |
| scaleTypeX | PixelScale | The unit for zDataX, which must be one of the predefined constants in the table above. |
| zDataY | [ Empty_Array ] | The sizes of the symbols at the y-axis direction, expressed using the unit defined by the scaleTypeY argument. An empty array means the sizes at the y-axis direction are the means as the sizes at the x-axis direction. |
| scaleTypeY | PixelScale | The unit for zDataY, which must be one of the predefined constants in the table above. |


- 28.28.9 setSymbolScale(zDataX() as Double, scaleTypeX as Integer, zDataY() as Double, scaleTypeY as Integer = 0) 5141


### 28.28.9 setSymbolScale(zDataX() as Double, scaleTypeX as Integer, zDataY() as Double, scaleTypeY as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the symbol for each data point (for creating bubble charts).
**Notes:** One common usage for this method is to draw circle symbols of different sizes at each data points, creating a bubble chart.

This method supports any valid data symbols. You can create bubble charts with square bubbles, or even custom data symbols. Also, this method supports independent x and y direction sizing, so you can create bubbles elliptical in shape, and use the horizontal and vertical radius to represent different data.

ChartDirector supports specifying sizes as pixels or in axis scale. The unit is specified by using the following predefined constants.

ConstantValueDescription

| | | |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| XAxisScale | 1 | The unit is measured in x-axis scale. |
| YAxisScale | 2 | The unit is measured in y-axis scale. |

See also:

| Argument | Default | Description |
|---|---|---|
| zDataX | (Mandatory) | The sizes of the symbols at the x-axis direction, expressed using the unit defined by the scaleTypeX argument. |
| scaleTypeX | PixelScale | The unit for zDataX, which must be one of the predefined constants in the table above. |
| zDataY | [ Empty_Array ] | The sizes of the symbols at the y-axis direction, expressed using the unit defined by the scaleTypeY argument. An empty array means the sizes at the y-axis direction are the means as the sizes at the x-axis direction. |
| scaleTypeY | PixelScale | The unit for zDataY, which must be one of the predefined constants in the table above. |

- 28.28.8 setSymbolScale(zDataX() as Double, scaleTypeX as Integer = 0) 5140

## 28.29 class CDLineMBS

### 28.29.1 class CDLineMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Line class represents straight lines.
**Notes:** Subclass of the CDDrawObjMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.29.2 Methods

### 28.29.3 setColor(c as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.29.4 setColor(c as Integer) 5143

### 28.29.4 setColor(c as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the line.
**Notes:** By default, the color of the line is LineColor. To draw a dash line, you can use a dash line color (created using BaseChart.dashLineColor or DrawArea.dashLineColor).

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The color of the line. |

See also:

- 28.29.3 setColor(c as color) 5143

### 28.29.5 setPos(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the end-points of the line..
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x coordinate of the first end-point of the line. |
| y1 | (Mandatory) | The y coordinate of the first end-point of the line. |
| x2 | (Mandatory) | The x coordinate of the second end-point of the line. |
| y2 | (Mandatory) | The y coordinate of the second end-point of the line. |

### 28.29.6 setWidth(w as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width of the line in pixels.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The width (thickness) of the line in pixels. |

## 28.30 class CDLineObjMBS

### 28.30.1 class CDLineObjMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The line object class.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.30.2 Methods

### 28.30.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 28.31 class CDMarkMBS

### 28.31.1 class CDMarkMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Mark class represents mark lines.
**Notes:** Subclass of the CDTextBoxMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 7.4, page 34: Easy Charts and Graphs, Using the ChartDirector Plugin

### 28.31.2 Methods

### 28.31.3 getLine as CDLineObjMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves an opaque LineObj representing the mark line. The opaque LineObj is to be used in XYChart.addInterLineLayer for adding coloring between lines.
**Notes:** Return Value
An opaque LineObj representing the mark line.

### 28.31.4 setDrawOnTop(b as boolean)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determine whether the mark line is drawn at the front of the chart layers, or at the back of the plot area (that is, like grid lines).
**Notes:**

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value means drawing the mark line at the front of the chart layers. A false value means drawing the mark line at the back of the plot area. |

### 28.31.5 setLineWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line width of the mark line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The mark line width in pixels. |

### 28.31.6 setMarkColor(lineColor as color, textColor as color, tickColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setMarkColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.31.7 setMarkColor(lineColor as Integer, textColor as Integer = -1, tickColor as Integer = -1) 5147

### 28.31.7 setMarkColor(lineColor as Integer, textColor as Integer = -1, tickColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line, text and tick colors of the mark line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| lineColor | (Mandatory) | The color of the mark line. |
| textColor | -1 | The color of the text label that will be shown on the axis. -1 means the text label color is the same as the line color. |
| tickColor | -1 | The color of the tick that will be shown on the axis. -1 means the tick color is the same as the line color. |

See also:

- 28.31.6 setMarkColor(lineColor as color, textColor as color, tickColor as color) 5147

### 28.31.8 setValue(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value of the mark line.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value of the mark. |

## 28.32 class CDMeterPointerMBS

### 28.32.1 class CDMeterPointerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The MeterPointer class represents meter pointers.
**Notes:** Subclass of the CDDrawObjMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- ChartDirector Meters and Gauges

**Xojo Developer Magazine**

- 21.6, pages 91 to 92: From 0 to 100, Creating Gauges with MBS and ChartDirector by Stefanie Juchmes

### 28.32.2 Methods

### 28.32.3 setColor(fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.32.4 setColor(fillColor as Integer, edgeColor as Integer = -1) 5148

### 28.32.4 setColor(fillColor as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the fill and border colors of the meter pointer.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| fillColor | (Mandatory) | The fill color of the meter pointer. |
| edgeColor | -1 | The border color of the meter pointer. The default value of -1 means it is the same as the fill color. |

See also:

- 28.32.3 setColor(fillColor as color, edgeColor as color) 5148

### 28.32.5 setPos(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value the pointer points to on the meter scale.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| value | (Mandatory) | The value the pointer points to. |

### 28.32.6 setShape(pointerCoor() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of polygon vertices.

For an angular meter, the polygon should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will become the radius of the meter.

For a linear meter, the length of the pointer should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will be the length required for the pointer to reach the meter scale. The width of the pointer will be in 0.1 pixel units (that is, 10 units = 1 pixel).

The coordinate system for defining the polygon is that the x-axis points from left to right, and the y-axis points from bottom to top. The polygon will be defined as a pointer with the pivot at the origin, pointing to the upward direction.

As an example, the coordinates of the standard diamond pointer for an angular meter are:

0, -100, -50, -50, 0, 1000, 50, -50
The coordinates for the standard pencil pointer for a linear meter are:

-30, 0, 30, 0, 30, 768, 0, 1000, -30, 768
After scaling the pointers based on the nominal units, ChartDirector will in addition applies the lengthRatio and widthRatio scaling factor to the pointer. These ratios allow you to change the pointer sizes without changing the polygon definition. For example, if you want the meter pointer to be only 80% of the radius in the angular meter, you can set the lengthRatio to 0.80.

See also:

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |


- 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
- 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double) 5151
- 28.32.9 setShape(pointerType as Integer) 5152
- 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153
- 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154


### 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of polygon vertices.

For an angular meter, the polygon should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will become the radius of the meter.

For a linear meter, the length of the pointer should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will be the length required for the pointer to reach the meter scale. The width of the pointer will be in 0.1 pixel units (that is, 10 units = 1 pixel).

The coordinate system for defining the polygon is that the x-axis points from left to right, and the y-axis points from bottom to top. The polygon will be defined as a pointer with the pivot at the origin, pointing to the upward direction.

As an example, the coordinates of the standard diamond pointer for an angular meter are:

0, -100, -50, -50, 0, 1000, 50, -50
The coordinates for the standard pencil pointer for a linear meter are:

-30, 0, 30, 0, 30, 768, 0, 1000, -30, 768
After scaling the pointers based on the nominal units, ChartDirector will in addition applies the lengthRatio

and widthRatio scaling factor to the pointer. These ratios allow you to change the pointer sizes without changing the polygon definition. For example, if you want the meter pointer to be only 80% of the radius in the angular meter, you can set the lengthRatio to 0.80.

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |

See also:


- 28.32.6 setShape(pointerCoor() as Integer) 5149
- 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double) 5151
- 28.32.9 setShape(pointerType as Integer) 5152
- 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153
- 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154


### 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of polygon vertices.

For an angular meter, the polygon should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will become the radius of the meter.

For a linear meter, the length of the pointer should be defined with a nominal dimension of 1000 units. ChartDirector will scale the polygon so that 1000 units will be the length required for the pointer to reach the meter scale. The width of the pointer will be in 0.1 pixel units (that is, 10 units = 1 pixel).

The coordinate system for defining the polygon is that the x-axis points from left to right, and the y-axis points from bottom to top. The polygon will be defined as a pointer with the pivot at the origin, pointing to the upward direction.

As an example, the coordinates of the standard diamond pointer for an angular meter are:

0, -100, -50, -50, 0, 1000, 50, -50
The coordinates for the standard pencil pointer for a linear meter are:

-30, 0, 30, 0, 30, 768, 0, 1000, -30, 768
After scaling the pointers based on the nominal units, ChartDirector will in addition applies the lengthRatio and widthRatio scaling factor to the pointer. These ratios allow you to change the pointer sizes without changing the polygon definition. For example, if you want the meter pointer to be only 80% of the radius in the angular meter, you can set the lengthRatio to 0.80.

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |

See also:


- 28.32.6 setShape(pointerCoor() as Integer) 5149
- 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
- 28.32.9 setShape(pointerType as Integer) 5152
- 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153
- 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154


### 28.32.9 setShape(pointerType as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to one of the built-in shapes.
**Notes:** The built-in symbols are specified by using the following predefined constants as the pointerType argument.

ConstantValueDescription

The length and width of the pointer can be scaled by using the lengthRatio and widthRatio arguments. The meters above are using default length and width ratios, which are both 1 for angular meters, and 0.75 and 1 for linear meters.

| | | |
|---|---|---|
| DiamondPointer | 0 | The blue pointers in the meters above. |
| TriangularPointer | 1 | The purple pointers in the meters above. |
| ArrowPointer | 2 | The red pointers in the meters above. |
| ArrowPointer2 | 3 | The yellow pointers in the meters above. |
| LinePointer | 4 | The green pointers in the meters above. |
| PencilPointer | 5 | The grey pointers in the meters above. |

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | One of the predefined pointer shape constants to specify the pointer shape to use. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |

See also:


- 28.32.6 setShape(pointerCoor() as Integer) 5149
- 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
- 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double) 5151
- 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153
- 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154


### 28.32.10 setShape(pointerType as Integer, lengthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to one of the built-in shapes.
**Notes:** The built-in symbols are specified by using the following predefined constants as the pointerType argument.

ConstantValueDescription

| | | |
|---|---|---|
| DiamondPointer | 0 | The blue pointers in the meters above. |
| TriangularPointer | 1 | The purple pointers in the meters above. |
| ArrowPointer | 2 | The red pointers in the meters above. |
| ArrowPointer2 | 3 | The yellow pointers in the meters above. |
| LinePointer | 4 | The green pointers in the meters above. |
| PencilPointer | 5 | The grey pointers in the meters above. |

The length and width of the pointer can be scaled by using the lengthRatio and widthRatio arguments. The meters above are using default length and width ratios, which are both 1 for angular meters, and 0.75 and 1 for linear meters.

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | One of the predefined pointer shape constants to specify the pointer shape to use. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |

See also:


- 28.32.6 setShape(pointerCoor() as Integer) 5149
- 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
- 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double) 5151
- 28.32.9 setShape(pointerType as Integer) 5152
- 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double) 5154


### 28.32.11 setShape(pointerType as Integer, lengthRatio as Double, widthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of the meter pointer to one of the built-in shapes.
**Notes:** The built-in symbols are specified by using the following predefined constants as the pointerType argument.

ConstantValueDescription

| | | |
|---|---|---|
| DiamondPointer | 0 | The blue pointers in the meters above. |
| TriangularPointer | 1 | The purple pointers in the meters above. |
| ArrowPointer | 2 | The red pointers in the meters above. |
| ArrowPointer2 | 3 | The yellow pointers in the meters above. |
| LinePointer | 4 | The green pointers in the meters above. |
| PencilPointer | 5 | The grey pointers in the meters above. |

The length and width of the pointer can be scaled by using the lengthRatio and widthRatio arguments. The meters above are using default length and width ratios, which are both 1 for angular meters, and 0.75 and

1 for linear meters.

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | One of the predefined pointer shape constants to specify the pointer shape to use. |
| lengthRatio | NoValue | The length ratio applies to the pointer. NoValue means the lengthRatio is not modified. The default is 1.0 for angular meters and 0.75 for linear meters. |
| widthRatio | NoValue | The width ratio applies to the pointer. NoValue means the widthRatio is not modified. The default is 1.0. |

See also:


- 28.32.6 setShape(pointerCoor() as Integer) 5149
- 28.32.7 setShape(pointerCoor() as Integer, lengthRatio as Double) 5150
- 28.32.8 setShape(pointerCoor() as Integer, lengthRatio as Double, widthRatio as Double) 5151
- 28.32.9 setShape(pointerType as Integer) 5152
- 28.32.10 setShape(pointerType as Integer, lengthRatio as Double) 5153


### 28.32.12 setShapeAndOffset(pointerCoor() as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of the polygon vertices, with the x-axis pointing from left to right and the y-axis pointing from bottom to top. The direction of the pointer should be pointing upwards, with the starting point at y = 0, and the ending point at y = 1000.

As an example, the coordinates of the new style triangular pointer are:

-15, 0, 15, 0, 0, 1000, 1000

The coordinates for the new style line pointer are:

-5, 0, 5, 0, 5, 1000, -5, 1000

In actual usage, ChartDirector will rotate the polygon to point it to the desired value, and adjust the polygon size and position based on the startOffset, endOffset and widthRatio arguments. Please refer to MeterPointer.setShapeAndOffset2 for the meaning of these arguments.

See also:

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| startOffset | NoValue | The position of the starting point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| endOffset | NoValue | The position of the ending point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |


- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.13 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of the polygon vertices, with the x-axis pointing from left to right and the y-axis pointing from bottom to top. The direction of the pointer should be pointing upwards, with the starting point at y = 0, and the ending point at y = 1000.

As an example, the coordinates of the new style triangular pointer are:

-15, 0, 15, 0, 0, 1000, 1000

The coordinates for the new style line pointer are:

-5, 0, 5, 0, 5, 1000, -5, 1000

In actual usage, ChartDirector will rotate the polygon to point it to the desired value, and adjust the polygon size and position based on the startOffset, endOffset and widthRatio arguments. Please refer to

MeterPointer.setShapeAndOffset2 for the meaning of these arguments.

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| startOffset | NoValue | The position of the starting point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| endOffset | NoValue | The position of the ending point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of the polygon vertices, with the x-axis pointing from left to right and the y-axis pointing from bottom to top. The direction of the pointer should be pointing upwards, with the starting point at y = 0, and the ending point at y = 1000.

As an example, the coordinates of the new style triangular pointer are:

-15, 0, 15, 0, 0, 1000, 1000

The coordinates for the new style line pointer are:

-5, 0, 5, 0, 5, 1000, -5, 1000

In actual usage, ChartDirector will rotate the polygon to point it to the desired value, and adjust the polygon size and position based on the startOffset, endOffset and widthRatio arguments. Please refer to MeterPointer.setShapeAndOffset2 for the meaning of these arguments.

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| startOffset | NoValue | The position of the starting point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| endOffset | NoValue | The position of the ending point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers to a custom polygon.
**Notes:** The custom polygon is specified as a list of numbers representing the (x, y) coordinates of the polygon vertices, with the x-axis pointing from left to right and the y-axis pointing from bottom to top. The direction of the pointer should be pointing upwards, with the starting point at y = 0, and the ending point at y = 1000.

As an example, the coordinates of the new style triangular pointer are:

-15, 0, 15, 0, 0, 1000, 1000

The coordinates for the new style line pointer are:

-5, 0, 5, 0, 5, 1000, -5, 1000

In actual usage, ChartDirector will rotate the polygon to point it to the desired value, and adjust the polygon size and position based on the startOffset, endOffset and widthRatio arguments. Please refer to MeterPointer.setShapeAndOffset2 for the meaning of these arguments.

| Argument | Default | Description |
|---|---|---|
| pointerCoor | (Mandatory) | An array of numbers x0, y0, x1, y1, x2, y2, ..., representing the coordinates the polygon vertices. |
| startOffset | NoValue | The position of the starting point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| endOffset | NoValue | The position of the ending point as a ratio to the scale radius. NoValue means the position is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.16 setShapeAndOffset(pointerType as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers.
**Notes:** New style pointers are designed to have configurable starting and ending points, as well as configurable width. In this documentation, the ending point refers to the "tip" of the pointer, while the starting point is the "base" of the pointer.

By default, the starting and ending points are at -0.15 and 0.95. It means the distance between the starting point and the center is 15% of the scale radius. The negative sign means that relative to the center, the starting point is at the opposite direction to the value the pointer is supposed to point to. Similarly, the distance between the ending point and the center is 95% of the scale radius, which means the ending point should be quite close to the outer rim of the meter scale.

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | Should be TriangularPointer2 for new style triangular pointer, and LinePointer2 for new style line pointer. |
| startOffset | NoValue | The radius the pointer starts at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| endOffset | NoValue | he radius the pointer ends at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers.
**Notes:** New style pointers are designed to have configurable starting and ending points, as well as configurable width. In this documentation, the ending point refers to the "tip" of the pointer, while the starting point is the "base" of the pointer.

By default, the starting and ending points are at -0.15 and 0.95. It means the distance between the starting point and the center is 15% of the scale radius. The negative sign means that relative to the center, the starting point is at the opposite direction to the value the pointer is supposed to point to. Similarly, the distance between the ending point and the center is 95% of the scale radius, which means the ending point

should be quite close to the outer rim of the meter scale.

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | Should be TriangularPointer2 for new style triangular pointer, and LinePointer2 for new style line pointer. |
| startOffset | NoValue | The radius the pointer starts at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| endOffset | NoValue | he radius the pointer ends at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers.
**Notes:** New style pointers are designed to have configurable starting and ending points, as well as configurable width. In this documentation, the ending point refers to the "tip" of the pointer, while the starting point is the "base" of the pointer.

By default, the starting and ending points are at -0.15 and 0.95. It means the distance between the starting point and the center is 15% of the scale radius. The negative sign means that relative to the center, the starting point is at the opposite direction to the value the pointer is supposed to point to. Similarly, the distance between the ending point and the center is 95% of the scale radius, which means the ending point should be quite close to the outer rim of the meter scale.

See also:

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | Should be TriangularPointer2 for new style triangular pointer, and LinePointer2 for new style line pointer. |
| startOffset | NoValue | The radius the pointer starts at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| endOffset | NoValue | he radius the pointer ends at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480
- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5162


### 28.32.19 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double, widthRatio as Double)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the shape of new style angular meter pointers.
**Notes:** New style pointers are designed to have configurable starting and ending points, as well as configurable width. In this documentation, the ending point refers to the "tip" of the pointer, while the starting point is the "base" of the pointer.

By default, the starting and ending points are at -0.15 and 0.95. It means the distance between the starting point and the center is 15% of the scale radius. The negative sign means that relative to the center, the starting point is at the opposite direction to the value the pointer is supposed to point to. Similarly, the distance between the ending point and the center is 95% of the scale radius, which means the ending point should be quite close to the outer rim of the meter scale.

See also:


- 28.32.12 setShapeAndOffset(pointerCoor() as Integer) 5155
- 188.5.1 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double) 22480

| Argument | Default | Description |
|---|---|---|
| pointerType | (Mandatory) | Should be TriangularPointer2 for new style triangular pointer, and LinePointer2 for new style line pointer. |
| startOffset | NoValue | The radius the pointer starts at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| endOffset | NoValue | he radius the pointer ends at, expressed as a ratio to the scale radius. NoValue means the radius is automatically determined. |
| widthRatio | NoValue | The width of the pointer relative to the default width. NoValue means the width is automatically determined. |


- 28.32.14 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double) 5157
- 28.32.15 setShapeAndOffset(pointerCoor() as Integer, startOffset as Double, endOffset as Double, widthRatio as Double) 5158
- 28.32.16 setShapeAndOffset(pointerType as Integer) 5159
- 28.32.17 setShapeAndOffset(pointerType as Integer, startOffset as Double) 5160
- 28.32.18 setShapeAndOffset(pointerType as Integer, startOffset as Double, endOffset as Double) 5161

## 28.33 class CDMLTableMBS

### 28.33.1 class CDMLTableMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a legend table.
**Notes:** Subclass of the CDDrawObjMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.33.2 Methods

### 28.33.3 appendCol as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a column.

### 28.33.4 appendRow as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a row.

### 28.33.5 getCell(col as Integer, row as Integer) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the textbox object for the cell.
**Notes:** The index of column and row is zero based.

### 28.33.6 getColCount as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of columns.

### 28.33.7 getColStyle(col as Integer) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the column style.
**Notes:** col is zero based.

### 28.33.8 getColWidth(col as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the width of a column.
**Notes:** col is zero based.

### 28.33.9 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the height of the table.

### 28.33.10 getRowCount as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of row.

### 28.33.11 getRowHeight(row as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the height of a row.
**Notes:** row is zero based.

### 28.33.12 getRowStyle(row as Integer) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the row style.
**Notes:** row is zero based.

### 28.33.13 getStyle as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the textbox defining the style of the table.

### 28.33.14 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the width of the table.

### 28.33.15 insertCol(col as Integer) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a column at the given column.
**Notes:** col is zero based.

### 28.33.16 insertRow(row as Integer) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a row on the given position.
**Notes:** row is zero based.

### 28.33.17 layout

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Layouts the table, so you can get the size.

### 28.33.18 setCell(col as Integer, row as Integer, width as Integer, height as Integer, text as string) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell to the given text.
**Notes:** col and row are zero based.

### 28.33.19 setPos(x as Integer, y as Integer, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the table.
**Notes:** x and y are zero based.

### 28.33.20 setText(col as Integer, row as Integer, text as string) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text of a cell.
**Notes:** col and row are zero based.

## 28.34 class CDMultiChartMBS

### 28.34.1 class CDMultiChartMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The MultiChart class represents multi-chart.
**Notes:** A multi-chart is a container to contain multiple charts. You can use a multi- chart to combine multiple BaseChart objects (or its subclass such as PieChart, XYChart, PolarChart, AngularMeter or LinearMeter) into one image.
Subclass of the CDBaseChartMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio Plugins, version 16.2pr3
- MBS Real Studio Plugins, version 12.5pr8

### 28.34.2 Methods

### 28.34.3 addChart(x as Integer, y as Integer, c as CDBaseChartMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a BaseChart object (or its subclass such as PieChart, XYChart, PolarChart, AngularMeter or LinearMeter) into the multi-chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of a point in the multi-chart that is to align with the top-left corner of the added BaseChart. |
| y | (Mandatory) | The y coordinate of a point in the multi-chart that is to align with the top-left corner of the added BaseChart. |
| c | (Mandatory) | The BaseChart object to be added to the multi-chart. |

### 28.34.4 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.34.5 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5169


### 28.34.5 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MultiChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:


- 28.34.4 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5168


### 28.34.6 getChart(index as Integer) as CDBaseChartMBS

MBS ChartDirector Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the specified chart in the MultiChart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | 0 | The index of the chart. The index of the first chart set added to the MultiChart is 0. The index of the Nth data set added to the MultiChart is N - 1. |

### 28.34.7 getChartCount as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the number of charts in the MultiChart.
**Notes:** Returns the number of charts in the MultiChart.

### 28.34.8 setMainChart(c as CDBaseChartMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the chart that receives view port mouse actions (for zooming and scrolling support).
**Notes:**

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The chart that is to receive view port mouse actions. |

# 28.35 class CDMultiPagePDFMBS

## 28.35.1 class CDMultiPagePDFMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The MultiPagePDF class is a utility class used to create PDF documents with multiple pages.
**Notes:** MultiPagePDF works by generating a PDF page for CDBaseChartMBS or CDDrawAreaMBS added to it. The CDBaseChartMBS can be a CDMultiChartMBS, and can contain free form CDML text, tables, shape and images. In this way, CDMultiPagePDFMBS can create complete PDF reports.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr5
- ChartDirector 7 update

## 28.35.2 Methods

## 28.35.3 addPage(chart as CDBaseChartMBS)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a BaseChart object as a PDF page.
**Notes:** You can use BaseChart.setOutputOptions to configure the PDF page options, such as the page size, margins, etc.

MultiPagePDF will immediately generate the PDF page using the BaseChart object. You can immediately delete the BaseChart object after calling this method. That means you do not need to keep a lot of BaseChart objects in memory even if the PDF has a lot of pages.

| Argument | Default | Description |
|---|---|---|
| c | (Mandatory) | The BaseChart object used to create the PDF page. |

See also:

- 28.35.4 addPage(DrawArea as CDDrawAreaMBS) 5171

## 28.35.4 addPage(DrawArea as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a DrawArea object as a PDF page.
**Notes:** You can use DrawArea.setOutputOptions to configure the PDF page options, such as the page size, margins, etc.

MultiPagePDF will immediately generate the PDF page using the DrawArea object. You can immediately delete the DrawArea object after calling this method. That means you do not need to keep a lot of DrawArea objects in memory even if the PDF has a lot of pages.

| Argument | Default | Description |
|---|---|---|
| d | (Mandatory) | The DrawArea object used to create the PDF page. |

See also:

- 28.35.3 addPage(chart as CDBaseChartMBS) 5171

### 28.35.5 Constructor

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a MultiPagePDF object.

### 28.35.6 outPDF as String

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Outputs the PDF document in memory.
**Notes:** Returns a memory block containing the PDF document.
See also:

- 28.35.7 outPDF(file as FolderItem) as Boolean 5172
- 28.35.8 outPDF(path as String) as Boolean 5173

### 28.35.7 outPDF(file as FolderItem) as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Outputs the PDF document as a file.
**Notes:**

A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the PDF file. |


- 28.35.6 outPDF as String 5172
- 28.35.8 outPDF(path as String) as Boolean 5173


### 28.35.8 outPDF(path as String) as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Outputs the PDF document as a file.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| filename | (Mandatory) | The filename of the PDF file. |

A true value indicates no error. A false value indicates the operation is unsuccessful.
See also:


- 28.35.6 outPDF as String 5172
- 28.35.7 outPDF(file as FolderItem) as Boolean 5172

## 28.36 class CDNotInitialzedExceptionMBS

### 28.36.1 class CDNotInitialzedExceptionMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exception raised if method is called on an uninitialized object.
**Notes:** Please report this as it may be a bug.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr17

## 28.37 class CDPieChartMBS

### 28.37.1 class CDPieChartMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PieChart class represents pie charts.
**Notes:** Subclass of the CDBaseChartMBS class.
**Blog Entries**

- Chart Diagrams with Xojo
- MBS Xojo Plugins, version 18.5pr4
- A chart similar to the one on Apple Watch

**Xojo Developer Magazine**

- 7.4, page 29: Easy Charts and Graphs, Using the ChartDirector Plugin
- 20.4, pages 38 to 41: PDF Pie Charts, Adding Xojo Charts to Your PDFs by Stefanie Juchmes
- 18.5, page 58: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes
- 18.5, page 52: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.37.2 Methods

### 28.37.3 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.37.4 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as Integer = &hFFFF0000, edgeColor as Integer = &hFF000000, raisedEffect as Integer = 0) 5175

### 28.37.4 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as Integer = &hFFFF0000, edgeColor as Integer = &hFF000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PieChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.37.3 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0) 5175

### 28.37.5 sector(sectorNo as Integer) as CDSectorMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the Sector object representing a single sector in the pie chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| sectorNo | (Mandatory) | The sector number of the sector to retrieve, starting from 0. The first sector is 0. The nth sector is (n-1). |

Return Value
The requested Sector object.

### 28.37.6 set3D(depth as Integer = -1, angle as Double = -1, shadowMode as boolean=false)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds 3D effects to the pie.
**Notes:**

See also:

- 28.37.7 set3D(depths() as Double, angle as Double = 45, shadowMode as boolean=false) 5177

| Argument | Default | Description |
|---|---|---|
| depth | -1 | The 3D depth of the pie in pixels. -1 means the depth is automatically determined. |
| angle | -1 | The 3D view angle in degrees. Must be 0 - 90 for standard 3D mode, and 0 - 360 in shadow 3D mode. -1 means the angle is automatically determined. |
| shadowMode | false | Flag to indicate whether the pie is in standard 3D or shadow 3D mode. A true value means shadow 3D mode. A false value means standard 3D mode. |

### 28.37.7 set3D(depths() as Double, angle as Double = 45, shadowMode as boolean=false)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds 3D effects to the pie, where each sector can have a different 3D depth.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| depths | (Mandatory) | An array of integers representing the 3D depths for the sectors. |
| angle | 45 | The 3D view angle in degrees. Must be 0 - 90 for standard 3D mode, and 0 - 360 in shadow 3D mode. -1 means the angle is automatically determined. |
| shadowMode | false | Flag to indicate whether the pie is in standard 3D or shadow 3D mode. A true value means shadow 3D mode. A false value means standard 3D mode. |

See also:

- 28.37.6 set3D(depth as Integer = -1, angle as Double = -1, shadowMode as boolean=false) 5176

### 28.37.8 setData(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data used to draw the pie chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points. |
| labels | [ Empty_Array ] | An array of text strings representing the labels of the sectors. An empty array means no sector label. |

See also:

- 28.37.9 setData(data() as Double, label() as string) 5178

### 28.37.9 setData(data() as Double, label() as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data used to draw the pie chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points. |
| labels | [ Empty_Array ] | An array of text strings representing the labels of the sectors. An empty array means no sector label. |

See also:

- 28.37.8 setData(data() as Double) 5177

### 28.37.10 setDonutSize(x as Integer, y as Integer, r as Integer, r2 as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and size of the donut in the donut chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the donut center. |
| y | (Mandatory) | The y coordinate of the donut center. |
| r | (Mandatory) | The inner radius of the donut. |
| r2 | (Mandatory) | The outer radius of the donut. |

### 28.37.11 setExplode(sectorNo as Integer, distance as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Explode a sector from the pie.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| sectorNo | (Mandatory) | The sector number of the sector to be exploded from the pie, starting from 0. The first sector is 0. The nth sector is (n - 1). |
| distance | -1 | The explosion distance in pixels. -1 means the distance is automatically determined. |

### 28.37.12 setExplodeGroup(startSector as Integer, endSector as Integer, distance as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Explode a group of sectors from the pie.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| startSector | (Mandatory) | The sector number of the first sector in the sector group to be exploded. The first sector is 0. The nth sector is (n - 1). |
| endSector | (Mandatory) | The sector number of the last sector in the sector group to be exploded. The first sector is 0. The nth sector is (n - 1). |
| distance | -1 | The explosion distance in pixels. -1 means the distance is automatically determined. |

### 28.37.13 setJoinLine(joinLineColor as color, joinLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setJoinLine method, but uses color instead of integer data type for passing color values.
See also:

- 28.37.14 setJoinLine(joinLineColor as Integer, joinLineWidth as Integer = -1) 5179

### 28.37.14 setJoinLine(joinLineColor as Integer, joinLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and width of the join lines used to connect the sector labels to the sector perimeter.
**Notes:** This method affects all sectors. To set the color and width of the join line for one particular sector only, use Sector.setJoinLine.

By default, for circular label layout, the join line color is Transparent. For side label layout, the join line color is SameAsMainColor.

| Argument | Default | Description |
|---|---|---|
| joinLineColor | (Mandatory) | The color of the line that joins the sector perimeter with the sector label. |
| joinLineWidth | 1 | The line width of the join line. |

See also:

- 28.37.13 setJoinLine(joinLineColor as color, joinLineWidth as Integer = -1) 5179

### 28.37.15 setLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format of the all sector labels.
**Example:**

```
dim c as CDPieChartMBS

// you can use label formats like this:

c.setLabelFormat("<*block,halign=left*><*font=timesbi.ttf,size=12,underline=1*>{ label } <*/font*><*br*>US$
{ value } K ( { percent } %)")

// we can reduce that to this:

c.setLabelFormat(" { label } { value } { percent } %")

// and it shows 3 numbers. With | 1 after the variable name, we define the decimals after dot:

c.setLabelFormat(" { label } { value | 1 } { percent | 1 } %")

// and

c.setLabelFormat(" { label } { value | 1., } { percent | 1., } %")

// uses dot for thousands and comma for decimal separator.
```

**Notes:** This method affects all sectors. To set the label format for one particular sector only, use Sector.setLabelFormat.

The default sector label format depends on the label layout method used (see PieChart.setLabelLayout).

| Label Layout Method | Default Label Format |
|---|---|
| Circular Layout | { label } <*br*> { percent } % |

(The "<*br*>" above is the CDML syntax for a line break.)

| | |
|---|---|
| Side Layout | { label } ( { percent } %) |

Please refer to Parameter Substitution and Formatting on all available parameters and how to format them.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.37.16 setLabelLayout(layoutMethod as Integer, pos as Integer = -1, topBound as Integer = -1, bottomBound as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the layout method and location of the sector labels.
**Notes:** This method affects all sectors. To set the sector label layout method and location for one particular sector only, use Sector.setLabelLayout.

ChartDirector supports two sector label layout methods - circular layout and side layout. The layout method is determined using the layoutMethod argument, which must be one of the following predefined constants.

ConstantValueDescription

| | | |
|---|---|---|
| SideLayout | 0 | Side Label Layout |
| CircleLayout | 1 | Circular Label Layout |

In the circular layout method, the sector labels are positioned around the perimeter of the pie.

In the side layout method, there is an invisible rectangle containing the pie, where the rectangle can be wider than the diameter of the pie.The sector labels are positioned on the left and right sides outside the rectangle. Because the labels can be quite far away from the sectors, join lines are typically used to connect the labels to the sectors.

The circular layout method usually uses less space and is the default layout method. However, if the pie chart contains a lot of small sectors, the labels may overlap with each others, due to insufficient space on the pie perimeter to position the labels.

The side layout method has the advantages that it can avoid label overlapping. In the side layout method, labels will automatically shift up and down to avoid overlapping.

One common issue in pie charts is the data contain a lot of small sectors. If the data are sorted, the small sectors will be crowded together instead of distributed evenly. Although the side layout method can avoid label overlapping by shifting the labels up and down, some labels may need to be shifted great distances.

Label layout can often be improved if the small sectors are near the horizontal axis. It is because the amount of vertical label space for a sector is greatest at the horizontal axis. This can be achieved by choosing an appropriate start angle (using PieChart.setStartAngle).

If the data is in ascending order (small sectors crowded at the beginning), a start angle of 45 degrees with clockwise sector layout is recommended. With this setting, the first few sectors (the smallest sectors) will be at around 45 - 135 degrees, so is near the horizontal axis (90 degrees). Similarly, if the data is in descending order (small sectors crowded at the end), a start angle of 135 degrees with clockwise sector layout can be used.

| Argument | Default | Description |
|---|---|---|
| layoutMethod | (Mandatory) | Specify the layout method. Must be one of the predefined constants CircleLayout or SideLayout. |
| pos | -1 | For circular layout, it is the distance between the sector perimeter and the sector label. A negative value (but not -1) means the sector label will be drawn in the interior of the sector. |

For side layout, it is the distance between the pie perimeter and the left or right edges of the invisible containing rectangle (equal to the width of the rectangle minus the pie diameter and then divided by 2).

In either case, -1 means the distance is automatically determined.

| | | |
|---|---|---|
| topBound | -1 | This parameter applies only to side label layout. It controls the top bound of the labels (the minimum y coordinate), thereby limiting the extent that the labels can be shifted up to avoid overlapping. This parameter is typically used avoid the labels from moving up too much and overlap with other chart objects (such as the chart title). |
| bottomBound | -1 | This parameter applies only to side label layout. It controls the bottom bound of the labels (the maximum y coordinate), thereby limiting the extent which the labels can be shifted down to avoid overlapping. This parameter is typically used to avoid the labels from moving down too much and overlap with other chart objects. |

### 28.37.17 setLabelPos(pos as Integer, joinLineColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelPos method, but uses color instead of integer data type for passing color values.
See also:

- 110.6.57 setLabelPos(pos as Integer, joinLineColor as Integer = -1) 16681

### 28.37.18 setLabelPos(pos as Integer, joinLineColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the circular label layout method, and configure the join lines used to connect the sector labels to the sector perimeter.
**Notes:** This method affects all sectors. To set the sector label position or join line color for one particular sector only, use Sector.setLabelPos.

| Argument | Default | Description |
|---|---|---|
| pos | (Mandatory) | The distance between the sector perimeter and the sector label. A negative value means the sector label will be drawn in the interior of the sector. |
| joinLineColor | -1 | The color of the line that joins the sector perimeter with the sector label. The default is Transparent. The join line is ignored if the sector label is inside the sector. |

See also:

- 28.37.17 setLabelPos(pos as Integer, joinLineColor as color) 5182

### 28.37.19 setLabelStyle(font as string = """, fontsize as Double = 8, fontColor as Integer = &hffff0002) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the style used to draw all sector labels.
**Notes:** This method affects all sectors. To set the label style for one particular sector only, use Sector.setLabelStyle.

See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the sector labels. |
| fontSize | 8 | The font size in points. |
| fontColor | TextColor | The text color for the sector labels. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

• 28.37.20 setLabelStyle(font as string, fontsize as Double, fontColor as color) as CDTextBoxMBS 5184

### 28.37.20 setLabelStyle(font as string, fontsize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

• 28.37.19 setLabelStyle(font as string = """, fontsize as Double = 8, fontColor as Integer = &hffff0002) as CDTextBoxMBS 5183

### 28.37.21 setLineColor(edgeColor as color, joinLineColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLineColor method, but uses color instead of integer data type for passing color values.
See also:

• 28.37.22 setLineColor(edgeColor as Integer, joinLineColor as Integer = -1) 5184

### 28.37.22 setLineColor(edgeColor as Integer, joinLineColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the sector edge color and join line color.
**Notes:** This method affects all sectors. To set the sector label position and join line color for one particular sector, use Sector.setColor.

| Argument | Default | Description |
|---|---|---|
| edgeColor | (Mandatory) | The colors for the edges of the sectors. By default, the edge color is SameAsMainColor, which means the edge color is the same as the fill color of the sector, and the sector will appear borderless. |
| joinLineColor | -1 | The color of the line that join the sector perimeter with the sector label. By default, for circular label layout, the join line color is Transparent. For side label layout, the join line color is SameAsMainColor. |

See also:

• 28.37.21 setLineColor(edgeColor as color, joinLineColor as color) 5184

### 28.37.23 setPieSize(x as Integer, y as Integer, r as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and size of the pie in the pie chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the pie center. |
| y | (Mandatory) | The y coordinate of the pie center. |
| r | (Mandatory) | The radius of the pie. |

### 28.37.24 setSectorStyle(shadingMethod as Integer, edgeColor as color, edgeWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setSectorStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.37.25 setSectorStyle(shadingMethod as Integer, edgeColor as Integer = -1, edgeWidth as Integer = -1) 5185

### 28.37.25 setSectorStyle(shadingMethod as Integer, edgeColor as Integer = -1, edgeWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the sector shading style, edge color and edge width.
**Notes:** This method affects all sectors. To set the sector shading style, edge color and edge width for one particular sector, use CDSectorMBS.setStyle.

ChartDirector supports various shading effects, which are best illustrated using examples.

The followings are textual descriptions of the shading effects.

Arguments:

See also:

- 28.37.24 setSectorStyle(shadingMethod as Integer, edgeColor as color, edgeWidth as Integer = -1) 5185

| Constant | Value | Description |
|---|---|---|
| DefaultShading | 0 | This is the default shading method. The top surfaces are shaded with flat colors. For 3D sectors, the cylindrical surfaces are shaded with cylindrical lighting effects. |
| FlatShading | 1 | All surfaces are shaded with flat colors. |
| LocalGradientShading | 2 | The top surfaces are shaded with linear gradient colors. For each sector, the gradient is from the bottom of the sector bounding box to the top of the sector bounding box, with the bottom side brighter and the top side darker. For 3D sectors, the cylindrical surfaces are shaded with cylindrical lighting effects. |
| GlobalGradientShading | 3 | The top surfaces are shaded with linear gradient colors. The gradient is from the bottom the pie bounding box to the top of the pie bounding box, with the bottom side brighter and the top side darker. For 3D sectors, the cylindrical surfaces are shaded with cylindrical lighting effects. |
| ConcaveShading | 4 | The top surfaces are shaded with a special effect so that they look concave, with the pie center appears to be depressed relative to the perimeter. For 3D sectors, the cylindrical surfaces are shaded with cylindrical lighting effects. |
| RoundedEdgeShading | 6 | The top surfaces are shaded with a special effect so that the pie looks raised with a rounded raised edge at the perimeter. |
| RadialShading | 7 | The top surfaces are shaded with radial gradient colors, with the pie center brighter and the perimeter darker. For 3D sectors, the cylindrical surfaces are shaded with cylindrical lighting effects. |
| RingShading | 8 | This effect is intended to be used with 2D donut charts only. The top surfaces are shaded with a special effect so that a 2D donut will look like a torus. |

| Argument | Default | Description |
|---|---|---|
| shadingMethod | (Mandatory) | The sector shading style to use, which must be one of the constants in the table above. -1 means to keep the existing value unchanged. |
| edgeColor | -1 | The edge color of the sectors. -1 means to keep the existing value unchanged. |
| edgeWidth | -1 | The edge width of the sectors. -1 means to keep the existing value unchanged. |

### 28.37.26 setStartAngle(startAngle as Double, clockWise as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the angle of the first sector in the pie and the layout direction for the sectors.
**Notes:** By default, the start angle is 0 degree (the upward pointing direction), and subsequent sectors are drawn clockwise.

| Argument | Default | Description |
|---|---|---|
| startAngle | (Mandatory) | The angle to start drawing the first sector in degrees. The angle is measured from the upward pointing direction in the clockwise direction. |
| clockWise | true | Flag to control the layout direction of the sectors. A true value means clockwise. A false value means anti-clockwise. |

### 28.37.27 Screenshots

### 28.37.28 legendpie2.jpg

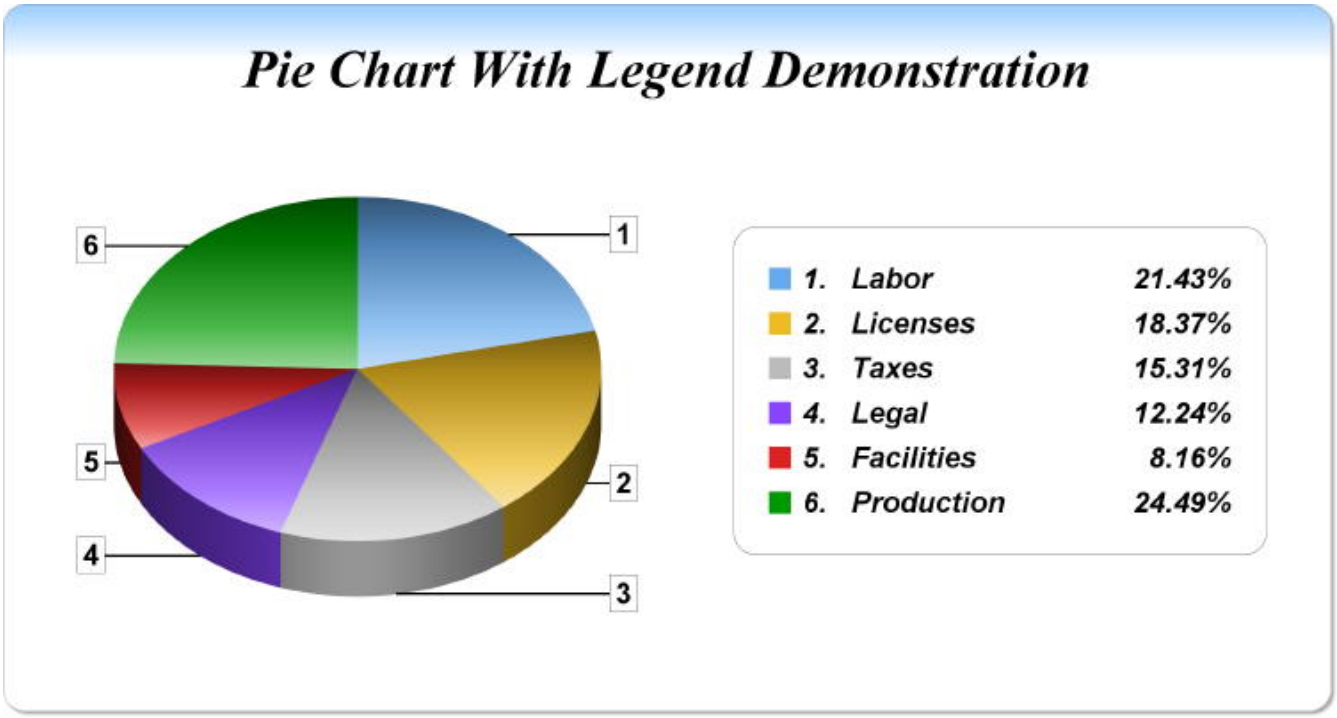


**Function:** A pie chart with legend created using ChartDirector with the CDPieChartMBS class.

### 28.37.29 smallsectorpie.jpg

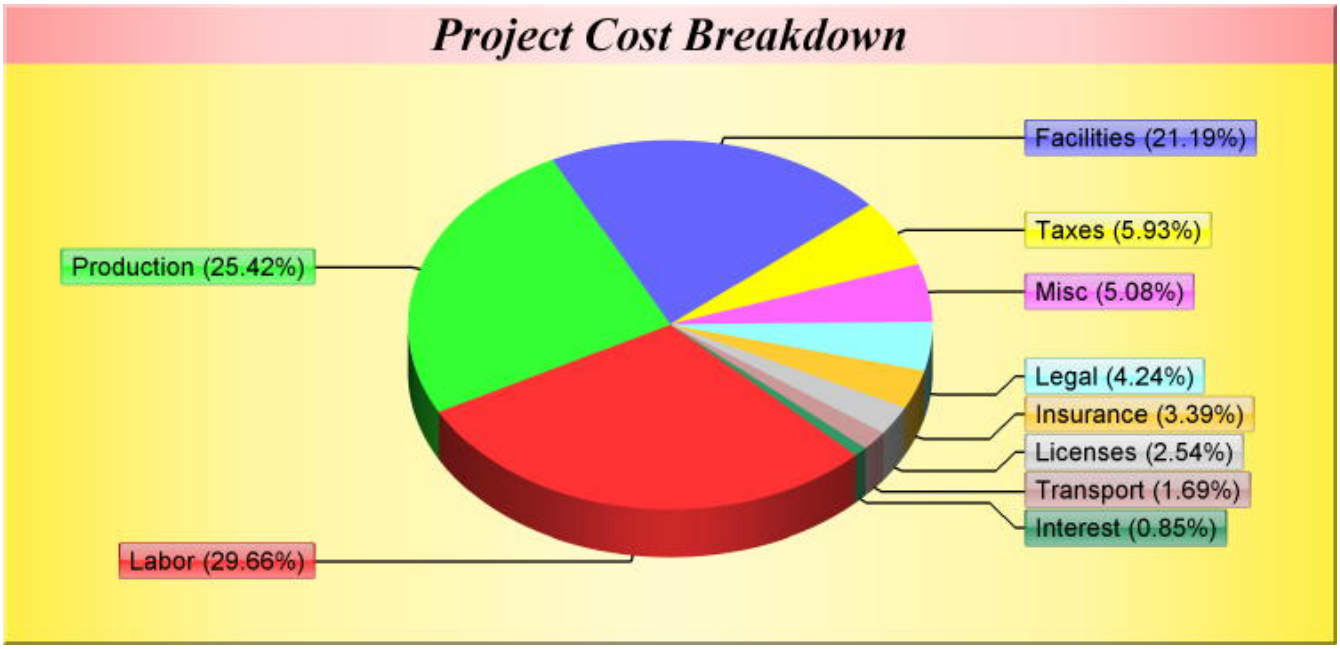


**Function:** A pie chart with small sectors created using ChartDirector with the CDPieChartMBS class.

### 28.37.30 threeddonutshading.jpg

**Function:** A donut created using ChartDirector with the CDPieChartMBS class.

## 28.38 class CDPlotAreaMBS

### 28.38.1 class CDPlotAreaMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PlotArea class represents plot areas in XY charts.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Runtime error with DLLs

**Xojo Developer Magazine**

- 7.4, page 34: Easy Charts and Graphs, Using the ChartDirector Plugin
- 20.1, page 43: Cool Charts and Heatmaps, Using Monkeybread Software's ChartDirector Plugin by Stefanie Juchmes
- 18.5, page 74: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.38.2 Methods

### 28.38.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.38.4 getBottomY as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the bottom y pixel coordinate of the plot area.
**Notes:** Returns the bottom y pixel coordinate of the plot area.

### 28.38.5 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the plot area.

### 28.38.6 getLeftX as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the left x pixel coordinate of the plot area.

### 28.38.7 getRightX as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the right x pixel coordinate of the plot area.
**Notes:** Returns the right x pixel coordinate of the plot area.

### 28.38.8 getTopY as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the top y pixel coordinate of the plot area.
**Notes:** In some cases, the top y coordinate of a box may be dynamically determined. An example is the top y coordinate of an LegendBox with alignment set to Center. To determine the top y coordinate, the size of the box must be known first. For these cases, the top y coordinate is undefined until the legend box or the entire chart has been laid out (using CDBaseChartMBS.layout or CDBaseChartMBS.layoutLegend), or the chart image has been drawn (eg. using CDBaseChartMBS.makeChart).

Arguments:
None

Return Value
The top y pixel coordinate of the plot area.

### 28.38.9 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the plot area.

### 28.38.10 moveGridBefore(layer as CDLayerMBS=nil)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the grid lines in front of a Layer.
**Notes:** By default, the grid lines will be drawn at the back of the plot area, behind all the layers. This method can be used to move the grid lines in front of a given layer.

Arguments:

| Argument | Default | Description |
|---|---|---|
| layer | nil | The Layer for the grid lines to move in front of. |

### 28.38.11 set4QBgColor(Q1Color as color, Q2Color as color, Q3Color as color, Q4Color as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other set4QBgColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.38.12 set4QBgColor(Q1Color as Integer, Q2Color as Integer, Q3Color as Integer, Q4Color as Integer, edgeColor as Integer = -1) 5192

### 28.38.12 set4QBgColor(Q1Color as Integer, Q2Color as Integer, Q3Color as Integer, Q4Color as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets using 4 background plot area colors for 4 quadrants.
**Notes:** The first quadrant is the region defined by x > 0 and y > 0. The second quadrant is the region defined by x < 0 and y > 0. The third quadrant is the region defined by x < 0 and y < 0. The fourth quadrant is the region defined by x > 0 and y < 0. These 4 regions can be colored using 4 different background colors.

| Argument | Default | Description |
|---|---|---|
| Q1Color | (Mandatory) | The background color to be used for the first quadrant. |
| Q2Color | (Mandatory) | The background color to be used for the second quadrant. |
| Q3Color | (Mandatory) | The background color to be used for the third quadrant. |
| Q4Color | (Mandatory) | The background color to be used for the fourth quadrant. |
| edgeColor | -1 | he border color of the plot area. -1 means to use the default, which is LineColor. However, if the axes are configured in 4 quadrant mode (see XYChart.setAxisAtOrigin), the default will change to Transparent. |

See also:

- 28.38.11 set4QBgColor(Q1Color as color, Q2Color as color, Q3Color as color, Q4Color as color, edgeColor as color) 5192


### 28.38.13 setAltBgColor(horizontal as Boolean, color1 as color, color2 as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setAltBgColor method, but uses color instead of integer data type for passing color values.
See also:

- 190.3.5 setAltBgColor(horizontal as Boolean, color1 as Integer, color2 as Integer, edgeColor as Integer = -1) 22661

### 28.38.14 setAltBgColor(horizontal as Boolean, color1 as Integer, color2 as Integer, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets alternating plot area background color.
**Notes:** This method can be used to specify two colors that will be used alternatively to draw horizontal or vertical bands on the plot area background, using major grid lines as boundaries for the bands.

| Argument | Default | Description |
|---|---|---|
| horizontal | (Mandatory) | true means to use horizontal bands. false means to use vertical bands. |
| color1 | (Mandatory) | The first color to be used as the alternating background color. |
| color2 | (Mandatory) | The second color to be used as the alternating background color. |
| edgeColor | -1 | The border color of the plot area. -1 means to use the default, which is LineColor. However, if the axes are configured in 4 quadrant mode (see XYChart.setAxisAtOrigin), the default will change to Transparent. |

See also:

- 190.2.1 setAltBgColor(horizontal as Boolean, color1 as color, color2 as color, edgeColor as color) 22658

### 28.38.15 setBackground(colorvalue as color, altBgColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBackground method, but uses color instead of integer data type for passing color values.
See also:

- 28.38.16 setBackground(colorvalue as Integer, altBgColor as Integer = -1, edgeColor as Integer = -1) 5194
- 28.38.17 setBackground(file as folderitem, align as Integer = 5) 5194


### 28.38.16 setBackground(colorvalue as Integer, altBgColor as Integer = -1, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the background colors and the border color of the plot area.
**Notes:** A plot area can have one or two background colors. If it has two background colors, they are drawn alternatively as horizontal bands on the major background grid.

ChartDirector Ver 4.0 introduces two new methods PlotArea.setAltBgColor and PlotArea.set4QBgColor. They are used for vertical alternating bands, and for supporting 4 background colors for 4 quadrants.

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The background color. |
| altBgColor | -1 | The second background color. -1 means there is no second background color. |
| edgeColor | -1 | The border color of the plot area. -1 means to use the default, which is LineColor. However, if the axes are configured in 4 quadrant mode (see XYChart.setAxisAtOrigin), the default will change to Transparent. |

See also:


- 28.38.15 setBackground(colorvalue as color, altBgColor as color, edgeColor as color) 5193
- 28.38.17 setBackground(file as folderitem, align as Integer = 5) 5194


### 28.38.17 setBackground(file as folderitem, align as Integer = 5)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the specified image file as the background image of the plot area.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

See also:


- 28.38.15 setBackground(colorvalue as color, altBgColor as color, edgeColor as color) 5193

| Argument | Default | Description |
|---|---|---|
| img | (Mandatory) | The image file that is used as the background image of the plot area. |
| align | Center | The alignment of the background image relative to the plot area. See Alignment Specification for supported alignment types. |

- 28.38.16 setBackground(colorvalue as Integer, altBgColor as Integer = -1, edgeColor as Integer = -1) 5194

### 28.38.18 setGridAxis(xGridAxis as CDAxisMBS, yGridAxis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the axis used for drawing grid lines.
**Notes:** By default, the grid lines will be based on the ticks on the primary x-axis (CDXYChartMBS.xAxis) and primary y-axis (CDXYChartMBS.yAxis). This method may be used to specify alternative x-axis and y-axis to base the grid lines on.

Arguments:

| Argument | Default | Description |
|---|---|---|
| xGridAxis | (Mandatory) | The x-axis used for drawing grid lines. |
| yGridAxis | (Mandatory) | The y-axis used for drawing grid lines. |

### 28.38.19 setGridColor(hGridColor as color, vGridColor as color, minorHGridColor as color, minorVGridColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGridColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.38.20 setGridColor(hGridColor as Integer, vGridColor as Integer = &hff000000, minorHGridColor as Integer = -1, minorVGridColor as Integer = -1) 5195

### 28.38.20 setGridColor(hGridColor as Integer, vGridColor as Integer = &hff000000, minorHGridColor as Integer = -1, minorVGridColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal and vertical grid colors of the plot area.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| hGridColor | (Mandatory) | The color for the horizontal grid lines associated with major ticks. |
| vGridColor | Transparent | The color for the vertical grid lines associated with major ticks. |
| minorHGridColor | -1 | The color for the horizontal grid lines associated with minor ticks. -1 means the color is the same as hGridColor. |
| minorVGridColor | -1 | The color for the vertical grid lines associated with minor ticks. -1 means the color is the same as vGridColor. |

See also:

- 28.38.19 setGridColor(hGridColor as color, vGridColor as color, minorHGridColor as color, minorVGridColor as color) 5195

### 28.38.21 setGridWidth(hGridWidth as Integer, vGridWidth as Integer = -1, minorHGridWidth as Integer = -1, minorVGridWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal and vertical grid line width.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| hGridWidth | (Mandatory) | The line width for the horizontal grid lines associated with major ticks. |
| vGridWidth | -1 | The line width for the vertical grid lines associated with major ticks. -1 means the vertical grid line width is the same as hGridWidth. |
| minorHGridWidth | -1 | The line width for the horizontal grid lines associated with minor ticks. -1 means the color is the same as hGridWidth. |
| minorVGridWidth | -1 | The line width for the horizontal grid lines associated with minor ticks. -1 means the color is the same as vGridWidth. |

## 28.39 class CDPolarAreaLayerMBS

### 28.39.1 class CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarAreaLayer class represents polar area layers.
**Notes:** Subclass of the CDPolarLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.40 class CDPolarChartMBS

### 28.40.1 class CDPolarChartMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarChart class represents polar charts (including radar charts).
**Notes:** Subclass of the CDBaseChartMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr5
- MBS Xojo Plugins, version 18.2pr5

**Xojo Developer Magazine**

- 7.5, pages 31 to 32: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin

### 28.40.2 Methods

### 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addAreaLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
- 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201
- 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201

### 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar area layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the area. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarAreaLayer object representing the chart layer created.
See also:


- 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198
- 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
- 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201
- 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201


### 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addAreaLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198

- 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
- 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201
- 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201


### 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar area layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the area. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarAreaLayer object representing the chart layer created.
See also:


- 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198
- 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201
- 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201

### 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar area layer to the polar chart.
See also:

- 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198
- 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
- 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS 5201

### 28.40.8 addAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar area layer to the polar chart.
See also:

- 28.40.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5198
- 28.40.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.5 addAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5199
- 28.40.6 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarAreaLayerMBS 5200
- 28.40.7 addAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarAreaLayerMBS 5201

### 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204
- 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205


### 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar line layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarLineLayer object representing the chart layer created.
See also:


- 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203

- 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204
- 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205


### 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204
- 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205


### 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar line layer to the polar chart.
**Notes:**

Return Value
A PolarLineLayer object representing the chart layer created.
See also:


- 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |


- 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204
- 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205


### 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar line layer to the polar chart.
**Notes:** Variation taking dateTime array and color.
See also:


- 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS 5205

### 28.40.14 addLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar line layer to the polar chart.
**Notes:** Variation taking dateTime array.
See also:


- 28.40.9 addLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.10 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5202
- 28.40.11 addLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.12 addLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarLineLayerMBS 5203
- 28.40.13 addLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarLineLayerMBS 5204


### 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addSplineAreaLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
- 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208
- 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208

### 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline area layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the spline area. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarSplineAreaLayer object representing the chart layer created.
See also:

- 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205
- 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
- 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208
- 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208

### 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addSplineAreaLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205

- 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
- 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208
- 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208


### 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar spline area layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the spline area. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarSplineAreaLayer object representing the chart layer created.
See also:


- 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205
- 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208
- 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208

### 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline area layer to the polar chart.
See also:

- 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205
- 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
- 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5208

### 28.40.20 addSplineAreaLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline area layer to the polar chart.
See also:

- 28.40.15 addSplineAreaLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5205
- 28.40.16 addSplineAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.17 addSplineAreaLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5206
- 28.40.18 addSplineAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineAreaLayerMBS 5207
- 28.40.19 addSplineAreaLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineAreaLayerMBS 5208

### 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addSplineLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211
- 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211


### 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline line layer to the polar chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the spline line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A PolarSplineLineLayer object representing the chart layer created.
See also:


- 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210

- 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211
- 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211


### 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addSplineLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211
- 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211


### 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a polar spline line layer to the polar chart.
**Notes:**

Return Value
A PolarSplineLineLayer object representing the chart layer created.
See also:


- 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data points in the layer. |
| color | -1 | The color to draw the spline line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |


- 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211
- 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211


### 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline line layer to the polar chart.
See also:


- 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5211


### 28.40.26 addSplineLineLayer(dates() as dateTime, colorvalue as integer = -1, name as string = "") as CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a polar spline line layer to the polar chart.
See also:

- 28.40.21 addSplineLineLayer(data() as Double, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.22 addSplineLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5209
- 28.40.23 addSplineLineLayer(dates() as date, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.24 addSplineLineLayer(dates() as date, colorvalue as Integer = -1, name as string = "") as CDPolarSplineLineLayerMBS 5210
- 28.40.25 addSplineLineLayer(dates() as dateTime, colorvalue as color, name as string = "") as CDPolarSplineLineLayerMBS 5211

### 28.40.27 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDPolarVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a vector layer to the chart.
**Notes:** The vectors are specified as 4 data series, representing the radial and angular coordinates of the reference points to put the vectors, and the lengths and directions of the vectors.

By default, the vector starts from the reference point and points away from it. You may use PolarVectorLayer.setArrowAlignment to specify other options, such as for the vectors to point into the reference point, or to have the reference as a pivot at the mid-point of the vector.

ChartDirector supports specifying vectors lengths as pixels or in axis scale. The unit is specified by using the following predefined constants.

| Constant | Value | Description |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| RadialAxisScale | 2 | The unit is measured in the radial axis scale. |

Return Value
A PolarVectorLayer object representing the vector layer created.
See also:

| Argument | Default | Description |
|---|---|---|
| rData | (Mandatory) | An array of numbers representing the radial coordinates for the reference points of the vectors. |
| aData | (Mandatory) | An array of numbers representing the angular coordinates for the reference points of the vectors. |
| lengths | (Mandatory) | An array of numbers representing the lengths of the vectors, in unit as specified in the lengthScale argument. |
| directions | (Mandatory) | An array of numbers representing the direction of the vectors as a clockwise angle in degrees, where 0 is upward pointing direction. |
| lengthScale | PixelScale | The unit for the lengths, which must be one of the predefined constants in the table above. |
| color | -1 | The color to draw the data points. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

- 28.40.28 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDPolarVectorLayerMBS 5213

### 28.40.28 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDPolarVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addVectorLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.27 addVectorLayer(rdata() as Double, adata() as Double, lengths() as Double, directions() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDPolarVectorLayerMBS 5212

### 28.40.29 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.30 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5214

### 28.40.30 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PolarChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.40.29 Constructor(width as Integer = 640, height as Integer = 480, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5213

### 28.40.31 getXCoor(r as Double, a as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x pixel coordinate of a point given its radial and angular coordinates.
**Notes:** The radial and angular coordinates are measured using the scale of the radial and angular axes. In particular, the scale of the angular axis may not be in degrees or radians. See AngularAxis.setLabels and AngularAxis.setLinearScale on how the angular axis scale is defined.

Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

| Argument | Default | Description |
|---|---|---|
| r | (Mandatory) | The radial coordinate of the point. |
| a | (Mandatory) | The angular coordinate of the point. |

Return Value
The x pixel coordinate of the point.

### 28.40.32 getYCoor(r as Double, a as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y pixel coordinate of a point given its radial and angular coordinates.
**Notes:** The radial and angular coordinates are measured using the scale of the radial and angular axes. In particular, the scale of the angular axis may not be in degrees or radians. See AngularAxis.setLabels and AngularAxis.setLinearScale on how the angular axis scale is defined.

Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

| Argument | Default | Description |
|---|---|---|
| r | (Mandatory) | The radial coordinate of the point. |
| a | (Mandatory) | The angular coordinate of the point. |

Return Value
The y pixel coordinate of the point.

### 28.40.33 setGridColor(rGridColor as color, rGridWidth as Integer, aGridColor as color, aGridWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGridColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.34 setGridColor(rGridColor as Integer = &h80000000, rGridWidth as Integer = 1, aGridColor as Integer = &h80000000, aGridWidth as Integer = 1) 5215

### 28.40.34 setGridColor(rGridColor as Integer = &h80000000, rGridWidth as Integer = 1, aGridColor as Integer = &h80000000, aGridWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the grid colors and widths of the polar plot area.
**Notes:**

See also:

- 28.40.33 setGridColor(rGridColor as color, rGridWidth as Integer, aGridColor as color, aGridWidth as Integer = 1) 5215

| Argument | Default | Description |
|---|---|---|
| rGridColor | 80000000 | The color of grid lines in the radial direction (from the center outwards). |
| rGridWidth | 1 | The line width for grid lines in the radial direction (from the center outwards). |
| aGridColor | 80000000 | The color of grid lines in the angular direction (concentric circles around the center). |
| aGridWidth | 1 | The line width of grid lines in the angular direction (concentric circles around the center) The line width is only used if the polar plot area is using a polygon grid (see PolarChart.setGridStyle). If circular grid is used, the line width is always 1. |

### 28.40.35 setGridStyle(polygonGrid as boolean, gridOnTop as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configure whether to use circular grids or polygon grids, and whether the grid lines are on top of the polar plot area or are at the back.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygonGrid | (Mandatory) | A true value means polygonal grid will be used. A false value means circular grid will be used. |
| gridOnTop | true | A true value means the grid lines will be on top of the polar plot area. A false value means the grid lines will be at the bottom of the polar plot area. |

### 28.40.36 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as color, edgeColor as color, edgeWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setPlotArea method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.37 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000, edgeWidth as Integer = 1) 5216

### 28.40.37 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as Integer = &hff000000, edgeColor as Integer = &hff000000, edgeWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position, background colors, border color and border width of the polar plot area.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the center of the polar plot area. |
| y | (Mandatory) | The y coordinate of the center of the polar plot area. |
| r | (Mandatory) | The radius of the polar plot area in pixels. |
| bgColor | Transparent | The background color of the polar plot area. |
| edgeColor | Transparent | The border color of the polar plot area. |
| edgeWidth | 1 | The border width of the polar plot area. The border width is only used if the polar plot area is using a polygon grid (see PolarChart.setGridStyle). If circular grid is used, the border width is always 1. |

See also:

- 28.40.36 setPlotArea(x as Integer, y as Integer, r as Integer, bgColor as color, edgeColor as color, edgeWidth as Integer = 1) 5216

### 28.40.38 setPlotAreaBg(bgColor1 as color, bgColor2 as color, altRings as boolean = true)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setPlotAreaBg method, but uses color instead of integer data type for passing color values.
See also:

- 28.40.39 setPlotAreaBg(bgColor1 as Integer, bgColor2 as Integer, altRings as boolean = true) 5217

### 28.40.39 setPlotAreaBg(bgColor1 as Integer, bgColor2 as Integer, altRings as boolean = true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets alternating background colors for the polar plot area.
**Notes:** ChartDirector supports using two alternating background colors for the polar plot area. The colors can change on the radial direction, resulting in concentric circles, on an the angular direction, resulting in alternating sectors.

See also:

- 28.40.38 setPlotAreaBg(bgColor1 as color, bgColor2 as color, altRings as boolean = true) 5217

### 28.40.40 setStartAngle(startAngle as Double, clockwise as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| bgColor1 | (Mandatory) | The first background color. |
| bgColor2 | -1 | The second background color. The default value of -1 means it is the same as the first background color. |
| altRings | true | A true value means the background colors alternate in the radial direction, resulting in concentric circles. A false value means the background colors alternates in the angular direction, resulting in alternating sectors. |

**Function:** Sets the angle of the radial axis, and the layout direction of radial grid lines.
**Notes:** The default radial axis angle is 0 degree, which means the radial axis is upward pointing.

| Argument | Default | Description |
|---|---|---|
| startAngle | (Mandatory) | The angle of the radial axis in degrees. The upward pointing direction is 0 degree, with angle measured in the clockwise direction. |
| clockwise | true | A true value means the radial grid line will be laid out in the clockwise direction. A false value means the radial grid lines will be laid out in the counter-clockwise direction. |

### 28.40.41 Properties

### 28.40.42 angularAxis as CDAngularAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the AngularAxis object representing the angular axis of the polar chart.
**Notes:** (Read only property)

### 28.40.43 radialAxis as CDRadialAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the RadialAxis object representing the radial axis of the polar chart.
**Notes:** (Read only property)

### 28.40.44 Screenshots

### 28.40.45 polarbubble.jpg

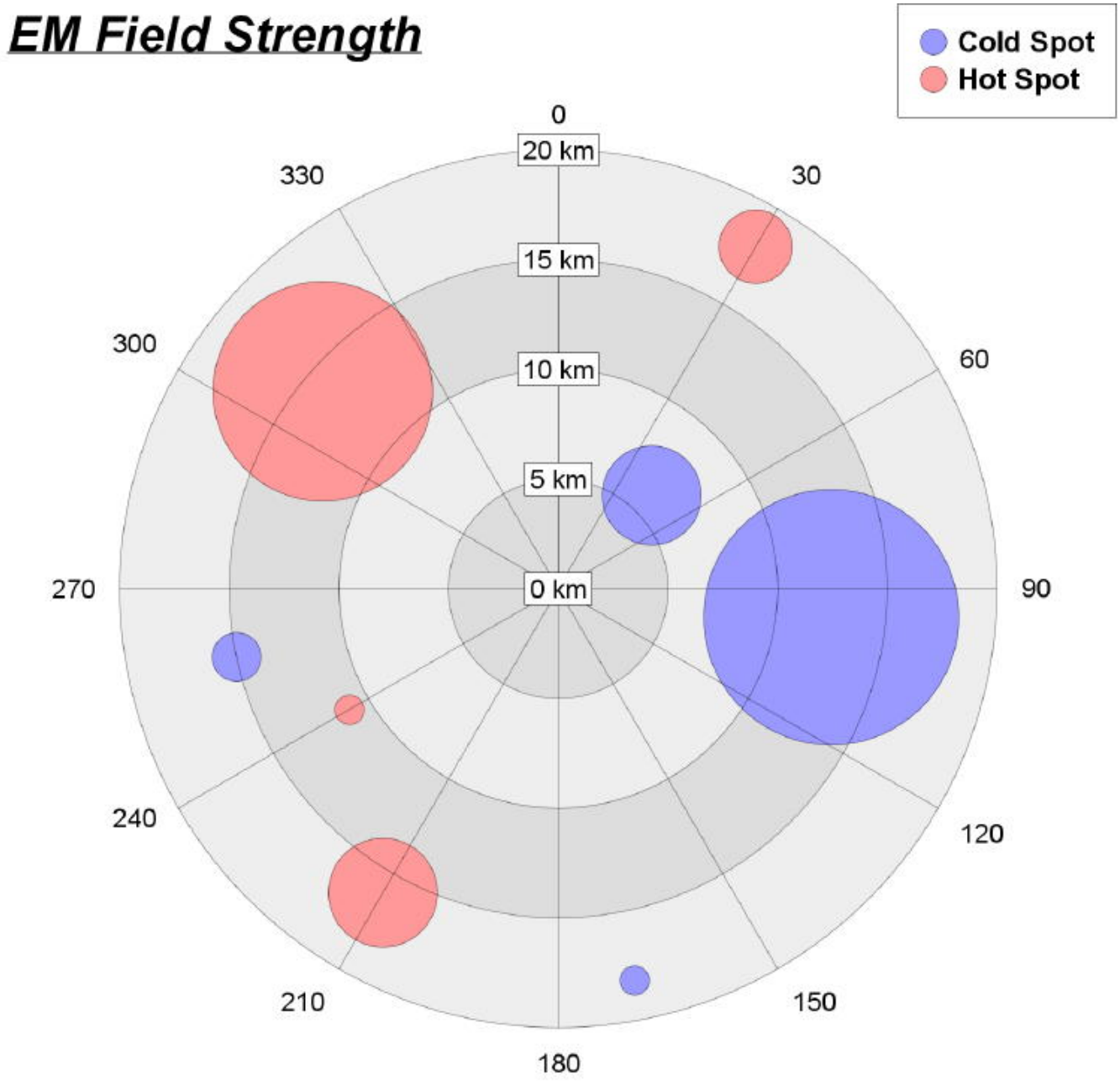


**Function:** A polar chart created using ChartDirector with the CDPolarChartMBS class.

### 28.40.46 polarzones.jpg

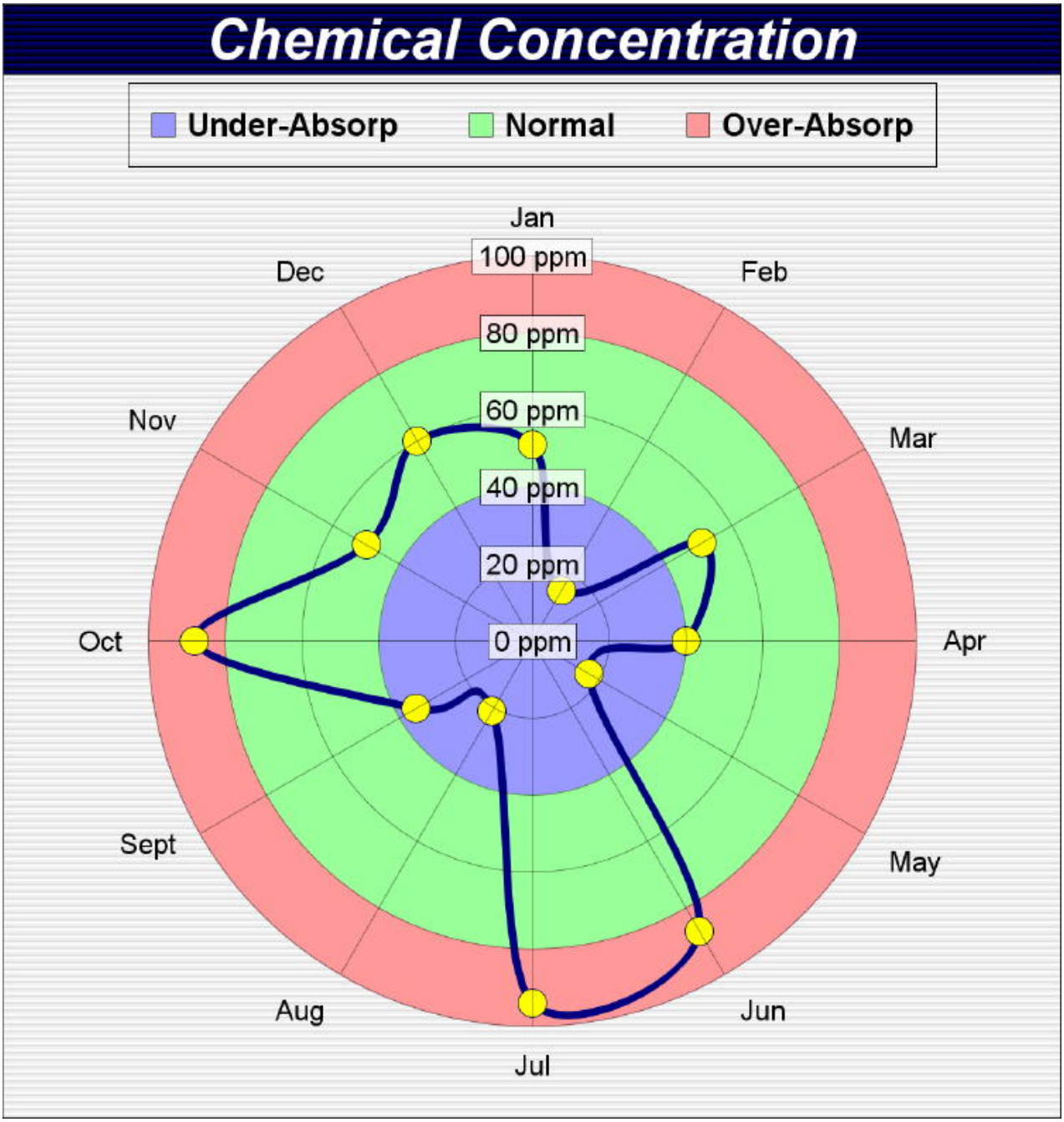


**Function:** A polar chart created using ChartDirector with the CDPolarChartMBS class.

## 28.41 class CDPolarLayerMBS

### 28.41.1 class CDPolarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarLayer class is the base class for all PolarChart layer classes.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr7
- MBS Real Studio Plugins, version 12.4pr3
- MBS Real Studio Plugins, version 12.1pr1

### 28.41.2 Methods

### 28.41.3 addCustomDataLabel(i as Integer, label as string, font as string = "", fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom data label to a data point.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The data point number for the data point. The first data point is 0, while the nth data point is (n - 1). |
| label | (Mandatory) | A text string representing the data label. Parameter Substitution and Formatting is supported. |
| font | "" | The font used to draw the label. |
| fontSize | 8 | The font size used to draw the label. |
| fontColor | TextColor | The color used to draw the label. |
| fontAngle | 0 | The rotation angle of the label. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.41.4 addCustomDataLabel(i as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS 5223


### 28.41.4 addCustomDataLabel(i as Integer, label as string, font as string, fontSize as Double, fontColor as color, fontAngle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCustomDataLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.41.3 addCustomDataLabel(i as Integer, label as string, font as string = """, fontSize as Double = 8, fontColor as Integer = &hffff0002, fontAngle as Double = 0) as CDTextBoxMBS 5222

### 28.41.5 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.41.6 getHTMLImageMap(url as string, queryFormat as string = """, extraAttr as string = """, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates an HTML image map for all data points on the layer.
**Notes:** This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. Use an empty string if no href attribute is needed. |
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the default query parameters. This is useful for specifying appending to the default.

Note that an empty string means to use the default query query parameters. To specify no query parameter, use a space character.

| | | |
|---|---|---|
| extraAttr | "" | A text string to specify additional attributes to add to the <area> tag. Parameter Substitution and Formatting is supported. |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string containing the image map generated.

### 28.41.7 getImageCoor(dataItem as Integer, offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of a data point.
**Notes:** The image map coordinates will be in the following format:

shape="rect" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] "
This format is specially designed so that it can easily be included into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| dataItem | (Mandatory) | The data point number for the data point. The first data point is 0, while the nth data point is (n - 1). |
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the image map coordinates of the data points as HTML image map attributes.

### 28.41.8 setAngles(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the angular coordinates of the data points.
**Notes:** Note that the angular coordinates are measured using the scale of the angular axis, which may not be in degrees or radians. See AngularAxis.setLabels and AngularAxis.setLinearScale on how the angular axis scale is defined.

If this method is not called, the first data point is assumed to have an angular coordinate of 0, and the nth data point is assumed to have an angular coordinate of (n - 1). This is common for radar charts, in which enumerated scale is used for the angular axis (see AngularAxis.setLabels).

| Argument | Default | Description |
|---|---|---|
| angles | (Mandatory) | An array of numbers representing the angular coordinates of the data points. |

### 28.41.9 setBorderColor(edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBorderColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.41.10 setBorderColor(edgeColor as Integer) 5225

### 28.41.10 setBorderColor(edgeColor as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color for drawing the data on the layer.
**Notes:** This method only applies to layers that represents data with elements that have borders (e.g. polar area layer and polar spline area layer).

| Argument | Default | Description |
|---|---|---|
| edgeColor | (Mandatory) | The border color. |

See also:

- 28.41.9 setBorderColor(edgeColor as color) 5225

### 28.41.11 setData(data() as Double, colorvalue as color, name as string = "")

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setData method, but uses color instead of integer data type for passing color values.
See also:

- 28.41.12 setData(data() as Double, colorvalue as Integer = -1, name as string = "") 5226

### 28.41.12 setData(data() as Double, colorvalue as Integer = -1, name as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the values of the data points.
See also:

- 28.41.11 setData(data() as Double, colorvalue as color, name as string = "") 5226

### 28.41.13 setDataLabelFormat(formatString as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data label format.
**Notes:** By default, the data label format is " { value } ". Please refer to Parameter Substitution and Formatting on available parameters and how to format them.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. |

### 28.41.14 setDataLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = 0, fontangle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables data labels and sets their styles.
**Notes:**

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.
See also:

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the labels. |
| fontSize | 8 | The font size used to draw the labels. |
| fontColor | TextColor | The color used to draw the labels. |
| fontAngle | 0 | The rotation angle of the labels. |


- 28.41.15 setDataLabelStyle(font as string, fontsize as Double, fontcolor as color, fontangle as Double = 0) as CDTextBoxMBS 5227


### 28.41.15 setDataLabelStyle(font as string, fontsize as Double, fontcolor as color, fontangle as Double = 0) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataLabelStyle method, but uses color instead of integer data type for passing color values.
See also:


- 28.41.14 setDataLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = 0, fontangle as Double = 0) as CDTextBoxMBS 5226


### 28.41.16 setDataSymbol(area as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a DrawArea object as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A DrawArea object to be used as the symbol. |

See also:


- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.18 setDataSymbol(pic as Picture) 5228
- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230

- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231


### 28.41.17 setDataSymbol(image as folderitem)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image from a file and use it as the graphics symbol to plot the data points.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| image | (Mandatory) | The filename of the image file. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp. |

See also:


- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.18 setDataSymbol(pic as Picture) 5228
- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230
- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231


### 28.41.18 setDataSymbol(pic as Picture)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a picture object as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A picture object to be used as the symbol. |

See also:

- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230
- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231


### 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means the color of the data set will be used. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means the edge color of the data set will be used. |

See also:


- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.18 setDataSymbol(pic as Picture) 5228
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230
- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231

### 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataSymbol method, but uses color instead of integer data type for passing color values.
See also:


- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.18 setDataSymbol(pic as Picture) 5228
- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230
- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231


### 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses one of the built-in symbols as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| symbol | (Mandatory) | One of the predefined shape constants representing the symbol shape. See Shape Specification for the available built-in shapes. |
| size | 7 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means the color of the data set will be used. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means the edge color of the data set will be used. |
| lineWidth | 1 | The line width used for drawing the symbols. |

See also:


- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.18 setDataSymbol(pic as Picture) 5228

- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5231


### 28.41.22 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setDataSymbol method, but uses color instead of integer data type for passing color values.
See also:


- 28.41.16 setDataSymbol(area as CDDrawAreaMBS) 5227
- 28.41.17 setDataSymbol(image as folderitem) 5228
- 28.41.18 setDataSymbol(pic as Picture) 5228
- 28.41.19 setDataSymbol(polygon() as Integer, size as Integer = 11, fillcolor as Integer = -1, edgecolor as Integer = -1) 5229
- 28.41.20 setDataSymbol(polygon() as Integer, size as Integer, fillcolor as color, edgecolor as Integer = -1) 5230
- 28.41.21 setDataSymbol(symbol as Integer, size as Integer = 7, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5230


### 28.41.23 setHTMLImageMap(url as string, queryFormat as string = ””, extraAttr as string = ””)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Override the default arguments used when generating HTML image map for the layer.
**Notes:** BaseChart.getHTMLImageMap can be used to generate HTML image map for the whole chart. When BaseChart.getHTMLImageMap is used, the image map for all layers will be generated based on the arguments supplied to BaseChart.getHTMLImageMap.

The setHTMLImageMap method can be used to override those arguments for a chart layer, so the image map for that layer can be different.

For a detail description of image maps, please refer to BaseChart.getHTMLImageMap.

| Argument | Default | Description |
|---|---|---|
| url | (Mandatory) | The URL to be used in the "href" attribute of the image map. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global URL as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global URL.

Note that an empty string also means to use the global URL. To specify no URL, use the special keyword " { none } ".

To disable the entire image map, use the special keyword " { disable } ".

| | | |
|---|---|---|
| queryFormat | "" | A text string representing the template of the query parameters to be appended to the URL. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global query parameters as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global query parameters.

Note that an empty string also means to use the global query parameters. To specify no query parameters, use the special keyword " { none } ".

| | | |
|---|---|---|
| extraAttr | "" | A text string to specify additional attributes to add to the <area> tag. Parameter Substitution and Formatting is supported. |

The special keyword " { default } " represents the global additional attributes as specified in BaseChart.getHTMLImageMap. This field is useful for specifying appending to the global additional attributes.

Note that an empty string also means to use the global additional attributes. To specify no additional attributes, use the special keyword " { none } ".

### 28.41.24 setImageMapWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the effective size of a data point for producing image maps.
**Notes:** For the purpose of producing image maps for the data points, the sizes of the data points are assumed to be the size of the data symbols. If no data symbol is used, an effective size is assumed. The

default is 10 pixels in width and height.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The effective width and height of the data point for the purpose of producing image maps. |

### 28.41.25 setLineWidth(w as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the line width of lines when drawing the data on the layer.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| w | (Mandatory) | The width of the line in pixels. |

### 28.41.26 setSymbolOffset(offsetX as Integer, offsetY as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offset the symbols in the x and y directions in pixel unit.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xOffset | (Mandatory) | The x offset in pixels. A positive value mean shifting to the right. |
| yOffset | (Mandatory) | The y offset in pixels. A positive value mean shifting to the bottom. |

### 28.41.27 setSymbolScale(data() as Double, scaleType as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the symbol for each data point (for creating bubble charts).
**Notes:** One common usage for this method is to draw circle symbols of different sizes at each data points, creating a bubble chart.

This method supports any valid data symbols. You can create bubble charts with square bubbles, or even custom data symbols.

ChartDirector supports specifying sizes as pixels or in axis scale. The unit is specified by using the following predefined constants.

ConstantValueDescription

| | | |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| RadialAxisScale | 2 | The unit is measured in the radial axis scale. |

| Argument | Default | Description |
|---|---|---|
| zData | (Mandatory) | The sizes of the symbols, expressed using the unit defined by the scaleType argument. |
| scaleType | PixelScale | The unit for zData, which must be one of the predefined constants in the table above. |

# 28.42 class CDPolarLineLayerMBS

## 28.42.1 class CDPolarLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarLineLayer class represents polar area layers.
**Notes:** Subclass of the CDPolarLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 7.5, page 32: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin

## 28.42.2 Methods

## 28.42.3 setCloseLoop(b as boolean)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies whether the polar line should form a close loop (joining the last point to the first point) or not.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value means the polar line should form a close loop. A false value means the polar line should not form a close loop. |

## 28.42.4 setGapColor(lineColor as color, lineWidth as Integer)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setGapColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.42.5 setGapColor(lineColor as Integer, lineWidth as Integer) 5235

## 28.42.5 setGapColor(lineColor as Integer, lineWidth as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and style of the line used for jumping across NoValue data points.
**Notes:** By default, the color of the line for jumping across NoValue data points is Transparent, which means

the line will become discontinuous

| Argument | Default | Description |
|---|---|---|
| lineColor | (Mandatory) | The line color of the line used for jumping across NoValue data points |
| lineWidth | -1 | The line width of the line used for jumping across NoValue data points. -1 means the width will be the same as the line width of the line for drawing normal data points. |

See also:

- 28.42.4 setGapColor(lineColor as color, lineWidth as Integer) 5235

# 28.43 class CDPolarSplineAreaLayerMBS

## 28.43.1 class CDPolarSplineAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarSplineAreaLayer class represents polar spline area layers.
**Notes:** Subclass of the CDPolarAreaLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.43.2 Methods

## 28.43.3 setTension(tension as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tension to use when computing the spline curve.
**Notes:** The tension parameter should be between -1 and 1. A positive tension will make the spline tighter. The spline curve will become straight line segments when tension is 1. A negative tension will make the spline looser.

| Argument | Default | Description |
|---|---|---|
| tension | (Mandatory) | The tension of the spline, which should be between -1 and 1. |

## 28.44 class CDPolarSplineLineLayerMBS

### 28.44.1 class CDPolarSplineLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarSplineLineLayer class represents polar spline line layers.
**Notes:** Subclass of the CDPolarLineLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.44.2 Methods

### 28.44.3 setTension(tension as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tension to use when computing the spline curve.
**Notes:** The tension parameter should be between -1 and 1. A positive tension will make the spline tighter. The spline curve will become straight line segments when tension is 1. A negative tension will make the spline looser.

| Argument | Default | Description |
|---|---|---|
| tension | (Mandatory) | The tension of the spline, which should be between -1 and 1. |

# 28.45 class CDPolarVectorLayerMBS

## 28.45.1 class CDPolarVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PolarVectorLayer class represents polar vector layers.
**Notes:** Subclass of the CDPolarLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.45.2 Methods

## 28.45.3 setArrowAlignment(alignment as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the alignment of the vector relative to the data point.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| alignment | (Mandatory) | A BottomCenter value means the vector will point away from the data point (the default). A TopCenter value means the vector will point into the data point. A Center value means the center of the vector will be at the data point. |

## 28.45.4 setArrowHead(polygon() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a custom shape to be used as the arrow head.
**Notes:** The custom shape is specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 10 x 10 units, in which the x-axis is from left to right, and the y-axis from bottom to top. The origin is assumed to be the bottom center of the arrow (the point where the arrow head joins the arrow stem). The shape is assumed to represent an arrow pointing upwards.

As an example, the followings are the integer array that represents the standard ChartDirector vector arrow head:

-5, -5, 0, 0, 5, -5, 0, 5

ChartDirector will automatically scale the shape to the actual width and height as specified in PolarVectorLayer.setArrowHead.

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates the polygon vertices on a 10 x 10 units grid. |

See also:


- 28.45.5 setArrowHead(width as Integer, height as Integer) 5240


### 28.45.5 setArrowHead(width as Integer, height as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the arrow head.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the arrow head in pixels. The default width is 8 pixels. |
| height | 0 | The height of the arrow head in pixels. The default value of 0 means the height is the same as the width. |

See also:


- 28.45.4 setArrowHead(polygon() as Integer) 5239


### 28.45.6 setArrowStem(polygon() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a custom shape to be used as the arrow stem.
**Notes:** By default, the arrow stem is just a straight line, with the line width controlled using PolarLayer.setLineWidth. The setArrowStem method can specify a custom shape for the arrow stem.

The custom shape is specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 10 x 100 units, in which the x-axis is from left to right, and the y-axis from bottom to top. The origin is assumed to be the starting point of the arrow stem, and the shape is assumed to represent an arrow stem pointing upwards.

ChartDirector will automatically scale the shape so that the total arrow length (head + stem) is the required length of the arrow as according to actual data, and the stem width is as specified in PolarLayer.setLineWidth.

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates the polygon vertices on a 10 x 100 units grid. |

### 28.45.7 setIconSize(height as Integer, width as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the icon to be used in legend box.
**Notes:** By default, if a legend box is available on the chart, ChartDirector will insert an legend entry if the PolarVectorLayer is named. The size of the icon will be the size of the vectors used on the chart, using a short vector length to fit the legend box.

This method can be used to override the legend box settings to specify a custom width/height for the icons of the current PolarVectorLayer.

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the icon in pixels. |
| width | 0 | The width of the icon in pixels. The default value of 0 means the width is automatically determined. |

### 28.45.8 setVector(lengths() as Double, directions() as Double, lengthScale as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the lengths and directions for the vectors.
**Notes:** ChartDirector supports specifying lengths as pixels or in axis scale. The unit is specified by using the following predefined constants.

ConstantValueDescription

| | | |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| RadialAxisScale | 2 | The unit is measured in the radial axis scale. |

| Argument | Default | Description |
|---|---|---|
| lengths | (Mandatory) | An array of numbers representing the lengths of the vectors, in unit as specified in the lengthScale argument. |
| directions | (Mandatory) | An array of numbers representing the direction of the vectors as a clockwise angle in degrees, where 0 is upward pointing direction. |
| lengthScale | PixelScale | The unit for the lengths, which must be one of the predefined constants in the table above. |

### 28.45.9 setVectorMargin(startMargin as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vector margin.
See also:

- 28.45.10 setVectorMargin(startMargin as Double, endMargin as Double) 5242

### 28.45.10 setVectorMargin(startMargin as Double, endMargin as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vector margin.
See also:

- 28.45.9 setVectorMargin(startMargin as Double) 5242

# 28.46 class CDPyramidChartMBS

## 28.46.1 class CDPyramidChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PyramidChart class represents pyramid charts (including cone charts and funnel charts).
**Notes:** The PyramidChart class is a subclass of BaseChart.
Subclass of the CDBaseChartMBS class.
**Blog Entries**

- Create a cone chart with MBS and ChartDirector
- Chart Diagrams with Xojo

**Xojo Developer Magazine**

- 7.4, page 31: Easy Charts and Graphs, Using the ChartDirector Plugin

## 28.46.2 Methods

## 28.46.3 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PyramidChart object.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | kBackgroundColor | The background color of the chart. |
| edgeColor | kTransparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.46.4 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5244

### 28.46.4 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.46.3 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5243

### 28.46.5 getLayer(layerNo as Integer) as CDPyramidLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the PyramidLayer object representing a single pyramid layer in the pyramid chart.
**Notes:** You must call CDPyramidChartMBS.setData to create the layers first before calling this method.
Arguments

| Argument | Default | Description |
|---|---|---|
| layerNo | (Mandatory) | The layer number of the pyramid layer to retrieve, starting from 0. The first pyramid layer is 0. The nth pyramid layer is (n-1). |

Return Value
The requested CDPyramidLayerMBS object.

### 28.46.6 setCenterLabel(labelTemplate as string = """, font as string = """, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds labels to the center of the pyramid layers.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setCenterLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

| Argument | Default | Description |
|---|---|---|
| template | " { skip } " | The label template. " { skip } " means to keep the existing value unchanged. |
| font | " { skip } " | The font style. " { skip } " means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

Return Value
A CDTextBoxMBS object representing the prototype of the labels. This may be used to fine-tune the appearance of the labels.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.46.7 setCenterLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5245

### 28.46.7 setCenterLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setCenterLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.46.6 setCenterLabel(labelTemplate as string = "", font as string = "", fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5244

### 28.46.8 setConeSize(cx as Integer, cy as Integer, radius as Integer, height as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and size of the cone in a cone chart.
**Notes:** Arguments:

### 28.46.9 setData(data() as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x-coordinate of the center of the cone. The center of the cone is the midpoint of the vertical axis of the cone. |
| cy | (Mandatory) | The y-coordinate of the center of the cone. The center of the cone is the midpoint of the vertical axis of the cone. |
| radius | (Mandatory) | The radius of the base of the cone. |
| height | (Mandatory) | The height of the cone. |

**Function:** Sets the data used to draw the pyramid chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data values. |
| labels | [ Empty_Array ] | An array of text strings representing the labels of the layers. An empty array means no layer label. |

See also:

- 28.46.10 setData(data() as Double, labels() as string) 5246

### 28.46.10 setData(data() as Double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data used to draw the pyramid chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data values. |
| labels | [ Empty_Array ] | An array of text strings representing the labels of the layers. An empty array means no layer label. |

See also:

- 28.46.9 setData(data() as Double) 5245

### 28.46.11 setFunnelSize(cx as Integer, cy as Integer, radius as Integer, height as Integer, tubeRadius as Double = 0.2, tubeHeight as Double = 0.3)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and size of the funnel in a funnel chart.
**Notes:** A funnel is similar to an inverted cone, except that the vertex of the cone is replaced by a tube.

Arguments:

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x-coordinate of the center of the funnel. The center of the funnel is the midpoint of the vertical axis of the funnel. |
| cy | (Mandatory) | The y-coordinate of the center of the funnel. The center of the funnel is the midpoint of the vertical axis of the funnel. |
| radius | (Mandatory) | The radius of the mouth of the funnel. |
| height | (Mandatory) | The height of the funnel, inclusive of the tube. |
| tubeRadius | 0.2 | The radius of the tube, as a ratio to the radius of the mouth of the funnel. |
| tubeHeight | 0.3 | The height (length) of the tube, as a ratio to the total height of the funnel. It must be between 0 to 1. |

### 28.46.12 setGradientShading(startBrightness as Double, endBrightness as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets gradient shading mode.
**Notes:** Gradient shading only applies to 2D and 3D pyramids, and 2D cones and funnels. 3D cones and funnels always use Phong lighting (see CDPyramidChartMBS.setLighting).

The gradient is specified with two brightness values at the gradient end points. A brightness less than 1 means the color is darkened, while a brightness greater than 1 means the color is brightened. For example, a brightness of 0.5 means the color is half as bright as the original color. If the original color is red, the color will become dark red. Conversely, a brightness of 2 means the color is twice as bright as the original color. If the original color is red, the color will become light red.

For a pyramid or cone layer, the gradient is from left edge to the right edge. For a funnel chart, the gradient is from the right edge to the left edge.

For a pyramid chart, this is the default coloring method. If this method is never called, the default brightness is from 0.75 to 2.

Arguments:

| Argument | Default | Description |
|---|---|---|
| startBrightness | (Mandatory) | The brightness at the starting point. |
| endBrightness | (Mandatory) | The brightness at the ending point. |

### 28.46.13 setJoinLine(ColorValue as color, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setJoinLine method, but uses color instead of integer data type for passing color values.
See also:

- 28.46.14 setJoinLine(ColorValue as Integer, width as Integer = -1) 5248

### 28.46.14 setJoinLine(ColorValue as Integer, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and line width of the join lines that join the pyramid layers with the left and right labels.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use PyramidLayer.setJoinLine.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the join line. -1 means to keep the existing value unchanged. |
| width | -1 | The width of the line join. -1 means to keep the existing value unchanged. |

See also:

- 28.46.13 setJoinLine(ColorValue as color, width as Integer = -1) 5248

### 28.46.15 setJoinLineGap(pyramidGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join lines that join the pyramid layers with the left and right labels.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding

box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

See also:


- 28.46.16 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer) 5249
- 28.46.17 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer) 5250


### 28.46.16 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join lines that join the pyramid layers with the left and right labels.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

See also:


- 28.46.15 setJoinLineGap(pyramidGap as Integer) 5248
- 28.46.17 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer) 5250

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

### 28.46.17 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join lines that join the pyramid layers with the left and right labels.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

See also:

- 28.46.15 setJoinLineGap(pyramidGap as Integer) 5248
- 28.46.16 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer) 5249

### 28.46.18 setLayerBorder(ColorValue as color, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLayerBorder method, but uses color instead of integer data type for passing color values.
See also:


- 28.46.19 setLayerBorder(ColorValue as Integer, width as Integer = -1) 5251


### 28.46.19 setLayerBorder(ColorValue as Integer, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and line width of the layer border.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setLayerBorder.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the layer border. -1 means to keep the existing value unchanged. |
| width | -1 | The width of the layer border. -1 means to keep the existing value unchanged. |

See also:


- 28.46.18 setLayerBorder(ColorValue as color, width as Integer = -1) 5250


### 28.46.20 setLayerGap(layerGap as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps between pyramid layers.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setLayerGap.

Arguments:

| Argument | Default | Description |
|---|---|---|
| layerGap | (Mandatory) | The gap between layers as a ratio to the height of the pyramid. The gap must be greater than or equals 0. The sum of all gaps must be less than 1. |

### 28.46.21 setLeftLabel(labelTemplate as string = ””, font as string = ””, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds labels to the left of the pyramid layers.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setLeftLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

| Argument | Default | Description |
|---|---|---|
| template | ” { skip } ” | The label template. ” { skip } ” means to keep the existing value unchanged. |
| font | ” { skip } ” | The font style. ” { skip } ” means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

Return Value
A CDTextBoxMBS object representing the prototype of the labels. This may be used to fine-tune the appearance of the labels.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.46.22 setLeftLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5252

### 28.46.22 setLeftLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLeftLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.46.21 setLeftLabel(labelTemplate as string = ””, font as string = ””, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5252

### 28.46.23 setLighting(ambientIntensity as Double = 0.5, diffuseIntensity as Double = 0.5,specularIntensity as Double = 1, shininess as Double = 8)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets Phong lighting mode.
**Notes:** This method adjusts the brightness of the surfaces as according to the Phong lighting model, in which the light source is from the viewer direction and is far away.

For a cone or funnel chart, this is the default coloring method.

For a pyramid chart, only ambient and diffuse reflections are used.

Arguments:

| Argument | Default | Description |
|---|---|---|
| ambientIntensity | 0.5 | The ambient reflection coefficient of the Phong lighting model. |
| diffuseIntensity | 0.5 | The diffuse reflection coefficient of the Phong lighting model. |
| specularIntensity | 1 | The specular reflection coefficient of the Phong lighting model. |
| shininess | 8 | The shininess coefficient of the Phong lighting model. |

### 28.46.24 setPyramidSides(noOfSides as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the number of sides of the base polygon in a pyramid chart.
**Notes:** By default, the base of a pyramid is a square. This method can be used to change it to other regular polygon.

Arguments:

| Argument | Default | Description |
|---|---|---|
| noOfSides | (Mandatory) | The number of sides of the base polygon in a pyramid chart. |

### 28.46.25 setPyramidSize(cx as Integer, cy as Integer, radius as Integer, height as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position and size of the pyramid in a pyramid chart.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x-coordinate of the center of the pyramid. The center of the pyramid is the midpoint of the vertical axis of the pyramid. |
| cy | (Mandatory) | The y-coordinate of the center of the pyramid. The center of the pyramid is the midpoint of the vertical axis of the pyramid. |
| radius | (Mandatory) | For a square pyramid, it is the length of the square. For a pyramid with other regular polygonal base, it is the radius of the circumcircle of the base. |
| height | (Mandatory) | The height of the pyramid. |

### 28.46.26 setRightLabel(labelTemplate as string = """, font as string = """, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds labels to the right of the pyramid layers.
**Notes:** This method affects all pyramid layers. To apply this method to one particular pyramid layer only, use CDPyramidLayerMBS.setRightLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

| Argument | Default | Description |
|---|---|---|
| template | " { skip } " | The label template. " { skip } " means to keep the existing value unchanged. |
| font | " { skip } " | The font style. " { skip } " means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

Return Value:
A TextBox object representing the prototype of the labels. This may be used to fine-tune the appearance of the labels.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.46.27 setRightLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5255


### 28.46.27 setRightLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setRightLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.46.26 setRightLabel(labelTemplate as string = """, font as string = """, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5254

### 28.46.28 setViewAngle(elevation as Double, rotation as Double = 0, twist as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the 3D view angles.
**Notes:** ChartDirector uses elevation, rotation and twist angles to specify the 3D view angles.

To explain the meaning of the angles, imagine the object being viewed is put at the center of a hollow sphere, and a camera (the view point) is put at the surface of the sphere, directed inwards to the center to look at the object.

The elevation angle refers to the "latitude" of the camera. An elevation angle of 0 degrees means the camera is at the "equator" pointing to the object from the side. An elevation angle of 90 degrees means the camera is at the "north pole" pointing down to the object. An angle elevation of -90 degrees means the camera is at the "south pole", pointing up to the object.

The rotation angle refers to the "longitude" of the camera. If the elevation is 0 degrees, and the rotation angle varies from 0 to 360 degrees, the camera will move around the "equator" in the easterly direction (counter-clockwise when viewed from the north pole).

The twist angle is for rotating the camera itself while still pointing to the object. For example, a twist angle of 90 degrees means you are holder the camera "vertically" instead of "horizontally". The rotation is clockwise from the view point of the person holding the camera.

Note that from the view point of the camera, the object will appear to be rotating in the opposite direction. For example, as the rotation angle rotates the camera counter-clockwise along the "equator", the object will appear to be rotating clockwise on the screen.

Arguments:

| Argument | Default | Description |
|---|---|---|
| elevation | (Mandatory) | The elevation angle in degrees. |
| rotation | 0 | The rotation angle in degrees. |
| twist | 0 | The twist angle in degrees. |

### 28.46.29 Screenshots

### 28.46.30 cone.jpg

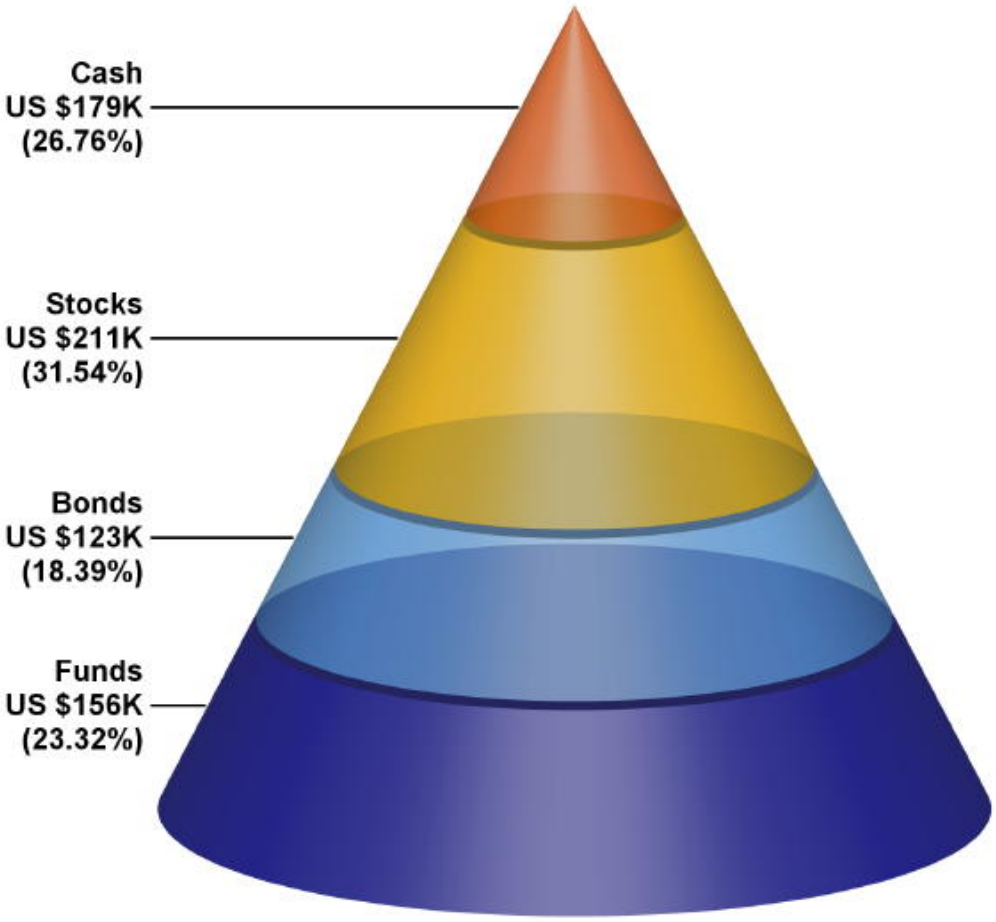


**Function:** A pyramid chart showing a cone created using ChartDirector with the CDPyramidChartMBS class.

### 28.46.31 pyramidrotation.jpg

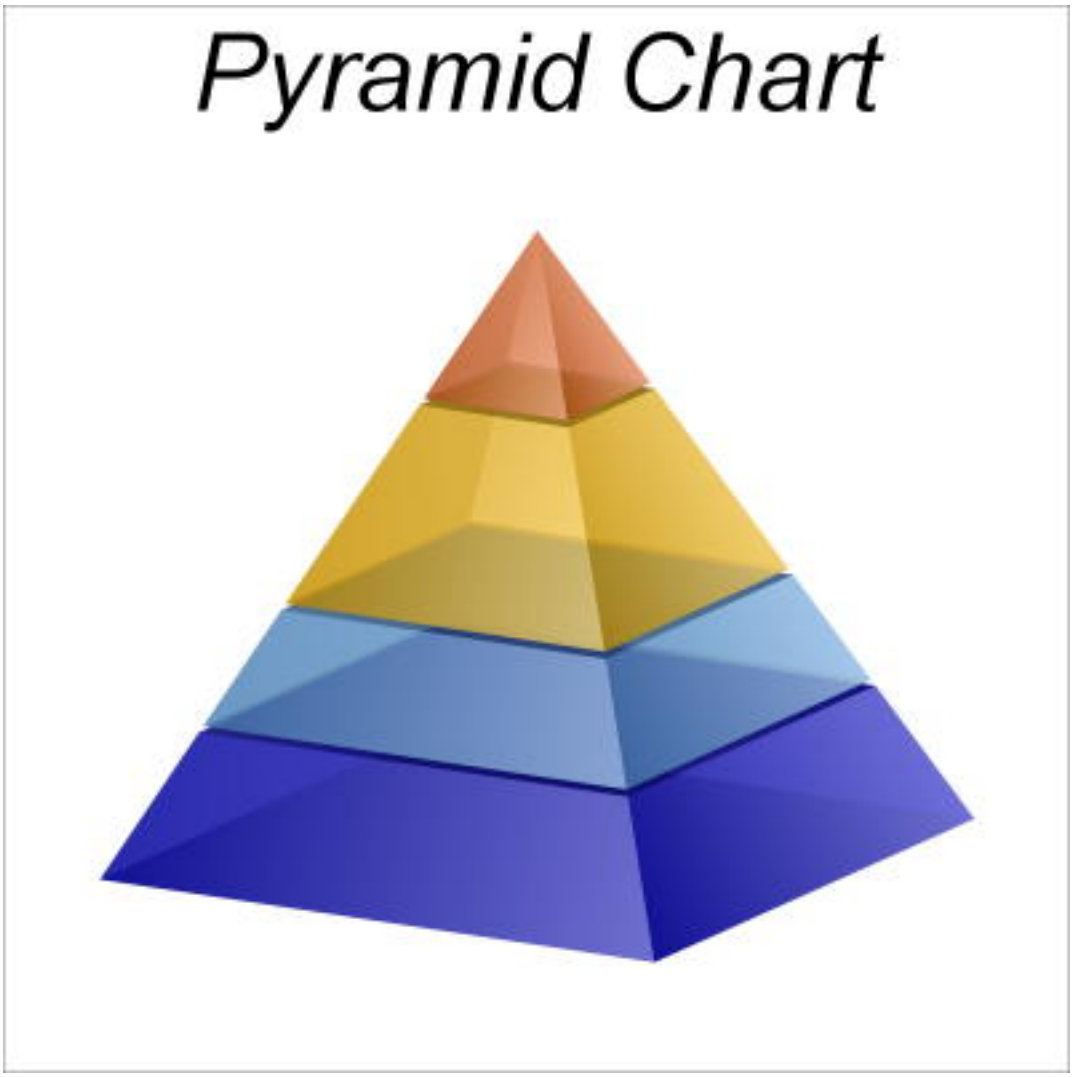


**Function:** A pyramid chart created using ChartDirector with the CDPyramidChartMBS class.

## 28.47 class CDPyramidLayerMBS

### 28.47.1 class CDPyramidLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PyramidLayer class represents pyramid layers (including cone and funnel layers).
**Notes:** The PyramidLayer object is obtained using PyramidChart.getLayer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.47.2 Methods

### 28.47.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.47.4 setCenterLabel(labelTemplate as string = "", font as string = "", fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a label to the center of the pyramid layer.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setCenterLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

| Argument | Default | Description |
|---|---|---|
| template | " { skip } " | The label template. " { skip } " means to keep the existing value unchanged. |
| font | " { skip } " | The font style. " { skip } " means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

Return Value
A CDTextBoxMBS object representing the prototype of the label. This may be used to fine-tune the ap-

pearance of the label.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.47.5 setCenterLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5260

### 28.47.5 setCenterLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setCenterLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.47.4 setCenterLabel(labelTemplate as string = """, font as string = """, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5259

### 28.47.6 setColor(ColorValue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.47.7 setColor(ColorValue as Integer) 5260

### 28.47.7 setColor(ColorValue as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the pyramid layer.
See also:

- 28.47.6 setColor(ColorValue as color) 5260

### 28.47.8 setJoinLine(ColorValue as color, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setJoinLine method, but uses color instead of integer data type for passing color values.
See also:


- 28.47.9 setJoinLine(ColorValue as Integer, width as Integer = -1) 5261


### 28.47.9 setJoinLine(ColorValue as Integer, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and line width of the join line that joins the pyramid layer with the left and right labels.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setJoinLine.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the join line. -1 means to keep the existing value unchanged. |
| width | -1 | The width of the line join. -1 means to keep the existing value unchanged. |

See also:


- 28.47.8 setJoinLine(ColorValue as color, width as Integer = -1) 5260


### 28.47.10 setJoinLineGap(pyramidGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join line that joins the pyramid layer with the left and right labels.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

See also:


- 28.47.11 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer) 5262

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

- 28.47.12 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer) 5262

### 28.47.11 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join line that joins the pyramid layer with the left and right labels.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

See also:

- 28.47.10 setJoinLineGap(pyramidGap as Integer) 5261
- 28.47.12 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer) 5262

### 28.47.12 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer, textGap as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gaps of the join line that joins the pyramid layer with the left and right labels.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setJoinLineGap.

By default, the starting point of the join line connects to the pyramid layer edge with a 3 pixels gap. The join line is horizontal, and its length is such that the ending point is 10 pixels outside the pyramid bounding box. The label text box connects to the ending point with a 3 pixels gap.

This method allows the gaps and positions of the join line end points to be configured to other values.

Arguments:

| Argument | Default | Description |
|---|---|---|
| pyramidGap | (Mandatory) | The gap in pixels between the starting point of the join line and the pyramid layer edge. |
| pyramidMargin | 10 | The distance in pixels between the ending point of the join line and the pyramid bounding box. |
| textGap | 3 | The gap in pixels between the label text box and the ending point of the join line. |

See also:

- 28.47.10 setJoinLineGap(pyramidGap as Integer) 5261
- 28.47.11 setJoinLineGap(pyramidGap as Integer, pyramidMargin as Integer) 5262

### 28.47.13 setLayerBorder(ColorValue as color, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLayerBorder method, but uses color instead of integer data type for passing color values.
See also:

- 28.47.14 setLayerBorder(ColorValue as Integer, width as Integer = -1) 5263

### 28.47.14 setLayerBorder(ColorValue as Integer, width as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and line width of the layer border.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setLayerBorder.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the layer border. -1 means to keep the existing value unchanged. |
| width | -1 | The width of the layer border. -1 means to keep the existing value unchanged. |

See also:

- 28.47.13 setLayerBorder(ColorValue as color, width as Integer = -1) 5263

### 28.47.15 setLayerGap(layerGap as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the gap between this pyramid layer and the next pyramid layer.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setLayerGap.

Arguments:

| Argument | Default | Description |
|---|---|---|
| layerGap | (Mandatory) | The gap between layers as a ratio to the height of the pyramid. The gap must be greater than or equals 0. The sum of all gaps must be less than 1. |

### 28.47.16 setLeftLabel(labelTemplate as string = ””, font as string = ””, fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a label to the left of the pyramid layer.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setLeftLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

Return Value
A CDTextBoxMBS object representing the prototype of the label. This may be used to fine-tune the appearance of the label.

| Argument | Default | Description |
|---|---|---|
| template | " { skip } " | The label template. " { skip } " means to keep the existing value unchanged. |
| font | " { skip } " | The font style. " { skip } " means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.47.17 setLeftLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5265

### 28.47.17 setLeftLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLeftLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.47.16 setLeftLabel(labelTemplate as string = "", font as string = "", fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5264

### 28.47.18 setRightLabel(labelTemplate as string = "", font as string = "", fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a label to the right of the pyramid layer.
**Notes:** To apply this method to all pyramid layers, use CDPyramidChartMBS.setRightLabel.

See Parameter Substitution and Formatting on available format parameters for the template.

See Font Specification for details on various font attributes.

Arguments:

Return Value
A CDTextBoxMBS object representing the prototype of the label. This may be used to fine-tune the appearance of the label.

| Argument | Default | Description |
|---|---|---|
| template | " { skip } " | The label template. " { skip } " means to keep the existing value unchanged. |
| font | " { skip } " | The font style. " { skip } " means to keep the existing value unchanged. |
| fontSize | -1 | The font size in points. -1 means to keep the existing value unchanged. |
| fontColor | -1 | The font color. -1 means to keep the existing value unchanged. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.47.19 setRightLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS 5266

### 28.47.19 setRightLabel(labelTemplate as string, font as string, fontSize as Double, fontColor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setRightLabel method, but uses color instead of integer data type for passing color values.
See also:

- 28.47.18 setRightLabel(labelTemplate as string = "", font as string = "", fontSize as Double = 8, fontColor as Integer = -1) as CDTextBoxMBS 5265

## 28.48 class CDRadialAxisMBS

### 28.48.1 class CDRadialAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RadialAxis class represents radial axes in polar charts.
**Notes:** In the current version of ChartDirector, RadialAxis is implemented as a special configuration of Axis.
Subclass of the CDAxisMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.49 class CDRanSeriesMBS

### 28.49.1 class CDRanSeriesMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RanSeries is a utility class to produce random series.
**Notes:** It facilitates testing and demonstrating ChartDirector programs without needing a real data source.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- MBS Real Studio Plugins, version 12.3pr16

**Xojo Developer Magazine**

- 18.5, page 69: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.49.2 Methods

### 28.49.3 Constructor(seed as Integer)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a RanSeries object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| seed | (Mandatory) | The seed to be used in the random number generator. |

### 28.49.4 create(seed as Integer) as CDRanSeriesMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a RanSeries object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| seed | (Mandatory) | The seed to be used in the random number generator. |

### 28.49.5 fillDateSeries(Values() as Double, startTime as double, tickInc as double, weekDayOnly as Boolean = false)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill an array with date/time values.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| ret | (Mandatory) | The array to be filled. |
| len | (Mandatory) | The number of values to generate. |
| startTime | (Mandatory) | The first date/time. |
| tickInc | (Mandatory) | The change in date/time for subsequent records in seconds. The value 30 * 86400 is assumed to mean 1 month (which is not a constant interval), and its multiplies are assumed to mean multiple months. In particular, the value 360 * 86400 is assumed to mean 12 months, or 1 year. |
| weekDayOnly | false | A true value means skipping dates that are not weekdays (Saturday and Sunday). A false value means no skipping. |

### 28.49.6 fillSeries(Values() as Double, minValue as double, maxValue as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill an array with independent random numbers.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| ret | (Mandatory) | The array to be filled. |
| len | (Mandatory) | The number of random numbers to generate. |
| minValue | (Mandatory) | The minimum value of the random number. |
| maxValue | (Mandatory) | The maximum value of the random number. |

See also:

- 28.49.7 fillSeries(Values() as Double, startValue as double, minDelta as double, maxDelta as double, lowerLimit as double = -1E+308, upperLimit as double = 1E+308) 5269

### 28.49.7 fillSeries(Values() as Double, startValue as double, minDelta as double, maxDelta as double, lowerLimit as double = -1E+308, upperLimit as double = 1E+308)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill an array with numbers in which the difference between adjacent numbers is random.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| ret | (Mandatory) | The array to be filled. |
| len | (Mandatory) | The number of random values to generate. |
| startValue | (Mandatory) | The first value in the sequence. |
| minDelta | (Mandatory) | The minimum change between two consecutive numbers. |
| maxDelta | (Mandatory) | The maximum change between two consecutive numbers. |
| lowerLimit | [ -Infinity ] | The minimum allowed value of the numbers. |
| upperLimit | [ +Infinity ] | The maximum allowed value of the numbers. |

See also:

- 28.49.6 fillSeries(Values() as Double, minValue as double, maxValue as double) 5269

### 28.49.8 get2DSeries(xLen as Integer, yLen as Integer, minValue as Double, maxValue as Double) as Double()

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of random numbers representing points on a 2D grid in which the difference between neighbouring points is random.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xLen | (Mandatory) | The number of points in the grid in the x direction. |
| yLen | (Mandatory) | The number of points in the grid in the y direction. |
| minValue | (Mandatory) | The minimum value of the random number. |
| maxValue | (Mandatory) | The maximum value of the random number. |

Returns an array of random numbers representing points on a 2D grid in which the difference between neighbouring points is random. The array will contain (xLen * yLen) elements. The element at index (y * xLen + x) represents the point at (x, y), in which x and y are integers such that 0 <= x <xLen and 0 <= y <yLen.

### 28.49.9 getDateSeries(len as Integer, startTime as Double, tickInc as Double, weekDayOnly as boolean = false) as Double()

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of date/time values.
**Notes:**

Returns an array of date/time values.

| Argument | Default | Description |
|---|---|---|
| len | (Mandatory) | The number of random values to get. |
| startTime | (Mandatory) | The date/time of the first record in the column. |
| tickInc | (Mandatory) | The change in date/time for subsequent records in seconds. The value 30 * 86400 is assumed to mean 1 month (which is not a constant interval), and its multiplies are assumed to mean multiple months. In particular, the value 360 * 86400 is assumed to mean 12 months, or 1 year. |
| weekDayOnly | false | A true value means skipping dates that are not weekdays (Saturday and Sunday). A %F value means no skipping. |

### 28.49.10 getSeries(len as Integer, minValue as Double, maxValue as Double) as Double()

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of numbers that fluctuate randomly.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| len | (Mandatory) | The number of random values to get. |
| startValue | (Mandatory) | The first value in the sequence. |
| minDelta | (Mandatory) | The minimum change between two consecutive numbers. |
| maxDelta | (Mandatory) | The maximum change between two consecutive numbers. |
| lowerLimit | [ -Infinity ] | The minimum allowed value of the numbers. |
| upperLimit | [ +Infinity ] | The maximum allowed value of the numbers. |

Returns an array of numbers that fluctuate randomly.
See also:


- 28.49.11 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double) as Double() 5271
- 28.49.12 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) as Double() 5272
- 28.49.13 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) as Double() 5273


### 28.49.11 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double) as Double()

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of numbers that fluctuate randomly.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| len | (Mandatory) | The number of random values to get. |
| startValue | (Mandatory) | The first value in the sequence. |
| minDelta | (Mandatory) | The minimum change between two consecutive numbers. |
| maxDelta | (Mandatory) | The maximum change between two consecutive numbers. |
| lowerLimit | [ -Infinity ] | The minimum allowed value of the numbers. |
| upperLimit | [ +Infinity ] | The maximum allowed value of the numbers. |

Returns an array of numbers that fluctuate randomly.
See also:

- 28.49.10 getSeries(len as Integer, minValue as Double, maxValue as Double) as Double() 5271
- 28.49.12 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) as Double() 5272
- 28.49.13 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) as Double() 5273

### 28.49.12 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) as Double()

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of numbers that fluctuate randomly.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| len | (Mandatory) | The number of random values to get. |
| startValue | (Mandatory) | The first value in the sequence. |
| minDelta | (Mandatory) | The minimum change between two consecutive numbers. |
| maxDelta | (Mandatory) | The maximum change between two consecutive numbers. |
| lowerLimit | [ -Infinity ] | The minimum allowed value of the numbers. |
| upperLimit | [ +Infinity ] | The maximum allowed value of the numbers. |

Returns an array of numbers that fluctuate randomly.
See also:

- 28.49.10 getSeries(len as Integer, minValue as Double, maxValue as Double) as Double() 5271
- 28.49.11 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double) as Double() 5271
- 28.49.13 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) as Double() 5273

### 28.49.13 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) as Double()

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an array of numbers that fluctuate randomly.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| len | (Mandatory) | The number of random values to get. |
| startValue | (Mandatory) | The first value in the sequence. |
| minDelta | (Mandatory) | The minimum change between two consecutive numbers. |
| maxDelta | (Mandatory) | The maximum change between two consecutive numbers. |
| lowerLimit | [ -Infinity ] | The minimum allowed value of the numbers. |
| upperLimit | [ +Infinity ] | The maximum allowed value of the numbers. |

Returns an array of numbers that fluctuate randomly.
See also:


- 28.49.10 getSeries(len as Integer, minValue as Double, maxValue as Double) as Double() 5271
- 28.49.11 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double) as Double() 5271
- 28.49.12 getSeries(len as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) as Double() 5272

## 28.50 class CDRanTableMBS

### 28.50.1 class CDRanTableMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RanTable is a utility class to produce tables with random numbers.
**Notes:** It facilitates testing and demonstrating ChartDirector programs without needing a real database table.
**Xojo Developer Magazine**

- 7.5, pages 34 to 35: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin

### 28.50.2 Methods

### 28.50.3 Constructor(seed as Integer, noOfCols as Integer, noOfRows as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a RanTable object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| seed | (Mandatory) | The seed to be used in the random number generator. |
| noOfCols | (Mandatory) | The number of columns in the random number table. |
| noOfRows | (Mandatory) | The number of rows in the random number table. |

### 28.50.4 getCol(colNo as Integer) as CDArrayMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the request column as an array of numbers.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The column to get. The first column is 0. The nth column is (n - 1). |

Return Value
An array containing numbers from the requested column.

### 28.50.5 selectDate(colNo as Integer, minDate as Double, maxDate as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects the rows within a certain date range.
**Notes:** After executing this method, the RanTable will be reduced to only contain rows that are within minDate and maxDate (inclusive of both dates).

| Argument | Default | Description |
|---|---|---|
| colNo | (Mandatory) | The date column to be used as selection criteria. |
| minDate | (Mandatory) | The minimum date (earliest date). |
| maxDate | (Mandatory) | The maximum date (latest date). |

### 28.50.6 setCol(colNo as Integer, minValue as Double, maxValue as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill the given column in the RanTable with random numbers in the given range.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colNo | (Mandatory) | The column to fill. The first column is 0. The nth column is (n - 1). |
| minValue | (Mandatory) | The minimum value of the random number. |
| maxValue | (Mandatory) | The maximum value of the random number. |

See also:


- 28.50.7 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double) 5275
- 28.50.8 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) 5276
- 28.50.9 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) 5277


### 28.50.7 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill the given column in the RanTable with random numbers that fluctuates within a given speed.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colNo | (Mandatory) | The column to fill. The first column is 0. The nth column is (n - 1). |
| startValue | (Mandatory) | The value of the first record in the column. |
| minDelta | (Mandatory) | The minimum change allowed for between the current random number and the previous random number. This parameter is usually negative. |
| maxDelta | (Mandatory) | The maximum change allowed for between the current random number and the previous random number. |
| lowerLimit | [ -Infinity ] | The minimum value of the random number. |
| upperLimit | [ +Infinity ] | The maximum value of the random number. |

See also:

- 28.50.6 setCol(colNo as Integer, minValue as Double, maxValue as Double) 5275
- 28.50.8 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) 5276
- 28.50.9 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) 5277

### 28.50.8 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill the given column in the RanTable with random numbers that fluctuates within a given speed.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colNo | (Mandatory) | The column to fill. The first column is 0. The nth column is (n - 1). |
| startValue | (Mandatory) | The value of the first record in the column. |
| minDelta | (Mandatory) | The minimum change allowed for between the current random number and the previous random number. This parameter is usually negative. |
| maxDelta | (Mandatory) | The maximum change allowed for between the current random number and the previous random number. |
| lowerLimit | [ -Infinity ] | The minimum value of the random number. |
| upperLimit | [ +Infinity ] | The maximum value of the random number. |

See also:

- 28.50.6 setCol(colNo as Integer, minValue as Double, maxValue as Double) 5275
- 28.50.7 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double) 5275
- 28.50.9 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) 5277

### 28.50.9 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill the given column in the RanTable with random numbers that fluctuates within a given speed.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colNo | (Mandatory) | The column to fill. The first column is 0. The nth column is (n - 1). |
| startValue | (Mandatory) | The value of the first record in the column. |
| minDelta | (Mandatory) | The minimum change allowed for between the current random number and the previous random number. This parameter is usually negative. |
| maxDelta | (Mandatory) | The maximum change allowed for between the current random number and the previous random number. |
| lowerLimit | [ -Infinity ] | The minimum value of the random number. |
| upperLimit | [ +Infinity ] | The maximum value of the random number. |

See also:


- 28.50.6 setCol(colNo as Integer, minValue as Double, maxValue as Double) 5275
- 28.50.7 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double) 5275
- 28.50.8 setCol(colNo as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double) 5276


### 28.50.10 setDateCol(i as Integer, startTime as Double, tickInc as Double, weekDayOnly as boolean=false)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill the given column in the RanTable with a date/time series.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The column to fill. The first column is 0. The nth column is (n - 1). |
| startTime | (Mandatory) | The date/time of the first record in the column. |
| tickInc | (Mandatory) | The change in date/time for subsequent records in seconds. The value 30 * 86400 is assumed to mean 1 month (which is not a constant interval), and its multiplies are assumed to mean multiple months. In particular, the value 360 * 86400 is assumed to mean 12 months, or 1 year. |
| weekDayOnly | false | A true value means skipping dates that are not weekdays (Saturday and Sunday). A %F value means no skipping. |

### 28.50.11 setHLOCCols(i as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double = 0.0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill 4 columns in the RanTable with random high, low, open and close records.
**Notes:** The 4 columns will meet the constraints that for each record, the high value will be greater than or equal to the low value, and both the open and close values will be in between the high and low values.

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The column number of the "high" column. The next column will be assumed to be "low", followed by "open" and "close". The column number starts at 0. The first column is 0. The nth column is (n - 1). |
| startValue | (Mandatory) | The initial "open" value. |
| minDelta | (Mandatory) | The minimum change allowed for between the current "open" and the previous "close" value, as well as between the current "close" value and the current "open" value. This parameter is usually negative. |
| maxDelta | (Mandatory) | The maximum change allowed for between the current "open" and the previous "close" value, as well as between the current "close" value and the current "open" value. |
| lowerLimit | 0 | The minimum value for "high", "low", "open" and "close". |
| upperLimit | [ +Infinity ] | The maximum value for "high", "low", "open" and "close". |

See also:

- 28.50.12 setHLOCCols(i as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double) 5278

### 28.50.12 setHLOCCols(i as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double, upperLimit as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fill 4 columns in the RanTable with random high, low, open and close records.
**Notes:** The 4 columns will meet the constraints that for each record, the high value will be greater than or equal to the low value, and both the open and close values will be in between the high and low values.

See also:

- 28.50.11 setHLOCCols(i as Integer, startValue as Double, minDelta as Double, maxDelta as Double, lowerLimit as Double = 0.0) 5278

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The column number of the "high" column. The next column will be assumed to be "low", followed by "open" and "close". The column number starts at 0. The first column is 0. The nth column is (n - 1). |
| startValue | (Mandatory) | The initial "open" value. |
| minDelta | (Mandatory) | The minimum change allowed for between the current "open" and the previous "close" value, as well as between the current "close" value and the current "open" value. This parameter is usually negative. |
| maxDelta | (Mandatory) | The maximum change allowed for between the current "open" and the previous "close" value, as well as between the current "close" value and the current "open" value. |
| lowerLimit | 0 | The minimum value for "high", "low", "open" and "close". |
| upperLimit | [ +Infinity ] | The maximum value for "high", "low", "open" and "close". |

## 28.51 class CDScatterLayerMBS

### 28.51.1 class CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ScatterLayer class represents scatter layers.
**Notes:** Subclass of the CDLineLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

# 28.52 class CDSectorMBS

## 28.52.1 class CDSectorMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Sector class represents sectors.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 28.52.2 Methods

## 28.52.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 28.52.4 getImageCoor(offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of the sector as HTML image map attributes.
**Notes:** The image map coordinates will be in the following format:

shape="poly" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] ..."
where (x1, y1), (x2, y2) ... are vertices of a polygon that approximate the sector. The format is specially designed so that it can easily be incorporated into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the coordinates of the sector in HTML image map attribute format.

### 28.52.5 getLabelCoor(offsetX as Integer = 0, offsetY as Integer = 0) as string

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the image map coordinates of the sector label as HTML image map attributes.
**Notes:** The image map coordinates will be in the following format:

shape="rect" cords=" [ x1 ] , [ y1 ] , [ x2 ] , [ y2 ] "
where (x1, y1) and (x2, y2) are opposite corners of the box that encloses the sector label. The format is specially designed so that it can easily be incorporated into HTML image maps.

This method should be called only after creating the chart image (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). The image map cannot be determined without creating the chart image first.

| Argument | Default | Description |
|---|---|---|
| offsetX | 0 | An offset to be added to all x coordinates in the image map. This is useful if the current image will be shifted and inserted into another image. In this case, the image map will need to be shifted by the same offset. |
| offsetY | 0 | An offset to be added to all y coordinates in the image map. See offsetX above for description. |

Return Value
A text string representing the coordinates of the sector label in HTML image map attribute format.

### 28.52.6 setColor(colorvalue as color, edgeColor as color, joinLineColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.52.7 setColor(colorvalue as Integer, edgeColor as Integer = -1, joinLineColor as Integer = -1) 5282

### 28.52.7 setColor(colorvalue as Integer, edgeColor as Integer = -1, joinLineColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the fill color, edge color and join line color of the sector.
**Notes:** By default, the edge color is SameAsMainColor. For the join line color, if the circular label layout method is used, the default is Transparent, otherwise the default is SameAsMainColor.

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color of the sector. |
| edgeColor | -1 | The edge color of the sector. -1 means the color is unchanged. |
| joinLineColor | -1 | The color of the line that join the sector perimeter with the sector label. -1 means the color is unchanged. |

See also:

- 28.52.6 setColor(colorvalue as color, edgeColor as color, joinLineColor as color) 5282

### 28.52.8 setExplode(distance as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Explode the sector.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| distance | -1 | The explosion distance in pixels. -1 means the distance is automatically determined. |

### 28.52.9 setJoinLine(joinLineColor as color, joinLineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setJoinLine method, but uses color instead of integer data type for passing color values.
See also:

- 28.52.10 setJoinLine(joinLineColor as Integer, joinLineWidth as Integer = 1) 5283

### 28.52.10 setJoinLine(joinLineColor as Integer, joinLineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color and width of the join line used to connect the sector label to the sector perimeter.
**Notes:** By default, for circular label layout, the join line color is Transparent. For side label layout, the join line color is SameAsMainColor.

| Argument | Default | Description |
|---|---|---|
| joinLineColor | (Mandatory) | The color of the line that joins the sector perimeter with the sector label. |
| joinLineWidth | 1 | The line width of the join line. |

See also:

- 28.52.9 setJoinLine(joinLineColor as color, joinLineWidth as Integer = 1) 5283

### 28.52.11 setLabelFormat(formatString as string = "")

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format of the sector label.
**Example:**

```
dim c as CDSectorMBS

// you can use label formats like this:

c.setLabelFormat("<*block,halign=left*><*font=timesbi.ttf,size=12,underline=1*>{ label } <*/font*><*br*>US$
{ value } K ( { percent } %)")

// we can reduce that to this:

c.setLabelFormat(" { label } { value } { percent } %")

// and it shows 3 numbers. With | 1 after the variable name, we define the decimals after dot:

c.setLabelFormat(" { label } { value | 1 } { percent | 1 } %")

// and

c.setLabelFormat(" { label } { value | 1., } { percent | 1., } %")

// uses dot for thousands and comma for decimal separator.
```

**Notes:** To set the label format for all sectors, use PieChart.setLabelFormat.

| Argument | Default | Description |
|---|---|---|
| formatString | (Mandatory) | The format string. See PieChart.setLabelFormat for details. |

### 28.52.12 setLabelLayout(layoutMethod as Integer, pos as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the layout method and location of the sector label.
**Notes:** To set the sector label layout method and location for all sectors, use PieChart.setLabelLayout.

ChartDirector supports two sector label layout methods - circular layout and side layout. For detail descriptions, please refer to PieChart.setLabelLayout.

| Argument | Default | Description |
|---|---|---|
| layoutMethod | (Mandatory) | Specify the layout method. Must be one of the predefined constants CircleLayout or SideLayout. |
| pos | -1 | For circular layout, it is the distance between the sector perimeter and the sector label. A negative value (but not -1) means the sector label will be drawn in the interior of the sector. |

For side layout, it is the distance between the pie perimeter and the left or right edges of the invisible containing rectangle (equal to the width of the rectangle minus the pie diameter and then divided by 2).

In either case, -1 means the distance is automatically determined.

### 28.52.13 setLabelPos(pos as Integer, joinLineColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelPos method, but uses color instead of integer data type for passing color values.
See also:

- 28.52.14 setLabelPos(pos as Integer, joinLineColor as Integer = -1) 5285

### 28.52.14 setLabelPos(pos as Integer, joinLineColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the circular label layout method, and configure the join lines used to connect the sector label to the sector perimeter.
**Notes:** To set the sector label position or join line color for all sectors, use PieChart.setLabelPos.

See also:

- 28.52.13 setLabelPos(pos as Integer, joinLineColor as color) 5285

| Argument | Default | Description |
|---|---|---|
| pos | (Mandatory) | The distance between the sector perimeter and the sector label. A negative value means the sector label will be drawn in the interior of the sector. |
| joinLineColor | -1 | The color of the line that joins the sector perimeter with the sector label. The default is Transparent. The join line is ignored if the sector label is inside the sector. |

### 28.52.15 setLabelStyle(font as string = """, fontsize as Double = 8, fontcolor as Integer = &hffff0002) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the style used to draw the sector label.
**Notes:** To set the label style for all sector labels, use PieChart.setLabelStyle.

See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | "" | The font used to draw the sector label. |
| fontSize | 8 | The font size in points. |
| fontColor | TextColor | The text color for the sector label. |

Return Value
A TextBox object representing the prototype of the obj. This may be used to fine-tune the appearance of the obj.

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml
See also:

- 28.52.16 setLabelStyle(font as string, fontsize as Double, fontcolor as color) as CDTextBoxMBS 5286

### 28.52.16 setLabelStyle(font as string, fontsize as Double, fontcolor as color) as CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setLabelStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.52.15 setLabelStyle(font as string = "", fontsize as Double = 8, fontcolor as Integer = &hffff0002) as CDTextBoxMBS 5286

### 28.52.17 setStyle(shadingMethod as Integer, edgeColor as color, edgeWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setStyle method, but uses color instead of integer data type for passing color values.
See also:

- 28.52.18 setStyle(shadingMethod as Integer, edgeColor as Integer = -1, edgeWidth as Integer = -1) 5287

### 28.52.18 setStyle(shadingMethod as Integer, edgeColor as Integer = -1, edgeWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the sector shading style, edge color and edge width.
**Notes:** This method is the same as CDPieChartMBS.setSectorStyle, except it only affects one sector. Please refer to CDPieChartMBS.setSectorStyle for the detail explanation of this method.

Arguments:

| Argument | Default | Description |
|---|---|---|
| shadingMethod | (Mandatory) | The sector shading style to use. -1 means to keep the existing value unchanged. |
| edgeColor | -1 | The edge color of the sector. -1 means to keep the existing value unchanged. |
| edgeWidth | -1 | The edge width of the sector. -1 means to keep the existing value unchanged. |

See also:

- 28.52.17 setStyle(shadingMethod as Integer, edgeColor as color, edgeWidth as Integer = -1) 5287

## 28.53 class CDSplineLayerMBS

### 28.53.1 class CDSplineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SplineLayer class represents spline layers.
**Notes:** In the current version of ChartDirector, SplineLayer is implemented as a special configuration of LineLayer.
Subclass of the CDLineLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 7.4, page 34: Easy Charts and Graphs, Using the ChartDirector Plugin

### 28.53.2 Methods

### 28.53.3 setMonotonicity(m as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the monotonicity constraint when computing the spline curve.
**Notes:** Monotonicity means a sequence is increasing or decreasing in one direction. For example, the sequence 1, 2, 3, 4 is monotonically increasing, while the sequence 1, 3, 2, 5, 4 is not monotonic.

A standard spline curve can overshoot or undershoot if the underlying points have "sharp corners". That means without any constrain, even if the data points are monotonic, the spline curve joining the points is not necessarily monotonic. It can overshoot and then "fall back".

In many charts, it may be desirable to constraint the spline curve to flow in a certain direction. For example, in a time based chart, it may be desirable to constraint the curve always flow from left to right.

ChartDirector supports the following monotonic modes.

Arguments:

### 28.53.4 setTension(tension as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tension to use when computing the spline curve.
**Notes:** The tension parameter should be between -1 and 1. A positive tension will make the spline tighter.

| Constant | Value | Description |
|---|---|---|
| MonotonicNone | 0 | The spline curve is not constraint to flow in any direction. This results in the smoothest spline curve. |
| MonotonicX | 1 | The spline curve is constraint to not overshooting or undershooting in the x-axis direction. This means if the data points are monotonic in the x-axis direction, the spline curve will also be monotonic in the x-axis direction. |
| MonotonicY | 2 | The spline curve is constraint to not overshooting or undershooting in the y-axis direction. This means if the data points are monotonic in the y-axis direction, the spline curve will also be monotonic in the y-axis direction. |
| MonotonicXY | 3 | The spline curve is constraint to not overshooting or undershooting in both the x-axis and the y-axis directions. This means if the data points are monotonic in the x-axis direction, the spline curve will also be monotonic in the x-axis direction. If the data points are monotonic in the y-axis direction, the spline curve will also be monotonic in the y-axis direction. |
| MonotonicAuto | 4 | Automatically choose between MonotonicX, MonotonicY or MonotonicXY, depending on whether the data points are monotonic in the x-axis direction, or y-axis direction, or both. |

| Argument | Default | Description |
|---|---|---|
| monotonicMode | (Mandatory) | The monotonic constraint of the spline curve. Must be be one of the constants in the above table. If this method is never called for a spline layer, the default is MonotonicAuto. |

The spline curve will become straight line segments when tension is 1. A negative tension will make the spline looser.

| Argument | Default | Description |
|---|---|---|
| tension | (Mandatory) | The tension of the spline, which should be between -1 and 1. |

## 28.54 class CDStepLineLayerMBS

### 28.54.1 class CDStepLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The StepLineLayer class represents step line layers.
**Notes:** Subclass of the CDLineLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.54.2 Methods

### 28.54.3 setAlignment(a as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the alignment of the steps relative to the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The alignment of the steps relative to the data points. Must be one of the predefined constants Left, Center or Right. |

# 28.55 class CDSurfaceChartMBS

## 28.55.1 class CDSurfaceChartMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SurfaceChart class represents surface charts.
**Notes:** Subclass of the CDThreeDChartMBS class.
**Xojo Developer Magazine**

- 7.5, page 33: Easy Charts and Graphs Part 2, Using the ChartDirector Plugin

## 28.55.2 Methods

## 28.55.3 addSurfaceLine(x() as double, y() as double, colorValue as Integer, lineWidth as Integer = -1, side as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-segment line to the surface.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | An array of containing the x coordinates of the data points that define the line. |
| y | (Mandatory) | An array of containing the y coordinates of the data points that define the line. |
| color | (Mandatory) | The color of the line. |
| lineWidth | 1 | The line width (thickness). |
| side | 0 | A value of 1 means the line is drawn on the front side of the surface. A value of 0 means the line is drawn on the back side of the surface. The default value of 0 means the line is drawn on both sides of the surface. |

See also:

- 28.55.4 addSurfaceLine(x1 as double, y1 as double, x2 as double, y2 as double, colorValue as Integer, lineWidth as Integer = -1, side as Integer = 0) 5291

## 28.55.4 addSurfaceLine(x1 as double, y1 as double, x2 as double, y2 as double, colorValue as Integer, lineWidth as Integer = -1, side as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line segment to the surface.
**Notes:**

See also:

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x data coordinate of the first end-point of the line. |
| y1 | (Mandatory) | The y data coordinate of the first end-point of the line. |
| x2 | (Mandatory) | The x data coordinate of the second end-point of the line. |
| y2 | (Mandatory) | The y data coordinate of the second end-point of the line. |
| color | (Mandatory) | The color of the line. |
| lineWidth | 1 | The line width (thickness). |
| side | 0 | A value of 1 means the line is drawn on the front side of the surface. A value of 0 means the line is drawn on the back side of the surface. The default value of 0 means the line is drawn on both sides of the surface. |

- 28.55.3 addSurfaceLine(x() as double, y() as double, colorValue as Integer, lineWidth as Integer = -1, side as Integer = 0) 5291

### 28.55.5 addSurfaceZone(x1 as double, y1 as double, x2 as double, y2 as double, fillColor as Integer, edgeColor as Integer = &hff000000, edgeWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a rectangular zone to the surface.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x1 | (Mandatory) | The x data coordinate for the first corner of the rectangle. |
| y1 | (Mandatory) | The y data coordinate for the first corner of the rectangle. |
| x2 | (Mandatory) | The x data coordinate for the corner opposite to the first corner. |
| y2 | (Mandatory) | The y data coordinate for the corner opposite to the first corner. |
| fillColor | (Mandatory) | The fill color of the rectangle. |
| edgeColor | Transparent | The border color of the rectangle. |
| edgeWidth | 1 | The border width in pixels. |

### 28.55.6 addXYProjection(offset as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a projection of the surface on the XY wall.
**Notes:** The XY wall is the wall containing the x axis and y axis. It is usually under the plotted surface. Because of this, the surface may block the projection, making it hard to see. To address this issue, it is common to add a bottom margin to the z-axis (see Axis.setMargin). This will move the z-axis scale and therefore the surface upwards, leaving more space between the surface and the XY wall to make the projection more visible.

This method accepts an optional offset argument that can be used to move the projection vertically. A

positive offset moves the it upwards. A negative offset moves it under the XY wall. Because of this, for negative offsets, the XY wall must be hidden using ThreeDChart.setWallVisibility, otherwise the chart will not be drawn correctly.

| Argument | Default | Description |
|---|---|---|
| offset | 0 | The vertical offset of the XY projection in 3D pixel coordinates. A positive offset moves it upwards. A negative offset moves it under the XY wall. |

### 28.55.7 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new SurfaceChart object.
**Notes:** Arguments:

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | kBackgroundColor | The background color of the chart. |
| edgeColor | kTransparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.55.8 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5293

### 28.55.8 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.55.7 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5293

### 28.55.9 getValuesAtPixel(x as Integer, y as Integer) as Double()

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the (x, y, z, w) values of the surface at the specified image pixel coordinates.
**Notes:** This method is valid only after the chart image has been drawn (eg. using BaseChart.makeChart, BaseChart.makeChart2 or BaseChart.makeChart3). It is typically used to provide user feedback when the mouse moves on the chart.

If w values are not provided to the surface chart, the returned w value will be set to the same as the z value. If the pixel is not on the plotted surface, the returned array will be empty or null.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate. |
| y | (Mandatory) | The y pixel coordinate. |

Returns an array of 4 numbers representing the x, y, z and w values at the image pixel location. If the pixel is not on the plotted surface, the returned array will be empty or null.

### 28.55.10 setBackSideBrightness(brightness as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back side brightness as a ratio of the front side brightness.
**Notes:** The surface of a surface chart has two sides. The side that is facing the positive z direction of the plot region is the front side. The side that is facing the negative z direction of the plot region is the back side.

By default, the back side brightness is half the front side brightness. This method can be used to adjust the ratio.

Arguments:

| Argument | Default | Description |
|---|---|---|
| brightness | (Mandatory) | The ratio of the back side brightness to the front side brightness. |

### 28.55.11 setBackSideColor(ColorValue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setBackSideColor method, but uses color instead of integer data type for passing color values.
See also:


- 28.55.12 setBackSideColor(ColorValue as Integer) 5295


### 28.55.12 setBackSideColor(ColorValue as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the back side of the surface.
**Notes:** The surface of a surface chart has two sides. The side that is facing the positive z direction of the plot region is the front side. The side that is facing the negative z direction of the plot region is the back side.

By default, the back side is colored similar to the front side, but with different brightness of lighting parameters. This method can be used to color the back side with a fixed color instead.

Arguments:

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The color used for the back side. |

See also:


- 28.55.11 setBackSideColor(ColorValue as color) 5294


### 28.55.13 setBackSideLighting(ambientLight as Double, diffuseLight as Double, specularLight as Double, shininess as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the Phong lighting parameters for the back side of the surface.
**Notes:** The surface of a surface chart has two sides. The side that is facing the positive z direction of the plot region is the front side. The side that is facing the negative z direction of the plot region is the back side.

ChartDirector uses the Phong lighting model to adjust the brightness of the surface to make it look realistic. The default lighting parameters for the back side is half the brightness of those for the front side. This method may be used to set alternative lighting parameters for the back side.

Arguments:

| Argument | Default | Description |
|---|---|---|
| ambientIntensity | (Mandatory) | The ambient reflection coefficient of the Phong lighting model. |
| diffuseIntensity | (Mandatory) | The diffuse reflection coefficient of the Phong lighting model. |
| specularIntensity | (Mandatory) | The specular reflection coefficient of the Phong lighting model. |
| shininess | (Mandatory) | The shininess coefficient of the Phong lighting model. |

### 28.55.14 setContourColor(contourColor as color, minorContourColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setContourColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.55.15 setContourColor(contourColor as Integer, minorContourColor as Integer = -1) 5296

### 28.55.15 setContourColor(contourColor as Integer, minorContourColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the contour lines on the surface.
**Notes:** The contour lines are lines that join regions of the same z value on the surface. The contour levels are determined by the ticks on the z-axis. Major ticks associate with major contour lines. Minor ticks associate with minor contour lines.

Arguments:

| Argument | Default | Description |
|---|---|---|
| contourColor | (Mandatory) | The color of the major contour lines. |
| minorContourColor | -1 | The color of the minor contour lines. -1 means it is the same as the contourColor. |

See also:

- 28.55.14 setContourColor(contourColor as color, minorContourColor as color) 5296

### 28.55.16 setData(xData() as Double, yData() as Double, zData() as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data for the surface chart.
**Notes:** ChartDirector supports both gridded and scattered data. If the data points are on a rectangular grid

will no missing points, they will be handled as gridded data. Otherwise, they will be handled as scattered data.

For gridded data, you may provide the x and y values of the grid, and the z values of the data points. For a 10 x 15 grid, that means the x data series should have 10 values, the y data series should have 15 values, and the z data series should have 150 values. The x and y data series should be strictly monotonic (either strictly increasing or strictly decreasing).

For both gridded and scattered data, you may also provide the (x, y, z) values of the data points. For example, for 150 data points, the x, y and z data series should each have 150 values. ChartDirector will automatically detect if the data points are gridded or scattered.

Arguments:

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x data series. |
| yData | (Mandatory) | An array of numbers representing the y data series. |
| zData | (Mandatory) | An array of numbers representing the z data series. |

See also:

- 28.55.17 setData(xData() as double, yData() as double, zData() as double, wData() as double) 5297

### 28.55.17 setData(xData() as double, yData() as double, zData() as double, wData() as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the data for the surface chart.
See also:

- 28.55.16 setData(xData() as Double, yData() as Double, zData() as Double) 5296

### 28.55.18 setInterpolation(xSamples as Integer, ySamples as Integer = -1, isSmooth as Boolean = true)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables and sets the degree and method of interpolation of the data points.
**Notes:** A surface chart consists of planar patches, drawn using the data points as the vertices. To create visually smooth surfaces, we may use a large number of small planar patches. However, this requires a large number of data points.

For example, consider a plot region of which the x and y dimensions are both 400 pixels in length. To create a smooth surface, if gridded data are used, the distance between grid lines should be no more than a few pixels. Suppose a grid spacing of 8 pixels is used. The grid size will be 51 x 51, and 2601 data points will be needed.

If the number of available data points are too small to create a smooth surface, This method can be used to generate a denser grid of data points from the original data points using interpolation.

Two types of interpolation are supported. In spline surface interpolation, ChartDirector will compute a smooth surface that passes through the original data points, and sample the spline surface for the new data points. In bilinear/linear interpolation, ChartDirector will apply bilinear/linear interpolation to its vertices of the original patches to compute the new data points.

Arguments:

| Argument | Default | Description |
|---|---|---|
| xSamples | (Mandatory) | The number of samples on the x-dimension to interpolate to. |
| ySamples | -1 | The number of samples on the y-dimension to interpolate to. -1 means it is the same as xSamples. |
| isSmooth | true | A true value means to use spline surface interpolation. A false value means to use bilinear/linear interpolation. |

See also:

- 28.55.19 setInterpolation(xSamples as Integer, ySamples as Integer, isSmooth as Boolean, isColorSmooth as Boolean) 5298

### 28.55.19 setInterpolation(xSamples as Integer, ySamples as Integer, isSmooth as Boolean, isColorSmooth as Boolean)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables and sets the degree and method of interpolation of the data points.
**Notes:** A surface chart consists of planar patches, drawn using the data points as the vertices. To create visually smooth surfaces, we may use a large number of small planar patches. However, this requires a large number of data points.

For example, consider a plot region of which the x and y dimensions are both 400 pixels in length. To create a smooth surface, if gridded data are used, the distance between grid lines should be no more than a few pixels. Suppose a grid spacing of 8 pixels is used. The grid size will be 51 x 51, and 2601 data points will be needed.

If the number of available data points are too small to create a smooth surface, This method can be used to generate a denser grid of data points from the original data points using interpolation.

Two types of interpolation are supported. In spline surface interpolation, ChartDirector will compute a smooth surface that passes through the original data points, and sample the spline surface for the new data points. In bilinear/linear interpolation, ChartDirector will apply bilinear/linear interpolation to its vertices of the original patches to compute the new data points.

| Argument | Default | Description |
|---|---|---|
| xSamples | (Mandatory) | The number of samples on the x-dimension to interpolate to. |
| ySamples | -1 | The number of samples on the y-dimension to interpolate to. -1 means it is the same as xSamples. |
| isSmooth | true | A true value means to use spline surface interpolation for the z values. A false value means to use bilinear/linear interpolation. |
| isColorSmooth | (Optional) | A true value means to use spline surface interpolation for the w values. A false value means to use bilinear/linear interpolation. If this argument is not specified, the default is to use the same interpolation method as the z values. |

See also:

- 28.55.18 setInterpolation(xSamples as Integer, ySamples as Integer = -1, isSmooth as Boolean = true) 5297

### 28.55.20 setLighting(ambientIntensity as Double, diffuseIntensity as Double, specularIntensity as Double, shininess as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the Phong lighting parameters for the front side of the surface.
**Notes:** The surface of a surface chart has two sides. The side that is facing the positive z direction of the plot region is the front side. The side that is facing the negative z direction of the plot region is the back side.

ChartDirector uses the Phong lighting model to adjust the brightness of the surface to make it look realistic. The light source is assumed to be from the direction of the viewer and is far away. The default lighting parameters for the front side are 0.5 for both ambient and diffuse reflections, 1 for specular reflection and 8 for shininess.

Arguments:

### 28.55.21 setShadingMode(shadingMode as Integer, wireWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| ambientIntensity | (Mandatory) | The ambient reflection coefficient of the Phong lighting model. |
| diffuseIntensity | (Mandatory) | The diffuse reflection coefficient of the Phong lighting model. |
| specularIntensity | (Mandatory) | The specular reflection coefficient of the Phong lighting model. |
| shininess | (Mandatory) | The shininess coefficient of the Phong lighting model. |

**Function:** Sets the shading mode for the surface.
**Notes:** ChartDirector supports the following methods for shading the surface.

| Constant | Value | Description |
|---|---|---|
| kSmoothShading | 0 | The brightness of the surface varies smoothly. |
| kTriangularShading | 0 | The surface is divided into triangular patches. The brightness of the patches varies according to their orientation. Within a patch, the brightness is constant. |
| kRectangularShading | 0 | The surface is divided into rectangular patches. The brightness of the patches varies according to their orientation. Within a patch, the brightness is constant. |
| kTriangularFrame | 0 | The surface is divided into triangular patches. Only the edges of the patches are drawn. |
| kRectangularFrame | 0 | The surface is divided into rectangular patches. Only the edges of the patches are drawn. |

Arguments:

| Argument | Default | Description |
|---|---|---|
| shadingMode | (Mandatory) | The shading mode, which must be one of the above constants. |
| wireWidth | 1 | The wire width for use with wireframe shading modes. |

### 28.55.22 setSurfaceAxisGrid(majorXGridColor as color, majorYGridColor as color, minorXGridColor as color, minorYGridColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setSurfaceAxisGrid method, but uses color instead of integer data type for passing color values.
See also:

- 28.55.23 setSurfaceAxisGrid(majorXGridColor as Integer, majorYGridColor as Integer = -1, minorXGridColor as Integer = -1, minorYGridColor as Integer = -1) 

### 28.55.23 setSurfaceAxisGrid(majorXGridColor as Integer, majorYGridColor as Integer = -1, minorXGridColor as Integer = -1, minorYGridColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the axis grid lines on the surface.
**Notes:** Axis grid lines are grid lines associated with the ticks on the x and y axes. Major grid lines associate with major ticks. Minor grid lines associate with minor ticks. They can be drawn on the surface of the surface chart, and on the plot region walls. This method is for the surface of the surface chart. For the plot region walls, see CDSurfaceChartMBS.setWallGrid.

Arguments:

| Argument | Default | Description |
|---|---|---|
| majorXGridColor | (Mandatory) | The color of the major x-axis grid lines on the surface. |
| majorYGridColor | -1 | The color of the major y-axis grid lines on the surface. -1 means it is the same as the majorXGridColor. |
| minorXGridColor | -1 | The color of the minor x-axis grid lines on the surface. -1 means it is the same as the majorXGridColor. |
| minorYGridColor | -1 | The color of the minor y-axis grid lines on the surface. -1 means it is the same as the majorYGridColor. |

See also:

- 28.55.22 setSurfaceAxisGrid(majorXGridColor as color, majorYGridColor as color, minorXGridColor as color, minorYGridColor as color) 5300

### 28.55.24 setSurfaceDataGrid(xGridColor as color, yGridColor as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setSurfaceDataGrid method, but uses color instead of integer data type for passing color values.
See also:

- 28.55.25 setSurfaceDataGrid(xGridColor as Integer, yGridColor as Integer = -1) 5301

### 28.55.25 setSurfaceDataGrid(xGridColor as Integer, yGridColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the data grid lines on the surface.
**Notes:** Data grid lines are grid lines that define the positions of the data points. They can be drawn on the

surface of the surface chart.

Arguments:

| Argument | Default | Description |
|---|---|---|
| xGridColor | (Mandatory) | The color of the x data grid lines. |
| yGridColor | -1 | The color of the y data grid lines. -1 means it is the same as the yGridColor. |

See also:

- 28.55.24 setSurfaceDataGrid(xGridColor as color, yGridColor as color) 5301

### 28.55.26 setSurfaceTexture(patternColor as color)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a texture image to the surface.
**Notes:** A texture is a 2D image pattern for mapping onto a 3D surface. The pattern can be defined by using BaseChart.patternColor or BaseChart.patternColor2.

One common usage of this method is to apply an image the same size as the plot region xy plane to the surface. To do this, simply use an image with width and height equals to the plot region width and depth.

| Argument | Default | Description |
|---|---|---|
| patternColor | (Mandatory) | A color (normally a pattern color) that contains the texture image to be applied to the surface. |

See also:

- 28.55.27 setSurfaceTexture(patternColor as integer) 5302

### 28.55.27 setSurfaceTexture(patternColor as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a texture image to the surface.
**Notes:** A texture is a 2D image pattern for mapping onto a 3D surface. The pattern can be defined by using BaseChart.patternColor or BaseChart.patternColor2.

One common usage of this method is to apply an image the same size as the plot region xy plane to the surface. To do this, simply use an image with width and height equals to the plot region width and depth.

| Argument | Default | Description |
|---|---|---|
| patternColor | (Mandatory) | A color (normally a pattern color) that contains the texture image to be applied to the surface. |

See also:

- 28.55.26 setSurfaceTexture(patternColor as color) 5302

### 28.55.28 setWContourColor(wContourColor as color, wMinorContourColor as color)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the w contour lines on the surface.
**Notes:** The w contour lines are lines that join regions of the same w value on the surface. The contour levels are determined by the ticks on the color axis. Major ticks associate with major contour lines. Minor ticks associate with minor contour lines.

| Argument | Default | Description |
|---|---|---|
| wContourColor | (Mandatory) | The color of the major contour lines. |
| wMinorContourColor | -1 | The color of the minor contour lines. -1 means it is the same as the contourColor. |

See also:

- 28.55.29 setWContourColor(wContourColor as integer, wMinorContourColor as Integer = -1) 5303

### 28.55.29 setWContourColor(wContourColor as integer, wMinorContourColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colors of the w contour lines on the surface.
**Notes:** The w contour lines are lines that join regions of the same w value on the surface. The contour levels are determined by the ticks on the color axis. Major ticks associate with major contour lines. Minor ticks associate with minor contour lines.

| Argument | Default | Description |
|---|---|---|
| wContourColor | (Mandatory) | The color of the major contour lines. |
| wMinorContourColor | -1 | The color of the minor contour lines. -1 means it is the same as the contourColor. |

See also:

• 28.55.28 setWContourColor(wContourColor as color, wMinorContourColor as color) 5303

### 28.55.30 Screenshots

### 28.55.31 surface.jpg

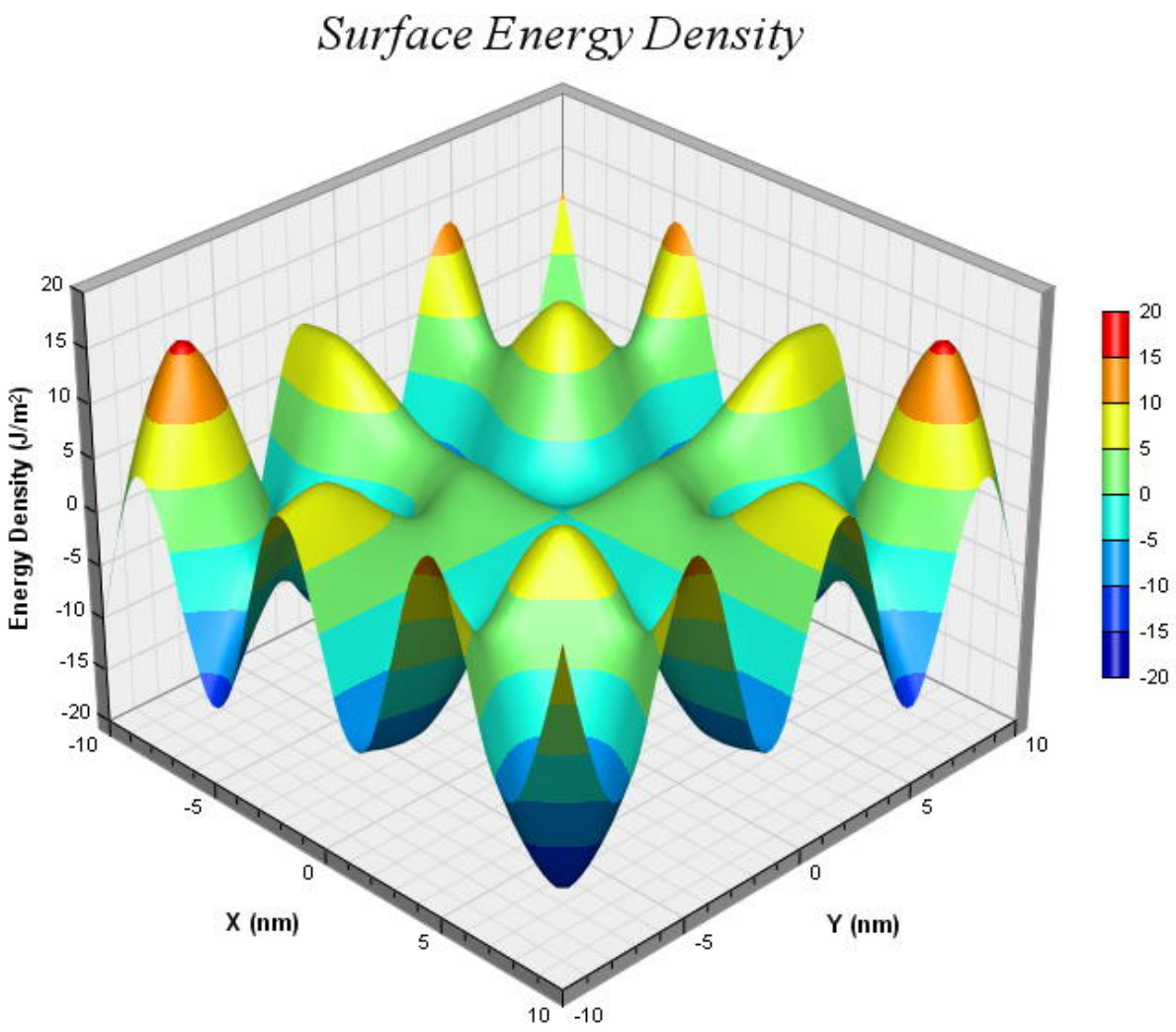


**Function:** A surface chart created using ChartDirector with the CDSurfaceChartMBS class.

### 28.55.32 surface3.jpg

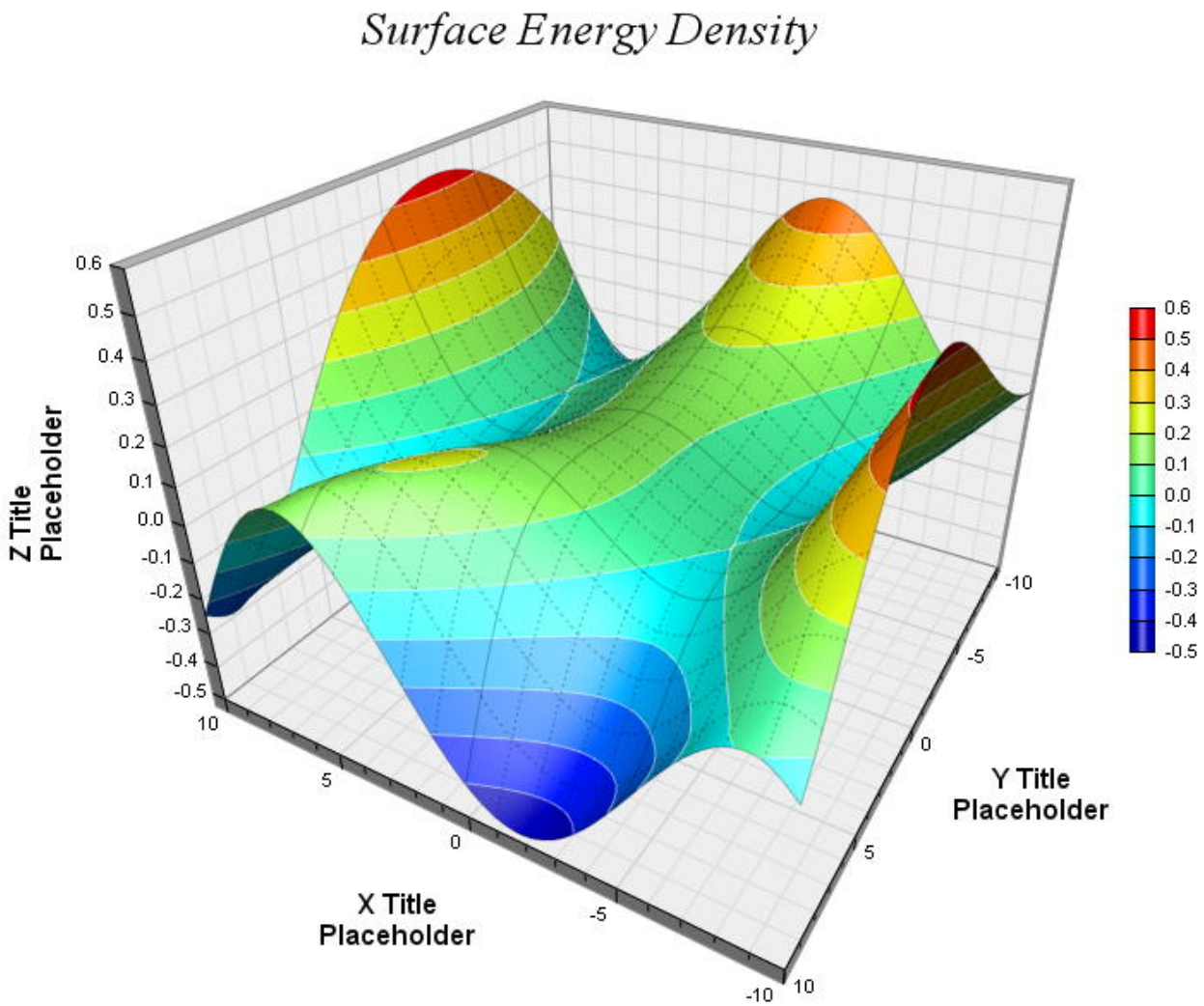


**Function:** A surface chart created using ChartDirector with the CDSurfaceChartMBS class.

### 28.55.33 surfaceaxis.jpg

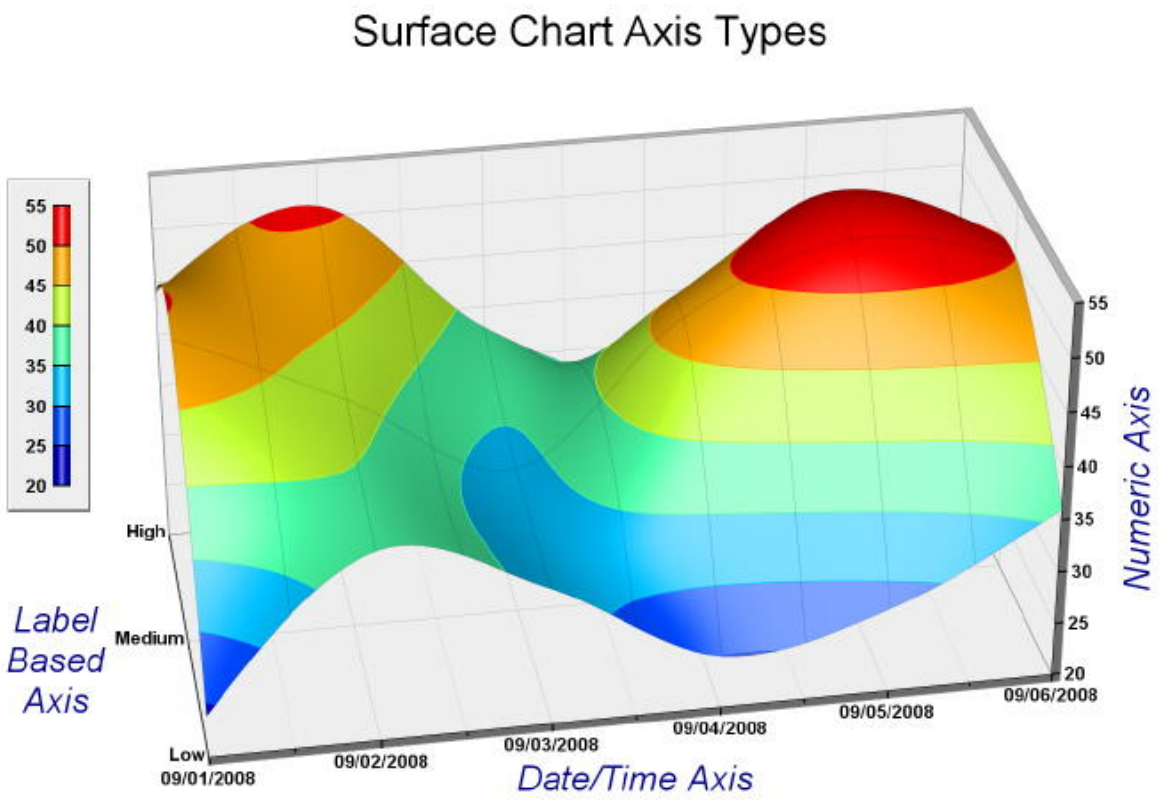


**Function:** A surface chart created using ChartDirector with the CDSurfaceChartMBS class.

### 28.55.34 surfaceshading.jpg

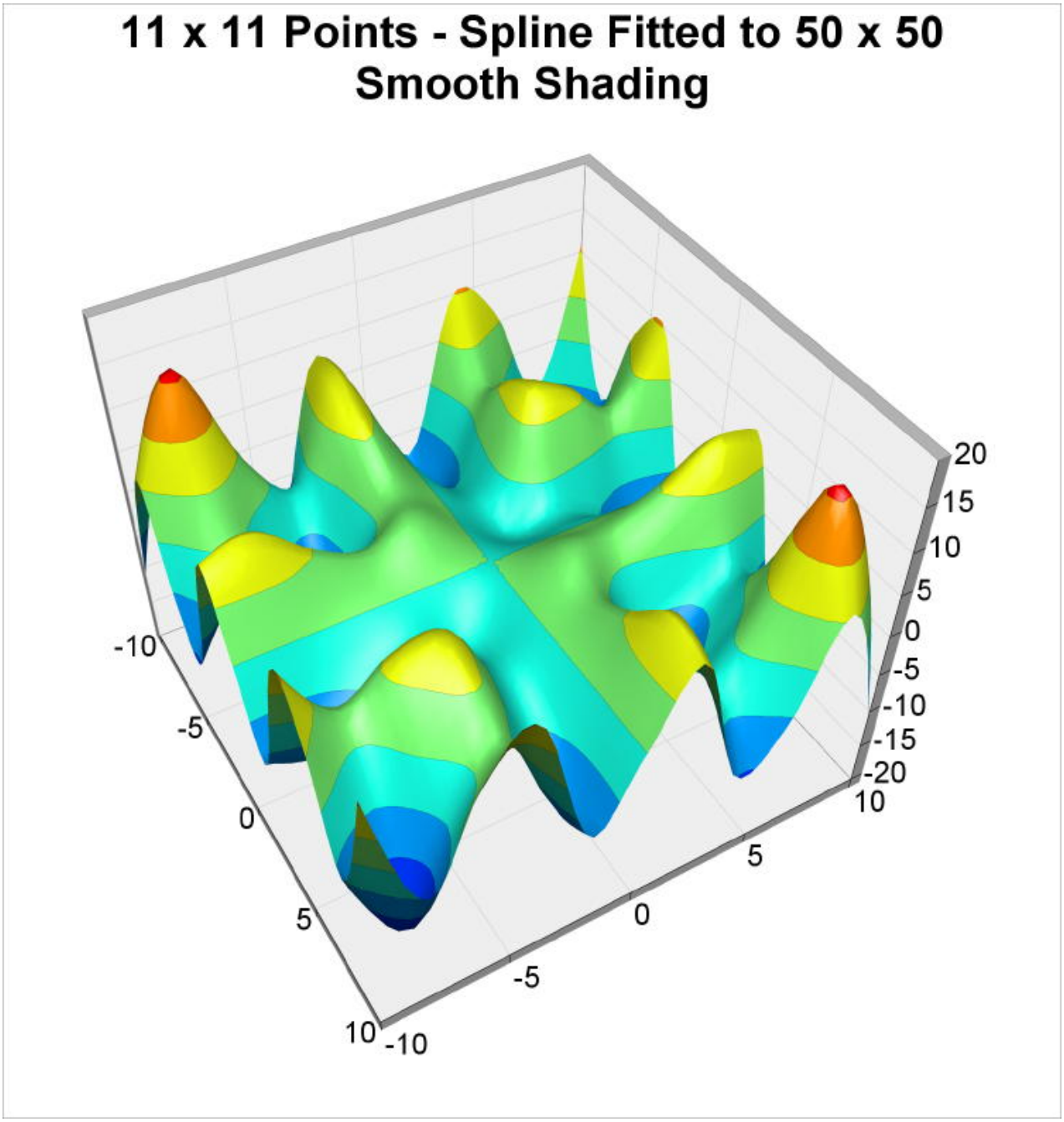


**Function:** A surface chart created using ChartDirector with the CDSurfaceChartMBS class.

### 28.55.35 surfacewireframe.jpg

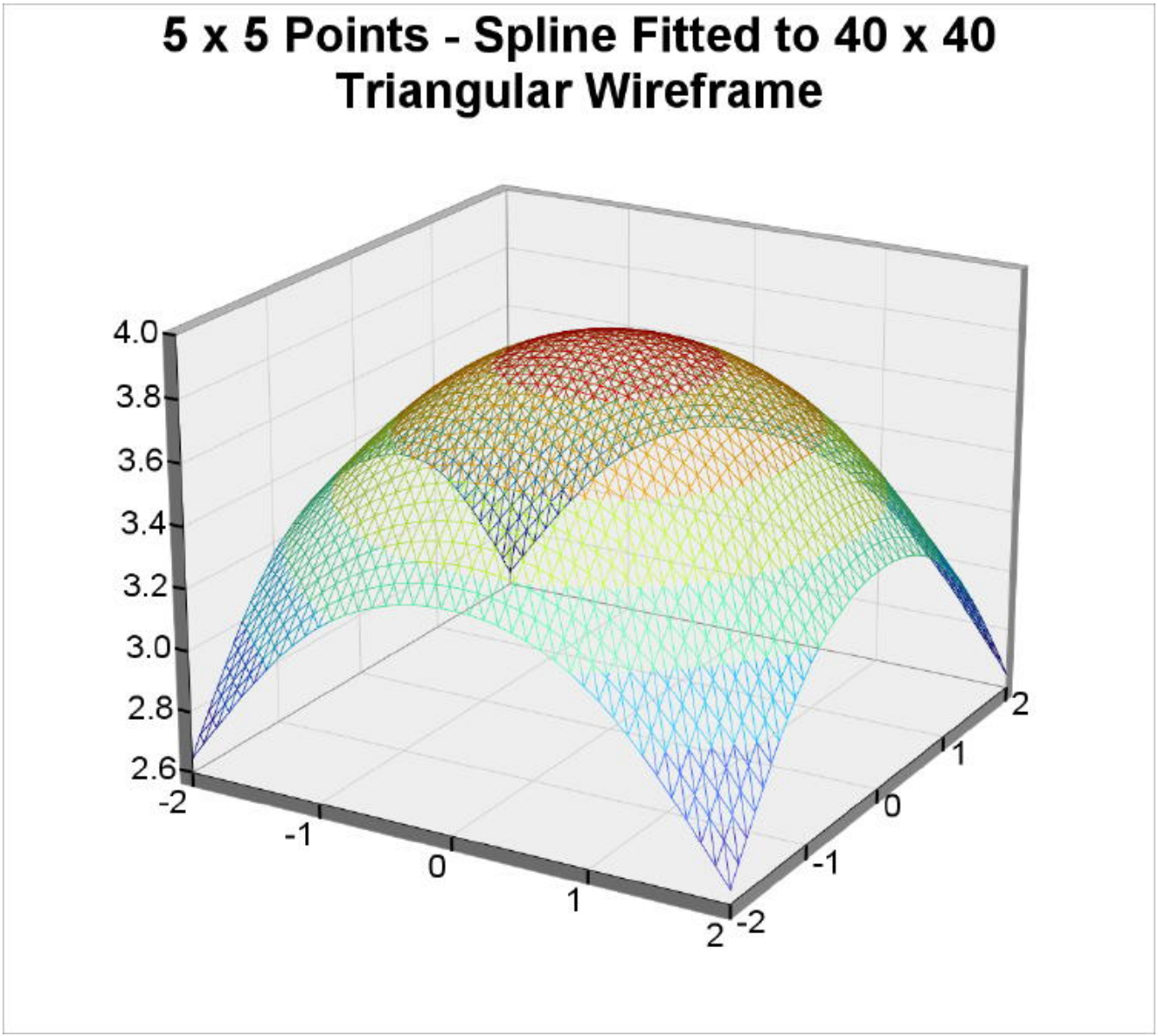


**Function:** A surface chart created using ChartDirector with the CDSurfaceChartMBS class.

## 28.56 class CDTextBoxMBS

### 28.56.1 class CDTextBoxMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TextBox class represents text boxes.
**Notes:** Subclass of the CDBoxMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Chart Diagrams with Xojo

**Xojo Developer Magazine**

- 7.4, pages 34 to 35: Easy Charts and Graphs, Using the ChartDirector Plugin
- 7.4, page 29: Easy Charts and Graphs, Using the ChartDirector Plugin
- 20.4, page 39: PDF Pie Charts, Adding Xojo Charts to Your PDFs by Stefanie Juchmes
- 17.2, page 35: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich

### 28.56.2 Methods

### 28.56.3 setAlignment(a as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the alignment of the text relative to the container box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| a | (Mandatory) | The alignment specification. See Alignment Specification for supported alignment types. |

### 28.56.4 setFontAngle(angle as Double, vertical as boolean=false)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the rotation angle and layout direction of the text.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| angle | (Mandatory) | The text rotation angle. Rotation is measured in counter-clockwise direction in degrees. |
| vertical | false | Determine if the font is layout horizontally (from left to right) or vertically (from top to down). Vertical layout is common for Oriental languages such as Chinese, Japanese and Korean. A true value means vertical layout. A false value means horizontal layout. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.56.5 setFontColor(colorvalue as color)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setFontColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.56.6 setFontColor(colorvalue as Integer) 5310

### 28.56.6 setFontColor(colorvalue as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the text.
**Notes:** If this method is not called, TextColor will be used to draw the text.

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The font color. |

See also:

- 28.56.5 setFontColor(colorvalue as color) 5310

### 28.56.7 setFontSize(fontHeight as Double, fontWidth as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font height and width in points.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| fontHeight | (Mandatory) | The font height in points. |
| fontWidth | 0 | The font width in points. If the font width is zero, it is assumed to be the same as the font height. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.56.8 setFontStyle(font as string, fontIndex as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font of the text by specifying the file that contains the font.
**Notes:** See Font Specification for details on various font attributes.

| Argument | Default | Description |
|---|---|---|
| font | (Mandatory) | The font name. |
| fontIndex | 0 | The font index in case the font name refers to a font collection. An index of 0 means the first font. |

See font specification here:
http://www.monkeybreadsoftware.net/faq-chartdirectorfontspecification.shtml

### 28.56.9 setHeight(height as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the height of the text box.
**Notes:** By default, the height of the text box is automatically determined to be just enough to hold the text. The setHeight method can be used to specified a fix height.

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the text box in pixels. |

### 28.56.10 setMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins of the text box in pixels.
**Notes:** The margins of a text box are the distances between the borders of the text box to the text inside. By default, the left and right margins are approximately half the font width, and the top and bottom margins are approximately 1/4 of the font height.

| Argument | Default | Description |
|---|---|---|
| leftMargin | (Mandatory) | The left margin in pixels. |
| rightMargin | (Mandatory) | The right margin in pixels. |
| topMargin | (Mandatory) | The top margin in pixels. |
| bottomMargin | (Mandatory) | The bottom margin in pixels. |

See also:

- 28.56.11 setMargin(m as Integer) 5312

### 28.56.11 setMargin(m as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets all margins (left, right, top, and bottom) of the text box to the same value.
**Notes:** The margins of a text box are the distances between the borders of the text box to the text inside. By default, the left and right margins are approximately half the font width, and the top and bottom margins are approximately 1/4 of the font height.

| Argument | Default | Description |
|---|---|---|
| m | (Mandatory) | The left, right, top and bottom margins in pixels. |

See also:

- 28.56.10 setMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer) 5311

### 28.56.12 setMaxWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the maximum width of the text box and wraps text if necessary.
**Notes:** By default, the width of the text box is automatically determined to be the length of the text. This method can be used to limit the width of the text box. If the text requires a longer width for display, it will be wrapped into multiple lines.

| Argument | Default | Description |
|---|---|---|
| maxWidth | (Mandatory) | The maximum width of the text box in pixels. |

### 28.56.13 setText(text as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text to be shown in the text box.
**Notes:** See ChartDirector Mark Up Language on how to embed special tags in the text for sophisticated formatting.

| Argument | Default | Description |
|---|---|---|
| text | (Mandatory) | The text to be displayed in the text box. |

### 28.56.14 setTruncate(maxWidth as Integer, maxLines as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the maximum number of lines in the text box, and truncate the text if it exceeds the line count.
**Notes:** The maxWidth parameter of this method specifies the maximum width of the text box. If the text requires a longer width for display, it will be wrapped into multiple lines. However, if the number of lines exceed maxLines, the text will be truncated, with the last visible characters replaced with "...".

If maxLines is 1 (the default), the text will never be wrapped and will be truncated directly if it needs more than maxWidth for display.

| Argument | Default | Description |
|---|---|---|
| maxWidth | (Mandatory) | The maximum width of the text box in pixels. |
| maxLines | 1 | The maximum number of lines that the text box can have. The text will be truncated if it exceeds the maximum number of lines. |

### 28.56.15 setWidth(width as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width of the text box and wraps text if necessary.
**Notes:** By default, the width of the text box is automatically determined to be the length of the text. The setWidth method can be used to specified a fix width. If the text requires a longer width for display, the text will be wrapped into multiple lines.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the text box in pixels. |

# 28.57 class CDThreeDChartMBS

## 28.57.1 class CDThreeDChartMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ThreeDChart class is an abstract class containing methods that are common to all true 3D chart types.
**Notes:** ThreeDChart is a subclass of BaseChart.
Subclass of the CDBaseChartMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr16

## 28.57.2 Methods

## 28.57.3 colorAxis as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the ColorAxis object representing the color axis (color legend).
**Notes:** Returns the ColorAxis object representing the color axis.

## 28.57.4 Constructor

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
**Notes:** The ThreeDChart class is an abstract class containing methods that are common to all true 3D chart types.
ThreeDChart is a subclass of BaseChart.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 28.57.5 getElevationAngle as double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the elevation angle.

### 28.57.6 getPlotRegionDepth as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the plot region depth.

### 28.57.7 getPlotRegionHeight as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the plot region height.

### 28.57.8 getPlotRegionWidth as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the plot region width.

### 28.57.9 getRotationAngle as double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the rotation angle.

### 28.57.10 getXCoor(xValue as Double, yValue as Double, zValue as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x pixel coordinate of a point given its x, y and z data values.
**Notes:** Note: You must call BaseChart.layout first before calling this method. ChartDirector needs to perform auto-scaling and layout the axis before it can compute pixel coordinates from data values.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x data value of the point. |
| y | (Mandatory) | The y data value of the point. |
| z | (Mandatory) | The z data value of the point. |

Returns the x pixel coordinate of the point.

### 28.57.11 getYCoor(xValue as Double, yValue as Double, zValue as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y pixel coordinate of a point given its x, y and z data values.
**Notes:** You must call BaseChart.layout first before calling this method. ChartDirector needs to perform auto-scaling and layout the axis before it can compute pixel coordinates from data values.

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x data value of the point. |
| y | (Mandatory) | The y data value of the point. |
| z | (Mandatory) | The z data value of the point. |

Returns the y pixel coordinate of the point.

### 28.57.12 setColorAxis(x as Integer, y as Integer, alignment as Integer, length as Integer, orientation as Integer) as CDColorAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position, length and orientation of the color axis (color legend).
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x-coordinate of the reference point used to position the color axis. |
| y | (Mandatory) | The y-coordinate of the reference point used to position the color axis. |
| alignment | (Mandatory) | The alignment of the color axis with respect to the reference point. For example, a value of TopLeft means the reference point is the top- left corner of the color axis. See Alignment Specification for supported alignment types.. |
| length | (Mandatory) | The length of the color axis in pixels. |
| orientation | (Mandatory) | The orientation of the color axis. A value of Top/Bottom means the axis is horizontal, and the axis labels are at top/bottom side of the axis. A value of Left/Right means the axis is vertical, and the axis labels are at the left/right side of the axis. |

### 28.57.13 setPerspective(perspective as Double)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the strength of the perspective effect.
**Notes:** When taking the photograph of a scene, things closer to the camera are larger in the photograph, while things farther from the camera are smaller. For example, two trees of exactly the same height but at

different distances from the camera will have different heights as measured in the photograph. This is known as the perspective effect.

This method configures the strength of the perspective effect for a ThreeDChart object. The nearer part of the plot region will be magnified, while the farther part will be reduced. The average size of the plot region will be approximately unchanged.

| Argument | Default | Description |
|---|---|---|
| perspective | (Mandatory) | The strength of the perspective effect. It approximately represents the maximum percentage magnification of the plot region, which is the same as the maximum percentage reduction. A value of 0 means no perspective effect. This value is usually between 0 to 100. If this method is never called, the default is 12. |

### 28.57.14 setPlotRegion(cx as Integer, cy as Integer, xWidth as Integer, yDepth as Integer, zHeight as Integer)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the plot region.
**Notes:** The plot region is a 3D box, with x, y, and z axes along its border, using a right-hand cartesian coordinate system.

To create the chart image, you may imagine a camera taking a photograph of the box. The photograph can be taken at different angles, configurable with ThreeDChart.setViewAngle. The position of the plot region in the photograph is such that the center of the plot region is at a given point (cx, cy) on the image.

| Argument | Default | Description |
|---|---|---|
| cx | (Mandatory) | The x pixel coordinate of the point on the image at which the center of the plot region is located. |
| cy | (Mandatory) | The y pixel coordinate of the point on the image at which the center of the plot region is located. |
| xWidth | (Mandatory) | The length of the x-dimension of the plot region in pixels. |
| yDepth | (Mandatory) | The length of the y-dimension of the plot region in pixels. |
| zHeight | (Mandatory) | The length of the z-dimension of the plot region in pixels. |

### 28.57.15 setViewAngle(elevation as Double, rotation as Double = 0, twist as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the 3D view angles.
**Notes:** ChartDirector uses elevation, rotation and twist angles to specify the 3D view angles.

To explain the meaning of the angles, imagine the object being viewed is put at the center of a hollow sphere, and a camera (the view point) is put at the surface of the sphere, directed inwards to the center to look at the object.

The elevation angle refers to the "latitude" of the camera. An elevation angle of 0 degrees means the camera is at the "equator" pointing to the object from the side. An elevation angle of 90 degrees means the camera is at the "north pole" pointing down to the object. An angle elevation of -90 degrees means the camera is at the "south pole", pointing up to the object.

The rotation angle refers to the "longitude" of the camera. If the elevation is 0 degrees, and the rotation angle varies from 0 to 360 degrees, the camera will move around the "equator" in the easterly direction (counter-clockwise when viewed from the north pole).

The twist angle is for rotating the camera itself while still pointing to the object. For example, a twist angle of 90 degrees means you are holder the camera "vertically" instead of "horizontally". The rotation is clockwise from the view point of the person holding the camera.

Note that from the view point of the camera, the object will appear to be rotating in the opposite direction. For example, as the rotation angle rotates the camera counter-clockwise along the "equator", the object will appear to be rotating clockwise on the screen.

Note: The twist angle is not supported in the current version of ChartDirector. It should always be 0, and should be considered as a reserved argument for future use.

| Argument | Default | Description |
|---|---|---|
| elevation | (Mandatory) | The elevation angle in degrees. |
| rotation | 0 | The rotation angle in degrees. |
| twist | 0 | The twist angle in degrees. |

### 28.57.16 setWallColor(xyColor as color, yzColor as color, zxColor as color, borderColor as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the plot region walls.
**Notes:** By default, the plot region walls are light grey (eeeeee) in color, with a grey (888888) border . This method can be used to modify the colors.

| Argument | Default | Description |
|---|---|---|
| xyColor | (Mandatory) | The color of the xy wall. |
| yzColor | -1 | The color of the yz wall. -1 means it is the same as xyColor. |
| zxColor | -1 | The color of the zx wall. -1 means it is the same as xyColor. |
| borderColor | -1 | The color of the wall border. -1 means to keep the existing value unchanged. |

See also:

- 28.57.17 setWallColor(xyColor as Integer, yzColor as Integer = -1, zxColor as Integer = -1, borderColor as Integer = -1) 5320

### 28.57.17 setWallColor(xyColor as Integer, yzColor as Integer = -1, zxColor as Integer = -1, borderColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color of the plot region walls.
**Notes:** By default, the plot region walls are light grey (eeeeee) in color, with a grey (888888) border . This method can be used to modify the colors.

| Argument | Default | Description |
|---|---|---|
| xyColor | (Mandatory) | The color of the xy wall. |
| yzColor | -1 | The color of the yz wall. -1 means it is the same as xyColor. |
| zxColor | -1 | The color of the zx wall. -1 means it is the same as xyColor. |
| borderColor | -1 | The color of the wall border. -1 means to keep the existing value unchanged. |

See also:

- 28.57.16 setWallColor(xyColor as color, yzColor as color, zxColor as color, borderColor as color) 5319

### 28.57.18 setWallGrid(majorXGridColor as color, majorYGridColor as color, majorZGridColor as color, minorXGridColor as color, minorYGridColor as color, minorZGridColor as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the grid line colors on plot region walls.
**Notes:** The grid lines on the walls are associated with the ticks on the x, y and z axes. Major ticks associate with major grid lines. Minor ticks associate with minor grid lines. By default, the major grid lines are light grey (cccccc), and the minor grid lines are lighter grey (dddddd). This method can be used to modify the grid line colors.

See also:

| Argument | Default | Description |
|---|---|---|
| majorXGridColor | (Mandatory) | The color of the major x-axis grid lines on the walls. |
| majorYGridColor | -1 | The color of the major y-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| majorZGridColor | -1 | The color of the major z-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| minorXGridColor | -1 | The color of the minor x-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| minorYGridColor | -1 | The color of the minor y-axis grid lines on the walls. -1 means it is the same as the majorYGridColor. |
| minorZGridColor | -1 | The color of the minor z-axis grid lines on the walls. -1 means it is the same as the majorZGridColor. |

- 28.57.19 setWallGrid(majorXGridColor as Integer, majorYGridColor as Integer = -1, majorZGridColor as Integer = -1, minorXGridColor as Integer = -1, minorYGridColor as Integer = -1, minorZGridColor as Integer = -1) 5321

### 28.57.19 setWallGrid(majorXGridColor as Integer, majorYGridColor as Integer = -1, majorZGridColor as Integer = -1, minorXGridColor as Integer = -1, minorYGridColor as Integer = -1, minorZGridColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the grid line colors on plot region walls.
**Notes:** The grid lines on the walls are associated with the ticks on the x, y and z axes. Major ticks associate with major grid lines. Minor ticks associate with minor grid lines. By default, the major grid lines are light grey (cccccc), and the minor grid lines are lighter grey (dddddd). This method can be used to modify the grid line colors.

| Argument | Default | Description |
|---|---|---|
| majorXGridColor | (Mandatory) | The color of the major x-axis grid lines on the walls. |
| majorYGridColor | -1 | The color of the major y-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| majorZGridColor | -1 | The color of the major z-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| minorXGridColor | -1 | The color of the minor x-axis grid lines on the walls. -1 means it is the same as the majorXGridColor. |
| minorYGridColor | -1 | The color of the minor y-axis grid lines on the walls. -1 means it is the same as the majorYGridColor. |
| minorZGridColor | -1 | The color of the minor z-axis grid lines on the walls. -1 means it is the same as the majorZGridColor. |

See also:

- 28.57.18 setWallGrid(majorXGridColor as color, majorYGridColor as color, majorZGridColor as color,

minorXGridColor as color, minorYGridColor as color, minorZGridColor as color) 5320

### 28.57.20 setWallThickness(xyThickness as Integer, yzThickness as Integer = -1, zxThickness as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the thickness of the plot region walls.
**Notes:** By default, the plot region walls are 10 pixels thick. This method can be used to modify the thickness.

| Argument | Default | Description |
|---|---|---|
| xyThickness | (Mandatory) | The thickness of the xy wall in pixels. |
| yzThickness | -1 | The thickness of the yz wall in pixels. -1 means it is the same as xyThickness. |
| zxThickness | -1 | The thickness of the zx wall in pixels. -1 means it is the same as xyThickness. |

### 28.57.21 setWallVisibility(xyVisible as boolean, yzVisible as boolean, zxVisible as boolean)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows or hides the plot region walls.
**Notes:** By default, all walls are visible. This method can be used to hide some or all of the walls.

| Argument | Default | Description |
|---|---|---|
| xyVisible | (Mandatory) | A true value means the xy wall is visible. A false value means the xy wall is hidden. |
| yzVisible | (Mandatory) | A true value means the yz wall is visible. A false value means the yz wall is hidden. |
| zxVisible | (Mandatory) | A true value means the zx wall is visible. A false value means the zx wall is hidden. |

### 28.57.22 setZAxisPos(pos as Integer)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the z-axis.
**Notes:** In a ThreeDChart object, the z-axis can be drawn either on the left side or the right side. By default, ChartDirector will draw the z-axis on the side that is nearer to the viewer.

This method can be used to specify which side the z-axis should be drawn.

| Argument | Default | Description |
|---|---|---|
| pos | (Mandatory) | The position of the z-axis, which must be either Left or Right. |

### 28.57.23 Properties

### 28.57.24 xAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the x-axis of the ThreeDChart object.
**Notes:** Returns the Axis object representing the x-axis of the ThreeDChart object.
(Read only property)

### 28.57.25 yAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the y-axis of the ThreeDChart object.
**Notes:** Returns the Axis object representing the y-axis of the ThreeDChart object.
(Read only property)

### 28.57.26 zAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the z-axis of the ThreeDChart object.
**Notes:** Returns the Axis object representing the z-axis of the ThreeDChart object.
(Read only property)

## 28.58 class CDThreeDScatterChartMBS

### 28.58.1 class CDThreeDScatterChartMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ThreeDScatterChart class represents 3D scatter charts.
**Notes:** ThreeDScatterChart is a subclass of ThreeDChart.
Subclass of the CDThreeDChartMBS class.
**Blog Entries**

- 3D Scatter Charts

### 28.58.2 Methods

### 28.58.3 addScatterGroup(xData() as Double, yData() as Double, zData() as Double, name as string = "", symbol as Integer = 7, symbolSize as Integer = 5, fillcolor as Integer = -1, edgeColor as Integer = -1) as CDThreeDScatterGroupMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a group of scatter symbols to the ThreeDScatterChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| zData | (Mandatory) | An array of numbers representing the z values of the data points. |
| name | "" | The name of the symbol group. The name will be used in the legend box, if one is available. An empty string means the symbol group has no name. |
| symbol | CircleShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

Returns a ThreeDScatterGroup object representing the symbol group created.
See also:

- 28.58.4 addScatterGroup(xData() as Double, yData() as Double, zData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillcolor as color, edgeColor as color) as CDThreeDScatterGroupMBS 5325


### 28.58.4 addScatterGroup(xData() as Double, yData() as Double, zData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillcolor as color, edgeColor as color) as CDThreeDScatterGroupMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a group of scatter symbols to the ThreeDScatterChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| zData | (Mandatory) | An array of numbers representing the z values of the data points. |
| name | "" | The name of the symbol group. The name will be used in the legend box, if one is available. An empty string means the symbol group has no name. |
| symbol | CircleShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

Returns a ThreeDScatterGroup object representing the symbol group created.
See also:


- 28.58.3 addScatterGroup(xData() as Double, yData() as Double, zData() as Double, name as string = "", symbol as Integer = 7, symbolSize as Integer = 5, fillcolor as Integer = -1, edgeColor as Integer = -1) as CDThreeDScatterGroupMBS 5324


### 28.58.5 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ThreeDScatterChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.58.6 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0) 5326

### 28.58.6 Constructor(width as Integer, height as Integer, bgColor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ThreeDScatterChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

See also:

- 28.58.5 Constructor(width as Integer = 640, height as Integer = 480, bgColor as Integer = &hffff0000, edgeColor as Integer = &hff000000, raisedEffect as Integer = 0) 5325

# 28.59 class CDThreeDScatterGroupMBS

## 28.59.1 class CDThreeDScatterGroupMBS

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ThreeDScatterGroup class represents a group of scatter symbols in a ThreeDScatterChart object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr7
- MBS Real Studio Plugins, version 12.4pr3
- MBS Real Studio Plugins, version 12.3pr16

## 28.59.2 Methods

## 28.59.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a DrawArea object as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A DrawArea object to be used as the symbol. |

See also:


- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330

- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.5 setDataSymbol(file as folderitem)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image from a file and use it as the graphics symbol to plot the data points.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| image | (Mandatory) | The filename of the image file. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333

### 28.59.6 setDataSymbol(ImageFilePath as string)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an image from a file and use it as the graphics symbol to plot the data points.
**Notes:** ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath on the directory that ChartDirector will search for the file.

| Argument | Default | Description |
|---|---|---|
| image | (Mandatory) | The filename of the image file. The image type is determined based on file extension, which must be png, jpg/jpeg, gif or wbmp/wmp. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.7 setDataSymbol(pic as Picture)

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a picture object as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| obj | (Mandatory) | A picture object to be used as the symbol. |

See also:

- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331

- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333

### 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |


- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1) 5333


### 28.59.12 setDataSymbol(symbol as Integer, size as Integer, fillColor as color, edgeColor as color, lineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses a custom polygon as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers representing the coordinates the polygon vertices. See Shape Specification on how the custom shape is defined. |
| size | 11 | The nominal width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. SameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |

See also:


- 28.59.4 setDataSymbol(DrawArea as CDDrawAreaMBS) 5327
- 28.59.5 setDataSymbol(file as folderitem) 5328
- 28.59.6 setDataSymbol(ImageFilePath as string) 5329
- 28.59.7 setDataSymbol(pic as Picture) 5329
- 28.59.8 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as color, edgeColor as color) 5330
- 28.59.9 setDataSymbol(polygon() as Integer, size as Integer = 11, fillColor as Integer = -1, edgeColor as Integer = -1) 5331
- 28.59.10 setDataSymbol(symbol as Integer, size as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1, lineWidth as Integer = 1) 5332
- 28.59.11 setDataSymbol(symbol as Integer, size as Integer, fillColor as color) 5332


### 28.59.13 setDropLine

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the drop line color and width.
**Notes:** Drop lines are vertical lines that join the data points to the bottom of the plot region. It helps in visualizing the height of the data points.

| Argument | Default | Description |
|---|---|---|
| dropLineColor | (Mandatory) | The color of the drop line. |
| dropLineWidth | 1 | The width of the drop line. |

See also:


- 28.59.14 setDropLine(dropLineColor as color, dropLineWidth as Integer = 1) 5334
- 28.59.15 setDropLine(dropLineColor as Integer, dropLineWidth as Integer = 1) 5335


### 28.59.14 setDropLine(dropLineColor as color, dropLineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the drop line color and width.
**Notes:** Drop lines are vertical lines that join the data points to the bottom of the plot region. It helps in visualizing the height of the data points.

See also:

| Argument | Default | Description |
|---|---|---|
| dropLineColor | (Mandatory) | The color of the drop line. |
| dropLineWidth | 1 | The width of the drop line. |


- 28.59.13 setDropLine 5334
- 28.59.15 setDropLine(dropLineColor as Integer, dropLineWidth as Integer = 1) 5335


### 28.59.15 setDropLine(dropLineColor as Integer, dropLineWidth as Integer = 1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the drop line color and width.
**Notes:** Drop lines are vertical lines that join the data points to the bottom of the plot region. It helps in visualizing the height of the data points.

| Argument | Default | Description |
|---|---|---|
| dropLineColor | (Mandatory) | The color of the drop line. |
| dropLineWidth | 1 | The width of the drop line. |

See also:


- 28.59.13 setDropLine 5334
- 28.59.14 setDropLine(dropLineColor as color, dropLineWidth as Integer = 1) 5334


### 28.59.16 setLegendIcon(width as Integer, height as Integer = -1, color as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses one of the built-in symbols as the graphics symbol to plot the data points.
**Notes:**

See also:


- 28.59.17 setLegendIcon(width as Integer, height as Integer, color as color) 5335


### 28.59.17 setLegendIcon(width as Integer, height as Integer, color as color)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| symbol | (Mandatory) | One of the predefined shape constants representing the symbol shape. See Shape Specification for the available built-in shapes. |
| size | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. kSameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |
| lineWidth | 1 | The line width used for drawing the symbols. |

**Function:** Uses one of the built-in symbols as the graphics symbol to plot the data points.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| symbol | (Mandatory) | One of the predefined shape constants representing the symbol shape. See Shape Specification for the available built-in shapes. |
| size | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. kSameAsMainColor means the color is based on the z value of the symbol as according to the ColorAxis (accessible via ThreeDChart.colorAxis). |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. -1 means using LineColor as the edge color. |
| lineWidth | 1 | The line width used for drawing the symbols. |

See also:

- 28.59.16 setLegendIcon(width as Integer, height as Integer = -1, color as Integer = -1) 5335

### 28.59.18 setSymbolOffset(offsetX as Integer, offsetY as Integer)

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offset the symbols in the x and y directions in pixel unit.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| xOffset | (Mandatory) | The x offset in pixels. A positive value mean shifting to the right. |
| yOffset | (Mandatory) | The y offset in pixels. A positive value mean shifting to the bottom. |

# 28.60 class CDTreeMapChartMBS

## 28.60.1 class CDTreeMapChartMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The TreeMapChart class represents tree map charts.
**Notes:** Subclass of the CDBaseChartMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2

## 28.60.2 Methods

## 28.60.3 Constructor(width as integer = 640, height as integer = 480, bgColor as integer = &hffff0000, edgeColor as integer = &hff000000, raisedEffect as integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new TreeMapChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

Returns the TreeMapChart object created.
See also:

- 28.60.4 Constructor(width as integer, height as integer, bgColor as color, edgeColor as color, raisedEffect as integer = 0) 5337

## 28.60.4 Constructor(width as integer, height as integer, bgColor as color, edgeColor as color, raisedEffect as integer = 0)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new TreeMapChart object.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

Returns the TreeMapChart object created.
See also:

- 28.60.3 Constructor(width as integer = 640, height as integer = 480, bgColor as integer = &hffff0000, edgeColor as integer = &hff000000, raisedEffect as integer = 0) 5337

### 28.60.5 getLevelPrototype(index as integer) as CDTreeMapNodeMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the prototype node for the specified level.
**Notes:** A tree map starts with the root node. The root node contains level 1 child nodes. The level 1 child nodes can in turn contain level 2 child nodes, and so on.

A prototype node is a node that acts as the template for nodes at a certain level. For example, if the level 1 prototype node is configured to use a certain font for labels, all level 1 nodes will use that font as the default for labels.

| Argument | Default | Description |
|---|---|---|
| level | (Mandatory) | The node level to which the prototype node applies. |

Returns TreeMapNode object representing the prototype node for the specified level.

### 28.60.6 setMapLevel(n as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the node level used to generate the image map.
**Notes:** By default, the image map will be based on the deepest node level. For example, if the tree map has 2 levels of nodes, the image map will be based on the level 2 nodes. The setMapLevel method can be used to specify an alternative node level for the image map.

| Argument | Default | Description |
|---|---|---|
| level | (Mandatory) | The node level used to generate the image map. |

### 28.60.7 setPlotArea(x as integer, y as integer, width as integer, height as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the position and size of the tree map plot area.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the top-left corner of the plot area. |
| y | (Mandatory) | The y coordinate of the top-left corner of the plot area. |
| width | (Mandatory) | The width of the plot area. |
| height | (Mandatory) | The height of the plot area. |

### 28.60.8 Properties

### 28.60.9 RootNode as CDTreeMapNodeMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the root node of the tree map.
**Notes:** The root node is the starting node of the tree map. Child nodes can be added to the root node, and a second level of child nodes can be added to the first level child nodes, and so on.
(Read only property)

## 28.61 class CDTreeMapNodeMBS

### 28.61.1 class CDTreeMapNodeMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The TreeMapNode class represents tree map nodes.
**Notes:** The TreeMapChart.getRootNode method can be used to obtain the root node of a tree map chart. TreeMapNode.setData can then be used to add child nodes.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr7
- News from the MBS Xojo Plugins Version 21.2

**Xojo Developer Magazine**

- 22.1, page 9: News

### 28.61.2 Methods

### 28.61.3 addExtraField(numbers() as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds an array of numbers/dates to be used as an extra field in various places.
**Notes:** This method merely stores the data inside the node object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| numbers | (Mandatory) | An array of numbers/dates an extra field of the child nodes. |

See also:

- 28.61.4 addExtraField(texts() as string)

### 28.61.4 addExtraField(texts() as string)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds an array of text to be used as an extra field of the child nodes.
**Notes:** This method merely stores the data inside the node object. The Parameter Substitution and Formatting mechanism will determine how the data are to be used.

A common use for extra fields is to specify extra information (such as a custom serial number for the data points) to be displayed on data labels or on tool tips, or to supply extra query parameters in clickable charts. All these are achieved by specifying the extra field on the data label template or image map templates during parameter substitution.

| Argument | Default | Description |
|---|---|---|
| texts | (Mandatory) | An array of text to be an extra field of the child nodes. |

See also:

- 28.61.3 addExtraField(numbers() as double) 5340

### 28.61.5 Constructor

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 28.61.6 Node(Index as Integer) as CDTreeMapNodeMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the child node at the specified index.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The index of the child node. |

Returns the TreeMapNode object representing the child node at the specified index.

### 28.61.7 setColors(fillColor as color, edgeColor as color, raisedEffect as integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the fill and border colors and 3D border effect of the node.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| fillColor | (Mandatory) | The fill color of the node. |
| edgeColor | (Optional) | The border color of the node. |
| raisedEffect | (Optional) | The 3D border width. For positive values, the border ill appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify CDBaseChartMBS.glassEffect, CDBaseChartMBS.softLighting, CDBaseChartMBS.cylinderEffect or CDBaseChartMBS.flatBorder effects. |

See also:

- 28.61.8 setColors(fillColor as integer, edgeColor as integer = -1, raisedEffect as integer = -2147483647) 5342

### 28.61.8 setColors(fillColor as integer, edgeColor as integer = -1, raisedEffect as integer = -2147483647)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the fill and border colors and 3D border effect of the node.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| fillColor | (Mandatory) | The fill color of the node. |
| edgeColor | (Optional) | The border color of the node. |
| raisedEffect | (Optional) | The 3D border width. For positive values, the border ill appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. This argument can also be used to specify CDBaseChartMBS.glassEffect, CDBaseChartMBS.softLighting, CDBaseChartMBS.cylinderEffect or CDBaseChartMBS.flatBorder effects. |

See also:

- 28.61.7 setColors(fillColor as color, edgeColor as color, raisedEffect as integer = -2147483647) 5342

### 28.61.9 setData(data() as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the data for the child nodes.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers for the values of the child node. This array can be empty if the child nodes contains other child nodes. In this case, the value of a node will be determined as the sum of the values of its child nodes. |

See also:


- 28.61.10 setData(data() as double, labels() as string) 5343
- 28.61.11 setData(data() as double, labels() as string, colors() as Color) 5343
- 28.61.12 setData(data() as double, labels() as string, colors() as Integer) 5344


### 28.61.10 setData(data() as double, labels() as string)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the data for the child nodes.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers for the values of the child node. This array can be empty if the child nodes contains other child nodes. In this case, the value of a node will be determined as the sum of the values of its child nodes. |
| labels | [ Empty_Array ] | An array of text strings for the node labels. |

See also:


- 28.61.9 setData(data() as double) 5342
- 28.61.11 setData(data() as double, labels() as string, colors() as Color) 5343
- 28.61.12 setData(data() as double, labels() as string, colors() as Integer) 5344


### 28.61.11 setData(data() as double, labels() as string, colors() as Color)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the data for the child nodes.
**Notes:**

See also:


- 28.61.9 setData(data() as double) 5342

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers for the values of the child node. This array can be empty if the child nodes contains other child nodes. In this case, the value of a node will be determined as the sum of the values of its child nodes. |
| labels | [ Empty_Array ] | An array of text strings for the node labels. |
| colors | [ Empty_Array ] | An array of colors to be used as the fill colors of the child nodes. An empty array means the colors are determined by the prototype node (See CDTreeMapChartMBS.getLevelPrototype). |


- 28.61.10 setData(data() as double, labels() as string) 5343
- 28.61.12 setData(data() as double, labels() as string, colors() as Integer) 5344


### 28.61.12 setData(data() as double, labels() as string, colors() as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the data for the child nodes.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers for the values of the child node. This array can be empty if the child nodes contains other child nodes. In this case, the value of a node will be determined as the sum of the values of its child nodes. |
| labels | [ Empty_Array ] | An array of text strings for the node labels. |
| colors | [ Empty_Array ] | An array of colors to be used as the fill colors of the child nodes. An empty array means the colors are determined by the prototype node (See CDTreeMapChartMBS.getLevelPrototype). |

See also:


- 28.61.9 setData(data() as double) 5342
- 28.61.10 setData(data() as double, labels() as string) 5343
- 28.61.11 setData(data() as double, labels() as string, colors() as Color) 5343


### 28.61.13 setLabelFormat(formatString as string = " { label } ", font as string = "normal", fontSize as Integer = 10, fontColor as Integer = &hffff0002, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the node label format and font style.
**Notes:** Please refer to Parameter Substitution and Formatting in FAQ on all available format parameters.

| Argument | Default | Description |
|---|---|---|
| format | (Mandatory) | The format string. |
| font | "normal" | The font used to draw the label. |
| fontSize | 10 | The font size used to draw the labels in points. |
| fontColor | TextColor | The color used to draw the labels. |
| alignment | TopLeft | The alignment of the label inside the node. See Alignment Specification for supported alignment types. |

See also:

- 28.61.14 setLabelFormat(formatString as string, font as string, fontSize as Integer, fontColor as Color, alignment as Integer = 7) 5345

### 28.61.14 setLabelFormat(formatString as string, font as string, fontSize as Integer, fontColor as Color, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the node label format and font style.
**Notes:** Please refer to Parameter Substitution and Formatting in FAQ on all available format parameters.

| Argument | Default | Description |
|---|---|---|
| format | (Mandatory) | The format string. |
| font | "normal" | The font used to draw the label. |
| fontSize | 10 | The font size used to draw the labels in points. |
| fontColor | TextColor | The color used to draw the labels. |
| alignment | TopLeft | The alignment of the label inside the node. See Alignment Specification for supported alignment types. |

See also:

- 28.61.13 setLabelFormat(formatString as string = " { label } ", font as string = "normal", fontSize as Integer = 10, fontColor as Integer = &hffff0002, alignment as Integer = 7) 5344

### 28.61.15 setLayoutAspectMultiplier(multiplier as Double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets layout aspect multiplier.

### 28.61.16 setLayoutAspectRatio(ratio as Double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the layout aspect ratio.

### 28.61.17 setLayoutMethod(layoutMethod as Integer, layoutDirection as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the layout method used to layout the child nodes.
**Notes:** The layout method is specified by using the following predefined constants as the layoutMethod argument.

If a layout method argument is not specified, it will be obtained from the prototype node (see TreeMapChart.getLevelPrototype). If it is still not specified, the parent node will be used. If the node is the root node with no parent, the default is to use TreeMapSquarify with kTopLeft layout direction and without swapXY.

| Argument | Default | Description |
|---|---|---|
| layoutMethod | (Mandatory) | The layout method used to layout the child nodes. A value of 0 means the layout method is not specified. |
| layoutDirection | (Optional) | The layout direction. Must be one of kTopLeft, kTopRight, kBottomLeft and kBottomRight. By default, the horizontal direction will be applied first, followed by the vertical direction. |
| swapXY | (Optional) | If set to true, the vertical direction will be applied first, followed by the horizontal direction. A false value means the opposite. |

See also:

- 28.61.18 setLayoutMethod(layoutMethod as Integer, layoutDirection as Integer, swapXY as Boolean) 5346

### 28.61.18 setLayoutMethod(layoutMethod as Integer, layoutDirection as Integer, swapXY as Boolean)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the layout method used to layout the child nodes.
**Notes:** The layout method is specified by using the following predefined constants as the layoutMethod argument.

If a layout method argument is not specified, it will be obtained from the prototype node (see TreeMapChart.getLevelPrototype). If it is still not specified, the parent node will be used. If the node is the root node with no parent, the default is to use TreeMapSquarify with kTopLeft layout direction and without swapXY.

| Argument | Default | Description |
|---|---|---|
| layoutMethod | (Mandatory) | The layout method used to layout the child nodes. A value of 0 means the layout method is not specified. |
| layoutDirection | (Optional) | The layout direction. Must be one of kTopLeft, kTopRight, kBottomLeft and kBottomRight. By default, the horizontal direction will be applied first, followed by the vertical direction. |
| swapXY | (Optional) | If set to true, the vertical direction will be applied first, followed by the horizontal direction. A false value means the opposite. |

See also:

- 28.61.17 setLayoutMethod(layoutMethod as Integer, layoutDirection as Integer = -1) 5346

### 28.61.19 setPos(x as Integer, y as Integer, w as Integer, h as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the position of the node.

### 28.61.20 setSorting(Mode as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Layout the nodes in sorted order.
**Notes:** ChartDirector supports a number of layout methods (see TreeMapNode.setLayoutMethod), most them will layout the nodes in the order they appear in the data array. The setSorting can be used to layout the nodes in sorted order instead.

| Argument | Default | Description |
|---|---|---|
| mode | (Mandatory) | The values -1, 0, 1 refer to descending, no sorting and ascending order. |

### 28.61.21 Properties

### 28.61.22 BottomY as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the bottom y coordinate of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

### 28.61.23 Handle as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 28.61.24 Height as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the height of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

### 28.61.25 Label as String

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the the label value of the node.
**Notes:** (Read only property)

### 28.61.26 LeftX as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the left x coordinate of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

### 28.61.27 NodeCount as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the the number of child nodes.
**Notes:** (Read only property)

### 28.61.28 RightX as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the right x coordinate of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

### 28.61.29 TopY as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the top y coordinate of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

### 28.61.30 Value as Double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the the data value of the node.
**Notes:** (Read only property)

### 28.61.31 Width as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the width of the node.
**Notes:** This method should be used only after calling BaseChart.layout or after ChartDirector has output the chart image.
(Read only property)

## 28.62 class CDTrendLayerMBS

### 28.62.1 class CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TrendLayer class represents trend layers.
**Notes:** The trend layer performs linear regression analysis on the data points, and represents the result as a best fit straight line with optional confidence and prediction bands.

In linear regression analysis, the data points are assumed to be related by:

y = m * x + c + err
where m and c are constants, and err is a random variable.

Linear regression analysis estimates m, c and err based on available data using the least square method. Using estimated values of m and c, the line y = m * x + c are plotted as the best fit straight line based on available data.

However, as m and c are estimations based on available data, it may not be exactly equal to the "real" m and c. In ChartDirector, the uncertainties are represented visually as a confidence band around the regression line. For example, the 95% confidence band means there are 95% probability that the "real" line is in that band.

To predict a data point (infer y given x), we can use the formula:

y = m * x + c + err
based on estimated values of m, c and err.

The uncertainties of the data point is contributed by the uncertainties in m and c, as well as err. In ChartDirector, the uncertainties of the data points are represented visually as a prediction band around the regression line. For example, a 95% prediction band means there are 95% probability that a data point will be in that band.

The prediction band is always wider than the confidence band. It is because the uncertainties of the regression line is contributed by m and c, while the uncertainties of the data points are contributed by m, c and err. The err term makes the data points less certain that the regression line.
Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Chart Diagrams with Xojo

### 28.62.2 Methods

### 28.62.3 addConfidenceBand(confidence as Double, upperFillColor as color, upperEdgeColor as color, upperLineWidth as Integer, lowerFillColor as color, lowerEdgeColor as color, lowerLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addConfidenceBand method, but uses color instead of integer data type for passing color values.
See also:

- 28.62.4 addConfidenceBand(confidence as Double, upperFillColor as Integer, upperEdgeColor as Integer = &hFF000000, upperLineWidth as Integer = -1, lowerFillColor as Integer = -1, lowerEdgeColor as Integer = -1, lowerLineWidth as Integer = -1) 5351

### 28.62.4 addConfidenceBand(confidence as Double, upperFillColor as Integer, upperEdgeColor as Integer = &hFF000000, upperLineWidth as Integer = -1, lowerFillColor as Integer = -1, lowerEdgeColor as Integer = -1, lowerLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a confidence band to the trend layer.
**Notes:** Please refer to the description of TrendLayer on what is a confidence band.

| Argument | Default | Description |
|---|---|---|
| confidence | (Mandatory) | The confidence level - must be between 0 - 1. |
| upperFillColor | (Mandatory) | The fill color for the upper side of the confidence band (the portion that is above the regression line). |
| upperEdgeColor | Transparent | The border color for the upper side of the confidence band (the portion that is above the regression line). |
| upperLineWidth | 1 | The border width for the upper side of the confidence band (the portion that is above the regression line). |
| lowerFillColor | -1 | The fill color for the lower side of the confidence band (the portion that is below the regression line). -1 means the color is the same as upperFillColor. |
| lowerEdgeColor | -1 | The border color for the lower side of the confidence band (the portion that is below the regression line). -1 means the color is the same as upperEdgeColor. |
| lowerLineWidth | -1 | The border width for the lower side of the confidence band (the portion that is below the regression line). -1 means the color is the same as upperLineWidth. |

See also:

- 28.62.3 addConfidenceBand(confidence as Double, upperFillColor as color, upperEdgeColor as color, upperLineWidth as Integer, lowerFillColor as color, lowerEdgeColor as color, lowerLineWidth as Integer = -1) 5351

### 28.62.5 addPredictionBand(confidence as Double, upperFillColor as color, upperEdgeColor as color, upperLineWidth as Integer, lowerFillColor as color, lowerEdgeColor as color, lowerLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addPredictionBand method, but uses color instead of integer data type for passing color values.
See also:

- 28.62.6 addPredictionBand(confidence as Double, upperFillColor as Integer, upperEdgeColor as Integer = &hFF000000, upperLineWidth as Integer = -1, lowerFillColor as Integer = -1, lowerEdgeColor as Integer = -1, lowerLineWidth as Integer = -1) 5352

### 28.62.6 addPredictionBand(confidence as Double, upperFillColor as Integer, upperEdgeColor as Integer = &hFF000000, upperLineWidth as Integer = -1, lowerFillColor as Integer = -1, lowerEdgeColor as Integer = -1, lowerLineWidth as Integer = -1)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a prediction band to the trend layer.
**Notes:** Please refer to the description of TrendLayer on what is a prediction band.

| Argument | Default | Description |
|---|---|---|
| confidence | (Mandatory) | The confidence level - must be between 0 - 1. |
| upperFillColor | (Mandatory) | The fill color for the upper side of the prediction band (the portion that is above the regression line). |
| upperEdgeColor | Transparent | The border color for the upper side of the prediction band (the portion that is above the regression line). |
| upperLineWidth | 1 | The border width for the upper side of the prediction band (the portion that is above the regression line). |
| lowerFillColor | -1 | The fill color for the lower side of the prediction band (the portion that is below the regression line). -1 means the color is the same as upperFillColor. |
| lowerEdgeColor | -1 | The border color for the lower side of the prediction band (the portion that is below the regression line). -1 means the color is the same as upperEdgeColor. |
| lowerLineWidth | -1 | The border width for the lower side of the prediction band (the portion that is below the regression line). -1 means the color is the same as upperLineWidth. |

See also:

- 28.62.5 addPredictionBand(confidence as Double, upperFillColor as color, upperEdgeColor as color, upperLineWidth as Integer, lowerFillColor as color, lowerEdgeColor as color, lowerLineWidth as Integer = -1) 5352

### 28.62.7 getCoefficient(index as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the coefficients of the regression function.
**Notes:** The coefficients depend on the regression type. They are indexed as a0, a1, a2, ... in the regression type table published on TrendLayer.

### 28.62.8 getCorrelation as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the correlation coefficient of the trend line.

### 28.62.9 getIntercept as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y-axis intercept of the trend line.

### 28.62.10 getLine as CDLineObjMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves an opaque LineObj representing the trend line. The opaque LineObj is to be used in XYChart.addInterLineLayer for adding coloring between lines.

### 28.62.11 getSlope as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the slope of the trend line.

### 28.62.12 getStdError as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the standard error of the trend line.

### 28.62.13 setImageMapWidth(w as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the effective width of the line used for producing image maps.
**Notes:** For thin lines, it is hard to click on the lines. So for the purpose of producing image maps for a line chart, ChartDirector can assume the line is very thick. The default is 10 pixels.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The effective width of the line used for producing image maps. |

### 28.62.14 setRegressionType(regressionType as Integer)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the regression type to be used.
**Notes:** RegressionType:
Must be one of the constants kLinearRegression, kConstrainedLinearRegression, kExponentialRegression and kLogarithmicRegression, or the return value of BaseChartMBS.PolynomialRegression. They represent linear regression, constrained linear regression, exponential regression, logarithmic regression, and polynomial regression of configurable degree.

## 28.63 class CDTTFTextMBS

### 28.63.1 class CDTTFTextMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TTFText class represents text blocks.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

**Xojo Developer Magazine**

- 18.5, page 76: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes

### 28.63.2 Methods

### 28.63.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 28.63.4 destroy

MBS ChartDirector Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the text object.
**Notes:** Normally you don't need to call this.

### 28.63.5 draw(x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other draw method, but uses color instead of integer data type for passing color values.
See also:

- 28.63.6 draw(x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7) 5356

### 28.63.6 draw(x as Integer, y as Integer, colorvalue as Integer, alignment as Integer = 7)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the text block.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of a reference point to align the text. |
| y | (Mandatory) | The y coordinate of a reference point to align the text. |
| color | (Mandatory) | The color of the text. |
| alignment | TopLeft | The location of the text relative to the reference point. See Alignment Specification for supported alignment types. |

See also:

- 28.63.5 draw(x as Integer, y as Integer, colorvalue as color, alignment as Integer = 7) 5355

### 28.63.7 getHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the text block.

### 28.63.8 getLineDistance as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the distance between two lines in the text block.
**Notes:** Return Value
The distance between two lines in the text block in pixels.

### 28.63.9 getLineHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of a typical line in the text block.

### 28.63.10 getWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the text block.

## 28.64 class CDVectorLayerMBS

### 28.64.1 class CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The VectorLayer class represents vector layers.
**Notes:** Subclass of the CDLayerMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 28.64.2 Methods

### 28.64.3 setArrowAlignment(alignment as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the alignment of the vector relative to the data point.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| alignment | (Mandatory) | A BottomCenter value means the vector will point away from the data point (the default). A TopCenter value means the vector will point into the data point. A Center value means the center of the vector will be at the data point. |

### 28.64.4 setArrowHead(polygon() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a custom shape to be used as the arrow head.
**Notes:** The custom shape is specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 10 x 10 units, in which the x-axis is from left to right, and the y-axis from bottom to top. The origin is assumed to be the bottom center of the arrow (the point where the arrow head joins the arrow stem). The shape is assumed to represent an arrow pointing upwards.

As an example, the followings are the integer array that represents the standard ChartDirector vector arrow head:

-5, -5, 0, 0, 5, -5, 0, 5

ChartDirector will automatically scale the shape to the actual width and height as specified in VectorLayer.setArrowHead.

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates the polygon vertices on a 10 x 10 units grid. |

See also:


- 28.64.5 setArrowHead(width as Integer, height as Integer = 0) 5359


### 28.64.5 setArrowHead(width as Integer, height as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the arrow head.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the arrow head in pixels. The default width is 8 pixels. |
| height | 0 | The height of the arrow head in pixels. The default value of 0 means the height is the same as the width. |

See also:


- 28.64.4 setArrowHead(polygon() as Integer) 5358


### 28.64.6 setArrowStem(polygon() as Integer)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a custom shape to be used as the arrow stem.
**Notes:** By default, the arrow stem is just a straight line, with the line width controlled using Layer.setLineWidth. The setArrowStem method can specify a custom shape for the arrow stem.

The custom shape is specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 10 x 100 units, in which the x-axis is from left to right, and the y-axis from bottom to top. The origin is assumed to be the starting point of the arrow stem, and the shape is assumed to represent an arrow stem pointing upwards.

ChartDirector will automatically scale the shape so that the total arrow length (head + stem) is the required length of the arrow as according to actual data, and the stem width is as specified in Layer.setLineWidth.

| Argument | Default | Description |
|---|---|---|
| polygon | (Mandatory) | An array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates the polygon vertices on a 10 x 100 units grid. |

### 28.64.7 setIconSize(height as Integer, width as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the size of the icon to be used in legend box.
**Notes:** By default, if a legend box is available on the chart, ChartDirector will insert an legend entry if the VectorLayer is named. The size of the icon will be the size of the vectors used on the chart, using a short vector length to fit the legend box.

This method can be used to override the legend box settings to specify a custom width/height for the icons of the current VectorLayer.

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the icon in pixels. |
| width | 0 | The width of the icon in pixels. The default value of 0 means the width is automatically determined. |

### 28.64.8 setVector(lengths() as Double, directions() as Double, lengthScale as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the lengths and directions for the vectors.
**Notes:** ChartDirector supports specifying lengths as pixels or in axis scale. The unit is specified by using the following predefined constants.

| Constant | Value | Description |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| XAxisScale | 1 | The unit is measured in x-axis scale. |
| YAxisScale | 2 | The unit is measured in y-axis scale. |

| Argument | Default | Description |
|---|---|---|
| lengths | (Mandatory) | An array of numbers representing the lengths of the vectors, in unit as specified in the lengthScale argument. |
| directions | (Mandatory) | An array of numbers representing the direction of the vectors as a clockwise angle in degrees, where 0 is upward pointing direction. |
| lengthScale | PixelScale | The unit for the lengths, which must be one of the predefined constants in the table above. |

### 28.64.9 setVectorMargin(startMargin as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins to shorten the vectors.
**Notes:** By default, vectors will be drawn from the given start points to the given end points.

In some cases, it may be desirable to shorten the vectors so that they do not start exactly at the start points and/or end exactly at the end points. For example, the vectors may be used to point to some circular symbols created by a ScatterLayer. The vectors may need to point to the perimeter of the circles, rather than their centers. This can be achieved by shortening the vectors by the radius of the circles.

Arguments:

| Argument | Default | Description |
|---|---|---|
| startMargin | (Mandatory) | The length to shorten at the start of the vector in pixels. |
| endMargin | NoValue | The length to shorten at the end of the vector in pixels. NoValue means the length is the same as startMargin. |

See also:

- 28.64.10 setVectorMargin(startMargin as Double, endMargin as Double) 5361

### 28.64.10 setVectorMargin(startMargin as Double, endMargin as Double)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the margins to shorten the vectors.
**Notes:** By default, vectors will be drawn from the given start points to the given end points.

In some cases, it may be desirable to shorten the vectors so that they do not start exactly at the start points and/or end exactly at the end points. For example, the vectors may be used to point to some circular symbols created by a ScatterLayer. The vectors may need to point to the perimeter of the circles, rather than their centers. This can be achieved by shortening the vectors by the radius of the circles.

Arguments:

| Argument | Default | Description |
|---|---|---|
| startMargin | (Mandatory) | The length to shorten at the start of the vector in pixels. |
| endMargin | NoValue | The length to shorten at the end of the vector in pixels. NoValue means the length is the same as startMargin. |

See also:

- 28.64.9 setVectorMargin(startMargin as Double) 5361

# 28.65 class CDViewPortControlBaseMBS

## 28.65.1 class CDViewPortControlBaseMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** A viewport control is a user interface element to let the user visualize and manipulate the viewport managed by the CDViewPortManagerMBS.
**Notes:** In typical usage, the viewport control displays an "overall chart" that shows the full data range, and connects to the CDViewPortManagerMBS using ViewPortControlBase.setViewPortManager. It can then include a rectangle on the overall chart to represent the viewport in the CDViewPortManagerMBS. The region outside the rectangle can be dimmed out to highlight the viewport region. If the viewport is updated (such as if the user uses the mouse wheel to zoom in the chart), the rectangle will also update automatically.

To manipulate the viewport, the user can drag the rectangle to move the viewport (equivalent to scrolling). The user can also resize the viewport by dragging the border of the rectangle (equivalent to zooming), or drag a new rectangular region on the overall chart to be used as the new viewport, or click on a point on the chart to center the viewport at that point.

In ChartDirector, the ViewPortControlBase implements the main logic of the viewport control without the GUI framework specific functions. The actual GUI framework specific control can derive from ViewPortControlBase and implement the GUI specific part. This greatly simplifies development of the actual control.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo Plugins, version 21.2pr1
- RealTimeViewPort in ChartDirector

**Videos**

- RealTimeViewPort in ChartDirector

## 28.65.2 Methods

## 28.65.3 Constructor

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 28.65.4 getProperty(attr as integer) as integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries a property by ID.

### 28.65.5 handleMouseDown(x as double, y as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Handles the mouse down.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate of the mouse. |
| y | (Mandatory) | The y pixel coordinate of the mouse. |

### 28.65.6 handleMouseMove(x as double, y as double, isDragging as boolean)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Handles the mouse move.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate of the mouse. |
| y | (Mandatory) | The y pixel coordinate of the mouse. |

### 28.65.7 handleMouseUp(x as double, y as double)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Handles the mouse up.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate of the mouse. |
| y | (Mandatory) | The y pixel coordinate of the mouse. |

### 28.65.8 isOnPlotArea(x as double, y as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Determines if a point is on the plot area.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x pixel coordinate of the point. |
| y | (Mandatory) | The y pixel coordinate of the point. |

### 28.65.9 paintViewPort

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Updates the viewport rectangle on the chart to reflect the state of the viewport.

### 28.65.10 setMouseMargin(mouseMargin as Integer, cornerMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the margin around the viewport border for mouse drag.
**Notes:** The viewport border can be as thin as 1 pixel, and it is hard to position the mouse over the border to drag it. To make it easier to drag the border, dragging can start if the mouse is within a certain margin from the border.

If both vertical and horizontal zooming is allowed, the viewport corners can be dragged diagonally to resize the viewport in both directions at the same time. To distinguish between dragging the corners and the borders, if the mouse is within a certain margin from the corner when the dragging starts, it is considered to be dragging the corner.

In either case, the mouse cursor will change to let the user know if the border or corner can be dragged.

| Argument | Default | Description |
|---|---|---|
| mouseMargin | (Mandatory) | The margin around the viewport border within which dragging of the border can start. The margin is in pixel unit. The default is 4 pixels. |
| cornerMargin | (Mandatory) | The margin around the viewport corner within which dragging of the corner can start. The margin is in pixel unit. The default is 8 pixels. |

### 28.65.11 setProperty(attr as integer, value as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets a property by ID.

### 28.65.12 setZoomScrollDirection(zoomDirection as integer, scrollDirection as integer)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the directions in which zooming and scrolling are allowed.
**Notes:** The viewport control uses this information to determine which type of dragging is allowed.
Arguments

| Argument | Default | Description |
|---|---|---|
| zoomDirection | (Mandatory) | The allowable zoom direction. Must be one of the predefined constants kDirectionHorizontal, kDirectionVertical and kDirectionHorizontalVertical for horizontal, vertical and bi-directional zooming. |
| scrollDirection | (Mandatory) | The allowable scroll direction. Must be one of the predefined constants kDirectionHorizontal, kDirectionVertical and kDirectionHorizontalVertical for horizontal, vertical and bi-directional scrolling. |

### 28.65.13 Properties

### 28.65.14 Chart as CDBaseChartMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The BaseChart object to be displayed in the viewport control.
**Notes:** (Read and Write property)

### 28.65.15 ClickToCenter as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enables or disables centering the viewport at the clicked point.
**Notes:** True to enable the behaviour, false to disable it.
(Read and Write property)

### 28.65.16 CornerMargin as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The corner margin.
**Notes:** See setMouseMargin.
(Read and Write property)

### 28.65.17 Cursor as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the mouse cursor to be used for user feedback.
**Notes:** Returns kLeft, kRight, kTop or kBottom if the mouse can initiate dragging the corresponding side of the viewport. Returns kTopLeft, kTopRight, kBottomLeft or kBottomRight if the mouse can initiate dragging the corresponding corner of the viewport. Returns kCenter if the mouse is within the viewport.
(Read only property)

### 28.65.18 DragBorderToResize as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enables or disables dragging the viewport border to resize it.
**Notes:** True to enable the behaviour, false to disable it.
(Read and Write property)

### 28.65.19 DragInsideToMove as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enables or disables dragging inside the viewport to move it.
**Notes:** (Read and Write property)

### 28.65.20 DragOutsideToSelect as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enables or disables dragging outside the viewport to select a new viewport.
**Notes:** True to enable the behaviour, false to disable it.
(Read and Write property)

### 28.65.21 MouseMargin as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The mouse margin.
**Notes:** See setMouseMargin.
(Read and Write property)

### 28.65.22 needUpdateChart as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks if need to update the chart in a viewport changed event.
**Notes:** True if need to update the chart in a viewport changed event, otherwise false.
(Read only property)

### 28.65.23 needUpdateDisplay as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks if need to update the viewport control screen display.
**Notes:** True if need to update the viewport control screen display, otherwise false.
(Read only property)

### 28.65.24 needUpdateImageMap as Boolean

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks if need to update the image map in a viewport changed event.
**Notes:** True if need to update the image map in a viewport changed event, otherwise false.
(Read only property)

### 28.65.25 SelectionBorderColor as Color

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the border color of the selection box.
**Notes:**

(Read and Write property)

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The border color of the selection box. The default is semi-transparent black (&c7F000000). |

### 28.65.26 SelectionBorderWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the border width of the selection box.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The border width of the selection box. The default is 1 pixel. |

(Read and Write property)

### 28.65.27 ViewPortBorderColor as Color

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the viewport border color.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The viewport border color. The default is semi-transparent black (&c7F000000). |

(Read and Write property)

### 28.65.28 ViewPortBorderWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the viewport border width.
**Notes:**

(Read and Write property)

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The viewport border width. The default is 1 pixel. |

### 28.65.29 ViewPortExternalColor as Color

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the fill color for the region outside the viewport.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The fill color for the region outside the viewport. The default is semi-transparent white (&c7FFFFFFF) to dim out the region. |

(Read and Write property)

### 28.65.30 ViewPortFillColor as Color

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the fill color for the region inside the viewport.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| color | (Mandatory) | The fill color for the region inside the viewport. The default is transparent. |

(Read and Write property)

### 28.65.31 ViewPortManager as CDViewPortManagerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The ViewPortManager object to be associated with the viewport control.
**Notes:** (Read and Write property)

# 28.66 class CDViewPortManagerMBS

## 28.66.1 class CDViewPortManagerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A view port can be imagined as a rectangular window of an underlying rectangular surface.
**Notes:** For example, a chart that has 10 years of data can be imagined as a very long chart. If one only displays one of the year, we can say the view port covers only 10% of the underlying chart.

With the view port concept, scrolling can be handled as moving the view port, while zooming in and out can be handled as changing the view port size.

ViewPortManager is a utility class for handling view ports. It manages mapping of the mouse and display pixel coordinates to view port coordinates, and supports various user interface constraints that limits how the view port may be changed.

View port coordinates are represented as fractions of the width or height of the underlying surface. For example, the width of a view port is represented as a fraction of the width of the underlying surface, so it must be between 0 to 1. A value of 0.1 means the view port width is 10% of the underlying surface width.

If you are using MFC, there is no need to create a ViewPortManager object directly. You may simply use the MFC CChartViewer control, which is a derived class of ViewPortManager and contains all its functions.

If you are using other GUI framework, and would like to perform zooming and scrolling functions by mouse drag, the ViewPortManager may be useful to you. The section Using ChartDirector with Other GUI Frameworks contains outlines on how the ViewPortManager may be used in general GUI frameworks.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr1

## 28.66.2 Methods

## 28.66.3 canZoomIn(zoomDirection as Integer) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if it is possible to zoom in further at a certain direction without violating zoom in limits.
**Notes:** See ViewPortManager.setZoomInWidthLimit and ViewPortManager.setZoomInHeightLimit on how to configure zoom in limits.

| Argument | Default | Description |
|---|---|---|
| zoomDirection | (Mandatory) | The zoom direction to check. Must be one of the predefined constants DirectionHorizontal, DirectionVertical and DirectionHorizontalVertical for horizontal, vertical and bi-directional zooming. |

Return Value
True if can zoom in further, otherwise false.

### 28.66.4 canZoomOut(zoomDirection as Integer) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if it is possible to zoom out further at a certain direction without violating zoom out limits.
**Notes:** See ViewPortManager.setZoomOutWidthLimit and ViewPortManager.setZoomOutHeightLimit on how to configure zoom out limits.

| Argument | Default | Description |
|---|---|---|
| zoomDirection | (Mandatory) | The zoom direction to check. Must be one of the predefined constants DirectionHorizontal, DirectionVertical and DirectionHorizontalVertical for horizontal, vertical and bi-directional zooming. |

Return Value
True if can zoom out further, otherwise false.

### 28.66.5 clearAllRanges

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method to clear all the ranges configured using setFullRange.

### 28.66.6 commitPendingSyncAxis(baseChart as CDBaseChartMBS)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The commitPendingSyncAxis is a method to actually perform the function in syncLinearAxisWithViewPort, syncLogAxisWithViewPort and syncDateAxisWithViewPort.

### 28.66.7 Constructor

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new viewport.

### 28.66.8 dragTo(scrollDirection as integer, x as double, y as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scrolls the view port to reflect dragging of the underlying rectangular surface.
**Notes:** The amount of drag is measured as changed in mouse cursor coordinates since the call to ViewPortManager.startDrag. A positive change means the dragging is to the right or bottom. A negative change means the dragging is to the left or top.

The drag is considered as applying to the underlying surface. The view port moves in the opposite direction to the drag. For example, dragging the underlying surface to the right is equivalent to moving the view port to the left.

The view port may not change at all if it has reached the borders of the underlying surface.

| Argument | Default | Description |
|---|---|---|
| scrollDirection | (Mandatory) | The allowed scroll direction. Must be one of the predefined constants DirectionHorizontal, DirectionVertical and DirectionHorizontalVertical for horizontal, vertical and bi-directional scrolling. |
| deltaX | (Mandatory) | The change in mouse x-coordinates. A positive change means the drag is to the right. A negative change means the drag is to the right. |
| deltaY | (Mandatory) | The change in mouse y-coordinates. A positive change means the drag is to the bottom. A negative change means the drag is to the top. |

### 28.66.9 getPlotAreaHeight as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the plot area in pixels.
**Notes:** Return Value
The height of the plot area in pixels.

### 28.66.10 getPlotAreaLeft as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x-coordinate of the left side of the plot area in pixels.
**Notes:** Return Value
The x-coordinate of the left side of the plot area in pixels.

### 28.66.11 getPlotAreaTop as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y-coordinate of the top side of the plot area in pixels.

### 28.66.12 getPlotAreaWidth as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the plot area in pixels.

### 28.66.13 getValueAtViewPort(id as string, ratio as Double, isLogScale as boolean = false) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a view port coordinate to a value of the specified data scale.
**Notes:** Please refer to ViewPortManager.setFullRange on how to define a data scale.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| vpCoor | (Mandatory) | The view port coordinate. |
| isLogScale | false | true if the conversion is based on a logarithmic scale. false if the conversion is based on a non-logarithmic scale. |

Returns the value of the specified data scale at the view port coordinate.

### 28.66.14 getViewPortAtValue(id as string, ratio as Double, isLogScale as boolean = false) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a value of the specified data scale to a view port coordinate.
**Notes:** Please refer to ViewPortManager.setFullRange on how to define a data scale.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| value | (Mandatory) | The value to be converted. |
| isLogScale | false | true if the conversion is based on a logarithmic scale. false if the conversion is based on a non-logarithmic scale. |

Returns the view port coordinate at the value of the specified data scale.

### 28.66.15 getViewPortHeight as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the height of the view port.
**Notes:** The view port height is expressed as a fraction of the height of the underlying surface. It should be between 0 and 1.

### 28.66.16 getViewPortLeft as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the position of the left side of the view port.
**Notes:** The position of the view port left side is its distance from the left side of the underlying surface, as a fraction of the width of the underlying surface. It should be between 0 and 1.

### 28.66.17 getViewPortTop as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the position of the top side of the view port.
**Notes:** The position of the view port top side is its distance from the top side of the underlying surface, as a fraction of the height of the underlying surface. It should be between 0 and 1.

### 28.66.18 getViewPortWidth as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the width of the view port.
**Notes:** The view port width is expressed as a fraction of the width of the underlying surface. It should be between 0 and 1.

### 28.66.19 getZoomInHeightLimit as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the view port height at maximum zoom in for mouse zoom in actions.

### 28.66.20 getZoomInWidthLimit as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the view port width at maximum zoom in for mouse zoom in actions.

### 28.66.21 getZoomOutHeightLimit as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the view port height at maximum zoom out for mouse zoom out actions.

### 28.66.22 getZoomOutWidthLimit as Double

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the view port width at maximum zoom out for mouse zoom out actions.

### 28.66.23 getZoomXYRatio as double

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the enforced aspect ratio of the viewport.
**Notes:** The ViewPortManager.setKeepAspectRatio can be used to keep the aspect ratio unchanged. This method gets that aspect ratio.

Returns the enforced aspect ratio, or 0 if the aspect ratio is not enforced.

### 28.66.24 inExtendedPlotArea(x as Integer, y as Integer) as boolean

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determines if a given (x, y) coordinate is within the extended plot area (the plot area plus the extra margin sets up using setPlotAreaMouseMargin).

### 28.66.25 inPlotArea(x as double, y as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Determines if a given point is within the plot area.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the point in pixel unit. |
| y | (Mandatory) | The y coordinate of the point in pixel unit. |

Return Value
True if the point is within the plot area, otherwise false.

### 28.66.26 setChartMetrics(metrics as string)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the chart metrics to the ViewPortManager so it knows the positions of the necessary chart objects for supporting view ports.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| metrics | (Mandatory) | A text string obtained from BaseChart.getChartMetrics that represents the metrics of the chart. |

### 28.66.27 setFullRange(ID as string, minValue as Double, maxValue as Double)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the full range of a view port data scale.
**Notes:** In the ChartDirector zooming and scrolling framework, the view port coordinates are expressed as the visible fractions of the "full data scale". For example, if the "full data scale" is 10 years horizontally, a view port width of 0.1 means that 1 year of data are visible.

The setFullRange method defines the full range of a data scale and gives it a name. As ChartDirector supports multiple x-axes and y-axes, so there can be multiple data scales with different names. The name can be used in other ChartDirector APIs to convert between the view port coordinates and data scale (see

ViewPortManager.getValueAtViewPort, ViewPortManager.getViewPortAtValue), and to configure an Axis to reflect the visible data scale (see ViewPortManager.syncLinearAxisWithViewPort, ViewPortManager.syncLogAxisWithViewPort and ViewPortManager.syncDateAxisWithViewPort).

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| minValue | (Mandatory) | The minimum value of the data scale. |
| maxValue | (Mandatory) | The maximum value of the data scale. |

### 28.66.28 setKeepAspectRatio(value as boolean)

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Keeps the current viewport aspect ratio.
**Notes:** If the viewport aspect ratio is keep unchanged, ViewPortManager will ensure the vertical and horizontal directions zoom by the same ratio.

| Argument | Default | Description |
|---|---|---|
| b | (Mandatory) | A true value ensures the vertical and horizontal directions zoom by the same ratio. A false value allows them to zoom independently. |

### 28.66.29 setPlotAreaMouseMargin(leftMargin as Integer, rightMargin as Integer, topMargin as Integer, bottomMargin as Integer)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures area for mouse tracking.
**Notes:** SetPlotAreaMouseMargin configures some margins outside the plot area, so that a mouse cursor in that region (and therefore just outside the plot area) will still be considered to be exactly at the boundary of the plot area for the purpose of triggering plot area mouse events. Without this mechanism, it would be difficult to put the mouse exactly at the edge of the plot area (as it is too easy to "overshoot" the edge). Putting the mouse exactly at the edge is very useful for "track cursors" as this tracks the first or last data point.

### 28.66.30 setViewPortHeight(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the height of the view port.
**Notes:** The view port height is expressed as a fraction of the height of the underlying surface. It should be

between 0 and 1.

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The height of the view port. |

### 28.66.31 setViewPortLeft(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the left side of the view port.
**Notes:** The position of the view port left side is its distance from the left side of the underlying surface, as a fraction of the width of the underlying surface. It should be between 0 and 1.

| Argument | Default | Description |
|---|---|---|
| left | (Mandatory) | The position of the left side of the view port. |

### 28.66.32 setViewPortTop(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position of the top side of the view port.
**Notes:** The position of the view port top side is its distance from the top side of the underlying surface, as a fraction of the height of the underlying surface. It should be between 0 and 1.

| Argument | Default | Description |
|---|---|---|
| top | (Mandatory) | The position of the top side of the view port. |

### 28.66.33 setViewPortWidth(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the width of the view port.
**Notes:** The view port width is expressed as a fraction of the width of the underlying surface. It should be between 0 and 1.

### 28.66.34 setZoomInHeightLimit(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the view port. |

**Function:** Sets the view port height at maximum zoom in.
**Notes:** In many applications, it is desirable to set a maximum zoom in level, instead of allowing the user to zoom in indefinitely.

This method determines the minimum allowed view port height. It should be between 0 and 1. The default is 0.01, which means a maximum zoom in of 100x (the view port see only 1% of the underlying surface).

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The minimum allowed view port height. |

### 28.66.35 setZoomInWidthLimit(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the view port width at maximum zoom in.
**Notes:** In many applications, it is desirable to set a maximum zoom in level, instead of allowing the user to zoom in indefinitely.

This method determines the minimum allowed view port width. It should be between 0 and 1. The default is 0.01, which means a maximum zoom in of 100x (the view port see only 1% of the underlying surface).

| Argument | Default | Description |
|---|---|---|
| width | (Mandatory) | The minimum allowed view port width. |

### 28.66.36 setZoomOutHeightLimit(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the view port height at maximum zoom in.
**Notes:** In many applications, it is desirable to set a maximum zoom in level, instead of allowing the user to zoom in indefinitely.

This method determines the minimum allowed view port height. It should be between 0 and 1. The default is 0.01, which means a maximum zoom in of 100x (the view port see only 1% of the underlying surface).

| Argument | Default | Description |
|---|---|---|
| height | (Mandatory) | The minimum allowed view port height. |

### 28.66.37 setZoomOutWidthLimit(value as Double)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the view port width at maximum zoom out for mouse zoom out actions.

### 28.66.38 startDrag

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes a snapshot of the view port to prepare for dragging.
**Notes:** This method must be called before calling ViewPortManager.dragTo.

### 28.66.39 syncDateAxisWithViewPort(id as string, axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes a date/time Axis with the part of the data scale in view port.
**Notes:** If the data scale has already been defined (see ViewPortManager.setFullRange on how to define a data scale), this method will compute the visible data scale based on the view port coordinates using date/time interpolation, and then sets the axis to that date/time scale.

If the data scale has not been defined, this method will define the data scale based on the axis scale and the the view port coordinates using date/time extrapolation. Because the axis scale may not be known at the time of calling this method (the axis could be auto-scaled by ChartDirector, which may not occur until the chart is rendered), the definition of the data scale will not occur immediately, but will be pending until the chart is to be displayed.

If your charting code calls this method but never defines the full data scale or the view port coordinates (in which case the view port defaults to showing the complete data scale), then the first time the code is executed, the data scale will be defined to be equal to the axis scale. Subsequently, when the user zooms into the chart (which means the view port coordinates are changed), the same charting code will set up the axis scale to the range that the user has zoomed to.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| axis | (Mandatory) | The Axis object to synchronize with. |

### 28.66.40 syncLinearAxisWithViewPort(id as string, axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes a linear Axis with the part of the data scale in view port.
**Notes:** If the data scale has already been defined (see ViewPortManager.setFullRange on how to define a data scale), this method will compute the visible data scale based on the view port coordinates using linear interpolation, and then sets the axis to that linear scale.

If the data scale has not been defined, this method will define the data scale based on the axis scale and the the view port coordinates using linear extrapolation. Because the axis scale may not be known at the time of calling this method (the axis could be auto-scaled by ChartDirector, which may not occur until the chart is rendered), the definition of the data scale will not occur immediately, but will be pending until the chart is to be displayed.

If your charting code calls this method but never defines the full data scale or the view port coordinates (in which case the view port defaults to showing the complete data scale), then the first time the code is executed, the data scale will be defined to be equal to the axis scale. Subsequently, when the user zooms into the chart (which means the view port coordinates are changed), the same charting code will set up the axis scale to the range that the user has zoomed to.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| axis | (Mandatory) | The Axis object to synchronize with. |

### 28.66.41 syncLogAxisWithViewPort(id as string, axis as CDAxisMBS)

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes a logarithmic Axis with the part of the data scale in view port.
**Notes:** If the data scale has already been defined (see ViewPortManager.setFullRange on how to define a data scale), this method will compute the visible data scale based on the view port coordinates using logarithmic interpolation, and then sets the axis to that logarithmic scale.

If the data scale has not been defined, this method will define the data scale based on the axis scale and the the view port coordinates using logarithmic extrapolation. Because the axis scale may not be known at the time of calling this method (the axis could be auto-scaled by ChartDirector, which may not occur until the chart is rendered), the definition of the data scale will not occur immediately, but will be pending until the chart is to be displayed.

If your charting code calls this method but never defines the full data scale or the view port coordinates (in which case the view port defaults to showing the complete data scale), then the first time the code is executed, the data scale will be defined to be equal to the axis scale. Subsequently, when the user zooms

into the chart (which means the view port coordinates are changed), the same charting code will set up the axis scale to the range that the user has zoomed to.

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the data scale. |
| axis | (Mandatory) | The Axis object to synchronize with. |

### 28.66.42 updateFullRangeH(id as string, minValue as Double, maxValue as Double, updateType as Integer) as boolean

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Updates the full range of a horizontal viewport data scale.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the horizontal data scale. |
| minValue | (Mandatory) | The new minimum value of the data scale. |
| maxValue | (Mandatory) | The new maximum value of the data scale. |
| updateType | (Mandatory) | The method to update the viewport. Must be one of ViewPortNoUpdate, KeepVisibleRange, ScrollWithMax or ScrollWithMin. |

### 28.66.43 updateFullRangeV(id as string, minValue as Double, maxValue as Double, updateType as Integer) as boolean

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Updates the full range of a vertical viewport data scale.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| id | (Mandatory) | The name of the vertical data scale. |
| minValue | (Mandatory) | The new minimum value of the data scale. |
| maxValue | (Mandatory) | The new maximum value of the data scale. |
| updateType | (Mandatory) | The method to update the viewport. Must be one of ViewPortNoUpdate, KeepVisibleRange, ScrollWithMax or ScrollWithMin. |

### 28.66.44 validateViewPort

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ensures the view port left, top, width and height are within valid ranges and adjusts them if necessary.
**Notes:** The valid ranges of the view port width and height should be 0 to 1. The view port left should be in between 0 and (1 - view port width). The view port top should be in between 0 and (1 - view port height).

### 28.66.45 zoomAround(x as double, y as double, xZoomRatio as double, yZoomRatio as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zoom at a given point using the zoom ratio.

### 28.66.46 zoomAt(zoomDirection as integer, x as double, y as double, zoomRatio as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zooms in/out around a certain point.
**Notes:** This method adjusts the view port position and size to reflect zooming in/out around the given point. If possible, the given point will be at the center of the view port after zooming in/out.

| Argument | Default | Description |
|---|---|---|
| zoomDirection | (Mandatory) | The allowed zoom direction. Must be one of the predefined constants DirectionHorizontal, DirectionVertical and DirectionHorizontalVertical for horizontal, vertical and bi-directional zooming. |
| x | (Mandatory) | The x-coordinate of the point to zoom around. |
| y | (Mandatory) | The y-coordinate of the point to zoom around. |
| zoomRatio | (Mandatory) | The zoom magnification factor. For example, a value of 2 means zooming in by 2x. A value of 0.5 means zooming out by 2x. |

Return Value
True if view port is changed, otherwise false. It is possible for no zooming to occur if zoom limits are reached. See ViewPortManager.setZoomInWidthLimit, ViewPortManager.setZoomOutWidthLimit, ViewPortManager.setZoomInHeightLimit and ViewPortManager.setZoomOutHeightLimit for the meaning of zoom limits.

### 28.66.47 zoomTo(zoomDirection as integer, x1 as double, y1 as double, x2 as double, y2 as double) as boolean

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zooms to the selected rectangular region.
**Notes:** This method updates the view port position and size to reflect a rectangular region on the chart. (x1, y1) and (x2, y2) are opposite vertices of the rectangular region in pixel coordinates.

The final view port position may not exactly reflect the rectangular region because of zoom limits. See ViewPortManager.setZoomInWidthLimit, ViewPortManager.setZoomOutWidthLimit, ViewPortManager.setZoomInHeightLimit and ViewPortManager.setZoomOutHeightLimit for the meaning of zoom limits.

| Argument | Default | Description |
|---|---|---|
| zoomDirection | (Mandatory) | The allowed zoom direction. Must be one of the predefined constants DirectionHorizontal, DirectionVertical and DirectionHorizontalVertical for horizontal, vertical and bi-directional zooming. |
| x1 | (Mandatory) | The x-coordinate of one vertices of the selected rectangular region. |
| y1 | (Mandatory) | The y-coordinate of one vertices of the selected rectangular region. |
| x2 | (Mandatory) | The x-coordinate of the vertex that is opposite to the vertex (x1, y1). |
| y2 | (Mandatory) | The y-coordinate of the vertex that is opposite to the vertex (x1, y1). |

Return Value
True if view port is changed, otherwise false.

## 28.67 class CDXYChartMBS

### 28.67.1 class CDXYChartMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XYChart class represents XY charts.
**Notes:** Subclass of the CDBaseChartMBS class.
**Blog Entries**

- Charts with more than one x or y axis
- Create a Bar Chart in Xojo with the ChartDirector
- Several ways for picture to PDF in MBS Plugins
- Chart Diagrams with Xojo
- ChartDirector 6 PDF example
- MBS Real Studio Plugins, version 12.5pr8
- A special chart with our MBS REALbasic ChartDirector Plugin

**Xojo Developer Magazine**

- 7.4, pages 31 to 34: Easy Charts and Graphs, Using the ChartDirector Plugin
- 20.1, page 43: Cool Charts and Heatmaps, Using Monkeybread Software's ChartDirector Plugin by Stefanie Juchmes
- 18.5, page 69: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes
- 18.5, pages 61 to 62: Xojo Charts, Charts in Xojo with the MBS Xojo ChartDirector plugin by Stefanie Juchmes
- 17.2, page 35: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich
- 17.2, page 33: More Beyond JSON, Develop APIs That Generate Barcodes, Charts, and More by Timothy Dietrich

### 28.67.2 Methods

### 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addAreaLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5387
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391


### 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an area chart layer to the XYChart, and specify the data set to use for drawing the area.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the area. -1 means that the color is automatically selected from the color palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the area layer. |

Return Value
An AreaLayer object representing the area layer created.
See also:


- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388

- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391


### 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an empty area chart layer to the XYChart.
**Notes:** This method is typically used to add multiple data sets to a single bar layer. First an empty area chart layer is created, then the data sets can be added using Layer.addDataSet.

The dataCombineMethod parameter specifies how to combine the data sets together in the area layer. The followings methods are supported:

| Constant | Value | Description |
|---|---|---|
| Stack | 1 | The data sets are combined by stacking up the areas. |
| Percentage | 4 | The data sets are combined similar to stacked area, except that the data are scaled so that the area always stacked up to 100. An area strip within the stacked area therefore represents the percentage of the data item relative to sum of all the data items in the stacked area. |

| Parameter | Default | Description |
|---|---|---|
| dataCombineMethod | Stack | The method to combine the data sets together in the area layer. |
| depth | 0 | The 3D depth of the area layer. |

Return Value
An AreaLayer object representing the area layer created.
See also:


- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5387

- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391


### 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addAreaLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5387
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391


### 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds an area chart layer to the XYChart, and specify the data set to use for drawing the area.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the area. -1 means that the color is automatically selected from the color palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the area layer. |

Return Value
An AreaLayer object representing the area layer created.
See also:

- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5387
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDAreaLayerMBS 5390
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDAreaLayerMBS 5391

### 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an area chart layer to the XYChart, and specify the data set to use for drawing the area.
See also:

- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5387
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDAreaLayerMBS 5389

- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5391


### 28.67.9 addAreaLayer(dates() as DateTime, colorvalue as integer = -1, name as string = """, depth as integer = 0) as CDAreaLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an area chart layer to the XYChart, and specify the data set to use for drawing the area.
See also:


- 28.67.3 addAreaLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5386
- 28.67.4 addAreaLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5387
- 28.67.5 addAreaLayer(dataCombineMethod as Integer = 1, depth as Integer = 0) as CDAreaLayerMBS 5388
- 28.67.6 addAreaLayer(dates() as date, colorvalue as color, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.7 addAreaLayer(dates() as date, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDAreaLayerMBS 5389
- 28.67.8 addAreaLayer(dates() as DateTime, colorvalue as color, name as string = """, depth as integer = 0) as CDAreaLayerMBS 5390


### 28.67.10 addAxis(align as Integer, offset as Integer) as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an additional axis to the chart.
**Notes:** By default, ChartDirector XY charts have 2 x-axes and 2 y-axes at the 4 borders of the plot area. The addAxis method can be used to create additional axis.

The new axis will be put at one of the 4 borders of the plot area. To avoid overlapping with existing axis, the new axis will not be put exactly as the plot area border, but at an offset from it.

### 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

| Parameter | Default | Description |
|---|---|---|
| align | (Mandatory) | Specifies which side of the plot area is the primary side of the axis. Must be one of the constants Left, Right, Top and Bottom for the 4 sides of the plot area. |
| offset | (Mandatory) | An offset in pixels to move the axis away from the plot area. If a negative value is used, it will mean to move the axis into the plot area. |

**Function:** Same as the other addBarLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5395
- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5396
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396

### 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBarLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5395

- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5396
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396


### 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an empty bar layer to the XYChart.
**Example:**

```
// Create a XYChart object of size 250 x 250 pixels
dim c as new CDXYChartMBS(250, 250)

// Add a bar chart layer using the given data
dim t as CDTextBoxMBS = c.addBarLayer(data)
t.setPos(0, -10) // move 10 up
```

**Notes:** This method is typically used to add multiple data sets to a single bar layer. First an empty bar layer is created, then the data sets can be added using Layer.addDataSet.

The dataCombineMethod parameter specifies how to combine the data sets together in the bar layer. The followings methods are supported:

| Constant | Value | Description |
|---|---|---|
| Side | 3 | The data sets are combined by plotting the bars side by side. |
| Stack | 1 | The data sets are combined by stacking up the bar segments. |
| Overlay | 0 | The data sets are combined similar to stacked bars. However, in Overlay, one data set is assumed to already include the other data set. For example, if the data sets are "average" and "peak", the "peak" cannot be stacked on top of "average", because the "peak" already contains "average". In the Overlay style, only "peak - average" is stacked on top of "average", and so the total bar length will be "peak". |
| Percentage | 4 | The data sets are combined similar to stacked bars, except that the data in a bar are scaled so that they summed to 100. In other words, all stacked bars will be of the same length. A bar segment within a bar represents the percentage of the data item relative to sum of all the data items in the stacked bar. |

Return Value
A BarLayer object representing the bar layer created.

| Parameter | Default | Description |
|---|---|---|
| dataCombineMethod | Side | The method to combine the data sets together in the bar layer. |
| depth | 0 | The 3D depth of the bar layer. |

To set some more options like transparent border of the bar, please use the methods in CDBarLayerMBS class. e.g. setBorderColor(CDXYChartMBS.kTransparent) will make them transparent.
See also:


- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5395
- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5396
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396


### 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color bar layer to the XYChart, and specify the data set to use for drawing the bars.
**Notes:** A multi-color bar layer is a bar layer in which each bar has a different color. In a normal bar layer, each data set has a different color, but the bars in the same data set have the same color.

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| colors | (Mandatory) | An array of colors to draw the bars. An empty array means the colors are automatically selected from the palette. |
| names | [ Empty_Array ] | An array of text strings as the names of the bars. The names will be used in the legend box, if one is available. An empty array means that bars have no name. |
| depth | 0 | The 3D depth of the bar layer. |

Return Value
A BarLayer object representing the bar layer created.

To set some more options like transparent border of the bar, please use the methods in CDBarLayerMBS class. e.g. setBorderColor(CDXYChartMBS.kTransparent) will make them transparent.
See also:

- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = ”", depth as Integer = 0) as CDBarLayerMBS 5395
- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = ”", depth as Integer = 0) as CDBarLayerMBS 5396
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396

### 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = ”", depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBarLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = ”", depth as Integer = 0) as CDBarLayerMBS 5396
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396

### 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bar layer to the XYChart, and specify the data set to use for drawing the bars.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the bars. -1 means that the color is automatically selected from the palette. |
| name | ”” | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the bar layer. |

Return Value
A BarLayer object representing the bar layer created.

To set some more options like transparent border of the bar, please use the methods in CDBarLayerMBS class. e.g. setBorderColor(CDXYChartMBS.kTransparent) will make them transparent.
See also:


- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDBarLayerMBS 5395
- 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS 5396


### 28.67.17 addBarLayer(dataCombineMethod as Integer = 3, depth as Integer = 0) as CDBarLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an empty bar layer to the XYChart.
**Notes:** This method is typically used to add multiple data sets to a single bar layer. First an empty bar

layer is created, then the data sets can be added using
Layer.addDataSet.

The dataCombineMethod parameter specifies how to combine the data sets together in the bar layer. The followings methods are supported:

| Constant | Value | Description |
|---|---|---|
| Side | 3 | The data sets are combined by plotting the bars side by side. |
| Stack | 1 | The data sets are combined by stacking up the bar segments. |
| Overlay | 0 | The data sets are combined similar to stacked bars. However, in Overlay, one data set is assumed to already include the other data set. For example, if the data sets are "average" and "peak", the "peak" cannot be stacked on top of "average", because the "peak" already contains "average". In the Overlay style, only "peak - average" is stacked on top of "average", and so the total bar length will be "peak". |
| Percentage | 4 | The data sets are combined similar to stacked bars, except that the data in a bar are scaled so that they summed to 100. In other words, all stacked bars will be of the same length. A bar segment within a bar represents the percentage of the data item relative to sum of all the data items in the stacked bar. |

| Parameter | Default | Description |
|---|---|---|
| dataCombineMethod | Side | The method to combine the data sets together in the bar layer. |
| depth | 0 | The 3D depth of the bar layer. |

Return Value
A BarLayer object representing the bar layer created.

To set some more options like transparent border of the bar, please use the methods in CDBarLayerMBS class. e.g. setBorderColor(CDXYChartMBS.kTransparent) will make them transparent.
See also:

- 28.67.11 addBarLayer(data() as Double, colors() as color, depth as Integer = 0) as CDBarLayerMBS 5391
- 28.67.12 addBarLayer(data() as Double, colors() as color, names() as string, depth as Integer = 0) as CDBarLayerMBS 5392
- 28.67.13 addBarLayer(data() as Double, colors() as Integer, depth as Integer = 0) as CDBarLayerMBS 5393
- 28.67.14 addBarLayer(data() as Double, colors() as Integer, names() as string, depth as Integer = 0) as CDBarLayerMBS 5394
- 28.67.15 addBarLayer(data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDBarLayerMBS 5395

- 28.67.16 addBarLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDBarLayerMBS 5396


### 28.67.18 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as color, name as string = """) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBoxLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.19 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as Integer = -1, name as string = """) as CDBoxWhiskerLayerMBS 5398


### 28.67.19 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as Integer = -1, name as string = """) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a floating box layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is a simplification of XYChart.addBoxWhiskerLayer. Instead of adding a full box-whisker layer, only the box part is used, resulting in a chart layer displaying floating boxes.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| color | -1 | The color to draw the area. -1 means that the color is automatically selected from the color palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:


- 28.67.18 addBoxLayer(boxTop() as Double, boxBottom() as Double, colorvalue as color, name as string = """) as CDBoxWhiskerLayerMBS 5398


### 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** Traditionally, each box-whisker symbol represents 5 values, which are the as maximum, 3rd quartile, median, 1st quartile and minimum of some data samples.

A vertical box-whisker symbol (on a non-swapped XY chart) consists of a vertical line joining the maximum and minimum points, a box extending from the 1st quartile point to the 3rd quartile point, and 3 horizontal mark lines at the maximum, median and minimum points.

In practice, the box-whisker symbol is not limited to representing the maximum, 3rd quartile, median, 1st quartile and minimum values. It can be used to represent any ordered values.

The boxTop and boxBottom data sets specifies the top and bottom edges of the box. The maxData, minData and midData specifies the top, bottom and middle mark lines.

You can use empty arrays to disable showing some parts of the box-whisker symbol.

For example, if you just want to show a floating box, you can use only boxTop and boxBottom and set the maxData, minData and midData to empty arrays.

Similarly, if the boxTop, boxBottom and midData are set to empty arrays, only the top and bottom mark lines and the joining center line are visible. This style is most often used as ”error bands” together with line charts.

In addition to maxData, minData and midData, you can add additional mark lines to the box-whisker element by adding more data sets using Layer.addDataSet.

By default, the box-whisker symbol will be drawn using the colors specified in the fillColor, whiskerColor and edgeColor argument. The fillColor and edgeColor are used as the fill and border colors of the box, while the whiskerColor is used as the color of the center line and the mark lines.

Internally, ChartDirector maps the colors of different parts of the box-whisker symbol to data set colors as shown in the following table. You may control the colors of the box-whisker symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5400

| Box-Whisker Symbol Color | Data Set Color |
|---|---|
| Fill color of the box | Data Color for the first data set (index = 0) |
| Border color of the box | Edge Color for the first data set (index = 0) |
| Center line color | Data Color for the second data set (index = 1) |
| Maximum value mark line color | Data Color for the third data set (index = 2) |
| Minimum value mark line color | Data Color for the fourth data set (index = 3) |
| Middle value mark line color | Data Color for the fifth data set (index = 4) |
| Mark line color for additional mark lines | Data Color for the data set representing the additional mark line |

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColor | -1 | The color used to fill the box. -1 means that the color is automatically selected from the palette. |
| whiskerColor | LineColor | The color used to draw the central line and mark lines. |
| edgeColor | LineColor | The color used to draw the border of the box. |


- 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5402
- 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS 5404
- 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS 5404


### 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** Traditionally, each box-whisker symbol represents 5 values, which are the as maximum, 3rd quartile, median, 1st quartile and minimum of some data samples.

A vertical box-whisker symbol (on a non-swapped XY chart) consists of a vertical line joining the maximum and minimum points, a box extending from the 1st quartile point to the 3rd quartile point, and 3 horizontal mark lines at the maximum, median and minimum points.

In practice, the box-whisker symbol is not limited to representing the maximum, 3rd quartile, median, 1st quartile and minimum values. It can be used to represent any ordered values.

The boxTop and boxBottom data sets specifies the top and bottom edges of the box. The maxData, minData and midData specifies the top, bottom and middle mark lines.

You can use empty arrays to disable showing some parts of the box-whisker symbol.

For example, if you just want to show a floating box, you can use only boxTop and boxBottom and set the maxData, minData and midData to empty arrays.

Similarly, if the boxTop, boxBottom and midData are set to empty arrays, only the top and bottom mark lines and the joining center line are visible. This style is most often used as "error bands" together with line charts.

In addition to maxData, minData and midData, you can add additional mark lines to the box-whisker element by adding more data sets using Layer.addDataSet.

By default, the box-whisker symbol will be drawn using the colors specified in the fillColor, whiskerColor and edgeColor argument. The fillColor and edgeColor are used as the fill and border colors of the box, while the whiskerColor is used as the color of the center line and the mark lines.

Internally, ChartDirector maps the colors of different parts of the box-whisker symbol to data set colors as shown in the following table. You may control the colors of the box-whisker symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

| Box-Whisker Symbol Color | Data Set Color |
|---|---|
| Fill color of the box | Data Color for the first data set (index = 0) |
| Border color of the box | Edge Color for the first data set (index = 0) |
| Center line color | Data Color for the second data set (index = 1) |
| Maximum value mark line color | Data Color for the third data set (index = 2) |
| Minimum value mark line color | Data Color for the fourth data set (index = 3) |
| Middle value mark line color | Data Color for the fifth data set (index = 4) |
| Mark line color for additional mark lines | Data Color for the data set representing the additional mark line |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5398
- 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5402

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColor | -1 | The color used to fill the box. -1 means that the color is automatically selected from the palette. |
| whiskerColor | LineColor | The color used to draw the central line and mark lines. |
| edgeColor | LineColor | The color used to draw the border of the box. |


- 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS 5404
- 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS 5404


### 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** Traditionally, each box-whisker symbol represents 5 values, which are the as maximum, 3rd quartile, median, 1st quartile and minimum of some data samples.

A vertical box-whisker symbol (on a non-swapped XY chart) consists of a vertical line joining the maximum and minimum points, a box extending from the 1st quartile point to the 3rd quartile point, and 3 horizontal mark lines at the maximum, median and minimum points.

In practice, the box-whisker symbol is not limited to representing the maximum, 3rd quartile, median, 1st quartile and minimum values. It can be used to represent any ordered values.

The boxTop and boxBottom data sets specifies the top and bottom edges of the box. The maxData, minData and midData specifies the top, bottom and middle mark lines.

You can use empty arrays to disable showing some parts of the box-whisker symbol.

For example, if you just want to show a floating box, you can use only boxTop and boxBottom and set the maxData, minData and midData to empty arrays.

Similarly, if the boxTop, boxBottom and midData are set to empty arrays, only the top and bottom mark lines and the joining center line are visible. This style is most often used as "error bands" together with line charts.

In addition to maxData, minData and midData, you can add additional mark lines to the box-whisker element by adding more data sets using Layer.addDataSet.

By default, the box-whisker symbol will be drawn using the colors specified in the fillColor, whiskerColor and edgeColor argument. The fillColor and edgeColor are used as the fill and border colors of the box, while the whiskerColor is used as the color of the center line and the mark lines.

Internally, ChartDirector maps the colors of different parts of the box-whisker symbol to data set colors as shown in the following table. You may control the colors of the box-whisker symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

| Box-Whisker Symbol Color | Data Set Color |
|---|---|
| Fill color of the box | Data Color for the first data set (index = 0) |
| Border color of the box | Edge Color for the first data set (index = 0) |
| Center line color | Data Color for the second data set (index = 1) |
| Maximum value mark line color | Data Color for the third data set (index = 2) |
| Minimum value mark line color | Data Color for the fourth data set (index = 3) |
| Middle value mark line color | Data Color for the fifth data set (index = 4) |
| Mark line color for additional mark lines | Data Color for the data set representing the additional mark line |

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColor | -1 | The color used to fill the box. -1 means that the color is automatically selected from the palette. |
| whiskerColor | LineColor | The color used to draw the central line and mark lines. |
| edgeColor | LineColor | The color used to draw the border of the box. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5398
- 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5400

- 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS 5404
- 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS 5404


### 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBoxWhiskerLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5398
- 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5400
- 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5402
- 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS 5404


### 28.67.24 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as Integer = -1, whiskerColor as Integer = &hffff0001, edgeColor as Integer = -1) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** Traditionally, each box-whisker symbol represents 5 values, which are the as maximum, 3rd quartile, median, 1st quartile and minimum of some data samples.

A vertical box-whisker symbol (on a non-swapped XY chart) consists of a vertical line joining the maximum and minimum points, a box extending from the 1st quartile point to the 3rd quartile point, and 3 horizontal mark lines at the maximum, median and minimum points.

In practice, the box-whisker symbol is not limited to representing the maximum, 3rd quartile, median, 1st quartile and minimum values. It can be used to represent any ordered values.

The boxTop and boxBottom data sets specifies the top and bottom edges of the box. The maxData, minData and midData specifies the top, bottom and middle mark lines.

You can use empty arrays to disable showing some parts of the box-whisker symbol.

For example, if you just want to show a floating box, you can use only boxTop and boxBottom and set the maxData, minData and midData to empty arrays.

Similarly, if the boxTop, boxBottom and midData are set to empty arrays, only the top and bottom mark lines and the joining center line are visible. This style is most often used as "error bands" together with line charts.

In addition to maxData, minData and midData, you can add additional mark lines to the box-whisker element by adding more data sets using Layer.addDataSet.

By default, the box-whisker symbol will be drawn using the colors specified in the fillColor, whiskerColor and edgeColor argument. The fillColor and edgeColor are used as the fill and border colors of the box, while the whiskerColor is used as the color of the center line and the mark lines.

Internally, ChartDirector maps the colors of different parts of the box-whisker symbol to data set colors as shown in the following table. You may control the colors of the box-whisker symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

| Box-Whisker Symbol Color | Data Set Color |
|---|---|
| Fill color of the box | Data Color for the first data set (index = 0) |
| Border color of the box | Edge Color for the first data set (index = 0) |
| Center line color | Data Color for the second data set (index = 1) |
| Maximum value mark line color | Data Color for the third data set (index = 2) |
| Minimum value mark line color | Data Color for the fourth data set (index = 3) |
| Middle value mark line color | Data Color for the fifth data set (index = 4) |
| Mark line color for additional mark lines | Data Color for the data set representing the additional mark line |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.20 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5398
- 28.67.21 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double) as

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColor | -1 | The color used to fill the box. -1 means that the color is automatically selected from the palette. |
| whiskerColor | LineColor | The color used to draw the central line and mark lines. |
| edgeColor | LineColor | The color used to draw the border of the box. |

CDBoxWhiskerLayerMBS 5400

- 28.67.22 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5402
- 28.67.23 addBoxWhiskerLayer(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColor as color, whiskerColor as color, edgeColor as color) as CDBoxWhiskerLayerMBS 5404

### 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |


- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412
- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414


### 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |

See also:


- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410
- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412
- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414


### 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.

**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410
- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412
- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

### 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double,

minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412

- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412

- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

### 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBoxWhiskerLayer2 method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406

- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407

- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408

- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410

- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412

- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412

- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

### 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addBoxWhiskerLayer2 method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410
- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412
- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

### 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410
- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
- 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5414

### 28.67.32 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color box-whisker layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** This method is similar to XYChart.addBoxWhiskerLayer, except that the layer will be added in multi-color mode. Please refer to XYChart.addBoxWhiskerLayer on basic information of what is a box-whisker layer.

In multi-color mode, the boxes of a BoxWhiskerLayer can have different fill colors. For the whisker, instead of specifying a single whisker color for all boxes, ChartDirector computes the whisker colors by darkening or brightening the corresponding fill colors using a configurable brightness factor.

| Parameter | Default | Description |
|---|---|---|
| boxTop | (Mandatory) | An array of numbers representing the top edge of the box. |
| boxBottom | (Mandatory) | An array of numbers representing the bottom edge of the box. |
| maxData | [ Empty_Array ] | An array of numbers representing the maximum value mark lines. |
| minData | [ Empty_Array ] | An array of numbers representing the minimum value mark lines. |
| midData | [ Empty_Array ] | An array of numbers representing the middle value mark lines. |
| fillColors | [ Empty_Array ] | An array of colors to be used as the fill color of the boxes. If there are insufficient colors in the array for the boxes, the remaining boxes will have their colors automatically selected from the palette. |
| whiskerBrightness | 0.5 | The brightness factor for whisker color. A value less than 1 means darkening. A value larger than 1 means brightening. A zero value means black. |
| names | [ Empty_Array ] | An array of names for the boxes to be used in the legend box, if one is configured for the chart. |

Return Value
A BoxWhiskerLayer object representing the box-whisker layer created.
See also:

- 28.67.25 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double) as CDBoxWhiskerLayerMBS 5406
- 28.67.26 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double) as CDBoxWhiskerLayerMBS 5407
- 28.67.27 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double) as CDBoxWhiskerLayerMBS 5408
- 28.67.28 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double) as CDBoxWhiskerLayerMBS 5410

- 28.67.29 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5411
- 28.67.30 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as color, whiskerBrightness as Double, names() as string) as CDBoxWhiskerLayerMBS 5412
- 28.67.31 addBoxWhiskerLayer2(boxTop() as Double, boxBottom() as Double, maxData() as Double, minData() as Double, midData() as Double, fillColors() as Integer, whiskerBrightness as Double = 0.5) as CDBoxWhiskerLayerMBS 5412


### 28.67.33 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as color, fallColor as color, edgeColor as color) as CDCandleStickLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addCandleStickLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.34 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as Integer = -1, fallColor as Integer = 0, edgeColor as Integer = &hffff0001) as CDCandleStickLayerMBS 5415


### 28.67.34 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as Integer = -1, fallColor as Integer = 0, edgeColor as Integer = &hffff0001) as CDCandleStickLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a candlestick layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** By default, the candlestick symbol will be drawn using the colors specified in the riseColor, fallColor and edgeColor argument. The riseColor and fallColor are used to fill the candle depending on whether the opening value or closing value is larger. The edgeColor is used to the center line and the border of the candle.

Internally, ChartDirector maps the colors of different parts of the candlestick symbol to data set colors as shown in the following table. You may control the colors of the candlestick symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

Return Value
A CandleStickLayer object representing the candlestick layer created.
See also:

| Candlestick Symbol Color | Data Set Color |
|---|---|
| Fill color for "up" candlesticks | Data Color for the first data set (index = 0). |
| Fill color for "down" candlesticks | Data Color for the second data set (index = 1). |
| Border color | Edge Color for the first data set (index = 0). |
| Center line color | Edge Color for the second data set (index = 1). |

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. |
| lowData | (Mandatory) | An array of numbers representing the low values. |
| openData | (Mandatory) | An array of numbers representing the opening values. |
| closeData | (Mandatory) | An array of numbers representing the closing values. |
| riseColor | FFFFFF | The color used to fill the candle if the closing value is higher than the opening value. |
| fallColor | 000000 | The color used to fill the candle if the opening value is higher than the closing value. |
| edgeColor | LineColor | The color used to draw the center line and the border of the candle. |

- 28.67.33 addCandleStickLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, riseColor as color, fallColor as color, edgeColor as color) as CDCandleStickLayerMBS 5415

### 28.67.35 addContourLayer(xData() as Double, yData() as Double, zData() as Double) as CDContourLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a contour layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** ChartDirector supports both gridded and scattered data. If the data points are on a rectangular grid will no missing points, they will be handled as gridded data. Otherwise, they will be handled as scattered data.
For gridded data, you may provide the x and y values of the grid, and the z values of the data points. For a 10 x 15 grid, that means the x data series should have 10 values, the y data series should have 15 values, and the z data series should have 150 values. The x and y data series should be strictly monotonic (either strictly increasing or strictly decreasing).
For both gridded and scattered data, you may also provide the (x, y, z) values of the data points. For example, for 150 data points, the x, y and z data series should each have 150 values. ChartDirector will automatically detect if the data points are gridded or scattered.

Arguments:

Return Value:
A ContourLayer object representing the contour layer created.

| Argument | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x data series. |
| yData | (Mandatory) | An array of numbers representing the y data series. |
| zData | (Mandatory) | An array of numbers representing the z data series. |

### 28.67.36 addDiscreteHeatMapLayer(xGrid() as double, yGrid() as Double, zData() as Double) as CDDiscreteHeatMapLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a discrete heat map layer to the XYChart by specifying the cell values and positions.
**Notes:** The cells are assumed to be arranged as a regular grid. The xGrid and yGrid arrays can be the center coordinates of the cells or the boundary coordinates of the cells.

Suppose there are 9 cells (the zData array contains 9 values). If the xGrid and yGrid arrays each contains 3 values, the cells will be assumed to be arranged as a 3 x 3 grid, and the xGrid and yGrid will be assumed to be the center coordinates of the cells.

If the xGrid array and yGrid array each contains 4 values instead, they will be assumed to be the boundaries of the cells. The first column of cells will occupy the space between xGrid [ 0 ] and xGrid [ 1 ] , the second column between xGrid [ 1 ] and xGrid [ 2 ] , and the third column between xGrid [ 2 ] and xGrid [ 3 ] . The same applies to the yGrid.

In general, if xGrid and yGrid contains enough values to be used as the boundary coordinates, they will be assumed to be the boundary coordinates. Otherwise they will be assumed to be the center coordinates.

| Argument | Default | Description |
|---|---|---|
| xGrid | (Mandatory) | An array containing the x coordinates of the centers or boundaries of the cells. |
| yGrid | (Mandatory) | An array containing the y coordinates of the centers or boundaries of the cells. |
| zData | (Mandatory) | An array containing the data values of the cells. |

Returns a DiscreteHeatMapLayer object representing the discrete heat map layer created.
See also:

- 28.67.37 addDiscreteHeatMapLayer(zData() as Double, xCount as Integer) as CDDiscreteHeatMapLayerMBS 5417

### 28.67.37 addDiscreteHeatMapLayer(zData() as Double, xCount as Integer) as CDDiscreteHeatMapLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a discrete heat map layer to the XYChart by specifying the cell values and the cell count in the x direction.
**Notes:** The zData array contains the cell values. xCount is the cell count in the x direction. The cell count in the y direction will be computed as the total cell count (the size of the zData array) divided by xCount.

The boundary of the cells will be at integer axis coordinates 0, 1, 2, ..... In the x direction, the first column of cells will occupy the space between x = 0 and x = 1, the second column between x = 1 and x = 2, and so on. The same applies to the y direction. The first row of cells will be between y = 0 and y = 1, the second row between y = 1 and y = 2, and so on.

This method is often used with Axis.setLabels and Axis.setLabelOffset for axis labelling. The Axis.setLabels put labels at coordinates 0, 1, 2, ... along the axis. The Axis.setLabelOffset can offset the labels by 0.5 units, so the labels will be at 0.5, 1.5, 2.5 ... which corresponds to the center of the cells.

A similar method XYChart.addDiscreteHeatMapLayer2 allows you to specify the exact x and y coordinates for the cells.

| Argument | Default | Description |
|---|---|---|
| zData | (Mandatory) | An array containing the data values of the cells. |
| xCount | (Mandatory) | The number of cells in the x direction. The number of cells in the y direction will be computed as the total number of cells (the size of the zData array) divided by xCount. |

See also:

- 28.67.36 addDiscreteHeatMapLayer(xGrid() as double, yGrid() as Double, zData() as Double) as CDDiscreteHeatMapLayerMBS 5417

### 28.67.38 addHLOCLayer as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an empty high-low-open-close (HLOC) layer to the XYChart.
**Notes:** Return Value
A HLOCLayer object representing the HLOC layer created.
See also:

- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422

- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a high-low-open-close (HLOC) layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** In this method, all HLOC symbols will be drawn using the color specified in the color argument. Use XYChart.addHLOCLayer for multi-color HLOC layers.

Internally, ChartDirector maps the colors of different parts of the HLOC symbol to data set colors as shown in the following table. You may control the colors of the HLOC symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

| HLOC Symbol Color | Data Set Color |
|---|---|
| Central Line | Data Color for the first data set (index = 0) |
| Open Mark Line | Data Color for the third data set (index = 2) |
| Close Mark Line | Data Color for the fourth data set (index = 3) |

Return Value
A HLOCLayer object representing the HLOC layer created.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. An empty array means there is no high value data available. |
| lowData | (Mandatory) | An array of numbers representing the low values. An empty array means there is no low value data available. |
| openData | [ Empty_Array ] | An array of numbers representing the opening values. An empty array means there is no opening value data available. |
| closeData | [ Empty_Array ] | An array of numbers representing the closing values. An empty array means there is no closing value data available. |
| color | -1 | The color to draw the HLOC symbol. -1 means that the color is automatically selected from the palette. |


- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a high-low-open-close (HLOC) layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** In this method, all HLOC symbols will be drawn using the color specified in the color argument. Use XYChart.addHLOCLayer for multi-color HLOC layers.

Internally, ChartDirector maps the colors of different parts of the HLOC symbol to data set colors as shown in the following table. You may control the colors of the HLOC symbol in more details by setting the data set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be

changed using DataSet.setDataColor.

| HLOC Symbol Color | Data Set Color |
|---|---|
| Central Line | Data Color for the first data set (index = 0) |
| Open Mark Line | Data Color for the third data set (index = 2) |
| Close Mark Line | Data Color for the fourth data set (index = 3) |

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. An empty array means there is no high value data available. |
| lowData | (Mandatory) | An array of numbers representing the low values. An empty array means there is no low value data available. |
| openData | [ Empty_Array ] | An array of numbers representing the opening values. An empty array means there is no opening value data available. |
| closeData | [ Empty_Array ] | An array of numbers representing the closing values. An empty array means there is no closing value data available. |
| color | -1 | The color to draw the HLOC symbol. -1 means that the color is automatically selected from the palette. |

Return Value
A HLOCLayer object representing the HLOC layer created.
See also:

- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426

### 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addHLOCLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a high-low-open-close (HLOC) layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** In this method, all HLOC symbols will be drawn using the color specified in the color argument. Use XYChart.addHLOCLayer for multi-color HLOC layers.

Internally, ChartDirector maps the colors of different parts of the HLOC symbol to data set colors as shown in the following table. You may control the colors of the HLOC symbol in more details by setting the data

set colors directly. The data set objects can be obtained using Layer.getDataSet, and the colors can be changed using DataSet.setDataColor.

| HLOC Symbol Color | Data Set Color |
|---|---|
| Central Line | Data Color for the first data set (index = 0) |
| Open Mark Line | Data Color for the third data set (index = 2) |
| Close Mark Line | Data Color for the fourth data set (index = 3) |

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. An empty array means there is no high value data available. |
| lowData | (Mandatory) | An array of numbers representing the low values. An empty array means there is no low value data available. |
| openData | [ Empty_Array ] | An array of numbers representing the opening values. An empty array means there is no opening value data available. |
| closeData | [ Empty_Array ] | An array of numbers representing the closing values. An empty array means there is no closing value data available. |
| color | -1 | The color to draw the HLOC symbol. -1 means that the color is automatically selected from the palette. |

Return Value
A HLOCLayer object representing the HLOC layer created.
See also:

- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426

### 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addHLOCLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addHLOCLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419

- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color high-low-open-close (HLOC) layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** ChartDirector supports drawing the HLOC symbol using different colors depending on whether the data represents an "up" day or "down" day. ChartDirector supports different definitions of what is an "up" day and "down" day, denoted using the following constants.

| Constant | Value | Description |
|---|---|---|
| HLOCDefault | 0 | Do not distinguish between "up" and "down" days and use the same color for all HLOC symbols. |
| HLOCOpenClose | 1 | An up day is a day of which the closing value is on or above the opening value. This is the same definition commonly used in candlestick charts. |
| HLOCUpDown | 2 | An up day is a day of which the closing value is on or above the closing value of the previous day. |

Return Value
A HLOCLayer object representing the HLOC layer created.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. An empty array means there is no high value data available. |
| lowData | (Mandatory) | An array of numbers representing the low values. An empty array means there is no low value data available. |
| openData | (Mandatory) | An array of numbers representing the opening values. An empty array means there is no opening value data available. |
| closeData | (Mandatory) | An array of numbers representing the closing values. An empty array means there is no closing value data available. |
| upColor | (Mandatory) | The color to be used on an "up" day. |
| downColor | (Mandatory) | The color to be used on a "down" day. |
| colorMode | -1 | The method used to determine if a day is an "up" or "down". Must be one of the constants in the above table. The default value of -1 means the colorMode is automatically determine to be either HLOCDefault or HLOCUpDown, depending on whether upColor and downColor are the same or different. |
| leadValue | [ -Infinity ] | The lead value to act as the closing pricing before the first day, so as to determine if the first day is an "up" or "down" day. |


- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422
- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5426


### 28.67.46 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a multi-color high-low-open-close (HLOC) layer to the XYChart, and specify the data sets to use for drawing the layer.
**Notes:** ChartDirector supports drawing the HLOC symbol using different colors depending on whether the data represents an "up" day or "down" day. ChartDirector supports different definitions of what is an "up" day and "down" day, denoted using the following constants.

| Constant | Value | Description |
|---|---|---|
| HLOCDefault | 0 | Do not distinguish between "up" and "down" days and use the same color for all HLOC symbols. |
| HLOCOpenClose | 1 | An up day is a day of which the closing value is on or above the opening value. This is the same definition commonly used in candlestick charts. |
| HLOCUpDown | 2 | An up day is a day of which the closing value is on or above the closing value of the previous day. |

| Parameter | Default | Description |
|---|---|---|
| highData | (Mandatory) | An array of numbers representing the high values. An empty array means there is no high value data available. |
| lowData | (Mandatory) | An array of numbers representing the low values. An empty array means there is no low value data available. |
| openData | (Mandatory) | An array of numbers representing the opening values. An empty array means there is no opening value data available. |
| closeData | (Mandatory) | An array of numbers representing the closing values. An empty array means there is no closing value data available. |
| upColor | (Mandatory) | The color to be used on an "up" day. |
| downColor | (Mandatory) | The color to be used on a "down" day. |
| colorMode | -1 | The method used to determine if a day is an "up" or "down". Must be one of the constants in the above table. The default value of -1 means the colorMode is automatically determine to be either HLOCDefault or HLOCUpDown, depending on whether upColor and downColor are the same or different. |
| leadValue | [ -Infinity ] | The lead value to act as the closing pricing before the first day, so as to determine if the first day is an "up" or "down" day. |

Return Value
A HLOCLayer object representing the HLOC layer created.
See also:


- 28.67.38 addHLOCLayer as CDHLOCLayerMBS 5418
- 28.67.39 addHLOCLayer(highData() as Double, lowData() as Double) as CDHLOCLayerMBS 5419
- 28.67.40 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double) as CDHLOCLayerMBS 5420
- 28.67.41 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as color) as CDHLOCLayerMBS 5422

- 28.67.42 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, colorValue as Integer = -1) as CDHLOCLayerMBS 5422
- 28.67.43 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer = -1) as CDHLOCLayerMBS 5424
- 28.67.44 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as color, downColor as color, colorMode as Integer, leadValue as Double) as CDHLOCLayerMBS 5424
- 28.67.45 addHLOCLayer(highData() as Double, lowData() as Double, openData() as Double, closeData() as Double, upColor as Integer, downColor as Integer, colorMode as Integer = -1) as CDHLOCLayerMBS 5425


### 28.67.47 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as color, color21 as color) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addInterLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.48 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as Integer, color21 as Integer = -1) as CDInterLineLayerMBS 5428


### 28.67.48 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as Integer, color21 as Integer = -1) as CDInterLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an inter-line layer the XYChart. An inter-line layer is used to fill the region between any two lines (straight lines, spline curves, step lines, etc).
**Notes:** This method expects two "line" objects representing the two lines. The line objects can be obtained using LineLayer.getLine (inherited by SplineLayer and StepLineLayer), TrendLayer.getLine, and Mark.getLine.

| Parameter | Default | Description |
|---|---|---|
| line1 | (Mandatory) | An opaque line object representing the first line. |
| line2 | (Mandatory) | An opaque line object representing the second line. |
| color12 | (Mandatory) | The color used to fill the region of the lines when line1 >line2. |
| color21 | -1 | The color used to fill the region of the lines when line2 >line1. -1 means this color is the same as color12. |

Return Value
An InterLineLayer object representing the inter-line layer created.
See also:

- 28.67.47 addInterLineLayer(line1 as CDLineObjMBS, line2 as CDLineObjMBS, color12 as color, color21 as color) as CDInterLineLayerMBS 5428

### 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = "", depth as Integer = 0) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLineLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431
- 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = "") as CDLineLayerMBS 5432

### 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line layer to the XYChart, and specify the data set to use for drawing the line.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A LineLayer object representing the line layer created.
See also:

- 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431
- 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = ””) as CDLineLayerMBS 5432

### 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addLineLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431
- 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = ””) as CDLineLayerMBS 5432

### 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

**Function:** Adds a line layer to the XYChart, and specify the data set to use for drawing the line.
**Notes:**

Return Value
A LineLayer object representing the line layer created.
See also:

- 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431
- 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = "") as CDLineLayerMBS 5432

### 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an empty line layer to the XYChart.
**Notes:** This method is typically used to add multiple data sets to a single line layer. First an empty line layer is created, then the data sets can be added using Layer.addDataSet.

| Parameter | Default | Description |
|---|---|---|
| dataCombineMethod | Overlay | In this version of ChartDirector, this parameter is ignored. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A LineLayer object representing the line layer created.
See also:

- 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = """) as CDLineLayerMBS 5432


### 28.67.54 addLineLayer(fastDB as CDDataAcceleratorMBS, seriesId as string, color as integer = -1, name as string = """) as CDLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line layer using data from a DataAccelerator.
**Notes:** The LineLayer created using this method will use only the data series provided by the DataAccelerator. It does not support adding more data sets, that is, Layer.addDataSet or Layer.setXData should not be used. Additional LineLayer objects should be used to plot other data series.

| Argument | Default | Description |
|---|---|---|
| fastDB | (Mandatory) | The CDDataAcceleratorMBS object that provides the x and y data values. |
| seriesId | (Mandatory) | The id of the data series. The DataAccelerator will provide the x data series and the y data series with the specified id to the LineLayer. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data series. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Returns a CDLineLayerMBS object representing the line layer created.
See also:


- 28.67.49 addLineLayer(data as CDArrayMBS, colorvalue as color, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.50 addLineLayer(data as CDArrayMBS, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5429
- 28.67.51 addLineLayer(data() as Double, colorvalue as color, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5430
- 28.67.52 addLineLayer(data() as Double, colorvalue as Integer = -1, name as string = """, depth as Integer = 0) as CDLineLayerMBS 5430

- 28.67.53 addLineLayer(dataCombineMethod as Integer = 0, depth as Integer = 0) as CDLineLayerMBS 5431

### 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | ”” | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |

Return Value
A ScatterLayer object representing the scatter layer created.
See also:

- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440

- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addScatterLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440

- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | ”” | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |

Return Value
A ScatterLayer object representing the scatter layer created.
See also:

- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as

Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433

- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446

### 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addScatterLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435

- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

Return Value
A ScatterLayer object representing the scatter layer created.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |


- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |

Return Value
A ScatterLayer object representing the scatter layer created.
See also:

- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442

- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an area chart layer to the XYChart, and specify the data set to use for drawing the area. See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445

- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446


### 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447

### 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ”“, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = ”“, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ”“, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = ”“, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ”“, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = ”“, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |

Return Value
A ScatterLayer object representing the scatter layer created.
See also:

- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = "", symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446

- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a scatter chart layer to the XYChart.
**Notes:** A scatter chart can be considered as a special configuration of a line chart, in the data symbols are enabled and the line width is set to zero. Therefore only the data symbols are visible and the chart appears as scattered.

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. If no explicit x coordinates are used in the chart (eg. using an enumerated x-axis), an empty array may be used for this argument. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| symbol | SquareShape | One of the predefined symbol constants to specify the symbol to use. (See Shape Specification for available built-in shapes.) |
| symbolSize | 5 | The width and height of the symbol in pixels. |
| fillColor | -1 | The color used to fill the symbol. -1 means that the color is automatically selected from the palette. |
| edgeColor | -1 | The edge color used to draw the edge of the symbol. The default value of -1 means using LineColor as the edge color. |

Return Value
A ScatterLayer object representing the scatter layer created.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.57 addScatterLayer(xDate() as date, yDate() as date, name as string = "", symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5435
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436

- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446


### 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ””, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ””, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441

- 28.67.63 addScatterLayer(xDate() as DateTime, yDate() as double, name as string = """, symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5442
- 28.67.64 addScatterLayer(xDate() as DateTime, yDate() as double, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5442
- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5447


### 28.67.68 addScatterLayer(xDate() as double, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a scatter chart layer to the XYChart.
See also:


- 28.67.55 addScatterLayer(xData() as Double, yData() as Double, name as string = """, symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5433
- 28.67.56 addScatterLayer(xData() as Double, yData() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5434
- 28.67.58 addScatterLayer(xDate() as date, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5436
- 28.67.59 addScatterLayer(xDate() as date, yDate() as Double, name as string = ""), symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5437
- 28.67.60 addScatterLayer(xDate() as date, yDate() as Double, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5438
- 28.67.61 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string = ""), symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5440
- 28.67.62 addScatterLayer(xDate() as DateTime, yDate() as DateTime, name as string, symbol as integer, symbolSize as integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5441
- 28.67.65 addScatterLayer(xDate() as Double, yDate() as date, name as string = ""), symbol as Integer = 1, symbolSize as Integer = 5, fillColor as Integer = -1, edgeColor as Integer = -1) as CDScatterLayerMBS 5443

- 28.67.66 addScatterLayer(xDate() as Double, yDate() as date, name as string, symbol as Integer, symbolSize as Integer, fillColor as color, edgeColor as color) as CDScatterLayerMBS 5445
- 28.67.67 addScatterLayer(xDate() as double, yDate() as DateTime, name as string = ""), symbol as integer = 1, symbolSize as integer = 5, fillColor as integer = -1, edgeColor as integer = -1) as CDScatterLayerMBS 5446


### 28.67.69 addSplineLayer as CDSplineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a spline layer to the XYChart.
**Notes:** In a spline layer, the data points are connected together using cardinal spline curves (as opposed to straight lines). The "tension" of the curve can be configured using SplineLayer.setTension.

| Parameter | Default | Description |
|---|---|---|
| data | [ Empty_Array ] | An array of numbers representing the data set. |
| color | -1 | The color to draw the spline line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Return Value
A SplineLayer object representing the spline layer created.
See also:


- 28.67.70 addSplineLayer(data() as Double, colorvalue as color, name as string = "") as CDSplineLayerMBS 5448
- 28.67.71 addSplineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDSplineLayerMBS 5449


### 28.67.70 addSplineLayer(data() as Double, colorvalue as color, name as string = "") as CDSplineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addSplineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.69 addSplineLayer as CDSplineLayerMBS 5448
- 28.67.71 addSplineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDSplineLayerMBS 5449

### 28.67.71 addSplineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDSplineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a spline layer to the XYChart.
**Notes:** In a spline layer, the data points are connected together using cardinal spline curves (as opposed to straight lines). The "tension" of the curve can be configured using SplineLayer.setTension.

| Parameter | Default | Description |
|---|---|---|
| data | [ Empty_Array ] | An array of numbers representing the data set. |
| color | -1 | The color to draw the spline line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Return Value
A SplineLayer object representing the spline layer created.
See also:

- 28.67.69 addSplineLayer as CDSplineLayerMBS 5448
- 28.67.70 addSplineLayer(data() as Double, colorvalue as color, name as string = "") as CDSplineLayerMBS 5448

### 28.67.72 addStepLineLayer as CDStepLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a step line chart layer to the XYChart.
**Notes:** In a step line layer, the data points are connected together using steps. The alignment of the steps relative to the data points can be configured using StepLineLayer.setAlignment.

| Parameter | Default | Description |
|---|---|---|
| data | [ Empty_Array ] | An array of numbers representing the data set. |
| color | -1 | The color to draw the step line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Return Value
A StepLineLayer object representing the step line layer created.
See also:

- 28.67.73 addStepLineLayer(data() as Double, colorvalue as color, name as string = "") as CDStepLineLayerMBS 5450
- 28.67.74 addStepLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDStepLineLayerMBS 5450


### 28.67.73 addStepLineLayer(data() as Double, colorvalue as color, name as string = "") as CDStepLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addStepLineLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.72 addStepLineLayer as CDStepLineLayerMBS 5449
- 28.67.74 addStepLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDStepLineLayerMBS 5450


### 28.67.74 addStepLineLayer(data() as Double, colorvalue as Integer = -1, name as string = "") as CDStepLineLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a step line chart layer to the XYChart.
**Notes:** In a step line layer, the data points are connected together using steps. The alignment of the steps relative to the data points can be configured using StepLineLayer.setAlignment.

| Parameter | Default | Description |
|---|---|---|
| data | [ Empty_Array ] | An array of numbers representing the data set. |
| color | -1 | The color to draw the step line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |

Return Value
A StepLineLayer object representing the step line layer created.
See also:


- 28.67.72 addStepLineLayer as CDStepLineLayerMBS 5449
- 28.67.73 addStepLineLayer(data() as Double, colorvalue as color, name as string = "") as CDStepLineLayerMBS 5450

### 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTrendLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460


### 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
**Notes:**

Return Value
A TrendLayer object representing the trend layer created.
See also:

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |


- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460


### 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A TrendLayer object representing the trend layer created.
See also:

- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460

## 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| data | (Mandatory) | An array of numbers representing the data set. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A TrendLayer object representing the trend layer created.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460

### 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addTrendLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460

### 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a trend chart layer to the XYChart, and specify the x and y values for drawing the trend line.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A TrendLayer object representing the trend layer created.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460

### 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460

### 28.67.82 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452

- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460


### 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
See also:


- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 19450

- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460


### 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the data set to use for drawing the trend line.
See also:


- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460
- 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5460

### 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addTrendLayer method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5456
- 141.13.6 addTrendLayer(dates() as DateTime, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 19450
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = ””, depth as integer = 0) as CDTrendLayerMBS 5459

### 28.67.86 addTrendLayer(xData() as Double, yData() as Double, colorvalue as Integer = -1, name as string = ””, depth as Integer = 0) as CDTrendLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a trend chart layer to the XYChart, and specify the x and y values for drawing the trend line.
**Notes:**

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x values of the data points. |
| yData | (Mandatory) | An array of numbers representing the y values of the data points. |
| color | -1 | The color to draw the line. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the data set. The name will be used in the legend box, if one is available. An empty string means the data set has no name. |
| depth | 0 | The 3D depth of the line layer. |

Return Value
A TrendLayer object representing the trend layer created.
See also:


- 28.67.75 addTrendLayer(Data() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.76 addTrendLayer(Data() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5451
- 28.67.77 addTrendLayer(dates() as date, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5452
- 28.67.78 addTrendLayer(dates() as date, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5453
- 28.67.79 addTrendLayer(dates() as date, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.80 addTrendLayer(dates() as date, yData() as Double, colorvalue as Integer = -1, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5455
- 28.67.81 addTrendLayer(dates() as DateTime, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5456
- 28.67.83 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as color, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5458
- 28.67.84 addTrendLayer(dates() as DateTime, yData() as double, colorvalue as integer = -1, name as string = "", depth as integer = 0) as CDTrendLayerMBS 5459
- 28.67.85 addTrendLayer(xData() as Double, yData() as Double, colorvalue as color, name as string = "", depth as Integer = 0) as CDTrendLayerMBS 5460


### 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a vector layer to the chart.
**Notes:** The vectors are specified as 4 data series, representing the x and y coordinates of the reference points to put the vectors, and the lengths and directions of the vectors.

By default, the vector starts from the reference point and points away from it. You may use VectorLayer.setArrowAlignment to specify other options, such as for the vectors to point into the reference point, or to have the reference as a pivot at the mid-point of the vector.

ChartDirector supports specifying vectors lengths as pixels or in axis scale. The unit is specified by using the following predefined constants.

| Constant | Value | Description |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| XAxisScale | 1 | The unit is measured in x-axis scale. |
| YAxisScale | 2 | The unit is measured in y-axis scale. |

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x coordinates for the reference points of the vectors. |
| yData | (Mandatory) | An array of numbers representing the y coordinates for the reference points of the vectors. |
| directions | (Mandatory) | An array of numbers representing the direction of the vectors as a clockwise angle in degrees, where 0 is upward pointing direction. |
| lengths | (Mandatory) | An array of numbers representing the lengths of the vectors, in unit as specified in the lengthScale argument. |
| lengthScale | PixelScale | The unit for the lengths, which must be one of the predefined constants in the table above. |
| color | -1 | The color to draw the data points. -1 means that the color is automatically selected from the palette. |
| name | ”” | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A VectorLayer object representing the vector layer created.
See also:

- 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = ””) as CDVectorLayerMBS 5463
- 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = ””) as CDVectorLayerMBS 23551
- 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = ””) as CDVectorLayerMBS 5464

- 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464
- 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466


### 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as the other addVectorLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461
- 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS 23551
- 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5464
- 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464
- 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466


### 28.67.89 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a vector layer to the chart.
See also:


- 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461

- 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5463
- 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5464
- 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464
- 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466


## 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a vector layer to the chart.
See also:


- 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461
- 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5463
- 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS 23551
- 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464
- 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466


## 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a vector layer to the chart.
**Notes:** The vectors are specified as 4 data series, representing the x and y coordinates of the reference

points to put the vectors, and the lengths and directions of the vectors.

By default, the vector starts from the reference point and points away from it. You may use VectorLayer.setArrowAlignment to specify other options, such as for the vectors to point into the reference point, or to have the reference as a pivot at the mid-point of the vector.

ChartDirector supports specifying vectors lengths as pixels or in axis scale. The unit is specified by using the following predefined constants.

| Constant | Value | Description |
|---|---|---|
| PixelScale | 0 | The unit is measured in pixels. |
| XAxisScale | 1 | The unit is measured in x-axis scale. |
| YAxisScale | 2 | The unit is measured in y-axis scale. |

| Parameter | Default | Description |
|---|---|---|
| xData | (Mandatory) | An array of numbers representing the x coordinates for the reference points of the vectors. |
| yData | (Mandatory) | An array of numbers representing the y coordinates for the reference points of the vectors. |
| directions | (Mandatory) | An array of numbers representing the direction of the vectors as a clockwise angle in degrees, where 0 is upward pointing direction. |
| lengths | (Mandatory) | An array of numbers representing the lengths of the vectors, in unit as specified in the lengthScale argument. |
| lengthScale | PixelScale | The unit for the lengths, which must be one of the predefined constants in the table above. |
| color | -1 | The color to draw the data points. -1 means that the color is automatically selected from the palette. |
| name | "" | The name of the layer. The name will be used in the legend box, if one is available. An empty string means the layer has no name. |

Return Value
A VectorLayer object representing the vector layer created.
See also:

- 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461
- 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5463
- 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS 23551

- 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5464
- 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5466


### 28.67.92 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other addVectorLayer method, but uses color instead of integer data type for passing color values.
See also:


- 28.67.87 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5461
- 28.67.88 addVectorLayer(dates() as date, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5463
- 201.3.1 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer = 0, colorvalue as integer = -1, name as string = "") as CDVectorLayerMBS 23551
- 28.67.90 addVectorLayer(dates() as DateTime, yData() as double, directions() as double, lengths() as double, lengthScale as integer, colorvalue as color, name as string = "") as CDVectorLayerMBS 5464
- 28.67.91 addVectorLayer(xData() as Double, yData() as Double, directions() as Double, lengths() as Double, lengthScale as Integer = 0, colorvalue as Integer = -1, name as string = "") as CDVectorLayerMBS 5464


### 28.67.93 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as Integer = &hFFFF0000, edgeColor as Integer = &hFF000000, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new XYChart object.
**Notes:**

See also:


- 28.67.94 Constructor(width as Integer, height as Integer, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0) 5467

| Parameter | Default | Description |
|---|---|---|
| width | (Mandatory) | The width of the chart in pixels. |
| height | (Mandatory) | The height of the chart in pixels. |
| bgColor | BackgroundColor | The background color of the chart. |
| edgeColor | Transparent | The edge color of the chart. |
| raisedEffect | 0 | The 3D border width. For positive values, the border will appear raised. For negative values, the border will appear depressed. A zero value means the border will appear flat. |

### 28.67.94 Constructor(width as Integer, height as Integer, bgcolor as color, edgeColor as color, raisedEffect as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other Constructor method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.93 Constructor(width as Integer = 640, height as Integer = 480, bgcolor as Integer = &hFFFF0000, edgeColor as Integer = &hFF000000, raisedEffect as Integer = 0) 5466

### 28.67.95 getLayer(i as Integer) as CDLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a Layer object based on the order in which it is being added to the chart.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| i | (Mandatory) | The index of the data layer. The index of the first layer added to the chart is 0. The index of the Nth layer added to the chart is N - 1. |

### 28.67.96 getLayerByZ(i as Integer) as CDLayerMBS

MBS ChartDirector Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a Layer object based on the order in which it is being drawn.
**Notes:** In ChartDirector, by default, the first layer added will stay on the top of the chart. The second layer will be added under the first layer, and so on. It means The layers will be drawn in the reverse order that they are added to the chart. The ordering can be configured with Layer.moveFront or Layer.moveBack.

| Argument | Default | Description |
|---|---|---|
| zIndex | (Mandatory) | The z-index of the required layer. The z-index of the first layer drawn is 0. The z-index for the Nth layer drawn is N - 1. |

### 28.67.97 getLayerCount as Integer

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the number of layers in the chart.

### 28.67.98 getNearestXValue(xCoor as Double) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x data value that is nearest to the specified x pixel coordinate.
**Notes:** This method will search all x data values in the XYChart to look for the x data value that is nearest to the given x coordinate. If there are two x data values equally near to the specified x pixel coordinate, this method will arbitrarily return one of the values.

| Argument | Default | Description |
|---|---|---|
| xCoor | (Mandatory) | The x pixel coordinate to search for. |

Returns the x data value that is nearest to the specified x coordinate.

### 28.67.99 getPlotArea as CDPlotAreaMBS

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the PlotArea object representing the plot area.

### 28.67.100 getXCoor(value as Double) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x pixel coordinate of a point given the x data value.
**Notes:** Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

For a 3D chart, this method will get the pixel coordinate of the data value on the top surface of the chart.

Use Layer.getXCoor to obtain the pixel coordinate of the data value on a particular chart layer.

| Parameter | Default | Description |
|---|---|---|
| v | (Mandatory) | The x data value. |

Return Value
The x coordinate of the x data value.

### 28.67.101 getXValue(xCoor as Integer) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the x data value given the x pixel coordinate.
**Notes:** Note: This method should be used only after ChartDirector has output the chart image, or after XYChart.layoutAxes, BaseChart.layout or XYChart.packPlotArea has been called. ChartDirector needs to perform auto- scaling and layout the axis before it can convert between pixel coordinates and data values.

| Argument | Default | Description |
|---|---|---|
| xCoor | (Mandatory) | The x pixel coordinate. |

Returns the x data value at the x pixel coordinate.

### 28.67.102 getYCoor(value as Double, yAxis as CDAxisMBS=nil) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y pixel coordinate of a point given the y data value.
**Notes:** Note: You must call BaseChart.layout first before calling this method. It is because ChartDirector needs to perform auto-scaling and determine the axis scale first before it can compute the coordinates.

For a 3D chart, this method will get the pixel coordinate of the data value on the top surface of the chart. Use Layer.getYCoor to obtain the pixel coordinate of the data value on a particular chart layer.

| Parameter | Default | Description |
|---|---|---|
| v | (Mandatory) | The y data value. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

Return Value
The y coordinate of the y data value.

### 28.67.103 getYValue(yCoor as Integer, axis as CDAxisMBS = nil) as Double

MBS ChartDirector Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the y data value given the y pixel coordinate.
**Notes:** Note: This method should be used only after ChartDirector has output the chart image, or after XYChart.layoutAxes, BaseChart.layout or XYChart.packPlotArea has been called. ChartDirector needs to perform auto- scaling and layout the axis before it can convert between pixel coordinates and data values.

| Argument | Default | Description |
|---|---|---|
| yCoor | (Mandatory) | The y pixel coordinate. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

Returns the y data value at the y pixel coordinate.

### 28.67.104 layoutAxes

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs axis auto-scaling and sets the axis positions and lengths.
**Notes:** ChartDirector automatically calls this method when creating the chart output (eg. using BaseChart.makeChart). There is usually no need to call this method explicitly.

However, if you would like to draw custom objects whose positions or contents depend on the axis scales, you may call this method to auto-scaling the axes before creating the chart output.

The axes will auto-scale based on the data at the time of calling this method. New data added afterwards will not affect the axis scale.

You should not modify the axis scale (eg. using Axis.setLinearScale, Axis.setLabels, etc) after calling this method.

### 28.67.105 packPlotArea(leftX as Integer, topY as Integer, rightX as Integer, bottomY as Integer, minWidth as Integer = 0, minHeight as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the plot area size and position to fit the plot area and the axis labels in a bounding box.

**Notes:** In some charts, the axis labels may vary widely and can be very short or very long. It may be difficult to determine to plot area position and size so as to reserve reasonable and sufficient space for the axis labels.
This method adjusts the size and position of the plot area, so that the plot area, together with the axis labels can fit within a given bounding box.
Note that this method only adjusts for the thickness of the primary and secondary axes, and assumes they are at the border of the plot area. For other axes, you may use Axis.getThickness to get their thickness and adjust the plot area size and position accordingly.
For this method to determine the thickness of the axes, it needs to auto-scale the axes to determine the axis labels. That means all the data should be entered to the chart before calling this method.
Furthermore, the labels generated by auto-scaling depend on the number of labels that can fit on the axis, which in turn depends on the plot area size. So even the final plot area size is determined by this method, the XYChart.setPlotArea must still be used to set a reasonable initial plot area size.
To adjust only the plot area width and horizontal position, and leave the height and vertical position unchanged, simply use a bounding box with zero height (eg. set both topY and bottomY to 0). Similarly, to adjust only the height and vertical position, use a bounding box with zero width.
In some extreme cases, the axis labels may be so long that the plot area needs to adjust to an unreasonably small size, or even zero in size. For example, the axis labels may be names entered by the user, and the user may enter a name thousands of characters long. These extreme cases should be avoided by checking and limiting the length of the labels before passing the labels to ChartDirector. This method also has a safeguard for these unreasonable labels by ensuring the plot area will not shrink below a given minimum size.

Arguments:

| Argument | Default | Description |
|---|---|---|
| leftX | (Mandatory) | The left x coordinate of the bounding box. |
| topY | (Mandatory) | The top y coordinate of the bounding box. |
| rightX | (Mandatory) | The right x coordinate of the bounding box. |
| bottomY | (Mandatory) | The bottom y coordinate of the bounding box. |
| minWidth | 0 | The minimum width the plot area can adjust to. |
| minHeight | 0 | The minimum height the plot area can adjust to. |

### 28.67.106 setAxisAtOrigin(originMode as Integer = 3, symmetryMode as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the chart into 4 quadrant mode. The axes may intersect at origin inside the plot area (as opposed to at the border of the plot area).
**Notes:** By default, ChartDirector puts the axes at the border of the plot area. This ensures the axes and the axes labels will not block the contents of the plot area.

However, in some cases, it may be desirable for the axes to intersect at the origin. The axes may need to move inside the plot area.

ChartDirector allows you to move the primary x-axis and/or y-axis to so that they intersect with the zero point of the other axis. The following constants represent different possibilities:

| Constant | Value | Description |
|---|---|---|
| XAxisAtOrigin | 1 | Move the x-axis so that it will intersect with the zero point of the y-axis, if that point exists. |
| YAxisAtOrigin | 2 | Move the y-axis so that it will intersect with the zero point of the x-axis, if that point exists. |
| XYAxisAtOrigin | 3 | Move the x-axis so that it will intersect with the zero point of the y-axis, if that point exists. Move the y-axis so that it will intersect with the zero point of the x-axis, if that point exists. |

In addition to ensure the axes intersects at the origin, ChartDirector allows you to control if the axes are symmetrical about the origin with the following flags. Multiple flags can be specified by "or" them together.

| Constant | Value | Description |
|---|---|---|
| XAxisSymmetric | 1 | Adjust the x-axis so that it becomes symmetrical about the zero point, that is, the positive and negative part of the x-axis will be of the same length. |
| XAxisSymmetricIfNeeded | 2 | Adjust the x-axis will be symmetrical about the zero point if the axis scale needs both positive and negative values. |
| YAxisSymmetric | 4 | Adjust the y-axis so that it becomes symmetrical about the zero point, that is, the positive and negative part of the y-axis will be of the same length. |
| YAxisSymmetricIfNeeded | 8 | Adjust the y-axis will be symmetrical about the zero point if the axis scale needs both positive and negative values. |
| XYAxisSymmetric | 16 | Adjust the x-axes and y-axes so that they become symmetrical about the zero point. The positive and negative parts of the x-axes and the y-axes will all be of the same length. |
| XYAxisSymmetricIfNeeded | 32 | Adjust the x-axes and y-axes so that they become symmetrical about the zero point. However, if an axis does not need both positive and negative values, it will not be adjusted. |

| Parameter | Default | Description |
|---|---|---|
| originMode | XYAxisAtOrigin | predefined constants to determine which axis needs to move to intersect with the zero point of the other axis. |
| symmetryMode | 0 | Flags to determine if the axes need to be symmetrical about the origin. |

### 28.67.107 setClipping(margin as Integer = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables clipping on the plot area.
**Notes:** In normal usage, ChartDirector will auto-scale the axis to ensure all the data points will be within

the plot area.

However, if manual scaling is used (e.g. using Axis.setLinearScale), it is possible to choose an axis scale such that some data points will be outside the plot area. So some of the data representation (bars, lines, etc) will be outside the plot area.

This method can be used to clip the plot area, so that any data representation that is outside the plot area will not be drawn.

| Parameter | Default | Description |
|---|---|---|
| margin | 0 | Additional margin, measured in pixels, to be added to the 4 sides of the plot area for the purpose of clipping. A positive value means the clipping region will be larger than the plot area. A negative value means the clipping region will be smaller than the plot area. The default value of 0 means the clipping region is equal to the plot area. |

### 28.67.108 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as color, altBgColor as color, edgeColor as color, hGridColor as color, vGridColor as color) as CDPlotAreaMBS

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other setPlotArea method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.109 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as Integer = &hff000000, altBgColor as Integer = -1, edgeColor as Integer = -1, hGridColor as Integer = &hc0c0c0, vGridColor as Integer = &hff000000) as CDPlotAreaMBS 5474

### 28.67.109 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as Integer = &hff000000, altBgColor as Integer = -1, edgeColor as Integer = -1, hGridColor as Integer = &hc0c0c0, vGridColor as Integer = &hff000000) as CDPlotAreaMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the position, size, background colors, edge color and grid colors of the plot area.
**Notes:**

Return Value
A PlotArea object representing the plot area.
See also:

| Parameter | Default | Description |
|---|---|---|
| x | (Mandatory) | The x coordinate of the left of the plot area. |
| y | (Mandatory) | The y coordinate of the top of the plot area. |
| width | (Mandatory) | The width of the plot area in pixels. |
| height | (Mandatory) | The height of the plot area in pixels. |
| bgColor | Transparent | The background color of the plot area. |
| altBgColor | -1 | The second background color of the plot area. -1 means there is no second background color. If there is a second background color, the two background colors will be used alternatively as horizontal bands on the background grid. |
| edgeColor | -1 | The border color of the plot area. -1 means to use the default, which is LineColor. However, if the axes are configured in 4 quadrant mode (see XYChart.setAxisAtOrigin), the default will change to Transparent. |
| hGridColor | C0C0C0 | The horizontal grid color. |
| vGridColor | Transparent | The vertical grid color. |

- 28.67.108 setPlotArea(x as Integer, y as Integer, width as Integer, height as Integer, bgColor as color, altBgColor as color, edgeColor as color, hGridColor as color, vGridColor as color) as CDPlotAreaMBS 5474

### 28.67.110 setTrimData(startPos as Integer, len as Integer = &h7fffffff)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses only a subset of the data series to draw charts.
**Notes:** In finance charts, "lead data" are commonly needed to plot technical indicators. For example, to show a 20-days moving average line for 30 days, one needs 50 days of data. It is because computing 20-days moving average requires 20 days of "lead data". The setTrimData method is a convenience method for trimming off these "lead data" so they will not appear on the chart.

| Parameter | Default | Description |
|---|---|---|
| startPos | (Mandatory) | The index for the first data position to use for plotting charts. |
| len | 7FFFFFFF | The length of the data points used for plotting charts. |

### 28.67.111 setXAxisOnTop(value as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Interchange the position of the primary x-axis and the secondary x-axis.
**Notes:** By default, the primary x-axis is the x-axis on the bottom side of the plot area (left side if XYChart.swapXY is in effect), and the secondary x-axis is on the top side of the plot area (right side if XYChart.swapXY is in effect). This method can be used to interchange their positions.

| Parameter | Default | Description |
|---|---|---|
| b | true | A true value means to interchange the positions of the primary and secondary x-axes. A false value means using the default positions for the primary and secondary x-axes. |

### 28.67.112 setYAxisOnRight(value as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Interchange the position of the primary y-axis and the secondary y-axis.
**Notes:** By default, the primary y-axis is the y-axis on the left side of the plot area (bottom side if XYChart.swapXY is in effect), and the secondary y-axis is on the right side of the plot area (top side if XYChart.swapXY is in effect). This method can be used to interchange their positions.

| Parameter | Default | Description |
|---|---|---|
| b | true | A true value means to interchange the positions of the primary and secondary y-axes. A false value means using the default positions for the primary and secondary y-axes. |

### 28.67.113 swapXY(value as boolean=true)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swap the position of the x and y axes, so the x-axes will become vertical, and the y-axes will become horizontal.
**Notes:** After swapping the x and y axes, the charts will appear rotated. For example, the bars in a bar chart will become horizontal instead of vertical, and the area in a stacked area chart will grow from left to right (instead of bottom to top).

| Parameter | Default | Description |
|---|---|---|
| b | true | A true value means the x and y axes will be swapped. A false value means the x and y axes not be swapped. |

### 28.67.114 syncYAxis(slope as Double = 1, intercept as Double = 0)

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a linear formula to synchronize the secondary y-axis scale to the primary y-axis scale.
**Notes:** The formula is in the format:

y2 = y1 * slope + intercept

This method is usually used if the two y-axes represent the same measurement using different units. Examples including temperature in Celsius and in Fahrenheit, and length in meters and feet.

| Parameter | Default | Description |
|---|---|---|
| slope | 1 | The slope parameter for the formula linking the secondary y-axis to the primary y-axis. |
| intercept | 0 | The intercept parameter for the formula linking the secondary y-axis to the primary y-axis. |

### 28.67.115 xScaleColor(scale() as double) as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an x-scale color. An x-scale is a color that will vary depending on the x value of the pixel.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colorStops | (Mandatory) | An array that defines the mapping from data values to colors. Please refer to ColorAxis.setColorScale for the format of this array. |

Returns a 32-bit integer representing the x scale color.

### 28.67.116 xZoneColor(threshold as Double, belowColor as color, aboveColor as color) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other xZoneColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.117 xZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer) as Integer 5477

### 28.67.117 xZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a x-zone color. A x-zone will change from one color to another depending on a threshold value on the x-axis.
**Notes:** For example, if a x-zone color is used as the line color in a line layer, the line will switch from one color to another when its passes through a certain value on the x-axis. Similarly, if a x-zone color is used as the fill color in an area layer, the area will switch from one color to another when it passes through a certain value on the x-axis.

The two colors used in a x-zone color can be other dynamic colors. For example, one color could be a solid color, while the other color could be a dash line color (see !BaseChart.dashLineColor). When this x-zone color is as the line color, the line will change from a solid style to a dash line style when the line passes through a certain value on the x-axis

You may create x-zone colors with more than 2 zones by cascading multiple x-zone colors.

For a 3D chart, this method will get the zone color at the top surface of the chart. Use Layer.xZoneColor to obtain the zone color for a particular chart layer.

| | | |
|---|---|---|
| threshold | (Mandatory) | The x value serving as the threshold for switching between two colors. |
| belowColor | (Mandatory) | The color to use when the x-axis value of the pixel is smaller than the threshold. |
| aboveColor | (Mandatory) | The color to use when the x-axis value of the pixel is greater than the threshold. |

Return Value
A 32-bit integer representing the x-zone color.
See also:

- 28.67.116 xZoneColor(threshold as Double, belowColor as color, aboveColor as color) as Integer 5477

### 28.67.118 yScaleColor(scale() as double, yAxis as CDAxisMBS = nil) as Integer

MBS ChartDirector Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a y-scale color. An y-scale is a color that will vary depending on the y value of the pixel.
**Notes:**

| Argument | Default | Description |
|---|---|---|
| colorStops | (Mandatory) | An array that defines the mapping from data values to colors. Please refer to ColorAxis.setColorScale for the format of this array. |
| yAxis | nil | The y-axis to use to determine the pixel coordinates of data values. The y-axis may be obtained using XYChart.yAxis, XYChart.yAxis2 or XYChart.addAxis. The default is to use the primary y-axis. |

Returns a 32-bit integer representing the y scale color.

### 28.67.119 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAxisMBS=nil) as Integer

MBS ChartDirector Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as the other yZoneColor method, but uses color instead of integer data type for passing color values.
See also:

- 28.67.120 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS=nil) as Integer 5479

### 28.67.120 yZoneColor(threshold as Double, belowColor as Integer, aboveColor as Integer, yAxis as CDAxisMBS=nil) as Integer

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a x-zone color. A x-zone will change from one color to another depending on a threshold value on the x-axis.
**Notes:** For example, if a x-zone color is used as the line color in a line layer, the line will switch from one color to another when its passes through a certain value on the x-axis. Similarly, if a x-zone color is used as the fill color in an area layer, the area will switch from one color to another when it passes through a certain value on the x-axis.

The two colors used in a x-zone color can be other dynamic colors. For example, one color could be a solid color, while the other color could be a dash line color (see !BaseChart.dashLineColor). When this x-zone color is as the line color, the line will change from a solid style to a dash line style when the line passes through a certain value on the x-axis

You may create x-zone colors with more than 2 zones by cascading multiple x-zone colors.

For a 3D chart, this method will get the zone color at the top surface of the chart. Use Layer.xZoneColor to obtain the zone color for a particular chart layer.

| Parameter | Default | Description |
|---|---|---|
| threshold | (Mandatory) | The x value serving as the threshold for switching between two colors. |
| belowColor | (Mandatory) | The color to use when the x-axis value of the pixel is smaller than the threshold. |
| aboveColor | (Mandatory) | The color to use when the x-axis value of the pixel is greater than the threshold. |

Return Value
A 32-bit integer representing the x-zone color.
See also:

- 28.67.119 yZoneColor(threshold as Double, belowColor as color, aboveColor as color, yAxis as CDAx-

isMBS=nil) as Integer 5479

### 28.67.121 Properties

### 28.67.122 xAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the Axis object representing primary x-axis of the XYChart.
**Notes:** By default, the primary x-axis is the x-axis on the bottom side of the plot area (left side if XYChart.swapXY is in effect), and the secondary x-axis is on the top side of the plot area (right side if XYChart.swapXY is in effect). You may interchange their positions using XYChart.setXAxisOnTop.

Return Value
The Axis object representing the primary x-axis of the XYChart.
(Read only property)

### 28.67.123 xAxis2 as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the Axis object representing secondary x-axis of the XYChart.
**Notes:** By default, the primary x-axis is the x-axis on the bottom side of the plot area (left side if XYChart.swapXY is in effect), and the secondary x-axis is on the top side of the plot area (right side if XYChart.swapXY is in effect). You may interchange their positions using XYChart.setXAxisOnTop.

Return Value
The Axis object representing the secondary x-axis of the XYChart.
(Read only property)

### 28.67.124 yAxis as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the Axis object representing primary y-axis of the XYChart.
**Notes:** Return Value
The Axis object representing the primary y-axis of the XYChart.
(Read only property)

### 28.67.125 yAxis2 as CDAxisMBS

MBS ChartDirector Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the Axis object representing secondary y-axis of the XYChart.
**Notes:** By default, the primary y-axis is the y-axis on the left side of the plot area (bottom side if XYChart.swapXY is in effect), and the secondary y-axis is on the right side of the plot area (top side if XYChart.swapXY is in effect). You may interchange their positions using XYChart.setYAxisOnRight.

Return Value
The Axis object representing the secondary y-axis of the XYChart.
(Read only property)

### 28.67.126 Screenshots

### 28.67.127 linefill.jpg

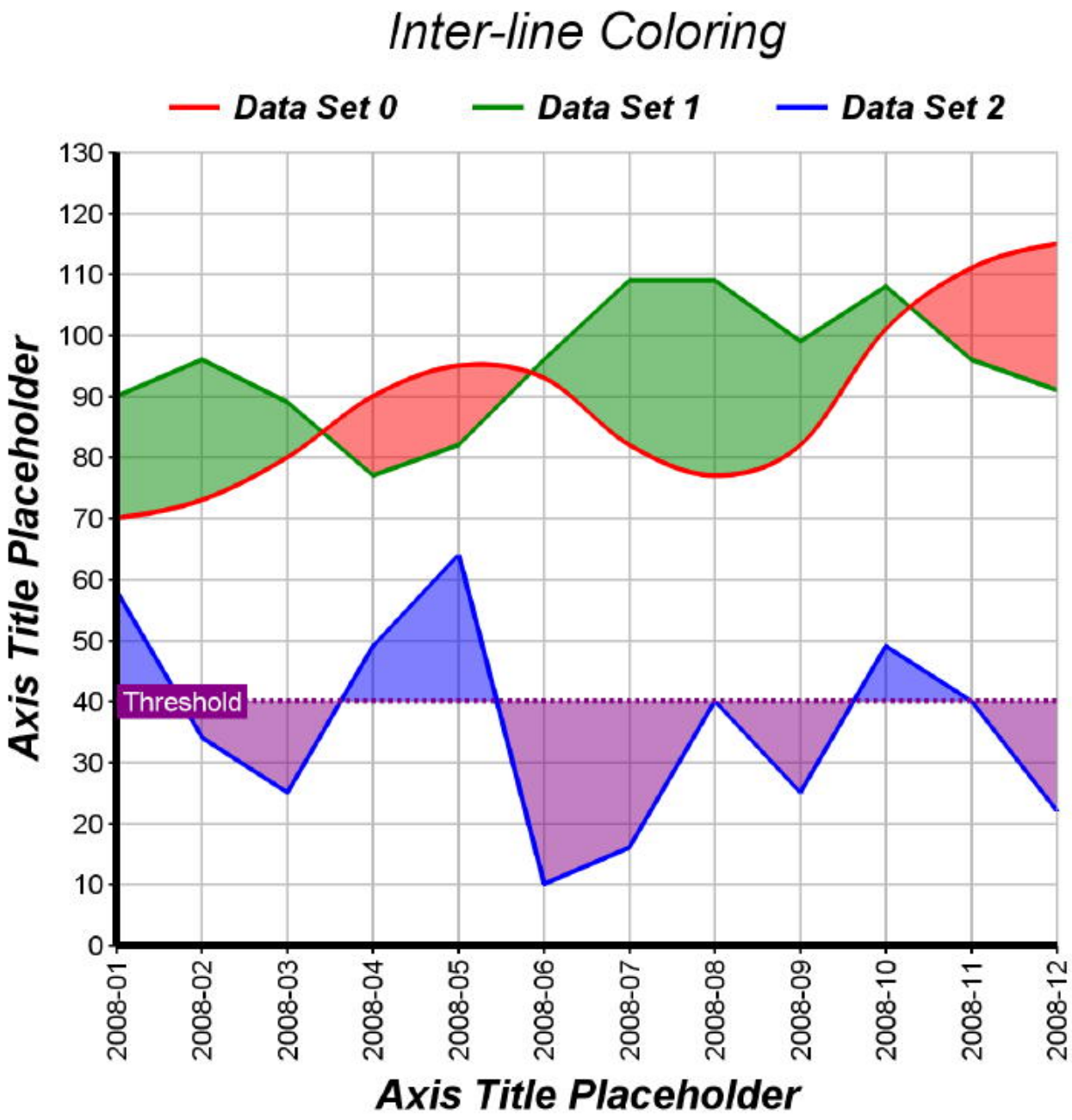


**Function:** A line chart created using ChartDirector with the CDXYChartMBS class.

### 28.67.128 softlightbar.jpg

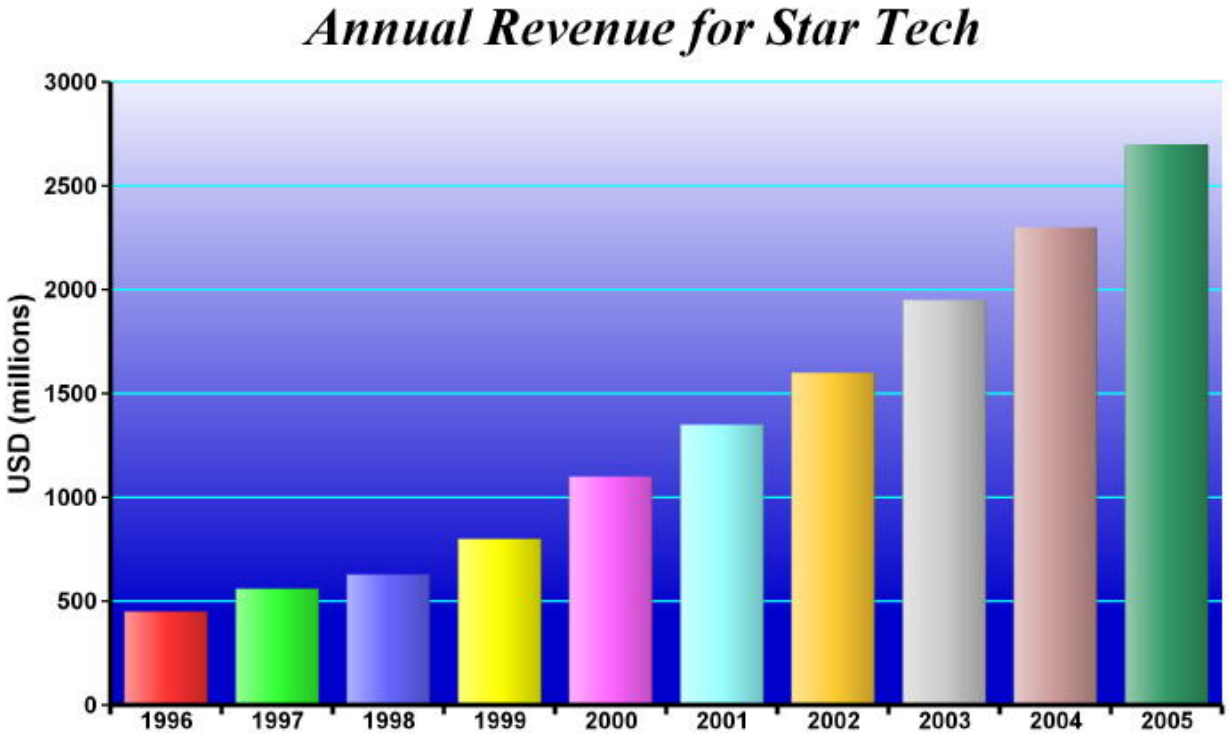


**Function:** A bar chart created using ChartDirector with the CDXYChartMBS class.

# Chapter 29

# Claris FileMaker Data API

## 29.1 class FMAdminMBS

### 29.1.1 class FMAdminMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for FileMaker Server Admin API.
**Example:**

```
Dim d As New FMAdminMBS

d.Password = "admin"
d.Username = "admin"
d.Server = "localhost"

Dim r As FMResponseMBS = d.Login

If r = Nil Then
msgbox "Failed?"
else
MsgBox r.ErrorMessage
End If
```

**Notes:** Our plugin does re-login if the session expired as well as login if needed.

For use with Claris Server or FileMaker Server.
Subclass of the FMConnectionMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 20.4
- Connect to Claris FileMaker Server from Xojo via Data API
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr7

### 29.1.2 Methods

### 29.1.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 29.1.4 CreateBackupSchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a Backup schedule.
**Notes:** Please pass Backup Schedule as dictionary:

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| backupType | dictionary | Parameters for the backup schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

### 29.1.5 CreateFileMakerScriptSchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a FileMaker Script schedule.
**Notes:** The parameter for creating a FileMaker Script Schedule as dictionary:

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| filemakerScriptType | dictionary | Parameters for the FileMaker script schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

### 29.1.6 CreateMessageSchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a message schedule.
**Notes:** Create Message Schedule Parameters as dictionary:

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| messageType | dictionary | Parameters for the message schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

### 29.1.7 CreateScriptSequenceSchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a Script Sequence schedule.
**Notes:** Pass Script Sequence Schedule Parameter as dictionary:

### 29.1.8 CreateSystemScriptSchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| scriptSequenceType | dictionary | Parameters for the script sequence schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

**Function:** Create a System Script schedule.
**Notes:** Pass System Script Schedule Parameters as dictionary:

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| systemScriptType | dictionary | Parameters for the system script schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

### 29.1.9 CreateVerifySchedule(schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a Verify schedule.
**Notes:** Pass Verify Schedule Parameters as dictionary:

### 29.1.10 DeleteSchedule(scheduleID as Integer) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Delete a schedule specified by the schedule ID.
**Notes:** scheduleID: ID of the schedule, a value ,â• 2. Schedule ID 1 is reserved by FileMaker Server.

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| verifyType | dictionary | Parameters for the verify schedule. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |

### 29.1.11 DisconnectClient(ClientID as Integer, messageText as String = "", graceTime as Integer = -1) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disconnect a FileMaker client.
**Notes:**

| | | |
|---|---|---|
| ClientID | integer >= 1 | ID of the client to disconnect. |
| messageText | string [ 0 .. 200 ] characters | The text message to send to the client that is being disconnected. |
| graceTime | integer [ 0 .. 3600 ] | The number of seconds to wait before disconnecting the client. Default: 90 |

### 29.1.12 DuplicateSchedule(scheduleID as Integer) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Duplicate a schedule specified by the schedule ID.
**Notes:** ScheduleID: The schedule ID for the schedule to duplicate, a value ,â• 2. Schedule ID 1 is reserved by FileMaker Server.

### 29.1.13 EditSchedule(scheduleID as Integer, schedule as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Edit or run a schedule specified by scheduleID.
**Notes:** Each parameter is optional, but at least one parameter is required.

To run a schedule, set the 'status' parameter to 'RUNNING'.
Use this call to run a schedule. Use the GetSchedule API call to verify the results.
You can not change schedule type in edit schedule api.

Parameters for dictionary:

| | | |
|---|---|---|
| name | string [ 1 .. 31 ] characters ^(?!\s*$ ).+ | Schedule name. This parameter cannot be an empty string or a string of whitespace characters. |
| status | string | Value: "RUNNING". Whether to run the schedule. |
| onceType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run on the specified date and time. |
| weeklyType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule to run weekly on one or more days. |
| everyndaysType | dictionary | If used with POST or PATCH, allows you to create or edit a schedule that has a specific interval in days, such as every 2, 3, or 4 days. |
| sendEmail | Array of strings | Email addresses to send notifications to. An empty array disables sending email. Note: SMTP configuration is required for sending email. |
| enabled | boolean | To enable a schedule to run, or to find out whether the schedule is enabled to run. If you create a schedule without specifying this parameter, the default value 'false' is used. |
| backupType | dictionary | Parameters for the backup schedule. |
| filemakerScriptType | dictionary | Parameters for the FileMaker script schedule. |
| messageType | dictionary | Parameters for the message schedule. |
| scriptSequenceType | dictionary | Parameters for the script sequence schedule. |
| systemScriptType | dictionary | Parameters for the system script schedule. |
| verifyType | dictionary | Parameters for the verify schedule. |

### 29.1.14 GetDataAPISettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the FileMaker Data API settings.

### 29.1.15 GetPHPSettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the PHP settings.

### 29.1.16 GetSchedule(scheduleID as Integer) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get a schedule specified by the schedule ID.
**Notes:** scheduleID: ID of the schedule, value ,â• 2. Schedule ID 1 is reserved by FileMaker Server.

### 29.1.17 GetServerGeneralSettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the server general settings.

### 29.1.18 GetServerSecuritySetting as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the server security setting..

### 29.1.19 GetServerStatus as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the Database Server status.

### 29.1.20 GetWebDirectSettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the FileMaker WebDirect settings.

### 29.1.21 GetWPESettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the Web Publishing Engine settings for all machines.
See also:

- 29.1.22 GetWPESettings(MachineID as Integer) as FMResponseMBS 5491

### 29.1.22 GetWPESettings(MachineID as Integer) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the Web Publishing Engine settings for a single machine.
**Notes:** MachineID: ID of machine, a value ,â • 1.
See also:

- 29.1.21 GetWPESettings as FMResponseMBS 5491

### 29.1.23 GetXDBCSettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the ODBC/JDBC settings.

### 29.1.24 GetXMLSettings as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the XML settings.

### 29.1.25 ListClients as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** List the connected clients.

### 29.1.26 ListDatabases as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** List all hosted databases.

### 29.1.27 ListSchedules as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** List all schedules.

### 29.1.28 Login as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request an access token from the host using the root administrator account name and password.
**Example:**

```
Dim d As New FMAdminMBS

d.Password = "admin"
```

```
d.Username = "admin"
d.Server = "localhost"

Dim r As FMResponseMBS = d.Login

If r = Nil Then
msgbox "Failed?"
else
MsgBox r.ErrorMessage
End If
```

**Notes:** Please either set UserName and Password before calling this.
If you don't call Login explicitly or the session token expired, the plugin will call it for you.

### 29.1.29 Logout as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Invalidate the specified JSON Web Token.
**Notes:** Clears session token property.

### 29.1.30 PerformDatabaseOperations(DatabaseID as Integer, status as String, key as string = "",saveKey as boolean = false, messageText as string = "", force as boolean = false) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open, close, pause, or resume the specified database.
**Notes:**

| | | |
|---|---|---|
| status | Enum: "OPENED" "PAUSED" "RESUMED" "CLOSED" | Status of the database. |
| key | string | The password required to open an encrypted database. Required and allowed only if status = OPENED. Note: FileMaker Admin API does not validate the encryption key. You receive an error code of 0 even if you enter an invalid key. |
| saveKey | boolean | Allow the host to save the encryption password. Allowed only if status = OPENED. |
| messageText | string [ 0 .. 200 ] characters | The text message to send to the client being disconnected. Required and allowed only if status = CLOSED. |
| force | boolean | Forces databases to be closed and disconnects connected clients. Overrides the graceTime option. Allowed only if status = CLOSED. |

See also:

- 29.1.31 PerformDatabaseOperations(status as String, force as boolean = false) as FMResponseMBS 5494

### 29.1.31 PerformDatabaseOperations(status as String, force as boolean = false) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open, close, pause, or resume all databases.
**Notes:** status: "OPENED", "PAUSED", "RESUMED", "CLOSED". Status of the database.
force: Forces databases to be closed and disconnects connected clients. Overrides the graceTime option. Allowed only if status = CLOSED.
See also:

- 29.1.30 PerformDatabaseOperations(DatabaseID as Integer, status as String, key as string = "",saveKey as boolean = false, messageText as string = "", force as boolean = false) as FMResponseMBS 5493

### 29.1.32 SendMessageToClient(clientID as Integer, messageText as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Send a message to a FileMaker client.
**Notes:** You cannot send a message to a client that is connected via FileMaker Data API. You receive an error code of 0 even if the client is connected via FileMaker Data API.

messageText: The text message to send to the client. This parameter cannot be an empty string or a string of whitespace characters.

### 29.1.33 UpdateDataAPISettings(enabled as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the FileMaker Data API settings.
**Notes:** enabled: allows you to enable or disable FileMaker Data API.

### 29.1.34 UpdatePHPSettings(settings as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the PHP settings. Parameters are optional, but at least one parameter is required.
**Notes:** PHP Configuration dictionary:

| | | |
|---|---|---|
| characterEncoding | string | Enum: "UTF-8" "ISO-8859-1". The default character encoding for PHP. |
| dataPreValidation | boolean | Whether the record data should be validated before committing changes to the Database Server. |
| enabled | boolean | If used with GET, specifies whether Custom Web Publishing with PHP is enabled or disabled. If used with PATCH, allows you to enable or disable Custom Web Publishing with PHP. |
| errorMessageLanguage | string | Enum: "en" "it" "de" "fr" "ja". The language used for error messages for PHP. |
| useFileMakerPhp | boolean | Whether to use the FileMaker version of the PHP engine rather than your own version of PHP. |

### 29.1.35 UpdateServerGeneralSettings(settings as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the server general settings. All parameters are optional, but at least one parameter is required.
**Notes:** Provide Server General Settings via dictionary with following keys:

| | | |
|---|---|---|
| cacheSize | integer >= 64 | Cache memory (in megabytes) allocated by the server. The maximum setting is not enforced, but allocating more memory than what the system can manage will impact server performance. |
| maxFiles | integer [ 1 .. 125 ] | Maximum number of databases that can be hosted. |
| maxProConnections | integer [ 0 .. 2000 ] | Maximum number of FileMaker Pro client connections. |
| maxPSOS | integer [ 0 .. 500 ] | Maximum number of script sessions that can run on the server simultaneously. |
| openDatabasesOnStart | boolean | Automatically open databases that are in the database folders when the Database Server starts. |
| startupRestorationEnabled | boolean | Enable/Disable database auto restoration. If you change this setting, you need to restart FileMaker Server for the change to take effect. |
| startupRestorationLogPath | string ^(?!\s*$ ).+ | The folder path to save restoration logs. If you change this setting, you need to restart FileMaker Server for the change to take effect. This parameter cannot be an empty string or a string of whitespace characters. |
| useSchedules | boolean | Allow enabled schedules to run. |
| autostartDBS | boolean | Whether the Database Server should start automatically. If autostartDBS is set to false, autostartWPE is also set to false. |
| autostartWPE | boolean | Whether the Web Publishing Engine should start automatically. If autostart-DBS is set to false, autostartWPE can't be set to true. |

### 29.1.36 UpdateServerSecuritySetting(requireSecureDB as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the server security setting.
**Notes:** requireSecureDB: If set to true, only databases with password-protected accounts that have the Full Access privilege set can be opened for hosting. Applies only to the default and additional folders.

### 29.1.37 UpdateServerStatus(status as String, messageText as String = """, graceTime as Integer = -1) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Run or stop the Database Server.
**Notes:** status: "RUNNING" or "STOPPED"
Allows you to start or stop FileMaker Database Server.

messageText: Up to 200 characters. The message to send to the FileMaker client when stopping the Database Server.
graceTime: The length of seconds to delay before stopping the Database Server. Default is 90 and range is 0 to 3600.

If messageText is empty or graceTime is negative, we don't include the value in the request.

### 29.1.38 UpdateWebDirectSettings(enabled as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the FileMaker WebDirect settings.
**Notes:** enabled: allows you to enable or disable FileMaker WebDirect.

### 29.1.39 UpdateWPESettings(machineID as Integer, enabled as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the Web Publishing Engine settings.
**Notes:**

| | | |
|---|---|---|
| machineID | integer >= 1 | ID of machine |
| enabled | boolean | Allows you to enable or disable Web Publishing Engine. |

### 29.1.40 UpdateXDBCSettings(enabled as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the ODBC and JDBC settings.
**Notes:** enabled: allows you to enable or disable ODBC/JDBC.

### 29.1.41 UpdateXMLSettings(enabled as Boolean) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Update the XML settings.
**Notes:** enabled: allows you to enable or disable XML.

### 29.1.42 Constants

Database Operations

| Constant | Value | Description |
|---|---|---|
| kDatabaseOperationClose | "CLOSED" | Close database. |
| kDatabaseOperationOpen | "OPENED" | Open database. |
| kDatabaseOperationPause | "PAUSED" | Pause database. |
| kDatabaseOperationResume | "RESUMED" | Resume database. |

Server Status

| Constant | Value | Description |
|---|---|---|
| kServerStatusRunning | "RUNNING" | Start server |
| kServerStatusStopped | "STOPPED" | Stop server |

## 29.2 class FMConnectionMBS

### 29.2.1 class FMConnectionMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The base class for a server connection.
**Notes:** Please see subclsses FMDataMBS for data API and FMAdminMBS for admin API.

Our plugin does re-login if the session expired as well as login if needed.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr7
- Connect to Claris FileMaker Server from Xojo via Data API
- MBS Xojo Plugins, version 20.4pr7

### 29.2.2 Methods

### 29.2.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
**Notes:** Please use subclasses FMDataMBS and FMAdminMBS.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 29.2.4 Login as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs login.
**Notes:** On success, updates SessionToken property.
If you don't call Login explicitly or the session token expired, the plugin will call it for you.

### 29.2.5 Logout as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs logout.

### 29.2.6 SendRequest(HTTPMethod as String, Query as String, Body as String = "") as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method to sends a request to the server.
**Notes:** This is to help with future API calls not yet supported or in case you like to do one yourself instead of using our existing methods.
If body contains something, we pass it with the request.

### 29.2.7 Properties

### 29.2.8 CAPath as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The path for the cacert.pem file with the valid root certificates.
**Notes:** If set, we can verify SSL certificates.
(Read and Write property)

### 29.2.9 Headers as Dictionary

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional headers to include with each request.
**Example:**

```
Dim d As New FMAdminMBS
// optional headers
d.Headers.Value("User-Agent") = "FileMaker Admin API Test 1.0"
```

**Notes:** (Read and Write property)

### 29.2.10 IncludeDataInDebugMessages as Boolean

MBS FMAPI Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable debug logs to contain the data sent/received.
**Notes:** A setting for all connections.
(Read and Write property)

### 29.2.11 Password as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password to use for basic authorization.
**Notes:** (Read and Write property)

### 29.2.12 Server as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The server to use.
**Notes:** Set to IP or domain name.
We prepend https:// when doing the request.
(Read and Write property)

### 29.2.13 SessionToken as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The session token for the current session.
**Notes:** Automatically set when doing login.
(Read and Write property)

### 29.2.14 Username as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user name to use for basic authorization.
**Notes:** (Read and Write property)

### 29.2.15 Version as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FileMaker Data API version requested.
**Notes:** currently v1, v2 or vLatest are allowed.
vLatest is default.
(Read and Write property)

## 29.3 class FMContainerUploadMBS

### 29.3.1 class FMContainerUploadMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a container upload.
**Blog Entries**

- Connect to Claris FileMaker Server from Xojo via Data API
- MBS Xojo Plugins, version 20.4pr7

### 29.3.2 Methods

### 29.3.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 29.3.4 SetPicture(Pic as Picture)

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets data with picture.
**Notes:** Convenience function to upload pictures.
We create PNG representation of the picture, set mime type and dataMemory property.

### 29.3.5 Properties

### 29.3.6 ContainerFieldName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Container Field Name.
**Notes:** (Read and Write property)

### 29.3.7 ContainerFieldRepetition as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Container Field Repetition
**Notes:** Optional.
(Read and Write property)

### 29.3.8 DataMemory as MemoryBlock

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data to send for the container as memoryblock.
**Notes:** We provide DataMemory and DataString to avoid conversion between those.
Setting this clears DataString.
(Read and Write property)

### 29.3.9 DataString as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data to send for the container as string.
**Notes:** We provide DataMemory and DataString to avoid conversion between those.
Setting this clears DataMemory.
(Read and Write property)

### 29.3.10 FileName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name for the upload.
**Notes:** (Read and Write property)

### 29.3.11 MimeType as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime type.
**Notes:** (Read and Write property)

### 29.3.12 ModId as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modification ID of record.
**Notes:** (Read and Write property)

### 29.3.13 RecordId as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Record ID.
**Notes:** (Read and Write property)

## 29.4 class FMDataMBS

### 29.4.1 class FMDataMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a FileMaker Server Data API connection.
**Example:**

```
Dim d As New FMDataMBS

d.Password = "admin"
d.Username = "admin"
d.Server = "localhost"
d.Database = "test"

Dim r As FMResponseMBS = d.Login

If r = Nil Then
msgbox "Failed?"
else
MsgBox r.ErrorMessage
End If
```

**Notes:** Our plugin does re-login if the session expired as well as login if needed.

For use with Claris Server or FileMaker Server.
Subclass of the FMConnectionMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr2
- MBS Xojo Plugins, version 21.6pr4
- News from the MBS Xojo Plugins Version 20.4
- Connect to Claris FileMaker Server from Xojo via Data API
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr7

**Xojo Developer Magazine**

- 18.6, page 9: News

### 29.4.2 Methods

### 29.4.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 29.4.4 CreateRecord(request as FMRequestMBS) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a new record.
**Notes:** Please set layout property before calling this.

### 29.4.5 DatabaseNames as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a list of hosted FileMaker databases.

### 29.4.6 DeleteRecord(request as FMRequestMBS = nil, recordId as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Delete a record by recordId.
**Notes:** Please set layout property before calling this.

### 29.4.7 DuplicateRecord(request as FMRequestMBS = nil, recordId as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Duplicate a record by recordId.
**Notes:** Please set layout property before calling this.

### 29.4.8 EditRecord(request as FMRequestMBS = nil, recordId as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Edit a record by recordId.
**Notes:** Please set layout property before calling this.

### 29.4.9 ExecuteScript(scriptName as String, scriptParam as String = "") as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Execute Script.

### 29.4.10 FindRecords(request as FMRequestMBS = nil, query as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Find Records in a Layout.
**Notes:** Please set layout property before calling this.

Query: JSON with Fields and Find criteria in the following query schema:
[ { "<fieldName>": "<fieldValue>", "omit" : "true" ... } , ... ]

### 29.4.11 GetRecord(request as FMRequestMBS = nil, recordId as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get a record by recordId.
**Notes:** Please set layout property before calling this.

### 29.4.12 GetRecords(request as FMRequestMBS = nil) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get records.
**Notes:** Please set layout property before calling this.

### 29.4.13 LayoutMetadata(recordId as String) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves layout metadata for a FileMaker database.
**Notes:** RecordID: Record ID to retrieve related value list data

### 29.4.14 LayoutNames as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves a list of layouts for a FileMaker database.

### 29.4.15 Login as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Login to a FileMaker database.
**Example:**

```
Dim d As New FMDataMBS

d.Password = "admin"
d.Username = "admin"
d.Server = "localhost"
d.Database = "test"

Dim r As FMResponseMBS = d.Login

If r = Nil Then
msgbox "Failed?"
else
MsgBox r.ErrorMessage
End If
```

**Notes:** Please either set UserName and Password or OAuthRequestId and OAuthIdentifier.
If you don't call Login explicitly or the session token expired, the plugin will call it for you.
See also:

- 29.4.16 Login(dataSources() as FMDataSourceMBS) as FMResponseMBS 

### 29.4.16 Login(dataSources() as FMDataSourceMBS) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Login to a FileMaker database.
**Notes:** Please either set UserName and Password or OAuthRequestId and OAuthIdentifier.

dataSources: External FileMaker Data Source Authentication.

Clears session token property.
If you don't call Login explicitly or the session token expired, the plugin will call it for you.
See also:

- 29.4.15 Login as FMResponseMBS 5508

### 29.4.17 Logout as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Log out of a FileMaker database.
**Notes:** Clears session token property.

### 29.4.18 ProductInfo as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves information about the Claris FileMaker Server or Claris FileMaker Cloud host.
**Notes:** Result property in FMResponseMBS is a dictionary with entries including buildDate, name, version, dateFormat, timeFormat and timeStampFormat.

### 29.4.19 ScriptNames as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves a list of scripts for a FileMaker database.

### 29.4.20 SetGlobalFields(globalFields as Dictionary) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set Global Fields.
**Notes:** globalFields: A dictionary that contains field-value pairs to set global fields in a target database.

Field names must be Fully Qualified.

### 29.4.21 UploadToContainerField(Upload as FMContainerUploadMBS) as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Upload a single file into a container field.
**Notes:** upload: File to upload into container field

### 29.4.22 ValidateSession as FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validate session token.

### 29.4.23 Properties

### 29.4.24 Database as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the current database.
**Notes:** (Read and Write property)

### 29.4.25 Layout as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The layout to use.
**Notes:** (Read and Write property)

### 29.4.26 OAuthIdentifier as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provide the OAuth login Request ID.
**Notes:** (Read and Write property)

### 29.4.27 OAuthRequestId as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provide the OAuth login Identifier.
**Notes:** (Read and Write property)

## 29.5 class FMDataSourceMBS

### 29.5.1 class FMDataSourceMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for external FileMaker Data Source Authentication.
**Notes:** If both "oAuthRequestId" and "oAuthIdentifier" are supplied, FileMaker Data API will perform an OAuth login.
This feature only supports databases hosted on the same FileMaker Server.
**Blog Entries**

- Connect to Claris FileMaker Server from Xojo via Data API
- MBS Xojo Plugins, version 20.4pr7

### 29.5.2 Methods

### 29.5.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 29.5.4 Properties

### 29.5.5 Database as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the external database file.
**Notes:** (Read only property)

### 29.5.6 oAuthIdentifier as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The URL query value for "identifier" in FileMaker Server OAuth workflow.
**Notes:** If both "oAuthRequestId" and "oAuthIdentifier" are supplied, FileMaker Data API will perform an OAuth login.
(Read only property)

### 29.5.7 oAuthRequestId as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X-FMS-Request-ID header value returned from '/oauth/getoauthurl' in FileMaker Server OAuth workflow.
**Notes:** If both "oAuthRequestId" and "oAuthIdentifier" are supplied, FileMaker Data API will perform an OAuth login.
(Read only property)

### 29.5.8 Password as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password to login to solution.
**Notes:** (Read only property)

### 29.5.9 UserName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The username to login to solution.
**Notes:** (Read only property)

## 29.6 class FMRequestMBS

### 29.6.1 class FMRequestMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to encapsulate parameters for various FileMaker Data API queries.
**Notes:** Not set properties are not included in request to server.
And not all properties used for all queries.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- Connect to Claris FileMaker Server from Xojo via Data API
- MBS Xojo Plugins, version 20.4pr7

### 29.6.2 Methods

### 29.6.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 29.6.4 portal as String()

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the portal result set to return.
**Notes:** Use the portal object name or portal table name. If this parameter is omitted, the API will return all portal objects and records in the layout. For best performance, pass the portal object name or portal table name.

### 29.6.5 setPortal(portal() as String)

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the portal result set to return.
**Notes:** Use the portal object name or portal table name. If this parameter is omitted, the API will return all portal objects and records in the layout. For best performance, pass the portal object name or portal table name.

### 29.6.6 Properties

### 29.6.7 FieldData as Dictionary

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A dictionary that contains field-value pairs for fields in the target layout.
**Notes:** If empty dictionary is provided as a data value, an empty record is created with any auto enter values defined in the current table,Äôs schema.
(Read and Write property)

### 29.6.8 layoutResponse as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The layout to switch to when processing response.
**Notes:** (Read and Write property)

### 29.6.9 limit as Integer

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum number of records that should be returned. If not specified, the default value is 100.
**Notes:** Default value is -1 for the plugin to not specify it in the request.
(Read and Write property)

### 29.6.10 ModId as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last modification ID.
**Notes:** When you use modId, a record is edited only when the modId matches.
Only for editing records.
(Read and Write property)

### 29.6.11 offset as Integer

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The record number of the first record in the range of records.

**Notes:** Default value is -1 for the plugin to not specify it in the request.
(Read and Write property)

### 29.6.12 PortalData as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A JSON object that contains portal row values in the target layout.
**Notes:** The format mirrors the portalData format from Get Records.
(Read and Write property)

### 29.6.13 scriptName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the FileMaker script to be run after the action specified by the API call and after the subsequent sort.
**Notes:** Pass parameter via scriptParam property.
(Read and Write property)

### 29.6.14 scriptParam as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A parameter for the FileMaker script named by scriptName.
**Notes:** (Read and Write property)

### 29.6.15 scriptPrerequestName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the FileMaker script to be run before the action specified by the API call and the subsequent sort.
**Notes:** Pass parameter via scriptPrerequestParam property.
(Read and Write property)

### 29.6.16 scriptPrerequestParam as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A parameter for the FileMaker script named by script.prerequest.
**Notes:** (Read and Write property)

### 29.6.17 scriptPresortName as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the FileMaker script to be run after the action specified by the API call but before the subsequent sort.
**Notes:** Pass parameter via scriptPresortParam property.
(Read and Write property)

### 29.6.18 scriptPresortParam as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A parameter for the FileMaker script named by scriptPresortName.
**Notes:** (Read and Write property)

### 29.6.19 sort as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field name and sort order of the result set.
**Notes:** The order in which the criteria are specified determines the precedence. Records are returned in the original creation order if a sort order is not provided. The default sort order is ”ascend”.
A JSON value, e.g.:
[ { ”fieldName”: ”LastName”, ”sortOrder”: ”ascend” } , { ”fieldName”: ”FirstName”, ”sortOrder”: ”ascend” } ]
(Read and Write property)

## 29.7 class FMResponseMBS

### 29.7.1 class FMResponseMBS

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a response from FileMaker Server.
**Notes:** We provide error status properties, the body sent and result returned.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- Connect to Claris FileMaker Server from Xojo via Data API
- MBS Xojo Plugins, version 20.4pr7

### 29.7.2 Methods

### 29.7.3 Constructor

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 29.7.4 Properties

### 29.7.5 BodySent as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The body we sent for inspection.
**Notes:** (Read only property)

### 29.7.6 CURLErrorCode as Integer

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code from CURL.
**Notes:** Value is zero for success.
(Read only property)

### 29.7.7 CURLErrorMessage as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message from CURL.
**Notes:** (Read only property)

### 29.7.8 DebugMessages as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CURL debug messages.
**Notes:** (Read only property)

### 29.7.9 EffectiveURL as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The effective URL used.
**Notes:** (Read only property)

### 29.7.10 ErrorCode as Integer

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code from FileMaker server.
**Notes:** Value is zero for no error.
Value is -1 if higher level things went wrong like the CURL transfer.
(Read only property)

### 29.7.11 ErrorMessage as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message.
**Notes:** May be CURL error message if the transfer failed.
(Read only property)

### 29.7.12 RawResultJSON as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RAW result from server.
**Notes:** Includes the wrapper and error message entries.
Inner response entry is used to fill ResultJSON and Result properties.
(Read only property)

### 29.7.13 ResponseCode as Integer

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The response code from the HTTP request.
**Notes:** Usually 200 for success. Or 401 for authorization error.
(Read only property)

### 29.7.14 Result as Variant

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parsed result.
**Notes:** Provided as variant with arrays, dictionary, numbers and strings as needed.
Arrays are arrays of variant and may contain values.
(Read only property)

### 29.7.15 ResultJSON as String

MBS FMAPI Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The JSON from the result.
**Notes:** Extracted response from RawResultJSON.
Available parsed as Xojo data via result property.
(Read only property)

# Chapter 30

# Clipboard

## 30.1 class ClipboardMBS

### 30.1.1 class ClipboardMBS

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** A clipboard class for Mac OS.
**Notes:** For all datatypes, the available function is faster than the size function. And the both functions are faster than the getter function.

This is older Carbon API. You may want to prefer NSPasteboardMBS class with new projects.
Only available in Mac 32 bit applications. Will not be ported to 64 bit.
**Blog Entries**

- Windows, Xojo and the Clipboard
- MBS Real Studio Plugins, version 13.1pr12

### 30.1.2 Methods

### 30.1.3 AddData(FlavorType as string,data as string)

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds data to the scrap.

### 30.1.4 AddText(Text as string)

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds text to the scrap.

### 30.1.5 AddUnicodeText(Text as string)

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds unicode text to the clipboard.
**Notes:** UTF16 encoded strings only.

### 30.1.6 clear

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Clears the clipboard.
**Notes:** You must clear before you add something.

### 30.1.7 close

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 30.1.8 DataAvailable(FlavorType as string) as boolean

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether data is available.

### 30.1.9 DataSize(FlavorType as string) as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the byte size of the selected data.

### 30.1.10 GetData(FlavorType as string) as string

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the data of a given type.
**Example:**

```
// Take PICT data from clipboard

dim c as ClipboardMBS
dim s as string

c=new ClipboardMBS

if c.DataAvailable("PICT") then

s=c.GetData("PICT")

if s<>"" then
Backdrop=BuildPictureWithPicHandleDataMBS(s)
end if
end if
```

### 30.1.11 GetText as string

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns text from the clipboard.

### 30.1.12 GetUnicodeText as string

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the unicode text from the scrap.
**Notes:** UTF16 encoded strings only.

### 30.1.13 PictAvailable as boolean

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether a pict handle picture is on the clipboard.

### 30.1.14 ScrapFlavorCount as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** The number of flavor in the clipboard.
**Example:**

```
dim clip as ClipboardMBS
dim i,c,c1,c2 as Integer
dim s as string

clip=new ClipboardMBS

c=clip.ScrapFlavorCount

s=str(c)+" types: "

c1=c-1
c2=c-2

for i=0 to c2
s=S+clip.ScrapFlavorType(i)+", "
next

if c>0 then
s=S+clip.ScrapFlavorType(c1)
end if

MsgBox s
```

**Notes:** Calling this function recreates the internal flavor list in the Xojo clipboard object.

### 30.1.15 ScrapFlavorFlags(index as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the flags of the given flavor.
**Notes:** Index goes from 0 to count-1.
Returns 0 on any error.

Flags are a combination of type values:
1 - private data (Sender only)
2 - translated data

### 30.1.16 ScrapFlavorType(index as Integer) as string

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of the given flavor.
**Notes:** Index goes from 0 to count-1.
Returns "" on any error.

### 30.1.17 TextAvailable as boolean

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether text is available.

### 30.1.18 TextSize as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** The length of the text available on the clipboard.

### 30.1.19 UnicodeTextAvailable as boolean

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether unicode text is available.
**Notes:** UTF16 encoded strings only.

### 30.1.20 UnicodeTextSize as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** The length of the unicode text.
**Notes:** UTF16 encoded strings only.

### 30.1.21 Properties

### 30.1.22 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the clipboard.
**Notes:** Carbon only.
(Read only property)

## 30.2 class NSPasteboardItemDataProviderMBS

### 30.2.1 class NSPasteboardItemDataProviderMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This protocol is implemented by the data provider of a pasteboard item to provide the data for a particular UTI type.
**Notes:** You can specify an object as a pasteboard data provider for a pasteboard item using NSPasteboard-ItemMBS's setDataProviderForTypes method. The data provider must implement this protocol to provide data upon request.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr11

### 30.2.2 Methods

### 30.2.3 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 30.2.4 Destructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 30.2.5 Properties

### 30.2.6 Handle as Integer

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 30.2.7 Events

### 30.2.8 Finished(Pasteboard as NSPasteboardMBS)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the pasteboard no longer needs the data provider for any of its pasteboard items.
**Notes:** One data provider can provide data for more than one pasteboard item. This method is called when the pasteboard no longer needs the data provider for any of its pasteboard items. This can be either because the data provider has fulfilled all promises, or because ownership of the pasteboard has changed.

Available in OS X v10.6 and later.

### 30.2.9 provideDataForType(Pasteboard as NSPasteboardMBS, item as NSPasteboardItemMBS, type as string)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the receiver to provide data for a specified type to a given pasteboard. (required)
**Notes:** pasteboard: A pasteboard to which the receiver has promised to provide data.
item: A pasteboard item for which the receiver has promised to provide data
type: A UTI type string.

The receiver was previously set as the provider using setDataProviderForTypes.
Available in OS X v10.6 and later.

## 30.3 class NSPasteboardItemMBS

### 30.3.1 class NSPasteboardItemMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** NSPasteboardItem is a generic class to represent an item on a pasteboard.
**Example:**

```
dim n as new NSPasteboardItemMBS

dim type as string = NSPasteboardmbs.NSPasteboardTypeString
n.stringForType(type) = "Hello World"
MsgBox n.stringForType(type)
```

**Notes:** There are three main uses for an NSPasteboardItem object:

Providing data on the pasteboard.
You can create one or more pasteboard items, set data or data providers for types, and write to them pasteboard.

Customizing data already on the pasteboard.
As a delegate or subclass, you can retrieve the pasteboard items currently on the pasteboard, read the existing types and data and set new data and data providers for types as needed.

Retrieving data from the pasteboard.
You can retrieve pasteboard items from the pasteboard then read the data for types you're interested in.

A pasteboard item can be associated with a single pasteboard. When you create an item, it can be written to any pasteboard. When you pass an item to a pasteboard in writeObjects, that item becomes bound to the pasteboard it was written to. When you retrieve items from a pasteboard using pasteboardItems, the returned items are associated with the messaged pasteboard. Passing an item that is already associated with a pasteboard into writeObjects: causes an exception to be raised.

Pasteboard items are intended to be used during a single pasteboard interaction, not held onto and used repeatedly. A pasteboard item is only valid until the owner of the pasteboard changes.

Important: If a pasteboard item is stale because the pasteboard owner has changed, it returns nil or false values from its methods.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr11

### 30.3.2 Methods

### 30.3.3 availableTypeFromArray(types() as string) as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns from a given array of types the the first type contained in the pasteboard item, according to the ordering of types.
**Notes:** types: An array of strings representing UTIs, arranged in order of preference (most preferred as the 0th element in the array).

Returns the first (according to the sender's ordering of types) type in types contained in the pasteboard item, or nil if the receiver does not contain any types given in types.

The method checks for UTI conformance of the requested types, preferring an exact match to conformance. Available in OS X v10.6 and later.

### 30.3.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 30.3.5 Destructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 30.3.6 setDataProviderForType(dataProvider as NSPasteboardItemDataProviderMBS, types() as string) as boolean

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the data provider for the specified types.
**Notes:** dataProvider: A pasteboard data provider.
types: An array of strings indicating the UTIs for the data representations dataProvider may provide.

Returns true if the data provider was set successfully, otherwise false.

This method registers the data provider to be messaged to provide the data for any of the specified types when requested.
Available in OS X v10.6 and later.

### 30.3.7 types as string()

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of UTI strings of the data types supported by the receiver.
**Notes:** Available in OS X v10.6 and later.

### 30.3.8 Properties

### 30.3.9 dataProvider as NSPasteboardItemDataProviderMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last dataprovider used with setDataProviderForTypes.
**Notes:** You should keep your dataprovider alive, so the object is not destroyed while pasteboarditem is used.
In this property we keep a reference to the data provider for you.
(Read and Write property)

### 30.3.10 Handle as Integer

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 30.3.11 dataForType(type as string) as memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value for a specified type as a memoryblock object.
**Example:**

```
dim n as new NSPasteboardItemMBS

dim data as MemoryBlock = "Hello World"
dim type as string = NSPasteboardmbs.NSPasteboardTypeString
```

```
n.dataForType(type) = data

dim d as MemoryBlock = n.dataForType(type)
MsgBox DefineEncoding(d, encodings.UTF8)
```

**Notes:** (Read and Write computed property)

### 30.3.12 propertyListForType(type as string) as Variant

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value for a specified type as a property list.
**Notes:** Stores a property list object (array, dictionary, string, numbers, memoryblocks)
Available in OS X v10.6 and later.
(Read and Write computed property)

### 30.3.13 stringForType(type as string) as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value for the specified type as a string.
**Example:**

```
dim n as new NSPasteboardItemMBS

dim type as string = NSPasteboardmbs.NSPasteboardTypeString
n.stringForType(type) = "Hello World"
MsgBox n.stringForType(type)
```

**Notes:** type: A UTI type string.

Available in OS X v10.6 and later.
(Read and Write computed property)

## 30.4 class NSPasteboardMBS

### 30.4.1 class NSPasteboardMBS

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for the clipboard access on Cocoa.
**Example:**

```
dim p as new NSPasteboardMBS

MsgBox join(p.types,EndOfLine)
```

**Notes:** NSPasteboard objects transfer data to and from the pasteboard server. The server is shared by all running applications. It contains data that the user has cut or copied, as well as other data that one application wants to transfer to another. NSPasteboard objects are an application's sole interface to the server and to all pasteboard operations.

An NSPasteboard object is also used to transfer data between applications and service providers listed in each application's Services menu. The drag pasteboard (NSDragPboard) is used to transfer data that is being dragged by the user.

The plugin class NSPasteboardMBS does not implement all features of the NSPasteboard. If you miss something, please email us.
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr2
- Windows, Xojo and the Clipboard
- MBS Xojo Plugins, version 17.1pr3
- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr12
- Teaser: Clipboard classes

### 30.4.2 Methods

### 30.4.3 addType(type as string) as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds promises for the specified types to the first pasteboard item.
**Notes:** types: An array of strings, each of which specifies a type of data that can be provided to the pasteboard.

Returns the new change count, or 0 if there was an error adding the types.

This method adds promises for the specified types to the first pasteboard item.

You use this methods to declare additional types of data for the first pasteboard item in the receiver. You can also use it to replace existing types added by a previous declareTypes or addTypes call.

The types parameter specifies the types of data you are promising to the pasteboard. The types should be ordered according to the preference of the source application, with the most preferred type coming first (typically, the richest representation). New types are added to the end of the list containing any existing types, if any.

If you specify a type that has already been declared, this method replaces the owner of that type with the value in newOwner. In addition, any data already already written to the pasteboard for that type is removed.

### 30.4.4 addTypes(types() as string) as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds promises for the specified types to the first pasteboard item.
**Notes:** types: An array of strings, each of which specifies a type of data that can be provided to the pasteboard.

Returns the new change count, or 0 if there was an error adding the types.

This method adds promises for the specified types to the first pasteboard item.

You use this methods to declare additional types of data for the first pasteboard item in the receiver. You can also use it to replace existing types added by a previous declareTypes or addTypes call.

The types parameter specifies the types of data you are promising to the pasteboard. The types should be ordered according to the preference of the source application, with the most preferred type coming first (typically, the richest representation). New types are added to the end of the list containing any existing types, if any.

If you specify a type that has already been declared, this method replaces the owner of that type with the

value in newOwner. In addition, any data already already written to the pasteboard for that type is removed.

### 30.4.5 changeCount as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's change count.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSGeneralPboard)

MsgBox str(p.changeCount)
```

**Notes:** The change count starts at zero when a client creates the receiver and becomes the first owner. The change count subsequently increments each time the pasteboard ownership changes.

The change count is also returned from clearContents and declareTypes. You can therefore record the change count at the time that you take ownership of the pasteboard and later compare it with the value returned from changeCount to determine whether you still have ownership.

### 30.4.6 clearContents as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clears the existing contents of the pasteboard.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSGeneralPboard)

MsgBox str(p.clearContents)
```

**Notes:** Clears the existing contents of the pasteboard, preparing it for new contents. This is the first step in providing data on the pasteboard.

Available in Mac OS X v10.6 and later.

### 30.4.7 Constructor

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new NSPasteboardMBS object linked to the general NSPasteboard object.
**Example:**

```
dim p as new NSPasteboardMBS

MsgBox join(p.types,EndOfLine)
```

**Notes:** On success the handle property is not 0.
See also:

- 30.4.8 Constructor(name as string) 5536

### 30.4.8 Constructor(name as string)

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new NSPasteboardMBS object linked to the pasteboard with the specified name.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSFindPboard)

// shows last find string
MsgBox p.stringForType(p.NSPasteboardTypeString)
```

**Notes:** On success the handle property is not 0.
See also:

- 30.4.7 Constructor 5535

### 30.4.9 declareType(type as string) as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Prepares the receiver for a change in its contents by declaring the new types of data it will contain.
**Notes:** type: An strings that specify the type of data that may be added to the new pasteboard. The types should be ordered according to the preference of the source application, with the most preferred type coming first (typically, the richest representation).

Returns the receiver's new change count.

This method is the equivalent of invoking clearContents, implicitly writing the first pasteboard item, and then calling addTypes to promise types for the first pasteboard item.

In Mac OS X v10.5 and earlier, this method is the first step in writing data to the pasteboard and must precede the messages that actually write the data. A declareTypes message essentially changes the contents of the receiver: It invalidates the current contents of the receiver and increments its change count.

### 30.4.10 declareTypes(types() as string) as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Prepares the receiver for a change in its contents by declaring the new types of data it will contain.
**Notes:** type: An array of Strings that specify the types of data that may be added to the new pasteboard. The types should be ordered according to the preference of the source application, with the most preferred type coming first (typically, the richest representation).

Returns the receiver's new change count.

This method is the equivalent of invoking clearContents, implicitly writing the first pasteboard item, and then calling addTypes to promise types for the first pasteboard item.

In Mac OS X v10.5 and earlier, this method is the first step in writing data to the pasteboard and must precede the messages that actually write the data. A declareTypes message essentially changes the contents of the receiver: It invalidates the current contents of the receiver and increments its change count.

### 30.4.11 generalPasteboard as NSPasteboardMBS

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the general NSPasteboard object.
**Example:**

```
dim p as NSPasteboardMBS = NSPasteboardMBS.generalPasteboard
MsgBox join(p.types,EndOfLine)
```

### 30.4.12 name as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's name.
**Example:**

```
dim p as new NSPasteboardMBS

MsgBox p.name
```

### 30.4.13 NSColorPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** NSColor data.
On Mac OS X v10.6 and later, use NSPasteboardTypeColor (and you read and write colors directly to and from the pasteboard).

### 30.4.14 NSDragPboard as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the names for pasteboards.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSDragPboard)
MsgBox p.name
```

**Notes:** The pasteboard that stores data to be moved as the result of a drag operation.
For additional information on working with the drag pasteboard, see Drag and Drop Programming Topics for Cocoa.

### 30.4.15 NSFilenamesPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** An array of strings designating one or more filenames.
On Mac OS X v10.6 and later, use writeObjects to write file URLs to the pasteboard.

### 30.4.16 NSFilesPromisePboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Promised files.
On Mac OS X v10.6 and later, use kPasteboardTypeFileURLPromise instead.
For information on promised files, see Dragging Files in Drag and Drop Programming Topics for Cocoa.

### 30.4.17 NSFindPboard as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the names for pasteboards.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSFindPboard)
MsgBox p.name
```

**Notes:** The pasteboard that holds information about the current state of the active application's find panel. This information permits users to enter a search string into the find panel, then switch to another application to conduct another search.

### 30.4.18 NSFontPboard as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the names for pasteboards.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSFontPboard)
MsgBox p.name
```

**Notes:** The pasteboard that holds font and character information and supports Copy Font and Paste Font commands that may be implemented in a text editor.

### 30.4.19 NSFontPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Font and character information.
On Mac OS X v10.6 and later, use NSPasteboardTypeFont instead.

### 30.4.20 NSGeneralPboard as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the names for pasteboards.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSGeneralPboard)
MsgBox p.name
```

**Notes:** The pasteboard that's used for ordinary cut, copy, and paste operations.
This pasteboard holds the contents of the last selection that's been cut or copied.

### 30.4.21 NSHTMLPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** HTML (which an NSTextView object can read from, but not write to).
On Mac OS X v10.6 and later, use NSPasteboardTypeHTML instead.

### 30.4.22 NSInkTextPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Ink text data.
On Mac OS X v10.6 and later, use kUTTypeInkText instead.
For information on ink text objects, see Using Ink Services in Your Application.

### 30.4.23 NSMultipleTextSelectionPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Multiple text selection.
On Mac OS X v10.6 and later, use NSPasteboardTypeMultipleTextSelection instead.
Available in Mac OS X v10.5 and later.

### 30.4.24 NSPasteboardTypeColor as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Color data (an NSColor object).
Available in Mac OS X v10.6 and later.

### 30.4.25 NSPasteboardTypeFindPanelSearchOptions as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Type for the Find panel metadata property list.
Available in Mac OS X v10.6 and later.

### 30.4.26 NSPasteboardTypeFont as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Font and character information.
Available in Mac OS X v10.6 and later.

### 30.4.27 NSPasteboardTypeHTML as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** HTML data.
Available in Mac OS X v10.6 and later.

### 30.4.28 NSPasteboardTypeMultipleTextSelection as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Multiple text selection.
Available in Mac OS X v10.6 and later.

### 30.4.29 NSPasteboardTypePDF as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** PDF data.
Available in Mac OS X v10.6 and later.

### 30.4.30 NSPasteboardTypePNG as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** PNG image data.
Available in Mac OS X v10.6 and later.

### 30.4.31 NSPasteboardTypeRTF as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Rich Text Format (RTF) data.
Available in Mac OS X v10.6 and later.

### 30.4.32 NSPasteboardTypeRTFD as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** RTFD formatted file contents.
Available in Mac OS X v10.6 and later.

### 30.4.33 NSPasteboardTypeRuler as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Paragraph formatting information.
Available in Mac OS X v10.6 and later.

### 30.4.34 NSPasteboardTypeSound as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Sound data (an NSSound object).
Available in Mac OS X v10.6 and later.

### 30.4.35 NSPasteboardTypeString as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** String data.
Available in Mac OS X v10.6 and later.

### 30.4.36 NSPasteboardTypeTabularText as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** A string containing tab-separated fields of text.
Available in Mac OS X v10.6 and later.

### 30.4.37 NSPasteboardTypeTIFF as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for defining UTIs for common pasteboard data types.
**Notes:** Tag Image File Format (TIFF) data.
Available in Mac OS X v10.6 and later.

### 30.4.38 NSPDFPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** PDF data.
On Mac OS X v10.6 and later, use NSPasteboardTypePDF instead.

### 30.4.39 NSPICTPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** QuickDraw picture data.
The PICT format was formally deprecated in Mac OS X v10.4 along with QuickDraw. You should not be explicitly providing or looking for PICT data on the pasteboard.
To aid in this deprecation, if PICT is the only image type on the pasteboard, as is sometimes the case when copying images from 32-bit Carbon applications, a translated image type will be automatically reported and provided by NSPasteboard. The translated type is added to the types array ahead of PICT so that the deprecated PICT format is not the preferred format. In addition, when an application provides image data to NSPasteboard, the Carbon Pasteboard Manager will automatically make a PICT translation available to 32-bit Carbon applications.
Although NSPICTPboardType, and its UTI equivalent kUTTypePICT, will appear in a pasteboard's type array retrieved from the existing NSPasteboard API, it may cease to be reported in future releases.

### 30.4.40 NSPostScriptPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Encapsulated PostScript (EPS) code.
On Mac OS X v10.6 and later, use @"com.adobe.encapsulated-postscript" instead.

### 30.4.41 NSRTFDPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** RTFD formatted file contents.
On Mac OS X v10.6 and later, use NSPasteboardTypeRTFD instead.

### 30.4.42 NSRTFPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Rich Text Format (RTF) data.
On Mac OS X v10.6 and later, use NSPasteboardTypeRTF instead.

### 30.4.43 NSRulerPboard as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the names for pasteboards.
**Example:**

```
dim p as new NSPasteboardMBS(NSPasteboardMBS.NSRulerPboard)
MsgBox p.name
```

**Notes:** The pasteboard that holds information about paragraph formats in support of the Copy Ruler and Paste Ruler commands that may be implemented in a text editor.

### 30.4.44 NSRulerPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Paragraph formatting information.
On Mac OS X v10.6 and later, use NSPasteboardTypeRuler instead.

### 30.4.45 NSStringPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** String data.
On Mac OS X v10.6 and later, use NSPasteboardTypeString instead.

### 30.4.46 NSTabularTextPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** A string containing tab-separated fields of text.
On Mac OS X v10.6 and later, use NSPasteboardTypeTabularText instead.

### 30.4.47 NSTIFFPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** Tag Image File Format (TIFF) data.
On Mac OS X v10.6 and later, use NSPasteboardTypeTIFF instead.

### 30.4.48 NSURLPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** NSURL data for one file or resource.
On Mac OS X v10.6 and later, use writeObjects: to write URLs directly to the pasteboard instead.
On Mac OS X v10.5 and earlier: to write an URL to a pasteboard you use writeToPasteboard: (NSURL); to get an URL from a pasteboard you use URLFromPasteboard: (NSURL).

### 30.4.49 NSVCardPboardType as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the common pasteboard data types.
**Notes:** VCard data.
On Mac OS X v10.6 and later, use kUTTypeVCard instead.

### 30.4.50 pasteboardItems as NSPasteboardItemMBS()

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns all the items held by the receiver.
**Notes:** Returns all the items held by the receiver, or nil if there is an error retrieving pasteboard items.
Available in OS X v10.6 and later.

### 30.4.51 pasteboardWithName(name as string) as NSPasteboardMBS

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the pasteboard with the specified name.
**Example:**

```
dim p as NSPasteboardMBS = NSPasteboardMBS.pasteboardWithName(NSPasteboardMBS.NSFindPboard)

// shows last find string
MsgBox p.stringForType(p.NSPasteboardTypeString)
```

### 30.4.52 pasteboardWithUniqueName as NSPasteboardMBS

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a new pasteboard with a name that is guaranteed to be unique with respect to other pasteboards on the computer.
**Notes:** This method is useful for applications that implement their own interprocess communication using pasteboards.

### 30.4.53 releaseGlobally

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Releases the receiver's resources in the pasteboard server.
**Notes:** After this method is invoked, no other application can use the receiver.

A temporary, privately named pasteboard can be released this way when it is no longer needed, but a standard pasteboard should never be released globally.

### 30.4.54 SetPasteboardItems(items() as NSPasteboardItemMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes pasteboard items to the pasteboard.
**Notes:** Returns true if the array was successfully added, otherwise false.
See also:

- 30.4.55 SetPasteboardItems(items() as Variant) as boolean 5547

### 30.4.55 SetPasteboardItems(items() as Variant) as boolean

MBS MacBase Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes pasteboard items to the pasteboard.
**Example:**

```
Dim paths() As String

paths.Append "/Users/cs/Pictures/test1.jpg"
paths.Append "/Users/cs/Pictures/test2.png"
```

```
paths.Append "/Users/cs/Pictures/test3.jpg"

Dim n As NSPasteboardMBS = NSPasteboardMBS.generalPasteboard

Dim files() As Variant
For Each path As String In paths

files.Append new FolderItem(path, FolderItem.PathModes.Native)

Next

Call n.clearContents

If n.SetPasteboardItems(files) Then
Break // okay
Else
Break // failed
End If
```

**Notes:** This method allows you to mix NSPasteboardItemMBS, folderitem, NSURLMBS, strings, NSAttributedStringMBS and other data to put on clipboard.
Returns true if the array was successfully added, otherwise false.
See also:

- 30.4.54 SetPasteboardItems(items() as NSPasteboardItemMBS) as Boolean 5547

### 30.4.56 types as string()

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the receiver's supported data types.
**Example:**

```
dim p as new NSPasteboardMBS

MsgBox join(p.types,EndOfLine)
```

**Notes:** An array of Strings containing the union of the types of data declared for all the pasteboard items on the receiver. The returned types are listed in the order they were declared.

You must send a types or availableTypeFromArray message before reading any data from an NSPasteboard object.

### 30.4.57 URLFromPasteboard as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads the URL string off of pasteboard.
**Notes:** Returns "" if pasteboard does not contain data of type NSURLPboardType.

### 30.4.58 writeURLToPasteboard(URL as string)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes the receiver to pasteboard.
**Notes:** You must declare an NSURLPboardType data type for pasteboard before invoking this method; otherwise it returns without doing anything.

### 30.4.59 Properties

### 30.4.60 Handle as Integer

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSPasteBoard object.
**Example:**

```
dim p as new NSPasteboardMBS

MsgBox hex(p.Handle)
```

**Notes:** (Read and Write property)

### 30.4.61 dataForType(type as string) as Memoryblock

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the data for the specified type from the first item in the receiver that contains the type or sets the given data as the representation for the specified type for the first item on the receiver.
**Example:**

```
dim p as new NSPasteboardMBS

// may have chr(0) on the end!
MsgBox p.dataForType(p.NSPasteboardTypeString)
```

**Notes:** Returns a data object containing the data for the specified type from the first item in the receiver that contains the type, or "" if the contents of the pasteboard changed since they were last checked.

This method may also return nil if the pasteboard server cannot supply the data in time—for example, if the pasteboard's owner is slow in responding to a pasteboard:provideDataForType: message and the interprocess communication times out.

Errors other than a timeout raise a NSPasteboardCommunicationException (a NSExceptionMBS in Xojo).

If "" is returned, the application should put up a panel informing the user that it was unable to carry out the paste operation.

For standard text data types such as string, RTF, and RTFD, the text data from each item is returned as one combined result separated by newlines.
(Read and Write computed property)

### 30.4.62 propertyListForType(type as string) as Variant

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The property list for the specified type from the first item in the receiver that contains the type.
**Notes:** dataType: The pasteboard data type containing the property-list data.

The property list for the specified type from the first item in the receiver that contains the type. This object consists of NSArray, NSData, NSDictionary, or NSString objects—or any combination thereof.

This method invokes the dataForType method.
You must send types or availableTypeFromArray before invoking propertyListForType.
(Read and Write computed property)

### 30.4.63 stringForType(type as string) as string

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get/Set the given string as the representation for the specified type for the first item on the receiver.
**Example:**

```
dim p as new NSPasteboardMBS
```

MsgBox p.stringForType(p.NSPasteboardTypeString)

**Notes:** A concatenation of the strings for the specified type from all the items in the receiver that contain the type, or nil if none of the items contain strings of the specified type.

This method invokes dataForType to obtain the string. If the string cannot be obtained, stringForType returns "". See dataForType for a description of what will cause "" to be returned.

In Mac OS X v10.6 and later, if the receiver contains multiple items that can provide string, RTF, or RTFD data, the text data from each item is returned as a combined result separated by newlines.
(Read and Write computed property)

# Chapter 31

# Clipper

## 31.1 class ClipperEngineMBS

### 31.1.1 class ClipperEngineMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Clipper class encapsulates boolean operations on polygons (intersection, union, difference and XOR), which is also called polygon clipping.
**Notes:** Input polygons, both subject and clip sets, are passed to a Clipper object by its AddPath and AddPaths methods, and the clipping operation is performed by calling its Execute method. Multiple boolean operations can be performed on the same input polygon sets by repeat calls to Execute.
**Videos**

- Presentation from Munich conference about MBS Plugins.

### 31.1.2 Methods

### 31.1.3 AddPath(path as ClipperPathMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.
**Notes:** 'Subject' paths may be either open (lines) or closed (polygons) or even a mixture of both, but 'clipping' paths must always be closed. Clipper allows polygons to clip both lines and other polygons, but doesn't allow lines to clip either lines or polygons.

With closed paths, orientation should conform with the filling rule that will be passed via Clippper's Execute

method.

Path Coordinate range:
Path coordinates must be between ¬± &h3FFFFFFFFFFFFFFF (¬± 4.6e+18), otherwise a range error will be thrown when attempting to add the path to the Clipper object. If coordinates can be kept between ¬± 0x3FFFFFFF (¬± 1.0e+9), a modest increase in performance (approx. 15-20%) over the larger range can be achieved by avoiding large integer math.

Return Value:
The function will return false if the path is invalid for clipping. A path is invalid for clipping when:

- it has less than 2 vertices
- it has 2 vertices but is not an open path
- the vertices are all co-linear and it is not an open path

Returns true on success.
See also:

- 31.1.4 AddPath(path as ClipperPathMBS, PolyType as Integer, Closed as Boolean) as Boolean 5554

### 31.1.4 AddPath(path as ClipperPathMBS, PolyType as Integer, Closed as Boolean) as Boolean

MBS Tools Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.
See also:

- 31.1.3 AddPath(path as ClipperPathMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean 5553

### 31.1.5 AddPaths(paths as ClipperPathsMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.
**Notes:** 'Subject' paths may be either open (lines) or closed (polygons) or even a mixture of both, but 'clipping' paths must always be closed. Clipper allows polygons to clip both lines and other polygons, but

doesn't allow lines to clip either lines or polygons.

With closed paths, orientation should conform with the filling rule that will be passed via Clippper's Execute method.

Path Coordinate range:
Path coordinates must be between ¬± &h3FFFFFFFFFFFFFFF (¬± 4.6e+18), otherwise a range error will be thrown when attempting to add the path to the Clipper object. If coordinates can be kept between ¬± 0x3FFFFFFF (¬± 1.0e+9), a modest increase in performance (approx. 15-20%) over the larger range can be achieved by avoiding large integer math.

Return Value:
The function will return false if the path is invalid for clipping. A path is invalid for clipping when:

- it has less than 2 vertices
- it has 2 vertices but is not an open path
- the vertices are all co-linear and it is not an open path

Returns true on success.
See also:

- 31.1.6 AddPaths(paths as ClipperPathsMBS, PolyType as Integer, Closed as Boolean) as Boolean 5555

### 31.1.6 AddPaths(paths as ClipperPathsMBS, PolyType as Integer, Closed as Boolean) as Boolean

MBS Tools Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.
See also:

- 31.1.5 AddPaths(paths as ClipperPathsMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean 5554

### 31.1.7 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Clear method removes any existing subject and clip polygons allowing the Clipper object to be reused for clipping operations on different polygon sets.

### 31.1.8 Constructor(initOptions as integer = 0)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Clipper constructor creates an instance of the Clipper class.
**Notes:** One or more InitOptions may be passed as a parameter to set the corresponding properties. (These properties can still be set or reset after construction.)

Options:

| | |
|---|---|
| ReverseSolution | 1 |
| StrictlySimple | 2 |
| PreserveCollinear | 4 |

### 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:


- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561

### 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:

- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561

### 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:

- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558

- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561


### 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:


- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561


### 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
**Notes:** Once subject and clip paths have been assigned (via AddPath and/or AddPaths), Execute can then perform the clipping operation (intersection, union, difference or XOR) specified by the clipType parameter.

The solution parameter can be either a Paths or PolyTree. The Paths is simpler than the PolyTree. Because of this it is quicker to populate and hence clipping performance is a little better (it's roughly 10% faster). However, the PolyTree class provides more information about the returned paths which may be important to users. Firstly, the PolyTree class preserves nested parent-child polygon relationships (ie outer polygons owning/containing holes and holes owning/containing other outer polygons etc). Also, only the PolyTree class can differentiate between open and closed paths since each PolyNode has an IsOpen property. (The Path structure has no member indicating whether it's open or closed.) For this reason, when open paths are passed to a Clipper object, the user must use a PolyTree object as the solution parameter, otherwise an exception will be raised.

When a PolyTree object is used in a clipping operation on open paths, two ancilliary functions have been provided to quickly separate out open and closed paths from the solution - ClipperMBS.OpenPathsFromPolyTree and ClipperMBS.ClosedPathsFromPolyTree. PolyTreeToPaths is also available to convert path data to a Paths structure (irrespective of whether they're open or closed).

There are several things to note about the solution paths returned:

- they aren't in any specific order
- they should never overlap or be self-intersecting (but see notes on rounding)
- holes will be oriented opposite outer polygons
- the solution fill type can be considered either EvenOdd or NonZero since it will comply with either filling rule
- polygons may rarely share a common edge (though this is now very rare as of version 6)

The subjFillType and clipFillType parameters define the polygon fill rule to be applied to the polygons (ie closed paths) in the subject and clip paths respectively. (It's usual though obviously not essential that both sets of polygons use the same fill rule.)

Execute can be called multiple times without reassigning subject and clip polygons (ie when different clipping operations are required on the same polygon sets).
See also:

- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558

- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561


### 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:


- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561


### 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:


- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556

- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5561


### 31.1.16 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer) as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper engine.
See also:


- 31.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5556
- 31.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 5557
- 31.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 5558
- 31.1.13 Execute(clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer) as Boolean 5558
- 31.1.14 Execute(clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer) as Boolean 5560
- 31.1.15 Execute(clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer) as Boolean 5560

### 31.1.17 GetBounds(byref left as integer, byref top as integer, byref right as integer, byref bottom as integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method returns the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.
**Notes:** This call is more efficient than querying all bounds properties.

### 31.1.18 Properties

### 31.1.19 BoundsBottom as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bottom of bounds.
**Notes:** This method returns the bottom value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.
(Read only property)

### 31.1.20 BoundsLeft as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Left of bounds.
**Notes:** This method returns the left value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.
(Read only property)

### 31.1.21 BoundsRight as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Right of bounds.
**Notes:** This method returns the right value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.
(Read only property)

### 31.1.22 BoundsTop as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Top of bounds.
**Notes:** This method returns the top value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.
(Read only property)

### 31.1.23 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.1.24 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.1.25 PreserveCollinear as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to preserve collinear in input polygons.
**Notes:** By default, when three or more vertices are collinear in input polygons (subject or clip), the Clipper object removes the 'inner' vertices before clipping. When enabled the PreserveCollinear property prevents this default behavior to allow these inner vertices to appear in the solution.
(Read and Write property)

### 31.1.26 ReverseSolution as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** When this property is set to true, polygons returned in the solution parameter of the Execute() method will have orientations opposite to their normal orientations.
**Notes:** (Read and Write property)

### 31.1.27 StrictlySimple as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to do strictly simple polygon.
**Notes:** Terminology:

- A simple polygon is one that does not self-intersect.
- A weakly simple polygon is a simple polygon that contains 'touching' vertices, or 'touching' edges.
- A strictly simple polygon is a simple polygon that does not contain 'touching' vertices, or 'touching' edges.

Vertices 'touch' if they share the same coordinates (and are not adjacent). An edge touches another if one of its end vertices touches another edge excluding its adjacent edges, or if they are co-linear and overlapping (including adjacent edges).

Polygons returned by clipping operations (see Clipper.Execute()) should always be simple polygons. When the StrictlySimply property is enabled, polygons returned will be strictly simple, otherwise they may be weakly simple. It's computationally expensive ensuring polygons are strictly simple and so this property is disabled by default.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
(Read and Write property)

### 31.1.28 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

## 31.2 class ClipperExceptionMBS

### 31.2.1 class ClipperExceptionMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception class for clipper.
**Notes:** Subclass of the RuntimeException class.

## 31.3 module ClipperMBS

### 31.3.1 module ClipperMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The central module for Clipper library methods.
**Blog Entries**

- Did you try our new Clipper plugin classes?
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr7

**Xojo Developer Magazine**

- 16.2, page 9: News

### 31.3.2 Methods

### 31.3.3 Area(path as ClipperPathMBS) as double

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the area of the supplied polygon.
**Notes:** It's assumed that the path is closed and does not self-intersect. Depending on orientation, this value may be positive or negative. If Orientation is true, then the area will be positive and conversely, if Orientation is false, then the area will be negative.

### 31.3.4 CleanPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clean polygon.
**Notes:** Removes vertices:
that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)
that are within the specified distance of an adjacent vertex
that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices
Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately ,àö2 so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit.

(If the egdes are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the InPoly and OutPolys parameters can reference the same Path object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.
See also:


- 31.3.5 CleanPolygon(Poly as ClipperPathMBS, distance as double = 1.415) 5567


### 31.3.5 CleanPolygon(Poly as ClipperPathMBS, distance as double = 1.415)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clean polygon.
**Notes:** Removes vertices:
that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)
that are within the specified distance of an adjacent vertex
that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices
Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately ,àö2 so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the egdes are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the in_poly and out_poly parameters can reference the same Path object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.
See also:


- 31.3.4 CleanPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415) 5566


### 31.3.6 CleanPolygons(InPoly as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates clean polygons.
**Notes:** Removes vertices:
that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)
that are within the specified distance of an adjacent vertex
that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices

Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately ,àö2 so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the egdes are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the InPoly and OutPoly parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.
See also:

- 31.3.7 CleanPolygons(Poly as ClipperPathsMBS, distance as double = 1.415) 5568

### 31.3.7 CleanPolygons(Poly as ClipperPathsMBS, distance as double = 1.415)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates clean polygons.
**Notes:** Removes vertices:
that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)
that are within the specified distance of an adjacent vertex
that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices
Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately ,àö2 so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the egdes are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the InPoly and OutPoly parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.
See also:

- 31.3.6 CleanPolygons(InPoly as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415) 5567

### 31.3.8 ClosedPathsFromPolyTree(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function filters out open paths from the PolyTree structure and returns only closed paths in a Paths structure.

### 31.3.9 EllipsePoints(Left as Double, Top as Double, Right as Double, Bottom as Double) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an ellipse as path of points with given bounding rectangle.
**Example:**

```
dim p as ClipperPathMBS = ClipperMBS.EllipsePoints(100,100,300,300)
```

### 31.3.10 MinkowskiDiff(poly1 as ClipperPathMBS, poly2 as ClipperPathMBS, byref solution as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates Minkowski Difference.
**Notes:** Minkowski Difference is performed by subtracting each point in a polygon from the set of points in an open or closed path. A key feature of Minkowski Difference is that when it's applied to two polygons, the resulting polygon will contain the coordinate space origin whenever the two polygons touch or overlap. (This function is often used to determine when polygons collide.)

In the image on the left the blue polygon is the 'minkowski difference' of the two red boxes. The black dot represents the coordinate space origin.

### 31.3.11 MinkowskiSum(pattern as ClipperPathMBS, path as ClipperPathMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates Minkowski sum.
**Notes:** Minkowski Addition is performed by adding each point in a polygon 'pattern' to the set of points in an open or closed path. The resulting polygon (or polygons) defines the region that the 'pattern' would pass over in moving from the beginning to the end of the 'path'.
See also:

- 31.3.12 MinkowskiSum(pattern as ClipperPathMBS, paths as ClipperPathsMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean) 

### 31.3.12 MinkowskiSum(pattern as ClipperPathMBS, paths as ClipperPathsMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates Minkowski sum.
**Notes:** Minkowski Addition is performed by adding each point in a polygon 'pattern' to the set of points in an open or closed path. The resulting polygon (or polygons) defines the region that the 'pattern' would pass over in moving from the beginning to the end of the 'path'.
See also:

- 31.3.11 MinkowskiSum(pattern as ClipperPathMBS, path as ClipperPathMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean) 5569

### 31.3.13 OpenPathsFromPolyTree(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function filters out closed paths from the PolyTree structure and returns only open paths in a Paths structure.

### 31.3.14 Orientation(path as ClipperPathMBS) as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries orientation of path.
**Notes:** Orientation is only important to closed paths. Given that vertices are declared in a specific order, orientation refers to the direction (clockwise or counter-clockwise) that these vertices progress around a closed path.

Orientation is also dependent on axis direction:

- On Y-axis positive upward displays, Orientation will return true if the polygon's orientation is counter-clockwise.
- On Y-axis positive downward displays, Orientation will return true if the polygon's orientation is clockwise.

Notes:

- Self-intersecting polygons have indeterminate orientations in which case this function won't return a meaningful value.

- The majority of 2D graphic display libraries (eg GDI, GDI+, XLib, Cairo, AGG, Graphics32) and even the SVG file format have their coordinate origins at the top-left corner of their respective viewports with their Y axes increasing downward. However, some display libraries (eg Quartz, OpenGL) have their coordinate origins undefined or in the classic bottom-left position with their Y axes increasing upward.

- For Non-Zero filled polygons, the orientation of holes must be opposite that of outer polygons.

- For closed paths (polygons) in the solution returned by Clipper's Execute method, their orientations will always be true for outer polygons and false for hole polygons (unless the ReverseSolution property has been enabled).

### 31.3.15 PointInPolygon(path as ClipperPathMBS, pt as ClipperPointMBS) as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns 0 when false, -1 when pt is on poly and +1 when pt is in poly.
**Notes:** It's assumed that 'poly' is closed and does not self-intersect.

### 31.3.16 PolyTreeToPaths(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function converts a PolyTree structure into a Paths structure.

### 31.3.17 ReversePath(path as ClipperPathMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the vertex order (and hence orientation) in the specified path.

### 31.3.18 ReversePaths(paths as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the vertex order (and hence orientation) in each contained path.

### 31.3.19 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygon (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'touching') will be split into two polygons.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:

- 31.3.20 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 5572

### 31.3.20 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygon (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'touching') will be split into two polygons.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:

- 31.3.19 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5572

### 31.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:


- 31.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 5573
- 31.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5573
- 31.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 5574


### 31.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:


- 31.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5572
- 31.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5573
- 31.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 5574


### 31.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:

- 31.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5572
- 31.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 5573
- 31.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 5574

### 31.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).
**Notes:** Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.
See also:

- 31.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5572
- 31.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 5573
- 31.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 5573

### 31.3.25 TranslatePath(path as ClipperPathMBS, delta as ClipperPointMBS) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offsets each point in path by x and y.
**Notes:** Returns a new path.
See also:

- 31.3.26 TranslatePath(path as ClipperPathMBS, x as Int64, y as Int64) as ClipperPathMBS 5575

### 31.3.26 TranslatePath(path as ClipperPathMBS, x as Int64, y as Int64) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offsets each point in path by x and y.
**Notes:** Returns a new path.
See also:

- 31.3.25 TranslatePath(path as ClipperPathMBS, delta as ClipperPointMBS) as ClipperPathMBS 5575

### 31.3.27 Version as string

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version of the Clipper library used.

### 31.3.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| hiRange | &h3FFFFFFFFFFFFFFF | The higher range. |
| loRange | &h3FFFFFFF | The lower range. |

## 31.4 class ClipperOffsetMBS

### 31.4.1 class ClipperOffsetMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ClipperOffset class encapsulates the process of offsetting (inflating/deflating) both open and closed paths using a number of different join types and end types.
**Notes:** Preconditions for offsetting:
1. The orientations of closed paths must be consistent such that outer polygons share the same orientation, and any holes have the opposite orientation (ie non-zero filling). Open paths must be oriented with closed outer polygons.
2. Polygons must not self-intersect.

Limitations:
When offsetting, small artefacts may appear where polygons overlap. To avoid these artefacts, offset overlapping polygons separately.
**Blog Entries**

- Did you try our new Clipper plugin classes?

### 31.4.2 Methods

### 31.4.3 AddPath(path as ClipperPathMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Path to a ClipperOffset object in preparation for offsetting.
**Notes:** Any number of paths can be added, and each has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.
See also:

- 31.4.4 AddPath(path as ClipperPathMBS, joinType as Integer, endType as Integer) 5576

### 31.4.4 AddPath(path as ClipperPathMBS, joinType as Integer, endType as Integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a Path to a ClipperOffset object in preparation for offsetting.
**Notes:** Any number of paths can be added, and each has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have

at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.
See also:

- 31.4.3 AddPath(path as ClipperPathMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType) 5576

### 31.4.5 AddPaths(paths as ClipperPathsMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds Paths to a ClipperOffset object in preparation for offsetting.
**Notes:** Any number of paths can be added, and each path has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.
See also:

- 31.4.6 AddPaths(paths as ClipperPathsMBS, joinType as Integer, endType as Integer) 5577

### 31.4.6 AddPaths(paths as ClipperPathsMBS, joinType as Integer, endType as Integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds Paths to a ClipperOffset object in preparation for offsetting.
**Notes:** Any number of paths can be added, and each path has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.
See also:

- 31.4.5 AddPaths(paths as ClipperPathsMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType) 5577

### 31.4.7 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method clears all paths from the ClipperOffset object, allowing new paths to be assigned.

### 31.4.8 Constructor(miterLimit as double = 2.0, roundPrecision as double = 0.25)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the clipper offset.
**Notes:** The ClipperOffset constructor takes 2 optional parameters: MiterLimit and ArcTolerance. Thes two parameters corresponds to properties of the same name. MiterLimit is only relevant when JoinType is jtMiter, and ArcTolerance is only relevant when JoinType is jtRound or when EndType is etOpenRound.

### 31.4.9 Execute(byref Paths as ClipperPathsMBS, delta as double)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper offset engine.
**Notes:** This method takes two parameters. The first is the structure that receives the result of the offset operation (either a PolyTree or a Paths structure). The second parameter is the amount to which the supplied paths will be offset. Negative delta values shrink polygons and positive delta expand them.

This method can be called multiple times, offsetting the same paths by different amounts (ie using different deltas).
See also:

- 31.4.10 Execute(byref PolyTree as ClipperPolyTreeMBS, delta as double) 5578

### 31.4.10 Execute(byref PolyTree as ClipperPolyTreeMBS, delta as double)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the clipper offset engine.
**Notes:** This method takes two parameters. The first is the structure that receives the result of the offset operation (either a PolyTree or a Paths structure). The second parameter is the amount to which the supplied paths will be offset. Negative delta values shrink polygons and positive delta expand them.

This method can be called multiple times, offsetting the same paths by different amounts (ie using different deltas).
See also:

- 31.4.9 Execute(byref Paths as ClipperPathsMBS, delta as double) 5578

### 31.4.11 Properties

### 31.4.12 ArcTolerance as Double

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The arc tolerance.
**Notes:** Firstly, this field/property is only relevant when JoinType = jtRound and/or EndType = etRound.

Since flattened paths can never perfectly represent arcs, this field/property specifies a maximum acceptable imprecision ('tolerance') when arcs are approximated in an offsetting operation. Smaller values will increase 'smoothness' up to a point though at a cost of performance and in creating more vertices to construct the arc.

The default ArcTolerance is 0.25 units. This means that the maximum distance the flattened path will deviate from the 'true' arc will be no more than 0.25 units (before rounding).

Reducing tolerances below 0.25 will not improve smoothness since vertex coordinates will still be rounded to integer values. The only way to achieve sub-integer precision is through coordinate scaling before and after offsetting (see example below).

It's important to make ArcTolerance a sensible fraction of the offset delta (arc radius). Large tolerances relative to the offset delta will produce poor arc approximations but, just as importantly, very small tolerances will substantially slow offsetting performance while providing unnecessary degrees of precision. This is most likely to be an issue when offsetting polygons whose coordinates have been scaled to preserve floating point precision.

Example:
Imagine a set of polygons (defined in floating point coordinates) that is to be offset by 10 units using round joins, and the solution is to retain floating point precision up to at least 6 decimal places.
To preserve this degree of floating point precision, and given that Clipper and ClipperOffset both operate on integer coordinates, the polygon coordinates will be scaled up by 108 (and rounded to integers) prior to offsetting. Both offset delta and ArcTolerance will also need to be scaled by this same factor. If ArcTolerance was left unscaled at the default 0.25 units, every arc in the solution would contain a fraction of 44 THOUSAND vertices while the final arc imprecision would be 0.25 √ó 10-8 units (ie once scaling was reversed). However, if 0.1 units was an acceptable imprecision in the final unscaled solution, then ArcTolerance should be set to 0.1 √ó scaling_factor (0.1 √ó 108 ). Now if scaling is applied equally to both ArcTolerance and to Delta Offset, then in this example the number of vertices (steps) defining each arc would be a fraction of 23.

The formula for the number of steps in a full circular arc is ... Pi / acos(1 - arc_tolerance / abs(delta))
(Read and Write property)

### 31.4.13 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.4.14 MiterLimit as Double

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The miter limit.
**Notes:** This property sets the maximum distance in multiples of delta that vertices can be offset from their original positions before squaring is applied. (Squaring truncates a miter by 'cutting it off' at 1 √ó delta distance from the original vertex.)

The default value for MiterLimit is 2 (ie twice delta). This is also the smallest MiterLimit that's allowed. If mitering was unrestricted (ie without any squaring), then offsets at very acute angles would generate unacceptably long 'spikes'.
(Read and Write property)

### 31.4.15 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.4.16 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

## 31.5 class ClipperPathMBS

### 31.5.1 class ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class contains a sequence of IntPoint vertices defining a single contour (see also terminology).
**Notes:** Paths may be open and represent a series of line segments bounded by 2 or more vertices, or they may be closed and represent polygons. Whether or not a path is open depends on context. Closed paths may be 'outer' contours or 'hole' contours. Which they are depends on orientation.

Multiple paths can be grouped into a Paths class: ClipperPathsMBS.

### 31.5.2 Methods

### 31.5.3 Append(item as ClipperPointMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a new point to the path.
See also:

- 31.5.4 Append(X as Int64, Y as Int64) 5581

### 31.5.4 Append(X as Int64, Y as Int64)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a new path.
**Notes:** Without creating intermediate Xojo ClipperPointMBS object.
See also:

- 31.5.3 Append(item as ClipperPointMBS) 5581

### 31.5.5 Area as double

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the area of the supplied polygon.
**Example:**

```
dim points() as ClipperPointMBS
```

```
points.Append new ClipperPointMBS(1,2)
points.Append new ClipperPointMBS(4,2)
points.Append new ClipperPointMBS(4,6)
points.Append new ClipperPointMBS(1,6)

dim path as new ClipperPathMBS(points)
dim area as Double = path.Area
```

**Notes:** It's assumed that the path is closed and does not self-intersect. Depending on orientation, this value may be positive or negative. If Orientation is true, then the area will be positive and conversely, if Orientation is false, then the area will be negative.

### 31.5.6 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the path.

### 31.5.7 Constructor

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty path.
See also:


- 31.5.8 Constructor(otherPath as ClipperPathMBS) 5582
- 31.5.9 Constructor(points() as ClipperPointMBS) 5582


### 31.5.8 Constructor(otherPath as ClipperPathMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new path with the copy of old path.
See also:


- 31.5.7 Constructor 5582
- 31.5.9 Constructor(points() as ClipperPointMBS) 5582


### 31.5.9 Constructor(points() as ClipperPointMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new path with given points.
See also:


- 31.5.7 Constructor 5582
- 31.5.8 Constructor(otherPath as ClipperPathMBS) 5582


### 31.5.10 Equal(otherPath as ClipperPathMBS) as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two paths are equal.
**Notes:** Returns true if both are equal.

### 31.5.11 Insert(Index as Integer, item as ClipperPointMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a point into the path at given index.
**Notes:** Index = 0 adds as first path.

### 31.5.12 Orientation as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries orientation of path.
**Example:**

```
dim points() as ClipperPointMBS

points.Append new ClipperPointMBS(1,2)
points.Append new ClipperPointMBS(4,2)
points.Append new ClipperPointMBS(4,6)
points.Append new ClipperPointMBS(1,6)

dim path as new ClipperPathMBS(points)
dim Orientation as boolean = path.Orientation
```

**Notes:** Orientation is only important to closed paths. Given that vertices are declared in a specific order, orientation refers to the direction (clockwise or counter-clockwise) that these vertices progress around a closed path.

Orientation is also dependent on axis direction:

- On Y-axis positive upward displays, Orientation will return true if the polygon's orientation is counter-clockwise.
- On Y-axis positive downward displays, Orientation will return true if the polygon's orientation is clockwise.

Notes:

- Self-intersecting polygons have indeterminate orientations in which case this function won't return a meaningful value.
- The majority of 2D graphic display libraries (eg GDI, GDI+, XLib, Cairo, AGG, Graphics32) and even the SVG file format have their coordinate origins at the top-left corner of their respective viewports with their Y axes increasing downward. However, some display libraries (eg Quartz, OpenGL) have their coordinate origins undefined or in the classic bottom-left position with their Y axes increasing upward.
- For Non-Zero filled polygons, the orientation of holes must be opposite that of outer polygons.
- For closed paths (polygons) in the solution returned by Clipper's Execute method, their orientations will always be true for outer polygons and false for hole polygons (unless the ReverseSolution property has been enabled).

### 31.5.13 PointInPolygon(pt as ClipperPointMBS) as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns 0 when false, -1 when pt is on poly and +1 when pt is in poly.
**Example:**

```
dim points() as ClipperPointMBS

points.Append new ClipperPointMBS(1,2)
points.Append new ClipperPointMBS(4,2)
points.Append new ClipperPointMBS(4,6)
points.Append new ClipperPointMBS(1,6)

dim path as new ClipperPathMBS(points)

dim b1 as Integer = path.PointInPolygon(new ClipperPointMBS(2,2)) // -1 on line
dim b2 as Integer = path.PointInPolygon(new ClipperPointMBS(2,22)) // 0 outside
dim b3 as Integer = path.PointInPolygon(new ClipperPointMBS(2,3)) // 1 = inside
```

**Notes:** It's assumed that 'poly' is closed and does not self-intersect.

### 31.5.14 Remove(index as integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a point.

### 31.5.15 ReversePath

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the vertex order (and hence orientation) in the specified path.

### 31.5.16 TranslatePath(delta as ClipperPointMBS) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offsets each point in path by x and y.
**Notes:** Returns a new path.
See also:

- 31.5.17 TranslatePath(x as Int64, y as Int64) as ClipperPathMBS 5585

### 31.5.17 TranslatePath(x as Int64, y as Int64) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offsets each point in path by x and y.
**Notes:** Returns a new path.
See also:

- 31.5.16 TranslatePath(delta as ClipperPointMBS) as ClipperPathMBS 5585

### 31.5.18 Values as ClipperPointMBS()

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates copy of path as Xojo array or ClipperPointMBS.

### 31.5.19 ValuesToArray(dest() as ClipperPointMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds ClipperPointMBS objects for the points in the path to the Xojo array.
**Notes:** Mainly for older Xojo versions where the plugin can't create an array for you.

### 31.5.20 Properties

### 31.5.21 Count as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of points in path.
**Notes:** (Read only property)

### 31.5.22 Empty as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if path is empty.
**Notes:** (Read only property)

### 31.5.23 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.5.24 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.5.25 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

### 31.5.26 Value(Index as Integer) as ClipperPointMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets a value in the path.
**Notes:** Raises exception if out of bounds.
(Read and Write computed property)

## 31.6 class ClipperPathsMBS

### 31.6.1 class ClipperPathsMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a list of paths.
**Notes:** This class is fundamental to the Clipper Library. It's a list or array of one or more Path structures. (The Path structure contains an ordered list of vertices that make a single contour.)

Paths may open (a series of line segments), or they may closed (polygons). Whether or not a path is open depends on context. Closed paths may be 'outer' contours or 'hole' contours. Which they are depends on orientation.

### 31.6.2 Methods

### 31.6.3 Append(item as ClipperPathMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a new path to the paths.

### 31.6.4 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the path.

### 31.6.5 Constructor

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty path.
See also:

- 31.6.6 Constructor(otherPaths as ClipperPathsMBS) 5588

### 31.6.6 Constructor(otherPaths as ClipperPathsMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new paths list with the copy of old paths list.
See also:

- 31.6.5 Constructor 5588

### 31.6.7 Equal(otherPaths as ClipperPathsMBS) as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two path lists are equal.
**Notes:** Returns true if both are equal.

### 31.6.8 Insert(Index as Integer, item as ClipperPathMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a path into the path list at given index.
**Notes:** Index = 0 adds as first point.

### 31.6.9 Remove(index as integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a path.

### 31.6.10 Reverse

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the vertex order (and hence orientation) in the specified paths.

### 31.6.11 Values as ClipperPathMBS()

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates copy of path list as Xojo array or ClipperPathMBS.

### 31.6.12 ValuesToArray(dest() as ClipperPathMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds ClipperPathMBS objects for the paths in the path list to the Xojo array.
**Notes:** Mainly for older Xojo versions where the plugin can't create an array for you.

### 31.6.13 Properties

### 31.6.14 Count as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of paths in paths.
**Notes:** (Read only property)

### 31.6.15 Empty as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if path list is empty.
**Notes:** (Read only property)

### 31.6.16 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.6.17 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.6.18 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

### 31.6.19 Value(Index as Integer) as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets a value in the path.
**Notes:** Raises exception if out of bounds.
(Read and Write computed property)

## 31.7 class ClipperPointMBS

### 31.7.1 class ClipperPointMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a point.
**Notes:** All functions accept nil as a point with values 0/0.

### 31.7.2 Methods

### 31.7.3 Constructor(x as Int64 = 0, y as Int64 = 0)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new point with given values.

### 31.7.4 Equal(other as ClipperPointMBS) as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two points.
**Notes:** Returns true if both have same value.
All functions accept nil as a point with values 0/0.

### 31.7.5 Point(x as Int64 = 0, y as Int64 = 0) as ClipperPointMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new point with given values.

### 31.7.6 Properties

### 31.7.7 X as Int64

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x coordinate.
**Notes:** (Read and Write property)

### 31.7.8 Y as Int64

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y coordinate.
**Notes:** (Read and Write property)

## 31.8 class ClipperPolyNodeMBS

### 31.8.1 class ClipperPolyNodeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a poly node.
**Notes:** PolyNodes are encapsulated within a PolyTree container, and together provide a data structure representing the parent-child relationships of polygon contours returned by Clipper's Execute method.

A PolyNode object represents a single polygon. Its IsHole property indicates whether it's an outer or a hole. PolyNodes may own any number of PolyNode children (Childs), where children of outer polygons are holes, and children of holes are (nested) outer polygons.

### 31.8.2 Methods

### 31.8.3 Constructor

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for a new object.

### 31.8.4 Properties

### 31.8.5 ChildCount as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of PolyNode Childs directly owned by the PolyNode object.
**Notes:** (Read only property)

### 31.8.6 Childs as ClipperPolyNodesMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The children.
**Notes:** A read-only list of PolyNode.
Outer PolyNode childs contain hole PolyNodes, and hole PolyNode childs contain nested outer PolyNodes.
(Read only property)

### 31.8.7 Contour as ClipperPathMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a path list which contains any number of vertices.
**Notes:** (Read and Write property)

### 31.8.8 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.8.9 IsHole as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true when the PolyNode's polygon (Contour) is a hole.
**Notes:** Children of outer polygons are always holes, and children of holes are always (nested) outer polygons. The IsHole property of a PolyTree object is undefined but its children are always top-level outer polygons.
(Read only property)

### 31.8.10 IsOpen as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true when the PolyNode's Contour results from a clipping operation on an open contour (path).
**Notes:** Only top-level PolyNodes can contain open contours.
(Read only property)

### 31.8.11 NextNode as ClipperPolyNodeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The returned Polynode will be the first child if any, otherwise the next sibling, otherwise the next sibling of the Parent etc.
**Notes:** A PolyTree can be traversed very easily by calling First() followed by NextNode in a loop until the returned object is a nil reference ...
(Read only property)

### 31.8.12 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.8.13 ParentNode as ClipperPolyNodeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the parent PolyNode.
**Notes:** The PolyTree object (which is also a PolyNode) does not have a parent and will return a null pointer.
(Read only property)

### 31.8.14 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

## 31.9 class ClipperPolyNodesMBS

### 31.9.1 class ClipperPolyNodesMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the node list.

### 31.9.2 Methods

### 31.9.3 Append(item as ClipperPolyNodeMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a new node to the node list.

### 31.9.4 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the node list.

### 31.9.5 Constructor

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty node list.
See also:

- 31.9.6 Constructor(otherPolyNodes as ClipperPolyNodesMBS) 5597

### 31.9.6 Constructor(otherPolyNodes as ClipperPolyNodesMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new poly node list with the copy of old poly node list.
See also:

- 31.9.5 Constructor 5597

### 31.9.7 Equal(otherPolyNodes as ClipperPolyNodesMBS) as boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two node lists are equal.
**Notes:** Returns true if both are equal.

### 31.9.8 Insert(Index as Integer, item as ClipperPolyNodeMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a poly node into the node list at given index.
**Notes:** Index = 0 adds as first node.

### 31.9.9 Remove(index as integer)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a node.

### 31.9.10 Values as ClipperPolyNodeMBS()

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates copy of node list as Xojo array or ClipperPolyNodeMBS.

### 31.9.11 Properties

### 31.9.12 Count as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of nodes.
**Notes:** (Read only property)

### 31.9.13 Empty as Boolean

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if list is empty.
**Notes:** (Read only property)

### 31.9.14 Handle as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 31.9.15 Owner as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

### 31.9.16 Tag as Variant

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store here whatever value you like.
(Read and Write property)

### 31.9.17 Value(Index as Integer) as ClipperPolyNodeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets a value in the node list.
**Notes:** Raises exception if out of bounds.
(Read and Write computed property)

## 31.10 class ClipperPolyTreeMBS

### 31.10.1 class ClipperPolyTreeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** PolyTree is intended as a read-only data structure that should only be used to receive solutions from clipping and offsetting operations.
**Notes:** It's an alternative to the Paths data structure which also receives these solutions. PolyTree's two major advantages over the Paths structure are: it properly represents the parent-child relationships of the returned polygons; it differentiates between open and closed paths. However, since PolyTree is a more complex structure than the Paths structure, and since it's more computationally expensive to process (the Execute method being roughly 5-10% slower), it should used only be when parent-child polygon relationships are needed, or when open paths are being 'clipped'.

An empty PolyTree object can be passed as the solution parameter in ClipperEngineMBS.Execute and in ClipperOffsetMBS.Execute. Once the clipping or offseting operation is completed, the method returns with the PolyTree structure filled with data representing the solution.

A PolyTree object is a container for any number of PolyNode children, with each contained PolyNode representing a single polygon contour (either an outer or hole polygon). PolyTree itself is a specialized PolyNode whose immediate children represent the top-level outer polygons of the solution. (Its own Contour property is always empty.) The contained top-level PolyNodes may contain their own PolyNode children representing hole polygons that may also contain children representing nested outer polygons etc. Children of outers will always be holes, and children of holes will always be outers.

PolyTrees can also contain open paths. Open paths will always be represented by top level PolyNodes. Two functions are provided to quickly separate out open and closed paths from a polytree - OpenPathsFromPolyTree and ClosedPathsFromPolyTree.
Subclass of the ClipperPolyNodeMBS class.

### 31.10.2 Methods

### 31.10.3 Clear

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method clears any PolyNode children contained by PolyTree the object.
**Notes:** Clear does not need to be called explicitly. The Clipper.Execute method that accepts a PolyTree parameter will automatically clear the PolyTree object before propagating it with new PolyNodes. Likewise, PolyTree's destructor will also automatically clear any contained PolyNodes.

### 31.10.4 Constructor

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty polytree.
See also:

- 31.10.5 Constructor(otherPolyNodes as ClipperPolyTreeMBS) 5601

### 31.10.5 Constructor(otherPolyNodes as ClipperPolyTreeMBS)

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of an existing poly tree.
See also:

- 31.10.4 Constructor 5601

### 31.10.6 Properties

### 31.10.7 First as ClipperPolyNodeMBS

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first node.
**Notes:** This method returns the first outer polygon contour if any, otherwise a null pointer.

This function is almost equivalent to calling Childs [ 0 ] except that when a PolyTree object is empty (has no children), calling Childs [ 0 ] would raise an out of range exception.
(Read only property)

### 31.10.8 Total as Integer

MBS Tools Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the total number of PolyNodes (polygons) contained within the PolyTree.
**Notes:** This value is not to be confused with ChildCount which returns the number of immediate children only (Childs) contained by PolyTree.
(Read only property)

# Chapter 32

# CloudKit

## 32.1 class CKAcceptSharesOperationMBS

### 32.1.1 class CKAcceptSharesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that accepts shared records.
**Notes:** Subclass of the CKOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr1

### 32.1.2 Methods

### 32.1.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to process share metadata.
**Notes:** You can use the returned CKAcceptSharesOperation only once. When executed, this query object processes the share metadata.
See also:


- 32.1.4 Constructor(shareMetadatas() as CKShareMetadataMBS) 5603


### 32.1.4 Constructor(shareMetadatas() as CKShareMetadataMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to process the specified share objects.
**Notes:** shareMetadatas: An array of CKShareMetadataMBS objects. This parameter is used to initialize the value in the shareMetadatas property. If you specify nil, you must assign an appropriate value to the shareMetadatas property before executing the operation.
See also:

- 32.1.3 Constructor 5603

### 32.1.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.1.6 setShareMetadatas(shareMetadatas() as CKShareMetadataMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the metadata of the shares that you want to process.
**Notes:** Use this property to view or change the metadata of the share objects you want to process. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.1.7 shareMetadatas as CKShareMetadataMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The metadata of the shares that you want to process.
**Notes:** Use this property to view or change the metadata of the share objects you want to process. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.1.8 Events

### 32.1.9 acceptSharesCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** This event is called when the operation completes.
**Notes:** The Completed event of the underlying NSOperation is also called if both are set. If the error is CKErrorPartialFailure, the error,Äôs userInfo dictionary contains a dictionary of shareURL objects to errors keyed off of CKPartialErrorsByItemIDKey. This call happens as soon as the server has seen all record

changes and may be invoked while the server is processing the side effects of those changes.

The event is executed serially with respect to the other progress blocks of the operation. If you intend to use this event to process results, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.1.10 perShareCompleted(shareMetadata as CKShareMetadataMBS, acceptedShare as CKShareMBS, error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each share metadata that the server has processed.
**Notes:** If the error is nil the share was successfully accepted. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.2 class CKAssetMBS

### 32.2.1 class CKAssetMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The class for a file.

### 32.2.2 Methods

### 32.2.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.2.4 Constructor(file as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initialize an asset to be saved with the content at the given file.
See also:

- 32.2.5 Constructor(URL as String) 5606

### 32.2.5 Constructor(URL as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initialize an asset to be saved with the content at the given file URL.
See also:

- 32.2.4 Constructor(file as FolderItem) 5606

### 32.2.6 Properties

### 32.2.7 fileURL as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The URL to the file.
**Notes:** Local file URL where fetched records are cached and saved records originate from.
(Read only property)

### 32.2.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 32.3 class CKContainerMBS

### 32.3.1 class CKContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An encapsulation of content associated with an app, including content that is accessible to all users and content that is available only to a specific user.
**Notes:** A container object manages all explicit and implicit attempts to access the contents of the container.

Every app has a default container object that manages its own native content. If you develop a suite of apps, you can also access any container objects for which you have the appropriate entitlements. Each new container distinguishes between publicly available data and data that is private to the current user. Private data is always stored in the appropriate container directory in the user,Äôs iCloud account.

see
https://developer.apple.com/reference/cloudkit/ckcontainer
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr1
- MBS Xojo Plugins, version 21.2pr4

### 32.3.2 Methods

### 32.3.3 accountStatus(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Reports whether the current user,Äôs iCloud account can be accessed.
**Notes:** This method determines the status of the current user,Äôs iCloud account asynchronously, reporting the results to the block in the completionHandler parameter. Call this method before accessing the private database to determine whether that database is available. While your app is running, use the NSUbiquityIdentityDidChangeNotification notification to detect account changes and call this method again to retrieve the status for the new account.

### 32.3.4 addOperation(operation as CKOperationMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Queues an operation for execution in the current container.
**Notes:** operation: The CKOperationMBS to enqueue. Make sure the operation object you provide is fully

configured and ready to be enqueued. Do not change the settings of this object after calling this method.

This method adds the operation object to an operation queue managed by the container itself. Operation objects in the container,Äôs queue execute concurrently with default priorities in background threads.

This method changes the operation object,Äôs container (if any) to the current container.

### 32.3.5 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.3.6 CKAccountChangedNotification as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The account changed notification name.

### 32.3.7 CKCurrentUserDefaultName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The default name for the current user.

### 32.3.8 CKErrorDomain as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The error domain name for CloudKit.

### 32.3.9 CKErrorRetryAfterKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the user dictionary keys for error dictionaries.
**Notes:** On CKErrorServiceUnavailable or CKErrorRequestRateLimited errors the userInfo dictionary may

contain a number that specifies the period of time in seconds after which the client may retry the request.

### 32.3.10 CKOwnerDefaultName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The user ID representing the current user. Use this value when creating zone IDs.

### 32.3.11 CKPartialErrorsByItemIDKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** When a CKErrorPartialFailure happens this key will be set in the error's userInfo dictionary.
**Notes:** The value of this key will be a dictionary, and the values will be errors for individual items with the keys being the item IDs that failed.

### 32.3.12 CKRecordChangedErrorAncestorRecordKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the error details keys.
**Notes:** If the server rejects a record save because it has been modified since the last time it was read, a CKErrorServerRecordChanged error will be returned and it will contain versions of the record in its user-Info dictionary. Apply your custom conflict resolution logic to the server record (CKServerRecordKey) and attempt a save of that record.

### 32.3.13 CKRecordChangedErrorClientRecordKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the error details keys.
**Notes:** If the server rejects a record save because it has been modified since the last time it was read, a CKErrorServerRecordChanged error will be returned and it will contain versions of the record in its user-Info dictionary. Apply your custom conflict resolution logic to the server record (CKServerRecordKey) and attempt a save of that record.

### 32.3.14 CKRecordChangedErrorServerRecordKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the error details keys.
**Notes:** If the server rejects a record save because it has been modified since the last time it was read, a CKErrorServerRecordChanged error will be returned and it will contain versions of the record in its user-Info dictionary. Apply your custom conflict resolution logic to the server record (CKServerRecordKey) and attempt a save of that record.

### 32.3.15 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.3.16 Constructor(Container as CKContainerMBS) 5611

### 32.3.16 Constructor(Container as CKContainerMBS)

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Creates a new object for an container reference.
**Notes:** Allows you to initialize with your subclass to fill events.
See also:

- 32.3.15 Constructor 5611

### 32.3.17 containerWithIdentifier(name as string) as CKContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the container object associated with the specified identifier.
**Notes:** containerIdentifier: The bundle identifier of the app whose container you want to access. The bundle identifier must be in the app,Äôs com.apple.developer.icloud-container-identifiers entitlement. This parameter must not be nil.

Returns the container object for the designated app,Äôs content, or nil if the container cannot be found.

The specified identifier must correspond to one of the ubiquity containers listed in the iCloud capabilities section of your Xcode project. Including the identifier with your app,Äôs capabilities adds the corresponding entitlements to your app. To access your app,Äôs default container, use the defaultContainer method instead.

### 32.3.18 defaultContainer as CKContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the default container object for managing the current app,Äôs content.
**Notes:** Returns the container object associated with the current app,Äôs content. This method always returns a valid container object.

Use this method to retrieve the container for your app,Äôs native content. This container is the one your app typically uses to store its data. If you want the container for a different app, create and initialize that container using the containerWithIdentifier method.

During development, the returned container object points to a development version of your app,Äôs container. When you ship your app, the returned object points to the live production environment.

### 32.3.19 discoverAllContactUserInfos(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about all discoverable users that are known to the current user.
**Notes:** Use this method to retrieve information about other users of the app. This method returns information about those users who meet the following criteria:

- There is contact information for the user in the current user,Äôs address book.
- The user has run the app.
- The user has granted the CKApplicationPermissionUserDiscoverability permission to your app for this container.

This method searches for the users asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverAllContactsOperationMBS object and configure the desired priority.

### 32.3.20 discoverAllIdentities(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches all user records that match an entry in the user,Äôs address book.
**Notes:** This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverAllContactsOperation object and configure the desired priority.

### 32.3.21 discoverUserIdentityWithEmailAddress(emailAddress as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the user record ID associated in the user,Äôs contacts with the email address.
**Notes:** email: The email address used to locate the user.

Use this method to retrieve the ID of a user that is known to the current user. The user you are searching for must meet the following criteria:

- The user must be in the current user,Äôs address book.
- The user must have run the app.
- The user must have granted the userDiscoverability permission for this container.

This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverUserInfosOperationMBS object and configure the desired priority.

### 32.3.22 discoverUserIdentityWithPhoneNumber(phoneNumber as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the user record ID associated in the user,Äôs contacts with the phone number.
**Notes:** phoneNumber: The phone number used to locate the user.

Use this method to retrieve the ID of a user that is known to the current user. The user you are searching for must meet the following criteria:

- The user must be in the current user,Äôs address book.
- The user must have run the app.
- The user must have granted the userDiscoverability permission for this container.

This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverUserInfosOperationMBS object and configure the desired priority.

### 32.3.23 discoverUserIdentityWithUserRecordID(userRecordID as CKRecordIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single user based on the ID of the corresponding user record.
**Notes:** userRecordID: The ID of the user record.

Use this method to retrieve information about a user for which you already have a user record ID. The user you are searching for must meet the following criteria:

- The user must have run the app.
- The user must have granted the userDiscoverability permission for this container.

This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverUserInfosOperationMBS object and configure the desired priority.

### 32.3.24 discoverUserInfoWithEmailAddress(emailAddress as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single user based on that user,Äôs email address.
**Notes:** email: The iCloud email address of the user you want to locate.

Use this method to retrieve the ID of a user that is known to the current user. The user you are searching for must meet the following criteria:

- The user must be in the current user,Äôs address book.
- The user must have run the app.
- The user must have granted the CKApplicationPermissionUserDiscoverability permission for this container.

This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverUserInfosOperationMBS object and configure the desired priority.

### 32.3.25 discoverUserInfoWithUserRecordID(userRecordID as CKRecordIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single user based on the ID of the corresponding user record.
**Notes:** userRecordID: The ID of the user record.

Use this method to retrieve information about a user for which you already have a user record ID. The user you are searching for must meet the following criteria:

- The user must have run the app.
- The user must have granted the CKApplicationPermissionUserDiscoverability permission for this container.

This method searches for the user asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKDiscoverUserInfosOperationMBS object and configure the desired priority.

### 32.3.26 fetchAllLongLivedOperationIDs(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the identifiers of the running or recently completed long-lived operations.
**Notes:** A long-lived operation is an operation that continues to run after the app exits, described in CKOperationMBS. To get the operation object for an identifier, use the fetchLongLivedOperationWithID method.

### 32.3.27 fetchLongLivedOperationWithID(operationID as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the running or recently completed long-lived operation specified by the operation identifier.
**Notes:** operationID: The identifier of the long-lived operation you want to fetch.

A long-lived operation is an operation that continues to run after the app exits, described in CKOperationMBS. To receive the callbacks for a long-lived operations, set its completion block and add it to an operation queue.

### 32.3.28 fetchShareParticipantWithEmailAddress(emailAddress as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single share participant (a person who accepted a shared record) based on that participant,Äôs email address.
**Notes:** emailAddress: The iCloud email address of the share participant you want to locate.

This method searches for the share participant asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKFetchShareParticipantsOperationMBS object and configure the desired priority.

### 32.3.29 fetchShareParticipantWithPhoneNumber(phoneNumber as string, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single share participant (a person who accepted a shared record) based on that participant,Äôs phone number.
**Notes:** phoneNumber: The phone number used to locate the share participant.

This method searches for the share participant asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKFetchShareParticipantsOperationMBS object and configure the desired priority.

### 32.3.30 fetchShareParticipantWithUserRecordID(userRecordID as CKRecordIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves information about a single share participant based on the ID of the corresponding user record.
**Notes:** userRecordID: The ID of the user record.

This method searches for the share participant asynchronously and with a low priority. If you want the task to execute with a higher priority, create a CKFetchShareParticipantsOperationMBS object and configure the desired priority.

### 32.3.31 fetchUserRecordID(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the user record ID associated with the current user.
**Notes:** At startup time, fetching the user record ID may take longer while CloudKit makes the initial iCloud account request. After the initial fetch, accessing the user record ID should take less time. If no iCloud account is associated with the device, or if access to the user,Äôs iCloud account is restricted, this method returns an error of type CKErrorNotAuthenticated.

### 32.3.32 registerCloudKitShare(Share as CKShareMBS, ServiceItems as Variant)

MBS Mac64bit Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** Registers a CloudKit share for the user to modify.
**Example:**

```
// The following example shows how to create an item provider with an existing share. It then invokes the cloud-sharing service with the provider and presents the share,Äôs configuration to the user.

Public Sub modifyShare(share as CKShareMBS, container as CKContainerMBS)
// Create an item provider and register a share that
// already exists on the server.

Dim itemProvider As New NSSharingServiceItemsMBS
container.registerCloudKitShare(share, itemProvider)

// Create and invoke the cloud-sharing service to
// present the share configuration to the user.
Dim service As NSSharingServiceMBS
service = NSSharingServiceMBS.sharingServiceNamed(NSSharingServiceMBS.NSSharingServiceNameCloud-Sharing)

If service <>Nil Then
If service.canPerformWithItems(itemProvider) then
service.performWithItems(itemProvider)
end if
End If

End Sub
```

**Notes:** share: The CloudKit share to modify.
self: The CloudKit container that stores the shared records.
ServiceItems: the NSSharingServiceItemsMBS object to add the item provider.

Use this method when the CloudKit share already exists on the server and you want to update it. The behavior of the sharing service depends on the role of the current user. An owner can edit the share,Äôs configuration, which includes managing participants and their permissions. A participant can view the share,Äôs configuration and choose to stop participating.
If you,Äôre unsure which container to use, fetch the share,Äôs metadata using CKFetchShareMetadataOperationMBS. Then initialize an instance of CKContainer using the metadata,Äôs containerIdentifier property.
Use the NSCloudSharingServiceMBS events to respond to any changes the sharing service makes.

To create a new share, use the registerCloudKitShareWithPreparationHandler method instead.

### 32.3.33 registerCloudKitShareWithPreparationHandler(ServiceItems as Variant, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** Registers a handler that prepares a new CloudKit share.
**Notes:** Calls registerCloudKitShareWithPreparationHandler event to let you fill in code.

ServiceItems: the NSSharingServiceItemsMBS object to add the item provider.
Tag: Variant passed through.

Use this method to share a hierarchy of CloudKit records with other iCloud users. When the service invokes the handler, create an instance of CKShare with a root record. Save the share to the server using CKModifyRecordsOperationMBS. The root record (and its hierarchy) must already exist on the server or be part of the same save operation. After the share saves, call preparationCompletionHandler with the saved share and its container. If the save fails, pass the error to the completion handler instead. Invoking the sharing service with a share you register using this method prompts the user to begin sharing.
Use the NSCloudSharingServiceMBS events to respond to any changes the sharing service makes.
See also:

- 32.3.57 registerCloudKitShareWithPreparationHandler(ServiceItems as Variant, byref share as CKShareMBS, byref container as CKContainerMBS, byref error as NSErrorMBS, tag as variant) 5625

### 32.3.34 requestApplicationPermission(applicationPermission as Integer, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Requests the specified permission from the user to make the user,Äôs identity discoverable.
**Notes:** applicationPermission: The requested permission. This requested permission applies to the current container only and will not impact permissions granted for other containers. For a list of possible values, see

CKApplicationPermissions.

To implement social features in your app, it is possible to correlate a user record with the user,Äôs actual name, but your app must get permission from the user to do so. Making a user record discoverable to the friends (contacts) of that user involves calling the the requestApplicationPermission method and asking for the CKApplicationPermissionUserDiscoverability permission. When you call that method, CloudKit asks the user on your behalf whether the user record should be made discoverable. If the user grants the request, that user,Äôs contacts can discover that user,Äôs true identity when running the app. To discover the contacts of the current user, you use the discoverAllContactUserInfos method or one of several other methods to get the related user information.

The first time you request a permission on any of the user,Äôs devices, the user is prompted to grant or deny the request. Once the user grants or denies a permission, subsequent requests for the same permission (on the same or separate devices), do not prompt the user again.

This method runs asynchronously and delivers the results to the block you provide.

### 32.3.35 statusForApplicationPermission(applicationPermission as Integer, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Checks the status of the specified permission asynchronously.
**Notes:** applicationPermission: The permission whose status you want to check. For a list of possible values, see CKApplicationPermissions.

Use this method to determine the extra capabilities granted to your app by the user. If your app has not yet requested a specific permission, calling this method may yield the value CKApplicationPermissionStatusInitialState for the permission. When that value is returned, call the requestApplicationPermission method to request the permission from the user.

### 32.3.36 Properties

### 32.3.37 containerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The string that identifies the app,Äôs container.
**Notes:** Use the value in this property to distinguish between different container objects in your app.
(Read only property)

### 32.3.38 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.3.39 privateCloudDatabase as CKDatabaseMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database containing the user,Äôs private data.
**Notes:** The database in this property is available only if the device has an active iCloud account. Access to the database is limited to the user of that iCloud account by default. The current user owns all content in the private database and is allowed to read and write that content. Data in the private database is not visible in the developer portal or to any other users.

Data stored in the private database counts against the storage quota of the current user,Äôs iCloud account.

If there is no active iCloud account on the user,Äôs device, this property still returns a valid database object, but attempts to use that object will return errors. To determine if there is an active iCloud account on the device, use the accountStatus method.
(Read only property)

### 32.3.40 publicCloudDatabase as CKDatabaseMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database containing the data shared by all users.
**Notes:** The database in this property is available regardless of whether the user,Äôs device has an active iCloud account. The contents of the public database are readable by all users of the app, and users have write access to the records (and other data objects) they create. Data in the public database is also visible in the developer portal, where you can assign roles to users and restrict access as needed.

Data stored in the public database counts against your app,Äôs iCloud storage quota and not against the quota of any single user.
(Read only property)

### 32.3.41 sharedCloudDatabase as CKDatabaseMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database containing shared user data.
**Notes:** The database in this property is available only if the device has an active iCloud account. Permissions on the database are limited to the user based on the permissions of the enclosing CKShareMBS object (representing the record that has been shared). The current user does not own the content in the shared database and is allowed to read and write that content only if that permission has been granted in the CKShareMBS. Data in the shared database is not visible in the developer portal or to any user who has not been granted access.

Data stored in the shared database does not count against the storage quota of the current user,Äôs iCloud account.

If there is no active iCloud account on the user,Äôs device, this property still returns a valid database object, but attempts to use the object will return errors. To determine whether the device has an active iCloud account use the accountStatus method.
(Read only property)

### 32.3.42 Events

### 32.3.43 accountStatusCompleted(accountStatus as Integer, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to be called when accountStatus is returned.
**Notes:** accountStatus: The status of the current user,Äôs iCloud account.
error: An error object, or nil if the status is determined successfully. Use the information in the error object to determine whether the problem has a workaround.

### 32.3.44 discoverAllContactUserInfosCompleted(userRecordID() as CKDiscoveredUserInfoMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverAllContactUserInfos method.
**Notes:** Your block must be capable of executing on any thread of the app. This block returns no value and takes the following parameters:

userInfos: An array of CKDiscoveredUserInfoMBS objects. Each object in the array contains information about the user, including the ID of the corresponding user record. If no users are discovered, the provided array is empty.
error: An error object if a problem occurs, or nil if the IDs are retrieved successfully.

### 32.3.45 discoverAllIdentitiesWithCompleted(userRecordID() as CKUserIdentityMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverAllIdentities method.
**Notes:** This event returns no value and takes the following parameters:

userIdentities: An array of CKUserIdentityMBS objects that match entries in the user,Äôs contacts.
error: An error object if a problem occurs or nil if the fetch completed successfully.

### 32.3.46 discoverUserIdentityWithEmailAddressCompleted(emailAddress as String, userInfo as CKUserIdentityMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverUserIdentityWithEmailAddress method.
**Notes:** This event returns no value and takes the following parameters:

userInfo: The user (CKUserIdentityMBS object) associated with the email address, or nil if an identity could not be located.
error: An error object if a problem occurs or nil if the CKUserIdentityMBS is retrieved successfully.

### 32.3.47 discoverUserIdentityWithPhoneNumberCompleted(phoneNumber as String,userInfo as CKUserIdentityMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverUserIdentityWithPhoneNumber method.
**Notes:** This event returns no value and takes the following parameters:

userInfo: The user (CKUserIdentityMBS object) associated with the phone number, or nil if an identity could not be located.
error: An error object if a problem occurs, or nil if the CKUserIdentityMBS is retrieved successfully.

### 32.3.48 discoverUserIdentityWithUserRecordIDCompleted(userRecordID as CKRecordIDMBS, userInfo as CKUserIdentityMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverUserIdentityWithUserRecordID.
**Notes:** This event returns no value and takes the following parameters:

userInfo
An object containing information about the user, or nil if the user is not found.

error
An error object if a problem occurs, or nil if the ID is retrieved successfully.

### 32.3.49 discoverUserInfoWithEmailAddressCompleted(emailAddress as String, userInfo as CKDiscoveredUserInfoMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for discoverUserInfoWithEmailAddress method.
**Notes:** This event returns no value and takes the following parameters:

userInfo: An object containing information about the user or nil if the user is not found.
error: An error object if a problem occurs or nil if the ID is retrieved successfully.

### 32.3.50 discoverUserInfoWithUserRecordIDCompleted(userRecordID as CKRecordIDMBS, userInfo as CKDiscoveredUserInfoMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the results for discoverUserInfoWithUserRecordID method.
**Notes:** This event returns no value and takes the following parameters:

userInfo: An object containing information about the user or nil if the user is not found.
error: An error object if a problem occurs or nil if the ID is retrieved successfully.

### 32.3.51 fetchAllLongLivedOperationIDsCompleted(outstandingOperationIDs() as String, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called for fetchAllLongLivedOperationIDs method.
**Notes:** outstandingOperationsByIDs: An array containing the identifiers for all the active long-lived operations. If a long-lived operation is canceled or completed, it is no longer an active operation, and its identifier will not be included in this array. An operation is complete if the app successfully receives the completion callback.
error: An error object, or nil if the fetch is successful.

### 32.3.52 fetchLongLivedOperationWithIDCompleted(operationID as String, outstandingOperation as CKOperationMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called when fetchLongLivedOperationWithID finished.
**Notes:** outstandingOperation: The proxy object for the corresponding long-lived operation. If a long-lived operation was canceled or completed, this is nil.
error: An error object, or nil if the fetch is successful.

### 32.3.53 fetchShareParticipantWithEmailAddressCompleted(emailAddress as String, shareParticipant as CKShareParticipantMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchShareParticipantWithEmailAddress method.
**Notes:** This event returns no value and takes the following parameters:

shareParticipant: An object containing information about the share participant, or nil if the participant is not found.
error: An error object if a problem occurs, or nil if the participant is retrieved successfully.

### 32.3.54 fetchShareParticipantWithPhoneNumberCompleted(phoneNumber as String,shareParticipant as CKShareParticipantMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchShareParticipantWithPhoneNumber method.
**Notes:** shareParticipant: An object containing information about the share participant, or nil if the participant is not found.
error: An error object if a problem occurs, or nil if the participant is retrieved successfully.

### 32.3.55 fetchShareParticipantWithUserRecordIDCompleted(userRecordID as CKRecordIDMBS, shareParticipant as CKShareParticipantMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called for fetchShareParticipantWithUserRecordID.
**Notes:** This event returns no value and takes the following parameters:

shareParticipant: An object containing information about the share participant, or nil if the participant is not found.
error: An error object if a problem occurs, or nil if the participant is retrieved successfully.

### 32.3.56 fetchUserRecordIDCompleted(userRecordID as CKRecordIDMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchUserRecordID method.
**Notes:** recordID: The ID of the user record for the current user, or nil if the current device is not configured with an iCloud account.
error: An error object if a problem occurs, or nil if the record ID is retrieved successfully.

### 32.3.57 registerCloudKitShareWithPreparationHandler(ServiceItems as Variant, byref share as CKShareMBS, byref container as CKContainerMBS, byref error as NSErrorMBS, tag as variant)

MBS Mac64bit Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** The event called by registerCloudKitShareWithPreparationHandler method.
**Notes:** ServiceItems: the NSSharingServiceItemsMBS object to add the item provider.
Tag: Variant passed through.
share: The share to use.
container: The container to use.
error: The error you encountered.
See also:

- 32.3.33 registerCloudKitShareWithPreparationHandler(ServiceItems as Variant, tag as variant = nil) 5618

### 32.3.58 requestApplicationPermissionCompleted(applicationPermissionStatus as Integer, accountStatus as Integer, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for requestApplicationPermission method.

### 32.3.59 statusForApplicationPermissionCompleted(applicationPermissionStatus as Integer, accountStatus as Integer, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for statusForApplicationPermission method.

### 32.3.60 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CKApplicationPermissionStatusCouldNotComplete | 1 | One of the constants indicating whether the app has been permission.<br>An error occurred during the getting or setting of the app p the provided NSErrorMBS object for more information. |
| CKApplicationPermissionStatusDenied | 2 | One of the constants indicating whether the app has been permission.<br>The user denied access to the permission. |
| CKApplicationPermissionStatusGranted | 3 | One of the constants indicating whether the app has been permission.<br>The user granted access to the permission. |
| CKApplicationPermissionStatusInitialState | 0 | One of the constants indicating whether the app has been permission.<br>The user has not yet decided whether to grant this permi questApplicationPermission method to ask the user to gran |
| CKApplicationPermissionUserDiscoverability | 1 | The current user is discoverable (through the user,Äôs emai users of the app. |

Status

| Constant | Value | Description |
|---|---|---|
| CKAccountStatusAvailable | 1 | The user,Äôs iCloud account is available and may be used by this app. |
| CKAccountStatusCouldNotDetermine | 0 | An error occurred during an attempt to retrieve the account status. Co the provided NSError object for more information. |
| CKAccountStatusNoAccount | 3 | The user,Äôs iCloud account is not available because no account inform has been provided for this device. |
| CKAccountStatusRestricted | 2 | The user,Äôs iCloud account is not available. Access was denied due to Par Controls or Mobile Device Management restrictions. |

Errors

| Constant | Value | Description |
|---|---|---|
| ErrorAlreadyShared | 30 | A record/share cannot be saved, doing so would cause a hierarchy of rec to exist in multiple shares. |
| ErrorAssetFileModified | 17 | Asset file content was modified while being saved. |
| ErrorAssetFileNotFound | 16 | Asset file was not found. |
| ErrorBadContainer | 5 | Un-provisioned or unauthorized container. Try provisioning the containe fore retrying the operation. |
| ErrorBadDatabase | 24 | Operation could not be completed on the given database. Likely cause attempting to modify zones in the public database. |
| ErrorBatchRequestFailed | 22 | One of the items in this batch operation failed in a zone with atomic upd so the entire batch was rejected. |
| ErrorChangeTokenExpired | 21 | The previousServerChangeToken value is too old and the client must re- from scratch. |
| ErrorConstraintViolation | 19 | The server rejected the request because there was a conflict with a unique |
| ErrorIncompatibleVersion | 18 | App version is less than the minimum allowed version. |
| ErrorInternalError | 1 | CloudKit.framework encountered an error. This is a non-recoverable erro |
| ErrorInvalidArguments | 12 | Bad client request (bad record graph, malformed predicate) |
| ErrorLimitExceeded | 27 | The request to the server was too large. Retry this request as a smaller b |
| ErrorManagedAccountRestricted | 32 | Request was rejected due to a managed account restriction. |
| ErrorMissingEntitlement | 8 | Missing entitlement |
| ErrorNetworkFailure | 4 | Network error (available but CFNetwork gave us an error) |
| ErrorNetworkUnavailable | 3 | Network not available |
| ErrorNotAuthenticated | 9 | Not authenticated (writing without being logged in, no user record) |
| ErrorOperationCancelled | 20 | A CKOperation was explicitly cancelled. |
| ErrorPartialFailure | 2 | Some items failed, but the operation succeeded overall. Check CKPartia rorsByItemIDKey in the userInfo dictionary for more details. |
| ErrorParticipantMayNeedVerification | 33 | Share Metadata cannot be determined, because the user is not a memb the share. There are invited participants on the share with email addr or phone numbers not associated with any iCloud account. The user ma able to join the share if they can associate one of those email addresse phone numbers with their iCloud account via the system Share Accept Call UIApplication's openURL on this share URL to have the user attem verify their information. |
| ErrorPermissionFailure | 10 | Access failure (save, fetch, or shareAccept) |
| ErrorQuotaExceeded | 25 | Saving a record would exceed quota |
| ErrorReferenceViolation | 31 | The target of a record's parent or share reference was not found. |
| ErrorRequestRateLimited | 7 | Client is being rate limited |
| ErrorResultsTruncated | 13 | Results Truncated. Deprecated and will not be returned. |
| ErrorServerRecordChanged | 14 | The record was rejected because the version on the server was different. |
| ErrorServerRejectedRequest | 15 | The server rejected this request. This is a non-recoverable error. |
| ErrorServiceUnavailable | 6 | Service unavailable |
| ErrorTooManyParticipants | 29 | A share cannot be saved because there are too many participants attache the share. |
| ErrorUnknownItem | 11 | Record does not exist |
| ErrorUserDeletedZone | 28 | The user deleted this zone through the settings UI. Your client should e remove its local data or prompt the user before attempting to re-upload data to this zone. |
| ErrorZoneBusy | 23 | The server is too busy to handle this zone operation. Try the operation a in a few seconds. |
| ErrorZoneNotFound | 26 | The specified zone does not exist on the server. |

## 32.4 class CKDatabaseMBS

### 32.4.1 class CKDatabaseMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A conduit for accessing and for performing operations on the public and private data of an app container.
**Notes:** An app container has a public database whose data is accessible to all users and a private database whose data is accessible only to the current user. A database object takes requests for data and applies them to the appropriate part of the container.

You do not create database objects yourself, nor should you subclass CKDatabaseMBS. Your app,Äôs CKContainerMBS objects provide the CKDatabaseMBS objects you use to access the associated data. Use database objects as-is to perform operations on data.

The public database is always available, regardless of whether the device has an an active iCloud account. When no iCloud account is available, your app may fetch records and perform queries on the public database, but it may not save changes. (Saving records to the public database requires an active iCloud account to identify the owner of those records.) Access to the private database always requires an active iCloud account on the device.

see
https://developer.apple.com/reference/cloudkit/ckdatabase
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr3
- MBS Xojo Plugins, version 21.2pr3

### 32.4.2 Methods

### 32.4.3 addOperation(operation as CKDatabaseOperationMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Executes the specified operation asynchronously against the current database.
**Notes:** operation: The operation object to execute. You must configure the operation object with any dependencies and completion handlers before calling this method. If this parameter is nil, the method does nothing.

Do not change the properties of the operation object after calling this method. Prior to executing the operation, this method sets the operation object,Äôs database property to the current database, replacing any previously assigned database.

This method executes the operation object with the priority you assigned to the object through its queuePriority property.

### 32.4.4 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.4.5 Constructor(Container as CKContainerMBS, databaseScope as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Retrieves the database with the appropriate scope.
**Notes:** databaseScope: The scope of the database you want returned.

Returns an initialized CKDatabase object with the appropriate scope.
This convenience method returns the database associated with the specified container that is of the scope requested.
See also:

- 32.4.6 Constructor(Database as CKDatabaseMBS) 5630

### 32.4.6 Constructor(Database as CKDatabaseMBS)

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Creates a new object for an database reference.
**Notes:** Allows you to initialize with your subclass to fill events.
See also:

- 32.4.5 Constructor(Container as CKContainerMBS, databaseScope as Integer) 5630

### 32.4.7 deleteRecordWithID(recordID as CKRecordIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Deletes the specified record asynchronously, with a low priority, from the current database.
**Notes:** recordID: The ID of the record you want to delete. This method throws an exception if this parameter is nil.

Deleting a record may trigger additional deletions if the record was referenced by other records. This method reports only the ID of the record you asked to delete. CloudKit does not report deletions triggered by owning relationships between records.

This method deletes the record with a low priority, which may cause the task to execute after higher-priority tasks. To delete records more urgently, create a CKModifyRecordsOperationMBS object with the desired priority. You can also use that operation object to delete multiple records simultaneously.

### 32.4.8 deleteRecordWithIDSync(recordID as CKRecordIDMBS, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Deletes the specified record synchronously, with a low priority, from the current database.
**Notes:** recordID: The ID of the record you want to delete. This method throws an exception if this parameter is nil.

Deleting a record may trigger additional deletions if the record was referenced by other records. This method reports only the ID of the record you asked to delete. CloudKit does not report deletions triggered by owning relationships between records.

This method deletes the record with a low priority, which may cause the task to execute after higher-priority tasks. To delete records more urgently, create a CKModifyRecordsOperationMBS object with the desired priority. You can also use that operation object to delete multiple records simultaneously.

### 32.4.9 deleteRecordZone(zoneID as CKRecordZoneIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Deletes one record zone (and its contents) asynchronously, with a low priority, from the current database.
**Notes:** zoneID: The ID of the zone you want to delete. This method throws an exception if this parameter is nil.

Deleting a zone permanently deletes the zone and all records in that zone. After deleting the zone, you can use the same ID to create a new empty zone.

This method deletes the record zone with a low priority, which may cause the task to execute after higher-priority tasks. To delete the record zone more urgently, create a CKModifyRecordZonesOperationMBS object with the desired priority. You can also use that operation object to delete multiple record zones

simultaneously.

### 32.4.10 deleteSubscriptionWithID(subscriptionID as String, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Deletes one subscription object asynchronously, with a low priority, from the current database.
**Notes:** subscriptionID: The ID of the subscription object to delete. This method throws an exception if this parameter is nil.

Deleting a subscription stops the subscription from watching its changed records and sending alerts.

This method deletes the subscription object with a low priority, which may cause the task to execute after higher-priority tasks. To delete the subscription more urgently, create a CKModifySubscriptionsOperationMBS object with the desired priority. You can also use that operation object to delete multiple subscription objects simultaneously.

### 32.4.11 fetchAllRecordZones(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches all record zones asynchronously, with a low priority, from the current database.
**Notes:** Use this method to locate the record zones in this database. Record zones represent groups of records with a common purpose.

This method fetches record zones with a low priority, which may cause the task to execute after higher-priority tasks. To fetch record zones more urgently, create a CKFetchRecordZonesOperationMBS object with the desired priority.

### 32.4.12 fetchAllSubscriptions(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches all subscription objects asynchronously, with a low priority, from the current database.
**Notes:** Use this method to locate the subscriptions in the current database. Subscriptions represent persistent queries on the server. A subscription can be used to alert the app when records change.

This method fetches the subscription objects with a low priority, which may cause the task to execute after higher-priority tasks. To fetch subscriptions more urgently, create a CKFetchSubscriptionsOperationMBS

object with the desired priority.

### 32.4.13 fetchRecordWithID(recordID as CKRecordIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches one record asynchronously, with a low priority, from the current database.
**Notes:** recordID: The ID of the record you want to fetch. This method throws an exception if this parameter is nil.

Use this method to fetch records that are not urgent to your app,Äôs execution. This method fetches the record with a low priority, which may cause the fetch to execute after higher-priority tasks. To fetch records more urgently, create a CKFetchRecordsOperation object with the desired priority. You can also use that operation object to fetch multiple records simultaneously.

### 32.4.14 fetchRecordWithIDSync(recordID as CKRecordIDMBS, byref record as CKRecordMBS, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches one record synchronously, with a low priority, from the current database.
**Notes:** recordID: The ID of the record you want to fetch. This method throws an exception if this parameter is nil.
record: The requested record object. If no such record is found, this parameter is nil.
error: An error object, or nil if the record was fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

Use this method to fetch records that are not urgent to your app,Äôs execution. This method fetches the record with a low priority, which may cause the fetch to execute after higher-priority tasks. To fetch records more urgently, create a CKFetchRecordsOperation object with the desired priority. You can also use that operation object to fetch multiple records simultaneously.

### 32.4.15 fetchRecordZoneWithID(zoneID as CKRecordZoneIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches one record zone asynchronously, with a low priority, from the current database.
**Notes:** zoneID: The ID of the record zone. This method throws an exception if this parameter is nil.

Use this method to retrieve a record zone whose ID you already know. You might retrieve a record zone object so that you can assess its capabilities.

This method fetches the record zone with a low priority, which may cause the task to execute after higher-priority tasks. To fetch the record zone more urgently, create a CKFetchRecordZonesOperationMBS object with the desired priority. You can also use that operation object to fetch multiple record zones simultaneously.

### 32.4.16 fetchSubscriptionWithID(subscriptionID as String, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Fetches one subscription object asynchronously, wiht a low priority, from the current database.
**Notes:** subscriptionID: The ID of the subscription object. This method throws an exception if this parameter is nil.

Use this method to retrieve a subscription object whose ID you already know. You might retrieve a subscription object so that you can assess its attributes or update the notification information used to generate alerts.

This method fetches the subscription object with a low priority, which may cause the task to execute after higher-priority tasks. To fetch the subscription more urgently, create a CKFetchSubscriptionsOperationMBS object with the desired priority. You can also use that operation object to fetch multiple subscription objects simultaneously.

### 32.4.17 performQuery(query as CKQueryMBS, zoneID as CKRecordZoneIDMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Searches the specified zone asynchronously for records that match the query parameters.
**Notes:** query: The query object containing the parameters for the search. This method throws an exception if this parameter is nil. For information about how to construct queries, see CKQueryMBS.
zoneID: The ID of the zone to search. Search results are limited to records in the specified zone. Specify nil to search the default zone of the database.

Use this method to execute searches against the current database. Do not use this method when the number of returned records is potentially more than a few hundred records; when more records are needed, create an execute a CKQueryOperationMBS instead of calling performQuery:inZoneWithID on the CKDatabaseMBS. For efficiency, all queries automatically limit the number of returned records based on current conditions. If your query hits the maximum value, this method returns only the first portion of the overall results. The number of returned records should be sufficient in most cases, but to get the entire set of records you must create and execute a CKQueryOperationMBS object instead. Query operations also return a maximum

number of results, but when they do, they provide a cursor object that you can use to fetch the next batch of results.

You can search any content that is represented by a CKRecord object, including user records. You cannot use this method to search for CKSubscriptionMBS or CKRecordZoneMBS objects.

### 32.4.18 saveRecord(record as CKRecordMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Saves one record asynchronously, with a low priority, to the current database, if the record has never been saved or if it is newer than the version on the server.
**Notes:** record: The record to save. This method throws an exception if this parameter is nil.

This method saves the record only if it has never been saved before or if it is newer than the version on the server. You cannot use this method to overwrite newer versions of a record on the server.

This method saves the record with a low priority, which may cause the task to execute after higher-priority tasks. To save records more urgently, create a CKModifyRecordsOperationMBS object with the desired priority. You can also use that operation object to save multiple records simultaneously.

### 32.4.19 saveRecordSync(record as CKRecordMBS, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Saves one record synchronously, with a low priority, to the current database, if the record has never been saved or if it is newer than the version on the server.
**Notes:** record: The record to save. This method throws an exception if this parameter is nil.

This method saves the record only if it has never been saved before or if it is newer than the version on the server. You cannot use this method to overwrite newer versions of a record on the server.

This method saves the record with a low priority, which may cause the task to execute after higher-priority tasks. To save records more urgently, create a CKModifyRecordsOperationMBS object with the desired priority. You can also use that operation object to save multiple records simultaneously.

### 32.4.20 saveRecordZone(zone as CKRecordZoneMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Saves one record zone asynchronously, with a low priority, to the current database.
**Notes:** zone: The zone you want to save to the database. This method throws an exception if this parameter is nil.

Use this method to save a record zone to the database so that you can subsequently store records in it. Record zones must be saved before you attempt to save any records that reside in that zone. Because this method executes asynchronously, use the completion handler to verify that the zone was saved successfully before attempting to save any records.

This method saves the record zone with a low priority, which may cause the task to execute after higher-priority tasks. To save the record zone more urgently, create a CKModifyRecordZonesOperationMBS object with the priority you want. You can also use that operation object to save multiple record zones all at once.

### 32.4.21 saveSubscription(subscription as CKSubscriptionMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Saves one subscription object asynchronously, with a low priority, to the current database.
**Notes:** subscription: The subscription object you want to save to the database. This method throws an exception if this parameter is nil.

Use this method to save a subscription to the database so that the subsription can begin watching for changes.

This method saves the subscription object with a low priority, which may cause the task to execute after higher-priority tasks. To save the subscription more urgently, create a CKModifySubscriptionsOperationMBS object with the desired priority. You can also use that operation object to save multiple subscription objects simultaneously.

### 32.4.22 Properties

### 32.4.23 databaseScope as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of database (public, private, or shared).
**Notes:** (Read only property)

### 32.4.24 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.4.25 Events

### 32.4.26 deleteRecordWithIDCompleted(recordID as CKRecordIDMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the results for deleteRecordWithID method.
**Notes:** recordID: The ID of the record you attempted to delete.
error: An error object, or nil if the record zone was deleted successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.27 deleteRecordZoneWithIDCompleted(zoneID as CKRecordZoneIDMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the results for deleteRecordZone method.
**Notes:** zoneID: The ID of the zone that you tried to delete.
error: An error object, or nil if the record zone was deleted successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.28 deleteSubscriptionWithIDCompleted(subscriptionID as String, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for deleteSubscriptionWithID method.
**Notes:** subscriptionID: The ID of the subscription object you attempted to delete.
error: An error object, or nil if the subscription was deleted successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.29 fetchAllRecordZonesCompleted(zones() as CKRecordZoneMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchAllRecordZones method.
**Notes:** zones: An array of CKRecordZoneMBS objects. The returned array always contains at least one record zone corresponding to the default zone.
error: An error object, or nil if the record zones were fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.30 fetchAllSubscriptionsCompleted(subscriptions() as CKSubscriptionMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchAllSubscriptions.
**Notes:** subscriptions: An array of CKSubscription objects. If the subscription objects cannot be retrieved, the array is empty.
error: An error object, or nil if the subscriptions were fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.31 fetchRecordWithIDCompleted(recordID as CKRecordIDMBS, record as CKRecordMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results.
**Notes:** record: The requested record object. If no such record is found, this parameter is nil.
error: An error object, or nil if the record was fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.32 fetchRecordZoneWithIDCompleted(zoneID as CKRecordZoneIDMBS, zone as CKRecordZoneMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchRecordZoneWithID method.
**Notes:** zone: The requested CKRecordZone object or nil if the object is not found or cannot be retrieved.
error: An error object, or nil if the record zone was fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.33 fetchSubscriptionWithIDCompleted(subscriptionID as String, subscription as CKSubscriptionMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for fetchSubscriptionWithID.
**Notes:** subscription: The requested subscription object or nil if the object is not found or cannot be retrieved.
error: An error object, or nil if the subscription was fetched successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.34 performQueryCompleted(query as CKQueryMBS, zoneID as CKRecordZoneIDMBS, results() as CKRecordMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the search results.
**Notes:** The event to execute with the search results for performQuery method.

results: An array containing zero or more CKRecord objects. The returned records correspond to the records in the specified zone that match the parameters of the query.

error: An error object, or nil if the query was completed successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.35 saveRecordCompleted(record as CKRecordMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for saveRecord.
**Notes:** record: The record object you attempted to save.
error: An error object, or nil if the record was saved successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.36 saveRecordZoneCompleted(zone as CKRecordZoneMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results for saveRecordZone method.
**Notes:** zone: The CKRecordZone object you attempted to save.
error: An error object, or nil if the record zone was saved successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.37 saveSubscriptionCompleted(subscription as CKSubscriptionMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the results for saveSubscription method.
**Notes:** subscription: The subscription object you attempted to save.
error: An error object, or nil if the subscription was saved successfully. Use the information in the error object to determine whether a problem has a workaround.

### 32.4.38 Constants

Database Scopes

| Constant | Value | Description |
|---|---|---|
| ScopePrivate | 2 | The private database. |
| ScopePublic | 1 | The public database. |
| ScopeShared | 3 | The shared database. |

## 32.5 class CKDatabaseNotificationMBS

### 32.5.1 class CKDatabaseNotificationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A notification object about a database.
**Notes:** Subclass of the CKNotificationMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.5.2 Methods

### 32.5.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.5.4 Properties

### 32.5.5 databaseScope as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database scope.
**Notes:** (Read only property)

## 32.6 class CKDatabaseOperationMBS

### 32.6.1 class CKDatabaseOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The CKDatabaseOperation class is an abstract parent class for operations that act on the public or private databases in a container.
**Notes:** Database operations typically involve fetching and saving records and other database objects, as well as queries on the contents of the database. You use the property of this class to tell the operation object which database to use when executing its task. Do not subclass this class or create instances of it. Instead, create instances of one of its concrete subclasses.

Available on macOS 10.12 or newer.
Subclass of the CKOperationMBS class.

### 32.6.2 Methods

### 32.6.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.6.4 Properties

### 32.6.5 database as CKDatabaseMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database that is the target of the operation.
**Notes:** For operations you plan to execute from your own custom queue, use this property to specify the target database. Setting the database also sets the corresponding container, inherited from the CKOperationMBS parent class. If the value of this property is nil, the operation targets the private database of the app,Äôs default container.

The default value of this property is nil.
(Read and Write property)

## 32.7 class CKDatabaseSubscriptionMBS

### 32.7.1 class CKDatabaseSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A subscription for database changes.
**Notes:** Subclass of the CKSubscriptionMBS class.

### 32.7.2 Methods

### 32.7.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

### 32.7.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 32.7.5 Constructor(subscriptionID as string) 5643

### 32.7.5 Constructor(subscriptionID as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.7.4 Constructor 5643

### 32.7.6 copy as CKDatabaseSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.7.7 Properties

### 32.7.8 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type.
**Notes:** (Read and Write property)

## 32.8 class CKDiscoverAllContactsOperationMBS

### 32.8.1 class CKDiscoverAllContactsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKDiscoverAllUserIdentitiesOperationMBS instead. **Function:** A CKDiscoverAllContactsOperation object retrieves the IDs of all discoverable users that are also in the user,Äôs address book.
**Notes:** The search of the user,Äôs address book does not return any personal data about the user,Äôs contacts. The search returns only the IDs of the corresponding user records, which contain only data that your app puts there. CloudKit uses the address book information to identify users of the app that the current user knows. Because the system accesses the address book instead of your app, the system does not display a prompt to the user when that access occurs.

Users of an app must opt in to discoverability before their user records can be accessed. To opt in for a user, your app must call the requestApplicationPermission:completion: method of your container object and request the userDiscoverability permission. Calling that method prompts the user to grant or deny the permission.

If you assign a completion block to the completionBlock property of the operation object, the completion block is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.

No Address Book access dialog will be displayed.
Available in OS X 10.10 and newer. Deprecated in 10.12 in favor of CKDiscoverAllUserIdentitiesOperationMBS classes.
Subclass of the CKOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr7

### 32.8.2 Methods

### 32.8.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.8.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.8.5 Events

### 32.8.6 discoverAllContactsCompleted(userInfos() as CKDiscoveredUserInfoMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to use to process the search results.
**Notes:** The event has no return value and takes the following parameters:

userRecordIDs: An array of CKDiscoveredUserInfoMBS objects. Each ID corresponds to a user of the app who opts in to discovery by other known users. Use this ID to retrieve the corresponding user record.
operationError: An error object containing information about a problem, or nil if the user record IDs are retrieved successfully.

This event is executed only once, at the conclusion of the operation. If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.9 class CKDiscoverAllUserIdentitiesOperationMBS

### 32.9.1 class CKDiscoverAllUserIdentitiesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that finds all discoverable users in the device,Äôs contacts.
**Notes:** The operation will not generate a dialog indicating that the contacts are being accessed.

Available in OS X 10.12 and newer.
Subclass of the CKOperationMBS class.

### 32.9.2 Methods

### 32.9.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to search the device,Äôs contacts.
**Notes:** You can use the returned CKDiscoverAllUserIdentitiesOperationMBS only once. When executed, this query object performs a new search and returns a batch of results.

### 32.9.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.9.5 Events

### 32.9.6 discoverAllUserIdentitiesCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results.
**Notes:** operationError: An error object that contains the information about a problem or nil if the results are retrieved successfully.

This event is executed only once and represents your last chance to process the operation results. It is executed after all of the individual progress blocks but before the operation,Äôs completed event. The block is executed serially with respect to the other progress blocks of the operation. If you intend to use this

block to process results, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.9.7 userIdentityDiscovered(identity as CKUserIdentityMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each user identity returned.
**Notes:** identity: A CKUserIdentityMBS object that was discovered in the device,Äôs contacts.

This event is executed once for each identity that is discovered. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.10 class CKDiscoveredUserInfoMBS

### 32.10.1 class CKDiscoveredUserInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKUserIdentityMBS instead. **Function:** A CKDiscoveredUserInfo object contains information about a discoverable user in a database.
**Notes:** You do not create instances of this class yourself. Instead, use a CKDiscoverAllContactsOperation object or other means to retrieve these objects.

Available in OS X 10.10 and newer.
Deprecated in OS X 10.12 in favor of CKUserIdentityMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr7

### 32.10.2 Methods

### 32.10.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.10.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.10.5 Properties

### 32.10.6 displayContact as Variant

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Contains the given and family name of the user who is not associated with the local Address Book.

**Notes:** DisplayContact is not associated with the local Address Book. It is a wrapper around information known to the CloudKit server, including first and last names.
Value is a CNContactMBS object.
(Read only property)

### 32.10.7 firstName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The first name of the user.
**Notes:** (Read only property)

### 32.10.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.10.9 lastName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The last name of the user.
**Notes:** (Read only property)

### 32.10.10 userRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the user record.
**Notes:** Use this value to retrieve the user record associated with the specified user. The user record does not contain any personal information about the user by default. Your app can add data to the user record but should not add any sensitive user data to it.
(Read only property)

## 32.11 class CKDiscoverUserIdentitiesOperationMBS

### 32.11.1 class CKDiscoverUserIdentitiesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that fetches user identities.
**Notes:** Subclass of the CKOperationMBS class.

### 32.11.2 Methods

### 32.11.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to discover user identities.
**Notes:** You can use the returned CKDiscoverUserIdentitiesOperation only once. When executed, this query object processes the share metadata.
See also:

- 32.11.4 Constructor(userIdentityLookupInfos() as CKUserIdentityLookupInfoMBS) 5651

### 32.11.4 Constructor(userIdentityLookupInfos() as CKUserIdentityLookupInfoMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to discover all user identities associated with the specified lookup info.
**Notes:** userIdentityLookupInfos: An array of CKUserIdentityLookupInfoMBS objects. This parameter is used to initialize the value in the userIdentityLookupInfos property. If you specify nil, you must assign an appropriate value to the userIdentityLookupInfos property before executing the operation.

Returns an initialized operation object.
See also:

- 32.11.3 Constructor 5651

### 32.11.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.11.6 setUserIdentityLookupInfos(IDs() as CKUserIdentityLookupInfoMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the lookup info (email address, phone number, or record ID) used to discover user identities.
**Notes:** Use this property to view or change the lookup info used to discover user identities. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.11.7 userIdentityLookupInfos as CKUserIdentityLookupInfoMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The lookup info (email address, phone number, or record ID) used to discover user identities.
**Notes:** Use this property to view or change the lookup info used to discover user identities. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.11.8 Events

### 32.11.9 discoverUserIdentitiesCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute when the operation has completed.
**Notes:** This block is called when the operation completes. The completionBlock of the underlying NSOperationMBS is also called if both are set. This block is executed serially with respect to the other progress blocks of the operation. If you intend to use this block to process results, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.11.10 userIdentityDiscovered(identity as CKUserIdentityMBS, lookupInfo as CKUserIdentityLookupInfoMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each user identity that has been discovered.
**Notes:** Each time the event is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.12 class CKDiscoverUserInfosOperationMBS

### 32.12.1 class CKDiscoverUserInfosOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKDiscoverUserIdentitiesOperationMBS instead. **Function:** A CKDiscoverUserInfosOperation object retrieves the IDs for discoverable users whose email addresses or user record IDs you already know.
**Notes:** This operation returns information about the corresponding users.

Users of an app must opt in to discoverability before their user records can be accessed. To opt in for a user, your app must call the requestApplicationPermission:completion: method of your container object and request the userDiscoverability permission. Calling that method prompts the user to grant or deny the permission.

If you assign a completed event of the operation object, the completed event is called after the operation executes and returns its results to you. You can use a completed event to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completed event you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr7

### 32.12.2 Methods

### 32.12.3 Constructor(emailAddresses() as String, userRecordIDs() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes the operation object with the specified email addresses.
**Notes:** emailAddresses: An array of strings, each of which contains a single email address to look for. The value you specify is used to initialize the value of the emailAddresses property. If you specify nil for this parameter, assign at least one email address to the emailAddresses property before executing the operation object.
userRecordIDs: An array of CKRecordIDMBS objects, each of which contains the ID of a user record to look for. The value you specify is used to initialize the value of the userRecordIDs property. If you specify nil for this parameter, assign at least one email address to the userRecordIDs property before executing the operation object.

The email addresses you specify need not belong to users in the current user,Äôs address book. The users associated with those email addresses must be discoverable for their user record ID to be returned.

### 32.12.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.12.5 emailAddresses as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The email addresses of the users whose information you want to retrieve.
**Notes:** This property contains an array of strings, each of which corresponds to a single email address. Use this property to add or remove email addresses to the operation. If you intend to change the property value, do so before executing the operation or submitting the operation object to a queue.

The default value of this property is set to the email addresses you specify in the Constructor.

### 32.12.6 setEmailAddresses(emails() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the email addresses of the users whose information you want to retrieve.
**Notes:** This property contains an array of strings, each of which corresponds to a single email address. Use this property to add or remove email addresses to the operation. If you intend to change the property value, do so before executing the operation or submitting the operation object to a queue.

The default value of this property is set to the email addresses you specify in the Constructor.

### 32.12.7 setUserRecordIDs(IDs() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the users whose information you want to retrieve.
**Notes:** This property contains an array of CKRecordIDMBS objects, each of which corresponds to the ID of a user record. Use this property to add or remove record IDs to the operation. If you intend to change the value of this property, you must do so before executing the operation or submitting the operation object to a queue.

The default value of this property is set to the record IDs you specify in the Constructor.

### 32.12.8 userRecordIDs as CKRecordIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the users whose information you want to retrieve.
**Notes:** This property contains an array of CKRecordIDMBS objects, each of which corresponds to the ID of a user record. Use this property to add or remove record IDs to the operation. If you intend to change the value of this property, you must do so before executing the operation or submitting the operation object to a queue.

The default value of this property is set to the record IDs you specify in the Constructor.

### 32.12.9 Events

### 32.12.10 discoverUserInfosCompleted(emailsToUserInfos as Dictionary, userRecordIDsToUserInfos as Dictionary, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to use to process the search results.
**Notes:** The event has no return value and takes the following parameters:

emailsToUserInfos: A dictionary whose keys are events with the email addresses you provided in the emailAddresses property. The value of each key is a CKDiscoveredUserInfo object that identifies the user associated with the email address. Use that object to get the user,Äôs name and fetch the corresponding user record.
userRecordIDsToUserInfos: A dictionary whose keys are the CKRecordIDMBS objects you provided. The value of each key is a CKDiscoveredUserInfo object that identifies the user associated with the user record. You can use that object to get the user,Äôs name.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

This event is executed only once, at the conclusion of the operation. If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.13 class CKFetchDatabaseChangesOperationMBS

### 32.13.1 class CKFetchDatabaseChangesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that fetches changes to the database.
**Notes:** Subclass of the CKDatabaseOperationMBS class.

### 32.13.2 Methods

### 32.13.3 Constructor(previousServerChangeToken as CKServerChangeTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured with the previous change token.
**Notes:** previousServerChangeToken: The previous change token.

Returns an initialized operation object.

After initializing the operation, assign a block to the fetchDatabaseChangesCompletionBlock property to process the results.

If a change anchor from a previous CKFetchDatabaseChangesOperation is passed in, only the zones that have changed since that anchor will be returned.

This per-database CKServerChangeToken is not to be confused with the per-recordZone CKServerChangeToken from CKFetchRecordZoneChangesOperationMBS.

If this is your first fetch or if you wish to re-fetch all zones, pass nil for the change token. Change tokens are opaque and clients should not infer any behavior based on their content.

### 32.13.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.13.5 Properties

### 32.13.6 fetchAllChanges as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Configuration setting to control whether this operation makes repeated calls to the server.
**Notes:** When this property is set to true, the operation sends repeated requests to the server until all record zone changes have been fetched. When this property is set to false, it is the responsibility of the caller to issue subsequent fetch-change operations when moreComing is true in a fetchDatabaseChangesCompleted invocation.

fetchAllChanges is true by default.
(Read and Write property)

### 32.13.7 previousServerChangeToken as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The change token from a previous fetch operation.
**Notes:** Assign the token you received previously from the fetchDatabaseChangesCompleted event to this property. Doing so yields only the changes that have occurred since your last fetch operation. If you specify nil for this parameter, the operation starts fetching changes at the beginning.
(Read and Write property)

### 32.13.8 resultsLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The maximum number of results to fetch with this operation.
**Notes:** Use this property to limit the number of changes processed in one operation. When the results limit is reached, the operation object updates the original token you provided and returns it to you to let you know that more results are available.
(Read and Write property)

### 32.13.9 Events

### 32.13.10 changeTokenUpdated(serverChangeToken as CKServerChangeTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the change token has changed.
**Notes:** This event will be executed periodically, giving you an updated change token so that already-fetched record zone changes do not need to be re-fetched on a subsequent operation.

### 32.13.11 fetchDatabaseChangesCompleted(serverChangeToken as CKServerChangeTokenMBS, moreComing as Boolean, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the operation completes.
**Notes:** serverChangeToken: The current server change token to be stored and used in subsequent CKFetchDatabaseChangesOperation instances.
moreComing: Indicates if this is the last record zone change. If fetchAllChanges is false, it is the responsibility of the client to create additional CKFetchDatabaseChangesOperation instances for the additional changes.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The client is responsible for saving the change token at the end of the operation and passing it into the next call to CKFetchDatabaseChangesOperationMBS. If the server returns a CKErrorChangeTokenExpired error, the previousServerChangeToken value was too old and the client should toss its local cache and re-fetch the changes in this record zone starting with a nil previousServerChangeToken.

### 32.13.12 recordZoneWithIDChanged(zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block that processes a single record zone change.
**Notes:** The event returns no value and takes the following parameter:

zoneID: The CKRecordZoneID corresponding to the record zone that changed.

### 32.13.13 recordZoneWithIDWasDeleted(zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event that processes a single record zone deletion.
**Notes:** The event returns no value and takes the following parameter:

zoneID: The CKRecordZoneID corresponding to the record zone that was deleted.

## 32.14 class CKFetchNotificationChangesOperationMBS

### 32.14.1 class CKFetchNotificationChangesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKFetchNotificationChangesOperationMBS object retrieves unread CKNotification objects from a container.
**Notes:** Notification objects contain the data associated with push notifications that have already been sent to an app. Fetch notification objects to identify changes that your app might have missed or to retrieve the complete push notification payload, which might have been truncated when it was delivered to the device.

After fetching the current notifications, you can mark some or all of them as read using a CKMarkNotificationsReadOperation object. Marking a notification as read prevents it from being returned by subsequent fetch operations.

The events to process the fetched notifications are executed serially on an internal queue that is managed by the operation object. Your events must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

The completion event is called after the operation executes and returns its results to you. You can use a completed event to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion event you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKOperationMBS class.

### 32.14.2 Methods

### 32.14.3 Constructor(previousServerChangeToken as CKServerChangeTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object set to fetch notification changes.
**Notes:** previousServerChangeToken: The change token from a previous fetch operation, or nil to fetch all changes. When you specify a change token, the operation object fetches only the changes that occurred since the change token was generated.

Returns an initialized operation object.

The first time you fetch notifications, specify nil for the previousServerChangeToken to get information about all push notifications that have been sent. When that operation finishes executing, it passes a change token to your completion block. Save that change token and use it to initialize new operation objects that fetch only the newly generated notification objects.

If you mark one or more notifications as read using a CKMarkNotificationsReadOperationMBS object, those notifications are not returned, even if you specify nil for previousServerChangeToken.

### 32.14.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.14.5 Properties

### 32.14.6 moreComing as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating that more notifications are waiting to be delivered.
**Notes:** Access this property only from your fetchNotificationChangesCompletionBlock block. When the value is true, your completed event should create another CKFetchNotificationChangesOperation object and use it to fetch the next batch of results. Use the change token passed to your completion block to configure the new operation object. Specifying the change token prevents the new operation object from returning older notifications.
(Read only property)

### 32.14.7 previousServerChangeToken as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The change token from a previous fetch operation.
**Notes:** Assign the token you received previously from the fetchNotificationChangesCompleted event to this property. Doing so yields only the notifications that have arrived since your last fetch operation. If you specify nil for this parameter, the operation starts fetching notifications at the beginning of the list and returns all but those that have already been marked as read.
(Read and Write property)

### 32.14.8 resultsLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The maximum number of results to fetch with this operation.
**Notes:** Use this property to limit the number of push notifications processed in one operation. When the

results limit is reached, the operation object updates the original token you provided and returns it to you to let you know that more results are available.
(Read and Write property)

### 32.14.9 Events

### 32.14.10 fetchNotificationChangesCompleted(serverChangeToken as CKServerChangeTokenMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event that is executed after all requested notifications are fetched.
**Notes:** The event returns no value and takes the following parameters:

serverChangeToken: An opaque object that you can use during subsequent fetch operations to retrieve the next batch of notifications.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this event only once, which represents your last chance to process the operation results. This event is executed after all individual progress events but before the operation,Äôs completion event. The event is executed serially with respect to the other progress events of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

In your event, check the value of the moreComing property to determine if there are more results waiting on the server. If the value of that property is treu, use the value in the serverChangeToken parameter to configure a new CKFetchNotificationChangesOperationMBS object to fetch the next batch of results.

### 32.14.11 notificationChanged(notification as CKNotificationMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event that processes a single push notification.
**Notes:** The event returns no value and takes the following parameter:

notification: The CKNotification object corresponding to a push notification. The actual object passed to this method is a concrete subclass of CKNotification that contains specific details about the source of the change.

The operation object executes this event once for each push notification that is found. Each time the event

is executed, it is executed serially with respect to the other progress events of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.15 class CKFetchRecordChangesOperationMBS

### 32.15.1 class CKFetchRecordChangesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKFetchRecordChangesOperation object reports on the changed and deleted records in the specified record zone.
**Notes:** Use this type of operation object to optimize fetch operations for locally managed sets of records. Specifically, use it when you maintain a local cache of your record data and need to synchronize that cache periodically with the server.

To get the most benefit out of a CKFetchRecordChangesOperation object, you must maintain a local cache of the records from the specified zone. Each time you fetch changes from that zone, the server provides a token that identifies your request. With each subsequent fetch request, you initialize the operation object with the token from the previous request, and the server returns only the records that changed since that request.

The blocks you assign to process the fetched records are executed serially on an internal queue managed by the operation. Your blocks must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

The completed event is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.

Available in 10.10 and newer and deprecated with 10.12.
Subclass of the CKDatabaseOperationMBS class.

### 32.15.2 Methods

### 32.15.3 Constructor(recordZoneID as CKRecordZoneIDMBS, previousServerChangeToken as CKServerChangeTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch changes in the specified record zone.
**Notes:** recordZoneID: The zone containing the records you want to fetch. The zone can be a custom zone. Syncing the default zone is not supported.
previousServerChangeToken: The change token from a previous fetch operation. This is the token passed to your fetchRecordChangesCompleted event during a previous fetch operation. Use this token to limit the

returned data to only those changes that have occurred since you last made the same fetch request. If you specify nil for this parameter, the operation object fetches all records and their contents.

Returns an initialized operation object.

When initializing the operation object, use the token from a previous fetch request if you have one. You can archive tokens and write them to disk for later use if needed.

The returned operation object is configured to retrieve all changed fields of the record, including any assets stored in those fields. If you want to minimize the amount of data returned even further, configure the desiredKeys property with the subset of keys whose values you want to fetch.

After initializing the operation, associate at least one progress block with the operation object (excluding the completion block) to process the results.

### 32.15.4 desiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property are included in the returned record. The default value is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and include at least one field name from each record type.

If you intend to specify the desired set of keys, set the value of this property before executing the operation or submitting it to a queue.

### 32.15.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.15.6 setDesiredKeys(desiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property are included in the returned record. The default value is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and include at least one field name from each record type.

If you intend to specify the desired set of keys, set the value of this property before executing the operation or submitting it to a queue.

### 32.15.7 Properties

### 32.15.8 moreComing as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating that more results are available.
**Notes:** If the server is unable to deliver all of the changed results with this operation object, it sets this property to true before executing the fetchRecordChangesCompleted event. To fetch the remaining changes, create a new CKFetchRecordChangesOperationMBS object using the change token returned by the server. (Read only property)

### 32.15.9 previousServerChangeToken as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The token that identifies the starting point for retrieving changes.
**Notes:** Each fetch request returns a unique token in addition to any changes. The token is passed as a parameter to your fetchRecordChangesCompleted event. During a subsequent fetch request, providing the previous token causes the server to return only the changes that have occurred since the last fetch request. Tokens are opaque data objects that you can write to disk safely and reuse later.

Typically, you set the value of this property when you initialize the operation object. If you intend to change the record zone, update the value of the property before executing the operation or submitting it to a queue. (Read and Write property)

### 32.15.10 recordZoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the record zone whose records you want to fetch.
**Notes:** Typically, you set the value of this property when you initialize the operation object. If you intend to change the record zone, update the value before executing the operation or submitting it to a queue.
(Read and Write property)

### 32.15.11 resultsLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:**

The maximum number of changed records to report with this operation object.
Language
**Notes:**

Use this property to limit the number of results in situations where you expect the number of changed records might be large. The default value is 0, which causes the server to choose an appropriate number of results to return based on dynamic conditions.

When the number of returned results exceeds the results limit, the operation object sets the moreComing property to true before executing the fetchRecordChangesCompleted event. In your event, check the value of that property, and if it is true, create a new CKFetchRecordChangesOperationMBS object to fetch more results.
(Read and Write property)

### 32.15.12 Events

### 32.15.13 fetchRecordChangesCompleted(serverChangeToken as CKServerChangeTokenMBS, clientChangeTokenData as MemoryBlock, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when all changes have been reported.
**Notes:** The block returns no value and takes the following parameters:

serverChangeToken: The new change token from the server. You can store this token locally and use it during subsequent fetch operations to limit the results to records that changed since this operation executed.
clientChangeToken: The last client change token received from this device. If this change token is not the last change token you provided, the server may not have received the associated changes.

operationError: An error object containing information about a problem, or nil if the changes are retrieved successfully.

Your implementation of this block should check the moreComing property of the operation object to ensure that the server was able to deliver all results. If that property is set to true, you must create another operation object (using the value in the serverChangeToken parameter) to fetch any remaining changes.

The operation object executes this block only once, at the conclusion of the operation. It is executed after all individual change blocks but before the operation,Äôs completed event. The block is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

### 32.15.14 recordChanged(record as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the contents of a changed record.
**Notes:** The event returns no value and takes the following parameters:

record: The record that changed. If you specified a value for the desiredKeys property, the record only contains the fields specified in the desiredKeys property.

The operation object executes this event once for each record in the zone that changed since the previous fetch request. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation. If no records changed, the block is not executed.

If you intend to use this event to process results, set it before executing the operation or submitting it to a queue.

### 32.15.15 recordWithIDWasDeleted(recordID as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the ID of a record that was deleted.
**Notes:** The block returns no value and takes the following parameters:

recordID: The ID of the record that was deleted.

The operation object executes this block once for each record in the zone that was deleted since the previous fetch request. Each time the event is executed, it is executed serially with respect to the other progress blocks of the operation. If no records were deleted, this event is not executed.

If you intend to use this event to process results, set it before executing the operation or submitting it to a queue.

## 32.16 class CKFetchRecordsOperationMBS

### 32.16.1 class CKFetchRecordsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKFetchRecordsOperation object retrieves CKRecord objects (whose IDs you already know) from iCloud.
**Notes:** Use this operation to retrieve the entire contents of each record or only a subset of its contained values. As records become available, the operation object reports progress about the state of the operation to several different blocks, which you can use to process the results.

Fetching records is a common use of CloudKit, even if your app does not cache record IDs locally. For example, when you fetch a record related to the current record through a CKReference object, you use the ID in the reference to perform the fetch.

The blocks you assign to process the fetched records are executed serially on an internal queue managed by the fetch records operation. Your blocks must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

In addition to data records, a fetch records operation can fetch the current user record. The fetchCurrentUserRecordOperation() method returns a specially configured operation object that retrieves the current user record. That record is a standard CKRecord object whose contents are empty initially. You can add data to the user record and save it as needed. Because a discoverable user record can be accessed by other users of the app, never store sensitive personal information such as passwords in the user record. If you must store sensitive information about a user, do so in a separate record that is accessible only to that user.

The completed event is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKDatabaseOperationMBS class.

### 32.16.2 Methods

### 32.16.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.16.4 Constructor(recordIDs() as CKRecordIDMBS) 5670

### 32.16.4 Constructor(recordIDs() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch the records with the specified IDs.
**Notes:** recordIDs: An array of CKRecordIDMBS objects representing the records you want to retrieve. This parameter is used to initialize the value in the recordIDs property. If specify nil, you must assign an appropriate value to the recordIDs property before executing the operation.

If any of the objects in the array are not CKRecordIDMBS objects, this method raises an exception.

Returns an initialized operation object.

The returned operation object is configured to retrieve all fields of the record, including any assets stored in those fields. If you want to minimize the amount of data returned initially, configure the desiredKeys property with the subset of keys whose values you want to retrieve.
See also:

- 32.16.3 Constructor 5669

### 32.16.5 desiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property are included in the returned record. The default value of this property is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and should include at least one field name from each record type.

If you intend to specify a value other than nil, do so before executing the operation or submitting the operation object to a queue.

### 32.16.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.16.7 fetchCurrentUserRecordOperation as CKFetchRecordsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an operation object that can be used to fetch the current user record.
**Notes:** The returned operation object searches for the single record corresponding to the current user record. You must associate at least one progress block with the operation object (excluding the completed event) to process the results.

### 32.16.8 recordIDs as CKRecordIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The array of IDs corresponding to the records to fetch.
**Notes:** Use this property to view or change the IDs of the records you want to retrieve. Each item in the array must be a CKRecordIDMBS object. If you used the fetchCurrentUserRecordOperation method to create the operation object, the contents of this property are ignored and the value is set to nil.

If you intend to specify a value other than nil, do so before executing the operation or submitting the operation object to a queue. The records you fetch do not need to be in the same record zone. The record ID for each record provides the zone information needed by the server to fetch the corresponding record.

### 32.16.9 setDesiredKeys(desiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Set the fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property are included in the returned record. The default value of this property is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and should include at least one field name from each record type.

If you intend to specify a value other than nil, do so before executing the operation or submitting the operation object to a queue.

### 32.16.10 setRecordIDs(IDs() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the array of IDs corresponding to the records to fetch.
**Notes:** Use this property to view or change the IDs of the records you want to retrieve. Each item in the array must be a CKRecordIDMBS object. If you used the fetchCurrentUserRecordOperation method to create the operation object, the contents of this property are ignored and the value is set to nil.

If you intend to specify a value other than nil, do so before executing the operation or submitting the operation object to a queue. The records you fetch do not need to be in the same record zone. The record ID for each record provides the zone information needed by the server to fetch the corresponding record.

### 32.16.11 Events

### 32.16.12 fetchRecordsCompleted(recordsByRecordID as Dictionary, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute after all records are fetched or have received appropriate errors.
**Notes:** The event returns no value and takes the following parameters:

recordsByRecordID: A dictionary containing the records that are retrieved successfully. Each key in the dictionary is a CKRecordID object corresponding to a record you requested. The value of each key is the corresponding CKRecord object that was retrieved from the database.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this event only once and is your last chance to process the operation results. The event is executed after all of the individual progress events but before the operation,Äôs completed event. The event is executed serially with respect to the other progress events of the operation.

This event reports an error of type CKErrorPartialFailure when it retrieves only some of the records successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is an NSDictionary object. The keys of that dictionary are the IDs of the records that were not retrieved, and the corresponding values are error objects containing information about what happened.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

### 32.16.13 RecordCompleted(record as CKRecordMBS, recordID as CKRecordIDMBS, error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the results of a single record are available.
**Notes:** The event returns no value and takes the following parameters:

record: The retrieved record, or nil if the specified record cannot be retrieved.
recordID: The ID of the record. This value corresponds to one of the IDs you specified in the recordIDs property.
error: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this block once for each record ID in the recordIDs property. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

### 32.16.14 RecordProgress(recordID as CKRecordIDMBS, progress as Double)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with progress information for individual records.
**Notes:** The event returns no value and takes the following parameters:

recordID: The ID of the record that is being retrieved.
progress: The amount of the record that has been downloaded, represented as a percentage of the total. The range of this value is 0.0 to 1.0, where 0.0 means nothing has been downloaded, and 1.0 means the download is complete.

The operation object executes this block zero or more times for each record ID in the recordIDs property. Each time the block is executed, it is executed serially with respect to the other progress events of the operation. You can use this event to track the ongoing progress of the download operation and possibly to provide feedback to the user.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.17 class CKFetchRecordZoneChangesOperationMBS

### 32.17.1 class CKFetchRecordZoneChangesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that fetches record changes across the given record zone.
**Notes:** Subclass of the CKDatabaseOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr7
- MBS Xojo Plugins, version 21.2pr5

### 32.17.2 Methods

### 32.17.3 Constructor(recordZoneIDs() as CKRecordZoneIDMBS, optionsByRecordZoneID as Dictionary = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch record zone changes.
**Notes:** The returned operation object is configured to retrieve all record zones passed in. If you want to minimize the amount of data returned even further, configure the CKFetchRecordZoneChangesOptionsMBS property for each record zone.

After initializing the operation, associate at least one progress block with the operation object (excluding the completion block) to process the results.

optionsByRecordZoneID: The options per zone.
recordZoneIDs: The record zones that should be fetched.

### 32.17.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.17.5 recordZoneIDs as CKRecordZoneIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the record zones whose records you want to fetch.
**Notes:** Typically, you set the value of this property when you initialize the operation object. If you intend to change the record zones, update the value before executing the operation or submitting it to a queue.

### 32.17.6 setRecordZoneIDs(IDs() as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the record zones whose records you want to fetch.
**Notes:** Typically, you set the value of this property when you initialize the operation object. If you intend to change the record zones, update the value before executing the operation or submitting it to a queue.

### 32.17.7 Properties

### 32.17.8 fetchAllChanges as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether repeated requests should be sent to the server.
**Notes:** If true, this operation sends repeated requests to the server until CKFetchRecordZoneChangesOperationMBS is false. The server calls recordZoneFetchCompletionBlock with an incremental change token after every request. The default value is true.
(Read and Write property)

### 32.17.9 optionsByRecordZoneID as Dictionary

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Options for each zone that is retrieved from the server.
**Notes:** Each CKRecordZoneIDMBS can have its own CKFetchRecordZoneChangesOptionsMBS object that allows you to configure what is fetched for that zone. See CKFetchRecordZoneChangesOptionsMBS for details on what options can be set.
(Read and Write property)

### 32.17.10 Events

### 32.17.11 fetchRecordZoneChangesCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to use to process the record zone changes.
**Notes:** The event has no return value and takes the following parameter:

operationError: An error object containing information about a problem, or nil if the record zone changes were retrieved successfully.

### 32.17.12 recordChanged(record as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the contents of a changed record.
**Notes:** The block returns no value and takes the following parameter:

record: The record that changed. If you specified a value for the desiredKeys property, the record only contains the fields specified in the desiredKeys property.

The operation object executes this block once for each record in the zone that changed since the previous fetch request. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation. If no records changed, the block is not executed.

If you intend to use this block to process results, set it before executing the operation or submitting it to a queue.

### 32.17.13 recordWithIDWasDeleted(recordID as CKRecordIDMBS, recordType as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the ID of a record that was deleted.
**Notes:** The event returns no value and takes the following parameter:

recordID: The ID of the record that was deleted.

The operation object executes this block once for each record that was deleted since the previous fetch request. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation. If no records were deleted, this block is not executed.

If you intend to use this block to process results, set it before executing the operation or submitting it to a queue.

### 32.17.14 recordZoneChangeTokensUpdated(recordZoneID as CKRecordZoneIDMBS, serverChangeToken as CKServerChangeTokenMBS, clientChangeTokenData as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the change token has been updated.
**Notes:** The event returns no value and takes the following parameters:

recordZoneID: The ID of the zone with the updated token.
serverChangeToken: The new change token from the server. You can store this token locally and use it during subsequent fetch operations to limit the results to records that changed since this operation executed.
clientChangeTokenData: The last client change token received from this device. If this change token is not the last change token you provided, the server may not have received the associated changes.

The operation object executes this block once for each record zone. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this block to process results, set it before executing the operation or submitting it to a queue.

### 32.17.15 recordZoneFetchCompleted(recordZoneID as CKRecordZoneIDMBS, serverChangeToken as CKServerChangeTokenMBS, clientChangeTokenData as MemoryBlock, moreComing as boolean, recordZoneError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the fetch for a zone has completed.
**Notes:** The block returns no value and takes the following parameters:

recordZoneID: The ID of the zone with the updated token.
serverChangeToken: The current server change token to be stored and used in subsequent CKFetchRecordZoneChangesOperation instances.
clientChangeTokenData: The last client change token received from this device. If this change token is not the last change token you provided, the server may not have received the associated changes.
moreComing: Indicates if this is the last record zone change. If fetchAllChanges is false, it is the responsibility of the client to create additional CKFetchRecordZoneChangesOperationMBS instances for the additional changes.
recordZoneError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The client is responsible for saving the change token at the end of the operation and passing it into the next

call to CKFetchRecordZoneChangesOperationMBS. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting it to a queue.

## 32.18 class CKFetchRecordZoneChangesOptionsMBS

### 32.18.1 class CKFetchRecordZoneChangesOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Options when fetching record zone changes.

### 32.18.2 Methods

### 32.18.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.18.4 desiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property are included in the returned record. The default value is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and include at least one field name from each record type.

If you intend to specify the desired set of keys, set the value of this property before executing the operation or submitting it to a queue.

### 32.18.5 setDesiredKeys(desiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the fields to fetch for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the fetch operation. This property contains an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the keys in this property

are included in the returned record. The default value is nil, which causes all keys of the record to be fetched.

Because the records you fetch can be of different types, the array should contain the merged set of all field names for the requested records and include at least one field name from each record type.

If you intend to specify the desired set of keys, set the value of this property before executing the operation or submitting it to a queue.

### 32.18.6 Properties

### 32.18.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.18.8 previousServerChangeToken as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The token that identifies the starting point for retrieving changes.
**Notes:** Each fetch request returns a unique token in addition to any changes. The token is passed as a parameter to your fetchRecordChangesCompleted event. During a subsequent fetch request, providing the previous token causes the server to return only the changes that have occurred since the last fetch request. Tokens are opaque data objects that you can write to disk safely and reuse later.

Typically, you set the value of this property when you initialize the operation object. If you intend to change the record zone, update the value of the property before executing the operation or submitting it to a queue. (Read and Write property)

### 32.18.9 resultsLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The maximum number of changed records to report with this operation object.
**Notes:** Use this property to limit the number of results in situations where you expect the number of changed records might be large. The default value is 0, which causes the server to choose an appropriate number of results to return based on dynamic conditions.

When the number of returned results exceeds the results limit, the operation object sets the moreComing property to true before executing the fetchRecordChangesCompleted event. In your block, check the value of that property, and if it is true, create a new CKFetchRecordChangesOperationMBS object to fetch more results.
(Read and Write property)

## 32.19 class CKFetchRecordZonesOperationMBS

### 32.19.1 class CKFetchRecordZonesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKFetchRecordZonesOperation object retrieves CKRecordZone objects (whose IDs you already know) from iCloud.
**Notes:** Use this operation object to fetch record zones so that you can ascertain their capabilities.

The completed event is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKDatabaseOperationMBS class.

### 32.19.2 Methods

### 32.19.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The default constructor.
See also:

- 32.19.4 Constructor(recordZoneIDs() as CKRecordZoneIDMBS) 5682

### 32.19.4 Constructor(recordZoneIDs() as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch the specified record zones.
**Notes:** zoneIDs: An array of CKRecordZoneID objects representing the zones you want to retrieve. This parameter is used to initialize the value in the recordZoneIDs property. If you specify nil, you must assign a value to the recordZoneIDs property before executing the operation.

Returns an initialized operation object.
See also:

- 32.19.3 Constructor 5682

### 32.19.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.19.6 fetchAllRecordZonesOperation as CKFetchRecordZonesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an operation object that can be used to fetch all record zones in the current database.

### 32.19.7 recordZoneIDs as CKRecordZoneIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the record zones you want to retrieve.
**Notes:** Use this property to view or change the IDs of the record zones you want to retrieve. Each item in the array must be a CKRecordZoneID object. If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

If you used the fetchAllRecordZonesOperationMBS method to create the operation object, the contents of this property are ignored and the default value is set to nil.

### 32.19.8 setRecordZoneIDs(IDs() as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the record zones you want to retrieve.
**Notes:** Use this property to view or change the IDs of the record zones you want to retrieve. Each item in the array must be a CKRecordZoneID object. If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

If you used the fetchAllRecordZonesOperationMBS method to create the operation object, the contents of this property are ignored and the default value is set to nil.

### 32.19.9 Events

### 32.19.10 fetchRecordZonesCompleted(recordZonesByZoneID as Dictionary, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the fetch results.
**Notes:** The event returns no value and takes the following parameters:

recordZonesByZoneID: A dictionary that maps the requested IDs to the retrieved objects. The keys in the dictionary are the CKRecordZoneID objects you requested, and the values are the corresponding CKRecordZone objects.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this block only once and it is your only chance to process the operation results. The block is executed before the operation,Äôs completion block. Your block must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

This block reports an error of type CKErrorPartialFailure when it retrieves only some of the record zones successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the record zones that were not retrieved, and the corresponding values are error objects containing information about what happened.

## 32.20 class CKFetchShareMetadataOperationMBS

### 32.20.1 class CKFetchShareMetadataOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that fetches shared record metadata for one or more shares.
**Notes:** This operation may be run in any container that the client has access to.
Subclass of the CKOperationMBS class.

### 32.20.2 Methods

### 32.20.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

### 32.20.4 Constructor(URLs() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch the metadata for the specified shares.
**Notes:** shareURLs: An array of URLs. This parameter is used to initialize the value in the shareURLs property. If you specify nil, you must assign an appropriate value to the shareURLs property before executing the operation.

Returns an initialized operation object.

### 32.20.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.20.6 rootRecordDesiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Keys to be fetched if the root record is to be fetched.
**Notes:** This property declares which user-defined keys should be fetched and added to the resulting root record. This property is only consulted if shouldFetchRootRecord is set to true.

If this property is set to nil, the entire root record is downloaded.
If this property is set to an empty array, no user fields are downloaded.

This property defaults to nil.

### 32.20.7 setRootRecordDesiredKeys(rootRecordDesiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the keys to be fetched if the root record is to be fetched.
**Notes:** This property declares which user-defined keys should be fetched and added to the resulting root record. This property is only consulted if shouldFetchRootRecord is set to true.

If this property is set to nil, the entire root record is downloaded.
If this property is set to an empty array, no user fields are downloaded.

This property defaults to nil.

### 32.20.8 setShareURLs(URLs() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the URLs of the shares that you want to process.
**Notes:** Use this property to view or change the URLs of the share objects that you want to fetch. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.20.9 shareURLs as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The URLs of the shares that you want to process.
**Notes:** Use this property to view or change the URLs of the share objects that you want to fetch. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.20.10 Properties

### 32.20.11 shouldFetchRootRecord as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A flag to indicate whether the root record should be retrieved.
**Notes:** If this property is set to true, the resulting CKShareMetadataMBS has a rootRecord object filled out.
The resulting CKShareMetadata has a rootRecordID property regardless of the value of this property.
This property defaults to false.
(Read and Write property)

### 32.20.12 Events

### 32.20.13 fetchShareMetadataCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the operation has completed.
**Notes:** This block is called when the operation completes. The Complete of the underlying NSOperation is also called if both are implemented.

The event is executed serially with respect to the other progress events of the operation. If you intend to use this event to process results, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.20.14 ShareMetadataFetched(shareURL as String, shareMetadata as CKShareMetadataMBS, error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each share metadata that has been fetched from the server.
**Notes:** If error is nil then the share was successfully accepted. Each time the event is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.21 class CKFetchShareParticipantsOperationMBS

### 32.21.1 class CKFetchShareParticipantsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An operation that fetches the participants of a shared record.
**Notes:** Subclass of the CKOperationMBS class.

### 32.21.2 Methods

### 32.21.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch share participants.
**Notes:** You can use the returned CKFetchShareParticipantsOperation only once. When executed, this query object fetches the share participants.

Note
If userIdentityLookupInfos is not set prior to executing the operation, it returns immediately with no results.
See also:

- 32.21.4 Constructor(userIdentityLookupInfos() as CKUserIdentityLookupInfoMBS) 5688

### 32.21.4 Constructor(userIdentityLookupInfos() as CKUserIdentityLookupInfoMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch the specified share participants.
**Notes:** userIdentityLookupInfos: An array of CKUserIdentityLookupInfoMBS objects. This parameter is used to initialize the value in the userIdentityLookupInfos property. If you specify nil, you must assign an appropriate value to the userIdentityLookupInfosuserIdentityLookupInfos property before executing this operation.

Returns an initialized operation object.
See also:

- 32.21.3 Constructor 5688

### 32.21.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.21.6 setUserIdentityLookupInfos(userIdentityLookupInfos() as CKUserIdentityLookupInfoMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the user identities that are used to fetch the share participants.
**Notes:** Use this property to view or change the user identities you want to fetch against. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

Note
If userIdentityLookupInfos is not set prior to executing the operation, it returns immediately with no results.

### 32.21.7 userIdentityLookupInfos as CKUserIdentityLookupInfoMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The user identities that are used to fetch the share participants.
**Notes:** Use this property to view or change the user identities you want to fetch against. If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.

Note
If userIdentityLookupInfos is not set prior to executing the operation, it returns immediately with no results.

### 32.21.8 Events

### 32.21.9 fetchShareParticipantsCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the operation has completed.
**Notes:** This event is called when the operation complete. The Comepleted of the underlying NSOperation is also called if both are set.

The event is executed serially with respect to the other progress blocks of the operation. If you intend to use this event to process results, update the value of this property before executing the operation or submitting the operation object to the queue.

### 32.21.10 shareParticipantFetched(participant as CKShareParticipantMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each share participant that has been fetched from the server.
**Notes:** Each time the event is executed, it is executed serially with respect to the other progress events of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

# 32.22 class CKFetchSubscriptionsOperationMBS

## 32.22.1 class CKFetchSubscriptionsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKFetchSubscriptionsOperation object retrieves CKSubscription objects (whose IDs you already know) from iCloud and can fetch all subscriptions associated with the current user.
**Notes:** You might fetch subscription objects so you can examine or modify their parameters; for example, to adjust the delivery options for push notifications generated by the subscription.

The completion event is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKDatabaseOperationMBS class.

## 32.22.2 Methods

## 32.22.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.22.4 Constructor(subscriptionIDs() as String) 5691

## 32.22.4 Constructor(subscriptionIDs() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to fetch the specified subscriptions.
**Notes:** subscriptionIDs: An array of strings, each of which contains the ID of a subscription object you want to retrieve. This parameter is used to initialize the value in the subscriptionIDs property. If you specify nil, you must assign an appropriate value to the subscriptionIDs property before executing the operation.

Returns an initialized operation object.
See also:

- 32.22.3 Constructor 5691

### 32.22.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.22.6 fetchAllSubscriptionsOperation as CKFetchSubscriptionsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an operation object that retrieves all of the user,Äôs subscription objects in the current database.
**Notes:** Returns a newly allocated operation object that fetches the active subscription objects operating on behalf of the current user.

### 32.22.7 setSubscriptionIDs(emails() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the subscription objects you want to retrieve.
**Notes:** Use this property to view or change the IDs of the subscription objects you want to retrieve. Each item in the array must be a string whose value is the ID of the subscription object you want to retrieve. If you intend to specify or change the value for this property, do so before executing the operation or submitting the operation object to a queue.

If you used the fetchAllSubscriptionsOperation method to create the operation object, the contents of this property are ignored and its value is set to nil.

### 32.22.8 subscriptionIDs as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the subscription objects you want to retrieve.
**Notes:** Use this property to view or change the IDs of the subscription objects you want to retrieve. Each item in the array must be a string whose value is the ID of the subscription object you want to retrieve. If you intend to specify or change the value for this property, do so before executing the operation or submitting the operation object to a queue.

If you used the fetchAllSubscriptionsOperation method to create the operation object, the contents of this property are ignored and its value is set to nil.

### 32.22.9 Events

### 32.22.10 fetchSubscriptionCompleted(subscriptionsBySubscriptionID as Dictionary, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the fetch results.
**Notes:** The event returns no value and takes the following parameters:

subscriptionsBySubscriptionID: A dictionary that maps the requested IDs to the retrieved objects. The keys in the dictionary are the NSString objects with the IDs of the subscription objects you requested and the values are the corresponding CKSubscription objects.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this block only once and it is your only chance to process the operation results. The block is executed before the operation,Äôs completion block. Your block must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

This block reports an error of type CKErrorPartialFailure when it retrieves only some of the subscriptions successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the subscriptions that were not retrieved and the corresponding values are error objects containing information about what happened.

## 32.23 class CKFetchWebAuthTokenOperationMBS

### 32.23.1 class CKFetchWebAuthTokenOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The CKFetchWebAuthTokenOperation object fetches a web authentication token given an API token that you obtain from CloudKit Dashboard.
**Notes:** Use the add method in the CKDatabase class to add this operation to the operation queue of the public database.
Subclass of the CKDatabaseOperationMBS class.

### 32.23.2 Methods

### 32.23.3 Constructor(APIToken as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a CKFetchWebAuthTokenOperationMBS object with the specified API token.
**Notes:** APIToken: An API token that allows access to an app,Äôs container.

### 32.23.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.23.5 Properties

### 32.23.6 APIToken as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An API token that allows access to an app,Äôs container.
**Notes:** (Read and Write property)

### 32.23.7 Events

### 32.23.8 fetchWebAuthTokenCompleted(webAuthToken as string, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when this CKFetchWebAuthTokenOperation object fetches the web authentication token.
**Notes:** The event returns no value and takes the following parameters:

webAuthToken: If the operation is successful, the web authentication token; otherwise, nil.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

The operation object executes this block only once and it is your only chance to process the operation results. Your block must be capable of executing on a background thread, so any tasks that require access to the main thread must be redirected accordingly.

## 32.24 class CKLocationSortDescriptorMBS

### 32.24.1 class CKLocationSortDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKLocationSortDescriptor object sorts records containing location data based on their distance from a location that you specify.
**Notes:** You can add a location sort descriptor to your queries when searching for records. At creation time, you must provide the sort descriptor with a key whose value is a CLLocation object. The sort descriptor uses the value of that key to perform the sort.

Distances are computed by drawing a direct line between the two locations that follows the curvature of the Earth. Distances do not take into account altitude changes between the two locations.
Subclass of the NSSortDescriptorMBS class.

### 32.24.2 Methods

### 32.24.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.24.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Private constructor.
See also:


- 32.24.5 Constructor(key as string, relativeLocation as Variant) 5696


### 32.24.5 Constructor(key as string, relativeLocation as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a location sort descriptor object.
**Notes:** key: The name of the key whose value is a CLLocationMBS object. The key must belong to the records being sorted. The sort descriptor uses this key to retrieve the corresponding value from the record. relativeLocation: The reference location to use when sorting. Records are sorted based on their distance to

this location.

Returns an initialized location sort descriptor object, or nil if the object cannot be initialized.

During sorting, the sort descriptor computes the distance between the value in the relativeLocation parameter and the location value found in the specified key of each record. It then sorts the records in ascending order using the distance between the two points. You cannot change the sort order.

relativeLocation must be a CLLocationMBS object.
See also:

- 32.24.4 Constructor 5696

### 32.24.6 Properties

### 32.24.7 relativeLocation as Variant

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The reference location against which records are sorted.
**Notes:** Value is a CLLocationMBS.
(Read only property)

## 32.25 class CKMarkNotificationsReadOperationMBS

### 32.25.1 class CKMarkNotificationsReadOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKMarkNotificationsReadOperation object marks push notifications as read by your app so that they do not show up in future fetch results.
**Notes:** If your app uses push notifications to track changes to records, you can use this operation object to note which push notifications do not need to be processed again.

The completion event is called after the operation executes and returns its results to you. You can use a completion block to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKOperationMBS class.

### 32.25.2 Methods

### 32.25.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 32.25.4 Constructor(IDs() as CKNotificationIDMBS) 5698

### 32.25.4 Constructor(IDs() as CKNotificationIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to mark the specified notifications as read.
**Notes:** notificationIDs: An array of CKNotificationIDMBS objects representing the notifications you want to mark as read. Use this parameter to initialize the value in the notificationIDs property. If you specify nil, assign an appropriate value to the notificationIDs property before executing the operation.

If any objects in the array are not CKNotificationIDMBS objects, this method raises an exception.

Returns an initialized operation object.
See also:

- 32.25.3 Constructor 5698

### 32.25.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.25.6 notificationIDs as CKNotificationIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The array of notifications to mark as read.
**Notes:** Use this property to view or change the IDs of the notifications you want to mark as read. Each item in the array must be a CKNotificationIDMBS object. If you intend to specify a value for this property, do so before executing the operation or submitting the operation object to a queue.

### 32.25.7 setNotificationIDs(IDs() as CKNotificationIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the array of notifications to mark as read.
**Notes:** Use this property to view or change the IDs of the notifications you want to mark as read. Each item in the array must be a CKNotificationIDMBS object. If you intend to specify a value for this property, do so before executing the operation or submitting the operation object to a queue.

### 32.25.8 Events

### 32.25.9 markNotificationsReadCompleted(notificationIDsMarkedRead() as CKNotificationIDMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when all results of the operation are known.
**Notes:** The event returns no value and takes the following parameters:

notificationIDsMarkedRead: An array of CKNotificationID objects corresponding to the notifications that were successfully marked as read.
operationError: An error object containing information about a problem, or nil if all notifications are updated successfully.

The operation object executes this block only once and it is your only chance to process the operation results. If you intend to use this block to process results, set it before executing the operation or submitting the

operation object to a queue.

This block reports an error of type CKErrorPartialFailure when it is able to update only some of the notifications successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the notifications that were not updated, and the corresponding values are error objects containing information about what happened.

## 32.26 class CKModifyBadgeOperationMBS

### 32.26.1 class CKModifyBadgeOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKModifyBadgeOperation object updates the badge value applied to the app,Äôs icon.
**Notes:** This operation object can update the badge for the current device or for all of the user,Äôs devices.

The completion event is called after the operation executes and returns its results to you. You can use a completion event to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion event you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKOperationMBS class.

### 32.26.2 Methods

### 32.26.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.26.4 Constructor(badgeValue as Integer) 5701

### 32.26.4 Constructor(badgeValue as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object for setting the badge of the app.
**Notes:** badgeValue: The numerical value of the app,Äôs badge. Specify 0 to remove the badge.
See also:

- 32.26.3 Constructor 5701

### 32.26.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.26.6 Properties

### 32.26.7 badgeValue as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The numerical value to apply to the app,Äôs badge.
**Notes:** The initial value of this property is set to the value you specified using the Constructor. If you intend to change the value, do so before executing the operation or submitting it to a queue.
(Read and Write property)

### 32.26.8 Events

### 32.26.9 modifyBadgeCompleted(operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with the results of the operation.
**Notes:** The event returns no value and takes the following parameters:

operationError: An error object containing information about a problem, or nil if the badge is applied successfully.

This event is executed only once and represents your only chance to process the operation results. If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue.

## 32.27 class CKModifyRecordsOperationMBS

### 32.27.1 class CKModifyRecordsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKModifyRecordsOperationMBS object saves changes to one or more CKRecordMBS objects.
**Notes:** After modifying the fields of a record, use this type of operation object to save those changes to a database. You also use instances of this class to delete records permanently from a database.

see
https://developer.apple.com/reference/cloudkit/ckmodifyrecordsoperation
Subclass of the CKDatabaseOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr8

### 32.27.2 Methods

### 32.27.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.27.4 Constructor(recordsToSave() as CKRecordMBS, recordIDsToDelete() as CKRecordIDMBS) 5703

### 32.27.4 Constructor(recordsToSave() as CKRecordMBS, recordIDsToDelete() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to save and delete the specified records.
**Notes:** recordsToSave: An array of CKRecordMBS objects representing the records to save, if any. You may specify nil for this parameter.
recordIDsToDelete: An array of CKRecordIDMBS objects representing the records you want to delete, if any. You may specify nil for this parameter.

Returns an initialized operation object.

The records you intend to save or delete must all reside in the same database, which you can specify when you configure the operation object. Saving a record that is not in the current database creates it in the

database. Trying to delete a record that does not exist in the current database returns an error for that record.
See also:

- 32.27.3 Constructor 5703

### 32.27.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.27.6 recordIDsToDelete as CKRecordIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the records to delete permanently from the database.
**Notes:** This property contains the array of CKRecordID objects that identify the records to delete. The initial contents of the array are set to the records you specified in the Constructor.

If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

When deleting records, the operation object reports progress only on the records you specify in this property. Deleting records can trigger the deletion of related records if there is an owner-owned relationship between the records involving a CKReference object. When additional deletions occur, they are not reported to the progress blocks of this object. For that reason, it is important to understand the implications of the ownership model you use when you relate records to each other through a CKReference object. For more information about owner-owned relationships, see CKReference.

### 32.27.7 recordsToSave as CKRecordMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The records to save to the database.
**Notes:** This property contains the array of CKRecordMBS objects that you want to save. The initial contents of the array are set to the records you specified in the constructor. You can modify this array as needed before executing the operation. The records must all target the same database but may belong to different zones in the database.

If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.27.8 setrecordIDsToDelete(IDs() as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the records to delete permanently from the database.
**Notes:** This property contains the array of CKRecordID objects that identify the records to delete. The initial contents of the array are set to the records you specified in the Constructor.

If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

When deleting records, the operation object reports progress only on the records you specify in this property. Deleting records can trigger the deletion of related records if there is an owner-owned relationship between the records involving a CKReference object. When additional deletions occur, they are not reported to the progress blocks of this object. For that reason, it is important to understand the implications of the ownership model you use when you relate records to each other through a CKReference object. For more information about owner-owned relationships, see CKReference.

### 32.27.9 setRecordsToSave(IDs() as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the records to save to the database.
**Notes:** This property contains the array of CKRecordMBS objects that you want to save. The initial contents of the array are set to the records you specified in the constructor. You can modify this array as needed before executing the operation. The records must all target the same database but may belong to different zones in the database.

If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.

### 32.27.10 Properties

### 32.27.11 atomic as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the entire operation fails when one or more records in the same zone cannot be written.
**Notes:** Modifying records atomically prevents you from updating your data in a way that would leave it in

an inconsistent state. You use atomic updates when you want to write multiple records to the same record zone. If there is a failure to modify any of the records in a particular zone, no changes are made to the other records in that same zone. The zone itself must have the CKRecordZoneCapabilityAtomic capability for this behavior to apply. If a record zone does not support the atomic capability, setting this property has no effect.

The default value of this property is true, which causes all modifications within a single record zone to be made atomically. If your operation object contains records in multiple record zones, a failure in one zone does not prevent modifications to records in a different zone. Changing the value of this property to false causes the records to be modified individually, regardless of whether the record zone supports atomic modifications.
(Read and Write property)

### 32.27.12 clientChangeTokenData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A data token used to track client-side changes to records.
**Notes:** When you modify records from a fetch operation, specify a client-generated data token using this property to indicate which version of the record you last modified. Compare the data token you supplied to the data token in the next record fetch to confirm the server has successfully received the device,Äôs last modify request.

The default value is nil.

If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.
(Read and Write property)

### 32.27.13 savePolicy as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The policy to apply when the server contains a newer version of a specific record.
**Notes:** Each record has a change tag that allows the server to track when that record was saved. When you save a record, CloudKit compares the change tag in your local copy of the record with the one on the server. If the two tags do not match—meaning that there is a potential conflict—the server uses the value in this property to determine how to proceed.

The default value of this property is CKRecordSaveIfServerRecordUnchanged. If you intend to change the value of this property, do so before executing the operation or submitting the operation object to a queue.
(Read and Write property)

### 32.27.14 Events

### 32.27.15 modifyRecordsCompleted(savedRecords() as CKRecordMBS, deletedRecordIDs() as CKRecordIDMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute after the status of all changes is known.
**Notes:** The event returns no value and takes the following parameters:

savedRecords: The array of CKRecordMBS objects you tried to save.
deletedRecordIDs: The array of CKRecordIDMBS objects corresponding to the records you tried to delete.
operationError: An error object containing information about a problem, or nil if the results are saved successfully.

This event is executed only once and represents your last chance to process the operation results. It is executed after all individual progress blocks have completed but before the operation,Äôs completion block. The block is executed serially with respect to the other progress blocks of the operation.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

This block reports an error of type CKErrorPartialFailure when it saves or deletes only some of the records successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the records that were not saved or deleted, and the corresponding values are error objects containing information about what happened.

### 32.27.16 RecordCompleted(record as CKRecordMBS, error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the save results of a single record are known.
**Notes:** The event returns no value and takes the following parameters:

record: A CKRecordMBS object that you attempted to save.
error: An error object containing information about a problem, or nil if the record was saved successfully.

This block is executed once for each record in the recordsToSave property. Each time the block is executed, it is executed serially with respect to the other progress events of the operation.

If you intend to use this event to process results, set it before executing the operation or submitting the operation object to a queue. Use this block to take any actions after the status of saving the record is known.

### 32.27.17 RecordProgress(record as CKRecordMBS, progress as Double)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute with progress information for an individual record.
**Notes:** The block returns no value and takes the following parameters:

record: The CKRecordMBS object that is in the process of being saved.
progress: The amount of progress toward saving the record, expressed as a percentage of its total size. This value is a number between 0.0 and 1.0, where 0.0 means none of the record is saved and 1.0 means the entire record has been saved.

The operation object executes this block zero or more times for each record in the recordsToSave property. Each time the block is executed, it is executed serially with respect to the other progress blocks of the operation.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue. Use this block to track the ongoing progress of the upload operation and possibly to provide feedback to the user.

### 32.27.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| SaveAllKeys | 2 | One of the constants indicating the policy to apply when saving records.<br>A policy that saves all keys of the record (including those that have not changed) to the server, overwriting any values currently on the server. Keys present only on the server remain unchanged. |
| SaveChangedKeys | 1 | One of the constants indicating the policy to apply when saving records.<br>A policy that saves only those fields of the record that actually changed, overwriting any values currently on the server. Unmodified fields are left untouched. |
| SaveIfServerRecordUnchanged | 0 | One of the constants indicating the policy to apply when saving records.<br>A policy that saves the record only if the local copy of the record is based on the record still on the server. The server maintains a change tag for each record automatically. When you fetch a record, that change tag is included with the rest of the record,Äôs data. If the change tag in your local record matches the change tag of the record on the server, the save operation proceeds normally. If the server record contains a newer change tag, the record is not saved and an error of type CKErrorServerRecordChanged is reported. |

## 32.28 class CKModifyRecordZonesOperationMBS

### 32.28.1 class CKModifyRecordZonesOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKModifyRecordZonesOperationMBS object saves or deletes record zones.
**Notes:** After creating one or more record zones, use this operation object to save those zones to the database. You can also use it to delete existing zones and the records they contain.

The completion event is called after the operation executes and returns its results to you. You can use a completion event to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion block you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.
Subclass of the CKDatabaseOperationMBS class.

### 32.28.2 Methods

### 32.28.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 32.28.4 Constructor(recordZonesToSave() as CKRecordZoneMBS, recordZoneIDsToDelete() as CKRecordZoneIDMBS) 5709

### 32.28.4 Constructor(recordZonesToSave() as CKRecordZoneMBS, recordZoneIDsToDelete() as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to save and delete the specified record zones.
**Notes:** recordZonesToSave: An array of CKRecordZoneMBS objects representing the record zones to save. You may specify nil for this parameter.
recordZoneIDsToDelete: An array of CKRecordZoneIDMBS objects representing the record zones you want to delete, if any. You may specify nil for this parameter.

Returns an initialized operation object.

The record zones you intend to save or delete must all reside in the same database, which you specify when

configuring the operation object. Deleting a record zone also deletes any records it contains. Trying to delete a record zone that does not exist in the current database returns an error.
See also:

- 32.28.3 Constructor 5709

### 32.28.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.28.6 recordZoneIDsToDelete as CKRecordZoneIDMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the record zones to delete permanently from the database.
**Notes:** This property contains an array of CKRecordZoneIDMBS objects identifying the zones you want to delete. You set the initial contents of this property with the Constructor. You can assign a new array as needed before executing the operation. The record zones must all be located in the same database. You may specify nil or an empty array for this property.

If you intend to change the value of this property, do so before executing the operation or submitting it to a queue.

### 32.28.7 recordZonesToSave as CKRecordZoneMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record zones to save to the database.
**Notes:** This property contains an array of CKRecordZoneMBS objects representing the zones you want to save. You set the initial contents of this property with the Constructor. You can assign a new array as needed before executing the operation. The record zones must all target the same database. You may specify nil or an empty array for this property.

If you intend to change the value of this property, do so before executing the operation or submitting it to a queue.

### 32.28.8 setRecordZoneIDsToDelete(IDs() as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Set the IDs of the record zones to delete permanently from the database.

### 32.28.9 setRecordZonesToSave(IDs() as CKRecordZoneMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the record zones to save to the database.

### 32.28.10 Events

### 32.28.11 modifyRecordZonesCompleted(savedRecordZones() as CKRecordZoneMBS, deletedRecordZoneIDs() as CKRecordZoneIDMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute after the status of all changes is known.
**Notes:** The event returns no value and takes the following parameters:

savedRecordZones: An array of CKRecordZone objects you tried to save.
deletedRecordZoneIDs: An array of CKRecordZoneID objects corresponding to the record zones you tried to delete.
operationError: An error object containing information about a problem, or nil if the results are saved successfully.

This block is executed only once and represents your only chance to process the operation results. If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

This event reports an error of type CKErrorPartialFailure when it saves or deletes only some of the record zones successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the record zones that were not saved or deleted, and the corresponding values are error objects containing information about what happened.

## 32.29 class CKModifySubscriptionsOperationMBS

### 32.29.1 class CKModifySubscriptionsOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKModifySubscriptionsOperation object saves changes to one or more CKSubscription objects.
**Notes:** After creating or changing the configuration of a subscription object, use this type of operation object to save those changes to an iCloud container. You also use instances of this class to delete subscriptions permanently from a database.

The complete event is called after the operation executes and returns its results to you. You can use a completion event to perform housekeeping chores related to the operation, but do not use it to process the results of the operation itself. Any completion event you specify should be prepared to handle the failure of the operation to complete its task, whether due to an error or an explicit cancellation.

Available in macOS 10.10 and newer in 64-bit applications.
Subclass of the CKDatabaseOperationMBS class.

### 32.29.2 Methods

### 32.29.3 Constructor(subscriptionsToSave() as CKSubscriptionMBS, subscriptionIDsToDelete() as String = nil)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to save and delete the specified subscriptions.
**Notes:** subscriptionsToSave: An array of CKSubscription objects representing the subscriptions to save or update. You may specify nil for this parameter.
subscriptionIDsToDelete: An array of strings representing the IDs of the subscriptions you want to delete, if any. You may specify nil for this parameter.

The subscriptions you intend to save or delete must all reside in the same container, which you must specify when configuring the operation object. Saving a subscription that is not in the current database creates it in the database. Trying to delete a subscription that does not exist in the current database returns an error for that subscription.

### 32.29.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.29.5 setSubscriptionIDsToDelete(SubscriptionIDsToDelete() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the IDs of the subscriptions you want to delete permanently from the database.

### 32.29.6 setSubscriptionsToSave(IDs() as CKSubscriptionMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the subscriptions to save to the database.

### 32.29.7 subscriptionIDsToDelete as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The IDs of the subscriptions you want to delete permanently from the database.
**Notes:** This property contains the array of strings that identify the subscriptions to delete. The initial contents of the array are set to the records you specified with the Constructor.

If you intend to change the set of subscriptions to be deleted, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.29.8 subscriptionsToSave as CKSubscriptionMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The subscriptions to save to the database.
**Notes:** This property contains the array of CKSubscriptionMBS objects that you want to save. The initial contents of the array are set to the subscriptions you specified with the Constructor. You can modify this array as needed before executing the operation. After saving the subscription objects, the server begins applying the criteria from those objects to the contents of the database, generating push notifications as appropriate.

If you intend to change the set of subscriptions to be saved, update the value of this property before executing the operation or submitting the operation object to a queue.

### 32.29.9 Events

### 32.29.10 modifySubscriptionsCompleted(savedSubscriptions() as CKSubscriptionMBS, deletedSubscriptionIDs() as String, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute after the status of all changes is known.
**Notes:** The event returns no value and takes the following parameters:

savedSubscriptions: The array of CKSubscription objects you tried to save.
deletedSubscriptionIDs: An array of NSString objects corresponding to the subscriptions you tried to delete.
operationError: An error object containing information about a problem, or nil if the results are saved successfully.

The operation object executes this block only once and represents your last chance to process the operation results. The block is executed on a background thread of your app. If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

This block reports an error of type CKErrorPartialFailure when it saves or delete only some of the subscriptions successfully. The userInfo dictionary of the error contains a CKPartialErrorsByItemIDKey key whose value is a dictionary. The keys of that dictionary are the IDs of the subscriptions that were not saved or deleted, and the corresponding values are error objects containing information about what happened.

## 32.30 class CKNotificationIDMBS

### 32.30.1 class CKNotificationIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKNotificationID object uniquely identifies a push notification sent from a container.
**Notes:** You do not create notification IDs directly. The server creates them when it creates the CKNotification objects that correspond to the push notifications sent to your app. You can compare two IDs using the isEqual method to determine if two notification objects are the same. This class defines no methods or properties.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.30.2 Methods

### 32.30.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.30.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.30.5 IsEqual(Other as CKNotificationIDMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Checks if two objects are equal.

### 32.30.6 Properties

### 32.30.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 32.31 class CKNotificationInfoMBS

## 32.31.1 class CKNotificationInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKNotificationInfo object specifies the push notification data that the server sends to your app when a subscription finds a match.
**Notes:** When configuring a CKSubscriptionMBS object, create one of these objects and use it to specify the type of push notifications you want generated when the subscription,Äôs trigger condition is met. You can provide a message for an alert panel, information about the sounds to play, and information about whether the app should be badged. You can also ask the server to provide information about the record that triggered the notification.

see
https://developer.apple.com/reference/cloudkit/cknotificationinfo

## 32.31.2 Methods

## 32.31.3 alertLocalizationArgs as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The array of fields to use when building an alert message.
**Notes:** Use of this property is optional. This property contains an array of strings, each of which corresponds to a field of the record that triggered the push notification. Those names are used to retrieve the corresponding values from the record. The values themselves must be string, integer, double, or dates. Do not specify keys with other values. String values that are greater than 100 characters in length may be truncated when added to the push notification.

If you use %@ for your substitution variables, those variables are replaced by walking the array in order. If you use variables of the form %n$ @, where n is an integer, n represents the index (starting at 1) of the item in the array to use. Thus, the first item in the array replaces the variable %1$ @, the second item replaces the variable %2$ @, and so on. You can use indexed substitution variables to change the order of items in the resulting string, which might be necessary when you localize your app,Äôs messages.

## 32.31.4 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.31.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.31.6 copy as CKNotificationInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.31.7 desiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The names of fields to include in the push notification payload.
**Notes:** This property contains an array of strings, each of which corresponds to the name of a field in the record that triggered the notification. When a push notification is delivered, the keys and their corresponding values are included in the payload of the push notification. You can include a maximum of three keys in the array.

For the keys you specify, the allowable values are string, integer, double, CLLocationMBS, date, and CKReferenceMBS. You cannot specify keys whose values contain other data types. String values that are greater than 100 characters in length may be truncated when added to the push notification.

### 32.31.8 setAlertLocalizationArgs(args() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the array of fields to use when building an alert message.
**Notes:** Use of this property is optional. This property contains an array of strings, each of which corresponds to a field of the record that triggered the push notification. Those names are used to retrieve the corresponding values from the record. The values themselves must be string, integer, double, or dates. Do not specify keys with other values. String values that are greater than 100 characters in length may be truncated when added to the push notification.

If you use %@ for your substitution variables, those variables are replaced by walking the array in order. If you use variables of the form %n$ @, where n is an integer, n represents the index (starting at 1) of the item in the array to use. Thus, the first item in the array replaces the variable %1$ @, the second item replaces the variable %2$ @, and so on. You can use indexed substitution variables to change the order of items in

the resulting string, which might be necessary when you localize your app,Äôs messages.

### 32.31.9 setDesiredKeys(desiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the names of fields to include in the push notification payload.
**Notes:** This property contains an array of strings, each of which corresponds to the name of a field in the record that triggered the notification. When a push notification is delivered, the keys and their corresponding values are included in the payload of the push notification. You can include a maximum of three keys in the array.

For the keys you specify, the allowable values are string, integer, double, CLLocationMBS, date, and CKReferenceMBS. You cannot specify keys whose values contain other data types. String values that are greater than 100 characters in length may be truncated when added to the push notification.

### 32.31.10 Properties

### 32.31.11 alertActionLocalizationKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The key that identifies the text to use for the action button in the alert panel.
**Notes:** This property identifies the text to use for the button to open your app. Specifically, it contains the name of a key to look up in the app,Äôs Localizable.strings file, the value of which is used for the button title.

Specifying a value for this property is optional. When its value is nil, the alert panel triggered by the push notification contains only an OK button to dismiss the alert. When its value is not nil, the alert panel contains one button to dismiss the alert and a second button to open your app.
(Read and Write property)

### 32.31.12 alertBody as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The text to use for the alert message.
**Notes:** Use of this property is optional. If you set its value, the corresponding push notification causes the device to display an alert with the specified message. If you want to use a localized string for the alert message, specify a value for the alertLocalizationKey property instead.
(Read and Write property)

### 32.31.13 alertLaunchImage as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The filename of an image to use as a launch image.
**Notes:** Use of this property is optional. If you specify a value, the string is used to locate an image file in the app bundle. That image is displayed as a launch image when the user launches the app after receiving a push notification.
(Read and Write property)

### 32.31.14 alertLocalizationKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The key that identifies the localized string to use for the alert message.
**Notes:** Use of this property is optional. If you set its value, the corresponding push notification causes the device to display an alert on the user,Äôs device. The push notification obtains the text for the alert by looking up the specified key in your app,Äôs Localizable.strings file. If you specify a value for this property, the value in the alertBody property is ignored.

For information about localizing string resources, see Internationalization and Localization Guide.
(Read and Write property)

### 32.31.15 category as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Name of the action group corresponding to this notification.
**Notes:** Categories allow you to present custom actions to the user on your push notifications. For more information, read UIMutableUserNotificationCategory.
(Read and Write property)

### 32.31.16 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.31.17 shouldBadge as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean setting that controls whether a badge value should be incremented.
**Notes:** The default value of this property is false. Setting it to true causes the system to increment the current badge count for the app whenever the corresponding push notification is delivered.
(Read and Write property)

### 32.31.18 shouldSendContentAvailable as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the push notification should include the content-available flag.
**Notes:** When this property is true, the server includes the content-available flag in the push notification,Äôs payload. That flag causes the system to wake or launch an app that is not currently running. The app is then given background execution time to download any data related to the push notification, such as the set of records that changed. If the app is already running in the foreground, the inclusion of this flag has no additional effect and the notification is delivered to the app delegate for processing as usual.

The default value of this property is false.
(Read and Write property)

### 32.31.19 soundName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The name of the sound file to play when a notification arrives.
**Notes:** Use of this property is optional. If you specify a value, the string is used to locate a sound file in the app bundle. That sound file is played as an alert when a push notification arrives on the user,Äôs device. If the specified sound file does not exist, or if you specify the string default for this property, the system plays the default alert sound.
(Read and Write property)

## 32.32 class CKNotificationMBS

### 32.32.1 class CKNotificationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKNotificationMBS object represents a push notification that was sent to your app.
**Notes:** Notification objects wrap the data associated with a push notification. Use notification objects to wrap recently received push notification data or to fetch notification objects representing already delivered push notifications from a container. In both cases, the information in the notification object tells you what changed.

The CKNotificationMBS class itself is an abstract class. When you create a new notification object from a payload dictionary, the constructor instantiates a subclass of the appropriate type. Similarly, when you fetch notifications from a container, what you receive are instances of a concrete subclass. The base CKNotificationMBS class provides information about the push notification and how it was delivered. Specific subclasses contain specific data indicating what change actually occurred.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.32.2 Methods

### 32.32.3 alertLocalizationArgs as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The array of fields used to build the alert message
**Notes:** This property contains an array of NSString objects, each of which corresponds to a field of the record that triggered the push notification. Use the field values to replace any substitution variables in the alert strings specified by the notificationFromRemoteNotificationDictionary or Identifying the Notification Object properties. The field values must be string, integer, double, or dates. String values that are greater than 100 characters in length may be truncated when added to the push notification.

If you used %@ for your substitution variables, those variables are replaced by walking the array in order. If you use variables of the form %n$ @, where n is an integer, n represents the index (starting at 1) of the item in the array to use. Thus, the first item in the array replaces the variable %1$ @, the second item replaces the variable %2$ @, and so on. You can use indexed substitution variables to change the order of items in the resulting string, which might be necessary when you localize your app,Äôs messages.

### 32.32.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.32.5 notificationFromRemoteNotificationDictionary(notificationDictionary as Dictionary) as CKNotificationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new notification object using the specified payload data.
**Notes:** notificationDictionary: The payload data for the push notification. This dictionary is the same one passed to your app delegate,Äôs didReceiveRemoteNotification method. This parameter must not be nil.

Returns a new notification object initialized with the payload data.

Use this method to initialize a notification object from a push notification received by your app.

### 32.32.6 Properties

### 32.32.7 alertActionLocalizationKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The key that identifies the text to use for the action button in the alert panel.
**Notes:** When this property is nil, the alert panel triggered by the push notification contains only an OK button to dismiss the alert. When this property is not nil, the alert panel contains one button to dismiss the alert and a second button to open your app. This property identifies the text to use for the button to open your app. Specifically, it contains the name of a key to look up in the app,Äôs Localizable.strings file, the value of which is used for the button title.
(Read only property)

### 32.32.8 alertBody as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The text of the alert message.
**Notes:** This property contains the nonlocalized version of the message string displayed by the alert.
(Read only property)

### 32.32.9 alertLaunchImage as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The filename of the launch image displayed when your app is launched from the push notification alert.
**Notes:** The string in this property is used to locate an image file in the app bundle.
(Read only property)

### 32.32.10 alertLocalizationKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The key that identifies the localized string to use for the alert message.
**Notes:** When delivered to your app, the push notification gets the text for the alert by looking up the specified key in your app,Äôs Localizable.strings file. When this property is set, the value in the notificationFromRemoteNotificationDictionary property is ignored.
(Read only property)

### 32.32.11 badge as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The current badge value.
**Notes:** The value of this property is the integer value displayed in the app,Äôs badge at the time the push notification was sent.
(Read only property)

### 32.32.12 category as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Name of the action group corresponding to this notification.
**Notes:** Categories allow you to present custom actions to the user on your push notifications. For more information, read UIMutableUserNotificationCategory.
(Read only property)

### 32.32.13 containerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the container whose content triggered the notification.
**Notes:** (Read only property)

### 32.32.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.32.15 isPruned as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether some push notification content was removed prior to delivery.
**Notes:** see
https://developer.apple.com/reference/cloudkit/cknotification/1428088-ispruned
(Read only property)

### 32.32.16 notificationID as CKNotificationIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the notification.
**Notes:** (Read only property)

### 32.32.17 notificationType as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of event that generated the notification.
**Notes:** Different notification types correspond to different subclasses of CKNotificationMBS, so you can use the value in this property to determine how to handle the notification data.
(Read only property)

### 32.32.18 soundName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The name of the sound file to play when a notification arrives.
**Notes:** This property contains the string used to locate a sound file in your app,Äôs bundle. That sound file is played as an alert when a push notification arrives on the user,Äôs device. If the specified sound file does not exist, or if you specify the string default for this property, the system plays the default alert sound.
(Read only property)

### 32.32.19 subscriptionID as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The identifier of the subscription that caused this notification to fire.
**Notes:** (Read only property)

### 32.32.20 Constants

Notification Types

| Constant | Value | Description |
|---|---|---|
| TypeDatabase | 4 | A notification generated when the contents of a database changed. |
| TypeQuery | 1 | A notification generated based on the conditions set forth in a subscription object. |
| TypeReadNotification | 3 | A notification that your app previously marked as read using a CKMarkNotificationsReadOperationMBS object. |
| TypeRecordZone | 2 | A notification generated when the contents of a record zone changed. |

## 32.33 class CKOperationConfigurationMBS

### 32.33.1 class CKOperationConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** An object that describes how a CloudKit operation behaves.
**Example:**

```
Dim operationConfiguration As CKOperationConfigurationMBS = New CKOperationConfigurationMBS()
operationConfiguration.timeoutIntervalForRequest = 30
operationConfiguration.timeoutIntervalForResource = 30
operationConfiguration.QualityOfService = CKOperationConfigurationMBS.NSQualityOfServiceUserInitiated
```

**Notes:** Requires macOS 10.13, iOS 11.0 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.4
- MBS Xojo Plugins, version 21.4pr1

### 32.33.2 Methods

### 32.33.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor.

### 32.33.4 Properties

### 32.33.5 AllowsCellularAccess as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether operations that use this configuration can send data over the cellular network.
**Notes:** (Read and Write property)

### 32.33.6 Container as CKContainerMBS

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The configuration,Äôs container.
**Notes:** If you don,Äôt provide a container, CloudKit uses the default container that CKContainerMBS provides.
(Read and Write property)

### 32.33.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.33.8 LongLived as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether the operations that use this configuration are long-lived.
**Notes:** (Read and Write property)

### 32.33.9 QualityOfService as Integer

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The priority that the system uses when it allocates resources to the operations that use this configuration.
**Notes:** (Read and Write property)

### 32.33.10 timeoutIntervalForRequest as Double

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The maximum amount of time that a request can take.
**Notes:** In seconds.
(Read and Write property)

### 32.33.11 timeoutIntervalForResource as Double

MBS Mac64bit Plugin, Plugin Version: 21.4, Platforms: macOS, iOS, Targets: All.

**Function:** The maximum amount of time that a resource request can take.
**Notes:** In seconds.
(Read and Write property)

### 32.33.12 Constants

Quality of Service Constants

| Constant | Value | Description |
|---|---|---|
| NSQualityOfServiceBackground | &h09 | Background QoS is used for work that is not user initiated or visible. In gener a user is unaware that this work is even happening and it will run in the mo efficient manner while giving the most deference to higher QoS work. F example, pre-fetching content, search indexing, backups, and syncing of da with external systems. |
| NSQualityOfServiceDefault | -1 | Default QoS indicates the absence of QoS information. Whenever possible Q information will be inferred from other sources. If such inference is not possib a QoS between UserInitiated and Utility will be used. |
| NSQualityOfServiceUserInitiated | &h19 | UserInitiated QoS is used for performing work that has been explicitly r quested by the user and for which results must be immediately presented order to allow for further user interaction. For example, loading an email af a user has selected it in a message list. |
| NSQualityOfServiceUserInteractive | &h21 | UserInteractive QoS is used for work directly involved in providing an intera tive UI such as processing events or drawing to the screen. |
| NSQualityOfServiceUtility | &h11 | Utility QoS is used for performing work which the user is unlikely to be i mediately waiting for the results. This work may have been requested the user or initiated automatically, does not prevent the user from further i teraction, often operates at user-visible timescales and may have its progre indicated to the user by a non-modal progress indicator. This work will r in an energy-efficient manner, in deference to higher QoS work when resourc are constrained. For example, periodic content updates or bulk file operatio such as media import. |

## 32.34 class CKOperationMBS

### 32.34.1 class CKOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The abstract base class for all operations that can be executed against a CloudKit database.
**Notes:** see
https://developer.apple.com/reference/cloudkit/ckoperation
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr1
- MBS Xojo Plugins, version 17.3pr3

### 32.34.2 Methods

### 32.34.3 cancel

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Advises the operation object that it should stop executing its task.
**Notes:** This method does not force your operation code to stop. The code for your operation must invoke the isCancelled method periodically to determine whether the operation should be stopped. Once cancelled, an operation cannot be restarted.

If the operation is already finished executing, this method has no effect. Canceling an operation that is currently in an operation queue, but not yet executing, causes it to be removed from the queue (although not necessarily right away).

### 32.34.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.34.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.34.6 isCancelled as boolean

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the operation has been cancelled.
**Notes:** True if the operation was explicitly cancelled by an invocation of the operation's cancel method; otherwise, false. This method may return true even if the operation is currently executing.

Discussion
Canceling an operation does not actively stop the operation's code from executing. An operation object is responsible for calling this method periodically and stopping itself if the method returns true.

### 32.34.7 isExecuting as boolean

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the operation is currently executing.
**Notes:** True if the operation is executing; otherwise, false if the operation has not been started or is already finished.

### 32.34.8 isFinished as boolean

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the operation is done executing.
**Notes:** True if the operation is no longer executing; otherwise, false.

### 32.34.9 start

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Begins the execution of the operation.
**Notes:** The default implementation of this method configures the execution environment for a non-concurrent operation and invokes the operation's main method. As part of the default configuration, this method performs several checks to ensure that the non-concurrent operation can actually run and generates appropriate KVO notifications for each change in the operation's state. If the operation's operation has already been performed, was cancelled, or is not yet ready to run, this method throws an NSInvalidArgumentException exception. If the operation is to be performed on a separate thread, this method may return before the operation itself completes on the other thread.

### 32.34.10 Properties

### 32.34.11 allowsCellularAccess as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKOperationConfigurationMBS instead. **Function:** A Boolean value indicating whether the operation object may send data over the cell network.
**Notes:** When you send or receive many records, or when you send records with large assets, you might set this property to false to avoid consuming too much of the user,Äôs cellular data bandwidth. For operations involving only a few records, it is fine to leave this property set to true, which is the default.

When this property is set to false, the operation executes normally but fails if Wi-Fi is not available.
(Read and Write property)

### 32.34.12 configuration as CKOperationConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: All.

**Function:** The operation,Äôs configuration.
**Notes:** Requires macOS 10.13, iOS 11.0 or newer.
(Read and Write property)

### 32.34.13 container as CKContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKOperationConfigurationMBS instead. **Function:** The container to use for the operation.
**Notes:** The container sets the context for where the operation should perform its work. The addOperation method of both the CKContainerMBS and CKDatabaseMBS classes implicitly sets the value of this property to their container.

If you execute the operation yourself, either directly or using a custom operation queue, it is recommended that you set the value of this property explicitly. If the value is nil when you execute an operation, the operation object implicitly executes against your app,Äôs default container.
(Read and Write property)

### 32.34.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** The handle to the internal used NSOperation reference.
**Notes:** (Read and Write property)

### 32.34.15 longLived as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKOperationConfigurationMBS instead. **Function:** A Boolean value indicating whether the operation is long-lived.
**Notes:** To create a long-lived operation, set to true. The default value is false. If the operation is running or is a long-lived operation fetched from a CKContainer object, changing this property value has no effect.

For more information on long-lived operations, read Long-Lived Operations.
(Read and Write property)

### 32.34.16 operationID as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A unique identifier for a long-lived operation.
**Notes:** Use this property to fetch a long-lived operation using the fetchLongLivedOperationWithID method in the CKContainer class. For more information on long-lived operations, read Long-Lived Operations.
(Read only property)

### 32.34.17 timeoutIntervalForRequest as Double

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKOperationConfigurationMBS instead. **Function:** The timeout interval to use when waiting for additional data.
**Notes:** This property determines the request timeout interval for the operation. The request timeout interval controls how long (in seconds) the operation should wait for additional data to arrive before giving up. The timer associated with this value is reset whenever new data arrives. When the request timer reaches the specified interval without receiving any new data, it triggers a timeout.

The default value is 60 seconds.
(Read and Write property)

### 32.34.18 timeoutIntervalForResource as Double

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CKOperationConfigurationMBS instead. **Function:** The maximum amount of time that a resource request should be allowed to take.
**Notes:** This property determines the resource timeout interval for this operation. The resource timeout interval controls how long (in seconds) to wait for the entire operation to complete before giving up. The resource timer starts when the operation is initiated and counts until either the operation completes or this timeout interval is reached, whichever comes first.

The default value is 7 days.
(Read and Write property)

### 32.34.19 Events

### 32.34.20 Completed

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The operation completed.

### 32.34.21 LongLivedOperationWasPersisted

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute when the server starts storing callbacks for this long-lived operation.
**Notes:** If your app exits before this event is called, the long-lived operation identifier is not included in the results of the fetchAllLongLivedOperationIDs method.

For more information on long-lived operations, read Long-Lived Operations.

## 32.35 class CKQueryCursorMBS

### 32.35.1 class CKQueryCursorMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKQueryCursor object is an opaque data object that marks the stopping point for a query and the starting point for retrieving the remaining results.
**Notes:** You do not create instances of this class yourself. When fetching records using a CKQueryOperation object, if the number of results exceeds the results limit value set for the query, the server provides you with a query cursor object. Use that cursor object to initialize a new CKQueryOperationMBS and retrieve the next batch of results for the same query.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.35.2 Methods

### 32.35.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.35.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.35.5 copy as CKQueryCursorMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.35.6 Properties

### 32.35.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 32.36 class CKQueryMBS

### 32.36.1 class CKQueryMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKQuery object manages the criteria to apply when searching for records in a database.
**Notes:** You create a query object as the first step in the search process. The query object stores the search parameters, including the type of records to search, the match criteria (predicate) to apply, and the sort parameters to apply to the results. The second step is to use the query object to initialize a CKQueryOperation object, which you then execute to generate the results.

see
https://developer.apple.com/reference/cloudkit/ckquery

### 32.36.2 Methods

### 32.36.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.36.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.36.5 Constructor(RecordType as String, predicate as NSPredicateMBS) 5737


### 32.36.5 Constructor(RecordType as String, predicate as NSPredicateMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a query object with the specified parameters.
**Notes:** recordType: The type of record to search. Specify the name of one of your app,Äôs supported record types. This method throws an exception if this parameter is nil or contains an empty string.
predicate: The search predicate to apply to the prospective records. Only records matching the predicate criteria are returned in the search results. For guidelines on how to construct predicates for your queries,

see Predicate Rules for Query Objects. This parameter must not be nil.

Returns an initialized query object.

Discussion
You cannot change the record type and predicate of a query object after you create it. If you want to search for a different set of records using a different set of search criteria, create a new query object. You can add sort descriptors to the query and change them later as needed.

You cannot query for user records and executing a query where the record type is set to CKRecordTypeUserRecordMBS results in an error. You must fetch user records directly using their ID.
See also:

- 32.36.4 Constructor 5737

### 32.36.6 setSortDescriptors(sortDescriptors() as NSSortDescriptorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the sort descriptors to use when organizing the query results.

### 32.36.7 sortDescriptors as NSSortDescriptorMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The sort descriptors to use when organizing the query results.
**Notes:** This property contains an array of NSSortDescriptor objects. You can add sort descriptors to a query object and change them later as needed. Each sort descriptor contains a field name of the intended record type and information about whether to sort values in that field in ascending or descending order. The default value of this property is nil, which means that records are returned in an indeterminate order.

The order of the items in the array matches the order in which the sort descriptors are applied to the results. In other words, the first sort descriptor in the array is applied first, followed by the second sort descriptor if needed, and the third, and so on.

### 32.36.8 Properties

### 32.36.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.36.10 predicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The search criteria to use when matching records.
**Notes:** A predicate contains one or more expressions that evaluate to true or false. Expressions are often value-based comparisons, but predicates support other types of operators, including string comparisons and aggregate operations. For guidelines on how to construct predicates for your queries, see Predicate Rules for Query Objects.

This property is set at initialization time and cannot be changed later.
(Read only property)

### 32.36.11 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type to search.
**Notes:** Searches return only records of the specified type. This property is set at initialization time and cannot be changed later.

The record type is an app-specific string that you use to distinguish among the records of your app. The records of a given type all represent different instances of the same information. For example, an employee record type might store the employee,Äôs name, phone number, and a reference to the employee,Äôs manager.
(Read only property)

## 32.37 class CKQueryNotificationMBS

### 32.37.1 class CKQueryNotificationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKQueryNotification object represents a push notification that was generated by a subscription object.
**Notes:** Subscription objects represent persistent queries on the server. When the server detects a change related to a subscription, it sends a push notification to the client that created the subscription and logs the push notification in the container. You use instances of this class to get information about the record involved in the push notification.

see
https://developer.apple.com/reference/cloudkit/ckquerynotification
Subclass of the CKNotificationMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.37.2 Methods

### 32.37.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.37.4 Properties

### 32.37.5 databaseScope as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The database scope.
**Notes:** (Read only property)

### 32.37.6 isPublicDatabase as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the record is in the public database.
**Notes:** The value of this property is true if the record is in the public database, or false if it is in the current

user,Äôs private database.
(Read only property)

### 32.37.7 queryNotificationReason as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The event that triggered the delivery of the push notification.
**Notes:** Subscription-initiated notifications are triggered by the creation, deletion, or updating of a single record. The record in question must match the predicate specified by the subscription object for an event to be triggered.
(Read only property)

### 32.37.8 recordFields as Dictionary

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A dictionary of the fields that changed.
**Notes:** For updated and newly created records, this property contains the desired keys requested by the subscription object. When you configure the CKNotificationInfoMBS object of a subscription object, you can specify the names of one or more fields in the desiredKeys property of that notification information object. When a push notification is triggered, the values for each of those keys is retrieved from the record and included in the push notification,Äôs payload, space permitting.

For query notification objects fetched from a container, all keys and values are present. For query notification objects generated from an incoming push notification, one or more keys and values may be missing. Push notification payloads are limited in size, and record fields are one of the first pieces of data to be excluded when that size limit is exceeded. For information about the order in which fields are removed, see the overview of this class.
(Read only property)

### 32.37.9 recordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The identifier of the record that was created, deleted, or updated.
**Notes:** Use this identifier to fetch the record from the container. Check the value of the isPublicDatabase property to determine which database to fetch it from.
(Read only property)

### 32.37.10 Constants

Reasons

| Constant | Value | Description |
|---|---|---|
| ReasonRecordCreated | 1 | A record matching the subscription,Äôs predicate was created. |
| ReasonRecordDeleted | 3 | A record matching the subscription,Äôs predicate was deleted. |
| ReasonRecordUpdated | 2 | A record matching the subscription,Äôs predicate was updated. |

## 32.38 class CKQueryOperationMBS

### 32.38.1 class CKQueryOperationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKQueryOperation object is a concrete operation that you can use to execute queries against a database.
**Notes:** A query operation takes the query parameters you provide and applies those parameters to the specified database and zone, delivering any matching records asynchronously to the blocks that you provide.

see
https://developer.apple.com/reference/cloudkit/ckqueryoperation
Subclass of the CKDatabaseOperationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr1

### 32.38.2 Methods

### 32.38.3 CKQueryOperationMaximumResults as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A placeholder value representing the maximum number of results to retrieve.
**Notes:** The value of this constant does not correspond to the actual number of records. The actual maximum value is determined dynamically by the server based on various conditions.

### 32.38.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:


- 32.38.5 Constructor(query as CKQueryMBS) 5743
- 32.38.6 Constructor(queryCursor as CKQueryCursorMBS) 5744


### 32.38.5 Constructor(query as CKQueryMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object configured to search for records in the specified zone.
**Notes:** query: The query to use during the search. This parameter must not be nil.

Returns an initialized operation object.

You can use the returned CKQueryOperationMBS object only once to perform a search, but the object you specify in the query parameter can be reused as needed. When executed, this query object performs a new search and returns the first batch of results. If there are more results available, you must create a separate query object using the provided cursor object.
See also:


- 32.38.4 Constructor 5743
- 32.38.6 Constructor(queryCursor as CKQueryCursorMBS) 5744


### 32.38.6 Constructor(queryCursor as CKQueryCursorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns an operation object that returns more results from a previous search.
**Notes:** cursor: The cursor object identifying the previous search. This value is passed to the completion block of the previous search.

Returns an initialized operation object ready to continue the search.

Use this method to initialize a query operation that retrieves the next batch of results from a previous search. When executing searches based on a cursor, do not cache cursor objects for a long time before using them. A cursor is not a snapshot of the previous search results; it stores a relative offset into the results list. An operation object created using a cursor performs a new search, sorts the new set of results, and uses the previous offset value to determine where the next batch of results starts.
See also:


- 32.38.4 Constructor 5743
- 32.38.5 Constructor(query as CKQueryMBS) 5743


### 32.38.7 desiredKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The fields to retrieve for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the search operation. The value is an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the specified keys are included in the returned record. If you specify nil, the operation retrieves all keys for the record. The default value of this

property is nil.

If you intend to specify a value, you must do so before executing the operation or submitting the operation object to a queue.

### 32.38.8 Destructor

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Destructor

### 32.38.9 setDesiredKeys(desiredKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets the fields to retrieve for the requested records.
**Notes:** Use this property to limit the amount of data retrieved for each record during the search operation. The value is an array of strings, each of which contains the name of a field from the target records. When you retrieve a given record, only fields whose names match one of the specified keys are included in the returned record. If you specify nil, the operation retrieves all keys for the record. The default value of this property is nil.

If you intend to specify a value, you must do so before executing the operation or submitting the operation object to a queue.

### 32.38.10 Properties

### 32.38.11 cursor as CKQueryCursorMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The data cursor to use for continuing the search.
**Notes:** You set the initial value of this property with the Constructor. When you use a cursor, the contents of the query property are ignored. The data cursor stored in this property is an opaque object that is provided to you by the server.

If you intend to specify or change the value in this property, do so before executing the operation or submitting the operation object to a queue.
(Read and Write property)

### 32.38.12 query as CKQueryMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The query to use for the search.
**Notes:** You set the initial value of this property with the Constructor method. When the value in the cursor property is nil, the query operation uses the CKQueryMBS object in this property to execute a new search and return the results to your completion handler. If the cursor value is not nil, the cursor is used instead.

If you intend to specify or change the value of this property, do so before executing the operation or submitting the operation object to a queue.
(Read and Write property)

### 32.38.13 resultsLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The maximum number of records to return at one time.
**Notes:** For most queries, leave the value of this property set to the default value, which is represented by the CKQueryOperationMaximumResults constant. When using that value, the server chooses a limit that aims to provide an optimal number of results that returns as many records as possible while minimizing delays in receiving those records. However, if you know that you want to process a fixed number of results, change the value of this property accordingly.
(Read and Write property)

### 32.38.14 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the zone containing the records to search.
**Notes:** When set, the value of this property limits the scope of the search to the records in the specified zone. If no zone is specified, the search takes place on all zones.

When you initialize the operation object using the Constructor method, the value of this property is set to nil and any changes you make to the property are ignored. When the operation object is executed, the cursor object provides the zone information from the initial search that generated the cursor.
(Read and Write property)

### 32.38.15 Events

### 32.38.16 queryCompleted(cursor as CKQueryCursorMBS, operationError as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The block to execute with the search results.
**Notes:** The block returns no value and takes the following parameters:

cursor: A CKQueryCursorMBS object that indicates there are more results to fetch or nil if the results parameter contains all of the remaining search results. Use the provided object to initialize a new query operation object when you are ready to retrieve the next batch of results.
operationError: An error object containing information about a problem, or nil if the results are retrieved successfully.

This block is executed only once and represents your last chance to process the operation results. It is executed after all of the individual progress blocks but before the operation,Äôs completion block. The block is executed serially with respect to the other progress blocks of the operation. If you intend to use this block to process results, update the value of this property before executing the operation or submitting the operation object to a queue.

When the results of a query operation are known, the operation object uses this block to deliver the available set of records to your app. If the number of records exceeds the value in resultsLimit, the operation object provides an opaque data object in the cursor parameter of your block that you can use to retrieve the next batch of results. You must create a separate operation object using that cursor to get the next batch of results.

### 32.38.17 recordFetched(record as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to execute for each record returned by the query.
**Notes:** record: A CKRecordMBS object matching the search criteria.

After identifying and sorting the records, the operation object executes this block once for each record in the sorted results. The block is executed serially with respect to all progress blocks of the operation object, so you can expect only one block at a time to be executing for this operation object.

If you intend to use this block to process results, set it before executing the operation or submitting the operation object to a queue.

Warning

Query indexes are updated asynchronously so they are not guaranteed to be current. If you query for records that you recently changed and not allow enough time for those changes to be processed, the query results may be incorrect. The results may not contain the correct records and the records may be out of order.

## 32.39 class CKQuerySubscriptionMBS

### 32.39.1 class CKQuerySubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Subscription that fires whenever a change matches the specified predicate.
**Notes:** Subclass of the CKSubscriptionMBS class.

### 32.39.2 Methods

### 32.39.3 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a query-based subscription that monitors records with the specified options.
**Notes:** recordType: The string that identifies the type of records to track. You are responsible for naming your app,Äôs record types. This parameter must not be nil or an empty string.
predicate: The matching criteria to apply to the records. This parameter must not be nil. For information about the operators that are supported in search predicates, see the discussion in CKQuery.
querySubscriptionOptions: A bitmask of the configuration options for the subscription. Specify at least one of the following values: CKSubscriptionOptionsFiresOnRecordCreation, CKSubscriptionOptionsFiresOnRecordUpdate, or CKSubscriptionOptionsFiresOnRecordDeletion.

Returns a subscription object initialized to track record-related changes.

The object returned by this method is configured as a query-based subscription searching records in the target dabatase. The subscription monitors the specified type of records in all of the user,Äôs record zones and generates push notifications when the search criteria are met.
See also:

- 32.39.4 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer) 5749

### 32.39.4 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a query-based subscription that monitors records with the specified options.

**Notes:** recordType: The string that identifies the type of records to track. You are responsible for naming your app,Äôs record types. This parameter must not be nil or an empty string.
predicate: The matching criteria to apply to the records. This parameter must not be nil. For information about the operators that are supported in search predicates, see the discussion in CKQuery.
subscriptionID: The unique name of the subscription. This string must be unique in the specified database and must not be nil.
querySubscriptionOptions: A bitmask of the configuration options for the subscription. Specify at least one of the following values: CKSubscriptionOptionsFiresOnRecordCreation, CKSubscriptionOptionsFiresOn-RecordUpdate, or CKSubscriptionOptionsFiresOnRecordDeletion.

Returns a subscription object initialized to track record-related changes.

The object returned by this method is configured as a query-based subscription searching records in the target dabatase. The subscription monitors the specified type of records in all of the user,Äôs record zones and generates push notifications when the search criteria are met.
See also:

- 32.39.3 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer) 5749

### 32.39.5 copy as CKQuerySubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.39.6 Properties

### 32.39.7 predicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The matching criteria to apply to records.
**Notes:** A query-based subscription uses its search predicate to identify potential matches for records. It combines the predicate information with the value in the querySubscriptionOptions property to determine the conditions under which to send a push notification to the app.

The search predicate defines the records that the subscription object monitors for changes. The value in this property is used only if the subscriptionType property is set to CKSubscriptionTypeQueryMBS; otherwise, it is ignored.
(Read only property)

### 32.39.8 querySubscriptionOptions as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Option flags describing the firing behavior of the subscription
**Notes:** Set the value of this property at initialization time. When configuring a query-based subscription, one of the following values must be specified:

CKQuerySubscriptionOptionsFiresOnRecordCreation
CKQuerySubscriptionOptionsFiresOnRecordUpdate
CKQuerySubscriptionsFiresOnRecordDeletion

If an option flag is not set, an NSInvalidArgumentException is thrown.
(Read only property)

### 32.39.9 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type being monitored in a query-based subscription. (read-only)
**Notes:** The value of this property applies only to query-based subscriptions and is set automatically by the Constructor. For all other types of subscription objects, the value of this property is ignored and set to nil.
(Read only property)

### 32.39.10 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Zone that this query subscription is scoped to.
**Notes:** The value of this property applies both to query-based subscriptions and zone-based subscriptions. Specifying a record zone limits the search scope to the records in that zone. In the case of a zone-based subscription, the search encompasses all records in the zone. For a query-based subscription, the search encompasses only records of a specific type in that zone.

For zone-based subscriptions, the value of this property is set automatically by the Constructor. For all other subscription types, the default value is nil. To apply a zone to a query-based subscriptions, you must assign a value explicitly.
(Read only property)

### 32.39.11 Constants

Option Flags

| Constant | Value | Description |
|---|---|---|
| OptionsFiresOnce | 8 | Fire only once. |
| OptionsFiresOnRecordCreation | 1 | Fire at record creation. |
| OptionsFiresOnRecordDeletion | 4 | Fire on record deletion. |
| OptionsFiresOnRecordUpdate | 2 | Fire on record update. |

# 32.40 class CKRecordIDMBS

## 32.40.1 class CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKRecordID object uniquely identifies a record in a database.
**Notes:** Record ID objects are normally created automatically when you create a new record, but you might also create IDs in several specific situations. For example, you must create record ID objects when you want to save a record in a zone other than the default zone. You can also create record ID objects when you want to retrieve records whose IDs you know from a database.

see
https://developer.apple.com/reference/cloudkit/ckrecordid

## 32.40.2 Methods

## 32.40.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

## 32.40.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.40.5 Constructor(recordName as string) 5753
- 32.40.6 Constructor(recordName as string, zoneID as CKRecordZoneIDMBS) 5754


## 32.40.5 Constructor(recordName as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a new record ID with the specified name in the default zone.
**Notes:** recordName: The name to use to identify the record. The string must contain only ASCII characters and must not exceed 255 characters. If you specify nil or an empty string for this parameter, this method

throws an exception.

Returns an initialized record ID object or nil if the object cannot be created.

Use this method when you are creating or searching for records in the default zone.
See also:


- 32.40.4 Constructor 5753
- 32.40.6 Constructor(recordName as string, zoneID as CKRecordZoneIDMBS) 5754


### 32.40.6 Constructor(recordName as string, zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a new record ID with the specified name and zone information.
**Notes:** recordName: The name to use to identify the record. The string must contain only ASCII characters and must not exceed 255 characters. If you specify nil or an empty string for this parameter, this method throws an exception.
zoneID: The ID of the zone in which to place the record. This parameter must not be nil.

Returns an initialized record ID object or nil if the object cannot be created.

Use this method when you create or search for records in a zone other than the default zone. The value in the zoneID parameter must represent a zone that already exists in the database. If the record zone does not exist yet, save the corresponding CKRecordZoneMBS object to the database before attempting to save any CKRecordMBS objects in that zone.
See also:


- 32.40.4 Constructor 5753
- 32.40.5 Constructor(recordName as string) 5753


### 32.40.7 copy as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.40.8 IsEqual(Other as CKRecordIDMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Checks if two objects are equal.

### 32.40.9 Properties

### 32.40.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.40.11 recordName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique name of the record.
**Notes:** (Read only property)

### 32.40.12 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the zone containing the record.
**Notes:** (Read only property)

## 32.41 class CKRecordMBS

### 32.41.1 class CKRecordMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A dictionary of key-value pairs that you use to fetch and save the data of your app.
**Notes:** Records are the fundamental objects you use to manage data in CloudKit. You may define any number of record types for your app, with each record type corresponding to a different type of information you need. Within a given record type, you then define one or more fields, each of which has a name and a data value. Records can contain simple data types such as strings and numbers or more complex types such as geographic locations or pointers to other records.

An important step in using CloudKit is defining the record types your app supports. Each new record object contains no keys or values initially. During development, you can add new keys and values at any time. The first time you set a value for a key and save the record, the server associates that type with the key for all records of the same type. (The CKRecordMBS class does not enforce these type constraints or do any local validation of a record,Äôs contents; those constraints are enforced by the server when you save records.)

Note

The ability to add new keys is only possible during development. When you deploy to a production environment, the server returns an error when you try to specify an unknown record type or try to save a record containing unknown keys.
Although records act like dictionaries, there are still limitations to the types of values you can assign to keys. The following are the object types that the CKRecord class supports. Attempting to specify objects of any other type is a programmer error and will fail. Fields of all types are searchable unless otherwise noted.

see also
https://developer.apple.com/reference/cloudkit/ckrecord
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr2
- MBS Xojo Plugins, version 21.3pr4
- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr7

### 32.41.2 Methods

### 32.41.3 allKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of strings corresponding to all keys currently in the record.
**Notes:** Returns an array of strings. The returned array contains only the keys that have corresponding values in the record. If no keys are set for the record, this method returns an empty array.

This method may not return all possible keys in the record. Specifically, the method does not return keys whose values are nil.

### 32.41.4 allTokens as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of strings that you can use for full-text searches of the field,Äôs string-based values.
**Notes:** Returns an array of strings containing data from the records string-based fields.

When performing your own full-text searches, you can use this method to get a list of strings for your search. The method acts only on keys whose values are NSString objects. It breaks each value string apart at whitespace boundaries, creates new strings for each word, adds the new strings to an array, and returns the array. This tokenized version of the record,Äôs string values makes it easier to do string-based comparisons of individual words.

### 32.41.5 archive(byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Archives the content of this record via NSKeyedArchiver.
**Example:**

```
Dim ckRecord As New CKRecordMBS("MyType")

// archive
Dim e1 As NSErrorMBS
Dim encodedRecordValue As String = ckRecord.archive(e1)

// unarchive
Dim e2 As NSErrorMBS
Dim decodedRecord As CKRecordMBS = CKRecordMBS.Unarchive(encodedRecordValue, e2)

MsgBox "OK "+decodedRecord.recordType
```

**Notes:** In case of error returns nil and sets error.

### 32.41.6 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.41.7 changedKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of strings representing the keys that have changed recently.
**Notes:** An array of strings, each of which represents a key whose value has changed since the record was downloaded or saved. If no keys have changed, this method returns an empty array.

### 32.41.8 CKRecordTypeUserRecord as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type for an user record.

### 32.41.9 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.41.10 Constructor(Coder as NSCoderMBS) 5758
- 32.41.11 Constructor(RecordType as String) 5759
- 32.41.12 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5760
- 32.41.13 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5760


### 32.41.10 Constructor(Coder as NSCoderMBS)

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Initializes record by reading from coder.
**Notes:** e.g. use with NSKeyedUnarchiverMBS class.
See also:

- 32.41.9 Constructor 5758
- 32.41.11 Constructor(RecordType as String) 5759
- 32.41.12 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5760
- 32.41.13 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5760


### 32.41.11 Constructor(RecordType as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a new record of the specified type.
**Example:**

```
// Create a new record of type "employee".
dim myRecord as new CKRecordMBS("employee")
```

**Notes:** recordType: A string reflecting the type of record that you want to create. This string becomes the type of record thereafter and cannot be changed. You define the record types that your app supports and use them to distinguish between records with different types of data. This parameter must not be nil or contain an empty string.

Record type names must consist of one or more alphanumeric characters and must start with a letter. Type names may include underscore characters as long as they do not start with that character. Spaces are not allowed in the names.

Returns an initialized record object or nil if the record cannot be created.

Use this method to initialize a new record object in the default zone of the database. The newly created record contains no data in any of its fields and is assigned a unique ID.

New records exist only in memory until you explicitly save them to iCloud. In addition, new records are sparse by default and have no values assigned to the fields you defined. (In fact, until you set the value of a key explicitly, getting the value of a key in a new record returns nil.) Even though a record has an associated type, that type information is ignored until you save the record.

Save the record using a CKModifyRecordsOperationMBS object or using the saveRecord method of CK-DatabaseMBS to transfer the record,Äôs contents to the server.
See also:


- 32.41.9 Constructor 5758
- 32.41.10 Constructor(Coder as NSCoderMBS) 5758

- 32.41.12 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5760
- 32.41.13 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5760


### 32.41.12 Constructor(RecordType as String, recordID as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a record using an ID that you provide.
**Notes:** recordType: A string reflecting the type of record that you want to create. Define the record types that your app supports, and use them to distinguish between records with different types of data. This parameter must not be nil or contain an empty string. Record type names consist of one or more alphanumeric characters and start with a letter. Type names may include underscore characters if they do not start with that character. Spaces are not allowed in record type names.
recordID: The ID to assign to the record itself. When creating the ID, you can specify the zone in which to place the record. The ID cannot currently be in use by any other record and must not be nil.

Returns an initialized record object or nil if the record cannot be created.

Discussion
Use this method to initialize a new record object with the specified ID. The newly created record contains no data.

Upon creation, record objects exist only in memory on the local device. Save the record using a CKModifyRecordsOperationMBS object or using the saveRecord method of CKDatabaseMBS to transfer the record,Äôs contents to the server.
See also:


- 32.41.9 Constructor 5758
- 32.41.10 Constructor(Coder as NSCoderMBS) 5758
- 32.41.11 Constructor(RecordType as String) 5759
- 32.41.13 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5760


### 32.41.13 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a record in the specified zone.
**Notes:** recordType: A string reflecting the type of record that you want to create. Define the record types that your app supports, and use them to distinguish between records with different types of data. This parameter must not be nil or contain an empty string. Record type names consist of one or more alphanumeric characters and start with a letter. Type names may include underscore characters if they do not start with that character. Spaces are not allowed in record type names.

zoneID: The ID of the record zone in which to place the record.

Returns an initialized record object, or nil if the record cannot be created.

Use this method to initialize a new record object in the specified record zone.

Upon creation, the new record contains no data and exists only in memory on the local device. Save the record using a CKModifyRecordsOperationMBS object or using the saveRecord:completion: method of CKDatabase to transfer the record,Äôs contents to the server.
See also:


- 32.41.9 Constructor 5758
- 32.41.10 Constructor(Coder as NSCoderMBS) 5758
- 32.41.11 Constructor(RecordType as String) 5759
- 32.41.12 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5760


### 32.41.14 copy as CKRecordMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.41.15 encodeSystemFieldsWithCoder(Coder as NSCoderMBS)

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Encodes the record,Äôs system fields using the specified archiver.
**Notes:** Use this method to encode the record,Äôs metadata that CloudKit provides. Every record has keys that the system defines that correspond to record metadata, such as the record ID, record type, creation date, and so on. This method encodes those keys in the specified archiver. This method doesn,Äôt include any keys you add to the record. It also doesn,Äôt encode the keys that the changedKeys() method returns. You might use this method when you want to store only the system metadata because you store the actual record data elsewhere.

use with NSKeyedArchiverMBS class.

### 32.41.16 encodeWithCoder(Coder as NSCoderMBS)

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Encodes this record with the given coder.
**Notes:** Best pass instance of NSKeyedArchiverMBS to encode.

### 32.41.17 setParentReferenceFromRecord(parentRecord as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates and sets a reference object for a parent from its record.
**Notes:** parentRecord: A record that you want to set as the parent to this record.

This method creates and sets a CKReferenceMBS object for the CKRecordMBS passed in. The resulting CKReferenceMBS will have its action set to none.

### 32.41.18 setParentReferenceFromRecordID(parentRecordID as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Sets parent via Record ID.

### 32.41.19 Unarchive(Data as MemoryBlock, byref error as NSErrorMBS) as CKRecordMBS

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Archives the data of to a new CKRecord via NSKeyedUnarchiver.
**Example:**

```
Dim ckRecord As New CKRecordMBS("MyType")

// archive
Dim e1 As NSErrorMBS
Dim encodedRecordValue As String = ckRecord.archive(e1)

// unarchive
Dim e2 As NSErrorMBS
Dim decodedRecord As CKRecordMBS = CKRecordMBS.Unarchive(encodedRecordValue, e2)

MsgBox "OK "+decodedRecord.recordType
```

**Notes:** In case of error returns nil and sets error.

### 32.41.20 Properties

### 32.41.21 creationDate as Date

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time when the record was first saved to the server.
**Notes:** The creation date reflects the time at which a record with the current record,Äôs ID was created on the server. For new instances of this class, the value of this property is initially set to nil. When you save the record to the server, the value is updated with the appropriate creation date for the record.
(Read only property)

### 32.41.22 creationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time when the record was first saved to the server.
**Notes:** The creation date reflects the time at which a record with the current record,Äôs ID was created on the server. For new instances of this class, the value of this property is initially set to nil. When you save the record to the server, the value is updated with the appropriate creation date for the record.
(Read only property)

### 32.41.23 creatorUserRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the user who created the record.
**Notes:** Use the value in this property to retrieve the user record of the user who created this record. Every user of the app has a unique user record that is empty by default. Apps can add data to the user record on behalf of the user but should not store sensitive data in it.
(Read only property)

### 32.41.24 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.41.25 lastModifiedUserRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the user who last modified the record.
**Notes:** Use the value in this property to retrieve the user record of the user who last modified this record. Every user of the app has a unique user record that is empty by default. Apps can add data to the user record on behalf of the user but should not store sensitive data in it.
(Read only property)

### 32.41.26 modificationDate as Date

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time when the record was last saved to the server.
**Notes:** The modification date reflects the time at which a record with the current record,Äôs ID was last saved to the server. For new instances of this class, the value of this property is initially set to nil. When you save the record to the server, the value is updated with the appropriate modification date for the record.
(Read only property)

### 32.41.27 modificationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time when the record was last saved to the server.
**Notes:** The modification date reflects the time at which a record with the current record,Äôs ID was last saved to the server. For new instances of this class, the value of this property is initially set to nil. When you save the record to the server, the value is updated with the appropriate modification date for the record.
(Read only property)

### 32.41.28 parent as CKReferenceMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to the parent record to this record.
**Notes:** A parent reference is used to teach CloudKit about the hierarchy of your records. This hierarchy of records will be shared if the share reference is set on a record.

A parent record reference must have a none set.

The target of a parent reference must exist at save time —either already on the server, or part of the same CKModifyRecordsOperationMBS batch.

You are encouraged to set up the parent relationships as part of normal record saves, even if you are not planning on sharing records at this time. This allows you to share and unshare a hiearchy of records at a later date by only modifying the ,Äútop level,Äù record, setting or clear its share reference.
(Read and Write property)

### 32.41.29 recordChangeTag as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A string containing the server change token for the record.
**Notes:** When you fetch a record from the server, you get the current version of that record as it exists on the server. However, at any time after you fetch a record, other users might save a newer version of the record to the server. Every time a record is saved, the server updates the record,Äôs change token to a new value. When you save your instance of the record to the server, the server compares the token in your record with the token on the server. If the two tokens match, the server knows that you modified the latest version of the record and that your changes can be applied right away. If the two tokens do not match, the server applies the save policy your app specified to determine how to proceed.

In your own code, you can use change tokens to distinguish between two different versions of the same record.
(Read only property)

### 32.41.30 recordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique ID of the record.
**Notes:** The ID of a new record is always set at initialization time. If you use the Constructor method to initialize the record, the ID is derived from the CKRecordIDMBS object you provide. In all other cases, the record generates a UUID and bases its ID on that value. The ID of a record never changes over the lifetime of that record.

When you save a new record object to the server, the server validates the uniqueness of the record but reports an error only if the save policy calls for it. Specifically, it reports an error when the save policy is set to ifServerRecordUnchanged, which is the default. For other save policies, the server overwrites the contents of the existing record accordingly.
(Read only property)

### 32.41.31 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The app-defined string that identifies the type of the record.
**Notes:** Use this string to differentiate between different record types in your app. The string is primarily for your benefit, so choose type names that reflect the data in the corresponding records.
(Read only property)

### 32.41.32 share as CKReferenceMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to the share associated with the sharing of this record.
**Notes:** The share property (CKReferenceMBS) on a record will be removed when the corresponding CKShare object is deleted from the server. Send this record in the same batch as the share that is being deleted, and this record,Äôs share property will be updated.

Sharing is only supported in zones with the CKRecordZoneCapabilitySharing capability. The default zone does not support sharing.

If any records have a parent reference to this record, they are implicitly shared alongside this record.

Note

Records in a hierarchy must only exist within one share. If a child record in a hierarchy already has a share reference set, you will get a CKErrorAlreadyShared error if you try to share any of that record,Äôs parents.
(Read only property)

### 32.41.33 dataForKey(key as string) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The value for the given key stored in the record as data.
**Notes:** If assign nil as value, CloudKit removes any object that the record associates with the key.
(Read and Write computed property)

### 32.41.34 objectForKey(key as string) as Variant

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The value for the given key stored in the record.
**Notes:** key: The string that identifies a field in the record. Key names consist of one or more alphanumeric characters and start with a letter. You may also include underscore characters if you do not use an under-

score as the first character in the name. Spaces are not allowed in key names.

Returns the object associated with the specified key or nil if no such key exists in the record.

New records do not contain any keys or values initially. Values are always one of the object types listed in Supported Data Types.

You access the fields of a CKRecord object the same way you access key-value pairs in an NSMutableDictionary. The CKRecord class defines the objectForKey: and setObject:forKey: methods for getting and setting values. It also supports dictionary index notation.

If assign nil as value, CloudKit removes any object that the record associates with the key.
(Read and Write computed property)

### 32.41.35 stringForKey(key as string) as string

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The value for the given key stored in the record as string.
**Notes:** If field contains a number, we convert it to string for you.

If assign "" as value, we put in an empty string. To clear the key, pass nil via objectForKey assignment.
(Read and Write computed property)

## 32.42 class CKRecordZoneIDMBS

### 32.42.1 class CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKRecordZoneID object uniquely identifies a record zone in a database.
**Notes:** Zones are a way to group related records together. You create zone ID objects when you want to fetch an existing zone object or create a new zone with a specific name.

Overview
A record zone ID distinguishes one zone from another by a name string and the ID of the user that created the zone. Both strings must be ASCII strings that do not exceed 255 characters. For automatically created record zones, the ID name string is based on a UUID and is therefore guaranteed to be unique. When creating your own record zone ID objects, you are free to use names that have more meaning to your app or to the user, providing each zone name is unique within the specified database. The owner name must be either the current user name (obtained from the fetchUserRecordID method) or the name of another user.

When creating new record zones, make the name string in the record zone ID unique in the target database. Public databases do not support custom zones, and zones in a private database can only be created by the user that owns the database.

This class is not intended to be subclassed.

Interacting with Record Zone IDs
After you create a CKRecordZoneIDMBS object, interactions with that object typically include:

- Creating a CKRecordIDMBS object so that you can fetch or create records in that zone.
- Retrieving an existing CKRecordZoneMBS object from the database.

You do not need to create a CKRecordZoneIDMBS object in order to create a CKRecordZoneMBS object. The CKRecordZoneMBS class has initialization methods that create a record zone ID using the name string you provide.

Creating Record Zone IDs to Use with Records
To create a new record in a custom zone, first create a CKRecordZoneIDMBS object that specifies the zone name. Use the record zone ID to create a CKRecordID and then use the record ID to create the record itself.

Fetching a Record Zone Object from the Database
To fetch a CKRecordZoneMBS object from a database, use a CKFetchRecordZonesOperationMBS object or the fetchRecordZoneWithID method of the CKDatabaseMBS class. Both techniques take a CKRecordZoneIDMBS object that you provide and retrieve the corresponding record zone object asynchronously. If

you use the operation object, you can retrieve multiple record zones at the same time.

### 32.42.2 Methods

### 32.42.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.42.4 Constructor(zoneName as string, ownerName as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a record zone ID with the specified name and owner.
**Notes:** zoneName: The name that identifies the record zone. The string must contain only ASCII characters and must not exceed 255 characters. To specify the default zone of the current database, pass the CKRecordZoneDefaultName constant for this parameter. This parameter must not be nil or the empty string.
ownerName: The user who created the record zone. To specify the current user, use the CKOwnerDefaultName constant. If you specify nil or an empty string for this parameter, this method throws an exception.

Returns an initialized record zone ID object or nil if the object cannot be created.

Use this method to create a record zone ID for use in creating or fetching a record zone.

### 32.42.5 copy as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.42.6 IsEqual(Other as CKRecordZoneIDMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Checks if two objects are equal.

### 32.42.7 Properties

### 32.42.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.42.9 ownerName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the user who owns the record zone.
**Notes:** (Read only property)

### 32.42.10 zoneName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique name of the record zone.
**Notes:** (Read only property)

# 32.43 class CKRecordZoneMBS

## 32.43.1 class CKRecordZoneMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A definition of a custom area for organizing related records in a database.
**Notes:** Zones are an important part of how you organize your data. The public and private databases have a single default zone. In the private database you can use CKRecordZoneMBS objects to create additional custom zones as needed. Use custom zones to arrange and encapsulate groups of related records in the private database. Custom zones support other capabilities too, such as the ability to write multiple records as a single atomic transaction.

Treat each custom zone as a single unit of data that is separate from every other zone in the database. Inside the zone, you add records as you would anywhere else. You can also create links between the records inside a zone by using the CKReferenceMBS class. However, the CKReferenceMBS class does not support cross-zone linking, so each reference object must point to a record in the same zone as the current record.

Use the CKRecordZoneMBS class as-is and do not subclass.

Creating a Custom Record Zone
For the most part, you use instances of this class to create and manage custom zones. Although you can use this class to retrieve a database,Äôs default zone, most operations act on records in the default zone by default, so you rarely need to specify it explicitly.

To create a custom zone, use CKRecordZoneMBS to create the zone object, and then save that zone to the user,Äôs private database using a CKModifyRecordZonesOperationMBS object. You cannot save any records in the zone until you save it to the database. When creating records, explicitly specify the zone ID if you want the records to reside in a specific zone; otherwise, they will be saved to the default zone. You cannot create custom zones in a public database.

After creating a CKRecordZoneMBS object and saving it to the database, you do not interact with the object much. Instead, most interactions occur with its associated CKRecordZoneIDMBS object, which you use to refer to the zone when creating records.

## 32.43.2 Methods

## 32.43.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.43.4 CKRecordZoneDefaultName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The name of the default zone.
**Notes:** Use this constant when you need to refer to the default zone by name, perhaps when creating a zone ID. The default zone has no special capabilities.

### 32.43.5 Constructor(zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a record zone object using the specified ID.
**Notes:** zoneID: The ID for the new zone. This parameter must not be nil.

Returns the new custom zone, or nil if the zone cannot be created.

Use this method when you want to create a new record zone based on the information in a zone ID. After creating the zone, save it to the server using a CKModifyRecordZonesOperationMBS object or the save method of the CKDatabaseMBS class.

Do not use this method to create a CKRecordZoneMBS object corresponding to a zone that already exists in the database. If the zone exists, fetch it using a CKFetchRecordZonesOperationMBS object or the fetch method of the CKDatabaseMBS class.
See also:

- 32.43.6 Constructor(zoneName as string) 5772

### 32.43.6 Constructor(zoneName as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a record zone object with the specified name.
**Notes:** zoneName: The name of the new zone. Zone names inside a user,Äôs private database are unique, consist of ASCII characters, are no longer than 255 characters, and do not start with an underscore (_) character. One way to ensure the uniqueness of zone names is to create a string based on a UUID, but you can also use other techniques.

If this parameter is nil or is an empty string, the method throws an exception.

Returns the new custom zone, or nil if the zone cannot be created.

Use this method to create a new record zone. The new zone has the name you provide and the zone,Äôs owner is set to the current user. After creating the zone, save it to the server using a CKModifyRecordZonesOperationMBS object or the saveRecordZone method of the CKDatabase class. You must save the zone to the server before attempting to save any records to that zone.

Do not use this method to create a CKRecordZone object corresponding to a zone that already exists in the database. If the zone exists, fetch it using a CKFetchRecordZonesOperationMBS object or the fetchRecordZoneWithID method of the CKDatabase class.
See also:

- 32.43.5 Constructor(zoneID as CKRecordZoneIDMBS) 5772

### 32.43.7 copy as CKRecordZoneMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.43.8 defaultRecordZone as CKRecordZoneMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the default zone for records.
**Notes:** The default record zone for a database.

Always use this method to retrieve the default zone for a database. The returned object can be used to specify the default zone for either the public or private database of a container. You do not need to save the returned zone object before using it. The owner of the zone is set to CKOwnerDefaultName, which corresponds to the current user.

The default zone of a database is a convenient place to store and access records. Whenever you do not explicitly assign a zone to a record, CloudKit puts the record in the default zone.

The disadvantage of using the default zone for storing records is that it does not have any special capabilities. You cannot save a group of records to iCloud atomically in the default zone. Similarly, you cannot use a CKFetchRecordChangesOperationMBS object on records in the default zone.

### 32.43.9 Properties

### 32.43.10 capabilities as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The capabilities supported by the zone.
**Notes:** The server determines the capabilities of the zone and sets the value of this property when you save the record zone. Always check this property before performing tasks that require a specific capability.

Typically, default zones do not support any special capabilities. Custom zones in a private database normally support all options.

For more information about what you can do with specific capabilities, see Capabilities* constants.
(Read only property)

### 32.43.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.43.12 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique ID of the zone.
**Notes:** The zone ID contains the name of the zone and the name of the user who owns the zone. Use this property to access both of those values.
(Read only property)

### 32.43.13 Constants

Capabilities

| Constant | Value | Description |
|---|---|---|
| CapabilityAtomic | 2 | A capability that allows changes to multiple records to be made atomically. When you use a CKModifyRecordsOperationMBS object to save records, if the server is unable to save the changes for one record, it does not save the changes for any of the records. When combined with the CKRecordSaveIfServerRecordUnchanged policy of the operation object, this behavior prevents your app from overwriting changes to a group of records if one of the records was modified elsewhere. |
| CapabilityFetchChanges | 1 | A capability that allows you to fetch only the changed values in records. This capability makes the creation of offline caches more efficient. Instead of fetching the entire record every time, use a CKFetchRecordChangesOperationMBS object to fetch only the values that changed, and use the returned data to update your caches. Doing so minimizes the amount of data you receive from the server. You can still fetch the entire record using a CKFetchRecordsOperationMBS object if you want. |
| CapabilitySharing | 4 | Sharing |

## 32.44 class CKRecordZoneNotificationMBS

### 32.44.1 class CKRecordZoneNotificationMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A notification that is caused by changes to the contents of a record zone.
**Notes:** Zone-related changes occur when existing records in the zone are modified, when new records are added, and when existing records are deleted. Use instances of this class to determine which zone triggered the notification.

You do not create instances of this class directly. When your app receives a push notification, call the notificationFromRemoteNotificationDictionary method of CKNotificationMBS to generate a notification object of the appropriate type. You can also fetch previously delivered notifications from a container using a CKFetchNotificationChangesOperationMBS object. If the notification was triggered due to a record zone change, the operation object delivers an instance of CKRecordZoneNotificationMBS with its notificationType property set to CKNotificationTypeRecordZoneMBS. Use the record zone notification object to get the record zone information and other push-related data.

If a push notification,Äôs payload is too large, pieces of data may be dropped until the payload meets the allowed size limit. The data that alerts the user is the most important and is dropped last. Data values in this class are among the first to be dropped, with values being dropped in the following order:

1. containerIdentifier—defined in the CKNotification class.
2. recordZoneID
3. Other properties of the CKNotification class.

Subclass of the CKNotificationMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.44.2 Methods

### 32.44.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.44.4 Properties

### 32.44.5 databaseScope as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of database (public, private, or shared) associated with the zone.
**Notes:** For more details on the values returned, see CKDatabaseMBS.Scope* constants.
(Read only property)

### 32.44.6 recordZoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the zone that changed.
**Notes:** Use the value of this property to fetch the corresponding zone from the database.
(Read only property)

## 32.45 class CKRecordZoneSubscriptionMBS

### 32.45.1 class CKRecordZoneSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A subscription that causes a push notification to fire whenever any change happens in the specified record zone.
**Notes:** Subclass of the CKSubscriptionMBS class.

### 32.45.2 Methods

### 32.45.3 Constructor(zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a subscription object that monitors all records in the specified record zone.
**Notes:** zoneID: The ID of the record zone containing the records you want to monitor. This parameter must not be nil.

Returns a subscription object initialized to track changes to the contents of the specified record zone.

The object returned by this method is configured as a zone-based subscription, which generates a push notification when any changes are made to the records in the specified zone.
See also:

- 32.45.4 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string) 5778

### 32.45.4 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a subscription object that monitors the specified zone and has a custom name that you provide.
**Notes:** zoneID: The ID of the record zone containing the records you want to monitor. This parameter must not be nil.
subscriptionID: The unique name of the subscription object. This string must be unique for each subscription object in the container. This parameter must not be nil.

Returns a subscription object initialized to track changes to the contents of a record zone.

The CKRecordZoneSubscriptionMBS returned by this method is configured as a zone-based subscription,

which generates a push notification when any changes are made to the records in the specified zone.
See also:

- 32.45.3 Constructor(zoneID as CKRecordZoneIDMBS) 5778

### 32.45.5 copy as CKRecordZoneSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.45.6 Properties

### 32.45.7 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type being monitored in a query-based subscription. (read-only)
**Notes:** The value of this property applies only to query-based subscriptions and is set automatically by the CKRecordZoneSubscriptionMBS and CKRecordZoneSubscriptionMBS methods. For all other types of subscription objects, the value of this property is ignored and set to nil.
(Read and Write property)

### 32.45.8 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Zone that the specified query subscription is scoped to.
**Notes:** The value of this property applies both to query-based subscriptions and zone-based subscriptions. Specifying a record zone limits the search scope to the records in that zone. In the case of a zone-based subscription, the search encompasses all records in the zone. For a query-based subscription, the search encompasses only records of recordType in that zone.

For zone-based subscriptions, the value of this property is set automatically by the CKRecordZoneSubscriptionMBS or CKRecordZoneSubscriptionMBS methods. For all other subscription types, the default value is nil. To apply a zone to a query-based subscription, you must assign a value explicitly.
(Read only property)

## 32.46 class CKReferenceMBS

### 32.46.1 class CKReferenceMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKReference object creates a many-to-one relationship between records in your database.
**Notes:** Each reference object stores information about the one record that is the target of the reference. You then save the reference object in the fields of one or more records to create a link from those records to the target. Both records must be located in the same zone of the same database.

see
https://developer.apple.com/reference/cloudkit/ckreference

### 32.46.2 Methods

### 32.46.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.46.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.46.5 Constructor(record as CKRecordMBS, action as Integer = 0) 5780
- 32.46.6 Constructor(recordID as CKRecordIDMBS, action as Integer = 0) 5781


### 32.46.5 Constructor(record as CKRecordMBS, action as Integer = 0)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a reference object that points to the specified record object.
**Notes:** record: The target record of the reference.
action: The ownership options to put in place for the records. If you specify the deleteSelf option, the object referred to by the recordID parameter becomes the owner of any objects that use this reference object. For

a list of possible values, see CKReferenceAction.

Returns an initialized reference object that points to the specified record, or nil if the reference cannot be initialized.

Use this method to initialize a reference to a local record object. The local record can be one that you just created or one that you fetched previously from the server.

When you create a reference object for use in a search predicate, the predicate ignores the value in the action parameter. Search predicates use only the ID of the record during their comparison.
See also:


- 32.46.4 Constructor 5780
- 32.46.6 Constructor(recordID as CKRecordIDMBS, action as Integer = 0) 5781


### 32.46.6 Constructor(recordID as CKRecordIDMBS, action as Integer = 0)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a reference object that points to the record with the specified ID.
**Notes:** recordID: The ID of the target record. This method throws an exception if you specify nil for this parameter.
action: The ownership option to put in place between the target record and any records that incorporate this reference object. If you specify the deleteSelf option, the record referred to by the recordID parameter owns (or acts as the parent) of any objects that use this reference object. For a list of possible values, see CKReferenceActionMBS.

Returns an initialized reference object that points to the specified record, or nil if the reference cannot be initialized.

Use this method when you have only the ID of the record that is to become the target of a link. You might use this method if you saved only the ID of the record to a local data cache.

When you create a reference object for use in a search predicate, the predicate ignores the value in the action parameter. Search predicates use only the ID of the record during their comparison.
See also:


- 32.46.4 Constructor 5780
- 32.46.5 Constructor(record as CKRecordMBS, action as Integer = 0) 5780

### 32.46.7 copy as CKReferenceMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.46.8 Properties

### 32.46.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.46.10 recordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the referenced record.
**Notes:** Use the ID in this property to fetch the record on the other end of the link.
(Read only property)

### 32.46.11 referenceAction as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ownership behavior for the records.
**Notes:** The value in this property determines what action, if any, to take when the target of the reference object—that is, the object pointed to in the recordID property—is deleted. When this property is set to deleteSelf, deleting the target object deletes any records that contain that reference in one of their fields. When this property is set to none, deleting the target object does not delete any additional objects.
(Read only property)

### 32.46.12 Constants

Actions

| Constant | Value | Description |
|---|---|---|
| ActionDeleteSelf | 1 | The delete action for referenced records.<br>Deleting a record also deletes any records containing CKReferenceMBS objects that point to that record. The deletion of the additional records may trigger a cascade deletion of more records. The deletions are asynchronous in the default zone and immediate in a custom zone. |
| ActionNone | 0 | No action when a referenced record is deleted.<br>Deleting a parent record does not delete the children that refer to that parent. The CKReference object still contains the ID of the deleted record and is not updated automatically. |

## 32.47 class CKServerChangeTokenMBS

### 32.47.1 class CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A CKServerChangeTokenMBS object is an opaque data object that identifies a specific version of a record.
**Notes:** You do not create instances of this class yourself. When fetching records using a CKFetchRecordChangesOperation object, the server provides one of these objects along with the record changes. The next time you fetch the records, pass the previous token to the server. Passing the previous token tells the server what portions of the records to fetch and return to your app.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr5

### 32.47.2 Methods

### 32.47.3 Archive(byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Archives the token.
**Notes:** You may do Base64 on top of the memoryblock before storing in e.g. a XML or JSON block.
Uses NSKeyedArchiver internally.

### 32.47.4 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.47.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.47.6 copy as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.47.7 IsEqual(Other as CKServerChangeTokenMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Checks if two objects are equal.

### 32.47.8 Unarchive(Data as MemoryBlock, byref error as NSErrorMBS) as CKServerChangeTokenMBS

MBS Mac64bit Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Unarchives the token.
**Notes:** If you used Base64 previously, don't forget to do Base64 Decode before passing in data.
Uses NSKeyedUnarchiver internally.

### 32.47.9 Properties

### 32.47.10 description as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The description text.
**Notes:** (Read only property)

### 32.47.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 32.48 class CKShareMBS

### 32.48.1 class CKShareMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to a shared record.
**Notes:** Available in macOS 10.12 and newer.
Subclass of the CKRecordMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr2
- MBS Xojo Plugins, version 21.3pr4

### 32.48.2 Methods

### 32.48.3 addParticipant(participant as CKShareParticipantMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Adds a participant to this share.
**Notes:** participant: The participant to be added to this share.

If a participant with a matching userIdentity already exists in this share, that existing participant,Äôs properties are updated; no new participant is added.

To modify the list of participants, a share must have publicPermission set to CKShareParticipantPermissionNone. You cannot mix and match private users and public users in the same share. Only certain participant types may be added via this API; see CKShareParticipantMBS.

### 32.48.4 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

### 32.48.5 CKRecordTypeShare as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of record for a share.

### 32.48.6 CKShareThumbnailImageDataKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the predefined keys in the CKRecordTypeShare schema.
**Notes:** They're used by the out of process UI flow to send a share, and as part of the share acceptance flow. These are optional.

Value is a data blob suitable to pass into NSImageMBS.imageWithData.

### 32.48.7 CKShareTitleKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the predefined keys in the CKRecordTypeShare schema.
**Notes:** They're used by the out of process UI flow to send a share, and as part of the share acceptance flow. These are optional.

Value is a string. Example for a recipe sharing app: "Pot Roast"

### 32.48.8 CKShareTypeKey as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the predefined keys in the CKRecordTypeShare schema.
**Notes:** They're used by the out of process UI flow to send a share, and as part of the share acceptance flow. These are optional.

Value is a string representing a UTI. Example for a recipe sharing app: "com.mycompany.recipe"

### 32.48.9 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 32.48.10 Constructor(RecordType as String) 5788

- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790


### 32.48.10 Constructor(RecordType as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.48.9 Constructor 5787
- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790


### 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.48.9 Constructor 5787
- 32.48.10 Constructor(RecordType as String) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790

### 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.48.9 Constructor 5787
- 32.48.10 Constructor(RecordType as String) 5788
- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790


### 32.48.13 Constructor(rootRecord as CKRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a share object.
**Notes:** When saving a newly created CKShare, you must save the share and its rootRecord in the same CKModifyRecordsOperationMBS batch.
See also:


- 32.48.9 Constructor 5787
- 32.48.10 Constructor(RecordType as String) 5788
- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790


### 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a share object.
**Notes:** rootRecord: The record being shared.
shareID: The CKRecordID associated with this share.

When saving a newly created CKShare, save the share and its rootRecord in the same CKModifyRecordsOperationMBS batch.
See also:

- 32.48.9 Constructor 5787
- 32.48.10 Constructor(RecordType as String) 5788
- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS) 5790


### 32.48.15 Constructor(zoneID as CKRecordZoneIDMBS)

MBS Mac64bit Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** Creates a new share for the specified record zone.
**Notes:** ZoneID: The ID of the record zone to share.

A shared record zone must have the CKRecordZoneCapabilityZoneWideSharing capability. Custom record zones that you create in the user,Äôs private database have this capability by default. A record zone, and the records it contains, can take part in only a single share.

After accepting a share invite, CloudKit adds the records of the shared record zone to a new zone in the participant,Äôs shared database. Use CKFetchDatabaseChangesOperationMBS to fetch the ID of the new record zone. Then configure CKFetchRecordZoneChangesOperationMBS with that record zone ID and execute the operation to fetch the records.
If you use CKFetchShareMetadataOperationMBS to fetch the metadata for a shared record zone, the operation ignores the shouldFetchRootRecord and rootRecordDesiredKeys properties because, unlike a shared record hierarchy, a record zone doesn,Äôt have a nominated root record.

Available in macOS 12 or later.
See also:


- 32.48.9 Constructor 5787
- 32.48.10 Constructor(RecordType as String) 5788
- 32.48.11 Constructor(RecordType as String, recordID as CKRecordIDMBS) 5788
- 32.48.12 Constructor(RecordType as String, zoneID as CKRecordZoneIDMBS) 5789
- 32.48.13 Constructor(rootRecord as CKRecordMBS) 5789
- 32.48.14 Constructor(rootRecord as CKRecordMBS, shareID as CKRecordIDMBS) 5789

### 32.48.16 participants as CKShareParticipantMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An array containing metadata objects for all participants in this share.
**Notes:** The participants array contains all participants on the share that the current user has permissions to see. At a minimum, this array includes the owner and the current user.

### 32.48.17 removeParticipant(participant as CKShareParticipantMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Removes a participant from the share.
**Notes:** participant: The participant to be removed from this share.

To modify the list of participants, a share must have publicPermission set to CKShareParticipantPermissionNone. You cannot mix and match private users and public users in the same share. Only certain participant types may be added via this API; see CKShareParticipantMBS.

### 32.48.18 Properties

### 32.48.19 currentUserParticipant as CKShareParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The current user,Äôs metadata for this share.
**Notes:** This computed property accesses the participants property and returns the CKShareParticipant that is associated with the current user.
(Read only property)

### 32.48.20 owner as CKShareParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The share owner,Äôs metadata.
**Notes:** This computed property accesses the participants property and returns the CKShareParticipant that is associated with the owner of this share.
(Read only property)

### 32.48.21 publicPermission as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Definition of permissions new users joining this share will have initially.
**Notes:** Shares with publicPermission more permissive than CKShareParticipantPermissionNone are joinable by any user with access to the share,Äôs URL. If the value is set to CKShareParticipantPermissionReadWrite, then those users can also create and modify records in the share. By default, public permission is CKShareParticipantPermissionNone. Changing the public permission to CKShareParticipantPermissionNone results in all public participants being removed when the share is saved.
(Read and Write property)

### 32.48.22 URL as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A URL that can be used to invite participants to this share.
**Notes:** This property is only available after a share record has been saved to the server. This URL is stable and is tied to the rootRecord. If you share a rootRecord, delete the share, and then re-share the same rootRecord via a newly created share, that newly created share,Äôs URL will be identical to the prior share,Äôs URL.
(Read only property)

# 32.49 class CKShareMetadataMBS

## 32.49.1 class CKShareMetadataMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to the metadata for a shared record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr1

## 32.49.2 Methods

## 32.49.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

## 32.49.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 32.49.5 copy as CKShareMetadataMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

## 32.49.6 Properties

## 32.49.7 containerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique identifier for the container associated with this share.
**Notes:** This read only property can be used to fetch the container associated with this share.
(Read only property)

### 32.49.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.49.9 ownerIdentity as CKUserIdentityMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The identity of the owner of the associated share.
**Notes:** This read only property is used to access the owner of the share.
(Read only property)

### 32.49.10 participantPermission as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Permissions associated with the user who retrieved the metadata for this share.
**Notes:** This property reflects the permissions associated with the participant who invoked the CKFetchShareMetadataOperationMBS.
(Read only property)

### 32.49.11 participantStatus as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The participation status of the user who retrieved the metadata for this share.
**Notes:** This property reflects the status of the participant who invoked the CKFetchShareMetadataOperationMBS. See CKShareParticipantMBS for the statuses available.
(Read only property)

### 32.49.12 participantType as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of the user who retrieved the metadata for this share.
**Notes:** This property reflects the participantType of the participant who invoked the CKFetchShareMetadataOperationMBS. See CKShareParticipantMBS for the types available.
(Read only property)

### 32.49.13 rootRecord as CKRecordMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The root record associated with this share.
**Notes:** This read only property contains a reference to the root record associated with this share. This property can be nil if the CKFetchShareMetadataOperationMBS did not set shouldFetchRootRecord to true.
(Read only property)

### 32.49.14 rootRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique identifier for the root record associated with this share.
**Notes:** This property is populated even if shouldFetchRootRecord is set to false on the CKFetchShareMetadataOperationMBS and can be used to retrieve the rootRecord if the record was not retrieved with the metadata.
(Read only property)

### 32.49.15 share as CKShareMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The associated share.
**Notes:** This read only property contains a reference to the CKShareMBS that this CKShareMetadataMBS is associated with.
(Read only property)

## 32.50 class CKShareParticipantMBS

### 32.50.1 class CKShareParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to a person who accepted a shared record..
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr7

### 32.50.2 Methods

### 32.50.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

### 32.50.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.50.5 copy as CKShareParticipantMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.50.6 Properties

### 32.50.7 acceptanceStatus as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The current state of the user,Äôs acceptance of this share. (read-only)
**Notes:** This property contains the current state of the participant,Äôs acceptance of this share. For a list of possible values, see CKShareParticipantAcceptanceStatus* constants.
(Read only property)

### 32.50.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.50.9 permission as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The permission level that the user has for this share.
**Notes:** This property controls the permissions that the participant has for this share. For a list of possible values, see CKShareParticipantPermission* constants.
(Read and Write property)

### 32.50.10 role as Integer

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** The participant,Äôs role for the share.
**Notes:** The property controls the participant role for the share.
For a list of possible values, see CKShareParticipantRole* constants.
(Read and Write property)

### 32.50.11 type as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use role instead. **Function:** The participant type.
**Notes:** The property controls the participant type for the share.
For a list of possible values, see CKShareParticipantType* constants.
(Read and Write property)

### 32.50.12 userIdentity as CKUserIdentityMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The identity of the participant. (read-only)
**Notes:** This property contains a reference to the user identity for the share participant.
(Read only property)

### 32.50.13 Constants

Acceptance Status

| Constant | Value | Description |
|---|---|---|
| CKShareParticipantAcceptanceStatusAccepted | 2 | The participant has accepted the share request. |
| CKShareParticipantAcceptanceStatusPending | 1 | The participant has not accepted the share request. |
| CKShareParticipantAcceptanceStatusRemoved | 3 | The participant was removed from the share. |
| CKShareParticipantAcceptanceStatusUnknown | 0 | The participant,Äôs status is unknown. |

Permissions

| Constant | Value | Description |
|---|---|---|
| CKShareParticipantPermissionNone | 1 | The participant does not have any permissions for this share. |
| CKShareParticipantPermissionReadOnly | 2 | The participant has read only permissions for this share. |
| CKShareParticipantPermissionReadWrite | 3 | The participant has full read and write permissions for this share. |
| CKShareParticipantPermissionUnknown | 0 | The current status of the participant,Äôs permissions is unknown. |

Participant Roles.

| Constant | Value | Description |
|---|---|---|
| CKShareParticipantRoleOwner | 1 | The participant is the owner of the share. As owner, the user can add pri users to the share. |
| CKShareParticipantRolePrivateUser | 3 | The participant is a private user and can access the share. |
| CKShareParticipantRolePublicUser | 4 | The participant is a private user and can access the share. |
| CKShareParticipantRoleUnknown | 0 | The type of the participant cannot be determined. |

Participant Types.

| Constant | Value | Description |
|---|---|---|
| CKShareParticipantTypeOwner | 1 | The participant is the owner of the share. As owner, the user can add pri users to the share. |
| CKShareParticipantTypePrivateUser | 3 | The participant is a private user and can access the share. |
| CKShareParticipantTypePublicUser | 4 | The participant is a public user. Public users are ,Äúself-added,Äù when participant accesses the shareURL. Owners cannot add public users. |
| CKShareParticipantTypeUnknown | 0 | The type of the participant cannot be determined. |

# 32.51 class CKSubscriptionMBS

## 32.51.1 class CKSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Use a CKSubscription object to track changes occurring on the server.
**Notes:** A subscription acts like a persistent query on the server that can track the creation, deletion, and modification of records. When changes occur, they trigger the delivery of push notifications so that your app can respond appropriately.

see
https://developer.apple.com/reference/cloudkit/cksubscription

Available in 10.10 in 64-bit, but most is deprecated by Apple with 10.12.

## 32.51.2 Methods

## 32.51.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.10 and newer in 64-bit application.

## 32.51.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:


- 32.51.5 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer) 5800
- 32.51.6 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer) 5800
- 32.51.7 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string, subscriptionOptions as Integer) 5801
- 32.51.8 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionOptions as Integer) 5802

### 32.51.5 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a query-based subscription that monitors records with the specified options.
**Notes:** recordType: The string that identifies the type of records to track. You are responsible for naming your app,Äôs record types. This parameter must not be nil or an empty string.
predicate: The matching criteria to apply to the records. This parameter must not be nil. For information about the operators that are supported in search predicates, see the discussion in CKQueryMBS.
subscriptionOptions: A bitmask of the configuration options for the subscription. You must specify at least one of the following values: CKSubscriptionOptionsFiresOnRecordCreation, CKSubscriptionOptionsFiresOnRecordUpdate, or CKSubscriptionOptionsFiresOnRecordDeletion.

Returns a subscription object initialized to track record-related changes.

The object returned by this method is configured as a query-based subscription for searching records in the target database. The subscription monitors the specified type of records in all of the user,Äôs record zones and generates push notifications when the search criteria are met.
See also:


- 32.51.4 Constructor 5799
- 32.51.6 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer) 5800
- 32.51.7 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string, subscriptionOptions as Integer) 5801
- 32.51.8 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionOptions as Integer) 5802


### 32.51.6 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a query-based subscription that monitors records with the specified options.
**Notes:** recordType: The string that identifies the type of records to track. You are responsible for naming your app,Äôs record types. This parameter must not be nil or an empty string.
predicate: The matching criteria to apply to the records. This parameter must not be nil. For information about the operators that are supported in search predicates, see the discussion in CKQueryMBS.
subscriptionOptions: A bitmask of the configuration options for the subscription. You must specify at least one of the following values: CKSubscriptionOptionsFiresOnRecordCreation, CKSubscriptionOptionsFiresOnRecordUpdate, or CKSubscriptionOptionsFiresOnRecordDeletion.

Returns a subscription object initialized to track record-related changes.

The object returned by this method is configured as a query-based subscription for searching records in the target database. The subscription monitors the specified type of records in all of the user,Äôs record zones and generates push notifications when the search criteria are met.
See also:


- 32.51.4 Constructor 5799
- 32.51.5 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer) 5800
- 32.51.7 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string, subscriptionOptions as Integer) 5801
- 32.51.8 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionOptions as Integer) 5802


### 32.51.7 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string, subscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a subscription object that monitors the specified zone and has a custom name that you provide.
**Notes:** zoneID: The ID of the record zone containing the records you want to monitor. This parameter must not be nil.
subscriptionID: The unique name of the subscription object. This string must be unique for all other subscription objects in the container. This parameter must not be nil.
subscriptionOptions: The configuration options for the subscription. You must specify 0 for this parameter. Zone subscriptions currently do not support any options.

Returns a subscription object initialized to track changes to the contents of a record zone.

The object returned by this method is configured as a zone-based subscription, which generates a push notification when any changes are made to the records in the specified zone.
See also:


- 32.51.4 Constructor 5799
- 32.51.5 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer) 5800
- 32.51.6 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer) 5800
- 32.51.8 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionOptions as Integer) 5802

### 32.51.8 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionOptions as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a subscription object that monitors all records in the specified record zone.
**Notes:** zoneID: The ID of the record zone containing the records you want to monitor. This parameter must not be nil.
subscriptionOptions: The configuration options for the subscription. You must specify 0 for this parameter. Zone subscriptions currently do not support any options.

Returns a subscription object initialized to track changes to the contents of a record zone.

The object returned by this method is configured as a zone-based subscription, which generates a push notification when any changes are made to the records in the specified zone.
See also:


- 32.51.4 Constructor 5799
- 32.51.5 Constructor(RecordType as String, predicate as NSPredicateMBS, querySubscriptionOptions as Integer) 5800
- 32.51.6 Constructor(RecordType as String, predicate as NSPredicateMBS, subscriptionID as string, querySubscriptionOptions as Integer) 5800
- 32.51.7 Constructor(zoneID as CKRecordZoneIDMBS, subscriptionID as string, subscriptionOptions as Integer) 5801


### 32.51.9 copy as CKSubscriptionMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.51.10 Properties

### 32.51.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.51.12 notificationInfo as CKNotificationInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The configuration data for push notifications sent by the subscription.
**Notes:** If you want your subscription,Äôs push notifications to alert the user to corresponding changes, assign a value to this property. The server uses the information in the CKNotificationInfoMBS object to determine the delivery options for notifications. For example, you can specify the alert text to display and the name of a special sound file to play. When a push notification involves a record, you can also specify which fields of the record to include in the push notification,Äôs payload data.

If you do not assign a value to this property, the server still sends push notifications to your app but those notifications do not cause the system to alert the user. The default value of this property is nil.
(Read only property)

### 32.51.13 predicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The matching criteria to apply to records.
**Notes:** A query-based subscription uses its search predicate to identify potential matches for records. It combines the predicate information with the value in the subscriptionOptions property to determine the conditions under which to send a push notification to the app.

The search predicate defines the records that the subscription object monitors for changes. The value in this property is used only if the subscriptionTypeMBS property is set to CKSubscriptionTypeQuery; otherwise, it is ignored.
(Read only property)

### 32.51.14 recordType as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The record type being monitored in a query-based subscription.
**Notes:** The value of this property applies only to query-based subscriptions and is set automatically by the constructors. For all other types of subscription objects, the value of this property is ignored and set to nil.
(Read only property)

### 32.51.15 subscriptionID as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The unique identifier for the subscription.
**Notes:** If you initialize the subscription object using the constructor, the default value of this property is set to the value provided by those methods. In all other cases, an ID based on a UUID is generated for you automatically.
(Read only property)

### 32.51.16 subscriptionOptions as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The options for triggering notifications.
**Notes:** Set the value of this property at initialization time. When configuring a query-based subscription, you must specify at least one of the following values: CKSubscriptionOptionsFiresOnRecordCreation, CKSubscriptionOptionsFiresOnRecordUpdate, or CKSubscriptionOptionsFiresOnRecordDeletion.
(Read only property)

### 32.51.17 subscriptionType as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The type of behavior provided by the subscription.
**Notes:** The value of this property is set automatically at creation time. Use it to distinguish between query-based subscriptions and those that monitor specific types of data.
(Read only property)

### 32.51.18 zoneID as CKRecordZoneIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the record zone to monitor.
**Notes:** The value of this property applies both to query-based subscriptions and zone-based subscriptions. Specifying a record zone limits the search scope to the records in that zone. In the case of a zone-based subscription, the search encompasses all records in the zone. For a query-based subscription, the search encompasses only records of a specific type in that zone.

For zone-based subscriptions, the value of this property is set automatically by the constructor. For all other subscription types, the default value is nil. To apply a zone to a query-based subscriptions, you must assign a value explicitly.
(Read only property)

### 32.51.19 Constants

Configuration Options

| Constant | Value | Description |
|---|---|---|
| OptionsFiresOnce | 8 | An option for sending a push notification only one time. After sending the push notification, the server deletes the subscription object. This option applies only to query-based subscriptions. |
| OptionsFiresOnRecordCreation | 1 | An option for generating a push notification when a record that matches the search criteria in the predicate property is created. This option applies only to query-based subscriptions subscriptions. |
| OptionsFiresOnRecordDeletion | 4 | An option for generating a push notification when a record that matched the search criteria in the predicate property was deleted. This option applies only to query-based subscriptions. |
| OptionsFiresOnRecordUpdate | 2 | An option for generating a push notification when changes are made to the fields of a record that cause the record to match the search criteria specified in the predicate property. This option applies only to query-based subscriptions. |

Subscription Types

| Constant | Value | Description |
|---|---|---|
| TypeDatabase | 3 | A constant indicating the subscription is a query-based subscription. This type of subscription tracks the creation, modification, or deletion of a specific type of record. |
| TypeQuery | 1 | A constant indicating the subscription is a query-based subscription. This type of subscription tracks the creation, modification, or deletion of a specific type of record. |
| TypeRecordZone | 2 | A constant indicating the subscription is a zone-based subscription. The subscription tracks changes to records in a specific record zone. |

## 32.52 class CKUserIdentityLookupInfoMBS

### 32.52.1 class CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An object that represents information you use to fetch users.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.52.2 Methods

### 32.52.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

### 32.52.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
**Notes:** Please use the shared methods to constructor instances.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 32.52.5 copy as CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.52.6 lookupInfosWithEmailAddress(emailAddress as string) as CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of user identity lookup objects configured with email addresses as the search criteria.

**Notes:** emails: An array of strings that represent the email addresses to use to configure the CKUserIdentityLookupInfoMBS objects.

Returns an array of CKUserIdentityLookupInfoMBS objects that are configured with the email addresses that were passed in.
May return nil in case of error.

Once initialized, these objects can be passed into a CKDiscoverUserIdentitiesOperationMBS, or a CKFetchShareParticipantsOperationMBS to retrieve the CKUserIdentity objects for the user.

### 32.52.7 lookupInfosWithEmails(emailAddresses() as string) as CKUserIdentityLookupInfoMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of user identity lookup objects configured with email addresses as the search criteria.
**Notes:** emails: An array of strings that represent the email addresses to use to configure the CKUserIdentityLookupInfoMBS objects.

Returns an array of CKUserIdentityLookupInfoMBS objects that are configured with the email addresses that were passed in.
May return nil in case of error.

Once initialized, these objects can be passed into a CKDiscoverUserIdentitiesOperationMBS, or a CKFetchShareParticipantsOperationMBS to retrieve the CKUserIdentityMBS objects for the user.

### 32.52.8 lookupInfosWithPhoneNumbers(phoneNumbers() as string) as CKUserIdentityLookupInfoMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of user identity lookup objects configured with phone numbers as the search criteria.
**Notes:** phoneNumbers: An array of strings that represent the phone numbers to use to configure the CKUserIdentityLookupInfoMBS objects.

Returns an array of CKUserIdentityLookupInfoMBS objects that are configured with the phone numbers that were passed in.
May return nil in case of error.

Once initialized, these objects can be passed into a CKDiscoverUserIdentitiesOperationMBS, or a CKFetchShareParticipantsOperationMBS to retrieve the CKUserIdentityMBS objects for the user.

### 32.52.9 lookupInfosWithRecordIDs(userRecordIDs() as CKRecordIDMBS) as CKUserIdentityLookupInfoMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns an array of user identity lookup objects configured with phone numbers as the search criteria.
**Notes:** userRecordIDs: An array of CKRecordIDMBS objects that are used to configure the CKUserIdentityLookupInfoMBS objects.

Returns an array of CKUserIdentityLookupInfoMBS objects that are configured with the CKRecordIDMBS objects that were passed in.one

### 32.52.10 lookupInfosWithUserRecordID(userRecordID as CKRecordIDMBS) as CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a look up info object with the user record ID property configured.
**Notes:** userRecordID: The user record ID to use to look up the user.

Returns an user identity lookup object initialized to look up a user by the user,Äôs record ID, or nil if the object cannot be initialized.

Once initialized, this object can be passed into CKDiscoverUserIdentitiesOperationMBS, or a CKFetchShareParticipantsOperationMBS to retrieve the CKUserIdentityMBS for the user.

### 32.52.11 lookupInfosWithWithPhoneNumber(phoneNumber as string) as CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a look up info object with the phone number property configured.
**Notes:** phoneNumber: The phone number to use to look up the user.

Returns an user identity lookup object initialized to look up a user by the user,Äôs phone number, or nil if the object cannot be initialized.

Once initialized, this object can be passed into a CKDiscoverUserIdentitiesOperationMBS, or a CKFetchShareParticipantsOperationMBS to retrieve the CKUserIdentityMBS for the user.

### 32.52.12 Properties

### 32.52.13 emailAddress as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The email address of the user whose information you want to retrieve.
**Notes:** This property corresponds to a single email address associated with the user whose information you wish to look up.
(Read only property)

### 32.52.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.52.15 phoneNumber as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The phone number of the user whose information you want to retrieve.
**Notes:** This property corresponds to a single phone number associated with the user whose information you wish to look up.
(Read only property)

### 32.52.16 userRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The ID of the user record.
**Notes:** Use this value to retrieve the user record associated with the specified user. The user record does not contain any personal information about the user by default. Your app can add data to the user record but should not add any sensitive user data to it.
(Read only property)

## 32.53 class CKUserIdentityMBS

### 32.53.1 class CKUserIdentityMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A reference to a user.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 32.53.2 Methods

### 32.53.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.12 and newer in 64-bit application.

### 32.53.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 32.53.5 copy as CKUserIdentityMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.53.6 Properties

### 32.53.7 description as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The description text.
**Notes:** (Read only property)

### 32.53.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.53.9 hasiCloudAccount as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether this user has an iCloud account.
**Notes:** The value is true if this CKUserIdentity has an iCloud account associated with it; otherwise, false.
(Read only property)

### 32.53.10 localizedDisplayName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The localized display name.
**Notes:** (Read only property)

### 32.53.11 lookupInfo as CKUserIdentityLookupInfoMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The information (phone number, email address, etc.) used to retrieve this user.
**Notes:** The information that is passed into a CKDiscoverUserIdentitiesOperationMBS or CKFetchShareParticipantsOperationMBS object to retrieve the user identity.
(Read only property)

### 32.53.12 nameComponents as NSPersonNameComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The name of the user associated with the specified user identity object.
**Notes:** This property can be used to display the name of the user associated with this CKUserIdentity object.
(Read only property)

### 32.53.13 userRecordID as CKRecordIDMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Unique identifier for this record.
**Notes:** This property is the unique identifier associated with this CKUserIdentity.
(Read only property)

## 32.54 class NSPersonNameComponentsMBS

### 32.54.1 class NSPersonNameComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** An NSPersonNameComponents object encapsulates the components of a person's name in an extendable, object-oriented manner.
**Notes:** It is used to specify a person's name by providing the components comprising a full name: given name, middle name, family name, prefix, suffix, nickname, and phonetic representation.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr7

### 32.54.2 Methods

### 32.54.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Should be true for OS X 10.11 and newer.

### 32.54.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 32.54.5 copy as NSPersonNameComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of this object.

### 32.54.6 formatted as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** Provides a formatted representation of the name.
**Example:**

```
Dim n As New NSPersonNameComponentsMBS

n.familyName = "Smith"
n.givenName = "Bob"

Dim a As NSAttributedStringMBS = n.formatted

Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
tv.textStorage.setAttributedString a
```

### 32.54.7 Properties

### 32.54.8 familyName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Name bestowed upon an individual to denote membership in a group or family. (for example, ‚ÄúAppleseed‚Äù).
**Notes:** (Read and Write property)

### 32.54.9 givenName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Name bestowed upon an individual to differentiate them from other members of a group that share a family name (for example, ‚ÄúJohnathan‚Äù).
**Notes:** (Read and Write property)

### 32.54.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 32.54.11 middleName as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Secondary name bestowed upon an individual to differentiate them from others that have the same given name (for example, ,ÄúMaple,Äù).
**Notes:** (Read and Write property)

### 32.54.12 namePrefix as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The portion of a name,Äôs full form of address that precedes the name itself (for example, ,ÄúDr.,,Äù ,ÄúMr.,,Äù ,ÄúMs.,Äù).
**Notes:** (Read and Write property)

### 32.54.13 nameSuffix as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The portion of a name,Äôs full form of address that follows the name itself (for example, ,ÄúEsq.,,Äù ,ÄúJr.,,Äù ,ÄúPh.D.,Äù).
**Notes:** (Read and Write property)

### 32.54.14 nickname as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Name substituted for the purposes of familiarity (for example, "Johnny").
**Notes:** (Read and Write property)

### 32.54.15 phoneticRepresentation as NSPersonNameComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The phonetic representation name components of the receiver.
**Notes:** Each component of the receiver with a value should have a corresponding value for any value set for this property. nil by default.
(Read and Write property)

# Chapter 33

# Cocoa

## 33.1 control CocoaControlMBS

### 33.1.1 control CocoaControlMBS

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The control to embed NSViews into a Xojo window.
**Notes:** Due the way Cocoa event handling works, the keydown event handler (and others) do not work with this control. To actually get an event, you'd have to use a subclass of CustomNSViewMBS and handle events there. In the CustomNSViewMBS you add the actual view you like to have. So all events not handled by this view, fall through to your CustomNSViewMBS.
On Carbon the RS framework intercepts events and calls keydown event.
Requires the window being composite for Carbon targets which is currently not available for modal windows in Xojo.
**Blog Entries**

- MBS Xojo Plugins, version 22.4pr4
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Xojo / Real Studio Plugins, version 13.4pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr5
- MBS Real Studio Plugins, version 13.1pr16
- MBS Real Studio Plugins, version 13.0pr1
- Adding NSDatePickerMBS class.
- Using NSTextViewMBS
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 14.4, page 23: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 33.1.2 Properties

### 33.1.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control can work.
**Notes:** Returns true on Mac OS X 10.5 (or newer) and false on any other OS.
(Read only property)

### 33.1.4 View as NSViewMBS

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used with this control.
**Notes:** You define this view in the GetView event.
(Read only property)

### 33.1.5 WantsFocus as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control wants to have focus.
**Notes:** By default this is true.
(Read and Write property)

### 33.1.6 Events

### 33.1.7 Close

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** The control is about to close.

### 33.1.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 33.1.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 33.1.10 EnableMenuItems

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event where you can enable menu items.

### 33.1.11 GetView as NSViewMBS

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Asks your application which NSView should be used.
**Example:**

```
// an example on how to use this event:

Function GetView() As NSViewMBS
dim n as NSTextViewMBS

// create a textview:

n=new NSTextViewMBS(0, 0, CocoaControlMBS1.Width, CocoaControlMBS1.Height)
n.ContinuousSpellCheckingEnabled=true
Return n

End Function
```

**Notes:** Return a NSView setup as you like.

You may also want to keep a reference to the view you use for easier access.

### 33.1.12 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 33.1.13 MouseDrag(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 33.1.14 MouseUp(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 33.1.15 Open

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 33.1.16 ScaleFactorChanged(NewFactor as Double)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 33.2 module DictionaryServiceMBS

### 33.2.1 module DictionaryServiceMBS

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The Dictionary Services module.
**Notes:** Dictionary Services provides functions that let you access dictionaries programmatically from within your application.

A dictionary is any look-up reference that is built using the Dictionary Development Kit. The contents of a dictionary can serve many purposes. The most typical use is to provide definitions for a single language, but you can create content for a thesaurus, bilingual dictionaries (such as English-Japanese), in-house glossaries, and professional dictionaries (such as legal, medical, and technical).

Available in Mac OS X v10.5 and later.

### 33.2.2 Methods

### 33.2.3 GetTermRangeInString(text as string, offset as Integer=0) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Determines the range of the longest word or phrase with respect to an offset.
**Notes:** text: Text that contains the word or phrase to look up.
offset: A character offset in the textString parameter.

Return Value

The range that specifies the location, around the specified offset, of the word or phrase, or the value -1. The range is stored in the RangePosition and RangeLength properties and the function returns true. On any error it returns false.

You can use this function to determine the range of text that contains a word or phrase. After you determine the range, you can pass the result to the functions TextDefinition and Show.

To see how this works, follow these steps:
In Mac OS X v10.5 or later, open Text Edit.
Type It is a foggy day in San Francisco, California.
Control-click Francisco (don't select it). Then, choose "Lookup in Dictionary".

Note that the Dictionary window appears with a definition of San Francisco. The function GetTermRangeInString automatically detected the range of the phrase San Francisco, using Francisco as the text string to search for and a character offset in this string. The function expanded the range until it found a possible match.

You can also point the cursor at the word Francisco and, without making a selection or clicking, type Command-Control-D. GetTermRangeInString detects the range.

The function GetTermRangeInString only returns the range. You must call TextDefinition to copy the definition and Show to display the definition in a Dictionary window.

Available in Mac OS X v10.5 and later.

### 33.2.4 RangeLength as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The length from the range.
**Notes:** This value set by the GetTermRangeInString function.
(Read and Write computed property)

### 33.2.5 RangePosition as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The position from the range.
**Notes:** This value set by the GetTermRangeInString function.
(Read and Write computed property)

### 33.2.6 Show(text as string, start as Integer = 0, length as Integer = 0, textOriginX as Double = 0, textOriginY as Double = 0) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Displays dictionary search result in a dictionary window.
**Notes:** text: Text that contains the word or phrase to look up.

start and length:
If you are using this function to show the results associated with text selected by the user, then provide the selection range of the textString parameter. If you are using this function to show the results associ-

ated with calling the DCSGetTermRangeInString function, then provide the range returned by that function.

This function opens a window to display the definition of a word or phrase.

Available in Mac OS X v10.5 and later.

### 33.2.7 TextDefinition(text as string, position as Integer=0, length as Integer=0) as string

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Returns the definition associated with the provided text range.
**Notes:** text: Text that contains the word or phrase to look up.

position and length: A range that specifies the location of the word or phrase in the textString parameter. If text string exactly specifies the word or phrase that you want to look up, you can pass the range of the text string. For example, for the word make, you would pass (0,4) to specify the range.

If the textString parameter contains the word or phrase, but does not specify it exactly, then pass the range returned by the function GetTermRangeInString.

Return Value:
The definition of the word or phrase, as plain text. The returned text does not contain any elements that are marked with a priority attribute whose value is 2.

This function returns the description of the first matching record found in the the active dictionaries. It searches first in the default word definition dictionary which, in the English environment, is the Oxford dictionary.

Available in Mac OS X v10.5 and later.

## 33.3 class NSAlertMBS

### 33.3.1 class NSAlertMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The class for a standard Cocoa alert.
**Example:**

```
Dim a As New NSAlertMBS

a.alertStyle = NSAlertMBS.NSCriticalAlertStyle
a.messageText = "Should be do it?"

Dim actionButton As NSButtonMBS = a.addButtonWithTitle("Do it!")
actionButton.hasDestructiveAction = True
actionButton.keyEquivalent = encodings.UTF8.Chr(13) // enter

Dim cancelButton As NSButtonMBS = a.addButtonWithTitle("Cancel")
cancelButton.keyEquivalent = encodings.UTF8.Chr(27) // esc

Dim e As Integer = a.runModal

If e = a.NSAlertFirstButtonReturn Then
MessageBox "Do it!"
End If
```

#### Blog Entries

- MBS Xojo Plugins, version 22.5pr1
- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr6
- Text alignment for alerts
- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio Plugins, version 16.2pr2
- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr1

#### Xojo Developer Magazine

- 20.3, page 10: News
- 12.4, page 9: News

### 33.3.2 Methods

### 33.3.3 addButtonWithTitle(title as string) as Variant

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Customize the buttons in the alert panel.
**Example:**

```
// make dialog
dim a as NSAlertMBS = NSAlertMBS.alertWithMessageText("Hello World", "First Button", "Second Button")

// add button
dim thirdButton as NSButtonMBS = a.addButtonWithTitle("Third Button")

// and show dialog
call a.runModal
```

**Notes:** Buttons are added from right to left (for left to right languages).
Returns NSButtonMBS object.

### 33.3.4 alertWithError(error as NSErrorMBS) as NSAlertMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Given an NSError, create an NSAlert that can be used to present the error to the user.
**Notes:** The error's localized description, recovery suggestion, and recovery options will be used to set the alert's message text, informative text, and button titles, respectively.

### 33.3.5 alertWithMessageText(MessageText as string, defaultButton as string = "", alternateButton as string = "", otherButton as string = "", informativeText as string = "") as NSAlertMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new alert with given property values.

### 33.3.6 beginSheetModalForWindow(win as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Begins a sheet on the document window.
**Notes:** If the alert has an alertStyle of NSCriticalAlertStyle, it will be shown as a "critical" sheet; it will otherwise be presented as a normal sheet.
Calls later SheetDidEnd event with the result.

Please keep a reference to the dialog object alive to avoid trouble.
e.g. store reference in parent window, global property or app property.
See also:


- 33.3.7 beginSheetModalForWindow(win as NSWindowMBS) 5827
- 33.3.8 beginSheetModalForWindow(win as window) 5827


### 33.3.7 beginSheetModalForWindow(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Begins a sheet on the document window.
**Notes:** If the alert has an alertStyle of NSCriticalAlertStyle, it will be shown as a "critical" sheet; it will otherwise be presented as a normal sheet.
Calls later SheetDidEnd event with the result.

Please keep a reference to the dialog object alive to avoid trouble.
e.g. store reference in parent window, global property or app property.
See also:


- 33.3.6 beginSheetModalForWindow(win as DesktopWindow) 5826
- 33.3.8 beginSheetModalForWindow(win as window) 5827


### 33.3.8 beginSheetModalForWindow(win as window)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Begins a sheet on the document window.
**Notes:** If the alert has an alertStyle of NSCriticalAlertStyle, it will be shown as a "critical" sheet; it will otherwise be presented as a normal sheet.
Calls later SheetDidEnd event with the result.

Please keep a reference to the dialog object alive to avoid trouble.
e.g. store reference in parent window, global property or app property.
See also:


- 33.3.6 beginSheetModalForWindow(win as DesktopWindow) 5826
- 33.3.7 beginSheetModalForWindow(win as NSWindowMBS) 5827

### 33.3.9 buttons as Variant()

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Get the buttons, where the rightmost button is at index 0.
**Example:**

```
dim a as NSAlertMBS = NSAlertMBS.alertWithMessageText("Hello World", "First Button", "Second Button")
dim buttons() as Variant = a.buttons

for each b as NSButtonMBS in buttons
MsgBox b.title
next
```

**Notes:** Returns NSButtonMBS array.

### 33.3.10 close

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Closes the alert sheet.
**Notes:** The SheetDidEnd event will not run.

### 33.3.11 Constructor

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for an empty alert.
**Notes:** Use properties to configure the dialog.

### 33.3.12 Destructor

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 33.3.13 layout

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Performs the layout for the dialog.
**Notes:** Can be used to indicate that the alert panel should do immediate layout, overriding the default behavior of laying out lazily just before showing panel. You should only call this method if you want to do your own custom layout after it returns. You should call this method only after you have finished with NSAlert customization, including setting message and informative text, and adding buttons and an accessory view if needed. You can make layout changes after this method returns, in particular to adjust the frame of an accessory view. Note that the standard layout of the alert may change in the future, so layout customization should be done with caution.

### 33.3.14 runModal as Integer

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Run the alert as an application-modal panel and return the result.
**Example:**

```
Dim a As New NSAlertMBS

a.messageText = "Should be do it?"

// OK button is added by default
Dim e As Integer = a.runModal
```

### 33.3.15 SetTextAlignment(value as Integer)

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Changes text alignment for dialog to left text alignment.
**Notes:** on macOS Big Sur and later, the default alignment is center.
If you show multiple lines of text, it may be easier to read with left alignment.

This calls layout method to layout the dialog.

See NSParagraphStyleMBS or NSTextMBS class for the alignment constants.

### 33.3.16 Properties

### 33.3.17 accessoryView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The accessory view displayed in the alert panel.

**Notes:** By default, the accessory view is positioned below the informative text and the suppression button (if any) and above the alert buttons, left-aligned with the informative text. If you want to customize the location of the accessory view, you must first call layout method.
(Read and Write property)

### 33.3.18 alertStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The alert style.
**Notes:** Value can be:

| | | |
|---|---|---|
| NSWarningAlertStyle | 0 | Warning |
| NSInformationalAlertStyle | 1 | Information |
| NSCriticalAlertStyle | 2 | Critical Error |

(Read and Write property)

### 33.3.19 helpAnchor as String

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The help anchor to use.
**Notes:** (Read and Write property)

### 33.3.20 icon as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Custom icon for dialog.
**Notes:** By default uses the image named NSApplicationIcon.
(Read and Write property)

### 33.3.21 informativeText as String

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The informative text.
**Notes:** (Read and Write property)

### 33.3.22 messageText as String

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The message text.
**Notes:** (Read and Write property)

### 33.3.23 showsHelp as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to show help button.
**Notes:** True adds a help button to the alert panel. When the help button is pressed, the delegate is first consulted. If the event does not implement ShowHelp event or returns false, then NSHelpManager.openHelpAnchor is called with a nil book and the anchor specified by HelpAnchor, if any. An exception will be raised if the delegate returns false and there is no help anchor set.
(Read and Write property)

### 33.3.24 ShowsSuppressionButton as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether or not the alert should contain a suppression checkbox.
**Notes:** The default is false. This checkbox is typically used to give the user an option to not show this alert again. If shown, the suppression button will have a default localized title similar to @"Do not show this message again". You can customize this title using alert.suppressionButton.Title. When the alert is dismissed, you can get the state of the suppression button, using [ [ alert suppressionButton ] state ] and store the result in user defaults, for example. This setting can then be checked before showing the alert again. By default, the suppression button is positioned below the informative text, and above the accessory view (if any) and the alert buttons, and left-aligned with the informative text. However do not count on the placement of this button, since it might be moved if the alert panel user interface is changed in the future. If you need a checkbox for purposes other than suppression text, it is recommended you create your own using an accessory view.
(Read and Write property)

### 33.3.25 suppressionButton as Variant

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a suppression button which may be customized, including the title and the initial state.
**Example:**

```
// make dialog
dim a as NSAlertMBS = NSAlertMBS.alertWithMessageText("Hello World", "First Button", "Second But-
```

```
ton")

// get button
dim suppressionButton as NSButtonMBS = a.suppressionButton

// change title
suppressionButton.title = "Hello World Button"

// want to show it
a.ShowsSuppressionButton = true

// and show dialog
call a.runModal
```

**Notes:** You can also use this method to get the state of the button after the alert is dismissed, which may be stored in user defaults and checked before showing the alert again. In order to show the suppression button in the alert panel, you must set ShowsSuppressionButton to true.
Returns NSButtonMBS object.
(Read only property)

### 33.3.26 TimedOut as Boolean

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether we got a timeout.
**Notes:** This is set to true when a timeout occurred.
(Read only property)

### 33.3.27 timeOut as Double

MBS MacCocoa Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop only.

**Function:** Timeout for the dialog.
**Notes:** Set this to the number of seconds after which the dialog should close.
(Read and Write property)

### 33.3.28 window as Variant

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the application-modal panel or the document-modal sheet corresponding to this alert.

**Notes:** (Read only property)

### 33.3.29 Events

### 33.3.30 SheetDidEnd(returnCode as Integer)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The sheet did finish.

### 33.3.31 ShowHelp as boolean

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Show custom help.
**Notes:** See ShowHelp property.

### 33.3.32 Constants

Return codes

| Constant | Value | Description |
|---|---|---|
| NSAlertFirstButtonReturn | 1000 | First (rightmost) button |
| NSAlertSecondButtonReturn | 1001 | Second button. |
| NSAlertThirdButtonReturn | 1002 | Third button. |

Alert styles.

| Constant | Value | Description |
|---|---|---|
| NSCriticalAlertStyle | 2 | Critical Error |
| NSInformationalAlertStyle | 1 | Informational Alert |
| NSWarningAlertStyle | 0 | Warning Alert (Default style) |

## 33.4 class NSAnimationContextMBS

### 33.4.1 class NSAnimationContextMBS

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The Cocoa class for the context of a NSAnimation.
**Notes:** Available in Mac OS X v10.5 and later.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr1

### 33.4.2 Methods

### 33.4.3 beginGrouping

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Creates a new animation grouping.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.4.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Creates a new NSAnimationContextMBS object with the current animation context.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.4.5 currentContext as NSAnimationContextMBS

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the current animation context.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.4.6 endGrouping

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Ends the current animation grouping.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.4.7 Properties

### 33.4.8 allowsImplicitAnimation as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** Determine if animations are enabled or not for animations that occur as a result of another property change.
**Example:**

```
dim collectionView as NSCollectionViewMBS // your control

Dim context As NSAnimationContextMBS = NSAnimationContextMBS.currentContext
context.beginGrouping
context.allowsImplicitAnimation = True
context.duration = 0.5

Dim view As Variant = collectionView.animator
Dim animator As NSCollectionViewMBS = view

// scroll to top
Dim itemPaths() As NSIndexPathMBS
itemPaths.Append NSIndexPathMBS.indexPathForItem(0)

animator.scrollToItems(itemPaths, NSCollectionViewMBS.NSCollectionViewScrollPositionTop)

context.endGrouping
```

**Notes:** The default value is false.
(Read and Write property)

### 33.4.9 duration as Double

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The duration used when animating object properties that support animation.
**Example:**

```
NSAnimationContextMBS.currentContext.duration = 0.5
```

**Notes:** Any animations that occur as a result of setting the values of animatable properties in the current context will run for this duration.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.4.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSAnimationContext object.
**Notes:** (Read and Write property)

## 33.5 class NSAnimationMBS

### 33.5.1 class NSAnimationMBS

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Objects of the NSAnimation class manage the timing and progress of animations in the user interface.
**Notes:** The class also lets you link together multiple animations so that when one animation ends another one starts. It does not provide any drawing support for animation and does not directly deal with views, targets, or actions.

NSAnimation objects have several characteristics, including duration, frame rate, and animation curve, which describes the relative speed of the animation over its course. You can set progress marks in an animation, each of which specifies a percentage of the animation completed; when an animation reaches a progress mark, it notifies its delegate and posts a notification to any observers. Animations execute in one of three blocking modes: blocking, non-blocking on the main thread, and non-blocking on a separate thread. The non-blocking modes permit the handling of user events while the animation is running.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr11

### 33.5.2 Methods

### 33.5.3 clearStartAnimation

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Clears linkage to another animation that causes the receiver to start.

### 33.5.4 clearStopAnimation

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Clears linkage to another animation that causes the receiver to stop.

### 33.5.5 Constructor(duration as Double, animationCurve as Integer)

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Initializes the object with the specified duration and animation-curve values.
**Notes:** duration: The number of seconds over which the animation occurs. Specifying a negative number raises an exception.

animationCurve: An NSAnimationCurve constant that describes the relative speed of the animation over its course; if it is zero, the default curve (NSAnimationEaseInOut) is used.

You can always later change the duration of an NSAnimation object by sending it a setDuration: message, even while the animation is running. See "Constants" for descriptions of the NSAnimationCurve constants.

### 33.5.6 currentValue as Double

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the current value of the effect based on the current progress.

### 33.5.7 Destructor

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 33.5.8 isAnimating as boolean

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver is currently animating.
**Notes:** True if the receiver is animating, false otherwise.

### 33.5.9 startAnimation

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Starts the animation represented by the receiver.
**Notes:** The receiver retains itself and is then autoreleased at the end of the animation or when it receives stopAnimation. If the blocking mode is NSAnimationBlocking, the method only returns after the animation has completed or the delegate sends it stopAnimation. If the receiver has a progress of 1.0, it starts again at 0.0.

### 33.5.10 stopAnimation

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Stops the animation represented by the receiver.
**Notes:** The current progress of the receiver is not reset. When this method is sent to instances of NSViewAnimation (a subclass of NSAnimation) the receiver moves to the end frame location.

### 33.5.11 Properties

### 33.5.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The internal reference to the animation object.
**Notes:** (Read and Write property)

### 33.5.13 animationBlockingMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The blocking mode of the receiver.
**Notes:** A constant representing the blocking mode the animation is next scheduled to run under. See "NSAnimationBlockingMode" for valid values.

If the constant is NSAnimationNonblocking, the animation runs in the main thread in one of the standard run-loop modes or in a mode returned from runLoopModesForAnimating. If animationBlockingMode is NSAnimationNonblockingThreaded, a new thread is spawned to run the animation.

The default mode is NSAnimationBlocking, which means that the animation runs on the main thread in a custom run-loop mode that blocks user events. The new blocking mode takes effect the next time the receiver is started and has no effect on an animation underway.
(Read and Write computed property)

### 33.5.14 animationCurve as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The animation curve the receiver is running under.
**Notes:** The animation curve describes the relative frame rate over the course of the animation. See NSAnimation* constants.
(Read and Write computed property)

### 33.5.15 currentProgress as Double

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The current progress of the receiver.
**Notes:** The current progress is a value between 0.0 and 1.0 that represents the percentage of the animation currently completed.
(Read and Write computed property)

### 33.5.16 duration as Double

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The duration of the animation, in seconds.
**Notes:** (Read and Write computed property)

### 33.5.17 frameRate as Double

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The frame rate of the animation.
**Notes:** The frame rate is the number of updates per second. It is not guaranteed to be accurate because of differences between systems on the time needed to process a frame.
(Read and Write computed property)

### 33.5.18 Events

### 33.5.19 CurrentProgressChanged(progress as Double)

MBS MacFrameworks Plugin, Plugin Version: 10.0, Platform: macOS, Targets: .

**Function:** The event called whenever the current value changes.

### 33.5.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAnimationBlocking | 0 | One of the constants to indicate the blocking mode of an NSAnimation obj when it is running.<br>Requests the animation to run in the main thread in a custom run-loop mo that blocks user input.<br>This is the default. |
| NSAnimationEaseIn | 1 | One of the constants to describe the curve of an animation—that is, the relat speed of an animation from start to finish.<br>Describes an animation that slows down as it reaches the end. |
| NSAnimationEaseInOut | 0 | One of the constants to describe the curve of an animation—that is, the relat speed of an animation from start to finish.<br>Describes an S-curve in which the animation slowly speeds up and then slo down near the end of the animation. This constant is the default. |
| NSAnimationEaseOut | 2 | One of the constants to describe the curve of an animation—that is, the relat speed of an animation from start to finish.<br>Describes an animation that slowly speeds up from the start. |
| NSAnimationLinear | 3 | One of the constants to describe the curve of an animation—that is, the relat speed of an animation from start to finish.<br>Describes an animation in which there is no change in frame rate. |
| NSAnimationNonblocking | 1 | One of the constants to indicate the blocking mode of an NSAnimation obj when it is running.<br>Requests the animation to run in a standard or specified run-loop mode tl allows user input. |
| NSAnimationNonblockingThreaded | 2 | One of the constants to indicate the blocking mode of an NSAnimation obj when it is running.<br>Requests the animation to run in a separate thread that is spawned by t NSAnimation object.<br>The secondary thread has its own run loop. |

## 33.6 class NSAppearanceMBS

### 33.6.1 class NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The appearance class.
**Notes:** An NSAppearance object represents a file that specifies a standard or custom appearance that applies to a subset of UI elements in an app. An app can contain multiple appearance files and—because NSAppearance conforms to NSCoding—you can use Interface Builder to assign UI elements to an appearance.

Typically, you customize a window by using Xcode to create an appearance file that contains the views you want to customize and the custom art that should be applied to them. Xcode transforms the file,Äôs art content into a runtime format that AppKit can draw when the specified views are displayed.

If the art for a specific view can,Äôt be found, AppKit searches for the art in the appearances of the view,Äôs ancestors. A nil appearance means that a view uses the default Aqua appearance; a non-nil appearance means that the view uses an ancestor,Äôs appearance.

When AppKit draws a control, it automatically sets the current appearance on the current thread to the control,Äôs appearance. The current appearance can influence the actual drawing path and the return values you get when you access system fonts and colors. The current appearance also affects the appearance of text and images, such as the text and template images that can be displayed in a toolbar.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo Plugins, version 20.5pr1
- MBS Xojo Plugins, version 20.3pr10
- MBS Xojo Plugins, version 19.4pr1
- MBS Xojo / Real Studio Plugins, version 16.2pr2
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- New for Mac OS X 10.10 in MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 14.3pr10

### 33.6.2 Methods

### 33.6.3 appearance(item as Variant) as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The appearance of the receiver, in an NSAppearance object.
**Example:**

```
dim v as NSViewMBS = PushButton1.NSViewMBS
dim a as NSAppearanceMBS = NSAppearanceMBS.appearance(v)

MsgBox a.name
```

**Notes:** The default value for this property is nil, which means that the receiver uses the appearance it inherits from the nearest ancestor that has set an appearance. When you set appearance to a non-nil value, the receiver and the views it contains use the specified appearance.

Version 20.5 of MBS Plugin can accept application or NSApplicationMBS objects to query appearance of whole app.

### 33.6.4 appearanceNamed(name as string) as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSAppearance object with the specified name.
**Notes:** name: The name of a standard or custom appearance.
Returns a standard or custom appearance object.

When you specify a standard appearance name—such as NSAppearanceNameAqua—this method returns a built-in appearance. If you specify a custom appearance name, this method searches the main bundle for an appearance file that has the specified name.
Available in OS X v10.9 and later.
See also:

- 121.1.125 appearanceNamed(name as string, bundle as NSBundleMBS) as NSAppearanceMBS 17401

### 33.6.5 appearanceNamed(name as string, bundle as NSBundleMBS) as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an NSAppearance object initialized to the specified appearance file in the specified bundle.
**Notes:** name: The name of the appearance file to search for, without any path information.
bundle: The bundle in which to search for the appearance file. If bundle is nil, this method searches in the main bundle.

Returns an initialized appearance object, or nil if an error occurs.
Available in OS X v10.9 and later.
See also:

- 33.6.4 appearanceNamed(name as string) as NSAppearanceMBS 5843

### 33.6.6 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.

### 33.6.7 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 33.6.8 currentAppearance as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSAppearance object that,Äôs set on the current thread.
**Example:**

MsgBox NSAppearanceMBS.currentAppearance.name

**Notes:** When a UI element draws on the screen, it automatically sets the appearance that it,Äôs using on the current thread.
Available in OS X v10.9 and later.

### 33.6.9 effectiveAppearance(item as Variant) as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The appearance that will be used when the receiver is drawn onscreen, in an NSAppearance object.
**Notes:** The default value for this property is provided by the nearest ancestor of the receiver that has set an appearance.
You can use this property to ensure that an offscreen view sets the appropriate current appearance when it draws onscreen.

Available in OS X v10.9 and later.

Version 20.5 of MBS Plugin can accept application or NSApplicationMBS objects to query appearance of whole app.

### 33.6.10 NSAppearanceNameAccessibilityHighContrastAqua as string

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** A high-contrast version of the standard light system appearance.
**Notes:** Don't assign an NSAppearanceMBS object with this type directly to one of your views. Instead, assign a light appearance to your view. AppKit then returns this type when the user enables the Increase Contrast option in the Accessibility system preferences.
Available on MacOS 10.14 or newer.

### 33.6.11 NSAppearanceNameAccessibilityHighContrastDarkAqua as string

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** A high-contrast version of the standard dark system appearance.
**Notes:** Don't assign an NSAppearanceMBS object with this type directly to one of your views. Instead, assign a dark appearance to your view. AppKit then returns this type when the user enables the Increase Contrast option in the Accessibility system preferences.
Available on MacOS 10.14 or newer.

### 33.6.12 NSAppearanceNameAccessibilityHighContrastVibrantDark as string

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** A high-contrast version of the dark vibrant appearance.
**Notes:** Don't assign an NSAppearanceMBS object with this type directly to one of your views. Instead, assign a dark appearance to your view. AppKit then returns this type when the user enables the Increase Contrast option in the Accessibility system preferences and the view's allowsVibrancy property is true.
Available on MacOS 10.14 or newer.

### 33.6.13 NSAppearanceNameAccessibilityHighContrastVibrantLight as string

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** A high-contrast version of the light vibrant appearance.
**Notes:** Don't assign an NSAppearanceMBS object with this type directly to one of your views. Instead,

assign a light appearance to your view. AppKit then returns this type when the user enables the Increase Contrast option in the Accessibility system preferences and the view's allowsVibrancy property is true.
Available on MacOS 10.14 or newer.

### 33.6.14 NSAppearanceNameAqua as string

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the standard Aqua appearance.

### 33.6.15 NSAppearanceNameDarkAqua as string

MBS MacFrameworks Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the dark mode Aqua appearance.

### 33.6.16 NSAppearanceNameLightContent as string

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the standard appearance that can be used by controls in light content areas (not including window-frame areas).

### 33.6.17 NSAppearanceNameVibrantDark as string

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the vibrant dark appearance.
**Notes:** Available on Mac OS X 10.10 and newer.
Should only be set on an NSVisualEffectView, or one of its container subviews.

### 33.6.18 NSAppearanceNameVibrantLight as string

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the vibrant dark appearance.
**Notes:** Available on Mac OS X 10.10 and newer.
Should only be set on an NSVisualEffectView, or one of its container subviews.

### 33.6.19 setAppearance(item as Variant, appearance as NSAppearanceMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the appearance of the receiver, in an NSAppearance object.
**Example:**

```
// set the app to dark mode
Dim a As NSAppearanceMBS = NSAppearanceMBS.appearanceNamed(NSAppearanceMBS.NSAppearanceNameDarkAqua)
NSAppearanceMBS.setAppearance(app, a)
```

**Notes:** The default value for this property is nil, which means that the receiver uses the appearance it inherits from the nearest ancestor that has set an appearance. When you set appearance to a non-nil value, the receiver and the views it contains use the specified appearance.

Version 20.5 of MBS Plugin can accept application or NSApplicationMBS objects to set appearance of whole app.

### 33.6.20 setCurrentAppearance(appearance as NSAppearanceMBS = nil)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the current appearance to the specified NSAppearance object.
**Notes:** appearance: The NSAppearance object that should be used for the window or view, or nil to specify the default appearance.

When you set an appearance on a window, all views in that window—including the window background and controls in both the frame and content areas—use that appearance. By default, AppKit sets the current appearance for standard windows and views during window drawing, so you don't need to use this method unless you want to change the current appearance of a specific window or view.

You can use this method to set the current appearance for an offscreen view to the appearance that will be used when the view is drawn. To do this, use the offscreen view,Äôs effectiveAppearance for the appearance parameter.

Available in OS X v10.9 and later.

### 33.6.21 Properties

### 33.6.22 allowsVibrancy as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Query allowsVibrancy to see if the given appearance actually needs vibrant drawing.
**Notes:** You may want to draw differently if the current apperance is vibrant.
(Read only property)

### 33.6.23 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.6.24 name as String

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the appearance.
**Example:**

MsgBox NSAppearanceMBS.currentAppearance.name

**Notes:** (Read only property)

## 33.7 class NSApplicationDelegateMBS

### 33.7.1 class NSApplicationDelegateMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The class for an Cocoa application delegate.
**Notes:** Please install in app Constructor as App.Open event may be too late.

Using this class you can get application related events before (!) the app class gets it. And of course more events than just the onces the app class have.

Only for Cocoa desktop targets.

In general the plugin calls first the event. Depending on the result it may pass the event to the Xojo application delegate. If you have no code in the plugin event, everything just passes through and you should not see a difference.

The plugin application delegate is installed with the Constructor and uninstalled in the Destructor.

The original delegate from Xojo is preserved and all messages are forwarded to it. Also when this object is destroyed, the old delegate is restored.
**Blog Entries**

- The order of events in Xojo
- MBS Xojo Plugins, version 21.2pr2
- MBS Xojo / Real Studio Plugins, version 14.3pr9
- MBS Xojo / Real Studio Plugins, version 14.2pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 11.3
- MBS Real Studio Plugins, version 11.2pr12
- Lion features for Real Studio
- Lion arrived
- MBS Real Studio Plugins, version 11.2pr9
- Dock Menu for Cocoa in Real Studio

### 33.7.2 Events

### 33.7.3 applicationDidBecomeActive(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application becomes active.

### 33.7.4 applicationDidChangeScreenParameters(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center when the configuration of the displays attached to the computer is changed (either programmatically or when the user changes settings in the Displays control panel).

### 33.7.5 applicationDidDecodeRestorableState(coder as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event gives you the chance to restore your own state.

### 33.7.6 applicationDidFailToRegisterForRemoteNotificationsWithError(error as NSErrorMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Application failed to register for remote notifications.
**Notes:** Check your provisioning profile for entitlements.

Available on Mac OS X 10.7 or newer.

### 33.7.7 applicationDidFinishLaunching(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center after the application has been launched and initialized but before it has received its first event.
**Notes:** Delegates can implement this method to perform further initialization. This method is called after

the application's main run loop has been started but before it has processed any events. If the application was launched by the user opening a file, the delegate's applicationOpenFile method is called before this method. If you want to perform initialization before any files are opened, implement the applicationWillFinishLaunching method in your delegate, which is called before applicationOpenFile.)

### 33.7.8 applicationDidHide(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application is hidden.

### 33.7.9 applicationDidReceiveRemoteNotification(userInfo as Dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** A notification was received.
**Notes:** The dictionary contains payload like this:

key "aps" contains another dictionary. This secon dictionary contains keys like "alert", "badge" and "sound".

Available on Mac OS X 10.7 or newer.

### 33.7.10 applicationDidRegisterForRemoteNotificationsWithDeviceToken(deviceToken as memoryblock)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Application registered for remote notifications.
**Notes:** Tell your server the device token ID and use it in your push notifications.
Distinguish between iOS and Mac versions of your app!

Available on Mac OS X 10.7 or newer.

### 33.7.11 applicationDidResignActive(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application is deactivated.

### 33.7.12 applicationDidUnhide(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application is made visible.

### 33.7.13 applicationDidUpdate(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application object updates its windows.

### 33.7.14 applicationDockMenu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Allows the delegate to supply a dock menu for the application dynamically.
**Notes:** Return the menu to display in the dock. Or nil for having no/default menu.

### 33.7.15 applicationOpenFile(filename as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate to open a single file.
**Notes:** filename: The path of the file to open.

Return yes if the file was successfully opened or false if it was not.

Sent directly by application to the delegate. The method should open the file filename, returning true if the file is successfully opened, and false otherwise. If the user started up the application by double-clicking a file, the delegate receives the applicationOpenFile message before receiving applicationDidFinishLaunching. (applicationWillFinishLaunching is sent before applicationOpenFile.)

If you return false, the plugin will pass the event to the default Xojo runtime application delegate, so the OpenDocument event can fire.

### 33.7.16 applicationOpenFiles(filenames() as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate to open multiple files.
**Notes:** sender: The application object associated with the delegate.
filenames: An array of strings containing the names of the files to open..

Identical to applicationOpenFile except that the receiver opens multiple files corresponding to the file names in the filenames array. Delegates should invoke the replyToOpenOrPrint method upon success or failure, or when the user cancels the operation.

If you add code to this event, it is possible that OpenDocument event in Xojo does not fire.

### 33.7.17 applicationOpenFileWithoutUI(filename as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate to open a file programmatically.
**Notes:** filename: The name of the file to open.

Return true if the file was successfully opened or false if it was not.

Sent directly by sender to the delegate to request that the file filename be opened as a linked file. The method should open the file without bringing up its application's user interface—that is, work with the file is under programmatic control of sender, rather than under keyboard control of the user.

If you add code to this event, it is possible that OpenDocument event in Xojo does not fire.

### 33.7.18 applicationOpenTempFile(filename as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate to open a temporary file.
**Notes:** filename: The name of the temporary file to open.

True if the file was successfully opened or false if it was not.

Sent directly by application to the delegate. The method should attempt to open the file filename, returning true if the file is successfully opened, and false otherwise.

By design, a file opened through this method is assumed to be temporary—it's the application's responsibility to remove the file at the appropriate time.

If you add code to this event, it is possible that OpenDocument event in Xojo does not fire.

### 33.7.19 applicationOpenUntitledFile as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate to open an untitled file.
**Notes:** Return true if the file was successfully opened or false if it was not.
Sent directly by application to the delegate to request that a new, untitled file be opened.

If you return false, the plugin will pass the event to the default Xojo runtime application delegate.

If you add code to this event, it is possible that OpenDocument event in Xojo does not fire.

### 33.7.20 applicationPrintFile(filename as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent when the user starts up the application on the command line with the -NSPrint option.
**Notes:** filename: The name of the file to print.

Returns true if the file was successfully printed or false if it was not.

This message is sent directly by application to the delegate. The application terminates (using the terminate method) after this method returns.

If at all possible, this method should print the file without displaying the user interface. For example, if you pass the -NSPrint option to the TextEdit application, TextEdit assumes you want to print the entire contents of the specified file. However, if the application opens more complex documents, you may want to display a panel that lets the user choose exactly what they want to print.

### 33.7.21 applicationPrintFiles(fileNames() as string, printSettings as dictionary, showPrintPanels as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Prints a group of files.
**Notes:** fileNames: An array of strings, each of which contains the name of a file to print.

printSettings: A dictionary containing NSPrintInfo-compatible print job attributes.

showPrintPanels: A Boolean that specifies whether the print panel should be displayed for each file printed. Print progress indicators will be presented even if this value is false.

Return a constant indicating whether printing was successful. For a list of possible values, see NSPrinting* constants.

Return NSPrintingReplyLater if the result of printing cannot be returned immediately, for example, if printing will cause the presentation of a sheet. If your method returns NSPrintingReplyLater it must always invoke the NSApplicationMBS method replyToOpenOrPrint when the entire print operation has been completed, successfully or not.

### 33.7.22 applicationShouldHandleReopen(hasVisibleWindows as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the application to the delegate prior to default behavior to reopen (rapp) AppleEvents.
**Notes:** flag: Indicates whether the NSApplication object found any visible windows in your application. You can use this value as an indication of whether the application would do anything if you return true.

Return true if you want the application to perform its normal tasks or false if you want the application to do nothing.

These events are sent whenever the Finder reactivates an already running application because someone double-clicked it again or used the dock to activate it.

By default the Application Kit will handle this event by checking whether there are any visible NSWindow (not NSPanel) objects, and, if there are none, it goes through the standard untitled document creation (the same as it does if application is launched without any document to open). For most document-based applications, an untitled document will be created.

The application delegate will also get a chance to respond to the normal untitled document delegate methods. If you implement this method in your application delegate, it will be called before any of the default behavior happens. If you return true, then NSApplication will proceed as normal. If you return false, then NSApplication will do nothing. So, you can either implement this method with a version that does nothing, and return false if you do not want anything to happen at all (not recommended), or you can implement this method, handle the event yourself in some custom way, and return false.

Miniaturized windows, windows in the Dock, are considered visible by this method, and cause flag to return true, despite the fact that miniaturized windows return false when sent an isVisible message.

Having no code in the event will tell the plugin to return true.

### 33.7.23 applicationShouldOpenUntitledFile as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked immediately before opening an untitled file.
**Notes:** Return true if the application should open a new untitled file or false if it should not.

Use this method to decide whether the application should open a new, untitled file. Note that applicationOpenUntitledFile is invoked if this method returns true.

If you return false here, the NewDocument event in Xojo may not fire.
Having no code in this event is the same as returning true.

### 33.7.24 applicationShouldTerminate as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent to notify the delegate that the application is about to terminate..
**Notes:** One of the values defined in NSTerminate* constants indicating whether the application should terminate.

This method is called after the application's Quit menu item has been selected, or after the terminate method has been called. Generally, you should return NSTerminateNow to allow the termination to complete, but you can cancel the termination process or delay it somewhat as needed. For example, you might delay termination to finish processing some critical data but then terminate the application as soon as you are done by calling the replyToApplicationShouldTerminate method.

### 33.7.25 applicationShouldTerminateAfterLastWindowClosed as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the user closes the last window the application has open.
**Notes:** Return false if the application should not be terminated when its last window is closed; otherwise,

true to terminate the application.

The application sends this message to your delegate when the application's last window is closed. It sends this message regardless of whether there are still panels open. (A panel in this case is defined as being an instance of NSPanel or one of its subclasses.)

If your implementation returns false, control returns to the main event loop and the application is not terminated. If you return true, your delegate's applicationShouldTerminate method is subsequently invoked to confirm that the application should be terminated.

Having no code in this event is the same as returning false.

### 33.7.26 applicationWillBecomeActive(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application becomes active.

### 33.7.27 applicationWillEncodeRestorableState(coder as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Event called to give you chance to encode any additional state into the NSCoder.
**Notes:** If the restorable state managed by the delegate changes, you must call NSApplicationMBS.invalidateRestorableState so that it will be re-encoded.

### 33.7.28 applicationWillFinishLaunching(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application object is initialized.

### 33.7.29 applicationWillHide(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application is hidden.

### 33.7.30 applicationWillPresentError(error as NSErrorMBS) as NSErrorMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent to the delegate before the specified application presents an error message to the user.
**Notes:** error: The error object that is used to construct the error message. Your implementation of this method can return a new NSError object or the same one in this parameter.

Return the error object to display.

You can implement this delegate method to customize the presentation of any error presented by your application, as long as no code in your application overrides either of the NSResponder methods presentError in a way that prevents errors from being passed down the responder chain to the application object.

Your implementation of this delegate method can examine error and, if its localized description or recovery information is unhelpfully generic, return an error object with specific localized text that is more suitable for presentation in alert sheets and dialogs. If you do this, always use the domain and error code of the NSError object to distinguish between errors whose presentation you want to customize and those you do not. Don't make decisions based on the localized description, recovery suggestion, or recovery options because parsing localized text is problematic. If you decide not to customize the error presentation, just return the passed-in error object.

If you have no code in this event or you return nil, the plugin passes the given error back to the Cocoa runtime.

### 33.7.31 applicationWillResignActive(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application is deactivated.

### 33.7.32 applicationWillTerminate(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application terminates.

### 33.7.33 applicationWillUnhide(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately after the application is unhidden.

### 33.7.34 applicationWillUpdate(Notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Sent by the default notification center immediately before the application object updates its windows.

### 33.7.35 restoreWindowWithIdentifier(identifier as string, state as NSCoderMBS, byref resultWindow as Variant, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Invoked to request that a window be restored.
**Notes:** If you plan to use this event, please initialize the NSApplicationDelegateMBS subclass in app.constructor.

identifier: The unique interface item identifier string that was previously associated with the window. Use this string to determine which window to create.
state: A NSCoderMBS object containing the window state information. This coder object contains the combined restorable state of the window, which can include the state of the window, its delegate, window controller, and document object. You can use this state to determine which window to create.

Pass back with the parameters:
The window that was created or nil if the window could not be created.
An error object if the window was not recognized or could not be created for whatever reason; otherwise, specify nil. In OS X 10.7, the error parameter is ignored.

Return true if the window was restored; otherwise false.

If the receiver knows how to restore the identified window, it should invoke the completion handler with the window, possibly creating it. It is acceptable to use a pre-existing window, though you should not pass the same window to more than one completion handler. If the receiver cannot restore the identified window (for example, the window referenced a document that has been deleted), it should invoke the completion handler with a nil window.

The receiver is application is passed the identifier of the window, which allows it to quickly check for known windows. For example, you might give your preferences window an identifier of "preferences" in the nib, and then check for that identifier in your implementation. The receiver is also passed the NSCoder instance containing the combined restorable state of the window, its delegate, the window controller, and any document.

The receiver may decode information previously stored in the coder to determine what window to restore.

Available in OS X v10.7 and later.

The plugin implements this method for NSApplication and forwards the message to this event.
If you return true, please set either error or resultWindow values. resultWindow must be an NSWindowMBS or a window object.

### 33.7.36 userDidAcceptCloudKitShareWithMetadata(metadata as Variant)

MBS MacCocoa Plugin, Plugin Version: 21.2, Platform: macOS, Targets: .

**Function:** Tells you that the app has access to shared information in CloudKit.
**Example:**

```
// sample implementation of the event:

Sub userDidAcceptCloudKitShareWithMetadata(metadata as Variant) Handles userDidAcceptCloudKit-
ShareWithMetadata
Dim c As CKShareMetadataMBS = metadata

Message "User did accept CloudKit share: "+c.containerIdentifier
End Sub
```

**Notes:** metadata is a CKShareMetadataMBS class.

metdata: Information about the CloudKit data that is available to the app. Use this object to retrieve information about the CKShare object and the associated records that are available.

Use this method to respond to a CloudKit Sharing invitation. In your implementation, accept the share by scheduling a CKAcceptSharesOperationMBS object that contains the provided metadata object. After the user accepts the share, you can begin fetching records and incorporating the resulting data into your app. The system launches the app, as necessary, before calling this method.

### 33.7.37 Constants

Print Reply Constants

| Constant | Value | Description |
|---|---|---|
| NSPrintingCancelled | 0 | Printing was cancelled. |
| NSPrintingFailure | 3 | Printing failed. |
| NSPrintingReplyLater | 2 | The result of printing cannot be returned immediately, for example, if printing will cause the presentation of a sheet. If your method returns NSPrintingReplyLater it must always invoke replyToOpenOrPrint when the entire print operation has been completed, successfully or not. |
| NSPrintingSuccess | 1 | Printing was successful. |

Terminate Reply Constants

| Constant | Value | Description |
|---|---|---|
| NSTerminateCancel | 0 | The application should not be terminated. |
| NSTerminateLater | 2 | It may be OK to proceed with termination later. Returning this value causes Cocoa to run the run loop in the NSModalPanelRunLoopMode until your application subsequently calls replyToApplicationShouldTerminate with the value true or false. This return value is for delegates that need to provide document modal alerts (sheets) in order to decide whether to quit. |
| NSTerminateNow | 1 | It is OK to proceed with termination. |

## 33.8 class NSApplicationMBS

### 33.8.1 class NSApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The cocoa application class.
**Example:**

```
dim a as NSApplicationMBS = NSApplicationMBS.sharedApplication

// set a custom picture

dim p as Picture = LogoMBS(500)
dim n as new NSImageMBS(p)
a.applicationIconImage = n

// restore
'a.applicationIconImage = nil
```

**Notes:** The plugin only implements a small subset of what's available in Cocoa. If you miss something, please send us an email.

You can get an instance of this class using one of three ways:

- app.NSApplicationMBS function
- new NSApplicationMBS
- NSApplicationMBS.sharedInstance

**Blog Entries**

- MBS Xojo Plugins, version 20.5pr1
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- MBS Xojo / Real Studio Plugins, version 13.2pr1
- Working on Mountain Lion Support

- Lion features for Real Studio
- Lion arrived

**Xojo Developer Magazine**

- 16.1, page 10: News

### 33.8.2 Methods

### 33.8.3 activateIgnoringOtherApps(flag as boolean)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Makes the receiver the active application.
**Notes:** flag: If false, the application is activated only if no other application is currently active. If true, the application activates regardless.

The flag parameter is normally set to false. When the Finder launches an application, using a value of false for flag allows the application to become active if the user waits for it to launch, but the application remains unobtrusive if the user activates another application. Regardless of the setting of flag, there may be a time lag before the application activates—you should not assume the application will be active immediately after sending this message.

You rarely need to invoke this method. Under most circumstances, the Application Kit takes care of proper activation. However, you might find this method useful if you implement your own methods for inter-application communication.

You don't need to send this message to make one of the application's NSWindows key. When you send a makeKeyWindow message to an NSWindow object, you ensure that it is the key window when the application is active.

### 33.8.4 addWindowsItem(win as NSWindowMBS, title as string, isFilename as boolean)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds an item to the Window menu for a given window.
**Notes:** win: The window being added to the menu. If this window object already exists in the Window menu, this method has no effect.
Title: The string to display for the window's menu item. How the string is interpreted is dependent on the value in the isFilename parameter.
isFilename: If false, title appears literally in the menu; otherwise, title is assumed to be a converted pathname

with the name of the file preceding the path (the way the NSWindow method setTitleWithRepresentedFilename shows a title)

You rarely need to invoke this method directly because Cocoa places an item in the Window menu automatically whenever you set the title of an NSWindow object.

### 33.8.5 arrangeInFront

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Arranges windows listed in the Window menu in front of all other windows.
**Example:**

```
dim a as new NSApplicationMBS
a.arrangeInFront
```

**Notes:** Windows associated with the application but not listed in the Window menu are not ordered to the front.

### 33.8.6 cancelUserAttentionRequest(request as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Cancels a previous user attention request.
**Notes:** request: The request identifier returned by the requestUserAttention method.

A request is also canceled automatically by user activation of the application.

### 33.8.7 changeWindowsItem(win as NSWindowMBS, title as string, isFilename as boolean)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Changes the item for a given window in the Window menu to a given string.
**Notes:** win: The window whose title you want to change in the Window menu. If win is not in the Window menu, this method adds it.
title: The string to display for the window's menu item. How the string is interpreted is dependent on the value in the isFilename parameter.
isFilename: If false, title appears literally in the menu; otherwise, title is assumed to be a converted pathname with the name of the file preceding the path (the way the NSWindow method setTitleWithRepresentedFile-

name shows a title)

### 33.8.8 completeStateRestoration

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Completes the extended state restoration.
**Notes:** This method informs the application that the extended state restoration is completed for the balancing .

If a window has some state that may take a long time to restore, such as a web page, you may use this method and methods to completeStateRestoration to extend the period of this crash protection beyond the default.

You call extendStateRestoration within your implementation of restoreWindowWithIdentifier. You would then call completeStateRestoration some time after the window is fully restored. If the app crashes in the interim, then it may offer to discard restorable state on the next launch.

The extendStateRestoration and completeStateRestoration method act as a counter. Each call to extendStateRestorationincrements the counter, and must be matched with a corresponding call to completeStateRestoration which decrements it. When the counter reaches zero, the app is considered to have been fully restored, and any further calls are silently ignored.

This method is thread safe.
Available in OS X v10.7 and later.

### 33.8.9 Constructor

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim n as new NSApplicationMBS

n.dockTile.badgeLabel = "Hello"
n.dockTile.showsApplicationBadge = true
```

**Notes:** Creates an object which points to the shared NSApplication instance.

### 33.8.10 deactivate

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Deactivates the receiver.
**Example:**

```
dim a as new NSApplicationMBS

a.deactivate
```

**Notes:** Normally, you shouldn't invoke this method—the Application Kit is responsible for proper deactivation.

### 33.8.11 disableRelaunchOnLogin

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Disable relaunching this app on login, if the app was running at the time the user logged out.
**Notes:** These methods increment and decrement a counter respectively; if the counter is 0 at the time the user logs out, then the app may be relaunched when the user logs back in. The counter is initially zero, so by default apps are relaunched.

If your app should not be relaunched because it launches via some other mechanism (e.g. launchd), then the recommended usage is to call disableRelaunchOnLogin once, and never pair it with an enable call.

If your app should not be relaunched because it triggers a restart (e.g. an installer), then the recommended usage is to call disableRelaunchOnLogin immediately before you attempt to trigger a restart, and enableRelaunchOnLogin immediately after. This is because the user may cancel restarting; if the user later restarts for another reason, then your app should be brought back.

These methods are thread safe.
Available on Mac OS X 10.7 or newer.

### 33.8.12 discardEventsMatchingMask(mask as Integer, beforeEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes all events matching the given mask and generated before the specified event.
**Notes:** mask: Contains one or more flags indicating the types of events to discard. The constants section of the NSEvent class defines the constants you can add together to create this mask. The discussion section

also lists some of the constants that are typically used.
lastEvent: A marker event that you use to indicate which events should be discarded. Events that occurred before this event are discarded but those that occurred after it are not.

Use this method to ignore any events that occurred before a specific event. For example, suppose your app has a tracking loop that you exit when the user releases the mouse button. You could use this method, specifying NSAnyEventMask as the mask argument and the ending mouse-up event as the lastEvent argument, to discard all events that occurred while you were tracking mouse movements in your loop. Passing the mouse-up event as lastEvent ensures that any events that might have occurred after the mouse-up event (that is, that appear in the queue after the mouse-up event) are not discarded.

Typically, you send this message to an NSWindow object, rather than to the app object. Discarding events for a window clears out all of the events for that window only, leaving events for other windows in place.

For the mask parameter, you can add together event type constants such as the following:

- NSLeftMouseDownMask
- NSLeftMouseUpMask
- NSRightMouseDownMask
- NSRightMouseUpMask
- NSMouseMovedMask
- NSLeftMouseDraggedMask
- NSRightMouseDraggedMask
- NSMouseEnteredMask
- NSMouseExitedMask
- NSKeyDownMask
- NSKeyUpMask
- NSFlagsChangedMask
- NSPeriodicMask
- NSCursorUpdateMask
- NSAnyEventMask

This method can also be called in subthreads. Events posted in subthreads bubble up in the main thread event queue.

### 33.8.13 enabledRemoteNotificationTypes as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns what badges you enabled.
**Notes:** Available on Mac OS X 10.7 or newer.

### 33.8.14 enableRelaunchOnLogin

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Enable relaunching this app on login, if the app was running at the time the user logged out.
**Notes:** These methods increment and decrement a counter respectively; if the counter is 0 at the time the user logs out, then the app may be relaunched when the user logs back in. The counter is initially zero, so by default apps are relaunched.

If your app should not be relaunched because it launches via some other mechanism (e.g. launchd), then the recommended usage is to call disableRelaunchOnLogin once, and never pair it with an enable call.

If your app should not be relaunched because it triggers a restart (e.g. an installer), then the recommended usage is to call disableRelaunchOnLogin immediately before you attempt to trigger a restart, and enableRelaunchOnLogin immediately after. This is because the user may cancel restarting; if the user later restarts for another reason, then your app should be brought back.

These methods are thread safe.
Available on Mac OS X 10.7 or newer.

### 33.8.15 extendStateRestoration

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Allows an application to extend its state restoration period.
**Notes:** This method allows an application to extend the state restoration period beyond the usual. For example, the app crashes before state restoration is complete, then it may offer to discard restorable state on the next launch.

If a window has some state that may take a long time to restore, such as a web page, you may use this method and methods to completeStateRestoration to extend the period of this crash protection beyond the default.

You call extendStateRestoration within your implementation of restoreWindowWithIdentifier. You would then call completeStateRestoration some time after the window is fully restored. If the app crashes in the

interim, then it may offer to discard restorable state on the next launch.

The extendStateRestoration and completeStateRestoration method act as a counter. Each call to extendStateRestoration increments the counter, and must be matched with a corresponding call to completeStateRestoration which decrements it. When the counter reaches zero, the app is considered to have been fully restored, and any further calls are silently ignored.

This method is thread safe.
Available in OS X v10.7 and later.

### 33.8.16 hide

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Hides all the receiver's windows, and the next application in line is activated.
**Example:**

NSApplicationMBS.sharedApplication.hide

**Notes:** This method is usually invoked when the user chooses Hide in the application's main menu. When this method begins, it posts an NSApplicationWillHideNotification to the default notification center. When it completes successfully, it posts an NSApplicationDidHideNotification.

### 33.8.17 hideOtherApplications

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Hides all applications, except the receiver.
**Example:**

NSApplicationMBS.sharedApplication.hideOtherApplications

### 33.8.18 invalidateRestorableState

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Invalidates the restorable state.
**Notes:** applicationWillEncodeRestorableState event will be called soon in your NSApplicationDelegateMBS subclass to get a new state encoded.

### 33.8.19 miniaturizeAll

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Miniaturizes all the receiver's windows.
**Example:**

NSApplicationMBS.sharedApplication.miniaturizeAll

### 33.8.20 modalWindow as NSWindowMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the modal window that the receiver is displaying.
**Example:**

```
// show title of current dialog
MsgBox NSApplicationMBS.sharedApplication.modalWindow.Title
```

**Notes:** Returns the modal window being displayed or nil if no modal window is being displayed.

This method returns the current standalone modal window. It does not return sheets that are attached to other windows. If you need to retrieve a sheet window, use the attachedSheet method of NSWindow.

### 33.8.21 nextEventMatchingMask(mask as Integer, untilDate as date, mode as String, dequeueFlag as boolean) as NSEventMBS

MBS MacCocoa Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the next event matching a given mask, or nil if no such event is found before a specified expiration date.
**Example:**

```
Function MouseDown(X As Integer, Y As Integer) Handles MouseDown as Boolean
// in mousedown event

dim a as NSApplicationMBS = NSApplicationMBS.sharedApplication

// check current event
dim e as NSEventMBS = a.currentEvent

// check next mouse up event
dim d as new date
```

```
d.Second = d.Second + 2 // maximum 2 seconds wait time
dim n as NSEventMBS = a.nextEventMatchingMask(NSEventMBS.NSLeftMouseUpMask, d, NSRunLoopMBS.NS-
DefaultRunLoopMode, false)


// e->mouseDown
// e->mouseUp, if already available

Break
End Function
```

**Notes:** mask: Contains one or more flags indicating the types of events to return. The constants section of the NSEvent class defines the constants you can add together to create this mask. The discardEvents-MatchingMask method also lists several of these constants.
expiration: The expiration date for the current event request. Specifying nil for this parameter is equivalent to returning a date object using the distantPast method.
mode: The run loop mode in which to run while looking for events. The mode you specify also determines which timers and run-loop observers may fire while the app waits for the event.
flag: Specify true if you want the event removed from the queue.

Returns the event object whose type matches one of the event types specified by the mask parameter.

You can use this method to short circuit normal event dispatching and get your own events. For example, you may want to do this in response to a mouse-down event in order to track the mouse while its button is down. (In such an example, you would pass the appropriate event types for mouse-dragged and mouse-up events to the mask parameter and specify the NSEventTrackingRunLoopMode run loop mode.) Events that do not match one of the specified event types are left in the queue.
You can specify one of the run loop modes defined by AppKit or a custom run loop mode used specifically by your app. AppKit defines the following run-loop modes:

- NSDefaultRunLoopMode
- NSEventTrackingRunLoopMode
- NSModalPanelRunLoopMode
- NSConnectionReplyMode

See also:

- 33.8.22 nextEventMatchingMask(mask as Integer, untilDate as dateTime, mode as String, dequeueFlag as boolean) as NSEventMBS 5872

### 33.8.22 nextEventMatchingMask(mask as Integer, untilDate as dateTime, mode as String, dequeueFlag as boolean) as NSEventMBS

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the next event matching a given mask, or nil if no such event is found before a specified expiration date.
See also:

- 33.8.21 nextEventMatchingMask(mask as Integer, untilDate as date, mode as String, dequeueFlag as boolean) as NSEventMBS 5870

### 33.8.23 NSAppKitVersionNumber as Double

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This constant identifies the installed version of the Application Kit framework.
**Example:**

```
const NSAppKitVersionNumber10_0 = 577
const NSAppKitVersionNumber10_1 = 620
const NSAppKitVersionNumber10_2 = 663
const NSAppKitVersionNumber10_2_3 = 663.6
const NSAppKitVersionNumber10_3 = 743
const NSAppKitVersionNumber10_3_2 = 743.14
const NSAppKitVersionNumber10_3_3 = 743.2
const NSAppKitVersionNumber10_3_5 = 743.24
const NSAppKitVersionNumber10_3_7 = 743.33
const NSAppKitVersionNumber10_3_9 = 743.36
const NSAppKitVersionNumber10_4 = 824
const NSAppKitVersionNumber10_4_1 = 824.1
const NSAppKitVersionNumber10_4_3 = 824.23
const NSAppKitVersionNumber10_4_4 = 824.33
const NSAppKitVersionNumber10_4_7 = 824.41
const NSAppKitVersionNumber10_5 = 949
const NSAppKitVersionNumber10_5_2 = 949.27
const NSAppKitVersionNumber10_5_3 = 949.33
const NSAppKitVersionNumber10_6 = 1038
const NSAppKitVersionNumber10_7 = 1138
const NSAppKitVersionNumber10_7_2 = 1138.23

if NSApplicationMBS.NSAppKitVersionNumber >= NSAppKitVersionNumber10_5 then
MsgBox "This is Mac OS X 10.5 or newer."
end if
```

**Notes:** See NSAppKitVersionNumber* constants.

### 33.8.24 NSApplicationDidBecomeActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted immediately after the application becomes active.
The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.25 NSApplicationDidChangeScreenParametersNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted when the configuration of the displays attached to the computer is changed.
The configuration change can be made either programmatically or when the user changes settings in the Displays control panel. The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.26 NSApplicationDidFinishLaunchingNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the end of the finishLaunching method to indicate that the application has completed launching and is ready to run.
The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.27 NSApplicationDidFinishRestoringWindowsNotification as string

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Posted when the application is finished restoring windows.
**Notes:** The notification is posted when the application is finished restoring windows, that is, when all the completion handlers from restoreWindowWithIdentifier have been called. This is always posted after NSApplicationWillFinishLaunchingNotification, but may be posted before or after NSApplicationDidFinishLaunchingNotification, depending on whether clients copy the completion handlers and invoke them later. If there were no windows to restore, then this notification is still posted at the corresponding point in app launch (between NSApplicationWillFinishLaunchingNotification and NSApplicationDidFinishLaunchingNotification).

The notification object is sharedApplication. This notification does not contain a userInfo dictionary.
Available in OS X v10.7 and later.

### 33.8.28 NSApplicationDidHideNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the end of the hide method to indicate that the application is now hidden.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.29 NSApplicationDidResignActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted immediately after the application gives up its active status to another application.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.30 NSApplicationDidUnhideNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the end of the unhideWithoutActivation method to indicate that the application is now visible.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.31 NSApplicationDidUpdateNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the end of the updateWindows method to indicate that the application has finished updating its windows.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.32 NSApplicationLaunchIsDefaultLaunchKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the keys for the userinfo dictionary on didFinishLaunching.
**Notes:** The following key is present in the userInfo of NSApplicationDidFinishLaunchingNotification or in the didFinishLaunching event. Its value is a number containing a bool. It will be false if the app was launched to open or print a file, to perform a Service, if the app had saved state that will be restored, or if the app launch was in some other sense not a "default" launch. Otherwise its value will be true.

Available on Mac OS X 10.7 or newer.

### 33.8.33 NSApplicationLaunchRemoteNotificationKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the keys for the userinfo dictionary on didFinishLaunching.
**Notes:** User info keys for NSApplicationDidFinishLaunchingNotification.
Available on Mac OS X 10.7 or newer.

### 33.8.34 NSApplicationLaunchUserNotificationKey as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the user info keys for NSApplicationDidFinishLaunchingNotification.
**Example:**

```
Sub applicationDidFinishLaunching(Notification as NSNotificationMBS)
dim userInfo as Dictionary = Notification.userInfo
dim key as string = NSApplicationMBS.NSApplicationLaunchUserNotificationKey
dim UserNotification as NSUserNotificationMBS = userInfo.Lookup(key, nil)

if UserNotification <>nil then
MsgBox UserNotification.identifier+": "+UserNotification.informativeText
end if
End Sub
```

**Notes:** This key is present in the userInfo of NSApplicationDidFinishLaunchingNotification. It will be present if your application was launched because a user activated a notification in the Notification Center. Its value is an NSUserNotification object.
Available in Mac OS X 10.8.

### 33.8.35 NSApplicationWillBecomeActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted immediately after the application becomes active.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.36 NSApplicationWillFinishLaunchingNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the start of the finishLaunching method to indicate that the application has completed its initialization process and is about to finish launching.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.37 NSApplicationWillHideNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the start of the hide method to indicate that the application is about to be hidden.
The notification object is NSApp. This notification does not contain a userInfo dictionary.

### 33.8.38 NSApplicationWillResignActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted immediately before the application gives up its active status to another application.
The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.39 NSApplicationWillTerminateNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted by the terminate method to indicate that the application will terminate.
Posted only if the delegate method applicationShouldTerminate returns true. The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.40 NSApplicationWillUnhideNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the start of the unhideWithoutActivation method to indicate that the application is about to become visible.
The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.41 NSApplicationWillUpdateNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted at the start of the updateWindows method to indicate that the application is about to update its windows.
The notification object is sharedApplication. This notification does not contain a userInfo dictionary.

### 33.8.42 orderFrontCharacterPalette

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Opens the character palette.
**Example:**

```
dim a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

**Notes:** Available in Mac OS X v10.3 and later.
This shows the special characters palette.

### 33.8.43 orderFrontStandardAboutPanel

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Displays a standard About window.
**Example:**

```
dim a as new NSApplicationMBS

a.orderFrontStandardAboutPanel
```

**Notes:** This method calls orderFrontStandardAboutPanelWithOptions with a nil argument. See orderFrontStandardAboutPanelWithOptions for a description of what's displayed.

### 33.8.44 orderFrontStandardAboutPanelWithOptions(options as dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Displays a standard About window with information from a given options dictionary.
**Example:**

```
dim a as new NSApplicationMBS

// this image has no mask, so you'll see a white border
dim p as Picture = LogoMBS(500)
dim n as new NSImageMBS(p)
dim options as new Dictionary

// show window with default values
'a.orderFrontStandardAboutPanel

// we overwrite default values with new values
options.Value("Credits") = NSAttributedStringMBS.attributedStringWithString("Written by Christian Schmitz")
options.Value("ApplicationName") = "MyCoolApp"
options.Value("Version") = "1.2.3"
options.Value("Copyright") = "©2011 Monkeybread Software"
options.Value("ApplicationIcon") = n

a.orderFrontStandardAboutPanelWithOptions(options)

Exception ex as NSExceptionMBS
MsgBox ex.message
```

**Notes:** options: A dictionary whose keys define the contents of the About window. See the discussion for a description of the available keys.

The following strings are keys that can occur in optionsDictionary:

### 33.8.45 OverlayApplicationIconImage(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

| | |
|---|---|
| " " | An NSAttributedStringMBS displayed in the info area of the panel. If not specified, this method then looks for a file named "Credits.html", "Credits.rtf", and "Credits.rtfd", in that order, in the bundle returned by the NSBundle class method mainBundle. The first file found is used. If none is found, the info area is left blank. |
| "ApplicationName" | A string displayed as the application's name. If not specified, this method then uses the value of CFBundleName (localizable). If neither is found, this method uses the process name. |
| "ApplicationIcon" | A NSImageMBS object displayed as the application's icon. If not specified, this method then looks for an image named "NSApplicationIcon", using NSImageMBS.imageNamed("NSApplicationIcon"). If neither is available, this method uses the generic application icon. |
| "Version" | A string with the build version number of the application ("58.4"), displayed as "(v58.4)". If not specified, obtain from the CFBundleVersion key in infoDictionary; if not specified, leave blank (the "(v)" is not displayed). |
| "Copyright" | A string with a line of copyright information. If not specified, this method then looks for the value of NSHumanReadableCopyright in the localized version infoDictionary. If neither is available, this method leaves the space blank. |
| "ApplicationVersion" | A string with the application version ("Mac OS X", "3", "WebObjects 4.5", "AppleWorks 6",...). If not specified, obtain from the CFBundleShortVersionString key in infoDictionary. If neither is available, the build version, if available, is printed alone, as "Version x.x". |

**Function:** Overlays the image.
**Example:**

```
// draw a picture with a red dot on the top left

dim p as new Picture(512,512,32)

dim g as Graphics = p.Graphics
g.ForeColor = &cFF0000
g.FillRect 0,0,128,128

g = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.Fillrect 0,0,512,512
g.ForeColor = &c000000
g.Filloval 0,0,128,128

Backdrop = p

// create nsimage
dim n as new NSImageMBS(p,p.mask)
```

// and overlay over original image
NSApplicationMBS.sharedApplication.OverlayApplicationIconImage n

**Notes:** Same as setting applicationIconImage, but instead overlays the original image with the new image. This way you can show custom badges. For normal text badges, use NSDockTileMBS class.

Pass image = nil to reset application dock icon.

Size of the image seems to be 128 Pixel by default, but could go up to 1024 in the future. Plugin scales up or down as needed for you.

### 33.8.46 postEvent(e as NSEventMBS, atStart as boolean)

MBS MacCocoa Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Adds a given event to the receiver,Äôs event queue.
**Notes:** anEvent: The event object to post to the queue.
flag: Specify true to add the event to the front of the queue; otherwise, specify false to add the event to the back of the queue.

This method can also be called in subthreads. Events posted in subthreads bubble up in the main thread event queue.

### 33.8.47 preventWindowOrdering

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Suppresses the usual window ordering in handling the most recent mouse-down event.
**Notes:** This method is only useful for mouse-down events when you want to prevent the window that receives the event from being ordered to the front.

### 33.8.48 registerForRemoteNotificationTypes(type as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Registers for remote notifications.
**Example:**

NSApplicationMBS.sharedApplication.registerForRemoteNotificationTypes NSApplicationMBS.NSRemoteNotificationTypeBadge

**Notes:** Only applications distributed through the Mac App Store may use Push notifications.

Type can only be NSRemoteNotificationTypeBadge currently for Mac OS X 10.7.0.

Available on Mac OS X 10.7 or newer.

### 33.8.49 removeWindowsItem(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes the Window menu item for a given window.
**Notes:** Win: The window whose menu item is to be removed.

This method doesn't prevent the item from being automatically added again. Use the excludedFromWindowsMenu method of NSWindow if you want the item to remain excluded from the Window menu.

### 33.8.50 replyToApplicationShouldTerminate(reply as boolean)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Responds to NSTerminateLater once the application knows whether it can terminate.
**Notes:** souldTerminate: Specify true if you want the application to terminate; otherwise, specify false.

If your application delegate returns NSTerminateLater from its applicationShouldTerminate event, your code must subsequently call this method to let the NSApplication object know whether it can actually terminate itself.

### 33.8.51 replyToOpenOrPrint(reply as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Handles errors that might occur when the user attempts to open or print files.
**Notes:** reply: The error that occurred. For a list of possible values, see "Constants."

Delegates should invoke this method if an error is encountered in the applicationOpenFiles or applicationPrintFiles delegate methods.

### 33.8.52 requestUserAttention(type as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Starts a user attention request.
**Example:**

```
dim a as NSApplicationMBS = NSApplicationMBS.sharedApplication

if not a.isActive then // only when we are in background
call a.requestUserAttention(a.NSInformationalRequest) // dock bounces
end if
```

**Notes:** requestType: The severity of the request. Can be NSInformationalRequest or NSCriticalRequest.

Returns the identifier for the request. You can use this value to cancel the request later using the cancelUserAttentionRequest method.

Activating the application cancels the user attention request. A spoken notification will occur if spoken notifications are enabled. Sending requestUserAttention to an application that is already active has no effect.

If the inactive application presents a modal panel, this method will be invoked with NSCriticalRequest automatically. The modal panel is not brought to the front for an inactive application.

### 33.8.53 runModalForWindow(win as NSWindowMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts a modal event loop for the specified window.
**Notes:** win: The window to be displayed modally. If it is not already visible, the window is centered on the screen using the value in its center method and made visible and key. If it is already visible, it is simply made key.

Returns an integer indicating the reason that this method returned.

This method runs a modal event loop for the specified window synchronously. It displays the specified window, makes it key, starts the run loop, and processes events for that window. (You do not need to show the window yourself.) While the app is in that loop, it does not respond to any other events (including mouse, keyboard, or window-close events) unless they are associated with the window. It also does not perform any tasks (such as firing timers) that are not associated with the modal run loop. In other words, this method consumes only enough CPU time to process events and dispatch them to the action methods associated with the modal window.

You can exit the modal loop by calling the stopModal, stopModalWithCode, or abortModal methods from your modal window code. If you use the stopModalWithCode method to stop the modal event loop, this method returns the argument passed to stopModalWithCode. If you use stopModal instead, this method returns the constant NSModalResponseStop (-1000). If you use abortModal, this method returns the constant NSModalResponseAbort (-1001).

### 33.8.54 runPageLayout

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Displays the app's page layout panel, an instance of NSPageLayout.
**Example:**

NSApplicationMBS.sharedApplication.runPageLayout

**Notes:** If the NSPageLayout instance does not exist, this method creates one. This method is typically invoked when the user chooses Page Setup from the application's FIle menu.

### 33.8.55 sendEvent(theEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Dispatches an event to other objects.
**Notes:** You rarely invoke sendEvent directly, although you might want to override this method to perform some action on every event. sendEvent messages are sent from the main event loop (the run method). sendEvent is the method that dispatches events to the appropriate responders—NSApp handles application events, the NSWindow object indicated in the event record handles window-related events, and mouse and key events are forwarded to the appropriate NSWindow object for further dispatching.

If you need to override sendEvent method, please call MBS support.

### 33.8.56 sharedApplication as NSApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the application instance, creating it if it doesn't exist yet.
**Notes:** The plugin makes sure that there is only one application object by returning the same object each time.

### 33.8.57 showHelp

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Shows help.
**Example:**

NSApplicationMBS.sharedApplication.showHelp

**Notes:** If your project is properly registered, and the necessary keys have been set in the property list, this method launches Help Viewer and displays the first page of your app,Äôs help book.

### 33.8.58 startDictation

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Starts dictation.
**Example:**

NSApplicationMBS.sharedApplication.startDictation

**Notes:** For Mac OS X 10.8.

### 33.8.59 stopDictation

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Stops dictation.
**Notes:** For Mac OS X 10.8.

### 33.8.60 terminate

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Terminates the receiver.
**Example:**

NSApplicationMBS.sharedApplication.terminate

**Notes:** This method is typically invoked when the user chooses Quit or Exit from the application's menu.

When invoked, this method performs several steps to process the termination request. First, it asks the application's document controller (if one exists) to save any unsaved changes in its documents. During this process, the document controller can cancel termination in response to input from the user. If the document controller does not cancel the operation, this method then calls the delegate's applicationShouldTerminate method. If applicationShouldTerminate returns NSTerminateCancel, the termination process is aborted and control is handed back to the main event loop. If the method returns NSTerminateLater, the application runs its run loop in the NSModalPanelRunLoopMode mode until the replyToApplicationShouldTerminate method is called with the value true or false. If the applicationShouldTerminate method returns NSTerminateNow, this method posts a NSApplicationWillTerminateNotification notification to the default notification center.

Do not bother to put final cleanup code in your application's main() function—it will never be executed. If cleanup is necessary, perform that cleanup in the delegate's applicationWillTerminate method.

### 33.8.61 unhide

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Restores hidden windows to the screen and makes the receiver active.
**Example:**

NSApplicationMBS.sharedApplication.unhide

### 33.8.62 unhideAllApplications

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Unhides all applications, including the receiver.
**Example:**

NSApplicationMBS.sharedApplication.unhideAllApplications

**Notes:** This action causes each application to order its windows to the front, which could obscure the currently active window in the active application.

### 33.8.63 unhideWithoutActivation

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Restores hidden windows without activating their owner (the receiver).
**Example:**

NSApplicationMBS.sharedApplication.unhideWithoutActivation

**Notes:** When this method begins, it posts an NSApplicationWillUnhideNotification to the default notification center. If it completes successfully, it posts an NSApplicationDidUnhideNotification.

### 33.8.64 unregisterForRemoteNotifications

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Unregisters for remote notifications.
**Example:**

NSApplicationMBS.sharedApplication.unregisterForRemoteNotifications

**Notes:** Available on Mac OS X 10.7 or newer.

### 33.8.65 updateWindows

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sends an update message to each onscreen window.
**Notes:** This method is invoked automatically in the main event loop after each event when running in NSDefaultRunLoopMode or NSModalRunLoopMode. This method is not invoked automatically when running in NSEventTrackingRunLoopMode.

When this method begins, it posts an NSApplicationWillUpdateNotification to the default notification center. When it successfully completes, it posts an NSApplicationDidUpdateNotification.

### 33.8.66 updateWindowsItem(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Updates the Window menu item for a given window to reflect the edited status of that window.
**Notes:** win: The window whose menu item is to be updated.

You rarely need to invoke this method because it is invoked automatically when the edit status of an NSWin-

dow object is set.

### 33.8.67 windows as NSWindowMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing the receiver's window objects.
**Example:**

```
// show all window titles in message boxes
for each w as NSWindowMBS in NSApplicationMBS.sharedApplication.windows
MsgBox w.Title
next
```

**Notes:** Returns an array of NSWindow objects. This array includes both onscreen and offscreen windows.

### 33.8.68 windowWithWindowNumber(windowNumber as Integer) as NSWindowMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the window corresponding to the specified window number.
**Example:**

```
dim w as window = window1
w.Title = "This is our test window"

// get a window ID somewhere
dim WindowID as Integer = CGWindowMBS.GetWindowID(w)

// now find back the window
dim n as NSWindowMBS = NSApplicationMBS.sharedApplication.windowWithWindowNumber(windowid)

MsgBox n.Title
```

**Notes:** windowNumber: The unique window number associated with the desired NSWindow object.

Returns the desired window object or nil if the window could not be found.

### 33.8.69 Properties

### 33.8.70 activationPolicy as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The application's activation policy.
**Notes:** Currently, NSApplicationActivationPolicyNone and NSApplicationActivationPolicyAccessory may be changed to NSApplicationActivationPolicyRegular, but other modifications are not supported.

Update: Seems to work better newer MacOS versions, so between 10.6 and 10.15 Apple implemented more transitions.

Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.8.71 applicationIconImage as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The image used for the receiver's icon.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim mask as new Picture(500, 500, 32)
dim g as Graphics = mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width, g.Height
g.ForeColor = &c000000
g.FillOval 0,0,g.Width, g.Height

dim n as new NSImageMBS(pic,mask)

NSApplicationMBS.sharedApplication.applicationIconImage = n
```

**Notes:** An image containing the application's icon.

This property can set the icon in the dock application tile. This method scales the image as necessary so that it fits in the dock tile. You can use this method to change your application icon while running. To restore your application's original icon, you pass nil to this method.
(Read and Write property)

### 33.8.72 currentEvent as NSEventMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current event, the last event the receiver retrieved from the event queue.
**Example:**

```
dim e as NSEventMBS = NSApplicationMBS.sharedApplication.currentEvent
```

**Notes:** The last event object retrieved by the application.

NSApp receives events and forwards them to the affected NSWindow objects, which then distribute them to the objects in its view hierarchy.

Only for Cocoa applications.
(Read only property)

### 33.8.73 currentSystemPresentationOptions as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the set of application presentation options that are currently in effect for the system.
**Example:**

```
dim a as new NSApplicationMBS

MsgBox "currentSystemPresentationOptions: "+str(a.currentSystemPresentationOptions)
```

**Notes:** The presentation options. See NSApplicationPresentation* constants and combine them using a C bitwise OR operator.

These are the presentation options that have been put into effect by the currently active application.
(Read only property)

### 33.8.74 dockTile as NSDockTileMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the application's Dock tile.
**Example:**

```
dim a as new NSApplicationMBS

a.dockTile.badgeLabel = "Hello"
```

**Notes:** Available in Mac OS X v10.5 and later.

Returns NSDockTileMBS object for the dock tile.
(Read only property)

### 33.8.75 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSApplication object.
**Notes:** (Read and Write property)

### 33.8.76 helpMenu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The help menu used by the application.
**Notes:** If helpMenu is nil, the system will append the help to an appropriate menu and will not return a reference to that menu when this method is called.

Available in Mac OS X v10.6 and later.

If helpMenu is a non-nil menu it is set as the Help menu, and Spotlight for Help will be installed in it. If helpMenu is nil, AppKit will install Spotlight for Help into a menu of its choosing, and that menu is not returned from helpMenu.

If you wish to completely suppress Spotlight for Help, you can set a menu that does not appear in the menu bar.

NSApplication retains its Help menu and releases it when a different menu is set.
(Read and Write property)

### 33.8.77 isActive as Boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether this is the active application.
**Example:**

```
dim a as NSApplicationMBS = NSApplicationMBS.sharedApplication
MsgBox "isActive:" +str(a.isActive)
```

**Notes:** True if this is the active application; false otherwise.
(Read only property)

### 33.8.78 isFullKeyboardAccessEnabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns that status of Full Keyboard Access set in the Keyboard preference pane.
**Example:**

```
dim a as NSApplicationMBS = NSApplicationMBS.sharedApplication
MsgBox "isFullKeyboardAccessEnabled:" +str(a.isFullKeyboardAccessEnabled)
```

**Notes:** True if Full Keyboard Access is enabled, otherwise false.

You may use this status to implement your own key loop or to implement in-control tabbing behavior similar to NSTableView.

Available in Mac OS X v10.6 and later.
(Read only property)

### 33.8.79 isHidden as Boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the receiver is hidden.
**Example:**

```
MsgBox str(NSApplicationMBS.sharedApplication.isHidden)
```

**Notes:** True if the receiver is hidden, false otherwise.
(Read only property)

### 33.8.80 isRunning as Boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the main event loop is running.
**Example:**

```
MsgBox str(NSApplicationMBS.sharedApplication.isRunning)
```

**Notes:** True if the main event loop is running; false otherwise.
False means the stop: method was invoked.

Should always be true for a Xojo application.
(Read only property)

### 33.8.81 keyWindow as NSWindowMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the window that currently receives keyboard events.
**Example:**

```
// title of front window
MsgBox NSApplicationMBS.sharedApplication.keyWindow.Title
```

**Notes:** The window object currently receiving keyboard events or nil if there is no key window.
This method might return nil if the application hasn't finished loading yet or if the receiver is not active.

Does return nil in Carbon applications.
(Read only property)

### 33.8.82 mainMenu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The menu object representing the application's menu bar.

**Example:**

```
// shows titles of the menus in a Cocoa app
dim m as NSMenuMBS = NSApplicationMBS.sharedApplication.mainMenu

if m<>nil then
dim c as Integer = m.numberOfItems-1
for i as Integer = 0 to c

MsgBox m.Item(i).Title
next
end if
```

**Notes:** Returns nil on a Carbon application.
(Read and Write property)

### 33.8.83 mainWindow as NSWindowMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the main window.
**Example:**

```
// shows title in Cocoa, but not in Carbon
MsgBox NSApplicationMBS.sharedApplication.mainWindow.Title
```

**Notes:** The application's main window or nil if there is no main window.
This method might return nil if the application hasn't finished loading, if the receiver is not active, or if the application is hidden.
(Read only property)

### 33.8.84 presentationOptions as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The presentation options that should be in effect for the system when this application is active.
**Example:**

```
dim a as new NSApplicationMBS

// hide dock
a.presentationOptions = NSApplicationMBS.NSApplicationPresentationAutoHideDock
```

**Notes:** Available in Mac OS X v10.6 and later.

Only certain combinations of "NSApplicationPresentationOptions" flags are supported. When given an invalid combination of option flags this method raises an exception NSInvalidArgumentException exception..

See NSApplicationPresentation* constants.
(Read and Write property)

### 33.8.85 servicesProvider as NSServiceProviderMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Registers or queries the service provider.
**Notes:** The service provider is an object that performs all services the application provides to other applications. When another application requests a service from the receiver, it sends the service request to aProvider. Service requests can arrive immediately after the service provider is set, so invoke this method only when your application is ready to receive requests.

Please keep an object reference around so the object is not going out of scope too early!
(Read and Write property)

### 33.8.86 userInterfaceLayoutDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 16.3, Platform: macOS, Targets: All.

**Function:** The layout direction of the user interface.
**Notes:** This property contains the general user interface layout flow directions. For a list of possible values, see NSUserInterfaceLayoutDirection.

NSUserInterfaceLayoutDirectionLeftToRight = 0
NSUserInterfaceLayoutDirectionRightToLeft = 1

Available in OS X v10.6 and later.
(Read only property)

### 33.8.87 windowsMenu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The window menu or nil if such a menu does not exist or has not yet been created.
**Notes:** (Read and Write property)

### 33.8.88 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSRemoteNotificationTypeAlert | 4 | One of the notification type constants.<br>Available in Mac OS X 10.8. |
| NSRemoteNotificationTypeBadge | 1 | One of the notification type constants. |
| NSRemoteNotificationTypeNone | 0 | One of the notification type constants. |
| NSRemoteNotificationTypeSound | 2 | One of the notification type constants.<br>Available in Mac OS X 10.8. |

Activation Policy Constants

| Constant | Value | Description |
|---|---|---|
| NSApplicationActivationPolicyAccessory | 1 | The application does not appear in the Dock and does not have a m<br>but it may be activated programmatically or by clicking on one of its<br>This corresponds to value of the LSUIElement key in the application's<br>being 1.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivationPolicyProhibited | 2 | The application does not appear in the Dock and may not create<br>or be activated. This corresponds to the value of the LSBackground<br>in the application's Info.plist being 1. This is also the default for u<br>executables that do not have Info.plists.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivationPolicyRegular | 0 | The application is an ordinary app that appears in the Dock and ma<br>user interface. This is the default for bundled apps, unless overridd<br>Info.plist.<br>Available in Mac OS X v10.6 and later. |

Presentation Option Constants.

| Constant | Value | Description |
|---|---|---|
| NSApplicationPresentationAutoHideDock | 1 | |
| NSApplicationPresentationAutoHideMenuBar | 4 | |
| NSApplicationPresentationAutoHideToolbar | 2048 | Fullscreen window toolbar is detached from window a toHidden menuBar. May be used only when both NS FullScreen and NSApplicationPresentationAutoHideM Available on Mac OS X 10.7 or newer. |
| NSApplicationPresentationDefault | 0 | |
| NSApplicationPresentationDisableAppleMenu | 16 | |
| NSApplicationPresentationDisableForceQuit | 64 | |
| NSApplicationPresentationDisableHideApplication | 256 | |
| NSApplicationPresentationDisableMenuBarTransparency | 512 | |
| NSApplicationPresentationDisableProcessSwitching | 32 | |
| NSApplicationPresentationDisableSessionTermination | 128 | |
| NSApplicationPresentationFullScreen | 1024 | Application is in fullscreen mode. Available on Mac OS X 10.7 or newer. |
| NSApplicationPresentationHideDock | 2 | |
| NSApplicationPresentationHideMenuBar | 8 | |

Request type constants.

| Constant | Value | Description |
|---|---|---|
| NSCriticalRequest | 0 | The user attention request is a critical request. The dock icon will bounce until either the application becomes active or the request is canceled. |
| NSInformationalRequest | 10 | The user attention request is an informational request. The dock icon will bounce for one second. The request, though, remains active until either the application becomes active or the request is canceled. |

## 33.9 class NSAutoreleasePoolMBS

### 33.9.1 class NSAutoreleasePoolMBS

MBS Main Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** The class for memory management in Cocoa.
**Example:**

```
dim pool as NSAutoreleasePoolMBS

sub MyThread.Run
pool=new NSAutoreleasePoolMBS
// do work
end sub
```

**Notes:** If you use threads, you need to create a NSAutoreleasePoolMBS on the start to have correct Cocoa memory manager.
**Blog Entries**

- REALbasic 2009r4 and MBS Plugins

### 33.9.2 Methods

### 33.9.3 Constructor

MBS Main Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** The constructor to create a new Autorelease Pool.
**Example:**

```
// Cleanup memory for Cocoa objects

Sub Action() // in Timer
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS
End Sub
```

**Notes:** The example code above is not needed in Xojo 2009r4 and above as the runtime does it automatically for you.

### 33.9.4 Properties

### 33.9.5 Handle as Integer

MBS Main Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** The handle to the internally used NSAutoreleasePool object.
**Notes:** (Read and Write property)

## 33.10 Globals

### 33.10.1 NSLogMBS(message as string)

MBS Main Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Writes a message to the Console.app on Mac OS X.
**Example:**

```
Sub Log(message as string)
if TargetMacOS then
NSLogMBS message
else
System.DebugLog message
end if

End Sub
```

**Notes:** As with Mac OS X 10.8 the system.debugLog method does not write to Console.app. So use this function.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr16

### 33.10.2 NSStringArraySortMBS(texts() as string, options as Integer) as string()

MBS Main Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Sorts array of string with options.
**Example:**

```
// constants for the function:
const NSCaseInsensitiveSearch = 1
const NSLiteralSearch = 2
const NSBackwardsSearch = 4
const NSAnchoredSearch = 8
const NSNumericSearch = 64
const NSDiacriticInsensitiveSearch = 128
const NSWidthInsensitiveSearch = 256
const NSForcedOrderingSearch = 512

const NSOrderedAscending = -1
const NSOrderedSame = 0
const NSOrderedDescending = 1

// test array
```

```
dim a() as string = array("Test 1", "Test 2", "Test 12")

// sort with Cocoa sorting
dim r() as string = NSStringArraySortMBS(a, NSDiacriticInsensitiveSearch + _
NSWidthInsensitiveSearch + _
NSCaseInsensitiveSearch + _
NSNumericSearch)

// sort with xojo
a.sort

// show result
MsgBox "Cocoa: "+Join(r,", ")+EndOfLine+_
"Xojo: "+Join(a, ", ")
```

**Notes:** This function allows you to use NSStringCompareMBS for array sorting.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr5

### 33.10.3 NSStringCompareMBS(s as string, t as string, options as Integer) as Integer

MBS Main Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Compares two things using the Cocoa string functions.
**Example:**

```
// constants for the function:
const NSCaseInsensitiveSearch = 1
const NSLiteralSearch = 2
const NSBackwardsSearch = 4
const NSAnchoredSearch = 8
const NSNumericSearch = 64
const NSDiacriticInsensitiveSearch = 128
const NSWidthInsensitiveSearch = 256
const NSForcedOrderingSearch = 512

const NSOrderedAscending = -1
const NSOrderedSame = 0
const NSOrderedDescending = 1

if NSStringCompareMBS("Hello","hello", NSCaseInsensitiveSearch)=0 then
msgbox "equal (correct)"
else
```

```
msgbox "not equal"
end if

if NSStringCompareMBS("Hello","hello", 0)=0 then
msgbox "equal"
else
msgbox "not equal (correct)"
end if

if NSStringCompareMBS("Hello","Hell√", NSDiacriticInsensitiveSearch)=0 then
msgbox "equal (correct)"
else
msgbox "not equal"
end if
```

**Notes:** Following constants can be used for the compare:

| | | |
|---|---|---|
| NSCaseInsensitiveSearch | 1 | Case Insensitive |
| NSLiteralSearch | 2 | Exact character-by-character equivalence |
| NSBackwardsSearch | 4 | Search from end of source string |
| NSAnchoredSearch | 8 | Search is limited to start (or end, if NSBackwardsSearch) of source string |
| NSNumericSearch | 64 | Added in 10.2; Numbers within strings are compared using numeric value, that is, Foo2.txt <Foo7.txt <Foo25.txt; only applies to compare methods, not find |
| NSDiacriticInsensitiveSearch | 128 | If specified, ignores diacritics (o-umlaut = o) |
| NSWidthInsensitiveSearch | 256 | If specified, ignores width differences ('a' = UFF41) |
| NSForcedOrderingSearch | 512 | If specified, comparisons are forced to return either NSOrderedAscending or NSOrderedDescending if the strings are equivalent but not strictly equal, for stability when sorting (e.g. "aaa" >"AAA" with NSCaseInsensitiveSearch specified) |

The constants NSDiacriticInsensitiveSearch, NSWidthInsensitiveSearch and NSForcedOrderingSearch are only for Mac OS X 10.5 and newer versions.

Returns value constants:

| | |
|---|---|
| NSOrderedAscending | -1 |
| NSOrderedSame | 0 |
| NSOrderedDescending | 1 |

**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 33.10.4 NSMakePointMBS(x as Double, y as Double) as NSPointMBS

MBS Main Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Creates a NSPoint object based on coordinates.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 33.10.5 NSMakeRangeMBS(location as UInt32, length as UInt32) as NSRangeMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new range with the given values.

### 33.10.6 NSMakeRectMBS(x as Double, y as Double, w as Double, h as Double) as NSRectMBS

MBS Main Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Creates a NSRect object based on coordinates and size.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 33.10.7 NSMakeSizeMBS(w as Double, h as Double) as NSSizeMBS

MBS Main Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Creates a NSSize object based on a size.
**Blog Entries**

- Line Wrap for Textarea in Xojo Mac applications
- MBS REALbasic plug-ins version 9.4

**Videos**

- Apple MapView In Xojo

### 33.10.8 CenterResizeAddWindowMBS(win as window)

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds a window to the list of center resizing windows.
**Notes:** Please call in open event of window.

### 33.10.9 CenterResizeInstallMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Installs the center resize function.
**Notes:** The plugin can provide for Xojo and Xojo the center based window resizing.
Call this method early in app.open to prepare everything.

Than register windows with CenterResizeAddWindowMBS in window open event and unregister with CenterResizeRemoveWindowMBS in window close event. This works for all windows you register.

### 33.10.10 CenterResizeRemoveWindowMBS(win as window)

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes a window from the list of center resizing windows.
**Notes:** Please call in Close event of window.

## 33.11 class NSBundleMBS

### 33.11.1 class NSBundleMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** An NSBundle object represents a location in the file system that groups code and resources that can be used in a program.
**Example:**

MsgBox NSBundleMBS.mainBundle.bundlePath

**Notes:** NSBundle objects locate program resources, dynamically load and unload executable code, and assist in localization. You build a bundle in Xcode using one of these project types: Application, Framework, plug-ins.
Although bundle structures vary depending on the target platform and the type of bundle you are building, the NSBundle class hides this underlying structure in most (but not all) cases. Many of the methods you use to load resources from a bundle automatically locate the appropriate starting directory and look for

resources in known places.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr2
- MBS Xojo Plugins, version 20.6pr1
- NSBundleMBS and NSDirectoryEnumeratorMBS

### 33.11.2 Methods

### 33.11.3 allBundles as NSBundleMBS()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an array of all the application's non-framework bundles.
**Example:**

```
dim a(-1) as NSBundleMBS = NSBundleMBS.allBundles
dim lines(-1) as string

for each n as NSBundleMBS in a
lines.Append n.bundlePath
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** The returned array includes the main bundle and all bundles that have been dynamically created but doesn't contain any bundles that represent frameworks.

### 33.11.4 allFrameworks as NSBundleMBS()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an array of all of the application's bundles that represent frameworks.
**Example:**

```
dim a(-1) as NSBundleMBS = NSBundleMBS.allFrameworks
dim lines(-1) as string

for each n as NSBundleMBS in a
lines.Append n.bundlePath
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Returns an array of all of the application's bundles that represent frameworks. Only frameworks with one or more Objective-C classes in them are included.

The returned array includes frameworks that are linked into an application when the application is built and bundles for frameworks that have been dynamically created.

### 33.11.5 builtInPlugInsFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing plug-ins.
**Example:**

MsgBox NSBundleMBS.mainBundle.builtInPlugInsFolder.DisplayName

**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.6 builtInPlugInsPath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing plug-ins.
**Example:**

MsgBox NSBundleMBS.mainBundle.builtInPlugInsPath

**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.7 bundleFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's bundle directory.
**Example:**

MsgBox NSBundleMBS.mainBundle.bundleFolder.DisplayName

### 33.11.8 bundleIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's bundle identifier.
**Example:**

```
dim n as NSBundleMBS = NSBundleMBS.mainBundle
MsgBox n.bundleIdentifier
```

**Notes:** Returns the receiver's bundle identifier, which is defined by the CFBundleIdentifier key in the bundle's information property list.

### 33.11.9 bundlePath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's bundle directory.
**Example:**

```
MsgBox NSBundleMBS.mainBundle.bundlePath
```

### 33.11.10 bundleWithIdentifier(identifier as string) as NSBundleMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the previously created NSBundle instance that has the specified bundle identifier.
**Example:**

```
// create with path
dim x as NSBundleMBS = NSBundleMBS.bundleWithPath(SpecialFolder.Applications.Child("iTunes.app"))
MsgBox x.bundlePath

// once the bundle is known it will be in the allBundles array and be found with bundleWithIdentifier:
dim n as NSBundleMBS = NSBundleMBS.bundleWithIdentifier("com.apple.iTunes")
MsgBox n.bundlePath
```

**Notes:** The previously created NSBundle instance that has the bundle identifier identifier. Returns nil if

the requested bundle is not found.

This method is typically used by frameworks and plug-ins to locate their own bundle at runtime. This method may be somewhat more efficient than trying to locate the bundle using the bundleForClass method.

### 33.11.11 bundleWithPath(path as folderitem) as NSBundleMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an NSBundle object that corresponds to the specified directory.
**Example:**

```
// create with path
dim x as NSBundleMBS = NSBundleMBS.bundleWithPath(SpecialFolder.Applications.Child("iTunes.app"))
MsgBox x.bundlePath
```

**Notes:** Returns the NSBundle object that corresponds to fullPath, or nil if fullPath does not identify an accessible bundle directory.

This method allocates and initializes the returned object if there is no existing NSBundle associated with fullPath, in which case it returns the existing object.
See also:

- 33.11.12 bundleWithPath(path as string) as NSBundleMBS 5907

### 33.11.12 bundleWithPath(path as string) as NSBundleMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an NSBundle object that corresponds to the specified directory.
**Example:**

```
// create with path
dim x as NSBundleMBS = NSBundleMBS.bundleWithPath("/Applications/iTunes.app")
MsgBox x.bundlePath
```

**Notes:** Returns the NSBundle object that corresponds to fullPath, or nil if fullPath does not identify an accessible bundle directory.

This method allocates and initializes the returned object if there is no existing NSBundle associated with fullPath, in which case it returns the existing object.

See also:

- 33.11.11 bundleWithPath(path as folderitem) as NSBundleMBS 5907

### 33.11.13 Constructor(path as folderitem)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates an NSBundle object that corresponds to the specified directory.
**Example:**

```
dim n as new NSBundleMBS(SpecialFolder.Applications.Child("iTunes.app"))
dim d as Dictionary = n.infoDictionary
MsgBox d.Value("CFBundleName")
```

**Notes:** Creates the NSBundle object that corresponds to fullPath, or fails if fullPath does not identify an accessible bundle directory. On failure the handle property is 0.

This method allocates and initializes the returned object if there is no existing NSBundle associated with fullPath, in which case it returns the existing object.
See also:

- 33.11.14 Constructor(path as string) 5908

### 33.11.14 Constructor(path as string)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates an NSBundle object that corresponds to the specified directory.
**Example:**

```
dim n as new NSBundleMBS("/Applications/iTunes.app")
dim d as Dictionary = n.infoDictionary
MsgBox d.Value("CFBundleName")
```

**Notes:** Creates the NSBundle object that corresponds to fullPath, or fails if fullPath does not identify an accessible bundle directory. On failure the handle property is 0.

This method allocates and initializes the returned object if there is no existing NSBundle associated with fullPath, in which case it returns the existing object.
See also:

- 33.11.13 Constructor(path as folderitem) 5908

### 33.11.15 developmentLocalization as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the localization used to create the bundle.
**Example:**

```
MsgBox NSBundleMBS.mainBundle.developmentLocalization
```

**Notes:** The returned localization corresponds to the value in the CFBundleDevelopmentRegion key of the bundle's property list (Info.plist).

### 33.11.16 executableArchitectures as Integer()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an array of numbers indicating the architecture types supported by the bundle's executable.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim b as new NSBundleMBS(f)

dim lines(-1) as string

for each e as Integer in b.executableArchitectures
dim s as string
Select case e
case NSBundleMBS.NSBundleExecutableArchitectureI386
s="i386"
case NSBundleMBS.NSBundleExecutableArchitecturePPC
s="PPC"
case NSBundleMBS.NSBundleExecutableArchitecturePPC64
s="PPC 64-bit"
case NSBundleMBS.NSBundleExecutableArchitectureX86_64
s="x86 64-bit"
case 12
s="iPhone"
else
s=Str(e)
end Select
lines.Append hex(e)+": "+s
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** This method scans the bundle's Mach-O executable and returns all of the architecture types it finds. Because they are taken directly from the executable, the returned values may not always correspond to one of the well-known CPU types defined in "Mach-O Architecture."

### 33.11.17 executableFile as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's executable file.
**Example:**

MsgBox NSBundleMBS.mainBundle.executableFile.NativePath

### 33.11.18 executablePath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's executable file.
**Example:**

MsgBox NSBundleMBS.mainBundle.executablePath

### 33.11.19 infoDictionary as dictionary

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns a dictionary that contains information about the receiver.
**Example:**

```
dim n as new NSBundleMBS(SpecialFolder.Applications.Child("iTunes.app"))
dim d as Dictionary = n.infoDictionary
dim lines(-1) as string

for each key as Variant in d.keys
dim value as Variant = d.Value(key)

// special handle folderitems
if value isa FolderItem then
dim f as FolderItem = value
value = f.Name
end if
```

```
lines.Append key.StringValue + " ->"+value.StringValue
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Returns a dictionary, constructed from the bundle's Info.plist file, that contains information about the receiver. If the bundle does not contain an Info.plist file, a valid dictionary is returned but this dictionary contains only private keys that are used internally by the NSBundle class. The NSBundle class may add extra keys to this dictionary for its own use.

### 33.11.20 isLoaded as boolean

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Obtains information about the load status of a bundle.
**Example:**

```
MsgBox str(NSBundleMBS.mainBundle.isLoaded) // mainbundle is always loaded
```

**Notes:** Returns true if the bundle's code is currently loaded, otherwise false.

### 33.11.21 load as boolean

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Dynamically loads the bundle's executable code into a running program, if the code has not already been loaded.
**Notes:** Returns true if the method successfully loads the bundle's code or if the code has already been loaded, otherwise false.

You can use this method to load the code associated with a dynamically loaded bundle, such as a plug-in or framework. Prior to Mac OS X version 10.5, a bundle would attempt to load its code—if it had any—only once. Once loaded, you could not unload that code. In Mac OS X version 10.5 and later, you can unload a bundle's executable code using the unload method.
You don't need to load a bundle's executable code to search the bundle's resources.

### 33.11.22 localizations as string()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns a list of all the localizations contained within the receiver's bundle.
**Example:**

```
MsgBox join(NSBundleMBS.mainBundle.localizations,EndOfLine)
```

**Notes:** Returna an array, containing strings, that specifies all the localizations contained within the receiver's bundle.

### 33.11.23 localizedInfoDictionary as dictionary

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns a dictionary with the keys from the bundle's localized property list.
**Example:**

```
dim n as new NSBundleMBS(SpecialFolder.Applications.Child("iTunes.app"))
dim d as Dictionary = n.localizedInfoDictionary
dim lines(-1) as string

for each key as Variant in d.keys
dim value as Variant = d.Value(key)

// special handle folderitems
if value isa FolderItem then
dim f as FolderItem = value
value = f.Name
end if

lines.Append key.StringValue + " ->"+value.StringValue
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Returns a dictionary with the keys from the bundle's localized property list (InfoPlist.strings).

This method uses the preferred localization for the current user when determining which resources to return. If the preferred localization is not available, this method chooses the most appropriate localization found in the bundle.

### 33.11.24 localizedStringForKey(key as string, value as string="", tableName as string="") as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns a localized version of the string designated by the specified key and residing in the specified table.
**Notes:** key: The key for a string in the table identified by tableName.
value: The value to return if key is "" or if a localized string for key can't be found in the table.
tableName: The receiver's string table to search. If tableName is an empty string, the method attempts to use the table in Localizable.strings.

Returns a localized version of the string designated by key in table tableName. If value is nil or an empty string, and a localized string is not found in the table, returns key. If key and value are both nil, returns the empty string.

For more details about string localization and the specification of a .strings file, see "Working With Localized Strings."
Using the user default NSShowNonLocalizedStrings, you can alter the behavior of localizedStringForKey to log a message when the method can't find a localized string. If you set this default to true (in the global domain or in the application's domain), then when the method can't find a localized string in the table, it logs a message to the console and capitalizes key before returning it.
The following example cycles through a static array of keys when a button is clicked, gets the value for each key from a strings table named Buttons.strings, and sets the button title with the returned value:

### 33.11.25 mainBundle as NSBundleMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the NSBundle object that corresponds to the directory where the current application executable is located.
**Example:**

MsgBox NSBundleMBS.mainBundle.bundlePath

**Notes:** Returns the NSBundle object that corresponds to the directory where the application executable is located, or nil if a bundle object could not be created.

This method allocates and initializes a bundle object if one doesn't already exist. The new object corresponds to the directory where the application executable is located. Be sure to check the return value to make sure you have a valid bundle. This method may return a valid bundle object even for unbundled applications.
In general, the main bundle corresponds to an application file package or application wrapper: a directory that bears the name of the application and is marked by a ".app" extension.

### 33.11.26 pathForImageResource(name as string) as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the location of the specified image resource file.
**Notes:** name: The name of the image resource file, without any pathname information. Including a filename extension is optional.

Returns the absolute pathname of the resource file or nil if the file was not found.

Image resources are those files in the bundle that are recognized by the NSImage class, including those that can be converted using the Image IO framework.

### 33.11.27 pathForResource(name as string, extension as string) as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname for the resource identified by the specified name and file extension.
**Notes:** name: The name of the resource file.
extension: If extension is an empty string, the extension is assumed not to exist and the file URL is the first file encountered that exactly matches name.

Returns the full pathname for the resource file or nil if the file could not be located.

The method first looks for a matching resource file in the non-localized resource directory of the specified bundle. (In Mac OS X, this directory is typically called Resources but in iPhone OS, it is the main bundle directory.) If a matching resource file is not found, it then looks in the top level of any available language-specific ".lproj" directories. (The search order for the language-specific directories corresponds to the user's preferences.) It does not recurse through other subdirectories at any of these locations. For more details see Bundles and Localization.
The following code fragment gets the path to a plist within the bundle, and loads it into a dictionary.
See also:


- 33.11.28 pathForResource(name as string, extension as string, subpath as string) as folderitem 5915
- 33.11.29 pathForResource(name as string, extension as string, subpath as string, localizationName as string) as folderitem 5915

### 33.11.28 pathForResource(name as string, extension as string, subpath as string) as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname for the resource identified by the specified name and file extension and located in the specified bundle subdirectory.
**Notes:** name: The name of the resource file.
extension: If extension is an empty string, the extension is assumed not to exist and the file URL is the first file encountered that exactly matches name.
subpath: The name of the bundle subdirectory.

Returns the full pathname for the resource file or nil if the file could not be located.

If subpath is "", this method searches the top-level nonlocalized resource directory and the top-level of any language-specific directories. (In Mac OS X, the top-level nonlocalized resource directory is typically called Resources but in iPhone OS, it is the main bundle directory.) For example, suppose you have a Mac OS X application with a modern bundle and you specify "Documentation" for the subpath parameter. This method would first look in the Contents/Resources/Documentation directory of the bundle, followed by the Documentation subdirectories of each language-specific .lproj directory. (The search order for the language-specific directories corresponds to the user's preferences.) This method does not recurse through any other subdirectories at any of these locations. For more details see Bundles and Localization.
See also:


- 33.11.27 pathForResource(name as string, extension as string) as folderitem 5914
- 33.11.29 pathForResource(name as string, extension as string, subpath as string, localizationName as string) as folderitem 5915


### 33.11.29 pathForResource(name as string, extension as string, subpath as string, localizationName as string) as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname for the resource identified by the specified name and file extension, located in the specified bundle subdirectory, and limited to global resources and those associated with the specified localization.
**Notes:** name: The name of the resource file.
extension: If extension is an empty string, the extension is assumed not to exist and the file URL is the first file encountered that exactly matches name.
subpath: The name of the bundle subdirectory to search.
localizationName: The name of the localization. This parameter should correspond to the name of one of the bundle's language-specific resource directories without the .lproj extension.

Returns the full pathname for the resource file or nil if the file could not be located.

This method is equivalent to pathForResource:ofType, except that only nonlocalized resources and those in the language-specific .lproj directory specified by localizationName are searched.

There should typically be little reason to use this method—see Getting the Current Language and Locale.
See also:


- 33.11.27 pathForResource(name as string, extension as string) as folderitem 5914
- 33.11.28 pathForResource(name as string, extension as string, subpath as string) as folderitem 5915


### 33.11.30 pathForSoundResource(name as string) as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the location of the specified sound resource file.
**Notes:** name: The name of the sound resource file, without any pathname information. Including a filename extension is optional

Returns the folderitme of the resource file or nil if the file was not found.

Sound resources are those files in the bundle that are recognized by the NSSound class. The types of sound files can be determined by calling the soundUnfilteredFileTypes method of NSSound.

### 33.11.31 preferredLocalizations as string()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an array of strings indicating the actual localizations contained in the receiver's bundle.
**Notes:** An array of strings, each of which identifies the a localization in the receiver's bundle. The localizations in the array are not returned in any particular order.

### 33.11.32 privateFrameworksFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing frameworks.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.33 privateFrameworksPath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing frameworks.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.34 resourceFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiving bundle's subdirectory containing resources.

### 33.11.35 resourcePath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiving bundle's subdirectory containing resources.

### 33.11.36 sharedFrameworksFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing shared frameworks.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.37 sharedFrameworksPath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing shared frameworks.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.38 sharedSupportFolder as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing shared support files.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.39 sharedSupportPath as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the full pathname of the receiver's subdirectory containing shared support files.
**Notes:** This method returns the appropriate path for modern application and framework bundles. This method may not return a path for non-standard bundle formats or for some older bundle formats.

### 33.11.40 unload as boolean

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Unloads the code associated with the receiver.
**Notes:** Returns true if the bundle was successfully unloaded or was not already loaded; otherwise, false if the bundle could not be unloaded.

This method attempts to unload a bundle's executable code using the underlying dynamic loader (typically dyld). You may use this method to unload plug-in and framework bundles when you no longer need the code they contain. You should use this method to unload bundles that were loaded using the methods of the NSBundle class only. Do not use this method to unload bundles that were originally loaded using the bundle-manipulation functions in Core Foundation.
It is the responsibility of the caller to ensure that no in-memory objects or data structures refer to the code being unloaded. For example, if you have an object whose class is defined in a bundle, you must release that object prior to unloading the bundle. Similarly, your code should not attempt to access any symbols defined in an unloaded bundle.

Prior to Mac OS X version 10.5, code could not be unloaded once loaded, and this method would always return false. In Mac OS X version 10.5 and later, you can unload a bundle's executable code using this method.

Available in Mac OS X v10.5 and later.

### 33.11.41 Properties

### 33.11.42 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSBundle object.
**Example:**

```
MsgBox hex(NSBundleMBS.mainBundle.Handle)
```

**Notes:** (Read and Write property)

### 33.11.43 Constants

Architectures

| Constant | Value | Description |
|---|---|---|
| NSBundleExecutableArchitectureARM64 | &h0100000c | Specifies the 64-bit ARM architecture. |
| NSBundleExecutableArchitectureI386 | 7 | Specifies the 32-bit Intel architecture. Available in Mac OS X v10.5 and later. |
| NSBundleExecutableArchitecturePPC | &h12 | Specifies the 32-bit PowerPC architecture. Available in Mac OS X v10.5 and later. |
| NSBundleExecutableArchitecturePPC64 | &h01000012 | Specifies the 64-bit PowerPC architecture. Available in Mac OS X v10.5 and later. |
| NSBundleExecutableArchitectureX86_64 | &h01000007 | Specifies the 64-bit Intel architecture. Available in Mac OS X v10.5 and later. |

## 33.12 class NSCalendarMBS

### 33.12.1 class NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The calendar class for Cocoa.
**Notes:** see also
https://developer.apple.com/library/mac/#documentation/Cocoa/Reference/Foundation/Classes/NSCalendar_Class/Reference/NSCalendar.html
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr4
- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr1
- MBS Real Studio Plugins, version 12.3pr11

### 33.12.2 Methods

### 33.12.3 AMSymbol as string

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** The symbol used to represent ,ÄúAM,Äù for this calendar.

### 33.12.4 autoupdatingCurrentCalendar as NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the current logical calendar for the current user.
**Notes:** Settings you get from this calendar do change as the user's settings change (contrast with currentCalendar).

Note that if you cache values based on the calendar or related information those caches will of course not be automatically updated by the updating of the calendar object.

Available in Mac OS X v10.5 and later.

### 33.12.5 calendarIdentifier as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identifier for the receiver.

### 33.12.6 calendarWithIdentifier(identifier as String) as NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Creates a new calendar specified by a given identifier.
**Notes:** identifier: The identifier for the new calendar. For valid identifiers, see Calendar Identifiers.

Returns he initialized calendar, or nil if the identifier is unknown (if, for example, it is either an unrecognized string or the calendar is not supported by the current version of the operating system).

The returned calendar defaults to the current locale and default time zone.

### 33.12.7 componentsInTimeZone(timezone as NSTimeZoneMBS, date as Date) as NSDateComponentsMBS

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns all the date components of a date, as if in a given time zone (instead of the receiving calendar,Äôs time zone).
**Notes:** timezone: The time zone to use when returning the components. This value overrides the time zone of the receiving NSCalendar.
date: The date for which to perform the calculation.

Returns an NSDateComponents object containing all the components from the given date, calculated using the given time zone.
See also:

- 33.12.8 componentsInTimeZone(timezone as NSTimeZoneMBS, date as DateTime) as NSDateComponentsMBS 5921

### 33.12.8 componentsInTimeZone(timezone as NSTimeZoneMBS, date as DateTime) as NSDateComponentsMBS

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns all the date components of a date, as if in a given time zone (instead of the receiving

calendar,Äôs time zone).
**Notes:** timezone: The time zone to use when returning the components. This value overrides the time zone of the receiving NSCalendar.
date: The date for which to perform the calculation.

Returns an NSDateComponents object containing all the components from the given date, calculated using the given time zone.
See also:

- 33.12.7 componentsInTimeZone(timezone as NSTimeZoneMBS, date as Date) as NSDateComponentsMBS 5921

### 33.12.9 Constructor

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates new calendar object with current calendar.
See also:

- 33.12.10 Constructor(identifier as string) 5922

### 33.12.10 Constructor(identifier as string)

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly-allocated NSCalendar object for the calendar specified by a given identifier.
See also:

- 33.12.9 Constructor 5922

### 33.12.11 copy as NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a copy of the calendar object.

### 33.12.12 currentCalendar as NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the logical calendar for the current user.
**Notes:** The returned calendar is formed from the settings for the current user's chosen system locale overlaid with any custom settings the user has specified in System Preferences. Settings you get from this calendar

do not change as System Preferences are changed, so that your operations are consistent (contrast with autoupdatingCurrentCalendar).

### 33.12.13 dateByAddingComponents(components as NSDateComponentsMBS, toDate as Date, Options as Integer = 0) as Date

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a date representing the absolute time calculated by adding given components to a given date.
**Notes:** components: The components to add to date.
date: The date to which comps are added.
options: Options for the calculation. See NSCalendarOptions in Apple documentation for possible values.

If you specify no options, overflow in a unit carries into the higher units (as in typical addition).

Returns a new date representing the absolute time calculated by adding to date the calendrical components specified by comps using the options specified by opts. Returns nil if date falls outside the defined range of the receiver or if the computation cannot be performed.

### 33.12.14 dateFromComponents(components as NSDateComponentsMBS) as Date

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a date representing the absolute time calculated from given components.
**Notes:** components: The components from which to calculate the returned date.

Returns a new Date object representing the absolute time calculated from comps. Returns nil if the receiver cannot convert the components given in comps into an NSDate object.

### 33.12.15 dateTimeByAddingComponents(components as NSDateComponentsMBS, toDate as DateTime, Options as Integer = 0) as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns a date representing the absolute time calculated by adding given components to a given date.
**Notes:** components: The components to add to date.
date: The date to which comps are added.
options: Options for the calculation. See NSCalendarOptions in Apple documentation for possible values.

If you specify no options, overflow in a unit carries into the higher units (as in typical addition).

Returns a new date representing the absolute time calculated by adding to date the calendrical components specified by comps using the options specified by opts. Returns nil if date falls outside the defined range of the receiver or if the computation cannot be performed.

### 33.12.16 dateTimeFromComponents(components as NSDateComponentsMBS) as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns a date representing the absolute time calculated from given components.
**Notes:** components: The components from which to calculate the returned date.

Returns a new Date object representing the absolute time calculated from comps. Returns nil if the receiver cannot convert the components given in comps into an NSDate object.

### 33.12.17 description as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The description for this timezone.

### 33.12.18 NSCalendarIdentifierBuddhist as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Buddhist calendar.

### 33.12.19 NSCalendarIdentifierChinese as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Chinese calendar.

### 33.12.20 NSCalendarIdentifierCoptic as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Coptic calendar.

### 33.12.21 NSCalendarIdentifierEthiopicAmeteAlem as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Ethiopic (Amete Alem) calendar.

### 33.12.22 NSCalendarIdentifierEthiopicAmeteMihret as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Ethiopic (Amete Mihret) calendar.

### 33.12.23 NSCalendarIdentifierGregorian as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Gregorian calendar.

### 33.12.24 NSCalendarIdentifierHebrew as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Hebrew calendar.

### 33.12.25 NSCalendarIdentifierIndian as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Indian calendar.

### 33.12.26 NSCalendarIdentifierIslamic as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Islamic calendar.

### 33.12.27 NSCalendarIdentifierIslamicCivil as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Islamic civil calendar.

### 33.12.28 NSCalendarIdentifierIslamicTabular as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for a tabular Islamic calendar.

### 33.12.29 NSCalendarIdentifierIslamicUmmAlQura as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Islamic Umm al-Qura calendar.

### 33.12.30 NSCalendarIdentifierISO8601 as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the ISO8601 calendar.

### 33.12.31 NSCalendarIdentifierJapanese as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Japanese calendar.

### 33.12.32 NSCalendarIdentifierPersian as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Persian calendar.

### 33.12.33 NSCalendarIdentifierRepublicOfChina as String

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** Identifier for the Republic of China calendar.

### 33.12.34 PMSymbol as string

MBS MacBase Plugin, Plugin Version: 22.5, Platform: macOS, Targets: All.

**Function:** The symbol used to represent ,ÄúPM,Äù for this calendar.

### 33.12.35 Print

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Writes the calendar to debug output.
**Notes:** This may help for debugging and you see output in console app.

### 33.12.36 Properties

### 33.12.37 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.12.38 firstWeekday as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The index of the first weekday.
**Notes:** (Read and Write computed property)

### 33.12.39 locale as NSLocaleMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The locale.
**Notes:** (Read and Write computed property)

### 33.12.40 minimumDaysInFirstWeek as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The minimum number of days in the first week.
**Notes:** (Read and Write computed property)

### 33.12.41 timeZone as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The time zone.
**Notes:** (Read and Write computed property)

### 33.12.42 Constants

Calendar Units

| Constant | Value | Description |
|---|---|---|
| kCFCalendarUnitDay | 16 | Specifies the day unit. |
| kCFCalendarUnitEra | 2 | Specifies the era unit. |
| kCFCalendarUnitHour | 32 | Specifies the hour unit. |
| kCFCalendarUnitMinute | 64 | Specifies the minute unit. |
| kCFCalendarUnitMonth | 8 | Specifies the month unit. |
| kCFCalendarUnitQuarter | 2048 | Specifies the quarter-year unit. |
| kCFCalendarUnitSecond | 128 | Specifies the second unit. |
| kCFCalendarUnitWeekday | 256 | Specifies the weekday unit. The weekday units are the numbers 1-N (where for the Gregorian cal N=7 and 1 is Sunday). |
| kCFCalendarUnitWeekdayOrdinal | 512 | Specifies the ordinal weekday unit. The weekday ordinal unit describes ordinal position within the month u the corresponding weekday unit. For example, in the Gregorian calen weekday ordinal unit of 2 for a weekday unit 3 indicates "the second Tu in the month". |
| kCFCalendarUnitWeekOfMonth | 4096 | Specifies the original week of a month calendar unit. |
| kCFCalendarUnitWeekOfYear | 8192 | Specifies the original week of the year calendar unit. |
| kCFCalendarUnitYear | 4) | Specifies the year unit. |
| kCFCalendarUnitYearForWeekOfYear | 16384 | Specifies the relative year for a week within a year calendar unit. |

## 33.13 class NSCharacterSetMBS

### 33.13.1 class NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** An NSCharacterSet object represents a set of Unicode-compliant characters.
**Example:**

```
// get the Symbol font
dim n as NSFontMBS = NSFontMBS.fontWithName("Symbol",10)

// what characters are defined for this font?
dim c as NSCharacterSetMBS = n.coveredCharacterSet

// display a string with all the characters
MsgBox c.StringValue
```

**Notes:** NSString and NSScanner objects use NSCharacterSet objects to group characters together for searching operations, so that they can find any of a particular set of characters during a search. The cluster's two public classes, NSCharacterSet and NSMutableCharacterSet, declare the programmatic interface for static and dynamic character sets, respectively.

The objects you create using these classes are referred to as character set objects (and when no confusion will result, merely as character sets). Because of the nature of class clusters, character set objects aren't actual instances of the NSCharacterSet or NSMutableCharacterSet classes but of one of their private subclasses. Although a character set object's class is private, its interface is public, as declared by these abstract superclasses, NSCharacterSet and NSMutableCharacterSet. The character set classes adopt the NSCopying and NSMutableCopying protocols, making it convenient to convert a character set of one type to the other.

The NSCharacterSet class declares the programmatic interface for an object that manages a set of Unicode characters (see the NSString class cluster specification for information on Unicode). NSCharacterSet's principal primitive method, characterIsMember:, provides the basis for all other instance methods in its interface. A subclass of NSCharacterSet needs only to implement this method, plus mutableCopyWithZone:, for proper behavior. For optimal performance, a subclass should also override bitmapRepresentation, which otherwise works by invoking characterIsMember: for every possible Unicode value.

NSCharacterSet is "toll-free bridged" with its Cocoa Foundation counterpart, CFCharacterSet Reference. This means that the Core Foundation type is interchangeable in function or method calls with the bridged Foundation object. Therefore, in a method where you see an NSCharacterSet * parameter, you can pass a CFCharacterSetRef, and in a function where you see a CFCharacterSetRef parameter, you can pass an NSCharacterSet instance (you cast one type to the other to suppress compiler warnings). See Interchangeable Data Types for more information on toll-free bridging.

The mutable subclass of NSCharacterSet is NSMutableCharacterSet.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

### 33.13.2 Methods

### 33.13.3 alphanumericCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the categories Letters, Marks, and Numbers.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.alphanumericCharacterSet
MsgBox left(n,200) // show only first 200 chars
```

**Notes:** Informally, this set is the set of all characters used as basic units of alphabets, syllabaries, ideographs, and digits.

### 33.13.4 bitmapRepresentation as MemoryBlock

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a memoryblock object encoding the receiver in binary format.
**Notes:** This format is suitable for saving to a file or otherwise transmitting or archiving.
A raw bitmap representation of a character set is a byte array of 2^16 bits (that is, 8192 bytes). The value of the bit at position n represents the presence in the character set of the character with decimal Unicode value n.

### 33.13.5 capitalizedLetterCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Titlecase Letters.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.capitalizedLetterCharacterSet
MsgBox n
```

### 33.13.6 characterIsMember(Character as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given character is in the receiver.
**Example:**

```
// get the Symbol font
dim n as NSFontMBS = NSFontMBS.fontWithName("Arial",10)

// what characters are defined for this font?
dim c as NSCharacterSetMBS = n.coveredCharacterSet

// is letter A part of this font?
MsgBox "A included: "+str(c.characterIsMember(asc("A")))
```

### 33.13.7 characterSetWithBitmapRepresentation(data as MemoryBlock) as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing characters determined by a given bitmap representation.
**Notes:** This method is useful for creating a character set object with data from a file or other external data source.

A raw bitmap representation of a character set is a byte array of 2^16 bits (that is, 8192 bytes). The value of the bit at position n represents the presence in the character set of the character with decimal Unicode value n.

### 33.13.8 characterSetWithCharactersInString(aString as string) as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in a given string.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.characterSetWithCharactersInString("Hello World")
MsgBox n
```

**Notes:** A character set containing the characters in aString. Returns an empty character set if aString is empty.

### 33.13.9 characterSetWithContentsOfFile(aString as string) as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set read from the bitmap representation stored in the file a given path.
**Notes:** To read a bitmap representation from any file, use the NSData methoddataWithContentsOfFile and pass the result to characterSetWithBitmapRepresentation.

This method doesn't use filenames to check for the uniqueness of the character sets it creates. To prevent duplication of character sets in memory, cache them and make them available through an API that checks whether the requested set has already been loaded.
See also:

- 33.13.10 characterSetWithContentsOfFile(file as folderitem) as NSCharacterSetMBS 5932

### 33.13.10 characterSetWithContentsOfFile(file as folderitem) as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set read from the bitmap representation stored in the file a given path.
**Notes:** To read a bitmap representation from any file, use the NSData.methoddataWithContentsOfFile and pass the result to characterSetWithBitmapRepresentation.

This method doesn't use filenames to check for the uniqueness of the character sets it creates. To prevent duplication of character sets in memory, cache them and make them available through an API that checks whether the requested set has already been loaded.
See also:

- 33.13.9 characterSetWithContentsOfFile(aString as string) as NSCharacterSetMBS 5932

### 33.13.11 characterSetWithRange(r as NSRangeMBS) as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing characters with Unicode values in a given range.
**Example:**

```
dim r as NSRangeMBS = NSMakeRangeMBS(asc("a"),26) // all small letters
dim n as NSCharacterSetMBS = NSCharacterSetMBS.characterSetWithRange(r)
MsgBox n
```

**Notes:** r: A range of Unicode values.

r.location is the value of the first character to return; aRange.location + r.length-1 is the value of the last.

Returns a character set containing characters whose Unicode values are given by aRange. If aRange.length is 0, returns an empty character set.

This code excerpt creates a character set object containing the lowercase English alphabetic characters:

### 33.13.12 componentsSeparatedByCharactersInSet(s as string) as String()

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns an array containing substrings from the receiver that have been divided by characters in a given set.
**Notes:** self: A character set containing the characters to to use to split the receiver. Must not be nil.
s: The text to process.

Returns an array of string containing substrings from the receiver that have been divided by characters in separator.

The substrings in the array appear in the order they did in the receiver. Adjacent occurrences of the separator characters produce empty strings in the result. Similarly, if the string begins or ends with separator characters, the first or last substring, respectively, is empty.

### 33.13.13 Constructor

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The constructor to create an empty character set.

### 33.13.14 controlCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the categories of Control or Format Characters.
**Notes:** These characters are specifically the Unicode values U+0000 to U+001F and U+007F to U+009F.

### 33.13.15 copy as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the character set.

### 33.13.16 decimalDigitCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Decimal Numbers.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.decimalDigitCharacterSet
MsgBox n
```

**Notes:** Informally, this set is the set of all characters used to represent the decimal values 0 through 9. These characters include, for example, the decimal digits of the Indic scripts and Arabic.

### 33.13.17 decomposableCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing all individual Unicode characters that can also be represented as composed character sequences.
**Notes:** Returns a character set containing all individual Unicode characters that can also be represented as composed character sequences (such as for letters with accents), by the definition of "standard decomposition" in version 3.2 of the Unicode character encoding standard.

These characters include compatibility characters as well as pre-composed characters.

Note: This character set doesn't currently include the Hangul characters defined in version 2.0 of the Unicode standard.

### 33.13.18 hasMemberInPlane(thePlane as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver has at least one member in a given character plane.
**Notes:** This method makes it easier to find the plane containing the members of the current character set. The Basic Multilingual Plane is plane 0.

### 33.13.19 illegalCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing values in the category of Non-Characters or that have not yet been defined in version 3.2 of the Unicode standard.

### 33.13.20 invertedSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing only characters that don't exist in the receiver.
**Notes:** Inverting an immutable character set is much more efficient than inverting a mutable character set.

### 33.13.21 isSupersetOfSet(theOtherSet as NSCharacterSetMBS) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver is a superset of another given character set.
**Notes:** Returns true if the receiver is a superset of theOtherSet, otherwise false.
Available in Mac OS X v10.2 and later.

### 33.13.22 letterCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the categories Letters and Marks.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.letterCharacterSet
MsgBox n
```

**Notes:** Informally, this set is the set of all characters used as letters of alphabets and ideographs.

### 33.13.23 longCharacterIsMember(theLongChar as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a given long character is a member of the receiver.
**Notes:** Returns true if theLongChar is in the receiver, otherwise false.
This method supports the specification of 32-bit characters.
Available in Mac OS X v10.2 and later.

### 33.13.24 lowercaseLetterCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Lowercase Letters.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.lowercaseLetterCharacterSet
MsgBox n
```

**Notes:** Informally, this set is the set of all characters used as lowercase letters in alphabets that make case distinctions.

### 33.13.25 mutableCopy as NSMutableCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the characterset.

### 33.13.26 newlineCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the newline characters.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.newlineCharacterSet
MsgBox n
```

**Notes:** A character set containing the newline characters (U+000A–U+000D, U+0085).
Available in Mac OS X v10.5 and later.

### 33.13.27 nonBaseCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Marks.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.nonBaseCharacterSet
MsgBox n
```

**Notes:** This set is also defined as all legal Unicode characters with a non-spacing priority greater than 0. Informally, this set is the set of all characters used as modifiers of base characters.

### 33.13.28 Operator_Convert as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a string containing all characters in this set.
**Example:**

```
dim r as NSRangeMBS = NSMakeRangeMBS(asc("a"),26) // all small letters
dim n as NSCharacterSetMBS = NSCharacterSetMBS.characterSetWithRange(r)
MsgBox n
```

**Notes:** This way you can use a characterset directly with functions expecting a string like msgbox.

### 33.13.29 punctuationCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Punctuation.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.punctuationCharacterSet
MsgBox n
```

**Notes:** Informally, this set is the set of all non-whitespace characters used to separate linguistic units in scripts, such as periods, dashes, parentheses, and so on.

### 33.13.30 rangeOfCharacterFromSet(s as string, options as Integer = 0, searchRange as NSRangeMBS = nil) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Finds and returns the range in the receiver of the first character from a given character set found in a given range with given options.
**Notes:** self: A character set. This value must not be nil.
s: The text to process:
options: A mask specifying search options. The following options may be specified by combining them with bitwise OR operator: NSAnchoredSearch (8), NSBackwardsSearch (4).
searchRange: Optional, the range in which to search. The range must not exceed the bounds of the receiver.

Raises a NSException if search range is invalid.

Returns the range in the receiver of the first character found from set within search range. Returns a range of { NSNotFound, 0 } if none of the characters in aSet are found.

Because pre-composed characters in set can match composed character sequences in the receiver, the length of the returned range can be greater than 1. For example, if you search for "√º" in the string "stru¬®del", the returned range is { 3,2 } .

Special Considerations
This method detects all invalid ranges (including those with negative lengths). For applications linked against OS X v10.6 and later, this error causes an exception; for applications linked against earlier releases, this error causes a warning, which is displayed just once per application execution.

### 33.13.31 stringByTrimmingCharactersInSet(s as string) as String

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns a new string made by removing from both ends of the receiver characters contained in a given character set.
**Notes:** Retruns a new string made by removing from both ends of the receiver characters contained in set.

If the receiver is composed entirely of characters from set, the empty string is returned.

Use whitespaceCharacterSet or whitespaceAndNewlineCharacterSet to remove whitespace around strings.

### 33.13.32 symbolCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the category of Symbols.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.symbolCharacterSet
MsgBox n
```

**Notes:** These characters include, for example, the dollar sign ($ ) and the plus (+) sign.
Available in Mac OS X v10.3 and later.

### 33.13.33 uppercaseLetterCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing the characters in the categories of Uppercase Letters and Titlecase Letters.
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.uppercaseLetterCharacterSet
MsgBox n
```

**Notes:** Informally, this set is the set of all characters used as uppercase letters in alphabets that make case distinctions.

### 33.13.34 whitespaceAndNewlineCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing only the whitespace characters space (U+0020) and tab (U+0009) and the newline and nextline characters (U+000A–U+000D, U+0085).
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.whitespaceAndNewlineCharacterSet
```

MsgBox n

### 33.13.35 whitespaceCharacterSet as NSCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a character set containing only the in-line whitespace characters space (U+0020) and tab (U+0009).
**Example:**

```
dim n as NSCharacterSetMBS = NSCharacterSetMBS.whitespaceCharacterSet
MsgBox n
```

**Notes:** This set doesn't contain the newline or carriage return characters.

### 33.13.36 Properties

### 33.13.37 CharacterCount as Integer

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: All.

**Function:** Queries the character count for this character set.
**Notes:** (Read only property)

### 33.13.38 Handle as Integer

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.13.39 StringValue as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a string containing all characters in this set.
**Example:**

```
// get the Symbol font
```

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Symbol",10)

// what characters are defined for this font?
dim c as NSCharacterSetMBS = n.coveredCharacterSet

// display a string with all the characters
MsgBox c.StringValue
```

**Notes:** Changed to property in v24.1.
(Read only property)

### 33.13.40 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSOpenStepUnicodeReservedBase | &hF400 | A constant to specify lower bound for a Unicode character range reserved Apple's corporate use.<br>Specifies lower bound for a Unicode character range reserved for Apple's porate use (the range is 0xF400–0xF8FF). |

## 33.14 class NSCoderMBS

### 33.14.1 class NSCoderMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The plugin class for NSCoder.
**Example:**

```
// make archiver
dim a as new NSKeyedArchiverMBS

// add a string
a.encodeString "Hello World", "Greeting"

// finish
a.finishEncoding

// query data
dim m as MemoryBlock = a.archiverData

// start unarchiver
dim u as new NSKeyedUnarchiverMBS(m)

// query and display a value
dim s as string = u.decodeString("Greeting")
MsgBox s
```

**Notes:** The NSCoder abstract class declares the interface used by concrete subclasses to transfer objects and other Objective-C data items between memory and some other format. This capability provides the basis for archiving (where objects and data items are stored on disk) and distribution (where objects and data items are copied between different processes or threads). The concrete subclasses provided by Foundation for these purposes are NSArchiver, NSUnarchiver, NSKeyedArchiver, NSKeyedUnarchiver, and NSPortCoder. Concrete subclasses of NSCoder are referred to in general as coder classes, and instances of these classes as coder objects (or simply coders). A coder object that can only encode values is referred to as an encoder object, and one that can only decode values as a decoder object.

NSCoder operates on objects, scalars, C arrays, structures, and strings, and on pointers to these types. It does not handle types whose implementation varies across platforms, such as union, void *, function pointers, and long chains of pointers. A coder object stores object type information along with the data, so an object decoded from a stream of bytes is normally of the same class as the object that was originally encoded into the stream. An object can change its class when encoded, however; this is described in Archives and Serializations Programming Guide.

For details of how to create a subclass of NSCoder, see "Subclassing NSCoder" in Archives and Serializations

Programming Guide.

The plugin implements this class because it is needed to encode and decode the window state.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1
- MBS Real Studio Plugins, version 11.3pr2
- MBS Real Studio Plugins, version 11.2pr11

### 33.14.2 Methods

### 33.14.3 allowsKeyedCoding as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver supports keyed coding of objects.
**Notes:** The default implementation returns false. Concrete subclasses that support keyed coding, such as NSKeyedArchiver, need to override this method to return true.

### 33.14.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 33.14.5 containsValueForKey(key as string) as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether an encoded value is available for a string.

### 33.14.6 decodeBool(key as string) as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes and returns a boolean value that was previously encoded with encodeBool and associated with the string key.

### 33.14.7 decodeBytes(key as string) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes a buffer of data whose types are unspecified.

### 33.14.8 decodeCFObjectMBS(key as string) as Variant

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Decodes CFObject object.
**Notes:** This is a special convenience methods to decode CF* classes which are bridged to Cocoa objects. Like CFDictionary, CFURL, CFData, CFString, CFNumber, CFArray and a few others.

### 33.14.9 decodeDictionary(key as string) as Dictionary

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Decodes a dictionary.

### 33.14.10 decodeDouble(key as string) as Double

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes and returns a double value that was previously encoded with either encodeFloat or encodeDouble and associated with the string key.

### 33.14.11 decodeFloat(key as string) as single

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes and returns a float value that was previously encoded with encodeFloat or encodeDouble and associated with the string key.

### 33.14.12 decodeInt32(key as string) as Int32

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes and returns a 32-bit integer value that was previously encoded with encodeInt, encodeInteger, encodeInt32, or encodeInt64 and associated with the string key.

**Notes:** If the encoded integer does not fit into a 32-bit integer, the method raises an NSRangeException.

### 33.14.13 decodeInt64(key as string) as Int64

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Decodes and returns a 64-bit integer value that was previously encoded with encodeInt, encodeInteger, encodeInt32, or encodeInt64 and associated with the string key.

### 33.14.14 decodeNSURLFile(key as string) as folderitem

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Decodes an NSURL and returns folderitem.

### 33.14.15 decodeNSURLString(key as string) as String

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Decodes an NSURL and returns string.

### 33.14.16 decodePoint(key as string) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decodes a point object.

### 33.14.17 decodeRect(key as string) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decodes a rectangle.

### 33.14.18 decodeSize(key as string) as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decodes a size object.

### 33.14.19 decodeString(key as string) as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Decodes a string.

### 33.14.20 decodeTypedStream(Data as MemoryBlock) as variant

MBS MacBase Plugin, Plugin Version: 23.2, Platform: macOS, Targets: All.

**Function:** Decodes an old and deprecated typedstream data block.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.bin")
Dim b As BinaryStream = BinaryStream.Open(f)
Dim s As String = b.Read(B.Length)
Dim v As Variant = NSCoderMBS.decodeTypedStream(s)

Break // check in debugger
```

### 33.14.21 encodeBool(value as boolean, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes value and associates it with the string key.

### 33.14.22 encodeBytes(value as MemoryBlock, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes a buffer of data whose types are unspecified.

### 33.14.23 encodeCFObjectMBS(value as Variant, key as string)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Encodes a CFObject.
**Notes:** This is a special convenience methods to encode CF* classes which are bridged to Cocoa objects.

Like CFDictionary, CFURL, CFData, CFString, CFNumber, CFArray and a few others.

### 33.14.24 encodeDictionary(value as Dictionary, key as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Encodes a dictionary.
**Notes:** Not all objects can be inside the dictionary.
Cocoa objects, string, booleans and numbers are okay.

### 33.14.25 encodeDouble(value as Double, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes value and associates it with the string key.

### 33.14.26 encodeFloat(value as single, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes value and associates it with the string key.

### 33.14.27 encodeInt32(value as Int32, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes the 32-bit integer value and associates it with the string key.

### 33.14.28 encodeInt64(value as Int64, key as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Encodes the 64-bit integer value and associates it with the string key.

### 33.14.29 encodeNSURLFile(value as folderitem, key as string)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Encodes a folderitem as NSURL.

### 33.14.30 encodeNSURLString(value as String, key as string)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Encodes a string with URL as NSURL object.

### 33.14.31 encodePoint(value as NSPointMBS, key as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Encodes a point object.

### 33.14.32 encodeRect(value as NSRectMBS, key as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Encodes a rectangle.

### 33.14.33 encodeSize(value as NSSizeMBS, key as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Encodes a size object.

### 33.14.34 encodeString(value as string, key as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Encodes a string.

### 33.14.35 systemVersion as Integer

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** During encoding, this method should return the system version currently in effect.
**Notes:** During decoding, this method should return the version that was in effect when the data was encoded.

By default, this method returns the current system version, which is appropriate for encoding but not for decoding. Subclasses that implement decoding must override this method to return the system version of the data being decoded.

### 33.14.36 Properties

### 33.14.37 Handle as Integer

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for this object.
**Notes:** (Read and Write property)

## 33.15 class NSCursorMBS

### 33.15.1 class NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Instances of the NSCursor class manage the appearance of the cursor.
**Example:**

```
Dim im As NSImageMBS
Dim p As Picture
Dim m As Picture
Dim theCursor As NSCursorMBS
Dim test As Boolean

// create a blue ball picture
p = New Picture(16,16,32)
p.Graphics.ForeColor = &c0000FF
p.Graphics.FillRect 0,0,16,16

m = New Picture(16,16,32)
m.Graphics.ForeColor = &c000000
m.Graphics.Filloval 0,0,16,16

// Create a new NSImage
im=New NSImageMBS(p,m)

// Create a cursor from the NSImage
theCursor=New NSCursorMBS(im, 10, 10)

Title = Str(theCursor.Handle)

// Make this the active cursor
theCursor.set

// display picture
p.Mask.Graphics.DrawPicture m,0,0
Backdrop = p

// so you see it for a second before RB resets the cursor
DelayMBS 1.0
```

**Notes:** In Cocoa, you can change the currently displayed cursor based on the position of the mouse over one of your views. You might use this technique to provide visual feedback about what actions the user can take with the mouse. For example, you might display one of the resize cursors whenever the mouse moves over a portion of your view that acts as a custom resizing handle. To set this up, you associate a cursor

object with one or more cursor rectangles in the view.

Cursor rectangles are a specialized type of tracking rectangles, which are used to monitor the mouse location in a view. Views implement cursor rectangles using tracking rectangles but provide methods for setting and refreshing cursor rectangles that are distinct from the generic tracking rectangle interface. For information on how to set up cursor rectangles, see "Handling Tracking-Rectangle and Cursor-Update Events in Views".
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr3
- MBS Real Studio Plugins, version 11.2pr9
- MBS REALbasic plug-in 9.6
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 33.15.2 Methods

### 33.15.3 arrowCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default cursor, the arrow cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.arrowCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The default cursor, a slanted arrow with its hot spot at the tip. The arrow cursor is the one you're used to seeing over buttons, scrollers, and many other objects in the window system.

### 33.15.4 closedHandCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the closed-hand system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.closedHandCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

### 33.15.5 Constructor(image as NSImageMBS, foregroundColorHint as NSColorMBS, backgroundColorHint as NSColorMBS, HotSpotX as Double, HotSpotY as Double)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the cursor with the specified image and hot spot.
See also:

- 33.15.6 Constructor(image as NSImageMBS, HotSpotX as Double, HotSpotY as Double) 5952

### 33.15.6 Constructor(image as NSImageMBS, HotSpotX as Double, HotSpotY as Double)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the cursor with the specified image and hot spot.
See also:

- 33.15.5 Constructor(image as NSImageMBS, foregroundColorHint as NSColorMBS, backgroundColorHint as NSColorMBS, HotSpotX as Double, HotSpotY as Double) 5952

### 33.15.7 contextualMenuCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the contextual menu system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.contextualMenuCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.15.8 crosshairCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the cross-hair system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.crosshairCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** This cursor is used for situations when precise location is required (where the lines cross is the hot spot).

### 33.15.9 currentCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the application's current cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.currentCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The top cursor on the application's cursor stack. This cursor may not be the visible cursor on the screen if a different application is currently active.

### 33.15.10 currentSystemCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.currentSystemCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Returns a cursor whose image and hot spot match those of the currently-displayed cursor on the system.
This method returns the current system cursor regardless of which application set the cursor, and whether

Cocoa or Carbon APIs were used to set it.
This method replaces the now deprecated QDGetCursorData function.
Available in Mac OS X v10.6 and later.

### 33.15.11 disappearingItemCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a cursor indicating that the current operation will result in a disappearing item.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.disappearingItemCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The system cursor that indicates that the current operation will result in a disappearing item (for example, when dragging an item from the dock or a toolbar).

Available in Mac OS X v10.3 and later.

### 33.15.12 dragCopyCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a cursor indicating that the current operation will result in a copy action.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.dragCopyCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.15.13 dragLinkCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a cursor indicating that the current operation will result in a link action.

**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.dragLinkCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.15.14 hide

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Makes the current cursor invisible.
**Notes:** If another cursor becomes current, that cursor will be invisible, too. It will remain invisible until you invoke the unhide method.

hide overrides setHiddenUntilMouseMoves.

### 33.15.15 hotSpotX as Double

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the position of the cursor's hot spot.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.arrowCursor

MsgBox str(c.hotSpotX)+"/"+str(c.hotSpotY)
```

**Notes:** The point describing the position of the hot spot, specified according to the cursor's flipped coordinate system.

For a more complete explanation, see the class description.

Note that an NSCursor object is immutable: you cannot change its hot spot after it's created. Instead, use the Constructor to create a new cursor with the new settings.

### 33.15.16 hotSpotY as Double

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the position of the cursor's hot spot.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.arrowCursor

MsgBox str(c.hotSpotX)+"/"+str(c.hotSpotY)
```

**Notes:** The point describing the position of the hot spot, specified according to the cursor's flipped coordinate system.

For a more complete explanation, see the class description.

Note that an NSCursor object is immutable: you cannot change its hot spot after it's created. Instead, use the Constructor to create a new cursor with the new settings.

### 33.15.17 IBeamCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a cursor that looks like a capital I with a tiny crossbeam at its middle.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.IBeamCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The I-beam cursor. This is the cursor that you're used to seeing over editable or selectable text. The I-beam cursor's default hot spot is where the crossbeam intersects the I.

### 33.15.18 IBeamCursorForVerticalLayout as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a cursor that looks like a capital I with a tiny crossbeam at its middle.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.IBeamCursorForVerticalLayout
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X 10.7.

### 33.15.19 image as NSImageMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's image.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.arrowCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The cursor image or nil if none exists

Note that an NSCursor object is immutable: you cannot change its image after it's created. Instead, use the constructor to create a new cursor with the new settings.

### 33.15.20 isSetOnMouseEntered as boolean

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the receiver becomes current on receiving a mouseEntered message.
**Notes:** True if the receiver will become current when it receives a mouseEntered message; otherwise, false.

To receive such a message, the receiver must first be assigned a cursor rectangle. This assignment can be made using the NSView method addCursorRect. For a more complete explanation, see the class description.

### 33.15.21 isSetOnMouseExited as boolean

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the receiver becomes current when it receives a mouseExited: message.
**Notes:** True if the receiver becomes current when it receives a mouseExited: message; otherwise, false.

To receive such a message, the receiver must first be assigned a cursor rectangle. This assignment can be made using the NSView method addCursorRect. For a more complete explanation, see the class description.

### 33.15.22 mouseEntered(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Automatically sent to the receiver when the cursor enters a cursor rectangle owned by the receiver.
**Notes:** If used after setOnMouseEntered has been called with an argument of true, mouseEntered can make the receiver the current cursor.

In your programs, you won't invoke mouseEntered explicitly. It's only included in the class interface so you can override it.

For a more complete explanation, see "Handling Tracking-Rectangle and Cursor-Update Events in Views" and the NSView method addTrackingRect

### 33.15.23 mouseExited(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Automatically sent to the receiver when the cursor exits a cursor rectangle owned by the receiver.
**Notes:** Like mouseEntered, this message is part of the class interface only so you can override it.

For a more complete explanation, see "Handling Tracking-Rectangle and Cursor-Update Events in Views" and the NSView method addTrackingRect.

### 33.15.24 openHandCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the open-hand system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.openHandCursor
```

```
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X v10.3 and later.

### 33.15.25 operationNotAllowedCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the operation not allowed cursor.
**Notes:** This cursor indicates that the operation that is being attempted, perhaps dragging to an item that can't accept the drag type, is being denied.

Available in Mac OS X v10.6 and later.

### 33.15.26 pointingHandCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the pointing-hand system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.pointingHandCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The pointing-hand cursor. The tip of the pointing finger is the hot spot.

### 33.15.27 pop

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sends a pop message to the receiver's class.
See also:

- 33.15.28 pop

### 33.15.28 pop

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Pops the current cursor off the top of the stack.
**Notes:** The new object on the top of the stack becomes the current cursor. If the current cursor is the only cursor on the stack, this method does nothing.
See also:

- 33.15.27 pop 5959

### 33.15.29 push

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Puts the receiver on top of the cursor stack and makes it the current cursor.

### 33.15.30 resizeDownCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-down system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeDownCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-down cursor. This cursor is used when moving or resizing an object to indicate that the user can move only in the indicated direction.

Available in Mac OS X v10.3 and later.

### 33.15.31 resizeLeftCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-left system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeLeftCursor
```

```
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-left cursor. This cursor is used when moving or resizing an object to indicate that the user can move only in the indicated direction.

Available in Mac OS X v10.3 and later.

### 33.15.32 resizeLeftRightCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-left-and-right system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeLeftRightCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-left-and-right cursor. This cursor is used when moving or resizing an object and the object can be moved left or right.

Available in Mac OS X v10.3 and later.

### 33.15.33 resizeRightCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-right system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeRightCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-right cursor. This cursor is used when moving or resizing an object to indicate that the user can move only in the indicated direction.

Available in Mac OS X v10.3 and later.

### 33.15.34 resizeUpCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-up system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeUpCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-up cursor. This cursor is used when moving or resizing an object to indicate that the user can move only in the indicated direction.

Available in Mac OS X v10.3 and later.

### 33.15.35 resizeUpDownCursor as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the resize-up-and-down system cursor.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.resizeUpDownCursor
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

**Notes:** The resize-up-and-down cursor. This cursor is used when moving or resizing an object and the object can be moved up or down.

Available in Mac OS X v10.3 and later.

### 33.15.36 ringCursorWithDiameter(diameter as Double) as NSCursorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Creates a ring cursor with the given size.
**Example:**

```
// shows cursor in window
dim c as NSCursorMBS = NSCursorMBS.ringCursorWithDiameter(20)
dim i as NSImageMBS = c.image
window1.Backdrop=i.CopyPictureWithMask
```

### 33.15.37 set

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Makes the receiver the current cursor.
**Notes:** If your application is not the front application, the system will ignore this set message!

### 33.15.38 setHiddenUntilMouseMoves(value as boolean)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets whether the cursor is hidden until the mouse moves.
**Notes:** value: True to hide the cursor until one of the following occurs:
The mouse moves.
You invoke the method again, with flag set to false.

Do not try to counter this method by invoking unhide. The results are undefined.

### 33.15.39 setOnMouseEntered(flag as boolean)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** pecifies whether the receiver accepts mouseEntered: events.
**Notes:** True if the receiver accepts future mouseEntered event messages; otherwise it ignores them.

Accepting mouseEntered event messages allows the cursor to be made the current cursor when the cursor enters a view's cursor rectangle.

### 33.15.40 setOnMouseExited(flag as boolean)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets whether the receiver accepts mouseExited events.
**Notes:** flag: True if the receiver accepts future mouseExited: event messages; otherwise it ignores them.

Accepting mouseExited event messages allows the cursor to be made the current cursor when the cursor exits a view's cursor rectangle.

### 33.15.41 unhide

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Negates an earlier call to hide by showing the current cursor.

### 33.15.42 Properties

### 33.15.43 Handle as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal used NSCursor reference.
**Notes:** (Read and Write property)

## 33.16 class NSDateComponentsMBS

### 33.16.1 class NSDateComponentsMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** NSDateComponents encapsulates the components of a date in an extendable, object-oriented manner.
**Notes:** It is used to specify a date by providing the temporal components that make up a date and time: hour, minutes, seconds, day, month, year, and so on. It can also be used to specify a duration of time, for example, 5 hours and 16 minutes. An NSDateComponents object is not required to define all the component fields. When a new instance of NSDateComponents is created the date components are set to NSUndefinedDateComponent.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr1
- MBS Real Studio Plugins, version 12.3pr11

### 33.16.2 Methods

### 33.16.3 Constructor

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates new date components object.

### 33.16.4 copy as NSDateComponentsMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a copy of the date component object.

### 33.16.5 isValidDateInCalendar(calendar as NSCalendarMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the current combination of properties represents a date which exists in the specified calendar.
**Notes:** calendar: The calendar for which to use in the calculation.

Returns yes if the date corresponding to the receiver's values is valid and exists in the given calendar, otherwise no.

If the timeZone property is set on the receiver, the time zone property value is used.
This property should not be used for NSDateComponents objects that represent relative quantities of calendar components.

### 33.16.6 NSUndefinedDateComponent as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** This constant specifies that an NSDateComponents component is undefined.

### 33.16.7 Print

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Writes the date components to debug output.
**Notes:** This may help for debugging and you see output in console app.

### 33.16.8 Properties

### 33.16.9 calendar as NSCalendarMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The calendar.
**Notes:** (Read and Write property)

### 33.16.10 date as date

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date.
**Notes:** Available in Mac OS X v10.7 and later.
(Read only property)

### 33.16.11 dateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date.
**Notes:** Available in Mac OS X v10.7 and later.
(Read only property)

### 33.16.12 day as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of day units.
**Notes:** (Read and Write property)

### 33.16.13 description as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns description of the calendar object.
**Notes:** (Read only property)

### 33.16.14 era as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of era units.
**Notes:** (Read and Write property)

### 33.16.15 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.16.16 hour as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of hour units.
**Notes:** (Read and Write property)

### 33.16.17 isLeapMonth as Boolean

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Whether it is leap month.
**Notes:** Available on Mac OS X 10.8.
(Read and Write property)

### 33.16.18 isValidDate as Boolean

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the current combination of properties represents a date which exists in the current calendar.
**Notes:** If the timeZone property is set on the receiver, the time zone property value is used. If the calendar property is not set on the receiver, nil is returned.
(Read only property)

### 33.16.19 minute as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of minute units.
**Notes:** (Read and Write property)

### 33.16.20 month as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of month units.
**Notes:** (Read and Write property)

### 33.16.21 quarter as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of quarters.
**Notes:** (Read and Write property)

### 33.16.22 second as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of second units.
**Notes:** (Read and Write property)

### 33.16.23 timeZone as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The time zone.
**Notes:** (Read and Write property)

### 33.16.24 week as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of week units.
**Notes:** (Read and Write property)

### 33.16.25 weekday as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of weekday units.
**Notes:** Weekday units are the numbers 1 through n, where n is the number of days in the week. For example, in the Gregorian calendar, n is 7 and Sunday is represented by 1.
(Read and Write property)

### 33.16.26 weekdayOrdinal as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The ordinal number of weekday units.
**Notes:** Weekday ordinal units represent the position of the weekday within the next larger calendar unit, such as the month. For example, 2 is the weekday ordinal unit for the second Friday of the month.

(Read and Write property)

### 33.16.27 weekOfMonth as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The week of the month.
**Notes:** (Read and Write property)

### 33.16.28 weekOfYear as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The week of the year.
**Notes:** (Read and Write property)

### 33.16.29 year as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The number of year unit.
**Notes:** (Read and Write property)

### 33.16.30 yearForWeekOfYear as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The year for the week of the year.
**Notes:** (Read and Write property)

## 33.17 class NSDateIntervalMBS

### 33.17.1 class NSDateIntervalMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An object representing the span of time between a specific start date and end date.
**Notes:** An NSDateIntervalMBS object represents a closed interval between two dates. The NSDateIntervalMBS class provides a programmatic interface for calculating the duration of a time interval and determining whether a date falls within it, as well as comparing date intervals and checking to see whether they intersect.
An NSDateIntervalMBS object consists of a startDate and an endDate. The startDate and endDate of a date interval can be equal, in which case its duration is 0. However, endDate cannot occur earlier than startDate.
You can use the NSDateIntervalFormatter class to create string representations of NSDateIntervalMBS objects that are suitable for display in the current locale.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr3

### 33.17.2 Methods

### 33.17.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Checks whether the class is available.
**Notes:** Returns true on MacOS 10.12 or newer.

### 33.17.4 compare(DateInterval as NSDateIntervalMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Compares the receiver with the specified date interval.
**Notes:** dateInterval: The date interval with which to compare the receiver.

Returns an NSComparisonResult value that indicates the temporal ordering of the receiver and a given date interval:
NSOrderedAscending (-1) if the receiver,Äôs startDate occurs earlier than that of dateInterval, or both startDate values are equal and the duration of the receiver is less than that of dateInterval.
NSOrderedDescending (1) if the receiver,Äôs startDate occurs later than that of dateInterval, or both startDate values are equal and the duration of the receiver is greater than that of dateInterval.

NSOrderedSame (0) if the receiver,Äôs startDate and duration values are equal to those of dateInterval.

### 33.17.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Initializes a date interval by setting the start and end date to the current date.
See also:


- 33.17.6 Constructor(startDate as date, duration as double) 5972
- 33.17.7 Constructor(startDate as date, endDate as date) 5972
- 33.17.8 Constructor(startDate as dateTime, endDate as dateTime) 5973


### 33.17.6 Constructor(startDate as date, duration as double)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a date interval with a given start date and duration.
**Notes:** startDate: The start date of the date interval.
duration: The duration from the start date for the date interval.

This method raises an NSExceptionMBS if duration is less than 0.
See also:


- 33.17.5 Constructor 5972
- 33.17.7 Constructor(startDate as date, endDate as date) 5972
- 33.17.8 Constructor(startDate as dateTime, endDate as dateTime) 5973


### 33.17.7 Constructor(startDate as date, endDate as date)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a date interval from a given start date and end date.
**Notes:** startDate: The start date of the date interval.
endDate: The end date of the date interval.

This method raises an NSExceptionMBS if endDate occurs earlier than startDate.
See also:


- 33.17.5 Constructor 5972

- 33.17.6 Constructor(startDate as date, duration as double) 5972
- 33.17.8 Constructor(startDate as dateTime, endDate as dateTime) 5973


### 33.17.8 Constructor(startDate as dateTime, endDate as dateTime)

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Initializes a date interval from a given start date and end date.
**Notes:** startDate: The start date of the date interval.
endDate: The end date of the date interval.

This method raises an NSExceptionMBS if endDate occurs earlier than startDate.
See also:


- 33.17.5 Constructor 5972
- 33.17.6 Constructor(startDate as date, duration as double) 5972
- 33.17.7 Constructor(startDate as date, endDate as date) 5972


### 33.17.9 containsDate(date as date) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver contains the specified date.
**Notes:** date: The date for which to test membership of the date interval.

Returns true if the receiver contains date. Otherwise, false.

### 33.17.10 containsDateTime(date as dateTime) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver contains the specified date.
**Notes:** date: The date for which to test membership of the date interval.

Returns true if the receiver contains date. Otherwise, false.

### 33.17.11 copy as NSDateIntervalMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 33.17.12 intersectionWithDateInterval(DateInterval as NSDateIntervalMBS) as NSDateIntervalMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Returns the intersection between the receiver and the specified date interval.
**Notes:** dateInterval: The date interval with which to calculate the intersection of the receiver.

Returns a date interval for the intersection of the receiver and dateInterval, or nil if no intersection occurs.

Calculating the intersection of date intervals is a commutative and associative operation. The intersection of a date interval with itself is equal to itself.

### 33.17.13 intersectsDateInterval(DateInterval as NSDateIntervalMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver intersects with the specified date interval.
**Notes:** dateInterval: The date interval with which to check the receiver for intersection.

See intersectionWithDateInterval for more information about determining whether two date intervals intersect.

### 33.17.14 isEqualToDateInterval(DateInterval as NSDateIntervalMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver is equal to the specified date interval.
**Notes:** dateInterval: The date interval with which to check the receiver for equality.

Returns true if the startDate and duration of dateInterval and the receiver are equal. Otherwise, false.

### 33.17.15 Operator_Compare(DateInterval as NSDateIntervalMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The compare operator to use in Xojo.

### 33.17.16 Properties

### 33.17.17 duration as Double

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The duration of the date interval.
**Notes:** In seconds.
(Read only property)

### 33.17.18 endDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The end date of the date interval.
**Notes:** (Read only property)

### 33.17.19 endDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The end date of the date interval.
**Notes:** (Read only property)

### 33.17.20 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.17.21 startDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The start date of the date interval.
**Notes:** (Read only property)

### 33.17.22 startDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The start date of the date interval.
**Notes:** (Read only property)

# 33.18 class NSDirectoryEnumeratorMBS

## 33.18.1 class NSDirectoryEnumeratorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** An NSDirectoryEnumerator object enumerates the contents of a directory, returning the pathnames of all files and directories contained within that directory.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
dim f as string = d.nextObject

while len(f)>0
List.AddRow f

f=d.nextObject
wend
```

**Notes:** These pathnames are relative to the directory.

An enumeration is recursive, including the files of all subdirectories, and crosses device boundaries. An enumeration does not resolve symbolic links, or attempt to traverse symbolic links that point to directories. Subclass of the NSEnumeratorMBS class.
**Blog Entries**

- NSBundleMBS and NSDirectoryEnumeratorMBS

## 33.18.2 Methods

## 33.18.3 Constructor(folder as folderitem)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSDirectoryEnumerator object that enumerates the contents of the directory at a given path.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)

MsgBox d.nextObject // shows ".DS_Store" or some other file name
```

**Notes:** An NSDirectoryEnumerator object that enumerates the contents of the directory at path.
If path is a filename, the method returns an enumerator object that enumerates no files—the first call to

nextObject will return nil.

Because the enumeration is deep—that is, it lists the contents of all subdirectories—this enumerator object is useful for performing actions that involve large file-system subtrees. This method does not resolve symbolic links encountered in the traversal process, nor does it recurse through them if they point to a directory.
See also:


- 33.18.4 Constructor(path as string) 5978


### 33.18.4 Constructor(path as string)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSDirectoryEnumerator object that enumerates the contents of the directory at a given path.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS("/Applications")
dim f as FolderItem = d.nextFile

while f<>Nil
List.AddRow f.Name

// if this is a folder, we skip the sub folders
d.skipDescendents

f=d.nextFile
wend
```

**Notes:** An NSDirectoryEnumerator object that enumerates the contents of the directory at path.
If path is a filename, the method returns an enumerator object that enumerates no files—the first call to nextObject will return nil.

Because the enumeration is deep—that is, it lists the contents of all subdirectories—this enumerator object is useful for performing actions that involve large file-system subtrees. This method does not resolve symbolic links encountered in the traversal process, nor does it recurse through them if they point to a directory.
See also:


- 33.18.3 Constructor(folder as folderitem) 5977


### 33.18.5 Destructor

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The destructor for this class.

### 33.18.6 directoryAttributes as dictionary

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an Dictionary object that contains the attributes of the directory at which enumeration started.

### 33.18.7 fileAttributes as dictionary

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an object that contains the attributes of the most recently returned file or subdirectory (as referenced by the pathname).
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
dim f as FolderItem = d.nextFile

while f<>Nil
List.AddRow f.Name

dim di as Dictionary = d.fileAttributes
dim size as int64 = di.Value(d.NSFileSize)

List.AddRow f.Name+" ("+str(size)+" Bytes)"

f=d.nextFile
wend
```

### 33.18.8 level as Integer

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the number of levels deep the current object is in the directory hierarchy being enumerated.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
dim f as FolderItem = d.nextFile

while f<>Nil
```

```
List.AddRow f.Name+" "+str(d.level)

f=d.nextFile
wend
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.18.9 nextFile as folderitem

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the next folderitem from the collection being enumerated.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
dim f as string = d.nextObject

while len(f)>0
List.AddRow f

f=d.nextObject
wend
```

**Notes:** The next folderitem from the collection being enumerated, or nil when all objects have been enumerated.

Same as nextObject, but returns a folderitem.

### 33.18.10 NSFileAppendOnly as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file is read-only.

### 33.18.11 NSFileBusy as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file is busy.

### 33.18.12 NSFileCreationDate as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's creation date.

### 33.18.13 NSFileDeviceIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the identifier for the device on which the file resides.

### 33.18.14 NSFileExtensionHidden as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** he key in a file attribute dictionary whose value indicates whether the file's extension is hidden.

### 33.18.15 NSFileGroupOwnerAccountID as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's group ID.

### 33.18.16 NSFileGroupOwnerAccountName as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the group name of the file's owner.

### 33.18.17 NSFileHFSCreatorCode as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's HFS creator code.

### 33.18.18 NSFileHFSTypeCode as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's HFS type code.

### 33.18.19 NSFileImmutable as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file is mutable.

### 33.18.20 NSFileModificationDate as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's last modified date.

### 33.18.21 NSFileOwnerAccountID as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's owner's account ID.

### 33.18.22 NSFileOwnerAccountName as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the name of the file's owner.

### 33.18.23 NSFilePosixPermissions as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's Posix permissions.

### 33.18.24 NSFileReferenceCount as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's reference count.

### 33.18.25 NSFileSize as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
dim f as FolderItem = d.nextFile

while f<>Nil
List.AddRow f.Name

dim di as Dictionary = d.fileAttributes
dim size as int64 = di.Value(d.NSFileSize)

List.AddRow f.Name+" ("+str(size)+" Bytes)"

f=d.nextFile
wend
```

**Notes:** The key in a file attribute dictionary whose value indicates the file's size in bytes.

### 33.18.26 NSFileSystemFileNumber as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's filesystem file number.

### 33.18.27 NSFileSystemFreeNodes as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file system attribute dictionary dictionary whose value indicates the number of free nodes in the file system.

### 33.18.28 NSFileSystemFreeSize as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file system attribute dictionary whose value indicates the amount of free space on the file system.

### 33.18.29 NSFileSystemNodes as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file system attribute dictionary dictionary whose value indicates the number of free nodes in the file system.

### 33.18.30 NSFileSystemNumber as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file system attribute dictionary dictionary whose value indicates the filesystem number of the file system.

### 33.18.31 NSFileSystemSize as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file system attribute dictionary whose value indicates the size of the file system.

### 33.18.32 NSFileType as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the attributes dictionaries.
**Notes:** The key in a file attribute dictionary whose value indicates the file's type.

### 33.18.33 NSFileTypeBlockSpecial as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Block special file

### 33.18.34 NSFileTypeCharacterSpecial as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Character special file

### 33.18.35 NSFileTypeDirectory as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Directory

### 33.18.36 NSFileTypeRegular as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Regular file

### 33.18.37 NSFileTypeSocket as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Socket

### 33.18.38 NSFileTypeSymbolicLink as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Symbolic link

### 33.18.39 NSFileTypeUnknown as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** One of the constants for the file type property.
**Notes:** Unknown

### 33.18.40 Path as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The path used in the constructor.

### 33.18.41 skipDescendents

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Causes the receiver to skip recursion into the most recently obtained subdirectory.

## 33.19 class NSDockTileMBS

### 33.19.1 class NSDockTileMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The cocoa class to customize the dock tile.
**Notes:** The NSDockTile class lets you customize the visual representation for your application's miniaturized windows and application icon as they appear in the Dock. You do not create Dock tile objects explicitly in your application. Instead, you retrieve the Dock tile for an existing window or for the application by calling that object's dockTile method.

Typically, you do not subclass the NSDockTile class. Instead, you use the methods of the class to make the following customizations:

- Badge the tile with a custom string.
- Remove or show the application icon badge.
- Draw the tile content yourself.

If you decide to draw the tile content yourself, you must provide a custom content view to handle the drawing.

Application Dock Tiles

An application Dock tile defaults to display the application's applicationIconImage.

The application Dock tile never shows a smaller application icon badge.

Whether using the default or custom view, the application Dock tile may be badged with a short custom string.

Window Dock Tiles

A window Dock tile defaults to display a miniaturized version of the windows contents with a badge derived from the application Dock icon, including any customized application Dock icon. The default window Dock tile image may not be badged with a custom string.

A window Dock tile can use a custom view to draw the Dock icon. If a custom view is used, no application badge will be added, but the text label will be overlaid on top of the icon.

Available in Mac OS X v10.5 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr9

### 33.19.2 Methods

### 33.19.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 33.19.4 display

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Redraws the dock tile's content.
**Notes:** If a custom content view is provided, Cocoa calls the drawRect method of that view (and its subviews) to draw the tile's content.

You can call this method to force the redrawing of the dock tile contents. You might do this if the contents of the underlying application or window change in a way that would require a refreshing of the tile. Some types of system activity, such as resizing the dock, may trigger automatic redraws of the tile. In most cases, however, your application is responsible for triggering redraws.

Cocoa does not automatically redraw the contents of your dock tile. Instead, your application must explicitly send display messages to the dock tile object whenever the contents of your view change and need to be redrawn.

### 33.19.5 owner as Variant

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the object represented by the dock tile.
**Example:**

```
dim d as NSDockTileMBS = NSApplicationMBS.sharedApplication.dockTile

if d<>nil then
dim t as Introspection.TypeInfo = Introspection.GetType(d.owner)
MsgBox t.FullName // shows NSApplicationMBS
```

```
end if
```

**Notes:** The object represented by the dock tile. This is either the NSApplicationMBS object or one of your application's NSWindowMBS objects.

### 33.19.6 size as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the size of the tile.
**Example:**

```
dim d as NSDockTileMBS = NSApplicationMBS.sharedApplication.dockTile

if d<>nil then
MsgBox str(D.size.Width)+" x "+str(d.size.Height)
// 128 x 128 in Mac OS X 10.5 and 10.6
end if
```

**Notes:** The size returned by this method corresponds to the size of the backing store in the dock, which may be bigger than the actual tile displayed on the screen.

### 33.19.7 Properties

### 33.19.8 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference to the docktile object.
**Notes:** (Read and Write property)

### 33.19.9 badgeLabel as string

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The tile's current badge label.
**Example:**

```
dim d as NSDockTileMBS = NSApplicationMBS.sharedApplication.dockTile
```

```
if d<>nil then
// this works in Carbon and Cocoa applications :-)

d.badgeLabel = "Hello"
d.showsApplicationBadge = true
end if
```

**Notes:** The localized string to be displayed in the tile's badging area. This string may be empty.
(Read and Write computed property)

### 33.19.10 contentView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The view used to draw the dock tile contents.
**Notes:** The view you specify should be height and width resizable.

Cocoa does not automatically redraw the contents of your dock tile. Instead, your application must explicitly send display messages to the dock tile object whenever the contents of your view change and need to be redrawn. Your dock tile view is responsible for drawing the entire contents of the dock tile. Your view does not need to draw the application or custom string badges.
(Read and Write computed property)

### 33.19.11 showsApplicationBadge as boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the tile should be badged with the application's icon.
**Example:**

```
dim d as NSDockTileMBS = NSApplicationMBS.sharedApplication.dockTile

if d<>nil then
// this works in Carbon and Cocoa applications :-)

d.badgeLabel = "Hello"
d.showsApplicationBadge = true
end if
```

**Notes:** Miniaturized windows include the application badge by default to convey the associated application to the user. In Mac OS X v10.5 and later, application tiles do not support the application badge. A minia-

turized window with a custom view does not draw the application badge.

The application icon is positioned automatically in the tile by the NSDockTile object.
(Read and Write computed property)

## 33.20 class NSEdgeInsetsMBS

### 33.20.1 class NSEdgeInsetsMBS

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** A description of the distance between the edges of two rectangles.
**Notes:** Edge insets describe the distance between the edges of one rectangle to a related rectangle that can be described by measuring a constant but edge-specific distance from each edge.
A common use for this structure is to describe the relationship between a view,Äôs frame and its alignment rectangle.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr2

### 33.20.2 Methods

### 33.20.3 Constructor

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor to create an edge insets object with all values zero.
See also:


- 33.20.4 Constructor(p as Ptr) 5992
- 33.20.5 Constructor(top as double, left as double, bottom as double, right as double) 5992


### 33.20.4 Constructor(p as Ptr)

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor to take a ptr to an NSEdgeInsets structure.
See also:


- 33.20.3 Constructor 5992
- 33.20.5 Constructor(top as double, left as double, bottom as double, right as double) 5992


### 33.20.5 Constructor(top as double, left as double, bottom as double, right as double)

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an edge inset with given values.
**Example:**

```
Dim e As New NSEdgeInsetsMBS(10, 20, 10, 20)

Break // see in debugger
```

See also:


- 33.20.3 Constructor 5992
- 33.20.4 Constructor(p as Ptr) 5992


### 33.20.6 Equal(other as NSEdgeInsetsMBS) as boolean

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** Returns true if both edge insets are equal.

### 33.20.7 Properties

### 33.20.8 Bottom as Double

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The distance from the bottom of the source rectangle to the bottom of the result rectangle.
**Notes:** (Read and Write property)

### 33.20.9 Handle as Ptr

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The ptr to the NSEdgeInsets structure.
**Notes:** (Read only property)

### 33.20.10 Left as Double

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The distance from the left side of the source rectangle to the left side of the result rectangle.
**Notes:** (Read and Write property)

### 33.20.11 Right as Double

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The distance from the right side of the source rectangle to the right side of the result rectangle.
**Notes:** (Read and Write property)

### 33.20.12 Top as Double

MBS Main Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** The distance from the top of the source rectangle to the top of the result rectangle.
**Notes:** (Read and Write property)

## 33.21 class NSEnumeratorMBS

### 33.21.1 class NSEnumeratorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** NSEnumerator is an abstract class, instances of whose subclasses enumerate collections of other objects, such as arrays and dictionaries.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)
MsgBox d.nextObject
```

**Notes:** You send nextObject repeatedly to a newly created NSEnumerator object to have it return the next object in the original collection. When the collection is exhausted, nil is returned. You cannot "reset" an enumerator after it has exhausted its collection. To enumerate a collection again, you need a new enumerator. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- NSBundleMBS and NSDirectoryEnumeratorMBS

### 33.21.2 Methods

### 33.21.3 allObjects as Variant()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns an array of objects the receiver has yet to enumerate.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)

dim a(-1) as Variant = d.allObjects
dim lines(-1) as string

for each v as Variant in a
lines.Append v
next

MsgBox Join(lines, EndOfLine) // shows all stuff on desktop
```

**Notes:** Put another way, the array returned by this method does not contain objects that have already been enumerated with previous nextObject messages.
Invoking this method exhausts the enumerator's collection so that subsequent invocations of nextObject

return nil.

### 33.21.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 33.21.5 nextObject as Variant

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the next object from the collection being enumerated.
**Example:**

```
dim d as new NSDirectoryEnumeratorMBS(SpecialFolder.Desktop)

MsgBox d.nextObject // shows ".DS_Store" or some other file name
```

**Notes:** The next object from the collection being enumerated, or nil when all objects have been enumerated.

### 33.21.6 Properties

### 33.21.7 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSEnumerator object.
**Notes:** (Read and Write property)

## 33.22 class NSErrorMBS

### 33.22.1 class NSErrorMBS

MBS Main Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The class for error information in the Cocoa World.
**Blog Entries**

- Contacts history for Xojo
- News from the MBS Xojo Plugins Version 21.1
- Write audio file with samples using AVFoundation
- MBS Xojo Plugins, version 18.5pr2
- Automated video editing with Xojo
- MBS Xojo / Real Studio Plugins, version 13.2pr7
- MBS Xojo / Real Studio Plugins, version 13.2pr4
- MBS REALbasic Plugins, version 10.6pr4
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 18.6, page 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.3, page 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 18.3, page 72: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 15.5, page 46: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar
- 12.6, page 35: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.6, page 27: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.6, page 25: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.5, pages 31 to 32: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.4, page 31: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner
- 12.2, pages 45 to 46: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 33.22.2 Methods

### 33.22.3 Constructor(Domain as String, Code as Integer, UserInfo as dictionary = nil)

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes error for a given domain and code with a given userInfo dictionary.
**Notes:** domain: The error domain—this can be one of the predefined NSError domains, or an arbitrary string describing a custom domain. domain must not be nil.
code: The error code for the error.
dict: The userInfo dictionary for the error. userInfo may be nil.

Returns an NSErrorMBS object initialized for domain with the specified error code and the dictionary of arbitrary data userInfo.
See also:


- 33.22.4 Constructor(Handle as Integer) 5998


### 33.22.4 Constructor(Handle as Integer)

MBS Main Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The constructor for a handle value of NSError.
**Notes:** Retains reference number and destructor later releases it.
Handle must be a NSError reference number and should not be zero.
See also:


- 33.22.3 Constructor(Domain as String, Code as Integer, UserInfo as dictionary = nil) 5998


### 33.22.5 error(Domain as String, Code as Integer, UserInfo as dictionary = nil) as NSErrorMBS

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates and initializes an NSError object for a given domain and code with a given userInfo dictionary.
**Notes:** domain: The error domain—this can be one of the predefined NSError domains, or an arbitrary string describing a custom domain. domain must not be nil.
code: The error code for the error.
dict: The userInfo dictionary for the error. userInfo may be nil.

Returns an NSErrorMBS object for domain with the specified error code and the dictionary of arbitrary data userInfo.

### 33.22.6 NSCocoaErrorDomain as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The cocoa error domain.

### 33.22.7 NSFilePathErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** Contains the file path of the error.

### 33.22.8 NSLocalizedDescriptionKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is a localized string representation of the error that, if present, will be returned by localizedDescription.

### 33.22.9 NSLocalizedFailureReasonErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is a localized string representation containing the reason for the failure that, if present, will be returned by localizedFailureReason.

### 33.22.10 NSLocalizedRecoveryOptionsErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is an array containing the localized titles of buttons appropriate for displaying in an alert panel.

The first string is the title of the right-most and default button, the second the one to the left, and so on. The recovery options should be appropriate for the recovery suggestion returned by localizedRecoverySuggestion.

### 33.22.11 NSLocalizedRecoverySuggestionErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is a string containing the localized recovery suggestion for the error.

This string is suitable for displaying as the secondary message in an alert panel.

### 33.22.12 NSMachErrorDomain as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Error domain for Mach errors.

### 33.22.13 NSOSStatusErrorDomain as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Error domain for Mac OS 9/Carbon errors.

### 33.22.14 NSPOSIXErrorDomain as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Error domain for unix errors.

### 33.22.15 NSRecoveryAttempterErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is an object that conforms to the NSErrorRecoveryAttempting informal protocol.

The recovery attempter must be an object that can correctly interpret an index into the array returned by recoveryAttempter.

### 33.22.16 NSStringEncodingErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is an NSNumber object containing the NSStringEncoding value.

### 33.22.17 NSUnderlyingErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is an error that was encountered in an underlying implementation and caused the error that the receiver represents to occur.

### 33.22.18 NSURLErrorKey as String

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the user info dictionary keys.
**Notes:** The corresponding value is an NSURL object.

### 33.22.19 Properties

### 33.22.20 code as Integer

MBS Main Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** This is a domain specific error code.
**Notes:** (Read only property)

### 33.22.21 description as string

MBS Main Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns the description for this object.
**Notes:** (Read only property)

### 33.22.22 domain as string

MBS Main Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The error domain.
**Notes:** Domains are described by names that are arbitrary strings used to differentiate groups of codes; for custom domain using reverse-DNS naming will help avoid conflicts.
(Read only property)

### 33.22.23 Handle as Integer

MBS Main Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The internal used handle for the NSError reference.
**Notes:** (Read and Write property)

### 33.22.24 localizedDescription as string

MBS Main Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The localized error description.
**Example:**

```
dim f as FolderItem=SpecialFolder.Desktop.Child("test.mov")
dim q as new QTKitMovieMBS(f)
dim e as NSErrorMBS

f=SpecialFolder.Desktop.Child("test2.aif")

MsgBox str(q.Handle)

if q.exportToFile(f,e,"AIFF","soun","") then
MsgBox "ok"
else
MsgBox "Fail"
end if

if e<>Nil then
MsgBox e.localizedDescription
end if
```

**Notes:** The primary user-presentable message for the error. This method can be overridden by subclassers wishing to present better error strings. By default this looks for NSLocalizedDescriptionKey in the user info.

If not present, it manufactures a string from the domain and code. Also, for some of the built-in domains it knows about, it might try to fetch an error string by calling a domain-specific function. In the absence of a custom error string, the manufactured one might not be suitable for presentation to the user, but can be used in logs or debugging.
(Read only property)

### 33.22.25 localizedFailureReason as string

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a string containing the localized explanation of the reason for the error.
**Notes:** A string containing the localized explanation of the reason for the error. By default this method returns the object in the user info dictionary for the key NSLocalizedFailureReasonErrorKey.
This method can be overridden by subclasses to present customized error strings.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.22.26 localizedRecoverySuggestion as string

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a string containing the localized recovery suggestion for the error.
**Notes:** Returns a string containing the localized recovery suggestion for the error. By default this method returns the object in the user info dictionary for the key NSLocalizedRecoverySuggestionErrorKey. If the user info dictionary doesn't contain a value for NSLocalizedRecoverySuggestionErrorKey, nil is returned.

The returned string is suitable for displaying as the secondary message in an alert panel.

This method can be overridden by subclasses to present customized recovery suggestion strings.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.22.27 userInfo as dictionary

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the receiver's user info dictionary.
**Notes:** The receiver's user info dictionary, or nil if the user info dictionary has not been set.
(Read only property)

## 33.23 class NSEventMBS

### 33.23.1 class NSEventMBS

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Cocoa class for an user event.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MBS Xojo Plugins, version 24.1pr3
- MBS Xojo Plugins, version 23.5pr7
- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins, version 22.3pr2
- MBS Xojo Plugins, version 18.2pr1
- MBS Xojo / Real Studio Plugins, version 15.1pr5
- MBS Real Studio Plugins, version 13.1pr16
- MBS Real Studio Plugins, version 11.3pr8
- Gestures on Mac OS X

### 33.23.2 Methods

### 33.23.3 allTouches as NSTouchMBS()

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns all touch objects associated with the event.
**Example:**

```
Dim e As NSEventMBS = NSApplicationMBS.sharedApplication.currentEvent
Dim touches() As NSTouchMBS = e.allTouches

Break
```

**Notes:** If the touches originate in different views or windows, each NSTouchMBS object may have a different responder object.

### 33.23.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 33.23.5 doubleClickInterval as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the time, in seconds, in which a second mouse click must occur in order to be considered a double click.
**Notes:** This is a system setting, overriding this method will have no effect.
Available in Mac OS X v10.6 and later.

### 33.23.6 eventWithCGEvent(CGEventRef as Integer) as NSEventMBS

MBS MacBase Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an event object that is based on a Core Graphics type of event.
**Notes:** The returned object retains the CGEventRef object (cgEvent) until it (the Xojo and Objective-C object) is freed—it then releases the CGEventRef object. If no Cocoa event corresponds to the CGEventRef object, this method returns nil.

### 33.23.7 isMouseCoalescingEnabled as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether mouse-movement event coalescing is enabled.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.23.8 keyEvent(Type as Integer, LocationX as Double, LocationY as Double, modifierFlags as Integer, timeStamp as double, windowNumber as Integer, characters as String, charactersIgnoringModifiers as String, isARepeat as boolean, keyCode as Integer) as NSEventMBS

MBS MacBase Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new NSEventMBS object describing a key event.
**Notes:** type: One of the following event-type constants: NSKeyDown, NSKeyUp, NSFlagsChanged. If anything else is specified, an NSInternalInconsistencyException is raised.

location: The cursor location in the base coordinate system of the window specified by windowNum.
modifierFlags: An integer bit field containing any of the modifier key masks.
timeStamp: The time the event occurred in seconds since system startup.
windowNumber: An integer that identifies the window device associated with the event, which is associated with the NSWindow that will receive the event.
characters: A string of characters associated with the key event. Though most key events contain only one character, it is possible for a single keypress to generate a series of characters.
unmodCharacters: The string of characters generated by the key event as if no modifier key had been pressed (except for Shift). This argument is useful for getting the ,Äúbasic,Äù key value in a hardware-independent manner.
isARepeat: True if the key event is a repeat caused by the user holding the key down, false if the key event is new.
keyCode: A number that identifies the keyboard key associated with the key event. Its value is hardware-independent.

Returns the created NSEvent instance or nil if the instance could not be created.

### 33.23.9 keyRepeatDelay as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the length of time a key must be held down in order to generate the first key repeat event.
**Notes:** This is a system setting, overriding this method will have no effect.
Available in Mac OS X v10.6 and later.

### 33.23.10 keyRepeatInterval as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the length between subsequent key repeat events being posted.
**Notes:** This is a system setting, overriding this method will have no effect.
Available in Mac OS X v10.6 and later.

### 33.23.11 modifierFlagsGlobal as UInt32

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the currently pressed modifier flags.
**Notes:** This returns the state of devices combined with synthesized events at the moment, independent of which events have been delivered via the event stream.
Available in Mac OS X v10.6 and later.

### 33.23.12 mouseEvent(Type as Integer, LocationX as Double, LocationY as Double, modifierFlags as Integer, timeStamp as double, windowNumber as Integer, eventNumber as Integer, clickCount as Integer, pressure as Single) as NSEventMBS

MBS MacBase Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new NSEvent object describing a mouse-down, -up, -moved, or -dragged event.
**Notes:** type: One of the modifier key masks described in NSEventType, or an NSInternalInconsistencyException is raised.
location: The cursor location in the base coordinate system of the window specified by windowNumber.
flags: An integer bit field containing any of the modifier key masks described in Getting Unicode Values, combined using the C bitwise OR operator.
timeStamp: The time the event occurred in seconds since system startup.
windowNumber: An integer that identifies the window device associated with the event, which is associated with the NSWindow that will receive the event.
eventNumber: An identifier for the new event. It,Äôs normally taken from a counter for mouse events, which continually increases as the application runs.
clickNumber: The number of mouse clicks associated with the mouse event.
pressure: A value from 0.0 to 1.0 indicating the pressure applied to the input device on a mouse event, used for an appropriate device such as a graphics tablet. For devices that aren,Äôt pressure-sensitive, the value should be either 0.0 or 1.0.

Returns the created NSEventMBS instance or nil if the instance could not be created.

### 33.23.13 mouseLocation as NSPointMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Reports the current mouse position in screen coordinates.
**Notes:** This method is similar to the NSWindow method mouseLocationOutsideOfEventStream. It returns the location regardless of the current event or pending events. The difference between these methods is that mouseLocationOutsideOfEventStream returns a point in the receiving window's coordinates and mouseLocation returns the same information in screen coordinates.

Note: The y coordinate in the returned point starts from a base of 1, not 0.

### 33.23.14 otherEvent(Type as Integer, LocationX as Double, LocationY as Double, modifierFlags as Integer, timeStamp as double, windowNumber as Integer, SubType as Integer, Data1 as Integer, Data2 as Integer) as NSEventMBS

MBS MacBase Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new NSEventMBS object describing a custom event.
**Notes:** type: One of the following event-type constants: NSAppKitDefined, NSSystemDefined, NSApplicationDefined or NSPeriodic.
If type is anything else, an NSInternalInconsistencyException is raised. Your code should only create events of type NSApplicationDefined.
location: The cursor location in the base coordinate system of the window specified by windowNum.
flags: An integer bit field containing any of the modifier key masks.
time: The time the event occurred in seconds since system startup.
windowNumber: An integer that identifies the window device associated with the event, which is associated with the NSWindow that will receive the event.
subtype: A numeric identifier that further differentiates custom events of types NSAppKitDefined, NSSystemDefined, and NSApplicationDefined. NSPeriodic events don,Äôt use this attribute.
data1: Additional data associated with the event. NSPeriodic events don,Äôt use these attributes.
data2: Additional data associated with the event. NSPeriodic events don,Äôt use these attributes.

Returns the created NSEvent object or nil if the object couldn't be created.

### 33.23.15 pressedMouseButtons as UInt32

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indices of the currently depressed mouse buttons.
**Notes:** The indices of the currently depressed mouse buttons.

A return value of 1 «0 corresponds to left the mouse, 1 «1 corresponds to the right mouse, 1«n, n >=2 to other mouse buttons.

This returns the state of devices combined with synthesized events at the moment, independent of which events have been delivered via the event stream, so this method is not suitable for tracking.

Available in Mac OS X v10.6 and later.

### 33.23.16 setMouseCoalescingEnabled(Value as boolean)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether mouse-movement event coalescing is enabled.
**Notes:** This method affects mouse-moved, mouse-dragged, and tablet events. Mouse-movement event coalescing is enabled by default.

Available in Mac OS X v10.5 and later.

### 33.23.17 touchesForView(view as NSViewMBS) as NSTouchMBS()

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns the touch objects from the event that belong to the specified view.

### 33.23.18 touchesForWindow(win as NSWindowMBS) as NSTouchMBS()

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: iOS only.

**Function:** Returns the touch objects from the event that belong to the specified window.

### 33.23.19 Properties

### 33.23.20 absoluteX as Integer

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Reports the absolute x coordinate of a pointing device on its tablet at full tablet resolution.
**Notes:** For the coordinate to be valid, the receiver should represent an event generated by a tablet pointing device (otherwise 0 is returned). This method is valid only for mouse events with a subtype of NSTabletPointEventSubtype and for events of type NSTabletPoint. Use this value if you want to scale from tablet location to screen location yourself; otherwise use the class method mouseLocation or the instance method locationInWindow.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.21 absoluteY as Integer

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Reports the absolute y coordinate of a pointing device on its tablet at full tablet resolution.
**Notes:** For the coordinate to be valid, the receiver should represent an event generated by a tablet pointing

device (otherwise 0 is returned). This method is valid only for mouse events with a subtype of NSTabletPointEventSubtype and for events of type NSTabletPoint. Use this value if you want to scale from tablet location to screen location yourself; otherwise use the class method mouseLocation or the instance method locationInWindow.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.22 absoluteZ as Integer

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Reports the absolute z coordinate of pointing device on its tablet at full tablet resolution.
**Notes:** For the coordinate to be valid, the receiver should represent an event generated by a tablet pointing device (otherwise 0 is returned). The z coordinate does not represent pressure. It registers the depth coordinate returned by some tablet devices with wheels; if the device is something other than these, 0 is returned. This method is valid only for mouse events with a subtype of NSTabletPointEventSubtype and for events of type NSTabletPoint.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.23 associatedEventsMask as Integer

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The event mask describing the various events that you may also get during this event sequence.
**Notes:** This message is valid for Mouse events. Useful for determining if the input device issuing this mouse event can also simultaneously issue NSEventTypePressure events.
(Read only property)

### 33.23.24 buttonMask as Integer

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a bit mask identifying the buttons pressed when the tablet event represented by the receiver was generated.
**Notes:** Use one or more of the button-mask constants described in Constants to determine which buttons of the pointing device are pressed. This method is valid only for mouse events with a subtype of NSTabletPointEventSubtype and for events of type NSTabletPoint.

Available in Mac OS X v10.4 and later.

Constants to use:

| | |
|---|---|
| NSPenTipMask=1 | The pen tip is activated. |
| NSPenLowerSideMask=2 | The button on the lower side of the device is activated. |
| NSPenUpperSideMask=4 | The button on the upper side of the device is activated. |

(Read only property)

### 33.23.25 buttonNumber as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the button number for the mouse button that generated an NSOtherMouse... event.
**Notes:** This method is intended for use with the NSOtherMouseDown, NSOtherMouseUp, and NSOtherMouseDragged events, but will return values for NSLeftMouse... and NSRightMouse... events also.
(Read only property)

### 33.23.26 capabilityMask as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a mask whose set bits indicate the capabilities of the tablet device that generated the event represented by the receiver.
**Notes:** These bits are vendor-defined. This method is valid only for mouse events with a subtype of NSTabletProximityEventSubtype and for events of type NSTabletProximity.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.27 CGEventRef as Integer

MBS MacBase Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** The Core Graphics event object corresponding to this event.
**Notes:** The CGEventRef opaque type returned. If no CGEventRef object corresponding to the NSEvent object can be created, this method returns 0.
(Read only property)

### 33.23.28 characters as string

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the characters associated with the receiving key-up or key-down event.
**Notes:** These characters are derived from a keyboard mapping that associates various key combinations with Unicode characters. Raises an NSInternalInconsistencyException if sent to any other kind of event object.

This method returns an empty string for dead keys, such as Option-e. However, for a key combination such as Option-Shift-e this method returns the standard accent (”’”).
(Read only property)

### 33.23.29 charactersIgnoringModifiers as string

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the characters generated by the receiving key event as if no modifier key (except for Shift) applies.
**Notes:** Raises an NSInternalInconsistencyException if sent to a nonkey event.

This method returns the non-modifier key character pressed for dead keys, such as Option-e. For example, Option-e (no shift key) returns an ”e” for this method, whereas the characters method returns an empty string.

This method is useful for determining ”basic” key values in a hardware-independent manner, enabling such features as keyboard equivalents defined in terms of modifier keys plus character keys. For example, to determine if the user typed Alt-S, you don’t have to know whether Alt-S generates a German double ess, an integral sign, or a section symbol. You simply examine the string returned by this method along with the event’s modifier flags, checking for ”s” and NSAlternateKeyMask.
(Read only property)

### 33.23.30 clickCount as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of mouse clicks associated with the receiver, which represents a mouse-down or mouse-up event.
**Notes:** Raises an NSInternalInconsistencyException if sent to a nonmouse event.

Returns 0 for a mouse-up event if a time threshold has passed since the corresponding mouse-down event. This is because if this time threshold passes before the mouse button is released, it is no longer considered

a mouse click, but a mouse-down event followed by a mouse-up event.

The return value of this method is meaningless for events other than mouse-down or mouse-up events.
(Read only property)

### 33.23.31 data1 as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns additional data associated with the receiver.
**Notes:** The value returned by this method is dependent on the event type, and is defined by the originator of the event. Raises an NSInternalInconsistencyException if sent to an event not of type NSAppKitDefined, NSSystemDefined, NSApplicationDefined, or NSPeriodic.

NSPeriodic events don't use this attribute.
(Read only property)

### 33.23.32 data2 as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns additional data associated with the receiver.
**Notes:** The value returned by this method is dependent on the event type, and is defined by the originator of the event. Raises an NSInternalInconsistencyException if sent to an event not of type NSAppKitDefined, NSSystemDefined, NSApplicationDefined, or NSPeriodic.

NSPeriodic events don't use this attribute.
(Read only property)

### 33.23.33 deltaX as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the x-coordinate change for a scroll wheel, mouse-move, or mouse-drag event.
**Notes:** (Read only property)

### 33.23.34 deltaY as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the y-coordinate change for a scroll wheel, mouse-move, or mouse-drag event.
**Notes:** The behavior of this method may seem counter-intuitive: as the mouse moves up the screen, the value is negative; and as it moves down the screen, the value is positive. The reason for this behavior is that NSEvent computes this delta value in device space, which is flipped, but both the screen and the window's base coordinate system are not flipped.
(Read only property)

### 33.23.35 deltaZ as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the z-coordinate change for a scroll wheel, mouse-move, or mouse-drag event.
**Notes:** (Read only property)

### 33.23.36 description as string

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the description for this object.
**Notes:** (Read only property)

### 33.23.37 deviceID as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a special identifier that is used to match tablet-pointer events with the tablet-proximity event represented by the receiver.
**Notes:** All tablet-pointer events generated in the period between the device entering and leaving tablet proximity have the same device ID. This message is valid only for mouse events with subtype NSTabletPointEventSubtype or NSTabletProximityEventSubtype, and for NSTabletPoint and NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.38 eventNumber as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the counter value of the latest mouse or tracking-rectangle event object; every system-generated mouse and tracking-rectangle event increments this counter.
**Notes:** Raises an NSInternalInconsistencyException if sent to any other type of event object.

(Read only property)

### 33.23.39 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The handle to the internal used NSEvent class.
**Notes:** (Read and Write property)

### 33.23.40 hasPreciseScrollingDeltas as boolean

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether there are precise scrolling deltas available.
**Notes:** Returns true if precise scrolling deltas are available; false otherwise.

This method is valid for NSScrollWheel events. A generic scroll wheel issues rather coarse scroll deltas. Some mice and trackpads provide much more precise delta. This method determines how the values of the scrollingDeltaX and scrollingDeltaY should be interpreted.
Available in OS X v10.7 and later.
(Read only property)

### 33.23.41 isARepeat as boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the receiving key event is a repeat caused by the user holding the key down, false if the key event is new.
**Notes:** Raises an NSInternalInconsistencyException if sent to an NSFlagsChanged event or other nonkey event.
(Read only property)

### 33.23.42 isDirectionInvertedFromDevice as boolean

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the user has changed the device inversion.
**Notes:** This method valid for NSEventScrollWheel and NSEventTypeSwipe events. The user may choose to change the scrolling behavior such that it feels like they are moving the content instead of the scroll bar.

To accomplish this, deltaX and deltaY and scrollingDeltaX and scrollingDeltaY values are automatically inverted for NSEventScrollWheel events according to the user's preferences.

The direction of fluid swipes matches the direction of scrolling and as such for NSEventTypeSwipe events gestureAmount is inverted. However, for some uses of NSEventScrollWheel and NSEventTypeSwipe events, the behavior should not respect the user preference. This method allows you to determine when the event has been inverted and compensate by multiplying -1 if needed.

Available in OS X v10.7 and later.
(Read only property)

### 33.23.43 isEnteringProximity as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns true to indicate that a pointing device is entering the proximity of its tablet and false when it is leaving it.
**Notes:** This method is valid for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.44 keyCode as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the virtual key code for the keyboard key associated with the receiving key event.
**Notes:** The virtual key code. The returned value is hardware-independent. The value returned is the same as the value returned in the kEventParamKeyCode when using Carbon Events.

Raises an NSInternalInconsistencyException if sent to a non-key event.
(Read only property)

### 33.23.45 locationInWindow as NSPointMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's location in the base coordinate system of the associated window.
**Notes:** For nonmouse events the return value of this method is undefined.

With NSMouseMoved and possibly other events, the receiver can have a nil window (that is, window returns nil). In this case, locationInWindow returns the event location in screen coordinates.
(Read only property)

### 33.23.46 magnification as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the change in magnification.
**Notes:** The change in magnification that should be added to the current scaling of an item to achieve the new scale factor.
This message is valid for events of type NSEventTypeMagnify.
Available in Mac OS X v10.6 and later.
(Read only property)

### 33.23.47 modifierFlags as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an integer bit field indicating the modifier keys in effect for the receiver.
**Notes:** You can examine individual flag settings using the C bitwise AND operator with the predefined key masks. The lower 16 bits of the modifier flags are reserved for device-dependent bits.
(Read only property)

### 33.23.48 pointingDeviceID as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the pointing device currently in proximity with the tablet.
**Notes:** This index is significant for multimode (or Dual Tracking) tablets that support multiple concurrent pointing devices; the index is incremented for each pointing device that comes into proximity. Otherwise, zero is always returned. The receiver of this message should be a mouse event object with subtype NSTabletProximityEventSubtype or an event of type NSTabletProximity.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.49 pointingDeviceSerialNumber as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the vendor-assigned serial number of a pointing device of a certain type.
**Notes:** Devices of different types, such as a puck and a pen, may have the same serial number. The receiver of this message should be a mouse event object with subtype NSTabletProximityEventSubtype or an event of type NSTabletProximity.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.50 pointingDeviceType as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a NSPointingDeviceType constant indicating the kind of pointing device associated with the receiver.
**Notes:** For example, the device could be a pen, eraser, or cursor pointing device. This method is valid for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events. See "Constants" for descriptions of valid NSPointingDeviceType constants.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.51 pressure as Double

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a value from 0.0 through 1.0 indicating the pressure applied to the input device (used for appropriate devices).
**Notes:** For devices that aren't pressure-sensitive, the value is either 0.0 or 1.0. Raises an NSInternalInconsistencyException if sent to a nonmouse event.

For tablet pointing devices that are in proximity, the pressure value is 0.0 if they are not actually touching the tablet. As the device is pressed into the tablet, the value is increased.
(Read only property)

### 33.23.52 rotation as Double

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rotation in degrees of the tablet pointing device associated with the receiver.
**Notes:** Many devices do not support rotation, in which case the returned value is 0.0. This method is valid

only for mouse events with subtype NSTabletPointEventSubtype and for NSTabletPoint events.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.53 scrollingDeltaX as Double

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scroll wheel horizontal delta.
**Notes:** This is the preferred method for accessing NSScrollWheel delta values. When hasPreciseScrollingDeltas returns false, your application may which to modify this value.

Available in OS X v10.7 and later.
(Read only property)

### 33.23.54 scrollingDeltaY as Double

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scroll wheel vertical delta.
**Notes:** This is the preferred method for accessing NSScrollWheel delta values. When hasPreciseScrollingDeltas returns false, multiply the value returned by this method by the line or row height. Otherwise scroll by the returned amount.

Available in OS X v10.7 and later.
(Read only property)

### 33.23.55 stage as Integer

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The stage of pressure events.
**Notes:** This message is valid for NSEventTypePressure events.
Pressure gesture events go through multiple stages.
(Read only property)

### 33.23.56 stageTransition as Double

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The stage transition for pressure events.
**Notes:** This message is valid for NSEventTypePressure events. Positive stageTransition describes approaching the next stage of the pressure gesture. Negative stageTransition describes approaching release of the current stage.
(Read only property)

### 33.23.57 subtype as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the subtype of the receiving event object.
**Notes:** Raises an NSInternalInconsistencyException if sent to an event not of type NSAppKitDefined, NSSystemDefined, NSApplicationDefined, or NSPeriodic.

NSPeriodic events don't use this attribute.

This method is also valid for mouse events on Mac OS X v10.4 and later. See the predefined mouse and tablet subtypes.
(Read only property)

### 33.23.58 systemTabletID as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the tablet device connected to the system.
**Notes:** If multiple tablets are connected to the system, the system-tablet ID is incremented for each subsequent one. If there is only one tablet device, its system-tablet ID is zero. The receiver of this message should be a mouse event object with subtype NSTabletProximityEventSubtype or an event of type NSTabletProximity.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.59 tabletID as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the USB model identifier of the tablet device associated with the receiver.
**Notes:** This method is valid for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.60 tangentialPressure as Double

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Reports the tangential pressure on the device that generated the event represented by the receiver.
**Notes:** The value returned can range from -1.0 to 1.0. Tangential pressure is also known as barrel pressure. Only some pointing devices support tangential pressure. This method is valid for mouse events with subtype NSTabletPointEventSubtype and for NSTabletPoint events.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.61 tilt as NSPointMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Reports the scaled tilt values of the pointing device that generated the event represented by the receiver.
**Notes:** The value returned can range from -1.0 to 1.0 for both axes. An x-coordinate value that is negative indicates a tilt to the left and a positive value indicates a tilt to the right; a y-coordinate value that is negative indicates a tilt to the top and a positive value indicates a tilt to the bottom. If the device is perfectly perpendicular to the table surface, the values are 0.0 for both axes. This method is valid for mouse events with subtype NSTabletPointEventSubtype and for NSTabletPoint events.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.62 timestamp as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the time the receiver occurred in seconds since system startup.
**Notes:** (Read only property)

### 33.23.63 trackingNumber as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the identifier of a mouse-tracking event.
**Notes:** This method returns either an NSTrackingArea object or a NSTrackingRectTag constant depending on whether the event was generated from an NSTrackingArea object or a call to addTrackingRect:owner:user-Data:assumeInside:. Valid mouse-tracking methods are of types NSMouseEntered, NSMouseExited, and NSCursorUpdate. This method raises an NSInternalInconsistencyException if sent to any other type of event.

The NSTrackingArea class is new with Mac OS X version 10.5
(Read only property)

### 33.23.64 type as Integer

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of the receiving event.
**Notes:** The type must be one of the following:

NSLeftMouseDown
NSLeftMouseUp
NSRightMouseDown
NSRightMouseUp
NSOtherMouseDown
NSOtherMouseUp
NSMouseMoved
NSLeftMouseDragged
NSRightMouseDragged
NSOtherMouseDragged
NSMouseEntered
NSMouseExited
NSKeyDown
NSKeyUp
NSFlagsChanged
NSAppKitDefined
NSSystemDefined
NSApplicationDefined
NSPeriodic
NSCursorUpdate
NSScrollWheel
(Read only property)

### 33.23.65 uniqueID as UInt64

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the unique identifier of the pointing device that generated the event represented by the receiver.
**Notes:** Also known as tool ID, this is a unique number recorded in the chip inside every pointing device. The unique ID makes it possible to assign a specific pointing device to a specific tablet. You can also use it to "sign" documents or to restrict access to document layers to a specific pointing device. This method is valid for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.66 vendorID as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the vendor identifier of the tablet associated with the receiver.
**Notes:** The tablet is typically a USB device. This method is valid only for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.67 vendorPointingDeviceType as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a coded bit field whose set bits indicate the type of pointing device (within a vendor selection) associated with the receiver.
**Notes:** See the vendor documentation for an interpretation of significant bits. This method is valid only for mouse events with subtype NSTabletProximityEventSubtype and for NSTabletProximity events.
Available in Mac OS X v10.4 and later.
(Read only property)

### 33.23.68 window as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the window object associated with the receiver.
**Notes:** A periodic event, however, has no window; in this case the return value is undefined.
(Read only property)

### 33.23.69 windowNumber as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the identifier for the window device associated with the receiver.
**Notes:** A periodic event, however, has no window; in this case the return value is undefined.
(Read only property)

### 33.23.70 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAlphaShiftKeyMask | &h10000 | One of the constants representing device-independent bits fo ifier flags. Set if Caps Lock key is pressed. |
| NSAlternateKeyMask | &h80000 | One of the constants representing device-independent bits fo ifier flags. Set if Option or Alternate key is pressed. |
| NSAnyEventMask | &hFFFFFFFF | One of the constants for masks for the events. Pass them to the NSCell method sendActionOn to specify should send its action message. |
| NSAppKitDefined | 13 | One of the event types. |
| NSAppKitDefinedMask | &h2000 | One of the constants for masks for the events. Pass them to the NSCell method sendActionOn to specify should send its action message. |
| NSApplicationActivatedEventType | 1 | One of the constants representing the types of events defined b Kit. The application has been activated. |
| NSApplicationDeactivatedEventType | 2 | One of the constants representing the types of events defined b Kit. The application has been deactivated. |
| NSApplicationDefined | 15 | One of the event types. |
| NSApplicationDefinedMask | &h8000 | One of the constants for masks for the events. Pass them to the NSCell method sendActionOn to specify should send its action message. |
| NSAWTEventType | 16 | One of the constants representing the types of events defined b Kit. An event type used to support Java applications. |
| NSBeginFunctionKey | &hF72A | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. Begin key. Not on most Macintosh keyboards. |
| NSBreakFunctionKey | &hF732 | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. Break key. Not on most Macintosh keyboards. |
| NSClearDisplayFunctionKey | &hF73A | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. Clear Display key. Not on most Macintosh keyboards. |
| NSClearLineFunctionKey | &hF739 | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. Clear/Num Lock key. |
| NSCommandKeyMask | &h100000 | One of the constants representing device-independent bits fo ifier flags. Set if Command key is pressed. |
| NSControlKeyMask | &h40000 | One of the constants representing device-independent bits fo ifier flags. Set if Control key is pressed. |
| NSCursorPointingDevice | 2 | One of the constants represent pointing-device types for N events or mouse events with subtype NSTabletProximityEve The pointingDeviceType method returns one of these consta Represents a cursor (or puck-like) pointing device. Available in Mac OS X v10.4 and later. |
| NSCursorUpdate | 17 | One of the event types. |
| NSCursorUpdateMask | &h20000 | One of the constants for masks for the events. Pass them to the NSCell method sendActionOn to specify should send its action message. |
| NSDeleteCharFunctionKey | &hF73E | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. Delete Character key. Not on most Macintosh keyboards. |
| NSDeleteFunctionKey | &hF728 | One of the constants representing Unicode characters (0xF7 are reserved for function keys on the keyboard. |

## 33.24 class NSEventMonitorMBS

### 33.24.1 class NSEventMonitorMBS

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The class for watching events in Cocoa.
**Notes:** For Mac OS X 10.5 compatibility, please use CarbonMonitorEventsMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr9

### 33.24.2 Methods

### 33.24.3 addGlobalMonitorForEventsMatchingMask(mask as UInt64) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Installs an event monitor that receives copies of events posted to other applications.
**Notes:** mask: An event mask specifying which events you wish to monitor. See NSEventMBS constants for possible values.

Events are delivered asynchronously to your app and you can only observe the event; you cannot modify or otherwise prevent the event from being delivered to its original target application.

Key-related events may only be monitored if accessibility is enabled or if your application is trusted for accessibility access (see AXIsProcessTrusted).

Note that your handler will not be called for events that are sent to your own application.

Special Considerations
In OS X v 10.6, event monitors are only able to monitor the following event types:

NSLeftMouseDragged
NSRightMouseDragged
NSOtherMouseDragged
NSLeftMouseUp
NSRightMouseUp
NSOtherMouseUp
NSLeftMouseDown
NSRightMouseDown
NSOtherMouseDown
NSMouseMoved
NSFlagsChanged

NSScrollWheel
NSTabletPoint
NSTabletProximity
NSKeyDown (Key repeats are determined by sending the event an isARepeat message.)

Available in OS X v10.6 and later.

### 33.24.4 addLocalMonitorForEventsMatchingMask(mask as UInt64) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Installs an event monitor that receives copies of events posted to this application before they are dispatched.
**Notes:** mask: An event mask specifying which events you wish to monitor. See NSEventMBS constants for possible values.

Calls the LocalEvent event. You can return the event unmodified, create and return a new NSEventMBS object, or return nil to stop the dispatching of the event.

Your handler will not be called for events that are consumed by nested event-tracking loops such as control tracking, menu tracking, or window dragging; only events that are dispatched through the applications sendEvent method will be passed to your handler.

Note: The monitor Block is called for all future events that match mask.

Special Considerations
In OS X v 10.6, event monitors are only able to monitor the following event types:

NSFlagsChanged
NSLeftMouseDragged
NSRightMouseDragged
NSOtherMouseDragged
NSLeftMouseUp
NSRightMouseUp
NSOtherMouseUp
NSLeftMouseDown
NSRightMouseDown
NSOtherMouseDown
NSMouseMoved
NSFlagsChanged
NSScrollWheel
NSTabletPoint
NSTabletProximity

NSKeyDown (Key repeats are determined by sending the event an isARepeat message.)

Available in OS X v10.6 and later.

### 33.24.5 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether event monitoring is available.
**Notes:** Returns true on Mac OS X 10.6 and newer.

### 33.24.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Initializes the object.

### 33.24.7 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** Remove all event monitors you added.

### 33.24.8 Properties

### 33.24.9 Count as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns number of event monitors you added.
**Notes:** (Read only property)

### 33.24.10 Events

### 33.24.11 GlobalEvent(e as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** This event is called for global system events.
**Notes:** It is passed the event to monitor. You are unable to change the event, merely observe it.

Events are delivered asynchronously to your app and you can only observe the event; you cannot modify or otherwise prevent the event from being delivered to its original target application.

### 33.24.12 LocalEvent(e as NSEventMBS) as NSEventMBS

MBS MacFrameworks Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** This event is called for local application events.
**Notes:** You can return the event unmodified, create and return a new NSEventMBS object, or return nil to stop the dispatching of the event.

## 33.25 class NSExceptionHandlerMBS

### 33.25.1 class NSExceptionHandlerMBS

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The class for a global handler to catch unhandled cocoa exceptions.
**Notes:** Previous plugin versions tried to show a dialog to inform you. Now you can intercept that.
If code is in this event, we do not show the dialog from the plugin.
**Blog Entries**

- Xojo Tips and Tricks
- MBS Xojo / Real Studio Plugins, version 17.0pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr3

### 33.25.2 Methods

### 33.25.3 Disable

MBS Main Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Disables the global exception handler.

### 33.25.4 Enable

MBS Main Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Enables the global exception handler.
**Notes:** By default the MBS Plugin automatically enables it when you use Cocoa classes.

### 33.25.5 Events

### 33.25.6 CaughtException(e as NSExceptionMBS, IsMainThread as boolean)

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** An exception was caught.
**Notes:** If IsMainThread is true, you can show a dialog/window. But if it's false, you may be in trouble on a worker thread and showing a dialog can cause more trouble.

## 33.26 class NSExceptionMBS

### 33.26.1 class NSExceptionMBS

MBS Main Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The Cocoa exception class.
**Example:**

```
dim m1 as new NSMenuMBS
dim m2 as new NSMenuMBS
dim n as new NSMenuItemMBS

n.CreateMenuItem

m1.addItem n
m2.addItem n // raises an exception as a menuitem can't be in two menus.

Exception e as NSExceptionMBS
MsgBox e.Message

// e.reason: "Item to be inserted into menu already is in another menu"
// e.name: "NSInternalInconsistencyException"
// e.message: "A Cocoa NSInternalInconsistencyException was not handled: Item to be inserted into menu already is in another menu"
```

**Notes:** The plugin installs exception handling code. If you use the NSExceptionMBS class somewhere in your code, the NSException plugin part will be included and a NSExceptionMBS object will be
Subclass of the RuntimeException class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr1
- More than just a wrapper
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Xojo / Real Studio Plugins, version 13.2pr3
- MBS Plugins 10.3 Release Notes

**Xojo Developer Magazine**

- 5.6, page 49: Made in the Shade, Using Core Graphics in a REALbasic Project by Toby Rush
- 15.5, pages 46 to 47: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 33.26.2 Methods

### 33.26.3 callStackSymbols as string()

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns an array containing the current call symbols.
**Notes:** This method returns an array of strings describing the call stack backtrace at the moment the exception was first raised. The format of each string is non-negotiable and is determined by the backtrace symbols API. (like BacktraceMBS function)

Available in OS X v10.6 and later. On older versions this array is empty.

### 33.26.4 Constructor

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 33.26.5 RaiseException(name as string, reason as string, userInfo as dictionary)

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Raises an exception.
**Notes:** The plugin does not catch it right away here, so this is a way to pass back an exception to the Cocoa frameworks.

### 33.26.6 Properties

### 33.26.7 Name as string

MBS Main Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The name of the exception. (Its type)
**Notes:** (Read only property)

### 33.26.8 Reason as string

MBS Main Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Reason the exception was raised.
**Notes:** (Read only property)

### 33.26.9 UserInfo as Dictionary

MBS Main Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns a Dictionary object containing application-specific data pertaining to the receiver.
**Notes:** Returns nil if no application-specific data exists. As an example, if a method's return value caused the exception to be raised, the return value might be available to the exception handler through this method. (Read only property)

### 33.26.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSDestinationInvalidException | "NSDestinationInvalidException" | One of the exception names. |
| NSGenericException | "NSGenericException" | One of the exception names. |
| NSInternalInconsistencyException | "NSInternalInconsistencyException" | One of the exception names. |
| NSInvalidArgumentException | "NSInvalidArgumentException" | One of the exception names. |
| NSInvalidReceivePortException | "NSInvalidReceivePortException" | One of the exception names. |
| NSInvalidSendPortException | "NSInvalidSendPortException" | One of the exception names. |
| NSMallocException | "NSMallocException" | One of the exception names. |
| NSObjectInaccessibleException | "NSObjectInaccessibleException" | One of the exception names. |
| NSObjectNotAvailableException | "NSObjectNotAvailableException" | One of the exception names. |
| NSPortReceiveException | "NSPortReceiveException" | One of the exception names. |
| NSPortSendException | "NSPortSendException" | One of the exception names. |
| NSPortTimeoutException | "NSPortTimeoutException" | One of the exception names. |
| NSRangeException | "NSRangeException" | One of the exception names. |

## 33.27 class NSFontDescriptorMBS

### 33.27.1 class NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The Cocoa class for a font descriptor.
**Notes:** NSFontDescriptor objects provide a mechanism to describe a font with a dictionary of attributes. This font descriptor can be used later to create or modify an NSFont object. Mac OS X v10.4 and later provides a font matching capability, so that you can partially describe a font by creating a font descriptor with, for example, just a family name. You can then find all the available fonts on the system with a matching family name using matchingFontDescriptorsWithMandatoryKeys.

There are several ways to create a new NSFontDescriptor object. You can use the Constructor, fontDescriptorWithFontAttributes or fontDescriptorWithName. to create a font descriptor based on either your custom attributes dictionary or on a specific font's name and size. Alternatively you can use one of the fontDescriptor,Ä¶ instance methods (such as fontDescriptorWithFace) to create a modified version of an existing descriptor. The latter methods are useful if you have an existing descriptor and simply want to change one aspect.

All attributes in the attributes dictionary are optional.
**Blog Entries**

- CocoaBase needs MacOSXCG
- MBS Real Studio Plugins, version 12.1pr10

### 33.27.2 Methods

### 33.27.3 Constructor(AttributesDic as Dictionary)

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns a new font descriptor with the specified attributes.
**Notes:** attributes: The attributes for the new font descriptor. If nil, the font descriptor's attribute dictionary will be empty.

### 33.27.4 copy as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 33.27.5 fontAttributes as Dictionary

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the receiver's dictionary of attributes.

### 33.27.6 fontDescriptorByAddingAttributes(AttributesDic as Dictionary) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor that is the same as the receiver but with the specified attributes taking precedence over the existing ones.

### 33.27.7 fontDescriptorWithFace(newFace as string) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor that is the same as the receiver but with the specified face.
**Notes:** newFace: The new font face.

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.

### 33.27.8 fontDescriptorWithFamily(newFamily as string) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor whose attributes are the same as the receiver but from the specified family.
**Notes:** newFamily: The new font family.

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.

### 33.27.9 fontDescriptorWithFontAttributes(AttributesDic as Dictionary) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a font descriptor with a dictionary of attributes.
**Example:**

```
// ask for monospace font trait
Dim traitsAttributes As New Dictionary
traitsAttributes.Value(NSFontDescriptorMBS.NSFontSymbolicTrait) = NSFontDescriptorMBS.NSFontMonoSpace-
Trait

// ask for traits
Dim fontAttributes As New Dictionary
fontAttributes.Value(NSFontDescriptorMBS.NSFontTraitsAttribute) = traitsAttributes

// now make a font descriptor for this
Dim fd As NSFontDescriptorMBS = NSFontDescriptorMBS.fontDescriptorWithFontAttributes(fontAttributes)

// and ask font manager for matching fonts
Dim fontManager As New NSFontManagerMBS
Dim fonts() As String = fontManager.availableFontNamesMatchingFontDescriptor(fd)

// finds e.g. AndaleMono, CourierNewPSMT, CourierNewPS-ItalicMT, CourierNewPS-BoldMT, CourierNewPS-
BoldItalicMT,
// FZLTXHB–B51-0, FZLTZHB–B51-0, FZLTTHB–B51-0, Menlo-Regular, Menlo-Italic, Menlo-Bold, Menlo-
BoldItalic,
// Monaco, Osaka-Mono, JCsmPC, PTMono-Regular, PTMono-Bold
```

**Notes:** attributes: The attributes for the font descriptor. If nil, the font descriptor's dictionary will be empty.

Returns the new font descriptor.

### 33.27.10 fontDescriptorWithMatrix(matrix as Variant) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor that is the same as the receiver but with the specified matrix.
**Notes:** matrix: The new font matrix. Must be a NSAffineTransformMBS object.

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.

### 33.27.11 fontDescriptorWithName(fontName as string, matrix as Variant) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a font descriptor with the NSFontNameAttribute and NSFontMatrixAttribute dictionary attributes set to the given values.
**Notes:** fontName: The value for NSFontNameAttribute.
matrix: The value for NSFontMatrixAttribute. Must be a NSAffineTransformMBS object or nil!

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.
See also:

- 33.27.12 fontDescriptorWithName(fontName as string, size as Double) as NSFontDescriptorMBS 6037

### 33.27.12 fontDescriptorWithName(fontName as string, size as Double) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a font descriptor with the NSFontNameAttribute and NSFontSizeAttribute dictionary attributes set to the given values.
**Notes:** fontName: The value for NSFontNameAttribute.
size: The value for NSFontSizeAttribute.

Returns the new font descriptor.
Available in Mac OS X v10.3 and later.
See also:

- 33.27.11 fontDescriptorWithName(fontName as string, matrix as Variant) as NSFontDescriptorMBS 6036

### 33.27.13 fontDescriptorWithSize(newPointSize as Double) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor that is the same as the receiver but with the specified point size.
**Notes:** newPointSize: The new point size.

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.

### 33.27.14 fontDescriptorWithSymbolicTraits(SymbolicTraits as Integer) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor that is the same as the receiver but with the specified symbolic traits taking precedence over the existing ones.
**Example:**

```
// get a bold font
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(13)
dim f as NSFontDescriptorMBS = n.fontDescriptor
dim w as Integer = f.symbolicTraits

// find similar font without bold
f = f.fontDescriptorWithSymbolicTraits( BitwiseAnd(w, Bitwise.OnesComplement(f.NSFontBoldTrait)))

// now check it
dim d as Dictionary = f.fontAttributes
w = f.symbolicTraits

if BitwiseAnd(w, f.NSFontBoldTrait) <>0 then
MsgBox "bold"
else
MsgBox "not bold"
end if
```

**Notes:** symbolicTraits: The new symbolic traits.

Returns the new font descriptor.
Available in Mac OS X v10.4 and later.

### 33.27.15 matchingFontDescriptorsWithMandatoryKeys as NSFontDescriptorMBS()

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns all the fonts available on the system whose specified attributes match those of the receiver.
**Notes:** mandatoryKeys: Optional, keys that must be identical to be matched. Can be nil.

Returns the matching font descriptors.

For example, suppose there are two versions of a given font installed that differ in the number of glyphs

covered (the new version has more glyphs). If you explicitly specify NSFontNameAttribute as the only mandatory key, then a font descriptor that specifies a font name and character set by default matches both versions, since the character set attribute is not used for matching. If you specify that font name and character set keys are mandatory, the returned array contains only the font that matches both keys.

Available in Mac OS X v10.4 and later.
See also:

- 33.27.16 matchingFontDescriptorsWithMandatoryKeys(mandatoryKeys() as string) as NSFontDescriptorMBS() 6039

### 33.27.16 matchingFontDescriptorsWithMandatoryKeys(mandatoryKeys() as string) as NSFontDescriptorMBS()

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns all the fonts available on the system whose specified attributes match those of the receiver.
**Notes:** mandatoryKeys: Optional, keys that must be identical to be matched. Can be nil.

Returns the matching font descriptors.

For example, suppose there are two versions of a given font installed that differ in the number of glyphs covered (the new version has more glyphs). If you explicitly specify NSFontNameAttribute as the only mandatory key, then a font descriptor that specifies a font name and character set by default matches both versions, since the character set attribute is not used for matching. If you specify that font name and character set keys are mandatory, the returned array contains only the font that matches both keys.

Available in Mac OS X v10.4 and later.
See also:

- 33.27.15 matchingFontDescriptorsWithMandatoryKeys as NSFontDescriptorMBS() 6038

### 33.27.17 matchingFontDescriptorWithMandatoryKeys as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a normalized font descriptor whose specified attributes match those of the receiver.
**Notes:** mandatoryKeys: Optional, keys that must be identical to be matched. Can be nil.

Returns the matching font descriptor.
The returned font descriptor is the first element returned from matchingFontDescriptorsWithMandatoryKeys.
See also:

- 33.27.18 matchingFontDescriptorWithMandatoryKeys(mandatoryKeys() as string) as NSFontDescriptorMBS 6040

### 33.27.18 matchingFontDescriptorWithMandatoryKeys(mandatoryKeys() as string) as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a normalized font descriptor whose specified attributes match those of the receiver.
**Notes:** mandatoryKeys: Optional, keys that must be identical to be matched. Can be nil.

Returns the matching font descriptor.
The returned font descriptor is the first element returned from matchingFontDescriptorsWithMandatoryKeys.
See also:

- 33.27.17 matchingFontDescriptorWithMandatoryKeys as NSFontDescriptorMBS 6039

### 33.27.19 matrix as Variant

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the current transform matrix of the receiver.
**Notes:** Must be a NSAffineTransformMBS object or nil!

### 33.27.20 NSFontCascadeListAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An array with sub-descriptors.
The default value is the system default cascading list for user's locale.
Available in Mac OS X v10.4 and later.

### 33.27.21 NSFontCharacterSetAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An NSCharacterSetMBS instance that represents the set of Unicode characters covered by the font.
The default value is supplied by the font.
Available in Mac OS X v10.4 and later.

### 33.27.22 NSFontColorAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional memoryblock that specifies the font color.
(Deprecated. Use NSForegroundColorAttributeName instead.)
Available in Mac OS X v10.3 and later.
Deprecated in Mac OS X v10.4.

### 33.27.23 NSFontFaceAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional string that specifies the font face.

### 33.27.24 NSFontFamilyAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional string that specifies the font family.

### 33.27.25 NSFontFeatureSelectorIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys for font descriptor attributes.
**Notes:** A number specifying a font feature selector such as common ligature off, traditional character shape, and so on. See "Font Features" in ATSUI Programming Guide for predefined feature selectors.
Available in Mac OS X v10.5 and later.

### 33.27.26 NSFontFeatureTypeIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys for font descriptor attributes.
**Notes:** A number specifying a font feature type such as ligature, character shape, and so on. See "Font Features" in ATSUI Programming Guide for predefined feature types.
Available in Mac OS X v10.5 and later.

### 33.27.27 NSFontFixedAdvanceAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** A number containing a float value that overrides the glyph advancement specified by the font.
The default value is 0.0.

### 33.27.28 NSFontMatrixAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An NSAffineTransformMBS instance that specifies the font's transformation matrix.
The default value is the identity matrix.
Available in Mac OS X v10.4 and later.

### 33.27.29 NSFontNameAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional string that specifies the font name.

### 33.27.30 NSFontSizeAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional string, containing a float value, that specifies the font size.

### 33.27.31 NSFontSlantTrait as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its trait dictionary.
**Notes:** The relative slant angle value as a number.
The valid value range is from -1.0 to 1.0. The value of 0.0 corresponds to 0 degree clockwise rotation from the vertical and 1.0 corresponds to 30 degrees clockwise rotation.
Available in Mac OS X v10.4 and later.

### 33.27.32 NSFontSymbolicTrait as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its trait dictionary.
**Notes:** The symbolic traits value as a number.
Available in Mac OS X v10.4 and later.

### 33.27.33 NSFontTraitsAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** A Dictionary instance instance fully describing font traits.
The default value is supplied by the font. See "Font traits dictionary keys" for dictionary keys.
Available in Mac OS X v10.4 and later.

### 33.27.34 NSFontVariationAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** A dictionary instance that describes the font's variation axis.
The default value is supplied by the font. See "Font variation axis dictionary keys" for dictionary keys.
Available in Mac OS X v10.4 and later.

### 33.27.35 NSFontVariationAxisDefaultValueKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its variation axis dictionary.
**Notes:** The default axis value as a number.
Available in Mac OS X v10.4 and later.

### 33.27.36 NSFontVariationAxisIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its variation axis dictionary.
**Notes:** The axis identifier value as a number.
Available in Mac OS X v10.4 and later.

### 33.27.37 NSFontVariationAxisMaximumValueKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its variation axis dictionary.
**Notes:** The maximum axis value as a number.
Available in Mac OS X v10.4 and later.

### 33.27.38 NSFontVariationAxisMinimumValueKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its variation axis dictionary.
**Notes:** The minimum axis value as a number.
Available in Mac OS X v10.4 and later.

### 33.27.39 NSFontVariationAxisNameKey as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its variation axis dictionary.
**Notes:** The localized variation axis name.
Available in Mac OS X v10.4 and later.

### 33.27.40 NSFontVisibleNameAttribute as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the attribute keys.
**Notes:** An optional string that specifies the font's visible name.

### 33.27.41 NSFontWeightTrait as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its trait dictionary.
**Notes:** The normalized weight value as a number.
The valid value range is from -1.0 to 1.0. The value of 0.0 corresponds to the regular or medium font weight.
Available in Mac OS X v10.4 and later.

### 33.27.42 NSFontWidthTrait as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** One of the keys to retrieve information about a font descriptor from its trait dictionary.
**Notes:** The relative inter-glyph spacing value as a number.
The valid value range is from -1.0 to 1.0. The value of 0.0 corresponds to the regular glyph spacing.
Available in Mac OS X v10.4 and later.

### 33.27.43 pointSize as Double

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the point size of the receiver.
**Example:**

```
dim f as NSFontMBS = NSFontMBS.fontWithName("Arial", 12)
dim d as NSFontDescriptorMBS = f.fontDescriptor
MsgBox str(d.pointSize)
```

### 33.27.44 postscriptName as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the PostScript name of the receiver.
**Example:**

```
dim f as NSFontMBS = NSFontMBS.fontWithName("Arial", 12)
dim d as NSFontDescriptorMBS = f.fontDescriptor
MsgBox d.postscriptName
```

### 33.27.45 symbolicTraits as Integer

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a bit mask that describes the traits of the receiver.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(13)
dim f as NSFontDescriptorMBS = n.fontDescriptor
dim w as Integer = f.symbolicTraits
```

```
if BitwiseAnd(w, f.NSFontBoldTrait) <>0 then
MsgBox "bold"
else
MsgBox "not bold"
end if
```

**Notes:** Typeface information is specified by the lower 16 bits of system trait value.

The font family class constants classify certain stylistic qualities of the font. These values correspond closely to the font class values in the OpenType OS/2 table. The class values are bundled in the upper four bits of the NSFontSymbolicTraits and can be accessed via NSFontFamilyClassMask. For more information about the specific meaning of each identifier, refer to the OpenType specification.

### 33.27.46 variantForKey(key as string) as Variant

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the font attribute specified by the given key.

### 33.27.47 Properties

### 33.27.48 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The internal reference.
**Notes:** (Read and Write property)

### 33.27.49 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSFontFamilyClassMask | &hF0000000 | The font family class mask used to access NSFontFamilyClass values.<br>Available in Mac OS X v10.4 and later.<br>This constant is used to access NSFontFamilyClass values in the upper four bits of NSFontSymbolicTraits. |

Typeface Constants

| Constant | Value | Description |
|---|---|---|
| NSFontBoldTrait | 2 | The font's typestyle is boldface.<br>Available in Mac OS X v10.4 and later. |
| NSFontCondensedTrait | 64 | The font's typestyle is condensed. Expanded and condensed traits are mutually exclusive.<br>Available in Mac OS X v10.4 and later. |
| NSFontExpandedTrait | 32 | The font's typestyle is expanded. Expanded and condensed traits are mutually exclusive.<br>Available in Mac OS X v10.4 and later. |
| NSFontItalicTrait | 1 | The font's typestyle is italic.<br>Available in Mac OS X v10.4 and later. |
| NSFontMonoSpaceTrait | 1024 | The font uses fixed-pitch glyphs if available. The font may have multiple glyph advances (many CJK glyphs contain two spaces).<br>Available in Mac OS X v10.4 and later. |
| NSFontUIOptimizedTrait | 4096 | The font synthesizes appropriate attributes for user interface rendering, such as control titles, if necessary.<br>Available in Mac OS X v10.4 and later. |
| NSFontVerticalTrait | 2048 | The font uses vertical glyph variants and metrics.<br>Available in Mac OS X v10.4 and later. |

Font Family Class Constants

| Constant | Value | Description |
|---|---|---|
| NSFontClarendonSerifsClass | &h40000000 | The font's style is a variation of the Oldstyle Serifs and the Transitional S<br>Available in Mac OS X v10.4 and later. |
| NSFontFreeformSerifsClass | &h70000000 | The font's style includes serifs, but it expresses a design freedom that doe<br>generally fit within the other serif design classifications.<br>Available in Mac OS X v10.4 and later. |
| NSFontModernSerifsClass | &h30000000 | The font's style is based on the Latin printing style of the 20th century.<br>Available in Mac OS X v10.4 and later. |
| NSFontOldStyleSerifsClass | &h10000000 | The font's style is based on the Latin printing style of the 15th to 17th cen<br>Available in Mac OS X v10.4 and later. |
| NSFontOrnamentalsClass | &h90000000 | The font's style includes highly decorated or stylized character shapes su<br>those typically used in headlines.<br>Available in Mac OS X v10.4 and later. |
| NSFontSansSerifClass | &h80000000 | The font's style includes most basic letter forms (excluding Scripts and O<br>mentals) that do not have serifs on the strokes.<br>Available in Mac OS X v10.4 and later. |
| NSFontScriptsClass | &hA0000000 | The font's style is among those typefaces designed to simulate handwritin<br>Available in Mac OS X v10.4 and later. |
| NSFontSlabSerifsClass | &h50000000 | The font's style is characterized by serifs with a square transition betwee<br>strokes and the serifs (no brackets).<br>Available in Mac OS X v10.4 and later. |
| NSFontSymbolicClass | &hC0000000 | The font's style is generally design independent, making it suitable for sp<br>characters (icons, dingbats, technical symbols, and so on) that may be<br>equally well with any font.<br>Available in Mac OS X v10.4 and later. |
| NSFontTransitionalSerifsClass | &h20000000 | The font's style is based on the Latin printing style of the 18th to 19th cen<br>Available in Mac OS X v10.4 and later. |
| NSFontUnknownClass | 0 | The font has no design classification.<br>Available in Mac OS X v10.4 and later. |

# 33.28 class NSFontManagerMBS

## 33.28.1 class NSFontManagerMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** NSFontManager is the center of activity for the font conversion system.
**Example:**

```
// pick some font
dim n1 as NSFontMBS = nsfontmbs.fontWithName("Book Antiqua bold", 12)
dim fm as new NSFontManagerMBS

// remove all font traits
dim n2 as NSFontMBS = fm.convertFontToNotHaveTrait(n1, fm.traitsOfFont(n1))

// show name of base font
MsgBox n2.fontName
```

**Notes:** It records the currently selected font, updates the Font panel and Font menu to reflect the selected font, initiates font changes, and converts fonts in response to requests from text-bearing objects. In a more prosaic role, NSFontManager can be queried for the fonts available to the application and for the particular attributes of a font, such as whether it's condensed or extended.

As of Mac OS X version 10.3, font collections are managed by NSFontManager.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr5
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr9
- MBS Xojo / Real Studio Plugins, version 15.4pr5
- MBS Xojo / Real Studio Plugins, version 13.2pr1
- MBS Real Studio Plugins, version 12.0pr6
- MBS Real Studio Plugins, version 11.3pr14

## 33.28.2 Methods

## 33.28.3 addCollection(collectionName as String, Options as Integer = 0) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a specified font collection to the font manager with a given set of options.
**Notes:** collectionName: The collection to add.
Options: Pass NSFontCollectionApplicationOnlyMask to make the collection available only to the application.
Return true if the font collection was successfully added; otherwise, false.

### 33.28.4 addFontDescriptorsToCollection(descriptors() as NSFontDescriptorMBS, collectionName as String)

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of font descriptors to the specified font collection.
**Example:**

```
dim fontManager as NSFontManagerMBS = NSFontManagerMBS.sharedFontManager

dim collectionNames() as string = fontManager.collectionNames
dim collectionName as string = collectionNames(collectionNames.Ubound) // get last one

dim fonts() as NSFontDescriptorMBS = fontManager.fontDescriptorsInCollection(collectionName)

// add Helvetica to this collection

dim font as NSFontMBS = NSFontMBS.fontWithName("Helvetica", 12)
dim fontDescriptor as NSFontDescriptorMBS = font.fontDescriptor

fontManager.addFontDescriptorsToCollection(array(fontDescriptor), collectionName)

dim fonts2() as NSFontDescriptorMBS = fontManager.fontDescriptorsInCollection(collectionName)

// fonts2 should have one more entry than fonts
Break
```

**Notes:** descriptors: The font descriptors to add.
collectionName: The font collection to which descriptors are added.

### 33.28.5 availableFontFamilies as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the names of the font families available in the system.
**Example:**

```
dim n as new NSFontManagerMBS
```

```
dim names() as string = n.availableFontFamilies

MsgBox Join(names,EndOfLine)
```

**Notes:** These fonts are in various system font directories.

### 33.28.6 availableFontNamesMatchingFontDescriptor(descriptor as NSFontDescriptorMBS) as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the names of the fonts that match the attributes in the given font descriptor.
**Example:**

```
// ask for monospace font trait
Dim traitsAttributes As New Dictionary
traitsAttributes.Value(NSFontDescriptorMBS.NSFontSymbolicTrait) = NSFontDescriptorMBS.NSFontMonoSpaceTrait

// ask for traits
Dim fontAttributes As New Dictionary
fontAttributes.Value(NSFontDescriptorMBS.NSFontTraitsAttribute) = traitsAttributes

// now make a font descriptor for this
Dim fd As NSFontDescriptorMBS = NSFontDescriptorMBS.fontDescriptorWithFontAttributes(fontAttributes)

// and ask font manager for matching fonts
Dim fontManager As New NSFontManagerMBS
Dim fonts() As String = fontManager.availableFontNamesMatchingFontDescriptor(fd)

// finds e.g. AndaleMono, CourierNewPSMT, CourierNewPS-ItalicMT, CourierNewPS-BoldMT, CourierNewPS-BoldItalicMT,
// FZLTXHB–B51-0, FZLTZHB–B51-0, FZLTTHB–B51-0, Menlo-Regular, Menlo-Italic, Menlo-Bold, Menlo-BoldItalic,
// Monaco, Osaka-Mono, JCsmPC, PTMono-Regular, PTMono-Bold
```

### 33.28.7 availableFontNamesWithTraits(traits as Integer) as string()

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the names of the fonts available in the system whose traits are described exactly by the given font trait mask (not the NSFont objects themselves).
**Example:**

```
dim n as new NSFontManagerMBS
dim names() as string = n.availableFontNamesWithTraits(n.NSBoldFontMask)

MsgBox str(UBound(names)+1)+" fonts: "+Join(names,", ")
```

**Notes:** traits: The font traits for which to return font names. You specify the desired traits by combining the font trait mask values described in Constants using the bitwiseor operator.

Returns the names of the corresponding fonts.

These fonts are in various system font directories.

If fontTraitMask is 0, this method returns all fonts that are neither italic nor bold. This result is the same one you'd get if fontTraitMask were NSUnitalicFontMask | NSUnboldFontMask.

### 33.28.8 availableFonts as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the names of the fonts available in the system (not the NSFont objects themselves).
**Example:**

```
dim n as new NSFontManagerMBS
dim names() as string = n.availableFonts

MsgBox Join(names,EndOfLine)
```

**Notes:** These fonts are in various system font directories.

### 33.28.9 availableMembersOfFontFamily(FontFamily as string) as Variant()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array with one entry for each available member of a font family.
**Example:**

```
dim n as new NSFontManagerMBS
dim members() as Variant = n.availableMembersOfFontFamily("Times")

for each m as Variant in members
```

```
dim member() as Variant = m

MsgBox "Postscript name: "+member(0)+EndOfLine+"Suffix: "+member(1)+EndOfLine+"Font weight: "+member(2)+EndOfLine+"Font trait: "+member(3)
next
```

**Notes:** family: The name of a font family, like one that availableFontFamilies returns.

Returns the available members of family.

Each entry of the returned variant array is another variant array with four members, as follows:

0. The PostScript font name, as a string.
1. The part of the font name used in the font panel that's not the font name, as a string. This value is not localized—for example, "Roman", "Italic", or "Bold".
2. The font's weight, as a double.
3. The font's traits, as a double.

The members of the family are arranged in the font panel order (narrowest to widest, lightest to boldest, plain to italic).

### 33.28.10 collectionNames as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the names of the currently loaded font collections.
**Example:**

```
dim n as new NSFontManagerMBS
dim names() as string = n.collectionNames

MsgBox Join(names,EndOfLine)
```

**Notes:** The names of the current font collections.

### 33.28.11 Constructor

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the object with the shared instance of the font manager for the application, creating it if necessary.

### 33.28.12 convertAttributes(dic as dictionary) as dictionary

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Converts attributes in response to an object initiating an attribute change, typically the Font panel or Font menu.

### 33.28.13 convertFont(font as NSFontMBS) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Converts the given font according to the object that initiated a font change, typically the Font panel or Font menu.

### 33.28.14 convertFontToFace(font as NSFontMBS, face as string) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns a font whose traits are as similar as possible to those of the given font except for the typeface, which is changed to the given typeface.
**Example:**

```
dim fontManager as new NSFontManagerMBS
// you have a font
dim font as NSFontMBS = NSFontMBS.fontWithName("Helvetica", 12)

// change font face
font = fontManager.convertFontToFace(font, "Helvetica-BoldOblique")

MsgBox font.fontName // shows Helvetica-BoldOblique
```

**Notes:** Font: The font whose traits are matched.
face: The new typeface; a fully specified family-face name, such as Helvetica-BoldOblique or Times-Roman.

Returns a font with matching traits and the given typeface, or aFont if it can't be converted.

This method attempts to match the weight and posture of aFont as closely as possible. Italic is mapped to Oblique, for example. Weights are mapped based on an approximate numeric scale of 0 to 15.

### 33.28.15 convertFontToFamily(font as NSFontMBS, family as string) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns a font whose traits are as similar as possible to those of the given font except for the font family, which is changed to the given family.
**Example:**

```
dim fontManager as new NSFontManagerMBS
// you have a font
dim font as NSFontMBS = NSFontMBS.fontWithName("Helvetica", 12)

// change font family
font = fontManager.convertFontToFamily(font, "Arial")

MsgBox font.fontName // shows ArialMT
```

**Notes:** Font: The font whose traits are matched.
family: The new font famliy; a generic font name, such as Helvetica or Times.

Returns a font with matching traits and the given family, or aFont if it can't be converted.

This method attempts to match the weight and posture of aFont as closely as possible. Italic is mapped to Oblique, for example. Weights are mapped based on an approximate numeric scale of 0 to 15.

### 33.28.16 convertFontToHaveTrait(font as NSFontMBS, trait as Integer) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns a font whose traits are the same as those of the given font, except that the traits are changed to include the single specified trait.
**Example:**

```
dim n as new NSFontManagerMBS
dim f as NSFontMBS = NSFontMBS.fontWithName("Times", 12.0)
```

```
dim g as NSFontMBS = n.convertFontToHaveTrait(f, n.NSBoldFontMask)

MsgBox g.fontName // Times-Bold
```

**Notes:** Font: The font whose traits are matched.
Trait: The new trait; may be any one of the traits described in Constants. Using NSUnboldFontMask or NSUnitalicFontMask removes the bold or italic trait, respectively.

Returns a font with matching traits including the given trait, or font if it can't be converted.
Using NSUnboldFontMask or NSUnitalicFontMask removes the bold or italic trait, respectively.

### 33.28.17 convertFontToNotHaveTrait(font as NSFontMBS, trait as Integer) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSFont object with the same traits as the given font, except for the traits in the given font trait mask, which are removed.
**Example:**

```
dim n as new NSFontManagerMBS
dim f as NSFontMBS = NSFontMBS.fontWithName("Times-Bold", 12.0)
dim g as NSFontMBS = n.convertFontToHaveTrait(f, n.NSUnBoldFontMask)

MsgBox g.fontName // Times-Roman
```

**Notes:** Font: The font whose traits are matched.
trait: The mask for the traits to remove, created using the bitwiseOr operator to combine the traits described in Constants. Using NSUnboldFontMask or NSUnitalicFontMask removes the bold or italic trait, respectively.
Returns a font with matching traits minus the given traits, or font if it can't be converted.

### 33.28.18 convertFontToSize(font as NSFontMBS, size as Double) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSFont object whose traits are the same as those of the given font, except for the size, which is changed to the given size.
**Example:**

```
dim fontManager as new NSFontManagerMBS
```

```
// you have a font
dim font as NSFontMBS = NSFontMBS.fontWithName("Helvetica", 12)

// change font size
font = fontManager.convertFontToSize(font, 20)

MsgBox str(font.pointSize)
```

**Notes:** Font: The font whose traits are matched.
size: The new font size.

Returns a font with matching traits except in the new size, or aFont if it can't be converted.

### 33.28.19 convertFontTraits(traits as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Converts font traits to a new traits mask value.
**Notes:** traits: The current font traits.

Returns the new traits mask value to be used by convertFont:.

This method is intended to be invoked to query the font traits while the action message (usually changeFont:) is being invoked when the current font action is either NSAddTraitFontAction or NSRemoveTraitFontAction.

Available in Mac OS X v10.5 and later.

### 33.28.20 convertWeightOfFont(font as NSFontMBS, up as boolean) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSFont object whose weight is greater or lesser than that of the given font, if possible.
**Example:**

```
dim n as new NSFontManagerMBS
dim f as NSFontMBS = NSFontMBS.fontWithName("Times", 12.0)
dim g as NSFontMBS = n.convertWeightOfFont(f, true)

MsgBox g.fontName // Times-Bold
```

**Notes:** up: If true, a heavier font is returned; if it's false, a lighter font is returned.
Font: The font whose weight is increased or decreased.

Returns a font with matching traits except for the new weight, or font if it can't be converted.

### 33.28.21 fontDescriptorsInCollection(collectionName as String) as NSFontDescriptorMBS()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the font descriptors in the collection specified by the given collection name.
**Example:**

```
dim fontManager as NSFontManagerMBS = NSFontManagerMBS.sharedFontManager
dim collectionNames() as string = fontManager.collectionNames
dim collectionName as string = collectionNames(collectionNames.Ubound) // get last one
dim fonts() as NSFontDescriptorMBS = fontManager.fontDescriptorsInCollection(collectionName)
Break
```

### 33.28.22 fontHasTraits(fontName as string, Traits as Integer) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the given font has all the specified traits.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(12)
dim m as new NSFontManagerMBS

dim isBold as Boolean = m.fontHasTraits(n.fontName, m.NSBoldFontMask)
dim isItalic as Boolean = m.fontHasTraits(n.fontName, m.NSItalicFontMask)

MsgBox "is bold: "+str(isBold)+_
EndOfLine+"is italic: "+str(isItalic)
```

**Notes:** typeface: The name of the font.
fontTraitMask: The font traits to test, specified by combining the font trait mask values described in Constants using the bitwiseOR operation.

Returns true if the font named typeface has all the traits specified in fontTraitMask; false if it doesn't.

Using NSUnboldFontMask returns true if the font is not bold, false otherwise. Using NSUnitalicFontMask returns true if the font is not italic, false otherwise.

### 33.28.23 isMultiple as boolean

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the last font selection recorded has multiple fonts.
**Notes:** Returns true if the last font selection recorded has multiple fonts; false if it's a single font.

### 33.28.24 orderFrontFontPanel

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method opens the Font panel by sending it an orderFront message, creating the Font panel if necessary.

### 33.28.25 orderFrontStylesPanel

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method opens the Font styles panel.

### 33.28.26 removeCollection(collectionName as String) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified font collection.
**Notes:** Returns true on success and false on failure.

### 33.28.27 removeFontDescriptorFromCollection(descriptor as NSFontDescriptorMBS, collectionName as String)

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified font descriptor from the specified collection.
**Notes:** descriptor: The font descriptor to remove.
collection: The font collection from which to remove the descriptor.

### 33.28.28 selectedFont as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the last font recorded.

### 33.28.29 setSelectedAttributes(dic as dictionary, isMultiple as boolean)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Informs the paragraph and character formatting panels when text in a selection has changed attributes.
**Notes:** dic: The new attributes.
isMultiple: If true, informs the panel that multiple fonts or attributes are enclosed within the selection.

This method is used primarily by NSTextView.
Available in Mac OS X v10.3 and later.

### 33.28.30 setSelectedFont(font as NSFontMBS, isMultiple as boolean)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Records the given font as the currently selected font and updates the Font panel to reflect this.
**Notes:** font: The font to set as selected.
isMultiple: If true, the Font panel indicates that more than one font is contained in the selection; if false, it does not.

An object that manipulates fonts should invoke this method whenever it becomes first responder and whenever its selection changes. It shouldn't invoke this method in the process of handling a changeFont message, as this causes the font manager to lose the information necessary to effect the change. After all fonts have been converted, the font manager itself records the new selected font.

### 33.28.31 sharedFontManager as NSFontManagerMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the shared instance of the font manager for the application, creating it if necessary.

### 33.28.32 traitsOfFont(font as NSFontMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the traits of the given font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(12)
dim m as new NSFontManagerMBS

// shows 2 which is m.NSBoldFontMask
MsgBox str(m.traitsOfFont(n))
```

**Notes:** Font: The font whose traits are returned.
Returns the font traits, returned as a mask created by combining values listed in Constants with the bitwiseOR operation.

### 33.28.33 weightOfFont(font as NSFontMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a rough numeric measure the weight of the given font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(12)
dim m as new NSFontManagerMBS

MsgBox str(m.weightOfFont(n))
```

**Notes:** Font: The font whose weight is returned.

A rough numeric measure the weight of the given font, where 0 indicates the lightest possible weight, 5 indicates a normal or book weight, and 9 or more indicates a bold or heavier weight.

### 33.28.34 Properties

### 33.28.35 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 15.4, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.28.36 Enabled as boolean

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the font conversion system's user interface items (the Font panel and Font menu items) are enabled.
**Notes:** True if the font conversion system's user interface items (the Font panel and Font menu items) are enabled; false if they're not.
(Read and Write computed property)

### 33.28.37 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAddTraitFontAction | 2 | One of the constants for use with modifyFont method.<br>Converts the font to have an additional trait using convertFontto |
| NSBoldFontMask | 2 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a bold font. |
| NSCompressedFontMask | &h00000200 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a compressed font. |
| NSCondensedFontMask | &h00000040 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a condensed font. |
| NSExpandedFontMask | &h00000020 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies an expanded font. |
| NSFixedPitchFontMask | &h00000400 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a fixed pitch font. |
| NSFontCollectionApplicationOnlyMask | 1 | One of the constants for options accepted by addCollection.<br>akes the collection available only to the application. This opti<br>implemented. |
| NSHeavierFontAction | 5 | One of the constants for use with modifyFont method.<br>Converts the font to a heavier weight using convertWeightofFont |
| NSItalicFontMask | 1 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies an italic font. |
| NSLighterFontAction | 6 | One of the constants for use with modifyFont method.<br>Converts the font to a lighter weight using convertWeightofFont. |
| NSNarrowFontMask | &h00000010 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a narrow font. |
| NSNoFontChangeAction | 0 | One of the constants for use with modifyFont method.<br>No action; the font is returned unchanged. |
| NSNonStandardCharacterSetFontMask | 8 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a font that uses a non-standard character |
| NSPosterFontMask | &h00000100 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a poster-style font. |
| NSRemoveTraitFontAction | 7 | One of the constants for use with modifyFont method.<br>Converts the font to remove a trait using convertFonttoNotHave |
| NSSizeDownFontAction | 4 | One of the constants for use with modifyFont method.<br>Converts the font to a smaller size using convertFonttoSize. |
| NSSizeUpFontAction | 3 | One of the constants for use with modifyFont method.<br>Converts the font to a larger size using convertFonttoSize. |
| NSSmallCapsFontMask | &h00000080 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a small-caps font. |
| NSUnboldFontMask | 4 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a font that is not bold. |
| NSUnitalicFontMask | &h01000000 | One of the constants for use with mask of traits assigned to a fo<br>A mask that specifies a font that is not italic. |
| NSViaPanelFontAction | 1 | One of the constants for use with modifyFont method.<br>Converts the font according to the NSFontPanel method panelC |

## 33.29 class NSFontMBS

### 33.29.1 class NSFontMBS

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** A class for a font in the Cocoa world.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.4
- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr5
- Styled Text for Labels in your Xojo iOS app
- Apply fonts to font PopupMenu
- MBS Xojo / Real Studio Plugins, version 14.3pr2
- MBS Xojo / Real Studio Plugins, version 13.2pr1
- CocoaBase needs MacOSXCG
- MBS Real Studio Plugins, version 12.1pr10
- MBS REALbasic Plugins, version 10.6pr2

**Xojo Developer Magazine**

- 6.1, page 6: Thoughts from the Publisher by Marc Zeedar
- 20.6, page 9: News

### 33.29.2 Methods

### 33.29.3 advancementForGlyph(aGlyph as Integer) as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the nominal spacing for the given glyph—the distance the current point moves after showing the glyph—accounting for the receiver's size.
**Notes:** This spacing is given according to the glyph's movement direction, which is either strictly horizontal or strictly vertical.

### 33.29.4 boldSystemFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the Aqua system font used for standard interface items that are rendered in boldface type in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.boldSystemFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande-Bold 12.00 pt. P [ ] (0x1c082c0) fobj=0x1c09d30, spc=3.96"
```

**Notes:** If fontSize is 0 or negative, returns the boldface system font at the default size.

### 33.29.5 boundingRectForGlyph(aGlyph as Integer) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bounding rectangle for the specified glyph, scaled to the receiver's size.
**Notes:** Japanese fonts encoded with the scheme "EUC12-NJE-CFEncoding" do not have individual metrics or bounding boxes available for the glyphs above 127. For those glyphs, this method returns the bounding rectangle for the font instead.

### 33.29.6 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 33.29.7 controlContentFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for the content of controls in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.controlContentFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x16017750) fobj=0x160175c0, spc=3.80"
```

**Notes:** For example, in a table, the user's input uses the control content font, and the table's header uses another font. If fontSize is 0 or negative, returns the control content font at the default size.

### 33.29.8 file as folderitem

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the folderitem for this font.
**Notes:** One file may give several font faces.

### 33.29.9 fontDescriptor as NSFontDescriptorMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the receiver's font descriptor.
**Notes:** A font descriptor object that describes the receiver.

The font descriptor contains a mutable dictionary of optional attributes for creating an NSFont object. See documentation on NSFontDescriptor for more information.

### 33.29.10 fontWithDescriptor(fontDescriptor as NSFontDescriptorMBS, fontSize as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a font object for the specified font descriptor and font size.
**Notes:** fontDescriptor: A font descriptor object.
fontSize: The size in points to which the font is scaled.

Returns a font object for the specified descriptor and size.

In most cases, you can simply use fontWithName to create standard scaled fonts.
Available in Mac OS X v10.4 and later.
See also:

- 33.29.11 fontWithDescriptor(fontDescriptor as NSFontDescriptorMBS, TextTransform as Variant) as NSFontMBS 

### 33.29.11 fontWithDescriptor(fontDescriptor as NSFontDescriptorMBS, TextTransform as Variant) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a font object for the specified font descriptor and text transform.
**Notes:** fontDescriptor: The font descriptor object describing the font to return.
textTransform: An affine transformation applied to the font. Must be a NSAffineTransformMBS object or nil!

Returns a font object for the specified name and transform.

In most cases, you can simply use fontWithName to create standard scaled fonts. If textTransform is non-nil, it has precedence over NSFontMatrixAttribute in fontDescriptor.

Available in Mac OS X v10.4 and later.
See also:

- 33.29.10 fontWithDescriptor(fontDescriptor as NSFontDescriptorMBS, fontSize as Double) as NSFontMBS 6066

### 33.29.12 fontWithName(fontName as string, fontSize as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Creates a font object for the specified font name and font size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Monaco", 12)

MsgBox n.description
// shows: "Monaco 12.00 pt. P [ ] (0x1805020) fobj=0x168114b0, spc=7.20"
```

**Notes:** The fontName is a fully specified family-face name, such as Helvetica-BoldOblique or Times-Roman. The fontSize is equivalent to using a font matrix of [ fontSize 0 0 fontSize 0 0 ] . If you use a fontSize of 0.0, this method uses the default User Font size.

Fonts created with this method automatically flip themselves in flipped views. This method is the preferred means for creating fonts.

### 33.29.13 glyphWithName(name as string) as UInt32

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the named encoded glyph, or –1 if the receiver contains no such glyph.
**Notes:** Returns –1 if the glyph named glyphName isn't encoded.
Glyph names in fonts do not always accurately identify the glyph. If possible, look up the appropriate glyph on your own.

### 33.29.14 labelFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Aqua font used for standard interface labels in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.labelFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x1829350) fobj=0x18293f0, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the label font with the default size.

### 33.29.15 labelFontSize as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the size of the standard label font.
**Example:**

```
MsgBox str(NSFontMBS.labelFontSize) // shows 10
```

### 33.29.16 menuBarFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for menu bar items, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.menuBarFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x17e00c00) fobj=0x17e00ca0, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the menu bar font with the default size.
Available in Mac OS X v10.3 and later.

### 33.29.17 menuFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for menu items, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.menuFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x1da6d80) fobj=0x1da6e20, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the menu items font with the default size.

### 33.29.18 messageFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for standard interface items, such as button labels, menu items, and so on, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.messageFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x1c11520) fobj=0x1c11790, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns this font at the default size. This method is equivalent to systemFontOfSize().

### 33.29.19 monospacedDigitSystemFontOfSize(fontSize as double, weight as double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 22.4, Platform: macOS, Targets: All.

**Function:** Returns a version of the standard system font that contains monospaced digit glyphs.
**Notes:** fontSize: The desired font size specified in points. If you specify 0.0 or a negative number for this

parameter, the method returns the system font at the default size.
weight: The desired weight of font lines, specified as one of the constants in NSFontWeight.

Returns a font object containing the system font with monospace digits at the specified size and weight.

The font returned by this method has monospaced digit glyphs. Glyphs for other characters and symbols may be wider or narrower than the monospaced characters. To ensure the font uses fixed spacing for all characters, apply the NSFontFixedAdvanceAttribute attribute to the any strings you render.

### 33.29.20 monospacedSystemFontOfSize(fontSize as double, weight as double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 22.4, Platform: macOS, Targets: All.

**Function:** Returns a monospace version of the system font with the specified size and weight.
**Notes:** fontSize: The desired font size specified in points. If you specify 0.0 or a negative number for this parameter, the method returns the system font at the default size.
weight: The desired weight of font lines, specified as one of the constants in NSFontWeight.

Returns a font object containing a monospace version of the system font at the specified size and weight.

Use the returned font for interface items that require monospaced glyphs. The returned font includes monospaced glyphs for the Latin characters and the symbols commonly found in source code. Glyphs for other symbols are usually wider or narrower than the monospaced characters. To ensure the font uses fixed spacing for all characters, apply the NSFontFixedAdvanceAttribute attribute to the any strings you render.

### 33.29.21 paletteFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for palette window title bars, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.paletteFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x18800c00) fobj=0x18800ca0, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the palette title font at the default size.

### 33.29.22 screenFontWithRenderingMode(renderingMode as Integer) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a bitmapped screen font, when sent to a font object representing a scalable PostScript font, with the specified rendering mode, matching the receiver in typeface and matrix (or size), or nil if such a font can't be found.
**Notes:** For valid rendering modes, see NSFontRenderingMode.
Screen fonts are for direct use with the window server only. Never use them with Application Kit objects, such as in setFont: methods. Internally, the Application Kit automatically uses the corresponding screen font for a font object as long as the view is not rotated or scaled.
Available in Mac OS X v10.4 and later.

### 33.29.23 setUserFixedPitchFont(font as NSFontMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the font used by default for documents and other text under the user's control, when that font should be fixed-pitch, to the specified font.
**Notes:** Specifying font as nil causes the default to be removed from the application domain.

### 33.29.24 setUserFont(font as NSFontMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the font used by default for documents and other text under the user's control to the specified font.
**Notes:** Specifying font as nil causes the default to be removed from the application domain.

### 33.29.25 smallSystemFontSize as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the size of the standard small system font.
**Example:**

```
MsgBox str(NSFontMBS.smallSystemFontSize) // shows 11
```

### 33.29.26 systemFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the Aqua system font used for standard interface items, such as button labels, menu items, and so on, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.systemFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x17e009d0) fobj=0x17e00ca0, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the system font at the default size.

### 33.29.27 systemFontSize as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the size of the standard system font.
**Example:**

```
MsgBox str(NSFontMBS.systemFontSize) // shows 13
```

### 33.29.28 systemFontSizeForControlSize(controlSize as Integer) as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font size used for the specified control size.
**Example:**

```
MsgBox str(NSFontMBS.systemFontSizeForControlSize(0)) // 13
MsgBox str(NSFontMBS.systemFontSizeForControlSize(1)) // 11
```

**Notes:** If controlSize does not correspond to a valid NSControlSize, returns the size of the standard system font.
Available in Mac OS X v10.3 and later.

### 33.29.29 titleBarFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for window title bars, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.titleBarFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x1a31b20) fobj=0x1a31bc0, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the title bar font at the default size. This method is equivalent to boldSystemFontOfSize.

### 33.29.30 toolTipsFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used for tool tips labels, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.toolTipsFontOfSize(12)

MsgBox n.description
// shows: "LucidaGrande 12.00 pt. P [ ] (0x1828db0) fobj=0x1828e50, spc=3.80"
```

**Notes:** If fontSize is 0 or negative, returns the tool tips font at the default size.

### 33.29.31 userFixedPitchFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used by default for documents and other text under the user's control (that is, text whose font the user can normally change), when that font should be fixed-pitch, in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.userFixedPitchFontOfSize(12)

MsgBox n.description
// shows: "Monaco 12.00 pt. P [ ] (0x1ad13a0) fobj=0x1ac2bd0, spc=7.20"
```

**Notes:** If fontSize is 0 or negative, returns the fixed-pitch font at the default size.

The system does not guarantee that all the glyphs in a fixed-pitch font are the same width. For example, certain Japanese fonts are dual-pitch, and other fonts may have nonspacing marks that can affect the display of other glyphs.

### 33.29.32 userFontOfSize(size as Double) as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the font used by default for documents and other text under the user's control (that is, text whose font the user can normally change), in the specified size.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.userFontOfSize(12)

MsgBox n.description
// shows: "Helvetica 12.00 pt. P [ ] (0x19019b0) fobj=0x181fd00, spc=3.33"
```

**Notes:** If fontSize is 0 or negative, returns the user font at the default size.

### 33.29.33 Properties

### 33.29.34 ascender as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the top y-coordinate, offset from the baseline, of the receiver's longest ascender.
**Notes:** (Read only property)

### 33.29.35 boundingRectForFont as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's bounding rectangle, scaled to the font's size.
**Notes:** The bounding rectangle is the union of the bounding rectangles of every glyph in the font.
(Read only property)

### 33.29.36 capHeight as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's cap height.
**Notes:** (Read only property)

### 33.29.37 coveredCharacterSet as Variant

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSCharacterSet object containing all of the nominal characters renderable by the receiver, which is all of the entries mapped in the receiver's ‚Äòcmap' table.
**Example:**

```
// get the Symbol font
dim n as NSFontMBS = NSFontMBS.fontWithName("Symbol",10)

// what characters are defined for this font?
dim c as NSCharacterSetMBS = n.coveredCharacterSet

// display a string with all the characters
MsgBox c.StringValue
```

**Notes:** Value is a NSCharacterSetMBS object. Returned as Variant to reduce plugin dependencies.
The number of glyphs supported by a given font is often larger than the number of characters contained in the character set returned by this method.
(Read only property)

### 33.29.38 descender as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the bottom y coordinate, offset from the baseline, of the receiver's longest descender.
**Notes:** Thus, if the longest descender extends 2 points below the baseline, descender will return –2.
(Read only property)

### 33.29.39 description as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The description of the font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.systemFontOfSize(12)
MsgBox n.description
```

**Notes:** (Read only property)

### 33.29.40 displayName as string

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The (localized) display name of the font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Monaco", 12)

MsgBox n.displayName // shows "Monaco"
```

**Notes:** (Read only property)

### 33.29.41 familyName as string

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The family name of the font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Monaco", 12)

MsgBox n.familyName // shows "Monaco"
```

**Notes:** (Read only property)

### 33.29.42 fontName as string

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The name of the font.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Monaco", 12)

MsgBox n.fontName // shows "Monaco"
```

**Notes:** (Read only property)

### 33.29.43 Handle as Integer

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSFont object.
**Notes:** (Read and Write property)

### 33.29.44 isFixedPitch as boolean

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether all glyphs in the receiver have the same advancement.
**Notes:** Returns true if all glyphs in the receiver have the same advancement; false if any advancements differ.

Some Japanese fonts encoded with the scheme "EUC12-NJE-CFEncoding" return that they have the same advancement, but actually encode glyphs with one of two advancements, for historical compatibility. You may need to handle such fonts specially for some applications.
(Read only property)

### 33.29.45 italicAngle as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's italic angle, the amount that the font is slanted in degrees counterclockwise from the vertical, as read from its AFM file.
**Notes:** Because the slant is measured counterclockwise, English italic fonts typically return a negative value.
(Read only property)

### 33.29.46 leading as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's leading.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 33.29.47 maximumAdvancement as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the greatest advancement of any of the receiver's glyphs.
**Notes:** This advancement is always either strictly horizontal or strictly vertical.
(Read only property)

### 33.29.48 mostCompatibleStringEncoding as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the string encoding that works best with the receiver, where there are the fewest possible unmatched characters in the string encoding and glyphs in the font.
**Notes:** You can use NSString,Äòs dataUsingEncoding method to convert the string to this encoding.
If this method returns NSASCIIStringEncoding, it could not determine the correct encoding and assumed that the font can render only ASCII characters.
This method works heuristically using well-known font encodings, so for nonstandard encodings it may not in fact return the optimal string encoding.
(Read only property)

### 33.29.49 numberOfGlyphs as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of glyphs in the receiver.
**Example:**

```
dim n as NSFontMBS = NSFontMBS.fontWithName("Monaco", 12)

MsgBox str(n.numberOfGlyphs) // 1678
```

**Notes:** Glyphs are numbered starting at 0.
(Read only property)

### 33.29.50 pointSize as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's point size, or the effective vertical point size for a font with a nonstandard matrix.
**Notes:** (Read only property)

### 33.29.51 printerFont as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the scalable PostScript font corresponding to itself.
**Notes:** When sent to a font object representing a scalable PostScript font, returns self. When sent to a font object representing a bitmapped screen font, returns its corresponding scalable PostScript font.
(Read only property)

### 33.29.52 renderingMode as Integer

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the rendering mode of the receiver.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 33.29.53 screenFont as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmapped screen font corresponding to itself.
**Notes:** When sent to a font object representing a scalable PostScript font, returns a bitmapped screen font matching the receiver in typeface and matrix (or size), or nil if such a font can't be found. When sent to a font object representing a bitmapped screen font, returns nil.

Screen fonts are for direct use with the window server only. Never use them with Application Kit objects, such as in setFont: methods. Internally, the Application Kit automatically uses the corresponding screen font for a font object as long as the view is not rotated or scaled.
(Read only property)

### 33.29.54 textTransform as Variant

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the current transformation matrix for the receiver.
**Notes:** Available in Mac OS X v10.4 and later.

Returns NSAffineTransformMBS. Returned as Variant to reduce plugin dependencies.
(Read only property)

### 33.29.55 underlinePosition as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the baseline offset that should be used when drawing underlines with the receiver, as determined by the font's AFM file.
**Notes:** This value is usually negative, which must be considered when drawing in a flipped coordinate system.
(Read only property)

### 33.29.56 underlineThickness as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the thickness that should be used when drawing underlines with the receiver, as determined by the font's AFM file.
**Notes:** (Read only property)

### 33.29.57 xHeight as Double

MBS MacBase Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Returns the x-height of the font.
**Notes:** (Read only property)

### 33.29.58 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSControlGlyph | &hFFFFFF | One of the constants define reserved glyph codes<br>NSGlyphGenerator generates NSControlGlyph fo<br>General Category C* and U200B (ZERO WIDT |
| NSFontAntialiasedIntegerAdvancementsRenderingMode | 3 | One of the constants specify the font rendering r<br>Specifies antialiased, integer advancements rende<br>Available in Mac OS X v10.4 and later. |
| NSFontAntialiasedRenderingMode | 1 | One of the constants specify the font rendering r<br>Specifies antialiased, floating-point advancements<br>with printerFont).<br>Available in Mac OS X v10.4 and later. |
| NSFontDefaultRenderingMode | 0 | One of the constants specify the font rendering r<br>Determines the actual mode based on the user p<br>Available in Mac OS X v10.4 and later. |
| NSFontIntegerAdvancementsRenderingMode | 2 | One of the constants specify the font rendering r<br>Specifies integer advancements rendering mode.<br>Available in Mac OS X v10.4 and later. |
| NSNativeShortGlyphPacking | 5 | A constant for glyph packing.<br>The native format for Mac OS X.<br>ocoa stores all text data as Unicode. The text<br>glyph IDs and places them in 1-, 2-, or 4-byte s<br>text. To render text, you must convert the storag<br>understands. The following constants describe t<br>text rendering engine can use. They are used t<br>for making a multibyte (or single-byte) array of g<br>preter, such as the window server, which expects<br>(that is, "packed glyphs") instead of a pure NSG<br>glyphPacking. With Quartz, the engine always e<br>byte short array, so NSNativeShortGlyphPackin<br>in use. |
| NSNullGlyph | 0 | One of the constants define reserved glyph codes<br>A null glyph. |

## 33.30 class NSFontPanelMBS

### 33.30.1 class NSFontPanelMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** The NSFontPanel class implements the Font panel—a user interface object that displays a list of available fonts, letting the user preview them and change the font used to display text.
**Example:**

NSFontPanelMBS.sharedFontPanel.Show

**Notes:** The actual changes are made through conversion messages sent to the shared NSFontManager instance. There's only one Font panel for each application.
Subclass of the NSPanelMBS class.
**Blog Entries**

- RTF functions in MBS Plugins
- MBS Real Studio Plugins, version 12.5pr6

### 33.30.2 Methods

### 33.30.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** The Constructor.

### 33.30.4 convertAttributes(old as dictionary) as dictionary

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Converts attributes in response to an object initiating an attribute change, typically the Font panel.
**Notes:** Call this function only in the changeAttributes event.

### 33.30.5 convertFont(oldFont as NSFontMBS) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Converts the given font according to the object that initiated a font change, typically the Font panel.

**Notes:** Call this function only in the ChangeFont event.

### 33.30.6 Destructor

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 33.30.7 panelConvertFont(font as NSFontMBS) as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Converts the specified font using the settings in the receiver, with the aid of the shared NSFontManager if necessary.
**Notes:** Font: The font to be converted.

Returns the converted font, or aFont itself if it can't be converted.

For example, if aFont is Helvetica Oblique 12.0 point and the user has selected the Times font family (and nothing else) in the Font panel, the font returned is Times Italic 12.0 point.

### 33.30.8 reloadDefaultFontFamilies

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Triggers a reload to the default state, so that the delegate is called.
**Notes:** This reloading provides the delegate opportunity to scrutinize the default list of fonts to be displayed in the panel.

### 33.30.9 setPanelFont(font as NSFontMBS, isMultiple as boolean)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Sets the selected font in the receiver to the specified font.
**Notes:** Font: The font to be selected.
flag: If false, selects the specified font; otherwise selects no font and displays a message in the preview area indicating that multiple fonts are selected.

You normally don't use this method directly; instead, you send setSelectedFont to the shared NSFontManager, which in turn invokes this method.

### 33.30.10 sharedFontPanel as NSFontPanelMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the single NSFontPanel instance for the application, creating it if necessary.
**Example:**

NSFontPanelMBS.sharedFontPanel.Show

### 33.30.11 sharedFontPanelExists as boolean

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the shared Font panel has been created, false if it hasn't.

### 33.30.12 worksWhenModal as boolean

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the receiver allows fonts to be changed in modal windows and panels.

### 33.30.13 Properties

### 33.30.14 accessoryView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** The accessory view.
**Notes:** Establishes the specified view as the receiver's accessory view, allowing you to add custom controls to your application's Font panel without having to create a subclass.
(Read and Write computed property)

### 33.30.15 Enabled as boolean

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver's Set button is enabled.
**Notes:** The receiver continues to reflect the font of the selection for cooperating text objects regardless of

this setting.
(Read and Write computed property)

### 33.30.16 Events

### 33.30.17 changeAttributes

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: .

**Function:** The event called whenever attributes in the font panel changed.
**Notes:** Use convertAttributes to know what changed.

### 33.30.18 changeFont

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: .

**Function:** The event called whenever the font in the font panel changed.
**Notes:** Use ConvertFont to know what changed.

### 33.30.19 validModesForFontPanel as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Returns the mode mask corresponding to the expected font panel mode.
**Notes:** The mode masks are defined in constants.
By default the plugin returns NSFontPanelAllModesMask.

### 33.30.20 Constants

Mode Constants

| Constant | Value | Description |
|---|---|---|
| NSFontPanelAllEffectsModeMask | &hFFF00 | Display all the effects user interface items. |
| NSFontPanelAllModesMask | &hFFFFFFFF | Display all the available adornments. |
| NSFontPanelCollectionModeMask | 4 | Display the font collections column. |
| NSFontPanelDocumentColorEffectModeMask | 2048 | Display the document color button. |
| NSFontPanelFaceModeMask | 1 | Display the typeface column. |
| NSFontPanelShadowEffectModeMask | 4096 | Display the shadow effects button. |
| NSFontPanelSizeModeMask | 2 | Display the font size column. |
| NSFontPanelStandardModesMask | &hFFFF | Display the standard default font panel—that is, includin face, and size columns. |
| NSFontPanelStrikethroughEffectModeMask | 512 | Display the strike-through popup menu. |
| NSFontPanelTextColorEffectModeMask | 1024 | Display the text color button. |
| NSFontPanelUnderlineEffectModeMask | 256 | Display the underline popup menu. |

## 33.31 class NSHelpManagerMBS

### 33.31.1 class NSHelpManagerMBS

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSHelpManager class provides an approach to displaying online help.
**Notes:** An application contains one NSHelpManager object.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr8
- MBS Xojo Plugins, version 19.3pr2
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 33.31.2 Methods

### 33.31.3 Constructor

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an NSHelpManagerMBS object in Xojo which points to the shared NSHelpManager object.

### 33.31.4 findString(query as string, book as string)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Performs a search for the specified string in the specified book.
**Notes:** query: String to search for.
book: Localized help book to search. When "", all installed help books are searched.

### 33.31.5 isContextHelpModeActive as boolean

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether context-sensitive help mode is active.
**Notes:** Returns true when the application is in context-sensitive help mode, false otherwise.

In context-sensitive help mode, when a user clicks a user interface item, help for that item is displayed in a small window just below the cursor.

### 33.31.6 NSContextHelpModeDidActivateNotification as string

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to be used with NSNotificationObserverMBS class.
**Notes:** Posted when the application enters context-sensitive help mode. This typically happens when the user holds down the Help key.
The notification object is the help manager. This notification does not contain a userInfo dictionary.

### 33.31.7 NSContextHelpModeDidDeactivateNotification as string

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to be used with NSNotificationObserverMBS class.
**Notes:** Posted when the application exits context-sensitive help mode. This happens when the user clicks the mouse button while the cursor is anywhere on the screen after displaying a context-sensitive help topic.
The notification object is the help manager. This notification does not contain a userInfo dictionary.

### 33.31.8 openHelpAnchor(anchor as string, book as string)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Finds and displays the text at the given anchor location in the given book.
**Notes:** anchor: Location of the desired text.
book: Help book containing the anchor. When "", all installed help books are searched.

### 33.31.9 registerBooksInBundle(bundle as NSBundleMBS) as boolean

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Registers one or more help books in the given bundle.
**Notes:** bundle: The bundle for additional help books. Books in the main bundle are automatically registered.

Returns true if registration is successful, false if if the bundle doesn't contain any help books or if registration fails.

You use registerBooksInBundle to register help books in, for example, a plug-in bundle. The Info.plist in the bundle should contain a help book directory path, which specifies one or more folders containing help books.

The main bundle is automatically registered by openHelpAnchor and findString.

### 33.31.10 setContextHelpModeActive(active as boolean)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether context-sensitive help mode is active.
**Notes:** active: True turns on context-sensitive help, false turns it off.

You never send this message directly; instead, the NSApplication method activateContextHelpMode activates context-sensitive help mode, and the first mouse click after displaying the context-sensitive help window deactivates it.

When the application enters context-sensitive help mode, the help manager posts an NSContextHelpModeDidActivateNotification to the default notification center. When the application returns to normal operation, the help manager posts an NSContextHelpModeDidDeactivateNotification.

### 33.31.11 Properties

### 33.31.12 Handle as Integer

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference to the NSHelpManager object.
**Notes:** (Read and Write property)

## 33.32 class NSIndexSetMBS

### 33.32.1 class NSIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The NSIndexSet class represents an immutable collection of unique unsigned integers, known as indexes because of the way they are used.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

**Notes:** This collection is referred to as a index set.

You use index sets in your code to store indexes into some other data structure. For example, given an array, you could use an index set to identify a subset of objects in that array.

Each index value can appear only once in the index set. This is an important concept to understand and is why you would not use index sets to store an arbitrary collection of integer values. To illustrate how this works, if you created an NSIndexSet object with the values 4, 5, 2, and 5, the resulting set would only have the values 4, 5, and 2 in it. Because index values are always maintained in sorted order, the actual order of the values when you created the set would be 2, 4, and then 5.

In most cases, using an index set is more efficient than storing a collection of individual integers. Internally, the NSIndexSet class represents indexes using ranges. For maximum performance and efficiency, overlapping ranges in an index set are automatically coalesced—that is, ranges merge rather than overlap. Thus, the more contiguous the indexes in the set, the fewer ranges are required to specify those indexes.

You must not subclass the NSIndexSet class.

The mutable subclass of NSIndexSet is NSMutableIndexSet.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr7

### 33.32.2 Methods

### 33.32.3 Constructor

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object.
**Example:**

```
dim x as new NSIndexSetMBS
```

See also:


- 33.32.4 Constructor(index as Integer) 6091
- 33.32.5 Constructor(indexes as NSIndexSetMBS) 6091
- 33.32.6 Constructor(StartIndex as Integer, Length as Integer) 6092


### 33.32.4 Constructor(index as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object with an index.
**Example:**

```
dim n as new NSIndexSetMBS(5)
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

See also:


- 33.32.3 Constructor 6090
- 33.32.5 Constructor(indexes as NSIndexSetMBS) 6091
- 33.32.6 Constructor(StartIndex as Integer, Length as Integer) 6092


### 33.32.5 Constructor(indexes as NSIndexSetMBS)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object with an index set.
**Example:**

```
dim n as new NSIndexSetMBS(5)
dim x as new NSIndexSetMBS(n)
MsgBox str(x.firstIndex)
```

See also:

- 33.32.3 Constructor 6090
- 33.32.4 Constructor(index as Integer) 6091
- 33.32.6 Constructor(StartIndex as Integer, Length as Integer) 6092


### 33.32.6 Constructor(StartIndex as Integer, Length as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object with an index range.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
```

**Notes:** This method raises an NSRangeException when indexRange would add an index that exceeds the maximum allowed value for unsigned integers.
See also:


- 33.32.3 Constructor 6090
- 33.32.4 Constructor(index as Integer) 6091
- 33.32.5 Constructor(indexes as NSIndexSetMBS) 6091


### 33.32.7 containsIndex(index as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver contains a specific index.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10

if n.containsIndex(6) then
MsgBox "OK"
else
MsgBox "Error."
end if

if n.containsIndex(11) then
MsgBox "Error."
else
MsgBox "OK"
end if
```

**Notes:** Returns true when the receiver contains index, false otherwise.

### 33.32.8 containsIndexes(indexes as NSIndexSetMBS) as boolean

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver contains a superset of the indexes in another index set.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
dim m as new NSIndexSetMBS(6,2)

if n.containsIndexes(m) then
MsgBox "OK"
else
MsgBox "Error."
end if
```

**Notes:** True when the receiver contains a superset of the indexes in indexSet, false otherwise.

### 33.32.9 containsIndexesInRange(StartIndex as Integer, Length as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver contains the indexes represented by an index range.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
if n.containsIndexesInRange(6,2) then
MsgBox "OK"
else
MsgBox "Error."
end if
```

**Notes:** Returns true when the receiver contains the indexes in indexRange, false otherwise.

### 33.32.10 copy as NSIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the Cocoa and RB object.

### 33.32.11 count as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns the number of indexes in the receiver.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.count) // shows 6
```

### 33.32.12 countOfIndexesInRange(StartIndex as Integer, Length as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns the number of indexes in the receiver that are members of a given range.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.countOfIndexesInRange(1,8)) // shows 4
```

**Notes:** Available in Mac OS X v10.5 and later.

### 33.32.13 firstIndex as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the first index in the receiver or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

**Notes:** First index in the receiver or NSNotFound (&h7fffffff) when the receiver is empty.

### 33.32.14 indexGreaterThanIndex(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the closest index in the receiver that is greater than a specific index or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.indexGreaterThanIndex(1)) // shows(5)
```

**Notes:** Returns the losest index in the receiver greater than index; NSNotFound (&h7FFFFFFF) when the receiver contains no qualifying index.

### 33.32.15 indexGreaterThanOrEqualToIndex(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the closest index in the receiver that is greater than or equal to a specific index or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.indexGreaterThanOrEqualToIndex(1)) // shows(5)
```

**Notes:** Returns closest index in the receiver greater than or equal to index; NSNotFound (&h7FFFFFFF) when the receiver contains no qualifying index.

### 33.32.16 indexLessThanIndex(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the closest index in the receiver that is less than a specific index or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.indexLessThanIndex(20)) // shows 10
MsgBox str(n.indexLessThanIndex(1)) // shows 2147483647 for not found
```

**Notes:** Returns closest index in the receiver less than index; NSNotFound (&h7FFFFFFF) when the re-

ceiver contains no qualifying index.

### 33.32.17 indexLessThanOrEqualToIndex(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the closest index in the receiver that is less than or equal to a specific index or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.indexLessThanOrEqualToIndex(20)) // shows 10
```

**Notes:** Returns closest index in the receiver less than or equal to index; NSNotFound (&h7FFFFFFF) when the receiver contains no qualifying index.

### 33.32.18 indexSet as NSIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty index set.
**Example:**

```
dim n as NSIndexSetMBS = NSIndexSetMBS.indexSet
MsgBox str(n.count) // 0 ->empty
```

**Notes:** Available in Mac OS X v10.3 and later.

### 33.32.19 indexSetWithIndex(index as Integer) as NSIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an index set with an index.
**Example:**

```
dim n as NSIndexSetMBS = NSIndexSetMBS.indexSetWithIndex(3)
MsgBox str(n.count) // 1
```

**Notes:** Available in Mac OS X v10.3 and later.

### 33.32.20 indexSetWithIndexesInRange(StartIndex as Integer, Length as Integer) as NSIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an index set with an index range.
**Example:**

```
dim n as NSIndexSetMBS = NSIndexSetMBS.indexSetWithIndexesInRange(3,2)
MsgBox str(n.count) // 2 and contains 3,4
```

**Notes:** Available in Mac OS X v10.3 and later.

### 33.32.21 intersectsIndexesInRange(StartIndex as Integer, Length as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Indicates whether the receiver contains any of the indexes in a range.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10

if n.intersectsIndexesInRange(1,4) then
MsgBox "Error"
else
MsgBox "OK"
end if

if n.intersectsIndexesInRange(1,6) then
MsgBox "OK"
else
MsgBox "Error"
end if
```

### 33.32.22 isEqualToIndexSet(other as NSIndexSetMBS) as boolean

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Indicates whether the indexes in the receiver are the same indeces contained in another index

set.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
dim m as NSIndexSetMBS = n.mutableCopy

if m.isEqualToIndexSet(n) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

### 33.32.23 lastIndex as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns either the last index in the receiver or the not-found indicator.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

**Notes:** Returns Last index in the receiver or NSNotFound (&h7FFFFFFF) when the receiver is empty.

### 33.32.24 mutableCopy as NSMutableIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the indexset.
**Example:**

```
dim n as new NSIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
dim m as NSMutableIndexSetMBS = n.mutableCopy

m.addIndex 20

MsgBox str(n.lastIndex)+" "+str(m.lastIndex)
```

### 33.32.25 Operator_Convert as string

MBS MacBase Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Converts an indexset to string for display.
**Example:**

```
dim n as NSIndexSetMBS = NSIndexSetMBS.indexSetWithIndexesInRange(10,40)
MsgBox n
```

**Notes:** This is for having str() function and msgbox work with NSIndexSetMBS class.
If more than 20 values, you get only 20 values followed with dots and last value on the end.

### 33.32.26 Values as Integer()

MBS MacBase Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns all values in array.
**Example:**

```
dim n1 as NSIndexSetMBS = NSIndexSetMBS.indexSetWithIndexesInRange(10,10)
dim n2 as NSIndexSetMBS = NSIndexSetMBS.indexSetWithIndexesInRange(30,5)
dim n3 as new NSMutableIndexSetMBS
n3.addIndexes n1
n3.addIndexes n2
dim count1 as Integer = n1.count // 10
dim count2 as Integer = n2.count // 5
dim count3 as Integer = n3.count // 15
dim values1() as Integer = n1.Values
dim values2() as Integer = n2.Values
dim values3() as Integer = n3.Values
break // look in debugger
```

### 33.32.27 Properties

### 33.32.28 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The internal reference for the NSIndexSex.
**Notes:** (Read and Write property)

## 33.33 class NSInputStreamMBS

### 33.33.1 class NSInputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A stream that provides read-only stream functionality.
**Notes:** Subclass of the NSStreamMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr2

### 33.33.2 Methods

### 33.33.3 Constructor(filePath as string)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSInputStream object that reads data from the file at a given path.
**Notes:** The stream must be opened before it can be used.

### 33.33.4 inputStreamWithData(data as Memoryblock) as NSInputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized NSInputStream object for reading from a given NSData object.
**Notes:** data: The data object from which to read. The contents of data are copied.

Returns an initialized NSInputStream object for reading from data. If data is not an NSData object, this method returns nil.

The stream must be opened before it can be used.

### 33.33.5 inputStreamWithFileAtPath(path as string) as NSInputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSInputStream object that reads data from the file at a given path.
**Notes:** path: The path to the file.

Returns an initialized NSInputStream object that reads data from the file at path.

The stream must be opened before it can be used.

### 33.33.6 inputStreamWithURL(URL as string) as NSInputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized NSInputStream object that reads data from the file at a given URL.
**Notes:** url: The URL to the file.

Returns an initialized NSInputStream object that reads data from the URL at url.

The stream must be opened before it can be used.

### 33.33.7 LookAHead as MemoryBlock

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns copy of read buffer.
**Notes:** Allows looking into data before reading it.

### 33.33.8 Read(maxLength as Integer) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Reads up to a given number of bytes into a given buffer.

### 33.33.9 Properties

### 33.33.10 hasBytesAvailable as Boolean

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver has bytes available to read.
**Notes:** True if the receiver has bytes available to read, otherwise false. May also return true if a read must be attempted in order to determine the availability of bytes.
(Read only property)

## 33.34 class NSKeyedArchiverMBS

### 33.34.1 class NSKeyedArchiverMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The plugin class for archiving objects.
**Example:**

```
// make archiver
dim a as new NSKeyedArchiverMBS

// add a string
a.encodeString "Hello World", "Greeting"

// finish
a.finishEncoding

// query data
dim m as MemoryBlock = a.archiverData

// start unarchiver
dim u as new NSKeyedUnarchiverMBS(m)

// query and display a value
dim s as string = u.decodeString("Greeting")
MsgBox s
```

**Notes:** NSKeyedArchiver, a concrete subclass of NSCoder, provides a way to encode objects (and scalar values) into an architecture-independent format that can be stored in a file. When you archive a set of objects, the class information and instance variables for each object are written to the archive. NSKeyedArchiver's companion class, NSKeyedUnarchiver, decodes the data in an archive and creates a set of objects equivalent to the original set.

A keyed archive differs from a non-keyed archive in that all the objects and values encoded into the archive are given names, or keys. When decoding a non-keyed archive, values have to be decoded in the same order in which they were encoded. When decoding a keyed archive, because values are requested by name, values can be decoded out of sequence or not at all. Keyed archives, therefore, provide better support for forward and backward compatibility.

The keys given to encoded values must be unique only within the scope of the current object being encoded. A keyed archive is hierarchical, so the keys used by object A to encode its instance variables do not conflict with the keys used by object B, even if A and B are instances of the same class. Within a single object, however, the keys used by a subclass can conflict with keys used in its superclasses.
Subclass of the NSCoderMBS class.

**Blog Entries**

- MBS Xojo Plugins, version 21.2pr7
- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 33.34.2 Methods

### 33.34.3 archiverData as memoryblock

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the archived data.

### 33.34.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Returns the receiver, initialized for encoding an archive.
See also:

- 33.34.5 Constructor(RequiringSecureCoding as Boolean) 6103

### 33.34.5 Constructor(RequiringSecureCoding as Boolean)

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Creates an archiver to encode data, and optionally disables secure coding.
**Example:**

```
Dim ckRecord As New CKRecordMBS("MyType")

// archive
Dim coder As NSKeyedArchiverMBS = New NSKeyedArchiverMBS(True)
ckRecord.encodeSystemFieldsWithCoder(coder)
coder.finishEncoding()

Dim encodedRecordValue As String = coder.archiverData

// unarchive
Dim unarchiver As New NSKeyedUnarchiverMBS(encodedRecordValue)
Dim decodedRecord As CKRecordMBS = New CKRecordMBS(unarchiver)

MsgBox "OK "+decodedRecord.recordType
```

```
Exception n As NSExceptionMBS
MsgBox n.message
```

**Notes:** requiresSecureCoding: A Boolean value indicating whether all encoded objects must conform to NSSecureCoding.

To prevent the possibility of encoding an object that NSKeyedUnarchiver can,Äôt decode, set requiresSecureCoding to true whenever possible. This ensures that all encoded objects conform to NSSecureCoding.

Requires macOS 10.13.
See also:

- 33.34.4 Constructor 6103

### 33.34.6 finishEncoding

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Instructs the receiver to construct the final data stream.
**Notes:** No more values can be encoded after this method is called. You must call this method when finished.

### 33.34.7 Properties

### 33.34.8 outputFormat as Integer

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Sets or queries the format in which the receiver encodes its data.
**Example:**

```
// make archiver
dim a as new NSKeyedArchiverMBS
a.outputFormat = a.kCFPropertyListXMLFormat_v1_0

// add a string
a.encodeString "Hello World", "Greeting"

// finish
a.finishEncoding

// query data and show
dim m as MemoryBlock = a.archiverData
dim s as string = DefineEncoding(m, encodings.UTF8)
```

MsgBox s

**Notes:** (Read and Write computed property)

### 33.34.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCFPropertyListBinaryFormat_v1_0 | 200 | One of the possible formats.<br>Specifies the binary property list format. |
| kCFPropertyListXMLFormat_v1_0 | 100 | One of the possible formats.<br>Specifies the XML property list format. |

## 33.35 class NSKeyedUnarchiverMBS

### 33.35.1 class NSKeyedUnarchiverMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** The plugin class for unarchiving objects.
**Example:**

```
// make archiver
dim a as new NSKeyedArchiverMBS

// add a string
a.encodeString "Hello World", "Greeting"

// finish
a.finishEncoding

// query data
dim m as MemoryBlock = a.archiverData

// start unarchiver
dim u as new NSKeyedUnarchiverMBS(m)

// query and display a value
dim s as string = u.decodeString("Greeting")
MsgBox s
```

**Notes:** NSKeyedUnarchiver, a concrete subclass of NSCoder, defines methods for decoding a set of named objects (and scalar values) from a keyed archive. Such archives are produced by instances of the NSKeyedArchiver class.

A keyed archive is encoded as a hierarchy of objects. Each object in the hierarchy serves as a namespace into which other objects are encoded. The objects available for decoding are restricted to those that were encoded within the immediate scope of a particular object. Objects encoded elsewhere in the hierarchy, whether higher than, lower than, or parallel to this particular object, are not accessible. In this way, the keys used by a particular object to encode its instance variables need to be unique only within the scope of that object.

If you invoke one of the decode... methods of this class using a key that does not exist in the archive, a non-positive value is returned. This value varies by decoded type. For example, if a key does not exist in an archive, decodeBoolForKey returns false, decodeIntForKey returns 0, and decodeObjectForKey returns nil.

NSKeyedUnarchiver supports limited type coercion. A value encoded as any type of integer, whether a

standard int or an explicit 32-bit or 64-bit integer, can be decoded using any of the integer decode methods. Likewise, a value encoded as a float or double can be decoded as either a float or a double value. If an encoded value is too large to fit within the coerced type, the decoding method raises an NSRangeException. Further, when trying to coerce a value to an incompatible type, for example decoding an int as a float, the decoding method raises an NSInvalidUnarchiveOperationException.
Subclass of the NSCoderMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 33.35.2 Methods

### 33.35.3 Constructor(data as memoryblock)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Initializes the receiver for decoding an archive previously encoded by NSKeyedArchiverMBS.
**Notes:** When you finish decoding data, you should invoke finishDecoding.
This method raises an NSExceptionMBS if data is not a valid archive.

### 33.35.4 finishDecoding

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Tells the receiver that you are finished decoding objects.
**Notes:** Invoking this method allows the receiver to notify its delegate and to perform any final operations on the archive. Once this method is invoked, the receiver cannot decode any further values.

## 33.36 class NSKeyValueObserverMBS

### 33.36.1 class NSKeyValueObserverMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The Plugin class to use a key value observer.
**Notes:** The NSKeyValueObserving (KVO) informal protocol defines a mechanism that allows objects to be notified of changes to the specified properties of other objects.

You can observe any object properties including simple attributes, to-one relationships, and to-many relationships. Observers of to-many relationships are informed of the type of change made —as well as which objects are involved in the change.

NSObject provides an implementation of the NSKeyValueObserving protocol that provides an automatic observing capability for all objects. You can further refine notifications by disabling automatic observer notifications and implementing manual notifications using the methods in this protocol.

This class implements an observer with event for use in Xojo.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr13

### 33.36.2 Methods

### 33.36.3 addObserver(keyPath as string, options as Integer = 5, context as Variant = nil)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Registers observer to receive KVO notifications for the specified key-path relative to the receiver.
**Notes:** keyPath: The key path, relative to the receiver, of the property to observe. This value must not be nil.
options: A combination of the option constants that specifies what is included in observation notifications.
context: Arbitrary data that is passed to anObserver in observeValueForKeyPath.

This class holds a strong references to context and a weak reference to target.
Available in OS X v10.3 and later.

### 33.36.4 Constructor(TargetHandle as Integer)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Please pass the handle of the target Cocoa object.
Like NSWindowMBS.handle or CALayerMBS.

### 33.36.5 Destructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 33.36.6 NSKeyValueChangeIndexesKey as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionary passed to observedValueForKeyPathChanged event.
**Notes:** If the value of the NSKeyValueChangeKindKey entry is NSKeyValueChangeInsertion, NSKeyValueChangeRemoval, or NSKeyValueChangeReplacement, the value of this key is an NSIndexSetMBS object that contains the indexes of the inserted, removed, or replaced objects.
Available in OS X v10.3 and later.

### 33.36.7 NSKeyValueChangeKindKey as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionary passed to observedValueForKeyPathChanged event.

### 33.36.8 NSKeyValueChangeNewKey as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionary passed to observedValueForKeyPathChanged event.
**Notes:** If the value of the NSKeyValueChangeKindKey entry is NSKeyValueChangeSetting, and NSKeyValueObservingOptionNew was specified when the observer was registered, the value of this key is the new value for the attribute.
For NSKeyValueChangeInsertion or NSKeyValueChangeReplacement, if NSKeyValueObservingOptionNew was specified when the observer was registered, the value for this key is an NSArray instance that contains the objects that have been inserted or replaced other objects, respectively.
Available in OS X v10.3 and later.

### 33.36.9 NSKeyValueChangeNotificationIsPriorKey as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionary passed to observedValueForKeyPathChanged event.
**Notes:** If the option NSKeyValueObservingOptionPrior was specified when the observer was registered this notification is sent prior to a change.
The change dictionary contains an NSKeyValueChangeNotificationIsPriorKey entry whose value is a boolean.
Available in OS X v10.5 and later.

### 33.36.10 NSKeyValueChangeOldKey as string

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionary passed to observedValueForKeyPathChanged event.
**Notes:** If the value of the NSKeyValueChangeKindKey entry is NSKeyValueChangeSetting, and NSKeyValueObservingOptionOld was specified when the observer was registered, the value of this key is the value before the attribute was changed.
For NSKeyValueChangeRemoval or NSKeyValueChangeReplacement, if NSKeyValueObservingOptionOld was specified when the observer was registered, the value is an NSArray instance that contains the objects that have been removed or have been replaced by other objects, respectively.
Available in OS X v10.3 and later.

### 33.36.11 removeObserver(keyPath as string, context as Variant = nil)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Stops a given object from receiving change notifications for the property specified by a given key-path relative to the receiver and a context.
**Notes:** keyPath: A key-path, relative to the receiver, for which observer is registered to receive KVO change notifications.
context: Arbitrary data that more specifically identifies the observer to be removed.

Examining the value in context you are able to determine precisely which addObserver method was used to create the observation relationship. When the same observer is registered for the same key-path multiple times, but with different context pointers, an application can determine specifically which object to stop observing.

The context object is only used in OS X v10.7 and later.

### 33.36.12 Properties

### 33.36.13 Handle as Integer

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.36.14 Events

### 33.36.15 observedValueForKeyPathChanged(keyPath as string, target as Variant, change as dictionary, context as Variant, ChangeNSDictionaryRef as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** This event is called when the value at the specified key path relative to the given object has changed.
**Notes:** keyPath: The key path, relative to object, to the value that has changed.
object: The source object of the key path keyPath.
change: A dictionary that describes the changes that have been made to the value of the property at the key path keyPath relative to object. Entries are described in Keys used by the change dictionary.
context: The value that was provided when the receiver was registered to receive key-value observation notifications.

The receiver must be registered as an observer for the specified keyPath and object.
ChangeNSDictionaryRef provides for debugging the reference to the original NSDictionary object.

### 33.36.16 Constants

Change Kind Constants.

| Constant | Value | Description |
|---|---|---|
| kChangeInsertion | 2 | Indicates that an object has been inserted into the to-many relationship that is being observed. |
| kChangeRemoval | 3 | Indicates that an object has been removed from the to-many relationship that is being observed. |
| kChangeReplacement | 4 | Indicates that an object has been replaced in the to-many relationship that is being observed. |
| kChangeSetting | 1 | Indicates that the value of the observed key path was set to a new value. This change can occur when observing an attribute of an object, as well as properties that specify to-one and to-many relationships. |

Option Constants

| Constant | Value | Description |
|---|---|---|
| kOptionInitial | 4 | If specified, a notification should be sent to the observer immediately, before the observer registration method even returns.<br>The change dictionary in the notification will always contain an NSKeyValueChangeNewKey entry if kOptionNew is also specified but will never contain an NSKeyValueChangeOldKey entry. (In an initial notification the current value of the observed property may be old, but it's new to the observer.) You can use this option instead of explicitly invoking, at the same time, code that is also invoked by the observer's observedValueForKeyPathChanged method. When this option is used with addObserver a notification will be sent for each indexed object to which the observer is being added.<br>Available in OS X v10.5 and later. |
| kOptionNew | 1 | Indicates that the change dictionary should provide the new attribute value, if applicable.<br>Available in OS X v10.3 and later. |
| kOptionOld | 2 | Indicates that the change dictionary should contain the old attribute value, if applicable.<br>Available in OS X v10.3 and later. |
| kOptionPrior | 8 | Whether separate notifications should be sent to the observer before and after each change, instead of a single notification after the change.<br>The change dictionary in a notification sent before a change always contains an NSKeyValueChangeNotificationIsPriorKey entry whose value is true, but never contains an NSKeyValueChangeNewKey entry. When this option is specified the change dictionary in a notification sent after a change contains the same entries that it would contain if this option were not specified. You can use this option when the observer's own key-value observing-compliance requires it to invoke one of the -willChange... methods for one of its own properties, and the value of that property depends on the value of the observed object's property. (In that situation it's too late to easily invoke -willChange... properly in response to receiving an observedValueForKeyPathChanged message after the change.)<br>Available in OS X v10.5 and later. |

# 33.37 class NSLayoutManagerMBS

## 33.37.1 class NSLayoutManagerMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** An NSLayoutManager object coordinates the layout and display of characters held in an NSTextStorage object.
**Notes:** It maps Unicode character codes to glyphs, sets the glyphs in a series of NSTextContainer objects, and displays them in a series of NSTextView objects. In addition to its core function of laying out text, an NSLayoutManager object coordinates its NSTextView objects, provides services to those text views to support NSRulerView instances for editing paragraph styles, and handles the layout and display of text attributes not inherent in glyphs (such as underline or strikethrough). You can create a subclass of NSLayoutManager to handle additional text attributes, whether inherent or not.

Text Antialiasing
NSLayoutManager provides the threshold for text antialiasing. It looks at the AppleAntiAliasingThreshold default value. If the font size is smaller than or equal to this threshold size, the text is rendered aliased by NSLayoutManager. You can change the threshold value from the Appearance pane of System Preferences.

Thread Safety of NSLayoutManager
Generally speaking, a given layout manager (and associated objects) should not be used in more than one block, operation, or thread at a time. Most layout managers are used on the main thread, since it is the main thread on which their text views are displayed, and since background layout occurs on the main thread. If it is intended that a layout manager should be used on a background thread, first make sure that text views associated with that layout manager (if any) are not displayed while the layout manager is being used on the background thread, and, second, turn off background layout for that layout manager while it is being used on the background thread.

Noncontiguous Layout
Noncontiguous layout is an optional layout manager behavior new in Mac OS X v10.5. Previously, both glyph generation and layout were always performed, in order, from the beginning to the end of the document. When noncontiguous layout is turned on, however, the layout manager gains the option of performing glyph generation or layout for one portion of the document without having done so for previous sections. This can provide significant performance improvements for large documents.

Noncontiguous layout is not turned on automatically because direct clients of NSLayoutManager typically have relied on the previous behavior—for example, by forcing layout for a given glyph range, and then assuming that previous glyphs would therefore be laid out. Clients who use NSLayoutManager only indirectly—for example, those who use NSTextView without directly calling the underlying layout manager—can usually turn on noncontiguous layout without difficulty. Clients using NSLayoutManager directly need to examine their usage before turning on noncontiguous layout.

To turn on noncontiguous layout, use AllowsNonContiguousLayout. In addition, see the other methods in

”Managing Noncontiguous Layout,” many of which enable you to ensure that glyph generation and layout are performed for specified portions of the text. The behavior of a number of other layout manager methods is affected by the state of noncontiguous layout, as noted in the discussion sections of those method descriptions.

So far the plugin implements a small subset of the functions in NSLayoutManager. If you miss a function, please email us and we can check whether we can add it for you.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr6
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr7
- MBS Real Studio Plugins, version 13.1pr8
- MBS Real Studio Plugins, version 12.5pr7
- MBS Real Studio Plugins, version 12.5pr5
- MBS Real Studio Plugins, version 12.4pr4
- Show invisible characters in NSTextView/TextArea
- MBS Real Studio Plugins, version 12.1pr5

### 33.37.2 Methods

### 33.37.3 addTextContainer(container as NSTextContainerMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Appends the given text container to the series of text containers where the receiver arranges text.
**Notes:** container: The text container to append.

Invalidates glyphs and layout as needed, but doesn't perform glyph generation or layout.

### 33.37.4 characterIndexForPoint(point as NSPointMBS, container as NSTextContainerMBS, byref partialFraction as Double) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the character falling under the given point, expressed in the given container's coordinate system.
**Notes:** point: The point to test.
container: The text container within which the point is tested.

partialFraction: A fraction of the distance from the insertion point, logically before the given character to the next one.

Returns the index of the character falling under point.

Analogous to glyphIndexForPoint:inTextContainer, but expressed in character index terms. The method returns the index of the character falling under point, expressed in coordinate system of container; if no character is under the point, the nearest character is returned, where nearest is defined according to the requirements of selection by mouse. However, this is not simply equivalent to taking the result of the corresponding glyph index method and converting it to a character index, because in some cases a single glyph represents more than one selectable character, for example an fi ligature glyph. In that case, there is an insertion point within the glyph, and this method returns one character or the other, depending on whether the specified point lies to the left or the right of that insertion point.

In general, this method returns only character indexes for which there is an insertion point. The partialFraction is a fraction of the distance from the insertion point, logically before the given character to the next one, which may be either to the right or to the left depending on directionality.

Available in OS X v10.6 and later.

### 33.37.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates new NSLayoutManager object.

### 33.37.6 glyphIndexForPoint(point as NSPointMBS, container as NSTextContainerMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** This method is a primitive for glyphIndexForPoint. You should always call the main method, not the primitives.
See also:

- 33.37.7 glyphIndexForPoint(point as NSPointMBS, container as NSTextContainerMBS, byref partialFraction as Double) as Integer 6116

### 33.37.7 glyphIndexForPoint(point as NSPointMBS, container as NSTextContainerMBS, byref partialFraction as Double) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the glyph falling under the given point, expressed in the given container's coordinate system.
**Notes:** point: The point for which to return the glyph, in coordinates of container.
container: The container in which the returned glyph is laid out.
partialFraction: On output, the fraction of the distance between the location of the glyph returned and the location of the next glyph.

Returns the index of the glyph falling under the given point, expressed in the given container's coordinate system.

If no glyph is under point, the nearest glyph is returned, where nearest is defined according to the requirements of selection by mouse. Clients who wish to determine whether the the point actually lies within the bounds of the glyph returned should follow this with a call to boundingRectForGlyphRange and test whether the point falls in the rectangle returned by that method. If partialFraction is non-NULL, it returns by reference the fraction of the distance between the location of the glyph returned and the location of the next glyph.

For purposes such as dragging out a selection or placing the insertion point, a partial percentage less than or equal to 0.5 indicates that point should be considered as falling before the glyph index returned; a partial percentage greater than 0.5 indicates that it should be considered as falling after the glyph index returned. If the nearest glyph doesn't lie under point at all (for example, if point is beyond the beginning or end of a line), this ratio is 0 or 1.

If the glyph stream contains the glyphs "A" and "b", with the width of "A" being 13 points, and the user clicks at a location 8 points into "A", partialFraction is 8/13, or 0.615. In this case, the point given should be considered as falling between "A" and "b" for purposes such as dragging out a selection or placing the insertion point.

Performs glyph generation and layout if needed.

As part of its implementation, this method calls fractionOfDistanceThroughGlyphForPoint and glyphIndexForPoint. To change this method's behavior, override those two methods instead of this one.
See also:

- 33.37.6 glyphIndexForPoint(point as NSPointMBS, container as NSTextContainerMBS) as Integer 6115

### 33.37.8 glyphRangeForTextContainer(container as NSTextContainerMBS) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the range of glyphs laid out within the given text container.
**Notes:** This is a less efficient method than the similar textContainerForGlyphAtIndex.
Performs glyph generation and layout if needed.

### 33.37.9 lineFragmentRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle for the line fragment in which the given glyph is laid out and (optionally), by reference, the whole range of glyphs that are in that fragment.
**Notes:** glyphIndex: The glyph for which to return the line fragment rectangle.
effectiveGlyphRange: On output, the range for all glyphs in the line fragment.

Retuns the line fragment in which the given glyph is laid out.

This method causes glyph generation and layout for the line fragment containing the specified glyph, or if noncontiguous layout is not enabled, for all of the text up to and including that line fragment.

Line fragment rectangles are always in container coordinates.

Overriding this method is not recommended. If the the line fragment rectangle needs to be modified, that should be done at the typesetter level or by calling setLineFragmentRect:forGlyphRange.
See also:

- 33.37.10 lineFragmentRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS, withoutAdditionalLayout as boolean) as NSRectMBS 6117

### 33.37.10 lineFragmentRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS, withoutAdditionalLayout as boolean) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the line fragment rectangle containing the glyph at the given glyph index.
**Notes:** glyphIndex: The glyph for which to return the line fragment rectangle.
effectiveGlyphRange: On output, the range for all glyphs in the line fragment.
withoutAdditionalLayout: If true, glyph generation and layout are not performed, so this option should not

be used unless layout is known to be complete for the range in question, or unless noncontiguous layout is enabled; if false, both are performed as needed.

Returns the line fragment in which the given glyph is laid out.

This method is primarily for use from within NSTypesetter, after layout is complete for the range in question, but before the layout manager's call to NSTypesetter has returned. In that case glyph and layout holes have not yet been recalculated, so the layout manager does not yet know that layout is complete for that range, and this variant must be used.

Overriding this method is not recommended. If the the line fragment rectangle needs to be modified, that should be done at the typesetter level or by calling setLineFragmentRect.
See also:

- 33.37.9 lineFragmentRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS) as NSRectMBS 6117

### 33.37.11 lineFragmentUsedRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the usage rectangle for the line fragment in which the given glyph is laid and (optionally) by reference the whole range of glyphs that are in that fragment.
**Notes:** glyphIndex: The glyph for which to return the line fragment used rectangle.
effectiveGlyphRange: On output, the range for all glyphs in the line fragment.

Returns the used rectangle for the line fragment in which the given glyph is laid out.

This method causes glyph generation and layout for the line fragment containing the specified glyph, or if noncontiguous layout is not enabled, up to and including that line fragment.

Line fragment used rectangles are always in container coordinates.

Overriding this method is not recommended. If the the line fragment used rectangle needs to be modified, that should be done at the typesetter level or by calling setLineFragmentRect.
See also:

- 33.37.12 lineFragmentUsedRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS, withoutAdditionalLayout as boolean) as NSRectMBS 6119

### 33.37.12 lineFragmentUsedRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS, withoutAdditionalLayout as boolean) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the usage rectangle for the line fragment in which the given glyph is laid and (optionally) by reference the whole range of glyphs that are in that fragment.
**Notes:** glyphIndex: The glyph for which to return the line fragment used rectangle.
effectiveGlyphRange: On output, the range for all glyphs in the line fragment.
withoutAdditionalLayout: If true, glyph generation and layout are not performed, so this option should not be used unless layout is known to be complete for the range in question, or unless noncontiguous layout is enabled; if false, both are performed as needed.

Returns the used rectangle for the line fragment in which the given glyph is laid out.

This method causes glyph generation and layout for the line fragment containing the specified glyph, or if noncontiguous layout is not enabled, up to and including that line fragment.

Line fragment used rectangles are always in container coordinates.

Overriding this method is not recommended. If the the line fragment used rectangle needs to be modified, that should be done at the typesetter level or by calling setLineFragmentRect.
See also:

- 33.37.11 lineFragmentUsedRectForGlyphAtIndex(glyphIndex as Integer, byref effectiveRange as NSRangeMBS) as NSRectMBS 6118

### 33.37.13 locationForGlyphAtIndex(glyphIndex as Integer) as NSPointMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the location for the given glyph within its line fragment.
**Notes:** glyphIndex: The glyph whose location is returned.

Returns the location of the given glyph.

If the given glyph does not have an explicit location set for it (for example, if it is part of (but not first in) a sequence of nominally spaced characters), the location is calculated by glyph advancements from the location of the most recent preceding glyph with a location set.

Glyph locations are relative to their line fragment rectangle's origin. The line fragment rectangle in turn is defined in the coordinate system of the text container where it resides.

This method causes glyph generation and layout for the line fragment containing the specified glyph, or if noncontiguous layout is not enabled, up to and including that line fragment.

### 33.37.14 rangeOfNominallySpacedGlyphsContainingIndex(glyphIndex as Integer) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the range for the glyphs around the given glyph that can be displayed using only their advancements from the font, without pairwise kerning or other adjustments to spacing.
**Notes:** glyphIndex: Index of the glyph to test.

Returns the range of nominally spaced glyphs.

The range returned begins with the first glyph, counting back from glyphIndex, that has a location set, and it continues up to, but does not include, the next glyph that has a location set.

Performs glyph generation and layout if needed.

### 33.37.15 rectArrayForCharacterRange(charRange as NSRangeMBS, selCharRange as NSRangeMBS, container as NSTextContainerMBS, byref rectCount as Integer) as NSRectMBS()

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of rectangles and, by reference, the number of such rectangles, that define the region in the given container enclosing the given character range.
**Notes:** charRange: The character range for which to return rectangles.
selCharRange: Selected characters within charRange, which can affect the size of the rectangles; it must be equal to or contain charRange. If the caller is interested in this more from an enclosing point of view rather than a selection point of view, pass { NSNotFound, 0 } as the selected range.
container: The text container in which the text is laid out.
rectCount: The number of rectangles returned.

Returns the array of rectangles enclosing the given range.

These rectangles can be used to draw the text background or highlight for the given range of characters. If a selected range is given in selCharRange, the rectangles returned are correct for drawing the selection. Selection rectangles are generally more complicated than enclosing rectangles and supplying a selected range

is the clue this method uses to determine whether to go to the trouble of doing this special work.

The number of rectangles returned isn't necessarily the number of lines enclosing the specified range. Contiguous lines can share an enclosing rectangle, and lines broken into several fragments have a separate enclosing rectangle for each fragment.

These rectangles don't necessarily enclose glyphs that draw outside their line fragment rectangles; use boundingRectForGlyphRange to determine the area that contains all drawing performed for a range of glyphs.

Performs glyph generation and layout if needed.

### 33.37.16 rectArrayForGlyphRange(glyphRange as NSRangeMBS, selGlyphRange as NSRangeMBS, container as NSTextContainerMBS, byref rectCount as Integer) as NSRectMBS()

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of rectangles and, by reference, the number of such rectangles, that define the region in the given container enclosing the given glyph range.
**Notes:** glyphRange: The glyph range for which to return rectangles.
selGlyphRange: Selected glyphs within glyphRange, which can affect the size of the rectangles; it must be equal to or contain glyphRange. If the caller is interested in this more from an enclosing point of view rather than a selection point of view, pass { NSNotFound, 0 } as the selected range.
container: The text container in which the text is laid out.
rectCount: The number of rectangles returned.

Returns the array of rectangles enclosing the given range.

These rectangles can be used to draw the text background or highlight for the given range of characters. If a selected range is given in selGlyphRange, the rectangles returned are correct for drawing the selection. Selection rectangles are generally more complicated than enclosing rectangles and supplying a selected range is the clue this method uses to determine whether to go to the trouble of doing this special work.

The number of rectangles returned isn't necessarily the number of lines enclosing the specified range. Contiguous lines can share an enclosing rectangle, and lines broken into several fragments have a separate enclosing rectangle for each fragment.

The purpose of this method is to calculate line rectangles for drawing the text background and highlighting. These rectangles don't necessarily enclose glyphs that draw outside their line fragment rectangles; use boundingRectForGlyphRange to determine the area that contains all drawing performed for a range of glyphs.

Performs glyph generation and layout if needed.

### 33.37.17 removeTextContainerAtIndex(index as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes the text container at the given index and invalidates the layout as needed.
**Notes:** index: The index of the text container to remove.

This method invalidates glyph information as needed.

### 33.37.18 replaceGlyphAtIndex(glyphIndex as Integer, newGlyph as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the glyph at the given index with a new glyph.
**Notes:** glyphIndex: Index of the glyph to replace.
newGlyph: The new glyph.

Doesn't alter the glyph-to-character mapping or invalidate layout information. The character index of the glyph is assumed to remain the same (although it can, of course, be set explicitly if needed).

This method is for use by the glyph-generation mechanism and doesn't perform any invalidation or generation of the glyphs or layout. This method should be invoked only during glyph generation and typesetting, in almost all cases only by the glyph generator or typesetter. For example, a custom glyph generator or typesetter might invoke it.

### 33.37.19 replaceTextStorage(newTextStorage as NSTextStorageMBS)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the NSTextStorage object for the group of text-system objects containing the receiver with the given text storage object.
**Notes:** All NSLayoutManager objects sharing the original NSTextStorage object then share the new one. This method makes all the adjustments necessary to keep these relationships intact, unlike setting textStorage property.

### 33.37.20 setCharacterIndex(charIndex as Integer, glyphIndex as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the index of the character corresponding to the glyph at the given glyph index.
**Notes:** charIndex: The index to set.
glyphIndex: The glyph corresponding to the character whose index is set. The glyph must already be present.

This method is for use by the glyph-generation mechanism and doesn't perform any invalidation or generation of the glyphs or layout. This method should be invoked only during glyph generation and typesetting, in almost all cases only by the glyph generator or typesetter. For example, a custom glyph generator or typesetter might invoke it.

### 33.37.21 setExtraLineFragmentRect(fragmentRect as NSRectMBS, usedRect as NSRectMBS, TextContainer as NSTextContainerMBS)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the bounds and container for the extra line fragment.
**Notes:** fragmentRect: The rectangle to set.
usedRect: Indicates where the insertion point is drawn.
TextContainer: The text container where the rectangle is to be laid out.

The extra line fragment is used when the text backing ends with a hard line break or when the text backing is totally empty, to define the extra line which needs to be displayed at the end of the text. If the text backing is not empty and does not end with a hard line break, this should be set to NSRectMBS.Zero and nil.

Line fragment rectangles and line fragment used rectangles are always in container coordinates.

This method is used by the layout mechanism and should be invoked only during typesetting, in almost all cases only by the typesetter. For example, a custom typesetter might invoke it.

### 33.37.22 setLineFragmentRect(fragmentRect as NSRectMBS, glyphRange as NSRangeMBS, usedRect as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Associates the given line fragment bounds with the given range of glyphs.
**Notes:** fragmentRect: The rectangle of the line fragment.
glyphRange: The range of glyphs to be associated with fragmentRect.
usedRect: The portion of fragmentRect that actually contains glyphs or other marks that are drawn (including the text container,Äôs line fragment padding. Must be equal to or contained within fragmentRect.

The typesetter must specify the text container first with setTextContainer, and it sets the exact positions of the glyphs afterwards with setLocation.

In the course of layout, all glyphs should end up being included in a range passed to this method, but only glyphs that start a new line fragment should be at the start of such ranges.

Line fragment rectangles and line fragment used rectangles are always in container coordinates.

This method is used by the layout mechanism and should be invoked only during typesetting, in almost all cases only by the typesetter. For example, a custom typesetter might invoke it.

### 33.37.23 usedRectForTextContainer(container as NSTextContainerMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the bounding rectangle for the glyphs laid out in the given text container.
**Notes:** Returns the text container's currently used area, which determines the size that the view would need to be in order to display all the glyphs that are currently laid out in the container. This causes neither glyph generation nor layout.
Used rectangles are always in container coordinates.

### 33.37.24 Properties

### 33.37.25 allowsNonContiguousLayout as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether noncontiguous layout is enabled.
**Notes:** Setting to true allows but does not require the layout manager to use noncontiguous layout, and the layout manager may in fact not do so, depending on its configuration.
(Read and Write property)

### 33.37.26 attributedString as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the text storage object from which the NSGlyphGenerator object procures characters for glyph generation.
**Notes:** This method is part of the NSGlyphStorage protocol, for use by the glyph generator. For NSLay-

outManager the attributed string is equivalent to the text storage.
Available in Mac OS X v10.5 and later.
(Read only property)

### 33.37.27 backgroundLayoutEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver generates glyphs and lays them out when the application's run loop is idle.
**Notes:** If true, background layout is enabled; if false, the receiver performs glyph generation and layout only when necessary.
(Read and Write property)

### 33.37.28 font as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The font for the invisible character drawing.
**Notes:** Use nil font for using the font of the current text.
This method is only available if the NSLayoutManagerMBS object has been created with new NSLayoutManagerMBS, so the plugin can use the special NSLayoutManager subclass with support for invisible character drawing.
(Read and Write property)

### 33.37.29 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.37.30 hasNonContiguousLayout as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the layout manager currently has any areas of noncontiguous layout.
**Notes:** There may be times at which there is no noncontiguous layout, such as when layout is complete; this method enables the layout manager to report that to clients.
(Read only property)

### 33.37.31 hyphenationFactor as Double

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The threshold controlling when hyphenation is done.
**Notes:** factor: The hyphenation factor, ranging from 0.0 to 1.0. By default, the value is 0.0, meaning hyphenation is off. A factor of 1.0 causes hyphenation to be attempted always.

Whenever (width of the real contents of the line) / (the line fragment width) is below factor, hyphenation is attempted when laying out the line. Hyphenation slows down text layout and increases memory usage, so it should be used sparingly.

May be overridden on a per-paragraph basis by the NSParagraphStyle method hyphenationFactor.
(Read and Write property)

### 33.37.32 showInvisibleCharacters as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether to show invisible characters.
**Notes:** This method is only available if the NSLayoutManagerMBS object has been created with new NSLayoutManagerMBS, so the plugin can use the special NSLayoutManager subclass with support for invisible character drawing. (from MBS Plugin)
(Read and Write property)

### 33.37.33 showsControlCharacters as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to substitute visible glyphs for control characters in layout.
**Example:**

```
if TargetCocoa then

dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
dim l as NSLayoutManagerMBS = t.layoutManager

l.showsControlCharacters = true

else
// not supported
break
end if
```

**Notes:** If true, the receiver substitutes visible glyphs for control characters if the font and script support it; if false, it doesn't. The default is false.
(Read and Write property)

### 33.37.34 showsInvisibleCharacters as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to substitute visible glyphs for whitespace and other typically invisible characters in layout.
**Example:**

```
if TargetCocoa then

dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
dim l as NSLayoutManagerMBS = t.layoutManager

l.showsInvisibleCharacters = true

else
// not supported
break
end if
```

**Notes:** If true, the receiver substitutes visible glyphs for invisible characters if the font and script support it; if false, it doesn't. The default is false. (from Apple framework)
(Read and Write property)

### 33.37.35 textColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The text color for drawing invisible characters.
**Notes:** This method is only available if the NSLayoutManagerMBS object has been created with new NSLayoutManagerMBS, so the plugin can use the special NSLayoutManager subclass with support for invisible character drawing.
(Read and Write property)

### 33.37.36 textStorage as NSTextStorageMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The text storage.
**Notes:** (Read and Write property)

### 33.37.37 usesFontLeading as Boolean

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the receiver uses the leading provided in the font.
**Notes:** (Read and Write property)

### 33.37.38 usesScreenFonts as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether screen fonts to calculate layout and display text.
**Notes:** If true, the receiver uses screen fonts; if false, it doesn't.
(Read and Write property)

### 33.37.39 InvisibleCharMapping(character as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets/gets character mapping for invisible character.
**Example:**

```
dim l as new NSLayoutManagerMBS
// ...
// set tab to map to plus sign
l.InvisibleCharMapping(9) = "+"
// set space to map to star sign
l.InvisibleCharMapping(asc(" ")) = "*"
```

**Notes:** By default characters are set for endofline, tab and spaces.
Set showInvisibleCharacters to true and put here all the characters you need.
(Read and Write computed property)

# 33.38 class NSLevelIndicatorMBS

## 33.38.1 class NSLevelIndicatorMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** NSLevelIndicatorMBS is a subclass of NSControlMBS that displays a value on a linear scale.
**Notes:** Level indicators provide a visual representation of a level or amount of something, using discrete values. While similar to NSSlider, it provides a more customized visual feedback to the user. Level indicators do not have a "knob" indicating the current setting or allowing the user to adjust settings. The supported indicator styles include:

- A capacity style level indicator. The continuous mode for this style is often used to indicate conditions such as how much data is on hard disk. The discrete mode is similar to audio level indicators in audio playback applications. You can specify both a warning value and a critical value that provides additional visual feedback to the user.
- A ranking style level indicator. This is similar to the star ranking displays provided in iTunes and iPhoto. You can also specify your own ranking image.
- A relevancy style level indicator. This style is used to display the relevancy of a search result, for example in Mail.

NSLevelIndicator uses an NSLevelIndicatorCell to implement much of the control's functionality. NSLevelIndicator provides cover methods for most of NSLevelIndicatorCell's methods, which invoke the corresponding cell method.
Subclass of the NSControlMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr6

## 33.38.2 Methods

## 33.38.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new level indicator with size 100/100 and position 0/0
**Example:**

```
dim t as new NSLevelIndicatorMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 33.38.4 Constructor(Handle as Integer) 6130
- 33.38.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6130


### 33.38.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSLevelIndicator handle.
**Example:**

```
dim t as new NSLevelIndicatorMBS(0, 0, 100, 100)
dim v as new NSLevelIndicatorMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSLevelIndicator and the plugin retains this handle.
See also:


- 33.38.3 Constructor 6129
- 33.38.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6130


### 33.38.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new level indicator with the given size and position.
**Example:**

```
dim x as new NSLevelIndicatorMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 33.38.3 Constructor 6129
- 33.38.4 Constructor(Handle as Integer) 6130


### 33.38.6 rectOfTickMarkAtIndex(index as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the bounding rectangle of the tick mark identified by index (the minimum-value tick mark is at index 0).
**Notes:** If no tick mark is associated with index, the method raises a NSExceptionMBS.

### 33.38.7 tickMarkValueAtIndex(index as Integer) as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's value represented by the tick mark at index (the minimum-value tick mark has an index of 0).

### 33.38.8 Properties

### 33.38.9 criticalValue as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The critical value.
**Notes:** (Read and Write computed property)

### 33.38.10 levelIndicatorStyle as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Set style of the indicator.
**Notes:** (Read and Write computed property)

### 33.38.11 maxValue as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value the level indicator can represent.
**Notes:** (Read and Write computed property)

### 33.38.12 minValue as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The minimum value.
**Notes:** (Read and Write computed property)

### 33.38.13 numberOfMajorTickMarks as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The number of major tick marks displayed.
**Notes:** The count must be less than or equal to the number of tick marks returned by numberOfTickMarks. For example, if the number of tick marks is 11 and you specify 3 major tick marks, the resulting level indicator will display 3 major tickmarks alternating with 8 minor tick marks.
(Read and Write computed property)

### 33.38.14 numberOfTickMarks as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The number of tick marks displayed by the receiver (which include those assigned to the minimum and maximum values) to count.
**Notes:** By default, this value is 0, and no tick marks appear. The number of tick marks assigned to a slider, along with the slider's minimum and maximum values, determines the values associated with the tick marks.
(Read and Write computed property)

### 33.38.15 tickMarkPosition as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Where tick marks appear relative to the indicator.
**Notes:** This method has no effect if no tick marks have been assigned (that is, numberOfTickMarks returns 0).
(Read and Write computed property)

### 33.38.16 warningValue as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The warning value.
**Notes:** (Read and Write computed property)

### 33.38.17 Constants

Style Constants

| Constant | Value | Description |
|---|---|---|
| NSContinuousCapacityLevelIndicatorStyle | 1 | A style that is often used to indicate conditions such as how much a hard disk. |
| NSDiscreteCapacityLevelIndicatorStyle | 2 | A style similar to audio level indicators in iTunes. |
| NSRatingLevelIndicatorStyle | 3 | A style similar to the star ranking displays provided in iTunes and i |
| NSRelevancyLevelIndicatorStyle | 0 | A style similar to the rank column displayed when searching in Mail |

Tick mark Constants

| Constant | Value | Description |
|---|---|---|
| NSTickMarkAbove | 1 | Tick marks above (for horizontal sliders). |
| NSTickMarkBelow | 0 | Tick marks below (for horizontal sliders); the default for horizontal sliders. |
| NSTickMarkLeft | 0 | Tick marks to the left (for vertical sliders); the default. for vertical sliders |
| NSTickMarkRight | 1 | Tick marks to the right (for vertical sliders). |

## 33.39 class NSMutableCharacterSetMBS

### 33.39.1 class NSMutableCharacterSetMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The NSMutableCharacterSet class declares the programmatic interface to objects that manage a modifiable set of Unicode characters.
**Notes:** You can add or remove characters from a mutable character set as numeric values in NSRange structures or as character values in strings, combine character sets by union or intersection, and invert a character set.

Mutable character sets are less efficient to use than immutable character sets. If you don't need to change a character set after creating it, create an immutable copy with copy and use that.

NSMutableCharacterSet defines no primitive methods. Subclasses must implement all methods declared by this class in addition to the primitives of NSCharacterSet. They must also implement mutableCopy.
Subclass of the NSCharacterSetMBS class.
**Blog Entries**

- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

### 33.39.2 Methods

### 33.39.3 addCharactersInRange(aRange as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Adds to the receiver the characters whose Unicode values are in a given range.
**Example:**

```
dim m as new NSMutableCharacterSetMBS
dim r as new NSRangeMBS(65,3)
m.addCharactersInRange r
MsgBox m // shows "ABC"
```

**Notes:** aRange: The range of characters to add.

aRange.location is the value of the first character to add; aRange.location + aRange.length–1 is the value

of the last. If aRange.length is 0, this method has no effect.

### 33.39.4 addCharactersInString(aString as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Adds to the receiver the characters in a given string.
**Example:**

```
dim m as new NSMutableCharacterSetMBS
m.addCharactersInString "Hello"
MsgBox m // shows "Helo"
```

**Notes:** This method has no effect if aString is empty.

### 33.39.5 Constructor

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty mutable character set.

### 33.39.6 formIntersectionWithCharacterSet(otherset as NSMutableCharacterSetMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Modifies the receiver so it contains only characters that exist in both the receiver and otherSet.

### 33.39.7 formUnionWithCharacterSet(otherset as NSMutableCharacterSetMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Modifies the receiver so it contains all characters that exist in either the receiver or otherSet.

### 33.39.8 invert

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Replaces all the characters in the receiver with all the characters it didn't previously contain.
**Notes:** Inverting a mutable character set, whether by invert or by invertedSet, is much less efficient than

inverting an immutable character set with invertedSet.

### 33.39.9 removeCharactersInRange(aRange as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Removes from the receiver the characters whose Unicode values are in a given range.
**Example:**

```
dim m as new NSMutableCharacterSetMBS
dim r as new NSRangeMBS(65,3)
m.addCharactersInRange new NSRangeMBS(65,6)
m.removeCharactersInRange r
MsgBox m // shows "DEF"
```

**Notes:** aRange: The range of characters to remove.

aRange.location is the value of the first character to remove; aRange.location + aRange.length–1 is the value of the last. If aRange.length is 0, this method has no effect.

### 33.39.10 removeCharactersInString(aString as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Removes from the receiver the characters in a given string.
**Example:**

```
dim m as new NSMutableCharacterSetMBS
m.addCharactersInString "Hello"
m.removeCharactersInString "World"
MsgBox m // shows "He"
```

**Notes:** This method has no effect if aString is empty.

## 33.40 class NSMutableIndexSetMBS

### 33.40.1 class NSMutableIndexSetMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The NSMutableIndexSet class represents a mutable collection of unique unsigned integers, known as indexes because of the way they are used.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

**Notes:** This collection is referred to as a mutable index set.

The values in a mutable index set are always sorted, so the order in which values are added is irrelevant.

You must not subclass the NSMutableIndexSet class.
Subclass of the NSIndexSetMBS class.

### 33.40.2 Methods

### 33.40.3 addIndex(index as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Adds an index to the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
n.addIndex 12
MsgBox str(n.count)
```

### 33.40.4 addIndexes(indexes as NSIndexSetMBS)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Adds the indexes in an index set to the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
```

```
dim x as new NSIndexSetMBS(12,5)
n.addIndexes x
MsgBox str(n.count)
```

### 33.40.5 addIndexesInRange(StartIndex as Integer, Length as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Adds the indexes in an index range to the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
n.addIndexesInRange 12,5
MsgBox str(n.count)
```

**Notes:** Index range to add. Must include only indexes representable as unsigned integers.

This method raises an NSRangeException when indexRange would add an index that exceeds the maximum allowed value for unsigned integers.

### 33.40.6 Constructor

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSMutableIndexSet object.
**Example:**

```
dim x as new NSMutableIndexSetMBS
```

See also:


- 33.40.7 Constructor(index as Integer) 6138
- 33.40.8 Constructor(indexes as NSIndexSetMBS) 6139
- 33.40.9 Constructor(StartIndex as Integer, Length as Integer) 6139


### 33.40.7 Constructor(index as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSMutableIndexSet object with an index.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5)
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

See also:


- 33.40.6 Constructor 6138
- 33.40.8 Constructor(indexes as NSIndexSetMBS) 6139
- 33.40.9 Constructor(StartIndex as Integer, Length as Integer) 6139


### 33.40.8 Constructor(indexes as NSIndexSetMBS)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object with an index set.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5)
dim x as new NSMutableIndexSetMBS(n)
MsgBox str(x.firstIndex)
```

See also:


- 33.40.6 Constructor 6138
- 33.40.7 Constructor(index as Integer) 6138
- 33.40.9 Constructor(StartIndex as Integer, Length as Integer) 6139


### 33.40.9 Constructor(StartIndex as Integer, Length as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Initializes an allocated NSIndexSet object with an index range.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
```

**Notes:** This method raises an NSRangeException when indexRange would add an index that exceeds the maximum allowed value for unsigned integers.
See also:

- 33.40.6 Constructor 6138
- 33.40.7 Constructor(index as Integer) 6138
- 33.40.8 Constructor(indexes as NSIndexSetMBS) 6139


### 33.40.10 removeAllIndexes

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Removes the receiver's indexes.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
n.removeAllIndexes
MsgBox str(n.count)
```

### 33.40.11 removeIndex(index as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Removes an index from the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
MsgBox str(n.count)
n.removeIndex 8
MsgBox str(n.count)
```

### 33.40.12 removeIndexes(indexes as NSIndexSetMBS)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Removes the indexes in an index set from the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
dim x as new NSIndexSetMBS(5,2)
n.removeIndexes x
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

### 33.40.13 removeIndexesInRange(StartIndex as Integer, Length as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Removes the indexes in an index range from the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
n.removeIndexesInRange 5,2
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

### 33.40.14 shiftIndexes(StartingAtIndex as Integer, delta as Integer)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Shifts a group of indexes to the left or the right within the receiver.
**Example:**

```
dim n as new NSMutableIndexSetMBS(5,6) // 5, 6, 7, 8, 9, 10
n.shiftIndexes 7,3
MsgBox str(n.firstIndex)+" "+str(n.lastIndex)
```

**Notes:** startIndex: Head of the group of indexes to shift.
delta: Amount and direction of the shift. Positive integers shift the indexes to the right. Negative integers shift the indexes to the left.

The group of indexes shifted is made up by startIndex and the indexes that follow it in the receiver.

A left shift deletes the indexes in the range (startIndex-delta,delta) from the receiver.

A right shift inserts empty space in the range (indexStart,delta) in the receiver.

## 33.41 class NSMutableURLRequestMBS

### 33.41.1 class NSMutableURLRequestMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The Cocoa class for a mutable URL Request.
**Notes:** NSMutableURLRequest is a subclass of NSURLRequest provided to aid developers who may find it more convenient to mutate a single request object for a series of URL load requests instead of creating an immutable NSURLRequest for each load.

This programming model is supported by the following contract between NSMutableURLRequest and NSURLConnection: NSURLConnection makes a deep copy of each NSMutableURLRequest object passed to one of its initializers.
Subclass of the NSURLRequestMBS class.
**Blog Entries**

- Notes from the last days
- MBS Real Studio Plugins, version 11.3pr6
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

### 33.41.2 Methods

### 33.41.3 addValue(value as string, field as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Adds an HTTP header to the receiver's HTTP header dictionary.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")

m.addValue "Hello", "test"
m.addValue "World", "test"

MsgBox m.valueForHTTPHeaderField("test")
```

**Notes:** value: The value for the header field.
field: The name of the header field. In keeping with the HTTP RFC, HTTP header field names are case-

insensitive

This method provides the ability to add values to header fields incrementally. If a value was previously set for the specified field, the supplied value is appended to the existing value using the appropriate field delimiter. In the case of HTTP, this is a comma.

### 33.41.4 Constructor(url as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")

MsgBox m.URL
```

**Notes:** Default values are used for cache policy (NSURLRequestUseProtocolCachePolicy) and timeout interval (60 seconds).
On success, handle property is not zero.
See also:

- 33.41.5 Constructor(url as string, cachePolicy as Integer, timeoutInterval as Double) 6143

### 33.41.5 Constructor(url as string, cachePolicy as Integer, timeoutInterval as Double)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.
See also:

- 33.41.4 Constructor(url as string) 6143

### 33.41.6 setAllHTTPHeaderFields(headerFields as Dictionary)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Replaces the receiver's header fields with the passed values.
**Notes:** headerFields: A dictionary with the new header fields. HTTP header fields must be string values; therefore, each object and key in the headerFields dictionary must be a String. If either the key or value for a key-value pair is not a string, the key-value pair is skipped.

### 33.41.7 setAttribution(Attribution as Integer)

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** Sets the NSURLRequestAttribution to associate with this request.
**Notes:** Defaults to NSURLRequestAttributionDeveloper.

### 33.41.8 setCachePolicy(policy as Integer)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the cache policy of the receiver.
**Notes:** policy: The new cache policy.

Available in Mac OS X v10.2 with Safari 1.0 installed.
Available in Mac OS X v10.2.7 and later.

These constants are used to specify interaction with the cached responses.
NSURLRequestUseProtocolCachePolicy = 0,
NSURLRequestReloadIgnoringLocalCacheData = 1,
NSURLRequestReloadIgnoringLocalAndRemoteCacheData = 4,
NSURLRequestReturnCacheDataElseLoad = 2,
NSURLRequestReturnCacheDataDontLoad = 3,
NSURLRequestReloadRevalidatingCacheData = 5

### 33.41.9 setHTTPBody(data as MemoryBlock)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the request body of the receiver to the specified data.
**Notes:** data: The new request body for the receiver. This is sent as the message body of the request, as in an HTTP POST request.

### 33.41.10 setHTTPMethod(HTTPMethod as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the receiver's HTTP request method.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setHTTPMethod "PUT"
```

MsgBox m.HTTPMethod

**Notes:** HTTPMethod: The new HTTP request method. The default HTTP method is "GET".

### 33.41.11 setHTTPShouldHandleCookies(should as boolean)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets whether the receiver should use the default cookie handling for the request.
**Example:**

```
dim r as NSURLRequestMBS = NSURLRequestMBS.requestWithURL("http://www.apple.de")
Dim m as NSMutableURLRequestMBS = r.mutableCopy
m.setHTTPShouldHandleCookies(false)
HTMLViewer1.LoadRequest m
```

**Notes:** handleCookies: True if the receiver should use the default cookie handling for the request, false otherwise. The default is true.

### 33.41.12 setHTTPShouldUsePipelining(shouldUsePipelining as boolean)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets whether the request should not wait for the previous response before transmitting.
**Notes:** True if the receiver should transmit before the previous response is received. False to wait for the previous response before transmitting.

Calling this method with a true value does not guarantee HTTP pipelining behavior. HTTP 1.1 allows the client to send multiple requests to the server without waiting for a response.
Though HTTP 1.1 requires support for pipelining, some servers report themselves as being HTTP 1.1 but do not support pipelining. To maintain compatibility with these servers, requests may have to wait for the previous response before transmitting.

Available on Mac OS X 10.7 or newer.

### 33.41.13 setMainDocumentURL(url as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the main document URL for the receiver.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test/test.jpg")
m.setMainDocumentURL "http://test.test/"
MsgBox m.mainDocumentURL
```

**Notes:** url: The new main document URL. Can be nil.

The caller should set the main document URL to an appropriate main document, if known. For example, when loading a web page the URL of the HTML document for the top-level frame would be appropriate. This URL will be used for the "only from same domain as main document" cookie accept policy.
Available in Mac OS X v10.2 with Safari 1.0 installed.
Available in Mac OS X v10.2.7 and later.

### 33.41.14 setNetworkServiceType(networkServiceType as Integer)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the NSURLRequestNetworkServiceType to associate with this request.
**Notes:** networkServiceType: The service type to associate with the request.
This method is used to provide the network layers with a hint as to the purpose of the request. Most clients should not need to use this method. See NSURLNetworkServiceType* constants.
Available in Mac OS X 10.7 or newer.

### 33.41.15 setTimeoutInterval(seconds as Double)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the receiver's timeout interval, in seconds.
**Notes:** seconds: The timeout interval, in seconds. If during a connection attempt the request remains idle for longer than the timeout interval, the request is considered to have timed out. The default timeout interval is 60 seconds.

Available in Mac OS X v10.2 with Safari 1.0 installed.
Available in Mac OS X v10.2.7 and later.

### 33.41.16 setURL(url as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the URL of the receiver.
**Notes:** Available in Mac OS X v10.2 with Safari 1.0 installed.
Available in Mac OS X v10.2.7 and later.

### 33.41.17 setValue(value as string, field as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the specified HTTP header field.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setValue("just a test", "test")
MsgBox m.valueForHTTPHeaderField("test")
```

**Notes:** value: The new value for the header field. Any existing value for the field is replaced by the new value.
field: The name of the header field to set. In keeping with the HTTP RFC, HTTP header field names are case-insensitive.

## 33.42 class NSOutputStreamMBS

### 33.42.1 class NSOutputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A stream that provides write-only stream functionality.
**Notes:** Subclass of the NSStreamMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr2

### 33.42.2 Methods

### 33.42.3 Constructor

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized output stream that will write stream data to memory.
**Notes:** Returns an initialized output stream that will write stream data to memory.

The stream must be opened before it can be used.

You retrieve the contents of the memory stream by OutputData property.
See also:

- 33.42.4 Constructor(filePath as string, append as boolean) 6148

### 33.42.4 Constructor(filePath as string, append as boolean)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized output stream for writing to a specified file.
**Notes:** path: The path to the file the output stream will write to.
append: True if newly written data should be appended to any existing file contents, otherwise false.

Returns an initialized output stream that can write to path.

The stream must be opened before it can be used.
See also:

- 33.42.3 Constructor 6148

### 33.42.5 OutputData as MemoryBlock

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The output of the memory stream.

### 33.42.6 outputStreamToFileAtPath(filePath as string, append as boolean) as NSOutputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized output stream for writing to a specified file.
**Notes:** path: The path to the file the output stream will write to.
append: True if newly written data should be appended to any existing file contents, otherwise false.

Returns an initialized output stream that can write to path.

The stream must be opened before it can be used.

### 33.42.7 outputStreamToMemory as NSOutputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized output stream that will write stream data to memory.
**Notes:** Returns an initialized output stream that will write stream data to memory.

The stream must be opened before it can be used.

You retrieve the contents of the memory stream by OutputData property.

### 33.42.8 outputStreamWithURL(fileURL as string, append as boolean) as NSOutputStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an initialized output stream for writing to a specified URL.
**Notes:** fileURL: The URL to the file the output stream will write to.
append: True if newly written data should be appended to any existing file contents, otherwise false.

Returns an initialized output stream that can write to url.

The stream must be opened before it can be used.

### 33.42.9 write(data as MemoryBlock) as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Writes the contents of a provided data buffer to the receiver.
**Notes:** Returns a number indicating the outcome of the operation:
A positive number indicates the number of bytes written.
0 indicates that a fixed-length stream and has reached its capacity.
-1 means that the operation failed; more information about the error can be obtained with streamError.

### 33.42.10 Properties

### 33.42.11 hasSpaceAvailable as Boolean

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** A boolean value that indicates whether the receiver can be written to.
**Notes:** True if the receiver can be written to or if a write must be attempted in order to determine if space is available, false otherwise.
(Read only property)

# 33.43 class NSPanelMBS

## 33.43.1 class NSPanelMBS

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** The NSPanel class implements a special kind of window (known as a panel), typically performing an auxiliary function.
**Example:**

```
static n as NSPanelMBS

dim style as Integer = NSPanelMBS.NSClosableWindowMask + NSPanelMBS.NSTitledWindowMask +
NSPanelMBS.NSUtilityWindowMask + NSPanelMBS.NSHUDWindowMask + NSPanelMBS.NSResizableWin-
dowMask

n = new NSPanelMBS(100,100,200,200, style, NSPanelMBS.NSWindowBackingLocationDefault, false)

n.Title = "Hello World"
n.Show
```

**Notes:** Subclass of the NSWindowMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8
- HUD Windows in REALbasic
- MonkeyBread Software Releases the MBS Plugins 8.2

## 33.43.2 Methods

## 33.43.3 Constructor(x as Double, y as Double, w as Double, h as Double, styleMask as Integer, BackingStoreType as Integer, deferCreation as boolean)

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new Cocoa Windows.
**Example:**

```
static n as NSPanelMBS

dim style as Integer = NSPanelMBS.NSClosableWindowMask + NSPanelMBS.NSTitledWindowMask +
NSPanelMBS.NSUtilityWindowMask + NSPanelMBS.NSHUDWindowMask + NSPanelMBS.NSResizableWin-
dowMask
```

```
n = new NSPanelMBS(100,100,200,200, style, NSPanelMBS.NSWindowBackingLocationDefault, false)

n.Title = "Hello World"
n.Show
```

**Notes:** x,y,w,h:
Location and size of the window's content area in screen coordinates. Note that the window server limits window position coordinates to ¬±16,000 and sizes to 10,000.

styleMask:
The window's style. Either it can be NSBorderlessWindowMask, or it can contain any of the options described in the constants, combined using the bitwiseOR function. Borderless windows display none of the usual peripheral elements and are generally useful only for display or caching purposes; you should normally not need to create them. Also, note that a window's style mask should include NSTitledWindowMask if it includes any of the others.

bufferingType:
Specifies how the drawing done in the window is buffered by the window device, and possible values are described in "Constants."

deferCreation:
Specifies whether the window server creates a window device for the window immediately. When true, the window server defers creating the window device until the window is moved onscreen. All display messages sent to the window or its views are postponed until the window is created, just before it's moved onscreen.

Initialized NSWindow object.

This method is the designated initializer for the NSWindow class.

Deferring the creation of the window improves launch time and minimizes the virtual memory load on the window server.

The new window creates a view to be its default content view. You can replace it with your own object by using the ContentView property.

### 33.43.4 RunAlertPanel(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs an alert panel.

### 33.43.5 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Run an alert panel.
See also:

- 33.43.6 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6153
- 33.43.7 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6153

### 33.43.6 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Run an alert panel.
See also:

- 33.43.5 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6153
- 33.43.7 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6153

### 33.43.7 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Run an alert panel.
See also:

- 33.43.5 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6153
- 33.43.6 RunAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6153

### 33.43.8 RunCriticalAlertPanel(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs a critical alert panel.

### 33.43.9 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Runs a critical alert panel.
See also:

- 33.43.10 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6154
- 33.43.11 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6154

### 33.43.10 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs a critical alert panel.
See also:

- 33.43.9 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6154
- 33.43.11 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6154

### 33.43.11 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs a critical alert panel.
See also:

- 33.43.9 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6154
- 33.43.10 RunCriticalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6154

### 33.43.12 RunInformationalAlertPanel(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Run an informational alert panel.

### 33.43.13 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Run an informational alert panel.
See also:

- 33.43.14 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6155
- 33.43.15 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6156

### 33.43.14 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Run an informational alert panel.
See also:

- 33.43.13 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6155
- 33.43.15 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer 6156


### 33.43.15 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as window) as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Run an informational alert panel.
See also:

- 33.43.13 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as DesktopWindow) as integer 6155
- 33.43.14 RunInformationalAlertPanelRelativeToWindow(title as string, message as string, defaultButton as string, alternateButton as string, otherButton as string, docWindow as NSWindowMBS) as Integer 6155

### 33.43.16 Properties

### 33.43.17 becomesKeyOnlyIfNeeded as boolean

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** whether the panel becomes the key window only when needed.
**Notes:** By default, this attribute is set to false, indicating that the panel becomes key as other windows do. (Read and Write computed property)

### 33.43.18 isFloatingPanel as boolean

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the panel is a floating panel.
**Notes:** True when the receiver is a floating panel, false otherwise.

By default, panels do not float above other windows. It's appropriate for an panel to float above other windows only if all of the following conditions are true:

- It is small enough not to obscure whatever is behind it.

- It is oriented more to the mouse than to the keyboard—that is, if it doesn't become the key window or becomes so only when needed.

- It needs to remain visible while the user works in the application's normal windows—for example, if the user must frequently move the cursor back and forth between a normal window and the panel (such as a tool palette), or if the panel gives information relevant to the user's actions in a normal window.

- It hides when the application is deactivated (the default behavior for panels).

(Read and Write computed property)

### 33.43.19 worksWhenModal as boolean

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver receives keyboard and mouse events even when some other window is being run modally.
**Notes:** True when the receiver receives keyboard and mouse events even when some other window is being run modally, false otherwise.

By default, this attribute is set to false, indicating a panel's ineligibility for events during a modal loop or session.
(Read and Write computed property)

### 33.43.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAlertAlternateReturn | 0 | One of the possible return values for the alert panels.<br>The user pressed the alternate button. |
| NSAlertDefaultReturn | 1 | One of the possible return values for the alert panels.<br>The user pressed the default button. |
| NSAlertErrorReturn | -2 | One of the possible return values for the alert panels.<br>The alert cannot identify the reason it was closed; it may have been closed by an external source or by a button other than those listed above. |
| NSAlertOtherReturn | -1 | One of the possible return values for the alert panels.<br>The user pressed a second alternate button. |
| NSCancelButton | 0 | One of the constants for the modal panel return values.<br>The Cancel button. |
| NSDocModalWindowMask | 64 | One of the constants you can use to specify the style when creating a window.<br>The panel is created as a modal sheet. |
| NSHUDWindowMask | 8192 | One of the constants you can use to specify the style when creating a window. |
| NSNonactivatingPanelMask | 128 | One of the constants you can use to specify the style when creating a window.<br>The panel can receive keyboard input without activating the owning application. |
| NSOKButton | 1 | One of the constants for the modal panel return values.<br>The OK button. |
| NSUtilityWindowMask | 16 | One of the constants you can use to specify the style when creating a window.<br>The panel is created as a floating window. |

# 33.44 class NSPointMBS

## 33.44.1 class NSPointMBS

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** A Xojo class for the point structure in Cocoa.
**Example:**

```
dim n as NSPointMBS = NSMakePointMBS(500,600)
MsgBox n.String
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr1
- MBS REALbasic plug-in 9.6

## 33.44.2 Methods

## 33.44.3 Constructor

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty point.
**Example:**

```
dim p as new NSPointMBS
MsgBox p // shows { 0 ,0 }
```

See also:


- 33.44.4 Constructor(p as Ptr) 6159
- 33.44.5 Constructor(s as string) 6160
- 33.44.6 Constructor(x as Double, y as Double) 6160


## 33.44.4 Constructor(p as Ptr)

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:

- 33.44.3 Constructor 6159
- 33.44.5 Constructor(s as string) 6160
- 33.44.6 Constructor(x as Double, y as Double) 6160


### 33.44.5 Constructor(s as string)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSPoint object using the given string.
**Example:**

```
dim p as new NSPointMBS(" { 3,4 } ")
MsgBox p // shows { 3 ,4 }
```

See also:


- 33.44.3 Constructor 6159
- 33.44.4 Constructor(p as Ptr) 6159
- 33.44.6 Constructor(x as Double, y as Double) 6160


### 33.44.6 Constructor(x as Double, y as Double)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSPoint object using the given values.
See also:


- 33.44.3 Constructor 6159
- 33.44.4 Constructor(p as Ptr) 6159
- 33.44.5 Constructor(s as string) 6160


### 33.44.7 Equal(other as NSPointMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether two points are equal.

### 33.44.8 Operator_Convert as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Converts the object to string.
**Example:**

```
dim p as new NSPointMBS(1,2)

MsgBox p // shows { 1 ,2 }
```

### 33.44.9 String as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the string representation of this point.
**Example:**

```
dim p as new NSPointMBS(1,2)

MsgBox p.String // shows { 1,2 }
```

### 33.44.10 Zero as NSPointMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Returns a point with all values being zero.

### 33.44.11 Properties

### 33.44.12 Handle as Ptr

MBS Main Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The pointer to the internal data structure.
**Notes:** May be useful for passing to declares requiring a NSPoint*.
Size of structure is 8 bytes for 32-bit (two singles) and 16 bytes for 64-bit (two doubles).
(Read only property)

### 33.44.13 X as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The horizontal coordinate.
**Notes:** (Read and Write property)

### 33.44.14 Y as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The vertical coordinate.
**Notes:** (Read and Write property)

# 33.45 class NSPopoverMBS

## 33.45.1 class NSPopoverMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo class for a pop-over.
**Notes:** A popover is a unit of content that is positioned relative to some other content on the screen. An anchor is used to express the relation between these two units of content. Each popover has an appearance that specifies its visual characteristics, as well as a behavior that determines which user interactions will cause the popover to close. A transient popover is closed in response to most user interactions, whereas a semi-transient popovers is closed when the user interacts with the window containing the popover's positioning view. Popovers with application-defined behavior are not usually closed on the developer's behalf. AppKit automatically positions each popover relative to its positioning view and moves the popover whenever its positioning view moves. A positioning rectangle within the positioning view can be specified for additional granularity. Popovers can be detached to become a separate window when they are dragged by implementing the appropriate delegate method.

Please also check the documentation from Apple for the NSPopover class.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- News from the MBS Xojo Plugins Version 22.4
- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr1
- MBS Xojo Plugins, version 20.3pr7
- Lion features for Real Studio

## 33.45.2 Methods

## 33.45.3 available as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether pop-overs are available.
**Example:**

```
msgbox "NSPopover available: "+str(NSPopoverMBS.available)
```

**Notes:** Returns true on Mac OS X 10.7.

### 33.45.4 Close

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Forces the popover to close without calling events.
**Notes:** Any popovers nested within the popovers will also receive a close message. When a window is closed in response to the close message being sent, all of its popovers will be closed. The popover will animate out when closed (unless the animates property is set to false).

### 33.45.5 Constructor

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new popover.

### 33.45.6 Destructor

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 33.45.7 isShown as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether popover is visible.
**Notes:** True if the popover is being shown, false otherwise. The popover is considered to be shown from the point when showRelativeToRect is invoked until the popover is closed in response to an invocation of either close or performClose.

### 33.45.8 NSPopoverCloseReasonDetachToWindow as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the constant for the close reason.
**Notes:** Specifies that the popover has been closed because it is being detached to a window; a possible value for NSPopoverCloseReasonKey.

### 33.45.9 NSPopoverCloseReasonKey as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the close notification parameter dictionary.
**Notes:** Specifies the close reason. Currently used only as the userInfo key for the NSPopoverWillCloseNotification.

### 33.45.10 NSPopoverCloseReasonStandard as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the constant for the close reason.
**Notes:** Specifies that the popover is being closed in a standard way; a possible value for NSPopoverCloseReasonKey.

### 33.45.11 NSPopoverDidCloseNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names you can use with NSNotificationObserverMBS class.
**Notes:** Sent after the popover has finished animating offscreen. This notification has the same user info keys as NSPopoverWillCloseNotification.

### 33.45.12 NSPopoverDidShowNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names you can use with NSNotificationObserverMBS class.
**Notes:** Sent after the popover has finished animating onscreen.

### 33.45.13 NSPopoverWillCloseNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names you can use with NSNotificationObserverMBS class.
**Notes:** Sent before the popover is closed. The userInfo key NSPopoverCloseReasonKey specifies the reason for closing. It can currently be either NSPopoverCloseReasonStandard or NSPopoverCloseReasonDetachToWindow, although more reasons for closing may be added in the future.

### 33.45.14 NSPopoverWillShowNotification as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names you can use with NSNotificationObserverMBS class.
**Notes:** Sent before the popover is shown.

### 33.45.15 performClose

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Attempts to close the popover.
**Notes:** The popover will not be closed if popoverShouldClose event returns false. The operation will fail if it is displaying a nested popover, or if it has a child window. A window will attempt to close its popovers when it receives a performClose message. The popover will animate out when closed (unless the animates property is set to false).

### 33.45.16 showRelativeToRect(positioningRect as NSRectMBS, view as NSViewMBS, edge as Integer)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Shows the popover positioned relative to positioningRect of positioningView (see the description of positioningRect).
**Notes:** The common case is to pass positioningView.bounds for positioningRect, in which case the popover will be placed adjacent to the positioningView and there is no need to update positioningRect (AppKit will detect the the bounds of the positioning view was specified and automatically update the positioningView). preferredEdge is a hint to AppKit about the desired placement of the anchor of the popover towards the positioningRect, and is with respect to the isFlipped state of the positioningView. Also, if positioningRect is an empty rect, the view.bounds will automatically be used. The current (but not guaranteed) behavior is that AppKit will place the anchor towards the preferredEdge of the positioningRect unless such a placement would cause the popover not to fit on the screen of positioningView. If the anchor cannot be placed towards the preferredEdge, AppKit will (in the current implementation) attempt to place the anchor on the opposite side of the positioningRect. If that cannot be done, AppKit will attempt to place the anchor on a remaining sides of the popover, and failing that will center the popover on the screen, causing it to (at least temporarily) lose its anchor. The popover will animate onscreen and eventually animate offscreen when it is closed (unless the property animates is set to false). This method will throw a NSInvalidArgumentException if view is nil or if view is not in a window, or if the popover's behavior is NSPopoverBehaviorSemitransient and the popover's positioningView is in a popover or child window. It will throw a NSInternalInconsistencyException if the popover's content view controller (or the view controller's view) is nil. If the popover is already being shown, this method will update to be associated with the new view and positioningRect passed. If the positioning view is not visible, this method does nothing.

### 33.45.17 Properties

### 33.45.18 Handle as Integer

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference to the NSPopover object.
**Notes:** (Read and Write property)

### 33.45.19 Tag as Variant

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The tag.
**Notes:** You can use this property for whatever you like.
e.g. to keep the reference to the NSViewControllerMBS object.
(Read and Write property)

### 33.45.20 animates as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Should the popover be animated when it shows, closes, or appears to transition to a detachable window.
**Notes:** This property also controls whether the popover animates when the content view or content size changes. AppKit does not guarantee which behaviors will be animated or that this property will be respected; it is regarded as a hint. The default value is true.
(Read and Write computed property)

### 33.45.21 behavior as Integer

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The behavior of the popover.
**Notes:** The default behavior is NSPopoverBehaviorApplicationDefined. See the declaration of NSPopoverBehavior* constants for more information about popover behaviors.
(Read and Write computed property)

### 33.45.22 contentSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The content size of the popover.
**Notes:** The popover's content size is set to match the size of the content view when the content view controller is set. Changes to the content size of the popover will animate while the popover is shown (provided animates is true).
(Read and Write computed property)

### 33.45.23 contentViewController as NSViewControllerMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The view controller that manages the content of the popover.
**Notes:** Please use with NSViewControllerMBS class.
The default value is nil. You must set the content view controller of the popover to a non-nil value before the popover is shown. Changes to the popover's content view controller while the popover is shown will animate (provided animates is true).
(Read and Write computed property)

### 33.45.24 positioningRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The positioning rectangle.
**Notes:** Popovers are positioned relative to a positioning view and are automatically moved when the location or size of the positioning view changes. Sometimes it is desirable to position popovers relative to a rectangle within the positioning view. In this case, you must update the positioningRect binding whenever this rectangle changes, or use the positioningRect binding so AppKit can re-position the popover when appropriate.
(Read and Write computed property)

### 33.45.25 Events

### 33.45.26 detachableWindowForPopover as NSWindowMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Detaches the popover creating a window containing the content.
**Notes:** You return a window instance to which the popover should be detached.

You should not remove the popover's content view as part of your implementation of this method.

The popover and the detachable window may be shown at the same time and therefore cannot share a

content view (or a content view controller).

If the popover and the detachable window should have the same content, you should define the content with a separate view and use a view controller to instantiate separate copies of the content for the popover and the detachable window.

The popover will animate to appear as though it morphs into the detachable window (unless the popover animates property is set to false. The exact animation used is not guaranteed.

If you do not implement this event or it returns nil, the default behavior is that the popup is not detached.

### 33.45.27 popoverDidClose(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the popover did close.
**Notes:** Invoked on the delegate when the NSPopoverDidCloseNotification notification is sent.

### 33.45.28 popoverDidDetach

MBS MacControls Plugin, Plugin Version: 22.4, Platform: macOS, Targets: .

**Function:** Indicates that a popover has been released while it's in an implicitly detached state.
**Notes:** This event is not called when the popover's detached window is returned by detachableWindowFor-Popover.

### 33.45.29 popoverDidShow(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the popover has been shown.
**Notes:** Invoked on the delegate when the NSPopoverDidShowNotification notification is sent.

### 33.45.30 popoverShouldClose as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Allows a delegate to override a close request.
**Notes:** Return true if the popover should close, false otherwise.

The popover invokes this method on its delegate whenever it is about to close. This gives you a chance to override the close.

If you do not implement this method the default behavior is that the popover will close.

### 33.45.31 popoverShouldDetach as boolean

MBS MacControls Plugin, Plugin Version: 22.4, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a popover should detach from its positioning view and become a separate window.
**Notes:** If you don't implement this event, it returns false by default. If you return true from this event, but you don't implement detachableWindowForPopover or you implement it to return nil, a detachable window is created with the popover,Äôs contentViewController.

An automatically created window has the same appearance as the detached popover. For example, if the popover's contentViewController has a title, it will be bound to and displayed as the title of the detached window. When a popover is released in a detached state, it calls popoverDidDetach event. When a detached popover is closed, calls to popoverShouldClose, popoverWillClose, and popoverDidClose, in addition to the related notifications, specify the reason NSPopoverCloseReasonStandard.

### 33.45.32 popoverWillClose(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the popover is about to close.
**Notes:** Invoked on the delegate when the NSPopoverWillCloseNotification notification is sent.

### 33.45.33 popoverWillShow(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the popover will show.
**Notes:** Invoked on the delegate when the NSPopoverWillShowNotification notification is sent.

### 33.45.34 Constants

Edge constants

| Constant | Value | Description |
|---|---|---|
| MaxXEdge | 2 | right |
| MaxYEdge | 3 | top<br>(Cocoa coordinates have 0 on bottom of screen) |
| MinXEdge | 0 | left |
| MinYEdge | 1 | bottom<br>(Cocoa coordinates have 0 on bottom of screen) |

Behavior modes

| Constant | Value | Description |
|---|---|---|
| NSPopoverBehaviorApplicationDefined | 0 | Your application assumes responsibility for closing the popover. AppK still close the popover in a limited number of circumstances. For instance Kit will attempt to close the popover when the window of its positionin is closed. The exact interactions in which AppKit will close the popov not guaranteed. You may consider implementing -cancel: to close the p when the escape key is pressed. |
| NSPopoverBehaviorSemitransient | 2 | AppKit will close the popover when the user interacts with user interfa ments in the window containing the popover's positioning view. Semi-tra popovers cannot be shown relative to views in other popovers, nor can t shown relative to views in child windows. The exact interactions that semi-transient popovers to close are not specified. |
| NSPopoverBehaviorTransient | 1 | AppKit will close the popover when the user interacts with a user in element outside the popover. Note that interacting with menus or pane become key only when needed will not cause a transient popover to clos exact interactions that will cause transient popovers to close are not sp |

## 33.46 class NSRangeMBS

### 33.46.1 class NSRangeMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** This is the Cocoa class for a Range.
**Blog Entries**

- Styled Text for Labels in your Xojo iOS app
- MBS Xojo / Real Studio Plugins, version 16.1pr1
- Tip of the day: Adding links to Textarea on OS X
- Apply fonts to font PopupMenu
- Nearly 2000 new Functions in the 9.6 prerelease of MBS
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 7.6, page 8: News

### 33.46.2 Methods

### 33.46.3 Constructor

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty range.
**Example:**

```
dim r as new NSRangeMBS
MsgBox r // { 0, 0 }
```

See also:


- 33.46.4 Constructor(Location as UInt32, Length as UInt32) 6173
- 33.46.5 Constructor(p as Ptr) 6173
- 33.46.6 Constructor(s as string) 6173

### 33.46.4 Constructor(Location as UInt32, Length as UInt32)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new range with the given values.
See also:


- 33.46.3 Constructor 6172
- 33.46.5 Constructor(p as Ptr) 6173
- 33.46.6 Constructor(s as string) 6173


### 33.46.5 Constructor(p as Ptr)

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 33.46.3 Constructor 6172
- 33.46.4 Constructor(Location as UInt32, Length as UInt32) 6173
- 33.46.6 Constructor(s as string) 6173


### 33.46.6 Constructor(s as string)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSRange object using the given string.
**Example:**

```
dim r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r // { 3, 4 }
```

See also:


- 33.46.3 Constructor 6172
- 33.46.4 Constructor(Location as UInt32, Length as UInt32) 6173
- 33.46.5 Constructor(p as Ptr) 6173

### 33.46.7 Equal(other as NSRangeMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether two ranges are equal.

### 33.46.8 Intersection(other as NSRangeMBS) as NSRangeMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the intersection of the two ranges.

### 33.46.9 LocationInRange(location as UInt32) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the location is in the range.

### 33.46.10 Operator_Convert as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Converts the object to string.
**Example:**

```
dim r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r // { 3, 4 }
```

### 33.46.11 String as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the string representation of this range.
**Example:**

```
dim r as new NSRangeMBS(" { 3, 4 } ")
MsgBox r.String // { 3, 4 }
```

### 33.46.12 Union(other as NSRangeMBS) as NSRangeMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates the union of two ranges.

### 33.46.13 Properties

### 33.46.14 Handle as Ptr

MBS Main Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The pointer to the internal data structure.
**Notes:** May be useful for passing to declares requiring a NSRange*.
(Read only property)

### 33.46.15 Length as UInt32

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The length of the range.
**Example:**

```
dim r as new NSRangeMBS(" { 3, 4 } ")
MsgBox str(R.Length) // 4
```

**Notes:** (Read and Write property)

### 33.46.16 Location as UInt32

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The position of the range.
**Notes:** (Read and Write property)

### 33.46.17 MaxRange as UInt32

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The maximum value of the range.
**Notes:** Same as location+length.
(Read only property)

# 33.47 class NSRectMBS

## 33.47.1 class NSRectMBS

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** A Xojo class for the rect structure in Cocoa.
**Example:**

```
dim n as NSRectMBS = NSMakeRectMBS(100,200,500,600)
MsgBox n.String
```

**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- MBS Xojo Plugins, version 17.3pr4
- MBS Xojo / Real Studio Plugins, version 16.1pr1
- Apply fonts to font PopupMenu
- MBS Real Studio Plugins, version 12.1pr1
- MBS REALbasic plug-in 9.6

## 33.47.2 Methods

## 33.47.3 Constructor

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty rectangle.
**Example:**

```
dim p as new NSRectMBS
MsgBox p // shows { { 0 ,0 } , { 0 ,0 } }
```

See also:


- 33.47.4 Constructor(p as Ptr) 6178
- 33.47.5 Constructor(s as string) 6178
- 33.47.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 6178

### 33.47.4 Constructor(p as Ptr)

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 33.47.3 Constructor 6177
- 33.47.5 Constructor(s as string) 6178
- 33.47.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 6178


### 33.47.5 Constructor(s as string)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSRect object using the given string.
**Example:**

```
dim p as new NSRectMBS(" { { 1,2 } , { 3,4 } } ")
MsgBox p // shows { { 1, 2 } , { 3, 4 } }
```

See also:


- 33.47.3 Constructor 6177
- 33.47.4 Constructor(p as Ptr) 6178
- 33.47.6 Constructor(X as Double, Y as Double, W as Double, H as Double) 6178


### 33.47.6 Constructor(X as Double, Y as Double, W as Double, H as Double)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSRect object using the given values.
See also:


- 33.47.3 Constructor 6177
- 33.47.4 Constructor(p as Ptr) 6178
- 33.47.5 Constructor(s as string) 6178

### 33.47.7 Contains(other as NSPointMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the rectangle contains the given point.
See also:

- 33.47.8 Contains(other as NSRectMBS) as boolean 6179

### 33.47.8 Contains(other as NSRectMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the rectangle contains the given rectangle.
See also:

- 33.47.7 Contains(other as NSPointMBS) as boolean 6179

### 33.47.9 Equal(other as NSRectMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether two rectangles are equal.

### 33.47.10 Inset(dx as Double, dy as Double) as NSRectMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Insets the rectangle by the given delta.
**Example:**

```
dim p as new NSRectMBS(1.1,2.2,3.3,4.4)
dim r as NSRectMBS = p.Inset(2,3)
MsgBox r.String // shows { { 3.1, 5.2 } , { -0.7, -1.6 } }
```

### 33.47.11 Integral as NSRectMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the integral of the rectangle.
**Example:**

```
dim p as new NSRectMBS(1.1,2.2,3.3,4.4)
dim r as NSRectMBS = p.Integral
MsgBox r.String // shows { { 1, 2 } , { 4, 5 } }
```

### 33.47.12 Intersection(other as NSRectMBS) as NSRectMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the intersection of two rectangles.

### 33.47.13 Intersects(other as NSRectMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the intersection of the rectangle with the other rectangle.

### 33.47.14 Operator_Convert as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Converts the object to string.
**Example:**

```
dim p as new NSRectMBS(1,2,3,4)
MsgBox p // shows { { 1, 2 } , { 3, 4 } }
```

### 33.47.15 String as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the string representation of this point.
**Example:**

```
dim p as new NSRectMBS(1,2,3,4)
MsgBox p.String // shows { { 1, 2 } , { 3, 4 } }
```

### 33.47.16 Union(other as NSRectMBS) as NSRectMBS

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the union of two rectangles.

### 33.47.17 Zero as NSRectMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Returns a rect with all values being zero.

### 33.47.18 Properties

### 33.47.19 Handle as Ptr

MBS Main Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The pointer to the internal data structure.
**Notes:** May be useful for passing to declares requiring a NSRect*.
Size of structure is 16 bytes for 32-bit (four singles) and 32 bytes for 64-bit (four doubles).
(Read only property)

### 33.47.20 Height as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The height of this rectangle.
**Notes:** (Read and Write property)

### 33.47.21 IsEmpty as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the rectangle is empty.
**Notes:** (Read only property)

### 33.47.22 MaxX as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns maximum x coordinate.
**Notes:** return x + width.
(Read only property)

### 33.47.23 MaxY as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns maximum y coordinate.
**Notes:** return y + height.
(Read only property)

### 33.47.24 MidX as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns center x coordinate.
**Notes:** (Read only property)

### 33.47.25 MidY as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns center y coordinate.
**Notes:** (Read only property)

### 33.47.26 MinX as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns x coordinate.
**Notes:** (Read only property)

### 33.47.27 MinY as Double

MBS Main Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns y coordinate.
**Notes:** (Read only property)

### 33.47.28 Origin as NSPointMBS

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The origin of the rectangle.
**Notes:** (Read and Write property)

### 33.47.29 Size as NSSizeMBS

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The size of the rectangle.
**Notes:** (Read and Write property)

### 33.47.30 Width as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The width of this rectangle.
**Notes:** (Read and Write property)

### 33.47.31 X as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The horizontal coordinate.
**Notes:** (Read and Write property)

### 33.47.32 Y as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The vertical coordinate.
**Notes:** (Read and Write property)

## 33.48 class NSResponderMBS

### 33.48.1 class NSResponderMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** NSResponder is an abstract class that forms the basis of event and command processing in the Application Kit.
**Notes:** See the Cocoa documentation for more details.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr4
- MBS Real Studio Plugins, version 12.4pr8
- MBS REALbasic plug-in 9.6

### 33.48.2 Methods

### 33.48.3 beginGestureWithEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.

### 33.48.4 cancelOperation

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to cancel the current operation.
**Notes:** This method is bound to the Escape and Command-. (period) keys. The key window first searches the view hierarchy for a view whose key equivalent is Escape or Command-., whichever was entered. If none of these views handles the key equivalent, the window sends a default action message of cancelOperation: to the first responder and from there the message travels up the responder chain.

If no responder in the responder chain implements cancelOperation:, the key window searches the view hierarchy for a view whose key equivalent is Escape (note that this may be redundant if the original key equivalent was Escape). If no such responder is found, then a cancel: action message is sent to the first responder in the responder chain that implements it.

NSResponder declares but does not implement this method.

### 33.48.5 capitalizeWord

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to capitalize the word or words surrounding the insertion point or selection, expanding the selection if necessary.
**Notes:** If either end of the selection partially covers a word, that entire word is made lowercase. The sender argument is typically the object that invoked this method. NSResponder declares but doesn't implement this method.

### 33.48.6 centerSelectionInVisibleArea

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the selection, whatever it is, inside its visible area.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.7 changeCaseOfLetter

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to change the case of a letter or letters in the selection, perhaps by opening a panel with capitalization options or by cycling through possible case combinations.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.8 complete

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to complete an operation in progress or a partially constructed element.
**Notes:** This method can be interpreted, for example, as a request to attempt expansion of a partial word, such as for expanding a glossary shortcut, or to close a graphics item being drawn. NSResponder declares but doesn't implement this method.

### 33.48.9 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 33.48.10 cursorUpdate(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the mouse cursor has moved into a cursor rectangle.
**Notes:** Override this method to set the cursor image. The default implementation uses cursor rectangles, if cursor rectangles are currently valid. If they are not, it calls super to send the message up the responder chain.

If the responder implements this method, but decides not to handle a particular event, it should invoke the superclass implementation of this method.
Available in Mac OS X v10.5 and later.

### 33.48.11 deleteBackward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or a single element backward from the insertion point (a letter or character in text, for example).
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.12 deleteBackwardByDecomposingPreviousCharacter

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or a single character backward from the insertion point.
**Notes:** If the previous character is canonically decomposable, this method should try to delete only the last character in the grapheme cluster (for example, deleting "a"+ "´" results in "a"). NSResponder declares but does not implement this method.

### 33.48.13 deleteForward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or a single element forward from the insertion point (a letter or character in text, for example).
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.14 deleteToBeginningOfLine

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or all text from the insertion point to the beginning of a line (typically of text).
**Notes:** Also places the deleted text into the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.15 deleteToBeginningOfParagraph

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or all text from the insertion point to the beginning of a paragraph of text.
**Notes:** Also places the deleted text into the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.16 deleteToEndOfLine

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or all text from the insertion point to the end of a line (typically of text).
**Notes:** Also places the deleted text into the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.17 deleteToEndOfParagraph

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or all text from the insertion point to the end of a paragraph of text.
**Notes:** Also places the deleted text into the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.18 deleteToMark

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or all items from the insertion point to a previously placed mark, including the selection itself if not empty.
**Notes:** Also places the deleted text into the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.19 deleteWordBackward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or a single word backward from the insertion point.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.20 deleteWordForward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to delete the selection, if there is one, or a single word forward from the insertion point.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.21 endGestureWithEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.22 flagsChanged(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has pressed or released a modifier key (Shift, Control, and so on).
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.23 flushBufferedKeyEvents

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Overridden by subclasses to clear any unprocessed key events.

### 33.48.24 helpRequested(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Displays context-sensitive help for the receiver if such exists; otherwise passes this message to the next responder.
**Notes:** NSWindow invokes this method automatically when the user clicks for help—while processing theEvent. Subclasses need not override this method, and application code shouldn't directly invoke it.

### 33.48.25 indent

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to indent the selection or the insertion point if there is no selection.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.26 insertBacktab

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to handle a backward tab.
**Notes:** A field editor might respond to this method by selecting the field before it, while a regular text object either doesn't respond to or ignores such a message. NSResponder declares but doesn't implement this method.

### 33.48.27 insertContainerBreak

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a container break (typically a page break) at the insertion point or selection, deleting the selection if there is one.
**Notes:** NSResponder declares but doesn't implement this method. NSTextView implements it to insert an NSFormFeedCharacter character (0x000c).

### 33.48.28 insertDoubleQuoteIgnoringSubstitution

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a double quote character at the insertion point without interference by automatic quote correction.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.29 insertLineBreak

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a line break (as distinguished from a paragraph break) at the insertion point or selection, deleting the selection if there is one.
**Notes:** NSResponder declares but doesn't implement this method. NSTextView implements it to insert an NSLineSeparatorCharacter character (0x2028).

### 33.48.30 insertNewline

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a newline character at the insertion point or selection, deleting the selection if there is one, or to end editing if the receiver is a text field or other field editor.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.31 insertNewlineIgnoringFieldEditor

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a line-break character at the insertion point or selection, deleting the selection if there is one.
**Notes:** Unlike insertNewline:, this method always inserts a line-break character and doesn't cause the receiver to end editing. NSResponder declares but doesn't implement this method.

### 33.48.32 insertParagraphSeparator

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a paragraph separator at the insertion point or selection, deleting the selection if there is one.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.33 insertSingleQuoteIgnoringSubstitution

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a single quote character at the insertion point without interference by automatic quote correction.
**Notes:** NSResponder declares but doesn't implement this method.

Available in Mac OS X v10.6 and later.

### 33.48.34 insertTab

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a tab character at the insertion point or selection, deleting the selection if there is one, or to end editing if the receiver is a text field or other field editor.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.35 insertTabIgnoringFieldEditor

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to insert a tab character at the insertion point or selection, deleting the selection if there is one.
**Notes:** Unlike insertTab:, this method always inserts a tab character and doesn't cause the receiver to end editing. NSResponder declares but doesn't implement this method.

### 33.48.36 keyDown(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has pressed a key.
**Notes:** The receiver can interpret theEvent itself, or pass it to the system input manager using interpretKeyEvents. The default implementation simply passes this message to the next responder.

### 33.48.37 keyUp(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has released a key.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.38 lowercaseWord

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to make lowercase every letter in the word or words surrounding the insertion point or selection, expanding the selection if necessary.

**Notes:** If either end of the selection partially covers a word, that entire word is made lowercase. NSResponder declares, but doesn't implement this method.

### 33.48.39 magnifyWithEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.

### 33.48.40 makeBaseWritingDirectionLeftToRight

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the paragraph base writing direction to be left to right.
**Notes:** Sets the NSAttributedString key NSWritingDirectionAttributeName to NSWritingDirectionLeftToRight.

This action method is intended to be used both as the target of a menu item and for key bindings. The base writing direction methods should be the target of three menu items in a submenu, under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.41 makeBaseWritingDirectionNatural

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the paragraph base writing direction to be natural.
**Notes:** Natural directionality is determined from the text in accordance with the Unicode bi-di algorithm. For more information see NSParagraphStyle.

Sets the NSAttributedStringkey NSWritingDirectionAttributeName to NSTextWritingDirectionEmbedding.

This action method is intended to be used both as the target of a menu item and for key bindings. The base writing direction methods should be the target of three menu items in a submenu, under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.42 makeBaseWritingDirectionRightToLeft

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the paragraph base writing direction to be right to left.
**Notes:** Sets the NSAttributedString key NSWritingDirectionAttributeName to NSWritingDirectionRightToLeft.

This action method is intended to be used both as the target of a menu item and for key bindings. The base writing direction methods should be the target of three menu items in a submenu, under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.43 makeTextWritingDirectionLeftToRight

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the character level attributed string direction attribute for left to right text.
**Notes:** Sets the NSAttributedString NSWritingDirectionAttributeName to NSWritingDirectionLeftToRight.

This action method is intended to be used both as the target of a menu item and for key bindings. The text writing directions should be the target of three similar menu items in a submenu under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.44 makeTextWritingDirectionNatural

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the character-level writing direction attribute.
**Notes:** Removes the NSWritingDirectionAttributeName from an NSAttributedString.

This action method is intended to be used both as the target of a menu item and for key bindings. The text writing directions should be the target of three similar menu items in a submenu under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.45 makeTextWritingDirectionRightToLeft

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the character-level writing direction attribute to a single right-to-left embedding.
**Notes:** Sets the NSAttributedString key NSWritingDirectionAttributeName to NSWritingDirectionRightToLeft.

This action method is intended to be used both as the target of a menu item and for key bindings. The text writing directions should be the target of three similar menu items in a submenu under the Edit menu.

Default key bindings will also be provided for this method but will only be enabled for users of Hebrew or Arabic, or those who have otherwise enabled a suitable preference.

Available in Mac OS X v10.6 and later.

### 33.48.46 mouseDown(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has pressed the left mouse button.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.47 mouseDragged(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has moved the mouse with the left button pressed.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.48 mouseEntered(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the cursor has entered a tracking rectangle.
**Notes:** The default implementation simply passes this message to the next responder.
Available in Mac OS X v10.0 and later.

### 33.48.49 mouseExited(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the cursor has exited a tracking rectangle.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.50 mouseMoved(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the mouse has moved.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.51 mouseUp(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has released the left mouse button.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.52 moveBackward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character backward.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed at the beginning of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.53 moveBackwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection backward by one element or character.
**Notes:** If the end being modified is the backward end, this method expands the selection; if the end being modified is the forward end, it reduces the selection. The first moveBackwardAndModifySelection: or moveForwardAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the backward end becoming the mobile one if invoked first. By default, moveLeftAndModifySelection: is bound to the left arrow key.

NSResponder declares but doesn't implement this method.

### 33.48.54 moveDown

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character down.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed below the beginning of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.55 moveDownAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce the top or bottom end of the selection downward by one element, character, or line (whichever is appropriate for text direction).
**Notes:** If the end being modified is the bottom, this method expands the selection; if the end being modified is the top, it reduces the selection. The first moveDownAndModifySelection: or moveUpAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the bottom end becoming the mobile one if invoked first.

NSResponder declares but doesn't implement this method.

### 33.48.56 moveForward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character forward.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed at the end of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.57 moveForwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection forward by one element or character.
**Notes:** If the end being modified is the backward end, this method reduces the selection; if the end being modified is the forward end, it expands the selection. The first moveBackwardAndModifySelection: or moveForwardAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the forward end becoming the mobile one if invoked first. By default, moveRightAndModifySelection: is bound to the right arrow key.

NSResponder declares but doesn't implement this method.

### 33.48.58 moveLeft

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character to the left.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed at the left end of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.59 moveLeftAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection to the left (display order) by one element or character.
**Notes:** If the end being modified is the left end, this method expands the selection; if the end being modified is the right end, it reduces the selection. The first moveLeftAndModifySelection: or moveRightAndModify-Selection: method in a series determines the end being modified by always expanding. Hence, this method results in the left end becoming the mobile one if invoked first. By default, this method is bound to the left

arrow key.

NSResponder declares but doesn't implement this method.

The essential difference between this method and the corresponding moveBackwardAndModifySelection: is that the latter method moves in logical order, which can differ in bidirectional text, whereas this method moves in display order.

### 33.48.60 moveParagraphBackwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the beginning of the previous paragraph, expanding or reducing the current selection.
**Notes:** If the cursor is already at the beginning of a paragraph, the selection moves backward to the beginning of the previous paragraph.
NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.61 moveParagraphForwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the beginning of the next paragraph, expanding or reducing the current selection.
**Notes:** If the cursor is already at the end of a paragraph, the selection moves forward to the end of the next paragraph.

NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.62 moveRight

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character to the right.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed at the right end of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.63 moveRightAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection to the right (display order) by one element or character.
**Notes:** If the end being modified is the left end, this method reduces the selection; if the end being modified is the right end, it expands the selection. The first moveLeftAndModifySelection: or moveRightAndModify-Selection: method in a series determines the end being modified by always expanding. Hence, this method results in the right end becoming the mobile one if invoked first. By default, this method is bound to the right arrow key.

NSResponder declares but doesn't implement this method.

The essential difference between this method and the corresponding moveForwardAndModifySelection: is that the latter method moves in logical order, which can differ in bidirectional text, whereas this method moves in display order.

### 33.48.64 moveToBeginningOfDocument

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection to the first element of the document or the insertion point to the beginning.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.65 moveToBeginningOfDocumentAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the beginning of the document, expanding or reducing the current selection.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.66 moveToBeginningOfLine

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection to the first element of the selected line or the insertion point to the beginning of the line.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.67 moveToBeginningOfLineAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the beginning of the line, expanding or reducing the current selection.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.68 moveToBeginningOfParagraph

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the insertion point to the beginning of the selected paragraph.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.69 moveToBeginningOfParagraphAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the beginning of the current paragraph, expanding or reducing the current selection.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.70 moveToEndOfDocument

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection to the last element of the document or the insertion point to the end.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.71 moveToEndOfDocumentAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the end of the document, expanding or reducing the current selection.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.72 moveToEndOfLine

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection to the last element of the selected line or the insertion point to the end of the line.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.73 moveToEndOfLineAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection to the last element of the selected line or the insertion point to the end of the line.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.0 and later.

### 33.48.74 moveToEndOfParagraph

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the insertion point to the end of the selected paragraph.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.75 moveToEndOfParagraphAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the end of the line, expanding or reducing the current selection.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.76 moveToLeftEndOfLine

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the left end of the line.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed at left end of the line. NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.77 moveToLeftEndOfLineAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the left end of the line, expanding or contracting the selection as required.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.78 moveToRightEndOfLine

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the right end of the line.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.79 moveToRightEndOfLineAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point to the right end of the line, expanding or contracting the selection as required.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.48.80 moveUp

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one element or character up.
**Notes:** In text, if there is a selection it should be deselected, and the insertion point should be placed above the beginning of the former selection. NSResponder declares but doesn't implement this method.

### 33.48.81 moveUpAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce the top or bottom end of the selection upward by one element, character, or line (whichever is appropriate for text direction).
**Notes:** If the end being modified is the bottom, this method reduces the selection; if the end being modified is the top, it expands the selection. The first moveDownAndModifySelection: or moveUpAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the top end becoming the mobile one if invoked first.

NSResponder declares but doesn't implement this method.

### 33.48.82 moveWordBackward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one word backward.
**Notes:** If there is a selection it should be deselected, and the insertion point should be placed at the end of the first word preceding the former selection. NSResponder declares but doesn't implement this method.

### 33.48.83 moveWordBackwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection backward by one whole word.
**Notes:** If the end being modified is the backward end, this method expands the selection; if the end being modified is the forward end, it reduces the selection. The first moveWordBackwardAndModifySelection: or moveWordForwardAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the backward end becoming the mobile one if invoked first.

NSResponder declares but doesn't implement this method.

### 33.48.84 moveWordForward

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one word forward, in logical order.
**Notes:** If there is a selection it should be deselected, and the insertion point should be placed at the beginning of the first word following the former selection. NSResponder declares but doesn't implement this method.

### 33.48.85 moveWordForwardAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection forward by one whole word.
**Notes:** If the end being modified is the backward end, this method reduces the selection; if the end being modified is the forward end, it expands the selection. The first moveWordBackwardAndModifySelection:

or moveWordForwardAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the forward end becoming the mobile one if invoked first. NSResponder declares but doesn't implement this method.

### 33.48.86 moveWordLeft

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one word to the left, in display order.
**Notes:** If there is a selection it should be deselected, and the insertion point should be placed at the end of the first word to the left of the former selection. NSResponder declares but doesn't implement this method.

The main difference between this method and the corresponding moveWordBackward: method is that the latter moves in logical order, which is important in bidirectional text, whereas this method moves in display order.

### 33.48.87 moveWordLeftAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection left by one whole word in display order.
**Notes:** If the end being modified is the left end, this method expands the selection; if the end being modified is the right end, it reduces the selection. The first moveWordLeftAndModifySelection: or moveWordRightAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the left end becoming the mobile one if invoked first.

NSResponder declares but doesn't implement this method.

The main difference between this method and the corresponding moveWordBackwardAndModifySelection: method is that the latter moves in logical order, which is important in bidirectional text, whereas this method moves in display order.

### 33.48.88 moveWordRight

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to move the selection or insertion point one word right.
**Notes:** If there is a selection it should be deselected, and the insertion point should be placed at the beginning of the first word to the right of the former selection. NSResponder declares but doesn't implement this

method.

The main difference between this method and the corresponding moveWordForward: method is that the latter moves in logical order, which is important in bidirectional text, whereas this method moves in display order.

### 33.48.89 moveWordRightAndModifySelection

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to expand or reduce either end of the selection to the right by one whole word.
**Notes:** If the end being modified is the backward end, this method reduces the selection; if the end being modified is the forward end, it expands the selection. The first moveWordBackwardAndModifySelection: or moveWordForwardAndModifySelection: method in a series determines the end being modified by always expanding. Hence, this method results in the forward end becoming the mobile one if invoked first. NSResponder declares but doesn't implement this method.

The main difference between this method and the corresponding moveWordForwardAndModifySelection: method is that the latter moves in logical order, which is important in bidirectional text, whereas this method moves in display order.

### 33.48.90 otherMouseDown(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has pressed a mouse button other than the left or right one.
**Notes:** The default implementation simply passes this message to the next responder.
Available in Mac OS X v10.1 and later.

### 33.48.91 otherMouseDragged(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has moved the mouse with a button other than the left or right button pressed.
**Notes:** The default implementation simply passes this message to the next responder.
Available in Mac OS X v10.1 and later.

### 33.48.92 otherMouseUp(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has released a mouse button other than the left or right button.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.93 pageDown

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver down (or back) one page in its scroll view, also moving the insertion point to the top of the newly displayed page.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.94 pageDownAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver down (or back) one page in its scroll view, also moving the insertion point to the top of the newly displayed page. The selection is expanded or contracted as required.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.95 pageUp

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver up (or forward) one page in its scroll view, also moving the insertion point to the top of the newly displayed page.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.96 pageUpAndModifySelection

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver up (or forward) one page in its scroll view, also moving the insertion point to the top of the newly displayed page. The selection is expanded or contracted as necessary.
**Notes:** NSResponder declares but doesn't implement this method.

Available in Mac OS X v10.6 and later.

### 33.48.97 performMnemonic(theString as string) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Overridden by subclasses to handle a mnemonic.
**Notes:** If the character code or codes in theString match the receiver's mnemonic, the receiver should perform the mnemonic and return true. The default implementation does nothing and returns false. Mnemonics are not supported in Mac OS X.

### 33.48.98 presentError(e as NSErrorMBS) as boolean

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Presents an error alert to the user as an application-modal dialog.
**Notes:** e: An object containing information about an error.

The alert displays information found in the NSError object e; this information can include error description, recovery suggestion, failure reason, and button titles (all localized). The method returns true if error recovery succeeded and false otherwise. For error recovery to be attempted, an recovery-attempter object (that is, an object conforming to the NSErrorRecoveryAttempting informal protocol) must be associated with e.

The default implementation of this method sends willPresentError to self. By doing this, NSResponder gives subclasses an opportunity to customize error presentation. It then forwards the message, passing any customized error object, to the next responder; if there is no next responder, it passes the error object to NSApp, which displays a document-modal error alert. When the user dismisses the alert, any recovery attempter associated with the error object is given a chance to recover from the error. See the class description for the precise route up the responder chain (plus document and controller objects) this message might travel.

Available in OS X v10.4 and later.

### 33.48.99 rightMouseDown(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has pressed the right mouse button.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.100 rightMouseDragged(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has moved the mouse with the right button pressed.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.101 rightMouseUp(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has released the right mouse button.
**Notes:** The default implementation simply passes this message to the next responder.

### 33.48.102 rotateWithEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.

### 33.48.103 scrollLineDown

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver one line down in its scroll view, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.104 scrollLineUp

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver one line up in its scroll view, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.105 scrollPageDown

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver one page down in its scroll view, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.106 scrollPageUp

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver one page up in its scroll view, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.107 scrollToBeginningOfDocument

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver to the beginning of the document, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.
Available in Mac OS X v10.6 and later.

### 33.48.108 scrollToEndOfDocument

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to scroll the receiver to the end of the document, without changing the selection.
**Notes:** NSResponder declares but doesn't implement this method.

Available in Mac OS X v10.6 and later.

### 33.48.109 scrollWheel(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the mouse's scroll wheel has moved.
**Notes:** The default implementation simply passes this message to the next responder.
Available in Mac OS X v10.0 and later.

### 33.48.110 selectAll

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to select all selectable elements.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.111 selectLine

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to select all elements in the line or lines containing the selection or insertion point.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.112 selectParagraph

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to select all paragraphs containing the selection or insertion point.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.113 selectToMark

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to select all items from the insertion point or selection to a previously placed mark, including the selection itself if not empty.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.114 selectWord

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to extend the selection to the nearest word boundaries outside it (up to, but not including, word delimiters).
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.115 setMark

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to set a mark at the insertion point or selection, which is used by deleteToMark and selectToMark.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.116 showContextHelp

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to invoke the help system, displaying information relevant to the receiver and its current state.

### 33.48.117 swapWithMark

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Swaps the mark and the selection or insertion point, so that what was marked is now the selection or insertion point, and what was the insertion point or selection is now the mark.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.118 swipeWithEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.

### 33.48.119 tabletPoint(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that a tablet-point event has occurred.
**Notes:** Tablet events are represented by NSEvent objects of type NSTabletPoint. They describe the current state of a transducer (that is, a pointing device) that is in proximity to its tablet, reflecting changes such as location, pressure, tilt, and rotation. See the NSEvent reference for the methods that allow you to extract this and other information from theEvent. The default implementation of NSResponder passes the message to the next responder.
Available in Mac OS X v10.4 or later.

### 33.48.120 tabletProximity(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Informs the receiver that a tablet-proximity event has occurred.
**Notes:** Tablet events are represented by NSEvent objects of type NSTabletProximity. Tablet devices generate proximity events when the transducer (pointing device) nears a tablet and when it moves away from a tablet. From an event object of this type you can extract information about the kind of device and its capabilities, as well as the relation of this tablet-proximity event to various tablet-point events; see the NSEvent reference for details. The default implementation passes the message to the next responder.
Available in Mac OS X v10.4 or later.

### 33.48.121 transpose

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Transposes the characters to either side of the insertion point and advances the insertion point past both of them. Does nothing to a selected range of text.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.122 transposeWords

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Transposes the words to either side of the insertion point and advances the insertion point past both of them. Does nothing to a selected range of text.
**Notes:** NSResponder declares but doesn't implement this method.

### 33.48.123 undoManager as NSUndoManagerMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The undo manager for this item.
**Notes:** Subclasses may implement this property.

### 33.48.124 uppercaseWord

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Implemented by subclasses to make uppercase every letter in the word or words surrounding the insertion point or selection, expanding the selection if necessary.
**Notes:** If either end of the selection partially covers a word, that entire word is made uppercase. NSResponder declares but doesn't implement this method.

### 33.48.125 yank

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Replaces the insertion point or selection with text from the kill buffer.
**Notes:** If invoked sequentially, cycles through the kill buffer in reverse order. See "Standard Action Methods for Selecting and Editing" for more information on the kill buffer. NSResponder declares but doesn't implement this method.

### 33.48.126 Properties

### 33.48.127 Handle as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal handle of this Responder.
**Notes:** (Read and Write property)

### 33.48.128 menu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's menu.
**Notes:** (On useful for NSApplication class on Mac)
(Read and Write computed property)

### 33.48.129 nextResponder as NSResponderMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The next responder in the responder chain.
**Notes:** (Read and Write computed property)

# 33.49 class NSRunLoopMBS

## 33.49.1 class NSRunLoopMBS

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The NSRunLoop class declares the programmatic interface to objects that manage input sources.
**Notes:** An NSRunLoop object processes input for sources such as mouse and keyboard events from the window system, NSPort objects, and NSConnection objects. An NSRunLoop object also processes NSTimer events.

Your application cannot either create or explicitly manage NSRunLoop objects. Each NSThread object, including the application's main thread, has an NSRunLoop object automatically created for it as needed. If you need to access the current thread's run loop, you do so with the class method currentRunLoop.

Note that from the perspective of NSRunloop, NSTimer objects are not "input"—they are a special type, and one of the things that means is that they do not cause the run loop to return when they fire.

Warning:
The NSRunLoop class is generally not considered to be thread-safe and its methods should only be called within the context of the current thread. You should never try to call the methods of an NSRunLoop object running in a different thread, as doing so might cause unexpected results.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr5
- MBS Xojo / Real Studio Plugins, version 13.5pr1

## 33.49.2 Methods

## 33.49.3 AddDummyPort

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Adds a dummy port as event source.
**Notes:** Run loops don't loop unless there is an event source, so you can add a dummy one here.

## 33.49.4 allModes as string()

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns array with all mode strings.

### 33.49.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a new object using current run loop.

### 33.49.6 currentRunLoop as NSRunLoopMBS

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns the NSRunLoop object for the current thread.
**Notes:** If a run loop does not yet exist for the thread, one is created and returned.

### 33.49.7 mainRunLoop as NSRunLoopMBS

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns the run loop of the main thread.
**Notes:** An object representing the main thread's run loop.
Available in OS X v10.5.

### 33.49.8 NSDefaultRunLoopMode as string

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** One of the runloop mode.
**Notes:** The mode to deal with input sources other than NSConnection objects.
This is the most commonly used run-loop mode.

### 33.49.9 NSRunLoopCommonModes as string

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** One of the runloop mode.
**Notes:** Objects added to a run loop using this value as the mode are monitored by all run loop modes that have been declared as a member of the set of "common" modes; see the description of CFRunLoopAddCommonMode for details.
Available in OS X v10.5 and later.

### 33.49.10 run

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Puts the receiver into a permanent loop, during which time it processes data from all attached input sources.
**Notes:** If no input sources or timers are attached to the run loop, this method exits immediately; otherwise, it runs the receiver in the NSDefaultRunLoopMode by repeatedly invoking runMode:beforeDate:. In other words, this method effectively begins an infinite loop that processes data from the run loop's input sources and timers.

Manually removing all known input sources and timers from the run loop is not a guarantee that the run loop will exit. OS X can install and remove additional input sources as needed to process requests targeted at the receiver's thread. Those sources could therefore prevent the run loop from exiting.

If you want the run loop to terminate, you shouldn't use this method. Instead, use one of the other run methods and also check other arbitrary conditions of your own, in a loop.
See also:

- 33.49.11 run(Seconds as Double) 6217

### 33.49.11 run(Seconds as Double)

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Runs the runloop for the given number of seconds.
See also:

- 33.49.10 run 6217

### 33.49.12 runMode(Mode as string, Seconds as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Runs the runloop for the given number of seconds in the given mode.

### 33.49.13 runModeUntilDate(Mode as string, limitDate as date) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs the loop once, blocking for input in the specified mode until a given date.
**Notes:** mode: The mode in which to run. You may specify custom modes or use one of the modes listed in "Run Loop Modes."

limitDate: The date until which to block.

Returns true if the run loop ran and processed an input source or if the specified timeout value was reached; otherwise, false if the run loop could not be started.

If no input sources or timers are attached to the run loop, this method exits immediately and returns false; otherwise, it returns after either the first input source is processed or limitDate is reached. Manually removing all known input sources and timers from the run loop does not guarantee that the run loop will exit immediately. OS X may install and remove additional input sources as needed to process requests targeted at the receiver's thread. Those sources could therefore prevent the run loop from exiting.

Note: A timer is not considered an input source and may fire multiple times while waiting for this method to return
See also:

- 33.49.14 runModeUntilDate(Mode as string, limitDate as dateTime) as boolean 6218

### 33.49.14 runModeUntilDate(Mode as string, limitDate as dateTime) as boolean

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Runs the loop once, blocking for input in the specified mode until a given date.
**Notes:** mode: The mode in which to run. You may specify custom modes or use one of the modes listed in "Run Loop Modes."
limitDate: The date until which to block.

Returns true if the run loop ran and processed an input source or if the specified timeout value was reached; otherwise, false if the run loop could not be started.

If no input sources or timers are attached to the run loop, this method exits immediately and returns false; otherwise, it returns after either the first input source is processed or limitDate is reached. Manually removing all known input sources and timers from the run loop does not guarantee that the run loop will exit immediately. OS X may install and remove additional input sources as needed to process requests targeted at the receiver's thread. Those sources could therefore prevent the run loop from exiting.

Note: A timer is not considered an input source and may fire multiple times while waiting for this method to return
See also:

- 33.49.13 runModeUntilDate(Mode as string, limitDate as date) as boolean 6217

### 33.49.15 runOnce

MBS MacCocoa Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Run the runloop once.
**Notes:** Great to process events now in a timer in web or console projects.

### 33.49.16 runUntilDate(limitDate as date)

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs the loop until the specified date, during which time it processes data from all attached input sources.
**Notes:** limitDate: The date up until which to run.

If no input sources or timers are attached to the run loop, this method exits immediately; otherwise, it runs the receiver in the NSDefaultRunLoopMode by repeatedly invoking runMode until the specified expiration date.

Manually removing all known input sources and timers from the run loop is not a guarantee that the run loop will exit. OS X can install and remove additional input sources as needed to process requests targeted at the receiver's thread. Those sources could therefore prevent the run loop from exiting.
See also:

- 33.49.17 runUntilDate(limitDate as dateTime) 6219

### 33.49.17 runUntilDate(limitDate as dateTime)

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Runs the loop until the specified date, during which time it processes data from all attached input sources.
**Notes:** limitDate: The date up until which to run.

If no input sources or timers are attached to the run loop, this method exits immediately; otherwise, it runs the receiver in the NSDefaultRunLoopMode by repeatedly invoking runMode until the specified expiration date.

Manually removing all known input sources and timers from the run loop is not a guarantee that the run loop will exit. OS X can install and remove additional input sources as needed to process requests targeted at the receiver's thread. Those sources could therefore prevent the run loop from exiting.
See also:

- 33.49.16 runUntilDate(limitDate as date) 6219

### 33.49.18 Properties

### 33.49.19 currentMode as String

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns the receiver's current input mode.
**Notes:** The receiver's current input mode. This method returns the current input mode only while the receiver is running; otherwise, it returns nil.
(Read only property)

### 33.49.20 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

# 33.50 class NSSavePanelObserverMBS

## 33.50.1 class NSSavePanelObserverMBS

MBS MacCocoa Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop only.

**Function:** Intercepts save and open dialogs on macOS to provide events to customize.
**Notes:** You can only have one instance of this class at a time.
First time you create an object, we initialize the necessary feature.

See also WinFileDialogObserverMBS class for Windows.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr7

**Xojo Developer Magazine**

- 18.6, page 10: News

## 33.50.2 Properties

## 33.50.3 Enabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the feature is enabled.
**Notes:** If value is false, no events will be called.
(Read and Write property)

## 33.50.4 Events

## 33.50.5 DidShowPanel(panel as NSSavePanelMBS, Result as Integer)

MBS MacCocoa Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Event called after panel showed.
**Notes:** You can read results from whatever modification you made.

## 33.50.6 WillShowPanel(panel as NSSavePanelMBS)

MBS MacCocoa Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Event called before panel shows.
**Notes:** You can do customization just before the dialog shows.

# 33.51 class NSScreenMBS

## 33.51.1 class NSScreenMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** An NSScreen object describes the attributes of a computer's monitor, or screen.
**Example:**

```
Dim mainScreen As NSScreenMBS = NSScreenMBS.mainScreen

msgbox mainScreen.localizedName
```

**Notes:** An application may use an NSScreen object to retrieve information about a screen and use this information to decide what to display upon that screen. For example, an application may use the deepestScreen method to find out which of the available screens can best represent color and then may choose to display all of its windows on that screen.

The application object should be created before you use the methods in this class, so that the application object can make the necessary connection to the window system. You can make sure the application object exists by invoking the sharedApplication method of NSApplication. If you created your application with Xcode, the application object is automatically created for you during initialization.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2
- Colorspaces in MacOS with Xojo
- Nearly 2000 new Functions in the 9.6 prerelease of MBS
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 7.6, page 8: News

## 33.51.2 Methods

## 33.51.3 backingAlignedRect(r as NSRectMBS, options as UInt64) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a rectangle in global screen coordinates to a pixel aligned rectangle.
**Notes:** r: The input rectangle in global screen coordinates.

options: Specifies the alignment options. See NSAlignmentOptions for possible values.
Returns a a pixel aligned rectangle on the target screen from the given input rectangle in global screen coordinates.

This method uses NSIntegralRectWithOptions() to produce the pixel aligned rectangle.
Available in Mac OS X v10.7 and later.

### 33.51.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 33.51.5 convertRectFromBacking(r as NSRectMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts the rectangle from the device pixel aligned coordinates system of a screen.
**Notes:** r: The rectangle.

Returns the rectangle converted from the device pixel aligned coordinates system of the screen.
Available in Mac OS X v10.7 and later.

### 33.51.6 convertRectToBacking(r as NSRectMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts the rectangle to the device pixel aligned coordinates system of a screen.
**Notes:** r: The rectangle.

Returns the rectangle converted to the device pixel aligned coordinates system of the screen.
Available in Mac OS X v10.7 and later.

### 33.51.7 NSScreenColorSpaceDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The notification name for the notification sent when the screen colorspace changed.
**Notes:** The notification object is the NSScreen whose colorSpace has changed. This notification does not

contain a userInfo dictionary.
Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.
Available in Mac OS X v10.6 and later.

### 33.51.8 screens as NSScreenMBS()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of NSScreen objects representing all of the screens available on the system.
**Notes:** Returns an array of the NSScreen objects available on the current system or nil if the screen information could not be obtained from the window system.

The screen at index 0 in the returned array corresponds to the primary screen of the user's system. This is the screen that contains the menu bar and whose origin is at the point (0, 0). In the case of mirroring, the first screen is the largest drawable display; if all screens are the same size, it is the screen with the highest pixel depth. This primary screen may not be the same as the one returned by the mainScreen method, which returns the screen with the active window.

The array should not be cached. Screens can be added, removed, or dynamically reconfigured at any time. When the display configuration is changed, the default notification center sends a NSApplicationDidChangeScreenParametersNotification notification.

### 33.51.9 supportedWindowDepths as Integer()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a zero-terminated array of the window depths supported by the receiver.

### 33.51.10 Properties

### 33.51.11 backingScaleFactor as Double

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the backing store pixel scale factor for the screen.
**Example:**

Msgbox str(NSScreenMBS.mainScreen.backingScaleFactor)

**Notes:** Returns the scale factor representing the number of backing store pixels corresponding to each linear

unit in screen space on this NSScreen.
This method is provided for rare cases when the explicit scale factor is needed. Please use the NSView class's convert backing methods whenever possible.
Available in Mac OS X v10.7 and later.

For apps which are not enabled for retina support, the function returns 1. So you only see 2 here if app is Cocoa, display is retina and info.plist has the NSHighResolutionCapable key.
(Read only property)

### 33.51.12 colorSpace as Variant

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the colorSpace of the screen.
**Example:**

```
dim s as NSScreenMBS = NSScreenMBS.mainScreen
dim c as NSColorSpaceMBS = s.colorSpace
MsgBox c.localizedName
```

**Notes:** Available in Mac OS X v10.6 and later.

Value is a NSColorSpaceMBS but declared as Variant to reduce plugin interdependencies.
(Read only property)

### 33.51.13 deepestScreen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSScreen object representing the screen that can best represent color.
**Notes:** This method always returns an object, even if there is only one screen and it is not a color screen.
(Read only property)

### 33.51.14 depth as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's current bit depth and colorspace information.
**Notes:** Returns the window depth information. This value cannot be used directly. You must pass it to a function such as NSBitsPerPixelFromDepth or NSColorSpaceFromDepth to obtain a concrete value for the desired information.

(Read only property)

### 33.51.15 deviceDescription as dictionary

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the device dictionary for the screen.
**Example:**

```
Dim dic As Dictionary = NSScreenMBS.mainScreen.deviceDescription

Break // see content in debugger
```

**Notes:** A dictionary containing the attributes of the receiver's screen.
(Read only property)

### 33.51.16 firstScreen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the NSScreen object for the first screen.
**Example:**

```
MessageBox NSScreenMBS.firstScreen.localizedName
```

**Notes:** Returns nil if no display is present.
(Read only property)

### 33.51.17 frame as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the dimensions and location of the receiver.
**Example:**

```
Dim screens() As NSScreenMBS = NSScreenMBS.screens

// show frame for each screen
For Each Screen As NSScreenMBS In screens
MsgBox Screen.frame.String
Next
```

**Notes:** The full screen rectangle at the current resolution. This rectangle includes any space currently occupied by the menu bar and dock.
(Read only property)

### 33.51.18 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference to the NSScreen object.
**Notes:** (Read and Write property)

### 33.51.19 localizedName as String

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The localized name of the screen.
**Example:**

```
MessageBox NSScreenMBS.firstScreen.localizedName
```

**Notes:** Either uses on MacOS 10.15 the value Apple frameworks provides.
Or returns name from plugin, either "Main Screen" or "Screen " plus index, so second screen is "Screen 2".
(Read only property)

### 33.51.20 mainScreen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the NSScreen object containing the window with the keyboard focus.
**Example:**

```
Dim mainScreen As NSScreenMBS = NSScreenMBS.mainScreen

msgbox mainScreen.localizedName
```

**Notes:** The main screen is not necessarily the same screen that contains the menu bar or has its origin at (0, 0). The main screen refers to the screen containing the window that is currently receiving keyboard

events. It is the main screen because it is the one with which the user is most likely interacting.

The screen containing the menu bar is always the first object (index 0) in the array returned by the screens method.
(Read only property)

### 33.51.21 screensHaveSeparateSpaces as Boolean

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether each screen can have its own set of spaces.
**Notes:** This method reflects whether the ‚ÄúDisplays have separate Spaces‚Äù option is enabled in Mission Control system preference. You might use the return value to determine how to present your app when in fullscreen mode.
(Read only property)

### 33.51.22 secondScreen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the NSScreen object for the second screen.
**Notes:** Returns nil if no second display is present.
(Read only property)

### 33.51.23 userSpaceScaleFactor as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scaling factor from user space to device space on the screen represented by the receiver.
**Example:**

Msgbox str(NSScreenMBS.mainScreen.userSpaceScaleFactor)

**Notes:** Returns the scaling factor, measured in pixels per point, where a point is always equal to 1/72 of an inch. For example, a scaling factor of 2.0 indicates the display has a resolution 2 pixels per point or 144 pixels-per-inch.

Available in Mac OS X v10.4 and later.
(Read only property)

### 33.51.24 visibleFrame as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the current location and dimensions of the visible screen.
**Example:**

```
Dim screens() As NSScreenMBS = NSScreenMBS.screens

// shows coordinates for each screen.
For Each Screen As NSScreenMBS In screens
MsgBox Screen.visibleFrame.String
Next
```

**Notes:** The returned rectangle is always based on the current user-interface settings and does not include the area currently occupied by the dock and menu bar. Because it is based on the current user -interface settings, the returned rectangle can change between calls and should not be cached.

Note: Even when dock hiding is enabled, the rectangle returned by this method may be smaller than the full screen. The system uses a small boundary area to determine when it should display the dock.
(Read only property)

# 33.52 class NSServiceProviderMBS

## 33.52.1 class NSServiceProviderMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The class to do service handlers in Cocoa applications.
**Notes:** This class must be subclassed to implement services.
Use ServiceInvoked as the name of the selector when declaring service (NSMessage parameter).
Use NSUserData parameter to distinguish between all the services you offer.
This class implements NSServiceProvider for Xojo and Xojo for Cocoa applications. For Carbon, please use CarbonApplicationEventsMBS events.

see also:
https://developer.apple.com/library/mac/documentation/Cocoa/Conceptual/SysServices/introduction.html
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr2
- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr4

## 33.52.2 Methods

## 33.52.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

## 33.52.4 Destructor

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

## 33.52.5 Properties

## 33.52.6 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 33.52.7 Events

### 33.52.8 readSelectionFromPasteboard(pboard as NSPasteboardMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Reads data from the pasteboard.
**Notes:** pboard: The pasteboard containing the data to read.

Return true if your implementation was able to read the pasteboard data successfully; otherwise, false.

### 33.52.9 ServiceInvoked(pboard as NSPasteboardMBS, userData as string, byref error as string)

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** This event is called when a service should perform.
**Notes:** Use ServiceInvoked as the name of the selector when declaring service (NSMessage parameter).
Use NSUserData parameter to distinguish between all the services you offer.

### 33.52.10 validRequestor(sendType as String, returnType as String) as Boolean

MBS MacCocoa Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Indicates whether the receiver can send and receive the specified pasteboard types.
**Notes:** sendType: The pasteboard type the app needs to send.
returnType: The pasteboard type the app needs to receive.

Return true if your class can send and receive the specified types or false if the receiver knows of no object that can send and receive data of that type.

### 33.52.11 writeSelectionToPasteboard(pboard as NSPasteboardMBS, types() as String) as Boolean

MBS MacCocoa Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Write the current selection to the specified pasteboard under each given type.
**Notes:** pboard: The pasteboard to write to.
types: An array of strings describing the types of data to write.

Return true if the data for any single type was successfully written, false otherwise.

## 33.53 class NSSizeMBS

### 33.53.1 class NSSizeMBS

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** A Xojo class for the size structure in Cocoa.
**Example:**

```
dim n as NSSizeMBS = NSMakeSizeMBS(500,600)
MsgBox n.String
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr1
- Apply fonts to font PopupMenu
- MBS REALbasic plug-in 9.6

### 33.53.2 Methods

### 33.53.3 Constructor

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty size.
**Example:**

```
dim p as new NSSizeMBS
MsgBox p // shows { 0 ,0 }
```

See also:


- 33.53.4 Constructor(p as Ptr) 6234
- 33.53.5 Constructor(s as string) 6235
- 33.53.6 Constructor(Width as Double, Height as Double) 6235


### 33.53.4 Constructor(p as Ptr)

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:

- 33.53.3 Constructor 6234
- 33.53.5 Constructor(s as string) 6235
- 33.53.6 Constructor(Width as Double, Height as Double) 6235

### 33.53.5 Constructor(s as string)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSSize object using the given string.
**Example:**

```
dim p as new NSSizeMBS(" { 1,2 } ")
MsgBox p // shows { 1, 2 }
```

See also:

- 33.53.3 Constructor 6234
- 33.53.4 Constructor(p as Ptr) 6234
- 33.53.6 Constructor(Width as Double, Height as Double) 6235

### 33.53.6 Constructor(Width as Double, Height as Double)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSSize object using the given values.
See also:

- 33.53.3 Constructor 6234
- 33.53.4 Constructor(p as Ptr) 6234
- 33.53.5 Constructor(s as string) 6235

### 33.53.7 Equal(other as NSSizeMBS) as boolean

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether two sizes are equal.

### 33.53.8 Operator_Convert as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Converts the object to string.
**Example:**

```
dim p as new NSSizeMBS(1,2)
MsgBox p // shows { 1, 2 }
```

### 33.53.9 String as String

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the string representation of this size object.
**Example:**

```
dim p as new NSSizeMBS(1,2)
MsgBox p.String // shows { 1, 2 }
```

### 33.53.10 Zero as NSSizeMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Returns a size with all values being zero.

### 33.53.11 Properties

### 33.53.12 Handle as Ptr

MBS Main Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The pointer to the internal data structure.
**Notes:** May be useful for passing to declares requiring a NSSize*.
Size of structure is 8 bytes for 32-bit (two singles) and 16 bytes for 64-bit (two doubles).
(Read only property)

### 33.53.13 Height as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The height of this size.
**Notes:** (Read and Write property)

### 33.53.14 Width as Double

MBS Main Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The width of this size.
**Notes:** (Read and Write property)

## 33.54 class NSSoundDelegateMBS

### 33.54.1 class NSSoundDelegateMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for the delegate to receive events from NSSoundMBS objects.

### 33.54.2 Events

### 33.54.3 SoundFinished(s as NSSoundMBS, didFinishPlaying as boolean)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: .

**Function:** This delegate method is called when an NSSoundMBS instance has completed playback of its sound data.
**Notes:** s: The NSSound that has completed playback of its sound data.

didFinishPlaying: True when playback was successful; false otherwise.

The parameter s is not the NSSoundMBS object you used before but a new one. But it has the same handle value as the one where you called play, so you can still compare which one was affected.

# 33.55 class NSSoundMBS

## 33.55.1 class NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSSound class provides a simple interface for loading and playing audio files.
**Notes:** This class supports the same audio encodings and file formats that are supported by Core Audio and QuickTime.

To use this class, initialize a new instance with the desired file or audio data. You can configure assorted aspects of the audio playback, including the volume and whether the sound loops before you play it. Depending on the type of the audio data, this class may use either Core Audio or QuickTime to handle the actual playback. (Typically, it uses Core Audio to play files in the AIFF, WAVE, NeXT, SD2, AU, and MP3 formats and may use it for other formats in the future as well.) Playback occurs asynchronously so that your application can continue doing work.

You should retain NSSound objects before initiating playback or make sure you have a strong reference to them in a garbage-collected environment. Upon deallocation, a sound object stops playback of the sound (as needed) so that it can free up the corresponding audio resources. If you want to deallocate a sound object immediately after playback, assign a delegate and use the sound:didFinishPlaying: method to deallocate it.

If you want to play the system beep sound, use the NSBeep function.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr1
- MBS REALbasic plug-ins version 9.5
- MBS REALbasic plug-ins version 9.4

## 33.55.2 Methods

## 33.55.3 availableSounds as string()

MBS MacBase Plugin, Plugin Version: 9.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the available sounds.
**Example:**

```
dim sounds(-1) as string = NSSoundMBs.availableSounds

// play first sound
dim n as NSSoundMBS = NSSoundMBS.soundNamed(sounds(0))

call n.play
```

```
// show list of sounds
MsgBox Join(sounds,EndOfLine)
```

**Notes:** You can use the names in this array for the soundNamed function.

### 33.55.4 canInitWithPasteboard as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver can create an instance of itself from the data in a pasteboard.
**Notes:** true when the receiver can handle the data represented by pasteboard; false otherwise.

The soundUnfilteredPasteboardTypes method is used to find out whether the class can handle the data in pasteboard.

### 33.55.5 channelMapping as Integer()

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the receiver,Äôs channel map.
**Notes:** A channel map correlates a sound,Äôs channels to the the output-device,Äôs channels. For example, a two-channel sound being played on a five-channel device should have a channel map to optimize the sound-playing experience. The default map, correlates the first sound channel to the first output channel, the second sound channel to the second output channel, and so on.

Available in OS X v10.5 and later. Deprecated in OS X v10.9.

### 33.55.6 Constructor

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the receiver with data from a pasteboard.
**Notes:** NSSound expects the data to have a proper magic number, sound header, and data for the formats it supports.
See also:


- 33.55.7 Constructor(data as MemoryBlock) 6241
- 33.55.8 Constructor(file as folderitem, ByReference as boolean) 6241

• 33.55.9 Constructor(url as string, ByReference as boolean) 6242

### 33.55.7 Constructor(data as MemoryBlock)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the receiver with a given audio data.
**Notes:** data: Audio data with which the receiver is to be initialized. The data must have a proper magic number, sound header, and data for the formats the NSSound class supports.
See also:

• 33.55.6 Constructor 6240

• 33.55.8 Constructor(file as folderitem, ByReference as boolean) 6241

• 33.55.9 Constructor(url as string, ByReference as boolean) 6242

### 33.55.8 Constructor(file as folderitem, ByReference as boolean)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the receiver with the the audio data located at a given file.
**Example:**

```
dim s as NSSoundMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.mp3")

s=new NSSoundMBS(f,true)

call s.play
```

**Notes:** file: Path to the sound file.
ByReference: When true only the name of the sound is stored with the NSSound instance when archived using encodeWithCoder:; otherwise the audio data is archived along with the instance. (not used in Xojo)
See also:

• 33.55.6 Constructor 6240

• 33.55.7 Constructor(data as MemoryBlock) 6241

• 33.55.9 Constructor(url as string, ByReference as boolean) 6242

### 33.55.9 Constructor(url as string, ByReference as boolean)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the receiver with the audio data located at a given URL.
**Notes:** url: URL to the sound file with which the receiver is to be initialized.
ByReference: When true only the name of the sound is stored with the NSSound instance when archived using encodeWithCoder:; otherwise the audio data is archived along with the instance. (not used in Xojo)
See also:


- 33.55.6 Constructor 6240
- 33.55.7 Constructor(data as MemoryBlock) 6241
- 33.55.8 Constructor(file as folderitem, ByReference as boolean) 6241


### 33.55.10 duration as Double

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the duration of the receiver in seconds.
**Notes:** Available in Mac OS X v10.5 and later.

### 33.55.11 isPlaying as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver is playing its audio data.
**Notes:** True when the receiver is playing its audio data, false otherwise.

### 33.55.12 name as string

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name assigned to the receiver.
**Notes:** Name assigned to the receiver; "" when no name has been assigned.

### 33.55.13 NSSoundPboardType as string

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSSound class defines this common pasteboard data type.

### 33.55.14 pause as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Pauses audio playback.
**Notes:** True when playback is paused successfully, false when playback is already paused or when an error occurred.

### 33.55.15 play as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates audio playback.
**Notes:** True when playback is initiated, false when playback is already in progress or when an error occurred.

This method initiates playback asynchronously and returns control to your application. Therefore, your application can continue doing work while the audio is playing.

### 33.55.16 resume as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resumes audio playback.
**Notes:** True when playback is resumed, false when playback is in progress or when an error occurred.

Assumes the receiver has been previously paused by sending it pause.

### 33.55.17 setChannelMapping(mapping() as Integer)

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies the receiver,Äôs channel map.
**Notes:** Mapping: Audio-channel—to—device–channel mappings for the receiver.

Available in OS X v10.5 and later. Deprecated in OS X v10.9.

### 33.55.18 setDelegate(DelegateHandler as NSSoundDelegateMBS)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Set the receiver's delegate.
**Notes:** You can assign one delegate to several sounds.
But the delegate object is not referenced, so keep it alive with your own reference, so RB won't destroy it too early.

### 33.55.19 setName(name as string) as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registers the receiver under a given name.
**Notes:** Returns True when successful; false otherwise.

If the receiver is already registered under another name, this method first unregisters the prior name.

### 33.55.20 soundNamed(name as string) as NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the NSSound instance associated with a given name.
**Example:**

```
dim s as NSSoundMBS

s=NSSoundMBS.soundNamed("Submarine")

call s.play
```

**Notes:** NSSound instance initialized with the sound data identified by soundName.

The returned object can be one of the following:

One that's been assigned a name with setName.

One of the named system sounds provided by the Application Kit framework If there's no known NSSound object with soundName, this method tries to create one by searching for sound files in the application's main bundle (see NSBundle for a description of how the bundle's contents are searched). If no sound file can be located in the application main bundle, the following directories are searched in order:
textasciitilde /Library/Sounds, /Library/Sounds, /Network/Library/Sounds or /System/Library/Sounds.

If no data can be found for soundName, no object is created, and nil is returned.

The preferred way to locate a sound is to pass a name without the file extension. See the class description for a list of the supported sound file extensions.

### 33.55.21 soundUnfilteredFileTypes as string()

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the list of file types the NSSound class understands.
**Notes:** Returns array of strings representing the file types the NSSound class understands.
The returned array may be passed directly to the runModalForTypes method of the NSOpenPanel class.
Available in OS X v10.0 and later. Deprecated in OS X v10.5.

### 33.55.22 soundUnfilteredPasteboardTypes as string()

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides a list of the pasteboard types that the NSSound class can accept.
**Notes:** Array of pasteboard types that the NSSound class can accept.
Available in OS X v10.0 and later. Deprecated in OS X v10.5.

### 33.55.23 soundUnfilteredTypes as string()

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the file types the NSSound class understands.
**Notes:** Returns array of UTIs identifying the file types the NSSound class understands.

Available in OS X v10.5 and later.

### 33.55.24 soundWithContentsOfFile(file as folderitem, ByReference as boolean) as NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a NSSound object with the the audio data located at a given file.
**Example:**

```
dim s as NSSoundMBS
dim f as FolderItem
```

```
f=SpecialFolder.Desktop.Child("test.mp3")

s=NSSoundMBS.soundWithContentsOfFile(f,true)

call s.play

// sound continues to play even after NSSoundMBS object is destroyed.
```

**Notes:** file: Path to the sound file.
ByReference: When true only the name of the sound is stored with the NSSound instance when archived using encodeWithCoder:; otherwise the audio data is archived along with the instance. (not used in Xojo)

### 33.55.25 soundWithContentsOfURL(url as string, ByReference as boolean) as NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a NSSoundMBS object with the audio data located at a given URL.
**Notes:** url: URL to the sound file with which the receiver is to be initialized.
ByReference: When true only the name of the sound is stored with the NSSound instance when archived using encodeWithCoder:; otherwise the audio data is archived along with the instance. (not used in Xojo)

### 33.55.26 soundWithData(data as MemoryBlock) as NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a NSSoundMBS object with a given audio data.
**Notes:** data: Audio data with which the receiver is to be initialized. The data must have a proper magic number, sound header, and data for the formats the NSSound class supports.

### 33.55.27 soundWithPasteboard as NSSoundMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a NSSoundMBS object with data from a pasteboard.
**Notes:** NSSound expects the data to have a proper magic number, sound header, and data for the formats it supports.

### 33.55.28 stop as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Concludes audio playback.
**Notes:** True when playback is concluded successfully or if it's paused, false otherwise.

### 33.55.29 writeToPasteboard

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes the receiver's data to a pasteboard.

### 33.55.30 Properties

### 33.55.31 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSSound object.
**Notes:** (Read and Write property)

### 33.55.32 currentTime as Double

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the receiver's playback progress in seconds.
**Notes:** Receiver's playback progress in seconds.

Sounds start with currentTime == 0 and end with currentTime == ( [ <sound>duration ] - 1).

Available in Mac OS X v10.5 and later.
This property is not archived, copied, or stored on the pasteboard.
(Read and Write computed property)

### 33.55.33 loops as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver restarts playback when it reaches the end of its content.
**Notes:** True when the receiver restarts playback when it finishes, false otherwise.
Default: false

Available in Mac OS X v10.5 and later.

When loops is true, the delegate does not call the SoundFinished event on the end of its content and restarts playback.
(Read and Write computed property)

### 33.55.34 playbackDeviceIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Identifies the receiver's output device.
**Notes:** Returns an unique identifier of a sound output device.
Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 33.55.35 volume as Double

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the volume of the receiver.
**Notes:** This method does not affect the systemwide volume.
Available in Mac OS X v10.5 and later.

0.0 is not sound and 1.0 is full sound.
(Read and Write computed property)

# 33.56 class NSStreamMBS

## 33.56.1 class NSStreamMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** An abstract class representing a stream.
**Notes:** This class's interface is common to all Cocoa stream classes, including its concrete subclasses NSInputStream and NSOutputStream.
NSStream objects provide an easy way to read and write data to and from a variety of media in a device-independent way. You can create stream objects for data located in memory, in a file, or on a network (using sockets), and you can use stream objects without loading all of the data into memory at once.
By default, NSStream instances that are not file-based are non-seekable, one-way streams (although custom seekable subclasses are possible). Once the data has been provided or consumed, the data cannot be retrieved from the stream.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr2

## 33.56.2 Methods

## 33.56.3 Close

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Closes the receiver.
**Notes:** Closing the stream terminates the flow of bytes and releases system resources that were reserved for the stream when it was opened. If the stream has been scheduled on a run loop, closing the stream implicitly removes the stream from the run loop. A stream that is closed can still be queried for its properties.

## 33.56.4 Constructor

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 33.56.5 Open

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Opens the receiving stream.
**Notes:** A stream must be created before it can be opened. Once opened, a stream cannot be closed and

reopened.

### 33.56.6 SetPosition(pos as Int64) as boolean

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Sets position in a stream.
**Notes:** Returns true on success or false on failure.

### 33.56.7 Properties

### 33.56.8 Error as NSErrorMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns an NSError object representing the stream error.
**Notes:** An NSError object representing the stream error, or nil if no error has been encountered.
(Read only property)

### 33.56.9 Handle as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.56.10 position as Int64

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Queries position in file stream.
**Notes:** (Read only property)

### 33.56.11 Status as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns the receiver,Äôs status.
**Notes:** See kStatus* constants.

(Read only property)

### 33.56.12 Constants

Status Constants

| Constant | Value | Description |
|---|---|---|
| kStatusAtEnd | 5 | There is no more data to read, or no more data can be written to the stream. When this status is returned, the stream is in a ,Äúnon-blocking,Äù mode and no data are available. |
| kStatusClosed | 6 | The stream is closed (close has been called on it). |
| kStatusError | 7 | The remote end of the connection can,Äôt be contacted, or the connection has been severed for some other reason. |
| kStatusNotOpen | 0 | The stream is not open for reading or writing. This status is returned before the underlying call to open a stream but after it,Äôs been created. |
| kStatusOpen | 2 | The stream is open, but no reading or writing is occurring. |
| kStatusOpening | 1 | The stream is in the process of being opened for reading or for writing. For network streams, this status might include the time after the stream was opened, but while network DNS resolution is happening. |
| kStatusReading | 3 | Data is being read from the stream. This status would be returned if code on another thread were to call<br>Status on the stream while a read() was in progress. |
| kStatusWriting | 4 | Data is being written to the stream. This status would be returned if code on another thread were to call<br>Status on the stream while a write() was in progress. |

## 33.57 class NSTimerMBS

### 33.57.1 class NSTimerMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** The cocoa timer class.
**Example:**

```
dim n as new NSTimerMBS(5, true)
```

**Notes:** You use the NSTimer class to create timer objects or, more simply, timers. A timer waits until a certain time interval has elapsed and then fires, calling the action event. For example, you could create an NSTimer object that calls the action event, telling it to update itself after a certain time interval.

A timer is not a real-time mechanism; it fires only when one of the run loop modes to which the timer has been added is running and able to check if the timer's firing time has passed. Because of the various input sources a typical run loop manages, the effective resolution of the time interval for a timer is limited to on the order of 50-100 milliseconds. If a timer's firing time occurs during a long callout or while the run loop is in a mode that is not monitoring the timer, the timer does not fire until the next time the run loop checks the timer. Therefore, the actual time at which the timer fires potentially can be a significant period of time after the scheduled firing time.

Repeating Versus Non-Repeating Timers
You specify whether a timer is repeating or non-repeating at creation time. A non-repeating timer fires once and then invalidates itself automatically, thereby preventing the timer from firing again. By contrast, a repeating timer fires and then reschedules itself on the same run loop.

A repeating timer always schedules itself based on the scheduled firing time, as opposed to the actual firing time. For example, if a timer is scheduled to fire at a particular time and every 5 seconds after that, the scheduled firing time will always fall on the original 5 second time intervals, even if the actual firing time gets delayed. If the firing time is delayed so far that it passes one or more of the scheduled firing times, the timer is fired only once for that time period; the timer is then rescheduled, after firing, for the next scheduled firing time in the future.

Scheduling Timers in Run Loops
A timer object can be registered in only one run loop at a time, although it can be added to multiple run loop modes within that run loop. There are three ways to create a timer:

Use the Constructor to create the timer and schedule it on the current run loop in the default mode.

Once scheduled, the timer fires at the specified interval until it is invalidated. A non-repeating timer invalidates itself immediately after it fires. However, for a repeating timer, you must invalidate the timer

object yourself by calling its invalidate method. Calling this method requests the removal of the timer from the current run loop; as a result, you should always call the invalidate method from the same thread on which the timer was installed. Invalidating the timer immediately disables it so that it no longer affects the run loop. The run loop then removes and releases the timer, either just before the invalidate method returns or at some later point. Once invalidated, timer objects cannot be reused.
**Blog Entries**

- MBS Xojo / Real Studio plug-ins in version 13.5
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- MBS REALbasic plug-ins version 10.0

**Xojo Developer Magazine**

- 12.1, page 9: News

### 33.57.2 Methods

### 33.57.3 Constructor(fireDate as date, timeInterval as Double, repeats as boolean)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new NSTimer.
**Example:**

```
dim d as new date
d.hour = d.hour + 1 // start in one hour

dim n as new NSTimerMBS(d, 5, true)
```

**Notes:** fireDate: The time at which the timer should first fire.

timeInterval: For a repeating timer, this parameter contains the number of seconds between firings of the timer. If seconds is less than or equal to 0.0, this method chooses the nonnegative value of 0.1 milliseconds instead.
repeats: If true, the timer will repeatedly reschedule itself until invalidated. If false, the timer will be invalidated after it fires.

The time is initialized such that, when added to a run loop, it will fire at date and then, if repeats is true, every seconds after that.
See also:

- 33.57.4 Constructor(fireDate as date, timeInterval as Double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6254

- 33.57.5 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean) 6254
- 33.57.6 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6255
- 33.57.7 Constructor(timeInterval as Double, repeats as boolean) 6256


### 33.57.4 Constructor(fireDate as date, timeInterval as Double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string)

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new NSTimer.
**Notes:** fireDate: The time at which the timer should first fire.

timeInterval: For a repeating timer, this parameter contains the number of seconds between firings of the timer. If seconds is less than or equal to 0.0, this method chooses the nonnegative value of 0.1 milliseconds instead.
repeats: If true, the timer will repeatedly reschedule itself until invalidated. If false, the timer will be invalidated after it fires.

The time is initialized such that, when added to a run loop, it will fire at date and then, if repeats is true, every seconds after that.

Schedules the timer to run on the given runloop in the given mode.
See also:


- 33.57.3 Constructor(fireDate as date, timeInterval as Double, repeats as boolean) 6253
- 33.57.5 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean) 6254
- 33.57.6 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6255
- 33.57.7 Constructor(timeInterval as Double, repeats as boolean) 6256


### 33.57.5 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean)

MBS MacCocoa Plugin, Plugin Version: 20.5, Platforms: macOS, iOS, Targets: All.

**Function:** Creates and returns a new NSTimer object and schedules it on the current run loop in the default mode.
**Notes:** timeInterval: The number of seconds between firings of the timer. If seconds is less than or equal to 0.0, this method chooses the nonnegative value of 0.1 milliseconds instead.

repeats: If true, the timer will repeatedly reschedule itself until invalidated. If false, the timer will be invalidated after it fires.

After seconds seconds have elapsed, the timer fires, calling the Action event.
See also:


- 33.57.3 Constructor(fireDate as date, timeInterval as Double, repeats as boolean) 6253
- 33.57.4 Constructor(fireDate as date, timeInterval as Double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6254
- 33.57.6 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6255
- 33.57.7 Constructor(timeInterval as Double, repeats as boolean) 6256


### 33.57.6 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string)

MBS MacCocoa Plugin, Plugin Version: 20.5, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes a new NSTimer.
**Notes:** fireDate: The time at which the timer should first fire.

timeInterval: For a repeating timer, this parameter contains the number of seconds between firings of the timer. If seconds is less than or equal to 0.0, this method chooses the nonnegative value of 0.1 milliseconds instead.
repeats: If true, the timer will repeatedly reschedule itself until invalidated. If false, the timer will be invalidated after it fires.

The time is initialized such that, when added to a run loop, it will fire at date and then, if repeats is true, every seconds after that.

Schedules the timer to run on the given runloop in the given mode.
See also:


- 33.57.3 Constructor(fireDate as date, timeInterval as Double, repeats as boolean) 6253
- 33.57.4 Constructor(fireDate as date, timeInterval as Double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6254
- 33.57.5 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean) 6254
- 33.57.7 Constructor(timeInterval as Double, repeats as boolean) 6256

### 33.57.7 Constructor(timeInterval as Double, repeats as boolean)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** Creates and returns a new NSTimer object and schedules it on the current run loop in the default mode.
**Example:**

```
dim n as new NSTimerMBS(5, true)
MsgBox str(n.timeInterval)
```

**Notes:** timeInterval: The number of seconds between firings of the timer. If seconds is less than or equal to 0.0, this method chooses the nonnegative value of 0.1 milliseconds instead.
repeats: If true, the timer will repeatedly reschedule itself until invalidated. If false, the timer will be invalidated after it fires.

After seconds seconds have elapsed, the timer fires, calling the Action event.
See also:


- 33.57.3 Constructor(fireDate as date, timeInterval as Double, repeats as boolean) 6253
- 33.57.4 Constructor(fireDate as date, timeInterval as Double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6254
- 33.57.5 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean) 6254
- 33.57.6 Constructor(fireDate as dateTime, timeInterval as double, repeats as boolean, runloop as NSRunLoopMBS, runloopMode as string) 6255


### 33.57.8 fire

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** Causes the receiver's message to be sent to its target.
**Notes:** You can use this method to fire a repeating timer without interrupting its regular firing schedule. If the timer is non-repeating, it is automatically invalidated after firing, even if its scheduled fire date has not arrived.

### 33.57.9 invalidate

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** Stops the receiver from ever firing again and requests its removal from its run loop.
**Example:**

```
dim n as new NSTimerMBS(5, true)

// later

n.invalidate
```

**Notes:** The destructor calls invalide automatically for you.

This method is the only way to remove a timer from an NSRunLoop object. The NSRunLoop object removes and releases the timer, either just before the invalidate method returns or at some later point.

You must send this message from the thread on which the timer was installed. If you send this message from another thread, the input source associated with the timer may not be removed from its run loop, which could prevent the thread from exiting properly.

### 33.57.10 Timer(t as timer) as NSTimerMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a NSTimerMBS object referencing the given timer object.
**Example:**

```
dim n as NSTimerMBS = NSTimerMBS.timer(timer1)
n.tolerance = 0.1
```

**Notes:** Only for Cocoa 32bit currently.
Works fine in Xojo 2012 and Xojo 2014r1 in Cocoa target.

### 33.57.11 Properties

### 33.57.12 fireDate as date

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date at which the receiver will fire.
**Example:**

```
dim d as new date
d.hour = d.hour + 1 // start in one hour

dim n as new NSTimerMBS(d, 5, true)
```

```
MsgBox n.fireDate.ShortDate+" "+n.fireDate.ShortTime
```

**Notes:** The date at which the receiver will fire. If the timer is no longer valid, this method returns the last date at which the timer fired.

Use the isValid method to verify that the timer is valid.

You typically use this method to adjust the firing time of a repeating timer. Although resetting a timer's next firing time is a relatively expensive operation, it may be more efficient in some situations. For example, you could use it in situations where you want to repeat an action multiple times in the future, but at irregular time intervals. Adjusting the firing time of a single timer would likely incur less expense than creating multiple timer objects, scheduling each one on a run loop, and then destroying them.

You should not call this method on a timer that has been invalidated, which includes non-repeating timers that have already fired. You could potentially call this method on a non-repeating timer that had not yet fired, although you should always do so from the thread to which the timer is attached to avoid potential race conditions.
(Read and Write property)

### 33.57.13 fireDateTime as DateTime

MBS MacCocoa Plugin, Plugin Version: 20.5, Platforms: macOS, iOS, Targets: All.

**Function:** The date at which the receiver will fire.
**Notes:** (Read and Write property)

### 33.57.14 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** The internal reference to the NSTimer object.
**Example:**

```
dim n as new NSTimerMBS(5, true)
MsgBox str(n.Handle)
```

**Notes:** (Read and Write property)

### 33.57.15 isValid as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver is currently valid.
**Example:**

```
dim n as new NSTimerMBS(5, true)
MsgBox str(n.isValid)
```

**Notes:** True if the receiver is still capable of firing or false if the timer has been invalidated and is no longer capable of firing.
(Read only property)

### 33.57.16 tag as Variant

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** A value you can use in your app however you like.
**Example:**

```
dim n as new NSTimerMBS(5, true)
n.tag = window1 // some value you may later use
```

**Notes:** (Read and Write property)

### 33.57.17 timeInterval as Double

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: All.

**Function:** The receiver's time interval.
**Example:**

```
dim n as new NSTimerMBS(5, true)
MsgBox str(n.timeInterval)
```

**Notes:** The receiver's time interval. If the receiver is a non-repeating timer, returns 0 (even if a time interval was set).
(Read only property)

### 33.57.18 tolerance as Double

MBS MacCocoa Plugin, Plugin Version: 13.5, Platforms: macOS, iOS, Targets: All.

**Function:** The tolerance for this timer.
**Notes:** Requires Mac OS X 10.9.

Setting a tolerance for a timer allows it to fire later than the scheduled fire date, improving the ability of the system to optimize for increased power savings and responsiveness. The timer may fire at any time between its scheduled fire date and the scheduled fire date plus the tolerance. The timer will not fire before the scheduled fire date. For repeating timers, the next fire date is calculated from the original fire date regardless of tolerance applied at individual fire times, to avoid drift. The default value is zero, which means no additional tolerance is applied. The system reserves the right to apply a small amount of tolerance to certain timers regardless of the value of this property.

As the user of the timer, you will have the best idea of what an appropriate tolerance for a timer may be. A general rule of thumb, though, is to set the tolerance to at least 10% of the interval, for a repeating timer. Even a small amount of tolerance will have a significant positive impact on the power usage of your application. The system may put a maximum value of the tolerance.
(Read and Write property)

### 33.57.19 Events

### 33.57.20 Action

MBS MacCocoa Plugin, Plugin Version: 10.0, Platforms: macOS, iOS, Targets: .

**Function:** The event called when the timer fires.

# 33.58 class NSTimeZoneMBS

## 33.58.1 class NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** NSTimeZone is an abstract class that defines the behavior of time zone objects.
**Notes:** Time zone objects represent geopolitical regions. Consequently, these objects have names for these regions. Time zone objects also represent a temporal offset, either plus or minus, from Greenwich Mean Time (GMT) and an abbreviation (such as PST for Pacific Standard Time).

NSTimeZone provides several class methods to get time zone objects: timeZoneWithName, timeZoneWithAbbreviation, and timeZoneForSecondsFromGMT. The class also permits you to set the default time zone within your application (setDefaultTimeZone). You can access this default time zone at any time with the defaultTimeZone class method, and with the localTimeZone class method, you can get a relative time zone object that decodes itself to become the default time zone for any locale in which it finds itself.

Cocoa does not provide any API to change the time zone of the computer, or of other applications.

Some NSCalendarDate methods return date objects that are automatically bound to time zone objects. These date objects use the functionality of NSTimeZone to adjust dates for the proper locale. Unless you specify otherwise, objects returned from NSCalendarDate are bound to the default time zone for the current locale.

Note that, strictly, time zone database entries such as "America/Los_Angeles" are IDs not names. An example of a time zone name is "Pacific Daylight Time". Although many NSTimeZone method names include the word "name", they refer to IDs.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr4
- MBS Real Studio Plugins, version 12.3pr11

## 33.58.2 Methods

## 33.58.3 Constructor

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a new timezone.
See also:

- 33.58.4 Constructor(name as string) 6262

### 33.58.4 Constructor(name as string)

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a time zone initialized with a given ID.
**Example:**

```
dim t as NSTimeZoneMBS = new NSTimeZoneMBS("Europe/Berlin")
MsgBox t.name
```

**Notes:** If name is a known ID, this method calls initWithName:data: with the appropriate data object.

In Mac OS X v10.4 and earlier providing nil for the parameter would have caused a crash. In Mac OS X v10.5 and later, this now raises an invalid argument exception.
See also:

- 33.58.3 Constructor 6261

### 33.58.5 copy as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the timezone object.
**Example:**

```
dim t as NSTimeZoneMBS = NSTimeZoneMBS.systemTimeZone
dim c as NSTimeZoneMBS = t.copy

MsgBox c.name
```

### 33.58.6 defaultTimeZone as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the default time zone for the current application.
**Example:**

```
MsgBox NSTimeZoneMBS.defaultTimeZone.name
```

**Notes:** The default time zone for the current application. If no default time zone has been set, this method invokes systemTimeZone and returns the system time zone.

Discussion
The default time zone is the one that the application is running with, which you can change (so you can make the application run as if it were in a different time zone).

If you get the default time zone and hold onto the returned object, it does not change if a subsequent invocation of setDefaultTimeZone changes the default time zone—you still have the specific time zone you originally got. Contrast this behavior with the object returned by localTimeZone.

### 33.58.7 isEqualToTimeZone(timeZone as NSTimeZoneMBS) as boolean

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver has the same name and data as another given time zone.
**Example:**

```
if NSTimeZoneMBS.systemTimeZone.isEqualToTimeZone(NSTimeZoneMBS.localTimeZone) then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

**Notes:** TimeZone: The time zone to compare with the receiver.
Returns true if TimeZone and the receiver have the same name and data, otherwise false.

### 33.58.8 knownTimeZoneNames as string()

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns an array of strings listing the IDs of all the time zones known to the system.
**Example:**

```
MsgBox join(NSTimeZoneMBS.knownTimeZoneNames, EndOfLine)
```

### 33.58.9 localTimeZone as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns an object that forwards all messages to the default time zone for the current application.
**Example:**

MsgBox NSTimeZoneMBS.localTimeZone.name

**Notes:** An object that forwards all messages to the default time zone for the current application.

Discussion
The local time zone represents the current state of the default time zone at all times. If you get the default time zone (using defaultTimeZone) and hold onto the returned object, it does not change if a subsequent invocation of setDefaultTimeZone changes the default time zone—you still have the specific time zone you originally got. The local time zone adds a level of indirection, it acts as if it were the current default time zone whenever you invoke a method on it.

### 33.58.10 Print

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Writes the time zone to debug output.
**Example:**

NSTimeZoneMBS.localTimeZone.print

**Notes:** This may help for debugging and you see output in console app.

### 33.58.11 systemTimeZone as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the time zone currently used by the system.
**Example:**

MsgBox NSTimeZoneMBS.systemTimeZone.name

**Notes:** The time zone currently used by the system. If the current time zone cannot be determined, returns the GMT time zone.

Special Considerations
If you get the system time zone, it is cached by the application and does not change if the user subsequently changes the system time zone. The next time you invoke systemTimeZone, you get back the same time zone you originally got. You have to invoke resetSystemTimeZone to clear the cached object.

### 33.58.12 timeZoneForSecondsFromGMT(seconds as Integer) as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 17.5, Platform: macOS, Targets: All.

**Function:** Creates time zone object based on a delta from GMT.
**Notes:** Time zones created with this never have daylight savings and the offset is constant no matter the date; the name and abbreviation do NOT follow the POSIX convention (of minutes-west).

### 33.58.13 timeZoneWithName(name as string) as NSTimeZoneMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the time zone object identified by a given ID.
**Example:**

```
dim t as NSTimeZoneMBS = NSTimeZoneMBS.timeZoneWithName("Europe/Berlin")
MsgBox t.name
```

**Notes:** Name: The ID for the time zone.

Returns the time zone in the information directory with a name matching name.
Returns nil if there is no match for the name.

### 33.58.14 Properties

### 33.58.15 abbreviation as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the abbreviation for the receiver.
**Example:**

```
MsgBox NSTimeZoneMBS.localTimeZone.Abbreviation
```

**Notes:** The abbreviation for the receiver, such as "EDT" (Eastern Daylight Time).
Invokes abbreviationForDate with the current date as the argument.
(Read only property)

### 33.58.16 DaylightSavingTimeOffset as Double

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the current daylight saving time offset of the receiver.
**Example:**

MsgBox str(NSTimeZoneMBS.localTimeZone.DaylightSavingTimeOffset)

**Notes:** Available in OS X v10.5 and later.
(Read only property)

### 33.58.17 description as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the description of the receiver.
**Example:**

MsgBox NSTimeZoneMBS.localTimeZone.Description

**Notes:** The description of the receiver, including the name, abbreviation, offset from GMT, and whether or not daylight savings time is currently in effect.
(Read only property)

### 33.58.18 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.58.19 isDaylightSavingTime as Boolean

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver is currently using daylight saving time.
**Example:**

MsgBox str(NSTimeZoneMBS.localTimeZone.isDaylightSavingTime)

**Notes:** Returns true if the receiver is currently using daylight savings time, otherwise false.
(Read only property)

### 33.58.20 name as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the geopolitical region ID that identifies the receiver.
**Example:**

MsgBox NSTimeZoneMBS.localTimeZone.Name

**Notes:** (Read only property)

### 33.58.21 SecondsFromGMT as Double

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the current difference in seconds between the receiver and Greenwich Mean Time.
**Example:**

MsgBox str(NSTimeZoneMBS.localTimeZone.SecondsFromGMT)

**Notes:** The current difference in seconds between the receiver and Greenwich Mean Time.
(Read only property)

### 33.58.22 abbreviationDictionary as Dictionary

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns a dictionary holding the mappings of time zone abbreviations to time zone names.
**Notes:** Note that more than one time zone may have the same abbreviation—for example, US/Pacific and Canada/Pacific both use the abbreviation "PST." In these cases, abbreviationDictionary chooses a single name to map the abbreviation to.
(Read and Write computed property)

## 33.59 class NSTokenFieldMBS

### 33.59.1 class NSTokenFieldMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** NSTokenField is a subclass of NSTextField that provides tokenized editing similar to the address field in the Mail application.
**Notes:** NSTokenField uses an NSTokenFieldCell to implement much of the control's functionality. NSTokenField provides cover methods for most methods of NSTokenFieldCell, which invoke the corresponding cell method.

In MBS Plugin the objects must be strings or numbers. With plugin version 12.5, you can also use normal Xojo objects.

In OS X v10.4, NSTokenField trims whitespace around tokens but it does not trim whitespace in OS X versions 10.5.0 and 10.5.1. In OS X v10.5.2, you get whitespace-trimming behavior by either linking against the v10.4 binary or linking against the v10.5 binary and not implementing the representedObjectForEditingString event. If you do not want the whitespace-trimming behavior, link against the v10.5 binary and implement this method, returning the editing string if you have no represented object.

Please note: Due to the way the plugin is implemented the Action, textShouldEndEditing and textShouldBeginEditing events do nothing, so please use tokenFieldAction, tokenFieldTextShouldEndEditing and tokenFieldTextShouldBeginEditing.
Subclass of the NSTextFieldMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr3
- MBS Real Studio Plugins, version 12.5pr1

### 33.59.2 Methods

### 33.59.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTokenFieldMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 33.59.4 Constructor(Handle as Integer) 6269
- 33.59.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6269


### 33.59.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSControl handle.
**Example:**

```
dim t as new NSTokenFieldMBS(0, 0, 100, 100)
dim v as new NSTokenFieldMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSControl and the plugin retains this handle.
See also:


- 33.59.3 Constructor 6268
- 33.59.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6269


### 33.59.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim x as new NSTokenFieldMBS(0, 0, 100, 20)
```

**Notes:** On success the handle property is not zero.
See also:


- 33.59.3 Constructor 6268
- 33.59.4 Constructor(Handle as Integer) 6269


### 33.59.6 defaultCompletionDelay as Double

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default completion delay.
**Notes:** The default completion delay is 0.

### 33.59.7 defaultTokenizingCharacterSet as NSCharacterSetMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default tokenizing character set.
**Notes:** The default tokenizing character set is ",".

### 33.59.8 objects as Variant()

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of represented objects.

### 33.59.9 setObjects(objects() as Variant)

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets current objects.

### 33.59.10 Properties

### 33.59.11 completionDelay as Double

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The completion delay.
**Notes:** (Read and Write computed property)

### 33.59.12 tokenizingCharacterSet as NSCharacterSetMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The tokenizing character set.
**Notes:** (Read and Write computed property)

### 33.59.13 tokenStyle as Integer

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The token style.
**Notes:** (Read and Write computed property)

### 33.59.14 Events

### 33.59.15 completionsForSubstring(substring as string, tokenIndex as Integer, byref selectedIndex as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide an array of appropriate completions for the contents of the receiver.
**Notes:** substring: The partial string that is to be completed.
tokenIndex: The index of the token being edited.
selectedIndex: Optionally, you can return by-reference an index into the returned array that specifies which of the completions should be initially selected. If none are to be selected, return by reference -1.

Returns an array of strings that are possible completions.
If the delegate does not implement this method, no completions are provided.

### 33.59.16 displayStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be displayed as a proxy for the given represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the string to be used as a proxy for representedObject. If you return nil or do not implement this method, then representedObject is displayed as the string.

### 33.59.17 editingStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be edited as a proxy for a represented object.
**Notes:** representedObject: A represented object of the token field.

Returns a string that's an editable proxy of the represented object, or nil if the token should not be editable.

### 33.59.18 hasMenuForRepresentedObject(representedObject as Variant) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify whether the given represented object provides a menu.
**Notes:** representedObject: A represented object of the token field.

Returns true if the represented object has a menu, false otherwise.
By default tokens in a token field have no menus.

### 33.59.19 menuForRepresentedObject(representedObject as Variant) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a menu for the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the menu associated with the represented object.
By default tokens in a token field do not return menus.

### 33.59.20 readFromPasteboard(pboard as NSPasteboardMBS) as Variant()

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to return an array of objects representing the data read from the specified pasteboard.
**Notes:** pboard: The pasteboard from which to read the represented objects.

Returns an array of represented objects created from the pasteboard data.

### 33.59.21 representedObjectForEditingString(editingString as string) as Variant

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a represented object for the given editing string.
**Notes:** editingString: The edited string representation of a represented object.

Returns a represented object that is displayed rather than the editing string.

Note: In OS X v10.4, NSTokenField trims whitespace around tokens but it does not trim whitespace in OS X versions 10.5.0 and 10.5.1. In OS X v10.5.2, you get whitespace-trimming behavior by either linking against the v10.4 binary or linking against the v10.5 binary and not implementing the this method. If you do not want the whitespace-trimming behavior, link against the v10.5 binary and implement this method, returning the editing string if you have no represented object.

### 33.59.22 shouldAddObjects(tokens() as Variant, index as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows to validate the tokens to be added to the receiver at a particular location.
**Notes:** tokens: An array of tokens to be inserted in the receiver at index.
index: The index of the receiver in which the array of tokens to be validated (tokens) will be inserted.

Returns an array of validated tokens.

The event can return the array unchanged or return a modified array of tokens. To reject the add completely, return an empty array. Returning nil causes an error.

### 33.59.23 styleForRepresentedObject(representedObject as Variant) as Integer

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to return the token style for editing the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the style that should be used to display the representedObject. Possible values are shown in NSTokenStyle Values.

If the event implements this method and returns an NSTokenStyle that differs from the style set by setTokenStyle:, the value the event returns is preferred.

If you don't implement this method, the token field's tokenStyle is used.

### 33.59.24 tokenFieldAction

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** For a button if it was pressed.

### 33.59.25 tokenFieldTextShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing.

### 33.59.26 tokenFieldTextShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow text editing.

### 33.59.27 writeRepresentedObjects(objects() as Variant, pboard as NSPasteboardMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Sent so the delegate can write represented objects to the pasteboard corresponding to a given array of display strings.
**Notes:** objects: An array of represented objects associated with the token field.
pboard: The pasteboard to which to write the represented objects.

Return true if you writes the represented objects to the pasteboard, false otherwise. If false, the token field writes the display strings to the NSStringPboardType pasteboard.

### 33.59.28 Constants

Token Styles

| Constant | Value | Description |
|---|---|---|
| NSDefaultTokenStyle | 0 | Style best used for keyword type tokens.<br>Available in OS X v10.4 and later. |
| NSPlainTextTokenStyle | 1 | Style to use for data you want represented as plain-text and without any token background.<br>Available in OS X v10.4 and later. |
| NSRoundedTokenStyle | 2 | Style best used for address type tokens.<br>Available in OS X v10.4 and later. |

## 33.60 class NSTouchMBS

### 33.60.1 class NSTouchMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** An object representing the location, size, movement, and force of a touch occurring on the screen.
**Notes:** You access touch objects through UIEvent objects passed into responder objects for event handling. A touch object includes accessors for:

- The view or window in which the touch occurred
- The location of the touch within the view or window
- The approximate radius of the touch
- The force of the touch (on devices that support 3D Touch or Apple Pencil)

A touch object also contains a timestamp indicating when the touch occurred, an integer representing the number of times the user tapped the screen, and the phase of the touch in the form of a constant that describes whether the touch began, moved, or ended, or whether the system canceled the touch.

To learn how to work with swipes, read Handling Swipe and Drag Gestures in Event Handling Guide for UIKit Apps.

A touch object persists throughout a multi-touch sequence. You may store a reference to a touch while handling a multi-touch sequence, as long as you release that reference when the sequence ends. If you need to store information about a touch outside of a multi-touch sequence, copy that information from the touch.

Using NSTouch on macOS and UITouch on iOS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- News from the MBS Xojo Plugins Version 23.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr7

**Xojo Developer Magazine**

- 22.1, page 9: News

### 33.60.2 Methods

### 33.60.3 Constructor

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 33.60.4 locationInView(View as NSViewMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns the current location of the touch in the coordinate system of the given view.
**Notes:** view: The view object in whose coordinate system you want the touch located. A custom view that is handling the touch may specify self to get the touch location in its own coordinate system. Pass nil to get the touch location in the window,Äôs coordinates.

Returns a point specifying the location of the receiver in view.

This method returns the current location of a UITouch object in the coordinate system of the specified view. Because the touch object might have been forwarded to a view from another view, this method performs any necessary conversion of the touch location to the coordinate system of the specified view.

### 33.60.5 previousLocationInView(View as NSViewMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns the previous location of the touch in the coordinate system of the given view.
**Notes:** view: The view object in whose coordinate system you want the touch located. A custom view that is handling the touch may specify self to get the touch location in its own coordinate system. Pass nil to get the touch location in the window,Äôs coordinates.

This method returns the previous location of a UITouch object in the coordinate system of the specified view. Because the touch object might have been forwarded to a view from another view, this method performs any necessary conversion of the touch location to the coordinate system of the specified view.

### 33.60.6 Properties

### 33.60.7 deviceSize as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** The range of the touch device in points, such as 72 ppi.
**Notes:** The lower-left corner of the surface is considered (0,0).
(Read only property)

### 33.60.8 force as Double

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The force of the touch, where a value of 1.0 represents the force of an average touch (predetermined by the system, not user-specific).
**Notes:** This property is available on devices that support 3D Touch or Apple Pencil. To check at runtime if a device supports 3D Touch, read the value of the forceTouchCapability property on the trait collection for any object in your app with a trait environment.
The force reported by Apple Pencil is measured along the axis of the pencil. If you want a force perpendicular to the device, you need to calculate this value using the altitudeAngle value.
The force reported by Apple Pencil is estimated at first, and may not always be updated. To determine if an update is expected, consult estimatedPropertiesExpectingUpdates and look for a UITouchPropertyForce flag. In this scenario, estimationUpdateIndex contains a non-nil value, which you can correlate with the original touch when the update occurs. When there are no expected force updates, the entire touch sequence usually won't have updates, so it may be appropriate to apply a custom, tool-specific force curve to the touch sequence.
(Read only property)

### 33.60.9 Handle as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.60.10 identity as MemoryBlock

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** The changes to a particular touch during its lifetime.
**Notes:** While touch identities may be re-used, they are unique during the life of the touch, even when

multiple devices are present.

As of current macOS releases, this value is a 16 byte value, which MBS Plugin provides back as MemoryBlock.
(Read only property)

### 33.60.11 majorRadius as Double

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The radius (in points) of the touch.
**Notes:** Use the value in this property to determine the size of the touch that was reported by the hardware. This value is an approximation of the size and can vary by the amount specified in the majorRadiusTolerance property.
(Read only property)

### 33.60.12 majorRadiusTolerance as Double

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The tolerance (in points) of the touch,Äôs radius.
**Notes:** This value determines the accuracy of the value in the majorRadius property. Add this value to the radius to get the maximum touch radius. Subtract the value to get the minimum touch radius.
(Read only property)

### 33.60.13 maximumPossibleForce as Double

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The maximum possible force for a touch.
**Notes:** The value of this property is sufficiently high to provide a wide dynamic range for values of the force property.
This property is available on devices that support 3D Touch or Apple Pencil. To check at runtime if a device supports 3D Touch, read the value of the forceTouchCapability property on the trait collection for any object in your app with a trait environment.
(Read only property)

### 33.60.14 normalizedPosition as NSPointMBS

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** The normalized position of the touch.
**Notes:** The normalized position is a scaled value between (0.0) and (1.0,1.0), where (0.0,0.0) is the lower-left position on the touch device.
(Read only property)

### 33.60.15 phase as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The phase of the touch.
**Notes:** The property value is a constant that indicates whether the touch began, moved, ended, or was canceled. For descriptions of the possible values of this property, see UITouchPhase.
(Read only property)

### 33.60.16 resting as Boolean

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** The indicator for a resting touch.
**Notes:** Resting touches occur when a user simply rests their thumb on the trackpad device.
(Read only property)

### 33.60.17 tapCount as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The number of times the finger was tapped for this given touch.
**Notes:** The value of this property is an integer containing the number of taps that occurred for this touch within a predefined period of time. Use this property to evaluate whether the user single-tapped, double-tapped, or even triple-tapped a particular view or window.
(Read only property)

### 33.60.18 timestamp as Double

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The time when the touch occurred or when it was last mutated.
**Notes:** The value of this property is the time, in seconds since system startup, that the touch originated or was last changed. You can store the value of this property and compare it to the timestamp in subsequent UITouch objects to determine the duration of the touch and, if it is being swiped, the speed of movement. For a definition of the time since system startup, see the description of the systemUptime method of the

NSProcessInfo class.
(Read only property)

### 33.60.19 type as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The type of the touch.
**Notes:** Type constants on macOS and iOS are different. Please check Apple's documentation.
(Read only property)

### 33.60.20 view as NSViewMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The view to which touches are being delivered, if any.
**Notes:** The value of this property is the view object to which touches are being delivered, which is not necessarily the view the touch is currently in. For example, when a gesture recognizer recognizes the touch, this property is nil because no view is receiving the touch.
(Read only property)

### 33.60.21 window as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platform: iOS, Targets: iOS only.

**Function:** The window in which the touch initially occurred.
**Notes:** The value of the property is the window in which the touch originally occurred. This window might not be the same window that currently contains the touch.
(Read only property)

### 33.60.22 Constants

Touch Types

| Constant | Value | Description |
|---|---|---|
| TouchTypeDirect | 0 | A touch resulting from direct contact with the screen. |
| TouchTypeIndirect | 1 | A touch that doesn,Äôt result from contact with the screen.<br>Indirect touches are generated by touch input devices that are separate from the screen. For example, the trackpad of an Apple TV remote generates indirect touches. |
| TouchTypeIndirectPointer | 3 | A touch resulting from a button-based, indirect input device that describes the input sequence from button press to button release. |
| TouchTypePencil | 2 | A touch from Apple Pencil.<br>A pencil touch occurs when Apple Pencil interacts with the device,Äôs screen. |
| TouchTypeStylus | 2 | A touch from a stylus. |

## 33.61 class NSUserDefaultsMBS

### 33.61.1 class NSUserDefaultsMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The Cocoa class to handle preferences.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setStringValue "test", "Hello World"
MsgBox u.stringForKey("test")
```

**Notes:** The NSUserDefaults class provides a programmatic interface for interacting with the defaults system. The defaults system allows an application to customize its behavior to match a user's preferences. For example, you can allow users to determine what units of measurement your application displays or how often documents are automatically saved. Applications record such preferences by assigning values to a set of parameters in a user's defaults database. The parameters are referred to as defaults since they're commonly used to determine an application's default state at startup or the way it acts by default.

At runtime, you use an NSUserDefaults object to read the defaults that your application uses from a user's defaults database. NSUserDefaults caches the information to avoid having to open the user's defaults database each time you need a default value. The synchronize method, which is automatically invoked at periodic intervals, keeps the in-memory cache in sync with a user's defaults database.

The NSUserDefaults class provides convenience methods for accessing common types such as floats, doubles, integers, Booleans, and URLs. A default object must be a property list, that is, an instance of (or for collections a combination of instances of): NSData, NSString, NSNumber, NSDate, NSArray, or NSDictionary. If you want to store any other type of object, you should typically archive it to create an instance of NSData.

Values returned from NSUserDefaults are immutable, even if you set a mutable object as the value. For example, if you set a mutable string as the value for "MyStringDefault", the string you later retrieve using stringForKey will be immutable.

A defaults database is created automatically for each user. The NSUserDefaults class does not currently support per-host preferences. To do this, you must use the CFPreferencesMBS class. However, NSUserDefaults correctly reads per-host preferences, so you can safely mix CFPreferencesMBS code with NSUserDefaultsMBS code.

If your application supports managed environments, you can use an NSUserDefaults object to determine which preferences are managed by an administrator for the benefit of the user. Managed environments correspond to computer labs or classrooms where an administrator or teacher may want to configure the systems in a particular way. In these situations, the teacher can establish a set of default preferences and

force those preferences on users. If a preference is managed in this manner, applications should prevent users from editing that preference by disabling any appropriate controls.

The NSUserDefaults class is thread-safe.
**Blog Entries**

- Important note for Webkit enabled applications in the Mac App Store
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr6

### 33.61.2 Methods

### 33.61.3 addSuiteNamed(suiteName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Inserts the specified domain name into the receiver's search list.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.addSuiteNamed "testsuite"
```

**Notes:** suiteName: The domain name to insert. This domain is inserted after the application domain.

The suiteName domain is similar to a bundle identifier string, but is not tied to a particular application or bundle. A suite can be used to hold preferences that are shared between multiple applications.

### 33.61.4 arrayForKey(key as string) as Variant()

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the array associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim t(-1) as Variant
t.Append "Hello"
t.Append "World"

u.setArrayValue "test", t

dim a(-1) as Variant = u.ArrayForKey("test")
```

```
for each v as Variant in a
MsgBox v
next
```

**Notes:** The array associated with the specified key, or an empty array if the key does not exist or its value is not an array.

### 33.61.5 Constructor

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Creates a new user defaults object initialized with the defaults for the current user account.
**Example:**

```
dim u as new NSUserDefaultsMBS
u.setURLValue "test", "http://www.apple.de/"
MsgBox u.URLForKey("test")
```

**Notes:** This method does not put anything in the search list.
See also:

- 33.61.6 Constructor(username as string) 6285

### 33.61.6 Constructor(username as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Creates an NSUserDefaultsMBS object initialized with the defaults for the specified user account.
**Notes:** username: The name of the user account.

Returns an initialized NSUserDefaultsMBS object whose argument and registration domains are already set up. If the current user does not have access to the specified user account, the object is invalid.

This method does not put anything in the search list. Invoke it only if you've allocated your own NSUserDefaults instance instead of using the shared one.

You do not normally use this method to initialize an instance of NSUserDefaults. Applications used by a superuser might use this method to update the defaults databases for a number of users. The user who started the application must have appropriate access (read, write, or both) to the defaults database of the

new user, or this method returns nil.
See also:

- 33.61.5 Constructor 6285

### 33.61.7 dictionaryRepresentation as dictionary

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a dictionary that contains a union of all key-value pairs in the domains in the search list.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim d as Dictionary = u.dictionaryRepresentation

break // "Look here in the dictionary in the debugger."
```

**Notes:** Returns a dictionary containing the keys. The keys are names of defaults and the value corresponding to each key is a property list object as Variant.

As with variantForKey, key-value pairs in domains that are earlier in the search list take precedence. The combined result does not preserve information about which domain each entry came from.

### 33.61.8 NSArgumentDomain as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the domain.
**Notes:** The domain consisting of defaults parsed from the application's arguments. These are one or more pairs of the form -default value included in the command-line invocation of the application.

### 33.61.9 NSGlobalDomain as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the domain.
**Notes:** The domain consisting of defaults meant to be seen by all applications.

### 33.61.10 NSRegistrationDomain as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** One of the constants to specify the domain.
**Notes:** The domain consisting of a set of temporary defaults whose values can be set by the application to ensure that searches will always be successful.

### 33.61.11 NSUserDefaultsDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The notification name for a did change notification.
**Notes:** Use with the NSNotification* objects.

### 33.61.12 objectIsForcedForKey(key as string) as boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the specified key is managed by an administrator.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
MsgBox str(u.objectIsForcedForKey("test"))
```

**Notes:** key: The key whose status you want to check.

Returns true if the value of the specified key is managed by an administrator, otherwise false.

This method assumes that the key is a preference associated with the current user and application. For managed keys, the application should disable any user interface that allows the user to modify the value of key.

Available in Mac OS X v10.2 and later.
See also:

- 33.61.13 objectIsForcedForKey(key as string, domain as string) as boolean 6287

### 33.61.13 objectIsForcedForKey(key as string, domain as string) as boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the key in the specified domain is managed by an administrator.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
MsgBox str(u.objectIsForcedForKey("test", u.NSGlobalDomain))
```

**Notes:** key: The key whose status you want to check.
domain: The domain of the key.

Returns true if the key is managed by an administrator in the specified domain, otherwise false.

This method assumes that the key is a preference associated with the current user. For managed keys, the application should disable any user interface that allows the user to modify the value of key.

Available in Mac OS X v10.2 and later.
See also:

- 33.61.12 objectIsForcedForKey(key as string) as boolean 6287

### 33.61.14 persistentDomainForName(domainName as string) as dictionary

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a dictionary containing the keys and values in the specified persistent domain.
**Notes:** Returns a dictionary containing the keys. The keys are names of defaults and the value corresponding to each key is a property list object (NSData, NSString, NSNumber, NSDate, NSArray, or NSDictionary).

### 33.61.15 persistentDomainNames as string()

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array of the current persistent domain names.
**Notes:** You can get the keys and values for each domain by passing the returned domain names to the persistentDomainForName method.

### 33.61.16 registerDefaults(dic as dictionary)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Adds the contents the specified dictionary to the registration domain.
**Notes:** dic: The dictionary of keys and values you want to register.

If there is no registration domain, one is created using the specified dictionary, and NSRegistrationDomain is added to the end of the search list.

The contents of the registration domain are not written to disk; you need to call this method each time your application starts. You can place a plist file in the application's Resources directory and call registerDefaults with the contents that you read in from that file.

### 33.61.17 removeObjectForKey(defaultName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Removes the value of the specified default key in the standard application domain.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setBoolValue("test", true)
u.removeObjectForKey "test"
MsgBox str(u.boolForKey("test")) // shows false as key does not exist
```

**Notes:** defaultName: The key whose value you want to remove.

Removing a default has no effect on the value returned by the variantForKey method if the same key exists in a domain that precedes the standard application domain in the search list.

### 33.61.18 removePersistentDomainForName(domainName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Removes the contents of the specified persistent domain from the user's defaults.
**Notes:** domainName: The domain whose keys and values you want. This value should be equal to your application's bundle identifier.

When a persistent domain is changed, an NSUserDefaultsDidChangeNotification is posted.

### 33.61.19 removeSuiteNamed(suiteName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Removes the specified domain name from the receiver's search list.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.removeSuiteNamed "testsuite"
```

**Notes:** suiteName: The domain name to remove.

### 33.61.20 removeVolatileDomainForName(domainName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Removes the specified volatile domain from the user's defaults.
**Notes:** domainName: The volatile domain you want to remove.

### 33.61.21 resetStandardUserDefaults

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Synchronizes any changes made to the shared user defaults object and releases it from memory.
**Example:**

```
NSUserDefaultsMBS.resetStandardUserDefaults
```

**Notes:** A subsequent invocation of standardUserDefaults creates a new shared user defaults object with the standard search list.

### 33.61.22 setArrayValue(key as string, values() as Variant)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified array.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim t(-1) as Variant
t.Append "Hello"
```

```
t.Append "World"

u.setArrayValue "test", t

dim a(-1) as Variant = u.ArrayForKey("test")

for each v as Variant in a
MsgBox v
next
```

### 33.61.23 setBoolValue(key as string, value as boolean)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified Boolean value.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setBoolValue("test", true)
MsgBox str(u.boolForKey("test"))
```

### 33.61.24 setDataValue(key as string, value as memoryblock)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified binary string.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults

u.setDataValue("test", "Hello √§√√º")

MsgBox u.dataForKey("test") // shows no umlauts as encoding is away in binary string
```

**Notes:** setStringValue is for text with encoding and setDataValue is for strings containing binary data.

### 33.61.25 setDictionaryValue(key as string, value as dictionary)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified dictionary.
**Example:**

```
dim u as new NSUserDefaultsMBS
dim d as new Dictionary

d.Value("First")="Hello"
d.Value("Second")=1234.5678
u.setDictionaryValue "test", d

dim e as Dictionary = u.dictionaryForKey("test")
for each key as Variant in e.keys
dim value as Variant = e.Value(key)
MsgBox key+": "+value
next
```

### 33.61.26 setDoubleValue(key as string, value as Double)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the double value.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setDoubleValue("test", 5)
MsgBox str(u.DoubleForKey("test"))
```

**Notes:** Available in Mac OS X v10.5 and later. On Mac OS X 10.4 the plugin will call setFloatValue for you to avoid an exception.

### 33.61.27 setFileValue(key as string, value as folderitem)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified URL.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim f as FolderItem = SpecialFolder.Desktop

// write
u.setFileValue "test", f
```

```
// read
MsgBox u.fileForKey("test").NativePath
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.61.28 setFloatValue(key as string, value as single)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified floating-point value.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setFloatValue("test", 5)
MsgBox str(u.FloatForKey("test"))
```

### 33.61.29 setIntegerValue(key as string, value as Integer)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified integer value.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setIntegerValue("test", 5)
MsgBox str(u.integerForKey("test"))
```

### 33.61.30 setPersistentDomain(domain as dictionary, domainName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the dictionary for the specified persistent domain.
**Notes:** domain: The dictionary of keys and values you want to assign to the domain.
domainName: The domain whose keys and values you want to set. This value should be equal to your application's bundle identifier.

When a persistent domain is changed, an NSUserDefaultsDidChangeNotification is posted.

### 33.61.31 setStringArrayValue(key as string, values() as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified string array.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim t(-1) as string = array("Hello","World")

u.setStringArrayValue "test", t

dim a(-1) as string = u.stringArrayForKey("test")

MsgBox Join(a) // shows "Hello World"
```

### 33.61.32 setStringValue(key as string, value as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified text string.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults

u.setStringValue "test", "Hello √§√√º"

MsgBox u.stringForKey("test")
```

**Notes:** setStringValue is for text with encoding and setDataValue is for strings containing binary data.

### 33.61.33 setURLValue(key as string, value as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key to the specified URL.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setURLValue "test", "http://www.apple.de/"
MsgBox u.URLForKey("test")
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.61.34 setVariantValue(key as string, value as Variant)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the value of the specified default key in the standard application domain.
**Example:**

```
dim u as new NSUserDefaultsMBS
u.setVariantValue "test", "Hello World"
MsgBox u.variantForKey("test")
```

**Notes:** The value parameter can be only property list objects: String, Number, Date, an Array of variant, or Dictionary. For Arrays and Dictionaries, their contents must be property list objects.

Setting a default has no effect on the value returned by the objectForKey: method if the same key exists in a domain that precedes the application domain in the search list.

### 33.61.35 setVolatileDomain(domain as dictionary, domainName as string)

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Sets the dictionary for the specified volatile domain.
**Notes:** domain: The dictionary of keys and values you want to assign to the domain.
domainName: The domain whose keys and values you want to set.

This method raises an NSInvalidArgumentException if a volatile domain with the specified name already exists.

### 33.61.36 standardUserDefaults as NSUserDefaultsMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the shared defaults object.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
```

**Notes:** If the shared defaults object does not exist yet, it is created with a search list containing the names of the following domains, in this order:

NSArgumentDomain, consisting of defaults parsed from the application's arguments. A domain identified by the application's bundle identifier
NSGlobalDomain, consisting of defaults meant to be seen by all applications. Separate domains for each of the user's preferred languages
NSRegistrationDomain, a set of temporary defaults whose values can be set by the application to ensure that searches will always be successful

The defaults are initialized for the current user. Subsequent modifications to the standard search list remain in effect even when this method is invoked again—the search list is guaranteed to be standard only the first time this method is invoked. The shared instance is provided as a convenience—you can create custom instances using the Constructor.

### 33.61.37 stringArrayForKey(key as string) as string()

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the array of strings associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim t(-1) as string = array("Hello","World")

u.setStringArrayValue "test", t

dim a(-1) as string = u.stringArrayForKey("test")

MsgBox Join(a) // shows "Hello World"
```

**Notes:** Returns an array with strings. The array is empty if the value for the key is not an array.

### 33.61.38 synchronize as boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Writes any modifications to the persistent domains to disk and updates all unmodified persistent domains to what is on disk.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
```

```
// do something

if u.synchronize then
MsgBox "Saved preferences."
else
MsgBox "Failed to save preferences."
end if
```

**Notes:** Returns true if the data was saved successfully to disk, otherwise false.

Because this method is automatically invoked at periodic intervals, use this method only if you cannot wait for the automatic synchronization (for example, if your application is about to exit) or if you want to update the user defaults to what is on disk even though you have not made any changes.

### 33.61.39 volatileDomainForName(domainName as string) as dictionary

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the dictionary for the specified volatile domain.
**Notes:** Returns the dictionary of keys and values belonging to the domain. The keys in the dictionary are names of defaults, and the value corresponding to each key is a property list object (String, Number, Date, Array, or Dictionary).

### 33.61.40 volatileDomainNames as string()

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array of the current volatile domain names.
**Notes:** You can get the contents of each domain by passing the returned domain names to the volatileDomainForName method.

### 33.61.41 Properties

### 33.61.42 boolForKey(key as string) as boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The Boolean value associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
```

```
u.boolForKey("test") = true
MsgBox str(u.boolForKey("test"))
```

**Notes:** If a boolean value is associated with defaultName in the user defaults, that value is returned. Otherwise, false is returned.
(Read and Write computed property)

### 33.61.43 dataForKey(key as string) as memoryblock

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The data string associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults

u.dataForKey("test")="Hello √§√√º"

MsgBox u.dataForKey("test") // shows no umlauts as encoding is away in binary string
```

**Notes:** Returns the memoryblock or nil if there is no value for this key.

dataForKey is for any string and does not store encoding. stringForKey does store encoding and works only for text strings.
(Read and Write computed property)

### 33.61.44 dictionaryForKey(key as string) as dictionary

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The dictionary object associated with the specified key.
**Example:**

```
dim u as new NSUserDefaultsMBS
dim d as new Dictionary

d.Value("First")="Hello"
d.Value("Second")=1234.5678
u.setDictionaryValue "test", d

dim e as Dictionary = u.dictionaryForKey("test")
for each key as Variant in e.keys
```

```
dim value as Variant = e.Value(key)
MsgBox key+": "+value
next
```

**Notes:** Returns dictionary object associated with the specified key, or nil if the key does not exist or its value is not an dictionary.
(Read and Write computed property)

### 33.61.45 doubleForKey(key as string) as Double

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The double value associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.doubleForKey("test") = 5
MsgBox str(u.doubleForKey("test"))
```

**Notes:** Returns the double value associated with the specified key. If the key does not exist, this method returns 0.
Available in Mac OS X v10.5 and later. On Mac OS X 10.4 the plugin will call floatForKey for you to avoid an exception.
(Read and Write computed property)

### 33.61.46 fileForKey(key as string) as folderitem

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The NSURL instance associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
dim f as FolderItem = SpecialFolder.Desktop

// write
u.fileForKey("test")=f

// read
MsgBox u.fileForKey("test").NativePath
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write computed property)

### 33.61.47 floatForKey(key as string) as single

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The floating-point value associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.floatForKey("test") = 5
MsgBox str(u.floatForKey("test"))
```

**Notes:** Returns the floating-point value associated with the specified key. If the key does not exist, this method returns 0.
(Read and Write computed property)

### 33.61.48 integerForKey(key as string) as Integer

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The integer value associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.IntegerForKey("test") = 5
MsgBox str(u.integerForKey("test"))
```

**Notes:** The integer value associated with the specified key. If the specified key does not exist, this method returns 0.
(Read and Write computed property)

### 33.61.49 stringForKey(key as string) as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The string associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
```

u.setStringValue "test", "Hello √§√√º"

MsgBox u.stringForKey("test")

**Notes:** Returns the string or "" if there is no value for this key.

dataForKey is for any string and does not store encoding. stringForKey does store encoding and works only for text strings.
(Read and Write computed property)

### 33.61.50 URLForKey(key as string) as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The NSURL instance associated with the specified key.
**Example:**

```
dim u as NSUserDefaultsMBS = NSUserDefaultsMBS.standardUserDefaults
u.setURLValue "test", "http://www.apple.de/"
MsgBox u.URLForKey("test")
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write computed property)

### 33.61.51 variantForKey(key as string) as Variant

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The object associated with the first occurrence of the specified default.
**Example:**

```
dim u as new NSUserDefaultsMBS
u.setVariantValue "test", "Hello World"
MsgBox u.variantForKey("test")
```

**Notes:** This method searches the domains included in the search list in the order they are listed.
(Read and Write computed property)

## 33.62 class NSUUIDMBS

### 33.62.1 class NSUUIDMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** An object representing a universally unique value that bridges to UUID; use NSUUID when you need reference semantics or other Foundation-specific behavior.
**Notes:** UUIDs (Universally Unique Identifiers), also known as GUIDs (Globally Unique Identifiers) or IIDs (Interface Identifiers), are 128-bit values. UUIDs created by NSUUID conform to RFC 4122 version 4 and are created with random bytes.
The standard format for UUIDs represented in ASCII is a string punctuated by hyphens, for example 68753A44-4D6F-1226-9C60-0050E4C00067. The hex representation looks, as you might expect, like a list of numerical values preceded by 0x. For example, 0xD7, 0x36, 0x95, 0x0A, 0x4D, 0x6E, 0x12, 0x26, 0x80, 0x3A, 0x00, 0x50, 0xE4, 0xC0, 0x00, 0x67. Because a UUID is expressed simply as an array of bytes, there are no endianness considerations for different platforms.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr2

### 33.62.2 Methods

### 33.62.3 Available as boolean

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.8 or newer.

### 33.62.4 Constructor

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes a new UUID with RFC 4122 version 4 random bytes.
See also:


- 33.62.5 Constructor(UUID as MemoryBlock) 6302
- 33.62.6 Constructor(UUID as String) 6303


### 33.62.5 Constructor(UUID as MemoryBlock)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes a new UUID with the given bytes.
See also:

- 33.62.4 Constructor 6302
- 33.62.6 Constructor(UUID as String) 6303

### 33.62.6 Constructor(UUID as String)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Initializes a new UUID with the formatted string.
See also:

- 33.62.4 Constructor 6302
- 33.62.5 Constructor(UUID as MemoryBlock) 6302

### 33.62.7 copy as NSUUIDMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Copies the UUID.

### 33.62.8 isEqual(other as NSUUIDMBS) as boolean

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Compares two UUIDs.
**Example:**

```
dim u1 as new NSUUIDMBS
dim s1 as string = u1.UUIDString

// make new object with same UUID
dim u2 as NSUUIDMBS = new NSUUIDMBS(s1)
dim s2 as string = u2.UUIDString

// other uuid
dim o as new NSUUIDMBS
dim so as string = o.UUIDString

dim e1 as Boolean = u1.isEqual(u2)
dim e2 as Boolean = u1.isEqual(o)

Break
```

**Notes:** Returns true if both are equal.

### 33.62.9 Operator_Compare(other as NSUUIDMBS) as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Compares two UUIDs.
**Example:**

```
dim u1 as new NSUUIDMBS
dim s1 as string = u1.UUIDString

// make new object with same UUID
dim u2 as NSUUIDMBS = new NSUUIDMBS(s1)
dim s2 as string = u2.UUIDString

// other uuid
dim o as new NSUUIDMBS
dim so as string = o.UUIDString

if u1 = u2 then
MsgBox "u1 and u2 are equal."
else
MsgBox "u1 and u2 are not equal. Problem?"
end if

if u1 = o then
MsgBox "u1 and o are equal. Problem?"
else
MsgBox "u1 and o are not equal."
end if
```

### 33.62.10 UUID as NSUUIDMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Create and returns a new UUID with RFC 4122 version 4 random bytes.

### 33.62.11 Properties

### 33.62.12 data as MemoryBlock

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Queries copy of the bytes as memory block.
**Notes:** (Read only property)

### 33.62.13 Handle as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.62.14 UUIDString as String

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The UUID as a string.
**Notes:** (Read only property)

## 33.63 class NSViewControllerMBS

### 33.63.1 class NSViewControllerMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The plugin class for a NSViewController.
**Notes:** Available in Mac OS X v10.5 and later.
Subclass of the NSResponderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MBS Xojo Plugins, version 18.4pr6
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

**Xojo Developer Magazine**

- 12.4, page 31: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner

### 33.63.2 Methods

### 33.63.3 available as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Example:**

MsgBox str(NSViewControllerMBS.available)

**Notes:** Returns true on Mac OS X 10.5 or newer.

### 33.63.4 Constructor

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor creating a new view controller.

### 33.63.5 contentViewController(window as NSWindowMBS) as NSViewControllerMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries content view's content view controller for the window.
**Notes:** Returns nil if the window has no controller.

The main content view controller for the window.

The value of this property provides the content view of the window. Setting this value removes the existing value of contentView and makes the contentViewController.view the main content view for the window. By default, the value of this property is nil.

### 33.63.6 dismissViewController(ViewController as NSViewControllerMBS)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Dismisses a presented view controller, using the same animator that presented it.
**Notes:** In macOS, this is the universal way to dismiss a view controller, no matter how it was presented.

### 33.63.7 loadView

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Explicitly load the view now.
**Notes:** This method connects an instantiated view from a nib file to the view property of the view controller. This method is called by the system, and is exposed in this class so you can override it to add behavior immediately before or after nib loading.
Do not call this method. If you require this method to be called, access the view property.

Do not invoke this method from other objects unless you take care to avoid redundant invocations. The default implementation of the loadView method handles redundant invocations correctly, but a view controller subclass might not. To be safe, other objects should instead access a view controller,Äôs view property.

The loadView method first obtains the values of the view controller,Äôs nibName and nibBundle properties. It then employs the NSNib class to instantiate the specified nib file via the instantiateWithOwner:topLevelObjects: method, providing the view controller object as the owner parameter.

For this method to work correctly, you need to have specified the file,Äôs owner of the nib file, in Interface Builder, to be NSViewController. You also need to have correctly connected the view outlet of the file's owner to the intended view in the nib file. Then, at runtime, the nib loading machinery sets the value of the view controller,Äôs view property to the nib file,Äôs instantiated view.

Prior to OS X v10.10, the loadView method did not provide well-defined behavior if the nibName property,Äôs value was nil. In macOS 10.10 and later, however, you get correct behavior without specifying a nib name as long as the nib file,Äôs name is the same as that of the view controller. For example, if you have a view controller subclass called MyViewController and a nib file with the same name, you can employ the convenient initialization pattern [ [ MyViewController alloc ] init ] .

### 33.63.8 presentViewControllerAsModalWindow(ViewController as NSViewControllerMBS)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Presents another view controller as a modal window, also known as an alert.
**Notes:** To dismiss the modal window, call the dismissViewController: method on self (the presenting view controller).

### 33.63.9 presentViewControllerAsPopover(ViewController as NSViewControllerMBS, RelativeToRect as NSRectMBS, positioningView as NSViewMBS, preferredEdge as Integer, behavior as Integer)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Presents another view controller as a popover.
**Notes:** viewController: The other view controller to present as a popover.
RelativeToRect: The content size of the popover.
positioningView: The view relative to which the popover should be positioned. Must not be nil, or else the view controller raises an NSInvalidArgumentException exception.
preferredEdge: The edge of positioningView that the popover should prefer to be anchored to.
behavior: The popover,Äôs closing behavior. See the NSPopoverBehavior enumeration.

To dismiss the popover, call the dismissViewController: method on self (the presenting view controller).

### 33.63.10 presentViewControllerAsSheet(ViewController as NSViewControllerMBS)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Presents a new sheet window with the given view controller.
**Notes:** The presented view controller is the delegate and the content view controller of its sheet.
To dismiss the sheet, call the dismissViewController: method on self (the presenting view controller).

### 33.63.11 windowWithContentViewController(ViewController as NSViewControllerMBS) as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a titled window that contains the specified content view controller.
**Notes:** ViewController: The view controller that provides the main content view for the window. The window,Äôs contentView property is set to contentViewController.view.

Returns a window with the content view controller set to the passed-in view controller object.

This method creates a basic window object that is titled, closable, resizable, and miniaturizable. By default, the window's title is automatically bound to the title of contentViewController. You can control the size of the window by using Auto Layout and applying size constraints to the view or its subviews. The initial size of the window is set to the initial size of contentView (that is, the size of contentViewController.view). The newly created window has releasedWhenClosed set to NO, and it must be explicitly retained to keep the window instance alive.

### 33.63.12 Properties

### 33.63.13 className as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of this NSViewController class.
**Notes:** (Read only property)

### 33.63.14 classPath as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The path of this NSViewController class.
**Notes:** Useful for debugging to know what super classes the view controller has.
(Read only property)

### 33.63.15 Identifier as String

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string that identifies this user interface item.
**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items,

you would typically set this value in code after creating a view but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a view is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the framework or application. For example, identifiers for standard AppKit interface items, such as the open panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 33.63.16 representedObject as Variant

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The object whose value is presented in the receiver,Äôs primary view.
**Notes:** (Read and Write property)

### 33.63.17 Title as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The localized title of the receiver's view.
**Notes:** NSViewController does not use the title property directly. This property is here because so many anticipated uses of this class will involve letting the user choose among multiple named views using a pull-down menu or some other user interface.
(Read and Write property)

### 33.63.18 view as NSViewMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The view belonging to this view controller.
**Notes:** (Read and Write property)

### 33.63.19 viewLoaded as Boolean

MBS MacBase Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether view is already loaded.
**Notes:** (Read only property)

### 33.63.20 Constants

Edge Constants

| Constant | Value | Description |
|---|---|---|
| NSMaxXEdge | 2 | the maximum X edge. Typically right side. |
| NSMaxYEdge | 3 | The maximum Y edge. Topically the top edge of a window. |
| NSMinXEdge | 0 | the minimum X edge. Typically left side. |
| NSMinYEdge | 1 | Minimum Y. As coordinates are upside down in the Cocoa world, this is the bottom edge of a window. |

Behavior modes

| Constant | Value | Description |
|---|---|---|
| PopoverBehaviorApplicationDefined | 0 | Your application assumes responsibility for closing the popover. AppKit still close the popover in a limited number of circumstances. For instance, A Kit will attempt to close the popover when the window of its positioningV is closed. The exact interactions in which AppKit will close the popover not guaranteed. You may consider implementing -cancel: to close the popo when the escape key is pressed. |
| PopoverBehaviorSemitransient | 2 | AppKit will close the popover when the user interacts with user interface ments in the window containing the popover's positioning view. Semi-trans popovers cannot be shown relative to views in other popovers, nor can they shown relative to views in child windows. The exact interactions that ca semi-transient popovers to close are not specified. |
| PopoverBehaviorTransient | 1 | AppKit will close the popover when the user interacts with a user inter element outside the popover. Note that interacting with menus or panels t become key only when needed will not cause a transient popover to close. exact interactions that will cause transient popovers to close are not specif |

## 33.64 class NSViewMBS

### 33.64.1 class NSViewMBS

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Cocoa class for a view.
**Notes:** To draw into a NSView, use either CustomNSViewMBS class with drawRect event or NSGraphicsMBS class.
Subclass of the NSResponderMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr5
- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Real Studio Plugins, version 12.1fc
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes
- MBS REALbasic plug-ins version 9.4
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

**Xojo Developer Magazine**

- 19.6, page 10: News

### 33.64.2 Methods

### 33.64.3 addSubview(subview as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a view to the subviews so it's displayed above its siblings.
**Example:**

```
// create a button
dim n as new NSButtonMBS(100, 100, 50, 24)

n.bezelStyle = n.NSRoundedBezelStyle
n.Title = "Test"
```

```
// add directly to window's content view
window1.NSWindowMBS.contentView.addSubview n
```

See also:

- 33.64.4 addSubview(subview as NSViewMBS, positioned as Integer, relativeToView as NSViewMBS) 6313

### 33.64.4 addSubview(subview as NSViewMBS, positioned as Integer, relativeToView as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Inserts a view among the receiver's subviews so it's displayed immediately above or below another view.
**Example:**

```
// create a button
dim n as new NSButtonMBS(100, 100, 50, 24)

n.bezelStyle = n.NSRoundedBezelStyle
n.Title = "Test"

// add directly to window's super view, below the content view
// so it is behind all RB controls
window1.NSWindowMBS.contentView.superview.addSubview n, NSWindowMBS.NSWindowBelow, window1.NSWindowMBS.contentView
```

**Notes:** subView: The view object to add to the receiver as a subview.
positioned: A constant specifying the position of the aView relative to otherView. Valid values are NSWindowAbove or NSWindowBelow.
relativeToView: The other view subView is to be positioned relative to. If relativeToView is nil (or isn't a subview of the receiver), subView is added above or below all of its new siblings.

This method also sets the receiver as the next responder of aView.
See also:

- 33.64.3 addSubview(subview as NSViewMBS) 6312

### 33.64.5 addToolTipRect(rect as NSRectMBS, tooltip as NSViewTooltipMBS)

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a tooltip for a defined area the view and returns a tag that identifies the tooltip rectangle.
**Notes:** Rect: A rectangle defining the region of the view to associate the tooltip with.
tooltip: The object to provide text.

Please keep reference of tooltip object as the tooltip is removed by it's destructor.

### 33.64.6 ancestorSharedWithView(view as NSViewMBS) as NSViewMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The closest ancestor shared by the receiver and a given view.
**Notes:** The closest ancestor or nil if there's no such object. Returns self if aView is identical to the receiver.

### 33.64.7 animator as NSViewMBS

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the proxy object for this view which animates.
**Example:**

```
dim v as NSViewMBS // your NSViewMBS object

v.alphaValue = 0.5 // switch alpha directly
v.animator.alphaValue = 0.5 // switch alpha animated
```

### 33.64.8 backgroundFilters as variant()

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** An array of Core Image filters to apply to the view,Äôs background.
**Notes:** This property contains an array of CIFilterMBS objects. This array represents the background filters stored in the backgroundFilters property of the view,Äôs layer. If the view does not have a layer, setting the value of this property has no effect.
The default value of this property is an empty array.

We use variant here to reduce plugin dependencies. Please use with array of variants containing CIFilterMBS.

### 33.64.9 beginDraggingSessionWithItems(items() as Variant, e as NSEventMBS, source as NSViewMBS) as Variant

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a dragging session with a group of dragging items.
**Notes:** items: The dragging items (array of variant containing NSDraggingItemMBS objects). The frame property of each NSDraggingItem must be in the view's coordinate system.
event: The mouse-down event object from which to initiate the drag operation. In particular, its mouse location is used for the offset of the icon being dragged.
source: An object that serves as the controller of the dragging operation. It must conform to the NSDraggingSource informal protocol and is typically the receiver itself or its NSWindow object.

Returns the dragging session for the drag (NSDraggingSessionMBS object). Returned as Variant to reduce plugin dependencies.

A basic drag starts by calling beginDraggingSessionWithItems.

The caller can take the returned NSDraggingSession and continue to modify its properties such as slidesBackOnCancelOrFail. When the drag actually starts, the source is sent a draggingSessionWillBeginAtPoint message followed by multiple draggingSessionMovedToPoint messages as the user drags.

Once the drag is ended or cancelled, the source receives a draggingSessionEndedAtPoint:operation and the drag is complete.

Available in OS X v10.7 and later.

### 33.64.10 Constructor

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new control with size 100/100 and position 0/0
**Notes:** On success the handle property is not zero.
See also:


- 33.64.11 Constructor(Handle as Integer) 6315
- 33.64.12 Constructor(left as Double, top as Double, width as Double, height as Double) 6316


### 33.64.11 Constructor(Handle as Integer)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new NSTextViewMBS(0, 0, 100, 100)
dim v as new NSTextViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSView and the plugin retains this handle.
See also:

- 33.64.10 Constructor 6315
- 33.64.12 Constructor(left as Double, top as Double, width as Double, height as Double) 6316

### 33.64.12 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor to create a new NSView.
**Notes:** On success handle is set.

For a toolbar, please get the view directly: self.NSToolbarMBS.toolbarView.
See also:

- 33.64.10 Constructor 6315
- 33.64.11 Constructor(Handle as Integer) 6315

### 33.64.13 contentFilters as variant()

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** An array of Core Image filters to apply to the contents of the view and its sublayers.
**Notes:** This property contains an array of CIFilterMBS objects. This array represents the filters stored in the filters property of the view,Äôs layer. If the view does not have a layer, setting the value of this property has no effect.
The default value of this property is an empty array.

We use variant here to reduce plugin dependencies. Please use with array of variants containing CIFilterMBS.

### 33.64.14 convertPointFromView(point as NSPointMBS, View as NSViewMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a point from the coordinate system of a given view to that of the receiver.
**Notes:** point: A point specifying a location in the coordinate system of aView.
View: The view with aPoint in its coordinate system. If View is nil, this method instead converts from window base coordinates. Otherwise, both View and the receiver must belong to the same NSWindow object.

Returns the point converted to the coordinate system of the receiver.

### 33.64.15 convertPointToView(point as NSPointMBS, View as NSViewMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a point from the receiver's coordinate system to that of a given view.
**Notes:** point: A point specifying a location in the coordinate system of the receiver.
View: The view into whose coordinate system point is to be converted. If View is nil, this method instead converts to window base coordinates. Otherwise, both View and the receiver must belong to the same NSWindow object.

Returns the point converted to the coordinate system of View.

### 33.64.16 convertRectFromView(rect as NSRectMBS, View as NSViewMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a rectangle from the coordinate system of another view to that of the receiver.
**Notes:** rect: The rectangle in aView's coordinate system.
view: The view with aRect in its coordinate system. If view is nil, this method instead converts from window base coordinates. Otherwise, both view and the receiver must belong to the same NSWindow object.

Returns the converted rectangle.

### 33.64.17 convertRectToView(rect as NSRectMBS, View as NSViewMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a rectangle from the receiver's coordinate system to that of another view.
**Notes:** rect: A rectangle in the receiver's coordinate system.
View: The view that is the target of the conversion operation. If View is nil, this method instead converts from window base coordinates. Otherwise, both View and the receiver must belong to the same NSWindow object.

Returns the converted rectangle.

### 33.64.18 convertSizeFromView(Size as NSSizeMBS, View as NSViewMBS) as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a size from another view's coordinate system to that of the receiver.
**Notes:** Size: The size (width and height) in aView's coordinate system.
View: The view with Size in its coordinate system. If View is nil, this method instead converts from window base coordinates. Otherwise, both View and the receiver must belong to the same NSWindow object.

Returns the converted size, as an NSSize structure.

### 33.64.19 convertSizeToView(Size as NSSizeMBS, View as NSViewMBS) as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Converts a size from the receiver's coordinate system to that of another view.
**Notes:** Size: The size (width and height) in the receiver's coordinate system.
View: The view that is the target of the conversion operation. If View is nil, this method instead converts from window base coordinates. Otherwise, both View and the receiver must belong to the same NSWindow object.

Returns the converted size, as an NSSize structure.

### 33.64.20 dataWithEPSInsideRect(left as Double, top as Double, width as Double, height as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 8.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns EPS data that draws the region of the receiver within a specified rectangle.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

dim data as string = n.dataWithEPSInsideRect(0, 0, n.frameWidth, n.frameHeight)
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ps")
dim b as BinaryStream = f.CreateBinaryFile("")

b.Write data
f.Launch
```

### 33.64.21 dataWithPDFInsideRect(left as Double, top as Double, width as Double, height as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 8.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns PDF data that draws the region of the receiver within a specified rectangle.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

dim data as string = n.dataWithPDFInsideRect(0, 0, n.frameWidth, n.frameHeight)
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim b as BinaryStream = f.CreateBinaryFile("")

b.Write data
f.Launch
```

See also:

- 33.64.22 dataWithPDFInsideRect(r as NSRectMBS) as Memoryblock 6319

### 33.64.22 dataWithPDFInsideRect(r as NSRectMBS) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns PDF data that draws the region of the receiver within a specified rectangle.
See also:

- 33.64.21 dataWithPDFInsideRect(left as Double, top as Double, width as Double, height as Double) as Memoryblock 6319

### 33.64.23 dragImage(image as NSImageMBS, viewLocation as NSPointMBS, offset as NSSizeMBS, NSEvent as NSEventMBS, pboard as NSPasteboardMBS, source as NSViewMBS, slideFlag as boolean)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a dragging operation from the receiver, allowing the user to drag arbitrary data with a specified icon into any application that has window or view objects that accept dragged data.
**Notes:** Image: The NSImage object to be dragged.
viewLocation: The location of the image's lower-left corner, in the receiver's coordinate system. It determines the placement of the dragged image under the cursor. When determining the image location you should use the mouse down coordinate, provided in theEvent, rather than the current mouse location.
offset: This parameter is ignored.
NSEvent: The left mouse-down event that triggered the dragging operation (see discussion below).
pboard: The pasteboard that holds the data to be transferred to the destination (see discussion below).
source: An object that serves as the controller of the dragging operation. It must conform to the NSDraggingSource protocol and is typically the receiver itself or its NSWindow object.
slideBack: A Boolean that determines whether the drag image should slide back if it's rejected. The image slides back to imageLoc if slideBack is true and the image isn't accepted by the dragging destination. If false the image doesn't slide back.

This method must be invoked only within an implementation of the mouseDown or mouseDragged methods. Before invoking this method, you must place the data to be transferred on pboard. To do this, get the drag pasteboard object (NSDragPboard), declare the types of the data, and then put the data on the pasteboard.

### 33.64.24 drawFocusRingMask

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Draws the focus ring mask for the view.
**Notes:** This method provides the shape of the focus ring mask by drawing the focus ring mask. An implementation of this method should draw in the view's interior (bounds) coordinate space, that the focus ring style has been set (it will be set it to NSFocusRingOnly to capture the focus ring itself), and that the fill and stroke colors have been set to an arbitrary fully opaque color.

Subclasses that find the default behavior insufficient should only draw the focus ring shape.

The NSView implementation of this method simply fills self.bounds.
Available in Mac OS X v10.7 and later.

### 33.64.25 enclosingMenuItem as Variant

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item containing the receiver or any of its superviews in the view hierarchy.
**Notes:** Returns the menu item containing the receiver or any of its superviews in the view hierarchy, or nil if the receiver's view hierarchy is not in a menu item

Available in Mac OS X v10.5 and later.

Declared as a variant to reduce plugin dependencies.
Please assign to a NSScrollViewMBS variable.

### 33.64.26 enclosingScrollView as Variant

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the nearest ancestor NSScrollView object containing the receiver (not including the receiver itself); otherwise returns nil.
**Notes:** Declared as a variant to reduce plugin dependencies.
Please assign to a NSScrollViewMBS variable.

### 33.64.27 focusRingMaskBounds as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the focus ring mask bounds.
**Notes:** Returns a rectangle containing the mask in the view's interior (bounds) coordinate space.

The mask bounds allows the focus ring's overall size and position to be determined before it is drawn.
Subclasses must override this method if they require the display of a focus ring.
The NSView implementation of this method simply returns NSRectMBS.Zero.

Note: The information provided by focusRingMaskBounds will enable Accessibility to identify selected subelements for zoom tracking, so it is important that this method provide a reasonably tight bounding box and that noteFocusRingMaskChanged is invoked as described.

### 33.64.28 isDescendantOf(view as NSViewMBS) as boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if the receiver is a subview of a given view or if it's identical to that view; otherwise, it returns false.

### 33.64.29 makeBackingLayer as Variant

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates the view's backing layer.
**Notes:** Value is a CALayerMBS object.
Available in OS X v10.6 and later.

### 33.64.30 nextValidKeyView as NSViewMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the closest view object in the key view loop that follows the receiver and accepts first responder status.
**Notes:** This method ignores hidden views when it determines the next valid key view.
Returns nil on any error.

### 33.64.31 noteFocusRingMaskChanged

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Invoked to notify the view that the focus ring mask requires updating.
**Notes:** It is important to note that it is only necessary for developers to invoke this method when some internal state change of their application, that the Application Kit can't determine, affects the shape of the focus ring mask.

It is assumed that if the view is marked as needing display, or is resized, its focus ring shape is likely to have changed, and there is no need for clients to explicitly send this message in such cases, they are handled automatically.

If, however, a view is showing a focus ring around some part of its content (an NSImage, perhaps), and that content changes, the client must provide notification by invoking this method so that focusRingMaskBounds and drawFocusRingMask will be invoked to redraw the focus ring.
Available in Mac OS X v10.7 and later.

### 33.64.32 NSViewBoundsDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to use with the NSView class.
**Notes:** Posted whenever the NSView's bounds rectangle changes independently of the frame rectangle, if the NSView is configured using setPostsBoundsChangedNotifications to post such notifications.

The notification object is the NSView object whose bounds rectangle has changed. This notification does not contain a userInfo dictionary.

The following methods can result in notification posting

- setBounds
- setBoundsOrigin
- setBoundsRotation
- setBoundsSize
- translateOriginToPoint
- scaleUnitSquareToSize
- rotateByAngle

Note that the bounds rectangle resizes automatically to track the frame rectangle. Because the primary change is that of the frame rectangle, however, setFrame and setFrameSize don't result in a bounds-changed notification.

### 33.64.33 NSViewDidUpdateTrackingAreasNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to use with the NSView class.
**Notes:** Posted whenever an NSView object recalculates its tracking areas. It is sent after the view receives updateTrackingAreas.

Available in Mac OS X v10.5 and later.

### 33.64.34 NSViewFocusDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to use with the NSView class.
**Notes:** Sent when focus changed. Object for this notification is the view.

### 33.64.35 NSViewFrameDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to use with the NSView class.
**Notes:** Posted whenever the view's frame rectangle changes, if the view is configured using setPostsFrameChangedNotifications to post such notifications.

The notification object is the NSView object whose frame rectangle has changed. This notification does not contain a userInfo dictionary.

The following methods can result in notification posting:

- setFrame
- setFrameOrigin
- setFrameRotation
- setFrameSize

### 33.64.36 NSViewGlobalFrameDidChangeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names to use with the NSView class.
**Notes:** Posted whenever an NSView object that has attached surfaces (that is, NSOpenGLContext objects) moves to a different screen, or other cases where the NSOpenGLContext object needs to be updated. The notification object is the surface's view. This notification does not contain a userInfo dictionary.

### 33.64.37 pageFooter as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a default footer string that includes the current page number and page count.
**Notes:** A printable view class can override this method to substitute its own content in place of the default value. You should not need to call this method directly. The printing system calls it once per page during printing.

Footers are generated only if the user defaults contain the key NSPrintHeaderAndFooter with the value true.

### 33.64.38 pageHeader as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a default header string that includes the print job title and date.
**Notes:** Typically, the print job title is the same as the window title. A printable view class can override this method to substitute its own content in place of the default value. You should not need to call this method directly. The printing system calls it once per page during printing.

Headers are generated only if the user defaults contain the key NSPrintHeaderAndFooter with the value true.

### 33.64.39 previousKeyView as NSViewMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the view object preceding the receiver in the key view loop.
**Notes:** This view should, if possible, be made first responder when the user navigates backward from the receiver using keyboard interface control.
Returns nil on any error.

### 33.64.40 previousValidKeyView as NSViewMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the closest view object in the key view loop that precedes the receiver and accepts first responder status.
**Notes:** This method ignores hidden views when it determines the previous valid key view.
Returns nil on any error.

### 33.64.41 print

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method opens the Print panel, and if the user chooses an option other than canceling, prints the receiver and all its subviews to the device specified in the Print panel.

### 33.64.42 registeredDraggedTypes as string()

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the array of pasteboard drag types that the view can accep
**Example:**

```
// we register some types
Listbox1.AcceptPictureDrop
Listbox1.AcceptTextDrop

// and query them:
MsgBox Join(Listbox1.NSViewMBS.registeredDraggedTypes, EndOfLine)

' shows:
'NeXT TIFF v4.0 pasteboard type
'com.apple.traditional-mac-plain-text
'NSStringPboardType
```

**Notes:** This method returns the types registered by calling registerForDraggedTypes:. Each element of the array is a uniform type identifier. The returned elements are in no particular order, but the array is guaranteed not to contain duplicate entries.

### 33.64.43 registerForDraggedTypes(Types() as string)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Registers the pasteboard types that the receiver will accept as the destination of an image-dragging session.
**Notes:** Types: An array of uniform type identifiers. See Types for Standard Data (Mac OS X 10.6 and later) for descriptions of the pasteboard type identifiers.

Registering an NSView object for dragged types automatically makes it a candidate destination object for a dragging session. As such, it must properly implement some or all of the NSDraggingDestination protocol methods. As a convenience, NSView provides default implementations of these methods. See the NSDraggingDestination protocol specification for details.

Xojo with Cocoa target implements the methods listed above. So this method is useful to change the allowed types for the case the framework has a bug.

### 33.64.44 removeAllToolTips

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes all tool tips assigned to the receiver.

### 33.64.45 removeFromSuperview

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Unlinks the view from its superview and its window, removes it from the responder chain, and invalidates its cursor rectangles.

### 33.64.46 removeFromSuperviewWithoutNeedingDisplay

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Unlinks the receiver from its superview and its window and removes it from the responder chain, but does not invalidate its cursor rectangles to cause redrawing.
**Notes:** The receiver is also released; if you plan to reuse it, be sure to retain it before sending this message and to release it as appropriate when adding it as a subview of another view.

Unlike its counterpart, removeFromSuperview, this method can be safely invoked during display.

### 33.64.47 RenderImage(subviews as boolean = false, flipped as boolean = false) as variant

MBS MacBase Plugin, Plugin Version: 8.5, Platform: macOS, Targets: Desktop only.

**Function:** Renders a picture of the view.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

dim image as NSImageMBS = n.RenderImage
dim pic as Picture = image.CopyPicture

Backdrop = pic
```

**Notes:** May return nil on any error.

The value of this variant must be an object of class NSImageMBS.

Added flipped parameter for version 20.3.
Flipped was true for older versions.

### 33.64.48 replaceSubview(oldView as NSViewMBS, newView as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Replaces one of the receiver's subviews with another view.
**Notes:** oldView: The view to be replaced by newView. May not be nil.
newView: The view to replace oldView. May not be nil.

This method does nothing if oldView is not a subview of the receiver.
Neither oldView nor newView may be nil, and the behavior is undefined if either of these parameters is nil.

### 33.64.49 rotateByAngle(angle as Double)

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Rotates the receiver's bounds rectangle by a specified degree value around the origin of the coordinate system, (0.0, 0.0).
**Notes:** angle: A float value specifying the angle of rotation, in degrees.

See the BoundsRotation property description for more information. This method neither redisplays the receiver nor marks it as needing display. You must do this yourself with display or NeedsDisplay.

This method posts an NSViewBoundsDidChangeNotification to the default notification center if the receiver is configured to do so.

### 33.64.50 scaleUnitSquareToSize(size as NSSizeMBS)

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** Scales the receiver's coordinate system so that the unit square scales to the specified dimensions.
**Notes:** For example, a newUnitSize of (0.5, 1.0) causes the receiver's horizontal coordinates to be halved, in turn doubling the width of its bounds rectangle. Note that scaling is performed from the origin of the coordinate system, (0.0, 0.0), not the origin of the bounds rectangle; as a result, both the origin and size of the bounds rectangle are changed. The frame rectangle remains unchanged.

This method neither redisplays the receiver nor marks it as needing display. You must do this yourself with display or setNeedsDisplay.

This method posts an NSViewBoundsDidChangeNotification to the default notification center if the receiver is configured to do so.

### 33.64.51 Screenshot as Picture

MBS MacBase Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Renders the view into a picture.
**Notes:** Like ScreenshotWindowMBS, but only for the view you are interested in, e.g. a map.
Returns nil on failure like out of memory.

### 33.64.52 setBackgroundFilters(Filters() as variant)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets an array of Core Image filters to apply to the view,Äôs background.
**Notes:** This property contains an array of CIFilterMBS objects. This array represents the background filters stored in the backgroundFilters property of the view,Äôs layer. If the view does not have a layer, setting the value of this property has no effect.
The default value of this property is an empty array.

We use variant here to reduce plugin dependencies. Please use with array of variants containing CIFilterMBS.

### 33.64.53 setBoundsOrigin(origin as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the bounds origin.
See also:

- 33.64.54 setBoundsOrigin(x as Double, y as Double) 6329

### 33.64.54 setBoundsOrigin(x as Double, y as Double)

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the bounds origin.
See also:

- 33.64.53 setBoundsOrigin(origin as NSPointMBS) 6329

### 33.64.55 setBoundsSize(size as NSSizeMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the bounds size of the nsview.
See also:

- 33.64.56 setBoundsSize(width as Double, height as Double) 6330

### 33.64.56 setBoundsSize(width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the bounds size of the nsview.
See also:

- 33.64.55 setBoundsSize(size as NSSizeMBS) 6330

### 33.64.57 setContentFilters(Filters() as variant)

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets an array of Core Image filters to apply to the contents of the view and its sublayers.
**Notes:** This property contains an array of CIFilterMBS objects. This array represents the filters stored in the filters property of the view,Äôs layer. If the view does not have a layer, setting the value of this property has no effect.
The default value of this property is an empty array.

We use variant here to reduce plugin dependencies. Please use with array of variants containing CIFilterMBS.

### 33.64.58 setFocus

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Convenience function to set the focus to this view.
**Notes:** Calls internally makeFirstResponder on NSWindow.

### 33.64.59 setFrameOrigin(origin as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the frame origin.
See also:

- 33.64.60 setFrameOrigin(x as Double, y as Double) 6331

### 33.64.60 setFrameOrigin(x as Double, y as Double)

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the frame origin.
See also:

- 33.64.59 setFrameOrigin(origin as NSPointMBS) 6330

### 33.64.61 setFrameSize(size as NSSizeMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the frame size.
See also:

- 33.64.62 setFrameSize(width as Double, height as Double) 6331

### 33.64.62 setFrameSize(width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the frame size.
See also:

- 33.64.61 setFrameSize(size as NSSizeMBS) 6331

### 33.64.63 subviews(recursive as boolean = false) as NSViewMBS()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The immediate subviews.
**Notes:** The order of the subviews may be considered as being back-to-front, but this does not imply invalidation and drawing behavior. The order is based on the order of the receiver's subviews as specified in the nib file from which they were unarchived or the programmatic interface for modifying the receiver's subview list. This ordering is also the reverse of the order in which hit-testing is done.

If recursive is true, we include all subviews of all subviews. (new in 14.2)

### 33.64.64 unregisterDraggedTypes

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Unregisters the receiver as a possible destination in a dragging session.

### 33.64.65 Properties

### 33.64.66 acceptsTouchEvents as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view will accept touch events.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.64.67 allowsVibrancy as Boolean

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** allowsVibrancy is queried when a vibrant appearance is used on a view hierarchy.
**Notes:** When allowsVibrancy returns YES, the view will have an appropriate measure taken to ensure it is vibrant on top of its given material.
Specific subclasses, such as NSControl, will answer this question based on the artwork they draw for a given appearance.
(Read only property)

### 33.64.68 alphaValue as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** the opacity of the view.
**Example:**

```
// makes a checkbox half transparent on Cocoa target:
CheckBox1.NSViewMBS.alphaValue = 0.5
```

**Notes:** This method returns the value of the opacity property of the view's layer. Possible values are between 0.0 (transparent) and 1.0 (opaque). The default is 1.0.

Sending this message to a view that is not managing a Core Animation layer causes an exception.

(Read and Write property)

### 33.64.69 autoresizesSubviews as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** True if the receiver automatically resizes its subviews using resizeSubviewsWithOldSize whenever its frame size changes, false otherwise.
**Notes:** (Read and Write property)

### 33.64.70 autoresizingMask as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The receiver's autoresizing mask, which determines how it's resized by the resizeWithOldSuperviewSize method.
**Notes:** If the autoresizing mask is equal to NSViewNotSizable (that is, if none of the options are set), then the receiver doesn't resize at all in resizeWithOldSuperviewSize.

| | |
|---|---|
| NSViewNotSizable = 0 | The receiver cannot be resized. |
| NSViewMinXMargin = 1 | The left margin between the receiver and its superview is flexible. |
| NSViewWidthSizable = 2 | The receiver's width is flexible. |
| NSViewMaxXMargin = 4 | The right margin between the receiver and its superview is flexible. |
| NSViewMinYMargin = 8 | The bottom margin between the receiver and its superview is flexible. |
| NSViewHeightSizable = 16 | The receiver's height is flexible. |
| NSViewMaxYMargin = 32 | The top margin between the receiver and its superview is flexible. |

(Read and Write property)

### 33.64.71 bounds as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the receiver's bounds rectangle, which expresses its location and size in its own coordinate system.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

MsgBox n.bounds.String
```

**Notes:** The bounds rectangle may be rotated; use the boundsRotation method to check this.
(Read and Write property)

### 33.64.72 boundsRotation as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The angle, in degrees, of the view's bounds rectangle relative to its frame rectangle.
**Notes:** (Read and Write property)

### 33.64.73 canBecomeKeyView as boolean

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.
(Read only property)

### 33.64.74 canDraw as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if drawing commands will produce any result, false otherwise.
**Notes:** Use this method when invoking a draw method directly along with lockFocus and unlockFocus, bypassing the display... methods (which test drawing ability and perform locking for you). If this method returns false, you shouldn't invoke lockFocus or perform any drawing.

A view object can draw on-screen if it is not hidden, it is attached to a view hierarchy in a window (NSWindow), and the window has a corresponding window device. A view object can draw during printing if it is a descendant of the view being printed.

To draw into a NSView, use either CustomNSViewMBS class with drawRect event or NSGraphicsMBS class.
(Read only property)

### 33.64.75 canDrawConcurrently as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view's drawRect: method can be invoked on a background thread.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.64.76 className as string

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of this NSView class.
**Example:**

```
// shows RBNSButton
MsgBox checkbox1.NSViewMBS.className
```

**Notes:** (Read only property)

### 33.64.77 classPath as string

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The path of this NSView class.
**Example:**

```
MsgBox TextArea1.NSViewMBS.classPath
// shows "RBNSScrollView:NSScrollView:NSView:NSResponder:NSObject"
```

**Notes:** Useful for debugging to know what super classes the view has.
(Read only property)

### 33.64.78 clipsToBounds as Boolean

MBS MacBase Plugin, Plugin Version: 23.4, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether subviews are confined to the bounds of the view.
**Notes:** Setting this value to true causes subviews to be clipped to the bounds of the view. If set to false, subviews whose frames extend beyond the visible bounds of the view aren,Äôt clipped.
The default value is false. Some subclasses of UIView, like UIScrollView, override the default value to true.
(Read and Write property)

### 33.64.79 focusRingType as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The type of focus ring to be drawn around the receiver.
**Notes:** This method only sets the desired focus ring type and does not cause the view to draw the actual focus ring. You are responsible for drawing the focus ring in your view's drawRect method whenever your view is made the first responder.

possible values:

| | |
|---|---|
| NSFocusRingTypeDefault | 0 |
| NSFocusRingTypeNone | 1 |
| NSFocusRingTypeExterior | 2 |

(Read and Write property)

### 33.64.80 frame as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the frame size and position of the view.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

MsgBox n.frame.String
```

**Notes:** (Read and Write property)

### 33.64.81 frameCenterRotation as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's rotation about the layer's position.
**Notes:** If the application has altered the layer's anchorPoint property, the behavior is undefined. Sending this message to a view that is not managing a Core Animation layer causes an exception.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.64.82 frameHeight as Double

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the view frame.
**Example:**

```
dim n as new NSProgressIndicatorMBS
MsgBox str(n.frameHeight)
```

**Notes:** This is a convenience property which calls the frame function to get the current rectangle, changes the value and sets the frame to the new rectangle.
(Read and Write property)

### 33.64.83 frameLeft as Double

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The left position of the view frame.
**Example:**

```
dim n as new NSProgressIndicatorMBS
MsgBox str(n.frameLeft)
```

**Notes:** This is a convenience property which calls the frame function to get the current rectangle, changes the value and sets the frame to the new rectangle.
(Read and Write property)

### 33.64.84 frameRotation as Double

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The angle, in degrees, of the view's frame relative to its superview's coordinate system.
**Notes:** dim n as new NSProgressIndicatorMBS
n.frameRotation=10
MsgBox str(n.frameRotation)
(Read and Write property)

### 33.64.85 frameTop as Double

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The top position of the view frame.
**Example:**

```
dim n as new NSProgressIndicatorMBS
MsgBox str(n.frameTop)
```

**Notes:** This is a convenience property which calls the frame function to get the current rectangle, changes the value and sets the frame to the new rectangle.
(Read and Write property)

### 33.64.86 frameWidth as Double

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the view frame.
**Example:**

```
dim n as new NSProgressIndicatorMBS
MsgBox str(n.frameWidth)
```

**Notes:** This is a convenience property which calls the frame function to get the current rectangle, changes the value and sets the frame to the new rectangle.
(Read and Write property)

### 33.64.87 identifier as string

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** A string that identifies this user interface item.
**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items, you would typically set this value in code after creating a control but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a control is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the

framework or application. For example, identifiers for standard AppKit interface items, such as the open panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 33.64.88 isFlipped as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if the nsview uses flipped drawing coordinates or false if it uses native coordinates.
**Notes:** (Read only property)

### 33.64.89 isHidden as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver is marked as hidden.
**Notes:** (Read and Write property)

### 33.64.90 isHiddenOrHasHiddenAncestor as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if the nsview is marked as hidden or has an ancestor in the view hierarchy that is marked as hidden; returns false otherwise.
**Notes:** (Read only property)

### 33.64.91 isOpaque as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Overridden by subclasses to return true if the view is opaque, false otherwise.
**Notes:** (Read only property)

### 33.64.92 isRotatedFromBase as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if the nsview or any of its ancestors has ever set a FrameRotation or BoundsRotation properties; otherwise returns false.
**Notes:** (Read only property)

### 33.64.93 isRotatedOrScaledFromBase as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if the nsview or any of its ancestors has ever had a nonzero frame or bounds rotation, or has been scaled from the window's base coordinate system; otherwise returns false.
**Notes:** The intent of this information is to optimize drawing and coordinate calculation, not necessarily to reflect the exact state of the receiver's coordinate system, so it may not reflect the actual rotation or scaling. For example, if an NSView object is rotated to 45 degrees and later back to 0, this method still returns true.
(Read only property)

### 33.64.94 layer as Variant

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns or sets the Core Animation layer that the receiver uses as its backing store.
**Notes:** Value is a CALayerMBS object.
Available in OS X v10.5 and later.
(Read and Write property)

### 33.64.95 layerUsesCoreImageFilters as Boolean

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the view,Äôs layer uses Core Image filters and needs in-process rendering.
**Notes:** If your view uses a custom layer and you assigned Core Image to that layer directly, you must set this property to YES to let AppKit know of that fact. In macOS 10.9 and later, AppKit prefers to render layer trees out-of-process but cannot do so if any layers have Core Image filters attached to them. Specifying true for property lets AppKit know that it must move rendering of the layer hierarchy back into your app,Äôs process. If the value of this property is false, adding a filter to the view,Äôs layer triggers an exception.

You do not need to modify this property if you assigned the filters using the backgroundFilters, compositingFilter, or contentFilters properties of the view. Those methods automatically let AppKit know that it needs to render the layer hierarchy in-process. Set it only if you set the filters on the layer directly.
(Read and Write property)

### 33.64.96 needsDisplay as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** whether the view needs to be displayed.
**Notes:** (Read and Write property)

### 33.64.97 nextKeyView as NSViewMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The view object following the receiver in the key view loop.
**Notes:** Returns the view object following the receiver in the key view loop, or nil if there is none.
On setting inserts a specified view object after the receiver in the key view loop of the receiver's window.
This view should, if possible, be made first responder when the user navigates forward from the receiver using keyboard interface control.
Returns nil on any error.
(Read and Write property)

### 33.64.98 opaqueAncestor as NSViewMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's closest opaque ancestor (including the receiver itself).
**Notes:** (Read only property)

### 33.64.99 RetainCount as Integer

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The retain count for the NSView object.
**Notes:** Useful for debugging. Should always be >0.
(Read only property)

### 33.64.100 superview as NSViewMBS

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the receiver's superview, or nil if it has none.
**Notes:** (Read only property)

### 33.64.101 toolTip as string

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The tooltip text for this view.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.toolTip = "Hello"
MsgBox n.toolTip
```

**Notes:** (Read and Write property)

### 33.64.102 userInteractionEnabled as Boolean

MBS MacBase Plugin, Plugin Version: 21.4, Platform: macOS, Targets: iOS only.

**Function:** A Boolean value that determines whether user events are ignored and removed from the event queue.
**Notes:** When set to false, touch, press, keyboard, and focus events intended for the view are ignored and removed from the event queue. When set to YES, events are delivered to the view normally. The default value of this property is true.

During an animation, user interactions are temporarily disabled for all views involved in the animation, regardless of the value in this property. You can disable this behavior by specifying the UIViewAnimationOptionAllowUserInteraction option when configuring the animation.
(Read and Write property)

### 33.64.103 visibleRect as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the portion of the receiver not clipped by its superviews.
**Notes:** Visibility for this method is defined quite simply and doesn't account for whether other NSView objects (or windows) overlap the receiver or whether the receiver has a window at all. This method returns an empty rectangle if the receiver is effectively hidden.

During a printing operation the visible rectangle is further clipped to the page being imaged.
(Read only property)

### 33.64.104 wantsDefaultClipping as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the Application Kit's default clipping provided to drawRect implementations is in effect.
**Notes:** Subclasses may override this method to return false if they want to suppress the default clipping. They may want to do this in situations where drawing performance is critical to avoid the cost of setting up, enforcing, and cleaning up the clip path

A view that overrides this method to refuse the default clipping must either set up whatever clipping it requires or constrain its drawing exactly to the list of rectangles returned by getRectsBeingDrawn. Failing to do so could result in corruption of other drawing in the view's window.
(Read only property)

### 33.64.105 wantsLayer as Boolean

MBS MacBase Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver and its subviews use a Core Animation layer as a backing store.
**Notes:** True if the view and its subviews should use a Core Animation layer as its backing store, otherwise false.

Requires Mac OS X 10.5.
(Read and Write property)

### 33.64.106 wantsRestingTouches as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view wants resting touches.
**Notes:** A resting touch occurs when a user rests their thumb on a device (for example, the glass trackpad of a MacBook).

By default, these touches are not delivered and are not included in the event's set of touches. Touches may transition in and out of resting at any time. Unless the view wants restingTouches, began / ended events are simulated as touches transition from resting to active and vice versa.

In general resting touches should be ignored.

Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.64.107 window as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the receiver's window object, or nil if it has none.
**Notes:** (Read only property)

### 33.64.108 compositingFilter as variant

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** The Core Image filter used to composite the view,Äôs contents with its background.
**Notes:** This property contains the compositing filter stored in the compositingFilter property of the view,Äôs layer. If the view does not have a layer, setting the value of this property has no effect.
The default value of this property is nil, which causes content to be rendered without any special compositing effects.

We use variant here to reduce plugin dependencies. Please use with variant containing CIFilterMBS.
(Read and Write computed property)

### 33.64.109 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBezelBorder | 2 | One of the constants to specify the type of a view's border. A concave border that makes the view look sunken. |
| NSFocusRingTypeDefault | 0 | One of the constants for the focusringtype property. The default focus ring type for NSView or NSCell. |
| NSFocusRingTypeExterior | 2 | One of the constants for the focusringtype property. The standard Aqua focus ring. |
| NSFocusRingTypeNone | 1 | One of the constants for the focusringtype property. No focus ring. If you set the focus ring type to this value, NS will not draw any focus ring. |
| NSGrooveBorder | 3 | One of the constants to specify the type of a view's border. A thin border that looks etched around the image. |
| NSLineBorder | 1 | One of the constants to specify the type of a view's border. A black line border around the view. |
| NSNoBorder | 0 | One of the constants to specify the type of a view's border. No border. |
| NSViewHeightSizable | 16 | One of the constants for the autoresizingMask property. The receiver's height is flexible. |
| NSViewLayerContentsRedrawBeforeViewResize | 3 | One of the view layer content redraw policy constants. |
| NSViewLayerContentsRedrawDuringViewResize | 2 | One of the view layer content redraw policy constants. |
| NSViewLayerContentsRedrawNever | 0 | One of the view layer content redraw policy constants. |
| NSViewLayerContentsRedrawOnSetNeedsDisplay | 1 | One of the view layer content redraw policy constants. |
| NSViewMaxXMargin | 4 | One of the constants for the autoresizingMask property. The right margin between the receiver and its superview is fl |
| NSViewMaxYMargin | 32 | One of the constants for the autoresizingMask property. The top margin between the receiver and its superview is flex |
| NSViewMinXMargin | 1 | One of the constants for the autoresizingMask property. The left margin between the receiver and its superview is flex |
| NSViewMinYMargin | 8 | One of the constants for the autoresizingMask property. The bottom margin between the receiver and its superview is |
| NSViewNotSizable | 0 | One of the constants for the autoresizingMask property. The receiver cannot be resized. |
| NSViewWidthSizable | 2 | One of the constants for the autoresizingMask property. The receiver's width is flexible. |

Window Order Constants

| Constant | Value | Description |
|---|---|---|
| NSWindowAbove | 1 | Moves the window above the indicated window. |
| NSWindowBelow | -1 | Moves the window below the indicated window. |
| NSWindowOut | 0 | Moves the window off the screen. |

## 33.65 class NSViewTooltipMBS

### 33.65.1 class NSViewTooltipMBS

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** The class for a dynamical NSView tooltip.
**Notes:** Can be used for customized helptags with event to return current text.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr7

**Xojo Developer Magazine**

- 16.2, page 9: News

### 33.65.2 Methods

### 33.65.3 Constructor

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 33.65.4 Properties

### 33.65.5 Text as String

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** The text for the tooltip.
**Notes:** If event is not implemented, we use this default text.
(Read and Write property)

### 33.65.6 Events

### 33.65.7 stringForToolTip(point as NSPointMBS) as string

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: .

**Function:** Queries string for tooltip at position.
**Notes:** The point allows you to customize the tooltip for the location.
Please return the text to display.

# 33.66 class NSVisualEffectViewMBS

## 33.66.1 class NSVisualEffectViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The class to use visual effect view.
**Notes:** The NSVisualEffectView is the basis for all visual effects, including "vibrant" appearances. You can optionally set the appearance to NSAppearanceMBS.appearanceNamed(NSAppearanceNameVibrantDark) (or Light) to get the desired light or dark appearance. Combine this with an appropriate light or dark material to get the desired vibrant look. Combining NSAppearanceNameVibrantDark with a light material will look bad, and should not be done.

Requires Mac OS X 10.10 or newer.

Please review Apple's documentation on this for details.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- New for Mac OS X 10.10 in MBS Xojo Plugins

## 33.66.2 Methods

## 33.66.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Only available on Mac OS X 10.10 or later.

## 33.66.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new NSVisualEffectViewMBS object.
See also:


- 33.66.5 Constructor(Handle as Integer) 6349
- 33.66.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6349

### 33.66.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSVisualEffectView handle.
**Example:**

```
dim t as new NSVisualEffectViewMBS(0, 0, 100, 100)
dim v as new NSVisualEffectViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSVisualEffectView and the plugin retains this handle.
See also:


- 33.66.4 Constructor 6348
- 33.66.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6349


### 33.66.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new NSVisualEffectViewMBS object.
See also:


- 33.66.4 Constructor 6348
- 33.66.5 Constructor(Handle as Integer) 6349


### 33.66.7 Properties

### 33.66.8 blendingMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** How this backdrop view blurs its contents.
**Notes:** It can either blend with the contents behind the window (NSVisualEffectBlendingModeBehindWindow – the default), or within the current window (NSVisualEffectBlendingModeWithinWindow). The blending mode for the material NSVisualEffectMaterialTitlebar can only be NSVisualEffectBlendingModeWithinWindow.

The blendingMode NSVisualEffectBlendingModeWithinWindow requires WantsLayer = true to be done on the parent view that you desire to blend with.

(Read and Write property)

### 33.66.9 Emphasized as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether to emphasize the look of the material.
**Notes:** Some materials change their appearance when they are emphasized. For example, the first responder view conveys its status.
The default value of this property is false.

Available in MacOS 10.12 or newer.
(Read and Write property)

### 33.66.10 interiorBackgroundStyle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The interior background style.
**Notes:** Returns "Light" or "Dark" depending on the material selected.
(Read only property)

### 33.66.11 maskImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The mask image masks this view.
**Notes:** (Read and Write property)

### 33.66.12 material as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The material used.
**Notes:** The default value is NSVisualEffectMaterialAppearanceBased; the material is updated to be the correct material based on the appearance set on this view.
(Read and Write property)

### 33.66.13 state as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The current state.
**Notes:** The state defaults to NSVisualEffectStateFollowsWindowActiveState.
(Read and Write property)

### 33.66.14 Constants

Background Styles

| Constant | Value | Description |
|---|---|---|
| NSBackgroundStyleDark | 1 | Dark |
| NSBackgroundStyleLight | 0 | Light |

Blending Modes

| Constant | Value | Description |
|---|---|---|
| NSVisualEffectBlendingModeBehindWindow | 0 | Blends and blurs with the contents behind the window (such as th other windows). These can overlap, and the view lower in the h "win". |
| NSVisualEffectBlendingModeWithinWindow | 1 | Blends and blurs with contents behind the view in the current wind now, these cannot overlap each other. This mode REQUIRES la with view.wantsLayer = true. |

Materials

| Constant | Value | Description |
|---|---|---|
| NSVisualEffectMaterialAppearanceBased | 0 | When NSVisualEffectMaterialAppearanceBased is set, the determined by the current effectiveAppearance that is on the |
| NSVisualEffectMaterialContentBackground | 18 | The material for the background of opaque content.<br>You might use this material as the background for content table view, or collection view.<br>This material supports Desktop Tinting in Dark Mode. With the system modifies the material's color dynamically by incor the color from the underlying desktop image. |
| NSVisualEffectMaterialDark | 2 | Dark |
| NSVisualEffectMaterialFullScreenUI | 15 | The material for the background of a full-screen modal interf |
| NSVisualEffectMaterialHeaderView | 10 | The material for in-line header or footer views. |
| NSVisualEffectMaterialHUDWindow | 13 | The material for the background of heads-up display (HUD) |
| NSVisualEffectMaterialLight | 1 | Light |
| NSVisualEffectMaterialMenu | 5 | The material for menus. |
| NSVisualEffectMaterialPopover | 6 | The material for the background of popover windows. |
| NSVisualEffectMaterialSelection | 4 | The material used to indicate a selection. |
| NSVisualEffectMaterialSheet | 11 | The material for the background of sheet windows. |
| NSVisualEffectMaterialSidebar | 7 | The material for the background of window sidebars. |
| NSVisualEffectMaterialTitlebar | 3 | The material for a window,Äôs titlebar. |
| NSVisualEffectMaterialToolTip | 17 | The material for the background of a tool tip. |
| NSVisualEffectMaterialUnderPageBackground | 22 | The material for the area behind the pages of a document.<br>This material supports Desktop Tinting in Dark Mode. With the system modifies the material's color dynamically by incor the color from the underlying desktop image. |
| NSVisualEffectMaterialUnderWindowBackground | 21 | The material to show under a window's background.<br>Use this material on a visual effect view with a blendingM EffectBlendingModeBehindWindow to create a sense of pee back of the window. This effect creates an illusion that the b window has peeled away to reveal what,Äôs under it. |
| NSVisualEffectMaterialWindowBackground | 12 | The material for the background of opaque windows.<br>This material supports Desktop Tinting in Dark Mode. With the system modifies the material's color dynamically by incor the color from the underlying desktop image. |

States

| Constant | Value | Description |
|---|---|---|
| NSVisualEffectStateActive | 1 | The backdrop is explicitly active, always. |
| NSVisualEffectStateFollowsWindowActiveState | 0 | The backdrop automatically appears active when the window inactive when it is not active. |
| NSVisualEffectStateInactive | 2 | The backdrop is explicitly inactive. |

# 33.67 class NSWindowControllerMBS

## 33.67.1 class NSWindowControllerMBS

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** An NSWindowController object manages a window, usually a window stored in a nib file.
**Notes:** Please read Apple's documentation for details:
https://developer.apple.com/library/mac/documentation/Cocoa/Reference/ApplicationKit/Classes/NSWindowController_Class/Reference/Reference.html
Subclass of the NSResponderMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr6

## 33.67.2 Methods

## 33.67.3 close

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Closes the window if it was loaded.
**Notes:** Because this method closes the window without asking the user for confirmation, you usually do not invoke it when the Close menu command is chosen. Instead invoke NSWindow's performClose on the receiver's window.

## 33.67.4 Constructor(win as NSWindowMBS)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a window controller initialized with a given window.
**Notes:** window: The window object to manage; can be nil.
Returns a newly initialized window controller.
This method is the designated initializer for NSWindowController.

This initializer is useful when a window has been loaded but no window controller is assigned. The default initialization turns on cascading, sets the shouldCloseDocument flag to NO, and sets the window frame autosave name to an empty string. As a side effect, the created window controller is added as an observer of the NSWindowWillCloseNotifications posted by that window object (which is handled by a private method). If you make the window controller a delegate of the window, you can implement NSWindow's windowShouldClose delegate method.
See also:

- 33.67.5 Constructor(windowNibName as string) 6354

### 33.67.5 Constructor(windowNibName as string)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a window controller initialized with a nib file.
**Notes:** windowNibName: The name of the nib file (minus the ".nib" extension) that archives the receiver's window; cannot be empty.

Sets the owner of the nib file to the receiver. The default initialization turns on cascading, sets the shouldCloseDocument flag to false, and sets the autosave name for the window's frame to an empty string.
See also:

- 33.67.4 Constructor(win as NSWindowMBS) 6353

### 33.67.6 showWindow

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Displays the window associated with the receiver.
**Notes:** If the window is an NSPanel object and has its becomesKeyOnlyIfNeeded flag set to true, the window is displayed in front of all other windows but is not made key; otherwise it is displayed in front and is made key. This method is useful for menu actions.

### 33.67.7 synchronizeWindowTitleWithDocumentName

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Synchronizes the displayed window title and the represented filename with the information in the associated document.
**Notes:** Does nothing if the window controller has no associated document or loaded window. This method queries the window controller's document to get the document's display name and full filename path, then calls windowTitleForDocumentDisplayName to get the display name to show in the window title.

### 33.67.8 Properties

### 33.67.9 className as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of this NSWindowController class.
**Notes:** (Read only property)

### 33.67.10 classPath as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The path of this NSWindowController class.
**Notes:** Useful for debugging to know what super classes the window controller has.
(Read only property)

### 33.67.11 shouldCascadeWindows as boolean

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver should necessarily close the associated document when the window it manages is closed.
**Notes:** True if the receiver necessarily closes the associated document when the window it manages is closed, false otherwise.
If false, the document is closed only when the last remaining window of the document is closed.
The default is false.
(Read and Write property)

### 33.67.12 shouldCloseDocument as boolean

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver should necessarily close the associated document when the window it manages is closed.
**Notes:** True if the receiver necessarily closes the associated document when the window it manages is closed, false otherwise.
If false, the document is closed only when the last remaining window of the document is closed.
The default is false.
(Read and Write property)

### 33.67.13 window as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The window owned by the controller.
**Notes:** If the window has not yet been loaded, this method attempts to load the window's nib file using loadWindow. Before it loads the window, it invokes windowWillLoad, and if the window controller has a document, it invokes the document's corresponding method windowControllerWillLoadNib (if implemented). After loading the window, this method invokes windowDidLoad and, if there is a document, the NSDocument method windowControllerDidLoadNib (if implemented).

(Read and Write property)

### 33.67.14 windowFrameAutosaveName as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name under which the frame rectangle of the window owned by the receiver is stored in the defaults database.
**Notes:** By default, name is an empty string, causing no information to be stored in the defaults database.
(Read and Write property)

### 33.67.15 windowNibName as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name of the nib file that stores the window associated with the receiver.
**Notes:** (Read only property)

### 33.67.16 windowNibPath as string

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the full path of the nib file that stores the window associated with the receiver.
**Notes:** The full path of the nib file that stores the window associated with the receiver; "" if it cannot be located.
(Read only property)

# 33.68 class NSWindowDelegateMBS

## 33.68.1 class NSWindowDelegateMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** A Xojo class for a cocoa windows delegate.
**Notes:** The NSWindowDelegate protocol defines the methods that a delegate of NSWindow should implement. All methods in this protocol are optional.

By implementing these methods, the delegate may respond to window resizing, moving, exposing, minimizing, and a number of other window events.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr3
- MBS Xojo / Real Studio Plugins, version 13.2pr1
- MBS Real Studio Plugins, version 12.5pr3
- Lion features for Real Studio
- MBS Real Studio Plugins, version 11.2pr11

## 33.68.2 Methods

## 33.68.3 Constructor(win as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the delegate class pointing to the Xojo window.
**Notes:** This class does not keep a reference to the window, so you can keep this delegate as a property of the window without a memory leak.

The original delegate from Xojo is preserved and all messages are forwarded to it. Also when this object is destroyed, the old delegate is restored.
See also:


- 33.68.4 Constructor(win as NSWindowMBS) 6357
- 33.68.5 Constructor(win as window) 6358


## 33.68.4 Constructor(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the delegate class pointing to the Cocoa window.
**Notes:** The original delegate on the window is preserved and all messages are forwarded to it. Also when this object is destroyed, the old delegate is restored.
See also:


- 33.68.3 Constructor(win as DesktopWindow) 6357
- 33.68.5 Constructor(win as window) 6358


### 33.68.5 Constructor(win as window)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the delegate class pointing to the Xojo window.
**Notes:** This class does not keep a reference to the window, so you can keep this delegate as a property of the window without a memory leak.

The original delegate from Xojo is preserved and all messages are forwarded to it. Also when this object is destroyed, the old delegate is restored.
See also:


- 33.68.3 Constructor(win as DesktopWindow) 6357
- 33.68.4 Constructor(win as NSWindowMBS) 6357


### 33.68.6 InstallRestoreEvents

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Activates plugin code to catch events restoreStateWithCoder and encodeRestorableStateWith-Coder.

### 33.68.7 Events

### 33.68.8 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 33.68.9 customWindowsToEnterFullScreenForWindow(win as NSWindowMBS) as NSWindowMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the window is about to enter full screen mode.
**Notes:** win: The window to enter to full screen mode.

Return an array of windows involved in the animation to fullscreen for window; otherwise nil.

This method lets a window delegate to customize the animation by providing a custom window or windows containing layers or other effects. If you do not want to perform custom animation, you can omit the implementation of this method, or it can return nil.

Available in Mac OS X v10.7 and later.

### 33.68.10 customWindowsToExitFullScreenForWindow(win as NSWindowMBS) as NSWindowMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The system has started its animation out of fullscreen, including transitioning back to the desktop space.
**Notes:** win: The window to exit fullscreen.

Return true if the window wants to run a custom animation; otherwise false if the default NSWindow animation should be used.

This method lets the window delegate customize the animation when the window is about to exit fullscreen. If an you do not want to perform custom animation, you can omit the implementation of this method, or it can return nil.

Available in Mac OS X v10.7 and later.

### 33.68.11 didDecodeRestorableState(win as NSWindowMBS, state as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the window is has extracted its restorable state from a given archiver.
**Notes:** win: The window extracting its restorable state from an archive.
state: The coder extracting the archive.

This method is invoked during the window's restoreStateWithCoder method.

Available in Mac OS X v10.7 and later.

### 33.68.12 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 33.68.13 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 33.68.14 draggingExited(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 33.68.15 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 33.68.16 encodeRestorableStateWithCoder(win as NSWindowMBS, coder as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Method called to save the restorable state.
**Notes:** The receiver is passed an NSCoderMBS that supports keyed encoding (but not decoding), and should encode its restorable state. If you override this method, you should call through to super. You should not otherwise invoke this method. If you encode an object that implements the NSUserInterfaceItemIdentification protocol, the object itself is not archived; only its identifier is stored. Thus, for example, a window may efficiently store its firstResponder as restorable state.

Called only if you called InstallRestoreEvents at least ones.

### 33.68.17 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 33.68.18 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 33.68.19 restoreStateWithCoder(win as NSWindowMBS, coder as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Method called to restore state.
**Notes:** The receiver is passed an NSCoder that supports keyed decoding (but not encoding). The receiver should decode any previously stored state. If you override this method, you should call through to super. You should not otherwise invoke this method.
Called only if you called InstallRestoreEvents at least ones.

### 33.68.20 shouldDragDocumentWithEvent(win as NSWindowMBS, evnt as NSEventMBS, dragImageLocation as NSPointMBS, pasteboard as Variant) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Asks the delegate whether a user can drag the document icon from the window's title bar.
**Notes:** win: The window containing the document icon the user wants to drag.
evnt: The left-mouse down event that triggered the dragging operation.
dragImageLocation: The location at which the user started the dragging operation.
pasteboard: The pasteboard containing the contents of the document, which the delegate can modify. This is a NSPasteboardMBS object.

Return true to allow the drag to proceed; false to prevent it. Before turning no the delegate can implement its own dragging behavior as described below.

Implementing this method allows an application to customize the process of dragging the window's document icon.implement its own dragging process, the delegate can perform the dragging operation and return false.

The delegate can prohibit the drag by returning false. Before returning false, the delegate may implement its own dragging behavior.

Available in Mac OS X v10.5 and later.

### 33.68.21 shouldPopUpDocumentPathMenu(win as NSWindowMBS, menu as NSMenuMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Asks the delegate whether the window displays the title pop-up menu in response to a Command-click or Control-click on its title.
**Notes:** win: The window whose title the user Command-clicked or Control-clicked.
menu: The menu the window will display, if allowed. By default, its items are the path components of the file represented by window.

Returns true to allow the display of the title pop-up menu; false to prevent it.

Available in Mac OS X v10.5 and later.

### 33.68.22 startCustomAnimationToEnterFullScreenWithDuration(win as NSWindowMBS, duration as Double)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked when the window is about to enter fullscreen mode.
**Notes:** win: The window to enter to full screen mode.
duration: The duration of the presentation change.

This method is called to start the window animation into fullscreen, including transitioning to a new space. You can implement this method to perform custom animation with the given duration to be in sync with the system animation.

Special Considerations
This method is called only if customWindowsToEnterFullScreenForWindow returned non-nil.

Available in Mac OS X v10.7 and later.

### 33.68.23 startCustomAnimationToExitFullScreenWithDuration(win as NSWindowMBS, duration as Double)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window is about to enter fullscreen mode.
**Notes:** win: The window to exit to fullscreen.
duration: The duration of the presentation change.

Special Considerations
This method is called only if customWindowsToExitFullScreenForWindow returned non-nil.

Available in Mac OS X v10.7 and later.

### 33.68.24 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 33.68.25 wantsPeriodicDraggingUpdates as boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

### 33.68.26 willEncodeRestorableState(win as NSWindowMBS, state as NSCoderMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the window is about to add its restorable state to a given archiver.
**Notes:** win: The window adding its restorable state to an archive.
state: The coder creating the archive.

This method is invoked during the window's encodeRestorableStateWithCoder method.

Available in Mac OS X v10.7 and later.

### 33.68.27 willPositionSheet(win as NSWindowMBS, sheet as NSWindowMBS, rect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window is about to show a sheet at the specified location, giving it the opportunity to return a custom location for the attachment of the sheet to the window.
**Notes:** win: The window containing the sheet to be animated.
sheet: The sheet to be shown.
rect: The default sheet location, just under the title bar of the window, aligned with the left and right edges of the window.

Return the custom location specified.

This method is also invoked whenever the user resizes window while sheet is attached.

This method is useful in many situations. If your window has a toolbar, for example, you can specify a location for the sheet that is just below it. If you want the sheet associated with a certain control or view, you could position the sheet so that it appears to originate from the object (through animation) or is positioned next to it.

Neither the rect parameter nor the returned NSRect value define the boundary of the sheet. They indicate where the top-left edge of the sheet is attached to the window. The origin is expressed in window coordinates; the default origin.y value is the height of the content view and the default origin.x value is 0. The size.width value indicates the width and behavior of the initial animation; if size.width is narrower than the sheet, the sheet genies out from the specified location, and if size.width is wider than the sheet, the sheet slides out. You cannot affect the size of the sheet through the size.width and size.height fields. It is recommended that you specify zero for the size.height value as this field may have additional meaning in a future release.

Available in Mac OS X v10.3 and later.

### 33.68.28 willResizeForVersionBrowser(win as NSWindowMBS, maxPreferredFrameSize as NSSizeMBS, maxAllowedFrameSize as NSSizeMBS) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the the window will resize for presentation during version browsing.
**Notes:** win: The window being presented in a version browser.
maxPreferredSize: The maximum size the version browser would prefer the window to be.
maxAllowedSize: The maximum allowed size for the window (the full screen frame minus the margins required to ensure the Versions controls are still visible).

Returns the size that the window should be.

Windows entering the version browser will be resized to the size returned by this method. If either dimension of the returned size is larger than the maxPreferredFrameSize, the window will also be scaled down to ensure it fits properly in the version browser.

If this method is not implemented, the version browser will use windowWillUseStandardFrame to determine the resulting window frame size.

Available in Mac OS X v10.7 and later.

### 33.68.29 willUseFullScreenContentSize(win as NSWindowMBS, proposedSize as NSSizeMBS) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the fullscreen content size.
**Notes:** win: The window to enter to full screen mode.
proposedSize: The proposed window size.

Returns the window size to actually use when displaying content size.

Available in Mac OS X v10.7 and later.

### 33.68.30 willUseFullScreenPresentationOptions(win as NSWindowMBS, proposedOptions as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Returns the presentation options the window will use when transitioning to fullscreen.
**Notes:** win: The window to enter to full screen mode.
proposedOptions: The proposed options. See NSApplicationPresentationOptions for the possible values.

Return the options the window should use when transitioning to fullscreen. These may be the same as the

proposedOptions or may be modified.

Available in Mac OS X v10.7 and later.

### 33.68.31 windowDidBecomeKey(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window has become the key window.
**Notes:** notification: A notification named NSWindowDidBecomeKeyNotification.

You can retrieve the window object in question by sending object to notification.

Available in Mac OS X v10.0 and later.

### 33.68.32 windowDidBecomeMain(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window has become main.
**Notes:** notification: A notification named NSWindowDidBecomeMainNotification.

You can retrieve the window object in question by sending object to notification.

Available in Mac OS X v10.0 and later.

### 33.68.33 windowDidChangeScreen(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has changed screens.
**Notes:** notification: A notification named NSWindowDidChangeScreenNotification.

You can retrieve the NSWindow object in question by sending object to notification.

Available in Mac OS X v10.0 and later.

### 33.68.34 windowDidChangeScreenProfile(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has changed screen display profiles.
**Notes:** notification: A notification named NSWindowDidChangeScreenProfileNotification.

You can retrieve the NSWindow object in question by sending object to notification.

Available in Mac OS X v10.4 and later.

### 33.68.35 windowDidDeminiaturize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has been deminimized.
**Notes:** notification: A notification named NSWindowDidDeminiaturizeNotification

You can retrieve the NSWindow object in question by sending object to notification.

Available in Mac OS X v10.0 and later.

### 33.68.36 windowDidEndLiveResize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that a live resize operation on the window has ended.
**Notes:** notification: A notification named NSWindowDidEndLiveResizeNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.6 and later.

### 33.68.37 windowDidEndSheet(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has closed a sheet.
**Notes:** notification: A notification named NSWindowDidEndSheetNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.1 and later.

### 33.68.38 windowDidEnterFullScreen(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The window just entered fullscreen mode.
**Notes:** notification: A notification named NSWindowDidEnterFullScreenNotification.
Available in Mac OS X v10.7 and later.

### 33.68.39 windowDidEnterVersionBrowser(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the the window just entered version browsing.
**Notes:** notification: An NSWindowDidEnterVersionBrowserNotification notification.

Available in Mac OS X v10.7 and later.

### 33.68.40 windowDidExitFullScreen(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The window is about to enter fullscreen mode.
**Notes:** notification: A notification named NSWindowDidExitFullScreenNotification.
Available in Mac OS X v10.7 and later.

### 33.68.41 windowDidExitVersionBrowser(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the the window is about to leave version browsing.
**Notes:** notification: An NSWindowDidExitVersionBrowserNotification notification.
Available in Mac OS X v10.7 and later.

### 33.68.42 windowDidExpose(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has been exposed.
**Notes:** notification: A notification named NSWindowDidExposeNotification.
You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.43 windowDidFailToEnterFullScreen(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked if the window failed to enter fullscreen.
**Notes:** win: The window that failed to enter to full screen mode.

In some cases, the transition to enter fullscreen will fail, due to being in the midst of handling some other animation or user gesture. This method indicates that there was an error, and you should clean up any work you may have done to prepare to enter fullscreen.

This message is sent whether or not the delegate indicated a custom animation by returning non-nil from customWindowsToEnterFullScreenForWindow.

Available in Mac OS X v10.7 and later.

### 33.68.44 windowDidFailToExitFullScreen(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked if the window failed to exit fullscreen.
**Notes:** win: The window that failed to exit to fullscreen.

In some cases, the transition to exit fullscreen will fail, due to being in the midst of handling some other animation or user gesture. This method indicates that there was an error, and you should clean up any work you may have done to prepare to enter fullscreen.

This message is sent whether or not the delegate indicated a custom animation by returning non-nil from customWindowsToExitFullScreenForWindow.

Available in Mac OS X v10.7 and later.

### 33.68.45 windowDidMiniaturize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has been minimized.
**Notes:** notification: A notification named NSWindowDidMiniaturizeNotification.

You can retrieve the NSWindow object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.46 windowDidMove(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window has moved.
**Notes:** notification: A notification named NSWindowDidMoveNotification.

You can retrieve the NSWindow object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.47 windowDidResignKey(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window has resigned key window status.
**Notes:** notification: A notification named NSWindowDidResignKeyNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.48 windowDidResignMain(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window has resigned main window status.
**Notes:** notification: A notification named NSWindowDidResignMainNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.49 windowDidResize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window has been resized.
**Notes:** notification: A notification named NSWindowDidResizeNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.50 windowDidUpdate(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window received an update message.
**Notes:** notification: A notification named NSWindowDidUpdateNotification

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.51 windowShouldClose as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the user has attempted to close a window or the window has received a performClose message.
**Notes:** Return true to allow sender to be closed; otherwise, false.

This method may not always be called during window closing. Specifically, this method is not called when a user quits an application.

Available in Mac OS X v10.0 and later.

### 33.68.52 windowShouldZoom(win as NSWindowMBS, newFrame as NSRectMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Asks the delegate whether the specified window should zoom to the specified frame.
**Notes:** win: The window being zoomed.

newFrame: The rectangle to which the specified window is being zoomed.

Return true to allow window's frame to become newFrame; otherwise, false.

Available in Mac OS X v10.0 and later.

### 33.68.53 windowWillBeginSheet(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the window is about to open a sheet.
**Notes:** notification: A notification named NSWindowWillBeginSheetNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.1 and later.

### 33.68.54 windowWillClose(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window is about to close.
**Notes:** notification: A notification named NSWindowWillCloseNotification.

You can retrieve the NSWindow object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.55 windowWillEnterFullScreen(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The window is about to enter fullscreen mode.
**Notes:** notification: A notification named NSWindowWillEnterFullScreenNotification.

Available in Mac OS X v10.7 and later.

### 33.68.56 windowWillEnterVersionBrowser(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the the window is about to enter version browsing.
**Notes:** notification: An NSWindowWillEnterVersionBrowserNotification notification.
Available in Mac OS X v10.7 and later.

### 33.68.57 windowWillExitFullScreen(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The window is about to exit fullscreen mode.
**Notes:** notification: A notification named NSWindowWillExitFullScreenNotification.
Available in Mac OS X v10.7 and later.

### 33.68.58 windowWillExitVersionBrowser(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate the the window just left version browsing.
**Notes:** notification: An NSWindowWillExitVersionBrowserNotification notification.
Available in Mac OS X v10.7 and later.

### 33.68.59 windowWillMiniaturize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window is about to be minimized.
**Notes:** notification: A notification named NSWindowWillMiniaturizeNotification.
You can retrieve the NSWindow object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.60 windowWillMove(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window is about to move.
**Notes:** notification: A notification named NSWindowWillMoveNotification.
You can retrieve the NSWindow object in question by sending object to notification.
Available in Mac OS X v10.0 and later.

### 33.68.61 windowWillResize(win as NSWindowMBS, newFrameSize as NSSizeMBS, newSize as NSSizeMBS) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window is being resized (whether by the user or through one of the setFrame... methods other than setFrame:display:).
**Notes:** The plugin first passes the event to Xojo runtime. In the newSize parameter you get the result from the runtime. Now you can decide. If you return nil, the newSize value is used.

win: The window being resized.
frameSize: The size to which the specified window is being resized.
newSize: The size Xojo wants to use.

Return a custom size to which the specified window will be resized.

The frameSize contains the size (in screen coordinates) sender will be resized to. To resize to a different size, simply return the desired size from this method; to avoid resizing, return the current size. sender's minimum and maximum size constraints have already been applied when this method is invoked.

While the user is resizing a window, the delegate is sent a series of windowWillResize messages as the window's outline is dragged. The window's outline is displayed at the constrained size as set by this method.

Available in Mac OS X v10.0 and later.

### 33.68.62 windowWillReturnUndoManager(win as NSWindowMBS) as NSUndoManagerMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the window's undo manager has been requested. Returns the appropriate undo manager for the window.
**Notes:** win: The window whose undo manager is being requested.

Return the appropriate undo manager for the specified window.

If this method is not implemented by the delegate, the window creates an NSUndoManager for window.

Available in Mac OS X v10.0 and later.

### 33.68.63 windowWillStartLiveResize(notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the delegate that the window is about to be live resized.
**Notes:** notification: A notification named NSWindowWillStartLiveResizeNotification.

You can retrieve the window object in question by sending object to notification.
Available in Mac OS X v10.6 and later.

### 33.68.64 windowWillUseStandardFrame(win as NSWindowMBS, newFrame as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Invoked by NSWindow's zoom: method while determining the frame a window may be zoomed to.
**Notes:** win: The window whose frame size is being determined.
newFrame: The size of the current screen, which is the screen containing the largest part of the window's current frame, possibly reduced on the top, bottom, left, or right, depending on the current interface style. The frame is reduced on the top to leave room for the menu bar.

Return the specified window's standard frame.

The standard frame for a window should supply the size and location that are "best" for the type of information shown in the window, taking into account the available display or displays. For example, the best width for a window that displays a word-processing document is the width of a page or the width of the display, whichever is smaller. The best height can be determined similarly. On return from this method, the zoom: method modifies the returned standard frame, if necessary, to fit on the current screen.

Available in Mac OS X v10.0 and later.

## 33.69 class NSWindowMBS

### 33.69.1 class NSWindowMBS

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Cocoa class for a window.
**Example:**

```
// add gray layer over Xojo window. Or hide it on second call, show on third call, etc...

If view = Nil Then
// view is property in window/module

Dim win As NSWindowMBS = Self.NSWindowMBS

view = New NSViewMBS(0, 0, Width, Height)

win.contentView.AddSubView(view)

view.wantsLayer = True
view.autoresizesSubviews = True
view.autoresizingMask = view.NSViewWidthSizable + view.NSViewHeightSizable

Dim layer As CALayerMBS = view.layer
layer.backgroundColor = CGColorMBS.CreateDeviceGray(0.3, 0.5)

Else

// show or hide
view.isHidden = Not view.isHidden

End If
```

**Notes:** Subclass of the NSResponderMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo / Real Studio plug-ins in version 16.5
- New for Mac OS X 10.10 in MBS Xojo Plugins
- Please don't call constructors outside new or constructor
- Lion features for Real Studio
- Lion arrived

- Tip of the day: a floating Cocoa HUD window
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes
- MonkeyBread Software Releases the MBS Plugins 8.2

**Xojo Developer Magazine**

- 15.1, page 9: News

### 33.69.2 Methods

### 33.69.3 addChildWindow(win as DesktopWindow, order as integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds a given window as a child window of the window.
**Notes:** win: The child window to order.
order: Either NSWindowAbove: childWindow is ordered immediately in front of the window, or NSWindowBelow: childWindow is ordered immediately behind the window.

After the childWindow is added as a child of the window, it is maintained in relative position indicated by order mode for subsequent ordering operations involving either window. While this attachment is active, moving childWindow will not cause the window to move (as in sliding a drawer in or out), but moving the window will cause childWindow to move.

Note that you should not create cycles between parent and child windows. For example, you should not add window B as child of window A, then add window A as a child of window B.
See also:


- 33.69.4 addChildWindow(win as NSWindowMBS, order as Integer) 6379
- 33.69.5 addChildWindow(win as window, order as Integer) 6380


### 33.69.4 addChildWindow(win as NSWindowMBS, order as Integer)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a given window as a child window of the window.
**Notes:** win: The child window to order.
order: Either NSWindowAbove: childWindow is ordered immediately in front of the window, or NSWindowBelow: childWindow is ordered immediately behind the window.

After the childWindow is added as a child of the window, it is maintained in relative position indicated by order mode for subsequent ordering operations involving either window. While this attachment is active, moving childWindow will not cause the window to move (as in sliding a drawer in or out), but moving the window will cause childWindow to move.

Note that you should not create cycles between parent and child windows. For example, you should not add window B as child of window A, then add window A as a child of window B.
See also:


- 33.69.3 addChildWindow(win as DesktopWindow, order as integer) 6379
- 33.69.5 addChildWindow(win as window, order as Integer) 6380


### 33.69.5 addChildWindow(win as window, order as Integer)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a given window as a child window of the window.
**Notes:** win: The child window to order.
order: Either NSWindowAbove: childWindow is ordered immediately in front of the window, or NSWindowBelow: childWindow is ordered immediately behind the window.

After the childWindow is added as a child of the window, it is maintained in relative position indicated by order mode for subsequent ordering operations involving either window. While this attachment is active, moving childWindow will not cause the window to move (as in sliding a drawer in or out), but moving the window will cause childWindow to move.

Note that you should not create cycles between parent and child windows. For example, you should not add window B as child of window A, then add window A as a child of window B.
See also:


- 33.69.3 addChildWindow(win as DesktopWindow, order as integer) 6379
- 33.69.4 addChildWindow(win as NSWindowMBS, order as Integer) 6379


### 33.69.6 addTabbedWindow(win as NSWindowMBS, ordered as Integer)

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Allows creating a group of tabbed windows, or adding a new window to an existing tabbed window group.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS

n.addTabbedWindow(Window2, n.NSWindowAbove)
```

**Notes:** The 'window' will be added to the receiver's tabbed window group, or create a group if needed. The tabbingIdentifier for the entire group should be the same for all the windows, otherwise an exception will be thrown. Use the ordered parameter with "NSWindowAbove" and "NSWindowBelow" to place the new window before or after the receiver's tab. Passing "NSWindowOut" will thrown an exception. Currently this method is not animatable, but that may change in the future.
Raises an exception when used on OS X 10.11 and older.

### 33.69.7 animator as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the proxy object for this window which animates.
**Example:**

```
dim v as NSWindowMBS // your NSWindowMBS object

v.alphaValue = 0.5 // switch alpha directly
v.animator.alphaValue = 0.5 // switch alpha animated
```

### 33.69.8 areCursorRectsEnabled as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the window's cursor rectangles are enabled.
**Notes:** Available in Mac OS X v10.0 and later.

### 33.69.9 attachedSheet as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the sheet attached to the window.
**Notes:** The sheet attached to the window; nil when the window doesn't have a sheet attached.

Available in Mac OS X v10.1 and later.

### 33.69.10 autorecalculatesContentBorderThicknessForEdge(edge as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window calculates the thickness of a given border automatically.
**Notes:** edge: Border whose thickness autorecalculation status to set:

NSMaxYEdge: Top border.
NSMinYEdge: Bottom border.

Returns true when the window auto-recalculates the given border's thickness; otherwise, false.

Requires Mac OS X 10.5.

### 33.69.11 becomeKeyWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invoked automatically to inform the window that it has become the key window; never invoke this method directly.
**Notes:** This method reestablishes the window's first responder, sends the becomeKeyWindow message to that object if it responds, and posts an NSWindowDidBecomeKeyNotification to the default notification center.

### 33.69.12 becomeMainWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invoked automatically to inform the window that it has become the main window; never invoke this method directly.

### 33.69.13 cacheImageInRect(r as NSRectMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Stores the window's raster image from a given rectangle expressed in the window's base coordinate system.
**Notes:** This method allows the window to perform temporary drawing, such as a band around the selection as the user drags the mouse, and to quickly restore the previous image by invoking restoreCachedImage and flushWindowIfNeeded. The next time the window displays, it discards its cached image rectangles. You can

also explicitly use discardCachedImage to free the memory occupied by cached image rectangles. aRect is made integral before caching the image to avoid antialiasing artifacts.

Only the last cached rectangle is remembered and can be restored.

### 33.69.14 Center

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the window's location to the center of the screen.
**Notes:** The window is placed exactly in the center horizontally and somewhat above center vertically. Such a placement carries a certain visual immediacy and importance. This method doesn't put the receiver on-screen, however; use makeKeyAndOrderFront (show) to do that.

You typically use this method to place a window—most likely an alert dialog—where the user can't miss it. This method is invoked automatically when a panel is placed on the screen by the runModalForWindow method of the NSApplication class.

### 33.69.15 childWindows as NSWindowMBS()

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of the window's attached child windows.

### 33.69.16 ClearFocus

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Clears the focus.
**Notes:** Moves the focus back to the window.

### 33.69.17 Close

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Closes the window.

### 33.69.18 Constructor(w as DesktopWindow)

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSWindow for the given Xojo window.
**Example:**

```
dim w as new NSWindowMBS(window1)

MsgBox w.Title
```

See also:

- 33.69.19 Constructor(w as window) 6384
- 33.69.20 Constructor(x as Double, y as Double, w as Double, h as Double, styleMask as Integer, BackingStoreType as Integer = 0, deferCreation as boolean = false, canBecomeKeyWindow as boolean = false) 6384

### 33.69.19 Constructor(w as window)

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSWindow for the given Xojo window.
**Example:**

```
dim w as new NSWindowMBS(window1)

MsgBox w.Title
```

**Notes:** In plugin version 9.4 and newer this works only with Cocoa windows.
In plugin version 9.7 and newer you can use it also for Carbon windows.
See also:

- 33.69.18 Constructor(w as DesktopWindow) 6384
- 33.69.20 Constructor(x as Double, y as Double, w as Double, h as Double, styleMask as Integer, BackingStoreType as Integer = 0, deferCreation as boolean = false, canBecomeKeyWindow as boolean = false) 6384

### 33.69.20 Constructor(x as Double, y as Double, w as Double, h as Double, styleMask as Integer, BackingStoreType as Integer = 0, deferCreation as boolean = false, canBecomeKeyWindow as boolean = false)

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor to create a new Cocoa Windows.
**Notes:** x,y,w,h:
Location and size of the window's content area in screen coordinates. Note that the window server limits window position coordinates to ¬±16,000 and sizes to 10,000.

styleMask:
The window's style. Either it can be NSBorderlessWindowMask, or it can contain any of the options described in the constants, combined using the bitwiseOR function. Borderless windows display none of the usual peripheral elements and are generally useful only for display or caching purposes; you should normally not need to create them. Also, note that a window's style mask should include NSTitledWindowMask if it includes any of the others.

bufferingType:
Specifies how the drawing done in the window is buffered by the window device, and possible values are described in "Constants."

deferCreation:
Specifies whether the window server creates a window device for the window immediately. When true, the window server defers creating the window device until the window is moved onscreen. All display messages sent to the window or its views are postponed until the window is created, just before it's moved onscreen.

Initialized NSWindow object.

This method is the designated initializer for the NSWindow class.

Deferring the creation of the window improves launch time and minimizes the virtual memory load on the window server.

The new window creates a view to be its default content view. You can replace it with your own object by using the ContentView property.

Parameter canBecomeKeyWindow (in 11.3 plugin) controls whether we use a special NSWindow subclass which returns true for the canBecomeKeyWindow function. This way you can create windows which can take key focus.
See also:


- 33.69.18 Constructor(w as DesktopWindow) 6384
- 33.69.19 Constructor(w as window) 6384


### 33.69.21 contentBorderThicknessForEdge(edge as Integer) as Double

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates the thickness of a given border of the window.
**Notes:** edge: The border whose thickness to get:

NSMaxYEdge: Top border.
NSMinYEdge: Bottom border.

Requires Mac OS X 10.5.

### 33.69.22 contentRectForFrameRect(windowFrame as NSRectMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the window's content rectangle with a given frame rectangle.
**Example:**

```
dim w as NSWindowMBS = window1.NSWindowMBS
dim fr as NSRectMBS = w.frame
dim cr as NSRectMBS = w.contentRectForFrameRect(fr)

MsgBox "Title height: "+str(fr.Height-cr.Height)
```

**Notes:** windowFrame: The frame rectangle for the window expressed in screen coordinates.

Returns the window's content rectangle, expressed in screen coordinates, with windowFrame.

The window uses its current style mask in computing the content rectangle. See Window Style Mask constants for a list of style mask values. The main advantage of this instance-method counterpart to contentRectForFrameRect (With styleMask) is that it allows you to take toolbars into account when converting between content and frame rectangles. (The toolbar is not included in the content rectangle.)
See also:

- 33.69.23 contentRectForFrameRect(windowFrame as NSRectMBS, styleMask as UInt32) as NSRectMBS 6386

### 33.69.23 contentRectForFrameRect(windowFrame as NSRectMBS, styleMask as UInt32) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the content rectangle used by a window with a given frame rectangle and window style.
**Notes:** windowFrame: The frame rectangle for the window expressed in screen coordinates.

windowStyle: The window style for the window. See constants for a list of style mask values.

Returns the content rectangle, expressed in screen coordinates, used by the window with windowFrame and windowStyle.
When a NSWindowMBS instance is available, you should use contentRectForFrameRect instead of this method.
See also:

- 33.69.22 contentRectForFrameRect(windowFrame as NSRectMBS) as NSRectMBS 6386

### 33.69.24 convertBaseToScreen(p as NSPointMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a given point from the window's base coordinate system to the screen coordinate system.

### 33.69.25 convertScreenToBase(p as NSPointMBS) as NSPointMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a given point from the screen coordinate system to the window's base coordinate system.

### 33.69.26 dataWithEPSInsideRect(r as NSRectMBS) as Memoryblock

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns EPS data that draws the region of the window within a given rectangle.
**Notes:** This data can be placed on a pasteboard, written to a file, or used to create an NSImage object.

### 33.69.27 dataWithPDFInsideRect(r as NSRectMBS) as Memoryblock

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns PDF data that draws the region of the window within a given rectangle.
**Notes:** This data can be placed on a pasteboard, written to a file, or used to create an NSImage object.

### 33.69.28 deminiaturize

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method deminimizes the receiver.
**Notes:** Invoke this method to programmatically deminimize a minimized window in the Dock.

### 33.69.29 disableCursorRects

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Disables all cursor rectangle management within the window.
**Notes:** Use this method when you need to do some special cursor manipulation and you don't want the Application Kit interfering.

### 33.69.30 disableFlushWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Disables the flushWindow method for the window.
**Notes:** If the window is buffered, disabling flushWindow prevents drawing from being automatically flushed by the NSView display... methods from the window's backing store to the screen. This method permits several views to be drawn before the results are shown to the user.

Flushing should be disabled only temporarily, while the window's display is being updated. Each disableFlushWindow message must be paired with a subsequent enableFlushWindow message. Invocations of these methods can be nested; flushing isn't reenabled until the last (unnested) enableFlushWindow message is sent.

### 33.69.31 disableScreenUpdatesUntilFlush

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Disables the window's screen updates until the window is flushed.
**Notes:** This method can be invoked to synchronize hardware surface flushes with the window's flushes. The window immediately disables screen updates using the NSDisableScreenUpdates function and reenables screen updates when the window flushes. Sending this message multiple times during a window update cycle has no effect.

Available in Mac OS X v10.4 and later.

### 33.69.32 disableSnapshotRestoration

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Disable snapshot restoration.
**Notes:** While snapshot restoration is disabled, the window will not be snapshotted for restorable state. Available in OS X v10.7 and later.

### 33.69.33 discardCachedImage

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Discards all of the window's cached image rectangles.
**Notes:** An NSWindow object automatically discards its cached image rectangles when it displays.

### 33.69.34 discardCursorRects

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invalidates all cursor rectangles in the window.
**Notes:** This method is invoked by resetCursorRects to clear out existing cursor rectangles before resetting them. You shouldn't invoke it in the code you write, but you might want to override it to change its behavior.

### 33.69.35 display

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Passes a display message down the window's view hierarchy, thus redrawing all views within the window, including the frame view that draws the border, title bar, and other peripheral elements.
**Notes:** You rarely need to invoke this method. NSWindow objects normally record which of their views need display and display them automatically on each pass through the event loop.

### 33.69.36 displayIfNeeded

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Passes a displayIfNeeded message down the window's view hierarchy, thus redrawing all views that need to be displayed, including the frame view that draws the border, title bar, and other peripheral elements.
**Notes:** This method is useful when you want to modify some number of views and then display only the ones that were modified.

You rarely need to invoke this method. NSWindow objects normally record which of their views need display and display them automatically on each pass through the event loop.

### 33.69.37 dockTile as Variant

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Provides the application's Dock tile.
**Notes:** Available in Mac OS X v10.5 and later.

Returns NSDockTileMBS object for the dock tile.

### 33.69.38 dragImage(image as NSImageMBS, viewLocation as NSPointMBS, offset as NSSizeMBS, NSEvent as NSEventMBS, pboard as NSPasteboardMBS, source as NSViewMBS, slideFlag as boolean)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Begins a dragging session.
**Notes:** image: The object to be dragged.
imageLocation: Location of the image's bottom-left corner in the window's coordinate system. It determines the placement of the dragged image under the pointer.
offset: The pointer's location relative to the mouse-down location. Not used in OS X v10.4 and later.
NSEvent: The left-mouse down event that triggered the dragging operation.
pasteboard: The pasteboard that holds the data to be transferred to the destination.
source: The object serving as the controller of the dragging operation. It must conform to the NSDraggingSource protocol.
slideBack: Specifies whether the drag image should slide back to imageLocation if it's rejected by the drag destination. Pass true to specify slide back behavior or false to specify that it should not.

This method should be invoked only from within a view's implementation of the mouseDown or mouseDragged methods (which overrides the version defined in NSResponder class). Essentially the same as the NSView method of the same name, except that imageLocation is given in the NSWindow object's base coordinate system.

### 33.69.39 enableCursorRects

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reenables cursor rectangle management within the window after a disableCursorRects message.

### 33.69.40 enableFlushWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reenables the flushWindow method for the window after it was disabled through a previous disableFlushWindow message.

### 33.69.41 enableSnapshotRestoration

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Enable snapshot restoration.
**Notes:** While snapshot restoration is enabled, the window will be snapshotted for restorable state.
Available in OS X v10.7 and later.

### 33.69.42 endEditingFor(anObject as object = nil)

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Forces the field editor to give up its first responder status and prepares it for its next assignment.
**Notes:** anObject: The object that is using the window's field editor.

If the field editor is the first responder, it's made to resign that status even if its resignFirstResponder method returns false. This registration forces the field editor to send a textDidEndEditing message to its delegate. The field editor is then removed from the view hierarchy, its delegate is set to nil, and it's emptied of any text it may contain.

This method is typically invoked by the object using the field editor when it's finished. Other objects normally change the first responder by simply using makeFirstResponder, which allows a field editor or other object to retain its first responder status if, for example, the user has entered an invalid value. The endEditingFor: method should be used only as a last resort if the field editor refuses to resign first responder status. Even in this case, you should always allow the field editor a chance to validate its text and take whatever other action it needs first. You can do this by first trying to make the NSWindow object the first responder.

### 33.69.43 fieldEditor(createFlag as boolean = True, forObject as object = nil) as Variant

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the window's field editor, creating it if requested.
**Notes:** Returns NSTextMBS object. Returned as Variant to reduce plugin dependencies.

createWhenNeeded: If true, creates a field editor if one doesn't exist; if false, does not create a field editor. A freshly created NSWindow object doesn't have a field editor. After a field editor has been created for a window, the createWhenNeeded argument is ignored. By passing false for createWhenNeeded and testing

the return value, however, you can predicate an action on the existence of the field editor.
forObject: A text-displaying object for which the delegate (in windowWillReturnFieldEditor) assigns a custom field editor. Pass nil to get the default field editor, which can be the NSWindow field editor or a custom field editor returned by the delegate.

Returns the field editor for the designated object (anObject) or, if anObject is nil, the default field editor. Returns nil if createFlag is false and if the field editor doesn't exist.

The field editor is a single NSTextView object that is shared among all the controls in a window for light text-editing needs. It is automatically instantiated when needed, and it can be used however your application sees fit. Typically, the field editor is used by simple text-bearing objects—for example, an NSTextField object uses its window's field editor to display and manipulate text. The field editor can be shared by any number of objects, and so its state may be constantly changing. Therefore, it shouldn't be used to display text that demands sophisticated layout (for this you should create a dedicated NSTextView object).

The field editor may be in use by some view object, so be sure to properly dissociate it from that object before actually using it yourself (the appropriate way to do this is illustrated in the description of endEditingFor:). Once you retrieve the field editor, you can insert it in the view hierarchy, set a delegate to interpret text events, and have it perform whatever editing is needed. Then, when it sends a textDidEndEditing message to the delegate, you can get its text to display or store and remove the field editor using endEditingFor.

The window's delegate can substitute a custom field editor in place of the window's field editor by implementing windowWillReturnFieldEditor. The custom field editor can become the default editor (common to all text-displaying objects) or specific to a particular text-displaying object (anObject). The window sends this message to its delegate with itself and anObject as the arguments; if the delegate returns a non-nil value, the window returns that object instead of its field editor in fieldEditor. However, note the following:

If the window's delegate is identical to anObject, windowWillReturnFieldEditor isn't sent to the delegate.
The object returned by the delegate method, though it may become first responder, does not become the window's default field editor. Other objects continue to use the window's default field editor.

### 33.69.44 firstResponder as NSResponderMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's first responder.
**Notes:** The first responder is usually the first object in a responder chain to receive an event or action message. In most cases, the first responder is a view object in that the user selects or activates with the mouse or keyboard.

You can use the firstResponder method in custom subclasses of responder classes (NSWindow, NSApplication, NSView, and subclasses) to determine if an instance of the subclass is currently the first responder. You can also use it to help locate a text field that currently has first-responder status. For more on this

subject, see Event Handling Basics (on developer.apple.com).

### 33.69.45 flushWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Flushes the window's offscreen buffer to the screen if the window is buffered and flushing is enabled.
**Notes:** Does nothing for other display devices, such as a printer. This method is automatically invoked by the NSWindow display and displayIfNeeded methods and the corresponding NSView display and displayIfNeeded methods.

### 33.69.46 flushWindowIfNeeded

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Flushes the window's offscreen buffer to the screen if flushing is enabled and if the last flushWindow message had no effect because flushing was disabled.
**Notes:** To avoid unnecessary flushing, use this method rather than flushWindow to flush an NSWindow object after flushing has been reenabled.

### 33.69.47 frameRectForContentRect(windowContent as NSRectMBS) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the window's frame rectangle with a given content rectangle.
**Notes:** windowContent: The content rectangle for the window expressed in screen coordinates.

Returns the window's frame rectangle, expressed in screen coordinates, with windowContent.

The window uses its current style mask in computing the frame rectangle. See "Window Style Masks" for a list of style mask values. The major advantage of this instance-method counterpart to frameRectForContentRect (with styleMask) is that it allows you to take toolbars into account when converting between content and frame rectangles. (The toolbar is included in the frame rectangle but not the content rectangle.)
See also:

- 33.69.48 frameRectForContentRect(windowContentRect as NSRectMBS, styleMask as UInt32) as NSRectMBS 6394

### 33.69.48 frameRectForContentRect(windowContentRect as NSRectMBS, styleMask as UInt32) as NSRectMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the frame rectangle used by a window with a given content rectangle and window style.
**Notes:** windowContentRect: The content rectangle for a window expressed in screen coordinates.
windowStyle: The window style for the window. See Window Style Mask constants for a list of style mask values.

Returns the frame rectangle, expressed in screen coordinates, used by the window with windowContentRect and windowStyle.
When a NSWindowMBS instance is available, you should use frameRectForContentRect instead of this method.
See also:

- 33.69.47 frameRectForContentRect(windowContent as NSRectMBS) as NSRectMBS 6393

### 33.69.49 GetFrame(byref left as Double, byref top as Double, byref width as Double, byref height as Double)

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asks for the current window dimensions.
**Notes:** The point 0/0 is on the left bottom position.

### 33.69.50 gState as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the window's graphics state object.
**Notes:** This graphics state is used by default for all NSView objects in the window's view hierarchy, but individual views can be made to use their own with the NSView method allocateGState.

### 33.69.51 Hide

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Hides the window.

### 33.69.52 inLiveResize as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window is being resized by the user.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.69.53 invalidateCursorRectsForView(View as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Marks as invalid the cursor rectangles of a given NSView object in the window's view hierarchy, so they'll be set up again when the window becomes key (or immediately if the window is key).

### 33.69.54 invalidateRestorableState

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Method that you may call to indicate that the restorable state is invalid.
**Notes:** At some point in the future, encodeRestorableStateWithCoder: will be called to encode the restorable state. You should not override this method.

### 33.69.55 invalidateShadow

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invalidates the window shadow so that it is recomputed based on the current window shape.

### 33.69.56 keyDown(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Handles a given keyboard event that may need to be interpreted as changing the key view or triggering a keyboard equivalent.
**Notes:** event: The keyboard event to process.

### 33.69.57 makeFirstResponder(r as NSResponderMBS) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Attempts to make a given responder the first responder for the window.
**Example:**

```
dim MySearchField as NSViewMBS // your control to move focus to
dim w as new NSWindowMBS(window1)
call w.makeFirstResponder(MySearchField)
```

**Notes:** responder: The responder to set as the window's first responder. nil makes the window its first responder.

Returns true when the operation is successful; otherwise, false.

If responder isn't already the first responder, this method first sends a resignFirstResponder message to the object that is the first responder. If that object refuses to resign, it remains the first responder, and this method immediately returns false. If the current first responder resigns, this method sends a becomeFirstResponder message to responder. If responder does not accept first responder status, the NSWindow object becomes first responder; in this case, the method returns true even if responder refuses first responder status.

If responder is nil, this method still sends resignFirstResponder to the current first responder. If the current first responder refuses to resign, it remains the first responder and this method immediately returns false. If the current first responder returns true from resignFirstResponder, the window is made its own first responder and this method returns true.

The Application Kit framework uses this method to alter the first responder in response to mouse-down events; you can also use it to explicitly set the first responder from within your program. The responder object is typically an NSView object in the window's view hierarchy. If this method is called explicitly, first send acceptsFirstResponder to responder, and do not call makeFirstResponder if acceptsFirstResponder returns false.

Use setInitialFirstResponder to the set the first responder to be used when the window is brought onscreen for the first time.

### 33.69.58 makeKeyAndOrderFront

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the window to the front of the screen list, within its level, and makes it the key window; that is, it shows the window.
**Notes:** More or less the same as Xojo's show command on the window class.

### 33.69.59 makeKeyWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Makes the window the key window.

### 33.69.60 makeMainWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Makes the window the main window.

### 33.69.61 mergeAllWindows

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Merges all windows into one window.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.mergeAllWindows
```

**Notes:** Raises an exception when used on OS X 10.11 and older.

### 33.69.62 minFrameWidthWithTitle(WindowTitle as string, styleMask as UInt32) as Double

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the minimum width a window's frame rectangle must have for it to display a title, with a given window style.
**Example:**

```
// shows 84.77588
MsgBox str(NSWindowMBS.minFrameWidthWithTitle("Hello World",0))
```

**Notes:** windowTitle: The title for the window.
windowStyle: The window style for the window. See Window Style Mask constants for a list of style mask values.

The minimum width of the window's frame, using windowStyle, in order to display windowTitle.

### 33.69.63 miniaturize

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method removes the receiver from the screen list and displays the minimized window in the Dock.

### 33.69.64 moveTabToNewWindow

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves current tab to a new window.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.moveTabToNewWindow
```

**Notes:** Raises an exception when used on OS X 10.11 and older.

### 33.69.65 NSDockWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for the doc. (Deprecated. There is no replacement.)

### 33.69.66 NSFloatingWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** Useful for floating palettes.

### 33.69.67 NSMainMenuWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** Reserved for the application's main menu.

### 33.69.68 NSModalPanelWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for a modal panel.

### 33.69.69 NSNormalWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The default level for NSWindow objects.

### 33.69.70 NSPopUpMenuWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for a pop-up menu.

### 33.69.71 NSScreenSaverWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for a screen saver.

### 33.69.72 NSStatusWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for a status window.

### 33.69.73 NSSubmenuWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** Reserved for submenus. Synonymous with NSTornOffMenuWindowLevel, which is preferred.

### 33.69.74 NSTornOffMenuWindowLevel as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the standard window levels in Mac OS X.
**Notes:** The level for a torn-off menu. Synonymous with NSSubmenuWindowLevel.

### 33.69.75 NSWindowDidBecomeKeyNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object becomes the key window.

The notification object is the NSWindow object that has become key. This notification does not contain a userInfo dictionary.

### 33.69.76 NSWindowDidBecomeMainNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object becomes the main window.

The notification object is the NSWindow object that has become main. This notification does not contain a userInfo dictionary.

### 33.69.77 NSWindowDidChangeScreenNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever a portion of an NSWindow object's frame moves onto or off of a screen.

The notification object is the NSWindow object that has changed screens. This notification does not contain a userInfo dictionary.

This notification is not sent in Mac OS X versions earlier than 10.4.

### 33.69.78 NSWindowDidChangeScreenProfileNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever the display profile for the screen containing the window changes.

This notification is sent only if the window returns true from displaysWhenScreenProfileChanges. This notification may be sent when a majority of the window is moved to a different screen (whose profile is also different from the previous screen) or when the ColorSync profile for the current screen changes.

The notification object is the NSWindow object whose profile changed. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.4 and later.

### 33.69.79 NSWindowDidDeminiaturizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is deminimized.

The notification object is the NSWindow object that has been deminimized. This notification does not contain a userInfo dictionary.

### 33.69.80 NSWindowDidEndLiveResizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted after the user resizes a window.

This notification is sent only once for a series of window resize operations.

The notification object is the NSWindow object that was resized. This notification does not contain a user-Info dictionary.

Available in Mac OS X v10.6 and later.

### 33.69.81 NSWindowDidEndSheetNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object closes an attached sheet.

The notification object is the NSWindow object that contained the sheet. This notification does not contain a userInfo dictionary.

### 33.69.82 NSWindowDidEnterFullScreenNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window entered full screen mode.
The notification object is the NSWindow object entered full screen mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.83 NSWindowDidEnterVersionBrowserNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will exit full screen mode.
The notification object is the NSWindow object that will exit full screen mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.84 NSWindowDidExitFullScreenNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will exit full screen mode.
The notification object is the NSWindow object that will exit full screen mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.85 NSWindowDidExitVersionBrowserNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window did exit version browser mode.
The notification object is the NSWindow object that did exit version browser mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.86 NSWindowDidExposeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever a portion of a nonretained NSWindow object is exposed, whether by being ordered in front of other windows or by other windows being removed from in front of it.

The notification object is the NSWindow object that has been exposed. The userInfo dictionary contains the following information:

| Key | Value |
|---|---|
| NSExposedRect | The rectangle that has been exposed (NSRect). |

### 33.69.87 NSWindowDidMiniaturizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is minimized.

The notification object is the NSWindow object that has been minimized. This notification does not contain a userInfo dictionary.

### 33.69.88 NSWindowDidMoveNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is moved.

The notification object is the NSWindow object that has moved. This notification does not contain a user-Info dictionary.

Note: This notification is sent when the window that moved didn't also change size. See NSWindowDidResizeNotification for more information.

### 33.69.89 NSWindowDidResignKeyNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object resigns its status as key window.

The notification object is the NSWindow object that has resigned its key window status. This notification does not contain a userInfo dictionary.

### 33.69.90 NSWindowDidResignMainNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object resigns its status as main window.

The notification object is the NSWindow object that has resigned its main window status. This notification does not contain a userInfo dictionary.

### 33.69.91 NSWindowDidResizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object's size changes.

The notification object is the NSWindow object whose size has changed. This notification does not contain a userInfo dictionary.

### 33.69.92 NSWindowDidUpdateNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object receives an update message.

The notification object is the NSWindow object that received the update message. This notification does not contain a userInfo dictionary.

### 33.69.93 NSWindowWillBeginSheetNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is about to open a sheet.

The notification object is the NSWindow object that is about to open the sheet. This notification does not contain a userInfo dictionary.

### 33.69.94 NSWindowWillCloseNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is about to close.

The notification object is the NSWindow object that is about to close. This notification does not contain a userInfo dictionary.

### 33.69.95 NSWindowWillEnterFullScreenNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will enter full screen mode.
The notification object is the NSWindow object will enter full screen mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.96 NSWindowWillEnterVersionBrowserNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will enter version browser mode.
The notification object is the NSWindow object that will enter version browser mode. This notification does not contain a userInfo dictionary.
Available in Mac OS X v10.7 and later.

### 33.69.97 NSWindowWillExitFullScreenNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will exit full screen mode.
The notification object is the NSWindow object that will exit full screen mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.98 NSWindowWillExitVersionBrowserNotification as string

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted when the window will exit version browser mode.
The notification object is the NSWindow object that will exit version browser mode. This notification does not contain a userInfo dictionary.

Available in Mac OS X v10.7 and later.

### 33.69.99 NSWindowWillMiniaturizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is about to be minimized.

The notification object is the NSWindow object that is about to be minimized. This notification does not contain a userInfo dictionary.

### 33.69.100 NSWindowWillMoveNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted whenever an NSWindow object is about to move.

The notification object is the NSWindow object that is about to move. This notification does not contain a userInfo dictionary.

### 33.69.101 NSWindowWillStartLiveResizeNotification as string

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification strings you can use with the NSNotification* classes.
**Notes:** Posted before the user resizes a window.
This notification is sent only once for a series of window resize operations.
The notification object is the NSWindow object that is about to be live resized. This notification does not contain a userInfo dictionary.
Available in Mac OS X v10.6 and later.

### 33.69.102 orderBack

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the window to the back of its level in the screen list, without changing either the key window or the main window.

### 33.69.103 orderFront

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the window to the front of its level in the screen list, without changing either the key window or the main window.

### 33.69.104 orderFrontRegardless

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the window to the front of its level, even if its application isn't active, without changing either the key window or the main window.
**Notes:** Normally an NSWindow object can't be moved in front of the key window unless it and the key window are in the same application. You should rarely need to invoke this method; it's designed to be used when applications are cooperating in such a way that an active application (with the key window) is using another application to display data.

Available in Mac OS X v10.0 and later.

### 33.69.105 orderOut

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the window from the screen list, which hides the window.
**Notes:** More or less the same as Xojo's hide command on the window class.

If the window is the key or main window, the NSWindow object immediately behind it is made key or main in its place. Calling the orderOut method causes the window to be removed from the screen, but does not cause it to be released. See the close method for information on when a window is released.

The default animation based on the window type will be used when the window is ordered out unless it has been modified by the setAnimationBehavior method.

### 33.69.106 PerformClose

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method simulates the user clicking the close button by momentarily highlighting the button and then closing the window.
**Notes:** Same as if the user clicks the close button.

So if the button is disabled or closing is not permitted by the window, it will do nothing.

### 33.69.107 performMiniaturize

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method simulates the user clicking the minimize button by momentarily highlighting the button, then minimizing the window.
**Notes:** If the receiver doesn't have a minimize button or can't be minimized for some reason, the system emits the alert sound.

### 33.69.108 performWindowDragWithEvent(event as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Starts a drag based on the specified mouse-down event.
**Notes:** event: The original mouse-down event received by the application or a view. If you don't have a NSEvent object, please pass the one from NSApplicationMBS.currentEvent here.

Your application (or a view) can call this method after receiving and examining a mouse-down event. Upon examination of the event, a view may allow that portion of the window to start a window drag and can hand off the work to the Window Server process by calling this method. Doing so allows the window to participate in space switching and other system features.
This method returns right away, and a mouse-up event may not get sent.

### 33.69.109 performZoom

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method simulates the user clicking the zoom box by momentarily highlighting the button and then zooming the window.
**Notes:** If the receiver doesn't have a zoom box or can't be zoomed for some reason, the computer beeps.

### 33.69.110 print

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method runs the Print panel, and if the user chooses an option other than canceling, prints the window (its frame view and all subviews).

### 33.69.111 registerForDraggedTypes(Types() as string)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Registers a give set of pasteboard types as the pasteboard types the window will accept as the destination of an image-dragging session.
**Notes:** Types: An array of the pasteboard types the window will accept as the destination of an image-dragging session.

Registering an NSWindow object for dragged types automatically makes it a candidate destination object for a dragging session. NSWindow has a default implementation for many of the methods in the NSDraggingDestination informal protocol. The default implementation forwards each message to the delegate if the delegate responds to the selector of the message. The messages forwarded this way are draggingEntered:, draggingUpdated:, draggingExited:, prepareForDragOperation:, performDragOperation:, and concludeDragOperation:.

Xojo with Cocoa target implements the methods listed above. So this method is useful to change the allowed types for the case the framework has a bug.

### 33.69.112 removeChildWindow(win as NSWindowMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Detaches a given child window from the window.
**Notes:** win: The child window to detach.
See also:

- 33.69.113 removeChildWindow(win as window) 6410

### 33.69.113 removeChildWindow(win as window)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Detaches a given child window from the window.
**Notes:** win: The child window to detach.
See also:

- 33.69.112 removeChildWindow(win as NSWindowMBS) 6410

### 33.69.114 removeFrameUsingName(name as string)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the frame data stored under a given name from the application's user defaults.

### 33.69.115 resetCursorRects

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Clears the window's cursor rectangles and the cursor rectangles of the NSView objects in its view hierarchy.
**Notes:** Invokes discardCursorRects to clear the window's cursor rectangles, then sends resetCursorRects to every NSView object in the window's view hierarchy.

This method is typically invoked by the NSApplication object when it detects that the key window's cursor rectangles are invalid. In program code, it's more efficient to invoke invalidateCursorRectsForView.

### 33.69.116 resignKeyWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invoked automatically when the window resigns key window status; never invoke this method directly.
**Notes:** This method sends resignKeyWindow to the window's first responder, sends windowDidResignKey to the window's delegate, and posts an NSWindowDidResignKeyNotification to the default notification center.

### 33.69.117 resignMainWindow

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invoked automatically when the window resigns main window status; never invoke this method directly.
**Notes:** This method sends windowDidResignMain to the window's delegate and posts an NSWindowDidResignMainNotification to the default notification center.

### 33.69.118 resizeFlags as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the flags field of the event record for the mouse-down event that initiated the resizing session.
**Notes:** A mask indicating which of the modifier keys was held down when the mouse-down event occurred.

The flags are listed in NSEvent object's modifierFlags method description.

This method is valid only while the window is being resized

You can use this method to constrain the direction or amount of resizing. Because of its limited validity, this method should only be invoked from within an implementation of the delegate method windowWillResize.

### 33.69.119 restoreCachedImage

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Splices the window's cached image rectangles, if any, back into its raster image (and buffer if it has one), undoing the effect of any drawing performed within those areas since they were established using cacheImageInRect.
**Notes:** You must invoke flushWindow after this method to guarantee proper redisplay. An NSWindow object automatically discards its cached image rectangles when it displays.

### 33.69.120 runToolbarCustomizationPalette

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The action method for the "Customize Toolbar..." menu item.

### 33.69.121 saveFrameUsingName(s as String)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Saves the window's frame rectangle in the user defaults system under a given name.
**Notes:** With the companion method setFrameUsingName, you can save and reset an NSWindow object's frame over various launches of an application. The default is owned by the application and stored under the name "NSWindow Frame frameName". See NSUserDefaults for more information.

### 33.69.122 selectKeyViewFollowingView(view as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Makes key the view that follows the given view.
**Notes:** Sends the nextValidKeyView message to referenceView and, if that message returns an NSView object, invokes makeFirstResponder with the returned object.

### 33.69.123 selectKeyViewPrecedingView(view as NSViewMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Makes key the view that follows the given view.
**Notes:** Sends the nextValidKeyView message to referenceView and, if that message returns an NSView object, invokes makeFirstResponder with the returned object.

### 33.69.124 selectNextKeyView

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method searches for a candidate next key view and, if it finds one, invokes makeFirstResponder to establish it as the first responder.
**Notes:** The candidate is one of the following (searched for in this order):

- The current first responder's next valid key view, as returned by the nextValidKeyView method of NSView
- The object designated as the window's initial first responder (using setInitialFirstResponder) if it returns true to an acceptsFirstResponder message
- Otherwise, the initial first responder's next valid key view, which may end up being nil

### 33.69.125 selectNextTab

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Selects next tab.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.selectNextTab
```

**Notes:** Raises an exception when used on OS X 10.11 and older.

### 33.69.126 selectPreviousKeyView

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method searches for a candidate previous key view and, if it finds one, invokes makeFirstResponder to establish it as the first responder.

**Notes:** The candidate is one of the following (searched for in this order):

- The current first responder's previous valid key view, as returned by the previousValidKeyView method of NSView
- The object designated as the window's initial first responder (using setInitialFirstResponder) if it returns true to an acceptsFirstResponder message
- Otherwise, the initial first responder's previous valid key view, which may end up being nil

### 33.69.127 selectPreviousTab

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Selects previous tab.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.selectPreviousTab
```

**Notes:** Raises an exception when used on OS X 10.11 and older.

### 33.69.128 sendEvent(e as NSEventMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method dispatches mouse and keyboard events sent to the window by the NSApplication object.
**Notes:** Never invoke this method directly. A right mouse-down event in a window of an inactive application is not delivered to the corresponding NSWindow object. It is instead delivered to the NSApplication object through a sendEvent: message with a window number of 0.

### 33.69.129 setAutorecalculatesContentBorderThickness(flag as boolean, edge as Integer)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether the window calculates the thickness of a given border automatically.
**Notes:** flag: If true, the window calculates the thickness of the edge automatically; if false, it does not.

edge: The border whose thickness auto-recalculation status to set:

NSMaxYEdge: Top border.
NSMinYEdge: Bottom border.

Special Considerations
Turning off a border's auto-recalculation status sets its border thickness to 0.0.

In a non-textured window calling setAutorecalculatesContentBorderThickness passing NSMaxYEdge will raise an exception. It is only valid to set the content border thickness of the top edge in a textured window.

Requires Mac OS X 10.5.

### 33.69.130 setBottomCornerRounded(flag as boolean)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the bottom corner to be round.
**Notes:** This is an undocumented function in the NSWindow class.

### 33.69.131 setContentBorderThickness(thickness as Double, edge as Integer)

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the thickness of a given border of the window.
**Example:**

```
dim w as NSWindowMBS = window1.NSWindowMBS

w.setContentBorderThickness(30, w.NSMinYEdge) // bottom 30 pixel
w.setContentBorderThickness(20, w.NSMaxYEdge) // top 30 pixel. Window must be metal for this
```

**Notes:** thickness: The thickness for edge, in points.
edge: The border whose thickness to set:

NSMaxYEdge: Top border.
NSMinYEdge: Bottom border.

In a non-textured window calling setContentBorderThickness passing NSMaxYEdge will raise an exception. It is only valid to set the content border thickness of the top edge in a textured window.

The contentBorder does not include the titlebar or toolbar, so a textured window that just wants the gra-

dient in the titlebar and toolbar should have a contentBorderThickness of 0 for NSMaxYEdge.

Requires Mac OS X 10.5.

### 33.69.132 setContentSize(size as NSSizeMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the size of the window's content view to a given size, which is expressed in the window's base coordinate system.
**Notes:** This size in turn alters the size of the NSWindow object itself. Note that the window server limits window sizes to 10,000; if necessary, be sure to limit aSize relative to the frame rectangle.

### 33.69.133 setFrame(frameRect as NSRectMBS)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the origin and size of the window's frame rectangle according to a given frame rectangle, thereby setting its position and size onscreen.
**Notes:** frameRect: The frame rectangle for the window, including the title bar.

Note that the window server limits window position coordinates to ¬±16,000 and sizes to 10,000.
See also:


- 33.69.134 setFrame(frameRect as NSRectMBS, display as boolean) 6416
- 33.69.135 setFrame(frameRect as NSRectMBS, display as boolean, animated as boolean) 6417
- 33.69.136 SetFrame(left as Double, top as Double, width as Double, height as Double) 6417


### 33.69.134 setFrame(frameRect as NSRectMBS, display as boolean)

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the origin and size of the window's frame rectangle according to a given frame rectangle, thereby setting its position and size onscreen.
**Notes:** The point 0/0 is on the bottom left position of the main screen.
display: Specifies whether the window redraws the views that need to be displayed. When true the window sends a displayIfNeeded message down its view hierarchy, thus redrawing all views.
See also:


- 33.69.133 setFrame(frameRect as NSRectMBS) 6416
- 33.69.135 setFrame(frameRect as NSRectMBS, display as boolean, animated as boolean) 6417

- 33.69.136 SetFrame(left as Double, top as Double, width as Double, height as Double) 6417


### 33.69.135 setFrame(frameRect as NSRectMBS, display as boolean, animated as boolean)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the origin and size of the window's frame rectangle, with optional animation, according to a given frame rectangle, thereby setting its position and size onscreen.
**Notes:** The point 0/0 is on the bottom left position of the main screen.
If animated is true, the change is animated.
See also:


- 33.69.133 setFrame(frameRect as NSRectMBS) 6416
- 33.69.134 setFrame(frameRect as NSRectMBS, display as boolean) 6416
- 33.69.136 SetFrame(left as Double, top as Double, width as Double, height as Double) 6417


### 33.69.136 SetFrame(left as Double, top as Double, width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the origin and size of the window's frame rectangle according to a given frame rectangle, thereby setting its position and size onscreen.
**Notes:** The point 0/0 is on the bottom left position of the main screen.
See also:


- 33.69.133 setFrame(frameRect as NSRectMBS) 6416
- 33.69.134 setFrame(frameRect as NSRectMBS, display as boolean) 6416
- 33.69.135 setFrame(frameRect as NSRectMBS, display as boolean, animated as boolean) 6417


### 33.69.137 setFrameAutosaveName(name as String) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the name used to automatically save the window's frame rectangle in the defaults system to a given name.
**Notes:** Returns true when the frame name is set successfully; false when frameName is being used as an autosave name by another NSWindow object in the application (in which case the window's old name remains in effect).

If frameName isn't the empty string (""), the window's frame is saved as a user default (as described in saveFrameUsingName) each time the frame changes.

When the window has an autosave name, its frame data is written whenever the frame rectangle changes.

If there is a frame rectangle previously stored for frameName in the user defaults, the window's frame is set to this frame rectangle. That is, when you call this method with a previously used frameName, the window picks up the previously saved setting. For example, if you call setFrameAutosaveName for a window that is already onscreen, this method could cause the window to move to a different screen location. For this reason, it is generally better to call this method before the window is visible on screen.

Keep in mind that a window controller may change the window's position when it displays it if window cascading is turned on. To preclude the window controller from changing a window's position from the one saved in the defaults system, you must send setShouldCascadeWindows(false) to the window controller.

### 33.69.138 setFrameFromString(s as String)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the window's frame rectangle from a given string representation.
**Notes:** If the window is not resizable, this method will not resize the window. The frame is constrained according to the window's minimum and maximum size settings. This method can cause a windowWillResize event.

### 33.69.139 setFrameOrigin(point as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Positions the bottom-left corner of the window's frame rectangle at a given point in screen coordinates.
**Notes:** Note that the window server limits window position coordinates to ¬±16,000.

### 33.69.140 setFrameTopLeftPoint(point as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Positions the top-left corner of the window's frame rectangle at a given point in screen coordinates.
**Notes:** Note that the window server limits window position coordinates to ¬±16,000; if necessary, adjust aPoint relative to the window's lower-left corner to account for this limit.

### 33.69.141 setFrameUsingName(name as String, force as boolean = false) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the window's frame rectangle by reading the rectangle data stored under a given name from the defaults system.
**Notes:** Returns true when frameName is read and the frame is set successfully; otherwise, false.

The frame is constrained according to the window's minimum and maximum size settings. This method causes a windowWillResize event.

### 33.69.142 setRestorationClass

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the class to use to acquire a matching window object during subsequent launches.
**Notes:** The plugin provides a class to restore windows. See NSWindowRestoreHandlerMBS class.

The restoration class of a window is responsible for recreating not just the window but any other objects needed to manage the window. Therefore, the restoration class must be able to create (or find existing instances of) all of these objects at launch time in your application.

If you mark your windows as restorable, you must associate a restoration class with them.
Available in OS X v10.7 and later.

### 33.69.143 setTitleWithRepresentedFile(filename as folderitem)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets a given path as the window's title, formatting it as a file-system path, and records this path as the window's associated filename using setRepresentedFilename.

### 33.69.144 setTitleWithRepresentedFilename(filename as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets a given path as the window's title, formatting it as a file-system path, and records this path as the window's associated filename using setRepresentedFilename.

### 33.69.145 Show

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Shows the window.

### 33.69.146 standardWindowButton(button as Integer) as Variant

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the window button of a given window button kind in the window's view hierarchy.
**Example:**

```
// another way to disable close button on Cocoa
dim n as NSButtonMBS = window1.NSWindowMBS.standardWindowButton(NSWindowMBS.NSWindow-
CloseButton)
n.isEnabled = false

// or move to to the right
dim r as NSRectMBS = n.frame
n.frame = NSMakeRectMBS(r.x+100, r.y, r.Width, r.Height)
```

**Notes:** button: The kind of standard window button to return.

Returns Window button in the window's view hierarchy of the kind identified by windowButtonKind; nil when such button is not in the window's view hierarchy.

Declared as Variant for reduced plugin dependencies.
Button constants: NSWindowCloseButton, NSWindowDocumentIconButton, NSWindowMiniaturizeButton, NSWindowToolbarButton and NSWindowZoomButton.
See also:

- 33.69.147 standardWindowButton(button as Integer, StyleMask as Integer) as Variant 6420

### 33.69.147 standardWindowButton(button as Integer, StyleMask as Integer) as Variant

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new instance of a given standard window button, sized appropriately for a given window style.
**Notes:** button: The kind of standard window button to return.
StyleMask: The window style for which windowButtonKind is to be sized. See "Window Style Masks" for

the list of allowable values.

Returns the new window button of the kind identified by windowButtonKind; nil when no such button kind exists.

The caller is responsible for adding the button to the view hierarchy and for setting the target to be the window.

Declared as Variant for reduced plugin dependencies.
Button constants: NSWindowCloseButton, NSWindowDocumentIconButton, NSWindowMiniaturizeButton, NSWindowToolbarButton and NSWindowZoomButton
See also:

- 33.69.146 standardWindowButton(button as Integer) as Variant 6420

### 33.69.148 stringWithSavedFrame as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a string representation of the window's frame rectangle.
**Notes:** A string representation of the window's frame rectangle in a format that can be used with a later setFrameFromString method.

### 33.69.149 tabbedWindows as NSWindowMBS()

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the entire group (stack) of windows that are all visually shown together in one virtual tabbed window and associated with this particular window.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
dim windows() as NSWindowMBS = n.tabbedWindows
break // check in debugger
```

**Notes:** Operations can then be done on each window, as necessary. For instance, iterating over each window in the group and calling performClose: will close the entire stack. The result will be nil when the window is not tabbed at all (not showing a tab bar), and non-nil with at least one object when the tab bar is shown. The order of items in the array is the same order as the tabs visually shown (leading to trailing).
Raises an exception when used on OS X 10.11 and older.

### 33.69.150 toggleFullScreen

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Toggles fullscreen mode for this window.
**Example:**

```
dim w as new NSWindowMBS(window1)

// set window to have fullscreen
w.collectionBehavior = BitwiseOr(w.collectionBehavior, NSWindowMBS.NSWindowCollectionBehaviorFullScreen-
Primary)

// and switch to fullscreen
w.toggleFullScreen
```

**Notes:** Available on Mac OS X 10.7 or later.
If an application supports fullscreen, it should add a menu item to the View menu with toggleFullScreen as the action.
This method does not much if you don't mark a window to be the primary fullscreen window.

### 33.69.151 toggleTabBar

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Toggles tab bar.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.toggleTabBar
```

**Notes:** Raises an exception when used on OS X 10.11 and older.

### 33.69.152 toggleToolbarShown

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The action method for the "Hide Toolbar" menu item (which alternates with "Show Toolbar").

### 33.69.153 toolbarview as NSViewMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Convenience function to find the toolbar view on the window.
**Example:**

```
dim v as NSViewMBS = window1.NSWindowMBS.toolbarview
dim m as NSMenuMBS = v.Menu
dim i as NSMenuItemMBS = m.Item(0)
MsgBox i.title
```

**Notes:** Returns nil if there is no toolbar view.

### 33.69.154 unregisterDraggedTypes

MBS MacBase Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Unregisters the window as a possible destination for dragging operations.

### 33.69.155 update

MBS MacBase Plugin, Plugin Version: 8.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates the window.
**Notes:** The NSWindow implementation of this method does nothing more than post an NSWindowDidUpdateNotification notification to the default notification center. A subclass can override this method to perform specialized operations, but it should send an update message to super just before returning. For example, the NSMenu class implements this method to disable and enable menu commands.

An NSWindow object is automatically sent an update message on every pass through the event loop and before it's displayed onscreen. You can manually cause an update message to be sent to all visible NSWindow objects through the NSApplication updateWindows method.

### 33.69.156 useOptimizedDrawing(value as boolean)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether the window is to optimize focusing and drawing when displaying its views.
**Notes:** value: If true, the window will optimize focusing and drawing for its views; if false, it will not, in which case, the window does not preserve the Z-ordering of overlapping views when an object explicitly

sends lockFocus to a view and draws directly to it, instead of using the AppKit standard display mechanism.

The optimizations may prevent sibling subviews from being displayed in the correct order—which matters only if the subviews overlap. You should always set optimizedDrawing to true when there are no overlapping subviews within the window. The default is false.

### 33.69.157 WindowHandle as Integer

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Window handle.
**Notes:** Can be used with the CarbonWindowsEventsMBS class.
(for events like open and close)

### 33.69.158 windowNumberAtPoint(x as Double, y as Double, belowWindowWithWindowNumber as Integer = 0) as Integer

MBS MacBase Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the number of the frontmost window that would be hit by a mouseDown at the screen location point.
**Notes:** belowWindowWithWindowNumber can be specified to exclude a given window along with all windows above it, and may belong to any application. If no windows are to be excluded, specify 0 for belowWindowWithWindowNumber. The windowNumber returned may correspond to a window in another application.
Requires Mac OS X 10.6 or newer.

### 33.69.159 windowNumbersWithOptions(options as Integer = 0) as Integer()

MBS MacBase Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of integers containing windowNumbers for all visible windows satisfying options.
**Example:**

```
dim windowNumbers1() as Integer
dim windowNumbers2() as Integer
dim windowNumbers3() as Integer

// To get an array of windowNumbers visible on the current space and belonging to the calling application:
windowNumbers1 = NSWindowMBS.windowNumbersWithOptions(0)
// To get an array of windowNumbers visible on any space and belonging to any application:
```

windowNumbers2 = NSWindowMBS.windowNumbersWithOptions(NSWindowMBS.NSWindowNumberListAllApplications+NSWindowMBS.NSWindowNumberListAllSpaces)
// To get an array of windowNumbers visible on any space and belonging to the calling application:
windowNumbers3 = NSWindowMBS.windowNumbersWithOptions(NSWindowMBS.NSWindowNumberListAllSpaces)

**Notes:** In no options are specified, only visible windows belonging to the calling application and on the active space are included. If options include NSWindowNumberListAllApplications, visible windows belonging to all applications are included. If options include NSWindowNumberListAllSpaces, visible windows on all spaces are included.

### 33.69.160 zoom

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** This action method toggles the size and location of the window between its standard state (provided by the application as the "best" size to display the window's data) and its user state (a new size and location the user may have set by moving or resizing the window).

### 33.69.161 Properties

### 33.69.162 acceptsMouseMovedEvents as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver is to accept mouse-moved events.
**Notes:** True to have the receiver accept mouse-moved events (and to distribute them to its responders); false to not accept such events.
(Read and Write property)

### 33.69.163 allowsAutomaticWindowTabbing as Boolean

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Allows automatic window tabbing when the value is true.
**Example:**

// disable automatic tabbing
NSWindowMBS.allowsAutomaticWindowTabbing = false

**Notes:** By default, this will be set to true, but applications can explicitly opt out of all automatic tabbing

by setting it to false, and can still adoped explicit window tabbing, if desired.
Raises an exception when used on OS X 10.11 and older.
(Read and Write property)

### 33.69.164 allowsConcurrentViewDrawing as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether threading of view drawing is enabled for this window.
**Notes:** Whether threading of view drawing should be enabled for this window. Defaults to true. When this is set to true, AppKit's view system is allowed to perform drawRect activity for the window's views on threads other than the main thread, for views that have canDrawConcurrently = true. When this is set to false, the window's views will be drawn serially as on 10.5 and earlier, even though some of the views may have canDrawConcurrently = true.

Available on Mac OS X 10.6.
(Read and Write property)

### 33.69.165 allowsToolTipsWhenApplicationIsInactive as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this window displays tooltips even when the application is in the background.
**Notes:** Default is false. Set to true to allow a window to display tooltips even when the application is in the background. Note that, enabling tooltips in an inactive application will cause the app to do work any time the mouse passes over the window. This can degrade system performance.
(Read and Write property)

### 33.69.166 alphaValue as Double

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The receiver's alpha value.
**Example:**

```
if TargetCocoa then
dim w as new NSWindowMBS(window1)
w.alphaValue=0.5
else
MsgBox "this sample requires Xojo Cocoa Target"
end if
```

**Notes:** (Read and Write property)

### 33.69.167 animationBehavior as Integer

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Provides for per-window control over automatic orderFront/orderOut animation behaviors added in 10.7.
**Example:**

```
dim w as new NSWindowMBS(window1)

w.animationBehavior = NSWindowMBS.NSWindowAnimationBehaviorDocumentWindow

Title = str(W.animationBehavior)
```

**Notes:** Can be set to NSWindowAnimationBehaviorNone to disable Appkit's automatic animations for a given window, or to one of the other non-Default NSWindowAnimationBehavior values to override AppKit's automatic inference of appropriate animation behavior based on the window's apparent type.
Available on Mac OS X 10.7 or later.
(Read and Write property)

### 33.69.168 aspectRatio as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's aspect ratio, which constrains the size of its frame rectangle to integral multiples of this ratio when the user resizes it.
**Notes:** (Read and Write property)

### 33.69.169 Autodisplay as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the window automatically displays views that need to be displayed.
**Notes:** Automatic display typically occurs on each pass through the event loop.

Available in Mac OS X v10.0 and later.
(Read and Write property)

### 33.69.170 backgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window background color.
**Notes:** (Read and Write property)

### 33.69.171 backingLocation as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates the window's backing store location.
**Notes:** The location of the window's backing store. See "Constants" for possible values.
Available in Mac OS X v10.5 and later.
(Read only property)

### 33.69.172 backingScaleFactor as Double

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the backing scale factor.
**Notes:** Returns 2.0 for high resolution scaled display modes, and 1.0 for all other cases.

There are some scenarios where an application that is resolution-aware may want to reason on its own about the display environment it is running in.

It is important to note that this number returned by this method does not represent anything concrete, such as pixel density or physical size, since it can vary based on the configured display mode. For example, the display may be in a mirrored configuration that is still high resolution scaled, resulting in pixel geometry that may not match the native resolution of the display device.

Note: For almost all common cases, developers should avoid using the backingScaleFactor as an input to layout or drawing calculations. Developers should instead use the backing coordinate space conversion methods instead, as the resulting code will more likely work consistently and correctly under both low and high resolution operation.

For apps which are not enabled for retina support, the function returns 1. So you only see 2 here if app is Cocoa, display is retina and info.plist has the NSHighResolutionCapable key.
(Read only property)

### 33.69.173 backingType as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's backing store type.
**Notes:** Use constants like this:

| | | |
|---|---|---|
| NSBackingStoreRetained | = 0 | The window uses a buffer, but draws directly to the screen where possible and to the buffer for obscured portions. You should not use this mode. It combines the limitations of NSBackingStoreNonretained with the memory use of NSBackingStoreBuffered. The original NeXTSTEP implementation was an interesting compromise that worked well with fast memory mapped framebuffers on the CPU bus—something that hasn't been in general use since around 1994. These tend to have performance problems. In Mac OS X 10.5 and later, requests for retained windows will result in the window system creating a buffered window, as that better matches actual use. Available in Mac OS X v10.0 and later. |
| NSBackingStoreNonretained | = 1 | The window draws directly to the screen without using any buffer. You should not use this mode. It exists primarily for use in the original Classic Blue Box. It does not support Quartz drawing, alpha blending, or opacity. Moreover, it does not support hardware acceleration, and interferes with system-wide display acceleration. If you use this mode, your application must manage visibility region clipping itself, and manage repainting on visibility changes. Available in Mac OS X v10.0 and later. |
| NSBackingStoreBuffered | = 2 | The window renders all drawing into a display buffer and then flushes it to the screen. You should use this mode. It supports hardware acceleration, Quartz drawing, and takes advantage of the GPU when possible. It also supports alpha channel drawing, opacity controls, using the compositor. Available in Mac OS X v10.0 and later. |

(Read and Write property)

### 33.69.174 canBecomeKeyWindow as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window can become the key window.
**Notes:** Attempts to make the window the key window are abandoned if this method returns false. The NSWindow implementation returns true if the window has a title bar or a resize bar, or false otherwise.
(Read only property)

### 33.69.175 canBecomeMainWindow as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window can become the application's main window.
**Notes:** Attempts to make the window the main window are abandoned if this method returns false. The NSWindow implementation returns true if the window is visible, is not an NSPanel object, and has a title bar or a resize mechanism. Otherwise it returns false.
(Read only property)

### 33.69.176 canBecomeVisibleWithoutLogin as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window can be displayed at the login window.
**Notes:** Default: false.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.69.177 canHide as boolean

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether the window can be hidden when its application becomes hidden (during execution of the NSApplication hide method).
**Notes:** (Read and Write property)

### 33.69.178 canStoreColor as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window has a depth limit that allows it to store color values.
**Notes:** (Read only property)

### 33.69.179 className as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of this NSWindow class.
**Notes:** (Read only property)

### 33.69.180 classPath as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The path of this NSView class.
**Notes:** Useful for debugging to know what super classes the window has.
(Read only property)

### 33.69.181 collectionBehavior as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Identifies the window's behavior in window collections.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.69.182 colorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The window's color space.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.69.183 contentAspectRatio as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The aspect ratio (height in relation to width) of the window's content view, constraining the dimensions of its content rectangle to integral multiples of that ratio when the user resizes it.
**Notes:** Available in Mac OS X v10.3 and later
(Read and Write property)

### 33.69.184 contentLayoutRect as NSRectMBS

MBS MacBase Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The area inside the window that is for non-obscured content, in window coordinates.
**Notes:** Typically, the area represented by this property is the same as the frame of the contentView. However, for windows with NSFullSizeContentViewWindowMask set, there needs to be a way to determine the portion that is not under the toolbar. The contentLayoutRect property contains the portion of the layout that is not obscured under the toolbar.

(Read only property)

### 33.69.185 contentMaxSize as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum size of the window's content view.
**Notes:** Available in Mac OS X v10.3 and later.
(Read and Write property)

### 33.69.186 contentMinSize as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum size of the window's content view.
**Notes:** Available in Mac OS X v10.3 and later.
(Read and Write property)

### 33.69.187 contentResizeIncrements as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's content-view resizing increments.
**Notes:** Available in Mac OS X v10.3 and later.
(Read and Write property)

### 33.69.188 contentView as NSViewMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The receiver's content view, the highest accessible NSView object in the receiver's view hierarchy.
**Notes:** (Read and Write property)

### 33.69.189 currentEvent as NSEventMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the event currently being processed by the application, by invoking NSApplication's currentEvent method.
**Notes:** Returns the event being processed by the application.

(Read only property)

### 33.69.190 deepestScreen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the deepest screen the window is on (it may be split over several screens).
**Notes:** The deepest screen the window is on; nil when the window is offscreen.
(Read only property)

### 33.69.191 depthLimit as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the depth limit of the window.
**Notes:** The value returned can be examined with the Application Kit functions NSPlanarFromDepth, NSColorSpaceFromDepth, NSBitsPerSampleFromDepth, and NSBitsPerPixelFromDepth.
(Read and Write property)

### 33.69.192 displaysWhenScreenProfileChanges as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window context should be updated when the screen profile changes or when the window moves to a different screen.
**Notes:** Returns true when the window context should be updated when the screen profile changes or when the window moves to a different screen; otherwise, false.

The default value is false.

Available in Mac OS X v10.4 and later.
(Read and Write property)

### 33.69.193 frame as NSRectMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's frame rectangle.
**Notes:** (Read only property)

### 33.69.194 hasDynamicDepthLimit as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window's depth limit can change to match the depth of the screen it's on.
**Notes:** True when the window has a dynamic depth limit; otherwise, false.
(Read and Write property)

### 33.69.195 hasShadow as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver has a shadow.
**Notes:** True when the receiver has a shadow, false when it doesn't.
(Read and Write property)

### 33.69.196 Height as Double

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the color panel in pixel.
**Notes:** (Read and Write property)

### 33.69.197 hidesOnDeactivate as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver is removed from the screen when its application becomes inactive.
**Notes:** True when the receiver is removed from the screen when its application is deactivated; false if it remains onscreen.

The default for NSWindow is false; the default for NSPanel is true.
(Read and Write property)

### 33.69.198 identifier as string

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string that identifies this user interface item.
**Example:**

```
dim w as new NSWindowMBS(window1)

w.identifier = "window1"
MsgBox w.identifier
```

**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items, you would typically set this value in code after creating a control but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a control is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the framework or application. For example, identifiers for standard AppKit interface items, such as the open panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 33.69.199 ignoresMouseEvents as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the receiver is transparent to mouse events.
**Notes:** True when the receiver is transparent to mouse events, otherwise false.
(Read and Write property)

### 33.69.200 initialFirstResponder as NSViewMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The view that's made first responder the first time the window is placed onscreen.
**Notes:** (Read and Write property)

### 33.69.201 isDocumentEdited as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the receiver's document has been edited.

**Notes:** True when the receiver's document has been edited; false otherwise.
Initially, by default, NSWindow objects are in the "not edited" state.
(Read and Write property)

### 33.69.202 isExcludedFromWindowsMenu as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver's title is omitted from the application's Windows menu.
**Notes:** True to specify that the receiver is to be omitted from the application's Windows menu; false to specify otherwise.
(Read and Write property)

### 33.69.203 isFlushWindowDisabled as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window's flushing ability is disabled.
**Notes:** (Read only property)

### 33.69.204 isKeyWindow as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window is the key window for the application.
**Notes:** (Read only property)

### 33.69.205 isMainWindow as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window is the application's main window.
**Notes:** (Read only property)

### 33.69.206 isMiniaturized as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver is minimized.
**Notes:** A minimized window is removed from the screen and replaced by a image, icon, or button that represents it, called the counterpart.
(Read only property)

### 33.69.207 isMovableByWindowBackground as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the receiver is movable by clicking and dragging anywhere in its background.
**Notes:** True when the window is movable by clicking and dragging anywhere in its background, otherwise false.

A window with a style mask of NSTexturedBackgroundWindowMask is movable by background by default. Sheets and drawers cannot be movable by window background.

Available in Mac OS X v10.2 and later.
Works in Xojo 2011r3, but not in 2011r4.
(Read and Write property)

### 33.69.208 isOnActiveSpace as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window is on the currently active space.
**Notes:** For visible windows, this method indicates whether the window is currently visible on the active space. For offscreen windows, it indicates whether ordering the window onscreen would cause it to be on the active space.
Available in Mac OS X v10.6 and later.
(Read only property)

### 33.69.209 isOneShot as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window device the window manages is freed when it's removed from the screen list.
**Notes:** (Read and Write property)

### 33.69.210 isOpaque as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver is opaque.
**Notes:** True when the receiver is opaque; false otherwise.
(Read and Write property)

### 33.69.211 isSheet as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window has ever run as a modal sheet.
**Notes:** Sheets are created using the NSPanel subclass.
Available in Mac OS X v10.1 and later.
(Read only property)

### 33.69.212 isZoomed as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the receiver is in a zoomed state.
**Notes:** (Read only property)

### 33.69.213 Left as Double

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The horizontal position of the color panel in pixel.
**Notes:** (Read and Write property)

### 33.69.214 Level as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window level of the receiver.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.Level = n.NSFloatingWindowLevel
```

**Notes:** (Read and Write property)

### 33.69.215 maxSize as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum size to which the window's frame (including its title bar) can be sized.
**Notes:** The maximum size to which the window's frame (including its title bar) can be sized either by the user or by the setFrame... methods other than setFrame.
(Read and Write property)

### 33.69.216 miniwindowImage as Variant

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The custom miniaturized window image of the receiver.
**Notes:** The miniaturized window image is the image displayed in the Dock when the window is minimized. If you did not assign a custom image to the window, this method returns nil.

Value is declares as Variant to minimize plugin dependencies, but should be NSImageMBS.
(Read and Write property)

### 33.69.217 miniwindowTitle as String

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title displayed in the receiver's minimized window.
**Notes:** (Read and Write property)

### 33.69.218 minSize as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum size to which the window's frame (including its title bar) can be sized.
**Notes:** The minimum size to which the window's frame (including its title bar) can be sized either by the user or by the setFrame... methods other than setFrame.
(Read and Write property)

### 33.69.219 Movable as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the window can be moved by clicking in its title bar or background.
**Notes:** setMovableByWindowBackground, called with the argument true, is ignored by a window that returns false from isMovable. If a window returns false, that means it can only be dragged between spaces in F8 mode, and its relative screen position is always preserved. Note that a resizable window may still be resized, and the window frame may be changed programmatically. A non-movable window will not be moved or resized by the system in response to a display reconfiguration. Applications may choose to enable application-controlled window dragging after disabling user-initiating dragging by handling the mouseDown/mouseDragged/mouseUp sequence in sendEvent in an NSWindow subclass.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.69.220 parentWindow as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The parent window to which the window is attached as a child.
**Notes:** Available in Mac OS X v10.2 and later.
(Read and Write property)

### 33.69.221 preferredBackingLocation as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The preferred location for the window's backing store.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.69.222 preservesContentDuringLiveResize as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the window tries to optimize user-initiated resize operations by preserving the content of views that have not changed.
**Notes:** Returns true if the window tries to optimize live resize operations by preserving the content of views that have not moved; otherwise, false.

Discussion
When live-resize optimization is active, the window redraws only those views that moved (or do not support this optimization) during a live resize operation.

See preservesContentDuringLiveResize in NSView for additional information on how to support this optimization.

Available in Mac OS X v10.4 and later.
(Read and Write property)

### 33.69.223 preventsApplicationTerminationWhenModal as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the window prevents application termination when modal.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 33.69.224 representedFile as folderitem

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The pathname of the file the window represents.
**Notes:** (Read and Write property)

### 33.69.225 representedFilename as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The pathname of the file the window represents.
**Notes:** (Read and Write property)

### 33.69.226 representedURL as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL of the file the window represents.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim n as new NSWindowMBS(window1)
n.representedURL = f.URLPath

MsgBox n.representedURL
```

**Notes:** The URL for the file the window represents.

When the URL specifies a path, the window shows an icon in its title bar, as described in Table 1.

Title bar document icon display:

| Filepath | Document icon |
|---|---|
| Empty | None. |
| Specifies a nonexistent file | Generic. |
| Specifies an existent file | Specific for the file's type. |

You can customize the file icon in the tile bar with the following code:

```
window.standardWindowButton(NSWindowDocumentIconButton).Image=theImage
```

When the URL identifies an existing file, the window's title offers a pop-up menu showing the path components of the URL. (The user displays this menu by Command-clicking the title.) The behavior and contents of this menu can be controlled with shouldPopUpDocumentPathMenu.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.69.227 resizeIncrements as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's resizing increments.
**Notes:** (Read and Write property)

### 33.69.228 Restorable as boolean

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether the window configuration is preserved between application launches.
**Notes:** value: Specify true if you want the window to be preserved or false if you do not want it preserved.

Windows should be preserved between launch cycles to maintain interface continuity for the user. During subsequent launch cycles, the system tries to recreate the window and restore its configuration to the preserved state. Configuration data is updated as needed and saved automatically by the system.

If you enable preservation for a given window, you should also specify a restoration class for the window using the setRestorationClass method.
Available in OS X v10.7 and later.
(Read and Write property)

### 33.69.229 screen as NSScreenMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the screen the window is on.
**Notes:** The screen where most of the window is on; nil when the window is offscreen.

When the window is partly on one screen and partly on another, the screen where most of it lies is returned.
(Read only property)

### 33.69.230 sharingType as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The level of access other processes have to the window's content.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 33.69.231 showsResizeIndicator as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver's resize indicator is visible
**Notes:** True to show it, false to hide it.
This method does not affect whether the receiver is resizable.
(Read and Write property)

### 33.69.232 showsToolbarButton as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the receiver shows the toolbar control button.
**Notes:** True to display the toolbar control button; false to hide the button.

If the window does not have a toolbar, this method has no effect.
(Read and Write property)

### 33.69.233 styleMask as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The receiver's style mask, indicating what kinds of control items it displays.
**Example:**

```
dim p as new IKPictureTakerMBS
p.styleMask = BitwiseAnd(p.styleMask, &hFD) // disable close button
```

**Notes:** See the information about the style mask in constants below. An NSWindow object's style is set when the object is initialized. Once set, it can't be changed.

constants:

| | |
|---|---|
| NSBorderlessWindowMask = 0 | The window displays none of the usual peripheral elements. Useful only for display or caching purposes. |
| NSTitledWindowMask = 1 | The window displays a title bar. |
| NSClosableWindowMask = 2 | The window displays a close button. |
| NSMiniaturizableWindowMask = 4 | The window displays a minimize button. |
| NSResizableWindowMask = 8 | The window displays a resize control. |
| NSTexturedBackgroundWindowMask = 256 | The window displays with a metal-textured background. Additionally, the window may be moved by clicking and dragging anywhere in the window background. A bordered window with this mask gets rounded bottom corners. |

(Read and Write property)

### 33.69.234 SubTitle as String

MBS MacBase Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Secondary text that may be displayed adjacent to or below the primary title depending on the configuration of the window.
**Notes:** A value of empty string will remove the subtitle from the window layout.
(Read and Write property)

### 33.69.235 tabbingIdentifier as String

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Windows with the same tabbingIdentifier will have the ability to be tabbed together when a window is being shown.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.tabbingIdentifier = "test"
MsgBox n.tabbingIdentifier
```

**Notes:** This allows aggregation of similiar windows. By default, the tabbingIdentifier will be generated based on inherit window properties, such as the window class name, the delegate class name, the window controller class name, and some additional state. Windows can be explicilty made to group together by using the same tabbingIdentifier.
Raises an exception when used on OS X 10.11 and older.
(Read and Write property)

### 33.69.236 tabbingMode as Integer

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Get and set the tabbing mode for this window.
**Example:**

```
dim n as NSWindowMBS = window1.NSWindowMBS
n.tabbingMode = n.NSWindowTabbingModeDisallowed
MsgBox str(n.tabbingMode) // shows 2
```

**Notes:** This should be set before a window is shown. The default value is NSWindowTabbingModeAutomatic. When the value is NSWindowTabbingModeAutomatic, the system will look at the userTabbingPreference and automatically tab windows together based on the tabbingIdentifier, when it is appropriate to do so.
Raises an exception when used on OS X 10.11 and older.
(Read and Write property)

### 33.69.237 Title as String

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the color panel window.
**Example:**

```
if TargetCocoa then
dim w as new NSWindowMBS(window1)

MsgBox w.title

else
MsgBox "this sample requires Xojo Cocoa Target"
end if
```

**Notes:** (Read and Write property)

### 33.69.238 titlebarAppearsTransparent as Boolean

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether titlebar appears transparent.
**Notes:** When True, the titlebar doesn't draw its background, allowing all buttons to show through, and

”click through” to happen. In general, this is only useful when NSFullSizeContentViewWindowMask is set.

Available on Mac OS X 10.10 and newer.
(Read and Write property)

### 33.69.239 titlebarSeparatorStyle as Integer

MBS MacBase Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the style of separator displayed between the window's titlebar and content.
**Notes:** The default value is NSTitlebarSeparatorStyleAutomatic. Changing this value will override any preference made by NSSplitViewItem.
(Read and Write property)

### 33.69.240 titleVisibility as Integer

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title visibility.
**Notes:** Can be NSWindowTitleVisible, NSWindowTitleHidden or NSWindowTitleHiddenWhenActive.
Available on Mac OS X 10.10 and newer.
(Read and Write property)

### 33.69.241 toolbar as Variant

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The window's toolbar.
**Notes:** Value is a NSToolbarMBS object.
Returned as Variant to reduce plugin dependencies.
(Read and Write property)

### 33.69.242 toolbarStyle as Integer

MBS MacBase Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies how the titlebar area of the window should appear when the window displays an NSToolbar.
**Example:**

```
Dim w as NSWindowMBS = window1.NSWindowMBS
```

w.toolbarStyle = NSWindowMBS.NSWindowToolbarStyleUnified

**Notes:** (Read and Write property)

### 33.69.243 Top as Double

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The vertical position of the color panel in pixel.
**Notes:** In the Cocoa world this is the distance from the bottom of the screen.
(Read and Write property)

### 33.69.244 userTabbingPreference as Integer

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the user's tabbing preference as set in System Preferences.
**Example:**

MsgBox str(NSWindowMBS.userTabbingPreference)

**Notes:** This value should be queried anytime a new window is made to see if the user wants to automatically show it in tabs.

Can be NSWindowUserTabbingPreferenceManual, NSWindowUserTabbingPreferenceAlways or NSWindowUserTabbingPreferenceInFullScreen.
Raises an exception when used on OS X 10.11 and older.
(Read only property)

### 33.69.245 viewsNeedDisplay as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether any of the window's views need to be displayed.
**Notes:** (Read and Write property)

### 33.69.246 Visible as boolean

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the color panel is currently visible.
**Notes:** Setting to false calls Hide and setting to true calls show.
(Read only property)

### 33.69.247 Width as Double

MBS MacBase Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the color panel in pixel.
**Notes:** (Read and Write property)

### 33.69.248 windowController as NSWindowControllerMBS

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The window's window controller.
**Notes:** (Read and Write property)

### 33.69.249 windowNumber as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Provides the window number of the receiver's window device.
**Example:**

```
if TargetCocoa then
dim w as new NSWindowMBS(window1)

MsgBox str(w.windowNumber)

else
MsgBox "this sample requires Xojo Cocoa Target"
end if
```

**Notes:** (Read only property)

### 33.69.250 worksWhenModal as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether the window is able to receive keyboard and mouse events even when some other window is being run modally.
**Notes:** True if the window is able to receive keyboard and mouse events even when some other window is being run modally; otherwise, false.

The NSWindow implementation of this method returns false. Only subclasses of NSPanel should override this default.
(Read only property)

### 33.69.251 frameAutosaveName as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name used to automatically save the window's frame rectangle data in the defaults system.
**Notes:** (Read and Write computed property)

### 33.69.252 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBorderlessWindowMask | 0 | One of the constants you can use to specify the style when c<br>The window displays none of the usual peripheral elements<br>display or caching purposes. |
| NSClosableWindowMask | 2 | One of the constants you can use to specify the style when c<br>The window displays a close button. |
| NSDirectSelection | 0 | One of the constants specify the direction a window is current<br>the key view using keyViewSelectionDirection.<br>The window isn't traversing the key view loop. |
| NSFullScreenWindowMask | 16384 | One of the constants you can use to specify the style when c<br>When set, the window will appear full screen. This mask<br>toggled when toggleFullScreen: is called. |
| NSFullSizeContentViewWindowMask | 32768 | One of the constants you can use to specify the style when c<br>If set, the contentView will consume the full size of the w<br>combined with other window style masks, but is only respe<br>with a titlebar.<br>Utilizing this mask opts-in to layer-backing. Utilize the cont<br>auto-layout contentLayoutGuide to layout views underneath<br>bar area. |
| NSMiniaturizableWindowMask | 4 | One of the constants you can use to specify the style when c<br>The window displays a minimize button. |
| NSResizableWindowMask | 8 | One of the constants you can use to specify the style when c<br>The window displays a resize control. |
| NSSelectingNext | 1 | One of the constants specify the direction a window is current<br>the key view using keyViewSelectionDirection.<br>The window is proceeding to the next valid key view. |
| NSSelectingPrevious | 2 | One of the constants specify the direction a window is current<br>the key view using keyViewSelectionDirection.<br>The window is proceeding to the previous valid key view. |
| NSTexturedBackgroundWindowMask | 256 | One of the constants you can use to specify the style when c<br>The window displays with a metal-textured background.<br>window may be moved by clicking and dragging anywhere in<br>ground. A bordered window with this mask gets rounded bo |
| NSTitledWindowMask | 1 | One of the constants you can use to specify the style when c<br>The window displays a title bar. |
| NSUnifiedTitleAndToolbarWindowMask | 4096 | One of the constants you can use to specify the style when c |
| NSUnscaledWindowMask | 2048 | One of the constants you can use to specify the style when c |
| NSWindowBackingLocationDefault | 0 | One of the constant to specify the window backing store loca<br>Determined by the operating system.<br>Available in Mac OS X v10.5 and later. |
| NSWindowBackingLocationMainMemory | 2 | One of the constant to specify the window backing store loca<br>Physical memory.<br>Available in Mac OS X v10.5 and later. |
| NSWindowBackingLocationVideoMemory | 1 | One of the constant to specify the window backing store loca<br>Video memory.<br>Available in Mac OS X v10.5 and later. |
| NSWindowCloseButton | 0 | One constants providing a way to access standard title bar b<br>The close button. |
| NSWindowCollectionBehaviorCanJoinAllSpaces | 1 | One of the constants for window collection behaviors relatec<br>Spaces.<br>The window appears in all spaces. The menu bar behaves th<br>Available in Mac OS X v10.5 and later. |
| NSWindowCollectionBehaviorDefault | 0 | One of the constants for window collection behaviors relatec<br>Spaces.<br>The window can be associated to one space at a time.<br>Available in Mac OS X v10.5 and later. |
| NSWindowCollectionBehaviorFullScreenAuxiliary | 256 | One of the constants for window collection behaviors.<br>Windows with this collection behavior can be shown with the f |
| NSWindowCollectionBehaviorFullScreenPrimary | 128 | One of the constants for window collection behaviors. |

Edge Constants

| Constant | Value | Description |
|---|---|---|
| NSMaxXEdge | 2 | the maximum X edge. Typically right side. |
| NSMaxYEdge | 3 | The maximum Y edge. Topically the top edge of a window. |
| NSMinXEdge | 0 | the minimum X edge. Typically left side. |
| NSMinYEdge | 1 | Minimum Y. As coordinates are upside down in the Cocoa world, this is the bottom edge of a window. |

Titlebar Separator Styles

| Constant | Value | Description |
|---|---|---|
| NSTitlebarSeparatorStyleAutomatic | 0 | The titlebar separator style is determined by the window,Äôs configuratio |
| NSTitlebarSeparatorStyleLine | 2 | The titlebar separator is a line. |
| NSTitlebarSeparatorStyleNone | 1 | There,Äôs no titlebar separator. |
| NSTitlebarSeparatorStyleShadow | 3 | The titlebar separator is a shadow. |

Window Order Constants

| Constant | Value | Description |
|---|---|---|
| NSWindowAbove | 1 | Moves the window above the indicated window. |
| NSWindowBelow | -1 | Moves the window below the indicated window. |
| NSWindowOut | 0 | Moves the window off the screen. |

Animation Behavior Constants.

| Constant | Value | Description |
|---|---|---|
| NSWindowAnimationBehaviorAlertPanel | 5 | Default behavior for alert window. |
| NSWindowAnimationBehaviorDefault | 0 | let AppKit infer animation behavior for this window |
| NSWindowAnimationBehaviorDocumentWindow | 3 | Default behavior for document window. |
| NSWindowAnimationBehaviorNone | 2 | suppress inferred animations (don't animate) |
| NSWindowAnimationBehaviorUtilityWindow | 4 | Default behavior for utility window. |

Tabbing Modes

| Constant | Value | Description |
|---|---|---|
| NSWindowTabbingModeAutomatic | 0 | The system automatically prefers to tab this window when appropriate. |
| NSWindowTabbingModeDisallowed | 2 | The window explicitly should not prefer to tab when shown |
| NSWindowTabbingModePreferred | 1 | The window explicitly should prefer to tab when shown. |

Title Visibility

| Constant | Value | Description |
|---|---|---|
| NSWindowTitleHidden | 1 | The always hidden mode hides the title and moves the toolbar up into the ar previously occupied by the title. |
| NSWindowTitleHiddenWhenActive | 2 | This mode hides the title when the window is active, and shows it when inacti It does not adjust toolbars. |
| NSWindowTitleVisible | 0 | The default mode has a normal window title and titlebar buttons. |

Toolbar Styles

| Constant | Value | Description |
|---|---|---|
| NSWindowToolbarStyleAutomatic | 0 | The system displays the toolbar based on the window,Äôs given configu |
| NSWindowToolbarStyleExpanded | 1 | The toolbar appears below the window title. |
| NSWindowToolbarStylePreference | 2 | The toolbar appears below the window title and items in the toolbar a tered and have increased margins. |
| NSWindowToolbarStyleUnified | 3 | The toolbar, when visible, appears inline with the window title. |
| NSWindowToolbarStyleUnifiedCompact | 4 | The toolbar appears inline and with the window title and with smaller r when visible. |

User Tabbing Preferences

| Constant | Value | Description |
|---|---|---|
| NSWindowUserTabbingPreferenceAlways | 1 | |
| NSWindowUserTabbingPreferenceInFullScreen | 2 | |
| NSWindowUserTabbingPreferenceManual | 0 | |

## 33.70 class NSWindowRestoreHandlerMBS

### 33.70.1 class NSWindowRestoreHandlerMBS

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The class implementing the event to be called for window restoration.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 33.70.2 Methods

### 33.70.3 Constructor

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 33.70.4 Destructor

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 33.70.5 SetError(error as NSErrorMBS)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the error to pass back from event.

### 33.70.6 SetRestoredWindow(win as DesktopWindow)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the window to pass back from event.
See also:


- 33.70.7 SetRestoredWindow(win as NSWindowMBS) 6455
- 33.70.8 SetRestoredWindow(win as window) 6455

### 33.70.7 SetRestoredWindow(win as NSWindowMBS)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the window to pass back from event.
See also:


- 33.70.6 SetRestoredWindow(win as DesktopWindow) 6454
- 33.70.8 SetRestoredWindow(win as window) 6455


### 33.70.8 SetRestoredWindow(win as window)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the window to pass back from event.
See also:


- 33.70.6 SetRestoredWindow(win as DesktopWindow) 6454
- 33.70.7 SetRestoredWindow(win as NSWindowMBS) 6455


### 33.70.9 Events

### 33.70.10 RestoreWindow(identifier as string, state as Variant)

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The following event is sent to request that a window be restored.
**Notes:** State is a NSCoderMBS object.

If the receiver knows how to restore the identified window, it should invoke the completion handler with the window, possibly creating it. It is acceptable to invoke the completion handler with a pre-existing window, though you should not pass the same window to more than one completion handler. If the receiver cannot restore the identified window (for example, the window referenced a document that has been deleted), it should invoke the completion handler with a nil window. In Mac OS X 10.7, the error parameter is ignored.

The receiver is passed the identifier of the window, which allows the receiver to quickly check for known windows. For example, you might give your preferences window an identifier of "preferences" in the nib, and then check for that identifier in your implementation. The receiver is also passed the NSCoder containing the combined restorable state of the window, its delegate, the window controller, and any document. The receiver may decode information previously stored in the coder to determine what window to restore.

Please call SetRestoredWindow or SetError to pass back status to system. It is not necessary or recommended for implementations of this method to order restored windows onscreen (for example, the window

may have been minimized, in which case it will not be ordered onscreen).

Please call SetError and SetRestoredWindow to provide result to system.

# 33.71 class NSWorkspaceAuthorizationMBS

## 33.71.1 class NSWorkspaceAuthorizationMBS

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: All.

**Function:** The authorization granted to the app by the user.
**Notes:** To enable your app to prompt the user for these file permissions, you must have a Privileged File Operation entitlement. If you have an app on the Mac App Store or plan to submit your app for review, you can request this entitlement (see https://developer.apple.com/go/?id=workspace-authorization).

see also
https://developer.apple.com/documentation/appkit/nsworkspaceauthorization
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr3

**Xojo Developer Magazine**

- 17.5, page 9: News

## 33.71.2 Methods

## 33.71.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 33.71.4 Properties

## 33.71.5 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 33.71.6 Constants

Authorization types

| Constant | Value | Description |
|---|---|---|
| NSWorkspaceAuthorizationTypeCreateSymbolicLink | 0 | Authorization for the app to create a symbolic link. |
| NSWorkspaceAuthorizationTypeReplaceFile | 2 | Authorization for the app to perform an atomic file write w target file's permissions. |
| NSWorkspaceAuthorizationTypeSetAttributes | 1 | Authorization for the app to change specific file attributes |

## 33.72 class NSWorkspaceMBS

### 33.72.1 class NSWorkspaceMBS

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSWorkspace object responds to application requests to perform a variety of services.
**Example:**

```
// get icon image
dim n as NSImageMBS = NSWorkspaceMBS.iconForFile(SpecialFolder.desktop)
// set the size we want
n.setSize 512,512
// make a copy as picture
Backdrop = n.CopyPictureWithMask
```

**Notes:**

- Opening, manipulating, and obtaining information about files and devices
- Tracking changes to the file system, devices, and the user database
- Launching applications

**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- IconFamilyMBS class deprecated
- Custom menu checkmarks
- Adding custom icons for MacOS in Xojo
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- Tip of the day: Windows Notifications
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2
- MonkeyBread Software Releases the MBS Plugins 8.1

**Xojo Developer Magazine**

- 17.5, page 9: News
- 13.1, page 10: News

### 33.72.2 Methods

### 33.72.3 absolutePathForAppBundleWithIdentifier(bundleIdentifier as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the absolute file-system path of an application bundle.
**Notes:** bundleIdentifier: The bundle identifier string. This value corresponds to the value in the CFBundleIdentifier key of the application's Info.plist file. For example, the bundle identifier of the TextEdit application is com.apple.TextEdit.

Returns the file system path to the application bundle identified by bundleIdentifier, or "" if the bundle cannot be found.

### 33.72.4 activateFileViewerSelectingFiles(Files() as folderitem)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Activates the Finder, and opens one or more windows selecting the specified files.
**Example:**

```
dim file as FolderItem = SpecialFolder.Pictures.Child("mbs.jpg") // some file

dim w as new NSWorkspaceMBS
dim files() as FolderItem

files.Append file

// show in Finder
w.activateFileViewerSelectingFiles(files)
```

**Notes:** Available in Mac OS X v10.6 and later.

### 33.72.5 activateFileViewerSelectingURLs(URLs() as string)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Activates the Finder, and opens one or more windows selecting the specified files.
**Notes:** Available in Mac OS X v10.6 and later.

### 33.72.6 desktopImageOptionsForScreen(screen as NSScreenMBS) as dictionary

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the desktop image options for the given screen.
**Example:**

```
dim w as new NSWorkspaceMBS
dim m as NSScreenMBS = NSScreenMBS.mainScreen
dim dic as Dictionary = w.desktopImageOptionsForScreen(m)

break // check in debugger
```

**Notes:** screen: The screen for which to get the desktop image options.

Returns a dictionary containing key-value pairs. Keys can be NSWorkspaceDesktopImageScalingKey, NSWorkspaceDesktopImageAllowClippingKey or NSWorkspaceDesktopImageFillColorKey.
Available in Mac OS X v10.6 and later.

### 33.72.7 desktopImageURLForScreen(screen as NSScreenMBS) as folderitem

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the folderitem for the desktop image for the given screen.
**Example:**

```
dim w as new NSWorkspaceMBS
dim m as NSScreenMBS = NSScreenMBS.mainScreen
dim file as FolderItem = w.desktopImageURLForScreen(m)

MsgBox file.NativePath
```

**Notes:** screen: The screen for which to get the desktop image.
Returns the desktop image.
Available in Mac OS X v10.6 and later.

### 33.72.8 fileLabelColors as NSColorMBS()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the corresponding array of file label colors for the file labels.
**Example:**

```
dim w as new NSWorkspaceMBS
dim labels() as string = w.fileLabels
dim colors() as NSColorMBS = w.fileLabelColors
dim lines() as string

dim u as Integer = UBound(Colors)
for i as Integer = 0 to u
dim co as NSColorMBS = colors(i)

lines.Append labels(i)+": "+str(co.colorValue)
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** This array has the same number of elements as fileLabels, and the color at a given index corresponds to the label at the same index.

You can listen for notifications named NSWorkspaceDidChangeFileLabelsNotification to be notified when file labels change which may result in changes to the order of the fileLabelColors.

Available in Mac OS X v10.6 and later.

### 33.72.9 fileLabels as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the array of file labels as strings.
**Example:**

```
dim w as new NSWorkspaceMBS
dim labels() as string = w.fileLabels

MsgBox Join(labels, EndOfLine)
```

**Notes:** You can listen for notifications named NSWorkspaceDidChangeFileLabelsNotification to be notified when file labels change.
Available in Mac OS X v10.6 and later.

### 33.72.10 findApplications

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Examines all applications and updates the records of registered services and file types.
**Example:**

```
NSWorkspaceMBS.findApplications
```

### 33.72.11 frontmostApplication as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the frontmost application, which is the application that will receive key events.
**Example:**

```
dim w as new NSWorkspaceMBS
dim n as NSRunningApplicationMBS = w.frontmostApplication

MsgBox n.localizedName
```

**Notes:** Requires Mac OS X 10.7.

### 33.72.12 fullPathForApplication(appname as string) as folderitem

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the full path for the specified application.
**Example:**

```
MsgBox NSWorkspaceMBS.fullPathForApplication("textedit").ShellPath
// shows /Applications/TextEdit.app
```

**Notes:** The full path for the application, or nil if the specified application was not found.

### 33.72.13 hideOtherApplications

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Hides all applications other than the sender.

**Example:**

NSWorkspaceMBS.hideOtherApplications

**Notes:** The user can hide all applications except the current one by Command-Option-clicking on an application's Dock icon.

### 33.72.14 iconForFile(file as folderitem) as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an image containing the icon for the specified file.
**Example:**

```
dim f as FolderItem
f=SpecialFolder.Desktop.Child("test.txt")

dim n as NSImageMBS = NSWorkspaceMBS.iconForFile(f)
n.size = new NSSizeMBS(512,512)
Backdrop=n.CopyPictureWithMask
```

**Notes:** The returned image has an initial size of 32 pixels by 32 pixels.
Returns nil on any error.

### 33.72.15 iconForFiles(files() as folderitem) as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an image containing the icon for the specified files.
**Example:**

```
dim w as new NSWorkspaceMBS
dim files() as FolderItem

dim folder as FolderItem = SpecialFolder.Pictures

// one file
files.Append folder.TrueItem(2)
canvas1.Backdrop = w.iconForFiles(files).CopyPictureWithMask

// two files
files.Append folder.TrueItem(3)
canvas2.Backdrop = w.iconForFiles(files).CopyPictureWithMask
```

```
// three files
files.Append folder.TrueItem(4)
canvas3.Backdrop = w.iconForFiles(files).CopyPictureWithMask
```

**Notes:** files: An array of folderitems, each of which contains the full path to a file.

Returns the icon associated with the group of files.

If fullPaths specifies one file, that file's icon is returned. If fullPaths specifies more than one file, an icon representing the multiple selection is returned.

### 33.72.16 iconForFileType(filetype as string) as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an image containing the icon for files of the specified type.
**Example:**

```
const SizeWanted = 512
const typeWanted = "txt"

dim n as NSImageMBS = NSWorkspaceMBS.iconForFileType(typeWanted)
// set size we want
n.setSize SizeWanted*2, SizeWanted*2

// make picture
dim p as Picture = n.CopyPictureWithMask

// set DPI
p.VerticalResolution = 144
p.HorizontalResolution = 144
```

**Notes:** filetype: The file type, which may be either a filename extension or an encoded HFS file type.

The returned image has an initial size of 32 pixels by 32 pixels.
Returns nil on any error.

Running this in a thread can lead to crashes.

### 33.72.17 isFilePackageAtPath(item as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines whether the specified path is a file package.
**Example:**

```
dim w as new NSWorkspaceMBS
dim file as FolderItem = SpecialFolder.Applications.Child("iTunes.app")

// shows true for iTunes
MsgBox str(w.isFilePackageAtPath(file))
```

**Notes:** Returns true if the path identifies a file package; otherwise, false if the path does not exist, is not a directory, or is not a file package.

### 33.72.18 launchApplication(appname as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the specified application.
**Example:**

```
if NSWorkspaceMBS.launchApplication("Textedit") then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** Returns true if the application was successfully launched or was already running; otherwise, false.

The appName parameter need not be specified with a full path and, in the case of an application wrapper, may be specified with or without the .app extension, as described in "Use of .app Extension".
See also:

- 33.72.19 launchApplication(appname as string, showicon as boolean, autolaunch as boolean) as boolean 6466

### 33.72.19 launchApplication(appname as string, showicon as boolean, autolaunch as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the specified application using additional options.
**Example:**

```
if NSWorkspaceMBS.launchApplication("Textedit",false,false) then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** appName: The name of the application to open.
showIcon: If false, the application's icon is not placed on the screen. (The icon still exists, though.)
autolaunch: If true, the autolaunch default is set as though the specified application were autolaunched at startup.

This method is provided to enable daemon-like applications that lack a normal user interface. Its use is not generally encouraged.
Returns true if the application is successfully launched or already running, and false if it can't be launched.
See also:

- 33.72.18 launchApplication(appname as string) as boolean 6466

### 33.72.20 launchApplicationAtFile(file as folderitem, options as UInt32 = 0, configuration as dictionary = nil) as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the app at the specified file location.
**Notes:** file: The application folderitem.
options: Options to use when launching the application. see NSWorkspaceLaunch* constants.
configuration: A dictionary containing the configuration options. Possible key-value pairs are described NSWorkspaceLaunchConfiguration* functions.
error: The error is returned here.

Returns reference to newly started application.

Available in Mac OS X v10.6 and later.
See also:

- 33.72.21 launchApplicationAtFile(file as folderitem, options as UInt32, configuration as dictionary, byref error as NSErrorMBS) as NSRunningApplicationMBS 6468

### 33.72.21 launchApplicationAtFile(file as folderitem, options as UInt32, configuration as dictionary, byref error as NSErrorMBS) as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the app at the specified file location.
**Example:**

```
dim w as new NSWorkspaceMBS
dim file as FolderItem = SpecialFolder.Applications.Child("Address Book.app")

dim error as NSErrorMBS
dim configuration as new Dictionary
dim options as Integer

// today we start 32 bit version
configuration.Value(w.NSWorkspaceLaunchConfigurationArchitecture) = w.NSBundleExecutableArchitectureI386

// and hide all others
options = w.NSWorkspaceLaunchAndHideOthers

dim r as NSRunningApplicationMBS = w.launchApplicationAtFile(file, options, configuration, error)

if r = nil then
MsgBox "Error: "+error.LocalizedDescription
else
MsgBox "Started: "+r.localizedName
end if
```

**Notes:** file: The application folderitem.
options: Options to use when launching the application. see NSWorkspaceLaunch* constants.
configuration: A dictionary containing the configuration options. Possible key-value pairs are described NSWorkspaceLaunchConfiguration* functions.
error: The error is returned here.

Returns reference to newly started application.

Available in Mac OS X v10.6 and later.
See also:

- 33.72.20 launchApplicationAtFile(file as folderitem, options as UInt32 = 0, configuration as dictionary = nil) as NSRunningApplicationMBS 6467

### 33.72.22 launchApplicationAtURL(URL as string, options as UInt32 = 0, configuration as dictionary = nil) as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the app at the specified URL.
**Notes:** url: The application URL.
options: Options to use when launching the application. see NSWorkspaceLaunch* constants.
configuration: A dictionary containing the configuration options. Possible key-value pairs are described NSWorkspaceLaunchConfiguration* functions.
error: The error is returned here.

Returns reference to newly started application.

Available in Mac OS X v10.6 and later.
See also:

- 33.72.23 launchApplicationAtURL(URL as string, options as UInt32, configuration as dictionary, byref error as NSErrorMBS) as NSRunningApplicationMBS 6469

### 33.72.23 launchApplicationAtURL(URL as string, options as UInt32, configuration as dictionary, byref error as NSErrorMBS) as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the app at the specified URL.
**Notes:** url: The application URL.
options: Options to use when launching the application. see NSWorkspaceLaunch* constants.
configuration: A dictionary containing the configuration options. Possible key-value pairs are described NSWorkspaceLaunchConfiguration* functions.
error: The error is returned here.

Returns reference to newly started application.

Available in Mac OS X v10.6 and later.
See also:

- 33.72.22 launchApplicationAtURL(URL as string, options as UInt32 = 0, configuration as dictionary = nil) as NSRunningApplicationMBS 6469

### 33.72.24 launchAppWithBundleIdentifier(bundleIdentifier as string, options as Integer = &h00030000, AppleEventDescriptor as Variant = nil) as Boolean

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the application corresponding to the specified bundleIdentifier.
**Notes:** bundleIdentifier: A bundle identifier string. This value corresponds to the value in the CFBundleIdentifier key of the application's Info.plist file. For example, the bundle identifier of the TextEdit application is com.apple.TextEdit.
options: Options to use when launching the application. Values for this parameter are described in constants.
descriptor: Additional options specified in an AppleEvent-style descriptor. For example, you could use this parameter to specify additional documents to open when the application is launched.

Returns true if the application was found and launched; otherwise, false.

### 33.72.25 localizedDescriptionForType(typeName as string) as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the localized description for the specified Uniform Type Identifier.
**Example:**

```
MsgBox NSWorkspaceMBS.localizedDescriptionForType("public.jpeg")
// "JPEG-Bild" in German
```

**Notes:** The localized description is suitable for displaying to the user.
Available in Mac OS X v10.5 and later.

### 33.72.26 menuBarOwningApplication as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the menu bar owning application, which is the application that currently owns and draws the menu bar.
**Example:**

```
dim w as new NSWorkspaceMBS
dim n as NSRunningApplicationMBS = w.menuBarOwningApplication

MsgBox n.localizedName
```

**Notes:** Requires Mac OS X 10.7.

### 33.72.27 mountedLocalVolumePaths as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the mount points of all local volumes, not just the removable ones returned by mountedRemovableMedia.
**Example:**

```
dim w as new NSWorkspaceMBS
dim paths() as string = w.mountedLocalVolumePaths

MsgBox Join(paths, EndOfLine)
```

**Notes:** Returns an array of strings, each of which contains the full pathname of the mount point for any local volumes.

### 33.72.28 mountedRemovableMedia as string()

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the full pathnames of all currently mounted removable disks.
**Example:**

```
dim w as new NSWorkspaceMBS
dim paths() as string = w.mountedRemovableMedia

MsgBox Join(paths, EndOfLine)
```

**Notes:** Returns an array of strings, each of which contains the full pathname of a mounted removable disk.

If the computer provides an interrupt or other notification when the user inserts a disk into a drive, the Finder will mount the disk immediately. However, if no notification is given, the Finder won't be aware that a disk needs to be mounted. On such systems, an application should invoke either mountNewRemovableMedia or checkForRemovableMedia before invoking mountedRemovableMedia. Either of these methods cause the Finder to poll the drives to see if a disk is present. If a disk has been inserted but not yet mounted, these methods will cause the Finder to mount it.

The Disk button in an Open or Save panel invokes mountedRemovableMedia and mountNewRemovableMedia as part of its operation, so most applications won't need to invoke these methods directly.

### 33.72.29 noteFileSystemChanged

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Informs the NSWorkspace object that the file system has changed.
**Notes:** The NSWorkspace object then gets the status of all the files and directories it is interested in and updates itself appropriately. This method is used by many objects that write or delete files.

The NSDocument and NSSavePanel objects use this method when saving a file. If you create a file directly, you should call noteFileSystemChanged so that the Finder can update the folder if it is open.

Available in Mac OS X v10.0 and later. Deprecated in Mac OS X v10.6.
See also:

- 33.72.30 noteFileSystemChanged(path as folderitem) 6472

### 33.72.30 noteFileSystemChanged(path as folderitem)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Informs the NSWorkspace object that the file system changed at the specified path.
**Notes:** The NSWorkspace object then gets the status of all the files and directories it is interested in and updates itself appropriately. This method is used by many objects that write or delete files.
See also:

- 33.72.29 noteFileSystemChanged 6472

### 33.72.31 notificationCenter as NSNotificationCenterMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the notification center for workspace notifications.

### 33.72.32 NSWorkspaceActiveSpaceDidChangeNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when a Spaces change has occurred.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

Available in Mac OS X v10.6 and later.

### 33.72.33 NSWorkspaceApplicationKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This constant is supplied in the userInfo dictionary of various notifications.
**Notes:** The value corresponding to this key is an instance of NSRunningApplication that reflects the affected application.
Available in Mac OS X v10.6 and later.

### 33.72.34 NSWorkspaceCompressOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Compress file. This operation always returns an error.

### 33.72.35 NSWorkspaceCopyOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim tag as Integer
dim files(-1) as string
dim b as Boolean
dim source,dest as FolderItem

// copies a file from one folder to another folder

source=f.Parent
files.Append f.name
dest=SpecialFolder.Pictures

b=NSWorkspaceMBS.performFileOperation(NSWorkspaceMBS.NSWorkspaceCopyOperation, source, dest,
files, tag)

if b then
MsgBox "OK"
else
```

```
MsgBox "Failed"
end if
```

**Notes:** Copy file to destination.

### 33.72.36 NSWorkspaceDecompressOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Decompress file. This operation always returns an error.

### 33.72.37 NSWorkspaceDecryptOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Decrypt file. This operation always returns an error.

### 33.72.38 NSWorkspaceDesktopImageAllowClippingKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary used with SetDesktopImageURL.
**Notes:** The value is a boolean, which affects the interpretation of Proportional scaling types. A false value will make the image fully visible, but there may be empty space on the sides or top and bottom. A true value will cause the image to fill the entire screen, but the image may be clipped. If this is not specified, false is assumed. Non-proportional scaling types ignore this value.
Available in Mac OS X v10.6 and later.

### 33.72.39 NSWorkspaceDesktopImageFillColorKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary used with SetDesktopImageURL.
**Notes:** The value is an NSColor, which is used to fill any empty space around the image. If not specified, a default value is used. Currently, only colors that use or can be converted to use NSCalibratedRGBColorSpace are supported, and any alpha value is ignored.
Available in Mac OS X v10.6 and later.

### 33.72.40 NSWorkspaceDesktopImageScalingKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary used with SetDesktopImageURL.
**Notes:** The value is an Number containing an NSImageScaling constant as declared in NSCell. If this is not specified, NSImageScaleProportionallyUpOrDown=3 is used. NSImageScaleProportionallyDown=0 is not currently supported.
Available in Mac OS X v10.6 and later.

### 33.72.41 NSWorkspaceDestroyOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Destroy file.

### 33.72.42 NSWorkspaceDidActivateApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder is about to activate an application.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.
Available in Mac OS X v10.6 and later.

### 33.72.43 NSWorkspaceDidChangeFileLabelsNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder file labels or colors change.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.
Available in Mac OS X v10.6 and later.

### 33.72.44 NSWorkspaceDidDeactivateApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder deactivated an application.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.
Available in Mac OS X v10.6 and later.

### 33.72.45 NSWorkspaceDidHideApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder hid an application.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.
Available in Mac OS X v10.6 and later.

### 33.72.46 NSWorkspaceDidLaunchApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when a new application has started up.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.

### 33.72.47 NSWorkspaceDidMountNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when a new device has been mounted.
The notification object is the shared NSWorkspace instance.

In Mac OS X v10.5 and earlier the userInfo dictionary contains a key @"NSDevicePath" that returns the path where the device was mounted, as a string.
Available in Mac OS X v10.0 and later.

### 33.72.48 NSWorkspaceDidPerformFileOperationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when a file operation has been performed in the receiving application.
The notification object is the shared NSWorkspace instance. The userInfo dictionary contains a key "NSOperationNumber" with a number containing an integer indicating the type of file operation
Available in Mac OS X v10.0 and later.

### 33.72.49 NSWorkspaceDidRenameVolumeNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when a volume changes its name and/or mount path. These typically change simultaneously, in which case only one notification is posted.
The notification object is the shared NSWorkspace instance.
Available in Mac OS X v10.6 and later.

### 33.72.50 NSWorkspaceDidTerminateApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when an application finishes executing.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.

Available in Mac OS X v10.0 and later.

### 33.72.51 NSWorkspaceDidUnhideApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder unhid an application.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.
Available in Mac OS X v10.6 and later.

### 33.72.52 NSWorkspaceDidUnmountNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder did unmount a device.
This notification is delivered even if a volume was forcibly and immediately made unavailable, such as when a drive is simply unplugged.

The notification object is the shared NSWorkspace instance. The userInfo dictionary contains a key "NSDevicePath" that returns the path where the device was mounted, as a string.
Available in Mac OS X v10.0 and later.

### 33.72.53 NSWorkspaceDidWakeNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the machine wakes from sleep.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.
Available in Mac OS X v10.3 and later.

### 33.72.54 NSWorkspaceDuplicateOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Duplicate file in source directory.

### 33.72.55 NSWorkspaceEncryptOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Notes:** Encrypt file. This operation always returns an error.

### 33.72.56 NSWorkspaceLaunchConfigurationAppleEvent as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the configuration dictionary for launchApplication* methods.
**Notes:** The value is the first NSAppleEventDescriptor to send to the new application. If an instance of the application is already running, this is sent to that application.
Available in Mac OS X v10.6 and later.

### 33.72.57 NSWorkspaceLaunchConfigurationArchitecture as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the configuration dictionary for launchApplication* methods.
**Notes:** The value is a number containing an Mach-O Architecture constant. Ignored if a new instance of the application is not launched.
Available in Mac OS X v10.6 and later.
See NSBundleExecutableArchitecture* constants.

### 33.72.58 NSWorkspaceLaunchConfigurationArguments as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the configuration dictionary for launchApplication* methods.
**Notes:** The value is an NSArray of NSStrings, passed to the new application in the argv parameter. Ignored if a new instance of the application is not launched.
Available in Mac OS X v10.6 and later.

### 33.72.59 NSWorkspaceLaunchConfigurationEnvironment as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the configuration dictionary for launchApplication* methods.
**Notes:** The value is an dictionary, mapping Strings to Strings, containing environment variables to set for the new app. Ignored if a new instance of the application is not launched.
Available in Mac OS X v10.6 and later.

### 33.72.60 NSWorkspaceLinkOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim tag as Integer
```

```
dim files(-1) as string
dim b as Boolean
dim source,dest as FolderItem

// creates a hard link to a file in a folder

source=f.Parent
files.Append f.name
dest=SpecialFolder.Pictures

b=NSWorkspaceMBS.performFileOperation(NSWorkspaceMBS.NSWorkspaceLinkOperation, source, dest, files, tag)

if b then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Create hard link to file in destination.

### 33.72.61 NSWorkspaceMoveOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim tag as Integer
dim files(-1) as string
dim b as Boolean
dim source,dest as FolderItem

// moves a file from one folder to another folder

source=f.Parent
files.Append f.name
dest=SpecialFolder.Pictures

b=NSWorkspaceMBS.performFileOperation(NSWorkspaceMBS.NSWorkspaceMoveOperation, source, dest, files, tag)

if b then
MsgBox "OK"
```

```
else
MsgBox "Failed"
end if
```

**Notes:** Move file to destination.

### 33.72.62 NSWorkspaceRecycleOperation as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the file operation modes.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim tag as Integer
dim files(-1) as string
dim b as Boolean
dim source,dest as FolderItem

source=f.Parent

files.Append f.name

b=NSWorkspaceMBS.performFileOperation(NSWorkspaceMBS.NSWorkspaceRecycleOperation, source, dest,
files, tag)

if b then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Move file to trash. The file is moved to the trash folder on the volume containing the file using the same semantics as NSWorkspaceMoveOperation. If a file with the same name currently exists in the trash folder, the new file is renamed. If no trash folder exists on the volume containing the file, the operation fails.

### 33.72.63 NSWorkspaceScreensDidSleepNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the machine's screen goes to sleep.

The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

Few applications are likely to be interested in this notification, but they may be useful for certain hardware-based drawing decisions, for example when using OpenGL.

Available in Mac OS X v10.6 and later.

### 33.72.64 NSWorkspaceScreensDidWakeNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the machine's screens wake.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

Few applications are likely to be interested in this notification, but they may be useful for certain hardware-based drawing decisions, for example when using OpenGL.

Available in Mac OS X v10.6 and later.

### 33.72.65 NSWorkspaceSessionDidBecomeActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted after a user session is switched in. This allows an application to re-enable some processing when a switched out session gets switched back in, for example.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

Available in Mac OS X v10.3 and later.

### 33.72.66 NSWorkspaceSessionDidResignActiveNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted before a user session is switched out. This allows an application to disable some processing

when its user session is switched out, and re-enable when that session gets switched back in, for example. The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

If an application is launched in an inactive session, NSWorkspaceSessionDidResignActiveNotification is sent after NSApplicationWillFinishLaunchingNotification and before sending NSApplicationDidFinishLaunching-Notification.

Available in Mac OS X v10.3 and later.

### 33.72.67 NSWorkspaceVolumeLocalizedNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the userinfo dictionary for the NSWorkspaceDidRenameVolumeNotification notification.
**Notes:** String containing the user-visible name of the volume.
Available in Mac OS X v10.6 and later.

### 33.72.68 NSWorkspaceVolumeOldLocalizedNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the userinfo dictionary for the NSWorkspaceDidRenameVolumeNotification notification.
**Notes:** String containing the old user-visible name of the volume
Available in Mac OS X v10.6 and later.

### 33.72.69 NSWorkspaceVolumeOldURLKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the userinfo dictionary for the NSWorkspaceDidRenameVolumeNotification notification.
**Notes:** URL containing the old mount path of the volume
Available in Mac OS X v10.6 and later.

### 33.72.70 NSWorkspaceVolumeURLKey as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the userinfo dictionary for the NSWorkspaceDidRenameVolumeNotification notification.
**Notes:** URL containing the mount path of the volume.
Available in Mac OS X v10.6 and later.

### 33.72.71 NSWorkspaceWillLaunchApplicationNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder is about to launch an application.
The notification object is the shared NSWorkspace instance. In Mac OS X v10.6 and later the userInfo dictionary contains the NSWorkspaceApplicationKey key with a corresponding instance of NSRunningApplication that represents the affected application.

Available in Mac OS X v10.0 and later.

### 33.72.72 NSWorkspaceWillPowerOffNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the user has requested a logout or that the machine be powered off.
The notification object is the shared NSWorkspace instance. This notification does not contain a userInfo dictionary.
Available in Mac OS X v10.0 and later.

### 33.72.73 NSWorkspaceWillSleepNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted before the machine goes to sleep. An observer of this message can delay sleep for up to 30 seconds while handling this notification.
The notification object is the shared NSWorkspace instance. The notification does not contain a userInfo dictionary.

Available in Mac OS X v10.3 and later.

### 33.72.74 NSWorkspaceWillUnmountNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Posted when the Finder is about to unmount a device.
This notification will not be delivered if a volume was forcibly and immediately made unavailable, such as when a FireWire drive is simply unplugged, because there is no chance to deliver it before the volume becomes unavailable.

The notification object is the shared NSWorkspace instance. The userInfo dictionary contains a key "NSDevicePath" that returns the path where the device was mounted, as a string.
Available in Mac OS X v10.0 and later.

### 33.72.75 openFile(file as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens the specified file specified using the default application associated with its type.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.txt")

if NSWorkspaceMBS.openFile(f) then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** Returns true if the file was successfully opened; otherwise, false.
The sending application is deactivated before the request is sent.
See also:


- 33.72.76 openFile(file as folderitem, appname as string) as boolean 6485
- 33.72.77 openFile(file as folderitem, appname as string, Deactivate as boolean) as boolean 6486


### 33.72.76 openFile(file as folderitem, appname as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens a file using the specified application.
**Example:**

```
dim f as FolderItem
f=SpecialFolder.Desktop.Child("test.txt")

if NSWorkspaceMBS.openFile(f,"BBEdit") then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** Returns true if the file was successfully opened; otherwise, false.

The appName parameter need not be specified with a full path and, in the case of an application wrapper, may be specified with or without the .app extension, as described in "Use of .app Extension". The sending application is deactivated before the request is sent.
See also:

- 33.72.75 openFile(file as folderitem) as boolean 6485
- 33.72.77 openFile(file as folderitem, appname as string, Deactivate as boolean) as boolean 6486

### 33.72.77 openFile(file as folderitem, appname as string, Deactivate as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens the specified file and optionally deactivates the sending application.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.file")

if NSWorkspaceMBS.openFile(f,"BBEdit",true) then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** appName: The name of the application to use when opening the file.

flag: If true, the sending application is deactivated before the request is sent, allowing the opening application to become the active application.

Returns true if the file was successfully opened; otherwise, false.

The appName parameter need not be specified with a full path and, in the case of an application wrapper, may be specified with or without the .app extension, as described in "Use of .app Extension". If appName is nil, the default application for the file's type is used.
See also:

- 33.72.75 openFile(file as folderitem) as boolean 6485
- 33.72.76 openFile(file as folderitem, appname as string) as boolean 6485

### 33.72.78 openURL(url as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens the location at the specified URL.
**Example:**

```
if NSWorkspaceMBS.openURL("http://www.apple.com") then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** Returns true if the location was successfully opened; otherwise, false.
See also:

- 33.72.79 openURL(url as string, bundleIdentifier as string, options as Integer = &h00030000, AppleEventDescriptor as Variant = nil) as Boolean 6487

### 33.72.79 openURL(url as string, bundleIdentifier as string, options as Integer = &h00030000, AppleEventDescriptor as Variant = nil) as Boolean

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens one or more files from an array of URLs.
**Notes:** url: A URL for the application to open.
bundleIdentifier: A bundle identifier string or "" to use the default system bindings. This value corresponds to the value in the CFBundleIdentifier key of the application's Info.plist file. For example, the bundle identifier of the TextEdit application is com.apple.TextEdit.
options: Options to use when launching the application. Values for this parameter are described in constants.
descriptor: Additional options specified in an AppleEvent-style descriptor. For example, you could use this parameter to specify additional documents to open when the application is launched.

Returns true if the application was found and launched; otherwise, false.
See also:

• 33.72.78 openURL(url as string) as boolean 6487

### 33.72.80 performFileOperation(operation as string, source as folderitem, destination as folderitem, files() as string, byref tag as Integer) as boolean

MBS MacCocoa Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a file operation on a set of files in a particular directory.
**Notes:** operation: The file operation to perform. The possible values for this parameter are described in "Constants."

source: The full path to the directory containing the files on which to operate.

destination: The full path to the destination directory of the operation.

files: An array of folderitems specifying the names of the files and directories to be manipulated. Each string must not contain any path information other than the name of the file or directory. In other words, all of the files and directories must be located in the source directory and not in one if its subdirectories.

tag: On input, a integer variable; on return, this variable contains a negative integer if the operation fails, 0 if he operation was performed synchronously and succeeded, or a positive integer if the operation was performed asynchronously. If the value is a positive integer, the value is a tag that identifies the requested file operation.

Return Value: True if the operation succeeded; otherwise, false.

Discussion:
Some operations—such as moving, copying, and linking files—require a destination directory to be specified. If not, destination should be the empty string (""). Before this method returns, it posts an NSWorkspaceDidPerformFileOperationNotification to the NSWorkspace object's notification center.

### 33.72.81 preferredFilenameExtensionForType(typeName as string) as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the preferred filename extension for the specified Uniform Type Identifier.
**Example:**

```
MsgBox NSWorkspaceMBS.preferredFilenameExtensionForType("public.jpeg")
// "jpeg" in German
```

**Notes:** The appropriate filename extension for typeName, or "" if no extension could be determined.

### 33.72.82 requestAuthorization(type as integer, tag as variant = nil)

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop only.

**Function:** Requests authorization to perform a privileged file operation.
**Notes:** type: The type of file operation to perform.

Calls requestAuthorizationCompleted event later.
Tag value is passed through as is to event.

Requires the application to be code-signed.

### 33.72.83 selectFile(file as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Selects the file in the Finder.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.txt")

if NSWorkspaceMBS.selectFile(f) then
MsgBox "Ok"
else
MsgBox "failed"
end if
```

**Notes:** Returns true on success.

For Windows, please use WinOpenFolderAndSelectItemsMBS function.

### 33.72.84 setDesktopImageURL(file as folderitem, screen as NSScreenMBS, options as dictionary, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the desktop image for the given screen to the image at the specified URL.

**Notes:** file: The image file. The file must not be nil.
screen: The screen to set the desktop image on.
options: The options dictionary may contain any of the Desktop Image Dictionary Keys (NSWorkspaceDesktopImageScalingKey, NSWorkspaceDesktopImageAllowClippingKey or NSWorkspaceDesktopImageFillColorKey), which control how the image is scaled on the screen.
error: A error that is returned by-reference if setting the image fails.

Returns true if the image was set as the desktop, otherwise false. If false is returned, the error parameter provides additional information.

You should not present a user interface for picking the options. Instead, choose appropriate defaults and allow the user to adjust them in the System Preference Pane.

Available in Mac OS X v10.6 and later.

### 33.72.85 setIcon(image as NSImageMBS, file as folderitem, flags as Integer = 0) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the icon for the file or directory at the specified path.
**Example:**

```
dim f as FolderItem
dim p as Picture
dim img as NSImageMBS

f=SpecialFolder.Desktop.Child("test.txt")

p=New Picture(128,128,32)
p.Graphics.ForeColor=rgb(0,128,0)
p.Graphics.fillrect 0,0,128,128
p.Graphics.ForeColor=rgb(255,0,0)
p.Graphics.filloval 0,0,128,128

img=new NSImageMBS(p)

if NSWorkspaceMBS.setIcon(img,f,0) then
MsgBox "Ok. Icon may not be visible directly. Maybe you make a copy of the file to see it directly?"
else
MsgBox "failed"
end if
```

**Notes:** image: The image to use as the icon for the file or directory.
file: The full path of the file or directory.
flags: The icon representations to generate from the image. You specify this value by combining the appropriate NSWorkspaceIconCreationOptions constants, listed in Constants, using the C bitwise OR operator. Specify 0 if you want to generate icons in all available icon representation formats.

Returns true if the icon was set; otherwise, false.

The image can be an arbitrary image, with or without transparency. This image is automatically scaled (as needed) to generate the icon representations. The file or folder must exist and be writable by the user.

It is recommended that applications include the NSExclude10_4ElementsIconCreationOption option for compatibility with pre-Mac OS X v10.3 Finder. Icons that include the high resolution elements prevent custom icons from being displayed on earlier systems.

Before setting icon, make sure you close all Binarystream, Textoutputstream or other classes which may have the file open.
See also:

- 33.72.86 setIcon(image as NSImageMBS, path as string, flags as Integer = 0) as boolean 6491

### 33.72.86 setIcon(image as NSImageMBS, path as string, flags as Integer = 0) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the icon for the file or directory at the specified path.
**Notes:** image: The image to use as the icon for the file or directory.
path: The full path of the file or directory.
flags: The icon representations to generate from the image. You specify this value by combining the appropriate NSWorkspaceIconCreationOptions constants, listed in Constants, using the C bitwise OR operator. Specify 0 if you want to generate icons in all available icon representation formats.

Returns true if the icon was set; otherwise, false.

The image can be an arbitrary image, with or without transparency. This image is automatically scaled (as needed) to generate the icon representations. The file or folder must exist and be writable by the user.

It is recommended that applications include the NSExclude10_4ElementsIconCreationOption option for compatibility with pre-Mac OS X v10.3 Finder. Icons that include the high resolution elements prevent custom icons from being displayed on earlier systems.

Before setting icon, make sure you close all Binarystream, Textoutputstream or other classes which may have the file open.
See also:

- 33.72.85 setIcon(image as NSImageMBS, file as folderitem, flags as Integer = 0) as boolean 6490

### 33.72.87 showSearchResultsForQueryString(queryString as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays a Spotlight search results window in Finder for the specified query string.
**Notes:** Returns true if the communication with Finder was successful, otherwise false.

Finder becomes the active application, if possible. The user can further refine the search via the Finder user interface.

Available in Mac OS X v10.6 and later.

### 33.72.88 typeOfFile(File as folderitem, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the uniform type identifier of the specified file, if it can be determined.
**Notes:** file: The absolute path of the file.
Error: If the Uniform Type Identifier of the file at absolutePath can't be determined, outError contains an NSError object that describes why.

Returns a string containing the uniform type identifier of the file at absoluteFilePath. If no UTI can be determined the return value is "".

If the file at the specified path is a symbolic link, the type of the symbolic link is returned.
See also:

- 33.72.89 typeOfFile(Path as string, byref error as NSErrorMBS) as string 6492

### 33.72.89 typeOfFile(Path as string, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the uniform type identifier of the specified file, if it can be determined.
**Notes:** file: The absolute path of the file.
Error: If the Uniform Type Identifier of the file at absolutePath can't be determined, outError contains an

NSError object that describes why.

Returns a string containing the uniform type identifier of the file at absoluteFilePath. If no UTI can be determined the return value is "".

If the file at the specified path is a symbolic link, the type of the symbolic link is returned.
See also:

- 33.72.88 typeOfFile(File as folderitem, byref error as NSErrorMBS) as string 6492

### 33.72.90 unmountAndEjectDevice(item as folderitem, byref e as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unmounts and ejects the device at the specified path.
**Example:**

```
dim w as new NSWorkspaceMBS
dim disk as FolderItem = Volume(VolumeCount-1)

MsgBox disk.Name

dim e as NSErrorMBS
if w.unmountAndEjectDevice(disk, e) then
MsgBox "OK"
else
MsgBox "Error: "+e.localizedDescription
end if
```

**Notes:** Returns true if the volume was unmounted and ejected successfully, otherwise false, for example, if the volume is not ejectable.
error: If the operation fails, this error contains more information about the failure.

### 33.72.91 URLForApplicationToOpenURL(url as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the URL to the default application that would be used to open the given URL.
**Notes:** url: The URL of the file to open.

Returns the URL of the default application that would open the specified url. Returns "" if no application

is able to open the url, or if the file url does not exist.

This is the programmatic equivalent of double clicking a document in the Finder.

### 33.72.92 URLForApplicationWithBundleIdentifier(bundleIdentifier as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the URL for the application with the specified identifier.
**Notes:** bundleIdentifier: A bundle identifier specifying an application.

Returns the URL of the application, or "" if no application has the bundle identifier.
This uses various (currently unspecified) heuristics in case multiple apps have the same bundle ID.

### 33.72.93 Properties

### 33.72.94 accessibilityDisplayShouldDifferentiateWithoutColor as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the current accessibility display option for differentiate without color.
**Notes:** If this is true, UI should not convey information using color alone and instead should use shapes or glyphs to convey information. You may listen for NSWorkspaceAccessibilityDisplayOptionsDidChangeNotification to be notified when this changes.
(Read only property)

### 33.72.95 accessibilityDisplayShouldIncreaseContrast as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value that indicates whether the app should present a high contrast user interface.
**Notes:** When this method returns true, present a high contrast UI. For example, use a less subtle color palette or bolder lines.
(Read only property)

### 33.72.96 accessibilityDisplayShouldInvertColors as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the current accessibility display option for invert colors.
**Notes:** If this property's value is true then the display will be inverted. In these cases it may be needed for UI drawing to be adjusted to in order to display optimally when inverted. You may listen for NSWorkspaceAccessibilityDisplayOptionsDidChangeNotification to be notified when this changes.

Available on MacOS 10.12 or newer.
(Read only property)

### 33.72.97 accessibilityDisplayShouldReduceMotion as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the current accessibility display option for reduce motion.
**Notes:** If this property's value is true, UI should avoid large animations, especially those that simulate the third dimension. You may listen for NSWorkspaceAccessibilityDisplayOptionsDidChangeNotification to be notified when this changes.
Available on MacOS 10.12 or newer.
(Read only property)

### 33.72.98 accessibilityDisplayShouldReduceTransparency as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the current accessibility display option for reduce transparency.
**Notes:** If this property's value is true, UI (mainly window) backgrounds should not be semi-transparent; they should be opaque. You may listen for NSWorkspaceAccessibilityDisplayOptionsDidChangeNotification to be notified when this changes.
(Read only property)

### 33.72.99 isSwitchControlEnabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates if Switch Control is currently running.
**Notes:** (Read only property)

### 33.72.100 isVoiceOverEnabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates if VoiceOver is currently running.
**Notes:** (Read only property)

### 33.72.101 Events

### 33.72.102 requestAuthorizationCompleted(type as Integer, authorization as NSWorkspaceAuthorizationMBS, error as NSErrorMBS, tag as variant)

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: .

**Function:** The request for authorization completed.
**Notes:** type: The type of file operation requested.
authorization: The authorization granted for this app. Use it when creating a new NSFileManagerMBS with fileManagerWithAuthorization function.
error: nil if the app is authorized; otherwise, a pointer to the authorization error.

The completion event to call when the authorization request is completed.

### 33.72.103 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSExclude10_4ElementsIconCreationOption | 4 | One of the possible constants you can use with SetIc |
| NSExcludeQuickDrawElementsIconCreationOption | 2 | One of the possible constants you can use with SetIc |
| NSWorkspaceLaunchAndHide | &h00100000 | One of the constants for the launch functions. |
| NSWorkspaceLaunchAndHideOthers | &h00200000 | One of the constants for the launch functions. |
| NSWorkspaceLaunchAndPrint | 2 | One of the constants for the launch functions. |
| NSWorkspaceLaunchAsync | &h00010000 | One of the constants for the launch functions. |
| NSWorkspaceLaunchDefault | &h00010000 | One of the constants for the launch functions. |
| NSWorkspaceLaunchInhibitingBackgroundOnly | &h00000080 | One of the constants for the launch functions. |
| NSWorkspaceLaunchNewInstance | &h00080000 | One of the constants for the launch functions. |
| NSWorkspaceLaunchWithErrorPresentation | &h00000040 | One of the constants for the launch functions. |
| NSWorkspaceLaunchWithoutActivation | &h00000200 | One of the constants for the launch functions. |
| NSWorkspaceLaunchWithoutAddingToRecents | &h00000100 | One of the constants for the launch functions. |

Architectures

| Constant | Value | Description |
|---|---|---|
| NSBundleExecutableArchitectureARM64 | &h0100000c | Specifies the 64-bit ARM architecture. |
| NSBundleExecutableArchitectureI386 | &h00000007 | Intel 32 bit. |
| NSBundleExecutableArchitecturePPC | &h00000012 | PPC 32 bit. |
| NSBundleExecutableArchitecturePPC64 | &h01000012 | PPC 64 bit. |
| NSBundleExecutableArchitectureX86_64 | &h01000007 | Intel 64 bit. |

Authorization Types

| Constant | Value | Description |
|---|---|---|
| NSWorkspaceAuthorizationTypeCreateSymbolicLink | 0 | Authorization for the app to create a symoblic link. |
| NSWorkspaceAuthorizationTypeReplaceFile | 2 | Authorization for the app to perform an atomic file write w target file's permissions. |
| NSWorkspaceAuthorizationTypeSetAttributes | 1 | Authorization for the app to change specific file attributes |

# Chapter 34

# Cocoa Collection View

## 34.1 control DesktopNSCollectionViewControlMBS

### 34.1.1 control DesktopNSCollectionViewControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSCollectionView within Xojo.
**Notes:** Requires macOS 10.11 or newer!

See also:
https://developer.apple.com/documentation/appkit/views_and_controls/collection_view
https://developer.apple.com/documentation/appkit/nscollectionview
https://developer.apple.com/documentation/appkit/nscollectionviewdatasource
https://developer.apple.com/documentation/appkit/nscollectionviewdelegate
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- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
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- Video about MBS Xojo Plugins 21.1
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**Videos**

- MBS Xojo Plugins 21.1

**Xojo Developer Magazine**

- 19.5, page 9: News
- 19.3, page 10: News

### 34.1.2 Methods

### 34.1.3 performBatchUpdates(tag as variant)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Encapsulates multiple insert, delete, reload, and move operations into a single animated operation.
**Notes:** Use this method to make multiple changes to the collection view in one single animated operation. Normally, when you insert, delete, reload, or move items, the collection view animates each change separately. Making those same changes inside the updates block causes them to be animated at the same time. This method updates the current layout information as needed before and after performing the operations in the updates block.

The order in which you make calls to insert, delete, or otherwise modify the collection view is ignored. When executing your updates block, this method gathers information about the operations you requested without performing those operations. After it gathers that information, the method reorders the operations and performs all deletion operations first, followed by all insertion operations and then all move operations. (Reloading an item is treated as a delete operation followed by an insert operation at the same location.) As a result, the indexes you specify for each set of operations must reflect the changes made by any preceding operations.

You may call this method from inside your performBatchUpdatesWork or performBatchUpdatesCompleted events.

This method calls performBatchUpdatesWork event, where you can perform the work and later performBatchUpdatesCompleted event when finished.

### 34.1.4 Properties

### 34.1.5 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used around the collection view.
**Notes:** (Read only property)

### 34.1.6 View as NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the NSCollectionView object.
**Notes:** (Read only property)

### 34.1.7 Events

### 34.1.8 acceptDrop(draggingInfo as NSDraggingInfoMBS, indexPath as NSIndexPathMBS, dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Incorporates the dropped content into the collection view.
**Notes:** draggingInfo: The information about the drag operation.
indexPath: The index path at which the drop occurred. Use this location as the insertion point for the content.
dropOperation: The type of drop operation to perform.

Return true if the drop operation should be accepted or false if it should be rejected.

The collection view calls this event when the user releases the mouse button while it is over a valid drop target. This event is called after the validateDrop method validates that dropping the content at the specified location is possible. You must implement this event to accept the dropped content and incorporate it into the collection view.

In your implementation, use the information in the draggingInfo parameter to retrieve the data, update your data source object, and insert the appropriate items into the collection view. The dropped data is stored in the draggingPasteboard property of the dragging information object.

If the animatesToDestination property of the dragging information is true, update the image and frame for each dragged item to its new location in the collection view.

### 34.1.9 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 34.1.10 cancelPrefetchingForItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies your 'prefetchDataSource' that items at the specified 'indexPaths', for which the CollectionView previously sent prefetchItems evnet, are no longer expected to be displayed.
**Notes:** This is a good opportunity to cancel any pending resource fetches you've initiated for the items, if possible and worthwhile. This is only sent for items that don't end up being displayed; CollectionView doesn't cancel prefetching for items that it actually instantiates and shows.

### 34.1.11 canDragItems(indexPaths() as NSIndexPathMBS, NSEvent as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean indicating whether a drag operation involving the specified items can begin.
**Notes:** indexPaths: The index paths of the items about to be dragged.
event: The mouse-down event that began the drag operation.

Return true if the drag operation can begin or false if it cannot.

If you do not implement this event, the collection view assumes a return value of true.

### 34.1.12 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 34.1.13 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 34.1.14 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 34.1.15 didChangeItems(indexPaths() as NSIndexPathMBS, highlightState as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending highlighting of the specified items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items being highlighted.
highlightState: The new highlight state for the items.

Returns the array of NSIndexPath objects corresponding to the items that you want to receive the specified highlight. If you do not want any items to receive the specified highlight state, return an empty set.

Use this method to approve or modify the set of items targeted to receive the specified highlight state. During interactive selection or dragging, the collection view calls this method when actions occur that would affect the highlight state of items. Your implementation of the method can return the proposed set of index paths as-is or modify the set and disallow the highlighting of some or all of the items. Removing items from the set suppresses the corresponding actions, such as selecting the item or showing its eligibility as a drop target.

If you do not implement this method, the collection view updates the highlight state for the items specified by the indexPaths parameter.

### 34.1.16 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 34.1.17 didDeselectItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate object that one or more items were deselected.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items that were deselected.

After the user successfully deselects one or more items, the collection view calls this method to let you know that the items are no longer selected. Use this method to respond to the selection change and to make any necessary adjustments to your content or the collection view.
This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class.

### 34.1.18 didEndDisplayingItem(item as NSCollectionViewItemMBS, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified item was removed from the collection view.
**Notes:** item: The item that was removed.
indexPath: The index path of the item.

The collection view calls this method after removing an item from its content. You can use this method to track the removal of items and perform related tasks.

### 34.1.19 didEndDisplayingSupplementaryView(view as NSViewMBS, elementKind as String, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified supplementary view was removed from the collection view.
**Notes:** view: The supplementary view that was removed.

elementKind: The type of the supplementary view. Layouts are responsible for defining the types of supplementary views they support.
indexPath: The index path associated with the supplementary view.

The collection view calls this method after removing a supplementary view from its content. You can use this method to track the removal of views and perform related tasks.

### 34.1.20 didSelectItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate object that one or more items were selected.
**Notes:** collectionView: The collection view notifying you of the selection change.
indexPaths: The array of NSIndexPathMBS objects corresponding to the items that are now selected.

After the user successfully selects one or more items, the collection view calls this method to let you know that the selection has been made. Use this method to respond to the selection change and to make any necessary adjustments to your content or the collection view.
This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class.

### 34.1.21 draggingImageForItems(indexPaths() as NSIndexPathMBS, NSEvent as NSEventMBS, byref dragImageOffset as NSPointMBS) as NSImageMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Creates and returns a drag image to represent the specified items during a drag.
**Notes:** indexPaths: The index paths of the items being dragged.
NSEvent: The mouse-down event that began the drag operation. You can use the mouse location when determining what value to return in the dragImageOffset parameter.
dragImageOffset: The offset value to use when positioning the image. On input, the point is NSZeroPoint, which centers the returned image under the mouse. Your method can return a different point that repositions the drag image by the specified offset values.

Return the image to use for the dragged items.

Your implementation of this event should create an appropriate image to use during the drag operation. The collection view places the center of your image at the current mouse location. Update the value in the dragImageOffset parameter to shift the position of your image by the specified amount.
If you do not implement this event, the collection view uses the drag image returned by the draggingImageForItemsAtIndexPaths method instead.

### 34.1.22 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, dragOperation as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies your delegate that a drag session ended.
**Notes:** session: The dragging session that ended.
screenPoint: The end point (in screen coordinates) for the drag operation.
operation: The operation that was performed. Use this value to determine how the operation ended. For example, for content that was dragged to the trash, the operation type would be NSDragOperationDelete (32).

You can use this method to perform tasks related to the ending of a drag session.

### 34.1.23 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies your delegate that a drag session is about to begin.
**Notes:** session: The dragging session that is about to begin.
screenPoint: The starting point (in screen coordinates) for the drag operation. (in Cocoa coordinate system with bottom = zero)
indexPaths: The index paths of the items being dragged.

You can use this method to modify the dragging session or to perform other tasks related to the beginning of a drag session.

### 34.1.24 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 34.1.25 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 34.1.26 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 34.1.27 insetForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as NSEdgeInsetsMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the margins to apply to content in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose margins are needed.

Return the margins to apply to items in the specified section.

Implement this method when you want to provide margins for sections in the flow layout. Your implementation can return the same margins for all sections or it can return different margins for different sections. You can also adjust the margins of each section dynamically each time you update the layout. If you do not implement this method, the margins are obtained from the properties of the flow layout object.

The insets you return reflect the spacing between the items and the header and footer views of the section. They also reflect the spacing at the edges of a single row or column. For more information about how insets are applied, see the description of the sectionInset property.

### 34.1.28 ItemApplyLayoutAttributes(item as NSCollectionViewItemMBS, layoutAttributes as NSCollectionViewLayoutAttributesMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Applies the specified layout attributes to the element.
**Notes:** In your custom elements, you can use this method to apply the specified attributes to your content. For example, if your element object is a view controller, you would override this method and use it to apply the attributes to the root view object. When using your element with a layout object that supports custom attributes, you would also use this method to apply those custom attributes.

### 34.1.29 ItemDidTransition(item as NSCollectionViewItemMBS, oldLayout as NSCollectionViewLayoutMBS, newLayout as NSCollectionViewLayoutMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the element that the layout object of the collection view changed.
**Notes:** oldLayout: The collection view,Äôs previous layout object.
newLayout: The current layout object associated with the collection view.

The default implementation of this method does nothing. Subclasses can override it and use it to finalize any behaviors associated with the change in layouts.

In OS X 10.11, this method is never called.

### 34.1.30 itemForRepresentedObject(indexPath as NSIndexPathMBS) as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the item at the specified location in the collection view.
**Notes:** indexPath: The index path that specifies the location of the item. This index path contains both the section index and the item index within that section.

Returns a configured item object. You must not return nil from this method.

All data source objects must implement this method. Your implementation is responsible for creating, configuring, and returning the appropriate item object based on the specified index path. You do this by calling the makeItem() method of the collection view to retrieve an empty item object of the appropriate type. After receiving the item object, update its properties with the data from your app,Äôs data structures and return it.
You do not need to set the frame of an item,Äôs view from this method. The collection view gets the

item,Äôs location and other layout-related attributes from the layout object during a separate step.

### 34.1.31 ItemPreferredLayoutAttributesFittingAttributes(item as NSCollectionViewItemMBS, layoutAttributes as NSCollectionViewLayoutAttributesMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your element if it wants to modify any layout attributes before they are applied.
**Notes:** layoutAttributes: The attributes provided by the layout object. These attributes represent the values that the layout object intends to apply to the element.

Return the final attributes to apply to the element.

The default implementation of this method returns the same attributes that are in the layoutAttributes parameter. You can override this method in subclasses and use it to return a different set of attributes. If you override this method, call super first to give the system the opportunity to make changes, then modify the returned attributes.

### 34.1.32 ItemPrepareForReuse(item as NSCollectionViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs any necessary cleanup to prepare the element for use again.
**Notes:** The recycling of content is an important technique for improving performance of a collection view. Instead of creating all views from scratch, the collection view recycles views and view controllers that move offscreen. When your app subsequently calls the makeItem or makeSupplementaryViewOfKind method, the collection view retrieves a recycled object from the appropriate storage, calls this method, and then returns the object to your app.

Implement this method when you need to delete old data or when you want to restore your recycled views to a standard initial state prior to their reuse. For example, you might use this method to restore the size of a view to some standard size or reset the alpha to 1.0 to ensure that the view is fully opaque. Do not use this method to configure the view with new data. Restoring your views to a default state in this method simplifies the configuration code you must write in your data source object later.

### 34.1.33 ItemWillTransition(item as NSCollectionViewItemMBS, oldLayout as NSCollectionViewLayoutMBS, newLayout as NSCollectionViewLayoutMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the element that the layout object of the collection view is about to change.
**Notes:** oldLayout: The current layout object used by the collection view.
newLayout: The new layout object that is about to be used by the collection view.

The default implementation of this method does nothing. Subclasses can override it and use it to prepare for the change in layouts.

Special Considerations
In OS X 10.11, this method is never called.

### 34.1.34 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 34.1.35 minimumInteritemSpacingForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the spacing between successive items of a single row or column.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose inter-item spacing is needed.

Return the minimum space (in points) to apply between successive items in a single row or column.

Implement this method when you want to provide custom inter-item spacing for sections in the flow layout. Your implementation can return the same spacing for all sections or it can return different spacing for different sections. You can also adjust the inter-item spacing of each section dynamically each time you update the layout. If you do not implement this method, the inter-item spacing is obtained from the properties of the flow layout object.

For a vertically scrolling layout, this value represents the minimum spacing between items in the same row. For a horizontally scrolling layout, this value represents the minimum spacing between items in the same column. The layout object uses this spacing only to compute how many items can fit in a single row or column. The actual spacing may be increased after the number of items has been determined. For more information about how inter-item spacing is applied, see the description of the minimumInteritemSpacing property.

### 34.1.36 minimumLineSpacingForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the spacing between successive rows or columns of a section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose line spacing is needed.

Returns the minimum space (in points) to apply between successive lines in a section.

Implement this method when you want to provide custom line spacing for sections in the flow layout. Your implementation can return the same line spacing for all sections or it can return different line spacing for different sections. You can also adjust the line spacing of each section dynamically each time you update the layout. If you do not implement this method, the line spacing is obtained from the properties of the flow layout object.

For a vertically scrolling layout, this value represents the minimum spacing between successive rows. For a horizontally scrolling layout, this value represents the minimum spacing between successive columns. This spacing is not applied to the space between the header and the first line or between the last line and the footer. For more information about how line spacing is applied, see the description of the minimumLineSpacing property.

### 34.1.37 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 34.1.38 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 34.1.39 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 34.1.40 namesOfPromisedFilesDroppedAtDestination(dropURL as String, indexPaths() as NSIndexPathMBS) as String()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the names of the promised files that you created for a drag operation.
**Notes:** dropURL: The URL at which to create the promised files.
indexPaths: The index paths of the dragged items.

Return an array of strings containing the filenames you created, or intend to create, at the specified URL.

At the start of a drag operation, your app must provide the data that constitutes the items being dragged. If you specify a file promise, instead of the data itself, use this method to specify the names of the files you promised. If the files already exist, move them to the directory specified by the dropURL parameter. If you must create the files first, use this method to specify the names of the files you intend to provide and begin creating those files asynchronously on a background thread.

The filenames you return are made available from the namesOfPromisedFilesDroppedAtDestination method of the NSDraggingInfo object passed around during the drag operation.

### 34.1.41 numberOfItemsInSection(section as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the number of items in the specified section.
**Notes:** All data source objects must implement this event. Your implementation should quickly return the number of items in the specified section.
Make sure the number of items you return is accurate. The itemForRepresentedObject event must be able to provide a visual representation for each item in the section.

### 34.1.42 numberOfSections as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the total number of sections.
**Notes:** Implement this method when the organization of your data requires more than one section. If you do not implement this method, the collection view creates only one section.

### 34.1.43 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 34.1.44 pasteboardWriterForItem(indexPath as NSIndexPathMBS) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Provides the pasteboard writer for the item at the specified index path.
**Notes:** collectionView: The collection view making the request.
indexPath: The index path of the item requiring a pasteboard writer.

Returns the pasteboard writer object to use for managing the item data. Return nil to prevent the collection view from dragging the item.

You must implement this method or the collectionView:writeItemsAtIndexPaths method to support drag operations. The collection view calls this method in preference over the writeItemsAtIndexPaths method if both are implemented. If your app supports multi-image drag and drop, you must implement this method.

The collection view calls this method for each item involved in the drag operation after it has determined that a drag should begin but before the drag operation has started. Your implementation of this method

should create and return the pasteboard writer—an object conforming to the NSPasteboardWriting protocol—to use for providing the item,Äôs data. Using the object you provide, the collection view creates an NSDraggingItem object for you and configures its draggingFrame and imageComponents properties for you using information from the item at the specified index path.
If you implement this method, the collection view does not call the draggingImageForItemsAtIndexPaths of your delegate or the draggingImageForItemsAtIndexPaths method of NSCollectionView.

### 34.1.45 performBatchUpdatesCompleted(tag as variant, finished as boolean)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** A event to execute when the changes made in the performBatchUpdatesWork events have finished animating.
**Notes:** finished: A Boolean value indicating whether the animations completed successfully. The value of this parameter is true if the animations ran to completion or false if they were interrupted.

### 34.1.46 performBatchUpdatesWork(tag as variant)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event that performs the needed inset, delete, reload, or move operations.

### 34.1.47 prefetchItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies your 'prefetchDataSource' that items at the specified 'indexPaths' are likely to be instantiated and displayed soon.
**Notes:** The CollectionView sends this as early as possible, to give your 'prefetchDataSource' the opportunity to begin acquiring any resources such as thumbnail images or metadata that you might need in order to prepare the item's content for display. The given 'indexPaths' are sorted by the order in which they are likely to be needed.

### 34.1.48 referenceSizeForFooterInSection(layout as NSCollectionViewLayoutMBS, section as Integer) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the size of the footer view in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.

section: The index of the section whose footer size is requested.

The size of the footer. Return NSZeroSize if you do not want a footer added to the section.

If you implement this method, the flow layout object calls it to obtain the size of the footer in each section and uses that information to set the size of the corresponding views. If you do not implement this method, the footer size is obtained from the properties of the flow layout object.

The flow layout object uses only one of the returned size values. For a vertically scrolling layout, the layout object uses the height value. For a horizontally scrolling layout, the layout object uses the width value. The other value is sized appropriately to match the opposing dimension of the collection view itself. Set the size of the footer to 0 to prevent it from being displayed.

### 34.1.49 referenceSizeForHeaderInSection(layout as NSCollectionViewLayoutMBS, section as Integer) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the size of the header view in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose header size is requested.

Returns the size of the header. Return NSZeroSize if you do not want a header added to the section.

If you implement this method, the flow layout object calls it to obtain the size of the header in each section and uses that information to set the size of the corresponding views. If you do not implement this method, the header size is obtained from the properties of the flow layout object.

The flow layout object uses only one of the returned size values. For a vertically scrolling layout, the layout object uses the height value. For a horizontally scrolling layout, the layout object uses the width value. The other value is sized appropriately to match the opposing dimension of the collection view itself. Set the size of the header to 0 to prevent it from being displayed.

### 34.1.50 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 34.1.51 shouldChangeItems(indexPaths() as NSIndexPathMBS, highlightState as Integer) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending highlighting of the specified items.
**Notes:** indexPaths: The set of NSIndexPathMBS objects corresponding to the items being highlighted.
highlightState: The new highlight state for the items.

Return the set of NSIndexPath objects corresponding to the items that you want to receive the specified highlight. If you do not want any items to receive the specified highlight state, return an empty set.

Use this method to approve or modify the set of items targeted to receive the specified highlight state. During interactive selection or dragging, the collection view calls this method when actions occur that would affect the highlight state of items. Your implementation of the method can return the proposed set of index paths as-is or modify the set and disallow the highlighting of some or all of the items. Removing items from the set suppresses the corresponding actions, such as selecting the item or showing its eligibility as a drop target.
If you do not implement this method, the collection view updates the highlight state for the items specified by the indexPaths parameter.

### 34.1.52 shouldDeselectItems(indexPaths() as NSIndexPathMBS) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate object to approve the pending deselection of items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items deselected by the user.

Return the array of NSIndexPathMBS objects corresponding to the items that you want to be deselected. If you do not want any items deselected, return an empty set.

Use this method to approve or modify the items that the user tries to deselect. During interactive selection, the collection view calls this method whenever the user deselects items. Your implementation of the method can return the proposed set of index paths as-is or modify the set before returning it. You might modify the set to disallow the deselection of specific items.

This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class. If you do not implement this method, the collection view deselects the items specified by the indexPaths parameter.

### 34.1.53 shouldSelectItems(indexPaths() as NSIndexPathMBS) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending selection of items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items selected by the user.

Returns the array of NSIndexPathMBS objects corresponding to the items that you want to be selected. If you do not want any items selected, return an empty array.

Use this method to approve or modify the items that the user tries to select. During interactive selection, the collection view calls this method whenever the user selects new items. Your implementation of the method can return the proposed set of index paths as-is or modify the set before returning it. You might modify the set to disallow the selection of specific items or specific combinations of items.

This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class. If you do not implement this method, the collection view selects the items specified by the indexPaths parameter.

### 34.1.54 sizeForItemAtIndexPath(layout as NSCollectionViewLayoutMBS, indexPath as NSIndexPathMBS) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you for the size of the specified item.
**Notes:** collectionViewLayout: The layout object requesting the information.
indexPath: The index path of the item.

Return the size of the item. The width and height values must both be greater than 0. Items must also not exceed the available space in the collection view.

Implement this method when you want to provide the size of items in the flow layout. Your implementation can return the same size for all items or it can return different sizes for items. You can also adjust the size of items dynamically each time you update the layout. If you do not implement this method, the size of items is obtained from the properties of the flow layout object.

The size value you return from this method must allow the item to be displayed fully by the collection view. In the scrolling direction, items can be larger than the collection view because the remaining content can always be scrolled into view, but in the nonscrolling directions, items should always be smaller than the collection view itself. For example, the width of an item in a vertically scrolling collection view must not exceed the width of the collection view minus any section insets. The flow layout does not crop an item,Äôs bounds to make it fit into the available space.

### 34.1.55 transitionLayout(fromLayout as NSCollectionViewLayoutMBS, toLayout as NSCollectionViewLayoutMBS) as NSCollectionViewTransitionLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the transition layout object to use when performing an animated change between different layouts.
**Notes:** fromLayout: The current layout object of the collection view. This is the starting point for the transition.
toLayout: The new layout for the collection view.

Return the collection view transition layout object to use to perform the transition.

When changing layouts for a collection view, you can use this method to customize the transition layout object used to make the change. A transition layout object lets you customize the behavior of collection view elements when transitioning from one layout to the next. Normally, transitioning between layouts causes the assorted items and views to animate from their current locations directly to their new locations. By returning a custom transition object, you could have those elements follow a nonlinear path, use a different timing algorithm, or move items in response to touch events.

If you do not implement this method in your delegate object, the collection view uses a standard UICollectionViewTransitionLayout object for the transition.

Special Considerations
In OS X 10.11, this method is never called by the collection view.

### 34.1.56 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your delegate to update the dragging items during a drag operation.
**Notes:** draggingInfo: The current information for the drag operation. Use this object to iterate over the dragging items.

You can use this method to update the current drag items while a drag is in progress. Updating the drag items is optional, but you might use this method to change the image for an item. For example, you might change the image when the mouse hovers over a particular part of the collection view. Use the enumerateDraggingItems method of the draggingInfo parameter to iterate over the drag items and update them as appropriate.

### 34.1.57 validateDrop(draggingInfo as NSDraggingInfoMBS, byref proposedIndexPath as NSIndexPathMBS, byref dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Validates whether a drop operation is possible at the specified location.
**Notes:** draggingInfo: The information about the drag operation.
proposedDropIndexPath: The index path at which the drop would occur. This parameter is passed by-reference and can be modified to change the proposed index path.
proposedDropOperation: The type of drop operation being proposed. This parameter is passed by-reference and can be modified to change the drop operation type.

Returns a value that indicates which dragging operation to perform. Return NSDragOperationNone to disallow a drop at the proposed location.

Although implementation of this method is optional, you must implement it to support drops onto the associated collection view. You must also call the collection view,Äôs registerForDraggedTypes method to register the types of drops it supports. If you do not perform both of these actions, the collection view does not accept drops.

When an interactive drag operation occurs, the collection view calls this method to determine whether the current mouse location is a valid place to drop the content. This method may be called many times during the course of the drag operation. Your implementation should look at the proposed location and return a constant that reflects how the drop would be handled.
While validating the drop location, you can suggest a better drop location by updating the values in the proposedDropIndexPath and proposedDropOperation parameters. For example, you might suggest dropping the content before the specified item instead of on it. The collection view sets the proposedDropOperation parameter to DropOn when the mouse is closer to the middle of an item than to its edges; otherwise, it sets the parameter to DropBefore.

### 34.1.58 viewForSupplementaryElement(kind as String, indexPath as NSIndexPathMBS) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the supplementary view at the specified location in a section of the collection view.
**Notes:** kind: The kind of supplementary view to provide. The value of this string is defined by the current layout object associated with the collection view. Layouts may define additional views to add visual content that is unrelated to specific items.
indexPath: The index path that identifies the section in which to place the supplementary view.

Returns a configured view object. You must not return nil from this method.

Implement this method if the collection view,Äôs layout object supports supplementary views. Your implementation is responsible for creating, configuring, and returning an appropriate view. You do this by calling the makeSupplementaryViewOfKind method of the collection view to retrieve an unconfigured view of the appropriate type. After receiving the view, update its properties and content using your app,Äôs data structures and return it.
You do not need to set the location of supplementary views inside the collection view,Äôs bounds. The collection view gets the view,Äôs location and other layout-related attributes from the layout object during a separate step.

### 34.1.59 willDisplayItem(item as NSCollectionViewItemMBS, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified item is about to be displayed by the collection view.
**Notes:** item: The item being added.
indexPath: The index path of the item.

The collection view calls this method before adding new items to its content. You can use this method to track the addition of items and perform related tasks.

### 34.1.60 willDisplaySupplementaryView(view as NSViewMBS, elementKind as String, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified supplementary view is about to be displayed by the collection view.
**Notes:** view: The supplementary view being added.
elementKind: The type of the supplementary view. Layouts are responsible for defining the types of supplementary views they support.
indexPath: The index path associated with the supplementary view.

The collection view calls this method before adding new supplementary views to its content. You can use this method to track the addition of those views and perform related tasks.

### 34.1.61 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 34.1.62 writeItems(indexPaths() as NSIndexPathMBS, Pasteboard as NSPasteboardMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Places the data for the drag operation on the pasteboard.
**Notes:** indexPaths: The index paths of the items being dragged.
pasteboard: The pasteboard on which to place the drag data.

Return true if the drag operation can continue or no if you want to refuse the drag.

The collection view calls this method after it has determined that a drag should begin but before the drag operation has started. Your implementation of this method should do the following:

- Declare the pasteboard types you support using the declareTypes method of the provided pasteboard object.
- Write data to the pasteboard for each type you declare.
- Return true from this event.

### 34.1.63 Constants

Drop Operation

| Constant | Value | Description |
|---|---|---|
| DropBefore | 1 | The drop occurs before the collection view item to which the item was dragged. |
| DropOn | 0 | The drop occurs at the collection view item to which the item was dragged. |

## 34.2 control NSCollectionViewControlMBS

### 34.2.1 control NSCollectionViewControlMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSCollectionView within Xojo.
**Notes:** Requires macOS 10.11 or newer!

See also:
https://developer.apple.com/documentation/appkit/views_and_controls/collection_view
https://developer.apple.com/documentation/appkit/nscollectionview
https://developer.apple.com/documentation/appkit/nscollectionviewdatasource
https://developer.apple.com/documentation/appkit/nscollectionviewdelegate
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- News from the MBS Xojo Plugins Version 21.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- Smooth scrolling list control with ContainerControls
- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- NSCollectionView for Xojo
- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0

**Videos**

- MBS Xojo Plugins 21.1

**Xojo Developer Magazine**

- 19.5, page 9: News
- 19.3, page 10: News

### 34.2.2 Methods

### 34.2.3 performBatchUpdates(tag as variant)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Encapsulates multiple insert, delete, reload, and move operations into a single animated operation.
**Notes:** Use this method to make multiple changes to the collection view in one single animated operation. Normally, when you insert, delete, reload, or move items, the collection view animates each change separately. Making those same changes inside the updates block causes them to be animated at the same time. This method updates the current layout information as needed before and after performing the operations in the updates block.

The order in which you make calls to insert, delete, or otherwise modify the collection view is ignored. When executing your updates block, this method gathers information about the operations you requested without performing those operations. After it gathers that information, the method reorders the operations and performs all deletion operations first, followed by all insertion operations and then all move operations. (Reloading an item is treated as a delete operation followed by an insert operation at the same location.) As a result, the indexes you specify for each set of operations must reflect the changes made by any preceding operations.

You may call this method from inside your performBatchUpdatesWork or performBatchUpdatesCompleted events.

This method calls performBatchUpdatesWork event, where you can perform the work and later performBatchUpdatesCompleted event when finished.

### 34.2.4 Properties

### 34.2.5 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used around the collection view.
**Notes:** (Read only property)

### 34.2.6 View as NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the NSCollectionView object.

**Notes:** (Read only property)

### 34.2.7 Events

### 34.2.8 acceptDrop(draggingInfo as NSDraggingInfoMBS, indexPath as NSIndexPathMBS, dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Incorporates the dropped content into the collection view.
**Notes:** draggingInfo: The information about the drag operation.
indexPath: The index path at which the drop occurred. Use this location as the insertion point for the content.
dropOperation: The type of drop operation to perform.

Return true if the drop operation should be accepted or false if it should be rejected.

The collection view calls this event when the user releases the mouse button while it is over a valid drop target. This event is called after the validateDrop method validates that dropping the content at the specified location is possible. You must implement this event to accept the dropped content and incorporate it into the collection view.

In your implementation, use the information in the draggingInfo parameter to retrieve the data, update your data source object, and insert the appropriate items into the collection view. The dropped data is stored in the draggingPasteboard property of the dragging information object.

If the animatesToDestination property of the dragging information is true, update the image and frame for each dragged item to its new location in the collection view.

### 34.2.9 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 34.2.10 cancelPrefetchingForItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies your 'prefetchDataSource' that items at the specified 'indexPaths', for which the Col-

lectionView previously sent prefetchItems evnet, are no longer expected to be displayed.
**Notes:** This is a good opportunity to cancel any pending resource fetches you've initiated for the items, if possible and worthwhile. This is only sent for items that don't end up being displayed; CollectionView doesn't cancel prefetching for items that it actually instantiates and shows.

### 34.2.11 canDragItems(indexPaths() as NSIndexPathMBS, NSEvent as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Returns a Boolean indicating whether a drag operation involving the specified items can begin.
**Notes:** indexPaths: The index paths of the items about to be dragged.
event: The mouse-down event that began the drag operation.

Return true if the drag operation can begin or false if it cannot.

If you do not implement this event, the collection view assumes a return value of true.

### 34.2.12 Close

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 34.2.13 Closing

Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 34.2.14 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 34.2.15 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 34.2.16 didChangeItems(indexPaths() as NSIndexPathMBS, highlightState as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending highlighting of the specified items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items being highlighted.
highlightState: The new highlight state for the items.

Returns the array of NSIndexPath objects corresponding to the items that you want to receive the specified highlight. If you do not want any items to receive the specified highlight state, return an empty set.

Use this method to approve or modify the set of items targeted to receive the specified highlight state. During interactive selection or dragging, the collection view calls this method when actions occur that would affect the highlight state of items. Your implementation of the method can return the proposed set of index paths as-is or modify the set and disallow the highlighting of some or all of the items. Removing items from the set suppresses the corresponding actions, such as selecting the item or showing its eligibility as a drop target.

If you do not implement this method, the collection view updates the highlight state for the items specified by the indexPaths parameter.

### 34.2.17 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 34.2.18 didDeselectItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate object that one or more items were deselected.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items that were deselected.

After the user successfully deselects one or more items, the collection view calls this method to let you know that the items are no longer selected. Use this method to respond to the selection change and to make any necessary adjustments to your content or the collection view.
This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class.

### 34.2.19 didEndDisplayingItem(item as NSCollectionViewItemMBS, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified item was removed from the collection view.
**Notes:** item: The item that was removed.
indexPath: The index path of the item.

The collection view calls this method after removing an item from its content. You can use this method to track the removal of items and perform related tasks.

### 34.2.20 didEndDisplayingSupplementaryView(view as NSViewMBS, elementKind as String, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified supplementary view was removed from the collection view.
**Notes:** view: The supplementary view that was removed.
elementKind: The type of the supplementary view. Layouts are responsible for defining the types of supplementary views they support.
indexPath: The index path associated with the supplementary view.

The collection view calls this method after removing a supplementary view from its content. You can use this method to track the removal of views and perform related tasks.

### 34.2.21 didSelectItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate object that one or more items were selected.
**Notes:** collectionView: The collection view notifying you of the selection change.
indexPaths: The array of NSIndexPathMBS objects corresponding to the items that are now selected.

After the user successfully selects one or more items, the collection view calls this method to let you know that the selection has been made. Use this method to respond to the selection change and to make any necessary adjustments to your content or the collection view.
This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class.

### 34.2.22 draggingImageForItems(indexPaths() as NSIndexPathMBS, NSEvent as NSEventMBS, byref dragImageOffset as NSPointMBS) as NSImageMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Creates and returns a drag image to represent the specified items during a drag.
**Notes:** indexPaths: The index paths of the items being dragged.
NSEvent: The mouse-down event that began the drag operation. You can use the mouse location when determining what value to return in the dragImageOffset parameter.
dragImageOffset: The offset value to use when positioning the image. On input, the point is NSZeroPoint, which centers the returned image under the mouse. Your method can return a different point that repositions the drag image by the specified offset values.

Return the image to use for the dragged items.

Your implementation of this event should create an appropriate image to use during the drag operation. The collection view places the center of your image at the current mouse location. Update the value in the dragImageOffset parameter to shift the position of your image by the specified amount.
If you do not implement this event, the collection view uses the drag image returned by the draggingImageForItemsAtIndexPaths method instead.

### 34.2.23 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, dragOperation as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies your delegate that a drag session ended.
**Notes:** session: The dragging session that ended.

screenPoint: The end point (in screen coordinates) for the drag operation.
operation: The operation that was performed. Use this value to determine how the operation ended. For example, for content that was dragged to the trash, the operation type would be NSDragOperationDelete (32).

You can use this method to perform tasks related to the ending of a drag session.

### 34.2.24 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies your delegate that a drag session is about to begin.
**Notes:** session: The dragging session that is about to begin.
screenPoint: The starting point (in screen coordinates) for the drag operation. (in Cocoa coordinate system with bottom = zero)
indexPaths: The index paths of the items being dragged.

You can use this method to modify the dragging session or to perform other tasks related to the beginning of a drag session.

### 34.2.25 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 34.2.26 FocusLost

Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 34.2.27 FocusReceived

Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 34.2.28 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 34.2.29 GotFocus

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 34.2.30 insetForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as NSEdgeInsetsMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the margins to apply to content in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose margins are needed.

Return the margins to apply to items in the specified section.

Implement this method when you want to provide margins for sections in the flow layout. Your implemen-

tation can return the same margins for all sections or it can return different margins for different sections. You can also adjust the margins of each section dynamically each time you update the layout. If you do not implement this method, the margins are obtained from the properties of the flow layout object.

The insets you return reflect the spacing between the items and the header and footer views of the section. They also reflect the spacing at the edges of a single row or column. For more information about how insets are applied, see the description of the sectionInset property.

### 34.2.31 ItemApplyLayoutAttributes(item as NSCollectionViewItemMBS, layoutAttributes as NSCollectionViewLayoutAttributesMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Applies the specified layout attributes to the element.
**Notes:** In your custom elements, you can use this method to apply the specified attributes to your content. For example, if your element object is a view controller, you would override this method and use it to apply the attributes to the root view object. When using your element with a layout object that supports custom attributes, you would also use this method to apply those custom attributes.

### 34.2.32 ItemDidTransition(item as NSCollectionViewItemMBS, oldLayout as NSCollectionViewLayoutMBS, newLayout as NSCollectionViewLayoutMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Tells the element that the layout object of the collection view changed.
**Notes:** oldLayout: The collection view,Äôs previous layout object.
newLayout: The current layout object associated with the collection view.

The default implementation of this method does nothing. Subclasses can override it and use it to finalize any behaviors associated with the change in layouts.

In OS X 10.11, this method is never called.

### 34.2.33 itemForRepresentedObject(indexPath as NSIndexPathMBS) as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the item at the specified location in the collection view.
**Notes:** indexPath: The index path that specifies the location of the item. This index path contains both

the section index and the item index within that section.

Returns a configured item object. You must not return nil from this method.

All data source objects must implement this method. Your implementation is responsible for creating, configuring, and returning the appropriate item object based on the specified index path. You do this by calling the makeItem() method of the collection view to retrieve an empty item object of the appropriate type. After receiving the item object, update its properties with the data from your app,Äôs data structures and return it.
You do not need to set the frame of an item,Äôs view from this method. The collection view gets the item,Äôs location and other layout-related attributes from the layout object during a separate step.

### 34.2.34 ItemPreferredLayoutAttributesFittingAttributes(item as NSCollectionViewItemMBS, layoutAttributes as NSCollectionViewLayoutAttributesMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your element if it wants to modify any layout attributes before they are applied.
**Notes:** layoutAttributes: The attributes provided by the layout object. These attributes represent the values that the layout object intends to apply to the element.

Return the final attributes to apply to the element.

The default implementation of this method returns the same attributes that are in the layoutAttributes parameter. You can override this method in subclasses and use it to return a different set of attributes. If you override this method, call super first to give the system the opportunity to make changes, then modify the returned attributes.

### 34.2.35 ItemPrepareForReuse(item as NSCollectionViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Performs any necessary cleanup to prepare the element for use again.
**Notes:** The recycling of content is an important technique for improving performance of a collection view. Instead of creating all views from scratch, the collection view recycles views and view controllers that move offscreen. When your app subsequently calls the makeItem or makeSupplementaryViewOfKind method, the collection view retrieves a recycled object from the appropriate storage, calls this method, and then returns the object to your app.

Implement this method when you need to delete old data or when you want to restore your recycled views

to a standard initial state prior to their reuse. For example, you might use this method to restore the size of a view to some standard size or reset the alpha to 1.0 to ensure that the view is fully opaque. Do not use this method to configure the view with new data. Restoring your views to a default state in this method simplifies the configuration code you must write in your data source object later.

### 34.2.36 ItemWillTransition(item as NSCollectionViewItemMBS, oldLayout as NSCollectionViewLayoutMBS, newLayout as NSCollectionViewLayoutMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Tells the element that the layout object of the collection view is about to change.
**Notes:** oldLayout: The current layout object used by the collection view.
newLayout: The new layout object that is about to be used by the collection view.

The default implementation of this method does nothing. Subclasses can override it and use it to prepare for the change in layouts.

Special Considerations
In OS X 10.11, this method is never called.

### 34.2.37 LostFocus

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 34.2.38 MenuBarSelected

Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 34.2.39 minimumInteritemSpacingForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as double

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the spacing between successive items of a single row or column.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose inter-item spacing is needed.

Return the minimum space (in points) to apply between successive items in a single row or column.

Implement this method when you want to provide custom inter-item spacing for sections in the flow layout. Your implementation can return the same spacing for all sections or it can return different spacing for different sections. You can also adjust the inter-item spacing of each section dynamically each time you update the layout. If you do not implement this method, the inter-item spacing is obtained from the properties of the flow layout object.

For a vertically scrolling layout, this value represents the minimum spacing between items in the same row. For a horizontally scrolling layout, this value represents the minimum spacing between items in the same column. The layout object uses this spacing only to compute how many items can fit in a single row or column. The actual spacing may be increased after the number of items has been determined. For more information about how inter-item spacing is applied, see the description of the minimumInteritemSpacing property.

### 34.2.40 minimumLineSpacingForSectionAtIndex(layout as NSCollectionViewLayoutMBS, section as Integer) as double

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the spacing between successive rows or columns of a section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose line spacing is needed.

Returns the minimum space (in points) to apply between successive lines in a section.

Implement this method when you want to provide custom line spacing for sections in the flow layout. Your implementation can return the same line spacing for all sections or it can return different line spacing for different sections. You can also adjust the line spacing of each section dynamically each time you update the layout. If you do not implement this method, the line spacing is obtained from the properties of the flow layout object.

For a vertically scrolling layout, this value represents the minimum spacing between successive rows. For a horizontally scrolling layout, this value represents the minimum spacing between successive columns. This

spacing is not applied to the space between the header and the first line or between the last line and the footer. For more information about how line spacing is applied, see the description of the minimumLineSpacing property.

### 34.2.41 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 34.2.42 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 34.2.43 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 34.2.44 namesOfPromisedFilesDroppedAtDestination(dropURL as String, indexPaths() as NSIndexPathMBS) as String()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Returns the names of the promised files that you created for a drag operation.
**Notes:** dropURL: The URL at which to create the promised files.
indexPaths: The index paths of the dragged items.

Return an array of strings containing the filenames you created, or intend to create, at the specified URL.

At the start of a drag operation, your app must provide the data that constitutes the items being dragged. If you specify a file promise, instead of the data itself, use this method to specify the names of the files you promised. If the files already exist, move them to the directory specified by the dropURL parameter. If you must create the files first, use this method to specify the names of the files you intend to provide and begin creating those files asynchronously on a background thread.

The filenames you return are made available from the namesOfPromisedFilesDroppedAtDestination method of the NSDraggingInfo object passed around during the drag operation.

### 34.2.45 numberOfItemsInSection(section as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the number of items in the specified section.
**Notes:** All data source objects must implement this event. Your implementation should quickly return the number of items in the specified section.
Make sure the number of items you return is accurate. The itemForRepresentedObject event must be able to provide a visual representation for each item in the section.

### 34.2.46 numberOfSections as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the total number of sections.
**Notes:** Implement this method when the organization of your data requires more than one section. If you do not implement this method, the collection view creates only one section.

### 34.2.47 Open

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 34.2.48 Opening

Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 34.2.49 pasteboardWriterForItem(indexPath as NSIndexPathMBS) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Provides the pasteboard writer for the item at the specified index path.
**Notes:** collectionView: The collection view making the request.
indexPath: The index path of the item requiring a pasteboard writer.

Returns the pasteboard writer object to use for managing the item data. Return nil to prevent the collection view from dragging the item.

You must implement this method or the collectionView:writeItemsAtIndexPaths method to support drag operations. The collection view calls this method in preference over the writeItemsAtIndexPaths method if both are implemented. If your app supports multi-image drag and drop, you must implement this method.

The collection view calls this method for each item involved in the drag operation after it has determined that a drag should begin but before the drag operation has started. Your implementation of this method should create and return the pasteboard writer—an object conforming to the NSPasteboardWriting protocol—to use for providing the item,Äôs data. Using the object you provide, the collection view creates an NSDraggingItem object for you and configures its draggingFrame and imageComponents properties for you using information from the item at the specified index path.
If you implement this method, the collection view does not call the draggingImageForItemsAtIndexPaths of your delegate or the draggingImageForItemsAtIndexPaths method of NSCollectionView.

### 34.2.50 performBatchUpdatesCompleted(tag as variant, finished as boolean)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** A event to execute when the changes made in the performBatchUpdatesWork events have finished animating.
**Notes:** finished: A Boolean value indicating whether the animations completed successfully. The value of this parameter is true if the animations ran to completion or false if they were interrupted.

### 34.2.51 performBatchUpdatesWork(tag as variant)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The event that performs the needed inset, delete, reload, or move operations.

### 34.2.52 prefetchItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies your 'prefetchDataSource' that items at the specified 'indexPaths' are likely to be instantiated and displayed soon.
**Notes:** The CollectionView sends this as early as possible, to give your 'prefetchDataSource' the opportunity to begin acquiring any resources such as thumbnail images or metadata that you might need in order to prepare the item's content for display. The given 'indexPaths' are sorted by the order in which they are likely to be needed.

### 34.2.53 referenceSizeForFooterInSection(layout as NSCollectionViewLayoutMBS, section as Integer) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the size of the footer view in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose footer size is requested.

The size of the footer. Return NSZeroSize if you do not want a footer added to the section.

If you implement this method, the flow layout object calls it to obtain the size of the footer in each section and uses that information to set the size of the corresponding views. If you do not implement this method, the footer size is obtained from the properties of the flow layout object.

The flow layout object uses only one of the returned size values. For a vertically scrolling layout, the layout object uses the height value. For a horizontally scrolling layout, the layout object uses the width value. The other value is sized appropriately to match the opposing dimension of the collection view itself. Set the size of the footer to 0 to prevent it from being displayed.

### 34.2.54 referenceSizeForHeaderInSection(layout as NSCollectionViewLayoutMBS, section as Integer) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the size of the header view in the specified section.
**Notes:** collectionViewLayout: The layout object requesting the information.
section: The index of the section whose header size is requested.

Returns the size of the header. Return NSZeroSize if you do not want a header added to the section.

If you implement this method, the flow layout object calls it to obtain the size of the header in each section and uses that information to set the size of the corresponding views. If you do not implement this method, the header size is obtained from the properties of the flow layout object.

The flow layout object uses only one of the returned size values. For a vertically scrolling layout, the layout object uses the height value. For a horizontally scrolling layout, the layout object uses the width value. The other value is sized appropriately to match the opposing dimension of the collection view itself. Set the size of the header to 0 to prevent it from being displayed.

### 34.2.55 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 34.2.56 shouldChangeItems(indexPaths() as NSIndexPathMBS, highlightState as Integer) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending highlighting of the specified items.
**Notes:** indexPaths: The set of NSIndexPathMBS objects corresponding to the items being highlighted.
highlightState: The new highlight state for the items.

Return the set of NSIndexPath objects corresponding to the items that you want to receive the specified highlight. If you do not want any items to receive the specified highlight state, return an empty set.

Use this method to approve or modify the set of items targeted to receive the specified highlight state. During interactive selection or dragging, the collection view calls this method when actions occur that would affect the highlight state of items. Your implementation of the method can return the proposed set of index paths as-is or modify the set and disallow the highlighting of some or all of the items. Removing items from the set suppresses the corresponding actions, such as selecting the item or showing its eligibility as a drop target.
If you do not implement this method, the collection view updates the highlight state for the items specified

by the indexPaths parameter.

### 34.2.57 shouldDeselectItems(indexPaths() as NSIndexPathMBS) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks the delegate object to approve the pending deselection of items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items deselected by the user.

Return the array of NSIndexPathMBS objects corresponding to the items that you want to be deselected. If you do not want any items deselected, return an empty set.

Use this method to approve or modify the items that the user tries to deselect. During interactive selection, the collection view calls this method whenever the user deselects items. Your implementation of the method can return the proposed set of index paths as-is or modify the set before returning it. You might modify the set to disallow the deselection of specific items.

This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class. If you do not implement this method, the collection view deselects the items specified by the indexPaths parameter.

### 34.2.58 shouldSelectItems(indexPaths() as NSIndexPathMBS) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks the delegate to approve the pending selection of items.
**Notes:** indexPaths: The array of NSIndexPathMBS objects corresponding to the items selected by the user.

Returns the array of NSIndexPathMBS objects corresponding to the items that you want to be selected. If you do not want any items selected, return an empty array.

Use this method to approve or modify the items that the user tries to select. During interactive selection, the collection view calls this method whenever the user selects new items. Your implementation of the method can return the proposed set of index paths as-is or modify the set before returning it. You might modify the set to disallow the selection of specific items or specific combinations of items.

This method is not called when you set the selection programmatically using the methods of the NSCollectionViewMBS class. If you do not implement this method, the collection view selects the items specified by the indexPaths parameter.

### 34.2.59 sizeForItemAtIndexPath(layout as NSCollectionViewLayoutMBS, indexPath as NSIndexPathMBS) as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: .

**Function:** Asks you for the size of the specified item.
**Notes:** collectionViewLayout: The layout object requesting the information.
indexPath: The index path of the item.

Return the size of the item. The width and height values must both be greater than 0. Items must also not exceed the available space in the collection view.

Implement this method when you want to provide the size of items in the flow layout. Your implementation can return the same size for all items or it can return different sizes for items. You can also adjust the size of items dynamically each time you update the layout. If you do not implement this method, the size of items is obtained from the properties of the flow layout object.

The size value you return from this method must allow the item to be displayed fully by the collection view. In the scrolling direction, items can be larger than the collection view because the remaining content can always be scrolled into view, but in the nonscrolling directions, items should always be smaller than the collection view itself. For example, the width of an item in a vertically scrolling collection view must not exceed the width of the collection view minus any section insets. The flow layout does not crop an item,Äôs bounds to make it fit into the available space.

### 34.2.60 transitionLayout(fromLayout as NSCollectionViewLayoutMBS, toLayout as NSCollectionViewLayoutMBS) as NSCollectionViewTransitionLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Returns the transition layout object to use when performing an animated change between different layouts.
**Notes:** fromLayout: The current layout object of the collection view. This is the starting point for the transition.
toLayout: The new layout for the collection view.

Return the collection view transition layout object to use to perform the transition.

When changing layouts for a collection view, you can use this method to customize the transition layout object used to make the change. A transition layout object lets you customize the behavior of collection view

elements when transitioning from one layout to the next. Normally, transitioning between layouts causes the assorted items and views to animate from their current locations directly to their new locations. By returning a custom transition object, you could have those elements follow a nonlinear path, use a different timing algorithm, or move items in response to touch events.

If you do not implement this method in your delegate object, the collection view uses a standard UICollectionViewTransitionLayout object for the transition.

Special Considerations
In OS X 10.11, this method is never called by the collection view.

### 34.2.61 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your delegate to update the dragging items during a drag operation.
**Notes:** draggingInfo: The current information for the drag operation. Use this object to iterate over the dragging items.

You can use this method to update the current drag items while a drag is in progress. Updating the drag items is optional, but you might use this method to change the image for an item. For example, you might change the image when the mouse hovers over a particular part of the collection view. Use the enumerateDraggingItems method of the draggingInfo parameter to iterate over the drag items and update them as appropriate.

### 34.2.62 validateDrop(draggingInfo as NSDraggingInfoMBS, byref proposedIndexPath as NSIndexPathMBS, byref dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Validates whether a drop operation is possible at the specified location.
**Notes:** draggingInfo: The information about the drag operation.
proposedDropIndexPath: The index path at which the drop would occur. This parameter is passed by-reference and can be modified to change the proposed index path.
proposedDropOperation: The type of drop operation being proposed. This parameter is passed by-reference and can be modified to change the drop operation type.

Returns a value that indicates which dragging operation to perform. Return NSDragOperationNone to disallow a drop at the proposed location.

Although implementation of this method is optional, you must implement it to support drops onto the

associated collection view. You must also call the collection view,Äôs registerForDraggedTypes method to register the types of drops it supports. If you do not perform both of these actions, the collection view does not accept drops.

When an interactive drag operation occurs, the collection view calls this method to determine whether the current mouse location is a valid place to drop the content. This method may be called many times during the course of the drag operation. Your implementation should look at the proposed location and return a constant that reflects how the drop would be handled.
While validating the drop location, you can suggest a better drop location by updating the values in the proposedDropIndexPath and proposedDropOperation parameters. For example, you might suggest dropping the content before the specified item instead of on it. The collection view sets the proposedDropOperation parameter to DropOn when the mouse is closer to the middle of an item than to its edges; otherwise, it sets the parameter to DropBefore.

### 34.2.63 viewForSupplementaryElement(kind as String, indexPath as NSIndexPathMBS) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Asks your data source object to provide the supplementary view at the specified location in a section of the collection view.
**Notes:** kind: The kind of supplementary view to provide. The value of this string is defined by the current layout object associated with the collection view. Layouts may define additional views to add visual content that is unrelated to specific items.
indexPath: The index path that identifies the section in which to place the supplementary view.

Returns a configured view object. You must not return nil from this method.

Implement this method if the collection view,Äôs layout object supports supplementary views. Your implementation is responsible for creating, configuring, and returning an appropriate view. You do this by calling the makeSupplementaryViewOfKind method of the collection view to retrieve an unconfigured view of the appropriate type. After receiving the view, update its properties and content using your app,Äôs data structures and return it.
You do not need to set the location of supplementary views inside the collection view,Äôs bounds. The collection view gets the view,Äôs location and other layout-related attributes from the layout object during a separate step.

### 34.2.64 willDisplayItem(item as NSCollectionViewItemMBS, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified item is about to be displayed by the collection view.
**Notes:** item: The item being added.
indexPath: The index path of the item.

The collection view calls this method before adding new items to its content. You can use this method to track the addition of items and perform related tasks.

### 34.2.65 willDisplaySupplementaryView(view as NSViewMBS, elementKind as String, indexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Notifies the delegate that the specified supplementary view is about to be displayed by the collection view.
**Notes:** view: The supplementary view being added.
elementKind: The type of the supplementary view. Layouts are responsible for defining the types of supplementary views they support.
indexPath: The index path associated with the supplementary view.

The collection view calls this method before adding new supplementary views to its content. You can use this method to track the addition of those views and perform related tasks.

### 34.2.66 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 34.2.67 writeItems(indexPaths() as NSIndexPathMBS, Pasteboard as NSPasteboardMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Places the data for the drag operation on the pasteboard.
**Notes:** indexPaths: The index paths of the items being dragged.
pasteboard: The pasteboard on which to place the drag data.

Return true if the drag operation can continue or no if you want to refuse the drag.

The collection view calls this method after it has determined that a drag should begin but before the drag operation has started. Your implementation of this method should do the following:

- Declare the pasteboard types you support using the declareTypes method of the provided pasteboard object.
- Write data to the pasteboard for each type you declare.
- Return true from this event.

### 34.2.68 Constants

Drop Operation

| Constant | Value | Description |
|---|---|---|
| DropBefore | 1 | The drop occurs before the collection view item to which the item was dragged. |
| DropOn | 0 | The drop occurs at the collection view item to which the item was dragged. |

## 34.3 class NSCollectionViewFlowLayoutInvalidationContextMBS

### 34.3.1 class NSCollectionViewFlowLayoutInvalidationContextMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An object that identifies the portions of a flow layout object that need to be updated.
**Notes:** Layout objects use invalidation contexts to optimize the layout process and avoid unnecessary work. You use this class to specify whether the NSCollectionViewFlowLayout object should fetch new size information from its delegate. You can also prevent the flow layout object from updating its layout information altogether.

When you want to invalidate your flow layout object, call the NewInvalidationContext method of your layout object and instantiate the resulting class. (The implementation of that method in NSCollectionViewFlowLayout returns this class.) After instantiating this class, set the properties to appropriate values and pass the object to the invalidateLayoutWithContext method of the layout object.
Subclass of the NSCollectionViewLayoutInvalidationContextMBS class.

### 34.3.2 Methods

### 34.3.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.3.4 Properties

### 34.3.5 invalidateFlowLayoutAttributes as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the flow layout object should invalidate its current attributes.
**Notes:** Setting this property to NO tells the flow layout object to keep its existing layout information, effectively stopping the invalidation process. Typically, you set this property to false only if you subclass NSCollectionViewFlowLayoutMBS and update changed layout information directly.
The default value of this property is true, which causes the flow layout object to throw out its existing layout information and recompute it.
(Read and Write property)

### 34.3.6 invalidateFlowLayoutDelegateMetrics as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the flow layout object should fetch new size information from its delegate.
**Notes:** As part of the invalidation process, the flow layout object normally asks its delegate to provide size information for the items in the flow layout. This behavior is necessary when the size of the items can change because it ensures that the corresponding layout attributes are always updated. However, if you know that the size of items has not changed, you can set this property to false. Doing so causes the flow layout to use its existing size information rather than querying the delegate, which saves time.
The default value of this property is YES, which causes the flow layout object to query the delegate for new size information.
(Read and Write property)

## 34.4 class NSCollectionViewFlowLayoutMBS

### 34.4.1 class NSCollectionViewFlowLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A layout that organizes items into a flexible and configurable arrangement.
**Notes:** In a flow layout, the first item is positioned in the top-left corner and other items are laid out either horizontally or vertically based on the scroll direction, which is configurable. Items may be the same size or different sizes, and you may use the flow layout object or the collection view,Äôs delegate object to specify the size of items and the spacing around them. The flow layout also lets you specify custom header and footer views for each section.

You can use an NSCollectionViewFlowLayoutMBS object as-is or subclass it to modify more aspects of the layout behavior. There are several ways to customize the basic layout behavior that do not require subclassing. For example, you can use a delegate object to change the size and spacing of items dynamically. Subclassing is appropriate for more advanced layout changes, such as adding supplementary views or decoration views, supporting custom layout attributes, or customizing the layout animations when inserting or deleting items.

see also
https://developer.apple.com/documentation/appkit/nscollectionviewflowlayout
Subclass of the NSCollectionViewLayoutMBS class.
**Blog Entries**

- NSCollectionView for Xojo

### 34.4.2 Methods

### 34.4.3 collapseSectionAtIndex(sectionIndex as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Collapses the section with the given index.

### 34.4.4 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.4.5 ElementKindSectionFooter as String

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A supplementary view that acts as a footer for a given section.

### 34.4.6 ElementKindSectionHeader as String

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A supplementary view that acts as a header for a given section.

### 34.4.7 expandSectionAtIndex(sectionIndex as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Expands the section with the given index.

### 34.4.8 Properties

### 34.4.9 estimatedItemSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The estimated size of items in the collection view.
**Notes:** Providing an estimated item size lets the collection view defer some of the calculations needed to determine the size of its content, which can improve performance. Instead of explicitly computing the size of each item, the flow layout assumes that offscreen items have the estimated size. The estimated size is used only until an actual value is calculated. The default value of this property is zero size.

If the value of this property is not NSZeroSize, the flow layout uses the estimated size you specified. If all of your items actually have the same size, use the itemSize property to set their size and set this property to NSZeroSize.
(Read and Write property)

### 34.4.10 footerReferenceSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The default size to use for section footers.
**Notes:** The layout object uses only the value that is appropriate for the current scrolling direction. In other

words, the layout object uses only the height value when the content scrolls vertically, setting the width of the footer to the width of the collection view. Similarly, the layout object uses only the width value when the content scrolls horizontally, setting the footer,Äôs height to the height of the collection view. If the size value for the appropriate dimension is 0, the layout object omits the footer entirely.

The default value of this property is zero size.
(Read and Write property)

### 34.4.11 headerReferenceSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The default size to use for section headers.
**Notes:** The layout object uses only the value that is appropriate for the current scrolling direction. In other words, the layout object uses only the height value when the content scrolls vertically, setting the width of the header to the width of the collection view. Similarly, the layout object uses only the width value when the content scrolls horizontally, setting the header,Äôs height to the height of the collection view. If the size value for the appropriate dimension is 0, the layout object omits the header entirely.

The default value of this property is zero size.
(Read and Write property)

### 34.4.12 itemSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The default size to use for items.
**Notes:** This property contains the default size of items.

All items are set to the same size. This value applies only to items and not to supplementary views.
The default value of this property is (50.0, 50.0).
(Read and Write property)

### 34.4.13 minimumInteritemSpacing as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:**

The minimum spacing (in points) to use between items in the same row or column.

**Notes:**

For a vertically scrolling layout, the value represents the minimum spacing between items in the same row. For a horizontally scrolling layout, the value represents the minimum spacing between items in the same column. The layout object uses this spacing only to compute how many items can fit in a single row or column. The actual spacing may be increased after the number of items has been determined.

The default value of this property is 10.0.
(Read and Write property)

### 34.4.14 minimumLineSpacing as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The minimum spacing (in points) to use between rows or columns.
**Notes:** For a vertically scrolling layout, the value represents the minimum spacing between successive rows. For a horizontally scrolling layout, the value represents the minimum spacing between successive columns. This spacing is not applied to the space between the header view and the first line or between the last line and the footer view. Figure 1 shows how the line spacing is applied to rows of unevenly sized items, illustrating how the actual spacing between individual items may be greater than the minimum value.

The default value of this property is 10.0.
(Read and Write property)

### 34.4.15 scrollDirection as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The scroll direction of the layout.
**Notes:** The flow layout scrolls along one axis only, either horizontally or vertically. When the scroll direction is ScrollDirectionVertical, the width of the content never exceeds the width of the collection view itself but the height grows as needed to accommodate the current items. When the scroll direction is ScrollDirection-Horizontal, the height never exceeds the height of the collection view but the width grows as needed.

The default value of this property is ScrollDirectionVertical.
(Read and Write property)

### 34.4.16 sectionFootersPinToVisibleBounds as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Set to true to get footers that pin to the bottom while scrolling.
**Notes:** Enabling this feature may affect the parenting of header and footer views.
(Read and Write property)

### 34.4.17 sectionHeadersPinToVisibleBounds as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Set to true to get headers that pin to the top of the visible area.
**Notes:** Enabling this feature may affect the parenting of header and footer views.
(Read and Write property)

### 34.4.18 sectionInset as NSEdgeInsetsMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The margins used to lay out content in a section.
**Notes:** Section insets reflect the spacing at the outer edges of the section. The margins affect the positioning of the header view, the minimum space on either side of each line of items, and the distance from the last line to the footer view. The margin insets do not affect the size of the header and footer views in the nonscrolling direction.

The default insets are all set to 0.
(Read and Write property)

### 34.4.19 sectionAtIndexIsCollapsed(sectionIndex as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the section is collapsed.
**Notes:** True if the specified section is currently collapsed; false if not, or if there is no such section. Defaults to false.
(Read and Write computed property)

### 34.4.20 Constants

Scroll Directions

| Constant | Value | Description |
|---|---|---|
| ScrollDirectionHorizontal | 1 | The layout scrolls content horizontally. |
| ScrollDirectionVertical | 0 | The layout scrolls content vertically. |

## 34.5 class NSCollectionViewGridLayoutMBS

### 34.5.1 class NSCollectionViewGridLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A layout that displays a single section of items in a row and column grid..
**Notes:** The NSCollectionViewGridLayoutMBS object provides the same layout behavior offered by the NSCollectionViewMBS class prior to macOS 10.11, and you can use it in cases where you want to maintain the old appearance while still taking advantage of newer collection view features.

Configuring a Collection View to Use a Grid Layout

You can configure a collection view to use a grid layout object programmatically or at design time:

- At design time, set the Layout attribute of your collection view to Grid.

Create an NSCollectionViewGridLayoutMBS object programmatically and assign it to the collection view,Äôs collectionViewLayout property.

- A grid layout displays only items and does not display supplementary views or decoration views. Use the properties of this class to configure the number of rows and columns in the grid. You can also use these properties to configure the spacing between items and the minimum sizes.

Subclass of the NSCollectionViewLayoutMBS class.

### 34.5.2 Methods

### 34.5.3 backgroundColors as NSColorMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The array of background colors to use when drawing the grid.
**Notes:** The NSColorMBS objects in this property are used to draw the grid,Äôs background. The appearance of the background depends on the value you specify:

- Specifying nil fills the background with the collection view,Äôs default background color.
- Specifying an empty array causes the collection view to draw no background color.
- Specifying an array with one color object fills the background with the specified color.

- Specifying an array with more than one color object causes the collection view to use the specified colors to create a checkerboard pattern. Each successive grid item is displayed with the next color in the array, cycling back to the beginning of the array when the last color is reached.

The default value of this property is nil.

### 34.5.4 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.5.5 setBackgroundColors(Colors() as NSColorMBS = nil)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the array of background colors to use when drawing the grid.
**Notes:** The NSColorMBS objects in this property are used to draw the grid,Äôs background. The appearance of the background depends on the value you specify:

- Specifying nil fills the background with the collection view,Äôs default background color.
- Specifying an empty array causes the collection view to draw no background color.
- Specifying an array with one color object fills the background with the specified color.
- Specifying an array with more than one color object causes the collection view to use the specified colors to create a checkerboard pattern. Each successive grid item is displayed with the next color in the array, cycling back to the beginning of the array when the last color is reached.

The default value of this property is nil.

### 34.5.6 Properties

### 34.5.7 margins as NSEdgeInsetsMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The amount of empty space (in points) around the grid,Äôs content.
**Notes:** The default value of this property is zeros. Changing this property to a new value invalidates the layout.
(Read and Write property)

### 34.5.8 maximumItemSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The largest allowable size for an item,Äôs view.
**Notes:** Use this property to limit the maximum size of items displayed in the grid. The default value of this property is (0.0, 0.0), which imposes no maximum size for items.
(Read and Write property)

### 34.5.9 maximumNumberOfColumns as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The maximum number of columns to display in the collection view,Äôs visible area.
**Notes:** Use this value to specify the maximum number of columns that should be visible in the collection view at any given time. The grid layout object uses this value during layout to configure the position and spacing of items. The default value of this property is 0, which means that there is no maximum number of columns.
(Read and Write property)

### 34.5.10 maximumNumberOfRows as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The maximum number of rows to display in the collection view,Äôs visible area.
**Notes:** Use this value to specify the maximum number of rows to display in the collection view at any given time. The grid layout object uses this value during layout to configure the position and spacing of items. The default value of this property is 0, which means that there is no maximum number of rows.
(Read and Write property)

### 34.5.11 minimumInteritemSpacing as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The minimum spacing (in points) to use between items in the same row or column.
**Notes:** For a vertically scrolling layout, the value represents the minimum spacing between items in the same row. For a horizontally scrolling layout, the value represents the minimum spacing between items in the same column. The layout object uses this spacing only to compute how many items can fit in a single row or column. The actual spacing may be increased after the number of items has been determined.
The default value of this property is 0.0.
(Read and Write property)

### 34.5.12 minimumItemSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The smallest allowable size for an item,Äôs view.
**Notes:** Use this property to ensure that items have a minimum size when displayed in the grid. The default value of this property is (0.0, 0.0), which imposes no minimum size for items.
(Read and Write property)

### 34.5.13 minimumLineSpacing as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The minimum spacing (in points) to use between rows or columns.
**Notes:** For a vertically scrolling layout, the value represents the minimum spacing between successive rows. For a horizontally scrolling layout, the value represents the minimum spacing between successive columns. This spacing is not applied to the space between the header view and the first line or between the last line and the footer view.
The default value of this property is 0.0.
(Read and Write property)

### 34.5.14 Constants

Highlight States

| Constant | Value | Description |
|---|---|---|
| HighlightAsDropTarget | 3 | The drop target highlight state. This type of highlight is applied when the item is the target of a drop operation on the collection view. After the drop operation completes, the highlight state returns to HighlightNone. |
| HighlightForDeselection | 2 | The deselection highlight state. During interactive selection, this state is used to indicate that the item will become deselected when interactions end. After interactions end, the highlight state returns to HighlightNone. |
| HighlightForSelection | 1 | The selected highlight state. This type of highlight is applied when an item is selected. During interactive highlighting, this state is also applied to indicate that the item will become highlighted. |
| HighlightNone | 0 | No highlight state. |

## 34.6 class NSCollectionViewItemMBS

### 34.6.1 class NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The visual representation for a single data element in a collection view.
**Notes:** Item objects are view controllers, and you use their view hierarchies to display your content. The default implementation of this class supports the creation of a simple item that displays a single image or string. If the appearance or layout of your items is more sophisticated, you can subclass and configure the view hierarchy based on your needs.

see also
https://developer.apple.com/documentation/appkit/nscollectionviewitem
Subclass of the NSViewControllerMBS class.

### 34.6.2 Methods

### 34.6.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.6.4 copy as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a copy of the item.

### 34.6.5 Properties

### 34.6.6 collectionView as NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The collection view that owns the item.
**Notes:** Use this property as a convenient way to access the collection view that owns the item.
(Read only property)

### 34.6.7 highlightState as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The highlight state currently applied to the item.
**Notes:** The highlight state provides a visual indication of operations happening to items in the collection view. The highlight state normally toggles between the HighlightNone and HighlightForSelection states, but other states may be applied to indicate transient conditions. For example, the HighlightForDeselection state is applied during interactive selections when a currently selected item is about to be deselected.
(Read and Write property)

### 34.6.8 identifier as String

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The identifier.
**Notes:** (Read only property)

### 34.6.9 imageView as NSImageViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An image view outlet that you can use to display images.
**Notes:** This is a convenience property for accessing an image view in your item,Äôs view hierarchy.
(Read and Write property)

### 34.6.10 selected as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean indicating whether the item is currently selected.
**Notes:** The value of this property is true when the item is selected or false when it is not.
(Read and Write property)

### 34.6.11 textField as NSTextFieldMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A text field outlet that you can use to display a string.
**Notes:** This is a convenience property for accessing a text field in your item,Äôs view hierarchy.
(Read and Write property)

### 34.6.12 Constants

Highlight States

| Constant | Value | Description |
|---|---|---|
| HighlightAsDropTarget | 3 | The drop target highlight state. This type of highlight is applied when the item is the target of a drop operation on the collection view. After the drop operation completes, the highlight state returns to HighlightNone. |
| HighlightForDeselection | 2 | The deselection highlight state. During interactive selection, this state is used to indicate that the item will become deselected when interactions end. After interactions end, the highlight state returns to HighlightNone. |
| HighlightForSelection | 1 | The selected highlight state. This type of highlight is applied when an item is selected. During interactive highlighting, this state is also applied to indicate that the item will become highlighted. |
| HighlightNone | 0 | No highlight state. |

## 34.7 class NSCollectionViewLayoutAttributesMBS

### 34.7.1 class NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An object that contains layout-related attributes for an element in a collection view.
**Notes:** During the layout, the layout object creates instances of NSCollectionViewLayoutAttributesMBS for each element displayed in the collection view. The layout attributes describe the position of an element and other information such as its alpha and position on the z axis. The collection view later applies the layout attributes to the onscreen elements.

The only time you interact with layout attribute objects is when you implement a custom layout, and the interactions are straightforward. When asked for layout attributes for a specific element, your layout object uses the methods of this class to create an appropriate instance of the class based on the type of the requested element. It then configures the properties of the object and returns it to the requester.

### 34.7.2 Methods

### 34.7.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.7.4 copy as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a copy of the object.

### 34.7.5 ElementKindInterItemGapIndicator as String

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The element kind string assigned to the attributes object when it represents an inter-item gap.

### 34.7.6 layoutAttributesForDecorationView(decorationViewKind as String, indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a layout attributes object for a decoration view based on the specified information.
**Notes:** decorationViewKind: A string that identifies the type of the decoration view. Use this string to differentiate from among the decoration views in a given section. This parameter must contain a valid value. indexPath: The index path of the item. You can use this information to identify the item in your app,Äôs data structures.

Returns a new layout attributes object configured with the initial attributes for the decoration view.

Call this method when you need to create a layout attributes object for a decoration view in a collection view. Decoration views are a tertiary type of content that display visual adornments in your collection view interface. For example, decoration views might display custom backgrounds. This method uses the parameters to set the initial values of the indexPath and representedElementKind properties the returned object.

### 34.7.7 layoutAttributesForInterItemGapBefore(indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a layout attributes object for an inter-item gap view at the specified index path.
**Notes:** indexPath: The index path at which to insert the gap view. The gap is placed after the item specified by the index path. This parameter must contain a valid value.

Returns a new layout attributes object configured with the initial attributes for the inter-item gap view.

Call this method when you need to create a layout attributes object for an inter-item gap view in a collection view. Gap views are used during drag and drop to indicate the area where content will drop. This method uses the parameters to set the initial values of the indexPath property of the returned object. The representedElementKind property is set to ElementKindInterItemGapIndicator.

### 34.7.8 layoutAttributesForItem(indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a layout attributes object for the item at the specified index path.
**Notes:** indexPath: The index path of the item. You can use this information to identify the item in your app,Äôs data structures. This parameter must contain a valid value.

Returns a new layout attributes object containing the initial attributes for the item.

Call this method when you need to create a layout attributes object for an item in a collection view. Items are the main type of content presented by a collection view. Items are grouped into sections, although a collection view may have only one section. This method assigns the provided index path to the indexPath property of the returned object.

### 34.7.9 layoutAttributesForSupplementaryView(elementKind as String, indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a layout attributes object for a supplementary view based on the specified information.
**Notes:** elementKind: A string that identifies the type of the supplementary view. Use this string to differentiate from among the supplementary views in a given section. This parameter must contain a valid value. indexPath: The index path of the item. You can use this information to identify the item in your app,Äôs data structures. This parameter must contain a valid value.

Returns a new layout attributes object configured with the initial attributes for the supplementary view.

Call this method when you need to create a layout attributes object for a supplementary view in a collection view. Supplementary views are a secondary type of content that display data related to a specific section. For example, header and footer views in a grid layout implemented using supplementary views. This method uses the parameters to set the initial values of the indexPath and representedElementKind properties the returned object.

### 34.7.10 Properties

### 34.7.11 alpha as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The transparency of the element.
**Notes:** Possible values are between 0.0 (fully transparent) and 1.0 (fully opaque). The default value is 1.0. Transparent items continue to participate in hit testing for the collection view.
(Read and Write property)

### 34.7.12 frame as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The frame rectangle of the element.
**Notes:** The frame rectangle is measured in points and specified in the collection view,Äôs coordinate system. Setting the value of this property also updates the value in the size property.
(Read and Write property)

### 34.7.13 Hidden as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the element is hidden.
**Notes:** The default value of this property is false. As an optimization, the collection view might not create the corresponding view when the value of this property is true. Because there might not be a view, hidden elements do not participate in hit testing for the collection view.
(Read and Write property)

### 34.7.14 indexPath as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The index path of the element.
**Notes:** Use the index path to locate information about the item in your app,Äôs data structures. For supplementary and decoration views, you must also use the representedElementKind property to identify the element.
(Read and Write property)

### 34.7.15 representedElementCategory as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The type of the element.
**Notes:** Use this property to distinguish whether the layout attributes apply to an item, a supplementary view, a decoration view, or another type of element presented by the collection view.
(Read only property)

### 34.7.16 representedElementKind as String

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The identifier for specific elements of your collection view interface.
**Notes:** For supplementary and decoration views, you use this string to distinguish between views in a given section. You also use this string to identify the intended purpose of the view in your collection view interface. When the value of the representedElementCategory property is ElementCategoryItem, this property is nil.
(Read only property)

### 34.7.17 size as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The size of the element.
**Notes:** Setting the value of this property also updates the value in the frame property.
(Read and Write property)

### 34.7.18 zIndex as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The element,Äôs position on the z axis.
**Notes:** Use this property to specify the front-to-back ordering of items during layout. Items with higher index values appear on top of those with lower values. Items with the same value have an undetermined order.
The default value of this property is 0.
(Read and Write property)

### 34.7.19 Constants

Element Categories

| Constant | Value | Description |
|---|---|---|
| ElementCategoryDecorationView | 2 | The element is a decoration view. Decoration views represent visual ac ments that do not contain any data of their own. |
| ElementCategoryInterItemGap | 3 | The element is an inter-item gap. An inter-item gap element is a cu visual indicator that is displayed between items when dropping items into collection view. |
| ElementCategoryItem | 0 | The element is an item. Items represent the main content of your colle view. |
| ElementCategorySupplementaryView | 1 | The element is a supplementary view. Use supplementary views for single v that contain some data but are associated with an entire section. For exar use them to specify header or footer views for a section. |

## 34.8 class NSCollectionViewLayoutInvalidationContextMBS

### 34.8.1 class NSCollectionViewLayoutInvalidationContextMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An object that identifies the portions of your layout that need to be updated.
**Notes:** Invalidation contexts are a way to improve the efficiency of layout operations and must be supported explicitly by the layout object. Instead of invalidating the entire layout, you can create an invalidation layout object that specifies only the portions of the layout that changed. You then pass that invalidation context to the invalidateLayoutWithContext: method of the layout object.

Typically, you ask the layout object to create an invalidation context for you. The NSCollectionViewLayoutMBS class defines methods for creating a supported invalidation context. If you define a custom layout, you can define additional methods for creating invalidation contexts with custom information. Layout objects may also create invalidation contexts in response to specific changes. For example, layout objects automatically create invalidation contexts when you change the collection view,Äôs data source, when you insert or delete items, and when you reload the collection view,Äôs data.

### 34.8.2 Methods

### 34.8.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.8.4 invalidateDecorationElementsOfKind(elementKind as String, indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Marks the specified decoration views as invalid so that their layout information can be updated.
**Notes:** elementKind: A string that identifies the type of the decoration views. This parameter must not be nil or an empty string.
indexPaths: An array of NSIndexPathMBS objects. Each index path contains the section in which the decoration view appears.

Call this method when you want the layout object to recompute attributes for one or more decoration views. All of the views must be of the type specified by the elementKind parameter. The method adds the views you specify to the invalidatedDecorationIndexPaths property. You can call this method more than once for the specified elementKind value.

### 34.8.5 invalidatedItemIndexPaths as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The set of items whose layout attributes are invalid.
**Notes:** The set contains zero or more NSIndexPathMBS objects, each of which identifies an invalid item.

### 34.8.6 invalidateItemsAtIndexPaths(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Marks the specified items as invalid so that their layout information can be updated.
**Notes:** indexPaths: An array of NSIndexPathMBS objects. Each index path represents an item whose layout needs to be recomputed.

Call this method when you want the layout object to recompute attributes for a specific set of items. The items you provide are added to the invalidatedItemIndexPaths property. You can call this method more than once to create a merged set of items.

### 34.8.7 invalidateSupplementaryElementsOfKind(elementKind as String, indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Marks the specified supplementary views as invalid so that their layout information can be updated.
**Notes:** elementKind: A string that identifies the type of the supplementary views. This parameter must not be nil or an empty string.
indexPaths: An array of NSIndexPathMBS objects. Each index path contains the section in which the supplementary view appears.

Call this method when you want the layout object to recompute attributes for one or more supplementary views. All of the views must be of the type specified by the elementKind parameter. The method adds the views you specify to the invalidatedSupplementaryIndexPaths property. You can call this method more than once for the specified elementKind value.

### 34.8.8 Properties

### 34.8.9 contentOffsetAdjustment as NSPointMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The delta value to add to the collection view,Äôs content offset.
**Notes:** The content offset adjustment shifts the position of content inside the collection view by the specified amount. You use this value to make tweaks based on how you want to present your content. For example, you might use it to ensure that the first line of items is always lined up at the same position in the collection view,Äôs visible rectangle. When making adjustments, you can specify both positive and negative values.
The default value of this property is zero/zero.
(Read and Write property)

### 34.8.10 contentSizeAdjustment as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The delta value to add to the collection view,Äôs content size.
**Notes:** Use this property to update the size of the collection view,Äôs content area, as computed by the associated layout object. The default value of this property is zero/zero. Changing the value causes the collection view to add the specified height and width values to its content size. Thus, positive values grow the content area and negative values shrink it. You might add space around the content area to provide a visual buffer for your collection view content.
(Read and Write property)

### 34.8.11 invalidateDataSourceCounts as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the layout object should ask for new section and item counts.
**Notes:** The collection view sets this property in response to specific layout invalidation scenarios. For example, the collection view sets the property to true when you insert or delete items or call the collection view,Äôs reloadData method.
When this property is set to true, the layout object must query the data source for the new number of sections and items. IT should also update its layout based on the updated number of sections and items.
(Read only property)

### 34.8.12 invalidatedDecorationIndexPaths as Dictionary

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A dictionary containing the decoration views whose layout attributes are invalid.
**Notes:** The keys in this dictionary are the element kind strings of the decoration views. The value for each key is an array object containing one or more NSIndexPath objects, each of which identifies the section containing the decoration view.
(Read only property)

### 34.8.13 invalidatedSupplementaryIndexPaths as Dictionary

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A dictionary containing the supplementary views whose layout attributes are invalid.
**Notes:** The keys in this dictionary are the element kind strings of the supplementary views. The value for each key is an array object containing one or more NSIndexPath objects, each of which identifies the section containing the supplementary view.
(Read only property)

### 34.8.14 invalidateEverything as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether all layout data should be marked as invalid.
**Notes:** The collection view sets this property in response to specific layout invalidation scenarios. For example, the collection view sets the property to true when you change the current layout object, change the data source of the collection view, or call the reloadData method and subsequently request a layout invalidation context.
When this property is set to true, the layout object must throw away all previous layout information and recompute it.
(Read only property)

## 34.9 class NSCollectionViewLayoutMBS

### 34.9.1 class NSCollectionViewLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An abstract base class that you subclass and use to generate layout information for a collection view.
**Notes:** The job of a layout object is to perform the calculations needed to determine the placement and appearance of items, supplementary views, and other content in the collection view. The layout object does not apply the layout attributes it generates to the views in your interface. Instead, it passes those layout attributes to the collection view, which then creates the needed views and applies the layout attributes to them.

see also
https://developer.apple.com/documentation/appkit/nscollectionviewlayout
**Blog Entries**

- NSCollectionView for Xojo

### 34.9.2 Methods

### 34.9.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 34.9.4 invalidateLayout

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Invalidates all layout information and triggers a layout update.
**Notes:** Call this method when you make changes that require updating all of the current layout information. This method marks the layout as invalid and returns right away, so you can call this method multiple times from the same block of code without triggering multiple layout updates. During the next update cycle, the collection view requests new layout information and updates its contents accordingly.

### 34.9.5 invalidateLayoutWithContext(context as NSCollectionViewLayoutInvalidationContextMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Invalidates specific parts of the layout using the specified context object.
**Notes:** context: The context object indicating which parts of the layout need to be updated.

Call this method when you make changes that need to be reflected by the collection view, but which do not require the replacement of all of the layout information. You use this method to minimize the work performed by the layout object. Instead of optimizing everything, the specified context object indicates which parts of the layout need to be recomputed. All other layout information is left alone.
When implementing a custom layout, you can override this method and use it to process information provided by a custom invalidation context. You are not required to provide a custom invalidation context but might do so if you are able to provide additional properties that can help optimize layout updates. If you override this method, you must call super at some point in your implementation.

### 34.9.6 NewInvalidationContext as NSCollectionViewLayoutInvalidationContextMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new invalidation context object.

### 34.9.7 NewLayoutAttributes as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new layout attributes object.

### 34.9.8 Properties

### 34.9.9 collectionView as NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The collection view object currently using this layout.
**Notes:** When you assign a layout object to a collection view, the collection view automatically updates this property.
(Read only property)

## 34.10 class NSCollectionViewMBS

### 34.10.1 class NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An ordered collection of data items displayed in a customizable layout.
**Notes:** The simplest type of collection view displays its items in a grid, but you can define layouts to arrange items however you like. For example, you might create a layout where items are arranged in a circle. You can also change layouts dynamically at runtime whenever you need to present items differently.

See also:
https://developer.apple.com/documentation/appkit/views_and_controls/collection_view
https://developer.apple.com/documentation/appkit/nscollectionview
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr2
- MBS Xojo Plugins, version 21.3pr1
- MBS Xojo Plugins, version 21.1pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 20.6pr2

### 34.10.2 Methods

### 34.10.3 backgroundColors as NSColorMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An array containing the collection view,Äôs background colors.
**Notes:** This property contains an array of NSColorMBS objects, representing the colors to use when drawing the background grid. Specifying an empty array or nil causes the collection view to use the default colors returned by the controlAlternatingRowBackgroundColors method.

When a background view is specified for the collection view, the colors in this property are ignored.

### 34.10.4 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new NSCollectionView object.
See also:

- 34.10.5 Constructor(Handle as Integer) 6573
- 34.10.6 Constructor(left as double, top as double, width as double, height as double) 6573


### 34.10.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Pass a valid handle to a NSTextField to initialize.
See also:


- 34.10.4 Constructor 6572
- 34.10.6 Constructor(left as double, top as double, width as double, height as double) 6573


### 34.10.6 Constructor(left as double, top as double, width as double, height as double)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSTextField object.
See also:


- 34.10.4 Constructor 6572
- 34.10.5 Constructor(Handle as Integer) 6573


### 34.10.7 deleteItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Deletes the items at the specified index paths.
**Example:**

```
// remove item at index

Dim index As Integer = 1

// remove from data source
MainWindow.items.RemoveAt(index)

// remove also from view
Dim items() As NSIndexPathMBS
items.Append NSIndexPathMBS.indexPathForItem(index)

MainWindow.collectionView.deleteItems items
```

**Notes:** indexPaths: A set of NSIndexPathMBS objects, each of which includes a section and item index corresponding to the insertion point of a single item. Specifying nil for this parameter raises an exception.

After removing items from your data source object, use this method to synchronize those changes with the collection view. Calling this method lets the collection view know that it must update its internal data structures and possibly update its visual appearance. In response, the collection view asks the layout object to update the positions of the remaining objects. If the layout object indicates that there are changes to the visible items, the collection view animates the affected items into place.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.8 deleteSections(sections as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Deletes the specified sections and their contained items.
**Notes:** sections: An index set containing the indexes of the sections that you want to delete. This parameter must not be nil.

Use this method to delete entire sections and their contained items. Always update your data source object before calling this method. Calling this method kicks off an update (and possible animations) to delete the specified sections. Specifically, the collection view asks the layout object for the final layout attributes for any deleted sections and may also ask for updated layout attributes for any remaining sections. If the layout attributes of any visible items changed, those changes are animated into place.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.9 deselectAll

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Deselects all items in the collection view.
**Notes:** This method works only when the selectable and allowsEmptySelection properties are both true YES. If either property is set to false, this method quietly does nothing and any connected menu item is disabled.

This method consults the delegate object regarding the selection. Specifically, it calls the delegate,Äôs

shouldDeselectItems method to see if the items should be selected. For any items that are selected, it calls the didDeselectItems method.

### 34.10.10 deselectItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified items from the current selection.
**Notes:** indexPaths: The index paths of the items you want to deselect.

Use this method to reduce the current selection. If you want to animate the deselection of the new items, call this method on the collection view,Äôs animator proxy object instead. This method does not call any methods of the delegate object when making the selection.

### 34.10.11 frameForItem(Index as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the frame of the collection view item at the specified index.
**Notes:** index: The index of the collection view item.

Return the frame calculated by the receiver where it intends to place the subview for the NSCollectionViewItem at the given index. The rectangle is returned in the collection view,Äôs coordinate system.

You can use this method in the draggingImageForItemsAtIndexes method to determine which views are in the visible portion of the enclosing scroll view.
Overriding this method will have no effect on the collection view,Äôs subview layout.
See also:

- 34.10.12 frameForItem(Index as Integer, numberOfItems as Integer) as NSRectMBS 6575

### 34.10.12 frameForItem(Index as Integer, numberOfItems as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the frame of the collection view item at the specified index.
**Notes:** index: The index of the collection view item.

Returns the frame calculated by the receiver where it intends to place the subview for the NSCollectionViewItem at the given index. The rectangle is returned in the collection view,Äôs coordinate system.

You can use this method in the draggingImageForItemsAtIndexes method to determine which views are in the visible portion of the enclosing scroll view.
Overriding this method will have no effect on the collection view,Äôs subview layout.
See also:

- 34.10.11 frameForItem(Index as Integer) as NSRectMBS 6575

### 34.10.13 indexPathForItem(indexPath as NSCollectionViewItemMBS) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index path of the specified item.
**Notes:** Returns the item,Äôs index path or nil if the item is not in the collection view.
See also:

- 34.10.14 indexPathForItem(x as double, y as double) as NSIndexPathMBS 6576

### 34.10.14 indexPathForItem(x as double, y as double) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index path of the specified item.
**Example:**

```
// remove item at index

Dim index As Integer = 1

// remove from data source
MainWindow.items.RemoveAt(index)

// remove also from view
Dim items() As NSIndexPathMBS
items.Append NSIndexPathMBS.indexPathForItem(index)

MainWindow.collectionView.deleteItems items
```

**Notes:** Returns the item,Äôs index path or nil if the item is not in the collection view.
See also:

- 34.10.13 indexPathForItem(indexPath as NSCollectionViewItemMBS) as NSIndexPathMBS 6576

### 34.10.15 indexPathsForVisibleItems as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index paths of the currently active items.
**Notes:** The set of NSIndexPathMBS objects corresponding to the currently visible items.

The index paths returned by this method belong to items that are active and currently being managed by the collection view. As a result, the returned set may include index paths for items that are outside of the collection view,Äôs actual visible rectangle. For example, it may contain index paths for items that were recently visible but have since been scrolled out of view. To test whether an item is visible, check to see if its frame rectangle intersects the visibleRect of the collection view.

### 34.10.16 indexPathsForVisibleSupplementaryElementsOfKind(elementKind as String) as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index paths of the currently active supplementary views.
**Notes:** elementKind: The kind of the supplementary views you want returned. The layout object defines the kinds of supplementary views it supports. This parameter must not be nil.

Return the set of NSIndexPathMBS objects. The returned array may be empty.

The index paths returned by this method correspond to supplementary views that are active and currently being managed by the collection view. The set may include index paths for views that are outside of the collection view,Äôs actual visible rectangle. For example, it might contain index paths for views that were recently visible but have since been scrolled out of the visible rectangle. To test whether a view is actually visible, check to see if its frame rectangle intersects the visibleRect of the collection view.

### 34.10.17 insertItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Inserts new items into the collection view at the specified locations.
**Notes:** indexPaths: A set of NSIndexPathMBS objects, each of which includes a section and item index corresponding to the insertion point of a single item. Specifying nil for this parameter raises an exception.

After adding new items to your data source object, use this method to synchronize those changes with the collection view. Calling this method lets the collection view know that it must update its internal data structures and possibly update its visual appearance. In response, the collection view asks the layout object for information about the new objects. If the layout object indicates that the new items should appear on-

screen, the collection view asks the data source to provide the appropriate content, animating that content into position as needed.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.18 insertSections(sections as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Inserts new sections at the specified indexes.
**Notes:** sections: An index set containing the indexes at which you want to insert new sections. This parameter must not be nil.

This method tells the collection view to insert the specified sections and update itself. Always update your data source object before calling this method. Calling this method kicks off an update (and possible animations) to add the new sections. Specifically, the collection view asks the layout object for any updated layout attributes related to the new sections or any existing sections. If the layout attributes of any visible items changed, those changes are animated into place.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.19 item(index as Integer) as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the item associated with the specified index path.
**Notes:** The item for the specified index path or nil if no item is available.

For efficiency, the collection view does not create items until they are needed, and usually it creates them only when they need to be displayed onscreen. If the collection view does not currently have an item for the specified index path, because that item would be positioned offscreen, this method returns nil.
See also:

- 34.10.20 item(indexPath as NSIndexPathMBS) as NSCollectionViewItemMBS 6578

### 34.10.20 item(indexPath as NSIndexPathMBS) as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the item associated with the specified index path.
**Notes:** The item for the specified index path or nil if no item is available.

For efficiency, the collection view does not create items until they are needed, and usually it creates them only when they need to be displayed onscreen. If the collection view does not currently have an item for the specified index path, because that item would be positioned offscreen, this method returns nil.
See also:

- 34.10.19 item(index as Integer) as NSCollectionViewItemMBS 6578

### 34.10.21 layoutAttributesForItem(indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the layout information for the item at the specified index path.
**Notes:** The layout attributes of the item or nil if no item exists at the specified path.

This method updates the layout information as needed before returning the specified attributes. Always use this method to retrieve the layout attributes for items in the collection view. Do not query the layout object directly.

### 34.10.22 layoutAttributesForSupplementaryElementOfKind(kind as String, indexPath as NSIndexPathMBS) as NSCollectionViewLayoutAttributesMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the layout information for the supplementary view at the specified index path.
**Notes:** kind: The kind of the supplementary view whose attributes you want. The layout object defines the kinds of supplementary views it supports. This parameter must not be nil.
indexPath: The index path of the supplementary view. Normally, this path

Returns the layout attributes of the supplementary view or nil if no item exists at the specified path.

This method updates the layout information as needed before returning the specified attributes. Always use this method to retrieve the layout attributes for supplementary views in the collection view. Do not query the layout object directly.

### 34.10.23 makeItem(indexPath as NSIndexPathMBS) as NSCollectionViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates or returns a reusable item object of the specified type.
**Notes:** indexPath: The index path specifying the location of the item. The data source object receives this information in its itemForRepresentedObjectAtIndexPath method and you should just pass it along.

### 34.10.24 makeSupplementaryViewOfKind(elementKind as String, indexPath as NSIndexPathMBS) as NSCollectionViewSectionHeaderViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates or returns a reusable supplementary view of the specified type.
**Notes:** elementKind: The kind of supplementary view to create. This value is defined by the layout object. This parameter must not be an empty string or nil.
identifier: The reuse identifier for the specified item. This is the identifier you specified when registering the supplementary view. This parameter must not be nil.
indexPath: The index path specifying the location of the supplementary view. The data source object receives this information in its viewForSupplementaryElementOfKind method and you should just pass it along.

Returns a view that adopts the NSCollectionViewElement protocol, e.g. a NSCollectionViewSectionHeaderViewMBS object.

This method looks for a recycled supplementary view of the specified type and returns it if one exists. If one does not exist, it creates it one.

### 34.10.25 moveItem(indexPath as NSIndexPathMBS, toIndexPath as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Moves an item from one location to another in the collection view.
**Notes:** indexPath: The index path of the item that you want to move. This parameter must not be nil.
newIndexPath: The index path of the item,Äôs new location. This parameter must not be nil.

After rearranging items in your data source object, use this method to synchronize those changes with the collection view. Calling this method lets the collection view know that it must update its internal data structures and possibly update its visual appearance. You can move the item to a different section or to a new location in the same section. The collection view updates the layout as needed to account for the move, animating cells into position in response.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.26 moveSection(section as Integer, toSection as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Moves a section from its current location to a new location.
**Notes:** section: The index of the section that you want to move.
newSection: The new index at which to insert the section.

Use this method to reorganize sections and their contained items. Always update your data source object before calling this method. Calling this method kicks off an update (and possible animations) to move the specified section to its new location. Specifically, the collection view asks the layout object for any updated layout attributes related to the new sections or any existing sections. If the layout attributes of any visible items changed, those changes are animated into place.

When inserting or deleting multiple sections and items, you can animate all of your changes at once using the performBatchUpdates method.

### 34.10.27 numberOfItemsInSection(section as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in the specified section.
**Notes:** section: The index of the section whose item count you want. This index is 0-based.

Returns the number of items in the section.

Use this method to get the number of items currently displayed by the collection view for the specified section. Do not call the methods of the data source to get this information.

### 34.10.28 reloadData

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Reloads all of the data for the collection view.
**Notes:** Call this method when the data in your data source object changes or when you want to force the collection view to update its contents. When you call this method, the collection view discards any currently visible items and views and redisplays them. For efficiency, the collection view displays only the items and supplementary views that are visible after reloading the data. If the collection view,Äôs size changes as a result of reloading the data, the collection view adjusts its scrolling offsets accordingly.
Do not call this method in the middle of animation blocks where items are being inserted or deleted. The methods used to insert and delete items automatically update the collection view,Äôs contents.

### 34.10.29 reloadItems(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Reloads only the specified items.
**Notes:** indexPaths: The index paths of the specific items that you want to reload. Specifying nil for this parameter raises an exception.

Call this method to update specific items in your collection view. You call this method when the underlying data for those items changes and you want to update the visual appearance of those items. When you call this method, the collection view discards the specified items and asks your data source to provide new ones. For efficiency, the collection view requests only the items that are visible.

### 34.10.30 reloadSections(sections as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the data in the specified sections of the collection view.
**Notes:** sections: The indexes of the sections that you want to reload. Specifying nil for this parameter raises an exception.

Call this method when the data for the specified sections changes or when you want to force the appearance of those sections to be updated. When you call this method, the collection view discards visible elements in the section along with any cached attributes for those elements. For efficiency, it then asks the layout object to provide fresh attributes for only the visible items and views and requests new views for those elements. Do not call this method in the middle of animation blocks where items are being inserted or deleted. The methods used to insert and delete items automatically update the collection view,Äôs contents.

### 34.10.31 scrollToItems(indexPaths() as NSIndexPathMBS, scrollPosition as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the collection view contents until the specified items are visible.
**Example:**

```
dim collectionView as NSCollectionViewMBS

Dim itemPaths() As NSIndexPathMBS
itemPaths.Append NSIndexPathMBS.indexPathForItem(0)

collectionView.scrollToItems(itemPaths, NSCollectionViewMBS.NSCollectionViewScrollPositionTop)
```

**Notes:** indexPaths: The index paths of the items. The layout attributes of these items define the bounding box that needs to be scrolled onscreen.
scrollPosition: The options for scrolling the bounding box of the specified items into view. You may combine one vertical and one horizontal scrolling option when calling this method. Specifying more than one option for either the vertical or horizontal directions raises an exception.

To animate the scrolling operation, call this method on the collection view,Äôs animator proxy object instead.

### 34.10.32 selectAll

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects all items in the collection view, if doing so is possible.
**Notes:** This method works only when the selectable and allowsMultipleSelection properties are both true. If either property is set to false, this method quietly does nothing and any connected menu item is disabled.

This method consults the delegate object regarding the selection. Specifically, it calls the delegate,Äôs shouldSelectItems method to see if the items should be selected. For any items that are selected, it calls the didSelectItems method.

### 34.10.33 selection as NSIndexPathMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The array of index paths representing the currently selected items.
**Notes:** This property reflects the index paths of the currently selected items, where each index path contains a section number and an index number for the item in that section. This property is updated automatically when the user selects items interactively. You can also change the selection programmatically by assigning a new value to this property. To animate changes to the selection, call this method on the collection view,Äôs animator proxy object instead.
It is a programmer error to specify an index path that does not refer to a valid item in the data source. If you specify an invalid index path, this method raises an exception.
This property is key-value observable. Other methods that modify the selection automatically update this property.

### 34.10.34 selectItems(indexPaths() as NSIndexPathMBS, scrollPosition as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds the specified items to the current selection and optionally scrolls the items into position.
**Notes:** indexPaths: The index paths of the items you want to select.

scrollPosition: The options for scrolling the newly selected items into view. You may combine one vertical and one horizontal scrolling option when calling this method. Specifying more than one option for either the vertical or horizontal directions raises an exception.

Use this method to extend the current selection. If you want to animate the selection of the new items, call this method on the collection view,Äôs animator proxy object instead. This method does not call any methods of the delegate object when making the selection.

### 34.10.35 setBackgroundColors(Colors() as NSColorMBS = nil)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets array containing the collection view,Äôs background colors.
**Notes:** This property contains an array of NSColorMBS objects, representing the colors to use when drawing the background grid. Specifying an empty array or nil causes the collection view to use the default colors returned by the controlAlternatingRowBackgroundColors method.

When a background view is specified for the collection view, the colors in this property are ignored.

### 34.10.36 setDraggingSourceOperationMask(mask as integer, local as boolean)

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** Configures the default value returned from draggingSourceOperationMaskForLocal.
**Notes:** mask: The types of drag operations allowed.
isLocal: If true, mask applies when the drag destination object is in the same application as the receiver; if false, mask applies when the destination object is outside the receiver's application.

By default, draggingSourceOperationMaskForLocal returns NSDragOperationEvery when isLocal is true and NSDragOperationNone when isLocal is false.

Available in Mac OS X v10.5 and later.

### 34.10.37 setSelection(indexPaths() as NSIndexPathMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the selection.

### 34.10.38 supplementaryViewForElementKind(elementKind as String, indexPath as NSIndexPathMBS) as NSCollectionViewSectionHeaderViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the supplementary view associated with the specified index path.
**Notes:** elementKind: The kind of the supplementary views you want returned. The layout object defines the kinds of supplementary views it supports. This parameter must not be nil.
indexPath: The index path whose supplementary view you want.

Returns the view for the specified index path or nil if no view is available.

For efficiency, the collection view does not create supplementary views until they are needed. Typically, views are created only when they need to be displayed onscreen. If the collection view does not currently have a supplementary view for the specified index path, because that view would be positioned offscreen, this method returns nil.

### 34.10.39 toggleSectionCollapse(sender as NSViewMBS)

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** Collapses the section in which the sender resides into a single horizontally scrollable row.
**Notes:** Please pass the button clicked as sender.

### 34.10.40 visibleItems as NSCollectionViewItemMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the actively managed items in the collection view.
**Notes:** An array of NSCollectionViewItemMBS objects. The returned array may be empty.

The items returned by this method represent the ones that are active and currently being managed by the collection view. This array may contain items that are outside of the collection view,Äôs actual visible rectangle. For example, it may contain items that were recently visible but have since been scrolled out of view. To test whether an item is actually visible, check to see if its frame rectangle intersects the visibleRect of the collection view.

### 34.10.41 visibleSupplementaryViewsOfKind(elementKind as String) as NSViewMBS()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the actively managed supplementary views in the collection view.
**Notes:** elementKind: The kind of the supplementary views you want returned. The layout object defines the kinds of supplementary views it supports. This parameter must not be nil.

Returns an array of view objects. The returned array may be empty.

The views returned by this method represent the ones that are active and are currently being managed by the collection view. The array may contain supplementary views that are outside of the collection view,Äôs actual visible rectangle. For example, it might contain views that were recently visible but have since been scrolled out of the visible rectangle. To test whether a view is actually visible, check to see if its frame rectangle intersects the visibleRect of the collection view.

### 34.10.42 Properties

### 34.10.43 allowsEmptySelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the collection view may have no selected items.
**Notes:** The default value of this property is true, which allows the collection view to have no selected items. Setting this property to false causes the collection view to always leave at least one item selected.
(Read and Write property)

### 34.10.44 allowsMultipleSelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the user may select more than one item in the collection view.
**Notes:** The value of this property is true if the collection view supports the selection of more than one item at a time. The default value of this property is false. Changing the value from true to false reduces the current selection to the first item in the selected group.
(Read and Write property)

### 34.10.45 animator as NSCollectionViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The animator proxy object.
**Example:**

```
dim collectionView as NSCollectionViewMBS // your control
```

```
Dim context As NSAnimationContextMBS = NSAnimationContextMBS.currentContext
context.beginGrouping
context.allowsImplicitAnimation = True
context.duration = 0.5

Dim view As Variant = collectionView.animator
Dim animator As NSCollectionViewMBS = view

// scroll to top
Dim itemPaths() As NSIndexPathMBS
itemPaths.Append NSIndexPathMBS.indexPathForItem(0)

animator.scrollToItems(itemPaths, NSCollectionViewMBS.NSCollectionViewScrollPositionTop)

context.endGrouping
```

**Notes:** You can call methods on the animator instead of the direct object. Methods with animation support will then be animated.
(Read only property)

### 34.10.46 backgroundView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The background view placed behind all items and supplementary views.
**Notes:** The view you assign to this property is positioned underneath all other content and sized automatically to match the enclosing clip view,Äôs frame. The view itself does not scroll with the rest of the collection view content. The view,Äôs layer redraw policy is also changed to NSViewLayerContentsRedrawNever.

In macOS 10.12 and later, a collection view that sets both backgroundView and backgroundColors shows backgroundColors [ 0 ] through all areas that are not opaquely covered by the backgroundView.
(Read and Write property)

### 34.10.47 backgroundViewScrollsWithContent as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the collection view,Äôs background view scrolls with the items and other content.
**Notes:** The default value of this property is false, which means that backgroundView (if it exists) fills the collection view's visible area and remains stationary when the collection view's content is scrolled. When

the value of this property is YES, backgroundView matches the collection view's frame and scrolls with the collection view's items and other content.
Changing the value of this property also changes the background view,Äôs parent. When backgroundView floats behind the scrolling content, it is a sibling of the collection view,Äôs clip view. When it scrolls with the collection view,Äôs content, it is a subview of the collection view.
(Read and Write property)

### 34.10.48 collectionViewLayout as NSCollectionViewLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The layout object used to organize the collection view,Äôs content.
**Notes:** Typically, you specify the layout object at design time in Interface Builder. The layout object works with your data source object to generate the needed items and views to display. In macOS 10.11 and later, using a data source object is recommended, but you may specify nil for this property if your collection view does not use a data source object. The collection view uses the NSCollectionViewGridLayout object by default.

Assigning a new value to this property changes the layout object and causes the collection view to update its contents immediately and without animations.
(Read and Write property)

### 34.10.49 firstResponder as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the collection view is the first responder.
**Notes:** The value of this property is true when the collection view is the first responder. This property is fully key-value observing compliant.
(Read only property)

### 34.10.50 numberOfSections as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The number of sections in the collection view.
**Notes:** This property contains the number of sections reported by the data source object. If the collection view does not use a data source object, the value in this property is 1.
(Read only property)

### 34.10.51 selectable as Boolean

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the user may select items in the collection view.
**Notes:** The value of this property is true when the collection view allows the user to select items, or false when it does not. You can set selections programmatically regardless of this setting.

The default value of this property is false. Changing the value from YES to NO removes the current selection if there is one.
(Read and Write property)

### 34.10.52 Constants

Scroll Position

| Constant | Value | Description |
|---|---|---|
| NSCollectionViewScrollPositionBottom | 4 | Scroll so that the bottom edge of the bounding box is a of the collection view,Äôs bounds.<br>This option must not be combined with the NSCol tionTop, NSCollectionViewScrollPositionCenteredVertic ViewScrollPositionNearestHorizontalEdge options, but r other options. |
| NSCollectionViewScrollPositionCenteredHorizontally | 16 | Scroll so that the selected items,Äô bounding box is ce the collection view,Äôs bounds.<br>This option must not be combined with the NSCollecti Left, NSCollectionViewScrollPositionRight, NSCollecti LeadingEdge, NSCollectionViewScrollPositionTrailingE ViewScrollPositionNearestVerticalEdge options, but ma other options. |
| NSCollectionViewScrollPositionCenteredVertically | 2 | Scroll so that the bounding box of the selected items is the collection view,Äôs bounds.<br>This option must not be combined with the NSCollecti Top, NSCollectionViewScrollPositionBottom, or NSCol tionNearestHorizontalEdge options, but may be combine |
| NSCollectionViewScrollPositionLeadingEdge | 64 | Scroll so that the leading edge of the selected items,Äô bo to the leading edge of the collection view,Äôs bounds.<br>Use this option to support both left-to-right and right- priately. This option must not be combined with the NS PositionLeft, NSCollectionViewScrollPositionCenteredH tionViewScrollPositionRight, NSCollectionViewScrollPos NSCollectionViewScrollPositionNearestVerticalEdge opti bined with other options. |
| NSCollectionViewScrollPositionLeft | 8 | Scroll so that the left edge of the selected items,Äô bou to the left edge of the collection view,Äôs bounds.<br>This option must not be combined with the NSCollecti CenteredHorizontally, NSCollectionViewScrollPositionl ViewScrollPositionLeadingEdge, NSCollectionViewScroll or NSCollectionViewScrollPositionNearestVerticalEdge combined with other options. |
| NSCollectionViewScrollPositionNearestHorizontalEdge | 512 | Scroll so that the bounding box is adjacent to the nearest of the collection view.<br>This option must not be combined with the NSCol tionTop, NSCollectionViewScrollPositionCenteredVertic ViewScrollPositionBottom options, but may be combine |
| NSCollectionViewScrollPositionNearestVerticalEdge | 256 | Scroll so that the bounding box is adjacent to the nea trailing) of the collection view.<br>Use this option to support both left-to-right and right- priately. This option must not be combined with the NS PositionLeft, NSCollectionViewScrollPositionCenteredH tionViewScrollPositionRight, NSCollectionViewScrollPos NSCollectionViewScrollPositionTrailingEdge options, b with other options. |
| NSCollectionViewScrollPositionNone | 0 | Do not scroll. |
| NSCollectionViewScrollPositionRight | 32 | Scroll so that the right edge of the selected items,Äô bou to the right edge of the collection view,Äôs bounds.<br>This option must not be combined with the NSCol tionLeft, NSCollectionViewScrollPositionCenteredHoriz ViewScrollPositionLeadingEdge, NSCollectionViewScroll or NSCollectionViewScrollPositionNearestVerticalEdge combined with other options. |
| NSCollectionViewScrollPositionTop | 1 | Scroll so that the top edge of the selected items,Äô bou to the top edge of the collection view,Äôs bounds.<br>This option must not be combined with the NSCollecti CenteredVertically, NSCollectionViewScrollPositionBotto |

## 34.11 class NSCollectionViewSectionHeaderViewMBS

### 34.11.1 class NSCollectionViewSectionHeaderViewMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** A protocol that defines a button to control the collapse of a collection view,Äôs section.
**Notes:** A collection view can support a section that can collapse into a single horizontally scrollable row, similar to the groupings in the icon view in Finder. To ensure that the collection view can communicate with the button that controls the collapsing of a section, the section header view object connects to the button via sectionCollapseButton property.
Subclass of the NSViewMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr4
- MBS Xojo Plugins, version 21.3pr2

### 34.11.2 Methods

### 34.11.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSCollectionViewSectionHeaderView object.
See also:


- 34.11.4 Constructor(Handle as Integer) 6591
- 34.11.5 Constructor(left as double, top as double, width as double, height as double) 6592


### 34.11.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSCollectionViewSectionHeaderView object.
**Notes:** Pass a valid handle to a NSCollectionViewSectionHeaderView to initialize.
See also:


- 34.11.3 Constructor 6591
- 34.11.5 Constructor(left as double, top as double, width as double, height as double) 6592

### 34.11.5 Constructor(left as double, top as double, width as double, height as double)

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSCollectionViewSectionHeaderView object.
See also:


- 34.11.3 Constructor 6591
- 34.11.4 Constructor(Handle as Integer) 6591


### 34.11.6 Properties

### 34.11.7 sectionCollapseButton as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** A control that lets users collapse and open a collection view section.
**Notes:** For the best user experience, set this property to the button that lets users control the collapsing of a section so that the collection view can show and hide the button appropriately, based on whether the section,Äôs items can be displayed in the available space. The collection view uses its toggleSectionCollapse property to access this button.
(Read and Write property)

## 34.12 class NSCollectionViewTransitionLayoutMBS

### 34.12.1 class NSCollectionViewTransitionLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** An object that implements custom behaviors when changing from one layout to another in a collection view.
**Notes:** Transition layout objects are commonly used to implement interactive transitions between layouts, where the transition itself is driven by a gesture recognizer.
Subclass of the NSCollectionViewLayoutMBS class.

### 34.12.2 Methods

### 34.12.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 34.12.4 Constructor(currentLayout as NSCollectionViewLayoutMBS, nextLayout as NSCollectionViewLayoutMBS) 6593

### 34.12.4 Constructor(currentLayout as NSCollectionViewLayoutMBS, nextLayout as NSCollectionViewLayoutMBS)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Initializes and returns the transition layout object.
**Notes:** currentLayout: The layout object currently in use by the collection view.
newLayout: The new layout object that is about to be installed into the collection view.

This method initializes the transition layout object and saves references to the current and new layout objects. If you subclass and implement your own initialization method, you must call this method to initialize the superclass.
See also:

- 34.12.3 Constructor 6593

### 34.12.5 Properties

### 34.12.6 currentLayout as NSCollectionViewLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The collection view,Äôs current layout object.
**Notes:** Use this object to retrieve the initial layout attributes for elements of the collection view. If the transition is ultimately cancelled, the collection view animates its items back to the attributes provided by this object.
(Read only property)

### 34.12.7 nextLayout as NSCollectionViewLayoutMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The collection view,Äôs new layout object.
**Notes:** Use this object to retrieve the final layout attributes for elements of the collection view. If the transition completes as expected, the collection view animates its items to the attributes provided by this object.
(Read only property)

### 34.12.8 transitionProgress as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The completion percentage of the transition.
**Notes:** During the transition, set the value of this property periodically and call the invalidateLayout method to force the collection view to update item positions. For example, when driving a transition using a gesture recognizer, you can set this property from the handler method of your gesture recognizer.
(Read and Write property)

### 34.12.9 valueForAnimatedKey(AnimatedKey as String) as Double

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries or sets the value of a key whose value you use during the animation.
**Notes:** value: The value of the key.
key: The key that you define for your custom transition layout.

Use this method to query or update the value of a specific key that you use in your custom transition layout.

Use this method to retrieve floating-point values that relate to laying out the contents of your collection view. The key you specify is a string that you define and that has some meaning to your layout,Äôs implementation. At points during an interactive transition, you can assign new values to that key.
(Read and Write computed property)

## 34.13 class NSCollectionViewUpdateItemMBS

### 34.13.1 class NSCollectionViewUpdateItemMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** A description of a single change to make to an item in a collection view.
**Notes:** You do not create instances of this class directly. When updating its content, the collection view object creates them and passes them to the layout object,Äôs prepareForCollectionViewUpdates method, which can use them to prepare for the upcoming changes.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 34.13.2 Methods

### 34.13.3 Constructor

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 34.13.4 Properties

### 34.13.5 indexPathAfterUpdate as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The index path of the item after the update.
**Notes:** The value of this property is nil for an action of type UpdateActionDelete.
(Read only property)

### 34.13.6 indexPathBeforeUpdate as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The index path of the item before the update.
**Notes:** The value of this property is nil for an action of type UpdateActionInsert.
(Read only property)

### 34.13.7 updateAction as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The action being performed on the item.
**Notes:** For a list of relevant actions, see constants.
(Read only property)

### 34.13.8 Constants

Update Actions

| Constant | Value | Description |
|---|---|---|
| UpdateActionDelete | 1 | Remove the action from the collection view. |
| UpdateActionInsert | 0 | Insert the item into the collection view. |
| UpdateActionMove | 3 | Move the item from its current location to a new location. |
| UpdateActionNone | 4 | Take no action on the item. |
| UpdateActionReload | 2 | Reload the item, which consists of deleting and then inserting the item. |

## 34.14 class NSIndexPathMBS

### 34.14.1 class NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A list of indexes that together represent the path to a specific location in a tree of nested arrays.
**Notes:** Each index in an index path represents the index into an array of children from one node in the tree to another, deeper, node.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1

### 34.14.2 Methods

### 34.14.3 compare(other as NSIndexPathMBS) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the depth-first traversal order of the receiving index path and another index path.
**Notes:** Returns the depth-first traversal ordering of the receiving index path and indexPath.

NSOrderedAscending = -1: The receiving index path comes before indexPath.
NSOrderedDescending = 1: The receiving index path comes after indexPath.
NSOrderedSame = 0: The receiving index path and indexPath are the same index path.

### 34.14.4 Constructor(Index as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an index path with a single node.
**Notes:** Returns an initialized NSIndexPath object representing a one-node index path with index.
See also:

- 34.14.5 Constructor(Indexes() as Integer) 6598

### 34.14.5 Constructor(Indexes() as Integer)

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an index path with the given nodes and length.
**Notes:** indexes: Array of indexes to make up the index path.
See also:

• 34.14.4 Constructor(Index as Integer) 6598

### 34.14.6 copy as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the object.

### 34.14.7 indexAtPosition(position as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the value at a particular node in the index path.
**Notes:** position: Index value of the desired node. Node numbering starts at zero.

Returns the index value at node or NSNotFound (-1) if the node is outside the range of the index path.

### 34.14.8 indexes as Integer()

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries indexes.

### 34.14.9 indexPathByAddingIndex(index as Integer) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an index path containing the nodes in the receiving index path plus another given index.
**Notes:** index: Index to append to the index path,Äôs indexes.

Returns a new index path containing the receiving index path,Äôs indexes and index.

### 34.14.10 indexPathByRemovingLastIndex as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an index path with the nodes in the receiving index path, excluding the last one.
**Notes:** Returns an empty NSIndexPath instance if the receiving index path,Äôs length is 1 or less.

In OS X v10.4 this method returns nil when the length of the receiving index path is 1 or less. On iOS and macOS 10.5 and later this method never returns nil.

### 34.14.11 indexPathForItem(item as Integer, section as Integer = 0) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an index path with the indexes of a specific item and section in a collection view.
**Notes:** item: An index number identifying an item in a NSCollectionViewMBS object in a section identified by the section parameter.
section: An index number identifying a section in a NSCollectionViewMBS object.

### 34.14.12 indexPathWithIndex(index as Integer) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an index path with a single node.
**Notes:** Returns an initialized NSIndexPath object representing a one-node index path with index.

### 34.14.13 indexPathWithIndexes(indexes() as Integer) as NSIndexPathMBS

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an index path with the given nodes and length.
**Notes:** indexes: Array of indexes to make up the index path.

### 34.14.14 Properties

### 34.14.15 item as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An index number identifying an item in a section of a collection view.
**Notes:** The section the item is in is identified by the value of section.
(Read only property)

### 34.14.16 length as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of nodes in the index path.
**Notes:** (Read only property)

### 34.14.17 section as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An index number identifying a section in a table view or collection view.
**Notes:** (Read only property)

# Chapter 35

# Cocoa Controls

## 35.1 class BevelButton

### 35.1.1 class BevelButton

Plugin Version: 3.0, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.1.2 Methods

### 35.1.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox BevelButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.2 class CanvasGesturesMBS

### 35.2.1 class CanvasGesturesMBS

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** The class to catch canvas gesture events.
**Notes:** Please use one global instance of this class to catch the events for all canvases you track.

Updated class for v23.2 to work with DesktopCanvas control.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr3
- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo Plugins, version 22.5pr7
- MBS Xojo Plugins, version 19.2pr7
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo Plugins, version 18.2pr5

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 21.4, page 10: News
- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 16.4, page 11: News

### 35.2.2 Methods

### 35.2.3 AddCanvas(c as Canvas)

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a canvas to the list of canvases to track.
**Notes:** Please add canvas controls in Window.Open event.
See also:

- 35.2.4 AddCanvas(c as DesktopCanvas) 6605

### 35.2.4 AddCanvas(c as DesktopCanvas)

MBS MacControls Plugin, Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a canvas to the list of canvases to track.
**Notes:** Please add canvas controls in Window.Open event.
See also:

- 35.2.3 AddCanvas(c as Canvas) 6604

### 35.2.5 Constructor

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 35.2.6 Destructor

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.2.7 RemoveCanvas(c as Canvas)

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes a canvas from the list.
**Notes:** Please remove canvas controls in Window.Close event.
The plugin tries to remove all when a window closes automatically.
See also:

- 35.2.8 RemoveCanvas(c as DesktopCanvas) 6605

### 35.2.8 RemoveCanvas(c as DesktopCanvas)

MBS MacControls Plugin, Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes a canvas from the list.
**Notes:** Please remove canvas controls in Window.Close event.
The plugin tries to remove all when a window closes automatically.
See also:

- 35.2.7 RemoveCanvas(c as Canvas) 6605

### 35.2.9 Properties

### 35.2.10 CanvasCount as Integer

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop only.

**Function:** Number of Canvas controls registered.
**Notes:** (Read only property)

### 35.2.11 Events

### 35.2.12 beginGestureWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.13 endGestureWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.14 magnifyWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.15 rotateWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.16 scrollWheel(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 19.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the mouse,Äôs scroll wheel has moved.
**Notes:** The default implementation simply passes this message to the next responder.

e: An event object representing the swipe gesture.

The event will be sent to the view under the touch in the key window.
Return true if you handled this event.

### 35.2.17 smartMagnifyWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 19.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user performed a smart zoom gesture.
**Notes:** The smart zoom gesture is a two-finger double tap on trackpads. In response to this event, you

should intelligently magnify the content.

e: An event object representing the swipe gesture.

The event will be sent to the view under the touch in the key window.
Return true if you handled this event.

### 35.2.18 swipeWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.19 touchesBeganWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that new set of touches has been recognized.
**Notes:** can: The Canvas or DesktopCanvas control.
e: An event object representing the beginning of a touch.

The system sends the event to the view under the touch in the key window.
This isn,Äôt always the point of contact with the touch device. A touch that transitions from resting to active may be part of a touchesBeganWithEvent set.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.20 touchesCancelledWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that tracking of touches has been cancelled for any reason.

**Notes:** can: The Canvas or DesktopCanvas control.
e: An event object representing the cancellation of a touch event.

The event will be sent to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.21 touchesEndedWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Returns that a set of touches have been removed.
**Notes:** can: The Canvas or DesktopCanvas control.
e: An event object representing the ending of a touch event.

The system sends the event to the view under the touch in the key window.

This isn,Äôt always the point of removal with the touch device. A touch that transitions from active to resting may be part of an touchesEndedWithEvent set.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.2.22 touchesMovedWithEvent(can as Variant, e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that one or more touches has moved.
**Notes:** can: The Canvas or DesktopCanvas control.
e: An event object representing a touch movement.

The system sends the to the view under the touch in the key window.

Available in Mac OS X v10.6 and later.
Return true if you handled this event.

## 35.3 class Checkbox

### 35.3.1 class Checkbox

Plugin Version: 2.9, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.3.2 Methods

### 35.3.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox CheckBox1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.4 class ComboBox

### 35.4.1 class ComboBox

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in ComboBox class in Xojo.

### 35.4.2 Methods

### 35.4.3 NSComboBoxMBS as NSComboBoxMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSComboBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.5 class ContainerControl

### 35.5.1 class ContainerControl

Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The container class in Xojo.

### 35.5.2 Methods

### 35.5.3 NSViewMBS as NSViewMBS

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSViewMBS object for the given container.
**Example:**

MsgBox ContainerControl1.NSViewMBS.className

**Notes:** This way you can manipulate Cocoa container controls directly.

## 35.6 class CustomNSScrollerMBS

### 35.6.1 class CustomNSScrollerMBS

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom scroller.
**Notes:** Subclass of the NSScrollerMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr4
- Custom Scrollbars for Real Studio Cocoa Apps
- MBS Real Studio Plugins, version 12.1pr6

### 35.6.2 Methods

### 35.6.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSScroller object.
See also:

- 35.6.4 Constructor(Handle as Integer) 6613
- 35.6.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6613

### 35.6.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.6.3 Constructor 6613
- 35.6.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6613

### 35.6.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSScroller object.
See also:

- 35.6.3 Constructor 6613
- 35.6.4 Constructor(Handle as Integer) 6613


### 35.6.6 Destructor

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.6.7 Events

### 35.6.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.6.9 acceptsFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.6.10 becomeFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.6.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.6.12 canBecomeKeyView as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.6.13 Close

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.6.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.6.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.6.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.6.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.6.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.6.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.6.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.6.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.6.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.6.23 drawArrow(g as NSGraphicsMBS, Arrow as Integer, highlight as boolean)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Called when arrow need to be drawn.
**Notes:** Draw the scroll button indicated by arrow, which is either NSScrollerIncrementArrow (the down or right scroll button) or NSScrollerDecrementArrow (up or left).
If flag is true, the button is drawn highlighted; otherwise it's drawn normally. You should never need to invoke this method directly, but may wish to override it to customize the appearance of scroll buttons.

### 35.6.24 drawKnob(g as NSGraphicsMBS)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Draw the knob.

### 35.6.25 drawKnobSlotInRect(g as NSGraphicsMBS, slotRect as NSRectMBS, highlight as boolean)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Draw the knob slow in the rectangle.

### 35.6.26 drawParts(g as NSGraphicsMBS)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Called when parts need to be drawn.

### 35.6.27 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.6.28 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.6.29 isOpaque as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.6.30 keyDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

### 35.6.31 keyUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

### 35.6.32 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.6.33 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.6.34 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.35 mouseDownCanMoveWindow as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.6.36 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.

**Notes:** Return true if you handled this event.

### 35.6.37 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.38 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.39 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.40 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.41 Open

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is created.

### 35.6.42 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.6.43 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.6.44 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.6.45 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.6.46 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.6.47 pressureChange(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.6.48 resignFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.6.49 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.50 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.51 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.6.52 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.6.53 scrollWheel(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.6.54 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.

The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.6.55 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.6.56 viewDidMoveToWindow

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose to ignore such cases if they are not of interest.

### 35.6.57 wantsPeriodicDraggingUpdates as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages

even if nothing changes.

## 35.7 class CustomNSSearchFieldMBS

### 35.7.1 class CustomNSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom searchfield.
**Notes:** Some events will not fire as Searchfield eats them itself.
Subclass of the NSSearchFieldMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.0pr1
- MBS Real Studio Plugins, version 13.1pr11
- MBS Real Studio Plugins, version 12.5pr1
- MBS Real Studio Plugins, version 12.4pr9

### 35.7.2 Methods

### 35.7.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor doing nothing.
See also:

- 35.7.4 Constructor(Handle as Integer) 6628
- 35.7.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6628

### 35.7.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.7.3 Constructor 6628
- 35.7.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6628

### 35.7.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSView object.
See also:


- 35.7.3 Constructor 6628
- 35.7.4 Constructor(Handle as Integer) 6628


### 35.7.6 Destructor

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.7.7 Events

### 35.7.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.7.9 acceptsFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.7.10 becomeFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.7.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.7.12 canBecomeKeyView as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.7.13 Close

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.7.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.7.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.7.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.7.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.7.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.7.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.7.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.7.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.7.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.7.23 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.7.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.7.25 isOpaque as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.7.26 keyDown(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.7.27 keyUp(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.7.28 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.7.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.7.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.31 mouseDownCanMoveWindow as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.7.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.37 Open

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the custom NSSearchField is created.

### 35.7.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.7.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.7.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.7.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.7.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.7.43 pressureChange(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.

**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.7.44 resignFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.7.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.7.48 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.7.49 scrollWheel(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.7.50 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.7.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.7.52 viewDidMoveToWindow

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose to ignore such cases if they are not of interest.

### 35.7.53 wantsPeriodicDraggingUpdates as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 35.8 class CustomNSTextFieldCellMBS

### 35.8.1 class CustomNSTextFieldCellMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The class to customize cells.
**Notes:** Subclass of the NSTextFieldCellMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr1

### 35.8.2 Methods

### 35.8.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 35.8.4 superDrawWithFrame(frame as NSRectMBS, view as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Calls drawWithFrame on super class.
**Notes:** This is for calling in DrawWithFrame event.

### 35.8.5 Events

### 35.8.6 cellSize(size as NSSizeMBS) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Return a custom cell size.
**Notes:** If not implemented, we call through to super.cellSize.
We provide super.cellSize in size parameter.

### 35.8.7 Clone(clonedCell as NSTextFieldCellMBS) as CustomNSTextFieldCellMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Requests a clone of the object.
**Notes:** This event is called when the system needs a clone of the object.
Please create a new object, keep a reference and return it.

SuperClone provides the cloned object, which we use together with the xojo object you return.

### 35.8.8 didDrawWithFrame(cellFrame as NSRectMBS, controlView as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Event called after drawWithFrame run.

### 35.8.9 drawWithFrame(cellFrame as NSRectMBS, controlView as NSViewMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Event to replace drawWithFrame.
**Notes:** If false is returned or not implemented, we call super.drawWithFrame.

### 35.8.10 fieldEditorForView(controlView as NSViewMBS) as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Returns a custom field editor for editing in the view.
**Notes:** ,ÄãControl,ÄãView: The view containing cells that require a custom field editor.

Returns a custom field editor. The field editor must have field,ÄãEditor set to true.

This is an override point for NSCell subclasses designed to use their own custom field editors. This message is sent to the selected cell of ,ÄãControl,ÄãView using the NSWindow method in field,ÄãEditor,Äã.

Returning non-nil from this method indicates skipping the standard field editor querying processes including window,ÄãWill,ÄãReturn,ÄãField,ÄãEditor delegation.
The default implementation returns nil.

### 35.8.11 imageRectForBounds(rect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event for imageRectForBounds method.

### 35.8.12 selectWithFrame(rect as NSRectMBS, controlView as NSViewMBS, text as NSTextMBS, theDelegate as Variant, selStart as Integer, selLength as Integer) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event for selectWithFrame method.
**Notes:** If you return false, we call super.selectWithFrame.

### 35.8.13 setUpFieldEditorAttributes(textObj as NSTextMBS, superFieldEditor as NSTextMBS) as NSTextMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Sets up the field editor. You never invoke this method directly; by overriding it, however, you can customize the field editor.
**Notes:** When you override this method, you should generally invoke the implementation of super and return the text,ÄãObj argument. For information on field editors, see Using the Window,Äôs Field Editor.

### 35.8.14 titleRectForBounds(rect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event for titleRectForBounds method.
**Notes:** If you return nil, we call super.titleRectForBounds.

## 35.9 class CustomNSTextFieldMBS

### 35.9.1 class CustomNSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom text field.
**Notes:** Some events will not fire as text field eats them itself.
Subclass of the NSTextFieldMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr3

### 35.9.2 Methods

### 35.9.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSTextField object.
See also:


- 35.9.4 Constructor(Handle as Integer) 6645
- 35.9.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6645


### 35.9.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Pass a valid handle to a NSTextField to initialize.
See also:


- 35.9.3 Constructor 6645
- 35.9.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6645


### 35.9.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSTextField object.
See also:

- 35.9.3 Constructor 6645
- 35.9.4 Constructor(Handle as Integer) 6645


### 35.9.6 Destructor

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.9.7 Events

### 35.9.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.9.9 acceptsFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.9.10 becomeFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.9.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.9.12 canBecomeKeyView as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.9.13 Close

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.9.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.9.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.9.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.9.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.9.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.9.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.9.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.9.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.9.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.9.23 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.9.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.9.25 isOpaque as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.9.26 keyDown(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.9.27 keyUp(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.9.28 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.9.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.9.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.31 mouseDownCanMoveWindow as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.9.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.37 Open

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the custom NSSearchField is created.

### 35.9.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.9.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.9.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.9.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.9.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.9.43 pressureChange(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.9.44 resignFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.9.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.9.48 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.9.49 scrollWheel(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.9.50 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.9.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.9.52 viewDidMoveToWindow

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose

to ignore such cases if they are not of interest.

### 35.9.53 wantsPeriodicDraggingUpdates as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 35.10 class CustomNSTextViewMBS

### 35.10.1 class CustomNSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom text view.
**Notes:** Some events will not fire as text view eats them itself.
Subclass of the NSTextViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr1

### 35.10.2 Methods

### 35.10.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor doing nothing.
See also:

- 35.10.4 Constructor(Handle as Integer) 6659
- 35.10.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6659

### 35.10.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.10.3 Constructor 6659
- 35.10.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6659

### 35.10.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSView object.
See also:

- 35.10.3 Constructor 6659

• 35.10.4 Constructor(Handle as Integer) 6659

### 35.10.6 Destructor

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.10.7 Events

### 35.10.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.10.9 acceptsFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.10.10 becomeFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.10.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.10.12 canBecomeKeyView as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.10.13 Close

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.10.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.10.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.10.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.10.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.10.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.10.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.10.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.10.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.10.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.10.23 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.10.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.10.25 isOpaque as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.10.26 keyDown(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.10.27 keyUp(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.10.28 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.10.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.10.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.31 mouseDownCanMoveWindow as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.10.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.37 Open

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** The event called when the custom NSSearchField is created.

### 35.10.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.10.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.10.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.10.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.10.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.10.43 pressureChange(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.10.44 resignFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.10.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.10.48 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.10.49 scrollWheel(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.10.50 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.10.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.10.52 viewDidMoveToWindow

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose

to ignore such cases if they are not of interest.

### 35.10.53 wantsPeriodicDraggingUpdates as boolean

MBS MacCocoa Plugin, Plugin Version: 17.2, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 35.11 class CustomNSTokenFieldMBS

### 35.11.1 class CustomNSTokenFieldMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom NSTokenField.
**Notes:** Subclass of the NSTokenFieldMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr2

### 35.11.2 Methods

### 35.11.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor doing nothing.
See also:

- 35.11.4 Constructor(Handle as Integer) 6673
- 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6673

### 35.11.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.11.3 Constructor 6673
- 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6673

### 35.11.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSTokenField object.
See also:

- 35.11.3 Constructor 6673
- 35.11.4 Constructor(Handle as Integer) 6673

### 35.11.6 Destructor

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.11.7 Events

### 35.11.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.11.9 acceptsFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.11.10 becomeFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.11.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.11.12 canBecomeKeyView as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.11.13 Close

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.11.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.11.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.11.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.11.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.11.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.11.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.11.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.11.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.11.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.11.23 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.11.24 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.11.25 isOpaque as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.11.26 keyDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.11.27 keyUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.11.28 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.11.29 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.11.30 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.31 mouseDownCanMoveWindow as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.11.32 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.33 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.34 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.35 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.36 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.37 Open

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is created.

### 35.11.38 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.11.39 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.11.40 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.11.41 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.11.42 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.11.43 pressureChange(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.11.44 resignFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.11.45 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.46 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.47 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.11.48 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.11.49 scrollWheel(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.11.50 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.11.51 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.11.52 viewDidMoveToWindow

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose

to ignore such cases if they are not of interest.

### 35.11.53 wantsPeriodicDraggingUpdates as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 35.12 class CustomNSViewMBS

### 35.12.1 class CustomNSViewMBS

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom NSView.
**Notes:** Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr2
- MBS Real Studio Plugins, version 12.3pr3
- MBS Real Studio Plugins, version 12.3pr2
- MBS Real Studio Plugins, version 12.0pr7
- MBS Real Studio Plugins, version 11.3pr14
- MBS Real Studio Plugins, version 11.3pr9
- Gestures on Mac OS X
- MBS Real Studio Plugins, version 11.2pr6
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes

### 35.12.2 Methods

### 35.12.3 Constructor

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor doing nothing.
See also:


- 35.12.4 Constructor(Handle as Integer) 6687
- 35.12.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6688


### 35.12.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given CustomNSView handle.
**Notes:** The handle is casted to a CustomNSView and the plugin retains this handle.
See also:

- 35.12.3 Constructor 6687
- 35.12.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6688


### 35.12.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom NSView object.
See also:


- 35.12.3 Constructor 6687
- 35.12.4 Constructor(Handle as Integer) 6687


### 35.12.6 Destructor

MBS MacControls Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.12.7 Events

### 35.12.8 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.12.9 acceptsFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.12.10 becomeFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.12.11 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.12.12 canBecomeKeyView as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.12.13 Close

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.

### 35.12.14 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.

**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.12.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.12.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the

overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.12.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.12.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.12.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.12.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.12.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.12.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on

the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.12.23 drawFocusRingMask(g as NSGraphicsMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Draw the focus ring mask for the view.
**Notes:** If false is returned, the default method from NSView class runs.

This method provides the shape of the focus ring mask by drawing the focus ring mask. An implementation of this method should draw in the view's interior (bounds) coordinate space, that the focus ring style has been set (it will be set it to NSFocusRingOnly to capture the focus ring itself), and that the fill and stroke colors have been set to an arbitrary fully opaque color.

Subclasses that find the default behavior insufficient should only draw the focus ring shape.

The NSView default implementation of this method simply fills self.bounds.
Available in Mac OS X v10.7 and later.

Please use NSGraphicsMBS class for drawing.

### 35.12.24 DrawRect(g as NSGraphicsMBS, left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** The paint event with the rectangle which needs to be redrawn.

### 35.12.25 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.12.26 focusRingMaskBounds as NSRectMBS

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Returns the focus ring mask bounds.
**Notes:** Return nil to run default NSView method.

Return a rectangle containing the mask in the view's interior (bounds) coordinate space.

The mask bounds allows the focus ring's overall size and position to be determined before it is drawn.
Subclasses must override this method if they require the display of a focus ring.
The NSView default implementation of this method simply returns NSRectMBS.Zero.

Note: The information provided by focusRingMaskBounds will enable Accessibility to identify selected subelements for zoom tracking, so it is important that this method provide a reasonably tight bounding box and that noteFocusRingMaskChanged is invoked as described.

### 35.12.27 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.12.28 isFlipped as Boolean

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event to return a boolean value indicating whether the view uses a flipped coordinate system.
**Notes:** The default value of this property is false, which results in a non-flipped coordinate system. In a non-flipped coordinate system, the origin is in the lower-left corner of the view and positive y-values extend upward. In a flipped coordinate system, the origin is in the upper-left corner of the view and y-values extend downward. X-values always extend to the right.

If you want your view to use a flipped coordinate system, override this property and return true.

### 35.12.29 isOpaque as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.12.30 keyDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.12.31 keyUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.12.32 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.

Return true if you handled this event.

### 35.12.33 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.12.34 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.35 mouseDownCanMoveWindow as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.12.36 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.37 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.38 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.39 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.40 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.41 Open

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is created.

### 35.12.42 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.12.43 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.12.44 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.12.45 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.12.46 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.12.47 pressureChange(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.12.48 resignFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.12.49 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.50 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.51 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.12.52 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.12.53 scrollWheel(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.12.54 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.12.55 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.12.56 viewDidMoveToWindow

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose to ignore such cases if they are not of interest.

### 35.12.57 wantsPeriodicDraggingUpdates as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 35.13 class DateTimePicker

### 35.13.1 class DateTimePicker

Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The built-in date time picker control in Xojo.
**Notes:** Only for Xojo 2020r2 or newer.

### 35.13.2 Methods

### 35.13.3 NSDatePickerMBS as NSDatePickerMBS

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries date picker object for the control.
**Notes:** Only for Xojo 2020r2 or newer.

## 35.14 class DesktopBevelButton

### 35.14.1 class DesktopBevelButton

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.14.2 Methods

### 35.14.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox BevelButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.15 class DesktopButton

### 35.15.1 class DesktopButton

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in Button class in Xojo.

### 35.15.2 Methods

### 35.15.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox PushButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.16 class DesktopCheckBox

### 35.16.1 class DesktopCheckBox

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.16.2 Methods

### 35.16.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox CheckBox1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.17 class DesktopComboBox

### 35.17.1 class DesktopComboBox

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in ComboBox class in Xojo.

### 35.17.2 Methods

### 35.17.3 NSComboBoxMBS as NSComboBoxMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSComboBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.18 class DesktopContainer

### 35.18.1 class DesktopContainer

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The container class in Xojo.

### 35.18.2 Methods

### 35.18.3 NSViewMBS as NSViewMBS

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSViewMBS object for the given container.
**Example:**

MsgBox ContainerControl1.NSViewMBS.className

**Notes:** This way you can manipulate Cocoa container controls directly.

## 35.19 class DesktopDateTimePicker

### 35.19.1 class DesktopDateTimePicker

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built-in date time picker control in Xojo.
**Notes:** Only for Xojo 2021r3 or newer.

### 35.19.2 Methods

### 35.19.3 NSDatePickerMBS as NSDatePickerMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries date picker object for the control.
**Notes:** Only for Xojo 2020r2 or newer.

## 35.20 class DesktopDisclosureTriangle

### 35.20.1 class DesktopDisclosureTriangle

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in DisclosureTriangle class in Xojo.

### 35.20.2 Methods

### 35.20.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox DisclosureTriangle1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.21 class DesktopGroupBox

### 35.21.1 class DesktopGroupBox

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in Groupbox class in Xojo.

### 35.21.2 Methods

### 35.21.3 NSBoxMBS as NSBoxMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.22 class DesktopImageViewer

### 35.22.1 class DesktopImageViewer

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in ImageWell class in Xojo.

### 35.22.2 Methods

### 35.22.3 NSImageViewMBS as NSImageViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSImageViewMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.23 control DesktopNSButtonControlMBS

### 35.23.1 control DesktopNSButtonControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSButton.
**Notes:** This control embeds a special NSButton subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.2pr6

### 35.23.2 Properties

### 35.23.3 AlternateTitle as String

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The title that the button displays when it's in its alternate state.
**Notes:** (Read and Write property)

### 35.23.4 BezelStyle as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The appearance of the border, if the view has one.
**Notes:** Use this constants:

(Read and Write property)

### 35.23.5 ButtonType as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The button type.
**Notes:** See also NSButtonMBS.ButtonType and the constants there like NSPushOnPushOffButton.
(Read and Write property)

| | |
|---|---|
| NSRoundedBezelStyle | = 1 |
| NSRegularSquareBezelStyle | = 2 |
| NSThickSquareBezelStyle | = 3 |
| NSThickerSquareBezelStyle | = 4 |
| NSDisclosureBezelStyle | = 5 |
| NSShadowlessSquareBezelStyle | = 6 |
| NSCircularBezelStyle | = 7 |
| NSTexturedSquareBezelStyle | = 8 |
| NSHelpButtonBezelStyle | = 9 |
| NSSmallSquareBezelStyle | = 10 |
| NSTexturedRoundedBezelStyle | = 11 |
| NSRoundRectBezelStyle | = 12 |
| NSRecessedBezelStyle | = 13 |
| NSRoundedDisclosureBezelStyle | = 14 |

### 35.23.6 Title as String

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The title displayed on the button when it's in its normal state.
**Notes:** (Read and Write property)

### 35.23.7 View as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.23.8 Events

### 35.23.9 Action

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The action event.

### 35.23.10 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.23.11 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.23.12 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.23.13 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.23.14 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.23.15 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.23.16 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.23.17 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.23.18 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.23.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.23.20 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.23.21 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.23.22 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.23.23 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.23.24 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.24 control DesktopNSComboBoxControlMBS

### 35.24.1 control DesktopNSComboBoxControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSComboBox.
**Notes:** This control embeds a special NSComboBox subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins, version 21.4pr2

**Xojo Developer Magazine**

- 19.6, page 10: News

### 35.24.2 Properties

### 35.24.3 View as NSComboBoxMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.24.4 Events

### 35.24.5 Action

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The action event run, when e.g. return key is pressed.

### 35.24.6 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.24.7 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.24.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.24.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.24.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.24.11 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.24.12 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.24.13 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.24.14 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.24.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.24.16 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.24.17 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.24.18 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.24.19 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.24.20 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.24.21 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.24.22 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this

event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.24.23 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.24.24 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.24.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.25 control DesktopNSDatePickerControlMBS

### 35.25.1 control DesktopNSDatePickerControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control to put a Mac OS X date picker on a Xojo window.
**Notes:** This control embeds a special NSDatePicker subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr7

### 35.25.2 Properties

### 35.25.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.25.4 View as NSDatePickerMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSDatePicker.
**Notes:** (Read only property)

### 35.25.5 Events

### 35.25.6 Action

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.25.7 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.25.8 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.25.9 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.25.10 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.25.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.25.12 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.25.13 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.25.14 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.25.15 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.25.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.25.17 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.25.18 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.25.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.25.20 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.25.21 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.26 control DesktopNSOutlineControlMBS

### 35.26.1 control DesktopNSOutlineControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control for a NSOutlineView.
**Notes:** Please use NSOutlineControlMBS for hierarchical lists and NSTableControlMBS for normal lists.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr4

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.3, page 10: News

### 35.26.2 Properties

### 35.26.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.26.4 allowsColumnReordering as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to rearrange columns by dragging their headers.
**Notes:** The default value of this property is true, which allows the user to rearrange the table view,Äôs columns. You can rearrange columns programmatically regardless of this setting.
(Read and Write property)

### 35.26.5 allowsColumnResizing as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to resize columns by dragging between their headers.
**Notes:** The default of this property is true, which allows the user to resize the table view,Äôs columns. You can resize columns programmatically regardless of this setting.
(Read and Write property)

### 35.26.6 allowsColumnSelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select columns by clicking their headers.
**Notes:** The default is false, which prevents the user from selecting columns (if you create the table view in Interface Builder, the default value is true). You can select columns programmatically regardless of this setting.
(Read and Write property)

### 35.26.7 allowsEmptySelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select zero columns or rows.
**Notes:** The default is true, which allows the user to select zero columns or rows.
(Read and Write property)

### 35.26.8 allowsMultipleSelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select more than one column or row at a time.
**Notes:** The default is false, which allows the user to select only one column or row at a time. You can select multiple columns or rows programmatically regardless of this setting.
(Read and Write property)

### 35.26.9 autohidesScrollers as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view automatically hides its scroll bars when they are not needed.
**Notes:** The horizontal and vertical scroll bars are hidden independently of each other. When the value of this property is YES and the content of the scroll view doesn't extend beyond the size of the clip view on a given axis, the scroller on that axis is removed to leave more room for the content.
(Read and Write property)

### 35.26.10 hasHorizontalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a horizontal scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a horizontal scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.26.11 hasVerticalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a vertical scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a vertical scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.26.12 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used in this control.
**Notes:** (Read only property)

### 35.26.13 View as NSOutlineViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The outline view used in this control.
**Notes:** (Read only property)

See also:

- 35.26.94 view(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSViewMBS 6756

### 35.26.14 Events

### 35.26.15 acceptDrop(info as NSDraggingInfoMBS, item as NSOutlineViewItemMBS, index as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drop operation was successful.
**Notes:** info: An object that contains more information about this dragging operation.
item: The parent of the item over which the cursor was placed when the mouse button was released.
index: The index of the child of item over which the cursor was placed when the mouse button was released.

Return true if the drop operation was successful, otherwise false.

The data source should incorporate the data from the dragging pasteboard in the implementation of this method. You can get the data for the drop operation from info using the draggingPasteboard method.
The return value indicates success or failure of the drag operation to the system.

### 35.26.16 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.26.17 childOfItem(index as Integer, item as NSOutlineViewItemMBS) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the child item at the specified index of a given item.
**Notes:** index: The index of the child item from item to return.
item: An item in the data source.

Return the child item at index of item. If item is nil, returns the appropriate child item of the root object.

Children of a given parent item are accessed sequentially. In order for the collapsed state of the outline view to remain consistent when it is reloaded you must always return the same object for a specified child and item.

Do not call reloadData from this method.

This event is called very frequently, so it must be efficient.

### 35.26.18 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.26.19 ColumnDidMove(notification as NSNotificationMBS, OldColumn as Integer, NewColumn as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked whenever the user moves a column in the outline view.

### 35.26.20 ColumnDidResize(notification as NSNotificationMBS, tableColumn as NSTableColumnMBS, OldWidth as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked whenever the user resizes a column in the outline view.

### 35.26.21 concludeDragOperation(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.26.22 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.26.23 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.26.24 dataCell(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the cell to use in a given column for a given item.
**Notes:** tableColumn: The table column for which the cell is required. This value may be nil.
item: The item for which the cell is required.

Return the cell to use in column tableColumn for item item, or nil. The cell must properly implement copyWithZone (since it may be copied by by the outline view).

You can return a different data cell for any particular combination of table column and item, or a cell that will be used for the entire row (a full-width cell). If tableColumn is non-nil, you should return a cell. Typically, you should default to returning the result from [ tableColumn dataCellForRow:row ] .
When each row (identified by the item) is being drawn, this method is first called with a nil value for

tableColumn. At this time, you can return a cell that is used to draw the entire row, acting like a group. If you do return a cell for the nil table column, your implementations of the other corresponding data source and delegate methods must be prepared to be invoked with a nil value for tableColumn. If do not return a cell for the nil table column, the method is called once for each column in the outline view, as usual.

### 35.26.25 didAddRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implemented to know when a new row view is added to the table.
**Notes:** rowView: The new row view.
row: The row to which the view was added.

This evemt is for NSView-based outline views. At this point, you can choose to add in extra views or modify any properties on rowView.

### 35.26.26 didClickTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button subsequently goes up in outlineView and tableColumn has been ‚Äúclicked‚Äù without having been dragged anywhere.

### 35.26.27 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.26.28 didDragTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button goes up in outlineView and tableColumn has been dragged during the time the mouse button was down.

### 35.26.29 didRemoveRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implemented to know when a row view is removed from the table
**Notes:** rowView: The row view that was removed.
row: The number of the row that was removed due to being moved offscreen, or -1 if the row was removed from the table so it is no longer valid.

The removed rowView may be reused by the table, so any additionally inserted views should be removed at this point.

### 35.26.30 didTile

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The tableview did tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.26.31 DoubleClick

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse made a double click.

### 35.26.32 draggingEnded(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.26.33 draggingExited(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.

**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.26.34 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to know when the given dragging session has ended.
**Notes:** session: The dragging session that ended.
screenPoint: The point onscreen at which the drag ended.
operation: A mask specifying the types of drag operations permitted by the dragging source.

You can implement this optional delegate method to know when the dragging source operation ended at a specific location, such as the trash (by checking for an operation of NSDragOperationDelete).

### 35.26.35 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, draggedItems() as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method know when the given dragging session is about to begin and potentially modify the dragging session.
**Notes:** session: The dragging session that is about to begin.

screenPoint: The point onscreen at which the drag is to begin.
draggedItems: A array of items to be dragged, excluding items for which pasteboardWriterForItem returns nil.

The draggedItems array directly matches the pasteboard writer array used to begin the dragging session with the NSView method beginDraggingSessionWithItems. Hence, the order is deterministic, and can be used in acceptDrop when enumerating the NSDraggingInfo protocol's pasteboard classes.

### 35.26.36 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.26.37 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.26.38 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.26.39 heightOfRowByItem(item as NSOutlineViewItemMBS) as Double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the height in points of the row containing item.
**Notes:** item: The row item.

Return the height of the row.

Values returned by this method should not include intercell spacing and must be greater than 0.
Implement this event to support an outline view with varying row heights.

For large tables in particular, you should make sure that this method is efficient. NSOutlineView may cache the values this method returns, so if you would like to change a row's height make sure to invalidate the row height by calling noteHeightOfRowsWithIndexesChanged. NSOutlineView automatically invalidates its entire row height cache in reloadData and noteNumberOfRowsChanged.

If you call viewAtColumn or rowViewAtRow within your implementation of this method, an exception is thrown.

To avoid the possibility of a hang due to unexpected recursion, don,Äôt call geometry-calculating methods such as bounds, rectOfColumn, or any NSTableView method that calls tile within your implementation of this method.

### 35.26.40 isGroupItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean that indicates whether a given row should be drawn in the ,Äúgroup row,Äù style.
**Notes:** item: An item in the outline view.

Return true to indicate a particular row should have the "group row" style drawn for that row, otherwise false.

If the cell in that row is an instance of NSTextFieldCell and contains only a string value, the ,Äúgroup row,Äù style attributes are automatically applied for that cell.

### 35.26.41 isItemExpandable(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the a given item is expandable.
**Notes:** item: An item in the data source.

Returns true if item can be expanded to display its children, otherwise NO.

This method may be called quite often, so it must be efficient.

Do not call reloadData from this method.

### 35.26.42 ItemDidCollapse(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the did collapse notification is posted—that is, whenever the user collapses an item in the outline view.

### 35.26.43 ItemDidExpand(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user expands an item in the outline view.

### 35.26.44 itemForPersistentObject(PersistentObject as Variant) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return the item for the archived object.
**Notes:** object: An archived representation of an item in outlineView's data source.

Return the unarchived item corresponding to object. If the item is an archived object, this method may return the object.

When the outline view is restoring the saved expanded items, this method is called for each expanded item, to translate the archived object to an outline view item.

You must implement this method if you are automatically saving expanded items (that is, if autosaveExpandedItems returns true).

### 35.26.45 ItemWillCollapse(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user is about to collapse an item in the outline view.

### 35.26.46 ItemWillExpand(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user is about to expand an item in the outline view.

### 35.26.47 LeftMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.48 LeftMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the left button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.49 LeftMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.50 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.26.51 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.26.52 mouseDownInHeaderOfTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Event sent whenever the mouse button is clicked in outlineView while the cursor is in a column header tableColumn.

### 35.26.53 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.26.54 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.26.55 namesOfPromisedFilesDroppedAtDestination(dropDestination as folderItem, DraggedItems() as NSOutlineViewItemMBS) as string()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns an array of filenames for the created files that the receiver promises to create.
**Notes:** dropDestination: The drop location where the files are created.
items: The items being dragged.

Returns an array of filenames (not full paths) for the created files that the receiver promises to create.

For more information on file promise dragging, see documentation on the NSDraggingSource protocol and namesOfPromisedFilesDroppedAtDestination.

### 35.26.56 nextTypeSelectMatchFromItem(startItem as NSOutlineViewItemMBS, endItem as NSOutlineViewItemMBS, searchString as String) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the first item that matches the searchString from within the range of startItem to endItem.
**Notes:** startItem: The first item to search.
endItem: The item before which to stop searching. It is possible for endItem to be less than startItem if the search will wrap.
searchString: The string for which to search.

Returns the first item—from within the range of startItem to endItem—that matches the searchString, or nil if there is no match.

Implement this method if you want to control how type selection works. You should include startItem as a possible match, but do not include endItem.
It is not necessary to implement this event in order to support type select.

### 35.26.57 numberOfChildrenOfItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the number of child items encompassed by a given item.
**Notes:** item: An item in the data source.

Returns the number of child items encompassed by item. If item is nil, this method should return the number of children for the top-level item.

The numberOfChildrenOfItem method is called very frequently, so it must be efficient.

Do not call reloadData from this method.

### 35.26.58 objectValue(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Variant

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return the data object associated with the specified item.
**Notes:** tableColumn: A column in outlineView.
item: An item in the data source in the specified tableColumn of the view.

Returns the item is located in the specified tableColumn of the view.

Do not call reloadData from this method.

### 35.26.59 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.26.60 OtherMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed a mouse button other than the left or right one.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.61 OtherMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with a button other than the left or right button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.62 OtherMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released a mouse button other than the left or right button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.63 pasteboardWriterForItem(item as NSOutlineViewItemMBS) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to enable the table to be an NSDraggingSource that supports dragging multiple items.
**Notes:** item: The item for which to return a pasteboard writer.

Returns a NSPasteboardItem object.

If this method is implemented, then writeItems is not called.

### 35.26.64 persistentObjectForItem(item as NSOutlineViewItemMBS) as Variant

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return an archived object for item.
**Notes:** item: The item for which to return an archived object.

Returns an archived representation of item. If the item is an archived object, this method may return the item.

When the outline view is saving the expanded items, this method is called for each expanded item, to translate the outline view item to an archived object.

You must implement this method if you are automatically saving expanded items (that is, if autosaveExpandedItems returns true).

### 35.26.65 RightMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the view that the user has pressed the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.66 RightMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the right button pressed .
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.67 RightMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.26.68 rowViewForItem(item as NSOutlineViewItemMBS) as NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to return a custom NSTableRowView for a particular item.

**Notes:** item: The item displayed by the returned table row view.

Return an instance or subclass of NSTableRowView. If nil is returned, a NSTableRowView instance is created and used.

This method, if implemented, is only invoked for NSView-based outline views.

### 35.26.69 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.26.70 SelectionDidChange(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the selection did change notification is posted—that is, immediately after the outline view,Äôs selection has changed.

### 35.26.71 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the proposed selection.
**Notes:** proposedSelectionIndexes: An index set containing the indexes of the proposed selection.
Return an NSIndexSet instance containing the indexes of the new selection. Return proposedSelectionIndexes if the proposed selection is acceptable, or the value of the table view,Äôs existing selection to avoid changing the selection.

This method may be called multiple times with one new index added to the existing selection to find out if a particular index can be selected when the user is extending the selection with the keyboard or mouse.

Implementation of this method is optional. If implemented, this method will be called instead of willDisplayOutlineCell.

If not implemented or returns nil, the plugin will return proposedSelectionIndexes.

### 35.26.72 SelectionIsChanging(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the outline view,Äôs selection changes.

### 35.26.73 selectionShouldChangeInOutlineView as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should change its selection.
**Notes:** Return true to permit outlineView to change its selection (typically a row being edited), false to deny permission.

For example, if the user is editing a cell and enters an improper value, the delegate can prevent the user from selecting or editing any other cells until a proper value has been entered into the original cell. You can implement this method for complex validation of edited rows based on the values of any of their cells.

### 35.26.74 setObjectValue(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS, value as Variant)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Set the data object for a given item in a given column.
**Notes:** object: The new value for the item.
tableColumn: A column in outlineView.
item: An item in the data source in the specified tableColumn of the view.

The item is located in the specified tableColumn of the view.

Do not call reloadData from this method.

### 35.26.75 shouldCollapseAutoExpandedItemsForDeposited(deposited as Boolean, superResult as Boolean) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether auto-expanded items should return to their original collapsed state.
**Notes:** deposited: If true, the drop terminated successfully; if false the drop failed.

Return true if auto-expanded items should return to their original collapsed state; otherwise false.

Implement this event to provide custom behavior. If the target of a drop is not auto-expanded (by hovering long enough) the drop target still gets expanded after a successful drop unless this method returns true. The default implementation returns false after a successful drop.
This method is called in a variety of situations. For example, it is called shortly after the acceptDrop method is called and also if the drag exits the outline view (exiting the view is treated the same as a failed drop). The return value of the acceptDrop method determines the incoming value of the deposited parameter.

### 35.26.76 shouldCollapseItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should collapse a given item.
**Notes:** item: The item that should collapse.

Return true to permit outlineView to collapse item, false to deny permission.

You can implement this method to disallow collapsing of specific items. For example, if the first row of your outline view should not be collapsed, your delegate method could contain this line of code:

return rowForItem(item ) <>0

### 35.26.77 shouldEdit(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMB as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should allow editing of a given item in a given table column.
**Notes:** tableColumn: The table column.
item: The item.

Returns true to permit outlineView to edit the cell specified by tableColumn and item, false to deny permission.
If this method returns true, the cell may still not be editable—for example, if you have set up a custom NSTextFieldCell as a data cell, it must return true for isEditable to allow editing.

You can implement this method to disallow editing of specific cells.

### 35.26.78 shouldExpandItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should expand a given item.
**Notes:** item: The item that should expand.

Returns true to permit outlineView to expand item, false to deny permission.
You can implement this method to disallow expanding of specific items.

### 35.26.79 shouldReorderColumn(columnIndex as Integer, newColumnIndex as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent to the delegate to allow or prohibit the specified column to be dragged to a new location.
**Notes:** columnIndex: The index of the column being dragged.
newColumnIndex: The proposed target index of the column.

Returns true if the column reordering should be allowed, otherwise false.

When a column is initially dragged by the user, the delegate is first called with a newColumnIndex value of -1. Returning false will disallow that column from being reordered at all. Returning true allows it to be reordered, and the delegate will be called again when the column reaches a new location.

The actual NSTableColumn instance can be retrieved from the tableColumns array.
If this method is not implemented, all columns are considered reorderable.

### 35.26.80 shouldSelectItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should select a given item.
**Notes:** item: The item.

Return true to permit outlineView to select item, false to deny permission.

You implement this event to disallow selection of particular items.
For better performance and finer grain control over the selection, use dataCell.

### 35.26.81 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should select a given table column.
**Notes:** tableColumn: The table column.

Return true to permit outlineView to select tableColumn, false to deny permission.

You can implement this method to disallow selection of specific columns.

### 35.26.82 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to control cell expansion for a specific column and item.
**Notes:** tableColumn: A table column in the outline view.
item: An item in the outline view.

Returns true to allow an expansion tooltip to appear in the column tableColumn for item item, otherwise false.

Cell expansion can occur when the mouse hovers over the specified cell and the cell contents are unable to be fully displayed within the cell. If this method returns true, the full cell contents will be shown in a special floating tool tip view, otherwise the content is truncated.

### 35.26.83 shouldShowOutlineCellForItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns whether the specified item should display the outline cell (the disclosure triangle).
**Notes:** item: An item in the outline view.

Returns true if the outline cell should be displayed, otherwise false.

Returning false causes frameOfOutlineCellAtRow to return NSZeroRect, hiding the cell. In addition, the row will not be collapsible by keyboard shortcuts.

This method is called only for expandable rows.

### 35.26.84 shouldTrackCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a given cell should be tracked.
**Notes:** cell: The cell used to display item item in column tableColumn
tableColumn: A table column in the outline view.
item: An item in the outline view.

Returns true if the cell should be tracked for the item item in column tableColumn, otherwise false.

Normally, only selectable or selected cells can be tracked. If you implement this method, cells which are not selectable or selected can be tracked (and vice-versa). For example, this allows you to have a button cell in a table which does not change the selection, but can still be clicked on and tracked.

### 35.26.85 shouldTypeSelectForEvent(e as NSEventMBS, searchString as String) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether type select should proceed for a given event and search string.
**Notes:** e: The event that caused the message to be sent.
searchString: The string for which searching is to proceed. The search string is nil if no type select has begun.

Return true if type select should proceed, otherwise false.

Generally, this method will be called from keyDown and the event will be a key event.

### 35.26.86 sizeToFitWidthOfColumn(Column as Integer) as Double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to provide custom sizing behavior when a column,Äôs resize divider is double clicked.
**Notes:** column: The index of the column.

Returns the width of the specified column.

By default, NSOutlineView iterates every row in the table, accesses a cell via preparedCellAtColumn, and requests the cellSize to find the appropriate largest width to use.
For accurate results and performance, it is recommended that this method is implemented when using large tables. By default, large tables use a monte carlo simulation instead of iterating every row.

### 35.26.87 sortDescriptorsDidChange(oldDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked by an outline view to notify the data source that the descriptors changed and the data may need to be resorted.
**Notes:** oldDescriptors: An array that contains the previous descriptors.

The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source does not itself manage them, you can get outlineView's current sort descriptors by sending it a sortDescriptors message.

### 35.26.88 textShouldBeginEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow.

### 35.26.89 textShouldEndEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow.

### 35.26.90 toolTipForCell(cell as NSCellMBS, byref rect as NSRectMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS, mouseLocation as NSPointMBS) as String

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** When the cursor pauses over a given cell, the value returned from this method is displayed in a tooltip.
**Notes:** cell: The cell for which to generate a tooltip.
rect: The proposed active area of the tooltip. To control the default active area, you can modify the rect parameter. By default, rect is computed as cell.drawingRectForBounds(cellFrame).
tc: The table column that contains cell.
item: The item for which to display a tooltip.
mouseLocation: The current mouse location in view coordinates.

If you don,Äôt want a tooltip at that location, return nil or the empty string.

### 35.26.91 typeSelectString(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as String

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the string that is used for type selection for a given column and item.
**Notes:** tableColumn: A table column in the outline view.
item: An item in the outline view.

Return the string that is used for type selection. You may want to change what is searched for based on what is displayed, or simply return nil for that row and/or column to not be searched

Implement this method if you want to control the string that is used for type selection. You may want to change what is searched for based on what is displayed, or simply return nil to specify that the given row and/or column should not be searched. By default, all cells with text in them are searched.

The default value when this delegate method is not implemented is:
outlineView.preparedCellAtColumn(tableColumn, outlineView.rowForItem(item)).stringValue
and you can return this value from the event if you wish.

### 35.26.92 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to enable the table to update dragging items as they are dragged over

the view.
**Notes:** draggingInfo: The dragging info object.

### 35.26.93 validateDrop(info as NSDraggingInfoMBS, proposedItem as NSOutlineViewItemMBS, proposedChildIndex as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Used by an outline view to determine a valid drop target.
**Notes:** info: An object that contains more information about this dragging operation.
item: The proposed parent.
index: The proposed child location.

Returns a value that indicates which dragging operation the data source will perform.

Based on the mouse position, the outline view will suggest a proposed drop location. The data source may ‚Äúretarget‚Äù a drop if desired by calling setDropItem and returning something other than NSDragOperationNone. You may choose to retarget for various reasons (for example, for better visual feedback when inserting into a sorted position).
Implementation of this method is optional.

### 35.26.94 view(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implemented to return the view used to display the specified item and column.
**Notes:** tableColumn: The table column, or nil if the row is a group row.
item: The item displayed by the returned view.

Return the view to display the specified column and row. Returning nil is acceptable, in which case a view is not shown at that location.

This method is required if you wish to use NSView objects instead of NSCell objects for the cells within an outline view. Cells and views cannot be mixed within the same outline view.
It is recommended that the implementation of this method first call the NSTableView method makeViewWithIdentifier passing, respectively, the tableColumn parameter,Äôs identifier and self as the owner to attempt to reuse a view that is no longer visible. The frame of the view returned by this method is not important, and is automatically set by the outline view.
The view's properties should be properly set up before returning the result.
When using Cocoa bindings, this method is optional if at least one identifier has been associated with the table view at design time. If this method is not implemented, the outline view automatically calls make-

ViewWithIdentifier with the tableColumn parameter,Äôs identifier and the outline view,Äôs delegate as parameters, to attempt to reuse a previous view or automatically unarchive a prototype associated with the table view.
The autoresizingMask of the returned view is automatically set to NSViewHeightSizable to resize properly on row height changes.
See also:

- 35.26.13 View as NSOutlineViewMBS 6732

### 35.26.95 willDisplayCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the delegate that the cell specified by the column and item will be displayed.
**Notes:** cell: The cell.
tableColumn: The table column.
item: The item.

You can implement this method to modify cell to provide further setup for the cell in tableColumn and item. It is not safe to do drawing inside this method—you should only set up state for cell.

### 35.26.96 willDisplayOutlineCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the delegate that an outline view is about to display a cell used to draw the expansion symbol.
**Notes:** cell: The cell.
tableColumn: The table column.
item: The item.

Informs the event that outlineView is about to display cell—an expandable cell (a cell that has the expansion symbol)—for the column and item specified by tableColumn and item. The delegate can modify cell to alter its display attributes.
This method is not invoked when outlineView is about to display a non-expandable cell.

### 35.26.97 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.26.98 willTile

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The tableview will tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.26.99 writeItems(items() as NSOutlineViewItemMBS, pasteboard as NSPasteboardMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drag operation is allowed.
**Notes:** items: An array of the items participating in the drag.
pasteboard: The pasteboard to which to write the drag data.

Returns true if the drag operation is allowed, otherwise false.

Invoked by outlineView after it has been determined that a drag should begin, but before the drag has been started.
To refuse the drag, return false. To start a drag, return true and place the drag data onto the pboard (data, owner, and so on). The drag image and other drag-related information will be set up and provided by the outline view once this call returns with true.

## 35.27 control DesktopNSPathControlControlMBS

### 35.27.1 control DesktopNSPathControlControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a NSPathControl.
**Notes:** We know the fact, that the control wrapping the segmented control has control twice in the name. Suggestions to rename are welcome, but unlikely to happen as it would break code.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- NSSegmentedControl and NSPathControl
- MBS Xojo Plugins, version 24.0pr7

**Xojo Developer Magazine**

- 22.2, page 9: News

### 35.27.2 Properties

### 35.27.3 View as NSPathControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSPathControlMBS.
**Notes:** (Read only property)

### 35.27.4 Events

### 35.27.5 Action

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.27.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.27.7 Closing

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.27.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.27.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.27.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.27.11 DoubleClick

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a double click happened.
**Notes:** May call Action event before.

### 35.27.12 FocusLost

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.27.13 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.27.14 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.27.15 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.27.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.27.17 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.27.18 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.27.19 Opening

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.
**Example:**

```
Sub Open() Handles Open
// set small font
```

```
Dim p As NSPathControlMBS = Me.View
p.Font = NSFontMBS.systemFontOfSize(10)

// disable focus ring
p.focusRingType = p.NSFocusRingTypeNone
End Sub
```

### 35.27.20 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.27.21 willDisplayOpenPanel(openPanel as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the Open panel shown by a pop-up–style path.
**Notes:** This method is called before the Open panel is shown but after its allowed file types are set to the cell's allowed types. At this time, you can further customize the Open panel as required. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

openPanel is a NSOpenPanelMBS object.

### 35.27.22 willPopUpMenu(menu as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the menu of a pop-up–style path.
**Notes:** This event is called before the pop-up menu is shown. At this time, you can further customize the menu as required, adding and removing items. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

Menu is a NSMenuMBS object.

### 35.27.23 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.28 control DesktopNSPopUpButtonControlMBS

### 35.28.1 control DesktopNSPopUpButtonControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSPopUpButtonControl.
**Notes:** This control embeds a special NSPopUpButtonControl subclass.
Designed for Xojo 2021r3 and newer.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.2pr6

### 35.28.2 Properties

### 35.28.3 View as NSPopUpButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.28.4 Events

### 35.28.5 Action

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The action event.

### 35.28.6 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.28.7 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.28.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.28.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.28.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.28.11 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.28.12 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.28.13 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.28.14 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.28.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.28.16 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.28.17 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.28.18 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.28.19 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.28.20 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.29 control DesktopNSSearchFieldControlMBS

### 35.29.1 control DesktopNSSearchFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSSearchField.
**Notes:** This control embeds a special NSSearchField subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 23.2pr1
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.5pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 35.29.2 Properties

### 35.29.3 View as NSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.29.4 Events

### 35.29.5 Action

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The action event run, when e.g. return key is pressed.

### 35.29.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.29.7 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.29.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.29.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.29.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.29.11 FocusLost

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.29.12 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.29.13 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.29.14 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.29.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.29.16 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.29.17 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.29.18 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.29.19 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.29.20 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.29.21 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.29.22 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDi-

dEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.29.23 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.29.24 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.29.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.30 control DesktopNSSecureTextFieldControlMBS

### 35.30.1 control DesktopNSSecureTextFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSSecureTextField.
**Notes:** This control embeds a special NSSecureTextField subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 35.30.2 Properties

### 35.30.3 echosBullets as Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver echoes a bullet character rather than each character typed.
**Example:**

```
dim t as DesktopNSSecureTextFieldControlMBS // your textfield
t.echosBullets = true
```

**Notes:** If true, bullets are echoed. If false, the cursor is moved for each character typed, but nothing is displayed.
(Read and Write property)

### 35.30.4 View as NSSecureTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.30.5 Events

### 35.30.6 Action

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** The text changed.

### 35.30.7 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.30.8 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.30.9 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.30.10 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.30.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.30.12 FocusLost

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.30.13 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.30.14 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.30.15 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.30.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.30.17 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.30.18 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.30.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.30.20 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.30.21 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.30.22 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.30.23 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.30.24 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.30.25 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.30.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.31 control DesktopNSSegmentedControlControlMBS

### 35.31.1 control DesktopNSSegmentedControlControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a NSSegmentedControl.
**Notes:** We know the fact, that the control wrapping the segmented control has control twice in the name. Suggestions to rename are welcome, but unlikely to happen as it would break code.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- NSSegmentedControl and NSPathControl
- MBS Xojo Plugins, version 24.0pr7

### 35.31.2 Properties

### 35.31.3 View as NSSegmentedControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSSegmentedControlMBS.
**Notes:** (Read only property)

### 35.31.4 Events

### 35.31.5 Action

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.31.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.31.7 Closing

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.31.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.31.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.31.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.31.11 FocusLost

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.31.12 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.31.13 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.31.14 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.31.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.31.16 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.31.17 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.31.18 Opening

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.31.19 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.31.20 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.32 control DesktopNSSplitViewControlMBS

### 35.32.1 control DesktopNSSplitViewControlMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Our control to wrap a NSSplitViewMBS object.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr7
- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- NSSplitView Control for Xojo
- MBS Xojo Plugins, version 23.4pr5

### 35.32.2 Properties

### 35.32.3 View as NSSplitViewMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSSplitView.
**Notes:** (Read only property)

### 35.32.4 Events

### 35.32.5 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.32.6 canCollapseSubview(subview as NSViewMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to determine whether the user can collapse and expand the specified subview.
**Notes:** subview: The subview to collapse.

Returns true if subview collapses when the user drags a divider beyond the halfway mark between its minimum size and its edge; otherwise, false.

The subview expands when the user drags the divider beyond the halfway mark between its minimum size and its edge.

To specify the minimum size, define the constrainMaxCoordinate and constrainMinCoordinate events. A subview can collapse only if you also define constrainMinCoordinate.
A collapsed subview isn,Äôt visible, but the split view object retains it with the same size as before the collapse.
If the events are implemented, the subviews can,Äôt collapse.

### 35.32.7 Closing

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.32.8 constrainMaxCoordinate(proposedMaximumPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the maximum coordinate limit of a divider when the user drags it.
**Notes:** proposedMax: The proposed maximum coordinate limit of the subview in the split view,Äôs flipped coordinate system.
dividerIndex: Specifies the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the maximum coordinate limit of the divider.

The delegate receives this message before the split view begins tracking the mouse to position a divider. You can further constrain the limits, but you can,Äôt extend the divider limits.
If the split bars are horizontal (views are one on top of the other), proposedMax is the bottom limit. If the split bars are vertical (views are side by side), proposedMax is the right limit. The initial value of proposedMax is the bottom (or right side) of the subview after the divider.

### 35.32.9 constrainMinCoordinate(proposedMinimumPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the minimum coordinate limit of a divider when the user drags it.
**Notes:** proposedMin: The proposed minimum coordinate limit of the subview in the split view,Äôs flipped coordinate system.
dividerIndex: Specifies the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the minimum coordinate limit of the divider.

The delegate receives this message before the split view begins tracking the cursor to position a divider. You can further constrain the limits, but you can,Äôt extend the divider limits.
If the split bars are horizontal (views are one on top of the other), proposedMin is the top limit. If the split bars are vertical (views are side by side), proposedMin is the left limit. The initial value of proposedMin is the top (or left side) of the subview before the divider.

### 35.32.10 constrainSplitPosition(proposedPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the divider to certain positions.
**Notes:** proposedPosition: The cursor,Äôs current position, and the proposed position of the divider.
dividerIndex: The index of the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the position for constraining the divider.

If the delegate implements this method, the split view calls it repeatedly as the user moves the divider.
If a subview,Äôs height must be a multiple of a certain number, use this method to return the multiple nearest to proposedPosition.

### 35.32.11 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.32.12 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.32.13 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.32.14 drawDivider(graphics as NSGraphicsMBS, Rect as NSRectMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Draws a divider between two of the split view,Äôs subviews.
**Example:**

```
Function drawDivider(graphics as NSGraphicsMBS, Rect as NSRectMBS) Handles drawDivider as Boolean

// draw a red box with blue border
graphics.setFillColor NSColorMBS.redColor
graphics.setStrokeColor NSColorMBS.blueColor

Dim r As New NSRectMBS(rect.X, rect.y + rect.Height/2 - 5, 10, 10)
graphics.fillRect r
graphics.strokeRect r

Return True
End Function
```

**Notes:** Rect: The entire divider rectangle in the split view,Äôs flipped coordinate system.

If you override this method to use a custom style for the divider, you may need to change the size of the

divider.

### 35.32.15 FocusLost

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.32.16 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.32.17 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.32.18 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.32.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.32.20 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.32.21 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.32.22 Opening

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.32.23 resizeSubviewsWithOldSize(oldSize as NSSizeMBS)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify custom sizing behavior for the subviews of the split view.
**Notes:** oldSize: The size of the split view before the user resizes it.

If the delegate implements this method, it receives this message after the split view resizes.

Resize the subviews so that the sum of the sizes of the subviews plus the sum of the thickness of the dividers equals the size of the new frame of the NSSplitView. You can get the thickness of a divider through the dividerThickness method.

If you implement this delegate method to resize subviews on your own, the NSSplitViewMBS doesn,Äôt perform any error checking for you. However, you can invoke adjustSubviews() to perform the default sizing behavior.

### 35.32.24 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.32.25 shouldAdjustSizeOfSubview(view as NSViewMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify whether to resize the subview.
**Notes:** subview: The subview to resize.

If adjustSubviews() can change the size of the subview, return true; otherwise, false. By returning false, you lock the size of the split view subview while the split view resizes.

Regardless of the value that this method returns, adjustSubviews() may change the origin of the subview. Nonresizable subviews may resize to prevent an invalid subview layout.
If a split view has no delegate, or if its delegate doesn,Äôt respond to this message, the split view behaves as if this method returns true.

### 35.32.26 shouldHideDivider(dividerIndex as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to determine whether the user can drag a divider or adjust it off the edge of the split view.
**Notes:** dividerIndex: The zero-based index of the divider.

Return true if the user can drag the divider off the edge of the split view, resulting in it not being visible.

If a split view has no delegate, or if its delegate doesn,Äôt respond to this message, the split view behaves as if it has a delegate that returns false when it receives this message.

### 35.32.27 splitViewDidResizeSubviews

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Notifies the delegate when the split view resizes its subviews.
**Notes:** The control invokes this event after the split view resizes two of its subviews in response to the repositioning of a divider.

### 35.32.28 splitViewWillResizeSubviews

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Notifies the delegate when the split view is about to resize its subviews.
**Notes:** The control invokes this method before the split view resizes two of its subviews in response to the repositioning of a divider.

### 35.32.29 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.33 control DesktopNSSwitchControlMBS

### 35.33.1 control DesktopNSSwitchControlMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSSwitch as control in Xojo.
**Notes:** Available on macOS 10.15 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr3
- Adding NSSwitch to Xojo
- MBS Xojo Plugins, version 22.1pr2

**Xojo Developer Magazine**

- 20.4, page 10: News
- 20.3, page 10: News

### 35.33.2 Properties

### 35.33.3 State as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The current state.
**Notes:** Set to true for toggle on and set to false for toggle off.
(Read and Write property)

### 35.33.4 View as NSSwitchMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.33.5 Events

### 35.33.6 Action

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The action event.

### 35.33.7 BoundsChanged

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.33.8 Closing

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.33.9 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.33.10 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.33.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.33.12 FocusLost

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.33.13 FocusReceived

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.33.14 FrameChanged

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.33.15 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.33.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.33.17 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.33.18 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.33.19 Opening

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.33.20 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.33.21 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.34 control DesktopNSTableControlMBS

### 35.34.1 control DesktopNSTableControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control for a NSTableView.
**Notes:** Please use NSOutlineControlMBS for hierarchical lists and NSTableControlMBS for normal lists.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3
- Xojo 2022r3 released
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr5
- MBS Xojo Plugins, version 17.1pr3
- MBS Xojo Plugins, version 17.1pr2
- MBS Xojo / Real Studio Plugins, version 15.2pr2

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.3, page 10: News
- 14.4, page 22: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.34.2 Properties

### 35.34.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.34.4 allowsColumnReordering as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to rearrange columns by dragging their headers.
**Notes:** The default value of this property is true, which allows the user to rearrange the table view,Äôs columns. You can rearrange columns programmatically regardless of this setting.
(Read and Write property)

### 35.34.5 allowsColumnResizing as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to resize columns by dragging between their headers.
**Notes:** The default of this property is true, which allows the user to resize the table view,Äôs columns. You can resize columns programmatically regardless of this setting.
(Read and Write property)

### 35.34.6 allowsColumnSelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select columns by clicking their headers.
**Notes:** The default is false, which prevents the user from selecting columns (if you create the table view in Interface Builder, the default value is true). You can select columns programmatically regardless of this setting.
(Read and Write property)

### 35.34.7 allowsEmptySelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select zero columns or rows.
**Notes:** The default is true, which allows the user to select zero columns or rows.
(Read and Write property)

### 35.34.8 allowsMultipleSelection as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select more than one column or row at a time.
**Notes:** The default is false, which allows the user to select only one column or row at a time. You can select multiple columns or rows programmatically regardless of this setting.
(Read and Write property)

### 35.34.9 autohidesScrollers as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view automatically hides its scroll bars when they are not needed.
**Notes:** The horizontal and vertical scroll bars are hidden independently of each other. When the value of this property is YES and the content of the scroll view doesn't extend beyond the size of the clip view on a given axis, the scroller on that axis is removed to leave more room for the content.
(Read and Write property)

### 35.34.10 disableCellEvents as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to disable cell based events.
**Notes:** The table view can work with cell modes and use NSCell to disable cells.
Or since OS X 10.7 it can work with NSView to display cells or rows.
This property lets you explicitly disable cells and use only views.
(Read and Write property)

### 35.34.11 disableViewEvents as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to disable view based events.
**Notes:** The table view can work with cell modes and use NSCell to disable cells.
Or since OS X 10.7 it can work with NSView to display cells or rows.
This property lets you explicitly disable views and use only cells.
(Read and Write property)

### 35.34.12 hasHorizontalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a horizontal scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a horizontal scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.34.13 hasVerticalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a vertical scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a vertical scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.34.14 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used in this control.
**Notes:** (Read only property)

### 35.34.15 View as NSTableViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The table view used in this control.
**Notes:** (Read only property)
See also:

- 35.34.82 view(tableColumn as NSTableColumnMBS, row as Integer) as NSViewMBS 6822

### 35.34.16 Events

### 35.34.17 acceptDrop(info as NSDraggingInfoMBS, row as Integer, dropOperation as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called by TableView when the mouse button is released over a table view that previously decided to allow a drop.
**Notes:** info: An object that contains more information about this dragging operation.
row: The index of the proposed target row.
operation: The type of dragging operation.

Returns true if the drop operation was successful, otherwise false.

The data source should incorporate the data from the dragging pasteboard in the implementation of this method. You can use the draggingPasteboard method to get the data for the drop operation from info.
To accept a drop on the second row, row would be 2 and operation would be NSTableViewDropOn. To accept a drop below the last row, row would be TableView.numberOfRows and operation would be NSTableViewDropAbove.

### 35.34.18 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.34.19 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.34.20 ColumnDidMove(notification as NSNotificationMBS, oldColumn as Integer, newColumn as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event informs the delegate that a column was moved by user action in the table view.

### 35.34.21 ColumnDidResize(notification as NSNotificationMBS, tableColumn as NSTableColumnMBS, OldWidth as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event informs you that a column was resized in the table view.

### 35.34.22 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.34.23 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.34.24 dataCell(tableColumn as NSTableColumnMBS, row as Int64) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Optional return a different cells for each row.
**Notes:** A different data cell can be returned for any particular tableColumn and row, or a cell that will be used for the entire row (a full width cell). The returned cell should properly implement copyWithZone:, since the cell may be copied by NSTableView. If the tableColumn is non-nil, and nil is returned, then the table will use the default cell from tableColumn.dataCellForRow(Row).

When each row is being drawn, this method will first be called with a nil tableColumn. At this time, you can return a cell that will be used to draw the entire row, acting like a group. If you do return a cell for the 'nil' tableColumn, be prepared to have the other corresponding datasource and delegate methods to be called with a 'nil' tableColumn value. If don't return a cell, the method will be called once for each tableColumn in the tableView, as usual.

### 35.34.25 didAddRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was added at the specified row.
**Notes:** rowView: The row view.

row: The index of the row.

At this point, the delegate can add extra views, or modify the properties of rowView.

This method is only valid for NSView-based table views.

### 35.34.26 didClickTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called if a table column was clicked on.

### 35.34.27 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.34.28 didDragTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button goes up in tableView and tableColumn has been dragged during the time the mouse button was down.
**Notes:** tableColumn: The table column.

The behavior of this method on Mac OS X v10.5 is different from prior versions. On Mac OS X v 10.5 the dragged column is sent to the subclass. In earlier versions the table column that is currently located at the dragged column's original index is sent.

### 35.34.29 didRemoveRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was removed from the table at the specified row.
**Notes:** rowView: The row view.

row: The index of the row.

If row equals -1, the row is being deleted from the table and is no longer a valid row; otherwise row is a valid row that is being removed by being moved off screen.

This method is only valid for NSView-based table views.

### 35.34.30 didTile

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The tableview did tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.34.31 DoubleClick

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse made a double click.

### 35.34.32 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to determine when a dragging session has ended.
**Notes:** session: The dragging session.
screenPoint: The ending drag location in screen coordinates.
operation: The drag operation. See NSDragOperation for supported values.

This delegate method can be used to determine when the dragging source operation ended at a specific location, such as the trash, by checking for an operation of NSDragOperationDelete.

### 35.34.33 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, rowIndexes as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to determine when a dragging session will begin.
**Notes:** session: The dragging session.
screenPoint: The initial drag location in screen coordinates.
rowIndexes: The indexes of the rows to be dragged, excluding rows that were not dragged due to pasteboardItemForRow returning nil.

Implement this method to know when the dragging session is about to begin and to potentially modify the dragging session.
The dragged item order will directly match the pasteboard writer array used to begin the dragging session with the NSView method beginDraggingSessionWithItems. Hence, the order is deterministic, and can be used in acceptDrop when enumerating the NSDraggingInfo pasteboard classes.

### 35.34.34 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.34.35 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.34.36 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.34.37 heightOfRow(row as Int64) as Double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this event to support a table with varying row heights.
**Notes:** The height returned by this method should not include intercell spacing and must be greater than zero. Performance Considerations: For large tables in particular, you should make sure that this method is efficient. NSTableView may cache the values this method returns, but this should NOT be depended on, as all values may not be cached. To signal a row height change, call noteHeightOfRowsWithIndexesChanged. For a given row, the same row height should always be returned until noteHeightOfRowsWithIndexesChanged is called, otherwise unpredicable results will happen. NSTableView automatically invalidates its entire row height cache in reloadData, and noteNumberOfRowsChanged.

### 35.34.38 isGroupRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to indicate that a specified row is a group row.
**Notes:** row: The row index.

Return true if the specified row should have the group row style drawn, false otherwise.

If the cell in row is an NSTextFieldCell and contains only a string, the group row style attributes will automatically be applied to the cell.

Group rows in view-based table views can be made to visually ‚Äòfloat' by setting the tableview method setFloatsGroupRows to true.

Note: When configured as a source list style table view, rows identified as group rows draw with a specific style unique for source lists.
Available in Mac OS X v10.5 and later.

### 35.34.39 LeftMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.40 LeftMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the left button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.41 LeftMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.42 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.34.43 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.34.44 mouseDownInHeaderOfTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent to the subclass whenever the mouse button is clicked in the table view's header column.
**Notes:** tableColumn: The table column.

### 35.34.45 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.34.46 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.34.47 namesOfPromisedFilesDroppedAtDestination(dropDestination as folderItem, DraggedRowsWithIndexes as NSIndexSetMBS) as string()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns an array of filenames that represent the indexSet rows for a drag to dropDestination.
**Notes:** dropDestination: The drop location where the files are created.
indexSet: The indexes of the items being dragged.

Returns an array of filenames (not full paths) for the created files that the receiver promises to create.

This method is called when a destination has accepted a promise drag.
For more information on file promise dragging, see documentation on the NSDraggingSource protocol and namesOfPromisedFilesDroppedAtDestination:.

### 35.34.48 nextTypeSelectMatchFromRow(startRow as Int64, endRow as Int64, searchString as string) as Int64

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to modify how type selection works.
**Notes:** startRow: The starting row of the search range.
endRow: The ending row of the search range.
searchString: A string containing the typed selection.

Return the first row in the range of startRow through endRow (excluding endRow itself) that matches selectionString. Return -1 if no match is found.

It is possible for endRow to be less than startRow if the search will wrap.
Available in Mac OS X v10.5 and later.

### 35.34.49 numberOfRowsInTableView as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when the table view needs to know the number of rows.
**Notes:** numberOfRowsInTableView is called very frequently, so it must be efficient.

### 35.34.50 objectValue(column as NSTableColumnMBS, row as Integer) as Variant

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a value is required for a given cell.
**Notes:** Please implement your own arrays to store values.

### 35.34.51 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.34.52 OtherMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed a mouse button other than the left or right one.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.53 OtherMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with a button other than the left or right button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.54 OtherMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released a mouse button other than the left or right button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.55 pasteboardItemForRow(row as Integer) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called to allow the table to support multiple item dragging.
**Notes:** row: The row.

Returns an instance of NSPasteboardItem. Returning nil excludes the row from being dragged.

This method is required for multi-image dragging.
If this method is implemented, then writeRowsWithIndexes will not be called.

This is pasteboardWriterForRow method.

### 35.34.56 RightMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the view that the user has pressed the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.57 RightMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the right button pressed .
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.58 RightMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.34.59 rowActionsForRow(row as Integer, edge as Integer) as NSTableViewRowActionMBS()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the control to provide an array of row actions to be attached to the specified edge of a table row and displayed when the user swipes horizontally across the row.
**Notes:** row: The index of the target row.
edge: The edge (NSTableRowActionEdgeLeading or NSTableRowActionEdgeTrailing) for which row actions are requested. This is based on the direction in which the user swiped on the row. Swiping to the right results in an edge value of leading. Swiping to the left results in an edge value of trailing.

Returns an array of row actions (of class NSTableViewRowActionMBS) to be enabled on the specified edge of the table row.

Implement this method if your table row supports actions that are displayed when the user swipes horizontally across the row. For example, your table view could use this method to implement a swipe left to delete function in your table rows. When called, this method receives the table view, the index of the row

the user swiped, and an edge of type NSTableRowActionEdge. The method should return an array of any row actions of class NSTableViewRowAction that are supported for the specified edge. If no row actions are available, an empty array should be returned.
If this method isn,Äôt implemented, then the table row displays no actions when the user swipes horizontally away from the specified edge.

### 35.34.60 rowViewForRow(row as Integer) as NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row.
**Notes:** row: The row index.

Return an instance or subclass of NSTableRowView. If nil is returned, an NSTableRowView instance will be created and used.

You can implement this event to return a custom NSTableRowView for row.
The reuse queue can be used in the same way as documented in tableView:view:row:. The returned view will have attributes properly set to it before it,Äôs added to the tableView.

This method is only valid for NSView-based table views.

### 35.34.61 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.34.62 SelectionDidChange(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection has changed.

### 35.34.63 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the proposed selection.
**Notes:** proposedSelectionIndexes: An index set containing the indexes of the proposed selection.

Return an NSIndexSet instance containing the indexes of the new selection. Return proposedSelectionIndexes if the proposed selection is acceptable, or the value of the table view's existing selection to avoid changing the selection.

This method may be called multiple times with one new index added to the existing selection to find out if a particular index can be selected when the user is extending the selection with the keyboard or mouse.

Implementation of this method is optional. If implemented, this method will be called instead of shouldSelectRow.
Available in Mac OS X v10.5 and later.

### 35.34.64 SelectionIsChanging(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection is in the process of changing (typically because the user is dragging the mouse across a number of rows).

### 35.34.65 selectionShouldChangeInTableView as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns whether the selection should change.
**Notes:** Return true to allow the table view to change its selection (typically a row being edited), false to deny selection change.

The user can select and edit different cells within the same row, but can't select another row unless the delegate approves. The subclass can implement this method for complex validation of edited rows based on the values of any of their cells.

### 35.34.66 setObjectValue(value as Variant, column as NSTableColumnMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a cell value is saved to the datasource.

### 35.34.67 shouldEditTableColumn(tableColumn as NSTableColumnMBS, row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns whether the cell at the specified row and column can be edited.
**Notes:** TableColumn: The table column.
rowIndex: The row index.
Return true to allow editing the cell, false to deny editing.

The subclass can implement this method to disallow editing of specific cells.
Note: This method is only valid for cell-based table views.

### 35.34.68 shouldReorderColumn(columnIndex as Int64, newColumnIndex as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent to the subclass to allow or prohibit the specified column to be dragged to a new location.
**Notes:** columnIndex: The index of the column being dragged.
newColumnIndex: The proposed target index of the column.

Return true if the column reordering should be allowed, otherwise false.

When a column is initially dragged by the user, the delegate is first called with a newColumnIndex value of -1. Returning false will disallow that column from being reordered at all. Returning true allows it to be reordered, and the delegate will be called again when the column reaches a new location.

The actual NSTableColumn instance can be retrieved from the tableColumns array.

If this method is not implemented, all columns are considered reorderable.
Available in Mac OS X v10.6 and later.

### 35.34.69 shouldSelectRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns whether the table view should allow selection of the specified row.
**Notes:** rowIndex: The row index.

Return true to permit selection of the row, false to deny selection.

The delegate can implement this method to disallow selection of particular rows.
For better performance and finer-grain control over the selection, use selectionIndexesForProposedSelection.

### 35.34.70 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns whether the specified table column can be selected.
**Notes:** TableColumn: The table column.

Return true to permit selection, otherwise false.

The subclass can implement this event to disallow selection of particular columns.

### 35.34.71 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control cell expansion for a specific row and column.
**Notes:** TableColumn: The table column.
row: The row index.

Return true if the tooltip cell should expand, false otherwise.

Cell expansion can occur when the mouse hovers over the specified cell and the cell contents are unable to be fully displayed within the cell. If this method returns true, the full cell contents will be shown in a special floating tool tip view, otherwise the content is truncated.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.34.72 shouldTrackCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control the tracking behavior for a specific cell.
**Notes:** cell: The cell to track.
tableColumn: The table column.
row: A row in tableView.

Returns true if the cell should track, false otherwise.

Normally, only selectable or selected cells can be tracked. If you implement this method, cells which are not selectable or selected can be tracked, and vice-versa.

For example, this allows you to have an NSButtonCell in a table which does not change the selection, but can still be clicked on and tracked.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.34.73 shouldTypeSelectForEvent(e as NSEventMBS, searchString as string) as Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control type select for a specific event.
**Notes:** event: The event.
searchString: The search string or nil if no type select has began.

Return true to allow type select for event, false otherwise.

Typically, this is called from the table view keyDown implementation and the event will be a key event.
Available in Mac OS X v10.5 and later.

### 35.34.74 sizeToFitWidthOfColumn(column as Int64) as Double

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide custom sizing behavior when a column's resize divider is double clicked.
**Notes:** column: The index of the column.

Returns the width of the specified column.

By default, NSTableView iterates every row in the table, accesses a cell via preparedCellAtColumn, and requests the cellSize to find the appropriate largest width to use.

For accurate results and performance, it is recommended that this method is implemented when using large tables. By default, large tables use a monte carlo simulation instead of iterating every row.

Available in Mac OS X v10.6 and later.

### 35.34.75 sortDescriptorsDidChange(oldDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called by TableView to indicate that sorting may need to be done.
**Notes:** The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source doesn,Äôt manage them itself, you can get the current sort descriptors by calling TableView.sortDescriptors function.

### 35.34.76 textShouldBeginEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow.

### 35.34.77 textShouldEndEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow.

### 35.34.78 toolTipForCell(cell as NSCellMBS, r as NSRectMBS, tableColumn as NSTableColumnMBS, row as Int64, mouseLocation as NSPointMBS) as string

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a string that is displayed as a tooltip for the specified cell in the column and row.
**Notes:** Cell: The cell.
r: The proposed active area of the tooltip. You can modify rect to provide an alternative active area.
TableColumn: The table column.
row: The row index.
mouseLocation: The mouse location.

Return a string containing the tooltip. Return empty string if no tooltip is desired.

By default, rect is computed as cell.drawingRectForBounds(cellFrame).
Available in Mac OS X v10.4 and later.

### 35.34.79 typeSelectString(tableColumn as NSTableColumnMBS, row as Int64) as string

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide an alternate text value used for type selection for a specified row and column.
**Notes:** tableColumn: The table column.
row: The row index.

Returns a string that is used in type select comparison for row and tableColumn. Return "" if the row or tableColumn should not be searched.

Implement this method to change the string value that is searched for based on what is displayed. By default, all cells with text in them are searched.

If this event is not implemented the string value is the cell string value.
Implementation of this event is optional.

Available in Mac OS X v10.5 and later.

### 35.34.80 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this method to allow the table to update dragging items as they are dragged over a view.
**Notes:** The dragging information.

Required for multi-image dragging. Typically this will involve invoking enumerateDraggingItemsWithOptions on the draggingInfo parameter value and setting the draggingItem object,Äôs imageComponentsProvider to a proper image based on the content.
For view-based table views, you can use the NSTableCellView method draggingImageComponents. For cell-based tables, use the NSCell method draggingImageComponentsWithFrame.

### 35.34.81 validateDrop(info as NSDraggingInfoMBS, proposedRow as Integer, dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Used by aTableView to determine a valid drop target.
**Notes:** info: An object that contains more information about this dragging operation.
row: The index of the proposed target row.
operation: The type of dragging operation proposed.

Returns the dragging operation the data source will perform.

The data source may retarget a drop by calling setDropRow and returning something other than NSDragOperationNone. A data source might retarget for various reasons, such as to provide better visual feedback when inserting into a sorted position.
To propose a drop on the second row, row would be 2 and operation would be NSTableViewDropOn. To propose a drop below the last row, row would be TableView.numberOfRows and operation would be NSTableViewDropAbove.

### 35.34.82 view(tableColumn as NSTableColumnMBS, row as Integer) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row and column.
**Notes:** see also
https://developer.apple.com/reference/appkit/nstableviewdelegate/1527449-tableview?language=objc
See also:

- 35.34.15 View as NSTableViewMBS 6803

### 35.34.83 willDisplayCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the tableview will display the specified cell at the row in the column.
**Notes:** Cell: The cell to be displayed.
TableColumn: The table column.
row: The row index.

The event can modify the display attributes of cell to alter the appearance of the cell.

Because cell is reused for every row in tableColumn, the event must set the display attributes both when drawing special cells and when drawing normal cells.

Note: The implementation of this method must not draw portions of the cell. It should only alter the state of the passed in cell.

### 35.34.84 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.34.85 willTile

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The tableview will tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.34.86 writeRowsWithIndexes(rowIndexes as NSIndexSetMBS, pboard as NSPasteboardMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drag operation is allowed.
**Notes:** rowIndexes: An index set of row numbers that will be participating in the drag.

pboard: The pasteboard to which to write the drag data.

Returns true if the drag operation is allowed, false otherwise.

Called by TableView after it has been determined that a drag should begin, but before the drag has been started.
To refuse the drag, return false. To start a drag, return true and place the drag data onto pboard (data, owner, and so on). The drag image and other drag-related information will be set up and provided by the table view once this call returns with true.

## 35.35 control DesktopNSTextFieldControlMBS

### 35.35.1 control DesktopNSTextFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSTextField.
**Notes:** This control embeds a special NSTextField subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 35.35.2 Properties

### 35.35.3 View as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.35.4 Events

### 35.35.5 Action

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** The text changed.

### 35.35.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.35.7 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.35.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.35.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.35.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.35.11 FocusLost

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.35.12 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.35.13 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.35.14 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.35.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.35.16 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.35.17 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.35.18 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.35.19 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.35.20 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.35.21 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.35.22 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.35.23 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.35.24 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.35.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.36 control DesktopNSTextViewControlMBS

### 35.36.1 control DesktopNSTextViewControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSTextView.
**Notes:** This control embeds a special NSTextView subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 16.5pr6
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 35.36.2 Properties

### 35.36.3 AcceptTabs as Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.36.4 Scrollview as Variant

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview for this textview.
**Notes:** (Read only property)

### 35.36.5 View as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.36.6 Events

### 35.36.7 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.36.8 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.36.9 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.36.10 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.36.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.36.12 FocusLost

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.36.13 FocusReceived

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.36.14 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.36.15 MenuBarSelected

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.36.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.36.17 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.36.18 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.36.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.36.20 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.36.21 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a text view needs to determine if text in a specified range should be changed.
**Notes:** affectedCharRange: The range of characters to be replaced.
replacementString: The characters that will replace the characters in affectedCharRange; nil if only text attributes are being changed.

Return true to allow the replacement, or false to reject the change.

### 35.36.22 textDidBeginEditing

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has begun editing (that the user has begun changing it).

### 35.36.23 textDidChange

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has changed its characters or formatting attributes.

### 35.36.24 textDidEndEditing

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs you that the text object has finished editing (that it has resigned first responder status).

### 35.36.25 textShouldBeginEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a text object begins to change its text, this method requests permission to begin editing.
**Notes:** If the delegate returns false, the text object proceeds to make changes. If the delegate returns true, the text object abandons the editing operation. This method is also invoked when the user drags and drops a file onto the text object.

### 35.36.26 textShouldEndEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked from a text object's implementation of resignFirstResponder, this method requests permission to end editing.
**Notes:** If the delegate returns false, the text object proceeds to finish editing and resign first responder status. If the delegate returns true, the text object selects all of its text and remains the first responder.

### 35.36.27 textViewDidChangeSelection

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the selection changes in the text view.

### 35.36.28 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.37 control DesktopNSTokenFieldControlMBS

## 35.37.1 control DesktopNSTokenFieldControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSTokenField.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.4pr1
- MBS Xojo Plugins, version 21.1pr2

## 35.37.2 Properties

## 35.37.3 View as NSTokenFieldMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used for the control.
**Notes:** (Read only property)

## 35.37.4 Events

## 35.37.5 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

## 35.37.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.37.7 completionsForSubstring(substring as string, tokenIndex as Integer, byref selectedIndex as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide an array of appropriate completions for the contents of the receiver.
**Notes:** substring: The partial string that is to be completed.
tokenIndex: The index of the token being edited.
selectedIndex: Optionally, you can return by-reference an index into the returned array that specifies which of the completions should be initially selected. If none are to be selected, return by reference -1.

Returns an array of strings that are possible completions.

If the delegate does not implement this method, no completions are provided.
Available in OS X v10.4 and later.

### 35.37.8 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.37.9 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.37.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.37.11 displayStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be displayed as a proxy for the given represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the string to be used as a proxy for representedObject. If you return nil or do not implement this method, then representedObject is displayed as the string.

### 35.37.12 editingStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be edited as a proxy for a represented object.
**Notes:** representedObject: A represented object of the token field.

Returns a string that's an editable proxy of the represented object, or nil if the token should not be editable.

### 35.37.13 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.37.14 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.37.15 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.37.16 hasMenuForRepresentedObject(representedObject as Variant) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify whether the given represented object provides a menu.
**Notes:** representedObject: A represented object of the token field.

Returns true if the represented object has a menu, false otherwise.
By default tokens in a token field have no menus.

### 35.37.17 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.37.18 menuForRepresentedObject(representedObject as Variant) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a menu for the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the menu associated with the represented object.
By default tokens in a token field do not return menus.

### 35.37.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.37.20 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.37.21 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.37.22 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.37.23 readFromPasteboard(pboard as NSPasteboardMBS) as Variant()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to return an array of objects representing the data read from the specified pasteboard.
**Notes:** pboard: The pasteboard from which to read the represented objects.

Returns an array of represented objects created from the pasteboard data.

### 35.37.24 representedObjectForEditingString(editingString as string) as Variant

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a represented object for the given editing string.
**Notes:** editingString: The edited string representation of a represented object.

Returns a represented object that is displayed rather than the editing string.

Note: In OS X v10.4, NSTokenField trims whitespace around tokens but it does not trim whitespace in OS X versions 10.5.0 and 10.5.1. In OS X v10.5.2, you get whitespace-trimming behavior by either linking against the v10.4 binary or linking against the v10.5 binary and not implementing the this method. If you do not want the whitespace-trimming behavior, link against the v10.5 binary and implement this method, returning the editing string if you have no represented object.

### 35.37.25 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.37.26 shouldAddObjects(tokens() as Variant, index as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows to validate the tokens to be added to the receiver at a particular location.
**Notes:** tokens: An array of tokens to be inserted in the receiver at index.
index: The index of the receiver in which the array of tokens to be validated (tokens) will be inserted.

Returns an array of validated tokens.

The event can return the array unchanged or return a modified array of tokens. To reject the add completely, return an empty array. Returning nil causes an error.

### 35.37.27 styleForRepresentedObject(representedObject as Variant) as Integer

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Allows the delegate to return the token style for editing the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the style that should be used to display the representedObject. Possible values are shown in NSTokenStyle Values.

If the event implements this method and returns an NSTokenStyle that differs from the style set by setTokenStyle:, the value the event returns is preferred.

If you don't implement this method, the token field's tokenStyle is used.

### 35.37.28 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

See TextDidEndEditing for an explanation of why you may not always get one invocation of TextDidBeginEditing for each invocation of TextDidEndEditing.

### 35.37.29 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.37.30 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

Warning: In some cases, such as when editing within an instance of NSOutlineView, this method may be invoked without a previous invocation of TextDidBeginEditing. You will only get the TextDidBeginEditing: notification if the user actually types something, but you can get the TextDidEndEditing notification if the user just double-clicks the field and then clicks outside the field, without typing.

### 35.37.31 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.37.32 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.37.33 tokenFieldAction

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** For a button if it was pressed.

### 35.37.34 tokenFieldTextShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing.

### 35.37.35 tokenFieldTextShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow text editing.

### 35.37.36 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.37.37 writeRepresentedObjects(objects() as Variant, pboard as NSPasteboardMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sent so the delegate can write represented objects to the pasteboard corresponding to a given array of display strings.
**Notes:** objects: An array of represented objects associated with the token field.
pboard: The pasteboard to which to write the represented objects.

Return true if you writes the represented objects to the pasteboard, false otherwise. If false, the token field writes the display strings to the NSStringPboardType pasteboard.

## 35.38 class DesktopPopupMenu

### 35.38.1 class DesktopPopupMenu

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Gives access to the NSMenuMBS of the PopupMenu.

### 35.38.2 Methods

### 35.38.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox PopupMenu1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

### 35.38.4 NSPopUpButtonMBS as NSPopUpButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSPopUpButtonMBS object for the given control.
**Example:**

```
// get cocoa view for the popupmenu
dim p as NSPopUpButtonMBS = PopupMenu1.NSPopUpButtonMBS

// find a menu entry
dim it as NSMenuItemMBS = p.itemAtIndex(0)

// get a picture
dim pic as Picture = LogoMBS(500)
dim img as new NSImageMBS(pic)
img.setSize 16,16

// and assign icon
it.image = img
```

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.39 class DesktopProgressWheel

### 35.39.1 class DesktopProgressWheel

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in ProgressWheel class in Xojo.

### 35.39.2 Methods

### 35.39.3 NSProgressIndicatorMBS as NSProgressIndicatorMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSProgressIndicatorMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.40 class DesktopRadioButton

### 35.40.1 class DesktopRadioButton

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.40.2 Methods

### 35.40.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox RadioButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

# 35.41 class DesktopRadioGroup

## 35.41.1 class DesktopRadioGroup

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

## 35.41.2 Methods

## 35.41.3 NSButtonsMBS as NSButtonMBS()

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries the buttons within a radio button group.
**Example:**

```
Dim buttons() As NSButtonMBS = RadioGroup1.NSButtonsMBS

For Each button As NSButtonMBS In buttons
button.alphaValue = 0.5 // half transparent
Next

Break
```

## 35.42 class DesktopScrollBar

### 35.42.1 class DesktopScrollBar

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in Scrollbar class in Xojo.

### 35.42.2 Methods

### 35.42.3 NSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSScrollerMBS object for the given control.
**Example:**

MsgBox ScrollBar1.NSScrollerMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.43 class DesktopSearchField

### 35.43.1 class DesktopSearchField

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built-in search field control in Xojo.
**Notes:** Only for Xojo 2020r2 or newer.

### 35.43.2 Methods

### 35.43.3 NSSearchFieldMBS as NSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries search field object for the control.
**Notes:** Only for Xojo 2021r3 or newer.

## 35.44 class DesktopSegmentedButton

### 35.44.1 class DesktopSegmentedButton

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Build in Segmented Control class in Xojo.

### 35.44.2 Methods

### 35.44.3 NSSegmentedControlMBS as NSSegmentedControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSSegmentedControlMBS object for the given control.
**Example:**

SegmentedControl1.NSSegmentedControlMBS.selectedSegment = 0

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.45 class DesktopSeparator

### 35.45.1 class DesktopSeparator

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in Separator class in Xojo.

### 35.45.2 Methods

### 35.45.3 NSBoxMBS as NSBoxMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.46 class DesktopSlider

### 35.46.1 class DesktopSlider

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The built in slider class in Xojo.

### 35.46.2 Methods

### 35.46.3 NSSliderMBS as NSSliderMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSSliderMBS object for the given control.
**Example:**

MsgBox Slider1.NSSliderMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.47 class DesktopTabPanel

### 35.47.1 class DesktopTabPanel

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Extends the TabPanel control inside Xojo.

### 35.47.2 Methods

### 35.47.3 NSTabViewMBS as NSTabViewMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTabViewMBS object for the given control.
**Example:**

MsgBox TabPanel1.NSTabViewMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.48 class DesktopTextArea

### 35.48.1 class DesktopTextArea

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in textarea class in Xojo.
**Example:**

```
// make a PDF from a textarea in Cocoa Xojo target:

// find view
dim n as NSViewMBS = TextArea1.NSViewMBS
if n = nil then
MsgBox "Only in Cocoa!"
Return
end if

// make pdf data
dim s as string = n.dataWithPDFInsideRect(0,0,n.frame.Width, n.frame.Height)

// save
dim f as FolderItem = GetSaveFolderItem("", "test.pdf")

if f<>Nil then

dim b as BinaryStream = BinaryStream.Create(f, true)

b.Write s

end if
```

**Notes:** Requires Xojo 2021r3 or newer.

### 35.48.2 Methods

### 35.48.3 NSScrollViewMBS as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSScrollViewMBS object for the given control.
**Example:**

```
MsgBox TextArea1.NSScrollViewMBS.className
```

**Notes:** This way you can manipulate Cocoa controls directly.

### 35.48.4 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Xojo uses a NSTextField for text areas without style and without multiline.

### 35.48.5 NSTextViewMBS as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextViewMBS object for the given control.
**Example:**

```
// load rtfd file into textarea
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
dim n as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithPath(file)
dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
t.textStorage.setAttributedString(n)
```

**Notes:** This way you can manipulate Cocoa controls directly.
Xojo uses a NSTextField for text areas without style and without multiline.

### 35.48.6 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Example:**

```
// called im a thread:
TextArea1.SetTextThreadSafeMBS "Hello World"
```

**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 35.48.7 WinInsertImageMBS(data as string, Width as Integer, Height as Integer)

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Inserts image to file.
**Example:**

```
Dim pic As Picture = LogoMBS(500)
Dim data As String = pic.GetData(pic.SaveAsJPEG)

call TextArea1.WinInsertImageMBS(data, 500, 500)
```

**Notes:** Specify size in pixels and image data.
Image data works with JPEG and other data types.
Requires Windows 8 or newer.

### 35.48.8 WinShowFontPanelMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Shows font dialog.
**Example:**

```
If TextArea1.WinShowFontPanelMBS Then
// update controls as font may have been changed?

End If
```

**Notes:** You can make changes and apply them with OK button.
Returns true when OK is selected.

### 35.48.9 Properties

### 35.48.10 RTFDataMBS as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the textview content as RTF data.
**Example:**

```
dim rtf as MemoryBlock = TextArea1.RTFDataMBS
TextArea2.RTFDataMBS = rtf
```

**Notes:** Works only for Cocoa and uses RTF parser/generator from Apple.

See also RTFDataMBS in StyledText, WinRTFDataMBS in TextArea and DesktopTextArea controls and RTFData in NSTextViewMBS class.
(Read and Write computed property)

### 35.48.11 WinAutoCorrectionMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Enables auto correction for Textarea.
**Example:**

```
#If TargetWindows Then
TextArea1.WinAutoCorrectionMBS = True
#ElseIf TargetMacOS Then
TextArea1.NSTextViewMBS.AutomaticSpellingCorrectionEnabled = True
#EndIf
```

**Notes:** Only for Windows 8 and newer.
Uses current language from user.

See AutomaticSpellingCorrectionEnabled and ContinuousSpellCheckingEnabled properties in NSTextViewMBS for MacOS.
(Read and Write computed property)

### 35.48.12 WinAutoHorizontalScrollMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether to auto scroll horizontally.
**Notes:** Automatically scrolls text to the right by 10 characters when the user types a character at the end of the line. When the user presses the ENTER key, the control scrolls all text back to position zero.

This property controls an option of the RichEdit control used by Xojo for the Textarea control on Windows.
(Read and Write computed property)

### 35.48.13 WinAutoVerticalScrollMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether to auto scroll vertically.
**Notes:** Automatically scrolls text up one page when the user presses the ENTER key on the last line.

This property controls an option of the RichEdit control used by Xojo for the Textarea control on Windows.
(Read and Write computed property)

### 35.48.14 WinRTFDataMBS(SelectionOnly as boolean = false) as string

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Get or set the RTF data for the text area.
**Example:**

```
Dim rtfData As String

#If TargetWindows Then
rtfData = TextArea1.WinRTFDataMBS
#ElseIf TargetMacOS Then
rtfData = TextArea1.RTFDataMBS
#EndIf
```

**Notes:** Including images and probably faster as StyledText.RTFData.
(Read and Write computed property)

### 35.48.15 WinSelHasTextBackColorMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether a custom background color is in used for the selection.
**Example:**

textArea1.WinSelHasTextBackColorMBS = false

**Notes:** If false, standard background color is used.
(Read and Write computed property)

### 35.48.16 WinSelHasTextColorMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether a custom text color is in used for the selection.
**Example:**

textArea1.WinSelHasTextColorMBS = false

**Notes:** If false, standard text color is used.
(Read and Write computed property)

### 35.48.17 WinSelStrikeThroughMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Get or set StrikeThrough text style.
**Example:**

TextArea1.WinSelStrikeThroughMBS = True

**Notes:** See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.48.18 WinSelSubScriptMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Get or set subscript text style.
**Example:**

TextArea1.WinSelSubScriptMBS = True

**Notes:** Subscript text has a lower base line and is smaller.
See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.48.19 WinSelSuperScriptMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Get or set superscript text style.
**Example:**

TextArea1.WinSelSuperScriptMBS = True

**Notes:** Superscript text has a higher base line and is smaller.
See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.48.20 WinSelTextBackColorMBS as Color

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The current background text color.
**Example:**

textArea1.WinSelTextBackColorMBS = &cFF0000

**Notes:** If set also sets WinSelHasTextBackColorMBS to true internally.
(Read and Write computed property)

### 35.48.21 WinSelTextColorMBS as Color

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The current foreground text color.
**Example:**

textArea1.WinSelTextColorMBS = &cFF0000

**Notes:** If set also sets WinSelHasTextColorMBS to true internally.

(Read and Write computed property)

### 35.48.22 WinSpellcheckingMBS as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Enables spellchecking for Textarea.
**Example:**

```
#If TargetWindows Then
TextArea1.WinSpellcheckingMBS = True
#ElseIf TargetMacOS Then
TextArea1.NSTextViewMBS.continuousSpellCheckingEnabled = True
#EndIf
```

**Notes:** Only for Windows 8 and newer.
Uses current language from user.

See AutomaticSpellingCorrectionEnabled and ContinuousSpellCheckingEnabled properties in NSTextViewMBS for MacOS.
(Read and Write computed property)

## 35.49 class DesktopUpDownArrows

### 35.49.1 class DesktopUpDownArrows

Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The build in control class in Xojo.

### 35.49.2 Methods

### 35.49.3 NSStepperMBS as NSStepperMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSStepperMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.50 class DisclosureTriangle

### 35.50.1 class DisclosureTriangle

Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** The built in DisclosureTriangle class in Xojo.

### 35.50.2 Methods

### 35.50.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox DisclosureTriangle1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.51 class Groupbox

### 35.51.1 class Groupbox

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in Groupbox class in Xojo.

### 35.51.2 Methods

### 35.51.3 NSBoxMBS as NSBoxMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.52 class ImageWell

### 35.52.1 class ImageWell

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in ImageWell class in Xojo.

### 35.52.2 Methods

### 35.52.3 NSImageViewMBS as NSImageViewMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSImageViewMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

## 35.53 class KeyValueCodingMBS

### 35.53.1 class KeyValueCodingMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for key value coding and using NSSortDescriptor class.
**Notes:** Events are only raised if called on main thread to avoid threading trouble.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr3

### 35.53.2 Methods

### 35.53.3 Constructor

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 35.53.4 sortedArrayUsingDescriptor(values() as KeyValueCodingMBS, sortDescriptor as NSSortDescriptorMBS) as KeyValueCodingMBS()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a copy of the receiving array sorted as specified by a given a sort descriptor.
**Notes:** sortDescriptor: The NSSortDescriptor objects.

Returns a copy of the receiving array sorted as specified by sortDescriptor.

### 35.53.5 sortedArrayUsingDescriptors(values() as KeyValueCodingMBS, sortDescriptor() as NSSortDescriptorMBS) as KeyValueCodingMBS()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a copy of the receiving array sorted as specified by a given array of sort descriptors.
**Notes:** sortDescriptors: An array of NSSortDescriptor objects.

Returns a copy of the receiving array sorted as specified by sortDescriptors.

The first descriptor specifies the primary key path to be used in sorting the receiving array,Äôs contents. Any subsequent descriptors are used to further refine sorting of objects with duplicate values. See NSSortDescriptor for additional information.

### 35.53.6 Properties

### 35.53.7 Description as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The description text property.
**Notes:** (Read only property)
See also:

- 35.53.12 Description as String 6872

### 35.53.8 Handle as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 35.53.9 Tag as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The tag value.
**Notes:** Store anything you need, e.g. a dictionary.
(Read and Write property)

### 35.53.10 valueForKey(key as String) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Get/set the value for the property identified by a given key.
**Notes:** key: The name of one of the receiver's properties.
(Read and Write computed property)
See also:

- 35.53.15 valueForKey(key as string) as Variant 6872

### 35.53.11 Events

### 35.53.12 Description as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event when system queries description for object.
See also:

- 35.53.7 Description as String 6871

### 35.53.13 setValueForKey(key as string, value as Variant)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Sets the property of the receiver specified by a given key to a given value.
**Notes:** value: The value for the property identified by key.
key: The name of one of the receiver's properties.

If key identifies a to-one relationship, relate the object specified by value to the receiver, unrelating the previously related object if there was one. Given a collection object and a key that identifies a to-many relationship, relate the objects contained in the collection to the receiver, unrelating previously related objects if there were any.
The search pattern that setValueForKey uses is described in Accessor Search Patterns in Key-Value Coding Programming Guide.
In a reference-counted environment, if the instance variable is accessed directly, value is retained.

### 35.53.14 setValueForUndefinedKey(key as string, value as Variant)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by setValueForKey when it finds no property for a given key.
**Notes:** value: The value for the key identified by key.
key: A string that is not equal to the name of any of the receiver's properties.

Subclasses can override this method to handle the request in some other way. The default implementation raises an NSUndefinedKeyException.

### 35.53.15 valueForKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Return the value for the property identified by a given key.
**Notes:** key: The name of one of the receiver's properties.

Returns the value for the property identified by key.

If event is not implemented, the search pattern that valueForKey uses to find the correct value to return is described in Accessor Search Patterns in Key-Value Coding Programming Guide.
See also:

- 35.53.10 valueForKey(key as String) as Variant 6871

### 35.53.16 valueForUndefinedKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by valueForKey when it finds no property corresponding to a given key.
**Notes:** key: A string that is not equal to the name of any of the receiver's properties.

Subclasses can override this method to return an alternate value for undefined keys. The default implementation raises an NSUndefinedKeyException.

## 35.54 class NSActionCellMBS

### 35.54.1 class NSActionCellMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** An NSActionCell defines an active area inside a control (an instance of NSControl or one of its subclasses).
**Notes:** As an NSControl's active area, an NSActionCell does three things: it usually performs display of text or an icon; it provides the NSControl with a target and an action; and it handles mouse (cursor) tracking by properly highlighting its area and sending action messages to its target based on cursor movement.
Subclass of the NSCellMBS class.
**Blog Entries**

- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

### 35.54.2 Methods

### 35.54.3 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with an image.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim n as NSImageMBS = new NSImageMBS(pic)
dim c as new NSActionCellMBS(n)

Backdrop = c.image.CopyPictureWithMask
Title = c.classPath
```

See also:

- 35.54.4 Constructor(text as string) 6874

### 35.54.4 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.
**Example:**

```
dim c as new NSActionCellMBS("Hello")
MsgBox c.StringValue
```

See also:

- 35.54.3 Constructor(image as NSImageMBS) 6874

## 35.55 class NSBoxMBS

### 35.55.1 class NSBoxMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The NSBox class implements simple views that can title themselves and draw a border around their content.
**Notes:** These objects are known as boxes. You can use box to group, visually, some number of other views.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr5

### 35.55.2 Methods

### 35.55.3 borderRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle in which the receiver's border is drawn.
**Notes:** The rectangle in which the border of the NSBox is drawn.

### 35.55.4 Constructor

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new NSBoxMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.55.5 Constructor(Handle as Integer) 6877
- 35.55.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6877

### 35.55.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new NSBoxMBS(0, 0, 100, 100)
dim v as new NSBoxMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSBox and the plugin retains this handle.
See also:


- 35.55.4 Constructor 6876
- 35.55.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6877


### 35.55.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new NSBoxMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.55.4 Constructor 6876
- 35.55.5 Constructor(Handle as Integer) 6877


### 35.55.7 setFrameFromContentFrame(contentFrame as NSRectMBS)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Places the receiver so its content view lies on the specified frame.
**Notes:** contentFrame: The rectangle specifying the frame of the box's content view, reckoned in the coor-

dinate system of the box's superview. The box is marked for redisplay.

### 35.55.8 setTitleWithMnemonic(stringWithAmpersand as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the title of the receiver with a character denoted as an access key.
**Notes:** Mnemonics are not supported in Mac OS X.

By default, a box's title is "Title." The content view is not automatically resized, and the box is not marked for redisplay.

### 35.55.9 sizeToFit

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Resizes and moves the receiver's content view so it just encloses its subviews.
**Example:**

```
dim n as new NSProgressIndicatorMBS
n.sizeToFit

MsgBox n.frame.String
```

**Notes:** The receiver is then moved and resized to wrap around the content view. The receiver's width is constrained so its title will be fully displayed.

You should invoke this method after:

- Adding a subview (to the content view)
- Altering the size or location of such a subview
- Setting the margins around the content view

The mechanism by which the content view is moved and resized depends on whether the object responds to its own sizeToFit message: If it does respond, then that message is sent, and the content view is expected to be so modified. If the content view doesn't respond, the box moves and resizes the content view itself.

### 35.55.10 titleCell as NSCellMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the cell used to display the receiver's title.

### 35.55.11 titleRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle in which the receiver's title is drawn.
**Notes:** The rectangle in which the title is drawn.

### 35.55.12 Properties

### 35.55.13 borderColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the color of the receiver's border when the receiver is a custom box with a simple line border.
**Notes:** The receiver's border color. It must be a custom box—that is, it has a type of NSBoxCustom—and it must have a border style of NSLineBorder.

Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.55.14 borderType as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The border type to aType, which must be a valid border type.
**Notes:** A constant describing the type of border. Border types are defined in NSView.h. Currently, the following border types are defined: NSNoBorder, NSLineBorder, NSBezelBorder, NSGrooveBorder.

If the size of the new border is different from that of the old border, the content view is resized to absorb the difference, and the box is marked for redisplay.
(Read and Write computed property)

### 35.55.15 borderWidth as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The border width.
**Notes:** Functional only when the receiver's box type (boxType) is NSBoxCustom and its border type (borderType) is NSLineBorder.

Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.55.16 boxType as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The box type.
**Notes:** Use the NSBox* constants.
(Read and Write computed property)

### 35.55.17 contentView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's content view.
**Notes:** On settings the NSView object is resized to fit within the box's current content area and the box is marked for redisplay.
(Read and Write computed property)

### 35.55.18 contentViewMargins as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The horizontal and vertical distance between the border of the receiver and its content view.
**Notes:** Value: The width and height of the offset between the box's border and content view. The horizontal value is applied (reckoned in the box's coordinate system) fully and equally to the left and right sides of the box. The vertical value is similarly applied to the top and bottom.

Unlike changing a box's other attributes, such as its title position or border type, changing the offsets doesn't automatically resize the content view. In general, you should send a sizeToFit message to the box after changing the size of its offsets. This message causes the content view to remain unchanged while the box is sized to fit around it.

(Read and Write computed property)

### 35.55.19 cornerRadius as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The corner radius for the box.
**Notes:** Functional only when the receiver's box type (boxType) is NSBoxCustom and its border type (borderType) is NSLineBorder.
(Read and Write computed property)

### 35.55.20 fillColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The color of the receiver's background when the receiver is a custom box with a simple line border.
**Notes:** The receiver's fill color. It must be a custom box—that is, it has a type of NSBoxCustom—and it must have a border style of NSLineBorder.
Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.55.21 title as string

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The title for the box.
**Notes:** By default, a box's title is "Title."
(Read and Write computed property)

### 35.55.22 titleFont as NSFontMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The font object used to draw the receiver's title.
**Notes:** By default, the title is drawn using the small system font (obtained using (smallSystemFontSize as the parameter of systemFontOfSize:, both NSFont class methods). If the size of the new font is different from that of the old font, the content view is resized to absorb the difference.
(Read and Write computed property)

### 35.55.23 titlePosition as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The position of the box's title.
**Notes:** If the new title position changes the size of the box's border area, the content view is resized to absorb the difference, and the box is marked as needing redisplay.

Use this constants: NSNoTitle, NSAboveTop, NSAtTop, NSBelowTop, NSAboveBottom, NSAtBottom and NSBelowBottom.
(Read and Write computed property)

### 35.55.24 Transparent as Boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver is transparent.
**Notes:** True makes the receiver transparent.
False makes the receiver opaque.
(Read and Write computed property)

### 35.55.25 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAboveBottom | 4 | One of the constants for the title position.<br>Title positioned above the box's bottom border. |
| NSAboveTop | 1 | One of the constants for the title position.<br>Title positioned above the box's top border. |
| NSAtBottom | 5 | One of the constants for the title position.<br>Title positioned within the box's bottom border. |
| NSAtTop | 2 | One of the constants for the title position.<br>Title positioned within the box's top border. |
| NSBelowBottom | 6 | One of the constants for the title position.<br>Title positioned below the box's bottom border. |
| NSBelowTop | 3 | One of the constants for the title position.<br>Title positioned below the box's top border. |
| NSBoxCustom | 4 | One of the constants and data type identifies box types, which, in conjunction with a box's border type, define the appearance of the box.<br>Specifies that the appearance of the box is determined entirely by the by box-configuration methods, without automatically applying Apple human interface guidelines. |
| NSBoxOldStyle | 3 | One of the constants and data type identifies box types, which, in conjunction with a box's border type, define the appearance of the box.<br>Specifies that the box is a Mac OS X v10.2–style box. |
| NSBoxPrimary | 0 | One of the constants and data type identifies box types, which, in conjunction with a box's border type, define the appearance of the box.<br>Specifies the primary box appearance. This is the default box type. |
| NSBoxSecondary | 1 | One of the constants and data type identifies box types, which, in conjunction with a box's border type, define the appearance of the box.<br>Specifies the secondary box appearance. |
| NSBoxSeparator | 2 | One of the constants and data type identifies box types, which, in conjunction with a box's border type, define the appearance of the box.<br>Specifies the secondary box appearance. |
| NSNoTitle | 0 | One of the constants for the title position.<br>The box has no title. |

## 35.56 class NSButtonCellMBS

### 35.56.1 class NSButtonCellMBS

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The NSButtonCell class is a subclass of NSActionCell used to implement the user interfaces of push buttons, checkboxes (switches), and radio buttons.
**Notes:** It can also be used for any other region of a view that's designed to send a message to a target when clicked. The NSButton subclass of NSControl uses a single NSButtonCell.

The NSButtonCell class implements the user interface of NSButton.

Setting the integer, float, double, or object value of an NSButtonCell object results in a call to setState with the value converted to integer. In the case of setObjectValue, nil is equivalent to 0, and a non-nil object that doesn't respond to intValue sets the state to 1. Otherwise, the state is set to the object's intValue. Similarly, querying the integer, float, double, or object value of an NSButtonCell returns the current state in the requested representation. In the case of objectValue, this is an NSNumber containing true for on, false for off, and integer value -1 for the mixed state.

For more information on the behavior of NSButtonCell, see the NSButton and NSMatrix class specifications, and Button Programming Topics.
Subclass of the NSActionCellMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr8
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr6

**Xojo Developer Magazine**

- 12.2, page 10: News

### 35.56.2 Methods

### 35.56.3 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with an image.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim n as NSImageMBS = new NSImageMBS(pic)
```

```
dim c as new NSButtonCellMBS(n)

Backdrop = c.image.CopyPictureWithMask
Title = c.classPath
```

See also:

- 35.56.4 Constructor(text as string) 6885

### 35.56.4 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.
**Example:**

```
dim c as new NSButtonCellMBS("Hello")
MsgBox c.StringValue
```

See also:

- 35.56.3 Constructor(image as NSImageMBS) 6884

### 35.56.5 Properties

### 35.56.6 alternateImage as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The image the button displays in its alternate state and, if necessary, redraws its contents.
**Notes:** Note that some button types don't display an alternate image.
(Read and Write property)

### 35.56.7 alternateTitle as String

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The title the button displays when it's in its alternate state.
**Notes:** Note that some button types don't display an alternate title.
(Read and Write property)

### 35.56.8 attributedAlternateTitle as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The string the button displays when it's in its alternate state to the given attributed string.
**Notes:** Note that some button types don't display an alternate title.

Graphics attributes that are set on the cell (backgroundColor, alignment, font, etc.) are overridden when corresponding properties are set for the attributed string.
(Read and Write property)

### 35.56.9 attributedTitle as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The string the button displays when it's in its normal state to the given attributed string and redraws the button.
**Notes:** The title is always shown on buttons that don't use their alternate contents when highlighting or displaying their alternate state.

Graphics attributes configured for the cell (backgroundColor, alignment, font, etc.) are overridden when corresponding properties are set for the attributed string.
(Read and Write property)

### 35.56.10 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The background color for the button.
**Notes:** (Read and Write property)

### 35.56.11 imageDimsWhenDisabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to dim image when button is disabled.
**Notes:** When disabled, the image and text of an NSButtonCell are normally dimmed with gray.
Radio buttons and switches use (imageDimsWhenDisabled = false) so only their text is dimmed.
(Read and Write property)

### 35.56.12 imagePosition as Integer

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The position of the receiver's image relative to its title.
**Notes:** (Read and Write property)

### 35.56.13 imageScaling as Integer

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The scale factor for the receiver's image.
**Notes:** Available in OS X v10.5 and later.
(Read and Write property)

### 35.56.14 showsBorderOnlyWhileMouseInside as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to show border only while mouse is inside.
**Notes:** (Read and Write property)

### 35.56.15 sound as Variant

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** The sound that's played when the user presses the receiver.
**Notes:** The sound is played during a mouse-down event, such as NSLeftMouseDown.
Value is a NSSoundMBS object.
(Read and Write property)

## 35.57 control NSButtonControlMBS

### 35.57.1 control NSButtonControlMBS

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSButton.
**Notes:** This control embeds a special NSButton subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.2pr6

### 35.57.2 Properties

### 35.57.3 AlternateTitle as String

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The title that the button displays when it's in its alternate state.
**Notes:** (Read and Write property)

### 35.57.4 BezelStyle as Integer

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The appearance of the border, if the view has one.
**Notes:** Use this constants:

(Read and Write property)

### 35.57.5 ButtonType as Integer

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The button type.
**Notes:** See also NSButtonMBS.ButtonType and the constants there like NSPushOnPushOffButton.
(Read and Write property)

| | |
|---|---|
| NSRoundedBezelStyle | = 1 |
| NSRegularSquareBezelStyle | = 2 |
| NSThickSquareBezelStyle | = 3 |
| NSThickerSquareBezelStyle | = 4 |
| NSDisclosureBezelStyle | = 5 |
| NSShadowlessSquareBezelStyle | = 6 |
| NSCircularBezelStyle | = 7 |
| NSTexturedSquareBezelStyle | = 8 |
| NSHelpButtonBezelStyle | = 9 |
| NSSmallSquareBezelStyle | = 10 |
| NSTexturedRoundedBezelStyle | = 11 |
| NSRoundRectBezelStyle | = 12 |
| NSRecessedBezelStyle | = 13 |
| NSRoundedDisclosureBezelStyle | = 14 |

### 35.57.6 Title as String

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The title displayed on the button when it's in its normal state.
**Notes:** (Read and Write property)

### 35.57.7 View as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.57.8 Events

### 35.57.9 Action

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The action event.

### 35.57.10 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.57.11 Close

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.57.12 Closing

Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.57.13 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.57.14 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.57.15 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.57.16 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.57.17 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.57.18 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.57.19 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.57.20 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.57.21 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.57.22 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.57.23 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.57.24 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.57.25 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.57.26 Open

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.57.27 Opening

Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.57.28 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.57.29 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.58 class NSButtonMBS

## 35.58.1 class NSButtonMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa class for a button control.
**Notes:** Subclass of the NSControlMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo / Real Studio Plugins, version 16.5pr5
- MBS Xojo / Real Studio Plugins, version 15.2pr3
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Geoff's Cocoa update

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

## 35.58.2 Methods

## 35.58.3 Constructor

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with size 100/100 and position 0/0
**Example:**

```
dim t as new NSButtonMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.58.4 Constructor(Handle as Integer) 6896
- 35.58.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6896
- 35.58.6 Constructor(Title as String, Image as NSImageMBS = nil, Type as Integer = 0) 6896

### 35.58.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSButton handle.
**Example:**

```
dim t as new NSButtonMBS(0, 0, 100, 100)
dim v as new NSButtonMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSButton and the plugin retains this handle.
See also:


- 35.58.3 Constructor 6895
- 35.58.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6896
- 35.58.6 Constructor(Title as String, Image as NSImageMBS = nil, Type as Integer = 0) 6896


### 35.58.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with the given size and position.
**Example:**

```
dim x as new NSButtonMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.58.3 Constructor 6895
- 35.58.4 Constructor(Handle as Integer) 6896
- 35.58.6 Constructor(Title as String, Image as NSImageMBS = nil, Type as Integer = 0) 6896


### 35.58.6 Constructor(Title as String, Image as NSImageMBS = nil, Type as Integer = 0)

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with default settings.
**Notes:** For macOS 10.12, we use the convenience functions from Apple.
For older systems, we use our own code.
Title is the title to use. Can be empty.
Image is the image to use. Can be nil.
Type is the type, e.g. NSMomentaryLightButton.
See also:


- 35.58.3 Constructor 6895
- 35.58.4 Constructor(Handle as Integer) 6896
- 35.58.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6896


### 35.58.7 setButtonType(buttonType as Integer)

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Sets how the button highlights while pressed and how it shows its state.
**Notes:** Use this constants:

| | |
|---|---|
| NSMomentaryLightButton | = 0 |
| NSPushOnPushOffButton | = 1 |
| NSToggleButton | = 2 |
| NSSwitchButton | = 3 |
| NSRadioButton | = 4 |
| NSMomentaryChangeButton | = 5 |
| NSOnOffButton | = 6 |
| NSMomentaryPushInButton | = 7 |

### 35.58.8 setNextState

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Sets the view to its next state.
**Notes:** If the button has three states, it cycles through them in this order: on, off, mixed, on, and so forth.
If the button has two states, it toggles between them.

### 35.58.9 Properties

### 35.58.10 allowsMixedState as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the button allows a mixed state.
**Notes:** (Read and Write property)

### 35.58.11 alternateImage as NSImageMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The image that appears on the button when it's in its alternate state.
**Notes:** The image displayed by the button when it's in its alternate state, or nil if there is no alternate image. Note that some button types don't display an alternate image. Buttons don't display images by default.
(Read and Write property)

### 35.58.12 alternateTitle as string

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The title that the button displays when it's in its alternate state.
**Notes:** (Read and Write property)

### 35.58.13 attributedAlternateTitle as NSAttributedStringMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The title that appears on the button when it's in its alternate state to the given attributed string.
**Notes:** (Read and Write property)

### 35.58.14 attributedTitle as NSAttributedStringMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The title that the button displays in its normal state as an attributed string.
**Notes:** (Read and Write property)

### 35.58.15 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** The background color is used only when drawing borderless buttons.
(Read and Write property)

### 35.58.16 bezelColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The color of the button's bezel, in appearances that support it.
**Notes:** (Read and Write property)

### 35.58.17 bezelStyle as Integer

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The appearance of the border, if the view has one.
**Notes:** Use this constants:

| | |
|---|---|
| NSRoundedBezelStyle | = 1 |
| NSRegularSquareBezelStyle | = 2 |
| NSThickSquareBezelStyle | = 3 |
| NSThickerSquareBezelStyle | = 4 |
| NSDisclosureBezelStyle | = 5 |
| NSShadowlessSquareBezelStyle | = 6 |
| NSCircularBezelStyle | = 7 |
| NSTexturedSquareBezelStyle | = 8 |
| NSHelpButtonBezelStyle | = 9 |
| NSSmallSquareBezelStyle | = 10 |
| NSTexturedRoundedBezelStyle | = 11 |
| NSRoundRectBezelStyle | = 12 |
| NSRecessedBezelStyle | = 13 |
| NSRoundedDisclosureBezelStyle | = 14 |

(Read and Write property)

### 35.58.18 hasDestructiveAction as Boolean

MBS MacControls Plugin, Plugin Version: 22.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that defines whether a button,Äôs action has a destructive effect.
**Notes:** Available on macOS 11.0 and newer.

The default value of hasDestructiveAction is false. Setting this to true allows the system to guard a destructive-action button against accidental presses, and can give the button a special appearance in certain contexts to caution against unintentional use.
(Read and Write property)

### 35.58.19 image as NSImageMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The view's image.
**Notes:** A button's image is displayed when the button is in its normal state, or all the time for a button that doesn't change its contents when highlighting or displaying its alternate state.
(Read and Write property)

### 35.58.20 imageDimsWhenDisabled as Boolean

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver,Äôs image appears "dim" when the button cell is disabled.
**Notes:** True to indicate that the button's image should dim when the button is disabled.

By default, all button types except NSSwitchButton and NSRadioButton do dim when disabled. When NSSwitchButtons and NSRadioButtons are disabled, only the associated text dims. The default setting for this condition is reasserted whenever you set ButtonType, so be sure to specify the button cell,Äôs type before you set ImageDimsWhenDisabled.
(Read and Write property)

### 35.58.21 imageHugsTitle as Boolean

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether image hugs title.
**Notes:** Available in macOS 10.12 and newer.
(Read and Write property)

### 35.58.22 imagePosition as Integer

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The position of the button's image relative to its title.
**Notes:** Value can be:

| | | |
|---|---|---|
| NSNoImage | 0 | The cell doesn,Äôt display an image. |
| NSImageOnly | 1 | The cell displays an image, but not a title. |
| NSImageLeft | 2 | The image is to the left of the title. |
| NSImageRight | 3 | The image is to the right of the title. |
| NSImageBelow | 4 | The image is below the title. |
| NSImageAbove | 5 | The image is above the title. |
| NSImageOverlaps | 6 | The image overlaps the title. |

(Read and Write property)

### 35.58.23 imageScaling as Integer

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The scale factor for the receiver,Äôs image.
**Notes:** These constants specify a cell,Äôs image scaling behavior.

| | | |
|---|---|---|
| NSImageScaleProportionallyDown | 0 | If it is too large for the destination, scale the image down while preserving the aspect ratio. |
| NSImageScaleAxesIndependently | 1 | Scale each dimension to exactly fit destination. This setting does not preserve the aspect ratio of the image. |
| NSImageScaleNone | 2 | Do not scale the image. |
| NSImageScaleProportionallyUpOrDown | 3 | Scale the image to its maximum possible dimensions while both staying within the destination area and preserving its aspect ratio. |

Available in OS X v10.5 and later.
(Read and Write property)

### 35.58.24 isBordered as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the button has a border.
**Notes:** (Read and Write property)

### 35.58.25 isTransparent as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the button is transparent.
**Notes:** (Read and Write property)

### 35.58.26 keyEquivalent as string

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The key-equivalent character of the view.
**Notes:** (Read and Write property)

### 35.58.27 keyEquivalentModifierMask as Integer

MBS MacControls Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** the controls's keyboard equivalent modifier mask.
**Example:**

```
const NSShiftKeyMask=131.072
const NSControlKeyMask=262144
const NSAlternateKeyMask=524288
const NSCommandKeyMask=1048576

dim d as NSButtonMBS // your button
d.KeyEquivalent="A"
d.KeyEquivalentModifierMask=NSShiftKeyMask+NSCommandKeyMask+NSAlternateKeyMask // command-option-shift
```

**Notes:** Constants for the mask:

NSAlphaShiftKeyMask = 65536
Set if Caps Lock key is pressed.
Available in Mac OS X v10.0 and later.

NSShiftKeyMask = 131072
Set if Shift key is pressed.
Available in Mac OS X v10.0 and later.

NSControlKeyMask = 262144
Set if Control key is pressed.
Available in Mac OS X v10.0 and later.

NSAlternateKeyMask = 524288
Set if Option or Alternate key is pressed.
Available in Mac OS X v10.0 and later.

NSCommandKeyMask = 1048576
Set if Command key is pressed.
Available in Mac OS X v10.0 and later.

NSNumericPadKeyMask = 2097152
Set if any key in the numeric keypad is pressed. The numeric keypad is generally on the right side of the keyboard. This is also set if any of the arrow keys are pressed (NSUpArrowFunctionKey, NSDownArrowFunctionKey, NSLeftArrowFunctionKey, and NSRightArrowFunctionKey).
Available in Mac OS X v10.0 and later.

NSHelpKeyMask = 4194304
Set if the Help key is pressed.
Available in Mac OS X v10.0 and later.

NSFunctionKeyMask = 8388608
Set if any function key is pressed. The function keys include the F keys at the top of most keyboards (F1, F2, and so on) and the navigation keys in the center of most keyboards (Help, Forward Delete, Home, End, Page Up, Page Down, and the arrow keys).
Available in Mac OS X v10.0 and later.

NSDeviceIndependentModifierFlagsMask = 16777216
Used to retrieve only the device-independent modifier flags, allowing applications to mask off the device-dependent modifier flags, including event coalescing information.
Available in Mac OS X v10.4.
(Read and Write property)

### 35.58.28 maxAcceleratorLevel as Integer

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Configures the maximum allowed level for an NSMultiLevelAcceleratorButton, allowed values range from [ 1,5 ] .
**Notes:** Defaults to 2.
Available on Mac OS X 10.10.3.
(Read and Write property)

### 35.58.29 showsBorderOnlyWhileMouseInside as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view's border is displayed only when the cursor is over the button.
**Notes:** If isBordered returns false, the border is never displayed, regardless of what this method returns.
(Read and Write property)

### 35.58.30 sound as Variant

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The sound played when the user presses the button.
**Notes:** The sound that should be played when the user presses the button. The sound is played during a mouse-down event, such as NSLeftMouseDown.
Value is NSSoundMBS object.
(Read and Write property)

### 35.58.31 SpringLoaded as Boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Sends action on deep-press or extended hover while dragging.
**Notes:** Defaults to false.
Available on Mac OS X 10.10.3.
(Read and Write property)

### 35.58.32 state as Integer

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The state of the button.
**Notes:** This can be NSOnState (1), NSOffState (0), NSMixedState (-1).
(Read and Write property)

### 35.58.33 title as string

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The title displayed on the button when it's in its normal state.
**Notes:** (Read and Write property)

### 35.58.34 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCircularBezelStyle | 7 | One of the button styles that can be specified using bezelStyle.<br>A round button with room for a small icon or a single character.<br>This style has both regular and small variants, but the large variant is available only in gray at this time. |
| NSDisclosureBezelStyle | 5 | One of the button styles that can be specified using bezelStyle.<br>A bezel style for use with a disclosure triangle.<br>To create the disclosure triangle, set the button bezel style to NSDisclosure-BezelStyle and the button type to NSOnOffButton. |
| NSHelpButtonBezelStyle | 9 | One of the button styles that can be specified using bezelStyle.<br>A round button with a question mark providing the standard help button look. |
| NSInlineBezelStyle | 15 | One of the button styles that can be specified using bezelStyle.<br>Inline Style. |
| NSMomentaryChangeButton | 5 | One of the button types that can be specified using ButtonType.<br>While the button is held down, the alternate image and alternate title are displayed.<br>The normal image and title are displayed when the button isn't pressed. This option is called "Momentary Change" in Interface Builder's Button Inspector. |
| NSMomentaryLightButton | 0 | One of the button types that can be specified using ButtonType.<br>While the button is held down it's shown as "lit," and also "pushed in" to the screen if the button is bordered.<br>This type of button is best for simply triggering actions, as it doesn't show its state; it always displays its normal image or title. This option is called "Momentary Light" in Interface Builder's Button Inspector. |
| NSMomentaryPushInButton | 7 | One of the button types that can be specified using ButtonType.<br>While the button is held down it's shown as "lit."<br>This type of button is best for simply triggering actions, as it doesn't show its state; it always displays its normal image or title. This option is called "Momentary Push In" in Interface Builder's Button Inspector. |
| NSOnOffButton | 6 | One of the button types that can be specified using ButtonType.<br>The first click highlights the button; a second click returns it to the normal (unhighlighted) state. |
| NSPushOnPushOffButton | 1 | One of the button types that can be specified using ButtonType.<br>The first click both highlights and causes the button to be "pushed in" if the button is bordered; a second click returns it to its normal state. |
| NSRadioButton | 4 | One of the button types that can be specified using ButtonType.<br>This style is similar to NSSwitchButton, but it used to constrain a selection to a single element from several. |
| NSRecessedBezelStyle | 13 | One of the button styles that can be specified using bezelStyle.<br>A bezel style that matches the recessed buttons in Mail, Finder and Safari. |
| NSRegularSquareBezelStyle | 2 | One of the button styles that can be specified using bezelStyle.<br>A rectangular button with a 2 point border, designed for icons. |
| NSRoundedBezelStyle | 1 | One of the button styles that can be specified using bezelStyle.<br>A rounded rectangle button, designed for text. |
| NSRoundedDisclosureBezelStyle | 14 | One of the button styles that can be specified using bezelStyle.<br>A bezel style that matches the disclosure style used in the standard Save panel. |
| NSRoundRectBezelStyle | 12 | One of the button styles that can be specified using bezelStyle.<br>A bezel style that matches the search buttons in Finder and Mail. |
| NSShadowlessSquareBezelStyle | 6 | One of the button styles that can be specified using bezelStyle.<br>Similar to NSRegularSquareBezelStyle, but has no shadow so you can abut the cells without overlapping shadows.<br>This style would be used in a tool palette, for example. |
| NSSmallSquareBezelStyle | 10 | One of the button styles that can be specified using bezelStyle.<br>A simple square bezel style. Buttons using this style can be scaled to any size. |
| NSSwitchButton | 3 | One of the button types that can be specified using ButtonType.<br>This style is a variant of NSToggleButton that has no border and is used to represent a checkbox. |
| NSTexturedRoundedBezelStyle | 11 | One of the button styles that can be specified using bezelStyle.<br>A textured (metal) bezel style similar in appearance to the Finder's action |

# 35.59 class NSCellMBS

## 35.59.1 class NSCellMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The NSCell class provides a mechanism for displaying text or images in an NSView object without the overhead of a full NSView subclass.
**Notes:** It's used heavily by most of the NSControl classes to implement their internal workings.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MBS Xojo / Real Studio Plugins, version 14.0pr6
- MBS Xojo / Real Studio Plugins, version 13.2pr7
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

## 35.59.2 Methods

## 35.59.3 acceptsFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver accepts first responder status.
**Notes:** The default value is true if the receiver is enabled. Subclasses may override this method to return a different value.

## 35.59.4 calcDrawInfo(theRect as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Recalculates the cell geometry.
**Notes:** Objects (such as controls) that manage NSCell objects generally maintain a flag that informs them if any of their cells have been modified in such a way that the location or size of the cell should be recomputed. If so, calcSize method of NSControl is automatically invoked prior to the display of the cell, and that method invokes the calcDrawInfo method of the cell.
The default implementation of this method does nothing.

### 35.59.5 cellSize as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the minimum size needed to display the receiver.
**Notes:** Returns the size of the cell, or the size (10000, 10000) if the receiver is not a text or image cell. If the cell is an image cell but no image has been set, returns NSZeroSize.
This method takes into account of the size of the image or text within a certain offset determined by the border type of the cell.

### 35.59.6 cellSizeForBounds(theRect as NSRectMBS) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the minimum size needed to display the receiver, constraining it to the specified rectangle.
**Notes:** aRect: The size of the cell, or the size of the aRect parameter if the cell is not a text or image cell. If the cell is an image cell but no image has been set, returns an empty size.

This method takes into account of the size of the image or text within a certain offset determined by the border type of the cell. If the receiver is of text type, the text is resized to fit within aRect (as much as aRect is within the bounds of the cell).

### 35.59.7 compare(otherCell as NSCellMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Compares the string values of the receiver another cell, disregarding case.
**Notes:** otherCell: The cell to compare against the receiver. This parameter must be of type NSCell; if it is not, this method raises NSBadComparisonException.

This value must not be nil. If the value is nil, the behavior is undefined and may change in future versions of Mac OS X.

Returns NSOrderedAscending if the string value of the receiver precedes the string value of otherCell in lexical ordering, NSOrderedSame if the string values are equivalent in lexical value, and NSOrderedDescending string value of the receiver follows the string value of otherCell in lexical ordering.

### 35.59.8 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with an image.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim n as NSImageMBS = new NSImageMBS(pic)
dim c as new NSCellMBS(n)

Backdrop = c.image.CopyPictureWithMask
Title = c.classPath
```

See also:

- 35.59.9 Constructor(text as string) 6909

### 35.59.9 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.
**Example:**

```
dim c as new NSCellMBS("Hello")
MsgBox c.StringValue
```

See also:

- 35.59.8 Constructor(image as NSImageMBS) 6908

### 35.59.10 defaultFocusRingType as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default type of focus ring for the receiver.
**Notes:** Use this constants:

| | | |
|---|---|---|
| NSFocusRingTypeDefault | = 0 | The default focus ring type for NSView or NSCell. |
| NSFocusRingTypeNone | = 1 | No focus ring. If you set the focus ring type to this value, NSView and NSCell will not draw any focus ring. |
| NSFocusRingTypeExterior | = 2 | The standard Aqua focus ring. |

### 35.59.11 defaultMenu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default menu for instances of the receiver.
**Notes:** Returns the default menu. The NSCell implementation of this method returns nil.

### 35.59.12 drawingRectForBounds(theRect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle within which the receiver draws itself.
**Notes:** theRect: The bounding rectangle of the receiver.
Returns the rectangle in which the receiver draws itself. This rectangle is slightly inset from the one in theRect.

### 35.59.13 highlightColorWithFrame(theRect as NSRectMBS, controlView as NSViewMBS) as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Redraws the receiver with the specified highlight setting.
**Notes:** theRect: The bounding rectangle of the receiver.
controlView: The control that manages the cell.

Returns the color the receiver uses when drawing the selection highlight.
You should not assume that a cell would necessarily want to draw itself with the value returned from selectedControlColor. A cell may wish to draw with different a selection highlight color depending on such things as the key state of its controlView.

### 35.59.14 imageRectForBounds(theRect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle in which the receiver draws its image.
**Notes:** theRect: The bounding rectangle of the receiver.

The rectangle in which the receiver draws its image. This rectangle is slightly offset from the one in theRect.

### 35.59.15 isEntryAcceptable(aString as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether a string representing a numeric or date value is formatted in a suitable way for the cell's entry type.
**Notes:** This method is being deprecated in favor of a new class of formatter objects. For more information, see NSFormatter. This documentation is provided only for developers who need to modify older applications

### 35.59.16 mnemonic as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the character in the receiver's title that appears underlined for use as a mnemonic.
**Notes:** A string containing the mnemonic character, or an empty string if no mnemonic character is set.

### 35.59.17 nextState as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's next state.
**Notes:** If the receiver has three states, it cycles through them in this order: on, off, mixed, on, and so forth. If the receiver has two states, it toggles between them.

### 35.59.18 performClick

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Simulates a single mouse click on the receiver.
**Notes:** This method performs the receiver's action on its target. The receiver must be enabled to perform the action. If the receiver's control view is valid, that view is used as the sender; otherwise, the value in sender is used.

The receiver of this message must be a cell of type NSActionCell. This method raises an exception if the action message cannot be successfully sent.

### 35.59.19 prefersTrackingUntilMouseUp as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether tracking stops when the cursor leaves the cell.
**Notes:** The default implementation returns false. Subclasses may override this method to return a different value.

### 35.59.20 sendActionOn(mask as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the conditions on which the receiver sends action messages to its target.
**Notes:** mask: A bit mask containing the conditions for sending the action. The only conditions that are actually checked are associated with the NSLeftMouseDownMask, NSLeftMouseUpMask, NSLeftMouseDraggedMask, and NSPeriodicMask bits.

Returns a bit mask containing the previous settings. This bit mask uses the same values as specified in the mask parameter.

You use this method during mouse tracking when the mouse button changes state, the mouse moves, or if the cell is marked to send its action continuously while tracking. Because of this, the only bits checked in mask are NSLeftMouseDownMask, NSLeftMouseUpMask, NSLeftMouseDraggedMask, and NSPeriodicMask, which are declared in the NSEvent class reference.

You can use the setContinuous method to turn on the flag corresponding to NSPeriodicMask or NSLeftMouseDraggedMask, whichever is appropriate to the given subclass of NSCell.

### 35.59.21 setNextState

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Changes the state of the receiver to its next state.
**Notes:** If the receiver has three states, it cycles through them in this order: on, off, mixed, on, and so forth. If the receiver has two states, it toggles between them.

### 35.59.22 setTitleWithMnemonic(stringWithAmpersand as string)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the title of the receiver with one character in the string denoted as an access key.
**Notes:** stringWithAmpersand: The new title of the cell. One character in the string should be preceded by an ampersand (&) character. The character that follows becomes the mnemonic character for the title. Mnemonics are not supported in Mac OS X.

### 35.59.23 titleRectForBounds(theRect as NSRectMBS) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle in which the receiver draws its title text.
**Notes:** If the receiver is a text-type cell, this method resizes the drawing rectangle for the title (theRect) inward by a small offset to accommodate the cell border. If the receiver is not a text-type cell, the method does nothing.

### 35.59.24 wantsNotificationForMarkedText as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the field editor initiated by the receiver should post text change notifications.
**Notes:** Returns true if the field editor initiated by the receiver should post text change notifications (NSTextDidChangeNotification) while editing marked text; otherwise, they are delayed until the marked text confirmation.

### 35.59.25 Properties

### 35.59.26 alignment as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The alignment of text in the receiver..
**Notes:** The alignment of text in the receiver (one of the following constants: NSLeftTextAlignment, NSRightTextAlignment,NSCenterTextAlignment, NSJustifiedTextAlignment, NSNaturalTextAlignment).
The default value is NSNaturalTextAlignment.
(Read and Write property)

### 35.59.27 allowsEditingTextAttributes as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver allows user editing of textual attributes.
**Notes:** (Read and Write property)

### 35.59.28 allowsMixedState as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver supports three states.
**Notes:** Valus is true if the receiver supports all three states (on, off, and mixed), otherwise false (the receiver supports only the on and off states).
(Read and Write property)

### 35.59.29 allowsUndo as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver assumes responsibility for undo operations.
**Notes:** By default, the NSTextFieldCell class uses this feature to handle undo operations for edited text. Other controls set a value that is appropriate for their implementation.
Available in Mac OS X v10.4 and later.
(Read and Write property)

### 35.59.30 attributedStringValue as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The value of the receiver's cell as an attributed string using the receiver's formatter object (if one exists).
**Notes:** The textual attributes are the default paragraph style, the receiver's font and alignment, and whether the receiver is enabled and scrollable.

For Mac OS X v10.3 and later: If you use a class that responds to the selector attributedStringValue for the object value of a cell, then the cell will use that method to fetch the string to draw rather than using stringValue.
(Read and Write property)

### 35.59.31 backgroundStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the background style for the receiver.
**Notes:** The background describes the surface the cell is drawn onto in drawWithFrame A control typically sets this before it asks the cell to draw. A cell may draw differently based on background characteristics. For example, a tableview drawing a cell in a selected row might set cell.backgroundStyle=NSBackgroundStyleDark. A text cell might decide to render its text white as a result. A rating-style level indicator might draw its stars white instead of gray.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.59.32 baseWritingDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The initial writing direction used to determine the actual writing direction for text.
**Notes:** The default value is NSWritingDirectionNatural.
The Text system uses this value as a hint for calculating the actual direction for displaying Unicode characters. You should not need to call this method directly.
(Read and Write property)

### 35.59.33 Bezeled as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver has a bezeled border.
**Notes:** (Read and Write property)

### 35.59.34 Bordered as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver has a plain border.
**Notes:** (Read and Write property)

### 35.59.35 className as string

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The name of this NSCell class.
**Example:**

```
dim c as new NSActionCellMBS("Hello")
MsgBox c.className // shows "NSActionCell"
```

**Notes:** (Read only property)

### 35.59.36 classPath as string

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The path of this NSCell class.
**Example:**

```
dim c as new NSActionCellMBS("Hello")
MsgBox c.classPath // shows "NSActionCell:NSCell:NSObject"
```

**Notes:** Useful for debugging to know what super classes the view has.
(Read only property)

### 35.59.37 Continuous as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver's cell sends its action message continuously to its target during mouse tracking.
**Notes:** (Read and Write property)

### 35.59.38 controlSize as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The size of the receiver.
**Notes:** Can be NSRegularControlSize, NSMiniControlSize or NSSmallControlSize.
(Read and Write property)

### 35.59.39 controlTint as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's control tint.
**Notes:** Can be NSGraphiteControlTint, NSBlueControlTint, NSClearControlTint or NSDefaultControlTint.
(Read and Write property)

### 35.59.40 controlView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's control view.
**Notes:** The control view represents the control currently being rendered by the cell.

(Read and Write property)

### 35.59.41 doubleValue as Double

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The value of the receiver's cell as a double-precision floating-point number.
**Notes:** The value of the cell interpreted as a double-precision floating-point number. If the receiver is not a text-type cell or the cell value is not scannable, returns 0.
(Read and Write property)

### 35.59.42 Editable as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver is editable.
**Notes:** (Read and Write property)

### 35.59.43 Enabled as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver is enabled or disabled.
**Notes:** (Read and Write property)

### 35.59.44 floatValue as Double

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The value of the receiver's cell as a single-precision floating-point number.
**Notes:** Returns the value of the cell interpreted as a single-precision floating-point number. If the receiver is not a text-type cell or the cell value is not scannable, returns 0.
(Read and Write property)

### 35.59.45 font as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The font used to display text in the receiver.
**Notes:** The receiver's current font, or nil if the receiver is not a text-type cell.

(Read and Write property)

### 35.59.46 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal NSCell reference.
**Notes:** (Read and Write property)

### 35.59.47 hasValidObjectValue as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver has a valid object value.
**Notes:** A valid object value is one that the receiver's formatter can "understand." Objects are always assumed to be valid unless they are rejected by the formatter.
(Read only property)

### 35.59.48 Highlighted as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver is highlighted.
**Notes:** (Read and Write property)

### 35.59.49 Identifier as String

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** A string that identifies this user interface item.
**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items, you would typically set this value in code after creating a view but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a view is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the framework or application. For example, identifiers for standard AppKit interface items, such as the open

panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 35.59.50 image as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The image displayed by the receiver (if any).
**Notes:** The image displayed by the receiver, or nil if the receiver is not an image-type cell.
(Read and Write property)

### 35.59.51 importsGraphics as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the text of the receiver can contain imported graphics.
**Notes:** true if the receiver's text is in the RTFD format and supports imported graphics, otherwise false.
(Read and Write property)

### 35.59.52 interiorBackgroundStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the interior background style for the receiver.
**Notes:** The interior background style describes the surface drawn onto in drawInteriorWithFrame:inView:. This is often the same as the backgroundStyle, but a button that draws a bezel would have a different interiorBackgroundStyle.
This is both an override point and a useful method to call. In a custom button with a custom bezel you can override this method to describe that surface. A cell that has custom interior drawing might query this method to help pick an image that looks good on the cell. Calling this method gives you some independence from changes in framework art style.
Available in Mac OS X v10.5 and later.
(Read only property)

### 35.59.53 intValue as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's value as an integer.
**Notes:** The value of the cell interpreted as an integer. If the receiver is not a text-type cell or the cell value is not scannable, returns 0.
On Mac OS X v10.5 and later, you should use integerValue instead.
(Read and Write property)

### 35.59.54 isOpaque as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver is opaque (nontransparent).
**Notes:** (Read only property)

### 35.59.55 keyEquivalent as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the key equivalent to clicking the cell.
**Notes:** Subclasses can override this method to return a string with a valid character for the key equivalent.
(Read only property)

### 35.59.56 lineBreakMode as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The line break mode currently used when drawing text.
**Notes:** The line break mode the receiver currently uses when drawing text (one of the following constants: NSLineBreakByWordWrapping, NSLineBreakByCharWrapping, NSLineBreakByClipping, NSLineBreakByTruncatingHead, NSLineBreakByTruncatingTail, or NSLineBreakByTruncatingMiddle).
Available in Mac OS X v10.4 and later.
(Read and Write property)

### 35.59.57 menu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's contextual menu.
**Notes:** The receiver's contextual menu, or nil if no menu is assigned.
(Read and Write property)

### 35.59.58 mnemonicLocation as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The position of the underlined mnemonic character in the receiver's title.
**Notes:** A zero-based index into the receiver's title string indicating the position of the character. If there is no mnemonic character, this method returns NSNotFound.
Mnemonics are not supported in Mac OS X.
(Read and Write property)

### 35.59.59 refusesFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver should not become the first responder.
**Notes:** To find out whether the receiver can become first responder at this time, use the method acceptsFirstResponder.
(Read and Write property)

### 35.59.60 Scrollable as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver scrolls excess text past the cell's bounds.
**Notes:** (Read and Write property)

### 35.59.61 Selectable as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the text of the receiver can be selected.
**Notes:** (Read and Write property)

### 35.59.62 sendsActionOnEndEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver's NSControl object sends its action message whenever the user finishes editing the cell's text.
**Notes:** If this method returns true, the receiver's NSControl object sends its action message when the user does one of the following:

- Presses the Return key
- Presses the Tab key to move out of the field
- Clicks another text field

If it returns false, the cell's NSControl object sends its action message only when the user presses the Return key.
(Read and Write property)

### 35.59.63 showsFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver should draw some indication of its first responder status.
**Notes:** The NSCell class itself does not draw a first-responder indicator. Subclasses may use the returned value to determine whether or not they should draw one, however.
(Read and Write property)

### 35.59.64 state as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's state.
**Notes:** Cells can have two or three states. If the receiver has two states, it returns either NSOffState (the normal or unpressed state) or NSOnState (the alternate or pressed state). If it has three, it may also return NSMixedState, indicating the feature is in effect somewhere.
To check whether the receiver uses the mixed state, use the method allowsMixedState.
Note that the value state returns may not be the same value you passed into setState.
(Read and Write property)

### 35.59.65 stringValue as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The value of the receiver's cell as a string.
**Notes:** If no formatter exists and the cell's value is a string, this method returns the value as a plain, attributed, or localized formatted string. If the value is not a string or cannot be converted to one, this method returns an empty string.

For Mac OS X v10.3 and later: If you use a class that responds to the selector attributedStringValue for the object value of a cell, the cell uses that method to fetch the string to draw rather than the stringValue

method.
(Read and Write property)

### 35.59.66 tag as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The tag identifying the receiver.
**Notes:** The tag value. The NSCell implementation of this method returns –1.
Tags allow you to identify particular cells. Tag values are not used internally; they are only changed by external invocations of setTag:. You typically set tag values in Interface Builder and use them at runtime in your application. When you set the tag of a control with a single cell in Interface Builder, it sets the tags of both the control and the cell to the same value as a convenience.
(Read and Write property)

### 35.59.67 title as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's title.
**Notes:** Subclasses (such as NSButtonCell) may override this method to return a different value.
(Read and Write property)

### 35.59.68 truncatesLastVisibleLine as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the receiver truncates and adds the ellipsis character to the last visible line if the text doesn't fit into the cell bounds.
**Notes:** The line break mode must be either NSLineBreakByWordWrapping or NSLineBreakByCharWrapping. Otherwise, this setting is ignored.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.59.69 type as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The type of the cell, changing it to a text cell, image cell, or null cell.
**Notes:** If the cell is already the same type as the one specified in the aType parameter, this method does nothing.

If aType is NSTextCellType, this method converts the receiver to a cell of that type, giving it a default title and setting the font to the system font at the default size. If aType is NSImageCellType, the cell type is not changed until you set a new non-nil image.
(Read and Write property)

### 35.59.70 userInterfaceLayoutDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The layout direction of the user interface.
**Notes:** This property specifies the general user interface layout flow directions. For subclasses that have multiple visual components in a single cell instance, this property should specify the directionality or flow of components.

NSUserInterfaceLayoutDirectionLeftToRight = 0
NSUserInterfaceLayoutDirectionRightToLeft = 1

Available in OS X v10.6 and later.
(Read and Write property)

### 35.59.71 usesSingleLineMode as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the text cell restricts layout and rendering of its content to a single line.
**Notes:** If true, the cell ignores the return value from wraps, interprets NSLineBreakByWordWrapping and NSLineBreakByCharWrapping returned by lineBreakMode as NSLineBreakByClipping, and configures the field editor to ignore key binding commands that insert paragraph and line separators.

The field editor bound to a single line cell filters paragraph and line separator insertion from user actions. Cells in the single line mode use the fixed baseline layout. The text baseline position is determined solely by the control size regardless of content font style or size.
(Read and Write property)

### 35.59.72 wraps as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether text in the receiver wraps when its length exceeds the frame of the cell.
**Notes:** If the text of the receiver is an attributed string value you must explicitly set the paragraph style line break mode. Calling this method with the value true is equivalent to calling the setLineBreakMode:

method with the value NSLineBreakByWordWrapping.
(Read and Write property)

### 35.59.73 cellAttribute(aParameter as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The value for the specified cell attribute.
**Notes:** aParameter: The cell attribute whose value you want to get. Attributes include the receiver's current state and whether it is disabled, editable, or highlighted.

Returns the value for the cell attribute specified by aParameter.
(Read and Write computed property)

### 35.59.74 focusRingType as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The type of focus ring currently set for the receiver.
**Notes:** You can disable a view's focus ring drawing by overriding this method so it always returns NSFocusRingTypeNone, or by calling setFocusRingType: with NSFocusRingTypeNone. You should only disable a view from drawing its focus ring if you want to draw your own focus ring, or if there isn't sufficient space to display a focus ring in the default location.
Available in Mac OS X v10.3 and later.
(Read and Write computed property)

### 35.59.75 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAnyType | 0 | One of the constants specify how a cell formats numeric data.<br>Any value is allowed.<br>Deprecated in Mac OS X v10.4 and later. |
| NSBlueControlTint | 1 | One of the constants specify a cell's tint.<br>Aqua control tint<br>Available in Mac OS X v10.3 and later. |
| NSCellAllowsMixedState | 16 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Lets the cell's state be NSMixedState, as well as NSOffState and NSOnState |
| NSCellChangesContents | 14 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>If the cell's state is NSMixedState or NSOnState, displays the cell's alternat<br>image. |
| NSCellDisabled | 0 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Does not let the user manipulate the cell. |
| NSCellEditable | 3 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Lets the user edit the cell's contents. |
| NSCellHasImageHorizontal | 12 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Controls the position of the cell's image: places the image on the right of an<br>text in the cell.<br>Together, NSCellHasImageOnLeftOrBottom, NSCellHasImageHorizontal, an<br>NSCellHasOverlappingImage control the position of the cell's image and tex<br>To place the image above, set none of them. To place the image below, se<br>NSCellHasImageOnLeftOrBottom. To place the image to the right, set NSCel<br>HasImageHorizontal. To place the image to the left, set NSCellHasImageHor<br>izontal and NSCellHasImageOnLeftOrBottom. To place the image directl<br>over, set NSCellHasOverlappingImage. |
| NSCellHasImageOnLeftOrBottom | 13 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Controls the position of the cell's image: places the image on the left of c<br>below any text in the cell.<br>See NSCellHasImageHorizontal for more details. |
| NSCellHasOverlappingImage | 11 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Controls the position of the cell's image: places the image over any text in th<br>cell.<br>See NSCellHasImageHorizontal for more details. |
| NSCellHighlighted | 5 | One of the constants specify how a button behaves when pressed and how<br>displays its state.<br>Draws the cell with a highlighted appearance. (Deprecated. Use Highlighte<br>instead.) |
| NSCellHitContentArea | 1 | One of the constants are used by hitTestForEvent to determine the effect of a<br>event.<br>A content area in the cell.<br>Available in Mac OS X v10.5 and later. |
| NSCellHitEditableTextArea | 2 | One of the constants are used by hitTestForEvent to determine the effect of a<br>event.<br>An editable text area of the cell.<br>Available in Mac OS X v10.5 and later. |
| NSCellHitNone | 0 | One of the constants are used by hitTestForEvent to determine the effect of a<br>event.<br>An empty area, or did not hit in the cell.<br>Available in Mac OS X v10.5 and later. |
| NSCellHitTrackableArea | 4 | One of the constants are used by hitTestForEvent to determine the effect of a<br>event. |

Background Styles

| Constant | Value | Description |
|---|---|---|
| NSBackgroundStyleDark | 1 | The background is a dark color.<br>Light content contrasts well with this background.<br>Available in Mac OS X v10.5 and later. |
| NSBackgroundStyleLight | 0 | The background is a light color.<br>Dark content contrasts well with this background.<br>Available in Mac OS X v10.5 and later. |
| NSBackgroundStyleLowered | 3 | The background is intended to appear lower than the content drawn on it.<br>Content might need to be embossed.<br>Available in Mac OS X v10.5 and later. |
| NSBackgroundStyleRaised | 2 | The background is intended to appear higher than the content drawn on it.<br>Content might need to be inset.<br>Available in Mac OS X v10.5 and later. |

Scaling Modes

| Constant | Value | Description |
|---|---|---|
| NSImageScaleAxesIndependently | 1 | Scale each dimension to exactly fit destination.<br>This setting does not preserve the aspect ratio of the image.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleNone | 2 | Do not scale the image.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleProportionallyDown | 0 | If it is too large for the destination, scale the image down while preserv<br>aspect ratio.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleProportionallyUpOrDown | 3 | Scale the image to its maximum possible dimensions while both staying<br>the destination area and preserving its aspect ratio.<br>Available in Mac OS X v10.5 and later. |

## 35.60 class NSClipViewMBS

### 35.60.1 class NSClipViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** An NSClipView contains and scrolls the document view displayed by an NSScrollView.
**Notes:** You normally don't need to program with NSClipViews, as NSScrollView handles most of the details of their operation.

An NSClipView holds the document view of an NSScrollView, clipping the document view to its frame, handling the details of scrolling in an efficient manner, and updating the NSScrollView when the document view's size or position changes. You don't normally use the NSClipView class directly; it's provided primarily as the scrolling machinery for the NSScrollView class. However, you might use the NSClipView class to implement a class similar to NSScrollView.

Interaction With NSScrollView
When using an NSClipView within an NSScrollView (the usual configuration), you should issue messages that control background drawing state to the NSScrollView, rather than messaging the NSClipView directly. This recommendation applies to the following methods:

- backgroundColor
- drawsBackground

The NSClipView methods are intended for when the NSClipView is used independently of a containing NSScrollView. In the usual case, NSScrollView should be allowed to manage the background-drawing properties of its associated NSClipView.

There is only one background-drawing state per NSScrollView/NSClipView pair. The two objects do not maintain independent and distinct drawsBackground and backgroundColor properties; rather, NSScrollView's accessors for these properties largely defer to the associated NSClipView and allow the NSClipView to maintain the state. In Mac OS X v10.2 and earlier system versions, NSScrollView maintained a cache of the last state it set for its NSClipView. If the NSClipView was sent a setDrawsBackground: message directly, the cache might not reflect the state accurately. This caching of state has been removed in Mac OS X v10.3.

It is also important to note that sending a setDrawsBackground message with a parameter of false to an NSScrollView has the added effect of sending the NSClipView a setCopiesOnScroll message with a parameter of false. The side effect of sending the setDrawsBackground message directly to the NSClipView is the appearance of "trails" (vestiges of previous drawing) in the document view as it is scrolled.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.

**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1

### 35.60.2 Methods

### 35.60.3 autoscroll(theEvent as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver proportionally to theEvent's distance outside of it.
**Notes:** theEvent's location should be expressed in the window's base coordinate system (which it normally is), not the receiving NSClipView's. Returns true if any scrolling is performed; otherwise returns false.

Never invoke this method directly; instead, the NSClipView's document view should repeatedly send itself autoscroll: messages when the cursor is dragged outside the NSClipView's frame during a modal event loop initiated by a mouse-down event. The NSView class implements autoscroll to forward the message to the receiver's superview; thus the message is ultimately forwarded to the NSClipView.

### 35.60.4 constrainScrollPoint(newOrigin as NSPointMBS) as NSPointMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a scroll point adjusted from proposedNewOrigin, if necessary, to guarantee the receiver will still lie within its document view.
**Notes:** For example, if proposedNewOrigin's y coordinate lies to the left of the document view's origin, then the y coordinate returned is set to that of the document view's origin.

### 35.60.5 Constructor

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new clipview with the given size and position.
**Example:**

```
dim x as new NSClipViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 35.60.6 Constructor(Handle as Integer) 6930
- 35.60.7 Constructor(left as Double, top as Double, width as Double, height as Double) 6930

### 35.60.6 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSClipView handle.
**Example:**

```
dim t as new NSClipViewMBS(0, 0, 100, 100)
dim v as new NSClipViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSClipView and the plugin retains this handle.
See also:


- 35.60.5 Constructor 6929
- 35.60.7 Constructor(left as Double, top as Double, width as Double, height as Double) 6930


### 35.60.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new NSClipView with the given size and position.
**Example:**

```
dim x as new NSClipViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.60.5 Constructor 6929
- 35.60.6 Constructor(Handle as Integer) 6930


### 35.60.8 documentRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle defining the document view's frame, adjusted to the size of the receiver if the document view is smaller.
**Notes:** In other words, this rectangle is always at least as large as the receiver itself.

The document rectangle is used in conjunction with an NSClipView's bounds rectangle to determine values for the indicators of relative position and size between the NSClipView and its document view. For example, NSScrollView uses these rectangles to set the size and position of the knobs in its scrollers. When the document view is much larger than the NSClipView, the knob is small; when the document view is near the same size, the knob is large; and when the document view is the same size or smaller, there is no knob.

### 35.60.9 documentVisibleRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the exposed rectangle of the receiver's document view, in the document view's own coordinate system.
**Notes:** Note that this rectangle doesn't reflect the effects of any clipping that may occur above the NSClipView itself. To get the portion of the document view that's guaranteed to be visible, send it a visibleRect message.

### 35.60.10 reflectScrolledClipView(clipView as NSClipViewMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Adjusts the receiver's scrollers to reflect the size and positioning of its content view.

### 35.60.11 scrollClipView(clipview as NSClipViewMBS, toPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Notifies the superview of a clip view that the clip view needs to reset the origin of its bounds rectangle.

### 35.60.12 scrollToPoint(newOrigin as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Changes the origin of the receiver's bounds rectangle to newOrigin.

### 35.60.13 viewBoundsChanged(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Handles an NSViewBoundsDidChangeNotification, passed in the aNotification argument, by updating a containing NSScrollView based on the new bounds.

### 35.60.14 viewFrameChanged(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Handles an NSViewFrameDidChangeNotification, passed in the aNotification argument, by updating a containing NSScrollView based on the new frame.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.60.15 Properties

### 35.60.16 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The color of the receiver's background.
**Notes:** (Read and Write computed property)

### 35.60.17 copiesOnScroll as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver copies rendered images while scrolling.
**Notes:** If true, the receiver copies the existing rendered image to its new location while scrolling and only draws exposed portions of its document view. If false, the receiver always forces its document view to draw itself on scrolling.
(Read and Write computed property)

### 35.60.18 documentCursor as Variant

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The cursor object used over the receiver.
**Notes:** Value is an NSCursorMBS object.
(Read and Write computed property)

### 35.60.19 documentView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The document view.
**Notes:** Gets or sets the receiver's document view. On set removes any previous document view, and sets the origin of the receiver's bounds rectangle to the origin of the new view's frame rectangle.

If the receiver is contained in an NSScrollView, you should set the NSScrollView DocumentView instead, so it can perform whatever updating it needs.

In the process of setting the document view, this method registers the receiver for the notifications NSViewFrameDidChangeNotification and NSViewBoundsDidChangeNotification, adjusts the key view loop to include the new document view, and updates a parent NSScrollView's display if needed using reflectScrolledClipView.
(Read and Write computed property)

### 35.60.20 drawsBackground as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver draws its background color.
**Notes:** If your NSClipView is enclosed in an NSScrollView, you should set the DrawsBackground on the NSScrollView.
(Read and Write computed property)

### 35.60.21 Constants

Findbar position constants.

| Constant | Value | Description |
|---|---|---|
| NSClipViewFindBarPositionAboveContent | 1 | The find bar is displayed above the scroll view content. Available in Mac OS X v10.7 and later. |
| NSClipViewFindBarPositionAboveHorizontalRuler | 0 | The find bar is displayed above the horizontal ruler, if visibl Available in Mac OS X v10.7 and later. |
| NSClipViewFindBarPositionBelowContent | 2 | The find bar is displayed below the scroll view content. Available in Mac OS X v10.7 and later. |

Elasticity behavior constants.

| Constant | Value | Description |
|---|---|---|
| NSScrollElasticityAllowed | 2 | Allow content to be scrolled past its bounds on this axis in an elastic fashion. Available in Mac OS X v10.7 and later. |
| NSScrollElasticityAutomatic | 0 | Automatically determine whether to allow elasticity on this axis. Available in Mac OS X v10.7 and later. |
| NSScrollElasticityNone | 1 | Disallow scrolling beyond document bounds on this axis. Available in Mac OS X v10.7 and later. |

## 35.61 control NSComboBoxControlMBS

### 35.61.1 control NSComboBoxControlMBS

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSComboBox.
**Notes:** This control embeds a special NSComboBox subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins, version 21.4pr2

**Xojo Developer Magazine**

- 19.6, page 10: News

### 35.61.2 Properties

### 35.61.3 View as NSComboBoxMBS

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.61.4 Events

### 35.61.5 Action

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The action event run, when e.g. return key is pressed.

### 35.61.6 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.61.7 Close

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.61.8 Closing

Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.61.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.61.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.61.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.61.12 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.61.13 FocusLost

Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.61.14 FocusReceived

Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.61.15 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.61.16 GotFocus

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.61.17 LostFocus

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.61.18 MenuBarSelected

Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.61.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.61.20 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.61.21 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.61.22 Open

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.61.23 Opening

Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.61.24 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.61.25 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.61.26 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.61.27 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.61.28 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.61.29 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 21.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.61.30 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.62 class NSComboBoxMBS

### 35.62.1 class NSComboBoxMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The ComboBox control from Cocoa.
**Notes:** An NSComboBox is a kind of NSControl that allows you to either enter text directly (as you would with an NSTextField) or click the attached arrow at the right of the combo box and select from a displayed ("pop-up") list of items.
Subclass of the NSTextFieldMBS class.

### 35.62.2 Methods

### 35.62.3 addItemWithObjectValue(value as Variant)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds an object to the end of the receiver's internal item list.
**Notes:** anObject: The object to add to the internal item list.

This method logs a warning if usesDataSource returns true.

### 35.62.4 Constructor

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with size 100/100 and position 0/0
**Example:**

```
dim t as new NSComboBoxMBS(0, 0, 100, 20)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.62.5 Constructor(Handle as Integer) 6942
- 35.62.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6943


### 35.62.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSComboBox handle.
**Example:**

```
dim t as new NSComboBoxMBS(0, 0, 100, 100)
dim v as new NSComboBoxMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSComboBox and the plugin retains this handle.
See also:

- 35.62.4 Constructor 6942
- 35.62.6 Constructor(left as Double, top as Double, width as Double, height as Double) 6943

### 35.62.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new combo box with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new NSComboBoxMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:

- 35.62.4 Constructor 6942
- 35.62.5 Constructor(Handle as Integer) 6942

### 35.62.7 deselectItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Deselects the pop-up list item at the specified index if it's selected.
**Notes:** index: The index of the item to deselect.

If the selection does in fact change, this method posts an NSComboBoxSelectionDidChangeNotification to the default notification center.

### 35.62.8 indexOfItemWithObjectValue(value as Variant) as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Searches the receiver's internal item list for the specified object and returns the lowest matching index.
**Notes:** anObject: The object for which to return the index.

Returns the lowest index in the internal item list whose corresponding value is equal to that of the specified object. Objects are considered equal if they have the same id or if isEqual returns true.

If none of the objects in the receiver's internal item list are equal to anObject, indexOfItemWithObjectValue returns NSNotFound (-1).

This method logs a warning if usesDataSource returns true.

### 35.62.9 indexOfSelectedItem as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the last item selected from the pop-up list.
**Notes:** Returns the index of the last item selected from the receiver's pop-up list or -1 if no item is selected.

Note that nothing is initially selected in a newly initialized combo box.

### 35.62.10 noteNumberOfItemsChanged

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Informs the receiver that the number of items in its data source has changed.
**Notes:** This method allows the receiver to update the scrollers in its displayed pop-up list without actually reloading data into the receiver. It is particularly useful for a data source that continually receives data in the background over a period of time, in which case the NSComboBox can remain responsive to the user while the data is received.

See the NSComboBoxDataSource informal protocol specification for information on the messages an NSComboBox sends to its data source.

### 35.62.11 numberOfItems as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the total number of items in the pop-up list.

### 35.62.12 reloadData

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Marks the receiver as needing redisplay, so that it will reload the data for visible pop-up items and draw the new values.

### 35.62.13 removeAllItems

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes all items from the receiver's internal item list.
**Notes:** This method logs a warning if usesDataSource returns true.

### 35.62.14 removeItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes the object at the specified location from the receiver's internal item list.
**Notes:** index: The index of the object to remove. All items beyond index are moved up one slot to fill the gap.

The removed object receives a release message. This method raises an NSRangeException if index is beyond the end of the list and logs a warning if usesDataSource returns true.

### 35.62.15 removeItemWithObjectValue(value as Variant)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes all occurrences of the given object from the receiver's internal item list.
**Notes:** anObject: The object to remove from the internal item list. Objects are considered equal if they have the same id or if isEqual: returns true.

This method logs a warning if usesDataSource returns true.

### 35.62.16 scrollItemAtIndexToTop(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver's pop-up list vertically so that the item at the specified index is as close to the top as possible.
**Notes:** index: The index of the item to scroll to the top.

The pop-up list need not be displayed at the time this method is invoked.

### 35.62.17 scrollItemAtIndexToVisible(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver's pop-up list vertically so that the item at the specified index is visible.
**Notes:** index: The index of the item to make visible.

The pop-up list need not be displayed at the time this method is invoked.

### 35.62.18 selectItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the pop-up list row at the given index.
**Notes:** index: The index of the item to select in the pop-up list.

Posts an NSComboBoxSelectionDidChangeNotification to the default notification center if the selection does in fact change. Note that this method does not alter the contents of the combo box's text field—see Setting the Combo Box's Value for more information.

### 35.62.19 selectItemWithObjectValue(value as Variant)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the first pop-up list item that corresponds to the given object.
**Notes:** anObject: The object to select in the pop-up list. Objects are considered equal if they have the same id or if isEqual: returns true.

This method logs a warning if usesDataSource returns true. Posts an NSComboBoxSelectionDidChangeNotification to the default notification center if the selection does in fact change. Note that this method doesn't alter the contents of the combo box's text field—see Setting the Combo Box's Value for more information.

### 35.62.20 Properties

### 35.62.21 completes as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the receiver tries to complete what the user types in the text field.
**Notes:** Returns true if the receiver tries to complete what the user types in the text field; otherwise false.
(Read and Write computed property)

### 35.62.22 hasVerticalScroller as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the receiver will display a vertical scroller.
**Notes:** Returns true if the receiver will display a vertical scroller; otherwise false.

Note that the scroller will be displayed even if the pop-up list contains fewer items than will fit in the area specified for display.
(Read and Write computed property)

### 35.62.23 intercellSpacing as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the horizontal and vertical spacing between cells in the receiver's pop-up list.
**Notes:** Returns the space between cells in the pop-up list. The default spacing is (3.0, 2.0).
(Read and Write computed property)

### 35.62.24 isButtonBordered as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the combo box button is set to display a border.
**Notes:** True if the button has a border; otherwise false.

Available in Mac OS X v10.3 and later
(Read and Write computed property)

### 35.62.25 itemHeight as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the height of each item in the receiver's pop-up list.
**Notes:** The default item height is 16.0.
(Read and Write computed property)

### 35.62.26 numberOfVisibleItems as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the maximum number of items visible in the pop-up list.
**Notes:** The maximum number of items visible at any one time in the pop-up list.
(Read and Write computed property)

### 35.62.27 usesDataSource as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver uses an external data source to populate its pop-up list.
**Notes:** True if the receiver uses an external data source to populate the receiver's pop-up list, false if it uses an internal item list.
(Read and Write computed property)

# 35.63 class NSControlMBS

## 35.63.1 class NSControlMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa class for a NSControl.
**Notes:** You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MBS Real Studio Plugins, version 13.0pr10
- MBS Real Studio Plugins, version 12.5pr11
- MBS Real Studio Plugins, version 12.5pr8
- MBS Real Studio Plugins, version 12.5pr6
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes

**Xojo Developer Magazine**

- 20.4, page 10: News
- 20.3, page 10: News

## 35.63.2 Methods

## 35.63.3 calcSize

MBS MacCocoa Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Recomputes any internal sizing information for the receiver, if necessary.
**Notes:** This method uses the calcDrawInfo method of its cell to perform the calculations. Most controls maintain a flag that informs them if any of their cells have been modified in such a way that the location or size of the cell should be recomputed. If such a modification happens, this method is automatically invoked before the control is displayed. You should never need to invoke it yourself.

### 35.63.4 ConnectActionEvent

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Connects the action event.
**Notes:** If you want to use addhandler with this class and the action event, you need to call ConnectActionEvent after addhandler to actually have the plugin put things in place for handling the event.

### 35.63.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with size 100/100 and position 0/0
**Example:**

```
dim t as new NSControlMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.63.6 Constructor(Handle as Integer) 6950
- 35.63.7 Constructor(left as Double, top as Double, width as Double, height as Double) 6951


### 35.63.6 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSControl handle.
**Example:**

```
dim t as new NSControlMBS(0, 0, 100, 100)
dim v as new NSControlMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSControl and the plugin retains this handle.
See also:


- 35.63.5 Constructor 6950
- 35.63.7 Constructor(left as Double, top as Double, width as Double, height as Double) 6951

### 35.63.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim x as new NSControlMBS(0, 0, 100, 20)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.63.5 Constructor 6950
- 35.63.6 Constructor(Handle as Integer) 6950


### 35.63.8 Destructor

MBS MacCocoa Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 35.63.9 EnableEvents

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Enables events after you assigned methods to them with AddHandler.

### 35.63.10 performClick

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Simulates a single mouse click on the receiver.
**Notes:** This method calls the performClick method of the receiver's cell. This method raises an exception if the action message cannot be successfully sent.

### 35.63.11 selectCell(Cell as NSCellMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Selects the specified cell and redraws the control as needed.
**Notes:** Cell: The cell to select. The cell must belong to the receiver.

If the cell is already selected (or does not belong to the receiver), this method does nothing. If the cell belongs to the receiver and is not selected, this method changes its state to NSOnState and redraws the cell.

### 35.63.12 setNeedsDisplay

MBS MacCocoa Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Marks the receiver as needing redisplay (assuming automatic display is enabled).
**Notes:** This method also recalculates the dimensions of the control as needed.

### 35.63.13 sizeToFit

MBS MacCocoa Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the receiver's frame so that it is the minimum size needed to contain its cell.
**Notes:** If you want a multiple-cell custom subclass of NSControl to size itself to fit its cells, you must override this method. This method neither redisplays the receiver nor marks it as needing display. You must do this yourself with either thedisplay or setNeedsDisplay method.

### 35.63.14 validateEditing

MBS MacCocoa Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Validates changes to any user-typed text.
**Notes:** Validation sets the object value of the cell to the current contents of the cell's editor (the NSText object used for editing), storing it as a simple string or an attributed string object based on the attributes of the editor.

### 35.63.15 Properties

### 35.63.16 ActionSelector as String

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of the selector.
**Notes:** The new action-message selector to associate with the receiver's cell. Specify NULL to prevent action messages from being sent to the receiver's target.

(Read and Write property)

### 35.63.17 alignment as Integer

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The alignment mode of the text in the view's cell.
**Example:**

```
dim n as NSControlMBS // your control
n.alignment=3
```

**Notes:** One of the following constants: NSLeftTextAlignment, NSRightTextAlignment,NSCenterTextAlignment, NSJustifiedTextAlignment, or NSNaturalTextAlignment. The default value is NSNaturalTextAlignment.

Constants:

NSLeftTextAlignment = 0
Text is visually left aligned.

NSRightTextAlignment = 1
Text is visually right aligned.

NSCenterTextAlignment = 2
Text is visually center aligned.

NSJustifiedTextAlignment = 3
Text is justified.

NSNaturalTextAlignment = 4
Use the natural alignment of the text's script.
(Read and Write property)

### 35.63.18 attributedStringValue as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The value of the view's cell as an attributed string.
**Notes:** The value of the cell interpreted as an attributed string, or an empty attributed string if the receiver

has no cell.

If the control contains many cells (for example, NSMatrix), then the value of the currently selected cell is returned. If the control is in the process of editing the affected cell, then it invokes the validateEditing method before extracting and returning the value.
(Read and Write property)

### 35.63.19 baseWritingDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The initial writing direction used to determine the actual writing direction for text.
**Notes:** One of the following values: NSWritingDirectionNatural, NSWritingDirectionLeftToRight, or NSWritingDirectionRightToLeft. The default value is NSWritingDirectionNatural.

The Text system uses this value as a hint for calculating the actual direction for displaying Unicode characters. You should not need to call this method directly.
(Read and Write property)

### 35.63.20 cell as Variant

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's cell object.
**Notes:** Cocoa controls often have a frame control and inside a Cell which implements the raw functionality. This way you can for example have a table which embeds such cell controls inside the table cells.

Use this method with great care as it can irrevocably damage the affected control; specifically, you should only use this method in initializers for subclasses of NSControl.
(Read and Write property)

### 35.63.21 controlSize as Integer

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The size of the cell.
**Notes:** Use this property to change the rendered size of the cell and its control.

Changing the cell,Äôs control size does not change the font used by the cell. Use the systemFontSize class method of NSFontMBS to obtain an appropriate font based on the new control size.

If you set this property for Xojo's controls, you may need to set it again in Resized events as it may reset to the default.

Use constants:

| | | |
|---|---|---|
| ControlSizeRegular | 0 | Regular |
| ControlSizeSmall | 1 | Small size |
| ControlSizeMini | 2 | Mini size |
| ControlSizeLarge | 3 | Large size |

(Read and Write property)

### 35.63.22 currentEditor as NSTextMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current field editor for the control.
**Notes:** Returns the field editor for the current control, or nil if the receiver does not have a field editor.

When the receiver is a control displaying editable text (for example, a text field) and it is the first responder, it has a field editor, which is returned by this method. The field editor is a single NSTextView object that is shared among all the controls in a window for light text-editing needs. It is automatically instantiated when needed.
(Read only property)

### 35.63.23 doubleValue as Double

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The double value of the control.
**Notes:** (Read and Write property)

### 35.63.24 font as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** The font used to draw text in the receiver's cell.
**Notes:** f the cell is being edited, the text in the cell is redrawn in the new font, and the cell's editor (the NSText object used globally for editing) is updated with the new font object.

(Read and Write property)

### 35.63.25 ignoresMultiClick as boolean

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver ignores multiple clicks made in rapid succession.
**Example:**

```
dim n as NSControlMBS // your control
n.ignoresMultiClick=True
```

**Notes:** True if the view ignores multiple clicks; otherwise, false.
(Read and Write property)

### 35.63.26 integerValue as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The value of the receiver's cell as an Integer value.
**Notes:** If the control contains many cells (for example, NSMatrix), then the value of the currently selected cell is returned. If the control is in the process of editing the affected cell, then it invokes the validateEditing method before extracting and returning the value.

Available in OS X v10.5 and later.
(Read and Write property)

### 35.63.27 intValue as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The integer value of the control.
**Example:**

```
dim n as new nsbuttonMBS(0,0,100,100)

n.intValue=1
MsgBox str(n.intValue) // shows 1
n.intValue=0
MsgBox str(n.intValue) // shows 0
```

**Notes:** (Read and Write property)

### 35.63.28 isContinuous as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver's cell sends its action message continuously to its target during mouse tracking.
**Notes:** True if the action message should be sent continuously; otherwise, false.
(Read and Write property)

### 35.63.29 isEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver reacts to mouse events.
**Notes:** True if the view responds to mouse events; otherwise, false.
(Read and Write property)

### 35.63.30 refusesFirstResponder as boolean

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver refuses the first responder role.
**Notes:** By default, the user can advance the focus of keyboard events between controls by pressing the Tab key; when this focus—or first responder status—is indicated for a control (by the insertion point or, for nontext controls, a faint rectangle), the user can activate the control by pressing the Space bar.
(Read and Write property)

### 35.63.31 selectedCell as NSCellMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's selected cell.
**Notes:** The default implementation of this method simply returns the control's associated cell (or nil if no cell has been set). Subclasses of NSControl that manage multiple cells (such as NSMatrix and NSForm) must override this method to return the cell selected by the user.
(Read only property)

### 35.63.32 selectedTag as Integer

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The tag of the views's selected cell.
**Notes:** (Read only property)

### 35.63.33 stringValue as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The string value of the control.
**Notes:** (Read and Write property)

### 35.63.34 tag as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The tag identifying the object.
**Notes:** You can set this property to the value you need.
(Read and Write property)

### 35.63.35 Events

### 35.63.36 Action

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** For a button if it was pressed.

### 35.63.37 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

See TextDidEndEditing for an explanation of why you may not always get one invocation of TextDidBeginEditing for each invocation of TextDidEndEditing.

### 35.63.38 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.63.39 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

Warning: In some cases, such as when editing within an instance of NSOutlineView, this method may be invoked without a previous invocation of TextDidBeginEditing. You will only get the TextDidBeginEditing: notification if the user actually types something, but you can get the TextDidEndEditing notification if the user just double-clicks the field and then clicks outside the field, without typing.

### 35.63.40 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.63.41 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.63.42 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ControlSizeLarge | 3 | One of the constants to specify a cell,Äôs size.<br>A size larger than the default control size. |
| ControlSizeMini | 2 | One of the constants to specify a cell,Äôs size.<br>The smallest control size. |
| ControlSizeRegular | 0 | One of the constants to specify a cell,Äôs size.<br>The default control size. |
| ControlSizeSmall | 1 | One of the constants to specify a cell,Äôs size.<br>A size smaller than the default control size.<br>This constant is for controls that can,Äôt be resized in one direction, such as push buttons, radio buttons, checkboxes, sliders, scroll bars, pop-up buttons, tabs, and progress indicators. Use a small system font with a small control. |

## 35.64 control NSDatePickerControlMBS

### 35.64.1 control NSDatePickerControlMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The control to put a Mac OS X date picker on a Xojo window.
**Notes:** This control embeds a special NSDatePicker subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr7

### 35.64.2 Properties

### 35.64.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.64.4 View as NSDatePickerMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSDatePicker.
**Notes:** (Read only property)

### 35.64.5 Events

### 35.64.6 Action

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.64.7 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.64.8 Close

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.64.9 Closing

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.64.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.64.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or

false to give others a chance.

### 35.64.12 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.64.13 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.64.14 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.64.15 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.64.16 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.64.17 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.64.18 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.64.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.64.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.64.21 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.64.22 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.64.23 Open

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.64.24 Opening

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.64.25 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.64.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.65 class NSDatePickerMBS

## 35.65.1 class NSDatePickerMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The plugin class for a Cocoa date picker.
**Notes:** NSDatePicker is a subclass of NSControl that provides a user interface for displaying and editing an NSDate object.
Subclass of the NSControlMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr7
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MBS Real Studio Plugins, version 12.2pr4

## 35.65.2 Methods

## 35.65.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new date picker with size 100/100 and position 0/0
**Example:**

```
dim t as new NSDatePickerMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.65.4 Constructor(Handle as Integer) 6967
- 35.65.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6968


## 35.65.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSDatePicker handle.
**Example:**

```
dim t as new NSDatePickerMBS(0, 0, 100, 100)
dim v as new NSDatePickerMBS(t.handle)
```

```
MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSDatePicker and the plugin retains this handle.
See also:


- 35.65.3 Constructor 6967
- 35.65.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6968


### 35.65.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new date picker with the given size and position.
**Example:**

```
dim x as new NSDatePickerMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.65.3 Constructor 6967
- 35.65.4 Constructor(Handle as Integer) 6967


### 35.65.6 Properties

### 35.65.7 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** See also drawsBackground property.
(Read and Write property)

### 35.65.8 Bezeled as Boolean

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver has a bezeled border.
**Notes:** True if the receiver has a bezeled border, false otherwise.

(Read and Write property)

### 35.65.9 Bordered as Boolean

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver has a plain border.
**Notes:** True if the receiver has a plain border, false otherwise.
(Read and Write property)

### 35.65.10 calendar as NSCalendarMBS

MBS MacControls Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The calendar.
**Notes:** (Read and Write property)

### 35.65.11 datePickerElements as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** A bitmask that indicates which visual elements of the date picker are currently shown, and which won't be usable because they are hidden.
**Notes:** (Read and Write property)

### 35.65.12 datePickerMode as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The date picker mode.
**Notes:** (Read and Write property)

### 35.65.13 datePickerStyle as Integer

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The date picker style.
**Notes:** (Read and Write property)

### 35.65.14 dateTimeValue as dateTime

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The current date value.
**Notes:** (Read and Write property)

### 35.65.15 dateValue as date

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The current date value.
**Notes:** For a range of dates, this is start date and you use timeInterval to get the second one.
(Read and Write property)

### 35.65.16 drawsBackground as Boolean

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver draws the background.
**Notes:** True if the receiver draws the background, false otherwise.
(Read and Write property)

### 35.65.17 locale as NSLocaleMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The locale.
**Notes:** (Read and Write property)

### 35.65.18 maxDate as date

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The maximum date.
**Notes:** nil indicates no maximum date.
(Read and Write property)

### 35.65.19 maxDateTime as dateTime

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The maximum date.
**Notes:** nil indicates no maximum date.
(Read and Write property)

### 35.65.20 minDate as date

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The minimum date.
**Notes:** nil indicates no minimum date.
(Read and Write property)

### 35.65.21 minDateTime as dateTime

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The minimum date.
**Notes:** nil indicates no minimum date.
(Read and Write property)

### 35.65.22 textColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The text color.
**Notes:** (Read and Write property)

### 35.65.23 timeInterval as Double

MBS MacControls Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The time interval that represents the date range.
**Notes:** The time interval that represents the receiver's date range. The date range begins at the date returned by dateValue. This method returns 0 when the receiver is not in the NSRangeDateMode mode.
(Read and Write property)

### 35.65.24 timeZone as NSTimeZoneMBS

MBS MacControls Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The time zone.
**Notes:** (Read and Write property)

### 35.65.25 Constants

Date Picker Style Constants

| Constant | Value | Description |
|---|---|---|
| NSClockAndCalendarDatePickerStyle | 1 | Provide a visual clock and calendar style interface. |
| NSTextFieldAndStepperDatePickerStyle | 0 | Provide a text field and stepper style interface. |
| NSTextFieldDatePickerStyle | 2 | Provide a text field interface. |

Element Flag Constants

| Constant | Value | Description |
|---|---|---|
| NSEraDatePickerElementFlag | &h100 | Display and allow editing of the era of the date, if applicable. This flag has been declared for possible future use, and does not effect. |
| NSHourMinuteDatePickerElementFlag | &hC | Display and allow editing of the hour and minute elements of th |
| NSHourMinuteSecondDatePickerElementFlag | &hE | Display and allow editing of the hour, minute and second elemen |
| NSTimeZoneDatePickerElementFlag | &h10 | Display and allow editing of the time zone. This flag has been declared for possible future use, and does not effect. |
| NSYearMonthDatePickerElementFlag | &hC0 | Display and allow editing of the year and month elements of the |
| NSYearMonthDayDatePickerElementFlag | &hE0 | Display and allow editing of the year, month and day elements o |

Date Picker Mode Constants

| Constant | Value | Description |
|---|---|---|
| NSRangeDateMode | 1 | Allow selection of a range of dates. (First implemented in Mac OS X v 10.5.) |
| NSSingleDateMode | 0 | Allow selection of a single date. |

# 35.66 class NSImageCellMBS

## 35.66.1 class NSImageCellMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** An NSImageCell object displays a single image (encapsulated in an NSImage object) in a frame.
**Notes:** This class provides methods for choosing the frame and for aligning and scaling the image to fit the frame.

The object value of an NSImageCell object must be an NSImage object, so if you use the setObjectValue: method of NSCell, be sure to supply an NSImage object as an argument. Because an NSImage object does not need to be converted for display, do not use the NSCell methods relating to formatters.

An NSImageCell object is usually associated with some kind of control object—an NSImageView, an NSMatrix, or an NSTableView.
Subclass of the NSCellMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1

## 35.66.2 Methods

## 35.66.3 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with an image.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim n as NSImageMBS = new NSImageMBS(pic)
dim c as new NSImageCellMBS(n)

Backdrop = c.image.CopyPictureWithMask
Title = c.classPath
```

See also:

- 35.66.4 Constructor(text as string) 6974

### 35.66.4 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.
**Example:**

```
dim c as new NSImageCellMBS("Hello")
MsgBox c.StringValue
```

See also:

- 35.66.3 Constructor(image as NSImageMBS) 6973

### 35.66.5 Properties

### 35.66.6 imageAlignment as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The alignment of the receiver's image relative to its frame.
**Notes:** For a list of possible values, see NSImageAlign* constants. The default value is NSImageAlignCenter.
(Read and Write property)

### 35.66.7 imageFrameStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The style of the frame that borders the image.
**Notes:** Value is one of the frame style constants. For a list of frame styles, see NSImageFrame* constants.
(Read and Write property)

### 35.66.8 imageScaling as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The scaling mode used to fit the receiver's image into the frame.
**Notes:** Value is one of the image scaling constants. For a list of possible values, see NSScale* constants.
(Read and Write property)

### 35.66.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSImageAlignBottom | 5 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom edge of the cell. |
| NSImageAlignBottomLeft | 6 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom and left edges of the cell. |
| NSImageAlignBottomRight | 7 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom and right edges of the cell. |
| NSImageAlignCenter | 0 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Center the image in the cell. |
| NSImageAlignLeft | 4 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the left edge of the cell. |
| NSImageAlignRight | 8 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Position the image along the right edge of the cell. |
| NSImageAlignTop | 1 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Position the image along the top edge of the cell. |
| NSImageAlignTopLeft | 2 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the top and left edges of the cell. |
| NSImageAlignTopRight | 3 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the top and right edges of the cell. |
| NSImageFrameButton | 4 | One of the frame constants for the imageFrameStyle property.<br>A convex bezel that makes the image stand out in relief, like a button |
| NSImageFrameGrayBezel | 2 | One of the frame constants for the imageFrameStyle property.<br>A gray, concave bezel that makes the image look sunken |
| NSImageFrameGroove | 3 | One of the frame constants for the imageFrameStyle property.<br>A thin groove that looks etched around the image |
| NSImageFrameNone | 0 | One of the frame constants for the imageFrameStyle property.<br>An invisible frame |
| NSImageFramePhoto | 1 | One of the frame constants for the imageFrameStyle property.<br>A thin black outline and a dropped shadow |

Scale Methods

| Constant | Value | Description |
|---|---|---|
| NSImageScaleAxesIndependently | 1 | Scale each dimension to exactly fit destination. This setting does not p the aspect ratio of the image. |
| NSImageScaleNone | 2 | Do not scale the image. |
| NSImageScaleProportionallyDown | 0 | If it is too large for the destination, scale the image down while preserv aspect ratio. |
| NSImageScaleProportionallyUpOrDown | 3 | Scale the image to its maximum possible dimensions while both staying the destination area and preserving its aspect ratio. |
| NSScaleNone | 2 | Do not scale the image. |
| NSScaleProportionally | 0 | If it is too large for the destination, scale the image down while preserv aspect ratio. |
| NSScaleToFit | 1 | Scale each dimension to exactly fit destination. This setting does not p the aspect ratio of the image. |

# 35.67 class NSImageViewMBS

## 35.67.1 class NSImageViewMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** An NSImageView object displays a single image from an NSImage object in a frame and can optionally allow a user to drag an image to it.
**Example:**

ImageWell1.NSImageViewMBS.alphaValue = 0.5

**Notes:** You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSControlMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- Several ways for picture to PDF in MBS Plugins
- MBS Xojo Plugins, version 21.2pr1
- Fun with ImageWell and NSImageViewMBS

## 35.67.2 Methods

## 35.67.3 Constructor

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new imageview with size 100/100 and position 0/0
**Example:**

```
dim t as new NSImageViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.67.4 Constructor(Handle as Integer) 6977
- 35.67.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6978


## 35.67.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSImageView handle.
**Example:**

```
dim t as new NSImageViewMBS(0, 0, 100, 100)
dim v as new NSImageViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSImageView and the plugin retains this handle.
See also:


- 35.67.3 Constructor 6977
- 35.67.5 Constructor(left as Double, top as Double, width as Double, height as Double) 6978


### 35.67.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new image view with the given size and position.
**Example:**

```
dim x as new NSImageViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.67.3 Constructor 6977
- 35.67.4 Constructor(Handle as Integer) 6977


### 35.67.6 Properties

### 35.67.7 allowsCutCopyPaste as Boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows the user to cut, copy and paste the image contents.
**Notes:** True if the user can cut, copy, and paste the image contents; otherwise, false to prevent the use of pasteboard operations.
(Read and Write computed property)

### 35.67.8 animates as Boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver automatically plays animated images.
**Notes:** True if the receiver automatically plays animated images; otherwise, false. The default value is true for NSImageView objects you create programmatically. For NSImageView objects loaded from a nib file, the control takes the value set in Interface Builder.

The timing and looping characteristics of the animation are taken from the image data. If this method returns false, the receiver displays the first frame of the animation only.
(Read and Write computed property)

### 35.67.9 image as NSImageMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSImage object displayed by the receiver.
**Notes:** (Read and Write computed property)

### 35.67.10 imageAlignment as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The alignment of the receiver's image relative to its frame.
**Notes:** For a list of possible values, see NSImageAlign* constants. The default value is NSImageAlignCenter.
(Read and Write computed property)

### 35.67.11 imageFrameStyle as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The style of the frame that borders the image.
**Example:**

ImageWell1.NSImageViewMBS.imageFrameStyle = NSImageViewMBS.NSImageFramePhoto

**Notes:** Value is one of the frame style constants. For a list of frame styles, see NSImageFrame* constants.
(Read and Write computed property)

### 35.67.12 imageScaling as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The scaling mode used to fit the receiver's image into the frame.
**Example:**

ImageWell1.NSImageViewMBS.imageScaling = NSImageViewMBS.NSScaleNone

**Notes:** Value is one of the image scaling constants. For a list of possible values, see NSScale* constants.
(Read and Write computed property)

### 35.67.13 isEditable as Boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can drag a new image into the frame.
**Notes:** True if the user can drag an image into the receiver's frame; otherwise, false.
(Read and Write computed property)

### 35.67.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSImageAlignBottom | 5 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom edge of the cell. |
| NSImageAlignBottomLeft | 6 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom and left edges of the cell. |
| NSImageAlignBottomRight | 7 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the bottom and right edges of the cell. |
| NSImageAlignCenter | 0 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Center the image in the cell. |
| NSImageAlignLeft | 4 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the left edge of the cell. |
| NSImageAlignRight | 8 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Position the image along the right edge of the cell. |
| NSImageAlignTop | 1 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Position the image along the top edge of the cell. |
| NSImageAlignTopLeft | 2 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the top and left edges of the cell. |
| NSImageAlignTopRight | 3 | One of the constants to specify the location of the image in the frame using the imageAlignment property.<br>Align the image with the top and right edges of the cell. |
| NSImageFrameButton | 4 | One of the frame constants for the imageFrameStyle property.<br>A convex bezel that makes the image stand out in relief, like a button |
| NSImageFrameGrayBezel | 2 | One of the frame constants for the imageFrameStyle property.<br>A gray, concave bezel that makes the image look sunken |
| NSImageFrameGroove | 3 | One of the frame constants for the imageFrameStyle property.<br>A thin groove that looks etched around the image |
| NSImageFrameNone | 0 | One of the frame constants for the imageFrameStyle property.<br>An invisible frame |
| NSImageFramePhoto | 1 | One of the frame constants for the imageFrameStyle property.<br>A thin black outline and a dropped shadow |

Scale Methods

| Constant | Value | Description |
|---|---|---|
| NSImageScaleAxesIndependently | 1 | Scale each dimension to exactly fit destination. This setting does not p the aspect ratio of the image. |
| NSImageScaleNone | 2 | Do not scale the image. |
| NSImageScaleProportionallyDown | 0 | If it is too large for the destination, scale the image down while preserv aspect ratio. |
| NSImageScaleProportionallyUpOrDown | 3 | Scale the image to its maximum possible dimensions while both staying the destination area and preserving its aspect ratio. |
| NSScaleNone | 2 | Do not scale the image. |
| NSScaleProportionally | 0 | If it is too large for the destination, scale the image down while preserv aspect ratio. |
| NSScaleToFit | 1 | Scale each dimension to exactly fit destination. This setting does not p the aspect ratio of the image. |

# 35.68 class NSMenuItemCellMBS

## 35.68.1 class NSMenuItemCellMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** NSMenuItemCell is a class that handles the measurement and display of a single menu item in its encompassing frame.
**Notes:** Instances of NSMenuItemCell work in conjunction with an NSMenuView object to control the overall appearance of the menu.
Subclass of the NSButtonCellMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr5

## 35.68.2 Methods

## 35.68.3 calcSize

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Calculates the minimum required width and height of the receiver,Äôs menu item.
**Notes:** The calculated values are cached for future use. This method also calculates the sizes of individual components of the cell,Äôs menu item and caches those values.
This method is invoked automatically when necessary. You should not need to invoke it directly.

## 35.68.4 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
**Notes:** Don't use it.
See also:

- 35.68.5 Constructor(text as string) 6983

## 35.68.5 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.68.4 Constructor(image as NSImageMBS) 6983

### 35.68.6 Properties

### 35.68.7 menuItem as NSMenuItemMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The menu item object associated with the cell.
**Notes:** (Read and Write property)

### 35.68.8 needsDisplay as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the menu item needs to be displayed.
**Notes:** Set this property to true when you want the menu item to be drawn.
(Read and Write property)

### 35.68.9 needsSizing as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the size of the menu needs to be calculated.
**Notes:** When the value of this property is true, the next attempt to obtain size information about the menu cause the calcSize method to be called. When the value of the property is false, the size information is obtained from the currently cached values.
Subclasses that drastically change the way a menu item is drawn can change the value of this property to update the menu item information. Other parts of your application should not need to change this property directly. The cell checks this value of this property as necessary when the content of its menu item changes.
(Read and Write property)

### 35.68.10 tag as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The integer tag of the selected menu item.
**Notes:** If no item is selected, the value in this property is 0.
(Read and Write property)

## 35.69 control NSOutlineControlMBS

### 35.69.1 control NSOutlineControlMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The control for a NSOutlineView.
**Notes:** Please use NSOutlineControlMBS for hierarchical lists and NSTableControlMBS for normal lists.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr4

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.3, page 10: News

### 35.69.2 Properties

### 35.69.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.69.4 allowsColumnReordering as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to rearrange columns by dragging their headers.
**Notes:** The default value of this property is true, which allows the user to rearrange the table view,Äôs columns. You can rearrange columns programmatically regardless of this setting.
(Read and Write property)

### 35.69.5 allowsColumnResizing as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to resize columns by dragging between their headers.
**Notes:** The default of this property is true, which allows the user to resize the table view,Äôs columns. You can resize columns programmatically regardless of this setting.
(Read and Write property)

### 35.69.6 allowsColumnSelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select columns by clicking their headers.
**Notes:** The default is false, which prevents the user from selecting columns (if you create the table view in Interface Builder, the default value is true). You can select columns programmatically regardless of this setting.
(Read and Write property)

### 35.69.7 allowsEmptySelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select zero columns or rows.
**Notes:** The default is true, which allows the user to select zero columns or rows.
(Read and Write property)

### 35.69.8 allowsMultipleSelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select more than one column or row at a time.
**Notes:** The default is false, which allows the user to select only one column or row at a time. You can select multiple columns or rows programmatically regardless of this setting.
(Read and Write property)

### 35.69.9 autohidesScrollers as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view automatically hides its scroll bars when they are not needed.
**Notes:** The horizontal and vertical scroll bars are hidden independently of each other. When the value of this property is YES and the content of the scroll view doesn't extend beyond the size of the clip view on a given axis, the scroller on that axis is removed to leave more room for the content.
(Read and Write property)

### 35.69.10 hasHorizontalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a horizontal scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a horizontal scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.69.11 hasVerticalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a vertical scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a vertical scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.69.12 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used in this control.
**Notes:** (Read only property)

### 35.69.13 View as NSOutlineViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The outline view used in this control.
**Notes:** (Read only property)

See also:

- 35.69.99 view(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSViewMBS 7012

### 35.69.14 Events

### 35.69.15 acceptDrop(info as NSDraggingInfoMBS, item as NSOutlineViewItemMBS, index as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drop operation was successful.
**Notes:** info: An object that contains more information about this dragging operation.
item: The parent of the item over which the cursor was placed when the mouse button was released.
index: The index of the child of item over which the cursor was placed when the mouse button was released.

Return true if the drop operation was successful, otherwise false.

The data source should incorporate the data from the dragging pasteboard in the implementation of this method. You can get the data for the drop operation from info using the draggingPasteboard method.
The return value indicates success or failure of the drag operation to the system.

### 35.69.16 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.69.17 childOfItem(index as Integer, item as NSOutlineViewItemMBS) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the child item at the specified index of a given item.
**Notes:** index: The index of the child item from item to return.
item: An item in the data source.

Return the child item at index of item. If item is nil, returns the appropriate child item of the root object.

Children of a given parent item are accessed sequentially. In order for the collapsed state of the outline view to remain consistent when it is reloaded you must always return the same object for a specified child and item.

Do not call reloadData from this method.

This event is called very frequently, so it must be efficient.

### 35.69.18 Close

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.69.19 Closing

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.69.20 ColumnDidMove(notification as NSNotificationMBS, OldColumn as Integer, NewColumn as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked whenever the user moves a column in the outline view.

### 35.69.21 ColumnDidResize(notification as NSNotificationMBS, tableColumn as NSTableColumnMBS, OldWidth as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked whenever the user resizes a column in the outline view.

### 35.69.22 concludeDragOperation(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.69.23 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.69.24 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.69.25 dataCell(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the cell to use in a given column for a given item.
**Notes:** tableColumn: The table column for which the cell is required. This value may be nil.

item: The item for which the cell is required.

Return the cell to use in column tableColumn for item item, or nil. The cell must properly implement copyWithZone (since it may be copied by by the outline view).

You can return a different data cell for any particular combination of table column and item, or a cell that will be used for the entire row (a full-width cell). If tableColumn is non-nil, you should return a cell. Typically, you should default to returning the result from [ tableColumn dataCellForRow:row ] .
When each row (identified by the item) is being drawn, this method is first called with a nil value for tableColumn. At this time, you can return a cell that is used to draw the entire row, acting like a group. If you do return a cell for the nil table column, your implementations of the other corresponding data source and delegate methods must be prepared to be invoked with a nil value for tableColumn. If do not return a cell for the nil table column, the method is called once for each column in the outline view, as usual.

### 35.69.26 didAddRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implemented to know when a new row view is added to the table.
**Notes:** rowView: The new row view.
row: The row to which the view was added.

This evemt is for NSView-based outline views. At this point, you can choose to add in extra views or modify any properties on rowView.

### 35.69.27 didClickTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button subsequently goes up in outlineView and tableColumn has been ,Äúclicked,Äù without having been dragged anywhere.

### 35.69.28 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.69.29 didDragTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button goes up in outlineView and tableColumn has been dragged during the time the mouse button was down.

### 35.69.30 didRemoveRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implemented to know when a row view is removed from the table
**Notes:** rowView: The row view that was removed.
row: The number of the row that was removed due to being moved offscreen, or -1 if the row was removed from the table so it is no longer valid.

The removed rowView may be reused by the table, so any additionally inserted views should be removed at this point.

### 35.69.31 didTile

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The tableview did tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.69.32 DoubleClick

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse made a double click.

### 35.69.33 draggingEnded(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.69.34 draggingExited(info as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.69.35 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to know when the given dragging session has ended.
**Notes:** session: The dragging session that ended.
screenPoint: The point onscreen at which the drag ended.
operation: A mask specifying the types of drag operations permitted by the dragging source.

You can implement this optional delegate method to know when the dragging source operation ended at a specific location, such as the trash (by checking for an operation of NSDragOperationDelete).

### 35.69.36 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, draggedItems() as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method know when the given dragging session is about to begin and potentially modify the dragging session.
**Notes:** session: The dragging session that is about to begin.
screenPoint: The point onscreen at which the drag is to begin.
draggedItems: A array of items to be dragged, excluding items for which pasteboardWriterForItem returns nil.

The draggedItems array directly matches the pasteboard writer array used to begin the dragging session with the NSView method beginDraggingSessionWithItems. Hence, the order is deterministic, and can be used in acceptDrop when enumerating the NSDraggingInfo protocol's pasteboard classes.

### 35.69.37 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.69.38 FocusLost

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.69.39 FocusReceived

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.

In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.69.40 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.69.41 GotFocus

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.69.42 heightOfRowByItem(item as NSOutlineViewItemMBS) as Double

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the height in points of the row containing item.
**Notes:** item: The row item.

Return the height of the row.

Values returned by this method should not include intercell spacing and must be greater than 0.
Implement this event to support an outline view with varying row heights.

For large tables in particular, you should make sure that this method is efficient. NSOutlineView may cache the values this method returns, so if you would like to change a row's height make sure to invalidate the row height by calling noteHeightOfRowsWithIndexesChanged. NSOutlineView automatically invalidates its entire row height cache in reloadData and noteNumberOfRowsChanged.

If you call viewAtColumn or rowViewAtRow within your implementation of this method, an exception is

thrown.

To avoid the possibility of a hang due to unexpected recursion, don,Äôt call geometry-calculating methods such as bounds, rectOfColumn, or any NSTableView method that calls tile within your implementation of this method.

### 35.69.43 isGroupItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean that indicates whether a given row should be drawn in the ,Äúgroup row,Äù style.
**Notes:** item: An item in the outline view.

Return true to indicate a particular row should have the "group row" style drawn for that row, otherwise false.

If the cell in that row is an instance of NSTextFieldCell and contains only a string value, the ,Äúgroup row,Äù style attributes are automatically applied for that cell.

### 35.69.44 isItemExpandable(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the a given item is expandable.
**Notes:** item: An item in the data source.

Returns true if item can be expanded to display its children, otherwise NO.

This method may be called quite often, so it must be efficient.

Do not call reloadData from this method.

### 35.69.45 ItemDidCollapse(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when the did collapse notification is posted—that is, whenever the user collapses an item in the outline view.

### 35.69.46 ItemDidExpand(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user expands an item in the outline view.

### 35.69.47 itemForPersistentObject(PersistentObject as Variant) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return the item for the archived object.
**Notes:** object: An archived representation of an item in outlineView's data source.

Return the unarchived item corresponding to object. If the item is an archived object, this method may return the object.

When the outline view is restoring the saved expanded items, this method is called for each expanded item, to translate the archived object to an outline view item.

You must implement this method if you are automatically saving expanded items (that is, if autosaveExpandedItems returns true).

### 35.69.48 ItemWillCollapse(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user is about to collapse an item in the outline view.

### 35.69.49 ItemWillExpand(notification as NSNotificationMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the user is about to expand an item in the outline view.

### 35.69.50 LeftMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.51 LeftMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the left button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.52 LeftMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.53 LostFocus

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.69.54 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.69.55 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.69.56 mouseDownInHeaderOfTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Event sent whenever the mouse button is clicked in outlineView while the cursor is in a column header tableColumn.

### 35.69.57 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.69.58 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.69.59 namesOfPromisedFilesDroppedAtDestination(dropDestination as folderItem, DraggedItems() as NSOutlineViewItemMBS) as string()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns an array of filenames for the created files that the receiver promises to create.
**Notes:** dropDestination: The drop location where the files are created.
items: The items being dragged.

Returns an array of filenames (not full paths) for the created files that the receiver promises to create.

For more information on file promise dragging, see documentation on the NSDraggingSource protocol and namesOfPromisedFilesDroppedAtDestination.

### 35.69.60 nextTypeSelectMatchFromItem(startItem as NSOutlineViewItemMBS, endItem as NSOutlineViewItemMBS, searchString as String) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the first item that matches the searchString from within the range of startItem to endItem.
**Notes:** startItem: The first item to search.
endItem: The item before which to stop searching. It is possible for endItem to be less than startItem if the search will wrap.
searchString: The string for which to search.

Returns the first item—from within the range of startItem to endItem—that matches the searchString, or nil if there is no match.

Implement this method if you want to control how type selection works. You should include startItem as a possible match, but do not include endItem.
It is not necessary to implement this event in order to support type select.

### 35.69.61 numberOfChildrenOfItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the number of child items encompassed by a given item.
**Notes:** item: An item in the data source.

Returns the number of child items encompassed by item. If item is nil, this method should return the number of children for the top-level item.

The numberOfChildrenOfItem method is called very frequently, so it must be efficient.

Do not call reloadData from this method.

### 35.69.62 objectValue(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return the data object associated with the specified item.
**Notes:** tableColumn: A column in outlineView.
item: An item in the data source in the specified tableColumn of the view.

Returns the item is located in the specified tableColumn of the view.

Do not call reloadData from this method.

### 35.69.63 Open

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.69.64 Opening

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.69.65 OtherMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed a mouse button other than the left or right one.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.66 OtherMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with a button other than the left or right button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.67 OtherMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released a mouse button other than the left or right button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.68 pasteboardWriterForItem(item as NSOutlineViewItemMBS) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to enable the table to be an NSDraggingSource that supports dragging multiple items.
**Notes:** item: The item for which to return a pasteboard writer.

Returns a NSPasteboardItem object.

If this method is implemented, then writeItems is not called.

### 35.69.69 persistentObjectForItem(item as NSOutlineViewItemMBS) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by outlineView to return an archived object for item.
**Notes:** item: The item for which to return an archived object.

Returns an archived representation of item. If the item is an archived object, this method may return the item.

When the outline view is saving the expanded items, this method is called for each expanded item, to translate the outline view item to an archived object.

You must implement this method if you are automatically saving expanded items (that is, if autosaveExpandedItems returns true).

### 35.69.70 RightMouseDown(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the view that the user has pressed the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.71 RightMouseDragged(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the right button pressed .
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.69.72 RightMouseUp(e as NSEventMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide

event from Xojo runtime.

### 35.69.73 rowViewForItem(item as NSOutlineViewItemMBS) as NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to return a custom NSTableRowView for a particular item.
**Notes:** item: The item displayed by the returned table row view.

Return an instance or subclass of NSTableRowView. If nil is returned, a NSTableRowView instance is created and used.

This method, if implemented, is only invoked for NSView-based outline views.

### 35.69.74 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.69.75 SelectionDidChange(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when the selection did change notification is posted—that is, immediately after the outline view,Äôs selection has changed.

### 35.69.76 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the proposed selection.
**Notes:** proposedSelectionIndexes: An index set containing the indexes of the proposed selection.
Return an NSIndexSet instance containing the indexes of the new selection. Return proposedSelectionIndexes if the proposed selection is acceptable, or the value of the table view,Äôs existing selection to avoid changing the selection.

This method may be called multiple times with one new index added to the existing selection to find out if a particular index can be selected when the user is extending the selection with the keyboard or mouse.

Implementation of this method is optional. If implemented, this method will be called instead of willDisplayOutlineCell.

If not implemented or returns nil, the plugin will return proposedSelectionIndexes.

### 35.69.77 SelectionIsChanging(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked when notification is posted—that is, whenever the outline view,Äôs selection changes.

### 35.69.78 selectionShouldChangeInOutlineView as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should change its selection.
**Notes:** Return true to permit outlineView to change its selection (typically a row being edited), false to deny permission.

For example, if the user is editing a cell and enters an improper value, the delegate can prevent the user from selecting or editing any other cells until a proper value has been entered into the original cell. You can implement this method for complex validation of edited rows based on the values of any of their cells.

### 35.69.79 setObjectValue(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS, value as Variant)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Set the data object for a given item in a given column.
**Notes:** object: The new value for the item.
tableColumn: A column in outlineView.
item: An item in the data source in the specified tableColumn of the view.

The item is located in the specified tableColumn of the view.

Do not call reloadData from this method.

### 35.69.80 shouldCollapseAutoExpandedItemsForDeposited(deposited as Boolean, superResult as Boolean) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether auto-expanded items should return to their original collapsed state.
**Notes:** deposited: If true, the drop terminated successfully; if false the drop failed.

Return true if auto-expanded items should return to their original collapsed state; otherwise false.

Implement this event to provide custom behavior. If the target of a drop is not auto-expanded (by hovering long enough) the drop target still gets expanded after a successful drop unless this method returns true. The default implementation returns false after a successful drop.
This method is called in a variety of situations. For example, it is called shortly after the acceptDrop method is called and also if the drag exits the outline view (exiting the view is treated the same as a failed drop). The return value of the acceptDrop method determines the incoming value of the deposited parameter.

### 35.69.81 shouldCollapseItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should collapse a given item.
**Notes:** item: The item that should collapse.

Return true to permit outlineView to collapse item, false to deny permission.

You can implement this method to disallow collapsing of specific items. For example, if the first row of your outline view should not be collapsed, your delegate method could contain this line of code:

return rowForItem(item ) <>0

### 35.69.82 shouldEdit(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMB as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should allow editing of a given item in a given table column.
**Notes:** tableColumn: The table column.
item: The item.

Returns true to permit outlineView to edit the cell specified by tableColumn and item, false to deny permission.
If this method returns true, the cell may still not be editable—for example, if you have set up a custom NSTextFieldCell as a data cell, it must return true for isEditable to allow editing.

You can implement this method to disallow editing of specific cells.

### 35.69.83 shouldExpandItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should expand a given item.
**Notes:** item: The item that should expand.

Returns true to permit outlineView to expand item, false to deny permission.
You can implement this method to disallow expanding of specific items.

### 35.69.84 shouldReorderColumn(columnIndex as Integer, newColumnIndex as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Sent to the delegate to allow or prohibit the specified column to be dragged to a new location.
**Notes:** columnIndex: The index of the column being dragged.
newColumnIndex: The proposed target index of the column.

Returns true if the column reordering should be allowed, otherwise false.

When a column is initially dragged by the user, the delegate is first called with a newColumnIndex value of -1. Returning false will disallow that column from being reordered at all. Returning true allows it to be reordered, and the delegate will be called again when the column reaches a new location.

The actual NSTableColumn instance can be retrieved from the tableColumns array.
If this method is not implemented, all columns are considered reorderable.

### 35.69.85 shouldSelectItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should select a given item.

**Notes:** item: The item.

Return true to permit outlineView to select item, false to deny permission.

You implement this event to disallow selection of particular items.
For better performance and finer grain control over the selection, use dataCell.

### 35.69.86 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the outline view should select a given table column.
**Notes:** tableColumn: The table column.

Return true to permit outlineView to select tableColumn, false to deny permission.

You can implement this method to disallow selection of specific columns.

### 35.69.87 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to control cell expansion for a specific column and item.
**Notes:** tableColumn: A table column in the outline view.
item: An item in the outline view.

Returns true to allow an expansion tooltip to appear in the column tableColumn for item item, otherwise false.

Cell expansion can occur when the mouse hovers over the specified cell and the cell contents are unable to be fully displayed within the cell. If this method returns true, the full cell contents will be shown in a special floating tool tip view, otherwise the content is truncated.

### 35.69.88 shouldShowOutlineCellForItem(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns whether the specified item should display the outline cell (the disclosure triangle).
**Notes:** item: An item in the outline view.

Returns true if the outline cell should be displayed, otherwise false.

Returning false causes frameOfOutlineCellAtRow to return NSZeroRect, hiding the cell. In addition, the row will not be collapsible by keyboard shortcuts.
This method is called only for expandable rows.

### 35.69.89 shouldTrackCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a given cell should be tracked.
**Notes:** cell: The cell used to display item item in column tableColumn
tableColumn: A table column in the outline view.
item: An item in the outline view.

Returns true if the cell should be tracked for the item item in column tableColumn, otherwise false.

Normally, only selectable or selected cells can be tracked. If you implement this method, cells which are not selectable or selected can be tracked (and vice-versa). For example, this allows you to have a button cell in a table which does not change the selection, but can still be clicked on and tracked.

### 35.69.90 shouldTypeSelectForEvent(e as NSEventMBS, searchString as String) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether type select should proceed for a given event and search string.
**Notes:** e: The event that caused the message to be sent.
searchString: The string for which searching is to proceed. The search string is nil if no type select has begun.

Return true if type select should proceed, otherwise false.

Generally, this method will be called from keyDown and the event will be a key event.

### 35.69.91 sizeToFitWidthOfColumn(Column as Integer) as Double

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to provide custom sizing behavior when a column,Äôs resize divider is double clicked.
**Notes:** column: The index of the column.

Returns the width of the specified column.

By default, NSOutlineView iterates every row in the table, accesses a cell via preparedCellAtColumn, and requests the cellSize to find the appropriate largest width to use.
For accurate results and performance, it is recommended that this method is implemented when using large tables. By default, large tables use a monte carlo simulation instead of iterating every row.

### 35.69.92 sortDescriptorsDidChange(oldDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by an outline view to notify the data source that the descriptors changed and the data may need to be resorted.
**Notes:** oldDescriptors: An array that contains the previous descriptors.

The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source does not itself manage them, you can get outlineView's current sort descriptors by sending it a sortDescriptors message.

### 35.69.93 textShouldBeginEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow.

### 35.69.94 textShouldEndEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow.

### 35.69.95 toolTipForCell(cell as NSCellMBS, byref rect as NSRectMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS, mouseLocation as NSPointMBS) as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** When the cursor pauses over a given cell, the value returned from this method is displayed in a tooltip.
**Notes:** cell: The cell for which to generate a tooltip.
rect: The proposed active area of the tooltip. To control the default active area, you can modify the rect parameter. By default, rect is computed as cell.drawingRectForBounds(cellFrame).
tc: The table column that contains cell.
item: The item for which to display a tooltip.
mouseLocation: The current mouse location in view coordinates.

If you don,Äôt want a tooltip at that location, return nil or the empty string.

### 35.69.96 typeSelectString(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns the string that is used for type selection for a given column and item.
**Notes:** tableColumn: A table column in the outline view.
item: An item in the outline view.

Return the string that is used for type selection. You may want to change what is searched for based on what is displayed, or simply return nil for that row and/or column to not be searched

Implement this method if you want to control the string that is used for type selection. You may want to change what is searched for based on what is displayed, or simply return nil to specify that the given row and/or column should not be searched. By default, all cells with text in them are searched.

The default value when this delegate method is not implemented is:

outlineView.preparedCellAtColumn(tableColumn, outlineView.rowForItem(item)).stringValue
and you can return this value from the event if you wish.

### 35.69.97 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to enable the table to update dragging items as they are dragged over the view.
**Notes:** draggingInfo: The dragging info object.

### 35.69.98 validateDrop(info as NSDraggingInfoMBS, proposedItem as NSOutlineViewItemMBS, proposedChildIndex as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Used by an outline view to determine a valid drop target.
**Notes:** info: An object that contains more information about this dragging operation.
item: The proposed parent.
index: The proposed child location.

Returns a value that indicates which dragging operation the data source will perform.

Based on the mouse position, the outline view will suggest a proposed drop location. The data source may ‚Äúretarget‚Äù a drop if desired by calling setDropItem and returning something other than NSDragOperationNone. You may choose to retarget for various reasons (for example, for better visual feedback when inserting into a sorted position).
Implementation of this method is optional.

### 35.69.99 view(tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implemented to return the view used to display the specified item and column.
**Notes:** tableColumn: The table column, or nil if the row is a group row.
item: The item displayed by the returned view.

Return the view to display the specified column and row. Returning nil is acceptable, in which case a view is not shown at that location.

This method is required if you wish to use NSView objects instead of NSCell objects for the cells within an outline view. Cells and views cannot be mixed within the same outline view.
It is recommended that the implementation of this method first call the NSTableView method makeViewWithIdentifier passing, respectively, the tableColumn parameter,Äôs identifier and self as the owner to attempt to reuse a view that is no longer visible. The frame of the view returned by this method is not important, and is automatically set by the outline view.
The view's properties should be properly set up before returning the result.
When using Cocoa bindings, this method is optional if at least one identifier has been associated with the table view at design time. If this method is not implemented, the outline view automatically calls makeViewWithIdentifier with the tableColumn parameter,Äôs identifier and the outline view,Äôs delegate as parameters, to attempt to reuse a previous view or automatically unarchive a prototype associated with the table view.
The autoresizingMask of the returned view is automatically set to NSViewHeightSizable to resize properly on row height changes.
See also:

- 35.69.13 View as NSOutlineViewMBS 6987

### 35.69.100 willDisplayCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the delegate that the cell specified by the column and item will be displayed.
**Notes:** cell: The cell.
tableColumn: The table column.
item: The item.

You can implement this method to modify cell to provide further setup for the cell in tableColumn and item. It is not safe to do drawing inside this method—you should only set up state for cell.

### 35.69.101 willDisplayOutlineCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the delegate that an outline view is about to display a cell used to draw the expansion symbol.
**Notes:** cell: The cell.
tableColumn: The table column.
item: The item.

Informs the event that outlineView is about to display cell—an expandable cell (a cell that has the expansion symbol)—for the column and item specified by tableColumn and item. The delegate can modify cell to alter

its display attributes.
This method is not invoked when outlineView is about to display a non-expandable cell.

### 35.69.102 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.69.103 willTile

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The tableview will tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.69.104 writeItems(items() as NSOutlineViewItemMBS, pasteboard as NSPasteboardMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drag operation is allowed.
**Notes:** items: An array of the items participating in the drag.
pasteboard: The pasteboard to which to write the drag data.

Returns true if the drag operation is allowed, otherwise false.

Invoked by outlineView after it has been determined that a drag should begin, but before the drag has been started.
To refuse the drag, return false. To start a drag, return true and place the drag data onto the pboard (data, owner, and so on). The drag image and other drag-related information will be set up and provided by the outline view once this call returns with true.

## 35.70 class NSOutlineViewItemMBS

### 35.70.1 class NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to subclass for your items.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr4

### 35.70.2 Methods

### 35.70.3 Constructor

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 35.70.4 sortedArrayUsingDescriptor(values() as NSOutlineViewItemMBS, sortDescriptor as NSSortDescriptorMBS) as NSOutlineViewItemMBS()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a copy of the receiving array sorted as specified by a given a sort descriptor.
**Notes:** sortDescriptor: The NSSortDescriptor objects.

Returns a copy of the receiving array sorted as specified by sortDescriptor.

### 35.70.5 sortedArrayUsingDescriptors(values() as NSOutlineViewItemMBS, sortDescriptor() as NSSortDescriptorMBS) as NSOutlineViewItemMBS()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a copy of the receiving array sorted as specified by a given array of sort descriptors.
**Notes:** sortDescriptors: An array of NSSortDescriptor objects.

Returns a copy of the receiving array sorted as specified by sortDescriptors.

The first descriptor specifies the primary key path to be used in sorting the receiving array,Äôs contents. Any subsequent descriptors are used to further refine sorting of objects with duplicate values. See NSSort-

Descriptor for additional information.

### 35.70.6 Properties

### 35.70.7 Description as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The description text property.
**Notes:** (Read only property)
See also:

- 35.70.11 Description as String 7017

### 35.70.8 Handle as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 35.70.9 valueForKey(key as String) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get/set the value for the property identified by a given key.
**Notes:** key: The name of one of the receiver's properties.
(Read and Write computed property)
See also:

- 35.70.14 valueForKey(key as string) as Variant 7018

### 35.70.10 Events

### 35.70.11 Description as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event when system queries description for object.
See also:

- 35.70.7 Description as String 7017

### 35.70.12 setValueForKey(key as string, value as Variant)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Sets the property of the receiver specified by a given key to a given value.
**Notes:** value: The value for the property identified by key.
key: The name of one of the receiver's properties.

If key identifies a to-one relationship, relate the object specified by value to the receiver, unrelating the previously related object if there was one. Given a collection object and a key that identifies a to-many relationship, relate the objects contained in the collection to the receiver, unrelating previously related objects if there were any.
The search pattern that setValueForKey uses is described in Accessor Search Patterns in Key-Value Coding Programming Guide.
In a reference-counted environment, if the instance variable is accessed directly, value is retained.

### 35.70.13 setValueForUndefinedKey(key as string, value as Variant)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by setValueForKey when it finds no property for a given key.
**Notes:** value: The value for the key identified by key.
key: A string that is not equal to the name of any of the receiver's properties.

Subclasses can override this method to handle the request in some other way. The default implementation raises an NSUndefinedKeyException.

### 35.70.14 valueForKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Return the value for the property identified by a given key.
**Notes:** key: The name of one of the receiver's properties.

Returns the value for the property identified by key.

If event is not implemented, the search pattern that valueForKey uses to find the correct value to return is described in Accessor Search Patterns in Key-Value Coding Programming Guide.
See also:

- 35.70.9 valueForKey(key as String) as Variant 7017

### 35.70.15 valueForUndefinedKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Invoked by valueForKey when it finds no property corresponding to a given key.
**Notes:** key: A string that is not equal to the name of any of the receiver's properties.

Subclasses can override this method to return an alternate value for undefined keys. The default implementation raises an NSUndefinedKeyException.

## 35.71 class NSOutlineViewMBS

### 35.71.1 class NSOutlineViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for a hierarchical list.
**Notes:** NSOutlineView is a subclass of NSTableView that uses a row-and-column format to display hierarchical data that can be expanded and collapsed, such as directories and files in a file system. A user can expand and collapse rows, edit values, and resize and rearrange columns.

Like a table view, an outline view does not store its own data, instead it retrieves data values as needed from a data source to which it has a weak reference.

MBS Plugin provides all events in NSOutlineControlMBS control.

An outline view has the following features:

- A user can expand and collapse rows.
- Each item in the outline view must be unique. In order for the collapsed state to remain consistent between reloads the item's pointer must remain the same and the item must maintain isEqual: sameness.
- The view gets data from a data source (see NSOutlineControlMBS).
- The view retrieves only the data that needs to be displayed.

Subclass of the NSTableViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr4

### 35.71.2 Methods

### 35.71.3 child(index as Integer, ofItem as NSOutlineViewItemMBS) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the specified child of an item.
**Notes:** index: The index of the child item in the parent.
item: The parent item whose child item you want to retrieve.

Returns the child item or nil if the item could not be found.

You can call this method on an outline view with either a static or dynamic data source. For an outline view whose contents are dynamic, this method may call out to the child event of the associated data source.

### 35.71.4 childIndexForItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the child index of the specified item within its parent.
**Notes:** The performance of this method is O(1) at best and O(n) at worst.

### 35.71.5 collapseItem(item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Collapses a given item.
**Notes:** If item is not expanded or not expandable, does nothing
If collapsing takes place, posts item collapse notification.
See also:

- 35.71.6 collapseItem(item as NSOutlineViewItemMBS, collapseChildren as Boolean) 7021

### 35.71.6 collapseItem(item as NSOutlineViewItemMBS, collapseChildren as Boolean)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Collapses a given item and, optionally, its children.
**Notes:** item: An item in the receiver.
Starting in OS X version 10.5, passing 'nil' will collapse each item under the root in the outline view.
collapseChildren: If true, recursively collapses item and its children. If NO, collapses item only (identical to collapseItem:).

For example, this method is invoked with the collapseChildren parameter set to true when a user Option-clicks the disclosure triangle for an item in the outline view (to collapse the item and all its contained items).
For each item collapsed, posts an item collapsed notification.
See also:

- 35.71.5 collapseItem(item as NSOutlineViewItemMBS) 7021

### 35.71.7 Constructor

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new outline view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSOutlineViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.71.8 Constructor(Handle as Integer) 7022
- 35.71.9 Constructor(left as Double, top as Double, width as Double, height as Double) 7022


### 35.71.8 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSOutlineView handle.
**Example:**

```
dim t as new NSOutlineViewMBS(0, 0, 100, 100)
dim v as new NSOutlineViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSOutlineViewMBS and the plugin retains this handle.
See also:


- 35.71.7 Constructor 7022
- 35.71.9 Constructor(left as Double, top as Double, width as Double, height as Double) 7022


### 35.71.9 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new outline view with the given size and position.
**Example:**

```
dim x as new NSOutlineViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 35.71.7 Constructor 7022
- 35.71.8 Constructor(Handle as Integer) 7022

### 35.71.10 expandItem(item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Expands a given item.
**Notes:** If item is not expandable or is already expanded, does nothing.
If expanding takes place, posts an item expanded notification.
See also:

- 35.71.11 expandItem(item as NSOutlineViewItemMBS, expandChildren as Boolean) 7023

### 35.71.11 expandItem(item as NSOutlineViewItemMBS, expandChildren as Boolean)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Expands a specified item and, optionally, its children.
**Notes:** item: An item in the receiver.
Starting in OS X version 10.5, passing 'nil' will expand each item under the root in the outline view.

expandChildren: If true, recursively expands item and its children. If false, expands item only (identical to expandItem).

For example, this method is invoked with the expandChildren parameter set to YES when a user Option-clicks the disclosure triangle for an item in the outline view (to expand the item and all its contained items).
For each item expanded, posts an item expanded notification.
See also:

- 35.71.10 expandItem(item as NSOutlineViewItemMBS) 7023

### 35.71.12 frameOfOutlineCellAtRow(row as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the frame of the outline cell for a given row.
**Notes:** row: The index of the row for which to return the frame.

Returns the frame of the outline cell for the row at index row, considering the current indentation and the value in the indentationMarkerFollowsCell property. If the row at index row is not an expandable row,

returns NSZeroRect.

You can override this method in a subclass to return a custom frame for the outline button cell. If your override returns an empty rect, no outline cell is drawn for that row. You might do that, for example, so that the disclosure triangle will not be shown for a row that should never be expanded.

### 35.71.13 insertItemsAtIndexes(indexes as NSIndexSetMBS, Parent as NSOutlineViewItemMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Inserts new items at the given indexes in the given parent with the specified optional animations.
**Notes:** indexes: Indexes at which to insert items.
parent: The parent for the items, or nil if the parent is the root.
animationOptions: Animated slide effects used when inserting items.

This method parallels the insertRowsAtIndexes method of NSTableView and is used in a way similar to the insertObjects method of NSMutableArray. The method does nothing if parent is not expanded. The actual item values are determined by the data source,Äôs child event (which is called only after endUpdates to ensure data source integrity).

NSCell-based outline views must first call beginUpdates before calling this method.

You can call this method multiple times within the same beginUpdates/endUpdates block; new insertions move previously inserted new items, just like modifying an array. Inserting an index beyond what is available throws an exception.

### 35.71.14 insertRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Private method to block you from calling this method in NSTableViewMBS.

### 35.71.15 isExpandable(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether a given item is expandable.
**Notes:** True if item is expandable—that is, item can contain other items, otherwise false.

### 35.71.16 isItemExpanded(item as NSOutlineViewItemMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether a given item is expanded.
**Notes:** True if item is expanded, otherwise false.

### 35.71.17 itemAtRow(row as Integer) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the item associated with a given row.
**Notes:** row: The index of a row in the receiver.

Returns the item associated with row.

### 35.71.18 levelForItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indentation level for a given item.
**Notes:** The indentation level for item. If item is nil (which is the root item), returns -1.
The levels are zero-based—that is, the first level of displayed items is level 0.

### 35.71.19 levelForRow(row as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indentation level for a given row.
**Notes:** The indentation level for row. For an invalid row, returns -1.
The levels are zero-based—that is, the first level of displayed items is level 0.

### 35.71.20 moveItemAtIndex(oldIndex as Integer, oldParent as NSOutlineViewItemMBS, newIndex as Integer, newParent as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Moves an item at a given index in the given parent to a new index in a new parent.
**Notes:** fromIndex: Index of the item to be moved.
oldParent: The parent of the item to be moved.
toIndex: Index in the new parent to which the item is moved.
newParent: The parent of the item after it is moved.

This method parallels the moveRowAtIndex method of NSTableView. The newParent can be the same as oldParent to reorder an item within the same parent.

NSCell-based outline views must first call beginUpdates before calling this method.

You can call this method multiple times within the same beginUpdates/endUpdates block. Moving from an invalid index, or to an invalid index, throws an exception.

### 35.71.21 moveRowAtIndex(oldIndex as Integer, newIndex as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Private method to block you from calling this method in NSTableViewMBS.

### 35.71.22 NSOutlineViewColumnDidMoveNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted whenever a column is moved by user action in an NSOutlineView object.
**Notes:** The notification object is the NSOutlineView object in which a column moved. The userInfo dictionary contains the following information:

NSOldColumn: An NSNumber object containing the integer value of the column,Äôs original index
NSNewColumn: An NSNumber object containing the integer value of the column,Äôs present index

### 35.71.23 NSOutlineViewColumnDidResizeNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted whenever a column is resized in an NSOutlineView object.
**Notes:** The notification object is the NSOutlineView object in which a column was resized. The userInfo dictionary contains the following information:

NSTableColumn: The column that was resized.

NSOldWidth: An NSNumber object containing the column,Äôs original width

### 35.71.24 NSOutlineViewDisclosureButtonKey as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** These key is used by the outline view to create disclosure buttons that collapse and expand items.
**Notes:** The normal triangle disclosure button.

### 35.71.25 NSOutlineViewItemDidCollapseNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted whenever an item is collapsed in an NSOutlineView object.
**Notes:** The notification object is the NSOutlineView object in which an item was collapsed. A collapsed item,Äôs children lose their status as being selected. The userInfo dictionary contains the following information:

NSObject: The item that was collapsed (an id)

### 35.71.26 NSOutlineViewItemDidExpandNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted whenever an item is expanded in an NSOutlineView object.
**Notes:** The notification object is the NSOutlineView object in which an item was expanded. The userInfo dictionary contains the following information:

NSObject: The item that was expanded (an id)

### 35.71.27 NSOutlineViewItemWillCollapseNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted before an item is collapsed (after the user clicks the arrow but before the item is collapsed).
**Notes:** The notification object is the NSOutlineView object that contains the item about to be collapsed. A collapsed item,Äôs children will lose their status as being selected. The userInfo dictionary contains the

following information:

NSObject: The item about to be collapsed (an id)

### 35.71.28 NSOutlineViewItemWillExpandNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted before an item is expanded (after the user clicks the arrow but before the item is collapsed).
**Notes:** The notification object is the outline view that contains an item about to be expanded. The userInfo dictionary contains the following information:

NSObject: The item that is to be expanded (an id)

### 35.71.29 NSOutlineViewSelectionDidChangeNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted after the outline view's selection changes.
**Notes:** The notification object is the outline view whose selection changed. This notification does not contain a userInfo dictionary.

### 35.71.30 NSOutlineViewSelectionIsChangingNotification as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Posted as the outline view,Äôs selection changes (while the mouse button is still down).
**Notes:** The notification object is the outline view whose selection is changing. This notification does not contain a userInfo dictionary.

### 35.71.31 NSOutlineViewShowHideButtonKey as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** These key is used by the outline view to create disclosure buttons that collapse and expand items.
**Notes:** The Show/Hide button.

### 35.71.32 numberOfChildrenOfItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of children for the specified parent item.
**Notes:** item: The parent item.

Returns the number of children associated with the parent.

You can call this method on an outline view with either a static or dynamic data source. For an outline view whose contents are dynamic, this method may call out to the numberOfChildrenOfItem event of the associated data source.

### 35.71.33 parentForItem(item as NSOutlineViewItemMBS) as NSOutlineViewItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the parent for a given item.
**Notes:** item: The item for which to return the parent.

Returns the parent for item, or nil if the parent is the root.

### 35.71.34 reloadItem(item as NSOutlineViewItemMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Reloads and redisplays the data for the given item.
**Notes:** Reloading the cell views associated with item occurs only in apps that link against macOS 10.12 and later.
This method may cause the outline view to change its selection without calling the SelectionDidChange event.
See also:

- 35.71.35 reloadItem(item as NSOutlineViewItemMBS, reloadChildren as Boolean) 7029

### 35.71.35 reloadItem(item as NSOutlineViewItemMBS, reloadChildren as Boolean)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Reloads a given item and, optionally, its children.
**Notes:** item: An item in the receiver.

Starting in OS X version 10.5, passing 'nil' will reload everything under the root in the outline view.

reloadChildren: If true, recursively reloads item and its children. If false, reloads item only (identical to reloadItem).

It is not necessary, or efficient, to reload children if the item is not expanded.
See also:

- 35.71.34 reloadItem(item as NSOutlineViewItemMBS) 7029

### 35.71.36 removeItemsAtIndexes(indexes as NSIndexSetMBS, Parent as NSOutlineViewItemMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes items at the given indexes in the given parent with the specified optional animations.
**Notes:** indexes: Indexes of the items to be removed.
parent: The parent of the items to be removed.
animationOptions: Animated slide effects used when removing items.

This method parallels the removeRowsAtIndexes method of NSTableView and is used in a way similar to the removeObjectsAtIndexes method of NSMutableArray. The method does nothing if parent is not expanded. If any of the child items is expanded, then all of its child rows are also be removed.

NSCell-based outline views must first call beginUpdates before calling this method.

You can call this method multiple times within the same beginUpdates/endUpdates block; changes work just like modifying an array. Removing an item at an index beyond what is available throws an exception.

### 35.71.37 removeRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Private method to block you from calling this method in NSTableViewMBS.

### 35.71.38 rowForItem(item as NSOutlineViewItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the row associated with a given item.
**Notes:** The row associated with item, or -1 if item is nil or cannot be found.

### 35.71.39 setDropItem(item as NSOutlineViewItemMBS, dropChildIndex as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Used to ,Äúretarget,Äù a proposed drop.
**Notes:** item: The target item.
index: The drop index.

For example, to specify a drop on someOutlineItem, you specify item as someOutlineItem and index as NSOutlineViewDropOnItemIndex. To specify a drop between child 2 and 3 of someOutlineItem, you specify item as someOutlineItem and index as 3 (children are a zero-based index). To specify a drop on an un-expandable someOutlineItem, you specify item as someOutlineItem and index as NSOutlineViewDropOnItemIndex.

### 35.71.40 Properties

### 35.71.41 autoresizesOutlineColumn as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the outline view resizes its outline column when the user expands or collapses items.
**Notes:** The outline column contains the cells with the expansion symbols and is generally the first column. The default value of this property is true, which causes the outline column to be resized.
The outline column is resized based on how many indentation levels are exposed or hidden. For example, if expanding a row exposes a single indentation level, the outline column width is increased by one indentationPerLevel.
(Read and Write property)

### 35.71.42 autosaveExpandedItems as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the expanded items are automatically saved across launches of the app.
**Notes:** When the value of this property is true, the outline view saves the state of its expanded items and restores that state the next time the user launches the app. (If the outline view,Äôs autosaveName property is nil, or if you have not implemented the itemForPersistentObject and persistentObjectForItem events, this

setting is ignored and outline information is not saved.) The configuration data is saved separately for each user and for each app. The default value of this property is NO.
You can have separate settings for the autosaveExpandedItems and autosaveTableColumns properties, so you could, for example, save expanded item information, but not table column positions.
(Read and Write property)

### 35.71.43 indentationMarkerFollowsCell as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the indentation marker symbol displayed in the outline column should be indented along with the cell contents.
**Notes:** When the value of this property is true, the indentation marker is indented along with the cell contents. When the value is false, the marker is always displayed left-justified in the column. The default value of this property is true.
(Read and Write property)

### 35.71.44 indentationPerLevel as Double

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The per-level indentation, measured in points.
**Notes:** (Read and Write property)

### 35.71.45 outlinetableColumn as NSTableColumnMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The table column in which hierarchical data is displayed.
**Notes:** Each level of hierarchical data is indented by the amount specified by the indentationPerLevel property (the default is 16.0), and decorated with the indentation marker (disclosure triangle) on rows that are expandable. Outline table column data is archived with the rest of the outline view,Äôs state information. Attempts to set the value of this property to nil are silently ignored.
(Read and Write property)

### 35.71.46 stronglyReferencesItems as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the outline view retains and releases the objects returned from its data source.

**Notes:** For Xojo applications we highly recommend to keep all items in arrays in Xojo, so they are not released by Xojo too early!

When the value of this property is true, the outline view retains and releases the objects returned to it from dataSource. When the value is NO, the outline view treats the objects as opaque items and assumes that the client has a retain on them. The default value is YES for applications linked on macOS 10.12 and later, and false for applications linked on earlier versions of macOS. If you require the legacy behavior and your app links in macOS 10.12 or later, the value of this property must be explicitly set toNO in code, because it is not encoded in the nib. In general, this is required if the items themselves create a retain cycle.
(Read and Write property)

### 35.71.47 userInterfaceLayoutDirection as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The user interface layout direction.
**Notes:** When set to NSUserInterfaceLayoutDirectionRightToLeft, the outline view displays the disclosure triangle to the right of the cell instead of the left. The default value is NSUserInterfaceLayoutDirectionLeftToRight.
(Read and Write property)

### 35.71.48 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSOutlineViewDropOnItemIndex | -1 | May be used as a valid child index of a drop target item. In this case, the drop will happen directly on the target item. |

## 35.72 class NSPathComponentCellMBS

### 35.72.1 class NSPathComponentCellMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The NSPathComponentCell class displays a component of a path.
**Notes:** An NSPathCell object manages a collection of NSPathComponentCell objects, in conjunction with an NSPathControl object, to represent a path.
Subclass of the NSTextFieldCellMBS class.
**Blog Entries**

- NSSegmentedControl and NSPathControl
- MBS Real Studio Plugins, version 12.0pr6

### 35.72.2 Methods

### 35.72.3 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.

### 35.72.4 Properties

### 35.72.5 File as folderitem

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The value of the portion of the path from the root through the component represented by the receiver.
**Notes:** (Read and Write computed property)

### 35.72.6 Image as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The image displayed for this component cell.
**Notes:** Generally, a 16-by-16–point image fits best when the path style is NSPathStyleStandard or NSPathStylePopUp, and a 14-by-14–point image is best when the path style is NSPathStyleNavigationBar.
Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.72.7 URL as string

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The value of the portion of the path from the root through the component represented by the receiver.
**Notes:** (Read and Write computed property)

## 35.73 control NSPathControlControlMBS

### 35.73.1 control NSPathControlControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a NSPathControl.
**Notes:** We know the fact, that the control wrapping the segmented control has control twice in the name. Suggestions to rename are welcome, but unlikely to happen as it would break code.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- NSSegmentedControl and NSPathControl
- MBS Xojo Plugins, version 24.0pr7

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### 35.73.2 Properties

### 35.73.3 View as NSPathControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSPathControlMBS.
**Notes:** (Read only property)

### 35.73.4 Events

### 35.73.5 Action

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.73.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.73.7 Close

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.73.8 Closing

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.73.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.73.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.73.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.73.12 DoubleClick

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a double click happened.
**Notes:** May call Action event before.

### 35.73.13 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.73.14 FocusLost

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.73.15 FocusReceived

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.73.16 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.73.17 GotFocus

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.73.18 LostFocus

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.73.19 MenuBarSelected

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.73.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.73.21 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.73.22 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.73.23 Open

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.
**Example:**

```
Sub Open() Handles Open
// set small font
Dim p As NSPathControlMBS = Me.View
p.Font = NSFontMBS.systemFontOfSize(10)
```

```
// disable focus ring
p.focusRingType = p.NSFocusRingTypeNone
End Sub
```

### 35.73.24 Opening

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.
**Example:**

```
Sub Open() Handles Open
// set small font
Dim p As NSPathControlMBS = Me.View
p.Font = NSFontMBS.systemFontOfSize(10)

// disable focus ring
p.focusRingType = p.NSFocusRingTypeNone
End Sub
```

### 35.73.25 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.73.26 willDisplayOpenPanel(openPanel as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the Open panel shown by a pop-up–style path.
**Notes:** This method is called before the Open panel is shown but after its allowed file types are set to the cell's allowed types. At this time, you can further customize the Open panel as required. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

openPanel is a NSOpenPanelMBS object.

### 35.73.27 willPopUpMenu(menu as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the menu of a pop-up–style path.
**Notes:** This event is called before the pop-up menu is shown. At this time, you can further customize the menu as required, adding and removing items. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

Menu is a NSMenuMBS object.

### 35.73.28 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.74 class NSPathControlMBS

## 35.74.1 class NSPathControlMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** NSPathControl is a subclass of NSControl that represents a file system path or virtual path.
**Notes:** The NSPathControl class uses NSPathCell to implement its user interface. NSPathControl provides cover methods for most NSPathCell methods—the cover method simply invokes the corresponding cell method. See also NSPathComponentCell, which represents individual components of the path, and two associated protocols: NSPathCellDelegate and NSPathControlDelegate.

NSPathControl has three styles represented by the NSPathStyle enumeration constants NSPathStyleStandard, NSPathStyleNavigationBar, and NSPathStylePopUp. The represented path can be a file system path or any other type of path leading through a sequence of nodes or components, as defined by the programmer.

NSPathControl automatically supports drag and drop, which can be further customized via delegate methods. To accept drag and drop, NSPathControl calls registerForDraggedTypes: with NSFilenamesPboardType and NSURLPboardType. When the URL value in the NSPathControl object changes because of an automatic drag and drop operation or the user selecting a new path via the open panel, the action is sent. On Mac OS X v10.5 the value returned by clickedPathComponentCell is nil, on Mac OS X v10.6 and later, clickedPathComponentCell returns the clicked cell.
Subclass of the NSControlMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- NSSegmentedControl and NSPathControl
- MBS Xojo Plugins, version 24.0pr7
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 12.0pr5

**Xojo Developer Magazine**

- 10.3, page 9: News

## 35.74.2 Methods

## 35.74.3 clickedPathComponentCell as NSPathComponentCellMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns component cell that was clicked.
**Notes:** The value returned is generally valid only when the action or double action is being sent.

Note: In Mac OS X 10.5 and earlier the returned value was nil if no cell had been clicked. In Mac OS X 10.6, the folder of the cell that the user selected is returned instead.

### 35.74.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new path control with size 100/100 and position 0/0
**Example:**

```
dim t as new NSPathControlMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.74.5 Constructor(Handle as Integer) 7044
- 35.74.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7044


### 35.74.5 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSPathControl handle.
**Example:**

```
dim t as new NSPathControlMBS(0, 0, 100, 100)
dim v as new NSPathControlMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSPathControl and the plugin retains this handle.
See also:


- 35.74.4 Constructor 7044
- 35.74.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7044


### 35.74.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new path control with the given size and position.
**Example:**

```
dim x as new NSPathControlMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.74.4 Constructor 7044
- 35.74.5 Constructor(Handle as Integer) 7044


### 35.74.7 pathComponentCells as NSPathComponentCellMBS()

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the NSPathComponentCell objects currently being displayed.
**Notes:** Available in Mac OS X v10.5 and later.

### 35.74.8 setDraggingSourceOperationMask(mask as Integer, local as boolean)

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Configures the default value returned from draggingSourceOperationMaskForLocal.
**Notes:** mask: The types of drag operations allowed.
isLocal: If true, mask applies when the drag destination object is in the same application as the receiver; if false, mask applies when the destination object is outside the receiver's application.

By default, draggingSourceOperationMaskForLocal returns NSDragOperationEvery when isLocal is true and NSDragOperationNone when isLocal is false.

Available in Mac OS X v10.5 and later.

### 35.74.9 setPathComponentCells(cells() as NSPathComponentCellMBS)

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the array of NSPathComponentCell objects currently being displayed.
**Notes:** cells: An array of NSPathComponentCell objects.

Each item in the array must be an instance of NSPathComponentCell or a subclass thereof. You cannot set this value to nil, but you can set it to an empty array.

Available in Mac OS X v10.5 and later.

### 35.74.10 Properties

### 35.74.11 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** By default, the background is set to a light blue color for NSPathStyleStandard and nil for the other styles. You can use NSColorMBS.clearColor to make the background transparent.
Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.74.12 File as folderitem

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The path property.
**Notes:** When setting, an array of NSPathComponentCell objects is automatically set based on the path in url. If url is a file URL (returns true from isFileURL), the images are automatically filled with file icons, if the path exists. The URL value itself is stored in the objectValue property of the cell.

See also URL property.
(Read and Write computed property)

### 35.74.13 menu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The menu used for the path control's cells.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write computed property)

### 35.74.14 pathStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The path style.
**Notes:** Either NSPathStyleStandard or NSPathStylePopUp.
(Read and Write computed property)

### 35.74.15 URL as string

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The path property.
**Notes:** When setting, an array of NSPathComponentCell objects is automatically set based on the path in url. If url is a file URL (returns true from isFileURL), the images are automatically filled with file icons, if the path exists. The URL value itself is stored in the objectValue property of the cell.

See also File property.
(Read and Write computed property)

### 35.74.16 Events

### 35.74.17 DoubleClick

MBS MacCocoa Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Called on a double click.

### 35.74.18 willDisplayOpenPanel(openPanel as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the Open panel shown by a pop-up–style path.
**Notes:** This method is called before the Open panel is shown but after its allowed file types are set to the cell's allowed types. At this time, you can further customize the Open panel as required. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

openPanel is a NSOpenPanelMBS object.

### 35.74.19 willPopUpMenu(menu as Variant)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Implement this method to customize the menu of a pop-up–style path.
**Notes:** This event is called before the pop-up menu is shown. At this time, you can further customize the menu as required, adding and removing items. This method is called only when the style is set to NSPathStylePopUp. Implementation of this method is optional.

Menu is a NSMenuMBS object.

### 35.74.20 Constants

Path Style Constants

| Constant | Value | Description |
|---|---|---|
| NSPathStyleNavigationBar | 1 | The navigation bar display style and behavior. Similar to the NSPathStyleStandard with the navigation bar drawing style. Also known as the breadcrumb style.<br>Available in Mac OS X v10.5 and later. |
| NSPathStylePopUp | 2 | The pop-up display style and behavior. Only the last path component is displayed with an icon image and component name. The full path is shown when the user clicks on the cell. If the cell is editable, a Choose item is included to enable selecting a different path.<br>Available in Mac OS X v10.5 and later. |
| NSPathStyleStandard | 0 | The standard display style and behavior. All path component cells are displayed with an icon image and component name. If the path can not fully be displayed, the middle parts are truncated as required.<br>Available in Mac OS X v10.5 and later. |

## 35.75 class NSPopUpButtonCellMBS

### 35.75.1 class NSPopUpButtonCellMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSPopUpButtonCell class defines the visual appearance of pop-up buttons that display pop-up or pull-down menus.
**Notes:** Pop-up menus present the user with a set of choices, much the way radio buttons do, but using much less space. Pull-down menus also provide a set of choices but present the information in a slightly different way, usually to provide a set of commands from which the user can choose.

The NSPopUpButtonCellMBS class implements the user interface for the NSPopUpButtonMBS class.
Changes made to a menu (such as adding, removing, or changing the items) are not apparent while the menu is being displayed or interacted with.
Subclass of the NSMenuItemCellMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr5

### 35.75.2 Methods

### 35.75.3 addItemsWithTitles(itemTitles() as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds multiple items to the end of the menu.
**Notes:** itemTitles: An array of strings containing the titles of the items you want to add. Each string in the array should be unique. If an item with the same title already exists in the menu, the existing item is removed and the new one is added.

The new menu items use the pop-up button,Äôs default action and target, but you can change these using the setAction: and setTarget: methods of the corresponding NSMenuItem object.

If you want to move an item, it,Äôs better to invoke removeItemWithTitle: explicitly and then call this method. After adding the items, this method uses the synchronizeTitleAndSelectedItem method to make sure the item being displayed matches the currently selected item.

Because this method searches for duplicate items, it should not be used if you are adding items to an already populated menu with more than a few hundred items. In a situation like this, add items directly to the receiver's menu instead.

### 35.75.4 addItemWithTitle(title as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Adds an item with the specified title to the end of the menu.
**Notes:** title: The title of the new menu item. If an item with the same title already exists in the menu, the existing item is removed and the new one is added.

The menu item uses the pop-up button,Äôs default action and target, but you can change these using the setAction: and setTarget: methods of the corresponding NSMenuItemMBS object.
Because this method searches for duplicate items, it should not be used if you are adding an item to an already populated menu with more than a few hundred items. In a situation like this, add items directly to the button's menu instead.

### 35.75.5 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
See also:

- 35.75.6 Constructor(text as string, pullsDown as boolean) 7050

### 35.75.6 Constructor(text as string, pullsDown as boolean)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSPopUpButtonCell object initialized with the specified title.
See also:

- 35.75.5 Constructor(image as NSImageMBS) 7050

### 35.75.7 dismissPopUp

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Dismisses the pop-up button,Äôs menu by ordering its window out.
**Notes:** If the pop-up button was not displaying its menu, this method does nothing.
You normally do not call this method explicitly. It is called by the Application Kit automatically to dismiss the menu for the pop-up button.

### 35.75.8 indexOfItem(item as NSMenuItemMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the specified menu item.
**Notes:** item: The menu item whose index you want.

Returns the index of the item or -1 if no such item was found.

### 35.75.9 indexOfItemWithTag(tag as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the menu item with the specified tag.
**Notes:** tag: The tag of the menu item you want.

Returns the index of the item or -1 if no item with the specified tag was found.

Tags are values your application assigns to an object to identify it. You can assign tags to menu items using the tag property of NSMenuItemMBS.

### 35.75.10 indexOfItemWithTitle(title as String) as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the item with the specified title.
**Notes:** title: The title of the item you want. You must not pass nil for this parameter.

Returns the index of the item or -1 if no item with the specified title was found.

### 35.75.11 insertItemWithTitle(title as string, atIndex as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Inserts an item at the specified position in the menu.
**Notes:** title: The title of the new item. If an item with the same title already exists in the menu, the existing item is removed and the new one is added
index: The zero-based index at which to insert the item. Specifying 0 inserts the item at the top of the menu.

The value in index must represent a valid position in the array. The menu item at index and all those that

follow it are shifted down one slot to make room for the new menu item.
This method assigns the pop-up button,Äôs default action and target to the new menu item. This triggers the action event of the NSActionCellMBS.

Because this method searches for duplicate items, it should not be used if you are adding an item to an already populated menu with more than a few hundred items. In a situation like this, add items directly to the button's menu instead.

### 35.75.12 itemArray as NSMenuItemMBS()

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** An array of NSMenuItemMBS objects that represent the items in the menu.

### 35.75.13 itemAtIndex(Index as Integer) as NSMenuItemMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item at the specified index.
**Notes:** index: The index of the item you want. The specified index must refer to an existing menu item.

Returns the menu item, or nil if no item exists at the specified index.

### 35.75.14 itemTitleAtIndex(Index as Integer) as String

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the title of the item at the specified index.
**Notes:** index: The index of the item you want.

Returns the title of the item, or an empty string if no item exists at the specified index.

### 35.75.15 itemTitles as String()

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** An array of strings containing the titles of every item in the menu.
**Notes:** The titles appear in the order in which the items appear in the menu. If the menu contains separator items, the array contains an empty string ("") for each separator item.

### 35.75.16 itemWithTitle(title as String) as NSMenuItemMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item with the specified title.
**Notes:** title: The title of the menu item you want.

Returns the menu item, or nil if no item with the specified title exists in the menu.

### 35.75.17 removeAllItems

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes all items in the receiver,Äôs item menu.

### 35.75.18 removeItemAtIndex(Index as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item at the specified index.
**Notes:** index: The zero-based index indicating which item to remove. Specifying 0 removes the item at the top of the menu. The index must be valid and non-negative.

### 35.75.19 removeItemWithTitle(title as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item with the specified title from the menu.
**Notes:** title: The title of the item you want to remove. If no menu item exists with the specified title, this method triggers an assertion.

### 35.75.20 selectItem(item as NSMenuItemMBS)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the specified menu item.
**Notes:** item: The menu item to select, or nil if you want to deselect all menu items.

By default, selecting or deselecting a menu item from a pop-up menu changes its state. Selecting a menu item from a pull-down menu does not automatically alter the state of the item. To disassociate the current

selection from the state of menu items, set the altersStateOfSelectedItem property to NO.

### 35.75.21 selectItemAtIndex(Index as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the item in the menu at the specified index.
**Notes:** index: The index of the item you want to select, or -1 you want to deselect all menu items.

By default, selecting or deselecting a menu item from a pop-up menu changes its state. Selecting a menu item from a pull-down menu does not automatically alter the state of the item. To disassociate the current selection from the state of menu items, set the altersStateOfSelectedItem property to false.
Subclassers can override this method to catch all select calls.

### 35.75.22 selectItemWithTag(tag as Integer) as boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the menu item with the specified tag.
**Notes:** tag: The tag of the item you want to select.

Returns true if the item was successfully selected; otherwise, false.

If no item with the specified tag is found, this method returns false and leaves the menu state unchanged. You typically assign tags to menu items from Interface Builder, but you can also assign them programmatically using the tag property of NSMenuItemMBS.

### 35.75.23 selectItemWithTitle(title as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the item with the specified title.
**Notes:** title: The title of the item to select. If you specify nil, an empty string, or a string that does not match the title of a menu item, this method deselects the currently selected item.

By default, selecting or deselecting a menu item changes its state. To disassociate the current selection from the state of menu items, set the altersStateOfSelectedItem property to false.

### 35.75.24 setTitle(title as string)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the string displayed in the receiver when the user isn,Äôt pressing the mouse button.
**Notes:** title: The string to display.

For pull-down menus that get their titles from a menu item, this method simply sets the pop-up button cell,Äôs menu item to the first item in the menu. For pop-up menus, if a menu item whose title matches aString exists, this method makes that menu item the current selection; otherwise, it creates a new menu item with the title aString, adds it to the pop-up menu, and selects it.

### 35.75.25 synchronizeTitleAndSelectedItem

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Synchronizes the the pop-up button,Äôs displayed item with the currently selected menu item.
**Notes:** If no item is currently selected, this method synchronizes the pop-up buttons displayed item with the first menu item. If the pop-up button cell does not get its displayed item from a menu item, this method does nothing.
For pull-down menus, this method sets the displayed item to the title first menu item.
If the pop-up button,Äôs menu does not contain any menu items, this method sets the pop-up button,Äôs displayed item to nil, resulting in nothing being displayed in the control.

### 35.75.26 Properties

### 35.75.27 altersStateOfSelectedItem as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates if the pop-up button links the state of the selected menu item to the current selection.
**Notes:** When the value of this property is true (which is the default value), the state of the selected item is set to NSOnState. When the value of this property is false, the items in the menu are left alone. When you change the value of this property, the state of the currently selected item is updated appropriately.
Note that this property affects only pop-up buttons (it is ignored for pull-down menus).
(Read and Write property)

### 35.75.28 arrowPosition as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The position of the arrow displayed on the button.
**Notes:** When the value of this property is NSPopUpNoArrow, the control displays no arrow. NSPopUpArrowAtCenter displays the arrow centered horizontally within the cell and NSPopUpArrowAtBottom displays the arrow at the edge of the cell. This property is used with preferredEdge to determine the exact location and orientation of the arrow.
This property applies to only bezel style and borderless pop-up buttons.
(Read and Write property)

### 35.75.29 autoenablesItems as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates if the button automatically enables and disables its items every time a user event occurs.
**Notes:** When the value of this property is true, the button automatically enables and disables items. The default value is true. For more information about enabling and disabling menu items, see NSMenuValidation.
(Read and Write property)

### 35.75.30 indexOfSelectedItem as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The index of the item last selected by the user.
**Notes:** The value of this property is the index of the selected item, or -1 if no item is selected.
(Read only property)

### 35.75.31 lastItem as NSMenuItemMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The last item in the menu.
**Notes:** (Read only property)

### 35.75.32 menu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The pop-up button,Äôs associated menu.
**Notes:** (Read and Write property)

### 35.75.33 numberOfItems as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The number of items in the menu.
**Notes:** (Read only property)

### 35.75.34 preferredEdge as Integer

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The edge of the cell from which the menu should pop out when screen conditions are restrictive.
**Notes:** At display time, if attaching the menu to the preferred edge would cause part of the menu to be obscured, the pop-up button may use a different edge. If no preferred edge is set, the pop-up button uses the bottom edge by default, which is NSMaxYEdge for flipped views or NSMinYEdge for unflipped views. Additional values for this property include NSMinXEdge and NSMaxXEdge.
The exact location of the arrow is determined by examining the value of this property and arrowPosition.

If the arrow position is NSPopUpArrowAtCenter, the arrow stays in the center of the button and the value of this property determines which edge the arrow points to: NSMinXEdge points to the left, NSMaxYEdge points to the top, NSMaxXEdge points to the right, and NSMinYEdge points to the bottom.

If the arrow position is NSPopUpArrowAtBottom, the value of this property determines which edge at which the arrow is placed: NSMinXEdge places the arrow at the center of the left side, pointing to the left, NSMinYEdge places the arrow at bottom right corner, pointing up, NSMaxXEdge places the arrow at the center of the right side, pointing to the right, and NSMaxYEdge places the arrow at the bottom right corner, pointing down.
(Read and Write property)

### 35.75.35 pullsDown as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates the behavior of the button,Äôs menu.
**Notes:** When the value of this property is true, the menu behaves like a pull-down menu; when the value is false, it behaves like a pop-up menu. If you use this property to change the menu type from a pop-up menu to a pull-down menu, and the cell alters the state of its selected items, the state of the currently selected item is set to NSOffState before the menu type is changed.
(Read and Write property)

### 35.75.36 selectedItem as NSMenuItemMBS

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The menu item last selected by the user.
**Notes:** The value of this property is the menu item that is currently selected, or nil if no item is selected. The last selected menu item is the one that was highlighted when the user released the mouse button. It is possible for a pull-down menu,Äôs selected item to be its first item.
(Read only property)

### 35.75.37 titleOfSelectedItem as String

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The title of the item last selected by the user.
**Notes:** The value of this property is the title of the selected menu item, or an empty string if no item is selected.
(Read only property)

### 35.75.38 usesItemFromMenu as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates if the control uses an item from the menu for its own title.
**Notes:** When the value of this property is true, a pull-down menu uses the title of the first menu item, and a pop-up menu uses the title of the currently selected menu (if no menu item is selected, the pop-up button displays no item and is drawn empty). When the value is false, the menu item set with menuItem (NSMenuItemMBS) is always displayed. The default value is true.
(Read and Write property)

### 35.75.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSPopUpArrowAtBottom | 2 | One of the arrowPosition constants.<br>Arrow is drawn at the edge of the button, pointing toward the preferredEdge. |
| NSPopUpArrowAtCenter | 1 | One of the arrowPosition constants.<br>Arrow is centered vertically, pointing toward the preferredEdge. |
| NSPopUpNoArrow | 0 | One of the arrowPosition constants.<br>Does not display any arrow in the control. |

## 35.76 control NSPopUpButtonControlMBS

### 35.76.1 control NSPopUpButtonControlMBS

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSPopUpButtonControl.
**Notes:** This control embeds a special NSPopUpButtonControl subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.2pr6

### 35.76.2 Properties

### 35.76.3 View as NSPopUpButtonMBS

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.76.4 Events

### 35.76.5 Action

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The action event.

### 35.76.6 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.76.7 Close

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.76.8 Closing

Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.76.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.76.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.76.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.76.12 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.76.13 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.76.14 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.76.15 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.76.16 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.76.17 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.76.18 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.76.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.76.20 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.76.21 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.76.22 Open

MBS MacControls Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.76.23 Opening

Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.76.24 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.76.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.77 class NSPopUpButtonMBS

## 35.77.1 class NSPopUpButtonMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** An NSPopUpButton object controls a pop-up menu or a pull-down menu from which a user can select an item.
**Example:**

```
// get cocoa view for the popupmenu
dim p as NSPopUpButtonMBS = PopupMenu1.NSPopUpButtonMBS

// find a menu entry
dim it as NSMenuItemMBS = p.itemAtIndex(0)

// get a picture
dim pic as Picture = LogoMBS(500)
dim img as new NSImageMBS(pic)
img.setSize 16,16

// and assign icon
it.image = img
```

**Notes:** The NSPopUpButton class defines objects that implement the pop-up and pull-down menus of the graphical user interface.

An NSPopUpButton object uses an NSPopUpButtonCell object to implement its user interface.

Note that while a menu is tracking, adding, removing, or changing items on the menu is not reflected.
Subclass of the NSButtonMBS class.
**Blog Entries**

- Apply fonts to font PopupMenu
- MBS Xojo / Real Studio Plugins, version 14.3pr4
- More notes

## 35.77.2 Methods

## 35.77.3 addItemsWithTitles(titles() as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds multiple items to the end of the menu.
**Notes:** temTitles: An array of strings containing the titles of the items you want to add. Each string in the array should be unique. If an item with the same title already exists in the menu, the existing item is removed and the new one is added.

If you want to move an item, it's better to invoke removeItemWithTitle: explicitly and then send this method. After adding the items, this method uses the synchronizeTitleAndSelectedItem method to make sure the item being displayed matches the currently selected item.

Since this method searches for duplicate items, it should not be used if you are adding items to an already populated menu with more than a few hundred items. Add items directly to the receiver's menu instead.

### 35.77.4 addItemWithTitle(title as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds an item with the specified title to the end of the menu.
**Notes:** title: The title of the menu-item entry. If an item with the same title already exists in the menu, the existing item is removed and the new one is added.

If you want to move an item, it's better to invoke removeItemWithTitle explicitly and then send this method. After adding the item, this method calls the synchronizeTitleAndSelectedItem method to make sure the item being displayed matches the currently selected item.

Since this method searches for duplicate items, it should not be used if you are adding an item to an already populated menu with more than a few hundred items. Add items directly to the receiver's menu instead.

### 35.77.5 Constructor

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with size 100/100 and position 0/0
**Example:**

```
dim t as new NSPopUpButtonMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.77.6 Constructor(Handle as Integer) 7067
- 35.77.7 Constructor(left as Double, top as Double, width as Double, height as Double) 7067

- 35.77.8 Constructor(left as Double, top as Double, width as Double, height as Double, pullsDown as boolean) 7068


### 35.77.6 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSPopUpButton handle.
**Example:**

```
dim t as new NSPopUpButtonMBS(0, 0, 100, 100)
dim v as new NSPopUpButtonMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSPopUpButton and the plugin retains this handle.
See also:


- 35.77.5 Constructor 7066
- 35.77.7 Constructor(left as Double, top as Double, width as Double, height as Double) 7067
- 35.77.8 Constructor(left as Double, top as Double, width as Double, height as Double, pullsDown as boolean) 7068


### 35.77.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new popup button with the given size and position.
**Example:**

```
dim x as new NSPopUpButtonMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.77.5 Constructor 7066
- 35.77.6 Constructor(Handle as Integer) 7067
- 35.77.8 Constructor(left as Double, top as Double, width as Double, height as Double, pullsDown as boolean) 7068

### 35.77.8 Constructor(left as Double, top as Double, width as Double, height as Double, pullsDown as boolean)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates an NSPopUpButton object initialized to the specified dimensions.
**Notes:** left,top,width,height: The frame rectangle for the button, specified in the parent view's coordinate system.

pullsDown: true if you want the receiver to display a pull-down menu; otherwise, false if you want it to display a pop-up menu.
See also:


- 35.77.5 Constructor 7066
- 35.77.6 Constructor(Handle as Integer) 7067
- 35.77.7 Constructor(left as Double, top as Double, width as Double, height as Double) 7067


### 35.77.9 indexOfItem(item as NSMenuItemMBS) as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the specified menu item.
**Notes:** item: The menu item whose index you want.

Returns the index of the item or -1 if no such item was found.
This method invokes the method of the same name of its NSPopUpButtonCell object.

### 35.77.10 indexOfItemWithTag(tag as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the menu item with the specified tag.
**Notes:** tag: The tag of the menu item you want.

Returns the index of the item or -1 if no item with the specified tag was found.

This method invokes the method of the same name of its NSPopUpButtonCell object.

### 35.77.11 indexOfItemWithTitle(title as string) as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the item with the specified title.
**Notes:** title: The title of the item you want.

Returns the index of the item or -1 if no item with the specified title was found.

### 35.77.12 indexOfSelectedItem as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the item last selected by the user.
**Notes:** The index of the selected item, or -1 if no item is selected.

### 35.77.13 insertItemWithTitle(title as string, atIndex as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Inserts an item at the specified position in the menu.
**Notes:** title: The title of the new item. If an item with the same title already exists in the menu, the existing item is removed and the new one is added

index: The zero-based index at which to insert the item. Specifying 0 inserts the item at the top of the menu.

If you want to move an item, it's better to invoke removeItemWithTitle: explicitly and then send this method. After adding the item, this method uses the synchronizeTitleAndSelectedItem method to make sure the item displayed matches the currently selected item.

Since this method searches for duplicate items, it should not be used if you are adding an item to an already populated menu with more than a few hundred items. Add items directly to the receiver's menu instead.

### 35.77.14 itemAtIndex(index as Integer) as NSMenuItemMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item at the specified index.
**Notes:** index: The index of the item you want.

Returns the menu item, or nil if no item exists at the specified index.

### 35.77.15 itemWithTitle(title as string) as NSMenuItemMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item with the specified title.
**Notes:** title: The title of the menu item you want.

The menu item, or nil if no item with the specified title exists in the menu.

### 35.77.16 lastItem as NSMenuItemMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the last item in the menu.

### 35.77.17 removeAllItems

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes all items in the receiver's item menu.
**Notes:** After removing the items, this method uses the synchronizeTitleAndSelectedItem method to refresh the menu.

### 35.77.18 removeItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item at the specified index.
**Notes:** index: The zero-based index indicating which item to remove. Specifying 0 removes the item at the top of the menu.

After removing the item, this method uses the synchronizeTitleAndSelectedItem method to make sure the title displayed matches the currently selected item.

### 35.77.19 removeItemWithTitle(title as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item with the specified title from the menu.
**Notes:** title: The title of the item you want to remove. If no menu item exists with the specified title, this method triggers an assertion.

This method removes the first item it finds with the specified name. This method then uses synchronizeTitleAndSelectedItem to refresh the menu.

### 35.77.20 selectItem(item as NSMenuItemMBS)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the specified menu item.
**Notes:** item: The menu item to select, or nil if you want to deselect all menu items.

### 35.77.21 selectItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the item in the menu at the specified index.
**Notes:** index: The index of the item you want to select, or -1 you want to deselect all menu items.

### 35.77.22 selectItemWithTag(tag as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the menu item with the specified tag.
**Notes:** tag: The tag of the item you want to select.

Returns true if the item was successfully selected; otherwise, false.

If no item with the specified tag is found, this method returns false and leaves the menu state unchanged.

You typically assign tags to menu items from Interface Builder, but you can also assign them programmatically using the setTag: method of NSMenuItem.

Available in Mac OS X v10.4 and later.

### 35.77.23 selectItemWithTitle(title as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the item with the specified title.
**Notes:** title: The title of the item to select. If you specify an empty string, or a string that does not match the title of a menu item, this method deselects the currently selected item.

### 35.77.24 setTitle(title as string)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the string displayed in the receiver when the user isn't pressing the mouse button.
**Notes:** If the receiver displays a pop-up menu, this method changes the current item to be the item with the specified title, adding a new item by that name if one does not already exist. If the receiver displays a pull-down list, this method sets its title to the specified string.

### 35.77.25 synchronizeTitleAndSelectedItem

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Ensures that the item being displayed by the receiver agrees with the selected item.
**Notes:** If there's no selected item, this method selects the first item in the item menu and sets the receiver's item to match. For pull-down menus, this method makes sure that the first item is being displayed (the NSPopUpButtonCell object must be set to use the selected menu item, which happens by default).

### 35.77.26 titleOfSelectedItem as string

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the title of the item last selected by the user.
**Notes:** Returns the title of the selected menu item, or an empty string if no item is selected.

### 35.77.27 Properties

### 35.77.28 arrowPosition as Integer

MBS MacControls Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The position of the arrow displayed.
**Notes:** If you specify NSPopUpNoArrow, the receiver displays no arrow. NSPopUpArrowAtCenter displays the arrow centered horizontally within the cell. NSPopUpArrowAtBottom displays the arrow at the edge of the cell. This method works with setPreferredEdge: to determine the exact location and orientation of the arrow. For more information, see setPreferredEdge:.

This method is ignored unless the receiver is a pull-down list with a beveled border.
(Read and Write property)

### 35.77.29 autoenablesItems as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver automatically enables and disables its items every time a user event occurs.
**Notes:** true if the receiver automatically enables and disables items; otherwise, false. The default value is true.
(Read and Write property)

### 35.77.30 menu as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the pop-up button's associated menu.
**Notes:** (Read and Write property)

### 35.77.31 numberOfItems as Integer

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in the menu.
**Notes:** (Read only property)

### 35.77.32 pullsDown as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating the behavior of the control's menu.
**Notes:** True if the menu behaves like a pull-down menu; otherwise, false if it behaves like a pop-up menu.
(Read and Write property)

### 35.77.33 selectedItem as NSMenuItemMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item last selected by the user.
**Notes:** Returns the menu item that is currently selected, or nil if no item is selected.

The last selected menu item is the one that was highlighted when the user released the mouse button. It is possible for a pull-down menu's selected item to be its first item.
(Read and Write computed property)

### 35.77.34 Constants

Arrow Position Constants

| Constant | Value | Description |
|---|---|---|
| NSPopUpArrowAtBottom | 2 | Arrow is drawn at the edge of the button, pointing toward the preferredEdge. |
| NSPopUpArrowAtCenter | 1 | Arrow is centered vertically, pointing toward the preferredEdge. |
| NSPopUpNoArrow | 0 | Does not display any arrow in the receiver. |

# 35.78 class NSProgressIndicatorMBS

## 35.78.1 class NSProgressIndicatorMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The NSProgressIndicator class lets an application display a progress indicator to show that a lengthy task is under way.
**Notes:** Some progress indicators are indeterminate and do nothing more than spin to show that the application is busy. Others are determinate and show the percentage of the task that has been completed.

This also eliminates the hung appearance is you move the window or open a menu. Unlike the RB progress controls that pause when you do these things, the Cocoa version continues to update.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

## 35.78.2 Methods

## 35.78.3 Constructor

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new progress indicator with size 100/100 and position 0/0
**Example:**

```
dim t as new NSProgressIndicatorMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.78.4 Constructor(Handle as Integer) 7076
- 35.78.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7076

### 35.78.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSProgressIndicator handle.
**Example:**

```
dim t as new NSProgressIndicatorMBS(0, 0, 100, 100)
dim v as new NSProgressIndicatorMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSProgressIndicator and the plugin retains this handle.
See also:


- 35.78.3 Constructor 7075
- 35.78.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7076


### 35.78.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new progress indicator with the given size and position.
**Example:**

```
dim x as new NSProgressIndicatorMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.78.3 Constructor 7075
- 35.78.4 Constructor(Handle as Integer) 7076


### 35.78.6 incrementBy(delta as Double)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Advances the progress bar of a determinate progress indicator by the specified amount.
**Notes:** The amount by which to increment the progress bar. For example, if you want to advance a progress bar from 0.0 to 100.0 in 20 steps, you would invoke incrementBy 20 times with a delta value of 5.0.

### 35.78.7 sizeToFit

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method resizes the receiver to an appropriate size depending on what style returns.
**Notes:** Use this after you set style to re-size the receiver.

### 35.78.8 startAnimation

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Starts the animation of an indeterminate progress indicator.
**Notes:** Does nothing for a determinate progress indicator.

### 35.78.9 stopAnimation

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Stops the animation of an indeterminate progress indicator.
**Notes:** Does nothing for a determinate progress indicator.

### 35.78.10 Properties

### 35.78.11 controlSize as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The size of the receiver.
**Notes:** (Read and Write computed property)

### 35.78.12 controlTint as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's control tint.
**Notes:** (Read and Write computed property)

### 35.78.13 doubleValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A value that indicates the current extent of the progress bar of a determinate progress indicator.
**Notes:** The value representing the current extent of a determinate progress bar. For example, a determinate progress indicator goes from 0.0 to 100.0 by default. If the progress bar has advanced halfway across the view, the value returned by doubleValue would be 50.0. An indeterminate progress indicator does not use this value.
(Read and Write computed property)

### 35.78.14 isBezeled as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver's frame has a bezel.
**Notes:** True if the receiver's frame has a three-dimensional bezel; otherwise, false.
(Read and Write computed property)

### 35.78.15 isDisplayedWhenStopped as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver shows itself even when it's not animating.
**Notes:** True if the progress indicator shows itself even when it's not animating. By default, this returns returns true if style is NSProgressIndicatorBarStyle and false if style isNSProgressIndicatorSpinningStyle.
(Read and Write computed property)

### 35.78.16 isIndeterminate as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver is indeterminate.
**Notes:** This method only has an effect if style returns NSProgressIndicatorBarStyle. If style returns NSProgressIndicatorSpinningStyle, the indicator is always indeterminate, regardless of what you pass to this method.
(Read and Write computed property)

### 35.78.17 maxValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value for the receiver.
**Notes:** The maximum value of the progress indicator. An indeterminate progress indicator does not use this value.
(Read and Write computed property)

### 35.78.18 minValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The minimum value for the receiver.
**Notes:** An indeterminate progress indicator does not use this value.
(Read and Write computed property)

### 35.78.19 style as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The style of the progress indicator (bar or spinning).
**Notes:** Either NSProgressIndicatorBarStyle or NSProgressIndicatorSpinningStyle.
(Read and Write computed property)

### 35.78.20 usesThreadedAnimation as boolean

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A hint as to whether the receiver should implement animation of the progress indicator in a separate thread.
**Notes:** Value is true to indicate that animation of the progress indicator should occur in a separate thread; otherwise, false. This value is only a hint and may be ignored.

If the application becomes multithreaded as a result of an invocation of this method, the application's performance could become noticeably slower.
(Read and Write computed property)

### 35.78.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBlueControlTint | 1 | One of the constants to specify a the control tint.<br>Aqua control tint |
| NSClearControlTint | 7 | One of the constants to specify a the control tint.<br>Clear control tint |
| NSDefaultControlTint | 0 | One of the constants to specify a the control tint.<br>The current default tint setting |
| NSGraphiteControlTint | 6 | One of the constants to specify a the control tint.<br>Graphite control tint |
| NSMiniControlSize | 2 | One of the values for the ControlSize property.<br>The control has a smaller size than NSSmallControlSize. |
| NSProgressIndicatorBarStyle | 0 | One of the constants for the style property.<br>A rectangular indicator that can be determinate or indeterminate |
| NSProgressIndicatorPreferredAquaThickness | 12 | One of the constants to specify the height of a progress indicator. |
| NSProgressIndicatorPreferredLargeThickness | 18 | One of the constants to specify the height of a progress indicator. |
| NSProgressIndicatorPreferredSmallThickness | 10 | One of the constants to specify the height of a progress indicator. |
| NSProgressIndicatorPreferredThickness | 14 | One of the constants to specify the height of a progress indicator. |
| NSProgressIndicatorSpinningStyle | 1 | One of the constants for the style property.<br>A small square indicator that can be indeterminate only . |
| NSRegularControlSize | 0 | One of the values for the ControlSize property.<br>The control is sized as regular. |
| NSSmallControlSize | 1 | One of the values for the ControlSize property.<br>This constant is for controls that cannot be resized in one direct<br>push buttons, radio buttons, checkboxes, sliders, scroll bars, pop<br>tabs, and progress indicators. You should use a small system font<br>control. |

# 35.79 class NSScrollerMBS

## 35.79.1 class NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** An NSScroller object controls scrolling of a document view within an NSScrollView's clip view (or potentially another kind of container view).
**Notes:** It typically displays a pair of buttons that the user can click to scroll by a small amount (called a line increment or decrement) and Alt-click to scroll by a large amount (called a page increment or decrement), plus a slot containing a knob that the user can drag directly to the desired location. The knob indicates both the position within the document view and, by varying in size within the slot, the amount visible relative to the size of the document view. You can configure whether an NSScroller object uses scroll buttons, but it always draws the knob when there's room for it.

Don't use an NSScroller when an NSSlider would be better. A slider represents a range of values for something in the application and lets the user choose a setting. A scroller represents the relative position of the visible portion of a view and lets the user choose which portion to view.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSControlMBS class.
**Blog Entries**

- Tip of the day: Autohide scrollbar
- Custom Scrollbars for Real Studio Cocoa Apps
- MBS Real Studio Plugins, version 11.3pr1
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

## 35.79.2 Methods

## 35.79.3 checkSpaceForParts

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Checks to see if there is enough room in the receiver to display the knob and buttons.
**Notes:** usableParts returns the state calculated by this method. You should never need to invoke this method; it's invoked automatically whenever the NSScroller's size changes.

### 35.79.4 Constructor

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new scroller with size 100/100 and position 0/0
**Example:**

```
dim t as new NSScrollerMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 35.79.5 Constructor(Handle as Integer) 7082
- 35.79.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7082

### 35.79.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSScroller handle.
**Example:**

```
dim t as new NSScrollerMBS(0, 0, 100, 100)
dim v as new NSScrollerMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSScroller and the plugin retains this handle.
See also:

- 35.79.4 Constructor 7082
- 35.79.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7082

### 35.79.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new scroller with the given size and position.
**Example:**

```
dim x as new NSScrollerMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.79.4 Constructor 7082
- 35.79.5 Constructor(Handle as Integer) 7082


### 35.79.7 drawArrow(Arrow as Integer, highlight as boolean)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Draws the scroll button indicated by arrow, which is either NSScrollerIncrementArrow (the down or right scroll button) or NSScrollerDecrementArrow (up or left).
**Notes:** If flag is true, the button is drawn highlighted; otherwise it's drawn normally. You should never need to invoke this method directly, but may wish to override it to customize the appearance of scroll buttons.
Calling this method on CustomNSScrollerMBS objects does not trigger the drawArrow event.

### 35.79.8 drawKnob

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Draws the knob.
**Notes:** You should never need to invoke this method directly, but may wish to override it to customize the appearance of the knob.
Calling this method on CustomNSScrollerMBS objects does not trigger the drawKnob event.

### 35.79.9 drawKnobSlotInRect(slotRect as NSRectMBS, highlight as boolean)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Draws the knob slow in the rectangle.
**Notes:** Calling this method on CustomNSScrollerMBS objects does not trigger the drawKnobSlotInRect event.

### 35.79.10 drawParts

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Caches images for the scroll buttons and knob.
**Notes:** It's invoked only once when the NSScroller is created. You may want to override this method if you alter the look of the NSScroller, but you should never invoke it directly.

Calling this method on CustomNSScrollerMBS objects does not trigger the drawParts event.

### 35.79.11 highlight(flag as boolean)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Highlights or unhighlights the scroll button the user clicked.
**Notes:** The receiver invokes this method while tracking the mouse; you should not invoke it directly. If flag is true, the appropriate part is drawn highlighted; otherwise it's drawn normally.

### 35.79.12 hitPart as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a part code indicating the manner in which the scrolling should be performed.
**Notes:** This method is typically invoked by an NSScrollView to determine how to scroll its document view when it receives an action message from the NSScroller.

### 35.79.13 isCompatibleWithOverlayScrollers as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the class is compatible with overlay scroller style and behavior.
**Notes:** Returns true if the the class is compatible with overlay scroller style and behavior, otherwise false. The plugin implements this so you can query the value.

### 35.79.14 NSPreferredScrollerStyleDidChangeNotification as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** A notification name.
**Notes:** Posted if the preferred scroller style changes.
Available in Mac OS X v10.7 and later.

### 35.79.15 preferredScrollerStyle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the style of scrollers that applications should use wherever possible.
**Notes:** The preferred scroller style is determined by the Appearance preference panel's "Show scroll bars" setting for the current user, and—when the user's preference is set to "Automatically based on input device"—by the set of built-in and connected pointing devices and the user's scroll capability preference settings for them. The preferred scroller style may therefore change over time, and applications should be prepared to adapt their user interfaces to the new scroller style if needed.

In most cases, updating to a new scroller style is automatic: When the preferred scroller style changes, AppKit notifies all NSScrollView instances, sending setScrollerStyle to each with the new style, which causes each scroll view to automatically re-tile (update its layout) to adapt to the new scroller style. Some NSScrollView instances may refuse the new scroller style setting if they cannot accommodate it for compatibility reasons (the presence of accessory views or legacy scroller subclasses prevent use of overlay scrollers), but most instances will switch to the specified new preferred scroller style.

If you need to be notified of changes to the preferred scroller style, you can register to receive NSPreferredScrollerStyleDidChangeNotification notifications.

Available in Mac OS X v10.7 and later.

### 35.79.16 rectForPart(part as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle occupied by aPart, which for this method is interpreted literally rather than as an indicator of scrolling direction.
**Notes:** Note the interpretations of NSScrollerDecrementPage and NSScrollerIncrementPage. The actual part of an NSScroller that causes page-by-page scrolling varies, so as a convenience these part codes refer to useful parts different from the scroll buttons.

Returns NSRectMBS.Zero if the part requested isn't present on the receiver.

### 35.79.17 scrollerWidth as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the width of "normal-sized" instances.
**Notes:** NSScrollView uses this value to lay out its components. Subclasses that use a different width should override this method.

### 35.79.18 scrollerWidthForControlSize(controlsize as Integer) as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the width of the scroller based on controlSize.

### 35.79.19 setFloatValue(aFloat as Double, proportion as Double)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the position of the knob to aFloat, which is a value from 0.0 (indicating the top or left end) to 1.0 (the bottom or right end).
**Notes:** Also sets the proportion of the knob slot filled by the knob to knobProp, also a value from 0.0 (minimal size) to 1.0 (fills the slot).

Available in Mac OS X v10.0 and later.
Deprecated in Mac OS X v10.5.

### 35.79.20 testPart(p as NSPointMBS) as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the part that would be hit by a mouse-down event at p (expressed in the window's coordinate system).
**Notes:** Note the interpretations of NSScrollerDecrementPage and NSScrollerIncrementPage. The actual part of an NSScroller that causes page-by-page scrolling varies, so as a convenience these part codes refer to useful parts different from the scroll buttons.

### 35.79.21 trackKnob(theEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Tracks the knob and sends action messages to the receiver's target.
**Notes:** This method is invoked automatically when the receiver receives theEvent mouse-down event in the knob; you should not invoke it directly.

### 35.79.22 trackScrollButtons(theEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Tracks the scroll buttons and sends action messages to the receiver's target.
**Notes:** This method is invoked automatically when the receiver receives theEvent mouse-down event in a scroll button; you should not invoke this method directly.

### 35.79.23 usableParts as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a value indicating which parts of the receiver are displayed and usable.

### 35.79.24 Properties

### 35.79.25 arrowsPosition as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The location of the scroll buttons within the receiver.
**Notes:** Can be NSScrollerArrowsMaxEnd, NSScrollerArrowsMinEnd, NSScrollerArrowsDefaultSetting or NSScrollerArrowsNone.
(Read and Write computed property)

### 35.79.26 controlSize as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The size of the receiver.
**Notes:** Can be NSRegularControlSize, NSMiniControlSize or NSSmallControlSize.
(Read and Write computed property)

### 35.79.27 controlTint as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's control tint.
**Notes:** Can be NSGraphiteControlTint, NSBlueControlTint, NSClearControlTint or NSDefaultControlTint.
(Read and Write computed property)

### 35.79.28 knobProportion as Double

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** The portion of the knob slot the knob should fill, as a floating-point value from 0.0 (minimal size) to 1.0 (fills the slot).
**Notes:** Can be set on Mac OS X 10.5 directly.
(Read and Write computed property)

### 35.79.29 knobStyle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The knob style.
**Notes:** The value of this property does not affect legacy scrollers. NSScrollerKnobStyleDefault is appropriate for a wide range of content, but in some cases choosing an alternative knob style may enhance visibility of the scroller knob atop some kinds of content.

Available in Mac OS X v10.7 and later.

use constants: NSScrollerKnobStyleDefault, NSScrollerKnobStyleDark or NSScrollerKnobStyleLight.
(Read and Write computed property)

### 35.79.30 scrollerStyle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The scroller style.
**Notes:** or a scroller that's managed by an NSScrollView object, the setter is automatically invoked by the scroll view with the appropriate setting, according to the user's Appearance preference settings and possibly what pointing device(s) are present (see preferredScrollerStyle).
Available in Mac OS X v10.7 and later.
(Read and Write computed property)

### 35.79.31 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAllScrollerParts | 2 | One of the constants to specify which parts of the scroller are visible.<br>Scroller has at least a knob, possibly also scroll buttons. |
| NSBlueControlTint | 1 | One of the constants to specify a the control tint.<br>Aqua control tint |
| NSClearControlTint | 7 | One of the constants to specify a the control tint.<br>Clear control tint |
| NSDefaultControlTint | 0 | One of the constants to specify a the control tint.<br>The current default tint setting |
| NSGraphiteControlTint | 6 | One of the constants to specify a the control tint.<br>Graphite control tint |
| NSMiniControlSize | 2 | One of the values for the ControlSize property.<br>The control has a smaller size than NSSmallControlSize. |
| NSNoScrollerParts | 0 | One of the constants to specify which parts of the scroller are visible.<br>Scroller has neither a knob nor scroll buttons, only the knob slot. |
| NSOnlyScrollerArrows | 1 | One of the constants to specify which parts of the scroller are visible.<br>Scroller has only scroll buttons, no knob. |
| NSRegularControlSize | 0 | One of the values for the ControlSize property.<br>The control is sized as regular. |
| NSScrollerArrowsDefaultSetting | 0 | One of the constants to specify where the scroller's buttons appear with the arrowsPosition property.<br>Contains the information from the AppleScrollBarVariant default value. |
| NSScrollerArrowsMaxEnd | 0 | One of the constants to specify where the scroller's buttons appear with the arrowsPosition property.<br>Buttons at bottom or right. This constant has been deprecated. |
| NSScrollerArrowsMinEnd | 1 | One of the constants to specify where the scroller's buttons appear with the arrowsPosition property.<br>Buttons at top or left. This has been deprecated. |
| NSScrollerArrowsNone | 2 | One of the constants to specify where the scroller's buttons appear with the arrowsPosition property.<br>No buttons. |
| NSScrollerDecrementArrow | 1 | One of the constants describe the two scroller buttons and are used by drawArrow.<br>The down or right scroll button. |
| NSScrollerDecrementLine | 4 | One of the constants to specify the different parts of the scroller.<br>Up or left by a small amount. |
| NSScrollerDecrementPage | 1 | One of the constants to specify the different parts of the scroller.<br>Up or left by a large amount. |
| NSScrollerIncrementArrow | 0 | One of the constants describe the two scroller buttons and are used by drawArrow.<br>The up or left scroll button. |
| NSScrollerIncrementLine | 5 | One of the constants to specify the different parts of the scroller.<br>Down or right by a small amount. |
| NSScrollerIncrementPage | 3 | One of the constants to specify the different parts of the scroller.<br>Down or right by a large amount. |
| NSScrollerKnob | 2 | One of the constants to specify the different parts of the scroller.<br>Directly to the NSScroller's value, as given by floatValue. |
| NSScrollerKnobSlot | 6 | One of the constants to specify the different parts of the scroller.<br>Directly to the NSScroller's value, as given by floatValue. |
| NSScrollerNoPart | 0 | One of the constants to specify the different parts of the scroller.<br>Don't scroll at all. |
| NSSmallControlSize | 1 | One of the values for the ControlSize property.<br>This constant is for controls that cannot be resized in one direction, such as push buttons, radio buttons, checkboxes, sliders, scroll bars, pop-up buttons, tabs, and progress indicators. You should use a small system font with a small control. |

Knob style constants

| Constant | Value | Description |
|---|---|---|
| NSScrollerKnobStyleDark | 1 | Specifies a dark knob.<br>This style is particularly good against a light background.<br>Available in Mac OS X v10.7 and later. |
| NSScrollerKnobStyleDefault | 0 | Specifies a dark knob with a light border.<br>This is the default style; it is good against any background.<br>Available in Mac OS X v10.7 and later. |
| NSScrollerKnobStyleLight | 2 | Specifies a light knob.<br>This style is particularly good against a dark background.<br>Available in Mac OS X v10.7 and later. |

Scroller Style Constants

| Constant | Value | Description |
|---|---|---|
| NSScrollerStyleLegacy | 0 | Specifies legacy-style scrollers as prior to Mac OS X v10.7.<br>Available in Mac OS X v10.7 and later. |
| NSScrollerStyleOverlay | 1 | Specifies overlay-style scrollers in Mac OS X v10.7 and later.<br>Available in Mac OS X v10.7 and later. |

# 35.80 class NSScrollViewMBS

## 35.80.1 class NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa class for a view which has scrollbars.
**Notes:** Embed another view inside it to add scrolling.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- Smooth scrolling list control with ContainerControls
- Use Text Finder for TextArea in Xojo
- MBS Xojo Plugins, version 18.5pr3
- Line Wrap for Textarea in Xojo Mac applications
- MBS Xojo Plugins, version 17.1pr2
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Xojo / Real Studio Plugins, version 14.3pr7
- Tip of the day: Autohide scrollbar
- Custom Scrollbars for Real Studio Cocoa Apps

**Xojo Developer Magazine**

- 19.4, page 10: News
- 14.4, page 24: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

## 35.80.2 Methods

## 35.80.3 Constructor

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new scrollview with size 100/100 and position 0/0
**Example:**

```
dim t as new NSScrollViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 35.80.4 Constructor(Handle as Integer) 7092
- 35.80.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7092

### 35.80.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSScrollView handle.
**Example:**

```
dim t as new NSScrollViewMBS(0, 0, 100, 100)
dim v as new NSScrollViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSScrollView and the plugin retains this handle.
See also:

- 35.80.3 Constructor 7091
- 35.80.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7092

### 35.80.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new scrollview with the given size and position.
**Example:**

```
dim x as new NSScrollViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 35.80.3 Constructor 7091
- 35.80.4 Constructor(Handle as Integer) 7092

### 35.80.6 flashScrollers

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Flash the overlay scroll bars.
**Notes:** This method is only to scroll views that use overlay scrollers.

This method can be invoked to cause the overlay scroller knobs to be momentarily shown. This may be desirable when changing a document view's size or swapping new content into the view, or to give the user a sense of the current position within the scrollable range at each step of an incremental search or similar operation.

Available in Mac OS X v10.7 and later.

### 35.80.7 reflectScrolledClipView(clipView as NSClipViewMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Adjusts the receiver's scrollers to reflect the size and positioning of its content view.
**Notes:** ClipView: The clip view being adjusted to. If aClipView is any view object other than the receiver's content view, the method does nothing.

This method is invoked automatically during scrolling and when an NSClipView object's relationship to its document view changes; you should rarely need to invoke it yourself, but may wish to override it for custom updating or other behavior. If you override this method, be sure to call the superclass implementation. If you do not, other controls (such as the current scrollers) may not be updated properly.

Available in Mac OS X v10.0 and later.

### 35.80.8 tile

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Lays out the components of the receiver: the content view, the scrollers, and the ruler views.
**Notes:** You rarely need to invoke this method, but subclasses may override it to manage additional components.

### 35.80.9 Properties

### 35.80.10 autohidesScrollers as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True when autohiding is set for scroll bars in the scrollview.
**Notes:** (Read and Write property)

### 35.80.11 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** (Read and Write property)

### 35.80.12 borderType as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The border type.
**Notes:** Specifies the appearance of the style of the scroll view's border. See NSBorderType for a list of possible values.
Use constants NSNoBorder = 0, NSLineBorder = 1, NSBezelBorder = 2 or NSGrooveBorder = 3.
(Read and Write property)

### 35.80.13 contentSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the size of the receiver's content view.
**Notes:** (Read only property)

### 35.80.14 contentView as NSClipViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The content view.
**Notes:** If view has a document view, this method also sets the receiver's document view to be the document view of view. The original content view retains its document view.

(Read and Write property)

### 35.80.15 documentCursor as Variant

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The cursor used when the cursor is over the content view.
**Notes:** Value is an NSCursorMBS object.
(Read and Write property)

### 35.80.16 documentView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The view the receiver scrolls within its content view.
**Notes:** (Read and Write property)

### 35.80.17 documentVisibleRect as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the portion of the document view, in its own coordinate system, visible through the receiver's content view.
**Notes:** (Read only property)

### 35.80.18 drawsBackground as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the scrollview draws its background.
**Notes:** (Read and Write property)

### 35.80.19 FindBarPosition as Integer

MBS MacControls Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** The position of the find bar.
**Notes:** See NSScrollViewFindBarPosition* constants for possible values.
(Read and Write property)

### 35.80.20 FindBarView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** The view assigned by the text bar as the find bar view for the container.
**Notes:** This property is managed by NSTextFinderMBS and you must not set this property.
The container may freely modify the view's width, but should not modify its height.
(Read only property)

### 35.80.21 FindBarVisible as Boolean

MBS MacControls Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the container should display its find bar.
**Notes:** When this property is true and the findBarView property is set, then the find bar is displayed by the container. Otherwise, the find bar is not displayed.
The default value should be false.
(Read and Write property)

### 35.80.22 hasHorizontalRuler as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True if the receiver maintains a horizontal ruler view, false if it doesn't.
**Notes:** (Read and Write property)

### 35.80.23 hasHorizontalScroller as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver keeps a horizontal scroller
**Notes:** (Read and Write property)

### 35.80.24 hasVerticalRuler as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Determines whether the scrollview keeps a vertical ruler object.
**Notes:** (Read and Write property)

### 35.80.25 hasVerticalScroller as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True if the scrollview displays a vertical scroller, false if it doesn't.
**Notes:** (Read and Write property)

### 35.80.26 horizontalLineScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The amount by which the receiver scrolls itself horizontally when scrolling line by line to aFloat, expressed in the content view's coordinate system.
**Notes:** This amount is the amount used when the user clicks the scroll arrows on the horizontal scroll bar without holding down a modifier key. When displaying text in an NSScrollView, for example, you might set this amount to the height of a single line of text in the default font.
(Read and Write property)

### 35.80.27 horizontalPageScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The amount of the document view kept visible when scrolling horizontally page by page, expressed in the content view's coordinate system.
**Notes:** This amount is used when the user clicks the scroll arrows on the horizontal scroll bar while holding down the Option key.

This amount expresses the context that remains when the receiver scrolls by one page, allowing the user to orient to the new display. It differs from the line scroll amount, which indicates how far the document view moves. The page scroll amount is the amount common to the content view before and after the document view is scrolled by one page.
(Read and Write property)

### 35.80.28 horizontalScrollElasticity as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view's horizontal elasticity mode.
**Notes:** A scroll view can scroll its contents past its bounds to achieve an elastic effect.

When set to NSScrollElasticityAutomatic, scrolling the horizontal axis beyond its document bounds only occurs if the document width is greater than the view width or, the vertical scroller is hidden and the hori-

zontal scroller is visible.

The default value is NSScrollElasticityAutomatic.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 35.80.29 horizontalScroller as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's horizontal scroller, regardless of whether the receiver is currently displaying it, or nil if the receiver has none.
**Notes:** (Read and Write property)

### 35.80.30 lineScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The horizontal and vertical line scroll amounts to aFloat.
**Notes:** The line scroll is the amount by which the receiver scrolls itself when scrolling line by line, expressed in the content view's coordinate system. It's used when the user clicks the scroll arrows without holding down a modifier key. When displaying text in an NSScrollView, for example, you might set this value to the height of a single line of text in the default font.

As part of its implementation, this method sets VerticalLineScroll and HorizontalLineScroll.
(Read and Write property)

### 35.80.31 pageScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The vertical page scroll amount: the amount of the document view kept visible when scrolling vertically page by page, expressed in the content view's coordinate system.
**Notes:** This amount is used when the user clicks the scroll arrows on the vertical scroll bar while holding down the Option key. As part of its implementation, this method calls verticalPageScroll.

This amount expresses the context that remains when the receiver scrolls by one page, allowing the user to orient to the new display. It differs from the line scroll amount, which indicates how far the document view moves. The page scroll amount is the amount common to the content view before and after the document

view is scrolled by one page.

Note that a scroll view can have two different page scroll amounts: verticalPageScroll and horizontalPageScroll. Use this method only if you can be sure they're both the same.
(Read and Write property)

### 35.80.32 rulersVisible as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether rulers should be visible.
**Notes:** (Read and Write property)

### 35.80.33 scrollerKnobStyle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The knob style of scroll views that use the overlay scroller style.
**Notes:** Applicable only to scroll views that use overlay scrollers.
Available in Mac OS X v10.7 and later.
(Read and Write property)

### 35.80.34 scrollerStyle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The scroller style used by the scroll view.
**Notes:** This setting is automatically set at runtime, based on the user's preference setting and, if relevant, the set of connected pointing devices and their configured scroll capabilities, as determined by the NSScroller method preferredScrollerStyle.

Setting an scroll view's scroller style sets the style of both the horizontal and vertical scrollers. If the scroll view subsequently creates or is assigned a new horizontal or vertical scroller, they will be assigned the same scroller style that was assigned to the scroll view..

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 35.80.35 scrollsDynamically as boolean

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True if the scrollview redraws its document view while tracking the knob, false if it redraws only when the scroller knob is released.
**Notes:** NSScrollView scrolls dynamically by default.
(Read and Write property)

### 35.80.36 usesPredominantAxisScrolling as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the scroll view uses a predominant scrolling axis for content.
**Notes:** Whether the scroll view supports a predominant scrolling direction. true if there is a predominant scrolling direction; otherwise false.

Some content is scrollable in both the horizontal and vertical axes, but is predominantly scrolled one axis at a time. Other content (such as a drawing canvas) should scroll freely in both axes.

Traditionally this is not an issue with scroll wheels since they can only scroll in one direction at a time. With scroll balls and touch surfaces, it becomes more difficult to determine the user's intention.

This property helps a scroll view determine the user's intention by specifying if there is a predominant scrolling axis for content.

The default value is true.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 35.80.37 verticalLineScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The amount by which the view scrolls itself vertically when scrolling line by line to aFloat, expressed in the content view's coordinate system.
**Notes:** This value is the amount used when the user clicks the scroll arrows on the vertical scroll bar without holding down a modifier key. When displaying text in an NSScrollView, for example, you might set this value to the height of a single line of text in the default font.
(Read and Write property)

### 35.80.38 verticalPageScroll as Double

MBS MacControls Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The amount of the document view kept visible when scrolling vertically page by page to aFloat, expressed in the content view's coordinate system.
**Notes:** This amount is used when the user clicks the scroll arrows on the vertical scroll bar while holding down the Option key.

This amount expresses the context that remains when the receiver scrolls by one page, allowing the user to orient to the new display. It differs from the line scroll amount, which indicates how far the document view moves. The page scroll amount is the amount common to the content view before and after the document view is scrolled by one page. Thus, setting the page scroll amount to 0.0 implies that the entire visible portion of the document view is replaced when a page scroll occurs.
(Read and Write property)

### 35.80.39 verticalScrollElasticity as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view's vertical elasticity mode.
**Notes:** A scroll view can scroll its contents past its bounds to achieve an elastic effect.

When set to NSScrollElasticityAutomatic, scrolling the vertical axis beyond its document bounds occurs if any of the following are true: the vertical scroller is visible, the content height is greater than view height, or the horizontal scroller hidden.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 35.80.40 verticalScroller as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's vertical scroller, regardless of whether the receiver is currently displaying it, or nil if the receiver has none.
**Notes:** (Read and Write property)

### 35.80.41 Constants

Elasticity behavior Constants

| Constant | Value | Description |
|---|---|---|
| NSScrollElasticityAllowed | 2 | Allow content to be scrolled past its bounds on this axis in an elastic fashion. Available in Mac OS X v10.7 and later. |
| NSScrollElasticityAutomatic | 0 | Automatically determine whether to allow elasticity on this axis. Available in Mac OS X v10.7 and later. |
| NSScrollElasticityNone | 1 | Disallow scrolling beyond document bounds on this axis. Available in Mac OS X v10.7 and later. |

Findbar position constants

| Constant | Value | Description |
|---|---|---|
| NSScrollViewFindBarPositionAboveContent | 1 | The find bar is displayed above the scroll view content. Available in Mac OS X v10.7 and later. |
| NSScrollViewFindBarPositionAboveHorizontalRuler | 0 | The find bar is displayed above the horizontal ruler, if visi Available in Mac OS X v10.7 and later. |
| NSScrollViewFindBarPositionBelowContent | 2 | The find bar is displayed below the scroll view content. Available in Mac OS X v10.7 and later. |

# 35.81 class NSSearchFieldCellMBS

## 35.81.1 class NSSearchFieldCellMBS

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The programmatic interface for text fields that are used for text-based searches.
**Notes:** The NSSearchFieldCell class defines the programmatic interface for text fields that are optimized for text-based searches. An NSSearchFieldCell object is ‚Äúwrapped‚Äù by an NSSearchFieldMBS control object, which directly inherits from the NSTextFieldMBS class. The search field implemented by these classes presents a standard user interface for searches, including a search button, a cancel button, and a pop-up icon menu for listing recent search strings and custom search categories.

When the user types and then pauses, the cell‚Äôs action message is sent to its target. You can query the cell‚Äôs string value for the current text to search for. Do not rely on the sender of the action to be an NSMenuMBS object because the menu may change. If you need to change the menu, modify the search menu template and update the value in the searchMenuTemplate property.
Subclass of the NSTextFieldCellMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr2

## 35.81.2 Methods

## 35.81.3 Constructor(image as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor not to use.
See also:

- 35.81.4 Constructor(text as string) 7103

## 35.81.4 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 35.81.3 Constructor(image as NSImageMBS) 7103

### 35.81.5 recentSearches as String()

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of the recent search strings to display in the pop-up icon menu of the search field.
**Notes:** This property contains an array of string objects, each of which contains a search string either displayed in the search menu or from a recent autosave archive. If there have been no recent searches and no prior searches saved under an autosave name, this array may be empty. When loading your interface, you might set the value of this property to a set of saved search strings.

### 35.81.6 resetCancelButtonCell

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets the cancel button cell to its default attributes.
**Notes:** This method resets the target, action, regular image, and pressed image for the cancel button cell. By default, when users click the cancel button, the delete: action message is sent up the responder chain to the first NSText object that can handle it. This method gives you a way to customize the cancel button for specific situations and then reset the button defaults without having to undo changes individually.

### 35.81.7 resetSearchButtonCell

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets the search button cell to its default attributes.
**Notes:** This method resets the target, action, regular image, and pressed image for the search button cell. By default, when users click the search button or press the Return key, the action defined for the receiver is sent to its designated target. This method gives you a way to customize the search button for specific situations and then reset the button defaults without having to undo changes individually.

### 35.81.8 setRecentSearches(RecentSearches() as String = nil)

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of the recent search strings to display in the pop-up icon menu of the search field.
**Notes:** This property contains an array of string objects, each of which contains a search string either displayed in the search menu or from a recent autosave archive. If there have been no recent searches and no prior searches saved under an autosave name, this array may be empty. When loading your interface, you might set the value of this property to a set of saved search strings.

### 35.81.9 Properties

### 35.81.10 cancelButtonCell as NSButtonCellMBS

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The button cell used to display the cancel-button image.
**Notes:** (Read and Write property)

### 35.81.11 maximumRecents as Integer

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum number of search strings that can appear in the search menu.
**Notes:** The value of this property must be between 0 and 254. Specifying a negative value for the property sets it to the default value, which is 10. Specifying a value greater than 254 sets the property to 254.
When the maximum number of search strings is exceeded, the oldest search string on the menu is dropped.
(Read and Write property)

### 35.81.12 recentsAutosaveName as String

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The autosave name under which the search field automatically saves the list of recent search strings.
**Notes:** The autosave name is used as a key in the standard user defaults to save the recent searches. If you specify nil or an empty string for this parameter, no autosave name is set and searches are not automatically saved.
(Read and Write property)

### 35.81.13 searchButtonCell as NSButtonCellMBS

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The button cell used to display the search-button image.
**Notes:** (Read and Write property)

### 35.81.14 searchMenuTemplate as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The menu object used to dynamically construct the search field,Äôs pop-up icon menu.
**Notes:** The cell looks for the tag constants described in Menu tags to determine how to populate the menu with items related to recent searches. For an example of how you might set up the search menu template, see Configuring a Search Menu:
https://developer.apple.com/library/archive/documentation/Cocoa/Conceptual/SearchFields/Articles/MenuTemplate.html#//apple_ref/doc/uid/20002245
(Read and Write property)

### 35.81.15 sendsSearchStringImmediately as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the cell calls its action method immediately when an appropriate action occurs.
**Notes:** When the value of this property is true, the cell calls its action method immediately upon notification of any changes to the search field. When the value is NO, the cell pauses briefly after receiving a notification and then calls its action method. Pausing gives the user an opportunity to type more text into the search field and minimize the number of searches that are performed.
(Read and Write property)

### 35.81.16 sendsWholeSearchString as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the cell calls its search action method when the user clicks the search button (or presses Return) or after each keystroke.
**Notes:** When the value of this property is true, the cell calls its action method when the user clicks the search button or presses Return. When the value is false, the cell calls the action method after each keystroke. The default value of this property is false.
(Read and Write property)

### 35.81.17 Constants

Menu Tags

| Constant | Value | Description |
|---|---|---|
| ClearRecentsMenuItemTag | 1002 | The menu item for clearing the current set of recent string searches in the menu. |
| NoRecentsMenuItemTag | 1003 | The menu item that describes a lack of recent search strings. |
| RecentsMenuItemTag | 1001 | The location of recent search strings in the ,Äúrecents,Äù menu group. |
| RecentsTitleMenuItemTag | 1000 | The menu item that provides the title of the menu group for recent search strings. |

## 35.82 control NSSearchFieldControlMBS

### 35.82.1 control NSSearchFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSSearchField.
**Notes:** This control embeds a special NSSearchField subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 23.2pr1
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.5pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 35.82.2 Properties

### 35.82.3 View as NSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.82.4 Events

### 35.82.5 Action

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The action event run, when e.g. return key is pressed.

### 35.82.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.82.7 Close

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.82.8 Closing

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.82.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.82.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or

false to give others a chance.

### 35.82.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.82.12 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.82.13 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.82.14 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.82.15 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.82.16 GotFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.82.17 LostFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.82.18 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.82.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.82.20 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.82.21 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.82.22 Open

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.82.23 Opening

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.82.24 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.82.25 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.82.26 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.82.27 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.82.28 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.82.29 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.82.30 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.83 class NSSearchFieldMBS

### 35.83.1 class NSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** An NSSearchField object implements a text field control that is optimized for performing text-based searches.
**Example:**

```
// create searchfield
dim n as new NSSearchFieldMBS(0,0,100,20)

// set placeholder
dim x as NSTextFieldCellMBS = n.cell
x.placeholderString = "Test"
```

**Notes:** The control provides a customized text field for entering search data, a search button, a cancel button, and a pop-up icon menu for listing recent search strings and custom search categories.

An NSSearchField object wraps an NSSearchFieldCell object. Access to most search field attributes occurs through the cell, which provides a more comprehensive programmatic interface for manipulating the search field. You can use an NSSearchField object though to manipulate some aspects of the search field. For additional information about search fields and how to manipulate them, see the NSSearchFieldCell class.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSTextFieldMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Cocoa SearchField with menu
- MBS Real Studio Plugins, version 11.2pr8
- MBS Real Studio Plugins, version 11.2pr3
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

### 35.83.2 Methods

### 35.83.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new search field with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSearchFieldMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.83.4 Constructor(Handle as Integer) 7115
- 35.83.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7115


### 35.83.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSSearchField handle.
**Example:**

```
dim t as new NSSearchFieldMBS(0, 0, 100, 100)
dim v as new NSSearchFieldMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSSearchField and the plugin retains this handle.
See also:


- 35.83.3 Constructor 7114
- 35.83.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7115


### 35.83.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new search field with the given size and position.
**Example:**

```
dim x as new NSSearchFieldMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 35.83.3 Constructor 7114
- 35.83.4 Constructor(Handle as Integer) 7115


### 35.83.6 recentSearches as string()

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of recent search strings for the control.
**Notes:** An array of strings, each of which contains a search string either displayed in the search menu or from a recent autosave archive. If there have been no recent searches and no prior searches saved under an autosave name, this array may be empty.

### 35.83.7 setRecentSearches(values() as string)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the list of recent search strings to list in the pop-up icon menu of the receiver.
**Notes:** You might use this method to set the recent list of searches from an archived copy.

### 35.83.8 Properties

### 35.83.9 Scrollable as Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver scrolls excess text past the cell's bounds.
**Notes:** (Read and Write property)

### 35.83.10 maximumRecents as Integer

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The maximum number of search strings that can appear in the search menu.
**Notes:** The maximum number of search strings that can appear in the menu. This value can be between 0 and 254. Specifying a value less than 0 sets the value to the default, which is 10. Specifying a value greater than 254 sets the maximum to 254.

When the limit is exceeded, the oldest search string on the menu is dropped.
(Read and Write computed property)

### 35.83.11 recentsAutosaveName as string

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The key under which the prior list of recent search strings has been archived.
**Notes:** The autosave name, which is used as a key in the standard user defaults to save the recent searches. The default value is "", which causes searches not to be autosaved.
(Read and Write computed property)

### 35.83.12 searchMenuTemplate as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The menu template object used to dynamically construct the search pop-up icon menu.
**Notes:** The receiver looks for the tag constants described in Menu tags to determine how to populate the menu with items related to recent searches. (See constants)

To modify the actual menu shown, please use NSMenuItemMBS.validateMenuItem event. There you can for example set the state of the menu item shown. The SearchField makes a copy of the NSMenuItem, so the menuitem where the event is called, is not the one shown. It's the one passes as parameter.
(Read and Write computed property)

### 35.83.13 sendsSearchStringImmediately as boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the cell sends its action message to the target immediately upon notification of any changes to the search field text or after a brief pause.
**Notes:** True to send the cell's action immediately upon notification of any changes to the search field; otherwise, false if you want the cell to pause briefly before sending its action message. Pausing gives the user the opportunity to type more text into the search field before initiating the search.
(Read and Write computed property)

### 35.83.14 sendsWholeSearchString as boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver sends the search action message when the user clicks the search button (or presses return) or after each keystroke.
**Notes:** True to send the action message all at once when the user clicks the search button or presses return; otherwise, False to send the search string after each keystroke.
(Read and Write computed property)

### 35.83.15 Constants

Search menu template constants

| Constant | Value | Description |
|---|---|---|
| NSSearchFieldClearRecentsMenuItemTag | 1002 | Identifies the menu item for clearing the current set of recent string in the menu.<br>This item is hidden if there are no recent strings. |
| NSSearchFieldNoRecentsMenuItemTag | 1003 | Identifies the menu item that describes a lack of recent search str example, ”No recent searches”).<br>This item is hidden if there have been recent searches. |
| NSSearchFieldRecentsMenuItemTag | 1001 | Identifies where recent search strings should appear in the ”recent group. |
| NSSearchFieldRecentsTitleMenuItemTag | 1000 | Identifies the menu item that is the title of the menu group for rece strings.<br>This item is hidden if there are no recent strings.<br>You may use this tagged item for separator characters that also do no if there are no recent strings to display. |

## 35.84 control NSSecureTextFieldControlMBS

### 35.84.1 control NSSecureTextFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSSecureTextField.
**Notes:** This control embeds a special NSSecureTextField subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 35.84.2 Properties

### 35.84.3 echosBullets as Boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver echoes a bullet character rather than each character typed.
**Example:**

```
dim t as NSSecureTextFieldControlMBS // your textfield
t.echosBullets = true
```

**Notes:** If true, bullets are echoed. If false, the cursor is moved for each character typed, but nothing is displayed.
(Read and Write property)

### 35.84.4 View as NSSecureTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.84.5 Events

### 35.84.6 Action

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** The text changed.

### 35.84.7 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.84.8 Close

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.84.9 Closing

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.84.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.84.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.84.12 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.84.13 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.84.14 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.84.15 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.84.16 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.84.17 GotFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.84.18 LostFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.84.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.84.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.84.21 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.84.22 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.84.23 Open

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.84.24 Opening

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.84.25 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.84.26 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.84.27 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDid-

ChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.84.28 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.84.29 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.84.30 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.84.31 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.85 class NSSecureTextFieldMBS

## 35.85.1 class NSSecureTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** NSSecureTextField is a subclass of NSTextField that hides its text from display or other access via the user interface.
**Notes:** It's suitable for use as a password-entry object or for any item in which a secure value must be kept.

NSSecureTextField uses NSSecureTextFieldCell to implement its user interface.
Subclass of the NSTextFieldMBS class.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

## 35.85.2 Methods

## 35.85.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new secure text field with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSecureTextFieldMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.85.4 Constructor(Handle as Integer) 7127
- 35.85.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7128


## 35.85.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSSecureTextField handle.
**Example:**

```
dim t as new NSSecureTextFieldMBS(0, 0, 100, 100)
dim v as new NSSecureTextFieldMBS(t.handle)
```

```
MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSSecureTextField and the plugin retains this handle.
See also:


- 35.85.3 Constructor 7127
- 35.85.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7128


### 35.85.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new secure text field with the given size and position.
**Example:**

```
dim x as new NSSecureTextFieldMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.85.3 Constructor 7127
- 35.85.4 Constructor(Handle as Integer) 7127


### 35.85.6 Properties

### 35.85.7 echosBullets as boolean

MBS MacCocoa Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver echoes a bullet character rather than each character typed.
**Example:**

```
dim t as NSSecureTextFieldMBS // your textfield
t.echosBullets = true
```

**Notes:** If true, bullets are echoed. If false, the cursor is moved for each character typed, but nothing is displayed.
(Read and Write computed property)

## 35.86 control NSSegmentedControlControlMBS

### 35.86.1 control NSSegmentedControlControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a NSSegmentedControl.
**Notes:** We know the fact, that the control wrapping the segmented control has control twice in the name. Suggestions to rename are welcome, but unlikely to happen as it would break code.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- NSSegmentedControl and NSPathControl
- MBS Xojo Plugins, version 24.0pr7

### 35.86.2 Properties

### 35.86.3 View as NSSegmentedControlMBS

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSSegmentedControlMBS.
**Notes:** (Read only property)

### 35.86.4 Events

### 35.86.5 Action

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when user clicks on a date/time and changes something.

### 35.86.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.86.7 Close

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.86.8 Closing

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.86.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.86.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.86.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.86.12 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.86.13 FocusLost

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.86.14 FocusReceived

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.86.15 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.86.16 GotFocus

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.86.17 LostFocus

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.86.18 MenuBarSelected

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.86.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.86.20 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.86.21 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.86.22 Open

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.86.23 Opening

Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.86.24 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 24.0, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.86.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.87 class NSSegmentedControlMBS

## 35.87.1 class NSSegmentedControlMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The plugin class for a Cocoa NSSegmentedControl.
**Notes:** An NSSegmentedControl object implements a horizontal button made of multiple segments.

The NSSegmentedControl class uses an NSSegmentedCell class to implement much of the control's functionality. Most methods in NSSegmentedControl are simply "cover methods" that call the corresponding method in NSSegmentedCell. The methods of NSSegmentedCell that do not have covers relate to accessing and setting values for tags and tool tips; programatically setting the key segment; and establishing the mode of the control.

The features of a segmented control include:

- Each segment can have an image, text (label), menu, tooltip, and tag
- Either the whole control or individual segments can be enabled or disabled
- There are three tracking modes for segments: select one mode (also known as radio button mode and illustrated by Finder's view mode selection control), momentary mode (as illustrated by Safari's toolbar buttons), or select any mode (where any combination of buttons may be on or off)
- Each segment can be either a fixed width or autosized to fit the contents
- If a segment has text and is marked as autosizing, then the text may be truncated so that the control completely fits
- If an image is too large to fit in a segment, it is clipped
- Full keyboard control of the user interface

Subclass of the NSControlMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- NSSegmentedControl and NSPathControl
- MBS Xojo / Real Studio Plugins, version 15.2pr4
- MBS Xojo / Real Studio Plugins, version 15.2pr3
- MonkeyBread Software releases MBS Real Studio plug-ins in version 12.1
- MBS Real Studio Plugins, version 12.1pr10

**Xojo Developer Magazine**

- 10.4, page 9: News

### 35.87.2 Methods

### 35.87.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new path control with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSegmentedControlMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.87.4 Constructor(Handle as Integer) 7136
- 35.87.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7137


### 35.87.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSPathControl handle.
**Example:**

```
dim t as new NSSegmentedControlMBS(0, 0, 100, 100)
dim v as new NSSegmentedControlMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSSegmentedControl and the plugin retains this handle.
See also:


- 35.87.3 Constructor 7136
- 35.87.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7137

### 35.87.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new path control with the given size and position.
**Example:**

```
dim x as new NSSegmentedControlMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.87.3 Constructor 7136
- 35.87.4 Constructor(Handle as Integer) 7136


### 35.87.6 makeNextSegmentKey

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the next segment.
**Notes:** The next segment is the one to the right of the currently selected segment. For the last segment, the selection wraps back to the beginning of the control.

### 35.87.7 makePreviousSegmentKey

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the previous segment.
**Notes:** The previous segment is the one to the left of the currently selected segment. For the first segment, the selection wraps around to the last segment of the control.

### 35.87.8 selectSegmentWithTag(Tag as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects the segment with the specified tag.
**Notes:** tag: The tag associated with the desired segment.
True if the segment was selected successfully; otherwise, false.

Typically, you use Interface Builder to specify the tag for each segment. You may also set this value programmatically using the setTag:forSegment: method of NSSegmentedCell.

### 35.87.9 Properties

### 35.87.10 cellTrackingMode as Integer

MBS MacCocoa Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** The tracking mode used for the segments of the receiver.
**Notes:** Possible values for trackingMode are described in NSSegmentSwitchTracking. The default value is NSSegmentSwitchTrackingSelectOne.

This property was named only trackingMode in 15.1 and older plugins.
(Read and Write property)

### 35.87.11 doubleValueForSelectedSegment as Double

MBS MacCocoa Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Query the double value for selected segment.
**Notes:** This message is valid only for trackingMode = NSSegmentSwitchTrackingMomentaryAccelerator and provides the double value for the selected segment.
Available on Mac OS X 10.10.3.
(Read only property)

### 35.87.12 segmentCount as Integer

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of segments in the receiver.
**Notes:** (Read and Write property)

### 35.87.13 segmentStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The visual style used to display the receiver.
**Notes:** See style constants.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.87.14 selectedSegment as Integer

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The index of the selected segment of the receiver.
**Notes:** The index of the currently selected segment or -1 if no segment is selected. If the receiver allows multiple selections, this method returns the most recently selected segment.
(Read and Write property)

### 35.87.15 springLoaded as Boolean

MBS MacCocoa Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Sends action on deep-press or extended hover while dragging.
**Notes:** Defaults to false.
(Read and Write property)

### 35.87.16 trackingMode as Integer

MBS MacCocoa Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** The type of tracking behavior the control exhibits.
**Notes:** An NSSegmentSwitchTracking value specifies how the control responds when the user presses a keyboard key or clicks, force clicks (applies pressure in a pressure-sensitive system), releases pressure, and so on.

see NSSegmentSwitchTracking* constants.
Available on Mac OS X 10.10.3 and newer.
(Read and Write property)

### 35.87.17 imageForSegment(segment as Integer) as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The image for the specified segment.
**Notes:** image: The image to apply to the segment or nil if you want to clear the existing image. Images are not scaled to fit inside a segment. If the image is larger than the available space, it is clipped.
segment: The index of the segment whose image you want to set. This method raises an NSRangeException if the index is out of bounds.
(Read and Write computed property)

### 35.87.18 imageScalingForSegment(segment as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The scaling mode used to display the specified segment's image.
**Notes:** scaling: One of the image scaling constants. For a list of possible values, see constants.
segment: The index of the segment whose enabled state you want to get. This method raises an NSRangeException if the index is out of bounds.
Available in Mac OS X v10.5 and later.
(Read and Write computed property)

### 35.87.19 isEnabledForSegment(segment as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The enabled state of the specified segment.
**Notes:** True to enable the segment; otherwise, false to disable it.
segment: The index of the segment you want to enable or disable. This method raises an NSRangeException if the index is out of bounds.
(Read and Write computed property)

### 35.87.20 isSelectedForSegment(segment as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The selection state of the specified segment.
**Notes:** True if you want to select the segment; otherwise, false.

segment: The index of the segment whose selection state you want to set. This method raises an NSRangeException if the index is out of bounds.

If the receiver allows only a single selection, this method deselects any other selected segments.
(Read and Write computed property)

### 35.87.21 labelForSegment(segment as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The label for the specified segment.
**Notes:** label: The label you want to display in the segment. If the width of the string is greater than the width of the segment, the string's text is truncated during drawing.
segment: The index of the segment whose label you want to set. This method raises an NSRangeException

if the index is out of bounds.
(Read and Write computed property)

### 35.87.22 menuForSegment(segment as Integer) as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The menu for the specified segment.
**Notes:** menu: The menu you want to add to the segment or nil to clear the current menu. This menu is displayed when the user clicks and holds the mouse button while the mouse is over the segment.
segment: The index of the segment whose menu you want to set. This method raises an NSRangeException if the index is out of bounds.

Adding a menu to a segment allows that segment to be used as a pop-up button.
(Read and Write computed property)

### 35.87.23 tagForSegment(segment as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The tag value for the segment.
**Notes:** segment: The index of the segment whose width you want to get. This method raises an NSRangeException if the index is out of bounds.

The tag is an integer you define to identify your items.
(Read and Write computed property)

### 35.87.24 ToolTipForSegment(segment as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The tool tip for the specified segment.
**Notes:** segment: The index of the segment whose tool tip you want to set. This method raises an NSRangeException if the index is out of bounds.

Tool tips are currently not displayed. Apple may change that in the future.
(Read and Write computed property)

### 35.87.25 widthForSegment(segment as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The width of the specified segment.
**Notes:** width: The width of the segment, measured in points. Specify the value 0 if you want the segment to be sized to fit the available space automatically.
segment: The index of the segment whose width you want to set. This method raises an NSRangeException if the index is out of bounds.
(Read and Write computed property)

### 35.87.26 Constants

Scaling Modes

| Constant | Value | Description |
|---|---|---|
| NSImageScaleAxesIndependently | 1 | Scale each dimension to exactly fit destination.<br>This setting does not preserve the aspect ratio of the image.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleNone | 2 | Do not scale the image.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleProportionallyDown | 0 | If it is too large for the destination, scale the image down while preserv<br>aspect ratio.<br>Available in Mac OS X v10.5 and later. |
| NSImageScaleProportionallyUpOrDown | 3 | Scale the image to its maximum possible dimensions while both staying<br>the destination area and preserving its aspect ratio.<br>Available in Mac OS X v10.5 and later. |

Style Constants

| Constant | Value | Description |
|---|---|---|
| NSSegmentStyleAutomatic | 0 | The appearance of the segmented control is automatically determined based on<br>the type of window in which the control is displayed and the position within<br>the window.<br>Available in Mac OS X v10.5 and later. |
| NSSegmentStyleRounded | 1 | The control is displayed using the rounded style.<br>Available in Mac OS X v10.5 and later. |
| NSSegmentStyleRoundRect | 2 | The control is displayed using the round rect style.<br>Available in Mac OS X v10.5 and later. |
| NSSegmentStyleSmallSquare | 6 | The control is displayed using the small square style.<br>Available in Mac OS X v10.5 and later. |
| NSSegmentStyleTexturedSquare | 4 | The control is displayed using the textured square style.<br>Available in Mac OS X v10.5 and later. |

Constants for the Switch Tracking

| Constant | Value | Description |
|---|---|---|
| NSSegmentSwitchTrackingMomentary | 2 | A segment is selected only when tracking. |
| NSSegmentSwitchTrackingMomentaryAccelerator | 3 | accelerator behavior, only selected while tracking. |
| NSSegmentSwitchTrackingSelectAny | 1 | Any segment can be selected. |
| NSSegmentSwitchTrackingSelectOne | 0 | Only one segment may be selected. |

## 35.88 class NSSliderMBS

### 35.88.1 class NSSliderMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** An NSSlider object displays a range of values for something in the application.
**Notes:** Sliders can be vertical or horizontal bars or circular dials. An indicator, or knob, notes the current setting. The user can move the knob in the slider's bar—or rotate the knob in a circular slider—to change the setting.

The NSSlider class uses the NSSliderCell class to implement its user interface.
Subclass of the NSControlMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

### 35.88.2 Methods

### 35.88.3 acceptsFirstMouse(event as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.88.4 closestTickMarkValueToValue(value as Double) as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value of the tick mark closest to the specified value.

### 35.88.5 Constructor

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new slider with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSliderMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.88.6 Constructor(Handle as Integer) 7145
- 35.88.7 Constructor(left as Double, top as Double, width as Double, height as Double) 7145


### 35.88.6 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSSlider handle.
**Example:**

```
dim t as new NSSliderMBS(0, 0, 100, 100)
dim v as new NSSliderMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSSlider and the plugin retains this handle.
See also:


- 35.88.5 Constructor 7145
- 35.88.7 Constructor(left as Double, top as Double, width as Double, height as Double) 7145


### 35.88.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new slider with the given size and position.
**Example:**

```
dim x as new NSSliderMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.88.5 Constructor 7145
- 35.88.6 Constructor(Handle as Integer) 7145


### 35.88.8 indexOfTickMarkAtPoint(p as NSPointMBS) as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the tick mark closest to the location of the receiver represented by the given point.
**Notes:** Returns the index of the tick mark closest to the location specified by point. If point is not within the bounding rectangle (plus an extra pixel of space) of any tick mark, the method returns NSNotFound.
In its implementation of this method, the receiving NSSlider instance simply invokes the method of the same name of its NSSliderCell instance. This method invokes rectOfTickMarkAtIndex: for each tick mark on the slider until it finds a tick mark containing the point.
See also:


- 35.88.9 indexOfTickMarkAtPoint(x as Double, y as Double) as Integer 7146


### 35.88.9 indexOfTickMarkAtPoint(x as Double, y as Double) as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the tick mark closest to the location of the receiver represented by the given point.
**Notes:** The index of the tick mark closest to the location specified by point. If point is not within the bounding rectangle (plus an extra pixel of space) of any tick mark, the method returns NSNotFound (&h7fffffff).
See also:


- 35.88.8 indexOfTickMarkAtPoint(p as NSPointMBS) as Integer 7146


### 35.88.10 rectOfTickMarkAtIndex(index as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the bounding rectangle of the tick mark at the given index.
**Notes:** If no tick mark is associated with index, the method raises NSRangeException.

### 35.88.11 tickMarkValueAtIndex(index as Integer) as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's value represented by the tick mark at the specified index.

### 35.88.12 Properties

### 35.88.13 allowsTickMarkValuesOnly as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver fixes its values to those values represented by its tick marks.
**Notes:** True if the slider fixes its values to the values represented by its tick marks; otherwise, false.
(Read and Write property)

### 35.88.14 altIncrementValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The amount by which the receiver changes its value when the user Option–drags the slider knob.
**Notes:** The amount by which the value changes when the user drags the slider knob with the Option key held down. Unless you assign a value to AltIncrementValue, altIncrementValue returns –1.0, and the receiver behaves no differently with the Option key down than with it up.
(Read and Write property)

### 35.88.15 image as NSImageMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** This method has been deprecated. Returns nil.
**Notes:** The slider may scale and distort barImage to fit inside the bar.

The knob may cover part of the image. If you want the image to be visible all the time, you're better off placing it near the slider.

This method has been deprecated by Apple.
(Read and Write property)

### 35.88.16 isVertical as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns an integer indicating the orientation (horizontal or vertical) of the slider.
**Notes:** 1 if the receiver is vertical, 0 if it's horizontal, and –1 if the orientation can't be determined (for example, if the slider hasn't been displayed yet). A slider is defined as vertical if its height is greater than its width.

Settable with macOS 10.12.
(Read and Write property)

### 35.88.17 knobThickness as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The knob's thickness, in pixels.
**Notes:** The thickness of the slider knob. The thickness is defined to be the extent of the knob along the long dimension of the bar. In a vertical slider, then, a knob's thickness is its height; in a horizontal slider, a knob's thickness is its width.
(Read and Write property)

### 35.88.18 maxValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value the receiver can send to its target.
**Notes:** The slider's maximum value. A horizontal slider sends its maximum value when the knob is at the right end of the bar; a vertical slider sends it when the knob is at the top.
(Read and Write property)

### 35.88.19 minValue as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** the minimum value the receiver can send to its target.
**Notes:** The slider's minimum value. A vertical slider sends its minimum value when its knob is at the bottom; a horizontal slider, when its knob is all the way to the left.
(Read and Write property)

### 35.88.20 numberOfTickMarks as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The number of tick marks associated with the receiver.
**Notes:** The number of the slider's tick marks.The tick marks assigned to the minimum and maximum values

are included.
(Read and Write property)

### 35.88.21 sliderType as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The slider type.
**Notes:** Either NSLinearSlider or NSCircularSlider.
(Read and Write property)

### 35.88.22 tickMarkPosition as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** How the receiver's tick marks are aligned with it.
**Notes:** A constant indicating the position of the tick marks. Possible values are NSTickMarkBelow, NSTickMarkAbove, NSTickMarkLeft, and NSTickMarkRight (the last two are for vertical sliders). The default alignments are NSTickMarkBelow and NSTickMarkLeft.
(Read and Write property)

### 35.88.23 title as string

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's title.
**Notes:** The default title is the empty string.
(Read and Write property)

### 35.88.24 titleCell as NSCellMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the cell used to draw the receiver's title.
**Notes:** You only need to invoke this method if the default title cell, NSTextFieldCell, doesn't suit your needs—that is, you want to display the title in a manner that NSTextFieldCell doesn't permit. When you do choose to override the default, titleCell should be an instance of a subclass of NSTextFieldCell.

This method has been deprecated by Apple.
(Read and Write property)

### 35.88.25 titleColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the color used to draw the receiver's title.
**Notes:** This method has been deprecated by Apple.
(Read and Write property)

### 35.88.26 titleFont as NSFontMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the font used to draw the receiver's title.
**Notes:** This method has been deprecated by Apple.
(Read and Write property)

### 35.88.27 trackFillColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The color of the filled portion of the slider track, in appearances that support it.
**Notes:** Requires macOS 10.12.2 or newer.
(Read and Write property)

### 35.88.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCircularSlider | 1 | One of the slider type constants.<br>A circular slider; that is, a dial. |
| NSLinearSlider | 0 | One of the slider type constants.<br>A bar-shaped slider. |
| NSTickMarkAbove | 1 | One of the values for the tickMarkPosition property.<br>Tick marks above (for horizontal sliders). |
| NSTickMarkBelow | 0 | One of the values for the tickMarkPosition property.<br>Tick marks below (for horizontal sliders); the default for horizontal sliders. |
| NSTickMarkLeft | 1 | One of the values for the tickMarkPosition property.<br>Tick marks to the left (for vertical sliders); the default. for vertical sliders |
| NSTickMarkRight | 0 | One of the values for the tickMarkPosition property.<br>Tick marks to the right (for vertical sliders). |

# 35.89 control NSSplitViewControlMBS

## 35.89.1 control NSSplitViewControlMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Our control to wrap a NSSplitViewMBS object.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr7
- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- NSSplitView Control for Xojo
- MBS Xojo Plugins, version 23.4pr5

## 35.89.2 Properties

## 35.89.3 View as NSSplitViewMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the underlaying NSSplitView.
**Notes:** (Read only property)

## 35.89.4 Events

## 35.89.5 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

## 35.89.6 canCollapseSubview(subview as NSViewMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to determine whether the user can collapse and expand the specified subview.
**Notes:** subview: The subview to collapse.

Returns true if subview collapses when the user drags a divider beyond the halfway mark between its minimum size and its edge; otherwise, false.

The subview expands when the user drags the divider beyond the halfway mark between its minimum size and its edge.

To specify the minimum size, define the constrainMaxCoordinate and constrainMinCoordinate events. A subview can collapse only if you also define constrainMinCoordinate.
A collapsed subview isn,Äôt visible, but the split view object retains it with the same size as before the collapse.
If the events are implemented, the subviews can,Äôt collapse.

### 35.89.7 Close

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.89.8 Closing

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.89.9 constrainMaxCoordinate(proposedMaximumPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the maximum coordinate limit of a divider when the user drags it.
**Notes:** proposedMax: The proposed maximum coordinate limit of the subview in the split view,Äôs flipped coordinate system.
dividerIndex: Specifies the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the maximum coordinate limit of the divider.

The delegate receives this message before the split view begins tracking the mouse to position a divider. You can further constrain the limits, but you can,Äôt extend the divider limits.
If the split bars are horizontal (views are one on top of the other), proposedMax is the bottom limit. If the split bars are vertical (views are side by side), proposedMax is the right limit. The initial value of proposedMax is the bottom (or right side) of the subview after the divider.

### 35.89.10 constrainMinCoordinate(proposedMinimumPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the minimum coordinate limit of a divider when the user drags it.
**Notes:** proposedMin: The proposed minimum coordinate limit of the subview in the split view,Äôs flipped coordinate system.
dividerIndex: Specifies the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the minimum coordinate limit of the divider.

The delegate receives this message before the split view begins tracking the cursor to position a divider. You can further constrain the limits, but you can,Äôt extend the divider limits.
If the split bars are horizontal (views are one on top of the other), proposedMin is the top limit. If the split bars are vertical (views are side by side), proposedMin is the left limit. The initial value of proposedMin is the top (or left side) of the subview before the divider.

### 35.89.11 constrainSplitPosition(proposedPosition as double, dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to constrain the divider to certain positions.
**Notes:** proposedPosition: The cursor,Äôs current position, and the proposed position of the divider.
dividerIndex: The index of the divider the user is moving, with the first divider being 0 and increasing from top to bottom (or left to right).

Returns the position for constraining the divider.

If the delegate implements this method, the split view calls it repeatedly as the user moves the divider.

If a subview,Äôs height must be a multiple of a certain number, use this method to return the multiple nearest to proposedPosition.

### 35.89.12 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.89.13 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.89.14 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.89.15 drawDivider(graphics as NSGraphicsMBS, Rect as NSRectMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Draws a divider between two of the split view,Äôs subviews.
**Example:**

```
Function drawDivider(graphics as NSGraphicsMBS, Rect as NSRectMBS) Handles drawDivider as Boolean

// draw a red box with blue border
graphics.setFillColor NSColorMBS.redColor
graphics.setStrokeColor NSColorMBS.blueColor

Dim r As New NSRectMBS(rect.X, rect.y + rect.Height/2 - 5, 10, 10)
```

```
graphics.fillRect r
graphics.strokeRect r

Return True
End Function
```

**Notes:** Rect: The entire divider rectangle in the split view,Äôs flipped coordinate system.

If you override this method to use a custom style for the divider, you may need to change the size of the divider.

### 35.89.16 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.89.17 FocusLost

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.89.18 FocusReceived

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.89.19 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.89.20 GotFocus

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.89.21 LostFocus

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.89.22 MenuBarSelected

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.89.23 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.89.24 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.89.25 MouseUp(x As Integer, y As Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.89.26 Open

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.89.27 Opening

Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.89.28 resizeSubviewsWithOldSize(oldSize as NSSizeMBS)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify custom sizing behavior for the subviews of the split view.
**Notes:** oldSize: The size of the split view before the user resizes it.

If the delegate implements this method, it receives this message after the split view resizes.

Resize the subviews so that the sum of the sizes of the subviews plus the sum of the thickness of the dividers equals the size of the new frame of the NSSplitView. You can get the thickness of a divider through the dividerThickness method.

If you implement this delegate method to resize subviews on your own, the NSSplitViewMBS doesn,Äôt perform any error checking for you. However, you can invoke adjustSubviews() to perform the default sizing behavior.

### 35.89.29 ScaleFactorChanged(NewFactor as double)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.89.30 shouldAdjustSizeOfSubview(view as NSViewMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify whether to resize the subview.
**Notes:** subview: The subview to resize.

If adjustSubviews() can change the size of the subview, return true; otherwise, false. By returning false, you lock the size of the split view subview while the split view resizes.

Regardless of the value that this method returns, adjustSubviews() may change the origin of the subview.

Nonresizable subviews may resize to prevent an invalid subview layout.
If a split view has no delegate, or if its delegate doesn,Äôt respond to this message, the split view behaves as if this method returns true.

### 35.89.31 shouldHideDivider(dividerIndex as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to determine whether the user can drag a divider or adjust it off the edge of the split view.
**Notes:** dividerIndex: The zero-based index of the divider.

Return true if the user can drag the divider off the edge of the split view, resulting in it not being visible.

If a split view has no delegate, or if its delegate doesn,Äôt respond to this message, the split view behaves as if it has a delegate that returns false when it receives this message.

### 35.89.32 splitViewDidResizeSubviews

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Notifies the delegate when the split view resizes its subviews.
**Notes:** The control invokes this event after the split view resizes two of its subviews in response to the repositioning of a divider.

### 35.89.33 splitViewWillResizeSubviews

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: .

**Function:** Notifies the delegate when the split view is about to resize its subviews.
**Notes:** The control invokes this method before the split view resizes two of its subviews in response to the repositioning of a divider.

### 35.89.34 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.90 class NSSplitViewMBS

## 35.90.1 class NSSplitViewMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** A view that arranges two or more views in a linear stack running horizontally or vertically.
**Example:**

```
Sub Opening()
// add sub views
Dim view As NSSplitViewMBS = Me.View

view.Vertical = True
view.addArrangedSubview TextArea1.NSViewMBS
view.addArrangedSubview TextArea2.NSViewMBS

End Sub
```

**Notes:** By default, dividers have a horizontal orientation so that the split view arranges its panes vertically from top to bottom.

Divider indices are zero-based. If the Vertical property is false, which is the default value, the top divider has an index of 0. If isVertical is true, the leading divider has an index of 0.
Subclass of the NSViewMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- NSSplitView Control for Xojo
- MBS Xojo Plugins, version 23.4pr5

**Xojo Developer Magazine**

- 21.6, page 8: News

## 35.90.2 Methods

## 35.90.3 addArrangedSubview(view as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds a view as an arranged split pane.
**Notes:** If the view isn,Äôt a subview of the split view, calling this method adds it to the split view,Äôs

subviews array.

### 35.90.4 adjustSubviews

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Adjusts the sizes of the split view,Äôs subviews so they (plus the dividers) fill the split view.
**Notes:** When you call this method, the split view,Äôs subviews resize proportionally; the relative sizes of the subviews don,Äôt change.

The default implementation of this method resizes subviews proportionally so that the ratio of heights (when using horizontal dividers) or widths (when using vertical dividers) doesn,Äôt change, even though the absolute sizes change.

Call this method on split views where you,Äôve added or removed subviews to reestablish the consistency of subview placement.

This method invalidates the cursor when it is over a divider, ensuring the cursor is always of the correct type during and after resizing animations.

### 35.90.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new split view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSDatePickerMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 35.90.6 Constructor(Handle as Integer) 7162
- 35.90.7 Constructor(left as double, top as double, width as double, height as double) 7163

### 35.90.6 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSSplitView handle.
**Example:**

```
dim t as new NSSplitViewMBS(0, 0, 100, 100)
dim v as new NSSplitViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSSplitView and the plugin retains this handle.
See also:


- 35.90.5 Constructor 7162
- 35.90.7 Constructor(left as double, top as double, width as double, height as double) 7163


### 35.90.7 Constructor(left as double, top as double, width as double, height as double)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new split view with the given size and position.
**Example:**

```
dim x as new NSSplitViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.90.5 Constructor 7162
- 35.90.6 Constructor(Handle as Integer) 7162


### 35.90.8 insertArrangedSubview(view as NSViewMBS, index as Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds a view as an arranged split pane at the specified index.
**Notes:** If the view is already an arranged view, calling this method moves the view to the specified index in the arrangedSubviews array. This change doesn,Äôt affect the view,Äôs index in the split view,Äôs subviews array.
If the view isn,Äôt a subview of the split view, calling this method adds it to the split view,Äôs subviews array.

### 35.90.9 isSubviewCollapsed(view as NSViewMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the specified view is in a collapsed state.
**Notes:** subview: The subview in the split view.

Returns true if subview is in a collapsed state; otherwise, false.

### 35.90.10 maxPossiblePositionOfDividerAtIndex(dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the maximum possible position of the divider at the specified index.
**Notes:** dividerIndex: The index of the divider.

Returns a number that specifies the maximum possible position of the divider.

The position is possible because the bounds of the split view and the current position of other dividers dictate it. Allowable positions result from letting the delegate apply constraints to the possible positions.

You can invoke this method to determine the range of values that you can pass to setPosition. You can also invoke it from delegate methods like constrainSplitPosition to implement relatively complex behaviors that depend on the current state of the split view.

The result of invoking this method when you haven,Äôt invoked adjustSubviews, and the subview frames are invalid, is undefined.

### 35.90.11 minPossiblePositionOfDividerAtIndex(dividerIndex as Integer) as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the minimum possible position of the divider at the specified index.
**Notes:** dividerIndex: The index of the divider.

Return a number that specifies the minimum possible position of the divider.

The position is possible because the bounds of the split view and the current position of other dividers dictate it. Allowable positions result from letting the delegate apply constraints to the possible positions.

You can invoke this method to determine the range of values that you can pass to setPosition(). You can

also invoke it from delegate methods like constrainSplitPosition to implement relatively complex behaviors that depend on the current state of the split view.

The result of invoking this method when you haven,Äôt invoked adjustSubviews, and the subview frames are invalid, is undefined.

### 35.90.12 removeArrangedSubview(view as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes a view as an arranged split pane.
**Notes:** If the value of arrangesAllSubviews is false, calling this method doesn,Äôt remove the view as a subview; it remains in the split view,Äôs subviews array.
If you remove a view as a subview (either by calling removeFromSuperview() or removing it from the split view,Äôs subviews array), the system automatically removes the view as an arranged subview.

### 35.90.13 setPosition(position as double, dividerIndex as Integer)

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** Updates the location of a divider you specify by index.
**Notes:** dividerIndex: The index of the divider.

One of the views adjacent to the divider may collapse because the method,Äôs default implementation assumes a person is dragging the divider to the new location. The Auto Layout system collapses the view if it can,Äôt satisfy the view,Äôs constraints —typically imposed by its delegate —with the divider,Äôs new location.
NSSplitView doesn,Äôt invoke this method.

### 35.90.14 Properties

### 35.90.15 arrangesAllSubviews as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether the split view arranges all of its subviews as split panes.
**Notes:** If the value of this property is true, the split view arranges all of its subviews automatically. The arrangedSubviews array is identical to the split view,Äôs subviews array, so any change to subviews reflects in the arrangedSubviews array. The default value of this property is true.

If the value of this property is false, you must explicitly add a view as an arranged subview to arrange it as a split pane. You add an arranged subview using addArrangedSubview.

When you change the value of this property from true to false, all existing subviews stay as arranged subviews in arrangedSubviews. When you change the value of this property from false to true, all existing subviews become arranged subviews, and the value of the subviews array becomes the arrangedSubviews array.
(Read and Write property)

### 35.90.16 autosaveName as String

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The name to use when the system automatically saves the split view,Äôs divider configuration.
**Notes:** If this property,Äôs value is empty, autosaving doesn,Äôt occur.
(Read and Write property)

### 35.90.17 dividerColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The color of the dividers that the split view draws between subviews.
**Notes:** The default implementation of this method returns clear when the split view,Äôs dividerStyle is thick, or when dividerStyle is paneSplitter and the split view is in a textured window. The system draws all other thin dividers with a color that provides appropriate contrast between two white panes.

Can be assigned to when you use the NSSplitView from our NSSplitViewControlMBS.
(Read only property)

### 35.90.18 dividerStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The style of divider between views.
**Notes:** See NSSplitViewDividerStyle* constants.
(Read and Write property)

### 35.90.19 dividerThickness as Double

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The thickness of the dividers for the split view.
**Notes:** Can be assigned to when you use the NSSplitView from our NSSplitViewControlMBS.
(Read and Write property)

### 35.90.20 Vertical as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines the geometric orientation of the split view's dividers.
**Notes:** The default value of this property is false, which indicates horizontal dividers and views that stack one above the other (top-to-bottom) in the containing split view controller,Äôs view.
To specify vertical dividers and a horizontal (side-by-side) arrangement of views within a split view controller, implement this property to return true.
(Read and Write property)

### 35.90.21 holdingPriorityForSubview(subviewIndex as Integer) as Integer

MBS MacCocoa Plugin, Plugin Version: 23.4, Platform: macOS, Targets: Desktop only.

**Function:** The priority of the subview,Äôs width or height when resizing.
**Notes:** The priority is the manner that the split view subviews use to maintain their width (for a vertical split view) or height (for a horizontal split view). During a split view resize, subviews with higher priorities maintain their sizes before subviews with lower priorities. The subview with the lowest priority is the first to gain additional thickness if the split view grows or shrinks.
(Read and Write computed property)

### 35.90.22 Constants

Layout Priorities

| Constant | Value | Description |
|---|---|---|
| NSLayoutPriorityDefaultHigh | 750 | Priority level with which a button resists compressing its con |
| NSLayoutPriorityDefaultLow | 250 | Priority level at which a button hugs its contents horizontally |
| NSLayoutPriorityDragThatCannotResizeWindow | 490 | Priority level at which a split view divider, say, is dragged. |
| NSLayoutPriorityDragThatCanResizeWindow | 510 | Appropriate priority level for a drag that may end up resizing |
| NSLayoutPriorityFittingSizeCompression | 50 | When you send a fittingSize message to a view, the smallest enough for the view's contents is computed. |
| NSLayoutPriorityRequired | 1000 | A required constraint. |
| NSLayoutPriorityWindowSizeStayPut | 500 | Priority level for the window,Äôs current size. |

Divider Styles

| Constant | Value | Description |
|---|---|---|
| NSSplitViewDividerStylePaneSplitter | 3 | A thick style divider with a 3D appearance displays between subviews. |
| NSSplitViewDividerStyleThick | 1 | A thick style divider displays between subviews. |
| NSSplitViewDividerStyleThin | 2 | A thin style divider displays between subviews. |

# 35.91 class NSStepperMBS

## 35.91.1 class NSStepperMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A stepper consists of two small arrows that can increment and decrement a value that appears beside it, such as a date or time.
**Notes:** The illustration below shows a stepper to the right of a text field, which would show the stepper's value.
Subclass of the NSControlMBS class.

## 35.91.2 Methods

## 35.91.3 Constructor

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new stepper with size 100/100 and position 0/0
**Example:**

```
dim t as new NSStepperMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.91.4 Constructor(Handle as Integer) 7169
- 35.91.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7170


## 35.91.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSStepper handle.
**Example:**

```
dim t as new NSStepperMBS(0, 0, 100, 100)
dim v as new NSStepperMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSStepper and the plugin retains this handle.
See also:


- 35.91.3 Constructor 7169
- 35.91.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7170


### 35.91.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new stepper with the given size and position.
**Example:**

```
dim x as new NSStepperMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.91.3 Constructor 7169
- 35.91.4 Constructor(Handle as Integer) 7169


### 35.91.6 Properties

### 35.91.7 autorepeat as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating how the receiver responds to mouse events.
**Notes:** True if the first mouse down does one increment (or decrement) and, after a delay of 0.5 seconds, increments (or decrements) at a rate of ten times per second. False if the receiver does one increment (decrement) on a mouse up. The default is true.
(Read and Write computed property)

### 35.91.8 increment as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The amount by which the receiver will change per increment (decrement).
**Notes:** (Read and Write computed property)

### 35.91.9 maxValue as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value.
**Notes:** (Read and Write computed property)

### 35.91.10 minValue as Double

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The minimum value.
**Notes:** (Read and Write computed property)

### 35.91.11 valueWraps as boolean

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver wraps around the minimum and maximum values.
**Notes:** If true, then when incrementing or decrementing, the value wraps around to the minimum or maximum. If valueWraps is false, the value stays pinned at the minimum or maximum.

For example for an angle where 359 increases to 0.
(Read and Write computed property)

## 35.92 control NSSwitchControlMBS

### 35.92.1 control NSSwitchControlMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSSwitch as control in Xojo.
**Notes:** Available on macOS 10.15 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr3
- Adding NSSwitch to Xojo
- MBS Xojo Plugins, version 22.1pr2

**Xojo Developer Magazine**

- 20.4, page 10: News
- 20.3, page 10: News

### 35.92.2 Properties

### 35.92.3 State as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The current state.
**Notes:** Set to true for toggle on and set to false for toggle off.
(Read and Write property)

### 35.92.4 View as NSSwitchMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.92.5 Events

### 35.92.6 Action

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The action event.

### 35.92.7 BoundsChanged

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.92.8 Close

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.92.9 Closing

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.92.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.92.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.92.12 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.92.13 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.92.14 FocusLost

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.92.15 FocusReceived

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.92.16 FrameChanged

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.92.17 GotFocus

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.92.18 LostFocus

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.92.19 MenuBarSelected

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.92.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.92.21 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.92.22 MouseUp(x As Integer, y As Integer)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.92.23 Open

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.92.24 Opening

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.92.25 ScaleFactorChanged(NewFactor as double)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.92.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.93 class NSSwitchMBS

### 35.93.1 class NSSwitchMBS

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The switch control class for Xojo.
**Notes:** The NSSwitch class provides a simple interface for displaying and toggling a Boolean state, such as on/off. A switch toggles its state and sends its action when clicked, activated through the keyboard, or tapped in the Touch Bar. NSSwitch also allows dragging between states, and if continuous is true, the switch sends its action for each change in position during the drag.

Use a switch to toggle significant preferences, or preferences that provide access to other controls. Avoid creating lists or tables of switches; instead, for general-purpose toggles, use an instance of NSButtonMBS to display a checkbox.

NSSwitch doesn,Äôt use an instance of NSCellMBS to provide its functionality. The cellClass class property and cell instance property both return nil, and they ignore attempts to set a non-nil value.

Available on macOS 10.15 or newer.
Subclass of the NSControlMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- Adding NSSwitch to Xojo
- MBS Xojo Plugins, version 22.1pr2

**Xojo Developer Magazine**

- 20.4, page 10: News
- 20.3, page 10: News

### 35.93.2 Methods

### 35.93.3 Constructor

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSwitchMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.93.4 Constructor(Handle as Integer) 7179
- 35.93.5 Constructor(left as double, top as double, width as double, height as double) 7179


### 35.93.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with size 100/100 and position 0/0
**Example:**

```
dim t as new NSSwitchMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.93.3 Constructor 7178
- 35.93.5 Constructor(left as double, top as double, width as double, height as double) 7179


### 35.93.5 Constructor(left as double, top as double, width as double, height as double)

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new button with the given size and position.
**Example:**

```
dim x as new NSSwitchMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.93.3 Constructor 7178
- 35.93.4 Constructor(Handle as Integer) 7179

### 35.93.6 Properties

### 35.93.7 state as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The current state.
**Notes:** Set to true for toggle on and set to false for toggle off.
(Read and Write property)

## 35.94 class NSTableColumnMBS

### 35.94.1 class NSTableColumnMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** An NSTableColumn stores the display characteristics and attribute identifier for a column in an NSTableView.
**Notes:** The NSTableColumn determines the width and width limits, resizability, and editability of its column in the NSTableView. It also stores two NSCell objects: the header cell, which is used to draw the column header, and the data cell, used to draw the values for each row. You can control the display of the column by setting the subclasses of NSCell used and by setting the font and other display characteristics for these NSCells. For example, you can use the default NSTextFieldCell for displaying string values or substitute an NSImageCell to display pictures.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr5

**Xojo Developer Magazine**

- 14.4, pages 27 to 28: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.94.2 Methods

### 35.94.3 Constructor(identifier as string)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a NSTableColumn with identifier as its identifier and with an NSTextFieldCell as its data cell.

### 35.94.4 dataCellForRow(row as Integer) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSCell object used by the NSTableView to draw values for the receiver.
**Notes:** NSTableView always calls this method. By default, this method just calls dataCell. Subclassers can override if they need to potentially use different cells for different rows. Subclasses should expect this method to be invoked with row equal to –1 in cases where no actual row is involved but the table view needs to get some generic cell info.

### 35.94.5 sizeToFit

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the receiver to fit the width of its header cell.
**Notes:** If the maximum width is less than the width of the header, the maximum is increased to the header's width. Similarly, if the minimum width is greater than the width of the header, the minimum is reduced to the header's width. Marks the NSTableView as needing display if the width actually changes.

### 35.94.6 Properties

### 35.94.7 dataCell as NSCellMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The NSCell object used by the NSTableView to draw values for the receiver.
**Notes:** You can use this property to control the font, alignment, and other text attributes for an NSTableColumn. You can also assign a cell to display things other than text—for example, an NSImageCell to display images.
(Read and Write property)

### 35.94.8 Editable as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the user can edit cells in the receiver by double-clicking them.
**Notes:** If value is true a double click initiates editing; if flag is false it merely sends the double-click event to the NSTableView. You can initiate editing programmatically regardless of this setting with NSTableView's editColumn() method.
(Read and Write property)

### 35.94.9 headerCell as NSTableHeaderCellMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The NSCell used to draw the receiver's header to aCell.
**Notes:** (Read and Write property)

### 35.94.10 headerToolTip as string

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The tooltip string that is displayed when the cursor pauses over the header cell of the receiver.
**Notes:** (Read and Write property)

### 35.94.11 Hidden as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the column is hidden.
**Notes:** (Read and Write property)

### 35.94.12 identifier as string

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The object used by the data source to identify the attribute corresponding to the receiver.
**Notes:** (Read and Write property)

### 35.94.13 maxWidth as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The maximum width.
**Notes:** Setting this value will also adjusting the current width if it's greater than this value.
(Read and Write property)

### 35.94.14 minWidth as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The minimum width.
**Notes:** Setting this value will also adjusting the current width if it's less than this value.
(Read and Write property)

### 35.94.15 Resizable as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether this column can be resized.
**Notes:** (Read and Write property)

### 35.94.16 resizingMask as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Defines the resizing mode for this column.
**Notes:** Use kNoResizing, kAutoresizingMask and kUserResizingMask constants.
(Read and Write property)

### 35.94.17 sortDescriptorPrototype as NSSortDescriptorMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The table column,Äôs sort descriptor prototype.
**Notes:** A table column is considered sortable if it has a sort descriptor that specifies the sorting direction, a key to sort by, and a selector that defines how to sort.
(Read and Write property)

### 35.94.18 tableView as NSTableViewMBS

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The owner tableview.
**Notes:** (Read and Write property)

### 35.94.19 title as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The title of the table column,Äôs header.
**Notes:** (Read and Write property)

### 35.94.20 width as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The width of the column.
**Notes:** (Read and Write property)

### 35.94.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTableColumnAutoresizingMask | 1 | One of the constants specify the resizing modes available for the table colum<br>Allows the table column to resize automatically in response to resizing tl<br>tableview. Enabling this option is the same as enabling the "Live Resizabl<br>option in Interface Builder. The resizing behavior for the table view is set usi<br>the NSTableView method setColumnAutoresizingStyle:.<br>Available in Mac OS X v10.4 and later. |
| NSTableColumnNoResizing | 0 | One of the constants specify the resizing modes available for the table colum<br>Prevents the table column from resizing.<br>Available in Mac OS X v10.4 and later. |
| NSTableColumnUserResizingMask | 2 | One of the constants specify the resizing modes available for the table colum<br>Allows the table column to be resized explicitly by the user. Enabling th<br>option is the same as enabling the "User Resizable" option in Interface Builde<br>Available in Mac OS X v10.4 and later. |

## 35.95 control NSTableControlMBS

### 35.95.1 control NSTableControlMBS

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** The control for a NSTableView.
**Notes:** Please use NSOutlineControlMBS for hierarchical lists and NSTableControlMBS for normal lists.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3
- Xojo 2022r3 released
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr5
- MBS Xojo Plugins, version 17.1pr3
- MBS Xojo Plugins, version 17.1pr2
- MBS Xojo / Real Studio Plugins, version 15.2pr2

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.3, page 10: News
- 14.4, page 22: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.95.2 Properties

### 35.95.3 AcceptTabs as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.95.4 allowsColumnReordering as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to rearrange columns by dragging their headers.
**Notes:** The default value of this property is true, which allows the user to rearrange the table view,Äôs columns. You can rearrange columns programmatically regardless of this setting.
(Read and Write property)

### 35.95.5 allowsColumnResizing as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to resize columns by dragging between their headers.
**Notes:** The default of this property is true, which allows the user to resize the table view,Äôs columns. You can resize columns programmatically regardless of this setting.
(Read and Write property)

### 35.95.6 allowsColumnSelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select columns by clicking their headers.
**Notes:** The default is false, which prevents the user from selecting columns (if you create the table view in Interface Builder, the default value is true). You can select columns programmatically regardless of this setting.
(Read and Write property)

### 35.95.7 allowsEmptySelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select zero columns or rows.
**Notes:** The default is true, which allows the user to select zero columns or rows.
(Read and Write property)

### 35.95.8 allowsMultipleSelection as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view allows the user to select more than one column or row at a time.
**Notes:** The default is false, which allows the user to select only one column or row at a time. You can select multiple columns or rows programmatically regardless of this setting.
(Read and Write property)

### 35.95.9 autohidesScrollers as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view automatically hides its scroll bars when they are not needed.
**Notes:** The horizontal and vertical scroll bars are hidden independently of each other. When the value of this property is YES and the content of the scroll view doesn't extend beyond the size of the clip view on a given axis, the scroller on that axis is removed to leave more room for the content.
(Read and Write property)

### 35.95.10 disableCellEvents as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to disable cell based events.
**Notes:** The table view can work with cell modes and use NSCell to disable cells.
Or since OS X 10.7 it can work with NSView to display cells or rows.
This property lets you explicitly disable cells and use only views.
(Read and Write property)

### 35.95.11 disableViewEvents as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to disable view based events.
**Notes:** The table view can work with cell modes and use NSCell to disable cells.
Or since OS X 10.7 it can work with NSView to display cells or rows.
This property lets you explicitly disable views and use only cells.
(Read and Write property)

### 35.95.12 hasHorizontalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a horizontal scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a horizontal scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.95.13 hasVerticalScroller as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean that indicates whether the scroll view has a vertical scroller.
**Notes:** When the value of this property is true, the scroll view allocates and displays a vertical scroller as needed. The default value of this property is false.
(Read and Write property)

### 35.95.14 ScrollView as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The scroll view used in this control.
**Notes:** (Read only property)

### 35.95.15 View as NSTableViewMBS

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** The table view used in this control.
**Notes:** (Read only property)
See also:

- 35.95.87 view(tableColumn as NSTableColumnMBS, row as Integer) as NSViewMBS 7209

### 35.95.16 Events

### 35.95.17 acceptDrop(info as NSDraggingInfoMBS, row as Integer, dropOperation as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called by TableView when the mouse button is released over a table view that previously decided to allow a drop.
**Notes:** info: An object that contains more information about this dragging operation.
row: The index of the proposed target row.
operation: The type of dragging operation.

Returns true if the drop operation was successful, otherwise false.

The data source should incorporate the data from the dragging pasteboard in the implementation of this method. You can use the draggingPasteboard method to get the data for the drop operation from info.
To accept a drop on the second row, row would be 2 and operation would be NSTableViewDropOn. To accept a drop below the last row, row would be TableView.numberOfRows and operation would be NSTableViewDropAbove.

### 35.95.18 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.95.19 Close

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.95.20 Closing

Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.95.21 ColumnDidMove(notification as NSNotificationMBS, oldColumn as Integer, newColumn as Integer)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** This event informs the delegate that a column was moved by user action in the table view.

### 35.95.22 ColumnDidResize(notification as NSNotificationMBS, tableColumn as NSTableColumnMBS, OldWidth as Double)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** This event informs you that a column was resized in the table view.

### 35.95.23 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.95.24 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.95.25 dataCell(tableColumn as NSTableColumnMBS, row as Int64) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Optional return a different cells for each row.
**Notes:** A different data cell can be returned for any particular tableColumn and row, or a cell that will be used for the entire row (a full width cell). The returned cell should properly implement copyWithZone:, since the cell may be copied by NSTableView. If the tableColumn is non-nil, and nil is returned, then the table will use the default cell from tableColumn.dataCellForRow(Row).

When each row is being drawn, this method will first be called with a nil tableColumn. At this time, you can return a cell that will be used to draw the entire row, acting like a group. If you do return a cell for the 'nil'

tableColumn, be prepared to have the other corresponding datasource and delegate methods to be called with a 'nil' tableColumn value. If don't return a cell, the method will be called once for each tableColumn in the tableView, as usual.

### 35.95.26 didAddRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was added at the specified row.
**Notes:** rowView: The row view.
row: The index of the row.

At this point, the delegate can add extra views, or modify the properties of rowView.

This method is only valid for NSView-based table views.

### 35.95.27 didClickTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Called if a table column was clicked on.

### 35.95.28 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.95.29 didDragTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button goes up in tableView and tableColumn has been dragged during the time the mouse button was down.
**Notes:** tableColumn: The table column.

The behavior of this method on Mac OS X v10.5 is different from prior versions. On Mac OS X v 10.5 the

dragged column is sent to the subclass. In earlier versions the table column that is currently located at the dragged column's original index is sent.

### 35.95.30 didRemoveRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was removed from the table at the specified row.
**Notes:** rowView: The row view.
row: The index of the row.

If row equals -1, the row is being deleted from the table and is no longer a valid row; otherwise row is a valid row that is being removed by being moved off screen.

This method is only valid for NSView-based table views.

### 35.95.31 didTile

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The tableview did tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.95.32 DoubleClick

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse made a double click.

### 35.95.33 draggingSessionEnded(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to determine when a dragging session has ended.
**Notes:** session: The dragging session.
screenPoint: The ending drag location in screen coordinates.

operation: The drag operation. See NSDragOperation for supported values.

This delegate method can be used to determine when the dragging source operation ended at a specific location, such as the trash, by checking for an operation of NSDragOperationDelete.

### 35.95.34 draggingSessionWillBegin(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, rowIndexes as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to determine when a dragging session will begin.
**Notes:** session: The dragging session.
screenPoint: The initial drag location in screen coordinates.
rowIndexes: The indexes of the rows to be dragged, excluding rows that were not dragged due to pasteboardItemForRow returning nil.

Implement this method to know when the dragging session is about to begin and to potentially modify the dragging session.
The dragged item order will directly match the pasteboard writer array used to begin the dragging session with the NSView method beginDraggingSessionWithItems. Hence, the order is deterministic, and can be used in acceptDrop when enumerating the NSDraggingInfo pasteboard classes.

### 35.95.35 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.95.36 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.95.37 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.95.38 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.95.39 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.95.40 heightOfRow(row as Int64) as Double

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Implement this event to support a table with varying row heights.
**Notes:** The height returned by this method should not include intercell spacing and must be greater than zero. Performance Considerations: For large tables in particular, you should make sure that this method is efficient. NSTableView may cache the values this method returns, but this should NOT be depended on, as all values may not be cached. To signal a row height change, call noteHeightOfRowsWithIndexesChanged. For a given row, the same row height should always be returned until noteHeightOfRowsWithIndexesChanged is called, otherwise unpredicable results will happen. NSTableView automatically invalidates its entire row height cache in reloadData, and noteNumberOfRowsChanged.

### 35.95.41 isGroupRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to indicate that a specified row is a group row.
**Notes:** row: The row index.

Return true if the specified row should have the group row style drawn, false otherwise.

If the cell in row is an NSTextFieldCell and contains only a string, the group row style attributes will automatically be applied to the cell.

Group rows in view-based table views can be made to visually ‚Äòfloat' by setting the tableview method setFloatsGroupRows to true.

Note: When configured as a source list style table view, rows identified as group rows draw with a specific style unique for source lists.
Available in Mac OS X v10.5 and later.

### 35.95.42 LeftMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.43 LeftMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the left button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.44 LeftMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the left mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide

event from Xojo runtime.

### 35.95.45 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.95.46 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.95.47 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.95.48 mouseDownInHeaderOfTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Sent to the subclass whenever the mouse button is clicked in the table view's header column.
**Notes:** tableColumn: The table column.

### 35.95.49 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.95.50 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.95.51 namesOfPromisedFilesDroppedAtDestination(dropDestination as folderItem, DraggedRowsWithIndexes as NSIndexSetMBS) as string()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns an array of filenames that represent the indexSet rows for a drag to dropDestination.
**Notes:** dropDestination: The drop location where the files are created.
indexSet: The indexes of the items being dragged.

Returns an array of filenames (not full paths) for the created files that the receiver promises to create.

This method is called when a destination has accepted a promise drag.
For more information on file promise dragging, see documentation on the NSDraggingSource protocol and namesOfPromisedFilesDroppedAtDestination:.

### 35.95.52 nextTypeSelectMatchFromRow(startRow as Int64, endRow as Int64, searchString as string) as Int64

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to modify how type selection works.
**Notes:** startRow: The starting row of the search range.
endRow: The ending row of the search range.
searchString: A string containing the typed selection.

Return the first row in the range of startRow through endRow (excluding endRow itself) that matches selectionString. Return -1 if no match is found.

It is possible for endRow to be less than startRow if the search will wrap.
Available in Mac OS X v10.5 and later.

### 35.95.53 numberOfRowsInTableView as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when the table view needs to know the number of rows.
**Notes:** numberOfRowsInTableView is called very frequently, so it must be efficient.

### 35.95.54 objectValue(column as NSTableColumnMBS, row as Integer) as Variant

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a value is required for a given cell.
**Notes:** Please implement your own arrays to store values.

### 35.95.55 Open

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.95.56 Opening

Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.95.57 OtherMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has pressed a mouse button other than the left or right one.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.58 OtherMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with a button other than the left or right button pressed.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.59 OtherMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released a mouse button other than the left or right button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.60 pasteboardItemForRow(row as Integer) as NSPasteboardItemMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called to allow the table to support multiple item dragging.
**Notes:** row: The row.

Returns an instance of NSPasteboardItem. Returning nil excludes the row from being dragged.

This method is required for multi-image dragging.
If this method is implemented, then writeRowsWithIndexes will not be called.

This is pasteboardWriterForRow method.

### 35.95.61 RightMouseDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the view that the user has pressed the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.62 RightMouseDragged(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has moved the mouse with the right button pressed .
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.63 RightMouseUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has released the right mouse button.
**Notes:** This event is called before the normal event processing from Xojo happens. So return true to hide event from Xojo runtime.

### 35.95.64 rowActionsForRow(row as Integer, edge as Integer) as NSTableViewRowActionMBS()

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Asks the control to provide an array of row actions to be attached to the specified edge of a table row and displayed when the user swipes horizontally across the row.
**Notes:** row: The index of the target row.
edge: The edge (NSTableRowActionEdgeLeading or NSTableRowActionEdgeTrailing) for which row actions are requested. This is based on the direction in which the user swiped on the row. Swiping to the right results in an edge value of leading. Swiping to the left results in an edge value of trailing.

Returns an array of row actions (of class NSTableViewRowActionMBS) to be enabled on the specified edge of the table row.

Implement this method if your table row supports actions that are displayed when the user swipes horizontally across the row. For example, your table view could use this method to implement a swipe left to delete function in your table rows. When called, this method receives the table view, the index of the row the user swiped, and an edge of type NSTableRowActionEdge. The method should return an array of any row actions of class NSTableViewRowAction that are supported for the specified edge. If no row actions are available, an empty array should be returned.
If this method isn,Äôt implemented, then the table row displays no actions when the user swipes horizontally away from the specified edge.

### 35.95.65 rowViewForRow(row as Integer) as NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row.
**Notes:** row: The row index.

Return an instance or subclass of NSTableRowView. If nil is returned, an NSTableRowView instance will be created and used.

You can implement this event to return a custom NSTableRowView for row.
The reuse queue can be used in the same way as documented in tableView:view:row:. The returned view will have attributes properly set to it before it,Äôs added to the tableView.

This method is only valid for NSView-based table views.

### 35.95.66 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.95.67 SelectionDidChange(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection has changed.

### 35.95.68 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the proposed selection.
**Notes:** proposedSelectionIndexes: An index set containing the indexes of the proposed selection.

Return an NSIndexSet instance containing the indexes of the new selection. Return proposedSelectionIndexes if the proposed selection is acceptable, or the value of the table view's existing selection to avoid changing the selection.

This method may be called multiple times with one new index added to the existing selection to find out if a particular index can be selected when the user is extending the selection with the keyboard or mouse.

Implementation of this method is optional. If implemented, this method will be called instead of shouldSelectRow.
Available in Mac OS X v10.5 and later.

### 35.95.69 SelectionIsChanging(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection is in the process of changing (typically because the user is dragging the mouse across a number of rows).

### 35.95.70 selectionShouldChangeInTableView as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Returns whether the selection should change.
**Notes:** Return true to allow the table view to change its selection (typically a row being edited), false to deny selection change.

The user can select and edit different cells within the same row, but can't select another row unless the delegate approves. The subclass can implement this method for complex validation of edited rows based on the values of any of their cells.

### 35.95.71 setObjectValue(value as Variant, column as NSTableColumnMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a cell value is saved to the datasource.

### 35.95.72 shouldEditTableColumn(tableColumn as NSTableColumnMBS, row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Returns whether the cell at the specified row and column can be edited.
**Notes:** TableColumn: The table column.
rowIndex: The row index.
Return true to allow editing the cell, false to deny editing.

The subclass can implement this method to disallow editing of specific cells.
Note: This method is only valid for cell-based table views.

### 35.95.73 shouldReorderColumn(columnIndex as Int64, newColumnIndex as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Sent to the subclass to allow or prohibit the specified column to be dragged to a new location.
**Notes:** columnIndex: The index of the column being dragged.
newColumnIndex: The proposed target index of the column.

Return true if the column reordering should be allowed, otherwise false.

When a column is initially dragged by the user, the delegate is first called with a newColumnIndex value of -1. Returning false will disallow that column from being reordered at all. Returning true allows it to be reordered, and the delegate will be called again when the column reaches a new location.

The actual NSTableColumn instance can be retrieved from the tableColumns array.

If this method is not implemented, all columns are considered reorderable.
Available in Mac OS X v10.6 and later.

### 35.95.74 shouldSelectRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Returns whether the table view should allow selection of the specified row.
**Notes:** rowIndex: The row index.

Return true to permit selection of the row, false to deny selection.

The delegate can implement this method to disallow selection of particular rows.
For better performance and finer-grain control over the selection, use selectionIndexesForProposedSelection.

### 35.95.75 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Returns whether the specified table column can be selected.
**Notes:** TableColumn: The table column.

Return true to permit selection, otherwise false.

The subclass can implement this event to disallow selection of particular columns.

### 35.95.76 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control cell expansion for a specific row and column.
**Notes:** TableColumn: The table column.
row: The row index.

Return true if the tooltip cell should expand, false otherwise.

Cell expansion can occur when the mouse hovers over the specified cell and the cell contents are unable to be fully displayed within the cell. If this method returns true, the full cell contents will be shown in a special floating tool tip view, otherwise the content is truncated.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.95.77 shouldTrackCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control the tracking behavior for a specific cell.
**Notes:** cell: The cell to track.
tableColumn: The table column.
row: A row in tableView.

Returns true if the cell should track, false otherwise.

Normally, only selectable or selected cells can be tracked. If you implement this method, cells which are not selectable or selected can be tracked, and vice-versa.

For example, this allows you to have an NSButtonCell in a table which does not change the selection, but can still be clicked on and tracked.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.95.78 shouldTypeSelectForEvent(e as NSEventMBS, searchString as string) as Boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control type select for a specific event.
**Notes:** event: The event.
searchString: The search string or nil if no type select has began.

Return true to allow type select for event, false otherwise.

Typically, this is called from the table view keyDown implementation and the event will be a key event.
Available in Mac OS X v10.5 and later.

### 35.95.79 sizeToFitWidthOfColumn(column as Int64) as Double

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide custom sizing behavior when a column's resize divider is double clicked.
**Notes:** column: The index of the column.

Returns the width of the specified column.

By default, NSTableView iterates every row in the table, accesses a cell via preparedCellAtColumn, and requests the cellSize to find the appropriate largest width to use.

For accurate results and performance, it is recommended that this method is implemented when using large tables. By default, large tables use a monte carlo simulation instead of iterating every row.

Available in Mac OS X v10.6 and later.

### 35.95.80 sortDescriptorsDidChange(oldDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called by TableView to indicate that sorting may need to be done.
**Notes:** The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source doesn,Äôt manage them itself, you can get the current sort descriptors by calling TableView.sortDescriptors function.

### 35.95.81 textShouldBeginEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow.

### 35.95.82 textShouldEndEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow.

### 35.95.83 toolTipForCell(cell as NSCellMBS, r as NSRectMBS, tableColumn as NSTableColumnMBS, row as Int64, mouseLocation as NSPointMBS) as string

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Returns a string that is displayed as a tooltip for the specified cell in the column and row.
**Notes:** Cell: The cell.
r: The proposed active area of the tooltip. You can modify rect to provide an alternative active area.
TableColumn: The table column.
row: The row index.
mouseLocation: The mouse location.

Return a string containing the tooltip. Return empty string if no tooltip is desired.

By default, rect is computed as cell.drawingRectForBounds(cellFrame).
Available in Mac OS X v10.4 and later.

### 35.95.84 typeSelectString(tableColumn as NSTableColumnMBS, row as Int64) as string

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide an alternate text value used for type selection for a specified row and column.
**Notes:** tableColumn: The table column.
row: The row index.

Returns a string that is used in type select comparison for row and tableColumn. Return "" if the row or tableColumn should not be searched.

Implement this method to change the string value that is searched for based on what is displayed. By default, all cells with text in them are searched.

If this event is not implemented the string value is the cell string value.
Implementation of this event is optional.

Available in Mac OS X v10.5 and later.

### 35.95.85 updateDraggingItemsForDrag(draggingInfo as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Implement this method to allow the table to update dragging items as they are dragged over a view.
**Notes:** The dragging information.

Required for multi-image dragging. Typically this will involve invoking enumerateDraggingItemsWithOptions on the draggingInfo parameter value and setting the draggingItem object,Äôs imageComponentsProvider to a proper image based on the content.
For view-based table views, you can use the NSTableCellView method draggingImageComponents. For cell-based tables, use the NSCell method draggingImageComponentsWithFrame.

### 35.95.86 validateDrop(info as NSDraggingInfoMBS, proposedRow as Integer, dropOperation as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Used by aTableView to determine a valid drop target.
**Notes:** info: An object that contains more information about this dragging operation.
row: The index of the proposed target row.
operation: The type of dragging operation proposed.

Returns the dragging operation the data source will perform.

The data source may retarget a drop by calling setDropRow and returning something other than NSDragOperationNone. A data source might retarget for various reasons, such as to provide better visual feedback when inserting into a sorted position.
To propose a drop on the second row, row would be 2 and operation would be NSTableViewDropOn. To propose a drop below the last row, row would be TableView.numberOfRows and operation would be NSTableViewDropAbove.

### 35.95.87 view(tableColumn as NSTableColumnMBS, row as Integer) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row and column.
**Notes:** see also

https://developer.apple.com/reference/appkit/nstableviewdelegate/1527449-tableview?language=objc
See also:

- 35.95.15 View as NSTableViewMBS 7189

### 35.95.88 willDisplayCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64)

MBS MacControls Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** Informs you that the tableview will display the specified cell at the row in the column.
**Notes:** Cell: The cell to be displayed.
TableColumn: The table column.
row: The row index.

The event can modify the display attributes of cell to alter the appearance of the cell.

Because cell is reused for every row in tableColumn, the event must set the display attributes both when drawing special cells and when drawing normal cells.

Note: The implementation of this method must not draw portions of the cell. It should only alter the state of the passed in cell.

### 35.95.89 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.95.90 willTile

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The tableview will tile.
**Notes:** The internal tile function properly sizes the table view and its header view and marks it as needing display.

### 35.95.91 writeRowsWithIndexes(rowIndexes as NSIndexSetMBS, pboard as NSPasteboardMBS) as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether a drag operation is allowed.
**Notes:** rowIndexes: An index set of row numbers that will be participating in the drag.
pboard: The pasteboard to which to write the drag data.

Returns true if the drag operation is allowed, false otherwise.

Called by TableView after it has been determined that a drag should begin, but before the drag has been started.
To refuse the drag, return false. To start a drag, return true and place the drag data onto pboard (data, owner, and so on). The drag image and other drag-related information will be set up and provided by the table view once this call returns with true.

## 35.96 class NSTableDataSourceMBS

### 35.96.1 class NSTableDataSourceMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The class for a data source of a NSTableView.
**Notes:** A listbox stores the data itself, but the NSTableView is just a view.
so you need to handle the storage of the table view yourself by subclassing this class and filling the events.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1

**Xojo Developer Magazine**

- 14.4, page 27: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.96.2 Events

### 35.96.3 Close

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** The event is called when the datasource is destroyed.

### 35.96.4 numberOfRowsInTableView as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Called when the table view needs to know the number of rows.
**Notes:** numberOfRowsInTableView is called very frequently, so it must be efficient.

### 35.96.5 objectValue(column as NSTableColumnMBS, row as Integer) as Variant

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Called when a value is required for a given cell.
**Notes:** Please implement your own arrays to store values.

### 35.96.6 setObjectValue(value as Variant, column as NSTableColumnMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Called when a cell value is saved to the datasource.

### 35.96.7 sortDescriptorsDidChange(oldDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called by TableView to indicate that sorting may need to be done.
**Notes:** The data source typically sorts and reloads the data, and adjusts the selections accordingly. If you need to know the current sort descriptors and the data source doesn,Äôt manage them itself, you can get the current sort descriptors by calling TableView.sortDescriptors function.

## 35.97 class NSTableHeaderCellMBS

### 35.97.1 class NSTableHeaderCellMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** An NSTableHeaderCell is used by an NSTableHeaderView to draw its column headers.
**Notes:** See the NSTableViewMBS class specification for more information on how it's used.

Subclasses of NSTableHeaderCell can override drawInteriorWithFrame, editWithFrame, and highlight:withFrame to change the way headers appear. See the NSCell class specification, and the following description, for information on these methods. (This works in Cocoa, but does not yet work in the plugin. If you need, send in a feature request.)
Subclass of the NSTextFieldCellMBS class.
**Blog Entries**

- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News
- 14.4, page 29: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.97.2 Methods

### 35.97.3 drawSortIndicatorWithFrame(cellFrame as NSRectMBS, inView as NSViewMBS, ascending as boolean, priority as Integer)

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Draws a sorting indicator given a cellFrame contained inside controlView.
**Notes:** If priority is 0, this is the primary sort indicator. If ascending is true, a "^" indicator will be drawn.
Override this method to customize the sorting user interface.
Available in Mac OS X v10.3 and later.

### 35.97.4 sortIndicatorRectForBounds(r as NSRectMBS) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the location to display the sorting indicator given rectangle.
**Notes:** Available in Mac OS X v10.3 and later.

# 35.98 class NSTableHeaderViewMBS

## 35.98.1 class NSTableHeaderViewMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** An NSTableHeaderView is used by an NSTableView to draw headers over its columns and to handle mouse events in those headers.
**Notes:** NSTableHeaderView uses NSTableHeaderCell to implement its user interface.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr5
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News

## 35.98.2 Methods

## 35.98.3 columnAtPoint(point as NSPointMBS) as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the column whose header lies under aPoint in the receiver, or –1 if no such column is found.
**Notes:** point: is expressed in the receiver's coordinate system.

## 35.98.4 Constructor

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new table header view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTableHeaderViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 35.98.5 Constructor(Handle as Integer) 7216
- 35.98.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7216


### 35.98.5 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSTableHeaderView handle.
**Example:**

```
dim t as new NSTableHeaderViewMBS(0, 0, 100, 100)
dim v as new NSTableHeaderViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSTableHeaderView and the plugin retains this handle.
See also:


- 35.98.4 Constructor 7215
- 35.98.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7216


### 35.98.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new table header view with the given size and position.
**Example:**

```
dim x as new NSTableHeaderViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.98.4 Constructor 7215
- 35.98.5 Constructor(Handle as Integer) 7216


### 35.98.7 draggedColumn as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** If the user is dragging a column in the receiver, returns the index of that column.
**Notes:** Otherwise returns –1.

### 35.98.8 draggedDistance as Double

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** If the user is dragging a column in the receiver, returns the column's horizontal distance from its original position.
**Notes:** Otherwise the return value is meaningless.

### 35.98.9 headerRectOfColumn(Column as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle containing the header tile for the column at columnIndex.
**Notes:** Raises an NSInternalInconsistencyException if columnIndex is out of bounds.

### 35.98.10 resizedColumn as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** If the user is resizing a column in the receiver, returns the index of that column.
**Notes:** Otherwise returns –1.

### 35.98.11 Properties

### 35.98.12 tableView as NSTableViewMBS

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop only.

**Function:** The owner tableview.
**Notes:** (Read and Write computed property)

## 35.99 class NSTableRowViewMBS

### 35.99.1 class NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSTableRowView class is the view shown for a row in an NSTableView.
**Notes:** It is responsible for displaying attributes associated with the row, including the selection highlight, and group row look.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr2

### 35.99.2 Methods

### 35.99.3 Constructor

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 35.99.4 Properties

### 35.99.5 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The background color of the row.
**Notes:** The property defaults to the table view,Äôs backgroundColor, unless usesAlternatingRowBackgroundColors is set to true. In that case, the colors alternate, and are automatically updated as required by insertions and deletions.
The value of the background color can be customized in the NSTableViewMBS.didAddRowView event. The property is animatable.
(Read and Write property)

### 35.99.6 emphasized as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Determines whether the row will draw with the alternate or secondary color (unless overridden).
**Notes:** When emphasized is true, the view will draw with the alternateSelectedControlColor defined by NSColor. When false it will use the secondarySelectedControlColor defined by NSColor.

(Read and Write property)

### 35.99.7 Floating as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the row is drawn using the floating style.
**Notes:** Floating is a temporary attribute that is set when a particular group row is actually floating above other rows. The state may change dynamically based on the position of the group row. Drawing may be different for rows that are currently 'floating'.
(Read and Write property)

### 35.99.8 groupRowStyle as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether this row view is a group row.
**Notes:** When true this row is a group row and will draw appropriately.
(Read and Write property)

### 35.99.9 NextRowSelected as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether next row is selected.
**Notes:** (Read and Write property)

### 35.99.10 PreviousRowSelected as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the previous row is selected.
**Notes:** (Read and Write property)

### 35.99.11 selected as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Determines whether the row is selected.
**Notes:** True if selected, otherwise false.

(Read and Write property)

### 35.99.12 selectionHighlightStyle as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the selection highlight style.
**Notes:** The possible values are specified in NSTableViewSelectionHighlightStyle in NSTableView.
(Read and Write property)

# 35.100 class NSTableViewMBS

## 35.100.1 class NSTableViewMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** An NSTableView object displays record-oriented data in a table and allows the user to edit values and resize and rearrange columns.
**Notes:** You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 17.1pr2
- MBS Xojo / Real Studio Plugins, version 15.5pr3
- MBS Xojo / Real Studio Plugins, version 15.2pr2
- MBS Xojo / Real Studio Plugins, version 14.2pr9
- MBS Xojo / Real Studio Plugins, version 13.4pr7
- MBS Real Studio Plugins, version 13.0pr7
- MBS REALbasic Plugins Version 10.4 release notes
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News
- 14.4, page 25: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

## 35.100.2 Methods

## 35.100.3 addTableColumn(column as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds a given column as the last column of the receiver.

### 35.100.4 beginUpdates

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Begins a group of updates for the table view.
**Notes:** For NSView-based table views, multiple row changes—that is, insertions, deletions, and moves—are animated simultaneously by surrounding calls to those method calls with beginUpdates and endUpdates. These methods are nestable.
The selected rows are maintained during the series of insertions, deletions, moves, and scrolling. If a selected row is deleted, a selection changed notification occurs after removeRowsAtIndexes is called.
It is not necessary to call beginUpdates and endUpdates if only one insertion, deletion, or move is occurring and the table view is an NSView-based table view. When using an NSCell-based table view, you must surround any insertion, deletion, or move in an update block for animations to occur.
The main reason for doing a batch update of changes to a table view is to avoid having the table animate unnecessarily.
Note that these methods should be called to reflect changes in your model; they do not make any underlying model changes.

For NSCell-based table views, it is required to call beginUpdates if you want to animate the insertRowsAtIndexes, removeRowsAtIndexes, and moveRowAtIndex.

### 35.100.5 canDragRowsWithIndexes(rowIndexes as NSIndexSetMBS, mouseDownPoint as NSPointMBS) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the table view allows dragging the rows at with the drag initiated at the specified point.
**Notes:** rowIndexes: The row indexes to drag.
mouseDownPoint: The location where the drag was initiated.

Returns no to disallow the drag.

### 35.100.6 columnAtPoint(p as NSPointMBS) as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the column a given point lies in.
**Notes:** Returns the index of the column aPoint lies in, or –1 if aPoint lies outside the receiver's bounds.
See also:

- 35.100.7 columnAtPoint(x as Double, y as Double) as Integer 

### 35.100.7 columnAtPoint(x as Double, y as Double) as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the column a given point lies in.
**Notes:** Returns the index of the column aPoint lies in, or –1 if aPoint lies outside the receiver's bounds.
See also:

- 35.100.6 columnAtPoint(p as NSPointMBS) as Integer 7222

### 35.100.8 columnForView(view as NSViewMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the column index for the specified view.
**Notes:** view: The view for which to retrieve the column.

Returns the index of the column containing view in the tableColumns array. This method returns -1 if the view is not in the table view. This method may also return -1 if the row containing the view is being animated away, such as during the deletion of a row.

This method is typically called in the action method of an NSButton (or NSControl) to find out what row (and column) the action should be performed on.
The implementation is O(n) where n is the number of visible rows, so this method should generally not be called within a loop.

### 35.100.9 columnIndexesInRect(rect as NSRectMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indexes of the receiver's columns that intersect the specified rectangle.
**Notes:** Available in Mac OS X v10.5 and later.

### 35.100.10 columnWithIdentifier(identifier as string) as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the first column in the receiver whose identifier is equal to a given identifier.
**Notes:** Returns the index of the first column in the receiver whose identifier is equal to anObject (when compared using isEqual:) or –1 if no columns are found with the specified identifier.

### 35.100.11 Constructor

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new table view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTableViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.100.12 Constructor(Handle as Integer) 7224
- 35.100.13 Constructor(left as Double, top as Double, width as Double, height as Double) 7224


### 35.100.12 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSTableView handle.
**Example:**

```
dim t as new NSTableViewMBS(0, 0, 100, 100)
dim v as new NSTableViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSTableView and the plugin retains this handle.
See also:


- 35.100.11 Constructor 7224
- 35.100.13 Constructor(left as Double, top as Double, width as Double, height as Double) 7224


### 35.100.13 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new table view with the given size and position.
**Example:**

```
dim x as new NSTableViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.100.11 Constructor 7224
- 35.100.12 Constructor(Handle as Integer) 7224


### 35.100.14 deselectAll

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Deselects all selected rows or columns if empty selection is allowed; otherwise does nothing.

### 35.100.15 deselectColumn(column as Integer)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Deselects the column at a given index if it's selected.
**Notes:** Colunn is from 0 to numberOfColumns-1.

### 35.100.16 deselectRow(row as Integer)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Deselects the row at a given index if it's selected.
**Notes:** Deselects the row at rowIndex if it's selected, regardless of whether empty selection is allowed.

### 35.100.17 Destructor

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** Xojo calls this destructor automatically.

### 35.100.18 dragImageForRowsWithIndexes(dragRows as NSIndexSetMBS, tableColumns() as NSTableColumnMBS, theEvent as NSEventMBS, byref dragImageOffset as NSPointMBS) as NSImageMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Computes and returns an image to use for dragging.
**Notes:** dragRows: An index set containing the row indexes that should be in the image.
tableColumns: An array of table columns that should be in the image.
dragEvent: The event that initiated the drag.
dragImageOffset: An in/out parameter specifying the offset of the cursor in the image, the default value is NSZeroPoint. Returning NSZeroPoint causes the cursor to be centered.

Returns an NSImage containing a custom image for the specified rows and columns participating in the drag.

### 35.100.19 edit(column as Integer, row as Integer, selectit as boolean)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Edits the cell at columnIndex and rowIndex, selecting its entire contents if flag is true.
**Notes:** This method is invoked automatically in response to user actions; you should rarely need to invoke it directly.

This method scrolls the receiver so that the cell is visible, sets up the field editor, and sends selectWithFrame() and editWithFrame() to the field editor's NSCell object with the NSTableView as the text delegate.

The row at rowIndex must be selected prior to calling editColumn:row:withEvent:select:, or an exception will be raised.

### 35.100.20 endUpdates

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Ends the group of updates for the table view.
**Notes:** Ends the group of updates for the table view. This method, like beginUpdates, is nestable. See beginUpdates for details.

### 35.100.21 frameOfCellAtColumnRow(column as Integer, row as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a rectangle locating the cell that lies at the intersection of the specified column and row.
**Notes:** column: The index in the tableColumns array of the column containing the cell whose rectangle you want.
row: The index of the row containing the cell whose rectangle you want.

Returns a rectangle locating the cell that lies at the intersection of columnIndex and rowIndex. This method returns NSRectMBS.Zero if columnIndex or rowIndex is greater than the number of columns or rows in the table view.

You can use this method to update a single cell more efficiently than sending the table view a reloadData message using reloadData function.
The result of this method is used in a drawWithFrame:inView: message to the table column's data cell. You can subclass and override this method to customize the frame of a particular cell. However, never return a frame larger than the default implementation returns.
The default frame is computed to have a height equal to the rectOfRow: for rowIndex, minus the half intercellSpacing height on the top and half on the bottom. The width of frame is equal to the with of the table column minus half the intercellSpacing width on the left, and half on the right.

### 35.100.22 hiddenRowIndexes as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The indexes of all hidden table rows.
**Notes:** The value of this property is an index set containing the indexes of any hidden table rows. Table rows may be hidden by invoking the hideRowsAtIndexes method. Some drag-and-drop operations also result in hidden rows.

### 35.100.23 hideRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Hides the specified table rows.
**Notes:** indexes: An index set containing indexes of the rows to be hidden.
rowAnimation: An animation effect to be applied when the rows are hidden.

Use this method when you no longer want the data to be visible to the user, but you don,Äôt want to permanently remove the data. Hidden table rows have a height of zero and cannot be selected by the user. However, if a selected table row is hidden, it will remain selected.
Hiding a table row causes the didRemoveRowView delegate method to be invoked.

### 35.100.24 insertRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Inserts the rows using the specified animation.
**Notes:** indexes: The final positions of the new rows to be inserted.
animationOptions: The animation displayed during the insert. See NSTableViewAnimationOptions for the possible values that can be combined using the bitwise OR operator.

The numberOfRows in the table view is automatically increased by the count of indexes.
Calling this method multiple times within the same beginUpdates and endUpdates block is allowed, and changes are processed incrementally.

NSCell-based table views must first call beginUpdates before calling this method.

### 35.100.25 isColumnSelected(column as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the column at a given index is selected.
**Notes:** column is from 0 to to numberOfColumns.

### 35.100.26 isRowSelected(row as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the row at a given index is selected.
**Notes:** row is from 0 to to numberOfRows.

### 35.100.27 moveColumn(column as Integer, toIndex as Integer)

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Moves the column and heading at a given index to a new given index.
**Notes:** columnIndex: The current index of the column to move.
newIndex: The new index for the moved column.

This method raises the ColumnDidMove event.

### 35.100.28 moveRowAtIndex(oldIndex as Integer, newIndex as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Moves the specified row to the new row location using animation.
**Notes:** oldIndex: Initial row index.
newIndex: New row index.

This is similar to removing a row at oldIndex and inserting it at newIndex, except the same view is used and simply has its position updated to the new location.
Changes happen incrementally as they are sent to the table, so as soon as this method is called the row can be considered moved. However the underlying view is not moved until endUpdates has been called.
This method can be called multiple times within the same beginUpdates and endUpdates block.

NSCell-based table views must first call beginUpdates before calling this method.

### 35.100.29 noteHeightOfRowsWithIndexesChanged(indexSet as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop only.

**Function:** Informs the table view that the rows specified in indexSet have changed height.
**Notes:** indexSet: Index set of rows that have changed their height.

If you implement heightOfRow event this method immediately retiles the table view using the row heights the event provides.

For NSView-based tables, this method will animate. To turn off the animation, create an NSAnimationContext grouping and set the duration to 0. Then call this method and end the grouping.

For NSCell-based tables, this method normally doesn't animate. However, it will animate if you call it inside a beginUpdates/endUpdates block.

### 35.100.30 noteNumberOfRowsChanged

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Informs the receiver that the number of records in its data source has changed.
**Notes:** This method allows the receiver to update the scrollers in its scroll view without actually reloading data into the receiver. It's useful for a data source that continually receives data in the background over a period of time, in which case the table view can remain responsive to the user while the data is received.

### 35.100.31 rectOfColumn(column as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle containing the column at at a given index.
**Notes:** The rectangle containing the column at columnIndex. Returns NSRectMBS.Zero (an empty rectangle) if columnIndex lies outside the range of valid column indices for the receiver.

You can use this method to update a single column more efficiently than sending the table view a reloadData message.

aTableView.setNeedsDisplayInRect(aTableView.rectOfColumn(column))

### 35.100.32 rectOfRow(row as Integer) as NSRectMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle containing the row at a given index.
**Notes:** Returns the rectangle containing the row at rowIndex. Returns NSRectMBS.Zero (an empty rectangle) if rowIndex lies outside the range of valid row indices for the receiver.

### 35.100.33 reloadData

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Marks the receiver as needing redisplay, so it will reload the data for visible cells and draw the new values.
**Notes:** This method forces redraw of all the visible cells in the receiver. If you want to update the value in a single cell, column, or row, it is more efficient to use frameOfCellAtColumn(), rectOfColumn(), or rectOfRow() in conjunction with setNeedsDisplayInRect(). If you just want to update the scroller, use noteNumberOfRowsChanged; if the height of a set of rows changes, use noteHeightOfRowsWithIndexesChanged().
See also:

- 35.100.34 reloadData(rowIndexes as NSIndexSetMBS, columnIndexes as NSIndexSetMBS) 7230

### 35.100.34 reloadData(rowIndexes as NSIndexSetMBS, columnIndexes as NSIndexSetMBS)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the data for only the specified rows and columns.
**Notes:** rowIndexes: The indexes of the rows to update.
columnIndexes: The indexes of the columns to update.

For cells that are visible, the appropriate dataSource and delegate methods are called and the cells are redrawn.
For tables that support variable row heights, the row height is not re-queried from the delegate; it is your responsibility to invoke noteHeightOfRowsWithIndexesChanged if a row height change is required.

For NSView-based table views, this method drops the view-cells in the table row, but not the NSTableRowView instances.
See also:

- 35.100.33 reloadData 7230

### 35.100.35 removeRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Removes the rows using the specified animation.
**Notes:** indexes: An index set containing the rows to remove.
animationOptions: The animation displayed during the insert. See NSTableViewAnimationOptions for the possible values that can be combined using the bitwise OR operator.

This method deletes from the table the rows represented at indexes and automatically decreases numberOfRows by the count of indexes.
The row indexes should be with respect to the current state displayed in the table view, and not the final state, because the specified rows do not exist in the final state.
Calling this method multiple times within the same beginUpdates and endUpdates block is allowed, and changes are processed incrementally.
Changes are processed incrementally as the insertRowsAtIndexes, removeRowsAtIndexes, and the moveRowAtIndex methods are called. It is acceptable to delete row 0 multiple times, as long as there is still a row available.

NSCell-based table views must first call beginUpdates before calling this method.

### 35.100.36 removeTableColumn(column as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes a given column from the receiver.

### 35.100.37 rowAtPoint(p as NSPointMBS) as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the row a given point lies in.
**Notes:** Returns the index of the row aPoint lies in, or –1 if aPoint lies outside the receiver's bounds.
See also:

- 35.100.38 rowAtPoint(x as Double, y as Double) as Integer 7232

### 35.100.38 rowAtPoint(x as Double, y as Double) as Integer

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the row a given point lies in.
**Notes:** Returns the index of the row aPoint lies in, or –1 if aPoint lies outside the receiver's bounds.
See also:

- 35.100.37 rowAtPoint(p as NSPointMBS) as Integer 7231

### 35.100.39 rowForView(view as NSViewMBS) as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the row for the specified view.
**Notes:** view: The view for which to retrieve the row.

Returns the index of the row containing to view. This method returns -1 if the view is not in the table view. This method may also return -1 if the row containing the view is being animated away, such as during the deletion of a row.

This method is typically called in the action method for an NSButton (or NSControl) to find out what row (and column) the action should be performed on.
The implementation is O(n) where n is the number of visible rows, so this method should generally not be called within a loop.

### 35.100.40 rowsInRect(rect as NSRectMBS) as NSRangeMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a range of indexes for the rows that lie wholly or partially within the vertical boundaries of the specified rectangle.
**Notes:** Rect: A rectangle in the coordinate system of the table view.

Returns a range of indexes for the table view,Äôs rows that lie wholly or partially within the horizontal boundaries of aRect. If the width or height of aRect is 0, this method returns an NSRange whose length is

0.

The location of the range is the index of the first row in the rectangle, and the length is the number of rows that lie in the rectangle.

### 35.100.41 rowViewAtRow(row as Integer, makeIfNecessary as Boolean) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a row view at the specified index, creating one if necessary.
**Notes:** row: The row index.
makeIfNecessary: True if a view is required, NO if you want to update properties on a view, if one is available.

Returns an instance, or subclass, of NSTableRowView. Returning nil is also valid if makeIfNecessary is false and the view did not exist.

This method first attempts to return a currently displayed view in the visible area. If there is no visible view, and makeIfNecessary is true, a prepared temporary view is returned. If makeIfNecessary is false, and the view is not visible, nil is returned.
In general, makeIfNecessary should be true if you require a resulting view, and false if you want to update properties on a view only if it is available (generally this means it is visible).
An exception is thrown if row falls outside of the number of rows in the table (numberOfRows). The returned result should generally not be held onto for longer than the current run loop cycle. It,Äôs better to call rowViewAtRow whenever a view is required.

### 35.100.42 scrollColumnToVisible(column as Integer)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver and header view horizontally in an enclosing NSClipView so the column specified by columnIndex is visible.

### 35.100.43 scrollRowToVisible(row as Integer)

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver vertically in an enclosing NSClipView so the row specified by rowIndex is visible.

### 35.100.44 ScrollToLine(Line as Integer, Animated as Boolean)

MBS MacControls Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls to line.
**Notes:** If animated is true, the scroll is animated.
The line is centered in the middle of the viewable area if possible.

### 35.100.45 selectAll

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Selects all rows or all columns, according to whether rows or columns were most recently selected.
**Notes:** If the table allows multiple selection, this action method selects all rows or all columns, according to whether rows or columns were most recently selected. If nothing has been recently selected, this method selects all rows. If this table doesn't allow multiple selection, this method does nothing.

### 35.100.46 selectColumnIndexes(indexes as NSIndexSetMBS, extend as boolean)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the column selection using indexes.
**Notes:** f the extend flag is false the selected columns are specified by indexes. If extend is true, the columns indicated by indexes are added to the collection of already selected columns, providing multiple selection.

### 35.100.47 selectedColumnIndexes as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an index set containing the indexes of the selected columns.
**Notes:** Returns an index set containing the indexes of the selected columns.

### 35.100.48 selectedRowIndexes as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an index set containing the indexes of the selected rows.
**Notes:** Available in Mac OS X v10.3 and later.

### 35.100.49 selectRowIndexes(indexes as NSIndexSetMBS, extend as boolean)

MBS MacControls Plugin, Plugin Version: 9.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the row selection using indexes.
**Notes:** If the extend flag is false the selected rows are specified by indexes. If extend is true, the rows indicated by indexes are added to the collection of already selected rows, providing multiple selection.

Available in Mac OS X v10.3 and later.

### 35.100.50 setDraggingSourceOperationMask(mask as Integer, isLocal as Boolean)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the default operation mask returned by draggingSourceOperationMaskForLocal to mask.
**Notes:** mask: The drag operation mask. See NSDragOperation for the supported values.
isLocal: True if the destination is the same application, otherwise false. In either case the specified mask value is archived and used.

### 35.100.51 setDropRow(row as Integer, dropOperation as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Retargets the proposed drop operation.
**Notes:** row: The target row index.
dropOperation: The drop operation. Supported values are specified by NSTableViewDropOperation.

For example, to specify a drop on the second row, specify row as 1, and operation as NSTableViewDropOn. To specify a drop below the last row, specify row as [ self numberOfRows ] and operation as NSTableViewDropAbove.
Passing a value of –1 for row and NSTableViewDropOn as the operation causes the entire table view to be highlighted rather than a specific row. This is useful if the data displayed by the table view does not allow the user to drop items at a specific row location.

### 35.100.52 setSortDescriptor(sortDescriptor as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver's sort descriptors.
**Notes:** A table column is considered sortable if it has a sort descriptor that specifies the sorting direction, a key to sort by, and a selector defining how to sort.

The array of sort descriptors is archived. Sort descriptors persist along with other column information if an autosave name is set.

Calling setSortDescriptors may have the side effect of invoking the data source method tableViewSortDescriptorsDidChange.

### 35.100.53 setSortDescriptors(sortDescriptors() as NSSortDescriptorMBS)

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver's sort descriptors.
**Notes:** A table column is considered sortable if it has a sort descriptor that specifies the sorting direction, a key to sort by, and a selector defining how to sort.

The array of sort descriptors is archived. Sort descriptors persist along with other column information if an autosave name is set.

Calling setSortDescriptors may have the side effect of invoking the data source method tableViewSortDescriptorsDidChange.

### 35.100.54 sizeLastColumnToFit

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the last column if there's room so the receiver fits exactly within its enclosing clip view.

### 35.100.55 sizeToFit

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Changes the width of columns in the receiver so all columns are visible.
**Notes:** All columns are resized to the same size, up to a column's maximum size. This method then invokes tile.

### 35.100.56 sortDescriptors as NSSortDescriptorMBS()

MBS MacControls Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver,Äôs sort descriptors.

### 35.100.57 tableColumns as NSTableColumnMBS()

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing the the NSTableColumn objects in the receiver.
**Notes:** The array returned by tableColumns contains all receiver's columns, including those that are hidden.

### 35.100.58 tableColumnWithIdentifier(identifier as string) as NSTableColumnMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSTableColumn object for the first column whose identifier is equal to a given object.
**Notes:** Returns the NSTableColumn object for the first column whose identifier is equal to anObject, as compared using isEqual:, or nil if no columns are found with the specified identifier.

### 35.100.59 tile

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Properly sizes the receiver and its header view and marks it as needing display.
**Notes:** Also resets cursor rectangles for the header view and line scroll amounts for the NSScrollView object.

### 35.100.60 unhideRowsAtIndexes(indexes as NSIndexSetMBS, animationOptions as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Unhides the specified table rows.
**Notes:** indexes: An index set containing indexes of the hidden rows to be shown again.
rowAnimation: An animation effect to be applied when the rows are hidden.

Unhiding a table row causes the didAddRowView event to be invoked.

### 35.100.61 viewAtColumn(column as Integer, row as Integer, makeIfNecessary as Boolean) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a view at the specified row and column indexes, creating one if necessary.
**Notes:** column: The index of the column in the tableColumns array.
row: The row index.
makeIfNecessary: true if a view is required, false if you want to update properties on a view, if one is available.

Returns an instance of NSView.

This method first attempts to return an available view, which is generally in the visible area. If there is no available view, and makeIfNecessary is true, a prepared temporary view is returned. If makeIfNecessary is false, and the view is not available, nil will be returned.
In general, makeIfNecessary should be true if you require a resulting view, and false if you only want to update properties on a view only if it is available (generally this means it is visible).
An exception will be thrown if row is not within the numberOfRows. The returned result should generally not be held onto for longer than the current run loop cycle. Instead they should re-query the table view for the row view.

### 35.100.62 Properties

### 35.100.63 allowsColumnReordering as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the user can drag column headers to reorder columns.
**Notes:** The default is true. You can rearrange columns programmatically regardless of this setting.
(Read and Write property)

### 35.100.64 allowsColumnResizing as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver allows the user to resize columns by dragging between their headers.
**Notes:** (Read and Write property)

### 35.100.65 allowsColumnSelection as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the user can select an entire column by clicking its header.
**Notes:** The default is false. You can select columns programmatically regardless of this setting.
(Read and Write property)

### 35.100.66 allowsEmptySelection as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the receiver allows zero rows or columns to be selected.
**Notes:** Unlike with the other settings that affect selection behavior, you cannot set an empty selection programmatically if empty selection is disallowed.
(Read and Write property)

### 35.100.67 allowsMultipleSelection as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the user can select more than one row or column at a time.
**Notes:** The default is false. You can select multiple columns or rows programmatically regardless of this setting.
(Read and Write property)

### 35.100.68 allowsTypeSelect as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows the user to type characters to select rows.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.100.69 autosaveName as string

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The name under which table information is automatically saved.
**Notes:** The table information is saved separately for each user and for each application that user uses.

Note that even when a table view has an autosave name, it may not be saving table information automatically.
(Read and Write property)

### 35.100.70 autosaveTableColumns as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the order and width of this table view's columns are automatically saved.
**Notes:** If flag is different from the current value, this method also reads in the saved information and sets the table options to match.

The table information is saved separately for each user and for each application that user uses. Note that if autosaveName returns nil, this setting is ignored and table information isn't saved.
(Read and Write property)

### 35.100.71 backgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The color used to draw the background of the receiver.
**Notes:** The default background color is light gray.
(Read and Write property)

### 35.100.72 clickedColumn as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the column the user clicked to trigger an action message.
**Notes:** The index of the column the user clicked to trigger an action message. Returns –1 if the user clicked in an area of the table view not occupied by columns.

Index is zero based.
(Read only property)

### 35.100.73 clickedRow as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the row the user clicked to trigger an action message.
**Notes:** The index of the row the user clicked to trigger an action message. Returns –1 if the user clicked in an area of the table view not occupied by table rows.

Index is zero based.
(Read only property)

### 35.100.74 columnAutoresizingStyle as Integer

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The table's column autoresizing style.
**Notes:** Use the following constants:

NSTableViewMBS.kFirstColumnOnlyAutoresizingStyle
NSTableViewMBS.kUniformColumnAutoresizingStyle
NSTableViewMBS.kSequentialColumnAutoresizingStyle
NSTableViewMBS.kReverseSequentialColumnAutoresizingStyle
NSTableViewMBS.kNoColumnAutoresizing
NSTableViewMBS.kLastColumnOnlyAutoresizingStyle

Available in Mac OS X v10.4 and later.
(Read and Write property)

### 35.100.75 cornerView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The view used to draw the area to the right of the column headers and above the vertical scroller of the enclosing scroll view.
**Notes:** This is by default a simple view that merely fills in its frame, but you can replace it with a custom view using this property.
(Read and Write property)

### 35.100.76 dataSource as NSTableDataSourceMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The object that provides the data displayed in the table view.
**Notes:** (Read and Write property)

### 35.100.77 draggingDestinationFeedbackStyle as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The feedback style displayed when the user drags over the table view.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.100.78 editedColumn as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the column being edited.
**Notes:** First column has index zero.
If sent during editColumn(), the index of the row being edited; otherwise –1.
(Read only property)

### 35.100.79 editedRow as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the row being edited.
**Notes:** The first row index is zero.
If sent during editColumn(), the index of the row being edited; otherwise –1.
(Read only property)

### 35.100.80 effectiveRowSizeStyle as Integer

MBS MacControls Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the effective row size style for the table.
**Notes:** If the rowSizeStyle is NSTableViewRowSizeStyleDefault, then this method returns the default size for this table.
The default size is currently set in the System Preferences by the users.
Available in OS X v10.7 and later.
(Read only property)

### 35.100.81 effectiveStyle as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The effective style when style is NSTableViewStyleAutomatic.
**Notes:** Otherwise, it returns the same value as style.
(Read only property)

### 35.100.82 floatsGroupRows as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table view draws grouped rows as if they are floating.
**Notes:** Group rows are rows for which the table view delegate,Äôs isGroupRow method returns true. These rows can be displayed as if they are floating in a view-based table view.
The default value of this property is true.
(Read and Write property)

### 35.100.83 focusedColumn as Integer

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The currently focused column.
**Notes:** Returns the index of the column, or -1 if there is no focused column
The focus interaction will always be on the selectedRow of the table. If the selectedRow is a full width cell, then focusedColumn will return 1 when focused..
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.100.84 gridColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The color used to draw grid lines.
**Notes:** The default color is gray.
(Read and Write property)

### 35.100.85 gridStyleMask as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's grid style mask.
**Notes:** use the constants;

```
kGridNone                    = 0,
 kSolidVerticalGridLineMask  = 1
 kSolidHorizontalGridLineMask = 2
```

(Read and Write property)

### 35.100.86 headerView as NSTableHeaderViewMBS

MBS MacControls Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The NSTableHeaderView object used to draw headers over columns.
**Notes:** The NSTableHeaderView object used to draw headers over columns, or nil if the receiver has no header view
(Read and Write property)

### 35.100.87 highlightedtableColumn as NSTableColumnMBS

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The table column highlighted in the receiver.
**Notes:** A highlightable column header can be used in conjunction with row selection to highlight a particular column of the table. An example of this is how the Mail application indicates the currently sorted column.
(Read and Write property)

### 35.100.88 intercellSpacing as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The horizontal and vertical spacing between cells.
**Notes:** The default spacing is (3.0, 2.0).
(Read and Write property)

### 35.100.89 numberOfColumns as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of columns in the receiver.
**Notes:** The value returned includes table columns that are currently hidden.
(Read only property)

### 35.100.90 numberOfRows as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of rows in the receiver.
**Notes:** Typically you should not ask the table view how many rows it has; instead you should interrogate the table view's data source.

(Read only property)

### 35.100.91 numberOfSelectedColumns as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of selected columns.
**Notes:** (Read only property)

### 35.100.92 numberOfSelectedRows as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of selected rows.
**Notes:** (Read only property)

### 35.100.93 rowActionsVisible as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether a table row,Äôs actions are visible.
**Notes:** This property contains a Boolean value indicating whether a table row,Äôs actions are visible or not—the user has swiped the row to reveal the row actions. Set the value of this property to false to hide any visible row actions. Setting the value of this property to true is not supported, and will result in an exception.
(Read and Write property)

### 35.100.94 rowHeight as Double

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the height of each row in the receiver.
**Notes:** The default row height is 16.0.
(Read and Write property)

### 35.100.95 rowSizeStyle as Integer

MBS MacControls Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The row size used by the tableview: small, medium, large, or on a custom row by row basis.
**Notes:** The row size style can be modified on a row by row basis by invoking the event heightOfRow, if implemented.

The rowSizeStyle defaults to NSTableViewRowSizeStyleCustom. NSTableViewRowSizeStyleCustom indicates to use the rowHeight of the table, instead of the pre-determined system values.

Generally, rowSizeStyle should always be NSTableViewRowSizeStyleCustom except for "source lists". To implement variable row heights, set the value to NSTableViewRowSizeStyleCustom and implement tableView:heightOfRow: in the delegate.

Available in OS X v10.7 and later.
(Read and Write property)

### 35.100.96 selectedColumn as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the last column selected or added to the selection.
**Notes:** Returns the index of the last column selected or added to the selection, or –1 if no column is selected.
(Read only property)

### 35.100.97 selectedRow as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the last row selected or added to the selection.
**Notes:** Returns the index of the last row selected or added to the selection, or –1 if no row is selected.
(Read only property)

### 35.100.98 selectionHighlightStyle as Integer

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The selection highlight style used by the receiver to indicate row and column selection.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.100.99 style as Integer

MBS MacControls Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** The table view style.
**Example:**

```
dim tableView as NSTableViewMBS // your table view

tableView.style = NSTableViewMBS.NSTableViewStyleFullWidth
```

**Notes:** Defaults to NSTableViewStyleAutomatic.
For macOS 11.0 or newer.

Available styles:

| | |
|---|---|
| NSTableViewStyleFullWidth | The table view style resolves to a full-width style. |
| NSTableViewStyleInset | The table view style resolves to an inset style. |
| NSTableViewStyleSourceList | The table view style resolves to a source-list style. |
| NSTableViewStylePlain | The table view style resolves to a plain style. |

(Read and Write property)

### 35.100.100 usesAlternatingRowBackgroundColors as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver uses the standard alternating row colors for its background.
**Notes:** Available in Mac OS X v10.3 and later.
(Read and Write property)

### 35.100.101 usesStaticContents as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the table uses static data.
**Notes:** A static table does not rely on a data source to provide the number of rows. A static table view,Äôs contents are set at design time and can be changed programmatically as needed. Typically, you do not change the contents of a static table view after setting them.
In Xcode, any rows you add to a static table are saved in the corresponding nib or storyboard file and

loaded with the rest of the table at runtime. You can add table rows programmatically to a static table view using the insertRowsAtIndexes method. When adding rows programmatically, your table view delegate must implement the view method to provide the corresponding view for any new rows. You can also remove rows at any time using the removeRowsAtIndexes method.

A table with static contents must be an NSView-based table view.

Available in macOS 10.10 or later.
(Read and Write property)

### 35.100.102 verticalMotionCanBeginDrag as boolean

MBS MacControls Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether vertical motion is treated as a drag or selection change to flag.
**Notes:** If flag is false then vertical motion will not start a drag. The default is true.

Note that horizontal motion is always a valid motion to begin a drag. Most often, you would want to disable vertical dragging when it's expected that horizontal dragging is the natural motion.
(Read and Write property)

### 35.100.103 indicatorImageInTableColumn(column as NSTableColumnMBS) as NSImageMBS

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The indicator image of a given table column.
**Notes:** An indicator image is an arbitrary (small) image that is rendered on the right side of the column header. An example of its use is in Mail to indicate the sorting direction of the currently sorted column in a mailbox.
(Read and Write computed property)

### 35.100.104 Events

### 35.100.105 ColumnDidMove(notification as NSNotificationMBS, oldColumn as Integer, newColumn as Integer)

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** This event informs the delegate that a column was moved by user action in the table view.

### 35.100.106 ColumnDidResize(notification as NSNotificationMBS, column as NSTableColumnMBS, index as Integer)

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** This event informs you that a column was resized in the table view.

### 35.100.107 dataCell(tableColumn as NSTableColumnMBS, row as Int64) as NSCellMBS

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Optional return a different cells for each row.
**Notes:** A different data cell can be returned for any particular tableColumn and row, or a cell that will be used for the entire row (a full width cell). The returned cell should properly implement copyWithZone:, since the cell may be copied by NSTableView. If the tableColumn is non-nil, and nil is returned, then the table will use the default cell from tableColumn.dataCellForRow(Row).

When each row is being drawn, this method will first be called with a nil tableColumn. At this time, you can return a cell that will be used to draw the entire row, acting like a group. If you do return a cell for the 'nil' tableColumn, be prepared to have the other corresponding datasource and delegate methods to be called with a 'nil' tableColumn value. If don't return a cell, the method will be called once for each tableColumn in the tableView, as usual.

### 35.100.108 didAddRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was added at the specified row.
**Notes:** rowView: The row view.
row: The index of the row.

At this point, the delegate can add extra views, or modify the properties of rowView.

This method is only valid for NSView-based table views.

### 35.100.109 didClickTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Called if a table column was clicked on.

### 35.100.110 didDragTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Sent at the time the mouse button goes up in tableView and tableColumn has been dragged during the time the mouse button was down.
**Notes:** tableColumn: The table column.

The behavior of this method on Mac OS X v10.5 is different from prior versions. On Mac OS X v 10.5 the dragged column is sent to the subclass. In earlier versions the table column that is currently located at the dragged column's original index is sent.

### 35.100.111 didRemoveRowView(rowView as NSTableRowViewMBS, row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Tells the delegate that a row view was removed from the table at the specified row.
**Notes:** rowView: The row view.
row: The index of the row.

If row equals -1, the row is being deleted from the table and is no longer a valid row; otherwise row is a valid row that is being removed by being moved off screen.

This method is only valid for NSView-based table views.

### 35.100.112 DoubleClick

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** A double click was recognized.

### 35.100.113 heightOfRow(row as Int64) as Double

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Implement this event to support a table with varying row heights.
**Notes:** The height returned by this method should not include intercell spacing and must be greater than zero. Performance Considerations: For large tables in particular, you should make sure that this method is efficient. NSTableView may cache the values this method returns, but this should NOT be depended on, as all values may not be cached. To signal a row height change, call noteHeightOfRowsWithIndexesChanged. For a given row, the same row height should always be returned until noteHeightOfRowsWithIndexesChanged is called, otherwise unpredicable results will happen. NSTableView automatically invalidates its entire row height cache in reloadData, and noteNumberOfRowsChanged.

### 35.100.114 isGroupRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to indicate that a specified row is a group row.
**Notes:** row: The row index.

Return true if the specified row should have the group row style drawn, false otherwise.

If the cell in row is an NSTextFieldCell and contains only a string, the group row style attributes will automatically be applied to the cell.

Group rows in view-based table views can be made to visually ‚Äòfloat’ by setting the tableview method setFloatsGroupRows to true.

Note: When configured as a source list style table view, rows identified as group rows draw with a specific style unique for source lists.
Available in Mac OS X v10.5 and later.

### 35.100.115 mouseDownInHeaderOfTableColumn(tableColumn as NSTableColumnMBS)

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Sent to the subclass whenever the mouse button is clicked in the table view's header column.
**Notes:** tableColumn: The table column.

### 35.100.116 nextTypeSelectMatchFromRow(startRow as Int64, endRow as Int64, searchString as string) as Int64

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to modify how type selection works.
**Notes:** startRow: The starting row of the search range.
endRow: The ending row of the search range.
searchString: A string containing the typed selection.

Return the first row in the range of startRow through endRow (excluding endRow itself) that matches selectionString. Return -1 if no match is found.

It is possible for endRow to be less than startRow if the search will wrap.
Available in Mac OS X v10.5 and later.

### 35.100.117 rowViewForRow(row as Integer) as NSTableRowViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row.
**Notes:** row: The row index.

Return an instance or subclass of NSTableRowView. If nil is returned, an NSTableRowView instance will be created and used.

You can implement this event to return a custom NSTableRowView for row.
The reuse queue can be used in the same way as documented in tableView:view:row:. The returned view will have attributes properly set to it before it,Äôs added to the tableView.

This method is only valid for NSView-based table views.

### 35.100.118 SelectionDidChange(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection has changed.

### 35.100.119 selectionIndexesForProposedSelection(proposedSelectionIndexes as NSIndexSetMBS) as NSIndexSetMBS

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to modify the proposed selection.
**Notes:** proposedSelectionIndexes: An index set containing the indexes of the proposed selection.

Return an NSIndexSet instance containing the indexes of the new selection. Return proposedSelectionIndexes if the proposed selection is acceptable, or the value of the table view's existing selection to avoid changing the selection.

This method may be called multiple times with one new index added to the existing selection to find out if a particular index can be selected when the user is extending the selection with the keyboard or mouse.

Implementation of this method is optional. If implemented, this method will be called instead of shouldSelectRow.
Available in Mac OS X v10.5 and later.

### 35.100.120 SelectionIsChanging(notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** This event informs you that the table view's selection is in the process of changing (typically because the user is dragging the mouse across a number of rows).

### 35.100.121 selectionShouldChangeInTableView as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Returns whether the selection should change.
**Notes:** Return true to allow the table view to change its selection (typically a row being edited), false to deny selection change.

The user can select and edit different cells within the same row, but can't select another row unless the

delegate approves. The subclass can implement this method for complex validation of edited rows based on the values of any of their cells.

### 35.100.122 shouldEditTableColumn(tableColumn as NSTableColumnMBS, row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Returns whether the cell at the specified row and column can be edited.
**Notes:** TableColumn: The table column.
rowIndex: The row index.
Return true to allow editing the cell, false to deny editing.

The subclass can implement this method to disallow editing of specific cells.
Note: This method is only valid for cell-based table views.

### 35.100.123 shouldReorderColumn(columnIndex as Int64, newColumnIndex as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Sent to the subclass to allow or prohibit the specified column to be dragged to a new location.
**Notes:** columnIndex: The index of the column being dragged.
newColumnIndex: The proposed target index of the column.

Return true if the column reordering should be allowed, otherwise false.

When a column is initially dragged by the user, the delegate is first called with a newColumnIndex value of -1. Returning false will disallow that column from being reordered at all. Returning true allows it to be reordered, and the delegate will be called again when the column reaches a new location.

The actual NSTableColumn instance can be retrieved from the tableColumns array.

If this method is not implemented, all columns are considered reorderable.
Available in Mac OS X v10.6 and later.

### 35.100.124 shouldSelectRow(row as Int64) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Returns whether the table view should allow selection of the specified row.
**Notes:** rowIndex: The row index.

Return true to permit selection of the row, false to deny selection.

The delegate can implement this method to disallow selection of particular rows.
For better performance and finer-grain control over the selection, use selectionIndexesForProposedSelection.

### 35.100.125 shouldSelectTableColumn(tableColumn as NSTableColumnMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Returns whether the specified table column can be selected.
**Notes:** TableColumn: The table column.

Return true to permit selection, otherwise false.

The subclass can implement this event to disallow selection of particular columns.

### 35.100.126 shouldShowCellExpansion(tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control cell expansion for a specific row and column.
**Notes:** TableColumn: The table column.
row: The row index.

Return true if the tooltip cell should expand, false otherwise.

Cell expansion can occur when the mouse hovers over the specified cell and the cell contents are unable to be fully displayed within the cell. If this method returns true, the full cell contents will be shown in a special floating tool tip view, otherwise the content is truncated.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.100.127 shouldTrackCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64) as Boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control the tracking behavior for a specific cell.
**Notes:** cell: The cell to track.
tableColumn: The table column.
row: A row in tableView.

Returns true if the cell should track, false otherwise.

Normally, only selectable or selected cells can be tracked. If you implement this method, cells which are not selectable or selected can be tracked, and vice-versa.

For example, this allows you to have an NSButtonCell in a table which does not change the selection, but can still be clicked on and tracked.

Note: This method is only valid for cell-based table views.

Available in Mac OS X v10.5 and later.

### 35.100.128 shouldTypeSelectForEvent(e as NSEventMBS, searchString as string) as Boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to control type select for a specific event.
**Notes:** event: The event.
searchString: The search string or nil if no type select has began.

Return true to allow type select for event, false otherwise.

Typically, this is called from the table view keyDown implementation and the event will be a key event.
Available in Mac OS X v10.5 and later.

### 35.100.129 sizeToFitWidthOfColumn(column as Int64) as Double

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide custom sizing behavior when a column's resize divider is double clicked.
**Notes:** column: The index of the column.

Returns the width of the specified column.

By default, NSTableView iterates every row in the table, accesses a cell via preparedCellAtColumn, and requests the cellSize to find the appropriate largest width to use.

For accurate results and performance, it is recommended that this method is implemented when using large tables. By default, large tables use a monte carlo simulation instead of iterating every row.

Available in Mac OS X v10.6 and later.

### 35.100.130 textShouldBeginEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow.

### 35.100.131 textShouldEndEditing(control as NSControlMBS, fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow.

### 35.100.132 toolTipForCell(cell as NSCellMBS, r as NSRectMBS, tableColumn as NSTableColumnMBS, row as Int64, mouseLocation as NSPointMBS) as string

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Returns a string that is displayed as a tooltip for the specified cell in the column and row.
**Notes:** Cell: The cell.
r: The proposed active area of the tooltip. You can modify rect to provide an alternative active area.
TableColumn: The table column.

row: The row index.
mouseLocation: The mouse location.

Return a string containing the tooltip. Return empty string if no tooltip is desired.

By default, rect is computed as cell.drawingRectForBounds(cellFrame).
Available in Mac OS X v10.4 and later.

### 35.100.133 typeSelectString(tableColumn as NSTableColumnMBS, row as Int64) as string

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Invoked to allow the subclass to provide an alternate text value used for type selection for a specified row and column.
**Notes:** tableColumn: The table column.
row: The row index.

Returns a string that is used in type select comparison for row and tableColumn. Return "" if the row or tableColumn should not be searched.

Implement this method to change the string value that is searched for based on what is displayed. By default, all cells with text in them are searched.

If this event is not implemented the string value is the cell string value.
Implementation of this event is optional.

Available in Mac OS X v10.5 and later.

### 35.100.134 view(tableColumn as NSTableColumnMBS, row as Integer) as NSViewMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Asks the delegate for a view to display the specified row and column.
**Notes:** see also
https://developer.apple.com/reference/appkit/nstableviewdelegate/1527449-tableview?language=objc

### 35.100.135 willDisplayCell(cell as NSCellMBS, tableColumn as NSTableColumnMBS, row as Int64)

MBS MacControls Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Informs you that the tableview will display the specified cell at the row in the column.
**Notes:** Cell: The cell to be displayed.
TableColumn: The table column.
row: The row index.

The event can modify the display attributes of cell to alter the appearance of the cell.

Because cell is reused for every row in tableColumn, the event must set the display attributes both when drawing special cells and when drawing normal cells.

Note: The implementation of this method must not draw portions of the cell. It should only alter the state of the passed in cell.

### 35.100.136 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTableViewDashedHorizontalGridLineMask | 8 | One of the constants to specify grid styles.<br>Specifies that the horizontal grid lines should be dra |
| NSTableViewDraggingDestinationFeedbackStyleGap | 2 | One of the dragging styles.<br>Provides a gap insertion when dragging over the tab<br>only officially supported for View Based TableViews,<br>Cell Based TableViews. The decision to use the gap s<br>style) can be made in draggingSessionWillBeginAtPo<br>be changed. |
| NSTableViewDraggingDestinationFeedbackStyleNone | -1 | One of the constants to specify the drag styles displ<br>Provides no feedback when the user drags over the<br>exists to allow subclasses to implement their draggin<br>or to make it not show anything all.<br>Available in Mac OS X v10.6 and later. |
| NSTableViewDraggingDestinationFeedbackStyleRegular | 0 | One of the constants to specify the drag styles displ<br>Draws a solid round-rect background on drop targ<br>marker between rows. This style should be used in r<br>Available in Mac OS X v10.6 and later. |
| NSTableViewDraggingDestinationFeedbackStyleSourceList | 1 | One of the constants to specify the drag styles displ<br>Draws an outline on drop target rows, and an insert<br>This style will automatically be set for source lists wh<br>HighlightStyle: is set to NSTableViewSelectionHighl<br>is the standard look for Source Lists, but may be use<br>Available in Mac OS X v10.6 and later. |
| NSTableViewDropAbove | 1 | One of the constants to specify drop operations.<br>Specifies that the drop should occur above the speci<br>For example, given a table with n rows (numbere<br>visually), a row of n–1 and operation of NSTableVie<br>drop on the last row. To specify a drop below the la<br>and NSTableViewDropAbove for the operation. |
| NSTableViewDropOn | 0 | One of the constants to specify drop operations.<br>Specifies that the drop should occur on the specified<br>For example, given a table with n rows (numbere<br>visually), a row of n–1 and operation of NSTableVie<br>drop on the last row. To specify a drop below the la<br>and NSTableViewDropAbove for the operation. |
| NSTableViewFirstColumnOnlyAutoresizingStyle | 5 | One of the constants to specify the autoresizing styl<br>Autoresize only the first table column.<br>When that table column can no longer be resized, st<br>you should use one of the sequential autoresizing mo<br>Available in Mac OS X v10.4 and later. |
| NSTableViewGridNone | 0 | One of the constants for the grid styles.<br>Specifies that no grid lines should be displayed. |
| NSTableViewLastColumnOnlyAutoresizingStyle | 4 | One of the constants to specify the autoresizing styl<br>Autoresize only the last table column.<br>When that table column can no longer be resized, st<br>you should use one of the sequential autoresizing mo<br>Available in Mac OS X v10.4 and later. |
| NSTableViewNoColumnAutoresizing | 0 | One of the constants to specify the autoresizing styl<br>Disable table column autoresizing.<br>Available in Mac OS X v10.4 and later. |
| NSTableViewReverseSequentialColumnAutoresizingStyle | 3 | One of the constants to specify the autoresizing styl<br>Autoresize each table column sequentially, from the f<br>to the last auto-resizable column; proceed to the next<br>column has reached its minimum or maximum size.<br>Available in Mac OS X v10.4 and later. |
| NSTableViewSelectionHighlightStyleNone | -1 | One of the constants to specify the selection highligh<br>Displays no highlight style at all.<br>Available in Mac OS X v10.6 and later. |

RowActionEdge

| Constant | Value | Description |
|---|---|---|
| NSTableRowActionEdgeLeading | 0 | Denotes the leading, or left, edge of an table row view. |
| NSTableRowActionEdgeTrailing | 1 | Denotes the trailing, or right, edge of an table row view. |

Animation options

| Constant | Value | Description |
|---|---|---|
| NSTableViewAnimationEffectFade | 1 | Use a fade for row or column removal. The effect can be combined with any the slide constants. |
| NSTableViewAnimationEffectGap | 2 | Creates a gap for newly inserted rows. This is useful for drag and drop anim tions that animate to a newly opened gap and should be used in the acceptDr event. |
| NSTableViewAnimationEffectNone | 0 | Use no animation effects. |
| NSTableViewAnimationSlideDown | &h20 | Animates a row insertion or removal by sliding downward. |
| NSTableViewAnimationSlideLeft | &h30 | Animates a row insertion by sliding from the left. Animates a row removal sliding towards the left. |
| NSTableViewAnimationSlideRight | &h40 | Animates a row insertion by sliding from the right. Animates a row remov by sliding towards the right. |
| NSTableViewAnimationSlideUp | &h10 | Animates a row insertion or removal by sliding upward. |

Row Size Style Constants

| Constant | Value | Description |
|---|---|---|
| NSTableViewRowSizeStyleCustom | 0 | The table will use the rowHeight or invoke the delegate method tabl View:heightOfRow:, if implemented. The cell layout is not changed. Available in OS X v10.7 and later. The row size style constants define the size of the rows in the table view. Th are used by the effectiveRowSizeStyle and rowSizeStyle methods. You can al query the row size in the NSTableCellView class' property rowSizeStyle. |
| NSTableViewRowSizeStyleDefault | -1 | The table will use the system default layout size: small, medium or large. Available in OS X v10.7 and later. The row size style constants define the size of the rows in the table view. Th are used by the effectiveRowSizeStyle and rowSizeStyle methods. You can al query the row size in the NSTableCellView class' property rowSizeStyle. |
| NSTableViewRowSizeStyleLarge | 3 | The table will use a row height specified for a small table. It is required th the size be fully tested and supported if NSTableViewRowSizeStyleCustom not used. Available in OS X v10.7 and later. The row size style constants define the size of the rows in the table view. Th are used by the effectiveRowSizeStyle and rowSizeStyle methods. You can al query the row size in the NSTableCellView class' property rowSizeStyle. |
| NSTableViewRowSizeStyleMedium | 2 | The table will use a row height specified for a medium table. It is required th the size be fully tested and supported if NSTableViewRowSizeStyleCustom not used. Available in OS X v10.7 and later. The row size style constants define the size of the rows in the table view. Th are used by the effectiveRowSizeStyle and rowSizeStyle methods. You can al query the row size in the NSTableCellView class' property rowSizeStyle. |
| NSTableViewRowSizeStyleSmall | 1 | The table will use a row height specified for a small table. It is required th the size be fully tested and supported if NSTableViewRowSizeStyleCustom not used. Available in OS X v10.7 and later. The row size style constants define the size of the rows in the table view. Th are used by the effectiveRowSizeStyle and rowSizeStyle methods. You can al query the row size in the NSTableCellView class' property rowSizeStyle. |

Styles

| Constant | Value | Description |
|---|---|---|
| NSTableViewStyleAutomatic | 0 | Automatically infers the effectiveStyle from the table view hierarchy. |
| NSTableViewStyleFullWidth | 1 | Edge-to-edge style with standard content padding at the ends of each row. This content padding is constant and independent of intercellSpacing. |
| NSTableViewStyleInset | 2 | Inset style with rounded corners selection |
| NSTableViewStylePlain | 4 | A plain style. No insets, padding or any other kind of decoration applied to the row or its background. The cells are equally spaced in the row using intercellSpacing.width. |
| NSTableViewStyleSourceList | 3 | The source list style of NSTableView. Setting this style will have the side effect of setting the background color to "source list".<br>Additionally in NSOutlineView, the following properties may change to get the standard "source list" look: indentationPerLevel, rowHeight and intercellSpacing. After setting the style it is possible to change any of the other properties as required.<br>In 10.11, if the background color has been changed from the "source list" background color to something else, the table will no longer draw the selection as a source list blur style, and instead will draw a normal selection highlight.<br>This replaces NSTableViewSelectionHighlightStyleSourceList which is to be deprecated. |

# 35.101 class NSTableViewRowActionMBS

## 35.101.1 class NSTableViewRowActionMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** An NSTableViewRowAction object defines a single action to present when the user swipes horizontally on a table row.
**Notes:** In an editable table, performing a horizontal swipe on a row reveals a button to delete the row by default. This class lets you define one or more custom actions to display for a given row in your table. Each instance of this class represents a single action to perform and includes the text, formatting information, and behavior for the corresponding button.

To add custom actions to your table view,Äôs rows, implement the rowActionsForRow event in your table view,Äôs delegate object. In that method, create and return an array of actions for the specified row. The table handles the remaining work of displaying the action buttons and executing the appropriate handler block when the user clicks the button.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr3

## 35.101.2 Methods

## 35.101.3 available as boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Check whether this class is available.
**Notes:** Returns true on macOS 10.11.

## 35.101.4 Constructor(Style as Integer, Title as String)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new table view row action object.
**Notes:** style: The style characteristics to apply to the button. Use this value to apply default appearance characteristics to the button. These characteristics visually communicate, such as by color, information about what the button does. For example, specify a style of NSTableViewRowActionStyleDestructive to indicate an action is destructive to the underlying data. For a list of possible style values, see NSTableViewRowActionStyle.
title: The string to display in the button. Specify a string localized for the user,Äôs current language.

Returns a new table row action object that you can return from your table view,Äôs event.

The style you specify cannot be changed later. You can change the title of the action button. You can also configure other appearance-related properties of the button using the properties of this class.
You can assign the same row action object to multiple rows of your table.

### 35.101.5 Properties

### 35.101.6 BackgroundColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The background color of the action button.
**Notes:** Use this property to specify the background color for your button. If you do not specify a value for this property, AppKit assigns a default color based on the value in the style property. Generally, this color is red for destructive actions and blue for nondestructive actions.
(Read and Write property)

### 35.101.7 Handle as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 35.101.8 Image as NSImageMBS

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The image.
**Notes:** Available in macOS 10.12 or later.
(Read and Write property)

### 35.101.9 Style as Integer

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The style applied to the action button.
**Notes:** The value of this property is set at creation time and cannot be changed later.
(Read only property)

### 35.101.10 Title as String

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** The title of the action button.
**Notes:** (Read and Write property)

### 35.101.11 Events

### 35.101.12 Action(row as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when action is invoked.
**Notes:** The event to execute when the user clicks the button associated with this action. When the user selects the action represented by this object, AppKit executes your event on the app,Äôs main thread.

### 35.101.13 Constants

Styles

| Constant | Value | Description |
|---|---|---|
| NSTableViewRowActionStyleDestructive | 1 | Apply a style that indicates that the action might change or delete da style changes the value of the backgroundColor property to an app value to reflect the destructive action. After creating the action obj can change the background color as needed. Destructive actions require swipe to activate, and trigger an animation when a table row is delete |
| NSTableViewRowActionStyleRegular | 0 | Apply the default style to the button. This style does not apply any coloring to the button. |

# 35.102 class NSTabViewItemMBS

## 35.102.1 class NSTabViewItemMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa class for items on the tabview.
**Notes:** An NSTabViewItem is a convenient way for presenting information in multiple pages. A tab view is usually distinguished by a row of tabs that give the visual appearance of folder tabs. When the user clicks a tab, the tab view displays a view page provided by your application. A tab view keeps a zero-based array of NSTabViewItems, one for each tab in the view.
**Blog Entries**

- Disable tab panel item in Xojo
- MBS Xojo / Real Studio Plugins, version 15.1pr4

## 35.102.2 Methods

## 35.102.3 Constructor(identifier as Variant)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new tabview item with the identifier.

## 35.102.4 Properties

## 35.102.5 color as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The color of the tab view item.
**Notes:** May not be used by the control.
(Read and Write property)

## 35.102.6 Enabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The enabled state of the tab view item.
**Example:**

```
dim n as NSTabViewMBS = TabPanel1.NSTabViewMBS
dim t as NSTabViewItemMBS = n.tabViewItemAtIndex(0)
```

t.Enabled = false

**Notes:** (Read and Write property)

### 35.102.7 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference to the NSTabViewItem object.
**Notes:** (Read and Write property)

### 35.102.8 identifier as Variant

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The identifier for this item.
**Notes:** (Read and Write property)

### 35.102.9 image as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The image for the tab panel item.
**Notes:** Available in Mac OS X 10.10.
(Read and Write property)

### 35.102.10 initialFirstResponder as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The initial first responder for the view associated with the receiver.
**Notes:** Sets the initial first responder for the view associated with the receiver (the view that is displayed when a user clicks on the tab) to view.
(Read and Write property)

### 35.102.11 label as string

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The label text for the receiver.
**Notes:** (Read and Write property)

### 35.102.12 tabState as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current display state of the tab associated with the receiver.
**Notes:** The possible values are NSSelectedTab, NSBackgroundTab, or NSPressedTab. Your application does not directly set the tab state.
(Read only property)

### 35.102.13 tabView as NSTabViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the parent tab view for the receiver.
**Notes:** Note that this is the tab view itself, not the view displayed when a user clicks the tab.

A tab view item normally learns about its parent tab view when it is inserted into the view's array of items. The NSTabView methods addTabViewItem and insertTabViewItem set the tab view for the added or inserted item.
(Read only property)

### 35.102.14 toolTip as string

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The tooltip displayed for the tab view item.
**Notes:** (Read and Write property)

### 35.102.15 view as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The view associated with the receiver to view.
**Notes:** This is the view displayed when a user clicks the tab. When you set a new view, the old view is released.
(Read and Write property)

### 35.102.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBackgroundTab | 1 | One of the constants describing the current display state of a tab.<br>A tab that's not being displayed. |
| NSPressedTab | 2 | One of the constants describing the current display state of a tab.<br>A tab that the user is in the process of clicking. That is, the user has pressed the mouse button while the cursor is over the tab but has not released the mouse button. |
| NSSelectedTab | 0 | One of the constants describing the current display state of a tab.<br>The tab that's being displayed. |

# 35.103 class NSTabViewMBS

## 35.103.1 class NSTabViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa tabpanel control.
**Notes:** An NSTabView object provides a convenient way to present information in multiple pages. The view contains a row of tabs that give the appearance of folder tabs, as shown in the following figure. The user selects the desired page by clicking the appropriate tab or using the arrow keys to move between pages. Each page displays a view hierarchy provided by your application.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- Disable tab panel item in Xojo

## 35.103.2 Methods

## 35.103.3 addTabViewItem(tabViewItem as NSTabViewItemMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds the tab item specified by tabViewItem.
**Notes:** tabViewItem: The tab view item to be added.

The item is added at the end of the array of tab items, so the new tab appears on the right side of the view.

## 35.103.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new tab view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTabViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 35.103.5 Constructor(Handle as Integer) 7272

- 35.103.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7272


### 35.103.5 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSTabView handle.
**Example:**

```
dim t as new NSTabViewMBS(0, 0, 100, 100)
dim v as new NSTabViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSTabView and the plugin retains this handle.
See also:


- 35.103.4 Constructor 7271
- 35.103.6 Constructor(left as Double, top as Double, width as Double, height as Double) 7272


### 35.103.6 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new tab view with the given size and position.
**Example:**

```
dim x as new NSTabViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.103.4 Constructor 7271
- 35.103.5 Constructor(Handle as Integer) 7272


### 35.103.7 contentRect as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle describing the content area of the receiver.
**Notes:** This area does not include the space required for the receiver's tabs or borders (if any).

### 35.103.8 indexOfTabViewItem(tabViewItem as NSTabViewItemMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the specified item in the tab view.
**Notes:** The zero-based index of tabViewItem, or [ NSNotFound ] if the item is not found.

### 35.103.9 indexOfTabViewItemWithIdentifier(identifier as Variant) as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the item that matches the specified identifier. identifier, or NSNotFound (-1) if the item is not found.
**Notes:** Returns nil on any error.

### 35.103.10 insertTabViewItem(tabViewItem as NSTabViewItemMBS, atIndex as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Inserts tabViewItem into the receiver's array of tab view items at index.
**Notes:** tabViewItem: The tab view item to be added.
index: The index at which to insert the tab view item. The index parameter is zero-based.

### 35.103.11 minimumSize as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the minimum size necessary for the receiver to display tabs in a useful way.
**Notes:** You can use the value returned by this method to limit how much a user can resize a tab view.

### 35.103.12 numberOfTabViewItems as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in the receiver's array of tab view items.

### 35.103.13 removeTabViewItem(tabViewItem as NSTabViewItemMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item specified by tabViewItem from the receiver's array of tab view items.

### 35.103.14 selectedTabViewItem as NSTabViewItemMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the specified tab view item.

### 35.103.15 selectFirstTabViewItem

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** This action method selects the first tab view item.

### 35.103.16 selectLastTabViewItem

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** This action method selects the last tab view item.

### 35.103.17 selectNextTabViewItem

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** This action method selects the next tab view item in the sequence.
**Notes:** If the currently visible item is the last item in the sequence, this method does nothing, and the last page remains displayed.

### 35.103.18 selectPreviousTabViewItem

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** This action method selects the previous tab view item in the sequence.
**Notes:** If the currently visible item is the first item in the sequence, this method does nothing, and the first page remains displayed.

### 35.103.19 selectTabViewItem(tabViewItem as NSTabViewItemMBS)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the tab view item for the currently selected tab.
**Notes:** Returns the currently selected tab view item, or nil if no item is selected.

### 35.103.20 selectTabViewItemAtIndex(index as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the tab view item specified by index.
**Notes:** The index parameter is base 0.

### 35.103.21 selectTabViewItemWithIdentifier(identifier as Variant)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Selects the tab view item specified by identifier.

### 35.103.22 tabViewItemAtIndex(index as Integer) as NSTabViewItemMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the tab view item at index in the tab view's array of items.
**Notes:** index: The index at which to insert the tab view item. The index parameter is zero-based.

Returns the tab view item at the specified index.

### 35.103.23 tabViewItemAtPoint(x as Double, y as Double) as NSTabViewItemMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the tab view item at the specified point.
**Notes:** Returns the tab view item under the hit point, or nil if no tab view item is under that location.
You can use this method to find a tab view item based on a user's mouse click.

### 35.103.24 tabViewItems as NSTabViewItemMBS()

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's array of tab view items.
**Notes:** A tab view keeps an array containing one tab view item for each tab in the view.

### 35.103.25 Properties

### 35.103.26 allowsTruncatedLabels as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether if the receiver allows truncating for labels that don't fit on a tab.
**Notes:** Value is true if the receiver allows truncating for labels that don't fit on a tab, otherwise false.

The default is true.
When truncating is allowed, the tab view inserts an ellipsis, if necessary, to fit a label in the tab.
(Read and Write computed property)

### 35.103.27 controlSize as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The size of the receiver.
**Notes:** Use NSRegularControlSize, NSSmallControlSize or NSMiniControlSize.
(Read and Write computed property)

### 35.103.28 controlTint as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The tab view's control tint.
**Notes:** Use NSDefaultControlTint, NSBlueControlTint, NSGraphiteControlTint or NSClearControlTint.
(Read and Write computed property)

### 35.103.29 drawsBackground as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether if the receiver draws a background color when the tab view type is NSNoTabsNoBorder.
**Notes:** True if the receiver draws a background color when the tab view type is NSNoTabsNoBorder, otherwise false.

If the receiver uses bezeled edges or a line border, the appropriate background color for that border is used.
(Read and Write computed property)

### 35.103.30 font as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The font for tab label text.
**Notes:** Tab height is adjusted automatically to accommodate a new font size. If the view allows truncating, tab labels are truncated as needed.
(Read and Write computed property)

### 35.103.31 tabViewType as Integer

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The tab type for the receiver.
**Notes:** Use constants: NSTopTabsBezelBorder, NSLeftTabsBezelBorder, NSBottomTabsBezelBorder, NSRightTabsBezelBorder, NSNoTabsBezelBorder, NSNoTabsLineBorder or NSNoTabsNoBorder.
(Read and Write computed property)

### 35.103.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBlueControlTint | 1 | One of the constants to specify a the control tint.<br>Aqua control tint |
| NSBottomTabsBezelBorder | 2 | One of the constants to specify the tab view's type as used by tabViewType.<br>Tabs are on the bottom of the view with a bezeled border. |
| NSClearControlTint | 7 | One of the constants to specify a the control tint.<br>Clear control tint |
| NSDefaultControlTint | 0 | One of the constants to specify a the control tint.<br>The current default tint setting |
| NSGraphiteControlTint | 6 | One of the constants to specify a the control tint.<br>Graphite control tint |
| NSLeftTabsBezelBorder | 1 | One of the constants to specify the tab view's type as used by tabViewType.<br>Tabs are on the left of the view with a bezeled border. |
| NSMiniControlSize | 2 | One of the values for the ControlSize property.<br>The control has a smaller size than NSSmallControlSize. |
| NSNoTabsBezelBorder | 4 | One of the constants to specify the tab view's type as used by tabViewType.<br>The view does not include tabs and has a bezeled border. |
| NSNoTabsLineBorder | 5 | One of the constants to specify the tab view's type as used by tabViewType.<br>The view does not include tabs and has a lined border. |
| NSNoTabsNoBorder | 6 | One of the constants to specify the tab view's type as used by tabViewType.<br>The view does not include tabs and has no border. |
| NSRegularControlSize | 0 | One of the values for the ControlSize property.<br>The control is sized as regular. |
| NSRightTabsBezelBorder | 3 | One of the constants to specify the tab view's type as used by tabViewType.<br>Tabs are on the right of the view with a bezeled border. |
| NSSmallControlSize | 1 | One of the values for the ControlSize property.<br>This constant is for controls that cannot be resized in one direction, such as push buttons, radio buttons, checkboxes, sliders, scroll bars, pop-up buttons, tabs, and progress indicators. You should use a small system font with a small control. |
| NSTopTabsBezelBorder | 0 | One of the constants to specify the tab view's type as used by tabViewType.<br>The view includes tabs on the top of the view and has a bezeled border (the default). |

# 35.104 class NSTextFieldCellMBS

## 35.104.1 class NSTextFieldCellMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The text field class for using as NSCell.
**Example:**

```
// ask for the textfield behind the label
dim n as NSTextFieldMBS = NSTextFieldMBS(label1.NSViewMBS)

// query cell
dim c as NSTextFieldCellMBS = n.cell

// and set background style
c.backgroundStyle = NSTextFieldCellMBS.NSBackgroundStyleRaised
```

**Notes:** The NSTextFieldCell class adds to the text display capabilities of the NSCell class by allowing you to set the color of both the text and its background. You can also specify whether the cell draws its background at all.

All of the methods declared by this class are also declared by the NSTextField class, which uses NSTextFieldCell objects to draw and edit text. These NSTextField cover methods call the corresponding NSTextFieldCell methods.

Placeholder strings, set using PlaceholderString or PlaceholderAttributedString, now appear in the text field cell if the actual string is "". They are drawn in grey on the cell.
Subclass of the NSActionCellMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 7.6, page 8: News
- 14.4, page 29: NSTabula Rasa, What to do when your new sports car arrives in parts by Ulrich Bogun

### 35.104.2 Methods

### 35.104.3 allowedInputSourceLocales as string()

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of locale identifiers representing input sources that are allowed to be enabled when the receiver has the keyboard focus.
**Notes:** Available in Mac OS X v10.5 and later.

### 35.104.4 Constructor(text as string)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Cell object with a text.
**Example:**

```
dim c as new NSTextFieldCellMBS("Hello")
MsgBox c.StringValue
```

### 35.104.5 setAllowedInputSourceLocales(Identifiers() as string)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets an array of locale identifiers representing input sources that are allowed to be enabled when the receiver has the keyboard focus.
**Notes:** You can use the meta-locale identifier, NSAllRomanInputSourcesLocaleIdentifier, to specify input sources that are limited for Roman script editing.

Available in Mac OS X v10.5 and later.

### 35.104.6 setUpFieldEditorAttributes(textobj as NSTextMBS) as NSTextMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets up the field editor. You never invoke this method directly; by overriding it, however, you can customize the field editor.

### 35.104.7 setWantsNotificationForMarkedText(value as boolean)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Directs the cell's associated field editor to post text change notifications.
**Notes:** If true, the field editor posts text change notifications (NSTextDidChangeNotification) while editing marked text; if false, notifications are delayed until the marked text confirmation.

Available in Mac OS X v10.5 and later.

### 35.104.8 Properties

### 35.104.9 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The color of the background the receiver draws behind the text.
**Notes:** (Read and Write property)

### 35.104.10 bezelStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's bezel style.
**Notes:** To set the bezel style, you must have already set Bezeled to true.
(Read and Write property)

### 35.104.11 drawsBackground as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver draws its background color.
**Notes:** In order to prevent inconsistent rendering, background color rendering is disabled for rounded-bezel text fields.
(Read and Write property)

### 35.104.12 placeholderAttributedString as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The placeholder of the cell as an attributed string.
**Notes:** Note that invoking this successfully will clear out any plain text string set by PlaceholderString.

Available in Mac OS X v10.3 and later.
(Read and Write property)

### 35.104.13 placeholderString as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The placeholder of the cell as a plain text string.
**Notes:** Note that invoking this successfully will clear out any attributed string set by setPlaceholderAttributedString.
(Read and Write property)

### 35.104.14 textColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The color used to draw the receiver's text.
**Notes:** (Read and Write property)

### 35.104.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTextFieldRoundedBezel | 1 | One of the constants to specify the bezel style of the text field cell. Corners are rounded. Available in Mac OS X v10.2 and later. |
| NSTextFieldSquareBezel | 0 | One of the constants to specify the bezel style of the text field cell. Corners are square. Available in Mac OS X v10.2 and later. |

# 35.105 control NSTextFieldControlMBS

## 35.105.1 control NSTextFieldControlMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSTextField.
**Notes:** This control embeds a special NSTextField subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.0pr2
- MBS Xojo / Real Studio Plugins, version 13.4pr7

## 35.105.2 Properties

## 35.105.3 View as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

## 35.105.4 Events

## 35.105.5 Action

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** The text changed.

## 35.105.6 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.105.7 Close

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.105.8 Closing

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.105.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.105.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.105.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.105.12 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.105.13 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.105.14 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.105.15 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.105.16 GotFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.105.17 LostFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.105.18 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.105.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.

- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.105.20 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.105.21 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.105.22 Open

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.105.23 Opening

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.105.24 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.105.25 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

### 35.105.26 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.105.27 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDi-

dEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

### 35.105.28 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.105.29 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.105.30 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 35.106 class NSTextFieldMBS

### 35.106.1 class NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** An NSTextField object is a kind of NSControl that displays text that the user can select or edit and that sends its action message to its target when the user presses the Return key while editing.
**Notes:** Subclass of the NSControlMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr4
- MBS Xojo / Real Studio Plugins, version 14.4pr1
- MBS Xojo / Real Studio Plugins, version 13.3pr1
- MBS Real Studio Plugins, version 12.5pr6
- MBS Real Studio Plugins, version 12.3pr2
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 35.106.2 Methods

### 35.106.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text field with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTextFieldMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.106.4 Constructor(Handle as Integer) 7290
- 35.106.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7291


### 35.106.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSTextField handle.
**Example:**

```
dim t as new NSTextFieldMBS(0, 0, 100, 100)
dim v as new NSTextFieldMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSTextField and the plugin retains this handle.
See also:


- 35.106.3 Constructor 7290
- 35.106.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7291


### 35.106.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text field with the given size and position.
**Example:**

```
dim x as new NSTextFieldMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.106.3 Constructor 7290
- 35.106.4 Constructor(Handle as Integer) 7290


### 35.106.6 selectText

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Ends editing and selects the entire contents of the receiver if it's selectable.
**Notes:** If the receiver isn't in some window's view hierarchy, this method has no effect.

### 35.106.7 Properties

### 35.106.8 AllowsCharacterPickerTouchBarItem as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to allow character picker in touch bar.
**Notes:** Available in macOS 10.12.2.
(Read and Write property)

### 35.106.9 allowsEditingTextAttributes as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows the user to change font attributes of the receiver's text.
**Notes:** If true, the user is permitted to change font attributes of the receiver's text; if flag is false, the user isn't so permitted. You can change text attributes programmatically regardless of this setting.
(Read and Write property)

### 35.106.10 AutomaticTextCompletionEnabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic text completion is enabled.
**Notes:** Available in macOS 10.12.2.
(Read and Write property)

### 35.106.11 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The color of the background that the receiver's cell draws behind the text.
**Notes:** (Read and Write property)

### 35.106.12 Bezeled as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver draws a bezeled frame.
**Notes:** (Read and Write property)

### 35.106.13 bezelStyle as Integer

MBS MacCocoa Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's bezel style.
**Notes:** You must have already sent the receiver Bezeled with true to make this property take affect.
(Read and Write property)

### 35.106.14 Bordered as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the receiver draws a black border around its contents.
**Notes:** True if the receiver draws a solid black border around its contents; otherwise false.
(Read and Write property)

### 35.106.15 drawsBackground as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the receiver's cell draws its background color behind its text.
**Notes:** In order to prevent inconsistent rendering, background color rendering is disabled for rounded-bezel text fields.

To really make the background go away, also set bordered=false.
(Read and Write property)

### 35.106.16 Editable as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can edit the receiver's text.
**Notes:** If true, then the user is allowed to both select and edit text. If flag is false, then the user isn't permitted to edit text, and the receiver's selectability is restored to its previous value.

For example, if an NSTextField object is selectable but not editable, then made editable for a time, then made not editable, it remains selectable. To guarantee that text is neither editable nor selectable, simply use setSelectable to turn off selectability.
(Read and Write property)

### 35.106.17 importsGraphics as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the receiver allows the user to drag image files into it.
**Notes:** If true, the receiver accepts dragged images; if false, it doesn't. You can add images programmatically regardless of this setting.
(Read and Write property)

### 35.106.18 placeholderAttributedString as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** The attributed placeholder string.
**Notes:** (Read and Write property)

### 35.106.19 placeholderString as String

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** The plain text placeholder string.
**Notes:** (Read and Write property)

### 35.106.20 Selectable as boolean

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver is selectable (but not editable).
**Notes:** If true, the receiver is made selectable but not editable (use Editable to make text both selectable and editable). If false, the text is neither editable nor selectable.
(Read and Write property)

### 35.106.21 textColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The color used to draw the receiver's text.
**Notes:** (Read and Write property)

### 35.106.22 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTextFieldRoundedBezel | 1 | One of the constants for the bezelStyle property. Corners are rounded. |
| NSTextFieldSquareBezel | 0 | One of the constants for the bezelStyle property. Corners are square. |

## 35.107 class NSTextFinderMBS

### 35.107.1 class NSTextFinderMBS

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** An optional search-and-replace find interface inside a view, usually a scroll view.
**Notes:** The class serves as a controller for the standard Cocoa find bar. The NSTextFinder class interacts heavily with a client object which supports the NSTextFinderClient protocol. The client object provides access to the content being searched and provides visual feedback for a search operation.
All menu items related to finding (Find,Ä¶, Find Next, Find Previous, Use Selection for Find, etc.) should have the same action, performTextFinderAction:, which gets sent down the responder chain in the standard method.

see
https://developer.apple.com/documentation/appkit/nstextfinder
**Blog Entries**

- XDC Anywhere - MBS Xojo Plugins
- MBS Xojo Plugin, June 2021 News
- Use Text Finder for TextArea in Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr3

**Videos**

- XDC Anywhere - MBS Xojo Plugins
- MBS Xojo Videos - MBS Xojo Plugin, June 2021 News

### 35.107.2 Methods

### 35.107.3 cancelFindIndicator

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Cancels the find indicator immediately.
**Notes:** There may be some circumstances where the find indicator should be immediately cancelled or hidden, such as when the view's content or selection is changed without the knowledge of the text finder. This method will immediately cancel the current find indicator.
The NSTextFinderMBS and NSViewMBS classes will handle the find indicator correctly when a content view is resized, moved, or removed from the view hierarchy. If your content view's scrolling is done by an NSScrollViewMBS, the find indicator will also be handled for you during scrolling.

### 35.107.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new object.

### 35.107.5 performAction(operation as Integer)

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Performs the specified text finding action.
**Notes:** operation: The text finding action. See NSTextFinderAction for the possible values.

Objects that respond to performTextFinderAction typically call validateAction: to ensure that the action is valid and then invoke performAction if validation is successful.

When invoking the validateAction and performAction the item or sender,Äôs tag should be passed as the parameter. By convention, the sender parameter for this method will have an kAction* constants set as its tag. The responder that receives this method should pass the tag as the action for this method:

### 35.107.6 validateAction(operation as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Allows validation of the find action before performing.
**Notes:** Returns true if the operation is valid; otherwise false.

### 35.107.7 Properties

### 35.107.8 client as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** The object that provides the target search string, find bar location, and feedback methods.
**Notes:** The NSTextFinderMBS instance class must be associated with a client object that implements the NSTextFinderClient protocol in order to function. The client is responsible for providing the string to be searched, the location for the find bar, and the methods which control feedback to the user about the search results.
(Read and Write property)

### 35.107.9 findBarContainer as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the find bar container.
**Notes:** This property must be set to support the find bar.
When the find bar is to be shown, NSTextFinderMBS invokes showFindBarView on the findBarContainer object, passing the view for the find bar, which it should display somewhere that is associated appropriately with the content being searched.
The NSScrollViewMBS class implements NSTextFinderBarContainer protocol and is the correct place to display the find bar in most circumstances. The container may freely modify the find bar view's width and origin, but not its height.
If this property is not set, then the find bar cannot be shown.
(Read and Write property)

### 35.107.10 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference number.
**Notes:** (Read and Write property)

### 35.107.11 incrementalSearchingEnabled as Boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Determines if incremental searching is enabled.
**Notes:** If true, then the find bar will do incremental searches. If it returns false, then the find bar will behave regularly.
The default value is false.
(Read and Write property)

### 35.107.12 incrementalSearchingShouldDimContentView as Boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** Determines the type of incremental search feedback to be presented.
**Notes:** If true, then when an incremental search begins, the findBarContainer instance,Äôs parent contentView will be dimmed, except for the locations of the incremental matches. If false, then the incremental matches will not be highlighted automatically, but you can use incrementalMatchRanges to highlight the matches yourself.
The default value is true.

(Read and Write property)

### 35.107.13 Constants

Actions

| Constant | Value | Description |
|---|---|---|
| kActionHideFindInterface | 11 | Hides the find bar interface. |
| kActionHideReplaceInterface | 13 | Displays the find bar interface including the replace functionality. |
| kActionNextMatch | 2 | The next match, if any, is displayed. |
| kActionPreviousMatch | 3 | The previous match, if any, is displayed. |
| kActionReplace | 5 | Replaces a single instance of the string. |
| kActionReplaceAll | 4 | All occurrences of the string are replaced. |
| kActionReplaceAllInSelection | 8 | Selects all matching search strings within the current selection. |
| kActionReplaceAndFind | 6 | Replaces a single instance of the string and searches for the next match. |
| kActionSelectAll | 9 | Selects all matching search strings. |
| kActionSelectAllInSelection | 10 | Replaces all occurrences of the string within the current selection. |
| kActionSetSearchString | 7 | Sets the search string. |
| kActionShowFindInterface | 1 | The find bar interface is displayed. |
| kActionShowReplaceInterface | 12 | Displays the find bar interface including the replace functionality. |

## 35.108 control NSTextViewControlMBS

### 35.108.1 control NSTextViewControlMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a NSTextView.
**Notes:** This control embeds a special NSTextView subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 16.5pr6
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 35.108.2 Properties

### 35.108.3 AcceptTabs as Boolean

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 35.108.4 Scrollview as Variant

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview for this textview.
**Notes:** (Read only property)

### 35.108.5 View as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.108.6 Events

### 35.108.7 BoundsChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 35.108.8 Close

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.108.9 Closing

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.108.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacCocoa Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.108.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.108.12 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.108.13 EnableMenuItems

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.108.14 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.108.15 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.108.16 FrameChanged

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.108.17 GotFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.108.18 LostFocus

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.108.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.108.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.108.21 MouseDrag(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.108.22 MouseUp(x as Integer, y as Integer)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.108.23 Open

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.108.24 Opening

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.108.25 ScaleFactorChanged(NewFactor as Double)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.108.26 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Sent when a text view needs to determine if text in a specified range should be changed.
**Notes:** affectedCharRange: The range of characters to be replaced.
replacementString: The characters that will replace the characters in affectedCharRange; nil if only text attributes are being changed.

Return true to allow the replacement, or false to reject the change.

### 35.108.27 textDidBeginEditing

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has begun editing (that the user has begun changing it).

### 35.108.28 textDidChange

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has changed its characters or formatting attributes.

### 35.108.29 textDidEndEditing

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has finished editing (that it has resigned first responder status).

### 35.108.30 textShouldBeginEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Invoked when a text object begins to change its text, this method requests permission to begin editing.
**Notes:** If the delegate returns false, the text object proceeds to make changes. If the delegate returns true, the text object abandons the editing operation. This method is also invoked when the user drags and drops a file onto the text object.

### 35.108.31 textShouldEndEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Invoked from a text object's implementation of resignFirstResponder, this method requests permission to end editing.
**Notes:** If the delegate returns false, the text object proceeds to finish editing and resign first responder status. If the delegate returns true, the text object selects all of its text and remains the first responder.

### 35.108.32 textViewDidChangeSelection

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Sent when the selection changes in the text view.

### 35.108.33 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacCocoa Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 35.109 class NSTextViewMBS

## 35.109.1 class NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The cocoa text view class.
**Notes:** Like the editfield in Xojo.
Should be placed in a scrollview.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSTextMBS class.
**Blog Entries**

- RTF functions in MBS Plugins
- Adding a Scintilla based control to Xojo
- Use Text Finder for TextArea in Xojo
- Windows Font Dialog
- Line Wrap for Textarea in Xojo Mac applications
- SuperScript and SubScript for Xojo Textarea
- Tip of the day: Adding links to Textarea on OS X
- Tip of the day: Autohide scrollbar
- Show invisible characters in NSTextView/TextArea
- Using NSTextViewMBS

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 6.6, page 8: News

## 35.109.2 Methods

## 35.109.3 alignJustified

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Applies full justification to selected paragraphs (or all text, if the receiver is a plain text object).

### 35.109.4 breakUndoCoalescing

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Informs the receiver that it should begin coalescing successive typing operations in a new undo grouping.
**Notes:** This method should be invoked when saving the receiver's contents to preserve proper tracking of unsaved changes and the document's dirty state.

### 35.109.5 changeAttributes

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Changes the attributes of the current selection.
**Notes:** This method changes the attributes by invoking convertAttributes: on sender and applying the returned attributes to the appropriate text. See the NSFontManager class reference for more information on attribute conversion.

Available in Mac OS X v10.3 and later.

### 35.109.6 changeColor

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the color of the selected text.

### 35.109.7 changeDocumentBackgroundColor

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** An action method used to set the background color.
**Notes:** This method gets the new color by sending a color message to sender.
This will only set the background color if allowsDocumentBackgroundColorChangereturns true.

### 35.109.8 checkTextInDocument

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Check text in document.
**Notes:** Available in Mac OS X v10.6 and later.

### 35.109.9 checkTextInSelection

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Check text in selection.
**Notes:** Available in Mac OS X v10.6 and later.

### 35.109.10 complete

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Invokes completion in a text view.
**Notes:** By default invoked using the Escape key, this method provides users with a choice of completions for the word currently being typed. May be invoked programmatically if autocompletion is desired by a client of the text system. You can change the key invoking this method using the text system's key bindings mechanism; see "Text System Defaults and Key Bindings" for an explanation of the procedure (on Apple website).

### 35.109.11 Constructor

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text view with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTextViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.109.12 Constructor(Handle as Integer) 7309
- 35.109.13 Constructor(left as Double, top as Double, width as Double, height as Double) 7310


### 35.109.12 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSTextView handle.
**Example:**

```
dim t as new NSTextViewMBS(0, 0, 100, 100)
dim v as new NSTextViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSTextView and the plugin retains this handle.
See also:


- 35.109.11 Constructor 7309
- 35.109.13 Constructor(left as Double, top as Double, width as Double, height as Double) 7310


### 35.109.13 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text view with the given size and position.
**Example:**

```
dim x as new NSTextViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 35.109.11 Constructor 7309
- 35.109.12 Constructor(Handle as Integer) 7309


### 35.109.14 didChangeText

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop only.

**Function:** Sends out necessary notifications when a text change completes.
**Notes:** Invoked automatically at the end of a series of changes, this method posts an NSTextDidChangeNotification to the default notification center, which also results in the delegate receiving an NSText delegate textDidChange message.

Subclasses implementing methods that change their text should invoke this method at the end of those methods. See Subclassing NSTextView for more information.

### 35.109.15 insertText(attributedString as NSAttributedStringMBS)

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Inserts text into the receiver's text at the insertion point if there is one, otherwise replacing the selection.
**Example:**

```
dim textView as NSTextViewMBS // your view
dim a as new NSMutableAttributedStringMBS

if a.initWithString( "Hello World. This is just a little test." ) then

Dim NSFont as NSFontMBS = NSFontMBS.fontWithName("Arial", 24.0)
Dim NSColor as NSColorMBS = NSColorMBS.blueColor
Dim NSRange as NSRangeMBS = NSMakeRangeMBS( 0, 20)
Dim NSAttributes as New Dictionary

NSAttributes.value(NSAttributedStringMBS.NSFontAttributeName) = NSFont
NSAttributes.value(NSAttributedStringMBS.NSForegroundColorAttributeName) = NSColor

a.addAttributes( NSAttributes, NSRange)

textView.insertText a

// replace text with new one:
'textView.textStorage.setAttributedString a

end if
```

**Notes:** text: The string to insert. Can be either an string or an NSAttributedStringMBS object.

The inserted text is assigned the current typing attributes.

This method is the means by which text typed by the user enters an NSTextView. See the NSInputManager class and NSTextInput protocol specifications for more information.

This method is the entry point for inserting text typed by the user and is generally not suitable for other purposes. Programmatic modification of the text is best done by operating on the text storage directly. Because this method pertains to the actions of the user, the text view must be editable for the insertion to work.
See also:

- 35.109.16 insertText(text as string) 7311

### 35.109.16 insertText(text as string)

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Inserts text into the receiver's text at the insertion point if there is one, otherwise replacing the selection.
**Notes:** text: The string to insert. Can be either an string or an NSAttributedStringMBS object.

The inserted text is assigned the current typing attributes.

This method is the means by which text typed by the user enters an NSTextView. See the NSInputManager class and NSTextInput protocol specifications for more information.

This method is the entry point for inserting text typed by the user and is generally not suitable for other purposes. Programmatic modification of the text is best done by operating on the text storage directly. Because this method pertains to the actions of the user, the text view must be editable for the insertion to work.
See also:

- 35.109.15 insertText(attributedString as NSAttributedStringMBS) 7310

### 35.109.17 invalidateTextContainerOrigin

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Invalidates the calculated origin of the text container.
**Notes:** This method is invoked automatically; you should never need to invoke it directly. Usually called because the text view has been resized or the contents of the text container have changed.

### 35.109.18 loosenKerning

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Increases the space between glyphs in the receiver's selection, or in all text if the receiver is a plain text view.
**Notes:** Kerning values are determined by the point size of the fonts in the selection.

### 35.109.19 lowerBaseline

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Lowers the baseline offset of selected text by 1 point, or of all text if the receiver is a plain text view.
**Notes:** As such, this method defines a more primitive operation than subscripting.

### 35.109.20 orderFrontLinkPanel

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Brings forward a panel allowing the user to manipulate links in the text view.
**Notes:** Available in Mac OS X v10.4 and later.

### 35.109.21 orderFrontListPanel

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Brings forward a panel allowing the user to manipulate text lists in the text view.
**Notes:** Available in Mac OS X v10.4 and later.

### 35.109.22 orderFrontSpacingPanel

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Brings forward a panel allowing the user to manipulate text line heights, interline spacing, and paragraph spacing, in the text view.
**Notes:** Available in Mac OS X v10.4 and later.

### 35.109.23 orderFrontSubstitutionsPanel

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Orders the substitution panel to the front.
**Notes:** Available on Mac OS X 10.6 or newer.

### 35.109.24 orderFrontTablePanel

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Brings forward a panel allowing the user to manipulate text tables in the text view.

### 35.109.25 outline

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Adds the outline attribute to the selected text attributes if absent; removes the attribute if present.
**Notes:** If there is a selection and the first character of the selected range has a non-zero stroke width, or if there is no selection and the typing attributes have a non-zero stroke width, then the stroke width is removed; otherwise the value of NSStrokeWidthAttributeName is set to the default value for outline (3.0).

Operates on the selected range if the receiver contains rich text. For plain text the range is the entire contents of the receiver.

### 35.109.26 pasteAsPlainText

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Inserts the contents of the pasteboard into the receiver's text as plain text.
**Notes:** This method behaves analogously to insertText.

### 35.109.27 pasteAsRichText

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method inserts the contents of the pasteboard into the receiver's text as rich text, maintaining its attributes.
**Notes:** The text is inserted at the insertion point if there is one, otherwise replacing the selection.

### 35.109.28 performFindPanelAction(FindAction as Integer)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Performs a find panel action specified by the sender's tag.
**Example:**

```
const NSFindPanelActionShowFindPanel = 1

dim n as NSTextViewMBS = TextArea1.NSTextViewMBS
n.usesFindPanel = true
n.performFindPanelAction(NSFindPanelActionShowFindPanel)
```

**Notes:** This is the generic action method for the find menu and find panel, and can be overridden to implement a custom find panel.

Possible values:
NSFindPanelActionShowFindPanel = 1
NSFindPanelActionNext = 2
NSFindPanelActionPrevious = 3
NSFindPanelActionReplaceAll = 4
NSFindPanelActionReplace = 5
NSFindPanelActionReplaceAndFind = 6
NSFindPanelActionSetFindString = 7
NSFindPanelActionReplaceAllInSelection = 8
NSFindPanelActionSelectAll = 9
NSFindPanelActionSelectAllInSelection = 10
See also:


- 35.109.29 performFindPanelAction(sender as object) 7315


### 35.109.29 performFindPanelAction(sender as object)

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Performs a find panel action specified by the sender.
**Notes:** This is the generic action method for the find menu and find panel, and can be overridden to implement a custom find panel.
Sender could be a NSMenuItem or maybe also a NSView.
See also:


- 35.109.28 performFindPanelAction(FindAction as Integer) 7314


### 35.109.30 raiseBaseline

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Raises the baseline offset of selected text by 1 point, or of all text if the receiver is a plain text view.
**Notes:** As such, this method defines a more primitive operation than superscripting.

### 35.109.31 replaceTextContainer(textContainer as NSTextContainerMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the text container for the group of text system objects containing the receiver, keeping the association between the receiver and its layout manager intact.
**Notes:** textContainer: The new text container. This method raises NSInvalidArgumentException if TextContainer is nil.

### 35.109.32 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string = "") as Boolean

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a series of delegate messages (and general notifications) to determine whether modifications can be made to the characters and attributes of the receiver,Äôs text.
**Notes:** affectedCharRange: The range of characters affected by the proposed change.
replacementString: The characters that will replace those in affectedCharRange. If only text attributes are being changed, replacementString is "".

Returns true to allow the change, false to prohibit it.

This method checks with the delegate as needed using textShouldBeginEditing and shouldChangeTextInRange.
This method must be invoked at the start of any sequence of user-initiated editing changes. If your subclass of NSTextView implements methods that modify the text, make sure to invoke this method to determine whether the change should be made. If the change is allowed, complete the change by invoking the didChangeText method.

If the receiver is not editable, this method automatically returns false. This result prevents instances in which a text view could be changed by user actions even though it had been set to be non-editable.
In macOS 10.4 and later, if there are multiple selections, this method acts on the first selected subrange.
See also:

- 35.109.97 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean 7333

### 35.109.33 showFindIndicatorForRange(charRange as NSRangeMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Causes a temporary highlighting effect to appear around the visible portion (or portions) of the specified range.
**Notes:** charRange: The character range around which indicators appear.

This method supports lozenge-style indication of find results. The indicators automatically disappear after a certain period of time, or when the method is called again, or when any of a number of changes occur to the view (such as changes to text, view size, or view position).

This method does not itself scroll the specified range to be visible; any desired scrolling should be done before this method is called, first, because the method acts only on the visible portion of the specified range, and, second, because scrolling causes the indicators to disappear. Calling this method with a zero-length range always removes any existing indicators.

Available in OS X v10.5 and later.

### 35.109.34 startSpeaking

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Speaks the selected text, or all text if no selection.

### 35.109.35 stopSpeaking

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Stops the speaking of text.

### 35.109.36 tightenKerning

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Decreases the space between glyphs in the receiver's selection, or for all glyphs if the receiver is a plain text view.
**Notes:** Kerning values are determined by the point size of the fonts in the selection.

### 35.109.37 toggleAutomaticDashSubstitution

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Toggles automatic dash substitution.
**Notes:** Available on Mac OS X 10.6 or newer.

### 35.109.38 toggleAutomaticDataDetection

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Toggles automatic data detection.
**Notes:** Available on Mac OS X 10.6 or newer.

### 35.109.39 toggleAutomaticLinkDetection

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Changes the state of automatic link detection from enabled to disabled and vice versa.
**Notes:** Automatic link detection causes strings representing URLs typed in the view to be automatically made into links to those URLs.

Available in Mac OS X v10.5 and later.

### 35.109.40 toggleAutomaticQuoteSubstitution

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Changes the state of automatic quotation mark substitution from enabled to disabled and vice versa.
**Notes:** Automatic quote substitution causes ASCII quotation marks and apostrophes to be automatically replaced, on a context-dependent basis, with more typographically accurate symbols.

Available in Mac OS X v10.5 and later.

### 35.109.41 toggleAutomaticSpellingCorrection

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Toggles automatic spelling correction.
**Notes:** Available on Mac OS X 10.6 or newer.

### 35.109.42 toggleAutomaticTextReplacement

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Toggles automatic text replacements.
**Notes:** Available on Mac OS X 10.6 or newer.

### 35.109.43 toggleBold

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the use of a bold/non-bold font.
**Example:**

```
// some textview
dim textview as NSTextView = TextArea1.NSTextViewMBS

// switch between bold and non bold
textview.toggleBold
```

**Notes:** You can set this to continue typing with/without bold or change current selection.
Can only provide bold if the font supports it.

### 35.109.44 toggleContinuousSpellChecking

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Toggles whether continuous spell checking is enabled for the receiver.

### 35.109.45 toggleGrammarChecking

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Changes the state of grammar checking from enabled to disabled and vice versa.
**Notes:** Available in Mac OS X v10.5 and later.

### 35.109.46 toggleItalic

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the use of an italic/non-italic font.
**Example:**

```
// some textview
dim textview as NSTextView = TextArea1.NSTextViewMBS

// switch between italic and non italic
textview.toggleItalic
```

**Notes:** You can set this to continue typing with/without bold or change current selection.
Can only provide italic if the font supports it.

### 35.109.47 toggleSmartInsertDelete

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Changes the state of smart insert and delete from enabled to disabled and vice versa.
**Notes:** Controls whether the receiver inserts or deletes space around selected words so as to preserve proper spacing and punctuation.

Available in Mac OS X v10.5 and later.

### 35.109.48 toggleTraditionalCharacterShape

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the NSCharacterShapeAttributeName attribute at the current selection.

### 35.109.49 turnOffKerning

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver to use nominal glyph spacing for the glyphs in its selection, or for all glyphs if the receiver is a plain text view.

### 35.109.50 turnOffLigatures

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver to use only required ligatures when setting text, for the glyphs in the selection if the receiver is a rich text view, or for all glyphs if it's a plain text view.

### 35.109.51 updateDragTypeRegistration

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Updates the acceptable drag types of all text views associated with the receiver's layout manager.
**Notes:** If the receiver is editable and is a rich text view, causes all text views associated with the receiver's layout manager to register their acceptable drag types. If the text view isn't editable or isn't rich text, causes those text views to unregister their dragged types.

Subclasses can override this method to change the conditions for registering and unregistering drag types,

whether as a group or individually based on the current state of the text view. They should invoke this method when that state changes to perform the necessary update.

### 35.109.52 updateFontPanel

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Updates the Font panel to contain the font attributes of the selection.
**Notes:** Does nothing if the receiver doesn't use the Font panel. You should never need to invoke this method directly, but you can override it if needed to handle additional font attributes.

### 35.109.53 updateRuler

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Updates the ruler view in the receiver's enclosing scroll view to reflect the selection's paragraph and marker attributes.
**Notes:** Does nothing if the ruler isn't visible or if the receiver doesn't use the ruler. You should never need to invoke this method directly, but you can override this method if needed to handle additional ruler attributes.

### 35.109.54 useAllLigatures

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver to use all ligatures available for the fonts and languages used when setting text, for the glyphs in the selection if the receiver is a rich text view, or for all glyphs if it's a plain text view.

### 35.109.55 useStandardKerning

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Set the receiver to use pair kerning data for the glyphs in its selection, or for all glyphs if the receiver is a plain text view.

### 35.109.56 useStandardLigatures

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver to use the standard ligatures available for the fonts and languages used when setting text, for the glyphs in the selection if the receiver is a rich text view, or for all glyphs if it's a plain text view.

### 35.109.57 Properties

### 35.109.58 acceptsGlyphInfo as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver accepts the glyph info attribute.
**Notes:** True if the receiver should accept the NSGlyphInfoAttributeName attribute from text input sources such as input methods and the pasteboard, false otherwise.
(Read and Write property)

### 35.109.59 allowsDocumentBackgroundColorChange as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets whether the receiver allows its background color to change.
**Notes:** This corresponds to the background color of the entirety of the text view, not just to a selected range of text.
(Read and Write property)

### 35.109.60 allowsImageEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether image attachments should permit editing of their images.
**Notes:** True if image editing is allowed; otherwise, false.

For image editing to be allowed, the text view must be editable and the text attachment cell must support image editing.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.109.61 allowsUndo as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether undo support is enabled.
**Notes:** (Read and Write property)

### 35.109.62 AutomaticDashSubstitutionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic dash substitution is enabled.
**Example:**

```
Sub CellGotFocus(row as Integer, column as Integer) Handles CellGotFocus
// disable dash subsitution for current cell
Dim v As Variant = Me.ActiveCell
if v isa TextArea then
Dim t As TextArea = v
Dim n As NSTextViewMBS = t.NSTextViewMBS
n.AutomaticDashSubstitutionEnabled = False
End If
End
```

**Notes:** Turning on automatic dash substitution enables automatic conversion of sequences of ASCII hyphen (-) characters to typographic dashes.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.109.63 AutomaticDataDetectionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic data detection is enabled.
**Notes:** Automatic data detection enables detection of dates, addresses, and phone numbers.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.109.64 AutomaticLinkDetectionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Enables or disables automatic link detection.
**Notes:** If true, automatic link detection is enabled; if false, it is disabled.

Automatic link detection causes strings representing URLs typed in the view to be automatically made into links to those URLs.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.109.65 AutomaticQuoteSubstitutionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic quotation mark substitution is enabled.
**Notes:** True if automatic quotation mark substitution is enabled; otherwise, false.

Automatic quote substitution causes ASCII quotation marks and apostrophes to be automatically replaced, on a context-dependent basis, with more typographically accurate symbols.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.109.66 AutomaticSpellingCorrectionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic spelling correction is enabled.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.109.67 AutomaticTextReplacementEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether automatic text replacement is enabled.
**Notes:** Turning on automatic text replacement enables automatic substitution of a variety of static text items based on user preferences.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 35.109.68 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** (Read and Write property)

### 35.109.69 Bold as Boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the current typing uses a bold font.
**Example:**

```
// some textview
dim textview as NSTextView = TextArea1.NSTextViewMBS

// switch to bold font
textview.Bold = true
```

**Notes:** You can set this to continue typing with/without bold or change current selection.
Can only provide bold if the font supports it.
(Read and Write property)

### 35.109.70 ContinuousSpellCheckingEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver has continuous spell checking enabled.
**Notes:** True if the receiver has continuous spell checking enabled, otherwise, false.

See Textarea.WinSpellcheckingMBS property for Windows.
(Read and Write property)

### 35.109.71 defaultParagraphStyle as Variant

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Gets or sets the receiver's default paragraph style.
**Example:**

```
Dim n As NSTextViewMBS = TextArea1.NSTextViewMBS
```

```
Dim a As NSTextStorageMBS = n.textStorage

// get first paragraph style
Dim m As New NSMutableParagraphStyleMBS

// get old tab stops
Dim tabs() As NSTextTabMBS

For i As Integer = 0 To 11
Dim options As New Dictionary
Dim neu As New NSTextTabMBS(n.NSLeftTextAlignment, i * 50.0, options)
tabs.append neu
next

m.setTabStops tabs

// change for current text
a.addAttribute(a.NSParagraphStyleAttributeName, m, New NSRangeMBS(0, a.Length))

// and for future text
n.defaultParagraphStyle = m
```

**Notes:** Use with NSParagraphStyleMBS class.
(Read and Write property)

### 35.109.72 displaysLinkToolTips as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the text view automatically supplies the destination of a link as a tooltip for text that has a link attribute.
**Notes:** True if link tooltips are automatically displayed; otherwise, false.

The default value for this feature is true; clients who do not wish tooltips to be displayed automatically must explicitly disable it.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 35.109.73 enabledTextCheckingTypes as Int64

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The default text checking types.
**Notes:** Available in Mac OS X v10.6 and later.

Can be NSTextCheckingAllSystemTypes (&hffffffff) or NSTextCheckingAllCustomTypes (&hffffffff00000000) or NSTextCheckingAllTypes (&hffffffffffffffff).
(Read and Write property)

### 35.109.74 GrammarCheckingEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not grammar checking is enabled.
**Notes:** Available on Mac OS X 10.5 or newer.
If grammar checking is enabled, then it is performed alongside spell checking, whenever the text view checks spelling, whether continuously or manually.
(Read and Write property)

### 35.109.75 insertionPointColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The color used to draw the insertion point.
**Notes:** (Read and Write property)

### 35.109.76 isCoalescingUndo as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether undo coalescing is in progress.
**Notes:** True if undo coalescing is in progress, otherwise false.
Available in OS X v10.6 and later.
(Read only property)

### 35.109.77 Italic as Boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the current typing uses a italic font.
**Example:**

```
// some textview
```

```
dim textview as NSTextView = TextArea1.NSTextViewMBS

// switch to italic font
textview.Italic = true
```

**Notes:** You can set this to continue typing with/without italic or change current selection.
Can only provide italic if the font supports it.
(Read and Write property)

### 35.109.78 layoutManager as NSLayoutManagerMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the layout manager that lays out text for the receiver's text container.
**Notes:** The layout manager that lays out text for the receiver's text container, or nil if there's no such object, such as when a text view isn't linked into a group of text objects.
(Read only property)

### 35.109.79 linkTextAttributes as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Gets and sets the attributes used to draw the onscreen presentation of link text.
**Notes:** A dictionary of attributes corresponding to the onscreen presentation of link text.

Link text attributes are applied as temporary attributes to any text with a link attribute. Candidates include those attributes that do not affect layout.

In applications created prior to OS X v10.3, the default value is an empty dictionary. In applications created with OS X v10.3 or greater, the default attributes specify blue text with a single underline and the pointing hand cursor.
(Read and Write property)

### 35.109.80 markedTextAttributes as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Gets or sets the attributes used to draw marked text.
**Notes:** A dictionary of attributes used to draw marked text. Text color, background color, and underline are the only supported attributes for marked text.

(Read and Write property)

### 35.109.81 RTFData as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the textview content as RTF data.
**Notes:** Works only for Cocoa and uses RTF parser/generator from Apple.

See also RTFDataMBS in StyledText, RTFDataMBS and WinRTFDataMBS in TextArea and Desktop-TextArea controls.
(Read and Write property)

### 35.109.82 RulerVisible as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the scroll view enclosing the text views sharing the receiver's layout manager shows its ruler.
**Notes:** True if the scroll view enclosing the text views sharing the receiver's layout manager shows its ruler, false otherwise. The default is false.
(Read and Write property)

### 35.109.83 selectedTextAttributes as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Gets or sets the attributes used to indicate the selection.
**Example:**

```
// underline selected text in TextArea1

dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
dim s as NSTextStorageMBS = t.textStorage

dim d as Dictionary = t.selectedTextAttributes
d.Value(NSAttributedStringMBS.NSStrikethroughStyleAttributeName) = s.NSUnderlineStyleSingle
t.selectedTextAttributes = d
```

**Notes:** A dictionary of attributes used to indicate the selection. Text color, background color, and underline are the only supported attributes for selected text.

(Read and Write property)

### 35.109.84 smartInsertDeleteEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view inserts or deletes space around selected words so as to preserve proper spacing and punctuation.
**Notes:** (Read and Write property)

### 35.109.85 spellCheckerDocumentTag as Integer

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a tag identifying the text view's text as a document for the spell checker server.
**Notes:** The document tag is obtained by sending a uniqueSpellDocumentTag message to the spell server the first time this method is invoked for a particular group of text views. See the NSSpellChecker and NSSpellServer class specifications for more information on how this tag is used.
(Read only property)

### 35.109.86 textContainer as NSTextContainerMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The text container.
**Notes:** The receiver uses the layout manager and text storage of aTextContainer.

Special Considerations
This method is invoked automatically when you create a text view; you should never invoke it directly, but might want to override it. To change the text view for an established group of text system objects, use TextView setter on the text container. To replace the text container for a text view and maintain the view's association with the existing layout manager and text storage, use replaceTextContainer.
(Read and Write property)

### 35.109.87 textContainerInset as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The empty space the receiver leaves around its text container.
**Example:**

```
dim n as NSTextViewMBS = TextArea1.NSTextViewMBS

n.textContainerInset = NSMakeSizeMBS(-3,0)
```

**Notes:** It is possible to set the text container and view sizes and resizing behavior so that the inset cannot be maintained exactly, although the text system tries to maintain the inset wherever possible. In any case, the textContainerOrigin and size of the text container are authoritative as to the location of the text container within the view.

The text itself can have an additional inset, inside the text container, specified by the setLineFragmentPadding method of NSTextContainer.
(Read and Write property)

### 35.109.88 textContainerOrigin as NSPointMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the origin of the receiver's text container.
**Notes:** The origin of the receiver's text container, which is calculated from the receiver's bounds rectangle, container inset, and the container's used rect.
(Read only property)

### 35.109.89 textStorage as NSTextStorageMBS

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's text storage object.
**Example:**

```
// load rtfd file into textarea
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
dim n as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithPath(file)
dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
t.textStorage.setAttributedString(n)
```

**Notes:** (Read only property)

### 35.109.90 typingAttributes as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Get or set typing attributes.
**Notes:** Typing attributes are reset automatically whenever the selection changes. However, if you add any user actions that change text attributes, the action should use this method to apply those attributes afterwards. User actions that change attributes should always set the typing attributes because there might not be a subsequent change in selection before the next typing.
(Read and Write property)

### 35.109.91 usesFindBar as Boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether to use the find bar for this text view.
**Notes:** The value of this property is true if the find bar is used for this text view; otherwise false.
See NSTextFinderMBS class for information about the find bar.
A text view can use either a find panel or a find bar. If usesFindBar is set to true, usesFindPanel is set to false and vice versa.
(Read and Write property)

### 35.109.92 usesFindPanel as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows for a find panel.
**Notes:** (Read and Write property)

### 35.109.93 usesFontPanel as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the text views sharing the receiver's layout manager use the Font panel and Font menu.
**Notes:** (Read and Write property)

### 35.109.94 usesInspectorBar as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether this text view uses the inspector bar.
**Example:**

```
dim t as NSTextViewMBS = textarea1.NSTextViewMBS
t.usesInspectorBar = true
```

**Notes:** Available in OS X v10.7 and later.
(Read and Write property)

### 35.109.95 usesRuler as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether the text views sharing the receiver's layout manager use a ruler.
**Notes:** True to cause text views sharing the receiver's layout manager to respond to NSRulerView client messages and to paragraph-related menu actions, and update the ruler (when visible) as the selection changes with its paragraph and tab attributes, otherwise false.

Text views must use a ruler to respond to Format menu commands. If a set of text views don't use the ruler, the ruler is hidden, and the text views disallow paragraph attribute changes. By default, text view objects use the ruler.
(Read and Write property)

### 35.109.96 Events

### 35.109.97 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 10.1, Platform: macOS, Targets: .

**Function:** Sent when a text view needs to determine if text in a specified range should be changed.
**Notes:** affectedCharRange: The range of characters to be replaced.
replacementString: The characters that will replace the characters in affectedCharRange; nil if only text attributes are being changed.

Return true to allow the replacement, or false to reject the change.
See also:

- 35.109.32 shouldChangeTextInRange(affectedCharRange as NSRangeMBS, replacementString as string = "") as Boolean 7316

### 35.109.98 textViewDidChangeSelection

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Sent when the selection changes in the text view.

### 35.109.99 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSFindPanelSubstringMatchTypeContains | 0 | One of the constants to specify the type of substring matching Find panel.<br>Finds a word containing the search string.<br>Available in Mac OS X v10.5 and later. |
| NSFindPanelSubstringMatchTypeEndsWith | 3 | One of the constants to specify the type of substring matching Find panel.<br>Finds a word ending with the search string.<br>Available in Mac OS X v10.5 and later. |
| NSFindPanelSubstringMatchTypeFullWord | 2 | One of the constants to specify the type of substring matching Find panel.<br>Finds a word exactly matching the search string.<br>Available in Mac OS X v10.5 and later. |
| NSFindPanelSubstringMatchTypeStartsWith | 1 | One of the constants to specify the type of substring matching Find panel.<br>Finds a word starting with the search string.<br>Available in Mac OS X v10.5 and later. |
| NSSelectByCharacter | 0 | One of the constants to specify how much the text view extends when the user drags the mouse.<br>Extends the selection character by character. |
| NSSelectByParagraph | 2 | One of the constants to specify how much the text view extends when the user drags the mouse.<br>Extends the selection paragraph by paragraph. |
| NSSelectByWord | 1 | One of the constants to specify how much the text view extends when the user drags the mouse.<br>Extends the selection word by word. |
| NSSelectionAffinityDownstream | 1 | One of the constants to specify the preferred direction of selectio<br>The selection is moving toward the bottom of the document. |
| NSSelectionAffinityUpstream | 0 | One of the constants to specify the preferred direction of selectio<br>The selection is moving toward the top of the document. |

# 35.110 control NSTokenFieldControlMBS

## 35.110.1 control NSTokenFieldControlMBS

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a NSTokenField.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.4pr1
- MBS Xojo Plugins, version 21.1pr2

## 35.110.2 Properties

## 35.110.3 View as NSTokenFieldMBS

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used for the control.
**Notes:** (Read only property)

## 35.110.4 Events

## 35.110.5 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

## 35.110.6 Close

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 35.110.7 Closing

Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 35.110.8 completionsForSubstring(substring as string, tokenIndex as Integer, byref selectedIndex as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide an array of appropriate completions for the contents of the receiver.
**Notes:** substring: The partial string that is to be completed.
tokenIndex: The index of the token being edited.
selectedIndex: Optionally, you can return by-reference an index into the returned array that specifies which of the completions should be initially selected. If none are to be selected, return by reference -1.

Returns an array of strings that are possible completions.

If the delegate does not implement this method, no completions are provided.
Available in OS X v10.4 and later.

### 35.110.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.110.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.110.11 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 35.110.12 displayStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be displayed as a proxy for the given represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the string to be used as a proxy for representedObject. If you return nil or do not implement this method, then representedObject is displayed as the string.

### 35.110.13 editingStringForRepresentedObject(representedObject as Variant) as string

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a string to be edited as a proxy for a represented object.
**Notes:** representedObject: A represented object of the token field.

Returns a string that's an editable proxy of the represented object, or nil if the token should not be editable.

### 35.110.14 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 35.110.15 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.110.16 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.110.17 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 35.110.18 GotFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 35.110.19 hasMenuForRepresentedObject(representedObject as Variant) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to specify whether the given represented object provides a menu.
**Notes:** representedObject: A represented object of the token field.

Returns true if the represented object has a menu, false otherwise.
By default tokens in a token field have no menus.

### 35.110.20 LostFocus

MBS MacControls Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 35.110.21 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 35.110.22 menuForRepresentedObject(representedObject as Variant) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a menu for the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the menu associated with the represented object.
By default tokens in a token field do not return menus.

### 35.110.23 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 35.110.24 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 35.110.25 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 35.110.26 Open

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 35.110.27 Opening

Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 35.110.28 readFromPasteboard(pboard as NSPasteboardMBS) as Variant()

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to return an array of objects representing the data read from the specified pasteboard.
**Notes:** pboard: The pasteboard from which to read the represented objects.

Returns an array of represented objects created from the pasteboard data.

### 35.110.29 representedObjectForEditingString(editingString as string) as Variant

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to provide a represented object for the given editing string.
**Notes:** editingString: The edited string representation of a represented object.

Returns a represented object that is displayed rather than the editing string.

Note: In OS X v10.4, NSTokenField trims whitespace around tokens but it does not trim whitespace in OS X versions 10.5.0 and 10.5.1. In OS X v10.5.2, you get whitespace-trimming behavior by either linking against the v10.4 binary or linking against the v10.5 binary and not implementing the this method. If you do not want the whitespace-trimming behavior, link against the v10.5 binary and implement this method, returning the editing string if you have no represented object.

### 35.110.30 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.110.31 shouldAddObjects(tokens() as Variant, index as Integer) as Variant()

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows to validate the tokens to be added to the receiver at a particular location.
**Notes:** tokens: An array of tokens to be inserted in the receiver at index.
index: The index of the receiver in which the array of tokens to be validated (tokens) will be inserted.

Returns an array of validated tokens.

The event can return the array unchanged or return a modified array of tokens. To reject the add completely, return an empty array. Returning nil causes an error.

### 35.110.32 styleForRepresentedObject(representedObject as Variant) as Integer

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to return the token style for editing the specified represented object.
**Notes:** representedObject: A represented object of the token field.

Returns the style that should be used to display the representedObject. Possible values are shown in NSTokenStyle Values.

If the event implements this method and returns an NSTokenStyle that differs from the style set by setTokenStyle:, the value the event returns is preferred.

If you don't implement this method, the token field's tokenStyle is used.

### 35.110.33 TextDidBeginEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text begins an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidBeginEditingNotification.

This event is invoked when the user begins editing text in a control such as a text field or a form field. The control posts a NSControlTextDidBeginEditingNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is also delivered for inspection.

See TextDidEndEditing for an explanation of why you may not always get one invocation of TextDidBeginEditing for each invocation of TextDidEndEditing.

### 35.110.34 TextDidChange(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Sent when the text in the receiving control changes.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidChangeNotification.

This event is invoked when text in a control such as a text field or form changes. The control posts a NSControlTextDidChangeNotification notification, and if the control's subclass implements this event, it is automatically registered to receive the notification. The field editor is provided as parameter for inspection.

### 35.110.35 TextDidEndEditing(fieldEditor as NSTextMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Sent when a control with editable text ends an editing session.
**Notes:** Notification: The notification object. The name of the notification is always NSControlTextDidEndEditingNotification.

This event is invoked when the user stops editing text in a control such as a text field or form. The control posts a NSControlTextDidEndEditingNotification notification, and if the control' subclass implements this event, it is automatically registered to receive the notification. The field editor is also provided for inspection.

Warning: In some cases, such as when editing within an instance of NSOutlineView, this method may be invoked without a previous invocation of TextDidBeginEditing. You will only get the TextDidBeginEditing: notification if the user actually types something, but you can get the TextDidEndEditing notification if the user just double-clicks the field and then clicks outside the field, without typing.

### 35.110.36 textShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.

**Notes:** Return true to allow text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.110.37 textShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow end of text editing or false to deny.
Be aware that an event in Xojo without return will cause false to be returned.

### 35.110.38 tokenFieldAction

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** The control's action was triggered.
**Notes:** For a button if it was pressed.

### 35.110.39 tokenFieldTextShouldBeginEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether text editing should be allowed.
**Notes:** Return true to allow text editing.

### 35.110.40 tokenFieldTextShouldEndEditing(fieldEditor as NSTextMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** The event called to decide whether ending text editing should be allowed.
**Notes:** Return true to allow text editing.

### 35.110.41 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 35.110.42 writeRepresentedObjects(objects() as Variant, pboard as NSPasteboardMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.4, Platform: macOS, Targets: .

**Function:** Sent so the delegate can write represented objects to the pasteboard corresponding to a given array of display strings.
**Notes:** objects: An array of represented objects associated with the token field.
pboard: The pasteboard to which to write the represented objects.

Return true if you writes the represented objects to the pasteboard, false otherwise. If false, the token field writes the display strings to the NSStringPboardType pasteboard.

## 35.111 control NSViewControlMBS

### 35.111.1 control NSViewControlMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a generic NSView.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo / Real Studio Plugins, version 15.0pr10

### 35.111.2 Properties

### 35.111.3 View as NSViewMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 35.111.4 Events

### 35.111.5 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 35.111.6 acceptsFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 35.111.7 becomeFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 35.111.8 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.111.9 canBecomeKeyView as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 35.111.10 Close

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to close.

### 35.111.11 Closed

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event called when the custom view is destroyed.
**Notes:** Renamed to Closed in plugin version 20.5. Used to be named Close.

### 35.111.12 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 35.111.13 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 35.111.14 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 35.111.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 35.111.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 35.111.17 draggingExited(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 35.111.18 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 35.111.19 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 35.111.20 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 35.111.21 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 35.111.22 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 35.111.23 drawFocusRingMask(g as NSGraphicsMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Draw the focus ring mask for the view.
**Notes:** If false is returned, the default method from NSView class runs.

This method provides the shape of the focus ring mask by drawing the focus ring mask. An implementation of this method should draw in the view's interior (bounds) coordinate space, that the focus ring style has been set (it will be set it to NSFocusRingOnly to capture the focus ring itself), and that the fill and stroke colors have been set to an arbitrary fully opaque color.

Subclasses that find the default behavior insufficient should only draw the focus ring shape.

The NSView default implementation of this method simply fills self.bounds.
Available in Mac OS X v10.7 and later.

Please use NSGraphicsMBS class for drawing.

### 35.111.24 DrawRect(g as NSGraphicsMBS, left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The paint event with the rectangle which needs to be redrawn.

### 35.111.25 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event where you can enable menu items.

### 35.111.26 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.111.27 focusRingMaskBounds as NSRectMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Returns the focus ring mask bounds.
**Notes:** Return nil to run default NSView method.

Return a rectangle containing the mask in the view's interior (bounds) coordinate space.

The mask bounds allows the focus ring's overall size and position to be determined before it is drawn.
Subclasses must override this method if they require the display of a focus ring.
The NSView default implementation of this method simply returns NSRectMBS.Zero.

Note: The information provided by focusRingMaskBounds will enable Accessibility to identify selected subelements for zoom tracking, so it is important that this method provide a reasonably tight bounding box and that noteFocusRingMaskChanged is invoked as described.

### 35.111.28 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 35.111.29 isOpaque as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 35.111.30 keyDown(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first

responder and receive key events.

### 35.111.31 keyUp(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.
Please return true in becomeFirstResponder and acceptsFirstResponder, so your nsview can become first responder and receive key events.

### 35.111.32 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.111.33 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.
**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 35.111.34 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.35 mouseDownCanMoveWindow as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 35.111.36 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.37 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.38 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.39 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.40 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.41 Open

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 35.111.42 Opened

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is created.
**Notes:** Renamed to Opened in plugin version 20.5. Used to be named Open.

### 35.111.43 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.111.44 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.111.45 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 35.111.46 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 35.111.47 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 35.111.48 pressureChange(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 35.111.49 resignFirstResponder as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 35.111.50 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.51 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.52 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 35.111.53 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.111.54 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 35.111.55 scrollWheel(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 35.111.56 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.

The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 35.111.57 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 35.111.58 viewDidMoveToWindow

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose to ignore such cases if they are not of interest.

### 35.111.59 wantsPeriodicDraggingUpdates as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages

even if nothing changes.

## 35.112 class PopupMenu

### 35.112.1 class PopupMenu

Platform: macOS, Targets: Desktop only.

**Function:** Gives access to the NSMenuMBS of the PopupMenu.

### 35.112.2 Methods

### 35.112.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox PopupMenu1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

### 35.112.4 NSPopUpButtonMBS as NSPopUpButtonMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSPopUpButtonMBS object for the given control.
**Example:**

```
// get cocoa view for the popupmenu
dim p as NSPopUpButtonMBS = PopupMenu1.NSPopUpButtonMBS

// find a menu entry
dim it as NSMenuItemMBS = p.itemAtIndex(0)

// get a picture
dim pic as Picture = LogoMBS(500)
dim img as new NSImageMBS(pic)
img.setSize 16,16

// and assign icon
it.image = img
```

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.113 class ProgressWheel

### 35.113.1 class ProgressWheel

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in ProgressWheel class in Xojo.

### 35.113.2 Methods

### 35.113.3 NSProgressIndicatorMBS as NSProgressIndicatorMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSProgressIndicatorMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

# 35.114 class PushButton

## 35.114.1 class PushButton

Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** The built in Button class in Xojo.

## 35.114.2 Methods

## 35.114.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox PushButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.115 class Radiobutton

### 35.115.1 class Radiobutton

Plugin Version: 2.9, Platform: macOS, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 35.115.2 Methods

### 35.115.3 NSButtonMBS as NSButtonMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSButtonMBS object for the given control.
**Example:**

MsgBox RadioButton1.NSButtonMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

# 35.116 class ScrollBar

## 35.116.1 class ScrollBar

Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** The built in Scrollbar class in Xojo.

## 35.116.2 Methods

## 35.116.3 NSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSScrollerMBS object for the given control.
**Example:**

MsgBox ScrollBar1.NSScrollerMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.117 class SearchField

### 35.117.1 class SearchField

Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built-in search field control in Xojo.
**Notes:** Only for Xojo 2020r2 or newer.

### 35.117.2 Methods

### 35.117.3 NSSearchFieldMBS as NSSearchFieldMBS

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries search field object for the control.
**Notes:** Only for Xojo 2020r2 or newer.

# 35.118 class SegmentedControl

## 35.118.1 class SegmentedControl

Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Build in Segmented Control class in Xojo.

## 35.118.2 Methods

## 35.118.3 NSSegmentedControlMBS as NSSegmentedControlMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSSegmentedControlMBS object for the given control.
**Example:**

SegmentedControl1.NSSegmentedControlMBS.selectedSegment = 0

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.119 class Separator

### 35.119.1 class Separator

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in Separator class in Xojo.

### 35.119.2 Methods

### 35.119.3 NSBoxMBS as NSBoxMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSBoxMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

# 35.120 class Slider

## 35.120.1 class Slider

Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** The built in slider class in Xojo.

## 35.120.2 Methods

## 35.120.3 NSSliderMBS as NSSliderMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSSliderMBS object for the given control.
**Example:**

MsgBox Slider1.NSSliderMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 35.121 class SpinningProgressIndicatorMBS

### 35.121.1 class SpinningProgressIndicatorMBS

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** A resizable, recolorable clone of the spinning NSProgressIndicator.
**Notes:** Based on YRKSpinningProgressIndicator from Kelan Champagne.
See also https://github.com/kelan/yrk-spinning-progress-indicator
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr8
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.2
- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 35.121.2 Methods

### 35.121.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new progress indicator with size 100/100 and position 0/0
**Example:**

```
dim t as new SpinningProgressIndicatorMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 35.121.4 Constructor(Handle as Integer) 7372
- 35.121.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7373


### 35.121.4 Constructor(Handle as Integer)

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given SpinningProgressIndicator handle.
**Example:**

```
dim t as new SpinningProgressIndicatorMBS(0, 0, 100, 100)
dim v as new SpinningProgressIndicatorMBS(t.handle)
```

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)

**Notes:** The handle is casted to a SpinningProgressIndicator and the plugin retains this handle.
See also:

- 35.121.3 Constructor 7372
- 35.121.5 Constructor(left as Double, top as Double, width as Double, height as Double) 7373

### 35.121.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new progress indicator with the given size and position.
**Example:**

dim x as new SpinningProgressIndicatorMBS(0, 0, 100, 100)

**Notes:** On success the handle property is not zero.
See also:

- 35.121.3 Constructor 7372
- 35.121.4 Constructor(Handle as Integer) 7372

### 35.121.6 startAnimation

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts animation.
**Notes:** If you see no animation, you can maybe add a timer with short period (50ms) and set needsDisplay to true.

### 35.121.7 stopAnimation

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Stops the animation.

### 35.121.8 Properties

### 35.121.9 backgroundColor as NSColorMBS

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** Default color is NSColorMBS.clearColor.
(Read and Write computed property)

### 35.121.10 colorValue as NSColorMBS

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The color for drawing.
**Notes:** Default color is NSColorMBS.blackColor.
(Read and Write computed property)

### 35.121.11 doubleValue as Double

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The current value.
**Notes:** Default is 0.0.
(Read and Write computed property)

### 35.121.12 drawsBackground as boolean

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to draw background.
**Notes:** Default is false.
(Read and Write computed property)

### 35.121.13 isDisplayedWhenStopped as boolean

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is visible without animation turned on.
**Notes:** Default is true.

(Read and Write computed property)

### 35.121.14 isIndeterminate as boolean

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether progress is indeterminated.
**Notes:** Default is true.
(Read and Write computed property)

### 35.121.15 maxValue as Double

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value.
**Notes:** Default is 100.0.
(Read and Write computed property)

### 35.121.16 usesThreadedAnimation as boolean

MBS MacExtras Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to use a thread for the animation.
**Notes:** Default is true.
(Read and Write computed property)

## 35.122 class Statictext

### 35.122.1 class Statictext

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The built in Statictext class in Xojo.

### 35.122.2 Methods

### 35.122.3 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

# 35.123 class TextArea

## 35.123.1 class TextArea

Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in textarea class in Xojo.
**Example:**

```
// make a PDF from a textarea in Cocoa Xojo target:

// find view
dim n as NSViewMBS = TextArea1.NSViewMBS
if n = nil then
MsgBox "Only in Cocoa!"
Return
end if

// make pdf data
dim s as string = n.dataWithPDFInsideRect(0,0,n.frame.Width, n.frame.Height)

// save
dim f as FolderItem = GetSaveFolderItem("", "test.pdf")

if f<>Nil then

dim b as BinaryStream = BinaryStream.Create(f, true)

b.Write s

end if
```

**Notes:** Requires RB 2009r4 or newer.

## 35.123.2 Methods

## 35.123.3 NSScrollViewMBS as NSScrollViewMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSScrollViewMBS object for the given control.
**Example:**

```
MsgBox TextArea1.NSScrollViewMBS.className
```

**Notes:** This way you can manipulate Cocoa controls directly.

### 35.123.4 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Xojo uses a NSTextField for text areas without style and without multiline.

### 35.123.5 NSTextViewMBS as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextViewMBS object for the given control.
**Example:**

```
// load rtfd file into textarea
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
dim n as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithPath(file)
dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
t.textStorage.setAttributedString(n)
```

**Notes:** This way you can manipulate Cocoa controls directly.
Xojo uses a NSTextField for text areas without style and without multiline.

### 35.123.6 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Example:**

```
// called im a thread:
TextArea1.SetTextThreadSafeMBS "Hello World"
```

**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 35.123.7 WinInsertImageMBS(data as string, Width as Integer, Height as Integer)

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop only.

**Function:** Inserts image to file.
**Example:**

```
Dim pic As Picture = LogoMBS(500)
Dim data As String = pic.GetData(pic.SaveAsJPEG)

call TextArea1.WinInsertImageMBS(data, 500, 500)
```

**Notes:** Specify size in pixels and image data.
Image data works with JPEG and other data types.
Requires Windows 8 or newer.
**Blog Entries**

- RTF functions in MBS Plugins
- MBS Xojo / Real Studio Plugins, version 14.3pr1
- New RTF functions coming for Windows

### 35.123.8 WinShowFontPanelMBS as Boolean

MBS Win Plugin, Plugin Version: 19.2, Platform: Windows, Targets: Desktop only.

**Function:** Shows font dialog.
**Example:**

```
If TextArea1.WinShowFontPanelMBS Then
// update controls as font may have been changed?

End If
```

**Notes:** You can make changes and apply them with OK button.
Returns true when OK is selected.
**Blog Entries**

- RTF functions in MBS Plugins
- MBS Xojo Plugins in version 19.2
- Windows Font Dialog
- MBS Xojo Plugins, version 19.2pr3

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 43: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 35.123.9 Properties

### 35.123.10 RTFDataMBS as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the textview content as RTF data.
**Example:**

```
dim rtf as MemoryBlock = TextArea1.RTFDataMBS
TextArea2.RTFDataMBS = rtf
```

**Notes:** Works only for Cocoa and uses RTF parser/generator from Apple.

See also RTFDataMBS in StyledText, WinRTFDataMBS in TextArea and DesktopTextArea controls and RTFData in NSTextViewMBS class.
(Read and Write computed property)

### 35.123.11 WinAutoCorrectionMBS as Boolean

MBS Win Plugin, Plugin Version: 19.2, Platform: Windows, Targets: Desktop only.

**Function:** Enables auto correction for Textarea.
**Example:**

```
#If TargetWindows Then
TextArea1.WinAutoCorrectionMBS = True
#ElseIf TargetMacOS Then
TextArea1.NSTextViewMBS.AutomaticSpellingCorrectionEnabled = True
#EndIf
```

**Notes:** Only for Windows 8 and newer.
Uses current language from user.

See AutomaticSpellingCorrectionEnabled and ContinuousSpellCheckingEnabled properties in NSTextViewMBS for MacOS.
(Read and Write computed property)

### 35.123.12 WinAutoHorizontalScrollMBS as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Whether to auto scroll horizontally.
**Notes:** Automatically scrolls text to the right by 10 characters when the user types a character at the end of the line. When the user presses the ENTER key, the control scrolls all text back to position zero.

This property controls an option of the RichEdit control used by Xojo for the Textarea control on Windows.
(Read and Write computed property)

### 35.123.13 WinAutoVerticalScrollMBS as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Whether to auto scroll vertically.
**Notes:** Automatically scrolls text up one page when the user presses the ENTER key on the last line.

This property controls an option of the RichEdit control used by Xojo for the Textarea control on Windows.
(Read and Write computed property)

### 35.123.14 WinRTFDataMBS(SelectionOnly as boolean = false) as string

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop only.

**Function:** Get or set the RTF data for the text area.
**Example:**

```
Dim rtfData As String

#If TargetWindows Then
rtfData = TextArea1.WinRTFDataMBS
#ElseIf TargetMacOS Then
rtfData = TextArea1.RTFDataMBS
#EndIf
```

**Notes:** Including images and probably faster as StyledText.RTFData.

See also RTFDataMBS in StyledText, RTFDataMBS in TextArea and DesktopTextArea controls and RTF-Data in NSTextViewMBS class.
(Read and Write computed property)

### 35.123.15 WinSelHasTextBackColorMBS as Boolean

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** Whether a custom background color is in used for the selection.
**Example:**

```
textArea1.WinSelHasTextBackColorMBS = false
```

**Notes:** If false, standard background color is used.
(Read and Write computed property)

### 35.123.16 WinSelHasTextColorMBS as Boolean

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** Whether a custom text color is in used for the selection.
**Example:**

```
textArea1.WinSelHasTextColorMBS = false
```

**Notes:** If false, standard text color is used.
(Read and Write computed property)

### 35.123.17 WinSelStrikeThroughMBS as Boolean

MBS Win Plugin, Plugin Version: 17.4, Platform: Windows, Targets: Desktop only.

**Function:** Get or set StrikeThrough text style.
**Example:**

TextArea1.WinSelStrikeThroughMBS = True

**Notes:** See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.123.18 WinSelSubScriptMBS as Boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** Get or set subscript text style.
**Example:**

TextArea1.WinSelSubScriptMBS = True

**Notes:** Subscript text has a lower base line and is smaller.
See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.123.19 WinSelSuperScriptMBS as Boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** Get or set superscript text style.
**Example:**

TextArea1.WinSelSuperScriptMBS = True

**Notes:** Superscript text has a higher base line and is smaller.
See example project for how to do this for both Mac and Windows.
(Read and Write computed property)

### 35.123.20 WinSelTextBackColorMBS as Color

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** The current background text color.
**Example:**

```
textArea1.WinSelTextBackColorMBS = &cFF0000
```

**Notes:** If set also sets WinSelHasTextBackColorMBS to true internally.
(Read and Write computed property)

### 35.123.21 WinSelTextColorMBS as Color

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** The current foreground text color.
**Example:**

```
textArea1.WinSelTextColorMBS = &cFF0000
```

**Notes:** If set also sets WinSelHasTextColorMBS to true internally.
(Read and Write computed property)

### 35.123.22 WinSpellcheckingMBS as Boolean

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop only.

**Function:** Enables spellchecking for Textarea.
**Example:**

```
#If TargetWindows Then
TextArea1.WinSpellcheckingMBS = True
#ElseIf TargetMacOS Then
TextArea1.NSTextViewMBS.continuousSpellCheckingEnabled = True
#EndIf
```

**Notes:** Only for Windows 8 and newer.
Uses current language from user.

See AutomaticSpellingCorrectionEnabled and ContinuousSpellCheckingEnabled properties in NSTextViewMBS

for MacOS.
(Read and Write computed property)

## 35.124 class UpDownArrows

### 35.124.1 class UpDownArrows

Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** The build in control class in Xojo.

### 35.124.2 Methods

### 35.124.3 NSStepperMBS as NSStepperMBS

MBS MacControls Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSStepperMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

# Chapter 36

# Cocoa Drawing

## 36.1 class NSBezierPathMBS

### 36.1.1 class NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The plugin class for a Cocoa NSBezierPath.
**Notes:** An NSBezierPath object allows you to create paths using PostScript-style commands. Paths consist of straight and curved line segments joined together. Paths can form recognizable shapes such as rectangles, ovals, arcs, and glyphs; they can also form complex polygons using either straight or curved line segments. A single path can be closed by connecting its two endpoints, or it can be left open.

An NSBezierPath object can contain multiple disconnected paths, whether they are closed or open. Each of these paths is referred to as a subpath. The subpaths of an NSBezierPath object must be manipulated as a group. The only way to manipulate subpaths individually is to create separate NSBezierPath objects for each.

For a given NSBezierPath object, you can stroke the path's outline or fill the region occupied by the path. You can also use the path as a clipping region for views or other regions. Using methods of NSBezierPath, you can also perform hit detection on the filled or stroked path. Hit detection is needed to implement interactive graphics, as in rubberbanding and dragging operations.

The current graphics context is automatically saved and restored for all drawing operations involving NSBezierPath objects, so your application does not need to worry about the graphics settings changing across invocations.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr4

### 36.1.2 Methods

### 36.1.3 appendBezierPath(path as NSBezierPathMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends the contents of the specified path object to the receiver's path.
**Notes:** Path: The path to add to the receiver.

This method adds the commands used to create aPath to the end of the receiver's path. This method does not explicitly try to connect the subpaths in the two objects, although the operations in Path may still cause that effect.

### 36.1.4 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends an arc of a circle to the receiver's path.
**Notes:** center: Specifies the center point of the circle used to define the arc.
radius: Specifies the radius of the circle used to define the arc.
startAngle: Specifies the starting angle of the arc, measured in degrees counterclockwise from the x-axis.
endAngle: Specifies the end angle of the arc, measured in degrees counterclockwise from the x-axis.

The created arc lies on the perimeter of the circle, between the angles specified by the startAngle and endAngle parameters. The arc is drawn in a counterclockwise direction. If the receiver's path is empty, this method sets the current point to the beginning of the arc before adding the arc segment. If the receiver's path is not empty, a line is drawn from the current point to the starting point of the arc.

Depending on the length of the arc, this method may add multiple connected curve segments to the path.
See also:

- 36.1.5 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double, clockwise as boolean) 7388
- 36.1.6 appendBezierPathWithArc(point1 as NSPointMBS, point2 as NSPointMBS, radius as Double) 7389

### 36.1.5 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double, clockwise as boolean)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends an arc of a circle to the receiver's path.
**Notes:** center: Specifies the center point of the circle used to define the arc.
radius: Specifies the radius of the circle used to define the arc.
startAngle: Specifies the starting angle of the arc, measured in degrees counterclockwise from the x-axis.
endAngle: Specifies the end angle of the arc, measured in degrees counterclockwise from the x-axis.
clockwise: true if you want the arc to be drawn in a clockwise direction; otherwise false to draw the arc in a counterclockwise direction.

The created arc lies on the perimeter of the circle, between the angles specified by the startAngle and endAngle parameters. The arc is drawn in the direction indicated by the clockwise parameter. If the receiver's path is empty, this method sets the current point to the beginning of the arc before adding the arc segment. If the receiver's path is not empty, a line is drawn from the current point to the starting point of the arc.

Depending on the length of the arc, this method may add multiple connected curve segments to the path.
See also:

- 36.1.4 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double) 7388
- 36.1.6 appendBezierPathWithArc(point1 as NSPointMBS, point2 as NSPointMBS, radius as Double) 7389

### 36.1.6 appendBezierPathWithArc(point1 as NSPointMBS, point2 as NSPointMBS, radius as Double)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends an arc to the receiver's path.
**Notes:** point1: The middle point of the angle.
point2: The end point of the angle.
radius: The radius of the circle inscribed in the angle.

The created arc is defined by a circle inscribed inside the angle specified by three points: the current point, the fromPoint parameter, and the toPoint parameter (in that order). The arc itself lies on the perimeter of the circle, whose radius is specified by the radius parameter. The arc is drawn between the two points of the circle that are tangent to the two legs of the angle.

The arc usually does not contain the points in the fromPoint and toPoint parameters. If the starting point of the arc does not coincide with the current point, a line is drawn between the two points. The starting point of the arc lies on the line defined by the current point and the fromPoint parameter.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

Depending on the length of the arc, this method may add multiple connected curve segments to the path.
See also:


- 36.1.4 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double) 7388
- 36.1.5 appendBezierPathWithArc(center as NSPointMBS, radius as Double, startAngle as Double, endAngle as Double, clockwise as boolean) 7388


### 36.1.7 appendBezierPathWithGlyph(glyph as Integer, font as NSFontMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends an outline of the specified glyph to the receiver's path.
**Notes:** Glyph: The glyph to add to the path.
font: The font in which the glyph is encoded.

If the glyph is not encoded in the font specified by the font parameter—that is, the font does not have an entry for the specified glyph—then no path is appended to the receiver.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.8 appendBezierPathWithGlyphs(glyphs() as Integer, font as NSFontMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends the outlines of the specified glyphs to the receiver's path.
**Notes:** glyphs: An array of glpyhs to add to the path.
count: The number of glyphs in the glyphs parameter.
font: The font in which the glyphs are encoded.

If the glyphs are not encoded in the font specified by the font parameter—that is, the font does not have an entry for one of the specified glyphs—then no path is appended to the receiver.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.9 appendBezierPathWithOvalInRect(rect as NSRectMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends an oval path to the receiver, inscribing the oval in the specified rectangle.
**Notes:** rect: The rectangle in which to inscribe the oval.

Before adding the oval, this method moves the current point, which implicitly closes the current subpath. If the aRect parameter specifies a square, the inscribed path is a circle. The path is constructed by starting in the lower-right quadrant of the rectangle and adding arc segments counterclockwise to complete the oval.

### 36.1.10 appendBezierPathWithPoints(points() as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends a series of line segments to the receiver's path.
**Notes:** points: An array of NSPoint data types, each of which contains the end point of the next line segment.
count :The number of points in the points parameter.

This method interprets the points as a set of connected line segments. If the current path contains an open subpath, a line is created from the last point in that subpath to the first point in the points array. If the current path is empty, the first point in the points array is used to set the starting point of the line segments. Subsequent line segments are added using the remaining points in the array.

This method does not close the path that is created. If you wish to create a closed path, you must do so by explicitly invoking the receiver's closePath method.

### 36.1.11 appendBezierPathWithRect(rect as NSRectMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends a rectangular path to the receiver's path.
**Notes:** rect: The rectangle describing the path to create.

Before adding the rectangle, this method moves the current point to the origin of the rectangle, which implicitly closes the current subpath (if any). The path is constructed by starting at the origin of aRect and adding line segments in a counterclockwise direction. The final segment is added using a closePath message.

### 36.1.12 appendBezierPathWithRoundedRect(rect as NSRectMBS, xRadius as Double, yRadius as Double)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends a rounded rectangular path to the receiver's path.
**Notes:** rect: The rectangle that defines the basic shape of the path.
xRadius: The radius of each corner oval along the x-axis. Values larger than half the rectangle's width are clamped to half the width.
yRadius: The radius of each corner oval along the y-axis. Values larger than half the rectangle's height are clamped to half the height.

The path is constructed in a counter-clockwise direction, starting at the top-left corner of the rectangle. If either one of the radius parameters contains the value 0.0, the returned path is a plain rectangle without rounded corners.

### 36.1.13 bezierPath as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new NSBezierPath object.

### 36.1.14 bezierPathByFlatteningPath as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a "flattened" copy of the receiver.
**Notes:** Returns a new path object whose contents are a flattened version of the receiver's path.

Flattening a path converts all curved line segments into straight line approximations. The granularity of the approximations is controlled by the path's current flatness value, which is set using the DefaultFlatness property.

### 36.1.15 bezierPathByReversingPath as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new NSBezierPath object with the reversed contents of the receiver's path.
**Notes:** Returns a new path object whose contents are a reversed version of the receiver's path.

Reversing a path does not necessarily change the appearance of the path when rendered. Instead, it changes

the direction in which path segments are drawn. For example, reversing the path of a rectangle (whose line segments are normally drawn starting at the origin and proceeding in a counterclockwise direction) causes its line segments to be drawn in a clockwise direction instead. Drawing a reversed path could affect the appearance of a filled pattern, depending on the pattern and the fill rule in use.

This method reverses each whole or partial subpath in the path object individually.

### 36.1.16 bezierPathWithOvalInRect(r as NSRectMBS) as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new NSBezierPath object initialized with an oval path inscribed in the specified rectangle.
**Notes:** r: The rectangle in which to inscribe an oval.

Returns an NSBezierPath new path object with the oval path.

If the rect parameter specifies a square, the inscribed path is a circle. The path is constructed by starting in the lower-right quadrant of the rectangle and adding arc segments counterclockwise to complete the oval.

### 36.1.17 bezierPathWithRect(r as NSRectMBS) as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new NSBezierPath object initialized with a rectangular path.
**Notes:** r: The rectangle describing the path to create.

Returns a new path object with the rectangular path.
The path is constructed by starting at the origin of aRect and adding line segments in a counterclockwise direction.

### 36.1.18 bezierPathWithRoundedRect(r as NSRectMBS, xRadius as Double, yRadius as Double) as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a new NSBezierPath object initialized with a rounded rectangular path.
**Notes:** r: The rectangle that defines the basic shape of the path.
xRadius: The radius of each corner oval along the x-axis. Values larger than half the rectangle's width are clamped to half the width.

yRadius: The radius of each corner oval along the y-axis. Values larger than half the rectangle's height are clamped to half the height.

Returns a new path object with the rounded rectangular path.

The path is constructed in a counter-clockwise direction, starting at the top-left corner of the rectangle. If either one of the radius parameters contains the value 0.0, the returned path is a plain rectangle without rounded corners.

### 36.1.19 closePath

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Closes the most recently added subpath.
**Notes:** This method closes the current subpath by creating a line segment between the first and last points in the subpath. This method subsequently updates the current point to the end of the newly created line segment, which is also the first point in the now closed subpath.

### 36.1.20 Constructor

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Initializes a new empty NSBezierPath object.

### 36.1.21 containsPoint(p as NSPointMBS) as boolean

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the receiver contains the specified point.
**Example:**

```
dim r as new NSRectMBS(10, 10, 50, 50)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(r)
dim p as new NSPointMBS(20,20)

MsgBox str(b.containsPoint(p))
```

**Notes:** p: The point to test against the path, specified in the path object's coordinate system.

Returns true if the path's enclosed area contains the specified point; otherwise, false.

This method checks the point against the path itself and the area it encloses. When determining hits in the enclosed area, this method uses the non-zero winding rule (NSNonZeroWindingRule). It does not take into account the line width used to stroke the path.

### 36.1.22 copy as NSBezierPathMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates a copy of the bezier path.

### 36.1.23 curveToPoint(endPoint as NSPointMBS, controlPoint1 as NSPointMBS, controlPoint2 as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a Bezier cubic curve to the receiver's path.
**Notes:** endPoint: The destination point of the curve segment, specified in the current coordinate system
controlPoint1: The point that determines the shape of the curve near the current point.
controlPoint2: The point that determines the shape of the curve near the destination point.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.24 elementAtIndex(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the type of path element at the specified index.
**Notes:** index: The index of the desired path element.

Returns the type of the path element.
Path elements describe the commands used to define a path and include basic commands such as moving to a specific point, creating a line segment, creating a curve, or closing the path. The elements are stored in the order of their execution.
See also:

- 36.1.25 elementAtIndex(index as Integer, byref associatedPoints() as NSPointMBS) as Integer 7396

### 36.1.25 elementAtIndex(index as Integer, byref associatedPoints() as NSPointMBS) as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the element type and (and optionally) the associated points for the path element at the specified index.
**Notes:** index: The index of the desired path element.
associatedPoints: On output, the data points associated with the specified path element.

Returns the type of the path element.

For curve operations, the order of the points is controlPoint1 (associatedPoints(0)), controlPoint2 (associatedPoints(1)), endPoint (associatedPoints(2)).
See also:

- 36.1.24 elementAtIndex(index as Integer) as Integer 7395

### 36.1.26 elementCount as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the total number of path elements in the receiver's path.
**Example:**

```
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath

b.moveToPoint NSMakePointMBS(10, 10)
b.lineToPoint NSMakePointMBS(290, 290)
MsgBox str(b.elementCount) // 2

b.removeAllPoints
MsgBox str(b.elementCount) // 0
```

**Notes:** Each element type corresponds to one of the operations described in constants.

### 36.1.27 getLineDash(byref pattern() as Double, byref count as Integer, byref phase as Double)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns the line-stroking pattern for the receiver.
**Notes:** pattern: On output, this array contains the lengths (measured in points) of the line segments and

gaps in the pattern. The values in the array alternate, starting with the first line segment length, followed by the first gap length, followed by the second line segment length, and so on.
count: On output, the number of entries written to pattern.
phase: On output, this value contains the offset at which to start drawing the pattern, measured in points along the dashed-line pattern. For example, a phase of 6 in the pattern 5-2-3-2 would cause drawing to begin in the middle of the first gap.

### 36.1.28 isEmpty as boolean

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the receiver is empty.
**Example:**

```
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath
MsgBox "isEmpty: "+str(b.isEmpty)
```

**Notes:** True if the receiver contains no path elements; otherwise, false.

### 36.1.29 lineToPoint(p as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends a straight line to the receiver's path.
**Notes:** p: The destination point of the line segment, specified in the current coordinate system.

This method creates a straight line segment starting at the current point and ending at the point specified by the aPoint parameter. The current point is the last point in the receiver's most recently added segment.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.30 moveToPoint(p as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Moves the receiver's current point to the specified location.
**Notes:** p: A point in the current coordinate system.

This method implicitly closes the current subpath (if any) and sets the current point to the value in p. When closing the previous subpath, this method does not cause a line to be created from the first and last points in the subpath.

For many path operations, you must invoke this method before issuing any commands that cause a line or curve segment to be drawn.

### 36.1.31 relativeCurveToPoint(endPoint as NSPointMBS, controlPoint1 as NSPointMBS, controlPoint2 as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a Bezier cubic curve to the receiver's path from the current point to a new location, which is specified as a relative distance from the current point.
**Notes:** endPoint: The destination point of the curve segment, interpreted as a relative offset from the current point.
controlPoint1: The point that determines the shape of the curve near the current point, interpreted as a relative offset from the current point.
controlPoint2: The point that determines the shape of the curve near the destination point, interpreted as a relative offset from the current point.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.32 relativeLineToPoint(p as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Appends a straight line segment to the receiver's path starting at the current point and moving towards the specified point, relative to the current location.
**Notes:** p: A point whose coordinates are interpreted as a relative offset from the current point.

The destination point is relative to the current point. For example, if the current point is (1, 1) and aPoint contains the value (1, 2), a line segment is created between the points (1, 1) and (2, 3).

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.33 relativeMoveToPoint(p as NSPointMBS)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the receiver's current point to a new point whose location is the specified distance from the current point.
**Notes:** p: A point whose coordinates are interpreted as a relative offset from the current point.

This method implicitly closes the current subpath (if any) and updates the location of the current point. For example, if the current point is (1, 1) and aPoint contains the value (1, 2), the previous subpath would be closed and the current point would become (2, 3). When closing the previous subpath, this method does not cause a line to be created from the first and last points in the subpath.

You must set the path's current point (using the moveToPoint method or through the creation of a preceding line or curve segment) before you invoke this method. If the path is empty, this method raises an NSGenericException exception.

### 36.1.34 removeAllPoints

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Removes all path elements from the receiver, effectively clearing the path.
**Example:**

```
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath

b.moveToPoint NSMakePointMBS(10, 10)
b.lineToPoint NSMakePointMBS(290, 290)
MsgBox str(b.elementCount) // 2

b.removeAllPoints
MsgBox str(b.elementCount) // 0
```

### 36.1.35 setAssociatedPoints(points() as NSPointMBS, index as Integer)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changes the points associated with the specified path element.
**Notes:** points: An array containing up to three NSPointMBS data types. This parameter must contain the correct number of points for the path element at the specified index. Move, close path, and line segment commands require one point. Curve operations require three points.
index: The index of the path element you want to modify.

You can use this method to change the points associated with a path quickly and without recreating the path. You cannot use this method to change the type of the path element.

The following example shows you how you would modify the point associated with a line path element. The path created by this example results in a path with two elements. The first path element specifies a move to point (0, 0) while the second creates a line to point (100, 100). It then changes the line to go only to the point (50,50) using this method:

Note: If you specify too few points for a path element of type NSCurveToBezierPathElement, the behavior of this method is undefined.

### 36.1.36 setLineDash(pattern() as Double, phase as Double)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Sets the line-stroking pattern for the receiver.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setFillColor NSColorMBS.redColor

dim r as NSRectMBS = NSMakeRectMBS(50, 50, 100, 100)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath

b.moveToPoint NSMakePointMBS(10, 10)
b.lineToPoint NSMakePointMBS(290, 290)

dim pattern() as Double
pattern.Append 5
pattern.Append 2
b.setLineDash pattern, 6

g.stroke(b)

g = nil

window1.Backdrop = n.CopyPicture // red line with dash pattern
```

**Notes:** pattern: An array of floating point values that contains the lengths (measured in points) of the line segments and gaps in the pattern. The values in the array alternate, starting with the first line segment length, followed by the first gap length, followed by the second line segment length, and so on
count: The number of values in pattern.

phase: The offset at which to start drawing the pattern, measured in points along the dashed-line pattern. For example, a phase of 6 in the pattern 5-2-3-2 would cause drawing to begin in the middle of the first gap.

### 36.1.37 transformUsingAffineTransform(transform as Variant)

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Transforms all points in the receiver using the specified transform.
**Example:**

```
dim bezierPath as NSBezierPathMBS = NSBezierPathMBS.bezierPath
dim transform as NSAffineTransformMBS = NSAffineTransformMBS.transform

bezierPath.moveToPoint NSMakePointMBS(0.0, 0.0)
bezierPath.lineToPoint NSMakePointMBS(100.0, 100.0)

transform.translate(10,10)
bezierPath.transformUsingAffineTransform(transform)

Break // bezierPath.bounds starts now at 10/10
```

**Notes:** Transform: The transform to apply to the path.

This method applies the transform to the path's points immediately. The following code translates a line from 0,0 to 100,100 to a line from 10,10 to 110,110.

transform must be a NSAffineTransformMBS object.

### 36.1.38 Properties

### 36.1.39 Bounds as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns the bounding box of the receiver's path.
**Example:**

```
dim r as new NSRectMBS(10, 10, 50, 50)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(r)
dim rr as NSRectMBS = b.Bounds
MsgBox rr.String
```

**Notes:** The rectangle that encloses the path of the receiver. If the path contains curve segments, the bounding box encloses the curve but may not enclose the control points used to calculate the curve.
(Read only property)

### 36.1.40 ControlPointBounds as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bounding box of the receiver's path, including any control points.
**Notes:** The rectangle that encloses the receiver's path. If the path contains curve segments, the bounding box encloses the control points of the curves as well as the curves themselves.
(Read only property)

### 36.1.41 CurrentPoint as NSPointMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns the receiver's current point (the trailing point or ending point in the most recently added segment).
**Example:**

```
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath
b.moveToPoint NSMakePointMBS(10,10)

MsgBox b.CurrentPoint.String
```

**Notes:** The point from which the next drawn line or curve segment begins.
If the receiver is empty, this method raises NSGenericException.
(Read only property)

### 36.1.42 defaultFlatness as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The default flatness value for all paths.
**Notes:** The flatness value specifies the accuracy (or smoothness) with which curves are rendered. It is also the maximum error tolerance (measured in pixels) for rendering curves, where smaller numbers give smoother curves at the expense of more computation. The exact interpretation may vary slightly on different rendering devices.

The default flatness value is 0.6, which yields smooth curves.
(Read and Write property)

### 36.1.43 defaultLineCapStyle as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The default line cap style for all paths.
**Notes:** The default line cap style or NSButtLineCapStyle if no other style has been set. For a list of values, see Constants.

The default line cap style can be overridden for individual paths by setting a custom style for that path using the LineCapStyle property.
(Read and Write property)

### 36.1.44 defaultLineJoinStyle as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The default line join style for all paths.
**Notes:** The default line join style or NSMiterLineJoinStyle if no other value has been set. For a list of values, see Constants.
(Read and Write property)

### 36.1.45 defaultLineWidth as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default line width for the all paths.
**Notes:** The line width defines the thickness of stroked paths. A width of 0 is interpreted as the thinnest line that can be rendered on a particular device. The actual rendered line width may vary from the specified width by as much as 2 device pixels, depending on the position of the line with respect to the pixel grid and the current anti-aliasing settings. The width of the line may also be affected by scaling factors specified in the current transformation matrix of the active graphics context.
(Read and Write property)

### 36.1.46 defaultMiterLimit as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default miter limit for all paths.
**Notes:** The miter limit helps you avoid spikes at the junction of two line segments connected by a miter join (NSMiterLineJoinStyle). If the ratio of the miter length—the diagonal length of the miter join—to the line thickness exceeds the miter limit, the joint is converted to a bevel join. The default miter limit value is 10, which converts miters whose angle at the joint is less than 11 degrees.
(Read and Write property)

### 36.1.47 defaultWindingRule as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default winding rule used to fill all paths.
**Notes:** The current default winding rule or NSNonZeroWindingRule if no default rule has been set. This value may be either NSNonZeroWindingRule or NSEvenOddWindingRule.

Winding rules determine how to paint (or fill) the region enclosed by a path. You use this method to set the default rule that is applied to paths that do not have a custom winding rule assigned.
(Read and Write property)

### 36.1.48 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 36.1.49 flatness as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The flatness value of the path.
**Notes:** If no value is set, this method returns the default flatness value.
(Read and Write computed property)

### 36.1.50 lineCapStyle as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The line cap style for the receiver's path.
**Notes:** If this value is not set for the receiver, the default line cap style is returned.

(Read and Write computed property)

### 36.1.51 lineJoinStyle as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The receiver's line join style.
**Notes:** If this value is not set for the receiver, the default line join style is returned.
(Read and Write computed property)

### 36.1.52 lineWidth as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The line width of the receiver's path.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setFillColor NSColorMBS.redColor

dim r as NSRectMBS = NSMakeRectMBS(50, 50, 100, 100)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPath

b.moveToPoint NSMakePointMBS(10, 10)
b.lineToPoint NSMakePointMBS(290, 290)

dim pattern() as Double
pattern.Append 10
pattern.Append 4

b.lineWidth = 5
b.setLineDash pattern, 12

g.stroke(b)

g = nil

window1.Backdrop = n.CopyPicture // red line with dash pattern
```

**Notes:** The line width of the receiver, measured in points in the user coordinate space.
If no value was set explicitly for the receiver, this method returns the default line width.

(Read and Write computed property)

### 36.1.53 miterLimit as Double

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The miter limit of the receiver's path.
**Notes:** If no value is set, this method returns the default miter limit.
(Read and Write computed property)

### 36.1.54 windingRule as Integer

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the winding rule used to fill the receiver's path.
**Notes:** Returns the winding rule for the path. This value may be either NSNonZeroWindingRule or NSEvenOddWindingRule.

This value overrides the default value returned by defaultWindingRule.
For more information on how winding rules affect the appearance of filled paths, see Constants.
(Read and Write computed property)

### 36.1.55 Constants

Line Joint Style Constants

| Constant | Value | Description |
|---|---|---|
| NSBevelLineJoinStyle | 2 | Specifies a bevel line shape of the joints between connected segments of a stroked path.<br>See the setDefaultLineJoinStyle method for an example of the appearance. |
| NSMiterLineJoinStyle | 0 | Specifies a miter line shape of the joints between connected segments of a stroked path.<br>See the setDefaultLineJoinStyle method for an example of the appearance. |
| NSRoundLineJoinStyle | 1 | Specifies a round line shape of the joints between connected segments of a stroked path.<br>See the setDefaultLineJoinStyle method for an example of the appearance. |

Line Cap Style Constants

| Constant | Value | Description |
|---|---|---|
| NSButtLineCapStyle | 0 | Specifies a butt line cap style for endpoints for an open path when stroked. See the setDefaultLineCapStyle method for an example of the appearance. |
| NSRoundLineCapStyle | 1 | Specifies a round line cap style for endpoints for an open path when stroked. See the setDefaultLineCapStyle method for an example of the appearance. |
| NSSquareLineCapStyle | 2 | Specifies a square line cap style for endpoints for an open path when stroked. See the setDefaultLineCapStyle method for an example of the appearance. |

Path Element Command Constants

| Constant | Value | Description |
|---|---|---|
| NSClosePathBezierPathElement | 3 | Marks the end of the current subpath at the specified point. Note that the point specified for the Close Path element is essentially the same as the current point. |
| NSCurveToBezierPathElement | 2 | Creates a curved line segment from the current point to the specified endpoint using two control points to define the curve. The points are stored in the following order: controlPoint1, controlPoint2, endPoint. Ovals, arcs, and Bezier curves all use curve elements to specify their geometry. Contains 3 points. |
| NSLineToBezierPathElement | 1 | Creates a straight line from the current drawing point to the specified point. Lines and rectangles are specified using this path element. Contains 1 point. |
| NSMoveToBezierPathElement | 0 | Moves the path object's current drawing point to the specified point. This path element does not result in any drawing. Using this command in the middle of a path results in a disconnected line segment. Contains 1 point. |

Window Rule Constants

| Constant | Value | Description |
|---|---|---|
| NSEvenOddWindingRule | 1 | Specifies the even-odd winding rule. Count the total number of path crossings. If the number of crossings is even, the point is outside the path. If the number of crossings is odd, the point is inside the path and the region containing it should be filled. |
| NSNonZeroWindingRule | 0 | Specifies the non-zero winding rule. Count each left-to-right path as +1 and each right-to-left path as -1. If the sum of all crossings is 0, the point is outside the path. If the sum is nonzero, the point is inside the path and the region containing it is filled. This is the default winding rule. |

## 36.2 class NSBitmapImageRepMBS

### 36.2.1 class NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSBitmapImageRep class renders an image from bitmap data.
**Notes:** Bitmap data formats supported include GIF, JPEG, TIFF, PNG, and various permutations of raw bitmap data.

Alpha Premultiplication

If a coverage (alpha) plane exists, a bitmap's color components are premultiplied with it. If you modify the contents of the bitmap, you are therefore responsible for premultiplying the data. For this reason, though, if you want to manipulate the actual data, an NSBitmapImageRep object is not recommended for storage. If you need to work with data that is not premultiplied, you should use Quartz, specifically CGImageCreate with kCGImageAlphaLast.

Note that premultiplying does not affect the output quality. Given source bitmap pixel s, destination pixel d, and alpha value a, a blend is basically

d' = a * s + (1 - a) * d

All premultiplication does is precalculate a * s.
Subclass of the NSImageRepMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr1
- MBS Xojo / Real Studio Plugins, version 14.2pr3
- MBS Xojo / Real Studio Plugins, version 13.5pr5
- MBS Real Studio Plugins, version 12.3pr7
- MBS Real Studio Plugins, version 12.0pr5

### 36.2.2 Methods

### 36.2.3 bitmapImageRepByConvertingToColorSpace(colorSpace as NSColorSpaceMBS, renderingIntent as Integer) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Converts the image rep to the specified colorspace.
**Notes:** targetSpace: The new colorSpace
renderingIntent: The rendering intent specifies how to handle colors that are not located within the target color space. The supported values are NSColorRenderingIntent.

| Constant | Value |
|---|---|
| Default | 0 |
| AbsoluteColorimetric | 1 |
| RelativeColorimetric | 2 |
| Perceptual | 3 |
| Saturation | 4 |

An NSBitmapImageRep, or nil, if the conversion fails. If the original NSBitmapImageRep already uses that colorSpace, it is returned as is.

### 36.2.4 bitmapImageRepByRetaggingWithColorSpace(newSpace as NSColorSpaceMBS) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changes the colorSpace tag of the receiver.
**Notes:** newSpace: The desired colorSpace.

Returns an NSBitmapImageRep, or nil, if the conversion fails. If the original NSBitmapImageRep already uses that colorSpace, it is returned as is.

This method will definitely fail if you pass a colorSpace that has a different color space model than the receiver. That is, if your original image is sRGB, you can only retag with some other RGB colorspace.
Available in Mac OS X v10.6 and later.

### 36.2.5 BMPRepresentation(properties as dictionary = nil) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap as bmp data.

### 36.2.6 canBeCompressedUsing(compression as Integer) as Boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tests whether the receiver can be compressed by the specified compression scheme.
**Notes:** Returns ture if the receiver's data matches compression with this type, false if the data doesn't match compression or if compression is unsupported..

Legal values for compression can be found in NSBitmapImageRep.h and are described in TIFF Compression in NSBitmapImageReps. This method returns true if the receiver's data matches compression; for example, if compression is NSTIFFCompressionCCITTFAX3, then the data must be 1 bit per sample and 1 sample per pixel.

### 36.2.7 Constructor(data as Memoryblock)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated NSBitmapImageRep from the provided data.
**Notes:** data: A data object containing image data. The contents of bitmapData can be any supported bitmap format. For TIFF data, the NSBitmapImageRep is initialized from the first header and image data found in bitmapData.

On success the handle property is not zero.
See also:


- 36.2.8 Constructor(pic as Picture) 7410
- 36.2.9 Constructor(pixelsWide as Integer, pixelsHigh as Integer, bitsPerSample as Integer, samplesPerPixel as Integer, hasAlpha as boolean, colorSpaceName as string, bytesPerRow as Integer, bitsPerPixel as Integer) 7411


### 36.2.8 Constructor(pic as Picture)

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Creates an NSBitmapImageRep object created from a Core Graphics image object.
**Notes:** pic: A Core Graphics image object (an opaque type) from which to create the receiver. This opaque type is retained.

An NSBitmapImageRep object initialized from the contents of the Core Graphics image or nil if the NSBitmapImageRep couldn't be created.

If you use this method, you should treat the resulting bitmap NSBitmapImageRep object as read only. Because it only retains the value in the cgImage parameter, rather than unpacking the data, accessing the pixel data requires the creation of a copy of that data in memory. Changes to that data are not saved back to the Core Graphics image.

Available in OS X v10.5 and later.
See also:


- 36.2.7 Constructor(data as Memoryblock) 7410
- 36.2.9 Constructor(pixelsWide as Integer, pixelsHigh as Integer, bitsPerSample as Integer, samplesPerPixel as Integer, hasAlpha as boolean, colorSpaceName as string, bytesPerRow as Integer, bitsPerPixel as Integer) 7411


### 36.2.9 Constructor(pixelsWide as Integer, pixelsHigh as Integer, bitsPerSample as Integer, samplesPerPixel as Integer, hasAlpha as boolean, colorSpaceName as string, bytesPerRow as Integer, bitsPerPixel as Integer)

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a newly allocated NSBitmapImageRep object, so it can render the specified image.
**Example:**

```
dim n as new NSImageMBS(300,300)
dim r as new NSBitmapImageRepMBS(300, 300, 8, 4, true, NSColorSpaceMBS.NSCalibratedRGBColorSpace, 4*300, 32)

dim g as new NSGraphicsMBS(r)
g.SetColorRGB 1.0,0,0,0.5
g.fillRect 0, 0, 100, 100
g = nil // flush
n.addRepresentation r

Backdrop = n.CopyPictureWithMask
```

**Notes:** The image bitmap data is allocated for you.

pixelsWide: The width of the image in pixels. This value must be greater than 0.
pixelsHigh: The height of the image in pixels. This value must be greater than 0.
bitsPerSample: The number of bits used to specify one pixel in a single component of the data. All components are assumed to have the same bits per sample. bps should be one of these values: 1, 2, 4, 8, 12, or 16.
samplesPerPixel: The number of data components, or samples per pixel. This value includes both color components and the coverage component (alpha), if present. Meaningful values range from 1 through 5. An image with cyan, magenta, yellow, and black (CMYK) color components plus a coverage component would have an spp of 5; a grayscale image that lacks a coverage component would have an spp of 1.
hasAlpha: True if one of the components counted in the number of samples per pixel (spp) is a coverage (alpha) component, and false if there is no coverage component. If true, the color components in the bitmap data must be premultiplied with their coverage component.
colorSpaceName: A string constant that indicates how data values are to be interpreted. It should be one of the following values: NSCalibratedWhiteColorSpace, NSCalibratedBlackColorSpace, NSCalibrate-

dRGBColorSpace, NSDeviceWhiteColorSpace, NSDeviceBlackColorSpace, NSDeviceRGBColorSpace, NSDeviceCMYKColorSpace, NSNamedColorSpace or NSCustomColorSpace. (see NSColorSpaceMBS)
If bps is 12, you cannot specify the monochrome color space.
bytesPerRow: The number of bytes that are allocated for each scan line in each plane of data. A scan line is a single row of pixels spanning the width of the image.
Normally, rowBytes can be figured from the width of the image, the number of bits per pixel in each sample (bps), and, if the data is in a meshed configuration, the number of samples per pixel (spp). However, if the data for each row is aligned on word or other boundaries, it may have been necessary to allocate more memory for each row than there is data to fill it. rowBytes lets the object know whether that's the case.
If you pass in a rowBytes value of 0, the bitmap data allocated may be padded to fall on long word or larger boundaries for performance. If your code wants to advance row by row, use bytesPerRow and do not assume the data is packed. Passing in a non-zero value allows you to specify exact row advances.
bitsPerPixel: This integer value informs NSBitmapImageRep how many bits are actually allocated per pixel in each plane of data. If the data is in planar configuration, this normally equals bps (bits per sample). If the data is in meshed configuration, it normally equals bps times spp (samples per pixel). However, it's possible for a pixel specification to be followed by some meaningless bits (empty space), as may happen, for example, if pixel data is aligned on byte boundaries. NSBitmapImageRep supports only a limited number of pixelBits values (other than the default): for RGB images with 4 bps, pixelBits may be 16; for RGB images with 8 bps, pixelBits may be 32. The legal values for pixelBits are system dependent.
If you specify 0 for this parameter, the object interprets the number of bits per pixel using the values in the bps and spp parameters, as described in the preceding paragraph, without any meaningless bits.

On success the handle property is not zero.

You can add several NSBitmapImageRepMBS to NSImage to make a multi page tiff file.
To make a 300 dpi image, the size of the NSImage must be smaller than the size of the bitmap inside by factor 72/300.
See also:


- 36.2.7 Constructor(data as Memoryblock) 7410
- 36.2.8 Constructor(pic as Picture) 7410


### 36.2.10 GIFRepresentation(properties as dictionary = nil) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap as gif data.

### 36.2.11 imageRepWithCGImage(CGImage as Variant) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an NSBitmapImageRep object created from a Core Graphics image object.
**Notes:** cgimage: A Core Graphics image object (an opaque type) from which to create the receiver. This

opaque type is retained.

An NSBitmapImageRep object initialized from the contents of the Core Graphics image or nil if the NSBitmapImageRep couldn't be created.

If you use this method, you should treat the resulting bitmap NSBitmapImageRep object as read only. Because it only retains the value in the cgImage parameter, rather than unpacking the data, accessing the pixel data requires the creation of a copy of that data in memory. Changes to that data are not saved back to the Core Graphics image.

Available in OS X v10.5 and later.

### 36.2.12 imageRepWithCGImageRef(CGImageHandle as Integer) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an NSBitmapImageRep object created from a Core Graphics image reference.
**Notes:** CGImageHandle: A Core Graphics image object (an opaque type) from which to create the receiver. This opaque type is retained.

An NSBitmapImageRep object initialized from the contents of the Core Graphics image or nil if the NSBitmapImageRep couldn't be created.

If you use this method, you should treat the resulting bitmap NSBitmapImageRep object as read only. Because it only retains the value in the cgImage parameter, rather than unpacking the data, accessing the pixel data requires the creation of a copy of that data in memory. Changes to that data are not saved back to the Core Graphics image.

Available in OS X v10.5 and later.

### 36.2.13 imageRepWithCIImage(CIImage as variant) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an NSBitmapImageRep object created from a CoreImage object.
**Notes:** CIImage: A Core Graphics image object (an opaque type) from which to create the receiver. This opaque type is retained.

An NSBitmapImageRep object initialized from the contents of the Core Graphics image or nil if the NS-

BitmapImageRep couldn't be created.

If you use this method, you should treat the resulting bitmap NSBitmapImageRep object as read only. Because it only retains the value in the CIImage parameter, rather than unpacking the data, accessing the pixel data requires the creation of a copy of that data in memory. Changes to that data are not saved back to the Core Graphics image.

Available in OS X v10.5 and later.

### 36.2.14 imageRepWithCIImageRef(CIImageHandle as Integer) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an NSBitmapImageRep object created from a CoreImage reference.
**Notes:** CIImageHandle: A Core Graphics image object (an opaque type) from which to create the receiver. This opaque type is retained.

An NSBitmapImageRep object initialized from the contents of the Core Graphics image or nil if the NSBitmapImageRep couldn't be created.

If you use this method, you should treat the resulting bitmap NSBitmapImageRep object as read only. Because it only retains the value in the CIImage parameter, rather than unpacking the data, accessing the pixel data requires the creation of a copy of that data in memory. Changes to that data are not saved back to the Core Graphics image.

Available in OS X v10.5 and later.

### 36.2.15 imageRepWithData(data as Memoryblock) as NSBitmapImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSBitmapImageRep object initialized with the first image in the supplied data.
**Notes:** data: A data object containing one or more bitmapped images. The bitmapData parameter can contain data in any supported bitmap format.

Returns an NSBitmapImageRep instance or nil if the class is unable to create an image representation.

### 36.2.16 JPEGRepresentation(properties as dictionary = nil) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap as jpeg data.

### 36.2.17 NSImageColorSyncProfileData as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a memoryblock containing the ColorSync profile data.
It can be used for TIFF, JPEG, GIF, and PNG files. This value is set when reading in and used when writing out image data. You can get the profile data for a particular color space from the corresponding NSColorSpace object or from the ColorSync Manager.

### 36.2.18 NSImageCompressionFactor as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the compression factor of the image.
Used only for JPEG files. JPEG compression in TIFF files is not supported, and the factor is ignored. The value is a float between 0.0 and 1.0, with 1.0 resulting in no compression and 0.0 resulting in the maximum compression possible. It's set when reading in and used when writing out the image.

### 36.2.19 NSImageCompressionMethod as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number identifying the compression method of the image.
Used only for TIFF files. The value corresponds to one of the NSTIFFCompression constants, described below. It's set when reading in and used when writing out.

### 36.2.20 NSImageCurrentFrame as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the current frame for an animated GIF file.

The first frame is 0.

### 36.2.21 NSImageCurrentFrameDuration as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the duration (in seconds) of the current frame for an animated GIF image.
The frame duration can be a floating-point value. It is used when reading in, but not when writing out.

### 36.2.22 NSImageDitherTransparency as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing a boolean that indicates whether the image is dithered.
Used only when writing GIF files.

### 36.2.23 NSImageEXIFData as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies an dictionary containing the EXIF data for the image.
This property is used only when reading or writing JPEG files. The dictionary contains the EXIF keys and values. Th standard dictionary keys (that is, those that are not specific to camera vendors) are identical to those for kCGImagePropertyExifDictionary declared in the CGImageSource API. See kCGImagePropertyExifDictionary Keys for details.

### 36.2.24 NSImageFallbackBackgroundColor as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Specifies the background color to use when writing to an image format (such as JPEG) that doesn't support alpha. The color's alpha value is ignored. The default background color, when this property is not specified, is white. The value of the property should be an NSColorMBS object. This constant corresponds to the kCGImageDestinationBackgroundColor constant in Quartz.
Available in Mac OS X v10.5 and later.

### 36.2.25 NSImageFrameCount as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the number of frames in an animated GIF file.
This value is used when reading in data.

### 36.2.26 NSImageGamma as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the gamma value for the image.
Used only for PNG files. The gamma values is a floating-point number between 0.0 and 1.0, with 0.0 being black and 1.0 being the maximum color. It's set when reading in and used when writing out.

### 36.2.27 NSImageInterlaced as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing a Boolean value that indicates whether the image is interlaced.
Used only when writing out PNG files.

### 36.2.28 NSImageLoopCount as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing the number of loops to make when animating a GIF image.
A value of 0 indicates the animation should loop indefinitely. Values should be specified as Integer numbers.
It is used when reading in but not when writing out the image.

### 36.2.29 NSImageProgressive as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies a number containing a boolean that indicates whether the image uses progressive encoding.
Used only for JPEG files. It's set when reading in and used when writing out.

### 36.2.30 NSImageRGBColorTable as string

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys.
**Notes:** Identifies an Memoryblock containing the RGB color table.
Used only for GIF files. It's stored as packed RGB. It's set when reading in and used when writing out.

### 36.2.31 PNGRepresentation(properties as dictionary = nil) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap as PNG data.

### 36.2.32 TIFFRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a TIFF representation of the receiver.
**Notes:** This method invokes TIFFRepresentationUsingCompression using the stored compression type and factor retrieved from the initial image data or changed using setCompression. If the stored compression type isn't supported for writing TIFF data (for example, NSTIFFCompressionNEXT), the stored compression is changed to NSTIFFCompressionNone before invoking TIFFRepresentationUsingCompression. receiver, using the compression that's returned by getCompression (if applicable).

If a problem is encountered during generation of the TIFF, TIFFRepresentation raises an NSTIFFException or an NSBadBitmapParametersException.
See also:

- 36.2.33 TIFFRepresentation(properties as dictionary = nil) as Memoryblock 7418

### 36.2.33 TIFFRepresentation(properties as dictionary = nil) as Memoryblock

MBS MacBase Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap as tiff data.
See also:

- 36.2.32 TIFFRepresentation as Memoryblock 7418

### 36.2.34 Properties

### 36.2.35 bitmapData as Ptr

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a pointer to the bitmap data.
**Notes:** If the data is planar, returns a pointer to the first plane.
(Read only property)

### 36.2.36 bitmapFormat as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bitmap format of the receiver.
**Notes:** Returns 0 by default. The return value can indicate several different attributes, which are described in Constants.
(Read only property)

### 36.2.37 bitsPerPixel as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of bits allocated for each pixel in each plane of data.
**Notes:** This number is normally equal to the number of bits per sample or, if the data is in meshed configuration, the number of bits per sample times the number of samples per pixel. It can be explicitly set to another value (in initWithBitmapDataPlanes) in case extra memory is allocated for each pixel. This may be the case, for example, if pixel data is aligned on byte boundaries.
(Read only property)

### 36.2.38 bytesPerPlane as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of bytes in each plane or channel of data.
**Notes:** This number is calculated from the number of bytes per row and the height of the image.
(Read only property)

### 36.2.39 bytesPerRow as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the minimum number of bytes required to specify a scan line (a single row of pixels spanning the width of the image) in each data plane.
**Notes:** If not explicitly set to another value (in initWithBitmapDataPlanes), this number will be figured from the width of the image, the number of bits per sample, and, if the data is in a meshed configuration, the number of samples per pixel. It can be set to another value to indicate that each row of data is aligned on word or other boundaries.
(Read only property)

### 36.2.40 CGImage as Variant

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the CGImageMBS for this image representation.
**Notes:** If the image was created using a CGImage, you can get it back.
Else a new CGImage may be created for you.
(Read only property)

### 36.2.41 colorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the image rep's colorSpace
**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 36.2.42 isPlanar as Boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if image data is a planar configuration and false if its in a meshed configuration.
**Notes:** In a planar configuration, the image data is segregated into a separate plane for each color and coverage component. In a meshed configuration, the data is integrated into a single plane.
(Read only property)

### 36.2.43 numberOfPlanes as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of separate planes image data is organized into.
**Notes:** This number is the number of samples per pixel if the data has a separate plane for each component (isPlanar returns true) and 1 if the data is meshed (isPlanar returns false).

(Read only property)

### 36.2.44 samplesPerPixel as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of components in the data.
**Notes:** The returned value includes both color components and the coverage component, if present.
(Read only property)

### 36.2.45 valueForProperty(key as string) as Variant

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The value for the specified property.
**Notes:** Value can be nil.
(Read and Write computed property)

### 36.2.46 Constants

Bitmap Format Constants

| Constant | Value | Description |
|---|---|---|
| NSAlphaFirstBitmapFormat | 1 | If 0, alpha values are the last component. For example, CMYKA and RGBA. Available in Mac OS X v10.4 and later. |
| NSAlphaNonpremultipliedBitmapFormat | 2 | If 0, alpha values are premultiplied. Available in Mac OS X v10.4 and later. |
| NSFloatingPointSamplesBitmapFormat | 4 | If 0, samples are integer values. Available in Mac OS X v10.4 and later. |

Image format file type constants

| Constant | Value | Description |
|---|---|---|
| NSBMPFileType | 1 | Windows bitmap image (BMP) format |
| NSGIFFileType | 2 | Graphics Image Format (GIF), originally created by CompuServe for online downloads |
| NSJPEG2000FileType | 5 | JPEG 2000 file format. |
| NSJPEGFileType | 3 | JPEG format. |
| NSPNGFileType | 4 | Portable Network Graphics (PNG) format. |
| NSTIFFFileType | 0 | Tagged Image File Format (TIFF) |

Image Loading State Constants

| Constant | Value | Description |
|---|---|---|
| NSImageRepLoadStatusCompleted | -6 | Enough data has been provided to successfully decompress the image less of the complete: flag). |
| NSImageRepLoadStatusInvalidData | -4 | An error occurred during image decompression. The image contains tions of the data that have already been successfully decompressed, i |
| NSImageRepLoadStatusReadingHeader | -2 | The image format is known, but not enough data has been read to d the size, depth, etc., of the image. You should continue to provide m |
| NSImageRepLoadStatusUnexpectedEOF | -5 | incrementalLoadFromData was called with true, but not enough data able for decompression. The image contains the portions of the data already been successfully decompressed, if any. |
| NSImageRepLoadStatusUnknownType | -1 | Not enough data to determine image format. You should continue t more data. |
| NSImageRepLoadStatusWillNeedAllData | -3 | Incremental loading cannot be supported. Until you call incremen FromData with true, this status will be returned. You can continue t method but no decompression will take place. Once you do call the with true, then the image will be decompressed and one of the final thr messages will be returned. |

Tiff Compression Constants

| Constant | Value | Description |
|---|---|---|
| NSTIFFCompressionCCITTFAX3 | 3 | CCITT Fax Group 3 compression.<br>Used for 1-bit fax images sent over telephone lines. |
| NSTIFFCompressionCCITTFAX4 | 4 | CCITT Fax Group 4 compression.<br>Used for 1-bit fax images sent over ISDN lines. |
| NSTIFFCompressionJPEG | 6 | JPEG compression. No longer supported for input or output. |
| NSTIFFCompressionLZW | 5 | LZW compression. |
| NSTIFFCompressionNEXT | 32766 | NeXT compressed. Supported for input only. |
| NSTIFFCompressionNone | 1 | No compression. |
| NSTIFFCompressionOldJPEG | 32865 | Old JPEG compression. No longer supported for input or output. |
| NSTIFFCompressionPackBits | 32773 | PackBits compression. |

## 36.3 class NSColorListMBS

### 36.3.1 class NSColorListMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a Cocoa ColorList.

### 36.3.2 Methods

### 36.3.3 colorWithKey(key as string) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color with the given key.
**Notes:** Returns nil if key doesn't exist.

### 36.3.4 Create(name as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a color list; specify "" if you don't want a name.
**Notes:** Note that this does not add the color list to availableColorLists until the color list is saved into the user's path with writeToFile("").
See also:

- 36.3.5 Create(name as string, path as string) as boolean 7423

### 36.3.5 Create(name as string, path as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a color list; specify "" if you don't want a name.
**Notes:** Note that this does not add the color list to availableColorLists until the color list is saved into the user's path with writeToFile("").
See also:

- 36.3.4 Create(name as string) as boolean 7423

### 36.3.6 insertColor(theColor as NSColorMBS, key as string, index as Integer)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Inserts color at the specified location.
**Notes:** If a color by the same key is already in the list but at a different location it is removed from there.

### 36.3.7 isEditable as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this color list is editable.
**Notes:** True if it is editable.

### 36.3.8 Load(name as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads the named color list from availableColorLists.
**Notes:** Returns true on success.

### 36.3.9 name as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Name of the color list.

### 36.3.10 removeColorWithKey(key as string)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the color with the given key.
**Notes:** Does nothing if the key does not exist.

### 36.3.11 removeFile

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the color list is in the user's path, removes the corresponding file in user's colorlists directory.
**Notes:** Also removes the color list from availableColorLists. If there are no outstanding references to the color list this might deallocate the object as well.

### 36.3.12 setColor(theColor as NSColorMBS, key as string)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If key already exists, sets the corresponding color; otherwise inserts the color at the end.

### 36.3.13 writeToFile(path as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes the color list to the given path.
**Notes:** Use "" to save to the user's private colorlists directory. If the color list is named, this method will also insert the color list into availableColorLists.
Returns true for success.

## 36.4 class NSColorMBS

### 36.4.1 class NSColorMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The class for a Cocoa color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
MsgBox str(c.blueComponent)
```

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- More Menubar options in macOS Sonoma
- Styled Text for Labels in your Xojo iOS app
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- Basic Forms in MBS Xojo SceneKit Plugin
- Physics example for SceneKit in Xojo
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- Alternating row colors for Dark Mode
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
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#### Videos

- Presentation from Xojo Developer Conference 2019 in Miami.

#### Xojo Developer Magazine

- 19.6, page 50: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 19.6, pages 46 to 48: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, pages 39 to 41: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 35 to 37: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

- 18.1, pages 32 to 33: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 26 to 27: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.1, page 10: News
- 15.5, pages 39 to 40: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar
- 15.5, page 37: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 36.4.2 Methods

### 36.4.3 alternateSelectedControlColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the face of a selected control.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.alternateSelectedControlColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for the face of a selected control—a control being clicked or dragged. This color can be used where iApp-like highlighting is desired.

### 36.4.4 alternateSelectedControlTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text in a selected control.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.alternateSelectedControlTextColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for text in a selected control—a control being clicked or dragged. This color can be used where iApp-like highlighting is desired.

### 36.4.5 alternatingContentBackgroundColors as NSColorMBS()

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background colors for alternating content items: such as table view rows, collection view items.
**Notes:** Available on MacOS 10.14 or newer.
This function calls controlAlternatingRowBackgroundColors when alternatingContentBackgroundColors is not available.

### 36.4.6 blackColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale value is 0.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blackColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.7 blendedColorWithFraction(alpha as Double, c as NSColorMBS) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor object whose component values are a weighted sum of the receiver's and the specified color object's.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.blueColor
dim r as NSColorMBS = NSColorMBS.redColor
dim c as NSColorMBS = b.blendedColorWithFraction(0.5, r)

MsgBox c.description
```

**Notes:** fraction: The amount of the color to blend with the receiver's color. The method converts color and a copy of the receiver to RGB, and then sets each component of the returned color to fraction of color's value plus 1 –fraction of the receiver's.
color: The color to blend with the receiver's color.

The resulting color object or nil if the colors can't be converted.

### 36.4.8 blueColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 0.0, 0.0, 1.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.9 brownColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 0.6, 0.4, 0.2 and whose alpha value is 1.0.
**Notes:** dim c as NSColorMBS = NSColorMBS.brownColor

```
window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.10 CGColorHandle as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Converts NSColor to CGColor.
**Notes:** Return value may be an approximation in some cases, so there isn't guaranteed round-trip fidelity. Available on Mac OS X 10.8.

### 36.4.11 clearColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale and alpha values are both 0.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.clearColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.12 colorFromPasteboard as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the NSColor currently on the given pasteboard.
**Notes:** The color currently on the pasteboard or nil if pasteBoard doesn't contain color data.

### 36.4.13 colorNamed(colorName as String) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Create catalog colors from values stored with the given name in the Asset Catalog of the main app bundle.

### 36.4.14 colorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an object representing the color space of the receiver.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.blueColor

MsgBox b.colorSpace.localizedName
```

**Notes:** An object representing a color space. The returned NSColorSpace object may represent a custom color space.

Calling this method raises an exception if the receiver is not based on a color space represented by an NSColorSpace object—specifically, colors designated by NSNamedColorSpace and NSPatternColorSpace. If you are unsure about a color object, convert it to an equivalent NSColorSpace-based object before calling this method. Color objects created with color-space names NSCalibratedWhiteColorSpace, NSCalibratedBlackColorSpace, NSCalibratedRGBColorSpace, NSDeviceWhiteColorSpace, NSDeviceBlackColorSpace, NSDeviceRGBColorSpace, NSDeviceCMYKColorSpace, or NSCustomColorSpace—or with the NSColorSpace class methods corresponding to these names—are safe to use with this method. See "About Color Spaces" in Color Programming Topics for Cocoa for a list of these corresponding methods.

### 36.4.15 colorUsingColorSpace(colorSpace as NSColorSpaceMBS) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a new color object representing the color of the receiver in the specified color space.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.blueColor
dim c as NSColorMBS = b.colorUsingColorSpace(NSColorSpaceMBS.deviceRGBColorSpace)

MsgBox b.description
```

**Notes:** space: The color space of the new NSColor object.

Returns the new NSColor object. This method converts the receiver's color to an equivalent one in the new color space. Although the new color might have different component values, it looks the same as the original. Returns nil if conversion is not possible.

If the receiver's color space is the same as that specified in space, this method returns the same NSColor object.

### 36.4.16 colorUsingColorSpaceName(colorSpace as string) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor whose color is the same as the receiver's, except that the new NSColor is in the specified color space.
**Notes:** colorSpace: The name of the color space containing the new NSColor object. If colorSpace is "", the most appropriate color space is used.

The new NSColor object or nil if the specified conversion cannot be done.

### 36.4.17 colorUsingType(type as Integer) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convert the color to a color of different type.
**Notes:** Return nil if conversion is not possible.

### 36.4.18 colorWithAlphaComponent(alpha as Double) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object that has the same color space and component values as the receiver, but the specified alpha component.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.blueColor.colorWithAlphaComponent(0.5)
MsgBox b.description // shows "NSCalibratedRGBColorSpace 0 0 1 0.5"
```

**Notes:** alpha: The opacity value of the new NSColor object.

Returns a new NSColor object. If the receiver's color space doesn't include an alpha component, the receiver is returned.

A subclass with explicit opacity components should override this method to return a color with the specified alpha.

### 36.4.19 colorWithCalibratedHSV(hue as Double, saturation as Double, brightness as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor object using the given opacity and HSB color space components.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithCalibratedHSV(1.0, 0.5, 0.2, 1.0)
MsgBox b.description // shows "NSCalibratedRGBColorSpace 0.2 0.1 0.1 1"
```

**Notes:** hue: The hue component of the color object in the HSB color space.
saturation: The saturation component of the color object in the HSB color space.
brightness: The brightness (or value) component of the color object in the HSB color space.
alpha: The opacity value of the color object,

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.

### 36.4.20 colorWithCalibratedRGB(red as Double, green as Double, blue as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object using the given opacity and RGB components.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithCalibratedRGB(1.0, 0.5, 0.2, 1.0)
MsgBox b.description // shows "NSCalibratedRGBColorSpace 1 0.5 0.2 1"
```

**Notes:** red: The red component of the color object.
green: The green component of the color object.
blue: The blue component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.

### 36.4.21 colorWithCalibratedWhite(white as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object using the given opacity and grayscale value.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithCalibratedWhite(1.0, 1.0)
MsgBox b.description // shows "NSCalibratedWhiteColorSpace 1 1"
```

**Notes:** white: The grayscale value of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.

### 36.4.22 colorWithCatalogName(listName as String, colorName as String) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Look up and return catalog colors from standard color catalogs, or from NSColorList whose name matches the specified catalog name.

### 36.4.23 colorWithCGColor(CGColorHandle as Integer) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Converts CGColor to NSColor.
**Notes:** Return value may be an approximation in some cases, so there isn't guaranteed round-trip fidelity. Available on Mac OS X 10.8.

### 36.4.24 colorWithColorSpace(ColorSpace as NSColorSpaceMBS, components() as Double) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColor object created from the specified components of the given color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericRGBColorSpace
MsgBox n.localizedName

dim co as NSColorMBS = NSColorMBS.colorWithColorSpace(n, 1.0, 0, 0, 1.0)
MsgBox co.description
```

**Notes:** space: An NSColorSpace object representing a color space. The method raises an exception if this is nil.
components: An array of the components in the specified color space to use to create the NSColor object. The order of these components is determined by the color-space profile, with the alpha component always last. (If you want the created color to be opaque, specify 1.0 for the alpha component.)

Returns the color object. If space represents a color space that cannot cannot be used with NSColor objects (for example, a "pattern" color space) the method returns nil.
Raises an NSExceptionMBS if the number of components does not match.
See also:

- 36.4.25 colorWithColorSpace(ColorSpace as NSColorSpaceMBS, paramarray components as Double) as NSColorMBS

### 36.4.25 colorWithColorSpace(ColorSpace as NSColorSpaceMBS, paramarray components as Double) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColor object created from the specified components of the given color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericRGBColorSpace
MsgBox n.localizedName

dim co as NSColorMBS = NSColorMBS.colorWithColorSpace(n, 1.0, 0, 0, 1.0)
MsgBox co.description
```

**Notes:** space: An NSColorSpace object representing a color space. The method raises an exception if this is nil.
components: An array of the components in the specified color space to use to create the NSColor object. The order of these components is determined by the color-space profile, with the alpha component always last. (If you want the created color to be opaque, specify 1.0 for the alpha component.)

Returns the color object. If space represents a color space that cannot cannot be used with NSColor objects (for example, a "pattern" color space) the method returns nil.
Raises an NSExceptionMBS if the number of components does not match.
See also:

- 36.4.24 colorWithColorSpace(ColorSpace as NSColorSpaceMBS, components() as Double) as NSColorMBS 7434

### 36.4.26 colorWithColorSpaceHSV(ColorSpace as NSColorSpaceMBS, hue as Double, saturation as Double, brightness as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor object with the specified color space, hue, saturation, brightness, and alpha channel values.
**Notes:** ColorSpace: An NSColorSpace object representing a color space. An exception is raised if the color model of the provided color space is not RGB.
hue: The hue (color) component, expressed as a floating-point value in the range 0–1.0.
saturation: The color saturation component, expressed as a floating-point value in the range 0–1.0.
brightness: The brightness component, expressed as a floating-point value in the range 0–1.0.
alpha: The alpha (opacity), expressed as a floating-point value in the range 0 (transparent) to 1.0 (opaque).

Returns the color object.

### 36.4.27 colorWithDeviceCMYK(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor object using the given opacity value and CMYK components.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(0.5, 1.0, 0.5, 0.2, 1.0)
MsgBox b.description // shows "NSDeviceCMYKColorSpace 0.5 1 0.5 0.2 1"
```

**Notes:** cyan: The cyan component of the color object.
magenta: The magenta component of the color object.
yellow: The yellow component of the color object.
black: The black component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0. In PostScript, this color space corresponds directly to the device-dependent operator setcmykcolor.

### 36.4.28 colorWithDeviceHSV(hue as Double, saturation as Double, brightness as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSColor object using the given opacity value and HSB color space components.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithDeviceHSV(1.0, 0.5, 0.2, 1.0)
MsgBox b.description // shows "NSDeviceRGBColorSpace 0.2 0.1 0.1 1"
```

**Notes:** hue: The hue component of the color object.
saturation: The saturation component of the color object.
brightness: The brightness component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0. In PostScript, this color space corresponds directly to the device-dependent operator setrgbcolor.

### 36.4.29 colorWithDeviceRGB(red as Double, green as Double, blue as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object using the given opacity value and RGB components.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithDeviceRGB(1.0, 0.5, 0.2, 1.0)
MsgBox b.description // shows "NSDeviceRGBColorSpace 1 0.5 0.2 1"
```

**Notes:** red: The red component of the color object.
green: The green component of the color object.
blue: The blue component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0. In PostScript, this color space corresponds directly to the device-dependent operator setrgbcolor.

### 36.4.30 colorWithDeviceWhite(white as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object using the given opacity and grayscale values.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.colorWithDeviceWhite(1.0, 1.0)
MsgBox b.description // shows "NSDeviceWhiteColorSpace 1 1"
```

**Notes:** white: The grayscale value of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0. In PostScript, this color space corresponds directly to the device-dependent operator setgray.

### 36.4.31 colorWithDisplayP3(red as Double, green as Double, blue as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns a color created from the specified components in the Display P3 colorspace.
**Notes:** red: The red component of the color object.
green: The green component of the color object.
blue: The blue component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.

### 36.4.32 colorWithGenericGamma22White(white as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns an color created with the specified white and alpha values in the GenericGamma22 colorspace.
**Notes:** white: The white value of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.
Available in OS X v10.7 and later.

### 36.4.33 colorWithHSV(hue as double, saturation as double, brightness as double, alpha as double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Create component-based colors that are compatible with sRGB colorspace.
**Notes:** These methods are effectively same as colorWithSRGBHSV:, but provided for easier reuse of code that uses UIColor on iOS. If red, green, blue, or saturation, brightness, or white values are outside of the 0..1 range, these will create colors in the extended sRGB (or for colorWithWhite:alpha:, extendedGenericGamma22GrayColorSpace) color spaces. This behavior is compatible with iOS UIColor.

### 36.4.34 colorWithPatternImage(image as Variant) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSColor object that uses the specified image pattern.
**Example:**

```
dim p as Picture = LogoMBS(100)
dim n as new NSImageMBS(p)
dim c as NSColorMBS = NSColorMBS.colorWithPatternImage(n)
```

```
dim x as NSImageMBS = c.patternImage

Backdrop=x.CopyPictureWithMask
```

**Notes:** The image is tiled starting at the bottom of the window. The image is not scaled.

Parameter is a NSImageMBS object. We declare it as a variant to reduce plugin dependencies.

### 36.4.35 colorWithRGB(red as double, green as double, blue as double, alpha as double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Create component-based colors that are compatible with sRGB colorspace.
**Notes:** These methods are effectively same as colorWithSRGBHSV:, but provided for easier reuse of code that uses UIColor on iOS. If red, green, blue, or saturation, brightness, or white values are outside of the 0..1 range, these will create colors in the extended sRGB (or for colorWithWhite:alpha:, extendedGenericGamma22GrayColorSpace) color spaces. This behavior is compatible with iOS UIColor.

### 36.4.36 colorWithSRGB(red as Double, green as Double, blue as Double, alpha as Double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a color created from the specified components in the sRGB colorspace.
**Notes:** red: The red component of the color object.
green: The green component of the color object.
blue: The blue component of the color object.
alpha: The opacity value of the color object.

Values below 0.0 are interpreted as 0.0, and values above 1.0 are interpreted as 1.0.
Available in OS X v10.7 and later.

### 36.4.37 colorWithSystemEffect(systemEffect as Integer) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a color representing the base color with a system defined effect applied to it.
**Notes:** This color is safe to create before draw time, as the resolution of the final color only happens when being set, retrieving its CGColor, resolving with colorWithType, etc. The return color type is named.

Available on MacOS 10.14 or newer.

### 36.4.38 colorWithWhite(white as double, alpha as double=1.0) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Create component-based colors that are compatible with sRGB colorspace.
**Notes:** These methods are effectively same as colorWithSRGBHSV:, but provided for easier reuse of code that uses UIColor on iOS. If red, green, blue, or saturation, brightness, or white values are outside of the 0..1 range, these will create colors in the extended sRGB (or for colorWithWhite:alpha:, extendedGenericGamma22GrayColorSpace) color spaces. This behavior is compatible with iOS UIColor.

### 36.4.39 Components as Double()

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the components of the receiver as an array.
**Example:**

```
dim b as NSColorMBS = NSColorMBS.blueColor
dim c(-1) as Double = b.Components
dim lines(-1) as string

for each d as Double in c
lines.Append str(d)
next

MsgBox Join(lines) // shows 0 0 1 1
```

**Notes:** You can invoke this method on NSColor objects created from custom color spaces to get the individual floating point components, including alpha. Raises an exception if the receiver doesn't have floating-point components. To find out how many components are in the components array, send the receiver a numberOfComponents message.

### 36.4.40 Constructor(c as color)

MBS MacBase Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Initializes the color with generic colorspace.
**Example:**

```
dim r as NSColorMBS = NSColorMBS.redColor
```

```
dim c as color = &cFF0000
dim n as new NSColorMBS(c)

Break // check debugger
```

See also:

- 36.4.41 Constructor(red as Double, green as Double, blue as Double, alpha as Double = 1.0) 7441

### 36.4.41 Constructor(red as Double, green as Double, blue as Double, alpha as Double = 1.0)

MBS MacBase Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Initializes the color with generic colorspace.
**Notes:** Pass values in range from 0.0 to 1.0.
See also:

- 36.4.40 Constructor(c as color) 7440

### 36.4.42 controlAccentColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A dynamic color that reflects the user's current preferred accent color.
**Notes:** This color automatically updates when the accent color preference changes. Do not make assumptions about the color space of this color, which may change across releases.
Available on MacOS 10.14 or newer.

### 36.4.43 controlAlternatingRowBackgroundColors as NSColorMBS()

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background colors for alternating content items: such as table view rows, collection view items.
**Notes:** Available on MacOS 10.3 or newer.

### 36.4.44 controlBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the background of large controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlBackgroundColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for the background of large controls such as browsers, table views, and clip views.

### 36.4.45 controlColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the flat surfaces of a control.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for the flat surfaces of a control. By default, the control color is a pattern color that will draw the ruled lines for the window background, which is the same as returned by windowBackgroundColor.

If you use controlColor assuming that it is a solid, you may have an incorrect appearance. You should use lightGrayColor in its place.

### 36.4.46 controlDarkShadowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the dark edge of the shadow dropped from controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlDarkShadowColor

window1.Title=c.description
```

```
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** Of the two dark borders that run along the bottom and right of controls, representing shadows, the color of the outer, darker border.

### 36.4.47 controlHighlightColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the highlighted bezels of controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlHighlightColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** Of the two light borders that run along the top and left of controls, representing reflections from a light source in the upper left, the color of the inner, duller border.

### 36.4.48 controlLightHighlightColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for light highlights in controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlLightHighlightColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** Of the two light borders that run along the top and left of controls, representing reflections from a light source in the upper left, the color of the outer, brighter border.

### 36.4.49 controlShadowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the shadows dropped from controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlShadowColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** Of the two dark borders that run along the bottom and right of controls, representing shadows, the color of the inner, lighter border.

### 36.4.50 controlTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text on controls that aren't disabled.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.controlTextColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.51 currentControlTint as Integer

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns current system control tint.

### 36.4.52 cyanColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 0.0, 1.0, 1.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.cyanColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.53 darkGrayColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale value is 1/3 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.darkGrayColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.54 disabledControlTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text on disabled controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.disabledControlTextColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.55 findHighlightColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Background color of find indicators: the bubbles that show inline search result hits.
**Notes:** Requires MacOS 10.13 or newer.

### 36.4.56 getCMYK(byref cyan as Double, byref magenta as Double, byref yellow as Double, byref black as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's CMYK and opacity values.
**Example:**

```
dim co as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(1.0, 0.5, 1.0, 0.8)
dim c,m,y,k as Double

co.getCMYK(c,m,y,k)

MsgBox str(c)+" "+str(m)+" "+str(y)+" "+str(k)
```

**Notes:** cyan: Upon return, contains the cyan component of the color object.
magenta: Upon return, contains the magenta component of the color object.
yellow: Upon return, contains the yellow component of the color object.
black: Upon return, contains the black component of the color object.
alpha: Upon return, contains opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSDeviceCMYKColorSpace. Sending it to other objects raises an exception.
See also:

- 36.4.57 getCMYK(byref cyan as Double, byref magenta as Double, byref yellow as Double, byref black as Double, byref alpha as Double) 7446

### 36.4.57 getCMYK(byref cyan as Double, byref magenta as Double, byref yellow as Double, byref black as Double, byref alpha as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's CMYK and opacity values.
**Example:**

```
dim co as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(1.0, 0.5, 1.0, 0.8, 0.4)
dim c,m,y,k,a as Double

co.getCMYK(c,m,y,k,a)

MsgBox str(c)+" "+str(m)+" "+str(y)+" "+str(k)+" "+str(a)
```

**Notes:** cyan: Upon return, contains the cyan component of the color object.

magenta: Upon return, contains the magenta component of the color object.
yellow: Upon return, contains the yellow component of the color object.
black: Upon return, contains the black component of the color object.
alpha: Upon return, contains opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSDeviceCMYKColorSpace. Sending it to other objects raises an exception.
See also:

- 36.4.56 getCMYK(byref cyan as Double, byref magenta as Double, byref yellow as Double, byref black as Double) 7446

### 36.4.58 getHSV(byref hue as Double, byref saturation as Double, byref brightness as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's HSB component and opacity values in the respective arguments.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithCalibratedHSV(1.0, 0.5, 1.0, 0.4)
dim h,s,v,a as Double

c.getHSV(h,s,v,a)

MsgBox str(h)+" "+str(s)+" "+str(v)+" "+str(a)
```

**Notes:** hue: Upon return, contains the hue component of the color object.
saturation: Upon return, contains the saturation component of the color object.
brightness: Upon return, contains the brightness component of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedRGBColorSpace or NSDeviceRGBColorSpace color space. Sending it to other objects raises an exception.
See also:

- 36.4.59 getHSV(byref hue as Double, byref saturation as Double, byref brightness as Double, byref alpha as Double) 7447

### 36.4.59 getHSV(byref hue as Double, byref saturation as Double, byref brightness as Double, byref alpha as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's HSB component and opacity values in the respective arguments.
**Notes:** hue: Upon return, contains the hue component of the color object.
saturation: Upon return, contains the saturation component of the color object.
brightness: Upon return, contains the brightness component of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedRGBColorSpace or NSDeviceRGBColorSpace color space. Sending it to other objects raises an exception.
See also:

- 36.4.58 getHSV(byref hue as Double, byref saturation as Double, byref brightness as Double) 7447

### 36.4.60 getRGB(byref red as Double, byref green as Double, byref blue as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's RGB component and opacity values in the respective arguments.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
dim r,g,b as Double

c.getRGB(r,g,b)

MsgBox str(r)+" "+str(g)+" "+str(b) // shows "0 0 1"
```

**Notes:** red: Upon return, contains the red component of the color object.
green: Upon return, contains the green component of the color object.
blue: Upon return, contains the blue component of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedRGBColorSpace or NSDeviceRGBColorSpace color space. Sending it to other objects raises an exception.

Plugin converts color to calibrated RGB if needed.
See also:

- 36.4.61 getRGB(byref red as Double, byref green as Double, byref blue as Double, byref alpha as Double) 7449

### 36.4.61 getRGB(byref red as Double, byref green as Double, byref blue as Double, byref alpha as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's RGB component and opacity values in the respective arguments.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
dim r,g,b,a as Double

c.getRGB(r,g,b,a)

MsgBox str(r)+" "+str(g)+" "+str(b)+" "+str(a) // shows "0 0 1 1"
```

**Notes:** red: Upon return, contains the red component of the color object.
green: Upon return, contains the green component of the color object.
blue: Upon return, contains the blue component of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedRGBColorSpace or NSDeviceRGBColorSpace color space. Sending it to other objects raises an exception.

Plugin converts color to calibrated RGB if needed.
See also:

- 36.4.60 getRGB(byref red as Double, byref green as Double, byref blue as Double) 7448

### 36.4.62 getWhite(byref white as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's grayscale value and alpha values.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceWhite(1.0, 1.0)
dim w as Double

c.getWhite(w)

MsgBox str(w)
```

**Notes:** white: Upon return, contains the grayscale value of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedWhiteColorSpace, NSCalibratedBlackColorSpace, NSDeviceBlackColorSpace, or NSDeviceWhiteColorSpace color space. Sending it to other objects raises an exception.
See also:


- 36.4.63 getWhite(byref white as Double, byref alpha as Double) 7450


### 36.4.63 getWhite(byref white as Double, byref alpha as Double)

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the receiver's grayscale value and alpha values.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceWhite(1.0, 1.0)
dim w,a as Double

c.getWhite(w,a)

MsgBox str(w)+" "+str(a)
```

**Notes:** white: Upon return, contains the grayscale value of the color object.
alpha: Upon return, contains the opacity value of the color object. (optionally)

This method works only with objects representing colors in the NSCalibratedWhiteColorSpace, NSCalibratedBlackColorSpace, NSDeviceBlackColorSpace, or NSDeviceWhiteColorSpace color space. Sending it to other objects raises an exception.
See also:


- 36.4.62 getWhite(byref white as Double) 7449


### 36.4.64 grayColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale value is 0.5 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.grayColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.65 greenColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 0.0, 1.0, 0.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.greenColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.66 gridColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the optional gridlines in, for example, a table view.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.gridColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.67 headerColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used as the background color for header cells in table views and outline views.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.headerColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used as the background for header cells in table and outline views.

### 36.4.68 headerTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text in header cells in table views and outline views.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.headerTextColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.69 highlightColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color that represents the virtual light source on the screen.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.highlightColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.70 highlightWithLevel(level as Double) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColor object that represents a blend between the receiver and the highlight color returned by highlightColor.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
dim h as NSColorMBS = c.highlightWithLevel(0.5)
MsgBox h.description
```

**Notes:** level: The amount of the highlight color that is blended with the receiver's color. This should be a number from 0.0 through 1.0. A highlightLevel below 0.0 is interpreted as 0.0; a highlightLevel above 1.0 is interpreted as 1.0.

Returns the new NSColor object. Returns nil if the colors can't be converted.

Invoke this method when you want to brighten the receiving NSColor for use in highlights.

### 36.4.71 keyboardFocusIndicatorColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color that represents the keyboard focus ring around controls.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.keyboardFocusIndicatorColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.72 knobColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the flat surface of a slider knob that hasn't been selected.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.knobColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The knob's beveled edges, which set it in relief, are drawn in highlighted and shadowed versions of the face color. When a knob is selected, its color changes to selectedKnobColor.

### 36.4.73 labelColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for static text and related elements.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.74 lightGrayColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale value is 2/3 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.lightGrayColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.75 linkColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for standard system links
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.76 magentaColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 1.0, 0.0, 1.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.magentaColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.77 orangeColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 1.0, 0.5, 0.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.orangeColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.78 patternImage as Variant

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the image that the receiver is using as a pattern.
**Example:**

```
dim p as Picture = LogoMBS(100)
dim n as new NSImageMBS(p)
dim c as NSColorMBS = NSColorMBS.colorWithPatternImage(n)
dim x as NSImageMBS = c.patternImage

Backdrop=x.CopyPictureWithMask
```

**Notes:** The image used by the color object. If the receiver doesn't have an image, this method raises an exception.

Declared a variant instead of NSImageMBS to reduce plugin dependencies.

### 36.4.79 placeholderTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for placeholder text in controls or text views.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.80 purpleColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 0.5, 0.0, 0.5 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.purpleColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.81 quaternaryLabelColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for large secondary or disabled static text, separators, large glyphs/icons, etc.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.82 redColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 1.0, 0.0, 0.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.redColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.83 scrollBarColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for scroll "bars"—that is, for the groove in which a scroller's knob moves.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.scrollBarColor
```

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue

**Notes:** The system color used for scroll bars.

### 36.4.84 scrubberTexturedBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The scrubber texture background color.

### 36.4.85 secondaryLabelColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for secondary static text and related elements.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.86 secondarySelectedControlColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used in non-key views.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.secondarySelectedControlColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.87 selectedContentBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background color of selected and emphasized (focused) content: table views rows, collection views, etc.

**Notes:** Alias for alternateSelectedControlColor
Requires MacOS 10.14 or newer.

### 36.4.88 selectedControlColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the face of a selected control.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedControlColor

window1.Title=c.description
window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for the face of a selected control—a control being dragged or clicked.

### 36.4.89 selectedControlTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text in a selected control—a control being clicked or dragged.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedControlTextColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.90 selectedKnobColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the slider knob when it is selected.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedKnobColor

Title=c.description
```

window1.HasBackColor=true
window1.backcolor=c.colorValue

**Notes:** The system color used for a slider knob that is selected—that is, dragged.

### 36.4.91 selectedMenuItemColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the face of selected menu items.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedMenuItemColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for selected menu items.

### 36.4.92 selectedMenuItemTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the text in menu items.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedMenuItemTextColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for text in selected menu items.

### 36.4.93 selectedTextBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the background of selected text.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedTextBackgroundColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.94 selectedTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for selected text.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.selectedTextColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.95 separatorColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground used for separators between sections of content.
**Notes:** Not appropriate for use as split view or window chrome dividers.
Requires MacOS 10.14 or newer.

### 36.4.96 shadowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color that represents the virtual shadows cast by raised objects on the screen.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.shadowColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.97 shadowWithLevel(level as Double) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColor object that represents a blend between the receiver and the shadow color returned by shadowColor.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
dim h as NSColorMBS = c.shadowWithLevel(0.5)
MsgBox h.description
```

**Notes:** level: The amount of the shadow color used for the blend. This should be a number from 0.0 through 1.0. A shadowLevel below 0.0 is interpreted as 0.0; a shadowLevel above 1.0 is interpreted as 1.0.

Returns the new NSColor object. Returns nil if the colors can't be converted.

Invoke this method when you want to darken the receiving NSColor for use in shadows.

### 36.4.98 systemBlueColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system blue color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.99 systemBrownColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The system brown color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.100 systemGrayColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system gray color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.101 systemGreenColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system green color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.102 systemIndigoColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The system indigo color.
**Notes:** Available in MacOS 10.15 or later.

### 36.4.103 systemOrangeColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system orange color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.104 systemPinkColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system pink color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.105 systemPurpleColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system purple color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.106 systemRedColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system red color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.107 systemTealColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The system teal color.
**Notes:** Available in MacOS 10.12 or later.

### 36.4.108 systemYellowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The system yellow color.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.109 tertiaryLabelColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Foreground color for disabled static text and related elements.
**Notes:** Requires MacOS 10.10 or newer.

### 36.4.110 textBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the text background.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.textBackgroundColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for the background of text. When text is selected, its background color changes to the return value of selectedTextBackgroundColor.

### 36.4.111 textColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for text.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.textColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

**Notes:** The system color used for text. When text is selected, its color changes to the return value of selectedTextColor.

### 36.4.112 underPageBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Background areas revealed behind documents. This should not be used for drawing, and NSVisualEffectMaterialUnderPageBackground should be used instead.
**Notes:** Requires MacOS 10.8 or newer.

### 36.4.113 unemphasizedSelectedContentBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background color of selected and unemphasized content: table views rows, collection views, etc.
**Notes:** Requires MacOS 10.14 or newer.
Alias for secondarySelectedControlColor

### 36.4.114 unemphasizedSelectedTextBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background for unemphasized text selection (e.g. when the associated control/view/window is not key)
**Notes:** Requires MacOS 10.14 or newer.

### 36.4.115 unemphasizedSelectedTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The foreground for unemphasized text selection (e.g. when the associated control/view/window is not key)
**Notes:** Requires MacOS 10.14 or newer.

### 36.4.116 whiteColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose grayscale and alpha values are both 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.whiteColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.117 windowBackgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a pattern color that will draw the ruled lines for the window background.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.windowBackgroundColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.118 windowFrameColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for window frames, except for their text.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.windowFrameColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.119 windowFrameTextColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the system color used for the text in window frames.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.windowFrameTextColor

// convert to Calibrated RGB ColorSpace
c=c.colorUsingColorSpaceName("NSCalibratedRGBColorSpace")

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.120 writeToPasteboard

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes the receiver's data to the specified pasteboard.

### 36.4.121 yellowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns an NSColor object whose RGB value is 1.0, 1.0, 0.0 and whose alpha value is 1.0.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.yellowColor

Title=c.description

window1.HasBackColor=true
window1.backcolor=c.colorValue
```

### 36.4.122 Properties

### 36.4.123 alphaComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The alpha value of the color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
MsgBox str(c.alphaComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.124 blackComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a CMYK color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(0.1, 0.2, 0.3, 0.4)
MsgBox str(c.blackComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.125 blueComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a RGB color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
MsgBox str(c.blueComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.126 brightnessComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a HSV color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceHSV(0.1, 0.2, 0.3)
MsgBox str(c.brightnessComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.127 catalogNameComponent as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name of the catalog containing the receiver's name.
**Notes:** This method raises an exception if the receiver's color space isn't NSNamedColorSpace.
(Read only property)

### 36.4.128 colorNameComponent as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's name.
**Notes:** This method raises an exception if the receiver's color space isn't NSNamedColorSpace.
(Read only property)

### 36.4.129 colorSpaceName as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Get the color space of the color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceHSV(0.1, 0.2, 0.3)

MsgBox c.colorSpaceName
```

**Notes:** (Read only property)

### 36.4.130 colorValue as color

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Returns the color value of this color (ignoring color space).
**Notes:** The alphaComponent is ignored.
Returns RGB(RedComponent*255, GreenComponent*255, BlueComponent*255).

Plugin converts color to calibrated RGB if needed.
The color is converted to generic RGB Colorspace if needed as that is the one Xojo uses for pictures.
(Read only property)

### 36.4.131 cyanComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a CMYK color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(0.1, 0.2, 0.3, 0.4)
MsgBox str(c.cyanComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.132 description as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** The description of the color object.
**Example:**

```
dim n as NSColorMBS = NSColorMBS.blueColor

MsgBox n.description // shows "NSCalibratedRGBColorSpace 0 0 1 1"
```

**Notes:** (Read only property)

### 36.4.133 greenComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a RGB color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
MsgBox str(c.greenComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.134 Handle as Integer

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** Useful for declares. Value is a NSColor pointer.
(Read and Write property)

### 36.4.135 hueComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a HSV color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceHSV(0.1, 0.2, 0.3)
MsgBox str(c.hueComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.136 localizedCatalogNameComponent as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name of the catalog containing the receiver's name as a localized string.
**Notes:** This string may be displayed in user interface items like color pickers.
(Read only property)

### 36.4.137 localizedColorNameComponent as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name of the receiver as a localized string.
**Notes:** The name of color object as a localized string. This string may be displayed in user interface items like color pickers.
(Read only property)

### 36.4.138 magentaComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a CMYK color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(0.1, 0.2, 0.3, 0.4)
MsgBox str(c.magentaComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.139 numberOfComponents as Integer

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Returns the number of components in the receiver.
**Example:**

```
dim n as NSColorMBS = NSColorMBS.blueColor

MsgBox str(n.numberOfComponents) // shows 4
```

**Notes:** The number of components in the color object. The floating-point components counted include alpha. This method raises an exception if the receiver doesn't have floating-point components.

Available in Mac OS X v10.4 and later.
(Read only property)

### 36.4.140 redComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a RGB color.

**Example:**

```
dim c as NSColorMBS = NSColorMBS.blueColor
MsgBox str(c.redComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.141 saturationComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a HSV color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceHSV(0.1, 0.2, 0.3)
MsgBox str(c.saturationComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.142 Type as Integer

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Return the type of the color, which in turn determines which accessors are valid for this color.
**Notes:** It's an exception-raising error to use properties that are not valid for a color; so, before using a given accessor on a color, call colorUsingType to convert the color to the appropriate type. Or, if wanting to use colorSpace-specific accessors such as redComponent, convert to the desired colorSpace with colorUsingColorSpace.

Note that as of macOS 10.13, the new APIs type and colorUsingType replace colorSpaceName and colorUsingColorSpaceName as the funnel APIs for determining the type of color. In code destined to run on 10.13 and newer systems, subclassers are encouraged to implement these two rather than the older colorSpaceName based methods.

Requires MacOS 10.13 or newer.
(Read only property)

### 36.4.143 whiteComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a Gray color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceWhite(0.1)
MsgBox str(c.whiteComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.144 yellowComponent as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color value from a CMYK color.
**Example:**

```
dim c as NSColorMBS = NSColorMBS.colorWithDeviceCMYK(0.1, 0.2, 0.3, 0.4)
MsgBox str(c.yellowComponent)
```

**Notes:** Value is from 0.0 to 1.0.
(Read only property)

### 36.4.145 Constants

System Effect

| Constant | Value | Description |
|---|---|---|
| SystemEffectDeepPressed | 2 | Deep Pressed |
| SystemEffectDisabled | 3 | Disabled |
| SystemEffectNone | 0 | No |
| SystemEffectPressed | 1 | Pressed |
| SystemEffectRollover | 4 | Rollover |

Color Types

| Constant | Value | Description |
|---|---|---|
| TypeCatalog | 2 | nColor with a catalog name and a color name. These colors can be dynamic and have multiple underlying color values.one |
| TypeComponentBased | 0 | Colors which have a color space (specified as NSColorSpace) and appropriate number of CGFloat components. |
| TypePattern | 1 | Colors that draw a pattern, specified as an NSImage. |

## 36.5 class NSColorPanelMBS

### 36.5.1 class NSColorPanelMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** A class to control a Color Panel (floating window).
**Notes:** If you use SelectColor in your application, this color panel will be converted in a dialog which makes this class useless.

You should only have one instance of this class in your application.

If you compile for Cocoa, a TextField/TextArea automatically registers for color panel. So in order to avoid them updating text color with color panel selection, clear the focus by calling window.clearfocus method.

This class does only work on desktop computers, not in a webbrowser.

See WinColorPickerMBS class for Windows.
Subclass of the NSPanelMBS class.
**Blog Entries**

- Xojo 2021r1.1 available
- Windows Font Dialog
- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 14.2pr1
- MBS Real Studio Plugins, version 11.2pr9

### 36.5.2 Methods

### 36.5.3 attachColorList(list as NSColorListMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Attaches the given color list to the panel.
**Notes:** An application should use this method to add an NSColorList saved with a document in its file package or in a directory other than NSColorList's standard search directories.

### 36.5.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new color panel.

### 36.5.5 detachColorList(list as NSColorListMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Detaches the color list from the panel.

### 36.5.6 GetColor(byref red as single, byref green as single, byref blue as single, byref alpha as single) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current color in the RGB color model.
**Notes:** Values from 0.0 to 1.0.
Returns true if the values are valid.
See also:

- 36.5.21 getColor as NSColorMBS 7480

### 36.5.7 GetColorFromDrag as color

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns color values from the drag.
**Notes:** If you receive a drag flavor which can't be handled, it may be a NSColor.
In this case only this method will be successfull.
See also:

- 36.5.8 GetColorFromDrag(byref red as single, byref green as single, byref blue as single, byref alpha as single) as boolean 7477

### 36.5.8 GetColorFromDrag(byref red as single, byref green as single, byref blue as single, byref alpha as single) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns color values from the drag.
**Notes:** If you receive a drag flavor which can't be handled, it may be a NSColor.
In this case only this method will be successfull.
See also:

- 36.5.7 GetColorFromDrag as color 7477

### 36.5.9 orderFrontColorPanel

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Brings up the color panel, an instance of NSColorPanel.
**Notes:** If the NSColorPanel object does not exist yet, this method creates one. This method is typically invoked when the user chooses Colors from a menu.

### 36.5.10 SetColor(red as single, green as single, blue as single, alpha as single)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the color.
**Notes:** Values from 0.0 to 1.0.
See also:

- 36.5.11 setColor(value as NSColorMBS) 7478

### 36.5.11 setColor(value as NSColorMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the color.
See also:

- 36.5.10 SetColor(red as single, green as single, blue as single, alpha as single) 7478

### 36.5.12 setContinuous(value as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether you want to receive Changed events while the user chooses the color.
**Notes:** Set value to true to have the receiver calls the Changed event continuously as the color of the NSColorPanel is set by the user; otherwise false.

### 36.5.13 setMode(value as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the mode of the panel the mode is one of the modes allowed by the color mask.
**Notes:** Constants:

```
const NSGrayModeColorPanel              = 0
const NSRGBModeColorPanel               = 1
const NSCMYKModeColorPanel              = 2
const NSHSBModeColorPanel               = 3
const NSCustomPaletteModeColorPanel     = 4
const NSColorListModeColorPanel         = 5
const NSWheelModeColorPanel             = 6
const NSCrayonModeColorPanel            = 7
```

### 36.5.14 SetPickerMode(value as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the color panel's initial picker.
**Notes:** Constants:

```
NSColorPanelGrayModeMask                = &h00000001
NSColorPanelRGBModeMask                 = &h00000002
NSColorPanelCMYKModeMask                = &h00000004
NSColorPanelHSBModeMask                 = &h00000008
NSColorPanelCustomPaletteModeMask       = &h00000010
NSColorPanelColorListModeMask           = &h00000020
NSColorPanelWheelModeMask               = &h00000040
NSColorPanelCrayonModeMask              = &h00000080
NSColorPanelAllModesMask                = &h0000ffff
```

### 36.5.15 setShowsAlpha(value as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Tells the panel whether or not to show alpha values and an opacity slider.
**Notes:** Note that calling the NSColor method setIgnoresAlpha with a value of true overrides any value set with this method.

### 36.5.16 SharedColorPanelExists as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the NSColorPanel has been created already.
**Notes:** True if the NSColorPanel has been created already; otherwise false.

### 36.5.17 Properties

### 36.5.18 accessoryView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The accessory view displayed in the panel.
**Notes:** The accessory view can be any custom view you want to display with NSColorPanel, such as a view offering color blends in a drawing program. The accessory view is displayed below the color picker and above the color swatches in the NSColorPanel. The NSColorPanel automatically resizes to accommodate the accessory view.
(Read and Write property)

### 36.5.19 alpha as Double

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's current alpha value based on its opacity slider.
**Notes:** Value is in the range between 0.0 and 1.0.
This is 1.0 (opaque) if the panel has no opacity slider.
(Read only property)

### 36.5.20 ColorValue as Color

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current color as a Xojo color in the RGB model.
**Notes:** (Read and Write property)

### 36.5.21 getColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current color.
**Notes:** The color returned can be RGB or something else.
(Read and Write property)
See also:

- 36.5.6 GetColor(byref red as single, byref green as single, byref blue as single, byref alpha as single) as boolean 7477

### 36.5.22 getColorAsRGB as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The current color.
**Notes:** Returned NSColorMBS object is in RGB color mode.
(Read only property)

### 36.5.23 isContinuous as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether the class continuously calls the Changed event.
**Notes:** Returns true if the receiver continuouslycalls the Changed event as the user manipulates the color picker; otherwise false.
(Read and Write property)

### 36.5.24 mode as Integer

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the color picker mode.
**Notes:** Constants:

```
const NSGrayModeColorPanel              = 0
const NSRGBModeColorPanel               = 1
const NSCMYKModeColorPanel              = 2
const NSHSBModeColorPanel               = 3
const NSCustomPaletteModeColorPanel     = 4
const NSColorListModeColorPanel         = 5
const NSWheelModeColorPanel             = 6
const NSCrayonModeColorPanel            = 7
```

(Read and Write property)

### 36.5.25 showsAlpha as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether or not the panel shows alpha values and an opacity slider.
**Notes:** Note that calling the NSColor method setIgnoresAlpha with a value of true overrides any value set with setShowsAlpha.

(Read and Write property)

### 36.5.26 Events

### 36.5.27 Changed

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** The color changed.
**Notes:** May not fire in the RB IDE.

### 36.5.28 DidMove

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel did move.

### 36.5.29 GotFocus

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel got focus.

### 36.5.30 Hidden

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel is hidden.

### 36.5.31 LostFocus

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel lost focus.

### 36.5.32 Shown

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel shows.

### 36.5.33 WillClose

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The color panel will close.

### 36.5.34 Constants

Modes

| Constant | Value | Description |
|---|---|---|
| NSCMYKModeColorPanel | 2 | Cyan-yellow-magenta-black |
| NSColorListModeColorPanel | 5 | Custom color list |
| NSCrayonModeColorPanel | 7 | Crayons. |
| NSCustomPaletteModeColorPanel | 4 | Custom palette |
| NSGrayModeColorPanel | 0 | Grayscale-alpha |
| NSHSBModeColorPanel | 3 | Hue-saturation-brightness |
| NSNoModeColorPanel | -1 | Indicates no color panel mode. Available in OS X version 10.5 and later. |
| NSRGBModeColorPanel | 1 | Red-green-blue |
| NSWheelModeColorPanel | 6 | Color wheel |

Masks

| Constant | Value | Description |
|---|---|---|
| NSColorPanelAllModesMask | &h0000ffff | All of the above. |
| NSColorPanelCMYKModeMask | &h00000004 | Cyan-yellow-magenta-black. |
| NSColorPanelColorListModeMask | &h00000020 | Custom color list. |
| NSColorPanelCrayonModeMask | &h00000080 | Crayons. |
| NSColorPanelCustomPaletteModeMask | &h00000010 | Custom palette. |
| NSColorPanelGrayModeMask | &h00000001 | Grayscale-alpha. |
| NSColorPanelHSBModeMask | &h00000008 | Hue-saturation-brightness. |
| NSColorPanelRGBModeMask | &h00000002 | Red-green-blue. |
| NSColorPanelWheelModeMask | &h00000040 | Color wheel. |

### 36.5.35 Screenshots

### 36.5.36 NSColorPanel.jpg

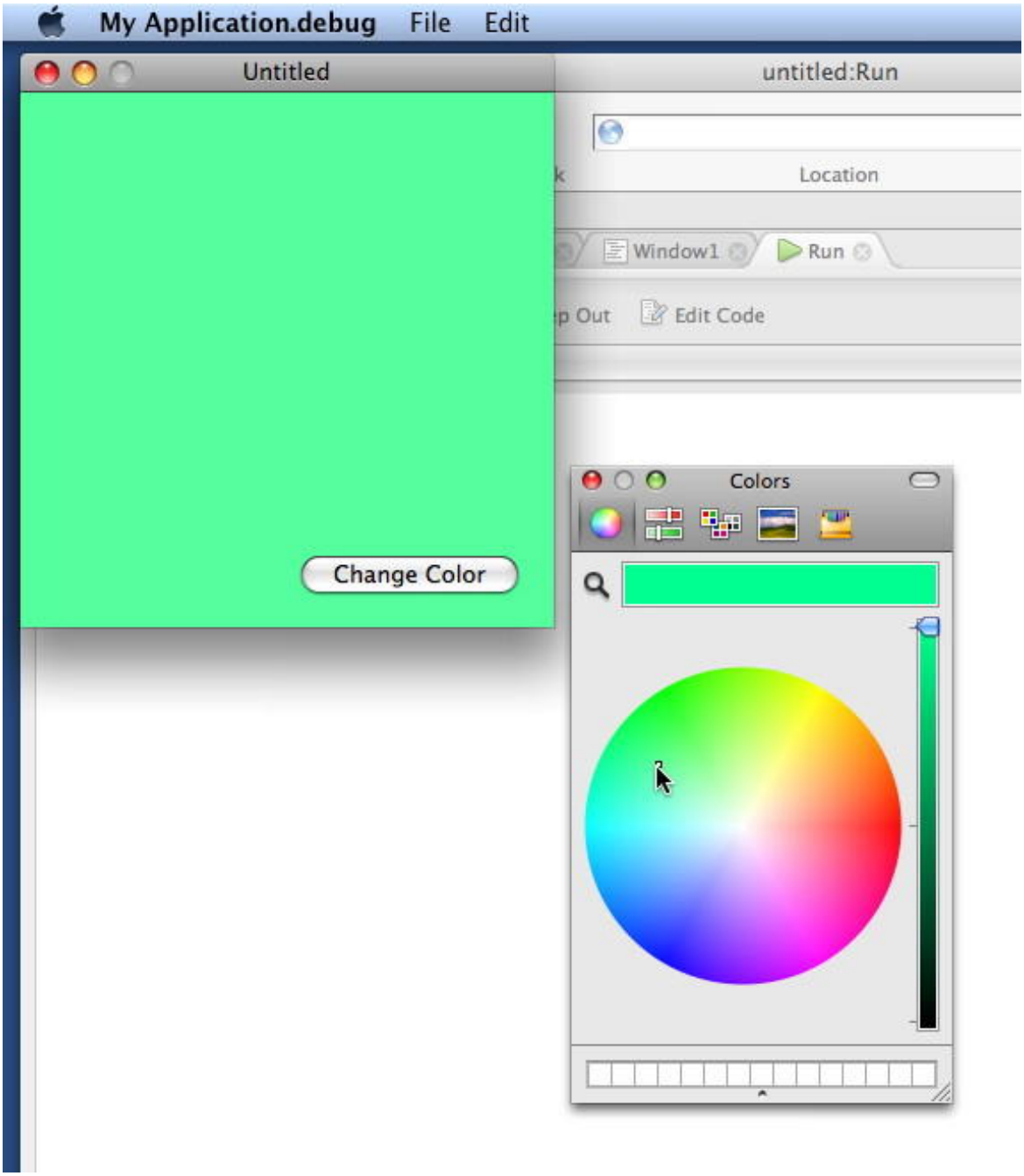


**Function:** The NSColorPanel running in a Xojo application.

## 36.6 class NSColorSamplerMBS

### 36.6.1 class NSColorSamplerMBS

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for color sampler.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr2

**Xojo Developer Magazine**

- 17.6, page 11: News

### 36.6.2 Methods

### 36.6.3 Available as Boolean

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether NSColorSampler is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 36.6.4 Constructor

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** May raise PlatformNotSupportedException if not available.

### 36.6.5 Show

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Shows the color sampler.
**Notes:** Begins or attaches to an existing color sampling session which presents UI to the user for selecting a color from their screen. The handler will be called on the main thread when the user completes the session (either by selection, or cancelation). In the event of user-cancellation, the color passed with be nil.

Calls Completed event later.

### 36.6.6 Properties

### 36.6.7 Handle as Integer

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 36.6.8 Events

### 36.6.9 Completed(selectedColor as NSColorMBS)

MBS MacBase Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** The event called when color sampler finished.
**Notes:** selectedColor is selected color or nil in case of cancel.

## 36.7 class NSColorSpaceMBS

### 36.7.1 class NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSColorSpace class enables the creation of objects representing custom color spaces.
**Notes:** You can make custom color spaces from ColorSync profiles or from ICC profiles. NSColorSpace also has factory methods that return objects representing the system color spaces.
**Blog Entries**

- MBS Xojo Plugins, version 24.0pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2
- MBS Xojo Plugins, version 18.5pr3
- Colorspaces in MacOS with Xojo
- MBS Xojo / Real Studio plug-ins in version 13.4
- MBS Xojo / Real Studio Plugins, version 13.4pr3
- Plugin merge/split
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 36.7.2 Methods

### 36.7.3 adobeRGB1998ColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing an Adobe RGB (1998) color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.adobeRGB1998ColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color-additive color space has red, green, blue, and alpha components.

The Adobe RGB (1998) color space was designed to encompass most of the colors achievable on CMYK color printers, but by using RGB primary colors on a device such as the computer display. For more information on this color space, go to this website:

http://www.adobe.com/digitalimag/adobergb.html

### 36.7.4 availableColorSpacesWithModel(Model as Integer) as NSColorSpaceMBS()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of color spaces available on the system that are displayed in the color panel, in the order they are displayed in the color panel.
**Example:**

```
dim a(-1) as NSColorSpaceMBS
dim m as Integer = NSColorSpaceMBS.NSRGBColorSpaceModel

a = NSColorSpaceMBS.availableColorSpacesWithModel(m)

dim names(-1) As string

for each c as NSColorSpaceMBS in a
names.Append c.localizedName
next

MsgBox Join(names,EndOfLine)
```

**Notes:** This method doesn't return color spaces created on the fly or spaces without user-displayable names. Pass NSUnknownColorSpaceModel as model to get all available color spaces.

Available in Mac OS X v10.6 and later.

### 36.7.5 CGColorSpaceHandle as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Core Graphics color-space object that represents a color space equivalent to the receiver's.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox hex(n.CGColorSpaceHandle)
```

**Notes:** A reference to an Core Graphics color-space object (CGColorSpaceRef) or 0if the type of color space represented by the receiver cannot be represented by a CGColorSpace object.

Available in Mac OS X version 10.5.

### 36.7.6 colorSpaceForColorSpaceName(name as string) as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The colorspace for this color space name.
**Example:**

dim n as NSColorSpaceMBS = NSColorSpaceMBS.colorSpaceForColorSpaceName(NSColorSpaceMBS.NSDeviceWhiteColorSpace)
MsgBox n.localizedName

**Notes:** This plugin function uses an undocumented method from Apple's AppKit framework. Seems like they use it only internally.

Works well on Mac OS X 10.6.

### 36.7.7 ColorSpaceWithCGColorSpace(CGColorSpaceHandle as Integer) as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object initialized from a Core Graphics color-space object.
**Notes:** The initialized NSColorSpace object or nil if initialization was not successful, which might happen if the color space represented by the CGColorSpace object is not supported by NSColorSpace.

Because NSColorSpace might retain or copy the CGColorSpace object depending on circumstances, you should not assume pointer equality of the provided object with that returned by CGColorSpace. And even if the pointer equality is preserved during runtime, it may not be after the NSColorSpace object is archived and unarchived.

Available in Mac OS X version 10.5 and later.

### 36.7.8 ColorSpaceWithColorSyncProfile(ColorSyncProfileHandle as Integer) as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object given a ColorSync profile.
**Notes:** The initialized NSColorSpace object or nil if initialization was not successful.

Available in Mac OS X v10.4 and later.

### 36.7.9 ColorSpaceWithICCProfileData(File as FolderItem) as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object given an ICC profile.
**Notes:** file: The path to the ICC profile to use when initializing the NSColorSpace object. For information on ICC profiles, see the latest ICC specification at the International Color Consortium website.

Returns the initialized NSColorSpace object or nil if initialization was not successful.
Available in Mac OS X v10.4 and later.
See also:

- 36.7.10 ColorSpaceWithICCProfileData(ICCProfileData as Memoryblock) as NSColorSpaceMBS 7491

### 36.7.10 ColorSpaceWithICCProfileData(ICCProfileData as Memoryblock) as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object given an ICC profile.
**Notes:** ICCProfileData:
The ICC profile to use when initializing the NSColorSpace object. For information on ICC profiles, see the latest ICC specification at the International Color Consortium website.

Returns the initialized NSColorSpace object or nil if initialization was not successful.
Available in Mac OS X v10.4 and later.
See also:

- 36.7.9 ColorSpaceWithICCProfileData(File as FolderItem) as NSColorSpaceMBS 7491

### 36.7.11 colorSyncProfileHandle as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the ColorSync profile from which the receiver was created.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox hex(n.colorSyncProfileHandle)
```

**Notes:** The ColorSync profile on which the receiver is based. You need to cast this value to an object of opaque type CMProfileRef. Returns NULL if the receiver was created from a ICC-profile data instead. See ColorSync Manager Reference for further information on CMProfileRef.

Available in Mac OS X v10.4 and later.

### 36.7.12 Constructor(ICCProfileData as Memoryblock)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object given an ICC profile.
**Notes:** ICCProfileData:
The ICC profile to use when initializing the NSColorSpace object. For information on ICC profiles, see the latest ICC specification at the International Color Consortium website.

The initialized NSColorSpace object or nil if initialization was not successful.

Available in Mac OS X v10.4 and later.

### 36.7.13 deviceCMYKColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a calibrated or device-dependent CMYK color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.deviceCMYKColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color space has cyan, magenta, yellow, black, and alpha components. Typical devices that use the color-subtractive CMYK color space are color printers. This object corresponds to the Cocoa color space name NSDeviceCMYKColorSpace.

Available in Mac OS X v10.4 and later.

### 36.7.14 deviceGrayColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a calibrated or device-dependent gray color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.deviceGrayColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. The color space also includes an alpha component. Typical devices that use this color space are grayscale printers and displays. This object corresponds to the Cocoa color space name NSDeviceWhiteColorSpace.

Available in Mac OS X v10.4 and later.

### 36.7.15 deviceRGBColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a calibrated or device-dependent RGB color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.deviceRGBColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color space has red, green, blue, and alpha components. Typical devices that use the color-additive RGB color space are displays and scanners. This object corresponds to the Cocoa color space name NSDeviceRGBColorSpace.

### 36.7.16 genericCMYKColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a device-independent CMYK color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericCMYKColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color space has cyan, magenta, yellow, black and alpha component.

Available in Mac OS X v10.4 and later.

### 36.7.17 genericGamma22GrayColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a gray color space with a gamma value of 2.2.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericGamma22GrayColorSpace
MsgBox n.localizedName
```

**Notes:** Available in Mac OS X v10.6 and later.

### 36.7.18 genericGrayColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a device-independent gray color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericGrayColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. The color space also includes an alpha component. This object corresponds to the Cocoa color space name NSCalibratedWhiteColorSpace.

Available in Mac OS X v10.4 and later.

### 36.7.19 genericRGBColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing a device-independent RGB color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericRGBColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color-additive color space has red, green, blue, and alpha components. This object corresponds to the Cocoa color space name NSCalibratedRGBColorSpace.

Available in Mac OS X v10.4 and later.

### 36.7.20 ICCProfileData as Memoryblock

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the ICC profile data from which the receiver was created.
**Notes:** The ICC profile from which the receiver was created. This method attempts to compute the profile data from a CMProfileRef object and returns nil if it is unable to.

For information on ICC profiles, see the latest ICC specification at the International Color Consortium website.

Available in Mac OS X v10.4 and later.

### 36.7.21 initWithCGColorSpace(CGColorSpaceHandle as Integer)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object initialized from a Core Graphics color-space object.
**Notes:** The initialized NSColorSpace object or nil if initialization was not successful, which might happen if the color space represented by the CGColorSpace object is not supported by NSColorSpace.

Because NSColorSpace might retain or copy the CGColorSpace object depending on circumstances, you should not assume pointer equality of the provided object with that returned by CGColorSpace. And even if the pointer equality is preserved during runtime, it may not be after the NSColorSpace object is archived and unarchived.

Available in Mac OS X version 10.5 and later.

### 36.7.22 initWithColorSyncProfile(ColorSyncProfileHandle as Integer)

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSColorSpace object given a ColorSync profile.
**Notes:** The initialized NSColorSpace object or nil if initialization was not successful.

Available in Mac OS X v10.4 and later.

### 36.7.23 sRGBColorSpace as NSColorSpaceMBS

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSColorSpace object representing an sRGB color space.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox n.localizedName
```

**Notes:** The NSColorSpace object. This color-additive color space has red, green, blue, and alpha components.

The sRGB color space is a standard color space for use on monitors, printers, and the Internet. For further information on sRGB, see this website:

http://www.color.org/srgb.html

Available in Mac OS X version 10.5.

### 36.7.24 Properties

### 36.7.25 colorSpaceModel as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the model on which the color space of the receiver is based.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox str(n.colorSpaceModel)
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 36.7.26 colorSpaceName as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the colorspace.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericRGBColorSpace
MsgBox n.colorSpaceName
```

**Notes:** This plugin function uses an undocumented method from Apple's AppKit framework. Seems like they use it only internally.

Works well on Mac OS X 10.6.
Returns an empty string for some color spaces.
(Read only property)

### 36.7.27 description as string

MBS MacBase Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the description of the color space.
**Notes:** (Read only property)

### 36.7.28 File as FolderItem

MBS MacBase Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to file if available.
**Notes:** Will be nil for profiles created from string/MemoryBlock.
(Read only property)

### 36.7.29 Handle as Integer

MBS MacBase Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 36.7.30 localizedName as string

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the localized name of the receiver.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox n.localizedName
```

**Notes:** The name of the color space as a localized string or nil if no localized name exists.

Available in Mac OS X v10.4 and later.
(Read only property)

### 36.7.31 numberOfColorComponents as Integer

MBS MacBase Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of components supported by the receiver.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.sRGBColorSpace
MsgBox str(n.numberOfColorComponents) // shows 3
```

**Notes:** The number of components (excluding alpha) the receiver supports or zero if the receiver is not based on float components.

Available in Mac OS X v10.4 and later.
(Read only property)

### 36.7.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCalibratedBlackColorSpace | "NSCalibratedBlackColorSpace" | Calibrated color space with black and alpha compon<br>Deprecated in Mac OS X v10.6. |
| NSCalibratedRGBColorSpace | "NSCalibratedRGBColorSpace" | Calibrated color space with red, green, blue, and alp<br>You can also create a color with HSB (hue, saturati<br>components and can extract these components. |
| NSCalibratedWhiteColorSpace | "NSCalibratedWhiteColorSpace" | Calibrated color space with white and alpha compor |
| NSCMYKColorSpaceModel | 2 | The CYMK (cyan, yellow, magenta, black) color-spa<br>Can refer to both device-dependent and generic colo<br>Available in Mac OS X v10.4 and later. |
| NSCustomColorSpace | "NSCustomColorSpace" | Custom NSColorSpace object and floating-point com<br>in that space.<br>A custom color-space object represents a color spa<br>predefined by the Application Kit. See "Working W<br>formation on creating custom color-space objects. |
| NSDeviceBlackColorSpace | "NSDeviceBlackColorSpace" | Device-dependent color space with black and alpha c<br>1.0) |
| NSDeviceCMYKColorSpace | "NSDeviceCMYKColorSpace" | Device-dependent color space with cyan, magenta,<br>components. |
| NSDeviceNColorSpaceModel | 4 | DeviceN is a color-space model from Adobe System<br>and PDF color specification.<br>Available in Mac OS X v10.4 and later. |
| NSDeviceRGBColorSpace | "NSDeviceRGBColorSpace" | Device-dependent color space with red, green, blue,<br>You can also create a color with HSB (hue, saturati<br>components and can extract these components. |
| NSDeviceWhiteColorSpace | "NSDeviceWhiteColorSpace" | Device-dependent color space with white and alpha c<br>1.0) |
| NSGrayColorSpaceModel | 0 | The grayscale color-space model. Can refer to bo<br>generic color space variants.<br>Available in Mac OS X v10.4 and later. |
| NSIndexedColorSpaceModel | 5 | An indexed color space, which identifies specified dis<br>by index number.<br>An indexed color value (a color specification in index<br>an index value that refers to a color in a color list.<br>Available in Mac OS X version 10.5 and later. |
| NSLABColorSpaceModel | 3 | The L*a*b* device-independent color-space model, w<br>ative to a reference white point.<br>Available in Mac OS X v10.4 and later. |
| NSNamedColorSpace | "NSNamedColorSpace" | Catalog name and color name components.<br>The components of this color space are indexes into li<br>colors. The catalogs of named colors come with look<br>generate the correct color on a given device. |
| NSPatternColorSpace | "NSPatternColorSpace" | Pattern image (tiled)<br>Identifies a pattern color space, which is simply an in<br>and over again in a tiled pattern. |
| NSPatternColorSpaceModel | 6 | Identifies a pattern color space, which is simply an in<br>and over again in a tiled pattern.<br>Available in Mac OS X version 10.5 and later. |
| NSRGBColorSpaceModel | 1 | The RGB (red green blue) color-space model.<br>Can refer to both device-dependent and generic colo<br>Available in Mac OS X v10.4 and later. |
| NSUnknownColorSpaceModel | -1 | This model is not known to NSColorSpace.<br>Available in Mac OS X v10.4 and later. |

## 36.8 class NSEPSImageRepMBS

### 36.8.1 class NSEPSImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** An NSEPSImageRep object can render an image from encapsulated PostScript (EPS) code.
**Notes:** Won't work in macOS Sonoma since Apple removed the feature from the OS.
Subclass of the NSImageRepMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr2
- EPS support deprecated in macOS Sonoma
- MBS Xojo Plugins, version 18.1pr2
- MBS Real Studio Plugins, version 12.0pr5

### 36.8.2 Methods

### 36.8.3 boundingBox as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the rectangle that bounds the receiver.
**Notes:** This rectangle is obtained from the "%%BoundingBox:" comment in the EPS header when the NSEPSImageRep object is initialized.

### 36.8.4 Constructor(data as Memoryblock)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an NSEPSImageRep object initialized with the specified EPS data.
**Notes:** The size of the receiver is set using the bounding box information specified in the EPS header comments.
On success the handle property is not zero.

### 36.8.5 EPSRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the EPS representation of the receiver.

### 36.8.6 imageRepWithData(data as Memoryblock) as NSEPSImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSEPSImageRep object initialized with the specified EPS data.
**Notes:** Returns a new, initialized NSEPSImageRep object or nil if the object could not be initialized.
The size of the receiver is set using the bounding box information specified in the EPS header comments.

### 36.8.7 prepareGState

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Implemented by subclasses to configure the graphics state prior to drawing.
**Notes:** The draw method of NSEPSImageRep sends this message to itself just before rendering the EPS code. The default implementation of this method does nothing. You can override it in your subclass to prepare the graphics state as needed.

### 36.8.8 Properties

### 36.8.9 pdfImage as NSPDFImageRepMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDF representation of the image.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("logo_new.eps")

// read in as image
dim image as new nsimageMBS(f)

// get represenations
dim reps() as NSImageRepMBS = image.representations

// get EPS representation
dim rep as NSEPSImageRepMBS = NSEPSImageRepMBS(Reps(0))

// get PDF representation
dim pdf as NSPDFImageRepMBS = rep.pdfImage

Break
```

**Notes:** When you load an EPS file, a PDF file is automatically created.

(Read only property)

## 36.9 class NSGraphicsMBS

### 36.9.1 class NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** The Cocoa class for drawing.
**Example:**

```
// make new image
dim myImage as new NSImageMBS(500,500)
dim myGraphics as new NSGraphicsMBS(myImage)

// make logo image
dim myPicture as Picture = LogoMBS(500)
dim anotherImage as new NSImageMBS(myPicture)

// draw logo image to new image
myGraphics.drawInRect(anotherImage, 0, 0, myImage.width, myImage.height, 0, 0, anotherImage.width,
anotherImage.height, myGraphics.NSCompositeSourceOver, 1.0)
myGraphics = nil // flush drawing

// save to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, True)
if b<>nil then
b.Write myImage.JPEGRepresentation
b.Close
end if
```

**Notes:** The plugin often provides in events such objects for drawing. In that case please only use the object in the event and don't store it for later use. It is only valid with in a draw event.

Internally this is a NSGraphicsContext object.

If you create objects on your own, make sure you only use the methods while the object is valid.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3
- MBS Xojo / Real Studio Plugins, version 15.4pr4
- Apply fonts to font PopupMenu
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Real Studio Plugins, version 12.5pr4

- MBS Real Studio Plugins, version 12.4pr7
- MBS Real Studio Plugins, version 12.3pr7
- MBS Real Studio Plugins, version 12.3pr6
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.2
- MBS Plugins 10.3 Release Notes

**Xojo Developer Magazine**

- 10.5, page 10: News

### 36.9.2 Methods

### 36.9.3 addClip(path as NSBezierPathMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Intersects the area enclosed by the receiver's path with the clipping path of the current graphics context and makes the resulting shape the current clipping path.
**Notes:** This method uses the current winding rule to determine the clipping shape of the receiver. This method does not affect the receiver's path.

### 36.9.4 boundingRectWithSize(text as NSAttributedStringMBS, size as NSSizeMBS, options as Integer = 0) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Calculates and returns bounding rectangle for the receiver drawn using the options specified, within the given rectangle in the current graphics context.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// query size
dim g as new NSGraphicsMBS(Canvas1.NSViewMBS)
dim r as NSRectMBS = g.boundingRectWithSize(m, new NSSizeMBS(canvas1.Width, canvas1.Height),
g.NSStringDrawingUsesLineFragmentOrigin)

MsgBox r.String
```

**Notes:** size: The size of the rectangle to draw in.
options: The string drawing options.

Returns the bounding rectangle in the current graphics context.
The origin of the rectangle returned from this method is the first glyph origin.
See also:

- 36.9.5 boundingRectWithSize(text as string, size as NSSizeMBS, options as Integer = 0, DicAttributes as dictionary = nil) as NSRectMBS 7505

### 36.9.5 boundingRectWithSize(text as string, size as NSSizeMBS, options as Integer = 0, DicAttributes as dictionary = nil) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Calculates and returns the bounding rect for the text drawn using the given options and display characteristics, within the specified rectangle in the current graphics context.
**Example:**

```
Dim NSGraphics as New NSGraphicsMBS()
dim size as NSSizeMBS = new NSSizeMBS(100,100)
dim text as string = "Hello World. How are you? I'm fine. This is just a test string."
dim options as Integer = NSGraphics.NSStringDrawingUsesLineFragmentOrigin
Dim rect as NSRectMBS = NSGraphics.boundingRectWithSize(text, size, options)

MsgBox str(Rect.Width)+" "+str(Rect.Height)
```

**Notes:** text: the text to use for calculation.
size: The size of the rectangle to draw in.
options: String drawing options.
attributes: A dictionary of text attributes to be applied to the string. These are the same attributes that can be applied to an NSAttributedString object, but in the case of Strings, the attributes apply to the entire string, rather than ranges within the string.

Returns the bounding rect for the receiver drawn using the given options and display characteristics. The rect origin returned from this method is the first glyph origin.

Available in Mac OS X v10.4 and later.

See NSStringDrawing* constants. Use NSStringDrawingUsesLineFragmentOrigin to switch to multiline mode.

See also:

- 36.9.4 boundingRectWithSize(text as NSAttributedStringMBS, size as NSSizeMBS, options as Integer = 0) as NSRectMBS 7504

### 36.9.6 clipRect(r as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Intersects the specified rectangle with the clipping path of the current graphics context and makes the resulting shape the current clipping path
**Notes:** r: The rectangle to intersect with the current clipping path.

### 36.9.7 concat(transform as NSAffineTransformMBS)

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Concats this transform to the current transform of the graphics environment.

### 36.9.8 ConcatTransform(NSAffineTransform as Variant)

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Appends the receiver's matrix to the current transformation matrix stored in the current graphics context, replacing the current transformation matrix with the result.
**Notes:** Please use saveGraphicsState so you can restore the state before applying matrix for other drawings.

Concatenation is performed by matrix multiplication.

If this method is invoked from within an NSView drawRect method, then the current transformation matrix is an accumulation of the screen, window, and any superview's transformation matrices. Invoking this method defines a new user coordinate system whose coordinates are mapped into the former coordinate system according to the receiver's transformation matrix. To undo the concatenation, you must invert the receiver's matrix and invoke this method again.

NSAffineTransform must be a NSAffineTransformMBS object.

### 36.9.9 Constructor

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Initializes the current graphics context of the current thread.
See also:


- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509
- 36.9.15 Constructor(targetWindow as window) 7510


### 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS)

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new graphics context for drawing into a bitmap image representation.
**Example:**

```
dim n as new NSImageMBS(300,300)
dim r as new NSBitmapImageRepMBS(300, 300, 8, 4, true, NSColorSpaceMBS.NSCalibratedRGBColorSpace, 4*300, 32)

dim g as new NSGraphicsMBS(r)
g.SetColorRGB 1.0,0,0,0.5
g.fillRect 0, 0, 100, 100
g = nil // flush
n.addRepresentation r

Backdrop = n.CopyPictureWithMask
```

**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the image.
Returns nil on any error.
See also:


- 36.9.9 Constructor 7506
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509
- 36.9.15 Constructor(targetWindow as window) 7510

### 36.9.11 Constructor(targetImage as NSImageMBS)

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a new graphics context for drawing into an image.
**Example:**

```
// make new image
dim myImage as new NSImageMBS(500,500)
dim myGraphics as new NSGraphicsMBS(myImage)

// make logo image
dim myPicture as Picture = LogoMBS(500)
dim anotherImage as new NSImageMBS(myPicture)

// draw logo image to new image
myGraphics.drawInRect(anotherImage, 0, 0, myImage.width, myImage.height, 0, 0, anotherImage.width,
anotherImage.height, myGraphics.NSCompositeSourceOver, 1.0)
myGraphics = nil // flush drawing

// save to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, True)
if b<>nil then
b.Write myImage.JPEGRepresentation
b.Close
end if
```

**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the image.
See also:


- 36.9.9 Constructor 7506
- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509
- 36.9.15 Constructor(targetWindow as window) 7510


### 36.9.12 Constructor(targetView as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a Cocoa view.
**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the window.
See also:


- 36.9.9 Constructor 7506
- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509
- 36.9.15 Constructor(targetWindow as window) 7510


### 36.9.13 Constructor(targetWindow as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
See also:


- 36.9.9 Constructor 7506
- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509
- 36.9.15 Constructor(targetWindow as window) 7510


### 36.9.14 Constructor(targetWindow as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
See also:


- 36.9.9 Constructor 7506
- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.15 Constructor(targetWindow as window) 7510

### 36.9.15 Constructor(targetWindow as window)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
See also:


- 36.9.9 Constructor 7506
- 36.9.10 Constructor(targetImage as NSBitmapImageRepMBS) 7507
- 36.9.11 Constructor(targetImage as NSImageMBS) 7508
- 36.9.12 Constructor(targetView as NSViewMBS) 7508
- 36.9.13 Constructor(targetWindow as DesktopWindow) 7509
- 36.9.14 Constructor(targetWindow as NSWindowMBS) 7509


### 36.9.16 drawAtPoint(image as NSImageMBS, x as Double, y as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Draws all or part of the image at the specified point in the current coordinate system.
**Notes:** x/y: The location in the current coordinate system at which to draw the image.
sx/sy/sw/sh: The source rectangle specifying the portion of the image you want to draw. The coordinates of this rectangle are specified in the image's own coordinate system. If you pass in zeros, the entire image is drawn.
operation: The compositing operation to use when drawing the image. See the NSCompositingOperation constants.
fraction: The opacity of the image, specified as a value from 0.0 to 1.0. Specifying a value of 0.0 draws the image as fully transparent while a value of 1.0 draws the image as fully opaque. Values greater than 1.0 are interpreted as 1.0.

The image content is drawn at its current resolution and is not scaled unless the CTM of the current coordinate system itself contains a scaling factor. The image is otherwise positioned and oriented using the current coordinate system.

For Operation you use the Composite constants in this class.
In the Cocoa world the y axis is reversed. y=0 is on the bottom.
See also:


- 36.9.17 drawAtPoint(text as NSAttributedStringMBS, point as NSPointMBS) 7511
- 36.9.18 drawAtPoint(text as string, point as NSPointMBS, DicAttributes as dictionary = nil) 7511

### 36.9.17 drawAtPoint(text as NSAttributedStringMBS, point as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Draws the receiver with its font and other display attributes at the given point in the currently focused view.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m

// draw in Canvas
dim g as new NSGraphicsMBS(Canvas1.NSViewMBS)

g.drawAtPoint m, new NSPointMBS(20,20)
```

**Notes:** point: The point in the current view to draw the text.

The width (height for vertical layout) of the rendering area is unlimited, unlike drawInRect, which uses a bounding rectangle. As a result, this method renders the text in a single line.

Don't invoke this method when no NSView is focused.
See also:

- 36.9.16 drawAtPoint(image as NSImageMBS, x as Double, y as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double) 7510
- 36.9.18 drawAtPoint(text as string, point as NSPointMBS, DicAttributes as dictionary = nil) 7511

### 36.9.18 drawAtPoint(text as string, point as NSPointMBS, DicAttributes as dictionary = nil)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Draws the text with the font and other display characteristics of the given attributes, at the specified point in the currently focused view.
**Notes:** Point: The origin for the bounding box for drawing the string. If the focused view is flipped, the origin is the upper-left corner of the drawing bounding box; otherwise, the origin is the lower-left corner.
attributes: A dictionary of text attributes to be applied to the string. These are the same attributes that

can be applied to an NSAttributedString object, but in the case of strings, the attributes apply to the entire string, rather than ranges within the string.

The width (height for vertical layout) of the rendering area is unlimited, unlike drawInRect, which uses a bounding rectangle. As a result, this method renders the text in a single line.

You should only invoke this method when an NSView object has focus.
See also:

- 36.9.16 drawAtPoint(image as NSImageMBS, x as Double, y as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double) 7510
- 36.9.17 drawAtPoint(text as NSAttributedStringMBS, point as NSPointMBS) 7511

### 36.9.19 drawInRect(image as NSImageMBS, x as Double, y as Double, w as Double, h as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** draws the image into the given rectangle with the given source rectangle and the given mode.
**Example:**

```
// make new image
dim myImage as new NSImageMBS(500,500)
dim myGraphics as new NSGraphicsMBS(myImage)

// make logo image
dim myPicture as Picture = LogoMBS(500)
dim anotherImage as new NSImageMBS(myPicture)

// draw logo image to new image
myGraphics.drawInRect(anotherImage, 0, 0, myImage.width, myImage.height, 0, 0, anotherImage.width,
anotherImage.height, myGraphics.NSCompositeSourceOver, 1.0)
myGraphics = nil // flush

// save to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, True)
if b<>nil then
b.Write myImage.JPEGRepresentation
b.Close
end if
```

**Notes:** For Operation you use the Composite constants in this class.

In the Cocoa world the y axis is reversed. y=0 is on the bottom.
See also:


- 36.9.20 drawInRect(text as NSAttributedStringMBS, rect as NSRectMBS) 7513
- 36.9.21 drawInRect(text as string, rect as NSRectMBS, DicAttributes as dictionary = nil) 7514


### 36.9.20 drawInRect(text as NSAttributedStringMBS, rect as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Draws the attributed string within the given rectangle in the currently view, clipping the text layout to this rectangle.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m

// draw in Canvas
dim g as new NSGraphicsMBS(Canvas1.NSViewMBS)

g.drawInRect m, new NSRectMBS(20,20, 100, 100)
```

**Notes:** rect: The rectangle in which to draw.

Text is drawn within rect according to its line sweep direction; for example, Arabic text will begin at the right edge and potentially be clipped on the left.

The rect parameter determines how many glyphs are typeset within the width of a line, but it's possible for a portion of a glyph to appear outside the area of rect if the image bounding box of the particular glyph exceeds its typographic bounding box.

If the focus view is flipped, the text origin is set at the upper-left corner of the drawing bounding box; otherwise the origin is set at the lower-left corner. For text rendering, whether the view coordinates are flipped or not doesn't affect the flow of line layout, which goes from top to bottom. However, it affects the interpretation of the text origin. So, for example, if the rect argument is { 0.0, 0.0, 100.0, 100.0 } , the text origin is { 0.0, 0.0 } when the view coordinates are flipped and { 0.0, 100.0 } when not.

Don't invoke this method when no NSView is focused.
See also:

- 36.9.19 drawInRect(image as NSImageMBS, x as Double, y as Double, w as Double, h as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double) 7512
- 36.9.21 drawInRect(text as string, rect as NSRectMBS, DicAttributes as dictionary = nil) 7514

### 36.9.21 drawInRect(text as string, rect as NSRectMBS, DicAttributes as dictionary = nil)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Draws the text with the font and other display characteristics of the given attributes, within the specified rectangle in the currently focused NSView.
**Notes:** text: The text to draw.
Rect: The rectangle in which to draw the string.
attributes: A dictionary of text attributes to be applied to the string. These are the same attributes that can be applied to an NSAttributedString object, but in the case of strings, the attributes apply to the entire string, rather than ranges within the string.

The rendering area is bounded by rect, unlike drawAtPoint, which has an unlimited width. As a result, this method renders the text in multiple lines.

You should only invoke this method when an NSView has focus.
See also:

- 36.9.19 drawInRect(image as NSImageMBS, x as Double, y as Double, w as Double, h as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double) 7512
- 36.9.20 drawInRect(text as NSAttributedStringMBS, rect as NSRectMBS) 7513

### 36.9.22 drawPicture(image as Picture, x as Double, y as Double, w as Double, h as Double, sx as Double, sy as Double, sw as Double, sh as Double, Operation as Integer, fraction as Double)

MBS MacCocoa Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Draws a picture.
**Notes:** Same as drawInRect with NSImageMBS, but using picture.

### 36.9.23 drawRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Draws a rectangle with the current color.
**Notes:** In the Cocoa world the y axis is reversed. y=0 is on the bottom.

### 36.9.24 DrawWindowBackground(x as Double, y as Double, w as Double, h as Double)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Draws the window's default background pattern into the specified rectangle of the currently focused view.
**Notes:** Pass the rectangle (in the current coordinate system) in which to draw the window's background pattern.

### 36.9.25 drawWithRect(text as NSAttributedStringMBS, rect as NSRectMBS, options as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Draws the receiver with the specified options, within the given rectangle in the current graphics context.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m

// draw in Canvas
dim g as new NSGraphicsMBS(Canvas1.NSViewMBS)

g.drawWithRect m, new NSRectMBS(20,20, 100, 100), g.NSStringDrawingUsesLineFragmentOrigin
```

**Notes:** rect: The rectangle specifies the rendering origin in the current graphics context.
options: The string drawing options. See NSStringDrawingOptions for the available options..

The rect argument's origin field specifies the rendering origin. The point is interpreted as the baseline origin by default. With NSStringDrawingUsesLineFragmentOrigin, it is interpreted as the upper left corner of the line fragment rect. The size field specifies the text container size. The width part of the size field

specifies the maximum line fragment width if larger than 0.0. The height defines the maximum size that can be occupied with text if larger than 0.0 and NSStringDrawingUsesLineFragmentOrigin is specified. If NSStringDrawingUsesLineFragmentOrigin is not specified, height is ignored and considered to be single-line rendering (NSLineBreakByWordWrapping and NSLineBreakByCharWrapping are treated as NSLineBreakByClipping).

You should only invoke this method when there is a current graphics context.
Available in OS X v10.4 and later.

### 36.9.26 eraseRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Erases a rectangle with the current color.
**Notes:** In the Cocoa world the y axis is reversed. y=0 is on the bottom.

### 36.9.27 fill(path as NSBezierPathMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Paints the region enclosed by the receiver's path.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setFillColor NSColorMBS.redColor

dim r as NSRectMBS = NSMakeRectMBS(50, 50, 100, 100)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(r)
g.fill(b)

g = nil

window1.Backdrop = n.CopyPicture // black image with red color rect
```

**Notes:** This method fills the path using the current fill color and the receiver's current winding rule. If the path contains any open subpaths, this method implicitly closes them before painting the fill region.

The painted region includes the pixels right up to, but not including, the path line itself. For paths with large line widths, this can result in overlap between the fill region and the stroked path (which is itself centered on the path line).

### 36.9.28 fillRect(r as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Fills the specified rectangular path with the current fill color.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setFillColor NSColorMBS.redColor

dim r as new NSRectMBS(10,10,200,200)
g.fillRect(r)

g = nil

window1.Backdrop = n.CopyPicture // black image with red color rectangle
```

**Notes:** r: A rectangle in the current coordinate system.

This method fills the specified region immediately. This method uses the compositing operation returned by the compositingOperation method of NSGraphicsContext.
See also:


- 36.9.29 fillRect(x as Double, y as Double, w as Double, h as Double) 7517
- 36.9.30 fillRect(x as Double, y as Double, w as Double, h as Double, operation as Integer) 7518


### 36.9.29 fillRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Fills a rectangle with the current color.
**Notes:** In the Cocoa world the y axis is reversed. y=0 is on the bottom.
See also:


- 36.9.28 fillRect(r as NSRectMBS) 7517
- 36.9.30 fillRect(x as Double, y as Double, w as Double, h as Double, operation as Integer) 7518

### 36.9.30 fillRect(x as Double, y as Double, w as Double, h as Double, operation as Integer)

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Fills a rectangle using the current fill color and the specified compositing operation.
**Notes:** See NSComposite* constants.
See also:

- 36.9.28 fillRect(r as NSRectMBS) 7517
- 36.9.29 fillRect(x as Double, y as Double, w as Double, h as Double) 7517

### 36.9.31 flushGraphics

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Forces any buffered operations or data to be sent to the receiver's destination.
**Notes:** Graphics contexts use buffers to queue pending operations but for efficiency reasons may not always empty those buffers immediately. This method forces the buffers to be emptied.

### 36.9.32 graphicsContext as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a NSGraphicsMBS object with the current graphics context of the current thread.
**Example:**

```
Sub Paint(g As Graphics)
// Canvas Paint event in a Mac Cocoa application

dim ng as NSGraphicsMBS = NSGraphicsMBS.graphicsContext
ng.drawAtPoint "Hello World", new NSPointMBS(30, 30)

End Sub
```

**Notes:** Returns nil on any error.

### 36.9.33 graphicsContextWithCGContext(targetCGContext as Variant, initialFlippedState as boolean = false) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new graphics context pointing to the given CGContextMBS object.
**Example:**

```
Sub Paint(g As Graphics)
// get current context
dim cg as CGContextMBS = GetCurrentCGContextMBS

// get graphics context
dim ng as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithCGContext(cg)

// and draw inside
ng.drawAtPoint "Hello World", new NSPointMBS(30, 30)
End Sub
```

**Notes:** Returns nil on any error.

### 36.9.34 graphicsContextWithCGContextHandle(targetCGContextRef as Integer, initialFlippedState as boolean = false) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Creates a new graphics context pointing to the given CGContext reference.
**Example:**

```
Sub Paint(g As Graphics)
// get current context
dim cg as CGContextMBS = GetCurrentCGContextMBS

// get graphics context
dim ng as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithCGContextHandle(cg.Handle)

// and draw inside
ng.drawAtPoint "Hello World", new NSPointMBS(30, 30)
End Sub
```

**Notes:** Returns nil on any error.
See also:

- 36.9.35 graphicsContextWithCGContextHandle(targetCGContextRef as Ptr, initialFlippedState as boolean = false) as NSGraphicsMBS 7520

### 36.9.35 graphicsContextWithCGContextHandle(targetCGContextRef as Ptr, initialFlippedState as boolean = false) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a new graphics context pointing to the given CGContext reference.
**Example:**

```
Sub Paint(g As Graphics)
// get current context
dim cg as CGContextMBS = GetCurrentCGContextMBS

// get graphics context
dim ng as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithCGContextHandle(cg.Handle)

// and draw inside
ng.drawAtPoint "Hello World", new NSPointMBS(30, 30)
End Sub
```

**Notes:** Returns nil on any error.
See also:

- 36.9.34 graphicsContextWithCGContextHandle(targetCGContextRef as Integer, initialFlippedState as boolean = false) as NSGraphicsMBS 7519

### 36.9.36 graphicsContextWithNSBitmapImageRep(targetImage as NSBitmapImageRepMBS) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new graphics context for drawing into a bitmap image representation.
**Example:**

```
dim n as new NSImageMBS(300,300)
dim r as new NSBitmapImageRepMBS(300, 300, 8, 4, true, NSColorSpaceMBS.NSCalibratedRGBColorSpace, 4*300, 32)

dim g as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithNSBitmapImageRep(r)
g.SetColorRGB 1.0,0,0,0.5
g.fillRect 0, 0, 100, 100
g = nil // flush
n.addRepresentation r

Backdrop = n.CopyPictureWithMask
```

**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the image. Returns nil on any error.

### 36.9.37 graphicsContextWithNSImage(targetImage as NSImageMBS) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new graphics context for drawing into an image.
**Example:**

```
// make new image
dim myImage as new NSImageMBS(500,500)
dim myGraphics as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithNSImage(myImage)

// make logo image
dim myPicture as Picture = LogoMBS(500)
dim anotherImage as new NSImageMBS(myPicture)

// draw logo image to new image
myGraphics.drawInRect(anotherImage, 0, 0, myImage.width, myImage.height, 0, 0, anotherImage.width,
anotherImage.height, myGraphics.NSCompositeSourceOver, 1.0)
myGraphics = nil // flush drawing

// save to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, True)
if b<>nil then
b.Write myImage.JPEGRepresentation
b.Close
end if
```

**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the image. Returns nil on any error.

### 36.9.38 graphicsContextWithNSView(targetView as NSViewMBS) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a Cocoa view.
**Example:**

```
// draws in a Cocoa view
dim gg as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithNSView(canvas1.NSViewMBS)
gg.SetColorRGB 1.0,0,0,0.5
gg.fillRect 0, 0, 100, 100
gg = nil // flush
```

**Notes:** Please make sure the graphics object is destroyed (Set to nil) so the drawings flush to the window. Returns nil on any error.

### 36.9.39 graphicsContextWithNSWindow(targetNSWindow as NSWindowMBS) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
**Example:**

```
// draw in a Cocoa window
dim g as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithNSWindow(window1.NSWindowMBS)
g.SetColorRGB 1.0,0,0,0.5
g.fillRect 0, 0, 100, 100
g = nil // flush
```

**Notes:** Returns nil on any error.

### 36.9.40 graphicsContextWithWindow(targetWindow as DesktopWindow) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
**Notes:** Returns nil on any error.
See also:

- 36.9.41 graphicsContextWithWindow(targetWindow as window) as NSGraphicsMBS 7522

### 36.9.41 graphicsContextWithWindow(targetWindow as window) as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new graphics context for drawing into a window.
**Example:**

```
// draws in a Cocoa window
dim g as NSGraphicsMBS = NSGraphicsMBS.graphicsContextWithWindow(window1)
g.SetColorRGB 1.0,0,0,0.5
g.fillRect 0, 0, 100, 100
g = nil // flush
```

**Notes:** Returns nil on any error.
See also:

- 36.9.40 graphicsContextWithWindow(targetWindow as DesktopWindow) as NSGraphicsMBS 7522

### 36.9.42 graphicsPort as Variant

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the low-level, platform-specific graphics context represented by the receiver.
**Notes:** In Mac OS X, this is the Core Graphics context, a CGContextMBS object.

### 36.9.43 highlightRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Highlights the rectangle.
**Notes:** In the Cocoa world the y axis is reversed. y=0 is on the bottom.

### 36.9.44 invalidate

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Invalides the graphics object.

### 36.9.45 isDrawingToScreen as boolean

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the drawing destination is the screen.
**Notes:** True if the drawing destination is the screen, otherwise false.

A return value of false may mean that the drawing destination is a printer, but the destination may also be a PDF or EPS file. If this method returns false, you can call attributes to see if additional information is available about the drawing destination.

### 36.9.46 isFlipped as boolean

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates the receiver's flipped state.
**Notes:** True if the receiver is flipped, otherwise false.

The state is determined by sending isFlipped to the receiver's view that has focus. If no view has focus, returns false unless the receiver is instantiated using graphicsContextWithGraphicsPort:flipped: specifying true as the flipped parameter.

Available in Mac OS X v10.4 and later.

### 36.9.47 restoreGraphicsState

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Removes the receiver's graphics state from the top of the graphics state stack and makes the next graphics state the current graphics state.
**Notes:** This method must have been preceded with a saveGraphicsState message to add the graphics state to the stack. Invocations of saveGraphicsState and restoreGraphicsState methods may be nested.

Restoring the graphics state restores such attributes as the current drawing style, transformation matrix, color, and font of the original graphics state.

### 36.9.48 saveGraphicsState

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Saves the graphics state of the current graphics context.
**Notes:** This method pushes the context onto the per-thread stack.

### 36.9.49 ScaleCoordinates(x as Double, y as Double)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Scales coordinate system so the next drawing commands will use different scaling.
**Notes:** Use saveGraphicsState and restoreGraphicsState so you can restore the old state.

### 36.9.50 set(transform as NSAffineTransformMBS)

MBS MacCocoa Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Sets the current transform of the graphics environment.

### 36.9.51 setClip(path as NSBezierPathMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Replaces the clipping path of the current graphics context with the area inside the receiver's path.
**Notes:** You should avoid using this method as a way of adjusting the clipping path, as it may expand the clipping path beyond the bounds set by the enclosing view. If you do use this method, be sure to save the graphics state prior to modifying the clipping path and restore the graphics state when you are done.

This method uses the current winding rule to determine the clipping shape of the receiver. This method does not affect the receiver's path.

### 36.9.52 setColor(c as NSColorMBS)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Sets the color of subsequent drawing to the color that the receiver represents.

### 36.9.53 SetColorBW(white as Double, alpha as Double = 1.0)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Sets the color to a BW color.
**Notes:** Values range is from 0.0 to 1.0.
Alpha 0.0 is invisible and alpha 1.0 is visible.

### 36.9.54 SetColorCMYK(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double = 1.0)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Sets the color to a CMYK color.
**Notes:** Values range is from 0.0 to 1.0.
Alpha 0.0 is invisible and alpha 1.0 is visible.

### 36.9.55 SetColorHSV(hue as Double, saturation as Double, brightness as Double, alpha as Double = 1.0)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Sets the color to an HSV color.
**Notes:** Values range is from 0.0 to 1.0.

### 36.9.56 SetColorRGB(red as Double, green as Double, blue as Double, alpha as Double = 1.0)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Sets the color to a RGB color.
**Notes:** Values range is from 0.0 to 1.0.
Alpha 0.0 is invisible and alpha 1.0 is visible.

### 36.9.57 setCurrentContext

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets this context to be the current.

### 36.9.58 setFillColor(c as NSColorMBS)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Sets the fill color of subsequent drawing to the receiver's color.

### 36.9.59 setStrokeColor(c as NSColorMBS)

MBS MacCocoa Plugin, Plugin Version: 9.8, Platform: macOS, Targets: All.

**Function:** Sets the stroke color of subsequent drawing to the receiver's color.

### 36.9.60 SetTransform(NSAffineTransform as Variant)

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Sets the current transformation matrix to the receiver's transformation matrix.
**Notes:** Please use saveGraphicsState so you can restore the state before applying matrix for other drawings.

The current transformation is stored in the current graphics context and is applied to subsequent drawing operations. You should use this method sparingly because it removes the existing transformation matrix, which is an accumulation of transformation matrices for the screen, window, and any superviews. Instead use the concat method to add this transformation matrix to the current transformation matrix.

NSAffineTransform must be a NSAffineTransformMBS object.

### 36.9.61 sizeWithAttributes(text as string, DicAttributes as dictionary = nil) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the bounding box size the text occupies when drawn with the given attributes.
**Example:**

```
Dim NSGraphics as New NSGraphicsMBS()
Dim NSStringWidth as Double = NSGraphics.sizeWithAttributes("Hello World").Width

MsgBox("StringWidth from NSGraphicsMBS: " + Str(NSStringWidth))

Dim REALGraphics as Graphics = window1.Graphics
Dim REALStringWidth as Double = REALGraphics.StringWidth("Hello World")

MsgBox("StringWidth from REAL Graphics: " + Str(REALStringWidth))
```

**Notes:** attributes: A dictionary of text attributes to be applied to the string. These are the same attributes that can be applied to an NSAttributedString object, but in the case of strings, the attributes apply to the entire string, rather than ranges within the string.

Returns the bounding box size the receiver occupies when drawn with attributes.

### 36.9.62 stroke(path as NSBezierPathMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Draws a line along the receiver's path using the current stroke color and drawing attributes.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setStrokeColor NSColorMBS.redColor

dim r as NSRectMBS = NSMakeRectMBS(50, 50, 100, 100)
dim b as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(r)
b.lineWidth = 5
g.stroke(b)

g = nil

window1.Backdrop = n.CopyPicture // black image with red color rect
```

**Notes:** The drawn line is centered on the path with its sides parallel to the path segment. This method uses the current drawing attributes associated with the receiver. If a particular attribute is not set for the receiver, this method uses the corresponding default attribute.

### 36.9.63 strokeLine(point1 as NSPointMBS, point2 as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Strokes a line between two points using the current stroke color and the default drawing attributes.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setStrokeColor NSColorMBS.redColor

dim p1 as new NSPointMBS(10,10)
dim p2 as new NSPointMBS(50,50)
g.strokeLine(p1,p2)
```

```
g = nil

window1.Backdrop = n.CopyPicture // black image with red color line
```

**Notes:** point1: The starting point of the line.
point2: The ending point of the line.

This method strokes the specified path immediately.
See also:

- 36.9.64 strokeLine(x1 as Double, y1 as Double, x2 as Double, y2 as Double) 7529

### 36.9.64 strokeLine(x1 as Double, y1 as Double, x2 as Double, y2 as Double)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Strokes a line.
See also:

- 36.9.63 strokeLine(point1 as NSPointMBS, point2 as NSPointMBS) 7528

### 36.9.65 strokeRect(r as NSRectMBS)

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Strokes the path of the specified rectangle using the current stroke color and the default drawing attributes.
**Example:**

```
dim n as new NSImageMBS(300, 300)
dim g as new NSGraphicsMBS(n)

g.setStrokeColor NSColorMBS.redColor

dim r as NSRectMBS = NSMakeRectMBS(50, 50, 100, 100)
g.strokeRect(r)

g = nil

window1.Backdrop = n.CopyPicture // black image with red color rect
```

**Notes:** r: A rectangle in the current coordinate system.

The path is drawn beginning at the rectangle's origin and proceeding in a counterclockwise direction. This method strokes the specified path immediately.

### 36.9.66 TranslateCoordinates(x as Double, y as Double)

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Moves coordinate system so the next drawing commands will use different starting point.
**Notes:** Use saveGraphicsState and restoreGraphicsState so you can restore the old state.

### 36.9.67 Properties

### 36.9.68 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The internal handle to the Graphics Context.
**Notes:** Reference to NSGraphicsContext object.
(Read and Write property)

### 36.9.69 Owner as Variant

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The owner object.
**Notes:** When you have a graphics object based on a window, view or image, this property points to the original object to keep it alive while drawing.
(Read and Write property)

### 36.9.70 Valid as Boolean

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Wheter this graphics object is still valid.
**Notes:** Set to true when the plugin creates an object and false when the object is no longer needed.
(Read and Write property)

### 36.9.71 imageInterpolation as Integer

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The interpolation behavior.
**Notes:** Note that this value is not part of the graphics state, so it cannot be reset using restoreGraphicsState.
(Read and Write computed property)

### 36.9.72 shouldAntialias as boolean

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Whether the receiver should use antialiasing.
**Notes:** This value is part of the graphics state and is restored by restoreGraphicsState.
(Read and Write computed property)

### 36.9.73 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCompositeClear | 0 | Transparent. (R = 0) |
| NSCompositeCopy | 1 | Source image. (R = S) |
| NSCompositeDestinationAtop | 9 | Destination image wherever both images are opaque, source image wherever source image is opaque but destination image is transparent, and transparent elsewhere. (R = S*(1 - Da) + D*Sa) |
| NSCompositeDestinationIn | 7 | Destination image wherever both images are opaque, and transparent elsewhere. (R = D*Sa) |
| NSCompositeDestinationOut | 8 | Destination image wherever destination image is opaque but source image is transparent, and transparent elsewhere. (R = D*(1 - Sa)) |
| NSCompositeDestinationOver | 6 | Destination image wherever destination image is opaque, and source image elsewhere. (R = S*(1 - Da) + D) |
| NSCompositeHighlight | 12 | Source image wherever source image is opaque, and destination image elsewhere. (Deprecated. Mapped to NSCompositeSourceOver.) |
| NSCompositePlusDarker | 11 | Sum of source and destination images, with color values approaching 0 as a limit. (R = MAX(0, (1 - D) + (1 - S))) |
| NSCompositePlusLighter | 13 | Sum of source and destination images, with color values approaching 1 as a limit. (R = MIN(1, S + D)) |
| NSCompositeSourceAtop | 5 | Source image wherever both images are opaque, destination image wherever destination image is opaque but source image is transparent, and transparent elsewhere. (R = S*Da + D*(1 - Sa)) |
| NSCompositeSourceIn | 3 | Source image wherever both images are opaque, and transparent elsewhere. (R = S*Da) |
| NSCompositeSourceOut | 4 | Source image wherever source image is opaque but destination image is transparent, and transparent elsewhere. (R = S*(1 - Da)) |
| NSCompositeSourceOver | 2 | Source image wherever source image is opaque, and destination image elsewhere. (R = S + D*(1 - Sa)) |
| NSCompositeXOR | 10 | Exclusive OR of source and destination images. (R = S*(1 - Da) + D*(1 - Sa)) Works only with black and white images and is not recommended for color contexts. |
| NSImageInterpolationDefault | 0 | One of the interpolation contants.<br>Use the context's default interpolation. |
| NSImageInterpolationHigh | 3 | One of the interpolation contants.<br>Slower, higher-quality interpolation. |
| NSImageInterpolationLow | 2 | One of the interpolation contants.<br>Fast, low-quality interpolation. |
| NSImageInterpolationMedium | 4 | One of the interpolation contants.<br>Medium quality, slower than NSImageInterpolationLow.<br>Available in Mac OS X v10.6 and later. |
| NSImageInterpolationNone | 1 | One of the interpolation contants.<br>No interpolation. |

Drawing Option Constants

| Constant | Value | Description |
|---|---|---|
| NSStringDrawingDisableScreenFontSubstitution | 4 | Disable screen font substitution (equivalent to NSLayoutMa creenFonts(false)). |
| NSStringDrawingOneShot | 16 | Suppresses caching layout information. |
| NSStringDrawingTruncatesLastVisibleLine | 32 | Truncates and adds the ellipsis character to the last visible doesn't fit into the bounds specified.<br>This option is ignored if NSStringDrawingUsesLineFragmentO set. In addition, the line break mode must be either NSLine Wrapping or NSLineBreakByCharWrapping for this option to line break mode can be specified in a paragraph style passed i dictionary argument of the drawing methods.<br>Available in Mac OS X v10.5 and later. |
| NSStringDrawingUsesDeviceMetrics | 8 | Uses image glyph bounds instead of typographic bounds. |
| NSStringDrawingUsesFontLeading | 2 | Uses the font leading for calculating line heights. |
| NSStringDrawingUsesLineFragmentOrigin | 1 | The specified origin is the line fragment origin, not the baselin |

## 36.10 class NSImageMBS

### 36.10.1 class NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** An NSImage object is a high-level class for manipulating image data.
**Notes:** You use this class to load existing images or create new ones and composite them into a view or other image. This class works in conjunction with one or more image representation objects (subclasses of NSImageRep), which manage the actual image data.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS Xojo Plugins in version 22.4
- News from the MBS Xojo Plugins Version 22.1
- Several ways for picture to PDF in MBS Plugins
- News from the MBS Xojo Plugins Version 20.5
- IconFamilyMBS class deprecated
- Custom menu checkmarks
- NSImage and image orientation
- Tip of the day: Rotate image with CoreImage
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic plug-in 9.6

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 6.4, page 34: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz
- 5.6, pages 32 to 33: Third Party Plugins: Statusitems, Getting an icon in the top right of the Mac OS X menubar by Christian Schmitz
- 20.3, page 80: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes

- 20.3, page 10: News
- 19.1, page 91: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 19.1, page 82: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 19.1, page 80: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 19.1, page 78: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 73: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, pages 68 to 69: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 36.10.2 Methods

### 36.10.3 addRepresentation(img as NSImageRepMBS)

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds the specified image representation object to to the receiver.
**Notes:** After invoking this method, you may need to explicitly set features of the new image representation, such as the size, number of colors, and so on. This is true particularly when the NSImage object has multiple image representations to choose from. See NSImageRep and its subclasses for the methods you use to complete initialization.

Any representation added by this method is retained by the receiver. Image representations cannot be shared among multiple NSImage objects.

### 36.10.4 BMPRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a BMP file.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream
```

```
p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p,p.Mask)

f=SpecialFolder.Desktop.Child("test.bmp")
b=f.CreateBinaryFile("")
b.Write img.BMPRepresentation
b.Close

f.Launch
```

**Notes:** BMP does not support masks.

### 36.10.5 BMPRepresentationMT as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a BMP file.
**Notes:** BMP does not support masks.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.6 cancelIncrementalLoad

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cancels the current download operation immediately, if the image is being incrementally loaded.
**Notes:** This call has no effect if the image is not loading.

### 36.10.7 canInitWithPasteboard as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Tests whether the receiver can create an instance of itself using pasteboard data.
**Notes:** This method uses the NSImageRep class method imageUnfilteredPasteboardTypes to find a class

that can handle the data in the specified pasteboard. If you create your own NSImageRep subclasses, override the imageUnfilteredPasteboardTypes method to notify NSImage of the pasteboard types your class supports.

### 36.10.8 Constructor

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The default constructor creating a dummy NSImage object.
See also:


- 36.10.9 Constructor(data as Memoryblock) 7537
- 36.10.10 Constructor(file as folderitem) 7537
- 36.10.11 Constructor(image as Picture, mask as picture = nil) 7538
- 36.10.12 Constructor(width as Double, height as Double) 7538


### 36.10.9 Constructor(data as Memoryblock)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The data constructor calling initWithData internally.
**Notes:** Calls initWithData.
On success the image is valid and the handle is not zero.
See also:


- 36.10.8 Constructor 7537
- 36.10.10 Constructor(file as folderitem) 7537
- 36.10.11 Constructor(image as Picture, mask as picture = nil) 7538
- 36.10.12 Constructor(width as Double, height as Double) 7538


### 36.10.10 Constructor(file as folderitem)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The file constructor calling initWithContentsOfURL(file) internally.
**Notes:** Calls initWithContentsOfURL.
On success the image is valid and the handle is not zero.
See also:


- 36.10.8 Constructor 7537
- 36.10.9 Constructor(data as Memoryblock) 7537

- 36.10.11 Constructor(image as Picture, mask as picture = nil) 7538
- 36.10.12 Constructor(width as Double, height as Double) 7538


### 36.10.11 Constructor(image as Picture, mask as picture = nil)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates a new NSImageMBS object based on the image data in a Xojo picture.
**Example:**

```
dim img as new NSImageMBS(pict)
```

**Notes:** Optional you can pass a picture with the mask. It is valid to use the mask property of the image for the second parameter.

With 11.3 plugins we are deprecating to pass a mask. The plugin prefers to simply take the mask or alpha channel of the picture itself.

On success the image is valid and the handle is not zero.
Calls initWithPicture.
See also:


- 36.10.8 Constructor 7537
- 36.10.9 Constructor(data as Memoryblock) 7537
- 36.10.10 Constructor(file as folderitem) 7537
- 36.10.12 Constructor(width as Double, height as Double) 7538


### 36.10.12 Constructor(width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The size constructor calling initWithSize internally.
**Notes:** Calls initWithSize.
On success the image is valid and the handle is not zero.
See also:


- 36.10.8 Constructor 7537
- 36.10.9 Constructor(data as Memoryblock) 7537
- 36.10.10 Constructor(file as folderitem) 7537
- 36.10.11 Constructor(image as Picture, mask as picture = nil) 7538

### 36.10.13 CopyMask as picture

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage in current size.
**Example:**

```
dim f as FolderItem
dim n as NSImageMBS

f=SpecialFolder.Desktop.Child("test.png")
n=new NSImageMBS(f)
Backdrop=n.CopyMask
```

**Notes:** Copies only the alpha channel as mask.
Returns nil on any error.

Not implemented for iOS.

### 36.10.14 CopyPicture(CGColorSpace as Variant = nil, BackgroundColor as NSColorMBS = nil) as picture

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage in current size.
**Example:**

```
dim f as FolderItem
dim n as NSImageMBS

f=SpecialFolder.Desktop.Child("test.png")
n=new NSImageMBS(f)
Backdrop=n.CopyPicture // background is black
```

**Notes:** A convenience function instead of using CGPictureContextMBS with DrawIntoCGContextAtRect.

Returns nil on any error.

With Colorspace parameter you can pass a RGB CGColorspace to define which colorspace is used. Default is DeviceRGB, but you could also pass generic RGB or other.

If BackgroundColor is not nil, the image is filled in background with this color and NSImage rendered on

top of it.

Implemented for iOS in v22.4 to return underlaying UIImage as Xojo picture. Colorspace and background are ignored as picture is passed directly.

### 36.10.15 CopyPictureRect(x as Integer, y as Integer, w as Integer, h as Integer, CGColorSpace as Variant = nil, BackgroundColor as NSColorMBS = nil) as picture

MBS MacBase Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage from the given rectangle.
**Example:**

```
dim f as FolderItem
dim n as NSImageMBS

f=SpecialFolder.Desktop.Child("test.png")
n=new NSImageMBS(f)
Backdrop=n.CopyPicture // background is black
```

**Notes:** A convenience function instead of using CGPictureContextMBS with DrawIntoCGContextAtRect.

Returns nil on any error.

With Colorspace parameter you can pass a RGB CGColorspace to define which colorspace is used. Default is DeviceRGB, but you could also pass generic RGB or other.

If BackgroundColor is not nil, the image is filled in background with this color and NSImage rendered on top of it.

Not implemented for iOS.

### 36.10.16 CopyPictureWithAlpha as picture

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage in current size.
**Notes:** This is a function for Cocoa target which returns picture with alpha channel.
Returns nil on any error.

Not implemented for iOS.

### 36.10.17 CopyPictureWithAlphaRect(x as Integer, y as Integer, w as Integer, h as Integer) as picture

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage in given rectangle.
**Notes:** This is a function for Cocoa target which returns picture with alpha channel.
Returns nil on any error.

Not implemented for iOS.

### 36.10.18 CopyPictureWithMask(CGColorSpace as Variant = nil) as picture

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Copies the content of the NSImage in current size.
**Example:**

```
dim f as FolderItem
dim n as NSImageMBS

f=SpecialFolder.Desktop.Child("test.png")
n=new NSImageMBS(f)
Backdrop=n.CopyPictureWithMask
```

**Notes:** Copies the picture and its mask.
This function is faster than CopyPicture and CopyMask combined as the picture is only copied one time to an internal buffer.

A convenience function instead of using CGPictureContextMBS with DrawIntoCGContextAtRect.

Returns nil on any error.

With Colorspace parameter you can pass a RGB CGColorspace to define which colorspace is used. Default is DeviceRGB, but you could also pass generic RGB or other.

Not implemented for iOS.

### 36.10.19 DrawIntoCGContextAtPoint(cgcontext as Integer, x as Double, y as Double, sx as Double, sy as Double, SourceW as Double, SourceH as Double, operation as Integer, fraction as Double) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Draws the image.
**Notes:** Same as DrawIntoCGContextAtRect, but with a point instead of a rectangle.

### 36.10.20 DrawIntoCGContextAtRect(cgcontext as Integer, x as Double, y as Double, w as Double, h as Double, SourceX as Double, SourceY as Double, SourceW as Double, SourceH as Double, operation as Integer, fraction as Double) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Draws the image.
**Example:**

```
Function OpenAsNSimage(extends file as folderitem) As picture
dim width as Integer
dim height as Integer
dim c as NSImageMBS
dim g as CGPictureContextMBS

// load image from file
c=new NSImageMBS

// is that image valid?
if c.initWithContentsOfURL(file) then
Width=c.Width
height=c.Height

// create a drawing buffer to draw inside
g=new CGPictureContextMBS(width,height)

if g.Handle<>0 then // valid?

// now draw the image inside.
// you could scale or even apply transparency...
if c.DrawIntoCGContextAtRect(g.Handle, 0, 0, width, height, 0,0,width,height,2,1.0) then
// make a RB Picture from it
Return g.CopyPicture
```

```
end if
end if
end if
End Function
```

**Notes:** Draws the image into a CGContext. You need to specify first the destination rectangle followed by the source rectangle.

fraction:
The opacity of the image, specified as a value from 0.0 to 1.0. Specifying a value of 0.0 draws the image as fully transparent while a value of 1.0 draws the image as fully opaque. Values greater than 1.0 are interpreted as 1.0.

operation codes:

| | | |
|---|---|---|
| NSCompositeClear | = 0 | Transparent. |
| NSCompositeCopy | = 1 | Source image. |
| NSCompositeSourceOver | = 2 | Source image wherever source image is opaque, and destination image elsewhere. |
| NSCompositeSourceIn | = 3 | Source image wherever both images are opaque, and transparent elsewhere. |
| NSCompositeSourceOut | = 4 | Source image wherever source image is opaque but destination image is transparent, and transparent elsewhere. |
| NSCompositeSourceAtop | = 5 | Source image wherever both images are opaque, destination image wherever destination image is opaque but source image is transparent, and transparent elsewhere. |
| NSCompositeDestinationOver | = 6 | Destination image wherever destination image is opaque, and source image elsewhere. |
| NSCompositeDestinationIn | = 7 | Destination image wherever both images are opaque, and transparent elsewhere. |
| NSCompositeDestinationOut | = 8 | Destination image wherever destination image is opaque but source image is transparent, and transparent elsewhere. |
| NSCompositeDestinationAtop | = 9 | Destination image wherever both images are opaque, source image wherever source image is opaque but destination image is transparent, and transparent elsewhere. |
| NSCompositeXOR | = 10 | Exclusive OR of source and destination images. |
| NSCompositePlusDarker | = 11 | Sum of source and destination images, with color values approaching 0 as a limit. |
| NSCompositeHighlight | = 12 | Source image wherever source image is opaque, and destination image elsewhere. |
| NSCompositePlusLighter | = 13 | Sum of source and destination images, with color values approaching 1 as a limit. |

Returns true on success and false on failure.

### 36.10.21 GIFRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a GIF file.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p,p.Mask)

f=SpecialFolder.Desktop.Child("test.gif")
b=f.CreateBinaryFile("")
b.Write img.GIFRepresentation
b.Close

f.Launch
```

**Notes:** GIF does support masks in a limited way.

### 36.10.22 GIFRepresentationMT as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a GIF file.
**Notes:** GIF does support masks in a limited way.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.23 imageByFadingToFraction(fraction as Double) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns an image with a mask faded to the given percentage
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

img=img.imageByFadingToFraction(0.1)

f=SpecialFolder.Desktop.Child("test.png")
b=f.CreateBinaryFile("")
b.Write img.PNGRepresentation
b.Close

f.Launch
```

**Notes:** Returns nil on failure.

### 36.10.24 imageByScalingToSize(width as Double, height as Double) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Scales image to the new size.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

img=img.imageByScalingToSize(200,200)
```

```
f=SpecialFolder.Desktop.Child("test.png")
b=f.CreateBinaryFile("")
b.Write img.PNGRepresentation
b.Close

f.Launch
```

**Notes:** Returns nil on failure.
Internally creates a copy of the image.
See also:

- 36.10.25 imageByScalingToSize(width as Double, height as Double, fraction as Double) as NSImageMBS 7546
- 36.10.26 imageByScalingToSize(width as Double, height as Double, fraction as Double, flip as boolean, proportionally as boolean) as NSImageMBS 7547

### 36.10.25 imageByScalingToSize(width as Double, height as Double, fraction as Double) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Scales image to the new size with given fading.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

img=img.imageByScalingToSize(200,200,0.5)

f=SpecialFolder.Desktop.Child("test.png")
b=f.CreateBinaryFile("")
b.Write img.PNGRepresentation
b.Close

f.Launch
```

**Notes:** Returns nil on failure.
Internally creates a copy of the image.
See also:

- 36.10.24 imageByScalingToSize(width as Double, height as Double) as NSImageMBS 7545
- 36.10.26 imageByScalingToSize(width as Double, height as Double, fraction as Double, flip as boolean, proportionally as boolean) as NSImageMBS 7547

### 36.10.26 imageByScalingToSize(width as Double, height as Double, fraction as Double, flip as boolean, proportionally as boolean) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Scales image to the new size with given fading fraction.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

img=img.imageByScalingToSize(200,200)

f=SpecialFolder.Desktop.Child("test.png")
b=f.CreateBinaryFile("")
b.Write img.PNGRepresentation
b.Close

f.Launch
```

**Notes:** Returns nil on failure.
The image can be flipped vertically with the flip property.
Internally creates a copy of the image.
See also:

- 36.10.24 imageByScalingToSize(width as Double, height as Double) as NSImageMBS 7545

- 36.10.25 imageByScalingToSize(width as Double, height as Double, fraction as Double) as NSImageMBS 7546

### 36.10.27 imageFileTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings identifying the image types supported by the registered NSImageRep objects.
**Example:**

```
dim types() as string = NSImageMBS.imageFileTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** An array of strings, each of which identifies a single supported file type. The array can include encoded HFS file types as well as filename extensions.

This list includes all file types supported by registered subclasses of NSImageRep plus those that can be converted to a supported type by a user-installed filter service. You can pass the array returned by this method directly to NSOpenPanelMBS.

When creating a subclass of NSImageRep, do not override this method. Instead, override the imageUnfilteredFileTypes method to notify NSImage of the file types your class supports directly.

### 36.10.28 imageNamed(name as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns the NSImage instance associated with the specified name.
**Notes:** This method searches for named images in several places, returning the first image it finds matching the given name. The order of the search is as follows:

1. Search for an object whose name was set explicitly using the setName: method and currently resides in the image cache.
2. Search the application's main bundle for a file whose name matches the pecified string. (For information on how the bundle is searched, see "Searching for Bundle Resources" in Bundle Programming Guide.)
3. Search the Application Kit framework for a shared image with the specified name.

When looking for files in the application bundle, it is better (but not required) to include the filename extension in the name parameter. When naming an image with the setName method, it is also convention not to include filename extensions in the names you specify. That way, you can easily distinguish between images you have named explicitly and those you want to load from the application's bundle.

One particularly useful image you can retrieve is your application's icon. This image is set by Cocoa automatically and referenced by the string "NSApplicationIcon". Icons for other applications can be obtained through the use of methods declared in the NSWorkspace class. You can also retrieve some standard system images using Cocoa defined constants; for more information, see the Constants section of this class.

If an application is linked in Mac OS X v10.5 or later, images requested using this method and whose name ends in the word "Template" are automatically marked as template images.

The NSImage class keeps a reference to any named images in a table until the image name is cleared. Consequently you do not need to retain the returned image object unless its name could be cleared. You can clear an image object from the table by passing nil to the setName: method of the corresponding NSImage object.

Here is a good list of identifiers you can use:
http://hetima.github.io/fucking_nsimage_syntax/

### 36.10.29 imagePasteboardTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings identifying the pasteboard types supported directly by the registered NSImageRep objects.
**Example:**

```
dim types() as string = NSImageMBS.imagePasteboardTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** Returns an array of strings, each of which identifies a single supported pasteboard type. By default, this list contains the NSPDFPboardType, NSPICTPboardType, NSPostScriptPboardType, and NSTIFFPboardType types.

This list includes all pasteboard types supported by registered subclasses of NSImageRep plus those that can be converted to a supported type by a user-installed filter service.

When creating a subclass of NSImageRep, do not override this method. Instead, override the imageUnfilteredPasteboardTypes method to notify NSImage of the pasteboard types your class supports.

### 36.10.30 imageTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of UTI strings identifying the image types supported by the registered NSImageRep objects, either directly or through a user-installed filter service.
**Example:**

```
dim types() as string = NSImageMBS.imageTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** Returns an array of strings, each of which contains a UTI identifying a supported image type. Some sample image-related UTI strings include "public.image", "public.jpeg", and "public.tiff". For a list of supported types, see UTCoreTypes.h.

The returned list includes UTIs all file types supported by registered subclasses of NSImageRep plus those that can be converted to a supported type by a user-installed filter service. You can use the returned UTI strings with any method that supports UTIs.

You should not override this method directly. Instead, you should override the imageTypes method of NSImageRep.

Available in Mac OS X v10.5 and later.

### 36.10.31 imageUnfilteredFileTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings identifying the file types supported directly by the registered NSImageRep objects.
**Example:**

```
dim types() as string = NSImageMBS.imageUnfilteredFileTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** An array of strings, each of which identifies a single supported file type. File types are identified by file extension and HFS file types.
The returned list does not contain pasteboard types that are available only through a user-installed filter service.

### 36.10.32 imageUnfilteredPasteboardTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings identifying the pasteboard types supported directly by the registered NSImageRep objects.
**Example:**

```
dim types() as string = NSImageMBS.imageUnfilteredPasteboardTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** An array of strings, each of which identifies a single supported pasteboard type.
The returned list does not contain pasteboard types that are supported only through a user-installed filter service.

### 36.10.33 imageUnfilteredTypes as string()

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of UTI strings identifying the image types supported directly by the registered NSImageRep objects.
**Example:**

```
dim types() as string = NSImageMBS.imageUnfilteredTypes
MsgBox Join(types, EndOfLine)
```

**Notes:** Returns an array of strings, each of which contains a UTI identifying a supported image type. Some sample image-related UTI strings include "public.image", "public.jpeg", and "public.tiff". For a list of supported types, see UTCoreTypes.h.

The returned list includes UTI strings only for those file types that are supported directly by registered subclasses of NSImageRep. It does not include types that are supported through user-installed filter services. You can use the returned UTI strings with any method that supports UTIs.

You should not override this method directly. Instead, you should override the imageUnfilteredTypes method of NSImageRep.

### 36.10.34 imageWithCGImage(CGImage as Variant, width as Double = 0, height as Double = 0) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the CGImage.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim cgimage as CGImageMBS = CGCreateImageMBS(logo)
dim nsimage as NSImageMBS = NSImageMBS.imageWithCGImage(cgimage)
dim pic as Picture = nsimage.CopyPictureWithMask
Backdrop = pic
```

**Notes:** If width is zero, we take the width from the CGImage.
If height is zero, we take the height from the CGImage.

cgImage: The source CGImageMBS object.
width & height: The size of the new image.

Returns an initialized NSImage instance, or nil if the new instance cannot be initialized.

You should not assume anything about the image, other than that drawing it is equivalent to drawing the CGImage.
Available in OS X v10.6 and later.

### 36.10.35 imageWithContentsOfFile(file as folderitem) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim image as NSImageMBS = NSImageMBS.imageWithContentsOfFile(file)
Backdrop = image.CopyPictureWithMask
```

**Notes:** File: The file to open.

Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified file.

### 36.10.36 imageWithContentsOfFileMT(file as folderitem) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim image as NSImageMBS = NSImageMBS.imageWithContentsOfFileMT(file)
Backdrop = image.CopyPictureWithMask
```

**Notes:** File: The file to open.

Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified file.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.37 imageWithContentsOfPath(path as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim path as string = file.NativePath
dim image as NSImageMBS = NSImageMBS.imageWithContentsOfPath(path)
Backdrop = image.CopyPictureWithMask
```

**Notes:** path: A full or relative path name specifying the file with the desired image data. Relative paths must be relative to the current working directory.

Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified file.

The filename parameter should include the file extension that identifies the type of the image data. This method looks for an NSImageRep subclass that handles that data type from among those registered with

NSImage.

### 36.10.38 imageWithContentsOfPathMT(path as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim path as string = file.NativePath
dim image as NSImageMBS = NSImageMBS.imageWithContentsOfPathMT(path)
Backdrop = image.CopyPictureWithMask
```

**Notes:** path: A full or relative path name specifying the file with the desired image data. Relative paths must be relative to the current working directory.

Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified file.

The filename parameter should include the file extension that identifies the type of the image data. This method looks for an NSImageRep subclass that handles that data type from among those registered with NSImage.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.39 imageWithContentsOfURL(URL as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified URL.
**Example:**

```
dim url as string = "http://www.monkeybreadsoftware.de/images/MBSLogo.jpg"
dim img as NSImageMBS = NSImageMBS.imageWithContentsOfURL(url)
Backdrop = img.CopyPictureWithMask
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified URL.

### 36.10.40 imageWithContentsOfURLMT(URL as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified URL.
**Example:**

```
dim url as string = "http://www.monkeybreadsoftware.de/images/MBSLogo.jpg"
dim img as NSImageMBS = NSImageMBS.imageWithContentsOfURLMT(url)
Backdrop = img.CopyPictureWithMask
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified URL.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 36.10.41 imageWithData(data as memoryblock) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified memoryblock.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpeg as string = PictureToJPEGStringMBS(logo, 75)
dim nsimage as NSImageMBS = NSImageMBS.imageWithData(jpeg)
dim pic as Picture = nsimage.CopyPictureWithMask
Backdrop = pic
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified data object.
See also:

- 36.10.42 imageWithData(data as string) as NSImageMBS 7556

### 36.10.42 imageWithData(data as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified string.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpeg as string = PictureToJPEGStringMBS(logo, 75)
dim nsimage as NSImageMBS = NSImageMBS.imageWithData(jpeg)
dim pic as Picture = nsimage.CopyPictureWithMask
Backdrop = pic
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified data object.
See also:

- 36.10.41 imageWithData(data as memoryblock) as NSImageMBS 7555

### 36.10.43 imageWithDataMT(data as memoryblock) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified memoryblock.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpeg as string = PictureToJPEGStringMBS(logo, 75)
dim nsimage as NSImageMBS = NSImageMBS.imageWithDataMT(jpeg)
dim pic as Picture = nsimage.CopyPictureWithMask
Backdrop = pic
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified data object.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 36.10.44 imageWithDataMT(data as string) as NSImageMBS 7557

### 36.10.44 imageWithDataMT(data as string) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified string.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpeg as string = PictureToJPEGStringMBS(logo, 75)
dim nsimage as NSImageMBS = NSImageMBS.imageWithDataMT(jpeg)
dim pic as Picture = nsimage.CopyPictureWithMask
Backdrop = pic
```

**Notes:** Returns an initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified data object.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 36.10.43 imageWithDataMT(data as memoryblock) as NSImageMBS 7556

### 36.10.45 imageWithHandle(Handle as Integer) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 14.4, Platform: macOS, Targets: All.

**Function:** Creates a new picture for a NSImage handle.

### 36.10.46 imageWithSymbolConfiguration(configuration as NSImageSymbolConfigurationMBS) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new symbol image with the specified configuration.
**Example:**

```
Dim config As NSImageSymbolConfigurationMBS = NSImageSymbolConfigurationMBS.configurationWith-
PointSize(40, 0)
Dim n As NSImageMBS = NSImageMBS.imageWithSystemSymbolName("trash")
Dim o As NSImageMBS = n.imageWithSymbolConfiguration(config)
```

Backdrop = o.CopyPictureWithAlpha

### 36.10.47 imageWithSystemSymbolName(name as string, accessibilityDescription as string = "") as NSImageMBS

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns an image for a given symbol name.
**Example:**

```
Dim n As NSImageMBS = NSImageMBS.imageWithSystemSymbolName("trash")
If n <>Nil Then

n.setSize(300,300)
Backdrop = n.CopyPictureWithAlpha

End If
```

**Notes:** For macOS 11.0 or newer.

See list of symbols in SF Symbol font, see SF Symbols app or the list here:
https://developer.apple.com/design/human-interface-guidelines/sf-symbols/overview/

### 36.10.48 imageWithTintColor(tintColor as NSColorMBS) as NSImageMBS

MBS MacBase Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the image colored with the given tint.
**Notes:** Input image should be grayscale.

### 36.10.49 initWithContentsOfURL(file as folderitem) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified folderitem.
**Notes:** Returns true on success and false on failure.
See also:

- 36.10.50 initWithContentsOfURL(url as string) as boolean 

### 36.10.50 initWithContentsOfURL(url as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes and returns an NSImage instance with the contents of the specified URL.
**Notes:** Returns true on success and false on failure.
See also:

- 36.10.49 initWithContentsOfURL(file as folderitem) as boolean 7558

### 36.10.51 initWithData(data as Memoryblock) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes and with the contents of the specified data in the string.
**Notes:** Returns true on success and false on failure.

### 36.10.52 initWithDataIgnoringOrientation(data as Memoryblock) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an NSImage instance with the contents of the specified memoryblock, ignoring the EXIF orientation tags.
**Notes:** An initialized NSImage instance, or nil if the method cannot create an image representation from the contents of the specified data object.
Available in Mac OS X v10.6 and later.

### 36.10.53 initWithIconRef(IconHandle as Integer) as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the image object with a Carbon-style icon resource.
**Notes:** IconHandle: A reference to a Carbon icon resource (IconRef).

Creates one or more bitmap image representations, one for each size icon contained in the IconRef data structure. This initialization method automatically retains the data in the iconRef parameter and loads the bitmaps from that data file lazily.
Available in Mac OS X v10.5 and later.

### 36.10.54 initWithPasteboard as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes an NSImage instance with data from the pasteboard.
**Notes:** The specified pasteboard should contain a type supported by one of the registered NSImageRep subclasses. Table 1 lists the default pasteboard types and file extensions for several NSImageRep subclasses.

### 36.10.55 initWithPicture(img as picture, mask as picture = nil) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes the image object with image data from the Xojo pictures.
**Example:**

```
dim img as new NSImageMBS
if img.initWithPicture(pict, pict.mask) then
MsgBox "OK"
end if
```

**Notes:** Optional you can pass a picture with the mask. It is valid to use the mask property of the image for the second parameter.

With 11.3 plugins we are deprecating to pass a mask. The plugin prefers to simply take the mask or alpha channel of the picture itself.

On success the image is valid and the handle is not zero.

### 36.10.56 initWithSize(width as Double, height as Double) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an empty image object with the given size.
**Notes:** Returns true on success and false on failure.

### 36.10.57 JPEGRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a JPEG file.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
```

```
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

f=SpecialFolder.Desktop.Child("test.jpeg")
b=f.CreateBinaryFile("")
b.Write img.JPEGRepresentation
b.Close

f.Launch
```

**Notes:** JPEG does not support masks. Uses 80% for the quality.

### 36.10.58 JPEGRepresentationMT as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a JPEG file.
**Example:**

```
// take some Picture
dim logo as Picture = LogoMBS(500)

// make a NSImageMBS from it
dim nsimage as new NSImageMBS(logo)

// use thread friendly compress function
dim jpeg as MemoryBlock = nsimage.JPEGRepresentationMT

// decode to see if it worked
dim test as Picture = JPEGStringToPictureMBS(jpeg)

// and display
Backdrop = test
```

**Notes:** JPEG does not support masks. Uses 80% for the quality.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will

block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.59 JPEGRepresentationWithCompressionFactor(factor as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a JPEG file.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p)

f=SpecialFolder.Desktop.Child("test.jpeg")
b=f.CreateBinaryFile("")
b.Write img.JPEGRepresentationWithCompressionFactor(0.01)
b.Close

f.Launch
```

**Notes:** Factor for compression goes from 0.0 to 1.0.
JPEG does not support masks.

### 36.10.60 JPEGRepresentationWithCompressionFactorMT(factor as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a JPEG file.
**Example:**

```
// take some Picture
dim logo as Picture = LogoMBS(500)
```

```
// make a NSImageMBS from it
dim nsimage as new NSImageMBS(logo)

// use thread friendly compress function
dim jpeg as MemoryBlock = nsimage.JPEGRepresentationWithCompressionFactorMT(1.0)

// decode to see if it worked
dim test as Picture = JPEGStringToPictureMBS(jpeg)

// and display
Backdrop = test
```

**Notes:** Factor for compression goes from 0.0 to 1.0.
JPEG does not support masks.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.61 NSImageHintUserInterfaceLayoutDirection as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the dictionary keys used in the hints dictionary.
**Notes:** value is a number with NSUserInterfaceLayoutDirection enum value

### 36.10.62 NSImageNameActionTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An action menu template image.
Available in Mac OS X v10.5 and later.

### 36.10.63 NSImageNameAddTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Example:**

```
Dim n As NSImageMBS = NSImageMBS.imageNamed(NSImageMBS.NSImageNameAddTemplate)

canvas1.backdrop = n.CopyPictureWithAlpha
```

**Notes:** An add item template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.64 NSImageNameAdvanced as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Example:**

```
Dim n As NSImageMBS = NSImageMBS.imageNamed(NSImageMBS.NSImageNameAdvanced)

canvas1.backdrop = n.CopyPictureWithAlpha
```

**Notes:** To access this image, pass the specified constant to the imageNamed method.
Advanced preferences toolbar icon. Use in a preferences window only.
Available in Mac OS X v10.5 and later.

### 36.10.65 NSImageNameApplicationIcon as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
The application's icon.
On versions of Mac OS X prior to v10.6, you can use the string "NSApplicationIcon".
Available in Mac OS X v10.6 and later.

### 36.10.66 NSImageNameBluetoothTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A Bluetooth template image.
Available in Mac OS X v10.5 and later.

### 36.10.67 NSImageNameBonjour as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A Bonjour icon.
Available in Mac OS X v10.5 and later.

### 36.10.68 NSImageNameBookmarksTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Bookmarks image suitable for a template.
Available in Mac OS X v10.6 and later.

### 36.10.69 NSImageNameCaution as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Caution Image.
Available in Mac OS X v10.6 and later.

### 36.10.70 NSImageNameColorPanel as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.

A color panel toolbar icon.
Available in Mac OS X v10.5 and later.

### 36.10.71 NSImageNameColumnViewTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images used in segmented controls to switch the current view type.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A column view mode template image.
Available in Mac OS X v10.5 and later.

### 36.10.72 NSImageNameComputer as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Example:**

```
dim n as NSImageMBS = NSImageMBS.imageNamed(NSImageMBS.NSImageNameComputer)

// set to size you need
n.size = NSMakeSizeMBS(512,512)

// and make picture
Backdrop = n.CopyPictureWithMask
```

**Notes:** To access this image, pass the specified constant to the imageNamed method.
A computer icon.
Available in Mac OS X v10.5 and later.

### 36.10.73 NSImageNameDotMac as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A Dot Mac icon.
Available in Mac OS X v10.5 and later.

### 36.10.74 NSImageNameEnterFullScreenTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** An enter full-screen mode template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.75 NSImageNameEveryone as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing sharing permission icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Permissions for all users.
Available in Mac OS X v10.5 and later.

### 36.10.76 NSImageNameExitFullScreenTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** An exit full-screen mode template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.77 NSImageNameFlowViewTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images used in segmented controls to switch the current view type.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A cover flow view mode template image.
Available in Mac OS X v10.5 and later.

### 36.10.78 NSImageNameFolder as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.

A folder image.
Available in Mac OS X v10.6 and later.

### 36.10.79 NSImageNameFolderBurnable as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A burnable folder icon.
Available in Mac OS X v10.5 and later.

### 36.10.80 NSImageNameFolderSmart as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Notes:** A smart folder icon.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.81 NSImageNameFollowLinkFreestandingTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A link template image. You can use this image to implement a borderless button.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.82 NSImageNameFontPanel as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A font panel toolbar icon.
Available in Mac OS X v10.5 and later.

### 36.10.83 NSImageNameGoBackTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The template name for the go back image.
**Notes:** Use these images for "go forward" or "go back" functions, as seen in Safari's toolbar. These images will automatically mirror when the user interface layout direction is right to left.
Available in macOS 10.12 and newer.

### 36.10.84 NSImageNameGoForwardTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** The template name for the go forward image.
**Notes:** Use these images for "go forward" or "go back" functions, as seen in Safari's toolbar. These images will automatically mirror when the user interface layout direction is right to left.
Available in macOS 10.12 and newer.

### 36.10.85 NSImageNameGoLeftTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A "go back" template image.
Available in Mac OS X v10.5 and later.

### 36.10.86 NSImageNameGoRightTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A "go forward" template image.
Available in Mac OS X v10.5 and later.

### 36.10.87 NSImageNameHomeTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.

Home image suitable for a template.
Available in Mac OS X v10.6 and later.

### 36.10.88 NSImageNameIChatTheaterTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An iChat Theater template image.
Available in Mac OS X v10.5 and later.

### 36.10.89 NSImageNameIconViewTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images used in segmented controls to switch the current view type.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An icon view mode template image.
Available in Mac OS X v10.5 and later.

### 36.10.90 NSImageNameInfo as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An information toolbar icon.
Available in Mac OS X v10.5 and later.

### 36.10.91 NSImageNameInvalidDataFreestandingTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An invalid data template image. Place this icon to the right of any fields containing invalid data. You can use this image to implement a borderless button.
Available in Mac OS X v10.5 and later.

### 36.10.92 NSImageNameLeftFacingTriangleTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A generic left-facing triangle template image.
Available in Mac OS X v10.5 and later.

### 36.10.93 NSImageNameListViewTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images used in segmented controls to switch the current view type.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A list view mode template image.
Available in Mac OS X v10.5 and later.

### 36.10.94 NSImageNameLockLockedTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A locked lock template image. Use to indicate locked content.
Available in Mac OS X v10.5 and later.

### 36.10.95 NSImageNameLockUnlockedTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An unlocked lock template image. Use to indicate modifiable content that can be locked.
Available in Mac OS X v10.5 and later.

### 36.10.96 NSImageNameMenuMixedStateTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.

A horizontal dash. Drawing these outside of menus is discouraged.
Available in Mac OS X v10.6 and later.

### 36.10.97 NSImageNameMenuOnStateTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A check mark. Drawing these outside of menus is discouraged.
Available in Mac OS X v10.6 and later.

### 36.10.98 NSImageNameMobileMe as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
MobileMe logo. Note that this is preferred to using the NSImageNameDotMac image, although that image is not expected to be deprecated.
Available in Mac OS X v10.6 and later.

### 36.10.99 NSImageNameMultipleDocuments as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Drag image you can use in your applications.
**Notes:** A drag image for multiple items.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.100 NSImageNameNetwork as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing Finder items.
**Notes:** A network icon.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.101 NSImageNamePathTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A path button template image.
Available in Mac OS X v10.5 and later.

### 36.10.102 NSImageNamePreferencesGeneral as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
General preferences toolbar icon. Use in a preferences window only.
Available in Mac OS X v10.5 and later.

### 36.10.103 NSImageNameQuickLookTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A Quick Look template image.
Available in Mac OS X v10.5 and later.

### 36.10.104 NSImageNameRefreshFreestandingTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A refresh template image. You can use this image to implement a borderless button.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.105 NSImageNameRefreshTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A refresh template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.106 NSImageNameRemoveTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Example:**

```
Dim n As NSImageMBS = NSImageMBS.imageNamed(NSImageMBS.NSImageNameRemoveTemplate)

canvas1.backdrop = n.CopyPictureWithAlpha
```

**Notes:** A remove item template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.107 NSImageNameRevealFreestandingTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A reveal contents template image. You can use this image to implement a borderless button.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.108 NSImageNameRightFacingTriangleTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A generic right-facing triangle template image.
Available in Mac OS X v10.5 and later.

### 36.10.109 NSImageNameShareTemplate as string

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** One of the images used in segmented controls to switch the current view type.
**Notes:** A share view template image.
Available in OS X v10.8 and later.

### 36.10.110 NSImageNameSlideshowTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A slideshow template image.
Available in Mac OS X v10.5 and later.

### 36.10.111 NSImageNameSmartBadgeTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A badge for a ”smart” item.
Available in Mac OS X v10.5 and later.

To access this image, pass the specified constant to the imageNamed method.

### 36.10.112 NSImageNameStatusAvailable as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Small green indicator, similar to iChat's available image.
Available in Mac OS X v10.6 and later.

### 36.10.113 NSImageNameStatusNone as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Small clear indicator.
Available in Mac OS X v10.6 and later.

### 36.10.114 NSImageNameStatusPartiallyAvailable as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Small yellow indicator, similar to iChat's idle image.
Available in Mac OS X v10.6 and later.

### 36.10.115 NSImageNameStatusUnavailable as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Small red indicator, similar to iChat's unavailable image.
Available in Mac OS X v10.6 and later.

### 36.10.116 NSImageNameStopProgressFreestandingTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
A stop progress template image. You can use this image to implement a borderless button.
Available in Mac OS X v10.5 and later.

### 36.10.117 NSImageNameStopProgressTemplate as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing standard artwork and icons that you can use in your applications.
**Notes:** A stop progress button template image.
Available in Mac OS X v10.5 and later.
To access this image, pass the specified constant to the imageNamed method.

### 36.10.118 NSImageNameTouchBarAddDetailTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAddDetailTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.119 NSImageNameTouchBarAddTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAddTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.120 NSImageNameTouchBarAlarmTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAlarmTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.121 NSImageNameTouchBarAudioInputMuteTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioInputMuteTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.122 NSImageNameTouchBarAudioInputTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioInputTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.123 NSImageNameTouchBarAudioOutputMuteTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioOutputMuteTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.124 NSImageNameTouchBarAudioOutputVolumeHighTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioOutputVolumeHighTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.125 NSImageNameTouchBarAudioOutputVolumeLowTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioOutputVolumeLowTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.126 NSImageNameTouchBarAudioOutputVolumeMediumTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioOutputVolumeMediumTemplate
img = NSImageMBS.imageNamed(n)
```

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.127 NSImageNameTouchBarAudioOutputVolumeOffTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarAudioOutputVolumeOffTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.128 NSImageNameTouchBarBookmarksTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarBookmarksTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.129 NSImageNameTouchBarColorPickerFill as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarColorPickerFill
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.130 NSImageNameTouchBarColorPickerFont as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarColorPickerFont
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.131 NSImageNameTouchBarColorPickerStroke as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS
```

name = NSImageMBS.NSImageNameTouchBarColorPickerStroke
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.132 NSImageNameTouchBarCommunicationAudioTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarCommunicationAudioTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.133 NSImageNameTouchBarCommunicationVideoTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarCommunicationVideoTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.134 NSImageNameTouchBarComposeTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarComposeTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.135 NSImageNameTouchBarDeleteTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarDeleteTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.136 NSImageNameTouchBarDownloadTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarDownloadTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.137 NSImageNameTouchBarEnterFullScreenTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarEnterFullScreenTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.138 NSImageNameTouchBarExitFullScreenTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarExitFullScreenTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.139 NSImageNameTouchBarFastForwardTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarFastForwardTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.140 NSImageNameTouchBarFolderCopyToTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarFolderCopyToTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.141 NSImageNameTouchBarFolderMoveToTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarFolderMoveToTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.142 NSImageNameTouchBarFolderTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarFolderTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.143 NSImageNameTouchBarGetInfoTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarGetInfoTemplate
img = NSImageMBS.imageNamed(n)
```

```
Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.144 NSImageNameTouchBarGoBackTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarGoBackTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.145 NSImageNameTouchBarGoDownTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarGoDownTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.146 NSImageNameTouchBarGoForwardTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarGoForwardTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.147 NSImageNameTouchBarGoUpTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarGoUpTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.148 NSImageNameTouchBarHistoryTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS
```

```
name = NSImageMBS.NSImageNameTouchBarHistoryTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.149 NSImageNameTouchBarIconViewTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarIconViewTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.150 NSImageNameTouchBarListViewTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarListViewTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.151 NSImageNameTouchBarMailTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarMailTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.152 NSImageNameTouchBarNewFolderTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarNewFolderTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.153 NSImageNameTouchBarNewMessageTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarNewMessageTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.154 NSImageNameTouchBarOpenInBrowserTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarOpenInBrowserTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.155 NSImageNameTouchBarPauseTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarPauseTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.156 NSImageNameTouchBarPlayheadTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarPlayheadTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.157 NSImageNameTouchBarPlayPauseTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarPlayPauseTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.158 NSImageNameTouchBarPlayTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarPlayTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.159 NSImageNameTouchBarQuickLookTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarQuickLookTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.160 NSImageNameTouchBarRecordStartTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarRecordStartTemplate
img = NSImageMBS.imageNamed(n)
```

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.161 NSImageNameTouchBarRecordStopTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarRecordStopTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.162 NSImageNameTouchBarRefreshTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarRefreshTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.163 NSImageNameTouchBarRewindTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarRewindTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.164 NSImageNameTouchBarRotateLeftTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarRotateLeftTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.165 NSImageNameTouchBarRotateRightTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS
```

name = NSImageMBS.NSImageNameTouchBarRotateRightTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.166 NSImageNameTouchBarSearchTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSearchTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.167 NSImageNameTouchBarShareTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarShareTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.168 NSImageNameTouchBarSidebarTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSidebarTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.169 NSImageNameTouchBarSkipAhead15SecondsTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipAhead15SecondsTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.170 NSImageNameTouchBarSkipAhead30SecondsTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipAhead30SecondsTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.171 NSImageNameTouchBarSkipAheadTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipAheadTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.172 NSImageNameTouchBarSkipBack15SecondsTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipBack15SecondsTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.173 NSImageNameTouchBarSkipBack30SecondsTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipBack30SecondsTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.174 NSImageNameTouchBarSkipBackTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipBackTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.175 NSImageNameTouchBarSkipToEndTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipToEndTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.176 NSImageNameTouchBarSkipToStartTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSkipToStartTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.177 NSImageNameTouchBarSlideshowTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarSlideshowTemplate
img = NSImageMBS.imageNamed(n)
```

Backdrop = img.CopyPictureWithAlpha

**Notes:** Available in macOS 10.12 and newer.

### 36.10.178 NSImageNameTouchBarTagIconTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTagIconTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.179 NSImageNameTouchBarTextBoldTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextBoldTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.180 NSImageNameTouchBarTextBoxTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextBoxTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.181 NSImageNameTouchBarTextCenterAlignTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextCenterAlignTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.182 NSImageNameTouchBarTextItalicTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS
```

```
name = NSImageMBS.NSImageNameTouchBarTextItalicTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.183 NSImageNameTouchBarTextJustifiedAlignTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextJustifiedAlignTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.184 NSImageNameTouchBarTextLeftAlignTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextLeftAlignTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.185 NSImageNameTouchBarTextListTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextListTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.186 NSImageNameTouchBarTextRightAlignTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextRightAlignTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.187 NSImageNameTouchBarTextStrikethroughTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextStrikethroughTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.188 NSImageNameTouchBarTextUnderlineTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarTextUnderlineTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.189 NSImageNameTouchBarUserAddTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarUserAddTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.190 NSImageNameTouchBarUserGroupTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarUserGroupTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.191 NSImageNameTouchBarUserTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarUserTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.192 NSImageNameTouchBarVolumeDownTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarVolumeDownTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.193 NSImageNameTouchBarVolumeUpTemplate as string

MBS MacBase Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** One of the touchbar image templates.
**Example:**

```
dim name as string
dim img as NSImageMBS

name = NSImageMBS.NSImageNameTouchBarVolumeUpTemplate
img = NSImageMBS.imageNamed(n)

Backdrop = img.CopyPictureWithAlpha
```

**Notes:** Available in macOS 10.12 and newer.

### 36.10.194 NSImageNameTrashEmpty as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An image of the empty trash can.
Available in Mac OS X v10.6 and later.

### 36.10.195 NSImageNameTrashFull as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
An image of the full trash can.
Available in Mac OS X v10.6 and later.

### 36.10.196 NSImageNameUser as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing sharing permission icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Permissions for a single user.
Available in Mac OS X v10.5 and later.

### 36.10.197 NSImageNameUserAccounts as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
User account toolbar icon. Use in a preferences window only.
Available in Mac OS X v10.5 and later.

### 36.10.198 NSImageNameUserGroup as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images representing sharing permission icons that you can use in your applications.
**Notes:** To access this image, pass the specified constant to the imageNamed method.
Permissions for a group of users.
Available in Mac OS X v10.5 and later.

### 36.10.199 NSImageNameUserGuest as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** One of the images that you can use in application toolbars.
**Notes:** To access this image, pass the specified constant to the imageNamed method.

Shaded user figure.
Available in Mac OS X v10.6 and later.

### 36.10.200 PNGRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a PNG file.
**Example:**

```
dim img as NSImageMBS
dim p as Picture
dim f as FolderItem
dim b as BinaryStream

p=New Picture(100,100,32)
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillOval 0,0,100,100
Backdrop=p
img=new NSImageMBS(p,p.Mask)

f=SpecialFolder.Desktop.Child("test.png")
b=f.CreateBinaryFile("")
b.Write img.PNGRepresentation
b.Close

f.Launch
```

**Notes:** PNG does support masks.

### 36.10.201 PNGRepresentationMT as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The image as the binary data in a PNG file.
**Example:**

```
// take some Picture
dim logo as Picture = LogoMBS(500)

// make a NSImageMBS from it
dim nsimage as new NSImageMBS(logo)

// use thread friendly compress function
```

```
dim jpeg as MemoryBlock = nsimage.PNGRepresentationMT

// decode to see if it worked
dim test as Picture = PNGStringToPictureMBS(jpeg)

// and display
Backdrop = test
```

**Notes:** PNG does support masks.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.202 recache

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Invalidates and frees the offscreen caches of all image representations.
**Notes:** If you modify an image representation, you must send a recache message to the corresponding image object to force the changes to be recached. The next time any image representation is drawn, it is asked to recreate its cached image. If you do not send this message, the image representation may use the old cache data. This method simply clears the cached image data; it does not delete the NSCachedImageRep objects associated with any image representations.
If you do not plan to use an image again right away, you can free its caches to reduce the amount of memory consumed by your program.

### 36.10.203 removeRepresentation(img as NSImageRepMBS)

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the specified image representation from the receiver and releases it.

### 36.10.204 RepresentationHeight(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Height of the representation with the given index in pixel.
**Notes:** Index from 0 to RepresetationCount-1.
Returns 0 on invalid index.

### 36.10.205 representations as NSImageRepMBS()

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array containing all of the receiver's image representations.
**Notes:** An array containing zero or more NSImageRep objects.
Returns nil on any error.

### 36.10.206 RepresentationWidth(index as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Width of the representation with the given index in pixel.
**Notes:** Index from 0 to RepresetationCount-1.
Returns 0 on invalid index.

### 36.10.207 setName(value as String) as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registers the image under the specified name.
**Notes:** Returns true if the receiver was successfully registered with the given name; otherwise, false.

Discussion
If the receiver is already registered under a different name, this method unregisters the other name. If a different image is registered under the name specified in aString, this method does nothing and returns false.

When naming an image using this method, it is convention not to include filename extensions in the names you specify. That way, you can easily distinguish between images you have named explicitly and those you want to load from the application's bundle. For information about the rules used to search for images, see the imageNamed method.

### 36.10.208 setSize(width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the width and height of the image.
**Notes:** Pass the new size of the image, measured in points.

Discussion:
The size of an NSImage object must be set before it can be used. If the size of the image hasn't already been set when an image representation is added, the size is taken from the image representation's data. For EPS images, the size is taken from the image's bounding box. For TIFF images, the size is taken from the ImageLength and ImageWidth attributes.

Changing the size of an NSImage after it has been used effectively resizes the image. Changing the size invalidates all its caches and frees them. When the image is next composited, the selected representation will draw itself in an offscreen window to recreate the cache.

### 36.10.209 TIFFRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns a string containing TIFF data for all of the image representations in the receiver.
**Example:**

```
Dim p As Picture = LogoMBS(500)

// save as tiff

Dim n As New NSImageMBS(p)
Dim tiff As String = n.TIFFRepresentation
Dim file1 As FolderItem = SpecialFolder.Desktop.Child("test1.tif")
Dim b As BinaryStream = BinaryStream.Create(file1)
b.Write tiff
b.Close
```

**Notes:** A string containing the TIFF data, or nil if the TIFF data could not be created.

Discussion:
You can use the returned data object to write the TIFF data to a file. For each image representation, this method uses the TIFF compression option associated with that representation or NSTIFFCompressionNone, if no option is set.

If one of the receiver's image representations does not support the creation of TIFF data natively (PDF and EPS images, for example), this method creates the TIFF data from that representation's cached content.

### 36.10.210 TIFFRepresentationMT as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a string containing TIFF data for all of the image representations in the receiver.
**Example:**

```
// take some Picture
dim logo as Picture = LogoMBS(500)

// make a NSImageMBS from it
dim nsimage as new NSImageMBS(logo)

// use thread friendly compress function
dim data as MemoryBlock = nsimage.TIFFRepresentationMT

// decode to see if it worked
dim test as Picture = TIFFStringToPictureMBS(data)

// and display
Backdrop = test
```

**Notes:** A string containing the TIFF data, or nil if the TIFF data could not be created.

Discussion:
You can use the returned data object to write the TIFF data to a file. For each image representation, this method uses the TIFF compression option associated with that representation or NSTIFFCompressionNone, if no option is set.

If one of the receiver's image representations does not support the creation of TIFF data natively (PDF and EPS images, for example), this method creates the TIFF data from that representation's cached content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.211 TIFFRepresentationUsingCompression(comp as Integer, factor as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns a string containing TIFF data for all of the image representations in the receiver.
**Notes:** comp: The type of compression to use. For a list of values, see the constants in NSBitmapImageRep.

aFloat: Provides a hint for compression types that implement variable compression ratios. Currently, only JPEG compression uses a compression factor.

Returns a string containing the TIFF data, or nil if the TIFF data could not be created.

Discussion:
You can use the returned data object to write the TIFF data to a file. If the specified compression isn't applicable, no compression is used. If a problem is encountered during generation of the TIFF data, this method may raise an exception.

If one of the receiver's image representations does not support the creation of TIFF data natively (PDF and EPS images, for example), this method creates the TIFF data from that representation's cached content.

### 36.10.212 TIFFRepresentationUsingCompressionMT(comp as Integer, factor as Double) as Memoryblock

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a string containing TIFF data for all of the image representations in the receiver.
**Notes:** comp: The type of compression to use. For a list of values, see the constants in NSBitmapImageRep.

aFloat: Provides a hint for compression types that implement variable compression ratios. Currently, only JPEG compression uses a compression factor.

Returns a string containing the TIFF data, or nil if the TIFF data could not be created.

Discussion:
You can use the returned data object to write the TIFF data to a file. If the specified compression isn't applicable, no compression is used. If a problem is encountered during generation of the TIFF data, this

method may raise an exception.

If one of the receiver's image representations does not support the creation of TIFF data natively (PDF and EPS images, for example), this method creates the TIFF data from that representation's cached content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 36.10.213 Properties

### 36.10.214 accessibilityDescription as string

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** The image's accessibility description.
**Notes:** A short localized string that does not include the name of the interface element.

This description will be used automatically by interface elements that display images. Like all accessibility descriptions, the string should be a short localized string that does not include the name of the interface element. For instance, "delete" rather than "delete button".
(Read and Write property)

### 36.10.215 backgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** The background color of image.
**Notes:** The background color of the image. The default color is transparent, as returned by the clearColor method of NSColor.
The background color is visible only if the drawn image representation does not completely cover all of the pixels available for the image's current size.

The value of this variant must be an object of class NSColorMBS.
(Read and Write property)

### 36.10.216 cacheDepthMatchesImageDepth as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether an image's offscreen window caches use the same bit depth as the image data itself.
**Notes:** Returns true if the offscreen window caches use the same bit depth as the image data; otherwise, false. The default value is false.
(Read and Write property)

### 36.10.217 cacheMode as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The receiver's caching mode.
**Notes:** The caching mode determines when the receiver's image representations use offscreen caches. Offscreen caches speed up rendering time but do so by using extra memory. In the default caching mode (NSImageCacheDefault), each image representation chooses the caching technique that produces the fastest drawing times. For example, in the default mode, the NSPDFImageRep and NSEPSImageRep classes use the NSImageCacheAlways mode but the NSBitmapImageRep class uses the NSImageCacheBySize mode.
(Read and Write property)

### 36.10.218 EXIFData as Dictionary

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns a dictionary with exif data.
**Notes:** (Read only property)

### 36.10.219 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The handle to the internally used NSImage object.
**Notes:** (Read and Write property)

### 36.10.220 height as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The height of the image or zero.
**Notes:** If no size has been set and the size cannot be determined from any of the receiver's image represen-

tations.
(Read only property)

### 36.10.221 isCachedSeparately as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether each image representation caches its contents in a separate offscreen window.
**Notes:** Returns true if the image representations cache their content in separate offscreen windows; otherwise, false. The default value is false.

Discussion:
If this method returns false, it means that the image may be cached in a shared window but is not required to be. Images are cached in a shared window if they have the same general attributes, such as color space, resolution, and bit depth.
(Read and Write property)

### 36.10.222 isDataRetained as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the receiver retains its source image data.
**Notes:** Returns true if the image retains its source data; otherwise, false. The default value is false with some exceptions, which are covered in the discussion.
(Read and Write property)

### 36.10.223 isFlipped as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the image uses a flipped coordinate system.
**Notes:** Returns true if the image's coordinate system is flipped; otherwise, false. The default is false.
(Read and Write property)

### 36.10.224 isTemplate as Boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the image is a template image.
**Example:**

```
Dim ActionGearTemplate as string // content of PDF file
Dim Image as New NSImageMBS( ActionGearTemplate )
Image.setSize( 14,14 )
Image.IsTemplate = true
```

**Notes:** Value is true if the image is a template image; otherwise, false.
Template images consist of black and clear colors (and an alpha channel). Template images are not intended to be used as standalone images and are usually mixed with other content to create the desired final appearance.
Available in Mac OS X v10.5 and later.
Assigning value to istemplate, will internally call setTemplate.
(Read and Write property)

### 36.10.225 isValid as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the image can be drawn.
**Notes:** Return value: true if the receiver can be drawn; otherwise, false.

If the object is initialized with an existing image file, but the corresponding image data is not yet loaded into memory, this method loads the data and expands it as needed. If the object contains no image representations and no associated image file, this method creates a valid cached image representation and initializes it to the default bit depth. This method returns false in cases where the file or URL from which it was initialized is nonexistent or when the data in an existing file is invalid.
(Read only property)

### 36.10.226 matchesOnMultipleResolution as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether image representations whose resolution is an integral multiple of the device resolution are considered a match.
**Notes:** Returns true if image representations whose resolution is an integral multiple of the device resolution are considered a match; otherwise, false.

Discussion:
When this method returns false, only image representations whose resolution is exactly the same as the device resolution are considered matches. If this method returns true and multiple image representations fit this criteria, the one whose resolution is closest to the device resolution is chosen.

The default value is true.
(Read and Write property)

### 36.10.227 MaximumPixelHeight as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** From all the image representation the height of the heighest one.
**Notes:** Value is returned in pixels. Returns 0 on any error.
(Read only property)

### 36.10.228 MaximumPixelWidth as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** From all the image representation the width of the widest one.
**Notes:** Value is returned in pixels. Returns 0 on any error.
(Read only property)

### 36.10.229 MinimumPixelHeight as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** From all the image representation the width of the smallest one.
**Notes:** Value is returned in pixels. Returns 0 on any error.
(Read only property)

### 36.10.230 MinimumPixelWidth as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** From all the image representation the width of the smallest one.
**Notes:** Value is returned in pixels. Returns 0 on any error.
(Read only property)

### 36.10.231 name as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the name associated with the receiver, if any.
**Notes:** (Read only property)

### 36.10.232 prefersColorMatch as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the image prefers to choose image representations using color matching or resolution matching.
**Notes:** Discussion:
Both color matching and resolution matching may influence the choice of an image representation. This method simply indicates which technique is used first during the selection process. The default value is true.
(Read and Write property)

### 36.10.233 RepresentationsCount as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Number of represtations this image has.
**Notes:** Same as Representations.Count
(Read only property)

### 36.10.234 scalesWhenResized as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether image representations are scaled to fit the receiver's size.
**Notes:** Returns true if image representations are scaled to fit the receiver; otherwise, false. The default value is false.

Images are not resized during drawing if this method returns true. They are only resized when you change the size by sending the receiver a setSize message.
(Read and Write property)

### 36.10.235 size as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The size of the receiver.
**Notes:** The size of the receiver or (0.0, 0.0) if no size has been set and the size cannot be determined from

any of the receiver's image representations.

The size of an NSImage object must be set before it can be used. If the size of the image hasn't already been set when an image representation is added, the size is taken from the image representation's data. For EPS images, the size is taken from the image's bounding box. For TIFF images, the size is taken from the ImageLength and ImageWidth attributes.

Changing the size of an NSImage after it has been used effectively resizes the image. Changing the size invalidates all its caches and frees them. When the image is next composited, the selected representation will draw itself in an offscreen window to recreate the cache.
(Read and Write property)

### 36.10.236 symbolConfiguration as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** The configuration details for a symbol image.
**Notes:** Use this property to access the traits and rendering attributes the system uses with the symbol image. These details determine which variant of the image to load and draw and how to render it, falling back on the current environment for values that you don,Äôt specify. For symbol images, the default value of this property is a symbol image configuration object with unspecified values.
You can,Äôt modify this property directly, but you can use imageWithSymbolConfiguration() when you want to create a new image object with a specific set of traits.

For macOS 12.0 or newer.
(Read only property)

### 36.10.237 usesEPSOnResolutionMismatch as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether EPS image representations are preferred when no other representations match the resolution of the device.
**Notes:** (Read and Write property)

### 36.10.238 width as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The width of the image or zero.
**Notes:** If no size has been set and the size cannot be determined from any of the receiver's image represen-

tations.
(Read only property)

### 36.10.239 Constants

Image Cache Modes

| Constant | Value | Description |
|---|---|---|
| NSImageCacheAlways | 1 | Always generate a cache when drawing. |
| NSImageCacheBySize | 2 | Cache if cache size is smaller than the original data. |
| NSImageCacheDefault | 0 | Caching is unspecified.<br>Use the image rep's default. |
| NSImageCacheNever | 3 | Never cache; always draw direct. |

Image Load Status

| Constant | Value | Description |
|---|---|---|
| NSImageLoadStatusCancelled | 1 | Image loading was canceled.<br>The image contains the portions of the data that have already been success decompressed, if any. |
| NSImageLoadStatusCompleted | 0 | Enough data has been provided to completely decompress the image. |
| NSImageLoadStatusInvalidData | 2 | An error occurred during image decompression.<br>The image data is probably corrupt. The image contains the portions of data that have already been successfully decompressed, if any. |
| NSImageLoadStatusReadError | 4 | Not enough data was available for full decompression of the image.<br>The image contains the portions of the data that have already been success decompressed, if any. |
| NSImageLoadStatusUnexpectedEOF | 3 | Not enough data was available for full decompression of the image.<br>The image contains the portions of the data that have already been success decompressed, if any. |

## 36.11 class NSImageRepMBS

### 36.11.1 class NSImageRepMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSImageRep class is a semiabstract superclass ("semi" because it has some instance variables and implementation of its own).
**Notes:** Each of its subclasses knows how to draw an image from a particular kind of source data. While an NSImageRep subclass can be used directly, it is typically through an NSImage object. An NSImage object manages a group of image representations, choosing the best one for the current output device.

Subclasses are not implemented in the plugin currently.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 36.11.2 Methods

### 36.11.3 canInitWithData(data as memoryblock) as Boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the receiver can initialize itself from the specified data.
**Notes:** Returns true if the receiver understands the format of the specified data and can use it to initialize itself; otherwise, false.

This method should be overridden by subclasses. Note that this method does not need to do a comprehensive check of the image data; it should return false only if it knows it cannot initialize itself from the data.

### 36.11.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 36.11.5 setSize(width as Double, height as Double)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the size of the image representation to the specified value.
**Notes:** This method determines the size of the image when it's rendered. It is not necessarily the same as the width and height of the image in pixels as specified by the image data, nor must it be equal to the size set for the NSImage object that wraps this image representation. You must set the image size before you can render it.

The size of an image representation combined with the physical dimensions of the image data determine the resolution of the image.

### 36.11.6 Properties

### 36.11.7 bitsPerSample as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of bits per sample in the receiver.
**Notes:** (Read and Write property)

### 36.11.8 colorSpaceName as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the receiver's color space.
**Notes:** The colorspace name, or NSCalibratedRGBColorSpace if no name has been assigned.

By default, an NSImageRep object's color space name is NSCalibratedRGBColorSpace. Color space names are defined as part of the NSColor class, in NSGraphics.h. The following are valid color space names:

NSCalibratedWhiteColorSpace
NSCalibratedBlackColorSpace
NSCalibratedRGBColorSpace
NSDeviceWhiteColorSpace
NSDeviceBlackColorSpace
NSDeviceRGBColorSpace
NSDeviceCMYKColorSpace
NSNamedColorSpace
NSCustomColorSpace
(Read and Write property)

### 36.11.9 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 36.11.10 hasAlpha as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver has an alpha channel.
**Notes:** Returns true if the receiver has a known alpha channel; otherwise, false.

Subclasses should call this method when loading image data to notify the parent class whether that data contains an alpha component. Passing in a value of true does not add an alpha channel to the image data itself; it merely records the fact that the data has an alpha channel.
(Read and Write property)

### 36.11.11 height as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Height of image in points.
**Notes:** 0 on any error.
(Read only property)

### 36.11.12 isOpaque as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the receiver is opaque.
**Notes:** Use this method to test whether an image representation completely covers the area within the rectangle returned by the size method.

The returned value does not indicate whether the image has an alpha channel or if there is partial or complete transparency when drawing the image rep. Use the hasAlpha method to determine if the image has an alpha channel.
(Read and Write property)

### 36.11.13 pixelsHigh as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the height of the image, measured in pixels.
**Notes:** Return Value:
The height of the image, measured in the units of the device coordinate space. This value is usually derived from the image data itself.
(Read and Write property)

### 36.11.14 pixelsWide as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the width of the image, measured in pixels.
**Notes:** Return Value:
The width of the image, measured in the units of the device coordinate space. This value is usually derived from the image data itself.
(Read and Write property)

### 36.11.15 size as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The size of the image representation.
**Notes:** This size is the size of the image representation when it's rendered. It is not necessarily the same as the width and height of the image in pixels as specified by the image data, nor must it be equal to the size set for the NSImage object that wraps this image representation.

The size of an image representation combined with the physical dimensions of the image data determine the resolution of the image.
(Read and Write property)

### 36.11.16 width as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Width of image in points.
**Notes:** 0 on any error.
(Read only property)

### 36.11.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSImageRepMatchesDevice | 0 | One of the constants used by NSImageRep to denote an attribute whose value changes to match the display device.<br>Indicates that the value of certain attributes, such as the number of colors or bits per sample, will change to match the display device.<br>This value can be passed in (or received back) as the value of bitsPerSample, pixelsWide, and pixelsHigh. |

## 36.12 class NSImageSymbolConfigurationMBS

### 36.12.1 class NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** An object that contains the specific font, style, and weight attributes to apply to a symbol image.
**Example:**

```
Dim config As NSImageSymbolConfigurationMBS = NSImageSymbolConfigurationMBS.configurationWith-
PointSize(40, 0)
Dim n As NSImageMBS = NSImageMBS.imageWithSystemSymbolName("trash")
Dim o As NSImageMBS = n.imageWithSymbolConfiguration(config)

Backdrop = o.CopyPictureWithAlpha
```

**Notes:** Symbol image configuration objects include details such as the point size, scale, text style, and weight to apply to your symbol image. The system uses these details to determine which variant of the image to use and how to scale or style the image.

NSImageSymbolConfiguration objects are immutable after you create them. If you use the configurationByApplyingConfiguration method on the object, the new image attributes replace any previous attributes you supplied. After creating a symbol configuration object, assign it to the symbolConfiguration property of the NSImageViewMBS object you use to display the image. If you draw the image directly, use the imageWithSymbolConfiguration method to create a new image that contains the new attributes.

For design guidance, see Human Interface Guidelines.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr1

**Xojo Developer Magazine**

- 20.4, page 10: News
- 20.3, page 10: News

### 36.12.2 Methods

### 36.12.3 available as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on macOS 11.0 or later.

### 36.12.4 configurationByApplyingConfiguration(configuration as NSImageSymbolConfigurationMBS) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a configuration object by applying the values from the configuration you specify.
**Notes:** for macOS 12.0 or newer.

### 36.12.5 configurationPreferringMulticolor as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a configuration that specifies that the symbol should prefer its multicolor variant if one exists.
**Notes:** You can combine this configuration with one of the palette-based configurations. In that case, the symbol uses the multicolor variant if one exists; otherwise the symbol uses the palette version.
If the symbol supports neither, the symbol uses the monochrome (templated) symbol.

### 36.12.6 configurationWithHierarchicalColor(hierarchicalColor as NSColorMBS) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a hierarchical color configuration using the color you specify.
**Notes:** This method creates a color scheme based on a single color. The system reduces the intensity of the base color to create the secondary and tertiary colors.
When combining this with another configuration, the last configuration overrides existing values.
If the symbol doesn,Äôt have a palette variant, this color configuration doesn,Äôt have an effect, so the symbol uses the monochrome (templated) symbol.

### 36.12.7 configurationWithPaletteColors(paletteColors() as NSColorMBS) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a color configuration by specifying a palette of colors.
**Example:**

```
// shows red colored trash can
Dim colors() As NSColorMBS
colors.Append NSColorMBS.redColor
Dim config As NSImageSymbolConfigurationMBS = NSImageSymbolConfigurationMBS.configurationWithPaletteColors(colors)
Dim n As NSImageMBS = NSImageMBS.imageWithSystemSymbolName("trash")
Dim o As NSImageMBS = n.imageWithSymbolConfiguration(config)

Backdrop = o.CopyPictureWithAlpha
```

**Notes:** The system applies the colors sequentially per layer —the first color for the first layer, and the second color for the second layer. This is independent of the hierarchy level of the layer.
When you combine this with another configuration to create a palette, the last configuration overrides any existing color configuration.
If the symbol doesn,Äôt have a palette variant, this color configuration doesn,Äôt have an effect, so the symbol uses the monochrome (templated) symbol.

### 36.12.8 configurationWithPointSize(pointSize as Double, weight as Double) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a symbol configuration with the specified point size and font weight.
See also:

- 36.12.9 configurationWithPointSize(pointSize as Double, weight as Double, SymbolScale as Integer) as NSImageSymbolConfigurationMBS 7631

### 36.12.9 configurationWithPointSize(pointSize as Double, weight as Double, SymbolScale as Integer) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a symbol configuration with the specified point size, font weight, and symbol scale.
See also:

- 36.12.8 configurationWithPointSize(pointSize as Double, weight as Double) as NSImageSymbolConfigurationMBS 7631

### 36.12.10 configurationWithScale(SymbolScale as Integer) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a symbol configuration using the scale you specify.
**Example:**

```
Dim config As NSImageSymbolConfigurationMBS = NSImageSymbolConfigurationMBS.configurationWithScale(NSImageSymbolConfigurationMBS.kSymbolScaleLarge)
Dim n As NSImageMBS = NSImageMBS.imageWithSystemSymbolName("trash")
Dim o As NSImageMBS = n.imageWithSymbolConfiguration(config)

Backdrop = o.CopyPictureWithAlpha
```

### 36.12.11 configurationWithTextStyle(TextStyle as Integer) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a symbol configuration with the specified text style.
See also:

- 36.12.12 configurationWithTextStyle(TextStyle as Integer, SymbolScale as Integer) as NSImageSymbolConfigurationMBS 7632

### 36.12.12 configurationWithTextStyle(TextStyle as Integer, SymbolScale as Integer) as NSImageSymbolConfigurationMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a symbol configuration with the specified text style and symbol scale.
See also:

- 36.12.11 configurationWithTextStyle(TextStyle as Integer) as NSImageSymbolConfigurationMBS 7632

### 36.12.13 Constructor

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 36.12.14 NSFontTextStyleBody as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for body text.

### 36.12.15 NSFontTextStyleCallout as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for callouts.

### 36.12.16 NSFontTextStyleCaption1 as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for standard captions.

### 36.12.17 NSFontTextStyleCaption2 as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for alternate captions.

### 36.12.18 NSFontTextStyleFootnote as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use in footnotes.

### 36.12.19 NSFontTextStyleHeadline as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for headings.

### 36.12.20 NSFontTextStyleLargeTitle as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for titles.

### 36.12.21 NSFontTextStyleSubheadline as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for subheadings.

### 36.12.22 NSFontTextStyleTitle1 as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for first-level hierarchical headings.

### 36.12.23 NSFontTextStyleTitle2 as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for second-level hierarchical headings.

### 36.12.24 NSFontTextStyleTitle3 as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the text style constants.
**Notes:** The font you use for third-level hierarchical headings.

### 36.12.25 Properties

### 36.12.26 Description as String

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** Shows description for debugging.
**Example:**

Dim config As NSImageSymbolConfigurationMBS = NSImageSymbolConfigurationMBS.configurationWithScale(NSImageSymbolConfigurationMBS.kSymbolScaleLarge)

MessageBox config.Description

**Notes:** (Read only property)

### 36.12.27 Handle as Integer

MBS MacBase Plugin, Plugin Version: 22.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference number.
**Notes:** (Read only property)

### 36.12.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kSymbolScaleLarge | 3 | Specifies which scale variant of a symbol image to use.<br>The symbol uses the large scale variant.<br>This scale is approximately 30% larger than the kSymbolScaleMedium scale. |
| kSymbolScaleMedium | 2 | Specifies which scale variant of a symbol image to use.<br>The symbol uses the default medium scale variant. |
| kSymbolScaleSmall | 1 | Specifies which scale variant of a symbol image to use.<br>The symbol uses the small scale variant.<br>This scale is approximately 20% smaller than the kSymbolScaleMedium scale. |

## 36.13 class NSPDFImageRepMBS

### 36.13.1 class NSPDFImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSPDFImageRep object can render an image from a PDF format data stream.
**Notes:** Subclass of the NSImageRepMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr5

### 36.13.2 Methods

### 36.13.3 Constructor(data as Memoryblock)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSPDFImageRep object initialized with the specified PDF data.
**Notes:** Initialized NSPDFImageRep object. Initialization may fail if the PDF data does not conform to the PDF file format.
On success handle property is not zero.

### 36.13.4 imageRepWithData(data as Memoryblock) as NSPDFImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSPDFImageRep object initialized with the specified PDF data.
**Notes:** Returns an initialized NSPDFImageRep object or nil if the object could not be initialized. Initialization may fail if the PDF data does not conform to the PDF file format.

### 36.13.5 PDFRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the PDF representation of the receiver's image.

### 36.13.6 Properties

### 36.13.7 bounds as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's bounding rectangle.
**Notes:** This value is equivalent to the crop box specified by the PDF data.
(Read only property)

### 36.13.8 currentPage as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The page currently displayed by the image representation.
**Notes:** A zero-based index indicating the page being displayed.
(Read and Write property)

### 36.13.9 pageCount as Integer

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of pages in the receiver.
**Notes:** (Read only property)

## 36.14 class NSPICTImageRepMBS

### 36.14.1 class NSPICTImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSPICTImageRep object renders an image from a PICT format data stream as described in the Carbon QuickDraw Manager documentation.
**Notes:** This class can render PICT format version 1, version 2, and extended version 2 pictures.
Subclass of the NSImageRepMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr5

### 36.14.2 Methods

### 36.14.3 Constructor(data as Memoryblock)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSPICTImageRep object initialized with the specified data.
**Notes:** data: A data object containing the PICT data.

Initialization may fail if the data does not conform to the PICT file format.
On success the handle property is not zero.

If the PICT data is obtained directly from a PICT file or document, this method ignores most of the 512-byte header that occurs before the start of the actual picture data. It may retrieve some relevant meta information from the header.

### 36.14.4 imageRepWithData(data as Memoryblock) as NSPICTImageRepMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSPICTImageRep object initialized with the specified data.
**Notes:** Initialization may fail if the data does not conform to the PICT file format.
On failure the handle property is nil.

### 36.14.5 PICTRepresentation as Memoryblock

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's PICT data.
**Notes:** A data object containing the PICT data. The returned data does not include the 512-byte header, if it was present in the original data. If you want to write the returned data to a file, you must precede it with a 512-byte header (containing all zeros) if you want to conform to the PICT document format.

### 36.14.6 Properties

### 36.14.7 boundingBox as NSRectMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the rectangle that bounds the receiver.
**Notes:** The rectangle bounding the receiver. This rectangle is obtained from the the picFrame field in the picture header. See the Carbon QuickDraw Manager documentation for information on the picture header. (Read only property)

# Chapter 37

# Cocoa Menus

## 37.1 class NSMenuItemMBS

### 37.1.1 class NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** A class to represent a menuitem from the Cocoa world.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- More Menubar options in macOS Sonoma
- MBS Xojo Plugins, version 23.5pr2
- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins 18.3
- Custom menu checkmarks
- Apply fonts to font PopupMenu
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1

**Xojo Developer Magazine**

- 5.6, page 49: Made in the Shade, Using Core Graphics in a REALbasic Project by Toby Rush
- 5.6, page 33: Third Party Plugins: Statusitems, Getting an icon in the top right of the Mac OS X menubar by Christian Schmitz
- 22.1, page 9: News
- 16.5, page 9: News

### 37.1.2 Methods

### 37.1.3 clearAction

MBS MacBase Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Clears action event.
**Notes:** Call this method once to have a menuitem which has no action.

### 37.1.4 Constructor(DesktopMenuitem as DesktopMenuitem)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new NSMenuItemMBS object for a given MenuItem.
**Notes:** May raise UnsupportedOperationException or NilObjectException if used incorrectly.
See also:


- 37.1.5 Constructor(Handle as Integer) 7642
- 37.1.6 Constructor(MenuItem as MenuItem) 7643
- 37.1.7 Constructor(Other as NSMenuItemMBS) 7644
- 37.1.8 Constructor(title as string="", keyEquivalent as string="") 7644


### 37.1.5 Constructor(Handle as Integer)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Example:**

```
dim m as MenuItem = EditCopy
dim h as Integer = m.Handle(MenuItem.HandleType.CocoaNSMenuItem)
dim i as new NSMenuItemMBS(h)

i.Title = "Hello"
```

**Notes:** Useful if you get a NSMenuItem reference from a declare.
The object is retained.
See also:


- 37.1.4 Constructor(DesktopMenuitem as DesktopMenuitem) 7642
- 37.1.6 Constructor(MenuItem as MenuItem) 7643
- 37.1.7 Constructor(Other as NSMenuItemMBS) 7644
- 37.1.8 Constructor(title as string="", keyEquivalent as string="") 7644


### 37.1.6 Constructor(MenuItem as MenuItem)

MBS MacBase Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new NSMenuItemMBS object for a given MenuItem.
**Example:**

```
dim FileDot, FileDiamond as MenuItem

FileDot.enable
FileDot.checked = true

// via constructor
dim n1 as new NSMenuItemMBS(fileDot)
n1.onStateImage = NSImageMBS.imageNamed("NSMenuItemBullet")

FileDiamond.enable
FileDiamond.checked = true

// via function
dim n2 as NSMenuItemMBS = NSMenuItemMBS.MenuItem(FileDiamond)
n2.onStateImage = NSImageMBS.imageNamed("NSMenuItemDiamond")
```

**Notes:** May raise UnsupportedOperationException or NilObjectException if used incorrectly.
See also:


- 37.1.4 Constructor(DesktopMenuitem as DesktopMenuitem) 7642
- 37.1.5 Constructor(Handle as Integer) 7642
- 37.1.7 Constructor(Other as NSMenuItemMBS) 7644
- 37.1.8 Constructor(title as string="", keyEquivalent as string="") 7644

### 37.1.7 Constructor(Other as NSMenuItemMBS)

MBS MacBase Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new NSMenuItemMBS object referencing same NSMenuItem with a new Xojo object.
See also:


- 37.1.4 Constructor(DesktopMenuitem as DesktopMenuitem) 7642
- 37.1.5 Constructor(Handle as Integer) 7642
- 37.1.6 Constructor(MenuItem as MenuItem) 7643
- 37.1.8 Constructor(title as string="", keyEquivalent as string="") 7644


### 37.1.8 Constructor(title as string="", keyEquivalent as string="")

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new menu items.
**Notes:** Handle is not 0 after this call if it was successfull.
name and charcode are optional and can be "".
Charcode is the initial keyEquivalent for this menu item.
You can set the KeyEquivalentModifierMask to get different modifier keys.
See also:


- 37.1.4 Constructor(DesktopMenuitem as DesktopMenuitem) 7642
- 37.1.5 Constructor(Handle as Integer) 7642
- 37.1.6 Constructor(MenuItem as MenuItem) 7643
- 37.1.7 Constructor(Other as NSMenuItemMBS) 7644


### 37.1.9 CreateMenuItem(title as string="", keyEquivalent as string="")

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new menu items.
**Notes:** Handle is not 0 after this call if it was successfull.
name and charcode are optional and can be "".
Charcode is the initial keyEquivalent for this menu item.
You can set the KeyEquivalentModifierMask to get different modifier keys.

Deprecated, please use the Constructor instead.

### 37.1.10 CreateSeparator

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a Separator menu item.

### 37.1.11 MenuItem(DesktopMenuItem as DesktopMenuItem) as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries NSMenuItemMBS for a given menu item.
**Notes:** Returns nil on any error.
See also:

- 37.1.12 MenuItem(MenuItem as MenuItem) as NSMenuItemMBS 7645

### 37.1.12 MenuItem(MenuItem as MenuItem) as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries NSMenuItemMBS for a given menu item.
**Example:**

```
dim FileDot, FileDiamond as MenuItem

FileDot.enable
FileDot.checked = true

// via constructor
dim n1 as new NSMenuItemMBS(fileDot)
n1.onStateImage = NSImageMBS.imageNamed("NSMenuItemBullet")

FileDiamond.enable
FileDiamond.checked = true

// via function
dim n2 as NSMenuItemMBS = NSMenuItemMBS.MenuItem(FileDiamond)
n2.onStateImage = NSImageMBS.imageNamed("NSMenuItemDiamond")
```

**Notes:** Returns nil on any error.
See also:

- 37.1.11 MenuItem(DesktopMenuItem as DesktopMenuItem) as NSMenuItemMBS 7645

### 37.1.13 sectionHeaderWithTitle(Title as String) as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a menu item representing a section header with the provided title.
**Example:**

```
dim m as NSMenuItemMBS = NSMenuItemMBS.MenuItem(EditMenu)

// add the header
dim h as NSMenuItemMBS = NSMenuItemMBS.sectionHeaderWithTitle("Section Header")
h.Enabled = true
m.submenu.addItem h
self.SectionHeader = h

// and the new entry with our MyNSMenuItemMBS class to handle validate and action.
dim n as new MyNSMenuItemMBS("Hello")
n.Enabled = true
m.submenu.addItem n
self.HelloMenu = n // keep references
```

**Notes:** Section header items are used to provide context to a grouping of menu items.
Items created using this method are non-interactive and do not perform an action.

Requires macOS Sonoma or newer.

### 37.1.14 separatorItem as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new separator menu item.

### 37.1.15 setAction(target as NSResponderMBS, selectorName as string)

MBS MacBase Plugin, Plugin Version: 23.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the target for the menu action.
**Example:**

```
dim n as NSMenuItemMBS // your menu item

n.setAction(window1.NSWindowMBS, "performClose:")
```

**Notes:** Please make sure the selector is correct as otherwise you get an exception later.

And make sure the target object stays alive.

### 37.1.16 setTitleWithMnemonic(title as String)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the title of a menu item with a character denoting an access key.
**Notes:** Use an ampersand character to mark the character (the one following the ampersand) to be designated.
Deprecated by Apple.

### 37.1.17 Properties

### 37.1.18 ActionSelector as String

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name of the objective-c method called for this menu event.
**Notes:** You can use this to find menu items by their selector. Which is often more save than by index or title.
(Read only property)

### 37.1.19 Alternate as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this menu item is an alternate to the previous menu item.
**Notes:** Available in Mac OS X v10.3 and later.
(Read and Write property)

### 37.1.20 attributedTitle as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Specifies a custom string for a menu item.
**Notes:** You can use this method to add styled text and embedded images to menu item strings. If you do not set a text color for the attributed string, it is black when not selected, white when selected, and gray when disabled. Colored text remains unchanged when selected.

When you call this method to set the menu title to an attributed string, the setTitle: method is also called to set the menu title with a plain string. If you clear the attributed title, the plain title remains unchanged.

(Read and Write property)

### 37.1.21 Enabled as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this menuitem is enabled.
**Notes:** (Read and Write property)

### 37.1.22 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The reference to the NSMenuItem object used internally.
**Notes:** (Read and Write property)

### 37.1.23 hasSubmenu as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the menuitem has a submenu, false if it doesn't.
**Notes:** (Read only property)

### 37.1.24 Identifier as String

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** A string that identifies this user interface item.
**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items, you would typically set this value in code after creating a view but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a view is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the framework or application. For example, identifiers for standard AppKit interface items, such as the open panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 37.1.25 image as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The image displayed by the menuitem, or nil if it displays no image.
**Notes:** (Read and Write property)

### 37.1.26 indentationLevel as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The menu item indentation level for the menu item.
**Notes:** The value will be from 0 to 15. The default indentation level is 0.
Available in Mac OS X v10.3 and later.
(Read and Write property)

### 37.1.27 isHidden as boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the menuitem is hidden.
**Notes:** Mac OS X 10.5 only.
Returns true if the receiver is hidden, otherwise false.
This value can be set to hide or show a menuitem.
(Read and Write property)

### 37.1.28 isHiddenOrHasHiddenAncestor as boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the menuitem or any of its superitems is hidden.
**Notes:** Mac OS X 10.5 only.
Returns true if the receiver or any of its superitems is hidden, otherwise false.
(Read only property)

### 37.1.29 isHighlighted as boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver should be drawn highlighted.
**Notes:** Returns true if the receiver should be drawn highlighted, otherwise false.
Mac OS X 10.5 only.
(Read only property)

### 37.1.30 isSectionHeader as Boolean

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the item is a section header.
**Notes:** Section header items are created using the sectionHeader() class method.

Requires macOS Sonoma or newer.
(Read only property)

### 37.1.31 isSeparatorItem as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the receiver is a separator item (that is, a menu item used to visually segregate related menu items).
**Notes:** (Read only property)

### 37.1.32 keyEquivalent as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's unmodified keyboard equivalent, or the empty string if one hasn't been defined.
**Example:**

```
dim m as new NSMenuItemMBS
m.CreateMenuItem "Hello"
m.keyEquivalent = "a" // A
m.keyEquivalent = "A" // shift-A
```

**Notes:** Use keyEquivalentModifierMask to determine the modifier mask for the key equivalent. In the current implementation "A" can be interpreted as Shift-A by the system even without the shift in the mask.

(Read and Write property)

### 37.1.33 keyEquivalentModifierMask as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** the menu item's keyboard equivalent modifier mask.
**Example:**

```
const NSShiftKeyMask=131072
const NSControlKeyMask=262144
const NSAlternateKeyMask=524288
const NSCommandKeyMask=1048576

dim d as new NSMenuItemMBS
d.CreateMenuItem "Last menu entry",""
d.Enabled=true
d.KeyEquivalent="A"
d.KeyEquivalentModifierMask=NSShiftKeyMask+NSCommandKeyMask+NSAlternateKeyMask // command-option-shift
```

**Notes:** Constants for the mask:

NSAlphaShiftKeyMask = 65536
Set if Caps Lock key is pressed.
Available in Mac OS X v10.0 and later.

NSShiftKeyMask = 131072
Set if Shift key is pressed.
Available in Mac OS X v10.0 and later.

NSControlKeyMask = 262144
Set if Control key is pressed.
Available in Mac OS X v10.0 and later.

NSAlternateKeyMask = 524288
Set if Option or Alternate key is pressed.
Available in Mac OS X v10.0 and later.

NSCommandKeyMask = 1048576
Set if Command key is pressed.
Available in Mac OS X v10.0 and later.

NSNumericPadKeyMask = 2097152
Set if any key in the numeric keypad is pressed. The numeric keypad is generally on the right side of the keyboard. This is also set if any of the arrow keys are pressed (NSUpArrowFunctionKey, NSDownArrowFunctionKey, NSLeftArrowFunctionKey, and NSRightArrowFunctionKey).
Available in Mac OS X v10.0 and later.

NSHelpKeyMask = 4194304
Set if the Help key is pressed.
Available in Mac OS X v10.0 and later.

NSFunctionKeyMask = 8388608
Set if any function key is pressed. The function keys include the F keys at the top of most keyboards (F1, F2, and so on) and the navigation keys in the center of most keyboards (Help, Forward Delete, Home, End, Page Up, Page Down, and the arrow keys).
Available in Mac OS X v10.0 and later.

NSDeviceIndependentModifierFlagsMask = 16777216
Used to retrieve only the device-independent modifier flags, allowing applications to mask off the device-dependent modifier flags, including event coalescing information.
Available in Mac OS X v10.4.
(Read and Write property)

### 37.1.34 menu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The menu where this menu item is inside.
**Notes:** nil if no menu belongs to this menuitem.
(Read only property)

### 37.1.35 mixedStateImage as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The image used to depict a "mixed state."
**Notes:** A mixed state is useful for indicating "off" and "on" attribute values in a group of selected objects, such as a selection of text containing bold and plain (nonbolded) words.
(Read and Write property)

### 37.1.36 offStateImage as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The image used to depict the receiver's "off" state, or nil if the image has not been set.
**Notes:** By default, there is no off state image.
(Read and Write property)

### 37.1.37 onStateImage as NSImageMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The image of the receiver that indicates an "on" state.
**Notes:** The Image object to use for the "on" state of the menu item. If itemImage is nil, any current on-state image is removed.
(Read and Write property)

### 37.1.38 parentItem as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu item whose submenu contains the receiver.
**Notes:** Returns the parent menu item, or nil if the receiver does not have a parent item.
Available in Mac OS X v10.6 and later.
(Read only property)

### 37.1.39 state as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The state of the menuitem.
**Notes:** An integer constant representing a state; it should be one of NSOffState, NSOnState, or NSMixedState.
Same as Checked property on Xojo's menu items.

Constants:

| | |
|---|---|
| NSMixedState = -1 | The corresponding feature is in effect somewhere. |
| NSOffState = 0 | The corresponding feature is in effect nowhere. |
| NSOnState = 1 | The corresponding feature is in effect everywhere. |

(Read and Write property)

### 37.1.40 submenu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The submenu attached to this menuitem.
**Notes:** nil if there is no submenu.
(Read and Write property)

### 37.1.41 tag as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The menu item tag value.
**Notes:** You can use this value as you like.

If you need to store more custom data than just an integer, you should subclass the NSMenuItemMBS class and add properties as needed.
(Read and Write property)

### 37.1.42 Title as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The title of the menu item.
**Notes:** (Read and Write property)

### 37.1.43 toolTip as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The help tag for a menu item.
**Notes:** (Read and Write property)

### 37.1.44 userKeyEquivalent as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The user-assigned key equivalent for the menu item.
**Notes:** (Read only property)

### 37.1.45 view as NSViewMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The view to be used for this menuitem.
**Notes:** Using a view you can draw whatever you like in the menu item.
You can set it to nil to remove the view.
Requires Mac OS X 10.5.
(Read and Write property)

### 37.1.46 usesUserKeyEquivalents as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether menu items conform to user preferences for key equivalents.
**Notes:** If true, menu items conform to user preferences for key equivalents; if false, the key equivalents originally assigned to the menu items are used.
(Read and Write computed property)

### 37.1.47 Events

### 37.1.48 Action

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** The action event called when the user clicks on the statusitem.
**Notes:** This event is coming from the Cocoa event system. What you can do is a bit limited when using GUI functions from Xojo. To avoid some redraw errors, you may want to start a timer and let your Xojo code run a millisecond after the menu code has finished.
Depending on what you do, you can see the menu not redrawing properly (staying highlighted) and crashes if the Xojo code modifies some global Cocoa states.

### 37.1.49 validateMenuItem(menuItem as NSMenuItemMBS) as boolean

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implemented to override the default action of enabling or disabling a specific menu item.
**Notes:** Return true to enable menuItem, false to disable it.

This is needed to modify the menuitem for a menu attached to a NSSearchFieldMBS.
Menuitem parameter is often the same as self, but for a searchfield menu, self is the template and menuitem parameter the actual menu item.

### 37.1.50 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSMixedState | -1 | One of the constants for the state property.<br>The corresponding feature is in effect somewhere. |
| NSOffState | 0 | One of the constants for the state property.<br>The corresponding feature is in effect nowhere. |
| NSOnState | 1 | One of the constants for the state property.<br>The corresponding feature is in effect everywhere. |

## 37.2 class NSMenuMBS

### 37.2.1 class NSMenuMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** A class to represent a menu in the Cocoa world.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- News from the MBS Xojo Plugins Version 23.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- More Menubar options in macOS Sonoma
- MBS Xojo Plugins, version 23.5pr2
- MBS Xojo / Real Studio Plugins, version 15.5pr1
- MBS Xojo / Real Studio Plugins, version 15.2pr1
- Apply fonts to font PopupMenu
- MBS Xojo / Real Studio Plugins, version 14.3pr1
- MBS Xojo / Real Studio Plugins, version 14.0pr2

**Xojo Developer Magazine**

- 5.6, page 33: Third Party Plugins: Statusitems, Getting an icon in the top right of the Mac OS X menubar by Christian Schmitz
- 22.1, page 9: News

### 37.2.2 Methods

### 37.2.3 addItem(m as NSMenuItemMBS)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a menu item to the end.
**Notes:** If the menuitem is nil, nothing happens.
The menuitem can only be in one menu.

The menu doesn't references to the RB classes behind, so it's up to you to keep those references if you want to get the events and avoid crashes.
The StatusItem example keeps an array with all those menu item objects it needs so RB will not destroy them.

### 37.2.4 cancelTracking

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Dismisses the menu and ends all menu tracking.
**Notes:** Available in Mac OS X v10.5 and later.

### 37.2.5 cancelTrackingWithoutAnimation

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Dismisses the menu and ends all menu tracking without displaying the associated animation.
**Notes:** Available in Mac OS X v10.6 and later.

### 37.2.6 Constructor(Handle as Integer)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a NSMenu reference from a declare.
The object is retained.
See also:

- 37.2.7 Constructor(title as string="") 7658

### 37.2.7 Constructor(title as string="")

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for a new nsmenu.
**Example:**

```
dim m as NSMenuMBS
m=new NSMenuMBS("Hello World")
msgbox m.title // shows "Hello World"
```

**Notes:** Title is optional.
See also:

- 37.2.6 Constructor(Handle as Integer) 7658

### 37.2.8 helpMenu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the help menu if one is registered.

### 37.2.9 indexOfItem(item as NSMenuItemMBS) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index identifying the location of a specified menu item in the receiver.
**Notes:** Returns the integer index of the menu item or, if no such menu item is in the menu, –1.

### 37.2.10 indexOfItemWithSelector(selector as string) as Integer

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Searches menu items for one with the given selector.
**Notes:** Returns -1 if not found.
You can use this to find menu items by their selector. Which is often more save than by index or title.

### 37.2.11 indexOfItemWithSubmenu(item as NSMenuMBS) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the menu item in the receiver with the given submenu.
**Notes:** item: A menu object that is a menu item of the receiver (that is, a submenu).

The integer index of the menu item or, if no such menu item is in the menu, –1.

### 37.2.12 indexOfItemWithTag(tag as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the first menu item in the receiver identified by a tag.
**Notes:** Returns the integer index of the menu item or, if no such menu item is in the menu, –1.

### 37.2.13 indexOfItemWithTitle(title as string) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the first menu item in the receiver that has a specified title.
**Notes:** The integer index of the menu item or, if no such menu item is in the menu, –1.

### 37.2.14 insertItem(m as NSMenuItemMBS, index as Integer)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Inserts a menu item into the menu at a specific location.
**Notes:** If the menuitem is nil, nothing happens. A menuitem can only be part of one menu.

index: An integer index identifying the location of the menu item in the menu. Zero based.

### 37.2.15 Item(index as Integer) as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the item with the given index.
**Notes:** Index is from 0 to numberOfItems-1.
Remember: The objects returned are not the same Xojo objects used with additem or insertitem.

### 37.2.16 itemWithSelector(selector as string) as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Searches menu items for one with the given selector.
**Notes:** You can use this to find menu items by their selector. Which is often more save than by index or title.

### 37.2.17 mainMenu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the main menu.

### 37.2.18 menuBarVisible as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the menu bar is visible.
**Notes:** Available in Mac OS X v10.2 and later.
Returns true if the menu bar is visible, otherwise false.

### 37.2.19 NSMenuDidAddItemNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted after a menu item is added to the menu. The notification object is the instance of NSMenuMBS that just added the new menu item.
This is very useful to customize the menu in Xojo. The runtime rebuilds menu bar often, so you can catch it and edit menu.

The userInfo dictionary contains the following information:
NSMenuItemIndex: An integer index of the menu item that was added.

### 37.2.20 NSMenuDidBeginTrackingNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Posted when menu tracking begins. The notification object is the main menu bar (NSApplicationMBS mainMenu) or the root menu of a popup button. This notification does not contain a userInfo dictionary.

Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

### 37.2.21 NSMenuDidChangeItemNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted after a menu item in the menu changes appearance. Changes include enabling/disabling, changes in state, and changes to title. The notification object is the instance of NSMenuMBS with the menu item that changed. The userInfo dictionary contains the following information:

| Key | Value |
|---|---|
| NSMenuItemIndex | An integer index of the menu item that changed. |

### 37.2.22 NSMenuDidEndTrackingNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted when menu tracking ends, even if no action is sent. The notification object is the main menu bar (NSApplicationMBS mainMenu) or the root menu of a popup button. This notification does not contain a userInfo

### 37.2.23 NSMenuDidRemoveItemNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted after a menu item is removed from the menu. The notification object is the instance of NSMenu that just removed the menu item. The userInfo dictionary contains the following information:

NSMenuItemIndex: An integer index of the menu item that was removed. Note that this index may no longer be valid and in any event no longer points to the menu item that was removed.

### 37.2.24 NSMenuDidSendActionNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted just after the application dispatches a menu item's action method to the menu item's target. The notification object is the instance of NSMenuMBS containing the chosen menu item. The userInfo dictionary contains the following information:

| Key | Value |
|---|---|
| MenuItem | The menu item that was chosen. |

### 37.2.25 NSMenuWillSendActionNotification as string

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notifications sent for menus.
**Notes:** Use this constant with NSNotificationObserverMBS class to get an event when such a notification is sent.

Posted just before the application dispatches a menu item's action method to the menu item's target. The notification object is the instance of NSMenuMBS containing the chosen menu item. The userInfo dictionary contains the following information:

| Key | Value |
|---|---|
| MenuItem | The menu item that was chosen. |

### 37.2.26 paletteMenuWithColors(colors() as NSColorMBS, itemTitles() as String, templateImage as NSImageMBS = nil) as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates an palette menu displaying user-selectable color tags using the provided template image, tinted using the specified array of colors.
**Example:**

```
dim m as NSMenuItemMBS = NSMenuItemMBS.MenuItem(EditMenu)
```

```
// gather data for menu
dim colors() as NSColorMBS
colors.Append NSColorMBS.whiteColor
colors.Append NSColorMBS.redColor
colors.Append NSColorMBS.blueColor

dim titles() as string = array("White", "Red", "Blue")

// now create palette and attach our handler
paletteMenu = NSMenuMBS.paletteMenuWithColors(Colors, titles)
AddHandler paletteMenu.PaletteSelectionChange, WeakAddressOf PaletteSelectionChange

// now make a dummy menu and add palette
dim n as new MyNSMenuItemMBS("Hello")
n.Enabled = true
n.submenu = paletteMenu
m.submenu.addItem n
self.HelloMenu = n
```

**Notes:** Optionally allows observing changes to the selection state in the compact menu. The block is invoked after the selection has been updated. Currently selected items can be retrieved from the 'selectedItems' property.

Returns a palette menu.

Requires macOS Sonoma or newer.

### 37.2.27 performActionForItemAtIndex(index as Integer)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Causes the application to send the action message of a specified menu item to its target.
**Notes:** If a target is not specified, the message is sent to the first responder. As a side effect, this method posts NSMenuWillSendActionNotification and NSMenuDidSendActionNotification.

In Mac OS X v10.6 and laster the performActionForItemAtIndex no longer triggers menu validation. This is because validation is typically done during menu tracking or key equivalent matching, so the subsequent performActionForItemAtIndex validation was redundant. To trigger validation explicitly, use invoke the update method.

In Mac OS X v10.6 performActionForItemAtIndex, when called, now triggers highlighting in the menu bar. It also sends out appropriate accessibility notifications indicating the item was selected.

### 37.2.28 popUpContextMenu(menu as NSMenuMBS, theEvent as NSEventMBS, view as NSViewMBS, font as NSFontMBS = nil)

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Displays a contextual menu over a view for an event using a specified font.
**Notes:** menu: The menu object to use for the contextual menu.
event: An NSEvent object representing the event.
view: The view object over which to display the contextual menu.
font: An NSFont object representing the font for the contextual menu. If you pass in nil for the font, the method uses the default font for menu.

Specifying a font using the font parameter is discouraged. Instead set the menu,Äôs font using the setFont: method and pass nil for the font parameter.

### 37.2.29 popUpMenuPositioningItem(item as NSMenuItemMBS, location as NSPointMBS, view as NSViewMBS = nil) as boolean

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Pops up the menu at the specified location.
**Example:**

```
// create menu
dim m as new NSMenuMBS
m.autoenablesItems = false

// add some items
dim it as new NSMenuItemMBS
it.CreateMenuItem "Hello"
it.Enabled = true
m.addItem it

it = new NSMenuItemMBS
it.CreateMenuItem "World"
it.Enabled = true
m.addItem it

// show relative to this view
dim v as NSViewMBS = window1.PushButton1.NSViewMBS

dim r as Boolean
r = m.popUpMenuPositioningItem(nil, nil, v)
// you need to use NSMenuItemMBS subclasses with action event to get an event for which item was selected...
```

**Notes:** item: The menu item to be positioned at the specified location in the view.
location: The location in the view coordinate system to display the menu item.
view: The view to display the menu item over.

Returns true if menu tracking ended because an item was selected, and false if menu tracking was cancelled for any reason.

Pops up the receiver as a popup menu. The top left corner of the specified item (if specified, item must be present in the receiver) is positioned at the specified location in the specified view, interpreted in the view's own coordinate system.

If item is nil, the menu is positioned such that the top left of the menu content frame is at the given location. If view is nil, the location is interpreted in the screen coordinate system. This allows you to pop up a menu disconnected from any window.

Available in OS X v10.6 and later.

### 37.2.30 removeAllItems

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Removes all the menu items in the receiver.
**Example:**

```
dim n as NSMenuMBS // your menu

// for Mac OS X 10.6
n.removeAllItems

// for any Mac OS X version
for i as Integer = n.numberOfItems-1 DownTo 0
n.removeItemAtIndex i
next
```

**Notes:** This method is more efficient than removing menu items individually.
Unlike the other remove methods, this method does not post NSMenuDidChangeItemNotification notifications.
Available in Mac OS X v10.6 and later.

### 37.2.31 removeItem(m as NSMenuItemMBS)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the menuitem.
**Notes:** Does nothing if menuitem is nil.

The Xojo object used to add the menuitem must not be the same as the one you use here, but the values for the menuitems handle property must match.

### 37.2.32 removeItemAtIndex(index as Integer)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the menu item with the given index.
**Example:**

```
dim n as NSMenuMBS // your menu

// for Mac OS X 10.6
n.removeAllItems

// for any Mac OS X version
for i as Integer = n.numberOfItems-1 DownTo 0
n.removeItemAtIndex i
next
```

**Notes:** Index is from 0 to NumberOfItems-1.

### 37.2.33 selectedItems as NSMenuItemMBS()

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** The menu items that are selected.
**Notes:** An item is selected when its state is ‘NSControl.StateValue.on‘.

Requires macOS Sonoma or newer.

### 37.2.34 setMenuBarVisible(value as boolean)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets whether the menu bar is visible and selectable by the user.
**Notes:** value: true if menu bar is to be visible, otherwise false.
Available in Mac OS X v10.2 and later.

### 37.2.35 setSelectedItems(items() as NSMenuItemMBS)

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the menu items that are selected.
**Notes:** An item is selected when its state is 'NSControl.StateValue.on'.

Setting 'selectedItems' will select any items that are contained in the provided array, and deselect any previously selected items that are not in the array.

Requires macOS Sonoma or newer.

### 37.2.36 update

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Enables or disables the receiver's menu items based on the NSMenuValidation informal protocol and sizes the menu to fit its current menu items if necessary.

### 37.2.37 windowsMenu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the window menu if one is registered.

### 37.2.38 Properties

### 37.2.39 allowsContextMenuPlugIns as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the popup menu allows appending of contextual menu plugin items.
**Notes:** Value is true if the popup menu allows appending of contextual menu plugin items, otherwise false.
Available in Mac OS X v10.6 and later.

Can be used to hide services menu items.
(Read and Write property)

### 37.2.40 autoenablesItems as Boolean

MBS MacBase Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether menu items are automatically enabled and disabled.
**Notes:** Mac OS X 10.5 only.
(Read and Write property)

### 37.2.41 Font as NSFontMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The font used to display the menu and its submenus.
**Notes:** This font will be used to display the menu and any submenus that have not had their font set explicitly.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 37.2.42 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference to the NSMenu object.
**Notes:** (Read and Write property)

### 37.2.43 highlightedItem as NSMenuItemMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the highlighted item in the receiver.
**Notes:** Returns the highlighted item in the receiver, or nil if no item in the menu is highlighted.
Available in Mac OS X v10.5 and later.
(Read only property)

### 37.2.44 Identifier as String

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop only.

**Function:** A string that identifies this user interface item.
**Notes:** It should be set to a unique value on NSViews when they are intended to be used inside a view-based NSTableView. Identifiers should be unique per-window. For programmatically created user interface items, you would typically set this value in code after creating a view but before adding it to a window. You may also want to set an identifier on a window, after creating it programmatically, to identify the window easily when it is reopened. You should not change the identifier after a view is added to a window. Identifiers beginning with an underscore are reserved for the system. In framework classes that implement this protocol, the accessor methods are not intended to be overridden.

To help avoid collision of identifiers, it is recommended that identifiers use the same prefix as is used for the framework or application. For example, identifiers for standard AppKit interface items, such as the open panel, will begin with "NS".

The slash '/', backslash '\', and colon ':' characters are reserved and should not be used in identifiers.
(Read and Write property)

### 37.2.45 menuBarHeight as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the menu bar height for the current application's main menu.
**Notes:** Returns the receiver's main menu bar height or 0.0 if the receiver is some other menu.
This method supersedes the menuBarHeight class method of the NSMenuView class.
Available in Mac OS X v10.4 and later.
(Read only property)

### 37.2.46 minimumWidth as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The minimum width of the menu.
**Notes:** The menu will not draw smaller than its minimum width, but may draw larger if it needs more space. The default value is 0.
Available in Mac OS X v10.6 and later.
(Read and Write property)

### 37.2.47 numberOfItems as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The number of menu items in this menu.
**Notes:** (Read only property)

### 37.2.48 presentationStyle as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** The presentation style of the menu.
**Notes:** This property is not respected if the menu is the main menu of the app.

Requires macOS Sonoma or newer.
(Read and Write property)

### 37.2.49 selectionMode as Integer

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: Desktop only.

**Function:** The selection mode of the menu.
**Notes:** Note the selection mode only has effect on menu items that belong to the same selection group. A selection group consists of the items with the same target/action.

Requires macOS Sonoma or newer.
(Read and Write property)

### 37.2.50 showsStateColumn as boolean

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver displays the state column.
**Notes:** Available in Mac OS X v10.5 and later.
Returns true if the receiver displays the state column, otherwise false.

The state column is the area in the menu items, where state of menuitems are shown like a checkmark.
(Read and Write property)

### 37.2.51 size as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the size of the menu.
**Notes:** Returns the size of the menu in screen coordinates.
The menu may draw at a smaller size when shown, depending on its positioning and display configuration.
Available in Mac OS X v10.6 and later.
(Read only property)

### 37.2.52 supermenu as NSMenuMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The parent menu of this menu.
**Notes:** (Read only property)

### 37.2.53 Title as String

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The title of the menu.
**Notes:** (Read and Write property)

### 37.2.54 userInterfaceLayoutDirection as Integer

MBS MacBase Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Configures the layout direction of menu items in the menu.
**Notes:** This property configures the layout direction (a value of type NSUserInterfaceLayoutDirection) of menu items in the menu. If no layout direction is explicitly set for a menu, then the menu defaults to the layout direction specified for the application object. See userInterfaceLayoutDirection in NSApplication Class Reference.

NSUserInterfaceLayoutDirectionLeftToRight = 0
NSUserInterfaceLayoutDirectionRightToLeft = 1

Available in OS X v10.11 and later.
(Read and Write property)

### 37.2.55 Events

### 37.2.56 DidClose

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Invoked after a menu closed.
**Notes:** Don,Äôt modify the structure of the menu or the menu items during this method.

### 37.2.57 EnableMenuItems

MBS MacBase Plugin, Plugin Version: 8.7, Platform: macOS, Targets: .

**Function:** This event is called before the menu opens so you can edit the menu.

### 37.2.58 PaletteSelectionChange

MBS MacBase Plugin, Plugin Version: 23.5, Platform: macOS, Targets: .

**Function:** The event called when the palette selection changes.

### 37.2.59 willHighlightItem(item as NSMenuItemMBS)

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Invoked to indicate that a menu is about to highlight a given item.
**Notes:** item: The item about to be highlighted.

Only one item per menu can be highlighted at a time. If item is nil, it means that all items in the menu are about to be unhighlighted.

### 37.2.60 WillOpen

MBS MacBase Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Invoked when a menu is about to open.
**Notes:** Don,Äôt modify the structure of the menu or the menu items during this method.

### 37.2.61 Constants

Presentation Styles

| Constant | Value | Description |
|---|---|---|
| PresentationStylePalette | 1 | The menu marked as palette is to be displayed in place of the menu item presenting it, with its items aligned horizontally. |
| PresentationStyleRegular | 0 | The default presentation style. Typically means the menu will be presented as either a popup or pulldown menu, based on the context. |

Selection Modes

| Constant | Value | Description |
|---|---|---|
| SelectionModeAutomatic | 0 | The menu will determine the appropriate selection mode based on the context and its contents. |
| SelectionModeSelectAny | 2 | The user can select multiple items in the menu. A change in selection will not automatically deselect any previously selected item in the same selection group. |
| SelectionModeSelectOne | 1 | The user will be allowed to select at most one menu item in the same selection group at a time. A change in selection will deselect any previously selected item. |

# Chapter 38

# Cocoa Networking

## 38.1 class NSCachedURLResponseMBS

### 38.1.1 class NSCachedURLResponseMBS

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** A cached response to a URL request.
**Notes:** A NSCachedURLResponseMBS object provides the server,Äôs response metadata in the form of a NSURLResponseMBS object, along with an NSData object containing the actual cached content data. Its storage policy determines whether the response should be cached on disk, in memory, or not at all.
Cached responses also contain a user info dictionary where you can store app-specific information about the cached item.
The NSURLCacheMBS class stores and retrieves instances of NSCachedURLResponseMBS.
**Blog Entries**

- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr2

**Xojo Developer Magazine**

- 17.2, page 11: News

### 38.1.2 Methods

### 38.1.3 Constructor(response as NSURLResponseMBS, data as MemoryBlock, userInfo as Dictionary = nil, storagePolicy as Integer = 0)

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Creates a cached URL response instance.
**Notes:** response: The response to cache.
data: The data to cache.

Returns a cached URL response object, containing the response and data.

The cache storage policy is set to the default, kCacheStorageAllowed, and the user info dictionary is set to nil.

### 38.1.4 copy as NSCachedURLResponseMBS

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 38.1.5 Properties

### 38.1.6 Data as MemoryBlock

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The cached response,Äôs data.
**Notes:** (Read only property)

### 38.1.7 Handle as Integer

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.1.8 Response as NSURLResponseMBS

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The URL response object associated with the instance.
**Notes:** (Read only property)

### 38.1.9 StoragePolicy as Integer

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The cached response,Äôs storage policy.
**Notes:** (Read only property)

### 38.1.10 UserInfo as Dictionary

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The cached response,Äôs user info dictionary.
**Notes:** This value is nil if there is no user info dictionary.
(Read only property)

### 38.1.11 Constants

Storage Policies

| Constant | Value | Description |
|---|---|---|
| kCacheStorageAllowed | 0 | Allow caching. |
| kCacheStorageAllowedInMemoryOnly | 1 | Allow caching only in memory. |
| kCacheStorageNotAllowed | 1 | Caching is not allowed. |

## 38.2 class NSHTTPCookieMBS

### 38.2.1 class NSHTTPCookieMBS

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSHTTPCookie object represents an HTTP cookie.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// we collect domain names
dim domains(-1) as string
for each cookie as NSHTTPCookieMBS in cookies
if domains.IndexOf(cookie.domain) <0 then
domains.Append cookie.domain
end if
next

// and display them
MsgBox "You have cookies from this domains: "+Join(domains, ", ")
```

**Notes:** It's an immutable object initialized from a dictionary containing the cookie attributes.

Two versions of cookies are supported:

Version 0: This version refers to "traditional" or "old-style" cookies, the original cookie format defined by Netscape. The majority of cookies encountered are in this format.
Version 1: This version refers to cookies as defined in RFC 2965, HTTP State Management Mechanism.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 20.5pr7
- News from the MBS Xojo Plugins Version 20.1
- Cookies in HTMLViewer
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

### 38.2.2 Methods

### 38.2.3 Constructor(properties as dictionary)

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an initialized NSHTTPCookie object using the provided properties.
**Example:**

```
// create dictionary with properties:
dim prop as new Dictionary
dim d as new date
d.Year = d.Year + 1

prop.Value(NSHTTPCookieMBS.NSHTTPCookieVersion)="0"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieName)="test"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieValue)="some value"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieOriginURL)="http://www.mbsplugins.de/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieDomain)="www.mbsplugins.de"
prop.Value(NSHTTPCookieMBS.NSHTTPCookiePath)="/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieExpires)=d

// create cookie from properties
dim cookie as new NSHTTPCookieMBS(prop)

// and display properties
dim dic as Dictionary = cookie.properties
dim list(-1) as string

for each key as Variant in dic.keys
List.Append key.StringValue+": "+dic.Value(key).StringValue
next

MsgBox Join(list,EndOfLine)
```

**Notes:** properties: The properties for the new cookie object, expressed as key value pairs.

Handle is non zero on success.

### 38.2.4 cookiesWithResponseHeaderFields(headerFields as dictionary, URL as string) as NSHTTPCookieMBS()

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of NSHTTPCookie objects corresponding to the provided response header fields for the provided URL.
**Notes:** headerFields: The header fields used to create the NSHTTPCookie objects.
URL: The URL associated with the created cookies.

Returns the array of created cookies.

This method ignores irrelevant header fields in headerFields, allowing dictionaries to contain additional data.

If headerFields does not specify a domain for a given cookie, the cookie is created with a default domain value of theURL.

If headerFields does not specify a path for a given cookie, the cookie is created with a default path value of "/".

### 38.2.5 cookieWithProperties(dic as dictionary) as NSHTTPCookieMBS

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and initializes an NSHTTPCookie object using the provided properties.
**Example:**

```
// create dictionary with properties:
dim prop as new Dictionary
dim d as new date
d.Year = d.Year + 1

prop.Value(NSHTTPCookieMBS.NSHTTPCookieVersion)="0"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieName)="test"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieValue)="some value"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieOriginURL)="http://www.mbsplugins.de/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieDomain)="www.mbsplugins.de"
prop.Value(NSHTTPCookieMBS.NSHTTPCookiePath)="/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieExpires)=d

// create cookie from properties
dim cookie as NSHTTPCookieMBS = NSHTTPCookieMBS.cookieWithProperties(prop)

// and display properties
dim dic as Dictionary = cookie.properties
dim list(-1) as string

for each key as Variant in dic.keys
List.Append key.StringValue+": "+dic.Value(key).StringValue
next
```

MsgBox Join(list,EndOfLine)

**Notes:** dic: The properties for the new cookie object, expressed as key value pairs.

Returns the newly created cookie object. Returns nil if the provided properties are invalid.

See NSHTTPCookie* shared method for more information on the available header field constants and the constraints imposed on the values in the dictionary.

### 38.2.6 NSHTTPCookieComment as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the comment for the cookie.
Only valid for Version 1 cookies and later. This header field is optional.

### 38.2.7 NSHTTPCookieCommentURL as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the comment URL for the cookie.
Only valid for Version 1 cookies or later. This header field is optional.

### 38.2.8 NSHTTPCookieDiscard as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String stating whether the cookie should be discarded at the end of the session.
String value must be either "TRUE" or "FALSE". This header field is optional. Default is "FALSE", unless this is cookie is version 1 or greater and a value for NSHTTPCookieMaximumAge is not specified, in which case it is assumed "TRUE".

### 38.2.9 NSHTTPCookieDomain as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the domain for the cookie.
A value must be specified for either NSHTTPCookieDomain or NSHTTPCookieOriginURL. If this header field is missing the domain is inferred from the value for NSHTTPCookieOriginURL.

### 38.2.10 NSHTTPCookieExpires as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An Date object or String specifying the expiration date for the cookie.
This header field is only used for Version 0 cookies. This header field is optional.

### 38.2.11 NSHTTPCookieMaximumAge as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing an integer value stating how long in seconds the cookie should be kept, at most.
Only valid for Version 1 cookies and later. Default is ”0”. This field is optional.

### 38.2.12 NSHTTPCookieName as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String object containing the name of the cookie. This field is required.

### 38.2.13 NSHTTPCookieOriginURL as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the URL that set this cookie.
A value must be specified for either NSHTTPCookieDomain or NSHTTPCookieOriginURL.

### 38.2.14 NSHTTPCookiePath as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the path for the cookie. This field is required if you are using the NSHTTP-CookieDomain key instead of the NSHTTPCookieOriginURL key.
If you are using the NSHTTPCookieOriginURL key, the path is inferred if it is not provided. The default value is "/".

### 38.2.15 NSHTTPCookiePort as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing comma-separated integer values specifying the ports for the cookie.
Only valid for Version 1 cookies or later. The default value is an empty string (""). This header field is optional.

### 38.2.16 NSHTTPCookieSecure as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String indicating that the cookie should be transmitted only over secure channels.
Providing any value for this key indicates that the cookie should remain secure.

### 38.2.17 NSHTTPCookieValue as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String containing the value of the cookie.
This header field is required.

### 38.2.18 NSHTTPCookieVersion as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary constants for cookies.
**Notes:** An String that specifies the version of the cookie.

Must be either "0" or "1". The default is "0". This header field is optional.

### 38.2.19 portList as Integer()

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's port list.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display port list

dim PortList(-1) as Integer = cookie.portList
if UBound(PortList)=-1 then
MsgBox "Port List: all ports."
else
dim list(-1) as string
for each port as Integer in portList
List.Append str(port)
next

MsgBox "Port List: "+Join(list, ", ")
end if
```

**Notes:** The list of ports for the cookie, returned as an array of integers. If the cookie has no port list this method returns nil and the cookie will be sent to any port. Otherwise, the cookie is only sent to ports specified in the port list.

### 38.2.20 requestHeaderFieldsWithCookies(cookies() as NSHTTPCookieMBS) as dictionary

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary of header fields corresponding to a provided array of cookies.
**Example:**

```
// create dictionary with properties:
dim prop as new Dictionary
dim d as new date
```

```
d.Year = d.Year + 1

prop.Value(NSHTTPCookieMBS.NSHTTPCookieVersion)="0"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieName)="test"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieValue)="some value"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieOriginURL)="http://www.mbsplugins.de/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieDomain)="www.mbsplugins.de"
prop.Value(NSHTTPCookieMBS.NSHTTPCookiePath)="/"
prop.Value(NSHTTPCookieMBS.NSHTTPCookieExpires)=d

// create cookie from properties
dim cookie as new NSHTTPCookieMBS(prop)
dim cookies(-1) as NSHTTPCookieMBS
cookies.Append cookie

// get request headers
dim dic as Dictionary = NSHTTPCookieMBS.requestHeaderFieldsWithCookies(cookies)

// and show them:
dim list(-1) as string

for each key as Variant in dic.keys
List.Append key.StringValue+": "+dic.Value(key).StringValue
next

MsgBox Join(list,EndOfLine)
```

**Notes:** cookies: The cookies from which the header fields are created.

Returns the dictionary of header fields created from the provided cookies. This dictionary can be used to add cookies to a request.

### 38.2.21 Properties

### 38.2.22 comment as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's comment string.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies
```

```
// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display comment
MsgBox "Comment: "+Cookie.comment
```

**Notes:** The receiver's comment string or "" if the cookie has no comment. This string is suitable for presentation to the user, explaining the contents and purpose of this cookie.
(Read only property)

### 38.2.23 commentURL as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's comment URL.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display comment URL
MsgBox "commentURL: "+Cookie.commentURL
```

**Notes:** The receiver's comment URL or "" if the cookie has none. This value specifies a URL which is suitable for presentation to the user as a link for further information about this cookie.
(Read only property)

### 38.2.24 domain as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the domain of the receiver's cookie.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)
```

```
// display domain:
MsgBox "Domain: "+Cookie.Domain
```

**Notes:** If the domain does not start with a dot, then the cookie is only sent to the exact host specified by the domain. If the domain does start with a dot, then the cookie is sent to other hosts in that domain as well, subject to certain restrictions. See RFC 2965 for more detail.
(Read only property)

### 38.2.25 expiresDate as date

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's expiration date.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display date:
MsgBox "Domain: "+Cookie.expiresDate.ShortTime+" "+Cookie.expiresDate.LongTime
```

**Notes:** The receiver's expiration date, or nil if there is no specific expiration date such as in the case of "session-only" cookies. The expiration date is the date when the cookie should be deleted.
(Read only property)

### 38.2.26 expiresDateTime as dateTime

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's expiration date.
**Notes:** (Read only property)

### 38.2.27 Handle as Integer

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.2.28 isHTTPOnly as boolean

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the receiver should only be sent to HTTP servers per RFC 2965.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display isHTTPOnly value:
MsgBox "isHTTPOnly: "+str(Cookie.isHTTPOnly)
```

**Notes:** Returns true if this cookie should only be sent via HTTP headers, false otherwise.

Cookies may be marked as HTTP only by a server (or by a javascript). Cookies marked as such must only be sent via HTTP Headers in HTTP requests for URL's that match both the path and domain of the respective cookies.

Important: Cookies specified as HTTP only should not be delivered to any javascript applications to prevent cross-site scripting vulnerabilities.
(Read only property)

### 38.2.29 isSecure as boolean

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether his cookie should only be sent over secure channels.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display isSecure value:
```

```
MsgBox "isSecure: "+str(Cookie.isSecure)
```

**Notes:** True if this cookie should only be sent over secure channels, otherwise false.
(Read only property)

### 38.2.30 isSessionOnly as boolean

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the receiver should be discarded at the end of the session (regardless of expiration date).
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display isSessionOnly value:
MsgBox "isSessionOnly: "+str(Cookie.isSessionOnly)
```

**Notes:** True if the receiver should be discarded at the end of the session (regardless of expiration date), otherwise false.
(Read only property)

### 38.2.31 name as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's name.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display name:
MsgBox "name: "+Cookie.name
```

**Notes:** (Read only property)

### 38.2.32 path as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's path.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display path:
MsgBox "path: "+Cookie.path
```

**Notes:** The cookie will be sent with requests for this path in the cookie's domain, and all paths that have this prefix. A path of "/" means the cookie will be sent for all URLs in the domain.
(Read only property)

### 38.2.33 properties as dictionary

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's cookie properties.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display properties

dim dic as Dictionary = cookie.properties
dim list(-1) as string

for each key as Variant in dic.keys
List.Append key.StringValue+": "+dic.Value(key).StringValue
```

next

MsgBox Join(list,EndOfLine)

**Notes:** Returns dictionary representation of the receiver's cookie properties.
This dictionary can be used with Constructor or cookieWithProperties to create an equivalent NSHTTP-Cookie object.
(Read only property)

### 38.2.34 value as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's value.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display value
MsgBox "Value: "+Cookie.value
```

**Notes:** (Read only property)

### 38.2.35 version as Integer

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's version.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// pick first one
dim cookie as NSHTTPCookieMBS = cookies(0)

// display version value:
MsgBox "Version: "+str(Cookie.Version)
```

**Notes:** Returns the receiver's version. Version 0 maps to "old-style" Netscape cookies. Version 1 maps to RFC 2965 cookies.
(Read only property)

## 38.3 class NSHTTPCookieStorageMBS

### 38.3.1 class NSHTTPCookieStorageMBS

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** NSHTTPCookieStorage implements a singleton object (shared instance) that manages the shared cookie storage.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// we collect values
dim list(-1) as string
for each cookie as NSHTTPCookieMBS in cookies
List.Append cookie.name+": "+cookie.value
next

// and display them
MsgBox join(list, EndOfLine)
```

**Notes:** These cookies are shared among all applications and are kept in sync cross-process.

Note: Changes made to the cookie accept policy affect all currently running applications using the cookie storage.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Cookies in HTMLViewer
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

### 38.3.2 Methods

### 38.3.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 38.3.4 cookies as NSHTTPCookieMBS()

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the cookie storage's cookies.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookies

// we collect values
dim list(-1) as string
for each cookie as NSHTTPCookieMBS in cookies
List.Append cookie.name+": "+cookie.value
next

// and display them
MsgBox join(list, EndOfLine)
```

**Notes:** Returns an array containing all of the cookie storage's cookies.

### 38.3.5 cookiesForURL(URL as string) as NSHTTPCookieMBS()

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns all the cookie storage's cookies that are sent to a specified URL.
**Example:**

```
// query list of all cookies in shared storage
dim cookies(-1) as NSHTTPCookieMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookiesForURL("http://www.apple.com/")

// we collect values for apple.com:
dim list(-1) as string
for each cookie as NSHTTPCookieMBS in cookies
List.Append cookie.name+": "+cookie.value
next

// and display them
MsgBox join(list, EndOfLine)
```

**Notes:** An application can use NSHTTPCookie method requestHeaderFieldsWithCookies to turn this array into a set of header fields to add to an NSMutableURLRequest object.

### 38.3.6 cookiesToArray(cookies() as NSHTTPCookieMBS) as Integer

MBS MacControls Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Puts the cookie storage's cookies in the given array.
**Example:**

```
// get storage
dim s as NSHTTPCookieStorageMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage

// predim an array with a lot of space
dim cookies(5000) as NSHTTPCookieMBS

// now ask plugin to put cookies inside
dim c as Integer = s.cookiesToArray(cookies)

// show count
MsgBox str(c)+" cookies"

// pick first and show name
dim cookie as NSHTTPCookieMBS = cookies(0)
MsgBox cookie.name
```

**Notes:** Returns total number of cookies.
This is for Xojo 2007 where the cookies function doesn't work.
For Xojo and Xojo you can use cookies function.

### 38.3.7 deleteCookie(cookie as NSHTTPCookieMBS)

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes the specified cookie from the cookie storage.

### 38.3.8 NSHTTPCookieManagerAcceptPolicyChangedNotification as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names you can register with the NSNotificationObserverMBS class.
**Notes:** This notification is posted when the acceptance policy of the NSHTTPCookieStorage instance has changed.
In Mac OS X, cookies are shared among applications, meaning this notification can be sent in response to another application's actions. Cookies are not shared among applications in iOS.

The notification object is the NSHTTPCookieStorage instance. This notification does not contain a userInfo dictionary.

### 38.3.9 NSHTTPCookieManagerCookiesChangedNotification as string

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names you can register with the NSNotificationObserverMBS class.
**Notes:** This notification is posted when the cookies stored in the NSHTTPCookieStorage instance have changed.
In Mac OS X, cookies are shared among applications, meaning this notification can be sent in response to another application's actions. Cookies are not shared among applications in iOS.

The notification object is the NSHTTPCookieStorage instance. This notification does not contain a userInfo dictionary.

### 38.3.10 removeCookiesSinceDate(d as date)

MBS MacControls Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Delete all cookies from the cookie storage since the provided date.
**Notes:** Available on macOS 10.10 or newer.
See also:

- 38.3.11 removeCookiesSinceDate(d as dateTime) 7696

### 38.3.11 removeCookiesSinceDate(d as dateTime)

MBS MacControls Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Delete all cookies from the cookie storage since the provided date.
**Notes:** Available on macOS 10.10 or newer.
See also:

- 38.3.10 removeCookiesSinceDate(d as date) 7696

### 38.3.12 setCookie(cookie as NSHTTPCookieMBS)

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stores a specified cookie in the cookie storage if the cookie accept policy permits.
**Notes:** The cookie replaces an existing cookie with the same name, domain, and path, if one exists in

the cookie storage. This method accepts the cookie only if the receiver's cookie accept policy is NSHTTPCookieAcceptPolicyAlways or NSHTTPCookieAcceptPolicyOnlyFromMainDocumentDomain. The cookie is ignored if the receiver's cookie accept policy is NSHTTPCookieAcceptPolicyNever.

### 38.3.13 setCookies(cookies() as NSHTTPCookieMBS, URL as string, mainDocumentURL as string)

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds an array of cookies to the receiver if the receiver's cookie acceptance policy permits.
**Notes:** cookies: The cookies to add.
URL: The URL associated with the added cookies.
mainDocumentURL: The URL of the main HTML document for the top-level frame, if known. Can be "". This URL is used to determine if the cookie should be accepted if the cookie accept policy is NSHTTPCookieAcceptPolicyOnlyFromMainDocumentDomain.

The cookies will replace existing cookies with the same name, domain, and path, if one exists in the cookie storage. The cookie will be ignored if the receiver's cookie accept policy is NSHTTPCookieAcceptPolicyNever.

To store cookies from a set of response headers, an application can use cookiesWithResponseHeaderFields passing a header field dictionary and then use this method to store the resulting cookies in accordance with the receiver's cookie acceptance policy.

### 38.3.14 sharedHTTPCookieStorage as NSHTTPCookieStorageMBS

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the shared cookie storage instance.
**Example:**

```
dim s as NSHTTPCookieStorageMBS = NSHTTPCookieStorageMBS.sharedHTTPCookieStorage
dim cookies() as NSHTTPCookieMBS = s.cookies
MsgBox str(UBound(cookies)+1)+" cookies"
```

### 38.3.15 Properties

### 38.3.16 Handle as Integer

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSHTTPCookieStorage object.
**Notes:** (Read and Write property)

### 38.3.17 cookieAcceptPolicy as Integer

MBS MacControls Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The cookie storage's cookie accept policy.
**Example:**

```
Select case NSHTTPCookieStorageMBS.sharedHTTPCookieStorage.cookieAcceptPolicy
case NSHTTPCookieStorageMBS.NSHTTPCookieAcceptPolicyOnlyFromMainDocumentDomain
MsgBox "Cookies: only from main document domain"
case NSHTTPCookieStorageMBS.NSHTTPCookieAcceptPolicyNever
MsgBox "Cookies: never"
case NSHTTPCookieStorageMBS.NSHTTPCookieAcceptPolicyAlways
MsgBox "Cookies: always"
else
MsgBox "Cookies: unknown setting"
end Select
```

**Notes:** The default cookie accept policy is NSHTTPCookieAcceptPolicyAlways.

Changing the cookie policy affects all currently running applications using the cookie storage.
(Read and Write computed property)

### 38.3.18 Constants

One of the cookie accept policy constants.

| Constant | Value | Description |
|---|---|---|
| NSHTTPCookieAcceptPolicyAlways | 0 | Accept all cookies. This is the default cookie ac |
| NSHTTPCookieAcceptPolicyNever | 1 | Reject all cookies. |
| NSHTTPCookieAcceptPolicyOnlyFromMainDocumentDomain | 2 | Accept cookies only from the main document do |

## 38.4 class NSNetServiceBrowserMBS

### 38.4.1 class NSNetServiceBrowserMBS

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A network service browser that finds published services on a network using multicast DNS.
**Notes:** Services can range from standard services, such as HTTP and FTP, to custom services defined by other applications. You can use a network service browser in your code to obtain the list of accessible domains and then to obtain an NSNetServiceMBS object for each discovered service. Each network service browser performs one search at a time, so if you want to perform multiple simultaneous searches, use multiple network service browsers.

A network service browser performs all searches asynchronously using the current run loop to execute the search in the background. Results from a search are returned through the associated delegate object, which your client application must provide. Searching proceeds in the background until the object receives a stop message.

To use an NSNetServiceBrowserMBS object to search for services, use the constructor. Once your object is ready, you begin by gathering the list of accessible domains using either the searchForRegistrationDomains or searchForBrowsableDomains methods. From the list of returned domains, you can pick one and use the searchForServicesOfType method to search for services in that domain.

The NSNetServiceBrowserMBS class provides two ways to search for domains. In most cases, your client should use the searchForRegistrationDomains method to search only for local domains to which the host machine has registration authority. This is the preferred method for accessing domains as it guarantees that the host machine can connect to services in the returned domains. Access to domains outside this list may be more limited.
**Blog Entries**

- Using Bonjour to find iOS companion app
- News from the MBS Xojo Plugins Version 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr5
- NSNetService classes for Xojo

### 38.4.2 Methods

### 38.4.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes an NSNetServiceBrowser object.

### 38.4.4 Destructor

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The destructor.

### 38.4.5 searchForBrowsableDomains

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initiates a search for domains visible to the host. This method returns immediately.
**Notes:** didFindDomain:moreComing event is raised for each domain discovered.

### 38.4.6 searchForRegistrationDomains

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initiates a search for domains in which the host may register services.
**Notes:** This method returns immediately, sending a WillSearch event if the network was ready to initiate the search. Subsequent didFindDomain event is raised for each domain discovered.

Most network service browser clients do not have to use this method—it is sufficient to publish a service with the empty string, which registers it in any available registration domains automatically.

### 38.4.7 searchForServicesOfType(serviceType as string, domainName as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Starts a search for services of a particular type within a specific domain.
**Notes:** serviceType: Type of the service to search for.
domainName: Domain name in which to perform the search.

This method returns immediately, sending a WillSearch event if the network was ready to initiate the search.The delegate receives subsequent didFindService event for each service discovered.

The serviceType argument must contain both the service type and transport layer information. To ensure

that the mDNS responder searches for services, rather than hosts, make sure to prefix both the service name and transport layer name with an underscore character (,Äú_,Äù). For example, to search for an HTTP service on TCP, you would use the type string ,Äú_http._tcp.,Äú. Note that the period character at the end is required.

The domainName argument can be an explicit domain name, the generic local domain "local." (note trailing period, which indicates an absolute name), or the empty string (""), which indicates the default registration domains. Usually, you pass in an empty string. Note that it is acceptable to use an empty string for the domainName argument when publishing or browsing a service, but do not rely on this for resolution.

### 38.4.8 stop

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Halts a currently running search or resolution.
**Notes:** This method sends a DidStop event and causes the browser to discard any pending search results.

### 38.4.9 Properties

### 38.4.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 38.4.11 includesPeerToPeer as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Whether to browse over peer-to-peer Bluetooth and Wi-Fi, if available. NO, by default.
**Notes:** This property must be set before initiating a search to have an effect.
(Read and Write property)

### 38.4.12 Events

### 38.4.13 DidFindDomain(domainName as String, moreComing as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you the sender found a domain.
**Notes:** domainName: Name of the domain found by netServiceBrowser.
moreComing: True when netServiceBrowser is waiting for additional domains. false when there are no additional domains.

You use this event to compile a list of available domains. It should wait until moreComing is false to do a bulk update of user interface elements.

### 38.4.14 DidFindService(service as NSNetServiceMBS, moreComing as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you that it found a service.
**Notes:** Service: Network service found by netServiceBrowser.
moreComing: True when netServiceBrowser is waiting for additional services. False when there are no additional services.

You use this event to compile a list of available services. It should wait until moreComing is false to do a bulk update of user interface elements.

Special Considerations
If you choose to resolve netService, you need to create a new object with copy constructor in your subclass to catch events. And please store the new reference in an array or property.

### 38.4.15 DidNotSearch(error as Dictionary)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you that a search was not successful.
**Notes:** error: Dictionary with the reasons the search was unsuccessful. Use the dictionary keys NSNetServicesErrorCode and NSNetServicesErrorDomain to retrieve the error information from the dictionary.

### 38.4.16 DidRemoveDomain(domainName as String, moreComing as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you that a domain has disappeared or has become unavailable.
**Notes:** domainName: Name of the domain that became unavailable.
moreComing: True when netServiceBrowser is waiting for additional domains. False when there are no additional domains.

You this event to compile a list of unavailable domains. It should wait until moreComing is false to do a bulk update of user interface elements.

### 38.4.17 DidRemoveService(service as NSNetServiceMBS, moreComing as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you a service has disappeared or has become unavailable.
**Notes:** Service: Network service that has become unavailable.
moreComing: True when netServiceBrowser is waiting for additional services. False when there are no additional services.

You this event to compile a list of unavailable services. It should wait until moreComing is false to do a bulk update of user interface elements.

### 38.4.18 DidStopSearch

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you that a search was stopped.
**Notes:** Triggered by stop method.

### 38.4.19 WillSearch

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you that a search is commencing.
**Notes:** This event is raised only if the underlying network layer is ready to begin a search.

## 38.5 class NSNetServiceMBS

### 38.5.1 class NSNetServiceMBS

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A network service that broadcasts its availability using multicast DNS.
**Notes:** The NSNetServiceMBS class represents a network service, either one your application publishes or is a client of. This class and the NSNetServiceBrowserMBS class use multicast DNS to convey information about network services to and from your application. The API of NSNetServiceMBS provides a convenient way to publish the services offered by your application and to resolve the socket address for a service.

The types of services you access using NSNetServiceMBS are the same types that you access directly using BSD sockets. HTTP and FTP are two services commonly provided by systems. (For a list of common services and the ports used by those services, see the file /etc/services.) Applications can also define their own custom services to provide specific data to clients.

You can use the NSNetServiceMBS class as either a publisher of a service or a client of a service. If your application publishes a service, your code must acquire a port and prepare a socket to communicate with clients. Once your socket is ready, you use the NSNetServiceMBS class to notify clients that your service is ready. If your application is the client of a network service, you can either create an NSNetServiceMBS object directly (if you know the exact host and port information) or use an NSNetServiceBrowserMBS object to browse for services.

To publish a service, initialize your NSNetServiceMBS object with the service name, domain, type, and port information. All of this information must be valid for the socket created by your application. Once initialized, call the publish method to broadcast your service information to the network.

When connecting to a service, use the NSNetServiceBrowserMBS class to locate the service on the network and obtain the corresponding NSNetServiceMBS object. Once you have the object, call the resolve method to verify that the service is available and ready for your application. If it is, the addresses property provides the socket information you can use to connect to the service.

The methods of NSNetServiceMBS operate asynchronously so your application is not impacted by the speed of the network. All information about a service is returned to your application through events. You must subclass and fill event handlers to respond to messages and to handle errors appropriately.
**Blog Entries**

- Using Bonjour to find iOS companion app
- MBS Xojo Plugins, version 22.3pr6
- MBS Xojo Plugins, version 22.3pr5
- News from the MBS Xojo Plugins Version 21.1

- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr5
- NSNetService classes for Xojo

**Videos**

- MBS Xojo Plugins 21.1

**Xojo Developer Magazine**

- 19.3, page 10: News

### 38.5.2 Methods

### 38.5.3 addresses as String()

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** An array of addresses.
**Notes:** We take the raw addresses and decode IPv4 and IPv6 addresses for you.

### 38.5.4 addressesIPv4 as String()

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** An array of IPv4 addresses.
**Notes:** We take the raw addresses and decode only IPv4 addresses for you.

### 38.5.5 addressesIPv6 as String()

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** An array of IPv6 addresses.
**Notes:** We take the raw addresses and decode only IPv6 addresses for you.

### 38.5.6 addressesRaw as MemoryBlock()

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A read-only array containing Memoryblock objects, each of which contains a socket address for the service.
**Notes:** An array containing Memoryblock objects, each of which contains a socket address for the service. Each Memoryblock object in the returned array contains an appropriate sockaddr structure that you can use to connect to the socket. The exact type of this structure depends on the service to which you are connecting. If no addresses were resolved for the service, the returned array contains zero elements.
It is possible for a single service to resolve to more than one address or not resolve to any addresses. A service might resolve to multiple addresses if the computer publishing the service is currently multihoming.

### 38.5.7 Constructor(Domain as String, Type as String, Name as String)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the receiver, initialized as a network service of a given type and sets the initial host information.
**Notes:** domain: The domain for the service. To resolve in the default domains, pass in an empty string (""). To limit resolution to the local domain, use "local.".
If you are creating this object to resolve a service whose information your app stored previously, you should set this to the domain in which the service was originally discovered.
You can also use a NSNetServiceBrowserMBS object to obtain a list of possible domains in which you can discover and resolve services.
type: The network service type.
type must contain both the service type and transport layer information. To ensure that the mDNS responder searches for services, as opposed to hosts, prefix both the service name and transport layer name with an underscore character (,Äú_,Äù). For example, to search for an HTTP service on TCP, you would use the type string "_http._tcp.". Note that the period character at the end of the string, which indicates that the domain name is an absolute name, is required.
name: The name of the service to resolve.

Returns the receiver, initialized as a network service named name of type type in the domain domain.

This method is the appropriate initializer to use to resolve a service—to publish a service, use Constructor with port.
If you know the values for domain, type, and name of the service you wish to connect to, you can create an NSNetServiceMBS object using this initializer and call resolve on the result.

You cannot use this initializer to publish a service. This initializer passes an invalid port number to the designated initializer, which prevents the service from being registered. Calling publish on an NSNetService object initialized with this method generates a call to your didNotPublish event with an NSNetServicesBadArgumentError error.
See also:


- 38.5.8 Constructor(Domain as String, Type as String, Name as String, Port as Integer) 7707
- 38.5.9 Constructor(other as NSNetServiceMBS) 7708

### 38.5.8 Constructor(Domain as String, Type as String, Name as String, Port as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes the receiver for publishing a network service of type type at the socket location specified by domain, name, and port.
**Notes:** domain: The domain for the service. To use the default registration domains, pass in an empty string (""). To limit registration to the local domain, use "local.".
You can also use a NSNetServiceBrowser object to obtain a list of possible domains in which you can publish your service.
type: The network service type.
type must contain both the service type and transport layer information. To ensure that the mDNS responder searches for services, as opposed to hosts, prefix both the service name and transport layer name with an underscore character (,Äú_,Äù). For example, to search for an HTTP service on TCP, you would use the type string "_http._tcp.". Note that the period character at the end of the string, which indicates that the domain name is an absolute name, is required.
name: The name by which the service is identified to the network. The name must be unique. If you pass the empty string (""), the system automatically advertises your service using the computer name as the service name.
port: The port on which the service is published.
If you specify the NSNetServiceListenForConnections flag, you may pass zero (0), in which case the service automatically allocates an arbitrary (ephemeral) port for your service. When the DidPublish event is called, you can determine the actual port chosen by calling the service object,Äôs NSNetServiceMBS method or accessing the corresponding property.
If your app is listening for connections on its own, the value of port must be a port number acquired by your application for the service.

You use this method to create a service that you wish to publish on the network. Although you can also use this method to create a service you wish to resolve on the network, it is generally more appropriate to use the Constructor method instead.

When publishing a service, you must provide valid arguments in order to advertise your service correctly. If the host computer has access to multiple registration domains, you must create separate NSNetServiceMBS objects for each domain. If you attempt to publish in a domain for which you do not have registration authority, your request may be denied.

It is acceptable to use an empty string for the domain argument when publishing or browsing a service, but do not rely on this for resolution.

This method is the designated initializer.
See also:


- 38.5.7 Constructor(Domain as String, Type as String, Name as String) 7706
- 38.5.9 Constructor(other as NSNetServiceMBS) 7708

### 38.5.9 Constructor(other as NSNetServiceMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a new object to catch events.
**Notes:** You can subclass and fill in events. Then create a copy with this constructor to connect events.
See also:


- 38.5.7 Constructor(Domain as String, Type as String, Name as String) 7706
- 38.5.8 Constructor(Domain as String, Type as String, Name as String, Port as Integer) 7707


### 38.5.10 dataFromTXTRecordDictionary(data as Dictionary) as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an Memoryblock object representing a TXT record formed from a given dictionary.
**Notes:** Data: A dictionary containing a TXT record.

Returns a Memoryblock representing TXT data formed from txtDictionary. Fails an assertion if data cannot be represented as a MemoryBlock.

### 38.5.11 Destructor

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The destructor.

### 38.5.12 dictionaryFromTXTRecordData(data as Memoryblock) as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a dictionary representing a TXT record given as a Memoryblock.
**Notes:** Data: A data object encoding a TXT record.

Returns a dictionary representing txtData. The dictionary,Äôs keys are strings. The values associated with all the dictionary,Äôs keys are Memoryblcoks that encapsulate strings or data.
Fails an assertion if txtData cannot be represented as an Dictionary object.

### 38.5.13 getStreams(byref inputStream as NSInputStreamMBS, byref outputStream as NSOutputStreamMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a pair of input and output streams for the receiver and returns a Boolean value that indicates whether they were retrieved successfully.
**Notes:** inputStream: Upon return, the input stream for the receiver.
outputStream: Upon return, the output stream for the receiver.

Returns yes if the streams are created successfully, otherwise false.

After this method is called, no events are called by the receiver.

### 38.5.14 isEqual(other as NSNetServiceMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks whether two services are same.
**Notes:** Returns true if equal or false if not.

### 38.5.15 NSNetServicesErrorCode as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** This key identifies the error that occurred during the most recent operation.

### 38.5.16 NSNetServicesErrorDomain as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** This key identifies the originator of the error, which is either the NSNetService object or the mach network layer.
**Notes:** For most errors, you should not need the value provided by this key.

### 38.5.17 publish

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Attempts to advertise the receiver,Äôs on the network.

**Notes:** This method returns immediately, with success or failure indicated by the events.
This is equivalent to calling publish with the default options (0).
See also:


- 38.5.18 publish(options as Integer) 7710


### 38.5.18 publish(options as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Attempts to advertise the receiver on the network, with the given options.
**Notes:** options: Options for the receiver. The supported options are described in constants.

This method returns immediately, with success or failure indicated by the events.
See also:


- 38.5.17 publish 7709


### 38.5.19 resolve

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Starts a resolve process for the service.
**Notes:** Attempts to determine at least one address for the service. This method returns immediately, with success or failure indicated by the callbacks to the delegate.
See also:


- 38.5.20 resolve(timeout as Double) 7710


### 38.5.20 resolve(timeout as Double)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Starts a resolve process of a finite duration for the service.
**Notes:** timeout: The maximum number of seconds to attempt a resolve. A value of 0.0 indicates no timeout and a resolve process of indefinite duration.

During the resolve period, the service sends DidResolveAddress event for each address it discovers that matches the service parameters. Once the timeout is hit, the service sends DidStop event. If no addresses resolve during the timeout period, the service sends didNotResolve event.
See also:


- 38.5.19 resolve 7710

### 38.5.21 setTXTRecordData(Data as MemoryBlock) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Sets the TXT record for the receiver, and returns a Boolean value that indicates whether the operation was successful.
**Notes:** Data: The TXT record for the receiver.

True if recordData is successfully set as the TXT record, otherwise false.

### 38.5.22 startMonitoring

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Starts the monitoring of TXT-record updates for the receiver.
**Notes:** Please implement didUpdateTXTRecordData event, which is called when the TXT record for the receiver is updated.

### 38.5.23 stop

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Halts a currently running attempt to publish or resolve a service.
**Notes:** We raise DidStop event after the service stops.
It is safe to remove all strong references to the service immediately after calling stop.

### 38.5.24 stopMonitoring

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Stops the monitoring of TXT-record updates for the receiver.

### 38.5.25 Properties

### 38.5.26 Address as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** First address decoded.
**Notes:** Can be IPv4 or IPv6.

(Read only property)

### 38.5.27 AddressIPv4 as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** First IPv4 address decoded.
**Notes:** (Read only property)

### 38.5.28 AddressIPv6 as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** First IPv6 address decoded.
**Notes:** (Read only property)

### 38.5.29 description as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The description string for debugging.
**Notes:** (Read only property)

### 38.5.30 domain as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string containing the domain for this service.
**Notes:** This can be an explicit domain name or it can contain the generic local domain name, "local." (note the trailing period, which indicates an absolute name).

This property,Äôs value is set when the object is first initialized, whether by your code or by a browser object. See Constructor for more information.
(Read only property)

### 38.5.31 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 38.5.32 hostName as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string containing the DNS hostname for this service.
**Notes:** This value is "" until the service has been resolved (when addresses is non-nil).
(Read only property)

### 38.5.33 includesPeerToPeer as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Specifies whether to also publish, resolve, or monitor this service over peer-to-peer Bluetooth and Wi-Fi, if available.
**Notes:** False by default.

This property must be set before calling publish, resolve, or startMonitoring in order to take effect.
(Read and Write property)

### 38.5.34 name as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string containing the name of this service.
**Notes:** This value is set when the object is first initialized, whether by your code or by a browser object. See Constructor for more information.
(Read only property)

### 38.5.35 port as Integer

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The port on which the service is listening for connections.
**Notes:** If the object was initialized by calling Constructor (whether by your code or by a browser object), then the value was set when the object was first initialized.
If the object was initialized by calling Constructor without port, the value of this property is not valid (-1) until after the service has successfully been resolved (when addresses is non-nil).

(Read only property)

### 38.5.36 TXTRecordData as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the TXT record for the receiver.
**Notes:** (Read only property)

### 38.5.37 type as String

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The type of the published service.
**Notes:** This value is set when the object is first initialized, whether by your code or by a browser object. See Constructor for more information.
(Read only property)

### 38.5.38 Events

### 38.5.39 DidAcceptConnection(InputStream as NSInputStreamMBS, outputStream as NSOutputStreamMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Called when a client connects to a service managed by Bonjour.
**Notes:** inputStream: A stream object for receiving data from the client.
outputStream: A stream object for sending data to the client.

When you publish a service, if you set the NSNetServiceListenForConnections flag in the service options, the service object accepts connections on behalf of your app. Later, when a client connects to that service, the service object calls this method to provide the app with a pair of streams for communicating with that client.

### 38.5.40 DidNotPublish(Error as Dictionary)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Notifies the delegate that a service could not be published.
**Notes:** error: A dictionary containing information about the problem. The dictionary contains the keys

NSNetServicesErrorCode and NSNetServicesErrorDomain.

This method may be called long after a WillPublish event has been delivered.

### 38.5.41 DidNotResolve(Error as Dictionary)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Informs that an error occurred during resolution of a given service.
**Notes:** error: A dictionary containing information about the problem. The dictionary contains the keys NSNetServicesErrorCode and NSNetServicesErrorDomain.

Clients may try to resolve again upon receiving this error. For example, a DNS rotary may yield different IP addresses on different resolution requests. A common error condition is that no addresses were resolved during the timeout period specified in resolve.

### 38.5.42 DidPublish

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Notifies you that a service was successfully published.

### 38.5.43 DidResolveAddress

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Informs you that the address for a given service was resolved.
**Notes:** The delegate can use the addresses method to retrieve the service,Äôs address. If the delegate needs only one address, it can stop the resolution process using stop. Otherwise, the resolution will continue until the timeout specified in resolve is reached.

### 38.5.44 DidStop

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Informs you that a publish or resolveWithTimeout: request was stopped.

### 38.5.45 DidUpdateTXTRecordData(data as MemoryBlock)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Notifies the delegate that the TXT record for a given service has been updated.
**Notes:** data: The new TXT record.

### 38.5.46 WillPublish

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Notifies you that the network is ready to publish the service.
**Notes:** Publication of the service proceeds asynchronously and may still generate a call to the didNotPublish event if an error occurs.

### 38.5.47 WillResolve

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** Notifies you that the network is ready to resolve the service.
**Notes:** Resolution of the service proceeds asynchronously and may still generate a call to the didNotResolve event if an error occurs.

### 38.5.48 Constants

NetService Options

| Constant | Value | Description |
|---|---|---|
| NSNetServiceListenForConnections | 2 | Specifies that a TCP listener should be started for both IPv4 and IPv6 on t port specified by this service. If the listening port can't be opened, the serv calls its didNotPublish event to report the error.<br>The listener supports only TCP connections. If the service,Äôs type does n end with _tcp, publication fails with NSNetServicesBadArgumentError.<br>Whenever a client connects to the listening socket, the service calls its didA ceptConnection event with a pair of NSStream objects. |
| NSNetServiceNoAutoRename | 1 | Specifies that the network service should not rename itself in the event o name collision. |

Errors

| Constant | Value | Description |
|---|---|---|
| NSNetServicesActivityInProgress | -72003 | The net service cannot process the request at this time. N mation about the network state is known. |
| NSNetServicesBadArgumentError | -72004 | An invalid argument was used when creating the NSNetSer |
| NSNetServicesCancelledError | -72005 | The client canceled the action. |
| NSNetServicesCollisionError | -72001 | The service could not be published because the name is al name could be in use locally or on another system. |
| NSNetServicesInvalidError | -72006 | The net service was improperly configured. |
| NSNetServicesMissingRequiredConfigurationError | -72008 | Missing required configuration error. |
| NSNetServicesNotFoundError | -72002 | The service could not be found on the network. |
| NSNetServicesTimeoutError | -72007 | The net service has timed out. |
| NSNetServicesUnknownError | -72000 | An unknown error occurred. |

## 38.6 class NSURLAuthenticationChallengeMBS

### 38.6.1 class NSURLAuthenticationChallengeMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** A class for an authentication challenge.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 38.6.2 Methods

### 38.6.3 cancelAuthenticationChallenge

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Tells the system to cancel this challenge.

### 38.6.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.6.5 continueWithoutCredentialForAuthenticationChallenge

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Tells the system to continue this challenge without a password.

### 38.6.6 error as NSErrorMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the NSError object representing the last authentication failure.
**Notes:** This method returns nil if the protocol doesn't use errors to indicate an authentication failure.

Available in Mac OS X v10.2 with Safari 1.0 installed.
Available in Mac OS X v10.2.7 and later.

### 38.6.7 failureResponse as NSURLResponseMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the response representing authentication failure.
**Notes:** If there was a previous authentication failure, and this protocol uses responses to indicate authentication failure, then this method will return the response. Otherwise it will return nil.

### 38.6.8 previousFailureCount as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get count of previous failed authentication attempts.

### 38.6.9 proposedCredential as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the proposed credential for this challenge.
**Notes:** proposedCredential may be nil, if there is no default credential to use for this challenge (either stored or in the URL). If the credential is not nil and returns true for hasPassword, this means the NSURLConnection thinks the credential is ready to use as-is. If it returns false for hasPassword, then the credential is not ready to use as-is, but provides a default username the client could use when prompting.

### 38.6.10 protectionSpace as NSURLProtectionSpaceMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get a description of the protection space that requires authentication.
**Notes:** Returns the protection space that needs authentication.

### 38.6.11 useCredential(credential as NSURLCredentialMBS)

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Tells the system to use a certain credential for this challenge.

### 38.6.12 Properties

### 38.6.13 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** The internal used handle for this challenge.
**Notes:** (Read and Write property)

## 38.7 class NSURLCacheMBS

### 38.7.1 class NSURLCacheMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for the caching.
**Notes:** NSURLCache implements the caching of responses to URL load requests by mapping NSURLRequest objects to NSCachedURLResponse objects. It is a composite of an in-memory and an on-disk cache. Methods are provided to manipulate the sizes of each of these caches as well as to control the path on disk to use for persistent storage of cache data.
**Blog Entries**

- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr2

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 41: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News

### 38.7.2 Methods

### 38.7.3 cachedResponseForRequest(request as NSURLRequestMBS) as NSCachedURLResponseMBS

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Returns the cached URL response in the cache for the specified URL request.
**Notes:** request: The URL request whose cached response is desired.

Returns the cached URL response for request, or nil if no response has been cached.

### 38.7.4 Constructor(memoryCapacity as UInt64, diskCapacity as UInt64, diskPath as folderitem)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Initializes an NSURLCache object with the specified values.
**Notes:** memoryCapacity: The memory capacity of the cache, in bytes.
diskCapacity: The disk capacity of the cache, in bytes.
path: The location at which to store the on-disk cache.

The returned NSURLCache is backed by disk, so developers can be more liberal with space when choosing the capacity for this kind of cache. A disk cache measured in the tens of megabytes should be acceptable in most cases.

### 38.7.5 removeAllCachedResponses

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Clears the receiver's cache, removing all stored cached URL responses.

### 38.7.6 removeCachedResponseForRequest(request as NSURLRequestMBS)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Removes the cached URL response for a specified URL request.
**Notes:** request: The URL request whose cached URL response should be removed. If there is no corresponding cached URL response, no action is taken.

### 38.7.7 removeCachedResponsesSinceDate(d as date)

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clears the given cache of any cached responses since the provided date.
**Notes:** d: The earliest date of responses that should remain in the cache. Any responses with dates later than this parameter should be removed.

Available in macOS 10.10 or newer.
See also:


- 38.7.8 removeCachedResponsesSinceDate(d as dateTime) 7722


### 38.7.8 removeCachedResponsesSinceDate(d as dateTime)

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Clears the given cache of any cached responses since the provided date.
**Notes:** d: The earliest date of responses that should remain in the cache. Any responses with dates later than this parameter should be removed.

Available in macOS 10.10 or newer.
See also:

- 38.7.7 removeCachedResponsesSinceDate(d as date) 7722

### 38.7.9 setSharedURLCache(cache as NSURLCacheMBS)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Sets the shared NSURLCache instance to a specified cache object.
**Notes:** Applications that have special caching requirements or constraints should use this method to specify an NSURLCache instance with customized cache settings.

### 38.7.10 sharedURLCache as NSURLCacheMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the shared NSURLCache instance.
**Notes:** The disk path is set to: <user_home_directory>/Library/Caches/<current_process_name>. The user's home directory is determined by calling NSHomeDirectory and the current process name is determined using NSProcessInfoMBS.processName.

Applications that do not have special caching requirements or constraints should find the default shared cache instance acceptable. Applications with more specific needs can create a custom NSURLCache object and set it as the shared cache instance using setSharedURLCache.

### 38.7.11 storeCachedResponse(cachedResponse as NSCachedURLResponseMBS, request as NSURLRequestMBS)

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Stores a cached URL response for a specified request.
**Notes:** cachedResponse: The cached URL response to store.
request: The request for which the cached URL response is being stored.

If you override this method, you should also override storeCachedResponse.

### 38.7.12 Properties

### 38.7.13 currentDiskUsage as UInt64

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the current size of the receiver's on-disk cache, in bytes.
**Notes:** (Read only property)

### 38.7.14 currentMemoryUsage as UInt64

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the current size of the receiver's in-memory cache, in bytes.
**Notes:** (Read only property)

### 38.7.15 diskCapacity as UInt64

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The on-disk cache capacity.
**Notes:** (Read and Write property)

### 38.7.16 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal handle to the NSURLCache object.
**Notes:** (Read and Write property)

### 38.7.17 memoryCapacity as UInt64

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The in-memory cache capacity.
**Notes:** (Read and Write property)

### 38.7.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSURLCacheStorageAllowed | 0 | One of the constants for the cache strategy.<br>Specifies that storage in an NSURLCache is allowed without restr |
| NSURLCacheStorageAllowedInMemoryOnly | 1 | One of the constants for the cache strategy.<br>Specifies that storage in an NSURLCache is allowed; however sto<br>be done in memory only, no disk storage should be done. |
| NSURLCacheStorageNotAllowed | 2 | One of the constants for the cache strategy.<br>Specifies that storage in an NSURLCache is not allowed in any fas<br>in memory or on disk. |

## 38.8 class NSURLConnectionFilterMBS

### 38.8.1 class NSURLConnectionFilterMBS

MBS MacBase Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to filter URL connections.
**Notes:** This class is designed to allow you to intercept your application creating NSURLConnection objects and change the NSURLRequest used. This can be useful to change timeouts on Xojo.Net.HTTPSocket class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo Plugins, version 18.2pr3
- Xojo.Net.HTTPSocket and Timeouts

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 38.8.2 Properties

### 38.8.3 Enabled as Boolean

MBS MacBase Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the event is enabled.
**Notes:** Default is true.
(Read and Write property)

### 38.8.4 Events

### 38.8.5 FilterConnection(request as NSURLRequestMBS) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** The event called when a new connection is made.
**Example:**

```
Function FilterConnection(request as NSURLRequestMBS) Handles FilterConnection as NSURLRequestMBS
system.debuglog CurrentMethodName
system.debuglog "URL: "+request.URL

dim newRequest as NSMutableURLRequestMBS = request.mutableCopy
```

```
// change to 10 minutes
newRequest.setTimeoutInterval 600

return newRequest
End Function
```

**Notes:** You get the current request and you can return a new request.
If you return nil, we pass through the existing one.
Only requests on main thread trigger the event.

## 38.9 class NSURLConnectionMBS

### 38.9.1 class NSURLConnectionMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSURLSessionMBS instead. **Function:** An NSURLConnection object provides support to perform the loading of a URL request. **Notes:** The interface for NSURLConnection is sparse, providing only the controls to start and cancel asynchronous loads of a URL request.

NSURLConnection's events allow an object to receive informational callbacks about the asynchronous load of a URL request. Other events provide facilities that allow the subclass to customize the process of performing an asynchronous URL load. These events are called on the thread that started the asynchronous load operation for the associated NSURLConnection object.

NSURLConnection also has a convenience class method, sendSynchronousRequest, to load a URL request synchronously.

The following contract governs the events defined in this class:

- Zero or more willSendRequest events are called before any further event is called if it is determined that the download must redirect to a new location. The delegate can allow the redirect, modify the destination, or deny the redirect.
- Zero or more willSendRequestForAuthenticationChallenge events are called before a request for an authentication challenge is sent. The delegate can call the appropriate NSURLAuthenticationChallengeMBS method and perform any other required task related to credentials.
- Zero or more didReceiveAuthenticationChallenge vents are called if it is necessary to authenticate in order to download the request and the connection does not already have authenticated credentials.
- Zero or more didCancelAuthenticationChallenge vents are called if the connection cancels the authentication challenge due to the protocol implementation encountering an error.
- Zero or more didReceiveResponse events are called before receiving a didReceiveData message. The only case where didReceiveResponse is not sent to a delegate is when the protocol implementation encounters an error before a response can be created.
- Zero or more didReceiveData events are called before any of the following messages are sent to the delegate: willCacheResponse, DidFinishLoading, didFailWithError.
- Zero or one willCacheResponse events are called to the delegate after didReceiveData is sent but before a DidFinishLoading message is sent.

Unless an NSURLConnection object receives a cancel message, the subclasses receives one and only one of DidFinishLoading, or didFailWithError message, but never both. In addition, once either of these messages

is sent, the delegate receives no further messages for the connection.
**Blog Entries**

- Adding NSURLSession classes for Xojo
- MBS Xojo Plugins, version 20.2pr3
- MBS Real Studio Plugins, version 12.5pr3
- MBS Real Studio Plugins, version 11.3pr7

### 38.9.2 Methods

### 38.9.3 cancel

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Cancels an asynchronous load of a request.
**Notes:** After this method is called, the connection's delegate no longer receives any messages for the connection. If you want to reattempt the connection, you should create a new connection object.

### 38.9.4 canHandleRequest(request as NSURLRequestMBS) as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns whether a request can be handled based on a preflight evaluation.
**Notes:** request: The request to evaluate.

Returns true if a preflight operation determines that a connection with request can be created and the associated I/O can be started, false otherwise.

The result of this method is valid as long as no NSURLProtocol classes are registered or unregistered, and request remains unchanged. Applications should be prepared to handle failures even if they have performed request preflighting by calling this method.

### 38.9.5 Constructor(request as NSURLRequestMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates URL connection and begins to load the data for the URL request.
**Notes:** request: The URL request to load. The request object is deep-copied as part of the initialization process. Changes made to request after this method returns do not affect the request that is used for the loading process.

On success handle property is not zero.

This is equivalent to calling Constructor and passing true for optional startImmediately.
See also:

- 38.9.6 Constructor(request as NSURLRequestMBS, startImmediately as boolean) 7730

### 38.9.6 Constructor(request as NSURLRequestMBS, startImmediately as boolean)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates URL connection and begins to load the data for the URL request, if specified.
**Notes:** request: The URL request to load. The request object is deep-copied as part of the initialization process. Changes made to request after this method returns do not affect the request that is used for the loading process.
startImmediately: True if the connection should being loading data immediately, otherwise false.

On success the handle property is not zero.

Available in Mac OS X v10.5 and later.
See also:

- 38.9.5 Constructor(request as NSURLRequestMBS) 7729

### 38.9.7 data as MemoryBlock

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The data downloaded so far.
**Notes:** The plugin adds the new data it gets in the didReceiveData event to a big memoryblock and gives you access to it using this event.

### 38.9.8 sendSynchronousRequest(request as NSURLRequestMBS, byref response as NSURLResponseMBS, byref error as NSErrorMBS) as Memoryblock

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Performs a synchronous load of the specified URL request.
**Example:**

```
dim request as new NSURLRequestMBS("http://www.monkeybreadsoftware.de/images/MBSLogo.jpg")
dim error as NSErrorMBS
dim response as NSURLResponseMBS
```

```
dim d as MemoryBlock = NSURLConnectionMBS.sendSynchronousRequest(request, response, error)

if d<>Nil then
dim pic as Picture = JPEGStringToPictureMBS(d, true)
window1.Backdrop = pic
end if

if error<>Nil then
MsgBox "Error: "+error.description
end if
```

**Notes:** request: The URL request to load. The request object is deep-copied as part of the initialization process. Changes made to request after this method returns do not affect the request that is used for the loading process.
response: Out parameter for the URL response returned by the server.
error: Out parameter used if an error occurs while processing the request.

Returns the downloaded data for the URL request. Returns nil if a connection could not be created or if the download fails.

A synchronous load is built on top of the asynchronous loading code made available by the class. The calling thread is blocked while the asynchronous loading system performs the URL load on a thread spawned specifically for this load request. No special threading or run loop configuration is necessary in the calling thread in order to perform a synchronous load.

Important: Because this call can potentially take several minutes to fail (particularly when using a cellular network in iOS), you should never call this function from the main thread of a GUI application.

If authentication is required in order to download the request, the required credentials must be specified as part of the URL. If authentication fails, or credentials are missing, the connection will attempt to continue without credentials.

### 38.9.9 start

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Causes the connection to begin loading data, if it has not already.
**Notes:** Calling this method is necessary only if you create a connection with the Constructor method and provide false for the startImmediately parameter.

Available in Mac OS X v10.5 and later.

### 38.9.10 Properties

### 38.9.11 Handle as Integer

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.9.12 Events

### 38.9.13 canAuthenticateAgainstProtectionSpace(protectionSpace as NSURLProtectionSpaceMBS) as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to determine whether the delegate is able to respond to a protection space's form of authentication.
**Notes:** protectionSpace: The protection space that generates an authentication challenge.

Return true if you are able to respond to a protection space's form of authentication, otherwise false.

This method is called before didReceiveAuthenticationChallenge, allowing the class to inspect a protection space before attempting to authenticate against it. By returning true, the event indicates that it can handle the form of authentication, which it does in the subsequent call to didReceiveAuthenticationChallenge. If the event returns false, the system attempts to use the user's keychain to authenticate. If your delegate does not implement this method and the protection space uses client certificate authentication or server trust authentication, the system behaves as if you returned false. The system behaves as if you returned true for all other authentication methods.

Available in Mac OS X v10.6 and later.

### 38.9.14 didCancelAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a connection cancels an authentication challenge.
**Notes:** challenge: The challenge that was canceled.

### 38.9.15 didFailWithError(error as NSErrorMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a connection fails to load its request successfully.
**Notes:** error: An error object containing details of why the connection failed to load the request successfully.

Once the delegate receives this message, it will receive no further messages for connection.

### 38.9.16 didFinishLoading

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a connection has finished loading successfully.

### 38.9.17 didReceiveAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a connection must authenticate a challenge in order to download its request.
**Notes:** challenge: The challenge that connection must authenticate in order to download its request.

This method gives the class the opportunity to determine the course of action taken for the challenge provide credentials, continue without providing credentials, or cancel the authentication challenge and the download.

The delegate can determine the number of previous authentication challenges by sending the message previousFailureCount to challenge.

If the previous failure count is 0 and the value returned by proposedCredential is nil, the delegate can create a new NSURLCredential object, providing information specific to the type of credential, and send a useCredential:forAuthenticationChallenge: message to [ challenge sender ] , passing the credential and challenge as parameters. If proposedCredential is not nil, the value is a credential from the URL or the shared credential storage that can be provided to the user as feedback.

The delegate may decide to abandon further attempts at authentication at any time by sending [ challenge sender ] a continueWithoutCredentialForAuthenticationChallenge: or a cancelAuthenticationChallenge: message. The specific action is implementation dependent.

If the delegate implements this method, the download will suspend until [ challenge sender ] is sent one of the following messages: useCredential:forAuthenticationChallenge:, continueWithoutCredentialForAuthen-

ticationChallenge: or cancelAuthenticationChallenge:.

If the delegate does not implement this method the default implementation is used. If a valid credential for the request is provided as part of the URL, or is available from the NSURLCredentialStorage the [ challenge sender ] is sent a useCredential:forAuthenticationChallenge: with the credential. If the challenge has no credential or the credentials fail to authorize access, then continueWithoutCredentialForAuthenticationChallenge: is sent to [ challenge sender ] instead.

### 38.9.18 didReceiveData(newData as Memoryblock)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent as a connection loads data incrementally.
**Notes:** newdata: The newly available data.

The data property is updated before this event is called and gives you a way to see all data received so far.

### 38.9.19 didReceiveResponse(response as NSURLResponseMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when the connection has received sufficient data to construct the URL response for its request.
**Notes:** response: The URL response for the connection's request. This object is immutable and will not be modified by the URL loading system once it is presented to the delegate.

In rare cases, for example in the case of an HTTP load where the content type of the load data is multipart/x-mixed-replace, the delegate will receive more than one didReceiveResponse message. In the event this occurs, delegates should discard all data previously delivered by didReceiveData, and should be prepared to handle the, potentially different, MIME type reported by the newly reported URL response.

The only case where this message is not sent to the delegate is when the protocol implementation encounters an error before a response could be created.

### 38.9.20 didSendBodyData(bytesWritten as Int64, totalBytesWritten as Int64, totalBytesExpectedToWrite as Int64)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent as the body (message data) of a request is transmitted (such as in an http POST request).

**Notes:** bytesWritten: The number of bytes written in the latest write.
totalBytesWritten: The total number of bytes written for this connection.
totalBytesExpectedToWrite: The number of bytes the connection expects to write.

This method provides an estimate of the progress of a URL upload.
The value of totalBytesExpectedToWrite may change during the upload if the request needs to be retransmitted due to a lost connection or an authentication challenge from the server.
Available in Mac OS X v10.6 and later.

### 38.9.21 shouldUseCredentialStorage as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to determine whether the URL loader should consult the credential storage for authenticating the connection.
**Notes:** This method is called before any attempt to authenticate is made. By returning false, the delegate tells the connection not to consult the credential storage and makes itself responsible for providing credentials for any authentication challenges. Not implementing this method is the same as returning true. The delegate is free to consult the credential storage itself when it receives a didReceiveAuthenticationChallenge event.

Available in Mac OS X v10.6 and later.

### 38.9.22 willCacheResponse(cachedResponse as NSCachedURLResponseMBS) as NSCachedURLResponseMBS

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The connection will cache this response.
**Notes:** If you implement this event, please return request to cache or nil to not cache.

### 38.9.23 willSendRequest(request as NSURLRequestMBS, redirectResponse as NSURLResponseMBS) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when the connection determines that it must change URLs in order to continue loading a request.
**Notes:** request: The proposed redirected request. You should inspect the redirected request to verify that it meets its needs, and create a copy with new attributes to return to the connection if necessary.
redirectResponse: The URL response that caused the redirect. May be nil in cases where this method is not

being sent as a result of involving the delegate in redirect processing.

The actual URL request to use in light of the redirection response. The event may return request unmodified to allow the redirect, return a new request, or return nil to reject the redirect and continue processing the connection.

If you wish to cancel the redirect connection, it should call the connection object's cancel method. Alternatively, the delegate method can return nil to cancel the redirect connection, and the original connection will continue to process. This has special relevance in the case where redirectResponse is not nil. In this case, any data that is loaded for the connection will be sent to the delegate, and the delegate will receive a connectionDidFinishLoading or didFailLoadingWithError message, as appropriate.

Note: Prior to Mac OS X version 10.5, returning nil in this method sometimes would cancel the connection but other times would cause the connection to use the given request unmodified. In addition, prior to version 10.5, NSURLConnection would often modify the incoming NSURLRequest object before transmission without notifying the delegate. In version 10.5 and later, it always notifies the delegate via willSendRequest, and thus the delegate might receive this message before the connection has even properly begun, prior to transmitting the request to the remote server.
The delegate can receive this message as a result of modifying a request before it is sent, for example to transform the request's URL to its canonical form. To detect this case, examine redirectResponse; if it is nil, the message was not sent due to a redirect.

The delegate should be prepared to receive this message multiple times.

### 38.9.24 willSendRequestForAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that the connection will send a request for an authentication challenge.
**Notes:** challenge: The authentication challenge for which a request is being sent.

This method allows the delegate to make an informed decision about connection authentication at once. If the delegate implements this method, it has no need to implement canAuthenticateAgainstProtectionSpace, didReceiveAuthenticationChallenge, shouldUseCredentialStorage. In fact, these other methods are not invoked.

In this method,you must invoke one of the challenge-responder methods (NSURLAuthenticationChallengeSenderMBS):

useCredential
continueWithoutCredentialForAuthenticationChallenge

cancelAuthenticationChallenge
performDefaultHandlingForAuthenticationChallenge
rejectProtectionSpaceAndContinueWithChallenge

You might also want to analyze challenge for the authentication scheme and the proposed credential before calling a NSURLAuthenticationChallengeSenderMBS method. You should never assume that a proposed credential is present. You can either create your own credential and respond with that, or you can send the proposed credential back. (Because this object is immutable, if you want to change it you must copy it and then modify the copy.)

## 38.10 class NSURLCredentialMBS

### 38.10.1 class NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** A class for a stored password.
**Notes:** dim u as NSURLCredentialMBS
dim p as Integer = NSURLCredentialMBS.NSURLCredentialPersistenceForSession

u = NSURLCredentialMBS.credential("Christian", "teddy123", p)

MsgBox u.user+EndOfLine+u.password+EndOfLine+str(u.persistence)
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr3
- MBS Xojo / Real Studio Plugins, version 13.4pr6

### 38.10.2 Methods

### 38.10.3 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.10.4 copy as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the credential object.

### 38.10.5 credential(User as string, password as string, persistence as Integer = 0) as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Create a new NSURLCredential with a user and password.
**Example:**

```
dim u as NSURLCredentialMBS
dim p as Integer = NSURLCredentialMBS.NSURLCredentialPersistenceForSession
```

u = NSURLCredentialMBS.credential("Christian", "teddy123", p)

MsgBox u.user+EndOfLine+u.password+EndOfLine+str(u.persistence)

**Notes:** user: the username
password: the password
persistence: Integer that says to store per session, permanently or not at all.
Can be NSURLCredentialPersistenceForSession, NSURLCredentialPersistenceNone or NSURLCredentialPersistencePermanent.

### 38.10.6 credentialWithPEM(Data as MemoryBlock, Password as String = "") as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an identity credentials with certificate and private key in PEM file.
**Notes:** Password is optional.
This is a convenience function using SecItemImport to read data and then builds the result with credentialWithIdentity function.
Returns nil for any error.

### 38.10.7 credentialWithPKCS12(Data as MemoryBlock, Password as String = "") as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates an identity credentials with certificate and private key in PKCS#12 file.
**Notes:** Password is optional.
This is a convenience function using SecPKCS12Import to read data and then builds the result with credentialWithIdentity function.
Returns nil for any error.

### 38.10.8 credentialWithTrustingServer(ProtectionSpace as NSURLProtectionSpaceMBS) as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a credential trusting the server in the protection space.
**Notes:** This is a convenience function using the ServerTrust in the protection space to wrap it in a new to read data and then builds the result with credential object with credentialForTrust function.

Returns nil for any error.

### 38.10.9 Properties

### 38.10.10 CertificateCount as Integer

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Queries number of certificates in this credential object.
**Notes:** (Read only property)

### 38.10.11 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** The internal used handle for this class.
**Notes:** (Read and Write property)

### 38.10.12 HasIdentity as Boolean

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this credential object contains an identity reference.
**Notes:** (Read only property)

### 38.10.13 hasPassword as Boolean

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Find out if this credential has a password, without trying to get it.
**Notes:** Returns true if this credential has a password, otherwise false.

If this credential's password is actually kept in an external store, the password method may return "" even if this method returns true, since getting the password may fail, or the user may refuse access.
(Read only property)

### 38.10.14 password as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the password.
**Notes:** This method might actually attempt to retrieve the password from an external store, possible resulting in prompting, so do not call it unless needed.
(Read only property)

### 38.10.15 persistence as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Determine whether this credential is or should be stored persistently.
**Notes:** Use the constants:
NSURLCredentialPersistenceNone
NSURLCredentialPersistenceForSession
NSURLCredentialPersistencePermanent
(Read only property)

### 38.10.16 user as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the username.
**Notes:** (Read only property)

### 38.10.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSURLCredentialPersistenceForSession | 1 | This credential will only be stored for this session. |
| NSURLCredentialPersistenceNone | 0 | This credential won't be saved. |
| NSURLCredentialPersistencePermanent | 2 | This credential will be stored permanently and shared with other appli |

## 38.11 class NSURLCredentialStorageMBS

### 38.11.1 class NSURLCredentialStorageMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** NSURLCredentialStorage implements a singleton object (shared instance) which manages the shared credentials cache.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 38.11.2 Methods

### 38.11.3 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.11.4 defaultCredentialForProtectionSpace(space as NSURLProtectionSpaceMBS) as NSURLCredentialMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the default credential for the specified protection space.

### 38.11.5 sharedCredentialStorage as NSURLCredentialStorageMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the shared singleton authentication storage.

### 38.11.6 Properties

### 38.11.7 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** The internal used handle for this class.
**Notes:** (Read and Write property)

## 38.12 class NSURLDownloadMBS

### 38.12.1 class NSURLDownloadMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSURL Download class which handles downloads for Webkit.
**Notes:** NSURLDownload downloads a request asynchronously and saves the data to a file. The interface for NSURLDownload is sparse, providing methods to initialize a download, set the destination path and cancel loading the request.

NSURLDownload's delegate methods—defined by the NSURLDownloadDelegate—allow an object to receive informational callbacks about the asynchronous load of the URL request. Other delegate methods provide facilities that allow the delegate to customize the process of performing an asynchronous URL load.

Note that these delegate methods are called on the thread that started the asynchronous load operation for the associated NSURLDownload object.

The MBS Plugins currently only implement a part of this class for use with WebDownloadDelegateMBS. So please contact us if you need more.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr2
- Notes from the last days
- MBS Real Studio Plugins, version 11.3pr6
- MBS Real Studio Plugins, version 11.3pr5

### 38.12.2 Methods

### 38.12.3 cancel

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cancels the receiver's download and deletes the downloaded file.

### 38.12.4 canResumeDownloadDecodedWithEncodingMIMEType(MimeType as string) as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether a URL download object can resume a download that was decoded with the specified MIME type.
**Notes:** MIMEType: The MIME type the caller wants to know about.
Returns true if the URL download object can resume a download that was decoded with the specified MIME type, false otherwise.
NSURLDownload cannot resume a download that was partially decoded in the gzip format.

### 38.12.5 Constructor(request as NSURLRequestMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an initialized URL download for a URL request and begins to download the data for the request.
**Notes:** request: The URL request to download. The request object is deep-copied as part of the initialization process. Changes made to request after this method returns do not affect the request that is used for the loading process.

On success the handle property is not zero.
See also:


- 38.12.6 Constructor(resumeData as Memoryblock, path as folderitem) 7745
- 38.12.7 Constructor(resumeData as Memoryblock, path as string) 7745


### 38.12.6 Constructor(resumeData as Memoryblock, path as folderitem)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an initialized NSURLDownload object that will resume downloading the specified data to the specified file and begins the download.
**Notes:** resumeData: Specifies the data to resume downloading.
path: The location for the downloaded data.

On success the handle property is not zero.
See also:


- 38.12.5 Constructor(request as NSURLRequestMBS) 7745
- 38.12.7 Constructor(resumeData as Memoryblock, path as string) 7745


### 38.12.7 Constructor(resumeData as Memoryblock, path as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an initialized NSURLDownload object that will resume downloading the specified data to the specified file and begins the download.
**Notes:** resumeData: Specifies the data to resume downloading.
path: The location for the downloaded data.

On success the handle property is not zero.
See also:


- 38.12.5 Constructor(request as NSURLRequestMBS) 7745
- 38.12.6 Constructor(resumeData as Memoryblock, path as folderitem) 7745


### 38.12.8 request as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the request that initiated the receiver's download.

### 38.12.9 resumeData as Memoryblock

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the resume data for a download that is not yet complete.
**Notes:** The resume data for a download that is not yet complete. This data represents the necessary state information that an NSURLDownload object needs to resume a download. The resume data can later be used when initializing a download with Constructor. Returns nil if the download is not able to be resumed.

Resume data will only be returned if the protocol of the download as well as the server support resuming. In order to later resume a download you must call setDeletesFileUponFailure passing false so the partially downloaded data is not deleted when the initial connection is lost or canceled.

### 38.12.10 setDestination(path as folderitem, allowOverwrite as boolean)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the destination path of the downloaded file.
**Notes:** path: The path for the downloaded file.
allowOverwrite: true if an existing file at path can be replaced, false otherwise.

If allowOverwrite is false and a file already exists at path, a unique filename will be created for the downloaded file by appending a number to the filename. The delegate can implement didCreateDestination to determine the filename used when the file is written to disk.

An NSURLDownload instance ignores multiple calls to this method.
See also:

- 38.12.11 setDestination(path as string, allowOverwrite as boolean) 7747

### 38.12.11 setDestination(path as string, allowOverwrite as boolean)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the destination path of the downloaded file.
**Notes:** path: The path for the downloaded file.
allowOverwrite: true if an existing file at path can be replaced, false otherwise.

If allowOverwrite is false and a file already exists at path, a unique filename will be created for the downloaded file by appending a number to the filename. The delegate can implement didCreateDestination to determine the filename used when the file is written to disk.

An NSURLDownload instance ignores multiple calls to this method.
See also:

- 38.12.10 setDestination(path as folderitem, allowOverwrite as boolean) 7746

### 38.12.12 Properties

### 38.12.13 Handle as Integer

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.12.14 deletesFileUponFailure as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver deletes partially downloaded files when a download stops prematurely.
**Notes:** True if partially downloaded files should be deleted when a download stops prematurely, false otherwise. The default is true.
(Read and Write computed property)

### 38.12.15 Events

### 38.12.16 canAuthenticateAgainstProtectionSpace(protectionSpace as NSURLProtectionSpaceMBS) as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to determine whether the delegate is able to respond to a protection space's form of authentication. (required)
**Notes:** protectionSpace: The protection space that generates an authentication challenge.

This method is called before didReceiveAuthenticationChallenge, allowing the delegate to inspect a protection space before attempting to authenticate against it. By returning true, the delegate indicates that it can handle the form of authentication, which it does in the subsequent call to didReceiveAuthenticationChallenge. Not implementing this method is the same as returning false, in which case default authentication handling is used.

Available in Mac OS X v10.6 and later.

### 38.12.17 decideDestinationWithSuggestedFilename(filename as string)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The delegate receives this message when download has determined a suggested filename for the downloaded file. (required)
**Notes:** filename: The suggested filename for the download.

The suggested filename is either derived from the last path component of the URL and the MIME type or, if the download was encoded, from the encoding. If the delegate wishes to modify the path, it should send setDestination to download.

The delegate will not receive this message if setDestination has already been called for the download.

Available in Mac OS X v10.2 and later.

### 38.12.18 DidBegin

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent immediately after a download object begins a download. (required)
**Notes:** Available in Mac OS X v10.2 and later.

### 38.12.19 didCancelAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent if an authentication challenge is canceled due to the protocol implementation encountering an error. (required)
**Notes:** challenge: The authentication challenge that caused the download object to cancel the download.

If the delegate receives this message the download will fail and the delegate will receive a didFailWithError message.

Available in Mac OS X v10.2 and later.

### 38.12.20 didCreateDestination(path as string, file as folderitem)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when the destination file is created. (required)
**Notes:** path: The path to the destination file.
file: The path to the destination file as folderitem.

Available in Mac OS X v10.2 and later.

### 38.12.21 didFailWithError(error as NSErrorMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent if the download fails or if an I/O error occurs when the file is written to disk. (required)
**Notes:** error: The error that caused the failure of the download.

Any partially downloaded file will be deleted.

Once the delegate receives this message, it will receive no further messages for download.
Available in Mac OS X v10.2 and later.

### 38.12.22 DidFinish

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a download object has completed downloading successfully and has written its results to disk. (required)
**Notes:** The delegate will receive no further messages for download.
Available in Mac OS X v10.2 and later.

### 38.12.23 didReceiveAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when the URL download must authenticate a challenge in order to download the request. (required)
**Notes:** challenge: The URL authentication challenge that must be authenticated in order to download the request.

This method gives the delegate the opportunity to determine the course of action taken for the challenge: provide credentials, continue without providing credentials or cancel the authentication challenge and the download.

The delegate can determine the number of previous authentication challenges by sending the message previousFailureCount to challenge.

If the previous failure count is 0 and the value returned by proposedCredential is nil, the delegate can create a new NSURLCredential object, providing information specific to the type of credential, and send a useCredential message to challenge, passing the credential and challenge as parameters. If proposedCredential is not nil, the value is a credential from the URL or the shared credential storage that can be provided to the user as feedback.

The delegate may decide to abandon further attempts at authentication at any time by sending challenge a continueWithoutCredentialForAuthenticationChallenge or a cancelAuthenticationChallenge message. The specific action is implementation dependent.

If the delegate implements this method, the download will suspend until [ challenge sender ] is sent one of the following messages: useCredential, continueWithoutCredentialForAuthenticationChallenge or cancelAuthenticationChallenge.

If the delegate does not implement this method the default implementation is used. If a valid credential for the request is provided as part of the URL, or is available from the NSURLCredentialStorage the challenge is sent a useCredential:forAuthenticationChallenge with the credential. If the challenge has no credential or

the credentials fail to authorize access, then continueWithoutCredentialForAuthenticationChallenge is sent to challenge sender instead.

Available in Mac OS X v10.2 and later.

### 38.12.24 didReceiveDataOfLength(length as UInt64)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent as a download object receives data incrementally. (required)
**Notes:** length: The amount of data received in this increment of the download, measured in bytes.

Available in Mac OS X v10.2 and later.

### 38.12.25 didReceiveResponse(response as NSURLResponseMBS)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a download object has received sufficient load data to construct the NSURLResponse object for the download. (required)
**Notes:** response: The URL response object received as part of the download. response is immutable and will not be modified after this method is called.

In some rare cases, multiple responses may be received for a single download. In this case, the client should assume that each new response resets the download progress to 0 and should check the new response for the expected content length.
Available in Mac OS X v10.2 and later.

### 38.12.26 shouldDecodeSourceDataOfMIMEType(encodingType as string) as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a download object determines that the downloaded file is encoded to inquire whether the file should be automatically decoded. (required)
**Notes:** encodingType: The type of encoding used by the downloaded file. The supported encoding formats are MacBinary ("application/macbinary"), Binhex ("application/mac-binhex40") and gzip ("application/gzip").

Return true to decode the file, false otherwise.

The delegate may receive this message more than once if the file has been encoded multiple times. This method is not called if the downloaded file is not encoded.
Available in Mac OS X v10.2 and later.

### 38.12.27 shouldUseCredentialStorage as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to determine whether the URL loader should consult the credential storage to authenticate the download. (required)
**Notes:** This method is called before any attempt to authenticate is made. By returning false, the delegate tells the download not to consult the credential storage and makes itself responsible for providing credentials for any authentication challenges. Not implementing this method is the same as returing true. The delegate is free to consult the credential storage itself when it receives a didReceiveAuthenticationChallenge message.

Available in Mac OS X v10.6 and later.

### 38.12.28 willResumeWithResponse(response as NSURLResponseMBS, startingByte as Int64)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when a download object has received a response from the server after attempting to resume a download. (required)
**Notes:** response: The URL response received from the server in response to an attempt to resume a download.

The location of the start of the resumed data, in bytes.
Available in Mac OS X v10.4 and later.

### 38.12.29 willSendRequest(request as NSURLRequestMBS, redirectResponse as NSURLResponseMBS) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent when the download object determines that it must change URLs in order to continue loading a request. (required)
**Notes:** request: The proposed redirected request. The delegate should inspect the redirected request to verify that it meets its needs, and create a copy with new attributes to return to the connection if necessary. redirectResponse: The URL response that caused the redirect. May be nil in cases where this method is not being sent as a result of involving the delegate in redirect processing.

Return the actual URL request to use in light of the redirection response. The delegate may copy and modify request as necessary to change its attributes, return request unmodified, or return nil.

If the delegate wishes to cancel the redirect, it should call the download object's cancel method. Alternatively, the delegate method can return nil to cancel the redirect, and the download will continue to process. This has special relevance in the case where redirectResponse is not nil. In this case, any data that is loaded for the download will be sent to the delegate, and the delegate will receive a downloadDidFinish: or download:didFailWithError: message, as appropriate.

The delegate can receive this message as a result of transforming a request's URL to its canonical form, or for protocol-specific reasons, such as an HTTP redirect. The delegate implementation should be prepared to receive this message multiple times.

Available in Mac OS X v10.2 and later.

## 38.13 class NSURLMBS

### 38.13.1 class NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The class for URL.
**Notes:** An NSURL object represents a URL that can potentially contain the location of a resource on a remote server, the path of a local file on disk, or even an arbitrary piece of encoded data.

Please also review Apples documentation on this class:
https://developer.apple.com/library/mac/documentation/Cocoa/Reference/Foundation/Classes/NSURL_Class/index.html

MBS Plugin only includes a part of the original class. EMail us if you miss something.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.1
- Tip of the day: Count files in upload for iCloud
- MBS Xojo Plugins, version 22.1pr3
- MBS Xojo Plugins, version 21.2pr3
- MBS Xojo Plugins, version 20.5pr6
- MBS Xojo Plugins, version 20.3pr6
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- MBS Xojo / Real Studio Plugins, version 15.2pr1

### 38.13.2 Methods

### 38.13.3 checkResourceIsReachableAndReturnError as NSErrorMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns whether the URL's resource exists and is reachable.
**Notes:** This method synchronously checks if the resource's backing store is reachable. Checking reachability is appropriate when making decisions that do not require other immediate operations on the resource, e.g. periodic maintenance of UI state that depends on the existence of a specific document. When performing operations such as opening a file or copying resource properties, it is more efficient to simply try the operation and handle failures. If this method returns false, the optional error is populated. This method is currently applicable only to URLs for file system resources. For other URL types, NO is returned. Symbol is present

in iOS 4, but performs no operation.

### 38.13.4 Constructor(item as folderitem)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates an URL based on folderItem.
See also:


- 38.13.5 Constructor(scheme as string, host as string, path as string) 7755
- 38.13.6 Constructor(url as string) 7755
- 38.13.7 Constructor(url as string, baseURL as NSURLMBS) 7756


### 38.13.5 Constructor(scheme as string, host as string, path as string)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Initializes a newly created NSURL with a specified scheme, host, and path.
**Notes:** scheme: The scheme for the NSURL object. For example, in the URL http://www.example.com/index.html, the scheme is http.
host: The host for the NSURL object (for example, www.example.com). May be the empty string.
path: The path for the NSURL object (for example, /index.html). If the path begins with a tilde, you must first expand it by calling stringByExpandingTildeInPath.
See also:


- 38.13.4 Constructor(item as folderitem) 7755
- 38.13.6 Constructor(url as string) 7755
- 38.13.7 Constructor(url as string, baseURL as NSURLMBS) 7756


### 38.13.6 Constructor(url as string)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSURL object initialized with a provided URL string.
See also:


- 38.13.4 Constructor(item as folderitem) 7755
- 38.13.5 Constructor(scheme as string, host as string, path as string) 7755
- 38.13.7 Constructor(url as string, baseURL as NSURLMBS) 7756

### 38.13.7 Constructor(url as string, baseURL as NSURLMBS)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSURL object initialized with a base URL and a relative string.
**Notes:** This method allows you to create a URL relative to a base path or URL. For example, if you have the URL for a folder on disk and the name of a file within that folder, you can construct a URL for the file by providing the folder,Äôs URL as the base path (with a trailing slash) and the filename as the string part.

This method expects URLString to contain only characters that are allowed in a properly formed URL. All other characters must be properly percent escaped. Any percent-escaped characters are interpreted using UTF-8 encoding.
See also:


- 38.13.4 Constructor(item as folderitem) 7755
- 38.13.5 Constructor(scheme as string, host as string, path as string) 7755
- 38.13.6 Constructor(url as string) 7755


### 38.13.8 copy as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the URL object.

### 38.13.9 fileURLWithFileSystemRepresentation(path as string, isDirectory as boolean, relativeToURL as NSURLMBS) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Initializes a newly created URL referencing the local file or directory at the file system representation of the path.
**Notes:** File system representation is a string with canonical UTF-8 encoding.

### 38.13.10 fileURLWithPath(path as string) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Builds a file URL with given file path.
**Notes:** Better to use fileURLWithPath with directory parameter if you know if the path is a directory vs non-directory, as it saves an i/o.
See also:


- 38.13.11 fileURLWithPath(path as string, isDirectory as boolean) as NSURLMBS 7757

### 38.13.11 fileURLWithPath(path as string, isDirectory as boolean) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Builds a file URL based on a given file path.
See also:

- 38.13.10 fileURLWithPath(path as string) as NSURLMBS 7756

### 38.13.12 fileURLWithPathComponents(components() as string) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Builds an URL based on given components.

### 38.13.13 getResourceValue(byref value as Variant, key as string, byref error as NSErrorMBS) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns the value of the resource property for the specified key.
**Notes:** value: The location where the value for the resource property identified by key should be stored.
key: The name of one of the URL,Äôs resource properties.
error: The error that occurred if the resource value could not be retrieved.

Returns true if value is successfully populated; otherwise, false.

This method first checks if the URL object already caches the resource value. If so, it returns the cached resource value to the caller. If not, then this method synchronously obtains the resource value from the backing store, adds the resource value to the URL object's cache, and returns the resource value to the caller.

The type of the returned resource value varies by resource property; for details, see the documentation for the key you want to access.

If this method returns true and the value is populated with nil, it means that the resource property is not available for the specified resource, and that no errors occurred when determining that the resource property was unavailable.

If this method returns false, an error occurred. The object pointer referenced by error is populated with additional information.

This method applies only to URLs that represent file system resources.

Available in OS X v10.6 and later.

Automatic type translation applies (See FAQ about NSDictionary).
e.g. NSNumber can be converted to Integer or Boolean depending on content.

### 38.13.14 isEqual(other as NSURLMBS) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Tests if two NSURLs are equal.
**Notes:** Returns a Boolean value that indicates whether the receiver and a given object have identical URL strings and base URLs.

### 38.13.15 Items(byref error as NSErrorMBS, VisibleItemsOnly as boolean = false) as NSURLMBS()

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Queries list of items in the directory the URL points to on disk.
**Notes:** Error is optional.
See also:

- 38.13.16 Items(VisibleItemsOnly as boolean = false) as NSURLMBS() 7758

### 38.13.16 Items(VisibleItemsOnly as boolean = false) as NSURLMBS()

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Queries list of items in the directory the URL points to on disk.
See also:

- 38.13.15 Items(byref error as NSErrorMBS, VisibleItemsOnly as boolean = false) as NSURLMBS() 7758

### 38.13.17 mountedVolumeURLs(SkipHidden as boolean = true) as NSURLMBS()

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Queries array of all NSURLs for mounted volumes.
**Notes:** if SkipHidden is true, hidden volumes are skipped.

Returns nil in case of error.

### 38.13.18 NSThumbnail1024x1024SizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible keys for the NSURLThumbnailDictionaryKey dictionary.
**Notes:** A 1024 x 1024 pixel thumbnail as an NSImage on OS X.
Available in OS X v10.10 and later.

### 38.13.19 NSURLAddedToDirectoryDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The time at which the resource,Äôs was created or renamed into or within its parent directory, returned as an date. Inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes. (read-only)

Available in OS X v10.10.

### 38.13.20 NSURLAttributeModificationDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The time at which the resource,Äôs attributes were most recently modified, returned as an NSDate object if the volume supports attribute modification dates, or nil if attribute modification dates are unsupported (read-write).

Available in OS X v10.6 and later.

### 38.13.21 NSURLContentAccessDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The time at which the resource was most recently accessed, returned as a date object if the volume supports access dates, or nil if access dates are unsupported (read-only).

Available in OS X v10.6 and later.

### 38.13.22 NSURLContentModificationDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The time at which the resource was most recently modified, returned as a date object if the volume supports modification dates, or nil if modification dates are unsupported (read-write).

Available in OS X v10.6 and later.

### 38.13.23 NSURLCreationDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs creation date, returned as an NSDate object if the volume supports creation dates, or nil if creation dates are unsupported (read-write).

Available in OS X v10.6 and later.

### 38.13.24 NSURLCustomIconKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The icon stored with the resource, returned as an NSImage object, or nil if the resource has no custom icon.
Available in OS X v10.6 and later.

### 38.13.25 NSURLDocumentIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The document identifier returned as a number (read-only).

The document identifier is a value assigned by the kernel to a file or directory. This value is used to identify the document regardless of where it is moved on a volume. The identifier persists across system restarts. It

is not transferred when the file is copied, but it survives "safe save" operations. For example, it remains on the path to which it was assigned, even after calling the replaceItemAtURL:withItemAtURL:backupItemName:options:resultingItemURL:error: method. Document identifiers are only unique within a single volume. This property is not supported by all volumes.

Available in OS X v10.10 and iOS 8.0.

### 38.13.26 NSURLEffectiveIconKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs normal icon, returned as an NSImage object (read-only).

Available in OS X v10.6 and later.

### 38.13.27 NSURLFileAllocatedSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that apply to properties of files.
**Notes:** Key for the total size allocated on disk for the file, returned as an NSNumber object (read-only).

Available in OS X v10.6 and later.

### 38.13.28 NSURLFileResourceIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs unique identifier, returned as an id (read-only).

This identifier can be used to determine equality between file system resources with the isEqual: method. Two resources are equal if they have the same file-system path or if their paths link to the same inode on the same file system.

The value of this identifier is not persistent across system restarts.

Available in OS X v10.7 and later.

If used with getResourceValue will give a MemoryBlock.

### 38.13.29 NSURLFileResourceTypeBlockSpecial as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a block special file.
Available in OS X v10.7 and later.

### 38.13.30 NSURLFileResourceTypeCharacterSpecial as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a character special file.
Available in OS X v10.7 and later.

### 38.13.31 NSURLFileResourceTypeDirectory as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a directory.
Available in OS X v10.7 and later.

### 38.13.32 NSURLFileResourceTypeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs object type, returned as an NSString object. See File Resource Types for possible values.
Available in OS X v10.7 and later.

### 38.13.33 NSURLFileResourceTypeNamedPipe as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a named pipe.
Available in OS X v10.7 and later.

### 38.13.34 NSURLFileResourceTypeRegular as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a regular file.
Available in OS X v10.7 and later.

### 38.13.35 NSURLFileResourceTypeSocket as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a socket.
Available in OS X v10.7 and later.

### 38.13.36 NSURLFileResourceTypeSymbolicLink as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource is a symbolic link.
Available in OS X v10.7 and later.

### 38.13.37 NSURLFileResourceTypeUnknown as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the possible values for the NSURLFileResourceTypeKey key.
**Notes:** The resource,Äôs type is unknown.
Available in OS X v10.7 and later.

### 38.13.38 NSURLFileScheme as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** These schemes are the ones that NSURL can parse.
**Notes:** Identifies a URL that points to a file on a mounted volume.

### 38.13.39 NSURLFileSecurityKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs security information, returned as an NSFileSecurity object (read-write).
Available in OS X v10.7 and later.

### 38.13.40 NSURLFileSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that apply to properties of files.
**Notes:** Key for the file,Äôs size in bytes, returned as an NSNumber object (read-only).
Available in OS X v10.6 and later.

### 38.13.41 NSURLGenerationIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** An opaque generation identifier, returned as an id (read-only)

The generation identifier can be compared using isEqual to determine if the data in a document has been modified. For URLs which refer to the same file inode, the generation identifier changes when the data in the file's data fork is changed. Changes to extended attributes or other file system metadata do not change the identifier. For URLs which refer to the same directory inode, the generation identifier changes when direct children of that directory are added, removed or renamed. Changes to the data of the direct children of that directory does not change the generation identifier. The identifier persists across system restarts. It is tied to a specific document on a specific volume and is not transferred when the document is copied to another volume. This property is not supported by all volumes.

Available in OS X v10.10 and iOS 8.0.

### 38.13.42 NSURLHasHiddenExtensionKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource,Äôs extension is normally removed from its localized name, returned as a Boolean (read-write).

### 38.13.43 NSURLIsAliasFileKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that apply to properties of files.
**Notes:** Key for determining whether the file is an alias, returned as a Boolean NSNumber object (read-only).

Available in OS X v10.6 and later.

### 38.13.44 NSURLIsDirectoryKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is a directory, returned as a Boolean- (read-only).
Available in OS X v10.6 and later.

### 38.13.45 NSURLIsExcludedFromBackupKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is excluded from all backups of app data, returned as a Boolean NSNumber object (read-write).

You can use this property to exclude cache and other app support files which are not needed in a backup. Some operations commonly made to user documents cause this property to be reset to false; consequently, do not use this property on user documents.

Available in OS X v10.8 and later.

### 38.13.46 NSURLIsExecutableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the current process (as determined by the EUID) can execute the resource (if it is a file) or search the resource (if it is a directory), returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.47 NSURLIsHiddenKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is normally not displayed to users, returned as a Boolean NSNumber object (read-write).

If the resource is hidden because its name begins with a period, setting this value has no effect.
Available in OS X v10.6 and later.

### 38.13.48 NSURLIsMountTriggerKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the URL is a file system trigger directory, returned as a Boolean NSNumber object (read-only). Traversing or opening a file system trigger directory causes an attempt to mount a file system on the directory.

Available in OS X v10.7 and later.

### 38.13.49 NSURLIsPackageKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is a file package, returned as a Boolean NSNumber object (read-write in OS X v10.8 and later, read-only in previous versions). A true value means that the resource is a file package.

If you attempt to set or clear this key,Äôs value on a file instead of a directory, the system ignores your attempt. If the directory is defined as a package by way of its filename extension or other reason apart from this key, setting this key,Äôs value to false has no effect.

Available in OS X v10.6 and later.

### 38.13.50 NSURLIsReadableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the current process (as determined by the EUID) can read the resource, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.51 NSURLIsRegularFileKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is a regular file, as opposed to a directory or a symbolic link. Returned as a Boolean NSNumber object (read-only).

Available in OS X v10.6 and later.

### 38.13.52 NSURLIsSymbolicLinkKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is a symbolic link, returned as a Boolean NSNumber object (read-only).

Available in OS X v10.6 and later.

### 38.13.53 NSURLIsSystemImmutableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource's system immutable bit is set, returned as a Boolean NSNumber object (read-write).

Available in OS X v10.6 and later.

### 38.13.54 NSURLIsUbiquitousItemKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the keys for files.
**Example:**

```
Dim f as FolderItem // your folderitem
Dim n As New NSURLMBS(f)

dim value as Variant
dim error as NSErrorMBS
Dim result As Boolean = n.getResourceValue(value, n.NSURLIsUbiquitousItemKey, error)
break // check in debugger
```

**Notes:** A boolean that contains true if this item is in iCloud storage, false if it is a local item (read-only).

Available in OS X v10.7 and later.

### 38.13.55 NSURLIsUserImmutableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource's user immutable bit is set, returned as a Boolean NSNumber object (read-write).
Available in OS X v10.6 and later.

### 38.13.56 NSURLIsVolumeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the resource is the root directory of a volume, returned as a Boolean NSNumber object (read-only).

Available in OS X v10.6 and later.

### 38.13.57 NSURLIsWritableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Key for determining whether the current process (as determined by the EUID) can write to the resource, returned as a Boolean NSNumber object (read-only).

Available in OS X v10.7 and later.

### 38.13.58 NSURLKeysOfUnsetValuesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Key for the resource properties that have not been set after setResourceValues returns an error, returned as an array of of strings.

### 38.13.59 NSURLLabelColorKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs label color, returned as an NSColor object, or nil if the resource has no label color (read-only).
Available in OS X v10.6 and later.

### 38.13.60 NSURLLabelNumberKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs label number, returned as an NSNumber object (read-write).

Available in OS X v10.6 and later.

### 38.13.61 NSURLLinkCountKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.

**Notes:** The number of hard links to the resource, returned as an NSNumber object (read-only).
Available in OS X v10.6 and later.

### 38.13.62 NSURLLocalizedLabelKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs localized label text, returned as an NSString object, or nil if the resource has no localized label text (read-only).

Available in OS X v10.6 and later.

### 38.13.63 NSURLLocalizedNameKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs localized or extension-hidden name, returned as an NSString object (read-only).

Available in OS X v10.6 and later.

### 38.13.64 NSURLLocalizedTypeDescriptionKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs localized type description, returned as an NSString object (read-only).
Available in OS X v10.6 and later.

### 38.13.65 NSURLNameKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs name in the file system, returned as an NSString object (read-write).
Available in OS X v10.6 and later.

### 38.13.66 NSURLParentDirectoryURLKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The parent directory of the resource, returned as an NSURL object, or nil if the resource is the root directory of its volume (read-only).
Available in OS X v10.6 and later.

### 38.13.67 NSURLPathKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The file system path for the URL, returned as an NSString object (read-only).

Available in OS X v10.8 and later.

### 38.13.68 NSURLPreferredIOBlockSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The optimal block size to use when reading or writing this file's data, returned as an NSNumber object, or nil if the preferred size is not available (read-only).
Available in OS X v10.7 and later.

### 38.13.69 NSURLQuarantinePropertiesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A key for quarantine properties.
**Example:**

```
Dim f As FolderItem = SpecialFolder.UserHome.Child("Downloads").Child("Installation.pdf")
Dim n As New NSURLMBS(f)
'Dim d As Dictionary = n.QuarantineProperties

Dim d As Dictionary
Dim v As Variant
dim e as NSErrorMBS

If n.getResourceValue(v, n.NSURLQuarantinePropertiesKey, e) Then
```

```
d = v
Break // inspect in debugger

Else
Break // failed
End If
```

**Notes:** The quarantine properties as defined in LSQuarantine.h. To remove quarantine information from a file, pass NSNull as the value when setting this property. (Read-write, value type dictionary)
Available on Mac OS X 10.10 and later.

### 38.13.70 NSURLTagNamesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The names of tags attached to the resource, returned as an array of String values (read-write).

Available in OS X v10.9 and later.

### 38.13.71 NSURLThumbnailDictionaryKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** A dictionary of NSImage objects keyed by size (read-write).
See Thumbnail Property Keys for a list of possible keys.
Available in OS X v10.10.

### 38.13.72 NSURLThumbnailKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** All thumbnails as a single NSImage (read-write).
Available in OS X v10.10.

### 38.13.73 NSURLTotalFileAllocatedSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that apply to properties of files.
**Notes:** Key for the total allocated size of the file in bytes, returned as an NSNumber object (read-only). This includes the size of any file metadata.

Available in OS X v10.7 and later.

### 38.13.74 NSURLTotalFileSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that apply to properties of files.
**Notes:** Key for the total displayable size of the file in bytes, returned as an NSNumber object (read-only). This includes the size of any file metadata.

Available in OS X v10.7 and later.

### 38.13.75 NSURLTypeIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The resource,Äôs uniform type identifier (UTI), returned as a string (read-only).
Available in OS X v10.6 and later.

### 38.13.76 NSURLUbiquitousItemContainerDisplayNameKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A string containing the name of the item,Äôs container, as it is displayed to the user.

Available in OS X v10.10 and later.

### 38.13.77 NSURLUbiquitousItemDownloadingErrorKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** An error object that indicates why downloading the item from iCloud failed.

Available in OS X v10.9 and later.

### 38.13.78 NSURLUbiquitousItemDownloadingStatusCurrent as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Values that describe the iCloud storage state of a file.
**Notes:** A local copy of this item exists and is the most up-to-date version known to the device.

Available in OS X v10.9 and later.

### 38.13.79 NSURLUbiquitousItemDownloadingStatusDownloaded as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Values that describe the iCloud storage state of a file.
**Notes:** A local copy of this item exists, but it is stale. The most recent version will be downloaded as soon as possible.

Available in OS X v10.9 and later.

### 38.13.80 NSURLUbiquitousItemDownloadingStatusKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** The current download state for the item, indicating whether a local copy exists and whether that copy is the most current version of the item. The possible values for this key are described in Ubiquitous Item Downloading Status Constants.

Available in OS X v10.9 and later.

### 38.13.81 NSURLUbiquitousItemDownloadingStatusNotDownloaded as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Values that describe the iCloud storage state of a file.
**Notes:** This item has not been downloaded yet. Use startDownloadingUbiquitousItemAtURL to download it.

Available in OS X v10.9 and later.

### 38.13.82 NSURLUbiquitousItemDownloadRequestedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A Boolean indicating whether a call to startDownloadingUbiquitousItemAtURL has already been made to download the item. The value of this key is read-only.

Available in OS X v10.10 and later.

### 38.13.83 NSURLUbiquitousItemHasUnresolvedConflictsKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A boolean NSNumber that contains true if this item has conflicts outstanding, false otherwise (read-only).
Available in OS X v10.7 and later.

### 38.13.84 NSURLUbiquitousItemIsDownloadedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A boolean NSNumber that contains true if this item,Äôs data has been downloaded to a ubiquity container, false otherwise (read-only).

Available in OS X v10.7 and later.
Deprecated in OS X v10.9.

### 38.13.85 NSURLUbiquitousItemIsDownloadingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A boolean NSNumber that contains true if this item is being downloaded from iCloud, false otherwise (read-only).

Available in OS X v10.7 and later.

### 38.13.86 NSURLUbiquitousItemIsExcludedFromSyncKey as string

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Value is a boolean.
The item is excluded from sync, which means it is locally on disk but won't be available on the server. An excluded item is no longer ubiquitous.

### 38.13.87 NSURLUbiquitousItemIsSharedKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the ubiquitous item is shared. (Read-only, value type boolean)

### 38.13.88 NSURLUbiquitousItemIsUploadedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A boolean NSNumber that contains true if this item,Äôs data has been uploaded to iCloud storage, false otherwise (read-only).

When waiting for an upload to complete, do not poll this key from within a block passed to coordinateReadingItemAtURL, because the coordinated read required to obtain this value cannot be performed until that block completes and returns. Instead, use NSMetadataQuery or an NSFilePresenter delegate to asynchronously notify your app when the status changes.

Available in OS X v10.7 and later.

### 38.13.89 NSURLUbiquitousItemIsUploadingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** A boolean NSNumber that contains true if this item is being uploaded to iCloud, false otherwise (read-only).

Available in OS X v10.7 and later.

### 38.13.90 NSURLUbiquitousItemPercentDownloadedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** An NSNumber in the range 0–100 that indicates the percentage of the data that has been downloaded (read-only).

Use the NSMetadataQuery class to search for NSMetadataItem objects that have the NSMetadataUbiquitousItemPercentDownloadedKey attribute instead.

Available in OS X v10.7 and later.
Deprecated in OS X v10.8.

### 38.13.91 NSURLUbiquitousItemPercentUploadedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** An NSNumber in the range 0–100 that indicates the percentage of the data that has been uploaded (read-only).

Use the NSMetadataQuery class to search for NSMetadataItem objects that have the NSMetadataUbiquitousItemPercentUploadedKey attribute instead.

Available in OS X v10.7 and later.
Deprecated in OS X v10.8.

### 38.13.92 NSURLUbiquitousItemUploadingErrorKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Keys that describe the iCloud storage state of a file.
**Notes:** An error object that indicates why uploading the item to iCloud failed.
Available in OS X v10.9 and later.

### 38.13.93 NSURLUbiquitousSharedItemCurrentUserPermissionsKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** returns the permissions for the current user, or nil if not shared. (Read-only, value type string). Possible values below.

### 38.13.94 NSURLUbiquitousSharedItemCurrentUserRoleKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Returns the current user's role for this shared item, or nil if not shared. (Read-only, value type string). See NSURLUbiquitousSharedItemRoleOwner and NSURLUbiquitousSharedItemRoleParticipant.

### 38.13.95 NSURLUbiquitousSharedItemMostRecentEditorNameComponentsKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** returns a NSPersonNameComponents for the most recent editor of the document, or nil if it is the current user. (Read-only, value type NSPersonNameComponents)

### 38.13.96 NSURLUbiquitousSharedItemOwnerNameComponentsKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** returns a NSPersonNameComponents, or nil if the current user. (Read-only, value type NSPersonNameComponents)

### 38.13.97 NSURLUbiquitousSharedItemPermissionsReadOnly as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** the current user is only allowed to read this item

### 38.13.98 NSURLUbiquitousSharedItemPermissionsReadWrite as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** the current user is allowed to both read and write this item

### 38.13.99 NSURLUbiquitousSharedItemRoleOwner as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** the current user is the owner of this shared item.

### 38.13.100 NSURLUbiquitousSharedItemRoleParticipant as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** the current user is a participant of this shared item.

### 38.13.101 NSURLVolumeAvailableCapacityForImportantUsageKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Total available capacity in bytes for "Opportunistic" resources, including space expected to be cleared by purging non-essential and cached resources. "Opportunistic" means something that the user is likely to want but does not expect to be present on the local system, but is ultimately non-essential and replaceable. This would include items that will be created or downloaded without an explicit request from the user on the current device.

Examples: A background download of a newly available episode of a TV series that a user has been recently watching, a piece of content explicitly requested on another device, or a new document saved to a

network server by the current user from another device.

Value is zero if unknown. Please switch to NSURLVolumeAvailableCapacityKey key in that case.

Read-only, value type number

### 38.13.102 NSURLVolumeAvailableCapacityForOpportunisticUsageKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** Total available capacity in bytes for "Important" resources, including space expected to be cleared by purging non-essential and cached resources. "Important" means something that the user or application clearly expects to be present on the local system, but is ultimately replaceable. This would include items that the user has explicitly requested via the UI, and resources that an application requires in order to provide functionality.

Examples: A video that the user has explicitly requested to watch but has not yet finished watching or an audio file that the user has requested to download.

This value should not be used in determining if there is room for an irreplaceable resource. In the case of irreplaceable resources, always attempt to save the resource regardless of available capacity and handle failure as gracefully as possible.

Value is zero if unknown. Please switch to NSURLVolumeAvailableCapacityKey key in that case.

Read-only, value type number

### 38.13.103 NSURLVolumeAvailableCapacityKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the volume,Äôs available capacity in bytes, returned as an Int64 (read-only).
Available in OS X v10.6 and later.

### 38.13.104 NSURLVolumeCreationDateKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the volume,Äôs creation date, returned as a date, or nil if it cannot be determined (read-only).

Available in OS X v10.7 and later.

### 38.13.105 NSURLVolumeIdentifierKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The unique identifier of the resource,Äôs volume, returned as an id (read-only).
This identifier can be used with the isEqual method to determine whether two file system resources are on the same volume.
The value of this identifier is not persistent across system restarts.
Available in OS X v10.7 and later.

If used with getResourceValue will give a MemoryBlock.

### 38.13.106 NSURLVolumeIsAutomountedKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is automounted, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.107 NSURLVolumeIsBrowsableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is visible in GUI-based file-browsing environments, such as the Desktop or the Finder application, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.108 NSURLVolumeIsEjectableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is ejectable from the drive mechanism under software control, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.109 NSURLVolumeIsEncryptedKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume is encrypted. (Read-only, value type boolean)

### 38.13.110 NSURLVolumeIsInternalKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is connected to an internal bus, returned as a Boolean, or nil if it cannot be determined (read-only).

Available in OS X v10.7 and later.

### 38.13.111 NSURLVolumeIsJournalingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is currently journaling, returned as a Boolean.
Available in OS X v10.6 and later.

### 38.13.112 NSURLVolumeIsLocalKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Example:**

```
dim f as FolderItem = GetFolderItem("/Volumes/Ablage1", FolderItem.PathTypeNative)

dim n as NSURLMBS = NSURLMBS.URLWithItem(f)
dim value as Variant
dim error as NSErrorMBS

dim Local as Boolean

// network volumes are not local
if n.getResourceValue(value, n.NSURLVolumeIsLocalKey, error) then
MsgBox "Local: "+value.StringValue
Local = value.BooleanValue
else
MsgBox error.LocalizedDescription
end if

// network volumes have an URL
if n.getResourceValue(value, n.NSURLVolumeURLForRemountingKey, error) then
MsgBox "URLForRemounting: "+value.StringValue
else
MsgBox error.LocalizedDescription
end if
```

**Notes:** Key for determining whether the volume is stored on a local device, returned as a Boolean (read-only).
Available in OS X v10.7 and later.

### 38.13.113 NSURLVolumeIsReadOnlyKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume is read-only, returned as a Boolean (read-only).
Available in OS X v10.7 and later.

### 38.13.114 NSURLVolumeIsRemovableKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Example:**

```
dim f as FolderItem = GetFolderItem("/Volumes/Test", FolderItem.PathTypeNative)

dim n as NSURLMBS = NSURLMBS.URLWithItem(f)
dim value as Variant
dim error as NSErrorMBS

if n.getResourceValue(value, n.NSURLVolumeIsRemovableKey, error) then
MsgBox "Removable: "+value.StringValue
else
MsgBox error.LocalizedDescription
end if
```

**Notes:** Key for determining whether the volume is removable from the drive mechanism, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.115 NSURLVolumeIsRootFileSystemKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume is the root filesystem. (Read-only, value type boolean)

### 38.13.116 NSURLVolumeLocalizedFormatDescriptionKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the volume,Äôs descriptive format name, returned as a string (read-only).
Available in OS X v10.6 and later.

### 38.13.117 NSURLVolumeLocalizedNameKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** The name of the volume as it should be displayed in the user interface, returned as a string (read-only).
Available in OS X v10.7 and later.

### 38.13.118 NSURLVolumeMaximumFileSizeKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the largest file size supported by the volume in bytes, returned as a Boolean, or nil if it cannot be determined (read-only).

Available in OS X v10.7 and later.

### 38.13.119 NSURLVolumeNameKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** The name of the volume, returned as an NSString object (read-write). Settable only if NSURLVolumeSupportsRenamingKey is true.

Available in OS X v10.7 and later.

### 38.13.120 NSURLVolumeResourceCountKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the total number of resources on the volume, returned as an integer (read-only).
Available in OS X v10.6 and later.

### 38.13.121 NSURLVolumeSupportsAccessPermissionsKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports setting POSIX access permissions with the NSURLFileSecurityKey property (Read-only, value type boolean)

### 38.13.122 NSURLVolumeSupportsAdvisoryFileLockingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume implements whole-file advisory locks in the style of flock, along with the O_EXLOCK and O_SHLOCK flags of the open function, returned as a Boolean NSNumber object (read-only).

Available in OS X v10.7 and later.

### 38.13.123 NSURLVolumeSupportsCasePreservedNamesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Example:**

```
dim f as FolderItem = Volume(0)
dim n as new NSURLMBS(f)

dim v as Variant
dim e as NSErrorMBS
if n.getResourceValue(v, n.NSURLVolumeSupportsCasePreservedNamesKey, e) then
MsgBox "VolumeSupportsCasePreservedNames: "+str(v.BooleanValue)
else
MsgBox "Failed to query: "+e.LocalizedDescription
end if
```

**Notes:** Key for determining whether the volume supports case-preserved names, returned as a Boolean (read-only).
Available in OS X v10.6 and later.

### 38.13.124 NSURLVolumeSupportsCaseSensitiveNamesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Example:**

```
dim f as FolderItem = Volume(0)
dim n as new NSURLMBS(f)

dim v as Variant
dim e as NSErrorMBS
if n.getResourceValue(v, n.NSURLVolumeSupportsCaseSensitiveNamesKey, e) then
MsgBox "VolumeSupportsCaseSensitiveNames: "+str(v.BooleanValue)
else
MsgBox "Failed to query: "+e.LocalizedDescription
end if
```

**Notes:** Key for determining whether the volume supports case-sensitive names, returned as a Boolean (read-only).
Available in OS X v10.6 and later.

### 38.13.125 NSURLVolumeSupportsCompressionKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports transparent decompression of compressed files using decmpfs. (Read-only, value type boolean)

### 38.13.126 NSURLVolumeSupportsExclusiveRenamingKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports renamex_np(2)'s RENAME_EXCL option (Read-only, value type boolean)

### 38.13.127 NSURLVolumeSupportsExtendedSecurityKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports extended security (access control lists), returned as a Boolean (read-only) (read-only).

Available in OS X v10.7 and later.

### 38.13.128 NSURLVolumeSupportsFileCloningKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports clonefile(2) (Read-only, value type boolean)

### 38.13.129 NSURLVolumeSupportsFileProtectionKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** True if the volume supports the File Protection attribute (see NSURLFileProtectionKey). (Read-only, value type number)

### 38.13.130 NSURLVolumeSupportsHardLinksKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports hard links, returned as a Boolean.
Available in OS X v10.6 and later.

### 38.13.131 NSURLVolumeSupportsImmutableFilesKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports making files immutable with the NSURLIsUserImmutableKey or NSURLIsSystemImmutableKey properties (Read-only, value type boolean)

### 38.13.132 NSURLVolumeSupportsJournalingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports journaling, returned as a Boolean.
Available in OS X v10.6 and later.

### 38.13.133 NSURLVolumeSupportsPersistentIDsKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports persistent IDs, returned as a Boolean (read-only).
Available in OS X v10.6 and later.

### 38.13.134 NSURLVolumeSupportsRenamingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume can be renamed, returned as a Boolean (read-only).
Available in OS X v10.7 and later.

### 38.13.135 NSURLVolumeSupportsRootDirectoryDatesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports reliable storage of times for the root directory, returned as a Boolean (read-only).

Available in OS X v10.7 and later.

### 38.13.136 NSURLVolumeSupportsSparseFilesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports sparse files, returned as a Boolean.

Available in OS X v10.6 and later.

### 38.13.137 NSURLVolumeSupportsSwapRenamingKey as string

MBS MacBase Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** true if the volume supports renamex_np(2)'s RENAME_SWAP option (Read-only, value type boolean)

### 38.13.138 NSURLVolumeSupportsSymbolicLinksKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports symbolic links, returned as a Boolean.
Available in OS X v10.6 and later.

### 38.13.139 NSURLVolumeSupportsVolumeSizesKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports returning volume size information, returned as a Boolean (read-only). If true, volume size information is available as values of the NSURLVolumeTotalCapacityKey and NSURLVolumeAvailableCapacityKey keys.

Available in OS X v10.7 and later.

### 38.13.140 NSURLVolumeSupportsZeroRunsKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for determining whether the volume supports zero runs, returned as a Boolean. (read-only).
Available in OS X v10.6 and later.

### 38.13.141 NSURLVolumeTotalCapacityKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the volume,Äôs capacity in bytes, returned as an Int64 (read-only).

Available in OS X v10.6 and later.

### 38.13.142 NSURLVolumeURLForRemountingKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the URL needed to remount the network volume, returned as an NSURL object, or nil if a URL is not available (read-only).

Available in OS X v10.7 and later.

### 38.13.143 NSURLVolumeURLKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the file system URL resource keys.
**Notes:** The root directory of the resource,Äôs volume, returned as an NSURL object (read-only).
Available in OS X v10.6 and later.

### 38.13.144 NSURLVolumeUUIDStringKey as string

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** One of the property keys for volumes.
**Notes:** Key for the volume,Äôs persistent UUID, returned as an NSString object, or nil if a persistent UUID is not available (read-only).

Available in OS X v10.7 and later.

### 38.13.145 pathComponents as string()

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** An array containing the path components. (read-only)
**Notes:** This property contains an array containing the individual path components of the URL. For example, in the URL file:///directory/directory2/file, the path components array would be "/", "directory", "directory2", "file".

### 38.13.146 removeAllCachedResourceValues

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Removes all cached resource values and temporary resource values from the URL object.
**Notes:** This method is applicable only to URLs that represent file system resources.
Available in OS X v10.9 and later.

### 38.13.147 removeCachedResourceValueForKey(key as string)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Removes the cached resource value identified by a given key from the URL object.
**Notes:** key: The resource value key whose cached values you want to remove.

Removing a cached resource value may remove other cached resource values because some resource values are cached as a set of values, and because some resource values depend on other resource values. (Temporary resource values have no dependencies.)

This method is currently applicable only to URLs for file system resources.

Available in OS X v10.9 and later.

### 38.13.148 resourceValuesForKeys(keys() as string, byref error as NSErrorMBS) as Dictionary

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns the resource values for the properties identified by specified array of keys.
**Notes:** Returns a dictionary of resource values indexed by key.

This method first checks if the URL object already caches the specified resource values. If so, it returns the

cached resource values to the caller. If not, then this method synchronously obtains the resource values from the backing store, adds the resource values to the URL object's cache, and returns the resource values to the caller.

The type of the returned resource value varies by resource property; for details, see the documentation for the key you want to access.

If the result dictionary does not contain a resource value for one or more of the requested resource keys, it means those resource properties are not available for the URL, and no errors occurred when determining those resource properties were not available.

If an error occurs, this method returns nil and populates the object pointer referenced by error with additional information.

This method applies only to URLs that represent file system resources.
Available in OS X v10.6 and later.
See also:


- 38.13.149 resourceValuesForKeys(keys() as string, targetDelegate as ResourceValuesForKeysDelegateMBS, tag as Variant = nil, PrecacheIcons as boolean = false) 7793


### 38.13.149 resourceValuesForKeys(keys() as string, targetDelegate as ResourceValuesForKeysDelegateMBS, tag as Variant = nil, PrecacheIcons as boolean = false)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Query keys asynchronously.
**Notes:** The plugin will query values on a different preemptive thread and call your delegate on main thread with results as soon as possible. This way you can keep app responsive while system e.g. loads icons.
For icons, you can set PrecacheIcons to true. In that case plugin will draw icon on the preemptive thread, so icon data is really loaded from disk. When you than draw on main thread, it's really quick.

The delegate has this parameters:
ResourceValuesForKeysDelegateMBS(URL as NSURLMBS, keys() as String, Values as Dictionary, Error as NSErrorMBS, tag as Variant)
See also:


- 38.13.148 resourceValuesForKeys(keys() as string, byref error as NSErrorMBS) as Dictionary 7792

### 38.13.150 setResourceValue(value as Variant, key as string, byref error as NSErrorMBS) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Sets the URL,Äôs resource property for a given key to a given value.
**Notes:** value: The value for the resource property defined by key.
key: The name of one of the URL,Äôs resource properties.
error: The error that occurred if the resource value could not be set.

Returns true if the resource property named key is successfully set to value; otherwise, false.

This method synchronously writes the new resource value out to disk. Attempts to set a read-only resource property or to set a resource property that is not supported by the resource are ignored and are not considered errors.

If an error occurs, this method returns NO and populates the object pointer referenced by error with additional information.

This method applies only to URLs for file system resources.
Available in OS X v10.6 and later.

Automatic type translation applies (See FAQ about NSDictionary).

### 38.13.151 setResourceValues(keyedValues as Dictionary, byref error as NSErrorMBS) as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Sets the URL,Äôs resource properties for a given set of keys to a given set of values.
**Notes:** keyedValues: A dictionary of resource values to be set.
error: The error that occurred if one or more resource values could not be set.

Returns true if all resource values in keyedValues are successfully set; otherwise, false.

This method synchronously writes the new resource value out to disk. If an error occurs after some resource properties have been successfully changed, the userInfo dictionary in the returned error object contains a kCFURLKeysOfUnsetValuesKey key whose value is an array of the resource values that were not successfully set.

Attempts to set a read-only resource property or to set a resource property that is not supported by the

resource are ignored and are not considered errors.

The order in which the resource values are set is not defined. If you need to guarantee the order in which resource values are set, you should make multiple requests to this method or setResourceValue:forKey:error:.

This method applies only to URLs for file system resources.
Available in OS X v10.6 and later.

Automatic type translation applies (See FAQ about NSDictionary).

### 38.13.152 setTemporaryResourceValue(value as Variant, key as string)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Sets a temporary resource value on the URL object.
**Notes:** value: The value to store.
key: The key where the value should be stored. This key must be unique and must not conflict with any system-defined keys. Reverse-domain-name notation is recommended.

Your app can use a temporary resource value to temporarily store a value for an app-defined resource value key in memory without modifying the actual resource that the URL represents. Once set, you can copy the temporary resource value from the URL object just as you would copy system-defined keys—by calling getResourceValue or resourceValuesForKeys.

Your app can remove a temporary resource value from the URL object by calling removeCachedResourceValueForKey or removeAllCachedResourceValues (to remove all temporary values).

This method is applicable only to URLs for file system resources.
Available in OS X v10.9 and later.

### 38.13.153 startAccessingSecurityScopedResource as boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Starts accessing a security scoped bookmark URL.
**Notes:** Given a NSURL created by resolving a bookmark data created with security scope, make the resource referenced by the url accessible to the process. When access to this resource is no longer needed the client must call stopAccessingSecurityScopedResource. Each call to startAccessingSecurityScopedResource must be balanced with a call to stopAccessingSecurityScopedResource (Note: this is not reference counted).

### 38.13.154 stopAccessingSecurityScopedResource

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Revokes the access granted to the url by a prior successful call to startAccessingSecurityScopedResource.

### 38.13.155 TagNames as string()

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The names of tags attached to the resource, returned as an array of String values.
**Notes:** Available in OS X v10.9 and later.

### 38.13.156 URLByAppendingPathComponent(pathComponent as string) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path component to the original URL.
**Notes:** pathComponent: The path component to add to the URL, in its original form (not URL encoded).

Returns a new URL with pathComponent appended.

If the original URL does not end with a forward slash and pathComponent does not begin with a forward slash, a forward slash is inserted between the two parts of the returned URL, unless the original URL is the empty string.

Available in OS X v10.6 and later.
See also:

- 38.13.157 URLByAppendingPathComponent(pathComponent as string, isDirectory as boolean) as NSURLMBS 7796

### 38.13.157 URLByAppendingPathComponent(pathComponent as string, isDirectory as boolean) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path component to the original URL, along with a trailing slash if the component is designated a directory.
**Notes:** pathComponent: The path component to add to the URL.

isDirectory: If true, a trailing slash is appended after pathComponent.

Returns a new URL with pathComponent appended.

If the original URL does not end with a forward slash and pathComponent does not begin with a forward slash, a forward slash is inserted between the two parts of the returned URL, unless the original URL is the empty string.

Available in OS X v10.7 and later.
On Mac OS X 10.6 the plugin falls back
See also:

- 38.13.156 URLByAppendingPathComponent(pathComponent as string) as NSURLMBS 7796

### 38.13.158 URLByAppendingPathExtension(PathExtension as string) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path extension to the original URL.
**Notes:** pathExtension: The path extension to add to the URL.

Returns a new URL with pathExtension appended.

If the original URL ends with one or more forward slashes, these are removed from the returned URL. A period is inserted between the two parts of the new URL.
Available in OS X v10.6 and later.

### 38.13.159 URLByDeletingLastPathComponent as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A URL created by taking the receiver and removing the last path component.
**Notes:** If the receiver,Äôs URL represents the root path, this property contains a copy of the original URL. Otherwise, if the original URL has only one path component, this property contains the empty string.

Available in OS X v10.6 and later.

### 38.13.160 URLByDeletingPathExtension as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A URL created by taking the receiver and removing the path extension, if any.
**Notes:** If the receiver represents the root path, this property contains a copy of the original URL. If the URL has multiple path extensions, only the last one is removed.

Available in OS X v10.6 and later.

### 38.13.161 URLByResolvingSymlinksInPath as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A URL that points to the same resource as the receiver and includes no symbolic links.
**Notes:** If the receiver has no symbolic links, this property contains a copy of the original URL.

If some symbolic links cannot be resolved, this property contains those broken symbolic links.

If the name of the receiving path begins with /private, this property strips off the /private designator, provided the result is the name of an existing file.

This property only works on URLs with the file: path scheme. For all other URLs, it contains a copy of the receiver.
Available in OS X v10.6 and later.

### 38.13.162 URLByStandardizingPath as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A URL that points to the same resource as the original URL using an absolute path.
**Notes:** This property only works on URLs with the file: path scheme. For all other URLs, it returns a copy of the original URL.

Like stringByStandardizingPath, this property can make the following changes in the provided URL:

- Expand an initial tilde expression using stringByExpandingTildeInPath.
- Reduce empty components and references to the current directory (that is, the sequences "//" and "/./") to single path separators.
- In absolute paths only, resolve references to the parent directory (that is, the component "..") to the real parent directory if possible using stringByResolvingSymlinksInPath, which consults the file system to resolve each potential symbolic link.

- In relative paths, because symbolic links can,Äôt be resolved, references to the parent directory are left in place.
- Remove an initial component of "/private" from the path if the result still indicates an existing file or directory (checked by consulting the file system).

Note that the path contained by this property may still have symbolic link components in it. Note also that this property only works with file paths (not, for example, string representations of URLs).

Available in OS X v10.6 and later.

### 38.13.163 URLsResourceValuesForKeys(URLs() as NSURLMBS, keys() as string, targetDelegate as URLsResourceValuesForKeysDelegateMBS, tag as Variant = nil, PrecacheIcons as boolean = false)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Queries several URLs for values.
**Notes:**

Similar to resourceValuesForKeys, this method will start a preemptive thread and queries values for all URLs on all keys in background. Once done it calls the delegate on main thread.

For icons, you can set PrecacheIcons to true. In that case plugin will draw icon on the preemptive thread, so icon data is really loaded from disk. When you than draw on main thread, it's really quick.

the delegate is declared like this:
URLsResourceValuesForKeysDelegateMBS(URLs() as NSURLMBS, keys() as String, Values() as Dictionary, Errors() as NSErrorMBS, tag as Variant)

### 38.13.164 URLWithHandle(Handle as Integer) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new URL object based on a handle value.
**Notes:** Will retain the reference.

### 38.13.165 URLWithItem(Item as FolderItem) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates an URL based on folderItem.
**Example:**

```
dim f as FolderItem = GetFolderItem("/Volumes/Ablage1", FolderItem.PathTypeNative)
dim n as NSURLMBS = NSURLMBS.URLWithItem(f)
MsgBox n.absoluteString
```

### 38.13.166 URLWithString(URL as string) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSURL object initialized with a provided URL string.
See also:

- 38.13.167 URLWithString(URL as string, baseURL as NSURLMBS) as NSURLMBS 7800

### 38.13.167 URLWithString(URL as string, baseURL as NSURLMBS) as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSURL object initialized with a base URL and a relative string.
**Notes:** This method allows you to create a URL relative to a base path or URL. For example, if you have the URL for a folder on disk and the name of a file within that folder, you can construct a URL for the file by providing the folder,Äôs URL as the base path (with a trailing slash) and the filename as the string part.

This method expects URLString to contain only characters that are allowed in a properly formed URL. All other characters must be properly percent escaped. Any percent-escaped characters are interpreted using UTF-8 encoding.
See also:

- 38.13.166 URLWithString(URL as string) as NSURLMBS 7800

### 38.13.168 Properties

### 38.13.169 absoluteString as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The URL string for the receiver as an absolute URL.
**Notes:** This property,Äôs value is calculated by resolving the receiver,Äôs string against its base according to the algorithm given in RFC 1808.
(Read only property)

### 38.13.170 absoluteURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** An absolute URL that refers to the same resource as the receiver.
**Notes:** If the URL is already absolute, this property contains a copy of the receiver. Resolution is performed per RFC 1808.
(Read only property)

### 38.13.171 AddedToDirectoryDate as Date

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time at which the resource,Äôs was created or renamed into or within its parent directory, returned as an date.
**Notes:** Inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes. (read-only)

Available in OS X v10.10.
(Read only property)

### 38.13.172 AddedToDirectoryDateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time at which the resource,Äôs was created or renamed into or within its parent directory, returned as an date.
**Notes:** Inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes. (read-only)

Available in OS X v10.10.
(Read only property)

### 38.13.173 AttributeModificationDate as Date

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Modification date.
**Notes:** The time at which the resource,Äôs attributes were most recently modified, returned as an NSDate object if the volume supports attribute modification dates, or nil if attribute modification dates are unsupported.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.174 AttributeModificationDateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Modification date.
**Notes:** The time at which the resource,Äôs attributes were most recently modified, returned as an NSDate object if the volume supports attribute modification dates, or nil if attribute modification dates are unsupported.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.175 baseURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The base URL.
**Notes:** This property contains the base URL. If the receiver is an absolute URL, this property contains nil.
(Read only property)

### 38.13.176 ContentAccessDate as Date

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time at which the resource was most recently accessed.
**Notes:** Returned as date object if the volume supports access dates, or nil if access dates are unsupported.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.177 ContentAccessDateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time at which the resource was most recently accessed.
**Notes:** Returned as date object if the volume supports access dates, or nil if access dates are unsupported.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.178 ContentModificationDate as Date

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The modification date.
**Notes:** The time at which the resource was most recently modified, returned as a date object if the volume supports modification dates, or nil if modification dates are unsupported.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.179 ContentModificationDateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The modification date.
**Notes:** The time at which the resource was most recently modified, returned as a date object if the volume supports modification dates, or nil if modification dates are unsupported.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.180 CreationDate as Date

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The creation date.
**Notes:** The resource,Äôs creation date, returned as an NSDate object if the volume supports creation dates, or nil if creation dates are unsupported.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.181 CreationDateTime as DateTime

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The creation date.
**Notes:** The resource,Äôs creation date, returned as an NSDate object if the volume supports creation dates, or nil if creation dates are unsupported.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.182 DocumentIdentifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The document identifier returned as a number.
**Notes:** The document identifier is a value assigned by the kernel to a file or directory. This value is used to identify the document regardless of where it is moved on a volume. The identifier persists across system restarts. It is not transferred when the file is copied, but it survives "safe save" operations.
Document identifiers are only unique within a single volume. This property is not supported by all volumes.

Available in OS X v10.10 and iOS 8.0.
(Read only property)

### 38.13.183 EffectiveIcon as Variant

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs normal icon, returned as an NSImage object.
**Notes:** Available in OS X v10.6 and later.

Value is a NSImageMBS object.
(Read only property)

### 38.13.184 filePathURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A file path URL that points to the same resource as the URL object.
**Notes:** If the receiver is a file reference URL, this property contains a copy of the URL converted to a file path URL. If the receiver,Äôs URL is a file path URL, this property contains the original URL. If the original URL is not a file URL, or if the resource is not reachable or no longer exists, this property contains nil.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.185 fileReferenceURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns a new file reference URL that points to the same resource as the receiver.
**Notes:** File reference URLs use a URL path syntax that identifies a file system object by reference, not by

path. This form of file URL remains valid when the file system path of the URL,Äôs underlying resource changes.

If the original URL is a file path URL, this property contains a copy of the URL converted into a file reference URL. If the original URL is a file reference URL, this property contains the original. If the original URL is not a file URL, this property contains nil.

File reference URLs cannot be created to file system objects which do not exist or are not reachable. This property contains nil instead.

In some areas of the file system hierarchy, file reference URLs cannot be generated to the leaf node of the URL path.

A file reference URL's path should never be persistently stored, because it is not valid across system restarts or remounts of volumes. If you need to store a persistent reference to a file system object, use a bookmark instead. You can create a bookmark by calling bookmarkDataWithOptions.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.186 FileResourceIdentifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs unique identifier, returned as an id.
**Notes:** This identifier can be used to determine equality between file system resources with the isEqual: method. Two resources are equal if they have the same file-system path or if their paths link to the same inode on the same file system.

The value of this identifier is not persistent across system restarts.

Available in OS X v10.7 and later.
Returns hex encoded data.
(Read only property)

### 38.13.187 FileResourceType as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs object type, returned as an NSString object.

**Notes:** See File Resource Types for possible values.
Available in OS X v10.7 and later.
(Read only property)

### 38.13.188 fileSystemRepresentation as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A string containing the URL,Äôs file system path.
**Notes:** (Read only property)

### 38.13.189 fragment as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The fragment identifier, conforming to RFC 1808. (read-only)
**Notes:** This property contains the URL,Äôs fragment. If the receiver does not conform to RFC 1808, this property contains nil. For example, in the URL http://www.example.com/index.html#jumpLocation, the fragment identifier is jumpLocation.
(Read only property)

### 38.13.190 GenerationIdentifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** An opaque generation identifier, returned as an id.
**Notes:** The generation identifier can be compared using isEqual to determine if the data in a document has been modified. For URLs which refer to the same file inode, the generation identifier changes when the data in the file's data fork is changed. Changes to extended attributes or other file system metadata do not change the identifier. For URLs which refer to the same directory inode, the generation identifier changes when direct children of that directory are added, removed or renamed. Changes to the data of the direct children of that directory does not change the generation identifier. The identifier persists across system restarts. It is tied to a specific document on a specific volume and is not transferred when the document is copied to another volume. This property is not supported by all volumes.

Available in OS X v10.10 and iOS 8.0.
(Read only property)

### 38.13.191 Handle as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** Can be used as NSURL* or CFURLRef for declares.
(Read and Write property)

### 38.13.192 HasHiddenExtension as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource,Äôs extension is normally removed from its localized name.
**Notes:** Returned as a Boolean (read-write).
(Read only property)

### 38.13.193 host as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The host, conforming to RFC 1808. (read-only)
**Notes:** This property contains the host. For example, in the URL http://www.example.com/index.html, the host is www.example.com.

If the receiver does not conform to RFC 1808, this property contains nil. The litmus test for conformance to RFC 1808 is as recommended in RFC 1808—specifically, whether the first two characters of resourceSpecifier are slashes (//).
(Read only property)

### 38.13.194 IsAlias as Boolean

MBS MacBase Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Whether the file is an alias.
**Example:**

```
Dim file As folderitem = specialfolder.desktop.child("Hello.txt")

Dim url As New NSURLMBS(file)
MsgBox "IsAlias: " + If(url.IsAlias, "yes", "no")
```

**Notes:** Returns true for alias files.
(Read only property)

### 38.13.195 IsDirectory as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is a directory.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.196 IsExcludedFromBackup as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is excluded from all backups of app data.
**Notes:** You can use this property to exclude cache and other app support files which are not needed in a backup. Some operations commonly made to user documents cause this property to be reset to false; consequently, do not use this property on user documents.

Available in OS X v10.8 and later.
(Read only property)

### 38.13.197 IsExecutable as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Key for determining whether the current process (as determined by the EUID) can execute the resource (if it is a file) or search the resource (if it is a directory), returned as a Boolean.
**Notes:** Available in OS X v10.7 and later.
(Read only property)

### 38.13.198 isFileReferenceURL as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Returns whether the URL is a file reference URL. S
**Notes:** (Read only property)

### 38.13.199 isFileURL as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the scheme is file.
**Notes:** if myURL.isFileURL is true, then myURL.path is suitable for input into NSFileManager or NSPathUtilities.
(Read only property)

### 38.13.200 IsHidden as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is normally not displayed to users.
**Notes:** If the resource is hidden because its name begins with a period, setting this value has no effect.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.201 IsMountTrigger as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the URL is a file system trigger directory, returned as a Boolean.
**Notes:** Traversing or opening a file system trigger directory causes an attempt to mount a file system on the directory.

Available in OS X v10.7 and later.
(Read only property)

### 38.13.202 IsPackage as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is a file package
**Notes:** A true value means that the resource is a file package.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.203 IsReadable as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the current process (as determined by the EUID) can read the resource.
**Notes:** Available in OS X v10.7 and later.
(Read only property)

### 38.13.204 IsRegularFile as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Determining whether the resource is a regular file, as opposed to a directory or a symbolic link.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.205 IsSymbolicLink as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is a symbolic link.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.206 IsSystemImmutable as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource's system immutable bit is set.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.207 IsUbiquitousItem as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if this item is synced to the cloud, false if it is only a local file.
**Notes:** (Read only property)

### 38.13.208 IsUserImmutable as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource's user immutable bit is set.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.209 IsVolume as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the resource is the root directory of a volume.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.210 IsWritable as Boolean

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Whether the current process (as determined by the EUID) can write to the resource.
**Notes:** Available in OS X v10.7 and later.
(Read only property)

### 38.13.211 Item as FolderItem

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** For the file URLs the corresponding folderitem.
**Notes:** (Read only property)

### 38.13.212 LabelColor as Variant

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs label color, returned as an NSColor object, or nil if the resource has no label color.
**Notes:** Available in OS X v10.6 and later.

Value is a NSColorMBS object.
(Read only property)

### 38.13.213 LabelNumber as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs label number.
**Notes:** Available in OS X v10.6 and later.

(Read only property)

### 38.13.214 lastPathComponent as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The last path component. (read-only)
**Notes:** This property contains the last path component. For example, in the URL file:///path/to/file, the last path component is file.
Available in OS X v10.6 and later.
(Read only property)

### 38.13.215 LinkCount as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The number of hard links to the resource.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.216 LocalizedLabel as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs localized label text, returned as a string, or empty if the resource has no localized label text.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.217 LocalizedName as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs localized or extension-hidden name, returned as a string.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.218 LocalizedTypeDescription as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs localized type description, returned as a string.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.219 Name as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs name in the file system, returned as a string.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.220 parameterString as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The parameter string conforming to RFC 1808. (read-only)
**Notes:** This property contains the parameter string. If the receiver does not conform to RFC 1808, this property contains nil. For example, in the URL file:///path/to/file;foo, the parameter string is foo.

This property should not be confused with the query property, which also often contains a string of parameters.
(Read only property)

### 38.13.221 ParentDirectoryURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The parent directory of the resource, returned as an NSURLMBS object, or nil if the resource is the root directory of its volume.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.222 password as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The password conforming to RFC 1808. (read-only)
**Notes:** This property contains the password. If the receiver does not conform to RFC 1808, it contains nil. For example, in the URL http://username:password@www.example.com/index.html, the password is password.
(Read only property)

### 38.13.223 path as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The path, conforming to RFC 1808. (read-only)
**Notes:** This property contains the path, unescaped with the stringByReplacingPercentEscapesUsingEncoding: method. If the receiver does not conform to RFC 1808, this property contains nil.

If the receiver contains a file or file reference URL (as determined with isFileURL), this property,Äôs value is suitable for input into methods of NSFileManager or NSPathUtilities. If the path has a trailing slash, it is stripped.

If the receiver contains a file reference URL, this property,Äôs value provides the current path for the referenced resource, which may be nil if the resource no longer exists.

If the parameterString property contains a non-nil value, the path may be incomplete. If the receiver contains an unencoded semicolon, the path property ends at the character before the semicolon. The remainder of the URL is provided in the parameterString property.

To obtain the complete path, if parameterString contains a non-nil value, append a semicolon, followed by the parameter string.

Per RFC 3986, the leading slash after the authority (host name and port) portion is treated as part of the path. For example, in the URL http://www.example.com/index.html, the path is /index.html.

Available in OS X v10.8 and later.
(Read only property)

### 38.13.224 pathExtension as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The path extension. (read-only)
**Notes:** This property contains the path extension. For example, in the URL file:///path/to/file.txt, the path extension is txt.

Available in OS X v10.6 and later.
(Read only property)

### 38.13.225 port as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The port, conforming to RFC 1808. (read-only)
**Notes:** This property contains the port number. For example, in the URL http://www.example.com:8080/index.php, the port number is 8080.

If the receiver does not conform to RFC 1808, this property contains nil. The litmus test for conformance to RFC 1808 is as recommended in RFC 1808—specifically, whether the first two characters of resourceSpecifier are slashes (//).
(Read only property)

### 38.13.226 PreferredIOBlockSize as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The preferred block size.
**Notes:** The optimal block size to use when reading or writing this file's data, returned as an integer, or zero if the preferred size is not available (read-only).
Available in OS X v10.7 and later.
(Read only property)

### 38.13.227 QuarantineProperties as Dictionary

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The quarantine properties as defined in LSQuarantine.h.
**Example:**

```
Dim f As FolderItem = SpecialFolder.UserHome.Child("Downloads").Child("Installation.pdf")
Dim n As New NSURLMBS(f)
Dim d As Dictionary = n.QuarantineProperties

Break // inspect in debugger
```

**Notes:** Available on Mac OS X 10.10 and later.
(Read only property)

### 38.13.228 query as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The query string, conforming to RFC 1808. (read-only)
**Notes:** This property contains the query string. If the receiver does not conform to RFC 1808, this property contains nil. For example, in the URL http://www.example.com/index.php?key1=value1&key2=value2, the query string is key1=value1&key2=value2.
(Read only property)

### 38.13.229 relativePath as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The relative path, conforming to RFC 1808. (read-only)
**Notes:** This property contains the relative path of the receiver,Äôs URL without resolving against its base URL. If the path has a trailing slash it is stripped. If the receiver is an absolute URL, this property contains the same value as path. If the receiver does not conform to RFC 1808, it contains nil.
(Read only property)

### 38.13.230 relativeString as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A string representation of the relative portion of the URL. (read-only)
**Notes:** This property contains a string representation of the relative portion of the URL. If the receiver is an absolute URL this method returns the same value as absoluteString.
(Read only property)

### 38.13.231 resourceSpecifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource specifier. (read-only)
**Notes:** This property contains the resource specifier. For example, in the URL http://www.example.com/index.html?key1=value1#jumplink, the resource specifier is //www.example.com/index.html?key1=value1#jumplink (everything after the colon).
(Read only property)

### 38.13.232 scheme as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The scheme. (read-only)
**Notes:** This property contains the scheme. For example, in the URL http://www.example.com/index.html, the scheme is http.

The full URL is the concatenation of the scheme, a colon (:), and the value of resourceSpecifier.

The term "protocol" is also sometimes used when talking about network-based URL schemes. However, not all URL schemes are networking protocols—data:// URLs, for example.
(Read only property)

### 38.13.233 standardizedURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** A copy of the URL with any instances of ".." or "." removed from its path. (read-only)
**Notes:** This property contains a new NSURL object, initialized using the receiver,Äôs path with any instances of ".." or "." removed.

If the URL conforms to RFC 1808 (the most common form of URL), this property contains the specified URL component; otherwise it contains nil. The litmus test for conformance to RFC 1808 is as recommended in RFC 1808—specifically, whether the first two characters of resourceSpecifier are slashes (//).
(Read only property)

### 38.13.234 TypeIdentifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The resource,Äôs uniform type identifier (UTI), returned as a string.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.235 UbiquitousItemContainerDisplayName as String

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Returns the name of this item's container as displayed to users.
**Notes:** (Read only property)

### 38.13.236 UbiquitousItemDownloadingError as NSErrorMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Returns the error when downloading the item from iCloud failed,.
**Notes:** (Read only property)

### 38.13.237 UbiquitousItemDownloadingStatus as String

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Returns the download status of this item.
**Notes:** (Read only property)

### 38.13.238 UbiquitousItemDownloadRequested as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Returns whether a download of this item has already been requested with an API like startDownloadingUbiquitousItem.
**Notes:** (Read only property)

### 38.13.239 UbiquitousItemHasUnresolvedConflicts as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if this item has conflicts outstanding.
**Notes:** (Read only property)

### 38.13.240 UbiquitousItemIsDownloaded as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Has never behaved as documented in earlier releases, hence deprecated.
**Notes:** Equivalent to UbiquitousItemDownloadingStatus = NSURLUbiquitousItemDownloadingStatusCurrent.
(Read only property)

### 38.13.241 UbiquitousItemIsDownloading as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if data is being downloaded for this item.
**Notes:** (Read only property)

### 38.13.242 UbiquitousItemIsExcludedFromSync as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if the item is excluded from sync, which means it is locally on disk but won't be available on the server.
**Notes:** An excluded item is no longer ubiquitous.
(Read only property)

### 38.13.243 UbiquitousItemIsShared as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if the ubiquitous item is shared.
**Notes:** (Read only property)

### 38.13.244 UbiquitousItemIsUploaded as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if there is data present in the cloud for this item.
**Notes:** (Read only property)

### 38.13.245 UbiquitousItemIsUploading as Boolean

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** True if data is being uploaded for this item.
**Notes:** (Read only property)

### 38.13.246 UbiquitousItemUploadingError as NSErrorMBS

MBS MacBase Plugin, Plugin Version: 22.1, Platform: macOS, Targets: All.

**Function:** Returns the error when uploading the item to iCloud failed.
**Notes:** (Read only property)

### 38.13.247 user as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The user name, conforming to RFC 1808. (read-only)
**Notes:** This property contains the user name. For example, in the URL ftp://username@www.example.com/, the user name is username.

If the receiver,Äôs URL does not conform to RFC 1808, this property returns nil. The litmus test for conformance to RFC 1808 is as recommended in RFC 1808—specifically, whether the first two characters of resourceSpecifier are slashes (//).
(Read only property)

### 38.13.248 VolumeIdentifier as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The unique identifier of the resource,Äôs volume, returned as an id.
**Notes:** The unique identifier of the resource,Äôs volume, returned as an id (read-only).
This identifier can be used with the isEqual method to determine whether two file system resources are on the same volume.
The value of this identifier is not persistent across system restarts.
Available in OS X v10.7 and later.
Returns hex encoded data.
(Read only property)

### 38.13.249 VolumeURL as NSURLMBS

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The root directory of the resource,Äôs volume, returned as an NSURL object.
**Notes:** Available in OS X v10.6 and later.
(Read only property)

### 38.13.250 Delegates

### 38.13.251 ResourceValuesForKeysDelegateMBS(URL as NSURLMBS, keys() as String, Values as Dictionary, Error as NSErrorMBS, tag as variant)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The delegate to use for resourceValuesForKeys method.

### 38.13.252 URLsResourceValuesForKeysDelegateMBS(URLs() as NSURLMBS, keys() as String, Values() as Dictionary, Errors() as NSErrorMBS, tag as variant)

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The delegate to use with URLsResourceValuesForKeys method.

## 38.14 class NSURLProtectionSpaceMBS

### 38.14.1 class NSURLProtectionSpaceMBS

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** A class for the Cocoa URL protection space class.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr3

### 38.14.2 Methods

### 38.14.3 authenticationMethod as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the authentication method to be used for this protection space

### 38.14.4 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.14.5 host as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the proxy host if this is a proxy authentication, or the host from the URL.
**Notes:** Returns the host for this protection space.

### 38.14.6 isProxy as boolean

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Determine if this authenticating protection space is a proxy server
**Notes:** Returns true if a proxy, false otherwise.

### 38.14.7 NSURLAuthenticationMethodClientCertificate as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use client certificate authentication for this protection space.
**Notes:** This authentication method can apply to any protocol.

### 38.14.8 NSURLAuthenticationMethodDefault as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use the default authentication method for a protocol.

### 38.14.9 NSURLAuthenticationMethodHTMLForm as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use HTML form authentication for this protection space.
**Notes:** The URL loading system never issues authentication challenges based on this authentication method. However, if your app authenticates by submitting a web form (or in some other protocol-neutral way), you can specify this protection space when you persist or look up credentials using the NSURLCredentialStorageMBS class.

### 38.14.10 NSURLAuthenticationMethodHTTPBasic as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use HTTP basic authentication for this protection space.

### 38.14.11 NSURLAuthenticationMethodHTTPDigest as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use HTTP digest authentication for this protection space.

### 38.14.12 NSURLAuthenticationMethodNegotiate as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Negotiate whether to use Kerberos or NTLM authentication for this protection space.

### 38.14.13 NSURLAuthenticationMethodNTLM as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Use NTLM authentication for this protection space.

### 38.14.14 NSURLAuthenticationMethodServerTrust as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Perform server trust authentication (certificate validation) for this protection space.
**Notes:** This authentication method can apply to any protocol, and is most commonly used for overriding SSL and TLS chain validation.

### 38.14.15 NSURLProtectionSpaceFTP as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The protocol type for FTP.

### 38.14.16 NSURLProtectionSpaceFTPProxy as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The proxy type for FTP proxies.

### 38.14.17 NSURLProtectionSpaceHTTP as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The protocol type for HTTP.

### 38.14.18 NSURLProtectionSpaceHTTPProxy as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The proxy type for HTTP proxies.

### 38.14.19 NSURLProtectionSpaceHTTPS as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The protocol type for HTTPS.

### 38.14.20 NSURLProtectionSpaceHTTPSProxy as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The proxy type for HTTPS proxies.

### 38.14.21 NSURLProtectionSpaceSOCKSProxy as String

MBS MacBase Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The proxy type for SOCKS proxies.

### 38.14.22 port as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the proxy port if this is a proxy authentication, or the port from the URL.
**Notes:** Returns the port for this protection space, or 0 if not set.

### 38.14.23 protocol as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the protocol of this protection space, if not a proxy.
**Notes:** Returns the type string, or "" if a proxy.

### 38.14.24 proxyType as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the type of this protection space, if a proxy.
**Notes:** Returns the type string, or "" if not a proxy.

### 38.14.25 realm as string

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Get the authentication realm for which the protection space that needs authentication
**Notes:** This is generally only available for http authentication, and may be "" otherwise.

### 38.14.26 receivesCredentialSecurely as boolean

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** Determine if the password for this protection space can be sent securely
**Notes:** True if a secure authentication method or protocol will be used, false otherwise.

### 38.14.27 Properties

### 38.14.28 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.5, Platform: macOS, Targets: All.

**Function:** The internal used handle for this class.
**Notes:** (Read and Write property)

## 38.15 class NSURLRequestCertificateFilterMBS

### 38.15.1 class NSURLRequestCertificateFilterMBS

MBS MacCocoa Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to filter certificate requests.
**Notes:** This is the only way to fix the problem with the webview that certificates which are not valid can still be used.

### 38.15.2 Events

### 38.15.3 allowsAnyHTTPSCertificateForHost(host as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.5, Platform: macOS, Targets: .

**Function:** An event being called for each host which may have a https certificate.
**Notes:** This event is called very often, so make it very fast.
Also this event is often called with the same host value as it is called for each request.

Retrun true to allow this host to run without a valid https certificate.

## 38.16 class NSURLRequestMBS

### 38.16.1 class NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** An NSURLRequest object represents a URL load request in a manner independent of protocol and URL scheme.
**Example:**

msgbox HTMLViewer1.mainFrameMBS.DataSource.Request.url

**Notes:** NSURLRequest encapsulates two basic data elements about a URL load request:

The URL to load.
The policy to use when consulting the URL content cache made available by the implementation.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr4
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- Notes from the last days
- MBS Real Studio Plugins, version 11.3pr6

**Xojo Developer Magazine**

- 20.1, page 9: News

### 38.16.2 Methods

### 38.16.3 allHTTPHeaderFields as Dictionary

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns a dictionary of the HTTP header fields associated with the receiver.

### 38.16.4 Constructor(url as string)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.
**Example:**

```
dim r as NSURLRequestMBS
r=new NSURLRequestMBS("http://www.apple.com")
```

**Notes:** Default values are used for cache policy (NSURLRequestUseProtocolCachePolicy) and timeout interval (60 seconds).
On success, handle property is not zero.
See also:

- 38.16.5 Constructor(url as string, cachePolicy as Integer, timeoutInterval as Double) 7830

### 38.16.5 Constructor(url as string, cachePolicy as Integer, timeoutInterval as Double)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.
**Example:**

```
dim r as NSURLRequestMBS
r=new NSURLRequestMBS("http://www.apple.com",NSURLRequestMBS.NSURLRequestReturnCacheDataElseLoad,5.0)
```

**Notes:** On success, handle property is not zero.
See also:

- 38.16.4 Constructor(url as string) 7830

### 38.16.6 copy as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the request.
**Example:**

```
// create PUT request
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setHTTPMethod "PUT"
```

```
// make a copy
dim r as NSURLRequestMBS = m.copy

// change first request to POST
m.setHTTPMethod "POST"

// and check values
MsgBox m.HTTPMethod+" "+r.HTTPMethod
```

### 38.16.7 mutableCopy as NSMutableURLRequestMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an editable copy of the request.
**Example:**

```
// create PUT request
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setHTTPMethod "PUT"

// make a copy
dim r as NSMutableURLRequestMBS = m.mutableCopy

// change request to POST
r.setHTTPMethod "POST"

// and check values
MsgBox m.HTTPMethod+" "+r.HTTPMethod
```

### 38.16.8 requestWithHandle(Handle as Integer) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new request object based on a handle value.
**Notes:** Will retain the reference.

### 38.16.9 requestWithURL(url as string) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.

**Example:**

```
dim r as NSURLRequestMBS

r=r.requestWithURL("http://www.apple.com",0,5.0)
```

**Notes:** Default values are used for cache policy (NSURLRequestUseProtocolCachePolicy) and timeout interval (60 seconds).
See also:

- 38.16.10 requestWithURL(url as string, cachePolicy as Integer, timeoutInterval as Double) as NSURLRequestMBS 7832

### 38.16.10 requestWithURL(url as string, cachePolicy as Integer, timeoutInterval as Double) as NSURLRequestMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates an NSURLRequest with the given URL.
**Example:**

```
dim r as NSURLRequestMBS

r=r.requestWithURL("http://www.apple.com", NSURLRequestMBS.NSURLRequestUseProtocolCachePolicy, 5.0)
```

See also:

- 38.16.9 requestWithURL(url as string) as NSURLRequestMBS 7831

### 38.16.11 valueForHTTPHeaderField(field as string) as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the value of the specified HTTP header field.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setValue("just a test", "test")
MsgBox m.valueForHTTPHeaderField("test")
```

**Notes:** field: The name of the header field whose value is to be returned. In keeping with the HTTP RFC, HTTP header field names are case-insensitive.

Returns the value associated with the header field field, or "" if there is no corresponding header field.

### 38.16.12 Properties

### 38.16.13 attribution as Integer

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** Returns the NSURLRequestAttribution associated with this request.
**Notes:** This will return NSURLRequestAttributionDeveloper for requests that have not explicitly set an attribution.
(Read only property)

### 38.16.14 cachePolicy as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the cache policy of the request.
**Example:**

```
dim r as NSURLRequestMBS

r=new NSURLRequestMBS("http://www.apple.com",0,5.0)

MsgBox str(r.cachePolicy)
```

**Notes:** Value is one of the constants in this class.
(Read only property)

### 38.16.15 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The reference to the internal used NSURLRequest object.
**Notes:** (Read and Write property)

### 38.16.16 HTTPBody as memoryblock

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns the body of the request.
**Notes:** This is the data sent in a POST request.
(Read only property)

### 38.16.17 HTTPMethod as string

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns the HTTP method assiciated with the receiver.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test")
m.setHTTPMethod "PUT"
MsgBox m.HTTPMethod
```

**Notes:** (Read only property)

### 38.16.18 HTTPShouldHandleCookies as boolean

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns a flag indicating whether this request should use standard cookie handling (sending of cookies with the request and storing any cookies returned in the response.
**Notes:** (Read only property)

### 38.16.19 HTTPShouldUsePipelining as boolean

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Reports whether the receiver is not expected to wait for the previous response before transmitting.
**Notes:** Returns true if the receiver should transmit before the previous response is received. False if the receiver should wait for the previous response before transmitting.

Available in Mac OS X 10.7 or newer.
(Read only property)

### 38.16.20 isHTTPRequest as boolean

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Whether this is an HTTP request.
**Notes:** If true, the allHTTPHeaderFields, HTTPShouldHandleCookies, HTTPMethod and HTTPBody methods do work.
(Read only property)

### 38.16.21 mainDocumentURL as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The main document URL associated with this load.
**Example:**

```
dim m as new NSMutableURLRequestMBS("http://test.test/test.jpg")
m.setMainDocumentURL "http://test.test/"
MsgBox m.mainDocumentURL
```

**Notes:** This URL is used for the cookie "same domain as main document" policy. There may also be other future uses.

NOTE: In the current implementation, this value is unused by the webkit framework. A fully functional version of this method will be available in the future.
(Read only property)

### 38.16.22 networkServiceType as Integer

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the service type associated with this request.
**Notes:** This will return NSURLNetworkServiceTypeDefault for requests that have not explicitly set a networkServiceType (using the setNetworkServiceType method). See NSURLNetworkServiceType* constants.

Available in Mac OS X 10.7 or newer.
(Read only property)

### 38.16.23 timeoutInterval as Double

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the timeout interval of the request.
**Example:**

```
dim r as NSURLRequestMBS

r=new NSURLRequestMBS("http://www.apple.com",0,5.0)

MsgBox str(r.timeoutInterval)
```

**Notes:** The timeout interval specifies the limit on the idle interval alloted to a request in the process of loading. The "idle interval" is defined as the period of time that has passed since the last instance of load activity occurred for a request that is in the process of loading. Hence, when an instance of load activity occurs (e.g. bytes are received from the network for a request), the idle interval for a request is reset to 0. If the idle interval ever becomes greater than or equal to the timeout interval, the request is considered to have timed out. This timeout interval is measured in seconds.
(Read only property)

### 38.16.24 URL as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the URL of the request.
**Example:**

```
dim r as NSURLRequestMBS

r=new NSURLRequestMBS("http://www.apple.com")

MsgBox r.URL
```

**Notes:** (Read only property)

### 38.16.25 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSURLRequestReloadIgnoringCacheData | 1 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifically, these constants cover interactions that already-existing cache data is returned to satisfy a NSURLRequestReloadIgnoringCacheData Specifies load should be loaded from the origin source. No exis of its freshness or validity, should be used to satisfy |
| NSURLRequestReloadIgnoringLocalAndRemoteCacheData | 4 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifies that not only should the local cache data b and other intermediates should be instructed to di as the protocol allows. Available in Mac OS X v10.5 and later. |
| NSURLRequestReloadRevalidatingCacheData | 5 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifies that the existing cache data may be used confirms its validity, otherwise the URL is loaded fr Available in Mac OS X v10.5 and later. |
| NSURLRequestReturnCacheDataDontLoad | 3 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifically, these constants cover interactions that already-existing cache data is returned to satisfy a NSURLRequestReturnCacheDataDontLoad Specifi data should be used to satisfy a URL load reques expiration date. However, if there is no existing data to a URL load request, no attempt is made to load source, and the load is considered to have failed. behavior that is similar to an "offline" mode. |
| NSURLRequestReturnCacheDataElseLoad | 2 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifically, these constants cover interactions that already-existing cache data is returned to satisfy a NSURLRequestReturnCacheDataElseLoad Specifie data should be used to satisfy a URL load reques expiration date. However, if there is no existing dat ing to a URL load request, the URL is loaded from |
| NSURLRequestUseProtocolCachePolicy | 0 | A constant that can be used to specify the type of i with the caching system when the URL loading sys Specifically, these constants cover interactions that already-existing cache data is returned to satisfy a NSURLRequestUseProtocolCachePolicy Specifies t fined in the protocol implementation, if any, is used request. This is the default policy for URL load req |

Network Service Type Constants

| Constant | Value | Description |
|---|---|---|
| NSURLNetworkServiceTypeBackground | 3 | Specifies that the request is for background traffic (such as a file down<br>The service type is used to provide the networking layers a hint of the<br>of the request. |
| NSURLNetworkServiceTypeDefault | 0 | Is the default value for an NSURLRequest when created. This value sh<br>left unchanged for the vast majority of requests.<br>The service type is used to provide the networking layers a hint of the<br>of the request. |
| NSURLNetworkServiceTypeVideo | 2 | Specifies that the request is for video traffic.<br>The service type is used to provide the networking layers a hint of the<br>of the request. |
| NSURLNetworkServiceTypeVoice | 4 | Specifies that the request is for voice data.<br>The service type is used to provide the networking layers a hint of the<br>of the request. |
| NSURLNetworkServiceTypeVoIP | 1 | Specifies that the request is for voice over IP control traffic.<br>The service type is used to provide the networking layers a hint of the<br>of the request. |

Attribution

| Constant | Value | Description |
|---|---|---|
| NSURLRequestAttributionDeveloper | 0 | Indicates that the URL was specified by the developer. This is the de<br>value for an NSURLRequest when created. |
| NSURLRequestAttributionUser | 1 | Indicates that the URL was specified by the user. |

## 38.17 class NSURLResponseMBS

### 38.17.1 class NSURLResponseMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** An NSURLResponse object represents a URL load response in a manner independent of protocol and URL scheme.
**Notes:** NSURLResponse encapsulates the metadata associated with a URL load. Note that NSURLResponse objects do not contain the actual bytes representing the content of a URL.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.

### 38.17.2 Methods

### 38.17.3 allHeaderFields as Dictionary

MBS MacBase Plugin, Plugin Version: 11.0, Platform: macOS, Targets: All.

**Function:** Returns all the HTTP header fields of the receiver.
**Notes:** A dictionary containing all the HTTP header fields of the receiver. By examining this dictionary clients can see the "raw" header information returned by the HTTP server.

### 38.17.4 Constructor(URL as string, MimeType as string, expectedContentLength as Integer, textEncodingName as string)

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initialize an NSURLResponse with the provided values.
**Notes:** URL: the URL
MIMETYPE: the MIME content type of the response
expectedContentLength: the expected content length of the associated data
textEncodingName: the name of the text encoding for the associated data, if applicable, else "".

Use -1 for an unknown length.
See also FileExtensionToMimeTypeMBS function.

### 38.17.5 copy as NSURLResponseMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.
**Notes:** Makes a copy of the RB object and the NSURLResponse object behind.

### 38.17.6 expectedContentLength as int64

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the expected content length of the response.
**Notes:** Some protocol implementations report a content length as part of delivering load metadata, but not all protocols guarantee the amount of data that will be delivered in actuality.
Hence, this method returns an expected amount. Clients should use this value as an advisory, and should be prepared to deal with either more or less data.

Returns the expected content length of the receiver, or -1 if there is no expectation that can be arrived at regarding expected content length.

### 38.17.7 isHTTPResponse as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Whether this response is a http response.
**Notes:** the StatusCode property can only be used on HTTP Responses.

### 38.17.8 localizedStringForStatusCode(statusCode as Integer) as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Convenience method which returns a localized string corresponding to the status code for this response.
**Notes:** statusCode: the status code to use to produce a localized string.
Returns a localized string corresponding to the given status code or an empty string.

### 38.17.9 MIMEType as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the MIME type of the response.
**Example:**

msgbox HTMLViewer1.mainFrameMBS.DataSource.response.MIMEType

**Notes:** The MIME type is based on the information provided from an origin source. However, that value may be changed or corrected by a protocol implementation if it can be determined that the origin server or source reported the information incorrectly or imprecisely. An attempt to guess the MIME type may be made if the origin source did not report any such information.
See also FileExtensionToMimeTypeMBS function.

### 38.17.10 statusCode as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the HTTP status code of the response.
**Notes:** Returns -1 if no statuscode is available (e.g. in case this is no ta http response)
See also: localizedStringForStatusCode

### 38.17.11 suggestedFilename as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns a suggested filename if the resource were saved to disk.
**Notes:** The method first checks if the server has specified a filename using the content disposition header. If no valid filename is specified using that mechanism, this method checks the last path component of the URL. If no valid filename can be obtained using the last path component, this method uses the URL's host as the filename.
If the URL's host can't be converted to a valid filename, the filename "unknown" is used. In mose cases, this method appends the proper file extension based on the MIME type. This method always returns a valid filename.

### 38.17.12 textEncodingName as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the name of the text encoding of the response.
**Notes:** This name will be the actual string reported by the origin source during the course of performing a protocol-specific URL load. Clients can inspect this string and convert it to a TextEncoding using the methods and functions made available in the appropriate framework.

Returns the name of the text encoding of the response, or an empty string if no text encoding was specified.

### 38.17.13 URL as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Returns the URL of the response.
**Example:**

msgbox HTMLViewer1.mainFrameMBS.DataSource.response.URL

### 38.17.14 Properties

### 38.17.15 Handle as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The internal used reference to the NSURLResponse object.
**Notes:** (Read and Write property)

### 38.17.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSURLResponseUnknownLength | -1 | The constant for use with expectedContentLength for an unknown length. |

## 38.18 class NSURLSessionConfigurationMBS

### 38.18.1 class NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A configuration object that defines behavior and policies for a URL session.
**Notes:** An NSURLSessionConfigurationMBS object defines the behavior and policies to use when uploading and downloading data using an NSURLSessionMBS object. When uploading or downloading data, creating a configuration object is always the first step you must take. You use this object to configure the timeout values, caching policies, connection requirements, and other types of information that you intend to use with your NSURLSessionMBS object.

It is important to configure your NSURLSessionConfigurationMBS object appropriately before using it to initialize a session object. Session objects make a copy of the configuration settings you provide and use those settings to configure the session. Once configured, the session object ignores any changes you make to the NSURLSessionConfigurationMBS object. If you need to modify your transfer policies, you must update the session configuration object and use it to create a new NSURLSessionMBS object.

Note
In some cases, the policies defined in this configuration may be overridden by policies specified by an NSURLRequestMBS object provided for a task. Any policy specified on the request object is respected unless the session,Äôs policy is more restrictive. For example, if the session configuration specifies that cellular networking should not be allowed, the NSURLRequestMBS object cannot request cellular networking.

For more information about using configuration objects to create sessions, see NSURLSessionMBS class.

Types of Session Configurations

The behavior and capabilities of a URL session are largely determined by the kind of configuration used to create the session.

The singleton shared session (which has no configuration object) is for basic requests. It,Äôs not as customizable as sessions that you create, but it serves as a good starting point if you have very limited requirements. You access this session by calling the shared class method. See that method,Äôs discussion for more information about its limitations.

Default sessions behave much like the shared session (unless you customize them further), but let you obtain data incrementally using a delegate. You can create a default session configuration by calling the default method on the URLSessionConfiguration class.

Ephemeral sessions are similar to default sessions, but they don,Äôt write caches, cookies, or credentials to disk. You can create an ephemeral session configuration by calling the ephemeral method on the URLSes-

sionConfiguration class.

Background sessions let you perform uploads and downloads of content in the background while your app isn,Äôt running. You can create a background session configuration by calling the backgroundSessionConfiguration(_:) method on the URLSessionConfiguration class.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.18.2 Methods

### 38.18.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.9 or newer.
A lot of properties require higher MacOS versions.

### 38.18.4 backgroundSessionConfiguration(identifier as String) as NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a session configuration object that allows HTTP and HTTPS uploads or downloads to be performed in the background.
**Notes:** identifier: The unique identifier for the configuration object. This parameter must not be nil or an empty string.

Returns a configuration object that causes the system to perform upload and download tasks in a separate process.

Use this method to initialize a configuration object suitable for transferring data files while the app runs in the background. A session configured with this object hands control of the transfers over to the system, which handles the transfers in a separate process. In iOS, this configuration makes it possible for transfers to continue even when the app itself is suspended or terminated.

If an iOS app is terminated by the system and relaunched, the app can use the same identifier to create a new configuration object and session and to retrieve the status of transfers that were in progress at the time of termination. This behavior applies only for normal termination of the app by the system. If the user terminates the app from the multitasking screen, the system cancels all of the session,Äôs background transfers. In addition, the system does not automatically relaunch apps that were force quit by the user.

The user must explicitly relaunch the app before transfers can begin again.

You can configure an background session to schedule transfers at the discretion of the system for optimal performance using the discretionary property. When transferring large amounts of data, you are encouraged to set the value of this property to true. For an example of using the background configuration, see Downloading Files in the Background.

Requires MacOS 10.10 or newer.

### 38.18.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Creates a new object for shared session.

### 38.18.6 copy as NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the configuration.

### 38.18.7 defaultSessionConfiguration as NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A default session configuration object.
**Notes:** The default session configuration uses a persistent disk-based cache (except when the result is downloaded to a file) and stores credentials in the user,Äôs keychain. It also stores cookies (by default) in the same shared cookie store as the NSURLConnectionMBS and NSURLDownloadMBS classes.

If you,Äôre porting code based on the NSURLConnectionMBS class, use this method to obtain an initial configuration object and then customize that object as needed.

Modifying the returned session configuration object does not affect any configuration objects returned by future calls to this method, and does not change the default behavior for existing sessions. It is therefore always safe to use the returned object as a starting point for additional customization.

### 38.18.8 ephemeralSessionConfiguration as NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A session configuration that uses no persistent storage for caches, cookies, or credentials.
**Notes:** An ephemeral session configuration object is similar to a default session configuration (see defaultSessionConfiguration), except that the corresponding session object doesn,Äôt store caches, credential stores, or any session-related data to disk. Instead, session-related data is stored in RAM. The only time an ephemeral session writes data to disk is when you tell it to write the contents of a URL to a file.

It is possible to customize a default session configuration object to obtain the same behavior (or any portion thereof) provided by an ephemeral session configuration object, but the use of this method is more convenient.

Privacy and Performance Considerations
The main advantage to using ephemeral sessions is privacy. By not writing potentially sensitive data to disk, you make it less likely that the data will be intercepted and used later. For this reason, ephemeral sessions are ideal for private browsing modes in web browsers and other similar situations.
Because an ephemeral session doesn,Äôt write cached data to disk, the size of the cache is limited by available RAM. This limitation means that previously fetched resources are less likely to be in the cache (and are guaranteed to not be there if the user quits and relaunches your app). This behavior may reduce perceived performance, depending on your app.
When your app invalidates the session, all ephemeral session data is purged automatically. Additionally, in iOS, the in-memory cache isn,Äôt purged automatically when your app is suspended but may be purged when your app is terminated or when the system experiences memory pressure.

### 38.18.9 Properties

### 38.18.10 allowsCellularAccess as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether connections should be made over a cellular network.
**Notes:** This property controls whether tasks in sessions based on this session configuration are allowed to make connections over a cellular network.
The default value is true.

For more information, read Restrict Cellular Networking Correctly on Apple website.
(Read and Write property)

### 38.18.11 allowsConstrainedNetworkAccess as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether connections may use the network when the user has specified Low Data Mode.
**Notes:** In iOS 13 and later, users can set their device to use Low Data Mode as one of the Cellular Data Options in the Settings app. Users can turn on Low Data Mode to reduce your app,Äôs network data usage. This property controls a URL session,Äôs behavior when the user turns on Low Data Mode. If there are no nonconstrained network interfaces available and the session,Äôs allowsConstrainedNetworkAccess property is false, any task created from the session fails. In this case, the error provided when the task fails has a networkUnavailableReason property whose value is NSURLErrorNetworkUnavailableReasonConstrained.
Limit your app,Äôs of use of constrained network access to user-initiated tasks, and put off discretionary tasks until a nonconstrained interface becomes available. To do this, set allowsConstrainedNetworkAccess (and allowsExpensiveNetworkAccess) to false and waitsForConnectivity to true. This way, your NSURLSessionTaskMBS waits for a suitable interface to become available before sending or receiving data.

Available in MacOS 10.15 or newer.
(Read and Write property)

### 38.18.12 allowsExpensiveNetworkAccess as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether connections may use a network interface that the system considers expensive.
**Notes:** The system determines what constitutes ,Äúexpensive,Äù based on the nature of the network interface and other factors. iOS 13 considers most cellular networks and personal hotspots expensive. If there are no nonexpensive network interfaces available and the session,Äôs allowsExpensiveNetworkAccess property is false, any task created from the session fails. In this case, the error provided when the task fails has a networkUnavailableReason property whose value is NSURLErrorNetworkUnavailableReasonExpensive.

Limit your app,Äôs of use of expensive network access to user-initiated tasks, and put off discretionary tasks until an nonexpensive interface becomes available. To do this, set allowsExpensiveNetworkAccess (and allowsConstrainedNetworkAccess) to false and waitsForConnectivity to true. This way, your NSURLSessionTaskMBS waits for a suitable interface to become available before sending or receiving data.

Available in MacOS 10.15 or newer.
(Read and Write property)

### 38.18.13 connectionProxyDictionary as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A dictionary containing information about the proxy to use within this session.
**Notes:** This property controls which proxy tasks within sessions based on this configuration use when connecting to remote hosts.

The default value is nil, which means that tasks use the default system settings.
See Global Proxy Configuration for more information about these dictionaries.
(Read and Write property)

### 38.18.14 discretionary as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether background tasks can be scheduled at the discretion of the system for optimal performance.
**Notes:** For configuration objects created using the backgroundSessionConfigurationWithIdentifier method, use this property to give the system control over when transfers should occur. This property is ignored for configuration objects created using other methods.
When transferring large amounts of data, you are encouraged to set the value of this property to true. Doing so lets the system schedule those transfers at times that are more optimal for the device. For example, the system might delay transferring large files until the device is plugged in and connected to the network via Wi-Fi. The default value of this property is false.
The session object applies the value of this property only to transfers that your app starts while it is in the foreground. For transfers started while your app is in the background, the system always starts transfers at its discretion—in other words, the system assumes this property is true and ignores any value you specified.

Available in MacOS 10.10 or newer.
(Read and Write property)

### 38.18.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.18.16 HTTPAdditionalHeaders as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A dictionary of additional headers to send with requests.
**Notes:** This property specifies additional headers that are added to all tasks within sessions based on this configuration. For example, you might set the User-Agent header so that it is automatically included in every request your app makes through sessions based on this configuration.

An NSURLSessionMBS object is designed to handle various aspects of the HTTP protocol for you. As a result, you should not modify the following headers:

- Authorization
- Connection
- Host
- Proxy-Authenticate
- Proxy-Authorization
- WWW-Authenticate

Additionally, if the length of your upload body data can be determined automatically—for example, if you provide the body content with an MemoryBlock object—the value of Content-Length is set for you.
If the same header appears in both this array and the request object (where applicable), the request object,Äôs value takes precedence.
The default value is an empty array.
(Read and Write property)

### 38.18.17 HTTPCookieAcceptPolicy as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A policy constant that determines when cookies should be accepted.
**Notes:** This property determines the cookie accept policy for all tasks within sessions based on this configuration.
The default value is CookieAcceptPolicyOnlyFromMainDocumentDomain. You can change it to any of the constants defined in the CookieAcceptPolicy enumerated type.
If you want more direct control over what cookies are accepted, set this value to CookieAcceptPolicyNever and then use the allHeaderFields and cookiesWithResponseHeaderFields methods to extract cookies from the URL response object yourself.
(Read and Write property)

### 38.18.18 HTTPCookieStorage as NSHTTPCookieStorageMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The cookie store for storing cookies within this session.
**Notes:** This property determines the cookie storage object used by all tasks within sessions based on this configuration.
To disable cookie storage, set this property to nil.
For default and background sessions, the default value is the sharedHTTPCookieStorage cookie storage object.
For ephemeralSessionConfiguration sessions, the default value is a private cookie storage object that stores

data in memory only, and is destroyed when you invalidate the session.
(Read and Write property)

### 38.18.19 HTTPMaximumConnectionsPerHost as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The maximum number of simultaneous connections to make to a given host.
**Notes:** This property determines the maximum number of simultaneous connections made to each host by tasks within sessions based on this configuration.
This limit is per session, so if you use multiple sessions, your app as a whole may exceed this limit. Additionally, depending on your connection to the Internet, a session may use a lower limit than the one you specify.
The default value is 6 in macOS, or 4 in iOS.
(Read and Write property)

### 38.18.20 HTTPShouldSetCookies as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether requests should contain cookies from the cookie store.
**Notes:** This property controls whether tasks within sessions based on this configuration should automatically provide cookies from the shared cookie store when making requests.
If you want to provide cookies yourself, set this value to false and provide a Cookie header either through the session,Äôs HTTPAdditionalHeaders property or on a per-request level using a custom NSURLRequestMBS object.
The default value is true.
(Read and Write property)

### 38.18.21 HTTPShouldUsePipelining as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether the session should use HTTP pipelining.
**Notes:** This property determines whether tasks within sessions based on this configuration should use HTTP pipelining. You can also enable pipelining on a per-task basis by creating the task with an NSURLRequestMBS object.
The default value is false.
(Read and Write property)

### 38.18.22 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The background session identifier of the configuration object.
**Notes:** The value of this property is set only when you use the backgroundSessionConfigurationWithIdentifier method to create the configuration object. The string uniquely identifies a background session object. In iOS, you use this string in cases where the app was terminated while transfers were occurring in the background. When the app relaunches, it uses the string to recreate the configuration and session objects associated with the transfers.
(Read only property)

### 38.18.23 NetworkServiceType as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The type of network service for all tasks within sessions based on this configuration.
**Notes:** The network service type provides a hint to the operating system about what the underlying traffic is used for. This hint enhances the system's ability to prioritize traffic, determine how quickly it needs to wake up the cellular or Wi-Fi radio, and so on. By providing accurate information, you improve the ability of the system to optimally balance battery life, performance, and other considerations.

For example, specify the NetworkServiceTypeBackground type if your app is performing a download that wasn,Äôt requested by the user, like prefetching content so that it,Äôs available when the user chooses to view it.
This setting can also affect the Wi-Fi Quality of Service (QoS) Priority.
The default value is NetworkServiceTypeDefault.
(Read and Write property)

### 38.18.24 RequestCachePolicy as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A predefined constant that determines when to return a response from the cache.
**Notes:** This property determines the request caching policy used by tasks within sessions based on this configuration.
Set this property to one of the constants defined in CachePolicy constants to specify whether the cache policy should depend on expiration dates and age, whether the cache should be disabled entirely, and whether the server should be contacted to determine if the content has changed since it was last requested.
The default value is CachePolicyUseProtocolCachePolicy.
(Read and Write property)

### 38.18.25 sharedContainerIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The identifier for the shared container into which files in background URL sessions should be downloaded.
**Notes:** To create a URL session for use by an app extension, set this property to a valid identifier for a container shared between the app extension and its containing app.

Available in MacOS 10.10 or newer.
(Read and Write property)

### 38.18.26 shouldUseExtendedBackgroundIdleMode as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether TCP connections should be kept open when the app moves to the background.
**Notes:** In addition to requesting that the connection be kept open, setting this value to true asks the system to delay reclaiming the connection when the app moves to the background.

Available in MacOS 10.11 or newer.
(Read and Write property)

### 38.18.27 timeoutIntervalForRequest as Double

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The timeout interval to use when waiting for additional data.
**Notes:** This property determines the request timeout interval for all tasks within sessions based on this configuration. The request timeout interval controls how long (in seconds) a task should wait for additional data to arrive before giving up. The timer associated with this value is reset whenever new data arrives. When the request timer reaches the specified interval without receiving any new data, it triggers a timeout. The default value is 60.

Important
Any upload or download tasks created by a background session are automatically retried if the original request fails due to a timeout. To configure how long an upload or download task should be allowed to be retried or transferred, use the timeoutIntervalForResource property.
(Read and Write property)

### 38.18.28 timeoutIntervalForResource as Double

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The maximum amount of time that a resource request should be allowed to take.
**Notes:** This property determines the resource timeout interval for all tasks within sessions based on this configuration. The resource timeout interval controls how long (in seconds) to wait for an entire resource to transfer before giving up. The resource timer starts when the request is initiated and counts until either the request completes or this timeout interval is reached, whichever comes first.
The default value is 7 days.
(Read and Write property)

### 38.18.29 URLCache as NSURLCacheMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The URL cache for providing cached responses to requests within the session.
**Notes:** This property determines the URL cache object used by tasks within sessions based on this configuration.
To disable caching, set this property to nil.
For default sessions, the default value is the shared URL cache object.
For background sessions, the default value is nil.
For ephemeral sessions, the default value is a private cache object that stores data in memory only, and is destroyed when you invalidate the session.
(Read and Write property)

### 38.18.30 URLCredentialStorage as NSURLCredentialStorageMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A credential store that provides credentials for authentication.
**Notes:** This property determines the credential storage object used by tasks within sessions based on this configuration.
If you don,Äôt want to use a credential store, set this property to nil.
For default and background sessions, the default value is the sharedCredentialStorage credential store object.
For ephemeralSessionConfiguration sessions, the default value is a private credential store object that stores data in memory only, and is destroyed when you invalidate the session.
(Read and Write property)

### 38.18.31 waitsForConnectivity as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the session should wait for connectivity to become available, or fail immediately.

**Notes:** Connectivity might be temporarily unavailable for several reasons. For example, a device might only have a cellular connection when allowsCellularAccess is set to false, or the device might require a VPN connection but none is available. If the value of this property is true and sufficient connectivity is unavailable, the session calls the taskIsWaitingForConnectivity: method of NSURLSessionTaskDelegate and waits for connectivity. When connectivity becomes available, the task begins its work and ultimately calls the delegate or completion handler as usual.

If the value of the property is false and connectivity is unavailable, the connection fails immediately with an error, such as NSURLErrorNotConnectedToInternet.

This property is relevant only during the establishment of a connection. If a connection is established and then drops, the completion handler or delegate receives an error, such as NSURLErrorNetworkConnectionLost. For help dealing with dropped connections, see Handling ,ÄúThe network connection was lost,Äù Errors.

This property is ignored by background sessions, which always wait for connectivity.

Available in MacOS 10.13 or newer.
(Read and Write property)

### 38.18.32 Constants

Cache Policy

| Constant | Value | Description |
|---|---|---|
| CachePolicyReloadIgnoringCacheData | 1 | The URL load should be loaded only from the originat |
| CachePolicyReloadIgnoringLocalAndRemoteCacheData | 4 | Ignore local cache data, and instruct proxies and other gard their caches so far as the protocol allows. |
| CachePolicyReloadIgnoringLocalCacheData | 1 | The URL load should be loaded only from the originat |
| CachePolicyReloadRevalidatingCacheData | 5 | Use cache data if the origin source can validate it; ot origin. |
| CachePolicyReturnCacheDataDontLoad | 3 | Use existing cache data, regardless or age or expirati cached data is available. |
| CachePolicyReturnCacheDataElseLoad | 2 | Use existing cache data, regardless or age or expirati originating source only if there is no cached data. |
| CachePolicyUseProtocolCachePolicy | 0 | Use the caching logic defined in the protocol implem particular URL load request. |

Cookie Accept Policy

| Constant | Value | Description |
|---|---|---|
| CookieAcceptPolicyAlways | 0 | Accept all cookies. This is the default cookie accept polic |
| CookieAcceptPolicyNever | 1 | Reject all cookies. |
| CookieAcceptPolicyOnlyFromMainDocumentDomain | 2 | Accept cookies only from the main document domain. |

Multipath TCP Modes

| Constant | Value | Description |
|---|---|---|
| MultipathServiceTypeAggregate | 3 | A service that aggregates the capacities of other Multipath options in an attempt to increase throughput and minimize latency. |
| MultipathServiceTypeHandover | 1 | A Multipath TCP service that provides seamless handover between Wi-Fi and cellular in order to preserve the connection. |
| MultipathServiceTypeInteractive | 2 | A service whereby Multipath TCP attempts to use the lowest-latency interface. |
| MultipathServiceTypeNone | 0 | The default service type indicating that Multipath TCP should not be used. |

Network Service Types

| Constant | Value | Description |
|---|---|---|
| NetworkServiceTypeAVStreaming | 8 | A service type for streaming audio/video data. |
| NetworkServiceTypeBackground | 3 | A service type for background traffic.<br>You should specify this type if your app is performing a download that not requested by the user—for example, prefetching content so that it wil available when the user chooses to view it. |
| NetworkServiceTypeCallSignaling | 11 | A service type for call signaling.<br>Use this service type with network traffic that establishes, maintains, or t down a VoIP call. Use the NSURLNetworkServiceTypeVoIP type for the ac media of a call. |
| NetworkServiceTypeDefault | 0 | A service type for standard network traffic. |
| NetworkServiceTypeResponsiveAV | 9 | A service type for responsive (time-sensitive) audio/video data. |
| NetworkServiceTypeResponsiveData | 6 | A service type for data that the user is actively waiting for.<br>This service type,Äôs priority is higher than NSURLNetworkServiceType fault. Use this service type for interactive situations where the user is an pating a quick response, like instant messaging or completing a purchase. |
| NetworkServiceTypeVideo | 2 | A service type for video traffic. |
| NetworkServiceTypeVoice | 4 | A service type for voice traffic. |
| NetworkServiceTypeVoIP | 1 | A service type for VoIP traffic.<br>With the VoIP service type, the kernel continues to listen for incoming tr while your app is in the background, then wakes up your app whenever new c arrives. This should be used only for connections that are used to communi with a VoIP service. |

## 38.19 class NSURLSessionDataTaskMBS

### 38.19.1 class NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A URL session task that returns downloaded data directly to the app in memory.
**Notes:** A NSURLSessionDataTaskMBS is a concrete subclass of NSURLSessionTaskMBS. The methods in the NSURLSessionDataTaskMBS class are documented in NSURLSessionTaskMBS.

A data task returns data directly to the app (in memory) as one or more NSData objects. When you use a data task:

- During upload of the body data (if your app provides any), the session periodically calls the taskDidSendBodyData event with status information.
- After receiving an initial response, the session calls the dataTaskDidReceiveResponse event to let you examine the status code and headers, and optionally convert the data task into a download task.
- During the transfer, the session calls dataTaskDidReceiveData event to provide your app with the content as it arrives.
- Upon completion, the session calls the dataTaskWillCacheResponse event to let you determine whether the response should be cached.

For examples of using data tasks for fetching and uploading data, see Fetching Website Data into Memory and Uploading Data to a Website on Apple website.
Subclass of the NSURLSessionTaskMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.19.2 Methods

### 38.19.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 38.20 class NSURLSessionDownloadTaskMBS

### 38.20.1 class NSURLSessionDownloadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A URL session task that stores downloaded data to file.
**Notes:** An NSURLSessionDownloadTaskMBS is a concrete subclass of NSURLSessionTask. Most of the methods associated with this class are documented in NSURLSessionTaskMBS.

Download tasks directly write the server,Äôs response data to a temporary file, providing your app with progress updates as data arrives from the server. When you use download tasks in background sessions, these downloads continue even when your app is suspended or is otherwise not running.

You can pause (cancel) download tasks and resume them later (assuming the server supports doing so). You can also resume downloads that failed because of network connectivity problems.

When you use a download task, your NSURLSessionMBS subclass receives several callbacks unique to download scenarios.

- During download, the session periodically calls the downloadTaskDidWriteData event with status information.
- Upon successful completion, the session calls the downloadTaskDidFinishDownloadingToURL event or completion handler. In that method, you must either open the file for reading or move it to a permanent location in your app,Äôs sandbox container directory.
- Upon unsuccessful completion, the session calls the taskDidCompleteWithError method or completion handler. Unlike NSURLSessionDataTaskMBS or NSURLSessionUploadTaskMBS, a download task reports server-side errors reported through HTTP status codes into corresponding NSError objects.

Subclass of the NSURLSessionTaskMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.20.2 Methods

### 38.20.3 cancelByProducingResumeData(Handler as ProducingResumeDataCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Cancels a download and calls a callback with resume data for later use.
**Notes:** A download can be resumed only if the following conditions are met:

- The resource has not changed since you first requested it
- The task is an HTTP or HTTPS GET request
- The server provides either the ETag or Last-Modified header (or both) in its response
- The server supports byte-range requests
- The temporary file hasn,Äôt been deleted by the system in response to disk space pressure

Calls the handler later when finished.

### 38.20.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.20.5 NSURLSessionDownloadTaskResumeData as string

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Key in the userInfo dictionary of an NSErrorMBS received during a failed download.

### 38.20.6 Delegates

### 38.20.7 ProducingResumeDataCompletedMBS(downloadTask as NSURLSessionDownloadTaskMBS, resumeData as MemoryBlock, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A completion handler that is called when the download has been successfully canceled.
**Notes:** If the download is resumable, the completion handler is provided with a resumeData object. Your app can later pass this object to a session,Äôs downloadTaskWithResumeDat methods in NSURLSessionMBS class to create a new task that resumes the download where it left off.

## 38.21 class NSURLSessionMBS

### 38.21.1 class NSURLSessionMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An object that coordinates a group of related, network data-transfer tasks.
**Notes:** Read more on Apple's website:
https://developer.apple.com/documentation/foundation/nsurlsession

MBS Plugin implements all delegates within NSURLSessionMBS class, so you can subclass it and fill events.
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr1
- NSNetService classes for Xojo
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.3pr10
- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- Adding NSURLSession classes for Xojo
- MBS Xojo Plugins, version 20.2pr3

### 38.21.2 Methods

### 38.21.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on MacOS 10.9 or newer.

### 38.21.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates new object referencing shared session.
See also:

- 38.21.5 Constructor(configuration as NSURLSessionConfigurationMBS) 7860

### 38.21.5 Constructor(configuration as NSURLSessionConfigurationMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a session with the specified session configuration.
**Notes:** configuration: A configuration object that specifies certain behaviors, such as caching policies, timeouts, proxies, pipelining, TLS versions to support, cookie policies, credential storage, and so on.
See NSURLSessionConfigurationMBS class for more information.
See also:

- 38.21.4 Constructor 7859

### 38.21.6 dataTaskWithRequest(request as NSURLRequestMBS) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that retrieves the contents of a URL based on the specified URL request object.
**Notes:** request: A URL request object that provides request-specific information such as the URL, cache policy, request type, and body data or body stream.

Returns he new session data task.

By creating a task based on a request object, you can tune various aspects of the task,Äôs behavior, including the cache policy and timeout interval.
After you create the task, you must start it by calling its resume method.
See also:

- 38.21.7 dataTaskWithRequest(request as NSURLRequestMBS, handler as NSURLSessionDataTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7860

### 38.21.7 dataTaskWithRequest(request as NSURLRequestMBS, handler as NSURLSessionDataTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that retrieves the contents of a URL based on the specified URL request object, and calls a handler upon completion.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, body data or body stream, and so on.
completionHandler: The completion handler to call when the load request is complete.
See also:

- 38.21.6 dataTaskWithRequest(request as NSURLRequestMBS) as NSURLSessionDataTaskMBS 7860

### 38.21.8 dataTaskWithURL(URL as String) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that retrieves the contents of the specified URL.
**Notes:** URL: The URL to be retrieved.

After you create the task, you must start it by calling its resume method. The task calls methods on the session,Äôs delegate to provide you with the response metadata, response data, and so on.
See also:

- 38.21.9 dataTaskWithURL(URL as String, handler as NSURLSessionDataTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7861

### 38.21.9 dataTaskWithURL(URL as String, handler as NSURLSessionDataTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that retrieves the contents of the specified URL, then calls a handler upon completion.
**Notes:** url: The URL to be retrieved.
handler: The completion handler to call when the load request is complete.
See also:

- 38.21.8 dataTaskWithURL(URL as String) as NSURLSessionDataTaskMBS 7861

### 38.21.10 downloadTaskWithRequest(request as NSURLRequestMBS) as NSURLSessionDownloadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task that retrieves the contents of a URL based on the specified URL request object and saves the results to a file.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, body data or body stream, and so on.

Returns the new session download task.

By creating a task based on a request object, you can tune various aspects of the task,Äôs behavior, including the cache policy and timeout interval.
After you create the task, you must start it by calling its resume method. The task calls methods on the session,Äôs delegate to provide you with progress notifications, the location of the resulting temporary file, and so on.
See also:

- 38.21.11 downloadTaskWithRequest(request as NSURLRequestMBS, handler as NSURLSessionUpload-TaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7862

### 38.21.11 downloadTaskWithRequest(request as NSURLRequestMBS, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task that retrieves the contents of a URL based on the specified URL request object, saves the results to a file, and calls a handler upon completion.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, body data or body stream, and so on.
Handler: The completion handler to call when the load request is complete.
See also:

- 38.21.10 downloadTaskWithRequest(request as NSURLRequestMBS) as NSURLSessionDownloadTaskMBS 7861

### 38.21.12 downloadTaskWithResumeData(resumeData as MemoryBlock) as NSURLSessionDownloadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task to resume a previously canceled or failed download.
**Notes:** resumeData: A data object that provides the data necessary to resume a download.

After you create the task, you must start it by calling its resume method.
This method is equivalent to the downloadTaskWithResumeData:completionHandler: with a nil completion handler. For detailed usage information, including ways to obtain a resume data object, see that method.
See also:

- 38.21.13 downloadTaskWithResumeData(resumeData as MemoryBlock, handler as NSURLSessionU-ploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7862

### 38.21.13 downloadTaskWithResumeData(resumeData as MemoryBlock, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task to resume a previously canceled or failed download and calls a handler upon completion.
**Notes:** resumeData: A data object that provides the data necessary to resume the download.

Handler: The completion handler to call when the load request is complete.
See also:

- 38.21.12 downloadTaskWithResumeData(resumeData as MemoryBlock) as NSURLSessionDownloadTaskMBS 7862

### 38.21.14 downloadTaskWithURL(URL as String) as NSURLSessionDownloadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task that retrieves the contents of the specified URL and saves the results to a file.
**Notes:** url: The URL to download.

After you create the task, you must start it by calling its resume method.
See also:

- 38.21.15 downloadTaskWithURL(URL as String, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7863

### 38.21.15 downloadTaskWithURL(URL as String, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a download task that retrieves the contents of the specified URL, saves the results to a file, and calls a handler upon completion.
**Notes:** url: An URL that provides the URL to download.
Handler: The completion handler to call when the load request is complete.
See also:

- 38.21.14 downloadTaskWithURL(URL as String) as NSURLSessionDownloadTaskMBS 7863

### 38.21.16 finishTasksAndInvalidate

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Invalidates the session, allowing any outstanding tasks to finish.
**Notes:** This method returns immediately without waiting for tasks to finish. Once a session is invalidated, new tasks cannot be created in the session, but existing tasks continue until completion. After the last task finishes and the session makes the last delegate call related to those tasks, the session calls the DidBecomeInvalidWithError event, then breaks references to the delegate and callback objects. After invalidation, session

objects cannot be reused.
To cancel all outstanding tasks, call invalidateAndCancel instead.

Important
Calling this method on the session returned by the sharedSession method has no effect.

### 38.21.17 flush(Handler as NSURLSessionFlushCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Flushes cookies and credentials to disk, clears transient caches, and ensures that future requests occur on a new TCP connection.
**Notes:** Handler: The completion handler to call when the flush operation is complete.

### 38.21.18 invalidateAndCancel

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Cancels all outstanding tasks and then invalidates the session.
**Notes:** Once invalidated, references to the delegate and callback objects are broken. After invalidation, session objects cannot be reused.
To allow outstanding tasks to run until completion, call finishTasksAndInvalidate instead.

Important
Calling this method on the session returned by the sharedSession method has no effect.

### 38.21.19 reset(Handler as NSURLSessionResetCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Resets the session.
**Notes:** Empties all cookies, caches and credential stores, removes disk files, flushes in-progress downloads to disk, and ensures that future requests occur on a new socket.

Handler: The completion handler to call when the reset operation is complete.

### 38.21.20 sharedSession as NSURLSessionMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The shared singleton session object.
**Notes:** For basic requests, the NSURLSessionMBS class provides a shared singleton session object that gives you a reasonable default behavior for creating tasks. Use the shared session to fetch the contents of a URL to memory with just a few lines of code.
Unlike the other session types, you don,Äôt create the shared session; you merely access it by using this property directly. As a result, you don,Äôt provide a delegate or a configuration object.

Limitations of the Shared Session
Because the shared session has neither a delegate nor a customizable configuration object, the shared session has important limitations:

- You can,Äôt obtain data incrementally as it arrives from the server.
- You can,Äôt significantly customize the default connection behavior.
- Your ability to perform authentication is limited.
- You can,Äôt perform background downloads or uploads when your app isn,Äôt running.

The shared session uses the shared NSURLCacheMBS, NSHTTPCookieStorageMBS, and NSURLCredentialStorageMBS objects, uses a shared custom networking protocol lis, and is based on a default configuration.

In general, when working with a shared session, you should avoid customizing the cache, cookie storage, or credential storage (unless you are already doing so with NSURLConnectionMBS). There,Äôs a good chance that you,Äôll outgrow the capabilities of the default session, at which point you,Äôll have to rewrite all of those customizations to work with your custom URL sessions.
In other words, if you,Äôre doing anything with caches, cookies, authentication, or custom networking protocols, you should probably be using a default session instead of the shared session.

### 38.21.21 streamTaskWithHostName(hostname as String, Port as Integer) as NSURLSessionStreamTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that establishes a bidirectional TCP/IP connection to a specified hostname and port.
**Notes:** hostname: The hostname of the connection endpoint.
port: The port of the connection endpoint.

Returns the new session stream task.

After you create the task, you must start it by calling its resume method.

### 38.21.22 Tasks as NSURLSessionTaskMBS()

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Queries all tasks for the session.
**Notes:** Please use the asynchronous variant if possible.
See also:

- 38.21.23 Tasks(Handler as NSURLSessionTasksCompletedMBS, tag as variant = nil) 7866

### 38.21.23 Tasks(Handler as NSURLSessionTasksCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Asynchronously calls a completion callback with all data, upload, and download tasks in a session.
**Notes:** Handler: The completion handler to call with the list of tasks. This handler is executed on the delegate queue.

The arrays passed to the completion handler contain any tasks that you have created within the session, not including any tasks that have been invalidated after completing, failing, or being cancelled.
See also:

- 38.21.22 Tasks as NSURLSessionTaskMBS() 7866

### 38.21.24 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock) as NSURLSessionUploadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that performs an HTTP request for the specified URL request object and uploads the provided data.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, and so on. The body stream and body data in this request object are ignored.
Data: The body data for the request.

Returns the new session upload task.

An HTTP upload request is any request that contains a request body, such as a POST or PUT request. Upload tasks require you to create a request object so that you can provide metadata for the upload, like

HTTP request headers.
After you create the task, you must start it by calling its resume method. The task calls methods on the session,Äôs delegate to provide you with the upload,Äôs progress, response metadata, response data, and so on.
See also:


- 38.21.25 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7867
- 38.21.26 uploadTaskWithRequest(request as NSURLRequestMBS, file as folderItem) as NSURLSessionUploadTaskMBS 7868
- 38.21.27 uploadTaskWithRequest(request as NSURLRequestMBS, file as FolderItem, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7869


### 38.21.25 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that performs an HTTP request for the specified URL request object, uploads the provided data, and calls a handler upon completion.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, and so on. The body stream and body data in this request object are ignored.
bodyData: The body data for the request.
Handler: The completion handler to call when the load request is complete.

Returns the new session upload task.

An HTTP upload request is any request that contains a request body, such as a POST or PUT request. Upload tasks require you to create a request object so that you can provide metadata for the upload, like HTTP request headers.

Unlike uploadTaskWithRequest, this method returns the response body after it has been received in full, and does not require you to write a custom delegate to obtain the response body.

By using a completion handler, the task bypasses calls to delegate methods for response and data delivery, and instead provides any resulting data, response, or error inside the completion handler. Delegate methods for handling authentication challenges, however, are still called.

Typically you pass a nil completion handler only when creating tasks in sessions whose delegates include a dataTaskDidReceiveData method. However, if you do not need the response data, use key-value observing to watch for changes to the task,Äôs status to determine when it completes.

After you create the task, you must start it by calling its resume method.

If the request completes successfully, the data parameter of the completion handler block contains the resource data, and the error parameter is nil. If the request fails, the data parameter is nil, and the error parameter contains information about the failure. If a response from the server is received, regardless of whether the request completes successfully or fails, the response parameter contains that information.
See also:


- 38.21.24 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock) as NSURLSessionUploadTaskMBS 7866
- 38.21.26 uploadTaskWithRequest(request as NSURLRequestMBS, file as folderItem) as NSURLSessionUploadTaskMBS 7868
- 38.21.27 uploadTaskWithRequest(request as NSURLRequestMBS, file as FolderItem, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7869


### 38.21.26 uploadTaskWithRequest(request as NSURLRequestMBS, file as folderItem) as NSURLSessionUploadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that performs an HTTP request for uploading the specified file.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, and so on. The body stream and body data in this request object are ignored.
file: The file to upload.

Returns the new session upload task.

An HTTP upload request is any request that contains a request body, such as a POST or PUT request. Upload tasks require you to create a request object so that you can provide metadata for the upload, like HTTP request headers.
After you create the task, you must start it by calling its resume method. The task calls methods on the session,Äôs delegate to provide you with the upload,Äôs progress, response metadata, response data, and so on.
See also:


- 38.21.24 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock) as NSURLSessionUploadTaskMBS 7866
- 38.21.25 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7867
- 38.21.27 uploadTaskWithRequest(request as NSURLRequestMBS, file as FolderItem, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7869

### 38.21.27 uploadTaskWithRequest(request as NSURLRequestMBS, file as FolderItem, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that performs an HTTP request for uploading the specified file, then calls a handler upon completion.
**Notes:** request: An NSURLRequestMBS instance that provides the URL, cache policy, request type, and so on. The body stream and body data in this request object are ignored.
file: The file to upload.
Handler: The completion handler to call when the load request is complete.

An HTTP upload request is any request that contains a request body, such as a POST or PUT request. Upload tasks require you to create a request object so that you can provide metadata for the upload, like HTTP request headers.

Unlike uploadTaskWithRequest, this method returns the response body after it has been received in full, and does not require you to write a custom delegate to obtain the response body.

By using a completion handler, the task bypasses calls to delegate methods for response and data delivery, and instead provides any resulting data, response, or error inside the completion handler. Delegate methods for handling authentication challenges, however, are still called.

Typically you usually pass a nil completion handler only when creating tasks in sessions whose delegates include a dataTaskDidReceiveData method. However, if you do not need the response data, use key-value observing to watch for changes to the task,Äôs status to determine when it completes.

After you create the task, you must start it by calling its resume method.

If the request completes successfully, the data parameter of the completion handler block contains the resource data, and the error parameter is nil. If the request fails, the data parameter is nil, and the error parameter contains information about the failure. If a response from the server is received, regardless of whether the request completes successfully or fails, the response parameter contains that information.
See also:

- 38.21.24 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock) as NSURLSessionUploadTaskMBS 7866
- 38.21.25 uploadTaskWithRequest(request as NSURLRequestMBS, data as MemoryBlock, handler as NSURLSessionUploadTaskCompletedMBS, tag as Variant = nil) as NSURLSessionDataTaskMBS 7867
- 38.21.26 uploadTaskWithRequest(request as NSURLRequestMBS, file as folderItem) as NSURLSessionUploadTaskMBS 7868

### 38.21.28 uploadTaskWithStreamedRequest(request as NSURLRequestMBS) as NSURLSessionUploadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a task that performs an HTTP request for uploading data based on the specified URL request.
**Notes:** request: A URL request object that provides the URL, cache policy, request type, and so on. The body stream and body data in this request object are ignored, and the session calls its taskNeedNewBodyStream event to provide the body data.

Returns the new session upload task.

An HTTP upload request is any request that contains a request body, such as a POST or PUT request. Upload tasks require you to provide a request object so that you can provide metadata for the upload, such as HTTP request headers.
After you create the task, you must start it by calling its resume method. The task calls methods on the session,Äôs delegate to provide you with the upload,Äôs progress, response metadata, response data, and so on. The session must have a taskNeedNewBodyStream event that provides the body data to upload.

### 38.21.29 webSocketTaskWithRequest(request as NSURLRequestMBS) as NSURLSessionWebSocketTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a WebSocket task for the provided URL request.
**Notes:** request: A URL request that indicates a WebSockets endpoint with which to connect.

You can modify the request,Äôs properties prior to calling resume on the task. The task uses these properties during the HTTP handshake phase.
To add custom protocols, add a header with the key Sec-WebSocket-Protocol, and a comma-separated list of protocols you want to negotiate with the server. The custom HTTP headers provided by the client remain unchanged for the handshake with the server.

### 38.21.30 webSocketTaskWithURL(URL as String) as NSURLSessionWebSocketTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a WebSocket task for the provided URL.
**Notes:** url: The WebSocket URL with which to connect.

The provided URL must have a ws or wss scheme.
See also:

- 38.21.31 webSocketTaskWithURL(URL as String, Protocols() as String) as NSURLSessionWebSocketTaskMBS 7871

### 38.21.31 webSocketTaskWithURL(URL as String, Protocols() as String) as NSURLSessionWebSocketTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a WebSocket task given a URL and an array of protocols.
**Notes:** url: The WebSocket URL with which to connect.
protocols: An array of protocols to negotiate with the server.

During the WebSocket handshake, the task uses the provided protocols to negotiate a preferred protocol with the server.

The protocol doesn,Äôt affect the WebSocket framing. More details on the protocol are available in RFC 6455, The WebSocket Protocol.
See also:

- 38.21.30 webSocketTaskWithURL(URL as String) as NSURLSessionWebSocketTaskMBS 7870

### 38.21.32 Properties

### 38.21.33 configuration as NSURLSessionConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A copy of the configuration object for this session.
**Notes:** Beginning in iOS 9 and OS X 10.11, NSURLSession objects store a copy of the NSURLSessionConfiguration object passed to their initializers, such that a session,Äôs configuration is immutable after initialization. Any further changes to mutable properties on the configuration object passed to a session,Äôs initializer or the value returned from a session,Äôs configuration property do not affect the behavior of that session. However, you can create a new session with the modified configuration object.
(Read only property)

### 38.21.34 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.21.35 sessionDescription as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An app-defined descriptive label for the session.
**Notes:** This property contains a human-readable string that you can use for debugging purposes. This value may be "" and defaults to "". The value is ignored by the session.
(Read and Write property)

### 38.21.36 Events

### 38.21.37 dataTaskDidBecomeDownloadTask(dataTask as NSURLSessionDataTaskMBS, downloadTask as NSURLSessionDownloadTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The data task was changed to a download task.
**Notes:** dataTask: The data task that was replaced by a download task.
downloadTask: The new download task that replaced the data task.

When your dataTaskDidReceiveResponse event uses the ResponseBecomeDownload disposition to convert the request to use a download, the session calls this event to provide you with the new download task. After this call, the session receives no further event calls related to the original data task.

### 38.21.38 dataTaskDidBecomeStreamTask(dataTask as NSURLSessionDataTaskMBS, downloadTask as NSURLSessionStreamTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The data task was changed to a stream task.
**Notes:** dataTask: The data task that was replaced by a stream task.
streamTask: The new stream task that replaced the data task.

When your dataTaskDidReceiveResponse event uses the ResponseBecomeStream disposition to convert the request to use a stream, the session calls this event to provide you with the new stream task. After this call, the session receives no further event calls related to the original data task.

For requests that were pipelined, the stream task allows only reading, and the object immediately sends the delegate message writeClosedForStreamTask. You can disable pipelining for all requests in a session by setting the HTTPShouldUsePipelining property on its NSURLSessionConfigurationMBS object, or for individual requests by setting the HTTPShouldUsePipelining property on an NSURLRequestMBS object.

### 38.21.39 dataTaskDidReceiveData(dataTask as NSURLSessionDataTaskMBS, data as MemoryBlock)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The data task has received some of the expected data.
**Notes:** dataTask: The data task that provided data.
data: A data object containing the transferred data.

This event may be called more than once, and each call provides only data received since the previous call. The app is responsible for accumulating this data if needed.

### 38.21.40 dataTaskDidReceiveResponse(dataTask as NSURLSessionDataTaskMBS, response as NSURLResponseMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The data task received the initial reply (headers) from the server.
**Notes:** dataTask:

The data task that received an initial reply.
response: A URL response object populated with headers.

Return your decision whether to continue a transfer, passing a NSURLSessionResponseDisposition constant to indicate whether the transfer should continue as a data task or should become a download task.

- If you pass ResponseAllow, the task continues as a data task.
- If you pass ResponseCancel, the task is canceled.
- If you pass ResponseBecomeDownload, your delegate,Äôs dataTaskDidBecomeDownloadTask method is called to provide the new download task that supersedes the current task.

Implementing this method is optional unless you need to cancel the transfer or convert it to a download task when the response headers are first received. If you don,Äôt provide this event, the session always allows the task to continue.
You also implement this method if you need to support the fairly obscure multipart/x-mixed-replace content

type. With that content type, the server sends a series of parts, each of which is intended to replace the previous part. The session calls this method at the beginning of each part, followed by one or more calls to dataTaskDidReceiveData with the contents of that part.

Each time the dataTaskDidReceiveResponse method is called for a part, collect the data received for the previous part (if any) and process the data as needed for your application. This processing can include storing the data to the filesystem, parsing it into custom types, or displaying it to the user. Next, begin receiving the next part by calling the completion handler with the NSURLSessionResponseAllow constant. Finally, if you have also implemented taskDidCompleteWithError, the session will call it after sending all the data for the last part.

### 38.21.41 dataTaskWillCacheResponse(dataTask as NSURLSessionDataTaskMBS, proposedResponse as NSCachedURLResponseMBS) as NSCachedURLResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Asks the event whether the data (or upload) task should store the response in the cache.
**Notes:** dataTask: The data (or upload) task.
proposedResponse: The default caching behavior. This behavior is determined based on the current caching policy and the values of certain received headers, such as the Pragma and Cache-Control headers.

Please return the new respnose:

Provide either the original proposed response, a modified version of that response, or nil to prevent caching the response.

The session calls this event after the task finishes receiving all of the expected data. If you don,Äôt implement this method, the default behavior is to use the caching policy specified in the session,Äôs configuration object. The primary purpose of this method is to prevent caching of specific URLs or to modify the userInfo dictionary associated with the URL response.

This method is called only if the NSURLProtocol handling the request decides to cache the response. As a rule, responses are cached only when all of the following are true:

- The request is for an HTTP or HTTPS URL (or your own custom networking protocol that supports caching).
- The request was successful (with a status code in the 200–299 range).
- The provided response came from the server, rather than out of the cache.
- The session configuration,Äôs cache policy allows caching.

- The provided NSURLRequestMBS object's cache policy (if applicable) allows caching.
- The cache-related headers in the server,Äôs response (if present) allow caching.
- The response size is small enough to reasonably fit within the cache. (For example, if you provide a disk cache, the response must be no larger than about 5% of the disk cache size.)

### 38.21.42 didBecomeInvalid(error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the URL session that the session has been invalidated.
**Notes:** error: The error that caused invalidation, or nil if the invalidation was explicit.

If you invalidate a session by calling its finishTasksAndInvalidate method, the session waits until after the final task in the session finishes or fails before calling this event. If you call the invalidateAndCancel method, the session calls this event immediately.

### 38.21.43 didReceiveChallenge(challenge as NSURLAuthenticationChallengeMBS, byref disposition as Integer, byref credential as NSURLCredentialMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Requests credentials from the delegate in response to a session-level authentication request from the remote server.
**Notes:** session: The session containing the task that requested authentication.
challenge: An object that contains the request for authentication.

disposition—One of several constants that describes how the challenge should be handled.
credential—The credential that should be used for authentication if disposition is NSURLSessionAuthChallengeUseCredential, otherwise nil.

This method is called in two situations:

- When a remote server asks for client certificates or Windows NT LAN Manager (NTLM) authentication, to allow your app to provide appropriate credentials
- When a session first establishes a connection to a remote server that uses SSL or TLS, to allow your app to verify the server,Äôs certificate chain

If you do not implement this event, the session calls its delegate,Äôs taskDidReceiveChallenge method instead.
Note

This method handles only the NSURLAuthenticationMethodNTLM, NSURLAuthenticationMethodNegotiate, NSURLAuthenticationMethodClientCertificate, and NSURLAuthenticationMethodServerTrust authentication types. For all other authentication schemes, the session calls only the taskDidReceiveChallenge method.

### 38.21.44 downloadTaskDidFinishDownloadingToURL(downloadTask as NSURLSessionDownloadTaskMBS, location as String, file as FolderItem)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** A download task has finished downloading.
**Notes:** downloadTask: The download task that finished.
location: A file URL for the temporary file. Because the file is temporary, you must either open the file for reading or move it to a permanent location in your app,Äôs sandbox container directory before returning from this event.

### 38.21.45 downloadTaskDidResumeAtOffset(downloadTask as NSURLSessionDownloadTaskMBS, fileOffset as Int64, expectedTotalBytes as Int64)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The download task has resumed downloading.
**Notes:** downloadTask: The download task that resumed. See explanation in the discussion.
fileOffset: If the file's cache policy or last modified date prevents reuse of the existing content, then this value is zero. Otherwise, this value is an integer representing the number of bytes on disk that do not need to be retrieved again.

In some situations, it may be possible for the transfer to resume earlier in the file than where the previous transfer ended.
expectedTotalBytes: The expected length of the file, as provided by the Content-Length header. If this header was not provided, the value is NSURLSessionTransferSizeUnknown (-1).

If a resumable download task is canceled or fails, you can request a resumeData object that provides enough information to restart the download in the future. Later, you can call downloadTaskWithResumeData with that data.

When you call those methods, you get a new download task. As soon as you resume that task, the session calls this method with that new task to indicate that the download is resumed.

### 38.21.46 downloadTaskDidWriteData(downloadTask as NSURLSessionDownloadTaskMBS, bytesWritten as Int64, totalBytesWritten as Int64, totalBytesExpectedToWrite as Int64)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Periodically informs the delegate about the download,Äôs progress.
**Notes:** downloadTask: The download task.
bytesWritten: The number of bytes transferred since the last time this event was called.
totalBytesWritten: The total number of bytes transferred so far.
totalBytesExpectedToWrite: The expected length of the file, as provided by the Content-Length header. If this header was not provided, the value is NSURLSessionTransferSizeUnknown (-1).

### 38.21.47 streamTaskBetterRouteDiscoveredForStreamTask(streamTask as NSURLSessionStreamTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** A better route to the host has been detected for the stream.
**Notes:** streamTask: The stream task that discovered a better route.

This method is called when the URL loading system determines that a better route to the endpoint host is available. For example, this method may be called when a Wi-Fi interface becomes available.
You should consider completing pending work and creating a new stream task in order to take advantage of better routes when they become available.

### 38.21.48 streamTaskDidBecomeInputStream(streamTask as NSURLSessionStreamTaskMBS, inputStream as NSInputStreamMBS, outputStream as NSOutputStreamMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The stream task has been completed as a result of the stream task calling the captureStreams method.
**Notes:** streamTask: The stream task that has been completed.
inputStream: The created input stream. This NSInputStream object is unopened.
outputStream: The created output stream. This NSOutputStream object is unopened

This event will only be called after all enqueued reads and writes for the stream task have been completed.

### 38.21.49 streamTaskReadClosedForStreamTask(streamTask as NSURLSessionStreamTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The read side of the underlying socket has been closed.
**Notes:** streamTask: The stream task that closed reads.

This method may be called even if no reads are currently in progress. This method does not indicate that the stream reached end-of-file (EOF), such that no more data can be read.

### 38.21.50 streamTaskWriteClosedForStreamTask(streamTask as NSURLSessionStreamTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The write side of the underlying socket has been closed.
**Notes:** streamTask: The stream task that closed writes.

This method may be called even if no writes are currently in progress.

### 38.21.51 taskDidCompleteWithError(task as NSURLSessionTaskMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The task finished transferring data.
**Notes:** task: The task whose request finished transferring data.
error: If an error occurred, an error object indicating how the transfer failed, otherwise nil.

Server errors are not reported through the error parameter. The only errors your delegate receives through the error parameter are client-side errors, such as being unable to resolve the hostname or connect to the host.

### 38.21.52 taskDidFinishCollectingMetrics(task as NSURLSessionTaskMBS, metrics as NSURLSessionTaskMetricsMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The session finished collecting metrics for the task.
**Notes:** task: The task whose metrics have been collected.

metrics: The collected metrics.

### 38.21.53 taskDidSendBodyData(task as NSURLSessionTaskMBS, bytesSent as Int64, totalBytesSent as Int64, totalBytesExpectedToSend as Integer)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Periodically informs the delegate of the progress of sending body content to the server.
**Notes:** task: The data task.
bytesSent: The number of bytes sent since the last time this event was called.
totalBytesSent: The total number of bytes sent so far.
totalBytesExpectedToSend: The expected length of the body data. The URL loading system can determine the length of the upload data in three ways:

- From the length of the NSData object provided as the upload body.
- From the length of the file on disk provided as the upload body of an upload task (not a download task).
- From the Content-Length in the request object, if you explicitly set it.

Otherwise, the value is NSURLSessionTransferSizeUnknown (-1) if you provided a stream or body data object, or zero (0) if you did not.

The totalBytesSent and totalBytesExpectedToSend parameters are also available as NSURLSessionTaskMBS properties countOfBytesSent and countOfBytesExpectedToSend.

### 38.21.54 taskIsWaitingForConnectivity(task as NSURLSessionTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The task is waiting until suitable connectivity is available before beginning the network load.
**Notes:** task: The task that is waiting for a change in connectivity.

This method is called if the waitsForConnectivity property of NSURLSessionConfigurationMBS is true, and sufficient connectivity is unavailable. The delegate can use this opportunity to update the user interface; for example, by presenting an offline mode or a cellular-only mode.

This method is called, at most, once per task, and only if connectivity is initially unavailable. It is never called for background sessions because waitsForConnectivity is ignored for those sessions.

### 38.21.55 taskWillPerformHTTPRedirection(task as NSURLSessionTaskMBS, response as NSURLResponseMBS, request as NSURLRequestMBS) as NSURLRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The remote server requested an HTTP redirect.
**Notes:** task: The task whose request resulted in a redirect.
response: An object containing the server,Äôs response to the original request.
request: A URL request object filled out with the new location.

Return either the value of the request parameter, a modified URL request object, or NULL to refuse the redirect and return the body of the redirect response.

This method is called only for tasks in default and ephemeral sessions. Tasks in background sessions automatically follow redirects.

### 38.21.56 webSocketTaskDidCloseWithCode(webSocketTask as NSURLSessionWebSocketTaskMBS, closeCode as Integer, reason as MemoryBlock)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The WebSocket task received a close frame from the server endpoint, optionally including a close code and reason from the server.
**Notes:** webSocketTask: The WebSocket task that closed.
closeCode: The close code provided by the server. If the close frame didn,Äôt include a close code, this value is 0.
reason: The close reason provided by the server. If the close frame didn,Äôt include a reason, this value is nil.

### 38.21.57 webSocketTaskDidOpenWithProtocol(webSocketTask as NSURLSessionWebSocketTaskMBS, protocol as String)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The WebSocket task successfully negotiated the handshake with the endpoint, indicating the negotiated protocol.
**Notes:** webSocketTask: The WebSocket task that opened.
protocol: The protocol picked during the handshake phase. This parameter is nil if the server did not pick a protocol, or if the client did not advertise protocols when creating the task.

If the handshake fails, the task doesn,Äôt call this event.

### 38.21.58 Constants

Auth Challenge Disposition Modes

| Constant | Value | Description |
|---|---|---|
| AuthChallengeCancelAuthenticationChallenge | 2 | The entire request will be canceled; the credential parameter is i |
| AuthChallengePerformDefaultHandling | 1 | Default handling for the challenge - as if this delegate were not the credential parameter is ignored. |
| AuthChallengeRejectProtectionSpace | 3 | This challenge is rejected and the next authentication protection be tried; the credential parameter is ignored. |
| AuthChallengeUseCredential | 0 | Use the specified credential, which may be nil |

Delayed Request Disposition

| Constant | Value | Description |
|---|---|---|
| DelayedRequestCancel | 2 | Cancel the task; the request parameter is ignored. |
| DelayedRequestContinueLoading | 0 | Use the original request provided when the task was created; the request parameter is ignored. |
| DelayedRequestUseNewRequest | 1 | Use the specified request, which may not be nil. |

Response Disposition

| Constant | Value | Description |
|---|---|---|
| ResponseAllow | 1 | Allow the load operation to continue. |
| ResponseBecomeDownload | 2 | Convert the response for this request to use a NSURLSessionDownloadTaskMBS. |
| ResponseBecomeStream | 3 | Convert the response for this request to use a NSURLSessionStreamTaskMBS. |
| ResponseCancel | 0 | Cancel the load. |

### 38.21.59 Delegates

### 38.21.60 NSURLSessionAllTasksCompletedMBS(tasks() as NSURLSessionTaskMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Asynchronously calls a completion callback with all tasks in a session.
**Notes:** Handler: The completion handler to call with the list of tasks.

### 38.21.61 NSURLSessionDataTaskCompletedMBS(data as MemoryBlock, response as NSURLResponseMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when the load request is complete.
**Notes:** data: The data returned by the server.
response: An object that provides response metadata, such as HTTP headers and status code. If you are making an HTTP or HTTPS request, the returned object is actually an NSHTTPURLResponseMBS object.
error: An error object that indicates why the request failed, or nil if the request was successful.

### 38.21.62 NSURLSessionDownloadTaskCompletedMBS(location as String, file as FolderItem, response as NSURLResponseMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when the load request is complete.
**Notes:** location: The location of a temporary file where the server,Äôs response is stored. You must move this file or open it for reading before your completion handler returns. Otherwise, the file is deleted, and the data is lost.
response: An object that provides response metadata, such as HTTP headers and status code. If you are making an HTTP or HTTPS request, the returned object is actually an NSHTTPURLResponse object.
error: An error object that indicates why the request failed, or nil if the request was successful.

For your convenience we provide a folderitem for the location URL.

### 38.21.63 NSURLSessionFlushCompletedMBS(tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when the flush operation is complete.

### 38.21.64 NSURLSessionResetCompletedMBS(tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when the reset operation is complete.

### 38.21.65 NSURLSessionTasksCompletedMBS(dataTasks() as NSURLSessionDataTaskMBS, uploadTasks() as NSURLSessionUploadTaskMBS, downloadTasks() as NSURLSessionDownloadTaskMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call with the list of tasks.
**Notes:** The arrays passed to the completion handler contain any tasks that you have created within the session, not including any tasks that have been invalidated after completing, failing, or being cancelled.

### 38.21.66 NSURLSessionUploadTaskCompletedMBS(data as MemoryBlock, response as NSURLResponseMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when the load request is complete.
**Notes:** data: The data returned by the server.
response: An object that provides response metadata, such as HTTP headers and status code. If you are making an HTTP or HTTPS request, the returned object is actually an NSHTTPURLResponse object.
error: An error object that indicates why the request failed, or nil if the request was successful.

## 38.22 class NSURLSessionStreamTaskMBS

### 38.22.1 class NSURLSessionStreamTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A URL session task that is stream-based.
**Notes:** NSURLSessionStreamTaskMBS is a concrete subclass of NSURLSessionTaskMBS. Many of the methods in the NSURLSessionStreamTaskMBS class are documented in NSURLSessionTaskMBS.
The NSURLSessionStreamTaskMBS class provides an interface a TCP/IP connection created via NSURLSession. Tasks may be created from an NSURLSession using the streamTaskWithHostName and streamTaskWithNetService methods. They may also created as a result of an NSURLSessionDataTaskMBS being upgraded via the HTTP Upgrade: response header and appropriate use of the HTTPShouldUsePipelining option of NSURLSessionConfigurationMBS.

See RFC 2817 and RFC 6455 for information about the Upgrade: header.
An NSURLSessionStreamTask object perform sasynchronous reads and writes, which are enqueued and executed serially, calling a handler upon completion being on the session delegate queue. If the task is canceled, all enqueued reads and writes will call their completion handlers with an appropriate error.

When working with APIs that accept NSStreamMBS objects, you can create NSInputStreamMBS and NSOutputStreamMBS objects from an NSURLSessionStreamTaskMBS object by calling the captureStreams method.
Subclass of the NSURLSessionTaskMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.22.2 Methods

### 38.22.3 captureStreams

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Completes any already enqueued reads and writes, and then invokes the streamTaskDidBecomeInputStream event.

### 38.22.4 closeRead

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Completes any enqueued reads and writes, and then closes the read side of the underlying socket.
**Notes:** You may continue to write data using the writeData method after calling this method. Any calls to

readData after calling this method will result in an error.

### 38.22.5 closeWrite

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Completes any enqueued reads and writes, and then closes the write side of the underlying socket.
**Notes:** You may continue to read data using the readDat method after calling this method. Any calls to writeData after calling this method will result in an error.
Because the server may continue to write bytes to the client, it is recommended that you continue reading until the stream reaches end-of-file (EOF).

### 38.22.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.22.7 readData(minBytes as Integer, maxBytes as Integer, timeout as Double, Handler as NSURLSessionStreamTaskReadDataCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Asynchronously reads a number of bytes from the stream, and calls a handler upon completion.
**Notes:** minBytes: The minimum number of bytes to read.
maxBytes: The maximum number of bytes to read.
timeout: A timeout for reading bytes. If the read is not completed within the specified interval, the read is canceled and the completionHandler is called with an error. Pass 0 to prevent a read from timing out.

Handler: The completion handler to call when all bytes are read, or an error occurs.

### 38.22.8 startSecureConnection

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Completes any enqueued reads and writes, and establishes a secure connection.
**Notes:** Authentication callbacks are sent to the taskDidReceiveChallenge event in NSURLSessionMBS class.

### 38.22.9 writeData(data as MemoryBlock, timeout as Double, Handler as NSURLSessionStreamTaskWriteDataCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Asynchronously writes the specified data to the stream, and calls a handler upon completion.
**Notes:** data: The data to be written.
timeout: A timeout for writing bytes. If the write is not completed within the specified interval, the write is canceled and the completionHandler is called with an error. Pass 0 to prevent a write from timing out.

completionHandler: The completion handler to call when all bytes are written, or an error occurs.

There is no guarantee that the remote side of the stream has received all of the written bytes at the time that completionHandler is called, only that all of the data has been written to the kernel.

### 38.22.10 Delegates

### 38.22.11 NSURLSessionStreamTaskReadDataCompletedMBS(streamTask as NSURLSessionStreamTaskMBS, data as MemoryBlock, atEOF as Boolean, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when all bytes are read, or an error occurs.
**Notes:** data: The data read from the stream.
atEOF: Whether or not the stream reached end-of-file (EOF), such that no more data can be read.
error: An error object that indicates why the read failed, or nil if the read was successful.

### 38.22.12 NSURLSessionStreamTaskWriteDataCompletedMBS(streamTask as NSURLSessionStreamTaskMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The completion handler to call when all bytes are written, or an error occurs.
**Notes:** error: An error object that indicates why the write failed, or nil if the write was successful.

# 38.23 class NSURLSessionTaskMBS

## 38.23.1 class NSURLSessionTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A task, like downloading a specific resource, performed in a URL session.
**Notes:** The NSURLSessionTaskMBS class is the base class for tasks in a URL session. Tasks are always part of a session; you create a task by calling one of the task creation methods on a NSURLSession instance. The method you call determines the type of task.

- Use NSURLSessionMBS,Äôs dataTaskWithURL and related methods to create NSURLSessionDataTaskMBS instances. Data tasks request a resource, returning the server,Äôs response as one or more NSData objects in memory. They are supported in default, ephemeral, and shared sessions, but are not supported in background sessions.
- Use NSURLSessionMBS,Äôs uploadTaskWithRequest and related methods to create NSURLSessionUploadTaskMBS instances. Upload tasks are like data tasks, except that they make it easier to provide a request body so you can upload data before retrieving the server,Äôs response. Additionally, upload tasks are supported in background sessions.
- Use NSURLSessionMBS,Äôs downloadTaskWithURL and related methods to create NSURLSessionDownloadTaskMBS instances. Download tasks download a resource directly to a file on disk. Download tasks are supported in any type of session.
- Use NSURLSessionMBS,Äôs streamTaskWithHostName or streamTaskWithNetService to create NSURLSessionStreamTaskMBS instances. Stream tasks establish a TCP/IP connection from a host name and port or a net service object.

After you create a task, you start it by calling its resume method. The session then maintains a strong reference to the task until the request finishes or fails; you don,Äôt need to maintain a reference to the task unless it,Äôs useful for your app,Äôs internal bookkeeping.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr7
- Adding NSURLSession classes for Xojo

## 38.23.2 Methods

## 38.23.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.9 or newer.

### 38.23.4 Cancel

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Cancels the task.
**Notes:** This method returns immediately, marking the task as being canceled. Once a task is marked as being canceled, taskDidCompleteWithError event is called, passing an error in the domain NSURLErrorDomain with the code NSURLErrorCancelled. A task may, under some circumstances, send messages to its delegate before the cancelation is acknowledged.
This method may be called on a task that is suspended.

### 38.23.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.23.6 copy as NSURLSessionTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Copies the task.

### 38.23.7 PriorityDefault as Single

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** One of the priorities.
**Notes:** The default URL session task priority, used implicitly for any task you have not prioritized. The floating point value of this constant is 0.5.

### 38.23.8 PriorityHigh as Single

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** One of the priorities.
**Notes:** A high URL session task priority, with a floating point value above the default value and below the maximum of 1.0.

### 38.23.9 PriorityLow as Single

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** One of the priorities.
**Notes:** A low URL session task priority, with a floating point value above the minimum of 0 and below the default value.

### 38.23.10 resume

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Resumes the task, if it is suspended.
**Notes:** Newly-initialized tasks begin in a suspended state, so you need to call this method to start the task.

### 38.23.11 suspend

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Temporarily suspends a task.
**Notes:** A task, while suspended, produces no network traffic and is not subject to timeouts. A download task can continue transferring data at a later time. All other tasks must start over when resumed.

### 38.23.12 Properties

### 38.23.13 countOfBytesClientExpectsToReceive as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A best-guess upper bound on the number of bytes the client expects to receive.
**Notes:** The value set for this property should account for the size of both HTTP response headers and the response body. If no value is specified, the system uses -1 instead. This property is used by the system to optimize the scheduling of URL session tasks. Developers are strongly encouraged to provide an approximate upper bound, or an exact byte count, if possible, rather than accept the default.
(Read only property)

### 38.23.14 countOfBytesClientExpectsToSend as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A best-guess upper bound on the number of bytes the client expects to send.

**Notes:** The value set for this property should account for the size of HTTP headers and body data or body stream. If no value is specified, the system uses -1 instead. This property is used by the system to optimize the scheduling of URL session tasks. Developers are strongly encouraged to provide an approximate upper bound, or an exact byte count, if possible, rather than accept the default.
(Read only property)

### 38.23.15 countOfBytesExpectedToReceive as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes that the task expects to receive in the response body.
**Notes:** This value is determined based on the Content-Length header received from the server. If that header is absent, the value is NSURLSessionTransferSizeUnknown = -1.
(Read only property)

### 38.23.16 countOfBytesExpectedToSend as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes that the task expects to send in the request body.
**Notes:** The URL loading system can determine the length of the upload data in three ways:

- From the length of the data object provided as the upload body.
- From the length of the file on disk provided as the upload body of an upload task (not a download task).
- From the Content-Length in the request object, if you explicitly set it.

Otherwise, the value is NSURLSessionTransferSizeUnknown (-1) if you provided a stream or body data object, or zero (0) if you did not.
(Read only property)

### 38.23.17 countOfBytesReceived as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes that the task has received from the server in the response body.
**Notes:** To be notified when this value changes, implement the dataTaskDidReceiveData event (for data and upload tasks) or the downloadTaskDidWriteData event (for download tasks).
(Read only property)

### 38.23.18 countOfBytesSent as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes that the task has sent to the server in the request body.
**Notes:** This byte count includes only the length of the request body itself, not the request headers.
To be notified when this value changes, implement the taskDidSendBodyData event in your NSURLSession-MBS class.
(Read only property)

### 38.23.19 currentRequest as NSURLRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The URL request object currently being handled by the task.
**Notes:** This value is typically the same as the initial request (originalRequest) except when the server has responded to the initial request with a redirect to a different URL.
(Read only property)

### 38.23.20 earliestBeginDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The earliest date at which the network load should begin.
**Notes:** For tasks created from background NSURLSessionMBS instances, this property indicates that the network load should not begin any earlier than this date. Setting this property does not guarantee that the load will begin at the specified date, but only that it will not begin sooner. If not specified, no start delay is used.
This property has no effect for tasks created from nonbackground sessions.
(Read and Write property)

### 38.23.21 earliestBeginDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The earliest date at which the network load should begin.
**Notes:** For tasks created from background NSURLSessionMBS instances, this property indicates that the network load should not begin any earlier than this date. Setting this property does not guarantee that the load will begin at the specified date, but only that it will not begin sooner. If not specified, no start delay is used.
This property has no effect for tasks created from nonbackground sessions.
(Read and Write property)

### 38.23.22 error as NSErrorMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An error object that indicates why the task failed.
**Notes:** This value is nil if the task is still active or if the transfer completed successfully.
(Read only property)

### 38.23.23 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.23.24 originalRequest as NSURLRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The original request object passed when the task was created.
**Notes:** This value is typically the same as the currently active request (currentRequest) except when the server has responded to the initial request with a redirect to a different URL.
(Read only property)

### 38.23.25 Priority as Single

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The relative priority at which you,Äôd like a host to handle the task, specified as a floating point value between 0.0 (lowest priority) and 1.0 (highest priority).
**Notes:** To provide hints to a host on how to prioritize URL session tasks from your app, specify a priority for each task. Specifying a priority provides only a hint and does not guarantee performance. If you don,Äôt specify a priority, a URL session task has a priority of NSURLSessionTaskPriorityDefault, with a value of 0.5.

There are three named priorities you can employ, described in URL Session Task Priority.

You can specify or change a task,Äôs priority at any time, but not all networking protocols respond to changes after a task has started. There is no API to let you determine the effective priority for a task from a host,Äôs perspective.
(Read and Write property)

### 38.23.26 response as NSURLResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The server,Äôs response to the currently active request.
**Notes:** This object provides information about the request as provided by the server. This information always includes the original URL. It may also include an expected length, MIME type information, encoding information, a suggested filename, or a combination of these.
(Read only property)

### 38.23.27 state as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The current state of the task—active, suspended, in the process of being canceled, or completed.
**Notes:** (Read only property)

### 38.23.28 taskDescription as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An app-provided string value for the current task.
**Notes:** The system doesn,Äôt interpret this value; use it for whatever purpose you see fit. For example, you could store a description of the task for debugging purposes, or a key to track the task in your own data structures.
(Read and Write property)

### 38.23.29 taskIdentifier as UInt64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An identifier uniquely identifying the task within a given session.
**Notes:** This value is unique only within the context of a single session; tasks in other sessions may have the same taskIdentifier value.
(Read only property)

### 38.23.30 Constants

States

| Constant | Value | Description |
|---|---|---|
| StateCanceling | 2 | The task has received a cancel message.<br>The delegate may or may not have received a taskDidCompleteWithError message yet. A task in this state is not subject to timeouts. |
| StateCompleted | 3 | The task has completed (without being canceled), and the task's delegate receives no further callbacks.<br>If the task completed successfully, the task,Äôs error property is nil. Otherwise, it provides an error object that tells what went wrong. A task in this state is not subject to timeouts. |
| StateRunning | 0 | The task is currently being serviced by the session.<br>A task in this state is subject to the request and resource timeouts specified in the session configuration object. |
| StateSuspended | 1 | The task was suspended by the app.<br>No further processing takes place until the task is resumed. A task in this state is not subject to timeouts. |

## 38.24 class NSURLSessionTaskMetricsMBS

### 38.24.1 class NSURLSessionTaskMetricsMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An object encapsulating the metrics for a session task.
**Notes:** Each NSURLSessionTaskMetricsMBS object contains the taskInterval and redirectCount, as well as metrics for each request-and-response transaction made during the execution of the task.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 38.24.2 Methods

### 38.24.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.12 or newer.

### 38.24.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.24.5 transactionMetrics as NSURLSessionTaskTransactionMetricsMBS()

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An array of metrics for each individual request-response transaction made during the execution of the task.

### 38.24.6 Properties

### 38.24.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.24.8 redirectCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of redirects that occurred during the execution of the task.
**Notes:** (Read only property)

### 38.24.9 taskInterval as NSDateIntervalMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The time interval between when a task is instantiated and when the task is completed.
**Notes:** (Read only property)

# 38.25 class NSURLSessionTaskTransactionMetricsMBS

## 38.25.1 class NSURLSessionTaskTransactionMetricsMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** An object that encapsualtes the performance metrics collected by the URL Loading System during the execution of a session task.
**Notes:** Each NSURLSessionTaskTransactionMetricsMBS object consists of a request and response property, corresponding to the request and response of the corresponding task. It also contains temporal metrics, starting with fetchStartDate and ending with responseEndDate, as well as other characteristics like networkProtocolName and resourceFetchType.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 38.25.2 Methods

## 38.25.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Wether this class is available.
**Notes:** Returns true on MacOS 10.12 or later.
Some properties are MacOS 10.15 or later.

## 38.25.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 38.25.5 Properties

## 38.25.6 Cellular as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection operates over a cellular interface.
**Notes:** You permit or deny use of cellular interfaces with the allowsCellularAccess property on NSURLSessionConfigurationMBS or allowsCellularAccess on NSMutableURLRequestMBS.
(Read only property)

### 38.25.7 connectEndDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately after the task finished establishing the connection to the server.
**Notes:** This value accounts for completion of security-related and other handshakes. The value will be nil if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.8 connectEndDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately after the task finished establishing the connection to the server.
**Notes:** This value accounts for completion of security-related and other handshakes. The value will be nil if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.9 connectStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately before the task started establishing a TCP connection to the server.
**Notes:** This value will be nil if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.10 connectStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately before the task started establishing a TCP connection to the server.
**Notes:** This value will be nil if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.11 Constrained as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this is a constrained network.
**Notes:** (Read only property)

### 38.25.12 countOfRequestBodyBytesBeforeEncoding as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The size of the upload body data, file, or stream, in bytes.
**Notes:** (Read only property)

### 38.25.13 countOfRequestBodyBytesSent as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes transferred for the request body.
**Notes:** This value includes protocol-specific framing, transfer encoding, and content encoding.
(Read only property)

### 38.25.14 countOfRequestHeaderBytesSent as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes transferred for the request header.
**Notes:** (Read only property)

### 38.25.15 countOfResponseBodyBytesAfterDecoding as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The size of data delivered to your delegate or completion handler.
**Notes:** (Read only property)

### 38.25.16 countOfResponseBodyBytesReceived as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes transferred for the response body.
**Notes:** This value includes protocol-specific framing, transfer encoding, and content encoding.
(Read only property)

### 38.25.17 countOfResponseHeaderBytesReceived as Int64

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The number of bytes transferred for the response header.
**Notes:** (Read only property)

### 38.25.18 domainLookupEndDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time after the name lookup was completed.
**Notes:** This value will be nil if a persistent connection was used, or if the resource was retrieved from local resources.
(Read only property)

### 38.25.19 domainLookupEndDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time after the name lookup was completed.
**Notes:** This value will be nil if a persistent connection was used, or if the resource was retrieved from local resources.
(Read only property)

### 38.25.20 domainLookupStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately before the task started the name lookup for the resource.
**Notes:** This value will be nil if a persistent connection was used, or if the resource was retrieved from local resources.
(Read only property)

### 38.25.21 domainLookupStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately before the task started the name lookup for the resource.
**Notes:** This value will be nil if a persistent connection was used, or if the resource was retrieved from local resources.

(Read only property)

### 38.25.22 Expensive as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection operates over an expensive interface.
**Notes:** An expensive interface is one which is more costly or consumes more power, such as 3G or LTE as compared to ethernet or Wi-Fi. You permit or deny use of expensive interfaces with the allowsExpensiveNetworkAccess property on NSURLSessionConfigurationMBS or allowsExpensiveNetworkAccess on NSMutableURLRequestMBS.
(Read only property)

### 38.25.23 fetchStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time when the task started fetching the resource, from the server or locally.
**Notes:** (Read only property)

### 38.25.24 fetchStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time when the task started fetching the resource, from the server or locally.
**Notes:** (Read only property)

### 38.25.25 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.25.26 localAddress as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The IP address string of the local interface for the connection.
**Notes:** For multipath protocols, this is the local address of the initial flow. If the app didn,Äôt use the

connection, this value is empty.
(Read only property)

### 38.25.27 localPort as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The port number of the local interface for the connection.
**Notes:** For multipath protocols, this is the local port of the initial flow. If the app didn,Äôt use the connection, this value is 0.
(Read only property)

### 38.25.28 Multipath as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the connection uses a successfully negotiated multipath protocol.
**Notes:** You configure the use of multipath protocols with the multipathServiceType property on NSURLSessionConfigurationMBS.
(Read only property)

### 38.25.29 negotiatedTLSCipherSuite as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The TLS cipher suite the task negotiated with the endpoint for the connection.
**Notes:** This value is a 2-byte sequence in host byte order. See TLSCipherSuite* constants for possible values. If the task didn,Äôt negotiate an encrypted connection, this value is 0.
(Read only property)

### 38.25.30 negotiatedTLSProtocolVersion as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The TLS protocol version the task negotiated with the endpoint for the connection.
**Notes:** This value is a 2-byte sequence in host byte order. See TLSProtocolVersion* constants for possible values. If the task didn,Äôt negotiate an encrypted connection, this value is 0.
(Read only property)

### 38.25.31 networkProtocolName as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The network protocol used to fetch the resource.
**Notes:** When a proxy is configured and a tunnel connection is established, this attribute returns the value for the tunneled protocol, which is identified by the ALPN Protocol ID Identification Sequence, as per RFC 7310. For example:

- If no proxy is used, and HTTP/2 is negotiated, then h2 is returned.
- If HTTP/1.1 is used with the proxy, and the tunneled connection is HTTP/2, then h2 is returned.
- If HTTP/1.1 is used with the proxy, and there,Äôs no tunnel, then http/1.1 is returned.

(Read only property)

### 38.25.32 ProxyConnection as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicastes whether the task used a proxy connection to fetch the resource.
**Notes:** (Read only property)

### 38.25.33 remoteAddress as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The IP address string of the remote interface for the connection.
**Notes:** For multipath protocols, this is the remote address of the initial flow. If the app didn,Äôt use the connection, this value is empty.
(Read only property)

### 38.25.34 remotePort as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The port number of the remote interface for the connection.
**Notes:** For multipath protocols, this is the remote port of the initial flow. If the app didn,Äôt use the connection, this value is 0.
(Read only property)

### 38.25.35 request as NSURLRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The transaction request.
**Notes:** (Read only property)

### 38.25.36 requestEndDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately after the task finished requesting the resource, regardless of whether it was retrieved from the server or local resources.
**Notes:** (Read only property)

### 38.25.37 requestEndDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately after the task finished requesting the resource, regardless of whether it was retrieved from the server or local resources.
**Notes:** (Read only property)

### 38.25.38 requestStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately before the task started requesting the resource, regardless of whether it is retrieved from the server or local resources.
**Notes:** (Read only property)

### 38.25.39 requestStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately before the task started requesting the resource, regardless of whether it is retrieved from the server or local resources.
**Notes:** (Read only property)

### 38.25.40 resourceFetchType as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A value that indicates whether the resource was loaded, pushed, or retrieved from the local cache.
**Notes:** (Read only property)

### 38.25.41 response as NSURLResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The transaction response.
**Notes:** This property is nil if an error occurred and no response was generated.
(Read only property)

### 38.25.42 responseEndDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately after the task received the last byte of the resource.
**Notes:** (Read only property)

### 38.25.43 responseEndDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately after the task received the last byte of the resource.
**Notes:** (Read only property)

### 38.25.44 responseStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately after the task received the first byte of the response from the server or from local resources.
**Notes:** (Read only property)

### 38.25.45 responseStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately after the task received the first byte of the response from the server or from local resources.
**Notes:** (Read only property)

### 38.25.46 ReusedConnection as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the task used a persistent connection to fetch the resource.
**Notes:** (Read only property)

### 38.25.47 secureConnectionEndDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately after the security handshake completed.
**Notes:** This value is nil if an encrypted connection isn,Äôt used, if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.48 secureConnectionEndDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately after the security handshake completed.
**Notes:** This value is nil if an encrypted connection isn,Äôt used, if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.49 secureConnectionStartDate as Date

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time immediately before the task started the TLS security handshake to secure the current connection.
**Notes:** This value is nil if an encrypted connection isn,Äôt used, if a persistent connection is used, or if the resource is retrieved from local resources.

(Read only property)

### 38.25.50 secureConnectionStartDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time immediately before the task started the TLS security handshake to secure the current connection.
**Notes:** This value is nil if an encrypted connection isn,Äôt used, if a persistent connection is used, or if the resource is retrieved from local resources.
(Read only property)

### 38.25.51 Constants

Fetch Types

| Constant | Value | Description |
|---|---|---|
| FetchTypeLocalCache | 3 | The resource was retrieved from the local storage. |
| FetchTypeNetworkLoad | 1 | The resource was loaded over the network. |
| FetchTypeServerPush | 2 | The resource was pushed by the server to the client. |
| FetchTypeUnknown | 0 | The manner in which the resource was fetched could not be determined. |

TLS Chipher Suites

| Constant | Value | Description |
|---|---|---|
| TLSCipherSuite_AES_128_GCM_SHA256 | &h1301 | AES 128 GCM SHA256 |
| TLSCipherSuite_AES_256_GCM_SHA384 | &h1302 | AES 256 GCM SHA384 |
| TLSCipherSuite_CHACHA20_POLY1305_SHA256 | &h1303 | CHACHA20 POLY1305 SI |
| TLSCipherSuite_ECDHE_ECDSA_WITH_3DES_EDE_CBC_SHA | &hC008 | ECDHE ECDSA with 3DE |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_128_CBC_SHA | &hC009 | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256 | &hC023 | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 | &hC02B | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_256_CBC_SHA | &hC00A | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384 | &hC024 | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 | &hC02C | ECDHE ECDSA with AES |
| TLSCipherSuite_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256 | &hCCA9 | ECDHE ECDSA with CH |
| TLSCipherSuite_ECDHE_RSA_WITH_3DES_EDE_CBC_SHA | &hC012 | ECDHE RSA with 3DES I |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_128_CBC_SHA | &hC013 | ECDHE RSA with AES 12 |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_128_CBC_SHA256 | &hC027 | ECDHE RSA with AES 12 |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_128_GCM_SHA256 | &hC02F | ECDHE RSA with AES 12 |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_256_CBC_SHA | &hC014 | ECDHE RSA with AES 25 |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_256_CBC_SHA384 | &hC028 | ECDHE RSA with AES 25 |
| TLSCipherSuite_ECDHE_RSA_WITH_AES_256_GCM_SHA384 | &hC030 | ECDHE RSA with AES 25 |
| TLSCipherSuite_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 | &hCCA8 | ECDHE RSA WITH CHA |
| TLSCipherSuite_RSA_WITH_3DES_EDE_CBC_SHA | &h000A | RSA with 3DES EDE CB |
| TLSCipherSuite_RSA_WITH_AES_128_CBC_SHA | &h002F | RSA with AES 128 CBC S |
| TLSCipherSuite_RSA_WITH_AES_128_CBC_SHA256 | &h003C | RSA with AES 128 CBC S |
| TLSCipherSuite_RSA_WITH_AES_128_GCM_SHA256 | &h009C | RSA with AES 1128 GCM |
| TLSCipherSuite_RSA_WITH_AES_256_CBC_SHA | &h0035 | RSA with AES 256 CBC S |
| TLSCipherSuite_RSA_WITH_AES_256_CBC_SHA256 | &h003D | RSA with AES 256 CBC S |
| TLSCipherSuite_RSA_WITH_AES_256_GCM_SHA384 | &h009D | RSA with AES 256 GCM |

TLS Protocol Version

| Constant | Value | Description |
|---|---|---|
| TLSProtocolVersionDTLSv10 | &hfeff | The DTLS 1.0 protocol. |
| TLSProtocolVersionDTLSv12 | &hfefd | The DTLS 1.2 protocol. |
| TLSProtocolVersionTLSv10 | &h0301 | The TLS 1.0 protocol. |
| TLSProtocolVersionTLSv11 | &h0302 | The TLS 1.1 protocol. |
| TLSProtocolVersionTLSv12 | &h0303 | The TLS 1.2 protocol. |
| TLSProtocolVersionTLSv13 | &h0304 | The TLS 1.3 protocol. |

## 38.26 class NSURLSessionUploadTaskMBS

### 38.26.1 class NSURLSessionUploadTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A URL session task that uploads data to the network in a request body.
**Notes:** The NSURLSessionUploadTaskMBS class is a subclass of NSURLSessionDataTaskMBS, which in turn is a concrete subclass of NSURLSessionTaskMBS. The methods associated with the NSURLSessionUploadTaskMBS class are documented in NSURLSessionTaskMBS.
Upload tasks are used for making HTTP requests that require a request body (such as POST or PUT). They behave similarly to data tasks, but you create them by calling different methods on the session that are designed to make it easier to provide the content to upload. As with data tasks, if the server provides a response, upload tasks return that response as one or more MemoryBlock objects in memory.

Unlike data tasks, you can use upload tasks to upload content in the background.

When you create an upload task, you provide a NSURLRequestMBS instance that contains any additional headers that you might need to send alongside the upload, such as the content type, content disposition, and so on. In iOS, when you create an upload task for a file in a background session, the system copies that file to a temporary location and streams data from there.
While the upload is in progress, the task calls the session taskDidSendBodyData event in NSURLSessionMBS class periodically to provide you with status information.

When the upload phase of the request finishes, the task behaves like a data task, calling events on the session to provide you with the server,Äôs response—headers, status code, content data, and so on.
Subclass of the NSURLSessionDataTaskMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.26.2 Methods

### 38.26.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 38.27 class NSURLSessionWebSocketMessageMBS

### 38.27.1 class NSURLSessionWebSocketMessageMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The client can create a WebSocket message object that will be passed to the send calls and will be delivered from the receive calls.
**Notes:** The message can be initialized with data or string. If initialized with data, the string property will be nil and vice versa.
Available on MacOS 10.15 or newer.

### 38.27.2 Methods

### 38.27.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 38.27.4 Constructor(data as MemoryBlock)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Create a message with data type
See also:

- 38.27.5 Constructor(text as string) 7910

### 38.27.5 Constructor(text as string)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Create a message with string type
See also:

- 38.27.4 Constructor(data as MemoryBlock) 7910

### 38.27.6 Properties

### 38.27.7 data as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The data for a data message.
**Notes:** (Read only property)

### 38.27.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 38.27.9 string as String

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The text of a text message.
**Notes:** (Read only property)

### 38.27.10 type as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The type of message.
**Notes:** (Read only property)

### 38.27.11 Constants

Types

| Constant | Value | Description |
|---|---|---|
| TypeData | 0 | Data Message |
| TypeString | 1 | Text Message |

## 38.28 class NSURLSessionWebSocketTaskMBS

### 38.28.1 class NSURLSessionWebSocketTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A WebSocket task can be created with a ws or wss url.
**Notes:** A client can also provide a list of protocols it wishes to advertise during the WebSocket handshake phase.
Once the handshake is successfully completed the client will be notified through an optional delegate.
All reads and writes enqueued before the completion of the handshake will be queued up and executed once the hanshake succeeds. Before the handshake completes, the client can be called to handle redirection or authentication using the same delegates as NSURLSessionTask. WebSocket task will also provide support for cookies and will store cookies to the cookie storage on the session and will attach cookies to outgoing HTTP handshake requests.

Available on MacOS 10.15 or newer.
Subclass of the NSURLSessionTaskMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Adding NSURLSession classes for Xojo

### 38.28.2 Methods

### 38.28.3 cancel(closeCode as Integer, reason as MemoryBlock)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Sends a close frame with the given closeCode.
**Notes:** An optional reason can be provided while sending the close frame.
Simply calling cancel on the task will result in a cancellation frame being sent without any reason.

### 38.28.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 38.28.5 receiveMessage(Handler as NSURLSessionWebSocketTaskReceiveMessageCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Reads a WebSocket message once all the frames of the message are available.
**Notes:** If the maximumMessage size is hit while buffering the frames, the receiveMessage call will error out and all outstanding work will also fail resulting in the end of the task.

Calls handler later when job is done.

### 38.28.6 sendMessage(message as NSURLSessionWebSocketMessageMBS, Handler as NSURLSessionWebSocketTaskSendMessageCompletedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Sends a WebSocket message.
**Notes:** If an error occurs, any outstanding work will also fail.
Note that invocation of the completion handler does not guarantee that the remote side has received all the bytes, only that they have been written to the kernel.

Calls handler on completion.

### 38.28.7 sendPing(Handler as NSURLSessionWebSocketTaskSendPingWithPongReceivedMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Sends a ping frame from the client side.
**Notes:** The pongReceiveHandler is invoked when the client receives a pong from the server endpoint.
If a connection is lost or an error occurs before receiving the pong from the endpoint, the handler will be invoked with an error.
Note - the pongReceiveHandler will always be called in the order in which the pings were sent.

### 38.28.8 Properties

### 38.28.9 closeCode as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A task can be queried for it's close code at any point.
**Notes:** When the task is not closed, it will be set to CloseCodeInvalid.
(Read only property)

### 38.28.10 closeReason as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** A task can be queried for it's close reason at any point.
**Notes:** A nil value indicates no closeReason or that the task is still running
(Read only property)

### 38.28.11 maximumMessageSize as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The maximum number of bytes to be buffered before erroring out.
**Notes:** This includes the sum of all bytes from continuation frames. Recieve calls will error out if this value is reached.
(Read and Write property)

### 38.28.12 Constants

Close Codes

| Constant | Value | Description |
|---|---|---|
| CloseCodeAbnormalClosure | 1006 | Abnormal Closure |
| CloseCodeGoingAway | 1001 | Going Away |
| CloseCodeInternalServerError | 1011 | Internal Server Error |
| CloseCodeInvalid | 0 | Invalid |
| CloseCodeInvalidFramePayloadData | 1007 | Invalid Frame Payload Data |
| CloseCodeMandatoryExtensionMissing | 1010 | Mandatory Extension Missing |
| CloseCodeMessageTooBig | 1009 | Message Too Big |
| CloseCodeNormalClosure | 1000 | Normal Closure |
| CloseCodeNoStatusReceived | 1005 | No Status Received |
| CloseCodePolicyViolation | 1008 | Policy Violation |
| CloseCodeProtocolError | 1002 | Protocol Error |
| CloseCodeTLSHandshakeFailure | 1015 | TLS Handshake Failure |
| CloseCodeUnsupportedData | 1003 | Unsupported Data |

### 38.28.13 Delegates

### 38.28.14 NSURLSessionWebSocketTaskReceiveMessageCompletedMBS(webSocketTask as NSURLSessionWebSocketTaskMBS, message as NSURLSessionWebSocketMessageMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The handler to be called when receiving finished.

### 38.28.15 NSURLSessionWebSocketTaskSendMessageCompletedMBS(webSocketTask as NSURLSessionWebSocketTaskMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Sending a web socket message succeeded.

### 38.28.16 NSURLSessionWebSocketTaskSendPingWithPongReceivedMBS(webSocketTask as NSURLSessionWebSocketTaskMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The ping answer may have been received.

# Chapter 39

# Cocoa Printing

## 39.1 class NSPageLayoutMBS

### 39.1.1 class NSPageLayoutMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** NSPageLayout is a panel that queries the user for information such as paper type and orientation.
**Notes:** It is normally displayed in response to the user selecting the Page Setup menu item. You obtain an instance with the pageLayout class method. The pane can then be run as a sheet using beginSheetWithPrintInfo or modally using runModal or runModalWithPrintInfo.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 39.1.2 Methods

### 39.1.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Presents a page setup sheet for the given NSPrintInfo object, document-modal relative to the given window.
**Notes:** printInfo: The NSPrintInfo object to use.
win: The window to which the sheet is attached.

This method calls the printPanelDidEnd event later passing returnCode which is either NSCancelButton (0) or NSOKButton (1).

See also:


- 39.1.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS) 7918
- 39.1.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window) 7918


### 39.1.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents a page setup sheet for the given NSPrintInfo object, document-modal relative to the given window.
**Notes:** printInfo: The NSPrintInfo object to use.
win: The window to which the sheet is attached.

This method calls the printPanelDidEnd event later passing returnCode which is either NSCancelButton (0) or NSOKButton (1).
See also:


- 39.1.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow) 7917
- 39.1.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window) 7918


### 39.1.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents a page setup sheet for the given NSPrintInfo object, document-modal relative to the given window.
**Notes:** printInfo: The NSPrintInfo object to use.
win: The window to which the sheet is attached.

This method calls the printPanelDidEnd event later passing returnCode which is either NSCancelButton (0) or NSOKButton (1).
See also:


- 39.1.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow) 7917
- 39.1.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS) 7918


### 39.1.6 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new page layout object.

### 39.1.7 pageLayout as NSPageLayoutMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a newly created NSPageLayout object.

### 39.1.8 printInfo as NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the NSPrintInfo object used when the receiver is run.
**Notes:** The NSPrintInfo object is set using the beginSheetWithPrintInfo or runModalWithPrintInfo method.
The shared NSPrintInfo object is used if the receiver is run using runModal.

### 39.1.9 runModal as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays the receiver and begins the modal loop using the shared NSPrintInfo object.
**Example:**

```
dim p as new NSPageLayoutMBS
MsgBox str(p.runModal)
```

**Notes:** Returns NSCancelButton (0) if the user clicks the Cancel button; otherwise, NSOKButton (1).
The receiver's values are recorded in the shared NSPrintInfo object.

### 39.1.10 runModalWithPrintInfo(printInfo as NSPrintInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays the receiver and begins the modal loop using the given NSPrintInfo object.
**Notes:** printInfo: The NSPrintInfo object to use.

Returns NSCancelButton if the user clicks the Cancel button; otherwise, NSOKButton.
The receiver's values are recorded in printInfo.

### 39.1.11 runPageLayout

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays the app's page layout panel, an instance of NSPageLayout.
**Example:**

NSPageLayoutMBS.runPageLayout

**Notes:** If the NSPageLayout instance does not exist, this method creates one. This method is typically invoked when the user chooses Page Setup from the application's FIle menu.

### 39.1.12 Properties

### 39.1.13 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 39.1.14 Events

### 39.1.15 printPanelDidEnd(returnCode as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** Called when the sheet is dismissed.

## 39.2 class NSPrinterMBS

### 39.2.1 class NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSPrinter object describes a printer's capabilities as defined in its PPD file.
**Example:**

```
dim p as NSPrinterMBS = NSPrinterMBS.defaultPrinter
MsgBox p.name+EndOfLine+p.type
```

**Notes:** An NSPrinter object can be constructed by specifying either the printer name or the make and model of an available printer. You use a printer object to get information about printers, not to modify printer attributes or control a printing job.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 39.2.2 Methods

### 39.2.3 booleanForKey(key as string, table as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Boolean value associated with the specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns the Boolean value associated with the key. Returns false if the key is not in the table or the receiver lacks a PPD file.

### 39.2.4 Constructor(name as string = "")

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a printer object.
**Notes:** On success the handle property is not zero.
Name can be empty to pick default printer. Else pass name of printer.

### 39.2.5 copy as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a clone of the printer object.

### 39.2.6 defaultPrinter as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default printer.
**Example:**

```
dim p as NSPrinterMBS = NSPrinterMBS.defaultPrinter
MsgBox p.name
```

### 39.2.7 deviceDescription as Dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary of keys and values describing the device.
**Notes:** A dictionary of the device properties. See NSGraphics.h for possible keys. The only key guaranteed to exist is NSDeviceIsPrinter.

### 39.2.8 floatForKey(key as string, table as string) as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the floating-point value associated with the specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns the floating-point value. Returns 0.0 if the key is not in the table or the receiver lacks a PPD file.

### 39.2.9 intForKey(key as string, table as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the integer value associated with the specified key.
**Notes:** key: The key whose value you want.

table: The name of a table from the printer's PPD file.

Returns the integer value. Returns 0 if the key is not in the table or the receiver lacks a PPD file.

### 39.2.10 isKey(key as string, table as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the specified key is in the specified table.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.
Returns true if the key is in the table; otherwise, false.

### 39.2.11 languageLevel as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the PostScript language level recognized by the printer.
**Example:**

```
dim p as NSPrinterMBS = NSPrinterMBS.defaultPrinter
MsgBox "languageLevel: "+str(p.languageLevel)
```

**Notes:** Returns the PostScript language level. The value is 0 if the receiver is not a PostScript printer.

### 39.2.12 name as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the printer's name.
**Example:**

```
dim p as NSPrinterMBS = NSPrinterMBS.defaultPrinter
MsgBox p.name
```

### 39.2.13 pageSizeForPaper(paperName as string) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the size of the page for the specified paper type.
**Notes:** paperName: Possible values are printer-dependent and are contained in the printer's PPD file. Typical values are "Letter" and "Legal".

Returns the size of the page, measured in points in the user coordinate space. The returned size is zero if the specified paper name is not recognized or its entry in the PPD file cannot be parsed.

### 39.2.14 printerNames as string()

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the names of all available printers.
**Example:**

MsgBox Join(NSPrinterMBS.printerNames, EndOfLine)

**Notes:** An array of strings, each of which contains the name of an available printer.
The user constructs the list of available printers using the Print Center application.

### 39.2.15 printerTypes as string()

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns descriptions of the makes and models of all available printers.
**Notes:** An array of strings, each of which contains the make and model information for a supported printer.

### 39.2.16 printerWithName(name as string) as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSPrinter object initialized with the specified printer name.
**Notes:** name: The name of the printer.

Returns an initialized NSPrinter object, or nil if the specified printer was not available.

### 39.2.17 printerWithType(type as string) as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an NSPrinter object initialized to the first available printer with the specified make and model information.
**Notes:** type: A string describing the make and model information. You can get this string using the printerTypes method.

Returns an initialized NSPrinter object, or nil if the specified printer was not available.

### 39.2.18 rectForKey(key as string, table as string) as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the rectangle associated with the specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns the rectangle value. Returns NSRectMBS.Zero if the key is not in the table or the receiver lacks a PPD file.

### 39.2.19 sizeForKey(key as string, table as string) as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the size data type associated with the specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns the size value. Returns NSZeroSize if the key is not in the table or the receiver lacks a PPD file.

### 39.2.20 statusForTable(paperName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the status of the specified table.
**Notes:** table: The name of a table from the printer's PPD file.

Returns one of the return values described in Constants.

### 39.2.21 stringForKey(key as string, table as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the first occurrence of a value associated with specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns the value for the specified key, or nil if the key is not in the table. The returned string may also be empty.

If key is a main keyword only, and if that keyword has options in the PPD file, this method returns an empty string. Use stringListForKey to retrieve the values for all occurrences of a main keyword.

### 39.2.22 stringListForKey(key as string, table as string) as string()

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings, one for each occurrence, associated with specified key.
**Notes:** key: The key whose value you want.
table: The name of a table from the printer's PPD file.

Returns an array of strings, each containing a value associated with the specified key. Returns nil if the key is not in the table.

### 39.2.23 type as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a description of the printer's make and model.
**Example:**

```
dim p as NSPrinterMBS = NSPrinterMBS.defaultPrinter
MsgBox p.type
```

### 39.2.24 Properties

### 39.2.25 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 39.2.26 Constants

Printer Information Table States

| Constant | Value | Description |
|---|---|---|
| NSPrinterTableError | 2 | Printer table is not valid. |
| NSPrinterTableNotFound | 1 | Printer table was not found. |
| NSPrinterTableOK | 0 | Printer table was found and is valid. |

## 39.3 class NSPrintInfoMBS

### 39.3.1 class NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSPrintInfo object stores information that's used to generate printed output.
**Example:**

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```

**Notes:** A shared NSPrintInfo object is automatically created for an application and is used by default for all printing jobs for that application.

The printing information in an NSPrintInfo object is stored in a dictionary. To access the standard attributes in the dictionary directly, this class defines a set of keys and provides the dictionary method. You can also initialize an instance of this class using the Constructor method.

You can use this dictionary to store custom information associated with a print job. Any non-object values should be stored as NSNumber or NSValue objects in the dictionary. See NSNumber Class Reference for a list of types which should be stored as numbers. For other non-object values, use the NSValue class.

Beginning with OS X v10.5, to store custom information that belongs in printing presets you should use the dictionary returned by the printSettings method.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- Tip fo the day: Print to PDF for WebView

- Tip of day: Save Xojo report to PDF
- Tip of the day: Print to PDF with OpenPrinter in Xojo
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3
- PDF printing via PDFKit
- MBS Xojo / Real Studio Plugins, version 14.3pr10
- MBS Xojo / Real Studio Plugins, version 14.1pr3
- Print to PDF File on Mac OS X with Xojo
- MBS Real Studio Plugins, version 12.4pr1

### 39.3.2 Methods

### 39.3.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the print info with a new instance.
**Example:**

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```

See also:


- 39.3.4 Constructor(attributes as Dictionary) 7930
- 39.3.5 Constructor(Data as Memoryblock) 7930

### 39.3.4 Constructor(attributes as Dictionary)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize the print info with the parameters in the specified dictionary.
See also:


- 39.3.3 Constructor 7929
- 39.3.5 Constructor(Data as Memoryblock) 7930


### 39.3.5 Constructor(Data as Memoryblock)

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize the print info with serialized dictionary or NSPrintInfo.
**Example:**

```
dim p as new PrinterSetup
dim info as new NSPrintInfoMBS(p.SetupString)
MsgBox info.paperName
```

See also:


- 39.3.3 Constructor 7929
- 39.3.4 Constructor(attributes as Dictionary) 7930


### 39.3.6 copy as NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the object.

### 39.3.7 defaultPrinter as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default printer.

### 39.3.8 NSPrintAllPages as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean.

### 39.3.9 NSPrintBottomMargin as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a floating-point value that specifies the bottom margin, in points.

### 39.3.10 NSPrintCancelJob as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible job disposition values.
**Notes:** Cancel print job.

### 39.3.11 NSPrintCopies as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** a number containing the number of copies of the print job to be printed

### 39.3.12 NSPrintDetailedErrorReporting as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean.

### 39.3.13 NSPrintFaxNumber as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A string containing a fax number.

### 39.3.14 NSPrintFirstPage as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A number containing the one-based index of the first job in the page to print.

### 39.3.15 NSPrintHeaderAndFooter as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean for whether the results of NSView pageHeader and NSView pageFooter should be drawn on pages

### 39.3.16 NSPrintHorizontallyCentered as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a Boolean value that is true if pages are centered horizontally.

### 39.3.17 NSPrintHorizontalPagination as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a NSPrintingPaginationMode value.
NSAutoPagination, NSFitPagination, or NSClipPagination. See HorizontalPagination for details.

### 39.3.18 NSPrintJobDisposition as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A string equal to NSPrintSpoolJob, NSPrintPreviewJob, NSPrintSaveJob, or NSPrintCancelJob.

### 39.3.19 NSPrintJobSavingFileNameExtensionHidden as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean for whether the job file's name extension should be hidden, for NSPrintSaveJob. Available on Mac OS X 10.6.

### 39.3.20 NSPrintJobSavingURL as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** An URL containing the location to which the job file will be saved, for NSPrintSaveJob. Available on Mac OS X 10.6.

### 39.3.21 NSPrintLastPage as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** An number containing the one-based index of the last job in the page to print.

### 39.3.22 NSPrintLeftMargin as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a floating-point value that specifies the left margin, in points.

### 39.3.23 NSPrintMustCollate as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean value.

### 39.3.24 NSPrintOrientation as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access page format attributes.
**Notes:** A number containing an NSPrintingOrientation.

NSPortraitOrientation or NSLandscapeOrientation

### 39.3.25 NSPrintPagesAcross as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A number containing the number of logical pages to be placed across a physical sheet.

### 39.3.26 NSPrintPagesDown as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A number containing the number of logical pages to be placed down a physical sheet.

### 39.3.27 NSPrintPaperName as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access page format attributes.
**Notes:** A string containing the paper name.

### 39.3.28 NSPrintPaperSize as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access page format attributes.
**Notes:** A size value specifying the height and width of paper in points.

### 39.3.29 NSPrintPreviewJob as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible job disposition values.
**Notes:** Send to Preview application.

### 39.3.30 NSPrintPrinter as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** Value in dictionary is a NSPrinterMBS.

### 39.3.31 NSPrintPrinterName as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A string containing the name of a printer.

### 39.3.32 NSPrintReversePageOrder as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** Value for this key is a boolean value.

### 39.3.33 NSPrintRightMargin as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a floating-point value that specifies the right margin, in points.

### 39.3.34 NSPrintSaveJob as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible job disposition values.
**Notes:** Save to a file.

### 39.3.35 NSPrintScalingFactor as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access page format attributes.
**Notes:** Scale factor percentage before pagination.

### 39.3.36 NSPrintSelectionOnly as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** A boolean value.
Available on Mac OS X 10.6 or newer.

### 39.3.37 NSPrintSpoolJob as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible job disposition values.
**Notes:** Normal print job.

### 39.3.38 NSPrintTime as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for print job attributes that are recognized by NSPrintInfo.
**Notes:** An NSDate containing the time at which printing should begin.

### 39.3.39 NSPrintTopMargin as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a floating-point value that specifies the top margin, in points.

### 39.3.40 NSPrintVerticallyCentered as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a Boolean value that is true if pages are centered vertically.

### 39.3.41 NSPrintVerticalPagination as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys to access pagination attributes.
**Notes:** Number, containing a NSPrintingPaginationMode value.
NSAutoPagination, NSFitPagination, or NSClipPagination. See VerticalPagination for details.

### 39.3.42 SetSaveDestination(file as folderitem)

MBS MacCocoa Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the print job to go to a PDF file.
**Example:**

```
// print to PDF in Xojo Cocoa app

// change print info to go to
dim s as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
dim d as MemoryBlock = s.data // save old
s.SetSaveDestination SpecialFolder.Desktop.Child("test.pdf")

// now print something
dim g as Graphics = OpenPrinter
if g<>Nil then
g.DrawString "Hello World PDF", 20, 20
end if


s.data = d // restore original settings

// now print something to regular printer
g = OpenPrinter
if g<>Nil then
g.DrawString "Hello World Printer", 20, 20
end if
```

### 39.3.43 setSharedPrintInfo(printInfo as NSPrintInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the shared NSPrintInfo object to the specified object.
**Notes:** printInfo: The new shared printer information. This value must not be nil.

The shared NSPrintInfo object defines the settings for the NSPageLayout panel and print operations that will be used if no NSPrintInfo object is specified for those operations.

### 39.3.44 setUpPrintOperationDefaultValues

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Validates the attributes encapsulated by the receiver.
**Notes:** Invoked when the print operation is about to start. Subclasses may override this method to set default values for any attributes that are not set.

### 39.3.45 sharedPrintInfo as NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the shared NSPrintInfo object.

### 39.3.46 Properties

### 39.3.47 bottomMargin as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The bottom margin, measured in points in the user coordinate space.
**Notes:** (Read and Write property)

### 39.3.48 data as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Query or set the current settings as data.
**Example:**

```
// print to PDF in Xojo Cocoa app

// change print info to go to
dim s as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
dim d as MemoryBlock = s.data // save old
s.SetSaveDestination SpecialFolder.Desktop.Child("test.pdf")

// now print something
```

```
dim g as Graphics = OpenPrinter
if g<>Nil then
g.DrawString "Hello World PDF", 20, 20
end if


s.data = d // restore original settings

// now print something to regular printer
g = OpenPrinter
if g<>Nil then
g.DrawString "Hello World Printer", 20, 20
end if
```

**Notes:** The plugin archives the current settings and you can later assign them back.
(Read and Write property)

### 39.3.49 dictionary as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's dictionary that contains the printing attributes.
**Notes:** The key-value pairs contained in the dictionary are described in Constants. Modifying the returned dictionary changes the receiver's attributes.

This dictionary is key-value observing compliant.
(Read and Write property)

### 39.3.50 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 39.3.51 HorizontallyCentered as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the image is centered horizontally.
**Notes:** True if you want the image to be centered horizontally; otherwise, false.

(Read and Write property)

### 39.3.52 horizontalPagination as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The horizontal pagination to the specified mode.
**Notes:** One of the pagination modes described in constants.
(Read and Write property)

### 39.3.53 imageablePageBounds as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the imageable area of a sheet of paper specified by the receiver.
**Notes:** Return the imageable area, measured in points in the user coordinate space.

This method takes into account the current printer, paper size, and orientation settings, but not scaling factors. Imageable area is the maximum area that can possibly be marked on by the printer hardware, not the area defined by the current margin settings.

The origin (0, 0) of the returned rectangle is in the lower-left corner of the oriented sheet. The imageable bounds may extend past the edges of the sheet when, for example, a printer driver specifies it so that borderless printing can be done reliably.
(Read only property)

### 39.3.54 jobDisposition as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The action specified for the job.
**Notes:** One of the following value:

- NSPrintSpoolJob is a normal print job.
- NSPrintPreviewJob sends the print job to the Preview application.
- NSPrintSaveJob saves the print job to a file.
- NSPrintCancelJob aborts the print job.

(Read and Write property)

### 39.3.55 leftMargin as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The left margin to the specified size.
**Notes:** The size for the left margin, measured in points in the user coordinate space.
(Read and Write property)

### 39.3.56 localizedPaperName as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the human-readable name of the currently selected paper size, suitable for presentation in user interfaces.
**Notes:** This is typically different from the name returned by paperName, which is almost never suitable for presentation to the user.
(Read only property)

### 39.3.57 orientation as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The page orientation to the specified value.
**Notes:** This printing orientation. See constants for possible values.
For consistency, this method may change either the paper name or the paper size.
(Read and Write property)

### 39.3.58 paperName as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The paper name to the specified value.
**Notes:** The name for the paper size. The string contains a value such as Letter or Legal. Paper names are implementation specific.
For consistency, this method may change either the paper size or the page orientation.
(Read and Write property)

### 39.3.59 paperSize as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The width and height of the paper to the specified size.
**Notes:** The new size of the paper, measured in points in the user coordinate space.
For consistency, this method may change either the paper name or the page orientation.
(Read and Write property)

### 39.3.60 printer as NSPrinterMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The printer object used for subsequent printing jobs.
**Notes:** This method iterates through the receiver's dictionary. If a feature in the dictionary is not supported by the new printer (as determined by a query to the PPD file), that feature is removed from the dictionary.
(Read and Write property)

### 39.3.61 printerName as String

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The printer name of printer used for subsequent printing jobs.
**Notes:** (Read only property)

### 39.3.62 printSettings as dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a mutable dictionary containing the print settings from Core Printing.
**Notes:** A mutable dictionary containing the printing system's current settings.

You can use this method to get and set values from the system print settings. The keys in the returned dictionary represent the values returned by the Core Printing function PMPrintSettingsGetValue. They correspond to the settings currently in the print panel and include everything from custom values set by your accessory panels to values provided by the printer driver's print dialog extension.
(Read only property)

### 39.3.63 rightMargin as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The right margin to the specified size.
**Notes:** The size for the right margin, measured in points in the user coordinate space.
(Read and Write property)

### 39.3.64 scalingFactor as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The print info's scaling factor.
**Notes:** Default is 1.0.
Using smaller value increases paper size.
(Read and Write property)

### 39.3.65 SelectionOnly as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether only the current selection should be printed.
**Notes:** True if only the current selection should be printed, otherwise false.
(Read and Write property)

### 39.3.66 SetupString as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Query or set the current settings as data.
**Example:**

```
// start with a printer setup
dim p as new PrinterSetup

// clone to NSPrintInfo
dim info as new NSPrintInfoMBS(p.SetupString)

// find out what name second printer has
dim printers() as string = NSPrinterMBS.printerNames
dim printer as NSPrinterMBS = NSPrinterMBS.printerWithName(printers(1))
System.DebugLog printers(1)

// now set a new paper size and this printer
info.paperSize = new NSSizeMBS(72*5, 72*6) // 5 by 6 inch
info.printer = printer
```

```
// and clone back
p.SetupString = info.SetupString

// now print to this printer with this paper
dim g as Graphics = OpenPrinter(p)

g.DrawString "Hello", 10, 10
```

**Notes:** While data property encodes the dictionary, this property encodes the NSPrintInfo which is same format as PrinterSetup.SetupString in Xojo.
(Read and Write property)

### 39.3.67 topMargin as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The top margin, measured in points in the user coordinate space.
**Notes:** The size for the top margin, measured in points in the user coordinate space.
(Read and Write property)

### 39.3.68 VerticallyCentered as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the image is centered vertically.
**Notes:** True if you want the image to be centered vertically; otherwise, false.
(Read and Write property)

### 39.3.69 verticalPagination as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vertical pagination mode.
**Notes:** One of the pagination modes described in constants.
(Read and Write property)

### 39.3.70 Constants

Pagination Modes

| Constant | Value | Description |
|---|---|---|
| NSAutoPagination | 0 | The image is divided into equal-sized rectangles and placed in one column of pages. |
| NSClipPagination | 2 | The image is clipped to produce one column or row of pages. |
| NSFitPagination | 1 | The image is scaled to produce one column or one row of pages. |

Page Orientation Constants

| Constant | Value | Description |
|---|---|---|
| NSLandscapeOrientation | 1 | Orientation is portrait (page is taller than it is wide). |
| NSPortraitOrientation | 0 | Orientation is landscape (page is wider than it is tall). |

## 39.4 class NSPrintOperationMBS

### 39.4.1 class NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An NSPrintOperation object controls operations that generate Encapsulated PostScript (EPS) code, Portable Document Format (PDF) code, or print jobs.
**Notes:** An NSPrintOperation object works in conjunction with two other objects: an NSPrintInfo object, which specifies how the code should be generated, and an NSView object, which generates the actual code.

It is important to note that the majority of methods in NSPrintOperation copy the instance of NSPrintInfo passed into them. Future changes to that print info are not reflected in the print info retained by the current NSPrintOperation object. All changes should be made to the print info before passing to the methods of this class.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- Several ways for picture to PDF in MBS Plugins
- MBS Xojo Plugins, version 21.2pr5
- MBS Xojo Plugins, version 20.6pr3
- Tip fo the day: Print to PDF for WebView
- MBS Xojo Plugins, version 17.6pr5
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- MBS Xojo / Real Studio Plugins, version 14.4pr10
- PDF printing via PDFKit
- MBS Real Studio Plugins, version 12.4pr1

### 39.4.2 Methods

### 39.4.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize the object the current print operation for this thread.
**Notes:** On success the handle property is not zero.
See also:

- 39.4.4 Constructor(other as NSPrintOperationMBS) 

- 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) 7947
- 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) 7948
- 39.4.7 Constructor(view as NSViewMBS) 7949
- 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS) 7949


### 39.4.4 Constructor(other as NSPrintOperationMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Special constructor to create new NSPrintOperationMBS for existing NSPrintOperationMBS object.
**Notes:** If you have a NSPrintOperationMBS and you want to use printOperationDidRun event, you can initialize a subclass of NSPrintOperationMBS with your existing object to get the event there.
See also:


- 39.4.3 Constructor 7946
- 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) 7947
- 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) 7948
- 39.4.7 Constructor(view as NSViewMBS) 7949
- 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS) 7949


### 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Example:**

```
// print a HTMLViewer
dim n as new NSPrintOperationMBS(HTMLViewer1)

n.showsPrintPanel = true
n.showsProgressPanel = true
n.runOperationModalForWindow(self)
```

**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.3 Constructor 7946
- 39.4.4 Constructor(other as NSPrintOperationMBS) 7947
- 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) 7948
- 39.4.7 Constructor(view as NSViewMBS) 7949
- 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS) 7949


### 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil)

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Example:**

```
// print a HTMLViewer
dim n as new NSPrintOperationMBS(HTMLViewer1)

n.showsPrintPanel = true
n.showsProgressPanel = true
n.runOperationModalForWindow(self)
```

**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.3 Constructor 7946
- 39.4.4 Constructor(other as NSPrintOperationMBS) 7947
- 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) 7947
- 39.4.7 Constructor(view as NSViewMBS) 7949

• 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS) 7949

### 39.4.7 Constructor(view as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view.
**Notes:** View: The view whose contents you want to print.

Returns the new NSPrintOperation object. You must run the operation to print the view.

The new NSPrintOperation object uses the settings stored in the shared NSPrintInfo object. This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

• 39.4.3 Constructor 7946

• 39.4.4 Constructor(other as NSPrintOperationMBS) 7947

• 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) 7947

• 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) 7948

• 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS) 7949

### 39.4.8 Constructor(view as NSViewMBS, printInfo as NSPrintInfoMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

• 39.4.3 Constructor 7946

• 39.4.4 Constructor(other as NSPrintOperationMBS) 7947

- 39.4.5 Constructor(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) 7947
- 39.4.6 Constructor(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) 7948
- 39.4.7 Constructor(view as NSViewMBS) 7949


### 39.4.9 context as NSGraphicsMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the graphics context object used for generating output.

### 39.4.10 currentOperation as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current print operation for this thread.
**Notes:** The print operation object, or nil if there is no current operation.

### 39.4.11 currentPage as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current page number being printed.

### 39.4.12 data as Memoryblock

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the data in PDF/EPS after the operation finished.

### 39.4.13 Destructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 39.4.14 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of EPS graphics from the specified view.
**Notes:** View: The view containing the data to be turned into EPS data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as EPS data.

After the job is run, use the Data function to get the EPS data.
Returns the new NSPrintOperation object. You must run the operation to generate the EPS data.

The new NSPrintOperation object uses the default NSPrintInfo object. This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.15 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7951
- 39.4.16 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7952
- 39.4.17 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7952


### 39.4.15 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of EPS graphics from the specified view using the specified print settings.
**Notes:** View: The view containing the data to be turned into EPS data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as EPS data.
PrintInfo: The print settings to use when generating the EPS data.

After the job is run, use the Data function to get the EPS data.
Returns the new NSPrintOperation object. You must run the operation to generate the EPS data.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

- 39.4.14 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7951
- 39.4.16 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7952
- 39.4.17 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7952


### 39.4.16 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of EPS graphics from the specified view and write the resulting data to the specified file.
**Notes:** View: The view containing the data to be turned into EPS data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as EPS data.
path: The path to a file. After the job is run, this file contains the EPS data.
PrintInfo: The print settings to use when generating the EPS data.

Returns the new NSPrintOperation object. You must run the operation to generate the EPS data.
This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.14 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7951
- 39.4.15 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7951
- 39.4.17 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7952


### 39.4.17 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of EPS graphics from the specified view and write the resulting data to the specified file.
**Notes:** View: The view containing the data to be turned into EPS data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as EPS data.
path: The path to a file. After the job is run, this file contains the EPS data.

PrintInfo: The print settings to use when generating the EPS data.

Returns the new NSPrintOperation object. You must run the operation to generate the EPS data.
This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

- 39.4.14 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7951
- 39.4.15 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7951
- 39.4.16 EPSOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7952

### 39.4.18 isCopyingOperation as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the receiver is an EPS or PDF copy operation.
**Notes:** True if the receiver is an EPS or PDF copy operation; otherwise, false.

### 39.4.19 NSPrintOperationExistsException as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of an exception raised when there is already a print operation in process.
**Notes:** The methods that raise the NSExceptionMBS exception are the EPSOperation... and printOperation....

### 39.4.20 pageRange as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the print order for the pages.
**Notes:** The print order. For a list of possible values, see Constants.

### 39.4.21 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of PDF graphics from the specified view.
**Notes:** View: The view containing the data to be turned into PDF data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as PDF data.

After the job is run, the data function gives you the PDF data.

Returns the new NSPrintOperation object. You must run the operation to generate the PDF data.

The new NSPrintOperation object uses the default NSPrintInfo object. This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

- 39.4.22 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7954
- 39.4.23 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7955
- 39.4.24 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7955

### 39.4.22 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of PDF graphics from the specified view using the specified print settings.
**Notes:** View: The view containing the data to be turned into PDF data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as PDF data.
PrintInfo: The print settings to use when generating the PDF data.

After the job is run, the data function returns the PDF data.

Returns the new NSPrintOperation object. You must run the operation to generate the PDF data.
This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

- 39.4.21 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7953

- 39.4.23 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7955
- 39.4.24 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7955


### 39.4.23 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of PDF graphics from the specified view and write the resulting data to the specified file.
**Notes:** View: The view containing the data to be turned into PDF data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as PDF data.
path: The path to a file. After the job is run, this file contains the PDF data.
PrintInfo: The print settings to use when generating the PDF data.

Returns the new NSPrintOperation object. You must run the operation to generate the PDF data.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.21 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7953
- 39.4.22 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7954
- 39.4.24 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS 7955


### 39.4.24 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, path as string) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new NSPrintOperation object ready to control the copying of PDF graphics from the specified view and write the resulting data to the specified file.
**Notes:** View: The view containing the data to be turned into PDF data.
rect: The portion of the view (specified in points in the view's coordinate space) to be rendered as PDF data.

path: The path to a file. After the job is run, this file contains the PDF data.
PrintInfo: The print settings to use when generating the PDF data.

Returns the new NSPrintOperation object. You must run the operation to generate the PDF data.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.21 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS) as NSPrintOperationMBS 7953
- 39.4.22 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7954
- 39.4.23 PDFOperationWithView(view as NSViewMBS, rect as NSRectMBS, printInfo as NSPrintInfoMBS, file as folderitem) as NSPrintOperationMBS 7955


### 39.4.25 preferredRenderingQuality as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the printing quality.
**Notes:** The preferred printing quality. See constants for the possible values.

If the print sheet is unresponsive or sluggish due to the time is takes to fully render a page, you can check this method in drawRect: and other printing methods such as beginDocument and knowsPageRage: to determine if the print operation prefers speed over fidelity. Most applications render each page fast enough and do not need to call this method. Only use this method after establishing that best quality rendering does indeed make the user interface unresponsive.

### 39.4.26 printOperationWithView(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Example:**

```
// print a HTMLViewer
dim n as NSPrintOperationMBS = NSPrintOperationMBS.printOperationWithView(HTMLViewer1)

n.showsPrintPanel = true
n.showsProgressPanel = true
```

```
n.runOperationModalForWindow(self)
```

**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.27 printOperationWithView(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7957
- 39.4.28 printOperationWithView(view as NSViewMBS) as NSPrintOperationMBS 7958
- 39.4.29 printOperationWithView(view as NSViewMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7959


### 39.4.27 printOperationWithView(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Example:**

```
// print a HTMLViewer
dim n as NSPrintOperationMBS = NSPrintOperationMBS.printOperationWithView(HTMLViewer1)

n.showsPrintPanel = true
n.showsProgressPanel = true
n.runOperationModalForWindow(self)
```

**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:

- 39.4.26 printOperationWithView(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7956
- 39.4.28 printOperationWithView(view as NSViewMBS) as NSPrintOperationMBS 7958
- 39.4.29 printOperationWithView(view as NSViewMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7959


### 39.4.28 printOperationWithView(view as NSViewMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view.
**Example:**

```
// print a text area
dim textView as NSTextViewMBS = TextArea1.NSTextViewMBS
dim o as NSPrintOperationMBS = NSPrintOperationMBS.printOperationWithView(textView)

o.showsPrintPanel = true
o.runOperationModalForWindow(Window1)
o = nil
```

**Notes:** View: The view whose contents you want to print.

Returns the new NSPrintOperation object. You must run the operation to print the view.

The new NSPrintOperation object uses the settings stored in the shared NSPrintInfo object. This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.26 printOperationWithView(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7956
- 39.4.27 printOperationWithView(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7957
- 39.4.29 printOperationWithView(view as NSViewMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS 7959

### 39.4.29 printOperationWithView(view as NSViewMBS, printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an NSPrintOperation object ready to control the printing of the specified view using custom print settings.
**Notes:** View: The view whose contents you want to print.
PrintInfo: The print settings to use when printing the view.

Returns the new NSPrintOperation object. You must run the operation to print the view.

This method raises an NSPrintOperationExistsException if there is already a print operation in progress; otherwise the returned object is made the current print operation for this thread.
See also:


- 39.4.26 printOperationWithView(view as DesktopHTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7956
- 39.4.27 printOperationWithView(view as HTMLViewer, printInfo as NSPrintInfoMBS = nil) as NSPrintOperationMBS 7957
- 39.4.28 printOperationWithView(view as NSViewMBS) as NSPrintOperationMBS 7958


### 39.4.30 runOperation as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs the print operation on the current thread.
**Notes:** Returns true if the operation was successful; otherwise, false.

The operation runs to completion in the current thread, blocking the application. A separate thread is not spawned, even if canSpawnSeparateThread is true. Use runOperationModalForWindow to use document-modal sheets and to allow a separate thread to perform the operation.

### 39.4.31 runOperationModalForWindow(win as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Runs the print operation, calling your custom delegate method upon completion.
**Notes:** win: The document window to receive a print progress sheet.

Calls the printOperationDidRun event.
See also:

- 39.4.32 runOperationModalForWindow(win as NSWindowMBS) 7960
- 39.4.33 runOperationModalForWindow(win as window) 7960


### 39.4.32 runOperationModalForWindow(win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs the print operation, calling your custom delegate method upon completion.
**Notes:** win: The document window to receive a print progress sheet.

Calls the printOperationDidRun event.
See also:


- 39.4.31 runOperationModalForWindow(win as DesktopWindow) 7959
- 39.4.33 runOperationModalForWindow(win as window) 7960


### 39.4.33 runOperationModalForWindow(win as window)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Runs the print operation, calling your custom delegate method upon completion.
**Notes:** win: The document window to receive a print progress sheet.

Calls the printOperationDidRun event.
See also:


- 39.4.31 runOperationModalForWindow(win as DesktopWindow) 7959
- 39.4.32 runOperationModalForWindow(win as NSWindowMBS) 7960


### 39.4.34 setCurrentOperation(operation as NSPrintOperationMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the current print operation for this thread.
**Notes:** operation: The print operation to make current. You may specify nil to clear the current print operation.

### 39.4.35 view as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the view object that generates the actual data for the print operation.

### 39.4.36 Properties

### 39.4.37 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 39.4.38 canSpawnSeparateThread as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver is allowed to spawn a separate printing thread.
**Notes:** canSpawnSeparateThread: True if the receiver is allowed to spawn a separate thread; otherwise, false.

If canSpawnSeparateThread is true, an NSThread object is detached when the print panel is dismissed (or immediately, if the panel is not to be displayed). The new thread performs the print operation, so that control can return to your application. A thread is detached only if the print operation is run using the runOperationModalForWindow:delegate:didRunSelector:contextInfo: method. If canSpawnSeparateThread is false, the operation runs on the current thread, blocking the application until the operation completes.

If you send setCanSpawnSeparateThread: to an NSPrintOperation object with an argument of true, then the delegate specified in a subsequent invocation of runOperationModalForWindow may be messaged in that spawned, non-main thread.
(Read and Write computed property)

### 39.4.39 jobTitle as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The title of the print job.
**Notes:** A string containing the print job title. If set, this value overrides the title returned by the printing view.
Available in OS X v10.5 and later.
(Read and Write computed property)

### 39.4.40 pageOrder as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the print order for the pages.
**Notes:** The print order. For a list of possible values, see Constants.
(Read and Write computed property)

### 39.4.41 printInfo as NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's NSPrintInfo object.
**Notes:** (Read and Write computed property)

### 39.4.42 printPanel as NSPrintPanelMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the NSPrintPanel object used when running the operation.
**Notes:** (Read and Write computed property)

### 39.4.43 showsPrintPanel as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Boolean value indicating whether a print panel is displayed during the operation,
**Notes:** True if the operation displays a print panel; otherwise, false.
Operations that generate EPS or PDF data do no display a print panel (instance of NSPrintPanel), regardless of the value returned by this method.
(Read and Write computed property)

### 39.4.44 showsProgressPanel as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver displays a progress panel for this operation.
**Notes:** True if you want to display a progress panel; otherwise, false.
This method does not affect the display of a print panel; that operation is controlled by the ShowsPrintPanel method.
Operations that generate EPS or PDF data do no display a progress panel, regardless of the value in the flag parameter.

(Read and Write computed property)

### 39.4.45 Events

### 39.4.46 printOperationDidRun(success as boolean)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the print operation ends.

### 39.4.47 Constants

Page Order Constants

| Constant | Value | Description |
|---|---|---|
| NSAscendingPageOrder | 1 | Ascending (back to front) page order. |
| NSDescendingPageOrder | -1 | Descending (front to back) page order. |
| NSSpecialPageOrder | 0 | The spooler does not rearrange pages—they are printed in the order received by the spooler. |
| NSUnknownPageOrder | 2 | No page order specified. |

Print Quality Constants

| Constant | Value | Description |
|---|---|---|
| NSPrintRenderingQualityBest | 0 | Renders the printing at the best possible quality, regardless of speed. Available in OS X v10.7 and later. |
| NSPrintRenderingQualityResponsive | 1 | Sacrifices the least possible amount of rendering quality for speed to main a responsive user interface. This option should be used only after establis that best quality rendering does indeed make the user interface unrespons Available in OS X v10.7 and later. |

## 39.5 class NSPrintPanelMBS

### 39.5.1 class NSPrintPanelMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** An NSPrintPanel object creates the Print panel used to query the user for information about a print job.
**Notes:** This panel may lets the user select the range of pages to print and the number of copies before executing the Print command.

Print panels can display a simplified interface when printing certain types of data. For example, the panel can display a list of print-setting presets, which lets the user enable print settings in groups as opposed to individually. The JobStyleHint property activates the simplified interface and identifies which presets to display.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 39.5.2 Methods

### 39.5.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Displays a Print panel sheet and runs it modally for the specified window.
**Notes:** printInfo: The printing information for the current job.
win: The window on which to display the sheet.

When the modal session ends, if printPanelDidEnd event is invoked on the object.
See also:


- 39.5.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS) 7964
- 39.5.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window) 7965


### 39.5.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Displays a Print panel sheet and runs it modally for the specified window.
**Notes:** printInfo: The printing information for the current job.

win: The window on which to display the sheet.

When the modal session ends, if printPanelDidEnd event is invoked on the object.
See also:


- 39.5.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow) 7964
- 39.5.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window) 7965


### 39.5.5 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as window)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Displays a Print panel sheet and runs it modally for the specified window.
**Notes:** printInfo: The printing information for the current job.
win: The window on which to display the sheet.

When the modal session ends, if printPanelDidEnd event is invoked on the object.
See also:


- 39.5.3 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as DesktopWindow) 7964
- 39.5.4 beginSheetWithPrintInfo(printInfo as NSPrintInfoMBS, win as NSWindowMBS) 7964


### 39.5.6 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a new print panel.

### 39.5.7 NSPrintAllPresetsJobStyleHint as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the values can be passed to the jobStyleHint property to activate the simplified Print panel interface and specify which presets to display.
**Notes:** Output appropriate to all graphics types. Equivalent to Core Printing's kPMPresetGraphicsTypeAll.
Available in OS X v10.6 and later.

### 39.5.8 NSPrintNoPresetsJobStyleHint as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the values can be passed to the jobStyleHint property to activate the simplified Print panel interface and specify which presets to display.
**Notes:** Output excludes all graphics printing. Equivalent to Core Printing's kPMPresetGraphicsTypeNone.
Available in OS X v10.6 and later.

### 39.5.9 NSPrintPhotoJobStyleHint as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the values can be passed to the jobStyleHint property to activate the simplified Print panel interface and specify which presets to display.
**Notes:** Output contains photographic data.

### 39.5.10 printInfo as NSPrintInfoMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the printing information associated with the running Print panel.
**Notes:** The current printing information. May return nil if the Print panel is not currently running.
This method is a convenience method that your delegate can use to get the printing information while the Print Panel is visible.
Available in OS X v10.5 and later.

### 39.5.11 printPanel as NSPrintPanelMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new PrintPanel object.

### 39.5.12 runModal as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays the receiver's Print panel and begins the modal loop.
**Notes:** NSCancelButton (0) if the user clicks the Cancel button; otherwise NSOKButton (1).
This method uses the printing information associated with the current printing operation.

### 39.5.13 runModalWithPrintInfo(printInfo as NSPrintInfoMBS) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays the receiver's Print panel and runs the modal loop using the specified printing information.
**Notes:** printInfo: The printing information to use while displaying the Print panel.

Returns NSCancelButton (0) if the user clicks the Cancel button; otherwise NSOKButton (1).

### 39.5.14 Properties

### 39.5.15 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 39.5.16 defaultButtonTitle as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The title of the Print panel's default button.
**Notes:** defaultButtonTitle: The string to use for the button title.

You can use this method to change the default button title from "Print" to something more appropriate for your usage of the panel. For example, if you are using the Print panel to save a representation of the document to a file, you might change the title to "Save".
Available in OS X v10.5 and later.
(Read and Write computed property)

### 39.5.17 helpAnchor as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The HTML help anchor for the print panel.
**Notes:** helpAnchor: The anchor name in your Apple Help file. This parameter should contain just the name portion of the HTML anchor element.

For information on how to insert anchors into your Apple Help files, see Authoring User Help in Apple Help

Programming Guide.
Available in OS X v10.5 and later.
(Read and Write computed property)

### 39.5.18 jobStyleHint as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The type of content the Print panel is representing.
**Notes:** hint: For a list of supported job style hints, see Job Style Hints functions. Pass nil to this method to deactivate the simplified Print panel interface and use the standard interface instead (the equivalent of Core Printing's kPMPresetGraphicsTypeGeneral).

This method controls the set of items that appear in the Presets menu of the simplified Print panel interface.
(Read and Write computed property)

### 39.5.19 options as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The configuration options for the Print panel.
**Notes:** The configuration options, which you specify by adding together the appropriate constant values.
Available in OS X v10.5 and later.
(Read and Write computed property)

### 39.5.20 Events

### 39.5.21 printPanelDidEnd(returnCode as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: .

**Function:** The event called when the sheet ends.
**Notes:** The value passed as returnCode is either NSCancelButton or NSOKButton. The value NSOKButton is returned even if the user clicked the Preview button.

### 39.5.22 Constants

Print Panel Option Constants

| Constant | Value | Description |
|---|---|---|
| NSPrintPanelShowsCopies | 1 | The Print panel includes a field for manipulating the number of cop printed. This field is separate from any accessory views. Available in OS X v10.5 and later. |
| NSPrintPanelShowsOrientation | 8 | The Print panel includes a control for manipulating the page orientati control is separate from any accessory views. Available in OS X v10.5 and later. |
| NSPrintPanelShowsPageRange | 2 | The Print panel includes a set of fields for manipulating the range being printed. These fields are separate from any accessory views. Available in OS X v10.5 and later. |
| NSPrintPanelShowsPageSetupAccessory | 256 | The Print panel includes a separate accessory view for manipulating t size, orientation, and scaling attributes. Page setup fields that are configured for display on the main portion of the Print panel appear t not on this accessory panel. Available in OS X v10.5 and later. |
| NSPrintPanelShowsPaperSize | 4 | The Print panel includes a control for manipulating the paper size of th This control is separate from any accessory views. Available in OS X v10.5 and later. |
| NSPrintPanelShowsPreview | 131072 | The Print panel displays a built-in preview of the document conten option is only appropriate when the Print panel is used in conjunction NSPrintOperation object to print a document. Available in OS X v10.5 and later. |
| NSPrintPanelShowsPrintSelection | 32 | The Print panel includes an additional selection option for paper ran control is separate from any accessory views. Available in OS X v10.6 and later. |
| NSPrintPanelShowsScaling | 16 | The Print panel includes a control for scaling the printed output. Thi is separate from any accessory views. Available in OS X v10.5 and later. |

# Chapter 40

# Cocoa Regular Expressions

## 40.1 class NSDataDetectorMBS

### 40.1.1 class NSDataDetectorMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** A specialized regular expression object that matches natural language text for predefined data patterns.
**Example:**

```
// create detector for links and emails
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeLink
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Email us at john@mbs.test today!"

// look for the links now
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show first link
Dim r As NSTextCheckingResultMBS = m(0)
MsgBox r.URL
```

**Notes:** Currently the NSDataDetectorMBS class can match dates, addresses, links, phone numbers and transit information.
(links includes email addresses)

The results of matching content is returned as NSTextCheckingResultMBS objects. However, the NS-

TextCheckingResultMBS objects returned by NSDataDetectorMBS are different from those returned by the base class NSRegularExpressionMBS. Results returned by NSDataDetector will be of one of the data detectors types, depending on the type of result being returned, and they will have corresponding properties. For example, results of type NSTextCheckingTypeDate have a date, timeZone, and duration; results of type NSTextCheckingTypeLink have a URL, and so forth.
Subclass of the NSRegularExpressionMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- Data Detectors as context menu
- XDC Anywhere - MBS Xojo Plugins
- MBS Xojo Plugin, June 2021 News
- News from the MBS Xojo Plugins Version 21.1
- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr6
- Data Detectors for Xojo

**Videos**

- MBS Xojo Plugins 21.1
- XDC Anywhere - MBS Xojo Plugins
- MBS Xojo Videos - MBS Xojo Plugin, June 2021 News

### 40.1.2 Methods

### 40.1.3 Constructor(checkingTypes as Integer, byref error as NSErrorMBS)

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes and returns a data detector instance.
**Example:**

```
// create detector for phone number
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypePhoneNumber
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Call us at (555)-555-555 today!"
```

```
// look for the phone number now
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show first phone number found
Dim r As NSTextCheckingResultMBS = m(0)
MsgBox r.phoneNumber
```

**Notes:** checkingTypes: The checking types. The supported checking types are a subset of the types NSTextCheckingType. Those constants can be combined using the BitWiseOR() function.
error: An out parameter that if an error occurs during initialization contains the encountered error.

Returns the newly initialized data detector. If an error was encountered returns nil, and error contains the error.

Currently, the supported data detectors checkingTypes are: NSTextCheckingTypeDate, NSTextCheckingTypeAddress, NSTextCheckingTypeLink, NSTextCheckingTypePhoneNumber, and NSTextCheckingTypeTransitInformation.
See also:

- 40.1.4 Constructor(script as string, options as Integer, byref error as NSErrorMBS) 7973

### 40.1.4 Constructor(script as string, options as Integer, byref error as NSErrorMBS)

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Private constructor.
**Notes:** Here to prevent you from accidentally calling the constructor for NSRegularExpressionMBS class.
See also:

- 40.1.3 Constructor(checkingTypes as Integer, byref error as NSErrorMBS) 7972

### 40.1.5 copy as NSDataDetectorMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a copy of the object.

### 40.1.6 dataDetectorWithTypes(checkingTypes as Integer, byref error as NSErrorMBS) as NSDataDetectorMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates and returns a new data detector instance.
**Example:**

```
// create detector for time, date and duration
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeDate
Dim Error As NSErrorMBS
Dim DataDetector As NSDataDetectorMBS = NSDataDetectorMBS.dataDetectorWithTypes(types, error)

Dim s As String = "Let's meet sunday at 3 pm!"

// look for it:
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show time
Dim r As NSTextCheckingResultMBS = m(0)

Dim d As date = r.date
MsgBox d.SQLDateTime
```

**Notes:** checkingTypes: The checking types. The supported checking types are a subset of the types specified in NSTextCheckingType. Those constants can be combined using the bitwise OR operator.
error: An out parameter that if an error occurs during initialization contains the encountered error.

Returns the newly initialized data detector. If an error was encountered returns nil, and error contains the error.
Discussion
Currently, the supported data detectors checkingTypes are: NSTextCheckingTypeDate, NSTextCheckingTypeAddress, NSTextCheckingTypeLink, NSTextCheckingTypePhoneNumber, and NSTextCheckingTypeTransitInformation.

### 40.1.7 Properties

### 40.1.8 checkingTypes as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the checking types for this data detector.
**Notes:** The supported subset of checking types are specified in NSTextCheckingType. Those constants can be combined using the bitwise OR operator.
Currently, the supported data detectors checkingTypes are: NSTextCheckingTypeDate, NSTextCheckingTypeAddress, NSTextCheckingTypeLink, NSTextCheckingTypePhoneNumber, and NSTextCheckingTypeTransitInformation.
(Read only property)

## 40.2 class NSRegularExpressionMBS

### 40.2.1 class NSRegularExpressionMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** An immutable representation of a compiled regular expression that you apply to Unicode strings.
**Notes:** The fundamental matching method for NSRegularExpressionMBS is a Block iterator method that allows clients to supply a Block object which will be invoked each time the regular expression matches a portion of the target string. There are additional convenience methods for returning all the matches as an array, the total number of matches, the first match, and the range of the first match.

An individual match is represented by an instance of the NSTextCheckingResultMBS class, which carries information about the overall matched range (via its range property), and the range of each individual capture group (via the rangeAtIndex: method). For basic NSRegularExpression objects, these match results will be of type NSTextCheckingTypeRegularExpression, but subclasses may use other types.

see also
https://developer.apple.com/documentation/foundation/nsregularexpression
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr6

### 40.2.2 Methods

### 40.2.3 Constructor(script as string, options as Integer, byref error as NSErrorMBS)

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an initialized NSRegularExpression instance with the specified regular expression pattern and options.
**Notes:** pattern: The regular expression pattern to compile.
options: The regular expression options that are applied to the expression during matching. See NSRegularExpressionOptions for possible values.
error: An out value that returns any error encountered during initialization. Returns an NSErrorMBS object if the regular expression pattern is invalid; otherwise returns nil.

Returns an instance of NSRegularExpressionMBS for the specified regular expression and options

### 40.2.4 copy as NSRegularExpressionMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a copy of the object.

### 40.2.5 enumerateMatches(text as string, options as Integer, range as NSRangeMBS = nil)

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Enumerates the string allowing the event to handle each regular expression match.
**Notes:** Calls enumerateMatch event.

text: The string.
options: The matching options to report. See MatchingOptions for the supported values.
range: The range of the string to test.

This method is the fundamental matching method for regular expressions and is suitable for overriding by subclassers. There are additional convenience methods for returning all the matches as an array, the total number of matches, the first match, and the range of the first match.

By default, the event iterator method calls the event precisely once for each match, with a non-nil result and the appropriate flags. The client may then stop the operation by setting the contents of stop to true. The stop argument is an out-only argument. You should only ever set this Boolean to true within the event.

If the MatchingReportProgress matching option is specified, the event will also be called periodically during long-running match operations, with nil result and MatchingProgress matching flag set in the event,Äôs flags parameter, at which point the client may again stop the operation by setting the contents of stop to true.

If the MatchingReportCompletion matching option is specified, the event object will be called once after matching is complete, with nil result and the MatchingCompleted matching flag is set in the flags passed to the event, plus any additional relevant MatchingFlags from among MatchingHitEnd, MatchingRequiredEnd, or MatchingInternalError.

MatchingProgress and MatchingCompleted matching flags have no effect for methods other than this method. The MatchingHitEnd matching flag is set in the flags passed to the event if the current match operation reached the end of the search range. The MatchingRequiredEnd matching flag is set in the flags passed to the event if the current match depended on the location of the end of the search range.

The MatchingFlags matching flag is set in the flags passed to the event if matching failed due to an internal error (such as an expression requiring exponential memory allocations) without examining the entire search

range.

The MatchingAnchored, MatchingWithTransparentBounds, and MatchingWithoutAnchoringBounds regular expression options, specified in the options property specified when the regular expression instance is created, can apply to any match or replace method.
If MatchingAnchored matching option is specified, matches are limited to those at the start of the search range.
If MatchingWithTransparentBounds matching option is specified, matching may examine parts of the string beyond the bounds of the search range, for purposes such as word boundary detection, lookahead, etc.

If MatchingWithoutAnchoringBounds matching option is specified, ^and $ will not automatically match the beginning and end of the search range, but will still match the beginning and end of the entire string.

MatchingWithTransparentBounds and MatchingWithoutAnchoringBounds matching options have no effect if the search range covers the entire string.

### 40.2.6 escapedPatternForString(text as String) as String

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a string by adding backslash escapes as necessary to protect any characters that would match as pattern metacharacters.
**Notes:** text: The string.

Returns the escaped string.

Returns a string by adding backslash escapes as necessary to the given string, to escape any characters that would otherwise be treated as pattern metacharacters. You typically use this method to match on a particular string within a larger pattern.
For example, the string "(N/A)" contains the pattern metacharacters (, /, and ). The result of adding backslash escapes to this string is "\\(N\\/A\\)".

### 40.2.7 escapedTemplateForString(text as String) as String

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a template string by adding backslash escapes as necessary to protect any characters that would match as pattern metacharacters.
**Notes:** text: The template string

Returns the escaped template string.

Returns a string by adding backslash escapes as necessary to the given string, to escape any characters that would otherwise be treated as pattern metacharacters. You typically use this method to match on a particular string within a larger pattern.
For example, the string "(N/A)" contains the pattern metacharacters (, /, and ). The result of adding backslash escapes to this string is "\\(N\\/A\\)".
See Flag Options for the format of the resulting template string.

### 40.2.8 firstMatch(text as string, options as Integer, range as NSRangeMBS = nil) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the first match of the regular expression within the specified range of the string.
**Notes:** text: The string to search.
options: The matching options to use. See NSMatchingOptions for possible values.
range: The range of the string to search.

Returns an NSTextCheckingResultMBS object. This result gives the overall matched range via its range property, and the range of each individual capture group via its rangeAtIndex: method. The range { NSNotFound, 0 } is returned if one of the capture groups did not participate in this particular match.

This is a convenience method that calls enumerateMatches.

### 40.2.9 matches(text as string, options as Integer, range as NSRangeMBS = nil) as NSTextCheckingResultMBS()

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an array containing all the matches of the regular expression in the string.
**Notes:** text: The string to search.
options: The matching options to use. See Matching Options for possible values.
range: The range of the string to search.

Returns an array of NSTextCheckingResultMBS objects. Each result gives the overall matched range via its range property, and the range of each individual capture group via its rangeAtIndex: method. The range { NSNotFound, 0 } is returned if one of the capture groups did not participate in this particular match.

This is a convenience method that calls enumerateMatches passing the appropriate string, options, and range.

### 40.2.10 numberOfMatches(text as string, options as Integer, range as NSRangeMBS = nil) as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the number of matches of the regular expression within the specified range of the string.
**Notes:** text: The string to search.
options: The matching options to use. See Matching Options for possible values.
range: The range of the string to search.

Returns the number of matches of the regular expression.

This is a convenience method that calls enumerateMatches.

### 40.2.11 rangeOfFirstMatch(text as string, options as Integer, range as NSRangeMBS = nil) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the range of the first match of the regular expression within the specified range of the string.
**Notes:** string: The string to search.
options: The matching options to use. See Matching Options for possible values.
range: The range of the string to search.

Returns the range of the first match. Returns { NSNotFound, 0 } if no match is found.

This is a convenience method that calls enumerateMatches.

### 40.2.12 regularExpressionWithPattern(pattern as String, options as Integer, byref error as NSErrorMBS) as NSDataDetectorMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an NSRegularExpression instance with the specified regular expression pattern and options.
**Notes:** pattern: The regular expression pattern to compile.
options: The matching options. See constants for possible values. The values can be combined using the bitwise OR operator.
error: An out value that returns any error encountered during initialization. Returns an NSErrorMBS object if the regular expression pattern is invalid; otherwise returns nil.

Returns an instance of NSRegularExpression for the specified regular expression and options.

### 40.2.13 replaceMatches(byref text as string, options as Integer, range as NSRangeMBS = nil, template as String) as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Replaces regular expression matches within the mutable string using the template string.
**Notes:** text: The Text to search and replace values within.
options: The matching options to use. See NSMatchingOptions for possible values.
range: The range of the string to search.
template: The substitution template used when replacing matching instances.

Returns the number of matches.

See Flag Options for the format of template.

### 40.2.14 replacementStringForResult(result as NSTextCheckingResultMBS, text as string, offset as Integer, template as String) as String

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Used to perform template substitution for a single result for clients implementing their own replace functionality.
**Notes:** result: The result of the single match.
text: The string from which the result was matched.
offset: The offset to be added to the location of the result in the string.
template: See Flag Options for the format of template.

Returns a replacement string.

For clients implementing their own replace functionality, this is a method to perform the template substitution for a single result, given the string from which the result was matched, an offset to be added to the location of the result in the string (for example, in cases that modifications to the string moved the result since it was matched), and a replacement template.
This is an advanced method that is used only if you wanted to iterate through a list of matches yourself and do the template replacement for each one, plus maybe some other calculation that you want to do in code, then you would use this at each step.

### 40.2.15 stringByReplacingMatches(text as string, options as Integer, range as NSRangeMBS = nil, template as String) as String

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a new string containing matching regular expressions replaced with the template string.
**Notes:** text: The string to search for values within.
options: The matching options to use. See Matching Options for possible values.
range: The range of the string to search.
template: The substitution template used when replacing matching instances.

Returns a string with matching regular expressions replaced by the template string.

See Flag Options for the format of template.

### 40.2.16 Properties

### 40.2.17 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 40.2.18 numberOfCaptureGroups as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the number of capture groups in the regular expression.
**Notes:** A capture group consists of each possible match within a regular expression. Each capture group can then be used in a replacement template to insert that value into a replacement string.
This value puts a limit on the values of n for $ n in templates, and it determines the number of ranges in the returned NSTextCheckingResultMBS instances returned in the match... methods.
An exception will be generated if you attempt to access a result with an index value exceeding numberOfCaptureGroups-1.
(Read only property)

### 40.2.19 options as Integer

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the options used when the regular expression option was created.
**Notes:** The options property specifies aspects of the regular expression matching that are always used when matching the regular expression. For example, if the expression is case sensitive, allows comments, ignores metacharacters, etc. See constants for a complete discussion of the possible constants and their meanings.
(Read only property)

### 40.2.20 pattern as String

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the regular expression pattern.
**Notes:** (Read only property)

### 40.2.21 Events

### 40.2.22 enumerateMatch(text as String, options as Integer, result as NSTextCheckingResultMBS, flags as Integer, byref stop as Boolean)

MBS MacCocoa Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: .

**Function:** The event for enumerateMatches callback.
**Notes:** We pass through text and options for debugging.
Set stop to true to exit early.
Can be used with addHandler if needed.

result: An NSTextCheckingResultMBS specifying the match. This result gives the overall matched range via its range property, and the range of each individual capture group via its rangeAtIndex: method. The range { NSNotFound, 0 } is returned if one of the capture groups did not participate in this particular match.
flags: The current state of the matching progress. See Matching Flags for the possible values.
stop: A reference to a Boolean value. The event can set the value to true to stop further processing of the array. The stop argument is an out-only argument. You should only ever set this Boolean to true within the event.

### 40.2.23 Constants

Matching Options

| Constant | Value | Description |
|---|---|---|
| MatchingAnchored | 4 | Specifies that matches are limited to those at the start of the search range. S enumerateMatches for a description of the constant in context. |
| MatchingReportCompletion | 2 | Call the Block once after the completion of any matching. This option has effect for methods other than enumerateMatches. See enumerateMatches fo description of the constant in context. |
| MatchingReportProgress | 1 | Call the Block periodically during long-running match operations. This opt has no effect for methods other than enumerateMatches. See enumerate atches for a description of the constant in context. |
| MatchingWithoutAnchoringBounds | 16 | Specifies that ^and $ will not automatically match the beginning and end the search range, but will still match the beginning and end of the entire stri This constant has no effect if the search range contains the entire string. S enumerateMatches for a description of the constant in context. |
| MatchingWithTransparentBounds | 8 | Specifies that matching may examine parts of the string beyond the bou of the search range, for purposes such as word boundary detection, lookahe etc. This constant has no effect if the search range contains the entire stri See enumerateMatches for a description of the constant in context. |

Progress

| Constant | Value | Description |
|---|---|---|
| MatchingCompleted | 2 | Set when the Block is called after matching has completed. |
| MatchingHitEnd | 4 | Set when the current match operation reached the end of the search range. |
| MatchingInternalError | 16 | Set when matching failed due to an internal error. |
| MatchingProgress | 1 | Set when the Block is called to report progress during a long-running match operation. |
| MatchingRequiredEnd | 8 | Set when the current match depended on the location of the end of the search range. |

Options

| Constant | Value | Description |
|---|---|---|
| RegularExpressionAllowCommentsAndWhitespace | 2 | Ignore whitespace and #-prefixed comments in the pattern. |
| RegularExpressionAnchorsMatchLines | 16 | Allow ^and $ to match the start and end of lines. |
| RegularExpressionCaseInsensitive | 1 | Match letters in the pattern independent of case. |
| RegularExpressionDotMatchesLineSeparators | 8 | Allow . to match any character, including line separators. |
| RegularExpressionIgnoreMetacharacters | 4 | Treat the entire pattern as a literal string. |
| RegularExpressionUseUnicodeWordBoundaries | 64 | Use Unicode TR#29 to specify word boundaries (otherwise, expression word boundaries are used). |
| RegularExpressionUseUnixLineSeparators | 32 | Treat only \n as a line separator (otherwise, all standard l used). |

## 40.3 class NSTextCheckingResultMBS

### 40.3.1 class NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An occurrence of textual content found during the analysis of a block of text, such as when matching a regular expression.
**Example:**

```
// create detector for Address
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeAddress
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Let's meet at Hauptstra√üe 123 in 12345 Berlin, Deutschland."

// look for it:
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show Address
Dim r As NSTextCheckingResultMBS = m(0)

Dim dic As Dictionary = r.components
Dim lines() As String
For Each key As Variant In dic.keys
lines.Append key.StringValue+": "+dic.Value(key).StringValue
Next

MsgBox Join(lines,EndOfLine)
```

**Notes:** On both iOS and macOS, instances of NSTextCheckingResultMBS are returned by the NSRegularExpression class and the NSDataDetectorMBS class to indicate the discovery of content. In those cases, what is found may be a match for a regular expression or a date, address, phone number, and so on. In macOS, instances of NSTextCheckingResultMBS are returned by the NSSpellCheckerMBS object to describe the results of spelling, grammar, or text-substitution actions.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Data Detectors as context menu
- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr6
- Data Detectors for Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1

- MBS Xojo Plugins, version 19.1pr6

**Xojo Developer Magazine**

- 17.3, page 11: News

### 40.3.2 Methods

### 40.3.3 addressCheckingResult(Range as NSRangeMBS, components as Dictionary) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified address components.
**Notes:** components: A dictionary containing the address components. The dictionary keys are described in Keys for Address Components.

### 40.3.4 alternativeStrings as String()

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns alternative strings.

### 40.3.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 40.3.6 copy as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the result.

### 40.3.7 correctionCheckingResult(Range as NSRangeMBS, replacementString as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result after detecting a possible correction.
**Notes:** range: The range of the detected result.
replacementString: The suggested replacement string.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeSpelling.
See also:

- 40.3.8 correctionCheckingResult(Range as NSRangeMBS, replacementString as String, alternativeStrings() as String) as NSTextCheckingResultMBS 7986

### 40.3.8 correctionCheckingResult(Range as NSRangeMBS, replacementString as String, alternativeStrings() as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result after detecting a possible correction.
**Notes:** range: The range of the detected result.
replacementString: The suggested replacement string.

Returns an NSTextCheckingResultMBS with the specified range and a resultType of NSTextCheckingTypeSpelling.
See also:

- 40.3.7 correctionCheckingResult(Range as NSRangeMBS, replacementString as String) as NSTextCheckingResultMBS 7985

### 40.3.9 dashCheckingResult(Range as NSRangeMBS, replacementString as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified dash corrected replacement string.
**Notes:** range: The range of the detected result.
replacementString: The replacement string.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeDash.

### 40.3.10 dateCheckingResult(Range as NSRangeMBS, date as Date) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a text checking result with the specified date.
See also:


- 40.3.11 dateCheckingResult(Range as NSRangeMBS, date as Date, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7987
- 40.3.12 dateCheckingResult(Range as NSRangeMBS, date as DateTime) as NSTextCheckingResultMBS 7987
- 40.3.13 dateCheckingResult(Range as NSRangeMBS, date as DateTime, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7988


### 40.3.11 dateCheckingResult(Range as NSRangeMBS, date as Date, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a text checking result with the specified date, time zone, and duration.
**Notes:** range: The range of the detected result.
date: The detected date.
timeZone: The detected time zone.
duration: The detected duration.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeDate.
See also:


- 40.3.10 dateCheckingResult(Range as NSRangeMBS, date as Date) as NSTextCheckingResultMBS 7986
- 40.3.12 dateCheckingResult(Range as NSRangeMBS, date as DateTime) as NSTextCheckingResultMBS 7987
- 40.3.13 dateCheckingResult(Range as NSRangeMBS, date as DateTime, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7988


### 40.3.12 dateCheckingResult(Range as NSRangeMBS, date as DateTime) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified date.
See also:


- 40.3.10 dateCheckingResult(Range as NSRangeMBS, date as Date) as NSTextCheckingResultMBS 7986
- 40.3.11 dateCheckingResult(Range as NSRangeMBS, date as Date, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7987

- 40.3.13 dateCheckingResult(Range as NSRangeMBS, date as DateTime, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7988

### 40.3.13 dateCheckingResult(Range as NSRangeMBS, date as DateTime, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified date, time zone, and duration.
**Notes:** range: The range of the detected result.
date: The detected date.
timeZone: The detected time zone.
duration: The detected duration.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeDate.
See also:

- 40.3.10 dateCheckingResult(Range as NSRangeMBS, date as Date) as NSTextCheckingResultMBS 7986
- 40.3.11 dateCheckingResult(Range as NSRangeMBS, date as Date, timeZone as NSTimeZoneMBS, duration as double) as NSTextCheckingResultMBS 7987
- 40.3.12 dateCheckingResult(Range as NSRangeMBS, date as DateTime) as NSTextCheckingResultMBS 7987

### 40.3.14 grammarCheckingResult(Range as NSRangeMBS, details() as Dictionary) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified array of grammatical errors.
**Notes:** range: The range of the detected result.
details: An array of details regarding the grammatical errors. This array of strings is suitable for presenting to the user.

Returns an NSTextCheckingResultMBS with the specified range and a resultType of NSTextCheckingTypeGrammar.

### 40.3.15 grammarDetails as Dictionary()

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The details of a located grammatical type checking result.
**Notes:** This array of strings is suitable for presenting to the user.

### 40.3.16 linkCheckingResult(Range as NSRangeMBS, URL as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified URL.

### 40.3.17 NSTextCheckingAirlineKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the components dictionary.
**Notes:** A key that corresponds to the airline of a transit result.

### 40.3.18 NSTextCheckingCityKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the city component of the address.

### 40.3.19 NSTextCheckingCountryKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the country component of the address.

### 40.3.20 NSTextCheckingFlightKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the components dictionary.
**Example:**

```
// create detector for transit information
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeTransitInformation
```

```
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Let's fly with LH444 to Atlanta!"

// look for it:
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show airline
Dim r As NSTextCheckingResultMBS = m(0)

Dim dic As Dictionary = r.components
Dim Airline As String = dic.Lookup(NSTextCheckingResultMBS.NSTextCheckingAirlineKey, "?")
Dim Flight As String = dic.Lookup(NSTextCheckingResultMBS.NSTextCheckingFlightKey, "?")

MsgBox Airline+" "+Flight
```

**Notes:** A key that corresponds to the flight component of a transit result.

### 40.3.21 NSTextCheckingJobTitleKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the job component of the address.

### 40.3.22 NSTextCheckingNameKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the name component of the address.

### 40.3.23 NSTextCheckingOrganizationKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the organization component of the address.

### 40.3.24 NSTextCheckingPhoneKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the phone number component of the address.

### 40.3.25 NSTextCheckingStateKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the state or province component of the address.

### 40.3.26 NSTextCheckingStreetKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the street address component of the address.

### 40.3.27 NSTextCheckingZIPKey as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** One of the constants to identify the possible keys returned in the addressComponents dictionary.
**Notes:** A key that corresponds to the zip code or postal code component of the address.

### 40.3.28 orthographyCheckingResult(Range as NSRangeMBS, orthography as NSOrthographyMBS) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified orthography.
**Notes:** range: The range of the detected result.
orthography: An orthography object that describes the script.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeOrthography.

### 40.3.29 phoneNumberCheckingResult(Range as NSRangeMBS, phoneNumber as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified phone number.

### 40.3.30 quoteCheckingResult(Range as NSRangeMBS, replacementString as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified quote-balanced replacement string.
**Notes:** range: The range of the detected result.
replacementString: The replacement string.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeQuote.

### 40.3.31 rangeAtIndex(index as Integer) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns the result type that the range represents.
**Notes:** index: The index of the result.

Returns the range of the result.

A result must have at least one range, but may optionally have more (for example, to represent regular expression capture groups).
Passing rangeAtIndex the value 0 always returns the value of the the range property. Additional ranges, if any, will have indexes from 1 to numberOfRanges-1.

### 40.3.32 rangeWithName(name as string) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns range with name.

### 40.3.33 replacementCheckingResult(Range as NSRangeMBS, replacementString as String) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified replacement string.

### 40.3.34 resultByAdjustingRangesWithOffset(offset as Integer) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns a new text checking result after adjusting the ranges as specified by the offset.
**Notes:** offset: The amount the ranges are adjusted.

Returns a new NSTextCheckingResultMBS instance with the adjusted range or ranges.

### 40.3.35 spellCheckingResult(Range as NSRangeMBS) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the range of a misspelled word.
**Notes:** range: The range of the detected result.

Returns an NSTextCheckingResult with the specified range and a resultType of NSTextCheckingTypeSpelling.

### 40.3.36 transitInformationCheckingResult(Range as NSRangeMBS, components as Dictionary) as NSTextCheckingResultMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a text checking result with the specified transit information.
**Notes:** components: A dictionary containing the transit components. The currently supported keys are NSTextCheckingAirlineKey and NSTextCheckingFlightKey.

### 40.3.37 Properties

### 40.3.38 addressComponents as Dictionary

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The address dictionary of a type checking result.
**Notes:** The dictionary keys are described in Keys for Address Components.
(Read only property)

### 40.3.39 components as Dictionary

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A dictionary containing the components of a type checking result.
**Example:**

```
// create detector for Address
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeAddress
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Let's meet at Hauptstra√üe 123 in 12345 Berlin, Deutschland."

// look for it:
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show Address
Dim r As NSTextCheckingResultMBS = m(0)

Dim dic As Dictionary = r.components
Dim lines() As String
For Each key As Variant In dic.keys
lines.Append key.StringValue+": "+dic.Value(key).StringValue
Next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Currently used by the transit checking result. The supported keys are located in Keys for Transit Components.
(Read only property)

### 40.3.40 date as Date

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date component of a type checking result.
**Example:**

```
// create detector for time, date and duration
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeDate
Dim Error As NSErrorMBS
Dim DataDetector As NSDataDetectorMBS = NSDataDetectorMBS.dataDetectorWithTypes(types, error)

Dim s As String = "Let's meet sunday at 3 pm!"

// look for it:
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show time
Dim r As NSTextCheckingResultMBS = m(0)

Dim d As date = r.date
MsgBox d.SQLDateTime
```

**Notes:** (Read only property)

### 40.3.41 dateTime as DateTime

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date component of a type checking result.
**Notes:** (Read only property)

### 40.3.42 duration as Double

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The duration component of a type checking result.
**Notes:** (Read only property)

### 40.3.43 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 40.3.44 numberOfRanges as Integer

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns the number of ranges.
**Notes:** A result must have at least one range, but may optionally have more (for example, to represent regular expression capture groups).
Passing rangeAtIndex the value 0 always returns the value of the the range property. Additional ranges, if any, will have indexes from 1 to numberOfRanges-1.
(Read only property)

### 40.3.45 orthography as NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The detected orthography of a type checking result.
**Notes:** (Read only property)

### 40.3.46 phoneNumber as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The phone number of a type checking result.
**Example:**

```
// create detector for phone number
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypePhoneNumber
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Call us at (555)-555-555 today!"

// look for the phone number now
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show first phone number found
Dim r As NSTextCheckingResultMBS = m(0)
MsgBox r.phoneNumber
```

**Notes:** (Read only property)

### 40.3.47 range as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns the range of the result that the receiver represents.
**Notes:** This property will be present for all returned NSTextCheckingResultMBS instances.
(Read only property)

### 40.3.48 regularExpression as NSRegularExpressionMBS

MBS MacCocoa Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The regular expression of a type checking result.
**Notes:** (Read only property)

### 40.3.49 replacementString as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A replacement string from one of a number of replacement checking results.
**Notes:** (Read only property)

### 40.3.50 resultType as Integer

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns the text checking result type that the receiver represents.
**Notes:** The possible result types for the built in checking capabilities are described in NSTextCheckingType.
This property will be present for all returned NSTextCheckingResultMBS instances.
(Read only property)

### 40.3.51 timeZone as NSTimeZoneMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The time zone component of a type checking result.
**Notes:** (Read only property)

### 40.3.52 URL as String

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The URL of a type checking result.
**Example:**

```
// create detector for links and emails
Dim types As Integer = NSTextCheckingResultMBS.NSTextCheckingTypeLink
Dim Error As NSErrorMBS
Dim DataDetector As New NSDataDetectorMBS(types, error)

Dim s As String = "Email us at john@mbs.test today!"

// look for the links now
Dim m() As NSTextCheckingResultMBS = DataDetector.matches(s, 0)

// show first link
Dim r As NSTextCheckingResultMBS = m(0)
MsgBox r.URL
```

**Notes:** (Read only property)

### 40.3.53 Constants

Checking Types

| Constant | Value | Description |
|---|---|---|
| NSTextCheckingAllCustomTypes | &hffffffff00000000 | Checking types that can be used by clients. |
| NSTextCheckingAllSystemTypes | &hffffffff | Checking types supported by the system. The first 32 typ |
| NSTextCheckingAllTypes | &hffffffffffffffff | All possible checking types, both system- and user-suppor |
| NSTextCheckingTypeAddress | 16 | Attempts to locate addresses. |
| NSTextCheckingTypeCorrection | 512 | Performs autocorrection on misspelled words. |
| NSTextCheckingTypeDash | 128 | Replaces dashes with em-dashes. |
| NSTextCheckingTypeDate | 8 | Attempts to locate dates. |
| NSTextCheckingTypeGrammar | 4 | Checks grammar. |
| NSTextCheckingTypeLink | 32 | Attempts to locate URL links or emails. |
| NSTextCheckingTypeOrthography | 1 | Attempts to identify the language |
| NSTextCheckingTypePhoneNumber | 2048 | Matches a phone number. |
| NSTextCheckingTypeQuote | 64 | Replaces quotes with smart quotes. |
| NSTextCheckingTypeRegularExpression | 1024 | Matches a regular expression. |
| NSTextCheckingTypeReplacement | 256 | Replaces characters such as (c) with the appropriate symb |
| NSTextCheckingTypeSpelling | 2 | Checks spelling. |
| NSTextCheckingTypeTransitInformation | 4096 | Matches a transit information, for example, flight informa |

# Chapter 41

# Cocoa Tasks

## 41.1 class NSFileHandleMBS

### 41.1.1 class NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** NSFileHandle objects provide an object-oriented wrapper for accessing open files or communications channels.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingAtFile(f)

if n<>Nil then
MsgBox n.readDataToEndOfFile
end if
```

**Notes:** Please call closeFile on the end if you want to close the file.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1

- MBS Xojo / Real Studio Plugins, version 14.1pr4

### 41.1.2 Methods

### 41.1.3 acceptConnectionInBackgroundAndNotify

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Accepts a socket connection (for stream-type sockets only) in the background and creates a file handle for the "near" (client) end of the communications channel.
**Notes:** This method is asynchronous. In a separate "safe" thread it accepts a connection, creates a file handle for the other end of the connection, and returns that object to the client by posting an NSFileHandleConnectionAcceptedNotification in the run loop of the client. The notification includes as data a userInfo dictionary containing the created NSFileHandle object; access this object using the NSFileHandleNotificationFileHandleItem key.
The receiver must be created by an fileHandleWithFileDescriptor message that takes as an argument a stream-type socket created by the appropriate system routine. The object that will write data to the returned file handle must add itself as an observer of NSFileHandleConnectionAcceptedNotification.
Note that this method does not continue to listen for connection requests after it posts NSFileHandleConnectionAcceptedNotification. If you want to keep getting notified, you need to call acceptConnectionInBackgroundAndNotify again in your observer method.

### 41.1.4 AvailableBytes as Integer

MBS MacCocoa Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Queries number of available bytes.
**Notes:** Returns -1 if query failed.
You can use this value with readDataOfLength function to have it not block.

### 41.1.5 availableData as MemoryBlock

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the data available through the receiver.
**Notes:** If the receiver is a file, returns the data obtained by reading the file from the file pointer to the end of the file. If the receiver is a communications channel, reads up to a buffer of data and returns it; if no data is available, the method blocks. Returns an empty data object if the end of file is reached. Raises NSFileHandleOperationException if attempts to determine file-handle type fail or if attempts to read from the file or channel fail.

### 41.1.6 closeFile

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Disallows further access to the represented file or communications channel and signals end of file on communications channels that permit writing.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim e as NSErrorMBS
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingFromFile(f,e)

if e<>Nil then
MsgBox e.localizedDescription
end if

if n<>Nil then
MsgBox n.readDataOfLength(5)
n.closeFile
end if
```

**Notes:** The file or communications channel is available for other uses after the file handle represented by the receiver is closed. Further read and write messages sent to a file handle to which closeFile has been sent raises an exception.
Sending closeFile to a file handle does not cause its deallocation. The deallocation of an NSFileHandle object deletes its descriptor and closes the represented file or channel unless the NSFileHandle object was created with fileHandleWithFileDescriptor with false as the parameter argument.

### 41.1.7 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 41.1.8 fileDescriptor as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the file descriptor associated with the receiver.
**Notes:** Returns the POSIX file descriptor associated with the receiver.

You can send this message to file handles originating from both file descriptors and file handles and receive a valid file descriptor so long as the file handle is open. If the file handle has been closed by sending it closeFile, this method raises an exception.

### 41.1.9 fileHandleForReadingAtFile(path as folderitem) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading the file, device, or named socket at the specified path.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingAtFile(f)

if n<>Nil then
MsgBox n.readDataToEndOfFile
end if
```

**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds only to NSFileHandle read... messages.

### 41.1.10 fileHandleForReadingAtPath(path as string) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading the file, device, or named socket at the specified path.
**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds only to NSFileHandle read... messages.

### 41.1.11 fileHandleForReadingFromFile(URL as folderitem, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading the file, device, or named socket at the specified

URL.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim e as NSErrorMBS
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingFromFile(f,e)

if e<>Nil then
MsgBox e.localizedDescription
end if

if n<>Nil then
MsgBox n.readDataOfLength(5)
MsgBox str(n.offsetInFile) // shows 5
end if
```

**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns the initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds only to NSFileHandleread... messages.

### 41.1.12 fileHandleForReadingFromURL(URL as string, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading the file, device, or named socket at the specified URL.
**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns the initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds only to NSFileHandleread... messages.

### 41.1.13 fileHandleForUpdatingAtFile(path as folderitem) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading and writing to the file, device, or named socket at the specified path.
**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds to both NSFileHandle read... messages and writeData.

### 41.1.14 fileHandleForUpdatingAtPath(path as string) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading and writing to the file, device, or named socket at the specified path.
**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds to both NSFileHandle read... messages and writeData.

### 41.1.15 fileHandleForUpdatingFile(URL as folderitem, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading and writing to the file, device, or named socket at the specified URL.
**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

The initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds to both NSFileHandleread... messages and writeData.

### 41.1.16 fileHandleForUpdatingURL(URL as string, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for reading and writing to the file, device, or named socket at the specified URL.
**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

The initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds to both NSFileHandleread... messages and writeData.

### 41.1.17 fileHandleForWritingAtFile(path as folderitem) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for writing to the file, device, or named socket at the specified path.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForWritingAtFile(f)

if n<>Nil then
n.writeData "Hello World"
n.closeFile
end if
```

**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds only to writeData.

### 41.1.18 fileHandleForWritingAtPath(path as string) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for writing to the file, device, or named socket at the specified path.
**Notes:** path: The path to the file, device, or named socket to access.

Returns the initialized file handle, or nil if no file exists at path.

The file pointer is set to the beginning of the file. The returned object responds only to writeData.

### 41.1.19 fileHandleForWritingToFile(URL as folderitem, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for writing to the file, device, or named socket at the specified URL.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim e as NSErrorMBS
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForWritingToFile(f, e)

if e<>Nil then
MsgBox e.localizedDescription
else
n.writeData "Hello World"
n.closeFile
end if
```

**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns the initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds only to writeData.

### 41.1.20 fileHandleForWritingToURL(URL as string, byref error as NSErrorMBS) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized for writing to the file, device, or named socket at the specified URL.
**Notes:** url: The URL of the file, device, or named socket to access.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns the initialized file handle, or nil if no file exists at url.

The file pointer is set to the beginning of the file. The returned object responds only to writeData.

### 41.1.21 fileHandleWithFileDescriptor(fd as Integer) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized with a file descriptor.
**Notes:** You can create a file handle for a socket by using the result of a socket call as fileDescriptor.
The object creating a file handle using this method owns fileDescriptor and is responsible for its disposition.
See also:

- 41.1.22 fileHandleWithFileDescriptor(fd as Integer, closeOnDealloc as boolean) as NSFileHandleMBS 8007

### 41.1.22 fileHandleWithFileDescriptor(fd as Integer, closeOnDealloc as boolean) as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle initialized with a file descriptor.
**Notes:** You can create a file handle for a socket by using the result of a socket call as fileDescriptor.
The object creating a file handle using this method owns fileDescriptor and is responsible for its disposition.

closeOnDealloc: True if the file descriptor should be closed when the receiver is deallocated, otherwise false.
See also:

- 41.1.21 fileHandleWithFileDescriptor(fd as Integer) as NSFileHandleMBS 8007

### 41.1.23 fileHandleWithNullDevice as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns a file handle associated with a null device.
**Notes:** You can use null-device file handles as "placeholders" for standard-device file handles or in collection objects to avoid exceptions and other errors resulting from messages being sent to invalid file handles. Read messages sent to a null-device file handle return an end-of-file indicator (an empty NSData object) rather than raise an exception. Write messages are no-ops, whereas fileDescriptor returns an illegal value. Other methods are no-ops or return "sensible" values.

### 41.1.24 fileHandleWithStandardError as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the file handle associated with the standard error file.
**Example:**

```
// for GUI apps this ends on the console: (see console.app)

dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleWithStandardError

n.writeData "Hello World"
```

**Notes:** Conventionally this is a terminal device to which error messages are sent. There is one standard error file handle per process; it is a shared instance.

### 41.1.25 fileHandleWithStandardInput as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the file handle associated with the standard input file.
**Notes:** Conventionally this is a terminal device on which the user enters a stream of data. There is one standard input file handle per process; it is a shared instance.

### 41.1.26 fileHandleWithStandardOutput as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the file handle associated with the standard output file.
**Example:**

```
// for GUI apps this ends on the console: (see console.app)

dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleWithStandardOutput
```

n.writeData "Hello World"

**Notes:** Conventionally this is a terminal device that receives a stream of data from a program. There is one standard output file handle per process; it is a shared instance.

### 41.1.27 NSFileHandleConnectionAcceptedNotification as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** This notification is posted when an NSFileHandle object establishes a socket connection between two processes, creates an NSFileHandle object for one end of the connection, and makes this object available to observers by putting it in the userInfo dictionary.
**Notes:** To cause the posting of this notification, you must send either acceptConnectionInBackgroundAndNotify to an NSFileHandle object representing a server stream-type socket.
The notification object is the NSFileHandle object that sent the notification. The userInfo dictionary contains the following information:

| | |
|---|---|
| NSFileHandleNotificationFileHandleItem | The NSFileHandle object representing the "near" end of a socket connection |
| NSFileHandleError | An integer representing the UNIX-type error which occurred |

### 41.1.28 NSFileHandleDataAvailableNotification as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** This notification is posted when the background thread determines that data is currently available for reading in a file or at a communications channel.
**Notes:** The observers can then issue the appropriate messages to begin reading the data. To cause the posting of this notification, you must send either waitForDataInBackgroundAndNotify or waitForDataInBackgroundAndNotifyForModes: to an appropriate NSFileHandle object.
The notification object is the NSFileHandle object that sent the notification. This notification does not contain a userInfo dictionary.

### 41.1.29 NSFileHandleNotificationDataItem as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** A key in the userinfo dictionary in a NSFileHandleReadCompletionNotification and NSFileHandleReadToEndOfFileCompletionNotification.
**Notes:** The corresponding value is an memoryblock containing the available data read from a socket connection.

### 41.1.30 NSFileHandleNotificationFileHandleItem as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** A key in the userinfo dictionary in a NSFileHandleConnectionAcceptedNotification notification.
**Notes:** The corresponding value is the NSFileHandle object handle representing the "near" end of a socket connection.

### 41.1.31 NSFileHandleNotificationMonitorModes as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Currently unused.

### 41.1.32 NSFileHandleOperationException as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Constant that defines the name of a file operation exception.
**Notes:** Raised by NSFileHandle if attempts to determine file-handle type fail or if attempts to read from a file or channel fail.

### 41.1.33 NSFileHandleReadCompletionNotification as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** One of the notification strings for the file handle class.
**Notes:** This notification is posted when the background thread reads the data currently available in a file or at a communications channel. It makes the data available to observers by putting it in the userInfo dictionary. To cause the posting of this notification, you must send either readInBackgroundAndNotify to an appropriate NSFileHandle object.
The notification object is the NSFileHandle object that sent the notification. The userInfo dictionary contains the following information:

| | |
|---|---|
| NSFileHandleNotificationDataItem | An string containing the available data read from a socket connection |
| NSFileHandleError | An integer representing the UNIX-type error which occurred |

### 41.1.34 NSFileHandleReadToEndOfFileCompletionNotification as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** This notification is posted when the background thread reads all data in the file or, if a communications channel, until the other process signals the end of data.
**Notes:** It makes the data available to observers by putting it in the userInfo dictionary. To cause the posting of this notification, you must send either readToEndOfFileInBackgroundAndNotify to an appropriate NSFileHandle object.
The notification object is the NSFileHandle object that sent the notification. The userInfo dictionary contains the following information:

NSFileHandleNotificationDataItem: A string containing the available data read from a socket connection

NSFileHandleError An integer representing the UNIX-type error which occurred

### 41.1.35 readDataOfLength(length as Integer) as MemoryBlock

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Reads data up to a specified number of bytes from the receiver.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingAtFile(f)

if n<>Nil then
MsgBox n.readDataOfLength(5)
end if
```

**Notes:** length: The number of bytes to read from the receiver.

Returns the data available through the receiver up to a maximum of length bytes.

If the receiver is a file, returns the data obtained by reading from the file pointer to length or to the end of the file, whichever comes first. If the receiver is a communications channel, the method reads data from the channel up to length. Returns an empty memoryblock if the file is positioned at the end of the file or if an end-of-file indicator is returned on a communications channel. Raises NSFileHandleOperationException if attempts to determine file-handle type fail or if attempts to read from the file or channel fail.

### 41.1.36 readDataToEndOfFile as MemoryBlock

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the data available through the receiver up to the end of file or maximum number of bytes.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingAtFile(f)

if n<>Nil then
MsgBox n.readDataToEndOfFile
end if
```

**Notes:** Returns the data available through the receiver up to UINT_MAX bytes (the maximum value for unsigned integers) or, if a communications channel, until an end-of-file indicator is returned.

This method invokes readDataOfLength as part of its implementation.

### 41.1.37 readInBackgroundAndNotify

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Reads from the file or communications channel in the background and posts a notification when finished.
**Notes:** This method performs an asynchronous availableData operation on a file or communications channel and posts an NSFileHandleReadCompletionNotification to the client process's run loop.
The length of the data is limited to the buffer size of the underlying operating system. The notification includes a userInfo dictionary that contains the data read; access this object using the NSFileHandleNotificationDataItem key.
Any object interested in receiving this data asynchronously must add itself as an observer of NSFileHandleReadCompletionNotification. In communication via stream-type sockets, the receiver is often the object returned in the userInfo dictionary of NSFileHandleConnectionAcceptedNotification.
Note that this method does not cause a continuous stream of notifications to be sent. If you wish to keep getting notified, you'll also need to call readInBackgroundAndNotify in your observer method.

### 41.1.38 readToEndOfFileInBackgroundAndNotify

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Reads to the end of file from the file or communications channel in the background and posts a notification when finished.
**Example:**

```
dim path as string = "/tmp/NSFileHandle async reading.txt"
dim f as FolderItem = GetFolderItem(path, FolderItem.PathTypeShell)
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingAtFile(f)

n.readToEndOfFileInBackgroundAndNotify
```

**Notes:** This method performs an asynchronous readToEndOfFile operation on a file or communications channel and posts an NSFileHandleReadToEndOfFileCompletionNotification to the client process's run loop. The notification includes a userInfo dictionary that contains the data read; access this object using the NSFileHandleNotificationDataItem key.
Any object interested in receiving this data asynchronously must add itself as an observer of NSFileHandleReadToEndOfFileCompletionNotification. In communication via stream-type sockets, the receiver is often the object returned in the userInfo dictionary of NSFileHandleConnectionAcceptedNotification.

### 41.1.39 seekToEndOfFile as UInt64

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Puts the file pointer at the end of the file referenced by the receiver and returns the new file offset.
**Notes:** Returns the file offset with the file pointer at the end of the file. This is therefore equal to the size of the file.

Raises an exception if the message is sent to an NSFileHandle object representing a pipe or socket or if the file descriptor is closed.

### 41.1.40 seekToFileOffset(offset as UInt64)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Moves the file pointer to the specified offset within the file represented by the receiver.
**Notes:** Raises an exception if the message is sent to an NSFileHandle object representing a pipe or socket, if the file descriptor is closed, or if any other error occurs in seeking.

### 41.1.41 synchronizeFile

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Causes all in-memory data and attributes of the file represented by the receiver to be written to permanent storage.
**Notes:** This method should be invoked by programs that require the file to always be in a known state. An invocation of this method does not return until memory is flushed.

### 41.1.42 truncateFileAtOffset(offset as UInt64)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Truncates or extends the file represented by the receiver to a specified offset within the file and puts the file pointer at that position.
**Notes:** offset: The offset within the file that will mark the new end of the file.

If the file is extended (if offset is beyond the current end of file), the added characters are null bytes.

### 41.1.43 waitForDataInBackgroundAndNotify

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Checks to see if data is available in a background thread.
**Notes:** When the data becomes available, the thread notifies all observers with NSFileHandleDataAvailableNotification. After the notification has been posted, the thread is terminated.

### 41.1.44 writeData(data as MemoryBlock)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Synchronously writes data to the file, device, pipe, or socket represented by the receiver.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForWritingAtFile(f)

if n<>Nil then
n.writeData "Hello World"
n.closeFile
end if
```

**Notes:** If the receiver is a file, writing takes place at the file pointer's current position. After it writes the

data, the method advances the file pointer by the number of bytes written. Raises an exception if the file descriptor is closed or is not valid, if the receiver represents an unconnected pipe or socket endpoint, if no free space is left on the file system, or if any other writing error occurs.

### 41.1.45 Properties

### 41.1.46 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal handle to the NSFileHandle object.
**Notes:** (Read and Write property)

### 41.1.47 offsetInFile as UInt64

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the position of the file pointer within the file represented by the receiver.
**Example:**

```
// file must exist for this sample:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim e as NSErrorMBS
dim n as NSFileHandleMBS = NSFileHandleMBS.fileHandleForReadingFromFile(f,e)

if e<>Nil then
MsgBox e.localizedDescription
end if

if n<>Nil then
MsgBox n.readDataOfLength(5)
MsgBox str(n.offsetInFile) // shows 5
end if
```

**Notes:** The position of the file pointer within the file represented by the receiver.

Raises an exception if the message is sent to a file handle representing a pipe or socket or if the file descriptor is closed.
(Read and Write computed property)

## 41.2 class NSPipeMBS

### 41.2.1 class NSPipeMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** NSPipe objects provide an object-oriented interface for accessing pipes.
**Notes:** An NSPipe object represents both ends of a pipe and enables communication through the pipe. A pipe is a one-way communications channel between related processes; one process writes data, while the other process reads that data. The data that passes through the pipe is buffered; the size of the buffer is determined by the underlying operating system. NSPipe is an abstract class, the public interface of a class cluster.
**Blog Entries**

- MBS Xojo Plugins, version 17.4pr2

### 41.2.2 Methods

### 41.2.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The constructor to create a new pipe.
**Notes:** Handle is not zero on success.

### 41.2.4 fileHandleForReading as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the receiver's read file handle.
**Notes:** You use the returned file handle to read from the pipe using NSFileHandle's read methods—availableData, readDataToEndOfFile, and readDataOfLength.
You don't need to send closeFile to this object or explicitly release the object after you have finished using it.

### 41.2.5 fileHandleForWriting as NSFileHandleMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the receiver's write file handle.
**Notes:** You use the returned file handle to write to the pipe using NSFileHandle's writeData: method. When you are finished writing data to this object, send it a closeFile message to delete the descriptor. Deleting the descriptor causes the reading process to receive an end-of-data signal (an empty memoryblock).

### 41.2.6 pipe as NSPipeMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns an initialized NSPipe object.
**Notes:** Returns nil if the method encounters errors while attempting to create the pipe or the NSFileHandle objects that serve as endpoints of the pipe.

### 41.2.7 Properties

### 41.2.8 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSPipe object.
**Notes:** (Read and Write property)

## 41.3 class NSTaskMBS

### 41.3.1 class NSTaskMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Using the NSTask class, your program can run another program as a subprocess and can monitor that program's execution.
**Example:**

```
// Launch "ls -l -a -t" in the current directory, and then read the result into a string:

dim task as new NSTaskMBS

task.launchPath = "/bin/ls"

dim arguments(-1) as string = array("-l", "-a", "-t")

task.setArguments arguments

dim pipe as new NSPipeMBS

task.setStandardOutput pipe

dim file as NSFileHandleMBS = pipe.fileHandleForReading

task.launch

dim data as string = file.readDataToEndOfFile
dim text as string = DefineEncoding(data, encodings.UTF8)

MsgBox text
```

**Notes:** An NSTask object creates a separate executable entity; it differs from NSThread in that it does not share memory space with the process that creates it.
A task operates within an environment defined by the current values for several items: the current directory, standard input, standard output, standard error, and the values of any environment variables. By default, an NSTask object inherits its environment from the process that launches it. If there are any values that should be different for the task, for example, if the current directory should change, you must change the value before you launch the task. A task's environment cannot be changed while it is running.
An NSTask object can only be run once. Subsequent attempts to run the task raise an error.

This class is comparable to the shell classe built into Xojo.
See also WindowsProcessMBS and WindowsShellExecuteMBS (Windows only), ConsoleExecuteMBS and ShellMBS (cross platform).
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.3pr1

### 41.3.2 Methods

### 41.3.3 arguments as string()

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The command arguments that should be used to launch the executable.

### 41.3.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

### 41.3.5 Destructor

MBS MacCocoa Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 41.3.6 interrupt

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends an interrupt signal to the receiver and all of its subtasks.
**Notes:** If the task terminates as a result, which is the default behavior, an NSTaskDidTerminateNotification gets sent to the default notification center. This method has no effect if the receiver was already launched and has already finished executing. If the receiver has not been launched yet, this method raises an NSInvalidArgumentException.
It is not always possible to interrupt the receiver because it might be ignoring the interrupt signal. interrupt sends SIGINT.

### 41.3.7 launch

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Launches the task represented by the receiver.
**Example:**

```
// Launch "ls -l -a -t" in the current directory, and then read the result into a string:

dim task as new NSTaskMBS

task.launchPath = "/bin/ls"

dim arguments(-1) as string = array("-l", "-a", "-t")

task.setArguments arguments

dim pipe as new NSPipeMBS

task.setStandardOutput pipe

dim file as NSFileHandleMBS = pipe.fileHandleForReading

task.launch

dim data as string = file.readDataToEndOfFile
dim text as string = DefineEncoding(data, encodings.UTF8)

MsgBox text
```

**Notes:** Raises an NSInvalidArgumentException if the launch path has not been set or is invalid or if it fails to create a process.
If you get an exception with posix_spawn and error 13, that's a permission denied.

### 41.3.8 launchedTaskWithLaunchPath(path as string, arguments() as string) as NSTaskMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and launches a task with a specified executable and arguments.
**Example:**

```
dim args(-1) as string
dim task as NSTaskMBS = NSTaskMBS.launchedTaskWithLaunchPath("/bin/ls", args)
```

**Notes:** path: The path to the executable.
arguments: An array of strings that supplies the arguments to the task.

The task inherits its environment from the process that invokes this method.
The NSTask object converts both path and the strings in arguments to appropriate C-style strings (using

fileSystemRepresentation) before passing them to the task via argv [ ] ) . The strings in arguments do not undergo shell expansion, so you do not need to do special quoting, and shell variables, such as $ PWD, are not resolved.

### 41.3.9 NSTaskDidTerminateNotification as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification name used to notify you that the task terminated.
**Notes:** Posted when the task has stopped execution. This notification can be posted either when the task has exited normally or as a result of terminate being sent to the NSTask object. If the NSTask object gets released, however, this notification will not get sent, as the port the message would have been sent on was released as part of the task release. The observer method can use terminationStatus to determine why the task died. See "Ending an NSTask" for an example.

The notification object is the NSTask object that was terminated. This notification does not contain a userInfo dictionary.

### 41.3.10 resume as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resumes execution of the receiver task that had previously been suspended with a suspend message.
**Notes:** If multiple suspend messages were sent to the receiver, an equal number of resume messages must be sent before the task resumes execution.

### 41.3.11 setArguments(arguments() as string)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the command arguments that should be used to launch the executable.
**Example:**

```
// Performing complex pipelines.
// You can create multiple NSTasks and a bunch of NSPipes and hook them together,
// or you can use the "sh -c" trick to feed a shell a command, and let it parse
// it and set up all the IPC. This pipeline cats /usr/share/dict/words, finds
// all the words with 'ham' in them, reverses them, and shows you the last 5.

dim task as new NSTaskMBS

task.LaunchPath="/bin/sh"
```

```
dim arguments(-1) as string

arguments.Append "-c"
arguments.Append "cat /usr/share/dict/words | grep -i ham | rev | tail -5"

task.setArguments arguments
```

### 41.3.12 setStandardError(p as NSFileHandleMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard error for the receiver.
**Notes:** This method can be used with NSPipeMBS or NSFileHandleMBS object.

If file is an NSPipe object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.
If this method isn't used, the standard error is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.13 setStandardError(p as NSPipeMBS) 8022

### 41.3.13 setStandardError(p as NSPipeMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard error for the receiver.
**Notes:** This method can be used with NSPipeMBS or NSFileHandleMBS object.

If file is an NSPipe object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.
If this method isn't used, the standard error is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.12 setStandardError(p as NSFileHandleMBS) 8022

### 41.3.14 setStandardInput(p as NSFileHandleMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard input for the receiver.
**Notes:** file: The standard input for the receiver, which can be either an NSFileHandle or an NSPipe object.

If file is an NSPipe object, launching the receiver automatically closes the read end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the read end of the pipe won't be closed automatically.
If this method isn't used, the standard input is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.15 setStandardInput(p as NSPipeMBS) 8023

### 41.3.15 setStandardInput(p as NSPipeMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard input for the receiver.
**Notes:** file: The standard input for the receiver, which can be either an NSFileHandle or an NSPipe object.

If file is an NSPipe object, launching the receiver automatically closes the read end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the read end of the pipe won't be closed automatically.
If this method isn't used, the standard input is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.14 setStandardInput(p as NSFileHandleMBS) 8022

### 41.3.16 setStandardOutput(p as NSFileHandleMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard output for the receiver.
**Notes:** file: The standard output for the receiver, which can be either an NSFileHandle or an NSPipe object.

If file is an NSPipe object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.
If this method isn't used, the standard output is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.17 setStandardOutput(p as NSPipeMBS) 8024

### 41.3.17 setStandardOutput(p as NSPipeMBS)

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the standard output for the receiver.
**Notes:** file: The standard output for the receiver, which can be either an NSFileHandle or an NSPipe object.

If file is an NSPipe object, launching the receiver automatically closes the write end of the pipe in the current task. Don't create a handle for the pipe and pass that as the argument, or the write end of the pipe won't be closed automatically.
If this method isn't used, the standard output is inherited from the process that created the receiver. This method raises an NSInvalidArgumentException if the receiver has already been launched.
See also:

- 41.3.16 setStandardOutput(p as NSFileHandleMBS) 8023

### 41.3.18 standardError as Variant

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the standard error file used by the receiver.
**Notes:** The standard error file used by the receiver.

Standard error is where all diagnostic messages are sent. The object returned is either an NSFileHandle or an NSPipe instance, depending on what type of object was passed to setStandardError.

### 41.3.19 standardInput as Variant

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the standard input file used by the receiver.
**Notes:** The standard input file used by the receiver.

Standard input is where the receiver takes its input from unless otherwise specified. The object returned is either an NSFileHandle or an NSPipe instance, depending on what type of object was passed to the setStandardInput method.

### 41.3.20 standardOutput as Variant

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the standard output file used by the receiver.

**Notes:** Standard output is where the receiver displays its output. The object returned is either an NSFileHandle or an NSPipe instance, depending on what type of object was passed to the setStandardOutput method.

### 41.3.21 suspend as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Suspends execution of the receiver task.
**Notes:** Returns true if the receiver was successfully suspended, false otherwise.

Multiple suspend messages can be sent, but they must be balanced with an equal number of resume messages before the task resumes execution.

### 41.3.22 terminate

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a terminate signal to the receiver and all of its subtasks.
**Notes:** If the task terminates as a result, which is the default behavior, an NSTaskDidTerminateNotification gets sent to the default notification center. This method has no effect if the receiver was already launched and has already finished executing. If the receiver has not been launched yet, this method raises an NSInvalidArgumentException.
It is not always possible to terminate the receiver because it might be ignoring the terminate signal. terminate sends SIGTERM.

### 41.3.23 waitUntilExit

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Block until the receiver is finished.
**Example:**

```
dim args(-1) as string
dim task as NSTaskMBS = NSTaskMBS.launchedTaskWithLaunchPath("/bin/ls", args)

task.waitUntilExit

MsgBox "done"
```

**Notes:** This method first checks to see if the receiver is still running using isRunning. Then it polls the

current run loop using NSDefaultRunLoopMode until the task completes.

### 41.3.24 Properties

### 41.3.25 currentDirectoryPath as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The task's current directory.
**Notes:** (Read and Write property)

### 41.3.26 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSTask object.
**Notes:** (Read and Write property)

### 41.3.27 isRunning as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the receiver is still running.
**Notes:** (Read only property)

### 41.3.28 launchPath as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The path of the receiver's executable.
**Notes:** (Read and Write property)

### 41.3.29 processIdentifier as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the receiver's process identifier.
**Example:**

```
dim args(-1) as string
dim task as NSTaskMBS = NSTaskMBS.launchedTaskWithLaunchPath("/bin/ls", args)

MsgBox "PID: "+str(task.processIdentifier)
```

**Notes:** (Read only property)

### 41.3.30 qualityOfService as Integer

MBS MacCocoa Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The quality of service setting for this application.
**Notes:** read-only after the task is launched.
(Read and Write property)

### 41.3.31 terminationReason as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the reason the task was terminated.
**Example:**

```
// Launch "ls -l -a -t" in the current directory, and then read the result into a string:

dim args(-1) as string
dim task as NSTaskMBS = NSTaskMBS.launchedTaskWithLaunchPath("/bin/ls", args)

if not task.isRunning then
dim status as Integer = Task.terminationReason

MsgBox "Task termination reason is: "+str(status)
end if
```

**Notes:** Available in Mac OS X v10.6 and later.

see this constants:

| | | |
|---|---|---|
| NSTaskTerminationReasonExit | = 1 | The task exited normally. |
| NSTaskTerminationReasonUncaughtSignal | = 2 | The task exited due to an uncaught signal. |

(Read only property)

### 41.3.32 terminationStatus as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the exit status returned by the receiver's executable.
**Example:**

```
// Launch "ls -l -a -t" in the current directory, and then read the result into a string:

dim args(-1) as string
dim task as NSTaskMBS = NSTaskMBS.launchedTaskWithLaunchPath("/bin/ls", args)

if not task.isRunning then
dim status as Integer = Task.terminationStatus

MsgBox "Task return value is: "+str(status)
end if
```

**Notes:** The exit status returned by the receiver's executable.

Each task defines and documents how its return value should be interpreted. For example, many commands return 0 if they complete successfully or an error code if they don't. You'll need to look at the documentation for that task to learn what values it returns under what circumstances.
This method raises an NSInvalidArgumentException if the receiver is still running. Verify that the receiver is not running before you use it.
(Read only property)

### 41.3.33 environment as dictionary

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A dictionary of variables for the environment from which the receiver was launched.
**Notes:** The dictionary keys are the environment variable names.
(Read and Write computed property)

### 41.3.34 Events

### 41.3.35 Terminated

MBS MacCocoa Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Event called when task terminated.

### 41.3.36 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTaskTerminationReasonExit | 1 | One of the constants used to specify the values that are returned b tionReason. The task exited normally. |
| NSTaskTerminationReasonUncaughtSignal | 2 | One of the constants used to specify the values that are returned b tionReason. The task exited due to an uncaught signal. |

Quality of Service Constants

| Constant | Value | Description |
|---|---|---|
| NSQualityOfServiceBackground | &h09 | Background QoS is used for work that is not user initiated or visible. In gener a user is unaware that this work is even happening and it will run in the m efficient manner while giving the most deference to higher QoS work. F example, pre-fetching content, search indexing, backups, and syncing of da with external systems. |
| NSQualityOfServiceDefault | -1 | Default QoS indicates the absence of QoS information. Whenever possible Q information will be inferred from other sources. If such inference is not possib a QoS between UserInitiated and Utility will be used. |
| NSQualityOfServiceUserInitiated | &h19 | UserInitiated QoS is used for performing work that has been explicitly quested by the user and for which results must be immediately presented order to allow for further user interaction. For example, loading an email af a user has selected it in a message list. |
| NSQualityOfServiceUserInteractive | &h21 | UserInteractive QoS is used for work directly involved in providing an intera tive UI such as processing events or drawing to the screen. |
| NSQualityOfServiceUtility | &h11 | Utility QoS is used for performing work which the user is unlikely to be i mediately waiting for the results. This work may have been requested the user or initiated automatically, does not prevent the user from further teraction, often operates at user-visible timescales and may have its progr indicated to the user by a non-modal progress indicator. This work will r in an energy-efficient manner, in deference to higher QoS work when resour are constrained. For example, periodic content updates or bulk file operatio such as media import. |

## 41.4 class NSUserAppleScriptTaskMBS

### 41.4.1 class NSUserAppleScriptTaskMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to run an AppleScript script.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("Hello.scpt")
dim e as NSErrorMBS
dim n as new NSUserAppleScriptTaskMBS(file, e)

if e <>nil then
MsgBox e.localizedDescription
end if


n.execute

exception u as UnsupportedOperationException

if e <>nil then
MsgBox e.localizedDescription
end if
```

**Notes:** These classes are intended to execute user-supplied scripts, and will execute them outside of the application's sandbox, if any. (They are *not* intended to execute scripts built into an application; for that, use NSTaskMBS, NSAppleScript classes, or AMWorkflow classes.) If the application is sandboxed, then the script must be in the "application scripts" folder, which you can get using ScriptFolder function. A sandboxed application may read from, but not write to, this folder.

If you simply need to execute scripts without regard to input or output, use NSUserScriptTaskMBS, which can execute any of the specific types. If you need specific control over the input to or output from the script, use one of the sub-classes, which have more detailed "execute" methods.
Subclass of the NSUserScriptTaskMBS class.

### 41.4.2 Methods

### 41.4.3 Constructor(file as folderitem, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a folderitem for a script file.

**Notes:** The returned object will be of one of the specific sub-classes, or raises exception if the file does not appear to match any of the known types. (If used from a sub-class, the result will be of that class, or raises exception.)
See also:

- 41.4.4 Constructor(URL as String, byref error as NSErrorMBS) 8031

### 41.4.4 Constructor(URL as String, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be of one of the specific sub-classes, or raises exception if the file does not appear to match any of the known types. (If used from a sub-class, the result will be of that class, or raises exception.)
See also:

- 41.4.3 Constructor(file as folderitem, byref error as NSErrorMBS) 8030

### 41.4.5 executeWithAppleEvent(eventDesc as NSAppleEventDescriptorMBS, tag as Variant = nil)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Execute the AppleScript script by sending it the given Apple event.
**Notes:** Pass nil for eventDesc to execute the script's default "run" handler.
Calls later ExecuteFinished event.
The tag value is passed to the executeFinished event.

## 41.5 class NSUserAutomatorTaskMBS

### 41.5.1 class NSUserAutomatorTaskMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to run an Automator workflow.
**Notes:** These classes are intended to execute user-supplied scripts, and will execute them outside of the application's sandbox, if any. (They are *not* intended to execute scripts built into an application; for that, use NSTaskMBS, NSAppleScript classes, or AMWorkflow classes.) If the application is sandboxed, then the script must be in the "application scripts" folder, which you can get using ScriptFolder function. A sandboxed application may read from, but not write to, this folder.

If you simply need to execute scripts without regard to input or output, use NSUserScriptTaskMBS, which can execute any of the specific types. If you need specific control over the input to or output from the script, use one of the sub-classes, which have more detailed "execute" methods.
Subclass of the NSUserScriptTaskMBS class.

### 41.5.2 Methods

### 41.5.3 Constructor(file as folderitem, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known types.
See also:

- 41.5.4 Constructor(URL as String, byref error as NSErrorMBS) 8032

### 41.5.4 Constructor(URL as String, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known types.
See also:

- 41.5.3 Constructor(file as folderitem, byref error as NSErrorMBS) 8032

### 41.5.5 executeWithInput(input as Variant, tag as Variant = nil)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Execute the Automator workflow, passing it the given input.
**Notes:** Calls later ExecuteFinished event.
The tag value is passed to the executeFinished event.

### 41.5.6 Properties

### 41.5.7 Variables as Dictionary

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Workflow variables.
**Notes:** If you want to change, query the current dictionary, change it and assign it back to the variables property.
(Read and Write property)

## 41.6 class NSUserScriptTaskMBS

### 41.6.1 class NSUserScriptTaskMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to run a script.
**Notes:** These classes are intended to execute user-supplied scripts, and will execute them outside of the application's sandbox, if any. (They are *not* intended to execute scripts built into an application; for that, use NSTaskMBS, NSAppleScript classes, or AMWorkflow classes.) If the application is sandboxed, then the script must be in the "application scripts" folder, which you can get using ScriptFolder function. A sandboxed application may read from, but not write to, this folder.

If you simply need to execute scripts without regard to input or output, use NSUserScriptTaskMBS, which can execute any of the specific types. If you need specific control over the input to or output from the script, use one of the sub-classes, which have more detailed "execute" methods.

### 41.6.2 Methods

### 41.6.3 Available as Boolean

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the class is available.
**Notes:** Should return true on OS X 10.8 and newer.

### 41.6.4 Constructor(file as folderitem, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known types.
See also:

- 41.6.5 Constructor(URL as String, byref error as NSErrorMBS) 8034

### 41.6.5 Constructor(URL as String, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known

types.
See also:

- 41.6.4 Constructor(file as folderitem, byref error as NSErrorMBS) 8034

### 41.6.6 execute(tag as Variant = nil)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Execute the script with no input and ignoring any result.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("Hello.scpt")
dim e as NSErrorMBS
dim n as new NSUserScriptTaskMBS(file, e)

n.execute
```

**Notes:** This and the other "execute" methods may be called at most once on any given instance. If the script completed normally, the ExecuteFinished event's "error" parameter will be nil.
Calls later ExecuteFinished event.
The tag value is passed to the executeFinished event.

### 41.6.7 ScriptFolder as FolderItem

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The script folder for the application.

### 41.6.8 Properties

### 41.6.9 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 41.6.10 scriptURL as String

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The script URL used for initialization.
**Notes:** (Read only property)

### 41.6.11 Events

### 41.6.12 executeFinished(error as NSErrorMBS, tag as Variant, result as Variant, input as Variant)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: .

**Function:** The event called when execution is finished.
**Notes:** For AppleEvent call the result and input are NSAppleEventDescriptorMBS objects.
For Automator scripts the result and input are set to the values.
For all other scripts, they are nil.

While a script executes the plugin keeps a reference tot he tag and itself, so the script object is not released too early.

## 41.7 class NSUserUnixTaskMBS

### 41.7.1 class NSUserUnixTaskMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to run a Unix executable file, typically a shell script.
**Notes:** These classes are intended to execute user-supplied scripts, and will execute them outside of the application's sandbox, if any. (They are *not* intended to execute scripts built into an application; for that, use NSTaskMBS, NSAppleScript classes, or AMWorkflow classes.) If the application is sandboxed, then the script must be in the "application scripts" folder, which you can get using ScriptFolder function. A sandboxed application may read from, but not write to, this folder.

If you simply need to execute scripts without regard to input or output, use NSUserScriptTaskMBS, which can execute any of the specific types. If you need specific control over the input to or output from the script, use one of the sub-classes, which have more detailed "execute" methods.

The script should have a valid file extension like ".sh" and the executable bit set (chmod +x) to be able to run. First line of the script should have the shebang line like "#!/bin/bash" and line endings should be Chr(10) as in EndOfLine.Unix.
Subclass of the NSUserScriptTaskMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr2
- MBS Xojo Plugins, version 17.2pr5

### 41.7.2 Methods

### 41.7.3 Constructor(file as folderitem, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known types.

The script should have a valid file extension like ".sh" and the executable bit set (chmod +x) to be able to run. First line of the script should have the shebang line like "#!/bin/bash" and line endings should be Chr(10) as in EndOfLine.Unix.
See also:

- 41.7.4 Constructor(URL as String, byref error as NSErrorMBS) 8038

### 41.7.4 Constructor(URL as String, byref error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initialize given a URL for a script file.
**Notes:** The returned object will be, or raises exception if the file does not appear to match any of the known types.
See also:

- 41.7.3 Constructor(file as folderitem, byref error as NSErrorMBS) 8037

### 41.7.5 executeWithArguments(arguments() as string, tag as Variant = nil)

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Execute the file with the given arguments.
**Notes:** The arguments do not undergo shell expansion, so you do not need to do special quoting, and shell variables are not resolved.
Calls later ExecuteFinished event.
The tag value is passed to the executeFinished event.

### 41.7.6 Properties

### 41.7.7 standardError as NSFileHandleMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Standard I/O stream for error.
**Notes:** Setting this to nil (the default) will bind it to /dev/null.

Can be redirected to file via NSFileHandleMBS.fileHandleForWritingToFile() function.
(Read and Write property)

### 41.7.8 standardInput as NSFileHandleMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Standard I/O stream for input.
**Notes:** Setting this to nil (the default) will bind it to /dev/null.
(Read and Write property)

### 41.7.9 standardOutput as NSFileHandleMBS

MBS MacExtras Plugin, Plugin Version: 16.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Standard I/O stream for output.
**Notes:** Setting this to nil (the default) will bind it to /dev/null.

Can be redirected to file via NSFileHandleMBS.fileHandleForWritingToFile() function.
(Read and Write property)

# Chapter 42

# Cocoa Text

## 42.1 class NSAttributedStringMBS

### 42.1.1 class NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** A class to represent a string in the Cocoa world with attached attributes.
**Example:**

```
dim a as new NSAttributedStringMBS

if a.initWithHTML("<B>Hello</B>") then
MsgBox a.htmlString
end if
```

**Blog Entries**

- RTF functions in MBS Plugins
- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- News from the MBS Xojo Plugins in version 21.5
- Styled Text for Labels in your Xojo iOS app
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo plug-ins in version 16.0
- Tip of the day: Adding links to Textarea on OS X

- Using NSTextViewMBS
- MBS Releases the MBS Real Studio plug-ins in version 12.0

**Xojo Developer Magazine**

- 5.6, page 32: Third Party Plugins: Statusitems, Getting an icon in the top right of the Mac OS X menubar by Christian Schmitz
- 20.2, page 10: News
- 19.4, page 10: News
- 10.3, page 9: News

### 42.1.2 Methods

### 42.1.3 AsCFAttributedString as Variant

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new CFAttributedStringMBS object pointing to same attributed string.
**Example:**

```
// make NS version
dim n as new NSAttributedStringMBS

if n.initWithString("Hello World") then
// convert
dim c as CFAttributedStringMBS = n.AsCFAttributedString

// and check content
MsgBox c.String
end if
```

**Notes:** For passing to functions which need a CFAttributedStringMBS.

### 42.1.4 attributeAtIndex(name as string, location as UInt64) as Variant

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the value for an attribute with a given name of the character at a given index, and by reference the range over which the attribute applies.
**Notes:** name: The name of an attribute.
location: The index for which to return attributes. This value must not exceed the bounds of the receiver.

effectiveRange: Optional. If the named attribute exists at index, upon return aRange contains a range over which the named attribute's value applies. If the named attribute does not exist at index, upon return aRange contains the range over which the attribute does not exist.
The range isn't necessarily the maximum range covered by attributeName, and its extent is implementation-dependent. If you need the maximum range, use the other variant of this method.

Returns the value for the attribute named attributeName of the character at index index, or nil if there is no such attribute.
Raises an NSRangeException if index lies beyond the end of the receiver's characters.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:

- 42.1.5 attributeAtIndex(name as string, location as UInt64, inRange as NSRangeMBS) as Variant 8043

### 42.1.5 attributeAtIndex(name as string, location as UInt64, inRange as NSRangeMBS) as Variant

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the value for the attribute with a given name of the character at a given index, and by reference the range over which the attribute applies.
**Notes:** name: The name of an attribute.
location: The index at which to test for attributeName.
longestEffectiveRange: Optional. If the named attribute exists at index, upon return aRange contains the full range over which the value of the named attribute is the same as that at index, clipped to rangeLimit. If the named attribute does not exist at index, upon return aRange contains the full range over which the attribute does not exist, clipped to rangeLimit.
inRange: The range over which to search for continuous presence of attributeName. This value must not exceed the bounds of the receiver.

Returns the value for the attribute named attributeName of the character at index, or nil if there is no such attribute.

Raises an NSRangeException if index or any part of rangeLimit lies beyond the end of the receiver's characters.

If you don't need the longest effective range, it's far more efficient to use the other variant method to retrieve the attribute value.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:

• 42.1.4 attributeAtIndex(name as string, location as UInt64) as Variant 8042

### 42.1.6 attributeAtIndex2(name as string, location as UInt64, byref effectiveRange as NSRangeMBS) as Variant

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the value for an attribute with a given name of the character at a given index, and by reference the range over which the attribute applies.
**Example:**

```
// list all links
Dim n As NSAttributedStringMBS = TextArea1.NSTextViewMBS.textStorage

Dim pos As Integer = 0
Dim Len As Integer = n.Length
Dim effectiveRange As NSRangeMBS

While pos <Len

Dim v As Variant = n.attributeAtIndex2(n.NSLinkAttributeName, pos, effectiveRange)

If v <>Nil Then
Dim url As String = v
Listbox1.AddRow url
End If

pos = pos + effectiveRange.Length

Wend
```

**Notes:** name: The name of an attribute.
location: The index for which to return attributes. This value must not exceed the bounds of the receiver.
effectiveRange: Optional. If the named attribute exists at index, upon return aRange contains a range over which the named attribute's value applies. If the named attribute does not exist at index, upon return aRange contains the range over which the attribute does not exist.
The range isn't necessarily the maximum range covered by attributeName, and its extent is implementation-dependent. If you need the maximum range, use the other variant of this method.

Returns the value for the attribute named attributeName of the character at index index, or nil if there is no such attribute.
Raises an NSRangeException if index lies beyond the end of the receiver's characters.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:

- 42.1.7 attributeAtIndex2(name as string, location as UInt64, byref longestEffectiveRange as NSRangeMBS, inRange as NSRangeMBS) as Variant 8045


### 42.1.7 attributeAtIndex2(name as string, location as UInt64, byref longestEffectiveRange as NSRangeMBS, inRange as NSRangeMBS) as Variant

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the value for the attribute with a given name of the character at a given index, and by reference the range over which the attribute applies.
**Notes:** name: The name of an attribute.
location: The index at which to test for attributeName.
longestEffectiveRange: Optional. If the named attribute exists at index, upon return aRange contains the full range over which the value of the named attribute is the same as that at index, clipped to rangeLimit. If the named attribute does not exist at index, upon return aRange contains the full range over which the attribute does not exist, clipped to rangeLimit.
inRange: The range over which to search for continuous presence of attributeName. This value must not exceed the bounds of the receiver.

Returns the value for the attribute named attributeName of the character at index, or nil if there is no such attribute.

Raises an NSRangeException if index or any part of rangeLimit lies beyond the end of the receiver's characters.

If you don't need the longest effective range, it's far more efficient to use the other variant method to retrieve the attribute value.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:


- 42.1.6 attributeAtIndex2(name as string, location as UInt64, byref effectiveRange as NSRangeMBS) as Variant 8044


### 42.1.8 attributedStringWithAttachment(attachment as NSTextAttachmentMBS) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Creates an attributed string with an attachment.
**Example:**

```
dim content as MemoryBlock = "Hello World"
```

```
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(content)
f.filename = "HelloWorld.txt"

dim a as new NSTextAttachmentMBS(f)
dim s as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(a)
```

**Notes:** This is a convenience method for creating an attributed string containing an attachment using NSAttachmentCharacter as the base character.

### 42.1.9 attributedStringWithAttributedString(text as NSAttributedStringMBS) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of the given attributed string.

### 42.1.10 attributedStringWithDocFormat(data as memoryblock) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes string with content of given DOC file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.11 attributedStringWithDocFormat(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8046

### 42.1.11 attributedStringWithDocFormat(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes string with content of given DOC file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.10 attributedStringWithDocFormat(data as memoryblock) as NSAttributedStringMBS 8046

### 42.1.12 attributedStringWithHTML(data as memoryblock) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.13 attributedStringWithHTML(data as memoryblock, BaseURL as string) as NSAttributedStringMBS 8047
- 42.1.14 attributedStringWithHTML(data as memoryblock, BaseURL as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8047
- 42.1.15 attributedStringWithHTML(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8048

### 42.1.13 attributedStringWithHTML(data as memoryblock, BaseURL as string) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes the object with html code from a given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.12 attributedStringWithHTML(data as memoryblock) as NSAttributedStringMBS 8047
- 42.1.14 attributedStringWithHTML(data as memoryblock, BaseURL as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8047
- 42.1.15 attributedStringWithHTML(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8048

### 42.1.14 attributedStringWithHTML(data as memoryblock, BaseURL as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes the object with html code from a given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.12 attributedStringWithHTML(data as memoryblock) as NSAttributedStringMBS 8047
- 42.1.13 attributedStringWithHTML(data as memoryblock, BaseURL as string) as NSAttributedStringMBS 8047

- 42.1.15 attributedStringWithHTML(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8048


### 42.1.15 attributedStringWithHTML(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.12 attributedStringWithHTML(data as memoryblock) as NSAttributedStringMBS 8047
- 42.1.13 attributedStringWithHTML(data as memoryblock, BaseURL as string) as NSAttributedStringMBS 8047
- 42.1.14 attributedStringWithHTML(data as memoryblock, BaseURL as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8047


### 42.1.16 attributedStringWithHTMLOld(data as string) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Notes:** With plugin version 9.4 the attributedStringWithHTML method uses the system function to parse html. The old plugin function is available with the name attributedStringWithHTMLOld.

### 42.1.17 attributedStringWithPath(file as folderitem) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Example:**

```
// load rtfd file into textarea
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
dim n as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithPath(file)
dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
t.textStorage.setAttributedString(n)
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.18 attributedStringWithPath(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049
- 42.1.19 attributedStringWithPath(path as string) as NSAttributedStringMBS 8049
- 42.1.20 attributedStringWithPath(path as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049


### 42.1.18 attributedStringWithPath(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.17 attributedStringWithPath(file as folderitem) as NSAttributedStringMBS 8048
- 42.1.19 attributedStringWithPath(path as string) as NSAttributedStringMBS 8049
- 42.1.20 attributedStringWithPath(path as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049


### 42.1.19 attributedStringWithPath(path as string) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given path string.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.17 attributedStringWithPath(file as folderitem) as NSAttributedStringMBS 8048
- 42.1.18 attributedStringWithPath(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049
- 42.1.20 attributedStringWithPath(path as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049


### 42.1.20 attributedStringWithPath(path as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given path string.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.17 attributedStringWithPath(file as folderitem) as NSAttributedStringMBS 8048
- 42.1.18 attributedStringWithPath(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8049
- 42.1.19 attributedStringWithPath(path as string) as NSAttributedStringMBS 8049


### 42.1.21 attributedStringWithRTF(data as memoryblock) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTF file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.22 attributedStringWithRTF(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8050


### 42.1.22 attributedStringWithRTF(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTF file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.21 attributedStringWithRTF(data as memoryblock) as NSAttributedStringMBS 8050


### 42.1.23 attributedStringWithRTFD(data as memoryblock) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTFD file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.24 attributedStringWithRTFD(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8050


### 42.1.24 attributedStringWithRTFD(data as memoryblock, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTFD file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.23 attributedStringWithRTFD(data as memoryblock) as NSAttributedStringMBS 8050

### 42.1.25 attributedStringWithString(text as string) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given plain text.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.26 attributedStringWithString(text as string, withAttributes as dictionary) as NSAttributedStringMBS 8051

### 42.1.26 attributedStringWithString(text as string, withAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given plain text.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.25 attributedStringWithString(text as string) as NSAttributedStringMBS 8051

### 42.1.27 attributedStringWithURL(file as folderitem) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.28 attributedStringWithURL(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052
- 42.1.29 attributedStringWithURL(url as string) as NSAttributedStringMBS 8052
- 42.1.30 attributedStringWithURL(url as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052

### 42.1.28 attributedStringWithURL(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.27 attributedStringWithURL(file as folderitem) as NSAttributedStringMBS 8051
- 42.1.29 attributedStringWithURL(url as string) as NSAttributedStringMBS 8052
- 42.1.30 attributedStringWithURL(url as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052

### 42.1.29 attributedStringWithURL(url as string) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.27 attributedStringWithURL(file as folderitem) as NSAttributedStringMBS 8051
- 42.1.28 attributedStringWithURL(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052
- 42.1.30 attributedStringWithURL(url as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052

### 42.1.30 attributedStringWithURL(url as string, byref DocumentAttributes as dictionary) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.27 attributedStringWithURL(file as folderitem) as NSAttributedStringMBS 8051
- 42.1.28 attributedStringWithURL(file as folderitem, byref DocumentAttributes as dictionary) as NSAttributedStringMBS 8052
- 42.1.29 attributedStringWithURL(url as string) as NSAttributedStringMBS 8052


### 42.1.31 attributedSubstringFromRange(range as NSRangeMBS) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns an NSAttributedString object consisting of the characters and attributes within a given range in the receiver.
**Notes:** Range: The range from which to create a new attributed string. aRange must lie within the bounds of the receiver.

Returns an NSAttributedString object consisting of the characters and attributes within aRange in the receiver.

Raises an NSRangeException if any part of aRange lies beyond the end of the receiver's characters. This method treats the length of the string as a valid range value that returns an empty string.

### 42.1.32 attributesAtIndex(location as UInt64) as dictionary

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the attributes for the character at a given index.
**Notes:** location: The index for which to return attributes. This value must lie within the bounds of the receiver.
Range: Optional. Upon return, the range over which the attributes and values are the same as those at index. This range isn't necessarily the maximum range covered, and its extent is implementation-dependent. If you need the maximum range, use other variant of this method.

Returns the attributes for the character at index.
Raises an NSRangeException if index lies beyond the end of the receiver's characters.
See also:


- 42.1.33 attributesAtIndex(location as UInt64, inRange as NSRangeMBS) as dictionary 8054

### 42.1.33 attributesAtIndex(location as UInt64, inRange as NSRangeMBS) as dictionary

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the attributes for the character at a given index, and by reference the range over which the attributes apply.
**Notes:** location: The index for which to return attributes. This value must not exceed the bounds of the receiver.
range: Optional. Upon return contains the maximum range over which the attributes and values are the same as those at index, clipped to range Limit.
inRange: The range over which to search for continuous presence of the attributes at index. This value must not exceed the bounds of the receiver.

Raises an NSRangeException if index or any part of rangeLimit lies beyond the end of the receiver's characters.
If you don't need the range information, it's far more efficient to use the other variant of this method to retrieve the attribute value.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:

- 42.1.32 attributesAtIndex(location as UInt64) as dictionary 8053

### 42.1.34 attributesAtIndex2(location as UInt64, byref range as NSRangeMBS) as dictionary

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the attributes for the character at a given index.
**Notes:** location: The index for which to return attributes. This value must lie within the bounds of the receiver.
Range: Optional. Upon return, the range over which the attributes and values are the same as those at index. This range isn't necessarily the maximum range covered, and its extent is implementation-dependent. If you need the maximum range, use other variant of this method.

Returns the attributes for the character at index.
Raises an NSRangeException if index lies beyond the end of the receiver's characters.
See also:

- 42.1.35 attributesAtIndex2(location as UInt64, byref range as NSRangeMBS, inRange as NSRangeMBS) as dictionary 8055

### 42.1.35 attributesAtIndex2(location as UInt64, byref range as NSRangeMBS, inRange as NSRangeMBS) as dictionary

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Returns the attributes for the character at a given index, and by reference the range over which the attributes apply.
**Notes:** location: The index for which to return attributes. This value must not exceed the bounds of the receiver.
range: Optional. Upon return contains the maximum range over which the attributes and values are the same as those at index, clipped to range Limit.
inRange: The range over which to search for continuous presence of the attributes at index. This value must not exceed the bounds of the receiver.

Raises an NSRangeException if index or any part of rangeLimit lies beyond the end of the receiver's characters.
If you don't need the range information, it's far more efficient to use the other variant of this method to retrieve the attribute value.

For information about where to find the attribute keys for the returned dictionary, see the overview section of this document.
See also:

- 42.1.34 attributesAtIndex2(location as UInt64, byref range as NSRangeMBS) as dictionary 8054

### 42.1.36 Constructor

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The constructor to create empty attributed string.

### 42.1.37 Convert_Operator as string

MBS MacBase Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Converts to string by just returning string part.

### 42.1.38 copy as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the attributed string.

### 42.1.39 CopyToClipboard as Boolean

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Copies styled text to clipboard.

### 42.1.40 dataFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil, byref error as NSErrorMBS) as memoryblock

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns an data object that contains a text stream corresponding to the characters and attributes within the given range.
**Notes:** offset and length: The range.
documentAttributes: A required dictionary specifying the document attributes. The dictionary contains values from Document Types and must at least contain NSDocumentTypeDocumentAttribute.
error: An in-out variable containing an encountered error, if any.

Returns the data for the attributed string, or nil if failure. When nil, error encapsulates the error information.
Raises an NSRangeException if any part of range lies beyond the end of the receiver,Äôs characters.

### 42.1.41 docFormatFromRange(documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates DOC data from the whole string.
**Notes:** Same as docFormatFromRange(0,length)
Returns nil on failure.
documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.42 docFormatFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock 8056

### 42.1.42 docFormatFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates DOC data from the current string range.
**Notes:** Returns nil on failure.

documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.41 docFormatFromRange(documentAttributes as dictionary = nil) as MemoryBlock 8056

### 42.1.43 fileWrapperFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil, byref Error as NSErrorMBS) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns an NSFileWrapper object that contains a text stream corresponding to the characters and attributes within the given range.
**Example:**

```
// get styled text from htmlviewer
dim w as WebViewMBS = HTMLViewer1.WebViewMBS
dim f as WebFrameMBS = w.mainFrame
dim v as WebFrameViewMBS = f.frameView
dim d as WebDocumentViewMBS = v.documentView
dim n as NSAttributedStringMBS = d.attributedString


// package it
dim da as new Dictionary
da.Value(n.NSDocumentTypeDocumentAttribute) = n.NSRTFDTextDocumentType

dim e as NSErrorMBS
dim fw as NSFileWrapperMBS = n.fileWrapperFromRange(0, n.Length, da, e)
if e <>nil then
MsgBox e.LocalizedDescription
Return
end if

// write to disk
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
if fw.writeToFile(file, e) then
MsgBox "OK"
else
MsgBox e.LocalizedDescription
end if
```

**Notes:** offset and length: The range.
documentAttributes: A required dictionary specifying the document attributes. The dictionary contains values from Document Types and must at least contain NSDocumentTypeDocumentAttribute.
error: An in-out variable containing an encountered error, if any.

Returns a file wrapper for the appropriate document type, or nil if failure. When nil, error encapsulates the error information.

Raises an NSRangeException if any part of range lies beyond the end of the receiver,Äôs characters.

### 42.1.44 FromClipboard as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries attributed string from clipboard.

### 42.1.45 GeneratePDF(PrintOptions as Variant = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a PDF for attributed string.
**Example:**

```
// read file
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.docx")

dim d as new Dictionary
dim n as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithPath(fi, d)

// write pdf
dim p as MemoryBlock = n.GeneratePDF(nil)

dim fo as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim bo as BinaryStream = BinaryStream.Create(fo)
bo.Write p
```

**Notes:** PrintOptions is optional NSPrintInfoMBS object for print settings like margin.

### 42.1.46 htmlString as string

MBS MacBase Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** A self made function to return the text content as html string preserving the style information.
**Example:**

```
dim s as NSAttributedStringMBS

s=new NSAttributedStringMBS

if s.initwithhtml("<b>Hello</b>") then
MsgBox s.htmlstring // shows "<b>Hello</b>"
MsgBox s.text // shows "Hello"
end if
```

**Notes:** Does not always work well, but can help.
(Apple has no official function for this)

### 42.1.47 initWithAttributedString(text as NSAttributedStringMBS) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of the given attributed string.
**Notes:** Returns true on success.

### 42.1.48 initWithDocFormat(data as MemoryBlock) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes string with content of given DOC file data.
**Notes:** Returns true on success.
documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.49 initWithDocFormat(data as memoryblock, byref documentAttributes as dictionary) as boolean 8059

### 42.1.49 initWithDocFormat(data as memoryblock, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes string with content of given DOC file data.
**Notes:** Returns true on success.
documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.48 initWithDocFormat(data as MemoryBlock) as boolean 8059

### 42.1.50 initWithHTML(data as MemoryBlock) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Example:**

```
dim n as NSAttributedStringMBS
n=new NSAttributedStringMBS
if n.initWithHTML("<b>test</b>") then
MsgBox n.text
else
MsgBox "failed"
end if

dim attribText as new NSAttributedStringMBS
dim text as string = "<P>Hello √∫§√º</P>"

text = ConvertEncoding(text, encodings.ISOLatin1)

If attribText.initWithHTML(text) Then
MsgBox attribText.text
End If
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.

With plugin version 9.4 this uses the system function to parse html. The old plugin function is available with the name initWithHTMLOld.

On Mac OS X 10.6 the text encoding expected is ISO Latin 1 as far as I see.
See also:


- 42.1.51 initWithHTML(data as MemoryBlock, BaseURL as string) as boolean 8061
- 42.1.52 initWithHTML(data as memoryblock, BaseURL as string, byref documentAttributes as dictionary) as boolean 8061
- 42.1.53 initWithHTML(data as memoryblock, byref documentAttributes as dictionary) as boolean 8062
- 42.1.54 initWithHTML(data as memoryblock, options as Dictionary, byref documentAttributes as dictionary) as boolean 8062

### 42.1.51 initWithHTML(data as MemoryBlock, BaseURL as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes the object with html code from a given url.
**Example:**

```
dim n as NSAttributedStringMBS
n=new NSAttributedStringMBS
if n.initWithHTML("<b>test</b>","http://www.apple.com") then
MsgBox n.text
else
MsgBox "failed"
end if
```

**Notes:** Returns true on success.
documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.50 initWithHTML(data as MemoryBlock) as boolean 8060
- 42.1.52 initWithHTML(data as memoryblock, BaseURL as string, byref documentAttributes as dictionary) as boolean 8061
- 42.1.53 initWithHTML(data as memoryblock, byref documentAttributes as dictionary) as boolean 8062
- 42.1.54 initWithHTML(data as memoryblock, options as Dictionary, byref documentAttributes as dictionary) as boolean 8062

### 42.1.52 initWithHTML(data as memoryblock, BaseURL as string, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes the object with html code from a given url.
**Notes:** Returns true on success.
documentAttributes: Optional dictionary to receive the attributes.
See also:

- 42.1.50 initWithHTML(data as MemoryBlock) as boolean 8060
- 42.1.51 initWithHTML(data as MemoryBlock, BaseURL as string) as boolean 8061
- 42.1.53 initWithHTML(data as memoryblock, byref documentAttributes as dictionary) as boolean 8062
- 42.1.54 initWithHTML(data as memoryblock, options as Dictionary, byref documentAttributes as dictionary) as boolean 8062

### 42.1.53 initWithHTML(data as memoryblock, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Notes:** Returns true on success.
documentAttributes: Optional dictionary to receive the attributes.

With plugin version 9.4 this uses the system function to parse html. The old plugin function is available with the name initWithHTMLOld.

On Mac OS X 10.6 the text encoding expected is ISO Latin 1 as far as I see.
See also:


- 42.1.50 initWithHTML(data as MemoryBlock) as boolean 8060
- 42.1.51 initWithHTML(data as MemoryBlock, BaseURL as string) as boolean 8061
- 42.1.52 initWithHTML(data as memoryblock, BaseURL as string, byref documentAttributes as dictionary) as boolean 8061
- 42.1.54 initWithHTML(data as memoryblock, options as Dictionary, byref documentAttributes as dictionary) as boolean 8062


### 42.1.54 initWithHTML(data as memoryblock, options as Dictionary, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 22.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Example:**

```
Dim theBody As String = "<html><body>Test √§√√º</body></html>"

Dim documentAttributes As Dictionary
Dim documentOptions As New Dictionary

// define the text encoding
Const NSUTF8StringEncoding = 4
documentOptions.Value(NSAttributedStringMBS.NSCharacterEncodingDocumentOption) = NSUTF8StringEncoding
// and a default base URL for finding images
documentOptions.Value(NSAttributedStringMBS.NSBaseURLDocumentOption) = NSURLMBS.URLWithString("https://monkeybreadsoftware.de/")
// and a timeout for network queries
documentOptions.Value(NSAttributedStringMBS.NSTimeoutDocumentOption) = 30
```

```
Dim BodyAttributed As New NSAttributedStringMBS
If BodyAttributed.initWithHTML(theBody, documentOptions, documentAttributes) Then
MessageBox BodyAttributed.Text
Else
Break // failed?
End If
```

**Notes:** Returns true on success.
options: Put in some options for parsing the document like NSCharacterEncodingDocumentOption or NSTextEncodingNameDocumentOption.
documentAttributes: Optional dictionary to receive the attributes.
See also:


- 42.1.50 initWithHTML(data as MemoryBlock) as boolean 8060
- 42.1.51 initWithHTML(data as MemoryBlock, BaseURL as string) as boolean 8061
- 42.1.52 initWithHTML(data as memoryblock, BaseURL as string, byref documentAttributes as dictionary) as boolean 8061
- 42.1.53 initWithHTML(data as memoryblock, byref documentAttributes as dictionary) as boolean 8062


### 42.1.55 initWithHTMLOld(data as string) as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given HTML file data.
**Notes:** With plugin version 9.4 the initWithHTML method uses the system function to parse html. The old plugin function is available with the name initWithHTMLOld.

### 42.1.56 initWithPath(file as folderitem) as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.57 initWithPath(file as folderitem, byref documentAttributes as dictionary) as boolean 8064
- 42.1.58 initWithPath(path as string) as boolean 8064
- 42.1.59 initWithPath(path as string, byref documentAttributes as dictionary) as boolean 8064

### 42.1.57 initWithPath(file as folderitem, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.56 initWithPath(file as folderitem) as boolean 8063
- 42.1.58 initWithPath(path as string) as boolean 8064
- 42.1.59 initWithPath(path as string, byref documentAttributes as dictionary) as boolean 8064


### 42.1.58 initWithPath(path as string) as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given path string.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.56 initWithPath(file as folderitem) as boolean 8063
- 42.1.57 initWithPath(file as folderitem, byref documentAttributes as dictionary) as boolean 8064
- 42.1.59 initWithPath(path as string, byref documentAttributes as dictionary) as boolean 8064


### 42.1.59 initWithPath(path as string, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given path string.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.56 initWithPath(file as folderitem) as boolean 8063
- 42.1.57 initWithPath(file as folderitem, byref documentAttributes as dictionary) as boolean 8064
- 42.1.58 initWithPath(path as string) as boolean 8064

### 42.1.60 initWithRTF(data as MemoryBlock) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTF file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.61 initWithRTF(data as memoryblock, byref documentAttributes as dictionary) as boolean 8065

### 42.1.61 initWithRTF(data as memoryblock, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTF file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.60 initWithRTF(data as MemoryBlock) as boolean 8065

### 42.1.62 initWithRTFD(data as MemoryBlock) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTFD file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.63 initWithRTFD(data as memoryblock, byref documentAttributes as dictionary) as boolean 8065

### 42.1.63 initWithRTFD(data as memoryblock, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given RTFD file data.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.62 initWithRTFD(data as MemoryBlock) as boolean 8065

### 42.1.64 initWithString(text as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given plain text.
**Example:**

```
dim n as NSAttributedStringMBS
n=new NSAttributedStringMBS
if n.initWithHTML("test") then
MsgBox n.text
else
MsgBox "failed"
end if
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.65 initWithString(text as string, withAttributes as Dictionary) as boolean 8066

### 42.1.65 initWithString(text as string, withAttributes as Dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of given plain text.
**Example:**

```
dim n as NSAttributedStringMBS
n=new NSAttributedStringMBS
if n.initWithHTML("test") then
MsgBox n.text
else
MsgBox "failed"
end if
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.64 initWithString(text as string) as boolean 8066

### 42.1.66 initWithURL(file as folderitem) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Example:**

```
dim n as NSAttributedStringMBS
n=new NSAttributedStringMBS
if n.initWithURL(SpecialFolder.Desktop.Child("testfile")) then
MsgBox n.text
else
MsgBox "failed"
end if
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.67 initWithURL(file as folderitem, byref documentAttributes as dictionary) as boolean 8067
- 42.1.68 initWithURL(url as string) as boolean 8068
- 42.1.69 initWithURL(url as string, byref documentAttributes as dictionary) as boolean 8068


### 42.1.67 initWithURL(file as folderitem, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given file.
**Example:**

```
dim n as NSAttributedStringMBS
dim documentAttributes as dictionary
n=new NSAttributedStringMBS
if n.initWithURL(SpecialFolder.Desktop.Child("testfile"), documentAttributes) then
MsgBox n.text
else
MsgBox "failed"
end if
```

**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:

- 42.1.66 initWithURL(file as folderitem) as boolean 8067
- 42.1.68 initWithURL(url as string) as boolean 8068
- 42.1.69 initWithURL(url as string, byref documentAttributes as dictionary) as boolean 8068


### 42.1.68 initWithURL(url as string) as boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.66 initWithURL(file as folderitem) as boolean 8067
- 42.1.67 initWithURL(file as folderitem, byref documentAttributes as dictionary) as boolean 8067
- 42.1.69 initWithURL(url as string, byref documentAttributes as dictionary) as boolean 8068


### 42.1.69 initWithURL(url as string, byref documentAttributes as dictionary) as boolean

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Initializes string with content of file at the given url.
**Notes:** documentAttributes: Optional dictionary to receive the attributes.
Returns true on success.
See also:


- 42.1.66 initWithURL(file as folderitem) as boolean 8067
- 42.1.67 initWithURL(file as folderitem, byref documentAttributes as dictionary) as boolean 8067
- 42.1.68 initWithURL(url as string) as boolean 8068


### 42.1.70 isEqualToAttributedString(other as NSAttributedStringMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Compares both strings.
**Example:**

```
dim n as NSAttributedStringMBS
dim m as NSAttributedStringMBS

n=new NSAttributedStringMBS
```

```
if n.initWithString("test") then
MsgBox n.text
else
MsgBox "failed"
end if

m=new NSAttributedStringMBS
if m.initWithString("test") then
MsgBox n.text
else
MsgBox "failed"
end if

if m.isEqualToAttributedString(n) then
MsgBox "Ok"
else
MsgBox "failed"
end if

m=new NSAttributedStringMBS
if m.initWithString("test2") then
MsgBox n.text
else
MsgBox "failed"
end if

if m.isEqualToAttributedString(n) then
MsgBox "failed"
else
MsgBox "Ok"
end if
```

**Notes:** Returns true if they are equal in content.

### 42.1.71 itemNumberInTextList(list as NSTextListMBS, location as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the index of the item at the given location within the list.
**Notes:** list: The text list.
location: The location of the item.

Returns the index within the list.

### 42.1.72 lineRangeForRange(range as NSRangeMBS) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns the range of characters representing the line or lines containing a given range.
**Notes:** Range: A range within the receiver. The value must not exceed the bounds of the receiver.

The range of characters representing the line or lines containing aRange, including the line termination characters.

### 42.1.73 mutableCopy as NSMutableAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the attributed string.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m
```

### 42.1.74 NSAttachmentAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSTextAttachment
Default nil, no attachment

### 42.1.75 NSAuthorDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Example:**

```
// get some attributed text:
dim t as new NSAttributedStringMBS
call t.initWithString("Hello World")

// set document attributes
dim dic as new Dictionary
dic.Value(t.NSAuthorDocumentAttribute) = "Test User"

// get rtf
dim rtf as string = t.RTFFromRange(dic)

// write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write rtf
```

**Notes:** string containing author name.
Available in Mac OS X v10.4 and later.

### 42.1.76 NSBackgroundColorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
// add background color for text in text area:

TextArea1.Text = "Hello"

Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
Dim ts As NSTextStorageMBS = tv.TextStorage

Dim value As Color = &cFF0000

Dim offset As Integer = 0
Dim length As Integer = 5

Dim range As NSRangeMBS = NSMakeRangeMBS( offset, length )
ts.AddAttribute( NSAttributedStringMBS.NSBackgroundColorAttributeName, value, range )
```

**Notes:** NSColor
Default nil, no background

### 42.1.77 NSBackgroundColorDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSColor, representing the document-wide page background color.
Mac OS X v10.3 and earlier string constant is "BackgroundColor".
For applications linked on versions prior to Mac OS X v10.5, HTML import sets the NSBackgroundColorDocumentAttribute to NSColorMBS.whiteColor in cases in which the HTML does not specify a background color. For applications linked on Mac OS X v10.5 and later, no NSBackgroundColorDocumentAttribute is set in these cases.
Available in Mac OS X v10.4 and later.

### 42.1.78 NSBaselineOffsetAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing floating point value, as points offset from baseline
Default 0.0

### 42.1.79 NSBaseURLDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** For HTML documents; NSURL containing base URL. Previous string constant was @"BaseURL"
Available in Mac OS X v10.4 and later.

### 42.1.80 NSBottomMarginDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Example:**

```
// get some attributed text:
dim t as new NSAttributedStringMBS
call t.initWithString("Hello World")
```

```
// set document attributes
dim dic as new Dictionary
dic.Value(t.NSBottomMarginDocumentAttribute) = 20
dic.Value(t.NSLeftMarginDocumentAttribute) = 20
dic.Value(t.NSRightMarginDocumentAttribute) = 20
dic.Value(t.NSTopMarginDocumentAttribute) = 20
dic.Value(t.NSAuthorDocumentAttribute) = "Test User"

// get rtf
dim rtf as string = t.RTFFromRange(dic)

// write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write rtf
```

**Notes:** Number, containing a float, in points.
Mac OS X v10.3 and earlier string constant is "BottomMargin".
Available in Mac OS X v10.4 and later.

### 42.1.81 NSCategoryDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing the document's category.
Available in Mac OS X v10.6 and later.

### 42.1.82 NSCharacterEncodingDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing an int specifying the stringEncoding for the file; for reading and writing plain text files and writing HTML; default for plain text is the default encoding; default for HTML is UTF-8.
Mac OS X v10.3 and earlier string constant is "CharacterEncoding".
Available in Mac OS X v10.4 and later.

### 42.1.83 NSCharacterEncodingDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** For plain text documents; Number containing the unsigned int stringEncoding to override any encoding specified in an HTML document. Previous string constant was @"CharacterEncoding".
Available in Mac OS X v10.4 and later.

### 42.1.84 NSCharacterShapeAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** An integer value. The value is interpreted as Apple Type Services kCharacterShapeType selector + 1.
The default value is 0 (disable). 1 is kTraditionalCharactersSelector, and so on. Refer to <ATS/SFNTLayoutTypes.h>and "Font Features" in ATSUI Programming Guide for additional information.
Available in Mac OS X v10.0 and later.

### 42.1.85 NSCocoaVersionDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing a float. For RTF files only, stores the version of Cocoa with which the file was created. Absence of this value indicates RTF file not created by Cocoa or its predecessors.
Values less than 100 are pre–Mac OS X; 100 is Mac OS X v10.0 or v10.1; 102 is Mac OS X v10.2 and 10.3; values greater than 102 correspond to values of NSAppKitVersionNumber on Mac OS X v10.4 and later.
Mac OS X v10.3 and earlier string constant is "CocoaRTFVersion".
Available in Mac OS X v10.4 and later.

### 42.1.86 NSCommentDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing document comments.
Available in Mac OS X v10.4 and later.

### 42.1.87 NSCompanyDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing company or organization name.
Available in Mac OS X v10.4 and later.

### 42.1.88 NSConvertedDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing an int. Indicates whether the file was converted by a filter service.
If missing or 0, the file was originally in the format specified by document type. If negative, the file was originally in the format specified by document type, but the conversion to NSAttributedString may have been lossy. If 1 or more, it was converted to this type by a filter service.
Mac OS X v10.3 and earlier string constant is @"Converted".
Available in Mac OS X v10.4 and later.

### 42.1.89 NSCopyrightDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing document copyright info.
Available in Mac OS X v10.4 and later.

### 42.1.90 NSCreationTimeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSDate containing the creation date of the document; note that this is not the file system creation date of the file, but of the document.
Available in Mac OS X v10.4 and later.

### 42.1.91 NSCursorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSCursor
Default as returned by the NSCursor method IBeamCursor
Available in Mac OS X v10.3 and later.

### 42.1.92 NSDefaultAttributesDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the document attributes.
**Notes:** NSDictionary containing attributes to be applied to plain files. Used by reader methods. This key in options can specify the default attributes applied to the entire document contents. The document attributes can contain this key indicating the actual attributes used.
Available on Mac OS X 10.11.

### 42.1.93 NSDefaultAttributesDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** For plain text documents; Dictionary containing attributes to be applied to plain files. Previous string constant was @"DefaultAttributes".
Available in Mac OS X v10.4 and later.

### 42.1.94 NSDefaultTabIntervalDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number containing a float. Represents the document-wide default tab stop interval.
Mac OS X v10.3 and earlier string constant is "DefaultTabInterval".
Available in Mac OS X v10.4 and later.

### 42.1.95 NSDocFormatTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Microsoft Word document.

### 42.1.96 NSDocumentTypeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** How the document was interpreted; one of the values in "Document Types."
Mac OS X v10.3 and earlier string constant is "DocumentType".
Available in Mac OS X v10.4 and later.

### 42.1.97 NSDocumentTypeDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** One of the document types described in "Document Types," indicating a document type to be forced when loading the document. Previous string constant was @"DocumentType".
Available in Mac OS X v10.4 and later.

### 42.1.98 NSEditorDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing name of person who last edited the document.
Available in Mac OS X v10.4 and later.

### 42.1.99 NSExcludedElementsDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString related to HTML generation.
**Notes:** An Array object containing string objects, representing HTML elements not to be used in generated HTML.
Available in Mac OS X v10.4 and later.

NSExcludedElementsDocumentAttribute allows control over the tags used. The recognized values in the NSExcludedElementsDocumentAttribute array are (case-insensitive) HTML tags, plus DOCTYPE (representing a doctype declaration) and XML (representing an XML declaration). By default, if this attribute is not present, the excluded elements will be those deprecated in HTML 4 (APPLET, BASEFONT, CENTER, DIR, FONT, ISINDEX, MENU, S, STRIKE, and U) plus XML. If XML is on the list, HTML forms are used; if XML is not on the list, XHTML forms are used where there is a distinction.

### 42.1.100 NSExpansionAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing floating point value, as log of expansion factor to be applied to glyphs
Default 0.0, no expansion
Available in Mac OS X v10.3 and later.

### 42.1.101 NSFileTypeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string indicating which document type was used to interpret the document, specified as a UTI; for reading, this is available along with NSDocumentTypeDocumentAttribute, but for writing the two are mutually exclusive.
Available in Mac OS X v10.6 and later.

### 42.1.102 NSFileTypeDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string indicating a document type to be forced when loading the document, specified as a UTI string; mutually exclusive with NSDocumentTypeDocumentOption.
Available in Mac OS X v10.6 and later.

### 42.1.103 NSFontAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
MsgBox NSAttributedStringMBS.NSFontAttributeName

Dim NSGraphics as New NSGraphicsMBS()
Dim NSFont as NSFontMBS = NSFontMBS.fontWithName("Helvetica", 11.0)
Dim NSAttributes as New Dictionary

NSAttributes.value(NSAttributedStringMBS.NSFontAttributeName) = nsfont

Dim stringWidth as Double = NSGraphics.sizeWithAttributes("Hello World", NSAttributes).Width
MsgBox("StringWidth from NSGraphicsMBS: " + Str(stringWidth))
```

**Notes:** NSFont
Default Helvetica 12-point

### 42.1.104 NSForegroundColorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
TextArea1.Text = "Hello"

Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
Dim ts As NSTextStorageMBS = tv.TextStorage

Dim value As Color = &cFF0000

Dim offset As Integer = 0
Dim length As Integer = 5

Dim range As NSRangeMBS = NSMakeRangeMBS( offset, length )
ts.AddAttribute( NSAttributedStringMBS.NSForegroundColorAttributeName, value, range )
```

**Notes:** NSColor
Default blackColor
Available in Mac OS X v10.0 and later.

### 42.1.105 NSGlyphInfoAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** The name of an NSGlyphInfo object.
NSLayoutManager assigns the glyph specified by this glyph info to the entire attribute range, provided that its contents match the specified base string, and that the specified glyph is available in the font specified by NSFontAttributeName.
Available in Mac OS X v10.2 and later.

### 42.1.106 NSHTMLTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Hypertext Markup Language (HTML) document.

### 42.1.107 NSHyphenationFactorDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing a float; 0 = off, 1 = full hyphenation.
Mac OS X v10.3 and earlier string constant is "HyphenationFactor".
Available in Mac OS X v10.4 and later.

### 42.1.108 NSKernAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing floating point value, as points by which to modify default kerning
Default nil, use default kerning specified in font file; 0.0, kerning off; non-zero, points by which to modify default kerning
Available in Mac OS X v10.0 and later.

### 42.1.109 NSKeywordsDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Array of string, containing keywords.
Available in Mac OS X v10.4 and later.

### 42.1.110 NSLeftMarginDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing a float, in points.
Mac OS X v10.3 and earlier string constant is "LeftMargin".
Available in Mac OS X v10.4 and later.

### 42.1.111 NSLigatureAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing integer
Default 1, standard ligatures; 0, no ligatures; 2, all ligatures.

### 42.1.112 NSLinkAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSURL (preferred) or string
Default nil, no link
Available in Mac OS X v10.0 and later.

### 42.1.113 NSMacSimpleTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Macintosh SimpleText document.

### 42.1.114 NSManagerDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing the name of the author's manager.
Available in Mac OS X v10.6 and later.

### 42.1.115 NSMarkedClauseSegmentAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing an integer, as an index in marked text indicating clause segments
Available in Mac OS X v10.5 and later.

### 42.1.116 NSModificationTimeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSDate containing the modification date of the document contents.
Available in Mac OS X v10.4 and later.

### 42.1.117 NSObliquenessAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing floating point value, as skew to be applied to glyphs
Default 0.0, no skew
Available in Mac OS X v10.3 and later.

### 42.1.118 NSOfficeOpenXMLTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** ECMA Office Open XML text document format.
Available in Mac OS X v10.5 and later.

### 42.1.119 NSOpenDocumentTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** OASIS Open Document text document format.
Available in Mac OS X v10.5 and later.

### 42.1.120 NSPaperSizeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSValue, containing NSSize.
Mac OS X v10.3 and earlier string constant is "PaperSize".
Available in Mac OS X v10.4 and later.

### 42.1.121 NSParagraphStyleAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
// change line spacing in a Label

dim n as NSTextFieldMBS = Label1.NSTextFieldMBS
dim a as NSAttributedStringMBS = n.attributedStringValue

dim p as NSParagraphStyleMBS = a.attributeAtIndex(a.NSParagraphStyleAttributeName, 0)
dim m as NSMutableParagraphStyleMBS = p.mutableCopy
m.setLineSpacing 5

dim s as NSMutableAttributedStringMBS = a.mutableCopy
s.addAttribute(a.NSParagraphStyleAttributeName, m, new NSRangeMBS(0, s.length))

n.attributedStringValue = s
```

**Notes:** NSParagraphStyle
Default as returned by the NSParagraphStyle method defaultParagraphStyle

### 42.1.122 NSPlainTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Plain text document.

### 42.1.123 NSPrefixSpacesDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString related to HTML generation.
**Notes:** An Number containing an integer (default 0) representing the number of spaces per level by which to indent certain nested HTML elements.
Available in Mac OS X v10.4 and later.

NSPrefixSpacesDocumentAttribute allows some control over formatting.

### 42.1.124 NSReadOnlyDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing int. If missing or 0 or negative, not read only; 1 or more, read only.
Note that this has nothing to do with the file system protection on the file, but instead can affect how the file should be displayed to the user.
Mac OS X v10.3 and earlier string constant is "ReadOnly".
Available in Mac OS X v10.4 and later.

### 42.1.125 NSRightMarginDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing a float, in points.
Mac OS X v10.3 and earlier string constant is "RightMargin".
Available in Mac OS X v10.4 and later.

### 42.1.126 NSRTFDTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Rich text format with attachments document.

### 42.1.127 NSRTFTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Rich text format document.

### 42.1.128 NSShadowAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSShadow
Default nil, no shadow.
Available in Mac OS X v10.3 and later.

### 42.1.129 NSSpellingStateAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** An integer value. Defaults to 0, indicating no grammar or spelling error. See "NSSpellingStateAttributeName Flags" for possible values.
This key is available in Mac OS X v10.2 and later, but its interpretation changed in Mac OS X v10.5. Previously, any non-zero value caused the spelling indicator to be displayed. For Mac OS X v10.5 and later, the (integer) value is treated as being composed of the spelling and grammar flags.
Available in Mac OS X v10.5 and later.

### 42.1.130 NSStrikethroughColorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSColor
Default nil, same as foreground color
Available in Mac OS X v10.3 and later.

### 42.1.131 NSStrikethroughStyleAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
// underline selected text in TextArea1

dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
dim s as NSTextStorageMBS = t.textStorage

const NSUnderlineStyleSingle = 1

dim d as Dictionary = t.selectedTextAttributes
d.Value(NSAttributedStringMBS.NSStrikethroughStyleAttributeName) = NSUnderlineStyleSingle
t.selectedTextAttributes = d
```

**Notes:** Number containing integer
Default 0, no strikethrough. See "Underlining Patterns", "Underlining Styles", and "Underline Masks" in Apple Documentation for mask values.
Available in Mac OS X v10.3 and later.

### 42.1.132 NSStrokeColorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSColor
Default nil, same as foreground color
Available in Mac OS X v10.3 and later.

### 42.1.133 NSStrokeWidthAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
TextArea1.Text = "Hello World!"

Dim v As NSTextViewMBS = TextArea1.NSTextViewMBS
Dim a As NSTextStorageMBS = v.textStorage

a.addAttribute(a.NSStrokeWidthAttributeName, 2.0, New NSRangeMBS(6,5))
```

**Notes:** Number containing floating point value, as percent of font point size
Default 0, no stroke; positive, stroke alone; negative, stroke and fill (a typical value for outlined text would be 3.0)
Available in Mac OS X v10.3 and later.

### 42.1.134 NSSubjectDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing subject of document.
Available in Mac OS X v10.4 and later.

### 42.1.135 NSSuperscriptAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing integer
Default 0

### 42.1.136 NSTextAlternativesAttributeName as string

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute names.
**Notes:** An NSTextAlternatives object. Used primarily as a temporary attribute, with primaryString equal to the substring for the range to which it is attached, and alternativeStrings representing alternatives for that string that may be presented to the user.
Available on OS X 10.8 and newer.

### 42.1.137 NSTextEffectAttributeName as string

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute names.
**Notes:** NSString, default nil: no text effect

### 42.1.138 NSTextEffectLetterpressStyle as string

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the text effect names.
**Notes:** Available on Mac OS X 10.10 or newer.

### 42.1.139 NSTextEncodingNameDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString related to HTML generation.
**Notes:** An string object containing the name, IANA or otherwise, of a text encoding to be used; mutually exclusive with NSCharacterEncodingDocumentAttribute.
Available in Mac OS X v10.4 and later.

Either NSCharacterEncodingDocumentAttribute or NSTextEncodingNameDocumentAttribute may be used to control the encoding used for generated HTML; character entities are used for characters not representable in the specified encoding.

### 42.1.140 NSTextEncodingNameDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** string containing the name, IANA or otherwise, of a text encoding to override any encoding specified in an HTML document. Mutually exclusive with @"CharacterEncoding". Previous string constant was @"TextEncodingName".
Available in Mac OS X v10.4 and later.

### 42.1.141 NSTextLayoutSectionOrientation as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the constants used as by the NSLayoutOrientationSectionsAttribute.
**Notes:** An Number containing an NSTextLayoutOrientation value. The default value is NSTextLayoutOrientationHorizontal.
Available in Mac OS X v10.7 and later.

### 42.1.142 NSTextLayoutSectionRange as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the constants used as by the NSLayoutOrientationSectionsAttribute.
**Notes:** An NSValue containing an NSRange representing a character range. The default value is a range covering the entire string.
Available in Mac OS X v10.7 and later.

### 42.1.143 NSTextLayoutSectionsAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** An Array containing dictionarys. Each dictionary describes a layout orientation section. The dictionary can have two attributes: NSTextLayoutSectionOrientation and NSTextLayoutSectionRange. When there is a gap between sections, it's assumed to have NSTextLayoutOrientationHorizontal.
Available in Mac OS X v10.7 and later.

### 42.1.144 NSTextSizeMultiplierDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Specifies a scale factor for font sizes.. Number containing float, default 1.0; for HTML only, corresponding to WebView's textSizeMultiplier.
There is no textual equivalent for Mac OS X v10.3.
Available in Mac OS X v10.4 and later.

### 42.1.145 NSTimeoutDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing float. Time in seconds to wait for a document to finish loading. Previous string constant was @"Timeout".

Available in Mac OS X v10.4 and later.

### 42.1.146 NSTitleDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** string containing document title.
Available in Mac OS X v10.4 and later.

### 42.1.147 NSToolTipAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** string
Default nil, no tooltip
Available in Mac OS X v10.3 and later.

### 42.1.148 NSTopMarginDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Number, containing a float, in points.
Mac OS X v10.3 and earlier string constant is "TopMargin".
Available in Mac OS X v10.4 and later.

### 42.1.149 NSUnderlineColorAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** NSColor
Default nil, same as foreground color
Available in Mac OS X v10.3 and later.

### 42.1.150 NSUnderlineStyleAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** Number containing integer
Default 0, no underline. See "Underlining Patterns", "Underlining Styles", and "Underline Masks" in Apple Documentation for mask values.

### 42.1.151 NSVerticalGlyphFormAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** An Number containing an integer value, 0 means horizontal text and 1 indicates vertical text. If no value specified, it's interpreted to determine the setting based on higher-level vertical orientation settings such as NSTextLayoutOrientation . The behavior for any other value is undefined.
Available in Mac OS X v10.7 and later.

### 42.1.152 NSViewModeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSValue, containing an int; 0 = normal; 1 = page layout (use value of "PaperSize").
Mac OS X v10.3 and earlier string constant is "ViewMode".
Available in Mac OS X v10.4 and later.

### 42.1.153 NSViewSizeDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** NSValue, containing NSSize.
Mac OS X v10.3 and earlier string constant is "ViewSize".
Available in Mac OS X v10.4 and later.

### 42.1.154 NSViewZoomDocumentAttribute as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for document wide attributes in a NSAttributedString.
**Notes:** Mac OS X v10.3 and earlier string constant is "ViewZoom".
NSValue, containing a float; 100 = 100% zoom.
Available in Mac OS X v10.4 and later.

### 42.1.155 NSWebArchiveTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Web Kit WebArchive document.

### 42.1.156 NSWebPreferencesDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** WebPreferences; for HTML only, specifies a WebPreferences object. If not present, a default set of preferences is used. Previous string constant was @"WebPreferences".
Available in Mac OS X v10.4 and later.

### 42.1.157 NSWebResourceLoadDelegateDocumentOption as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Notes:** WebResourceLoadDelegateMBS; for HTML only, specifies an object to serve as the web resource loading delegate.
If not present, a default delegate is used that permits the loading of subsidiary resources but does not respond to authentication challenges. Previous string constant was @"WebResourceLoadDelegate".
Available in Mac OS X v10.4 and later.

### 42.1.158 NSWordMLTextDocumentType as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the values for the NSDocumentTypeDocumentAttribute key in the document attributes dictionary.
**Notes:** Microsoft Word XML (WordML schema) document.

### 42.1.159 NSWritingDirectionAttributeName as string

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the attribute names for NSAttributedString.
**Example:**

```
const NSWritingDirectionNatural = -1 // Determines direction using the Unicode Bidi Algorithm rules P2 and P3
const NSWritingDirectionLeftToRight = 0 // Left to right writing direction
const NSWritingDirectionRightToLeft = 1 // Right to left writing direction

const NSTextWritingDirectionEmbedding = 0
const NSTextWritingDirectionOverride = 2

dim t as NSTextStorageMBS = TextArea1.NSTextViewMBS.textStorage

// get hello in arabic
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("ŸÖÿ±ÿÿ®ÿß")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

// now set attributes for right to left
m.addAttribute t.NSWritingDirectionAttributeName, array(NSWritingDirectionRightToLeft+NSTextWritingDirectionOverride), new NSRangeMBS(0,m.Length)

// and add to textarea
t.appendAttributedString m
```

**Notes:** An Array of Numbers.
This provides a means to override the default bidi algorithm, equivalent to the use of bidi control characters LRE, RLE, LRO, or RLO paired with PDF, as a higher-level attribute. This is the NSAttributedString equivalent of HTML's dir attribute and/or BDO element. The array represents nested embeddings or overrides, in order from outermost to innermost. The values of the Numbers should be 0, 1, 2, or 3, for LRE, RLE, LRO, or RLO respectively; these should be regarded as NSWritingDirectionLeftToRight or NSWritingDirectionRightToLeft plus NSTextWritingDirectionEmbedding or NSTextWritingDirectionOverride.
Available in Mac OS X v10.6 and later.

### 42.1.160 paragraphRangeForRange(range as NSRangeMBS) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Returns the range of characters representing the paragraph or paragraphs containing a given range.
**Notes:** Range: A range within the receiver. The range must not exceed the bounds of the receiver.

The range of characters representing the paragraph or paragraphs containing range, including the paragraph termination characters.

A paragraph is any segment of text delimited by a carriage return (U+000D), newline (U+000A), or paragraph separator (U+2029).

### 42.1.161 rangeOfTextBlock(textBlock as NSTextBlockMBS, location as Integer) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the range of the individual text block that contains the specified location.

### 42.1.162 rangeOfTextList(list as NSTextListMBS, location as Integer) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the range of the given text list that contains the given location.
**Notes:** list: The text list.
location: The location in the text list.

Returns the range of the given text list containing the location.

### 42.1.163 rangeOfTextTable(textTable as NSTextTableMBS, location as Integer) as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the range of the specified text table that contains the specified location.

### 42.1.164 rtf as MemoryBlock

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Returns the content of this attributed string as a RTF string.
**Example:**

```
dim s as NSAttributedStringMBS

s=new NSAttributedStringMBS
```

```
if s.initWithString("Hello") then
MsgBox s.RTF
end if

// shows this text:
// { \rtf1\ansi\ansicpg1252\cocoartf949
// { \fonttbl\f0\fswiss\fcharset0 Helvetica; }
// { \colortbl;\red255\green255\blue255; }
// \pard\tx560\tx1120\tx1680\tx2240\tx2800\tx3360\tx3920\tx4480\tx5040\tx5600\tx6160\tx6720\ql\qnat-
ural\pardirnatural
//
// \f0\fs24 \cf0 Hello }
```

**Notes:** Same as RTFFromRange(0,length)

### 42.1.165 RTFDFileWrapperFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSFileWrapper object that contains an RTFD document corresponding to the characters and attributes within the given range.
**Notes:** offset and length: The range.
documentAttributes: A required dictionary specifying the document attributes. The dictionary contains values from Document Types and must at least contain NSDocumentTypeDocumentAttribute. If there are no document-level attributes, dict can be nil.

Returns a file wrapper containing the RTFD data.

The file wrapper also includes the document-level attributes in docAttributes, as explained in RTF Files and Attributed Strings.
Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.
You can save the file wrapper using the NSFileWrapper method writeToFile.

### 42.1.166 RTFDFromRange(documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Creates RTFD data from the current string range.

**Notes:** Returns nil on failure.
Same as RTFDFromRange(0,length)
documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.167 RTFDFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock 8096

### 42.1.167 RTFDFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates RTFD data from the current string range.
**Notes:** Returns nil on failure.
documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.166 RTFDFromRange(documentAttributes as dictionary = nil) as MemoryBlock 8095

### 42.1.168 RTFFromRange(documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates RTF data from whole string.
**Notes:** Returns nil on failure.
Same as RTFFromRange(0,length)
documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.169 RTFFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock 8096

### 42.1.169 RTFFromRange(offset as Integer, length as Integer, documentAttributes as dictionary = nil) as MemoryBlock

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Creates RTF data from the current string range.
**Example:**

```
// get some attributed text:
dim t as new NSAttributedStringMBS
call t.initWithString("Hello World")
```

```
// set document attributes
dim dic as new Dictionary
dic.Value(t.NSBottomMarginDocumentAttribute) = 20
dic.Value(t.NSLeftMarginDocumentAttribute) = 20
dic.Value(t.NSRightMarginDocumentAttribute) = 20
dic.Value(t.NSTopMarginDocumentAttribute) = 20
dic.Value(t.NSAuthorDocumentAttribute) = "Test User"

// get rtf
dim rtf as string = t.RTFFromRange(dic)

// write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write rtf
```

**Notes:** Returns nil on failure.
documentAttributes can optionally be a dictionary with document attributes like author or title.
See also:

- 42.1.168 RTFFromRange(documentAttributes as dictionary = nil) as MemoryBlock 8096

### 42.1.170 Properties

### 42.1.171 containsAttachments as boolean

MBS MacBase Plugin, Plugin Version: 9.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this attributed string has attachments.
**Notes:** (Read only property)

### 42.1.172 Handle as Integer

MBS MacBase Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** Must not be nil to have the object being valid.
(Read and Write property)

### 42.1.173 length as Integer

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Length of text in characters.
**Example:**

```
dim n as NSAttributedStringMBS

n=new NSAttributedStringMBS
if n.initWithString("test") then
MsgBox str(n.length) // shows 4
else
MsgBox "failed"
end if
```

**Notes:** (Read only property)

### 42.1.174 Range as NSRangeMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Creates range for whole text.
**Notes:** (Read only property)

### 42.1.175 text as string

MBS MacBase Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** The plain text.
**Notes:** (Read only property)

### 42.1.176 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSSpellingStateSpellingFlag | 0 | One of the constants for spelling state. Flag for spelling issues. |

Spelling Constants.

| Constant | Value | Description |
|---|---|---|
| NSSpellingStateGrammarFlag | 1 | Flag for grammar issues. |

Underline Constants.

| Constant | Value | Description |
|---|---|---|
| NSUnderlineByWord | &h8000 | Draw the line only underneath or through words, not whitespace. |
| NSUnderlinePatternDash | &h0200 | Draw a line of dashes. |
| NSUnderlinePatternDashDot | &h0300 | Draw a line of alternating dashes and dots. |
| NSUnderlinePatternDashDotDot | &h0400 | Draw a line of alternating dashes and two dots. |
| NSUnderlinePatternDot | &h0100 | Draw a line of dots. |
| NSUnderlinePatternSolid | 0 | Draw a solid line. |
| NSUnderlineStyleDouble | 9 | Draw a double line. |
| NSUnderlineStyleNone | 0 | Do not draw a line. |
| NSUnderlineStyleSingle | 1 | Draw a single line. |
| NSUnderlineStyleThick | 2 | Draw a thick line. |

Writing Direction Constants.

| Constant | Value | Description |
|---|---|---|
| NSWritingDirectionEmbedding | 0 | Text is embedded in text with another writing direction. For example, an English quotation in the middle of an Arabic sentence could be marked as being embedded left-to-right text. |
| NSWritingDirectionOverride | 1 | Enables character types with inherent directionality to be overridden when required for special cases, such as for part numbers made of mixed English, digits, and Hebrew letters to be written from right to left. |

## 42.2 class NSFileWrapperMBS

### 42.2.1 class NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The NSFileWrapper class provides access to the attributes and contents of file-system nodes.
**Example:**

```
// insert a file to textview

Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
// read to file
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

**Notes:** A file-system node is a file, directory, or symbolic link. Instances of this class are known as file wrappers.

File wrappers represent a file-system node as an object that can be displayed as an image (and possibly edited in place), saved to the file system, or transmitted to another application.

There are three types of file wrappers:

- Regular-file file wrapper: Represents a regular file.
- Directory file wrapper: Represents a directory.
- Symbolic-link file wrapper: Represents a symbolic link.

A file wrapper has these attributes:

- Filename. Name of the file-system node the file wrapper represents.
- file-system attributes. See NSFileManager Class Reference for information on the contents of the attributes dictionary.
- Regular-file contents. Applicable only to regular-file file wrappers.
- File wrappers. Applicable only to directory file wrappers.
- Destination node. Applicable only to symbolic-link file wrappers.

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr6
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 42.2.2 Methods

### 42.2.3 addFileWrapper(child as NSFileWrapperMBS) as String

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Adds a child file wrapper to the receiver, which must be a directory file wrapper.
**Notes:** child: File wrapper to add to the directory.

Returns Dictionary key used to store fileWrapper in the directory,Äôs list of file wrappers. The dictionary key is a unique filename, which is the same as the passed-in file wrapper's preferred filename unless that name is already in use as a key in the directory,Äôs dictionary of children. See Working with Directory Wrappers in File System Programming Guide for more information about the file-wrapper list structure.

Use this method to add an existing file wrapper as a child of a directory file wrapper. If the file wrapper does not have a preferred filename, set the preferredFilename property to give it one before calling addFileWrapper. To create a new file wrapper and add it to a directory, use the addRegularFileWithContents method.

Special Considerations
This method raises NSInternalInconsistencyException if the receiver is not a directory file wrapper.
This method raises NSInvalidArgumentException if the child file wrapper doesn,Äôt have a preferred name.

### 42.2.4 addRegularFileWithContents(Data as MemoryBlock, preferredFilename as string) as String

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a regular-file file wrapper with the given contents and adds it to the receiver, which must be a directory file wrapper.
**Notes:** data: Contents for the new regular-file file wrapper.
filename: Preferred filename for the new regular-file file wrapper.

Returns Dictionary key used to store the new file wrapper in the directory,Äôs list of file wrappers. The dictionary key is a unique filename, which is the same as the passed-in file wrapper's preferred filename unless that name is already in use as a key in the directory's dictionary of children. See Working with Directory Wrappers in File System Programming Guide for more information about the file-wrapper list structure.

This is a convenience method. The default implementation allocates a new file wrapper, initializes it with initRegularFileWithContents, set its preferredFilename property, adds it to the directory with addFileWrapper, and returns what addFileWrapper returned.

This method raises NSInternalInconsistencyException if the receiver is not a directory file wrapper.
This method raises NSInvalidArgumentException if you pass nil or an empty value for filename.

Available in OS X v10.0 and later.

### 42.2.5 Constructor

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The constructor.

### 42.2.6 initDirectoryWithFileWrappers(childrenByPreferredName as Dictionary) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Initializes the receiver as a directory file wrapper, with a given file-wrapper list.
**Notes:** childrenByPreferredName: Key-value dictionary of file wrappers with which to initialize the receiver. The dictionary must contain entries whose values are the file wrappers that are to become children and whose keys are filenames. See Working with Directory Wrappers in File System Programming Guide for more information about the file-wrapper list structure.

Returns initialized file wrapper for fileWrappers.

After initialization, the file wrapper is not associated with a file-system node until you save it using writeToURL:options:originalContentsURL:.

The receiver is initialized with open permissions: anyone can read, write, or modify the directory on disk.

If any file wrapper in the directory doesn,Äôt have a preferred filename, its preferred name is automatically set to its corresponding key in the childrenByPreferredName dictionary.

### 42.2.7 initRegularFileWithContents(data as MemoryBlock) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes the receiver as a regular-file file wrapper.
**Example:**

```
dim content as MemoryBlock = "Hello World"
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(content)
f.filename = "HelloWorld.txt"
```

**Notes:** After initialization, the file wrapper is not associated with a file-system node until you save it using writeToURL.
The file wrapper is initialized with open permissions: anyone can write to or read the file wrapper.

### 42.2.8 initWithFile(File as folderItem, Options as Integer, byref error as NSErrorMBS) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes a file wrapper instance whose kind is determined by the type of file-system node located by the folderitem.
**Example:**

```
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)

if e <>nil then
MsgBox e.localizedDescription
else
dim dic as Dictionary = f.fileAttributes
Break // read dic in debugger
```

```
end if
```

**Notes:** File: FolderItem of the file-system node the file wrapper is to represent.
options: Option flags for reading the node located at folderitem. Can be NSFileWrapperReadingImmediate and/or NSFileWrapperReadingWithoutMapping.
Error: If an error occurs, upon return contains an NSErrorMBS object that describes the problem.

Returns File wrapper for the file-system node at folderitem. May be a directory, file, or symbolic link, depending on what is located at the folderitem. Returns nil if reading is not successful.

If folderitem is a directory, this method recursively creates file wrappers for each node within that directory. Use the fileWrappers property to get the file wrappers of the nodes contained by the directory.

Available in OS X v10.6 and later.

### 42.2.9 initWithSerializedRepresentation(data as MemoryBlock) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes the receiver as a regular-file file wrapper from given serialized data.
**Example:**

```
// get a wrapper
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)
dim data as MemoryBlock = f.serializedRepresentation

// later restore it
dim other as NSFileWrapperMBS = NSFileWrapperMBS.initWithSerializedRepresentation(data)
MsgBox other.preferredFilename
```

**Notes:** serializedRepresentation: Serialized representation of a file wrapper in the format used for the NSFileContentsPboardType pasteboard type. Data of this format is returned by such methods as serializedRepresentation and RTFDFromRange (in NSAttributedString).

Returns regular-file file wrapper initialized from serializedRepresentation.
The file wrapper is not associated with a file-system node until you save it using writeToURL.

### 42.2.10 initWithURL(URL as string, Options as Integer, byref error as NSErrorMBS) as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes a file wrapper instance whose kind is determined by the type of file-system node located by the URL.
**Notes:** url: URL of the file-system node the file wrapper is to represent.
options: Option flags for reading the node located at url. Can be NSFileWrapperReadingImmediate and/or NSFileWrapperReadingWithoutMapping.
Error: If an error occurs, upon return contains an NSErrorMBS object that describes the problem.

Returns File wrapper for the file-system node at url. May be a directory, file, or symbolic link, depending on what is located at the URL. Returns nil if reading is not successful.

If url is a directory, this method recursively creates file wrappers for each node within that directory. Use the fileWrappers property to get the file wrappers of the nodes contained by the directory.

Available in OS X v10.6 and later.

### 42.2.11 keyForFileWrapper(child as NSFileWrapperMBS) as String

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns the dictionary key used by a directory to identify a given file wrapper.
**Notes:** child: The child file wrapper for which you want the key.

Returns Dictionary key used to store the file wrapper in the directory,Äôs list of file wrappers. The dictionary key is a unique filename, which may not be the same as the passed-in file wrapper's preferred filename if more than one file wrapper in the directory's dictionary of children has the same preferred filename. See Working with Directory Wrappers in File System Programming Guide for more information about the file-wrapper list structure. Returns nil if the file wrapper specified in child is not a child of the directory.

Special Considerations
This method raises NSInternalInconsistencyException if the receiver is not a directory file wrapper.

### 42.2.12 matchesContentsOfFile(File as FolderItem) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Indicates whether the contents of a file wrapper matches a directory, regular file, or symbolic link on disk.

**Notes:** file: FolderItem of the file-system node with which to compare the file wrapper.

Returns true when the contents of the file wrapper match the contents of url, false otherwise.

The contents of files are not compared; matching of regular files is based on file modification dates. For a directory, children are compared against the files in the directory, recursively.

Because children of directory file wrappers are not read immediately by the initWithURL:options:error: method unless the NSFileWrapperReadingImmediate reading option is used, even a newly-created directory file wrapper might not have the same contents as the directory on disk. You can use this method to determine whether the file wrapper's contents in memory need to be updated.

If the file wrapper needs updating, use the readFromURL:options:error: method with the NSFileWrapperReadingImmediate reading option.

This table describes which attributes of the file wrapper and file-system node are compared to determine whether the file wrapper matches the node on disk:

| File-wrapper type | Comparison determinants |
|---|---|
| Regular file | Modification date and access permissions. |
| Directory | Children (recursive). |
| Symbolic link | Destination pathname. |

Available in OS X v10.6 and later.

### 42.2.13 matchesContentsOfURL(URL as String) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Indicates whether the contents of a file wrapper matches a directory, regular file, or symbolic link on disk.
**Notes:** url: URL of the file-system node with which to compare the file wrapper.

Returns true when the contents of the file wrapper match the contents of url, false otherwise.

The contents of files are not compared; matching of regular files is based on file modification dates. For a directory, children are compared against the files in the directory, recursively.

Because children of directory file wrappers are not read immediately by the initWithURL:options:error:

method unless the NSFileWrapperReadingImmediate reading option is used, even a newly-created directory file wrapper might not have the same contents as the directory on disk. You can use this method to determine whether the file wrapper's contents in memory need to be updated.

If the file wrapper needs updating, use the readFromURL:options:error: method with the NSFileWrapperReadingImmediate reading option.

This table describes which attributes of the file wrapper and file-system node are compared to determine whether the file wrapper matches the node on disk:

| File-wrapper type | Comparison determinants |
|---|---|
| Regular file | Modification date and access permissions. |
| Directory | Children (recursive). |
| Symbolic link | Destination pathname. |

Available in OS X v10.6 and later.

### 42.2.14 readFromFile(File as FolderItem, Options as Integer = 0, byref Error as NSErrorMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Recursively rereads the entire contents of a file wrapper from the specified location on disk.
**Notes:** File: FolderItem of the file-system node corresponding to the file wrapper.
options: Option flags for reading the node located at url.
Error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true if successful. If not successful, returns false after setting outError to an NSErrorMBS object that describes the reason why the file wrapper could not be reread.

When reading a directory, children are added and removed as necessary to match the file system.
Available in OS X v10.6 and later.

### 42.2.15 readFromURL(URL as String, Options as Integer = 0, byref Error as NSErrorMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Recursively rereads the entire contents of a file wrapper from the specified location on disk.
**Notes:** url: URL of the file-system node corresponding to the file wrapper.

options: Option flags for reading the node located at url.
Error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true if successful. If not successful, returns false after setting outError to an NSErrorMBS object that describes the reason why the file wrapper could not be reread.

When reading a directory, children are added and removed as necessary to match the file system.
Available in OS X v10.6 and later.

### 42.2.16 removeFileWrapper(child as NSFileWrapperMBS)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Removes a child file wrapper from the receiver, which must be a directory file wrapper.
**Notes:** This method raises NSInternalInconsistencyException if the receiver is not a directory file wrapper.

### 42.2.17 writeToFile(File as FolderItem, Options as Integer = 0, originalContentsURL as FolderItem = nil, byref Error as NSErrorMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Recursively writes the entire contents of a file wrapper to a given file-system URL.
**Example:**

```
// get styled text from htmlviewer
dim w as WebViewMBS = HTMLViewer1.WebViewMBS
dim f as WebFrameMBS = w.mainFrame
dim v as WebFrameViewMBS = f.frameView
dim d as WebDocumentViewMBS = v.documentView
dim n as NSAttributedStringMBS = d.attributedString


// package it
dim da as new Dictionary
da.Value(n.NSDocumentTypeDocumentAttribute) = n.NSRTFDTextDocumentType

dim e as NSErrorMBS
dim fw as NSFileWrapperMBS = n.fileWrapperFromRange(0, n.Length, da, e)
if e <>nil then
MsgBox e.LocalizedDescription
Return
end if

// write to disk
```

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtfd")
if fw.writeToFile(file, e) then
MsgBox "OK"
else
MsgBox e.LocalizedDescription
end if
```

**Notes:** File: FolderItem of the file-system node to which the file wrapper,Äôs contents are written.
options: Option flags for writing to the node located at url.
originalContentsURL: The location of a previous revision of the contents being written. The default implementation of this method attempts to avoid unnecessary I/O by writing hard links to regular files instead of actually writing out their contents when the contents have not changed. The child file wrappers must return accurate values when its filename property is accessed for this to work. Use the NSFileWrapperWritingWithNameUpdating writing option to increase the likelihood of that. Specify nil for this parameter if there is no earlier version of the contents or if you want to ensure that all the contents are written to files.
Error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true when the write operation is successful. If not successful, returns false after setting outError to an NSError object that describes the reason why the file wrapper,Äôs contents could not be written.

Available in OS X v10.6 and later.

### 42.2.18 writeToURL(URL as String, Options as Integer = 0, originalContentsURL as String = "", byref Error as NSErrorMBS) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Recursively writes the entire contents of a file wrapper to a given file-system URL.
**Notes:** url: URL of the file-system node to which the file wrapper,Äôs contents are written.
options: Option flags for writing to the node located at url.
originalContentsURL: The location of a previous revision of the contents being written. The default implementation of this method attempts to avoid unnecessary I/O by writing hard links to regular files instead of actually writing out their contents when the contents have not changed. The child file wrappers must return accurate values when its filename property is accessed for this to work. Use the NSFileWrapperWritingWithNameUpdating writing option to increase the likelihood of that. Specify nil for this parameter if there is no earlier version of the contents or if you want to ensure that all the contents are written to files.
Error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true when the write operation is successful. If not successful, returns false after setting outError to an NSError object that describes the reason why the file wrapper,Äôs contents could not be written.

Available in OS X v10.6 and later.

### 42.2.19 Properties

### 42.2.20 Directory as Boolean

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** This property contains a boolean value indicating whether the file wrapper is a directory file wrapper. (read-only)
**Notes:** This property will contain true when the file wrapper is a directory file wrapper, otherwise it contains false.
Invocations of readFromURL may change the value of this property, if the type of the file on disk has changed.
(Read only property)

### 42.2.21 fileAttributes as Dictionary

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** A dictionary of file attributes.
**Example:**

```
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)

if e <>nil then
MsgBox e.localizedDescription
else
dim dic as Dictionary = f.fileAttributes
Break // read dic in debugger
end if
```

**Notes:** The file attributes,Äô dictionary is the same format as that returned by attributesOfItemAtPath (see NSFileManagerMBS).
(Read and Write property)

### 42.2.22 filename as String

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The filename of the file wrapper object.
**Example:**

```
dim content as MemoryBlock = "Hello World"
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(content)
f.filename = "HelloWorld.txt"
```

**Notes:** This property contains the file wrapper,Äôs filename, or nil when the file wrapper has no corresponding file-system node.

The filename is used for record-keeping purposes only and is set automatically when the file wrapper is created from the file system using initWithURL and when it,Äôs saved to the file system using writeToURL (although this method allows you to request that the filename not be updated).

The filename is usually the same as the preferred filename, but might instead be a name derived from the preferred filename. You can use this method to get the name of a child that's just been read. Don,Äôt use this method to get the name of a child that's about to be written, because the name might be about to change; send keyForFileWrapper to the parent instead.
(Read and Write property)

### 42.2.23 fileWrappers as Dictionary

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The file wrappers contained by a directory file wrapper.
**Notes:** The dictionary contains entries whose values are the file wrappers and whose keys are the unique filenames that have been assigned to each one. See Working with Directory Wrappers in File System Programming Guide for more information about the file-wrapper list structure.

This property may contain nil if the user modifies the directory after you call readFromURL or initWithURL but before NSFileWrapper has read the contents of the directory. Use the NSFileWrapperReadingImmediate reading option to reduce the likelihood of that problem.

This property raises NSInternalInconsistencyException if the file wrapper object is not a directory file wrapper.
(Read only property)

### 42.2.24 Handle as Integer

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** Must not be 0 to have the object being valid.

(Read and Write property)

### 42.2.25 icon as NSImageMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An image that can be used to represent the file wrapper to the user.
**Example:**

```
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)
dim img as NSImageMBS = f.icon
dim pic as Picture = img.CopyPictureWithMask
window1.Backdrop = pic
```

**Notes:** An application does not have to use this icon; for example, a file viewer typically looks up icons automatically based on file extensions, and so wouldn,Äôt need this one. Similarly, if a file wrapper represents an image file, an application can display the image directly rather than a file icon.

This method may return nil if the file wrapper is a child created when its parent was read from the file system, and the child was modified before it was read. Use the NSFileWrapperReadingImmediate reading option to reduce the likelihood of that problem.

Because the NSImage object that's returned might be shared by many NSFileWrapper objects, you must not mutate it. If you need to mutate the returned object, make a copy first and mutate the copy instead.
(Read and Write property)

### 42.2.26 preferredFilename as String

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The preferred filename for the file wrapper object.
**Example:**

```
// get a wrapper
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)
dim data as MemoryBlock = f.serializedRepresentation

// later restore it
dim other as NSFileWrapperMBS = NSFileWrapperMBS.initWithSerializedRepresentation(data)
```

MsgBox other.preferredFilename

**Notes:** This name is normally used as the dictionary key when a child file wrapper is added to a directory file wrapper. However, if another file wrapper with the same preferred name already exists in the directory file wrapper when this object is added, the filename assigned as the dictionary key may differ from the preferred filename.

When you change the preferred filename, the default implementation of this property causes the existing parent directory file wrappers to remove and re-add the child to accommodate the change. Preferred filenames of children are not preserved when you write a file wrapper to disk and then later instantiate another file wrapper by reading the file from disk. If you need to preserve the user-visible names of attachments, you have to store the names yourself.
(Read and Write property)

### 42.2.27 RegularFile as Boolean

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** This property contains a boolean value that indicates whether the file wrapper object is a regular-file. (read-only)
**Notes:** This property contains true when the file wrapper object is a regular-file wrapper, otherwise it contains false. Invocations of readFromURL may change the value of this property if the type of the file on disk has changed.
(Read only property)

### 42.2.28 regularFileContents as MemoryBlock

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The contents of the file-system node associated with a regular-file file wrapper. (read-only)
**Notes:** This property may contain nil if the user modifies the file after you call readFromURL or initWithURL but before NSFileWrapper has read the contents of the file. Use the NSFileWrapperReadingImmediate reading option to reduce the likelihood of that problem.
This property raises NSInternalInconsistencyException if the file wrapper object is not a regular-file file wrapper.
(Read only property)

### 42.2.29 serializedRepresentation as MemoryBlock

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The contents of the file wrapper as an opaque collection of data. (read-only)
**Example:**

```
// get a wrapper
dim file as FolderItem = SpecialFolder.desktop.child("todo.rtf")
dim e as NSErrorMBS
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initWithFile(file, 0, e)
dim data as MemoryBlock = f.serializedRepresentation

// later restore it
dim other as NSFileWrapperMBS = NSFileWrapperMBS.initWithSerializedRepresentation(data)
MsgBox other.preferredFilename
```

**Notes:** This property contains an MemoryBlock in the format used by the pasteboard type NSFileContentsPboardType. This MemoryBlock is also suitable for passing to initWithSerializedRepresentation.

This property may contain nil if the user modifies the contents of the file-system node after you call readFromURL or initWithURL/File but before NSFileWrapper has read the contents of the file. Use the NSFileWrapperReadingImmediate reading option to reduce the likelihood of that problem.
(Read only property)

### 42.2.30 SymbolicLink as Boolean

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** A boolean that indicates whether the file wrapper object is a symbolic-link file wrapper. (read-only)
**Notes:** This property contains true when the file wrapper object is a symbolic-link file wrapper, false otherwise.
Invocations of readFromURL may change the value contained by this property, if the type of the file on disk has changed.
(Read only property)

### 42.2.31 symbolicLinkDestinationURL as String

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The URL referenced by the file wrapper object, which must be a symbolic-link file wrapper. (read-only)
**Notes:** This property may contain nil if the user modifies the symbolic link after you call readFromURL or initWithURL but before NSFileWrapper has read the contents of the link. Use the NSFileWrapperReadingImmediate reading option to reduce the likelihood of that problem.
This property raises NSInternalInconsistencyException if the file wrapper object is not a symbolic-link file

wrapper.
(Read only property)

### 42.2.32 Constants

Reading Options

| Constant | Value | Description |
|---|---|---|
| NSFileWrapperReadingImmediate | 1 | If reading with this option succeeds, then subsequent uses of fileWrapp ularFileContents, symbolicLinkDestinationURL, and serializedRepres sent to the file wrapper and all its child file wrappers will fail and re only if an actual error occurs (for example, the volume has disappeare file server is unreachable)—not as a result of the user moving or delet For performance reasons, NSFileWrapper may not read the contents of packages immediately even when this option is chosen. For example, the contents of bundles (not all file packages are bundles) are immutab user, NSFileWrapper may read the children of such a directory lazily. You can use this option to take a snapshot of a file or folder for writing la example, an application like TextEdit can use this option when creating wrappers to represent attachments that the user creates by copying and or dragging and dropping from the Finder to a TextEdit document. D this option when reading a document file package, because that wou unnecessarily bad performance. For example, an application wouldn't option when creating file wrappers to represent attachments as it's op document stored in a file package. Available in OS X v10.6 and later. |
| NSFileWrapperReadingWithoutMapping | 2 | Whether file mapping for regular file wrappers is disallowed. You can use this option to keep NSFileWrapper from memory-mapp This is useful if you want to make sure your application doesn't hold fi (mapped files are open files), therefore preventing the user from ejectin unmounting disk partitions, or unmounting disk images. In OS X v later, NSFileWrapper memory-maps files that are on internal drives never memory-maps files on external drives or network volumes, rega whether this option is used. Available in OS X v10.6 and later. |

Writing Options

| Constant | Value | Description |
|---|---|---|
| NSFileWrapperWritingAtomic | 1 | Whether writing is done atomically.<br>You can use this option to ensure that, when overwriting a file pa overwriting either completely succeeds or completely fails, with no of leaving the file package in an inconsistent state. Because this op additional I/O, you shouldn't use it unnecessarily. For example, do option in an override of - [ NSDocument writeToURL ] , because NS safe-saving is already done atomically.<br>Available in OS X v10.6 and later. |
| NSFileWrapperWritingWithNameUpdating | 2 | Whether descendant file wrappers,Äôfilename properties are set if t succeeds.<br>This option is necessary when your application passes a URL in nalContentsURL parameter to the writeToURL method. Without option (and reusing child file wrappers properly), subsequent inv writeToURL would not be able to reliably create hard links in a nev age, because the record of names in the old file package would be o<br>Available in OS X v10.6 and later. |

## 42.3 class NSMutableAttributedStringMBS

### 42.3.1 class NSMutableAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** NSMutableAttributedString declares the programmatic interface to objects that manage mutable attributed strings.
**Notes:** You can add and remove characters (raw strings) and attributes separately or together as attributed strings. See the class description for NSAttributedString for more information about attributed strings.
Subclass of the NSAttributedStringMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 24.0pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr3
- Styled Text for Labels in your Xojo iOS app
- Tip of the day: Adding links to Textarea on OS X
- Apply fonts to font PopupMenu
- Using NSTextViewMBS
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- Nearly 2000 new Functions in the 9.6 prerelease of MBS

**Xojo Developer Magazine**

- 22.2, page 9: News
- 10.3, page 9: News

### 42.3.2 Methods

### 42.3.3 addAttribute(name as string, value as Variant, range as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Adds an attribute with the given name and value to the characters in the specified range.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
```

```
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m
```

**Notes:** name: A string specifying the attribute name. Attribute keys can be supplied by another framework or can be custom ones you define. For information about where to find the system-supplied attribute keys, see the overview section in NSAttributedString Class Reference.
value: The attribute value associated with name.
Range: The range of characters to which the specified attribute/value pair applies.

You may assign any name/value pair you wish to a range of characters, in addition to the standard attributes described in the "Constants" section of NSAttributedString Additions. Raises an NSInvalidArgumentException if name or value is nil and an NSRangeException if any part of range lies beyond the end of the receiver's characters.

Plugin version 16.0 or newer ignores calls here with value = nil or empty name to avoid exceptions.

### 42.3.4 addAttributes(attrs as Dictionary, range as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Adds the given collection of attributes to the characters in the specified range.
**Example:**

```
TextArea1.Text = "Hello"

Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
Dim ts As NSTextStorageMBS = tv.TextStorage

Dim value As Color = &cFF0000

Dim offset As Integer = 0
Dim length As Integer = 5

Dim range As NSRangeMBS = NSMakeRangeMBS( offset, length )
ts.AddAttribute( NSAttributedStringMBS.NSForegroundColorAttributeName, value, range )
```

**Notes:** attributes: A dictionary containing the attributes to add. Attribute keys can be supplied by another framework or can be custom ones you define. For information about where to find the system-supplied

attribute keys, see the overview section in NSAttributedString Class Reference.
Range: The range of characters to which the specified attributes apply.

You may assign any name/value pair you wish to a range of characters, in addition to the standard attributes described in the "Constants" section of NSAttributedString Additions. Raises an NSInvalidArgumentException if attributes is nil and an NSRangeException if any part of range lies beyond the end of the receiver's characters.

### 42.3.5 appendAttributedString(attrString as NSAttributedStringMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Adds the characters and attributes of a given attributed string to the end of the receiver.
**Example:**

```
const NSWritingDirectionNatural = -1 // Determines direction using the Unicode Bidi Algorithm rules P2 and P3
const NSWritingDirectionLeftToRight = 0 // Left to right writing direction
const NSWritingDirectionRightToLeft = 1 // Right to left writing direction

const NSTextWritingDirectionEmbedding = 0
const NSTextWritingDirectionOverride = 2

dim t as NSTextStorageMBS = TextArea1.NSTextViewMBS.textStorage

// get hello in arabic
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("ŸÖÿ±ÿÿ®ÿß")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

// now set attributes for right to left
m.addAttribute t.NSWritingDirectionAttributeName, array(NSWritingDirectionRightToLeft+NSTextWritingDirectionOverride), new NSRangeMBS(0,m.Length)

// and add to textarea
t.appendAttributedString m
```

**Notes:** attributedString: The string whose characters and attributes are added.

### 42.3.6 appendString(attrString as String)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Adds the text to the end of the receiver.

### 42.3.7 applyFontTraits(FontTraitMask as Integer, offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Applies the font attributes specified by mask to the characters in a range.
**Notes:** See the NSFontManager class specification for a description of the font traits available. Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.

### 42.3.8 AsCFMutableAttributedString as Variant

MBS MacBase Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new CFMutableAttributedStringMBS object pointing to same mutable attributed string.
**Example:**

```
// make NS version
dim n as new NSAttributedStringMBS

if n.initWithString("Hello World") then

dim m as NSMutableAttributedStringMBS = n.mutableCopy

// convert
dim c as CFMutableAttributedStringMBS = m.AsCFMutableAttributedString

// and check content
MsgBox c.String
end if
```

**Notes:** For passing to functions which need a CFMutableAttributedStringMBS.

### 42.3.9 beginEditing

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Overridden by subclasses to buffer or optimize a series of changes to the receiver's characters or attributes, until it receives a matching endEditing message, upon which it can consolidate changes and notify any observers that it has changed.

**Notes:** You can nest pairs of beginEditing and endEditing messages.

### 42.3.10 Constructor

MBS MacBase Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** The constructor to create empty mutable attributed string.

### 42.3.11 containsAttachmentsInRange(offset as Integer, length as Integer) as Boolean

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the receiver contains a property configured (NSAttachmentAttributeName with NSAttachmentCharacter) in range.

### 42.3.12 deleteCharactersInRange(range as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Deletes the characters in the given range along with their associated attributes.
**Notes:** Raises an NSRangeException if any part of aRange lies beyond the end of the receiver's characters.

### 42.3.13 endEditing

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Overridden by subclasses to consolidate changes made since a previous beginEditing message and to notify any observers of the changes.
**Notes:** The NSMutableAttributedString implementation does nothing. NSTextStorage, for example, overrides this method to invoke fixAttributesInRange and to inform its NSLayoutManager objects that they need to re-lay the text.

### 42.3.14 fixAttachmentAttributeInRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cleans up attachment attributes in a range, removing all attachment attributes assigned to characters other than NSAttachmentCharacter.

**Notes:** Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.

### 42.3.15 fixAttributesInRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Invokes the other fix... methods, allowing you to clean up an attributed string with a single message.
**Notes:** Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.

NSTextStorage subclasses that return YES from the fixesAttributesLazily method should avoid directly calling fixAttributesInRange: or else bracket such calls with beginEditing and endEditing messages.

### 42.3.16 fixFontAttributeInRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fixes the font attribute in aRange, assigning default fonts to characters with illegal fonts for their scripts and otherwise correcting font attribute assignments.
**Notes:** For example, Kanji characters assigned a Latin font are reassigned an appropriate Kanji font. Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.

### 42.3.17 fixParagraphStyleAttributeInRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fixes the paragraph style attributes in a range, assigning the first paragraph style attribute value in each paragraph to all characters of the paragraph.
**Notes:** This method extends the range as needed to cover the last paragraph partially contained. A paragraph is delimited by any of these characters, the longest possible sequence being preferred to any shorter:

- U+000D (\r or CR)
- U+000A (\n or LF)
- U+2029 (Unicode paragraph separator) \r\n, in that order (also known as CRLF)

Raises an NSRangeException if any part of aRange lies beyond the end of the receiver,Äôs characters.

### 42.3.18 fontAttributesInRange(offset as Integer, length as Integer) as Dictionary

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attributes which should be copied/pasted with "copy font".

### 42.3.19 insertAttributedString(attrString as NSAttributedStringMBS, location as UInt64)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Inserts the characters and attributes of the given attributed string into the receiver at the given index.
**Notes:** attributedString: The string whose characters and attributes are inserted.
index: The index at which the characters and attributes are inserted.

The new characters and attributes begin at the given index and the existing characters and attributes from the index to the end of the receiver are shifted by the length of the attributed string. Raises an NSRangeException if index lies beyond the end of the receiver's characters.

### 42.3.20 insertString(attrString as String, location as UInt64)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Inserts the text into the receiver at the given index.

### 42.3.21 removeAttribute(name as string, range as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Removes the named attribute from the characters in the specified range.
**Notes:** name: A string specifying the attribute name to remove. Attribute keys can be supplied by another framework or can be custom ones you define. For information about where to find the system-supplied attribute keys, see the overview section in NSAttributedString Class Reference.
Range: The range of characters from which the specified attribute is removed.

Raises an NSRangeException if any part of range lies beyond the end of the receiver's characters.

### 42.3.22 replaceCharacters(search as String, text as String, Options as Integer = 1)

MBS MacBase Plugin, Plugin Version: 24.0, Platform: macOS, Targets: All.

**Function:** Searches and replaces text in a mutable attributed string.
**Example:**

```
// make some mutable string
Dim s As New NSMutableAttributedStringMBS
s.setString "Hello World!"

// now do the replace
s.replaceCharacters("world", "everyone")

// and show result
MessageBox s.Text
```

**Notes:** Default options is for case insensitive search, but you can pass other options.
(see search flags in PDFDocumentMBS class)

### 42.3.23 replaceCharactersInRange(range as NSRangeMBS, attrString as NSAttributedStringMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Replaces the characters and attributes in a given range with the characters and attributes of the given attributed string.
**Notes:** Range: The range of characters and attributes replaced.
attributedString: The attributed string whose characters and attributes replace those in the specified range.

Raises an NSRangeException if any part of range lies beyond the end of the receiver's characters.
See also:

- 42.3.24 replaceCharactersInRange(range as NSRangeMBS, text as string) 8124

### 42.3.24 replaceCharactersInRange(range as NSRangeMBS, text as string)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Replaces the characters in the given range with the characters of the given string.
**Notes:** Range: A range specifying the characters to replace.
text: A string specifying the characters to replace those in range.

The new characters inherit the attributes of the first replaced character from range. Where the length of range is 0, the new characters inherit the attributes of the character preceding range if it has any, otherwise of the character following range.

Raises an NSRangeException if any part of range lies beyond the end of the receiver's characters.
See also:

- 42.3.23 replaceCharactersInRange(range as NSRangeMBS, attrString as NSAttributedStringMBS) 8124

### 42.3.25 rulerAttributesInRange(offset as Integer, length as Integer) as Dictionary

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attributes which should be copied/pasted with "copy ruler".

### 42.3.26 setAlignment(alignment as Integer, offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the alignment characteristic of the paragraph style attribute for the characters in aRange to alignment.
**Notes:** When attribute fixing takes place, this change will affect only paragraphs whose first character was included in aRange. Raises an NSRangeException if any part of a range lies beyond the end of the receiver,Äôs characters.

### 42.3.27 setAttributedString(attrString as NSAttributedStringMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Replaces the receiver's entire contents with the characters and attributes of the given attributed string.
**Example:**

```
// create Hello World in red
dim a as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithString("Hello World")
dim m as NSMutableAttributedStringMBS = a.mutableCopy

m.addAttribute(a.NSForegroundColorAttributeName, NSColorMBS.redColor, new NSRangeMBS(0, m.length))

// put it in a textarea
TextArea1.NSTextViewMBS.textStorage.setAttributedString m
```

**Notes:** attributedString: The attributed string whose characters and attributes replace those in the receiver.

### 42.3.28 setAttributes(attrs as Dictionary, range as NSRangeMBS)

MBS MacBase Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Sets the attributes for the characters in the specified range to the specified attributes.
**Notes:** attributes: A dictionary containing the attributes to set. Attribute keys can be supplied by another framework or can be custom ones you define. For information about where to find the system-supplied attribute keys, see the overview section in NSAttributedString Class Reference.
Range: The range of characters whose attributes are set.

These new attributes replace any attributes previously associated with the characters in range. Raises an NSRangeException if any part of range lies beyond the end of the receiver's characters.

To set attributes for a zero-length NSMutableAttributedString displayed in a text view, use the NSTextView method setTypingAttributes.

### 42.3.29 setBaseWritingDirection(writingDirection as Integer, offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the base writing direction for the characters in range to writingDirection.

### 42.3.30 setString(attrString as String)

MBS MacBase Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** Replaces the receiver's entire contents with the given string.

### 42.3.31 subscriptRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decrements the value of the superscript attribute for characters in a range by 1.
**Example:**

TextArea1.Text = "Hello World"

```
dim n as NSTextViewMBS = TextArea1.NSTextViewMBS
dim s as NSTextStorageMBS = n.textStorage

s.subscriptRange(6,5)
```

### 42.3.32 superscriptRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Increments the value of the superscript attribute for characters in a range by 1.

### 42.3.33 unscriptRange(offset as Integer, length as Integer)

MBS MacBase Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the superscript attribute from the characters in a range.

### 42.3.34 updateAttachmentsFromPath(file as folderitem)

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates all attachments based on files contained in the RTFD file package at path.
See also:

- 42.3.35 updateAttachmentsFromPath(path as string) 8127

### 42.3.35 updateAttachmentsFromPath(path as string)

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates all attachments based on files contained in the RTFD file package at path.
See also:

- 42.3.34 updateAttachmentsFromPath(file as folderitem) 8127

## 42.4 class NSMutableParagraphStyleMBS

### 42.4.1 class NSMutableParagraphStyleMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** NSMutableParagraphStyle adds methods to its superclass, NSParagraphStyle, for changing the values of the subattributes in a paragraph style attribute.
**Example:**

```
dim n as NSParagraphStyleMBS = NSParagraphStyleMBS.defaultParagraphStyle
MsgBox str(n.alignment) // 4 = natural

dim m as NSMutableParagraphStyleMBS = n.mutableCopy
m.setAlignment NSParagraphStyleMBS.NSCenterTextAlignment
MsgBox str(m.alignment) // 2 = center
```

**Notes:** See the NSParagraphStyle and NSAttributedString specifications for more information.

Important A paragraph style object should not be mutated after adding it to an attributed string; doing so can cause your program to crash.
Subclass of the NSParagraphStyleMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MBS Xojo Plugins, version 18.1pr3
- MBS Xojo / Real Studio Plugins, version 13.5pr9
- MBS Real Studio Plugins, version 12.4pr1

### 42.4.2 Methods

### 42.4.3 addTabStop(tabstop as NSTextTabMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Adds tabStop to the receiver.

### 42.4.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 42.4.5 removeTabStop(tabstop as NSTextTabMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Removes the first text tab whose location and type are equal to those of tabStop.

### 42.4.6 setAlignment(alignment as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the alignment of the receiver to alignment.
**Example:**

```
dim n as NSParagraphStyleMBS = NSParagraphStyleMBS.defaultParagraphStyle
MsgBox str(n.alignment) // 4 = natural

dim m as NSMutableParagraphStyleMBS = n.mutableCopy
m.setAlignment NSParagraphStyleMBS.NSCenterTextAlignment
MsgBox str(m.alignment) // 2 = center
```

**Notes:** alignment may be one of:

NSLeftTextAlignment
NSRightTextAlignment
NSCenterTextAlignment
NSJustifiedTextAlignment
NSNaturalTextAlignment

### 42.4.7 setBaseWritingDirection(writingDirection as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the base writing direction for the receiver.
**Notes:** It can be NSWritingDirectionNaturalDirection, NSWritingDirectionLeftToRight, or NSWritingDirectionRightToLeft. If you specify NSWritingDirectionNaturalDirection, the receiver resolves the writing direction to either NSWritingDirectionLeftToRight or NSWritingDirectionRightToLeft, depending on the direction for the user's language preference setting.

### 42.4.8 setDefaultTabInterval(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the default tab interval for the receiver.
**Notes:** Tabs after the last specified in tabStops are placed at integral multiples of this distance. This value must be nonnegative.

### 42.4.9 setFirstLineHeadIndent(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the distance in points from the leading margin of a text container to the beginning of the paragraph's first line to value.
**Notes:** This value must be nonnegative.

### 42.4.10 setHeaderLevel(level as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Specifies whether the paragraph is to be treated as a header for purposes of HTML generation.
**Notes:** Should be set to 0 (the default value) if the paragraph is not a header, or from 1 through 6 if the paragraph is to be treated as a header.

### 42.4.11 setHeadIndent(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the distance in points from the leading margin of a text container to the beginning of lines other than the first to value.
**Notes:** This value must be nonnegative.

### 42.4.12 setHyphenationFactor(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Specifies the threshold for hyphenation.
**Notes:** Valid values lie between 0.0 and 1.0 inclusive. The default value is 0.0. Hyphenation is attempted when the ratio of the text width (as broken without hyphenation) to the width of the line fragment is less than the hyphenation factor. When the paragraph's hyphenation factor is 0.0, the layout manager's hyphenation factor is used instead. When both are 0.0, hyphenation is disabled.

### 42.4.13 setLineBreakMode(mode as Integer)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the mode used to break lines in a layout container to mode.
**Notes:** The mode parameter may be one of:

NSLineBreakByWordWrapping
NSLineBreakByCharWrapping
NSLineBreakByClipping
NSLineBreakByTruncatingHead
NSLineBreakByTruncatingTail
NSLineBreakByTruncatingMiddle
See the description of lineBreakMode in the NSParagraphStyle class specification for descriptions of these values.

### 42.4.14 setLineHeightMultiple(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the line height multiple for the receiver.
**Notes:** The natural line height of the receiver is multiplied by this factor before being constrained by minimum and maximum line height. This value must be nonnegative.

### 42.4.15 setLineSpacing(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the space in points added between lines within the paragraph to value.
**Example:**

```
// works for Labels, TextArea and TextFields

// control is either a textfield or a textview
dim n as NSTextFieldMBS = me.NSTextFieldMBS
dim v as NSTextViewMBS = me.NSTextViewMBS

// get text with attributes
dim a as NSAttributedStringMBS

if n<>Nil then
a = n.attributedStringValue
elseif v<>nil then
a = v.textStorage
end if
```

```
// get style
dim p as NSParagraphStyleMBS

try
p = a.attributeAtIndex(a.NSParagraphStyleAttributeName, 0)
catch ex as NSExceptionMBS
// we have none, so make one
p = new NSParagraphStyleMBS
end try

// modify it
dim m as NSMutableParagraphStyleMBS = p.mutableCopy
m.setLineSpacing 5

// add back to styled text
dim s as NSMutableAttributedStringMBS = a.mutableCopy
s.addAttribute(a.NSParagraphStyleAttributeName, m, new NSRangeMBS(0, s.length))

// and apply to control
if n<>Nil then
n.attributedStringValue = s
elseif v<>nil then
v.textStorage.setAttributedString s
end if
```

**Notes:** This value must be nonnegative.

### 42.4.16 setMaximumLineHeight(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the maximum height that any line in the paragraph style will occupy, regardless of the font size or size of any attached graphic, to value.
**Notes:** Glyphs and graphics exceeding this height will overlap neighboring lines; however, a maximum height of 0 implies no line height limit. This value must be nonnegative.

Although this limit applies to the line itself, line spacing adds extra space between adjacent lines.

### 42.4.17 setMinimumLineHeight(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the minimum height that any line in the paragraph style will occupy, regardless of the font size or size of any attached graphic, to value.
**Notes:** This value must be nonnegative.

### 42.4.18 setParagraphSpacing(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the space added at the end of the paragraph to separate it from the following paragraph to value.
**Notes:** This value must be nonnegative.

### 42.4.19 setParagraphSpacingBefore(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the distance between the paragraph's top and the beginning of its text content.
**Notes:** This value must be nonnegative.

### 42.4.20 setParagraphStyle(ParagraphStyle as NSParagraphStyleMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Replaces the subattributes of the receiver with those in ParagraphStyle.

### 42.4.21 setTabStops(tabStops() as NSTextTabMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Replaces the tab stops in the receiver with tabStops.

### 42.4.22 setTailIndent(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Sets the distance in points from the margin of a text container to the end of lines to value.
**Notes:** If positive, this is the distance from the leading margin (for example, the left margin in left-to-right text). That is, it's the absolute line width. If 0 or negative, it's the distance from the trailing margin—the value is added to the line width.

For example, to create a paragraph style that fits exactly in a 2-inch wide container, set its head indent to 0.0 and its tail indent to 0.0. To create a paragraph style with quarter-inch margins, set its head indent to 0.25 and its tail indent to –0.25.

### 42.4.23 setTextBlocks(TextBlocks() as NSTextBlockMBS)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the text blocks that contain the paragraph.

### 42.4.24 setTextLists(TextLists() as NSTextListMBS)

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the text lists containing the paragraph.

### 42.4.25 setTighteningFactorForTruncation(value as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Specifies the threshold for using tightening as an alternative to truncation.
**Notes:** When the line break mode specifies truncation, the text system attempts to tighten intercharacter spacing as an alternative to truncation, provided that the ratio of the text width to the line fragment width does not exceed 1.0 + the value returned by tighteningFactorForTruncation. Otherwise the text is truncated at a location determined by the line break mode. The default value is 0.05. This method accepts positive and negative values. Values less than or equal to 0.0 result in not tightening.

## 42.5 class NSParagraphStyleMBS

### 42.5.1 class NSParagraphStyleMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** NSParagraphStyle and its subclass NSMutableParagraphStyle encapsulate the paragraph or ruler attributes used by the NSAttributedString classes.
**Example:**

```
dim n as NSParagraphStyleMBS = NSParagraphStyleMBS.defaultParagraphStyle
MsgBox str(n.alignment) // 4 = natural
```

**Notes:** Instances of these classes are often referred to as paragraph style objects or, when no confusion will result, paragraph styles.
The mutable subclass of NSParagraphStyle is NSMutableParagraphStyle.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr3
- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.1
- MBS Xojo Plugins, version 18.1pr3
- MBS Xojo / Real Studio Plugins, version 13.5pr9
- MBS Real Studio Plugins, version 12.5pr3
- MBS Real Studio Plugins, version 12.4pr1

### 42.5.2 Methods

### 42.5.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 42.5.4 copy as NSParagraphStyleMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the paragraph style.

### 42.5.5 defaultParagraphStyle as NSParagraphStyleMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the default paragraph style.
**Example:**

```
dim n as NSParagraphStyleMBS = NSParagraphStyleMBS.defaultParagraphStyle
MsgBox str(n.alignment) // 4 = natural
```

**Notes:** The default paragraph style has the following default values:

| Subattribute | Default Value |
|---|---|
| Alignment | NSNaturalTextAlignment |
| Tab stops | 12 left-aligned tabs, spaced by 28.0 points |
| Line break mode | NSLineBreakByWordWrapping |
| All others | 0.0 |

### 42.5.6 defaultWritingDirectionForLanguage(languageName as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the default writing direction for the specified language.
**Notes:** languageName: The language specified in ISO language region format. Can be nil to return a default writing direction derived from the user's defaults database.

### 42.5.7 mutableCopy as NSMutableParagraphStyleMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the paragraph style.

### 42.5.8 NSCenterTextAlignment as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the text alignment constants for the alignment property.
**Notes:** Visually centered

### 42.5.9 NSRightTextAlignment as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the text alignment constants for the alignment property.
**Notes:** Visually right aligned

### 42.5.10 tabStops as NSTextTabMBS()

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the receiver's tab stops.
**Notes:** The NSTextTab objects, sorted by location, that define the tab stops for the paragraph style.

### 42.5.11 textBlocks as NSTextBlockMBS()

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The text blocks that contain the paragraph.

### 42.5.12 textLists as NSTextListMBS()

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array specifying the text lists containing the paragraph.

### 42.5.13 Properties

### 42.5.14 alignment as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the text alignment of the receiver.
**Example:**

```
dim n as NSParagraphStyleMBS = NSParagraphStyleMBS.defaultParagraphStyle
MsgBox str(n.alignment) // 4 = natural

dim m as NSMutableParagraphStyleMBS = n.mutableCopy
m.setAlignment NSParagraphStyleMBS.NSCenterTextAlignment
MsgBox str(m.alignment) // 2 = center
```

**Notes:** Natural text alignment is realized as left or right alignment depending on the line sweep direction of the first script contained in the paragraph.
(Read only property)

### 42.5.15 baseWritingDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the base writing direction for the receiver.
**Notes:** (Read only property)

### 42.5.16 defaultTabInterval as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the document-wide default tab interval.
**Notes:** The default tab interval in points. Tabs after the last specified in tabStops are placed at integer multiples of this distance (if positive). Default return value is 0.0.
(Read only property)

### 42.5.17 firstLineHeadIndent as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the indentation of the first line of the receiver.
**Notes:** The distance in points from the leading margin of a text container to the beginning of the paragraph's first line. This value is always nonnegative.
(Read only property)

### 42.5.18 firstTabStop as NSTextTabMBS

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: All.

**Function:** The first tab stop entry.
**Notes:** For debugging.
(Read only property)

### 42.5.19 firstTextList as NSTextListMBS

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The first text list entry.
**Notes:** For debugging.
(Read only property)

### 42.5.20 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 42.5.21 headerLevel as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Specifies whether the paragraph is to be treated as a header for purposes of HTML generation.
**Notes:** Returns 0 (the default value), if the paragraph is not a header, or from 1 through 6 if the paragraph is to be treated as a header.
(Read only property)

### 42.5.22 headIndent as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the indentation of the receiver's lines other than the first.
**Notes:** The distance in points from the leading margin of a text container to the beginning of lines other than the first. This value is always nonnegative.
(Read only property)

### 42.5.23 hyphenationFactor as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the paragraph's threshold for hyphenation.
**Notes:** A value between 0.0 and 1.0 inclusive. The default value is 0.0.

Hyphenation is attempted when the ratio of the text width (as broken without hyphenation) to the width of the line fragment is less than the hyphenation factor. When the paragraph's hyphenation factor is 0.0, the layout manager's hyphenation factor is used instead. When both are 0.0, hyphenation is disabled.
(Read only property)

### 42.5.24 lineBreakMode as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the mode that should be used to break lines in the receiver.
**Notes:** The line break mode to be used laying out the paragraph's text.
(Read only property)

### 42.5.25 lineHeightMultiple as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the line height multiple.
**Notes:** The line height multiple. The natural line height of the receiver is multiplied by this factor (if positive) before being constrained by minimum and maximum line height. Default return value is 0.0.
(Read only property)

### 42.5.26 lineSpacing as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the space between lines in the receiver (commonly known as leading).
**Notes:** The space in points added between lines within the paragraph. This value is always nonnegative.
(Read only property)

### 42.5.27 maximumLineHeight as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the receiver's maximum line height.
**Notes:** The maximum height in points that any line in the receiver will occupy, regardless of the font size or size of any attached graphic. This value is always nonnegative. The default value is 0.

Glyphs and graphics exceeding this height will overlap neighboring lines; however, a maximum height of 0 implies no line height limit. Although this limit applies to the line itself, line spacing adds extra space between adjacent lines.

(Read only property)

### 42.5.28 minimumLineHeight as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the receiver's minimum height.
**Notes:** The minimum height in points that any line in the receiver will occupy, regardless of the font size or size of any attached graphic. This value is always nonnegative.
(Read only property)

### 42.5.29 paragraphSpacing as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the space after the end of the paragraph.
**Notes:** The space in points added at the end of the paragraph to separate it from the following paragraph. This value is always nonnegative.

This value is determined by adding the previous paragraph's paragraphSpacing and the current paragraph's paragraphSpacingBefore.
(Read only property)

### 42.5.30 paragraphSpacingBefore as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the distance between the paragraph's top and the beginning of its text content.
**Notes:** The distance in points between the paragraph's top and the beginning of its text content. Default return value is 0.0.
(Read only property)

### 42.5.31 tailIndent as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the trailing indentation of the receiver.
**Notes:** The distance in points from the margin of a text container to the end of lines.

If positive, this value is the distance from the leading margin (for example, the left margin in left-to-right

text). If 0 or negative, it's the distance from the trailing margin.

For example, a paragraph style designed to fit exactly in a 2-inch wide container has a head indent of 0.0 and a tail indent of 0.0. One designed to fit with a quarter-inch margin has a head indent of 0.25 and a tail indent of –0.25.
(Read only property)

### 42.5.32 tighteningFactorForTruncation as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the threshold for using tightening as an alternative to truncation.
**Notes:** The tightening threshold value. The default value is 0.05.

When the line break mode specifies truncation, the text system attempts to tighten intercharacter spacing as an alternative to truncation, provided that the ratio of the text width to the line fragment width does not exceed 1.0 + the tightening factor returned by this method. Otherwise the text is truncated at a location determined by the line break mode.
(Read only property)

### 42.5.33 Constants

Alignment Modes

| Constant | Value | Description |
|---|---|---|
| NSJustifiedTextAlignment | 3 | Fully-justified. The last line in a paragraph is natural-aligned. |
| NSLeftTextAlignment | 0 | Visually left aligned |
| NSNaturalTextAlignment | 4 | Indicates the default alignment for script. |

Line Break Modes

| Constant | Value | Description |
|---|---|---|
| NSLineBreakByCharWrapping | 1 | Wrapping occurs before the first character that doesn't fit. |
| NSLineBreakByClipping | 2 | Lines are simply not drawn past the edge of the text container. |
| NSLineBreakByTruncatingHead | 3 | Each line is displayed so that the end fits in the container and the missing tex is indicated by some kind of ellipsis glyph. |
| NSLineBreakByTruncatingMiddle | 5 | Each line is displayed so that the beginning and end fit in the container an the missing text is indicated by some kind of ellipsis glyph in the middle. |
| NSLineBreakByTruncatingTail | 4 | Each line is displayed so that the beginning fits in the container and the missin text is indicated by some kind of ellipsis glyph. |
| NSLineBreakByWordWrapping | 0 | Wrapping occurs at word boundaries, unless the word itself doesn't fit on single line. |

Writing Direction

| Constant | Value | Description |
|---|---|---|
| NSWritingDirectionLeftToRight | 0 | The writing direction is left to right.<br>Available in Mac OS X v10.2 and later. |
| NSWritingDirectionNatural | -1 | The writing direction is determined using the Unicode Bidi Algorithm rules P2 and P3. Default.<br>Available in Mac OS X v10.4 and later. |
| NSWritingDirectionRightToLeft | 1 | The writing direction is right to left.<br>Available in Mac OS X v10.2 and later. |

## 42.6 class NSShadowMBS

### 42.6.1 class NSShadowMBS

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** An NSShadow object encapsulates the attributes used to create a drop shadow during drawing operations.
**Notes:** Shadows are always drawn in the default user coordinate space, regardless of any transformations applied to that space. This means that rotations, translations and other transformations of the current transformation matrix (the CTM) do not affect the resulting shadow. Another way to think about this is that changes to the CTM do not move or change the apparent position of the shadow,Äôs light source.

There are two positional parameters for a shadow: an x-offset and a y-offset. These values are expressed using a single size data type (CGSize on iOS, NSSize on OS X) and using the units of the default user coordinate space. Positive values for these offsets extend up and to the right.

In addition to its positional parameters, a shadow also contains a blur radius, which specifies how much a drawn object's image mask is blurred before it is composited onto the destination. A value of 0 means there is no blur. Larger values give correspondingly larger amounts of blurring.

An NSShadow object may be used in one of two ways. First, it may be set, like a color or a font, in which case its attributes are applied to all content drawn thereafter—or at least until another shadow is applied or a previous graphics state is restored. Second, it may be used as the value for the NSShadowAttributeName text attribute, in which case it is applied to the glyphs corresponding to the characters bearing this attribute.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr3
- MBS Xojo / Real Studio Plugins, version 16.1pr1

### 42.6.2 Methods

### 42.6.3 Constructor

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Initialized with 0 as its offset, 0 as its blur radius, and the default color as its color.

### 42.6.4 copy as NSShadowMBS

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the shadow object.

### 42.6.5 set

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the shadow of subsequent drawing operations to the shadow represented by the receiver.
**Notes:** The shadow attributes of the receiver are used until another shadow is set or until the graphics state is restored.

### 42.6.6 Properties

### 42.6.7 Handle as Integer

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 42.6.8 shadowBlurRadius as Double

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The blur radius of the shadow.
**Notes:** This property contains the blur radius, as measured in the default user coordinate space. A value of 0 indicates no blur, while larger values produce correspondingly larger blurring. The default value is 0.
(Read and Write property)

### 42.6.9 shadowColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The color of the shadow.
**Notes:** The default shadow color is black with an alpha of 1/3. If you set this property to nil, the shadow is not drawn.
(Read and Write property)

### 42.6.10 shadowOffset as NSSizeMBS

MBS MacBase Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The offset values of the shadow.
**Notes:** This property contains the horizontal and vertical offset values, specified using the width and height fields of the NSSize data type. These offsets are measured using the default user coordinate space and are not affected by custom transformations. This means that positive values always extend down and to the right from the user's perspective.
(Read and Write property)

## 42.7 class NSTextAttachmentMBS

### 42.7.1 class NSTextAttachmentMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** An attachment to a text.
**Notes:** NSTextAttachment objects are used by the NSAttributedString class cluster as the values for attachment attributes (stored in the attributed string under the key named NSAttachmentAttributeName). The objects you create with this class are referred to as text attachment objects, or when no confusion will result, as text attachments or merely attachments.

A text attachment object contains an NSFileWrapper in NSFileWrapper Class Reference object, which in turn holds the contents of the attached file. It also uses a cell object conforming to the NSTextAttachmentCell in NSTextAttachmentCell Protocol Reference protocol to draw and handle mouse events. Most of the behavior of a text attachment is relegated to the file wrapper and the attachment cell. See the corresponding class and protocol specifications for more information.

See the NSAttributedString in NSAttributedString Class Reference and NSTextView in NSTextView Class Reference class specifications for general information on text attachments.

see also
https://developer.apple.com/library/mac/documentation/Cocoa/Reference/ApplicationKit/Classes/NSTextAttachment_Class/index.html#//apple_ref/occ/instm/NSTextAttachment/initWithFileWrapper:
**Blog Entries**

- RTF functions in MBS Plugins
- MBS Xojo / Real Studio Plugins, version 15.1pr4
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 42.7.2 Methods

### 42.7.3 attributedStringWithAttachment(attachment as NSTextAttachmentMBS) as NSAttributedStringMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Creates an attributed string with an attachment.
**Example:**

```
dim content as MemoryBlock = "Hello World"
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(content)
```

```
f.filename = "HelloWorld.txt"

dim a as new NSTextAttachmentMBS(f)
dim s as NSAttributedStringMBS = NSTextAttachmentMBS.attributedStringWithAttachment(a)
```

**Notes:** This is a convenience method for creating an attributed string containing an attachment using NSAttachmentCharacter as the base character.

### 42.7.4 Constructor(fileWrapper as NSFileWrapperMBS)

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated NSTextAttachment object to contain the given file wrapper.
**Example:**

```
dim content as MemoryBlock = "Hello World"
dim f as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(content)
f.filename = "HelloWorld.txt"

dim a as new NSTextAttachmentMBS(f)

Break // inspect in debugger
```

**Notes:** If fileWrapper contains an image file that the receiver can interpret as an NSImage object, sets the attachment cell,Äôs image to the NSImage rather than to the icon of fileWrapper.
See also:

- 42.7.5 Constructor(image as NSImageMBS) 8148

### 42.7.5 Constructor(image as NSImageMBS)

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated NSTextAttachment object with a cell and given image.
**Example:**

```
Dim pic As Picture = LogoMBS(500)
Dim image As New NSImageMBS(pic)

// build attachment
Dim imageAttachment As New NSTextAttachmentMBS(image)
Dim attributedString As NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(imageAttachment)
```

```
// insert image
Dim textView As NSTextViewMBS = TextArea1.NSTextViewMBS
textview.insertText attributedString
```

See also:

- 42.7.4 Constructor(fileWrapper as NSFileWrapperMBS) 8148

### 42.7.6 Properties

### 42.7.7 attachmentCell as Variant

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The attachment cell.
**Notes:** As our plugin currently has no NSTextAttachmentCell class, we just give you a NSCell object.
This allows accessing most of the properties.
Value is a NSCellMBS declared as Variant to reduce plugin dependencies.
(Read only property)

### 42.7.8 fileWrapper as NSFileWrapperMBS

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The file wrapper.
**Notes:** The file wrapper holds the contents of the attached file.
(Read and Write property)

### 42.7.9 Handle as Integer

MBS MacBase Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** Must not be 0 to have the object being valid.
(Read and Write property)

### 42.7.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSAttachmentCharacter | &hFFFC | This character is used to denote an attachment. |

## 42.8 class NSTextBlockMBS

### 42.8.1 class NSTextBlockMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A block of text laid out in a subregion of the text container.
**Notes:** A text block appears as an attribute of a paragraph, and as part of the paragraph style. The most important subclass of NSTextBlockMBS is NSTextTableBlockMBS, which represents a block of text that appears as a cell in a table. The table itself is a NSTextTable object. All NSTextBlockMBS objects reference this table, which controls their sizing and positioning.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 22.0pr6

**Xojo Developer Magazine**

- 20.2, page 10: News

### 42.8.2 Methods

### 42.8.3 borderColor(edge as Integer) as NSColorMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the border color of the specified text block edge.
**Notes:** edge: The edge of the text block in question.

### 42.8.4 Constructor

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns an empty text block object.

### 42.8.5 copy as NSTextBlockMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of this object.

### 42.8.6 setBorderColor(color as NSColorMBS)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the color of all borders of the text block.
**Notes:** This setting has no visible effect unless the border width is larger than the default, which is 0.
See also:

- 42.8.7 setBorderColor(color as NSColorMBS, edge as Integer) 8152

### 42.8.7 setBorderColor(color as NSColorMBS, edge as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the border color of the specified edge of the text block.
**Notes:** color: The new color.
edge: The edge whose color is to be set.

This setting has no visible effect unless the border width is larger than the default, which is 0.
See also:

- 42.8.6 setBorderColor(color as NSColorMBS) 8152

### 42.8.8 setContentWidth(value as double, ValueType as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the width of the text block.
**Notes:** value: The new value for the width.
ValueType: The type of value being provided. This controls how val is interpreted.

### 42.8.9 setValue(value as double, ValueType as Integer, dimension as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a dimension of the text block.
**Notes:** value: The new value for the dimension.
ValueType: The type of value being provided. This controls how value is interpreted.
dimension: The dimension to set.

### 42.8.10 setWidth(value as double, ValueType as Integer, Layer as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the width of all edges of a specified layer of the text block.
**Notes:** value: The new value for the specified edge width.
type: The type of value being provided. This controls how val is interpreted.
layer: The layer of the text block to modify.
See also:

- 42.8.11 setWidth(value as double, ValueType as Integer, Layer as Integer, edge as Integer) 8153

### 42.8.11 setWidth(value as double, ValueType as Integer, Layer as Integer, edge as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the width of all edges of a specified layer of the text block.
**Notes:** value: The new value for the specified edge width.
type: The type of value being provided. This controls how val is interpreted.
layer: The layer of the text block to modify.
edge: The edge of the layer to examine.
See also:

- 42.8.10 setWidth(value as double, ValueType as Integer, Layer as Integer) 8153

### 42.8.12 valueForDimension(dimension as Integer) as Double

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value of the specified text block dimension.
**Notes:** The value for the specified dimension. This value should be interpreted according to the value type returned by valueTypeForDimension.

### 42.8.13 valueTypeForDimension(dimension as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value type of the specified text block dimension.
**Notes:** The value type for the specified text block dimension. This result determines how the value for the dimension should be interpreted.

### 42.8.14 width(layer as Integer, edge as Integer) as double

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the width of an edge of a specified layer of the text block.
**Notes:** layer: The layer to examine.
edge: The edge of the layer to examine.

Returns The width of the edge of layer. This value must be interpreted according to the value type returned by widthValueTypeForLayer().

### 42.8.15 widthValueType(layer as Integer, edge as Integer) as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value type of an edge of a specified layer of the text block.
**Notes:** layer: The layer to examine.
edge: The edge of the layer to examine.

Returns the value type of the edge of layer. This determines how the value for this edge of layer should be interpreted.

### 42.8.16 Properties

### 42.8.17 backgroundColor as NSColorMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background color of the text block.
**Notes:** (Read and Write property)

### 42.8.18 contentWidth as Double

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The width of the text block.
**Notes:** This property interpreted according to the value type returned by contentWidthValueType.
(Read only property)

### 42.8.19 contentWidthValueType as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The type of value stored for the text block width.
**Notes:** This property determines how the width value should be interpreted.
(Read only property)

### 42.8.20 Handle as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 42.8.21 verticalAlignment as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vertical alignment of the text block.
**Notes:** (Read and Write property)

### 42.8.22 Constants

Dimension

| Constant | Value | Description |
|---|---|---|
| DimensionHeight | 4 | Height of the text block. |
| DimensionMaximumHeight | 6 | Maximum height of the text block. |
| DimensionMaximumWidth | 2 | Maximum width of the text block. |
| DimensionMinimumHeight | 5 | Minimum height of the text block. |
| DimensionMinimumWidth | 1 | Minimum width of the text block. |
| DimensionWidth | 0 | Width of the text block. |

Layer

| Constant | Value | Description |
|---|---|---|
| LayerBorder | 0 | The border of the text block. |
| LayerMargin | 1 | Margin of the text block: space surrounding the border. |
| LayerPadding | -1 | Padding of the text block: space surrounding the content area extending to the border. |

Value Types

| Constant | Value | Description |
|---|---|---|
| ValueTypeAbsolute | 0 | Absolute value in points. |
| ValueTypePercentage | 1 | Percentage value (out of 100). |

Vertical Alignment

| Constant | Value | Description |
|---|---|---|
| VerticalAlignmentBaseline | 3 | Aligns adjacent blocks at the baseline of the first line of text in the block. |
| VerticalAlignmentBottom | 2 | Aligns adjacent blocks at their bottom. |
| VerticalAlignmentMiddle | 1 | Aligns adjacent blocks at their middle. |
| VerticalAlignmentTop | 0 | Aligns adjacent blocks at their top. |

## 42.9 class NSTextContainerMBS

### 42.9.1 class NSTextContainerMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The NSTextContainer class defines a region where text is laid out.
**Notes:** An NSLayoutManager uses NSTextContainer to determine where to break lines, lay out portions of text, and so on. NSTextContainer defines rectangular regions, but you can create subclasses that define regions of other shapes, such as circular regions, regions with holes in them, or regions that flow alongside graphics.
**Blog Entries**

- MBS Xojo Plugins, version 18.6pr1
- Line Wrap for Textarea in Xojo Mac applications
- MBS Xojo / Real Studio Plugins, version 14.2pr1
- MBS Real Studio Plugins, version 12.4pr4

### 42.9.2 Methods

### 42.9.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a text container with no bounds.
**Notes:** Returns the newly initialized text container.
See also:

- 42.9.4 Constructor(size as NSSizeMBS) 8157

### 42.9.4 Constructor(size as NSSizeMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a text container with a specified bounding rectangle.
**Notes:** size: The size of the text container's bounding rectangle.

Returns the newly initialized text container.

The new text container must be added to an NSLayoutManager object before it can be used. The text container must also have an NSTextView object set for text to be displayed. This method is the designated initializer for the NSTextContainer class.
See also:

• 42.9.3 Constructor 8157

### 42.9.5 containsPoint(p as NSPointMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Overridden by subclasses to return whether a point lies within the receiver's region or on the region's edge—not simply within its bounding rectangle.
**Notes:** True if aPoint lies within the receiver's region or on the region's edge—not simply within its bounding rectangle - false otherwise.

For example, if the receiver defines a donut shape and aPoint lies in the hole, this method returns false. This method can be used for hit testing of mouse events.

The default NSTextContainer implementation merely checks that aPoint lies within its bounding rectangle.

### 42.9.6 isSimpleRectangularTextContainer as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Overridden by subclasses to return whether the receiver's region is a rectangle with no holes or gaps and whose edges are parallel to the text view's coordinate system axes.
**Notes:** True if the receiver's region is a rectangle with no holes or gaps and whose edges are parallel to the text view's coordinate system axes, false otherwise.

A text container whose shape changes can return true if its region is currently a simple rectangle, but when its shape does change it must send textContainerChangedGeometry to its layout manager so the layout can be recalculated.

The default NSTextContainer implementation of this method returns true.

### 42.9.7 replaceLayoutManager(l as NSLayoutManagerMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the layout manager for the group of text system objects containing the receiver.
**Notes:** All text containers and text views sharing the original layout manager share the new layout manager. This method makes all the adjustments necessary to keep these relationships intact, unlike setLayoutManager.

### 42.9.8 Properties

### 42.9.9 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 42.9.10 containerSize as NSSizeMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The size of the receiver's bounding rectangle.
**Notes:** size: The new size of the text container's bounding rectangle.
This method also sends textContainerChangedGeometry to the text container's layout manager.
(Read and Write computed property)

### 42.9.11 heightTracksTextView as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the receiver adjusts the height of its bounding rectangle when its text view is resized.
**Notes:** value: True if the receiver should follow changes to the height of its text view, false otherwise.
(Read and Write computed property)

### 42.9.12 layoutManager as NSLayoutManagerMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The layout manager.
**Notes:** This method is invoked automatically when you add a text container to a layout manager; you should never need to invoke it directly, but might want to override it. If you want to replace the layout manager for an established group of text system objects, use replaceLayoutManager.
(Read and Write computed property)

### 42.9.13 lineFragmentPadding as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The amount by which text is inset within line fragment rectangles.
**Notes:** Value: The amount by which text is inset within line fragment rectangles, in points.

This method also sends textContainerChangedGeometry to the text container's layout manager.

Line fragment padding is not designed to express text margins. Instead, use the NSTextView method setTextContainerInset, paragraph margin attributes, or the position of the text view within a superview.
(Read and Write computed property)

### 42.9.14 textView as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** The text view.
**Notes:** This method sends setTextContainer to aTextView to complete the association of the text container and text view.

Because you usually specify a text container when you create a text view, you should rarely need to invoke this method. A text container doesn't need a text view to calculate line fragment rectangles, but must have one to display text.

You can use this method to disconnect a text view from a group of text system objects by sending this message to its text container and passing nil as aTextView.
(Read and Write computed property)

### 42.9.15 widthTracksTextView as boolean

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the receiver adjusts the width of its bounding rectangle when its text view is resized.
**Notes:** Returns true if the receiver adjusts the width of its bounding rectangle when its text view is resized, false otherwise.

If the receiver does track the text view width, its width is adjusted to the width of the text view minus twice the inset width (as given by NSTextView's textContainerInset method).
(Read and Write computed property)

### 42.9.16 Constants

Line Movement Constants

| Constant | Value | Description |
|---|---|---|
| NSLineDoesntMove | 0 | Line has no movement. |
| NSLineMovesDown | 3 | Lines move from top to bottom. |
| NSLineMovesLeft | 1 | Lines move from right to left. |
| NSLineMovesRight | 2 | Lines move from left to right. |
| NSLineMovesUp | 4 | Lines move from bottom to top. |

Line Sweep Direction Constants

| Constant | Value | Description |
|---|---|---|
| NSLineSweepDown | 2 | Characters move from top to bottom. |
| NSLineSweepLeft | 0 | Characters move from right to left. |
| NSLineSweepRight | 1 | Characters move from left to right. |
| NSLineSweepUp | 3 | Characters move from bottom to top. |

## 42.10 class NSTextListMBS

### 42.10.1 class NSTextListMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** A section of text that forms a single list.
**Notes:** The visible elements of the list, including list markers, appear in the text as they do for lists created by hand. The list object, however, allows the list to be recognized as such by the text system. This enables automatic creation of markers and spacing. Text lists are used in HTML import and export.

Text lists appear as attributes on paragraphs, as part of the paragraph style. An NSParagraphStyle may have an array of text lists, representing the nested lists containing the paragraph, in order from outermost to innermost. For example, if list1 contains four paragraphs, the middle two of which are also in the inner list2, then the text lists array for the first and fourth paragraphs is (list1), while the text lists array for the second and third paragraphs is (list1, list2).
The methods implementing this are textLists on NSParagraphStyle, and textLists on NSMutableParagraph-Style.

In addition, NSAttributedString has convenience methods for lists, such as rangeOfTextList, which determines the range covered by a list, and itemNumberInTextList, which determines the ordinal position within a list of a particular item.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.1
- MBS Xojo Plugins, version 18.1pr3

**Xojo Developer Magazine**

- 21.6, page 8: News

### 42.10.2 Methods

### 42.10.3 Constructor(format as String, OptionsMask as Integer = 0)

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an initialized text list.
**Notes:** format: The marker format for the text list.
mask: The marker options for the text list. Values for mask are listed in Constants.

Returns an initialized text list.

The marker format is specified as a constant string, except for a numbering specifier, which takes the form { keyword } . The currently supported values for keyword include:

- box
- check
- circle
- diamond
- disc
- hyphen
- square
- lower-hexadecimal
- upper-hexadecimal
- octal
- lower-alpha or lower-latin
- upper-alpha or upper-latin
- lower-roman
- upper-roman
- decimal

Thus, for example, "( { decimal } )" would specify the format for a list numbered (1), (2), (3), and so on, and @" { upper-roman } " would specify the format for a list numbered I, II, III, IV, and so on. (All of these keywords are included in the Cascading Style Sheets level 3 specification.)

### 42.10.4 copy as NSTextListMBS

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a copy of the text list.

### 42.10.5 markerForItemNumber(ItemNum as Integer) as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the computed value for a specific ordinal position in the list.
**Notes:** itemNum: The ordinal position in the list whose computed marker value is desired.

Returns the computed maker value for itemNum.

### 42.10.6 NSTextListMarkerBox as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.7 NSTextListMarkerCheck as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.8 NSTextListMarkerCircle as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.9 NSTextListMarkerDecimal as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.10 NSTextListMarkerDiamond as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.11 NSTextListMarkerDisc as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.12 NSTextListMarkerHyphen as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.13 NSTextListMarkerLowercaseAlpha as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.14 NSTextListMarkerLowercaseHexadecimal as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.15 NSTextListMarkerLowercaseLatin as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.16 NSTextListMarkerLowercaseRoman as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.17 NSTextListMarkerOctal as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.18 NSTextListMarkerSquare as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.19 NSTextListMarkerUppercaseAlpha as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.20 NSTextListMarkerUppercaseHexadecimal as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.21 NSTextListMarkerUppercaseLatin as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.22 NSTextListMarkerUppercaseRoman as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** One of the format texts.
**Notes:** Available on MacOS 10.13 or newer.

### 42.10.23 Properties

### 42.10.24 Handle as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal reference number.
**Notes:** (Read and Write property)

### 42.10.25 listOptions as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the list options mask value of the receiver.
**Notes:** Can be NSTextListPrependEnclosingMarker.
(Read only property)

### 42.10.26 markerFormat as String

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the marker format string used by the receiver.
**Notes:** (Read only property)

### 42.10.27 startingItemNumber as Integer

MBS MacBase Plugin, Plugin Version: 18.1, Platforms: macOS, iOS, Targets: All.

**Function:** Sets the starting item number for the text list.
**Notes:** The default value is 1. This value will be used only for ordered lists, and ignored in other cases.
(Read and Write property)

### 42.10.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTextListPrependEnclosingMarker | 1 | One of the constants for options.<br>Specifies that a nested list should include the marker for its enclosing supe<br>before its own marker. |

## 42.11 class NSTextMBS

### 42.11.1 class NSTextMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa class for text controls.
**Notes:** You may prefer to use the NSTextViewMBS class which is a subclass from NSTextMBS.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- RTF functions in MBS Plugins
- MBS Xojo Plugins, version 22.1pr3
- MBS Xojo / Real Studio Plugins, version 16.5pr6
- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 42.11.2 Methods

### 42.11.3 alignCenter

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method applies center alignment to selected paragraphs (or all text if the receiver is a plain text object).

### 42.11.4 alignLeft

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method applies left alignment to selected paragraphs (or all text if the receiver is a plain text object).

### 42.11.5 alignRight

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method applies right alignment to selected paragraphs (or all text if the receiver is a plain text object).

### 42.11.6 changeFont

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method changes the font of the selection for a rich text object, or of all text for a plain text object.
**Notes:** If the receiver doesn't use the Font panel, this method does nothing.

This method changes the font by sending a convertFont message to the shared NSFontManager and applying each NSFont returned to the appropriate text. See the NSFontManager class specification for more information on font conversion.

### 42.11.7 checkSpelling

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** This action method searches for a misspelled word in the receiver's text.
**Notes:** The search starts at the end of the selection and continues until it reaches a word suspected of being misspelled or the end of the text. If a word isn't recognized by the spelling server, a showGuessPanel message then opens the Guess panel and allows the user to make a correction or add the word to the local dictionary.

### 42.11.8 Constructor

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text with size 100/100 and position 0/0
**Example:**

```
dim t as new NSTextMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 42.11.9 Constructor(Handle as Integer) 8170
- 42.11.10 Constructor(left as Double, top as Double, width as Double, height as Double) 8171


### 42.11.9 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSText handle.
**Example:**

```
dim t as new NSTextMBS(0, 0, 100, 100)
dim v as new NSTextMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSText and the plugin retains this handle.
See also:

- 42.11.8 Constructor 8170
- 42.11.10 Constructor(left as Double, top as Double, width as Double, height as Double) 8171

### 42.11.10 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new text with the given size and position.
**Example:**

```
dim x as new NSTextMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 42.11.8 Constructor 8170
- 42.11.9 Constructor(Handle as Integer) 8170

### 42.11.11 copy

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method copies the selected text onto the general pasteboard, in as many formats as the receiver supports.

### 42.11.12 copyFont

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method copies the font information for the first character of the selection (or for the insertion point) onto the font pasteboard, as NSFontPboardType.

### 42.11.13 copyRuler

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method copies the paragraph style information for first selected paragraph onto the ruler pasteboard, as NSRulerPboardType, and expands the selection to paragraph boundaries.

### 42.11.14 cut

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method deletes the selected text and places it onto the general pasteboard, in as many formats as the receiver supports.

### 42.11.15 delete

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method deletes the selected text.

### 42.11.16 isRulerVisible as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver's enclosing scroll view shows its ruler.

### 42.11.17 maxSizeHeight as Double

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's maximum height.

### 42.11.18 maxSizeWidth as Double

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's maximum width.

### 42.11.19 minSizeHeight as Double

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's minimum height.

### 42.11.20 minSizeWidth as Double

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's maximum width.

### 42.11.21 NSCenterTextAlignment as Integer

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the text alignment constants for the alignment property.
**Notes:** Visually centered

### 42.11.22 NSRightTextAlignment as Integer

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the text alignment constants for the alignment property.
**Notes:** Visually right aligned

### 42.11.23 paste

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method pastes text from the general pasteboard at the insertion point or over the selection.

### 42.11.24 pasteFont

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method pastes font information from the font pasteboard onto the selected text or insertion point of a rich text object, or over all text of a plain text object.

### 42.11.25 pasteRuler

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method pastes paragraph style information from the ruler pasteboard onto the selected paragraphs of a rich text object.

### 42.11.26 readRTFDFromFile(file as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Attempts to read the RTFD file, returning true if successful and false if not.
**Notes:** file should be the path for an .rtf file or an .rtfd file wrapper, not for the RTF file within an .rtfd file wrapper.

### 42.11.27 replaceCharactersInRangeWithRTF(start as Integer, length as Integer, rtfData as MemoryBlock)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the characters in the given range with RTF text interpreted from the given RTF data.
**Notes:** This method applies only to rich text objects.

This method does not include undo support by default. Clients must invoke shouldChangeTextInRange to include this method in an undoable action.

This method is designed for transferring text from out-of-process sources such as the pasteboard. In most cases, programmatic modification of the text is best done by operating on the text storage directly, using the general methods of NSMutableAttributedString.

### 42.11.28 replaceCharactersInRangeWithRTFD(start as Integer, length as Integer, rtfdData as MemoryBlock)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the characters in the given range with RTFD text interpreted from the given RTFD data.

**Notes:** This method applies only to rich text objects.

This method does not include undo support by default. Clients must invoke shouldChangeTextInRange to include this method in an undoable action.

This method is designed for transferring text from out-of-process sources such as the pasteboard. In most cases, programmatic modification of the text is best done by operating on the text storage directly, using the general methods of NSMutableAttributedString.

### 42.11.29 replaceCharactersInRangeWithString(start as Integer, length as Integer, text as string)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the characters in the given range with those in the given string.
**Notes:** For a rich text object, the text is assigned the formatting attributes of the first character of the text it replaces, or of the character immediately before aRange if the range's length is 0. If the range's location is 0, the formatting attributes of the first character in the receiver are used.

This method does not include undo support by default. Clients must invoke shouldChangeTextInRange to include this method in an undoable action.

In most cases, programmatic modification of the text is best done by operating on the text storage directly, using the general methods of NSMutableAttributedString.

### 42.11.30 RTFDFromRange(start as Integer, length as Integer) as MemoryBlock

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a string that contains an RTFD stream corresponding to the characters and attributes within aRange.
**Notes:** Raises an NSRangeException if any part of aRange lies beyond the end of the receiver's characters.

When writing data to the pasteboard, you can use the memoryblock object as the first argument to NSPasteboard's setDataForType method, with a second argument of NSRTFDPboardType.

### 42.11.31 RTFFromRange(start as Integer, length as Integer) as MemoryBlock

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** eturns a string object that contains an RTF stream corresponding to the characters and attributes within aRange, omitting any attachment characters and attributes.
**Notes:** Raises an NSRangeException if any part of aRange lies beyond the end of the receiver's characters.

When writing data to the pasteboard, you can use the memoryblock as the first argument to NSPasteboard's setDataForType method, with a second argument of NSRTFPboardType.

### 42.11.32 scrollRangeToVisible(start as Integer, length as Integer)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver in its enclosing scroll view so the first characters of aRange are visible.

### 42.11.33 selectAll

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method selects all of the receiver's text.

### 42.11.34 setFontForRange(font as NSFontMBS, start as Integer, length as Integer)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the font of characters within the given range to font.
**Notes:** This method applies only to a rich text object.

This method does not include undo support by default. Clients must invoke shouldChangeTextInRanges to include this method in an undoable action.

### 42.11.35 setMaxSize(width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver's maximum size.

### 42.11.36 setMinSize(width as Double, height as Double)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the receiver's minimum size.

### 42.11.37 setTextColorForRange(colorValue as NSColorMBS, start as Integer, length as Integer)

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the text color of characters within the given range to colorValue.
**Notes:** Removes the text color attribute if colorValue is nil. This method applies only to rich text objects.

This method does not include undo support by default. Clients must invoke shouldChangeTextInRange to include this method in an undoable action.

### 42.11.38 showGuessPanel

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** This action method opens the Spelling panel, allowing the user to make a correction during spell checking.

### 42.11.39 sizeToFit

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the receiver to fit its text.
**Notes:** The text view will not be sized any smaller than its minimum size, however.

### 42.11.40 subscript

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method applies a subscript attribute to selected text (or all text if the receiver is a plain text object), lowering its baseline offset by a predefined amount.

### 42.11.41 superscript

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method applies a superscript attribute to selected text (or all text if the receiver is a plain text object), raising its baseline offset by a predefined amount.

### 42.11.42 textLength as Integer

MBS MacCocoa Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the length of the text in unicode chars.

### 42.11.43 toggleRuler

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method shows or hides the ruler, if the receiver is enclosed in a scroll view.

### 42.11.44 underline

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds the underline attribute to the selected text attributes if absent; removes the attribute if present.
**Notes:** If there is a selection and the first character of the selected range has any form of underline on it, or if there is no selection and the typing attributes have any form of underline, then underline is removed; otherwise a single simple underline is added.

Operates on the selected range if the receiver contains rich text. For plain text the range is the entire contents of the receiver.

### 42.11.45 unscript

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** This action method removes any superscripting or subscripting from selected text (or all text if the receiver is a plain text object).

### 42.11.46 writeRTFDToFile(file as folderitem, atomically as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Writes the receiver's text as RTF with attachments to a file or directory at file.
**Notes:** Returns true on success and false on failure. If atomically is true, attempts to write the file safely so that an existing file at path is not overwritten, nor does a new file at path actually get created, unless the write is successful.

### 42.11.47 Properties

### 42.11.48 alignment as Integer

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The text alignment.
**Notes:** (Read and Write computed property)

### 42.11.49 backgroundColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The background color.
**Notes:** (Read and Write computed property)

### 42.11.50 baseWritingDirection as Integer

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The initial writing direction used to determine the actual writing direction for text.
**Notes:** The Text system uses this value as a hint for calculating the actual direction for displaying Unicode characters. You should not need to call this method directly. If no writing direction is set, returns NSWritingDirectionNatural.

Available in Mac OS X v10.4 and later.
(Read and Write computed property)

### 42.11.51 drawsBackground as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the scrollview draws its background.
**Notes:** (Read and Write computed property)

### 42.11.52 Enabled as boolean

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Enables/disables the control.
**Notes:** If enabled, text is in default text color.
if disabled, you can't edit or select and the text color is gray.
(Read and Write computed property)

### 42.11.53 font as NSFontMBS

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The font of the first character in the receiver's text, or of the insertion point if there's no text.
**Notes:** (Read and Write computed property)

### 42.11.54 importsGraphics as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows the user to import files by dragging.
**Notes:** (Read and Write computed property)

### 42.11.55 isEditable as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver allows the user to edit text, false if it doesn't.
**Notes:** You can change the receiver's text programmatically regardless of this setting.

If the receiver is editable, it's also selectable.
(Read and Write computed property)

### 42.11.56 isFieldEditor as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver interprets Tab, Shift-Tab, and Return (Enter) as cues to end editing and possibly to change the first responder.
**Notes:** True if the receiver interprets Tab, Shift-Tab, and Return (Enter) as cues to end editing and possibly to change the first responder; false if it accepts them as text input.

See the NSWindow class specification for more information on field editors. By default, NSText objects don't behave as field editors.
(Read and Write computed property)

### 42.11.57 isHorizontallyResizable as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True if the receiver automatically changes its width to accommodate the width of its text, false if it doesn't.
**Notes:** By default, an NSText object is not horizontally resizable.
(Read and Write computed property)

### 42.11.58 isRichText as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the NSText allows the user to apply attributes to specific ranges of the text.
**Notes:** (Read and Write computed property)

### 42.11.59 isSelectable as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the text allows the user to select text, false if it doesn't.
**Notes:** (Read and Write computed property)

### 42.11.60 isVerticallyResizable as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** True if the receiver automatically changes its height to accommodate the height of its text, false if it doesn't.
**Notes:** By default, an NSText object is vertically resizable.

(Read and Write computed property)

### 42.11.61 selectedRange as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The range of selected characters.
**Example:**

```
dim t as NSTextViewMBS = TextArea1.NSTextViewMBS
dim s as NSTextStorageMBS = t.textStorage

const NSUnderlineStyleSingle = 1

dim r as NSRangeMBS = t.selectedRange
s.addAttribute NSAttributedStringMBS.NSStrikethroughStyleAttributeName, NSUnderlineStyleSingle, r
```

**Notes:** (Read and Write computed property)

### 42.11.62 text as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The characters of the text.
**Notes:** For performance reasons, this method returns the current backing store of the text object. If you want to maintain a snapshot of this as you manipulate the text storage, you should make a copy of the appropriate substring.
(Read and Write computed property)

### 42.11.63 textColor as NSColorMBS

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The text color.
**Notes:** (Read and Write computed property)

### 42.11.64 usesFontPanel as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver uses the Font panel.
**Notes:** (Read and Write computed property)

### 42.11.65 Events

### 42.11.66 textDidBeginEditing

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has begun editing (that the user has begun changing it).

### 42.11.67 textDidChange

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has changed its characters or formatting attributes.

### 42.11.68 textDidEndEditing

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Informs you that the text object has finished editing (that it has resigned first responder status).

### 42.11.69 textShouldBeginEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Invoked when a text object begins to change its text, this method requests permission to begin editing.
**Notes:** If the delegate returns false, the text object proceeds to make changes. If the delegate returns true, the text object abandons the editing operation. This method is also invoked when the user drags and drops a file onto the text object.

### 42.11.70 textShouldEndEditing as boolean

MBS MacCocoa Plugin, Plugin Version: 8.4, Platform: macOS, Targets: .

**Function:** Invoked from a text object's implementation of resignFirstResponder, this method requests permission to end editing.

**Notes:** If the delegate returns false, the text object proceeds to finish editing and resign first responder status. If the delegate returns true, the text object selects all of its text and remains the first responder.

### 42.11.71 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSBackspaceCharacter | 8 | One of the constants to specify commonly used Unicode characters. |
| NSBackTabCharacter | &h19 | One of the constants to specify commonly used Unicode characters. |
| NSBacktabTextMovement | &h12 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The Backtab (Shift-Tab) key was pressed. |
| NSCancelTextMovement | &h17 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The user cancelled the completion.<br>Available in Mac OS X v10.3 and later. |
| NSCarriageReturnCharacter | 13 | One of the constants to specify commonly used Unicode characters. |
| NSDeleteCharacter | &h7F | One of the constants to specify commonly used Unicode characters. |
| NSDownTextMovement | &h16 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The down arrow key was pressed. |
| NSEnterCharacter | 3 | One of the constants to specify commonly used Unicode characters. |
| NSFormFeedCharacter | 12 | One of the constants to specify commonly used Unicode characters. |
| NSIllegalTextMovement | 0 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>Currently unused. |
| NSLeftTextMovement | &h13 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The left arrow key was pressed. |
| NSLineSeparatorCharacter | &h2028 | One of the constants to specify commonly used Unicode characters. |
| NSNewlineCharacter | 10 | One of the constants to specify commonly used Unicode characters. |
| NSOtherTextMovement | 0 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The user performed some undefined action.<br>Available in Mac OS X v10.3 and later. |
| NSParagraphSeparatorCharacter | &h2029 | One of the constants to specify commonly used Unicode characters. |
| NSReturnTextMovement | &h10 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The Return key was pressed. |
| NSRightTextMovement | &h14 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The right arrow key was pressed. |
| NSTabCharacter | 9 | One of the constants to specify commonly used Unicode characters. |
| NSTabTextMovement | &h11 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The Tab key was pressed. |
| NSTextWritingDirectionEmbedding | 0 | An additional constant to specify the writing direction.<br>Direction is embedded.<br>Available in Mac OS X v10.6 and later. |
| NSTextWritingDirectionOverride | 1 | An additional constant to specify the writing direction.<br>Direction override<br>Available in Mac OS X v10.6 and later. |
| NSUpTextMovement | &h15 | One of the constants used to specify the reason for a change of editing among text fields, in essence answering the question "why am I leavin field?"<br>The up arrow key was pressed. |

Alignment Modes

| Constant | Value | Description |
|---|---|---|
| NSJustifiedTextAlignment | 3 | Fully-justified. The last line in a paragraph is natural-aligned. |
| NSLeftTextAlignment | 0 | Visually left aligned |
| NSNaturalTextAlignment | 4 | Indicates the default alignment for script. |

Writing Direction

| Constant | Value | Description |
|---|---|---|
| NSWritingDirectionLeftToRight | 0 | The writing direction is left to right.<br>Available in Mac OS X v10.2 and later. |
| NSWritingDirectionNatural | -1 | The writing direction is determined using the Unicode Bidi Algorithm rules P2 and P3. Default.<br>Available in Mac OS X v10.4 and later. |
| NSWritingDirectionRightToLeft | 1 | The writing direction is right to left.<br>Available in Mac OS X v10.2 and later. |

## 42.12 class NSTextStorageMBS

### 42.12.1 class NSTextStorageMBS

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The class for the text storage of a text view.
**Notes:** NSTextStorage is a semiconcrete subclass of NSMutableAttributedString that manages a set of client NSLayoutManager objects, notifying them of any changes to its characters or attributes so that they can relay and redisplay the text as needed. NSTextStorage defines the fundamental storage mechanism of the Application Kit's extended text-handling system.

NSTextStorage also defines a set of methods, listed under "Getting and setting scriptable properties" in the Method Types section, useful for getting and setting scriptable properties of NSTextStorage objects. Unless you are dealing with scriptability, you do not normally need to invoke these methods directly. In particular, using the characters, words or paragraphs methods or their corresponding setter methods is an inefficient way to manipulate the text storage, since these methods create and return many objects. Instead, use the text access methods defined by NSMutableAttributedString, NSAttributedString, NSMutableString, and NSString to perform character-level manipulation.
Subclass of the NSMutableAttributedStringMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr4

### 42.12.2 Methods

### 42.12.3 addLayoutManager(l as NSLayoutManagerMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds a layout manager to the receiver's set of layout managers.
**Notes:** l: The layout manager to add.

### 42.12.4 changeInLength as Integer

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the difference between the current length of the edited range and its length before editing began.
**Notes:** Returns the difference between the current length of the edited range and its length before editing began. That is, before the receiver was sent the first beginEditing message or a single edited:range:changeInLength: message.

This difference is accumulated with each invocation of edited:range:changeInLength:, until a final message

processes the changes.

The receiver's delegate and layout managers can use this information to determine the nature of edits in their respective notification methods.

### 42.12.5 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new empty text storage object.

### 42.12.6 editedMask as Integer

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the kinds of edits pending for the receiver.
**Notes:** Returns a mask describing the kinds of edits pending for the receiver.

### 42.12.7 editedRange as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** eturns the range of the receiver to which pending changes have been made, whether of characters or of attributes.
**Notes:** The receiver's delegate and layout managers can use this information to determine the nature of edits in their respective notification methods.

### 42.12.8 ensureAttributesAreFixedInRange(Range as NSRangeMBS)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Ensures that attributes are fixed in the given range.
**Notes:** range: The range of characters whose attributes might be examined.

An NSTextStorage object using lazy attribute fixing is required to call this method before accessing any attributes within range. This method gives attribute fixing a chance to occur if necessary. NSTextStorage subclasses wishing to support laziness must call this method from all attribute accessors they implement.

### 42.12.9 fixesAttributesLazily as boolean

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the receiver fixes attributes lazily.
**Notes:** By default, custom NSTextStorage subclasses are not lazy, but the provided concrete subclass is lazy by default.

### 42.12.10 invalidateAttributesInRange(Range as NSRangeMBS)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Invalidates attributes in the specified range.
**Notes:** range: The range of characters whose attributes should be invalidated.

Called from processEditing to invalidate attributes when the text storage changes. If the receiver is not lazy, this method simply calls fixAttributesInRange. If lazy attribute fixing is in effect, this method instead records the range needing fixing.

### 42.12.11 processEditing

MBS MacCocoa Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Cleans up changes made to the receiver and notifies its delegate and layout managers of changes.

### 42.12.12 removeLayoutManager(l as NSLayoutManagerMBS)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes a layout manager from the receiver's set of layout managers.
**Notes:** l: The layout manager to remove.

### 42.12.13 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSTextStorageEditedAttributes | 1 | The constants for text messages.<br>Attributes were added, removed, or changed. |
| NSTextStorageEditedCharacters | 2 | The constants for text messages.<br>Characters were added, removed, or replaced. |

## 42.13 class NSTextTableBlockMBS

### 42.13.1 class NSTextTableBlockMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A text block that appears as a cell in a text table.
**Notes:** Subclass of the NSTextBlockMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MBS Xojo Plugins, version 22.0pr6

### 42.13.2 Methods

### 42.13.3 Constructor

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 42.13.4 Constructor(table as NSTextTableMBS, startingRow as Integer, rowSpan as Integer, startingColumn as Integer, colSpan as Integer) 8191

### 42.13.4 Constructor(table as NSTextTableMBS, startingRow as Integer, rowSpan as Integer, startingColumn as Integer, colSpan as Integer)

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Returns an initialized text table block.

table: The text table containing this text table block.
startingRow: The table row at which the text table block starts.
rowSpan: How many rows the text table block covers.
startingColumn: The table column at which the text table block starts.
colSpan: How many columns the text table block covers.
See also:

- 42.13.3 Constructor 8191

### 42.13.5 Properties

### 42.13.6 columnSpan as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of table columns spanned by this text table block.
**Notes:** (Read only property)

### 42.13.7 rowSpan as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of table rows spanned by this text table block.
**Notes:** (Read only property)

### 42.13.8 startingColumn as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The table column at which this text table block starts.
**Notes:** (Read only property)

### 42.13.9 startingRow as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The table row at which this text table block starts.
**Notes:** (Read only property)

### 42.13.10 table as NSTextTableMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the table containing this text table block.
**Notes:** (Read only property)

## 42.14 class NSTextTableMBS

### 42.14.1 class NSTextTableMBS

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An object that represents a text table as a whole.
**Notes:** A text table is responsible for laying out and drawing the text table blocks it contains, and it maintains the basic parameters of the table.
Subclass of the NSTextBlockMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- MBS Xojo Plugins, version 22.0pr6

### 42.14.2 Methods

### 42.14.3 Constructor

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 42.14.4 Properties

### 42.14.5 collapsesBorders as Boolean

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value indicating whether the text table borders are collapsible.
**Notes:** The value of this property is true when the text table borders are collapsible.
(Read and Write property)

### 42.14.6 hidesEmptyCells as Boolean

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value indicating whether the text table hides empty cells.
**Notes:** The value of this property is true when the text table hides empty cells. If empty cells are hidden, locations with empty cells allow the background of the enclosing block or text container to show through.

(Read and Write property)

### 42.14.7 layoutAlgorithm as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The text table layout algorithm.
**Notes:** (Read and Write property)

### 42.14.8 numberOfColumns as Integer

MBS MacBase Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of columns in the text table.
**Notes:** (Read and Write property)

### 42.14.9 Constants

Text table layout algorithm

| Constant | Value | Description |
|---|---|---|
| LayoutAlgorithmAutomatic | 0 | Specifies automatic layout algorithm |
| LayoutAlgorithmFixed | 1 | Specifies fixed layout algorithm |

## 42.15 class NSTextTabMBS

### 42.15.1 class NSTextTabMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** An NSTextTab object represents a tab in an NSParagraphStyle object, storing an alignment type and location.
**Notes:** NSTextTab objects are most frequently used with the Application Kit's text system and with NSRulerView and NSRulerMarker objects. See the appropriate class specifications for more information on these uses.

The text system supports four alignment types: left, center, right, and decimal (based on the decimal separator character of the locale in effect). These alignment types are absolute, not based on the line sweep direction of text. For example, tabbed text is always positioned to the left of a right-aligned tab, whether the line sweep direction is left to right or right to left. A tab's location, on the other hand, is relative to the back margin. A tab set at 1.5", for example, is at 1.5" from the right in right to left text.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 42.15.2 Methods

### 42.15.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The default constructor.
See also:


- 42.15.4 Constructor(alignment as Integer, location as Double, options as dictionary) 8195
- 42.15.5 Constructor(type as Integer, location as Double) 8196


### 42.15.4 Constructor(alignment as Integer, location as Double, options as dictionary)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Initializes a text tab with the text alignment, location, and options.
**Notes:** The text alignment is used to determine the position of text inside the tab column. See NSTextTabType for a mapping between alignments and tab stop types.
See also:


- 42.15.3 Constructor 8195

- 42.15.5 Constructor(type as Integer, location as Double) 8196


### 42.15.5 Constructor(type as Integer, location as Double)

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated NSTextTab with an alignment of type at location on the paragraph.
**Notes:** The location is relative to the back margin, based on the line sweep direction of the paragraph. type can be any of the values described in NSTextTabType.
See also:


- 42.15.3 Constructor 8195
- 42.15.4 Constructor(alignment as Integer, location as Double, options as dictionary) 8195


### 42.15.6 copy as NSTextTabMBS

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the text tab.

### 42.15.7 Properties

### 42.15.8 alignment as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the text alignment of the receiver.
**Notes:** (Read only property)

### 42.15.9 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 42.15.10 location as Double

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the receiver's ruler location relative to the back margin.
**Notes:** (Read only property)

### 42.15.11 options as Dictionary

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the dictionary of attributes associated with the receiver.
**Notes:** (Read only property)

### 42.15.12 tabStopType as Integer

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the receiver's tab stop type.
**Notes:** (Read only property)

### 42.15.13 Constants

Tab Stop Types

| Constant | Value | Description |
|---|---|---|
| NSCenterTabStopType | 2 | A center-aligned tab stop. |
| NSDecimalTabStopType | 3 | Aligns columns of numbers by the decimal point. |
| NSLeftTabStopType | 0 | A left-aligned tab stop. |
| NSRightTabStopType | 1 | A right-aligned tab stop. |

## 42.16 class NSUndoManagerMBS

### 42.16.1 class NSUndoManagerMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** NSUndoManager is a general-purpose recorder of operations for undo and redo.
**Notes:** You register an undo operation by specifying the object that's changing (or the owner of that object), along with a method to invoke to revert its state, and the arguments for that method. When performing undo an NSUndoManager saves the operations reverted so that you can redo the undos. If used in a Cocoa Application Kit-based application, NSUndoManager groups all operations within a single cycle of the run loop, so that performing an undo reverts all changes that occurred during the cycle.

NSUndoManager is implemented as a class of the Foundation framework because executables other than applications might want to revert changes to their states. For example, you might have an interactive command-line tool with undo and redo commands, or there could be distributed object implementations that can revert operations "over the wire." However, users typically see undo and redo as application features. The Application Kit implements undo and redo in its NSTextView object and makes it easy to implement it in objects along the responder chain.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 42.16.2 Methods

### 42.16.3 beginUndoGrouping

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Marks the beginning of an undo group.
**Notes:** All individual undo operations before a subsequent endUndoGrouping message are grouped together and reversed by a later undo message. By default undo groups are begun automatically at the start of the event loop, but you can begin your own undo groups with this method, and nest them within other groups.

### 42.16.4 canRedo as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver has any actions to redo.

### 42.16.5 canUndo as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver has any actions to undo.
**Notes:** The return value does not mean you can safely invoke undo or undoNestedGroup—you may have to close open undo groups first.

### 42.16.6 Constructor

MBS MacBase Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 42.16.7 disableUndoRegistration

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Disables the recording of undo operations.
**Notes:** This method can be invoked multiple times by multiple clients. The enableUndoRegistration method must be invoked an equal number of times to re-enable undo registration.

### 42.16.8 enableUndoRegistration

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Enables the recording of undo operations.
**Notes:** Because undo registration is enabled by default, it is often used to balance a prior disableUndoRegistration message. Undo registration isn't actually re-enabled until an enable message balances the last disable message in effect. Raises an NSInternalInconsistencyException if invoked while no disableUndoRegistration message is in effect.

### 42.16.9 endUndoGrouping

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Marks the end of an undo group.
**Notes:** All individual undo operations back to the matching beginUndoGrouping message are grouped together and reversed by a later undo or undoNestedGroup message. Undo groups can be nested, thus providing functionality similar to nested transactions. Raises an NSInternalInconsistencyException if there's no beginUndoGrouping message in effect.

### 42.16.10 groupingLevel as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of nested undo groups (or redo groups, if Redo was invoked last) in the current event loop.
**Notes:** An integer indicating the number of nested groups. If 0 is returned, there is no open undo or redo group.

### 42.16.11 isRedoing as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver is in the process of performing its redo method.
**Notes:** True if the method is being performed, otherwise false.

### 42.16.12 isUndoing as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver is in the process of performing its undo or undoNestedGroup method.
**Notes:** True if the method is being performed, otherwise false.

### 42.16.13 isUndoRegistrationEnabled as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the recording of undo operations is enabled.
**Notes:** True if registration is enabled; otherwise, false.
Undo registration is enabled by default.

### 42.16.14 redo

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Performs the operations in the last group on the redo stack, if there are any, recording them on the undo stack as a single group.
**Notes:** Raises an NSInternalInconsistencyException if the method is invoked during an undo operation.

### 42.16.15 redoActionName as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name identifying the redo action.
**Notes:** The redo action name. Returns an empty string if no action name has been assigned or if there is nothing to redo.

For example, if the menu title is "Redo Delete," the string returned is "Delete."

### 42.16.16 redoMenuItemTitle as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the complete title of the Redo menu command, for example, "Redo Paste."
**Notes:** Returns "Redo" if no action name has been assigned or an empty string if there is nothing to redo.

### 42.16.17 redoMenuTitleForUndoActionName(actionName as string) as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the complete, localized title of the Redo menu command for the action identified by the given name.
**Notes:** Override this method if you want to customize the localization behavior. This method is invoked by redoMenuItemTitle.

Available in Mac OS X v10.0 and later.

### 42.16.18 removeAllActions

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Clears the undo and redo stacks and re-enables the receiver.

### 42.16.19 setActionName(actionName as string)

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the name of the action associated with the Undo or Redo command.
**Notes:** If actionName is an empty string, the action name currently associated with the menu command is

removed. There is no effect if actionName is "".

### 42.16.20 undo

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Closes the top-level undo group if necessary and invokes undoNestedGroup.
**Notes:** This method also invokes endUndoGrouping if the nesting level is 1. Raises an NSInternalInconsistencyException if more than one undo group is open (that is, if the last group isn't at the top level).

### 42.16.21 undoActionName as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name identifying the undo action.
**Notes:** The undo action name. Returns an empty string if no action name has been assigned or if there is nothing to undo.

For example, if the menu title is "Undo Delete," the string returned is "Delete."

### 42.16.22 undoMenuItemTitle as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the complete title of the Undo menu command, for example, "Undo Paste."
**Notes:** Returns "Undo" if no action name has been assigned or "" if there is nothing to undo.

### 42.16.23 undoMenuTitleForUndoActionName(actionName as string) as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the complete, localized title of the Undo menu command for the action identified by the given name.
**Notes:** Override this method if you want to customize the localization behavior. This method is invoked by undoMenuItemTitle.

### 42.16.24 undoNestedGroup

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Performs the undo operations in the last undo group (whether top-level or nested), recording the operations on the redo stack as a single group.
**Notes:** Raises an NSInternalInconsistencyException if any undo operations have been registered since the last enableUndoRegistration message.

### 42.16.25 Properties

### 42.16.26 Handle as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The internal uses reference to the NSUndoManager object.
**Notes:** (Read and Write property)

### 42.16.27 groupsByEvent as boolean

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver automatically creates undo groups around each pass of the run loop.
**Notes:** True if the receiver automatically creates undo groups around each pass of the run loop, otherwise false.
(Read and Write computed property)

### 42.16.28 levelsOfUndo as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the maximum number of top-level undo groups the receiver holds.
**Notes:** An integer specifying the number of undo groups. A limit of 0 indicates no limit, so old undo groups are never dropped.

When ending an undo group results in the number of groups exceeding this limit, the oldest groups are dropped from the stack. The default is 0.
(Read and Write computed property)

# Chapter 43

# Cocoa Threading

## 43.1 class NSOperationMBS

### 43.1.1 class NSOperationMBS

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to do operations in Cocoa.
**Notes:** Requires Mac OS X 10.5.

The NSOperation class manages the execution of a single encapsulated task. Operations are typically scheduled by adding them to an operation queue object (an instance of the NSOperationQueue class), although you can also execute them directly by explicitly invoking their start method.

Operation objects are single-shot objects, that is, they perform their task once. You cannot reuse the same NSOperation object to perform a task (or a slight variant of the task) multiple times in succession. Attempting to execute an operation that has already finished results in an exception.

When manually executing operations, you are responsible for making sure the object is ready to execute. Starting an operation that is not in the ready state generally results in an exception being thrown. If you use an operation queue to manage the execution, the NSOperationQueue object ensures that the operation is executed only when it is ready.

### 43.1.2 Methods

### 43.1.3 addDependency(op as NSOperationMBS)

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Makes the receiver dependent on the completion of the specified operation.
**Notes:** op: The operation on which the operation is dependent. The same dependency should not be added more than once to the operation, and the results of doing so are undefined.

The dependent is not considered ready to execute until all of its dependent operations finish executing. If the receiver is already executing its task, adding dependencies is unlikely to have any practical effect. This method may change the isReady and dependencies properties of the dependent.

It is a programmer error to create any circular dependencies among a set of operations. Doing so can cause a deadlock among the operations and may freeze your program.

Please setup dependencies before you add the operation to a queue. Once the operation is in the queue it may be executed directly.

### 43.1.4 cancel

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Advises the operation object that it should stop executing its task.
**Notes:** This method does not force your operation code to stop. The code for your operation must invoke the isCancelled method periodically to determine whether the operation should be stopped. Once cancelled, an operation cannot be restarted.

If the operation is already finished executing, this method has no effect. Canceling an operation that is currently in an operation queue, but not yet executing, causes it to be removed from the queue (although not necessarily right away).

### 43.1.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
See also:

- 43.1.6 Constructor(Handle as Integer) 

### 43.1.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** You can pass in handle to NSOperation object.
See also:

- 43.1.5 Constructor 8206

### 43.1.7 dependencies as NSOperationMBS()

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** the operations on which the operation is dependent.
**Notes:** The receiver is not considered ready to execute until all of its dependent operations finish executing.

### 43.1.8 dependenciesCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of the dependencies.

### 43.1.9 dependency(index as Integer) as NSOperationMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the dependency at the given index.
**Notes:** The receiver is not considered ready to execute until all of its dependent operations finish executing.

Operations are not removed from this dependency list as they finish executing. You can therefore use this list to track all dependent operations, including those that have already finished executing. The only way to remove an operation from this list is to use the removeDependency method.

Available in Mac OS X v10.5 and later.

### 43.1.10 isCancelled as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the operation has been cancelled.
**Notes:** True if the operation was explicitly cancelled by an invocation of the operation's cancel method;

otherwise, false. This method may return true even if the operation is currently executing.

Discussion
Canceling an operation does not actively stop the operation's code from executing. An operation object is responsible for calling this method periodically and stopping itself if the method returns true.

### 43.1.11 isConcurrent as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the operation runs asynchronously.
**Notes:** True if the operation is asynchronous; otherwise, false if the operation runs synchronously on whatever thread started it. This method returns false by default.

### 43.1.12 isExecuting as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the operation is currently executing.
**Notes:** True if the operation is executing; otherwise, false if the operation has not been started or is already finished.

### 43.1.13 isFinished as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value indicating whether the operation is done executing.
**Notes:** True if the operation is no longer executing; otherwise, false.

### 43.1.14 isReady as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether the operation can be performed now.
**Notes:** True if the operation can be performed now; otherwise, false.

Operations may not be ready due to dependencies on other operations or because of external conditions that might prevent needed data from being ready. The NSOperation class manages dependencies on other operations and reports the readiness of the receiver based on those dependencies.

Note: If the operation is cancelled before it starts, operations that are dependent on the completion of the receiver will never become ready.

### 43.1.15 Lock

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Locks the semaphore.
**Example:**

```
dim o as NSOperationMBS // your operation
dim myarray(-1) as window

o.lock
myarray.append window1
o.unlock
```

**Notes:** You need to pair all calls to Xojo runtime into lock and unlock to make sure you don't crash. Xojo is not reentrant safe, so you need to lock.

Be aware that locking costs performance. You should do locks often, so in the time between two locks another thread can get a lock. Also you should group locks nearby so you don't waste too much time waiting for the lock. Finally you need your main application thread to run nice so it doesn't lock too much, too.

### 43.1.16 main

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs the operation's non-concurrent task.
**Notes:** This will just call to the work event.

### 43.1.17 removeDependency(op as NSOperationMBS)

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the operation's dependence on the specified operation.
**Notes:** This method may change the isReady and dependencies properties of the operation.

### 43.1.18 start

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Begins the execution of the operation.
**Notes:** The default implementation of this method configures the execution environment for a non-concurrent operation and invokes the operation's main method. As part of the default configuration, this method performs several checks to ensure that the non-concurrent operation can actually run and generates appropriate KVO notifications for each change in the operation's state. If the operation's operation has already been performed, was cancelled, or is not yet ready to run, this method throws an NSInvalidArgumentException exception. If the operation is to be performed on a separate thread, this method may return before the operation itself completes on the other thread.

### 43.1.19 Unlock

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unlocks the semaphore.
**Example:**

```
dim o as NSOperationMBS // your operation
dim myarray(-1) as window

o.lock
myarray.append window1
o.unlock
```

**Notes:** You need to pair all calls to Xojo runtime into lock and unlock to make sure you don't crash. Xojo is not reentrant safe, so you need to lock.

Be aware that locking costs performance. You should do locks often, so in the time between two locks another thread can get a lock. Also you should group locks nearby so you don't waste too much time waiting for the lock. Finally you need your main application thread to run nice so it doesn't lock too much, too.

### 43.1.20 waitUntilFinished

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Spend time waiting for the operation to finish.

### 43.1.21 Properties

### 43.1.22 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the internal used NSOperation reference.
**Notes:** (Read and Write property)

### 43.1.23 queuePriority as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The priority of the operation in an operation queue.
**Notes:** The relative priority of the operation. The returned value always corresponds to one of the predefined constants. If no priority is explicitly set, this method returns NSOperationQueuePriorityNormal.

You should use priority values only as needed to classify the relative priority of non-dependent operations. Priority values should not be used to implement dependency management among different operation objects. If you need to establish dependencies between operations, use the addDependency method instead.

If you attempt to specify a priority value that does not match one of the defined constants, this method automatically adjusts the value you specify towards the NSOperationQueuePriorityNormal priority, stopping at the first valid constant value. For example, if you specified the value -10, this method would adjust that value to match the NSOperationQueuePriorityVeryLow constant. Similarly, if you specified +10, this method would adjust the value to match the NSOperationQueuePriorityVeryHigh constant.
(Read and Write computed property)

### 43.1.24 threadPriority as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The thread priority to use when executing the operation.
**Notes:** A floating-point number in the range 0.0 to 1.0, where 1.0 is the highest priority. The default thread priority is 0.5.

Available in Mac OS X v10.6 and later.
(Read and Write computed property)

### 43.1.25 Events

### 43.1.26 Close

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called just before the operation object is destroyed.

### 43.1.27 Finished

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called after work has finished.
**Notes:** This event is called asynchronously on the main thread, so you can do GUI stuff here to show the result.
Not called if object is released earlier.

### 43.1.28 Open

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called when the object is created.
**Notes:** Called on the main thread.

### 43.1.29 Work

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called for an operation to do the work.
**Notes:** You should test isCancelled regularly to see whether operation was cancelled.

Please read on the ThreadMBS.Work event for more details.
(NSOperationMBS is a Mac OS X feature, but the ThreadMBS class, does nearly the same on all platforms)

### 43.1.30 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSOperationQueuePriorityHigh | 4 | One of the constants for the priority property. Operations receive high priority for execution. |
| NSOperationQueuePriorityLow | -4 | One of the constants for the priority property. Operations receive low priority for execution. |
| NSOperationQueuePriorityNormal | 0 | One of the constants for the priority property. Operations receive the normal priority for execution. |
| NSOperationQueuePriorityVeryHigh | 8 | One of the constants for the priority property. Operations receive very high priority for execution. |
| NSOperationQueuePriorityVeryLow | -8 | One of the constants for the priority property. Operations receive very low priority for execution. |

## 43.2 class NSOperationQueueMBS

### 43.2.1 class NSOperationQueueMBS

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queues NSOperations for later execution.
**Notes:** Available in Mac OS X v10.5 and later.

The NSOperationQueue class manages a set of NSOperation objects in a priority queue and regulates their execution. Operations remain in the queue until they are explicitly cancelled or finish executing. An application may create multiple operation queues, with each queue running up to its designated maximum number of operations.

A specific NSOperation object can be in only one operation queue at a time. Operations within a single queue coordinate their execution order using both priority levels and inter-operation object dependencies. Operation objects in different queues can coordinate their execution order using dependencies, which are not queue-specific.

Inter-operation dependencies provide an absolute execution order for operations. An operation object is not considered ready to execute until all of its dependent operations have finished executing. For operations that are ready to execute, the operation queue always executes the one with the highest priority relative to the other ready operations. For details on how to set priority levels and dependencies, see NSOperation Class Reference.

You should never manually start an operation while it is sitting in an operation queue. Once added, an operation stays in its queue until it finishes executing or is cancelled.

### 43.2.2 Methods

### 43.2.3 addOperation(op as NSOperationMBS)

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds the specified operation object to the operation queue.
**Notes:** An operation object can be in at most one operation queue at a time and cannot be added if it is currently executing or finished. This method throws an NSInvalidArgumentException exception if any of these conditions is true.

Once added, the specified operation remains in the queue until it is executed or cancelled.

Please setup dependencies before you add the operation to a queue. Once the operation is in the queue it

may be executed directly.

### 43.2.4 addOperations(ops() as NSOperationMBS, wait as boolean)

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds the specified array of operations to the queue.
**Notes:** ops: The array of NSOperation objects that you want to add to the receiver.
wait: If true, the current thread is blocked until all of the specified operations finish executing. If false, the operations are added to the queue and control returns immediately to the caller.

An operation object can be in at most one operation queue at a time and cannot be added if it is currently executing or finished. This method throws an NSInvalidArgumentException exception if any of those error conditions are true for any of the operations in the ops parameter.

Once added, the specified operation remains in the queue until it its isFinished method returns true.

Available in Mac OS X v10.6 and later.

### 43.2.5 areAllOperationsFinished as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether all operations have been finished.
**Notes:** True if all operations have finished.

### 43.2.6 cancelAllOperations

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cancels all queued and executing operations.
**Notes:** This method sends a cancel message to all operations currently in the queue or executing. Queued operations are cancelled before they begin executing. If an operation is already executing, it is up to that operation to recognize the cancellation and stop what it is doing.

### 43.2.7 Constructor

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor creating a new operation queue.
**Notes:** On success the handle property is not 0.

### 43.2.8 currentQueue as NSOperationQueueMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the operation queue that launched the current operation.
**Notes:** Returns the operation queue that started the operation or nil if the queue could not be determined.

You can use this method from within a running operation object to get a reference to the operation queue that started it. Calling this method from outside the context of a running operation typically results in nil being returned.

Available in Mac OS X v10.6 and later.

### 43.2.9 isOneOperationExecuting as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether at least one operation is still executing.
**Notes:** True if one of the operations is executing.
False if no operation is executing.

### 43.2.10 mainQueue as NSOperationQueueMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the operation queue associated with the main thread.
**Notes:** The returned queue executes operations serially on the main thread. The main thread's run loop controls the execution times of these operations.
Available in Mac OS X v10.6 and later.

### 43.2.11 operation(index as UInt32) as NSOperationMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a noperations currently in the queue at the given index.
**Notes:** You can use this method to access the operations queued at any given moment. Operations remain queued until they finish their task. Therefore, the returned array may contain operations that are either

executing or waiting to be executed.

Available in Mac OS X v10.5 and later.

### 43.2.12 operationCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of operations currently in the queue.
**Notes:** The value returned by this method reflects the instantaneous number of objects in the queue and changes as operations are completed. As a result, by the time you use the returned value, the actual number of operations may be different. You should therefore use this value only for approximate guidance and should not rely on it for object enumerations or other precise calculations.

Available in Mac OS X v10.6 and later.

### 43.2.13 operations as NSOperationMBS()

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The operations currently in the queue.

### 43.2.14 waitUntilAllOperationsAreFinished

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Blocks the current thread until all of the receiver's queued and executing operations finish executing.
**Notes:** When called, this method blocks the current thread and waits for the receiver's current and pending operations to finish executing. While the thread is blocked, the receiver continues to launch already queued operations and monitor those that are executing. During this time, the current thread cannot add operations to the queue, but other threads may. Once all of the pending operations are finished, this method returns.

### 43.2.15 Properties

### 43.2.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the internal used NSOperationQueue reference.
**Notes:** (Read and Write property)

### 43.2.17 isSuspended as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value indicating whether the receiver is scheduling queued operations for execution.
**Notes:** True if operations are being scheduled for execution; otherwise, false.
(Read and Write computed property)

### 43.2.18 maxConcurrentOperationCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of concurrent operations that the queue can execute.
**Notes:** (Read and Write computed property)

### 43.2.19 name as string

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of this queue.
**Notes:** The default value of this string is "NSOperationQueue <id>", where <id>is the memory address of the operation queue. If you want to know when a queue's name changes, configure a KVO observer to observe the name key path of the operation queue.
Available in Mac OS X v10.6 and later.
(Read and Write computed property)

### 43.2.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSOperationQueueDefaultMaxConcurrentOperationCount | -1 | One of the constants to be used with the maxConcur erty.<br>The default maximum number of operations is deter NSOperationQueue object based on current system |

# Chapter 44

# Cocoa Toolbar

## 44.1 class CustomNSToolbarItemMBS

### 44.1.1 class CustomNSToolbarItemMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom toolbar item.
**Notes:** Use this class if you need to fill events.
Subclass of the NSToolbarItemMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5
- MBS Real Studio Plugins, version 11.3pr14
- MBS Real Studio Plugins, version 11.3pr4

### 44.1.2 Methods

### 44.1.3 Constructor(itemIdentifier as string)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** itemIdentifier: The identifier for the receiver. itemIdentifier is never seen by users and should not be localized.

The identifier is used by the toolbar and its delegate to identify the kind of the toolbar item.

### 44.1.4 Destructor

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 44.1.5 Events

### 44.1.6 Action

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The action event called when user clicks toolbar item.

### 44.1.7 allowsDuplicatesInToolbar as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the receiver can be represented in the toolbar at more than one position.
**Notes:** You use this event to override the default behavior in a subclass.
By default, if an item with the same identifier is already in the toolbar, dragging it in again will effectively move it to the new position.

If you leave this event empty (no code), you get the default behavior.

### 44.1.8 validate as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Validates a toolbar item.
**Notes:** If this event is implemented and returns false, NSToolbar will disable theItem; returning true causes theItem to be enabled.

NSToolbar only calls this method for image items.
validateis called very frequently, so it must be efficient.

If you don't have code in this event, the plugin will simply return enabled value.
This methods may not be called if you set Autovalidates to true.

## 44.2 class CustomNSToolbarMBS

### 44.2.1 class CustomNSToolbarMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The toolbar class for the case you need to use the events.
**Notes:** Subclass of the NSToolbarMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr13
- MBS Real Studio Plugins, version 13.1pr5
- MBS Real Studio Plugins, version 11.3pr4

### 44.2.2 Methods

### 44.2.3 Constructor(Identifier as string)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.

### 44.2.4 Destructor

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 44.2.5 Events

### 44.2.6 allowsSizeMode(mode as Integer, SuperAllows as boolean) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Whether to allow the given size mode.
**Example:**

```
Function allowsSizeMode(mode as Integer, SuperAllows as boolean) As boolean
#if DebugBuild then
System.DebugLog CurrentMethodName+" "+str(SuperAllows)
#endif
```

```
if mode = NSToolbarMBS.NSToolbarSizeModeSmall then
Return false
else
Return SuperAllows
end if

End Function
```

**Notes:** If you have nothing in the event, the default behavior is to allow all.
You can return false for a mode to disable it. e.g. NSToolbarSizeModeSmall
SuperAllows parameter tells you if mode is enabled by default.

### 44.2.7 itemForItemIdentifier(identifier as string, willBeInsertedIntoToolbar as boolean) as NSToolbarItemMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to request a new toolbar item; returns a toolbar item of the identified kind for the specified toolbar.
**Notes:** itemIdentifier: The identifier for the requested item.
willBeInsertedIntoToolbar: True if the item will be immediately inserted into the toolbar. If flag is false the toolbar item is being requested for display in the toolbar customization sheet and should always be enabled or provide some other canonical representation. If you ignore this parameter the same toolbar item will be used in the toolbar and in the customization sheet.
Return Value
The toolbar item for the specified toolbar and identifier. Return nil to indicate that the identified kind of toolbar item is not supported. When an item is requested again, you may return the same NSToolbarItem object returned earlier or a different instance.

Implement this method to create new toolbar item instances. This method is called lazily on behalf of a toolbar instance, which must be the sole owner of the toolbar item. A toolbar may ask again for a kind of toolbar item already supplied to it, in which case this method may return the same toolbar item it returned before or a different one. If your delegate services multiple toolbars, each attached to a different window, it is best to return a different item for each toolbar—an NSToolbarItem object can only be in one toolbar at a time.

If the item is a custom view item, the NSView object must be fully formed when the item is returned. Do not assume that the returned item is going to be added as an active item in the toolbar, as it could be that it will be used only in the customization palette. (The customization palette makes a copy of the returned item.)

This event must be implemented if the associated toolbar is created programatically.

### 44.2.8 toolbarAllowedItemIdentifiers as string()

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to discover the allowed item identifiers for a toolbar.
**Notes:** An array of toolbar item identifiers for toolbar, specifying the contents and the order of the items in the configuration palette.

Every allowed item must be explicitly listed, even the standard ones. The identifiers returned should include all of those returned by toolbarDefaultItemIdentifiers:.

This event must be implemented if the associated toolbar is created programatically.

### 44.2.9 toolbarDefaultItemIdentifiers as string()

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to discover the default item identifiers for a toolbar.
**Notes:** Return an array of toolbar item identifiers for toolbar, specifying the contents and the order of the items in the default toolbar configuration.

During initialization of toolbar, this method is called only if a toolbar configuration for the identifier of toolbar is not found in the user preferences. This method is called during initialization of the toolbar customization palette.

This event must be implemented if the associated toolbar is created programatically.

### 44.2.10 toolbarDidRemoveItem(item as NSToolbarItemMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent just after an item has been removed from a toolbar.
**Notes:** This method allows you to remove information related to the item that may have been cached.

### 44.2.11 toolbarItemAction(item as NSToolbarItemMBS)

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** The action event called when user clicks toolbar item.
**Notes:** Only for instances of CustomNSToolbarItemMBS, the plugin can forward the allowsDuplicatesIn-

Toolbar event to the CustomNSToolbarMBS, so you can handle it in a central place for all toolbar items.

### 44.2.12 toolbarItemAllowsDuplicatesInToolbar(item as NSToolbarItemMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns a Boolean value that indicates whether the receiver can be represented in the toolbar at more than one position.
**Notes:** You use this event to override the default behavior in a subclass.
By default, if an item with the same identifier is already in the toolbar, dragging it in again will effectively move it to the new position.

If you leave this event empty (no code), you get the default behavior.

Only for instances of CustomNSToolbarItemMBS, the plugin can forward the allowsDuplicatesInToolbar event to the CustomNSToolbarMBS, so you can handle it in a central place for all toolbar items.

### 44.2.13 toolbarItemValidate(item as NSToolbarItemMBS) as boolean

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Validates a toolbar item.
**Notes:** If this event is implemented and returns false, NSToolbar will disable theItem; returning true causes theItem to be enabled.

NSToolbar only calls this method for image items.
validateis called very frequently, so it must be efficient.

If you don't have code in this event, the plugin will simply return enabled value.
This methods may not be called if you set Autovalidates to true.

Only for instances of CustomNSToolbarItemMBS, the plugin can forward the allowsDuplicatesInToolbar event to the CustomNSToolbarMBS, so you can handle it in a central place for all toolbar items.

### 44.2.14 toolbarSelectableItemIdentifiers as string()

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent to discover the selectable item identifiers for a toolbar.

**Notes:** Return an array of item identifiers that should indicate selection in the specified toolbar.

Toolbars that need to indicate item selection should return an array containing the identifiers of the selectable toolbar items.

If implemented, toolbar will display the currently selected item with a visual highlight. Clicking on an item whose identifier is selectable will automatically update the toolbar's selected item identifier, when possible. Clicking an item whose identifier is not selectable will not update the toolbar's selected item identifier.

### 44.2.15 toolbarWillAddItem(item as NSToolbarItemMBS, notification as NSNotificationMBS)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Sent just before a new item is added to a toolbar.
**Notes:** If you need to cache a reference to a toolbar item or need to set up some initial state before a toolbar item is added, this is where to do it.

## 44.3 class NSToolbarItemGroupMBS

### 44.3.1 class NSToolbarItemGroupMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** NSToolbarItemGroup is a subclass of NSToolbarItem which contains subitems.
**Notes:** The views and labels of the subitems are used, but the parent's attributes take precedence.
Subclass of the NSToolbarItemMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 14.5pr3

### 44.3.2 Methods

### 44.3.3 Constructor(itemIdentifier as string)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** itemIdentifier: The identifier for the receiver. itemIdentifier is never seen by users and should not be localized.

The identifier is used by the toolbar and its delegate to identify the kind of the toolbar item.

### 44.3.4 SetSubItems(items() as NSToolbarItemMBS)

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the subitems for the receiver.
**Notes:** subitems: An array of instances of NSToolbarItem objects that form the subitems for the receiver.

You should call this method to set the subitems before returning the item to the toolbar. NSToolbarItemGroup objects cannot contain other NSToolbarItemGroup objects as subitems.

### 44.3.5 subitems as NSToolbarItemMBS()

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the subitems for the receiver.
**Notes:** By default, an NSToolbarItemGroup instance has an empty array of subitems.

## 44.4 class NSToolbarItemMBS

### 44.4.1 class NSToolbarItemMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for Cocoa toolbar items.
**Notes:** Each item in an NSToolbar is an instance of NSToolbarItem.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 21.1pr4
- MBS Real Studio Plugins, version 11.3pr4

### 44.4.2 Methods

### 44.4.3 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a NSToolbarItem reference from a declare.
The object is retained.
See also:

- 44.4.4 Constructor(itemIdentifier as string) 8228

### 44.4.4 Constructor(itemIdentifier as string)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** itemIdentifier: The identifier for the receiver. itemIdentifier is never seen by users and should not be localized.

The identifier is used by the toolbar and its delegate to identify the kind of the toolbar item.
See also:

- 44.4.3 Constructor(Handle as Integer) 8228

### 44.4.5 NSToolbarCloudSharingItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** A standard toolbar item identifier for cloud sharing via NSSharingServiceNameCloudSharing.
**Notes:** It validates itself and modifies its appearance by using the NSCloudSharingValidation protocol. It sends performCloudSharing to the firstResponder.
Requires macOS 10.12 or newer.

### 44.4.6 NSToolbarCustomizeToolbarItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Customize item. Shows the customization palette.

Deprecated. In OS X v10.7 and later the customization icon has been removed from the toolbar and customization palettes. This constant is ignored.

### 44.4.7 NSToolbarFlexibleSpaceItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Flexible Space item.

### 44.4.8 NSToolbarPrintItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Print item. Sends printDocument to firstResponder, but you can change this in toolbarWillAddItem if you need to do so.

### 44.4.9 NSToolbarSeparatorItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Separator item.

### 44.4.10 NSToolbarShowColorsItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Colors item. Shows the color panel.

### 44.4.11 NSToolbarShowFontsItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Fonts item. Shows the font panel.

### 44.4.12 NSToolbarSidebarTrackingSeparatorItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard identifiers.
**Notes:** Requires macOS 11.0 or newer.

### 44.4.13 NSToolbarSpaceItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the standard toolbar item identifiers.
**Notes:** The Space item.

### 44.4.14 NSToolbarToggleSidebarItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** A standard toolbar item identifier for sidebars.
**Notes:** It sends toggleSidebar to the firstResponder.
Requires macOS 10.11 or newer.

### 44.4.15 validate

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** This method is called by the receiver's toolbar during validation.
**Notes:** You may invoke this method directly if you have disabled automatic validation for an item—typically you do this for performance reasons if your validation code is slow.

### 44.4.16 Properties

### 44.4.17 allowsDuplicatesInToolbar as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver can be represented in the toolbar at more than one position.
**Notes:** Returns true to allow dragging the receiver into the toolbar at more than one position, otherwise false.

You use this method by overriding it in a subclass to always return true; typically, you wouldn't call it. By default, if an item with the same identifier is already in the toolbar, dragging it in again will effectively move it to the new position.
(Read only property)

### 44.4.18 autovalidates as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this item auto validates.
**Notes:** By default NSToolbar automatically invokes the receiver's validate method on a regular basis. If your validate method is time consuming, you can disable auto validation on a per toolbar item basis.
(Read and Write property)

### 44.4.19 Bordered as Boolean

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** When set on an item without a custom view, the button produced will have a bordered style.
**Notes:** Defaults to false.

Requires macOS 10.15 or newer.
(Read and Write property)

### 44.4.20 ClassName as String

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The name of this NSWindow class.
**Notes:** (Read only property)

### 44.4.21 ClassPath as String

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The path of this NSView class.
**Notes:** Useful for debugging to know what super classes the window has.
(Read only property)

### 44.4.22 Enabled as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver is enabled.
**Notes:** For a view item, this method calls isEnabled/setEnabled on the view if it responds and returns the result.
(Read and Write property)

### 44.4.23 Handle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference to the NSToolbarItem object.
**Notes:** (Read and Write property)

### 44.4.24 image as NSImageMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The image for this toolbar item.
**Notes:** For a custom view item (one whose view has already been set), this method calls setImage on the view if it responds. If image contains multiple representations, NSToolbarItem chooses the most appropriately sized representation when displaying.
(Read and Write property)

### 44.4.25 itemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's identifier.
**Notes:** Returns the receiver's identifier, which was provided in the initializer.
(Read only property)

### 44.4.26 label as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The label, which normally appears in the toolbar and in the overflow menu.
**Notes:** The length of the label should be appropriate and not too long. The label may be empty.
(Read and Write property)

### 44.4.27 MaxSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum size.
**Notes:** (Read and Write property)

### 44.4.28 menuFormRepresentation as NSMenuItemMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The menu form representation.
**Notes:** By default, this method returns nil, even though there is a default menu form representation.
(Read and Write property)

### 44.4.29 MinSize as NSSizeMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum size.
**Notes:** (Read and Write property)

### 44.4.30 Navigational as Boolean

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the item behaves as a navigation item (i.e. back/forward) in the toolbar.
**Notes:** Navigation items may be specially positioned by the system outside the normal list of items of the toolbar in the order specified by toolbarDefaultItemIdentifiers.

Requires macOS 11.0 or newer.
(Read and Write property)

### 44.4.31 paletteLabel as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The label that appears when the receiver is in the customization palette.
**Notes:** An item must have a palette label if the customization palette is to be used, and for most items it is reasonable to set paletteLabel to be the same value as label. One reason for paletteLabel to be different from label would be if it's more descriptive; another might be if there is no label.
(Read and Write property)

### 44.4.32 tag as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The tag value.
**Notes:** You can use the tag for your own custom purpose.
(Read and Write property)

### 44.4.33 Title as String

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Set and get the title of an item.
**Notes:** For custom views, this method will call setTitle:/title on the view if it responds.
(forwards to -view if it responds)

Requires macOS 10.15 or newer.
(Read and Write property)

### 44.4.34 toolbar as NSToolbarMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the toolbar that is using the receiver.
**Notes:** (Read only property)

### 44.4.35 toolTip as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The tooltip to be used when the receiver is displayed in the toolbar.
**Notes:** (Read and Write property)

### 44.4.36 view as NSViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The custom view for this item.
**Notes:** view: The view for the receiver. The view and all of its contents must conform to the NSCoding protocol if the toolbar supports customization.

Note that many of the set/get methods are implemented by calls forwarded to view, if it responds to it.
(Read and Write property)

### 44.4.37 visibilityPriority as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The visibility priority.
**Notes:** (Read and Write property)

### 44.4.38 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSToolbarItemVisibilityPriorityHigh | 1000 | One of the visibility priority constants.<br>When a toolbar does not have enough space to fit all its items, it m<br>some items into the overflow menu. These values allow you to suggest a<br>for a toolbar item.<br>Items with this priority are less inclined to be pushed to the overflow |
| NSToolbarItemVisibilityPriorityLow | -1000 | One of the visibility priority constants.<br>When a toolbar does not have enough space to fit all its items, it m<br>some items into the overflow menu. These values allow you to suggest a<br>for a toolbar item.<br>Items with this priority will be the first items to be pushed to the<br>menu. |
| NSToolbarItemVisibilityPriorityStandard | 0 | One of the visibility priority constants.<br>When a toolbar does not have enough space to fit all its items, it m<br>some items into the overflow menu. These values allow you to suggest a<br>for a toolbar item.<br>The default visibility priority. |
| NSToolbarItemVisibilityPriorityUser | 2000 | One of the visibility priority constants.<br>When a toolbar does not have enough space to fit all its items, it m<br>some items into the overflow menu. These values allow you to suggest a<br>for a toolbar item.<br>Items with this priority are the last to be pushed to the overflow mer<br>the user should set items to this priority. |

## 44.5 class NSToolbarMBS

### 44.5.1 class NSToolbarMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** NSToolbar and NSToolbarItem provide the mechanism for a titled window to display a toolbar just below its title bar.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 21.1pr4
- MBS Xojo Plugins, version 17.5pr9
- MBS Xojo / Real Studio Plugins, version 14.3pr10
- Please don't call constructors outside new or constructor
- MBS Real Studio Plugins, version 11.3pr4

### 44.5.2 Methods

### 44.5.3 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a NSToolbar reference from a declare.
The object is retained.
See also:

- 44.5.4 Constructor(Identifier as string) 8237

### 44.5.4 Constructor(Identifier as string)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Initializes a newly allocated toolbar with the specified identifier.
identifier is never seen by users and should not be localized.
See also:

- 44.5.3 Constructor(Handle as Integer) 8237

### 44.5.5 insertItemWithItemIdentifier(identifier as string, atIndex as Integer)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Inserts the specified item at the specified index.
**Notes:** Identifier: The identifier of the item to insert.
index: The index at which to insert the item.

If the toolbar needs a new instance, it will get it from itemForItemIdentifier. Typically, you should not call this method; you should let the user reconfigure the toolbar.

### 44.5.6 items as NSToolbarItemMBS()

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's current items, in order.

### 44.5.7 NSToolbarDidRemoveItemNotification as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification identifiers.
**Notes:** Posted after an item is removed from a toolbar. The notification item is the NSToolbar object that had an item removed from it. The userInfo dictionary contains the following information: item: The NSToolbarItem object that was removed.

### 44.5.8 NSToolbarWillAddItemNotification as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification identifiers.
**Notes:** Posted before a new item is added to the toolbar. The notification item is the NSToolbar object having an item added to it. The userInfo dictionary contains the following information: item: The NSToolbarItem object being added.

### 44.5.9 removeItemAtIndex(index as Integer)

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified item.
**Notes:** Typically, you should not call this method; you should let the user reconfigure the toolbar.

Index is zero based.

### 44.5.10 runCustomizationPalette

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the receiver's customization palette.

### 44.5.11 validateVisibleItems

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Called on window updates to validate the visible items.
**Notes:** You typically use this method by overriding it in a subclass. The default implementation of this method iterates through the list of visible items, sending each a validate message. Override it and call super if you want to know when this method is called.

In Mac OS X v 10.6 and later toolbars no longer automatically validate for some events, including: NSLeftMouseDragged, NSRightMouseDragged, NSOtherMouseDragged, NSMouseEntered, NSMouseExited, NSScrollWheel, NSCursorUpdate, NSKeyDown. In addition, validation for NSKeyUp and NSFlagsChanged events is deferred with the timer restarting for every new deferrable event. So a sequence of key events will not trigger any validation at all, until either a pause of .85 seconds, or an event other than NSKeyUp or NSFlagsChanged is processed. This change was made as an optimization.

To trigger validation for a single toolbar manually, send the toolbar a validateVisibleItems message. To trigger validation for all toolbars, invoke NSApplication's setWindowsNeedUpdate passing true.

### 44.5.12 visibleItems as NSToolbarItemMBS()

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's currently visible items.
**Notes:** Items in the overflow menu are not considered visible.

### 44.5.13 Properties

### 44.5.14 allowsExtensionItems as Boolean

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the toolbar can add items for Action extensions.
**Notes:** When true, the toolbar can dynamically create toolbar items for Action extensions in the toolbar configuration panel. To be included, an extension needs to set the NSExtensionServiceAllowsToolbarItem key to true in its Info.plist.

The default value is false.
(Read and Write property)

### 44.5.15 allowsUserCustomization as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether users are allowed to modify the toolbar.
**Notes:** True if users are allowed to modify the toolbar, false otherwise. The default is false.

If the value is false, then the Customize Toolbar,Ä¶ menu item is disabled and other modification is disabled. This attribute does not affect the user's ability to show or hide the toolbar.
(Read and Write property)

### 44.5.16 autosavesConfiguration as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver autosaves its configuration.
**Notes:** True if the receiver autosaves its configuration, otherwise false. The default is false.

When autosaving is enabled, the receiver will automatically write the toolbar settings to user defaults if the toolbar configuration changes. The toolbar's configuration is identified in user defaults by the toolbar identifier. If there are multiple toolbars active with the same identifier, they all share the same configuration.
(Read and Write property)

### 44.5.17 centeredItemIdentifier as String

MBS MacControls Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** The center item identifier.
**Notes:** The item with the specified identifier will be positioned in the absolute center of the Toolbar relative to the window assuming space allows. When the window shrinks, the highest priority is to have the most items visible. Thus, centering is broken first (it'll be pushed off to the left/right as necessary). Next, items will be shrunk down a little at a time towards their min size, at the same rate. Finally, items will be removed based on their visibility priority.

This property is archived.
(Read and Write property)

### 44.5.18 configurationDictionary as dictionary

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's configuration as a dictionary.
**Notes:** Set/get a dictionary containing configuration information for the toolbar.

Contains displayMode, isVisible, and a list of the item identifiers currently in the toolbar.
Do not depend on any details of the normal contents of a configuration dictionary.
(Read and Write property)

### 44.5.19 configurationDictionaryData as Memoryblock

MBS MacControls Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's configuration as a memoryblock.
**Notes:** Set/get a memoryblock containing configuration information for the toolbar.

Contains displayMode, isVisible, and a list of the item identifiers currently in the toolbar.
Do not depend on any details of the normal contents of a configuration dictionary.

you can read/write the data to preferences.
(Read and Write property)

### 44.5.20 customizationPaletteIsRunning as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value that indicates whether the receiver's customization palette is running (in use).
**Notes:** True if the receiver's customization palette is running, otherwise false.

(Read only property)

### 44.5.21 displayMode as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The receiver's display mode.
**Notes:** (Read and Write property)

### 44.5.22 fullScreenAccessoryView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The fullscreen mode accessory view.
**Notes:** Requires Mac OS X 10.7.
(Read and Write property)

### 44.5.23 fullScreenAccessoryViewMaxHeight as Double

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The fullscreen mode accessory view's maximum height.
**Notes:** Requires Mac OS X 10.7.
(Read and Write property)

### 44.5.24 fullScreenAccessoryViewMinHeight as Double

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The fullscreen mode accessory view's minimum height.
**Notes:** Requires Mac OS X 10.7.
(Read and Write property)

### 44.5.25 Handle as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal reference for this object.
**Notes:** (Read and Write property)

### 44.5.26 identifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's identifier.
**Notes:** Returns the receiver's identifier, a string used by the class to identify the kind of toolbar.

Within the application all toolbars with the same identifier are synchronized to maintain the same state, including for example, the display mode and item order. The identifier is used as the autosave name for toolbars that save their configuration.
(Read only property)

### 44.5.27 selectedItemIdentifier as string

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The selected item to the specified toolbar item.
**Notes:** Typically, a toolbar will manage the selection of items automatically. This method can be used to select identifiers of custom view items, or to force a selection change. See toolbarSelectableItemIdentifiers for more details. If itemIdentifier is not recognized by the receiver, the current selected item identifier does not change.
(Read and Write property)

### 44.5.28 showsBaselineSeparator as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the toolbar shows the separator between the toolbar and the main window contents.
**Notes:** True if the toolbar shows the separator between the toolbar and the main window contents, otherwise false. The default is true.
(Read and Write property)

### 44.5.29 sizeMode as Integer

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The size mode.
**Notes:** If there is no icon of the given size for a toolbar item, the toolbar item creates one by scaling an icon of another size.
(Read and Write property)

### 44.5.30 toolbarView as NSViewMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal NSView used for displaying the toolbar.
**Notes:** Useful to query values like the bounds of the toolbar.

Works for 64-bit with 17.5 version, but returns nil in older versions.
(Read only property)

### 44.5.31 visible as boolean

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver is visible or hidden.
**Notes:** True to indicate the receiver should be made visible, false to indicate it should be hidden.
(Read and Write property)

### 44.5.32 Constants

Display Mode Constants

| Constant | Value | Description |
|---|---|---|
| NSToolbarDisplayModeDefault | 0 | The default display mode. |
| NSToolbarDisplayModeIconAndLabel | 1 | The toolbar will display icons and labels. |
| NSToolbarDisplayModeIconOnly | 2 | The toolbar will display only icons. |
| NSToolbarDisplayModeLabelOnly | 3 | The toolbar will display only labels. |

SizeMode Constants

| Constant | Value | Description |
|---|---|---|
| NSToolbarSizeModeDefault | 0 | The toolbar uses the system-defined default size, which is NSToolbarSizeModeRegular. |
| NSToolbarSizeModeRegular | 1 | The toolbar uses regular-sized controls and 32 by 32 pixel icons. |
| NSToolbarSizeModeSmall | 2 | The toolbar uses small-sized controls and 24 by 24 pixel icons. |

# Chapter 45

# Collaboration

## 45.1 class CBGroupIdentityMBS

### 45.1.1 class CBGroupIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** An object of the CBGroupIdentity class represents a group identity and is used for viewing the attributes of group identities from an identity authority.
**Example:**

```
// get staff group
dim a as CBIdentityAuthorityMBS = CBIdentityAuthorityMBS.localIdentityAuthority
dim i as CBGroupIdentityMBS = CBGroupIdentityMBS.groupIdentityWithPosixGID(20,a)
MsgBox i.fullName
```

**Notes:** The principal attributes of a CBGroupIdentity object are a POSIX group identifier (GID) and a list of members.
Available in OS X v10.5 and later.
Subclass of the CBIdentityMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Collaboration Framework: CBIdentityPickerMBS class

### 45.1.2 Methods

### 45.1.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.1.4 copy as CBGroupIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 45.1.5 groupIdentityWithPosixGID(groupID as Integer, authority as CBIdentityAuthorityMBS) as CBGroupIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the group identity with the given POSIX GID in the specified identity authority.
**Example:**

```
// get staff group
dim a as CBIdentityAuthorityMBS = CBIdentityAuthorityMBS.localIdentityAuthority
dim i as CBGroupIdentityMBS = CBGroupIdentityMBS.groupIdentityWithPosixGID(20,a)

MsgBox i.fullName
```

**Notes:** groupID: The GID of the group identity you are searching for.
authority: An identity authority in which to search for the group identity.

Returns the group identity object with the given GID in the specified identity authority, or nil if no identity exists with the specified GID.

### 45.1.6 members as CBIdentityMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** An array of CBIdentity objects each representing a member of the group identity.
**Example:**

```
// get staff group
dim a as CBIdentityAuthorityMBS = CBIdentityAuthorityMBS.localIdentityAuthority
dim i as CBGroupIdentityMBS = CBGroupIdentityMBS.groupIdentityWithPosixGID(20,a)

MsgBox i.fullName

dim members() as CBIdentityMBS = i.members
for each m as CBIdentityMBS in members
MsgBox m.fullName
next
```

**Notes:** This method only returns direct members of a group, it does not return members of members. Both user and group identities can be members of a group, but a group cannot be a member of itself. You also cannot have "circular" membership, i.e. a group be a member of another group that is a member of the first group.

### 45.1.7 posixGID as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the POSIX GID of the identity.
**Notes:** The POSIX GID is an integer that can identify a group within an identity authority. GIDs are not guaranteed to be unique within an identity authority.

## 45.2 class CBIdentityAuthorityMBS

### 45.2.1 class CBIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** An identity authority is a database that stores information about identities.
**Notes:** The CBIdentityAuthority class defines one or more identity authorities. This database can be searched for identities in conjunction with the CBIdentity class factory methods.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Collaboration Framework: CBIdentityPickerMBS class

### 45.2.2 Methods

### 45.2.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
if CBIdentityAuthorityMBS.Available then
MsgBox "CBIdentityAuthorityMBS class is available"
else
MsgBox "CBIdentityAuthorityMBS class is not available"
end if
```

**Notes:** Returns true on Mac OS X 10.5 and newer.

### 45.2.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.2.5 CSIdentityAuthority as Variant

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an identity authority for use with the Core Services Identity API.
**Notes:** Returns CSIdentityAuthorityMBS object.
This method, along with identityAuthorityWithCSIdentityAuthority:, is used for interoperability with the Core Services Identity API.
Available in OS X v10.5 and later.

### 45.2.6 defaultIdentityAuthority as CBIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns an identity authority that contains the identities in both the local and the network-bound authorities.
**Example:**

MsgBox CBIdentityAuthorityMBS.defaultIdentityAuthority.localizedName

**Notes:** The default identity authority is the logical union of the identities in the local and managed authorities.

### 45.2.7 identityAuthorityWithCSIdentityAuthority(CSIdentityAuthority as Variant) as CBIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an identity authority specified by a given Core Services Identity authority object.
**Notes:** CSIdentityAuthority: The Core Services Identity opaque object. Must be a CSIdentityAuthorityMBS.
Returns the identity authority object for use with the Collaboration framework.
This method, along with CSIdentityAuthority, is used for interoperability with the Core Services Identity API.
Available in OS X v10.5 and later.

### 45.2.8 localIdentityAuthority as CBIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity authority on the local system.
**Example:**

MsgBox CBIdentityAuthorityMBS.localIdentityAuthority.localizedName

**Notes:** Any identities stored on the local system are contained within this identity authority.

### 45.2.9 localizedName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the localized name of the identity authority.
**Notes:** The computer's name if the authority is local, or Managed Network Directory if the authority is managed.

### 45.2.10 managedIdentityAuthority as CBIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity authority that contains all the identities in bound network directory servers.
**Example:**

MsgBox CBIdentityAuthorityMBS.managedIdentityAuthority.localizedName

**Notes:** If you are bound to a network directory server (such as an LDAP server) that has an identity authority, use this method to search those authorities.

### 45.2.11 Properties

### 45.2.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 45.3 class CBIdentityMBS

### 45.3.1 class CBIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A CBIdentity object is used for accessing the attributes of an identity stored in an identity authority.
**Notes:** You can use an identity object for finding identities, and storing them in an access control list (ACL). If you need to edit these attributes, take advantage of the CSIdentity class in Core Services.

You can obtain a CBIdentity object from one of the following class factory methods: identityWithName, identityWithUUIDString, identityWithPersistentReference, or identityWithCSIdentity.

There are two subclasses of CBIdentity: CBGroupIdentity and CBUserIdentity. If you are working specifically with a group identity, use CBGroupIdentityMBS. Similarly, if you are working with a user identity, use CBUserIdentityMBS.

see also
http://developer.apple.com/library/mac/#documentation/Networking/Conceptual/IdentityServices_ProgGuide/Introduction/Introduction.html#//apple_ref/doc/uid/TP40004490
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Collaboration Framework: CBIdentityPickerMBS class

### 45.3.2 Methods

### 45.3.3 aliases as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns an array of aliases (alternate names) for the identity.
**Notes:** Returns an array of strings containing the alternate names for the identity.
An identity can have zero or more aliases. Like the full and short names, two identities cannot share an alias.

### 45.3.4 authority as CBIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity authority where the identity is stored.

### 45.3.5 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.5 and newer.

### 45.3.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.3.7 copy as CBIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 45.3.8 CSIdentity as Variant

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an opaque object for use with the Core Services Identity API.
**Notes:** This method, along with identityWithCSIdentity, is used for interoperability with the Core Services Identity API.
Available in OS X v10.5 and later.

### 45.3.9 emailAddress as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the email address of an identity.
**Notes:** The email address of an identity or "" if none exists.

### 45.3.10 fullName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the full name of the identity.

### 45.3.11 identityWithCSIdentity(CSIdentity as Variant) as CBIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an identity object created from the specified Core Services Identity opaque object.
**Notes:** csIdentity: The Core Services Identity opaque object. Must be a CSIdentityMBS object.

Returns the identity object for use with the Collaboration framework.
This method is used for interoperability with the Core Services Identity API.

Available in OS X v10.5 and later.

### 45.3.12 identityWithName(name as string, authority as CBIdentityAuthorityMBS) as CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity object with the given name from the specified identity authority.
**Example:**

```
dim name as string = "cs" // put your name here
dim a as CBIdentityAuthorityMBS = CBIdentityAuthorityMBS.localIdentityAuthority
dim i as CBIdentityMBS = CBIdentityMBS.identityWithName(name, a)

MsgBox i.fullName+": "+Join(i.aliases,", ")
```

**Notes:** name: The name of the identity.
authority: The identity authority to search.

Returns the identity object, or nil if no identity is found with the specified name.
The name is compared against all valid identity names, including full names, short names, email addresses, and aliases.

### 45.3.13 identityWithPersistentReference(ref as Memoryblock) as CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity object matching the persistent reference data.
**Notes:** ref: The persistent data object that refers to an identity.

Returns the identity object matching the persistent data object, or nil if the identity is not found.
A persistent reference is an opaque data object suitable for persistent storage.

### 45.3.14 identityWithUUIDString(uuid as string, authority as CBIdentityAuthorityMBS) as CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the identity object with the given UUID from the specified identity authority.
**Notes:** uuid: The UUID of the identity you are searching for.
authority: The identity authority to search.

Returns the identity object, or nil if no identity is found with the matching criteria.

### 45.3.15 image as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the image associated with an identity.
**Notes:** The image associated with an identity, or nil if none exists.

### 45.3.16 isHidden as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating the state of the identity's hidden property.
**Notes:** A hidden identity does not show up in the Identity Picker. A hidden identity refers to system identities such as root, www, and wheel.
True if the identity is hidden; false if it is not.

### 45.3.17 isMemberOfGroup(g as CBGroupIdentityMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the identity is a member of the specified group.
**Notes:** g: The group to check for membership.

Returns true if the identity is a member of the group; false if it is not.

### 45.3.18 persistentReference as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a persistent reference to store a reference to an identity.
**Notes:** Returns a memoryblock that uniquely references an identity.

A persistent reference data object is an object generated from an identity. Persistent data objects can be written to and read from a file, making them extremely useful for storing identities in an ACL.

### 45.3.19 posixName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the POSIX name of the identity.
**Notes:** The POSIX name is also referred to as the "short name" for an identity. It can only contain the characters A-Z, a-z, 0-9, -, _, ., and @.

### 45.3.20 UUIDString as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the UUID of the identity as a string.
**Notes:** The UUID string is generated so it is unique across all identity authorities. When storing ACLs, one method is to store the UUID of each identity. However, it is recommended that you use a persistent data object instead (see persistentReference).

### 45.3.21 Properties

### 45.3.22 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 45.4 class CBIdentityPickerMBS

### 45.4.1 class CBIdentityPickerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A CBIdentityPicker object allows a user to select identities—for example, user or group objects—that it wants one or more services or shared resources to have access to.
**Example:**

```
dim c as new CBIdentityPickerMBS
c.Title = "Please choose your identity"

dim n as Integer = c.runModal
if n = c.NSOKButton then
for each i as CBIdentityMBS in c.identities
MsgBox i.fullName
next
end if
```

**Notes:** An identity picker can be displayed either as an application-modal dialog or as a sheet attached to a document window. An identity picker returns the selected records to be added to access control lists using Collaboration. If a selected record is not a user or group identity, then an identity picker prompts the end user for additional information—such as a password—to promote that record to a sharing account.
**Blog Entries**

- Collaboration Framework: CBIdentityPickerMBS class

### 45.4.2 Methods

### 45.4.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.5 and newer.

### 45.4.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 45.4.5 identities as CBIdentityMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the identities selected using the identity picker.

### 45.4.6 runModal as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the receiver as an application-modal dialog.
**Notes:** NSOKButton if the user selected OK; otherwise, NSCancelButton.
The receiver may create identities for selected records if necessary.

### 45.4.7 runModalForWindow(win as DesktopWindow)

MBS MacFrameworks Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Runs the receiver modally as a sheet attached to a specified window.
**Notes:** window: The parent window for the sheet.

Calls identityPickerDidEnd event later.
See also:

- 45.4.8 runModalForWindow(win as window) 8257

### 45.4.8 runModalForWindow(win as window)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Runs the receiver modally as a sheet attached to a specified window.
**Notes:** window: The parent window for the sheet.

Calls identityPickerDidEnd event later.
See also:

- 45.4.7 runModalForWindow(win as DesktopWindow) 8257

### 45.4.9 Properties

### 45.4.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 45.4.11 allowsMultipleSelection as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Allows a user to make select multiple identities.
**Notes:** By default, you cannot select multiple records.
Set to true if you can select multiple records; otherwise, false.
(Read and Write computed property)

### 45.4.12 title as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the identity picker.
**Example:**

```
dim c as new CBIdentityPickerMBS
c.Title = "Please choose your identity"
```

**Notes:** (Read and Write computed property)

### 45.4.13 Events

### 45.4.14 identityPickerDidEnd(returnCode as Integer)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** The event called when runModalForWindow finished.
**Notes:** ReturnCode is NSOKButton if the user selected OK; otherwise, NSCancelButton.

### 45.4.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCancelButton | 0 | One of the result codes you may need with this class. |
| NSOKButton | 1 | One of the result codes you may need with this class. |

## 45.5 class CBUserIdentityMBS

### 45.5.1 class CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** An object of the CBUserIdentity class represents a user identity and is used for accessing the attributes of a user identity from an identity authority.
**Notes:** The principal attributes of CBUserIdentity are a POSIX user identifier (UID), password, and certificate.
Subclass of the CBIdentityMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Collaboration Framework: CBIdentityPickerMBS class

### 45.5.2 Methods

### 45.5.3 authenticateWithPassword(password as string) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the given password is correct for the identity.
**Notes:** Returns true if the password is correct; otherwise, false.

### 45.5.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.5.5 copy as CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 45.5.6 isEnabled as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the identity is allowed to authenticate.
**Notes:** If the identity does not have authentication credentials (a password or certificate), it is not able to log in. However, an identity with authentication credentials does not ensure that it is enabled. Any identity can be disabled.
Returns true if the identity can authenticate; otherwise, false.

### 45.5.7 posixUID as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the POSIX UID of the identity.
**Notes:** The POSIX UID is a integer that can identify a user within an identity authority. UIDs are not guaranteed to be unique within an identity authority.

### 45.5.8 userIdentityWithPosixUID(userID as Integer, authority as CBIdentityAuthorityMBS) as CBUserIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the user identity with the given POSIX UID in the specified identity authority.
**Example:**

```
// get first user
dim a as CBIdentityAuthorityMBS = CBIdentityAuthorityMBS.localIdentityAuthority
dim i as CBUserIdentityMBS = CBUserIdentityMBS.userIdentityWithPosixUID(501,a)

MsgBox i.fullName
```

**Notes:** uid: The UID of the identity you are searching for.
authority: The identity authority to search.

Retruns the user identity with the given UID in the specified identity authority, or nil if no identity exists with the specified UID.
Available in OS X v10.5 and later.

## 45.6 class CSIdentityAuthorityMBS

### 45.6.1 class CSIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** A CSIdentityAuthority object represents an identity authority.
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.localIdentityAuthority
MsgBox a.localizedName
```

**Notes:** An identity authority is a logical repository of user and group information, such the users and groups database on a local system or on a directory server.

The local authority contains all users and groups defined on the local system. The managed authority contains all users and groups defined in directory servers to which the system is bound (LDAP, ActiveDirectory, etc.). The Default authority is a union of the local and managed authorities and is used to locate user/group info from both sources in one query.

Use one of the class factory methods to return an CSIdentityAuthority object, which can be used to search for an identity with an CSIdentityQuery object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr4
- MBS Real Studio Plugins, version 13.0pr6

### 45.6.2 Methods

### 45.6.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Whether the CSIdentityAuthority functions are available.
**Example:**

```
if not CSIdentityAuthorityMBS.Available then
MsgBox "not supported."
end if
```

### 45.6.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.6.5 defaultIdentityAuthority as CSIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the system's default identity authority.
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.defaultIdentityAuthority
MsgBox a.localizedName
```

**Notes:** The default identity authority is a pseudo-authority representing the union of the local identity authority and the managed identity authority. The function CSIdentityMBS.Authority will never return the default authority instance.

### 45.6.6 localIdentityAuthority as CSIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the identity authority for identities defined on the local host.
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.localIdentityAuthority
MsgBox a.localizedName
```

### 45.6.7 managedIdentityAuthority as CSIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the identity authority for identities defined in the system's managed directory server(s).
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.managedIdentityAuthority
MsgBox a.localizedName
```

**Notes:** There is always a valid managed identity authority instance, but if the system is not bound to any managed directory servers, the managed identity authority will contain no identities.

### 45.6.8 Properties

### 45.6.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 45.6.10 localizedName as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the localized name of an identity authority.
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.localIdentityAuthority
MsgBox a.localizedName
```

**Notes:** (Read only property)

## 45.7 class CSIdentityMBS

### 45.7.1 class CSIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** A CSIdentity object represents a user or group entity known to the system.
**Notes:** An identity object has the following required attributes: a class (user or group), a unique identitfier (UUID), a full name, a Posix ID (UID or GID), and a Posix name (a.k.a. "short" name). There are also a number of optional attributes such as email address, image data, etc.

Group identities have a membership which may include both users as well as other groups. An identity can be tested for membership in a specific group.

A CSIdentity object is a private copy of the identity information. It can be modified in memory, but requires authorization to commit changes back to the identity authority database. On OS X version 10.5, only local identities can be created, modified or deleted, and only by users with Administrator credentials.

Changes may be committed synchronously or asynchronously. All data validation occurs at commit time.
Two identities are equal if they have the same class and UUID.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr4
- MBS Xojo Plugins, version 22.5pr7
- MBS Real Studio Plugins, version 13.0pr6

**Xojo Developer Magazine**

- 22.1, page 9: News

### 45.7.2 Methods

### 45.7.3 AddAlias(alias as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Add a name alias to an identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
c.AddAlias "Hello"
MsgBox join(c.Aliases, EndOfLine)
```

**Notes:** This change must be committed.

### 45.7.4 AddMember(user as CSIdentityMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Add an identity to a group.
**Notes:** User: The identity to add to the group. Can be a user or group identity.

Please call only on group identities.
This change to the group must be committed.

### 45.7.5 Aliases as string()

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the aliases of an identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox join(c.Aliases, EndOfLine)
```

**Notes:** Returns an array containing the identity's name aliases as strings. The array may be empty.

Aliases are alternate names for identities. As with all identity names, aliases must be unique within the entire namespace of of the identity authority.

### 45.7.6 AuthenticateUsingPassword(password as string) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Attempt to autenticate a password for a user identity.
**Notes:** password: The password to authenticate
Returns true if the passord is correct for the specified user.
Please call only on user identity.

### 45.7.7 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Whether the CSIdentity functions are available.
**Example:**

```
if not CSIdentityMBS.Available then
MsgBox "not supported."
end if
```

### 45.7.8 Commit as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Synchronously commit all pending changes to the identity authority database.
**Notes:** error: Optional variant for CFErrorMBS which will be set if this function returns false. When this occurs, the caller is responsible for releasing the error.
Returns true if successful, false if an error occurred.
See also:

- 45.7.9 Commit(byref error as Variant) as Boolean 8267

### 45.7.9 Commit(byref error as Variant) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Synchronously commit all pending changes to the identity authority database.
**Notes:** error: Optional variant for CFErrorMBS which will be set if this function returns false. When this occurs, the caller is responsible for releasing the error.
Returns true if successful, false if an error occurred.
See also:

- 45.7.8 Commit as Boolean 8267

### 45.7.10 Constructor(identityClass as Integer, fullName as string, posixName as string, flags as Integer, authority as CSIdentityAuthorityMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates a new identity.
**Example:**

```
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.localIdentityAuthority
dim c as new CSIdentityMBS(CSIdentityMBS.kCSIdentityClassUser, "Test User", "TestUser", 0, a)
```

```
dim e as CFErrorMBS
dim v as Variant
if c.Commit(v) then
MsgBox "OK"
else
e = v
if e<>Nil then
MsgBox "Failed"+EndOfLine+e.Description
else
MsgBox "Failed"
end if
end if
```

**Notes:** identityClass: The type of identity to be created. Specifying kCSIdentityClassUser creates a user, while kCSIdentityClassGroup creates a group.
fullName: The primary name of the new identity.
posixName: The POSIX name of the new identity. Specify kCSIdentityGeneratePosixName to have a name generated autmatically from the full name.
flags: Attributes of the new identity
authority: The identity authority to host the identity. Caller must have write access to the identity authority or commit will fail. Currently, only local identities may be created, so callers must specify the local identity authority for this argument.

On success the handle property is not zero.

The new identity is allocated but is not committed to the identity authority's database. It will become persistent and available to other clients after being committed using Commit or CommitAsynchronously.

### 45.7.11 copy as CSIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of an identity.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
dim v as CSIdentityMBS = u.copy
v.SetFullName "Hello World" // modify the copy only
MsgBox u.fullName+" "+v.fullName
```

### 45.7.12 CurrentUser as CSIdentityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Queries current user identity.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox u.fullName
```

### 45.7.13 Delete

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Permanently delete an identity from the identity database.
**Notes:** Sets an identity to deleted state. This change must be committed.

### 45.7.14 GroupMembershipQuery as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates a query to find a group's members.
**Notes:** Please call on the group identity whose members are to be queried
Returns the CSIdentityQueryMBS of the newly created object. The query is ready to be executed.
Using a query to lookup group membership allows the caller to execute the query synchronously or asynchronously.

### 45.7.15 IsMemberOfGroup(group as CSIdentityMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Check if an identity is a memeber of a group.
**Notes:** Please call only on a group identity.
group: The group identity whose membership is to be checked
Returns true if the identity is a member (directly or indirectly) of the specified group

### 45.7.16 kCSIdentityGeneratePosixName as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** A special string for posix names to use to auto generate the posix name.

### 45.7.17 PersistentReference as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Create an opaque, persistent data reference to an identity.
**Example:**

```
// get a reference
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
dim p as MemoryBlock = u.PersistentReference
u = nil

// and search back later:
dim q as CSIdentityQueryMBS = CSIdentityQueryMBS.CreateForPersistentReference(p)
if q.Execute then
dim r() as CSIdentityMBS = q.Results
MsgBox r(0).fullName
end if
```

**Notes:** Returns a new persistent reference for the identity.
A persistent identity reference is an opaque data object from which an identity object may queried the future (see CreateForPersistentReference). A persistent reference is suitable for storage in an external data store, for example, as an entry in an application-specific access control list associated with a shared resource. Use of a persistent identity reference is preferred over a pure UUID-based identity reference because the persistent reference contains additional information needed to optimize the identity query and to improve the user experience when working in a distributed identity environment (LDAP, Active Directory, etc.).

### 45.7.18 RemoveAlias(alias as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Remove an alias name from an identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
c.AddAlias "Hello"
MsgBox join(c.Aliases, EndOfLine)
c.RemoveAlias "Hello"
MsgBox join(c.Aliases, EndOfLine)
```

**Notes:** alias: The alias name to remove
This change must be committed.

### 45.7.19 RemoveClient

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Invalidate an identity's client structure to stop client events.
**Notes:** After returning, this function guarantees that client event will never be invoked again. Use this function when releasing an identity which may have an outstanding asynchronous request. This function does not cancel an outstanding commit operation because a commit cannot be interrupted.

### 45.7.20 RemoveMember(user as CSIdentityMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Remove a member from a group.
**Notes:** Please call only on group identities.
member: The member identity to remove
This change to the group must be committed.

### 45.7.21 SetEmailAddress(email as string = "")

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Set an identity's email address.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser

u.SetEmailAddress("test@test.test")
MsgBox u.emailAddress
```

**Notes:** emailAddress: The user's new email address value. Pass "" to remove an email address.
This change must be committed.

### 45.7.22 SetFullName(name as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Sets an identity's full name.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser

// get old name
dim o as string = u.fullName

// change
u.SetFullName("Hello World")

// and report
MsgBox o+" ->"+u.fullName
```

**Notes:** fullName: The new full name of the identity
This change must be committed.

### 45.7.23 SetImageData(data as memoryblock = nil, datatype as string = "public.jpeg")

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Set the internally-stored image data and data type for an identity.
**Notes:** imageData: The image data. Pass nil to remove image data.
imageDataType: The uniform type identitier (UTI) of the image data. Currently, kUTTypeJPEG ("public.jpeg") is the only type supported.
This change must be committed.

### 45.7.24 SetImageURL(URL as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Set the URL of an identity's external image storage.
**Notes:** url: The URL file of the image. For local identities, this must be a file URL. Pass "" to remove the image URL from the identity.
This change must be committed.

### 45.7.25 SetIsEnabled(value as boolean)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Enable or disable a user.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser

u.SetIsEnabled(true)
MsgBox str(u.isEnabled)
```

**Notes:** isEnabled: The new value of the isEnabled attribute
A disabled user account cannot authenticate. Credentials (password and certificate) are not affected. This change must be committed.

### 45.7.26 SetPassword(password as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Set a user password.
**Notes:** Please call only on user identites.
password: The new password, or "" to remove the current password and disable password-based authentication.
Setting the password to "" removes the current password and disables password authentication for the user. Setting the password to a zero-length string allows authentication with a blank password. This change must be committed.

### 45.7.27 Properties

### 45.7.28 Authority as CSIdentityAuthorityMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the identity authority of an identity.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox u.Authority.localizedName
```

**Notes:** (Read only property)

### 45.7.29 EmailAddress as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the email address of a user identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox c.emailAddress
```

**Notes:** Returns the email address of the identity or "" if there is no email address.
(Read and Write property)

### 45.7.30 FullName as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the full name of an identity.
**Example:**

```
dim i as CSIdentityMBS = CSIdentityMBS.CurrentUser

MsgBox i.fullName
```

**Notes:** The full name is the name that is displayed in the user interface.
(Read and Write property)

### 45.7.31 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 45.7.32 IdentityClass as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an identity's class.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(u.IdentityClass) // shows 1 for user
```

**Notes:** (Read only property)

### 45.7.33 ImageData as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the image associated with a user identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
dim data as MemoryBlock = c.ImageData
dim pic as Picture = JPEGStringToPictureMBS(data)
Backdrop = pic
```

**Notes:** Returns the identity's image data as a memoryblock or nil if there is no image data.
(Read only property)

### 45.7.34 ImageDataType as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the uniform type identifier (UTI) of an identity's image.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox c.ImageDataType
```

**Notes:** Returns a UTI as a string for this identity's image data or "" if there is no image data. The identity object may release its reference to the return value when the identity is modified.
(Read only property)

### 45.7.35 ImageURL as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the URL to an identity's image file.

**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox c.ImageURL
```

**Notes:** Returns a URL that contains the location of the user's image file, or niol if there is no image URL.
(Read and Write property)

### 45.7.36 IsCommitting as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Determine if a commit operation is in progress.
**Notes:** Returns true if a commit operation is in progress.
(Read only property)

### 45.7.37 IsEnabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Determine if a user is enabled.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(c.IsEnabled)
```

**Notes:** Returns true if the user is enabled. A user that is not enabled cannot authenticate.
A user that is not enabled cannot authenticate. This setting may be used to temporarily allow a user's access to all services and resources.
(Read and Write property)

### 45.7.38 IsGroup as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Checks if identity class is group.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(c.IsUser)+" "+str(c.IsGroup)
```

**Notes:** (Read only property)

### 45.7.39 IsHidden as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Determine if a identity's hidden attribute is enabled.
**Example:**

```
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(u.IsHidden)
```

**Notes:** Returns true if the identity was created with the hidden attribute
(Read only property)

### 45.7.40 IsUser as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Checks if identity class is user.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(c.IsUser)+" "+str(c.IsGroup)
```

**Notes:** (Read only property)

### 45.7.41 PosixID as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve POSIX ID of an identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox str(c.PosixID)
```

**Notes:** Returns an identity's POSIX identifier (a UID or GID).
(Read only property)

### 45.7.42 PosixName as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the POSIX name (short name) of an identity.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox c.PosixName
```

**Notes:** Returns an identity's POSIX name. This attribute is always non-empty.
The POSIX name cannot be changed after an identity has been created.
(Read only property)

### 45.7.43 UUID as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns an identity's UUID as string.
**Example:**

```
dim c as CSIdentityMBS = CSIdentityMBS.CurrentUser
MsgBox c.UUID
```

**Notes:** (Read only property)

### 45.7.44 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCSIdentityFlagHidden | -1 | One of the flags for identity creation.<br>This flag causes the identity to be "hidden," that is, excluded from most user-visible identity lists. Hidden identities include administrative users and groups such as root, www, and mysql. System service access control groups should be created with the hidden flag. |
| kCSIdentityFlagNone | 0 | One of the flags for identity creation.<br>Use this flag to set no optional attributes for a new identity. |

Identity Class Constants

| Constant | Value | Description |
|---|---|---|
| kCSIdentityClassGroup | 2 | The class value for group identities. |
| kCSIdentityClassUser | 1 | The class value for user identities. |

## 45.8 class CSIdentityQueryMBS

### 45.8.1 class CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** A CSIdentityQuery object provides synchronous or asynchronous access to a collection of identities managed by an identity authority.
**Notes:** Clients call one of the CSIdentityQueryCreate* functions to define the query criteria. A query can be executed exactly once, in either synchronous or asynchronous mode.

For synchronous execution, the client calls CSIdentityQueryExecute. This function will return when all identies matching the criteria have been found. The results are accessed as an array via Results(). No live updates to the results array are provided in synchronous mode.

To execute in asynchronous mode, the client calls ExecuteAsynchronously, specifying a client object to receive callbacks and a runloop/mode on which callbacks are scheduled.

ExecuteAsynchronously returns immediately, and events will be reported to the callback function as results are added by the query. The client may request live updates to the query which will track changes to the results as changes are made to the identity authority by other processes. Currently, only changes to the local identity authority are monitored.

Asynchronous clients must call Stop when done processing query results to prevent the client callbacks from being called again.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

### 45.8.2 Methods

### 45.8.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Whether the CSIdentityQuery functions are available.
**Example:**

```
if not CSIdentityQueryMBS.Available then
MsgBox "not supported."
end if
```

### 45.8.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 45.8.5 Create(identityClass as Integer, authority as CSIdentityAuthorityMBS) as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates an identity query object for all identities in the specified authority.
**Example:**

```
dim c as CSIdentityQueryMBS = CSIdentityQueryMBS.Create(CSIdentityMBS.kCSIdentityClassUser, CSIdentityAuthorityMBS.localIdentityAuthority)

if c.Execute then
dim a() as CSIdentityMBS = c.Results

dim names() as string
for each p as CSIdentityMBS in a
names.append p.fullName
next

MsgBox join(names,EndOfLine)
end if
```

**Notes:** identityClass: The class of identity to find
authority: The identity authority to query

Returns a new CSIdentityQuery object.

The results of this query include all of the identities in the specified authority's database.

### 45.8.6 CreateForCurrentUser as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates a query for the current session user's identity.
**Example:**

```
dim q as CSIdentityQueryMBS = CSIdentityQueryMBS.CreateForCurrentUser
```

```
if q.Execute then
dim r() as CSIdentityMBS = q.Results

if UBound(r) = 0 then
dim i as CSIdentityMBS = r(0)

MsgBox i.fullName
end if
end if
```

### 45.8.7 CreateForName(name as string, comparisonMethod as Integer, identityClass as Integer, authority as CSIdentityAuthorityMBS) as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates an identity query object based on a name.
**Example:**

```
// search for short name and show full name
dim name as string = SystemInformationMBS.ShortUsername
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.defaultIdentityAuthority
dim f as Integer = CSIdentityQueryMBS.kCSIdentityQueryStringEquals
dim q as CSIdentityQueryMBS = CSIdentityQueryMBS.CreateForName(name, f, CSIdentityMBS.kCSIdentityClassUser, a)

if q.Execute then
dim r() as CSIdentityMBS = q.Results
MsgBox r(0).fullName
end if
```

**Notes:** name: The name criteria for the query.
comparisonMethod: The comparision function (equal or begins with)
identityClass: The class of identity to find
authority: The identity authority to query

Returns a new CSIdentityQuery object
The query finds identities by name. It searches the full names, posix names and aliases for matches.

### 45.8.8 CreateForPersistentReference(data as memoryblock) as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates an identity query object based on an identity reference data object.
**Example:**

```
// get a reference
dim u as CSIdentityMBS = CSIdentityMBS.CurrentUser
dim p as MemoryBlock = u.PersistentReference
u = nil

// and search back later:
dim q as CSIdentityQueryMBS = CSIdentityQueryMBS.CreateForPersistentReference(p)
if q.Execute then
dim r() as CSIdentityMBS = q.Results
MsgBox r(0).fullName
end if
```

**Notes:** referenceData: The reference data that fully describes an identity
Returns a new CSIdentityQuery object.
Finds an identity by reference data obtained from ReferenceData.

### 45.8.9 CreateForPosixID(posixID as Integer, identityClass as Integer, authority as CSIdentityAuthorityMBS) as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates an identity query object based on a POSIX ID.
**Example:**

```
// search for short name and show full name
dim a as CSIdentityAuthorityMBS = CSIdentityAuthorityMBS.defaultIdentityAuthority
dim f as Integer = CSIdentityQueryMBS.kCSIdentityQueryStringEquals
dim q as CSIdentityQueryMBS = CSIdentityQueryMBS.CreateForPosixID(501, CSIdentityMBS.kCSIden-
tityClassUser, a)

if q.Execute then
dim r() as CSIdentityMBS = q.Results
MsgBox r(0).fullName
end if
```

**Notes:** posixID: The UID or GID of the identity to find
identityClass: The class of identity to find

authority: The identity authority to query

Returns a new CSIdentityQuery object
Finds an identity by its UID or GID

### 45.8.10 CreateForUUID(uuid as string, authority as CSIdentityAuthorityMBS) as CSIdentityQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates an identity query object based on a UUID.
**Notes:** uuid: The UUID of the identity to find
authority: The identity authority to query
Returns a new CSIdentityQuery object
Finds an identity by its UUID.

### 45.8.11 Execute(flags as Integer = 0) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Execute an identity query synchronously.
**Notes:** flags: Execution options.
error: Optional pointer to a variant which is filled with CFErrorMBS object if function returns false.
Returns true if the query executed successfully, false if an error occurred.
See also:

- 45.8.12 Execute(flags as Integer, byref error as Variant) as Boolean 8284

### 45.8.12 Execute(flags as Integer, byref error as Variant) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Execute an identity query synchronously.
**Notes:** flags: Execution options.
error: Optional pointer to a variant which is filled with CFErrorMBS object if function returns false.
Returns true if the query executed successfully, false if an error occurred.
See also:

- 45.8.11 Execute(flags as Integer = 0) as Boolean 8284

### 45.8.13 Results as CSIdentityMBS()

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Retrieve the results of executing an identity query.

### 45.8.14 Stop

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Invalidate an identity query client.
**Notes:** Invalidate a query client so that its callback will never be called in the future. Clients should call Stop when an query will no longer be used, prior to releasing the final query reference.

### 45.8.15 Properties

### 45.8.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 45.8.17 Constants

Execution flags

| Constant | Value | Description |
|---|---|---|
| kCSIdentityQueryGenerateUpdateEvents | 1 | After the intial query phase is complete, monitor the result set for live |
| kCSIdentityQueryIncludeHiddenIdentities | 2 | Include all matching identities in the result set, including hidden "syst and groups (root, www, etc.). |

String Operation

| Constant | Value | Description |
|---|---|---|
| kCSIdentityQueryStringBeginsWith | 2 | The identity name must begin with the search string. When searching for identities by name, this value specifies the string comp son function. |
| kCSIdentityQueryStringEquals | 1 | The identity name must equal the search string. When searching for identities by name, this value specifies the string comp son function. |

# Chapter 46

# ColorSync

## 46.1 module CSDeviceMBS

### 46.1.1 module CSDeviceMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A module for device related Colorsync methods.
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr5

### 46.1.2 Methods

### 46.1.3 DeviceInfo(deviceClass as string, deviceID as CFUUIDMBS) as dictionary

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries information on the device.
**Notes:** Returns a dictionary with the following keys and values resolved for the current host and current user.

kColorSyncDeviceClass: camera, display, printer, scanner
kColorSyncDeviceID: CFUUIDRef registered with ColorSync
kColorSyncDeviceDescription: localized device description
kColorSyncDeviceUserScope: kCFPreferencesAnyUser or kCFPreferencesCurrentUser
kColorSyncDeviceHostScope: kCFPreferencesAnyHost or kCFPreferencesCurrentHost
kColorSyncFactoryProfiles: dictionary with ProfileID and kColorSyncCustomProfiles keys.
kColorSyncCustomProfiles: dictionary with keys ProfileID and values CFURLMBS or nil.

ProfileID is a dictionary with the following keys:

kColorSyncDeviceProfileURL: CFURLMBS or kCFNull
kColorSyncDeviceModeDescription: localized mode description

### 46.1.4 DeviceProfiles as dictionary()

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queris the device profiles.
**Notes:** The dictionaries contain the following keys:

| | |
|---|---|
| kColorSyncDeviceClass | camera, display, printer, scanner |
| kColorSyncDeviceID | CFUUIDRef registered with ColorSync |
| kColorSyncDeviceDescription | localized device description |
| kColorSyncDeviceModeDescription | localized device mode description |
| kColorSyncDeviceProfileID | ProfileID registered with ColorSync |
| kColorSyncDeviceProfileURL | CFURLMBS registered with ColorSync |
| kColorSyncDeviceProfileIsFactory | Boolean |
| kColorSyncDeviceProfileIsDefault | Boolean |
| kColorSyncDeviceProfileIsCurrent | Boolean |

### 46.1.5 kColorSyncCameraDeviceClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A constant for a possible value for the device class.

### 46.1.6 kColorSyncCustomProfiles as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** Dictionary containing custom profile info.

### 46.1.7 kColorSyncDeviceClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.8 kColorSyncDeviceDefaultProfileID as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.9 kColorSyncDeviceDescription as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** String with a name in current locale.

### 46.1.10 kColorSyncDeviceDescriptions as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** Dictionary with localized names.

### 46.1.11 kColorSyncDeviceHostScope as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.12 kColorSyncDeviceID as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** Value is a CFUUIDMBS for this key.

### 46.1.13 kColorSyncDeviceModeDescription as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** String, e.g. Glossy, Best Quality.

### 46.1.14 kColorSyncDeviceModeDescriptions as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** Dictionary with localized mode names.

### 46.1.15 kColorSyncDeviceProfileID as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.16 kColorSyncDeviceProfileIsCurrent as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.17 kColorSyncDeviceProfileIsDefault as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.18 kColorSyncDeviceProfileIsFactory as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.19 kColorSyncDeviceProfilesNotification as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.20 kColorSyncDeviceProfileURL as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.21 kColorSyncDeviceRegisteredNotification as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.22 kColorSyncDeviceUnregisteredNotification as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.23 kColorSyncDeviceUserScope as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.24 kColorSyncDisplayDeviceClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A constant for a possible value for the device class.

### 46.1.25 kColorSyncDisplayDeviceProfilesNotification as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.26 kColorSyncFactoryProfiles as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.
**Notes:** Dictionary containing factory profile info.

### 46.1.27 kColorSyncPrinterDeviceClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A constant for a possible value for the device class.

### 46.1.28 kColorSyncProfileHostScope as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.29 kColorSyncProfileUserScope as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants for the info/options dictionaries.

### 46.1.30 kColorSyncScannerDeviceClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A constant for a possible value for the device class.

### 46.1.31 RegisterDevice(deviceClass as string, deviceID as CFUUIDMBS, deviceInfo as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registeres a device.
**Notes:** deviceInfo: A dictionary containing information needed to register a device.

Required keys:

kColorSyncDeviceDescriptions: Dictionary with localized names of the device. Localization keys must be five character strings containing language code and region code in the lc_RG format and it must contain (at least) the "en_US" locale.
kColorSyncFactoryProfiles: Dictionary with factory profile info Dictionaries The keys are the profile IDs and the values are the profile info dictionaries.

Optional keys:

kColorSyncDeviceHostScope: host scope of the device; one of kCFPreferences { Current,Any } Host; if unspecified kCFPreferencesCurrentHost is assumed.
kColorSyncDeviceUserScope: user scope of the device; one of kCFPreferences { Current,Any } User; if unspecified kCFPreferencesCurrentUser is assumed.

factory profiles dictionary - value for the key kColorSyncFactoryProfiles in deviceInfo

Required keys and values:

Each profile is identified by a ProfileID (of String type) which used as the key. Value associated with the key is a profile info dictionary that describes an individual device profile.

kColorSyncDeviceDefaultProfileID: the associated value must be one of the ProfileID present in the dictionary. Presence of this key is not required if there is only one factory profile.

profile info Dictionary

Required keys:

kColorSyncDeviceProfileURL: CFURLMBS of the profile to be registered
kColorSyncDeviceModeDescriptions: Dictionary with localized device mode names for the profile. Localization keys must be five character strings containing language code and region code in the lc_RG format and it must contain (at least) the "en_US" locale. E.g. "en_US" "Glossy Paper with best quality"

Example of deviceInfo dictionary:

kColorSyncDeviceDescriptions:
en_US My Little Printer
de_DE Mein Kleiner Drucker
fr_FR Mon petit immprimeur
...

kColorSyncFactoryProfiles: "Profile 1"
kColorSyncDeviceProfileURL: CFURLMBS
kColorSyncDeviceModeDescriptions:
en_US Glossy Paper
de_DE Glanzpapier
fr_FR Papier glace
...

kColorSyncDeviceDefaultProfileID: "Profile 1"
kColorSyncDeviceUserScope: kCFPreferencesAnyUser
kColorSyncDeviceHostScope: kCFPreferencesCurrentHost

Notes:
1. Scope for factory profiles is exactly the same as the device scope.
2. Pass CFNullRef in lieu of the profile URL or no URl key/value pair at all if factory profile is not available. This will enable setting custom profile.
3. For the reasons of compatibility with legacy API, it is recommended that the profile keys are created as CFStrings from uint32 numbers as follows: key = encodings.UTF32.chr(value)

Returns true on success and false in case of failure

### 46.1.32 SetCustomProfiles(deviceClass as string, deviceID as CFUUIDMBS, profileInfo as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a custom profile:
**Notes:** profileInfo is a CFDictionary containing the information about custom profiles to be set in lieu of factory profiles.

Required keys:

ProfileIDs which must be the subset of the ProfileIDs that device was registered with or kColorSyncDeviceDefaultProfileID for setting custom default profile.

Required values:

CFURLMBS (folderitem) of the profile to be set as a custom profile.

Optional keys:

kColorSyncProfileHostScope: host scope of the profile; one of kCFPreferences { Current,Any } Host; if unspecified kCFPreferencesCurrentHost is assumed.
kColorSyncProfileUserScope: user scope of the profile; one of kCFPreferences { Current,Any } User; if unspecified kCFPreferencesCurrentUser is assumed.

Notes:
1. Profile scope for custom profiles cannot exceed scope of the factory profiles.
2. There is only one host scope and user scope per dictionary (i.e. per call)
3. Pass CFNullRef in lieu of the profile URL to unset the custom profile and reset the current profile to the factory profile.

Returns true on success and false in case of failure.

### 46.1.33 UnregisterDevice(deviceClass as string, deviceID as CFUUIDMBS) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unregisters a device of given deviceClass and deviceID.
**Notes:** Returns true on success and false in case of failure.

## 46.2 class CSManagementModuleMBS

### 46.2.1 class CSManagementModuleMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a Color Management Module module.
**Notes:** Color conversions are performed by a Color Management Module (CMM) which is a plugin to ColorSync. ColorSync contains Apple CMM, which is not replaceable, but third parties can install their own CMMs. ColorSync provides access to installed CMMs as well as those that can be part of the application bundle. CMM can be selected and specified as a preferred CMM per color transform created by the application. If the third party CMM fails to perform a task, Apple CMM will take it over.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr5

### 46.2.2 Methods

### 46.2.3 Bundle as CFBundleMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The bundle of the Color Management Module.
**Notes:** Nil for built-in Apple CMM.

### 46.2.4 CMMIdentifier as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal identifier for this Color Management Module.
**Example:**

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs

for each m as CSManagementModuleMBS in a
MsgBox m.CMMIdentifier
next
```

### 46.2.5 Constructor(Bundle as CFBundleMBS)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a Color Management Module object from a given CF Bundle.
**Example:**

```
dim f as FolderItem = GetFolderItem("/Library/ColorSync/CMMs/AdobeCMM.cmm", FolderItem.PathTypeShell)
dim b as CFBundleMBS = CreateBundleMBS(F)
dim m as new CSManagementModuleMBS(b)

' MsgBox stR(m.Handle) // must be non zero

MsgBox m.LocalizedName
MsgBox m.CMMIdentifier
```

### 46.2.6 InstalledCMMs as CSManagementModuleMBS()

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The list of installed Color Management Modules.
**Example:**

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs

for each m as CSManagementModuleMBS in a
dim path as string
dim bundle as CFBundleMBS = m.Bundle
if bundle<>nil then
dim ExecutableFileURL as CFURLMBS = bundle.URL
if ExecutableFileURL<>nil then
dim s as CFStringMBS = ExecutableFileURL.Str
if s<>nil then
path = s.str
end if
end if
end if

MsgBox m.CMMIdentifier+EndOfLine+EndOfLine+m.LocalizedName+EndOfLine+path
next
```

**Notes:** Returns an empty array on failure.

### 46.2.7 LocalizedName as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The localized name of this Color Management Module.
**Example:**

```
dim a(-1) as CSManagementModuleMBS = CSManagementModuleMBS.InstalledCMMs

for each m as CSManagementModuleMBS in a
MsgBox m.LocalizedName
next
```

## 46.3 class CSMutableProfileMBS

### 46.3.1 class CSMutableProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a mutable colorsync profile.
**Notes:** Subclass of the CSProfileMBS class.
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr5

### 46.3.2 Methods

### 46.3.3 Constructor

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new empty mutable profile.
See also:

- 46.3.4 Constructor(profile as CSProfileMBS) 8299

### 46.3.4 Constructor(profile as CSProfileMBS)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a mutable copy of the given profile.
See also:

- 46.3.3 Constructor 8299

### 46.3.5 RemoveTag(signature as string)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the tag with the signature.

### 46.3.6 SetHeader(data as string)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the raw header data.

### 46.3.7 SetRawTag(signature as string, data as string)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a tag with the raw data in a string.

## 46.4 class CSProfileMBS

### 46.4.1 class CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a Colorsync profile.
**Notes:** Subclass of the CFObjectMBS class.
**Blog Entries**

- Features to be removed
- MBS REALbasic Plugins, version 10.5pr5

### 46.4.2 Methods

### 46.4.3 Constructor(data as string, byref error as CFErrorMBS)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a profile with the data in the given string.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic Gray Profile.icc",
FolderItem.PathTypeShell)
dim stream as BinaryStream = file.OpenAsBinaryFile(False) // BinaryStream.Open(f, false)
dim data as string = stream.read(stream.length)
dim e as CFErrorMBS
dim p as new CSProfileMBS(data, e)

MsgBox p.Description
```

**Notes:** On success the handle property is not zero.
See also:


- 46.4.4 Constructor(DisplayID as Integer) 8302
- 46.4.5 Constructor(file as folderitem) 8302
- 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 8303
- 46.4.7 Constructor(name as string) 8303
- 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 8304

### 46.4.4 Constructor(DisplayID as Integer)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile with the given display.
**Notes:** displayID: system-wide unique display ID (defined by IOKIt); pass 0 for main display.

On success the handle property is not zero.
See also:


- 46.4.3 Constructor(data as string, byref error as CFErrorMBS) 8301
- 46.4.5 Constructor(file as folderitem) 8302
- 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 8303
- 46.4.7 Constructor(name as string) 8303
- 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 8304


### 46.4.5 Constructor(file as folderitem)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the given file.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)

MsgBox p.Description
```

**Notes:** On success the handle property is not zero.
See also:


- 46.4.3 Constructor(data as string, byref error as CFErrorMBS) 8301
- 46.4.4 Constructor(DisplayID as Integer) 8302
- 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 8303
- 46.4.7 Constructor(name as string) 8303
- 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 8304

### 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the given file.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim e as CFErrorMBS
dim p as new CSProfileMBS(file, e)

MsgBox p.Description
```

**Notes:** On success the handle property is not zero.
See also:


- 46.4.3 Constructor(data as string, byref error as CFErrorMBS) 8301
- 46.4.4 Constructor(DisplayID as Integer) 8302
- 46.4.5 Constructor(file as folderitem) 8302
- 46.4.7 Constructor(name as string) 8303
- 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 8304


### 46.4.7 Constructor(name as string)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a profile with the given predefined name.
**Example:**

```
dim c as new CSProfileMBS(CSProfileMBS.kColorSyncGenericXYZProfile)
MsgBox c.Description
```

**Notes:** On success the handle property is not zero.
See also:


- 46.4.3 Constructor(data as string, byref error as CFErrorMBS) 8301
- 46.4.4 Constructor(DisplayID as Integer) 8302
- 46.4.5 Constructor(file as folderitem) 8302
- 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 8303
- 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary) 8304

### 46.4.8 Constructor(profileSequence() as dictionary, options as dictionary)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a link profile.
**Notes:** profileSequence: An array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CSProfileMBS
kColorSyncRenderingIntent: String defining rendering intent
kColorSyncTransformTag: String defining which tags to use

Optional key:

kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

On success the handle property is not zero.
See also:


- 46.4.3 Constructor(data as string, byref error as CFErrorMBS) 8301
- 46.4.4 Constructor(DisplayID as Integer) 8302
- 46.4.5 Constructor(file as folderitem) 8302
- 46.4.6 Constructor(file as folderitem, byref error as CFErrorMBS) 8303
- 46.4.7 Constructor(name as string) 8303


### 46.4.9 ContainsTag(signature as string) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the tag is contained in the profile.

### 46.4.10 CreateDeviceProfile(deviceClass as string, deviceID as CFUUIDMBS, profileID as Variant) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a device profile.
**Notes:** deviceClass: ColorSync device class
deviceID: deviceID registered with ColorSync
profileID: profileID registered with ColorSync; pass kColorSyncDeviceDefaultProfileID to get the default profile.

See CSDeviceMBS for more info on deviceClass, deviceID and profileID

Returns nil on failure and Profile object on success.

### 46.4.11 CreateLink(profileSequence() as dictionary, options as dictionary) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a link profile.
**Notes:** profileSequence: An array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CSProfileMBS
kColorSyncRenderingIntent: String defining rendering intent
kColorSyncTransformTag: String defining which tags to use

Optional key:

kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

Returns nil on failure and Profile object on success.

### 46.4.12 CreateWithData(data as string) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a profile with the data in the given string.
**Notes:** Returns nil on failure and Profile object on success.

See also:

- 46.4.13 CreateWithData(data as string, byref error as CFErrorMBS) as CSProfileMBS 8306

### 46.4.13 CreateWithData(data as string, byref error as CFErrorMBS) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a profile with the data in the given string.
**Notes:** Returns nil on failure and Profile object on success.
See also:

- 46.4.12 CreateWithData(data as string) as CSProfileMBS 8305

### 46.4.14 CreateWithDisplayID(DisplayID as Integer) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile with the given display.
**Notes:** displayID: system-wide unique display ID (defined by IOKIt); pass 0 for main display.

Returns nil on failure and Profile object on success.

### 46.4.15 CreateWithFile(file as folderitem) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the given file.
**Notes:** Returns nil on failure and Profile object on success.
See also:

- 46.4.16 CreateWithFile(file as folderitem, byref error as CFErrorMBS) as CSProfileMBS 8306

### 46.4.16 CreateWithFile(file as folderitem, byref error as CFErrorMBS) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the given file.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
```

```
dim e as CFErrorMBS
dim p as new CSProfileMBS(file, e)

MsgBox p.Description
```

**Notes:** Returns nil on failure and Profile object on success.
See also:

- 46.4.15 CreateWithFile(file as folderitem) as CSProfileMBS 8306

### 46.4.17 CreateWithName(name as string) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a profile with the given name.
**Example:**

```
dim s as string = CSProfileMBS.kColorSyncGenericXYZProfile
dim c as CSProfileMBS = CSProfileMBS.CreateWithName(s)
MsgBox c.Description
```

**Notes:** Returns nil on failure and Profile object on success.

### 46.4.18 CreateWithURL(url as string) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the file at the given URL.
**Notes:** Returns nil on failure and Profile object on success.
See also:

- 46.4.19 CreateWithURL(url as string, byref error as CFErrorMBS) as CSProfileMBS 8307

### 46.4.19 CreateWithURL(url as string, byref error as CFErrorMBS) as CSProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new profile based on the file at the given URL.
**Notes:** Returns nil on failure and Profile object on success.
See also:

• 46.4.18 CreateWithURL(url as string) as CSProfileMBS 8307

### 46.4.20 Data as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a string with the raw data of the profile.

### 46.4.21 Edit as CSMutableProfileMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an editable copy of the profile.
**Notes:** Returns nil on any error.

### 46.4.22 EstimateGamma as Double

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calculates the estimated gamma for this profile.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic Gray Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)

MsgBox str(p.EstimateGamma) // 1.8
```

**Notes:** Returns non-zero value if success or 0.0 in case of error.
See also:

• 46.4.23 EstimateGamma(byref error as CFErrorMBS) as Double 8308

### 46.4.23 EstimateGamma(byref error as CFErrorMBS) as Double

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calculates the estimated gamma for this profile.
**Notes:** Returns non-zero value if success or 0.0 in case of error.
See also:

• 46.4.22 EstimateGamma as Double 8308

### 46.4.24 EstimateGammaWithDisplayID(displayID as Integer) as Double

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calculates the estimated gamma value for the given display.
**Notes:** displayID: system-wide unique display ID.
See also:

- 46.4.25 EstimateGammaWithDisplayID(displayID as Integer, byref error as CFErrorMBS) as Double 8309

### 46.4.25 EstimateGammaWithDisplayID(displayID as Integer, byref error as CFErrorMBS) as Double

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calculates the estimated gamma value for the given display.
**Notes:** displayID: system-wide unique display ID.
See also:

- 46.4.24 EstimateGammaWithDisplayID(displayID as Integer) as Double 8309

### 46.4.26 File as folderitem

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file reference for this profile.
See also:

- 46.4.27 File(byref error as CFErrorMBS) as folderitem 8309

### 46.4.27 File(byref error as CFErrorMBS) as folderitem

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file reference for this profile.
See also:

- 46.4.26 File as folderitem 8309

### 46.4.28 Header as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a string with the raw header content.

### 46.4.29 InstalledProfiles as dictionary()

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the list of installed profiles.
**Example:**

```
dim a(-1) as Dictionary = CSProfileMBS.InstalledProfiles
dim lines(-1) as string

for each d as Dictionary in a
lines.Append d.Value(CSProfileMBS.kColorSyncProfileDescription)
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Returns an empty array on any error.

Note: When called for the first time this function will return only system profiles because profile iteration is a slow process requiring multiple access to file system.

e.g. you may call it in app.open, so later when you call it again, the list is gathered.

### 46.4.30 kColorSyncAdobeRGB1998Profile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.31 kColorSyncGenericCMYKProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.32 kColorSyncGenericGrayGamma22Profile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.33 kColorSyncGenericGrayProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.34 kColorSyncGenericLabProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.35 kColorSyncGenericRGBProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.36 kColorSyncGenericXYZProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the predefined profile names.

### 46.4.37 kColorSyncProfileClass as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.38 kColorSyncProfileColorSpace as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.39 kColorSyncProfileDescription as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.40 kColorSyncProfileHeader as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.41 kColorSyncProfileMD5Digest as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.42 kColorSyncProfilePCS as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.43 kColorSyncProfileURL as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.44 kColorSyncSRGBProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the tag signature constants.
**Notes:** Can be used with the dictionary returned by the InstalledProfiles method.

### 46.4.45 MD5 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** MD5 digest for the profile calculated as defined by ICC specification.
**Notes:** Returns a 16 byte string with the raw bytes of the signature.
Returns an empty string on any error.

### 46.4.46 RawTag(signature as string) as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the raw tag value as string.

### 46.4.47 TagSignatures as string()

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the tag signatures.

### 46.4.48 URL as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL reference for this profile.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)

MsgBox p.URL
```

See also:

- 46.4.49 URL(byref error as CFErrorMBS) as string 8314

### 46.4.49 URL(byref error as CFErrorMBS) as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL reference for this profile.
See also:

- 46.4.48 URL as string 8313

### 46.4.50 Verify(byref errors as CFErrorMBS, byref warnings as CFErrorMBS) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Verifies the profile.
**Notes:** errors: returns error strings in case problems are found which would prevent use of the profile.
warnings: returns warning strings indicating problems due to lack of conformance with the ICC specification, but not preventing use of the profile.

Returns true if profile can be used or false otherwise.

### 46.4.51 Properties

### 46.4.52 Description as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the containing profile description localized to current locale.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)

MsgBox p.Description
```

**Notes:** (Read only property)

### 46.4.53 MD5String as String

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** MD5 digest for the profile calculated as defined by ICC specification.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/ColorSync/Profiles/Generic XYZ Profile.icc",
FolderItem.PathTypeShell)
dim p as new CSProfileMBS(file)

MsgBox p.MD5String
```

**Notes:** Returns a 32 byte human readable hexstring with the bytes of the signature.
Returns an empty string on any error.
(Read only property)

## 46.5 class CSTransformMBS

### 46.5.1 class CSTransformMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a ColorSync transformation.
**Notes:** This class uses newer APIs than those in the older ColorSyncWorldMBS class.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr1

- MBS REALbasic Plugins, version 10.5pr5

### 46.5.2 Methods

### 46.5.3 Constructor(profileSequence() as dictionary, options as dictionary)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new transformation.
**Notes:** profileSequence: Array of dictionaries, each one containing a profile object and the information on the usage of the profile in the transform.

Required keys:

kColorSyncProfile: CSProfileMBS
kColorSyncRenderingIntent: String defining rendering intent
kColorSyncTransformTag: String defining which tags to use

Optional key:
kColorSyncBlackPointCompensation: Boolean to enable/disable BPC

options: dictionary with additional public global options (e.g. preferred CMM, quality, etc... It can also contain custom options that are CMM specific.

On success the handle property is not zero.

### 46.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the convert methods to transform data.
**Notes:** dest: Destination picture.
source: Source picture.
src: A memroyblock to the data to be converted.
srcDepth: Describes the bit depth and type of the source color components
srcFormat: Describes the format and byte packing of the source pixels
srcBytesPerRow: Number of bytes in the row of data

returns true if conversion was successful or false otherwise
See also:


- 46.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 8317
- 46.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 8318
- 46.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8318


### 46.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the convert methods to transform data.
**Notes:** dest: Destination picture.
source: Source picture.

Should only be used with RGB for source/dest profile.

returns true if conversion was successful or false otherwise
See also:


- 46.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8317
- 46.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 8318

- 46.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8318

### 46.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the convert methods to transform data.
**Notes:** dest: Destination picture.
dst: A memroyblock to the destination where the results will be written.
dstDepth: Describes the bit depth and type of the destination color components
dstFormat: Describes the format and byte packing of the destination pixels
dstBytesPerRow: number of bytes in the row of data
source: Source picture.

returns true if conversion was successful or false otherwise
See also:

- 46.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8317
- 46.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 8317
- 46.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8318

### 46.5.7 Convert(width as Integer, height as Integer, dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the convert methods to transform data.
**Notes:** width: Width of the image in pixels. (or taken from picture object)
height: Height of the image in pixels. (or taken from picture object)
dst: A memroyblock to the destination where the results will be written.
dstDepth: Describes the bit depth and type of the destination color components
dstFormat: Describes the format and byte packing of the destination pixels
dstBytesPerRow: number of bytes in the row of data
src: A memroyblock to the data to be converted.
srcDepth: Describes the bit depth and type of the source color components

srcFormat: Describes the format and byte packing of the source pixels
srcBytesPerRow: Number of bytes in the row of data

returns true if conversion was successful or false otherwise
See also:


- 46.5.4 Convert(dest as picture, src as memoryblock, srcDepth as Integer, srcLayout as Integer, srcBytesPerRow as Integer, options as dictionary) as boolean 8317
- 46.5.5 Convert(dest as picture, src as picture, options as dictionary) as boolean 8317
- 46.5.6 Convert(dst as memoryblock, dstDepth as Integer, dstLayout as Integer, dstBytesPerRow as Integer, src as picture, options as dictionary) as boolean 8318


### 46.5.8 GetProperty(key as Variant) as Variant

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries a property.
**Notes:** Returns nil if the value is nil or we had an error.

### 46.5.9 kColorSyncBestQuality as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncConvertQuality key.
**Notes:** do not coalesce profile transforms (default)

### 46.5.10 kColorSyncBlackPointCompensation as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used for profile info and options.

### 46.5.11 kColorSyncConversion1DLut as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.12 kColorSyncConversion3DLut as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.13 kColorSyncConversionBPC as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.14 kColorSyncConversionChannelID as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.15 kColorSyncConversionGridPoints as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.16 kColorSyncConversionInpChan as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.17 kColorSyncConversionMatrix as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.18 kColorSyncConversionOutChan as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.19 kColorSyncConversionParamCurve0 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.20 kColorSyncConversionParamCurve1 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.21 kColorSyncConversionParamCurve2 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.22 kColorSyncConversionParamCurve3 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.23 kColorSyncConversionParamCurve4 as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.24 kColorSyncConvertQuality as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the transform options keys.

### 46.5.25 kColorSyncDraftQuality as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncConvertQuality key.
**Notes:** coalesce all transforms, do not interpolate

### 46.5.26 kColorSyncNormalQuality as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncConvertQuality key.
**Notes:** coalesce all transforms

### 46.5.27 kColorSyncPreferredCMM as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the transform options keys.
**Notes:** Value is a CSManagementModuleMBS object.

### 46.5.28 kColorSyncProfile as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used for profile info and options.

### 46.5.29 kColorSyncRenderingIntent as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used for profile info and options.

### 46.5.30 kColorSyncRenderingIntentAbsolute as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncRenderingIntent key.

### 46.5.31 kColorSyncRenderingIntentPerceptual as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncRenderingIntent key.

### 46.5.32 kColorSyncRenderingIntentRelative as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncRenderingIntent key.

### 46.5.33 kColorSyncRenderingIntentSaturation as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncRenderingIntent key.

### 46.5.34 kColorSyncRenderingIntentUseProfileHeader as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncRenderingIntent key.

### 46.5.35 kColorSyncTransformCreator as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the dictionary used with the kColorSyncTranformInfo keys.
**Notes:** name of the CMM that created the transform

### 46.5.36 kColorSyncTransformDeviceToDevice as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncTransformTag key.

### 46.5.37 kColorSyncTransformDeviceToPCS as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncTransformTag key.

### 46.5.38 kColorSyncTransformDstSpace as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the dictionary used with the kColorSyncTranformInfo keys.

### 46.5.39 kColorSyncTransformFullConversionData as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.40 kColorSyncTransformGamutCheck as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncTransformTag key.

### 46.5.41 kColorSyncTransformParametricConversionData as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.42 kColorSyncTransformPCSToDevice as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncTransformTag key.

### 46.5.43 kColorSyncTransformPCSToPCS as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the kColorSyncTransformTag key.

### 46.5.44 kColorSyncTransformSimplifiedConversionData as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** For more information lookup details in Apples headers/documentation.

### 46.5.45 kColorSyncTransformSrcSpace as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the value constants for use with the dictionary used with the kColorSyncTranformInfo keys.

### 46.5.46 kColorSyncTransformTag as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used for profile info and options.

### 46.5.47 PrintClasses

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes the declarations of the plugin classes to the console.
**Notes:** Call in console applications.

### 46.5.48 SetProperty(key as Variant, value as Variant)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a property.

### 46.5.49 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kColorSync16BitFloat | 4 | One of the possible data depth values constants.<br>16 bit floats. |
| kColorSync16BitInteger | 3 | One of the possible data depth values constants.<br>16 bit integers (short) |
| kColorSync1BitGamut | 1 | One of the possible data depth values constants.<br>1 bit graphics. |
| kColorSync32BitFloat | 7 | One of the possible data depth values constants.<br>32 bit float (single in Xojo) |
| kColorSync32BitInteger | 5 | One of the possible data depth values constants.<br>32 bit integer |
| kColorSync32BitNamedColorIndex | 6 | One of the possible data depth values constants.<br>32 bit integers with index of named color. |
| kColorSync8BitInteger | 2 | One of the possible data depth values constants.<br>8 bit graphics (this is used in Xojo Picture objects) |
| kColorSyncAlphaFirst | 4 | One of the alpha constants.<br>For example, non-premultiplied ARGB |
| kColorSyncAlphaInfoMask | &h1F | One of the alpha constants.<br>The bitmask for bitwise.BitAnd to extract the alpha value. |
| kColorSyncAlphaLast | 3 | One of the alpha constants.<br>For example, non-premultiplied RGBA |
| kColorSyncAlphaNone | 0 | One of the alpha constants.<br>For example, RGB. |
| kColorSyncAlphaNoneSkipFirst | 6 | One of the alpha constants.<br>For example, XRGB. |
| kColorSyncAlphaNoneSkipLast | 5 | One of the alpha constants.<br>For example, RBGX. |
| kColorSyncAlphaPremultipliedFirst | 2 | One of the alpha constants.<br>For example, premultiplied ARGB |
| kColorSyncAlphaPremultipliedLast | 1 | One of the alpha constants.<br>For example, premultiplied RGBA |
| kColorSyncByteOrder16Big | 12288 | One of the byte order constants.<br>16 bit, big endian. |
| kColorSyncByteOrder16Little | 4096 | One of the byte order constants.<br>16 bit, little endian. |
| kColorSyncByteOrder32Big | 16384 | One of the byte order constants.<br>32 bit, big endian. |
| kColorSyncByteOrder32Little | 8192 | One of the byte order constants.<br>32 bit, little endian. |
| kColorSyncByteOrderDefault | 0 | One of the byte order constants. |
| kColorSyncByteOrderMask | &h7000 | One of the byte order constants. |

# Chapter 47

# Common Types

## 47.1 Globals

### 47.1.1 MakeDoublePointMBS(x as Double, y as Double) as DoublePointMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new double point.
**Notes:** Returns nil on low memory.

### 47.1.2 MakeDoubleRectMBS(left as Double, top as Double, width as Double, height as Double) as DoubleRectMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new double rectangle.
**Notes:** Returns nil on low memory.

### 47.1.3 MakeIntegerPointMBS(x as Integer, y as Integer) as IntegerPointMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new integer point.
**Notes:** Returns nil on low memory.

### 47.1.4 MakeIntegerRectMBS(left as Integer, top as Integer, width as Integer, height as Integer) as IntegerRectMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new integer rectangle.
**Notes:** Returns nil on low memory.

## 47.2 class DoublePointMBS

### 47.2.1 class DoublePointMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a double point.

### 47.2.2 Methods

### 47.2.3 Move(deltax as Double, deltay as Double)

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the point.

### 47.2.4 Properties

### 47.2.5 x as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X property of the point.
**Notes:** (Read and Write property)

### 47.2.6 y as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y property of the point.
**Notes:** (Read and Write property)

## 47.3 class DoubleRectMBS

### 47.3.1 class DoubleRectMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a double rectangle.

### 47.3.2 Methods

### 47.3.3 Intersection(other as DoubleRectMBS) as DoubleRectMBS

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intersection area of two rectangles.
**Notes:** Returns nil if no intersection was found.

### 47.3.4 Intersects(other as DoubleRectMBS) as boolean

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether two rectangle intersect.
**Notes:** Returns true if yes and no on false.

### 47.3.5 Move(deltax as Double, deltay as Double)

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the rectangle.

### 47.3.6 Properties

### 47.3.7 Bottom as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bottom property of the rectangle.
**Notes:** (Read and Write property)

### 47.3.8 height as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height property of the rectangle.
**Notes:** Setting this property changes the right property.
(Read and Write property)

### 47.3.9 left as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The left property of the rectangle.
**Notes:** (Read and Write property)

### 47.3.10 right as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The right property of the rectangle.
**Notes:** (Read and Write property)

### 47.3.11 Size as Double

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of this rectangle.
**Notes:** (Read only property)

### 47.3.12 top as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The top property of the rectangle.
**Notes:** (Read and Write property)

### 47.3.13 width as Double

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width property of the rectangle.
**Notes:** Setting this property changes the bottom property.
(Read and Write property)

## 47.4 class IntegerPointMBS

### 47.4.1 class IntegerPointMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an integer point.

### 47.4.2 Methods

### 47.4.3 Move(deltax as Integer, deltay as Integer)

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the point.

### 47.4.4 Properties

### 47.4.5 x as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X property of the point.
**Notes:** (Read and Write property)

### 47.4.6 y as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y property of the point.
**Notes:** (Read and Write property)

## 47.5 class IntegerRectMBS

### 47.5.1 class IntegerRectMBS

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an integer rectangle.

### 47.5.2 Methods

### 47.5.3 Intersection(other as IntegerRectMBS) as IntegerRectMBS

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intersection area of two rectangles.
**Notes:** Returns nil if no intersection was found.

### 47.5.4 Intersects(other as IntegerRectMBS) as boolean

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether two rectangle intersect.
**Notes:** Returns true if yes and no on false.

### 47.5.5 Move(deltax as Integer, deltay as Integer)

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the rectangle.

### 47.5.6 Properties

### 47.5.7 bottom as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bottom property of the rectangle.
**Notes:** (Read and Write property)

### 47.5.8 height as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height property of the rectangle.
**Notes:** Setting this property changes the right property.
(Read and Write property)

### 47.5.9 left as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The left property of the rectangle.
**Notes:** (Read and Write property)

### 47.5.10 right as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The right property of the rectangle.
**Notes:** (Read and Write property)

### 47.5.11 Size as Integer

MBS Util Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of this rectangle.
**Notes:** (Read only property)

### 47.5.12 top as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The top property of the rectangle.
**Notes:** (Read and Write property)

### 47.5.13 width as Integer

MBS Util Plugin, Plugin Version: 2.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width property of the rectangle.
**Notes:** Setting this property changes the right property.
(Read and Write property)

# Chapter 48

# Compression

## 48.1 Globals

### 48.1.1 CompressBZip2MBS(buf as string,level as Integer) as string

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses the data and returns it as string.
**Example:**

```
dim s as string = "Hello World"
s=CompressBZip2MBS(s,9)
```

**Notes:** Compression level is going from 0 to 9, where 0 is no compression and 9 is best compression.

### 48.1.2 DecompressBZip2MBS(buf as string,size as Integer) as string

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses the data and returns it as string.
**Example:**

```
dim s as string = "Hello World"
s=CompressBZip2MBS(s,9)
s=DecompressBZip2MBS(s,10000)

MsgBox s
```

**Notes:** As DecompressZLibMBS can't know the size of the decompressed data you should give it a hint. Best is to save the size of the decompressed data on compression. Else you must guess the size which can be 10 times the size of the compressed data.

### 48.1.3 CompressZLibMBS(buf as string, level as Integer = 9) as string

MBS Compression Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses the data and returns it as string.
**Example:**

```
dim s as string = "Hello World"
dim l as Integer = lenb(s)

dim c as string = CompressZLibMBS(s,9)
dim d as string = DecompressZLibMBS(c, l)

MsgBox d
```

**Notes:** Compression level is going from 0 to 9, where 0 is no compression and 9 is best compression.
Error: Optional parameter to receive the error code. (see error codes in ZLibCompressMBS)

For result and temp memory this function needs maximum something like 110% of lenb(buf).

Version 18.5 and newer use level 9 as default.
See also:

- 48.1.4 CompressZLibMBS(buf as string, level as Integer, byref error as Integer) as string 8340

### 48.1.4 CompressZLibMBS(buf as string, level as Integer, byref error as Integer) as string

MBS Compression Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses the data and returns it as string.
**Notes:** Compression level is going from 0 to 9, where 0 is no compression and 9 is best compression.
Error: Optional parameter to receive the error code. (see error codes in ZLibCompressMBS)

For result and temp memory this function needs maximum something like 110% of lenb(buf).
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr10

See also:

- 48.1.3 CompressZLibMBS(buf as string, level as Integer = 9) as string 8340

### 48.1.5 DecompressZLibMBS(buf as string, size as Integer = 0) as string

MBS Compression Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses the data and returns it as string.
**Example:**

```
dim s as string = "Hello World"
s=CompressZLibMBS(s,9)
s=DecompressZLibMBS(s,10000)

MsgBox s
```

**Notes:** As DecompressZLibMBS can't know the size of the decompressed data you should give it a hint. Best is to save the size of the decompressed data on compression. Else you must guess the size which can be 10 times the size of the compressed data.
Error: Optional parameter to receive the error code. (see error codes in ZLibCompressMBS)

Version 18.5 and newer ignore size and manage it automatically.
See also:

- 48.1.6 DecompressZLibMBS(buf as string, size as Integer, byref error as Integer) as string 8341

### 48.1.6 DecompressZLibMBS(buf as string, size as Integer, byref error as Integer) as string

MBS Compression Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses the data and returns it as string.
**Notes:** As DecompressZLibMBS can't know the size of the decompressed data you should give it a hint. Best is to save the size of the decompressed data on compression. Else you must guess the size which can be 10 times the size of the compressed data.
Error: Optional parameter to receive the error code. (see error codes in ZLibCompressMBS)

Returned data is a string without known encoding.

Version 18.5 and newer ignore size and manage it automatically.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr8

- MBS Xojo Plugins, version 18.5pr7
- MBS Real Studio Plugins, version 12.4pr10

See also:

- 48.1.5 DecompressZLibMBS(buf as string, size as Integer = 0) as string 8341

### 48.1.7 CompressLZWMBS(buf as string) as string

MBS Compression Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses string using LZW algorithm.
**Example:**

```
dim s as string
dim b as BinaryStream
dim f as FolderItem
dim l as Integer

f=SpecialFolder.Desktop.Child("output.tiff")
b=f.OpenAsBinaryFile(false)
s=b.Read(b.Length)
b.Close

l=lenb(s)
s=CompressLZWMBS(s)

f=SpecialFolder.Desktop.Child("output.compressed.tiff")
b=f.CreateBinaryFile("text")
b.Write s
b.Close

s=DecompressLZWMBS(s,l)

f=SpecialFolder.Desktop.Child("output.uncompressed.tiff")
b=f.CreateBinaryFile("text")
b.Write s
b.Close
```

**Notes:** Please remember that the LZW algorithm can be implemented quite different. This one is byte based, uses 12bit offsets and a 4096 entry table.

Returns "" on low memory or Stack Overlow or Output buffer overlow.
(buffer and stack size may be increased on request for future plugin versions)
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr2

### 48.1.8 DecompressLZWMBS(buf as string, size as Integer) as string

MBS Compression Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses string using LZW algorithm.
**Notes:** Please remember that the LZW algorithm can be implemented quite different. This one is byte based, uses 12bit offsets and a 4096 entry table.

Returns "" on low memory or Stack Overlow or Output buffer overlow.
(buffer and stack size may be increased on request for future plugin versions)

Size of the uncompressed length is only a guess for how big the output buffer needs to be. Actual string returned will often be smaller.

## 48.2 class BZip2CompressMBS

### 48.2.1 class BZip2CompressMBS

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for bzip2 compression.

### 48.2.2 Methods

### 48.2.3 Close

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 48.2.4 Constructor(BufferSize as Integer=20000)

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** The buffer size you specify is the output buffer size.

If this size is small, you need to flush with ProcessZip.

### 48.2.5 EndZip

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the current compression stream.
**Notes:** You may check the Output property after this.
Error is set.

### 48.2.6 GetOutput as string

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the content of the output buffer.
**Notes:** The buffer is cleared after this function returns.

### 48.2.7 InitZip(level as Integer)

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the stream.
**Notes:** Level is from 0 to 9.
Error is set.

### 48.2.8 InputAvail as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes available in the input buffer.

### 48.2.9 OutputSize as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of bytes available in the output buffer.

### 48.2.10 ProcessZip(Flush as boolean=false)

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does zip compression.
**Notes:** Reduces the size of the input buffer and writes new data to the output buffer.
If the input buffer is not empty after this call, you need to call it again, but empty the output buffer before.
Error is set.

If flush is true, the data is flushed to output. Using flush=true all the the time will slow down compression, so use it only on the end to clear the output buffers.

### 48.2.11 SetInput(data as Memoryblock) as boolean

MBS Compression Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.2.12 SetInput(data as string) as boolean 8345

### 48.2.12 SetInput(data as string) as boolean

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.2.11 SetInput(data as Memoryblock) as boolean 8345

### 48.2.13 Properties

### 48.2.14 Error as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 48.2.15 OutputBufferSize as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output buffer size used in the constructor.
**Notes:** (Read only property)

### 48.2.16 TotalInput as UInt64

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.2.17 TotalOutput as UInt64

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.2.18 Version as String

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the used zlib library.
**Notes:** (Read only property)

### 48.2.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCONFIG_ERROR | -9 | One of the error constants.<br>Indicates that the library has been improperly compiled on your platform – a major configuration error. Specifically, it means that sizeof(char), sizeof(short) and sizeof(int) are not 1, 2 and 4 respectively, as they should be. Note that the library should still work properly on 64-bit platforms which follow the LP64 programming model – that is, where sizeof(long) and sizeof(void*) are 8. Under LP64, sizeof(int) is still 4, so libbzip2, which doesn't use the long type, is OK. This should never happen with the plugin. |
| kDATA_ERROR | -4 | One of the error constants.<br>Returned when a data integrity error is detected during decompression. Most importantly, this means when stored and computed CRCs for the data do not match. This value is also returned upon detection of any other anomaly in the compressed data. |
| kDATA_ERROR_MAGIC | -5 | One of the error constants.<br>As a special case of kDATA_ERROR, it is sometimes useful to know when the compressed stream does not start with the correct magic bytes ('B' 'Z' 'h'). |
| kFINISH | 2 | One of the command constants for bzip. |
| kFINISH_OK | 3 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kFLUSH | 1 | One of the command constants for bzip. |
| kFLUSH_OK | 2 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kIO_ERROR | -6 | One of the error constants.<br>Returned by Read and Write when there is an error reading or writing in the compressed file, and by ReadOpen and WriteOpen for attempts to use a file for which the error indicator (viz, ferror(f)) is set. On receipt of kIO_ERROR, the caller should consult errno and/or perror to acquire operating-system specific information about the problem. |
| kMEM_ERROR | -3 | One of the error constants.<br>Returned when a request to allocate memory failed. Note that the quantity of memory needed to decompress a stream cannot be determined until the stream's header has been read. So Decompress and Read may return kMEM_ERROR even though some of the compressed data has been read. The same is not true for compression; once CompressInit or WriteOpen have successfully completed, kMEM_ERROR cannot occur. |
| kOK | 0 | One of the error constants.<br>The requested action was completed successfully. |
| kOUTBUFF_FULL | -8 | One of the error constants.<br>Returned by BuffToBuffCompress and BuffToBuffDecompress to indicate that the output data will not fit into the output buffer provided. |
| kPARAM_ERROR | -2 | One of the error constants.<br>Returned when a parameter to a function call is out of range or otherwise manifestly incorrect. As with kSEQUENCE_ERROR, this denotes a bug in the client code. The distinction between kPARAM_ERROR and kSEQUENCE_ERROR is a bit hazy, but still worth making. |
| kRUN | 0 | One of the command constants for bzip. |
| kRUN_OK | 1 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kSEQUENCE_ERROR | -1 | One of the error constants.<br>When using the library, it is important to call the functions in the correct sequence and with data structures (buffers etc) in the correct states. libbzip2 checks as much as it can to ensure this is happening, and returns kSEQUENCE_ERROR if not. Code which complies precisely with the function semantics, as detailed below, should never receive this value; such an event denotes buggy code which you should investigate. |

## 48.3 class BZip2DecompressMBS

### 48.3.1 class BZip2DecompressMBS

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for bzip2 decompression.

### 48.3.2 Methods

### 48.3.3 Close

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 48.3.4 Constructor(BufferSize as Integer=20000)

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** The buffer size you specify is the output buffer size.
If this size is small, you need to flush with ProcessZip.

### 48.3.5 EndZip

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the current decompression stream.
**Notes:** You may check the Output property after this.
Error is set.

### 48.3.6 GetOutput as string

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the content of the output buffer.
**Notes:** The buffer is cleared after this function returns.

### 48.3.7 InitZip

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the stream.
**Notes:** Error is set.

### 48.3.8 InputAvail as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes available in the input buffer.

### 48.3.9 OutputSize as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of bytes available in the output buffer.

### 48.3.10 ProcessZip

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does zip compression.
**Notes:** Reduces the size of the input buffer and writes new data to the output buffer.
If the input buffer is not "" after this call, you need to call it again, but empty the output buffer before.
Error is set.

### 48.3.11 SetInput(data as Memoryblock) as boolean

MBS Compression Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.3.12 SetInput(data as string) as boolean 8350

### 48.3.12 SetInput(data as string) as boolean

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.3.11 SetInput(data as Memoryblock) as boolean 8349

### 48.3.13 Properties

### 48.3.14 Error as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 48.3.15 OutputBufferSize as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output buffer size used in the constructor.
**Notes:** (Read only property)

### 48.3.16 TotalInput as UInt64

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.3.17 TotalOutput as UInt64

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.3.18 Version as String

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the used zlib library.
**Notes:** (Read only property)

### 48.3.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCONFIG_ERROR | -9 | One of the error constants.<br>Indicates that the library has been improperly compiled on your platform – a major configuration error. Specifically, it means that sizeof(char), sizeof(short) and sizeof(int) are not 1, 2 and 4 respectively, as they should be. Note that the library should still work properly on 64-bit platforms which follow the LP64 programming model – that is, where sizeof(long) and sizeof(void*) are 8. Under LP64, sizeof(int) is still 4, so libbzip2, which doesn't use the long type, is OK. This should never happen with the plugin. |
| kDATA_ERROR | -4 | One of the error constants.<br>Returned when a data integrity error is detected during decompression. Most importantly, this means when stored and computed CRCs for the data do not match. This value is also returned upon detection of any other anomaly in the compressed data. |
| kDATA_ERROR_MAGIC | -5 | One of the error constants.<br>As a special case of kDATA_ERROR, it is sometimes useful to know when the compressed stream does not start with the correct magic bytes ('B' 'Z' 'h'). |
| kFINISH | 2 | One of the command constants for bzip. |
| kFINISH_OK | 3 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kFLUSH | 1 | One of the command constants for bzip. |
| kFLUSH_OK | 2 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kIO_ERROR | -6 | One of the error constants.<br>Returned by Read and Write when there is an error reading or writing in the compressed file, and by ReadOpen and WriteOpen for attempts to use a file for which the error indicator (viz, ferror(f)) is set. On receipt of kIO_ERROR, the caller should consult errno and/or perror to acquire operating-system specific information about the problem. |
| kMEM_ERROR | -3 | One of the error constants.<br>Returned when a request to allocate memory failed. Note that the quantity of memory needed to decompress a stream cannot be determined until the stream's header has been read. So Decompress and Read may return kMEM_ERROR even though some of the compressed data has been read. The same is not true for compression; once CompressInit or WriteOpen have successfully completed, kMEM_ERROR cannot occur. |
| kOK | 0 | One of the error constants.<br>The requested action was completed successfully. |
| kOUTBUFF_FULL | -8 | One of the error constants.<br>Returned by BuffToBuffCompress and BuffToBuffDecompress to indicate that the output data will not fit into the output buffer provided. |
| kPARAM_ERROR | -2 | One of the error constants.<br>Returned when a parameter to a function call is out of range or otherwise manifestly incorrect. As with kSEQUENCE_ERROR, this denotes a bug in the client code. The distinction between kPARAM_ERROR and kSEQUENCE_ERROR is a bit hazy, but still worth making. |
| kRUN | 0 | One of the command constants for bzip. |
| kRUN_OK | 1 | One of the error constants.<br>In Compress, the requested flush/finish/nothing-special action was completed successfully. |
| kSEQUENCE_ERROR | -1 | One of the error constants.<br>When using the library, it is important to call the functions in the correct sequence and with data structures (buffers etc) in the correct states. libbzip2 checks as much as it can to ensure this is happening, and returns kSEQUENCE_ERROR if not. Code which complies precisely with the function semantics, as detailed below, should never receive this value; such an event denotes buggy code which you should investigate. |

## 48.4 class BZip2FileMBS

### 48.4.1 class BZip2FileMBS

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to read and write bzip2 byte streams.
**Notes:** A .bz2 file is just the content of the original file compressed. No header.

### 48.4.2 Methods

### 48.4.3 Close

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

Lasterror and LasterrorMessage are set.

### 48.4.4 Flush

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flushes all pending output into the compressed file.
**Notes:** Lasterror and LasterrorMessage are set.

### 48.4.5 Open(file as folderitem, mode as string) as boolean

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a .bz2 file for reading or writing, using the given file path.
**Notes:** Returns false on failure.
Mode can be "r" for reading and "w" for writing. Or other values fopen accepts.

Lasterror and LasterrorMessage are set.

### 48.4.6 OpenString(data as string) as boolean

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a bzip compressed file from the given string.
**Notes:** Returns true on success and false on failure.

Lasterror and LasterrorMessage are set.

### 48.4.7 Read(ByteCount as Int64) as string

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data form a compresses file.
**Notes:** Lasterror and LasterrorMessage are set.

### 48.4.8 ReadByte as integer

MBS Compression Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a single byte.
**Notes:** Lasterror and LasterrorMessage are set.

### 48.4.9 ReadData(ByteCount as Int64) as Memoryblock

MBS Compression Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads data into memoryblock.
**Notes:** Lasterror and LasterrorMessage are set.

### 48.4.10 Write(data as Memoryblock)

MBS Compression Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to the file and compresses it.
**Notes:** Lasterror and LasterrorMessage are set.
See also:

- 48.4.11 Write(data as string)

### 48.4.11 Write(data as string)

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes data to the file and compresses it.
**Notes:** Lasterror and LasterrorMessage are set.
See also:

- 48.4.10 Write(data as Memoryblock) 8354

### 48.4.12 WriteByte(data as integer)

MBS Compression Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a single byte.
**Notes:** Lasterror and LasterrorMessage are set.

### 48.4.13 Properties

### 48.4.14 ErrorCode as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use Lasterror instead. **Function:** The last error code.
**Notes:** (Read and Write property)

### 48.4.15 ErrorMessage as String

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use LasterrorMessage instead.
**Function:** The last error message.
**Notes:** (Read and Write property)

### 48.4.16 Handle as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current bzip file handle.
**Notes:** (Read and Write property)

### 48.4.17 Lasterror as Integer

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error value.
**Notes:** (Read and Write property)

### 48.4.18 LasterrorMessage as String

MBS Compression Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.
**Notes:** (Read and Write property)

### 48.4.19 Version as String

MBS Compression Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string indicating the library version.
**Notes:** (Read only property)

## 48.5 class GZipFileMBS

### 48.5.1 class GZipFileMBS

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to read and write gzip byte streams.
**Notes:** A .gz file is just the content of the original file compressed. No header.

See also ArchiveReaderMBS and ArchiveWriterMBS classes for more features and compression formats.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1
- MBS Xojo Plugins, version 17.5pr8
- MBS Xojo / Real Studio Plugins, version 15.2pr1
- MBS Real Studio Plugins, version 13.0fc1
- MBS Real Studio Plugins, version 13.0pr8
- MBS Real Studio Plugins, version 13.0pr1
- MBS Real Studio Plugins, version 12.0pr4
- MBS Plugins 11.1 Release notes
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 16.5, page 9: News

### 48.5.2 Methods

### 48.5.3 Adler32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Adler Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.5.4 Close

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 48.5.5 CloseForString as string

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the file and returns the string.
**Example:**

```
Function GZIPStringWriteMBS(data as string) As string
dim g as new GZipFileMBS

if g.CreateForString then
g.Write data

Return g.CloseForString
end if
End Function
```

**Notes:** Only for use with CreateForString function.
Returns empty string on any error.

### 48.5.6 CRC32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.5.7 CreateForString as boolean

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new gzip file in memory.
**Example:**

```
Function GZIPStringWriteMBS(data as string) As string
dim g as new GZipFileMBS

if g.CreateForString then
g.Write data

Return g.CloseForString
end if
End Function
```

**Notes:** Use with the CloseForString method to compress data in memory.
Returns false on any error and true on success.

### 48.5.8 Flush(flush as Integer)

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flushes all pending output into the compressed file.
**Notes:** The parameter flush is as in the zlib deflate() function.
Lasterror is set.
Flush should be called only when strictly necessary because it can degrade compression.

### 48.5.9 Open(file as folderitem, mode as string) as boolean

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a gzip (.gz) file for reading or writing.
**Notes:** The mode parameter is as in fopen ("rb" read binary or "wb" for write binary) but can also include a compression level ("wb9") or a strategy: 'f' for filtered data as in "wb6f", 'h' for Huffman only compression as in "wb1h".

Open can be used to read a file which is not in gzip format; in this case Read will directly read from the file without decompression.

Open returns NULL if the file could not be opened or if there was insufficient memory to allocate the (de)compression state; errno can be checked to distinguish the two cases (if errno is zero, the zlib error is Z_MEM_ERROR).

Returns false on any error and true on success.

### 48.5.10 OpenString(data as string) as boolean

MBS Compression Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a gzip (.gz) file for reading from a file.
**Example:**

```
Function GZipStringReadMBS(compressedData as string) As string
dim g as new GZipFileMBS

const BlockSize=1000000

if g.OpenString(compressedData) then

dim parts(-1) as string

while not g.eof
dim s as string=g.Read(BlockSize)
parts.Append s
wend

Return Join(parts,"")
end if
End Function
```

**Notes:** Same as Open, but reading from the given string.

### 48.5.11 Read(ByteCount as Int64) as string

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the given number of bytes into a string.
**Notes:** Returns "" on any error.
May return less bytes than requested.
Lasterror is set.

### 48.5.12 ReadByte as Integer

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads one byte from the file.

### 48.5.13 ReadData(ByteCount as Int64) as Memoryblock

MBS Compression Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the given number of bytes into a memoryblock.
**Notes:** Returns nil on any error.
May return less bytes than requested.
Lasterror is set.

### 48.5.14 Rewind

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the file position for reading files to the file start.
**Notes:** Equal to: position=0

### 48.5.15 SetParameter(level as Integer, strategy as Integer)

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dynamically update the compression level or strategy.
**Notes:** Lasterror is set.

Possible values:

| | |
|---|---|
| FILTERED | 1 |
| HUFFMAN_ONLY | 2 |
| DEFAULT_STRATEGY | 0 |

### 48.5.16 Write(data as Memoryblock)

MBS Compression Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a Memoryblock to a file.
**Notes:** Lasterror is set.
See also:

- 48.5.17 Write(data as string) 8362

### 48.5.17 Write(data as string)

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a string to a file.
**Notes:** Note that encoding can make trouble as the raw bytes from the string are written.
Lasterror is set.
See also:

- 48.5.16 Write(data as Memoryblock) 8361

### 48.5.18 WriteByte(data as Integer)

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes one byte to the file.

### 48.5.19 Properties

### 48.5.20 Direct as Boolean

MBS Compression Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if file is being copied directly while reading, or false if file is a gzip stream being decompressed.
**Notes:** If the input file is empty, Direct will return true, since the input does not contain a gzip stream.
(Read only property)

### 48.5.21 EOF as Boolean

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if reading is on the end of the file.
**Notes:** Returns true on any error.
(Read only property)

### 48.5.22 ErrorCode as Integer

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last zlib error number.
**Notes:** If an error occurred in the file system and not in the compression library, errnum is set to Z_ERRNO

and the application may consult errno to get the exact error code. (errno is currently not available in Xojo)

Error codes:

| | |
|---|---|
| Z_OK | 0 |
| Z_STREAM_END | 1 |
| Z_NEED_DICT | 2 |
| Z_ERRNO | -1 |
| Z_STREAM_ERROR | -2 |
| Z_DATA_ERROR | -3 |
| Z_MEM_ERROR | -4 |
| Z_BUF_ERROR | -5 |
| Z_VERSION_ERROR | -6 |

(Read only property)

### 48.5.23 ErrorMessage as String

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the error message for the last error which occurred on the given compressed file.
**Notes:** (Read only property)

### 48.5.24 Handle as Integer

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current zlib file handle.
**Notes:** (Read and Write property)

### 48.5.25 Lasterror as Integer

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** 0 for success.
-1 for failure.
(Read and Write property)

### 48.5.26 Position as Integer

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current file position.
**Notes:** Not all positions are available.
e.g. on writing you can not move back.
Moving forward will add bytes with value 0 to the file.
Lasterror is set.
(Read and Write property)

### 48.5.27 Version as String

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the used zlib library.
**Notes:** (Read only property)

## 48.6 module LZ4MBS

### 48.6.1 module LZ4MBS

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for LZ4 compression.
**Example:**

```
Dim m As String = "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Lorem ipsum dolor site amat."

// make sure encoding is set
m = ConvertEncoding(m, encodings.UTF8)

// compress
Dim c As String = LZ4MBS.Compress(m)

// decompress
Dim d As String = LZ4MBS.Decompress(c)

// set encoding after decompressing
d = DefineEncoding(d, encodings.UTF8)

// and check
If d = m Then
MsgBox "Text match"
Else
MsgBox "Text doesn't match"
End If
```

**Blog Entries**

- MBS Xojo Plugins, version 21.1pr7
- MBS Xojo Plugins, version 19.5pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr6
- LZ4 Extremely fast compression for Xojo

**Videos**

- XDC 2020 MBS Plugins Presentation

### 48.6.2 Methods

### 48.6.3 Compress(InputData as MemoryBlock) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a MemoryBlock.
**Example:**

```
// some 10 million zeros will compress well
Dim m As New MemoryBlock(100000000)

// compress
Dim c As MemoryBlock = LZ4MBS.Compress(m)

// decompress
Dim d As MemoryBlock = LZ4MBS.Decompress(c)

// and check
If d.Size = m.size Then
MsgBox "Sizes match"
Else
MsgBox "Sizes don't match"
End If
```

**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.
See also:


- 48.6.4 Compress(InputData as Ptr, Size as Integer) as MemoryBlock 8366
- 48.6.5 Compress(InputData as string) as string 8367


### 48.6.4 Compress(InputData as Ptr, Size as Integer) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses data in ptr.
**Notes:** Same as memoryblock version, but with ptr parameter, so you can pass ptr with size.
Works also for passing memoryblocks and a custom size.
See also:


- 48.6.3 Compress(InputData as MemoryBlock) as MemoryBlock 8366
- 48.6.5 Compress(InputData as string) as string 8367

### 48.6.5 Compress(InputData as string) as string

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a string.
**Example:**

```
Dim m As String = "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Lorem ipsum dolor site amat."

// make sure encoding is set
m = ConvertEncoding(m, encodings.UTF8)

// compress
Dim c As String = LZ4MBS.Compress(m)

// decompress
Dim d As String = LZ4MBS.Decompress(c)

// set encoding after decompressing
d = DefineEncoding(d, encodings.UTF8)

// and check
If d = m Then
MsgBox "Text match"
Else
MsgBox "Text doesn't match"
End If
```

**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.
See also:

- 48.6.3 Compress(InputData as MemoryBlock) as MemoryBlock 8366
- 48.6.4 Compress(InputData as Ptr, Size as Integer) as MemoryBlock 8366

### 48.6.6 CompressFast(InputData as MemoryBlock, Acceleration as Integer = 1) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a memoryblock.
**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.

Same as Compress(), but allows selection of "acceleration" factor.

The larger the acceleration value, the faster the algorithm, but also the lesser the compression.
It's a trade-off. It can be fine tuned, with each successive value providing roughly +
textasciitilde 3% to speed.
An acceleration value of "1" is the same as regular Compress()
Values <= 0 will be replaced by AccelerationDefault (currently = 1).
See also:

- 48.6.7 CompressFast(InputData as Ptr, Size as Integer, Acceleration as Integer = 1) as MemoryBlock 8368
- 48.6.8 CompressFast(InputData as string, Acceleration as Integer = 1) as string 8368

### 48.6.7 CompressFast(InputData as Ptr, Size as Integer, Acceleration as Integer = 1) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses data in ptr.
**Notes:** Same as memoryblock version, but with ptr parameter, so you can pass ptr with size.
Works also for passing memoryblocks and a custom size.
See also:

- 48.6.6 CompressFast(InputData as MemoryBlock, Acceleration as Integer = 1) as MemoryBlock 8367
- 48.6.8 CompressFast(InputData as string, Acceleration as Integer = 1) as string 8368

### 48.6.8 CompressFast(InputData as string, Acceleration as Integer = 1) as string

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a string.
**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.

Same as Compress(), but allows selection of "acceleration" factor.
The larger the acceleration value, the faster the algorithm, but also the lesser the compression.
It's a trade-off. It can be fine tuned, with each successive value providing roughly +
textasciitilde 3% to speed.
An acceleration value of "1" is the same as regular Compress()
Values <= 0 will be replaced by AccelerationDefault (currently = 1).
See also:

- 48.6.6 CompressFast(InputData as MemoryBlock, Acceleration as Integer = 1) as MemoryBlock 8367
- 48.6.7 CompressFast(InputData as Ptr, Size as Integer, Acceleration as Integer = 1) as MemoryBlock 8368

### 48.6.9 CompressHC(InputData as MemoryBlock, compressionLevel as Integer = 9) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a memoryblock with high compression.
**Example:**

```
// lets make some data to compress
Dim p As Picture = LogoMBS(500)
Dim m As MemoryBlock = p.GetData(Picture.FormatBMP)

// compress
Dim c1 As MemoryBlock = LZ4MBS.Compress(m)
Dim c2 As MemoryBlock = LZ4MBS.CompressHC(m, LZ4MBS.CompressionLevelMin)
Dim c3 As MemoryBlock = LZ4MBS.CompressHC(m, LZ4MBS.CompressionLevelDefault)
Dim c4 As MemoryBlock = LZ4MBS.CompressHC(m, LZ4MBS.CompressionLevelOptMin)
Dim c5 As MemoryBlock = LZ4MBS.CompressHC(m, LZ4MBS.CompressionLevelMax)


MsgBox _
Str(c1.Size)+" normal"+EndOfLine+_
Str(c2.size)+" min"+EndOfLine+_
Str(c3.size)+" default"+EndOfLine+_
Str(c4.size)+" opt min"+EndOfLine+_
Str(c5.size)+" max"
```

**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.

Compression level, with # being any value from 1 to 12. Higher values trade compression speed for compression ratio. Values above 12 are considered the same as 12. Recommended values are 1 for fast compression (default), and 9 for high compression. Speed/compression trade-off will vary depending on data to compress\. Decompression speed remains fast at all settings.
See also:

- 48.6.10 CompressHC(InputData as Ptr, Size as Integer, compressionLevel as Integer = 9) as MemoryBlock 8369
- 48.6.11 CompressHC(InputData as string, compressionLevel as Integer = 9) as string 8370

### 48.6.10 CompressHC(InputData as Ptr, Size as Integer, compressionLevel as Integer = 9) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses data in ptr.
**Notes:** Same as memoryblock version, but with ptr parameter, so you can pass ptr with size.
Works also for passing memoryblocks and a custom size.
See also:

- 48.6.9 CompressHC(InputData as MemoryBlock, compressionLevel as Integer = 9) as MemoryBlock 8369
- 48.6.11 CompressHC(InputData as string, compressionLevel as Integer = 9) as string 8370

### 48.6.11 CompressHC(InputData as string, compressionLevel as Integer = 9) as string

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses a string with high compression.
**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns string on success.

Compression level, with # being any value from 1 to 12. Higher values trade compression speed for compression ratio. Values above 12 are considered the same as 12. Recommended values are 1 for fast compression (default), and 9 for high compression. Speed/compression trade-off will vary depending on data to compress\. Decompression speed remains fast at all settings.
See also:

- 48.6.9 CompressHC(InputData as MemoryBlock, compressionLevel as Integer = 9) as MemoryBlock 8369
- 48.6.10 CompressHC(InputData as Ptr, Size as Integer, compressionLevel as Integer = 9) as MemoryBlock 8369

### 48.6.12 Decompress(CompressedData as MemoryBlock, UncompressedSize as Integer = 0) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses a MemoryBlock.
**Example:**

```
// some 10 million zeros will compress well
Dim m As New MemoryBlock(100000000)

// compress
Dim c As MemoryBlock = LZ4MBS.Compress(m)

// decompress
```

```
Dim d As MemoryBlock = LZ4MBS.Decompress(c)

// and check
If d.Size = m.size Then
MsgBox "Sizes match"
Else
MsgBox "Sizes don't match"
End If
```

**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns memoryblock on success.

If UncompressedSize is zero, we try to determinate it.
If you know the size of decompressed data, please pass it to make function more efficient.
See also:


- 48.6.13 Decompress(CompressedData as Ptr, Size as Integer, UncompressedSize as Integer = 0) as MemoryBlock 8371
- 48.6.14 Decompress(CompressedData as string, UncompressedSize as Integer = 0) as string 8371


### 48.6.13 Decompress(CompressedData as Ptr, Size as Integer, UncompressedSize as Integer = 0) as MemoryBlock

MBS Compression Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses data in ptr.
**Notes:** Same as memoryblock version, but with ptr parameter, so you can pass ptr with size.
Works also for passing memoryblocks and a custom size.

If UncompressedSize is zero, we try to determinate it.
If you know the size of decompressed data, please pass it to make function more efficient.
See also:


- 48.6.12 Decompress(CompressedData as MemoryBlock, UncompressedSize as Integer = 0) as MemoryBlock 8370
- 48.6.14 Decompress(CompressedData as string, UncompressedSize as Integer = 0) as string 8371


### 48.6.14 Decompress(CompressedData as string, UncompressedSize as Integer = 0) as string

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses a String.
**Example:**

```
Dim m As String = "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Lorem ipsum dolor site amat."

// make sure encoding is set
m = ConvertEncoding(m, encodings.UTF8)

// compress
Dim c As String = LZ4MBS.Compress(m)

// decompress
Dim d As String = LZ4MBS.Decompress(c)

// set encoding after decompressing
d = DefineEncoding(d, encodings.UTF8)

// and check
If d = m Then
MsgBox "Text match"
Else
MsgBox "Text doesn't match"
End If
```

**Notes:** Raises exception on failure (OutOfMemoryException or UnsupportedOperationException) and returns memoryblock on success.

If UncompressedSize is zero, we try to determinate it.
If you know the size of decompressed data, please pass it to make function more efficient.
See also:

- 48.6.12 Decompress(CompressedData as MemoryBlock, UncompressedSize as Integer = 0) as MemoryBlock 8370
- 48.6.13 Decompress(CompressedData as Ptr, Size as Integer, UncompressedSize as Integer = 0) as MemoryBlock 8371

### 48.6.15 LibVersion as string

MBS Compression Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of the LZ4 library.

### 48.6.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AccelerationDefault | 1 | The default acceleration level. |
| MaxInputSize | &h7E000000 | Maximum input size LZ4 can handle. |

Compression Levels

| Constant | Value | Description |
|---|---|---|
| CompressionLevelDefault | 9 | Default compression level. |
| CompressionLevelMax | 12 | Maximum compression. |
| CompressionLevelMin | 3 | Minimum compression. |
| CompressionLevelOptMin | 10 | |

## 48.7 module PackbitsMBS

### 48.7.1 module PackbitsMBS

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with functions for packbits compression/decompression.
**Example:**

```
Dim test As String = "Hellllo Woooooorld"

Dim compressed As String = PackbitsMBS.Compress(test)
Dim uncompressed As String = PackbitsMBS.Decompress(compressed)

Print uncompressed
Dim Match As Boolean = test.Compare(uncompressed, ComparisonOptions.Binary) = 0

Print "Match: "+match.ToString
Break
```

**Notes:** see wikipedia:
http://en.wikipedia.org/wiki/PackBits
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr2
- MBS Xojo / Real Studio Plugins, version 15.1pr7

### 48.7.2 Methods

### 48.7.3 Compress(data as MemoryBlock) as MemoryBlock

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses data in a memoryblock.
**Notes:** Can raise out of memory exception if running low on memory.
See also:


- 48.7.4 Compress(data as string) as string 8374
- 48.7.5 Compress(InputFile as FolderItem, OutputFile as FolderItem) as boolean 8375


### 48.7.4 Compress(data as string) as string

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ccompresses data in a string.
**Notes:** Can raise out of memory exception if running low on memory.
Returned data is a string without known encoding. If you plan to store it in a file, use binarystream class, not textoutputstream. If you plan to store it in a database, please use BLOB field. For storing in a text field, you may need to use Base64 encoding.
See also:


- 48.7.3 Compress(data as MemoryBlock) as MemoryBlock 8374
- 48.7.5 Compress(InputFile as FolderItem, OutputFile as FolderItem) as boolean 8375


### 48.7.5 Compress(InputFile as FolderItem, OutputFile as FolderItem) as boolean

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses data in a file.
**Notes:** Returns true on success.
See also:


- 48.7.3 Compress(data as MemoryBlock) as MemoryBlock 8374
- 48.7.4 Compress(data as string) as string 8374


### 48.7.6 Decompress(data as MemoryBlock) as MemoryBlock

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses data in a memoryblock.
**Notes:** Can raise out of memory exception if running low on memory.
See also:


- 48.7.7 Decompress(data as string) as string 8375
- 48.7.8 Decompress(InputFile as FolderItem, OutputFile as FolderItem) as boolean 8376


### 48.7.7 Decompress(data as string) as string

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses data in a string.
**Notes:** Can raise out of memory exception if running low on memory.
Returned data is a string without known encoding.
See also:


- 48.7.6 Decompress(data as MemoryBlock) as MemoryBlock 8375
- 48.7.8 Decompress(InputFile as FolderItem, OutputFile as FolderItem) as boolean 8376

### 48.7.8 Decompress(InputFile as FolderItem, OutputFile as FolderItem) as boolean

MBS Compression Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses data in a file.
**Notes:** Returns true on success.
See also:


- 48.7.6 Decompress(data as MemoryBlock) as MemoryBlock 8375
- 48.7.7 Decompress(data as string) as string 8375

## 48.8 class UnZipFileInfoMBS

### 48.8.1 class UnZipFileInfoMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class keeps the metadata for a zip file.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1

### 48.8.2 Properties

### 48.8.3 CompressedSize as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The compressed file size.
**Notes:** (Read and Write property)

### 48.8.4 CompressionMethod as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The compression method.
**Notes:** (Read and Write property)

### 48.8.5 CRC as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The 32bit file checksum.
**Notes:** (Read and Write property)

### 48.8.6 Date as Date

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The date as a Xojo date object.
**Notes:** (Read and Write property)

### 48.8.7 Day as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** day of the month - [ 1,31 ]
(Read and Write property)

### 48.8.8 DiskNumStart as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disk number start.
**Notes:** (Read and Write property)

### 48.8.9 DosDate as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last mod file date in DOS format.
**Notes:** (Read and Write property)

### 48.8.10 ExternalFileAttributes as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** External file attributes.
**Notes:** (Read and Write property)

### 48.8.11 Flag as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** general purpose bit flag.
**Notes:** A 16 bit value.

The flag is a bit field with various values.
Last bit of the flag is encryption state: value is 1 (odd) for encrypted and 0 (even) for unencrypted value.
The bit values 2 and 4 define compression level between 0 to 9.

| Flag Value | Encryption | Compression Level |
|---|---|---|
| 0 | no | 6 |
| 1 | yes | 6 |
| 2 | no | 9 |
| 3 | yes | 9 |
| 4 | no | 2 |
| 5 | yes | 2 |
| 6 | no | 1 |
| 7 | yes | 1 |

(Read and Write property)

### 48.8.12 Hour as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** hours since midnight - [ 0,23 ]
(Read and Write property)

### 48.8.13 InternalFileAttributes as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal file attributes.
**Notes:** (Read and Write property)

### 48.8.14 Minute as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** minutes after the hour - [ 0,59 ]
(Read and Write property)

### 48.8.15 Month as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** months since January - [ 0,11 ]
(Read and Write property)

### 48.8.16 Second as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** seconds after the minute - [ 0,59 ]
(Read and Write property)

### 48.8.17 SizeFileComment as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** file comment length.
**Notes:** (Read and Write property)

### 48.8.18 SizeFileExtra as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** extra field length.
**Notes:** (Read and Write property)

### 48.8.19 SizeFilename as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** filename length.
**Notes:** (Read and Write property)

### 48.8.20 UncompressedSize as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The uncompressed file size.
**Notes:** (Read and Write property)

### 48.8.21 Version as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version used to make the archive.
**Notes:** (Read and Write property)

### 48.8.22 VersionNeeded as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version needed to extract.
**Notes:** (Read and Write property)

### 48.8.23 Year as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** years - [ 1980..2044 ]
(Read and Write property)

## 48.9 class UnZipFilePositionMBS

### 48.9.1 class UnZipFilePositionMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class contains information about a file in the zipfile.

### 48.9.2 Properties

### 48.9.3 NumberOfFile as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of the file.
**Notes:** (Read and Write property)

### 48.9.4 PositionInZipDirectory as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offset in zip file directory.
**Notes:** (Read and Write property)

## 48.10 class UnZipMBS

### 48.10.1 class UnZipMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to decompress a zip archive.
**Example:**

```
// open zip archive
dim f as FolderItem=SpecialFolder.Desktop.Child("test.zip")
dim z as new UnZipMBS(f)

// let's start
z.GoToFirstFile
do

// get details on this file:
dim info as UnZipFileInfoMBS = z.FileInfo
dim name as string = z.FileName

if left(name,8) <>"__MACOSX" then // ignore Mac special files for metadata
z.OpenCurrentFile
if z.Lasterror=0 then

// create output file (if you want to support folders, this needs to be changed. See other examples)
dim outfile as folderitem = GetFolderItem(Name)
dim b as BinaryStream = BinaryStream.Create(outfile, true)
dim s as string

// now read 100 KB chunks and write them to new file
do
s=z.ReadCurrentFile(100000)
b.Write s
loop until lenb(s)=0


// cleanup
b.Close
z.CloseCurrentFile

end if
end if

// move to next file until we reach the end
z.GoToNextFile
loop until z.Lasterror<>0
```

**Notes:** This is a simple class which uses zlib and has some limitations:

- only deflate as compression method
- only one date per file is preserved
- no resource forks on Mac OS
- no text encoding handling
- no Apple or Microsoft extensions for special file flags or permissions.

See also ArchiveReaderMBS and ArchiveWriterMBS classes for more features and compression formats.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo plug-ins in version 16.0
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr11
- MBS Real Studio Plugins, version 11.1pr10
- MBS REALbasic Plugins, version 11.0pr13
- MBS REALbasic Plugins, version 10.5pr2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

**Xojo Developer Magazine**

- 9.5, page 11: News
- 9.1, page 25: Optimizing Client-Server Communications, Using ZIP-archives and AES encryption to improve security and performance by Mattias Sandstr√m
- 9.1, page 23: Optimizing Client-Server Communications, Using ZIP-archives and AES encryption to improve security and performance by Mattias Sandstr√m

### 48.10.2 Methods

### 48.10.3 Close

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close a ZipFile.
**Notes:** Use CloseCurrentFile to close any open file before using Close.
Lasterror is UnZipOK on success.

### 48.10.4 CloseCurrentFile

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the file in the zip archive opened with OpenCurrentFile.
**Notes:** Lasterror is set to UnzipCRCError if all the file was read but the CRC was not correct.

### 48.10.5 Comment as string

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the global comment string of the ZipFile.

### 48.10.6 CommentSize as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Size of the global comment of the zipfile.

### 48.10.7 CompareFileNames(filename1 as string, filename2 as string, CaseSensitive as Integer) as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compare two filename (fileName1,fileName2).
**Notes:** If iCaseSenisivity = 1, comparision is case sensitivity (like strcmp)
If iCaseSenisivity = 2, comparision is not case sensitivity (like strcmpi or strcasecmp)
If iCaseSenisivity = 0, case sensitivity is defaut of your operating system (like 1 on Unix, 2 on Windows)

### 48.10.8 Constructor(data as memoryblock)

MBS Compression Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a Zip file from data in the memoryblock.
**Notes:** The Handle property is zero on failure and not zero on success.
The memory block must have a known size.
See also:


- 48.10.9 Constructor(data as string) 8386
- 48.10.10 Constructor(file as folderitem) 8386
- 48.10.11 Constructor(file as folderitem, Offset as Integer) 8387


### 48.10.9 Constructor(data as string)

MBS Compression Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a Zip file from data in the string.
**Notes:** The Handle property is zero on failure and not zero on success.
See also:


- 48.10.8 Constructor(data as memoryblock) 8386
- 48.10.10 Constructor(file as folderitem) 8386
- 48.10.11 Constructor(file as folderitem, Offset as Integer) 8387


### 48.10.10 Constructor(file as folderitem)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a Zip file from a file.
**Notes:** The Handle property is zero on failure and not zero on success.

If you run this class in a thread, please make sure your thread has a big stack (1 MB or more). Else it will crash.
See also:


- 48.10.8 Constructor(data as memoryblock) 8386
- 48.10.9 Constructor(data as string) 8386
- 48.10.11 Constructor(file as folderitem, Offset as Integer) 8387

### 48.10.11 Constructor(file as folderitem, Offset as Integer)

MBS Compression Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a Zip file from a file starting at the offset.
**Notes:** The Handle property is zero on failure and not zero on success.
See also:


- 48.10.8 Constructor(data as memoryblock) 8386
- 48.10.9 Constructor(data as string) 8386
- 48.10.10 Constructor(file as folderitem) 8386


### 48.10.12 Count as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Total number of entries in the zip archive.
**Notes:** This value is stored in the zip archive as 16 bit integer, so maximum value is 65535. The plugin can extract more files than that number.

### 48.10.13 EOF as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns 1 if you are on the end of a file.
**Notes:** This is not to test whether you are on the end of the zip archive.

### 48.10.14 ExtractFiles(DestFolder as FolderItem, ExtractWithoutPath as boolean = false, Overwrite as Boolean = false, Password as String = """, byref ErrorMessage as String) as boolean

MBS Compression Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simple function to extract all files from archive into folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.zip")

dim folder as FolderItem = SpecialFolder.Desktop.Child("test")
folder.CreateAsFolder

dim u as new UnZipMBS(f)
dim error as string
```

```
if u.ExtractFiles(folder, error) then
MsgBox "OK"
else
MsgBox "Error: "+error
end if
```

**Notes:** DestFolder: Destination folder.
ExtractWithoutPath: If true, all files are put in one folder.
Overwrite: Whether to allow overwriting files.
Password: The password to decrypt files.
ErrorMessage: An english error message.

Returns true on success or false on failure.
This function does not restore file permissions or other metadata.
And it may not work with non ASCII characters.

If you need more control over files being extracted, stored or error checking, please use example projects coming with plugin.

### 48.10.15 FileInfo as UnZipFileInfoMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries file information for the current file.
**Notes:** Returns nil on any error.

### 48.10.16 FileName as string

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The filename of the current open file.
**Notes:** This name has no text encoding defined, as the plugin has no idea what text encoding was used. You may need to define the text encoding as being ASCII, Windows, MacRoman or whatever, when you work with this file name.
This name may include path components for folders.

### 48.10.17 GetLocalExtrafield as string

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read extra field from the current file (opened by unzOpenCurrentFile)
**Notes:** This is the local-header version of the extra field (sometimes, there is more info in the local-header version than in the central-header)

### 48.10.18 GoToFirstFile

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the current file of the zipfile to the first file.
**Notes:** Lasterror is UnzipOk on success.

### 48.10.19 GoToNextFile

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the current file of the zipfile to the next file.
**Notes:** Lasterror is UnzipOk if there is no problem and UnzipEndOfListError if the actual file was the latest.

### 48.10.20 LocateFile(filename as string, CaseSensitive as Integer)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Try locate the file filename in the zipfile.
**Example:**

```
// open zip archive
dim f as FolderItem=SpecialFolder.Desktop.Child("test.zip")
dim z as new UnZipMBS(f)

// let's search the file
z.LocateFile "test.rtf",2

if z.Lasterror = z.UnzipOk then
dim info as UnZipFileInfoMBS = z.FileInfo
MsgBox "OK: "+str(info.UncompressedSize)+" bytes"
else
MsgBox "Failed."
end if
```

**Notes:** For the CaseSensitivity signification, see CompareFileNames. Text encoding must match the text encoding of the files.

Lasterror is UnzipOk if the file is found. It becomes the current file, UnzipEndOfListError if the file is not found.

### 48.10.21 OpenCurrentFile

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open for reading data the current file in the zipfile.
See also:


- 48.10.22 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean) 8390
- 48.10.23 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean, password as string) 8390
- 48.10.24 OpenCurrentFile(password as string) 8391


### 48.10.22 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same than OpenCurrentFile, but opens file for reading raw data (not uncompressed).
**Notes:** if raw=true the file data is returned uncompressed. If raw is false, it is decompressed for you.
Method will receive the method of compression.
level will receive the level of compression.
See also:


- 48.10.21 OpenCurrentFile 8390
- 48.10.23 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean, password as string) 8390
- 48.10.24 OpenCurrentFile(password as string) 8391


### 48.10.23 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean, password as string)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same than OpenCurrentFile, but opens file for reading raw data (not uncompressed) and with a password.
**Notes:** if raw=true the file data is returned uncompressed. If raw is false, it is decompressed for you.
Method will receive the method of compression.
level will receive the level of compression.
See also:

- 48.10.21 OpenCurrentFile 8390
- 48.10.22 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean) 8390
- 48.10.24 OpenCurrentFile(password as string) 8391


### 48.10.24 OpenCurrentFile(password as string)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open for reading data the current file in the zipfile.
**Notes:** password is a crypting password.
See also:


- 48.10.21 OpenCurrentFile 8390
- 48.10.22 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean) 8390
- 48.10.23 OpenCurrentFile(byref method as Integer, byref level as Integer, raw as boolean, password as string) 8390


### 48.10.25 Position as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current position in uncompressed data.

### 48.10.26 Position2 as UInt64

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current position in compressed data.
**Notes:** This property is useful to show progressbar with progress over reading the original zip file.

### 48.10.27 ReadCurrentFile(size as Integer) as string

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read bytes from the current file (opened by OpenCurrentFile).
**Notes:** Returns "" on any error or on file end.

### 48.10.28 Properties

### 48.10.29 Handle as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle for the unzip object.
**Notes:** (Read and Write property)

### 48.10.30 Lasterror as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 48.10.31 FilePosition as UnZipFilePositionMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current file position.
**Notes:** You can read or set the current file you edit.
(Read and Write computed property)

### 48.10.32 Offset as UInt64

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the current index of the file in the zip directory.
**Notes:** If you set this value, you basicly move to another file.
(Read and Write computed property)

### 48.10.33 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CompressionBestCompression | 9 | One of the compression level constants. |
| CompressionBestSpeed | 1 | One of the compression level constants. |
| CompressionDefault | -1 | One of the compression level constants. |
| CompressionNo | 0 | One of the compression level constants. |
| MethodDeflated | 8 | One of the compression methods. |
| MethodNone | 0 | One of the compression methods. |
| StrategyDefault | 0 | One of the strategy constants. |
| StrategyFiltered | 1 | One of the strategy constants. |
| StrategyFixed | 4 | One of the strategy constants. |
| StrategyHuffmanOnly | 2 | One of the strategy constants. |
| StrategyRLE | 3 | One of the strategy constants. |
| UnzipBadUnZipFile | -103 | One of the error constants. |
| UnzipCRCError | -105 | One of the error constants. |
| UnzipEndOfListError | -100 | One of the error constants. |
| UnzipInternalError | -104 | One of the error constants. |
| UnzipOk | 0 | One of the error constants. |
| UnzipParameterError | -102 | One of the error constants. |

## 48.11 class ZipFileInfoMBS

### 48.11.1 class ZipFileInfoMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class keeps the metadata for a zip file.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1

### 48.11.2 Methods

### 48.11.3 SetDate(d as date)

MBS Compression Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the date with a Xojo date object.
**Notes:** A convenience function to make your life easier.

### 48.11.4 SetDateTime(d as dateTime)

MBS Compression Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the date with a Xojo dateTime object.
**Notes:** A convenience function to make your life easier.

### 48.11.5 Properties

### 48.11.6 Day as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** day of the month - [ 1,31 ]
(Read and Write property)

### 48.11.7 DosDate as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The date in the 32bit DOS format.
**Notes:** If dos_date = 0, the plugin will calculate it from the day, month, year, hour, minute and second properties.
(Read and Write property)

### 48.11.8 ExternalFileAttributes as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** external file attributes.
**Notes:** A 32 bit value.
(Read and Write property)

### 48.11.9 Hour as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** hours since midnight - [ 0,23 ]
(Read and Write property)

### 48.11.10 InternalFileAttributes as UInt32

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal file attributes.
**Notes:** A 16 bit value.
(Read and Write property)

### 48.11.11 Minute as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** minutes after the hour - [ 0,59 ]
(Read and Write property)

### 48.11.12 Month as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** months since January - [ 0,11 ]
(Read and Write property)

### 48.11.13 Second as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** seconds after the minute - [ 0,59 ]
(Read and Write property)

### 48.11.14 Year as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file time.
**Notes:** years - [ 1980..2044 ]
(Read and Write property)

## 48.12 class ZipMBS

### 48.12.1 class ZipMBS

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for writing to a zip file.
**Notes:** This is a simple class which uses zlib and has some limitations:

- only deflate as compression method
- only one date per file is preserved
- no resource forks on Mac OS
- no encoding handling
- no Apple or Microsoft extensions for special file flags or permissions.

But it works nice to provide a zip file to clients. For example a download of JPEG files in an archive with one download from Web Edition.

Be aware that you can't compress Mac applications with this class, as the we don't preserve permissions, so the decompressed file has not the right flags set to make it executable.

See also ArchiveReaderMBS and ArchiveWriterMBS classes for more features and compression formats.
**Blog Entries**

- MBS Xojo plug-ins in version 16.0
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr10
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

**Xojo Developer Magazine**

- 9.5, page 11: News

### 48.12.2 Methods

### 48.12.3 Close(GlobalComment as string="")

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the zipfile.

### 48.12.4 CloseFile

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the current file in the zipfile.

### 48.12.5 CloseFileRaw(UncompressedSize as Integer, CRC32 as Integer)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the current file in the zipfile.
**Notes:** For files opened with parameter raw=true in CreateFile
UncompressedSize and crc32 are value for the uncompressed size,

### 48.12.6 CompressFiles(ZipFile as FolderItem, SourceFolder as FolderItem, files() as string, Overwrite as Integer = 0, Password as string = """, CompressionLevel as Integer = 9, byref ErrorMessage as string) as Integer

MBS Compression Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simple implementation of a batch file compression method.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.zip")
dim folder as FolderItem = SpecialFolder.Pictures // some folder with images
dim files() As string

dim c as Integer = folder.count
for i as Integer = 1 to c
dim file as FolderItem = folder.TrueItem(i)

if file.Directory then
// we go here for this example only one level deep

dim subfolder as FolderItem = file
dim cc as Integer = subfolder.count
for ii as Integer = 1 to cc
dim subfile as FolderItem = subfolder.TrueItem(ii)
if subfile.name.Right(4) = ".jpg" then
// here we pass a relative path
files.Append subfolder.name+"/"+subfile.name
```

```
end if
next

else

if file.name.Right(4) = ".jpg" then
// just padd a file name for files directly in source folder
files.Append file.name
end if
end if
next

dim ErrorMessage as string
dim e as Integer = ZipMBS.CompressFiles(f, folder, files, errorMessage)

MsgBox "Error: "+str(e)
```

**Notes:** ZipFile: The destination zip file.
SourceFolder: The source folder for the files.
files: relative file paths to source folder.
Overwrite: pass 1 to overwrite zip archive, 2 to append or 0 to not overwrite.
Password: the password for encryption.
CompressionLevel: The compression level to use from 0 (no compression) to 9 (maximum).
ErrorMessage: An english error message.

Returns 0 on success or error code on failure.

This is a simple function to compress a couple of files.
It does not preserve file permissions on Mac/Linux or other metadata.
And it may not work with non ASCII characters.

If you need more control over files being added, compression or error checking, please use example projects coming with plugin.

### 48.12.7 Constructor(file as folderitem, append as Integer = 0)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a zipfile.
**Notes:** If the file exist and append is AppendStatusCreateAfter, the zip will be created at the end of the file.
(useful if the file contain a self extractor code)
If the file exist and append is AppendStatusAddInZip, we will add files in existing zip (be sure you don't

add file that doesn't exist)
If the zipfile cannot be opened, the handle value will be zero.

AppendStatusCreateAfter seems not to be working currently.

If you run this class in a thread, please make sure your thread has a big stack (1 MB or more). Else it will crash.

### 48.12.8 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string = "", ExtraGlobal as string = "", Comment as String = "", CompressionMethod as Integer = 8, Level as Integer = 9, Zip64 as boolean = false)

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a file in the ZIP for writing.
**Notes:** filename: the filename in zip. This can include path information with slash as delimiter. e.g. "foldername/file.txt"
FileInfo: the file date.
ExtraLocal: contains the extrafield data the the local header.
ExtraGlobal: contains the extrafield data the the local header.
Comment: comment contain the comment string
CompressionMethod: contain the compression method (see Method* constants)
Level: contain the level of compression (a value from -1 to 9. see Compression* constants)
Zip64: If you want to have the zip file support more than 2 GB of data, set this to true to create a 64 bit file.
See also:

- 48.12.9 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean) 8401

- 48.12.10 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32) 8401

- 48.12.11 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32, versionMadeBy as UInt32, flagBase as UInt32) 8403

### 48.12.9 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean)

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a file in the ZIP for writing with the possibility to write raw files.
**Notes:** filename: the filename in zip. This can include path information with slash as delimiter. e.g. "foldername/file.txt"
FileInfo: the file date.
ExtraLocal: contains the extrafield data the the local header.
ExtraGlobal: contains the extrafield data the the local header.
Comment: comment contain the comment string
CompressionMethod: contain the compression method (see Method* constants)
Level: contain the level of compression (a value from -1 to 9. see Compression* constants)
Zip64: If you want to have the zip file support more than 2 GB of data, set this to true to create a 64 bit file.
Raw: If true you read the file raw (the data will not be compressed).
See also:

- 48.12.8 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string = "", ExtraGlobal as string = "", Comment as String = "", CompressionMethod as Integer = 8, Level as Integer = 9, Zip64 as boolean = false) 8400
- 48.12.10 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32) 8401
- 48.12.11 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32, versionMadeBy as UInt32, flagBase as UInt32) 8403

### 48.12.10 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32)

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a file in the ZIP for writing with the possibility to write raw files, chnage the compression and add a password.
**Notes:** filename: the filename in zip. This can include path information with slash as delimiter. e.g. "foldername/file.txt"
FileInfo: the file date.

ExtraLocal: contains the extrafield data the the local header.
ExtraGlobal: contains the extrafield data the the local header.
Comment: comment contain the comment string
CompressionMethod: contain the compression method (see Method* constants)
Level: contain the level of compression (a value from -1 to 9. see Compression* constants)
Zip64: If you want to have the zip file support more than 2 GB of data, set this to true to create a 64 bit file.
Raw: If true you read the file raw (the data will not be compressed).
windowBits: Parameters for zlib compression. (for example -15)
memLevel: Parameters for zlib compression. (for example 8 or 9)
Strategy: Parameters for zlib compression. (See Strategy* constants)
Password: The password to use.
crcForCtypting: the CRC value of the input file.

The windowBits parameter is the base two logarithm of the window size (the size of the history buffer). It should be in the range 8..15 for this version of the library. Larger values of this parameter result in better compression at the expense of memory usage. The default value is 15.

windowBits can also be -8..-15 for raw deflate. In this case, -windowBits determines the window size.

The memLevel parameter specifies how much memory should be allocated for the internal compression state. memLevel=1 uses minimum memory but is slow and reduces compression ratio; memLevel=9 uses maximum memory for optimal speed. The default value is 8. See zconf.h for total memory usage as a function of windowBits and memLevel.

The strategy parameter is used to tune the compression algorithm. Use the value StrategyDefault for normal data, StrategyFiltered for data produced by a filter (or predictor), StrategyHuffmanOnly to force Huffman encoding only (no string match), or StrategyRLE to limit match distances to one (run-length encoding). Filtered data consists mostly of small values with a somewhat random distribution. In this case, the compression algorithm is tuned to compress them better. The effect of StrategyFiltered is to force more Huffman coding and less string matching; it is somewhat intermediate between StrategyDefault and StrategyHuffmanOnly. StrategyRLE is designed to be almost as fast as StrategyHuffmanOnly, but give better compression for PNG image data. The strategy parameter only affects the compression ratio but not the correctness of the compressed output even if it is not set appropriately. StrategyFixed prevents the use of dynamic Huffman codes, allowing for a simpler decoder for special applications.
See also:


- 48.12.8 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string = ””, ExtraGlobal as string = ””, Comment as String = ””, CompressionMethod as Integer = 8, Level as Integer = 9, Zip64 as boolean = false) 8400
- 48.12.9 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean) 8401
- 48.12.11 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw

as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32, versionMadeBy as UInt32, flagBase as UInt32) 8403

### 48.12.11 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32, versionMadeBy as UInt32, flagBase as UInt32)

MBS Compression Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Open a file in the ZIP for writing with the possibility to write raw files, chnage the compression and add a password.
**Notes:** filename: the filename in zip. This can include path information with slash as delimiter. e.g. "foldername/file.txt"
FileInfo: the file date.
ExtraLocal: contains the extrafield data the the local header.
ExtraGlobal: contains the extrafield data the the local header.
Comment: comment contain the comment string
CompressionMethod: contain the compression method (see Method* constants)
Level: contain the level of compression (a value from -1 to 9. see Compression* constants)
Zip64: If you want to have the zip file support more than 2 GB of data, set this to true to create a 64 bit file.
Raw: If true you read the file raw (the data will not be compressed).
windowBits: Parameters for zlib compression. (for example -15)
memLevel: Parameters for zlib compression. (for example 8 or 9)
Strategy: Parameters for zlib compression. (See Strategy* constants)
Password: The password to use.
crcForCtypting: the CRC value of the input file.
versionMadeBy: value for Version made by field
flagBase: value for flag field (compression level info will be added)

The windowBits parameter is the base two logarithm of the window size (the size of the history buffer). It should be in the range 8..15 for this version of the library. Larger values of this parameter result in better compression at the expense of memory usage. The default value is 15.

windowBits can also be -8..-15 for raw deflate. In this case, -windowBits determines the window size.

The memLevel parameter specifies how much memory should be allocated for the internal compression state. memLevel=1 uses minimum memory but is slow and reduces compression ratio; memLevel=9 uses maximum memory for optimal speed. The default value is 8. See zconf.h for total memory usage as a function of windowBits and memLevel.

The strategy parameter is used to tune the compression algorithm. Use the value StrategyDefault for normal data, StrategyFiltered for data produced by a filter (or predictor), StrategyHuffmanOnly to force Huffman encoding only (no string match), or StrategyRLE to limit match distances to one (run-length encoding). Filtered data consists mostly of small values with a somewhat random distribution. In this case, the compression algorithm is tuned to compress them better. The effect of StrategyFiltered is to force more Huffman coding and less string matching; it is somewhat intermediate between StrategyDefault and StrategyHuffmanOnly. StrategyRLE is designed to be almost as fast as StrategyHuffmanOnly, but give better compression for PNG image data. The strategy parameter only affects the compression ratio but not the correctness of the compressed output even if it is not set appropriately. StrategyFixed prevents the use of dynamic Huffman codes, allowing for a simpler decoder for special applications.
See also:

- 48.12.8 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string = """, ExtraGlobal as string = """, Comment as String = """, CompressionMethod as Integer = 8, Level as Integer = 9, Zip64 as boolean = false) 8400

- 48.12.9 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean) 8401

- 48.12.10 CreateFile(Filename as string, FileInfo as ZipFileInfoMBS, ExtraLocal as string, ExtraGlobal as string, Comment as String, CompressionMethod as Integer, Level as Integer, Zip64 as boolean, Raw as boolean, WindowBits as Integer, MemLevel as Integer, Strategy as Integer, Password as string, crcForCtypting as UInt32) 8401

### 48.12.12 Write(data as string)

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write data in the zipfile.
**Notes:** A file in the zip archive must have been created.

### 48.12.13 Properties

### 48.12.14 Handle as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle for the open zip archive.
**Notes:** If 0 the constructor failed to create the file.
(Read and Write property)

### 48.12.15 Lasterror as Integer

MBS Compression Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 48.12.16 ZipFileVersion32 as Integer

MBS Compression Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number to put in Zip file header for 32bit zip archives.
**Notes:** Default is 20 for version 4.5. Apple Finder seems to prefer 10 for 1.0.
(Read and Write property)

### 48.12.17 ZipFileVersion64 as Integer

MBS Compression Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number to put in Zip file header for 32bit zip archives.
**Notes:** Default is 45 for version 4.5. Apple Finder seems to prefer 10 for 1.0.
(Read and Write property)

### 48.12.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AppendStatusAddInZip | 2 | One of the values for the constructor. |
| AppendStatusCreate | 0 | One of the values for the constructor. |
| AppendStatusCreateAfter | 1 | One of the values for the constructor. |
| CompressionBestCompression | 9 | One of the compression level constants. |
| CompressionBestSpeed | 1 | One of the compression level constants. |
| CompressionDefault | -1 | One of the compression level constants. |
| CompressionNo | 0 | One of the compression level constants. |
| MethodDeflated | 8 | One of the compression method constants. |
| MethodNone | 0 | One of the compression method constants. Use this value for no compression. |
| StrategyDefault | 0 | One of the strategy modes. |
| StrategyFiltered | 1 | One of the strategy modes. |
| StrategyFixed | 4 | One of the strategy modes. |
| StrategyHuffmanOnly | 2 | One of the strategy modes. |
| StrategyRLE | 3 | One of the strategy modes. |
| ZipBadZipFile | -103 | One of the error constants. |
| ZipInternalError | -104 | One of the error constants. |
| ZipOk | 0 | One of the error constants. |
| ZipParameterError | -102 | One of the error constants. |

## 48.13 class ZLibCompressMBS

### 48.13.1 class ZLibCompressMBS

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for zlib compression.
**Notes:** See also ArchiveReaderMBS and ArchiveWriterMBS classes for more features and compression formats.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr3
- MBS REALbasic plug-ins version 9.4

### 48.13.2 Methods

### 48.13.3 Adler32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Adler Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.13.4 close

MBS Compression Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 48.13.5 Constructor(BufferSize as Integer=20000)

MBS Compression Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** The buffer size you specify is the output buffer size.
If this size is small, you need to flush with ProcessZip.

### 48.13.6 CRC32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.13.7 EndZip

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the current compression stream.
**Notes:** You may check the Output buffer after this.
Error is set.

### 48.13.8 GetOutput as string

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the contents of the output buffer.
**Notes:** The buffer is cleared after this function returns.

### 48.13.9 InitZip(level as Integer)

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the stream.
**Notes:** Level is from 0 to 9.
Error is set.

### 48.13.10 InputAvail as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes available in the input buffer.

### 48.13.11 OutputSize as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of bytes available in the output buffer.

### 48.13.12 ProcessFinish

MBS Compression Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as process, but for finishing.
**Notes:** If error is zero after this function, please call it again.
Error is 1 if stream is at end, so you can call EndZip to finish.

### 48.13.13 ProcessZip(Flush as boolean=false)

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does zip compression.
**Notes:** Reduces the size of the input buffer and writes new data to the output buffer.
If the input buffer is not empty after this call, you need to call it again, but empty the output buffer before.
Error is set.

If flush is true, the data is flushed to output. Using flush=true all the the time will slow down compression, so use it only on the end to clear the output buffers.

### 48.13.14 SetInput(data as MemoryBlock) as boolean

MBS Compression Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current input buffer size is 128 K, so you may use something smaller.
See also:

- 48.13.15 SetInput(data as string) as boolean 8409

### 48.13.15 SetInput(data as string) as boolean

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current input buffer size is 128 K, so you may use something smaller.
See also:

- 48.13.14 SetInput(data as MemoryBlock) as boolean 8409

### 48.13.16 Properties

### 48.13.17 CRC as UInt32

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Adler32 CRC value of the uncompressed data.
**Notes:** (Read only property)

### 48.13.18 Error as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** Values:

| | | |
|---|---|---|
| Z_OK | 0 | (no error) |
| Z_STREAM_END | 1 | (Should be handles by the plugin inside) |
| Z_NEED_DICT | 2 | |
| Z_ERRNO | -1 | |
| Z_STREAM_ERROR | -2 | |
| Z_DATA_ERROR | -3 | |
| Z_MEM_ERROR | -4 | |
| Z_BUF_ERROR | -5 | |
| Z_VERSION_ERROR | -6 | |

(Read and Write property)

### 48.13.19 ErrorMessage as String

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message for the last error.
**Notes:** (Read only property)

### 48.13.20 OutputBufferSize as Integer

MBS Compression Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output buffer size used in the constructor.
**Notes:** (Read only property)

### 48.13.21 TotalInput as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.13.22 TotalOutput as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.13.23 Version as String

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the used zlib library.
**Example:**

```
Dim z As New ZLibCompressMBS
MessageBox z.Version
```

**Notes:** (Read only property)

### 48.13.24 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kASCII | 1 | One of the data type constants. |
| kBEST_COMPRESSION | 9 | One of the compression level constants. |
| kBEST_SPEED | 1 | One of the compression level constants. |
| kBINARY | 0 | One of the data type constants. |
| kBLOCK | 5 | One of the flush constants. |
| kBUF_ERROR | -5 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kDATA_ERROR | -3 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kDEFAULT_COMPRESSION | -1 | One of the compression level constants. |
| kDEFAULT_STRATEGY | 0 | One of the compression strategy constants. |
| kDEFLATED | 8 | One of the compression method constants. The deflate compression method (the only one supported in this version) |
| kERRNO | -1 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kFILTERED | 1 | One of the compression strategy constants. |
| kFINISH | 4 | One of the flush constants. |
| kFIXED | 4 | One of the compression strategy constants. |
| kFULL_FLUSH | 3 | One of the flush constants. |
| kHUFFMAN_ONLY | 2 | One of the compression strategy constants. |
| kMEM_ERROR | -4 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kNEED_DICT | 2 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kNO_COMPRESSION | 0 | One of the compression level constants. |
| kNO_FLUSH | 0 | One of the flush constants. |
| kNULL | 0 | The null value. |
| kOK | 0 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kPARTIAL_FLUSH | 1 | One of the flush constants. |
| kRLE | 3 | One of the compression strategy constants. |
| kSTREAM_END | 1 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kSTREAM_ERROR | -2 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kSYNC_FLUSH | 2 | One of the flush constants. |
| kTEXT | 1 | One of the data type constants. |
| kUNKNOWN | 2 | One of the data type constants. |
| kVERSION_ERROR | -6 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |

## 48.14 class ZLibDecompressMBS

### 48.14.1 class ZLibDecompressMBS

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for zlib decompression.
**Notes:** See also ArchiveReaderMBS and ArchiveWriterMBS classes for more features and compression formats.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 48.14.2 Methods

### 48.14.3 Adler32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Adler Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.14.4 close

MBS Compression Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 48.14.5 Constructor(BufferSize as Integer=20000)

MBS Compression Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** The buffer size you specify is the output buffer size.
If this size is small, you need to flush with ProcessZip.

### 48.14.6 CRC32(start as UInt32, data as string) as UInt32

MBS Compression Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about a given string.
**Notes:** Set start to 0 for the first call.
Later you can pass the result as the new start value to add data to your checksum.

This function is part of the zlib library and given as a free utility function to this class.

### 48.14.7 EndZip

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the current decompression stream.
**Notes:** You may check the Output property after this.
Error is set.

### 48.14.8 GetOutput as string

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the content of the output buffer.
**Notes:** The buffer is cleared after this function returns.

### 48.14.9 InitZip

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the stream.
**Notes:** Error is set.

### 48.14.10 InputAvail as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes available in the input buffer.

### 48.14.11 OutputSize as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes available in the output buffer.

### 48.14.12 ProcessZip(Flush as boolean=false)

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does zip compression.
**Notes:** Reduces the size of the input buffer and writes new data to the output buffer.
If the input buffer is not "" after this call, you need to call it again, but empty the output buffer before.
Error is set.

If flush is true, the data is flushed to output. Using flush=true all the the time will slow down compression, so use it only on the end to clear the output buffers.

### 48.14.13 SetInput(data as Memoryblock) as boolean

MBS Compression Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.14.14 SetInput(data as string) as boolean 8415

### 48.14.14 SetInput(data as string) as boolean

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the input buffer.
**Notes:** Returns true if successfull.
The current plugin uses a 128 K input buffer.
See also:

- 48.14.13 SetInput(data as Memoryblock) as boolean 8415

### 48.14.15 Properties

### 48.14.16 CRC as UInt32

MBS Compression Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CRC checksum.
**Notes:** (Read only property)

### 48.14.17 Error as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** Values:

| | | |
|---|---|---|
| Z_OK | 0 | (no error) |
| Z_STREAM_END | 1 | (Should be handles by the plugin inside) |
| Z_NEED_DICT | 2 | |
| Z_ERRNO | -1 | |
| Z_STREAM_ERROR | -2 | |
| Z_DATA_ERROR | -3 | |
| Z_MEM_ERROR | -4 | |
| Z_BUF_ERROR | -5 | |
| Z_VERSION_ERROR | -6 | |

(Read and Write property)

### 48.14.18 ErrorMessage as String

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message for the last error.
**Notes:** (Read only property)

### 48.14.19 OutputBufferSize as Integer

MBS Compression Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output buffer size used in the constructor.
**Notes:** (Read only property)

### 48.14.20 TotalInput as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.14.21 TotalOutput as Integer

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes processed so far.
**Notes:** (Read and Write property)

### 48.14.22 Version as String

MBS Compression Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the used zlib library.
**Example:**

```
Dim z As New ZLibDecompressMBS
MessageBox z.Version
```

**Notes:** (Read only property)

### 48.14.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kASCII | 1 | One of the data type constants. |
| kBEST_COMPRESSION | 9 | One of the compression level constants. |
| kBEST_SPEED | 1 | One of the compression level constants. |
| kBINARY | 0 | One of the data type constants. |
| kBLOCK | 5 | One of the flush constants. |
| kBUF_ERROR | -5 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kDATA_ERROR | -3 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kDEFAULT_COMPRESSION | -1 | One of the compression level constants. |
| kDEFAULT_STRATEGY | 0 | One of the compression strategy constants. |
| kDEFLATED | 8 | One of the compression method constants. The deflate compression method (the only one supported in this version) |
| kERRNO | -1 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kFILTERED | 1 | One of the compression strategy constants. |
| kFINISH | 4 | One of the flush constants. |
| kFIXED | 4 | One of the compression strategy constants. |
| kFULL_FLUSH | 3 | One of the flush constants. |
| kHUFFMAN_ONLY | 2 | One of the compression strategy constants. |
| kMEM_ERROR | -4 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kNEED_DICT | 2 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kNO_COMPRESSION | 0 | One of the compression level constants. |
| kNO_FLUSH | 0 | One of the flush constants. |
| kNULL | 0 | The null value. |
| kOK | 0 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kPARTIAL_FLUSH | 1 | One of the flush constants. |
| kRLE | 3 | One of the compression strategy constants. |
| kSTREAM_END | 1 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kSTREAM_ERROR | -2 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |
| kSYNC_FLUSH | 2 | One of the flush constants. |
| kTEXT | 1 | One of the data type constants. |
| kUNKNOWN | 2 | One of the data type constants. |
| kVERSION_ERROR | -6 | One of the return codes for the compression/decompression functions. Negative values are errors, positive values are used for special but normal events. |

## 48.15 class ZStdMBS

### 48.15.1 class ZStdMBS

MBS Compression Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for ZStandard compression scheme.
**Example:**

```
Dim InputText As String = "Hello World. Hello World. Hello World. Hello World. Just a test! Hello World. Testing üòù"

Dim Compressed As String = ZStdMBS.Compress(InputText)
Dim OutputText As String = ZStdMBS.Decompress(Compressed).DefineEncoding(encodings.UTF8)
```

Break

**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- MBS Xojo Plugins, version 22.2pr6

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 48.15.2 Methods

### 48.15.3 Compress(Data as MemoryBlock, CompressionLevel as Integer = 1) as MemoryBlock

MBS Compression Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compresses the given MemoryBlock.
**Example:**

```
Dim InputText As String = "Hello World. Hello World. Hello World. Hello World. Just a test! Hello World. Testing üòù"
Dim InputData As MemoryBlock = InputText

Dim Compressed As MemoryBlock = ZStdMBS.Compress(InputData)
Dim OutputData As MemoryBlock = ZStdMBS.Decompress(Compressed)
```

```
Dim OutputText As String = DefineEncoding(OutputData, encodings.UTF8)

Break
```

**Notes:** CompressionLevel range from 1 to 22 where 22 is best with most memory usage.

Raises exception (UnsupportedOperationException or OutOfMemoryException) in case it fails. Please read message property for details.
See also:

- 48.15.4 Compress(Data as String, CompressionLevel as Integer = 1) as String 8420

### 48.15.4 Compress(Data as String, CompressionLevel as Integer = 1) as String

MBS Compression Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compresses the given string.
**Example:**

```
Dim InputText As String = "Hello World. Hello World. Hello World. Hello World. Just a test! Hello World. Testing üòù"

Dim Compressed As String = ZStdMBS.Compress(InputText)
Dim OutputData As String = ZStdMBS.Decompress(Compressed).DefineEncoding(encodings.UTF8)

Break
```

**Notes:** CompressionLevel range from 1 to 22 where 22 is best with most memory usage.

Raises exception (UnsupportedOperationException or OutOfMemoryException) in case it fails. Please read message property for details.
See also:

- 48.15.3 Compress(Data as MemoryBlock, CompressionLevel as Integer = 1) as MemoryBlock 8419

### 48.15.5 Decompress(Data as MemoryBlock) as MemoryBlock

MBS Compression Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Decompresses MemoryBlock.
**Example:**

```
Dim InputText As String = "Hello World. Hello World. Hello World. Hello World. Just a test! Hello World. Testing üòù"
Dim InputData As MemoryBlock = InputText
```

```
Dim Compressed As MemoryBlock = ZStdMBS.Compress(InputData)
Dim OutputData As MemoryBlock = ZStdMBS.Decompress(Compressed)

Dim OutputText As String = DefineEncoding(OutputData, encodings.UTF8)

Break
```

**Notes:** Raises exception (UnsupportedOperationException or OutOfMemoryException) in case it fails. Please read message property for details.
See also:

- 48.15.6 Decompress(Data as String) as String 8421

### 48.15.6 Decompress(Data as String) as String

MBS Compression Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Decompresses string.
**Example:**

```
Dim InputText As String = "Hello World. Hello World. Hello World. Hello World. Just a test! Hello World. Testing üòù"

Dim Compressed As String = ZStdMBS.Compress(InputText)
Dim OutputData As String = ZStdMBS.Decompress(Compressed).DefineEncoding(encodings.UTF8)

Break
```

**Notes:** Raises exception (UnsupportedOperationException or OutOfMemoryException) in case it fails. Please read message property for details.
See also:

- 48.15.5 Decompress(Data as MemoryBlock) as MemoryBlock 8420

# Chapter 49

# Contacts

## 49.1 class CNChangeHistoryAddContactEventMBS

### 49.1.1 class CNChangeHistoryAddContactEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A contact was added.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.1.2 Methods

### 49.1.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.1.4 Properties

### 49.1.5 contact as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The contact added.
**Notes:** (Read only property)

### 49.1.6 containerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The identifier for the container.
**Notes:** (Read only property)

## 49.2 class CNChangeHistoryAddGroupEventMBS

### 49.2.1 class CNChangeHistoryAddGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A group was added.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.2.2 Methods

### 49.2.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.2.4 Properties

### 49.2.5 containerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The identifier for the container.
**Notes:** (Read only property)

### 49.2.6 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group.
**Notes:** (Read only property)

## 49.3 class CNChangeHistoryAddMemberToGroupEventMBS

### 49.3.1 class CNChangeHistoryAddMemberToGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A contact was added to a group.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.3.2 Methods

### 49.3.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.3.4 Properties

### 49.3.5 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group.
**Notes:** (Read only property)

### 49.3.6 member as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The member added.
**Notes:** (Read only property)

## 49.4 class CNChangeHistoryAddSubgroupToGroupEventMBS

### 49.4.1 class CNChangeHistoryAddSubgroupToGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A subgroup was added to a group.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.4.2 Methods

### 49.4.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.4.4 Properties

### 49.4.5 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group.
**Notes:** (Read only property)

### 49.4.6 subgroup as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The sub group.
**Notes:** (Read only property)

## 49.5 class CNChangeHistoryDeleteContactEventMBS

### 49.5.1 class CNChangeHistoryDeleteContactEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A contact was removed.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.5.2 Methods

### 49.5.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.5.4 Properties

### 49.5.5 contactIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The identifier for the deleted contact.
**Notes:** (Read only property)

## 49.6 class CNChangeHistoryDeleteGroupEventMBS

### 49.6.1 class CNChangeHistoryDeleteGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A group was deleted.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.6.2 Methods

### 49.6.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.6.4 Properties

### 49.6.5 groupIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The identifier on the deleted group.
**Notes:** (Read only property)

## 49.7 class CNChangeHistoryDropEverythingEventMBS

### 49.7.1 class CNChangeHistoryDropEverythingEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Drop all cached information your app has persisted.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.7.2 Methods

### 49.7.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 49.8 class CNChangeHistoryEventMBS

### 49.8.1 class CNChangeHistoryEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The base class for changing events.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.8.2 Methods

### 49.8.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.8.4 Properties

### 49.8.5 className as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The class name of the Objective-C class.
**Notes:** (Read only property)

### 49.8.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 49.9 class CNChangeHistoryFetchRequestMBS

### 49.9.1 class CNChangeHistoryFetchRequestMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Specifies the criteria to fetch change history.
**Notes:** Changes to contacts are always returned.
All changes are coalesced to remove redundant adds, updates and deletes.
This request is used with enumeratorForChangeHistoryFetchRequest in CNContactStoreMBS class.
Subclass of the CNContactFetchRequestMBS class.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.9.2 Methods

### 49.9.3 additionalContactKeyDescriptors as CNKeyDescriptorMBS()

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Additional keys to include in the fetched contacts.

### 49.9.4 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.15 or iOS 13 or later.

### 49.9.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.9.6 excludedTransactionAuthors as String()

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Exclude changes made by certain authors.
**Notes:** If set, transactions made by the specified authors will be excluded from the results. Use this, in conjunction with CNSaveRequest.transactionAuthor, to suppress processing of changes you already know about.

### 49.9.7 setAdditionalContactKeyDescriptors(additionalContactKeyDescriptors() as CNKeyDescriptorMBS)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Additional keys to include in the fetched contacts.
**Notes:** By default, only CNContactIdentifierKey will be fetched. If you would like to include additional key descriptors to process the contacts, include the key descriptors you need.

CNContactIdentifierKey will always be fetched, whether you request it or not.

### 49.9.8 setExcludedTransactionAuthors(setExcludedTransactionAuthors() as String)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Exclude changes made by certain authors.
**Notes:** If set, transactions made by the specified authors will be excluded from the results. Use this, in conjunction with CNSaveRequest.transactionAuthor, to suppress processing of changes you already know about.

### 49.9.9 Properties

### 49.9.10 includeGroupChanges as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Set to true to also fetch group changes.
**Notes:** Default is false.
(Read and Write property)

### 49.9.11 mutableObjects as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** To return mutable contacts and groups.
**Notes:** If true returns mutable contacts and groups. Default is false.

(Read and Write property)

### 49.9.12 shouldUnifyResults as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns contact changes as unified contacts.
**Notes:** If true, returns unified contact history. Otherwise returns individual contact history. Default is true.

A unified contact is the aggregation of properties from a set of linked individual contacts.
If an individual contact is not linked then the unified contact is simply that individual contact.
(Read and Write property)

### 49.9.13 startingToken as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Request changes made after a certain point.
**Notes:** If non-nil, only changes made after this point in history will be returned.

If nil, a CNChangeHistoryDropEverythingEventMBS will be returned, followed by an add event for every contact and group currently in the contacts database.
(Read and Write property)

## 49.10 class CNChangeHistoryRemoveMemberFromGroupEventMBS

### 49.10.1 class CNChangeHistoryRemoveMemberFromGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A contact was removed from a group.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.10.2 Methods

### 49.10.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.10.4 Properties

### 49.10.5 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group.
**Notes:** (Read only property)

### 49.10.6 member as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The member removed.
**Notes:** (Read only property)

## 49.11 class CNChangeHistoryRemoveSubgroupFromGroupEventMBS

### 49.11.1 class CNChangeHistoryRemoveSubgroupFromGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A subgroup was removed from a group.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.11.2 Methods

### 49.11.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.11.4 Properties

### 49.11.5 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group.
**Notes:** (Read only property)

### 49.11.6 subgroup as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The sub group.
**Notes:** (Read only property)

## 49.12 class CNChangeHistoryUpdateContactEventMBS

### 49.12.1 class CNChangeHistoryUpdateContactEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A contact was updated.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.12.2 Methods

### 49.12.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.12.4 Properties

### 49.12.5 contact as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The contact changed.
**Notes:** (Read only property)

## 49.13 class CNChangeHistoryUpdateGroupEventMBS

### 49.13.1 class CNChangeHistoryUpdateGroupEventMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A group was updated.
**Notes:** Subclass of the CNChangeHistoryEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Contacts history for Xojo
- MBS Xojo Plugins, version 22.0pr7

### 49.13.2 Methods

### 49.13.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.13.4 Properties

### 49.13.5 group as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The group used.
**Notes:** (Read only property)

## 49.14 class CNContactFetchRequestMBS

### 49.14.1 class CNContactFetchRequestMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A contact fetch request.
**Notes:** The CNContactFetchRequest class defines fetching options to use while fetching contacts. It is required to have contact property key(s) to fetch a contact,Äôs properties. Use this class with the enumerateContactsWithFetchRequest method to execute the contact fetch request.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr5

### 49.14.2 Methods

### 49.14.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.14.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The designated initializer for a fetch request that uses all keys.
**Notes:** Same as calling other Constructor and passing result of CNContactStoreMBS.AllFetchKeys function.
See also:

- 49.14.5 Constructor(keysToFetch() as CNKeyDescriptorMBS) 8439

### 49.14.5 Constructor(keysToFetch() as CNKeyDescriptorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The designated initializer for a fetch request that uses the specified keys.
**Notes:** keysToFetch: An array of contact property keys and/or key descriptors from contacts objects to be fetched in the returned contacts.
See also:

- 49.14.4 Constructor 8439

### 49.14.6 keysToFetch as CNKeyDescriptorMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The properties to fetch in the returned contacts.
**Notes:** An array of contact property keys or key descriptors from contact objects to be fetched in the returned contacts. For example, CNContactEmailAddressesKey, CNContactPhoneNumbersKey, CNContactFormatterStyleFullName fetches the contact,Äôs email addresses, phone numbers, and contact,Äôs full name with the contact formatter.

### 49.14.7 setKeysToFetch(keysToFetch() as CNKeyDescriptorMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the properties to fetch in the returned contacts.

### 49.14.8 Properties

### 49.14.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactFetchRequest object.
(Read and Write property)

### 49.14.10 mutableObjects as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether to return mutable contacts.
**Notes:** When the value of this property is true, the fetch returns CNMutableContact objects; otherwise it returns CNContact objects. The default value of this property is false.
(Read and Write property)

### 49.14.11 predicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The predicate to match contacts against.
**Notes:** Set the value of this property to nil to match all contacts or use the predicates define in CNContact

Predicates. Compound predicates are not supported.
(Read and Write property)

### 49.14.12 SortOrder as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The sort order for contacts.
**Notes:** The default sort order is CNContactSortOrderNone.
(Read and Write property)

### 49.14.13 unifyResults as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether to return linked contacts as unified contacts.
**Notes:** A unified contact is an aggregation of properties from a set of linked individual contacts. When the value of this property is true, the fetch returns unified contacts; otherwise, it returns individual contacts. The default value of this property is true.
(Read and Write property)

## 49.15 class CNContactFormatterMBS

### 49.15.1 class CNContactFormatterMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactFormatter class defines the different formatting styles for contacts.
**Example:**

```
dim m as new CNMutableContactMBS
m.givenName = "Bob"
m.familyName = "Miller"

dim f as new CNContactFormatterMBS
dim style as Integer = CNContactFormatterMBS.CNContactFormatterStyleFullName
MsgBox CNContactFormatterMBS.stringFromContact(m, style)
```

**Notes:** This class handles international ordering and delimiting for the contact name components. When formatting many contacts, create an instance of this class and use the instance methods; otherwise use the class methods.

### 49.15.2 Methods

### 49.15.3 attributedStringFromContact(contact as CNContactMBS, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats the contact name as an attributed string.
**Notes:** contact: The contact whose name is to be formatted.
attributes: The default attributes to use. For more information, see NSFormatter.

Returns the formatted contact name as an attributed string.

This method behaves similarly to stringFromContact, except that it returns an attributed string. It includes the attribute key CNContactPropertyAttribute whose attribute values are contact property keys, such as CNContactGivenNameKey. This identifies the name components in the formatted contact name.
See also:

- 49.15.4 attributedStringFromContact(contact as CNContactMBS, Style as Integer, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS

### 49.15.4 attributedStringFromContact(contact as CNContactMBS, Style as Integer, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats the contact name as an attributed string.
**Notes:** contact: The contact whose name is to be formatted.
style: The formatting style to be used for the contact name.
attributes: The default attributes to use. For more information, see NSFormatter.

Returns the formatted contact name as an attributed string.

This method behaves similarly to stringFromContact, except that it returns an attributed string. It includes the attribute key CNContactPropertyAttribute, whose attribute values are contact property keys, such as CNContactGivenNameKey. This identifies the name components in the formatted contact name.
See also:

- 49.15.3 attributedStringFromContact(contact as CNContactMBS, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS 8442

### 49.15.5 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.15.6 CNContactPropertyAttribute as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the attributes in the attribute dictionary.
**Notes:** If the attributes include the key CNContactPropertyAttribute whose attribute values are contact property keys, such as CNContactGivenNameKey. This identifies the name components in the formatted contact name.

### 49.15.7 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.15.8 delimiterForContact(contact as CNContactMBS) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the delimiter to use between name components.
**Notes:** contact: The contact whose name is to be formatted.

Returns the delimiter to use between name components.

If contact is nil, or if it has no first name, middle name, or last name, this method returns an empty string.

### 49.15.9 descriptorForRequiredKeysForStyle(Style as Integer) as CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the required key descriptor for the specified formatting style of the contact.
**Notes:** style: The formatting style to be used for contact name.

Returns the contact key descriptor for the formatting style.

Include this method with the keys to fetch when fetching contacts. To format multiple styles, you can include multiple key descriptors with the keys to fetch.

### 49.15.10 nameOrderForContact(contact as CNContactMBS) as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the display name order.
**Notes:** contact: The contact whose name is to be formatted.

Returns the display order to use when combining the given name and family name components.

For more information about display name orders, see CNContactDisplayNameOrder.

### 49.15.11 stringFromContact(contact as CNContactMBS) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats the contact name.
See also:

- 49.15.12 stringFromContact(contact as CNContactMBS, Style as Integer) as String 8445

### 49.15.12 stringFromContact(contact as CNContactMBS, Style as Integer) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the contact name, formatted with the specified formatter.
**Notes:** contact: The contact whose name is to be formatted.
style: The formatting style to be used for the contact name.
See also:

- 49.15.11 stringFromContact(contact as CNContactMBS) as String 8444

### 49.15.13 Properties

### 49.15.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactFormatter object.
(Read and Write property)

### 49.15.15 Style as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The formatting style for the contact name.
**Notes:** The style for a contact formatter instance. The default value for this property is CNContactFormatterStyleFullName. For more information on formatting styles, see CNContactFormatterStyle.
(Read and Write property)

### 49.15.16 Constants

Display Name Order

| Constant | Value | Description |
|---|---|---|
| CNContactDisplayNameOrderFamilyNameFirst | 2 | Display name order by family name first. |
| CNContactDisplayNameOrderGivenNameFirst | 1 | Display name order by given name first. |
| CNContactDisplayNameOrderUserDefault | 0 | Display name order by user default. |

Styles

| Constant | Value | Description |
|---|---|---|
| CNContactFormatterStyleFullName | 0 | Combines the contact name components into a full name. |
| CNContactFormatterStylePhoneticFullName | 1 | Combines the contact phonetic name components into a phonetic |

## 49.16 class CNContactMBS

### 49.16.1 class CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a contact.
**Notes:** The CNContact is a thread-safe class that represents an immutable value object for contact properties, such as the first name and phone numbers of a contact. CNContact is similar to a complex Foundation collection, in that it has a mutable subclass (CNMutableContact). Neither the CNContact nor CNMutableContact class maintain a reference to their data store. Every contact has a unique ID, which you obtain using the identifier property.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CNContactPickerViewController for Xojo
- Contacts history for Xojo
- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins, version 20.5pr1
- MBS Xojo Plugins, version 18.1pr2
- MBS Xojo Plugins, version 17.2pr5

### 49.16.2 Methods

### 49.16.3 areKeysAvailable(keyDescriptors() as CNKeyDescriptorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether all contact property values for the specified keys are fetched.
**Notes:** The isKeyAvailable or areKeysAvailable methods are used where you are not certain of the keys that when fetched. If this method returns false, refetch the contact using the contact identifier and the keys you want to fetch. Accessing a property that was not fetched will throw an CNContactPropertyNotFetchedExceptionName exception.

### 49.16.4 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.16.5 CNContactBirthdayKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Birthday.

### 49.16.6 CNContactDatesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Contact dates.

### 49.16.7 CNContactDepartmentNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Department name.

### 49.16.8 CNContactEmailAddressesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Email address.

### 49.16.9 CNContactFamilyNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Family name.

### 49.16.10 CNContactGivenNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Given name.

### 49.16.11 CNContactIdentifierKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** The identifier.

### 49.16.12 CNContactImageDataAvailableKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Image data availability.
Available in OS X 10.12 or newer.

### 49.16.13 CNContactImageDataKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Image data.

### 49.16.14 CNContactInstantMessageAddressesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Instant messages.

### 49.16.15 CNContactJobTitleKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Job title.

### 49.16.16 CNContactMiddleNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Middle name.

### 49.16.17 CNContactNamePrefixKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Name prefix.

### 49.16.18 CNContactNameSuffixKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Name suffix.

### 49.16.19 CNContactNicknameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Nickname.

### 49.16.20 CNContactNonGregorianBirthdayKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Non-Gregorian birthday.

### 49.16.21 CNContactNoteKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Note.

### 49.16.22 CNContactOrganizationNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Organization name.

### 49.16.23 CNContactPhoneNumbersKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Phone number.

### 49.16.24 CNContactPhoneticFamilyNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Phonetic family name.

### 49.16.25 CNContactPhoneticGivenNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Phonetic given name.

### 49.16.26 CNContactPhoneticMiddleNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Phonetic middle name.

### 49.16.27 CNContactPhoneticOrganizationNameKey as String

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic spelling of the contact's organization name.
**Notes:** Requires macOS 10.12 or newer.

### 49.16.28 CNContactPostalAddressesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Postal address.

### 49.16.29 CNContactPreviousFamilyNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Previous family name.

### 49.16.30 CNContactPropertyNotFetchedExceptionName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Exception thrown when an accessed property was not fetched.
**Notes:** The plugin throws a NSExceptionMBS where the name is this value in case a property is not available.

### 49.16.31 CNContactRelationsKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Contact relations.

### 49.16.32 CNContactSocialProfilesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Social profile.

### 49.16.33 CNContactThumbnailImageDataKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Thumbnail data.

### 49.16.34 CNContactTypeKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** Contact type.

### 49.16.35 CNContactUrlAddressesKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for contact properties.
**Notes:** URL Address.

### 49.16.36 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.16.37 contactRelations as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled relations for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNContactRelation value. This property was previously known as related names.

### 49.16.38 copy as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the contact object.

### 49.16.39 dates as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array containing labeled Gregorian dates.
**Notes:** This property is an array of CNLabeledValue objects, each of which has an NSString label and NSDateComponents value. You can use this property to store Gregorian dates such as anniversaries. Day and month components are required and year is optional. The calendar component can be nil or NSCalendarIdentifierGregorian. All other date components are invalid and including them results in an NSError object that includes the key paths of the invalid components and the error code CNErrorCodeValidationConfigurationError.

### 49.16.40 descriptorForAllComparatorKeys as CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all the keys required for the contact sort comparator.
**Notes:** This method implements the CNKeyDescriptor protocol and can be used as an array element when fetching keys for contacts.

### 49.16.41 emailAddresses as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled email addresses for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and an NSString that contains the email address.

### 49.16.42 instantMessageAddresses as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled IM addresses for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNInstantMessageAddress value.

### 49.16.43 isKeyAvailable(key as String) as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether the contact property value for the specified key is fetched.
**Notes:** The isKeyAvailable or areKeysAvailable methods are used when you are not certain of the keys that were fetched. If this method returns false, refetch the contact using the contact identifier and the keys you want to fetch. Accessing a property that was not fetched will throw CNContactPropertyNotFetchedExceptionName.

### 49.16.44 isUnifiedWithContactWithIdentifier(contactIdentifier as String) as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if the receiver was fetched as a unified contact and includes the contact having contactIdentifier in its unification.

### 49.16.45 localizedStringForKey(key as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a string containing the localized contact property name.
**Notes:** key: A string containing the contact property key.

Returns a localized string containing the contact property name.

This method returns a localized string for a contact property key. For example, the value of a Canadian CNContactPostalAddressesKey field would be ‚ÄúPostal Code‚Äù, while the value of a French one would be ‚ÄúCode Postal‚Äù.

### 49.16.46 mutableCopy as CNMutableContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a mutable copy of this contact.

### 49.16.47 phoneNumbers as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled phone numbers for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNPhoneNumber value.

### 49.16.48 postalAddresses as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled postal addresses for a contact.
**Example:**

```
Dim c As CNContactMBS // your contact

Dim postalAddresses() As CNLabeledValueMBS = c.postalAddresses
For Each postalAddresse As CNLabeledValueMBS In postalAddresses

Dim p As CNPostalAddressMBS = postalAddresse.Value

MsgBox p.Street + EndOfLine + p.PostalCode + " " + p.City
Next
```

**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNPostalAddress value.

### 49.16.49 predicateForContactsInContainerWithIdentifier(containerIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts in the specified container.
**Notes:** Returns a predicate that can be used to fetch contacts from CNContactStore.

### 49.16.50 predicateForContactsInGroupWithIdentifier(groupIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts that are members in the specified group.
**Notes:** Returns a predicate that can be used to fetch contacts from CNContactStore.

### 49.16.51 predicateForContactsMatchingEmailAddress(emailAddress as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts whose email address matches the specified value.
**Example:**

```
Dim keysToFetch() As CNKeyDescriptorMBS
keysToFetch.append CNContactVCardSerializationMBS.descriptorForRequiredKeys

Dim predicate As NSPredicateMBS = CNContactMBS.predicateForContactsMatchingEmailAddress("test@test.test")

Dim error As NSErrorMBS
Dim contacts() As CNContactMBS = m.unifiedContactsMatchingPredicate(predicate, keysToFetch, error)

If error <>Nil Then
List.AddRow "Error: "+error.LocalizedDescription
Else
List.AddRow Str(contacts.Ubound+1)+" contacts found"
End If
```

**Notes:** emailAddress: The email address to be matched.

Returns a predicate that you can use to fetch contacts from CNContactStoreMBS class.

Requires macOS 10.13 or newer.

### 49.16.52 predicateForContactsMatchingName(name as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts matching the specified name.
**Example:**

```
Dim keysToFetch() As CNKeyDescriptorMBS
keysToFetch.append CNContactVCardSerializationMBS.descriptorForRequiredKeys

Dim predicate As NSPredicateMBS = CNContactMBS.predicateForContactsMatchingName("Peter")

Dim error As NSErrorMBS
Dim contacts() As CNContactMBS = m.unifiedContactsMatchingPredicate(predicate, keysToFetch, error)

If error <>Nil Then
```

```
List.AddRow "Error: "+error.LocalizedDescription
Else
List.AddRow Str(contacts.Ubound+1)+" contacts found"
End If
```

**Notes:** The name can contain any number of words.
Returns a predicate that can be used to fetch contacts from CNContactStore.

### 49.16.53 predicateForContactsMatchingPhoneNumber(phoneNumber as CNPhoneNumberMBS) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts whose phone number matches the specified value.
**Example:**

```
Dim keysToFetch() As CNKeyDescriptorMBS
keysToFetch.append CNContactVCardSerializationMBS.descriptorForRequiredKeys

Dim phone As New CNPhoneNumberMBS("123456789,Ä¨")
Dim predicate As NSPredicateMBS = CNContactMBS.predicateForContactsMatchingPhoneNumber(phone)

Dim error As NSErrorMBS
Dim contacts() As CNContactMBS = m.unifiedContactsMatchingPredicate(predicate, keysToFetch, error)

If error <>Nil Then
List.AddRow "Error: "+error.LocalizedDescription
Else
List.AddRow Str(contacts.Ubound+1)+" contacts found"
End If
```

**Notes:** Returns a predicate that you can use to fetch contacts from CNContactStoreMBS.

Requires macOS 10.13 or newer.

### 49.16.54 predicateForContactsWithIdentifiers(Identifiers() as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the contacts matching the specified identifiers.

**Notes:** Returns a predicate that can be used to fetch contacts from CNContactStore.

### 49.16.55 socialProfiles as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled social profiles for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNSocialProfile value.

### 49.16.56 urlAddresses as CNLabeledValueMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of labeled URL addresses for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and an NSString value that contains the URL.

### 49.16.57 valueForKey(key as String) as Variant

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries value for a given key.
**Example:**

```
// your contact
dim c as CNContactMBS

dim value as Variant = c.valueForKey(c.CNContactPreviousFamilyNameKey)
if value = nil then
// empty
else
MsgBox value.StringValue
end if
```

**Notes:** Normally you use the properties, but if you loop over a list of keys, you can use this function to query value for key.

### 49.16.58 Properties

### 49.16.59 birthday as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A date component for the Gregorian birthday of the contact.
**Notes:** Birthdays are represented by this property, whose values are the relevant properties of an NSDateComponents object. Day and month components are required for this property, and year is optional. The calendar component can be nil or NSCalendarIdentifierGregorian. All other date components are invalid and including them results in an NSError object that includes the key paths of the invalid components and the error code CNErrorCodeValidationConfigurationError.
(Read only property)

### 49.16.60 contactType as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An enum identifying the contact type.
**Notes:** Can be CNContactMBS.CNContactTypeOrganization or CNContactMBS.CNContactTypePerson.
(Read only property)

### 49.16.61 departmentName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the department associated with the contact.
**Notes:** (Read only property)

### 49.16.62 familyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The family name of the contact.
**Notes:** (Read only property)

### 49.16.63 givenName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The given name of the contact.

**Notes:** The given name is often known as the first name of the contact.
(Read only property)

### 49.16.64 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContact object.
(Read and Write property)

### 49.16.65 identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A value that uniquely identifies a contact on the device.
**Notes:** It is recommended that you use the identifier when re-fetching the contact. An identifier can be persisted between the app launches. Note that this identifier only uniquely identifies the contact on the current device.
(Read only property)

### 49.16.66 imageData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The profile picture of a contact.
**Notes:** It is recommended that you fetch this property only when you need to access its value, such as when you need to display the contact,Äôs profile picture.
(Read only property)

### 49.16.67 imageDataAvailable as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicates whether a contact has a profile picture.
**Notes:** (Read only property)

### 49.16.68 jobTitle as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The contact,Äôs job title.
**Notes:** (Read only property)

### 49.16.69 middleName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The middle name of the contact.
**Notes:** (Read only property)

### 49.16.70 namePrefix as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name prefix of the contact.
**Notes:** (Read only property)

### 49.16.71 nameSuffix as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name suffix of the contact.
**Notes:** (Read only property)

### 49.16.72 nickname as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The nickname of the contact.
**Notes:** (Read only property)

### 49.16.73 nonGregorianBirthday as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A date component for the non-Gregorian birthday of the contact.
**Notes:** Non-Gregorian birthdays can be displayed using this property, whose values are the relevant properties of an NSDateComponents object. Day and month components are required; year and leap month are optional. The calendar component is also required and must be an NSCalendar object with an identifier other than NSCalendarIdentifierGregorian. For example, some supported calendars are Chinese, Hebrew, and Islamic. All other date components are invalid and including them results in an NSError object that includes the key paths of the invalid components and the error code CNErrorCodeValidationConfigurationError.
(Read only property)

### 49.16.74 note as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string containing notes for the contact.
**Notes:** To fetch the note property in iOS 13 or later or macOS 16 or later, add the com.apple.developer.contacts.notes entitlement to your app. The entitlement requires permission from Apple to use, and you can,Äôt publicly distribute your app until you have permission to use it. For more information about adding the entitlement and getting permission, see com.apple.developer.contacts.notes.
(Read only property)

### 49.16.75 organizationName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the organization associated with the contact.
**Notes:** (Read only property)

### 49.16.76 phoneticFamilyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string for the phonetic family name of the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs family (or last) name.
(Read only property)

### 49.16.77 phoneticGivenName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic given name of the contact.

**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs given (or first) name.
(Read only property)

### 49.16.78 phoneticMiddleName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic middle name of the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs middle name.
(Read only property)

### 49.16.79 phoneticOrganizationName as String

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic name of the organization associated with the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs organization name.
Requires macOS 10.12 or newer.
(Read only property)

### 49.16.80 previousFamilyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string for the previous family name of the contact.
**Notes:** The previous family name is often known as the maiden name of the contact.
(Read only property)

### 49.16.81 thumbnailImageData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The thumbnail version of the contact,Äôs profile picture.
**Notes:** The thumbnailImageData property is derived from the imageData property, including cropping information from vCards or edits from contact viewing. It is recommended that you fetch this property only when you need to access its value, such as when you need to display the contact,Äôs profile thumbnail picture.
(Read only property)

### 49.16.82 Constants

Sort Orders

| Constant | Value | Description |
|---|---|---|
| CNContactSortOrderFamilyName | 3 | Order by Family Name. |
| CNContactSortOrderGivenName | 2 | Order by Given Name. |
| CNContactSortOrderNone | 0 | Order by no order. |
| CNContactSortOrderUserDefault | 1 | Order by user preference. |

Contact Types

| Constant | Value | Description |
|---|---|---|
| CNContactTypeOrganization | 1 | The contact is an Organization. |
| CNContactTypePerson | 0 | The contact is a person. |

## 49.17 class CNContactPickerMBS

### 49.17.1 class CNContactPickerMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The CNContactPicker object displays the popover-based system interface for selecting a contact.
**Notes:** The methods and properties of this class help you choose a contact or a contact's value, such as a phone number or email address, of a contact.

### 49.17.2 Methods

### 49.17.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.17.4 close

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Closes the popover.

### 49.17.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 49.17.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 49.17.7 displayedKeys as String()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The keys to be displayed when a contact is expanded.
**Notes:** If no keys are provided, the picker selects contacts instead of values. For a list of possible keys, see Metadata Keys in CNContact.

### 49.17.8 setDisplayedKeys(keys() as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Set the keys to be displayed when a contact is expanded.
**Notes:** If no keys are provided, the picker selects contacts instead of values. For a list of possible keys, see Metadata Keys in CNContact.

### 49.17.9 showRelativeToRect(positioningRect as NSRectMBS, view as NSViewMBS, edge as Integer)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Shows the picker popover anchored to the specified view.
**Notes:** positioningRect: The content size of the popover.
positioningView: The view to which the popover should be positioned.
preferredEdge: The edge to which the popover should be anchored to. Can be MinYEdge, MinXEdge, MaxYEdge or MaxXEdge.

### 49.17.10 Properties

### 49.17.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactPicker object.
(Read and Write property)

### 49.17.12 Events

### 49.17.13 DidClose

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** Called when the contact picker,Äôs popover has closed.

### 49.17.14 didSelectContact(contact as CNContactMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** Called after a contact has been selected by the user.
**Notes:** The contact may only be partial loaded and not have all fields available as the picker may not need/show all fields.

### 49.17.15 didSelectContactProperty(contactProperty as CNContactPropertyMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** The event called when a contact property was selected.
**Notes:** The contact may only be partial loaded and not have all fields available as the picker may not need/show all fields.

### 49.17.16 WillClose

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** Called when the contact picker,Äôs popover is about to close.

### 49.17.17 Constants

Edge Constants

| Constant | Value | Description |
|---|---|---|
| MaxXEdge | 2 | |
| MaxYEdge | 3 | |
| MinXEdge | 0 | |
| MinYEdge | 1 | |

## 49.18 class CNContactPickerViewControllerMBS

### 49.18.1 class CNContactPickerViewControllerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A view controller that displays an interface for picking contacts.
**Notes:** A CNContactPickerViewController allows the user to select one or more contacts (or their properties) from the list of contacts displayed in the contact view controller (CNContactViewController). The picker supports both single selection and multiselection of the contacts. The app using contact picker view does not need access to the user,Äôs contacts and the user will not be prompted for ,Äúgrant permission,Äù access. The app has access only to the user,Äôs final selection.
There are predefined predicates in this class that let you control the user selection of the contact. Changing the predicates only take effect before the view is presented.
Subclass of the NSViewControllerMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- CNContactPickerViewController for Xojo
- MBS Xojo Plugins, version 22.3pr2

### 49.18.2 Methods

### 49.18.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Whether this class is available.
**Notes:** Requires iOS 9.0

### 49.18.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 49.18.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 49.18.6 Dismiss

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 49.18.7 displayedPropertyKeys as String()

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The CNContact property keys to display in the contact detail card.
**Notes:** All the properties of the contact are displayed if this property is not set.

### 49.18.8 Present

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 49.18.9 setdisplayedPropertyKeys(displayedPropertyKeys() as String)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The CNContact property keys to display in the contact detail card.
**Notes:** All the properties of the contact are displayed if this property is not set.

### 49.18.10 Properties

### 49.18.11 isBeingPresented as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Whether the controller is presented.
**Notes:** Returns true if the dialog is visible.
(Read only property)

### 49.18.12 predicateForEnablingContact as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A predicate to determine the contact selectability in the list of contacts.
**Notes:** You can set a value for this property to determine which contact should become selectable, such as emailAddresses.@count >0 to enable all the contacts that have an email address to become selectable. If no predicate is set for this property, all contacts become selectable. To learn about predicate syntax, see NSPredicateMBS.
(Read and Write property)

### 49.18.13 predicateForSelectionOfContact as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A predicate to control the return of the selected contact.
**Notes:** This property determines whether a selected contact should be returned (when the predicate evaluates to TRUE), or a default action for the property should be performed (when the predicate evaluates to FALSE). By default the contact picker view controller displays the contact,Äôs detail card when a contact is selected. To learn about predicates, see NSPredicateMBS.
(Read and Write property)

### 49.18.14 predicateForSelectionOfProperty as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A predicate to control the properties of the selected contact.
**Notes:** This property determines whether a selected contact should be returned (when the predicate evaluates to TRUE), or a default action for the property should be performed (when the predicate evaluates to FALSE). By default the contact picker view controller returns the first selected property of the contact. This predicate is evaluated on the CNContactProperty property that is being selected, such as (key == 'emailAddresses') AND (value LIKE '*@apple.com') to return email address of the contact if the address contains the string ,Äú@apple.com,Äù.
(Read and Write property)

### 49.18.15 Events

### 49.18.16 didCancel

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** In iOS, called when the user taps Cancel.
**Notes:** The picker is dismissed automatically after a contact or property is picked.

### 49.18.17 didSelectContact(contact as CNContactMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Called after a contact has been selected by the user.
**Notes:** This event is called when the user selects a single contact.

### 49.18.18 didSelectContactProperties(contactProperties() as CNContactPropertyMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Called after contact properties have been selected by the user.
**Notes:** This event is invoked when the user selects more than one property. Implementing this method configures the picker for multi-selection.

### 49.18.19 didSelectContactProperty(contactProperty as CNContactPropertyMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Called when a property of the contact has been selected by the user.
**Notes:** This event ia called when the user selects a single property of the contact.

### 49.18.20 didSelectContacts(contacts() as CNContactMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Called after contacts have been selected by the user.
**Notes:** This event is called when the user selects more than one contact. Implementing this method configures the picker for multi-selection.

# 49.19 class CNContactPropertyMBS

## 49.19.1 class CNContactPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactProperty is a convenience class and returns a tuple or quadruple to a contact,Äôs property.
**Notes:** A property contains related information for a specific contact. A contact (an instance of CNContact) has properties, such as firstName, phoneNumber, and jobTitle. Each property is represented by an instance of CNContactProperty, which provides a tuple that can contain three or five values, depending on whether the property is a member of an array of labeled values. For example, the phoneNumbers property is a member of an array of labeled values, so the CNContactProperty tuple contains the contact, key, value, identifier, and label. For the givenName property, which is not contained in a labeled array, CNContactProperty returns a tuple that contains the contact, key, and value. The CNContactProperty class is used by the CNContactPicker to return the user's selected property.
**Blog Entries**

- CNContactPickerViewController for Xojo

## 49.19.2 Methods

## 49.19.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

## 49.19.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

## 49.19.5 copy as CNContactPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the social property object.

### 49.19.6 Properties

### 49.19.7 Contact as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** CNContact property of the selected contact.
**Notes:** This property is used for properties that may or may not be in labeled arrays.
(Read only property)

### 49.19.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactProperty object.
(Read and Write property)

### 49.19.9 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The identifier of the labeled value in the array of labeled.
**Notes:** Identifier is used only for properties in labeled arrays. If the property is not an array of labeled values, the value of the identifier is "".
(Read only property)

### 49.19.10 Key as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The key of the contact property.
**Notes:** This property is used for properties that may or may not be in labeled arrays.
(Read only property)

### 49.19.11 Label as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The label of the labeled value of the property array.
**Notes:** Labeled property is used only for properties that are in labeled arrays. If the property is not an

array of labeled values, the value of the label is "".
(Read only property)

### 49.19.12 Value as Variant

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value of the property.
**Notes:** This property is used for properties that may or may not be in labeled arrays.
(Read only property)

## 49.20 class CNContactRelationMBS

### 49.20.1 class CNContactRelationMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactRelation class defines an immutable value object representing a contact related to another.
**Notes:** This is a thread-safe class.

### 49.20.2 Methods

### 49.20.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.20.4 CNLabelContactRelationAssistant as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Assistant.

### 49.20.5 CNLabelContactRelationBrother as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Brother

### 49.20.6 CNLabelContactRelationChild as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Child

### 49.20.7 CNLabelContactRelationDaughter as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Daugther
for macOS 10.13 or newer.

### 49.20.8 CNLabelContactRelationFather as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Father

### 49.20.9 CNLabelContactRelationFriend as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Friend

### 49.20.10 CNLabelContactRelationManager as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Manager

### 49.20.11 CNLabelContactRelationMother as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Mother

### 49.20.12 CNLabelContactRelationParent as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Parent

### 49.20.13 CNLabelContactRelationPartner as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Partner

### 49.20.14 CNLabelContactRelationSister as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Sister

### 49.20.15 CNLabelContactRelationSon as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Son
for macOS 10.13 or newer.

### 49.20.16 CNLabelContactRelationSpouse as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the relation values.
**Notes:** Spouse

### 49.20.17 Constructor(name as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initialize a class instance with the name of the related contact.

### 49.20.18 contactRelationWithName(name as string) as CNContactRelationMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new contact relation with a name.

### 49.20.19 copy as CNContactRelationMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the contact relation object.

### 49.20.20 Properties

### 49.20.21 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactRelation object.
(Read and Write property)

### 49.20.22 Name as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the related contact.
**Notes:** (Read only property)

## 49.21 class CNContactStoreMBS

### 49.21.1 class CNContactStoreMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactStore class is a thread-safe class that can fetch and save contacts, groups, and containers.
**Notes:** The CNContactStore class provides ways to execute fetch and save requests. There are a few recommended ways you can implement these requests in your app to load contacts:

- Fetch only the contact properties that will be used.
- When fetching all contacts and caching the results, first fetch all contacts identifiers, then fetch batches of detailed contacts by identifiers as required.
- To aggregate several contacts fetches, first collect a set of unique identifiers from the fetches. Then fetch batches of detailed contacts by those unique identifiers.
- If you cache the fetched contacts, groups, or containers, you need to refetch these objects (and release the old cached objects) when CNContactStoreDidChangeNotification is posted.

Because CNContactStore fetch methods perform I/O, it,Äôs recommended that you avoid using the main thread to execute fetches.

Your app must be code signed to see contacts.

Warning: Do not use in macOS 10.11 or earlier due to bugs, which have been fixed in macOS 10.12.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- Contacts history for Xojo
- MBS Xojo Plugins, version 20.5pr1
- MBS Xojo Plugins, version 19.0pr8
- MBS Xojo Plugins, version 18.4pr7
- MBS Xojo Plugins, version 18.4pr5
- MBS Xojo Plugins, version 18.1pr1

### 49.21.2 Methods

### 49.21.3 allContacts(byref error as NSErrorMBS) as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches all contacts.
**Notes:** Same as ContactsWithFetchRequest function with key list from CNContactStoreMBS.AllFetchKeys function.

### 49.21.4 AllFetchKeys as String()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns list of all keys used by the plugin to query all properties for contacts.

### 49.21.5 authorizationStatusForEntityType(entityType as Integer = 0) as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the current authorization status to access the contact data.
**Notes:** entityType: Set to CNEntityType, e.g. CNEntityTypeContacts.

Returns the current authorization status to access the contact data.

Based on the authorization status, your application might display or hide its UI elements that access any Contacts API. This method is thread-safe and will not block your application. To see different authorization status, see CNAuthorizationStatus.

### 49.21.6 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.21.7 CNContactStoreDidChangeNotification as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The notification posted when changes occur in another CNContactStore.

### 49.21.8 CNErrorDomain as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The error domain for NSErrorMBS.

### 49.21.9 CNErrorUserInfoAffectedRecordIdentifiersKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A key for the NSError userInfo dictionary.
**Notes:** When available an array of one or more NSString objects for which the error code applies.

### 49.21.10 CNErrorUserInfoAffectedRecordsKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A key for the NSError userInfo dictionary.
**Notes:** When available an array of one or more CNContact, CNGroup or CNContainer objects for which the error code applies.

### 49.21.11 CNErrorUserInfoKeyPathsKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A key for the NSError userInfo dictionary.
**Notes:** An array of key paths associated with a given error. For validation errors this will contain key paths to specific object properties.

### 49.21.12 CNErrorUserInfoValidationErrorsKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A key for the NSError userInfo dictionary.
**Notes:** An array of NSErrors for CNErrorCodeValidationMultipleErrors.

### 49.21.13 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.21.14 ContactsWithFetchRequest(fetchRequest as CNContactFetchRequestMBS, byref error as NSErrorMBS) as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns all contacts matching a contact fetch request.
**Notes:** fetchRequest: The contact fetch request that specifies the search criteria.
error: Error information, if an error occurred.

This method waits until the enumeration is finished. If there are no results, the method returns an empty array.
This can be used to fetch all contacts without keeping all of them at once in memory because this is expensive.

Your app must be code signed to see contacts.

### 49.21.15 containersMatchingPredicate(predicate as NSPredicateMBS, byref error as NSErrorMBS) as CNContainerMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all containers matching the specified predicate.
**Notes:** predicate: The predicate to use to fetch matching containers. Set this property to nil to match all containers.
error: Error information, if an error occurred.

Returns an array of CNContainer objects that match the predicate.

A container holds a collection of contacts, a contact (each contact can be in only one container). CardDAV accounts usually have only one container of contacts. Exchange accounts may have multiple containers, where each container represents an Exchange folder.

This method returns an empty array when no matching container is found. In case of an error this method returns nil. You should use only the predicates defined CNContainer class. Compound predicates are not supported.

### 49.21.16 defaultContainerIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the identifier of the default container.
**Notes:** This identifier can be used to fetch a default container. A default container is where the user wants new contacts to be added implicitly.

### 49.21.17 Destructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 49.21.18 enumerateContactsWithFetchRequest(fetchRequest as CNContactFetchRequestMBS, byref error as NSErrorMBS, tag as Variant = nil) as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value that indicates whether the enumeration of all contacts matching a contact fetch request executed successfully.
**Notes:** fetchRequest: The contact fetch request that specifies the search criteria.
error: Error information, if an error occurred.

Calls enumerateContactsWithFetchRequest event for each contact found.

Returns true if enumeration of all contacts matching a contact fetch request executes successfully; otherwise, false.

This method waits until the enumeration is finished. If there are no results, the event is not called and the method returns true.

This can be used to fetch all contacts without keeping all of them at once in memory because this is expensive.
See also:

- 49.21.37 enumerateContactsWithFetchRequest(contact as CNContactMBS, byref stop as boolean, tag as Variant) 8491

### 49.21.19 enumeratorForChangeHistoryFetchRequest(request as CNChangeHistoryFetchRequestMBS, byref error as NSErrorMBS) as CNFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Enumerate a change history fetch request.
**Notes:** Executes the given fetch request and returns an enumerator for the results.
This may prevent all events from being loaded into memory at once.

An exception may be thrown if an error occurs during enumeration.

request: A description of the events to fetch.
error: If the fetch fails, contains an NSErrorMBS object with more information.

Returns an enumerator of the events matching the result, or nil if there was an error.

### 49.21.20 enumeratorForContactFetchRequest(request as CNContactFetchRequestMBS, byref error as NSErrorMBS) as CNFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Enumerate a contact fetch request.
**Notes:** Executes the given fetch request and returns an enumerator for the results.
This may prevent all records from being loaded into memory at once.

An exception may be thrown if an error occurs during enumeration.

request: A description of the records to fetch.
error: If the fetch fails, contains an NSErrorMBS object with more information.

An enumerator of the records matching the result, or nil if there was an error.

### 49.21.21 executeSaveRequest(saveRequest as CNSaveRequestMBS, byref Error as NSErrorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Executes a save request and returns success or failure.
**Notes:** saveRequest: The save request to execute.

error: Error information, if an error occurred.

Returns true if the save request executes successfully; otherwise, false.

It is recommended that you do not access objects in the save request from other threads when it is in the process of being executed, because it may modify the contacts in the process. A save request only applies the changes to the objects. If there are overlapping changes with multiple or concurrent CNSaveRequest then the last saved change wins.

Warning: Do not use in macOS 10.11 or earlier due to bugs, which have been fixed in macOS 10.12.

### 49.21.22 groupsByName(name as String, byref error as NSErrorMBS) as CNGroupMBS()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Looks for groups with matching names.
**Notes:** Returns empty array if nothing found.
Comparison is localized case insensitive.

### 49.21.23 groupsForContact(contact as CNContactMBS, byref error as NSErrorMBS) as CNGroupMBS()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches all groups for a given contact.

### 49.21.24 groupsMatchingPredicate(predicate as NSPredicateMBS, byref error as NSErrorMBS) as CNGroupMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all groups matching the specified predicate.
**Notes:** predicate: The predicate to use to fetch the matching groups. Set predicate to nil to match all groups.
error: Error information, if an error occurred.

Returns an array of CNGroup objects that match the predicate.

This method returns an empty array when no matching groups are found. If an error occurs, this method returns nil. You should use only the predicates defined in CNGroup class predicates. Compound predicates are not supported. Contacts may be members of one or more groups, depending upon the account they come from.

### 49.21.25 requestAccessForEntityType(entityType as Integer = 0, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests access to the user's contacts.
**Notes:** entityType: Set to CNEntityTypeContacts.

Users are able to grant or deny access to contact data on a per-application basis. Request access to contact data by calling requestAccessForEntityType method. This will not block your application while the user is being asked for permission. The user will only be prompted the first time access is requested; any subsequent CNContactStore calls will use the existing permissions. The requestAccessForEntityType event is later called. This method is optional when CNContactStore is used in the background thread. If this method is not used, CNContactStore may block your application while the user is asked for access permission.

Your app must be code signed to see contacts.
See also:

- 49.21.38 requestAccessForEntityType(granted as boolean, error as NSErrorMBS, tag as Variant) 8491

### 49.21.26 unifiedContactsMatchingPredicate(predicate as NSPredicateMBS, byref error as NSErrorMBS) as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all unified contacts matching the specified predicate.
**Notes:** predicate: The predicate to match against.
error: Error information, if an error occurred.

Returns an array of CNContact objects matching the predicate.

If no matches are found, this method returns an empty array (or nil in case of error). Use only the predicates from the CNContact class predicates. Compound predicates are not supported by this method. Due to unification, the returned contacts may have different identifiers than you specify. To fetch all contacts, use enumerateContactsWithFetchRequest.

Same as other unifiedContactsMatchingPredicate function with key list from CNContactStoreMBS.AllFetchKeys

function.
See also:

- 49.21.27 unifiedContactsMatchingPredicate(predicate as NSPredicateMBS, keysToFetch() as CNKeyDescriptorMBS, byref error as NSErrorMBS) as CNContactMBS() 8488

### 49.21.27 unifiedContactsMatchingPredicate(predicate as NSPredicateMBS, keysToFetch() as CNKeyDescriptorMBS, byref error as NSErrorMBS) as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches all unified contacts matching the specified predicate.
**Notes:** predicate: The predicate to match against.
keys: The properties to fetch in the returned CNContact objects. You should fetch only the properties that you plan to use. Note that you can combine contact keys and contact key descriptors.
error: Error information, if an error occurred.

Returns an array of CNContact objects matching the predicate.

If no matches are found, this method returns an empty array (or nil in case of error). Use only the predicates from the CNContact class predicates. Compound predicates are not supported by this method. Due to unification, the returned contacts may have different identifiers than you specify. To fetch all contacts, use enumerateContactsWithFetchRequest.
See also:

- 49.21.26 unifiedContactsMatchingPredicate(predicate as NSPredicateMBS, byref error as NSErrorMBS) as CNContactMBS() 8487

### 49.21.28 unifiedContactWithIdentifier(identifier as string, byref error as NSErrorMBS) as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches a unified contact for the specified contact identifier.
**Notes:** identifier: The identifier of the contact to fetch.
error: Error information, if an error occurred.

Returns an unified contact matching or linked to the identifier.

Due to unification, the returned contact may have a different identifier, than you specify. To fetch a batch of contacts by identifiers use predicateForContactsWithIdentifiers with unifiedContactsMatchingPredicate. It is recommended to fetch only the properties that will be used. You can combine contact keys and contact

key descriptors together.

Same as other unifiedContactWithIdentifier function with key list from CNContactStoreMBS.AllFetchKeys function.
See also:

- 49.21.29 unifiedContactWithIdentifier(identifier as string, keys() as CNKeyDescriptorMBS, byref error as NSErrorMBS) as CNContactMBS 8489

### 49.21.29 unifiedContactWithIdentifier(identifier as string, keys() as CNKeyDescriptorMBS, byref error as NSErrorMBS) as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fetches a unified contact for the specified contact identifier.
**Notes:** identifier: The identifier of the contact to fetch.
keys: The properties to fetch in the returned CNContact object.
error: Error information, if an error occurred.

Returns an unified contact matching or linked to the identifier.

Due to unification, the returned contact may have a different identifier, than you specify. To fetch a batch of contacts by identifiers use predicateForContactsWithIdentifiers with unifiedContactsMatchingPredicate. It is recommended to fetch only the properties that will be used. You can combine contact keys and contact key descriptors together.
See also:

- 49.21.28 unifiedContactWithIdentifier(identifier as string, byref error as NSErrorMBS) as CNContactMBS 8488

### 49.21.30 unifiedMeContact(byref error as NSErrorMBS) as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** Queries an unified contact for the user.
**Example:**

```
dim ContactStore as CNContactStoreMBS // your store
Dim error As NSErrorMBS
Dim contact As CNContactMBS = ContactStore.unifiedMeContact(Error)

If contact <>nil then
MsgBox contact.familyName
Else
MsgBox "No contact?"
```

End If

**Notes:** Same as unifiedMeContactWithKeysToFetch function with key list from CNContactStoreMBS.AllFetchKeys function.

### 49.21.31 unifiedMeContactWithKeysToFetch(keys() as CNKeyDescriptorMBS, byref error as NSErrorMBS) as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries an unified contact for the user.

### 49.21.32 Properties

### 49.21.33 currentHistoryToken as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieve the current history token.
**Notes:** If you are fetching contacts or change history events, you should use the token on the CNFetchResultMBS class instead.
(Read only property)

### 49.21.34 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactStore object.
(Read and Write property)

### 49.21.35 Events

### 49.21.36 DidChange

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** The event posted when changes occur in another CNContactStore.

### 49.21.37 enumerateContactsWithFetchRequest(contact as CNContactMBS, byref stop as boolean, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** The event called by enumerateContactsWithFetchRequest for each new contact found.
See also:

- 49.21.18 enumerateContactsWithFetchRequest(fetchRequest as CNContactFetchRequestMBS, byref error as NSErrorMBS, tag as Variant = nil) as Boolean 8484

### 49.21.38 requestAccessForEntityType(granted as boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: .

**Function:** The request for access completed.
**Notes:** Set granted to true if the user allows access and error is nil.
See also:

- 49.21.25 requestAccessForEntityType(entityType as Integer = 0, tag as Variant = nil) 8487

### 49.21.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CNAuthorizationStatusAuthorized | 3 | One of the authorization status values the user can grant for an app to the specified entity type.<br>The application is authorized to access contact data. |
| CNAuthorizationStatusDenied | 2 | One of the authorization status values the user can grant for an app to the specified entity type.<br>The user explicitly denied access to contact data for the application. |
| CNAuthorizationStatusNotDetermined | 0 | One of the authorization status values the user can grant for an app to the specified entity type.<br>The user has not yet made a choice regarding whether the applicatio access contact data. |
| CNAuthorizationStatusRestricted | 1 | One of the authorization status values the user can grant for an app to the specified entity type.<br>The application is not authorized to access contact data. The user c change this application,Äôs status, possibly due to active restrictions s parental controls being in place. |

Contact Types

| Constant | Value | Description |
|---|---|---|
| CNEntityTypeContacts | 0 | Contacts |

Error Codes

| Constant | Value | Description |
|---|---|---|
| CNErrorCodeAuthorizationDenied | 100 | Authentication denied error. |
| CNErrorCodeCommunicationError | 1 | Communication error. |
| CNErrorCodeContainmentCycle | 202 | Code containment cycle error. |
| CNErrorCodeContainmentScope | 203 | Code containment scope error. |
| CNErrorCodeDataAccessError | 2 | Data access error. |
| CNErrorCodeInsertedRecordAlreadyExists | 201 | Record already exists. |
| CNErrorCodeParentRecordDoesNotExist | 204 | The contact does not exist error. |
| CNErrorCodePolicyViolation | 500 | Policy validation error. |
| CNErrorCodePredicateInvalid | 400 | Invalid predicate error. |
| CNErrorCodeRecordDoesNotExist | 200 | Record not found. |
| CNErrorCodeRecordIdentifierInvalid | 205 | Record identifier not valid. |
| CNErrorCodeValidationConfigurationError | 302 | Configuration validation error. |
| CNErrorCodeValidationMultipleErrors | 300 | Multiple validation error. |
| CNErrorCodeValidationTypeMismatch | 301 | Type mismatch validation error. |

## 49.22 class CNContactsUserDefaultsMBS

### 49.22.1 class CNContactsUserDefaultsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactsUserDefaults class defines properties used to access the user defaults for a contact.

### 49.22.2 Methods

### 49.22.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.22.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.22.5 sharedDefaults as CNContactsUserDefaultsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The singleton instance of the CNContactsUserDefaults class.

### 49.22.6 Properties

### 49.22.7 countryCode as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An ISO country code.
**Notes:** ISO is the default country code for phone numbers. This is determined by the device,Äôs SIM card or the operating system,Äôs configured language.

(Read only property)

### 49.22.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContactsUserDefaults object.
(Read and Write property)

### 49.22.9 sortOrder as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Default sorting order by name.
**Notes:** Sort order is determined by the operating system,Äôs configured language or overridden by the user.
(Read only property)

## 49.23 class CNContactVCardSerializationMBS

### 49.23.1 class CNContactVCardSerializationMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactVCardSerialization supports vCard representation for the given set of contacts.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 49.23.2 Methods

### 49.23.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.23.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.23.5 contactsWithData(Data as MemoryBlock, byref error as NSErrorMBS) as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the contacts from the vCard data.

### 49.23.6 dataWithContacts(Contacts() as CNContactMBS, byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the vCard representation of the specified contacts.

### 49.23.7 descriptorForRequiredKeys as CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Use to fetch all contact keys required to create vCard data from a contact.
**Notes:** A key descriptor to be used in the keysToFetch array when fetching the contacts.

## 49.24 class CNContactViewControllerMBS

### 49.24.1 class CNContactViewControllerMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContactViewController class implements the view to display a contact.
**Notes:** CNContactViewController can display a new contact, unknown contact, or existing contact.
Subclass of the NSViewControllerMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr3

### 49.24.2 Methods

### 49.24.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.24.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.24.5 descriptorForRequiredKeys as CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Descriptor for all keys that must be fetched on a contact before setting it on the view controller.
**Notes:** Pass this descriptor to the keysToFetch of the CNContactFetchRequest if you want to display the contact in a CNContactViewController.

### 49.24.6 Properties

### 49.24.7 Contact as CNContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A contact to display.
**Notes:** When contact is nil, displays an empty selection state.
(Read and Write property)

## 49.25 class CNContainerMBS

### 49.25.1 class CNContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNContainer class is a thread-safe class that defines an immutable object that represents a container.
**Notes:** A container has a collection of contacts. A contact can be in only one container. CardDAV accounts usually have only one container whereas Exchange accounts may have multiple containers, where each container represents an Exchange folder
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 49.25.2 Methods

### 49.25.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.25.4 CNContainerIdentifierKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined keys representing container properties that can be used with key value coding on CNContainer objects.
**Notes:** Identifier key.
This key represents the container identifier property for KVC/KVO usage. This property is always fetched.

### 49.25.5 CNContainerNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined keys representing container properties that can be used with key value coding on CNContainer objects.
**Notes:** Name key.
This key represents the container identifier property for KVC/KVO usage. This property is always fetched.

### 49.25.6 CNContainerTypeKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined keys representing container properties that can be used with key value coding on CNContainer objects.
**Notes:** Type key.
This key represents the container identifier property for KVC/KVO usage. This property is always fetched.

### 49.25.7 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private container.

### 49.25.8 copy as CNContainerMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the container object.

### 49.25.9 predicateForContainerOfContactWithIdentifier(contactIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the container of the specified contact.
**Notes:** If the identifier is for a unified contact then this method returns an empty array. To fetch the containers of a unified contact, first fetch the linked contacts and then fetch the container of each linked contact.

### 49.25.10 predicateForContainerOfGroupWithIdentifier(groupIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the container of the specified group.

### 49.25.11 predicateForContainersWithIdentifiers(Identifiers() as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find the containers with the specified identifiers.

### 49.25.12 Properties

### 49.25.13 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNContainer object.
(Read and Write property)

### 49.25.14 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unique identifier for a contacts container on the device.
**Notes:** It is recommended that you use the identifier when re-fetching the container. The identifier can be persisted between app launches.
(Read only property)

### 49.25.15 Name as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the container.
**Notes:** (Read only property)

### 49.25.16 Type as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of the container.
**Notes:** can be CNContainerTypeUnassigned, CNContainerTypeLocal, CNContainerTypeExchange or CNContainerTypeCardDAV.

(Read only property)

### 49.25.17 Constants

Container Types

| Constant | Value | Description |
|---|---|---|
| CNContainerTypeCardDAV | 3 | A container for contacts stored in an CardDAV server, such as iCloud. |
| CNContainerTypeExchange | 2 | A container for contacts stored in an Exchange folder from an Exchange server. |
| CNContainerTypeLocal | 1 | A container for contacts only stored locally on the device. There is only one local container for a device. |
| CNContainerTypeUnassigned | 0 | |

## 49.26 class CNFetchResultMBS

### 49.26.1 class CNFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The class for a fetch result with a time stamp.
**Notes:** Allows you to query contacts and changes with checking again later with new time.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- Contacts history for Xojo

### 49.26.2 Methods

### 49.26.3 ChangeHistoryEvents as CNChangeHistoryEventMBS()

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The history events.

### 49.26.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.26.5 Contacts as CNContactMBS()

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The contacts found.

### 49.26.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 49.26.7 Properties

### 49.26.8 currentHistoryToken as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The current history token.
**Notes:** Retrieve the current history token. If you are fetching contacts or change history events, you should use the token on the CNFetchResultMBS class instead.
(Read only property)

## 49.27 class CNGroupMBS

### 49.27.1 class CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNGroup is a thread-safe class that defines an immutable object that represents a group.
**Notes:** Contacts may be members of one or more groups, depending upon their accounts.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr5

### 49.27.2 Methods

### 49.27.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.27.4 CNGroupIdentifierKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined keys representing group properties that can be used with key value coding on CNGroup objects.
**Notes:** Group identifier.
This key takes a string value.

### 49.27.5 CNGroupNameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined keys representing group properties that can be used with key value coding on CNGroup objects.
**Notes:** Group name.
This key takes a string value.

### 49.27.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.27.7 copy as CNGroupMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the group object.

### 49.27.8 mutableCopy as CNMutableGroupMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a mutable copy of this group.

### 49.27.9 predicateForGroupsInContainerWithIdentifier(groupIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find groups in the specified container.
**Notes:** containerIdentifier: The container identifier to be matched.

Returns a predicate that can be used to fetch groups from CNContactStore.

### 49.27.10 predicateForGroupsWithIdentifiers(Identifiers() as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a predicate to find groups with the specified identifiers.
**Notes:** identifiers: The group identifiers to be matched.

Returns a predicate that can be used to fetch groups from CNContactStore.

### 49.27.11 predicateForSubgroupsInGroupWithIdentifier(contactIdentifier as String) as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a predicate to find all subgroups for a group.

### 49.27.12 valueForKey(key as String) as Variant

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries value for a given key.

### 49.27.13 Properties

### 49.27.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNGroup object.
(Read and Write property)

### 49.27.15 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unique identifier for a group on the device.
**Notes:** It is recommended that you use the identifier when re-fetching the group. The identifier can be persisted between app launches.
(Read only property)

### 49.27.16 Name as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the group.
**Notes:** (Read only property)

## 49.28 class CNInstantMessageAddressMBS

### 49.28.1 class CNInstantMessageAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNInstantMessageAddress class is a thread-safe class that defines an immutable value object representing an instant message address.
**Notes:** Use the methods and properties of this class to identify instant messaging address. Some instant message services, such as Facebook and Skype are predefined in this class. You can also specify your own instant message service using Constructor.

### 49.28.2 Methods

### 49.28.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.28.4 CNInstantMessageAddressServiceKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Instant message address service key.
**Notes:** This key takes a string value.

### 49.28.5 CNInstantMessageAddressUsernameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Instant message address user name key.
**Notes:** This key takes a string value.

### 49.28.6 CNInstantMessageServiceAIM as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for AIM.

This key takes a string value.

### 49.28.7 CNInstantMessageServiceFacebook as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Facebook.
This key takes a string value.

### 49.28.8 CNInstantMessageServiceGaduGadu as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Gadu Gadu.
This key takes a string value.

### 49.28.9 CNInstantMessageServiceGoogleTalk as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Google Talk.
This key takes a string value.

### 49.28.10 CNInstantMessageServiceICQ as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for ICQ.
This key takes a string value.

### 49.28.11 CNInstantMessageServiceJabber as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Jabber.

This key takes a string value.

### 49.28.12 CNInstantMessageServiceMSN as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for MSN.
This key takes a string value.

### 49.28.13 CNInstantMessageServiceQQ as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for QQ.
This key takes a string value.

### 49.28.14 CNInstantMessageServiceSkype as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Skype.
This key takes a string value.

### 49.28.15 CNInstantMessageServiceYahoo as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the service types.
**Notes:** Instant message service for Yahoo.
This key takes a string value.

### 49.28.16 Constructor(username as String, Service as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a CNInstantMessageAddress object initialized with the specified user name and service.
**Notes:** username: The user name with which to initialize the CNInstantMessageAddress object.

service: The service with which to Initialize the CNInstantMessageAddress object.

Returns the initialized CNInstantMessageAddress object with the specified user name and service.
User name and service are required to initialize CNInstantMessageAddress object.

### 49.28.17 copy as CNInstantMessageAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the instant message address object.

### 49.28.18 localizedStringForKey(key as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a string containing the localized property name.

### 49.28.19 localizedStringForService(key as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a string containing the localized name of the specified service.

### 49.28.20 Properties

### 49.28.21 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNInstantMessageAddress object.
(Read and Write property)

### 49.28.22 service as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Instant message address service.
**Notes:** (Read only property)

### 49.28.23 username as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The user name for instant message service address.
**Notes:** (Read only property)

# 49.29 class CNKeyDescriptorMBS

## 49.29.1 class CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for key descriptors.
**Blog Entries**

- Contacts history for Xojo

## 49.29.2 Methods

## 49.29.3 Constructor(Key as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a key descriptor from a string value.

## 49.29.4 copy as CNKeyDescriptorMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the key descriptor object.

## 49.29.5 Operator_Convert as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts key to string value.
**Notes:** Same as using StringValue property, but automatic.
See also:

- 49.29.6 Operator_Convert(Key as String) 8513

## 49.29.6 Operator_Convert(Key as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a key descriptor from a string value.
**Example:**

```
dim k as CNKeyDescriptorMBS = CNContactMBS.CNContactJobTitleKey
```

**Notes:** Same as constructor, but automatic.
See also:

- 49.29.5 Operator_Convert as String 8513

### 49.29.7 Properties

### 49.29.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNKeyDescriptor object.
(Read and Write property)

### 49.29.9 StringValue as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries string value of the key descriptor.
**Notes:** (Read only property)

# 49.30 class CNLabeledValueMBS

## 49.30.1 class CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for labeled values.
**Notes:** The CNLabeledValue class is a thread-safe class that defines an immutable value object that combines a contact property value with a label. For example, a contact phone number could have a label of Home, Work, iPhone, etc.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr4

## 49.30.2 Methods

## 49.30.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

## 49.30.4 CNLabelDateAnniversary as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** This constant is a predefined label that can be used in a CNLabeledValue object having an NSDateComponents value.

## 49.30.5 CNLabelEmailiCloud as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** This constant is a predefined label that can be used in a CNLabeledValue object having an email address string value.
**Notes:** Email.

This label takes a string value.

### 49.30.6 CNLabelHome as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined labels that can be used in a CNLabeledValue object having any value.
**Notes:** Home label.
This label takes a string value.

### 49.30.7 CNLabelOther as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined labels that can be used in a CNLabeledValue object having any value.
**Notes:** Other label.
This label takes a string value.

### 49.30.8 CNLabelURLAddressHomePage as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** This constant is a predefined label that can be used in a CNLabeledValue object having a URL address string value.
**Notes:** Identifier for the URL property.
This label takes a string value.

### 49.30.9 CNLabelWork as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the predefined labels that can be used in a CNLabeledValue object having any value.
**Notes:** Work label.
This label takes a string value.

### 49.30.10 Constructor(label as string, value as Variant)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new labeled value identifier initialized with the specified label and value.
**Notes:** label: A string value for the label of the labeled ,Ä¶value object, or nil if the value doesn,Äôt have a label.
value: A value for the labeled value object. For valid values, see CNContact properties that are arrays of

labeled value objects.

Returns a new labeled value object initialized with the specified identifier.

### 49.30.11 copy as CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the labeled value object.

### 49.30.12 labeledValueBySettingLabel(label as string) as CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a labeled value object with an existing value and identifier.
**Notes:** label: The label of the copied labeled value object, or nil if the contact property value doesn,Äôt have a label.

Returns a labeled value object with an existing value and identifier.
See also:

- 49.30.13 labeledValueBySettingLabel(label as string, value as Variant) as CNLabeledValueMBS 8517

### 49.30.13 labeledValueBySettingLabel(label as string, value as Variant) as CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a labeled value object with the specified label and value with the existing identifier.
**Notes:** label: The label of the copied labeled value object, or "" if the contact property value doesn,Äôt have a label.
value: The copied labeled value object. For valid values, see CNContact properties that are arrays of labeled value objects.

Returns a labeled value object with the existing identifier.
See also:

- 49.30.12 labeledValueBySettingLabel(label as string) as CNLabeledValueMBS 8517

### 49.30.14 labeledValueBySettingValue(value as Variant) as CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new value for an existing label and identifier.
**Notes:** value: A new value for the copied labeled value object. For valid values, see CNContact properties that are arrays of labeled value objects.

Returns the CNLabeledValue object with an existing label and identifier.

### 49.30.15 labeledValueWithLabel(label as string, value as Variant) as CNLabeledValueMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new labeled value identifier object with the specified label and value.
**Notes:** label: A string value for the label of the labeled value object, or nil if the value doesn,Äôt have a label.
value: A value for the labeled value object. For valid values, see CNContact properties that are arrays of labeled value objects.

Returns a new CNLabeledValue object with a new identifier.

### 49.30.16 localizedStringForLabel(label as string) as string

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a localized string for the specified label.
**Notes:** label: The label to be localized.

Returns a localized string for the label.

All predefined label constants are localized and this method returns their localized strings. A custom label will be returned as is, so this method can be used to convert all labels for display.

### 49.30.17 Properties

### 49.30.18 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNLabeledValue object.
(Read and Write property)

### 49.30.19 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A unique identifier for the labeled value object.
**Notes:** It is recommended that you use the identifier when searching for a previously known labeled value object in a re-fetched contact. The identifier can be persisted between the app launches.
(Read only property)

### 49.30.20 Label as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The label for a contact property value.
**Notes:** A contact property can have a label, such as Home, Work, iPhone, etc. For some predefined label constants, seeCNPhoneNumber, and CNContactRelation. Custom labels can also be used. Labels are not used for CNSocialProfile and CNInstantMessageAddress properties.
(Read only property)

### 49.30.21 Value as Variant

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A contact property value.
**Notes:** A contact property value, such as CNPhoneNumberMBS for a phone number, String for an email address, and so on. For valid values, see CNContact properties that are arrays of labeled value objects.
(Read only property)

## 49.31 class CNMutableContactMBS

### 49.31.1 class CNMutableContactMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNMutableContact class represents a mutable value object for the contact properties, such as the first name and the phone number of a contact.
**Notes:** When CNMutableContact object is a mutable copy of a CNContact object, if you access a CNMutableContact property value that was not fetched for the CNContact object, it throws an CNContactPropertyNotFetchedExceptionName exception. When needed, you can remove contact properties by setting string and array properties to empty, and all other properties to nil.
Available in OS X v10.11 and later.
Subclass of the CNContactMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr1

### 49.31.2 Methods

### 49.31.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.31.4 setContactRelations(contactRelations() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled contact relations for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNContactRelationMBS value.

### 49.31.5 setDates(dates() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array containing labeled Gregorian dates.
**Notes:** This property is an array of CNLabeledValue objects, each of which has an String label and NSDateComponentsMBS value. You can use this property to store Gregorian dates such as anniversaries. Day and month are required and year is optional. Calendar is nil or Gregorian. All other date components are invalid.

### 49.31.6 setEmailAddresses(emailAddresses() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled email addresses for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a String value.

### 49.31.7 setInstantMessageAddresses(instantMessageAddresses() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled IM addresses for the contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNInstantMessageAddressMBS value.

### 49.31.8 setPhoneNumbers(phoneNumbers() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled phone numbers for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNPhoneNumberMBS value.

### 49.31.9 setPostalAddresses(postalAddresses() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled postal addresses for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNPostalAddressMBS value.

### 49.31.10 setSocialProfiles(socialProfiles() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled social profiles for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a CNSocialProfileMBS value.

### 49.31.11 setURLAddresses(urlAddresses() as CNLabeledValueMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the array of labeled URL addresses for a contact.
**Notes:** This property is an array of CNLabeledValue objects, each of which has a label and a string value that contains the URL.

### 49.31.12 Properties

### 49.31.13 birthday as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A date component for the Gregorian birthday of the contact.
**Notes:** A Gregorian birthday can be displayed using this property, whose values are the relevant properties of an NSDateComponents object. Day and month are required for this property, and year is optional. Calendar can be nil or Gregorian. All other date components are invalid.
(Read and Write property)

### 49.31.14 contactType as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An enum identifying the contact type.
**Notes:** Can be CNContactMBS.CNContactTypeOrganization or CNContactMBS.CNContactTypePerson.
(Read and Write property)

### 49.31.15 departmentName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the department associated with the contact.
**Notes:** (Read and Write property)

### 49.31.16 familyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The family name of the contact.
**Example:**

```
dim m as new CNMutableContactMBS
m.familyName = "Miller"
msgbox "name: "+m.familyName
```

**Notes:** The family name is often known as the last name of the contact.
(Read and Write property)

### 49.31.17 givenName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The given name of the contact.
**Notes:** The given name is often known as the first name of the contact.
(Read and Write property)

### 49.31.18 imageData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The profile picture of a contact.
**Notes:** It is recommended that you fetch this property only when you need to access its value, such as when you need to display the contact,Äôs profile picture.
(Read and Write property)

### 49.31.19 jobTitle as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The contact,Äôs job title.
**Notes:** (Read and Write property)

### 49.31.20 middleName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The middle name of the contact.
**Notes:** (Read and Write property)

### 49.31.21 namePrefix as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name prefix of the contact.
**Notes:** (Read and Write property)

### 49.31.22 nameSuffix as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name suffix of the contact.
**Notes:** (Read and Write property)

### 49.31.23 nickname as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The nickname of the contact.
**Notes:** (Read and Write property)

### 49.31.24 nonGregorianBirthday as NSDateComponentsMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A date component for the non-Gregorian birthday of the contact.
**Notes:** A non-Gregorian birthday such as Lunisolar birthdays can be displayed using this property, whose values are the relevant properties of an NSDateComponents object. Day and month are required; year and leapMonth are optional. The calendar property is also required and must be non-Gregorian. Some supported calendars are Buddhist, Chinese, and Islamic. All other date components are invalid.
(Read and Write property)

### 49.31.25 note as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string containing notes for the contact.
**Notes:** (Read and Write property)

### 49.31.26 organizationName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the organization associated with the contact.
**Notes:** (Read and Write property)

### 49.31.27 phoneticFamilyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic family name of the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs family (or last) name.
(Read and Write property)

### 49.31.28 phoneticGivenName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic given name of the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs given (or first) name.
(Read and Write property)

### 49.31.29 phoneticMiddleName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic middle name of the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs middle name.
(Read and Write property)

### 49.31.30 phoneticOrganizationName as String

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phonetic name of the organization associated with the contact.
**Notes:** This property contains a string that specifies the pronunciation of the contact,Äôs organization name.
Requires macOS 10.12 or newer.

(Read and Write property)

### 49.31.31 previousFamilyName as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The previous family name of the contact.
**Notes:** The previous family name is often known as the maiden name of the contact.
(Read and Write property)

### 49.31.32 valueForKey(key as String) as Variant

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries or sets value for a given key.
**Notes:** (Read and Write computed property)

## 49.32 class CNMutableGroupMBS

### 49.32.1 class CNMutableGroupMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNMutableGroup class defines a mutable value object representing a group for a contact.
**Notes:** Contacts may be members of one or more groups, depending upon the accounts they come from.
Subclass of the CNGroupMBS class.

### 49.32.2 Methods

### 49.32.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.32.4 Properties

### 49.32.5 Name as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Name of the group.
**Example:**

```
dim m as new CNMutableGroupMBS
m.Name = "Hello"
```

**Notes:** (Read and Write property)

### 49.32.6 valueForKey(key as String) as Variant

MBS Mac64bit Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries or sets value for a given key.
**Notes:** (Read and Write computed property)

## 49.33 class CNMutablePostalAddressMBS

### 49.33.1 class CNMutablePostalAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNMutablePostalAddress class defines a mutable value object representing the postal address for a contact.
**Notes:** To remove properties when saving a mutable postal address, set string properties to empty values.
Subclass of the CNPostalAddressMBS class.
**Xojo Developer Magazine**

- 18.5, page 83: Maps (Part 6), A deep dive into Annotations by Markus Winter

### 49.33.2 Methods

### 49.33.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.33.4 Properties

### 49.33.5 City as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The city name.
**Example:**

```
dim m as new CNMutablePostalAddressMBS
m.City = "New York"
MsgBox m.city
```

**Notes:** (Read and Write property)

### 49.33.6 Country as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The country name.
**Notes:** (Read and Write property)

### 49.33.7 ISOCountryCode as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The ISO country code.
**Notes:** (Read and Write property)

### 49.33.8 PostalCode as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The postal code.
**Notes:** (Read and Write property)

### 49.33.9 State as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The state name.
**Notes:** (Read and Write property)

### 49.33.10 Street as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The street name.
**Notes:** A multiline address is delimited with carriage returns (that is, ,Äú\n,Äù).
(Read and Write property)

## 49.34 class CNPhoneNumberMBS

### 49.34.1 class CNPhoneNumberMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNPhoneNumber class defines an immutable value object representing a phone number for a contact.
**Notes:** It is a thread-safe class.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr1

### 49.34.2 Methods

### 49.34.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.34.4 CNLabelPhoneNumberAppleWatch as String

MBS Mac64bit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Phone number for Apple Watch.
**Notes:** This label takes a string value.
Available in macOS 11.1 or newer.

### 49.34.5 CNLabelPhoneNumberHomeFax as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Home fax number.
**Notes:** This label takes a string value.

### 49.34.6 CNLabelPhoneNumberiPhone as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** iPhone number.
**Notes:** This label takes a string value.

### 49.34.7 CNLabelPhoneNumberMain as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Main phone number.
**Notes:** This label takes a string value.

### 49.34.8 CNLabelPhoneNumberMobile as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Mobile phone number.
**Notes:** This label takes a string value.

### 49.34.9 CNLabelPhoneNumberOtherFax as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Other fax number.
**Notes:** This label takes a string value.

### 49.34.10 CNLabelPhoneNumberPager as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pager phone number.
**Notes:** This label takes a string value.

### 49.34.11 CNLabelPhoneNumberWorkFax as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Work fax number.
**Notes:** This label takes a string value.

### 49.34.12 Constructor(value as string)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new phone number object initialized with the specified phone number string.
**Notes:** You should initialize this with a phone number string. This method fails when the value of string is empty.

### 49.34.13 copy as CNPhoneNumberMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the phone number object.

### 49.34.14 phoneNumberWithStringValue(p as string) as CNPhoneNumberMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new phone number object initialized with the specified phone number string.
**Notes:** This is a convenience class method that provides the same functionality as Constructor.
This method fails when the value of stringValue is "".

### 49.34.15 Properties

### 49.34.16 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNPhoneNumber object.
(Read and Write property)

### 49.34.17 stringValue as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The string value of the phone number.
**Notes:** (Read only property)

# 49.35 class CNPostalAddressFormatterMBS

## 49.35.1 class CNPostalAddressFormatterMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNPostalAddressFormatter class formats the postal address in a contact.
**Notes:** This class handles international formatting of postal addresses. It is recommended that you create an instance of this class when formatting many postal addresses, and use the instance methods; otherwise use the class methods.

## 49.35.2 Methods

## 49.35.3 attributedStringFromPostalAddress(postalAddress as CNPostalAddressMBS, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a formatted postal address as an attributed string.
**Notes:** postalAddress: The postal address to format.
DefaultAttributes: The default attributes to use. To learn more, see NSFormatter.

Returns the formatted postal address as an attributed string.

This method behaves similarly to stringFromPostalAddress, except that it returns an attributed string. It includes the attribute key CNPostalAddressPropertyAttribute, whose attribute values are postal address property keys, such as CNPostalAddressStreetKey. This identifies the postal address components in the formatted postal address. Also includes the attribute key CNPostalAddressLocalizedPropertyNameAttribute whose attribute values are the localized strings for the postal address property keys.
See also:

- 49.35.4 attributedStringFromPostalAddress(postalAddress as CNPostalAddressMBS, style as Integer, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS 8533

## 49.35.4 attributedStringFromPostalAddress(postalAddress as CNPostalAddressMBS, style as Integer, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a formatted postal address as an attributed string.
**Notes:** postalAddress: The postal address to format.

DefaultAttributes: The default attributes to use. To learn more, see NSFormatter.

Returns the formatted postal address as an attributed string.

This method behaves similarly to stringFromPostalAddress, except that it returns an attributed string. It includes the attribute key CNPostalAddressPropertyAttribute, whose attribute values are postal address property keys, such as CNPostalAddressStreetKey. This identifies the postal address components in the formatted postal address. Also includes the attribute key CNPostalAddressLocalizedPropertyNameAttribute whose attribute values are the localized strings for the postal address property keys.
See also:

- 49.35.3 attributedStringFromPostalAddress(postalAddress as CNPostalAddressMBS, DefaultAttributes as Dictionary = nil) as NSAttributedStringMBS 8533

### 49.35.5 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.35.6 CNPostalAddressLocalizedPropertyNameAttribute as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** This constant is a key in the attributed string whose value is a localized version of the CNPostalAddress property key.
**Notes:** This label takes a string value.

### 49.35.7 CNPostalAddressPropertyAttribute as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** This constant is a key in the attributed string whose value is a CNPostalAddress property key.
**Notes:** This key takes a string value.

### 49.35.8 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.35.9 stringFromPostalAddress(postalAddress as CNPostalAddressMBS) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a formatted postal address.
See also:

- 49.35.10 stringFromPostalAddress(postalAddress as CNPostalAddressMBS, style as Integer) as String 8535

### 49.35.10 stringFromPostalAddress(postalAddress as CNPostalAddressMBS, style as Integer) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a formatted postal address.
**Notes:** Style can currently only be CNPostalAddressFormatterStyleMailingAddress.
See also:

- 49.35.9 stringFromPostalAddress(postalAddress as CNPostalAddressMBS) as String 8535

### 49.35.11 Properties

### 49.35.12 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNPostalAddressFormatter object.
(Read and Write property)

### 49.35.13 Style as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The style to use.
**Notes:** Style can currently only be CNPostalAddressFormatterStyleMailingAddress.
(Read and Write property)

### 49.35.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CNPostalAddressFormatterStyleMailingAddress | 0 | One of the style constants. |

## 49.36 class CNPostalAddressMBS

### 49.36.1 class CNPostalAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNPostalAddress class defines an immutable object that represents the postal address for a contact.
**Notes:** This is a thread-safe class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 18.5, page 83: Maps (Part 6), A deep dive into Annotations by Markus Winter

### 49.36.2 Methods

### 49.36.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.36.4 CNPostalAddressCityKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** City.
This key takes a string value.

### 49.36.5 CNPostalAddressCountryKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** Country.
This key takes a string value.

### 49.36.6 CNPostalAddressISOCountryCodeKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** ISO country code.
This key takes a string value.

### 49.36.7 CNPostalAddressPostalCodeKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** Postal code.
This key takes a string value.

### 49.36.8 CNPostalAddressStateKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** State.
This key takes a string value.

### 49.36.9 CNPostalAddressStreetKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties to fetch.
**Notes:** Street.
This key takes a string value.

### 49.36.10 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 49.36.11 copy as CNPostalAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the postal address object.

### 49.36.12 localizedStringForKey(key as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the localized name for the property associated with the specified key.
**Example:**

MsgBox CNPostalAddressMBS.localizedStringForKey(CNPostalAddressMBS.CNPostalAddressStreetKey)

### 49.36.13 mutableCopy as CNMutablePostalAddressMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a mutable copy of this postal address.

### 49.36.14 Properties

### 49.36.15 City as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The city name in a postal address.
**Notes:** (Read only property)

### 49.36.16 Country as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The country name in a postal address.
**Notes:** (Read only property)

### 49.36.17 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNPostalAddress object.
(Read and Write property)

### 49.36.18 ISOCountryCode as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The ISO country code for the country in a postal address.
**Notes:** (Read only property)

### 49.36.19 PostalCode as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The postal code in a postal address.
**Notes:** (Read only property)

### 49.36.20 State as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The state name in a postal address.
**Notes:** (Read only property)

### 49.36.21 Street as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The street name in a postal address.
**Notes:** Multiline addresses are delimited by carriage returns (that is, ,Äú\n,Äù).
(Read only property)

## 49.37 class CNSaveRequestMBS

### 49.37.1 class CNSaveRequestMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNSaveRequest class defines a save request operation for contacts.
**Notes:** The CNSaveRequest class creates a new save request for each save operation on the contact store. You can batch multiple changes into one save request (note that these changes only apply to objects). In the case of overlapping changes in multiple or concurrent save requests, the last change wins. If you try to add an object (that is, a contact, or a group,) that already exists in the contact store, the CNErrorCodeInsertedRecordAlreadyExists error occurs and the CNErrorUserInfoAffectedRecordsKey array is updated to contain the object you tried to add. If you try to update or delete an object that is not present in the contact store, the save request does not perform the update or deletion, the CNErrorCodeRecordDoesNotExist error occurs, and the CNErrorUserInfoAffectedRecordsKey array is updated to contain the object you tried to update or delete. Do not access objects in the save request while a save request is executing.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr4

### 49.37.2 Methods

### 49.37.3 addContact(contact as CNMutableContactMBS, ContainerIdentifier as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds the specified contact to the contact store.
**Notes:** contact: The new contact to add.
identifier: The identifier of the container to add the new contact. To add the new contact to the default container set identifier to "".

This method overrides any previously made deletion requests for the contact. The new contact may be modified by executing the save request.

### 49.37.4 addGroup(group as CNMutableGroupMBS, identifier as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a group to the contact store.
**Notes:** group: The group to add.
identifier: The identifier of the container to add the new group. To add the new group to the default con-

tainer, set identifier to "".

This method overrides any previously made delete request for the group.

### 49.37.5 addMember(contact as CNContactMBS, group as CNGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a contact as a member of a group.
**Notes:** contact: The contact to add to the group membership.
group: The group to add the contact to its membership.

This method overrides any previously made remove membership request on the contact from the group.

### 49.37.6 addSubgroup(subgroup as CNGroupMBS, group as CNGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a subgroup to a group.

### 49.37.7 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.37.8 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 49.37.9 deleteContact(contact as CNMutableContactMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Deletes a contact from the contact store.
**Notes:** contact: Contact to be delete.

### 49.37.10 deleteGroup(contact as CNMutableGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Deletes a group from the contact store.
**Notes:** group: The group to delete.

This method overrides any previously made add request on the group. The group to be deleted must already exist in the contact store. If it does not, the delete request fails, the CNErrorCodeRecordDoesNotExist error is thrown, and the CNErrorUserInfoAffectedRecordsKey array is updated to contain that object.

### 49.37.11 removeMember(contact as CNContactMBS, group as CNGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a contact as a member of a group.
**Notes:** contact: The contact to remove from the group membership.
group: The group to remove the contact from its membership.

This method removes the contact from the group, but does not delete it from the contact store. This method overrides any previously made add membership request on the contact to the group.

### 49.37.12 removeSubgroup(subgroup as CNGroupMBS, group as CNGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes a subgroup from a group.

### 49.37.13 updateContact(contact as CNMutableContactMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates an existing contact in the contact store.
**Notes:** contact: The contact to update.

The contact to be updated must already exist in the contact store. If it does not, the update request fails, the CNErrorCodeRecordDoesNotExist error occurs, and the CNErrorUserInfoAffectedRecordsKey array is

updated to contain the object. Note that the contact may be modified when the save request is executing.

### 49.37.14 updateGroup(contact as CNMutableGroupMBS)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates an existing group in the contact store.
**Notes:** group: The group to update.

The group to be updated must already exist in the contact store. If it does not, the update request fails, the CNErrorCodeRecordDoesNotExist error is thrown, and the CNErrorUserInfoAffectedRecordsKey array is updated to contain that object.

### 49.37.15 Properties

### 49.37.16 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNSaveRequest object.
(Read and Write property)

### 49.37.17 shouldRefetchContacts as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Should the contacts be refetched as part of executing the save request.
**Notes:** Default is true where added and updated contacts are refetched by the executing save request.
Set to false to suppress this refetch behavior and reduce the execution time of the save request.

If set to false do not use the contacts after the executed save request as they may not be in a current state.
(Read and Write property)

### 49.37.18 transactionAuthor as String

MBS Mac64bit Plugin, Plugin Version: 22.0, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The author of this transaction.
**Notes:** Use this, in conjunction with CNChangeHistoryFetchRequestMBS.excludedTransactionAuthors, to

suppress fetching of changes the author already knows about.
(Read and Write property)

## 49.38 class CNSocialProfileMBS

### 49.38.1 class CNSocialProfileMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The CNSocialProfile class defines an immutable object representing a social profile.
**Example:**

```
dim ContactStore as new CNContactStoreMBS
dim c as new CNMutableContactMBS

c.givenName = "Bob"

dim sr as new CNSaveRequestMBS

dim ContainerIdentifier as string = ContactStore.defaultContainerIdentifier
sr.addContact c, ContainerIdentifier

dim e as NSErrorMBS
if ContactStore.executeSaveRequest(sr, e) then
MsgBox "Saved"
else
MsgBox "Failed to save contact"+EndOfLine+EndOfLine+e.localizedDescription
end if
```

**Notes:** This is a thread-safe class. Some social profile services, such as Facebook and Twitter are predefined in this class. You can also specify your own social profile service with Constructor.

### 49.38.2 Methods

### 49.38.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Should return true in a 64-bit Mac app on Mac OS X 10.11 or newer.

### 49.38.4 CNSocialProfileServiceFacebook as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.

**Notes:** Facebook

### 49.38.5 CNSocialProfileServiceFlickr as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Flickr

### 49.38.6 CNSocialProfileServiceGameCenter as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Game Center

### 49.38.7 CNSocialProfileServiceKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties.
**Notes:** The social profile service.
This key takes a string value.

### 49.38.8 CNSocialProfileServiceLinkedIn as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** LinkedIn

### 49.38.9 CNSocialProfileServiceMySpace as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** MySpace

### 49.38.10 CNSocialProfileServiceSinaWeibo as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Sina Weibo

### 49.38.11 CNSocialProfileServiceTencentWeibo as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Tencent Weibo

### 49.38.12 CNSocialProfileServiceTwitter as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Twitter

### 49.38.13 CNSocialProfileServiceYelp as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the possible service keys.
**Notes:** Yelp

### 49.38.14 CNSocialProfileURLStringKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties.
**Notes:** The URL of the service.

### 49.38.15 CNSocialProfileUserIdentifierKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties.
**Notes:** The social profile user identifier.
This key takes a string value.

### 49.38.16 CNSocialProfileUsernameKey as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties.
**Notes:** The social profile user name.
This key takes a string value.

### 49.38.17 Constructor(URLString as String, UserName as String, Identifier as String, Service as String)

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes a new social profile object with the specified URL.
**Notes:** urlString: The URL for the social profile.
username: The user name for the social profile.
userIdentifier: The service,Äôs user identifier for the social profile.
service: The service name of the social profile.

### 49.38.18 copy as CNSocialProfileMBS

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a copy of the social profile object.

### 49.38.19 localizedStringForKey(key as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the localized name of the property for the specified key.
**Example:**

MsgBox CNSocialProfileMBS.localizedStringForService(CNSocialProfileServiceGameCenter)

**Notes:** key: Key for which to get the localized property name.

### 49.38.20 localizedStringForService(service as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the localized name of the specified service.
**Example:**

MsgBox CNSocialProfileMBS.localizedStringForKey(CNSocialProfileUsernameKey)

**Notes:** service: The service name for which to get the localized name.

### 49.38.21 Properties

### 49.38.22 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** Value is a pointer to a CNSocialProfile object.
(Read and Write property)

### 49.38.23 service as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The social profile,Äôs service name.
**Notes:** (Read only property)

### 49.38.24 urlString as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL associated with the social profile.
**Notes:** (Read only property)

### 49.38.25 userIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The service,Äôs user identifier associated with the social profile.
**Notes:** (Read only property)

### 49.38.26 username as String

MBS Mac64bit Plugin, Plugin Version: 16.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The user name for the social profile.
**Notes:** (Read only property)

# Chapter 50

# Continuity Camera

## 50.1 class ContinuityCameraMBS

### 50.1.1 class ContinuityCameraMBS

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** The class to work with Continuity feature in MacOS Mojave.
**Notes:** Works also with services to receive e.g. screenshot for older versions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr4
- Document Camera Scan functions for Xojo on iOS
- News from the MBS Xojo Plugins Version 22.1
- MBS Xojo Plugins, version 22.1pr4
- Embedded links with MBS and DynaPDF in Xojo
- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr3
- Continuity Camera for Xojo

**Videos**

- XDC 2020 MBS Plugins Presentation

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 20.3, page 83: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes
- 20.3, page 81: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes
- 20.3, page 79: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes
- 18.1, page 62: Embedding Links, Adding links inside PDFs by Stefanie Juchmes
- 17.5, page 34: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.4, page 10: News

### 50.1.2 Methods

### 50.1.3 Constructor

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 50.1.4 Destructor

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 50.1.5 Import(index as Integer)

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts import.
**Notes:** Index is 0 for photo, 1 for document or 2 for sketch.

If you have multiple devices, you may add 3 to switch to next device or better use popup menu.
If index is too big, nothing happens.
See also:

- 50.1.6 Import(index as Integer, Control as control) 8555
- 50.1.7 Import(index as Integer, Control as DesktopControl) 8555
- 50.1.8 Import(index as Integer, Win as DesktopWindow) 8556
- 50.1.9 Import(index as Integer, Win as window) 8556


### 50.1.6 Import(index as Integer, Control as control)

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts import for control.
**Notes:** Index is 0 for photo, 1 for document or 2 for sketch.

If you have multiple devices, you may add 3 to switch to next device or better use popup menu.
If index is invalid, nothing happens.
See also:


- 50.1.5 Import(index as Integer) 8554
- 50.1.7 Import(index as Integer, Control as DesktopControl) 8555
- 50.1.8 Import(index as Integer, Win as DesktopWindow) 8556
- 50.1.9 Import(index as Integer, Win as window) 8556


### 50.1.7 Import(index as Integer, Control as DesktopControl)

MBS MacExtras Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Starts import for control.
**Notes:** Index is 0 for photo, 1 for document or 2 for sketch.

If you have multiple devices, you may add 3 to switch to next device or better use popup menu.
If index is invalid, nothing happens.
See also:


- 50.1.5 Import(index as Integer) 8554
- 50.1.6 Import(index as Integer, Control as control) 8555
- 50.1.8 Import(index as Integer, Win as DesktopWindow) 8556
- 50.1.9 Import(index as Integer, Win as window) 8556

### 50.1.8 Import(index as Integer, Win as DesktopWindow)

MBS MacExtras Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Starts import for window.
**Notes:** Index is 0 for photo, 1 for document or 2 for sketch.

If you have multiple devices, you may add 3 to switch to next device or better use popup menu.
If index is invalid, nothing happens.
See also:


- 50.1.5 Import(index as Integer) 8554
- 50.1.6 Import(index as Integer, Control as control) 8555
- 50.1.7 Import(index as Integer, Control as DesktopControl) 8555
- 50.1.9 Import(index as Integer, Win as window) 8556


### 50.1.9 Import(index as Integer, Win as window)

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts import for window.
**Notes:** Index is 0 for photo, 1 for document or 2 for sketch.

If you have multiple devices, you may add 3 to switch to next device or better use popup menu.
If index is invalid, nothing happens.
See also:


- 50.1.5 Import(index as Integer) 8554
- 50.1.6 Import(index as Integer, Control as control) 8555
- 50.1.7 Import(index as Integer, Control as DesktopControl) 8555
- 50.1.8 Import(index as Integer, Win as DesktopWindow) 8556


### 50.1.10 InstallForCanvas

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Installs receiver for Xojo canvas controls.

### 50.1.11 InstallForListbox

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Installs receiver for Xojo listbox controls.

### 50.1.12 InstallForWindow

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Installs receiver for Xojo windows.

### 50.1.13 PopupMenu as NSMenuMBS

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Shows the import from device popup menu.
**Notes:** You can show this menu with popup method.
May return nil if unavailable.

### 50.1.14 SetDelegate(d as ContinuityCameraDelegateMBS)

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets delegate to call when we got new data.

### 50.1.15 Properties

### 50.1.16 Enabled as Boolean

MBS MacExtras Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is enabled.
**Notes:** Defaults to true.
(Read and Write property)

### 50.1.17 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the internal controller.
**Notes:** Is zero in case the constructor failed.
(Read only property)

### 50.1.18 Events

### 50.1.19 Allow(Handle as Integer) as boolean

MBS MacExtras Plugin, Plugin Version: 22.5, Platform: macOS, Targets: .

**Function:** Whether to allow the control to receive data.
**Example:**

```
Function Allow(Handle as Integer) Handles Allow as boolean
System.DebugLog CurrentMethodName+": "+Str(Handle)

For Each control As RectControl In allowedControls

// we hit our control
If control.handle = handle Then
Return True
End If


// are we within the coordinates with the mouse?

Dim cx As Integer = control.MouseX
Dim cy As Integer = control.MouseY

'System.DebugLog Str(cx)+"/"+Str(cy)

Dim controlLeft As Integer = control.Left
Dim controlTop As Integer = control.top
Dim controlRight As Integer = controlLeft + control.Width
Dim controlBottom As Integer = controlTop + control.Height

Dim win As Window = control.Window // container?
If win <>control.TrueWindow Then
controlLeft = controlLeft + win.Left
controlTop = controlTop + win.Top
controlRight = controlRight + win.Left
controlBottom = controlBottom + win.Top
End If

If cX >= controlLeft And cY >= controlTop And cX <controlRight And cy <controlBottom Then
return true
```

```
End If

Next
End Function
```

**Notes:** Return true to allow or false to disallow.
You may get the call for the control below mouse and for other control below it like containers.
So you may best decide based on the

### 50.1.20 Received(Data as MemoryBlock, type as String)

MBS MacExtras Plugin, Plugin Version: 22.5, Platform: macOS, Targets: .

**Function:** Data was received.
**Example:**

```
Sub Received(Data as MemoryBlock, type as String)
Select Case type
Case "JPEG"
WriteFile("import.jpg", data)

Dim p As Picture = Picture.FromData(data)
MainWindow.setPicture p

Else
MsgBox "new type: "+type
End Select
End Sub
```

**Notes:** Alternatively to using the delegate, you can subclass ContinuityCameraMBS and add this event to have a central place to receive data.

### 50.1.21 Constants

Index Values

| Constant | Value | Description |
|---|---|---|
| kIndexDrawSketch | 2 | Draw a sketch. |
| kIndexScanDocument | 1 | Scan a document as PDF. |
| kIndexTakePhoto | 0 | Take a picture. |

### 50.1.22 Delegates

### 50.1.23 ContinuityCameraDelegateMBS(Data as MemoryBlock, type as String)

MBS MacExtras Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** The delegate definition for the callback.
**Notes:** Please define a method in app or a module and pass addressOf that method to SetDelegate method.

## 50.2 class VNDocumentCameraScanMBS

### 50.2.1 class VNDocumentCameraScanMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A single document scanned in the document camera.
**Notes:** When the document camera scans a document, it returns the resulting information in this format, through the didFinishWithScan event.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5
- MBS Xojo Plugins, version 22.5pr4
- Document Camera Scan functions for Xojo on iOS

**Xojo Developer Magazine**

- 21.1, page 32: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 50.2.2 Methods

### 50.2.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 50.2.4 imageOfPageAtIndex(Index as Integer) as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The image of the page at a specified index.
**Notes:** We return a NSImageMBS wrapping the UIImage.

### 50.2.5 pictureOfPageAtIndex(Index as Integer) as Picture

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The picture of the page at a specified index.
**Notes:** We build a Picture wrapping the UIIMage.

### 50.2.6 Properties

### 50.2.7 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 50.2.8 pageCount as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The number of pages in the scanned document.
**Notes:** (Read only property)

### 50.2.9 title as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The title of the scanned document.
**Notes:** (Read only property)

## 50.3 class VNDocumentCameraViewControllerMBS

### 50.3.1 class VNDocumentCameraViewControllerMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Shows a panel to allow the user to scan a document.
**Notes:** A view controller that shows what the document camera sees.
Present this view controller, as follows, and add it to your view controller hierarchy to scan documents.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr4
- Document Camera Scan functions for Xojo on iOS

**Xojo Developer Magazine**

- 21.1, page 32: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 50.3.2 Methods

### 50.3.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 50.3.4 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 50.3.5 Dismiss

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 50.3.6 Present

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 50.3.7 Properties

### 50.3.8 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 50.3.9 isBeingPresented as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Whether the controller is presented.
**Notes:** Returns true if the dialog is visible.
(Read only property)

### 50.3.10 Supported as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Whether you can use this class on the current device.
**Notes:** Returns false for unsupported hardware.
(Read only property)

### 50.3.11 Events

### 50.3.12 didCancel

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the user cancels.
**Notes:** The plugin dismisses the dialog automatically.

### 50.3.13 didFailWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the user is unable to scan, with the following error.
**Notes:** The plugin dismisses the dialog automatically.

### 50.3.14 didFinishWithScan(scan as VNDocumentCameraScanMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be called when something was scanned.
**Notes:** The plugin dismisses the dialog automatically.

# Chapter 51

# Controls

## 51.1 control ButtonMBS

### 51.1.1 control ButtonMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Canvas instead. **Function:** A control to have a custom button in Xojo.
**Notes:** You provide the images for the button and the control will do the rest.

There are possibilities that this control shows thru pagepanels from a hidden panel.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 51.1.2 Properties

### 51.1.3 ImageDisabled as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image used if the button is disabled.
**Notes:** (Read and Write property)

### 51.1.4 ImageMouseOver as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image used for the unpressed button if the mouse is over the button.
**Notes:** (Read and Write property)

### 51.1.5 ImageNormal as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image for the normal state.
**Notes:** (Read and Write property)

### 51.1.6 ImagePressed as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image used for the pressed button.
**Notes:** (Read and Write property)

### 51.1.7 ImagePressedDisabled as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image used when the button is pressed and the button is disabled.
**Notes:** If this image is nil, the ImagePressed picture is used.
(Read and Write property)

### 51.1.8 ImagePressedMouseOver as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image used when the button is pressed and the mouse is over the button.
**Notes:** If this image is nil, the ImagePressed picture is used.
(Read and Write property)

### 51.1.9 Sticky as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the button is sticky.
**Notes:** Normally the value is set to false when you release the mouse button.
If Sticky is true, the button is not unpressed.
(Read and Write property)

### 51.1.10 TestEnabled as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This property can be used to see in the window editor how the button looks like when the button is enabled.
**Notes:** This property is only for designing, not for runtime.
(Read and Write property)

### 51.1.11 TestMouseOver as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This property can be used to see in the window editor how the button looks like if the mouse is over the button.
**Notes:** This property is only for designing, not for runtime.
(Read and Write property)

### 51.1.12 TestPressed as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This property can be used to see in the window editor how the button looks like when the button is pressed.
**Notes:** This property is only for designing, not for runtime.
(Read and Write property)

### 51.1.13 Toggle as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the button should toggle.
**Notes:** If pressed the button switches the value property.

Set Sticky to true if use set Toggle to true.
(Read and Write property)

### 51.1.14 Value as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the button is currently pressed.
**Notes:** True if the button is pressed.
(Read and Write property)

### 51.1.15 Events

### 51.1.16 Action(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the mouse button is clicked in the control.
**Notes:** Currently called after each MouseUp event.

### 51.1.17 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.1.18 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.1.19 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.1.20 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.1.21 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 51.1.22 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.1.23 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the mouse button is released.

### 51.1.24 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.1.25 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.2 class Control

### 51.2.1 class Control

Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** The built in Control class in Xojo.

### 51.2.2 Methods

### 51.2.3 CALayerMBS as CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the Core Animation layer that the receiver uses as its backing store.
**Notes:** Works only in Cocoa target.
Also sets wantsLayer to true for the view to make sure it has a layer.

### 51.2.4 NSControlMBS as NSControlMBS

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSControlMBS object for the given control.
**Example:**

```
BevelButton1.NSControlMBS.StringValue = "Hello"
```

**Notes:** This way you can manipulate Cocoa controls directly.

### 51.2.5 NSViewMBS as NSViewMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSViewMBS object for the given control.
**Example:**

```
MsgBox PushButton1.NSViewMBS.className
```

**Notes:** This way you can manipulate Cocoa controls directly.
For a pushbutton you may want to cast the NSViewMBS to NSButtonMBS to have more options.

### 51.2.6 WinClassNameMBS as string

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop only.

**Function:** Returns internal control class name for a Windows control.

## 51.3 Globals

### 51.3.1 ShowModalWithinThreadSafeMBS(extends theMessageDialog as MessageDialog, parent as DesktopWindow)

MBS Util Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call ShowModalWithin method on main thread.
**Notes:** This method is to allow you to call the ShowModalWithin method of a MessageDialog in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

Of course as this is asynchronously, you do not get details on which button was pressed.
Deprecated. Behavior from Xojo changed, so this method does no longer work.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 51.3.2 ShowModalThreadSafeMBS(extends theMessageDialog as MessageDialog)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call ShowModal method on main thread.
**Notes:** This method is to allow you to call the ShowModal method of a MessageDialog in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

Of course as this is asynchronously, you do not get details on which button was pressed.
Deprecated. Behavior from Xojo changed, so this method does no longer work.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0pr6

**Xojo Developer Magazine**

- 11.2, page 10: News

### 51.3.3 ShowModalWithinThreadSafeMBS(extends theMessageDialog as MessageDialog, parent as window)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call ShowModalWithin method on main thread.
**Notes:** This method is to allow you to call the ShowModalWithin method of a MessageDialog in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

Of course as this is asynchronously, you do not get details on which button was pressed.
Deprecated. Behavior from Xojo changed, so this method does no longer work.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

## 51.4 control CustomControlMBS

### 51.4.1 control CustomControlMBS

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Canvas instead. **Function:** A control where you can in the IDE define the paint event and see in the IDE what you see in the compiled application.

### 51.4.2 Properties

### 51.4.3 Code as String

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The code for the paint event.
**Notes:** Commands:
PenWidth n
PenHeight n
ForeColor n
FillRect x,y,w,h
DrawRect x,y,w,h
FillRoundRect x,y,w,h,X,Y
DrawRoundRect x,y,w,h,X,Y
FillOval x,y,w,h
DrawOval x,y,w,h
DrawPicture X,x,y,w,h - draws picture number X into the given rectangle
DrawLine x1,y1,x1,y1 - draws line

Variables:
width: width of control
height: height of control
left: left position of control
top: top position of control
ValueX: Value of the ValueX property (X from 1 to 4)
ColorX: Value of the Color1 property (X from 1 to 4)
(Read and Write property)

### 51.4.4 Color1 as Color

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the color properties.
**Notes:** (Read and Write property)

### 51.4.5 Color2 as Color

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the color properties.
**Notes:** (Read and Write property)

### 51.4.6 Color3 as Color

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the color properties.

**Notes:** (Read and Write property)

### 51.4.7 Color4 as Color

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the color properties.
**Notes:** (Read and Write property)

### 51.4.8 Picture1 as Picture

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the picture properties you can use for the drawpicture command.
**Notes:** (Read and Write property)

### 51.4.9 Picture2 as Picture

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the picture properties you can use for the drawpicture command.
**Notes:** (Read and Write property)

### 51.4.10 Picture3 as Picture

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the picture properties you can use for the drawpicture command.
**Notes:** (Read and Write property)

### 51.4.11 Picture4 as Picture

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the picture properties you can use for the drawpicture command.
**Notes:** (Read and Write property)

### 51.4.12 Value1 as String

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the value properties.
**Notes:** (Read and Write property)

### 51.4.13 Value2 as String

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the value properties.
**Notes:** (Read and Write property)

### 51.4.14 Value3 as String

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the value properties.
**Notes:** (Read and Write property)

### 51.4.15 Value4 as String

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** One of the value properties.
**Notes:** (Read and Write property)

### 51.4.16 Events

### 51.4.17 Close

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.4.18 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.4.19 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.4.20 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.4.21 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.4.22 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.4.23 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.4.24 Open

MBS Overlay Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.4.25 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.5 class DesktopControl

### 51.5.1 class DesktopControl

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in Control class in Xojo.

### 51.5.2 Methods

### 51.5.3 CALayerMBS as CALayerMBS

MBS MacCG Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the Core Animation layer that the receiver uses as its backing store.
**Notes:** Works only in Cocoa target.
Also sets wantsLayer to true for the view to make sure it has a layer.

### 51.5.4 NSControlMBS as NSControlMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSControlMBS object for the given control.
**Example:**

```
BevelButton1.NSControlMBS.StringValue = "Hello"
```

**Notes:** This way you can manipulate Cocoa controls directly.

### 51.5.5 NSViewMBS as NSViewMBS

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSViewMBS object for the given control.
**Example:**

```
MsgBox PushButton1.NSViewMBS.className
```

**Notes:** This way you can manipulate Cocoa controls directly.
For a pushbutton you may want to cast the NSViewMBS to NSButtonMBS to have more options.

### 51.5.6 WinClassNameMBS as string

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns internal control class name for a Windows control.

## 51.6 class DesktopLabel

### 51.6.1 class DesktopLabel

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 51.6.2 Methods

### 51.6.3 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

### 51.6.4 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

## 51.7 class DesktopListbox

### 51.7.1 class DesktopListbox

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in listbox class in Xojo.

### 51.7.2 Methods

### 51.7.3 HorizontalNSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns horizontal scrollbar for a listbox.
**Notes:** Only for Cocoa target.

### 51.7.4 RefreshCellThreadSafeMBS(Row As Integer, Column As Integer)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Calls refresh cell on main thread.
**Notes:** This method is to allow you to invalidate a listbox cell in a thread without a problem.

If called on main thread, the plugin will simply call through directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 51.7.5 VerticalNSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns vertical scrollbar for a listbox.
**Notes:** Only for Cocoa target.

## 51.8 class DesktopProgressbar

### 51.8.1 class DesktopProgressbar

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in progressbar class in Xojo.

### 51.8.2 Methods

### 51.8.3 NSProgressIndicatorMBS as NSProgressIndicatorMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSProgressIndicatorMBS object for the given control.
**Example:**

MsgBox ProgressBar1.NSProgressIndicatorMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

### 51.8.4 SetMaximumThreadSafeMBS(maximum as integer)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets maximum property on main thread.
**Notes:** This method is to allow you to set the maximum property of a progressbar in a thread without a problem.

If called on main thread, the plugin will simply set maximum property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 51.8.5 SetValueThreadSafeMBS(value as integer)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets value property on main thread.

**Notes:** This method is to allow you to set the value property of a progressbar in a thread without a problem.

If called on main thread, the plugin will simply set value property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

## 51.9 class DesktopTextField

### 51.9.1 class DesktopTextField

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in TextField class in Xojo.

### 51.9.2 Methods

### 51.9.3 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Seems like Xojo 2011r1 uses a NSTextField, so this method should return an object on Cocoa targets.

### 51.9.4 NSTextViewMBS as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextViewMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Seems like Xojo 2011r1 uses a NSTextField, so this method should return nil on Cocoa targets. Please use NSTextFieldMBS method in this case.

### 51.9.5 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

## 51.10 class DesktopUIControl

### 51.10.1 class DesktopUIControl

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 51.10.2 Methods

### 51.10.3 RefreshThreadSafeMBS(immediately as Boolean = False)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call refresh method on main thread.
**Notes:** This method is to allow you to call the refresh method of a control in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
See also:

- 51.10.4 RefreshThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, immediately as Boolean = False) 8589

### 51.10.4 RefreshThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, immediately as Boolean = False)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call refresh method on main thread.
**Notes:** This method is to allow you to call the refresh method of a control in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
See also:

- 51.10.3 RefreshThreadSafeMBS(immediately as Boolean = False) 8589

### 51.10.5 SetEnabledThreadSafeMBS(value as boolean)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets enabled property on main thread.
**Notes:** This method is to allow you to set the enabled property of a control in a thread without a problem.

If called on main thread, the plugin will simply set enabled property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 51.10.6 SetVisibleThreadSafeMBS(value as boolean)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets visible property on main thread.
**Notes:** This method is to allow you to set the visible property of a control in a thread without a problem.

If called on main thread, the plugin will simply set visible property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

## 51.11 control ImageMBS

### 51.11.1 control ImageMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Canvas instead. **Function:** A control for Xojo to draw an image into a window.
**Notes:** The image is scaled to the size of the control.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr14
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 51.11.2 Properties

### 51.11.3 Backdrop as Picture

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image to display.
**Notes:** This image is scaled to the needed size.
(Read and Write property)

### 51.11.4 Events

### 51.11.5 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.11.6 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.11.7 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.11.8 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.11.9 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.11.10 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.11.11 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.11.12 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.11.13 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.12 class Label

### 51.12.1 class Label

Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 51.12.2 Methods

### 51.12.3 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 13.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.

### 51.12.4 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

## 51.13 control LineMBS

### 51.13.1 control LineMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Line instead. **Function:** A control for Xojo to draw a line into a window.
**Notes:** Basicly the same as the original Line control from Xojo.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2fc1
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 51.13.2 Properties

### 51.13.3 BorderWidth as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the line.
**Notes:** Set to 0 to disabled the border.
(Read and Write property)

### 51.13.4 LineColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for drawing the line.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.13.5 Mirror as Boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the line is mirrored.
**Notes:** Normally the line is drawn from top left to bottom right.

If Mirror is true, the line is drawn from bottom left to top right.
(Read and Write property)

### 51.13.6 Events

### 51.13.7 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.13.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.13.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.13.10 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.13.11 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.13.12 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.13.13 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.13.14 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.13.15 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.14 class Listbox

### 51.14.1 class Listbox

Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in listbox class in Xojo.

### 51.14.2 Methods

### 51.14.3 HorizontalNSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns horizontal scrollbar for a listbox.
**Notes:** Only for Cocoa target.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0fc1

### 51.14.4 InvalidateCellThreadSafeMBS(Row as Integer, Column as Integer)

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Calls invalide cell on main thread.
**Notes:** This method is to allow you to invalidate a listbox cell in a thread without a problem.

If called on main thread, the plugin will simply call through directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr1

### 51.14.5 VerticalNSScrollerMBS as NSScrollerMBS

MBS MacControls Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns vertical scrollbar for a listbox.
**Notes:** Only for Cocoa target.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0fc1

## 51.15 control OvalMBS

### 51.15.1 control OvalMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Oval instead. **Function:** A control for Xojo to draw an oval into a window.
**Notes:** Basicly the same as the original Oval control from Xojo.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 51.15.2 Properties

### 51.15.3 BorderColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for drawing the border.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.15.4 BorderWidth as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the border line.
**Notes:** Set to 0 to disabled the border.
(Read and Write property)

### 51.15.5 FillColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for filling the oval.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.

(Read and Write property)

### 51.15.6 Events

### 51.15.7 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.15.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.15.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.15.10 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.15.11 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.15.12 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.15.13 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.15.14 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.15.15 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.16 class ProgressBar

### 51.16.1 class ProgressBar

Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in progressbar class in Xojo.

### 51.16.2 Methods

### 51.16.3 NSProgressIndicatorMBS as NSProgressIndicatorMBS

MBS MacControls Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSProgressIndicatorMBS object for the given control.
**Example:**

MsgBox ProgressBar1.NSProgressIndicatorMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

### 51.16.4 SetMaximumThreadSafeMBS(maximum as Integer)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets maximum property on main thread.
**Notes:** This method is to allow you to set the maximum property of a progressbar in a thread without a problem.

If called on main thread, the plugin will simply set maximum property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

### 51.16.5 SetMinimumThreadSafeMBS(minimum as Integer)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets minimum property on main thread.
**Notes:** This method is to allow you to set the minimum property of a progressbar in a thread without a problem.

If called on main thread, the plugin will simply set minimum property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

### 51.16.6 SetValueThreadSafeMBS(value as Integer)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets value property on main thread.
**Notes:** This method is to allow you to set the value property of a progressbar in a thread without a problem.

If called on main thread, the plugin will simply set value property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

## 51.17 control RectangleMBS

### 51.17.1 control RectangleMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use Rectangle instead.
**Function:** A control for Xojo to draw a rectangle into a window.
**Notes:** Basicly the same as the original Rectangle control from Xojo.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 51.17.2 Properties

### 51.17.3 BorderWidth as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the border line.
**Notes:** Set to 0 to disabled the border.
(Read and Write property)

### 51.17.4 BottomRightColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for drawing the bottom and right border lines.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.17.5 FillColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for filling the rectangle.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.

(Read and Write property)

### 51.17.6 TopLeftColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for drawing the top and left border lines.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.17.7 Events

### 51.17.8 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.17.9 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.17.10 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.17.11 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.17.12 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.17.13 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.17.14 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.17.15 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.17.16 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.18 class RectControl

### 51.18.1 class RectControl

Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** An extension of Xojo's internal control.

### 51.18.2 Methods

### 51.18.3 InvalidateThreadSafeMBS(EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call invalidate method on main thread.
**Notes:** This method is to allow you to call the invalidate method of a control in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
See also:

- 51.18.4 InvalidateThreadSafeMBS(X as Integer, Y as Integer, Width as Integer, Height as Integer, EraseBackground as boolean = true) 8608

### 51.18.4 InvalidateThreadSafeMBS(X as Integer, Y as Integer, Width as Integer, Height as Integer, EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call invalidate method on main thread.
**Notes:** This method is to allow you to call the invalidate method of a control in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
See also:

- 51.18.3 InvalidateThreadSafeMBS(EraseBackground as boolean = true) 8608

### 51.18.5 RefreshThreadSafeMBS(EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Call refresh method on main thread.
**Notes:** This method is to allow you to call the refresh method of a control in a thread without a problem.

If called on main thread, the plugin will simply call method directly.
If called on other threads the plugin will schedule to call the method a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

### 51.18.6 SetEnabledThreadSafeMBS(value as boolean)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets enabled property on main thread.
**Notes:** This method is to allow you to set the enabled property of a control in a thread without a problem.

If called on main thread, the plugin will simply set enabled property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9
- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

### 51.18.7 SetVisibleThreadSafeMBS(value as boolean)

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets visible property on main thread.
**Notes:** This method is to allow you to set the visible property of a control in a thread without a problem.

If called on main thread, the plugin will simply set visible property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.

**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9
- MBS Real Studio Plugins, version 13.1pr1
- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

## 51.19 control RoundRectangleMBS

### 51.19.1 control RoundRectangleMBS

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use RoundRectangle instead.
**Function:** A control for Xojo to draw a round rectangle into a window.
**Notes:** Basicly the same as the original round rectangle control from Xojo.
For composite windows there is a non zero chance that you see redraw problems.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

### 51.19.2 Properties

### 51.19.3 BorderColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for drawing the border lines.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.19.4 BorderWidth as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the border line.
**Notes:** Set to 0 to disabled the border.
(Read and Write property)

### 51.19.5 FillColor as Color

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The color for filling the rectangle.
**Notes:** There is a bug in Xojo. If you enter the color as a hex value (e.g. "&c123456"), the control will get black as color. If you use the color panel using the "..." buttons, the control will get the correct color.
(Read and Write property)

### 51.19.6 OvalHeight as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The height of the rounded corners in pixels.
**Notes:** (Read and Write property)

### 51.19.7 OvalWidth as Integer

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the rounded corners in pixels.
**Notes:** (Read and Write property)

### 51.19.8 Events

### 51.19.9 Close

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to close.

### 51.19.10 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Overlay Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 51.19.11 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 51.19.12 EnableMenuItems

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event where you can enable menu items.

### 51.19.13 MouseDown(x as Integer, y as Integer, Modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user clicks with the mouse in the control area.
**Notes:** Return true to handle the event and enable the MouseUp event.

This event exists because RB does not add a Mousedown event by default to the plugin control.

### 51.19.14 MouseDrag(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse drag event.

### 51.19.15 MouseUp(x as Integer, y as Integer)

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when the user releases the mouse button and you returned true on the MouseDown event.

### 51.19.16 Open

MBS Overlay Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 51.19.17 ScaleFactorChanged(NewFactor as Double)

MBS Overlay Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

## 51.20 class TabPanel

### 51.20.1 class TabPanel

Platform: macOS, Targets: Desktop only.

**Function:** Extends the TabPanel control inside Xojo.

### 51.20.2 Methods

### 51.20.3 NSTabViewMBS as NSTabViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTabViewMBS object for the given control.
**Example:**

MsgBox TabPanel1.NSTabViewMBS.className

**Notes:** This way you can manipulate Cocoa controls directly.

## 51.21 class TextField

### 51.21.1 class TextField

Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in TextField class in Xojo.

### 51.21.2 Methods

### 51.21.3 NSTextFieldMBS as NSTextFieldMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextFieldMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Seems like Xojo 2011r1 uses a NSTextField, so this method should return an object on Cocoa targets.

### 51.21.4 NSTextViewMBS as NSTextViewMBS

MBS MacCocoa Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSTextViewMBS object for the given control.
**Notes:** This way you can manipulate Cocoa controls directly.
Seems like Xojo 2011r1 uses a NSTextField, so this method should return nil on Cocoa targets. Please use NSTextFieldMBS method in this case.

### 51.21.5 SetTextThreadSafeMBS(text as string)

MBS Util Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets text property on main thread.
**Notes:** This method is to allow you to set the text property of a label in a thread without a problem.

If called on main thread, the plugin will simply set text property directly.
If called on other threads the plugin will schedule to set the property a short time later on the main thread.

It may be better to call an update method you created on your window with CallDelegatesMBS.CallDelegateOnMainThreadMBS instead to do several update steps on one.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr5
- Thread GUI Access
- MBS Real Studio Plugins, version 13.0pr3

# Chapter 52

# CoreAnimation

## 52.1 class CALayerMBS

### 52.1.1 class CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The plugin class for a CoreAnimation.
**Example:**

```
// add gray layer over Xojo window. Or hide it on second call, show on third call, etc...

If view = Nil Then
// view is property in window/module

Dim win As NSWindowMBS = Self.NSWindowMBS

view = New NSViewMBS(0, 0, Width, Height)

win.contentView.AddSubView(view)

view.wantsLayer = True
view.autoresizesSubviews = True
view.autoresizingMask = view.NSViewWidthSizable + view.NSViewHeightSizable

Dim layer As CALayerMBS = view.layer
layer.backgroundColor = CGColorMBS.CreateDeviceGray(0.3, 0.5)

Else

// show or hide
view.isHidden = Not view.isHidden
```

End If

**Notes:** The CALayer class manages image-based content and allows you to perform animations on that content. Layers are often used to provide the backing store for views but can also be used without a view to display content. A layer's main job is to manage the visual content that you provide but the layer itself has visual attributes that can be set, such as a background color, border, and shadow. In addition to managing visual content, the layer also maintains information about the geometry of its content (such as its position, size, and transform) that is used to present that content onscreen. Modifying the properties of the layer is how you initiate animations on the layer's content or geometry. A layer object encapsulates the duration and pacing of a layer and its animations by adopting the CAMediaTiming protocol, which defines the layer's timing information.

If the layer object was created by a view, the view typically assigns itself as the layer's delegate automatically, and you should not change that relationship. For layers you create yourself, you can assign a delegate object and use that object to provide the contents of the layer dynamically and perform other tasks. A layer may also have a layout manager object (assigned to the layoutManager property) to manage the layout of subviews separately.

Available in OS X v10.5 and later.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr2
- MBS Xojo Plugins, version 21.4pr2
- MBS Xojo / Real Studio Plugins, version 16.1pr3
- MBS Xojo / Real Studio Plugins, version 15.3pr3
- MBS Xojo / Real Studio Plugins, version 15.0pr12
- MBS Xojo / Real Studio Plugins, version 14.5pr2
- MBS Real Studio Plugins, version 13.1pr13
- MBS Real Studio Plugins, version 13.1pr9

### 52.1.2 Methods

### 52.1.3 addSublayer(layer as CALayerMBS)

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Appends the layer to the layer's list of sublayers.
**Notes:** If the array in the sublayers property is nil, calling this method creates an array for that property and adds the specified layer to it.

### 52.1.4 available as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns true if CALayer is available.
**Notes:** True on Mac and False on Windows/Linux.

### 52.1.5 Constructor

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes the layer.
**Notes:** Available in OS X v10.5 and later.

### 52.1.6 display

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Reloads the content of this layer.
**Notes:** Do not call this method directly. The layer calls this method at appropriate times to update the layer's content. If the layer has a delegate object, this method attempts to call the delegate's Configuring the Layer's Rendering Behavior method, which the delegate can use to update the layer's contents. If the delegate does not implement the Configuring the Layer's Rendering Behavior method, this method creates a backing store and calls the layer's drawInContext: method to fill that backing store with content. The new backing store replaces the previous contents of the layer.

Subclasses can override this method and use it to set the layer's contents property directly. You might do this if your custom layer subclass handles layer updates differently.

### 52.1.7 displayIfNeeded

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initiates the update process for a layer if it is currently marked as needing an update.
**Notes:** You can call this method as needed to force an update to your layer's contents outside of the normal update cycle. Doing so is generally not needed, though. The preferred way to update a layer is to call setNeedsDisplay and let the system update the layer during the next cycle.
Available in OS X v10.6 and later.

### 52.1.8 layer as CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an instance of the layer object.
**Notes:** Returns the initialized layer object or nil if initialization was not successful.
If you subclass CALayer, you may override this method and use it to provide an instance of your specific subclass.

### 52.1.9 layerFromHandle(Handle as Integer) as CALayerMBS

MBS MacCG Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a new MBS layer object for the given handle.
**Notes:** Handle must be pointing to a CALayer, UIView or NSView.
Returns nil in case of an error.
See also:

- 52.1.10 layerFromHandle(Handle as Ptr) as CALayerMBS 8622

### 52.1.10 layerFromHandle(Handle as Ptr) as CALayerMBS

MBS MacCG Plugin, Plugin Version: 21.0, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a new MBS layer object for the given handle.
**Notes:** Handle must be pointing to a CALayer, UIView or NSView.
Returns nil in case of an error.
See also:

- 52.1.9 layerFromHandle(Handle as Integer) as CALayerMBS 8622

### 52.1.11 layoutIfNeeded

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Recalculate the receiver's layout, if required.
**Notes:** When this message is received, the layer's super layers are traversed until a ancestor layer is found that does not require layout. Then layout is performed on the entire layer-tree beneath that ancestor.

### 52.1.12 layoutSublayers

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Tells the layer to update its layout.
**Notes:** Subclasses can override this method and use it to implement their own layout algorithm. Your implementation must set the frame of each sublayer managed by the receiver.

The default implementation of this method calls the layoutSublayersOfLayer method of the layer's delegate object. If there is no delegate object, or the delegate does not implement that method, this method calls the layoutSublayersOfLayer method of the object in the layoutManager property.

### 52.1.13 removeAllAnimations

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Remove all animations attached to the layer.

### 52.1.14 removeFromSuperlayer

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Detaches the layer from its parent layer.
**Notes:** You can use this method to remove a layer (and all of its sublayers) from a layer hierarchy. This method updates both the superlayer's list of sublayers and sets this layer's superlayer property to nil.
Available in OS X v10.5 and later.

### 52.1.15 renderInContext(CGContextHandle as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Renders content of CALayer into given CGContext.
**Notes:** Renders the receiver and its sublayers into the specified context.
This method renders directly from the layer tree, ignoring any animations added to the render tree. Renders in the coordinate space of the layer.

Returns true if plugin called render command, so layer can draw itself.
Not all layers support drawing into context.

### 52.1.16 renderInPicture(Pic as Picture) as boolean

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Renders content of CALayer into given Picture.

**Notes:** Renders the receiver and its sublayers into the specified context.
This method renders directly from the layer tree, ignoring any animations added to the render tree. Renders in the coordinate space of the layer.

Returns true if plugin called render command, so layer can draw itself.
Not all layers support drawing into context.

### 52.1.17 setNeedsDisplay

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Marks the layer's contents as needing to be updated.
**Notes:** Calling this method causes the layer to recache its content. This results in the layer potentially calling either the displayLayer or drawLayer:inContext method of its delegate. The existing content in the layer's contents property is removed to make way for the new content.

Available in OS X v10.5 and later.

### 52.1.18 setNeedsDisplayInRect(r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Marks the region within the specified rectangle as needing to be updated.
**Notes:** r: The rectangular region of the layer to mark as invalid. You must specify this rectangle in the layer's own coordinate system.
Available in OS X v10.5 and later.

### 52.1.19 setNeedsLayout

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Invalidates the layer's layout and marks it as needing an update.
**Notes:** You can call this method to indicate that the layout of a layer's sublayers has changed and must be updated. The system typically calls this method automatically when the layer's bounds change or when sublayers are added or removed. In OS X, if your layer's layoutManager property contains an object that implements the invalidateLayoutOfLayer method, that method is called too.

During the next update cycle, the system calls the layoutSublayers method of any layers requiring layout updates.
Available in OS X v10.5 and later.

### 52.1.20 sublayers as CALayerMBS()

MBS MacCG Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The array with sublayers.

### 52.1.21 Properties

### 52.1.22 affineTransform as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The affine version of the layer's transform..
**Notes:** The affine transform structure that corresponds to the value in the layer's transform property.
(Read and Write property)

### 52.1.23 anchorPoint as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Defines the anchor point of the layer's bounds rectangle. Animatable.
**Notes:** You specify the value for this property using the unit coordinate space. The default value of this property is (0.5, 0.5), which represents the center of the layer's bounds rectangle. All geometric manipulations to the view occur about the specified point. For example, applying a rotation transform to a layer with the default anchor point causes the layer to rotate around its center. Changing the anchor point to a different location would cause the layer to rotate around that new point.

For more information about the relationship between the frame, bounds, anchorPoint and position properties, see Core Animation Programming Guide.
Available in OS X v10.5 and later.
(Read and Write property)

### 52.1.24 anchorPointZ as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The anchor point for the layer's position along the z axis. Animatable.
**Notes:** This property specifies the anchor point on the z axis around which geometric manipulations occur. The point is expressed as a distance (measured in points) along the z axis. The default value of this property is 0.
Available in OS X v10.6 and later.

(Read and Write property)

### 52.1.25 AutoresizingMask as Integer

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A bitmask defining how the layer is resized when the bounds of its superlayer changes.
**Notes:** If your app does not use a layout manager or constraints to handle layout changes, you can assign a value to this property to adjust the layer's size in response to changes in the superlayer's bounds. For a list of possible values, see "Autoresizing Mask".

The default value of this property is kCALayerNotSizable.
(Read and Write property)

### 52.1.26 backgroundColor as Variant

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The background color of the receiver. Animatable.
**Notes:** Value must be a CGColorMBS.
The default value of this property is nil.

The value of this property is retained using the Core Foundation retain/release semantics. This behavior occurs despite the fact that the property declaration appears to use the default assign semantics for object retention.
(Read and Write property)

### 52.1.27 borderColor as Variant

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The color of the layer's border. Animatable.
**Notes:** Value must be a CGColorMBS.
The default value of this property is an opaque black color.

The value of this property is retained using the Core Foundation retain/release semantics. This behavior occurs despite the fact that the property declaration appears to use the default assign semantics for object retention.
(Read and Write property)

### 52.1.28 borderWidth as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The width of the layer's border. Animatable.
**Notes:** When this value is greater than 0.0, the layer draws a border using the current borderColor value. The border is drawn inset from the receiver's bounds by the value specified in this property. It is composited above the receiver's contents and sublayers and includes the effects of the cornerRadius property.

The default value of this property is 0.0.
(Read and Write property)

### 52.1.29 bounds as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The layer's bounds rectangle. Animatable.
**Notes:** The bounds rectangle is the origin and size of the layer in its own coordinate space. When you create a new standalone layer, the default value for this property is an empty rectangle, which you must change before using the layer. The values of each coordinate in the rectangle are measured in points.

For more information about the relationship between the frame, bounds, anchorPoint and position properties, see Core Animation Programming Guide.
(Read and Write property)

### 52.1.30 className as string

MBS MacCG Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The class name of the layer.
**Notes:** Useful for debugging.
(Read only property)

### 52.1.31 classPath as string

MBS MacCG Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The path of this layer class.
**Notes:** Useful for debugging to know what super classes the layer has.
(Read only property)

### 52.1.32 contents as Variant

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The contents of the layer.
**Notes:** Currently only CGImageMBS is allowed.
(Read and Write property)

### 52.1.33 contentsCenter as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The rectangle that defines how the layer contents are scaled during a resizing operation. Animatable.
**Notes:** You can use this property to subdivide the layer's content into a 3x3 grid. The value in this property specifies the location and size of the center rectangle in that grid. If the layer's contentsGravity property is set to one of the resizing modes, resizing the layer causes scaling to occur differently in each rectangle of the grid. The center rectangle is stretched in both dimensions, the top-center and bottom-center rectangles are stretched only horizontally, the left-center and right-center rectangles are stretched only vertically, and the four corner rectangles are not stretched at all. Therefore, you can use this technique to implement stretchable backgrounds or images using a three-part or nine-part image.

The value in this property is set to the unit rectangle (0.0,0.0) (1.0,1.0) by default, which causes the entire image to scale in both dimensions. If you specify a rectangle that extends outside the unit rectangle, the result is undefined. The rectangle you specify is applied only after the contentsRect property has been applied to the image.

Note: If the width or height of the rectangle in this property is very small or 0, the value is implicitly changed to the width or height of a single source pixel centered at the specified location.
(Read and Write property)

### 52.1.34 contentsRect as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The rectangle, in the unit coordinate space, that defines the portion of the layer's contents that should be used. Animatable.
**Notes:** Defaults to the unit rectangle (0.0, 0.0, 1.0, 1.0).
If pixels outside the unit rectangle are requested, the edge pixels of the contents image will be extended outwards.
If an empty rectangle is provided, the results are undefined.
(Read and Write property)

### 52.1.35 contentsScale as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The scale factor applied to the layer.
**Notes:** This value defines the mapping between the logical coordinate space of the layer (measured in points) and the physical coordinate space (measured in pixels). Higher scale factors indicate that each point in the layer is represented by more than one pixel at render time. For example, if the scale factor is 2.0 and the layer's bounds are 50 x 50 points, the size of the bitmap used to present the layer's content is 100 x 100 pixels.

The default value of this property is 1.0. For layers attached to a view, the view changes the scale factor automatically to a value that is appropriate for the current screen. For layers you create and manage yourself, you must set the value of this property yourself based on the resolution of the screen and the content you are providing. Core Animation uses the value you specify as a cue to determine how to render your content.

Available in OS X v10.7 and later.
(Read and Write property)

### 52.1.36 cornerRadius as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The radius to use when drawing rounded corners for the layer's background. Animatable.
**Notes:** Setting the radius to a value greater than 0.0 causes the layer to begin drawing rounded corners on its background. By default, the corner radius does not apply to the image in the layer's contents property; it applies only to the background color and border of the layer. However, setting the masksToBounds property to true causes the content to be clipped to the rounded corners.

The default value of this property is 0.0.
(Read and Write property)

### 52.1.37 DoubleSided as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether the layer displays its content when facing away from the viewer. Animatable.
**Notes:** When the value in this property is false, the layer hides its content when it faces away from the viewer. The default value of this property is true.
Available in OS X v10.5 and later.
(Read and Write property)

### 52.1.38 drawsAsynchronously as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether drawing commands are deferred and processed asynchronously in a background thread.
**Notes:** When this property is set to true, the graphics context used to draw the layer's contents queues drawing commands and executes them on a background thread rather than executing them synchronously. Performing these commands asynchronously can improve performance in some apps. However, you should always measure the actual performance benefits before enabling this capability.

The default value for this property is false.
Available in OS X v10.8 and later.
(Read and Write property)

### 52.1.39 frame as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The layer's frame rectangle.
**Notes:** The frame rectangle is position and size of the layer specified in the superlayer's coordinate space. For layers, the frame rectangle is a computed property that is derived from the values in the bounds, anchorPoint and position properties. When you assign a new value to this property, the layer changes its position and bounds properties to match the rectangle you specified. The values of each coordinate in the rectangle are measured in points.

For more information about the relationship between the frame, bounds, anchorPoint and position properties, see Core Animation Programming Guide.

Note: The frame property is not directly animatable. Instead you should animate the appropriate combination of the bounds, anchorPoint and position properties to achieve the desired result.
(Read and Write property)

### 52.1.40 Handle as Integer

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The internal reference to the layer.
**Notes:** (Read and Write property)

### 52.1.41 Hidden as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether the layer is displayed. Animatable.
**Notes:** The default value of this property is false.
(Read and Write property)

### 52.1.42 mask as CALayerMBS

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The layer to be used as mask for this layer.
**Notes:** A layer whose alpha channel is used as a mask to select between the layer's background and the result of compositing the layer's contents with its filtered background. Defaults to nil. When used as a mask the layer's 'compositingFilter' and 'backgroundFilters' properties are ignored. When setting the mask to a new layer, the new layer must have a nil superlayer, otherwise the behavior is undefined. Nested masks (mask layers with their own masks) are unsupported.
(Read and Write property)

### 52.1.43 masksToBounds as Boolean

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether to mask by bounds.
**Notes:** When true an implicit mask matching the layer bounds is applied to the layer (including the effects of the 'cornerRadius' property). If both 'mask' and 'masksToBounds' are non-nil the two masks are multiplied to get the actual mask values. Defaults to false. Animatable.
(Read and Write property)

### 52.1.44 minificationFilterBias as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The bias factor used by the minification filter to determine the levels of detail.
**Notes:** This value is used by the minificationFilter when it is set to kCAFilterTrilinear.
The default value of this property is 0.0.
Available in OS X v10.6 and later.
(Read and Write property)

### 52.1.45 modelLayer as CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the model layer object associated with the receiver, if any.
**Notes:** Calling this method on a layer in the presentation tree returns the corresponding layer object in the model tree. This method returns a value only when a transaction involving changes to the presentation layer is in progress. If no transaction is in progress, the results of calling this method are undefined.

Available in OS X v10.5 and later.
(Read only property)

### 52.1.46 needsDisplay as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether the layer has been marked as needing an update.
**Notes:** True if the layer needs to be updated.
Available in OS X v10.6 and later.
(Read only property)

### 52.1.47 needsDisplayOnBoundsChange as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether the layer contents must be updated when its bounds rectangle changes.
**Notes:** When this property is set to true, the layer automatically calls its setNeedsDisplay method whenever its bounds property changes. The default value of this property is false.
(Read and Write property)

### 52.1.48 needsLayout as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether the layer has been marked as needing a layout update.
**Notes:** True if the layer has been marked as requiring a layout update.
Available in OS X v10.6 and later.
(Read only property)

### 52.1.49 opacity as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The opacity of the receiver. Animatable.
**Notes:** The value of this property must be in the range 0.0 (transparent) to 1.0 (opaque). Values outside that range are clamped to the minimum or maximum. The default value of this property is 1.0.
(Read and Write property)

### 52.1.50 Opaque as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the layer contains completely opaque content.
**Notes:** The default value of this property is false. If your app draws completely opaque content that fills the layer's bounds, setting this property to true lets the system optimize the rendering behavior for the layer. Specifically, when the layer creates the backing store for your drawing commands, Core Animation omits the alpha channel of that backing store. Doing so can improve the performance of compositing operations. If you set the value of this property to true, you must fill the layer's bounds with opaque content.

Setting this property affects only the backing store managed by Core Animation. If you assign an image with an alpha channel to the layer's contents property, that image retains its alpha channel regardless of the value of this property.
(Read and Write property)

### 52.1.51 position as CGRectMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The layer's position in its superlayer's coordinate space. Animatable.
**Notes:** The value of this property is specified in points and is always specified relative to the value in the anchorPoint property. For new standalone layers, the default position is set to (0.0, 0.0). Changing the frame property also updates the value in this property.

For more information about the relationship between the frame, bounds, anchorPoint and position properties, see Core Animation Programming Guide.
(Read and Write property)

### 52.1.52 preferredFrameSize as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the preferred size of the layer in the coordinate space of its superlayer.
**Notes:** In OS X, the default implementation of this method calls the preferredSizeOfLayer method of its layout manager—that is, the object in its layoutManager property. If that object does not exist or does not implement that method, this method returns the size of the layer's current bounds rectangle mapped into the coordinate space of its superlayer.
(Read only property)

### 52.1.53 presentationLayer as CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a copy of the presentation layer object that represents the state of the layer as it currently appears onscreen.
**Notes:** The layer object returned by this method provides a close approximation of the layer that is currently being displayed onscreen. While an animation is in progress, you can retrieve this object and use it to get the current values for those animations.

The sublayers, mask, and superlayer properties of the returned layer return the corresponding objects from the presentation tree (not the model tree). This pattern also applies to any read-only layer methods. For example, the hitTest: method of the returned object queries the layer objects in the presentation tree.

Available in OS X v10.5 and later.
(Read only property)

### 52.1.54 rasterizationScale as Double

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The scale at which the layer will be rasterized.
**Notes:** (when the shouldRasterize property has been set to true) relative to the coordinate space of the layer. Defaults to one. Animatable.
(Read and Write property)

### 52.1.55 shadowColor as Variant

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The color of the layer,Äôs shadow. Animatable.
**Notes:** The default value of this property is an opaque black color.

The value of this property is retained using the Core Foundation retain/release semantics. This behavior

occurs despite the fact that the property declaration appears to use the default assign semantics for object retention.

Value is a CGColorMBS object.
(Read and Write property)

### 52.1.56 shadowOffset as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The offset (in points) of the layer,Äôs shadow. Animatable.
**Notes:** The default value of this property is (0.0, -3.0).
(Read and Write property)

### 52.1.57 shadowOpacity as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The opacity of the layer's shadow. Animatable.
**Notes:** The value in this property must be in the range 0.0 (transparent) to 1.0 (opaque). The default value of this property is 0.0.
Available in OS X v10.5 and later.
(Read and Write property)

### 52.1.58 shadowPath as Variant

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The shadow path.
**Notes:** Value is a CGPathMBS object.

The default value of this property is nil, which causes the layer to use a standard shadow shape. If you specify a value for this property, the layer creates its shadow using the specified path instead of the layer,Äôs composited alpha channel. The path you provide defines the outline of the shadow. It is filled using the non-zero winding rule and the current shadow color, opacity, and blur radius.

Unlike most animatable properties, this property (as with all CGPathRef animatable properties) does not support implicit animation. However, the path object may be animated using any of the concrete subclasses of CAPropertyAnimation. Paths will interpolate as a linear blend of the "on-line" points; "off-line" points may be interpolated non-linearly (to preserve continuity of the curve's derivative). If the two paths have a different number of control points or segments, the results are undefined. If the path extends outside the

layer bounds it will not automatically be clipped to the layer, only if the normal layer masking rules cause that.

Specifying an explicit path usually improves rendering performance.

The value of this property is retained using the Core Foundation retain/release semantics. This behavior occurs despite the fact that the property declaration appears to use the default assign semantics for object retention.
(Read and Write property)

### 52.1.59 shadowRadius as Double

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The blur radius (in points) used to render the layer,Äôs shadow. Animatable.
**Notes:** You specify the radius The default value of this property is 3.0.
(Read and Write property)

### 52.1.60 shouldRasterize as Boolean

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether view should raster.
**Notes:** When true, the layer is rendered as a bitmap in its local coordinate space (”rasterized”), then the bitmap is composited into the destination (with the minificationFilter and magnificationFilter properties of the layer applied if the bitmap needs scaling). Rasterization occurs after the layer's filters and shadow effects are applied, but before the opacity modulation. As an implementation detail the rendering engine may attempt to cache and reuse the bitmap from one frame to the next. (Whether it does or not will have no affect on the rendered output.) When false the layer is composited directly into the destination whenever possible (however, certain features of the compositing model may force rasterization, e.g. adding filters). Defaults to false. Animatable.
(Read and Write property)

### 52.1.61 superlayer as CALayerMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The superlayer of the layer.
**Notes:** The superlayer manages the layout of its sublayers.
Available in OS X v10.5 and later.
(Read only property)

### 52.1.62 zPosition as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The layer's position on the z axis. Animatable.
**Notes:** The default value of this property is 0. Changing the value of this property changes the the front-to-back ordering of layers onscreen. This can affect the visibility of layers whose frame rectangles overlap.

The value of this property is measured in points.
Available in OS X v10.5 and later.
(Read and Write property)

### 52.1.63 Constants

Edge constants

| Constant | Value | Description |
|---|---|---|
| kCALayerBottomEdge | 4 | Specifies that the bottom edge of the receiver's content should be antialiased. |
| kCALayerLeftEdge | 1 | Specifies that the left edge of the receiver's content should be antialiased. |
| kCALayerRightEdge | 2 | Specifies that the right edge of the receiver's content should be antialiased. |
| kCALayerTopEdge | 8 | Specifies that the top edge of the receiver's content should be antialiased. |

Autoresize Mask Constants

| Constant | Value | Description |
|---|---|---|
| kCALayerHeightSizable | 16 | The receiver's height is flexible. |
| kCALayerMaxXMargin | 4 | The left margin between the receiver and its superview is flexible. |
| kCALayerMaxYMargin | 32 | The top margin between the receiver and its superview is flexible. |
| kCALayerMinXMargin | 1 | The left margin between the receiver and its superview is flexible. |
| kCALayerMinYMargin | 8 | The top margin between the receiver and its superview is flexible. |
| kCALayerNotSizable | 0 | The receiver cannot be resized. |
| kCALayerWidthSizable | 2 | The receiver's width is flexible. |

## 52.2 class CATextLayerMBS

### 52.2.1 class CATextLayerMBS

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The text layer provides simple text layout and rendering of plain or attributed strings.
**Notes:** The first line is aligned to the top of the layer.
Subclass of the CALayerMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr1

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

### 52.2.2 Methods

### 52.2.3 Constructor

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 52.2.4 kCAAlignmentCenter as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for alignment.

### 52.2.5 kCAAlignmentJustified as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for alignment.

### 52.2.6 kCAAlignmentLeft as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for alignment.

### 52.2.7 kCAAlignmentNatural as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for alignment.

### 52.2.8 kCAAlignmentRight as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for alignment.

### 52.2.9 kCATruncationEnd as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for truncation.

### 52.2.10 kCATruncationMiddle as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for truncation.

### 52.2.11 kCATruncationNone as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for truncation.

### 52.2.12 kCATruncationStart as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** One of the modes for truncation.

### 52.2.13 Properties

### 52.2.14 alignmentMode as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Describes how individual lines of text are aligned within the layer bounds.
**Notes:** The possible options are 'natural', 'left', 'right', 'center' and 'justified'. Defaults to 'natural'.
(Read and Write property)

### 52.2.15 allowsFontSubpixelQuantization as Boolean

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Sets allowsFontSubpixelQuantization parameter of CGContextMBS passed to the drawInContext method.
**Notes:** Defaults to false.
(Read and Write property)

### 52.2.16 font as Variant

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The font to use.
**Notes:** May be either a CTFontMBS, NSFontMBS, CGFontMBS, or a string naming the font.
Defaults to the Helvetica font. Only used when the 'string' property is not an NSAttributedStringMBS object.
(Read and Write property)

### 52.2.17 fontSize as Double

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The font size.
**Notes:** Defaults to 36. Only used when the 'string' property is not an NSAttributedStringMBS. Animatable

(Mac OS X 10.6 and later.)
(Read and Write property)

### 52.2.18 foregroundColor as Variant

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The color object used to draw the text.
**Notes:** Defaults to opaque white.
Only used when the 'string' property is not an NSAttributedStringMBS object.
Animatable (Mac OS X 10.6 and later.)
(Read and Write property)

### 52.2.19 String as Variant

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** The text to be rendered, should be either a string or an NSAttributedString.
**Notes:** Defaults to nil.
(Read and Write property)

### 52.2.20 truncationMode as String

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Describes how the string is truncated to fit within the layer bounds.
**Notes:** The possible options are 'none', 'start', 'middle' and 'end'. Defaults to 'none'.
(Read and Write property)

### 52.2.21 Wrapped as Boolean

MBS MacCG Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** When true the string is wrapped to fit within the layer bounds.
**Notes:** Defaults to false.
(Read and Write property)

## 52.3 class CATransactionMBS

### 52.3.1 class CATransactionMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The plugin class for a CoreAnimation transaction.
**Notes:** CATransaction is the Core Animation mechanism for batching multiple layer-tree operations into atomic updates to the render tree. Every modification to a layer tree must be part of a transaction. Nested transactions are supported.

Core Animation supports two types of transactions: implicit transactions and explicit transactions. Implicit transactions are created automatically when the layer tree is modified by a thread without an active transaction and are committed automatically when the thread's run-loop next iterates. Explicit transactions occur when the the application sends the CATransaction class a begin message before modifying the layer tree, and a commit message afterwards.

CATransaction allows you to override default animation properties that are set for animatable properties. You can customize duration, timing function, whether changes to properties trigger animations, and provide a handler that informs you when all animations from the transaction group are completed.

During a transaction you can temporarily acquire a recursive spin-lock for managing property atomicity.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9

### 52.3.2 Methods

### 52.3.3 animationDuration as Double

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the animation duration used by all animations within this transaction group.

### 52.3.4 available as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns true if transaction class is available.
**Notes:** Returns true on Mac and false on Linux/Windows.

### 52.3.5 begin

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Begin a new transaction for the current thread.
**Notes:** The transaction is nested within the thread's current transaction, if there is one.
Available in OS X v10.5 and later.

### 52.3.6 commit

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Commit all changes made during the current transaction.
**Notes:** Raises an exception if no current transaction exists.
Available in OS X v10.5 and later.

### 52.3.7 Constructor

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 52.3.8 flush

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Flushes any extant implicit transaction.
**Notes:** Delays the commit until any nested explicit transactions have completed.

Flush is typically called automatically at the end of the current runloop, regardless of the runloop mode. If your application does not have a runloop, you must call this method explicitly.

However, you should attempt to avoid calling flush explicitly. By allowing flush to execute during the runloop your application will achieve better performance, atomic screen updates will be preserved, and transactions and animations that work from transaction to transaction will continue to function.

Available in OS X v10.5 and later.

### 52.3.9 kCATransactionAnimationDuration as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for values of a transaction.
**Notes:** Duration, in seconds, for animations triggered within the transaction group. The value for this key must be a number.
Available in OS X v10.5 and later.

### 52.3.10 kCATransactionDisableActions as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keys for values of a transaction.
**Notes:** If true, implicit actions for property changes made within the transaction group are suppressed. The value for this key must be a boolean.
Available in OS X v10.5 and later.

### 52.3.11 setAnimationDuration(value as Double)

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Sets the animation duration used by all animations within this transaction group.
**Notes:** Available in OS X v10.6 and later.

### 52.3.12 setValue(value as Variant, key as string)

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Sets the arbitrary keyed-data for the specified key.
**Notes:** value: The value for the key identified by key.
key: The name of one of the receiver's properties.

Nested transactions have nested data scope; setting a key always sets it in the innermost scope.
Available in OS X v10.5 and later.

### 52.3.13 valueForKey(key as string) as Variant

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the arbitrary keyed-data specified by the given key.
**Notes:** key: The name of one of the receiver's properties.

Returns the value for the data specified by the key.
Nested transactions have nested data scope. Requesting a value for a key first searches the innermost scope, then the enclosing transactions.
Available in OS X v10.5 and later.

### 52.3.14 Properties

### 52.3.15 Handle as Integer

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The internal transaction handle.
**Notes:** (Read and Write property)

# Chapter 53

# CoreAudio

## 53.1 class AudioPlayThruMBS

### 53.1.1 class AudioPlayThruMBS

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to do active play through on Mac OS X using CoreAudio.
**Notes:** Requires Mac OS X 10.4.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr3

### 53.1.2 Methods

### 53.1.3 Constructor

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Example:**

```
dim a as AudioPlayThruMBS
a=new AudioPlayThruMBS
```

**Notes:** Does nothing.
Only useful if you want to create an object, set the buffersize and call Init after that.
See also:

• 53.1.4 Constructor(InputDeviceID as Integer, OutputDeviceID as Integer, BufferSizeWish as Integer = 0) 8648

### 53.1.4 Constructor(InputDeviceID as Integer, OutputDeviceID as Integer, BufferSizeWish as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Example:**

```
dim InputDeviceID,OutputDeviceID as Integer
// get device IDs
dim a as AudioPlayThruMBS

a=new AudioPlayThruMBS(InputDeviceID, OutputDeviceID)
```

**Notes:** Calls Init method behind scenes with default buffer size.
Lasterror is set.
Device IDs are the IDs you get in the CoreAudio classes.
BufferSizeWish is the buffer size you prefer to use. If value is too small the default value will be used.
See also:

• 53.1.3 Constructor 8647

### 53.1.5 Init(InputDeviceID as Integer, OutputDeviceID as Integer, BufferSizeWish as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the engine behind this class.
**Example:**

```
dim InputDeviceID as Integer
dim OutputDeviceID as Integer
// get device IDs

dim a as AudioPlayThruMBS
a=new AudioPlayThruMBS
a.Init(InputDeviceID, OutputDeviceID)
```

**Notes:** Lasterror is set.
Device IDs are the IDs you get in the CoreAudio classes.

Can be used to set the buffersize before calling this method.

### 53.1.6 IsRunning as boolean

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether playthrough is active.

### 53.1.7 SetInputDeviceAsCurrent(DeviceID as Integer)

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets input device.
**Notes:** Device IDs are the IDs you get in the CoreAudio classes.

### 53.1.8 SetOutputDeviceAsCurrent(DeviceID as Integer)

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets output device.
**Notes:** Lasterror is set.
Device IDs are the IDs you get in the CoreAudio classes.

### 53.1.9 Start

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Starts playing.
**Notes:** Lasterror is set.

### 53.1.10 Stop

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops playing.
**Notes:** Lasterror is set.

### 53.1.11 Properties

### 53.1.12 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** 0 for success. -1 in case function is not available.
(Read and Write property)

### 53.1.13 Volume as Double

MBS MacOSX Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get or set the volume of the output audio unit.
**Notes:** Lasterror is set.
Range is from 0.0 to 1.0.
(Read and Write computed property)

# Chapter 54

# CoreFoundation

## 54.1 Globals

### 54.1.1 NewCFObjectMBSFromXML(XMLdata as MemoryBlock) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Notes:** Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.
See also:

- 54.1.2 NewCFObjectMBSFromXML(XMLdata as String) as CFObjectMBS 8651

### 54.1.2 NewCFObjectMBSFromXML(XMLdata as String) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Notes:** Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.
See also:

- 54.1.1 NewCFObjectMBSFromXML(XMLdata as MemoryBlock) as CFObjectMBS 8651

### 54.1.3 NewCFStringMBS2(s as string) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Returns a CFStringMBS object created using the given string.
**Example:**

```
dim s as CFStringMBS

s=NewCFStringMBS2("")
// s is not nil here
MsgBox str(s.Handle)
```

**Notes:** The cfstring may be unicode.
See also NewCFStringMBS.

### 54.1.4 kCFCharacterSetMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFCharacterSetMBS object.

### 54.1.5 NewCFObjectMBSFromXMLMT(data as string) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Notes:** Same as NewCFObjectMBSFromXML, but with additional multithreading.

Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:


- 54.1.6 NewCFObjectMBSFromXMLMT(file as folderitem) as CFObjectMBS 8652
- 54.1.7 NewCFObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CFObjectMBS 8653


### 54.1.6 NewCFObjectMBSFromXMLMT(file as folderitem) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")
dim o as CFObjectMBS = NewCFObjectMBSFromXMLMT(f)

if o = nil then
MsgBox "Error"
else
MsgBox "OK"
end if
```

**Notes:** Same as NewCFObjectMBSFromXML, but with additional multithreading.

Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 54.1.5 NewCFObjectMBSFromXMLMT(data as string) as CFObjectMBS 8652
- 54.1.7 NewCFObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CFObjectMBS 8653

### 54.1.7 NewCFObjectMBSFromXMLMT(XMLdata as CFBinaryDataMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Notes:** Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 54.1.5 NewCFObjectMBSFromXMLMT(data as string) as CFObjectMBS 8652
- 54.1.6 NewCFObjectMBSFromXMLMT(file as folderitem) as CFObjectMBS 8652

### 54.1.8 CFShowCFStringMBS(cfstring as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Prints the content of the given CFString to the console.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr3

### 54.1.9 CFShowMBS(cfobject as CFObjectMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Prints the content of the given CFObject to the console.
**Notes:** Very useful for e.g. CFDictionarys.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr3

### 54.1.10 CreateBundleMBS(file as folderitem) as CFBundleMBS

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates a CFBundle object for the bundle folder on the given position.
**Example:**

```
// Find and show the main executable file of a bundled application

dim f as FolderItem

f=SpecialFolder.Applications.Child("Mail.app")
MsgBox f.NativePath // shows app bundle path

dim b as CFBundleMBS
dim u as CFURLMBS

b=CreateBundleMBS(f)
if b<>nil then
u=b.ExecutableFile
if u<>nil then
MsgBox f.NativePath // shows app executable path
end if
end if
```

**Notes:** Returns nil on any error.
See also:

• 54.1.11 CreateBundleMBS(url as CFURLMBS) as CFBundleMBS 8655

### 54.1.11 CreateBundleMBS(url as CFURLMBS) as CFBundleMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a CFBundle object for the bundle folder on the given position.
**Example:**

```
// Find and show the main executable file of a bundled application

dim f as FolderItem

f=SpecialFolder.Applications.Child("Mail.app")
MsgBox f.NativePath // shows app bundle path

dim b as CFBundleMBS
dim u as CFURLMBS

u=NewCFURLMBSFile(f)
if u<>Nil then
b=CreateBundleMBS(u)
if b<>nil then
u=b.ExecutableFile
if u<>nil then
MsgBox f.NativePath // shows app executable path
end if
end if
end if
```

**Notes:** Returns nil on any error.
See also:

• 54.1.10 CreateBundleMBS(file as folderitem) as CFBundleMBS 8654

### 54.1.12 CreateBundlesFromDirectoryMBS(url as CFURLMBS, type as CFStringMBS) as CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all bundles in a folder.
**Notes:** Returns nil on any error.

With the Type parameter you can limit the bundles to a certain type.
The abstract type of the bundles you wish to locate and create. The type is expressed as a filename exten-

sion, such as bundle. Pass NULL to create CFBundle objects for bundles of any type.

### 54.1.13 CreateCFTimeZoneMBS(name as CFStringMBS, data as CFBinaryDataMBS) as CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Creates a new timezone object with the given name and data.
**Notes:** Returns nil on any error.

### 54.1.14 CreateCFTimeZoneMBSwithName(name as CFStringMBS, TryAbbrev as boolean) as CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Creates a new timezone object with the object from the system which matches the given name.
**Notes:** If TryAbbrev is true the system also checks if the name matches the abbreviated name of the timezone object.
Returns nil on any error.

### 54.1.15 CreateCFTimeZoneMBSwithTimeIntervalFromGMT(time as CFTimeIntervalMBS) as CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Creates a new timezone object with the given time interval.
**Notes:** Returns nil on any error.

### 54.1.16 CreateStringByAddingPercentEscapesMBS(original as CFStringMBS,charactersToLeaveEscaped as CFStringMBS,legalURLCharactersToBeEscaped as CFStringMBS,encoding as Integer) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Addes percent escapes inside a string.
**Notes:** If charactersToLeaveEscaped=nil then no string is changed. If charactersToLeaveEscaped contains an emptry string (””) all escapes are changed and if charactersToLeaveEscaped contains a string<>”” then this characters are not escaped.

### 54.1.17 CreateStringByReplacingPercentEscapesMBS(original as CFStringMBS,charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces percent escapes inside a string.
**Notes:** If charactersToLeaveEscaped=nil then no string is changed. If charactersToLeaveEscaped contains an emptry string ("") all escapes are changed and if charactersToLeaveEscaped contains a string<>"" then this characters are not escaped.

### 54.1.18 CurrentCFAbsoluteTimeMBS as CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The current time as an absolute time object.
**Example:**

```
// get current timezone
dim c as CFTimeZoneMBS = SystemCFTimeZoneMBS

// and current time
dim time as CFAbsoluteTimeMBS = CurrentCFAbsoluteTimeMBS

// Do we have daylight saving time?
MsgBox str(c.IsDaylightSavingTime(time))
```

**Notes:** Returns nil on any error.

### 54.1.19 GetAllBundlesMBS as CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all known bundles on the system.
**Notes:** Returns nil on any error.

### 54.1.20 GetBundleWithIdentifierMBS(id as CFStringMBS) as CFBundleMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a CFBundle object for the bundle with the given ID.
**Notes:** Returns nil on any error.

Returns only a bundle if that bundle has been loaded before.

For a bundle to be located using its identifier, the bundle object must have already been created. The principal intended purpose for locating bundles by identifier is so that code (in frameworks, plugins, etc.) can find its own bundle. If a bundle is created, then the bundle deleted from the filesystem and this function invoked afterwards, it will still return the original bundle.

### 54.1.21 GetDefaultCFTimeZoneMBS as CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The default time zone.
**Example:**

msgBox str(GetDefaultCFTimeZoneMBS.SecondsFromGMT(nil).Value)

**Notes:** Returns nil on any error.

### 54.1.22 kCFArrayMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFArrayMBS object.

### 54.1.23 kCFBagMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFBagMBS object.

### 54.1.24 kCFBinaryDataMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFBinary object.

### 54.1.25 kCFBooleanMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFBooleanMBS object.

### 54.1.26 kCFBundleMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFBundle object.
**Notes:** CFBundle objects may be supported in a future version of this plugin.
Request if you need more than the app.bundle functions offer you.

### 54.1.27 kCFDateMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFDateMBS object.

### 54.1.28 kCFDictionaryMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFDictionaryMBS object.

### 54.1.29 kCFNumberMBSNaN as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for NaN (not a number).

### 54.1.30 kCFNumberMBSNegativeInfinity as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for negative infinity.

### 54.1.31 kCFNumberMBSPositiveInfinity as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for positive infinity.

### 54.1.32 kCFNumberMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFNumberMBS object.

### 54.1.33 kCFSetMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFSetMBS object.

### 54.1.34 kCFStringMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFStringMBS object.

### 54.1.35 kCFTimeZoneMBSTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFTimeZone object.

### 54.1.36 kCFURLMBSTypeID as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFURLMBS object.

### 54.1.37 KnownTimeZoneNamesAsCFArrayMBS as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** An array of all known time zone names.
**Notes:** Returns nil on any error.

### 54.1.38 MacShowAboutBoxMBS(options as CFDictionaryMBS) as Integer

MBS MacCF Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Displays an HI-conformant about box.
**Example:**

```
dim kHIAboutBoxNameKey as CFStringMBS = NewCFStringMBS("HIAboutBoxName")
dim kHIAboutBoxVersionKey as CFStringMBS = NewCFStringMBS("HIAboutBoxVersion")
dim kHIAboutBoxCopyrightKey as CFStringMBS = NewCFStringMBS("HIAboutBoxCopyright")
dim kHIAboutBoxDescriptionKey as CFStringMBS = NewCFStringMBS("HIAboutBoxDescription")
dim kHIAboutBoxStringFileKey as CFStringMBS = NewCFStringMBS("HIAboutBoxStringFile")

dim d as CFMutableDictionaryMBS

d=NewCFMutableDictionaryMBS

// name, version and copyright are optional:
d.add(kHIAboutBoxNameKey, NewCFStringMBS("MyApp"))
d.add(kHIAboutBoxVersionKey, NewCFStringMBS("1.0"))
d.add(kHIAboutBoxCopyrightKey, NewCFStringMBS("©2009 by Christian Schmitz"))

// description is needed
d.add(kHIAboutBoxDescriptionKey, NewCFStringMBS("The best application I ever made!"))

// optional
'd.add(kHIAboutBoxStringFileKey, NewCFStringMBS("somefile"))

MsgBox Str(MacShowAboutBoxMBS(d))
```

**Notes:** This about box is a generic about box that automatically can display your application name, version string, and copyright string. It peeks into either the Info.plist (for the CFBundleName, CFBundleVersion, and CFBundleGetInfoString keys) or your bundle resource (not recommended) to get the information by default. You can customize what it displays by passing in various options in the input dictionary. Note that currently the description string can only be specified in the options dictionary; this function does not check your Info.plist for a descriptions string.

There are three basic ways to call this function. First, you can pass nil for inOptions. As mentioned, default

information will be displayed. Second, you can pass the actual values for the strings displayed by passing the strings in the inOptions dictionary using the keys provided, such as kHIAboutBoxNameKey. If a replacement string is not passed, the default behavior kicks in. For example, you could pass some variant of your application name in the dictionary, but not pass a replacement version or copyright strings. The Toolbox would display your replacement string, and fall back to looking in the Info.plist for the other strings. The third way to call this is to pass the name of a string file in the dictionary with the key kHIAboutBoxStringFileKey. We will automatically use that file to find the strings for the about box. The keys in the string file should be the same value as the keys you would use to pass into the inOptions dictionary. Again, if a string is not found in that file, we would fall back to looking for a string in the dictionary, and then finally the Info.plist. Certainly this is not the be-all-end-all of about boxes, but it does provide a simple no-work about box for your application. The standard Toolbox application handler now responds to the kHICommandAbout command ID by calling HIAboutBox for you. This means that any Carbon Event-based application will get this behavior for free right out of the box. If you wish for the window to respond to cmd-W in the menu bar, you should make sure that menu item has the kHICommandClose commandID.

Options: A dictionary of replacement strings, or the name of a string file to retrieve the strings from, or nil. See the discussion for how this is used.

Returns a Mac OS error code or -1 if function is not available.
Not supported on 64 bit targets.
**Blog Entries**

- MBS REALbasic plug-ins version 9.3

**Xojo Developer Magazine**

- 7.4, page 8: News

### 54.1.39 NewCFAbsoluteTimeMBS(time as Double) as CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns a new absolute time object with the given value.
**Notes:** Returns nil on any error.

### 54.1.40 NewCFBinaryDataMBSMem(mem as memoryblock,len as Integer) as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFBinary object for the given memoryblock.

### 54.1.41 NewCFBinaryDataMBSStr(s as string) as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFBinary object for the given string.
**Example:**

```
dim t as TextOutputStream
dim f as FolderItem
dim o as CFObjectMBS
dim s as string
dim i as TextInputStream

f=SpecialFolder.Desktop.Child("test")
o=NewCFStringMBS("Hello")

// write

s=o.XML.str
s=ConvertEncoding(s,Encodings.UTF8)

t=f.CreateTextFile
t.Write s
t.Close

// clear

o=nil

// now read back

i=f.OpenAsTextFile
s=i.ReadAll(Encodings.UTF8)
i.Close

o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

MsgBox CFStringMBS(o).str
```

### 54.1.42 NewCFBooleanMBS(value as boolean) as CFBooleanMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFBooleanMBS object created using the given boolean.

### 54.1.43 NewCFDateMBS as CFDateMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a new emptry CFDateMBS.

### 54.1.44 NewCFMutableArrayMBS as CFMutableArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new empty mutable array.
**Notes:** The array's maximum capacity is unlimited (or rather, only limited by address space and available memory constraints).

### 54.1.45 NewCFMutableBagMBS as CFMutableBagMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a new emptry CFMutableBagMBS.

### 54.1.46 NewCFMutableBinaryDataMBSMem(len as Integer) as CFMutableBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFMutableBinary object with the given size in bytes.

### 54.1.47 NewCFMutableDictionaryMBS as CFMutableDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a new emptry CFMutableDictionaryMBS.
**Example:**

```
dim d as CFMutableDictionaryMBS

d=NewCFMutableDictionaryMBS
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")
MsgBox d.XML.str
```

**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr10

### 54.1.48 NewCFMutableSetMBS as CFMutableSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a new emptry CFMutableSetMBS.

### 54.1.49 NewCFNumberMBSDouble(doubleValue as Double) as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for the given double value.

### 54.1.50 NewCFNumberMBSInteger(integerValue as Integer) as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for the given integer value.

### 54.1.51 NewCFNumberMBSSingle(singleValue as single) as CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFNumberMBS object for the given single value.

### 54.1.52 NewCFObjectMBS(handle as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFObjectMBS object for the given handle.
**Example:**

```
dim d as CFMutableDictionaryMBS
dim s as CFStringMBS
dim o as CFObjectMBS
dim t as CFStringMBS
```

```
d=NewCFMutableDictionaryMBS
s=NewCFStringMBS("Hello")

d.Add s,s

o=d.Value(s) // uses NewCFObjectMBS internally

t=cfstringMBS(o) // Now you can cast here in v5.2!

MsgBox t.str
```

**Notes:** Handle is just a CFTypeRef.
If release is true, the destructor of the CFObjectMBS will release the handle later.
In Version 5.2 this function can return objects which may be casted to CFURL, CFDictionary, CFString, CFNumber, CFCharacterSet, CFBag, CFArray, CFBoolean, CFBinaryData or CFSet.

### 54.1.53 NewCFObjectMBSFromXML(XMLdata as CFBinaryDataMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Parses the XML data and returns a CFObject.
**Example:**

```
dim f as FolderItem
dim t as TextInputStream
dim s as String
dim o as CFObjectMBS
dim d as CFDictionaryMBS

// get file name
f=GetFolderItem("CF XML Test.txt")
// open file
t=f.OpenAsTextFile
// Read String
s=t.ReadAll

// Create back
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// now check if the dictionary we saved is there:
if o<>nil then
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
```

```
MsgBox CFStringMBS(d.Value(NewCFStringMBS("Key"))).str
end if
end if
```

**Notes:** Note that the CFObject returned is in most times a CFDictionary or a CFArray.
This function takes text and binary plist file content.

### 54.1.54 NewCFStringMBS(s as string) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a CFStringMBS object created using the given string.
**Notes:** Returns nil if s is empty.
The cfstring may be unicode.

See also NewCFStringMBS2 if you want to get an empty CFString object for an empty string.

### 54.1.55 NewCFTimeIntervalMBS(time as Double) as CFTimeIntervalMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns a new time interval object with the given value.
**Notes:** Returns nil on any error.

### 54.1.56 NewCFURLMBSCFStringMBS(cfstr as CFStringMBS, baseurl as CFURLMBS) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the CFStringMBS.

### 54.1.57 NewCFURLMBSFile(f as folderitem) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from a file.

### 54.1.58 NewCFURLMBSHFSPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the CFStringMBS which is interpreted as a HFS path.

### 54.1.59 NewCFURLMBSMem(mem as memoryblock,len as Integer,encoding as Integer,baseurl as CFURLMBS) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the data inside the memoryblock.
**Notes:** Len is the len of the data inside the memoryblock.
Encoding the ID of the text encoding.
BaseURL is the base url. If baseurl=nil then the current application directory is used.

### 54.1.60 NewCFURLMBSPosixPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the CFStringMBS which is interpreted as a Posix path.

### 54.1.61 NewCFURLMBSStr(str as string, baseurl as CFURLMBS) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the string.
**Example:**

```
dim s as string
dim f as FolderItem
dim cu as CFURLMBS

s="file://localhost/Users/cs/Music/iTunes/iTunes%20Music"

cu=NewCFURLMBSStr(s,nil) // true=isdirectory
f=cu.file

MsgBox f.NativePath
```

**Notes:** BaseURL is the base url. If baseurl=nil then the current application directory is used.

### 54.1.62 NewCFURLMBSWindowsPath(cfstr as CFStringMBS,directory as boolean) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new CFURLMBS from the CFStringMBS which is interpreted as a Windows path.

### 54.1.63 SetDefaultCFTimeZoneMBS(timezone as CFTimeZoneMBS)

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The default time zone.
**Example:**

msgBox str(GetDefaultCFTimeZoneMBS.SecondsFromGMT(nil).Value)

**Notes:** Returns nil on any error.

### 54.1.64 SystemCFTimeZoneMBS as CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The current system time zone.
**Example:**

```
dim s as CFTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox s.Name.str
```

**Notes:** Returns nil on any error.

### 54.1.65 TypeIDDescriptionMBS(TypeID as Integer) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a string with the name for the CoreFoundation data type.
**Notes:** e.g. "CFStringMBS" for a CFStringMBS.

## 54.2 class CFAbsoluteTimeMBS

### 54.2.1 class CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for an absolute time value.
**Example:**

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(T.Value)
```

**Notes:** Basicly just a double property.
Subclass of the CFTimeIntervalMBS class.

### 54.2.2 Methods

### 54.2.3 AddGregorianUnits(timezone as CFTimeZoneMBS, units as CFGregorianUnitsMBS) as CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Adds gregorian time units to the given absolute time and returns the result.
**Notes:** Returns nil on any error.
Timezone is optional and can be nil.

### 54.2.4 Constructor

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The constructor to initialize the absolution time with the current time.
**Example:**

```
dim CFDateLocal as new CFAbsoluteTimeMBS
dim CFTimeZone as new CFTimeZoneMBS

dim MyDSTState as Boolean = CFTimeZone.IsDaylightSavingTime(CFDateLocal)

MsgBox str(MyDSTState)
```

See also:


- 54.2.5 Constructor(value as Double) 8671


### 54.2.5 Constructor(value as Double)

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** The constructor to initialize the absolution time with the given value.
**Example:**

```
dim a as new CFAbsoluteTimeMBS(5)
MsgBox str(a.Value)
```

See also:


- 54.2.4 Constructor 8670


### 54.2.6 DayofWeek(timezone as CFTimeZoneMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns an integer representing the day of the week indicated by the specified date.
**Example:**

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.DayofWeek(nil))
```

### 54.2.7 DayofYear(timezone as CFTimeZoneMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns an integer representing the day of the year indicated by the specified date.
**Example:**

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.DayofYear(nil))
```

### 54.2.8 GetDifferenceAsGregorianUnits(secondtime as CFAbsoluteTimeMBS, timezone as CFTimeZoneMBS, flags as Integer) as CFGregorianUnitsMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the difference of the two absolute times in gregorian units.
**Notes:** Timezone is optional and may be nil.

For flags:

```
kCFGregorianUnitsYears      = 1
kCFGregorianUnitsMonths     = 2
kCFGregorianUnitsDays       = 4
kCFGregorianUnitsHours      = 8
kCFGregorianUnitsMinutes    = 16
kCFGregorianUnitsSeconds    = 32
kCFGregorianAllUnits        = &hFFFFFF
```

### 54.2.9 GregorianDate(timezone as CFTimeZoneMBS) as CFGregorianDateMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the gregorian date for the given absolute time.
**Example:**

```
dim t as new CFAbsoluteTimeMBS
dim g as CFGregorianDateMBS = t.GregorianDate(nil)
MsgBox str(g.Year)
```

**Notes:** Timezone is optional and can be nil.
Returns nil on any error.

### 54.2.10 WeekofYear(timezone as CFTimeZoneMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns an integer representing the week of the year indicated by the specified date.
**Example:**

```
dim t as new CFAbsoluteTimeMBS
MsgBox str(t.WeekofYear(nil))
```

### 54.2.11 Properties

### 54.2.12 Date as CFDateMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date object representing this absolute time value.
**Notes:** Returns nil on any error.
(Read only property)

## 54.3 class CFArrayMBS

### 54.3.1 class CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation Array.
**Example:**

```
// copy names of recent items in Xojo Preferences

dim names() as string
dim c as new CFPreferencesMBS

dim o as CFObjectMBS = c.CopyAppValue(NewCFStringMBS("Recent Items Dict"), NewCFStringMBS("com.re-
alsoftware.realstudio"))

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

dim u as Integer = a.Count-1
for i as Integer = 0 to u

o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

dim no as CFObjectMBS = d.Value(NewCFStringMBS("Name"))
if no isa CFStringMBS then

dim ns as CFStringMBS = CFStringMBS(no)

names.Append ns.str
end if
end if
next
end if

MsgBox Join(names,EndOfLine)
```

**Notes:** If the release property is true, the destructor of this class will release the array reference.

From CFArrayMBS.h:

CFArray implements an ordered, compact container of pointer-sized values. Values are accessed via integer keys (indices), from the range 0 to N-1, where N is the number of values in the array when an operation is performed. The array is said to be "compact" because deleted or inserted values do not leave a gap in the key space – the values with higher-numbered indices have their indices renumbered lower (or higher, in the case of insertion) so that the set of valid indices is always in the integer range [ 0, N-1 ] . Thus, the index to access a particular value in the array may change over time as other values are inserted into or deleted from the array.

Arrays come in two flavors, immutable, which cannot have values added to them or removed from them after the array is created, and mutable, to which you can add values or from which remove values. Mutable arrays have two subflavors, fixed-capacity, for which there is a maximum number set at creation time of values which can be put into the array, and variable capacity, which can have an unlimited number of values (or rather, limited only by constraints external to CFArray, like the amount of available memory). Fixed-capacity arrays can be somewhat higher performing, if you can put a definate upper limit on the number of values that might be put into the array.

As with all CoreFoundation collection types, arrays maintain hard references on the values you put in them, but the retaining and releasing functions are user-defined callbacks that can actually do whatever the user wants (for example, nothing).

Computational Complexity The access time for a value in the array is guaranteed to be at worst O(lg N) for any implementation, current and future, but will often be O(1) (constant time). Linear search operations similarly have a worst case complexity of O(N*lg N), though typically the bounds will be tighter, and so on. Insertion or deletion operations will typically be linear in the number of values in the array, but may be O(N*lg N) clearly in the worst case in some implementations. There are no favored positions within the array for performance; that is, it is not necessarily faster access values with low indices, or to insert or delete values with high indices, or whatever.

This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- MBS Real Studio Plugins, version 13.0pr1
- MBS Real Studio Plugins, version 12.1pr10
- MBS Real Studio Plugins, version 11.2pr9

### 54.3.2 Methods

### 54.3.3 arrayWithContentsOfFile(file as folderitem) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an array containing the contents of the file specified by a given path.
**Example:**

```
dim a as new CFMutableArrayMBS

a.Append NewCFStringMBS("Hello")
a.Append NewCFStringMBS("World")

dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")

if a.writeToFile(f, true) then
MsgBox "OK"
else
MsgBox "Failed"
end if

dim x as CFArrayMBS = CFArrayMBS.arrayWithContentsOfFile(f)
MsgBox x.XML.str
```

**Notes:** file: The path to a file containing a string representation of an array produced by the writeToFile method.

Returns an array containing the contents of the file specified by aPath. Returns nil if the file can't be opened or if the contents of the file can't be parsed into an array.

The array representation in the file identified by aPath must contain only property list objects (NSString/CFString, NSData/CFData, NSArray/CFArray, or NSDictionary/CFDictionary objects).

Returns nil on any error.

### 54.3.4 arrayWithContentsOfURL(URL as string) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an array containing the contents specified by a given URL.
**Notes:** URL: The location of a file containing a string representation of an array produced by the writeToURL method.

Returns an array containing the contents specified by aURL. Returns nil if the location can't be opened or if the contents of the location can't be parsed into an array.

The array representation at the location identified by aURL must contain only property list objects (NSString/CF-

String, NSData/CFData, NSArray/CFArray, or NSDictionary/CFDictionary objects).

Returns nil on any error.

### 54.3.5 arrayWithHandle(Handle as Integer) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new array object based on a handle value.
**Notes:** Will retain the reference.

### 54.3.6 AsArray as Variant()

MBS MacCF Plugin, Plugin Version: 23.2, Platform: macOS, Targets: All.

**Function:** Converts all objects in the CFArray to Xojo variants.
**Example:**

```
Dim m As New CFMutableArrayMBS

// add one value
m.Append NewCFStringMBS("Hello")

// convert to Xojo array
Dim a() As Variant = m.AsArray

// and show value
MessageBox a(0)
```

### 54.3.7 clone as CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new immutable array with the values from the given array.
**Notes:** The values itself are not duplicated, but retained.

### 54.3.8 Constructor

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates a new editable array object.
**Example:**

```
dim b as new CFMutableArrayMBS

b.Append(NewCFStringMBS("Hello"))

MsgBox str(b.Count)
```

See also:

- 54.3.9 Constructor(values() as string) 8678

### 54.3.9 Constructor(values() as string)

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a new CFArrayMBS object with CFString objects created from the given string array.
**Example:**

```
dim values() as string = array("Hello", "World", "Just", "a", "Test")
dim a as new CFArrayMBS(values)

MsgBox str(a.Count)+" elements"
MsgBox a.XML.Str // show as xml
```

See also:

- 54.3.8 Constructor 8677

### 54.3.10 ContainsValue(value as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Reports whether or not the value is in the array.

### 54.3.11 CountOfValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts the number of times the given value occurs in the array.

### 54.3.12 Edit as CFMutableArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new mutable array with the values from the current array.

### 54.3.13 FirstIndexOfValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Searches the array for the value.
**Notes:** Result:
The lowest index of the matching values, or -1 if no value matched.

### 54.3.14 Item(index as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the entry with the given index.
**Notes:** Index from 0 to count-1.

### 54.3.15 LastIndexOfValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Searches the array for the value.
**Notes:** Result:
The lowest highest of the matching values, or -1 if no value matched.

### 54.3.16 writeToFile(file as folderitem, useAuxiliaryFile as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Writes the contents of the receiver to a file at a given path.
**Example:**

```
dim a as new CFMutableArrayMBS

a.Append NewCFStringMBS("Hello")
a.Append NewCFStringMBS("World")

dim f as FolderItem = SpecialFolder.Desktop.Child("test.xml")
```

```
if a.writeToFile(f, true) then
MsgBox "OK"
else
MsgBox "Failed"
end if

dim x as CFArrayMBS = CFArrayMBS.arrayWithContentsOfFile(f)
MsgBox x.XML.str
```

**Notes:** file: The path at which to write the contents of the receiver.
useAuxiliaryFile: If true, the array is written to an auxiliary file, and then the auxiliary file is renamed to path. If false, the array is written directly to path. The true option guarantees that path, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the file is written successfully, otherwise false.

If the receiver's contents are all property list objects (NSString, NSData, NSArray, or NSDictionary objects), the file written by this method can be used to initialize a new array with the class method arrayWithContentsOfFile. This method recursively validates that all the contained objects are property list objects before writing out the file, and returns false if all the objects are not property list objects, since the resultant file would not be a valid property list.

### 54.3.17 writeToURL(url as string, atomically as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Writes the contents of the receiver to the location specified by a given URL.
**Notes:** URL: The location at which to write the receiver.
atomically: If true, the array is written to an auxiliary location, and then the auxiliary location is renamed to aURL. If false, the array is written directly to aURL. The true option guarantees that aURL, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the location is written successfully, otherwise false.

If the receiver's contents are all property list objects (NSString, NSData, NSArray, or NSDictionary objects), the location written by this method can be used to initialize a new array with the class method arrayWithContentsOfURL.

### 54.3.18 Properties

### 54.3.19 count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the number of values currently in the array.
**Example:**

```
dim x as new CFMutableDictionaryMBS

x.Add(NewCFStringMBS("Hello"), NewCFStringMBS("World"))

MsgBox str(x.Count)
```

**Notes:** (Read only property)

## 54.4 class CFAttributedStringMBS

### 54.4.1 class CFAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** This is the class for a CoreFoundation attributed string.
**Notes:** Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr9
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr8

### 54.4.2 Methods

### 54.4.3 AsNSAttributedString as Variant

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new NSAttributedStringMBS object pointing to same attributed string.
**Example:**

```
// make CF version
dim c as CFAttributedStringMBS = CFAttributedStringMBS.Create("Hello World", nil)
MsgBox c.String

// get NS Version
dim n as NSAttributedStringMBS = c.AsNSAttributedString
MsgBox n.text
```

**Notes:** For passing to functions which need a NSAttributedStringMBS.

### 54.4.4 AttributeAndLongestEffectiveRange(location as Integer, attrName as CFStringMBS, inRange as CFRangeMBS, byref effectiveRange as CFRangeMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the value of a given attribute of an attributed string at a specified location.
**Notes:** location: The location in str at which to determine the attributes. It is a programming error for loc to specify a location outside the bounds of str.

attrName: The name of the attribute whose value you want to determine.
inRange: The range in str within which you want to find the longest effective range of the attributes at loc. inRange must not exceed the bounds of str.
effectiveRange: upon return contains the maximal range within inRange over which the exact same set of attributes apply. The returned range is clipped to inRange.
Returns the attribute value of str at the specified location.

### 54.4.5 AttributesAndLongestEffectiveRange(location as Integer, inRange as CFRangeMBS, byref effectiveRange as CFRangeMBS) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the attributes of an attributed string at a specified location.
**Notes:** location: The location in str at which to determine the attributes. loc must not exceed the bounds of str.
inRange: The range in str within to find the longest effective range of the attributes at loc. inRange must not exceed the bounds of str.
effectiveRange: upon return contains the maximal range within inRange over which the exact same set of attributes apply. The returned range is clipped to inRange.

### 54.4.6 AttributesDictionary(location as Integer, byref effectiveRange as CFRangeMBS) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the attributes of an attributed string at a specified location.
**Notes:** location: The location in str at which to determine the attributes. loc must not exceed the bounds of str.
effectiveRange: upon return contains a range including loc over which exactly the same set of attributes apply as at loc.

Returns a dictionary that contains the attributes of str at the specified location. Ownership follows the Get Rule.

For performance reasons, a range returned in effectiveRange is not necessarily the maximal range. If you need the maximum range, you should use AttributesAndLongestEffectiveRange.

Note that the returned attribute dictionary might change in unpredictable ways if the attributed string is edited after this call. If you want to preserve the state of the dictionary, you should make an actual copy of it rather than just retaining it. In addition, you should make no assumptions about the relationship of the actual dictionary returned by this call and the dictionary originally used to set the attributes, other than the fact that the values stored in the dictionaries will be identical (that is, ==) to those originally specified.

### 54.4.7 AttributeValue(location as Integer, attrName as CFStringMBS, byref effectiveRange as CFRangeMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the value of a given attribute of an attributed string at a specified location.
**Notes:** location: The location in str at which to determine the attributes. loc must not exceed the bounds of str.
attrName: The name of the attribute whose value you want to determine.
effectiveRange: upon return contains a range including loc over which exactly the same set of attributes apply as at location.

Returns the value of the specified attribute at the specified location in str. Ownership follows the Get Rule.

For performance reasons, a range returned in effectiveRange is not necessarily the maximal range. If you need the maximum range, you should use AttributeAndLongestEffectiveRange.

### 54.4.8 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a sub-attributed string from the specified range.
**Notes:** str: The attributed string to copy.
range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Raises OutOfMemory exception if there was a problem copying the object. Ownership follows the Create Rule.
See also:

- 54.4.9 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) 8684

### 54.4.9 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an attributed string with specified string and attributes.
**Notes:** str: A string that specifies the characters to use in the new attributed string. This value is copied.
attributeDictionary: A dictionary that contains the attributes to apply to the new attributed string. This

value is copied.

Returns an attributed string that contains the characters from str and the attributes specified by attributes. Raises OutOfMemory exception if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.
See also:

- 54.4.8 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS) 8684

### 54.4.10 Copy as CFAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable copy of an attributed string.

### 54.4.11 Create(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) as CFAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an attributed string with specified string and attributes.
**Notes:** str: A string that specifies the characters to use in the new attributed string. This value is copied. attributeDictionary: A dictionary that contains the attributes to apply to the new attributed string. This value is copied.

Returns an attributed string that contains the characters from str and the attributes specified by attributes. The result is nil if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.

### 54.4.12 CreateWithSubstring(str as CFAttributedStringMBS, range as CFRangeMBS) as CFAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a sub-attributed string from the specified range.

**Notes:** str: The attributed string to copy.
range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Returns nil if there was a problem copying the object. Ownership follows the Create Rule.

### 54.4.13 GetLength as Integer

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries the length of the string.
**Notes:** Deprecated in favor of Length property.

### 54.4.14 GetString as CFStringMBS

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries the text of the attributed string.
**Notes:** Deprecated in favor of String function.

### 54.4.15 MutableCopy(maxLength as Integer = 0) as CFAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a mutable attributed string copy.
**Notes:** maxLength, if not 0, is a hard bound on the length of the attributed string; exceeding this size limit during any editing operation is a programming error. If 0, there is no limit on the length.

### 54.4.16 String as CFStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the string for an attributed string.
**Notes:** For performance reasons, the string returned will often be the backing store of the attributed string, and it might therefore change if the attributed string is edited. However, this is an implementation detail, and you should not rely on this behavior.

### 54.4.17 Properties

### 54.4.18 Length as Integer

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the length of the attributed string in characters.
**Notes:** (Read only property)

## 54.5 class CFBagListMBS

### 54.5.1 class CFBagListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for the items of a CFBag.

### 54.5.2 Methods

### 54.5.3 Value(index as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the value with the given index.

### 54.5.4 Properties

### 54.5.5 Count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts the items in the set.
**Notes:** (Read and Write property)

## 54.6 class CFBagMBS

### 54.6.1 class CFBagMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation bag.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFObjectMBS class.

### 54.6.2 Methods

### 54.6.3 clone as CFBagMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Clones the set and all values.

### 54.6.4 Constructor

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** The constructor which creates a new editable bag.
**Example:**

```
dim b as new CFMutableBagMBS
```

### 54.6.5 ContainsValue(value as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does the set contain this value?

### 54.6.6 CountValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts how often this value is inside the set.

### 54.6.7 edit as CFMutableBagMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** To edit a set, this method returns you a CFMutableBagMBS.

### 54.6.8 List as CFBagListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all values.
**Notes:** This list will be invalid whenever this set is destroyed.

### 54.6.9 Value(value as CFObjectMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** If the value is found the value is returned.
**Notes:** Returns nil if key is not found.

### 54.6.10 Properties

### 54.6.11 Count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts all values.
**Example:**

```
dim b as new CFMutableBagMBS

b.Add(NewCFStringMBS("Hello"))

MsgBox str(b.Count)
```

**Notes:** (Read only property)

## 54.7 class CFBinaryDataMBS

### 54.7.1 class CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for core foundation data.
**Notes:** If the release property is true, the destructor of this class will release the data reference.
This class works on Windows with QuickTime 7 installed.

This wraps a CFDataRef from Apple. It was named CFBinaryDataMBS instead of CFDataMBS over 10 years ago.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr2
- MBS Real Studio Plugins, version 13.0pr1

### 54.7.2 Methods

### 54.7.3 clone as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Makes a deep copy of the CFBinaryDataMBS object.

### 54.7.4 Constructor(data as MemoryBlock)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a new data object with given content.
**Example:**

```
dim m as MemoryBlock = "Hello"
dim d as new CFBinaryDataMBS(m)

MsgBox d.Str
```

See also:

- 54.7.5 Constructor(data as string) 8692

### 54.7.5 Constructor(data as string)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a new data object with given content.
**Example:**

```
dim m as string = "Hello"
dim d as new CFBinaryDataMBS(m)

MsgBox d.Str
```

See also:

- 54.7.4 Constructor(data as MemoryBlock) 8691

### 54.7.6 Edit as CFMutableBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Makes a copy of the CFBinaryDataMBS object for editing.

### 54.7.7 Mem as Memoryblock

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The binary data returned as a Xojo memoryblocks.
See also:

- 54.7.8 Mem(pos as Integer,len as Integer) as Memoryblock 8692

### 54.7.8 Mem(pos as Integer,len as Integer) as Memoryblock

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The binary data returned as a Xojo memoryblocks.
See also:

- 54.7.7 Mem as Memoryblock 8692

### 54.7.9 Str as String

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The binary data returned as a Xojo string.
See also:


- 54.7.10 Str(pos as Integer,len as Integer) as String 8693


### 54.7.10 Str(pos as Integer,len as Integer) as String

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The binary data returned as a Xojo string.
See also:


- 54.7.9 Str as String 8692


### 54.7.11 Properties

### 54.7.12 len as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The length of this binary data in bytes.
**Example:**

```
dim b as CFBinaryDataMBS = NewCFBinaryDataMBSStr("Hello")
MsgBox str(b.Len) // shows 5
```

**Notes:** (Read only property)

## 54.8 class CFBooleanMBS

### 54.8.1 class CFBooleanMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation boolean.
**Notes:** If the release property is true, the destructor of this class will release the boolean reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr2
- MBS Real Studio Plugins, version 13.0pr1

### 54.8.2 Methods

### 54.8.3 Constructor(value as Boolean)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 54.8.4 Operator_Convert as Boolean

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** A helper method for auto conversion between boolean and CFBooleanMBS.
See also:

- 54.8.5 Operator_Convert(v As Boolean) 8694

### 54.8.5 Operator_Convert(v As Boolean)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** A helper method for auto conversion between boolean and CFBooleanMBS.
See also:

- 54.8.4 Operator_Convert as Boolean 8694

### 54.8.6 Properties

### 54.8.7 Value as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The value of this CFBooleanMBS object.
**Notes:** (Read only property)

## 54.9 class CFBundleMBS

### 54.9.1 class CFBundleMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation bundle.
**Example:**

```
// get FolderItem
dim f as FolderItem = SpecialFolder.Applications.Child("Safari.app")

// make bundle
dim b as CFBundleMBS = CreateBundleMBS(f)

// make a key
dim k as CFStringMBS = NewCFStringMBS("CFBundleShortVersionString")

// lookup the value
dim i as CFObjectMBS = b.GetValueForInfoDictionaryKey(k)

// it's a string, so show it
dim s as CFStringMBS = CFStringMBS(i)
MsgBox s.str
```

**Notes:** If the release property is true, the destructor of this class will release the boolean reference.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr1
- NSBundleMBS and NSDirectoryEnumeratorMBS

### 54.9.2 Methods

### 54.9.3 BuiltInPlugInsDirectory as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The built in plugins folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.4 Constructor

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 54.9.5 DevelopmentRegion as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The development region of the bundle.
**Notes:** Returns nil on any error.

### 54.9.6 ExecutableFile as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The executable file of the bundle.
**Example:**

```
// The following code does not have any check for nil, so it may crash at any point!

dim f as FolderItem
dim c as CFBundleMBS
dim url as CFURLMBS

// Get Path to Mail
f=ApplicationsFolderMBS(-32766).Child("mail.app")

// Make a CFURL from the file
url=NewCFURLMBSFile(f)
// Create a bundle object
c=CreateBundleMBS(url)

// show the path
MsgBox c.ExecutableFile.file.NativePath
```

**Notes:** Returns nil on any error.

### 54.9.7 GetInfoDictionary as CFDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The information dictionary for the bundle.
**Notes:** Returns nil on any error.

### 54.9.8 GetLocalInfoDictionary as CFDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The local information dictionary for the bundle.
**Notes:** Returns nil on any error.

### 54.9.9 GetValueForInfoDictionaryKey(key as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a value from the information dictionary for the given key.
**Example:**

```
// lists the document types Mail.app can read

dim f as FolderItem
dim b as CFBundleMBS
dim u as CFURLMBS
dim s as string
dim a as CFArrayMBS
dim i as Integer
dim c as Integer
dim o as CFObjectMBS
dim d as CFDictionaryMBS
dim t(-1) as string

f=ApplicationsFolderMBS(-32766).Child("Mail.app")
u=NewCFURLMBSFile(f)
b=CreateBundleMBS(u)
o=b.GetValueForInfoDictionaryKey(NewCFStringMBS("CFBundleDocumentTypes"))

if o isa CFArrayMBS then
a=cfarraymbs(o)

c=a.Count-1
for i=0 to c
o=a.Item(i)
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
o=d.Value(NewCFStringMBS("CFBundleTypeName"))
if o isa CFStringMBS then
```

```
s=CFStringMBS(o).str
t.Append s
end if
end if
next
end if

s=Join(t,", ")
MsgBox s
```

**Notes:** Returns nil on any error.

### 54.9.10 Identifier as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The identifier for the bundle.
**Notes:** Returns nil on any error.

### 54.9.11 kCFBundleDevelopmentRegionKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Notes:** Returns nil on any error.

### 54.9.12 kCFBundleDisplayNameKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Notes:** Display name of the bundle. Can be localized.
Returns nil on any error.

### 54.9.13 kCFBundleExecutableKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Notes:** Returns nil on any error.

### 54.9.14 kCFBundleIdentifierKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Example:**

```
// Find the bundle id for Mail.app

dim f as FolderItem
dim b as CFBundleMBS
dim u as CFURLMBS
dim s as string
dim o as CFObjectMBS

f=ApplicationsFolderMBS(-32766).Child("Mail.app")
u=NewCFURLMBSFile(f)
b=CreateBundleMBS(u)
o=b.GetValueForInfoDictionaryKey(b.kCFBundleIdentifierKey)

if o isa CFStringMBS then
s=cfstringmbs(o).str
end if

msgbox s
```

**Notes:** Returns nil on any error.

### 54.9.15 kCFBundleInfoDictionaryVersionKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Notes:** Returns nil on any error.

### 54.9.16 kCFBundleNameKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.

**Notes:** Returns nil on any error.

### 54.9.17 kCFBundleVersionKey as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** One of the keys for the dictionaries.
**Notes:** Returns nil on any error.

### 54.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Same as the other LocalizedString functions, but the default table and not value is always used.
See also:

- 54.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS 8701
- 54.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS 8701

### 54.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Same as the other LocalizedString functions, but the default table is always used.
See also:

- 54.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS 8701
- 54.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS 8701

### 54.9.20 LocalizedString(key as CFStringMBS, value as CFStringMBS, TableName as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Returns the localized string for the given key and table.
**Notes:** The table parameter is optional to specify which ".strings"-file to use.
without table or table="" the "Localizable.strings" file is used by Mac OS X.

key: The key for the localized string you wish to retrieve. This key will be used to look up the localized string in the strings file. Typically the key is identical to the value of the localized string in the development language.

value: A comment which might assist the translator. As used by the localized string macros and the genstrings tool, this value becomes an annotation in the generated strings file.

tableName: The name of the strings file you wish to search. The name should not include the strings filename extension.

Returns "" (empty string) on Mac OS Classic or Windows.
See also:


- 54.9.18 LocalizedString(key as CFStringMBS) as CFStringMBS 8701
- 54.9.19 LocalizedString(key as CFStringMBS, value as CFStringMBS) as CFStringMBS 8701


### 54.9.21 MainBundle as CFBundleMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns a CFBundle for the main bundle (current app).
**Example:**

MsgBox CFBundleMBS.MainBundle.Identifier

### 54.9.22 PackageMacCreator as string

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The Mac OS creator code for this bundle.
**Notes:** Returns "" on any error.

### 54.9.23 PackageMacType as string

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The Mac OS file type code for this bundle.
**Notes:** Returns "" on any error.
Should be "APPL" for applications.

### 54.9.24 PrivateFrameworksDirectory as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The private framework folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.25 ResourceDirectory as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The resource folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.26 ResourceURL(resourceName as CFStringMBS, resourceType as CFStringMBS, subDirName as CFStringMBS) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Searches inside the application bundle for a file.
**Example:**

```
dim b as CFBundleMBS
dim u as CFURLMBS
dim f as FolderItem

b=app.MainBundleMBS

u=b.ResourceURL(NewCFStringMBS("Photo"),NewCFStringMBS("tif"),nil)

f=u.file

MsgBox f.NativePath
// e.g. "Content/Resources/Photo.tif" inside your bundle.
```

**Notes:** ResourceName is the filename of the resource file.
ResourceType is the file extension.
SubDirectory is the name of the directory.
This function will take care for localization folders.

### 54.9.27 ResourceURLForLocalization(resourceName as CFStringMBS, resourceType as CFStringMBS, subDirName as CFStringMBS, localizationName as CFStringMBS) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Searches inside the application bundle for a file with the given localization.
**Notes:** ResourceName is the filename of the resource file.
ResourceType is the file extension.
SubDirectory is the name of the directory.
localizationName is the name of the localization requested.
This function will take care for localization folders.

### 54.9.28 ResourceURLsOfType(resourceType as CFStringMBS, subDirName as CFStringMBS) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Searches inside the bundle like ResourceURL, but returns an array of all matching files.

### 54.9.29 ResourceURLsOfTypeForLocalization(resourceType as CFStringMBS, subDirName as CFStringMBS, localizationName as CFStringMBS) as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Searches inside the bundle like ResourceURLForLocalization, but returns an array of all matching files.

### 54.9.30 SharedFrameworksDirectory as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The shared framework folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.31 SharedSupportURL as CFURLMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The shared support files folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.32 SupportFilesDirectory as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The support files folder of the bundle.
**Notes:** Returns nil on any error.

### 54.9.33 URL as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The URL for the given bundle.
**Notes:** Returns nil on any error.

### 54.9.34 Version as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The version of the bundle.
**Notes:** Returns nil on any error.

## 54.10 class CFCharacterSetMBS

### 54.10.1 class CFCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation character Set.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr9
- MBS Real Studio Plugins, version 13.0pr1

### 54.10.2 Methods

### 54.10.3 Binary as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** This function returns the content of the CharacterSet as a CFBinaryData.
**Notes:** Returns nil on any error.

### 54.10.4 edit as CFMutableCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** To edit a character set, this method returns you a CFMutableCharacterSetMBS.

### 54.10.5 GetPredefinedCFCharacterSet(id as Integer) as CFCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a predefined Character set.

### 54.10.6 IsMember(charcode as Integer) as Boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns true if the unicode character is part of this CharacterSet.
**Notes:** Works only for charcode from 0 to &hFFFF.

### 54.10.7 kCFCharacterSetAlphaNumeric as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for alpha numeric characters.

### 54.10.8 kCFCharacterSetControl as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for control characters.

### 54.10.9 kCFCharacterSetDecimalDigit as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for decimal digit characters.

### 54.10.10 kCFCharacterSetDecomposable as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for decomposable characters.

### 54.10.11 kCFCharacterSetIllegal as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for illegal characters.

### 54.10.12 kCFCharacterSetLetter as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for letter characters.

### 54.10.13 kCFCharacterSetLowercaseLetter as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for lowercase letter characters.

### 54.10.14 kCFCharacterSetNonBase as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for non base characters.

### 54.10.15 kCFCharacterSetPunctuation as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for punctuation characters.

### 54.10.16 kCFCharacterSetUppercaseLetter as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for uppercase letter characters.

### 54.10.17 kCFCharacterSetWhitespace as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for whitespace characters.

### 54.10.18 kCFCharacterSetWhitespaceAndNewline as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ID of the predefined character set for whitespace characters and newline.

### 54.10.19 NewCFCharacterSet(str as CFBinaryDataMBS) as CFCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a Character set with characters inside the CFBinary object.
See also:

- 54.10.20 NewCFCharacterSet(str as CFStringMBS) as CFCharacterSetMBS 8709

### 54.10.20 NewCFCharacterSet(str as CFStringMBS) as CFCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a Character set with characters inside the CFStringMBS object.
See also:

- 54.10.19 NewCFCharacterSet(str as CFBinaryDataMBS) as CFCharacterSetMBS 8709

### 54.10.21 NewCFCharacterSetRange(min as Integer, length as Integer) as CFCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a Character set with chars between min and max.
**Example:**

```
dim c as new CFCharacterSetMBS

c = CFCharacterSetMBS.NewCFCharacterSetRange(asc("A"), 26)

MsgBox str(c.IsMember(asc("C"))) // true
MsgBox str(c.IsMember(asc("1"))) // false
```

**Notes:** Use Unicode charcodes for min and max.

## 54.11 class CFDateMBS

### 54.11.1 class CFDateMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation date.
**Notes:** If the release property is true, the destructor of this class will release the date reference.
Subclass of the CFObjectMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins, version 19.0pr6

### 54.11.2 Methods

### 54.11.3 AbsoluteTime as CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The absolute time value for this date.
**Notes:** Returns nil on any error.
timezone is optional and may be nil.

### 54.11.4 Compare(otherdate as CFDateMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Compares two date objects.
**Notes:** Result codes:
kCFCompareLessThan = -1
kCFCompareEqualTo = 0
kCFCompareGreaterThan = 1

On any error returns 0.

### 54.11.5 Constructor

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Creates new date object with current timestamp.
**Example:**

```
dim d as new CFDateMBS
MsgBox d.date.SQLDateTime
```

See also:


- 54.11.6 Constructor(date as CFDateMBS) 8711
- 54.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil) 8711


### 54.11.6 Constructor(date as CFDateMBS)

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Creates a new Xojo object with a copy of the CFDate object inside.
See also:


- 54.11.5 Constructor 8710
- 54.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil) 8711


### 54.11.7 Constructor(date as date, timeZone as CFTimeZoneMBS = nil)

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor using Xojo date.
**Example:**

```
// Xojo now
dim d as new date
// convert to CFDate
dim c as new CFDateMBS(d)
// and convert back
dim x as date = c

// compare in de bugger
dim ds as string = d.SQLDateTime
dim dx as string = x.SQLDateTime

Break
```

**Notes:** If time zone is nil, we use UTC.
See also:


- 54.11.5 Constructor 8710
- 54.11.6 Constructor(date as CFDateMBS) 8711

### 54.11.8 Date(timeZone as CFTimeZoneMBS = nil) as Date

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a Xojo date from CFDate with given time zoen.
**Notes:** If time zone is nil, we use UTC.

### 54.11.9 DateTime(timeZone as CFTimeZoneMBS = nil) as DateTime

MBS MacCF Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Creates a Xojo date from CFDate with given time zoen.
**Notes:** If time zone is nil, we use UTC.

### 54.11.10 NewDate(date as date, timeZone as CFTimeZoneMBS = nil) as CFDateMBS

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a Xojo date from CFDate with given time zone.
**Example:**

```
// Xojo now
dim d as new date
// convert to CFDate in UTC
dim c as CFDateMBS = CFDateMBS.NewDate(d, nil)
// and convert back
dim x as date = c.Date(nil)

// compare in debugger
dim ds as string = d.SQLDateTime
dim dx as string = x.SQLDateTime

// and with current time zone
dim dx2 as string = c.Date(SystemCFTimeZoneMBS).SQLDateTime

Break
```

**Notes:** If time zone is nil, we use UTC.
See also:

- 54.11.11 NewDate(date as dateTime, timeZone as CFTimeZoneMBS = nil) as CFDateMBS 8713

### 54.11.11 NewDate(date as dateTime, timeZone as CFTimeZoneMBS = nil) as CFDateMBS

MBS MacCF Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Creates a Xojo dateTime from CFDate with given time zone.
**Notes:** If time zone is nil, we use UTC.
See also:

- 54.11.10 NewDate(date as date, timeZone as CFTimeZoneMBS = nil) as CFDateMBS 8712

### 54.11.12 Now as CFDateMBS

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Creates new date object with current timestamp.
**Example:**

```
dim d as CFDateMBS = CFDateMBS.now
MsgBox d.date.SQLDateTime
```

### 54.11.13 Operator_Convert as Date

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Converts from CFDate to Xojo date in UTC.
**Example:**

```
// Xojo now
dim d as new date
// convert to CFDate
dim c as new CFDateMBS(d)
// and convert back
dim x as date = c

// compare in de bugger
dim ds as string = d.SQLDateTime
dim dx as string = x.SQLDateTime

Break
```

See also:

- 54.11.14 Operator_Convert as DateTime 8714

### 54.11.14 Operator_Convert as DateTime

MBS MacCF Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Converts from CFDate to Xojo dateTime in UTC.
See also:

- 54.11.13 Operator_Convert as Date 8713

### 54.11.15 TimeIntervalSinceDate(otherdate as CFDateMBS) as CFTimeIntervalMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The dfference between two dates as a time interval.
**Notes:** Returns nil on any error.

## 54.12 class CFDictionaryListMBS

### 54.12.1 class CFDictionaryListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for the items of a CFDictionaryMBS.
**Notes:** This class works on Windows with QuickTime 7 installed.

### 54.12.2 Methods

### 54.12.3 close

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 54.12.4 Key(index as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the key with the given index.
**Notes:** Index between 0 and count-1.

### 54.12.5 Value(index as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** Index between 0 and count-1.

### 54.12.6 Properties

### 54.12.7 count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts the elements inside this list.
**Notes:** (Read and Write property)

## 54.13 class CFDictionaryMBS

### 54.13.1 class CFDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation dictionary.
**Example:**

```
dim c as new CFPreferencesMBS
dim o as CFObjectMBS = c.CopyAppValue(NewCFStringMBS("VisibleIdentifiers"), NewCFStringMBS("com.apple.speech.voice.prefs"))
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

break // see dictionary in debugger
```

**Notes:** If the release property is true, the destructor of this class will release the dictionary reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr2
- MBS Xojo Plugins, version 19.1pr1
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- MBS Real Studio Plugins, version 13.0pr1
- MBS Real Studio Plugins, version 12.1pr10
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr13

### 54.13.2 Methods

### 54.13.3 CGPointFromDictionary(dic as CFDictionaryMBS) as variant

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates CGPointMBS object from dictionary.
**Notes:** Make a CGPointMBS from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGPoint) and returns the value in point. Returns object on success; nil otherwise.

### 54.13.4 CGRectFromDictionary(dic as CFDictionaryMBS) as variant

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates CGRectMBS object from dictionary.
**Notes:** Make a CGRect from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGRect) and returns the value in point. Returns object on success; nil otherwise.

### 54.13.5 CGSizeFromDictionary(dic as CFDictionaryMBS) as variant

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates CGSizeMBS object from dictionary.
**Notes:** Make a CGSize from the contents of dict (presumably returned earlier from CFDictionaryMBS.dictionaryWithCGSize) and returns the value in point. Returns object on success; nil otherwise.

### 54.13.6 clone as CFDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Clones the dictionary and all values.

### 54.13.7 Constructor

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates a new editable dictionary.
**Example:**

```
dim m as new CFMutableDictionaryMBS
m.Add(NewCFStringMBS("Key"), NewCFStringMBS("value"))
MsgBox str(m.Count)
```

See also:


- 54.13.8 Constructor(dic as dictionary) 8718


### 54.13.8 Constructor(dic as dictionary)

MBS MacCF Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFDictionary based on the Xojo Dictionary.
**Example:**

```
// build a dictionary
dim d as new Dictionary

d.Value("Hello")=2
d.Value("test")="World"
d.Value("ddd")=5.6

// convert to CFDictionary
dim c as new CFDictionaryMBS(d)

// Display as XML
dim b as CFBinaryDataMBS = c.XML
MsgBox b.str

// now convert back
dim e as Dictionary = c.dictionary

// and display values
for each key as Variant in e.keys
MsgBox key+" ->"+e.Value(key)
next
```

**Notes:** Be aware that the Dictionary is converted as good as possible. Unsupported datatype will be missing.

See the FAQ for the supported type translation between CoreFoundation and Xojo data types.
See also:

- 54.13.7 Constructor 8718

### 54.13.9 ContainsKey(value as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does the dictionary contain this key?
**Example:**

```
dim c as CFMutableDictionaryMBS = NewCFMutableDictionaryMBS

c.Add NewCFStringMBS("test"),NewCFStringMBS("Value")

MsgBox c.XML.Str

if c.ContainsKey(NewCFStringMBS("test")) then
```

```
MsgBox "OK"
else
MsgBox "Failed"
end if

if c.ContainsKey(NewCFStringMBS("missing")) then
MsgBox "Failed"
else
MsgBox "OK"
end if
```

### 54.13.10 ContainsValue(value as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does the dictionary contain this value?

### 54.13.11 CountKey(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts how often this key is inside the dictionary.

### 54.13.12 CountValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts how often this value is inside the dictionary.

### 54.13.13 Dictionary as Dictionary

MBS MacCF Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** Creates a Xojo Dictionary from this CFDictionary.
**Example:**

```
// build a dictionary
dim d as new Dictionary

d.Value("Hello")=2
d.Value("test")="World"
```

```
d.Value("ddd")=5.6

// convert to CFDictionary
dim c as new CFDictionaryMBS(d)

// Display as XML
dim b as CFBinaryDataMBS = c.XML
MsgBox b.str

// now convert back
dim e as Dictionary = c.dictionary

// and display values
for each key as Variant in e.keys
MsgBox key+" ->"+e.Value(key)
next
```

**Notes:** Be aware that the CFDictionary is converted as good as possible. Unsupported datatype will be missing.

See the FAQ for the supported type translation between CoreFoundation and Xojo data types.

### 54.13.14 dictionaryWithCGPoint(point as variant) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Return a dictionary representation of point.
**Notes:** Rect must be a CGPointMBS object or nil.
Returns dictionary or nil.

### 54.13.15 dictionaryWithCGRect(rect as variant) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Return a dictionary representation of rect.
**Notes:** Rect must be a CGRectMBS object or nil.
Returns dictionary or nil.

### 54.13.16 dictionaryWithCGSize(size as variant) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Return a dictionary representation of size.
**Notes:** Rect must be a CGSizeMBS object or nil.
Returns dictionary or nil.

### 54.13.17 dictionaryWithContentsOfFile(file as folderitem) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a dictionary using the keys and values found in a file specified by a given path.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithContentsOfFile(f)

MsgBox d.XML.Str
```

**Notes:** path: A full or relative pathname. The file identified by path must contain a string representation of a property list whose root object is a dictionary. The dictionary must contain only property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary).

Returns a new dictionary that contains the dictionary at path, or nil if there is a file error or if the contents of the file are an invalid representation of a dictionary.

### 54.13.18 dictionaryWithContentsOfURL(URL as string) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a dictionary using the keys and values found in a resource specified by a given URL.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithContentsOfURL(f.URLPath)

MsgBox d.XML.Str
```

**Notes:** URL: An URL that identifies a resource containing a string representation of a property list whose

root object is a dictionary. The dictionary must contain only property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary).

Returns a new dictionary that contains the dictionary at aURL, or nil if there is an error or if the contents of the resource are an invalid representation of a dictionary.

### 54.13.19 dictionaryWithHandle(Handle as Integer) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new dictionary object based on a handle value.
**Notes:** Will retain the reference.

### 54.13.20 edit as CFMutableDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** To edit a dictionary, this method returns you a CFMutableDictionaryMBS.

### 54.13.21 list as CFDictionaryListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all values.
**Notes:** This list will be invalid whenever this dictionary is destroyed.

### 54.13.22 Value(key as CFObjectMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** If the key is found the value for this key is returned.
**Notes:** Returns nil if key is not found.

### 54.13.23 writeToFile(file as folderitem, useAuxiliaryFile as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Writes a property list representation of the contents of the receiver to a given path.
**Example:**

```
dim m as new CFMutableDictionaryMBS

m.Set(NewCFStringMBS("key"), NewCFStringMBS("value"))

dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")

if m.writeToFile(f, true) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** path: The path at which to write the file. Must be an absolute URL.
useAuxiliaryFile: A flag that specifies whether the file should be written atomically.

If flag is true, the receiver is written to an auxiliary file, and then the auxiliary file is renamed to path. If flag is false, the dictionary is written directly to path. The true option guarantees that path, if it exists at all, won't be corrupted even if the system should crash during writing.

Returns true if the file is written successfully, otherwise false.

This method recursively validates that all the contained objects are property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary) before writing out the file, and returns false if all the objects are not property list objects, since the resultant file would not be a valid property list.

If the receiver's contents are all property list objects, the file written by this method can be used to initialize a new dictionary with the class method dictionaryWithContentsOfFile or dictionaryWithContentsOfURL.

### 54.13.24 writeToURL(url as string, atomically as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Writes a property list representation of the contents of the receiver to a given URL.
**Example:**

```
dim m as new CFMutableDictionaryMBS

m.Set(NewCFStringMBS("key"), NewCFStringMBS("value"))

dim f as FolderItem = SpecialFolder.Desktop.Child("test.plist")

if m.writeTourl(f.URLPath, true) then
MsgBox "OK"
```

```
else
MsgBox "Failed"
end if
```

**Notes:** url: The URL to which to write the receiver.
atomically: A flag that specifies whether the output should be written atomically.

If flag is YtrueES, the receiver is written to an auxiliary location, and then the auxiliary location is renamed to aURL. If flag is false, the dictionary is written directly to aURL. The true option guarantees that aURL, if it exists at all, won't be corrupted even if the system should crash during writing. flag is ignored if aURL is of a type that cannot be written atomically.

Returns true if the location is written successfully, otherwise false.

This method recursively validates that all the contained objects are property list objects (instances of NSData, NSDate, NSNumber, NSString, NSArray, or NSDictionary) before writing out the file, and returns false if all the objects are not property list objects, since the resultant output would not be a valid property list.

If the receiver's contents are all property list objects, the location written by this method can be used to initialize a new dictionary with the class method dictionaryWithContentsOfURL or dictionaryWithContentsOfFile.

For more information about property lists, see Property List Programming Guide.

### 54.13.25 Properties

### 54.13.26 Count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts all values.
**Example:**

```
dim x as new CFMutableDictionaryMBS

x.Add(NewCFStringMBS("Hello"), NewCFStringMBS("World"))

MsgBox str(x.Count)
```

**Notes:** (Read only property)

## 54.14 class CFErrorMBS

### 54.14.1 class CFErrorMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** The Core Foundation error class.
**Notes:** A CFError object encapsulates rich and extensible error information than is possible using only an error code or error string. The core attributes of a CFError object are an error domain (represented by a string), a domain-specific error code and a user info dictionary containing application specific information. Errors are required to have a domain and an error code within that domain. The optional "userInfo" dictionary may provide additional information that might be useful for the interpretation and reporting of the error. This dictionary can even contain an "underlying" error, which is wrapped as an error bubbles up through various layers.

Several well-known domains are defined corresponding to Mach, POSIX, and OSStatus errors. In addition, CFError allows you to attach an arbitrary user info dictionary to an error object, and provides the means to return a human-readable description for the error.

In general, a method should signal an error condition by—for example—returning false or nil rather than by the simple presence of an error object. The method can then optionally return an CFError object by reference, in order to further describe the error.

CFError is toll-free bridged to NSError in the Foundation framework—for more details on toll-free bridging, see Interchangeable Data Types. NSError has some additional guidelines which makes it easy to automatically report errors to users and even try to recover from them. See Error Handling Programming Guide for more information on NSError programming guidelines.

Requires Mac OS X 10.5 or newer.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr4
- MBS REALbasic Plugins, version 10.5pr5

### 54.14.2 Methods

### 54.14.3 Constructor

MBS MacCF Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 54.14.4 kCFErrorDescriptionKey as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the keys in the userInfo dictionary.
**Notes:** Key to identify the description in the userInfo dictionary.
When you create a CFError, you can provide a value for this key if you do not have localizable error strings. The description should be a complete sentence if possible, and should not contain the domain name or error

### 54.14.5 kCFErrorDomainCocoa as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the constants defining domains for CFError objects.
**Notes:** A constant that specified the Cocoa domain.

### 54.14.6 kCFErrorDomainMach as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the constants defining domains for CFError objects.
**Notes:** A constant that specified the Mach domain.

### 54.14.7 kCFErrorDomainOSStatus as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the constants defining domains for CFError objects.
**Notes:** A constant that specified the OS domain.

### 54.14.8 kCFErrorDomainPOSIX as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the constants defining domains for CFError objects.
**Notes:** A constant that specified the POSIX domain.

### 54.14.9 kCFErrorLocalizedDescriptionKey as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the keys in the userInfo dictionary.
**Notes:** Key to identify the end user-presentable description in the userInfo dictionary.

### 54.14.10 kCFErrorLocalizedFailureReasonKey as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the keys in the userInfo dictionary.
**Notes:** Key to identify the end user-presentable failure reason in the userInfo dictionary.

### 54.14.11 kCFErrorLocalizedRecoverySuggestionKey as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the keys in the userInfo dictionary.
**Notes:** Key to identify the end user-presentable recovery suggestion in the userInfo dictionary.

### 54.14.12 kCFErrorUnderlyingErrorKey as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** One of the keys in the userInfo dictionary.
**Notes:** Key to identify the underlying error in the userInfo dictionary.

### 54.14.13 Properties

### 54.14.14 Code as Integer

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns the error code for a given CFError.
**Notes:** (Read only property)

### 54.14.15 Description as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns a human-presentable description for a given error.
**Notes:** (Read only property)

### 54.14.16 Domain as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns the error domain for a given CFError.
**Notes:** (Read only property)

### 54.14.17 FailureReason as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns a human-presentable failure reason for a given error.
**Notes:** (Read only property)

### 54.14.18 RecoverySuggestion as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns a human presentable recovery suggestion for a given error.
**Notes:** (Read only property)

### 54.14.19 UserInfo as dictionary

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns the user info dictionary for a given CFError.
**Notes:** (Read only property)

# 54.15 class CFGregorianDateMBS

## 54.15.1 class CFGregorianDateMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for a core foundation gregorian date value.

## 54.15.2 Methods

## 54.15.3 AbsoluteTime(timezone as CFTimeZoneMBS) as CFAbsoluteTimeMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The absolute time value for this date.
**Notes:** Returns nil on any error.

## 54.15.4 DateValid as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Are all those date properties in this object valid?

## 54.15.5 IsValid(flags as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns true if the requested parts of the date values are valid.
**Notes:** Flags can be a combination of the following values:

```
kCFGregorianUnitsYears      = 1
kCFGregorianUnitsMonths     = 2
kCFGregorianUnitsDays       = 4
kCFGregorianUnitsHours      = 8
kCFGregorianUnitsMinutes    = 16
kCFGregorianUnitsSeconds    = 32
kCFGregorianAllUnits        = &hFFFFFF
```

Combine using BitwiseOr.

### 54.15.6 TimeValid as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Are all those time properties in this object valid?

### 54.15.7 Valid as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Are all those properties in this object valid?

### 54.15.8 Properties

### 54.15.9 Day as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The day value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

### 54.15.10 Hour as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The hour value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

### 54.15.11 Minute as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The minute value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

### 54.15.12 Month as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The month value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

### 54.15.13 Second as Double

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The second value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

### 54.15.14 Year as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The year value.
**Notes:** Setting this property does not run a test for validation like Xojo's date class does.
(Read and Write property)

## 54.16 class CFGregorianUnitsMBS

### 54.16.1 class CFGregorianUnitsMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for gregorian time units.

### 54.16.2 Properties

### 54.16.3 Days as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The days.
**Notes:** (Read and Write property)

### 54.16.4 Hours as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The hours.
**Notes:** (Read and Write property)

### 54.16.5 Minutes as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The minutes.
**Notes:** (Read and Write property)

### 54.16.6 Months as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The months.
**Notes:** (Read and Write property)

### 54.16.7 Seconds as Double

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The seconds.
**Notes:** (Read and Write property)

### 54.16.8 Years as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The years.
**Notes:** (Read and Write property)

## 54.17 class CFMutableArrayMBS

### 54.17.1 class CFMutableArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation Array.
**Notes:** If the release property is true, the destructor of this class will release the array reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFArrayMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 54.17.2 Methods

### 54.17.3 Append(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends an item to this array.
**Example:**

```
dim a as CFMutableArrayMBS

a=NewCFMutableArrayMBS

a.Append NewCFStringMBS("Hello")

MsgBox str(a.Count)

MsgBox CFStringMBS(a.Item(0)).str
```

### 54.17.4 AppendArray(sourcearray as CFArrayMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds the values from an array to another array.
**Notes:** The whole array should be copied.
See also:

- 54.17.5 AppendArray(sourcearray as CFArrayMBS,min as Integer,max as Integer) 

### 54.17.5 AppendArray(sourcearray as CFArrayMBS,min as Integer,max as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds the values from an array to another array.
**Notes:** The whole array should be copied.
Min and Max are the range to be copied. Make sure they are correct indexes!
See also:

- 54.17.4 AppendArray(sourcearray as CFArrayMBS) 8736

### 54.17.6 Exchange(index1 as Integer,index2 as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Exchanges the values at two indices of the array.
**Notes:** Make sure indexes are in range between 0 and count-1.

### 54.17.7 Insert(index as Integer,value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Inserts an item to this array.
**Notes:** Make sure index is in range between 0 and count.
If Index=count then this function does like append.

### 54.17.8 Remove(index as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes the value with the given index from the array.
**Notes:** Make sure index is in range between 0 and count-1.

### 54.17.9 RemoveAll

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes all the values from the array, making it empty.

### 54.17.10 SetValue(index as Integer,value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Changes the value with the given index in the array.

## 54.18 class CFMutableAttributedStringMBS

### 54.18.1 class CFMutableAttributedStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The mutable version of an CoreFoundation attributed string.
**Notes:** Subclass of the CFAttributedStringMBS class.
**Blog Entries**

- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr9

**Xojo Developer Magazine**

- 12.4, page 9: News

### 54.18.2 Methods

### 54.18.3 AsNSMutableAttributedString as Variant

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new NSMutableAttributedStringMBS object pointing to same mutable attributed string.
**Notes:** For passing to functions which need a NSMutableAttributedStringMBS.

### 54.18.4 BeginEditing

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Marks the beginning of a series of changes.
**Notes:** In cases where attributed string might do a bunch of work to assure self-consistency, BeginEditing/EndEditing allow disabling that to allow deferring and coalescing any work. It's a good idea to call these around a set of related mutation calls which don't require the string to be in consistent state in between. These calls can be nested.

### 54.18.5 Constructor(maxLength as Integer = 0)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a mutable empty attributed string.
**Notes:** maxLength, if not 0, is a hard bound on the length of the attributed string; exceeding this size limit

during any editing operation is a programming error. If 0, there is no limit on the length.
See also:


- 54.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS) 8740
- 54.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) 8740


### 54.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a sub-attributed string from the specified range.
**Notes:** str: The attributed string to copy.
range: The range of the attributed string to copy. range must not exceed the bounds of Str.

Returns a new attributed string whose string and attributes are copied from the specified range of the supplied attributed string. Raises OutOfMemory exception if there was a problem copying the object. Ownership follows the Create Rule.
See also:


- 54.18.5 Constructor(maxLength as Integer = 0) 8739
- 54.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil) 8740


### 54.18.7 Constructor(str as CFStringMBS, attributeDictionary as CFDictionaryMBS = nil)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an attributed string with specified string and attributes.
**Notes:** str: A string that specifies the characters to use in the new attributed string. This value is copied.
attributeDictionary: A dictionary that contains the attributes to apply to the new attributed string. This value is copied.

Returns an attributed string that contains the characters from str and the attributes specified by attributes. Raises OutOfMemory exception if there was a problem in creating the attributed string.

Note that both the string and the attributes dictionary are copied. The specified attributes are applied to the whole string. If you want to apply different attributes to different ranges of the string, you should use a mutable attributed string.
See also:


- 54.18.5 Constructor(maxLength as Integer = 0) 8739
- 54.18.6 Constructor(str as CFAttributedStringMBS, range as CFRangeMBS) 8740

### 54.18.8 EndEditing

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Marks the end of a series of changes.
**Notes:** In cases where attributed string might do a bunch of work to assure self-consistency, BeginEditing/EndEditing allow disabling that to allow deferring and coalescing any work. It's a good idea to call these around a set of related mutation calls which don't require the string to be in consistent state in between. These calls can be nested.

### 54.18.9 MutableString as CFMutableStringMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the string for the attributed string as a mutable string, allowing editing the character contents of the string as if it were an CFMutableString.
**Notes:** Attributes corresponding to the edited range are appropriately modified. If, as a result of the edit, new characters are introduced into the string, they inherit the attributes of the first replaced character from range. If no existing characters are replaced by the edit, the new characters inherit the attributes of the character preceding range if it has any, otherwise of the character following range. If the initial string is empty, the attributes for the new characters are also empty.

(Note: This function is not yet implemented and will return NULL except for toll-free bridged instances.)

### 54.18.10 RemoveAttribute(Range as CFRangeMBS, attrName as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Removes the value of a single attribute over the specified range, which should be valid.
**Notes:** It's OK for the attribute not the exist over the specified range.

### 54.18.11 ReplaceAttributedString(Range as CFRangeMBS, Replacement as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Replaces the attributed substring over the specified range with the attributed string specified in replacement.
**Notes:** range should be valid. To delete a range of the attributed string, call ReplaceString() with empty string and specified range.

### 54.18.12 ReplaceString(Range as CFRangeMBS, Replacement as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Modifies the string for the attributed string, much like CFString.Replace.
**Notes:** It's an error for range to specify characters outside the bounds of aStr.

### 54.18.13 SetAttribute(Range as CFRangeMBS, attrName as CFStringMBS, Value as CFObjectMBS)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets the value of a single attribute over the specified range, which should be valid.
**Notes:** value should not be nil.

### 54.18.14 SetAttributes(Range as CFRangeMBS, replacements as CFDictionaryMBS, clearOtherAttributes as boolean)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets the value of multiple attributes over the specified range, which should be valid.
**Notes:** If clearOtherAttributes is false, existing attributes (which aren't being replaced) are left alone; otherwise they are cleared. The dictionary should be setup for "usual" CF type usage — CFString keys, and arbitrary CFType values. Note that after this call, further mutations to the replacement dictionary argument by the caller will not affect the contents of the attributed string.

## 54.19 class CFMutableBagMBS

### 54.19.1 class CFMutableBagMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation mutable bag.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFBagMBS class.

### 54.19.2 Methods

### 54.19.3 Add(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds an object to this bag.

### 54.19.4 Remove(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes an object in this bag.

### 54.19.5 RemoveAll

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes all items from this bag.

### 54.19.6 Replace(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces an object in this bag.

### 54.19.7 Set(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets an object in this bag.

## 54.20 class CFMutableBinaryDataMBS

### 54.20.1 class CFMutableBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for core foundation data.
**Notes:** If the release property is true, the destructor of this class will release the data reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFBinaryDataMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 54.20.2 Methods

### 54.20.3 AppendCFBinaryDataMBS(m as CFBinaryDataMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given CFBinary object.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.
See also:

- 54.20.4 AppendCFBinaryDataMBS(m as CFBinaryDataMBS,len as Integer) 8745

### 54.20.4 AppendCFBinaryDataMBS(m as CFBinaryDataMBS,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given CFBinary object.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.
See also:

- 54.20.3 AppendCFBinaryDataMBS(m as CFBinaryDataMBS) 8745

### 54.20.5 AppendMem(m as memoryblock)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given memoryblock.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with

a small application memory partition size.
See also:

- 54.20.6 AppendMem(m as memoryblock,len as Integer) 8746

### 54.20.6 AppendMem(m as memoryblock,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given memoryblock.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.
See also:

- 54.20.5 AppendMem(m as memoryblock) 8745

### 54.20.7 AppendStr(s as string)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given string.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.
See also:

- 54.20.8 AppendStr(s as string,len as Integer) 8746

### 54.20.8 AppendStr(s as string,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the bytes from the given string.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.
See also:

- 54.20.7 AppendStr(s as string) 8746

### 54.20.9 Constructor(capacity as Integer)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** The constructor for creating a new mutable data object.
**Example:**

```
// creates empty data object
dim c as new CFMutableBinaryDataMBS(10)
MsgBox str(c.Len)+" length"
```

See also:


- 54.20.10 Constructor(data as MemoryBlock) 8747
- 54.20.11 Constructor(data as string) 8747


### 54.20.10 Constructor(data as MemoryBlock)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a new data object with given content.
**Example:**

```
dim m as MemoryBlock = "Hello"
dim d as new CFMutableBinaryDataMBS(m)

MsgBox d.Str
```

See also:


- 54.20.9 Constructor(capacity as Integer) 8746
- 54.20.11 Constructor(data as string) 8747


### 54.20.11 Constructor(data as string)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a new data object with given content.
**Example:**

```
dim m as string = "Hello"
dim d as new CFMutableBinaryDataMBS(m)

MsgBox d.Str
```

See also:


- 54.20.9 Constructor(capacity as Integer) 8746

- 54.20.10 Constructor(data as MemoryBlock) 8747

### 54.20.12 Delete(pos as Integer,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Deletes bytes from a binary data object.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

### 54.20.13 IncreaseLength(extralen as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Resizes the binary data by extralen adding additional bytes.
**Notes:** This method may fail on low memory, e.g. on Mac OS Classic running a Carbon application with a small application memory partition size.

### 54.20.14 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the given binary data.
See also:

- 54.20.15 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer,newlen as Integer) 8748

### 54.20.15 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer,newlen as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the given binary data.
See also:

- 54.20.14 ReplaceCFBinaryDataMBS(m as CFBinaryDataMBS,pos as Integer,len as Integer) 8748

### 54.20.16 ReplaceMem(m as memoryblock,pos as Integer,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the memoryblock.
See also:

- 54.20.17 ReplaceMem(m as memoryblock,pos as Integer,len as Integer,newlen as Integer) 8749

### 54.20.17 ReplaceMem(m as memoryblock,pos as Integer,len as Integer,newlen as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the memoryblock.
See also:

- 54.20.16 ReplaceMem(m as memoryblock,pos as Integer,len as Integer) 8749

### 54.20.18 ReplaceStr(s as string,pos as Integer,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the string.
See also:

- 54.20.19 ReplaceStr(s as string,pos as Integer,len as Integer,newlen as Integer) 8749

### 54.20.19 ReplaceStr(s as string,pos as Integer,len as Integer,newlen as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces len bytes inside the binary data which start at position pos with the bytes from the string.
See also:

- 54.20.18 ReplaceStr(s as string,pos as Integer,len as Integer) 8749

### 54.20.20 SetLength(len as Integer)

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Sets length of the data.

## 54.21 class CFMutableCharacterSetMBS

### 54.21.1 class CFMutableCharacterSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation character set.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFCharacterSetMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 54.21.2 Methods

### 54.21.3 AddCFStringMBS(s as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds a range of characters from the CFStringMBS.

### 54.21.4 AddRange(min as Integer,max as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds a range of characters from min to max to the character set.

### 54.21.5 Intersect(value as CFCharacterSetMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Makes a intersection between both CFCharacterSets.

### 54.21.6 Invert

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Inverts this character set.

### 54.21.7 RemoveCFStringMBS(s as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes a range of characters from the CFStringMBS.

### 54.21.8 RemoveRange(min as Integer,max as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes a range of characters from min to max to the character set.

### 54.21.9 Union(value as CFCharacterSetMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Makes a Union between both CFCharacterSets.

## 54.22 class CFMutableDictionaryMBS

### 54.22.1 class CFMutableDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation dictionary.
**Notes:** If the release property is true, the destructor of this class will release the dictionary reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFDictionaryMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 54.22.2 Methods

### 54.22.3 Add(key as CFObjectMBS,value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds a key value combination to the dictionary.
**Example:**

```
dim d as CFMutableDictionaryMBS

d=NewCFMutableDictionaryMBS
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")
MsgBox d.XML.str
```

### 54.22.4 Remove(key as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes all entries with the given key.
**Notes:** Maybe no key is found.

### 54.22.5 RemoveAll

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes all entries.

### 54.22.6 Replace(key as CFObjectMBS,value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces all entries with the given key to contain the given value.
**Notes:** Maybe no key is found.

### 54.22.7 Set(key as CFObjectMBS,value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets the entry with the given key to the given value.
**Example:**

```
dim d as new CFMutableDictionaryMBS


d.Add NewCFStringMBS("Key"), NewCFStringMBS("Value")
d.Set NewCFStringMBS("Key"), NewCFStringMBS("Value2") // set changes value, add would not change
it here

MsgBox d.XML.Str
```

## 54.23 class CFMutableSetMBS

### 54.23.1 class CFMutableSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation set.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFSetMBS class.

### 54.23.2 Methods

### 54.23.3 Add(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds an object to this set.

### 54.23.4 Remove(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes an object in this set.

### 54.23.5 RemoveAll

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes all items from this set.

### 54.23.6 Replace(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces an object in this set.

### 54.23.7 Set(value as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets an object in this set.

## 54.24 class CFMutableStringMBS

### 54.24.1 class CFMutableStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation mutable string.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFStringMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr1
- MBS Real Studio Plugins, version 13.0pr1

### 54.24.2 Methods

### 54.24.3 AppendCFStringMBS(s as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the given CFStringMBS.

### 54.24.4 AppendString(s as String)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends the given Xojo string.

### 54.24.5 Capitalize

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Changes the first character represented by a CFStringMBS object to uppercase (if it is a lowercase alphabetical character).

### 54.24.6 Delete(pos as Integer,len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Deletes a range of characters in a mutable CFStringMBS object.

### 54.24.7 Insert(index as Integer,s as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Inserts a string at a specified location in the character buffer of a mutable CFStringMBS object.

### 54.24.8 LocalizedCapitalize(LocaleIdentifier as String)

MBS MacCF Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Localized capitalize.
**Notes:** Locale identifier can be "de", "de_DE" or "German" style.
Raises RaiseUnsupportedOperationException if locale identifier is not known.

### 54.24.9 LocalizedLowercase(LocaleIdentifier as String)

MBS MacCF Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Localized lowercase.
**Notes:** Locale identifier can be "de", "de_DE" or "German" style.
Raises RaiseUnsupportedOperationException if locale identifier is not known.

### 54.24.10 LocalizedUppercase(LocaleIdentifier as String)

MBS MacCF Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Localized uppercase.
**Example:**

```
dim m1 as new CFMutableStringMBS("i")
dim m2 as new CFMutableStringMBS("i")

m1.Uppercase
m2.LocalizedUppercase("Turkish")

MsgBox m1.Str+EndOfLine+m2.Str
// shows to variants of capital I
```

**Notes:** Locale identifier can be "de", "de_DE" or "German" style.
Raises RaiseUnsupportedOperationException if locale identifier is not known.

### 54.24.11 Lowercase

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Changes all uppercase alphabetical characters in a mutable CFStringMBS to lowercase.

### 54.24.12 Normalize(NormalizationForm as Integer)

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Normalizes the string into the specified form as described in Unicode Technical Report #15.
**Example:**

```
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS
dim m as CFMutableStringMBS

s=NewCFStringMBS("Hello √©")
m=s.Normalize(kCFStringNormalizationFormD)

MsgBox str(s.Len)+" "+str(m.len)

// decomposed the length is one more.
```

**Notes:** Requires Mac OS X 10.2 or newer.

### 54.24.13 Pad(padstr as CFStringMBS,len as Integer,indexIntoPad as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Enlarges the string represented by a CFStringMBS object, padding it with specified characters, or truncates the string.
**Notes:** The CFStringMBS.Pad function has two purposes. It either enlarges the character buffer of a mutable CFStringMBS object to a given length, padding the added length with a given character or characters,

or it truncates the character buffer to a smaller size. The key parameter for this behavior is the length parameter; if it is greater than the current length of the represented string, padding takes place, and if it less than that length, truncation occurs.

For example, say you have a mutable CFStringMBS ( aMutStr ) containing the characters "abcdef". The call

CFStringMBS.Pad(newcfstring(". "), 12, 1)

results in aMutStr containing "abcdef . . .". However, the following call

CFStringMBS.Pad( nil, 3, 0)

results in aMutStr containing "abc".

### 54.24.14 Replace(newstr as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces the content of this CFMutableStringMBS with the one from newstr.
See also:

- 54.24.15 Replace(pos as Integer,len as Integer,newstr as CFStringMBS) 8760

### 54.24.15 Replace(pos as Integer,len as Integer,newstr as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Replaces the substring with the given range of this CFMutableStringMBS with the one from newstr.
See also:

- 54.24.14 Replace(newstr as CFStringMBS) 8760

### 54.24.16 Trim

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Trims whitespace from the beginning and end of the characters represented by a mutable CF-StringMBS object.
See also:

- 54.24.17 Trim(trimchar as CFStringMBS) 8761

### 54.24.17 Trim(trimchar as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Trims a specified substring from the beginning and end of the character contents represented by a mutable CFStringMBS object.
See also:

- 54.24.16 Trim 8760

### 54.24.18 Truncate(len as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** If the string is longer than len, it is truncated to len.

### 54.24.19 Uppercase

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Changes all lowercase alphabetical characters in a mutable CFStringMBS object to uppercase.

## 54.25 class CFNumberMBS

### 54.25.1 class CFNumberMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation number.
**Example:**

```
dim n as CFNumberMBS = NewCFNumberMBSDouble(4.3)

MsgBox str(n.doubleValue)
```

**Notes:** If the release property is true, the destructor of this class will release the number reference.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr4

### 54.25.2 Methods

### 54.25.3 Compare(other as CFNumberMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Compares two CFNumbers.
**Notes:** Return values:

| | |
|---|---|
| Less Than | -1 |
| Equal To | 0 |
| Greater Than | 1 |

From CFNumberMBS.h:

Compares the two CFNumberMBS instances. If conversion of the types of the values is needed, the conversion and comparison follow human expectations and not C's promotion and comparison rules. Negative zero compares less than positive zero.
Positive infinity compares greater than everything except itself, to which it compares equal. Negative infinity compares less than everything except itself, to which it compares equal. Unlike standard practice, if both numbers are NaN, then they compare equal; if only one of the numbers is NaN, then the NaN compares greater than the other number if it is negative, and smaller than the other number if it is positive.

### 54.25.4 NewWithDouble(value as Double) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 64bit float value.

### 54.25.5 NewWithInt16(value as Int16) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 16bit integer value.

### 54.25.6 NewWithInt32(value as Int32) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 32bit integer value.

### 54.25.7 NewWithInt64(value as Int64) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 64bit integer value.
**Example:**

```
dim c as CFNumberMBS = CFNumberMBS.NewWithInt64(123456789123456789)

// shows type. 4 is signed 64-bit integer
MsgBox str(c.NumberType)+": "+str(c.int64Value)
```

### 54.25.8 NewWithInt8(value as Int8) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 8bit integer value.

### 54.25.9 NewWithSingle(value as Single) as CFNumberMBS

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFNumberMBS with a 32bit float value.

### 54.25.10 Properties

### 54.25.11 ByteSize as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the size in bytes of the type of the number.
**Notes:** (Read only property)

### 54.25.12 doubleValue as Double

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The value of this CFNumberMBS object.
**Notes:** (Read only property)

### 54.25.13 int16Value as Int16

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries value as 16bit integer.
**Notes:** (Read only property)

### 54.25.14 int32Value as Int32

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries value as 32bit integer.
**Notes:** (Read only property)

### 54.25.15 int64Value as Int64

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries value as 64bit integer.
**Example:**

```
dim c as CFNumberMBS = CFNumberMBS.NewWithInt64(123456789123456789)

// shows type. 4 is signed 64-bit integer
MsgBox str(c.NumberType)+": "+str(c.int64Value)
```

**Notes:** (Read only property)

### 54.25.16 int8Value as Int8

MBS MacCF Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** Queries value as 8bit integer.
**Notes:** (Read only property)

### 54.25.17 integerValue as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The value of this CFNumberMBS object.
**Example:**

```
dim n as CFNumberMBS

n=NewCFNumberMBSInteger(45)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSSingle(45.67)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSDouble(45.6789)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

// in version 5.1 of the plugins:
// 45 45 45
// 45.67 0 45.67
// 45.6789 0 0
//
// in version 5.2 of the plugins: (after a fix)
// 45 45 45
// 45.67 45 45.67
```

```
// 45.6789 45 45.6789
```

**Notes:** Returns a trancated value if the number is not storeable in an integer.
(Read only property)

### 54.25.18 isFloat as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns TRUE if the type of the CFNumberMBS's value is one of the defined floating point types.
**Notes:** (Read only property)

### 54.25.19 NumberType as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the storage format of the CFNumberMBS's value.
**Notes:** Possible values:

| Name | Value | Xojo Datatype |
|---|---|---|
| SInt8 | 1 | - |
| SInt16 | 2 | - |
| SInt32 | 3 | integer |
| SInt64 | 4 | - |
| Float32 | 5 | single |
| Float64 | 6 | double |
| Char | 7 | - |
| Short | 8 | - |
| Int | 9 | - |
| Long | 10 | integer |
| LongLong | 11 | - |
| Float | 12 | single |
| Double | 13 | double |
| CFIndex | 14 | integer |

(Read only property)

### 54.25.20 singleValue as single

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The value of this CFNumberMBS object.
**Example:**

```
dim n as CFNumberMBS

n=NewCFNumberMBSInteger(45)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSSingle(45.67)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

n=NewCFNumberMBSDouble(45.6789)

MsgBox str(n.doubleValue)+" "+str(n.integerValue)+" "+str(n.singleValue)

// in version 5.1 of the plugins:
// 45 45 45
// 45.67 0 45.67
// 45.6789 0 0
//
// in version 5.2 of the plugins: (after a fix)
// 45 45 45
// 45.67 45 45.67
// 45.6789 45 45.6789
```

**Notes:** Returns a trancated value if the number is not storeable in a single.
(Read only property)

## 54.26 class CFObjectMBS

### 54.26.1 class CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation object.
**Example:**

```
// is object is a CFStringMBS, return it a Xojo string.
Function st(o as CFObjectMBS) As string
if o isa CFStringMBS then
return CFStringMBS(o).str
end if
End Function
```

**Notes:** If the release property is true, the destructor of this class will release the object reference.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 14.3pr2
- MBS Xojo / Real Studio Plugins, version 14.2pr10
- MBS Xojo / Real Studio Plugins, version 13.2pr5
- MBS Real Studio Plugins, version 13.0fc1

### 54.26.2 Methods

### 54.26.3 close

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 54.26.4 DeepCopy as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Creates a deep copy of the CFObject.
**Notes:** Copies all sub objects if the Object has sub objects (like the Dictionary).

### 54.26.5 EncodedData as MemoryBlock

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Returns the content of the object and all subobjects as a binary encoded plist file content.
**Notes:** Returns nil on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.
You can write this to a plist file.

### 54.26.6 Equal(o as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns true if both CFObjects are equal in type and content.

### 54.26.7 NewCFObject(handle as Integer) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates new plugin CFObjectMBS around a handle of a CF Type.
**Example:**

```
// make string
dim s as CFStringMBS = NewCFStringMBS("Hello World")

// get handle
dim h as Integer = s.Handle

// get back from handel to plugin object
dim o as CFObjectMBS = CFObjectMBS.NewCFObject(h)

// and see if plugin detected a string
if o isa CFStringMBS then
dim t as CFStringMBS = CFStringMBS(o)

MsgBox t.str
end if
```

### 54.26.8 ReleaseObject

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Decreases the retain count of this object.
**Notes:** If the retain count falls below 1, the object is destroyed.

### 54.26.9 RetainCount as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the reference counter of the object.
**Example:**

```
dim o as CFObjectMBS
dim s as CFStringMBS

s=NewCFStringMBS("Hello")

MsgBox "s has "+str(s.RetainCount)+" refs in CF"
o=s

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.RetainObject

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.ReleaseObject

MsgBox "o has "+str(o.RetainCount)+" refs in CF"

o.Close

MsgBox "o has "+str(o.RetainCount)+" refs in CF"
```

**Notes:** If the retain count falls below 1, the object is destroyed.

### 54.26.10 RetainObject

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Increases the retain count of this object.
**Example:**

```
Function CFDateFromCFObject(o as cfobjectMBS) As cfdateMBS
dim d as CFDateMBS
```

```
if o<>nil then
if o.Type=kCFDateMBSTypeID then
d=new CFDateMBS
d.Handle=o.Handle
d.RetainObject
end if
end if

Exception
End Function
```

**Notes:** If the retain count falls below 1, the object is destroyed.

### 54.26.11 XML as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the content of the object and all subobjects as a XML file content.
**Example:**

```
// Save a dictionary in a XML file:

dim d as CFMutableDictionaryMBS
dim f as FolderItem
dim t as TextOutputStream

// Create dictionary
d=NewCFMutableDictionaryMBS
// Fill dictionary
d.Add NewCFStringMBS("Key"),NewCFStringMBS("Value")

// get file name
f=GetFolderItem("CF XML Test.txt")

// create file
t=f.CreateTextFile
// Write XML
t.Write d.XML.Str
// close file
t.Close
```

**Notes:** Returns nil on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.

You can write this to a plist file.

### 54.26.12 XMLdata as String

MBS MacCF Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Returns the content of the object and all subobjects as a XML file content.
**Notes:** Returns empty string on any error. For example if you have CFDictionary with keys not being CFStringMBS objects.
You can write this to a plist file.

### 54.26.13 Properties

### 54.26.14 Handle as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** The core foundation object references.
**Notes:** (Read and Write property)

### 54.26.15 Hash as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a hash code for this object.
**Notes:** (Read only property)

### 54.26.16 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The last error code reported.
**Notes:** Please check each function on whether it sets the lasterror property.
(Read and Write property)

### 54.26.17 Type as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Type ID for this object.
**Notes:** (Read only property)

### 54.26.18 TypeDescription as String

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the type description for this object.
**Notes:** e.g. "CFString" or "CFNumber".
(Read only property)

## 54.27 class CFPreferencesMBS

### 54.27.1 class CFPreferencesMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for the core foundation preferences services.
**Example:**

```
Sub Open()
// in a listbox on a window, list all preferences applications for the current user
dim c as CFArrayMBS
dim p as CFPreferencesMBS
dim i as Integer
dim count as Integer
dim o as CFObjectMBS
dim s as CFStringMBS

p=new CFPreferencesMBS
c=p.CopyApplicationList(p.kCFPreferencesCurrentUser, p.kCFPreferencesAnyHost)

count=c.Count-1
for i=0 to count
o=c.Item(i)
if o isa CFStringMBS then
s=CFStringMBS(o)
window1.listbox1.AddRow s.str
end if
next

Title=str(ListBox1.ListCount)+" "+Title
End Sub
```

**Notes:** Search for Apple Developer documentation on CFPreferences for details on functionality these plugin functions provide.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr4

### 54.27.2 Methods

### 54.27.3 AddSuitePreferencesToApp(ApplicationID as CFStringMBS, SuiteID as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Adds a new suite to the application preferences.

### 54.27.4 AppSynchronize(ApplicationID as CFStringMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Synchronizes the values in the RAM with the disk for the given application.
**Notes:** Returns false on any error.

### 54.27.5 CopyAppBooleanValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Copies the application preferences boolean value.
**Notes:** On an error it returns false and KeyExistsAndHasValidFormat is set to false.

### 54.27.6 CopyAppIntegerValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Copies the application preferences integer value.
**Notes:** On an error it returns false and KeyExistsAndHasValidFormat is set to false.

### 54.27.7 CopyApplicationList(userName as CFStringMBS, hostName as CFStringMBS) as CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all applications which have preferences.
**Example:**

```
Sub Open()
// in a listbox on a window, list all preferences applications for the current user
dim c as CFArrayMBS
dim p as CFPreferencesMBS
dim i as Integer
dim count as Integer
dim o as CFObjectMBS
dim s as CFStringMBS
```

```
p=new CFPreferencesMBS
c=p.CopyApplicationList(p.kCFPreferencesCurrentUser, p.kCFPreferencesAnyHost)

count=c.Count-1
for i=0 to count
o=c.Item(i)
if o isa CFStringMBS then
s=CFStringMBS(o)
Listbox1.AddRow s.str
end if
next

Title=str(ListBox1.ListCount)+" "+Title
End Sub
```

**Notes:** Returns false on any error.

### 54.27.8 CopyAppValue(Key as CFStringMBS, ApplicationID as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Copies the application preferences value.
**Example:**

```
// copy names of recent items in Xojo Preferences

dim names() as string
dim c as new CFPreferencesMBS

dim o as CFObjectMBS = c.CopyAppValue(NewCFStringMBS("Recent Items Dict"), NewCFStringMBS("com.re-
alsoftware.realstudio"))

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

dim u as Integer = a.Count-1
for i as Integer = 0 to u

o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)
```

```
dim no as CFObjectMBS = d.Value(NewCFStringMBS("Name"))
if no isa CFStringMBS then

dim ns as CFStringMBS = CFStringMBS(no)

names.Append ns.str
end if
end if
next
end if

MsgBox Join(names,EndOfLine)
```

**Notes:** Returns nil on any error.

### 54.27.9 CopyDictionary(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Copies all preferences value.
**Example:**

```
dim p as new CFPreferencesMBS

p.SetValue(NewCFStringMBS("TestString"), NewCFStringMBS("Hello World"), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
p.SetValue(NewCFStringMBS("TestDouble"), NewCFNumberMBSDouble(5.6), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
p.SetValue(NewCFStringMBS("TestInteger"), NewCFNumberMBSInteger(3), p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)

dim d as CFDictionaryMBS = p.CopyDictionary(p.kCFPreferencesCurrentApplication, p.kCFPreferencesCurrentUser, p.kCFPreferencesCurrentHost)
dim x as CFBinaryDataMBS = d.XML
dim s as string = x.Str

break
// check data in variable s with xml of all properties
```

**Notes:** Returns nil on any error.

### 54.27.10 CopyKeyList(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFArrayMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all preferences keys for the given application.
**Notes:** Returns false on any error.

### 54.27.11 CopyMultiple(Key as CFArrayMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFDictionaryMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Copies several preferences value.
**Notes:** Returns nil on any error.

### 54.27.12 CopyValue(Key as CFStringMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Copies a preferences value.
**Example:**

```
dim c as CFPreferencesMBS
dim o as CFObjectMBS
dim a as CFStringMBS // application
dim k as CFStringMBS // key

k=NewCFStringMBS("AvailableLanguages")
a=NewCFStringMBS("com.apple.systempreferences")

c=new CFPreferencesMBS

o=c.CopyValue(k,a,c.kCFPreferencesCurrentUser,c.kCFPreferencesAnyHost)

CFShowMBS o

// Shows in the console application something like this:
//
// <CFArray >{ type = mutable-small, count = 2, values = (
// 0 : <CFString >{ contents = "en" }
```

```
// 1 : <CFString >{ contents = "de" }
// ) }
```

**Notes:** Returns nil on any error.

### 54.27.13 kCFPreferencesAnyApplication as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.14 kCFPreferencesAnyHost as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.15 kCFPreferencesAnyUser as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.16 kCFPreferencesCurrentApplication as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.17 kCFPreferencesCurrentHost as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.18 kCFPreferencesCurrentUser as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A constant for preferences functions of Mac OS X.

### 54.27.19 RemoveSuitePreferencesFromApp(ApplicationID as CFStringMBS, SuiteID as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Removes a new suite to the application preferences.

### 54.27.20 SetAppValue(Key as CFStringMBS, value as CFObjectMBS, ApplicationID as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets an application preferences value.
**Notes:** Note that on saveing all strings are internally converted to UTF-8.

### 54.27.21 SetMultiple(KeysToSet as CFDictionaryMBS, KeysToRemove as CFArrayMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets several preferences values.
**Notes:** Note that on saveing all strings are internally converted to UTF-8.

### 54.27.22 SetValue(Key as CFStringMBS, Value as CFObjectMBS, ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS)

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Sets a preferences value.
**Notes:** Note that on saveing all strings are internally converted to UTF-8.

### 54.27.23 Synchronize(ApplicationID as CFStringMBS, userName as CFStringMBS, hostName as CFStringMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Synchronizes the values in the RAM with the disk for the given application.
**Notes:** Returns false on any error.

### 54.27.24 Properties

### 54.27.25 KeyExistsAndHasValidFormat as Boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Set by CopyAppBooleanValue and CopyAppIntegerValue.
**Notes:** (Read and Write property)

## 54.28 class CFRangeMBS

### 54.28.1 class CFRangeMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The class for a CFRange.
**Notes:** A range of sequential items in a container, such as characters in a buffer or elements in a collection.
**Blog Entries**

- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr10
- MBS Xojo / Real Studio Plugins, version 14.2pr9

**Xojo Developer Magazine**

- 12.4, page 9: News

### 54.28.2 Methods

### 54.28.3 Constructor(location as Integer = 0, length as Integer = 0)

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a new range with given values.

### 54.28.4 Properties

### 54.28.5 length as Integer

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** An integer representing the number of items in the range.
**Notes:** (Read and Write property)

### 54.28.6 location as Integer

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** An integer representing the starting location of the range.
**Notes:** (Read and Write property)

## 54.29 class CFSetListMBS

### 54.29.1 class CFSetListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for the items of a CFSetMBS.

### 54.29.2 Methods

### 54.29.3 Value(index as Integer) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the value with the given index.

### 54.29.4 Properties

### 54.29.5 Count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts the items in the set.
**Notes:** (Read and Write property)

## 54.30 class CFSetMBS

### 54.30.1 class CFSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation set.
**Notes:** If the release property is true, the destructor of this class will release the set reference.
Subclass of the CFObjectMBS class.

### 54.30.2 Methods

### 54.30.3 clone as CFSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Clones the set and all values.

### 54.30.4 Constructor

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** Creates a new editable set object.
**Example:**

```
dim e as new CFMutableSetMBS
e.Add(NewCFStringMBS("Hello"))
MsgBox str(e.Count)
```

### 54.30.5 ContainsValue(value as CFObjectMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does the set contain this value?

### 54.30.6 CountValue(value as CFObjectMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts how often this value is inside the set.

### 54.30.7 edit as CFMutableSetMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** To edit a set, this method returns you a CFMutableSetMBS.

### 54.30.8 list as CFSetListMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a list of all values.
**Notes:** This list will be invalid whenever this set is destroyed.

### 54.30.9 Value(value as CFObjectMBS) as CFObjectMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** If the value is found the value is returned.
**Notes:** Returns nil if key is not found.

### 54.30.10 Properties

### 54.30.11 Count as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Counts all values.
**Example:**

```
dim x as new CFMutableSetMBS

x.Set(NewCFStringMBS("Hello"))

MsgBox str(x.Count)
```

**Notes:** (Read only property)

## 54.31 class CFStringMBS

### 54.31.1 class CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation string.
**Example:**

```
dim s as CFStringMBS
dim t as CFStringMBS
dim x as string
dim o as CFObjectMBS

s=NewCFStringMBS("hello")

// make XML as string
x=s.XML.str

// recreate object from XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(x))

if o isa CFStringMBS then
t=CFStringMBS(o)

// show string content
MsgBox t.str
end if
```

**Notes:** If the release property is true, the destructor of this class will release the string reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr2
- MBS Real Studio Plugins, version 13.0pr1
- MBS Real Studio Plugins, version 12.1pr10
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8

### 54.31.2 Methods

### 54.31.3 Character(index as Integer) as string

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the character from this string with the given index.
**Notes:** The returned Xojo string contains a Unicode character.

### 54.31.4 Characters(pos as Integer,len as Integer) as string

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the characters from this string in the given range.
**Notes:** The returned Xojo string contains Unicode characters.

### 54.31.5 Compare(other as CFStringMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Compares two strings.
**Notes:** Return values:

| | |
|---|---|
| Less Than | -1 |
| Equal To | 0 |
| Greater Than | 1 |
| Function not available | -2 |

See also:


- 54.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 8787
- 54.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 8788
- 54.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 8789


### 54.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer

MBS MacCF Plugin, Plugin Version: 2.8, Platform: macOS, Targets: All.

**Function:** Compares two strings.
**Notes:** Return values:

| | |
|---|---|
| Less Than | -1 |
| Equal To | 0 |
| Greater Than | 1 |
| Function not available | -2 |

See also:


- 54.31.5 Compare(other as CFStringMBS) as Integer 8787
- 54.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 8788
- 54.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 8789


### 54.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Compares two strings.
**Example:**

```
dim s as CFStringMBS
dim t as CFStringMBS
dim n1,n2 as Integer

s=NewCFStringMBS("Hello7.txt")
t=NewCFStringMBS("Hello10.txt")
n1=s.Compare(t,false)

n2=s.Compare(t,false,true)

MsgBox "Without nummerical: "+str(n1)+", With nummerical: "+str(n2)+"."
```

**Notes:** Numerically works only if Mac OS X 10.2 or newer is running.

Return values:

See also:


- 54.31.5 Compare(other as CFStringMBS) as Integer 8787

| | |
|---|---|
| Less Than | -1 |
| Equal To | 0 |
| Greater Than | 1 |
| Function not available | -2 |


- 54.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 8787
- 54.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer 8789


### 54.31.8 Compare(other as CFStringMBS, Options as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 7.1, Platform: macOS, Targets: All.

**Function:** Compares two strings.
**Example:**

```
// Just a quick and dirty test for this function:

dim s(10) as string
dim i as Integer
dim temp as string
dim isDirty as boolean
dim a,b as CFStringMBS

s(1)="Apfel"
s(2)="Strasse"
s(3)="B√§um"
s(4)="Stra√üe"
s(5)="Zaun"
s(6)="√§pfel"
s(7)="b√§um"
s(8)="Baum"
s(9)="√Ñpfel"
s(10)="Ende"

// if kCFCompareLocalized is used, the √Ñpfel come near Apfel.

const kCFCompareCaseInsensitive = 1
const kCFCompareBackwards = 4 //* Starting from the end of the string */
const kCFCompareAnchored = 8 //* Only at the specified starting point */
const kCFCompareNonliteral = 16 //* If specified, loose equivalence is performed (o-umlaut == o, umlaut)
*/
const kCFCompareLocalized = 32 //* User's default locale is used for the comparisons */
const kCFCompareNumerically = 64 //* Numeric comparison is used; that is, Foo2.txt <Foo7.txt <Foo25.txt
*/
```

```
'Sortieren
do
isDirty = false// we haven't touched anything yet
for i = 1 to 10-1// loop through all the numbers

a=NewCFStringMBS(s(i))
b=NewCFStringMBS(s(i+1))

if a.Compare(b,kCFCompareLocalized)>0 then
temp = s(i+1)
s(i+1) = s(i)
s(i) = temp
isDirty = true// we touched the data so mark it as dirty
end
next
loop until isDirty = false// if we made it without touching the data thenwe are done


for i=1 to 10
EditField1.text=EditField1.text + s(i) + chr(13)
next i
```

**Notes:** Numerically works only if Mac OS X 10.2 or newer is running.

Return values:

| | |
|---|---|
| Less Than | -1 |
| Equal To | 0 |
| Greater Than | 1 |
| Function not available | -2 |

See also:

- 54.31.5 Compare(other as CFStringMBS) as Integer 8787
- 54.31.6 Compare(other as CFStringMBS, CaseInsensitive as boolean) as Integer 8787
- 54.31.7 Compare(other as CFStringMBS, CaseInsensitive as boolean, Numerically as boolean) as Integer 8788

### 54.31.9 Constructor(text as string = "")

MBS MacCF Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a new CFString.
**Example:**

```
dim c as new CFStringMBS("Hello")
MsgBox c
```

### 54.31.10 Edit as CFMutableStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a mutable string.

### 54.31.11 ExactFind(stringtofind as CFStringMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Finds the given string.
**Notes:** Exactly, so case sensitive.

### 54.31.12 Find(stringtofind as CFStringMBS) as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Finds the given string.

### 54.31.13 HasPrefix(s as CFStringMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does this string start with s.

### 54.31.14 HasSuffix(s as CFStringMBS) as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Does this string end with s.

### 54.31.15 Mid(pos as Integer,len as Integer) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns a new CFStringMBS with a substring from the current CFStringMBS.
**Notes:** Compare to Mid in RB.

### 54.31.16 Normalize(NormalizationForm as Integer) as CFMutableStringMBS

MBS MacCF Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Normalizes the string into the specified form as described in Unicode Technical Report #15.
**Example:**

```
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS
dim m as CFMutableStringMBS

s=NewCFStringMBS("Hello √©")
m=s.Normalize(kCFStringNormalizationFormD)

MsgBox str(s.Len)+" "+str(m.len)

// decomposed the length is one more.
```

**Notes:** Requires Mac OS X 10.2 or newer.
Returns nil on any error.

### 54.31.17 Operator_Convert as String

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** An internal method for Xojo 5.x.
**Example:**

```
dim s as cfstringmbs
s=NewCFStringMBS("Hello")
msgbox s
```

**Notes:** This method is used by Xojo 5.x to allow you to directly create a Xojo string based on a CoreFoundation string.
Xojo may create a NilObjectException if the cfstring object is nil.
See also:


- 54.31.18 Operator_Convert(v As String) 8793


### 54.31.18 Operator_Convert(v As String)

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** An internal method for Xojo 5.x.
**Example:**

```
dim s as cfstringmbs
s="Hello"
// replaces: s=NewCFStringMBS("Hello")
```

**Notes:** This method is used by Xojo 5.x to allow you to directly create a corefoundation string object based on a Xojo string.
See also:


- 54.31.17 Operator_Convert as String 8792


### 54.31.19 stringWithHandle(Handle as Integer) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new string object based on a handle value.
**Notes:** Will retain the reference.

### 54.31.20 Properties

### 54.31.21 DisplayString as String

MBS MacCF Plugin, Plugin Version: 10.1, Platform: macOS, Targets: All.

**Function:** For the debugger the string of this CFString reduced to maximum of 1000 characters.
**Notes:** (Read only property)

### 54.31.22 DoubleValue as Double

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the string interpreted as an double value.
**Example:**

```
dim d as CFStringMBS = NewCFStringMBS("3.4")
MsgBox str(d.DoubleValue)
```

**Notes:** Compare to val.
Skips whitespace; returns 0.0 on error.
(Read only property)

### 54.31.23 FastestEncoding as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Obtains the encoding for the characters in a CFString that requires the least conversion time.
**Notes:** -1 on Windows.
(Read only property)

### 54.31.24 IntegerValue as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the string interpreted as an integer value.
**Example:**

```
dim d as CFStringMBS = NewCFStringMBS("3.4")
MsgBox str(d.IntegerValue) // shows 3
```

**Notes:** Compare to val.
Skips whitespace; returns 0 on error, MAX or -MAX on overflow.
(Read only property)

### 54.31.25 Len as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the length in chars of the string.

**Notes:** (Read only property)

### 54.31.26 SmallestEncoding as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Obtains the smallest encoding on the current system for the character contents of a CFString object.
**Notes:** Value is -1 on Windows and Mac OS Classic.
(Read only property)

### 54.31.27 Str as String

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the string data as Xojo string.
**Notes:** Returns the string in a one byte encoding. If possible ASCII string, else if possible MacRoman encoded else UTF8.
(Read and Write computed property)

### 54.31.28 UStr as String

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use Str instead. **Function:** Returns the string data as Xojo unicode string (16bit).
**Notes:** If the string can not be returned as an unicode string, this function returns it as a normal string in System script (e.g. MacRoman).
(Read and Write computed property)

## 54.32 class CFTimeIntervalMBS

### 54.32.1 class CFTimeIntervalMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for a time interval value.
**Notes:** The time interval is basicly a double property inside the class.

### 54.32.2 Properties

### 54.32.3 Value as Double

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The value of the class.
**Notes:** (Read and Write property)

# 54.33 class CFTimeZoneMBS

## 54.33.1 class CFTimeZoneMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for a core foundation time zone.
**Example:**

```
dim t as new CFTimeZoneMBS
MsgBox t.Name.str
```

**Notes:** Subclass of the CFObjectMBS class.

## 54.33.2 Methods

## 54.33.3 Abbreviation(atTime as CFAbsoluteTimeMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The abbreviation for the given timezone name.
**Example:**

```
dim t as new CFTimeZoneMBS
MsgBox t.Abbreviation(nil)
```

**Notes:** Returns nil on any error.
As the name may change depending on whether it's daylight saving time, you should give an absolute time value.

## 54.33.4 Constructor

MBS MacCF Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** A constructor which fills the object with the system timezone.
**Example:**

```
dim CFDateLocal as new CFAbsoluteTimeMBS
dim CFTimeZone as new CFTimeZoneMBS

dim MyDSTState as Boolean = CFTimeZone.IsDaylightSavingTime(CFDateLocal)
```

```
MsgBox str(MyDSTState)
```

### 54.33.5 Data as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The binary data for the timezone.
**Example:**

```
dim t as new CFTimeZoneMBS
MsgBox t.Data.Str
```

### 54.33.6 IsDaylightSavingTime(atTime as CFAbsoluteTimeMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** whether it's daylight saving time at the given absolute time.
**Example:**

```
// get current timezone
dim c as CFTimeZoneMBS = SystemCFTimeZoneMBS

// and current time
dim time as CFAbsoluteTimeMBS = CurrentCFAbsoluteTimeMBS

// Do we have daylight saving time?
MsgBox str(c.IsDaylightSavingTime(time))
```

### 54.33.7 Name as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The name of the timezone.
**Example:**

```
dim s as CFTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox s.Name
```

### 54.33.8 SecondsFromGMT(atTime as CFAbsoluteTimeMBS) as CFTimeIntervalMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the time difference to GMT for the given time (for daylight saving).
**Example:**

```
dim s as cfTimeZoneMBS
s=SystemCFTimeZoneMBS
MsgBox str(s.SecondsFromGMT(nil).Value) // 3600 in Germany
```

**Notes:** Returns nil on any error.

## 54.34 class CFURLMBS

### 54.34.1 class CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** A class for a core foundation boolean.
**Notes:** If the release property is true, the destructor of this class will release the url reference.
This class works on Windows with QuickTime 7 installed.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr6
- MBS Xojo Plugins, version 17.4pr2
- MBS Xojo Plugins, version 17.1pr4
- MBS Xojo / Real Studio Plugins, version 16.4pr3
- MBS Xojo / Real Studio Plugins, version 14.1pr2
- MBS Real Studio Plugins, version 13.0pr1
- MBS Real Studio Plugins, version 12.1pr10

### 54.34.2 Methods

### 54.34.3 AbsoluteURL as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the absolute URL.
**Notes:** A URL contains normally a base and a relative part. This function creates one absolute URL from those parts.

### 54.34.4 AppendPathComponent(pathcomponent as CFStringMBS,isDirectory as boolean) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends a path component to this URL.

### 54.34.5 AppendPathExtension(extension as CFStringMBS) as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Appends a path extension to this URL.

### 54.34.6 BaseURL as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the base URL.
**Notes:** A URL contains normally a base and a relative part.

### 54.34.7 CanBeDecomposed as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Can this url be decomposed?

### 54.34.8 Constructor(File as FolderItem)

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates new CFURLMBS based on given folderitem.
**Notes:** Raises exception if not called on macOS or called with invalid URL.
See also:

- 54.34.9 Constructor(URL as string) 8801

### 54.34.9 Constructor(URL as string)

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates new CFURLMBS based on given URL.
**Notes:** Raises exception if not called on macOS or called with invalid URL.
See also:

- 54.34.8 Constructor(File as FolderItem) 8801

### 54.34.10 Data(encoding as Integer, escapeWhitespace as boolean) as CFBinaryDataMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the URL as binary data using the given encoding.

### 54.34.11 DeleteLastPathComponent as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Deletes the last path component of this URL.

### 54.34.12 DeletePathExtension as CFURLMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Deletes the path extension of this URL.

### 54.34.13 DisplayName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 2.9, Platform: macOS, Targets: All.

**Function:** Returns the display name for the url.
**Notes:** Returns "" on any error.

### 54.34.14 file as folderitem

MBS MacCF Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the URL as a folderitem.
**Notes:** Works only on RB 4.5 or later and if the file exists.

### 54.34.15 Fragment(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Fragment part of this URL.

### 54.34.16 HasDirectoryPath as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Has this URL a directory path?

### 54.34.17 HFSFileSystemPath as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the URL as HFSFileSystemPath.

### 54.34.18 HostName as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the HostName part of this URL.

### 54.34.19 isAbsolutePath as boolean

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Is the path an absolute path?

### 54.34.20 kCFURLAddedToDirectoryDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The date the resource was created, or renamed into or within its parent directory. Note that inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes. (Read-only, value type CFDateMBS)
for macOS 10.10 or later.

### 54.34.21 kCFURLApplicationIsScriptableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True if the resource is scriptable. Only applies to applications. (Read-only, value type CFBoolean-

MBS)
for macOS 10.11 or later.

### 54.34.22 kCFURLAttributeModificationDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The time the resource's attributes were last modified (Read-only, value type CFDateMBS)

### 54.34.23 kCFURLCanonicalPathKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** the URL's path as a canonical absolute file system path (Read-only, value type CFStringMBS)
for macOS 10.12 or later.

### 54.34.24 kCFURLContentAccessDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The date the resource was last accessed (Read-only, value type CFDateMBS)

### 54.34.25 kCFURLContentModificationDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The time the resource content was last modified (Read-write, value type CFDateMBS)

### 54.34.26 kCFURLCreationDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The date the resource was created (Read-write, value type CFDateMBS)

### 54.34.27 kCFURLDocumentIdentifierKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The document identifier – a value assigned by the kernel to a document (which can be either a file or directory) and is used to identify the document regardless of where it gets moved on a volume. The document identifier survives "safe save,Äù operations; i.e it is sticky to the path it was assigned to (NSURL -replaceItemAtURL:withItemAtURL:backupItemName:options:resultingItemURL:error: is the preferred safe-save API). The document identifier is persistent across system restarts. The document identifier is not transferred when the file is copied. Document identifiers are only unique within a single volume. This property is not supported by all volumes. (Read-only, value type CFNumberMBS)
for macOS 10.10 or later.

### 54.34.28 kCFURLFileAllocatedSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total size allocated on disk for the file in bytes (number of blocks times block size) (Read-only, value type CFNumberMBS)

### 54.34.29 kCFURLFileResourceIdentifierKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** An identifier which can be used to compare two file system objects for equality using CFObjectMBS.Equal (i.e, two object identifiers are equal if they have the same file system path or if the paths are linked to same inode on the same file system). This identifier is not persistent across system restarts. (Read-only, value type CFObjectMBS)

### 54.34.30 kCFURLFileResourceTypeBlockSpecial as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** Special block device.

### 54.34.31 kCFURLFileResourceTypeCharacterSpecial as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** Special charset device.

### 54.34.32 kCFURLFileResourceTypeDirectory as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** A folder.

### 54.34.33 kCFURLFileResourceTypeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Returns the file system object type. (Read-only, value type CFStringMBS) for macOS 10.7 or later.

### 54.34.34 kCFURLFileResourceTypeNamedPipe as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** A named pipe.

### 54.34.35 kCFURLFileResourceTypeRegular as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** Regular file.

### 54.34.36 kCFURLFileResourceTypeSocket as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** A network socket.

### 54.34.37 kCFURLFileResourceTypeSymbolicLink as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** An symbolic link.

### 54.34.38 kCFURLFileResourceTypeUnknown as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the file resource type values.
**Notes:** Unknown.

### 54.34.39 kCFURLFileSecurityKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The file system object's security information encapsulated in a CFFileSecurity object. (Read-write, value type CFFileSecurity)

### 54.34.40 kCFURLFileSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total file size in bytes (Read-only, value type CFNumberMBS)

### 54.34.41 kCFURLGenerationIdentifierKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** An opaque generation identifier which can be compared using CFObjectMBS.Equal() to determine if the data in a document has been modified. For URLs which refer to the same file inode, the generation identifier will change when the data in the file's data fork is changed (changes to extended attributes or other

file system metadata do not change the generation identifier). For URLs which refer to the same directory inode, the generation identifier will change when direct children of that directory are added, removed or renamed (changes to the data of the direct children of that directory will not change the generation identifier). The generation identifier is persistent across system restarts. The generation identifier is tied to a specific document on a specific volume and is not transferred when the document is copied to another volume. This property is not supported by all volumes. (Read-only, value type CFObjectMBS)
for macOS 10.10 or later.

### 54.34.42 kCFURLHasHiddenExtensionKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for resources whose filename extension is removed from the localized name property (Read-write, value type CFBooleanMBS)

### 54.34.43 kCFURLIsAliasFileKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the resource is a Finder alias file or a symlink, false otherwise ( Read-only, value type CFBooleanMBS)

### 54.34.44 kCFURLIsApplicationKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True if resource is an application (Read-only, value type CFBooleanMBS)
for macOS 10.11 or later.

### 54.34.45 kCFURLIsDirectoryKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for directories (Read-only, CFBooleanMBS)

### 54.34.46 kCFURLIsExcludedFromBackupKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if resource should be excluded from backups, false otherwise (Read-write, value type CFBooleanMBS). This property is only useful for excluding cache and other application support files which are not needed in a backup. Some operations commonly made to user documents will cause this property to be reset to false and so this property should not be used on user documents.
for macOS 10.8 or later.

### 54.34.47 kCFURLIsExecutableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this process (as determined by EUID) can execute a file resource or search a directory resource. (Read-only, value type CFBooleanMBS)
for mac OS 10.7 or later.

### 54.34.48 kCFURLIsHiddenKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for resources normally not displayed to users (Read-write, value type CFBooleanMBS).

If the resource is a hidden because its name starts with a period, setting this property to false will not change the property.

### 54.34.49 kCFURLIsMountTriggerKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this URL is a file system trigger directory. Traversing or opening a file system trigger will cause an attempt to mount a file system on the trigger directory. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

### 54.34.50 kCFURLIsPackageKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim c as CFURLMBS = NewCFURLMBSFile(f)

dim v as Variant
dim e as CFErrorMBS

if c.ResourcePropertyForKey(c.kCFURLIsPackageKey, v1, e) then
dim p as CFBooleanMBS = v

MsgBox "IsPackage: "+str(p.Value)
else
MsgBox "Error: "+e.Description
end if
```

**Notes:** True for packaged directories (Read-only 10.6 and 10.7, read-write 10.8, value type CFBooleanMBS).

You can only set or clear this property on directories; if you try to set this property on non-directory objects, the property is ignored. If the directory is a package for some other reason (extension type, etc), setting this property to false will have no effect.

### 54.34.51 kCFURLIsReadableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this process (as determined by EUID) can read the resource. (Read-only, value type CF-BooleanMBS)
for macOS 10.7 or later.

### 54.34.52 kCFURLIsRegularFileKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for regular files (Read-only, value type CFBooleanMBS)

### 54.34.53 kCFURLIsSymbolicLinkKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for symlinks (Read-only, value type CFBooleanMBS)

### 54.34.54 kCFURLIsSystemImmutableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for system-immutable resources (Read-write, value type CFBooleanMBS)

### 54.34.55 kCFURLIsUbiquitousItemKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this item is synced to the cloud, false if it is only a local file. (Read-only, value type CF-BooleanMBS)
for macOS 10.7 or newer.

### 54.34.56 kCFURLIsUserImmutableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for user-immutable resources (Read-write, value type CFBooleanMBS)

### 54.34.57 kCFURLIsVolumeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** True for the root directory of a volume (Read-only, value type CFBooleanMBS)

### 54.34.58 kCFURLIsWritableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this process (as determined by EUID) can write to the resource. (Read-only, value type CFBooleanMBS)
for mac OS 10.7 or later.

### 54.34.59 kCFURLLabelNumberKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The label number assigned to the resource (Read-write, value type CFNumberMBS)

### 54.34.60 kCFURLLinkCountKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Number of hard links to the resource (Read-only, value type CFNumberMBS)

### 54.34.61 kCFURLLocalizedLabelKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The user-visible label text (Read-only, value type CFStringMBS)

### 54.34.62 kCFURLLocalizedNameKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Localized or extension-hidden name as displayed to users (Read-only, value type CFStringMBS)

### 54.34.63 kCFURLLocalizedTypeDescriptionKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** User-visible type or ”kind” description (Read-only, value type CFStringMBS)

### 54.34.64 kCFURLNameKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The resource name provided by the file system (Read-write, value type CFStringMBS)

### 54.34.65 kCFURLParentDirectoryURLKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The resource's parent directory, if any (Read-only, value type CFURLMBS)

### 54.34.66 kCFURLPathKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** the URL's path as a file system path (Read-only, value type CFStringMBS)
for macOS 10.8 or later.

### 54.34.67 kCFURLPreferredIOBlockSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The optimal block size when reading or writing this file's data, or NULL if not available. (Read-only, value type CFNumberMBS)

### 54.34.68 kCFURLQuarantinePropertiesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Example:**

```
Dim f As FolderItem = SpecialFolder.UserHome.Child("Downloads").Child("Installation.pdf")
Dim n As New CFURLMBS(f)

Dim d As CFDictionaryMBS
Dim v As Variant
```

```
Dim e As CFErrorMBS

If n.ResourcePropertyForKey(n.kCFURLQuarantinePropertiesKey, v, e) Then

d = v
Dim dic As Dictionary = d.Dictionary
Break // inspect in debugger

Else
Break // failed
End If
```

**Notes:** The quarantine properties as defined in LSQuarantine.h. To remove quarantine information from a file, pass kCFNull as the value when setting this property. (Read-write, value type CFDictionaryMBS) for macOS 10.10 or later.

### 54.34.69 kCFURLTagNamesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The array of Tag names (Read-write, value type CFArrayMBS of CFStringMBS) for macOS 10.9 or later.

### 54.34.70 kCFURLTotalFileAllocatedSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total allocated size of the file in bytes (this may include space used by metadata), or nil if not available. This can be less than the value returned by kCFURLTotalFileSizeKey if the resource is compressed. (Read-only, value type CFNumberMBS)

### 54.34.71 kCFURLTotalFileSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total displayable size of the file in bytes (this may include space used by metadata), or NULL if not available. (Read-only, value type CFNumberMBS)

### 54.34.72 kCFURLTypeIdentifierKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Uniform type identifier (UTI) for the resource (Read-only, value type CFStringMBS)

### 54.34.73 kCFURLUbiquitousItemDownloadingErrorKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** returns the error when downloading the item from iCloud failed. See the NSUbiquitousFile section in FoundationErrors.h. (Read-only, value type CFErrorMBS)
for macOS 10.9 or later.

### 54.34.74 kCFURLUbiquitousItemDownloadingStatusCurrent as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the download status values.
**Notes:** there is a local version of this item and it is the most up-to-date version known to this device.
for macOS 10.9 or later.

### 54.34.75 kCFURLUbiquitousItemDownloadingStatusDownloaded as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the download status values.
**Notes:** there is a local version of this item available. The most current version will get downloaded as soon as possible.
for macOS 10.9 or later.

### 54.34.76 kCFURLUbiquitousItemDownloadingStatusKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Returns the download status of this item. (Read-only, value type CFStringMBS).
for macOS 10.9 or later.

### 54.34.77 kCFURLUbiquitousItemDownloadingStatusNotDownloaded as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the download status values.
**Notes:** this item has not been downloaded yet. Use NSFileManager's startDownloadingUbiquitousItemAtURL:error: to download it.
for macOS 10.9 or later.

### 54.34.78 kCFURLUbiquitousItemHasUnresolvedConflictsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if this item has conflicts outstanding. (Read-only, value type CFBooleanMBS)

### 54.34.79 kCFURLUbiquitousItemIsDownloadedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Equivalent to NSURLUbiquitousItemDownloadingStatusKey = NSURLUbiquitousItemDownloadingStatusCurrent. Has never behaved as documented in earlier releases, hence deprecated. (Read-only, value type CFBooleanMBS)

### 54.34.80 kCFURLUbiquitousItemIsDownloadingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if data is being downloaded for this item. (Read-only, value type CFBooleanMBS)

### 54.34.81 kCFURLUbiquitousItemIsExcludedFromSyncKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 21.5, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Value is a boolean.
The item is excluded from sync, which means it is locally on disk but won't be available on the server. An excluded item is no longer ubiquitous.

### 54.34.82 kCFURLUbiquitousItemIsUploadedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if there is data present in the cloud for this item. (Read-only, value type CFBooleanMBS)

### 54.34.83 kCFURLUbiquitousItemIsUploadingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if data is being uploaded for this item. (Read-only, value type CFBooleanMBS)

### 54.34.84 kCFURLUbiquitousItemPercentDownloadedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Percent downloaded.
Use NSMetadataQuery and NSMetadataUbiquitousItemPercentDownloadedKey on NSMetadataItem instead.

### 54.34.85 kCFURLUbiquitousItemPercentUploadedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Percent uploaded.
Use NSMetadataQuery and NSMetadataUbiquitousItemPercentUploadedKey on NSMetadataItem instead

### 54.34.86 kCFURLUbiquitousItemUploadingErrorKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** returns the error when uploading the item to iCloud failed. See the NSUbiquitousFile section in FoundationErrors.h. (Read-only, value type CFErrorMBS)
for macOS 10.9 or later.

### 54.34.87 kCFURLVolumeAvailableCapacityKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total free space in bytes (Read-only, value type CFNumberMBS)

### 54.34.88 kCFURLVolumeCreationDateKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The volume's creation date, or nil if this cannot be determined. (Read-only, value type CFDateMBS)

### 54.34.89 kCFURLVolumeIdentifierKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** An identifier that can be used to identify the volume the file system object is on. Other objects on the same volume will have the same volume identifier and can be compared using for equality using CFObjectMBS.Equal. This identifier is not persistent across system restarts. (Read-only, value type CFObjectMBS)

### 54.34.90 kCFURLVolumeIsAutomountedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is automounted. Note: do not mistake this with the functionality provided by kCFURLVolumeSupportsBrowsingKey. (Read-only, value type CFBooleanMBS)

### 54.34.91 kCFURLVolumeIsBrowsableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume should be visible via the GUI (i.e., appear on the Desktop as a separate volume). (Read-only, value type CFBooleanMBS)

### 54.34.92 kCFURLVolumeIsEjectableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume's media is ejectable from the drive mechanism under software control. (Read-only, value type CFBooleanMBS)

### 54.34.93 kCFURLVolumeIsEncryptedKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is encrypted. (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

### 54.34.94 kCFURLVolumeIsInternalKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume's device is connected to an internal bus, false if connected to an external bus, or nil if not available. (Read-only, value type CFBooleanMBS)

### 54.34.95 kCFURLVolumeIsJournalingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is currently using a journal for speedy recovery after an unplanned restart. (Read-only, value type CFBooleanMBS)

### 54.34.96 kCFURLVolumeIsLocalKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is stored on a local device. (Read-only, value type CFBooleanMBS)

### 54.34.97 kCFURLVolumeIsReadOnlyKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is read-only. (Read-only, value type CFBooleanMBS)

### 54.34.98 kCFURLVolumeIsRemovableKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume's media is removable from the drive mechanism. (Read-only, value type CFBooleanMBS)

### 54.34.99 kCFURLVolumeIsRootFileSystemKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume is the root filesystem. (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

### 54.34.100 kCFURLVolumeLocalizedFormatDescriptionKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The user-visible volume format (Read-only, value type CFStringMBS)

### 54.34.101 kCFURLVolumeLocalizedNameKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The user-presentable name of the volume (Read-only, value type CFStringMBS)

### 54.34.102 kCFURLVolumeMaximumFileSizeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The largest file size (in bytes) supported by this file system, or nil if this cannot be determined. (Read-only, value type CFNumberMBS)

### 54.34.103 kCFURLVolumeNameKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The name of the volume (Read-write, settable if kCFURLVolumeSupportsRenamingKey is true and permissions allow, value type CFStringMBS)

### 54.34.104 kCFURLVolumeResourceCountKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total number of resources on the volume (Read-only, value type CFNumberMBS)

### 54.34.105 kCFURLVolumeSupportsAdvisoryFileLockingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume implements whole-file flock(2) style advisory locks, and the O_EXLOCK and O_SHLOCK flags of the open(2) call. (Read-only, value type CFBooleanMBS)

### 54.34.106 kCFURLVolumeSupportsCasePreservedNamesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format preserves the case of file and directory names. Otherwise the volume may change the case of some characters (typically making them all upper or all lower case). (Read-only, value type CFBooleanMBS)

### 54.34.107 kCFURLVolumeSupportsCaseSensitiveNamesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format treats upper and lower case characters in file and directory names as different. Otherwise an upper case character is equivalent to a lower case character, and you can't have two names that differ solely in the case of the characters. (Read-only, value type CFBooleanMBS)

### 54.34.108 kCFURLVolumeSupportsCompressionKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports transparent decompression of compressed files using decmpfs. (Read-only, value type CFBooleanMBS)
for macOS 10.12.

### 54.34.109 kCFURLVolumeSupportsExclusiveRenamingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports renamex_np(2)'s RENAME_EXCL option (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

### 54.34.110 kCFURLVolumeSupportsExtendedSecurityKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume implements extended security (ACLs). (Read-only, value type CFBooleanMBS)

### 54.34.111 kCFURLVolumeSupportsFileCloningKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports clonefile(2) (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

### 54.34.112 kCFURLVolumeSupportsHardLinksKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format supports hard links (Read-only, value type CFBooleanMBS)

### 54.34.113 kCFURLVolumeSupportsJournalingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format supports a journal used to speed recovery in case of unplanned restart (such as a power outage or crash). This does not necessarily mean the volume is actively using a journal. (Read-only, value type CFBooleanMBS)

### 54.34.114 kCFURLVolumeSupportsPersistentIDsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format supports persistent object identifiers and can look up file system objects by their IDs (Read-only, value type CFBooleanMBS)

### 54.34.115 kCFURLVolumeSupportsRenamingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume can be renamed. (Read-only, value type CFBooleanMBS)

### 54.34.116 kCFURLVolumeSupportsRootDirectoryDatesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports reliable storage of times for the root directory. (Read-only, value type CFBooleanMBS)
for macOS 10.7 or later.

### 54.34.117 kCFURLVolumeSupportsSparseFilesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format supports sparse files, that is, files which can have 'holes' that have never been written to, and thus do not consume space on disk. A sparse file may have an allocated size on disk that is less than its logical length. (Read-only, value type CFBooleanMBS)

### 54.34.118 kCFURLVolumeSupportsSwapRenamingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports renamex_np(2)'s RENAME_SWAP option (Read-only, value type CFBooleanMBS)
for macOS 10.12 or later.

### 54.34.119 kCFURLVolumeSupportsSymbolicLinksKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume format supports symbolic links (Read-only, value type CFBooleanMBS)

### 54.34.120 kCFURLVolumeSupportsVolumeSizesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** true if the volume supports returning volume size values (kCFURLVolumeTotalCapacityKey and kCFURLVolumeAvailableCapacityKey). (Read-only, value type CFBooleanMBS)

### 54.34.121 kCFURLVolumeSupportsZeroRunsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** For security reasons, parts of a file (runs) that have never been written to must appear to contain zeroes. true if the volume keeps track of allocated but unwritten runs of a file so that it can substitute zeroes without actually writing zeroes to the media. (Read-only, value type CFBooleanMBS)

### 54.34.122 kCFURLVolumeTotalCapacityKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** Total volume capacity in bytes (Read-only, value type CFNumberMBS)

### 54.34.123 kCFURLVolumeURLForRemountingKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The CFURLMBS needed to remount a network volume, or nil if not available. (Read-only, value type CFURLMBS)

### 54.34.124 kCFURLVolumeURLKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** URL of the volume on which the resource is stored (Read-only, value type CFURLMBS)

### 54.34.125 kCFURLVolumeUUIDStringKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** One of the resource keys.
**Notes:** The volume's persistent UUID as a string, or nil if a persistent UUID is not available for the volume. (Read-only, value type CFStringMBS)

### 54.34.126 Kind as CFStringMBS

MBS MacCF Plugin, Plugin Version: 2.9, Platform: macOS, Targets: All.

**Function:** Returns the kind string for the file.

### 54.34.127 LastPathComponent as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the LastPathComponent part of this URL.

### 54.34.128 Launch as Integer

MBS MacCF Plugin, Plugin Version: 2.9, Platform: macOS, Targets: All.

**Function:** Launches a file.
**Notes:** Returns a Mac OS error string or -1 if the function is not available.

### 54.34.129 NetLocation as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the NetLocation part of this URL.

### 54.34.130 ParameterString(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ParameterString part of this URL.

### 54.34.131 Password as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Password part of this URL.

### 54.34.132 Path as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the Path part of this URL.
See also:

- 54.34.133 Path(resolveAgainstBase as boolean) as string 8827

### 54.34.133 Path(resolveAgainstBase as boolean) as string

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the path of this URL.
See also:

- 54.34.132 Path as CFStringMBS 8827

### 54.34.134 PathExtension as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the PathExtension part of this URL.

### 54.34.135 PortNumber as Integer

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the PortNumber part of this URL.
**Notes:** Returns -1 if no port specified and -2 on Windows and Mac OS Classic.

### 54.34.136 PosixFileSystemPath as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the URL as PosixFileSystemPath.

### 54.34.137 QueryString(charactersToLeaveEscaped as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the QueryString part of this URL.

### 54.34.138 ResourcePropertyForKey(key as CFStringMBS, byref value as Variant, byref error as CFErrorMBS) as boolean

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Returns the resource value identified by a given resource key.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test")
dim c as CFURLMBS = NewCFURLMBSFile(f)

dim v as Variant
dim e as CFErrorMBS

if c.ResourcePropertyForKey(c.kCFURLIsPackageKey, v1, e) then
dim p as CFBooleanMBS = v
```

```
MsgBox "IsPackage: "+str(p.Value)
else
MsgBox "Error: "+e.Description
end if
```

**Notes:** key: The resource key that identifies the resource property.
Value: On output when the result is true, the resource value or nil.
error: On output when the result is false, the error that occurred.

Returns true if value is successfully populated; false if an error occurs.

ResourcePropertyForKey first checks if the URL object already caches the resource value. If so, it returns the cached resource value to the caller. If not, then ResourcePropertyForKey synchronously obtains the resource value from the backing store, adds the resource value to the URL object's cache, and returns the resource value to the caller. The type of the resource value varies by resource property (see resource key definitions). If this function returns true and v alue is populated with nil, it means the resource property is not available for the specified resource and no errors occurred when determining the resource property was not available. If this function returns false, the optional error is populated. This function is currently applicable only to URLs for file system resources.

### 54.34.139 ResourceSpecifier as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the ResourceSpecifier part of this URL.

### 54.34.140 Scheme as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the scheme part of this URL.

### 54.34.141 SetResourcePropertyForKey(key as CFStringMBS, value as Variant, byref error as CFErrorMBS) as boolean

MBS MacCF Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Sets the resource value identified by a given resource key.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test")
Dim c As CFURLMBS = NewCFURLMBSFile(f)

Dim e As CFErrorMBS

If c.SetResourcePropertyForKey(c.kCFURLIsPackageKey, NewCFBooleanMBS(true), e) Then
MsgBox "OK"
Else
MsgBox "Error: "+e.Description
End If
```

**Notes:** key: The resource key that identifies the resource property.
Value: The resource value.
error: On output when the result is false, the error that occurred.

Returns true if the attempt to set the resource value completed with no errors; otherwise, false.

CFURLSetResourcePropertyForKey writes the new resource value out to the backing store. Attempts to set a read-only resource property or to set a resource property not supported by the resource are ignored and are not considered errors. If this function returns false, the optional error is populated. This function is currently applicable only to URLs for file system resources.

### 54.34.142 Str as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the URL as binary data.

### 54.34.143 StrictPath as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the StrictPath part of this URL.

### 54.34.144 URLWithHandle(Handle as Integer) as CFURLMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Creates a new URL object based on a handle value.
**Notes:** Will retain the reference.

### 54.34.145 UserName as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the UserName part of this URL.

### 54.34.146 WindowsFileSystemPath as CFStringMBS

MBS MacCF Plugin, Platform: macOS, Targets: All.

**Function:** Returns the URL as WindowsFileSystemPath.

### 54.34.147 Properties

### 54.34.148 AddedToDirectoryDate as CFDateMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The date the resource was created, or renamed into or within its parent directory.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.AddedToDirectoryDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianDateMBS = d.AbsoluteTime.GregorianDate(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "AddedToDirectoryDate: " + y.SQLDateTime
```

**Notes:** Note that inconsistent behavior may be observed when this attribute is requested on hard-linked items. This property is not supported by all volumes.
(Read only property)

### 54.34.149 AttributeModificationDate as CFDateMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The time the resource's attributes were last modified.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.AttributeModificationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianDateMBS = d.AbsoluteTime.GregorianDate(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "AttributeModificationDate: " + y.SQLDateTime
```

**Notes:** (Read only property)

### 54.34.150 ContentAccessDate as CFDateMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The date the resource was last accessed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.ContentAccessDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianDateMBS = d.AbsoluteTime.GregorianDate(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "ContentAccessDate: " + y.SQLDateTime
```

**Notes:** (Read only property)

### 54.34.151 ContentModificationDate as CFDateMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The time the resource content was last modified.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.ContentModificationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianDateMBS = d.AbsoluteTime.GregorianDate(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "ContentModificationDate: " + y.SQLDateTime
```

**Notes:** (Read only property)

### 54.34.152 CreationDate as CFDateMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The date the resource was created.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
dim d as CFDateMBS = u.CreationDate
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim x as CFGregorianDateMBS = d.AbsoluteTime.GregorianDate(t)
dim y as new date(x.Year, x.Month, x.Day, x.Hour, x.Minute, x.Second)
MsgBox "CreationDate: " + y.SQLDateTime
```

**Notes:** (Read only property)

### 54.34.153 HasHiddenExtension as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for resources whose filename extension is removed from the localized name property.
**Notes:** (Read only property)

### 54.34.154 IsAlias as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Whether this is an alias file.
**Notes:** true if the resource is a Finder alias file or a symlink, false otherwise.
(Read only property)

### 54.34.155 IsApplication as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True if resource is an application.
**Notes:** (Read only property)

### 54.34.156 IsDirectory as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for directories.
**Notes:** (Read only property)

### 54.34.157 IsHidden as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for resources normally not displayed to users.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox "IsHidden: "+str(u.IsHidden.Value)
```

**Notes:** If the resource is a hidden because its name starts with a period, setting this property to false will not change the property.
(Read only property)

### 54.34.158 IsPackage as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for packaged directories.
**Notes:** Note: You can only set or clear this property on directories; if you try to set this property on non-directory objects, the property is ignored. If the directory is a package for some other reason (extension type, etc), setting this property to false will have no effect.
(Read only property)

### 54.34.159 IsRegularFile as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for regular files.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox "IsRegularFile: "+str(u.IsRegularFile.Value)
```

**Notes:** (Read only property)

### 54.34.160 IsSymbolicLink as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for symlinks.
**Notes:** (Read only property)

### 54.34.161 IsSystemImmutable as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for system-immutable resources.
**Notes:** (Read only property)

### 54.34.162 IsUserImmutable as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for user-immutable resources.
**Notes:** (Read only property)

### 54.34.163 IsVolume as CFBooleanMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** True for the root directory of a volume.
**Notes:** (Read only property)

### 54.34.164 LocalizedName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Localized or extension-hidden name as displayed to users.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox u.LocalizedName
```

**Notes:** (Read only property)

### 54.34.165 Name as CFStringMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** The resource name provided by the file system.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("blog.html")
dim u as CFURLMBS = NewCFURLMBSFile(f)
MsgBox u.Name
```

**Notes:** (Read only property)

# 54.35 class CFUUIDMBS

## 54.35.1 class CFUUIDMBS

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** The Core Foundation class for an unique identifier.
**Example:**

```
dim u as new CFUUIDMBS
MsgBox u.StringValue
```

**Notes:** CFUUID objects are used by plug-ins to uniquely identify types, interfaces, and factories. When creating a new type, host developers must generate UUIDs to identify the type as well as its interfaces and factories.

UUIDs (Universally Unique Identifiers), also known as GUIDs (Globally Unique Identifiers) or IIDs (Interface Identifiers), are 128-bit values guaranteed to be unique. A UUID is made unique over both space and time by combining a value unique to the computer on which it was generated—usually the Ethernet hardware address—and a value representing the number of 100-nanosecond intervals since October 15, 1582 at 00:00:00.

The standard format for UUIDs represented in ASCII is a string punctuated by hyphens, for example 68753A44-4D6F-1226-9C60-0050E4C00067. The hex representation looks, as you might expect, like a list of numerical values preceded by &h. For example, &hD7, &h36, &h95, &h0A, &h4D, &h6E, &h12, &h26, &h80, &h3A, &h00, &h50, &hE4, &hC0, &h00, &h67 . To use a UUID, you simply create it and then copy the resulting strings into your header and C language source files. Because a UUID is expressed simply as an array of bytes, there are no endianness considerations for different platforms.

You can create a CFUUID object, and thereby generate a UUID, using any one of the Constructors.
Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr5

## 54.35.2 Methods

## 54.35.3 Bytes as Memoryblock

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns the value of a UUID object as raw bytes.
**Example:**

```
// create new UUID
```

```
dim u as new CFUUIDMBS

// get raw data

dim m as MemoryBlock = u.Bytes

// display

MsgBox EncodingToHexMBS(m)+EndOfLine+u.StringValue
```

**Notes:** Returns the value of uuid represented as raw bytes.

### 54.35.4 Constructor

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Creates a Universally Unique Identifier (UUID) object.
**Example:**

```
dim u as new CFUUIDMBS
MsgBox u.StringValue
```

**Notes:** Returns a new CFUUID object or nil on any failure.
See also:


- 54.35.5 Constructor(Bytes as Memoryblock) 8838
- 54.35.6 Constructor(uuidStr as string) 8839


### 54.35.5 Constructor(Bytes as Memoryblock)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Creates a CFUUID object from raw UUID bytes.
**Example:**

```
// create new UUID

dim u as new CFUUIDMBS

// get raw data
```

```
dim m as MemoryBlock = u.Bytes

// create new UUID with this bytes

dim v as new CFUUIDMBS(m)

// display UUIDs:

MsgBox u.StringValue+EndOfLine+v.StringValue

if u.Equal(v) then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

**Notes:** bytes: Raw UUID bytes to use to create the CFUUID object.

Rerturns a new CFUUID object or nil on any error.
See also:


- 54.35.4 Constructor 8838
- 54.35.6 Constructor(uuidStr as string) 8839


### 54.35.6 Constructor(uuidStr as string)

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Creates a CFUUID object for a specified string.
**Example:**

```
// create new UUID

dim u as new CFUUIDMBS

// get string

dim s as string = u.StringValue

// create new UUID with this string

dim v as new CFUUIDMBS(s)

// display UUIDs:
```

```
MsgBox u.StringValue+EndOfLine+v.StringValue

if u.Equal(v) then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

**Notes:** uuidStr: A string containing a UUID. The standard format for UUIDs represented in ASCII is a string punctuated by hyphens, for example 68753A44-4D6F-1226-9C60-0050E4C00067.

Returns a new CFUUID object, or if a CFUUID object of the same value already exists, the existing instance with its reference count incremented. Returns nil on any error.

If you need to validate a GUID or UUID, please check the IsGUID function in our FAQ.
See also:


- 54.35.4 Constructor 8838
- 54.35.5 Constructor(Bytes as Memoryblock) 8838


### 54.35.7 StringValue as string

MBS MacCF Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Returns the string representation of a specified CFUUID object.
**Example:**

```
dim u as new CFUUIDMBS
MsgBox u.StringValue
```

# Chapter 55

# CoreFoundation Network

## 55.1 class CFHostMBS

### 55.1.1 class CFHostMBS

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** A class for the CFHost API in CoreFoundation.
**Notes:** You can asyncronly resolve hostnames to IPs and back.
IPv6 compatible.
Subclass of the CFObjectMBS class.
**Xojo Developer Magazine**


- 3.6, page 6: News


### 55.1.2 Methods

### 55.1.3 LookupAddress(address as string) as boolean

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Starts the asyncron lookup process for the given address.
**Notes:** Address must be an IPv4 or IPv6 address.
Returns true on success or false on failure.

### 55.1.4 LookupName(hostname as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Starts an asyncron lookup process to find the IP addresses for the given domain name.
**Notes:** Returns true on success and false on failure.

### 55.1.5 Events

### 55.1.6 Error(ErrorDomain as Integer, ErrorCode as Integer)

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: .

**Function:** An error occurred.

### 55.1.7 GotAddress(address as string, addressIndex as Integer, count as Integer)

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: .

**Function:** An IP address was found.
**Notes:** As plugins can't create arrays, the plugin will call this event count times with addressIndex going from 0 to count-1.
Name is the IP address, e.g. "12.34.56.78".

### 55.1.8 GotName(name as CFStringMBS, nameIndex as Integer, count as Integer)

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: .

**Function:** A name was found.
**Notes:** As plugins can't create arrays, the plugin will call this event count times with nameIndex going from 0 to count-1.
Name is the domain name, e.g. "apple.com".

## 55.2 class CFHTTPMessageMBS

### 55.2.1 class CFHTTPMessageMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a HTTP message.
**Notes:** Subclass of the CFObjectMBS class.

### 55.2.2 Methods

### 55.2.3 AddAuthentication(authenticationFailureResponse as CFHTTPMessageMBS, username as CFStringMBS, password as CFStringMBS, authenticationScheme as CFStringMBS, forProxy as Boolean) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Adds authentication details.
**Notes:** Tries to modify request to contain the authentication information requested by authenticationFailureResponse (which presumably is a 401 or 407 response). Returns TRUE if successful; FALSE otherwise (leaving request unmodified). If authenticationScheme is NULL, the strongest supported scheme listed in failedResponse will be used.

### 55.2.4 AppendBytes(s as string) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Adds additional bytes to the message.
**Notes:** The following function appends the given bytes to the message given (parsing out any control information if appropriate).
Returns FALSE if a parsing error occurs while processing the new data.

### 55.2.5 Copy as CFHTTPMessageMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the HTTP message.
**Notes:** Returns nil on any error.

### 55.2.6 HeaderFields as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** All header fields in one big CFDictionary.

### 55.2.7 IsHeaderComplete as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Whether further header data is expected by the message.

### 55.2.8 IsRequest as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Whether the message is a response or a request.

### 55.2.9 kCFHTTPAuthenticationSchemeBasic as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A possible value you can pass when creating a HTTPMessage.

### 55.2.10 kCFHTTPAuthenticationSchemeDigest as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A possible value you can pass when creating a HTTPMessage.

### 55.2.11 kCFHTTPVersion1_0 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A possible value you can pass when creating a HTTPMessage.

### 55.2.12 kCFHTTPVersion1_1 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A possible value you can pass when creating a HTTPMessage.

### 55.2.13 RequestMethod as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The request method.

### 55.2.14 RequestURL as CFURLMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The request URL.

### 55.2.15 ResponseStatusCode as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The response status code.
**Notes:** See RFC 2616 for the codes.

### 55.2.16 ResponseStatusLine as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The response status line.

### 55.2.17 SerializedMessage as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** This message with all data stored in one CFBinaryData object to store in e.g. a file.

### 55.2.18 Version as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The HTTP version of the message.

### 55.2.19 Properties

### 55.2.20 Body as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The body of this message.
**Notes:** (Read and Write computed property)

### 55.2.21 HeaderField(headerfield as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Set or Get one of the header fields of the Message.
**Notes:** (Read and Write computed property)

## 55.3 Globals

### 55.3.1 CFStreamCreatePairWithSocketMBS(TheSocket as CFSocketMBS, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates two streams based on one socket.
**Notes:** You need to pass in stream objects to get those objects filled.
If you forget one of this objects the stream will be readonly or writeonly.

### 55.3.2 CFStreamCreatePairWithSocketToHostMBS(host as CFStringMBS, port as Integer, readstream as CFReadStreamMBS, writestream as CFWriteStreamMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a pair of streams based on a socket which connects to the given host.

### 55.3.3 CFHTTPMessageCreateEmptyMBS(isRequest as boolean) as CFHTTPMessageMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new empty http message.
**Notes:** Returns nil on any error.

Creates an empty request or response, which you can then append bytes to via CFHTTPMessage.AppendBytes(). The HTTP header information will be parsed out as the bytes are appended.

### 55.3.4 CFHTTPMessageCreateRequestMBS(requestMethod as CFStringMBS, url as CFURLMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new HTTP message as a request.

### 55.3.5 CFHTTPMessageCreateResponseMBS(statusCode as Integer, statusDescription as CFStringMBS, httpVersion as CFStringMBS) as CFHTTPMessageMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new HTTP message as a response.
**Notes:** Pass nil to use the standard description for the given status code, as found in RFC 2616.

### 55.3.6 kCFHostMBSGetTypeID as Integer

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFHostMBS object.

### 55.3.7 kCFHTTPMessageMBSGetTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFHTTPMessageMBS object.

### 55.3.8 kCFReadStreamMBSGetTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFReadStreamMBS object.

### 55.3.9 kCFSocketMBSGetTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFSocketMBS object.

### 55.3.10 kCFWriteStreamMBSGetTypeID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the Type ID of a CFWriteStreamMBS object.

## 55.4 class CFProxyMBS

### 55.4.1 class CFProxyMBS

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The class for proxy queries.
**Notes:** These APIs return arrays of dictionaries, where each dictionary describes a single proxy.
The arrays represent the order in which the proxies should be tried - try to download the URL using the first entry in the array, and if that fails, try using the second entry, and so on.

The keys to the proxy dictionaries follow the function declarations; every proxy dictionary will have an entry for kCFProxyTypeKey. If the type is anything except kCFProxyTypeAutoConfigurationURL, the dictionary will also have entries for the proxy's host and port (under kCFProxyHostNameKey and kCF-ProxyPortNumberKey respectively). If the type is kCFProxyTypeAutoConfigurationURL, it will have an entry for kCFProxyAutoConfigurationURLKey.

The keys for username and password are optional and will only be present if the username or password could be extracted from the information passed in (i.e. either the URL itself or the proxy dictionary supplied). These APIs do not consult any external credential stores (such as the Keychain).

All the class methods require Mac OS X 10.5 or newer.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- MBS Xojo / Real Studio Plugins, version 14.1pr1

### 55.4.2 Methods

### 55.4.3 ExecuteProxyAutoConfigurationScript(proxyAutoConfigurationScript as string, targetURL as string) as boolean

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Begins the process of executing proxyAutoConfigurationScript to determine the correct proxy to use to retrieve targetURL.
**Notes:** When the results are found, the event will be called on the main thread, passing a valid proxyList and nil error upon success, or a nil proxyList and valid error on failure.

proxyAutoConfigurationScript: A string containing the code of the script to be executed.
targetURL: The URL that should be passed to the autoconfiguration script.

Returns true if the request was started.

### 55.4.4 ExecuteProxyAutoConfigurationURL(proxyAutoConfigURL as string, targetURL as string) as boolean

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Executes the proxy auto configuration URL and returns which proxy to use.
**Notes:** As ExecuteProxyAutoConfigurationScript(), except that ExecuteProxyAutoConfigurationURL will additionally download the contents of proxyAutoConfigURL, convert it to a JavaScript string, and then execute that script.

### 55.4.5 kCFNetworkProxiesExceptionsList as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the list of host name patterns that should bypass the proxy.
**Notes:** Value is an array of strings.

### 55.4.6 kCFNetworkProxiesExcludeSimpleHostnames as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key whose value indicates if simple hostnames will be excluded
**Notes:** Value is a number.
Simple hostnames will be excluded if the key is present and has a non-zero value.

### 55.4.7 kCFNetworkProxiesFTPEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status of the ftp proxy.
**Notes:** Value is a number.
The proxy is enabled if the key is present and has a non-zero value.

### 55.4.8 kCFNetworkProxiesFTPPassive as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the state of passive mode for the ftp proxy.
**Notes:** Value is a Number.
A value of one indicates that passive mode is enabled, a value of zero indicates that passive mode is not enabled.

### 55.4.9 kCFNetworkProxiesFTPPort as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the port number associated with the ftp proxy.
**Notes:** Value is a number which is the port number.

### 55.4.10 kCFNetworkProxiesFTPProxy as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the host name associated with the ftp proxy.
**Notes:** Value is a string which is the proxy host name.

### 55.4.11 kCFNetworkProxiesHTTPPort as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the port number associated with the HTTP proxy.
**Notes:** Value is a number which is the port number.

### 55.4.12 kCFNetworkProxiesHTTPProxy as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the host name associated with the HTTP proxy.
**Notes:** Value is a string which is the proxy host name.

### 55.4.13 kCFNetworkProxiesHTTPSEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status of the HTTPS proxy; value is a number.
**Notes:** The proxy is enabled if the key is present and has a non-zero value.

### 55.4.14 kCFNetworkProxiesHTTPSPort as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the port number associated with the HTTPS proxy.
**Notes:** Value is a Number which is the port number.

### 55.4.15 kCFNetworkProxiesHTTPSProxy as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the host name associated with the HTTPS proxy.
**Notes:** Value is a string which is the proxy host name.

### 55.4.16 kCFNetworkProxiesProxyAutoConfigEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status ProxyAutoConfig (PAC).
**Notes:** Value is a number.
ProxyAutoConfig is enabled if the key is present and has a non-zero value.

### 55.4.17 kCFNetworkProxiesProxyAutoConfigURLString as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the url which indicates the location of the ProxyAutoConfig (PAC) file.
**Notes:** Value is a string which is url for the PAC file.

### 55.4.18 kCFNetworkProxiesProxyAutoDiscoveryEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status of proxy auto discovery.
**Notes:** Value is a number.
Proxy auto discovery is enabled if the key is present and has a non-zero value.

### 55.4.19 kCFNetworkProxiesRTSPEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status of the RTSP proxy.
**Notes:** Value is a Number.
The proxy is enabled if the key is present and has a non-zero value.

### 55.4.20 kCFNetworkProxiesRTSPPort as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the port number associated with the RTSP proxy.
**Notes:** Value is a Number which is the port number.

### 55.4.21 kCFNetworkProxiesRTSPProxy as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the host name associated with the RTSP proxy.
**Notes:** Value is a string which is the proxy host name.

### 55.4.22 kCFNetworkProxiesSOCKSEnable as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the enabled status of the SOCKS proxy.
**Notes:** Value is a number.
The proxy is enabled if the key is present and has a non-zero value.

### 55.4.23 kCFNetworkProxiesSOCKSPort as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the port number associated with the SOCKS proxy.
**Notes:** Value is a Number which is the port number.

### 55.4.24 kCFNetworkProxiesSOCKSProxy as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the host name associated with the SOCKS proxy.
**Notes:** value is a String which is the proxy host name.

### 55.4.25 kCFProxyAutoConfigurationJavaScriptKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the proxy's PAC script.
**Notes:** The value is a String that contains the full JavaScript soure text for the PAC file.

### 55.4.26 kCFProxyAutoConfigurationURLKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the proxy's PAC file location.
**Notes:** This key is only present if the proxy's type is kCFProxyTypeAutoConfigurationURL. Value is a string with URL specifying the location of a proxy auto-configuration file.

### 55.4.27 kCFProxyHostNameKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the proxy's hostname; value is a string.
**Notes:** Note that this may be an IPv4 or IPv6 dotted-IP string.

### 55.4.28 kCFProxyPasswordKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the password to be used with the proxy.
**Notes:** Value is a String. Note that this key will only be present if the username could be extracted from the information passed in. No external credential stores (like the Keychain) are consulted.

### 55.4.29 kCFProxyPortNumberKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the proxy's port number.
**Notes:** Value is a CFNumber specifying the port on which to contact the proxy.

### 55.4.30 kCFProxyTypeAutoConfigurationJavaScript as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is specified by a proxy autoconfiguration (PAC) file content.

### 55.4.31 kCFProxyTypeAutoConfigurationURL as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is specified by a proxy autoconfiguration (PAC) file.

### 55.4.32 kCFProxyTypeFTP as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is an FTP proxy.

### 55.4.33 kCFProxyTypeHTTP as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is an HTTP proxy.

### 55.4.34 kCFProxyTypeHTTPS as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is a tunneling proxy as used for HTTPS.

### 55.4.35 kCFProxyTypeKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the type of proxy being represented.
**Notes:** value will be one of the kCFProxyType* constants listed below.

### 55.4.36 kCFProxyTypeNone as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** No proxy should be used; contact the origin server directly.

### 55.4.37 kCFProxyTypeSOCKS as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the proxy types.
**Notes:** The proxy is a SOCKS proxy.

### 55.4.38 kCFProxyUsernameKey as string

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Key for the username to be used with the proxy.
**Notes:** Value is a String. Note that this key will only be present if the username could be extracted from the information passed in. No external credential stores (like the Keychain) are consulted.

### 55.4.39 ProxiesForAutoConfigurationScript(proxyAutoConfigurationScript as string, URL as string, byref error as CFErrorMBS) as Dictionary()

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:**

Synchronously executes the given proxy autoconfiguration script and returns a valid proxyList and nil error upon success or a
nil proxyList and valid error on failure.
**Notes:**

proxyAutoConfigurationScript: A string containing the code of the script to be executed.
targetURL: The URL that should be input in to the autoconfiguration script.
error: A return argument that will contain a valid error in case of failure.

Returns an array of dictionaries describing the proxies returned by the script or nil on failure.

### 55.4.40 ProxiesForURL(URL as string, proxySettings as Dictionary = nil) as Dictionary()

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Given a URL and a proxy dictionary, determines the ordered list of proxies that should be used to download the given URL.
**Notes:** url: The URL to be accessed
proxySettings: A dictionary describing the available proxy settings; the dictionary's format should match the dictionary returned by SystemProxySettings described below. If you pass nil, the plugin queries SystemProxySettings functions for you.

Returns an array of dictionaries; each dictionary describes a single proxy. See the comment at the top of this file for how to interpret the returned dictionaries.

### 55.4.41 SystemProxySettings as Dictionary

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns a Dictionary containing the current system internet proxy settings.
**Example:**

```
dim d as Dictionary = CFProxyMBS.SystemProxySettings

dim k as string = CFProxyMBS.kCFProxyTypeKey
MsgBox "Type: "+d.lookup(k, "unknown")
```

**Notes:** Returns a dictionary containing key-value pairs that represent the current internet proxy settings. Value is nil if no proxy settings have been defined or if an error was encountered.

### 55.4.42 Events

### 55.4.43 AutoConfigurationResult(error as CFErrorMBS, proxyList() as Dictionary)

MBS MacCF Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Event to be called when a PAC file computation has completed.
**Notes:** Initiated by either ExecuteProxyAutoConfigurationScript or ExecuteProxyAutoConfigurationURL.

proxyList: Upon success, the list of proxies returned by the autoconfiguration script. The list has the same format as returned by ProxiesForURL, above, except that no entry may be of type kCFProxyTypeAutoCon-

figurationURL.
error: Upon failure, an error object explaining the failure.

## 55.5 class CFReadStreamMBS

### 55.5.1 class CFReadStreamMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a CoreFoundation write stream.
**Notes:** You can read from a file, a memoryblock or using a socket over the network.
Subclass of the CFStreamMBS class.

### 55.5.2 Methods

### 55.5.3 close

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Closes the stream.
**Notes:** Terminates the flow of bytes; releases any system resources required by the stream. The stream may not fail to close.

### 55.5.4 CreateForHTTPRequest(request as CFHTTPMessageMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new read stream based on the given HTTP request.
**Notes:** Creates a read stream for the response to the given request; when the stream is opened, it will begin transmitting the request. The bytes returned are the pure body bytes; the response header has been parsed off. To retrieve the response header, ask for kCFStreamPropertyHTTPResponseHeader any time after the first bytes arrive on the stream (or when stream end is reported, if there are no data bytes).

Returns true if successfull.

### 55.5.5 CreateWithFile(fileurl as CFURLMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new file based readstream.
**Notes:** Returns true if successfull.

### 55.5.6 CreateWithMemoryBlock(mem as memoryblock, len as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new readstream based on the data of the given memoryblock.
**Notes:** Returns true if successfull.

### 55.5.7 CreateWithString(s as string) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new readstream based on the data of the given string.
**Notes:** Returns true if successfull.

### 55.5.8 ErrorCode as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** Meaning depends on the ErrorDomain.

### 55.5.9 ErrorDomain as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The error domain of the last error code.
**Notes:** Possible domains:

| | | |
|---|---|---|
| kCFStreamErrorDomainCustom | = -1 | custom to the kind of stream in question |
| kCFStreamErrorDomainPOSIX | = 1 | POSIX errno; interpret using <sys/errno.h> |
| kCFStreamErrorDomainMacOSStatus | = 2 | OSStatus type from Carbon APIs; interpret using <MacTypes.h> |

### 55.5.10 GetProperty(propertyName as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns a property of the stream.
**Notes:** Returns nil on any error.
Particular streams can name properties and assign meanings to them; you access these properties through the GetProperty and SetProperty calls. A property is any interesting information about the stream other than the data being transmitted itself. Examples include the headers from an HTTP transmission, or the

expected number of bytes, or permission information, etc. Properties that can be set configure the behavior of the stream, and may only be settable at particular times (like before the stream has been opened). See the documentation for particular properties to determine their get- and set-ability.

### 55.5.11 HasBytesAvailable as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** True if you can read bytes.
**Notes:** Whether there is data currently available for reading;
Returns TRUE if it's impossible to tell without trying.

### 55.5.12 InstallEvents

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Installs the event handler.
**Notes:** You need to remove the event handler later to not leak memory!
The event handler is needed to have the Callback event fireing.

### 55.5.13 Open as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Opens the stream.
**Notes:** Returns success/failure. Opening a stream causes it to reserve all the system resources it requires. If the stream can open non-blocking, this will always return TRUE; listen to the Callback to find out when the open completes and whether it was successful, or poll using the Status property, waiting for a status of kCFStreamStatusOpen or kCFStreamStatusError.

### 55.5.14 ReadMemory(maxBytesToRead as Integer, mem as memoryblock) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Reads some bytes from the stream.
**Notes:** Returns the number of bytes read, or -1 if an error occurs preventing any bytes from being read, or 0 if the stream's end was encountered.
It is an error to try and read from a stream that hasn't been opened first.
This call will block until at least one byte is available; it will NOT block until the entire buffer can be filled.

To avoid blocking, either poll using HasBytesAvailable or use the run loop and listen for the kCFStreamCanRead event for notification of data available.

### 55.5.15 ReadString(maxBytesToRead as Integer) as string

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Reads some bytes from the stream.
**Notes:** Returns a string as long as the number of bytes read, or "" if an error occurs preventing any bytes from being read or the stream's end was encountered.
It is an error to try and read from a stream that hasn't been opened first.
This call will block until at least one byte is available; it will NOT block until the entire buffer can be filled.
To avoid blocking, either poll using HasBytesAvailable or use the run loop and listen for the kCFStreamCanRead event for notification of data available.

### 55.5.16 RemoveEvents

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Removes the event handler.
**Notes:** You should remove this event handler after you finished with the stream.

### 55.5.17 SetProperty(propertyName as CFStringMBS, propertyValue as CFObjectMBS) as Boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Sets a property of the stream.
**Notes:** Returns true if successfull.

### 55.5.18 Status as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The status of the stream.
**Notes:** Possible values:

| | |
|---|---|
| kCFStreamStatusNotOpen | = 0 |
| kCFStreamStatusOpening | = 1 (open is in-progress) |
| kCFStreamStatusOpen | = 2 |
| kCFStreamStatusReading | = 3 |
| kCFStreamStatusWriting | = 4 |
| kCFStreamStatusAtEnd | = 5 (no further bytes can be read/written) |
| kCFStreamStatusClosed | = 6 |
| kCFStreamStatusError | = 7 |

### 55.5.19 Events

### 55.5.20 Callback(reason as Integer)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called when something happens.
**Notes:** Possible values for the reason:

| | |
|---|---|
| kCFStreamEventNone | = 0 |
| kCFStreamEventOpenCompleted | = 1 |
| kCFStreamEventHasBytesAvailable | = 2 |
| kCFStreamEventCanAcceptBytes | = 4 |
| kCFStreamEventErrorOccurred | = 8 |
| kCFStreamEventEndEncountered | = 16 |

## 55.6 class CFSocketMBS

### 55.6.1 class CFSocketMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a CFSocket.
**Notes:** A CFSocket contains a native socket within a structure that can be used to read from the socket in the background and make the data thus read available using a runloop source.

Addresses are stored as CFDatas containing a struct sockaddr appropriate for the protocol family; make sure that all fields are filled in properly when passing in an address.

Some error codes:

```
kCFSocketSuccess     = 0
 kCFSocketError      = -1
 kCFSocketTimeout    = -2
```

Subclass of the CFObjectMBS class.

### 55.6.2 Methods

### 55.6.3 ConnectToAddress(address as CFBinaryDataMBS, timeout as Double) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Connects the socket to the given address.
**Notes:** Returns a socket error.

Some error codes:

```
kCFSocketSuccess     = 0
 kCFSocketError      = -1
 kCFSocketTimeout    = -2
```

### 55.6.4 Create as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new socket.
**Notes:** Some error codes:

```
kCFSocketSuccess     = 0,
 kCFSocketError      = -1,
 kCFSocketTimeout    = -2
```

### 55.6.5 Invalidate

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Invalidates the socket.

### 55.6.6 IsValid as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Checks if the socket is valid.

### 55.6.7 NativeSocketHandle as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The native socket handle.

### 55.6.8 PeerAddress as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The peer address of this socket.
**Notes:** Returns nil on any error.

### 55.6.9 SendData(data as CFBinaryDataMBS, timeout as Double) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Sends data over the socket with a given timeout.
**Notes:** For convenience, a function is provided to send data using the socket with a timeout. The timeout will be used only if the specified value is positive.

Some error codes:

| | |
|---|---|
| kCFSocketSuccess | = 0 |
| kCFSocketError | = -1 |
| kCFSocketTimeout | = -2 |

### 55.6.10 Properties

### 55.6.11 Address as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The address of this socket.
**Notes:** (Read and Write computed property)

### 55.6.12 Events

### 55.6.13 Callback(reason as Integer, address as CFBinaryDataMBS, data as memoryblock)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** The callback event for this socket.
**Notes:** Possible reasons:

| | |
|---|---|
| kCFSocketNoCallBack | = 0 |
| kCFSocketReadCallBack | = 1 |
| kCFSocketAcceptCallBack | = 2 |
| kCFSocketDataCallBack | = 3 |
| kCFSocketConnectCallBack | = 4 |
| kCFSocketWriteCallBack | = 8 |

## 55.7 class CFStreamMBS

### 55.7.1 class CFStreamMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a CFStream.
**Notes:** (Only a place to store all those constants ;-)
Subclass of the CFObjectMBS class.

### 55.7.2 Methods

### 55.7.3 kCFHTTPAuthenticationSchemeBasic as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the authentication schemes available.

### 55.7.4 kCFHTTPAuthenticationSchemeDigest as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the authentication schemes available.

### 55.7.5 kCFHTTPVersion1_0 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** HTTP Version 1.0.

### 55.7.6 kCFHTTPVersion1_1 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** HTTP Version 1.1.

### 55.7.7 kCFStreamErrorDomainHTTP as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** An error domain used with the socket based streams.
**Notes:** Possible error values:

```
kCFStreamErrorHTTPParseFailure        = -1
 kCFStreamErrorHTTPRedirectionLoop    = -2
 kCFStreamErrorHTTPBadURL             = -3
```

### 55.7.8 kCFStreamErrorDomainSOCKS as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** SOCKS proxy error domain.

### 55.7.9 kCFStreamErrorDomainSSL as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** An error domain used with the socket based streams.
**Notes:** Secure stream support.

### 55.7.10 kCFStreamPropertyAppendToFile as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Whether to append new bytes to an existing file.
**Notes:** Property for file write streams; value should be a CFBoolean.
Set to TRUE to append to a file, rather than to replace its contents.
Requires Mac OS X 10.2

### 55.7.11 kCFStreamPropertyDataWritten as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A property name for use with the CFWriteStream class.
**Example:**

```
dim writestream as CFWriteStreamMBS
dim c as cfobjectmbs
c=writestream.getproperty(writestream.kCFStreamPropertyDataWritten)
```

**Notes:** Value will be a CFData containing all bytes thusfar written; used to recover the data written to a memory write stream.

### 55.7.12 kCFStreamPropertyHTTPAttemptPersistentConnection as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value should be a CFBoolean. If this property is set to true, an HTTP stream will look for an appropriate extant persistent connection to use, and if it finds none, will try to create one.

### 55.7.13 kCFStreamPropertyHTTPFinalURL as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value is the CFURL from the final request; will only differ from the URL in the original request if an autoredirection has occurred.

### 55.7.14 kCFStreamPropertyHTTPProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Which HTTP Proxy to use.
**Notes:** HTTP proxy information is set the same way as SOCKS proxies.
Call CFReadStream.SetProperty() passing an HTTP stream and the property kCFStreamPropertyHTTP-Proxy.
The value should be a CFDictionary that includes at least one Host/Port pair from the keys below.
The dictionary returned by SystemConfiguration.framework can also be passed directly as the value

Keys for the dictionary to use:
kCFStreamPropertyHTTPProxyHost
kCFStreamPropertyHTTPProxyPort
kCFStreamPropertyHTTPSProxyHost
kCFStreamPropertyHTTPSProxyPort

### 55.7.15 kCFStreamPropertyHTTPProxyHost as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the keys for the proxy CFDictionary for a socket based stream.

### 55.7.16 kCFStreamPropertyHTTPProxyPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the keys for the proxy CFDictionary for a socket based stream.

### 55.7.17 kCFStreamPropertyHTTPResponseHeader as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value is a CFHTTPMessage with 0 bytes data.

### 55.7.18 kCFStreamPropertyHTTPShouldAutoredirect as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value should be a CFBoolean.

### 55.7.19 kCFStreamPropertyHTTPSProxyHost as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the keys for the proxy CFDictionary for a socket based stream.

### 55.7.20 kCFStreamPropertyHTTPSProxyPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the keys for the proxy CFDictionary for a socket based stream.

### 55.7.21 kCFStreamPropertyShouldCloseNativeSocket as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Set the value to kCFBooleanTrue if the stream should close and release the underlying native socket when the stream is released. Set the value to kCFBooleanFalse to keep the native socket from closing and releasing when the stream is released.

If the stream was created with a native socket, the default property setting on the stream is kCFBooleanFalse.

The kCFStreamPropertyShouldCloseNativeSocket can be set through CFReadStream.SetProperty or CFWriteStream.SetProperty. The property can be copied through CFReadStream.GetProperty or CFWriteStream.GetProperty.

### 55.7.22 kCFStreamPropertySocketNativeHandle as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value will be a CFData containing the native handle.

### 55.7.23 kCFStreamPropertySocketRemoteHostName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value will be a CFString, or nil if unknown.

### 55.7.24 kCFStreamPropertySocketRemotePortNumber as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** Value will be a CFNumber, or nil if unknown.

### 55.7.25 kCFStreamPropertySocketSecurityLevel as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** You set this property to one of the following values:
kCFStreamSocketSecurityLevelSSLv3
kCFStreamSocketSecurityLevelSSLv2
kCFStreamSocketSecurityLevelNone

kCFStreamSocketSecurityLevelNegotiatedSSL
kCFStreamSocketSecurityLevelTLSv1
(this 5 properties return CFStrings which you pass to SetProperty)

### 55.7.26 kCFStreamPropertySOCKSPassword as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.

### 55.7.27 kCFStreamPropertySOCKSProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.
**Notes:** SOCKS Proxy usage
To set a stream to use a SOCKS proxy, call CFReadStream.SetProperty or CFWriteStream.SetProperty with the property name set to kCFStreamPropertySOCKSProxy and the value being a CFDictionary with at least the following two keys: kCFStreamPropertySOCKSProxyHost and kCFStreamPropertySOCKSProxyPort.
The dictionary returned by SystemConfiguration for SOCKS proxies will work without alteration.
The key kCFStreamPropertySOCKSProxyHost should contain a CFStringRef value representing the SOCKS proxy host. The key kCFStreamPropertySOCKSProxyPort should contain a CFNumberRef which itself is of type kCFNumberSInt32Type. This value should represent the port on which the proxy is listening.

By default, SOCKS5 will be used unless there is a kCFStreamPropertySOCKSVersion key in the CFDictionary. Its value must be kCFStreamSocketSOCKSVersion4 or kCFStreamSocketSOCKSVersion5 to set SOCKS4 or SOCKS5, respectively.

To set a user name and/or password, if required, the dictionary must contain the key(s) kCFStreamPropertySOCKSUser and/or kCFStreamPropertySOCKSPassword with the value being the user's name as a CFString and/or the user's password as a CFString, respectively.

kCFStreamPropertySOCKSProxy can be set through CFReadStream.SetProperty or CFWriteStream.SetProperty. The property can be copied through CFReadStream.GetProperty or CFWriteStream.GetProperty.

### 55.7.28 kCFStreamPropertySOCKSProxyHost as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.

### 55.7.29 kCFStreamPropertySOCKSProxyPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.

### 55.7.30 kCFStreamPropertySOCKSUser as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.

### 55.7.31 kCFStreamPropertySOCKSVersion as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property keys for a socket based stream.

### 55.7.32 kCFStreamSocketSecurityLevelNegotiatedSSL as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property values for a socket based stream.
**Notes:** TLS or SSL with fallback to lower versions; this is what HTTPS does, for instance.

### 55.7.33 kCFStreamSocketSecurityLevelNone as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property values for a socket based stream.

### 55.7.34 kCFStreamSocketSecurityLevelSSLv2 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property values for a socket based stream.

### 55.7.35 kCFStreamSocketSecurityLevelSSLv3 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property values for a socket based stream.

### 55.7.36 kCFStreamSocketSecurityLevelTLSv1 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the property values for a socket based stream.

### 55.7.37 kCFStreamSocketSOCKSVersion4 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the values used with the kCFStreamPropertySOCKSVersion property for a socket based stream.

### 55.7.38 kCFStreamSocketSOCKSVersion5 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the values used with the kCFStreamPropertySOCKSVersion property for a socket based stream.

## 55.8 class CFWriteStreamMBS

### 55.8.1 class CFWriteStreamMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a CoreFoundation write stream.
**Notes:** You can write to a file, a memoryblock or using a socket over the network.
Subclass of the CFStreamMBS class.

### 55.8.2 Methods

### 55.8.3 CanAcceptBytes as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Whether the stream can now accept data to write.
**Notes:** Whether the stream can currently be written to without blocking;
Returns TRUE if it's impossible to tell without trying.

### 55.8.4 close

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Closes the stream.
**Notes:** Terminates the flow of bytes; releases any system resources required by the stream. The stream may not fail to close.

### 55.8.5 CreateWithFile(fileurl as CFURLMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new WriteStream using the given file specification.
**Notes:** Returns true if successfull.

### 55.8.6 CreateWithMemory as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new memory based stream.
**Notes:** New buffers are allocated as bytes are written to the stream. At any point, you can recover the

bytes thusfar written by asking for the property kCFStreamPropertyDataWritten (using GetProperty).

### 55.8.7 CreateWithMemoryBlock(mem as memoryblock, len as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new WriteStream which writes the data into the given memoryblock.
**Notes:** The stream writes into the memoryblock given; when bufferCapacity is exhausted, the stream is exhausted (status becomes kCFStreamStatusAtEnd).
Returns nil on any error.

### 55.8.8 ErrorCode as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** Meaning depends on the ErrorDomain.

### 55.8.9 ErrorDomain as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The error domain of the last error code.
**Notes:** Possible domains:

| | | |
|---|---|---|
| kCFStreamErrorDomainCustom | = -1 | custom to the kind of stream in question |
| kCFStreamErrorDomainPOSIX | = 1 | POSIX errno; interpret using <sys/errno.h> |
| kCFStreamErrorDomainMacOSStatus | = 2 | OSStatus type from Carbon APIs; interpret using <MacTypes.h> |

### 55.8.10 GetProperty(propertyName as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns a property of the stream.
**Notes:** Returns nil on any error.
Particular streams can name properties and assign meanings to them; you access these properties through the GetProperty and SetProperty calls. A property is any interesting information about the stream other than the data being transmitted itself. Examples include the headers from an HTTP transmission, or the expected number of bytes, or permission information, etc. Properties that can be set configure the behavior of the stream, and may only be settable at particular times (like before the stream has been opened). See

the documentation for particular properties to determine their get- and set-ability.

### 55.8.11 InstallEvents

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Installs the event handler.
**Notes:** You need to remove the event handler later to not leak memory!
The event handler is needed to have the Callback event fireing.

### 55.8.12 Open as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Opens the stream.
**Notes:** Returns success/failure. Opening a stream causes it to reserve all the system resources it requires. If the stream can open non-blocking, this will always return TRUE; listen to the Callback to find out when the open completes and whether it was successful, or poll using the Status property, waiting for a status of kCFStreamStatusOpen or kCFStreamStatusError.

### 55.8.13 RemoveEvents

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Removes the event handler.
**Notes:** You should remove this event handler after you finished with the stream.

### 55.8.14 SetProperty(propertyName as CFStringMBS, propertyValue as CFObjectMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Sets a property of the stream.
**Notes:** Returns true if successfull.

### 55.8.15 Status as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The status of the stream.
**Notes:** Possible values:

| | |
|---|---|
| kCFStreamStatusNotOpen | = 0 |
| kCFStreamStatusOpening | = 1 (open is in-progress) |
| kCFStreamStatusOpen | = 2 |
| kCFStreamStatusReading | = 3 |
| kCFStreamStatusWriting | = 4 |
| kCFStreamStatusAtEnd | = 5 (no further bytes can be read/written) |
| kCFStreamStatusClosed | = 6 |
| kCFStreamStatusError | = 7 |

### 55.8.16 WriteMemory(mem as memoryblock, len as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Write the data from inside the memoryblock to the stream.
**Notes:** Returns the number of bytes successfully written, -1 if an error has occurred, or 0 if the stream has been filled to capacity (for fixed-length streams). If the stream is not full, this call will block until at least one byte is written. To avoid blocking, either poll via CanAcceptBytes or use the run loop and listen for the kCFStreamCanWrite event.

### 55.8.17 WriteString(buf as string) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Write the data from inside the string to the stream.
**Notes:** Returns the number of bytes successfully written, -1 if an error has occurred, or 0 if the stream has been filled to capacity (for fixed-length streams). If the stream is not full, this call will block until at least one byte is written. To avoid blocking, either poll via CanAcceptBytes or use the run loop and listen for the kCFStreamCanWrite event.

### 55.8.18 Events

### 55.8.19 Callback(reason as Integer)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called when something happens.
**Notes:** Possible values for the reason:

| | |
|---|---|
| kCFStreamEventNone | = 0 |
| kCFStreamEventOpenCompleted | = 1 |
| kCFStreamEventHasBytesAvailable | = 2 |
| kCFStreamEventCanAcceptBytes | = 4 |
| kCFStreamEventErrorOccurred | = 8 |
| kCFStreamEventEndEncountered | = 16 |

# Chapter 56

# CoreGraphics

## 56.1 Globals

### 56.1.1 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Notes:** Title, Author, Creator, Subject and Keywords parameters can be empty.

If OwnerPassword and UserPassword are filled in the PDF is encrypted and AllowsPrinting/AllowsCopy define what the user can do after he entered his password.

The passwords must be a string which can be represented in ASCII encoding; only the first 32 bytes will be used for the password.

Requires Mac OS X to work.
See also:

- 56.1.2 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 8882

### 56.1.2 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Notes:** Title, Author, Creator, Subject and Keywords parameters can be empty.

If OwnerPassword and UserPassword are filled in the PDF is encrypted and AllowsPrinting/AllowsCopy define what the user can do after he entered his password. #

The passwords must be a string which can be represented in ASCII encoding; only the first 32 bytes will be used for the password.

Keylength must be a value between 48 bit and 128 bit in 8 bit steps. 0 uses default value.

Requires Mac OS X to work.
**Xojo Developer Magazine**

- 6.4, pages 30 to 31: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

See also:

- 56.1.1 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 8881

### 56.1.3 GetCurrentCGContextMBS as CGContextMBS

MBS MacCG Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new CGContextMBS object for the current Cocoa graphics context.
**Notes:** Requires Mac OS X to work.
Returns nil on any error.

### 56.1.4 CGBitmapContextCreateMBS(data as memoryblock, width as Integer, height as Integer, bitsPerComponent as Integer, bytesPerRow as Integer, colorspace as CGColorSpaceMBS, alphaInfo as Integer) as CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Create a bitmap context.
**Notes:** The context draws into a bitmap which is 'width' pixels wide and 'height' pixels high. The number of components for each pixel is specified by 'colorspace', which also may specify a destination color profile. The number of bits for each component of a pixel is specified by 'bitsPerComponent', which must be 1, 2, 4, or 8. Each row of the bitmap consists of 'bytesPerRow' bytes, which must be at least '(width * bitsPerComponent * number of components + 7)/8' bytes. 'data' points a block of memory at least 'bytesPerRow * height' bytes. 'alphaInfo' specifies whether the bitmap should contain an alpha channel, and how it's to be generated.

Fails if data=nil or colorspace=nil.
The memoryblock is not referenced and not stored, so keep it alive while using the BitmapContext object.

Returns nil on any error.

data
A pointer to the destination in memory where the drawing is to be rendered. The size of this memoryblock should be at least(bytesPerRow*height) bytes.

width
The width of the bitmap in pixels.

height
The height of the bitmap in pixels.

bitsPerComponent
The number of bits to use for each component of a pixel in memory. Allowable values are 4, 5, or 8. For example, for a 32-bit RGB(A) colorspace, you would specify a value of 8 bits per color component. In combination, the number of bits per component, the color space, and the alpha value determine which bitmap context formats Quartz supports.

bytesPerRow
The number of bytes of memory to use per row of the bitmap. This value must be at least the product of the width and bitsPerComponentparameters, times the number of components per pixel. The result should be divided by 8 and rounded up to the nearest whole number to obtain the number of bytes to use per row. That is, the value must be at least (((width)*(bits per component)*(number of components per pixel))+7)/8 bytes. For a given row, Quartz stores bitmap data for the first width pixels and ignores any remaining bytes. The colorspace value referenced by the colorspace parameter specifies the number of components for each

pixel.

colorspace
The color space to use for the bitmap context.

alphaInfo
A CGImageAlphaInfo constant specifying whether the bitmap should contain an alpha channel and how it is to be generated. The alpha value determines the opacity of a pixel when it is drawn.

Supported pixel formats:

| Pixel format | Color space | Bits per pixel | Bits per component | Alpha option |
|---|---|---|---|---|
| Gray_8 | Grayscale | 8 | 8 | kCGImageAlphaNone |
| RGB555 | RGB | 16 | 5 | kCGImageAlphaNoneSkipFirst |
| XRGB_32 | RGB | 32 | 8 | kCGImageAlphaNoneSkipFirst |
| ARGB_32 | RGB | 32 | 8 | kCGImageAlphaPremultipliedFirst |
| RGBX_32 | RGB | 32 | 8 | kCGImageAlphaNoneSkipLast |
| RGBA_32 | RGB | 32 | 8 | kCGImageAlphaPremultipliedLast |

Quartz does not support the following formats in a bitmap context:

- 1-bit grayscale
- 24-bit RGB
- CMYK (any depth)

CGImageAlphaInfo constants:

| | | |
|---|---|---|
| kCGImageAlphaNone | 0 | |
| kCGImageAlphaPremultipliedLast | 1 | For example, premultiplied RGBA |
| kCGImageAlphaPremultipliedFirst | 2 | For example, premultiplied ARGB |
| kCGImageAlphaLast | 3 | For example, non-premultiplied RGBA |
| kCGImageAlphaFirst | 4 | For example, non-premultiplied ARGB |
| kCGImageAlphaNoneSkipLast | 5 | Equivalent to kCGImageAlphaNone. |
| kCGImageAlphaNoneSkipFirst | 6 | |

### 56.1.5 CGOpenPDFDocumentMBS(dataprovider as CGDataProviderMBS) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 5.1, Platform: macOS, Targets: All.

**Function:** Opens a CG PDF Document from a data stream.
**Example:**

```
Sub Paint(g As Graphics)
// window.paint event
dim f as FolderItem
dim b as BinaryStream
dim s as string
dim d as CGDataProviderMBS
dim p as CGPDFDocumentMBS

// get a folderitem to a pdf file.
f=SpecialFolder.Desktop.Child("notes.pdf")

// load the content in a string variable
b=f.OpenAsBinaryFile(false)
s=b.Read(b.Length)
b.Close

// now make a CGDataProvider based on a string.
d=CGDataProviderMBS.CreateWithData(s)

// Open the PDF from the Data Provider
p=CGOpenPDFDocumentMBS(d)

// And play with it
g.DrawCGPDFDocumentMBS p,p.MediaBox(1),1

Exception
// trouble goes here.
End Sub
```

**Notes:** Returns nil on any error.

### 56.1.6 CGShadingCreateAxialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, endPoint as CGPointMBS, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Creates a Quartz axial shading.
**Notes:** Parameters:

colorspace: The color space in which color values are expressed. Quartz retains this object; upon return, you may safely release it.
startPoint: The starting point of the axis, in the shading's target coordinate space.
endPoint: The ending point of the axis, in the shading's target coordinate space.

function: A CGFunction object. This object refers to your function for creating an axial shading. Quartz retains this object; upon return, you may safely release it.
extendStart: A Boolean value that specifies whether to extend the shading beyond the starting point of the axis.
extendEnd: A Boolean value that specifies whether to extend the shading beyond the ending point of the axis.

Returns a new Quartz axial shading or nil on any error.

Discussion
An axial shading is a color blend that varies along a linear axis between two endpoints and extends indefinitely perpendicular to that axis. When you are ready to draw the shading, call the function CGContextMBS.DrawShading.

Available in Mac OS X version 10.2 and later.

### 56.1.7 CGShadingCreateRadialMBS(colorspace as CGColorSpaceMBS, startPoint as CGPointMBS, startRadius as Double, endPoint as CGPointMBS, endRadius as Double, func as CGFunctionMBS, extendStart as boolean, extendEnd as boolean) as CGShadingMBS

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Creates a Quartz radial shading.
**Notes:** Parameters
colorspace: The color space in which color values are expressed.
startPoint: The center of the starting circle, in the shading's target coordinate space.
startRadius: The radius of the starting circle, in the shading's target coordinate space.
endPoint: The center of the ending circle, in the shading's target coordinate space.
endRadius: The radius of the ending circle, in the shading's target coordinate space.
function: A CGFunction object. This object refers to your function for creating a radial shading.
extendStart: A Boolean value that specifies whether to extend the shading beyond the starting circle.
extendEnd: A Boolean value that specifies whether to extend the shading beyond the ending circle.

Returns a new Quartz radial shading or nil on any error.

A radial shading is a color blend that varies between two circles. To draw the shading, call the function CGContextDrawShading.

Available in Mac OS X version 10.2 and later.

### 56.1.8 CGCreateImageFromJPEGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new CGImage with JPEG data.
**Example:**

```
// Shows moon.jpg from the desktop folder
// shows in the window title if i,p or u is nil.

Sub Mainwindow.Paint(g As Graphics)
dim f as FolderItem
dim p as CGDataProviderMBS
dim i as CGImageMBS

f=SpecialFolder.Desktop.Child("moon.jpg")
p=CGDataProviderMBS.CreateWithFile(f)
if p=nil then
Title="p=nil"
else
i=CGCreateImageFromJPEGDataProviderMBS(p,nil,true,0)

if i=nil then
Title="i=nil"
else
window1.CGContextMBS.DrawPicture i,CGMakeRectMBS(0,0,i.Width,i.Height)
end if
end if

End Sub
```

**Notes:** Dataprovider must be a CGDataProviderMBS object.

Parameters:

dataprovider:
A reference to a data provider supplying JPEG-encoded data.

decode:
Pass the decode array for the image. In the decode array, for each color component in the source color space, you provide a pair of values denoting the upper and lower limits of a range. For example, the decode array for a source image in the RGB color space would contain six entries total, consisting of one pair each for red, green, and blue. When the image is rendered, Quartz uses a linear transform to map the original

component value into a relative number within your designated range that is appropriate for the destination color space. If you do not want to allow remapping of the image's color values, pass nil for the decode array. The memoryblock for the array needs to be filled with double values.

shouldInterpolate:
Pass true if interpolation should occur; otherwise, pass false . The interpolation setting specifies whether Quartz should apply a pixel-smoothing algorithm to the image. If you pass false , the image may appear jagged or pixelated when drawn on an output device with higher resolution than the image data.

intent:
Pass a CGColorRenderingIntent value specifying how Quartz should display colors in the image that are not located within the current color space of the graphics context. The rendering intent determines the exact method used to map colors from one color space to another.

### 56.1.9 CGCreateImageFromPNGDataProviderMBS(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new CGImage with PNG data.
**Notes:** Dataprovider must be a CGDataProviderMBS object.

Parameters:

dataprovider:
A reference to a data provider supplying JPEG-encoded data.

decode:
Pass the decode array for the image. In the decode array, for each color component in the source color space, you provide a pair of values denoting the upper and lower limits of a range. For example, the decode array for a source image in the RGB color space would contain six entries total, consisting of one pair each for red, green, and blue. When the image is rendered, Quartz uses a linear transform to map the original component value into a relative number within your designated range that is appropriate for the destination color space. If you do not want to allow remapping of the image's color values, pass nil for the decode array. The memoryblock for the array needs to be filled with double values.

shouldInterpolate:
Pass true if interpolation should occur; otherwise, pass false . The interpolation setting specifies whether Quartz should apply a pixel-smoothing algorithm to the image. If you pass false , the image may appear jagged or pixelated when drawn on an output device with higher resolution than the image data.

intent:
Pass a CGColorRenderingIntent value specifying how Quartz should display colors in the image that are not located within the current color space of the graphics context. The rendering intent determines the exact method used to map colors from one color space to another.

### 56.1.10 CGCreateImageMBS(pic as picture) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGImageMBS from the given images.
**Example:**

```
dim c as CGImageMBS
dim pic, mask as Picture
// get picture and mask

c=CGCreateImageMBS(pic)
if c<>Nil then
// go on
end if
```

**Notes:** If the image has a mask, it is used.
See also:

- 56.1.11 CGCreateImageMBS(pic as picture, mask as picture) as CGImageMBS 8889

### 56.1.11 CGCreateImageMBS(pic as picture, mask as picture) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGImageMBS from the given images.
**Example:**

```
dim c as CGImageMBS
dim pic, mask as Picture
// get picture and mask

c=CGCreateImageMBS(pic, mask)
if c<>Nil then
// go on
end if
```

**Notes:** The mask is taken from the second image.

With 11.3 plugins we are deprecating to pass a mask. The plugin prefers to simply take the mask or alpha channel of the picture itself.
**Blog Entries**

- Notes and Tips
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

See also:

- 56.1.10 CGCreateImageMBS(pic as picture) as CGImageMBS 8889

### 56.1.12 CGMakePointMBS(x as Double, y as Double) as CGPointMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns a new CGPointMBS object.

### 56.1.13 CGMakeRectMBS(left as Double, top as Double, width as Double, height as Double) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns a new CGRectMBS object with the given value.
**Blog Entries**

- Colorspaces in MacOS with Xojo
- Automated video editing with Xojo

**Xojo Developer Magazine**

- 6.4, page 30: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

### 56.1.14 CGMakeSizeMBS(width as Double, height as Double) as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns a new CGSizeMBS object.
**Blog Entries**

- Automated video editing with Xojo

### 56.1.15 CGNewPDFDocumentMBS(consumer as CGDataConsumerMBS, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Notes:** Title, author and creator are all optional.
Requires Mac OS X to work.
Keep yourself a reference to the consumer object so RB does not release it resulting in a crash.

### 56.1.16 CGNewPDFDocumentMBS(file as folderitem, MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Notes:** Title, author and creator are all optional.
Requires Mac OS X to work.

### 56.1.17 CGOpenPDFDocumentMBS(file as folderitem) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Opens a PDF document.
**Notes:** RB 4.5 should do this perfectly, but older RB versions may have problems with longer file names.
Requires Mac OS X to work.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr12
- MBS REALbasic Plugins, version 10.4pr11

### 56.1.18 CGSessionMBS as CGSessionMBS

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A function to return the current CoreGraphics session information.
**Example:**

```
dim c as CGSessionMBS
```

```
c=CGSessionMBS

MsgBox C.UserName+" "+str(c.Userid)
```

**Notes:** Returns nil on any error.

Returns nil if the caller is not within a GUI session, as when the caller is a UNIX daemon, or if a system is configured to not run a Quartz GUI (window server disabled).

## 56.2 class CGAffineTransformMBS

### 56.2.1 class CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** A class for an affine transformation.
**Example:**

```
dim af as CGAffineTransformMBS = CGAffineTransformMBS.Identity

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

af = af.Scale( 1, -1 )

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

af = af.Translate( 0, 100 )

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

dim r1 as CGRectMBS
dim r2 as CGRectMBS

r1=CGMakeRectMBS(100,100,100,100)

r2=r1.ApplyAffineTransform(af)

MsgBox "("+str(r1.Left)+", "+str(r1.top)+", "+str(r1.width)+", "+str(r1.height)+") =>("+str(r2.Left)+",
"+str(r2.top)+", "+str(r2.width)+", "+str(r2.height)+")"
```

**Blog Entries**

- MBS Xojo Plugins, version 20.2pr2
- Automated video editing with Xojo

### 56.2.2 Methods

### 56.2.3 Binary as MemoryBlock

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the binary data of the object for toolbox calls.

### 56.2.4 Concat(t as CGAffineTransformMBS) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Concatenate 't2' to 't1' and returne the result: t' = t1 * t2

### 56.2.5 Constructor

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** This constructor creates the identity transform: [ 1 0 0 1 0 0 ] .
See also:

- 56.2.6 Constructor(a as double, b as double, c as double, d as double, tx as double = 0.0, ty as double = 0.0) 8893
- 56.2.7 Constructor(p as Ptr) 8894
- 56.2.8 Constructor(transform as CGAffineTransformMBS) 8894

### 56.2.6 Constructor(a as double, b as double, c as double, d as double, tx as double = 0.0, ty as double = 0.0)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates the transformation with the given values.
See also:

- 56.2.5 Constructor 8893
- 56.2.7 Constructor(p as Ptr) 8894
- 56.2.8 Constructor(transform as CGAffineTransformMBS) 8894

### 56.2.7 Constructor(p as Ptr)

MBS MacCG Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 56.2.5 Constructor 8893
- 56.2.6 Constructor(a as double, b as double, c as double, d as double, tx as double = 0.0, ty as double = 0.0) 8893
- 56.2.8 Constructor(transform as CGAffineTransformMBS) 8894


### 56.2.8 Constructor(transform as CGAffineTransformMBS)

MBS MacCG Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a matrix object with copying the values.
**Example:**

```
dim m as new CGAffineTransformMBS(1,2,3,4,5,6)
dim n as new CGAffineTransformMBS(m)
MsgBox n
```

See also:


- 56.2.5 Constructor 8893
- 56.2.6 Constructor(a as double, b as double, c as double, d as double, tx as double = 0.0, ty as double = 0.0) 8893
- 56.2.7 Constructor(p as Ptr) 8894


### 56.2.9 EqualToTransform(t as CGAffineTransformMBS) as boolean

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Checks whether two affine transforms are equal.
**Notes:** Returns true if t1 and t2 are equal, false otherwise.
Available in Mac OS X v10.4 and later.

### 56.2.10 Identity as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The identity transform: [ 1 0 0 1 0 0 ] .

### 56.2.11 Invert as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Invert 't' and return the result. If 't' has zero determinant, then 't' is returned unchanged.

### 56.2.12 IsIdentity as boolean

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Checks whether an affine transform is the identity transform.
**Notes:** Returns true if t is the identity transform, false otherwise.
Available in Mac OS X v10.4 and later.

### 56.2.13 Make(a as double, b as double, c as double, d as double, tx as double = 0.0, ty as double = 0.0) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Return the transform [ a b c d tx ty ] .

### 56.2.14 MakeRotation(angle as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Return a transform which rotates by 'angle' radians: t' = [ cos(angle) sin(angle) -sin(angle) cos(angle) 0 0 ]

### 56.2.15 MakeScale(sx as Double, sy as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Return a transform which scales by '(sx, sy)': t' = [ sx 0 0 sy 0 0 ]

### 56.2.16 MakeTranslation(tx as Double, ty as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Return a transform which translates by '(tx, ty)': t' = [ 1 0 0 1 tx ty ]

### 56.2.17 Operator_Convert as String

MBS MacCG Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Returns string value.

### 56.2.18 Operator_Multiply(other as CGAffineTransformMBS) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Multiplies both matrix where self is on the left side.

### 56.2.19 Operator_MultiplyRight(other as CGAffineTransformMBS) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Multiplies both matrix where self is on the right side.

### 56.2.20 Rotate(angle as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Rotate 't' by 'angle' radians and return the result: t' = [ cos(angle) sin(angle) -sin(angle) cos(angle) 0 0 ] * t

### 56.2.21 Scale(sx as Double, sy as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Scale 't' by '(sx, sy)' and return the result: t' = [ sx 0 0 sy 0 0 ] * t

### 56.2.22 Translate(tx as Double, ty as Double) as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Translate 't' by '(tx, ty)' and return the result: t' = [ 1 0 0 1 tx ty ] * t
**Example:**

```
dim t as new CGAffineTransformMBS(1,0,0,1,1,1)
t=t.Translate(2,3)

MsgBox str(T.A)+" "+str(t.B)+" "+str(t.C)+" "+str(t.D)+" "+str(t.TX)+" "+str(t.TY)

// shows 1 0 0 1 3 4
```

### 56.2.23 Properties

### 56.2.24 A as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The A value.
**Notes:** (Read and Write property)

### 56.2.25 B as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The B value.
**Notes:** (Read and Write property)

### 56.2.26 C as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The C value.
**Notes:** (Read and Write property)

### 56.2.27 D as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The D value.
**Notes:** (Read and Write property)

### 56.2.28 StringValue as String

MBS MacCG Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Returns string value.
**Notes:** (Read only property)

### 56.2.29 TX as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The TX value.
**Notes:** (Read and Write property)

### 56.2.30 TY as Double

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The TY value.
**Notes:** (Read and Write property)

## 56.3 class CGBitmapContextMBS

### 56.3.1 class CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** A class to hold a CoreGraphics bitmap context.
**Example:**

```
Sub Paint(g As Graphics)
dim c as CGPictureContextMBS
dim w as CGContextMBS // of window
dim p,m as Picture

c=new CGPictureContextMBS(100,100)

c.ClearRect CGMakeRectMBS(0,0,100,100)
c.SetRGBFillColor 1,0,0,1
c.FillRect CGMakeRectMBS(0,0,50,50)

w=window1.CGContextMBS // we are inside paint event!
// Draw using CGImage
w.DrawPicture c.CGImage(false,0),CGMakeRectMBS(0,0,c.BitmapWidth,c.BitmapHeight)
w.Flush

// Draw using RB picture, so we can see whether it looks equal.
m=c.CopyPictureMask
p=New Picture(m.Width,m.Height,32)
p.Graphics.DrawPicture c.CopyPicture,0,0
p.Mask.Graphics.DrawPicture m,0,0
g.DrawPicture p,0,0

End Sub
```

**Notes:** If the RB graphics class is like a CGContext, the RB picture class (created using NewPicture) is something like a CGBitmapContext.
Subclass of the CGContextMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Colorspaces in MacOS with Xojo
- MBS Xojo / Real Studio Plugins, version 15.0pr5
- MBS Xojo / Real Studio Plugins, version 14.3pr11
- MBS Real Studio Plugins, version 13.1pr3

- MBS REALbasic Plugins, version 11.2pr1

### 56.3.2 Methods

### 56.3.3 CGImage(shouldInterpolate as boolean = false, intent as Integer = 0) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Creates a CGImageMBS object referencing the CGBitmapContext object.
**Example:**

```
dim c as CGPictureContextMBS
dim w as CGContextMBS // of window

c=new CGPictureContextMBS(100,100)

c.SetRGBFillColor 1,0,0,1
c.FillRect CGMakeRectMBS(0,0,50,50)

w=window1.CGContextMBS // we are inside paint event!
w.DrawPicture c.CGImage(false,0),CGMakeRectMBS(0,0,c.BitmapWidth,c.BitmapHeight)
w.Flush
```

**Notes:** You will crash your application if you use this Image after the CGBitmapContext object was destroyed.
Changes made to the connected CGBitmapContext will be seen in the CGImage.
Returns nil on low memory.

Constants for intent:

| | |
|---|---|
| kCGRenderingIntentDefault | 0 |
| kCGRenderingIntentAbsoluteColorimetric | 1 |
| kCGRenderingIntentRelativeColorimetric | 2 |
| kCGRenderingIntentPerceptual | 3 |
| kCGRenderingIntentSaturation | 4 |

Set shouldInterpolate to true if the image should use interpolation.

### 56.3.4 Constructor

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 56.3.5 Create(data as memoryblock, width as Integer, height as Integer, bitsPerComponent as Integer, bytesPerRow as Integer, colorspace as CGColorSpaceMBS, alphaInfo as Integer) as CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Create a bitmap context.
**Notes:** The context draws into a bitmap which is 'width' pixels wide and 'height' pixels high. The number of components for each pixel is specified by 'colorspace', which also may specify a destination color profile. The number of bits for each component of a pixel is specified by 'bitsPerComponent', which must be 1, 2, 4, or 8. Each row of the bitmap consists of 'bytesPerRow' bytes, which must be at least '(width * bitsPerComponent * number of components + 7)/8' bytes. 'data' points a block of memory at least 'bytesPerRow * height' bytes. 'alphaInfo' specifies whether the bitmap should contain an alpha channel, and how it's to be generated.

Fails if data=nil or colorspace=nil.
The memoryblock is not referenced and not stored, so keep it alive while using the BitmapContext object.

Returns nil on any error.

data
A pointer to the destination in memory where the drawing is to be rendered. The size of this memoryblock should be at least(bytesPerRow*height) bytes. Can be nil to let system allocate it.

width
The width of the bitmap in pixels.

height
The height of the bitmap in pixels.

bitsPerComponent
The number of bits to use for each component of a pixel in memory. Allowable values are 4, 5, or 8. For example, for a 32-bit RGB(A) colorspace, you would specify a value of 8 bits per color component. In combination, the number of bits per component, the color space, and the alpha value determine which bitmap context formats Quartz supports.

bytesPerRow
The number of bytes of memory to use per row of the bitmap. This value must be at least the product of the width and bitsPerComponentparameters, times the number of components per pixel. The result should be divided by 8 and rounded up to the nearest whole number to obtain the number of bytes to use per row. That is, the value must be at least (((width)*(bits per component)*(number of components per pixel))+7)/8

bytes. For a given row, Quartz stores bitmap data for the first width pixels and ignores any remaining bytes. The colorspace value referenced by the colorspace parameter specifies the number of components for each pixel. Can be zero to let system decide (especially if data is nil)

colorspace
The color space to use for the bitmap context.

alphaInfo
A CGImageAlphaInfo constant specifying whether the bitmap should contain an alpha channel and how it is to be generated. The alpha value determines the opacity of a pixel when it is drawn.

Supported pixel formats:

| Pixel format | Color space | Bits per pixel | Bits per component | Alpha option |
|---|---|---|---|---|
| Gray_8 | Grayscale | 8 | 8 | kCGImageAlphaNone |
| RGB555 | RGB | 16 | 5 | kCGImageAlphaNoneSkipFirst |
| XRGB_32 | RGB | 32 | 8 | kCGImageAlphaNoneSkipFirst |
| ARGB_32 | RGB | 32 | 8 | kCGImageAlphaPremultipliedFirst |
| RGBX_32 | RGB | 32 | 8 | kCGImageAlphaNoneSkipLast |
| RGBA_32 | RGB | 32 | 8 | kCGImageAlphaPremultipliedLast |

Quartz does not support the following formats in a bitmap context:

- 1-bit grayscale
- 24-bit RGB
- CMYK (any depth)

CGImageAlphaInfo constants:

| | | |
|---|---|---|
| kCGImageAlphaNone | 0 | |
| kCGImageAlphaPremultipliedLast | 1 | For example, premultiplied RGBA |
| kCGImageAlphaPremultipliedFirst | 2 | For example, premultiplied ARGB |
| kCGImageAlphaLast | 3 | For example, non-premultiplied RGBA |
| kCGImageAlphaFirst | 4 | For example, non-premultiplied ARGB |
| kCGImageAlphaNoneSkipLast | 5 | Equivalent to kCGImageAlphaNone. |
| kCGImageAlphaNoneSkipFirst | 6 | |

See also:

- 56.3.6 Create(Other as CGBitmapContextMBS, NewColorspace as CGColorSpaceMBS) as CGBitmapContextMBS

### 56.3.6 Create(Other as CGBitmapContextMBS, NewColorspace as CGColorSpaceMBS) as CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Creates a new bitmap object.
**Example:**

```
dim pic as new Picture(100,100) // some picture
dim ICCProfileData as memoryblock // get a IIC Profile somewhere

dim colorspace as CGColorSpaceMBS = CGColorSpaceMBS.CreateWithICCProfile(ICCProfileData)
dim bitmap as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)
dim zweiteBitmap as CGBitmapContextMBS = bitmap.Create(bitmap, colorspace)
```

**Notes:** The new bitmap object uses same data as existing object, just accesses the pixels using the new color space.
See also:

- 56.3.5 Create(data as memoryblock, width as Integer, height as Integer, bitsPerComponent as Integer, bytesPerRow as Integer, colorspace as CGColorSpaceMBS, alphaInfo as Integer) as CGBitmapContextMBS 8901

### 56.3.7 CreateImage as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Return an image containing a snapshot of the bitmap context.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// color set to full red
b.SetRGBFillColor 1.0, 0.0, 0.0, 1.0

// draw ellipse
dim r as CGRectMBS = CGRectMBS.Make(0, 0, 500, 500)
b.FillEllipseInRect r

// flush drawings
b.Flush

// now try CGImage creation
```

```
dim cgimage as CGImageMBS = b.CreateImage

// and display by converting to a new picture
Backdrop = cgimage.Picture
```

**Notes:** If context is not a bitmap context, or if the image cannot be created for any reason, this function returns NULL. This is a "copy" operation subsequent changes to context will not affect the contents of the returned image.

Note that in some cases the copy will actually follow "copy-on-write" semantics, so that the actual physical copy of the bits will only occur if the underlying data in the bitmap context is modified. As a consequence, you may wish to use the resulting image and release it before performing more drawing into the bitmap context; in this way, the actual physical copy of the data may be avoided.

### 56.3.8 CreateRGB(data as memoryblock, width as Integer, height as Integer, bytesPerRow as Integer, colorspace as CGColorSpaceMBS = nil) as CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Convenience function to handle RGB data.
**Notes:** Same as Create method, but for RGB data.
Converts data from 3 byte/pixel to 4 byte/pixel and than creates CGBitmapContextMBS.
Colorspace is optional and defaults to Generic RGB.
Returns nil on error, raises OutOfBounds exception for invalid parameters.

### 56.3.9 CreateWithPicture(Pic as Picture) as CGBitmapContextMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a CGBitmapContext referencing the given picture.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// color set to full red
b.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
```

```
// draw ellipse
dim r as CGRectMBS = CGRectMBS.Make(0, 0, 500, 500)
b.FillEllipseInRect r

// flush drawings
b.Flush

// and show
Backdrop = pic
```

**Notes:** Only for Cocoa target.
The plugin will do a clear cache on the picture in the destructor.

### 56.3.10 Properties

### 56.3.11 BitmapAlphaInfo as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the alpha info of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows 2 for kCGImageAlphaPremultipliedFirst
MsgBox str(b.BitmapAlphaInfo)
```

**Notes:** Returns 0 on any error.

CGImageAlphaInfo constants:

(Read only property)

### 56.3.12 BitmapBitsPerComponent as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

| | | |
|---|---|---|
| kCGImageAlphaNone | 0 | |
| kCGImageAlphaPremultipliedLast | 1 | For example, premultiplied RGBA |
| kCGImageAlphaPremultipliedFirst | 2 | For example, premultiplied ARGB |
| kCGImageAlphaLast | 3 | For example, non-premultiplied RGBA |
| kCGImageAlphaFirst | 4 | For example, non-premultiplied ARGB |
| kCGImageAlphaNoneSkipLast | 5 | Equivalent to kCGImageAlphaNone. |
| kCGImageAlphaNoneSkipFirst | 6 | |

**Function:** Returns the bits per component of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows 8
MsgBox str(b.BitmapBitsPerComponent)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 56.3.13 BitmapBitsPerPixel as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the bits per pixel of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows 32
MsgBox str(b.BitmapBitsPerPixel)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 56.3.14 BitmapBytesPerRow as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the bytes per row of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows 2000
MsgBox str(b.BitmapBytesPerRow)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 56.3.15 BitmapColorSpace as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the colorspace used for this bitmap.
**Notes:** Returns nil on any error.

This is not the same RB object used when you created the bitmap, but it will contain the same handle.
(Read only property)

### 56.3.16 BitmapData as MemoryBlock

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns a memoryblock for the data of the bitmap.
**Notes:** Returns nil on any error.

This is not the same RB memoryblock object as you passed to the Create function, but it will point to the same bytes in memory.
(Read only property)

### 56.3.17 BitmapHeight as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the height of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows 500
MsgBox str(b.BitmapHeight)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 56.3.18 BitmapInfo as Integer

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Obtains the bitmap information associated with a bitmap graphics context.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// shows info: 2 for kCGImageAlphaPremultipliedFirst
MsgBox str(b.BitmapInfo)
```

**Notes:** The bitmap info of the bitmap graphics context or 0 if c is not a bitmap graphics context. See CGImage Reference for a description of the Image Bitmap Information constants that can be returned.

The CGBitmapInfo data returned by the function specifies whether the bitmap contains an alpha channel and how the alpha channel is generated, along with whether the components are floating-point or integer.
(Read only property)

### 56.3.19 BitmapWidth as Integer

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns the width of the bitmap.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// show info: 500
MsgBox str(b.BitmapWidth)
```

**Notes:** Returns 0 on any error.
(Read only property)

## 56.4 class CGColorMBS

### 56.4.1 class CGColorMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** A class for a CoreGraphics color object.
**Blog Entries**

- Colorspaces in MacOS with Xojo
- MBS Real Studio Plugins, version 13.1pr16
- MBS REALbasic plug-ins version 9.5

### 56.4.2 Methods

### 56.4.3 Alpha as Double

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The alpha value of the color.

### 56.4.4 Black as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The black color in the Generic gray color space.

### 56.4.5 Clear as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The clear color in the Generic gray color space.

### 56.4.6 ColorSpace as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The colorspace of this color.
**Notes:** May be nil if unkown.

### 56.4.7 Components as memoryblock

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The components of the color as a memoryblock.
**Notes:** The memoryblock contains double properties.
m.double(0), m.double(4), etc.

### 56.4.8 Copy as CGColorMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the color.
**Notes:** Returns nil on any error.

### 56.4.9 CopyWithAlpha(alpha as Double) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Makes a new copy of the color with a different alpha value.
**Notes:** Returns nil on any error.

### 56.4.10 Create(colorspace as CGColorSpaceMBS, components as memoryblock) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new color with the given components.
**Example:**

```
dim c as color = &cFF0000

Dim m As MemoryBlock

m=NewMemoryBlock(16)
m.SingleValue(0)=c.Red/256
m.SingleValue(4)=c.Green/256
m.SingleValue(8)=c.Blue/256
m.SingleValue(12)=1.0

dim colorspace as CGColorSpaceMBS

colorspace=CGColorSpaceMBS.CreateDeviceRGB
```

```
if colorspace=nil or colorspace.Handle=0 then
MsgBox "Failed to get RGB color space!"
Return
end if

Dim col As CGColorMBS

col=CGColorMBS.Create(colorspace, m)

if col=nil or col.Handle=0 then
MsgBox "Failed to create color."
Return
end if

MsgBox str(Col.NumberOfComponents)
```

**Notes:** This method was called NewCGColorMBS in earlier MBS Plugins.
See also:

- 56.4.11 Create(colorspace as CGColorSpaceMBS, components() as Double) as CGColorMBS 8912

### 56.4.11 Create(colorspace as CGColorSpaceMBS, components() as Double) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new color with the given components.
**Notes:** Supports up to 32 components.
Returns nil on any error.
See also:

- 56.4.10 Create(colorspace as CGColorSpaceMBS, components as memoryblock) as CGColorMBS 8911

### 56.4.12 CreateDeviceCMYK(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a color in the device CMYK color space.
**Notes:** cyan: A cyan value (0.0 - 1.0).
magenta: A magenta value (0.0 - 1.0).
yellow: A yellow value (0.0 - 1.0).
black: A black value (0.0 - 1.0).

alpha: An alpha value (0.0 - 1.0).

Returns a color object.

### 56.4.13 CreateDeviceGray(gray as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a color in the device gray color space.
**Notes:** gray: A grayscale value (0.0 - 1.0).
alpha: An alpha value (0.0 - 1.0).

Returns a color object.

### 56.4.14 CreateDeviceRGB(red as Double, green as Double, blue as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a color in the device RGB color space.
**Notes:** red: A red component value (0.0 - 1.0).
green: A green component value (0.0 - 1.0).
blue: A blue component value (0.0 - 1.0).
alpha: An alpha value (0.0 - 1.0).

Returns a new color object.

### 56.4.15 CreateGenericCMYK(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a color in the Generic CMYK color space.
**Notes:** cyan: A cyan value (0.0 - 1.0).
magenta: A magenta value (0.0 - 1.0).
yellow: A yellow value (0.0 - 1.0).
black: A black value (0.0 - 1.0).
alpha: An alpha value (0.0 - 1.0).

Returns a color object.
Available in Mac OS X v10.5 and later.

### 56.4.16 CreateGenericGray(gray as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a color in the Generic gray color space.
**Notes:** gray: A grayscale value (0.0 - 1.0).
alpha: An alpha value (0.0 - 1.0).

Returns a color object.
Available in Mac OS X v10.5 and later.

### 56.4.17 CreateGenericRGB(red as Double, green as Double, blue as Double, alpha as Double = 1.0) as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a color in the Generic RGB color space.
**Notes:** red: A red component value (0.0 - 1.0).
green: A green component value (0.0 - 1.0).
blue: A blue component value (0.0 - 1.0).
alpha: An alpha value (0.0 - 1.0).

Returns a new color object.
Available in Mac OS X v10.5 and later.

### 56.4.18 Equal(secondColor as CGColorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** True if both colors have equal values.
**Notes:** False on any error.

### 56.4.19 NumberOfComponents as Integer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The number of components.
**Notes:** Should be 3 for RGB and 4 for CMYK.

### 56.4.20 White as CGColorMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The white color in the Generic gray color space.

### 56.4.21 Properties

### 56.4.22 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The handle to the CGColorRef used internal.
**Notes:** (Read and Write property)

## 56.5 class CGColorSpaceMBS

### 56.5.1 class CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a CoreGraphics color space.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr5
- Colorspaces in Xojo
- Colorspaces in MacOS with Xojo
- MBS Xojo / Real Studio Plugins, version 15.4pr7
- Tip of day: Load ICC profile on OS X for any image format with CGImageSource
- MBS Xojo / Real Studio Plugins, version 15.0pr5
- MBS Xojo / Real Studio plug-ins in version 13.4
- Notes from this week
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic plug-ins version 9.5

### 56.5.2 Methods

### 56.5.3 CreateCalibratedGray(whitePoint() as Double, blackPoint() as Double, gamma as Double) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a calibrated gray colorspace.
**Notes:** WhitePoint is an array of 3 numbers (type double) specifying the tristimulus value, in the CIE 1931 XYZ-space, of the diffuse white point.
BlackPoint is an array of 3 numbers (type double) specifying the tristimulus value, in CIE 1931 XYZ-space, of the diffuse black point.
Gamma defines the gamma for the gray component.
Returns nil on any error.

### 56.5.4 CreateCalibratedRGB(whitePoint() as Double, blackPoint() as Double, gamma() as Double, matrix() as Double) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a calibrated RGB colorspace.
**Notes:** WhitePoint is an array of 3 numbers (type double) specifying the tristimulus value, in the CIE 1931 XYZ-space, of the diffuse white point.
BlackPoint is an array of 3 numbers (type double) specifying the tristimulus value, in CIE 1931 XYZ-space, of the diffuse black point.
Gamma is an array of 3 numbers (type double) specifying the gamma for the red, green, and blue components of the color space.
Matrix is an array of 9 numbers (type double) specifying the linear interpretation of the gamma-modified RGB values of the colorspace with respect to the final XYZ representation.
Returns nil on any error.

### 56.5.5 CreateDeviceCMYK as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a DeviceCMYK colorspace.
**Notes:** Returns nil on any error.

### 56.5.6 CreateDeviceGray as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a DeviceGray colorspace.
**Notes:** Returns nil on any error.

### 56.5.7 CreateDeviceRGB as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a DeviceRGB colorspace.
**Notes:** Returns nil on any error.

Old name: CGColorSpaceCreateDeviceRGBMBS

### 56.5.8 CreateLab(whitePoint() as Double, blackPoint() as Double, range() as Double) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an L*a*b* colorspace.
**Notes:** WhitePoint is an array of 3 numbers (type double) specifying the tristimulus value, in the CIE 1931

XYZ-space, of the diffuse white point.
BlackPoint is an array of 3 numbers (type double) specifying the tristimulus value, in CIE 1931 XYZ-space, of the diffuse black point.
Range is an array of four numbers (type double) specifying the range of valid values for the a* and b* components of the color space.
Returns nil on any error.

### 56.5.9 CreatePattern(baseSpace as CGColorSpaceMBS) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a pattern colorspace.
**Notes:** BaseSpace is the underlying colorspace of the pattern colorspace. For colored patterns, baseSpace should be nil; for uncolored patterns, baseSpace specifies the colorspace of colors which will be painted through the pattern.

Returns nil on any error.

### 56.5.10 CreateWithHandle(Handle as Integer) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Creates a CGColorSpace for a handle.
**Example:**

```
dim n as NSColorSpaceMBS = NSColorSpaceMBS.genericCMYKColorSpace
dim c as CGColorSpaceMBS = CGColorSpaceMBS.CreateWithHandle(n.CGColorSpaceHandle)
MsgBox c.Name
```

**Notes:** Sometimes you need to create CGColorSpaceMBS from NSColorSpaceMBS or some handle you got from an OS function and than you can use this function.
Returns nil on any error. Retains the handle.

### 56.5.11 CreateWithICCProfile(ICCProfileData as memoryblock) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates an ICC-based color space using the ICC profile contained in the specified data.
**Notes:** data: The data containing the ICC profile to set for the new color space.
Returns a new color space based on the specified profile.
See also:

• 56.5.12 CreateWithICCProfile(ICCProfileData as string) as CGColorSpaceMBS 8919

### 56.5.12 CreateWithICCProfile(ICCProfileData as string) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates an ICC-based color space using the ICC profile contained in the specified data.
**Notes:** data: The data containing the ICC profile to set for the new color space.
Returns a new color space based on the specified profile.
See also:

• 56.5.11 CreateWithICCProfile(ICCProfileData as memoryblock) as CGColorSpaceMBS 8918

### 56.5.13 CreateWithName(name as string) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a color space using name as the identifier for the color space.
**Notes:** Pass one of the kCGColorSpace* string constants.

### 56.5.14 CreateWithPlatformColorSpace(Handle as Integer) as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a CGColorSpace using a Colorsync Profile Handle.
**Notes:** Returns nil on any error.

### 56.5.15 ICCProfile as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns a copy of the ICC profile of the provided color space.
**Notes:** The ICC profile or "" if the color space does not have an ICC profile.

Available in Mac OS X v10.5 and later.

### 56.5.16 kCGColorSpaceACESCGLinear as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the ACEScg color space. For more information, see ,ÄúACEScg —A Working Space for CGI Render and Compositing,Äù, Version 1.0.1, Academy of Motion Picture Arts and Sciences (http://www.oscars.org/science-technology/sci-tech-projects/aces).

Available in OS X v10.11 and later.

### 56.5.17 kCGColorSpaceAdobeRGB1998 as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the Adobe RGB (1998) color space. For more information, see "Adobe RGB (1998) Color Image Encoding", Version 2005-05, Adobe Systems Inc. (http://www.adobe.com).

### 56.5.18 kCGColorSpaceDCIP3 as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the DCI P3 color space, created by Digital Cinema Initiatives, LLC. This color space is the digital cinema standard.

Available in OS X v10.11 and later.

### 56.5.19 kCGColorSpaceDisplayP3 as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the Display P3 color space, created by Apple Inc. This color space uses the DCI P3 primaries, a D65 white point, and the same gamma curve as the sRGB color space.

Available in OS X v10.10 and later.

### 56.5.20 kCGColorSpaceGenericCMYK as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the "Generic" CMYK color space.

### 56.5.21 kCGColorSpaceGenericGray as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the "Generic" gray color space.

### 56.5.22 kCGColorSpaceGenericGrayGamma2_2 as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the generic gray color space with a gamma value of 2.2.

Available in OS X v10.6 and later.

### 56.5.23 kCGColorSpaceGenericRGB as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the "Generic" RGB color space.

### 56.5.24 kCGColorSpaceGenericRGBLinear as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the "Generic" linear RGB color space. This is the same as kCGColorSpaceGenericRGB but with a 1.0 gamma.

### 56.5.25 kCGColorSpaceGenericXYZ as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the generic XYZ color space.

Available in OS X v10.11 and later.

### 56.5.26 kCGColorSpaceITUR_2020 as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the ITU-R Recommendation BT.2020 color space. For more information, see ,ÄúBT.2020 : Parameter values for ultra-high definition television systems for production and international programme exchange,Äù, Version 2014-06, International Telecommunication Union (https://www.itu.int/rec/R-REC-BT.2020).

Available in OS X v10.11 and later.

### 56.5.27 kCGColorSpaceITUR_709 as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the ITU-R Recommendation BT.2020 color space. For more information, see ,ÄúBT.2020 : Parameter values for ultra-high definition television systems for production and international programme exchange,Äù, Version 2014-06, International Telecommunication Union (https://www.itu.int/rec/R-REC-BT.2020).

Available in OS X v10.11 and later.

### 56.5.28 kCGColorSpaceROMMRGB as string

MBS MacCG Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the ROMM RGB color space. For more information, see ,ÄúReference Output Medium Metric RGB Color Space (ROMM RGB) White Paper,Äù, Version 2.1, Eastman Kodak Company (http://www.kodak.com/global/plugins/acrobat/en/professional/products/software/colorFlow/romm_rgb.pdf).

Available in OS X v10.11 and later.

### 56.5.29 kCGColorSpaceSRGB as string

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the names for color spaces.
**Notes:** The name of the sRGB color space. The capitalization in the name, while strictly inaccurate, avoids interpretational ambiguity. For more information, see IEC 61966-2-1 (1999-10): "Multimedia systems and equipment - Colour measurement and management - Part 2-1: Colour management - Default RGB colour space - sRGB".

### 56.5.30 Properties

### 56.5.31 BaseColorSpace as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the base color space of a pattern or indexed color space.
**Notes:** The base color space if the space parameter is a pattern or indexed color space; otherwise, nil.

Available in Mac OS X v10.5 and later.
(Read only property)

### 56.5.32 ColorTableCount as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the number of entries in the color table of an indexed color space.
**Notes:** The number of entries in the color table of the space parameter if the color space is an indexed color space; otherwise, returns 0.

Available in Mac OS X v10.5 and later.
(Read only property)

### 56.5.33 Description as String

MBS MacCG Plugin, Plugin Version: 15.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The description text.
**Example:**

```
dim c as CGColorSpaceMBS = window1.CGColorSpaceMBS
MsgBox c.description
```

**Notes:** (Read only property)

### 56.5.34 Handle as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The handle to the color space.
**Notes:** (a CGColorSpaceRef)
(Read and Write property)

### 56.5.35 Model as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the color space model of the provided color space.
**Notes:** Available in Mac OS X v10.5 and later.

Use this constants:
CGColorSpaceMBS.kCGColorSpaceModelUnknown
CGColorSpaceMBS.kCGColorSpaceModelCMYK
CGColorSpaceMBS.kCGColorSpaceModelDeviceN
CGColorSpaceMBS.kCGColorSpaceModelIndexed
CGColorSpaceMBS.kCGColorSpaceModelLab
CGColorSpaceMBS.kCGColorSpaceModelMonochrome
CGColorSpaceMBS.kCGColorSpaceModelPattern
CGColorSpaceMBS.kCGColorSpaceModelRGB
(Read only property)

### 56.5.36 ModelText as String

MBS MacCG Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** The model as text.
**Notes:** For viewing in debugger.
(Read only property)

### 56.5.37 Name as String

MBS MacCG Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Queries the name of the colorspace.
**Notes:** Not all CGColorspace objects have names. Some have only ICC Profile and you can get name via Name property in LCMS2ProfileMBS if you open the profile with LCMS.
(Read only property)

### 56.5.38 NumberOfComponents as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the number of components.
**Notes:** typical 1 for grayscale, 3 for RGB and 4 for CMYK.
(Read only property)

### 56.5.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGColorSpaceModelCMYK | 2 | One of the colorspace model constants.<br>A CMYK color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelDeviceN | 4 | One of the colorspace model constants.<br>A DeviceN color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelIndexed | 5 | One of the colorspace model constants.<br>An indexed color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelLab | 3 | One of the colorspace model constants.<br>A Lab color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelMonochrome | 0 | One of the colorspace model constants.<br>A monochrome color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelPattern | 6 | One of the colorspace model constants.<br>A pattern color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelRGB | 1 | One of the colorspace model constants.<br>An RGB color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGColorSpaceModelUnknown | -1 | One of the colorspace model constants.<br>An unknown color space model.<br>Available in Mac OS X v10.5 and later. |
| kCGRenderingIntentAbsoluteColorimetric | 1 | One of the color rendering intents constants.<br>Map colors outside of the gamut of the output device to the closes match inside the gamut of the output device. This can produce a effect, where two different color values in the gamut of the graphic are mapped to the same color value in the output device's gamut. U relative colorimetric, absolute colorimetric does not modify colors i gamut of the output device. |
| kCGRenderingIntentDefault | 0 | One of the color rendering intents constants.<br>The default rendering intent for the graphics context. |
| kCGRenderingIntentPerceptual | 3 | One of the color rendering intents constants.<br>Preserve the visual relationship between colors by compressing the the graphics context to fit inside the gamut of the output device. P intent is good for photographs and other complex, detailed images. |
| kCGRenderingIntentRelativeColorimetric | 2 | One of the color rendering intents constants.<br>Map colors outside of the gamut of the output device to the closes match inside the gamut of the output device. This can produce a effect, where two different color values in the gamut of the graphic are mapped to the same color value in the output device's gamut. Th colorimetric shifts all colors (including those within the gamut) to ac the difference between the white point of the graphics context and point of the output device. |
| kCGRenderingIntentSaturation | 4 | One of the color rendering intents constants.<br>Preserve the relative saturation value of the colors when convertin gamut of the output device. The result is an image with bright, colors. Saturation intent is good for reproducing images with low de as presentation charts and graphs. |

## 56.6 class CGContextMBS

### 56.6.1 class CGContextMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics context.
**Example:**

```
Dim p As New Picture(200, 200)
Dim g As Graphics = p.Graphics

// Clear image with white
g.ForeColor = &cFFFFFF
g.FillRect 0, 0, g.Width, g.Height

Dim c As New CGContextMBS(g)

c.SetRGBFillColor(1, 0, 0)

// coordinates are swapped in CGContext, so y = 20 means 20 pixels from bottom of picture!

Const x = 10
Const y = 20
Const w = 120
Const h = 100

c.FillRect New CGRectMBS(x, y, w, h)

Self.Backdrop = p
```

**Notes:** If the handle property has a non zero value, the destructor of this class will release the context reference.

If you create this in a method based on a window, please release it within that method. e.g. in a paint event, create it and let RB delete the last reference on the end of the method. Else you may see crashes as the context is still being around while the graphics port has been released.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- Drawing with DirectDraw in Xojo
- MBS Xojo Plugins, version 20.3pr3
- MBS Xojo Plugins, version 19.6pr3

- Removing 32-bit Carbon GUI classes
- MBS Xojo Plugins, version 18.4pr1
- Colorspaces in MacOS with Xojo
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- MBS Plugins 11.1 Release notes
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News
- 6.4, pages 30 to 31: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

### 56.6.2 Methods

### 56.6.3 AddArc(x as Double, y as Double, radius as Double, startangle as Double, endangle as Double, clockwise as boolean)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Add an arc to the current path.
**Example:**

```
const r=100.0
dim c as CGContextMBS
// draws a circle with radius r
c.BeginPath
c.SetLineWidth 5
c.SetGrayStrokeColor 0,1
c.AddArc 250,150,r,0,360,false
c.StrokePath
```

**Notes:** Add an arc of a circle to the context's path, possibly preceded by a straight line segment. '(x, y)' is the center of the arc; 'radius' is its radius; 'startAngle' is the angle to the first endpoint of the arc; 'endAngle' is the angle to the second endpoint of the arc; and 'clockwise' is true if the arc is to be drawn clockwise, false otherwise. 'startAngle' and 'endAngle' are measured in radians.

### 56.6.4 addArcToPath(x as Double, y as Double, w as Double, h as Double, startAngle as Integer, arcAngle as Integer)

MBS MacCG Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Adds an arc to the current path.

### 56.6.5 AddArcToPoint(x1 as Double, y1 as Double, x2 as Double, y2 as Double, radius as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Add an arc to the current path.
**Notes:** Add an arc of a circle to the context's path, possibly preceded by a straight line segment. 'radius' is the radius of the arc. The arc is tangent to the line from the current point to '(x1, y1)', and the line from '(x1, y1)' to '(x2, y2)'.

### 56.6.6 AddCurveToPoint(cp1x as Double, cp1y as Double, cp2x as Double, cp2y as Double, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Append a cubic Bezier curve from the current point to (x,y), with control points (cp1x, cp1y) and (cp2x, cp2y)

### 56.6.7 AddEllipseInRect(r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add an ellipse inside rect to the current path of context.
**Notes:** See the function CGPathMBS.AddEllipseInRect for more information on how the path for the ellipse is constructed.
Requires Mac OS X 10.4.

### 56.6.8 AddLines(p() as CGPointMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Add a set of lines to the context's path.
**Notes:** Currently this function is not available to RB versions before 3.5.

Note that the p parameter is an array of CGPointMBS and not just one.

### 56.6.9 AddLineToPoint(x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Append a straight line segment from the current point to (x, y).
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

c.SetRGBStrokeColor 1,0,0,1
c.BeginPath
c.MoveToPoint 0,0
c.AddLineToPoint 100,100
c.StrokePath
c.Flush
```

### 56.6.10 addOvalToPath(x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Adds an oval to the current path.

### 56.6.11 AddPath(path as CGPathMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add path to the path of context.
**Notes:** The points in path are transformed by the CTM of context before they are added.
Requires Mac OS X 10.2.

### 56.6.12 AddQuadCurveToPoint(cpx as Double, cpy as Double, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Append a quadratic curve from the current point to (x, y), with control point (cpx, cpy).

### 56.6.13 AddRect(r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Add a double rect to the context's path.

### 56.6.14 AddRects(r() as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Add a set of rects to the context's path.
**Notes:** Currently this function is not available to RB versions before 3.5.
Note that the r parameter is an array of CGRectMBS and not just one.

### 56.6.15 addRoundedRectToPath(x as Double, y as Double, w as Double, h as Double, arcWidth as Double, arcHeight as Double)

MBS MacCG Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Adds a round rectangle to the current path.

### 56.6.16 BeginPage(mediabox as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Begin a new page.

### 56.6.17 BeginPath

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Begin a new path. The old path is discarded.
**Example:**

```
#If XojoVersion >= 2019.02 Then
Dim p As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(p)
#Else
Dim h As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(h)
#EndIf
```

```
c.SetGrayStrokeColor(0,1)
c.SetGrayFillColor(0,1)
c.BeginPath
c.SetLineWidth 0.5
c.MoveToPoint 50, 550
c.AddLineToPoint 100, 600
c.StrokePath
c.Flush
c = nil
```

**Notes:** Note that a context has a double path in use at any time: a path is not part of the graphics state.

### 56.6.18 BeginTransparencyLayer(auxiliaryInfo as Dictionary = nil)

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Begin a transparency layer in context.
**Notes:** All subsequent drawing operations until a corresponding EndTransparencyLayer are composited into a fully transparent backdrop (which is treated as a separate destination buffer from the context). After the transparency layer is ended, the result is composited into the context using the global alpha and shadow state of the context. This operation respects the clipping region of the context. After a call to this function, all of the parameters in the graphics state remain unchanged with the exception of the following:

- The global alpha is set to 1.
- The shadow is turned off.
- The blend mode is set to 'kCGBlendModeNormal'.

Ending the transparency layer restores these parameters to the values they had before BeginTransparency-Layer was called. Transparency layers may be nested.

### 56.6.19 BeginTransparencyLayerWithRect(r as CGRectMBS, auxiliaryInfo as Dictionary = nil)

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Begin a transparency layer in context.
**Notes:** This function is identical to BeginTransparencyLayer except that the content of the transparency layer will be bounded by rect (specified in user space).

### 56.6.20 clearRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Clears the background.
**Notes:** Remeber that in CoreGraphics the position 0/0 is in the bottom left corner. In Xojo 0/0 is in the top left corner.

### 56.6.21 clip

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Clips the current path.
**Notes:** Intersect the context's path with the current clip path and use the resulting path as the clip path for subsequent rendering operations. Use the winding-number fill rule for deciding what's inside the path.

### 56.6.22 ClipToMask(rect as CGRectMBS, mask as CGImageMBS)

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Maps a mask into the specified rectangle and intersects it with the current clipping area of the graphics context.
**Notes:** rect: The rectangle to map the mask parameter to.
mask: An image or an image mask. If mask is an image, then it must be in the DeviceGray color space, may not have an alpha component, and may not be masked by an image mask or masking color.

If the mask parameter is an image mask, then Quartz clips in a manner identical to the behavior seen with the function DrawImage—the mask indicates an area to be left unchanged when drawing. The source samples of the image mask determine which points of the clipping area are changed, acting as an "inverse alpha" value. If the value of a source sample in the image mask is S, then the corresponding point in the current clipping area is multiplied by an alpha value of (1–S). For example, if S is 1 then the point in the clipping area becomes transparent. If S is 0, the point in the clipping area is unchanged.

If the mask parameter is an image, then mask acts like an alpha mask and is blended with the current clipping area. The source samples of mask determine which points of the clipping area are changed. If the value of the source sample in mask is S, then the corresponding point in the current clipping area is multiplied by an alpha of S. For example, if S is 0, then the point in the clipping area becomes transparent. If S is 1, the point in the clipping area is unchanged.

Available in Mac OS X v10.4 and later.

### 56.6.23 clipToRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Clips the current path.
**Notes:** Intersect the current clipping path with 'rect'. Note that this function resets the context's path to the empty path.

### 56.6.24 Close

MBS MacCG Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** Closes the context.
**Notes:** Same as destructor later, but running now when you call method.

### 56.6.25 closePath

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Close the current subpath of the context's path.

### 56.6.26 ConcatCTM(transform as CGAffineTransformMBS)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Concatenate the current graphics state's transformation matrix (the CTM) with the affine transform 'transform'.

### 56.6.27 Constructor(g as graphics)

MBS MacCG Plugin, Plugin Version: 20.3, Platform: macOS, Targets: All.

**Function:** Creates a new CGContextMBS object drawing to the existing graphics object.
**Example:**

```
Dim p As New Picture(200, 200)
Dim g As Graphics = p.Graphics

// Clear image with white
g.ForeColor = &cFFFFFF
g.FillRect 0, 0, g.Width, g.Height
```

```
Dim c As New CGContextMBS(g)

c.SetRGBFillColor(1, 0, 0)

// coordinates are swapped in CGContext, so y = 20 means 20 pixels from bottom of picture!

Const x = 10
Const y = 20
Const w = 120
Const h = 100

c.FillRect New CGRectMBS(x, y, w, h)

Self.Backdrop = p
```

**Notes:** Raises exception if we fail to get the CGContext from Xojo.
Works on macOS and iOS.
See also:


- 56.6.28 Constructor(handle as Integer) 8935
- 56.6.29 Constructor(pic as Picture) 8935


### 56.6.28 Constructor(handle as Integer)

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new CGContextMBS object based on a CGContextRef.
**Notes:** The CGContext is retained.
See also:


- 56.6.27 Constructor(g as graphics) 8934
- 56.6.29 Constructor(pic as Picture) 8935


### 56.6.29 Constructor(pic as Picture)

MBS MacCG Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGContextMBS object drawing to the existing Picture object.
**Example:**

```
Dim p As New Picture(100,100)
Dim pg As New CGContextMBS(p)
break // inspect in debugger
```

**Notes:** Raises exception, if the picture is not a bitmap picture.
Works on macOS and iOS.
See also:


- 56.6.27 Constructor(g as graphics) 8934
- 56.6.28 Constructor(handle as Integer) 8935


### 56.6.30 contextWithCGContext(handle as Integer) as CGContextMBS

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new CGContextMBS object based on a CGContextRef.
**Example:**

```
// load a picture
dim f as FolderItem = SpecialFolder.Desktop.Child("ColorSpin.jpg")
dim pic as Picture = picture.Open(f)

// open printer
dim g as Graphics = OpenPrinterDialog
if g = nil then Return

// draw
g.DrawPicture pic, 0, 0

// now load again
dim ImageSource as new CGImageSourceMBS(f)
dim img as CGImageMBS = ImageSource.CreateImageAtIndex(0)
dim cs as CGColorSpaceMBS = CGColorSpaceMBS.CreateDeviceRGB

// copy with replacing colorspace
img = img.CopyWithColorSpace(cs)

// and draw
#If XojoVersion >= 2019.02 Then
Dim p As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(p)
#Else
Dim h As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(h)
#EndIf
dim r as CGRectMBS = CGMakeRectMBS(0, 0, img.Width, img.Height)

c.DrawPicture(img, r)
```

```
c.Flush
```

**Notes:** The CGContext is retained.
Returns nil on any error.
See also:

- 56.6.31 contextWithCGContext(handle as Ptr) as CGContextMBS 8937

### 56.6.31 contextWithCGContext(handle as Ptr) as CGContextMBS

MBS MacCG Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a new CGContextMBS object based on a CGContextRef.
**Example:**

```
// load a picture
dim f as FolderItem = SpecialFolder.Desktop.Child("ColorSpin.jpg")
dim pic as Picture = picture.Open(f)

// open printer
dim g as Graphics = OpenPrinterDialog
if g = nil then Return

// draw
g.DrawPicture pic, 0, 0

// now load again
dim ImageSource as new CGImageSourceMBS(f)
dim img as CGImageMBS = ImageSource.CreateImageAtIndex(0)
dim cs as CGColorSpaceMBS = CGColorSpaceMBS.CreateDeviceRGB

// copy with replacing colorspace
img = img.CopyWithColorSpace(cs)

// and draw
#If XojoVersion >= 2019.02 Then
Dim p As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(p)
#Else
Dim h As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(h)
#EndIf
dim r as CGRectMBS = CGMakeRectMBS(0, 0, img.Width, img.Height)

c.DrawPicture(img, r)
c.Flush
```

**Notes:** The CGContext is retained.
Returns nil on any error.
See also:

- 56.6.30 contextWithCGContext(handle as Integer) as CGContextMBS 8936

### 56.6.32 CopyPath as CGPathMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Quartz path object built from the current path information in a graphics context.
**Notes:** Available in Mac OS X v10.6 and later.

### 56.6.33 DrawCGPDFDocument(pdf as Variant, rect as CGRectMBS, page as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draw 'page' in 'document' in the rectangular area specified by 'rect'.
**Example:**

```
'get a print session

// print this PDF
dim pathPrinted as FolderItem=GetFolderItem("test.pdf")

dim thePrintSession as CPMPrintSessionMBS = NewCPMPrintSessionMBS
if thePrintSession = nil then Return

'get default page format and print settings and attach it to the print settings
dim thePageFormat as CPMPageFormatMBS = NewCPMPageFormatMBS
dim thePrintSettings as CPMPrintSettingsMBS = NewCPMPrintSettingsMBS
thePrintSession.DefaultPageFormat thePageFormat
thePrintSession.DefaultPrintSettings thePrintSettings

'show the print dialog
if not thePrintSession.PrintDialog(thePrintSettings,thePageFormat) then return

'open the file which will be printed
dim thePdfDocument as CGPDFDocumentMBS = pathPrinted.OpenAsCGPDFDocumentMBS

' limit page counts to the one we have
dim LastPage as Integer = thePdfDocument.PageCount
```

```
if thePrintSettings.LastPage<lastpage then
lastpage=thePrintSettings.LastPage
end if

' you get better progress bar if you tell how many pages will come
thePrintSettings.LastPage=lastpage

'begin the printing
thePrintSession.BeginDocument(thePrintSettings, thePageFormat)

'loop over the number of copies
for currentCopy as Integer = 1 to thePrintSettings.Copies

'loop over the pages
for currentPage as Integer = thePrintSettings.FirstPage to LastPage

'prepage the page
dim PrintRect as CPMRectMBS =thePageFormat.AdjustedPageSize
dim CGRect as CGRectMBS =CGMakeRectMBS(PrintRect.left, PrintRect.top, PrintRect.Width, Print-
Rect.Height)
thePrintSession.BeginPage(thePageFormat, nil)
dim thePrintContext as CGContextMBS = thePrintSession.PageContext
if thePrintContext = Nil then return

'print the page
thePrintContext.DrawCGPDFDocument thePdfDocument, CGRect, currentPage

'end the page
thePrintContext = nil
thePrintSession.EndPage
next

next

'end the printing
thePrintSession.EndDocument
```

**Notes:** Pass a CGPDFDocumentMBS object for the pdf argument.
The media box of the page is scaled, if necessary, to fit into 'rect'.

### 56.6.34 DrawLayerAtPoint(Point as CGPointMBS, layer as CGLayerMBS)

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Draws the contents of a CGLayer object at the specified point.

**Notes:** context: The graphics context associated with the layer.
point: The location, in current user space coordinates, to use as the origin for the drawing.
layer: The layer whose contents you want to draw.

Calling the function DrawLayerAtPoint is equivalent to calling the function DrawLayerInRect with a rectangle that has its origin at point and its size equal to the size of the layer.

Available in Mac OS X version 10.4 and later.

### 56.6.35 DrawLayerInRect(rect as CGRectMBS, layer as CGLayerMBS)

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Draws the contents of a CGLayer object into the specified rectangle.
**Notes:** context: The graphics context associated with the layer.
rect: The rectangle, in current user space coordinates, to draw to.
layer: The layer whose contents you want to draw.

The contents are scaled, if necessary, to fit into the rectangle.
Available in Mac OS X version 10.4 and later.

### 56.6.36 DrawLinearGradient(gradient as CGGradientMBS, startPoint as CGPointMBS, endPoint as CGPointMBS, options as Integer)

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Paints a gradient fill that varies along the line defined by the provided starting and ending points.
**Notes:** gradient: A CGGradient object.
startPoint: The coordinate that defines the starting point of the gradient.
endPoint: The coordinate that defines the ending point of the gradient.
options: Option flags (kCGGradientDrawsBeforeStartLocation or kCGGradientDrawsAfterEndLocation) that control whether the fill is extended beyond the starting or ending point.

The color at location 0 in the CGGradient object is mapped to the starting point. The color at location 1 in the CGGradient object is mapped to the ending point. Colors are linearly interpolated between these two points based on the location values of the gradient. The option flags control whether the gradient is drawn before the start point or after the end point.

Available in Mac OS X v10.5 and later.

### 56.6.37 DrawPath(mode as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Draw the context's path using drawing mode 'mode'.

### 56.6.38 DrawPicture(pic as CGImageMBS, rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Draws a CGImageMBS at the given position.
**Example:**

```
// put inside window paint event

dim c as CGContextMBS
if TargetCocoa then
c = GetCurrentCGContextMBS
else
c = window1.CGContextMBS
end if

dim logo as Picture = logoMBS(500)
dim image as CGImageMBS = CGCreateImageMBS(logo)

dim r as CGRectMBS = CGMakeRectMBS(0,0,g.Width,g.Height)

c.DrawPicture image, r
```

**Notes:** Remeber that in CoreGraphics the position 0/0 is in the bottom left corner. In Xojo 0/0 is in the top left corner.

### 56.6.39 DrawRadialGradient(gradient as CGGradientMBS, startCenter as CGPointMBS, startRadius as Double, endCenter as CGPointMBS, endRadius as Double, options as Integer)

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Paints a gradient fill that varies along the area defined by the provided starting and ending circles.
**Notes:** gradient: A CGGradient object.
startCenter: The coordinate that defines the center of the starting circle.
startRadius: The radius of the starting circle.

endCenter: The coordinate that defines the center of the ending circle.
endRadius: The radius of the ending circle.
options: Option flags (kCGGradientDrawsBeforeStartLocation or kCGGradientDrawsAfterEndLocation) that control whether the gradient is drawn before the starting circle or after the ending circle.

The color at location 0 in the CGGradient object is mapped to the circle defined by startCenter and startRadius. The color at location 1 in the CGGradient object is mapped to the circle defined by endCenter and endRadius. Colors are linearly interpolated between the starting and ending circles based on the location values of the gradient. The option flags control whether the gradient is drawn before the start point or after the end point.

Available in Mac OS X v10.5 and later.

### 56.6.40 DrawShading(shading as CGShadingMBS)

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Fills the clipping path of a context with the specified shading.
**Notes:** shading: A Quartz shading. Quartz retains this object; upon return, you may safely release it.
Available in Mac OS X version 10.2 and later.

### 56.6.41 DrawTiledImage(pic as CGImageMBS, rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Repeatedly draws an image, scaled to the provided rectangle, to fill the current clip region.
**Example:**

```
// put inside window paint event

dim c as CGContextMBS
if TargetCocoa then
c = GetCurrentCGContextMBS
else
c = window1.CGContextMBS
end if

dim logo as Picture = logoMBS(50)
dim image as CGImageMBS = CGCreateImageMBS(logo)

dim r as CGRectMBS = CGMakeRectMBS(0,0,50,50)

c.DrawTiledImage image, r
```

**Notes:** rect: A rectangle that specifies the origin and size of the destination tile. Quartz scales the image—disproportionately, if necessary—to fit the bounds specified by the rect parameter.

image: The image to draw.

Quartz draws the scaled image starting at the origin of the rectangle in user space, then moves to a new point (horizontally by the width of the tile and/or vertically by the height of the tile), draws the scaled image, moves again, draws again, and so on, until the current clip region is tiled with copies of the image. Unlike patterns, the image is tiled in user space, so transformations applied to the CTM affect the final result.

Available in Mac OS X v10.5 and later.

### 56.6.42 EndPage

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** End the current page.

### 56.6.43 EndTransparencyLayer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** End a tranparency layer.

### 56.6.44 EOClip

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Clips the current path.
**Notes:** Intersect the context's path with the current clip path and use the resulting path as the clip path for subsequent rendering operations. Use the even-odd fill rule for deciding what's inside the path.

### 56.6.45 EOFillPath

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Fill the context's path using the even-odd fill rule. Any open subpath of the path is implicitly closed.

### 56.6.46 FillEllipseInRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Fill an ellipse (an oval) inside rect.
**Example:**

```
// a new picture in RB
dim pic as new Picture(500, 500)

// and create CGBitmapContextMBS pointing to it
dim b as CGBitmapContextMBS = CGBitmapContextMBS.CreateWithPicture(pic)

// color set to full red
b.SetRGBFillColor 1.0, 0.0, 0.0, 1.0

// draw ellipse
dim r as CGRectMBS = CGRectMBS.Make(0, 0, 500, 500)
b.FillEllipseInRect r

// flush drawings
b.Flush

// and show
Backdrop = pic
```

**Notes:** Requires Mac OS X 10.4.

### 56.6.47 FillPath

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Fill the context's path using the winding-number fill rule. Any open subpath of the path is implicitly closed.

### 56.6.48 FillRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Fills the background with current fill color.
**Example:**

```
// put in window.paint event
dim c as CGContextMBS

c=window1.CGContextMBS

c.RotateCTM 0.1
c.SetRGBFillColor 0,0,1,0.5
c.FillRect CGMakeRectMBS(0,0,100,100)

c.Flush
```

**Notes:** Remeber that in CoreGraphics the position 0/0 is in the bottom left corner. In Xojo 0/0 is in the top left corner.

### 56.6.49 fillRoundedRect(x as Double, y as Double, w as Double, h as Double, arcWidth as Double, arcHeight as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Fills a round rectangle.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.fillRoundedRect 100,100,100,100,20,20

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.strokeRoundedRect 100,100,100,100,20,20
```

### 56.6.50 Flush

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Updates the screen to show the current content.
**Notes:** Like UpdateNow in the RB window class.

### 56.6.51 frameArc(x as Double, y as Double, w as Double, h as Double, startAngle as Integer, arcAngle as Integer)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Draws an arc.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.paintArc 100,100,100,100,50,90

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameArc 100,100,100,100,50,90
```

**Notes:** angles are in degree.

### 56.6.52 frameOval(x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Draws an oval.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.paintOval 100,100,100,100

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameOval 100,100,100,100
```

### 56.6.53 frameRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Draws the frame for the rectangle.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.paintRect 100,100,100,100

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameRect 100,100,100,100
```

### 56.6.54 GetClipBoundingBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the bounding box of a clipping path.
**Notes:** Returns the bounding box of the clipping path, specified in user space.

The bounding box is the smallest rectangle completely enclosing all points in the clipping path, including control points for any Bezier curves in the path.

Available in Mac OS X v10.3 and later.

### 56.6.55 GetCTM as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Return the current graphics state's transformation matrix.
**Notes:** Returns nil on any error.

### 56.6.56 GetPathBoundingBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Return the bounding box of the context's path.
**Notes:** The bounding box is the smallest rectangle completely enclosing all points in the path, including control points for Bezier and quadratic curves.

### 56.6.57 GetPathCurrentPoint as CGPointMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Return the current point of the current subpath of the context's path.

### 56.6.58 GetTextPosition as CGPointMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Return the current user-space point at which text will be drawn to (x,y).
**Notes:** Returns nil on any problem.

### 56.6.59 IsPathEmpty as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns true if the context's path contains no elements.

### 56.6.60 MoveToPoint(x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Append a straight line segment from the current point to (x, y).

### 56.6.61 paintArc(x as Double, y as Double, w as Double, h as Double, startAngle as Integer, arcAngle as Integer)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Fills an arc.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS
```

```
// fill in red
c.SetRGBFillColor 1,0,0,1
c.paintArc 100,100,100,100,50,90

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameArc 100,100,100,100,50,90
```

**Notes:** angles are in degree.

### 56.6.62 paintOval(x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Fills an oval.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.paintOval 100,100,100,100

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameOval 100,100,100,100
```

### 56.6.63 paintRect(x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Fills the rectangle.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
```

```
c.paintRect 100,100,100,100

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.frameRect 100,100,100,100
```

### 56.6.64 PathContainsPoint(point as CGPointMBS, mode as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return true if point is contained in the current path of context.
**Notes:** A point is contained within a contexts path if it is inside the painted region when the path is stroked or filled with opaque colors using the path drawing mode mode. point is specified is user space.

Requires Mac OS X 10.4.

### 56.6.65 ReplacePathWithStrokedPath

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Replace the path in context with the stroked version of the path, using the parameters of context to calculate the stroked path.
**Notes:** The resulting path is created such that filling it with the appropriate color will produce the same results as stroking the original path. You can use this path in the same way you can use the path of any context; for example, you can clip to the stroked version of a path by calling this function followed by a call to "ClipPath".
Requires Mac OS X 10.4.

### 56.6.66 RestoreGState

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Restores the last saved graphics state.

### 56.6.67 RotateCTM(angle as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Rotate the current graphics state's transformation matrix (the CTM) by 'angle' radians.
**Example:**

```
// Rotate a picture not on the edge of the context:

dim c as CGImageMBS
dim f as FolderItem
dim d as CGDataProviderMBS
dim cg as CGContextMBS
dim r as CGRectMBS

f=SpecialFolder.Desktop.Child("IMAG0001.JPG")

d=CGDataProviderMBS.CreateWithFile(f)
c=CGCreateImageFromJPEGDataProviderMBS(d,nil,true,0)

cg=window1.CGContextMBS

r=CGMakeRectMBS(-c.Width/2,-c.Height/2,c.Width,c.Height)
cg.TranslateCTM Width/2,Height/2
cg.RotateCTM Slider1.Value/180.0*3.14
cg.DrawPicture c,r

cg.Flush
```

### 56.6.68 SaveGState

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Saves the current graphics state.

### 56.6.69 ScaleCTM(sx as Double, sy as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Scale the current graphics state's transformation matrix (the CTM) by (sx, sy).

### 56.6.70 SelectFont(name as string, size as Double, fontencoding as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Attempts to find the font named 'name'. If successful, scales it to 'size' units in user space.
**Notes:** Name: string that contains the PostScript name of the font to set.

'textEncoding' specifies how to translate from bytes to glyphs.

| | |
|---|---|
| kCGEncodingFontSpecific | 0 |
| kCGEncodingMacRoman | 1 |

As "Comic Sans MS" works, but not ""Comic Sans ms" this functions seems to be case sensitive.

Matthias Buercher notes that sometimes a font is not selected if the RGBFillColor was not set before.

You may need to reset the textmatrix with some code like c.TextMatrix = CGAffineTransformMBS.Identity. If the text matrix is different, your text may be rotated, skewed or resized.

### 56.6.71 SetAllowsAntialiasing(allowsAntialiasing as boolean)

MBS MacCG Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Whether to allow antialiasing.
**Notes:** Allow antialiasing in context if allowsAntialiasing is true; don't allow it otherwise. This parameter is not part of the graphics state. A context will perform antialiasing if both allowsAntialiasing and the graphics state parameter shouldAntialias are true.
Requires Mac OS X 10.4 to work.

### 56.6.72 SetAlpha(alpha as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the alpha value in the current graphics state to alpha.

### 56.6.73 SetBlendMode(BlendMode as Integer)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Set the blend mode of context to mode.
**Notes:** Requires Mac OS X 10.4.

### 56.6.74 SetCharacterSpacing(spacing as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the current character spacing to 'spacing'.
**Notes:** The character spacing is added to the displacement between the origin of one character and the origin of the next.

### 56.6.75 SetCMYKFillColor(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the fill color to a CMYK color.
**Notes:** colors are from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.76 SetCMYKStrokeColor(cyan as Double, magenta as Double, yellow as Double, black as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the stroke color to a CMYK color.
**Notes:** colors are from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.77 SetFillColor(color as CGColorMBS)

MBS MacCG Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Sets the given color as fill color.

### 56.6.78 SetFillColorSpace(colorspace as CGColorSpaceMBS)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Sets the colorspace used for the fill color of the graphics context.

### 56.6.79 SetFlatness(flatness as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the path flatness parameter in the current graphics state to flatness.

### 56.6.80 SetFont(font as CGFontMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets the current font.

### 56.6.81 SetFontSize(size as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the current font size to 'size'.

### 56.6.82 SetGrayFillColor(gray as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the fill color to a gray color.
**Notes:** gray is from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.83 SetGrayStrokeColor(gray as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the stroke color to a gray color.
**Notes:** gray is from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.84 SetLineCap(cap as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the line cap in the current graphics state to cap.

### 56.6.85 SetLineDash(phase as Double, lengths as memoryblock, count as Integer)

MBS MacCG Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Sets the pattern for dashed lines in a graphics context.
**Notes:** phase:
A value that specifies how far into the dash pattern the line starts, in units of the user space. For example,

passing a value of 3 means the line is drawn with the dash pattern starting at three units from its beginning. Passing a value of 0 draws a line starting with the beginning of a dash pattern.

lengths:
A memoryblock of float values that specify the lengths of the painted segments and unpainted segments, respectively, of the dash pattern—or nil for no dash pattern.

For example, passing a memoryblock with the values [ 2,3 ] sets a dash pattern that alternates between a 2-user-space-unit-long painted segment and a 3-user-space-unit-long unpainted segment. Passing the values [ 1,3,4,2 ] sets the pattern to a 1-unit painted segment, a 3-unit unpainted segment, a 4-unit painted segment, and a 2-unit unpainted segment.

count
If the lengths parameter specifies a memorybloc, pass the number of elements in the memoryblock. Otherwise, pass 0.

### 56.6.86 SetLineJoin(join as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the line join in the current graphics state to join.

### 56.6.87 SetLineWidth(width as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the line width in the current graphics state to width.
**Example:**

```
#If XojoVersion >= 2019.02 Then
Dim p As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(p)
#Else
Dim h As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(h)
#EndIf

c.SetGrayStrokeColor(0,1)
c.SetGrayFillColor(0,1)
c.BeginPath
c.SetLineWidth 0.5
c.MoveToPoint 50, 550
c.AddLineToPoint 100, 600
```

```
c.StrokePath
c.Flush
c = nil
```

### 56.6.88 SetMiterLimit(limit as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the miter limit in the current graphics state to limit.

### 56.6.89 SetRenderingIntent(intent as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the rendering intent in the graphics state to 'intent'.
**Notes:** Possible values for intent:

| | |
|---|---|
| kCGRenderingIntentDefault | 0 |
| kCGRenderingIntentAbsoluteColorimetric | 1 |
| kCGRenderingIntentRelativeColorimetric | 2 |
| kCGRenderingIntentPerceptual | 3 |
| kCGRenderingIntentSaturation | 4 |

### 56.6.90 SetRGBFillColor(red as Double, green as Double, blue as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the fill color to a RGB color.
**Notes:** colors are from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.91 SetRGBStrokeColor(red as Double, green as Double, blue as Double, alpha as Double = 1.0)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Sets the stroke color to a RGB color.
**Notes:** colors are from 0 to 1 and alpha is from 0 (transparent) to 1 (solid).

### 56.6.92 SetShadow(x as Double, y as Double, blur as Double)

MBS MacCG Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Enables shadowing in a graphics context.
**Example:**

```
Sub Paint(g As Graphics)
dim c as CGContextMBS

c=window1.CGContextMBS

c.SetShadow 5,5,0.5
c.SetRGBFillColor 1,0,0,1
c.FillRect CGMakeRectMBS(100,100,100,100)
c.Flush

End Sub
```

**Notes:** x/y: Specifies a translation of the context's coordinate system, to establish an offset for the shadow ( { 0,0 } specifies a light source immediately above the screen).
blur: A non-negative number specifying the amount of blur.

Shadow parameters are part of the graphics state in a context. After shadowing is set, all objects drawn are shadowed using a black color with 1/3 alpha (i.e., RGBA = { 0, 0, 0, 1.0/3.0 } ) in the DeviceRGB color space.

To turn off shadowing:

- Use the standard save/restore mechanism for the graphics state.
- Use CGContextSetShadowWithColor to set the shadow color to a fully transparent color (or pass nil as the color).

### 56.6.93 SetShadowWithColor(x as Double, y as Double, blur as Double, colorvalue as CGColorMBS)

MBS MacCG Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Enables shadowing with color a graphics context.
**Notes:** x/y: Specifies a translation in base-space.
blur: A non-negative number specifying the amount of blur.
colorvalue: Specifies the color of the shadow, which may contain a non-opaque alpha value. If nil, then shadowing is disabled.

See also SetShadow.

### 56.6.94 SetShouldAntialias(shouldAntialias as boolean)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Turn off antialiasing if 'shouldAntialias' is zero; turn it on otherwise.
**Notes:** This parameter is part of the graphics state.

### 56.6.95 SetShouldSmoothFonts(shouldSmoothFonts as boolean)

MBS MacCG Plugin, Plugin Version: 7.2, Platform: macOS, Targets: All.

**Function:** Whether font smoothing is enabled.
**Notes:** Turn on font smoothing if shouldSmoothFonts is true; turn it off otherwise. This parameter is part of the graphics state. Note that this doesn't guarantee that font smoothing will occur: not all destination contexts support font smoothing.
Requires Mac OS X 10.2.

### 56.6.96 SetStrokeColor(color as CGColorMBS)

MBS MacCG Plugin, Plugin Version: 17.2, Platform: macOS, Targets: All.

**Function:** Sets the given color as stroke color.

### 56.6.97 SetStrokeColorSpace(colorspace as CGColorSpaceMBS)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Sets the colorspace used for the stroke color of the graphics context.

### 56.6.98 SetTextDrawingMode(mode as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Set the text drawing mode to 'mode'.
**Notes:** Possible values:

| | |
|---|---|
| kCGTextFill | 0 |
| kCGTextStroke | 1 |
| kCGTextFillStroke | 2 |
| kCGTextInvisible | 3 |
| kCGTextFillClip | 4 |
| kCGTextStrokeClip | 5 |
| kCGTextFillStrokeClip | 6 |
| kCGTextClip | 7 |

### 56.6.99 ShowText(text as string)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Draw 'string' at the point specified by the current text matrix.
**Notes:** Each byte of the string is mapped through the encoding vector of the current font to obtain the glyph to display.
This function is more for quick and dirty text output, but not for serious drawing as it does not do most unicode strings correctly. Use ATS for better drawing.

Some RB 5.x versions show a bug that the text is not displayed on a CGContext in while running the application in debug mode.

### 56.6.100 ShowTextAtPoint(text as string, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Draw 'string' at the point '(x, y)', specified in user space.
**Notes:** Each byte of the string is mapped through the encoding vector of the current font to obtain the glyph to display.
This function is more for quick and dirty text output, but not for serious drawing as it does not do most unicode strings correctly. Use ATS for better drawing.

Some RB 5.x versions show a bug that the text is not displayed on a CGContext in while running the application in debug mode.

### 56.6.101 StrokeEllipseInRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Stroke an ellipse (an oval) inside rect.
**Notes:** Requires Mac OS X 10.4.

### 56.6.102 StrokePath

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Stroke the context's path.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

c.SetRGBStrokeColor 1,0,0,1
c.BeginPath
c.MoveToPoint 0,0
c.AddLineToPoint 100,100
c.StrokePath
c.Flush
```

### 56.6.103 StrokeRect(rect as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Stroke 'rect' with the current stroke color and the current linewidth.

### 56.6.104 StrokeRectWithWidth(rect as CGRectMBS, width as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Stroke 'rect' with the current stroke color, using 'width' as the the line width.

### 56.6.105 strokeRoundedRect(x as Double, y as Double, w as Double, h as Double, arcWidth as Double, arcHeight as Double)

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Draws the frame for the round rectangle.
**Example:**

```
dim c as CGContextMBS

c=window1.CGContextMBS

// fill in red
c.SetRGBFillColor 1,0,0,1
c.fillRoundedRect 100,100,100,100,20,20

// draw in green
c.SetRGBStrokeColor 0,1,0,1
c.strokeRoundedRect 100,100,100,100,20,20
```

### 56.6.106 Synchronize

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Synchronizes the context with the device.

### 56.6.107 TranslateCTM(tx as Double, ty as Double)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Translate the current graphics state's transformation matrix (the CTM) by (tx,ty).
**Example:**

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90¬∞
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage

c = nil

// show in PDF viewer
destfile.Launch
```

### 56.6.108 Properties

### 56.6.109 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The handle for this context.
**Notes:** Handle is a CGContextRef.
(Read and Write property)

### 56.6.110 InterpolationQuality as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The interpolation quality for image rendering of this context.
**Notes:** The interpolation quality is a gstate-parameter which controls the level of interpolation performed when an image is interpolated (for example, when scaling the image). Note that it is merely a hint to the context: not all contexts support all interpolation quality levels.

Possible values:

| | | |
|---|---|---|
| kCGInterpolationDefault | 0 | Let the context decide. |
| kCGInterpolationNone | 1 | Never interpolate. |
| kCGInterpolationLow | 2 | Fast, low quality. |
| kCGInterpolationHigh | 3 | Slow, high quality. |

(Read and Write property)

### 56.6.111 RetainCount as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the reference counter of the object.
**Notes:** If the retain count falls below 1, the object is destroyed.
(Read only property)

### 56.6.112 TextMatrix as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** Return the text matrix.
**Notes:** Returns nil on any error.
(Read and Write computed property)

### 56.6.113 TextPosition as CGPointMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** User-space point at which text will be drawn to (x,y).
**Notes:** (Read and Write computed property)

### 56.6.114 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGLineCapButt | 0 | A constant for the Line cap styles. |
| kCGLineCapRound | 1 | A constant for the Line cap styles. |
| kCGLineCapSquare | 2 | A constant for the Line cap styles. |
| kCGLineJoinBevel | 2 | A constant for the Line join styles. |
| kCGLineJoinMiter | 0 | A constant for the Line join styles. |
| kCGLineJoinRound | 1 | A constant for the Line join styles. |
| kCGPathEOFill | 1 | A constant for the Drawing modes for paths. |
| kCGPathEOFillStroke | 4 | A constant for the Drawing modes for paths. |
| kCGPathFill | 0 | A constant for the Drawing modes for paths. |
| kCGPathFillStroke | 3 | A constant for the Drawing modes for paths. |
| kCGPathStroke | 2 | A constant for the Drawing modes for paths. |
| kCGTextClip | 7 | A constant for the Drawing modes for text. |
| kCGTextFill | 0 | A constant for the Drawing modes for text. |
| kCGTextFillClip | 4 | A constant for the Drawing modes for text. |
| kCGTextFillStroke | 2 | A constant for the Drawing modes for text. |
| kCGTextFillStrokeClip | 6 | A constant for the Drawing modes for text. |
| kCGTextInvisible | 3 | A constant for the Drawing modes for text. |
| kCGTextStroke | 1 | A constant for the Drawing modes for text. |
| kCGTextStrokeClip | 5 | A constant for the Drawing modes for text. |

Blend Mode Constants

| Constant | Value | Description |
|---|---|---|
| kCGBlendModeClear | 16 | R = 0<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeColor | 14 | |
| kCGBlendModeColorBurn | 7 | |
| kCGBlendModeColorDodge | 6 | |
| kCGBlendModeCopy | 17 | R = S<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeDarken | 4 | |
| kCGBlendModeDestinationAtop | 24 | R = S*(1 - Da) + D*Sa<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeDestinationIn | 22 | R = D*Sa<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeDestinationOut | 23 | R = D*(1 - Sa)<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeDestinationOver | 21 | R = S*(1 - Da) + D<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeDifference | 10 | |
| kCGBlendModeExclusion | 11 | |
| kCGBlendModeHardLight | 9 | |
| kCGBlendModeHue | 12 | |
| kCGBlendModeLighten | 5 | |
| kCGBlendModeLuminosity | 15 | |
| kCGBlendModeMultiply | 1 | |
| kCGBlendModeNormal | 0 | |
| kCGBlendModeOverlay | 3 | |
| kCGBlendModePlusDarker | 26 | R = MAX(0, (1 - D) + (1 - S))<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModePlusLighter | 27 | R = MIN(1, S + D)<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeSaturation | 13 | |
| kCGBlendModeScreen | 2 | |
| kCGBlendModeSoftLight | 8 | |
| kCGBlendModeSourceAtop | 20 | R = S*Da + D*(1 - Sa)<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeSourceIn | 18 | R = S*Da<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeSourceOut | 19 | R = S*(1 - Da)<br>Available in Mac OS X v10.5 and later. |
| kCGBlendModeXOR | 25 | R = S*(1 - Da) + D*(1 - Sa). This XOR mode is only nominally related to the classical bitmap XOR operation, which is not supported by Quartz 2D.<br>Available in Mac OS X v10.5 and later. |

Encodings

| Constant | Value | Description |
|---|---|---|
| kCGEncodingFontSpecific | 0 | Font Specific encoding |
| kCGEncodingMacRoman | 1 | Mac Roman Encoding |

Interpolation Constants

| Constant | Value | Description |
|---|---|---|
| kCGInterpolationDefault | 0 | Let the context decide. |
| kCGInterpolationHigh | 3 | Slower, higher quality. |
| kCGInterpolationLow | 2 | Faster, lower quality. |
| kCGInterpolationMedium | 4 | A medium level of interpolation quality. This setting is slower than the low setting but faster than the high setting.<br>Available in Mac OS X v10.6 and later. |
| kCGInterpolationNone | 1 | Never interpolate. |

## 56.7 class CGDataConsumerMBS

### 56.7.1 class CGDataConsumerMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** A class for CoreGraphics to write data.
**Blog Entries**

- MBS REALbasic plug-ins version 9.5

### 56.7.2 Methods

### 56.7.3 Constructor

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new event based data consumer.
**Notes:** On failure the handle property is zero.
See also:

- 56.7.4 Constructor(file as folderitem) 8967
- 56.7.5 Constructor(url as string) 8967

### 56.7.4 Constructor(file as folderitem)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGDataConsumer to write data to the given file.
**Notes:** On failure the handle property is zero.
See also:

- 56.7.3 Constructor 8967
- 56.7.5 Constructor(url as string) 8967

### 56.7.5 Constructor(url as string)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGDataConsumer to write data to the given url.
**Notes:** On failure the handle property is zero.
See also:

- 56.7.3 Constructor 8967

• 56.7.4 Constructor(file as folderitem) 8967

### 56.7.6 CreateWithFile(file as folderitem) as CGDataConsumerMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGDataConsumer to write data to the given file.
**Notes:** Returns nil on any error.

### 56.7.7 CreateWithURL(url as string) as CGDataConsumerMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGDataConsumer to write data to the given url.
**Notes:** Returns nil on any error.

### 56.7.8 Properties

### 56.7.9 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: All.

**Function:** The hande to the CGDataConsumer object.
**Notes:** Data is a CGDataConsumerRef.
(Read and Write property)

### 56.7.10 Events

### 56.7.11 CloseConsumer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Event called when the consumer is no longer needed.

### 56.7.12 Put(data as string) as Integer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Some data needs to be stored.
**Notes:** Write the given data string into your backbuffer or file and return the number of bytes written.

Return 0 if you can't accept new input.

## 56.8 class CGDataProviderMBS

### 56.8.1 class CGDataProviderMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a Coregraphics data provider.
**Notes:** Something like a textinputstream in RB, but for Coregraphics this stream provides binary data.
**Blog Entries**

- MBS REALbasic plug-ins version 9.5

### 56.8.2 Methods

### 56.8.3 Constructor(data as string)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new data provider reading data from the given string.
**Notes:** On failure the handle property is zero.
Available in Mac OS X v10.4 and later.
See also:

- 56.8.4 Constructor(file as folderitem) 8970

### 56.8.4 Constructor(file as folderitem)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a data provider using a CFUrl.
**Notes:** On failure the handle property is zero.
See also:

- 56.8.3 Constructor(data as string) 8970

### 56.8.5 CreateWithData(data as string) as CGDataProviderMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new data provider reading data from the given string.
**Notes:** On failure the handle property is zero.
Available in Mac OS X v10.4 and later.

### 56.8.6 CreateWithFile(file as folderitem) as CGDataProviderMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a data provider using a file.
**Notes:** Returns nil on any error.

### 56.8.7 CreateWithURL(url as string) as CGDataProviderMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a data provider using an URL.
**Notes:** Returns nil on any error.

### 56.8.8 Data as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns a copy of the provider's data.
**Notes:** Available in Mac OS X v10.5 and later.

### 56.8.9 Properties

### 56.8.10 Handle as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The handle to CGDataProvider object.
**Notes:** (a CGDataProviderRef)
(Read and Write property)

## 56.9 class CGDisplayConfigMBS

### 56.9.1 class CGDisplayConfigMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for a display configuration.
**Notes:** The display reconfiguration process:

- Make all desired changes for all displays.
- Commit the changes using Complete(), or cancel with Cancel().

The resulting layout will be adjusted to remove gaps or overlaps from the requested layout, if needed. */
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8

### 56.9.2 Methods

### 56.9.3 Cancel

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Cancel a set of display configuration changes.
**Notes:** On return, the configuration is cancelled and is no longer valid.
Calls CGCancelDisplayConfiguration.

### 56.9.4 Complete(options as Integer)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Complete a set of display configuration changes.
**Notes:** On return, the configuration is no longer valid.

A configuration change can apply for the life of an application, the life of a login session, or permanently. If a request is made to make a change permanent, and the change cannot be supported by Mac OS X user interface, then the configuration change lasts only for the current login session.

A permanent configuration change also becomes the current session's configuration.
When the system reverts configurations at app termination, the configuration reverts to the session or permanent configuration setting.

When the system reverts configurations at session termination, the configuration reverts to the permanent configuration setting.
This operation may fail if an unsupported display mode is requested, or if another app is running in full-screen mode.

Calls CGCompleteDisplayConfiguration.

### 56.9.5 DisplayMode(display as CGDisplayMBS, mode as CGDisplayModeMBS)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Configure the display mode of a display.
**Notes:** A display mode is a set of properties such as width, height, pixel depth, and refresh rate, and options such as stretched LCD panel filling.

If you use this function to change the mode of a display in a mirroring set, Quartz may adjust the bounds, resolutions, and depth of the other displays in the set to a safe mode, with matching depth and the smallest enclosing size.

Calls CGConfigureDisplayWithDisplayMode.

### 56.9.6 MirrorOfDisplay(display as CGDisplayMBS, master as CGDisplayMBS)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Make a display a mirror of a master display.
**Notes:** Pass nil for the master display to disable mirroring.
Pass MainDisplay for the master display to mirror the main display.

Display mirroring and display matte generation are implemented either in hardware (preferred) or software, at the discretion of the device driver.

- Hardware mirroring

With hardware mirroring enabled, all drawing is directed to the primary
display — see PrimaryDisplay.

If the device driver selects hardware matte generation, the display bounds and rowbytes values are adjusted to reflect the active drawable area.

- Software mirroring

In this form of mirroring, identical content is drawn into each display in the mirroring set. Applications that use the window system need not be concerned about mirroring, as the window system takes care of all flushing of window content to the appropriate displays.

Applications that draw directly to the display, as with display capture, must make sure to draw the same content to all mirrored displays in a software mirror set. When drawing to software mirrored displays using a full screen OpenGL context (not drawing through a window), you should create shared OpenGL contexts for each display and re-render for each display.

You can use the function GetActiveDisplayList to determine which displays are active, or drawable. This automatically gives your application the correct view of the current displays.

Calls CGConfigureDisplayMirrorOfDisplay.

### 56.9.7 Mode(display as CGDisplayMBS, mode as Dictionary)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the mode given the values in the dictionary.
**Notes:** Deprecated with Mac OS X 10.6.
Calls CGConfigureDisplayMode.

### 56.9.8 Origin(display as CGDisplayMBS, x as Integer, y as Integer)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Configure the origin of a display in global display coordinates.
**Notes:** The new origin of the display is placed as close as possible to the requested location, without overlapping or leaving a gap between displays.

Any display whose origin is not explicitly set in a reconfiguration will be repositioned to a location as close as possible to its current location without overlapping or leaving a gap between displays.

Note that setting the origin of a display which is mirroring another display will remove that display from any mirroring set.

Calls CGConfigureDisplayOrigin.

### 56.9.9 RestorePermanentDisplayConfiguration

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Restore the permanent display configuration settings for the current user.
**Notes:** Calls CGRestorePermanentDisplayConfiguration.

### 56.9.10 StereoOperation(display as CGDisplayMBS, stereo as Boolean, forceBlueLine as Boolean)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Enable or disable stereo operation for a display.
**Notes:** Note that the system normally detects the presence of a stereo window, and will automatically switch a display containing a stereo window to stereo operation. This function provides a mechanism to force a display to stereo operation, and to set options (such as blue line sync signal) when in stereo operation.

When in stereo operation, a display may need to generate a special stereo sync signal as part of the video output. The sync signal consists of a blue line which occupies the first 25% of the last scanline for the left eye view, and the first 75% of the last scanline for the right eye view. The remainder of the scanline is black. To force the display to generate this sync signal, pass true for forceBlueLine; otherwise, pass false.

Returns kCGErrorSuccess on success, or kCGErrorRangeCheck if the display does not support the stereo operation settings requested.

On success, the display resolution, mirroring mode, and available display modes may change due to hardware-specific capabilities and limitations. You should check these settings to verify that they are appropriate for your application.

Calls CGConfigureDisplayStereoOperation.

### 56.9.11 Properties

### 56.9.12 Handle as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 56.9.13 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The last error value.
**Notes:** (Read only property)

### 56.9.14 Constants

Options for Complete

| Constant | Value | Description |
|---|---|---|
| kCGConfigureForAppOnly | 0 | For application only. |
| kCGConfigureForSession | 1 | For session only. |
| kCGConfigurePermanently | 2 | Permanently. |

## 56.10 class CGDisplayMBS

### 56.10.1 class CGDisplayMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A class for a CoreGraphics Display object.
**Example:**

```
dim c as new CGDisplayMBS
dim lines(-1) as string

dim DPIWidth as Double = c.PixelsWide/(c.ScreenSizeWidth/10.0/2.54)
dim DPIHeight as Double = c.PixelsHigh/(c.ScreenSizeHeight/10.0/2.54)

lines.append str(c.ScreenSizeWidth)+" x "+str(c.ScreenSizeHeight)+" Millimeter with"
lines.Append str(c.PixelsWide)+" x "+str(c.PixelsHigh)+" Pixel is"
lines.Append str(DPIWidth)+" x "+str(DPIHeight)+" DPI"

MsgBox Join(lines,EndOfLine)
```

**Blog Entries**

- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo / Real Studio Plugins, version 15.4pr3
- MBS Xojo / Real Studio Plugins, version 15.3pr5
- MBS Xojo / Real Studio Plugins, version 15.1pr4
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Xojo / Real Studio Plugins, version 14.4pr2
- Display Rotation
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 56.10.2 Methods

### 56.10.3 AllDisplayModes(Options as Dictionary = nil) as CGDisplayModeMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return an array of all modes for the specified display.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

Dim options As New Dictionary
options.Value(CGDisplayMBS.kCGDisplayShowDuplicateLowResolutionModes) = false

dim modes(-1) as string
for each mode as CGDisplayModeMBS in d.AllDisplayModes(options)
modes.append str(mode.Width)+" x "+str(mode.Height)
next
MsgBox Join(modes,EndOfLine)
```

**Notes:** Returns an empty array on any error.
Requires Mac OS X 10.6

### 56.10.4 AvailableModes as Dictionary()

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array filled with dictionaries (one for each mode).
**Example:**

```
// Display all available graphic modes:

Listbox1.DeleteAllRows
Listbox1.ColumnCount = 4

dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

dim a(-1) as Dictionary = d.AvailableModes

for each di as Dictionary in a

Listbox1.AddRow di.Value(d.kCGDisplayMode).stringValue
Listbox1.cell(Listbox1.LastIndex,1) = di.Value(d.kCGDisplayWidth)+" x "+di.Value(d.kCGDisplayHeight)
Listbox1.cell(Listbox1.LastIndex,2) = di.Value(d.kCGDisplayRefreshRate)
Listbox1.cell(Listbox1.LastIndex,3) = di.Value(d.kCGDisplayBitsPerPixel)

next
```

**Notes:** Returns empty error on any error.

### 56.10.5 BestModeForParameters(BitsPerPixel as Integer, Width as Integer, Height as Integer, byref ExactMatch as boolean) as Dictionary

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Dictionary with the best mode found for the given parameters.
**Notes:** Returns nil on any error.

Try to find a display mode of specified depth with dimensions equal or greater than specified.
If no depth match is found, try for the next larger depth with dimensions equal or greater than specified. If no luck, then just return the current mode.

exactmatch is set to 'true' if an exact match in width, height, and depth is found, and 'false' otherwise.
Returns nil if display is invalid.

### 56.10.6 BestModeForParametersAndRefreshRate(BitsPerPixel as Integer, Width as Integer, Height as Integer, RefreshRate as Integer, byref ExactMatch as boolean) as Dictionary

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Dictionary with the best mode found for the given parameters.
**Notes:** Returns nil on any error.

Try to find a display mode of specified depth with dimensions equal or greater than specified.
If no depth match is found, try for the next larger depth with dimensions equal or greater than specified. If no luck, then just return the current mode.

exactmatch is set to 'true' if an exact match in width, height, and depth is found, and 'false' otherwise.
Returns nil if display is invalid.

### 56.10.7 BestModeForParametersAndRefreshRateWithProperty(BitsPerPixel as Integer, Width as Integer, Height as Integer, RefreshRate as Integer, propertyName as string, byref ExactMatch as boolean) as Dictionary

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Dictionary with the best mode found for the given parameters.
**Notes:** Returns nil on any error.

Try to find a display mode of specified depth with dimensions equal or greater than specified.

If no depth match is found, try for the next larger depth with dimensions equal or greater than specified. If no luck, then just return the current mode.

exactmatch is set to 'true' if an exact match in width, height, and depth is found, and 'false' otherwise.
Returns nil if display is invalid.

### 56.10.8 Capture as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Captures this display for your use.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.Capture = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.Release
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** Don't forget to Release the display later.
Returns an error code.

### 56.10.9 CaptureAllDisplays as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Capture all displays.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.CaptureAllDisplays = 0 then
```

```
dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.ReleaseAllDisplays
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** This has the nice effect of providing an immersive environment, and preventing other apps from trying to adjust themselves to display changes only needed by your app.

Returns an error code.

### 56.10.10 CaptureAllDisplaysWithOptions(options as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Capture all displays.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.CaptureAllDisplaysWithOptions(d.kCGCaptureNoOptions) = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.ReleaseAllDisplays
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** This has the nice effect of providing an immersive environment, and preventing other apps from trying to adjust themselves to display changes only needed by your app.

Use kCGCaptureNoOptions and kCGCaptureNoFill for options parameter.
Returns an error code.

### 56.10.11 CaptureWithOptions(options as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Captures this display for your use.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.CaptureWithOptions(d.kCGCaptureNoOptions) = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.Release
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** Don't forget to Release the display later.
Returns an error code.
Use kCGCaptureNoOptions and kCGCaptureNoFill for options parameter.

### 56.10.12 CreateImage as CGImageMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return an image containing the contents of the display.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim img as CGImageMBS = d.CreateImage
```

Backdrop = img.Picture

**Notes:** Requires Mac OS X 10.6.

### 56.10.13 CreateImageAsync(receiverDelegate as CreateImageAsyncDelegateMBS, jpegQuality as Double = 0.9, tag as Variant = nil)

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** Asynchronously creates an image with screenshot.
**Notes:** If jpeg is >= 0, we use it as quality for the jpeg compression and provide the JPEG data as memoryblock in the delegate.
Tag is passed through as is.

Delegate declaration:
CreateImageAsyncDelegateMBS(img as CGImageMBS, JPEGData as MemoryBlock, Tag as Variant)

### 56.10.14 CreateImageForRect(rect as CGRectMBS) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return an image containing the contents of the rectangle rect, specified in display space, of the display identified by self.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(100,100,500,500)
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim img as CGImageMBS = d.CreateImageForRect(r)

Backdrop = img.Picture
```

**Notes:** The actual rectangle used is the rectangle returned from CGRectIntegral(rect).
Requires Mac OS X 10.6.

### 56.10.15 DrawingContext as CGContextMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return a CGContext suitable for drawing to the captured display, or nil if display has not been captured.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.Capture = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.Release
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** The context is owned by the device and should not be released by the caller.

The context remains valid while the display is captured and while the display configuration is unchanged. Releasing the captured display or reconfiguring the display invalidates the drawing context.

The determine when the display configuration is changing, use CGDisplayReconfigurationEventMBS class.

### 56.10.16 GetActiveDisplayList as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array with the active displays.
**Example:**

```
// List all displays in a 2 column listbox:

Listbox1.DeleteAllRows

for each d as CGDisplayMBS in CGDisplayMBS.GetActiveDisplayList

Listbox1.AddRow hex(d.Handle)
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)
```

next

**Notes:** Returns an empty array on any error.

The first display returned in the list is the main display, the one with the menu bar.
When mirroring, this will be the largest display, or if all are the same size, the one with the deepest pixel depth.

This function was named CGGetActiveDisplayListMBS in older plugin versions.

### 56.10.17 GetDisplaysWithOpenGLDisplayMask(mask as Integer) as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Find all displays for the given OpenGL mask.
**Notes:** Returns an empty array on any error.

### 56.10.18 GetDisplaysWithPoint(cgpoint as CGPointMBS) as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of CGDisplayMBS objects who are visible at the point on the virtual screen.
**Example:**

```
// List all displays in a 2 column listbox which match the point:

Listbox1.DeleteAllRows

dim p as CGPointMBS = CGMakePointMBS(100,100)
for each d as CGDisplayMBS in CGDisplayMBS.GetDisplaysWithPoint(p)

Listbox1.AddRow hex(d.Handle)
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)
```

next

**Notes:** Returns an empty array on any error.

This function was called CGGetDisplaysWithPointMBS in older plugin versions.

See also:

- 56.10.19 GetDisplaysWithPoint(x as Double, y as Double) as CGDisplayMBS() 8986

### 56.10.19 GetDisplaysWithPoint(x as Double, y as Double) as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of CGDisplayMBS objects who are visible at the point on the virtual screen.
**Example:**

```
// List all displays in a 2 column listbox which match the point:

Listbox1.DeleteAllRows

for each d as CGDisplayMBS in CGDisplayMBS.GetDisplaysWithPoint(100,100)

Listbox1.AddRow hex(d.Handle)
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)

next
```

**Notes:** Returns an empty array on any error.

This function was called CGGetDisplaysWithPointMBS in older plugin versions.
See also:

- 56.10.18 GetDisplaysWithPoint(cgpoint as CGPointMBS) as CGDisplayMBS() 8985

### 56.10.20 GetDisplaysWithRect(cgrect as CGRectMBS) as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of CGDisplayMBS objects who are visible within the rectangle on the virtual screen.
**Example:**

```
// List all displays in a 2 column listbox which match the rectangle:

Listbox1.DeleteAllRows

dim p as CGRectMBS = CGMakeRectMBS(100,100,100,100)
for each d as CGDisplayMBS in CGDisplayMBS.GetDisplaysWithRect(p)

Listbox1.AddRow hex(d.Handle)
```

```
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)

next
```

**Notes:** Returns an empty array on any error.
This function was called CGGetDisplaysWithRectMBS in older plugin versions.
See also:

- 56.10.21 GetDisplaysWithRect(x as Double, y as Double, w as Double, h as Double) as CGDisplayMBS() 8987

### 56.10.21 GetDisplaysWithRect(x as Double, y as Double, w as Double, h as Double) as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of CGDisplayMBS objects who are visible within the rectangle on the virtual screen.
**Example:**

```
// List all displays in a 2 column listbox which match the rectangle:

Listbox1.DeleteAllRows

for each d as CGDisplayMBS in CGDisplayMBS.GetDisplaysWithRect(100,100,100,100)

Listbox1.AddRow hex(d.Handle)
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)

next
```

**Notes:** Returns an empty array on any error.
This function was called CGGetDisplaysWithRectMBS in older plugin versions.
See also:

- 56.10.20 GetDisplaysWithRect(cgrect as CGRectMBS) as CGDisplayMBS() 8986

### 56.10.22 GetDisplayTransferByTable(capacity as Integer, red as memoryblock, green as memoryblock, blue as memoryblock, byref samplecount as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Get transfer tables.
**Notes:** Capacity should contain the number of samples each array can hold, and sampleCount is filled in with the number of samples actually copied in.

You must pass in Memoryblocks with the given size (capacity*4 Bytes).
Returns an error code.

### 56.10.23 GetDisplayTransferFormula(byref formula as CGDisplayTransferFormulaMBS) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries the display for the current gamma formula.
**Notes:** Returns an error code.

### 56.10.24 GetLastMouseDelta(byref deltax as Integer, byref deltay as Integer)

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Report the mouse position change associated with the last mouse move event recieved by this application.

### 56.10.25 GetOnlineDisplayList as CGDisplayMBS()

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array with the online displays.
**Example:**

```
// List all online displays in a 2 column listbox:

Listbox1.DeleteAllRows

for each d as CGDisplayMBS in CGDisplayMBS.GetOnlineDisplayList

Listbox1.AddRow hex(d.Handle)
Listbox1.cell(Listbox1.LastIndex,1)=str(d.PixelsWide)+" x "+str(d.PixelsHigh)

next
```

**Notes:** Returns an empty array on any error.

The first display returned in the list is the main display, the one with the menu bar.
When mirroring, this will be the largest display, or if all are the same size, the one with the deepest pixel depth.

With hardware mirroring, a display may be on-line, but not necessarily active, or drawable. Programs which manipulate display settings such as the palette or gamma tables need access to all displays in use, including hardware mirrors which are not drawable.

This function was named CGGetOnlineDisplayListMBS in older plugin versions.

### 56.10.26 HideCursor as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Hides the mouse cursor.
**Notes:** Returns an error code.
Decrements hide cursor count.

### 56.10.27 Info as Dictionary

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the information CFDictionary about the display.
**Example:**

```
dim c as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim d as Dictionary = c.Info

MsgBox d.Value("DisplaySerialNumber")
```

**Notes:** On any error the return value is nil.
This function leaks around 4 to 16 KB of memory on Mac OS X 10.4. Not in the versions 10.3 or 10.5.

### 56.10.28 InfoAsCFDictionary as Variant

MBS MacCG Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the information CFDictionary about the display.
**Notes:** On any error the return value is nil.

Returns a CFDictionaryMBS object. Returned as Variant to reduce plugin dependencies.

### 56.10.29 IsCaptured as boolean

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if you captured this display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsCaptured)
```

### 56.10.30 MainDisplay as CGDisplayMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the display object of the current main display.
**Example:**

```
dim c as CGDisplayMBS = CGDisplayMBS.MainDisplay

MsgBox str(c.PixelsWide)+" x "+str(c.PixelsHigh)
```

### 56.10.31 MoveCursorToPoint(x as Double, y as Double) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Move the cursor to the specified point relative to the display origin (the upper left corner of the display).
**Example:**

```
Function KeyDown(Key As String) As Boolean
// in a window keydown event:

if asc(key)=32 then
dim c as new CGDisplayMBS
dim error as Integer = c.MoveCursorToPoint(200,200)

Title=str(error) // zero on success

end if
```

```
End Function
```

**Notes:** Returns CGDisplayNoErr (0) on success.
No events are generated as a result of this move.
Points that would lie outside the desktop are clipped to the desktop.

### 56.10.32 OpenGLDisplayMask as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the OpenGL display mask for display, or 0 is display is an invalid display.

### 56.10.33 Release as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Releases the display.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.Capture = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.Release
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** Returns an error code.

### 56.10.34 ReleaseAllDisplays as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Release all captured displays.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay

if d.CaptureAllDisplays = 0 then

dim c as CGContextMBS = d.DrawingContext

// watch it drawing red
c.SetRGBFillColor 1.0, 0.0, 0.0, 1.0
c.FillRect CGMakeRectMBS(0,0,d.PixelsWide,d.PixelsHigh)

DelayMBS 3.0

call d.ReleaseAllDisplays
else
MsgBox "Failed to capture displays."
end if
```

**Notes:** Release all captured displays, and restore the display modes to the user's preferences. May be used in conjunction with Capture or CaptureAllDisplays.

### 56.10.35 RestoreColorSyncSettings

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Restore gamma tables of system displays to the user's ColorSync specified values.

### 56.10.36 SetDisplayMode(mode as CGDisplayModeMBS) as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Switch the display mode to mode.
**Notes:** The selected display mode persists for the life of the program, and automatically reverts to the permanent setting when the program terminates.

When changing display modes of displays in a mirroring set, other displays in the mirroring set will be set to a display mode capable of mirroring the bounds of the largest display being explicitly set.

Note that after switching, display parameters and addresses may change.

### 56.10.37 SetDisplayTransferByByteTable(count as Integer, red as memoryblock, green as memoryblock, blue as memoryblock) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Set a display gamma/transfer function using tables of data for each channel.
**Notes:** As a convenience, allow setting of the gamma table by byte values.
Returns an error code.

### 56.10.38 SetDisplayTransferByTable(count as Integer, red as memoryblock, green as memoryblock, blue as memoryblock) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Set a display gamma/transfer function.
**Notes:** Set a display gamma/transfer function using tables of data for each channel.
Values within each table should have values in the range of 0.0 through 1.0.
The same table may be passed in for red, green, and blue channels. 'count' indicates the number of entries in each table.
The tables are interpolated as needed to generate the number of samples needed by hardware.

Returns an error code.

### 56.10.39 SetDisplayTransferFormula(formula as CGDisplayTransferFormulaMBS) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Set a display gamma/transfer function.
**Notes:** Set a display gamma/transfer function from a formula specifying min and max values and a gamma for each channel.
Gamma values must be greater than 0.0.
To get an antigamma of 1.6, one would specify a value of (1.0 / 1.6)
Min values must be greater than or equal to 0.0 and less than 1.0.
Max values must be greater than 0.0 and less than or equal to 1.0.
Out of range values, or Max greater than or equal to Min result in a kCGSRangeCheck error.

Values are computed by sampling a function for a range of indices from 0 through 1: value = Min + ((Max

- Min) * pow(index, Gamma))
The resulting values are converted to a machine specific format and loaded into hardware.

Returns an error code.

### 56.10.40 SetRotation(angle as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Rescans the bus of displays and changes the rotation of the display.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim e as Integer = d.SetRotation(90)

if e<>0 then
MsgBox "Error: "+str(e)
end if
```

**Notes:** Returns IOKit error code. Zero means success.

Lasterror is set.

### 56.10.41 SetStereoOperation(stereo as boolean, forceBlueLine as boolean, option as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Immediately enable or disable stereo operation for a display.
**Notes:** Note that the system normally detects the presence of a stereo window, and will automatically switch a display containing a stereo window to stereo operation. This function provides a mechanism to force a display to stereo operation, and to set options (such as blue line sync signal) when in stereo operation.

When in stereo operation, a display may need to generate a special stereo sync signal as part of the video output. The sync signal consists of a blue line which occupies the first 25% of the last scanline for the left eye view, and the first 75% of the last scanline for the right eye view. The remainder of the scanline is black. To force the display to generate this sync signal, pass true for forceBlueLine; otherwise, pass false.

Lasterror is set to kCGErrorSuccess on success, or kCGErrorRangeCheck if the display does not support the stereo operation settings requested.

On success, the display resolution, mirroring mode, and available display modes may change due to hardware-specific capabilities and limitations. You should check these settings to verify that they are appropriate for your application.

Lasterror is set.

### 56.10.42 ShieldingWindowID as UInt32

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns window ID of the shield window for the captured display, or 0 if the display is not not shielded.

### 56.10.43 ShieldingWindowLevel as Int32

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the window level of the shield window for the captured display.

### 56.10.44 ShowCursor as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Shows the mouse cursor.
**Notes:** Returns an error code.
Increments hide cursor count.

### 56.10.45 SwitchToMode(Mode as Dictionary) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Switch display mode.
**Notes:** Note that after switching, display parameters and addresses may change.
The selected display mode persists for the life of the program, and automatically reverts to the permanent setting made by Preferences when the program terminates.
The mode dictionary passed in must be a dictionary vended by other CGDirectDisplay APIs such as BestModeForParameters() and AvailableModes().
Returns an error code.

### 56.10.46 WaitForBeamPositionOutsideLines(upperScanLine as UInt32, lowerScanLine as UInt32) as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Wait until the beam position is outside the range specified.
**Notes:** Wait until the beam position is outside the range specified by upperScanLine and lowerScanLine.
Note that if upperScanLine and lowerScanLine encompass the entire display height, the function returns an error.
lowerScanLine must be greater than or equal to upperScanLine.

Some display systems may not conventional video vertical and horizontal sweep in painting.
These displays report a kCGDisplayRefreshRate of 0 in the CFDictionaryRef returned by CurrentMode().
On such displays, this function returns at once.

Some drivers may not implement support for this mechanism.
On such displays, this function returns at once.

Returns CGDisplayNoErr on success, and an error if display or upperScanLine and lowerScanLine are invalid.

The app should set the values of upperScanLine and lowerScanLine to allow enough lead time for the drawing operation to complete. A common strategy is to wait for the beam to pass the bottom of the drawing area, allowing almost a full vertical sweep period to perform drawing.

To do this, set upperScanLine to 0, and set lowerScanLine to the bottom of the bounding box:
lowerScanLine = (CGBeamPosition)(cgrect.origin.y + cgrect.size.height);

IOKit may implement this as a spin-loop on the beam position call used for BeamPosition().
On such system the function is CPU bound, and subject to all the usual scheduling pre-emption.
In particular, attempting to wait for the beam to hit a specific scanline may be an exercise in frustration.

These functions are advisary in nature, and depend on IOKit and hardware specific drivers to implement support. If you need extremely precise timing, or access to vertical blanking interrupts, you should consider writing a device driver to tie into hardware-specific capabilities.

Returns an error code.

### 56.10.47 Properties

### 56.10.48 BeamPosition as UInt32

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current beam position on the display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.BeamPosition)
```

**Notes:** If display is invalid, or the display does not implement conventional video vertical and horizontal sweep in painting, or the driver does not implement this functionality, 0 is returned.
(Read only property)

### 56.10.49 Bounds as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Return screen size and origin in global coords.
**Notes:** Empty rect or nil if display is invalid.
(Read only property)

### 56.10.50 Brightness as Double

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Get/Set brightness of display.
**Notes:** Returns -1 if not supported.
Lasterror is set.
(Read and Write property)

### 56.10.51 CanSetPalette as boolean

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the current display mode supports palettes.
**Example:**

```
dim d as new CGDisplayMBS // pick main display
```

MsgBox str(d.CanSetPalette)

**Notes:** (Read only property)

### 56.10.52 ColorSpace as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the color space for a display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.ColorSpace.Model) // typical 1 = CGColorSpaceMBS.kCGColorSpaceModelRGB
```

**Notes:** This function returns a display-dependent ICC-based color space. You can use this function when rendering content for a specific display in order to produce color-matched output for that display.

Available in Mac OS X v10.5 and later.
(Read only property)

### 56.10.53 CurrentMode as Dictionary

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Return a Dictionary describing the current display mode.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim dic as Dictionary = d.CurrentMode

MsgBox dic.Value(d.kCGDisplayWidth)+" x "+dic.Value(d.kCGDisplayHeight)
```

**Notes:** Returns nil on any error.
(Read only property)

### 56.10.54 DisplayMode as CGDisplayModeMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the current mode of the specified display.
**Example:**

```
dim d as CGDisplayMBS = CGDisplayMBS.MainDisplay
MsgBox str(d.DisplayMode.Width)+" x "+str(d.DisplayMode.Height)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.6
(Read only property)

### 56.10.55 DisplayProductNames as Dictionary

MBS MacCG Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Queries product names for display in all available languages.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim names as Dictionary = display.DisplayProductNames

MsgBox names.Lookup("en_US", "?")
```

**Notes:** (Read only property)

### 56.10.56 Handle as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the current display.
**Notes:** Internally: The DisplayID.
0 is the main display (to keep it easier).
(Read only property)

### 56.10.57 IOServicePort as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the IOKit service port of a display.
**Notes:** (Read only property)

### 56.10.58 IsActive as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is active.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsActive)
```

**Notes:** If true, the specified display is active; otherwise, false.

An active display is connected, awake, and available for drawing. In a hardware mirroring set, only the primary display is active.
(Read only property)

### 56.10.59 IsAlwaysInMirrorSet as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is always in a mirroring set.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsAlwaysInMirrorSet)
```

**Notes:** If true, the specified display is in a mirroring set and cannot be removed from this set.

Some hardware configurations support the connection of auxiliary displays that always mirror the main display, and therefore cannot be removed from the mirroring set to which they belong.
(Read only property)

### 56.10.60 IsAsleep as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is sleeping (and is therefore not drawable.)
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsAsleep)
```

**Notes:** If true, the specified display is in sleep mode; otherwise, false.

A display is sleeping when its frame buffer and the attached monitor are in reduced power mode. A sleeping display is still considered to be a part of global display (desktop) space, but it is not drawable.
(Read only property)

### 56.10.61 IsBuiltin as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is built-in, such as the internal display in portable systems.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsBuiltin)
```

**Notes:** If true, the specified display is considered to be a built-in display; otherwise, false.

Portable systems typically identify the internal LCD panel as a built-in display.

Note that it is possible and reasonable for a system to have no displays marked as built-in. For example, a portable system running with the lid closed may report no built-in displays.
(Read only property)

### 56.10.62 IsInHWMirrorSet as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is in a hardware mirroring set.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsInHWMirrorSet)
```

**Notes:** If true, the specified display is a member of a hardware mirroring set; otherwise, false.

When hardware mirroring is enabled, the contents of a double frame buffer are rendered in all displays in the hardware mirroring set.
(Read only property)

### 56.10.63 IsInMirrorSet as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is in a mirroring set.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsInMirrorSet)
```

**Notes:** (Read only property)

### 56.10.64 IsMain as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is the main display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsMain)
```

**Notes:** If true, the specified display is currently the main display; otherwise, false.
(Read only property)

### 56.10.65 IsOnline as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is connected or online.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsOnline)
```

**Notes:** Returns true if the specified display is connected; otherwise, false.

A display is considered connected or online when the frame buffer hardware is connected to a monitor.

You can use this function to determine if someone has hot-plugged a display to the system. Note that hot-plugging is a hardware feature that may not be present on all displays.
(Read only property)

### 56.10.66 IsStereo as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether a display is running in a stereo graphics mode.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.IsStereo)
```

**Notes:** If true, the specified display is running in a stereo graphics mode; otherwise, false.

Available in Mac OS X v10.4 and later.
(Read only property)

### 56.10.67 LastError as Integer

MBS MacCG Plugin, Plugin Version: 15.4, Platform: macOS, Targets: Desktop only.

**Function:** The last error code.
**Notes:** Only set for a few properties like brightness where we do have an error code.

(Read only property)

### 56.10.68 MirrorsDisplay as CGDisplayMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** For a secondary display in a mirroring set, returns the primary display.
**Notes:** Returns the primary display in the mirroring set. Returns kCGNullDirectDisplay if the specified display is actually the primary display or is not in a mirroring set.
(Read only property)

### 56.10.69 ModelNumber as Integer

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the model number of a display monitor.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.ModelNumber)
```

**Notes:** A model number for the monitor associated with the specified display, or a constant to indicate an exception—see the discussion below.

This function uses I/O Kit to identify the monitor associated with the specified display. The return value depends on the following:

If I/O Kit can identify the monitor, the product ID code for the monitor is returned.
If I/O Kit can't identify the monitor, kDisplayProductIDGeneric is returned.
If no monitor is connected, a value of 0xFFFFFFFF is returned.
(Read only property)

### 56.10.70 PixelsHigh as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Height of the display in pixels.
**Notes:** dim d as new CGDisplayMBS // pick main display

MsgBox str(D.PixelsHigh)

(Read only property)

### 56.10.71 PixelsWide as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Width of the display in pixels.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(D.PixelsWide)
```

**Notes:** (Read only property)

### 56.10.72 PrimaryDisplay as CGDisplayMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the primary display in a hardware mirroring set.
**Notes:** The primary display in the mirror set. If display is not hardware-mirrored, this function simply returns display.

In hardware mirroring, the contents of a double frame buffer are rendered in two or more displays simultaneously. The mirrored displays are said to be in a hardware mirroring set.

At the discretion of the device driver, one of the displays in a hardware mirroring set is designated as the primary display. The device driver binds the drawing engine, hardware accelerator, and 3D engine to the primary display, and directs all drawing operations to this display.
(Read only property)

### 56.10.73 RefreshRate as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries refresh rate in Hz for this display.
**Example:**

```
dim m as CGDisplayMBS = CGDisplayMBS.MainDisplay
MsgBox str(m.RefreshRate)+" Hz"
```

**Notes:** Returns 60 for LCD displays.
(Read only property)

### 56.10.74 Rotation as Double

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rotation angle of a display in degrees.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.Rotation)
```

**Notes:** The rotation angle of the display in degrees, or 0 if the display is not valid.

This function returns the rotation angle of a display in a clockwise direction. For example, if the specified display is rotated clockwise 90 degrees then this function returns 90.0. After a 90 degree clockwise rotation, the physical bottom of the display is on the left side and the physical top is on the right side.

Available in Mac OS X v10.5 and later.
(Read only property)

### 56.10.75 ScreenSizeHeight as Double

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the height of a display in millimeters.
**Example:**

```
dim c as new CGDisplayMBS
dim lines(-1) as string

dim DPIWidth as Double = c.PixelsWide/(c.ScreenSizeWidth/10.0/2.54)
dim DPIHeight as Double = c.PixelsHigh/(c.ScreenSizeHeight/10.0/2.54)

lines.append str(c.ScreenSizeWidth)+" x "+str(c.ScreenSizeHeight)+" Millimeter with"
lines.Append str(c.PixelsWide)+" x "+str(c.PixelsHigh)+" Pixel is"
lines.Append str(DPIWidth)+" x "+str(DPIHeight)+" DPI"
```

```
MsgBox Join(lines,EndOfLine)
```

**Notes:** If Extended Display Identification Data (EDID) for the display device is not available, the size is estimated based on the device width and height in pixels from CGDisplayBounds, with an assumed resolution of 2.835 pixels/mm or 72 DPI, a reasonable guess for displays predating EDID support.
(Read only property)

### 56.10.76 ScreenSizeWidth as Double

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the width of a display in millimeters.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(d.ScreenSizeHeight) // for example 400 on a 30" Apple Display
MsgBox str(d.ScreenSizeWidth) // for example 640 on a 30" Apple Display
```

**Notes:** If Extended Display Identification Data (EDID) for the display device is not available, the size is estimated based on the device width and height in pixels from CGDisplayBounds, with an assumed resolution of 2.835 pixels/mm or 72 DPI, a reasonable guess for displays predating EDID support.
(Read only property)

### 56.10.77 SerialNumber as Integer

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the serial number of a display monitor.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(D.SerialNumber)
```

**Notes:** Returns the serial number for the monitor associated with the specified display, or a constant to indicate an exception—see the discussion below.

This function uses I/O Kit to identify the monitor associated with the specified display.

If I/O Kit can identify the monitor:

If the manufacturer has encoded a serial number for the monitor, the number is returned.
If there is no encoded serial number, 0x00000000 is returned.

If I/O Kit cannot identify the monitor:

If a monitor is connected to the display, 0x00000000 is returned.
If no monitor is connected to the display hardware, a value of 0xFFFFFFFF is returned.

Note that a serial number is meaningful only in conjunction with a specific vendor and product or model.
(Read only property)

### 56.10.78 UnitNumber as Integer

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the logical unit number of a display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(D.UnitNumber)
```

**Notes:** A logical unit number for the specified display.

The logical unit number represents a particular node in the I/O Kit device tree associated with the display's frame buffer. For a particular hardware configuration, this value will not change when the attached monitor is changed.

The unit number will change if the I/O Kit device tree changes, as when hardware is reconfigured, drivers are replaced, or significant changes occur to I/O Kit, so it should not be assumed to be invariant across login sessions.

For more information about I/O Kit, see the Apple publication "I/O Kit Fundamentals".
(Read only property)

### 56.10.79 UsesOpenGLAcceleration as boolean

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns a Boolean value indicating whether Quartz is using OpenGL-based window acceleration (Quartz Extreme) to render in a display.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(D.UsesOpenGLAcceleration)
```

**Notes:** Return value: If true, Quartz Extreme is used to render in the specified display; otherwise, false.

Quartz Extreme is an OpenGL-based, hardware-accelerated window compositor available in Mac OS X version 10.2 and later. Quartz Extreme requires a minimum hardware configuration to operate.

The information this function provides is typically used to adjust the demands of drawing operations to the capabilities of the display hardware. For example, an application running on an unaccelerated system could disable live window-resizing.
(Read only property)

### 56.10.80 VendorNumber as Integer

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the vendor number of the specified display's monitor.
**Example:**

```
dim d as new CGDisplayMBS // pick main display

MsgBox str(D.VendorNumber)
// 1552 seems to be Apple
```

**Notes:** A vendor number for the monitor associated with the specified display, or a constant to indicate an exception—see the discussion below.

This function uses I/O Kit to identify the monitor associated with the specified display.

There are three cases:

If I/O Kit can identify the monitor, the vendor ID is returned.
If I/O Kit cannot identify the monitor, kDisplayVendorIDUnknown is returned.
If there is no monitor associated with the display, 0xFFFFFFFF is returned.
(Read only property)

### 56.10.81 Constants

Capture option flags.

| Constant | Value | Description |
|---|---|---|
| kCGCaptureNoFill | 1 | Disables fill with black on capture. |
| kCGCaptureNoOptions | 0 | Default behavior. |

Keys for mode dictionary

| Constant | Value | Description |
|---|---|---|
| kCGDisplayBitsPerPixel | "BitsPerPixel" | The number of bits per pixel. The value for this key is a number in |
| kCGDisplayBitsPerSample | "BitsPerSample" | The number of bits per sample. The value for this key is a number in |
| kCGDisplayBytesPerRow | "kCGDisplayBytesPerRow" | |
| kCGDisplayHeight | "Height" | The display height. The value for this key is a number in |
| kCGDisplayIOFlags | "IOFlags" | The value for this key is a number in |
| kCGDisplayMode | "Mode" | The value for this key is a number in |
| kCGDisplayModeIsInterlaced | "kCGDisplayModeIsInterlaced" | This key reflects interesting bits of th |
| kCGDisplayModeIsSafeForHardware | "kCGDisplayModeIsSafeForHardware" | Set if display mode doesn't need a co |
| kCGDisplayModeIsStretched | "kCGDisplayModeIsStretched" | This key reflects interesting bits of th |
| kCGDisplayModeIsTelevisionOutput | "kCGDisplayModeIsTelevisionOutput" | This key reflects interesting bits of th |
| kCGDisplayModeUsableForDesktopGUI | "UsableForDesktopGUI" | Whether this display can be used for The value for this key is a boolean in |
| kCGDisplayRefreshRate | "RefreshRate" | The refresh rate. The value for this key is a number in |
| kCGDisplaySamplesPerPixel | "SamplesPerPixel" | The number of samples per pixel. The value for this key is a number in |
| kCGDisplayWidth | "Width" | The width of the display. The value for this key is a number in |
| kCGIODisplayModeID | "IODisplayModeID" | |

Keys for options dictionary

| Constant | Value | Description |
|---|---|---|
| kCGDisplayShowDuplicateLowResolutionModes | "kCGDisplayResolution" | Pass to AllDisplayModes with boolean to in low resolution modes. |

### 56.10.82 Delegates

### 56.10.83 CreateImageAsyncDelegateMBS(img as CGImageMBS, JPEGData as MemoryBlock, Tag as Variant)

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The delegate for CreateImageAsync method.

## 56.11 class CGDisplayModeMBS

### 56.11.1 class CGDisplayModeMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for a display mode.
**Notes:** Requires Mac OS X 10.6
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr11
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8

### 56.11.2 Methods

### 56.11.3 Constructor

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 56.11.4 Properties

### 56.11.5 Handle as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 56.11.6 Height as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the height in pixels of the specified display mode.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim mode as CGDisplayModeMBS = Display.DisplayMode
```

MsgBox str(mode.Height)+" Pixel"

**Notes:** Call CGDisplayModeGetHeight function.
(Read only property)

### 56.11.7 IODisplayModeID as Int32

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the IOKit display mode ID of the specified display mode.
**Notes:** Call CGDisplayModeGetIODisplayModeID function.
(Read only property)

### 56.11.8 IOFlags as UInt32

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the IOKit flags of the specified display mode.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim mode as CGDisplayModeMBS = Display.DisplayMode

MsgBox str(mode.IOFlags)
```

**Notes:** Call CGDisplayModeGetIOFlags function.
(Read only property)

### 56.11.9 IsUsableForDesktopGUI as boolean

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return true if the specified mode is usable for displaying the desktop GUI; false otherwise.
**Notes:** Call CGDisplayModeIsUsableForDesktopGUI function.
(Read only property)

### 56.11.10 PixelEncoding as string

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return a string representing the pixel encoding of the specified display mode, expressed as a CFString containing an IOKit graphics mode.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim mode as CGDisplayModeMBS = Display.DisplayMode

MsgBox mode.PixelEncoding // shows e.g. ———RRRRRRRRGGGGGGGGBBBBBBBB
```

**Notes:** Call CGDisplayModeCopyPixelEncoding function.
(Read only property)

### 56.11.11 PixelHeight as Integer

MBS MacCG Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Return the height in pixels of the specified display mode.
**Notes:** Call CGDisplayModeGetPixelHeight function.
(Read only property)

### 56.11.12 PixelWidth as Integer

MBS MacCG Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Return the width in pixels of the specified display mode.
**Notes:** Call CGDisplayModeGetPixelWidth function.
(Read only property)

### 56.11.13 RefreshRate as Double

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the refresh rate of the specified display mode.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim mode as CGDisplayModeMBS = Display.DisplayMode
```

```
MsgBox str(mode.RefreshRate)
```

**Notes:** Call CGDisplayModeGetRefreshRate function.
(Read only property)

### 56.11.14 Width as Integer

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Return the width in pixels of the specified display mode.
**Example:**

```
dim display as CGDisplayMBS = CGDisplayMBS.MainDisplay
dim mode as CGDisplayModeMBS = Display.DisplayMode

MsgBox str(mode.Width)+" Pixel"
```

**Notes:** Call CGDisplayModeGetWidth function.
(Read only property)

## 56.12 class CGDisplayReconfigurationEventMBS

### 56.12.1 class CGDisplayReconfigurationEventMBS

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The class to listen for display configuration changes.
**Notes:** In constructor the plugin registers for the event and in destructor unregisters. So keep the object reference alive to receive events.

events are invoked when the app is listening for events, on the event processing thread, or from within the display reconfiguration function when in the program that is driving the reconfiguration.

events should avoid changing display configurations, and should not raise exceptions or perform a non-local return such as calling longjmp.

Before display reconfiguration, a event fires to inform applications of a configuration change. The event runs once for each on-line display. The flag is set to kCGDisplayBeginConfigurationFlag. This event does not carry other per-display information, as details of how a reconfiguration affects a particular device rely on device-specific behaviors which may not be exposed by a device driver.

After display reconfiguration, at the time the event function is invoked, all display state reported by CoreGraphics, QuickDraw, and the Carbon Display Manager API will be up to date. This event runs after the Carbon Display Manager notification events. The event runs once for each added, removed, and currently on-line display. Note that in the case of removed displays, calls into the CoreGraphics API with the removed display ID will fail.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8

### 56.12.2 Events

### 56.12.3 DisplayReconfiguration(DisplayID as Integer, flags as Integer)

MBS MacCG Plugin, Plugin Version: 11.1, Platform: macOS, Targets: .

**Function:** This event is invoked whenever the configuration of a local display is changed.

### 56.12.4 Constants

Possible Flag Values

| Constant | Value | Description |
|---|---|---|
| kCGDisplayAddFlag | 16 | Display Added |
| kCGDisplayBeginConfigurationFlag | 1 | Begin Configuration for display. |
| kCGDisplayDesktopShapeChangedFlag | 4096 | Desktop Shape Changed. |
| kCGDisplayDisabledFlag | 512 | Display disabled. |
| kCGDisplayEnabledFlag | 256 | Display enabled. |
| kCGDisplayMirrorFlag | 1024 | Mirror enabled |
| kCGDisplayMovedFlag | 2 | Display Moved |
| kCGDisplayRemoveFlag | 32 | Display Removed |
| kCGDisplaySetMainFlag | 4 | Set Main |
| kCGDisplaySetModeFlag | 8 | Set Mode |
| kCGDisplayUnMirrorFlag | 2048 | Mirror disabled |

## 56.13 class CGDisplayStreamEventMBS

### 56.13.1 class CGDisplayStreamEventMBS

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** CGDisplayStreamEventMBS provides a streaming API for capturing display updates in a real-time manner.
**Notes:** It can also provide scaling and color space conversion services, as well as allow capturing sub regions of the display.
Requires OS X 10.8.

### 56.13.2 Methods

### 56.13.3 Constructor(DisplayHandle as Integer, outputWidth as Integer, outputHeight as Integer, pixelFormat as Integer = 0, properties as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Creates a new CGDisplayStream.
**Notes:** This function creates a new CGDisplayStream that is to be used to get a stream of frame updates from a particular display.

DisplayHandle: The CGDirectDisplayID to use as the source for generated frames. (Handle from CGDisplayMBS class)
outputWidth: The output width (in pixels, not points) of the frames to be generated. Must not be zero.
outputWidth: The output height (in pixels, not points) of the frames to be generated. Must not be zero.
pixelFormat: The desired CoreVideo/CoreMedia-style pixel format of the output IOSurfaces. If 0 the plugin will use RGBA.
properties: Any optional properties of the CGDisplayStream.

### 56.13.4 kCGDisplayStreamColorSpace as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Set the desired CGColorSpace of the output frames.
By default the color space will be that of the display.

### 56.13.5 kCGDisplayStreamDestinationRect as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** This may be used to request where within the destination buffer the display updates should be placed. Use CGRectCreateDictionaryRepresentation to convert from a CGRect to the value used here.
Note: The coordinate system for the destination rectangle is always specified in output pixels to match the fact that the output buffer size is also specified in terms of pixels.
Defaults to entire buffer

### 56.13.6 kCGDisplayStreamMinimumFrameTime as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Request that the delta between frame updates be at least as much specified by this value.
Number in seconds, defaults to zero.

### 56.13.7 kCGDisplayStreamPreserveAspectRatio as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Enable/disable the work the Window Server will do to preserve the display aspect ratio. By default the Window Server will assume that it should preserve the original aspect ratio of the source display rect. If the aspect ratio of the source display and the display stream destination rect are not the same, black borders will be inserted at the top/bottom or right/left sides of the destination in order to preserve the source aspect ratio.
Boolean - defaults to true

### 56.13.8 kCGDisplayStreamQueueDepth as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Controls how many frames deep the frame queue will be.
Defaults to 3.

### 56.13.9 kCGDisplayStreamShowCursor as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Controls whether the cursor is embedded within the provided buffers or not.

### 56.13.10 kCGDisplayStreamSourceRect as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** This may be used to request a subregion of the display to be provided as the source of the display stream. Use CGRectCreateDictionaryRepresentation to convert from a CGRect to the value used here. N
Note: The coordinate system for the source rectangle is specified in display logical coordinates and not in pixels, in order to match the normal convention on HiDPI displays.
Defaults to entire display.

### 56.13.11 kCGDisplayStreamYCbCrMatrix as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** When outputting frames in 420v or 420f format, this key may be used to control which YCbCr matrix is used
The value should be one of the three kCGDisplayStreamYCbCrMatrix values specified below:
kCGDisplayStreamYCbCrMatrix_SMPTE_240M_1995
kCGDisplayStreamYCbCrMatrix_ITU_R_709_2
kCGDisplayStreamYCbCrMatrix_ITU_R_601_4

### 56.13.12 kCGDisplayStreamYCbCrMatrix_ITU_R_601_4 as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** A possible value for kCGDisplayStreamYCbCrMatrix key.

### 56.13.13 kCGDisplayStreamYCbCrMatrix_ITU_R_709_2 as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** A possible value for kCGDisplayStreamYCbCrMatrix key.

### 56.13.14 kCGDisplayStreamYCbCrMatrix_SMPTE_240M_1995 as String

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** A possible value for kCGDisplayStreamYCbCrMatrix key.

### 56.13.15 Start

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Begin delivering frame updates to the event.

### 56.13.16 Stop

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** End delivery of frame updates.
**Notes:** After this call returns, the CGDisplayStream callback function will eventually be called with a status of StatusStopped. After that point it is safe to release the object.
It is safe to call this function from within the event, but the previous caveat still applies.

### 56.13.17 Properties

### 56.13.18 Handle as Integer

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 56.13.19 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The lasterror code.
**Notes:** (Read only property)

### 56.13.20 Events

### 56.13.21 FrameAvailable(Status as Integer, displayTime as UInt64, frameSurfaceHandle as Integer, Update as CGDisplayStreamUpdateMBS)

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** A new frame is available.
**Notes:** The event used for new frame delivery by CGDisplayStream objects

For each frame that is generated by the WindowServer for a particular display, the user provided event is invoked and provides the user with an IOSurface handle (inside update object), that contains the pixel data for the new frame, as well as a CGDisplayStreamUpdateMBS that contains all of the metadata associated with that IOSurface.

frameSurfaceHandle: The IOSurfaceRef for the current frame. May be zero/nil in some cases. The plugin retains it as part of Update object to keeps it alive.
displayTime: The mach absolute time of when the corresponding frame was to be displayed by the WindowServer
Update: The CGDisplayStreamUpdateMBS for the current frame. will be nil in cases when status is not kCGDisplayStreamFrameStatusFrameComplete.

### 56.13.22 Constants

Frame Status

| Constant | Value | Description |
|---|---|---|
| StatusFrameBlank | 2 | As of displayTime, the display is has gone blank |
| StatusFrameComplete | 0 | A new frame has been generated by the Window Server for a particular display at time displayTime. |
| StatusFrameIdle | 1 | The Window Server did not generate a new frame for displayTime |
| StatusStopped | 3 | The display stream has stopped and no more calls will be made to the handler until the stream is started. |

## 56.14 class CGDisplayStreamUpdateMBS

### 56.14.1 class CGDisplayStreamUpdateMBS

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** A single frame's extra metadata that describes useful frame delta information.
**Notes:** A CGDisplayStreamUpdate encapsulates information about what portions of a frame have changed relative to a previously delivered frame. This includes regions that were changed in any way, which ones were actually redrawn, and which regions were merely copied from one place to another.

### 56.14.2 Methods

### 56.14.3 getRects(type as Integer) as CGRectMBS()

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Returns an array of CGRectMBS that describe what parts of the frame have changed relative to the previously delivered frame.
**Notes:** This rectangle list encapsulates both the update rectangles and movement rectangles.

### 56.14.4 Properties

### 56.14.5 CIImage as Variant

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Queries the IOSurface with frame as CIImageMBS.
**Notes:** Returns CIImageMBS.
(Read only property)

### 56.14.6 DeltaX as Double

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The x component of the movement delta.
**Notes:** (Read only property)

### 56.14.7 DeltaY as Double

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The y component of the movement delta.
**Notes:** (Read only property)

### 56.14.8 DropCount as Integer

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Return how many frames (if any) have been dropped since the last call to the event.
**Notes:** This call is primarily useful for performance measurement to determine if the client is keeping up with all WindowServer updates.
(Read only property)

### 56.14.9 Handle as Integer

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 56.14.10 IOSurfaceHandle as Integer

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The internal object reference for the IOSurface.
**Notes:** (Read only property)

### 56.14.11 Constants

Rectangle Selectors

| Constant | Value | Description |
|---|---|---|
| UpdateDirtyRects | 2 | The union of both refreshed and moved rects. |
| UpdateMovedRects | 1 | The rectangles that were simply moved from one part of the display to another |
| UpdateReducedDirtyRects | 3 | A possibly simplified (but overstated) array of dirty rectangles. |
| UpdateRefreshedRects | 0 | The rectangles that were refreshed on the display, not counting moved rectangles |

## 56.15 class CGDisplayTransferFormulaMBS

### 56.15.1 class CGDisplayTransferFormulaMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** A class for a transfer formula.

### 56.15.2 Properties

### 56.15.3 BlueGamma as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The blue gamma value.
**Notes:** (Read and Write property)

### 56.15.4 BlueMax as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum blue value.
**Notes:** (Read and Write property)

### 56.15.5 BlueMin as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum blue value.
**Notes:** (Read and Write property)

### 56.15.6 GreenGamma as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The green gamma value.
**Notes:** (Read and Write property)

### 56.15.7 GreenMax as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum green value.
**Notes:** (Read and Write property)

### 56.15.8 GreenMin as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum green value.
**Notes:** (Read and Write property)

### 56.15.9 RedGamma as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The red gamma value.
**Notes:** (Read and Write property)

### 56.15.10 RedMax as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum red value.
**Notes:** (Read and Write property)

### 56.15.11 RedMin as Double

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum red value.
**Notes:** (Read and Write property)

## 56.16 class CGFontMBS

### 56.16.1 class CGFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CoreGraphics class for a font.
**Notes:** The CGFontRef opaque type encapsulates font information. A font is a set of shapes or glyphs associated with a character set. A glyph can represent a single character (such as ‚Äòb‚Äô), more than one character (such as the "Ô¨Å" ligature), or a special character such as a space. Quartz retrieves the glyphs for the font from ATS (Apple Type Services) and paints the glyphs based on the relevant parameters of the current graphics state.

Quartz provides a limited, low-level interface for drawing text. For information on text-drawing functions, see CGContext Reference. For full Unicode and text-layout support, use the services provided by Core Text or ATSUI).
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr7

**Xojo Developer Magazine**

- 12.4, page 9: News

### 56.16.2 Methods

### 56.16.3 CreateWithDataProvider(CGDataProvider as Variant) as CGFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a font object from data supplied from a data provider.
**Notes:** Dataprovider must be a CGDataProviderMBS object.
Returns the font object or nil if the font can't be created.

Before drawing text in a Quartz context, you must set the font in the current graphics state by calling the function CGContextMBS.SetFontSize.

### 56.16.4 CreateWithFontName(name as string) as CGFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a font object corresponding to the font specified by a PostScript or full name.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Courier")
MsgBox c.FullName
```

**Notes:** Returns the font object or nil if the font can't be created.
Before drawing text in a Quartz context, you must set the font in the current graphics state by calling the function CGContextMBS.SetFont.

### 56.16.5 CreateWithPlatformFont(ATSFontHandle as Integer) as CGFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a new font reference from an ATSFontRef.
**Notes:** Create a CGFont using platformFontReference, a handle to a platform-specific font reference.
For MacOS X, platformFontReference should be a handle to an ATSFontRef.

### 56.16.6 Properties

### 56.16.7 Ascent as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the ascent of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.Ascent)
```

**Notes:** The ascent is the maximum distance above the baseline of glyphs in a font. The value is specified in glyph space units.
(Read only property)

### 56.16.8 CapHeight as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the cap height of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.CapHeight)
```

**Notes:** The cap height is the distance above the baseline of the top of flat capital letters of glyphs in a font. The value is specified in glyph space units.
(Read only property)

### 56.16.9 Descent as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the descent of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.Descent)
```

**Notes:** The descent is the maximum distance below the baseline of glyphs in a font. The value is specified in glyph space units.
(Read only property)

### 56.16.10 FontBBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the bounding box of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
dim r as CGRectMBS = c.FontBBox
MsgBox str(r.Width)+" "+str(r.Height)
```

**Notes:** The font bounding box is the union of all of the bounding boxes for all the glyphs in a font. The value is specified in glyph space units.
(Read only property)

### 56.16.11 FullName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the full name associated with a font object.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Courier")
MsgBox c.FullName
```

**Notes:** (Read only property)

### 56.16.12 Handle as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 56.16.13 ItalicAngle as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the italic angle of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.ItalicAngle)
```

**Notes:** The italic angle of the font, measured in degrees counter-clockwise from the vertical.
(Read only property)

### 56.16.14 Leading as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the leading of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.Leading)
```

**Notes:** The leading is the spacing between consecutive lines of text in a font. The value is specified in glyph

space units.
(Read only property)

### 56.16.15 NumberOfGlyphs as UInt64

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the number of glyphs in a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.NumberOfGlyphs)
```

**Notes:** (Read only property)

### 56.16.16 PostScriptName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Obtains the PostScript name of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Courier")
MsgBox c.PostScriptName
```

**Notes:** (Read only property)

### 56.16.17 StemV as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the thickness of the dominant vertical stems of glyphs in a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.StemV)
```

**Notes:** The thickness of the dominant vertical stems of glyphs in a font.
(Read only property)

### 56.16.18 UnitsPerEm as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the number of glyph space units per em for the provided font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.UnitsPerEm)
```

**Notes:** The number of glyph space units per em for the provided font.
(Read only property)

### 56.16.19 XHeight as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the x-height of a font.
**Example:**

```
dim c as CGFontMBS = CGFontMBS.CreateWithFontName("Times")
MsgBox str(c.XHeight)
```

**Notes:** The x-height is the distance above the baseline of the top of flat, non-ascending lowercase letters (such as x) of glyphs in a font. The value is specified in glyph space units.
(Read only property)

### 56.16.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGFontIndexInvalid | 65535 | An invalid font index (a value which never represents a valid glyph). |
| kCGFontIndexMax | 65534 | The maximum allowed value for font index. |
| kCGGlyphMax | 65534 | The maximum value for a glyph. |

PostScript Formats

| Constant | Value | Description |
|---|---|---|
| kCGFontPostScriptFormatType1 | 1 | This is documented in Adobe Type 1 Font Format, which is available fro http://partners.adobe.com/. |
| kCGFontPostScriptFormatType3 | 3 | This is documented in PostScript Language Reference, 3rd edition, which available from http://partners.adobe.com/. |
| kCGFontPostScriptFormatType42 | 42 | This is documented in Adobe Technical Note 5012, The Type 42 Font Forma Specification, which is available from http://partners.adobe.com/. |

## 56.17 class CGFunctionMBS

### 56.17.1 class CGFunctionMBS

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** CGFunction provides a general facility for defining and using callback functions that take an arbitrary number of floating-point input values, and pass back an arbitrary number of floating-point output values.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1fc1

### 56.17.2 Methods

### 56.17.3 Create(domainDimension as Integer, domain as memoryblock, rangeDimension as Integer, range as memoryblock)

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Creates a Quartz function.
**Notes:** Parameters

domainDimension: The number of inputs.
domain: An array of (2*domainDimension) floats used to specify the valid intervals of input values. For each k from 0 to (domainDimension - 1), domain [ 2*k ] must be less than or equal to domain [ 2*k+1 ] , and the kth input value will be clipped to lie in the interval domain [ 2*k ] ,â§ input [ k ] ,â§ domain [ 2*k+1 ] . If this parameter is nil, then the input values are not clipped.
rangeDimension: The number of outputs.
range: An array of (2*rangeDimension) floats that specifies the valid intervals of output values. For each k from 0 to (rangeDimension - 1), range [ 2*k ] must be less than or equal to range [ 2*k+1 ] , and the kth output value will be clipped to lie in the interval range [ 2*k ] ,â§ output [ k ] ,â§ range [ 2*k+1 ] . If this parameter is nil, then the output values are not clipped.

Returns the new Quartz function or nil on any error.

Available in Mac OS X version 10.2 and later.

### 56.17.4 Properties

### 56.17.5 Handle as Integer

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Handle to the CGFunctionRef.
**Notes:** (Read and Write property)

### 56.17.6 Events

### 56.17.7 Evaluate(Input as memoryblock, Output as memoryblock)

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: .

**Function:** Asks the CGFunction to calculate the values.
**Notes:** memoryblocks must be big enough.

## 56.18 class CGGradientMBS

### 56.18.1 class CGGradientMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** A gradient defines a smooth transition between colors across an area.
**Notes:** The CGGradientMBS class, and the functions that operate on it, make creating and using radial and axial gradient fills an easy task. A CGGradient object has a color space, two or more colors, and a location for each color. The color space cannot be a pattern or indexed color space, otherwise it can be any Quartz color space (CGColorSpaceMBS).

Colors can be provided as component values (such as red, green, blue) or as Quartz color objects (CGColorMBS). In Quartz, component can vary from 0.0 to 1.0, designating the proportion of the component present in the color.

A location is a normalized value. When it comes time to paint the gradient, Quartz maps the normalized location values to the points in coordinate space that you provide.

If you want more precise control over gradients, or if your application runs in versions of Mac OS X that are earlier than v10.5, see CGShadingMBS.

Requires Mac OS X 10.5.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr6
- MBS Real Studio Plugins, version 13.1fc1
- MBS REALbasic Plugins, version 11.2pr1

### 56.18.2 Methods

### 56.18.3 CreateWithColorComponents(colorSpace as CGColorSpaceMBS, components() as Double) as CGGradientMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a CGGradient object from a color space and the provided color components and locations.
**Notes:** space: The color space to use for the gradient. You cannot use a pattern or indexed color space.
components: The color components for each color that defines the gradient. The components should be in the color space specified by space. If you are unsure of the number of components, you can call the function CGColorSpaceMBS.NumberOfComponents.

The number of items in this array should be the product of count and the number of components in the color space. For example, if the color space is an RGBA color space and you want to use two colors in the gradient (one for a starting location and another for an ending location), then you need to provide 8 values in components—red, green, blue, and alpha values for the first color, followed by red, green, blue, and alpha values for the second color.

locations: Optional, The location for each color provided in components. Each location must be a CGFloat value in the range of 0 to 1, inclusive. If 0 and 1 are not in the locations array, Quartz uses the colors provided that are closest to 0 and 1 for those locations.

If locations is not passed, the first color in colors is assigned to location 0, the last color incolors is assigned to location 1, and intervening colors are assigned locations that are at equal intervals in between.

Available in Mac OS X v10.5 and later.
See also:

- 56.18.4 CreateWithColorComponents(colorSpace as CGColorSpaceMBS, components() as Double, locations() as Double) as CGGradientMBS 9037

### 56.18.4 CreateWithColorComponents(colorSpace as CGColorSpaceMBS, components() as Double, locations() as Double) as CGGradientMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a CGGradient object from a color space and the provided color components and locations.
**Example:**

```
// put into paint event of window
dim c as CGContextMBS
if TargetCocoa then
c = GetCurrentCGContextMBS
else
c = window1.CGContextMBS
end if

dim locations() as Double = array(0.0, 0.6, 1.0)
dim components() as Double = array(1.0, 0.0, 0.0, 0.35, 0.0, 1.0, 0.0, 0.2, 0.0, 0.0, 1.0, 0.06) // Start color and End color

dim rgbColorspace as CGColorSpaceMBS = CGColorSpaceMBS.CreateDeviceRGB
dim glossGradient as CGGradientMBS = CGGradientMBS.CreateWithColorComponents(rgbColorspace, components, locations)
'dim glossGradient as CGGradientMBS = CGGradientMBS.CreateWithColorComponents(rgbColorspace, components)

dim currentBounds as CGRectMBS = CGMakeRectMBS(0,0,g.Width,g.Height)
```

```
dim topCenter as CGPointMBS = CGMakePointMBS(g.width/2, 0.0)
dim midCenter as CGPointMBS = CGMakePointMBS(g.width/2, g.height)

c.SaveGState

// fill white
c.SetRGBFillColor 1.0, 1.0, 1.0, 1.0
c.FillRect currentBounds


// draw gradient
c.AddRect(currentBounds)
c.Clip
c.DrawLinearGradient(glossGradient, topCenter, midCenter, 0)
c.RestoreGState
c.Flush
```

**Notes:** space: The color space to use for the gradient. You cannot use a pattern or indexed color space. components: The color components for each color that defines the gradient. The components should be in the color space specified by space. If you are unsure of the number of components, you can call the function CGColorSpaceMBS.NumberOfComponents.

The number of items in this array should be the product of count and the number of components in the color space. For example, if the color space is an RGBA color space and you want to use two colors in the gradient (one for a starting location and another for an ending location), then you need to provide 8 values in components—red, green, blue, and alpha values for the first color, followed by red, green, blue, and alpha values for the second color.

locations: Optional, The location for each color provided in components. Each location must be a CGFloat value in the range of 0 to 1, inclusive. If 0 and 1 are not in the locations array, Quartz uses the colors provided that are closest to 0 and 1 for those locations.

If locations is not passed, the first color in colors is assigned to location 0, the last color incolors is assigned to location 1, and intervening colors are assigned locations that are at equal intervals in between.

Available in Mac OS X v10.5 and later.
See also:

- 56.18.3 CreateWithColorComponents(colorSpace as CGColorSpaceMBS, components() as Double) as CGGradientMBS 9036

### 56.18.5 CreateWithColors(colorSpace as CGColorSpaceMBS, colors() as CGColorMBS) as CGGradientMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a CGGradient object from a color space and the provided color objects and locations.
**Example:**

```
// put into window paint event
dim c as CGContextMBS
if TargetCocoa then
c = GetCurrentCGContextMBS
else
c = window1.CGContextMBS
end if

dim colors(-1) as CGColorMBS

colors.Append CGColorMBS.CreateGenericRGB(1.0, 0.0, 0.0, 0.35)
colors.Append CGColorMBS.CreateGenericRGB(0.0, 1.0, 0.0, 0.2)
colors.Append CGColorMBS.CreateGenericRGB(0.0, 0.0, 1.0, 0.06)

dim glossGradient as CGGradientMBS = CGGradientMBS.CreateWithColors(nil, colors)

dim topCenter as CGPointMBS = CGMakePointMBS(g.width/2, 0.0)
dim midCenter as CGPointMBS = CGMakePointMBS(g.width/2, g.height)

// fill white
c.SetRGBFillColor 1.0, 1.0, 1.0, 1.0
c.FillRect CGMakeRectMBS(0,0,g.Width,g.Height)

// gradient
dim currentBounds as CGRectMBS = CGMakeRectMBS(0,0,g.Width,g.Height)
c.SaveGState
c.AddRect(currentBounds)
c.Clip
c.DrawLinearGradient(glossGradient, topCenter, midCenter, 0)
c.RestoreGState

c.Flush
```

**Notes:** space: The color space to use for the gradient. You cannot use a pattern or indexed color space. Can be nil.
colors: A non-empty array of CGColorMBS objects that should be in the color space specified by space. If space is not nil, each color will be converted (if necessary) to that color space and the gradient will drawn in that color space. Otherwise, each color will be converted to and drawn in the GenericRGB color space.
locations: Optional. The location for each color provided in colors; each location must be a CGFloat value

in the range of 0 to 1, inclusive. If 0 and 1 are not in the locations array, Quartz uses the colors provided that are closest to 0 and 1 for those locations.

If locations is missing, the first color in colors is assigned to location 0, the last color incolors is assigned to location 1, and intervening colors are assigned locations that are at equal intervals in between.
The locations array should contain the same number of items as the colors array.

Available in Mac OS X v10.5 and later.
See also:

- 56.18.6 CreateWithColors(colorSpace as CGColorSpaceMBS, colors() as CGColorMBS, locations() as Double) as CGGradientMBS 9040

### 56.18.6 CreateWithColors(colorSpace as CGColorSpaceMBS, colors() as CGColorMBS, locations() as Double) as CGGradientMBS

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a CGGradient object from a color space and the provided color objects and locations.
**Example:**

```
// put into window paint event
dim c as CGContextMBS
if TargetCocoa then
c = GetCurrentCGContextMBS
else
c = window1.CGContextMBS
end if

dim locations() as Double = array(0.0, 0.8, 1.0)

dim colors(-1) as CGColorMBS

colors.Append CGColorMBS.CreateGenericRGB(1.0, 0.0, 0.0, 0.35)
colors.Append CGColorMBS.CreateGenericRGB(0.0, 1.0, 0.0, 0.2)
colors.Append CGColorMBS.CreateGenericRGB(0.0, 0.0, 1.0, 0.06)

dim glossGradient as CGGradientMBS = CGGradientMBS.CreateWithColors(nil, colors, locations)

dim topCenter as CGPointMBS = CGMakePointMBS(g.width/2, 0.0)
dim midCenter as CGPointMBS = CGMakePointMBS(g.width/2, g.height)

// fill white
c.SetRGBFillColor 1.0, 1.0, 1.0, 1.0
c.FillRect CGMakeRectMBS(0,0,g.Width,g.Height)
```

```
// gradient
dim currentBounds as CGRectMBS = CGMakeRectMBS(0,0,g.Width,g.Height)
c.SaveGState
c.AddRect(currentBounds)
c.Clip
c.DrawLinearGradient(glossGradient, topCenter, midCenter, 0)
c.RestoreGState

c.Flush
```

**Notes:** space: The color space to use for the gradient. You cannot use a pattern or indexed color space. Can be nil.
colors: A non-empty array of CGColorMBS objects that should be in the color space specified by space. If space is not nil, each color will be converted (if necessary) to that color space and the gradient will drawn in that color space. Otherwise, each color will be converted to and drawn in the GenericRGB color space.
locations: Optional. The location for each color provided in colors; each location must be a CGFloat value in the range of 0 to 1, inclusive. If 0 and 1 are not in the locations array, Quartz uses the colors provided that are closest to 0 and 1 for those locations.

If locations is missing, the first color in colors is assigned to location 0, the last color incolors is assigned to location 1, and intervening colors are assigned locations that are at equal intervals in between.
The locations array should contain the same number of items as the colors array.

Available in Mac OS X v10.5 and later.
See also:

- 56.18.5 CreateWithColors(colorSpace as CGColorSpaceMBS, colors() as CGColorMBS) as CGGradientMBS 9039

### 56.18.7 Properties

### 56.18.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Handle to the CGGradientRef.
**Notes:** (Read and Write property)

### 56.18.9 Constants

Gradient Drawing Options

| Constant | Value | Description |
|---|---|---|
| kCGGradientDrawsAfterEndLocation | 2 | The fill should extend beyond the ending location. The color that e beyond the ending point is the solid color defined by the CGGradient to be at location 1.<br>Available in Mac OS X v10.5 and later. |
| kCGGradientDrawsBeforeStartLocation | 1 | The fill should extend beyond the starting location. The color that e beyond the starting point is the solid color defined by the CGGradient to be at location 0.<br>Available in Mac OS X v10.5 and later. |

## 56.19 class CGImageDestinationMBS

### 56.19.1 class CGImageDestinationMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** A class to write CGImages.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim image as CGImageMBS = CGCreateImageMBS(logo)

dim dic as new Dictionary

// 10%
'dic.Value(CGImageDestinationMBS.kCGImageDestinationLossyCompressionQuality)=0.1

// 100%
dic.Value(CGImageDestinationMBS.kCGImageDestinationLossyCompressionQuality)=1.0

dim file as FolderItem = SpecialFolder.Desktop.Child("logo.jpg")
dim d as new CGImageDestinationMBS(file, "public.jpeg", 1)

d.AddImage(image, dic)

if d.Finalize then
MsgBox "Saved"
else
MsgBox "Failed to save."
end if
```

**Notes:** CGImageDestination objects, available in Mac OS X v10.4 or later, abstract the data-writing task. An image destination can represent a single image or multiple images. It can contain thumbnail images as well as properties for each image.

The functions described in this reference can write data to three kinds of destinations: a file, an URL and a string. After creating a CGImageDestination object for the appropriate destination, you can add image data and set image properties. When you are finished adding data, call the function Finalize to write the image data and properties.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- Multithreaded plugin functions can increase speed of Xojo application
- Four ways to save picture as Tiff in Xojo

- Problems with killing Xojo threads with plugin calls.
- Tip of the day: Edit IPTC data in JPEG file with CGImageSource/CGImageDestination
- MBS Xojo / Real Studio Plugins, version 13.5pr8
- MBS REALbasic plug-ins version 9.5

### 56.19.2 Methods

### 56.19.3 AddImage(image as CGImageMBS, properties as dictionary=nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Adds an image to an image destination.
**Example:**

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

// reading the picture
dim c as new CGImageSourceMBS(inputfile)
dim img as CGImageMBS = c.CreateImageAtIndex(0)
dim propertiesGlobal as Dictionary = c.Properties
dim propertiesImage as Dictionary = c.PropertiesAtIndex(0)

dim outputFile as FolderItem = SpecialFolder.Desktop.Child("output.jpg")
dim d as new CGImageDestinationMBS(outputFile, "public.jpeg", 1)

// writing the picture and include metadata
d.SetProperties(propertiesGlobal)
d.AddImage(img, propertiesImage)
if d.FinalizeMT then
outputFile.Launch
else
MsgBox "Failed to write jpeg."
end if
```

**Notes:** image: The image to add.
properties: An optional dictionary that specifies the properties of the added image.

For properties you can use those in the CGImageSourceMBS class, kCGImageDestinationLossyCompressionQuality and kCGImageDestinationBackgroundColor.

The function logs an error if you add more images than what you specified when you created the image destination.

Available in Mac OS X version 10.4 and later.

### 56.19.4 AddImageCF(image as CGImageMBS, properties as Variant = nil)

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Adds an image to an image destination.
**Notes:** image: The image to add.
properties: An optional dictionary or CFDictionaryMBS that specifies the properties of the added image.

For properties you can use those in the CGImageSourceMBS class, kCGImageDestinationLossyCompressionQuality and kCGImageDestinationBackgroundColor.

The function logs an error if you add more images than what you specified when you created the image destination.
Available in Mac OS X version 10.4 and later.

### 56.19.5 AddImageFromSource(source as CGImageSourceMBS, index as Integer, options as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Adds an image from an image source to an image destination.
**Notes:** source: An image source.
index: An index that specifies the location of the image in the image source. The index is zero-based.
properties: A dictionary that specifies properties to overwrite or add to the source image properties.

Available in Mac OS X version 10.4 and later.

### 56.19.6 AddImageFromSourceCF(source as CGImageSourceMBS, index as Integer, options as Variant = nil)

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Adds an image from an image source to an image destination.
**Notes:** source: An image source.
index: An index that specifies the location of the image in the image source. The index is zero-based.
properties: A dictionary or CFDcitionaryMBS that specifies properties to overwrite or add to the source image properties.

Available in Mac OS X version 10.4 and later.

### 56.19.7 Constructor(file as folderitem, type as string, count as Integer = 1)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a location specified by a folderitem.
**Example:**

```
Dim p As Picture = LogoMBS(500)

// save as Photoshop

Dim image As CGImageMBS = CGImageMBS.CreateImage(p)
Dim file1 As FolderItem = SpecialFolder.Desktop.Child("test1.psd")
Dim dest As New CGImageDestinationMBS(file1, "com.adobe.photoshop-image", 1)

dest.AddImage(image, Nil)

If dest.Finalize Then
// MsgBox "Saved"
Else
MsgBox "Failed to save."
End If
```

**Notes:** file: The file to write to. If the file already exists, the data at this location is overwritten.

type: The UTI (uniform type identifier) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On success the handle value is not zero.

Available in Mac OS X version 10.4 and later.
See also:


- 56.19.8 Constructor(type as string, count as Integer = 1) 9047
- 56.19.9 Constructor(url as string, type as string, count as Integer = 1) 9047

### 56.19.8 Constructor(type as string, count as Integer = 1)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a string.
**Notes:** type: The uniform type identifier (UTI) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On success the handle is not zero.

Available in Mac OS X version 10.4 and later.
See also:

- 56.19.7 Constructor(file as folderitem, type as string, count as Integer = 1) 9046
- 56.19.9 Constructor(url as string, type as string, count as Integer = 1) 9047

### 56.19.9 Constructor(url as string, type as string, count as Integer = 1)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a location specified by a URL.
**Notes:** url: The URL to write to. If the URL already exists, the data at this location is overwritten.

type: The UTI (uniform type identifier) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On success the handle value is not zero.

Available in Mac OS X version 10.4 and later.
See also:

- 56.19.7 Constructor(file as folderitem, type as string, count as Integer = 1) 9046
- 56.19.8 Constructor(type as string, count as Integer = 1) 9047

### 56.19.10 CreateWithData(type as string, count as Integer = 1) as CGImageDestinationMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a string.
**Notes:** type: The uniform type identifier (UTI) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On error the function returns nil.

Available in Mac OS X version 10.4 and later.

### 56.19.11 CreateWithFile(file as folderitem, type as string, count as Integer = 1) as CGImageDestinationMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a location specified by a folderitem.
**Example:**

```
Dim p As Picture = LogoMBS(500)

// save as tiff

Dim image As CGImageMBS = CGImageMBS.CreateImage(p)
Dim file2 As FolderItem = SpecialFolder.Desktop.Child("test2.tif")
Dim dest As CGImageDestinationMBS = CGImageDestinationMBS.CreateWithFile(file2, "public.tiff", 1)

dest.AddImage(image, Nil)

If dest.Finalize Then
// MsgBox "Saved"
Else
MsgBox "Failed to save."
End If
```

**Notes:** file: The file to write to. If the file already exists, the data at this location is overwritten.

type: The UTI (uniform type identifier) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On failure the function returns nil.

Available in Mac OS X version 10.4 and later.

### 56.19.12 CreateWithURL(url as string, type as string, count as Integer = 1) as CGImageDestinationMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image destination that writes to a location specified by a URL.
**Notes:** url: The URL to write to. If the URL already exists, the data at this location is overwritten.

type: The UTI (uniform type identifier) of the resulting image file. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

count: The number of images (not including thumbnail images) that the image file will contain.

On error nil is returned.

Available in Mac OS X version 10.4 and later.

### 56.19.13 Data as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Makes a copy of the data.
**Notes:** The data is collected and after you called Finalize you can pick the data here.

### 56.19.14 Finalize as boolean

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Writes image data and properties to the data or URL associated with the image destination.
**Example:**

```
dim logo as Picture = LogoMBS(500)
```

```
dim image as CGImageMBS = CGCreateImageMBS(logo)

dim file as FolderItem = SpecialFolder.Desktop.Child("logo.png")
dim d as new CGImageDestinationMBS(file, "public.png", 1)

d.AddImage(image, nil)

if d.Finalize then
MsgBox "Saved"
else
MsgBox "Failed to save."
end if
```

**Notes:** Returns true if the image is successfully written; false otherwise.

You must call this function or the output of the image destination will not be valid. After calling this function, no additional data can be added to the image destination.

Available in Mac OS X version 10.4 and later.

### 56.19.15 FinalizeMT as boolean

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Writes image data and properties to the data or URL associated with the image destination.
**Notes:** Returns true if the image is successfully written; false otherwise.

You must call this function or the output of the image destination will not be valid. After calling this function, no additional data can be added to the image destination.

Available in Mac OS X version 10.4 and later.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 56.19.16 kCGImageDestinationBackgroundColor as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Notes:** The desired background color to composite against when writing an image that has an alpha component to a destination format that does not support alpha. If present, the value associated with this key must be a CGColorRef data type without an alpha component of its own. If not present, and if a background color is needed, a white color is used.

Available in Mac OS X v10.4 and later.

### 56.19.17 kCGImageDestinationDateTime as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Notes:** Updates the DateTime parameters of the image metadata. Only values present in the original image will updated. If present, the value should be a String or a Date. If String, the value must be in Exif DateTime or ISO 8601 DateTime format. This option is mutually exclusive with kCGImageDestinationMetadata.

### 56.19.18 kCGImageDestinationLossyCompressionQuality as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Notes:** The desired compression quality to use when writing to an image destination. If present, the value associated with this key must be a double in the range 0.0 to 1.0. A value of 1.0 specifies to use lossless compression if destination format supports it. A value of 0.0 implies to use maximum compression.

Available in Mac OS X v10.4 and later.

### 56.19.19 kCGImageDestinationMergeMetadata as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Example:**

```
// Change rotation in an image file

// files
dim dpath as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim opath as folderitem = dpath.parent.Child("output.jpg")

// open source
```

```
dim imageSource as new cgimagesourcembs(dpath)

// read image
dim img as cgimagembs = imageSource.createimageatindex(0)

// global properties
dim globalprop as dictionary = imageSource.properties
// per image properties
dim p as Dictionary = imageSource.PropertiesAtIndex(0)

dim imageDest as new CGImageDestinationMBS(opath,"public.jpeg",1)

'const orientation = 1 // top left
const orientation = 3 // bottom right

// set globals
imageDest.SetProperties(globalprop)

// now set new orientation
p.value(imageDest.kCGImageDestinationOrientation) = orientation
p.value(imageDest.kCGImageDestinationMergeMetadata) = true

// change tiff dictionary, if present
dim dTIFF as Dictionary = p.lookup(imageSource.kCGImagePropertyTIFFDictionary, nil)
if dTIFF <>nil then
dTIFF.value(imageSource.kCGImagePropertyTIFFOrientation) = orientation
end if

// change iptc dictionary, if present
dim dIPTC as Dictionary = p.lookup(imageSource.kCGImagePropertyIPTCDictionary, nil)
if dIPTC <>nil then
dIPTC.value(imageSource.kCGImagePropertyIPTCImageOrientation) = orientation
end if

// write out image
imageDest.AddImage(img,p)
call imageDest.Finalize
```

**Notes:** If true, The metadata will be copied from the source and merged with the tags specified in kCGImageDestinationMetadata. If a tag does not exist in the source, it will be added. If the tag exists in the source, it will be updated. A metadata tag can be removed by setting the tag's value to nil. If present, the value of this key is a Boolean. The default is False.

### 56.19.20 kCGImageDestinationMetadata as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Notes:** Set the metadata tags for the image destination. If present, the value of this key is a CGImageMetadata. By default, all EXIF, IPTC, and XMP tags will be replaced. Use kCGImageDestinationMergeMetadata to merge the tags with the existing tags in the image source.

### 56.19.21 kCGImageDestinationOrientation as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Example:**

```
// Change rotation in an image file

// files
dim dpath as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim opath as folderitem = dpath.parent.Child("output.jpg")

// open source
dim imageSource as new cgimagesourcembs(dpath)

// read image
dim img as cgimagembs = imageSource.createimageatindex(0)

// global properties
dim globalprop as dictionary = imageSource.properties
// per image properties
dim p as Dictionary = imageSource.PropertiesAtIndex(0)

dim imageDest as new CGImageDestinationMBS(opath,"public.jpeg",1)

'const orientation = 1 // top left
const orientation = 3 // bottom right

// set globals
imageDest.SetProperties(globalprop)

// now set new orientation
p.value(imageDest.kCGImageDestinationOrientation) = orientation
p.value(imageDest.kCGImageDestinationMergeMetadata) = true

// change tiff dictionary, if present
dim dTIFF as Dictionary = p.lookup(imageSource.kCGImagePropertyTIFFDictionary, nil)
```

```
if dTIFF <>nil then
dTIFF.value(imageSource.kCGImagePropertyTIFFOrientation) = orientation
end if

// change iptc dictionary, if present
dim dIPTC as Dictionary = p.lookup(imageSource.kCGImagePropertyIPTCDictionary, nil)
if dIPTC <>nil then
dIPTC.value(imageSource.kCGImagePropertyIPTCImageOrientation) = orientation
end if

// write out image
imageDest.AddImage(img,p)
call imageDest.Finalize
```

**Notes:** Updates the orientation in the image metadata. The image data itself will not be rotated. If present, the value should be a Integer from 1 to 8. This option is mutually exclusive with kCGImageDestinationMetadata.

### 56.19.22 kCGImageMetadataShouldExcludeXMP as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the constant for the image destination properties.
**Notes:** XMP data will not be written to the destination. If used in conjunction with kCGImageDestinationMetadata, EXIF and/or IPTC tags will be preserved, but an XMP packet will not be written to the file. If present, the value for this key is a Boolean. The default is False.

### 56.19.23 SetProperties(options as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Applies one or more properties to all images in an image destination.
**Example:**

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

// reading the picture
dim c as new CGImageSourceMBS(inputfile)
dim img as CGImageMBS = c.CreateImageAtIndex(0)
dim propertiesGlobal as Dictionary = c.Properties
dim propertiesImage as Dictionary = c.PropertiesAtIndex(0)

dim outputFile as FolderItem = SpecialFolder.Desktop.Child("output.jpg")
```

```
dim d as new CGImageDestinationMBS(outputFile, "public.jpeg", 1)

// writing the picture and include metadata
d.SetProperties(propertiesGlobal)
d.AddImage(img, propertiesImage)
if d.FinalizeMT then
outputFile.Launch
else
MsgBox "Failed to write jpeg."
end if
```

**Notes:** Available in Mac OS X version 10.4 and later.

### 56.19.24 SetPropertiesCF(options as Variant)

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Applies one or more properties to all images in an image destination.
**Notes:** Available in Mac OS X version 10.4 and later.
Options can be a Dictionary or CFDictionaryMBS.

### 56.19.25 TypeIdentifiers as string()

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns an array of the uniform type identifiers (UTIs) that are supported for image destinations.
**Example:**

```
dim s(-1) as string = CGImageDestinationMBS.TypeIdentifiers

MsgBox Join(s,EndOfLine)

// shows on Mac OS X 10.5:
//
// public.png
// public.jpeg
// com.compuserve.gif
// public.jpeg-2000
// public.tiff
// com.adobe.photoshop-image
// com.adobe.pdf
// com.microsoft.bmp
// com.apple.pict
```

// com.truevision.tga-image
// com.sgi.sgi-image
// com.ilm.openexr-image

**Notes:** Returns an array of the UTIs that are supported for image destinations. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs that can be returned.

Available in Mac OS X version 10.4 and later.

### 56.19.26 Properties

### 56.19.27 Handle as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The internal reference.
**Notes:** (Read and Write property)

## 56.20 class CGImageMBS

### 56.20.1 class CGImageMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics image.
**Notes:** If the release property is true, the destructor of this class will release the image reference.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr6
- Several ways for picture to PDF in MBS Plugins
- Four ways to save picture as Tiff in Xojo
- CGImageSourceMBS CreateThumbnailMT method for Xojo
- MBS Xojo Plugins in version 19.0
- Colorspaces in MacOS with Xojo
- Tip of day: Load ICC profile on OS X for any image format with CGImageSource
- Notes from this week
- MBS Plugins 11.1 Release notes
- MBS REALbasic plug-ins version 9.5

**Xojo Developer Magazine**

- 17.2, page 11: News
- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 56.20.2 Methods

### 56.20.3 Constructor

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 56.20.4 Copy as CGImageMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of a bitmap image.
See also:

- 56.20.5 Copy(r as CGRectMBS) as CGImageMBS 9058

### 56.20.5 Copy(r as CGRectMBS) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of a bitmap image.
See also:

- 56.20.4 Copy as CGImageMBS 9058

### 56.20.6 CopyWithColorSpace(profile as CGColorSpaceMBS) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns a copy of the image with the new Colorspace included.
**Example:**

```
// load a picture
dim f as FolderItem = SpecialFolder.Desktop.Child("ColorSpin.jpg")
dim pic as Picture = picture.Open(f)

// open printer
dim g as Graphics = OpenPrinterDialog
if g = nil then Return

// draw
g.DrawPicture pic, 0, 0

// now load again
dim ImageSource as new CGImageSourceMBS(f)
dim img as CGImageMBS = ImageSource.CreateImageAtIndex(0)
dim cs as CGColorSpaceMBS = CGColorSpaceMBS.CreateDeviceRGB

// copy with replacing colorspace
img = img.CopyWithColorSpace(cs)

// and draw
#If XojoVersion >= 2019.02 Then
Dim p As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
```

```
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(p)
#Else
Dim h As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim c As CGContextMBS = CGContextMBS.contextWithCGContext(h)
#EndIf
dim r as CGRectMBS = CGMakeRectMBS(0, 0, img.Width, img.Height)

c.DrawPicture(img, r)
c.Flush
```

**Notes:** profile must be a CGColorSpaceMBS.
Requires Mac OS X 10.3.

### 56.20.7 CopyWithMask(mask as CGImageMBS) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** reates a bitmap image from an existing image and an image mask.
**Notes:** Parameters:

self: The image to apply the mask parameter to. This image must not be an image mask and may not have an image mask or masking color associated with it.

mask: A mask. If the mask is an image, it must be in the DeviceGray color space, must not have an alpha component, and may not itself be masked by an image mask or a masking color. If the mask is not the same size as the image specified by the image parameter, then Quartz scales the mask to fit the image.

Return Value: An image created by masking image with mask. You are responsible for releasing this object by calling CGImageRelease.

The resulting image depends on whether the mask parameter is an image mask or an image. If the mask parameter is an image mask, then the source samples of the image mask act as an inverse alpha value. That is, if the value of a source sample in the image mask is S, then the corresponding region in image is blended with the destination using an alpha value of (1-S). For example, if S is 1, then the region is not painted, while if S is 0, the region is fully painted.

If the mask parameter is an image, then it serves as an alpha mask for blending the image onto the destination. The source samples of mask' act as an alpha value. If the value of the source sample in mask is S, then the corresponding region in image is blended with the destination with an alpha of S. For example, if S is 0, then the region is not painted, while if S is 1, the region is fully painted.

### 56.20.8 CreateImage(pic as picture) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGImageMBS from the given images.
**Example:**

```
dim c as CGImageMBS
dim pic, mask as Picture
// get picture and mask

c = CGImageMBS.CreateImage(pic)
if c<>Nil then
// go on
end if
```

**Notes:** If the image has a mask, it is used.
See also:

- 56.20.9 CreateImage(pic as picture, mask as picture) as CGImageMBS 9060

### 56.20.9 CreateImage(pic as picture, mask as picture) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGImageMBS from the given images.
**Example:**

```
dim c as CGImageMBS
dim pic, mask as Picture
// get picture and mask

c = CGImageMBS.CreateImage(pic, mask)
if c<>Nil then
// go on
end if
```

**Notes:** The mask is taken from the second image.
With 11.3 plugins we are deprecating to pass a mask. The plugin prefers to simply take the mask or alpha channel of the picture itself.
See also:

- 56.20.8 CreateImage(pic as picture) as CGImageMBS 9060

### 56.20.10 CreateImageFromJPEGDataProvider(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGImage with JPEG data.
**Example:**

```
// Shows moon.jpg from the desktop folder
// shows in the window title if i,p or u is nil.

Sub Mainwindow.Paint(g As Graphics)
dim f as FolderItem
dim p as CGDataProviderMBS
dim i as CGImageMBS

f=SpecialFolder.Desktop.Child("moon.jpg")
p=CGDataProviderMBS.CreateWithFile(f)
if p=nil then
Title="p=nil"
else
i = CGImageMBS.CreateImageFromJPEGDataProvider(p,nil,true,0)

if i=nil then
Title="i=nil"
else
window1.CGContextMBS.DrawPicture i,CGMakeRectMBS(0,0,i.Width,i.Height)
end if
end if

End Sub
```

**Notes:** Parameters:

dataprovider:
A reference to a data provider supplying JPEG-encoded data.

decode:
Pass the decode array for the image. In the decode array, for each color component in the source color space, you provide a pair of values denoting the upper and lower limits of a range. For example, the decode array for a source image in the RGB color space would contain six entries total, consisting of one pair each for red, green, and blue. When the image is rendered, Quartz uses a linear transform to map the original component value into a relative number within your designated range that is appropriate for the destination color space. If you do not want to allow remapping of the image's color values, pass nil for the decode array.

The memoryblock for the array needs to be filled with double values.

shouldInterpolate:
Pass true if interpolation should occur; otherwise, pass false . The interpolation setting specifies whether Quartz should apply a pixel-smoothing algorithm to the image. If you pass false , the image may appear jagged or pixelated when drawn on an output device with higher resolution than the image data.

intent:
Pass a CGColorRenderingIntent value specifying how Quartz should display colors in the image that are not located within the current color space of the graphics context. The rendering intent determines the exact method used to map colors from one color space to another.

### 56.20.11 CreateImageFromPNGDataProvider(dataprovider as Variant, decode as memoryblock, shouldInterpolate as boolean, intent as Integer) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGImage with PNG data.
**Notes:** Parameters:

dataprovider:
A reference to a data provider supplying JPEG-encoded data.

decode:
Pass the decode array for the image. In the decode array, for each color component in the source color space, you provide a pair of values denoting the upper and lower limits of a range. For example, the decode array for a source image in the RGB color space would contain six entries total, consisting of one pair each for red, green, and blue. When the image is rendered, Quartz uses a linear transform to map the original component value into a relative number within your designated range that is appropriate for the destination color space. If you do not want to allow remapping of the image's color values, pass nil for the decode array. The memoryblock for the array needs to be filled with double values.

shouldInterpolate:
Pass true if interpolation should occur; otherwise, pass false . The interpolation setting specifies whether Quartz should apply a pixel-smoothing algorithm to the image. If you pass false , the image may appear jagged or pixelated when drawn on an output device with higher resolution than the image data.

intent:
Pass a CGColorRenderingIntent value specifying how Quartz should display colors in the image that are not located within the current color space of the graphics context. The rendering intent determines the exact method used to map colors from one color space to another.

### 56.20.12 CreateImageWithFile(file as folderitem) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Opens a file as CGImage object.
**Notes:** Returns nil on any error.

### 56.20.13 CreateImageWithHandle(handle as Integer) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates image from a CGImageRef handle value.
**Notes:** Internally the CGImageMBS retains this reference and releases it in destructor.

### 56.20.14 DataProvider as Variant

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The data provider used for the image.
**Notes:** Value is a CGDataProviderMBS object.
Returns nil on any error.

### 56.20.15 DecodeArray as memoryblock

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The decode array used for the image.
**Notes:** A memoryblock with an array of double variables.
Returns nil on any error.

### 56.20.16 JPEGData(Compression as Integer = 90) as MemoryBlock

MBS MacCG Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns image compressed as JPEG file.
**Notes:** Compression defines the compression level from 0 to 100.
Returns nil on any error.

### 56.20.17 Picture(ColorSpace as CGColorSpaceMBS = nil) as Picture

MBS MacCG Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates a copy of the CGImage as a picture.
**Example:**

```
// get CGImage
dim f as FolderItem = SpecialFolder.Desktop.Child("bild.jpg")
dim c as CGImageMBS = CGImageMBS.CreateImageWithFile(f)
// get picture
dim p as Picture = c.Picture
// save as jpeg
dim d as FolderItem = SpecialFolder.Desktop.Child("output.jpg")
p.Save(d, p.SaveAsJPEG, 80)
```

**Notes:** Colorspace: the optional CoreGraphcis Colorspace to use for the bitmap conversion (CGColorSpaceMBS class).
Returns nil on any error.

### 56.20.18 PictureScaled(OutputWidth as Integer, OutputHeight as Integer, ColorSpace as CGColorSpaceMBS = nil) as Picture

MBS MacCG Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the CGImage as a picture scaled.
**Example:**

```
// get CGImage
dim f as FolderItem = SpecialFolder.Desktop.Child("bild.jpg")
dim c as CGImageMBS = CGImageMBS.CreateImageWithFile(f)
// get picture
dim p as Picture = c.PictureScaled(640,480)
// save as jpeg
dim d as FolderItem = SpecialFolder.Desktop.Child("output.jpg")
p.Save(d, p.SaveAsJPEG, 80)
```

**Notes:** Colorspace: the optional CoreGraphcis Colorspace to use for the bitmap conversion (CGColorSpaceMBS class).
Returns nil on any error.

If output width and height are zero, we use the image sizes.

### 56.20.19 PNGData as MemoryBlock

MBS MacCG Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns image compressed as PNG file.
**Notes:** Returns nil on any error.

### 56.20.20 ReleaseHandle

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Decrements the retain count of a CGImageRef.
**Notes:** Each retain must have a release. Too many releases and your app will crash, too many retains and it will leak memory.
Use only if you really know what you are doing.

### 56.20.21 RetainHandle

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Increments the retain count of a CGImageRef.
**Notes:** Each retain must have a release. Too many releases and your app will crash, too many retains and it will leak memory.
Use only if you really know what you are doing.

### 56.20.22 Properties

### 56.20.23 AlphaInfo as Integer

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the alpha channel information for a bitmap image.
**Notes:** A CGImageAlphaInfo constant that specifies (1) whether the bitmap contains an alpha channel, (2) where the alpha bits are located in the image data, and (3) whether the alpha value is premultiplied. For possible values, see Constants. The function returns kCGImageAlphaNone if the image parameter refers to an image mask.
(Read only property)

### 56.20.24 BitmapInfo as Integer

MBS MacCG Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the bitmap information for a bitmap image.
**Notes:** This function returns a constant that specifies:

The type of bitmap data—floating point or integer. You use the constant kCGBitmapFloatComponents to extract this information.

Whether an alpha channel is in the data, and if so, how the alpha data is stored. You use the constant kCGBitmapAlphaInfoMask to extract the alpha information. Alpha information is specified as one of the constants listed in Alpha Information for Images.
(Read only property)

### 56.20.25 BitsPerComponent as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the number of bits/component of the image.
**Notes:** (Read only property)

### 56.20.26 BitsPerPixel as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the number of bits/pixel of image.
**Notes:** (Read only property)

### 56.20.27 BytesPerRow as Integer

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns the number of bytes allocated for a double row of a bitmap image.
**Notes:** (Read only property)

### 56.20.28 ColorSpace as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The color space used for the image.
**Example:**

```
// get a picture file
dim file as FolderItem = SpecialFolder.Desktop.Child("sylwia.jpg")
```

```
// get image source
dim source as new CGImageSourceMBS(file)
// read image
dim image as CGImageMBS = source.CreateImageAtIndex(0)
// get Color space from image
dim profile as CGColorSpaceMBS = image.ColorSpace
// get ICC profile data
dim ICCProfile as string = profile.ICCProfile
// and parse it with LCMS and show name
dim LCMSProfile as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromString(ICCProfile)
MsgBox LCMSProfile.Name
```

**Notes:** Value is a CGColorSpaceMBS.
Returns nil on any error.
(Read only property)

### 56.20.29 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The handle for this image.
**Notes:** Handle is a CGImageRef.
(Read and Write property)

### 56.20.30 height as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the image's height.
**Notes:** Returns 0 on error.
(Read only property)

### 56.20.31 ImageIsMask as boolean

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns true if the image is an image mask, false otherwise.
**Notes:** (Read only property)

### 56.20.32 RenderingIntent as Integer

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the rendering intent of the image.
**Notes:** Constants:

| | |
|---|---|
| kCGRenderingIntentDefault | 0 |
| kCGRenderingIntentAbsoluteColorimetric | 1 |
| kCGRenderingIntentRelativeColorimetric | 2 |
| kCGRenderingIntentPerceptual | 3 |
| kCGRenderingIntentSaturation | 4 |

(Read only property)

### 56.20.33 RetainCount as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the retain count of the CGImageRef.
**Notes:** This is useful for debugging.
The retain count is for the CGImageRef, not the CGImageMBS object.
(Read only property)

### 56.20.34 ShouldInterpolate as boolean

MBS MacCG Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the interpolation parameter of image.
**Notes:** True if the image should use interpolation.
(Read only property)

### 56.20.35 width as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the image's width.
**Notes:** Returns 0 on error.
(Read only property)

### 56.20.36 Constants

Bitmap Info

| Constant | Value | Description |
|---|---|---|
| kCGBitmapAlphaInfoMask | &h1F | The alpha information mask. Use this to extract alpha information that specifies whether a bitmap contains an alpha channel and how the alpha channel is generated. |
| kCGBitmapByteOrder16Big | 12288 | 16-bit, big endian format. |
| kCGBitmapByteOrder16Little | 4096 | 16-bit, little endian format. |
| kCGBitmapByteOrder32Big | 16384 | 32-bit, big endian format. |
| kCGBitmapByteOrder32Little | 8192 | 32-bit, little endian format. |
| kCGBitmapByteOrderDefault | 0 | The default byte order. |
| kCGBitmapByteOrderMask | &h7000 | The byte ordering of pixel formats. |
| kCGBitmapFloatComponents | 256 | The components of a bitmap are floating-point values. |

Alpha Info

| Constant | Value | Description |
|---|---|---|
| kCGImageAlphaFirst | 4 | The alpha component is stored in the most significant bits of each pixel. F example, non-premultiplied ARGB. |
| kCGImageAlphaLast | 3 | The alpha component is stored in the least significant bits of each pixel. F example, non-premultiplied RGBA. |
| kCGImageAlphaNone | 0 | There is no alpha channel. If the total size of the pixel is greater than t space required for the number of color components in the color space, t least significant bits are ignored. This value is equivalent to kCGImageA phaNoneSkipLast. |
| kCGImageAlphaNoneSkipFirst | 6 | There is no alpha channel. If the total size of the pixel is greater than t space required for the number of color components in the color space, the mo significant bits are ignored. |
| kCGImageAlphaNoneSkipLast | 5 | There is no alpha channel. If the total size of the pixel is greater than t space required for the number of color components in the color space, the lea significant bits are ignored. This value is equivalent to kCGImageAlphaNon |
| kCGImageAlphaOnly | 7 | There is no color data, only an alpha channel. |
| kCGImageAlphaPremultipliedFirst | 2 | The alpha component is stored in the most significant bits of each pixel a the color components have already been multiplied by this alpha value. F example, premultiplied ARGB. |
| kCGImageAlphaPremultipliedLast | 1 | The alpha component is stored in the least significant bits of each pixel a the color components have already been multiplied by this alpha value. F example, premultiplied RGBA. |

## 56.21 class CGImageMetadataMBS

### 56.21.1 class CGImageMetadataMBS

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The class for a tag container.
**Blog Entries**

- MBS Xojo Plugins, version 18.6pr1
- MBS Xojo Plugins, version 18.5pr8

### 56.21.2 Methods

### 56.21.3 Constructor

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates an empty metadata object.
See also:

- 56.21.4 Constructor(metadata as CGImageMetadataMBS) 9070

### 56.21.4 Constructor(metadata as CGImageMetadataMBS)

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Copy constructor.
**Notes:** Creates a copy of the metadata.
See also:

- 56.21.3 Constructor 9070

### 56.21.5 CreateFromXMPData(data as MemoryBlock) as CGImageMetadataMBS

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a collection of CGImageMetadataTags from a block of XMP data.
**Notes:** Converts XMP data into a collection of metadata tags.
The data must be a complete XMP tree. XMP packet headers (<?xpacket .. ?>) are supported.

data: The XMP data.

Returns a collection of CGImageMetadata tags. Returns nil if an error occurred.

### 56.21.6 CreateXMPData(options as Dictionary = nil) as MemoryBlock

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Serializes the CGImageMetadataRef to XMP data.
**Notes:** This converts all of the metadata tags to a block of XMP data. Common uses include creating sidecar files that contain metadata for image formats that do not support embedded XMP, or cannot be edited due to other format restrictions (such as proprietary RAW camera formats).

options: should be nil. Options are currently not used, but may be used in future release.

Returns a Memoryblock containing an XMP representation of the metadata. Returns nil if an error occurred.

### 56.21.7 kCFErrorDomainCGImageMetadata as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Error domain for all errors originating in ImageIO for CGImageMetadata APIs.

### 56.21.8 kCGImageMetadataEnumerateRecursively as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A key for the 'options' of Tags function.
**Notes:** If present, the value should be a CFBoolean. If true, tags will be enumerated recursively, if false, only the direct children of 'rootPath' will be enumerated. The default is non-recursive.

### 56.21.9 kCGImageMetadataNamespaceDublinCore as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** Dublin Core

### 56.21.10 kCGImageMetadataNamespaceExif as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** Exif

### 56.21.11 kCGImageMetadataNamespaceExifAux as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** Exif Aux

### 56.21.12 kCGImageMetadataNamespaceExifEX as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** ExifEX

### 56.21.13 kCGImageMetadataNamespaceIPTCCore as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** IPTC Core

### 56.21.14 kCGImageMetadataNamespaceIPTCExtension as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** IPTC Extension

### 56.21.15 kCGImageMetadataNamespacePhotoshop as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** Photoshop

### 56.21.16 kCGImageMetadataNamespaceTIFF as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** TIFF

### 56.21.17 kCGImageMetadataNamespaceXMPBasic as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** XMP Basic

### 56.21.18 kCGImageMetadataNamespaceXMPRights as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the metadata namespaces.
**Notes:** XMP Rights

### 56.21.19 kCGImageMetadataPrefixDublinCore as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** Dublin Core

### 56.21.20 kCGImageMetadataPrefixExif as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** Exif

### 56.21.21 kCGImageMetadataPrefixExifAux as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** Exif Aux

### 56.21.22 kCGImageMetadataPrefixExifEX as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** Exif EX

### 56.21.23 kCGImageMetadataPrefixIPTCCore as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** IPTC Core

### 56.21.24 kCGImageMetadataPrefixIPTCExtension as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** IPTC Extension

### 56.21.25 kCGImageMetadataPrefixPhotoshop as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** Photoshop

### 56.21.26 kCGImageMetadataPrefixTIFF as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** TIFF

### 56.21.27 kCGImageMetadataPrefixXMPBasic as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** XMP Basic

### 56.21.28 kCGImageMetadataPrefixXMPRights as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the common prefix names.
**Notes:** XMP Rights

### 56.21.29 StringValueWithPath(parent as CGImageMetadataTagMBS = nil, path as String) as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Searches for a specific tag in a CGImageMetadataRef and returns its string value.
**Notes:** This is a convenience method for searching for a tag at path and extracting the string value.

parent: A parent tag. If nil, the path is relative to the root of the metadata (i.e. it is not a child of another property).
path: A string with the path to the desired tag. Please consult the documentation of TagWithPath for information about path syntax.

Returns a string from a CGImageMetadataTagMBS located at 'path'. The tag must be of type kTypeString or kTypeAlternateText.
For AlternateText tags, the element with the "x-default" language qualifier will be returned. For other types, "" will be returned.

### 56.21.30 TagMatchingImageProperty(dictionaryName as String, propertyName as String) as Variant

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Searches for a specific CGImageMetadataTag matching an image property constant.
**Notes:** Provides a bridge for values from CGImageCopyPropertiesAtIndex, simplifying access for properties defined in EXIF and IPTC standards, which have no notion of namespaces, prefixes, or XMP property types.

Metadata: Working Group guidance is factored into the mapping of CGImage properties to XMP compatible metadata tags.

For example, kCGImagePropertyExifDateTimeOriginal will get the value of the corresponding XMP tag, which is photoshop:DateCreated. Note that property values will still be in their XMP forms, such as "YYYY-MM-DDThh:mm:ss" for DateTime, rather than the EXIF or IPTC DateTime formats.

dictionaryName: the metadata subdictionary to which the image property belongs, such as kCGImagePropertyExifDictionary or kCGImagePropertyIPTCDictionary. Not all dictionaries and properties are supported at this time.
propertyName: the name of the property. This must be a defined property constant corresponding to the 'dictionaryName'. For example, kCGImagePropertyTIFFOrientation, kCGImagePropertyExifDateTimeOriginal, or kCGImagePropertyIPTCKeywords. A warning will be logged if the CGImageProperty is unsupported by CGImageMetadata.

Returns a CGImageMetadataTagRef with the appropriate namespace, prefix, tag name, and XMP value for the corresponding CGImageProperty. Returns nil if the property could not be found.

### 56.21.31 Tags as CGImageMetadataTagMBS()

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Obtain an array of tags from a metadata object.
See also:

- 56.21.32 Tags(rootPath as string, options as Dictionary = nil) as CGImageMetadataTagMBS() 9076

### 56.21.32 Tags(rootPath as string, options as Dictionary = nil) as CGImageMetadataTagMBS()

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the tags matching the path and options.
**Notes:** This function iterates over all of the tags in a metadata to collect the matching one. The default behavior iterates over all top-level tags in the metadata.

rootPath: Iteration will occur for all children of the tag matching the root path. Please refer to TagWithPath for information about path syntax. If an empty string, the search will be executed for all top-level tags in

the metadata container.
options: A dictionary of options for iterating through the tags.
Currently the only supported option is kCGImageMetadataEnumerateRecursively, which should be set to a boolean.

Returns array with found items.
See also:

- 56.21.31 Tags as CGImageMetadataTagMBS() 9076

### 56.21.33 TagWithPath(parent as CGImageMetadataTagMBS = nil, path as string) as Variant

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Searches for a specific CGImageMetadataTagMBS in a CGImageMetadataMBS.
**Notes:** This is the primary function for clients to obtain specific metadata properties from an image. The 'path' mechanism provides a way to access both simple top-level properties, such as Date & Time, or complex deeply-nested properties with ease.

parent: A parent tag. If nil, the path is relative to the root of the metadata (i.e. it is not a child of another property). If the parent is provided, the effective path will be the concatenation of the parent's path and the 'path' parameter. This is useful for accessing array elements or structure fields inside nested tags.

path: A string representing a path to the desired tag. Paths consist of a tag prefix (i.e. "exif") joined with a tag name (i.e. "Flash") by a colon (":"), such as "exif:Flash".
Elements of ordered and unordered arrays are accessed via 0-based indices inside square [ ] brackets.
Elements of alternate-text arrays are accessed by an RFC 3066 language code inside square [ ] brackets.
Fields of a structure are delimited by a period, ".".
Qualifiers are delimited by the '?' character. Only tags with string values (kTypeString) are allowed to have qualifiers - arrays and structures may not contain qualifiers.

If parent is nil, a prefix must be specified for the first tag. Prefixes for all subsequent tags are optional. If unspecified, the prefix is inherented from the nearest parent tag with a prefix. Custom prefixes must be registered using RegisterNamespaceForPrefix prior to use in any path-based functions.

Examples:

- 'path' = "xmp:CreateDate"
- 'path' = "exif:Flash.Fired"
- 'parent' = tag at path "exif:Flash", path = "exif:Fired" (equivilent to previous)

- 'path' = "exif:Flash.RedEyeMode"
- 'path' = "dc:title"
- 'path' = "dc:subject"
- 'path' = "dc:subject [ 2 ] "
- 'parent' = tag at path "dc:subject", path = " [ 2 ] " (equivilent to previous
- 'path' = "dc:description [ x-default ]
- 'path' = "dc.description [ de ]
- 'path' = "dc.description [ fr ]
- 'path' = "foo:product
- 'path' = "foo:product?bar:manufacturer

Returns a CGImageMetadataTagMBS matching 'path', or nil if no match is found. The copy of the tag's value is shallow. Tags copied from an immutable CGImageMetadataMBS are also immutable. Because this function returns a copy of the tag's value, any modification of the tag's value must be followed by a SetTagWithPath to commit the change to the metadata container.

### 56.21.34 Properties

### 56.21.35 Handle as Integer

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 56.21.36 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorBadArgument | 2 | Bad argument |
| kErrorConflictingArguments | 3 | Conflicting Arguments |
| kErrorPrefixConflict | 4 | Prefix conflict |
| kErrorUnknown | 0 | Unknown error |
| kErrorUnsupportedFormat | 1 | Unsupported Format |

## 56.22 class CGImageMetadataTagMBS

### 56.22.1 class CGImageMetadataTagMBS

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The class for a metadata tag.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr8

### 56.22.2 Methods

### 56.22.3 Constructor

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 56.22.4 Create(XMLNS as String, Prefix as String, Name as String, Type as Integer, Value as Variant) as CGImageMetadataTagMBS

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGImageMetadataTagMBS object.
**Notes:** xmlns: The namespace for the tag. The value can be a common XMP namespace defined above, such as kCGImageMetadataNamespaceExif, or a string with a custom namespace URI. Custom namespaces must be a valid XML namespace. By convention, namespaces should end with either '/' or '#'. For example, exif uses the namespace "http://ns.adobe.com/exif/1.0/".
prefix: An abbreviation for the XML namespace. The value can be empty if the namespace is defined as a constant. Custom prefixes must be a valid XML name. For example, the prefix used for "http://ns.adobe.com/exif/1.0/" is "exif". The XMP serialization of the tag will use the prefix. Prefixes are also important for path-based metadata functions, such as StringValueWithPath or SetValueWithPath.
name: The name of the tag. It must be a valid XMP name.
type: The type of the tag's value. Must be a kType* constant.
value: The value of the tag. Allowable types include string, double, integer, boolean, array, and dictionary. The type of 'value' must correspond to the 'type'. The elements of an array must be either a string or tags itself. The keys of a CFDictionary must be string with valid XMP names. The values of a dictionary must be either strings or tags. A shallow copy of the value is stored in the tag. Therefore, modifying a mutable value after the tag is created will not affect the tag's value.

Returns a new CGImageMetadataTagMBS object. Returns nil if a tag could not be created with the speci-

fied parameters.

### 56.22.5 Qualifiers as CGImageMetadataTagMBS()

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Return a copy of the tag's qualifiers.
**Notes:** XMP allows properties to contain supplemental properties called qualifiers. Qualifiers are themselves CGImageMetadataTagMBS objects with their own namespace, prefix, name, and value. A common use is the xml:lang qualifier for elements of an alternate-text array.

Returns a copy of the array of qualifiers. Elements of the array are CGImageMetadataTagMBS. Returns nil if the tag does not have any qualifiers.

### 56.22.6 Properties

### 56.22.7 Handle as Integer

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 56.22.8 Name as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the tag's name.
**Notes:** (Read only property)

### 56.22.9 Namespace_ as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the tag's namespace.
**Notes:** As Namespace is a reserved word in Xojo, we need to add a _ to get it to compile.
(Read only property)

### 56.22.10 Prefix as String

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the tag's prefix.
**Notes:** (Read only property)

### 56.22.11 Type as Integer

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Get the type of the tag.
**Notes:** Returns a kType constant for the tag.
This is primarily used to determine how to interpret the tag's value.
(Read only property)

### 56.22.12 Value as Variant

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns a shallow copy of the tag's value.
**Notes:** This function should only be used to read the tag's value.
TagWithPath returns the tag (including the tag's value). Therefore mutating a tag's value returned from this function may not actually mutate the value in the CGImageMetadata. It is recommended to create a new tag followed by SetTagWithPath, or use SetValueWithPath to mutate a metadata value.
(Read only property)

### 56.22.13 Constants

Types

| Constant | Value | Description |
|---|---|---|
| kTypeAlternateArray | 4 | An ordered array where all elements are alternates for the same value. Serialized in XMP as <rdf:Alt>. |
| kTypeAlternateText | 5 | A special case of an alternate array where all elements are different localized strings for the same value. Serialized in XMP as an alternate array of strings with xml:lang qualifiers. |
| kTypeArrayOrdered | 3 | An array where order is preserved. Serialized in XMP as <rdf:Seq>. |
| kTypeArrayUnordered | 2 | An array where order does not matter. Serialized in XMP as <rdf:Bag>. |
| kTypeDefault | 0 | The type is taken from the passed value for new tags. |
| kTypeInvalid | -1 | Invalid. |
| kTypeString | 1 | A string value. Number and boolean values will be converted to a string. |
| kTypeStructure | 6 | A collection of keys and values. Unlike array elements, fields of a structure may belong to different namespaces. |

## 56.23 class CGImageSourceMBS

### 56.23.1 class CGImageSourceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The CoreGraphics class for image loading.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim c as new CGImageSourceMBS(file)
dim img as CGImageMBS = c.CreateImageAtIndex(0)

Backdrop=img.Picture
```

**Notes:** CGImageSource objects, available in Mac OS X v10.4 or later, abstract the data-reading task. An image source can read image data from a URL, a file or a string.

After creating a CGImageSource object for the appropriate source, you can obtain images, thumbnails, image properties, and other image information using CGImageSource functions.
**Blog Entries**

- Reading JPEG Thumbnails from EXIF
- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2
- CGImageSourceMBS CreateThumbnailMT method for Xojo
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- Tip of day: Load ICC profile on OS X for any image format with CGImageSource
- Tip of the day: Edit IPTC data in JPEG file with CGImageSource/CGImageDestination
- Tip of the day: Quickly query image size
- MBS REALbasic plug-ins version 9.5

**Xojo Developer Magazine**

- 17.3, page 11: News
- 15.2, page 10: News

### 56.23.2 Methods

### 56.23.3 Constructor(data as string, options as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image source that reads from a string.
**Notes:** data: The data string to read from.
options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

On success the handle value is not zero.
Available in Mac OS X version 10.4 and later.
See also:


- 56.23.4 Constructor(file as folderitem, options as dictionary = nil) 9084
- 56.23.5 Constructor(options as dictionary = nil) 9084


### 56.23.4 Constructor(file as folderitem, options as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image source that reads from a location specified by a file.
**Notes:** url: The URL to read from.

options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

On success the handle value is not zero.

Available in Mac OS X version 10.4 and later.
See also:


- 56.23.3 Constructor(data as string, options as dictionary = nil) 9084
- 56.23.5 Constructor(options as dictionary = nil) 9084


### 56.23.5 Constructor(options as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Create an incremental image source.
**Notes:** options: A dictionary that specifies additional creation options. For example kCGImageSource-

TypeIdentifierHint.

Returns an image source object.

The constructor creates an empty image source container to which you can add data later by calling the function UpdateData. You don't provide data when you call this function.

An incremental image is an image that is created in chunks, similar to the way large images viewed over the web are loaded piece by piece.

Available in Mac OS X version 10.4 and later.
See also:


- 56.23.3 Constructor(data as string, options as dictionary = nil) 9084
- 56.23.4 Constructor(file as folderitem, options as dictionary = nil) 9084


### 56.23.6 CreateImageAtIndex(index as Integer, options as dictionary = nil) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a CGImage object for the image data associated with the specified index in an image source.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim c as new CGImageSourceMBS(file)
dim img as CGImageMBS = c.CreateImageAtIndex(0)

Backdrop=img.Picture
```

**Notes:** index: The index that specifies the location of the image. The index is zero-based.

options: A dictionary that specifies additional creation options.

Returns a CGImage object.

Available in Mac OS X version 10.4 and later.

### 56.23.7 CreateIncremental(options as dictionary=nil) as CGImageSourceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Create an incremental image source.
**Notes:** options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

The function CreateIncremental creates an empty image source container to which you can add data later by calling the function UpdateData. You don't provide data when you call this function.

An incremental image is an image that is created in chunks, similar to the way large images viewed over the web are loaded piece by piece.

Available in Mac OS X version 10.4 and later.

### 56.23.8 CreateThumbnailAtIndex(index as Integer, options as dictionary = nil) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a thumbnail image of the image located at a specified location in an image source.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim c as new CGImageSourceMBS(file)

dim d as new Dictionary
d.Value(c.kCGImageSourceThumbnailMaxPixelSize)=200
d.Value(c.kCGImageSourceCreateThumbnailFromImageIfAbsent)=true

dim img as CGImageMBS = c.CreateThumbnailAtIndex(0,d)

Backdrop=img.Picture
```

**Notes:** index: The index that specifies the location of the image. The index is zero-based.

options: A dictionary that specifies additional creation options.

Returns a CGImageMBS.

If the image source is a PDF, this function creates a 72 dpi image of the PDF page specified by the in-

dex that you pass. You must, however, pass an options dictionary that contains either the kCGImageSourceCreateThumbnailFromImageIfAbsent or kCGImageSourceCreateThumbnailFromImageAlways keys, with the value of the key set to TRUE.

Available in Mac OS X version 10.4 and later.

### 56.23.9 CreateThumbnailMT(data as MemoryBlock, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates thumbnail for image thread friendly.
**Notes:** Data contains the image file data.
ImageIndex is the index of the image in the file to query.
Options contains various flags for options to creating image source and creating thumbnail.

Returns nil in case of any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:


- 56.23.10 CreateThumbnailMT(data as String, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9087
- 56.23.11 CreateThumbnailMT(file as FolderItem, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9088


### 56.23.10 CreateThumbnailMT(data as String, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates thumbnail for image thread friendly.
**Notes:** Data contains the image file data.
ImageIndex is the index of the image in the file to query.
Options contains various flags for options to creating image source and creating thumbnail.

Returns nil in case of any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 56.23.9 CreateThumbnailMT(data as MemoryBlock, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9087
- 56.23.11 CreateThumbnailMT(file as FolderItem, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9088

### 56.23.11 CreateThumbnailMT(file as FolderItem, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS

MBS MacCG Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates thumbnail for image thread friendly.
**Notes:** File refers to image file on disk.
ImageIndex is the index of the image in the file to query.
Options contains various flags for options to creating image source and creating thumbnail.

Returns nil in case of any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 56.23.9 CreateThumbnailMT(data as MemoryBlock, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9087
- 56.23.10 CreateThumbnailMT(data as String, ImageIndex as integer = 0, Options as dictionary = nil) as CGImageMBS 9087

### 56.23.12 CreateWithData(data as string, options as dictionary=nil) as CGImageSourceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image source that reads from a string.
**Notes:** data: The data string to read from.

options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

Returns an image source.
Available in Mac OS X version 10.4 and later.

### 56.23.13 CreateWithFile(file as folderitem, options as dictionary=nil) as CGImageSourceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image source that reads from a location specified by a file.
**Example:**

```
// get a picture file
dim file as FolderItem = SpecialFolder.Desktop.Child("sylwia.jpg")
// get image source
dim source as new CGImageSourceMBS(file)
// read image
dim image as CGImageMBS = source.CreateImageAtIndex(0)
// get Color space from image
dim profile as CGColorSpaceMBS = image.ColorSpace
// get ICC profile data
dim ICCProfile as string = profile.ICCProfile
// and parse it with LCMS and show name
dim LCMSProfile as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromString(ICCProfile)
MsgBox LCMSProfile.Name
```

**Notes:** url: The URL to read from.

options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

Returns an image source.

Available in Mac OS X version 10.4 and later.

### 56.23.14 CreateWithURL(url as string, options as dictionary=nil) as CGImageSourceMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an image source that reads from a location specified by a URL.
**Notes:** url: The URL to read from.

options: A dictionary that specifies additional creation options. For example kCGImageSourceTypeIdentifierHint.

On success the handle value is not zero.

Available in Mac OS X version 10.4 and later.

### 56.23.15 kCGImageProperty8BIMDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an Adobe Photoshop image.

### 56.23.16 kCGImageProperty8BIMLayerNames as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The layer names for an Adobe Photoshop file.

### 56.23.17 kCGImagePropertyCIFFCameraSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The camera serial number.

### 56.23.18 kCGImagePropertyCIFFContinuousDrive as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The continuous drive mode.

### 56.23.19 kCGImagePropertyCIFFDescription as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The camera description..

### 56.23.20 kCGImagePropertyCIFFDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses Camera Image File Format (CIFF).

Available in Mac OS X v10.5 and later.

### 56.23.21 kCGImagePropertyCIFFFirmware as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The firmware version.

### 56.23.22 kCGImagePropertyCIFFFlashExposureComp as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The flash exposure compensation.

### 56.23.23 kCGImagePropertyCIFFFocusMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The focus mode.

### 56.23.24 kCGImagePropertyCIFFImageFileName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The image file name.

### 56.23.25 kCGImagePropertyCIFFImageName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The image name.

### 56.23.26 kCGImagePropertyCIFFImageSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The image serial number.

### 56.23.27 kCGImagePropertyCIFFLensMaxMM as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The maximum lens length.

### 56.23.28 kCGImagePropertyCIFFLensMinMM as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The minimum lens length.

### 56.23.29 kCGImagePropertyCIFFLensModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The lens model.

### 56.23.30 kCGImagePropertyCIFFMeasuredEV as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The measured EV.

### 56.23.31 kCGImagePropertyCIFFMeteringMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The metering mode.

### 56.23.32 kCGImagePropertyCIFFOwnerName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The owner name.

### 56.23.33 kCGImagePropertyCIFFRecordID as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The record ID

### 56.23.34 kCGImagePropertyCIFFReleaseMethod as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The release method.

### 56.23.35 kCGImagePropertyCIFFReleaseTiming as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The release timing.

### 56.23.36 kCGImagePropertyCIFFSelfTimingTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The self timing time.

### 56.23.37 kCGImagePropertyCIFFShootingMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The shooting mode.

### 56.23.38 kCGImagePropertyCIFFWhiteBalanceIndex as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Camera Image File Format (CIFF).
**Notes:** The white balance index.

### 56.23.39 kCGImagePropertyColorModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The color model of the image such as, ”RGB”, ”CMYK”, ”Gray”, or ”Lab”. The value of this key is CFStringRef.

A color model describes how color values are represented mathematically. A color space is a color model combined with a definition of how to interpret values within the model.

### 56.23.40 kCGImagePropertyColorModelCMYK as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Values for the color model property.
**Notes:** A CMYK color model.

### 56.23.41 kCGImagePropertyColorModelGray as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Values for the color model property.
**Notes:** A Gray color model.

### 56.23.42 kCGImagePropertyColorModelLab as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Values for the color model property.
**Notes:** A Lab color model.

### 56.23.43 kCGImagePropertyColorModelRGB as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Values for the color model property.
**Notes:** An RGB color model.

### 56.23.44 kCGImagePropertyDepth as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The number of bits in each color sample of each pixel. If present, this key is a CFNumber value.

### 56.23.45 kCGImagePropertyDNGBackwardVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** The oldest version for which a file is compatible.

### 56.23.46 kCGImagePropertyDNGCameraSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** The camera serial number.

### 56.23.47 kCGImagePropertyDNGDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses the Digital Negative (DNG) archival format.

### 56.23.48 kCGImagePropertyDNGLensInfo as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** Information about the lens used for the image.

### 56.23.49 kCGImagePropertyDNGLocalizedCameraModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** The localized camera model name.

### 56.23.50 kCGImagePropertyDNGUniqueCameraModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** A unique, nonlocalized name for the camera mode.

### 56.23.51 kCGImagePropertyDNGVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses the Digital Negative (DNG) archival format.
**Notes:** An encoding of the four-tier version number.

### 56.23.52 kCGImagePropertyDPIHeight as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The resolution, in dots per inch, in the x dimension. If present, this key is a CFNumber value.

### 56.23.53 kCGImagePropertyDPIWidth as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The resolution, in dots per inch, in the y dimension. If present, this key is a CFNumber value.

### 56.23.54 kCGImagePropertyExifApertureValue as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The aperture value.

### 56.23.55 kCGImagePropertyExifAuxDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** An auxiliary dictionary of key-value pairs for an image that uses Exchangeable Image File Format (EXIF).

### 56.23.56 kCGImagePropertyExifAuxFirmware as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** Firmware information.

### 56.23.57 kCGImagePropertyExifAuxFlashCompensation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** Flash compensation.

### 56.23.58 kCGImagePropertyExifAuxImageNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The image number.

### 56.23.59 kCGImagePropertyExifAuxLensID as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The lens ID.

### 56.23.60 kCGImagePropertyExifAuxLensInfo as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** Lens information.

### 56.23.61 kCGImagePropertyExifAuxLensModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The lens model.

### 56.23.62 kCGImagePropertyExifAuxLensSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The lens serial number.

### 56.23.63 kCGImagePropertyExifAuxOwnerName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The owner name.

### 56.23.64 kCGImagePropertyExifAuxSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the Exif Auxiliary dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The serial number.

### 56.23.65 kCGImagePropertyExifBrightnessValue as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The brightness value.

### 56.23.66 kCGImagePropertyExifCFAPattern as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The color filter array (CFA) pattern, which is the geometric patter of the image sensor for a 1-chip color sensor area.

### 56.23.67 kCGImagePropertyExifColorSpace as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The color space.

### 56.23.68 kCGImagePropertyExifComponentsConfiguration as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The components configuration. For compressed data, specifies that the channels of each component are arranged in increasing numeric order (from first component to the fourth).

### 56.23.69 kCGImagePropertyExifCompressedBitsPerPixel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The compressed bits per pixel.

### 56.23.70 kCGImagePropertyExifContrast as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The contrast applied to the image.

### 56.23.71 kCGImagePropertyExifCustomRendered as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** Special rendering performed on the image data.

### 56.23.72 kCGImagePropertyExifDateTimeDigitized as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The digitized date and time.

### 56.23.73 kCGImagePropertyExifDateTimeOriginal as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The original date and time.

### 56.23.74 kCGImagePropertyExifDeviceSettingDescription as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** For a particular camera mode, indicates the conditions for taking the picture.

### 56.23.75 kCGImagePropertyExifDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses Exchangeable Image File Format (EXIF).

### 56.23.76 kCGImagePropertyExifDigitalZoomRatio as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The digital zoom ratio.

### 56.23.77 kCGImagePropertyExifExposureBiasValue as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The exposure bias value.

### 56.23.78 kCGImagePropertyExifExposureIndex as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The selected exposure index.

### 56.23.79 kCGImagePropertyExifExposureMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The exposure mode setting.

### 56.23.80 kCGImagePropertyExifExposureProgram as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The exposure program.

### 56.23.81 kCGImagePropertyExifExposureTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The exposure time.

### 56.23.82 kCGImagePropertyExifFileSource as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The image source.

### 56.23.83 kCGImagePropertyExifFlash as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The flash status when the image was shot.

### 56.23.84 kCGImagePropertyExifFlashEnergy as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The strobe energy when the image was captures, in beam candle power seconds.

### 56.23.85 kCGImagePropertyExifFlashPixVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The FlashPix version supported by an FPXR file. FlashPix is a format for multi-resolution, tiled images, that facilitates fast onscreen viewing.

### 56.23.86 kCGImagePropertyExifFNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The F number.

### 56.23.87 kCGImagePropertyExifFocalLength as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The focal length.

### 56.23.88 kCGImagePropertyExifFocalLenIn35mmFilm as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The equivalent focal length in 35 mm film.

### 56.23.89 kCGImagePropertyExifFocalPlaneResolutionUnit as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The unit of measurement for the focal plane x and y tags.

### 56.23.90 kCGImagePropertyExifFocalPlaneXResolution as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The number of image-width pixels (x) per focal plane resolution unit.

### 56.23.91 kCGImagePropertyExifFocalPlaneYResolution as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The number of image-height pixels (y)per focal plane resolution unit.

### 56.23.92 kCGImagePropertyExifGainControl as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The gain adjustment applied to the image.

### 56.23.93 kCGImagePropertyExifGamma as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The gamma setting.

### 56.23.94 kCGImagePropertyExifImageUniqueID as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The unique ID of the image.

### 56.23.95 kCGImagePropertyExifISOSpeedRatings as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** ISO speed ratings.

### 56.23.96 kCGImagePropertyExifLightSource as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The light source.

### 56.23.97 kCGImagePropertyExifMakerNote as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** A maker note.

### 56.23.98 kCGImagePropertyExifMaxApertureValue as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The maximum aperture value.

### 56.23.99 kCGImagePropertyExifMeteringMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The metering mode.

### 56.23.100 kCGImagePropertyExifOECF as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The opto-electrical conversion function (OECF), which defines the relationship between the optical input of the camera and the image values.

### 56.23.101 kCGImagePropertyExifPixelXDimension as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The pixel x dimension.

### 56.23.102 kCGImagePropertyExifPixelYDimension as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The pixel y dimension.

### 56.23.103 kCGImagePropertyExifRelatedSoundFile as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** A related sound file.

### 56.23.104 kCGImagePropertyExifSaturation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The saturation applied to the image.

### 56.23.105 kCGImagePropertyExifSceneCaptureType as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The scene capture type (standard, landscape, portrait, night).

### 56.23.106 kCGImagePropertyExifSceneType as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The scene type.

### 56.23.107 kCGImagePropertyExifSensingMethod as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The sensor type of the camera or input device.

### 56.23.108 kCGImagePropertyExifSharpness as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The sharpness applied to the image.

### 56.23.109 kCGImagePropertyExifShutterSpeedValue as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The shutter speed value.

### 56.23.110 kCGImagePropertyExifSpatialFrequencyResponse as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The spatial frequency table and spatial frequency response values in the direction of image width, image height, and diagonal directions. See ISO 12233..

### 56.23.111 kCGImagePropertyExifSpectralSensitivity as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The spectral sensitivity of each channel.

### 56.23.112 kCGImagePropertyExifSubjectArea as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The subject area.

### 56.23.113 kCGImagePropertyExifSubjectDistance as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The distance to the subject, in meters.

### 56.23.114 kCGImagePropertyExifSubjectDistRange as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The subject distance range.

### 56.23.115 kCGImagePropertyExifSubjectLocation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The location of the scene's primary subject.

### 56.23.116 kCGImagePropertyExifSubsecTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The fraction of seconds for the date and time tag.

### 56.23.117 kCGImagePropertyExifSubsecTimeDigitized as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The fraction of seconds for the digitized time tag.

### 56.23.118 kCGImagePropertyExifSubsecTimeOriginal as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The fraction of seconds for the original date and time tag.

### 56.23.119 kCGImagePropertyExifUserComment as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** A user comment.

### 56.23.120 kCGImagePropertyExifVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The version.

### 56.23.121 kCGImagePropertyExifWhiteBalance as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for the (EXIF) dictionary for an image that uses Exchangeable Image File Format (EXIF).
**Notes:** The white balance mode.

### 56.23.122 kCGImagePropertyFileSize as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The size of the image file in bytes, if known. If present, this key is a CFNumber value.
Available in Mac OS X v10.4 and later.

This key is used in the image source properties.

### 56.23.123 kCGImagePropertyGIFDelayTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Graphics Interchange Format (GIF).
**Notes:** The delay time.

### 56.23.124 kCGImagePropertyGIFDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses Graphics Interchange Format (GIF).

### 56.23.125 kCGImagePropertyGIFHasGlobalColorMap as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Graphics Interchange Format (GIF).
**Notes:** Whether or not the GIF has a global color map.

### 56.23.126 kCGImagePropertyGIFImageColorMap as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Graphics Interchange Format (GIF).
**Notes:** The image color map.

### 56.23.127 kCGImagePropertyGIFLoopCount as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Graphics Interchange Format (GIF).
**Notes:** The loop count.

### 56.23.128 kCGImagePropertyGIFUnclampedDelayTime as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The unclamped delay time.
Available in OS X v10.7 and later.

### 56.23.129 kCGImagePropertyGPSAltitude as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The altitude.

### 56.23.130 kCGImagePropertyGPSAltitudeRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The reference altitude.

### 56.23.131 kCGImagePropertyGPSAreaInformation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The name of the GPS area.

### 56.23.132 kCGImagePropertyGPSDateStamp as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The data and time information relative to Coordinated Universal Time (UTC).

### 56.23.133 kCGImagePropertyGPSDestBearing as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The bearing to the destination point.

### 56.23.134 kCGImagePropertyGPSDestBearingRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The reference for giving the bearing to the destination point.

### 56.23.135 kCGImagePropertyGPSDestDistance as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The distance to the destination point.

### 56.23.136 kCGImagePropertyGPSDestDistanceRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The units for expressing the distance to the destination point.

### 56.23.137 kCGImagePropertyGPSDestLatitude as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The latitude of the destination point.

### 56.23.138 kCGImagePropertyGPSDestLatitudeRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** Whether the latitude of the destination point is northern or southern.

### 56.23.139 kCGImagePropertyGPSDestLongitude as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The longitude of the destination point.

### 56.23.140 kCGImagePropertyGPSDestLongitudeRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** Whether the longitude of the destination point is east or west.

### 56.23.141 kCGImagePropertyGPSDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that has Global Positioning System (GPS) information.

### 56.23.142 kCGImagePropertyGPSDifferental as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** Whether differential correction is applied to the GPS receiver.

### 56.23.143 kCGImagePropertyGPSDOP as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The data degree of precision (DOP).

### 56.23.144 kCGImagePropertyGPSImgDirection as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The direction of the image.

### 56.23.145 kCGImagePropertyGPSImgDirectionRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The reference for the direction of the image.

### 56.23.146 kCGImagePropertyGPSLatitude as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The latitude.

### 56.23.147 kCGImagePropertyGPSLatitudeRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** Whether the latitude is northern or southern.

### 56.23.148 kCGImagePropertyGPSLongitude as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The longitude.

### 56.23.149 kCGImagePropertyGPSLongitudeRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** Whether the longitude is east or west.

### 56.23.150 kCGImagePropertyGPSMapDatum as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The geodetic survey data used by the GPS receiver.

### 56.23.151 kCGImagePropertyGPSMeasureMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The measurement mode.

### 56.23.152 kCGImagePropertyGPSProcessingMethod as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The name of the method used for finding a location.

### 56.23.153 kCGImagePropertyGPSSatellites as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The satellites used for GPS measurements.

### 56.23.154 kCGImagePropertyGPSSpeed as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The GPS receiver speed of movement.

### 56.23.155 kCGImagePropertyGPSSpeedRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The unit for expressing the GPS receiver speed of movement.

### 56.23.156 kCGImagePropertyGPSStatus as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The status of the GPS receiver.

### 56.23.157 kCGImagePropertyGPSTimeStamp as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The time as UTC (Coordinated Universal Time).

### 56.23.158 kCGImagePropertyGPSTrack as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The direction of GPS receiver movement.

### 56.23.159 kCGImagePropertyGPSTrackRef as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The reference for the direction of GPS receiver movement.

### 56.23.160 kCGImagePropertyGPSVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that has Global Positioning System (GPS) information.
**Notes:** The version.

### 56.23.161 kCGImagePropertyHasAlpha as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Whether or not the image has an alpha channel. The value of this key is kCFBooleanTrue if the image contains an alpha channel.

### 56.23.162 kCGImagePropertyIPTCActionAdvised as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The advised action.

### 56.23.163 kCGImagePropertyIPTCByline as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The byline.

### 56.23.164 kCGImagePropertyIPTCBylineTitle as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The byline title.

### 56.23.165 kCGImagePropertyIPTCCaptionAbstract as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The caption abstract.

### 56.23.166 kCGImagePropertyIPTCCategory as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The category.

### 56.23.167 kCGImagePropertyIPTCCity as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The city.

### 56.23.168 kCGImagePropertyIPTCContact as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** Contact information.

### 56.23.169 kCGImagePropertyIPTCContactInfoAddress as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The address portion of the contact information.
Available in OS X v10.6 and later.

### 56.23.170 kCGImagePropertyIPTCContactInfoCity as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The city portion of the contact information.
Available in OS X v10.6 and later.

### 56.23.171 kCGImagePropertyIPTCContactInfoCountry as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The country portion of the contact information.
Available in OS X v10.6 and later.

### 56.23.172 kCGImagePropertyIPTCContactInfoEmails as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Email addresses for the contact.
Available in OS X v10.6 and later.

### 56.23.173 kCGImagePropertyIPTCContactInfoPhones as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Phone numbers for the contact.
Available in OS X v10.6 and later.

### 56.23.174 kCGImagePropertyIPTCContactInfoPostalCode as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The postal code portion of the contact information.
Available in OS X v10.6 and later.

### 56.23.175 kCGImagePropertyIPTCContactInfoStateProvince as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The state or province for the contact.
Available in OS X v10.6 and later.

### 56.23.176 kCGImagePropertyIPTCContactInfoWebURLs as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Web addresses for the contact.
Available in OS X v10.6 and later.

### 56.23.177 kCGImagePropertyIPTCContentLocationCode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The content location code.

### 56.23.178 kCGImagePropertyIPTCContentLocationName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The content location name.

### 56.23.179 kCGImagePropertyIPTCCopyrightNotice as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The copyright notice.

### 56.23.180 kCGImagePropertyIPTCCountryPrimaryLocationCode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The country primary location code.

### 56.23.181 kCGImagePropertyIPTCCountryPrimaryLocationName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The country primary location name.

### 56.23.182 kCGImagePropertyIPTCCreatorContactInfo as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The creator's contact info. See "IPTC Creator Contact Info Dictionary Keys."
Available in OS X v10.6 and later.

### 56.23.183 kCGImagePropertyIPTCCredit as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** Credit information.

### 56.23.184 kCGImagePropertyIPTCDateCreated as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The date created.

### 56.23.185 kCGImagePropertyIPTCDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Example:**

```
// Change rotation in an image file

// files
dim dpath as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim opath as folderitem = dpath.parent.Child("output.jpg")

// open source
dim imageSource as new cgimagesourcembs(dpath)

// read image
dim img as cgimagembs = imageSource.createimageatindex(0)

// global properties
dim globalprop as dictionary = imageSource.properties
// per image properties
dim p as Dictionary = imageSource.PropertiesAtIndex(0)

dim imageDest as new CGImageDestinationMBS(opath,"public.jpeg",1)

'const orientation = 1 // top left
const orientation = 3 // bottom right

// set globals
imageDest.SetProperties(globalprop)

// now set new orientation
p.value(imageDest.kCGImageDestinationOrientation) = orientation
p.value(imageDest.kCGImageDestinationMergeMetadata) = true

// change tiff dictionary, if present
dim dTIFF as Dictionary = p.lookup(imageSource.kCGImagePropertyTIFFDictionary, nil)
if dTIFF <>nil then
dTIFF.value(imageSource.kCGImagePropertyTIFFOrientation) = orientation
```

```
end if

// change iptc dictionary, if present
dim dIPTC as Dictionary = p.lookup(imageSource.kCGImagePropertyIPTCDictionary, nil)
if dIPTC <>nil then
dIPTC.value(imageSource.kCGImagePropertyIPTCImageOrientation) = orientation
end if

// write out image
imageDest.AddImage(img,p)
call imageDest.Finalize
```

**Notes:** A dictionary of key-value pairs for an image that uses International Press Telecommunications Council (IPTC) metadata.

IPTC constants are metadata elements of the Information Interchange Model (IIM) used to provide information about images. The IIM was developer by the Newspaper Association of America (NAA) and the International Press Telecommunications Council (IPTC).

### 56.23.186 kCGImagePropertyIPTCDigitalCreationDate as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The digital creation date.

### 56.23.187 kCGImagePropertyIPTCDigitalCreationTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The digital creation time.

### 56.23.188 kCGImagePropertyIPTCEditorialUpdate as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** An editorial update.

### 56.23.189 kCGImagePropertyIPTCEditStatus as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The edit status.

### 56.23.190 kCGImagePropertyIPTCExpirationDate as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The expiration date.

### 56.23.191 kCGImagePropertyIPTCExpirationTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The expiration time.

### 56.23.192 kCGImagePropertyIPTCFixtureIdentifier as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** A fixture identifier.

### 56.23.193 kCGImagePropertyIPTCHeadline as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The headline.

### 56.23.194 kCGImagePropertyIPTCImageOrientation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The image orientation.

### 56.23.195 kCGImagePropertyIPTCImageType as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The image type.

### 56.23.196 kCGImagePropertyIPTCKeywords as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** Keywords

### 56.23.197 kCGImagePropertyIPTCLanguageIdentifier as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The language identifier.

### 56.23.198 kCGImagePropertyIPTCObjectAttributeReference as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The object attribute.

### 56.23.199 kCGImagePropertyIPTCObjectCycle as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The object cycle.

### 56.23.200 kCGImagePropertyIPTCObjectName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The object name.

### 56.23.201 kCGImagePropertyIPTCObjectTypeReference as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The object type.

### 56.23.202 kCGImagePropertyIPTCOriginalTransmissionReference as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The original transmission reference.

### 56.23.203 kCGImagePropertyIPTCOriginatingProgram as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The originating program.

### 56.23.204 kCGImagePropertyIPTCProgramVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The program version.

### 56.23.205 kCGImagePropertyIPTCProvinceState as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The province or state.

### 56.23.206 kCGImagePropertyIPTCReferenceDate as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The reference date.

### 56.23.207 kCGImagePropertyIPTCReferenceNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The reference number.

### 56.23.208 kCGImagePropertyIPTCReferenceService as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The reference service.

### 56.23.209 kCGImagePropertyIPTCReleaseDate as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The release date.

### 56.23.210 kCGImagePropertyIPTCReleaseTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The release time.

### 56.23.211 kCGImagePropertyIPTCRightsUsageTerms as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The usage rights for the image.
Available in OS X v10.6 and later.

### 56.23.212 kCGImagePropertyIPTCScene as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The scene codes for the image; a scene code is a six-digit string.
Available in OS X v10.6 and later.

### 56.23.213 kCGImagePropertyIPTCSource as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The source.

### 56.23.214 kCGImagePropertyIPTCSpecialInstructions as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** Special instructions.

### 56.23.215 kCGImagePropertyIPTCStarRating as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The star rating.

### 56.23.216 kCGImagePropertyIPTCSubjectReference as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The subject.

### 56.23.217 kCGImagePropertyIPTCSubLocation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The sublocation.

### 56.23.218 kCGImagePropertyIPTCSupplementalCategory as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** A supplemental category.

### 56.23.219 kCGImagePropertyIPTCTimeCreated as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The time created.

### 56.23.220 kCGImagePropertyIPTCUrgency as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The urgency level.

### 56.23.221 kCGImagePropertyIPTCWriterEditor as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.
**Notes:** The writer or editor.

### 56.23.222 kCGImagePropertyIsFloat as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Whether or not the image contains floating-point pixel samples. The value of this key is kCFBooleanTrue if the image contains them.

### 56.23.223 kCGImagePropertyIsIndexed as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** Whether or not the image contains indexed pixel samples (sometimes called paletted samples). The value of this key is kCFBooleanTrue if the image contains them.

### 56.23.224 kCGImagePropertyJFIFDensityUnit as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses JPEG File Interchange Format (JFIF).
**Notes:** The density unit.

### 56.23.225 kCGImagePropertyJFIFDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses JPEG File Interchange Format (JFIF).

### 56.23.226 kCGImagePropertyJFIFIsProgressive as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses JPEG File Interchange Format (JFIF).
**Notes:** Whether or not the image is progressive.

### 56.23.227 kCGImagePropertyJFIFVersion as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses JPEG File Interchange Format (JFIF).
**Notes:** The version.

### 56.23.228 kCGImagePropertyJFIFXDensity as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses JPEG File Interchange Format (JFIF).
**Notes:** The x density.

### 56.23.229 kCGImagePropertyJFIFYDensity as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses JPEG File Interchange Format (JFIF).
**Notes:** The y density.

### 56.23.230 kCGImagePropertyMakerCanonAspectRatioInfo as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The image aspect ratio.

### 56.23.231 kCGImagePropertyMakerCanonCameraSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The camera serial number.

### 56.23.232 kCGImagePropertyMakerCanonContinuousDrive as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The presence of a continuous drive.

### 56.23.233 kCGImagePropertyMakerCanonDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Canon camera.
Available in Mac OS X v10.5 and later.

### 56.23.234 kCGImagePropertyMakerCanonFirmware as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The firmware version.

### 56.23.235 kCGImagePropertyMakerCanonFlashExposureComp as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The flash exposure compensation.

### 56.23.236 kCGImagePropertyMakerCanonImageSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The image serial number.

### 56.23.237 kCGImagePropertyMakerCanonLensModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The lens model.

### 56.23.238 kCGImagePropertyMakerCanonOwnerName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The owner name.

### 56.23.239 kCGImagePropertyMakerFujiDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Fuji camera.
Available in Mac OS X v10.5 and later.

### 56.23.240 kCGImagePropertyMakerMinoltaDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Minolta camera.
Available in Mac OS X v10.5 and later.

### 56.23.241 kCGImagePropertyMakerNikonCameraSerialNumber as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The camera serial number.

### 56.23.242 kCGImagePropertyMakerNikonColorMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The color mode.

### 56.23.243 kCGImagePropertyMakerNikonDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Nikon camera.
Available in Mac OS X v10.5 and later.

### 56.23.244 kCGImagePropertyMakerNikonDigitalZoom as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The digital zoom setting.

### 56.23.245 kCGImagePropertyMakerNikonFlashExposureComp as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The flash exposure compensation.

### 56.23.246 kCGImagePropertyMakerNikonFlashSetting as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The flash setting.

### 56.23.247 kCGImagePropertyMakerNikonFocusDistance as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The focus distance.

### 56.23.248 kCGImagePropertyMakerNikonFocusMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The focus mode.

### 56.23.249 kCGImagePropertyMakerNikonImageAdjustment as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** Image adjustment setting.

### 56.23.250 kCGImagePropertyMakerNikonISOSelection as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The ISO selection.

### 56.23.251 kCGImagePropertyMakerNikonISOSetting as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The ISO setting.

### 56.23.252 kCGImagePropertyMakerNikonLensAdapter as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The lens adapter.

### 56.23.253 kCGImagePropertyMakerNikonLensInfo as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** Lens information.

### 56.23.254 kCGImagePropertyMakerNikonLensType as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The lens type.

### 56.23.255 kCGImagePropertyMakerNikonQuality as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The quality setting.

### 56.23.256 kCGImagePropertyMakerNikonSharpenMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The sharpening mode.

### 56.23.257 kCGImagePropertyMakerNikonShootingMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The shooting mode.

### 56.23.258 kCGImagePropertyMakerNikonShutterCount as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The shutter count.

### 56.23.259 kCGImagePropertyMakerNikonWhiteBalanceMode as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image from a Nikon camera.
**Notes:** The white balance mode.

### 56.23.260 kCGImagePropertyMakerOlympusDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Olympus camera.
Available in Mac OS X v10.5 and later.

### 56.23.261 kCGImagePropertyMakerPentaxDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image from a Pentax camera.
Available in Mac OS X v10.5 and later.

### 56.23.262 kCGImagePropertyOrientation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The intended display orientation of the image. If present, this key is a CFNumber value with the same value as defined by the TIFF and EXIF specifications. The value specifies where the origin (0,0) of the image is locates, as shown in Table 1. If not present, a value of 1 is assumed.

| Value | Location of the origin of the image |
|---|---|
| 1 | Top, left |
| 2 | Top, right |
| 3 | Bottom, right |
| 4 | Bottom, left |
| 5 | Left, top |
| 6 | Right, top |
| 7 | Right, bottom |
| 8 | Left, bottom |

### 56.23.263 kCGImagePropertyPixelHeight as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Example:**

```
// open an image file
dim path as string = "/Library/Desktop Pictures/Galaxy.jpg"
dim f as FolderItem = GetFolderItem(path, FolderItem.PathTypeNative)
Dim c As New CGImageSourceMBS(f)

// properties for first image
dim p as Dictionary = c.PropertiesAtIndex(0)
dim w as Integer = p.Value(c.kCGImagePropertyPixelWidth)
dim h as Integer = p.Value(c.kCGImagePropertyPixelHeight)

// show size
MsgBox str(w)+" x "+str(h)
```

**Notes:** The number of pixels in the y dimension. If present, this key is a CFNumber value.

### 56.23.264 kCGImagePropertyPixelWidth as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Example:**

```
// open an image file
dim path as string = "/Library/Desktop Pictures/Galaxy.jpg"
dim f as FolderItem = GetFolderItem(path, FolderItem.PathTypeNative)
```

```
Dim c As New CGImageSourceMBS(f)

// properties for first image
dim p as Dictionary = c.PropertiesAtIndex(0)
dim w as Integer = p.Value(c.kCGImagePropertyPixelWidth)
dim h as Integer = p.Value(c.kCGImagePropertyPixelHeight)

// show size
MsgBox str(w)+" x "+str(h)
```

**Notes:** The number of pixels in the x dimension. If present, this key is a CFNumber value.

### 56.23.265 kCGImagePropertyPNGAuthor as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that identifies the author of the image.
Available in OS X v10.7 and later.

### 56.23.266 kCGImagePropertyPNGChromaticities as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The chromaticities.

### 56.23.267 kCGImagePropertyPNGCopyright as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that identifies the copyright of the image.
Available in OS X v10.7 and later.

### 56.23.268 kCGImagePropertyPNGCreationTime as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that identifies the date and time the image was created.
Available in OS X v10.7 and later.

### 56.23.269 kCGImagePropertyPNGDescription as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that describes the image.
Available in OS X v10.7 and later.

### 56.23.270 kCGImagePropertyPNGDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that uses Portable Network Graphics (PNG) format.

### 56.23.271 kCGImagePropertyPNGGamma as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The gamma value.

### 56.23.272 kCGImagePropertyPNGInterlaceType as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The interlace type.

### 56.23.273 kCGImagePropertyPNGModificationTime as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that identifies the last date and time the image was modified.

Available in OS X v10.7 and later.

### 56.23.274 kCGImagePropertyPNGSoftware as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that identifies the software used to create the image.
Available in OS X v10.7 and later.

### 56.23.275 kCGImagePropertyPNGsRGBIntent as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The sRGB intent.

### 56.23.276 kCGImagePropertyPNGTitle as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** The content is a string that holds the image's title.
Available in OS X v10.7 and later.

### 56.23.277 kCGImagePropertyPNGXPixelsPerMeter as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The number of x pixels per meter.

### 56.23.278 kCGImagePropertyPNGYPixelsPerMeter as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Portable Network Graphics (PNG) format.
**Notes:** The number of y pixels per meter.

### 56.23.279 kCGImagePropertyProfileName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** The name of the optional ICC profile embedded in the image, if known. If present, the value of this key is a CFStringRef.

### 56.23.280 kCGImagePropertyRawDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Notes:** A dictionary of key-value pairs for an image that contains minimally processed, or raw, data.

### 56.23.281 kCGImagePropertyTIFFArtist as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The artist.

### 56.23.282 kCGImagePropertyTIFFCompression as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The compression scheme used on the image data.

### 56.23.283 kCGImagePropertyTIFFCopyright as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** Copyright information.

### 56.23.284 kCGImagePropertyTIFFDateTime as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The date and time.

### 56.23.285 kCGImagePropertyTIFFDictionary as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** One of the keys for the properties dictionary.
**Example:**

```
// Change rotation in an image file

// files
dim dpath as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim opath as folderitem = dpath.parent.Child("output.jpg")

// open source
dim imageSource as new cgimagesourcembs(dpath)

// read image
dim img as cgimagembs = imageSource.createimageatindex(0)

// global properties
dim globalprop as dictionary = imageSource.properties
// per image properties
dim p as Dictionary = imageSource.PropertiesAtIndex(0)

dim imageDest as new CGImageDestinationMBS(opath,"public.jpeg",1)

'const orientation = 1 // top left
const orientation = 3 // bottom right

// set globals
imageDest.SetProperties(globalprop)

// now set new orientation
p.value(imageDest.kCGImageDestinationOrientation) = orientation
p.value(imageDest.kCGImageDestinationMergeMetadata) = true

// change tiff dictionary, if present
dim dTIFF as Dictionary = p.lookup(imageSource.kCGImagePropertyTIFFDictionary, nil)
if dTIFF <>nil then
dTIFF.value(imageSource.kCGImagePropertyTIFFOrientation) = orientation
end if

// change iptc dictionary, if present
dim dIPTC as Dictionary = p.lookup(imageSource.kCGImagePropertyIPTCDictionary, nil)
```

```
if dIPTC <>nil then
dIPTC.value(imageSource.kCGImagePropertyIPTCImageOrientation) = orientation
end if

// write out image
imageDest.AddImage(img,p)
call imageDest.Finalize
```

**Notes:** A dictionary of key-value pairs for an image that uses Tagged Image File Format (TIFF).

### 56.23.286 kCGImagePropertyTIFFDocumentName as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The document name.

### 56.23.287 kCGImagePropertyTIFFHostComputer as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The computer or operation system used when the image was created.

### 56.23.288 kCGImagePropertyTIFFImageDescription as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The image description.

### 56.23.289 kCGImagePropertyTIFFMake as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The camera or input device make.

### 56.23.290 kCGImagePropertyTIFFModel as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** A camera or input device model.

### 56.23.291 kCGImagePropertyTIFFOrientation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Example:**

```
// Change rotation in an image file

// files
dim dpath as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim opath as folderitem = dpath.parent.Child("output.jpg")

// open source
dim imageSource as new cgimagesourcembs(dpath)

// read image
dim img as cgimagembs = imageSource.createimageatindex(0)

// global properties
dim globalprop as dictionary = imageSource.properties
// per image properties
dim p as Dictionary = imageSource.PropertiesAtIndex(0)

dim imageDest as new CGImageDestinationMBS(opath,"public.jpeg",1)

'const orientation = 1 // top left
const orientation = 3 // bottom right

// set globals
imageDest.SetProperties(globalprop)

// now set new orientation
p.value(imageDest.kCGImageDestinationOrientation) = orientation
p.value(imageDest.kCGImageDestinationMergeMetadata) = true

// change tiff dictionary, if present
dim dTIFF as Dictionary = p.lookup(imageSource.kCGImagePropertyTIFFDictionary, nil)
if dTIFF <>nil then
dTIFF.value(imageSource.kCGImagePropertyTIFFOrientation) = orientation
```

```
end if

// change iptc dictionary, if present
dim dIPTC as Dictionary = p.lookup(imageSource.kCGImagePropertyIPTCDictionary, nil)
if dIPTC <>nil then
dIPTC.value(imageSource.kCGImagePropertyIPTCImageOrientation) = orientation
end if

// write out image
imageDest.AddImage(img,p)
call imageDest.Finalize
```

**Notes:** The image orientation.

### 56.23.292 kCGImagePropertyTIFFPhotometricInterpretation as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The color space of the image data.

### 56.23.293 kCGImagePropertyTIFFPrimaryChromaticities as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The chromaticities of the primaries of the image.

### 56.23.294 kCGImagePropertyTIFFResolutionUnit as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The units of resolution.

### 56.23.295 kCGImagePropertyTIFFSoftware as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The name and version of the software used for image creation.

### 56.23.296 kCGImagePropertyTIFFTransferFunction as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The transfer function, in tabular format, used to map pixel components from a nonlinear form into a linear form.

### 56.23.297 kCGImagePropertyTIFFWhitePoint as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The white point.

### 56.23.298 kCGImagePropertyTIFFXResolution as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The number of pixels per resolution unit in the image width direction.

### 56.23.299 kCGImagePropertyTIFFYResolution as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Keys for an image that uses Tagged Image File Format (TIFF).
**Notes:** The number of pixels per resolution unit in the image height direction.

### 56.23.300 kCGImageSourceCreateThumbnailFromImageAlways as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies whether a thumbnail should be created from the full image even if a thumbnail is present in the image source file. The thumbnail will be created from the full image, subject to the limit specified by kCGImageSourceThumbnailMaxPixelSize — if a maximum pixel size isn't specified, then the thumbnail will

be the size of the full image, which probably isn't what you want. The value of this key must be a Boolean; the default value of this key is False.

### 56.23.301 kCGImageSourceCreateThumbnailFromImageIfAbsent as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies whether a thumbnail should be automatically created for an image if a thumbnail isn't present in the image source file. The thumbnail will be created from the full image, subject to the limit specified by kCGImageSourceThumbnailMaxPixelSize—if a maximum pixel size isn't specified, then the thumbnail will be the size of the full image, which probably isn't what you want. The value of this key must be a Boolean; the default value of this key is False.

### 56.23.302 kCGImageSourceCreateThumbnailWithTransform as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies whether the thumbnail should be rotated and scaled according to the orientation and pixel aspect ratio of the full image. The value of this key must be a Boolean; the default value of this key is False.

### 56.23.303 kCGImageSourceShouldAllowFloat as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies whether the image should be returned as a floating point CGImage if supported by the file format. Extended range floating point CGImage may require additional processing to render pleasingly. The value of this key must be a Boolean; the default value is False.

### 56.23.304 kCGImageSourceShouldCache as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies whether the image should be cached in a decoded form. The value of this key must be a Boolean; the default value is False.

### 56.23.305 kCGImageSourceShouldCacheImmediately as string

MBS MacCG Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** One of the keys for the options dictionary.
**Notes:** Specifies whether image decoding and caching should happen at image creation time.
The value of this key must be a boolean. The default value is kCFBooleanFalse (image decoding will happen at rendering time).

### 56.23.306 kCGImageSourceThumbnailMaxPixelSize as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies the maximum width and height in pixels of a thumbnail. If this this key is not specified, the width and height of a thumbnail is not limited and thumbnails may be as big as the image itself. If present, this value of this key must be an Integer.

### 56.23.307 kCGImageSourceTypeIdentifierHint as string

MBS MacCG Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the key names for the properties.
**Notes:** Specifies the "best guess" of the type identifier for the format of the image source file. If specified, the value of this key must be a String. For more information about type identifiers, see "UTType.h" in the

Application Services framework.

### 56.23.308 Properties(options as dictionary = nil) as dictionary

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the properties of the image source.
**Example:**

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

// reading the picture
dim c as new CGImageSourceMBS(inputfile)
dim img as CGImageMBS = c.CreateImageAtIndex(0)
dim propertiesGlobal as Dictionary = c.Properties
dim propertiesImage as Dictionary = c.PropertiesAtIndex(0)

dim outputFile as FolderItem = SpecialFolder.Desktop.Child("output.jpg")
dim d as new CGImageDestinationMBS(outputFile, "public.jpeg", 1)

// writing the picture and include metadata
d.SetProperties(propertiesGlobal)
d.AddImage(img, propertiesImage)
if d.FinalizeMT then
outputFile.Launch
else
MsgBox "Failed to write jpeg."
end if
```

**Notes:** options: A dictionary you can use to request additional options.
Returns a dictionary that contains the properties associated with the image source container.
These properties apply to the container in general but not necessarily to any individual image contained in the image source.
Available in Mac OS X version 10.4 and later.

### 56.23.309 PropertiesAtIndex(index as Integer, options as dictionary = nil) as dictionary

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the properties of the image at a specified location in an image source.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
```

```
dim c as new CGImageSourceMBS(file)

dim d as Dictionary = c.PropertiesAtIndex(0)

dim e as Dictionary
e=d.Value(c.kCGImagePropertyExifDictionary)

if e<>Nil then
dim keys(-1) as Variant = e.Keys
dim lines(-1) as string

for each key as string in keys
lines.Append key+": "+e.Value(key)
next

MsgBox "Exif: "+EndOfLine+EndOfLine+Join(lines,EndOfLine)
end if

e=d.Value(c.kCGImagePropertyGPSDictionary)

if e<>Nil then
dim keys(-1) as Variant = e.Keys
dim lines(-1) as string

for each key as string in keys
lines.Append key+": "+e.Value(key)
next

MsgBox "GPS: "+EndOfLine+EndOfLine+Join(lines,EndOfLine)
end if
```

**Notes:** index: The index of the image whose properties you want to obtain. The index is zero-based.
options: A dictionary you can use to request additional options.
Returns a dictionary that contains the properties associated with the image.
Available in Mac OS X version 10.4 and later.

### 56.23.310 PropertiesAtIndexCF(index as Integer, options as Variant = nil) as Variant

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns the properties of the image at a specified location in an image source.
**Notes:** index: The index of the image whose properties you want to obtain. The index is zero-based.
options: A dictionary or CFDictionaryMBS you can use to request additional options.

Returns a CFDictionaryMBS that contains the properties associated with the image.
Available in Mac OS X version 10.4 and later.

### 56.23.311 PropertiesCF(options as Variant = nil) as Variant

MBS MacCG Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns the properties of the image source.
**Notes:** options: A dictionary or CFDictionaryMBS you can use to request additional options.
Returns a CFDictionaryMBS that contains the properties associated with the image source container.
These properties apply to the container in general but not necessarily to any individual image contained in the image source.
Available in Mac OS X version 10.4 and later.

### 56.23.312 StatusAtIndex(index as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the current status of an image that is at a specified location in an image source.
**Notes:** index: The index of the image whose status you want to obtain. The index is zero-based.

Returns the current status of the image.

The status is particularly informative for incremental image sources, but may also be used by clients that provide non-incremental data.

Available in Mac OS X version 10.4 and later.

### 56.23.313 TypeIdentifiers as string()

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns an array of uniform type identifiers (UTIs) that are supported for image sources.
**Example:**

```
dim s(-1) as string = CGImageSourceMBS.TypeIdentifiers

MsgBox Join(s,EndOfLine)

// shows:
//
// public.png
```

```
// public.jpeg
// com.compuserve.gif
// public.jpeg-2000
// com.adobe.raw-image
// com.leafamerica.raw-image
// com.hasselblad.fff-raw-image
// com.hasselblad.3fr-raw-image
// com.nikon.raw-image
// com.nikon.nrw-raw-image
// com.pentax.raw-image
// com.sony.sr2-raw-image
// com.sony.arw-raw-image
// com.epson.raw-image
// com.kodak.raw-image
// public.tiff
// com.apple.icns
// com.canon.tif-raw-image
// com.canon.cr2-raw-image
// com.canon.crw-raw-image
// com.fuji.raw-image
// com.panasonic.raw-image
// com.panasonic.rw2-raw-image
// com.panasonic.rwl-raw-image
// com.leica.pwl-raw-image
// com.konicaminolta.raw-image
// com.olympus.raw-image
// com.olympus.raw-image
// com.sony.raw-image
// com.adobe.photoshop-image
// com.adobe.pdf
// com.adobe.illustrator.ai-image
// com.microsoft.ico
// com.microsoft.bmp
// public.xbitmap-image
// com.microsoft.cur
// com.apple.pict
// com.truevision.tga-image
// com.sgi.sgi-image
// com.apple.quicktime-image
// com.kodak.flashpix-image
// com.apple.macpaint-image
// com.ilm.openexr-image
// public.radiance
```

**Notes:** Returns an array of the UTIs that are supported for image sources.

See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

Available in Mac OS X version 10.4 and later.

### 56.23.314 UpdateData(data as string, final as boolean)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Updates an incremental image source with new data.
**Notes:** data: The data to add to the image source. Each time you call the function UpdateData, the data parameter must contain all of the image file data accumulated so far.

final: A value that specifies whether the data is the final set. Pass true if it is, false otherwise.

Available in Mac OS X version 10.4 and later.

### 56.23.315 Properties

### 56.23.316 Count as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the number of images (not including thumbnails) in the image source.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim c as new CGImageSourceMBS(file)

MsgBox str(c.Count)+" images in this file."
```

**Notes:** The number of images. If the image source is a multilayered PSD file, the function returns 1.

This function does not extract the layers of a PSD file.

Available in Mac OS X version 10.4 and later.
(Read only property)

### 56.23.317 Handle as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The internal reference.
**Notes:** (Read and Write property)

### 56.23.318 Status as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Return the status of an image source.
**Notes:** Returns the current status of the image source.

The status is particularly informative for incremental image sources, but may also be used by clients that provide non-incremental data.

Available in Mac OS X version 10.4 and later.
(Read only property)

### 56.23.319 Type as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the uniform type identifier of the source container.
**Notes:** The uniform type identifier of the image.

The uniform type identifier (UTI) of the source container can be different from the type of the images in the container. For example, the .icns format supports embedded JPEG2000. The type of the source container is "com.apple.icns" but type of the images is JPEG2000.

Available in Mac OS X version 10.4 and later.
(Read only property)

### 56.23.320 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGImageStatusComplete | 0 | One of the status constants.<br>The operation is complete. |
| kCGImageStatusIncomplete | -1 | One of the status constants.<br>The operation is not complete. |
| kCGImageStatusInvalidData | -4 | One of the status constants.<br>The data is not valid. |
| kCGImageStatusReadingHeader | -2 | One of the status constants.<br>In the process of reading the header. |
| kCGImageStatusUnexpectedEOF | -5 | One of the status constants.<br>The end of the file was encountered unexpectedly. |
| kCGImageStatusUnknownType | -3 | One of the status constants.<br>The image is an unknown type. |

## 56.24 class CGLayerMBS

### 56.24.1 class CGLayerMBS

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** The CoreGraphics layer class, similar to a template.
**Notes:** CGLayer objects are useful for offscreen drawing and can be used in much the same way that a bitmap context can be used. In fact, a CGLayer object is a much better representation than a bitmap context.

Using CGLayer objects can improve performance, particularly when you need to capture a piece of drawing that you stamp repeatedly (using the same scale factor and orientation). Quartz can cache CGLayer objects to the video card, making drawing a CGLayer to a destination much faster than rendering the equivalent image constructed from a bitmap context.

A CGLayer object is created relative to a graphics context. Although layer uses this graphics context as a reference for initialization, you are not restricted to drawing the layer to this graphics context. You can draw the layer to other graphics contexts, although any limitations of the original context are imposed. For example, if you create a CGLayer object using a bitmap context, the layer is rendered as a bitmap when drawn to any other graphics context.

You can use a CGLayer when you want to apply a shadow to a group of objects (such as a group of circles) rather than to individual objects.

Use these layers in your code whenever you can, especially when:

- You need to reuse a filled or stroked shape.
- You are building a scene and at least some of it can be reused. Put the reusable drawing in its own CGLayer.

Any CG object that you draw repeatedly—including CGPath, CGShading, and CGPDFPage—benefit from improved performance if you draw it to a CGLayer object.

see also
https://developer.apple.com/library/mac/#documentation/graphicsimaging/conceptual/drawingwithquartz2d/dq_layers/dq_layers.html
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr3

### 56.24.2 Methods

### 56.24.3 Constructor(context as CGContextMBS, size as CGSizeMBS, auxiliaryInfo as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Creates a CGLayer object that is associated with a graphics context.
**Notes:** context: The graphics context you want to create the layer relative to. The layer uses this graphics context as a reference for initialization.
size: The size, in default user space units, of the layer relative to the graphics context.
auxiliaryInfo: Reserved for future use. Pass nil.

On Success the handle property is not nil.

After you create a CGLayer object, you should reuse it whenever you can to facilitate the Quartz caching strategy. Quartz caches any objects that are reused, including CGLayer objects. Objects that are reused frequently remain in the cache. In contrast, objects that are used once in a while may be moved in and out of the cache according to their frequency of use. If you don't reuse CGLayer objects, Quartz won't cache them. This means that you lose an opportunity to improve the performance of your application.

Available in Mac OS X version 10.4 and later.
See also:

- 56.24.4 Constructor(context as CGContextMBS, width as Double, height as Double, auxiliaryInfo as dictionary = nil) 9158

### 56.24.4 Constructor(context as CGContextMBS, width as Double, height as Double, auxiliaryInfo as dictionary = nil)

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Creates a CGLayer object that is associated with a graphics context.
**Notes:** context: The graphics context you want to create the layer relative to. The layer uses this graphics context as a reference for initialization.
width/height: The size, in default user space units, of the layer relative to the graphics context.
auxiliaryInfo: Reserved for future use. Pass nil.

On Success the handle property is not nil.

After you create a CGLayer object, you should reuse it whenever you can to facilitate the Quartz caching strategy. Quartz caches any objects that are reused, including CGLayer objects. Objects that are reused frequently remain in the cache. In contrast, objects that are used once in a while may be moved in and out of the cache according to their frequency of use. If you don't reuse CGLayer objects, Quartz won't cache

them. This means that you lose an opportunity to improve the performance of your application.

Available in Mac OS X version 10.4 and later.
See also:

- 56.24.3 Constructor(context as CGContextMBS, size as CGSizeMBS, auxiliaryInfo as dictionary = nil) 9158

### 56.24.5 Context as CGContextMBS

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Returns the graphics context associated with a CGLayer object.
**Notes:** The context that's returned is the context for the layer itself, not the context that you specified when you created the layer.

### 56.24.6 Size as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Returns the width and height of a CGLayer object.

### 56.24.7 Properties

### 56.24.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 12.2, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 56.25 class CGMutableImageMetadataMBS

### 56.25.1 class CGMutableImageMetadataMBS

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The class for a mutable tag container.
**Notes:** Subclass of the CGImageMetadataMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr8

### 56.25.2 Methods

### 56.25.3 Constructor

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates an empty metadata object.
See also:

- 56.25.4 Constructor(metadata as CGImageMetadataMBS) 9160

### 56.25.4 Constructor(metadata as CGImageMetadataMBS)

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Copy constructor.
**Notes:** Creates a copy of the metadata.
See also:

- 56.25.3 Constructor 9160

### 56.25.5 RegisterNamespaceForPrefix(parent as CGImageMetadataTagMBS = nil, xmlns as String, prefix as String, byref error as CFErrorMBS) as Boolean

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Associates an XMP namespace URI with a prefix string.
**Notes:** This allows ImageIO to create custom metadata when it encounters an unrecognized prefix in a path (see TagWithPath for more information about path syntax). A namespace must be registered before it can be used to add custom metadata. All namespaces found in the image's metadata, or defined as a constant above, will be pre-registered. Namespaces and prefixes must be unique.

Returns true if successful. Returns false and sets 'error' if an error or conflict occurs.

### 56.25.6 RemoveTagWithPath(parent as CGImageMetadataTagMBS = nil, path as string) as Boolean

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the tag at a specific path in a CGMutableImageMetadataMBS container or a parent tag
**Notes:** This is the primary function for adding new metadata tags to a metadata container, or updating existing tags. All tags required to reach the final tag (at the end of the path) will be created, if needed. Tags will created with default types (ordered arrays). Creating tags will fail if a prefix is encountered that has not been registered. Use RegisterNamespaceForPrefix to associate a prefix with a namespace prior to using a path-based CGImageMetadataMBS function.

Note that if a parent tag is provided, the children of that tag reference will be modified, which may be a different reference from the tag stored in the metadata container. Since tags are normally obtained as a copy, it is typically neccesary to use SetTagWithPath to commit the changed parent object back to the metadata container (using the parent's path and nil for the parent).

metadata: A mutable collection of metadata tags.
parent: A parent tag. If nil, the path is relative to the root of the metadata (i.e. it is not a child of another property).
Note that if a parent tag is provided, the children of that tag reference will be modified, which may be a different reference from the tag stored in the metadata container. Since tags are normally obtained as a copy, it is typically neccesary to use SetTagWithPath to commit the changed parent object back to the metadata container (using the parent's path and nil for the parent).
path: A string with the path to the desired tag. Please consult the documentation of TagWithPath for information about path syntax.
Value: The CGImageMetadataTagMBS object to be added to the metadata. The tag will be retained.

Returns true if successful, false otherwise.

### 56.25.7 SetTagWithPath(parent as CGImageMetadataTagMBS = nil, path as string, value as CGImageMetadataTagMBS) as Boolean

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the value of the tag at a specific path in a CGMutableImageMetadataMBS container or a parent tag.
**Notes:** This function is used to add new metadata values to a metadata container, or update existing tag values. All tags required to reach the final tag (at the end of the path) are created, if needed. Tags are created with default types (i.e. arrays will be ordered). Creating tags will fail if a prefix is encountered that

has not been registered. Use RegisterNamespaceForPrefix to associate a prefix with a namespace prior to using a path-based CGImageMetadata function.

Examples

- 'path' = "xmp:CreateDate", 'value' = "2011-09-20T14:54:47-08:00")
- 'path' = "dc:subject [ 0 ] ", 'value' = "San Francisco")
- 'path' = "dc:subject [ 1 ] ", 'value' = "Golden Gate Bridge")
- 'path' = "dc:description [ en ] " 'value' = "my image description")
- 'path' = "dc:description [ de ] " 'value' = "meine bildbeschreibung")

Note that if a parent tag is provided, the children of that tag reference will be modified, which may be a different reference from the tag stored in the metadata container. Since tags are normally obtained as a copy, it is typically neccesary to use SetTagWithPath to commit the changed parent object back to the metadata container (using the parent's path and "" for the parent).

parent: A parent tag. If nil, the path is relative to the root of the metadata (i.e. it is not a child of another property).
path: A string with the path to the desired tag. Please consult the documentation of TagWithPath for information about path syntax.
value: The value to be added to the CGImageMetadataTag matching the path.

The tag will be retained. The restrictions for the value are the same as in Create.
Returns true if successful, false otherwise.

### 56.25.8 SetValueMatchingImageProperty(dictionaryName as String, propertyName as String, value as CGImageMetadataTagMBS) as Boolean

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the value of the CGImageMetadataTag matching a kCGImageProperty constant.
**Notes:** Provides a bridge for values from CGImageCopyPropertiesAtIndex, simplifying changing property values defined in EXIF and IPTC standards, which have no notion of namespaces, prefixes, or XMP property types.
Metadata Working Group guidance is factored into the mapping of CGImageProperties to XMP compatible CGImageMetadataTags.

For example, setting kCGImagePropertyExifDateTimeOriginal will set the value of the corresponding XMP tag, which is photoshop:DateCreated. Note that property values should still be in their XMP forms, such as

"YYYY-MM-DDThh:mm:ss" for DateTime, rather than the EXIF or IPTC DateTime formats. Although this function will allow the caller to set custom values for these properties, you should consult the appropriate specifications for details about property value formats for EXIF and IPTC tags in XMP.

dictionaryName the metadata subdictionary to which the image property belongs, such as kCGImagePropertyExifDictionary or kCGImagePropertyIPTCDictionary. Not all dictionaries and properties are supported at this time.
propertyName the name of the property. This must be a defined property constant corresponding to the 'dictionaryName'. For example, kCGImagePropertyTIFFOrientation, kCGImagePropertyExifDateTimeOriginal, or kCGImagePropertyIPTCKeywords. A warning will be logged if the CGImageProperty is unsupported by CGImageMetadata.
value: A variant with the value for the tag. The same value restrictions apply as in Create.

Returns true if successful, false otherwise.

### 56.25.9 SetValueWithPath(parent as CGImageMetadataTagMBS = nil, path as string, value as Variant) as Boolean

MBS MacCG Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the value of the tag at a specific path in a CGMutableImageMetadataMBS container or a parent tag.
**Notes:** This function is used to add new metadata values to a metadata container, or update existing tag values. All tags required to reach the final tag (at the end of the path) are created, if needed. Tags are created with default types (i.e. arrays will be ordered). Creating tags will fail if a prefix is encountered that has not been registered. Use RegisterNamespaceForPrefix to associate a prefix with a namespace prior to using a path-based CGImageMetadata function.

Examples

- 'path' = "xmp:CreateDate", 'value' = "2011-09-20T14:54:47-08:00")
- 'path' = "dc:subject [ 0 ] ", 'value' = "San Francisco")
- 'path' = "dc:subject [ 1 ] ", 'value' = "Golden Gate Bridge")
- 'path' = "dc:description [ en ] " 'value' = "my image description")
- 'path' = "dc:description [ de ] " 'value' = "meine bildbeschreibung")

Note that if a parent tag is provided, the children of that tag reference will be modified, which may be a different reference from the tag stored in the metadata container. Since tags are normally obtained as a copy, it is typically neccesary to use SetTagWithPath to commit the changed parent object back to the metadata

container (using the parent's path and "" for the parent).

parent: A parent tag. If nil, the path is relative to the root of the metadata (i.e. it is not a child of another property).
path: A string with the path to the desired tag. Please consult the documentation of TagWithPath for information about path syntax.
value: The value to be added to the CGImageMetadataTag matching the path.

The tag will be retained. The restrictions for the value are the same as in Create.
Returns true if successful, false otherwise.

## 56.26 class CGMutablePathMBS

### 56.26.1 class CGMutablePathMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** A class for a CoreGraphics mutable path.
**Notes:** Subclass of the CGPathMBS class.

### 56.26.2 Methods

### 56.26.3 AddArc(transform as CGAffineTransformMBS, x as Double, y as Double, radius as Double, startAngle as Double, endAngle as Double, clockwise as boolean)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add an arc of a circle to path, possibly preceded by a straight line segment.
**Notes:** The arc is approximated by a sequence of cubic Bezier curves. (x, y) is the center of the arc; radius is its radius; startAngle is the angle to the first endpoint of the arc; endAngle is the angle to the second endpoint of the arc; and clockwise is true if the arc is to be drawn clockwise, false otherwise. startAngle and endAngle are measured in radians. If m is not nil, then the constructed Bezier curves representing the arc will be transformed by the matrix before they are added to path.

### 56.26.4 AddArcToPoint(transform as CGAffineTransformMBS, x as Double, y as Double, x2 as Double, y2 as Double, radius as Double)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add an arc of a circle to path, possibly preceded by a straight line segment.
**Notes:** The arc is approximated by a sequence of cubic Bezier curves. (x, y) is the center of the arc; radius is its radius; startAngle is the angle to the first endpoint of the arc; endAngle is the angle to the second endpoint of the arc; and clockwise is true if the arc is to be drawn clockwise, false otherwise. startAngle and endAngle are measured in radians. If m is not nil, then the constructed Bezier curves representing the arc will be transformed by the matrix before they are added to path.

### 56.26.5 AddCurveToPoint(transform as CGAffineTransformMBS, cpx1 as Double, cpy1 as Double, cpx2 as Double, cpy2 as Double, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Append a cubic Bezier curve from the current point to (x,y) with control points (cp1x, cp1y) and (cp2x, cp2y) in path and move the current point to (x, y).
**Notes:** If transform is not nil, then transform all points by the matrix first.

### 56.26.6 AddEllipseInRect(transform as CGAffineTransformMBS, r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add an ellipse (an oval) inside rect to path.
**Notes:** The ellipse is approximated by a sequence of Bezier curves. The center of the ellipse is the midpoint of rect. If rect is square, then the ellipse will be circular with radius equal to one-half the width (equivalently, one-half the height) of rect. If rect is rectangular, then the major- and minor-axes will be the width and height of rect. The ellipse forms a complete subpath of path — that is, it begins with a "move to" and ends with a "close subpath" — oriented in the clockwise direction. If transform is not nil, then the constructed Bezier curves representing the ellipse will be transformed by m before they are added to path.

### 56.26.7 AddLineToPoint(transform as CGAffineTransformMBS, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Append a straight line segment from the current point to (x, y) in the path and move the current point to (x, y).
**Notes:** If transform is not nil, then transform (x, y) by the matrix first.

### 56.26.8 AddPath(transform as CGAffineTransformMBS, path as CGPathMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add a path to the path.
**Notes:** If m is not nil, then the points in the new path will be transformed by the matrix before they are added to path1.

### 56.26.9 AddQuadCurveToPoint(transform as CGAffineTransformMBS, cpx as Double, cpy as Double, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Append a quadratic curve from the current point to (x, y) with control point (cpx, cpy) in path and move the current point to (x, y'.

**Notes:** If transform is not nil, then transform all points by the matrix first.

### 56.26.10 AddRect(transform as CGAffineTransformMBS, r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add rect to path.
**Notes:** If transform is not nil, then transform the rectangle by the matrix first.

### 56.26.11 CloseSubpath

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Append a line from the current point to the starting point of the current subpath of path and end the subpath.

### 56.26.12 Constructor

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Create a mutable path.

### 56.26.13 ContainsPoint(transform as CGAffineTransformMBS, point as CGPointMBS, eoFill as boolean) as boolean

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return true if point is contained in path; false otherwise.
**Notes:** A point is contained in a path if it is inside the painted region when the path is filled; if eoFill is true, then the even-odd fill rule is used to evaluate the painted region of the path, otherwise, the winding-number fill rule is used. If m is not nil, then the point is transformed by m before determining whether the path contains it.

### 56.26.14 MoveToPoint(transform as CGAffineTransformMBS, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Move the current point to (x, y) in path and begin a new subpath.
**Notes:** If transform is not nil, then transform (x, y) by the matrix first.

# 56.27 class CGPathElementMBS

## 56.27.1 class CGPathElementMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The class for CGPath elements.
**Example:**

```
dim m as new CGMutablePathMBS

m.MoveToPoint nil, 10, 10
m.AddLineToPoint nil, 20, 30

dim e() as CGPathElementMBS = m.Elements
Break // see in debugger
```

**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.1
- MBS Xojo / Real Studio Plugins, version 15.1pr7

**Xojo Developer Magazine**

- 13.4, page 10: News

## 56.27.2 Methods

## 56.27.3 Point(Index as Integer) as CGPointMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns point with given index.

## 56.27.4 PointX(Index as Integer) as Double

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns point x with given index.

### 56.27.5 PointY(Index as Integer) as Double

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns point y with given index.

### 56.27.6 Properties

### 56.27.7 PointCount as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Returns number of points in this element.
**Notes:** (Read and Write property)

### 56.27.8 Type as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The type of this element.
**Notes:** (Read and Write property)

### 56.27.9 Constants

Type Constants

| Constant | Value | Description |
|---|---|---|
| kTypeAddCurveToPoint | 3 | The path element that adds a cubic curve from the current point to the specified point. The element holds two control points and a destination point. |
| kTypeAddLineToPoint | 1 | The path element that adds a line from the current point to a new point. The element holds a single point for the destination. |
| kTypeAddQuadCurveToPoint | 2 | The path element that adds a quadratic curve from the current point to the specified point. The element holds a control point and a destination point. |
| kTypeCloseSubpath | 4 | The path element that closes and completes a subpath. The element does not contain any points. |
| kTypeMoveToPoint | 0 | The path element that starts a new subpath. The element holds a single point for the destination. |

# 56.28 class CGPathMBS

## 56.28.1 class CGPathMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** A class for a CoreGraphics path.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.1
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- MBS Xojo / Real Studio Plugins, version 14.4pr10
- MBS Real Studio Plugins, version 13.1fc1

**Xojo Developer Magazine**

- 13.4, page 10: News

## 56.28.2 Methods

## 56.28.3 BoundingBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return the bounding box of path.
**Notes:** The bounding box is the smallest rectangle completely enclosing all points in the path, including control points for Bezier and quadratic curves. If the path is empty, then return (0,0,0,0).

## 56.28.4 Copy as CGPathMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the path.
**Notes:** Returns nil on any error.

## 56.28.5 CurrentPoint as CGPointMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return the current point of the current subpath of path.
**Notes:** If there is no current point, then return (0,0).

### 56.28.6 Elements as CGPathElementMBS()

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Queries all the elements in a CGPath.
**Example:**

```
dim m as new CGMutablePathMBS

m.MoveToPoint nil, 10, 10
m.AddLineToPoint nil, 20, 30

dim e() as CGPathElementMBS = m.Elements
Break // see in debugger
```

### 56.28.7 EqualToPath(path as CGPathMBS) as boolean

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return true if the path self is equal to path; false otherwise.
**Notes:** Returns false if the path is nil.

### 56.28.8 IsEmpty as boolean

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return true if path contains no elements, false otherwise.

### 56.28.9 IsRect(byref rect as CGRectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Return true if path represents a rectangle, false otherwise.

### 56.28.10 MutableCopy as CGMutablePathMBS

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Create a mutable copy of path.
**Notes:** Returns nil on any error.

### 56.28.11 Properties

### 56.28.12 Handle as Integer

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The handle to the internal used object.
**Notes:** (Read and Write property)

## 56.29 class CGPDFArrayMBS

### 56.29.1 class CGPDFArrayMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf array.

### 56.29.2 Methods

### 56.29.3 ArrayValue(index as Integer, byref value as CGPDFArrayMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a pdf array, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.4 BooleanValue(index as Integer, byref value as boolean) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a boolean value, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.5 Count as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the count of items in this array.

### 56.29.6 DictionaryValue(index as Integer, byref value as CGPDFDictionaryMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a pdf dictionary, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.7 IntegerValue(index as Integer, byref value as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is an integer value, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.29.8 NameValue(index as Integer, byref value as string) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a name string, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.9 NullValue(index as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a nil value, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.10 ObjectValue(index as Integer, byref value as CGPDFObjectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a pdf object, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.11 SingleValue(index as Integer, byref value as Double) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a floating point value, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.29.12 StreamValue(index as Integer, byref value as CGPDFStreamMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a pdf stream, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.13 StringValue(index as Integer, byref value as CGPDFStringMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given index is a pdf string, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.29.14 Properties

### 56.29.15 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Array belongs to.
**Notes:** (Read only property)

### 56.29.16 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf array.
**Notes:** (Read and Write property)

## 56.30 class CGPDFContextMBS

### 56.30.1 class CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** A CoreGraphics context for PDF specific functions.
**Example:**

```
// create pdf
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim r as new CGRectMBS(0,0,500,500)
dim c as CGContextMBS = file.NewCGPDFDocumentMBS(r, "My Title", "My Author", "My Creator")

if c<>Nil then

// create page
c.BeginPage r

// draw something
c.SetRGBFillColor(1.0, 0.0, 0.0, 1.0)
c.FillRect CGMakeRectMBS(100,100,100,100)

// close page
c.EndPage

// flush and show in PDF viewer
c = nil
file.Launch
end if
```

**Notes:** This class defines functions to create and get information about a Quartz PDF context. A CGPDFContext object is a type of CGContext that is used for drawing PDF content. The functions in this reference operate only on Quartz PDF graphics contexts created using the functions CGPDFContextCreate or CGPDFContextCreateWithURL.

When you draw to the PDF context using CGContext functions the drawing operations are recorded in PDF format. The PDF commands that represent the drawing are written to the destination specified when you create the PDF graphics context.
Subclass of the CGContextMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr5
- MBS Real Studio Plugins, version 12.0pr6

### 56.30.2 Methods

### 56.30.3 AddDestinationAtPoint(name as string, x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Sets a destination to jump to when a point in the current page of a PDF graphics context is clicked.
**Notes:** name: A destination name.
x/y: A location in the current page of the PDF graphics context.
Available in Mac OS X v10.4 and later.

### 56.30.4 BeginPage(pageInfo as dictionary)

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Begins a new page in a PDF graphics context.
**Notes:** pageInfo: A dictionary that contains key-value pairs that define the page properties.

You must call the function EndPage to signal the end of the page.
Available in Mac OS X v10.4 and later.

### 56.30.5 Close

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Closes a PDF document.
**Notes:** After closing the context, all pending data is written to the context destination, and the PDF file is completed. No additional data can be written to the destination context after the PDF document is closed.

### 56.30.6 EndPage

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Ends the current page in the PDF graphics context.
**Notes:** You can call EndPage only after you call the function BeginPage.

### 56.30.7 kCGPDFContextAllowsCopying as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** Whether the document allows copying when unlocked with the user password. The value of this key must be a Boolean object. The default value of this key is true.
Available in Mac OS X v10.4 and later.

### 56.30.8 kCGPDFContextAllowsPrinting as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** Whether the document allows printing when unlocked with the user password. The value of this key must be a boolean value. The default value of this key is true.
Available in Mac OS X v10.4 and later.

### 56.30.9 kCGPDFContextArtBox as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that specify various PDF boxes.
**Notes:** The art box for the document or for a given page. This key is optional. If present, the value of this key must be a CGRectMBS.
Available in Mac OS X v10.4 and later.

### 56.30.10 kCGPDFContextAuthor as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The corresponding value is a string that represents the name of the person who created the document. This key is optional.
Available in Mac OS X v10.4 and later.

### 56.30.11 kCGPDFContextBleedBox as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that specify various PDF boxes.
**Notes:** The bleed box for the document or for a given page. This key is optional. If present, the value of this key must be a CGRectMBS object.
Available in Mac OS X v10.4 and later.

### 56.30.12 kCGPDFContextCreator as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The corresponding value is a string that represents the name of the application used to produce the document. This key is optional.
Available in Mac OS X v10.4 and later.

### 56.30.13 kCGPDFContextCropBox as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that specify various PDF boxes.
**Notes:** The crop box for the document or for a given page. This key is optional. If present, the value of this key must be a CGRect object.
Available in Mac OS X v10.4 and later.

### 56.30.14 kCGPDFContextEncryptionKeyLength as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The encryption key length in bits; see Table 3.18 "Entries common to all encryption dictionaries", PDF Reference: Adobe PDF version 1.5 (4th ed.) for more information. Optional; if present, the value of this key must be a number with value which is a multiple of 8 between 40 and 128, inclusive. If this key is absent or invalid, the encryption key length defaults to 40 bits.
Available in Mac OS X v10.5 and later.

### 56.30.15 kCGPDFContextKeywords as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The keywords for this document. This key is optional. If the value of this key is a string, the /Keywords entry will be the specified string. If the value of this key is a array, then it must be an array of variants with strings. The /Keywords entry will, in this case, be the concatenation of the specified strings separated by commas (","). In addition, an entry with the key "/AAPL:Keywords" is stored in the document information dictionary; its value is an array consisting of each of the specified strings. The value of this key must be in one of the above forms; otherwise, this key is ignored.
Available in Mac OS X v10.5 and later.

### 56.30.16 kCGPDFContextMediaBox as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that specify various PDF boxes.
**Notes:** The media box for the document or for a given page. This key is optional. If present, the value of this key must be a CGRectMBS object.
Available in Mac OS X v10.4 and later.

### 56.30.17 kCGPDFContextOutputIntent as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The output intent PDF/X. This key is optional. If present, the value of this key must be a dictionary. The dictionary is added to the /OutputIntents entry in the PDF file document catalog. The keys and values contained in the dictionary must match those specified in section 9.10.4 of the PDF 1.4 specification, ISO/DIS 15930-3 document published by ISO/TC 130, and Adobe Technical Note #5413.
Available in Mac OS X v10.4 and later.

### 56.30.18 kCGPDFContextOutputIntents as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** Output intent dictionaries. This key is optional. If present, the value must be an array of one or more kCGPDFContextOutputIntent dictionaries. The array is added to the PDF document in the /OutputIntents entry in the PDF file's document catalog. Each dictionary in the array must be of form specified for the kCGPDFContextOutputIntent key, except that only the first dictionary in the array is required to contain the "S" key with a value of GTS_PDFX. If both the kCGPDFContextOutputIntent and kCGPDFContextOutputIntents keys are specified, the former is ignored.
Available in Mac OS X v10.4 and later.

### 56.30.19 kCGPDFContextOwnerPassword as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The owner password of the PDF document. If this key is specified, the document is encrypted using the value as the owner password; otherwise, the document will not be encrypted. The value of this key must be a string that can be represented in ASCII encoding. Only the first 32 bytes are used for the password. There is no default value for this key. If the value of this key cannot be represented in ASCII, the document is not created and the creation function returns nil.

Available in Mac OS X v10.4 and later.

### 56.30.20 kCGPDFContextSubject as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The subject of a document. Optional; if present, the value of this key must be a string.
Available in Mac OS X v10.5 and later.

### 56.30.21 kCGPDFContextTitle as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The corresponding value is a string that represents the title of the document. This key is optional.
Available in Mac OS X v10.4 and later.

### 56.30.22 kCGPDFContextTrimBox as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that specify various PDF boxes.
**Notes:** The trim box for the document or for a given page. This key is optional. If present, the value of this key must be a memoryblock that contains a CGRect (stored by value, not by reference).
Available in Mac OS X v10.4 and later.

### 56.30.23 kCGPDFContextUserPassword as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Keys that used to set up a PDF context.
**Notes:** The user password of the PDF document. If the document is encrypted, then the value of this key will be the user password for the document. If not specified, the user password is the empty string. The value of this key must be a string that can be represented in ASCII encoding; only the first 32 bytes will be used for the password. If the value of this key cannot be represented in ASCII, the document is not created and the creation function returns nil.
Available in Mac OS X v10.4 and later.

### 56.30.24 kCGPDFXDestinationOutputProfile as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.
**Notes:** An ICC profile stream defining the transformation from the PDF document's source colors to output device colorants. This key is required if the value of kCGPDFXOutputConditionIdentifier does not specify a standard production condition. It is optional otherwise. If present, the value of this key must be an ICC-based color space specified as a CGColorSpaceMBS object.
Available in Mac OS X v10.4 and later.

### 56.30.25 kCGPDFXInfo as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.
**Notes:** A human-readable text string containing additional information or comments about the intended target device or production condition. This key is required if the value of kCGPDFXOutputConditionIdentifier does not specify a standard production condition. It is optional otherwise. If present, the value of this key must be a string.
Available in Mac OS X v10.4 and later.

### 56.30.26 kCGPDFXOutputCondition as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.
**Notes:** A text string identifying the intended output device or production condition in a human- readable form. This key is optional. If present, the value of this key must be a string.
Available in Mac OS X v10.4 and later.

### 56.30.27 kCGPDFXOutputConditionIdentifier as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.
**Notes:** A string identifying the intended output device or production condition in a human- or machine-readable form. This key is required. The value of this key must be a string. For best results, the string should be restricted to characters in the ASCII character set.
Available in Mac OS X v10.4 and later.

### 56.30.28 kCGPDFXOutputIntentSubtype as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.

### 56.30.29 kCGPDFXRegistryName as string

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** One of the Output Intent Dictionary Keys.
**Notes:** The output intent subtype. This key is required. The value of this key must be a String object equal to "GTS_PDFX"; otherwise, the dictionary is ignored.
Available in Mac OS X v10.4 and later.

### 56.30.30 SetDestinationForRect(name as string, x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Sets a destination to jump to when a rectangle in the current PDF page is clicked.
**Notes:** name: A destination name.
x,y,w,h: A rectangle that specifies an area of the current page of a PDF graphics context. The rectangle is specified in default user space (not device space).
Available in Mac OS X v10.4 and later.

### 56.30.31 SetURLForRect(url as string, x as Double, y as Double, w as Double, h as Double)

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Sets the URL associated with a rectangle in a PDF graphics context.
**Example:**

```
dim c as CGPDFContextMBS // your pdf context
c.SetURLForRect("http://www.apple.com/", 100, 100, 100, 100)
```

**Notes:** url: A string that specifies the destination of the contents associated with the rectangle.
rect: A rectangle specified in default user space (not device space).
Available in Mac OS X v10.4 and later.

# 56.31 class CGPDFDictionaryListMBS

## 56.31.1 class CGPDFDictionaryListMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf dictionary list.

## 56.31.2 Methods

## 56.31.3 Close

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

## 56.31.4 Key(index as Integer) as string

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the key with the give index.
**Notes:** Returns "" on any error.

## 56.31.5 Value(index as Integer) as CGPDFObjectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The value with the given index.
**Notes:** Returns nil on any error.

## 56.31.6 Properties

## 56.31.7 Count as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the number of key&value pairs.
**Notes:** Returns 0 on any error.

(Read only property)

### 56.31.8 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Dictionary belongs to.
**Notes:** (Read only property)

## 56.32 class CGPDFDictionaryMBS

### 56.32.1 class CGPDFDictionaryMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf dictionary.

### 56.32.2 Methods

### 56.32.3 ArrayValue(key as string, byref value as CGPDFArrayMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a pdf array, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.4 BooleanValue(key as string, byref value as boolean) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a boolean value, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.5 Count as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The number of keys in this dictionary.

### 56.32.6 DictionaryValue(key as string, byref value as CGPDFDictionaryMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a pdf dictionary, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.7 IntegerValue(key as string, byref value as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is an integer value, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.32.8 List as CGPDFDictionaryListMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns a list of all key&value pairs in the dictionary.
**Notes:** Returns nil on any error.

### 56.32.9 NameValue(key as string, byref value as string) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a name string, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.10 ObjectValue(key as string, byref value as CGPDFObjectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a pdf object, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.11 SingleValue(key as string, byref value as Double) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a floating point value, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.32.12 StreamValue(key as string, byref value as CGPDFStreamMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a pdf stream, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.13 StringValue(key as string, byref value as CGPDFStringMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object with the given key is a pdf string, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.32.14 Properties

### 56.32.15 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Dictionary belongs to.
**Notes:** (Read only property)

### 56.32.16 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf dictionary.
**Notes:** (Read and Write property)

## 56.33 class CGPDFDocumentMBS

### 56.33.1 class CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics pdf document.
**Example:**

```
dim f as FolderItem
dim input as CGPDFDocumentMBS
dim output as CGContextMBS
dim r,c as CGRectMBS

f=SpecialFolder.Desktop.Child("test.pdf")
input=f.OpenAsCGPDFDocumentMBS

r=CGMakeRectMBS(0,0,200,200) // 200 by 200 Pixel page

f=SpecialFolder.Desktop.Child("output.pdf")
output=f.NewCGPDFDocumentMBS(r,"SomeTitle","SomeAuthor","SomeCreator")

// Create a new page
output.BeginPage r

// get size of input page one
c=input.CropBox(1)

// clip to a part of the new page leaving a border
r=CGMakeRectMBS(20,20,160,160)
output.ClipToRect r

// draw old pdf on a different position
c.top=-100
c.left=-100

// do the drawing of page one of input at new new output
output.DrawCGPDFDocument(input,c,1)

// cleanup
output.EndPage
output.Flush
```

**Notes:** If the release property is true, the destructor of this class will release the pdfdocument reference.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- MBS Xojo Plugins, version 17.3pr7
- MBS Real Studio Plugins, version 12.5pr1
- MBS Real Studio Plugins, version 11.2pr7

**Xojo Developer Magazine**

- 8.5, pages 20 to 21: Printing PDFs, Easy PDF printing on Mac and Windows
- 6.4, page 30: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

### 56.33.2 Methods

### 56.33.3 ArtBox(page as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the ArtBox of this page.
**Notes:** Returns nil on any error.
This function is deprecated by Apple in favor of using the CGPDFPageMBS class.

### 56.33.4 BleedBox(page as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the BleedBox of this page.
**Notes:** Returns nil on any error.
This function is deprecated by Apple in favor of using the CGPDFPageMBS class.

### 56.33.5 Catalog as CGPDFDictionaryMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return the document catalog of 'document'.

### 56.33.6 Constructor(dataProvider as CGDataProviderMBS)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using a data provider.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.
See also:


- 56.33.7 Constructor(file as folderitem) 9192
- 56.33.8 Constructor(Handle as Integer) 9192
- 56.33.9 Constructor(url as string) 9192


### 56.33.7 Constructor(file as folderitem)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using data specified by a file.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.
See also:


- 56.33.6 Constructor(dataProvider as CGDataProviderMBS) 9191
- 56.33.8 Constructor(Handle as Integer) 9192
- 56.33.9 Constructor(url as string) 9192


### 56.33.8 Constructor(Handle as Integer)

MBS MacCG Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document object based on the given handle value.
**Notes:** Handle must not be zero and should be a valid CGPDFDocumentRef casted to integer.
See also:


- 56.33.6 Constructor(dataProvider as CGDataProviderMBS) 9191
- 56.33.7 Constructor(file as folderitem) 9192
- 56.33.9 Constructor(url as string) 9192


### 56.33.9 Constructor(url as string)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using data specified by a URL.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want

to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.
See also:


- 56.33.6 Constructor(dataProvider as CGDataProviderMBS) 9191
- 56.33.7 Constructor(file as folderitem) 9192
- 56.33.8 Constructor(Handle as Integer) 9192


### 56.33.10 CreateWithData(data as Memoryblock) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using a data.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.
See also:


- 56.33.11 CreateWithData(data as string) as CGPDFDocumentMBS 9193


### 56.33.11 CreateWithData(data as string) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using a data.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.
See also:


- 56.33.10 CreateWithData(data as Memoryblock) as CGPDFDocumentMBS 9193


### 56.33.12 CreateWithFile(file as folderitem) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using data specified by a file.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.

### 56.33.13 CreateWithProvider(dataProvider as CGDataProviderMBS) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using a data provider.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.

### 56.33.14 CreateWithURL(url as string) as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a Quartz PDF document using data specified by a URL.
**Notes:** Distributing individual pages of a PDF document to separate threads is not supported. If you want to use threads, consider creating a separate document for each thread and operating on a block of pages per thread.

### 56.33.15 CropBox(page as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the CropBox of this page.
**Notes:** Returns nil on any error.
This function is deprecated by Apple in favor of using the CGPDFPageMBS class.

### 56.33.16 GetID as CGPDFArrayMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Gets the file identifier for a PDF document.
**Notes:** A PDF file identifier is defined in the PDF specification as an array of two strings, the first of which is a permanent identifier that doesn't change even when the file is updated. The second string changes each time the file is updated. For more information, see PDF Reference: Version 1.3 (Second Edition), Adobe Systems Incorporated.

Available in Mac OS X v10.4 and later.

### 56.33.17 GetInfo as CGPDFDictionaryMBS

MBS MacCG Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Queries the PDF info dictionary.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim p as cgpdfdocumentMBS=f.OpenAsCGPDFDocumentMBS

dim Co as CGPDFStringMBS
dim info as CGPDFDictionaryMBS = p.GetInfo
if info.StringValue("Subject",co) then
MsgBox co.Text // shows subject
end if
```

**Notes:** Returns nil on any error.

### 56.33.18 MediaBox(page as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the MediaBox of this page.
**Notes:** Returns nil on any error.
This function is deprecated by Apple in favor of using the CGPDFPageMBS class.

### 56.33.19 Page(index as Integer) as CGPDFPageMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns a page of the document.

### 56.33.20 RotationAngle(page as Integer) as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the rotation of a page in degrees.
**Notes:** Returns 0 on any error.

### 56.33.21 TrimBox(page as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns the TrimBox of this page.
**Notes:** Returns nil on any error.
This function is deprecated by Apple in favor of using the CGPDFPageMBS class.

### 56.33.22 UnlockWithPassword(name as string) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return true if 'document' is unlocked; false otherwise.
**Notes:** A document is unlocked if it isn't encrypted, or if it is encrypted and a valid password was previously specified with CGPDFDocumentUnlockWithPassword.

### 56.33.23 Properties

### 56.33.24 AllowsCopying as Boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return true if 'document' allows copying; false otherwise.
**Notes:** Typically, this function returns false only if the document is encrypted and the document's current password doesn't grant permission to perform copying.
(Read only property)

### 56.33.25 AllowsPrinting as Boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return true if 'document' allows printing; false otherwise.
**Notes:** Typically, this function returns false only if the document is encrypted and the document's current password doesn't grant permission to perform printing.
(Read only property)

### 56.33.26 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The handle for this pdfdocument.

**Notes:** Handle is a CGPDFDocumentRef.
(Read and Write property)

### 56.33.27 IsEncrypted as Boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return true if the PDF file associated with 'document' is encrypted; false otherwise.
**Notes:** If the PDF file is encrypted, then a password must be supplied before certain operations are enabled; different passwords may enable different operations.
(Read only property)

### 56.33.28 IsUnlocked as Boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Return true if 'document' is unlocked; false otherwise.
**Notes:** A document is unlocked if it isn't encrypted, or if it is encrypted and a valid password was previously specified with CGPDFDocumentUnlockWithPassword.
(Read only property)

### 56.33.29 MajorVersion as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the major version of the pdf document.
**Notes:** (Read only property)

### 56.33.30 MinorVersion as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the minor version of the pdf document.
**Notes:** (Read only property)

### 56.33.31 PageCount as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Counts the pages inside the PDF document.
**Example:**

```
dim f as FolderItem
dim d as CGPDFDocumentMBS

f=SpecialFolder.Desktop.Child("test.pdf")
d=f.OpenAsCGPDFDocumentMBS

MsgBox str(d.PageCount)
```

**Notes:** Returns 0 on any error.
(Read only property)

## 56.34 class CGPDFObjectMBS

### 56.34.1 class CGPDFObjectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf object.

### 56.34.2 Methods

### 56.34.3 ArrayValue(byref value as CGPDFArrayMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a pdf array, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.4 BooleanValue(byref value as boolean) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a boolean, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.5 DictionaryValue(byref value as CGPDFDictionaryMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a pdf dictionary, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.6 IntegerValue(byref value as Integer) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains an integer, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.34.7 NameValue(byref value as string) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a name string, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.8 SingleValue(byref value as Double) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a floating point number, this function will return it.
**Notes:** Returns true on success and false on failure.
Is function will return double and integer values. Conversion is done automatically.

### 56.34.9 StreamValue(byref value as CGPDFStreamMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a pdf stream, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.10 StringValue(byref value as CGPDFStringMBS) as boolean

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** If the object contains a pdfstring, this function will return it.
**Notes:** Returns true on success and false on failure.

### 56.34.11 Type as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the type of the object content.
**Notes:** Some useful constants:

kCGPDFObjectTypeNull = 1
kCGPDFObjectTypeBoolean = 2
kCGPDFObjectTypeInteger = 3
kCGPDFObjectTypeReal = 4
kCGPDFObjectTypeName = 5

kCGPDFObjectTypeString = 6
kCGPDFObjectTypeArray = 7
kCGPDFObjectTypeDictionary = 8
kCGPDFObjectTypeStream = 9

### 56.34.12 Properties

### 56.34.13 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Object belongs to.
**Notes:** (Read only property)

### 56.34.14 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf object.
**Notes:** (Read and Write property)

### 56.34.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGPDFObjectTypeArray | 7 | One of the type constants for a PDF object type. Type for a PDF array. |
| kCGPDFObjectTypeBoolean | 2 | One of the type constants for a PDF object type. The type for a PDF Boolean. |
| kCGPDFObjectTypeDictionary | 8 | One of the type constants for a PDF object type. The type for a PDF dictionary. |
| kCGPDFObjectTypeInteger | 3 | One of the type constants for a PDF object type. The type for a PDF integer. |
| kCGPDFObjectTypeName | 5 | One of the type constants for a PDF object type. Type for a PDF name. |
| kCGPDFObjectTypeNull | 1 | One of the type constants for a PDF object type. The type for a PDF null. |
| kCGPDFObjectTypeReal | 4 | One of the type constants for a PDF object type. The type for a PDF real. |
| kCGPDFObjectTypeStream | 9 | One of the type constants for a PDF object type. The type for a PDF stream. |
| kCGPDFObjectTypeString | 6 | One of the type constants for a PDF object type. The type for a PDF string. |

## 56.35 class CGPDFPageMBS

### 56.35.1 class CGPDFPageMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf page.

### 56.35.2 Methods

### 56.35.3 ArtBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the ArtBox of this page.
**Notes:** Returns nil on any error.
This is the value of the corresponding entry in the page's dictionary.

### 56.35.4 BleedBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the BleedBox of this page.
**Notes:** Returns nil on any error.
This is the value of the corresponding entry in the page's dictionary.

### 56.35.5 CropBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the BleedBox of this page.
**Notes:** Returns nil on any error.
This is the value of the corresponding entry in the page's dictionary.

### 56.35.6 Dictionary as CGPDFDictionaryMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The information dictionary of this page.
**Notes:** Returns nil on any error.

### 56.35.7 MediaBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the MediaBox of this page.
**Notes:** Returns nil on any error.
This is the value of the corresponding entry in the page's dictionary.

### 56.35.8 PageNumber as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The page number of this page.

### 56.35.9 RotationAngle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the rotation of a page in degrees.
**Notes:** This is the value of the /Rotate entry in the page's dictionary.

### 56.35.10 TrimBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the TrimBox of this page.
**Notes:** Returns nil on any error.
This is the value of the corresponding entry in the page's dictionary.

### 56.35.11 Properties

### 56.35.12 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Page belongs to.
**Notes:** (Read only property)

### 56.35.13 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf page.
**Notes:** (Read and Write property)

### 56.35.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGPDFArtBox | 4 | One of the box types for a PDF page.<br>The page art box—a rectangle, expressed in default user space units, defining the extent of the page's meaningful content (including potential white space) as intended by the page's creator.<br>Available in Mac OS X v10.3 and later. |
| kCGPDFBleedBox | 2 | One of the box types for a PDF page.<br>The page bleed box—a rectangle, expressed in default user space units, that defines the region to which the contents of the page should be clipped when output in a production environment<br>Available in Mac OS X v10.3 and later. |
| kCGPDFCropBox | 1 | One of the box types for a PDF page.<br>The page crop box—a rectangle, expressed in default user space units, that defines the visible region of default user space. When the page is displayed or printed, its contents are to be clipped to this rectangle.<br>Available in Mac OS X v10.3 and later. |
| kCGPDFMediaBox | 0 | One of the box types for a PDF page.<br>The page media box—a rectangle, expressed in default user space units, that defines the boundaries of the physical medium on which the page is intended to be displayed or printed<br>Available in Mac OS X v10.3 and later. |
| kCGPDFTrimBox | 3 | One of the box types for a PDF page.<br>The page trim box—a rectangle, expressed in default user space units, that defines the intended dimensions of the finished page after trimming.<br>Available in Mac OS X v10.3 and later. |

## 56.36 class CGPDFStreamMBS

### 56.36.1 class CGPDFStreamMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf stream.

### 56.36.2 Methods

### 56.36.3 Data(byref format as Integer) as string

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The data of this pdf stream.
**Notes:** Format is set to one of the following constants:

| | |
|---|---|
| CGPDFDataFormatRaw | 0 |
| CGPDFDataFormatJPEGEncoded | 1 |
| CGPDFDataFormatJPEG2000 | 2 |

Returns nil on any error.

### 56.36.4 Dictionary as CGPDFDictionaryMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The information dictionary for this stream.
**Notes:** Returns nil on any error.

### 56.36.5 Properties

### 56.36.6 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF Stream belongs to.
**Notes:** (Read only property)

### 56.36.7 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf stream.
**Notes:** (Read and Write property)

### 56.36.8 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CGPDFDataFormatJPEG2000 | 2 | One of the data format constants. |
| CGPDFDataFormatJPEGEncoded | 1 | One of the data format constants. |
| CGPDFDataFormatRaw | 0 | One of the data format constants. |

## 56.37 class CGPDFStringMBS

### 56.37.1 class CGPDFStringMBS

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for a pdf string.

### 56.37.2 Methods

### 56.37.3 Bytes as MemoryBlock

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The bytes of this pdf string.
**Notes:** Returns nil on any error.
This memoryblock is not encoding safe!

### 56.37.4 Length as Integer

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The length of the text.

### 56.37.5 Text as string

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The text of the pdf string as a string.
**Notes:** In contrast to the bytes in the memoryblock, this String is encoding save.
Returns nil on any error.

### 56.37.6 Properties

### 56.37.7 Document as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The document this PDF String belongs to.
**Notes:** (Read only property)

### 56.37.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The handle of the pdf string.
**Notes:** (Read and Write property)

## 56.38 class CGPointMBS

### 56.38.1 class CGPointMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics point.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Real Studio Plugins, version 12.0pr6
- MBS REALbasic plug-ins version 9.5

### 56.38.2 Methods

### 56.38.3 ApplyAffineTransform(p as CGAffineTransformMBS) as CGPointMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Transform 'point' by 't' and return the result: p' = p * t where p = [ x y 1 ] .

### 56.38.4 Binary as MemoryBlock

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the internal data of the object as a CGPoint for use on Toolbox calls.
**Example:**

```
dim c as CGPointMBS
dim m as MemoryBlock

c=CGMakePointMBS(10,20)

m=c.Binary

MsgBox str(m.Size) // 8
MsgBox str(m.doubleValue( 0)) // 10
MsgBox str(m.doubleValue( 4)) // 20
```

### 56.38.5 Constructor

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new point object with the given values.
See also:


- 56.38.6 Constructor(p as Ptr) 9211
- 56.38.7 Constructor(source as CGPointMBS) 9211
- 56.38.8 Constructor(x as Double, y as Double) 9211


### 56.38.6 Constructor(p as Ptr)

MBS MacCG Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 56.38.5 Constructor 9211
- 56.38.7 Constructor(source as CGPointMBS) 9211
- 56.38.8 Constructor(x as Double, y as Double) 9211


### 56.38.7 Constructor(source as CGPointMBS)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new point object with the given values.
See also:


- 56.38.5 Constructor 9211
- 56.38.6 Constructor(p as Ptr) 9211
- 56.38.8 Constructor(x as Double, y as Double) 9211


### 56.38.8 Constructor(x as Double, y as Double)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new point object with the given values.
See also:


- 56.38.5 Constructor 9211

- 56.38.6 Constructor(p as Ptr) 9211
- 56.38.7 Constructor(source as CGPointMBS) 9211


### 56.38.9 Equal(p as CGPointMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns true if both points are equal.

### 56.38.10 Make(x as Double, y as Double) as CGPointMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns a new CGPointMBS object.

### 56.38.11 Zero as CGPointMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the zero point.
**Notes:** The "zero" point – equivalent to CGMakePointMBS(0, 0).

### 56.38.12 Properties

### 56.38.13 x as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The X property of the point.
**Notes:** (Read and Write property)

### 56.38.14 y as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The Y property of the point.
**Notes:** (Read and Write property)

# 56.39 class CGPSConverterMBS

## 56.39.1 class CGPSConverterMBS

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class in CoreGraphics to convert Postscript code to PDF data.
**Notes:** Requires Mac OS X 10.3.
Won't work in macOS Sonoma since Apple removed the feature from the OS.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr2
- EPS support deprecated in macOS Sonoma
- MBS Real Studio Plugins, version 12.1pr10

## 56.39.2 Methods

## 56.39.3 Abort as boolean

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tell the converter to abort conversion at the next possible opportunity.
**Notes:** Returns false on any error and true on success.

## 56.39.4 Constructor(options as Dictionary = nil)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Create a CGPSConverter.
**Notes:** Currently you should pass nil for options. (Mac OS X 10.3)
On failure the handle property is zero.

## 56.39.5 Convert(provider as CGDataProviderMBS, consumer as CGDataConsumerMBS, options as Dictionary = nil) as boolean

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Converts PostScript data to PDF data.
**Notes:** The PostScript data is supplied by provider; the resulting PDF is written to consumer. Returns true if the conversion succeeded; false otherwise.

### 56.39.6 IsConverting as boolean

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the converter is currently converting data.
**Notes:** False on any error.

### 56.39.7 Properties

### 56.39.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The hande to the CGPSConverter object.
**Notes:** Datatype is CGPSConverterRef.
(Read and Write property)

### 56.39.9 Events

### 56.39.10 BeginDocument

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Is called at the beginning of the conversion of the PostScript document.

### 56.39.11 BeginPage(PageNumber as Integer, PageInfo as Dictionary)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called at the start of the conversion of each page in the PostScript document.

### 56.39.12 EndDocument(success as boolean)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called at the end of conversion of the PostScript document.

### 56.39.13 EndPage(PageNumber as Integer, PageInfo as Dictionary)

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called at the end of the conversion of each page in the PostScript document.

### 56.39.14 Finished

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called when the converter is no longer needed.

### 56.39.15 Message(message as string)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: .

**Function:** Called to pass any messages that might result during the conversion.

### 56.39.16 Progress

MBS MacCG Plugin, Plugin Version: 4.3, Platform: macOS, Targets: .

**Function:** Called periodically during the conversion to indicate that conversion is proceeding.

## 56.40 class CGRectMBS

### 56.40.1 class CGRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics rectangle.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins
- Automated video editing with Xojo
- MBS Real Studio Plugins, version 12.0pr6
- MBS REALbasic plug-ins version 9.5

**Xojo Developer Magazine**

- 6.4, page 30: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

### 56.40.2 Methods

### 56.40.3 ApplyAffineTransform(a as CGAffineTransformMBS) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: All.

**Function:** Applies an affine transform to the rectangle and returns the result.
**Example:**

```
dim af as CGAffineTransformMBS = CGAffineTransformMBS.Identity

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

af = af.Scale( 1, -1 )

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

af = af.Translate( 0, 100 )

MsgBox str(af.A)+" "+str(af.b)+" "+str(af.c)+" "+str(af.d)+" "+str(af.tx)+" "+str(af.ty)

dim r1 as CGRectMBS
dim r2 as CGRectMBS

r1=CGMakeRectMBS(100,100,100,100)

r2=r1.ApplyAffineTransform(af)
```

```
MsgBox "("+str(r1.Left)+", "+str(r1.top)+", "+str(r1.width)+", "+str(r1.height)+") =>("+str(r2.Left)+",
"+str(r2.top)+", "+str(r2.width)+", "+str(r2.height)+")"
```

**Notes:** Returns nil on any error.

### 56.40.4 Binary as MemoryBlock

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the internal data of the object as a CGRect for use on Toolbox calls.
**Example:**

```
dim c as CGRectMBS
dim m as MemoryBlock

c=CGMakeRectMBS(10,20,30,40)

m=c.Binary

MsgBox str(m.Size) // 16
MsgBox str(m.doubleValue( 0)) // 10
MsgBox str(m.doubleValue( 4)) // 20
MsgBox str(m.doubleValue( 8)) // 30
MsgBox str(m.doubleValue(12)) // 40
```

### 56.40.5 Constructor

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The constructor to create a zero rectangle.
See also:


- 56.40.6 Constructor(p as Ptr) 9217
- 56.40.7 Constructor(source as CGRectMBS) 9218
- 56.40.8 Constructor(x as Double, y as Double, width as Double, height as Double) 9218


### 56.40.6 Constructor(p as Ptr)

MBS MacCG Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 56.40.5 Constructor 9217
- 56.40.7 Constructor(source as CGRectMBS) 9218
- 56.40.8 Constructor(x as Double, y as Double, width as Double, height as Double) 9218


### 56.40.7 Constructor(source as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGRectMBS object by copying the values.
See also:


- 56.40.5 Constructor 9217
- 56.40.6 Constructor(p as Ptr) 9217
- 56.40.8 Constructor(x as Double, y as Double, width as Double, height as Double) 9218


### 56.40.8 Constructor(x as Double, y as Double, width as Double, height as Double)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a new CGRectMBS object with the given values.
See also:


- 56.40.5 Constructor 9217
- 56.40.6 Constructor(p as Ptr) 9217
- 56.40.7 Constructor(source as CGRectMBS) 9218


### 56.40.9 ContainsPoint(r as CGPointMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return true if 'point' is contained in the rect, false otherwise.

### 56.40.10 ContainsRect(r as CGRectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return true if 'rect2' is contained in 'rect1', false otherwise.
**Notes:** 'rect2' is contained in 'rect1' if the union of 'rect1' and 'rect2' is equal to 'rect1'.
(rect1 is the current rect and rect2 the rect you pass to this function)

### 56.40.11 Divide(byref slice as CGRectMBS, byref remainder as CGRectMBS, amount as Double, edge as Integer)

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Divides the rectangle.
**Notes:** Make two new rectangles, 'slice' and 'remainder', by dividing the rect with a line that's parallel to one of its sides, specified by 'edge' – either 'CGRectMinXEdge', 'CGRectMinYEdge', 'CGRectMaxXEdge', or 'CGRectMaxYEdge'. The size of 'slice' is determined by 'amount', which measures the distance from the specified edge.

### 56.40.12 Equal(r as CGRectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns true if both rectangles are equal.

### 56.40.13 Infinite as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** A rectangle that has infinite extent.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Infinite
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** Available in Mac OS X v10.4 and later.

### 56.40.14 Inset(dx as Double, dy as Double) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Inset the rect by '(dx, dy)' – i.e., offset its origin by '(dx, dy)', and decrease its size by '(2*dx, 2*dy)'

### 56.40.15 Integral as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Expand the rect to the smallest rect containing it with integral origin and size.

### 56.40.16 Intersection(r as CGRectMBS) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the intersection of both rectangles.
**Notes:** This may return a null rect.

### 56.40.17 IntersectsRect(r as CGRectMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return true if 'rect1' intersects 'rect2', false otherwise.
**Notes:** 'rect1' intersect 'rect2' if the intersection of 'rect1' and 'rect2' is not the null rect.

### 56.40.18 IsEmpty as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return true if the rect is empty – i.e., if it has zero width or height.
**Notes:** A null rect is defined to be empty.

### 56.40.19 IsInfinite as boolean

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns whether a rectangle is infinite.
**Notes:** Returns true if the specified rectangle is infinite, false otherwise.

An infinite rectangle is one that has no defined bounds. Infinite rectangles can be created as output from a tiling filter. For example, the Core Image framework perspective tile filter creates an image whose extent is

described by an infinite rectangle.

### 56.40.20 IsNull as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return true if the rect is null – e.g., the result of intersecting two disjoint rectangles is a null rect.

### 56.40.21 Make(x as Double, y as Double, width as Double, height as Double) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns a new CGRectMBS object with the given values.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Make(1,2,3,4)
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

### 56.40.22 MaxX as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the rightmost x-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MaxX) // 40
```

### 56.40.23 MaxY as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the topmost y-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MaxY) // 60
```

### 56.40.24 MidX as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the midpoint x-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MidX) // 25
```

### 56.40.25 MidY as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the midpoint y-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MidY) // 40
```

### 56.40.26 MinX as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the leftmost x-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MinX) // 10
```

### 56.40.27 MinY as Double

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the bottommost y-value of the rect.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.MinY) // 20
```

### 56.40.28 Null as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the null rect.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Null
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** The "empty" rect. This is the rectangle returned when, for example, we intersect two disjoint rectangles.
Note that the null rect is not the same as the zero rect.

### 56.40.29 Offset(dx as Double, dy as Double) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Offset the rect by '(dx, dy)'.

### 56.40.30 Standardize as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Standardize the rect – i.e., convert it to an equivalent rect which has positive width and height.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Make(5, 6, -3, -2)
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
r = r.Standardize
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

### 56.40.31 Union(r as CGRectMBS) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the union of both rectangles.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Infinite
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

### 56.40.32 Zero as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** A rectangle constant with location (0,0), and width and height of 0.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Zero
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** The zero rectangle is equivalent to CGRectMBS.Make(0,0,0,0).

### 56.40.33 Properties

### 56.40.34 height as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The height property of the rectangle.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** (Read and Write property)

### 56.40.35 left as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The left property of the rectangle.
**Notes:** (Read and Write property)

### 56.40.36 Origin as CGPointMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The origin of the rectangle.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Make(5, 6, 3, 2)
dim s as CGPointMBS = r.Origin
MsgBox str(s.x)+" x "+str(s.y)
```

**Notes:** (Read and Write property)

### 56.40.37 Size as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The size of the rectangle.
**Example:**

```
dim r as CGRectMBS = CGRectMBS.Make(5, 6, 3, 2)
dim s as CGSizeMBS = r.Size
MsgBox str(s.Width)+" x "+str(s.Height)
```

**Notes:** (Read and Write property)

### 56.40.38 top as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The top property of the rectangle.
**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** (Read and Write property)

### 56.40.39 width as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The width property of the rectangle.

**Example:**

```
dim r as CGRectMBS = CGMakeRectMBS(10, 20, 30, 40)
MsgBox str(r.Left)+" "+str(R.Top)+" "+str(R.Width)+" "+str(r.Height)
```

**Notes:** (Read and Write property)

## 56.41 class CGSConnectionMBS

### 56.41.1 class CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a connection to the CoreGraphics System.
**Example:**

```
dim c as new CGSConnectionMBS
dim list as CGSWindowListMBS = c.GetWindowList

dim names() as string
dim u as Integer = List.Count-1
for i as Integer = 0 to u
dim w as CGSWindowMBS = List.Item(i)
names.append w.Title
next

MsgBox str(List.Count)+" windows: "+Join(names, ", ")
```

**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.
**Blog Entries**

- MBS REALbasic Plugins, version 11.0fc1
- MonkeyBread Software Releases the MBS Plugins 8.1

### 56.41.2 Methods

### 56.41.3 CGSWindow(w as window) as CGSWindowMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a CGSWindow reference to a normal RB window.
**Notes:** Can be used for the CGSTransitionRequestMBS.Win property.

### 56.41.4 CGSWindowbyHandle(windowhandle as Integer) as CGSWindowMBS

MBS MacCG Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a CGSWindow reference to any window where you can have a handle.
**Notes:** WindowHandle must be of C type WindowRef. Not a CGS Window Handle.
Can be used for the handle from an OverlayWindowMBS.

### 56.41.5 FlushAllWindows

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** Flushes all windows.
**Notes:** Walks over the window list (of the current process) and does a flush on each window.
Lasterror is set.

### 56.41.6 FlushAllWindowsForAllOtherProceses

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** Flushes all windows.
**Notes:** Walks over the list of processes asking each for its window list and doing a flush on each window.
The own process is ignored.
Lasterror is set.

### 56.41.7 FlushAllWindowsForAllProceses

MBS MacCG Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** Flushes all windows.
**Notes:** Walks over the list of processes asking each for its window list and doing a flush on each window.
Lasterror is set.

### 56.41.8 GetOnScreenWindowList as CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of windows on screen for the current process.
**Notes:** Returns nil on any error.

### 56.41.9 GetOnScreenWindowListForProcess(PID as Integer) as CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of windows on screen for the process with the given Process ID.
**Notes:** Returns nil on any error.

### 56.41.10 GetWindowList as CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of windows for the current process.
**Notes:** Returns nil on any error.

### 56.41.11 GetWindowListForProcess(PID as Integer) as CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of windows for the process with the given Process ID.
**Notes:** Returns nil on any error.

### 56.41.12 NewTransition(request as CGSTransitionRequestMBS) as CGSTransitionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new transition.
**Notes:** Lasterror is set.
Request must be a valid object reference.
Transitions seem not to work in Carbon PEF builds. MachO works.

### 56.41.13 RunTransition(request as CGSTransitionRequestMBS, duration as single)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A method to run a transition for the given request and given time.
**Example:**

```
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
```

```
cw=co.CGSWindow(window1)

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.TransitionOption=r.CGSLeft
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
co.RunTransition(r,2)
```

**Notes:** Lasterror is set.
Transitions seem not to work in Carbon PEF builds. MachO works.

### 56.41.14 SetWorkspaceWithTransition(workspace as CGSWorkspaceMBS, transition as Integer, type as Integer, time as single)

MBS MacCG Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Performs a transition with a workspace specified by the workspace object.
**Notes:** The values for the parameters are not documented on the web except that the transition and type property may use the same transition constants as for the other transitions.
Lasterror is set.
See also:

- 56.41.15 SetWorkspaceWithTransition(workspace as Integer, transition as Integer, type as Integer, time as single) 9230

### 56.41.15 SetWorkspaceWithTransition(workspace as Integer, transition as Integer, type as Integer, time as single)

MBS MacCG Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Performs a transition with a workspace specified by the workspace number.
**Example:**

```
dim c as new CGSConnectionMBS
dim t as new CGSTransitionRequestMBS

// from space 1 to 2
c.SetWorkspaceWithTransition(2,t.CGSFade, t.CGSInOut, 5)

// but transition and time are ignored on testing Mac.

MsgBox str(c.Lasterror)
```

**Notes:** The values for the parameters are not documented on the web except that the transition and type property may use the same transition constants as for the other transitions.
Lasterror is set.
See also:

- 56.41.14 SetWorkspaceWithTransition(workspace as CGSWorkspaceMBS, transition as Integer, type as Integer, time as single) 9230

### 56.41.16 Properties

### 56.41.17 Handle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle for this connection.
**Notes:** (Read and Write property)

### 56.41.18 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last error code reported.
**Notes:** The list of CoreGraphics error (from Mac OS X 10.4)

(Read and Write property)

### 56.41.19 Workspace as CGSWorkspaceMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The workspace this connection is pointing to.
**Notes:** (Read and Write computed property)

| | | |
|---|---|---|
| kCGErrorSuccess | = 0 | Success |
| kCGErrorFailure | = 1000 | Failure |
| kCGErrorIllegalArgument | = 1001 | Illegal Argument |
| kCGErrorInvalidConnection | = 1002 | Invalid Connection |
| kCGErrorInvalidContext | = 1003 | Invalid Context |
| kCGErrorCannotComplete | = 1004 | Cannot complete |
| kCGErrorNameTooLong | = 1005 | Name is too long |
| kCGErrorNotImplemented | = 1006 | Not implemented |
| kCGErrorRangeCheck | = 1007 | Out of bounds |
| kCGErrorTypeCheck | = 1008 | Type error |
| kCGErrorNoCurrentPoint | = 1009 | No current point |
| kCGErrorInvalidOperation | = 1010 | Invalid Operation |
| kCGErrorNoneAvailable | = 1011 | internal errors have taken 1012 1013 and 1014 |
| kCGErrorApplicationRequiresNewerSystem | = 1015 | the application being launched says in it's bundle info that it requires a newer version of the system than is currently running. |
| kCGErrorApplicationNotPermittedToExecute | = 1016 | Macintosh Manager is active and this application is not permitted to run |
| kCGErrorApplicationIncorrectExecutableFormatFound | = 1023 | the application being launched does not have any executable code for the current system. |
| kCGErrorApplicationIsLaunching | = 1024 | The application is in the process of launching but hasn't checked in yet. Any launch data provided will be given to the application when it does check in. |
| kCGErrorApplicationAlreadyRunning | = 1025 | The application being launched was already running ( and had already checked in ) and so any launch data provided can not be delivered to in by CPS |
| kCGErrorApplicationCanOnlyBeRunInOneSessionAtATime | = 1026 | The application being launched is incompatible with multiple user sessions and is already running in another session by another user. |
| kCGErrorClassicApplicationsMustBeLaunchedByClassic | = 1027 | To avoid deadlock Classic can't launch another Classic application by going thru CPS. This error gets returned in that case and it signals TruBlueEnvironment that it must handle this launch on its own. |
| kCGErrorForkFailed | = 1028 | CPS was unable to fork a new process in order to launch an application. |

## 56.42 class CGScreenRefreshEventMBS

### 56.42.1 class CGScreenRefreshEventMBS

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The class to receive events for screen updates.

### 56.42.2 Properties

### 56.42.3 Initialized as Boolean

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Whether object is initialized correctly.
**Notes:** Should be true on OS X if initializing was done.
(Read only property)

### 56.42.4 Events

### 56.42.5 ScreenRefresh(rectCount as Integer, rects() as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** The event to inform you about a screen refresh.
**Notes:** When an area of the display is modified or refreshed, this event function will be invoked with a count of the number of rectangles in the refreshed areas, and a list of the refreshed rectangles. The rectangles are in global coordinates.

Quartz invokes this event when operations such as drawing, window movement, scrolling, or display reconfiguration occur on local displays.

Note that a single rectangle may occupy multiple displays, either by overlapping the displays or by residing on coincident displays when mirroring is active. You can use the function CGDisplayMBS.GetDisplaysWithRect to determine the displays a rectangle occupies.

## 56.43 class CGScreenUpdateMoveEventMBS

### 56.43.1 class CGScreenUpdateMoveEventMBS

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The class to get event when something on screen changes.

### 56.43.2 Properties

### 56.43.3 Initialized as Boolean

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** Whether object is initialized correctly.
**Notes:** This should be true on Mac after calling constructor.
(Read only property)

### 56.43.4 Events

### 56.43.5 ScreenMove(deltaX as Integer, deltaY as Integer, rectCount as Integer, rects() as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** The event invoked when an area of the display is moved.
**Notes:** When an area of the display is moved, your callback function will be invoked with a count of the number of rectangles in the moved area, and a list of the moved rectangles. The rectangles are in global coordinates, and describe the area prior to the move operation.

A single rectangle may occupy multiple displays, either by overlapping the displays or by residing on coincident displays when mirroring is active. Use CGDisplayMBS.GetDisplaysWithRect to determine the displays a rectangle occupies.

DeltaX/DeltaY: The distance a region on the screen moves in pixel units.

The fields deltaX and deltaY describe the direction of movement. Positive values of deltaX indicate movement to the right; negative values indicate movement to the left. Positive values of deltaY indicate movement downward; negative values indicate movement upward.

## 56.44 class CGSessionMBS

### 56.44.1 class CGSessionMBS

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class to hold some values about the current CoreGraphics session.
**Example:**

```
dim c as CGSessionMBS = CGSessionMBS
MsgBox c.UserName
```

**Notes:** You need to call the CGSessionMBS global method to get a valid object of this class (with values).

### 56.44.2 Properties

### 56.44.3 ConsoleSet as Integer

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Value is a 32 bit unsigned integer value representing a set of hardware composing a console.
**Example:**

```
dim c as CGSessionMBS = CGSessionMBS

MsgBox str(c.ConsoleSet)
```

**Notes:** (Read only property)

### 56.44.4 LoginDone as Boolean

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** True if login operation has been done, otherwise False.
**Example:**

```
dim c as CGSessionMBS = CGSessionMBS

MsgBox str(c.LoginDone)
```

**Notes:** (Read only property)

### 56.44.5 OnConsole as Boolean

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** True if the session is on a console, otherwise False.
**Example:**

```
dim c as CGSessionMBS = CGSessionMBS

MsgBox str(c.OnConsole)
```

**Notes:** (Read only property)

### 56.44.6 UserID as Integer

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The user id for the session's current user.
**Example:**

```
dim c as CGSessionMBS = CGSessionMBS

MsgBox str(c.UserID)
```

**Notes:** (Read only property)

### 56.44.7 UserName as String

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** The session's short user name as set by loginwindow.
**Example:**

```
dim usr as CGSessionMBS
usr=CGSessionMBS
msgbox usr.UserName
```

**Notes:** (Read only property)

## 56.45 class CGShadingMBS

### 56.45.1 class CGShadingMBS

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** To shade means to fill using a smooth transition between colors across an area. Quartz shadings simplify several common shading operations. Quartz shadings currently support radial and axial gradient fills.
**Notes:** To paint with a Quartz shading, you call CGContextMBS.DrawShading. This function fills the current clipping path using the specified color gradient, calling your parametric function repeatedly as it draws.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1fc1

### 56.45.2 Properties

### 56.45.3 Handle as Integer

MBS MacCG Plugin, Plugin Version: 6.2, Platform: macOS, Targets: All.

**Function:** Handle to the CGShadingRef.
**Notes:** (Read and Write property)

## 56.46 class CGSizeMBS

### 56.46.1 class CGSizeMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** A class for a core graphics size.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr6
- MBS REALbasic plug-ins version 9.5

**Xojo Developer Magazine**

- 12.2, page 45: Moving to AVFoundation, Leaving QuickTime behind by Christian Schmitz

### 56.46.2 Methods

### 56.46.3 ApplyAffineTransform(p as CGAffineTransformMBS) as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Transform 'size' by 't' and return the result: s' = s * t where s = [ width height 0 ] .

### 56.46.4 Binary as MemoryBlock

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the internal data of the object as a CGSize for use on Toolbox calls.
**Example:**

```
dim c as CGSizeMBS
dim m as MemoryBlock

c=CGMakeSizeMBS(10,20)

m=c.Binary

MsgBox str(m.Size) // 8
MsgBox str(m.doubleValue( 0)) // 10
MsgBox str(m.doubleValue( 4)) // 20
```

### 56.46.5 Constructor

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates an zero size object.
See also:


- 56.46.6 Constructor(p as Ptr) 9240
- 56.46.7 Constructor(source as CGSizeMBS) 9240
- 56.46.8 Constructor(width as Double, height as Double) 9240


### 56.46.6 Constructor(p as Ptr)

MBS MacCG Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates a new instance using data at the pointer.
**Notes:** Make sure the pointer is valid and has the right data and size.
See also:


- 56.46.5 Constructor 9240
- 56.46.7 Constructor(source as CGSizeMBS) 9240
- 56.46.8 Constructor(width as Double, height as Double) 9240


### 56.46.7 Constructor(source as CGSizeMBS)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** The constructor which copies the values from the other size object.
See also:


- 56.46.5 Constructor 9240
- 56.46.6 Constructor(p as Ptr) 9240
- 56.46.8 Constructor(width as Double, height as Double) 9240


### 56.46.8 Constructor(width as Double, height as Double)

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Creates a size object with the given values.
See also:


- 56.46.5 Constructor 9240

- 56.46.6 Constructor(p as Ptr) 9240
- 56.46.7 Constructor(source as CGSizeMBS) 9240


### 56.46.9 Equal(p as CGSizeMBS) as boolean

MBS MacCG Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns true if two CGSize objects are equal.

### 56.46.10 Make(width as Double, height as Double) as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns a new CGSizeMBS object with the given values.

### 56.46.11 Zero as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Returns the zero size.
**Notes:** The "zero" size – equivalent to CGSizeMBS.Make(0, 0).

### 56.46.12 Properties

### 56.46.13 height as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The height property of the point.
**Notes:** (Read and Write property)

### 56.46.14 width as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The width property of the point.
**Notes:** (Read and Write property)

## 56.47 class CGSTransitionMBS

### 56.47.1 class CGSTransitionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for a transition to the CoreGraphics System.
**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7

### 56.47.2 Methods

### 56.47.3 Invoke(duration as single)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs the transition.
**Example:**

```
// cube transition for the whole screen
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim ct as CGSTransitionMBS // global property

co=new CGSConnectionMBS

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSCube
r.TransitionOption=r.CGSLeft
r.HasBackGround=true
r.HasBackColor=false

ct=co.NewTransition(r)
if ct<>Nil then
window1.refresh // draw new screen
ct.invoke 5
ct.wait 5
ct.release
else
MsgBox "Error creating the transition."
end if
```

**Notes:** duration is the time in seconds the duration will need to complete.
Lasterror is set.

### 56.47.4 Release

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Releases the transaction.
**Example:**

```
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim ct as CGSTransitionMBS // global property
dim cw as CGSWindowMBS

co=new CGSConnectionMBS

cw=co.CGSWindow(window1)

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSCube
r.TransitionOption=r.CGSLeft
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw

ct=co.NewTransition(r)
if ct<>Nil then
window1.refresh // draw new screen
ct.invoke 5
ct.wait 5
ct.release
else
MsgBox "Error creating the transition."
end if
```

**Notes:** Lasterror is set.
Must be called after performing a transition, but not before the transition is finished.

### 56.47.5 Run(duration as single)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs a transition effect for the given duration.
**Example:**

```
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim ct as CGSTransitionMBS // global property
dim cw as CGSWindowMBS

co=new CGSConnectionMBS

cw=co.CGSWindow(window1)

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSCube
r.TransitionOption=r.CGSLeft
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw

ct=co.NewTransition(r)
if ct<>Nil then
window1.Refresh // draw new window

ct.run(2)
else
MsgBox "Error creating the transition."
end if
```

**Notes:** Same as calling Invoke, Wait and Release.

### 56.47.6 Wait(duration as single)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Waits the given time in second.
**Example:**

```
// instead of wait(5) you can do this to give time to other threads and timers of your application:

dim ct as CGSTransitionMBS
dim t as Integer
```

```
t=ticks+300 // 60th of a second * 300 = 5 seconds

while ticks<t
ct.wait(0.1)
app.YieldToNextThread
wend
```

**Notes:** All the CPU time is given away to other applications to give maximum performance to the transition.

### 56.47.7 Properties

### 56.47.8 Connection as CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to the connection used.
**Notes:** Every CGS class has a reference to the connection so the connection object stays in memory as long as one of the depending objects is being used.
(Read only property)

### 56.47.9 ConnectionHandle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the CGS connection being used.
**Notes:** Most of the functions need this value and it needs to be not zero.
(Read and Write property)

### 56.47.10 Handle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle for this transition.
**Notes:** (Read and Write property)

### 56.47.11 Screenshots

### 56.47.12 CGS1.jpg

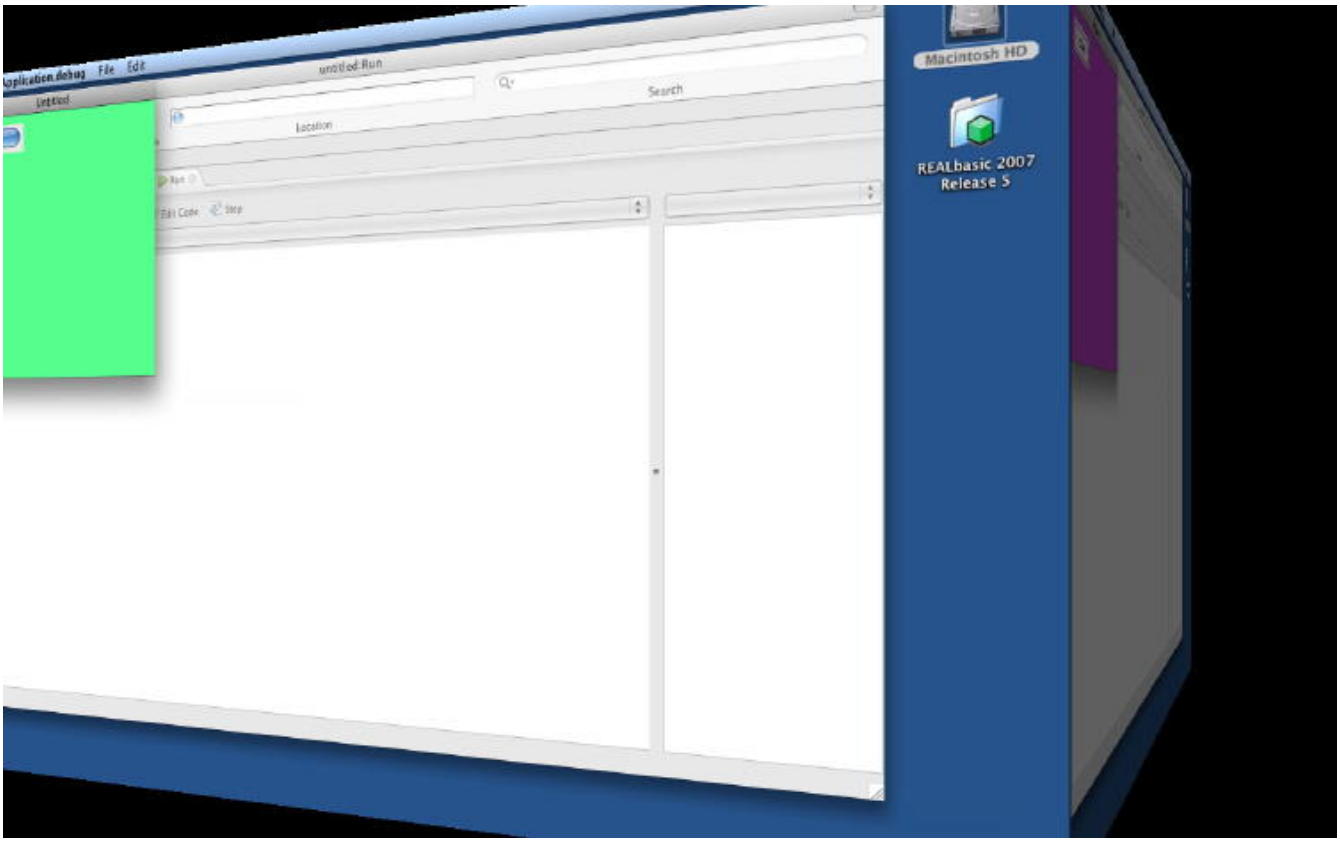


**Function:** A cube transition running on the whole desktop with black background.

### 56.47.13 CGS2.jpg

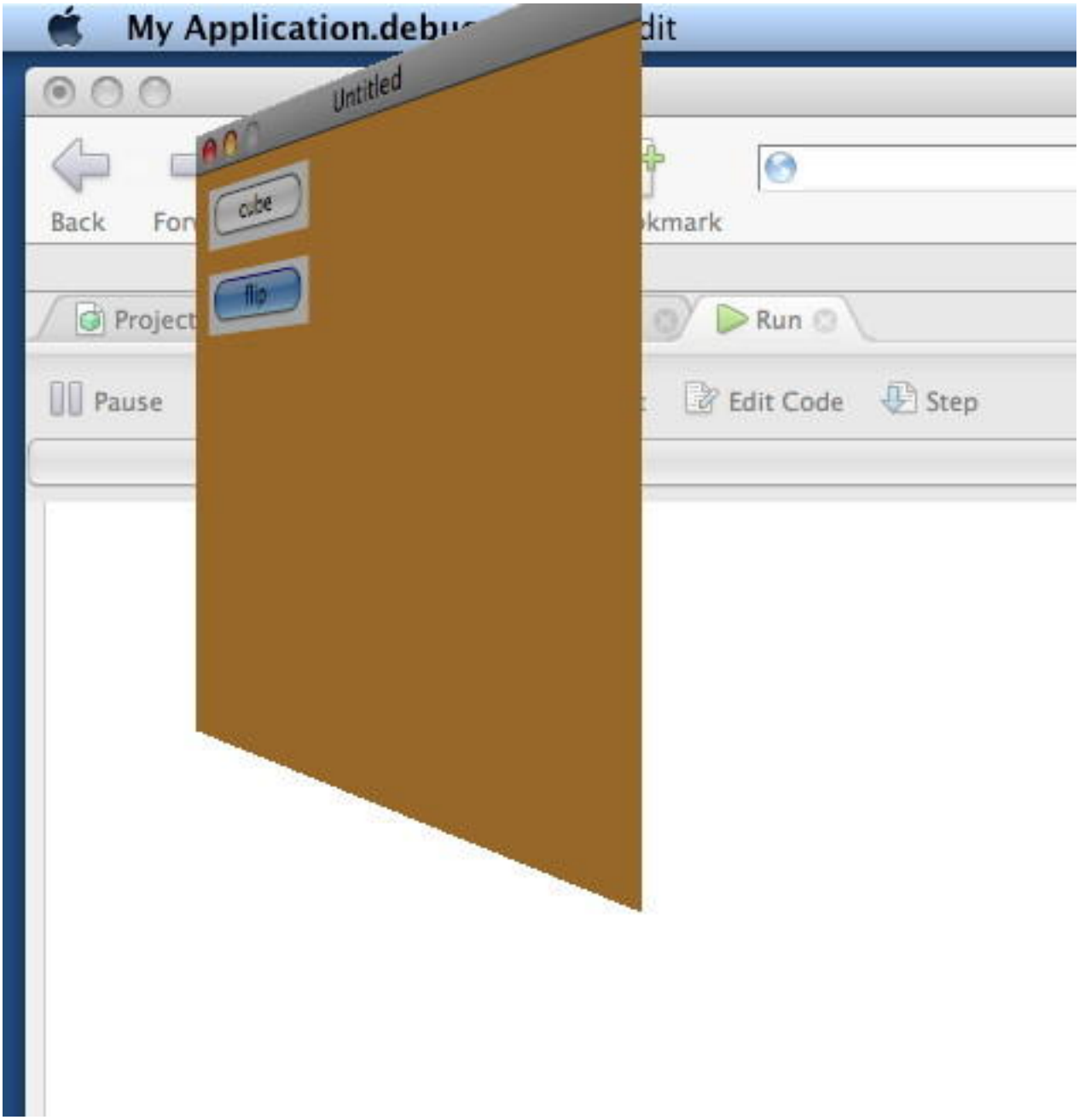


**Function:** A flip transition running on a window. (like Dashboard)

### 56.47.14 CGS3.jpg

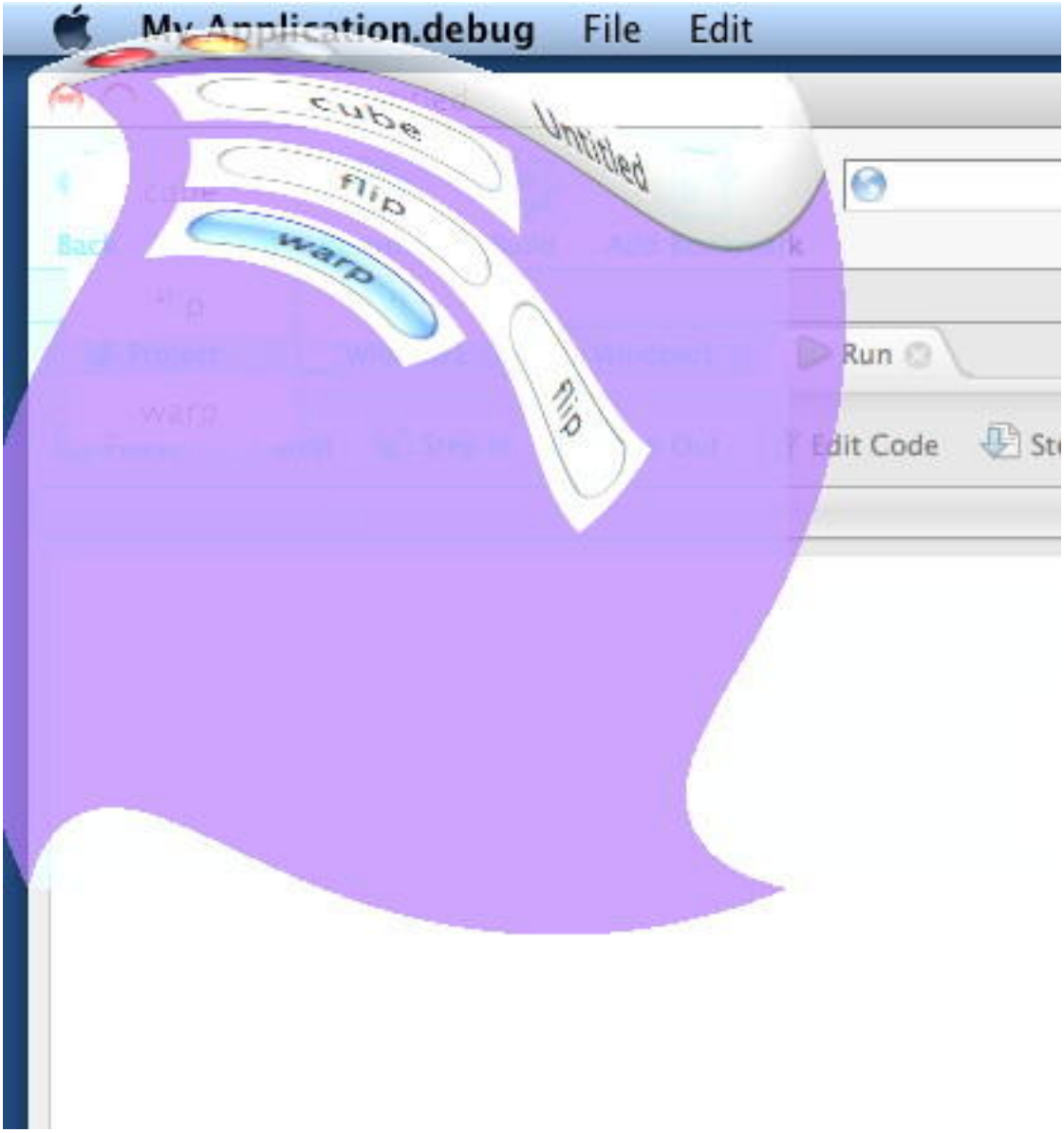


**Function:**

A wrap transition running on the window.

### 56.47.15 CGS4.jpg

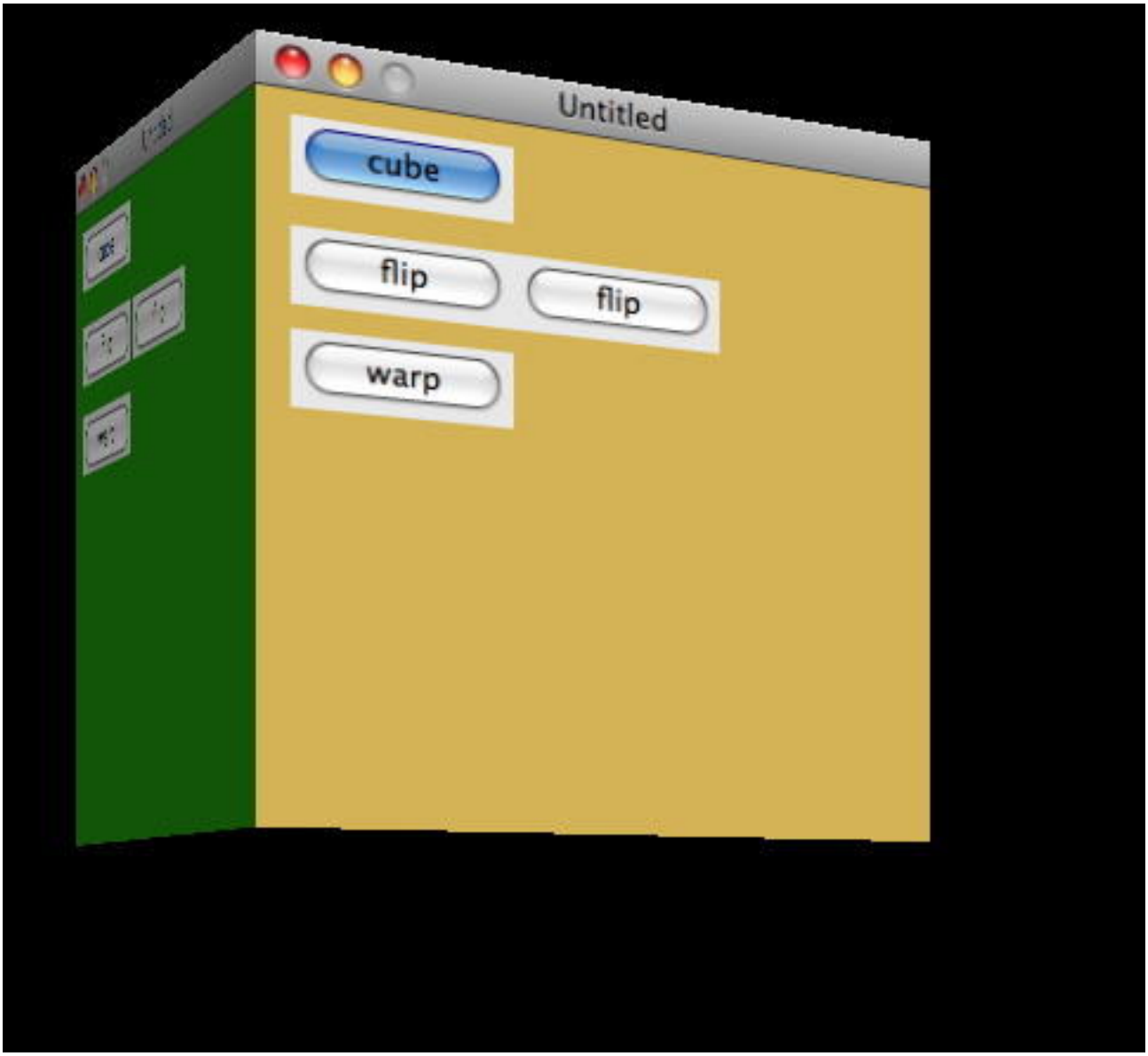


**Function:** A cube transition running on a window with black background.

### 56.47.16 CGS5.jpg

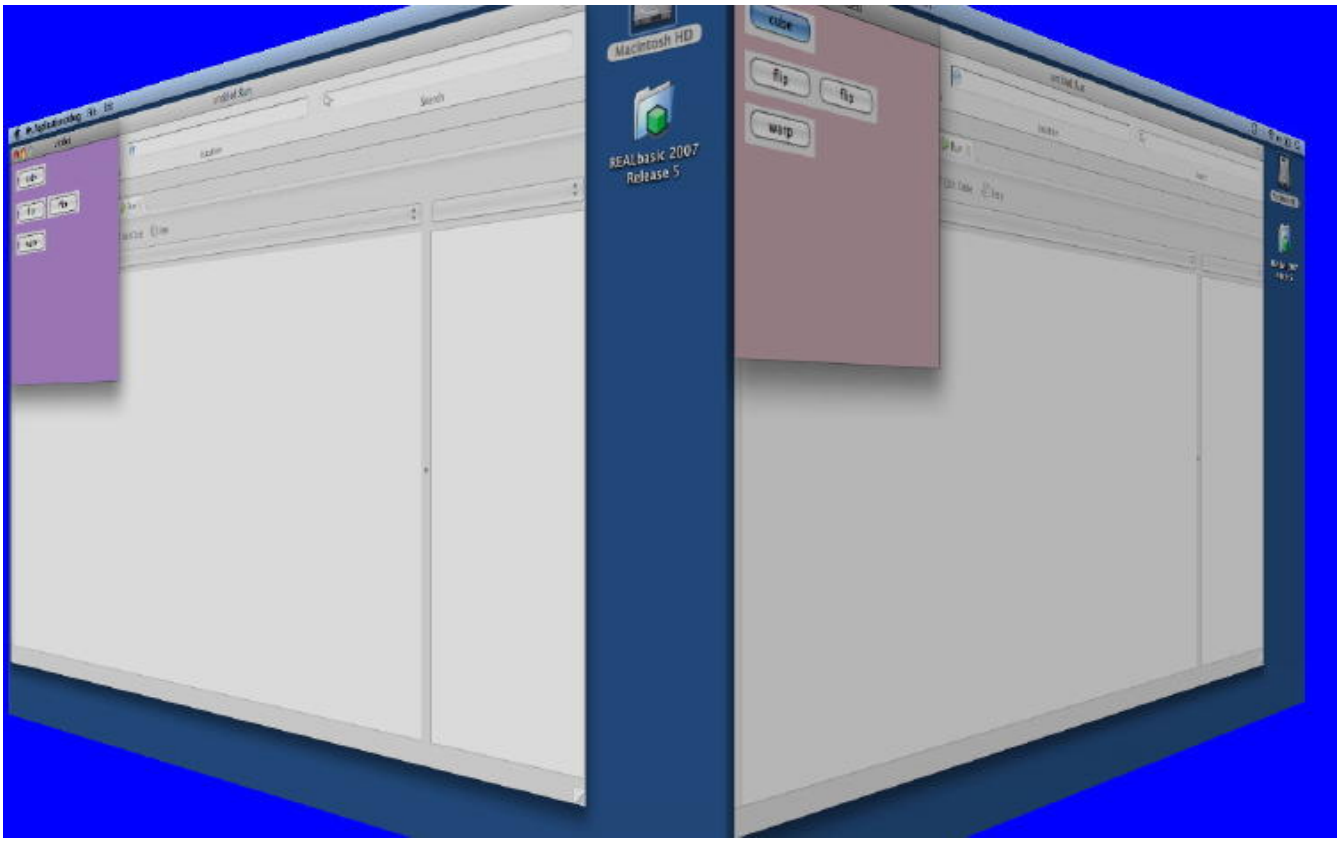


**Function:** A cube transition running on the whole desktop with blue background.

### 56.47.17 CGS6.jpg

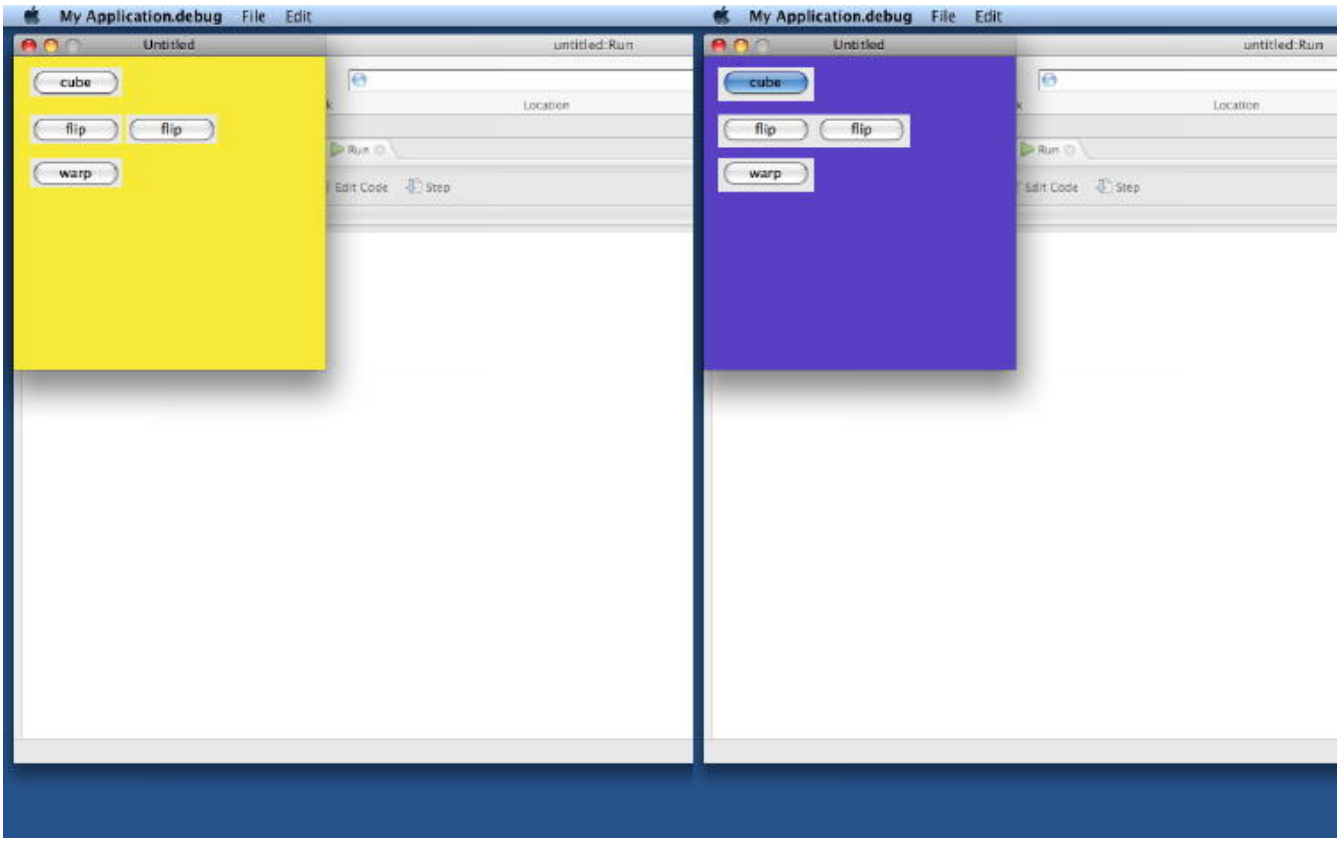


**Function:** A cube transition running on the whole desktop.

## 56.48 class CGSTransitionRequestMBS

### 56.48.1 class CGSTransitionRequestMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for a transition request to the CoreGraphics System.
**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr7

### 56.48.2 Methods

### 56.48.3 Run(duration as single) as boolean

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Runs a transition.
**Example:**

```
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim cw as CGSWindowMBS // global property

co=new CGSConnectionMBS

cw=co.CGSWindow(window1)

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSCube
r.TransitionOption=r.CGSLeft
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
call r.run(5)
```

**Notes:** Lasterror is set.
Transitions seem not to work in Carbon PEF builds. MachO works.

### 56.48.4 Properties

### 56.48.5 Blue as Single

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Blue part of the backcolor.
**Notes:** Range is from 0.0 (no color) to 1.0 (full color).
(Read and Write property)

### 56.48.6 Green as Single

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Green part of the backcolor.
**Notes:** Range is from 0.0 (no color) to 1.0 (full color).
(Read and Write property)

### 56.48.7 HasBackColor as Boolean

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the background on the transition has a color.
**Example:**

```
dim r as CGSTransitionRequestMBS
dim co as CGSConnectionMBS // global property
dim ct as CGSTransitionMBS // global property

r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSWarpSwitch
r.TransitionOption=r.CGSLeft
r.HasBackGround=true
r.HasBackColor=true
r.red=0 // all zero is black, all one is white
r.Blue=0
r.Green=0

ct=co.NewTransition(r)
if ct<>Nil then
window1.Refresh
ct.Invoke(2)
ct.Wait(2)
ct.Release
else
```

```
MsgBox "Error creating the transition."
end if
```

**Notes:** (Read and Write property)

### 56.48.8 HasBackGround as Boolean

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether you want to use the background or not.
**Example:**

```
dim r as new CGSTransitionRequestMBS
r.HasBackGround=false // best for a window in place transition
```

**Notes:** If HasBackGround is true, a background is drawn behind the transition which may have a background color.
(Read and Write property)

### 56.48.9 Red as Single

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Red part of the backcolor.
**Notes:** Range is from 0.0 (no color) to 1.0 (full color).
(Read and Write property)

### 56.48.10 TransitionOption as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The transition options to use.
**Example:**

```
dim r as CGSTransitionRequestMBS
r.TransitionOption=r.CGSLeft
```

**Notes:** One of the constants:

| | | |
|---|---|---|
| CGSDown | = 0 | Old desktop moves down. |
| CGSLeft | = 1 | Old desktop moves left. |
| CGSRight | = 2 | Old desktop moves right. |
| CGSInRight | = 3 | CGSSwap: Old desktop moves into screen, new comes from right. |
| CGSBottomLeft | = 5 | CGSSwap: Old desktop moves to bottom left, new comes from top right. |
| CGSBottomRight | = 6 | Old desktop to bottom right, New from top left. |
| CGSDownTopRight | = 7 | CGSSwap: Old desktop moves down, new from top right. |
| CGSUp | = 8 | Old desktop moves up. |
| CGSTopLeft | = 9 | Old desktop moves top left. |
| CGSTopRight | = 10 | CGSSwap: old to top right. new from bottom left. |
| CGSUpBottomRight | = 11 | CGSSwap: old desktop up, new from bottom right. |
| CGSInBottom | = 12 | CGSSwap: old in, new from bottom. |
| CGSLeftBottomRight | = 13 | CGSSwap: old one moves left, new from bottom right. |
| CGSRightBottomLeft | = 14 | CGSSwap: old one moves right, new from bottom left. |
| CGSInBottomRight | = 15 | CGSSwap: onl one in, new from bottom right. |
| CGSInOut | = 16 | CGSSwap: old in, new out. |

(Read and Write property)

### 56.48.11 TransitionType as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The transition to use.
**Notes:** One of the constants:

| | | |
|---|---|---|
| CGSNone | = 0 | No transition effect. |
| CGSFade | = 1 | Cross-fade. |
| CGSZoom | = 2 | Zoom/fade towards us. |
| CGSReveal | = 3 | Reveal new desktop under old. |
| CGSSlide | = 4 | Slide old out and new in. |
| CGSWarpFade | = 5 | Warp old and fade out revealing new. |
| CGSSwap | = 6 | Swap desktops over graphically. |
| CGSCube | = 7 | The well-known cube effect. |
| CGSWarpSwitch | = 8 | Warp old, switch and un-warp. |
| CGSFlip | = 9 | The flip effect known from Dashboard |

(Read and Write property)

### 56.48.12 Win as CGSWindowMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The window to use for the transition.
**Notes:** Set to nil to do a full screen transition.
(Read and Write property)

### 56.48.13 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CGSBottomLeft | 5 | CGSSwap: Old desktop moves to bottom left, new comes from top right. |
| CGSBottomRight | 6 | Old desktop to bottom right, New from top left. |
| CGSCube | 7 | The well-known cube effect. |
| CGSDown | 0 | Old desktop moves down. |
| CGSDownTopRight | 7 | CGSSwap: Old desktop moves down, new from top right. |
| CGSFade | 1 | Cross-fade effect. |
| CGSFlip | 9 | The flip transition effect. (like Dashboard) |
| CGSInBottom | 12 | CGSSwap: old in, new from bottom. |
| CGSInBottomRight | 15 | CGSSwap: onl one in, new from bottom right. |
| CGSInOut | 16 | CGSSwap: old in, new out. |
| CGSInRight | 3 | CGSSwap: Old desktop moves into screen, new comes from right. |
| CGSLeft | 1 | Old desktop moves left. |
| CGSLeftBottomRight | 13 | CGSSwap: old one moves left, new from bottom right. |
| CGSNone | 0 | No transition effect. |
| CGSReveal | 3 | Reveal new desktop under old. |
| CGSRight | 2 | Old desktop moves right. |
| CGSRightBottomLeft | 14 | CGSSwap: old one moves right, new from bottom left. |
| CGSSlide | 4 | Slide old out and new in. |
| CGSSwap | 6 | Swap desktops over graphically. |
| CGSTopLeft | 9 | Old desktop moves top left. |
| CGSTopRight | 10 | CGSSwap: old to top right. new from bottom left. |
| CGSUp | 8 | Old desktop moves up. |
| CGSUpBottomRight | 11 | CGSSwap: old desktop up, new from bottom right. |
| CGSWarpFade | 5 | Warp old and fade out revealing new. |
| CGSWarpSwitch | 8 | Warp old, switch and un-warp. |
| CGSZoom | 2 | Zoom/fade towards us. |

# 56.49 class CGSValueMBS

## 56.49.1 class CGSValueMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a value to the CoreGraphics System.
**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.

## 56.49.2 Methods

## 56.49.3 IntegerValue as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The integer value of this object.

## 56.49.4 StringValue as string

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The string value of this object.

## 56.49.5 Properties

## 56.49.6 Connection as CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to the connection used.
**Notes:** Every CGS class has a reference to the connection so the connection object stays in memory as long as one of the depending objects is being used.
(Read only property)

## 56.49.7 ConnectionHandle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the CGS connection being used.
**Notes:** Most of the functions need this value and it needs to be not zero.
(Read and Write property)

### 56.49.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal used handle.
**Notes:** (Read and Write property)

# 56.50 class CGSWindowListMBS

## 56.50.1 class CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of CGSWindowMBS objects.
**Example:**

```
dim c as new CGSConnectionMBS
dim list as CGSWindowListMBS = c.GetWindowList

dim names() as string
dim u as Integer = List.Count-1
for i as Integer = 0 to u
dim w as CGSWindowMBS = List.Item(i)
names.append w.Title
next

MsgBox str(List.Count)+" windows: "+Join(names, ", ")
```

**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr3
- MBS Xojo / Real Studio Plugins, version 15.1pr1
- MonkeyBread Software Releases the MBS Plugins 8.1

## 56.50.2 Methods

## 56.50.3 Item(index as Integer) as CGSWindowMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the window with the given index.
**Notes:** Index is from 0 to count-1.

## 56.50.4 PreflightScreenCaptureAccess as Boolean

MBS MacCG Plugin, Plugin Version: 23.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Checks whether the current process already has screen capture access.
**Notes:** For macOS 10.15 and newer.
Always returns false on other targets.

### 56.50.5 RequestScreenCaptureAccess as Boolean

MBS MacCG Plugin, Plugin Version: 23.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requests event listening access if absent, potentially prompting.
**Notes:** For macOS 10.15 and newer.
Always returns false on other targets.

### 56.50.6 Properties

### 56.50.7 Connection as CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to the connection used.
**Notes:** Every CGS class has a reference to the connection so the connection object stays in memory as long as one of the depending objects is being used.
(Read only property)

### 56.50.8 ConnectionHandle as Integer

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the CGS connection being used.
**Notes:** Most of the functions need this value and it needs to be not zero.
(Read and Write property)

### 56.50.9 Count as Integer

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of CGSWindow objects in that array.
**Notes:** (Read and Write property)

### 56.50.10 Handle as Integer

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the window list.
**Notes:** (Read and Write property)

## 56.51 class CGSWindowMBS

### 56.51.1 class CGSWindowMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a window in the CoreGraphics System.
**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.

To find all processes on Mac, use the ProcessMBS class.
To find all windows on Windows, use the WindowsListMBS class.

Not official supported by Apple and some effects don't work well on latest OS X versions!
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Plugins 8.1

### 56.51.2 Methods

### 56.51.3 Flush

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Flushes this window.
**Example:**

```
dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)

cw.Flush
```

**Notes:** Lasterror is set.

### 56.51.4 Height as Double

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The height of this window.
**Example:**

```
dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)

MsgBox str(cw.height)
```

### 56.51.5 Left as Double

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The left position of this window.
**Example:**

```
dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)

MsgBox str(cw.left)
```

### 56.51.6 Level as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The window level of this window.
**Notes:** See WindowGroupMBS.level or OverlayWindow.Level for details.

### 56.51.7 Move(byref x as single, byref y as single)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the window.

### 56.51.8 Order(mode as Integer, relativeToWindow as CGSWindowMBS=nil)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reorders the window.
**Notes:** Lasterror is set.
Mode must be kCGSOrderAbove, kCGSOrderBelow or kCGSOrderOut.

### 56.51.9 Title as string

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The window title.

### 56.51.10 Top as Double

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The top position of this window.
**Example:**

```
dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)

MsgBox str(cw.top)
```

**Notes:** In Pixel from the top of the screen.

### 56.51.11 Uncover

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Uncovers the window.
**Notes:** Lasterror is set.

### 56.51.12 Warp(w as Integer, h as Integer, value as memoryblock)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the wrap of a window.
**Example:**

```
dim w,h as Integer
dim m as memoryblock
dim localx,localy, gobalx,gobaly as Integer
dim offset as Integer

m=newmemoryblock(w*h*16)
// for each row
// for each point in row
m.SingleValue(offset)=localx
offset=offset+4
m.SingleValue(offset)=localy
offset=offset+4
m.SingleValue(offset)=gobalx
offset=offset+4
m.SingleValue(offset)=gobaly
offset=offset+4
```

**Notes:** the memoryblock must be of size w*h*sizeof(single)*4.
a single is 4 bytes, so this is 16*w*h
w is the number of horizontal points you define.
h is the number of vertical points you define.

Basicly you define for a local point in the window the point onscreen where it is moved to. See the example project for more details.

### 56.51.13 Width as Double

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The width of this window.
**Example:**

```
dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)
```

MsgBox str(cw.width)

### 56.51.14 Workspace as CGSWorkspaceMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The workspace where this window is part of.

### 56.51.15 Properties

### 56.51.16 Connection as CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to the connection used.
**Notes:** Every CGS class has a reference to the connection so the connection object stays in memory as long as one of the depending objects is being used.
(Read only property)

### 56.51.17 ConnectionHandle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the CGS connection being used.
**Notes:** Most of the functions need this value and it needs to be not zero.
(Read and Write property)

### 56.51.18 Handle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The window handle.
**Notes:** This is not a WindowRef or a NSWindow pointer!
(Read and Write property)

### 56.51.19 LastError as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last error code reported.
**Notes:** The list of CoreGraphics error (from Mac OS X 10.4)

| | | |
|---|---|---|
| kCGErrorSuccess | = 0 | Success |
| kCGErrorFailure | = 1000 | Failure |
| kCGErrorIllegalArgument | = 1001 | Illegal Argument |
| kCGErrorInvalidConnection | = 1002 | Invalid Connection |
| kCGErrorInvalidContext | = 1003 | Invalid Context |
| kCGErrorCannotComplete | = 1004 | Cannot complete |
| kCGErrorNameTooLong | = 1005 | Name is too long |
| kCGErrorNotImplemented | = 1006 | Not implemented |
| kCGErrorRangeCheck | = 1007 | Out of bounds |
| kCGErrorTypeCheck | = 1008 | Type error |
| kCGErrorNoCurrentPoint | = 1009 | No current point |
| kCGErrorInvalidOperation | = 1010 | Invalid Operation |
| kCGErrorNoneAvailable | = 1011 | internal errors have taken 1012 1013 and 1014 |
| kCGErrorApplicationRequiresNewerSystem | = 1015 | the application being launched says in it's bundle info that it requires a newer version of the system than is currently running. |
| kCGErrorApplicationNotPermittedToExecute | = 1016 | Macintosh Manager is active and this application is not permitted to run |
| kCGErrorApplicationIncorrectExecutableFormatFound | = 1023 | the application being launched does not have any executable code for the current system. |
| kCGErrorApplicationIsLaunching | = 1024 | The application is in the process of launching but hasn't checked in yet. Any launch data provided will be given to the application when it does check in. |
| kCGErrorApplicationAlreadyRunning | = 1025 | The application being launched was already running ( and had already checked in ) and so any launch data provided can not be delivered to in by CPS |
| kCGErrorApplicationCanOnlyBeRunInOneSessionAtATime | = 1026 | The application being launched is incompatible with multiple user sessions and is already running in another session by another user. |
| kCGErrorClassicApplicationsMustBeLaunchedByClassic | = 1027 | To avoid deadlock Classic can't launch another Classic application by going thru CPS. This error gets returned in that case and it signals TruBlueEnvironment that it must handle this launch on its own. |
| kCGErrorForkFailed | = 1028 | CPS was unable to fork a new process in order to launch an application. |

(Read and Write property)

### 56.51.20 AffineTransform as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The transformation of this window.
**Example:**

```
// rotates the window.
dim a as CGAffineTransformMBS

a=CGAffineTransformMBS.MakeRotation(1)

a=a.Translate(-Width,-Height)

dim co as CGSConnectionMBS
dim cw as CGSWindowMBS

co=new CGSConnectionMBS
cw=co.CGSWindow(window1)
```

```
cw.AffineTransform=a
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 56.51.21 Alpha as single

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The alpha value for this window.
**Example:**

```
dim cw as CGSWindowMBS
dim co as new CGSConnectionMBS

cw=co.CGSWindow(window1)
cw.Alpha=0.2

// same as:

// self.TransparencyMBS=0.2
```

**Notes:** 0 is invisible and 1.0 is visible.

You may prefer to use the window TransparencyMBS property instead as it uses documented APIs.
(Read and Write computed property)

### 56.51.22 EventMask as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The event mask of this window.
**Notes:** (Read and Write computed property)

### 56.51.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGSOrderAbove | 1 | Window is ordered above target. |
| kCGSOrderBelow | -1 | Window is ordered below target. |
| kCGSOrderOut | 0 | Window is removed from the on-screen. |

## 56.52 class CGSWorkspaceMBS

### 56.52.1 class CGSWorkspaceMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a workspace to the CoreGraphics System.
**Notes:** Requires Mac OS X 10.4.
All functions used by the CGS classes are private APIs, so Apple does not guarantee that they work in future Mac OS X versions.

Not official supported by Apple and some effects don't work well on latest OS X versions!

### 56.52.2 Methods

### 56.52.3 GetWorkspaceWindowList as CGSWindowListMBS

MBS MacCG Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of windows for this workspace.
**Notes:** Returns nil on any error.

### 56.52.4 MoveWindows(target as CGSWorkspaceMBS)

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves all windows from one workspace to another.
**Notes:** Lasterror is set.

### 56.52.5 Properties

### 56.52.6 Connection as CGSConnectionMBS

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The reference to the connection used.
**Notes:** Every CGS class has a reference to the connection so the connection object stays in memory as long as one of the depending objects is being used.
(Read only property)

### 56.52.7 ConnectionHandle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the CGS connection being used.
**Notes:** Most of the functions need this value and it needs to be not zero.
(Read and Write property)

### 56.52.8 Handle as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal used handle to the workspace.
**Notes:** (Read and Write property)

### 56.52.9 LastError as Integer

MBS MacCG Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last error code reported.
**Notes:** The list of CoreGraphics error (from Mac OS X 10.4)

| | | |
|---|---|---|
| kCGErrorSuccess | = 0 | Success |
| kCGErrorFailure | = 1000 | Failure |
| kCGErrorIllegalArgument | = 1001 | Illegal Argument |
| kCGErrorInvalidConnection | = 1002 | Invalid Connection |
| kCGErrorInvalidContext | = 1003 | Invalid Context |
| kCGErrorCannotComplete | = 1004 | Cannot complete |
| kCGErrorNameTooLong | = 1005 | Name is too long |
| kCGErrorNotImplemented | = 1006 | Not implemented |
| kCGErrorRangeCheck | = 1007 | Out of bounds |
| kCGErrorTypeCheck | = 1008 | Type error |
| kCGErrorNoCurrentPoint | = 1009 | No current point |
| kCGErrorInvalidOperation | = 1010 | Invalid Operation |
| kCGErrorNoneAvailable | = 1011 | internal errors have taken 1012 1013 and 1014 |
| kCGErrorApplicationRequiresNewerSystem | = 1015 | the application being launched says in it's bundle info that it requires a newer version of the system than is currently running. |
| kCGErrorApplicationNotPermittedToExecute | = 1016 | Macintosh Manager is active and this application is not permitted to run |
| kCGErrorApplicationIncorrectExecutableFormatFound | = 1023 | the application being launched does not have any executable code for the current system. |
| kCGErrorApplicationIsLaunching | = 1024 | The application is in the process of launching but hasn't checked in yet. Any launch data provided will be given to the application when it does check in. |
| kCGErrorApplicationAlreadyRunning | = 1025 | The application being launched was already running ( and had already checked in ) and so any launch data provided can not be delivered to in by CPS |
| kCGErrorApplicationCanOnlyBeRunInOneSessionAtATime | = 1026 | The application being launched is incompatible with multiple user sessions and is already running in another session by another user. |
| kCGErrorClassicApplicationsMustBeLaunchedByClassic | = 1027 | To avoid deadlock Classic can't launch another Classic application by going thru CPS. This error gets returned in that case and it signals TruBlueEnvironment that it must handle this launch on its own. |
| kCGErrorForkFailed | = 1028 | CPS was unable to fork a new process in order to launch an application. |

(Read and Write property)

## 56.53 module CGWindowMBS

### 56.53.1 module CGWindowMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** This module contains CoreGraphics functions related to windows.
**Example:**

```
// screenshot of all windows on screens
Backdrop = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, 0, 0, 0)
```

**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr3

### 56.53.2 Methods

### 56.53.3 CreateWindowList(windowOption as Integer, WindowID as Integer = 0) as UInt32()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the list of window IDs associated with the specified windows in the current user session.
**Example:**

```
dim a(-1) as UInt32 = CGWindowMBS.CreateWindowList(0,0)

MsgBox str(UBound(a)+1) + " windows"
```

**Notes:** windowOption: The options describing which window IDs to return. Typical options let you obtain IDs for all windows or for windows above or below the window specified in the relativeToWindow parameter.

WindowID: The ID of the window to use as a reference point when determining which other windows to return. For options that do not require a reference window, this parameter can be kCGNullWindowID.

Returns an array of CGWindowID values corresponding to the desired windows. If there are no windows matching the desired criteria, the function returns an empty array. If you call this function from outside of a GUI security session or when no window server is running, this function returns nil.

Available in Mac OS X v10.5 and later.

May fail and cause a consent prompt on MacOS 10.15 to ask user whether he/she allows your app to take the picture.

### 56.53.4 CreateWindowListCGImage(left as Double, top as Double, width as Double, height as Double, windowOption as Integer, WindowID as Integer = 0, ImageOption as Integer = 0) as Variant

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Takes a screenshot from a list of windows.
**Notes:** Same as CreateWindowListImage, but returns a CGImageMBS. Declared as Variant to reduce plugin interdependencies.

May fail and cause a consent prompt on MacOS 10.15 to ask user whether he/she allows your app to take the picture.

### 56.53.5 CreateWindowListImage(left as Double, top as Double, width as Double, height as Double, windowOption as Integer, WindowID as Integer = 0, ImageOption as Integer = 0) as picture

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Takes a screenshot from a list of windows.
**Example:**

```
dim p as Picture

// Screenshot of everything:
p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListOptionAll,0,
CGWindowMBS.kCGWindowImageDefault)

// Screenshot of everything behind a window:
p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListOptionOnScreen-
BelowWindow, CGWindowMBS.GetWindowID(window1), CGWindowMBS.kCGWindowImageDefault)

// Screenshot of everything in front of a window (dock and menubar):
p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListOptionOnScreen-
AboveWindow, CGWindowMBS.GetWindowID(window1), CGWindowMBS.kCGWindowImageDefault)

// screenshot of a window
p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListOptionInclud-
ingWindow, CGWindowMBS.GetWindowID(window1), CGWindowMBS.kCGWindowImageDefault)

// only shadow of a window (will be in the mask)
```

p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListOptionIncludingWindow, CGWindowMBS.GetWindowID(window1), CGWindowMBS.kCGWindowImageOnlyShadows)

// desktop decoration is white
p = CGWindowMBS.CreateWindowListImage(0, 0, 0, 0, CGWindowMBS.kCGWindowListExcludeDesktopElements, CGWindowMBS.GetWindowID(window1), CGWindowMBS.kCGWindowImageShouldBeOpaque)

**Notes:** Parameters:

| | |
|---|---|
| left | Left coordinate rectangle |
| top | Top coordinate rectangle |
| width | Width of rectangle |
| height | Height of rectangle |
| windowOption | A combination of kCGWindowListOption* flags |
| WindowID | The window ID or 0. |
| ImageOption | A combination of kCGWindowImage* flags |

If you pass a rectangle with all values zero, you select the whole screen.
Returns the screenshot as picture or nil on any error.

Window Options:

| | | |
|---|---|---|
| kCGWindowListOptionAll | 0 | List all windows in this user session, including both on and off-screen windows. relativeToWindow should be kCGNullWindowID=0. |
| kCGWindowListOptionOnScreenOnly | 1 | List all on-screen windows in this user session, ordered from front to back. relativeToWindow should be kCGNullWindowID=0. |
| kCGWindowListOptionOnScreenAboveWindow | 2 | List all on-screen windows above the specified window ordered from front to back. relativeToWindow should be the window number. |
| kCGWindowListOptionOnScreenBelowWindow | 4 | List all on-screen windows below the specified window ordered from front to back. relativeToWindow should be the window number. |
| kCGWindowListOptionIncludingWindow | 8 | Include the named window in any list, effectively creating 'at-or-above' or 'at-or-below' lists. relativeToWindow should be the window number. |
| kCGWindowListExcludeDesktopElements | 16 | Exclude any windows from the list that are elements of the desktop, including the background picture and icons on the desktop. |

Image Options:

| | | |
|---|---|---|
| kCGWindowImageDefault | 0 | Default behavior: If a rect of CGRectNull is used bounds computation includes the framing effects, such as a shadow. |
| kCGWindowImageBoundsIgnoreFraming | 1 | If a rect of CGRectNull is used, ignore framing effects for bounds computation |
| kCGWindowImageShouldBeOpaque | 2 | The captured image should be opaque. Empty areas are white |
| kCGWindowImageOnlyShadows | 4 | Capture only shadows. |

May fail and cause a consent prompt on MacOS 10.15 to ask user whether he/she allows your app to take

the picture.

### 56.53.6 GetWindowID(w as DesktopWindow) as integer

MBS MacFrameworks Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries the CoreGraphics Window ID for the given window.
**Notes:** Returns 0 on any error.
This ID can be used for CreateWindowListImage.
See also:

- 56.53.7 GetWindowID(w as window) as Integer 9276

### 56.53.7 GetWindowID(w as window) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries the CoreGraphics Window ID for the given window.
**Notes:** Returns 0 on any error.
This ID can be used for CreateWindowListImage.
See also:

- 56.53.6 GetWindowID(w as DesktopWindow) as integer 9276

### 56.53.8 GetWindowListInfo(windowOption as Integer, WindowID as Integer = 0) as dictionary()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Generates and returns information about the selected windows in the current user session.
**Example:**

```
dim a(-1) as Dictionary = CGWindowMBS.GetWindowListInfo(0,0)

dim u as Integer = UBound(a)
if u >10 then u = 10 // show only 10 times

dim lines(-1) as string
for i as Integer = 0 to u
dim d as Dictionary = a(i)

lines.Append d.Value(CGWindowMBS.kCGWindowName)+" of "+d.Value(CGWindowMBS.kCGWindowOwnerName)

next
```

```
// shows 11 windows with names. Not all windows have names.
MsgBox Join(lines, EndOfLine)
```

**Notes:** option: The options describing which window dictionaries to return. Typical options let you return dictionaries for all windows or for windows above or below the window specified in the relativeToWindow parameter. For more information, see "Window List Option Constants."

WindowID: The ID of the window to use as a reference point when determining which other window dictionaries to return. For options that do not require a reference window, this parameter can be 0.

Returns an array of CFDictionaryRef types, each of which contains information about one of the windows in the current user session. If there are no windows matching the desired criteria, the function returns an empty array. If you call this function from outside of a GUI security session or when no window server is running, this function returns nil.

You can use this function to get detailed information about the configuration of one or more windows in the current user session. For example, you can use this function to get the bounds of the window, its window ID, and information about how it is managed by the window server. For the list of keys and values that may be present in the dictionary, see kCGWindow* constants.

Generating the dictionaries for system windows is a relatively expensive operation. As always, you should profile your code and adjust your usage of this function appropriately for your needs.

Available in Mac OS X v10.5 and later.

### 56.53.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGNullWindowID | 0 | The number for an invalid window ID. |

Backing Store Constants

| Constant | Value | Description |
|---|---|---|
| kCGBackingStoreBuffered | 2 | |
| kCGBackingStoreNonretained | 1 | |
| kCGBackingStoreRetained | 0 | |

Window Info Dictionary Key Constants

| Constant | Value | Description |
|---|---|---|
| kCGWindowAlpha | ”kCGWindowAlpha” | The alpha fade of the wind The value 1.0 is normal (op |
| kCGWindowBackingLocationVideoMemory | ”kCGWindowBackingLocationVideoMemory” | Optional. If present, true if otherwise. If the key is not memory. The value of this |
| kCGWindowBounds | ”kCGWindowBounds” | The bounds of the window corner of the main display. |
| kCGWindowIsOnscreen | ”kCGWindowIsOnscreen” | Optional. If present, true i If the key is not present, th of this key is a boolean. |
| kCGWindowLayer | ”kCGWindowLayer” | The window layer number signed integer value. |
| kCGWindowMemoryUsage | ”kCGWindowMemoryUsage” | An estimate of the memor supporting data structures value. |
| kCGWindowName | ”kCGWindowName” | Optional. If present, the na |
| kCGWindowNumber | ”kCGWindowNumber” | The window ID, a unique va The value of this key is a 3 |
| kCGWindowOwnerName | ”kCGWindowOwnerName” | Optional. If present, the window. The value of this |
| kCGWindowOwnerPID | ”kCGWindowOwnerPID” | The process ID of the proc a 32-bit signed integer valu |
| kCGWindowSharingState | ”kCGWindowSharingState” | The sharing state of the wi dowSharingReadOnly, or k key is a 32-bit signed integ |
| kCGWindowStoreType | ”kCGWindowStoreType” | The backing store type of th BackingStoreNonretained, is a 32-bit signed integer va |
| kCGWindowWorkspace | ”kCGWindowWorkspace” | Optional. If present, the w window. The value of this |

Image Options Constants

| Constant | Value | Description |
|---|---|---|
| kCGWindowImageBoundsIgnoreFraming | 1 | If null rect is passed as the screen bounds, then then bounds com excludes window frame ornamentation, such as a shadow. |
| kCGWindowImageDefault | 0 | If null rectangle is passed as the screen bounds, then then bounds com includes window frame ornamentation, such as a shadow. |
| kCGWindowImageOnlyShadows | 4 | Only draw the windows’ shadows, not the windows themselves. |
| kCGWindowImageShouldBeOpaque | 2 | Force the created image to be opaque. Empty areas are white. |

Window list option Constants

| Constant | Value | Description |
|---|---|---|
| kCGWindowListExcludeDesktopElements | 16 | Exclude any windows from the list that are elements of the des |
| kCGWindowListOptionAll | 0 | List all windows in this user session, including both on- and off-s The parameter WindowID should be kCGNullWindowID. |
| kCGWindowListOptionIncludingWindow | 8 | Include the window specified by WindowID in any list, effective or-above' or 'at-or-below' lists. |
| kCGWindowListOptionOnScreenAboveWindow | 2 | List all on-screen windows above the window specified by Win from front to back. |
| kCGWindowListOptionOnScreenBelowWindow | 4 | List all on-screen windows below the window specified by Win from front to back. |
| kCGWindowListOptionOnScreenOnly | 1 | List all on-screen windows in this user session, ordered from fro parameter WindowID should be kCGNullWindowID. |

Sharing State Constants

| Constant | Value | Description |
|---|---|---|
| kCGWindowSharingNone | 0 | No sharing. |
| kCGWindowSharingReadOnly | 1 | Read only. |
| kCGWindowSharingReadWrite | 2 | Read and Write |

## 56.54 class QDPictMBS

### 56.54.1 class QDPictMBS

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class to draw QuickDraw PICT data to a CoreGraphics context.
**Notes:** Note: QuickDraw picture data typically comes in two forms: a PICT resource that begins the picture header data at the beginning of the resource and PICT files that begin with 512 bytes of arbitrary data, followed by the picture header data. For this reason, the routines that create a QTPict object attempt to find the picture header data beginning at either the first byte of the data provided or at byte 513 of the data provided.

Additionally the Picture Bounds must not be an empty rect.
This class has been deprecated by Apple.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr10

### 56.54.2 Methods

### 56.54.3 Constructor(dataProvider as CGDataProviderMBS)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new QTPictMBS object based on a data provider.
**Notes:** Create a QDPict object, using dataProvider to obtain the QDPict's data.
It is assumed that either the first byte or the 513th byte of data in the file referenced by the URL is the first byte of the picture header. If the URL does not begin PICT data at one of these places in the data fork then the handle property will be 0.
See also:


- 56.54.4 Constructor(file as folderitem) 9280
- 56.54.5 Constructor(url as string) 9281


### 56.54.4 Constructor(file as folderitem)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new QTPictMBS object based on a file.
See also:


- 56.54.3 Constructor(dataProvider as CGDataProviderMBS) 9280
- 56.54.5 Constructor(url as string) 9281

### 56.54.5 Constructor(url as string)

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new QTPictMBS object based on an url.
**Notes:** Create a QDPict from an url.
It is assumed that either the first byte or the 513th byte of data in the file referenced by the URL is the first byte of the picture header. If the URL does not begin PICT data at one of these places in the data fork then the handle property will be 0.
See also:


- 56.54.3 Constructor(dataProvider as CGDataProviderMBS) 9280
- 56.54.4 Constructor(file as folderitem) 9280


### 56.54.6 DrawToCGContext(context as CGContextMBS, r as CGRectMBS)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draws the picture into the given context.
**Notes:** You can increase the drawing resolution by passing a bigger rectangle.
Lasterror is set. -1 if context or rectangle are invalid.

Draw picture in the rectangular area specified by r. The PICT bounds of the page is scaled, if necessary, to fit into the rectangle. To get unscaled results, supply a rect the size of the rect returned by GetBounds.

### 56.54.7 GetBounds as CGRectMBS

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the bounds of the picture.
**Notes:** This are the bounds in pixel for 72 dpi.

Return the Picture Bounds of the QuickDraw picture represented by the picture. This rectangle is in the default user space with one unit = 1/72 inch.

### 56.54.8 GetResolution(byref xRes as single, byref yRes as single)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the resolution of the picture.
**Notes:** Return the resolution of the QuickDraw picture represented by the picture.
This data, together with the CGRect returned by GetBounds, can be used to compute the size of the picture

in pixels, which is what QuickDraw really records into pictures.

### 56.54.9 Height as Double

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The height of the picture.
**Notes:** This value is using 72 dpi.

### 56.54.10 HorizontalResolution as Double

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The horizontal resolution.

### 56.54.11 VerticalResolution as Double

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vertical resolution.

### 56.54.12 Width as Double

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The width of the picture.
**Notes:** This value is using 72 dpi.

### 56.54.13 Properties

### 56.54.14 Handle as Integer

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle.
**Notes:** (Read and Write property)

### 56.54.15 LastError as Integer

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Set by DrawToCGContext.
(Read and Write property)

## 56.55 class QuartzFilterManagerMBS

### 56.55.1 class QuartzFilterManagerMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to manage the quartz filters on the system.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr9

### 56.55.2 Methods

### 56.55.3 filterPanel as NSPanelMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the panel where users can select a filter.
**Example:**

```
dim m as QuartzFiltermanagerMBS
dim p as NSPanelMBS

m=new QuartzFiltermanagerMBS
p=m.filterPanel
p.Show
```

**Notes:** Returns nil on any error.

### 56.55.4 filters as QuartzFilterMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with all filters.
**Example:**

```
dim q as new QuartzFilterManagerMBS
dim a() as QuartzFilterMBS

a=q.filters

MsgBox str(ubound(a)+1)+" filters found."
```

### 56.55.5 filtersInDomains(domains() as string) as QuartzFilterMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with all filters in the given domains.
**Example:**

```
dim domains() as string = array(QuartzFilterManagerMBS.kQuartzFilterPrintingDomain)
dim a() as QuartzFilterMBS = QuartzFilterManagerMBS.filtersInDomains(domains)

MsgBox str(ubound(a)+1)+" filters found."
```

### 56.55.6 filterView as QuartzFilterViewMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The view which you can use to select views.
**Notes:** You can use the panel as an extra window or add this view to one of your settings windows.

### 56.55.7 selectedFilter as QuartzFilterMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The currently selected filter.

### 56.55.8 selectFilter(filter as QuartzFilterMBS) as boolean

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Selects a filter.
**Notes:** Returns true on success.

### 56.55.9 Properties

### 56.55.10 Handle as Integer

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal used handle to the filter manager.
**Notes:** (Read and Write property)

### 56.55.11 Events

### 56.55.12 didAddFilter(filter as QuartzFilterMBS)

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The given filter was added to the filter list.

### 56.55.13 didModifyFilter(filter as QuartzFilterMBS)

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The given filter was modified.

### 56.55.14 didRemoveFilter(filter as QuartzFilterMBS)

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The given filter was removed.

### 56.55.15 didSelectFilter(filter as QuartzFilterMBS)

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The selection changed to the new filter.

### 56.55.16 Constants

Filter Domain Constants

| Constant | Value | Description |
|---|---|---|
| kQuartzFilterApplicationDomain | "kQuartzFilterApplicationDomain" | |
| kQuartzFilterPDFWorkflowDomain | "kQuartzFilterPDFWorkflowDomain" | |
| kQuartzFilterPrintingDomain | "kQuartzFilterPrintingDomain" | |

## 56.56 class QuartzFilterMBS

### 56.56.1 class QuartzFilterMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The Quartz filter class.
**Example:**

```
// Create a couple of PDF files to test different Quartz filters

// get some picture
dim pic as Picture = LogoMBS(500)
dim image as new NSImageMBS(pic)

// create page with picture
dim page as new PDFPageMBS(image)

// create new document
dim doc as new PDFDocumentMBS

// add page
doc.insertPage(page,0)

// get filters
dim manager as new QuartzFilterManagerMBS
dim filters() as QuartzFilterMBS = Manager.filters

for each filter as QuartzFilterMBS in filters

// save PDF with this filter
dim file as FolderItem = SpecialFolder.Desktop.Child(filter.localizedName+".pdf")

call doc.write(file, filter)

next
```

**Notes:** This filters can be used to change PDFs on writing like to reduce the file size.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr7

### 56.56.2 Methods

### 56.56.3 applyToContext(CGContextHandle as Integer) as boolean

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Applies a filter to a given context.
**Example:**

```
dim c as CGContextMBS // your context
dim fi as QuartzFilterMBS

fi=QuartzFilterMBS.quartzFilterWithFile(SpecialFolder.Desktop.Child("Reduce File Size.qfilter"))

call fi.applyToContext(c.Handle)
```

**Notes:** Returns true on success.

### 56.56.4 Constructor

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 56.56.5 localizedName as string

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The localized name of the filter.
**Example:**

```
dim q as new QuartzFilterManagerMBS
dim s(-1) as string

dim a() as QuartzFilterMBS = q.filters

for each f as QuartzFilterMBS in a
s.append f.localizedName
next

MsgBox Join(s,EndOfLine)
```

### 56.56.6 quartzFilterWithFile(file as folderitem) as QuartzFilterMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads a quartz filter from the given folderitem.
**Example:**

```
dim c as CGContextMBS // your context
dim fi as QuartzFilterMBS
dim file as folderitem

file=SpecialFolder.Desktop.Child("Reduce File Size.qfilter")
fi=QuartzFilterMBS.quartzFilterWithFile(file)

call fi.applyToContext(c.Handle)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.5.

### 56.56.7 quartzFilterWithURL(url as string) as QuartzFilterMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads the quartz filter from the given URL.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.5.

### 56.56.8 removeFromContext(CGContextHandle as Integer)

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes a filter from a CGContext.
**Notes:** Pass CGContextMBS.handle and make sure it is not 0.

### 56.56.9 url as string

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL where this filter is located.
**Example:**

```
dim q as new QuartzFilterManagerMBS
```

```
dim s(-1) as string

dim a() as QuartzFilterMBS = q.filters

for each f as QuartzFilterMBS in a
s.append f.url
next

MsgBox Join(s,EndOfLine)
```

### 56.56.10 Properties

### 56.56.11 Handle as Integer

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle to the filter object.
**Notes:** (Read and Write property)

# 56.57 class QuartzFilterViewMBS

## 56.57.1 class QuartzFilterViewMBS

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The view to select quartz filters.
**Notes:** You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr5

## 56.57.2 Methods

## 56.57.3 Constructor

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Quartz Filter View with size 100/100 and position 0/0
**Example:**

```
dim t as new QuartzFilterViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 56.57.4 Constructor(Handle as Integer) 9291
- 56.57.5 Constructor(left as Double, top as Double, width as Double, height as Double) 9292


## 56.57.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given QuartzFilterViewMBS handle.
**Example:**

```
dim t as new QuartzFilterViewMBS(0, 0, 100, 100)
dim v as new QuartzFilterViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a QuartzFilterView and the plugin retains this handle.
See also:


- 56.57.3 Constructor 9291
- 56.57.5 Constructor(left as Double, top as Double, width as Double, height as Double) 9292


### 56.57.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Quartz Filter View with the given size and position.
**Example:**

```
dim x as new QuartzFilterViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
The new movie view object must be inserted into the view hierarchy of an NSWindow before it can be used.
This method is the designated initializer for the QuartzFilterView class.
See also:


- 56.57.3 Constructor 9291
- 56.57.4 Constructor(Handle as Integer) 9291


### 56.57.6 sizeToFit

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the view to the best size.

# Chapter 57

# CoreGraphics Events

## 57.1 class CGEventMBS

### 57.1.1 class CGEventMBS

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The class for a CoreGraphics event.
**Notes:** Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.4pr5

### 57.1.2 Methods

### 57.1.3 available as boolean

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.4 or newer.

### 57.1.4 Constructor(Handle as Integer)

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor taking a CGEventRef value.
**Notes:** The object is retained and should not be zero.

### 57.1.5 Copy as CGEventMBS

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Return a copy of event.

### 57.1.6 Properties

### 57.1.7 EventSource as CGEventSourceMBS

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The event source.
**Notes:** (Read and Write property)

### 57.1.8 Flags as Integer

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The event flags of an event.
**Notes:** (Read and Write property)

### 57.1.9 Timestamp as UInt64

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The timestamp of an event.
**Notes:** (Read and Write property)

### 57.1.10 Type as Integer

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The event type of an event (left mouse down, for example).
**Notes:** See constants like kCGMouseButtonLeft.
(Read and Write property)

### 57.1.11 UnicodeString as String

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Unicode string associated with a keyboard event.
**Notes:** By default, the system translates the virtual key code in a keyboard event into a Unicode string based on the keyboard ID in the event source. This function allows you to manually override this string. Note that application frameworks may ignore the Unicode string in a keyboard event and do their own translation based on the virtual keycode and perceived event state.
(Read and Write property)

### 57.1.12 UnicodeStringLength as Integer

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Return the length of the unicode string associated with a keyboard event.
**Notes:** (Read only property)

### 57.1.13 DoubleValueField(field as Integer) as Double

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The floating-point value of a field in an event.
**Notes:** Before setting a value, the event type must be set using a typed event creation function such as CGEventCreateMouseEvent, or by setting type property.

If you are creating a mouse event generated by a tablet, call this function and specify the field kCG-MouseEventSubtype with a value of kCGEventMouseSubtypeTabletPoint or kCGEventMouseSubtypeTablet-Proximity before setting other parameters.
(Read and Write computed property)

### 57.1.14 IntegerValueField(field as Integer) as Int64

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The integer value of a field in an event.
**Notes:** Before calling this function, the event type must be set using a typed event creation function such as CGEventCreateMouseEvent, or by setting type property.

In cases where the field value is represented within the event by a fixed point number or an integer, the result is scaled to the appropriate range as part of creating the floating-point representation.

(Read and Write computed property)

### 57.1.15 Constants

Event Types

| Constant | Value | Description |
|---|---|---|
| kCGEventFlagsChanged | 12 | Key flags changed, e.g. modifier keys pressed. |
| kCGEventKeyDown | 10 | Key Down |
| kCGEventKeyUp | 11 | Key up. |
| kCGEventLeftMouseDown | 1 | left mouse-down event |
| kCGEventLeftMouseDragged | 6 | left mouse-dragged event |
| kCGEventLeftMouseUp | 2 | left mouse-up event |
| kCGEventMouseMoved | 5 | mouse-moved event |
| kCGEventNull | 0 | The null event. (not defined) |
| kCGEventOtherMouseDown | 25 | other mouse-down event |
| kCGEventOtherMouseDragged | 27 | other mouse-dragged event |
| kCGEventOtherMouseUp | 26 | other mouse-up event |
| kCGEventRightMouseDown | 3 | right mouse-down event |
| kCGEventRightMouseDragged | 7 | right mouse-dragged event |
| kCGEventRightMouseUp | 4 | right mouse-up event |
| kCGEventScrollWheel | 22 | Scroll Wheel event. |
| kCGEventTabletPointer | 23 | Tablet pointer event. |
| kCGEventTabletProximity | 24 | Tablet Proximity event. |
| kCGEventTapDisabledByTimeout | &hFFFFFFFE | Out of band event types. These are delivered to the event tap callb it of unusual conditions that disable the event tap. |
| kCGEventTapDisabledByUserInput | &hFFFFFFFF | Out of band event types. These are delivered to the event tap callb it of unusual conditions that disable the event tap. |

Mouse Buttons

| Constant | Value | Description |
|---|---|---|
| kCGMouseButtonCenter | 2 | Center |
| kCGMouseButtonLeft | 0 | Left |
| kCGMouseButtonRight | 1 | Right |

Scroll Event Units

| Constant | Value | Description |
|---|---|---|
| kCGScrollEventUnitLine | 1 | Line |
| kCGScrollEventUnitPixel | 0 | Pixel |

## 57.2 class CGEventSourceMBS

### 57.2.1 class CGEventSourceMBS

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The class for CGEventSource class.
**Notes:** Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr8

### 57.2.2 Methods

### 57.2.3 Constructor(Handle as Integer)

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor taking a CGEventSourceRef value.
**Notes:** The object is retained and should not be zero.

### 57.2.4 Properties

### 57.2.5 KeyboardType as Integer

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The keyboard type.
**Notes:** e.g. 198 for Touchbar or 59 for Macbook Pro keyboard.
(Read only property)

### 57.2.6 UserData as Int64

MBS MacCF Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Custom user data to associate with event source.
**Notes:** (Read and Write property)

## 57.3 class CGEventTapMBS

### 57.3.1 class CGEventTapMBS

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The class for a Event taps.
**Notes:** Taps may be placed at the point where HIDSystem events enter the server, at the point where HIDSystem and remote control events enter a session, at the point where events have been annotated to flow to a specific application, or at the point where events are delivered to the application. Taps may be inserted at a specified point at the head of pre-existing filters, or appended after any pre-existing filters.

Taps may be passive event listeners, or active filters. An active filter may pass an event through unmodified, modify an event, or discard an event. When a tap is registered, it identifies the set of events to be observed with a mask, and indicates if it is a passive or active event filter. Multiple event type bitmasks may be ORed together.
Taps may only be placed at kCGHIDEventTap by a process running as the root user. An exception is raised for other users.

Taps placed at kCGHIDEventTap, kCGSessionEventTap, kCGAnnotatedSessionEventTap, or on a specific process may only receive key up and down events if access for assistive devices is enabled (Preferences Accessibility panel, Keyboard view) or the caller is enabled for assistive device access, as by AXMakeProcessTrusted. If the tap is not permitted to monitor these events when the tap is created, then the appropriate bits in the mask are cleared. If that results in an empty mask, then an exception is raised.

For MacOS 10.15 using CGEventTap to track other applications may result in a dialog asking for permissions. This may not happen if you track your own process' events.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr3
- MBS Xojo Plugins, version 17.4pr5

### 57.3.2 Methods

### 57.3.3 available as boolean

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true for macOS 10.4 or newer.

### 57.3.4 Constructor(tapLocation as Integer, Place as Integer, Options as Integer, EventMask as Integer, PID as Integer = -1)

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates an event tap.
**Notes:** If you pass PID >0, we will create an event tap for a specified process. tapLocation is then ignored. PID parameter added for plugin version 19.4.

### 57.3.5 Properties

### 57.3.6 Enabled as Boolean

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Whether this tap is enabled.
**Notes:** (Read and Write property)

### 57.3.7 Events

### 57.3.8 GotEvent(Proxy as Ptr, type as Integer, e as CGEventMBS) as CGEventMBS

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: .

**Function:** The event called when you can process an event.
**Notes:** For an active tap, please return the event back.

### 57.3.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCGEventTapOptionDefault | 0 | One of the constants that specify whether a new event tap is an active filter or a passive listener.<br>Default, active filter. |
| kCGEventTapOptionListenOnly | 1 | One of the constants that specify whether a new event tap is an active filter or a passive listener.<br>Listen only. |
| kCGHeadInsertEventTap | 0 | One of the constants that specify where a new event tap is inserted into the list of active event taps.<br>Insert in front. |
| kCGTailAppendEventTap | 1 | One of the constants that specify where a new event tap is inserted into the list of active event taps.<br>Append to the tail. |

Tapping Points

| Constant | Value | Description |
|---|---|---|
| kCGAnnotatedSessionEventTap | 2 | At the point where events have been annotated to flow to a specific application, or at the point where events are delivered to the application. |
| kCGHIDEventTap | 0 | When HIDSystem events enter the server. |
| kCGSessionEventTap | 1 | At the point where HIDSystem and remote control events enter a session. |

Event Masks

| Constant | Value | Description |
|---|---|---|
| kCGEventMaskFlagsChanged | 4096 | Key flags changed, e.g. modifier keys pressed. |
| kCGEventMaskForAllEvents | -1 | Listen for all events. |
| kCGEventMaskKeyDown | 1024 | Key Down |
| kCGEventMaskKeyUp | 2048 | Key up. |
| kCGEventMaskLeftMouseDown | 2 | left mouse-down event |
| kCGEventMaskLeftMouseDragged | 64 | left mouse-dragged event |
| kCGEventMaskLeftMouseUp | 4 | left mouse-up event |
| kCGEventMaskMouseMoved | 32 | mouse-moved event |
| kCGEventMaskOtherMouseDown | &h2000000 | other mouse-down event |
| kCGEventMaskOtherMouseDragged | &h8000000 | other mouse-dragged event |
| kCGEventMaskOtherMouseUp | &h4000000 | other mouse-up event |
| kCGEventMaskRightMouseDown | 8 | right mouse-down event |
| kCGEventMaskRightMouseDragged | 128 | right mouse-dragged event |
| kCGEventMaskRightMouseUp | 16 | right mouse-up event |
| kCGEventMaskScrollWheel | &h400000 | Scroll Wheel event. |
| kCGEventMaskTabletPointer | &h800000 | Tablet pointer event. |
| kCGEventMaskTabletProximity | &h1000000 | Tablet Proximity event. |

# Chapter 58

# CoreImage

## 58.1 class CIAttributeMBS

### 58.1.1 class CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class for attributes of CoreImage Filters.

### 58.1.2 Properties

### 58.1.3 ClassName as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Class name of the filter.
**Notes:** (Read only property)

### 58.1.4 DefaultAffineTransform as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The default value for this color.
**Notes:** Only valid for affine transformations.
(Read only property)

### 58.1.5 DefaultColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The default value for this color.
**Notes:** Only valid for colors.
(Read only property)

### 58.1.6 DefaultNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The default value for this color.
**Notes:** Only valid for numbers.
(Read only property)

### 58.1.7 DefaultValue as Variant

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The default value.
**Notes:** (Read only property)

### 58.1.8 DefaultVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The default value for this color.
**Notes:** Only valid for vectors.
(Read only property)

### 58.1.9 description as string

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The description of this attribute.
**Notes:** (Read only property)

### 58.1.10 DisplayName as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The localized display name for the attribute.
**Notes:** Not all attributes do have a localized name and not all do have a name at all.
(e.g. outputImage normally has no display name)
(Read only property)

### 58.1.11 HasMaxNumber as Boolean

MBS MacCI Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Whether this attribute has a defined maximum value.
**Notes:** (Read only property)

### 58.1.12 HasMinNumber as Boolean

MBS MacCI Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Whether this attribute has a defined minimum value.
**Notes:** (Read only property)

### 58.1.13 HasSliderMaxNumber as Boolean

MBS MacCI Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Whether this attribute has a defined slider maximum value.
**Notes:** (Read only property)

### 58.1.14 HasSliderMinNumber as Boolean

MBS MacCI Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Whether this attribute has a defined slider minimum value.
**Notes:** (Read only property)

### 58.1.15 IdentityAffineTransform as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The value to be used to keep the filter doing nothing.
**Notes:** Only valid for affine transformations.
(Read only property)

### 58.1.16 IdentityNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The value to be used to keep the filter doing nothing.
**Notes:** Only valid for numbers.
(Read only property)

### 58.1.17 IdentityValue as Variant

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The identity value.
**Notes:** (Read only property)

### 58.1.18 IdentityVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The value to be used to keep the filter doing nothing.
**Notes:** Only valid for vectors.
(Read only property)

### 58.1.19 LocalizedDescription as string

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Description of the filter intended for UI display (eg. localized)
**Notes:** (Read only property)

### 58.1.20 MaxNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Maximum value for the attribute.
**Notes:** Only valid for numbers.

If no value is defined, this property is zero and HasMaxNumber returns false.
(Read only property)

### 58.1.21 MinNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Minimum value for the attribute.
**Notes:** Only valid for numbers.
If no value is defined, this property is zero and HasMinNumber returns false.
(Read only property)

### 58.1.22 Name as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The name of this attribute.
**Notes:** (Read only property)

### 58.1.23 SliderMaxNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Maximum value for the slider.
**Example:**

```
dim f as CIFilterEdgesMBS
dim a as CIAttributeMBS

f=new CIFilterEdgesMBS
f.inputImage=NewCIImagewithFileMBS(SpecialFolder.Desktop.Child("Paris.jpg"))

a=f.AttributeinputIntensity
Title=str(a.SliderMinNumber)+" "+str(a.SliderMaxNumber)
f.inputIntensity=a.SliderMaxNumber

Backdrop=f.outputImage.RenderPicture
```

**Notes:** Only valid for numbers.
If no value is defined, this property is zero and HasSliderMaxNumber returns false.
(Read only property)

### 58.1.24 SliderMinNumber as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Minimum value for the slider.
**Notes:** Only valid for numbers.
If no value is defined, this property is zero and HasSliderMinNumber returns false.
(Read only property)

### 58.1.25 Type as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The type of this attribute.
**Notes:** Types for numbers:
kCIAttributeTypeDistance
kCIAttributeTypeBoolean
kCIAttributeTypeTime
kCIAttributeTypeAngle
kCIAttributeTypeScalar

Types for vectors:
kCIAttributeTypePosition (2 Dimensions)
kCIAttributeTypeOffset (2 Dimensions)
kCIAttributeTypePosition3 (3 Dimensions)
kCIAttributeTypeRectangle (4 Dimensions)

Types for colors:
kCIAttributeTypeOpaqueColor

Types for images:
kCIAttributeTypeGradient
(Read only property)

### 58.1.26 Values as Dictionary

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Queries all values as dictionary.
**Notes:** (Read only property)

## 58.2 class CIAztecCodeDescriptorMBS

### 58.2.1 class CIAztecCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** CIAztecCodeDescriptor is a concrete subclass of CIBarcodeDescriptor that defines an abstract representation of an Aztec Code symbol.
**Notes:** CIAztecCodeDescriptor may not be instantiated directly.
Subclass of the CIBarcodeDescriptorMBS class.

### 58.2.2 Methods

### 58.2.3 Constructor(errorCorrectedPayload as MemoryBlock, isCompact as Boolean, layerCount as Integer, dataCodewordCount as Integer)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Initializes a descriptor that can be used as input to CIBarcodeGenerator.

### 58.2.4 descriptorWithPayload(errorCorrectedPayload as MemoryBlock, isCompact as Boolean, layerCount as Integer, dataCodewordCount as Integer) as CIAztecCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a descriptor that can be used as input to CIBarcodeGenerator.

### 58.2.5 Properties

### 58.2.6 dataCodewordCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The number of non-error-correction codewords carried by the Aztec code symbol.
**Notes:** Used to determine the level of error correction in conjunction with the number of data layers. Valid values are 1...2048. Compact symbols can have up to 64 message codewords.

Note that this value can exceed the number of message codewords allowed by the number of data layers in this symbol. In this case, the actual number of message codewords is 1024 fewer than this value and the message payload is to be interpreted in an application-defined manner.

(Read only property)

### 58.2.7 errorCorrectedPayload as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error-corrected codewords that comprise the Aztec code symbol.
**Notes:** Aztec Codes are formally specified in ISO/IEC 24778:2008(E).

The error corrected payload consists of the 6-, 8-, 10-, or 12-bit message codewords produced at the end of the step described in section 7.3.1.2 "Formation of data codewords", which exists immediately prior to adding error correction. These codewords have dummy bits inserted to ensure that an entire codeword isn't all 0's or all 1's. Clients will need to remove these extra bits as part of interpreting the payload.
(Read only property)

### 58.2.8 isCompact as Boolean

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** A boolean indicating whether the symbol is compact.
**Notes:** Compact Aztec symbols use one-fewer ring in the central finder pattern than full-range Aztec symbols of the same number of data layers.
(Read only property)

### 58.2.9 layerCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The number of data layers in the Aztec code symbol.
**Notes:** Combined with the isCompact property, the number of data layers determines the number of modules in the Aztec Code symbol. Valid values range from 1 to 32. Compact symbols can have up to 4 data layers.

The number of data layers also determines the number of bits in each data codeword of the message carried by the Aztec Code symbol.
(Read only property)

## 58.3 class CIBarcodeDescriptorMBS

### 58.3.1 class CIBarcodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** CIBarcodeDescriptor is an abstract base class that defines an abstract representation of a machine readable code's symbol attributes.
**Notes:** Each subclass is sufficient to recreate the symbol exactly as seen or to be used with a custom parser. Subclasses of CIBarcodeDescriptor are defined for each code type to contain the formal specification of each symbology.
Available on macOS 10.13.

### 58.3.2 Methods

### 58.3.3 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor with passing in a handle to an existing object.
**Notes:** Handle must be of type CIBarcodeDescriptor and will be retained.

### 58.3.4 copy as CIBarcodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of this barcode description.

### 58.3.5 Properties

### 58.3.6 description as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The description string to debug.
**Notes:** (Read only property)

### 58.3.7 Handle as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 58.4 class CIColorMBS

### 58.4.1 class CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class for a color in CoreImage.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter
- MBS Real Studio Plugins, version 13.1pr13
- MBS Real Studio Plugins, version 12.1pr5

### 58.4.2 Methods

### 58.4.3 blackColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock black color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.4 blueColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock blue color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.5 clearColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock clear color with sRGB color space.
**Notes:** Transparent color.
Available in macOS 10.12 or newer.

### 58.4.6 colorWithCGColor(ColorValue as CGColorMBS) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a new color based on a CoreGraphics color.

### 58.4.7 colorWithRGB(Red as Double, Green as Double, Blue as Double) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a color object using the specified RGB color component values
**Notes:** r: The value of the red component.
g: The value of the green component.
b: The value of the blue component.

Initializes Core Image color object that represents an RGB color in the color space specified by the Quartz 2D constant kCGColorSpaceGenericRGB.
See also:

- 58.4.8 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double) as CIColorMBS 9312
- 58.4.9 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313
- 58.4.10 colorWithRGB(Red as Double, Green as Double, Blue as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313

### 58.4.8 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a color object using the specified RGBA color component values.
**Notes:** r: The value of the red component.
g: The value of the green component.
b: The value of the blue component.
a: The value of the alpha component.

Initializes a Core Image color object that represents an RGB color in the color space specified by the Quartz 2D constant kCGColorSpaceGenericRGB and an alpha value.
See also:

- 58.4.7 colorWithRGB(Red as Double, Green as Double, Blue as Double) as CIColorMBS 9312
- 58.4.9 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313

- 58.4.10 colorWithRGB(Red as Double, Green as Double, Blue as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313


### 58.4.9 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create a new color object in a given colorspace.
**Notes:** Will return nil if the colorspace is not kCGColorSpaceModelRGB.
Available in macOS 10.12 or newer.
See also:


- 58.4.7 colorWithRGB(Red as Double, Green as Double, Blue as Double) as CIColorMBS 9312
- 58.4.8 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double) as CIColorMBS 9312
- 58.4.10 colorWithRGB(Red as Double, Green as Double, Blue as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313


### 58.4.10 colorWithRGB(Red as Double, Green as Double, Blue as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create a new color object in a given colorspace.
**Notes:** Will return nil if the colorspace is not kCGColorSpaceModelRGB.
Available in macOS 10.12 or newer.
See also:


- 58.4.7 colorWithRGB(Red as Double, Green as Double, Blue as Double) as CIColorMBS 9312
- 58.4.8 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double) as CIColorMBS 9312
- 58.4.9 colorWithRGB(Red as Double, Green as Double, Blue as Double, Alpha as Double, ColorSpace as CGColorSpaceMBS) as CIColorMBS 9313


### 58.4.11 colorWithString(representation as String) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a color from a color string representation.

### 58.4.12 Component(index as UInt32) as Double

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The color component with the given index.
**Notes:** Index is from 0 to NumberOfComponents - 1.

### 58.4.13 Constructor(ColorValue as CGColorMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new CIColor based on the given CoreGraphics color.
**Notes:** On success, the handle is not zero.
See also:


- 58.4.14 Constructor(Handle as Integer) 9314
- 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double) 9315
- 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double) 9315
- 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS) 9316
- 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS) 9316


### 58.4.14 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIColor* and the object is retained.
Raises UnsupportedOperationException if object is not a CIColor.
See also:


- 58.4.13 Constructor(ColorValue as CGColorMBS) 9314
- 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double) 9315
- 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double) 9315
- 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS) 9316
- 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS) 9316

### 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double)

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a color object using the specified RGB color component values
**Notes:** r: The value of the red component.
g: The value of the green component.
b: The value of the blue component.

Initializes Core Image color object that represents an RGB color in the color space specified by the Quartz 2D constant kCGColorSpaceGenericRGB.
See also:


- 58.4.13 Constructor(ColorValue as CGColorMBS) 9314
- 58.4.14 Constructor(Handle as Integer) 9314
- 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double) 9315
- 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS) 9316
- 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS) 9316


### 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double)

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a color object using the specified RGBA color component values.
**Notes:** r: The value of the red component.
g: The value of the green component.
b: The value of the blue component.
a: The value of the alpha component.

Initializes a Core Image color object that represents an RGB color in the color space specified by the Quartz 2D constant kCGColorSpaceGenericRGB and an alpha value.
See also:


- 58.4.13 Constructor(ColorValue as CGColorMBS) 9314
- 58.4.14 Constructor(Handle as Integer) 9314
- 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double) 9315
- 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS) 9316

- 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS) 9316


### 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create a new color object in a given colorspace.
**Notes:** Will fail if the colorspace is not kCGColorSpaceModelRGB.
Available in macOS 10.12 or newer.
See also:


- 58.4.13 Constructor(ColorValue as CGColorMBS) 9314
- 58.4.14 Constructor(Handle as Integer) 9314
- 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double) 9315
- 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double) 9315
- 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS) 9316


### 58.4.18 Constructor(Red as double, Green as Double, Blue as double, ColorSpace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create a new color object in a given colorspace.
**Notes:** Will fail if the colorspace is not kCGColorSpaceModelRGB.
Available in macOS 10.12 or newer.
See also:


- 58.4.13 Constructor(ColorValue as CGColorMBS) 9314
- 58.4.14 Constructor(Handle as Integer) 9314
- 58.4.15 Constructor(Red as Double, Green as Double, Blue as Double) 9315
- 58.4.16 Constructor(Red as Double, Green as Double, Blue as Double, Alpha as Double) 9315
- 58.4.17 Constructor(Red as double, Green as Double, Blue as double, Alpha as Double, ColorSpace as CGColorSpaceMBS) 9316

### 58.4.19 copy as CIColorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the color object.

### 58.4.20 cyanColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock cyan color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.21 grayColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock gray color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.22 greenColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock green color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.23 magentaColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock magenta color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.24 redColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock red color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.25 whiteColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock white color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.26 yellowColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns stock yellow color with sRGB color space.
**Notes:** Available in macOS 10.12 or newer.

### 58.4.27 Properties

### 58.4.28 Alpha as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The alpha value of the color.
**Notes:** Values range between 0.0 to 1.0.
(Read only property)

### 58.4.29 Blue as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The (unpremultiplied) blue component of the color.
**Notes:** Values range between 0.0 to 1.0.
(Read only property)

### 58.4.30 ColorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The color space object associated with the color.
**Notes:** nil on any error.

(Read only property)

### 58.4.31 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this color.
**Notes:** (Read only property)

### 58.4.32 Green as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The (unpremultiplied) green component of the color.
**Notes:** Values range between 0.0 to 1.0.
(Read only property)

### 58.4.33 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the CIColor object used internally.
**Notes:** (Read only property)

### 58.4.34 NumberOfComponents as Integer

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The number of color components (including alpha).
**Notes:** (Read only property)

### 58.4.35 Red as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The (unpremultiplied) red component of the color.
**Notes:** Values range between 0.0 to 1.0.
(Read only property)

### 58.4.36 StringRepresentation as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns a formatted string with the components of the color.
**Example:**

```
dim c as CIColorMBS

c=NewCIColorMBS(1,0,0)

MsgBox c.stringRepresentation // shows "1 0 0 1"
```

**Notes:** Returns "" on any error.
(Read only property)

## 58.5 class CIContextMBS

### 58.5.1 class CIContextMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class for a drawing context for CoreImage.
**Blog Entries**

- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr3
- Load RAW image on MacOS with options
- MBS Xojo Plugins, version 17.3pr3
- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Real Studio Plugins, version 13.1pr3
- MBS Real Studio Plugins, version 12.1pr5

### 58.5.2 Methods

### 58.5.3 ClearCaches

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Frees any cached data (such as temporary images) associated with the context.
**Notes:** This also runs the garbage collector.

### 58.5.4 Constructor

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Creates a new CIContext without a specific target.
**Notes:** Great to create a context and render something inside.
See also:


- 58.5.5 Constructor(cgcontext as CGContextMBS) 9322
- 58.5.6 Constructor(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) 9322
- 58.5.7 Constructor(Handle as Integer) 9322
- 58.5.8 Constructor(Pic as Picture) 9323

### 58.5.5 Constructor(cgcontext as CGContextMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a new CoreImage context object, all output will be drawn into the CG context.
**Notes:** On success, the handle is not zero.
See also:


- 58.5.4 Constructor 9321
- 58.5.6 Constructor(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) 9322
- 58.5.7 Constructor(Handle as Integer) 9322
- 58.5.8 Constructor(Pic as Picture) 9323


### 58.5.6 Constructor(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a new CoreImage context object with options, all output will be drawn into the CG context.
**Notes:** OutputColorSpace: A CGColorSpaceMBS object defining the color space in which all intermediate operations are performed.
WorkingColorSpace: A CGColorSpaceRef object defining the color space that images are converted to before rendering into the context.
UseSoftwareRenderer: Whether you want software renderer only.

On success, the handle is not zero.
See also:


- 58.5.4 Constructor 9321
- 58.5.5 Constructor(cgcontext as CGContextMBS) 9322
- 58.5.7 Constructor(Handle as Integer) 9322
- 58.5.8 Constructor(Pic as Picture) 9323


### 58.5.7 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIContext* and the object is retained.

Raises UnsupportedOperationException if object is not a CIContext.
See also:


- 58.5.4 Constructor 9321
- 58.5.5 Constructor(cgcontext as CGContextMBS) 9322
- 58.5.6 Constructor(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) 9322
- 58.5.8 Constructor(Pic as Picture) 9323


### 58.5.8 Constructor(Pic as Picture)

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a context targeting the picture.
**Notes:** Works only on Cocoa target.
See also:


- 58.5.4 Constructor 9321
- 58.5.5 Constructor(cgcontext as CGContextMBS) 9322
- 58.5.6 Constructor(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) 9322
- 58.5.7 Constructor(Handle as Integer) 9322


### 58.5.9 CreateCGImage(image as CIImageMBS, r as CGRectMBS = nil) as CGImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new image with the content of the CIImage.
**Notes:** Render the region 'r' of image 'im' into a temporary buffer using the context, then create and return a new CoreGraphics image with the results.
If r is nil, the whole image extent is used.
See also:


- 58.5.10 CreateCGImage(image as CIImageMBS, r as CGRectMBS, ColorSpace as CGColorSpaceMBS) as CGImageMBS 9323


### 58.5.10 CreateCGImage(image as CIImageMBS, r as CGRectMBS, ColorSpace as CGColorSpaceMBS) as CGImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new image with the content of the CIImage.
**Notes:** Render the region 'r' of image 'im' into a temporary buffer using the context, then create and return a new CoreGraphics image with the results.
If r is nil, the whole image extent is used.
See also:

- 58.5.9 CreateCGImage(image as CIImageMBS, r as CGRectMBS = nil) as CGImageMBS 9323

### 58.5.11 createCGLayer(size as CGSizeMBS, info as dictionary = nil) as CGLayerMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a CGLayer object from the provided parameters.
**Notes:** size: The size, in default user space units, of the layer relative to the graphics context.
ifno: A dictionary, which is passed to CGLayerCreateWithContext as the auxiliaryInfo parameter. Pass nil because this parameter is reserved for future use.

Returns a CGLayer object.

After calling this method, Core Image draws content into the CGLayer object. Core Image creates a CGLayer object by calling the Quartz 2D function CGLayerCreateWithContext, whose prototype is:

```
CGLayerRef CGLayerCreateWithContext (
CGContextRef context,
CGSize size,
CFDictionaryRef auxiliaryInfo
);
```

Core Image passes the CIContext object as the context parameter, the size as the size parameter, and the dictionary as the auxiliaryInfo parameter. For more information on CGLayer objects, see Quartz 2D Programming Guide and CGLayer Reference.

Available in OS X v10.4 and later.

### 58.5.12 Destructor

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 58.5.13 DrawImage(ciImage as CIImageMBS)

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Render the ciImage to the the context's destination.
**Notes:** Rendering the image will cause the calculations to be done so this call is quite expensive.

### 58.5.14 DrawImagePoint(ciImage as CIImageMBS, DestPoint as CGPointMBS, SourceRect as CGRectMBS = nil)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use DrawImageRect instead.
**Function:** Render the subregion 'SourceRect' of 'ciImage' to point 'DestPoint' in the context's destination.
**Notes:** Rendering the image will cause the calculations to be done so this call is quite expensive.
If SourceRect is nil, we use the extent from image.

### 58.5.15 DrawImageRect(ciImage as CIImageMBS, DestRect as CGRectMBS, SourceRect as CGRectMBS = nil)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Render the rectangle 'SourceRect' of 'ciImage' to the rectangle 'DestRect' in the context's destination.
**Notes:** Rendering the image will cause the calculations to be done so this call is quite expensive.
If SourceRect is nil, we use the extent from image.

### 58.5.16 Flush

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Flushes drawings to CGContext and target picture (if any).

### 58.5.17 HEIFRepresentationOfImage(Image as CIImageMBS, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil) as MemoryBlock

MBS MacCI Plugin, Plugin Version: 19.2, Platform: macOS, Targets: All.

**Function:** Render a CIImage to HEIF data.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
Dim i As New CIImageMBS(f)
Dim c As New CIContextMBS

Dim heifData As MemoryBlock = c.HEIFRepresentationOfImage(i)

Break // see debugger
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.13 or later.

### 58.5.18 JPEGRepresentationOfImage(Image as CIImageMBS, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil) as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to JPEG data.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS

dim jpegData as MemoryBlock = c.JPEGRepresentationOfImage(i)

Break // see debugger
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome.
Supported options keys are kCGImageDestinationLossyCompressionQuality, kCIImageRepresentationAVDepthData, kCIImageRepresentationDepthImage, kCIImageRepresentationDisparityImage.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.12 or later.

### 58.5.19 kCIContextCacheIntermediates as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys that may be passed in the dictionary while creating contexts.
**Notes:** A boolean NSNumber controlling how intermediate buffers are cached.
If false, the context will empty intermediates during and after renders.
The default value is true.

### 58.5.20 kCIContextHighQualityDownsample as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the option keys.
**Notes:** A boolean controlling the quality of affine downsample operations.
True imply that more quality is desired.
On iOS the the default value is false.
On OSX the the default value is true.

### 58.5.21 kCIContextOutputColorSpace as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A key for the color space to use for images before they are rendered to the context.
**Notes:** By default, Core Image uses the GenericRGB color space, which leaves color matching to the system. You can specify a different output color space by providing a Quartz 2D CGColorSpace object (CG-ColorSpaceRef). (See Quartz 2D Programming Guide for information on creating and using CGColorSpace objects.)

To request that Core Image perform no color management, specify the NSNull object as the value for this key. Use this option for images that don,Äôt contain color data (such as elevation maps, normal vector maps, and sampled function tables).

Available in OS X v10.6 and later.

### 58.5.22 kCIContextOutputPremultiplied as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys that may be passed in the dictionary while creating contexts.
**Notes:** A boolean controlling whether output renders produce alpha-premultiplied pixels.
The default value is true.

### 58.5.23 kCIContextPriorityRequestLow as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys that may be passed in the dictionary while creating contexts.
**Notes:** An number with a boolean value. When @YES the context will use low priority rendering on the GPU.

### 58.5.24 kCIContextUseSoftwareRenderer as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A key for enabling software renderer use. If the associated NSNumber object is true, then the software renderer is required.
**Notes:** Available in OS X v10.6 and later.

### 58.5.25 kCIContextWorkingColorSpace as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A key for the color space to use for image operations.
**Notes:** By default, Core Image assumes that processing nodes are 128 bits-per-pixel, linear light, premultiplied RGBA floating-point values that use the GenericRGB color space. You can specify a different working color space by providing a Quartz 2D CGColorSpace object (CGColorSpaceRef). Note that the working color space must be RGB-based. If you have YUV data as input (or other data that is not RGB-based), you can use ColorSync functions to convert to the working color space. (See Quartz 2D Programming Guide for information on creating and using CGColorSpace objects.)

To request that Core Image perform no color management, specify the NSNull object as the value for this key. Use this option for images that don,Äôt contain color data (such as elevation maps, normal vector maps, and sampled function tables).

Available in OS X v10.6 and later.

### 58.5.26 kCIContextWorkingFormat as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** An option for the color format to use for intermediate results when rendering with the context.
**Notes:** The value for this key is an NSNumber object containing a CIFormat value. The default working format is kCIFormatRGBA8 for CPU rendering and kCIFormatRGBAf for GPU rendering. GPU rendering also supports the kCIFormatRGBAh format for greater color precision, but this format requires twice as

much memory and can be used only with color management enabled.

Available in OS X v10.4 and later.

### 58.5.27 kCIImageRepresentationAVDepthData as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the representation name.
**Notes:** For the raw depth data.

### 58.5.28 kCIImageRepresentationDepthImage as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the representation name.
**Notes:** For the depth image.

### 58.5.29 kCIImageRepresentationDisparityImage as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the representation name.
**Notes:** For the disparity image.

### 58.5.30 PNGRepresentationOfImage(Image as CIImageMBS, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil) as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to PNG data.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS

dim pngData as MemoryBlock = c.PNGRepresentationOfImage(i)

Break // see debugger
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.13 or later.

### 58.5.31 ReclaimResources

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Frees temporary memory.
**Notes:** Runs the context's garbage collector to reclaim any resources that are no longer required (e.g. removes textures from the texture cache that reference deleted images.) This method is called automatically after every rendering operation.

### 58.5.32 TIFFRepresentationOfImage(Image as CIImageMBS, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil) as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to TIFF data.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS

dim tiffData as MemoryBlock = c.TIFFRepresentationOfImage(i)

Break // see debugger
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.12 or later.

### 58.5.33 writeHEIFRepresentationOfImage(Image as CIImageMBS, file as FolderItem, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil, byref error as NSErrorMBS) as Boolean

MBS MacCI Plugin, Plugin Version: 19.2, Platform: macOS, Targets: All.

**Function:** Render a CIImage to HEIF file.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
Dim i As New CIImageMBS(f)
Dim c As New CIContextMBS
Dim d As FolderItem = SpecialFolder.Desktop.Child("output.heif")

Dim e As NSErrorMBS
Dim b As Boolean = c.writePNGRepresentationOfImage(i, d, e)
If b Then
MsgBox "OK"
Else
MsgBox "Failed"+EndOfLine+e.LocalizedDescription
End If
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.13 or later.

### 58.5.34 writeJPEGRepresentationOfImage(Image as CIImageMBS, file as FolderItem, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil, byref error as NSErrorMBS) as Boolean

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to JPEG file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS
dim d as FolderItem = SpecialFolder.Desktop.Child("output.jpg")

dim e as NSErrorMBS
dim b as Boolean = c.writeJPEGRepresentationOfImage(i, d, e)
```

```
if b then
MsgBox "OK"
else
MsgBox "Failed"+EndOfLine+e.LocalizedDescription
end if
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome.
Supported options keys are kCGImageDestinationLossyCompressionQuality, kCIImageRepresentationAVDepthData, kCIImageRepresentationDepthImage, kCIImageRepresentationDisparityImage.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.12 or later.

### 58.5.35 writePNGRepresentationOfImage(Image as CIImageMBS, file as FolderItem, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil, byref error as NSErrorMBS) as Boolean

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to PNG file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS
dim d as FolderItem = SpecialFolder.Desktop.Child("output.png")

dim e as NSErrorMBS
dim b as Boolean = c.writePNGRepresentationOfImage(i, d, e)
if b then
MsgBox "OK"
else
MsgBox "Failed"+EndOfLine+e.LocalizedDescription
end if
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.13 or later.

### 58.5.36 writeTIFFRepresentationOfImage(Image as CIImageMBS, file as FolderItem, format as Integer = 24, colorSpace as CGColorSpaceMBS = nil, options as dictionary = nil, byref error as NSErrorMBS) as Boolean

MBS MacCI Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Render a CIImage to TIFF file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim i as new CIImageMBS(f)
dim c as new CIContextMBS
dim d as FolderItem = SpecialFolder.Desktop.Child("output.tif")

dim e as NSErrorMBS
dim b as Boolean = c.writeTIFFRepresentationOfImage(i, d, e)
if b then
MsgBox "OK"
else
MsgBox "Failed"+EndOfLine+e.LocalizedDescription
end if
```

**Notes:** Image must have a finite non-empty extent.
The CGColorSpace must be kCGColorSpaceModelRGB or kCGColorSpaceModelMonochrome and must match the specified format.
No options keys are supported at this time.
If colorspace is nil, we use generic RGB colorspace.
Available on macOS 10.12 or later.

### 58.5.37 Properties

### 58.5.38 CGContext as CGContextMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The CGContextMBS targeted by this CIContext.
**Notes:** (Read and Write property)

### 58.5.39 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this context.

**Notes:** (Read only property)

### 58.5.40 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the CIContext object used internally.
**Notes:** (Read only property)

### 58.5.41 Picture as Picture

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The picture used in the constructor (if any).
**Notes:** (Read and Write property)

### 58.5.42 Constants

Formats

| Constant | Value | Description |
|---|---|---|
| kCIFormatA16 | 4 | Alpha with 16-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatA8 | 3 | Alpha with 8-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatABGR8 | 46 | ABGR with 8-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatAf | 6 | Alpha with float values.<br>Available in macOS 10.11 or newer. |
| kCIFormatAh | 5 | Alpha with half floating point.<br>Available in macOS 10.11 or newer. |
| kCIFormatARGB8 | 23 | ARGB with 8-bit. |
| kCIFormatBGRA8 | 22 | BGRA with 8-bit. |
| kCIFormatR16 | 37 | Red with 16-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatR8 | 36 | Red with 8-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatRf | 39 | Red with floating point.<br>Available in macOS 10.11 or newer. |
| kCIFormatRG16 | 41 | Red and green with 16-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatRG8 | 40 | Red and green with 8-bit.<br>Available in macOS 10.11 or newer. |
| kCIFormatRGBA16 | 27 | RGBA with 16-bit. |
| kCIFormatRGBA8 | 24 | RGBA with 8-bit. |
| kCIFormatRGBAf | 34 | RGBA with floating point. |
| kCIFormatRGBAh | 31 | RGBA values that are IEEE 754-2008 half float compliant. |
| kCIFormatRGf | 43 | Red and green with floating point values.<br>Available in macOS 10.11 or newer. |
| kCIFormatRGh | 42 | Red and green with half precision floating point values.<br>Available in macOS 10.11 or newer. |
| kCIFormatRh | 38 | Red with half precision floating point.<br>Available in macOS 10.11 or newer. |

## 58.6 class CIDataMatrixCodeDescriptorMBS

### 58.6.1 class CIDataMatrixCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** CIDataMatrixCodeDescriptor is a concrete subclass of CIBarcodeDescriptor that defines an abstract representation of a Data Matrix code symbol.
**Notes:** Subclass of the CIBarcodeDescriptorMBS class.

### 58.6.2 Methods

### 58.6.3 Constructor(errorCorrectedPayload as MemoryBlock, rowCount as Integer, columnCount as Integer, eccVersion as integer)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Initializes a descriptor that can be used as input to CIBarcodeGenerator.

### 58.6.4 descriptorWithPayload(errorCorrectedPayload as MemoryBlock, rowCount as Integer, columnCount as Integer, eccVersion as integer) as CIDataMatrixCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a descriptor that can be used as input to CIBarcodeGenerator.

### 58.6.5 Properties

### 58.6.6 columnCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The number of module columns.
**Notes:** Refer to ISO/IEC 16022:2006(E) for valid module row and column count combinations.
(Read only property)

### 58.6.7 eccVersion as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Data Matrix code ECC version.
**Notes:** Valid values are 000, 050, 080, 100, 140, and 200. Any symbol with an even number of rows and columns will be ECC 200.

ECC 000 - 140 symbols offer five levels of error correction using convolutional code error correction. Each successive level of error correction offers more protection for the message data and increases the size of the symbol required to carry a specific message. ECC 000 symbols offer no data protection. The other modes are described in ISO/IEC 16022:2006 and enumerated in this list only for completeness.

ECC 200 symbols utilize Reed-Solomon error correction. The error correction capacity for any given Data Matrix symbol is fixed by the size (in rows and columns) of the symbol. See Table 7 of ISO/IEC 16022:2006(E) for more details.
(Read only property)

### 58.6.8 errorCorrectedPayload as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error corrected payload that comprise the Data Matrix code symbol.
**Notes:** DataMatrix symbols are specified bn ISO/IEC 16022:2006(E). ECC 200-type symbols will always have an even number of rows and columns.

For ECC 200-type symbols, the phases of encoding data into a symbol are described in section 5.1 – Encode procedure overview. The error corrected payload comprises the de-interleaved bits of the message described at the end of Step 1: Data encodation.
(Read only property)

### 58.6.9 rowCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The number of module rows.
**Notes:** Refer to ISO/IEC 16022:2006(E) for valid module row and column count combinations.
(Read only property)

### 58.6.10 Constants

ECC Versions

| Constant | Value | Description |
|---|---|---|
| ECCVersion000 | 0 | Indicates error correction using convolutional code error correction with no data protection. |
| ECCVersion050 | 50 | Indicates 1/4 of the symbol is dedicated to convolutional code error correction. |
| ECCVersion080 | 80 | Indicates 1/3 of the symbol is dedicated to convolutional code error correction. |
| ECCVersion100 | 100 | Indicates 1/2 of the symbol is dedicated to convolutional code error correction. |
| ECCVersion140 | 140 | Indicates 3/4 of the symbol is dedicated to convolutional code error correction. |
| ECCVersion200 | 200 | Indicates error correction using Reed-Solomon error correction. Data protection overhead varies based on symbol size. |

## 58.7 class CIDetectorMBS

### 58.7.1 class CIDetectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The Core Image class to detect features in images.
**Notes:** This class potentially holds onto a lot of state. Hence it may be beneficial from a performance perspective to re-use the same CIDetector instance. Specifying a CIContext when creating a detector may have an impact on performance since this context may be used when analyzing an image.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr6
- Live barcode detection with Xojo for MacOS
- MBS Xojo Plugins, version 17.3pr1
- MBS Xojo / Real Studio Plugins, version 16.0pr5
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr7
- New plugin class for CIDetector

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

### 58.7.2 Methods

### 58.7.3 CIDetectorAccuracy as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The key in the options dictionary used to specify a accuracy / performance tradeoff to be used.

### 58.7.4 CIDetectorAccuracyHigh as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** One of the values for use with the CIDetectorAccuracy key.
**Notes:** Lower performance, higher accuracy

### 58.7.5 CIDetectorAccuracyLow as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** One of the values for use with the CIDetectorAccuracy key.
**Notes:** Lower accuracy, higher performance

### 58.7.6 CIDetectorAspectRatio as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the keys used in the options dictionary for featuresInImage.
**Notes:** An option specifying the aspect ratio (width divided by height) of rectangles to search for.

The value of this key is an NSNumber object whose value is a positive floating-point number. Use this option with the CIDetectorTypeRectangle detector type to fine-tune the accuracy of the detector. For example, to more accurately find a business card (3.5 x 2 inches) in an image, specify an aspect ratio of 1.75 (3.5 / 2).

### 58.7.7 CIDetectorEyeBlink as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** An option for whether Core Image will perform additional processing to recognize closed eyes in detected faces.
**Notes:** Available in OS X v10.9 and later.

### 58.7.8 CIDetectorFocalLength as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the keys used in the options dictionary for featuresInImage.
**Notes:** An option identifying the focal length used in capturing images to be processed by the detector.

The value of this key is an NSNumber object whose value is a floating-point number between -1.0 and 1.0. Use this option with the CIDetectorTypeRectangle detector type to fine-tune the accuracy of the detector.

### 58.7.9 CIDetectorImageOrientation as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** An option for the display orientation of the image whose features you want to detect.
**Notes:** The value of this key is an NSNumber object whose value is an integer between 1 and 8. The TIFF and EXIF specifications define these values to indicate where the pixel coordinate origin (0,0) of the image should appear when it is displayed. The default value is 1, indicating that the origin is in the top left corner of the image. For further details, see kCGImagePropertyOrientation.
Core Image only detects faces whose orientation matches that of the image. You should provide a value for this key if you want to detect faces in a different orientation.
Available in OS X v10.8 and later.

### 58.7.10 CIDetectorMaxFeatureCount as string

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for featuresInImage.
**Notes:** For rectangle detector, the value for this key is an integer number from 1 ... 256 that represents the maximum number of features to return.
valid value range: 1 <= CIDetectorMaxFeatureCount <= 256. The default value is 1.

### 58.7.11 CIDetectorMinFeatureSize as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A key used to specify the minimum size that the detector will recognize as a feature.
**Notes:** The value for this key is an NSNumber object ranging from 0.0 through 1.0 that represents a fraction of the minor dimension of the image.
Available in OS X v10.8 and later.

### 58.7.12 CIDetectorNumberOfAngles as string

MBS MacCI Plugin, Plugin Version: 15.4, Platform: macOS, Targets: All.

**Function:** One of the configuration keys.
**Notes:** The number of perspectives to use for detecting a face in video input.

The value for this key is a number 1, 3, 5, 7, 9, or 11. At higher numbers of angles, face detection in video becomes more accurate, but at a higher computational cost.

Available in OS X 10.11 and later.

### 58.7.13 CIDetectorReturnSubFeatures as string

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for featuresInImage.
**Notes:** The value for this key is a bool. Controls whether the text detector should detect subfeatures or not. The default value is false. Requires 64-bit.

### 58.7.14 CIDetectorSmile as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** An option for whether Core Image will perform additional processing to recognize smiles in detected faces.
**Notes:** Available in OS X v10.9 and later.

### 58.7.15 CIDetectorTracking as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A key used to enable or disable face tracking for the detector.
**Notes:** Use this option when you want to track faces across frames in a video.
Available in OS X v10.8 and later.

### 58.7.16 CIDetectorTypeFace as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Specifies a detector type for face recognition.

### 58.7.17 CIDetectorTypeQRCode as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the strings used to declare the detector for which you are interested.
**Notes:** A detector that searches for Quick Response codes (a type of 2D barcode) in a still image or video, returning CIQRCodeFeature objects that provide information about detected barcodes.
This is Mac 64-bit only.

### 58.7.18 CIDetectorTypeRectangle as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the strings used to declare the detector for which you are interested.
**Notes:** A detector that searches for rectangular areas in a still image or video, returning CIRectangleFeature objects that provide information about detected regions.

The rectangle detector finds areas that are likely to represent rectangular objects that appear in perspective in the image, such as papers or books seen on a desktop.

### 58.7.19 CIDetectorTypeText as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the strings used to declare the detector for which you are interested.
**Notes:** A detector that searches for text in a still image or video, returning CITextFeature objects that provide information about detected regions.

The text detector finds areas that are likely to contain upright text, but does not perform optical character recognition.

### 58.7.20 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new CIDetectorMBS object for the given handle.
See also:

- 58.7.21 Constructor(type as string, context as CIContextMBS = nil, options as dictionary = nil) 9343

### 58.7.21 Constructor(type as string, context as CIContextMBS = nil, options as dictionary = nil)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns a new detector instance of the given type.
**Notes:** The type is used to specify the usage intent.
The context argument specifies the CIContext to be used to operate on the image. May be nil.

If the input image to featuresInImage is the output of a CoreImage operation, it may improve performance to specify the same context that was used to operate on that image.

The detector may do image processing in this context and if the image is on the GPU and the specified context is a GPU context this may avoid additional upload to / download from the GPU. If the input image is on the CPU (or the output from a CPU based context) specifying a GPU based context (or vice versa) may reduce performance.

The options parameter lets you optinally specify a accuracy / performance tradeoff. Can be nil or an empty dictionary.
See also:

- 58.7.20 Constructor(Handle as Integer) 9343

### 58.7.22 detectorOfType(type as string, context as CIContextMBS = nil, options as dictionary = nil) as CIDetectorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns a new detector instance of the given type.
**Notes:** The type is used to specify the usage intent.
The context argument specifies the CIContext to be used to operate on the image. May be nil.

If the input image to featuresInImage is the output of a CoreImage operation, it may improve performance to specify the same context that was used to operate on that image.

The detector may do image processing in this context and if the image is on the GPU and the specified context is a GPU context this may avoid additional upload to / download from the GPU. If the input image is on the CPU (or the output from a CPU based context) specifying a GPU based context (or vice versa) may reduce performance.

The options parameter lets you optinally specify a accuracy / performance tradeoff. Can be nil or an empty dictionary.

### 58.7.23 featuresInImage(image as CIImageMBS) as CIFeatureMBS()

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns an array of CIFeature instances in the given image.
**Notes:** The array is sorted by confidence, highest confidence first.
See also:

- 58.7.24 featuresInImage(image as CIImageMBS, options as dictionary) as CIFeatureMBS() 9345

### 58.7.24 featuresInImage(image as CIImageMBS, options as dictionary) as CIFeatureMBS()

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns an array of CIFeature instances in the given image.
**Notes:** The array is sorted by confidence, highest confidence first.
The options dictionary can contain a CIDetectorImageOrientation key value.
See also:

- 58.7.23 featuresInImage(image as CIImageMBS) as CIFeatureMBS() 9344

### 58.7.25 Properties

### 58.7.26 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 58.8 class CIFaceFeatureMBS

### 58.8.1 class CIFaceFeatureMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** A CIFaceFeature object describes a face detected in a picture.
**Notes:** Its properties provide locations for the face's eyes and mouth.
All positions are relative to the original image.
Subclass of the CIFeatureMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr7

### 58.8.2 Methods

### 58.8.3 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new CIFaceFeature object from a handle value.

### 58.8.4 Properties

### 58.8.5 faceAngle as Double

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The rotation of the face. (read-only)
**Notes:** Rotation is measured counterclockwise in radians, with zero indicating that a line drawn between the eyes is horizontal relative to the image orientation.

Available in OS X v10.9 and later.
(Read only property)

### 58.8.6 hasFaceAngle as boolean

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether information about face rotation is available. (read-only)
**Notes:** Available in OS X v10.9 and later.
(Read only property)

### 58.8.7 hasLeftEyePosition as boolean

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** A Boolean that indicates whether the detector found the face's left eye. (read-only)
**Notes:** (Read only property)

### 58.8.8 hasMouthPosition as boolean

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** A Boolean that indicates whether the detector found the face's mouth. (read-only)
**Notes:** (Read only property)

### 58.8.9 hasRightEyePosition as boolean

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** A Boolean that indicates whether the detector found the face's right eye. (read-only)
**Notes:** (Read only property)

### 58.8.10 hasSmile as boolean

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether a smile is detected in the face. (read-only)
**Notes:** Available in OS X v10.9 and later.
For smiles to be detected, the key CIDetectorSmile must be present with a value of true in the dictionary passed to a detector's featuresInImage method.
(Read only property)

### 58.8.11 hasTrackingFrameCount as boolean

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Whether there is a tracking frame count.
**Notes:** (Read only property)

### 58.8.12 hasTrackingID as boolean

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Whether the tracking ID is set.
**Notes:** (Read only property)

### 58.8.13 leftEyeClosed as boolean

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the a closed left eye is detected in the face. (read-only)
**Notes:** "Left" is relative to the original (non-mirrored) image orientation, not to the owner of the eye.

For closed eyes to be detected, the key CIDetectorEyeBlink must be present with a value of true in the dictionary passed to a detector's featuresInImage method.
Available in OS X v10.9 and later.
(Read only property)

### 58.8.14 leftEyePosition as CGPointMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the left eye, in image coordinates. (read-only)
**Notes:** (Read only property)

### 58.8.15 mouthPosition as CGPointMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the mouth eye, in image coordinates (read-only)
**Notes:** (Read only property)

### 58.8.16 rightEyeClosed as boolean

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the a closed left eye is detected in the face. (read-only)
**Notes:** "Right" is relative to the original (non-mirrored) image orientation, not to the owner of the eye.

For closed eyes to be detected, the key CIDetectorEyeBlink must be present with a value of true in the dictionary passed to a detector's featuresInImage method.
Available in OS X v10.9 and later.
(Read only property)

### 58.8.17 rightEyePosition as CGPointMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the right eye, in image coordinates (read-only)
**Notes:** (Read only property)

### 58.8.18 trackingFrameCount as Integer

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The tracking frame count.
**Notes:** (Read only property)

### 58.8.19 trackingID as Integer

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The tracking ID.
**Notes:** (Read only property)

## 58.9 class CIFeatureMBS

### 58.9.1 class CIFeatureMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Generic feature found by a CIDetector.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr7

### 58.9.2 Methods

### 58.9.3 CIFeatureTypeFace as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** One of the keys that define specific kinds of findable features.
**Notes:** The discovered feature is a person,Äôs face.
Use the CIFaceFeatureMBS class to find more information about the detected feature.
Available in OS X v10.7 and later.

### 58.9.4 CIFeatureTypeQRCode as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the keys that define specific kinds of findable features.
**Notes:** The discovered feature is a Quick Response code (2D barcode).
Use the CIQRCodeFeature class to find more information about the detected feature.
Available in OS X v10.11 and later.

### 58.9.5 CIFeatureTypeRectangle as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the keys that define specific kinds of findable features.
**Notes:** The discovered feature is a rectangular object, though it might appear in perspective in the image.
Use the CIRectangleFeatureMBS class to find more information about the detected feature.
Available in OS X v10.10 and later.

### 58.9.6 CIFeatureTypeText as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the keys that define specific kinds of findable features.
**Notes:** The discovered feature is a region likely to contain upright text.
Use the CITextFeature class to find more information about the detected feature.
Available in OS X v10.11 and later.

### 58.9.7 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new CIFeature object from a handle value.

### 58.9.8 Properties

### 58.9.9 bounds as CGRectMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The bounds of the feature in the image it was detected in.
**Notes:** (Read only property)

### 58.9.10 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 58.9.11 type as string

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The type of the feature.
**Notes:** (Read only property)

## 58.10 class CIFilterAccordionFoldTransitionMBS

### 58.10.1 class CIFilterAccordionFoldTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Accordion Fold Transition filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAccordionFoldTransition |
| DisplayName English: | Accordion Fold Transition |
| DisplayName German: | Leporello-√úbergang |
| DisplayName French: | Transition de type accord√©on |
| DisplayName Italian: | Transizione foglio a fisarmonica |
| DisplayName Spanish: | Transici√n con pliegues a modo de acorde√n |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputBottomHeight: Bottom Height
- inputNumberOfFolds: Number of Folds
- inputFoldShadowAmount: Fold Shadow Amount
- inputTime: Time

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.10.2 Methods

### 58.10.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.10.4 Properties

### 58.10.5 AttributeinputBottomHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomHeight |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Bottom Height |
| DisplayName German: | Abstand unten |
| DisplayName French: | Hauteur du bas |
| DisplayName Italian: | Altezza inferiore |
| DisplayName Spanish: | Altura inferior |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.10.6 AttributeinputFoldShadowAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputFoldShadowAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Fold Shadow Amount |
| DisplayName German: | Faltschattenumfang |
| DisplayName French: | Degr√© d,Äôombre des plis |
| DisplayName Italian: | Quantit√† d,Äôombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado por doblado |
| DefaultNumber: | 0.1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.10.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.10.8 AttributeinputNumberOfFolds as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputNumberOfFolds |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Number of Folds |
| DisplayName German: | Anzahl der Falzungen: |
| DisplayName French: | Nombre de plis |
| DisplayName Italian: | Numero di campi |
| DisplayName Spanish: | N√mero de dobleces |
| DefaultNumber: | 3 |
| IdentityNumber: | 0 |
| MaxNumber: | 50 |
| MinNumber: | 1 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.10.9 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.10.10 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Accordion Fold Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.10.11 inputBottomHeight as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Height
**Notes:**

| | |
|---|---|
| Name: | inputBottomHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Bottom Height |
| DisplayName German: | Abstand unten |
| DisplayName French: | Hauteur du bas |
| DisplayName Italian: | Altezza inferiore |
| DisplayName Spanish: | Altura inferior |
| Type: | CIAttributeTypeDistance |

See AttributeinputBottomHeight for more details.
(Read and Write property)

### 58.10.12 inputFoldShadowAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Fold Shadow Amount
**Notes:**

| | |
|---|---|
| Name: | inputFoldShadowAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Fold Shadow Amount |
| DisplayName German: | Faltschattenumfang |
| DisplayName French: | Degr√© d,Äôombre des plis |
| DisplayName Italian: | Quantit√† d,Äôombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado por doblado |
| Type: | CIAttributeTypeScalar |

See AttributeinputFoldShadowAmount for more details.
(Read and Write property)

### 58.10.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.10.14 inputNumberOfFolds as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Number of Folds
**Notes:**

See AttributeinputNumberOfFolds for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputNumberOfFolds |
| Class: | double (NSNumber) |
| DisplayName English: | Number of Folds |
| DisplayName German: | Anzahl der Falzungen: |
| DisplayName French: | Nombre de plis |
| DisplayName Italian: | Numero di campi |
| DisplayName Spanish: | N√mero de dobleces |
| Type: | CIAttributeTypeScalar |

### 58.10.15 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.10.16 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

## 58.11 class CIFilterAdditionCompositingMBS

### 58.11.1 class CIFilterAdditionCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Addition filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAdditionCompositing |
| DisplayName English: | Addition |
| DisplayName German: | Addition |
| DisplayName French: | Addition |
| DisplayName Italian: | Aggiunta |
| DisplayName Spanish: | Adici√n |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.11.2 Methods

### 58.11.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.11.4 Properties

### 58.11.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Addition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.11.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Addition attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.11.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.11.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.12 class CIFilterAffineClampMBS

### 58.12.1 class CIFilterAffineClampMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Affine Clamp filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAffineClamp |
| DisplayName English: | Affine Clamp |
| DisplayName German: | Rand erweitern |
| DisplayName French: | Attache affine |
| DisplayName Italian: | Distanza affine |
| DisplayName Spanish: | Fijaci√n af√n |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTransform: Transform

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.12.2 Methods

### 58.12.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.12.4 Properties

### 58.12.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Clamp attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.12.6 AttributeinputTransform as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Clamp attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS |
| Type: | CIAttributeTypeTransform |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| DefaultAffineTransform: | [ 0.4, 0, 0, 0.4, 0, 0 ] |
| IdentityAffineTransform: | [ 1, 0, 0, 1, 0, 0 ] |

### 58.12.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.12.8 inputTransform as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Transform
**Notes:**

See AttributeinputTransform for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS (NSAffineTransform) |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| Type: | CIAttributeTypeTransform |

## 58.13 class CIFilterAffineTileMBS

### 58.13.1 class CIFilterAffineTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Affine Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAffineTile |
| DisplayName English: | Affine Tile |
| DisplayName German: | Affin kacheln |
| DisplayName French: | Mosa√Øque affine |
| DisplayName Italian: | Mosaico affine |
| DisplayName Spanish: | Mosaico af√n |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTransform: Transform

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.13.2 Methods

### 58.13.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.13.4 Properties

### 58.13.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.13.6 AttributeinputTransform as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS |
| Type: | CIAttributeTypeTransform |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| DefaultAffineTransform: | [ 0.4, 0, 0, 0.4, 0, 0 ] |
| IdentityAffineTransform: | [ 1, 0, 0, 1, 0, 0 ] |

### 58.13.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.13.8 inputTransform as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Transform
**Notes:**

See AttributeinputTransform for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS (NSAffineTransform) |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| Type: | CIAttributeTypeTransform |

## 58.14 class CIFilterAffineTransformMBS

### 58.14.1 class CIFilterAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Affine Transform filter.
**Example:**

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Real Studio picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

**Notes:** Details for this filter:

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video

| | |
|---|---|
| FilterName: | CIAffineTransform |
| DisplayName English: | Affine Transform |
| DisplayName German: | Affin transformieren |
| DisplayName French: | Transformation affine |
| DisplayName Italian: | Trasformazione affine |
| DisplayName Spanish: | Transformaci√n af√n |

- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTransform: Transform

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- Tip of the day: Rotate image with CoreImage

### 58.14.2 Methods

### 58.14.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.14.4 Properties

### 58.14.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.14.6 AttributeinputTransform as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Affine Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS |
| Type: | CIAttributeTypeTransform |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| DefaultAffineTransform: | [ 1, 0, 0, 1, 0, 0 ] |
| IdentityAffineTransform: | [ 1, 0, 0, 1, 0, 0 ] |

(Read only property)

### 58.14.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.14.8 inputTransform as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Transform
**Example:**

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation
```

```
// as Real Studio picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

**Notes:**

| | |
|---|---|
| Name: | inputTransform |
| Class: | NSAffineTransformMBS (NSAffineTransform) |
| DisplayName English: | Transform |
| DisplayName German: | Transformation |
| DisplayName French: | Transformer |
| DisplayName Italian: | Trasforma |
| DisplayName Spanish: | Transformaci√n |
| Type: | CIAttributeTypeTransform |

See AttributeinputTransform for more details.
(Read and Write property)

## 58.15 class CIFilterAreaAverageMBS

### 58.15.1 class CIFilterAreaAverageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Average filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaAverage |
| DisplayName English: | Area Average |
| DisplayName German: | Bereichsdurchschnitt |
| DisplayName French: | Moyenne de la zone |
| DisplayName Italian: | Media area |
| DisplayName Spanish: | Media del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage
- outputImageNonMPS:

Subclass of the CIFilterMBS class.

### 58.15.2 Methods

### 58.15.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.15.4 Properties

### 58.15.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Average attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.15.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Average attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.15.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.15.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.16 class CIFilterAreaHistogramMBS

### 58.16.1 class CIFilterAreaHistogramMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Histogram filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaHistogram |
| DisplayName English: | Area Histogram |
| DisplayName German: | Bereichs-Histogramm |
| DisplayName French: | Histogramme de la zone |
| DisplayName Italian: | Istogramma area |
| DisplayName Spanish: | Histograma del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent
- inputScale: Scale
- inputCount: Count

Output:

- outputImage
- outputData
- outputImageMPS
- outputImageNonMPS

Subclass of the CIFilterMBS class.

### 58.16.2 Methods

### 58.16.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.16.4 Properties

### 58.16.5 AttributeinputCount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| DefaultNumber: | 64 |
| IdentityNumber: | 0 |
| MaxNumber: | 2048 |
| MinNumber: | 1 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 10 |

(Read only property)

### 58.16.6 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.16.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.16.8 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.16.9 inputCount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Count
**Notes:**

| | |
|---|---|
| Name: | inputCount |
| Class: | double (NSNumber) |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| Type: | CIAttributeTypeScalar |

See AttributeinputCount for more details.
(Read and Write property)

### 58.16.10 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

See AttributeinputExtent for more details.

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

(Read and Write property)

### 58.16.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.16.12 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

See AttributeinputScale for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

## 58.17 class CIFilterAreaLogarithmicHistogramMBS

### 58.17.1 class CIFilterAreaLogarithmicHistogramMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Logarithmic Histogram filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaLogarithmicHistogram |
| DisplayName English: | Area Logarithmic Histogram |
| DisplayName German: | Logarithmisches Fl√§chenhistogramm |
| DisplayName French: | Histogramme logarithmique de la zone |
| DisplayName Italian: | Istogramma logaritmico area |
| DisplayName Spanish: | Histograma logar√tmico del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent
- inputScale: Scale
- inputCount: Count
- inputMinimumStop: Minimum Stop
- inputMaximumStop: Maximum Stop

Output:

- outputData

- outputImageMPS
- outputImageNonMPS
- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.17.2 Methods

### 58.17.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.17.4 Properties

### 58.17.5 AttributeinputCount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| DefaultNumber: | 64 |
| IdentityNumber: | 0 |
| MaxNumber: | 2048 |
| MinNumber: | 1 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 10 |

(Read only property)

### 58.17.6 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.17.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.17.8 AttributeinputMaximumStop as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaximumStop |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Maximum Stop |
| DisplayName German: | Obere Grenze |
| DisplayName French: | Valeur maximale |
| DisplayName Italian: | Valore massimo |
| DisplayName Spanish: | Parada m√°xima |
| DefaultNumber: | 4 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 8 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.17.9 AttributeinputMinimumStop as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.17.10 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Area Logarithmic Histogram attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMinimumStop |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Minimum Stop |
| DisplayName German: | Untere Grenze |
| DisplayName French: | Valeur minimale |
| DisplayName Italian: | Valore minimo |
| DisplayName Spanish: | Parada m√nima |
| DefaultNumber: | -10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | -4 |
| SliderMinNumber: | -12 |

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.17.11 inputCount as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Count
**Notes:**

See AttributeinputCount for more details.
(Read and Write property)

### 58.17.12 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputCount |
| Class: | double (NSNumber) |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| Type: | CIAttributeTypeScalar |

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.17.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.17.14 inputMaximumStop as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Maximum Stop
**Notes:**

| | |
|---|---|
| Name: | inputMaximumStop |
| Class: | double (NSNumber) |
| DisplayName English: | Maximum Stop |
| DisplayName German: | Obere Grenze |
| DisplayName French: | Valeur maximale |
| DisplayName Italian: | Valore massimo |
| DisplayName Spanish: | Parada m√°xima |
| Type: | CIAttributeTypeScalar |

See AttributeinputMaximumStop for more details.
(Read and Write property)

### 58.17.15 inputMinimumStop as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Minimum Stop
**Notes:**

| | |
|---|---|
| Name: | inputMinimumStop |
| Class: | double (NSNumber) |
| DisplayName English: | Minimum Stop |
| DisplayName German: | Untere Grenze |
| DisplayName French: | Valeur minimale |
| DisplayName Italian: | Valore minimo |
| DisplayName Spanish: | Parada m√nima |
| Type: | CIAttributeTypeScalar |

See AttributeinputMinimumStop for more details.
(Read and Write property)

### 58.17.16 inputScale as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

## 58.18 class CIFilterAreaMaximumAlphaMBS

### 58.18.1 class CIFilterAreaMaximumAlphaMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Maximum Alpha filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMaximumAlpha |
| DisplayName English: | Area Maximum Alpha |
| DisplayName German: | Bereichsmaximum im Alpha-Kanal |
| DisplayName French: | Alpha maximum de la zone |
| DisplayName Italian: | Alfa massimo area |
| DisplayName Spanish: | Alfa m√°ximo del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.18.2 Methods

### 58.18.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.18.4 Properties

### 58.18.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Maximum Alpha attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.18.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Maximum Alpha attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.18.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.18.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.19 class CIFilterAreaMaximumMBS

## 58.19.1 class CIFilterAreaMaximumMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Maximum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMaximum |
| DisplayName English: | Area Maximum |
| DisplayName German: | Bereichsmaximum |
| DisplayName French: | Maximum de la zone |
| DisplayName Italian: | Massimo area |
| DisplayName Spanish: | M√°ximo del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.19.2 Methods

### 58.19.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.19.4 Properties

### 58.19.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Maximum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.19.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Maximum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.19.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.19.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.20 class CIFilterAreaMinimumAlphaMBS

### 58.20.1 class CIFilterAreaMinimumAlphaMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Minimum Alpha filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMinimumAlpha |
| DisplayName English: | Area Minimum Alpha |
| DisplayName German: | Bereichsminimum im Alpha-Kanal |
| DisplayName French: | Alpha minimum de la zone |
| DisplayName Italian: | Alfa minimo area |
| DisplayName Spanish: | Alfa m√nimo del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.20.2 Methods

### 58.20.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.20.4 Properties

### 58.20.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Minimum Alpha attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.20.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Minimum Alpha attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.20.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.20.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.21 class CIFilterAreaMinimumMBS

### 58.21.1 class CIFilterAreaMinimumMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Minimum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMinimum |
| DisplayName English: | Area Minimum |
| DisplayName German: | Bereichsminimum |
| DisplayName French: | Minimum de la zone |
| DisplayName Italian: | Minimo area |
| DisplayName Spanish: | M√nimo del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.21.2 Methods

### 58.21.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.21.4 Properties

### 58.21.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Minimum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.21.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Minimum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.21.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.21.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.22 class CIFilterAreaMinMaxMBS

### 58.22.1 class CIFilterAreaMinMaxMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Min and Max filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMinMax |
| DisplayName English: | Area Min and Max |
| DisplayName German: | Fl√§che f√ºr min. und max. |
| DisplayName French: | Min. et max. de la zone |
| DisplayName Italian: | Min e max area |
| DisplayName Spanish: | M√nimo y m√°ximo del √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage
- outputImageNonMPS
- outputImageMPS:

Subclass of the CIFilterMBS class.

### 58.22.2 Methods

### 58.22.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.22.4 Properties

### 58.22.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Min and Max attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.22.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Min and Max attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.22.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.22.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.23 class CIFilterAreaMinMaxRedMBS

## 58.23.1 class CIFilterAreaMinMaxRedMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Area Min and Max Red filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAreaMinMaxRed |
| DisplayName English: | Area Min and Max Red |
| DisplayName German: | Fl√§che f√º r min. und max. Rot |
| DisplayName French: | Rouge min. et max. de la zone |
| DisplayName Italian: | Minimo e massimo di rosso nell,Äôarea |
| DisplayName Spanish: | M√nimo y m√°ximo de rojo en el √°rea |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.23.2 Methods

### 58.23.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.23.4 Properties

### 58.23.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Min and Max Red attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.23.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Area Min and Max Red attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.23.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.23.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.24 class CIFilterAttributedTextImageGeneratorMBS

### 58.24.1 class CIFilterAttributedTextImageGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Attributed Text Image Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAttributedTextImageGenerator |
| DisplayName English: | Attributed Text Image Generator |
| DisplayName German: | Attributtextbildgenerator |
| DisplayName French: | G√©n√©rateur d,Äôimage de texte attribu√© |
| DisplayName Italian: | Generatore immagine di testo attribuita |
| DisplayName Spanish: | Generador de im√°genes con texto con atributos |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputText: Text
- inputScaleFactor: Scale Factor
- inputPadding: Padding

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.24.2 Methods

### 58.24.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.24.4 Properties

### 58.24.5 AttributeinputPadding as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Attributed Text Image Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPadding |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName: | Padding |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 200 |
| MinNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.24.6 AttributeinputScaleFactor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Attributed Text Image Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 4 |
| SliderMinNumber: | 1 |

### 58.24.7 AttributeinputText as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Attributed Text Image Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputText |
| Class: | NSAttributedStringMBS |
| DisplayName: | Text |

(Read only property)

### 58.24.8 inputPadding as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Padding
**Notes:**

| | |
|---|---|
| Name: | inputPadding |
| Class: | double (NSNumber) |
| DisplayName English: | Padding |
| DisplayName German: | Padding |
| DisplayName French: | Padding |
| DisplayName Italian: | Padding |
| DisplayName Spanish: | Padding |
| Type: | CIAttributeTypeInteger |

See AttributeinputPadding for more details.
(Read and Write property)

### 58.24.9 inputScaleFactor as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale Factor
**Notes:**

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double (NSNumber) |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScaleFactor for more details.
(Read and Write property)

### 58.24.10 inputText as NSAttributedStringMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Text
**Notes:**

| | |
|---|---|
| Name: | inputText |
| Class: | NSAttributedStringMBS (NSAttributedString) |
| DisplayName English: | Text |
| DisplayName German: | Text |
| DisplayName French: | Text |
| DisplayName Italian: | Text |
| DisplayName Spanish: | Text |

See AttributeinputText for more details.
(Read and Write property)

## 58.25 class CIFilterAztecCodeGeneratorMBS

### 58.25.1 class CIFilterAztecCodeGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Aztec Code Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIAztecCodeGenerator |
| DisplayName English: | Aztec Code Generator |
| DisplayName German: | Aztec-Code-Generator |
| DisplayName French: | G√©n√©rateur de code Aztec |
| DisplayName Italian: | Generatore codice Aztec |
| DisplayName Spanish: | Generador de c√digo Aztec |

Categories:

- CICategoryGenerator: Generator
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputMessage: Message
- inputCorrectionLevel: Correction Level
- inputLayers: Layers
- inputCompactStyle: Compact Style

Output:

- outputImage
- outputCGImage

Subclass of the CIFilterMBS class.

### 58.25.2 Methods

### 58.25.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.25.4 Properties

### 58.25.5 AttributeinputCompactStyle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Aztec Code Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCompactStyle |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Compact Style |
| DisplayName German: | Komprimierungsstil |
| DisplayName French: | Style compact |
| DisplayName Italian: | Stile compatto |
| DisplayName Spanish: | Estilo compacto |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.25.6 AttributeinputCorrectionLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Aztec Code Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |
| DefaultNumber: | 23 |
| IdentityNumber: | 0 |
| MaxNumber: | 95 |
| MinNumber: | 5 |
| SliderMaxNumber: | 95 |
| SliderMinNumber: | 5 |

(Read only property)

### 58.25.7 AttributeinputLayers as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Aztec Code Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputLayers |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Layers |
| DisplayName German: | Ebenen |
| DisplayName French: | Couches |
| DisplayName Italian: | Livelli |
| DisplayName Spanish: | Capas |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 32 |
| MinNumber: | 1 |
| SliderMaxNumber: | 32 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.25.8 AttributeinputMessage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Aztec Code Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.25.9 inputCompactStyle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Compact Style
**Notes:**

| | |
|---|---|
| Name: | inputCompactStyle |
| Class: | double (NSNumber) |
| DisplayName English: | Compact Style |
| DisplayName German: | Komprimierungsstil |
| DisplayName French: | Style compact |
| DisplayName Italian: | Stile compatto |
| DisplayName Spanish: | Estilo compacto |
| Type: | CIAttributeTypeBoolean |

See AttributeinputCompactStyle for more details.
(Read and Write property)

### 58.25.10 inputCorrectionLevel as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Correction Level
**Notes:**

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | double (NSNumber) |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |
| Type: | CIAttributeTypeInteger |

See AttributeinputCorrectionLevel for more details.
(Read and Write property)

### 58.25.11 inputLayers as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Layers
**Notes:**

| | |
|---|---|
| Name: | inputLayers |
| Class: | double (NSNumber) |
| DisplayName English: | Layers |
| DisplayName German: | Ebenen |
| DisplayName French: | Couches |
| DisplayName Italian: | Livelli |
| DisplayName Spanish: | Capas |
| Type: | CIAttributeTypeInteger |

See AttributeinputLayers for more details.
(Read and Write property)

### 58.25.12 inputMessage as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Message
**Notes:**

See AttributeinputMessage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |

## 58.26 class CIFilterBarcodeGeneratorMBS

### 58.26.1 class CIFilterBarcodeGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Barcode Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBarcodeGenerator |
| DisplayName English: | Barcode Generator |
| DisplayName German: | Barcode-Generator |
| DisplayName French: | G√©n√©rateur de code-barres |
| DisplayName Italian: | Generatore codice a barre |
| DisplayName Spanish: | Generador de c√digos de barras |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputBarcodeDescriptor: Barcode Descriptor

Output:

- outputCGImageForQRCodeDescriptor
- outputCGImageForAztecCodeDescriptor
- outputCGImageForPDF417CodeDescriptor
- outputCGImageForDataMatrixCodeDescriptor
- outputCGImage
- outputImage

Subclass of the CIFilterMBS class.
**Videos**

- Presentation from Munich conference about MBS Plugins.

### 58.26.2 Methods

### 58.26.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.26.4 Properties

### 58.26.5 AttributeinputBarcodeDescriptor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBarcodeDescriptor |
| Class: | CIBarcodeDescriptorMBS |
| DisplayName English: | Barcode Descriptor |
| DisplayName German: | Barcodebeschreibung |
| DisplayName French: | Descripteur du code-barres |
| DisplayName Italian: | Descrittore codice a barre |
| DisplayName Spanish: | Descriptor de c√digo de barras |

(Read only property)

### 58.26.6 inputBarcodeDescriptor as CIBarcodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Barcode Descriptor
**Notes:**

See AttributeinputBarcodeDescriptor for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBarcodeDescriptor |
| Class: | CIBarcodeDescriptorMBS (CIBarcodeDescriptor) |
| DisplayName English: | Barcode Descriptor |
| DisplayName German: | Barcodebeschreibung |
| DisplayName French: | Descripteur du code-barres |
| DisplayName Italian: | Descrittore codice a barre |
| DisplayName Spanish: | Descriptor de c√digo de barras |

## 58.27 class CIFilterBarsSwipeTransitionMBS

### 58.27.1 class CIFilterBarsSwipeTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bars Swipe Transition filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBarsSwipeTransition |
| DisplayName English: | Bars Swipe Transition |
| DisplayName German: | Balken-Swipe-√übergang |
| DisplayName French: | Transition de type balayage |
| DisplayName Italian: | Transizione colpi a barre |
| DisplayName Spanish: | Transici√n de barrido de barras |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputAngle: Angle
- inputWidth: Width
- inputBarOffset: Bar Offset
- inputTime: Time

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.27.2 Methods

### 58.27.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.27.4 Properties

### 58.27.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 3.141593 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.27.6 AttributeinputBarOffset as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBarOffset |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Bar Offset |
| DisplayName German: | Balkenversatz |
| DisplayName French: | D√©calage de la barre |
| DisplayName Italian: | Scarto della barra |
| DisplayName Spanish: | Desviaci√n barra |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

### 58.27.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.27.8 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.27.9 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.27.10 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bars Swipe Transition attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 30 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 2 |
| SliderMaxNumber: | 300 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.27.11 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.27.12 inputBarOffset as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bar Offset
**Notes:**

| | |
|---|---|
| Name: | inputBarOffset |
| Class: | double (NSNumber) |
| DisplayName English: | Bar Offset |
| DisplayName German: | Balkenversatz |
| DisplayName French: | D√©calage de la barre |
| DisplayName Italian: | Scarto della barra |
| DisplayName Spanish: | Desviaci√n barra |
| Type: | CIAttributeTypeScalar |

See AttributeinputBarOffset for more details.
(Read and Write property)

### 58.27.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.27.14 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

See AttributeinputTargetImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

### 58.27.15 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

### 58.27.16 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.28 class CIFilterBicubicScaleTransformMBS

### 58.28.1 class CIFilterBicubicScaleTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bicubic Scale Transform filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBicubicScaleTransform |
| DisplayName English: | Bicubic Scale Transform |
| DisplayName German: | Bikubische Skalierungstransformation |
| DisplayName French: | Transformation d,Äô√©chelle bicubique |
| DisplayName Italian: | Trasforma scala bicubica |
| DisplayName Spanish: | Transformar mediante escala bic√bica |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputScale: Scale
- inputAspectRatio: Aspect Ratio
- inputB: B
- inputC: C

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.28.2 Methods

### 58.28.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.28.4 Properties

### 58.28.5 AttributeinputAspectRatio as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bicubic Scale Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAspectRatio |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Aspect Ratio |
| DisplayName German: | Seitenverh√§ltnis |
| DisplayName French: | Proportions |
| DisplayName Italian: | Proporzioni |
| DisplayName Spanish: | Proporciones |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0.5 |

(Read only property)

### 58.28.6 AttributeinputB as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bicubic Scale Transform attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputB |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | B |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.28.7 AttributeinputC as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bicubic Scale Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputC |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | C |
| DefaultNumber: | 0.75 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.28.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bicubic Scale Transform attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.28.9 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bicubic Scale Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0.05 |

(Read only property)

### 58.28.10 inputAspectRatio as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Aspect Ratio
**Notes:**

See AttributeinputAspectRatio for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAspectRatio |
| Class: | double (NSNumber) |
| DisplayName English: | Aspect Ratio |
| DisplayName German: | Seitenverh√§ltnis |
| DisplayName French: | Proportions |
| DisplayName Italian: | Proporzioni |
| DisplayName Spanish: | Proporciones |
| Type: | CIAttributeTypeScalar |

### 58.28.11 inputB as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute B
**Notes:**

| | |
|---|---|
| Name: | inputB |
| Class: | double (NSNumber) |
| DisplayName English: | B |
| DisplayName German: | B |
| DisplayName French: | B |
| DisplayName Italian: | B |
| DisplayName Spanish: | B |
| Type: | CIAttributeTypeScalar |

See AttributeinputB for more details.
(Read and Write property)

### 58.28.12 inputC as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute C
**Notes:**

| | |
|---|---|
| Name: | inputC |
| Class: | double (NSNumber) |
| DisplayName English: | C |
| DisplayName German: | C |
| DisplayName French: | C |
| DisplayName Italian: | C |
| DisplayName Spanish: | C |
| Type: | CIAttributeTypeScalar |

See AttributeinputC for more details.
(Read and Write property)

### 58.28.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.28.14 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

## 58.29 class CIFilterBlendWithAlphaMaskMBS

### 58.29.1 class CIFilterBlendWithAlphaMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Blend With Alpha Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBlendWithAlphaMask |
| DisplayName English: | Blend With Alpha Mask |
| DisplayName German: | Mit Alpha-Maske √ºberblenden |
| DisplayName French: | Fusion avec masque Alpha |
| DisplayName Italian: | Sfumatura con maschera alfa |
| DisplayName Spanish: | Fusionar con la m√°scara alfa |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image
- inputMaskImage: Mask Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.29.2 Methods

### 58.29.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.29.4 Properties

### 58.29.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Alpha Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.29.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Alpha Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.29.7 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Alpha Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.29.8 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

See AttributeinputBackgroundImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

### 58.29.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.29.10 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

# 58.30 class CIFilterBlendWithBlueMaskMBS

## 58.30.1 class CIFilterBlendWithBlueMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Blend With Blue Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBlendWithBlueMask |
| DisplayName English: | Blend With Blue Mask |
| DisplayName German: | Mit blauer Maske |
| DisplayName French: | Fusion avec masque de bleu |
| DisplayName Italian: | Sfumatura con maschera blu |
| DisplayName Spanish: | Fusionar con la m√°scara azul |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image
- inputMaskImage: Mask Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.30.2 Methods

### 58.30.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.30.4 Properties

### 58.30.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Blue Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.30.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Blue Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.30.7 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Blue Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.30.8 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

See AttributeinputBackgroundImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

### 58.30.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.30.10 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

## 58.31 class CIFilterBlendWithMaskMBS

### 58.31.1 class CIFilterBlendWithMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Blend With Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBlendWithMask |
| DisplayName English: | Blend With Mask |
| DisplayName German: | Mit Bild maskieren |
| DisplayName French: | Fusion avec masque |
| DisplayName Italian: | Sfumatura con maschera |
| DisplayName Spanish: | Fusionar con la m√°scara |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image
- inputMaskImage: Mask Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.31.2 Methods

### 58.31.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.31.4 Properties

### 58.31.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.31.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.31.7 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.31.8 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

See AttributeinputBackgroundImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

### 58.31.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.31.10 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

## 58.32 class CIFilterBlendWithRedMaskMBS

### 58.32.1 class CIFilterBlendWithRedMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Blend With Red Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBlendWithRedMask |
| DisplayName English: | Blend With Red Mask |
| DisplayName German: | Mit roter Maske |
| DisplayName French: | Fusion avec masque de rouge |
| DisplayName Italian: | Sfumatura con maschera rossa |
| DisplayName Spanish: | Fusionar con la m√°scara roja |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image
- inputMaskImage: Mask Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.32.2 Methods

### 58.32.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.32.4 Properties

### 58.32.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Red Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.32.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Red Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.32.7 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Blend With Red Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.32.8 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

See AttributeinputBackgroundImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

### 58.32.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.32.10 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

## 58.33 class CIFilterBloomMBS

### 58.33.1 class CIFilterBloomMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bloom filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBloom |
| DisplayName English: | Bloom |
| DisplayName German: | √überstrahlen |
| DisplayName French: | Floraison |
| DisplayName Italian: | Velatura |
| DisplayName Spanish: | Veladura |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.33.2 Methods

### 58.33.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.33.4 Properties

### 58.33.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bloom attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.33.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bloom attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.33.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bloom attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.33.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.33.9 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

### 58.33.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

# 58.34 class CIFilterBokehBlurMBS

## 58.34.1 class CIFilterBokehBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bokeh Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBokehBlur |
| DisplayName English: | Bokeh Blur |
| DisplayName German: | Bokeh unscharf |
| DisplayName French: | Bokeh (flou) |
| DisplayName Italian: | Sfocatura bokeh |
| DisplayName Spanish: | Desenfoque bokeh |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius
- inputRingAmount: Ring Amount
- inputRingSize: Ring Size
- inputSoftness: Softness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.34.2 Methods

### 58.34.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.34.4 Properties

### 58.34.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bokeh Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.34.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bokeh Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 20 |
| IdentityNumber: | 0 |
| MaxNumber: | 500 |
| MinNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

### 58.34.7 AttributeinputRingAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bokeh Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRingAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Ring Amount |
| DisplayName German: | Ringst√§rke |
| DisplayName French: | Intensit√© de l,Äôanneau |
| DisplayName Italian: | Intensit√† anello |
| DisplayName Spanish: | N√mero de anillos |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.34.8 AttributeinputRingSize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bokeh Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRingSize |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Ring Size |
| DisplayName German: | Ringgr√√üe |
| DisplayName French: | Taille de l,Äôanneau |
| DisplayName Italian: | Dimensioni anello |
| DisplayName Spanish: | Tama√±o del anillo |
| DefaultNumber: | 0.1 |
| IdentityNumber: | 0 |
| MaxNumber: | 0.2 |
| MinNumber: | 0 |
| SliderMaxNumber: | 0.2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.34.9 AttributeinputSoftness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bokeh Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSoftness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Softness |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 10 |
| MinNumber: | 0 |
| SliderMaxNumber: | 0.4 |
| SliderMinNumber: | 0.25 |

(Read only property)

### 58.34.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.34.11 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.34.12 inputRingAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Ring Amount
**Notes:**

| | |
|---|---|
| Name: | inputRingAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Ring Amount |
| DisplayName German: | Ringst√§rke |
| DisplayName French: | Intensit√© de l,Äôanneau |
| DisplayName Italian: | Intensit√† anello |
| DisplayName Spanish: | N√mero de anillos |
| Type: | CIAttributeTypeScalar |

See AttributeinputRingAmount for more details.
(Read and Write property)

### 58.34.13 inputRingSize as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Ring Size
**Notes:**

| | |
|---|---|
| Name: | inputRingSize |
| Class: | double (NSNumber) |
| DisplayName English: | Ring Size |
| DisplayName German: | Ringgr√√üe |
| DisplayName French: | Taille de l,Äôanneau |
| DisplayName Italian: | Dimensioni anello |
| DisplayName Spanish: | Tama√±o del anillo |
| Type: | CIAttributeTypeScalar |

See AttributeinputRingSize for more details.
(Read and Write property)

### 58.34.14 inputSoftness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Softness
**Notes:**

See AttributeinputSoftness for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputSoftness |
| Class: | double (NSNumber) |
| DisplayName English: | Softness |
| DisplayName German: | Softness |
| DisplayName French: | Softness |
| DisplayName Italian: | Softness |
| DisplayName Spanish: | Softness |
| Type: | CIAttributeTypeScalar |

## 58.35 class CIFilterBoxBlurMBS

### 58.35.1 class CIFilterBoxBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Box Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBoxBlur |
| DisplayName English: | Box Blur |
| DisplayName German: | Quadratische Unsch√§rfe |
| DisplayName French: | Flou (Box blur) |
| DisplayName Italian: | Sfocatura riquadro |
| DisplayName Spanish: | Caja difuminada |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.35.2 Methods

### 58.35.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.35.4 Properties

### 58.35.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Box Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.35.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Box Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

### 58.35.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.35.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.36 class CIFilterBumpDistortionLinearMBS

### 58.36.1 class CIFilterBumpDistortionLinearMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bump Distortion Linear filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBumpDistortionLinear |
| DisplayName English: | Bump Distortion Linear |
| DisplayName German: | Verzerrung ,ÄûBump,Äú (Linear) |
| DisplayName French: | D√©formation Bosse lin√©aire |
| DisplayName Italian: | Lineare distorsione urto |
| DisplayName Spanish: | Distorsi√n linear suplementaria |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputAngle: Angle
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.36.2 Methods

### 58.36.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.36.4 Properties

### 58.36.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion Linear attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.36.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion Linear attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.36.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion Linear attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.36.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion Linear attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 600 |
| SliderMinNumber: | 0 |

### 58.36.9 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion Linear attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.36.10 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.36.11 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.36.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.36.13 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.36.14 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

# 58.37 class CIFilterBumpDistortionMBS

## 58.37.1 class CIFilterBumpDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Bump Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIBumpDistortion |
| DisplayName English: | Bump Distortion |
| DisplayName German: | Verzerrung ,ÄûBump,Äú |
| DisplayName French: | D√©formation Bosse |
| DisplayName Italian: | Distorsione urto |
| DisplayName Spanish: | Distorsi√n suplementaria |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.37.2 Methods

### 58.37.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.37.4 Properties

### 58.37.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.37.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.37.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 600 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.37.8 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Bump Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

### 58.37.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.37.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.37.11 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.37.12 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

# 58.38 class CIFilterCameraCalibrationLensCorrectionMBS

## 58.38.1 class CIFilterCameraCalibrationLensCorrectionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Lens Correction for AVC filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICameraCalibrationLensCorrection |
| DisplayName English: | Lens Correction for AVC |
| DisplayName German: | Objektivkorrektur: AVC |
| DisplayName French: | Correction d,Äôobjectif pour AVC |
| DisplayName Italian: | Correzione lente AVC |
| DisplayName Spanish: | Correcci√n de lente para AVC |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputAVCameraCalibrationData: AVCameraCalibrationData
- inputUseInverseLookUpTable: Use Inverse Lookup Table

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.38.2 Methods

### 58.38.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.38.4 Properties

### 58.38.5 AttributeinputAVCameraCalibrationData as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lens Correction for AVC attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAVCameraCalibrationData |
| Class: | Variant |
| DisplayName: | AVCameraCalibrationData |

(Read only property)

### 58.38.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lens Correction for AVC attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.38.7 AttributeinputUseInverseLookUpTable as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lens Correction for AVC attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

| | |
|---|---|
| Name: | inputUseInverseLookUpTable |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Use Inverse Lookup Table |
| DisplayName German: | Invertierte Lookup-Tabelle verwenden |
| DisplayName French: | Utiliser la table de conversion invers√©e |
| DisplayName Italian: | Utilizza la tabella di ricerca inversa |
| DisplayName Spanish: | Usar tabla de consulta inversa |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.38.8 inputAVCameraCalibrationData as Variant

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute AVCameraCalibrationData
**Notes:**

| | |
|---|---|
| Name: | inputAVCameraCalibrationData |
| Class: | Variant (AVCameraCalibrationData) |
| DisplayName English: | AVCameraCalibrationData |
| DisplayName German: | AVCameraCalibrationData |
| DisplayName French: | AVCameraCalibrationData |
| DisplayName Italian: | AVCameraCalibrationData |
| DisplayName Spanish: | AVCameraCalibrationData |

See AttributeinputAVCameraCalibrationData for more details.
(Read and Write property)

### 58.38.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.38.10 inputUseInverseLookUpTable as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Use Inverse Lookup Table
**Notes:**

| | |
|---|---|
| Name: | inputUseInverseLookUpTable |
| Class: | double (NSNumber) |
| DisplayName English: | Use Inverse Lookup Table |
| DisplayName German: | Invertierte Lookup-Tabelle verwenden |
| DisplayName French: | Utiliser la table de conversion invers√©e |
| DisplayName Italian: | Utilizza la tabella di ricerca inversa |
| DisplayName Spanish: | Usar tabla de consulta inversa |
| Type: | CIAttributeTypeBoolean |

See AttributeinputUseInverseLookUpTable for more details.
(Read and Write property)

# 58.39 class CIFilterCheckerboardGeneratorMBS

## 58.39.1 class CIFilterCheckerboardGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Checkerboard filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICheckerboardGenerator |
| DisplayName English: | Checkerboard |
| DisplayName German: | Schachbrettmuster |
| DisplayName French: | Damier |
| DisplayName Italian: | Scacchiera |
| DisplayName Spanish: | Tablero |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor0: Color 1
- inputColor1: Color 2
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.39.2 Methods

### 58.39.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.39.4 Properties

### 58.39.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Checkerboard attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.39.6 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Checkerboard attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.39.7 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Checkerboard attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.39.8 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Checkerboard attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.39.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Checkerboard attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 80 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.39.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.39.11 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor0 for more details.
(Read and Write property)

### 58.39.12 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

See AttributeinputColor1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

### 58.39.13 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.39.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.40 class CIFilterCircleSplashDistortionMBS

### 58.40.1 class CIFilterCircleSplashDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Circle Splash Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICircleSplashDistortion |
| DisplayName English: | Circle Splash Distortion |
| DisplayName German: | Verzerrung ,ÄûKreisf√rmiger Platscher,Äú |
| DisplayName French: | D√©formation √âclaboussure circulaire |
| DisplayName Italian: | Distorsione spruzzo circolare |
| DisplayName Spanish: | Distorsi√n a modo de salpicadura en c√rculo |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.40.2 Methods

### 58.40.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.40.4 Properties

### 58.40.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circle Splash Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.40.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circle Splash Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.40.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circle Splash Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 150 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.40.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.40.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.40.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.41 class CIFilterCircularScreenMBS

## 58.41.1 class CIFilterCircularScreenMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Circular Screen filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICircularScreen |
| DisplayName English: | Circular Screen |
| DisplayName German: | Konzentrisches Halbtonraster |
| DisplayName French: | √âcran circulaire |
| DisplayName Italian: | Schermo circolare |
| DisplayName Spanish: | Pantalla circular |

Categories:

- CICategoryHalftoneEffect: Halftone Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.41.2 Methods

### 58.41.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.41.4 Properties

### 58.41.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.41.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.41.7 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.41.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.41.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.41.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.41.11 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.41.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

## 58.42 class CIFilterCircularWrapMBS

### 58.42.1 class CIFilterCircularWrapMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Circular Wrap Distortion filter.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim data as string = PictureToPNGStringMBS(p,80)
dim i as new CIImageMBS(data)

dim c as new CIFilterCircularWrapMBS
c.inputImage = i

dim o as CIImageMBS = c.outputImage
Backdrop = o.RenderPicture
```

**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICircularWrap |
| DisplayName English: | Circular Wrap Distortion |
| DisplayName German: | Kreisf√rmig kr√ºmmen |
| DisplayName French: | D√©formation Bouclage circulaire |
| DisplayName Italian: | Distorsione involucro circolare |
| DisplayName Spanish: | Distorsi√n a modo de envoltura circular |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image

- inputCenter: Center
- inputRadius: Radius
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.42.2 Methods

### 58.42.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.42.4 Properties

### 58.42.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Wrap Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.42.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Wrap Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.42.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Wrap Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.42.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Circular Wrap Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 150 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 600 |
| SliderMinNumber: | 0 |

### 58.42.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Example:**

```
dim p as Picture = LogoMBS(500)
dim data as string = PictureToPNGStringMBS(p,80)
dim i as new CIImageMBS(data)

dim c as new CIFilterCircularWrapMBS
c.inputImage = i
c.inputAngle = 0.1

dim o as CIImageMBS = c.outputImage
Backdrop = o.RenderPicture
```

**Notes:**

See AttributeinputAngle for more details.

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

(Read and Write property)

### 58.42.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.42.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Example:**

```
dim p as Picture = LogoMBS(500)
dim data as string = PictureToPNGStringMBS(p,80)
dim i as new CIImageMBS(data)

dim c as new CIFilterCircularWrapMBS
```

```
c.inputImage = i

dim o as CIImageMBS = c.outputImage
Backdrop = o.RenderPicture
```

**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.42.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.43 class CIFilterClampMBS

## 58.43.1 class CIFilterClampMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Clamp filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIClamp |
| DisplayName English: | Clamp |
| DisplayName German: | Arretieren |
| DisplayName French: | Attacher |
| DisplayName Italian: | Morsetto |
| DisplayName Spanish: | Fijar |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.43.2 Methods

### 58.43.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.43.4 Properties

### 58.43.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Clamp attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.43.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Clamp attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.43.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.43.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.44 class CIFilterCMYKHalftoneMBS

### 58.44.1 class CIFilterCMYKHalftoneMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage CMYK Halftone filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICMYKHalftone |
| DisplayName English: | CMYK Halftone |
| DisplayName German: | CMYK-Halbton |
| DisplayName French: | Demi-teinte CMJN |
| DisplayName Italian: | Mezzitoni CMYK |
| DisplayName Spanish: | Semitono CMYK |

Categories:

- CICategoryHalftoneEffect: Halftone Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputWidth: Width
- inputAngle: Angle
- inputSharpness: Sharpness
- inputGCR: Gray Component Replacement
- inputUCR: Under Color Removal

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.44.2 Methods

### 58.44.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.44.4 Properties

### 58.44.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.44.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.44.7 AttributeinputGCR as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGCR |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Gray Component Replacement |
| DisplayName German: | Graukomponente ersetzen |
| DisplayName French: | Remplacement de la composante grise |
| DisplayName Italian: | Sostituzione componente grigio |
| DisplayName Spanish: | Sustituci√n de componente gris |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.44.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.44.9 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.44.10 AttributeinputUCR as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputUCR |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Under Color Removal |
| DisplayName German: | Unterfarben-Korrektur |
| DisplayName French: | √âlimination des sous-couleurs |
| DisplayName Italian: | Rimozione colore inferiore |
| DisplayName Spanish: | Bajo supresi√n de color |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0.5 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.44.11 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the CMYK Halftone attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 6 |
| IdentityNumber: | 6 |
| MaxNumber: | 0 |
| MinNumber: | -2 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.44.12 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.44.13 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.44.14 inputGCR as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Gray Component Replacement
**Notes:**

See AttributeinputGCR for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputGCR |
| Class: | double (NSNumber) |
| DisplayName English: | Gray Component Replacement |
| DisplayName German: | Graukomponente ersetzen |
| DisplayName French: | Remplacement de la composante grise |
| DisplayName Italian: | Sostituzione componente grigio |
| DisplayName Spanish: | Sustituci√n de componente gris |
| Type: | CIAttributeTypeScalar |

### 58.44.15 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.44.16 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeDistance |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.44.17 inputUCR as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Under Color Removal
**Notes:**

| | |
|---|---|
| Name: | inputUCR |
| Class: | double (NSNumber) |
| DisplayName English: | Under Color Removal |
| DisplayName German: | Unterfarben-Korrektur |
| DisplayName French: | √âlimination des sous-couleurs |
| DisplayName Italian: | Rimozione colore inferiore |
| DisplayName Spanish: | Bajo supresi√n de color |
| Type: | CIAttributeTypeScalar |

See AttributeinputUCR for more details.
(Read and Write property)

### 58.44.18 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.45 class CIFilterCode128BarcodeGeneratorMBS

## 58.45.1 class CIFilterCode128BarcodeGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Code 128 Barcode Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICode128BarcodeGenerator |
| DisplayName English: | Code 128 Barcode Generator |
| DisplayName German: | Code 128 Barcode-Generator |
| DisplayName French: | G√©n√©rateur de code-barres Code¬†128 |
| DisplayName Italian: | Generatore codice a barre Code128 |
| DisplayName Spanish: | Generador de c√digos de barras Code128 |

Categories:

- CICategoryGenerator: Generator
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputMessage: Message
- inputQuietSpace: Quiet Space
- inputBarcodeHeight: Barcode Height

Output:

- outputImage
- outputCGImage

Subclass of the CIFilterMBS class.
**Videos**

- Presentation from Munich conference about MBS Plugins.

### 58.45.2 Methods

### 58.45.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.45.4 Properties

### 58.45.5 AttributeinputBarcodeHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Code 128 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBarcodeHeight |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Barcode Height |
| DisplayName German: | Barcodeh√he |
| DisplayName French: | Hauteur du code-barres |
| DisplayName Italian: | Altezza codice a barre |
| DisplayName Spanish: | Altura del c√digo de barras |
| DefaultNumber: | 32 |
| IdentityNumber: | 0 |
| MaxNumber: | 500 |
| MinNumber: | 1 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.45.6 AttributeinputMessage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Code 128 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.45.7 AttributeinputQuietSpace as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Code 128 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputQuietSpace |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Quiet Space |
| DisplayName German: | Ruheraum |
| DisplayName French: | Marge |
| DisplayName Italian: | Area non interattiva |
| DisplayName Spanish: | Espacio sin modificaciones |
| DefaultNumber: | 7 |
| IdentityNumber: | 0 |
| MaxNumber: | 100 |
| MinNumber: | 0 |
| SliderMaxNumber: | 20 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.45.8 inputBarcodeHeight as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Barcode Height

**Notes:**

| | |
|---|---|
| Name: | inputBarcodeHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Barcode Height |
| DisplayName German: | Barcodeh√he |
| DisplayName French: | Hauteur du code-barres |
| DisplayName Italian: | Altezza codice a barre |
| DisplayName Spanish: | Altura del c√digo de barras |
| Type: | CIAttributeTypeInteger |

See AttributeinputBarcodeHeight for more details.
(Read and Write property)

### 58.45.9 inputMessage as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Message
**Notes:**

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |

See AttributeinputMessage for more details.
(Read and Write property)

### 58.45.10 inputQuietSpace as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Quiet Space
**Notes:**

See AttributeinputQuietSpace for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputQuietSpace |
| Class: | double (NSNumber) |
| DisplayName English: | Quiet Space |
| DisplayName German: | Ruheraum |
| DisplayName French: | Marge |
| DisplayName Italian: | Area non interattiva |
| DisplayName Spanish: | Espacio sin modificaciones |
| Type: | CIAttributeTypeInteger |

## 58.46 class CIFilterColorAbsoluteDifferenceMBS

### 58.46.1 class CIFilterColorAbsoluteDifferenceMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Absolute Difference filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorAbsoluteDifference |
| DisplayName English: | Color Absolute Difference |
| DisplayName German: | Absolute Farbdifferenz |
| DisplayName French: | Diff√©rence absolue des couleurs |
| DisplayName Italian: | Differenza assoluta colore |
| DisplayName Spanish: | Diferencia absoluta de color |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputImage2: Image2

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.46.2 Methods

### 58.46.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.46.4 Properties

### 58.46.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Absolute Difference attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.46.6 AttributeinputImage2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Absolute Difference attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage2 |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName: | Image2 |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.46.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.46.8 inputImage2 as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image2
**Notes:**

| | |
|---|---|
| Name: | inputImage2 |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image2 |
| DisplayName German: | Image2 |
| DisplayName French: | Image2 |
| DisplayName Italian: | Image2 |
| DisplayName Spanish: | Image2 |
| Type: | CIAttributeTypeImage |

See AttributeinputImage2 for more details.

(Read and Write property)

## 58.47 class CIFilterColorBlendModeMBS

### 58.47.1 class CIFilterColorBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorBlendMode |
| DisplayName English: | Color Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûFarbe‚Äú |
| DisplayName French: | Mode de fusion des couleurs |
| DisplayName Italian: | Modalit√† sfumatura colore |
| DisplayName Spanish: | Modo de mezcla de color |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.47.2 Methods

### 58.47.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.47.4 Properties

### 58.47.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.47.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.47.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.47.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.48 class CIFilterColorBurnBlendModeMBS

### 58.48.1 class CIFilterColorBurnBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Burn Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorBurnBlendMode |
| DisplayName English: | Color Burn Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûFarbig nachbelichten‚Äú |
| DisplayName French: | Mode de fusion Densit√© couleur |
| DisplayName Italian: | Modalit√† sfumatura colore bruciato |
| DisplayName Spanish: | Modo de mezcla por sobreexposici√n de color |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.48.2 Methods

### 58.48.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.48.4 Properties

### 58.48.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Burn Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.48.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Burn Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.48.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.48.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.49 class CIFilterColorClampMBS

### 58.49.1 class CIFilterColorClampMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Clamp filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorClamp |
| DisplayName English: | Color Clamp |
| DisplayName German: | Color Clamp |
| DisplayName French: | Limitation de la couleur |
| DisplayName Italian: | Fissaggio colore |
| DisplayName Spanish: | Fijaci√n del color |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputMinComponents: Min Components
- inputMaxComponents: Max Components

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.49.2 Methods

### 58.49.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.49.4 Properties

### 58.49.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Clamp attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.49.6 AttributeinputMaxComponents as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Clamp attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputMaxComponents |
| Class: | CIVectorMBS |
| DisplayName English: | Max Components |
| DisplayName German: | Max. Komponenten |
| DisplayName French: | Composantes max. |
| DisplayName Italian: | Componenti Max |
| DisplayName Spanish: | M√°x. de componentes |
| DefaultVector: | [ 1 1 1 1 ] |
| IdentityVector: | n/a |

### 58.49.7 AttributeinputMinComponents as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Clamp attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMinComponents |
| Class: | CIVectorMBS |
| DisplayName English: | Min Components |
| DisplayName German: | Min. Komponenten |
| DisplayName French: | Composantes min. |
| DisplayName Italian: | Componenti Min |
| DisplayName Spanish: | M√n. de componentes |
| DefaultVector: | [ 0 0 0 0 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.49.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.49.9 inputMaxComponents as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Max Components
**Notes:**

| | |
|---|---|
| Name: | inputMaxComponents |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Max Components |
| DisplayName German: | Max. Komponenten |
| DisplayName French: | Composantes max. |
| DisplayName Italian: | Componenti Max |
| DisplayName Spanish: | M√°x. de componentes |

See AttributeinputMaxComponents for more details.
(Read and Write property)

### 58.49.10 inputMinComponents as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Min Components
**Notes:**

| | |
|---|---|
| Name: | inputMinComponents |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Min Components |
| DisplayName German: | Min. Komponenten |
| DisplayName French: | Composantes min. |
| DisplayName Italian: | Componenti Min |
| DisplayName Spanish: | M√n. de componentes |

See AttributeinputMinComponents for more details.

(Read and Write property)

# 58.50 class CIFilterColorControlsMBS

## 58.50.1 class CIFilterColorControlsMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Controls filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorControls |
| DisplayName English: | Color Controls |
| DisplayName German: | Farbsteuerung |
| DisplayName French: | Contr√¥le des couleurs |
| DisplayName Italian: | Controlli colore |
| DisplayName Spanish: | Controles de color |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputSaturation: Saturation
- inputBrightness: Brightness
- inputContrast: Contrast

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.50.2 Methods

### 58.50.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.50.4 Properties

### 58.50.5 AttributeinputBrightness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Controls attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBrightness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Brightness |
| DisplayName German: | Helligkeit |
| DisplayName French: | Luminosit√© |
| DisplayName Italian: | Luminosit√† |
| DisplayName Spanish: | Brillo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

(Read only property)

### 58.50.6 AttributeinputContrast as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Controls attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputContrast |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Contrast |
| DisplayName German: | Kontrast |
| DisplayName French: | Contraste |
| DisplayName Italian: | Contrasto |
| DisplayName Spanish: | Contraste |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 4 |
| SliderMinNumber: | 0.25 |

(Read only property)

### 58.50.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Controls attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.50.8 AttributeinputSaturation as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Controls attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSaturation |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Saturation |
| DisplayName German: | S√§ttigung |
| DisplayName French: | Saturation |
| DisplayName Italian: | Saturazione |
| DisplayName Spanish: | Saturaci√n |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.50.9 inputBrightness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Brightness
**Notes:**

| | |
|---|---|
| Name: | inputBrightness |
| Class: | double (NSNumber) |
| DisplayName English: | Brightness |
| DisplayName German: | Helligkeit |
| DisplayName French: | Luminosit√© |
| DisplayName Italian: | Luminosit√† |
| DisplayName Spanish: | Brillo |
| Type: | CIAttributeTypeScalar |

See AttributeinputBrightness for more details.
(Read and Write property)

### 58.50.10 inputContrast as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Contrast
**Notes:**

| | |
|---|---|
| Name: | inputContrast |
| Class: | double (NSNumber) |
| DisplayName English: | Contrast |
| DisplayName German: | Kontrast |
| DisplayName French: | Contraste |
| DisplayName Italian: | Contrasto |
| DisplayName Spanish: | Contraste |
| Type: | CIAttributeTypeScalar |

See AttributeinputContrast for more details.
(Read and Write property)

### 58.50.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.50.12 inputSaturation as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Saturation
**Notes:**

See AttributeinputSaturation for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputSaturation |
| Class: | double (NSNumber) |
| DisplayName English: | Saturation |
| DisplayName German: | S√§ttigung |
| DisplayName French: | Saturation |
| DisplayName Italian: | Saturazione |
| DisplayName Spanish: | Saturaci√n |
| Type: | CIAttributeTypeScalar |

# 58.51 class CIFilterColorCrossPolynomialMBS

## 58.51.1 class CIFilterColorCrossPolynomialMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Cross Polynomial filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorCrossPolynomial |
| DisplayName English: | Color Cross Polynomial |
| DisplayName German: | Farb√ºberblend-Polynom |
| DisplayName French: | Fonction polynomiale crois√©e de couleur |
| DisplayName Italian: | Polinomio cromatico incrociato |
| DisplayName Spanish: | Polinomio cruzado crom√°tico |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRedCoefficients: Red Coefficients
- inputGreenCoefficients: Green Coefficients
- inputBlueCoefficients: Blue Coefficients

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.51.2 Methods

### 58.51.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.51.4 Properties

### 58.51.5 AttributeinputBlueCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cross Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBlueCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Blue Coefficients |
| DisplayName German: | Blau-Koeffizienten |
| DisplayName French: | Coefficients Bleu |
| DisplayName Italian: | Coefficienti colore blu |
| DisplayName Spanish: | Coeficientes de azul |
| DefaultVector: | [ 0 0 1 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 0 1 0 0 0 0 0 0 0 ] |

(Read only property)

### 58.51.6 AttributeinputGreenCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cross Polynomial attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputGreenCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Green Coefficients |
| DisplayName German: | Gr√ºn-Koeffizienten |
| DisplayName French: | Coefficients Vert |
| DisplayName Italian: | Coefficienti colore verde |
| DisplayName Spanish: | Coeficientes de verde |
| DefaultVector: | [ 0 1 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 1 0 0 0 0 0 0 0 0 ] |

### 58.51.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cross Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.51.8 AttributeinputRedCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cross Polynomial attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRedCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Red Coefficients |
| DisplayName German: | Rot-Koeffizienten |
| DisplayName French: | Coefficients Rouge |
| DisplayName Italian: | Coefficienti colore rosso |
| DisplayName Spanish: | Coeficientes de rojo |
| DefaultVector: | [ 1 0 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 1 0 0 0 0 0 0 0 0 0 ] |

### 58.51.9 inputBlueCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Blue Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputBlueCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Blue Coefficients |
| DisplayName German: | Blau-Koeffizienten |
| DisplayName French: | Coefficients Bleu |
| DisplayName Italian: | Coefficienti colore blu |
| DisplayName Spanish: | Coeficientes de azul |

See AttributeinputBlueCoefficients for more details.
(Read and Write property)

### 58.51.10 inputGreenCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Green Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputGreenCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Green Coefficients |
| DisplayName German: | Gr√ºn-Koeffizienten |
| DisplayName French: | Coefficients Vert |
| DisplayName Italian: | Coefficienti colore verde |
| DisplayName Spanish: | Coeficientes de verde |

See AttributeinputGreenCoefficients for more details.
(Read and Write property)

### 58.51.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.51.12 inputRedCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Red Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputRedCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Red Coefficients |
| DisplayName German: | Rot-Koeffizienten |
| DisplayName French: | Coefficients Rouge |
| DisplayName Italian: | Coefficienti colore rosso |
| DisplayName Spanish: | Coeficientes de rojo |

See AttributeinputRedCoefficients for more details.
(Read and Write property)

## 58.52 class CIFilterColorCubeMBS

### 58.52.1 class CIFilterColorCubeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Cube filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorCube |
| DisplayName English: | Color Cube |
| DisplayName German: | Farbw√ºrfel |
| DisplayName French: | Cube de couleur |
| DisplayName Italian: | Cubo colore |
| DisplayName Spanish: | Cubo de color |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCubeDimension: Cube Dimension
- inputCubeData: Cube Data
- inputExtrapolate: Extrapolate

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.52.2 Methods

### 58.52.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.52.4 Properties

### 58.52.5 AttributeinputCubeData as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCubeData |
| Class: | Memoryblock |
| DisplayName English: | Cube Data |
| DisplayName German: | W√ºrfeldaten |
| DisplayName French: | Donn√©es du cube |
| DisplayName Italian: | Dati cubo |
| DisplayName Spanish: | Datos del cubo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.52.6 AttributeinputCubeDimension as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double |
| Type: | CIAttributeTypeCount |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| DefaultNumber: | 2 |
| IdentityNumber: | 2 |
| MaxNumber: | 128 |
| MinNumber: | 2 |

### 58.52.7 AttributeinputExtrapolate as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

(Read only property)

### 58.52.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.52.9 inputCubeData as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube Data
**Notes:**

| | |
|---|---|
| Name: | inputCubeData |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Cube Data |
| DisplayName German: | W√ºrfeldaten |
| DisplayName French: | Donn√©es du cube |
| DisplayName Italian: | Dati cubo |
| DisplayName Spanish: | Datos del cubo |

See AttributeinputCubeData for more details.
(Read and Write property)

### 58.52.10 inputCubeDimension as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube Dimension
**Notes:**

See AttributeinputCubeDimension for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double (NSNumber) |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| Type: | CIAttributeTypeCount |

### 58.52.11 inputExtrapolate as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Extrapolate
**Notes:**

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double (NSNumber) |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |
| Type: | CIAttributeTypeBoolean |

See AttributeinputExtrapolate for more details.
(Read and Write property)

### 58.52.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.53 class CIFilterColorCubesMixedWithMaskMBS

### 58.53.1 class CIFilterColorCubesMixedWithMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Cubes Mixed With Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorCubesMixedWithMask |
| DisplayName English: | Color Cubes Mixed With Mask |
| DisplayName German: | Mit Maske gemischte Farbw√ºrfel |
| DisplayName French: | Cubes de couleur m√©lang√©s avec masque |
| DisplayName Italian: | Cubi di colori misti con maschera |
| DisplayName Spanish: | Cubos de color mezclados con la m√°scara |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputMaskImage: Mask Image
- inputCubeDimension: Cube Dimension
- inputCube0Data: Cube 0 Data
- inputCube1Data: Cube 1 Data
- inputColorSpace: Color Space
- inputExtrapolate: Extrapolate

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.53.2 Methods

### 58.53.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.53.4 Properties

### 58.53.5 AttributeinputColorSpace as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.53.6 AttributeinputCube0Data as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCube0Data |
| Class: | Memoryblock |
| DisplayName English: | Cube 0 Data |
| DisplayName German: | Daten W√ºrfel 0 |
| DisplayName French: | Donn√©es du cube¬†0 |
| DisplayName Italian: | Dati 0 cubo |
| DisplayName Spanish: | Datos del cubo 0 |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.53.7 AttributeinputCube1Data as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCube1Data |
| Class: | Memoryblock |
| DisplayName English: | Cube 1 Data |
| DisplayName German: | Daten W√ºrfel 1 |
| DisplayName French: | Donn√©es du cube¬†1 |
| DisplayName Italian: | Dati 1 cubo |
| DisplayName Spanish: | Datos del cubo 1 |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.53.8 AttributeinputCubeDimension as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double |
| Type: | CIAttributeTypeCount |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| DefaultNumber: | 2 |
| IdentityNumber: | 2 |
| MaxNumber: | 128 |
| MinNumber: | 2 |

(Read only property)

### 58.53.9 AttributeinputExtrapolate as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

(Read only property)

### 58.53.10 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.53.11 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cubes Mixed With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.53.12 inputColorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color Space
**Notes:**

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS (NSObject) |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |

See AttributeinputColorSpace for more details.
(Read and Write property)

### 58.53.13 inputCube0Data as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube 0 Data
**Notes:**

| | |
|---|---|
| Name: | inputCube0Data |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Cube 0 Data |
| DisplayName German: | Daten W√ºrfel 0 |
| DisplayName French: | Donn√©es du cube¬†0 |
| DisplayName Italian: | Dati 0 cubo |
| DisplayName Spanish: | Datos del cubo 0 |

See AttributeinputCube0Data for more details.
(Read and Write property)

### 58.53.14 inputCube1Data as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube 1 Data
**Notes:**

See AttributeinputCube1Data for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCube1Data |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Cube 1 Data |
| DisplayName German: | Daten W√ºrfel 1 |
| DisplayName French: | Donn√©es du cube¬†1 |
| DisplayName Italian: | Dati 1 cubo |
| DisplayName Spanish: | Datos del cubo 1 |

### 58.53.15 inputCubeDimension as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube Dimension
**Notes:**

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double (NSNumber) |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| Type: | CIAttributeTypeCount |

See AttributeinputCubeDimension for more details.
(Read and Write property)

### 58.53.16 inputExtrapolate as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Extrapolate
**Notes:**

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double (NSNumber) |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |
| Type: | CIAttributeTypeBoolean |

See AttributeinputExtrapolate for more details.
(Read and Write property)

### 58.53.17 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.53.18 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

## 58.54 class CIFilterColorCubeWithColorSpaceMBS

### 58.54.1 class CIFilterColorCubeWithColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Cube with ColorSpace filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorCubeWithColorSpace |
| DisplayName English: | Color Cube with ColorSpace |
| DisplayName German: | Farbw√ºrfel mit ColorSpace |
| DisplayName French: | Cube de couleur avec ColorSpace |
| DisplayName Italian: | Cubo colore con spazio colore |
| DisplayName Spanish: | Cubo de color con espacio de color |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCubeDimension: Cube Dimension
- inputCubeData: Cube Data
- inputExtrapolate: Extrapolate
- inputColorSpace: Color Space

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.54.2 Methods

### 58.54.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.54.4 Properties

### 58.54.5 AttributeinputColorSpace as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube with ColorSpace attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.54.6 AttributeinputCubeData as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube with ColorSpace attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCubeData |
| Class: | Memoryblock |
| DisplayName English: | Cube Data |
| DisplayName German: | W√ºrfeldaten |
| DisplayName French: | Donn√©es du cube |
| DisplayName Italian: | Dati cubo |
| DisplayName Spanish: | Datos del cubo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.54.7 AttributeinputCubeDimension as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube with ColorSpace attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double |
| Type: | CIAttributeTypeCount |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| DefaultNumber: | 2 |
| IdentityNumber: | 2 |
| MaxNumber: | 128 |
| MinNumber: | 2 |

(Read only property)

### 58.54.8 AttributeinputExtrapolate as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube with ColorSpace attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.54.9 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Cube with ColorSpace attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.54.10 inputColorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color Space
**Notes:**

See AttributeinputColorSpace for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS (NSObject) |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |

### 58.54.11 inputCubeData as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube Data
**Notes:**

| | |
|---|---|
| Name: | inputCubeData |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Cube Data |
| DisplayName German: | W√ºrfeldaten |
| DisplayName French: | Donn√©es du cube |
| DisplayName Italian: | Dati cubo |
| DisplayName Spanish: | Datos del cubo |

See AttributeinputCubeData for more details.
(Read and Write property)

### 58.54.12 inputCubeDimension as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cube Dimension
**Notes:**

| | |
|---|---|
| Name: | inputCubeDimension |
| Class: | double (NSNumber) |
| DisplayName English: | Cube Dimension |
| DisplayName German: | W√ºrfelma√üe |
| DisplayName French: | Dimension du cube |
| DisplayName Italian: | Dimensione cubo |
| DisplayName Spanish: | Dimensi√n del cubo |
| Type: | CIAttributeTypeCount |

See AttributeinputCubeDimension for more details.

(Read and Write property)

### 58.54.13 inputExtrapolate as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Extrapolate
**Notes:**

| | |
|---|---|
| Name: | inputExtrapolate |
| Class: | double (NSNumber) |
| DisplayName English: | Extrapolate |
| DisplayName German: | Extrapolieren |
| DisplayName French: | Extrapoler |
| DisplayName Italian: | Estrapola |
| DisplayName Spanish: | Extrapolar |

See AttributeinputExtrapolate for more details.
(Read and Write property)

### 58.54.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.55 class CIFilterColorCurvesMBS

### 58.55.1 class CIFilterColorCurvesMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Curves filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorCurves |
| DisplayName English: | Color Curves |
| DisplayName German: | Farbkurven |
| DisplayName French: | Courbes de couleur |
| DisplayName Italian: | Curve colore |
| DisplayName Spanish: | Curvas de colores |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCurvesData: Curves Data
- inputCurvesDomain: Curves Domain
- inputColorSpace: Color Space

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.55.2 Methods

### 58.55.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.55.4 Properties

### 58.55.5 AttributeinputColorSpace as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Curves attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.55.6 AttributeinputCurvesData as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Curves attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCurvesData |
| Class: | Memoryblock |
| DisplayName English: | Curves Data |
| DisplayName German: | Kurvendaten |
| DisplayName French: | Donn√©es des courbes |
| DisplayName Italian: | Dati curve |
| DisplayName Spanish: | Datos de las curvas |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.55.7 AttributeinputCurvesDomain as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Curves attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCurvesDomain |
| Class: | CIVectorMBS |
| DisplayName English: | Curves Domain |
| DisplayName German: | Kurven-Domain |
| DisplayName French: | Domaine des courbes |
| DisplayName Italian: | Dominio curve |
| DisplayName Spanish: | Dominio de curvas |
| DefaultVector: | [ 0 1 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.55.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Curves attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.55.9 inputColorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color Space
**Notes:**

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS (NSObject) |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |

See AttributeinputColorSpace for more details.
(Read and Write property)

### 58.55.10 inputCurvesData as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Curves Data
**Notes:**

| | |
|---|---|
| Name: | inputCurvesData |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Curves Data |
| DisplayName German: | Kurvendaten |
| DisplayName French: | Donn√©es des courbes |
| DisplayName Italian: | Dati curve |
| DisplayName Spanish: | Datos de las curvas |

See AttributeinputCurvesData for more details.
(Read and Write property)

### 58.55.11 inputCurvesDomain as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Curves Domain
**Notes:**

| | |
|---|---|
| Name: | inputCurvesDomain |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Curves Domain |
| DisplayName German: | Kurven-Domain |
| DisplayName French: | Domaine des courbes |
| DisplayName Italian: | Dominio curve |
| DisplayName Spanish: | Dominio de curvas |

See AttributeinputCurvesDomain for more details.
(Read and Write property)

### 58.55.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.56 class CIFilterColorDodgeBlendModeMBS

## 58.56.1 class CIFilterColorDodgeBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Dodge Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorDodgeBlendMode |
| DisplayName English: | Color Dodge Blend Mode |
| DisplayName German: | Mischmethode ,ÄûFarbig abwedeln,Äú |
| DisplayName French: | Mode de fusion Densit√© couleur n√©gative |
| DisplayName Italian: | Modalit√† sfumatura colore schermato |
| DisplayName Spanish: | Modo de mezcla por evasi√n de color |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.56.2 Methods

### 58.56.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.56.4 Properties

### 58.56.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Dodge Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.56.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Dodge Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.56.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.56.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.57 class CIFilterColorInvertMBS

## 58.57.1 class CIFilterColorInvertMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Invert filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorInvert |
| DisplayName English: | Color Invert |
| DisplayName German: | Farbe umkehren |
| DisplayName French: | Inversion de couleur |
| DisplayName Italian: | Inversione colore |
| DisplayName Spanish: | Inversi√n de color |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.57.2 Methods

### 58.57.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.57.4 Properties

### 58.57.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Invert attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.57.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.58 class CIFilterColorMapMBS

### 58.58.1 class CIFilterColorMapMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Map filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorMap |
| DisplayName English: | Color Map |
| DisplayName German: | Farbkarte |
| DisplayName French: | Carte de couleurs |
| DisplayName Italian: | Mappa colore |
| DisplayName Spanish: | Mapa de color |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputGradientImage: Gradient Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.58.2 Methods

### 58.58.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.58.4 Properties

### 58.58.5 AttributeinputGradientImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Map attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGradientImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeGradient |
| DisplayName English: | Gradient Image |
| DisplayName German: | Bild f√ºr Verlauf |
| DisplayName French: | Image du d√©grad√© |
| DisplayName Italian: | Immagine gradiente |
| DisplayName Spanish: | Imagen degradada |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.58.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Map attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.58.7 inputGradientImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Gradient Image
**Notes:**

| | |
|---|---|
| Name: | inputGradientImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Gradient Image |
| DisplayName German: | Bild f√ºr Verlauf |
| DisplayName French: | Image du d√©grad√© |
| DisplayName Italian: | Immagine gradiente |
| DisplayName Spanish: | Imagen degradada |
| Type: | CIAttributeTypeGradient |

See AttributeinputGradientImage for more details.
(Read and Write property)

### 58.58.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.59 class CIFilterColorMatrixMBS

### 58.59.1 class CIFilterColorMatrixMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Matrix filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorMatrix |
| DisplayName English: | Color Matrix |
| DisplayName German: | Farbmatrix |
| DisplayName French: | Matrice de couleurs |
| DisplayName Italian: | Matrice colore |
| DisplayName Spanish: | Matriz de color |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRVector: Red Vector
- inputGVector: Green Vector
- inputBVector: Blue Vector
- inputAVector: Alpha Vector
- inputBiasVector: Bias Vector

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.59.2 Methods

### 58.59.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.59.4 Properties

### 58.59.5 AttributeinputAVector as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAVector |
| Class: | CIVectorMBS |
| DisplayName English: | Alpha Vector |
| DisplayName German: | Alpha-Vektor |
| DisplayName French: | Vecteur alpha |
| DisplayName Italian: | Vettore alfa |
| DisplayName Spanish: | Vector alfa |
| DefaultVector: | [ 0 0 0 1 ] |
| IdentityVector: | [ 0 0 0 1 ] |

(Read only property)

### 58.59.6 AttributeinputBiasVector as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBiasVector |
| Class: | CIVectorMBS |
| DisplayName English: | Bias Vector |
| DisplayName German: | Bias-Vektor |
| DisplayName French: | Vecteur de biais |
| DisplayName Italian: | Vettore BIAS |
| DisplayName Spanish: | Vector oblicuo |
| DefaultVector: | [ 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 ] |

(Read only property)

### 58.59.7 AttributeinputBVector as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBVector |
| Class: | CIVectorMBS |
| DisplayName English: | Blue Vector |
| DisplayName German: | Blau-Vektor |
| DisplayName French: | Vecteur bleu |
| DisplayName Italian: | Vettore blu |
| DisplayName Spanish: | Vector azul |
| DefaultVector: | [ 0 0 1 0 ] |
| IdentityVector: | [ 0 0 1 0 ] |

(Read only property)

### 58.59.8 AttributeinputGVector as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGVector |
| Class: | CIVectorMBS |
| DisplayName English: | Green Vector |
| DisplayName German: | Gr√ºn-Vektor |
| DisplayName French: | Vecteur vert |
| DisplayName Italian: | Vettore verde |
| DisplayName Spanish: | Vector verde |
| DefaultVector: | [ 0 1 0 0 ] |
| IdentityVector: | [ 0 1 0 0 ] |

(Read only property)

### 58.59.9 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.59.10 AttributeinputRVector as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Matrix attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRVector |
| Class: | CIVectorMBS |
| DisplayName English: | Red Vector |
| DisplayName German: | Rot-Vektor |
| DisplayName French: | Vecteur rouge |
| DisplayName Italian: | Vettore rosso |
| DisplayName Spanish: | Vector rojo |
| DefaultVector: | [ 1 0 0 0 ] |
| IdentityVector: | [ 1 0 0 0 ] |

### 58.59.11 inputAVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Alpha Vector
**Notes:**

| | |
|---|---|
| Name: | inputAVector |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Alpha Vector |
| DisplayName German: | Alpha-Vektor |
| DisplayName French: | Vecteur alpha |
| DisplayName Italian: | Vettore alfa |
| DisplayName Spanish: | Vector alfa |

See AttributeinputAVector for more details.
(Read and Write property)

### 58.59.12 inputBiasVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias Vector
**Notes:**

| | |
|---|---|
| Name: | inputBiasVector |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bias Vector |
| DisplayName German: | Bias-Vektor |
| DisplayName French: | Vecteur de biais |
| DisplayName Italian: | Vettore BIAS |
| DisplayName Spanish: | Vector oblicuo |

See AttributeinputBiasVector for more details.
(Read and Write property)

### 58.59.13 inputBVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Blue Vector
**Notes:**

| | |
|---|---|
| Name: | inputBVector |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Blue Vector |
| DisplayName German: | Blau-Vektor |
| DisplayName French: | Vecteur bleu |
| DisplayName Italian: | Vettore blu |
| DisplayName Spanish: | Vector azul |

See AttributeinputBVector for more details.
(Read and Write property)

### 58.59.14 inputGVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Green Vector
**Notes:**

| | |
|---|---|
| Name: | inputGVector |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Green Vector |
| DisplayName German: | Gr√ºn-Vektor |
| DisplayName French: | Vecteur vert |
| DisplayName Italian: | Vettore verde |
| DisplayName Spanish: | Vector verde |

See AttributeinputGVector for more details.
(Read and Write property)

### 58.59.15 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.59.16 inputRVector as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Red Vector
**Notes:**

| | |
|---|---|
| Name: | inputRVector |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Red Vector |
| DisplayName German: | Rot-Vektor |
| DisplayName French: | Vecteur rouge |
| DisplayName Italian: | Vettore rosso |
| DisplayName Spanish: | Vector rojo |

See AttributeinputRVector for more details.
(Read and Write property)

# 58.60 class CIFilterColorMonochromeMBS

## 58.60.1 class CIFilterColorMonochromeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Monochrome filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorMonochrome |
| DisplayName English: | Color Monochrome |
| DisplayName German: | Einfarbig |
| DisplayName French: | Couleur monochrome |
| DisplayName Italian: | Colore monocromo |
| DisplayName Spanish: | Color monocromo |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputColor: Color
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.60.2 Methods

### 58.60.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.60.4 Properties

### 58.60.5 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Monochrome attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeOpaqueColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 0.6, Green = 0.45, Blue = 0.3, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.60.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Monochrome attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.60.7 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Monochrome attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.60.8 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

See AttributeinputColor for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeOpaqueColor |

### 58.60.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.60.10 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

## 58.61 class CIFilterColorPolynomialMBS

### 58.61.1 class CIFilterColorPolynomialMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Polynomial filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorPolynomial |
| DisplayName English: | Color Polynomial |
| DisplayName German: | Farb-Polynom |
| DisplayName French: | Fonction polynomiale de la couleur |
| DisplayName Italian: | Polinomio cromatico |
| DisplayName Spanish: | Polinomio crom√°tico |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRedCoefficients: Red Coefficients
- inputGreenCoefficients: Green Coefficients
- inputBlueCoefficients: Blue Coefficients
- inputAlphaCoefficients: Alpha Coefficients

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.61.2 Methods

### 58.61.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.61.4 Properties

### 58.61.5 AttributeinputAlphaCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAlphaCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Alpha Coefficients |
| DisplayName German: | Alpha-Koeffizienten |
| DisplayName French: | Coefficients Alpha |
| DisplayName Italian: | Coefficienti alfa |
| DisplayName Spanish: | Coeficientes alfa |
| DefaultVector: | [ 0 1 0 0 ] |
| IdentityVector: | [ 0 1 0 0 ] |

(Read only property)

### 58.61.6 AttributeinputBlueCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBlueCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Blue Coefficients |
| DisplayName German: | Blau-Koeffizienten |
| DisplayName French: | Coefficients Bleu |
| DisplayName Italian: | Coefficienti colore blu |
| DisplayName Spanish: | Coeficientes de azul |
| DefaultVector: | [ 0 1 0 0 ] |
| IdentityVector: | [ 0 1 0 0 ] |

(Read only property)

### 58.61.7 AttributeinputGreenCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGreenCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Green Coefficients |
| DisplayName German: | Gr√ºn-Koeffizienten |
| DisplayName French: | Coefficients Vert |
| DisplayName Italian: | Coefficienti colore verde |
| DisplayName Spanish: | Coeficientes de verde |
| DefaultVector: | [ 0 1 0 0 ] |
| IdentityVector: | [ 0 1 0 0 ] |

(Read only property)

### 58.61.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Polynomial attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.61.9 AttributeinputRedCoefficients as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Polynomial attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRedCoefficients |
| Class: | CIVectorMBS |
| DisplayName English: | Red Coefficients |
| DisplayName German: | Rot-Koeffizienten |
| DisplayName French: | Coefficients Rouge |
| DisplayName Italian: | Coefficienti colore rosso |
| DisplayName Spanish: | Coeficientes de rojo |
| DefaultVector: | [ 0 1 0 0 ] |
| IdentityVector: | [ 0 1 0 0 ] |

(Read only property)

### 58.61.10 inputAlphaCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Alpha Coefficients
**Notes:**

See AttributeinputAlphaCoefficients for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAlphaCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Alpha Coefficients |
| DisplayName German: | Alpha-Koeffizienten |
| DisplayName French: | Coefficients Alpha |
| DisplayName Italian: | Coefficienti alfa |
| DisplayName Spanish: | Coeficientes alfa |

### 58.61.11 inputBlueCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Blue Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputBlueCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Blue Coefficients |
| DisplayName German: | Blau-Koeffizienten |
| DisplayName French: | Coefficients Bleu |
| DisplayName Italian: | Coefficienti colore blu |
| DisplayName Spanish: | Coeficientes de azul |

See AttributeinputBlueCoefficients for more details.
(Read and Write property)

### 58.61.12 inputGreenCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Green Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputGreenCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Green Coefficients |
| DisplayName German: | Gr√°n-Koeffizienten |
| DisplayName French: | Coefficients Vert |
| DisplayName Italian: | Coefficienti colore verde |
| DisplayName Spanish: | Coeficientes de verde |

See AttributeinputGreenCoefficients for more details.
(Read and Write property)

### 58.61.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.61.14 inputRedCoefficients as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Red Coefficients
**Notes:**

| | |
|---|---|
| Name: | inputRedCoefficients |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Red Coefficients |
| DisplayName German: | Rot-Koeffizienten |
| DisplayName French: | Coefficients Rouge |
| DisplayName Italian: | Coefficienti colore rosso |
| DisplayName Spanish: | Coeficientes de rojo |

See AttributeinputRedCoefficients for more details.
(Read and Write property)

## 58.62 class CIFilterColorPosterizeMBS

### 58.62.1 class CIFilterColorPosterizeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Posterize filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorPosterize |
| DisplayName English: | Color Posterize |
| DisplayName German: | Farbe aufl√sen |
| DisplayName French: | Post√©riser la couleur |
| DisplayName Italian: | Posterizzazione colore |
| DisplayName Spanish: | Posterizaci√n de color |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputLevels: Levels

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.62.2 Methods

### 58.62.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.62.4 Properties

### 58.62.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Posterize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.62.6 AttributeinputLevels as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Color Posterize attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputLevels |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Levels |
| DisplayName German: | Werte |
| DisplayName French: | Niveaux |
| DisplayName Italian: | Livelli |
| DisplayName Spanish: | Niveles |
| DefaultNumber: | 6 |
| IdentityNumber: | 300 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 30 |
| SliderMinNumber: | 2 |

### 58.62.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.62.8 inputLevels as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Levels
**Notes:**

See AttributeinputLevels for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputLevels |
| Class: | double (NSNumber) |
| DisplayName English: | Levels |
| DisplayName German: | Werte |
| DisplayName French: | Niveaux |
| DisplayName Italian: | Livelli |
| DisplayName Spanish: | Niveles |
| Type: | CIAttributeTypeScalar |

## 58.63 class CIFilterColorThresholdMBS

### 58.63.1 class CIFilterColorThresholdMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Threshold filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorThreshold |
| DisplayName English: | Color Threshold |
| DisplayName German: | Farbschwellenwert |
| DisplayName French: | Seuil de coloration |
| DisplayName Italian: | Soglia colore |
| DisplayName Spanish: | Umbral de color |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputThreshold: Threshold

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.63.2 Methods

### 58.63.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.63.4 Properties

### 58.63.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Threshold attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.63.6 AttributeinputThreshold as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Threshold attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputThreshold |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Threshold |
| DisplayName German: | Schwellenwert |
| DisplayName French: | Seuil |
| DisplayName Italian: | Soglia |
| DisplayName Spanish: | Umbral |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.63.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.63.8 inputThreshold as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Threshold
**Notes:**

See AttributeinputThreshold for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputThreshold |
| Class: | double (NSNumber) |
| DisplayName English: | Threshold |
| DisplayName German: | Schwellenwert |
| DisplayName French: | Seuil |
| DisplayName Italian: | Soglia |
| DisplayName Spanish: | Umbral |
| Type: | CIAttributeTypeScalar |

## 58.64 class CIFilterColorThresholdOtsuMBS

### 58.64.1 class CIFilterColorThresholdOtsuMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Color Threshold Otsu filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColorThresholdOtsu |
| DisplayName English: | Color Threshold Otsu |
| DisplayName German: | Farbschwellenwert Otsu |
| DisplayName French: | Seuil de coloration selon la m√©thode d,ÄôOtsu |
| DisplayName Italian: | Soglia colore Otsu |
| DisplayName Spanish: | Umbral de color Otsu |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.64.2 Methods

### 58.64.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.64.4 Properties

### 58.64.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Color Threshold Otsu attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.64.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.65 class CIFilterColumnAverageMBS

## 58.65.1 class CIFilterColumnAverageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Column Average filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIColumnAverage |
| DisplayName English: | Column Average |
| DisplayName German: | Spaltendurchschnitt |
| DisplayName French: | Moyenne des colonnes |
| DisplayName Italian: | Media colonna |
| DisplayName Spanish: | Media de la columna |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.65.2 Methods

### 58.65.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.65.4 Properties

### 58.65.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Column Average attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.65.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Column Average attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.65.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.65.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.66 class CIFilterComicEffectMBS

## 58.66.1 class CIFilterComicEffectMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Comic Effect filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIComicEffect |
| DisplayName English: | Comic Effect |
| DisplayName German: | Comic-Effekt |
| DisplayName French: | Effet comique |
| DisplayName Italian: | Effetto fumetto |
| DisplayName Spanish: | Efecto c√mic |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.66.2 Methods

## 58.66.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.66.4 Properties

### 58.66.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Comic Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.66.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.67 class CIFilterConstantColorGeneratorMBS

### 58.67.1 class CIFilterConstantColorGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Constant Color filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConstantColorGenerator |
| DisplayName English: | Constant Color |
| DisplayName German: | Farbfl√§che |
| DisplayName French: | Couleur constante |
| DisplayName Italian: | Colore costante |
| DisplayName Spanish: | Color constante |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputColor: Color

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.67.2 Methods

### 58.67.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.67.4 Properties

### 58.67.5 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Constant Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.67.6 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

# 58.68 class CIFilterConvertLabToRGBMBS

## 58.68.1 class CIFilterConvertLabToRGBMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Convert Lab to RGB filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvertLabToRGB |
| DisplayName English: | Convert Lab to RGB |
| DisplayName German: | Lab in RGB konvertieren |
| DisplayName French: | Convertir Lab en RVB |
| DisplayName Italian: | Converti Lab in RGB |
| DisplayName Spanish: | Convertir Lab en RGB |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputNormalize: Normalize

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.68.2 Methods

### 58.68.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.68.4 Properties

### 58.68.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Convert Lab to RGB attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.68.6 AttributeinputNormalize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Convert Lab to RGB attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputNormalize |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Normalize |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

### 58.68.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.68.8 inputNormalize as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Normalize
**Notes:**

See AttributeinputNormalize for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputNormalize |
| Class: | double (NSNumber) |
| DisplayName English: | Normalize |
| DisplayName German: | Normalize |
| DisplayName French: | Normalize |
| DisplayName Italian: | Normalize |
| DisplayName Spanish: | Normalize |
| Type: | CIAttributeTypeBoolean |

# 58.69 class CIFilterConvertRGBtoLabMBS

## 58.69.1 class CIFilterConvertRGBtoLabMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Convert RGB to Lab filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvertRGBtoLab |
| DisplayName English: | Convert RGB to Lab |
| DisplayName German: | RGB in Lab konvertieren |
| DisplayName French: | Convertir RVB en Lab |
| DisplayName Italian: | Converti RGB in Lab |
| DisplayName Spanish: | Convertir RGB en Lab |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputNormalize: Normalize

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.69.2 Methods

### 58.69.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.69.4 Properties

### 58.69.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Convert RGB to Lab attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.69.6 AttributeinputNormalize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Convert RGB to Lab attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputNormalize |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Normalize |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

### 58.69.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.69.8 inputNormalize as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Normalize
**Notes:**

See AttributeinputNormalize for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputNormalize |
| Class: | double (NSNumber) |
| DisplayName English: | Normalize |
| DisplayName German: | Normalize |
| DisplayName French: | Normalize |
| DisplayName Italian: | Normalize |
| DisplayName Spanish: | Normalize |
| Type: | CIAttributeTypeBoolean |

# 58.70 class CIFilterConvolution3X3MBS

## 58.70.1 class CIFilterConvolution3X3MBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 3 by 3 Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolution3X3 |
| DisplayName English: | 3 by 3 Convolution |
| DisplayName German: | 3 x 3-Faltung |
| DisplayName French: | Convolution¬†3 par¬†3 |
| DisplayName Italian: | Convoluzione 3 per 3 |
| DisplayName Spanish: | Convoluci√n de 3x3 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.70.2 Methods

### 58.70.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.70.4 Properties

### 58.70.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 3 by 3 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.70.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 3 by 3 Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.70.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 3 by 3 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.70.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.70.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.70.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.71 class CIFilterConvolution5X5MBS

## 58.71.1 class CIFilterConvolution5X5MBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 5 by 5 Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolution5X5 |
| DisplayName English: | 5 by 5 Convolution |
| DisplayName German: | 5 x 5-Faltung |
| DisplayName French: | Convolution¬†5 par¬†5 |
| DisplayName Italian: | Convoluzione 5 per 5 |
| DisplayName Spanish: | Convoluci√n de 5x5 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.71.2 Methods

### 58.71.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.71.4 Properties

### 58.71.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 5 by 5 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.71.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 5 by 5 Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.71.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 5 by 5 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 ] |

(Read only property)

### 58.71.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.71.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.71.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.72 class CIFilterConvolution7X7MBS

## 58.72.1 class CIFilterConvolution7X7MBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 7 by 7 Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolution7X7 |
| DisplayName English: | 7 by 7 Convolution |
| DisplayName German: | 7 x 7-Faltung |
| DisplayName French: | Convolution¬†7 par¬†7 |
| DisplayName Italian: | Convoluzione 7 per 7 |
| DisplayName Spanish: | Convoluci√n de 7x7 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.72.2 Methods

### 58.72.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.72.4 Properties

### 58.72.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 7 by 7 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.72.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the 7 by 7 Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.72.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 7 by 7 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ] |

(Read only property)

### 58.72.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.

(Read and Write property)

### 58.72.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.72.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.73 class CIFilterConvolution9HorizontalMBS

## 58.73.1 class CIFilterConvolution9HorizontalMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Horizontal 9 Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolution9Horizontal |
| DisplayName English: | Horizontal 9 Convolution |
| DisplayName German: | Horizontale 9-Faltung |
| DisplayName French: | Convolution¬†9 horizontale |
| DisplayName Italian: | Convoluzione orizzontale 9 |
| DisplayName Spanish: | Convoluci√n horizontal con 9 valores |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.73.2 Methods

### 58.73.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.73.4 Properties

### 58.73.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal 9 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.73.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal 9 Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.73.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Horizontal 9 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.73.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.73.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.73.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

## 58.74 class CIFilterConvolution9VerticalMBS

### 58.74.1 class CIFilterConvolution9VerticalMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vertical 9 Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolution9Vertical |
| DisplayName English: | Vertical 9 Convolution |
| DisplayName German: | Vertikale 9-Faltung |
| DisplayName French: | Convolution¬†9 verticale |
| DisplayName Italian: | Convoluzione verticale 9 |
| DisplayName Spanish: | Convoluci√n vertical con 9 valores |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.74.2 Methods

### 58.74.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.74.4 Properties

### 58.74.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vertical 9 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.74.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vertical 9 Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.74.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Vertical 9 Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.74.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.74.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.74.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.75 class CIFilterConvolutionRGB3X3MBS

## 58.75.1 class CIFilterConvolutionRGB3X3MBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 3 by 3 RGB Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolutionRGB3X3 |
| DisplayName English: | 3 by 3 RGB Convolution |
| DisplayName German: | 3 x 3-RGB-Faltung |
| DisplayName French: | Convolution¬†RVB 3 par¬†3 |
| DisplayName Italian: | Convoluzione RGB 3 per 3 |
| DisplayName Spanish: | Convoluci√n RGB de 3x3 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.75.2 Methods

### 58.75.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.75.4 Properties

### 58.75.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 3 by 3 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.75.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 3 by 3 RGB Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.75.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 3 by 3 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.75.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.75.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.75.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.76 class CIFilterConvolutionRGB5X5MBS

## 58.76.1 class CIFilterConvolutionRGB5X5MBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 5 by 5 RGB Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolutionRGB5X5 |
| DisplayName English: | 5 by 5 RGB Convolution |
| DisplayName German: | 5 x 5-RGB-Faltung |
| DisplayName French: | Convolution¬†RVB 5 par¬†5 |
| DisplayName Italian: | Convoluzione RGB 5 per 5 |
| DisplayName Spanish: | Convoluci√n RGB de 5x5 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.76.2 Methods

### 58.76.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.76.4 Properties

### 58.76.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 5 by 5 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.76.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 5 by 5 RGB Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.76.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 5 by 5 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 ] |

(Read only property)

### 58.76.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.76.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.76.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.77 class CIFilterConvolutionRGB7X7MBS

## 58.77.1 class CIFilterConvolutionRGB7X7MBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage 7 by 7 RGB Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolutionRGB7X7 |
| DisplayName English: | 7 by 7 RGB Convolution |
| DisplayName German: | 7 x 7-RGB-Faltung |
| DisplayName French: | Convolution¬†RVB 7 par¬†7 |
| DisplayName Italian: | Convoluzione RGB 7 per 7 |
| DisplayName Spanish: | Convoluci√n RGB de 7x7 |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.77.2 Methods

### 58.77.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.77.4 Properties

### 58.77.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 7 by 7 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.77.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the 7 by 7 RGB Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.77.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the 7 by 7 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ] |

(Read only property)

### 58.77.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.

(Read and Write property)

### 58.77.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.77.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.78 class CIFilterConvolutionRGB9HorizontalMBS

## 58.78.1 class CIFilterConvolutionRGB9HorizontalMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Horizontal 9 RGB Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolutionRGB9Horizontal |
| DisplayName English: | Horizontal 9 RGB Convolution |
| DisplayName German: | Horizontale 9-RGB-Faltung |
| DisplayName French: | Convolution RVB¬†9 horizontale |
| DisplayName Italian: | Convoluzione orizzontale RGB 9 |
| DisplayName Spanish: | Convoluci√n RGB horizontal con 9¬†valores |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.78.2 Methods

### 58.78.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.78.4 Properties

### 58.78.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.78.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.78.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Horizontal 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.78.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.78.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.78.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.79 class CIFilterConvolutionRGB9VerticalMBS

## 58.79.1 class CIFilterConvolutionRGB9VerticalMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vertical 9 RGB Convolution filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIConvolutionRGB9Vertical |
| DisplayName English: | Vertical 9 RGB Convolution |
| DisplayName German: | Vertikale 9-RGB-Faltung |
| DisplayName French: | Convolution RVB 9¬†verticale |
| DisplayName Italian: | Convoluzione verticale RGB 9 |
| DisplayName Spanish: | Convoluci√n RGB vertical con 9¬†valores |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputWeights: Weights
- inputBias: Bias

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.79.2 Methods

### 58.79.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.79.4 Properties

### 58.79.5 AttributeinputBias as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBias |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Bias |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.79.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.79.7 AttributeinputWeights as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Vertical 9 RGB Convolution attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS |
| DisplayName: | Weights |
| DefaultVector: | [ 0 0 0 0 1 0 0 0 0 ] |
| IdentityVector: | [ 0 0 0 0 1 0 0 0 0 ] |

(Read only property)

### 58.79.8 inputBias as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bias
**Notes:**

| | |
|---|---|
| Name: | inputBias |
| Class: | double (NSNumber) |
| DisplayName English: | Bias |
| DisplayName German: | Bias |
| DisplayName French: | Bias |
| DisplayName Italian: | Bias |
| DisplayName Spanish: | Bias |
| Type: | CIAttributeTypeScalar |

See AttributeinputBias for more details.
(Read and Write property)

### 58.79.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.79.10 inputWeights as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Weights
**Notes:**

| | |
|---|---|
| Name: | inputWeights |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Weights |
| DisplayName German: | Weights |
| DisplayName French: | Weights |
| DisplayName Italian: | Weights |
| DisplayName Spanish: | Weights |

See AttributeinputWeights for more details.
(Read and Write property)

# 58.80 class CIFilterCopyMachineTransitionMBS

## 58.80.1 class CIFilterCopyMachineTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Copy Machine filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICopyMachineTransition |
| DisplayName English: | Copy Machine |
| DisplayName German: | Kopieren |
| DisplayName French: | Photocopieur |
| DisplayName Italian: | Fotocopiatrice |
| DisplayName Spanish: | Copiar m√°quina |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputExtent: Extent
- inputColor: Color
- inputTime: Time
- inputAngle: Angle
- inputWidth: Width
- inputOpacity: Opacity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.80.2 Methods

### 58.80.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.80.4 Properties

### 58.80.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.80.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeOpaqueColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 0.6, Green = 1, Blue = 0.8, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.80.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.80.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.80.9 AttributeinputOpacity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputOpacity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Opacity |
| DisplayName German: | Deckkraft |
| DisplayName French: | Opacit√© |
| DisplayName Italian: | Opacit√† |
| DisplayName Spanish: | Opacidad |
| DefaultNumber: | 1.3 |
| IdentityNumber: | 1.3 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.80.10 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.80.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.80.12 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Copy Machine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 200 |
| IdentityNumber: | 200 |
| MaxNumber: | 0 |
| MinNumber: | 0.1 |
| SliderMaxNumber: | 500 |
| SliderMinNumber: | 0.1 |

(Read only property)

### 58.80.13 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.

(Read and Write property)

### 58.80.14 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeOpaqueColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.80.15 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.80.16 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.80.17 inputOpacity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Opacity
**Notes:**

| | |
|---|---|
| Name: | inputOpacity |
| Class: | double (NSNumber) |
| DisplayName English: | Opacity |
| DisplayName German: | Deckkraft |
| DisplayName French: | Opacit√© |
| DisplayName Italian: | Opacit√† |
| DisplayName Spanish: | Opacidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputOpacity for more details.
(Read and Write property)

### 58.80.18 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.80.19 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

### 58.80.20 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

# 58.81 class CIFilterCoreMLModelFilterMBS

## 58.81.1 class CIFilterCoreMLModelFilterMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage CoreML Model Filter filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICoreMLModelFilter |
| DisplayName English: | CoreML Model Filter |
| DisplayName German: | CoreML-Modellfilter |
| DisplayName French: | Filtre de mod√®le CoreML |
| DisplayName Italian: | Filtro modello CoreML |
| DisplayName Spanish: | Filtro de modelo CoreML |

Categories:

- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryStylize: Stylize

Input:

- inputImage: Image
- inputModel: Model
- inputHeadIndex: Head Index
- inputSoftmaxNormalization: Softmax Normalization

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.81.2 Methods

### 58.81.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.81.4 Properties

### 58.81.5 AttributeinputHeadIndex as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the CoreML Model Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHeadIndex |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Head Index |
| DisplayName German: | HitzeIndex |
| DisplayName French: | Index des t√™tes |
| DisplayName Italian: | Indice di testa |
| DisplayName Spanish: | √çndice de cabeza |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 10 |
| MinNumber: | 0 |

(Read only property)

### 58.81.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the CoreML Model Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.81.7 AttributeinputModel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the CoreML Model Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputModel |
| Class: | |
| DisplayName English: | Model |
| DisplayName German: | Modell |
| DisplayName French: | Mod√®le |
| DisplayName Italian: | Modello |
| DisplayName Spanish: | Modelo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.81.8 AttributeinputSoftmaxNormalization as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the CoreML Model Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSoftmaxNormalization |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Softmax Normalization |
| DisplayName German: | Softmax-Normalisierung |
| DisplayName French: | Normalisation Softmax |
| DisplayName Italian: | Normalizzazione softmax |
| DisplayName Spanish: | Normalizaci√n softmax |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

### 58.81.9 inputHeadIndex as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Head Index
**Notes:**

| | |
|---|---|
| Name: | inputHeadIndex |
| Class: | double (NSNumber) |
| DisplayName English: | Head Index |
| DisplayName German: | HitzeIndex |
| DisplayName French: | Index des t√™tes |
| DisplayName Italian: | Indice di testa |
| DisplayName Spanish: | √çndice de cabeza |
| Type: | CIAttributeTypeInteger |

See AttributeinputHeadIndex for more details.
(Read and Write property)

### 58.81.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.81.11 inputModel as Variant

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Model
**Notes:**

| | |
|---|---|
| Name: | inputModel |
| Class: | (MLModel) |
| DisplayName English: | Model |
| DisplayName German: | Modell |
| DisplayName French: | Mod√®le |
| DisplayName Italian: | Modello |
| DisplayName Spanish: | Modelo |

See AttributeinputModel for more details.
(Read and Write property)

### 58.81.12 inputSoftmaxNormalization as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Softmax Normalization
**Notes:**

| | |
|---|---|
| Name: | inputSoftmaxNormalization |
| Class: | double (NSNumber) |
| DisplayName English: | Softmax Normalization |
| DisplayName German: | Softmax-Normalisierung |
| DisplayName French: | Normalisation Softmax |
| DisplayName Italian: | Normalizzazione softmax |
| DisplayName Spanish: | Normalizaci√n softmax |
| Type: | CIAttributeTypeBoolean |

See AttributeinputSoftmaxNormalization for more details.
(Read and Write property)

# 58.82 class CIFilterCropMBS

## 58.82.1 class CIFilterCropMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Crop filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICrop |
| DisplayName English: | Crop |
| DisplayName German: | Freistellen |
| DisplayName French: | Recadrer |
| DisplayName Italian: | Ritaglia |
| DisplayName Spanish: | Recortar |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRectangle: Rectangle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.82.2 Methods

### 58.82.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.82.4 Properties

### 58.82.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Crop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.82.6 AttributeinputRectangle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Crop attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRectangle |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Rectangle |
| DisplayName German: | Rechteck |
| DisplayName French: | Rectangle |
| DisplayName Italian: | Rettangolo |
| DisplayName Spanish: | Rect√°ngulo |
| DefaultVector: | [ -8.98847e+307 -8.98847e+307 1.79769e+308 1.79769e+308 ] |
| IdentityVector: | [ -8.98847e+307 -8.98847e+307 1.79769e+308 1.79769e+308 ] |

### 58.82.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.82.8 inputRectangle as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Rectangle
**Notes:**

See AttributeinputRectangle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRectangle |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Rectangle |
| DisplayName German: | Rechteck |
| DisplayName French: | Rectangle |
| DisplayName Italian: | Rettangolo |
| DisplayName Spanish: | Rect√°ngulo |
| Type: | CIAttributeTypeRectangle |

# 58.83 class CIFilterCrystallizeMBS

## 58.83.1 class CIFilterCrystallizeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Crystallize filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CICrystallize |
| DisplayName English: | Crystallize |
| DisplayName German: | Kristallisieren |
| DisplayName French: | Cristalliser |
| DisplayName Italian: | Cristallizzazione |
| DisplayName Spanish: | Cristalizaci√n |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius
- inputCenter: Center

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.83.2 Methods

### 58.83.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.83.4 Properties

### 58.83.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Crystallize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.83.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Crystallize attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.83.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Crystallize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 20 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.83.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.83.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.83.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.84 class CIFilterDarkenBlendModeMBS

### 58.84.1 class CIFilterDarkenBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Darken Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDarkenBlendMode |
| DisplayName English: | Darken Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûAbdunkeln‚Äú |
| DisplayName French: | Mode de fusion Assombrir |
| DisplayName Italian: | Modalit√† sfumatura scura |
| DisplayName Spanish: | Oscurecer modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.84.2 Methods

### 58.84.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.84.4 Properties

### 58.84.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Darken Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.84.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Darken Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.84.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.84.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.85 class CIFilterDepthBlurEffectMBS

### 58.85.1 class CIFilterDepthBlurEffectMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Depth Blur Effect filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDepthBlurEffect |
| DisplayName English: | Depth Blur Effect |
| DisplayName German: | Tiefenweichzeichneneffekt |
| DisplayName French: | Effet de flou de profondeur |
| DisplayName Italian: | Effetto sfocatura profondit√† |
| DisplayName Spanish: | Efecto de profundidad desenfocado |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputDisparityImage: Disparity Image
- inputMatteImage: Matte Image
- inputHairImage: Hair Image
- inputGlassesImage: Glasses Image
- inputGainMap: Gain Map
- inputAperture: Aperture
- inputLeftEyePositions: Left Eye Positions
- inputRightEyePositions: Right Eye Positions

- inputChinPositions: Chin Positions
- inputNosePositions: Nose Positions
- inputFocusRect: Focus Rectangle
- inputLumaNoiseScale: Luma Noise Scale
- inputScaleFactor: Scale Factor
- inputCalibrationData: Calibration Data
- inputAuxDataMetadata: Aux Data Metadata
- inputShape: Shape

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.85.2 Methods

### 58.85.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.85.4 Properties

### 58.85.5 AttributeinputAperture as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputAperture |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Aperture |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 22 |
| MinNumber: | 0 |
| SliderMaxNumber: | 22 |
| SliderMinNumber: | 1 |

### 58.85.6 AttributeinputAuxDataMetadata as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAuxDataMetadata |
| Class: | CGImageMetadataMBS |
| DisplayName English: | Aux Data Metadata |
| DisplayName German: | Hilfsdaten –Metadaten |
| DisplayName French: | M√©tadonn√©es des donn√©es auxiliaires |
| DisplayName Italian: | Metadati dati canale |
| DisplayName Spanish: | Metadatos auxiliares |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.85.7 AttributeinputCalibrationData as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCalibrationData |
| Class: | Variant |
| DisplayName English: | Calibration Data |
| DisplayName German: | Kalibrierungsdaten |
| DisplayName French: | Donn√©es d,Äô√©talonnage |
| DisplayName Italian: | Dati di calibrazione |
| DisplayName Spanish: | Datos de calibraci√n |

### 58.85.8 AttributeinputChinPositions as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputChinPositions |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Chin Positions |
| DisplayName German: | Kinnpositionen |
| DisplayName French: | Positions du menton |
| DisplayName Italian: | Posizioni mento |
| DisplayName Spanish: | Posiciones de barbilla |
| DefaultVector: | [ -1 -1 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.85.9 AttributeinputDisparityImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.85.10 AttributeinputFocusRect as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputDisparityImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Disparity Image |
| DisplayName German: | Abweichungsbild |
| DisplayName French: | Image de disparit√© |
| DisplayName Italian: | Immagine di disparit√† |
| DisplayName Spanish: | Imagen de disparidad |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFocusRect |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Focus Rectangle |
| DisplayName German: | Fokusrechteck |
| DisplayName French: | Rectangle de mise au point |
| DisplayName Italian: | Rettangolo di messa a fuoco |
| DisplayName Spanish: | Rect√°ngulo focal |
| DefaultVector: | n/a |
| IdentityVector: | [ -8.98847e+307 -8.98847e+307 1.79769e+308 1.79769e+308 ] |

(Read only property)

### 58.85.11 AttributeinputGainMap as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.85.12 AttributeinputGlassesImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputGainMap |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Gain Map |
| DisplayName German: | St√§rkeverteilung |
| DisplayName French: | Carte des gains |
| DisplayName Italian: | Mappa guadagno |
| DisplayName Spanish: | Mapa de ganancia |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGlassesImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Glasses Image |
| DisplayName German: | Bild einer Brille |
| DisplayName French: | Image de lunettes |
| DisplayName Italian: | Immagine degli occhiali |
| DisplayName Spanish: | Imagen de las gafas |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.85.13 AttributeinputHairImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.85.14 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputHairImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Hair Image |
| DisplayName German: | Haareffekt |
| DisplayName French: | Image de cheveu |
| DisplayName Italian: | Immagine capelli |
| DisplayName Spanish: | Imagen del cabello |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.85.15 AttributeinputLeftEyePositions as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.85.16 AttributeinputLumaNoiseScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputLeftEyePositions |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Left Eye Positions |
| DisplayName German: | Positionen der linken Augen |
| DisplayName French: | Positions de l,Äôìil gauche |
| DisplayName Italian: | Posizioni occhio sinistro |
| DisplayName Spanish: | Posiciones de ojo izquierdo |
| DefaultVector: | [ -1 -1 ] |
| IdentityVector: | n/a |

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputLumaNoiseScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Luma Noise Scale |
| DisplayName German: | Luma-Rauschen-Skalierung |
| DisplayName French: | √âchelle de bruit de luminance |
| DisplayName Italian: | Scala rumore di luminanza |
| DisplayName Spanish: | Escala de ruido de luminancia |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 0.1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 0.1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.85.17 AttributeinputMatteImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputMatteImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Matte Image |
| DisplayName German: | Bild mit Maske |
| DisplayName French: | Image de cache |
| DisplayName Italian: | Immagine opaca |
| DisplayName Spanish: | Imagen mate |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.85.18 AttributeinputNosePositions as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputNosePositions |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Nose Positions |
| DisplayName German: | Nasenpositionen |
| DisplayName French: | Positions du nez |
| DisplayName Italian: | Posizioni naso |
| DisplayName Spanish: | Posiciones de nariz |
| DefaultVector: | [ -1 -1 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.85.19 AttributeinputRightEyePositions as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRightEyePositions |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Right Eye Positions |
| DisplayName German: | Positionen der rechten Augen |
| DisplayName French: | Positions de l,Äôìil droit |
| DisplayName Italian: | Posizioni occhio destro |
| DisplayName Spanish: | Posiciones de ojo derecho |
| DefaultVector: | [ -1 -1 ] |
| IdentityVector: | n/a |

### 58.85.20 AttributeinputScaleFactor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.85.21 AttributeinputShape as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth Blur Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputShape |
| Class: | String |
| DisplayName: | Shape |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.85.22 inputAperture as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Aperture
**Notes:**

| | |
|---|---|
| Name: | inputAperture |
| Class: | double (NSNumber) |
| DisplayName English: | Aperture |
| DisplayName German: | Aperture |
| DisplayName French: | Aperture |
| DisplayName Italian: | Aperture |
| DisplayName Spanish: | Aperture |
| Type: | CIAttributeTypeScalar |

See AttributeinputAperture for more details.
(Read and Write property)

### 58.85.23 inputAuxDataMetadata as CGImageMetadataMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Aux Data Metadata
**Notes:**

| | |
|---|---|
| Name: | inputAuxDataMetadata |
| Class: | CGImageMetadataMBS (CGImageMetadataRef) |
| DisplayName English: | Aux Data Metadata |
| DisplayName German: | Hilfsdaten –Metadaten |
| DisplayName French: | M√©tadonn√©es des donn√©es auxiliaires |
| DisplayName Italian: | Metadati dati canale |
| DisplayName Spanish: | Metadatos auxiliares |

See AttributeinputAuxDataMetadata for more details.
(Read and Write property)

### 58.85.24 inputCalibrationData as Variant

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Calibration Data
**Notes:**

| | |
|---|---|
| Name: | inputCalibrationData |
| Class: | Variant (AVCameraCalibrationData) |
| DisplayName English: | Calibration Data |
| DisplayName German: | Kalibrierungsdaten |
| DisplayName French: | Donn√©es d,Äô√©talonnage |
| DisplayName Italian: | Dati di calibrazione |
| DisplayName Spanish: | Datos de calibraci√n |

See AttributeinputCalibrationData for more details.
(Read and Write property)

### 58.85.25 inputChinPositions as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Chin Positions
**Notes:**

| | |
|---|---|
| Name: | inputChinPositions |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Chin Positions |
| DisplayName German: | Kinnpositionen |
| DisplayName French: | Positions du menton |
| DisplayName Italian: | Posizioni mento |
| DisplayName Spanish: | Posiciones de barbilla |
| Type: | CIAttributeTypePosition |

See AttributeinputChinPositions for more details.
(Read and Write property)

### 58.85.26 inputDisparityImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Disparity Image
**Notes:**

| | |
|---|---|
| Name: | inputDisparityImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Disparity Image |
| DisplayName German: | Abweichungsbild |
| DisplayName French: | Image de disparit√© |
| DisplayName Italian: | Immagine di disparit√† |
| DisplayName Spanish: | Imagen de disparidad |
| Type: | CIAttributeTypeImage |

See AttributeinputDisparityImage for more details.
(Read and Write property)

### 58.85.27 inputFocusRect as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Focus Rectangle
**Notes:**

| | |
|---|---|
| Name: | inputFocusRect |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Focus Rectangle |
| DisplayName German: | Fokusrechteck |
| DisplayName French: | Rectangle de mise au point |
| DisplayName Italian: | Rettangolo di messa a fuoco |
| DisplayName Spanish: | Rect√°ngulo focal |
| Type: | CIAttributeTypeRectangle |

See AttributeinputFocusRect for more details.
(Read and Write property)

### 58.85.28 inputGainMap as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Gain Map
**Notes:**

See AttributeinputGainMap for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputGainMap |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Gain Map |
| DisplayName German: | St√§rkeverteilung |
| DisplayName French: | Carte des gains |
| DisplayName Italian: | Mappa guadagno |
| DisplayName Spanish: | Mapa de ganancia |
| Type: | CIAttributeTypeImage |

### 58.85.29 inputGlassesImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Glasses Image
**Notes:**

| | |
|---|---|
| Name: | inputGlassesImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Glasses Image |
| DisplayName German: | Bild einer Brille |
| DisplayName French: | Image de lunettes |
| DisplayName Italian: | Immagine degli occhiali |
| DisplayName Spanish: | Imagen de las gafas |
| Type: | CIAttributeTypeImage |

See AttributeinputGlassesImage for more details.
(Read and Write property)

### 58.85.30 inputHairImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Hair Image
**Notes:**

| | |
|---|---|
| Name: | inputHairImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Hair Image |
| DisplayName German: | Haareffekt |
| DisplayName French: | Image de cheveu |
| DisplayName Italian: | Immagine capelli |
| DisplayName Spanish: | Imagen del cabello |
| Type: | CIAttributeTypeImage |

See AttributeinputHairImage for more details.
(Read and Write property)

### 58.85.31 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.85.32 inputLeftEyePositions as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Left Eye Positions
**Notes:**

| | |
|---|---|
| Name: | inputLeftEyePositions |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Left Eye Positions |
| DisplayName German: | Positionen der linken Augen |
| DisplayName French: | Positions de l,Äôìil gauche |
| DisplayName Italian: | Posizioni occhio sinistro |
| DisplayName Spanish: | Posiciones de ojo izquierdo |
| Type: | CIAttributeTypePosition |

See AttributeinputLeftEyePositions for more details.
(Read and Write property)

### 58.85.33 inputLumaNoiseScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Luma Noise Scale
**Notes:**

| | |
|---|---|
| Name: | inputLumaNoiseScale |
| Class: | double (NSNumber) |
| DisplayName English: | Luma Noise Scale |
| DisplayName German: | Luma-Rauschen-Skalierung |
| DisplayName French: | √âchelle de bruit de luminance |
| DisplayName Italian: | Scala rumore di luminanza |
| DisplayName Spanish: | Escala de ruido de luminancia |
| Type: | CIAttributeTypeScalar |

See AttributeinputLumaNoiseScale for more details.
(Read and Write property)

### 58.85.34 inputMatteImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Matte Image
**Notes:**

| | |
|---|---|
| Name: | inputMatteImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Matte Image |
| DisplayName German: | Bild mit Maske |
| DisplayName French: | Image de cache |
| DisplayName Italian: | Immagine opaca |
| DisplayName Spanish: | Imagen mate |
| Type: | CIAttributeTypeImage |

See AttributeinputMatteImage for more details.
(Read and Write property)

### 58.85.35 inputNosePositions as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Nose Positions
**Notes:**

| | |
|---|---|
| Name: | inputNosePositions |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Nose Positions |
| DisplayName German: | Nasenpositionen |
| DisplayName French: | Positions du nez |
| DisplayName Italian: | Posizioni naso |
| DisplayName Spanish: | Posiciones de nariz |
| Type: | CIAttributeTypePosition |

See AttributeinputNosePositions for more details.
(Read and Write property)

### 58.85.36 inputRightEyePositions as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Right Eye Positions
**Notes:**

| | |
|---|---|
| Name: | inputRightEyePositions |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Right Eye Positions |
| DisplayName German: | Positionen der rechten Augen |
| DisplayName French: | Positions de l,Äôìil droit |
| DisplayName Italian: | Posizioni occhio destro |
| DisplayName Spanish: | Posiciones de ojo derecho |
| Type: | CIAttributeTypePosition |

See AttributeinputRightEyePositions for more details.
(Read and Write property)

### 58.85.37 inputScaleFactor as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale Factor
**Notes:**

See AttributeinputScaleFactor for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double (NSNumber) |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| Type: | CIAttributeTypeScalar |

### 58.85.38 inputShape as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shape
**Notes:**

| | |
|---|---|
| Name: | inputShape |
| Class: | String (NSString) |
| DisplayName English: | Shape |
| DisplayName German: | Shape |
| DisplayName French: | Shape |
| DisplayName Italian: | Shape |
| DisplayName Spanish: | Shape |

See AttributeinputShape for more details.
(Read and Write property)

## 58.86 class CIFilterDepthOfFieldMBS

### 58.86.1 class CIFilterDepthOfFieldMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Depth of Field filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDepthOfField |
| DisplayName English: | Depth of Field |
| DisplayName German: | Sch√§rfentiefe |
| DisplayName French: | Profondeur de champ |
| DisplayName Italian: | Profondit√† di campo |
| DisplayName Spanish: | Profundidad de campo |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputPoint0: Point 0
- inputPoint1: Point 1
- inputSaturation: Saturation
- inputUnsharpMaskRadius: Unsharp Mask Radius
- inputUnsharpMaskIntensity: Unsharp Mask Intensity
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.86.2 Methods

### 58.86.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.86.4 Properties

### 58.86.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.86.6 AttributeinputPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| DefaultVector: | [ 0 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.86.7 AttributeinputPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| DefaultVector: | [ 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.86.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 30 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.86.9 AttributeinputSaturation as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSaturation |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Saturation |
| DisplayName German: | S√§ttigung |
| DisplayName French: | Saturation |
| DisplayName Italian: | Saturazione |
| DisplayName Spanish: | Saturaci√n |
| DefaultNumber: | 1.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.86.10 AttributeinputUnsharpMaskIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputUnsharpMaskIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Unsharp Mask Intensity |
| DisplayName German: | Intensit√§t von ‚ÄûUnscharf maskieren‚Äú |
| DisplayName French: | Intensit√© du masque flou |
| DisplayName Italian: | Intensit√† maschera di contrasto |
| DisplayName Spanish: | Intensidad de la m√°scara de desenfoque |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.86.11 AttributeinputUnsharpMaskRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth of Field attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputUnsharpMaskRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Unsharp Mask Radius |
| DisplayName German: | Radius von ‚ÄûUnscharf maskieren‚Äú |
| DisplayName French: | Rayon du masque flou |
| DisplayName Italian: | Raggio maschera di contrasto |
| DisplayName Spanish: | Radio de la m√°scara de desenfoque |
| DefaultNumber: | 2.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.86.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.86.13 inputPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 0
**Notes:**

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint0 for more details.
(Read and Write property)

### 58.86.14 inputPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 1
**Notes:**

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint1 for more details.
(Read and Write property)

### 58.86.15 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.86.16 inputSaturation as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Saturation
**Notes:**

| | |
|---|---|
| Name: | inputSaturation |
| Class: | double (NSNumber) |
| DisplayName English: | Saturation |
| DisplayName German: | S√§ttigung |
| DisplayName French: | Saturation |
| DisplayName Italian: | Saturazione |
| DisplayName Spanish: | Saturaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputSaturation for more details.
(Read and Write property)

### 58.86.17 inputUnsharpMaskIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Unsharp Mask Intensity
**Notes:**

| | |
|---|---|
| Name: | inputUnsharpMaskIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Unsharp Mask Intensity |
| DisplayName German: | Intensit√§t von ‚ÄûUnscharf maskieren‚Äú |
| DisplayName French: | Intensit√© du masque flou |
| DisplayName Italian: | Intensit√† maschera di contrasto |
| DisplayName Spanish: | Intensidad de la m√°scara de desenfoque |
| Type: | CIAttributeTypeScalar |

See AttributeinputUnsharpMaskIntensity for more details.
(Read and Write property)

### 58.86.18 inputUnsharpMaskRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Unsharp Mask Radius
**Notes:**

See AttributeinputUnsharpMaskRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputUnsharpMaskRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Unsharp Mask Radius |
| DisplayName German: | Radius von ‚ÄûUnscharf maskieren‚Äú |
| DisplayName French: | Rayon du masque flou |
| DisplayName Italian: | Raggio maschera di contrasto |
| DisplayName Spanish: | Radio de la m√°scara de desenfoque |
| Type: | CIAttributeTypeScalar |

# 58.87 class CIFilterDepthToDisparityMBS

## 58.87.1 class CIFilterDepthToDisparityMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Depth To Disparity filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDepthToDisparity |
| DisplayName English: | Depth To Disparity |
| DisplayName German: | Tiefe zu Abweichung |
| DisplayName French: | Profondeur en disparit√© |
| DisplayName Italian: | Da profondit√† a disparit√† |
| DisplayName Spanish: | De profundidad a disparidad |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.87.2 Methods

## 58.87.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.87.4 Properties

### 58.87.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Depth To Disparity attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.87.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.88 class CIFilterDifferenceBlendModeMBS

### 58.88.1 class CIFilterDifferenceBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Difference Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDifferenceBlendMode |
| DisplayName English: | Difference Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûDifferenz‚Äú |
| DisplayName French: | Mode de fusion Diff√©rence |
| DisplayName Italian: | Modalit√† sfumatura differenza |
| DisplayName Spanish: | Diferenciar modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.88.2 Methods

### 58.88.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.88.4 Properties

### 58.88.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Difference Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.88.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Difference Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.88.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.88.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.89 class CIFilterDiscBlurMBS

### 58.89.1 class CIFilterDiscBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Disc Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDiscBlur |
| DisplayName English: | Disc Blur |
| DisplayName German: | Kreisf√rmige Unsch√§rfe |
| DisplayName French: | Flou (Disc Blur) |
| DisplayName Italian: | Effetto disco |
| DisplayName Spanish: | Disco difuminado |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.89.2 Methods

### 58.89.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.89.4 Properties

### 58.89.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disc Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.89.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disc Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 8 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

### 58.89.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.89.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.90 class CIFilterDisintegrateWithMaskTransitionMBS

### 58.90.1 class CIFilterDisintegrateWithMaskTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Disintegrate With Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDisintegrateWithMaskTransition |
| DisplayName English: | Disintegrate With Mask |
| DisplayName German: | √úbergang mit Maske |
| DisplayName French: | D√©sint√©grer avec masque |
| DisplayName Italian: | Disintegra con maschera |
| DisplayName Spanish: | Desintegrar con m√°scara |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputMaskImage: Mask Image
- inputTime: Time
- inputShadowRadius: Shadow Radius
- inputShadowDensity: Shadow Density
- inputShadowOffset: Shadow Offset

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.90.2 Methods

### 58.90.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.90.4 Properties

### 58.90.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.90.6 AttributeinputMaskImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.90.7 AttributeinputShadowDensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadowDensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Shadow Density |
| DisplayName German: | Schattendichte |
| DisplayName French: | Densit√© de l,Äôombre |
| DisplayName Italian: | Densit√† ombra |
| DisplayName Spanish: | Densidad del sombreado |
| DefaultNumber: | 0.65 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.90.8 AttributeinputShadowOffset as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadowOffset |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Shadow Offset |
| DisplayName German: | Schattenabstand |
| DisplayName French: | D√©calage de l,Äôombre |
| DisplayName Italian: | Offset ombra |
| DisplayName Spanish: | Proyecci√n del sombreado |
| DefaultVector: | [ 0 -10 ] |
| IdentityVector: | [ 0 0 ] |

(Read only property)

### 58.90.9 AttributeinputShadowRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadowRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Shadow Radius |
| DisplayName German: | Schattenradius |
| DisplayName French: | Rayon de l,Äôombre |
| DisplayName Italian: | Raggio dell'ombra |
| DisplayName Spanish: | Radio del sombreado |
| DefaultNumber: | 8 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.90.10 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.90.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disintegrate With Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.90.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.90.13 inputMaskImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask Image
**Notes:**

| | |
|---|---|
| Name: | inputMaskImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask Image |
| DisplayName German: | Maske |
| DisplayName French: | Image du masque |
| DisplayName Italian: | Immagine maschera |
| DisplayName Spanish: | Imagen de m√°scara |
| Type: | CIAttributeTypeImage |

See AttributeinputMaskImage for more details.
(Read and Write property)

### 58.90.14 inputShadowDensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Density
**Notes:**

| | |
|---|---|
| Name: | inputShadowDensity |
| Class: | double (NSNumber) |
| DisplayName English: | Shadow Density |
| DisplayName German: | Schattendichte |
| DisplayName French: | Densit√© de l,Äôombre |
| DisplayName Italian: | Densit√† ombra |
| DisplayName Spanish: | Densidad del sombreado |
| Type: | CIAttributeTypeScalar |

See AttributeinputShadowDensity for more details.
(Read and Write property)

### 58.90.15 inputShadowOffset as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Offset
**Notes:**

| | |
|---|---|
| Name: | inputShadowOffset |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Shadow Offset |
| DisplayName German: | Schattenabstand |
| DisplayName French: | D√©calage de l,Äôombre |
| DisplayName Italian: | Offset ombra |
| DisplayName Spanish: | Proyecci√n del sombreado |
| Type: | CIAttributeTypeOffset |

See AttributeinputShadowOffset for more details.
(Read and Write property)

### 58.90.16 inputShadowRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Radius
**Notes:**

| | |
|---|---|
| Name: | inputShadowRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Shadow Radius |
| DisplayName German: | Schattenradius |
| DisplayName French: | Rayon de l,Äôombre |
| DisplayName Italian: | Raggio dell'ombra |
| DisplayName Spanish: | Radio del sombreado |
| Type: | CIAttributeTypeDistance |

See AttributeinputShadowRadius for more details.
(Read and Write property)

### 58.90.17 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.90.18 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

See AttributeinputTime for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

# 58.91 class CIFilterDisparityToDepthMBS

## 58.91.1 class CIFilterDisparityToDepthMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Disparity To Depth filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDisparityToDepth |
| DisplayName English: | Disparity To Depth |
| DisplayName German: | Abweichung zu Tiefe |
| DisplayName French: | Disparit√© en profondeur |
| DisplayName Italian: | Da disparit√† a profondit√† |
| DisplayName Spanish: | De disparidad a profundidad |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.91.2 Methods

## 58.91.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.91.4 Properties

### 58.91.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Disparity To Depth attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.91.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.92 class CIFilterDisplacementDistortionMBS

### 58.92.1 class CIFilterDisplacementDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Displacement Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDisplacementDistortion |
| DisplayName English: | Displacement Distortion |
| DisplayName German: | Verzerrung ,ÄûVerdr√§ngung,Äú |
| DisplayName French: | D√©formation D√©placement |
| DisplayName Italian: | Distorsione spostamento |
| DisplayName Spanish: | Distorsi√n de desplazamiento |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputDisplacementImage: Displacement Image
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.92.2 Methods

### 58.92.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.92.4 Properties

### 58.92.5 AttributeinputDisplacementImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Displacement Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputDisplacementImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Displacement Image |
| DisplayName German: | Bildverschiebung |
| DisplayName French: | Image du d√©placement |
| DisplayName Italian: | Immagine spostamento |
| DisplayName Spanish: | Imagen de desplazamiento |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.92.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Displacement Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.92.7 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Displacement Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 50 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.92.8 inputDisplacementImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Displacement Image
**Notes:**

See AttributeinputDisplacementImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputDisplacementImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Displacement Image |
| DisplayName German: | Bildverschiebung |
| DisplayName French: | Image du d√©placement |
| DisplayName Italian: | Immagine spostamento |
| DisplayName Spanish: | Imagen de desplazamiento |
| Type: | CIAttributeTypeImage |

### 58.92.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.92.10 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeDistance |

See AttributeinputScale for more details.
(Read and Write property)

# 58.93 class CIFilterDissolveTransitionMBS

## 58.93.1 class CIFilterDissolveTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Dissolve filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDissolveTransition |
| DisplayName English: | Dissolve |
| DisplayName German: | √überblenden |
| DisplayName French: | Dissoudre |
| DisplayName Italian: | Dissolvenza |
| DisplayName Spanish: | Disoluci√n |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputTime: Time

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.93.2 Methods

### 58.93.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.93.4 Properties

### 58.93.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dissolve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.93.6 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dissolve attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.93.7 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dissolve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.93.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.93.9 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.93.10 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

See AttributeinputTime for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

## 58.94 class CIFilterDitherMBS

### 58.94.1 class CIFilterDitherMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Dither filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDither |
| DisplayName English: | Dither |
| DisplayName German: | Dither |
| DisplayName French: | Tramage |
| DisplayName Italian: | Dithering |
| DisplayName Spanish: | Tramar |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.94.2 Methods

### 58.94.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.94.4 Properties

### 58.94.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dither attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.94.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dither attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 0.1 |
| IdentityNumber: | 0 |
| MaxNumber: | 5 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.94.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.94.8 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

See AttributeinputIntensity for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

## 58.95 class CIFilterDivideBlendModeMBS

### 58.95.1 class CIFilterDivideBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Divide Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDivideBlendMode |
| DisplayName English: | Divide Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûTeilen‚Äú |
| DisplayName French: | Mode de fusion Diviser |
| DisplayName Italian: | Modalit√† sfumatura dissolvenza |
| DisplayName Spanish: | Dividir modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.95.2 Methods

### 58.95.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.95.4 Properties

### 58.95.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Divide Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.95.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Divide Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.95.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.95.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.96 class CIFilterDocumentEnhancerMBS

### 58.96.1 class CIFilterDocumentEnhancerMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Document Enhancer filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDocumentEnhancer |
| DisplayName English: | Document Enhancer |
| DisplayName German: | Dokumentverbesserung |
| DisplayName French: | Am√©lioration du document |
| DisplayName Italian: | Migliora documento |
| DisplayName Spanish: | Mejorar documentos |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputAmount: Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.96.2 Methods

### 58.96.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.96.4 Properties

### 58.96.5 AttributeinputAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Document Enhancer attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 10 |
| MinNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.96.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Document Enhancer attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.96.7 inputAmount as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Amount
**Notes:**

| | |
|---|---|
| Name: | inputAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputAmount for more details.
(Read and Write property)

### 58.96.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.97 class CIFilterDotScreenMBS

### 58.97.1 class CIFilterDotScreenMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Dot Screen filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDotScreen |
| DisplayName English: | Dot Screen |
| DisplayName German: | Punktf√rmiges Halbtonraster |
| DisplayName French: | √âcran en pointill√© |
| DisplayName Italian: | Schermo a punti |
| DisplayName Spanish: | Pantalla punteada |

Categories:

- CICategoryHalftoneEffect: Halftone Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.97.2 Methods

### 58.97.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.97.4 Properties

### 58.97.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dot Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.97.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dot Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.97.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dot Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.97.8 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dot Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.97.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Dot Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.97.10 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.97.11 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.97.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.97.13 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.97.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.98 class CIFilterDrosteMBS

## 58.98.1 class CIFilterDrosteMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Droste filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIDroste |
| DisplayName English: | Droste |
| DisplayName German: | Droste |
| DisplayName French: | Droste |
| DisplayName Italian: | Droste |
| DisplayName Spanish: | Droste |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputInsetPoint0: Inset Point 0
- inputInsetPoint1: Inset Point 1
- inputStrands: Strands
- inputPeriodicity: Periodicity
- inputRotation: Rotation
- inputZoom: Zoom

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.98.2 Methods

### 58.98.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.98.4 Properties

### 58.98.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.98.6 AttributeinputInsetPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputInsetPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Inset Point 0 |
| DisplayName German: | Abstandspunkt 0 |
| DisplayName French: | Point d,Äôinsertion¬†0 |
| DisplayName Italian: | Punto di inserimento 0 |
| DisplayName Spanish: | Punto de inserci√n 0 |
| DefaultVector: | [ 200 200 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.98.7 AttributeinputInsetPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputInsetPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Inset Point 1 |
| DisplayName German: | Abstandspunkt 1 |
| DisplayName French: | Point d,Äôinsertion¬†1 |
| DisplayName Italian: | Punto di inserimento 1 |
| DisplayName Spanish: | Punto de inserci√n 1 |
| DefaultVector: | [ 400 400 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.98.8 AttributeinputPeriodicity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPeriodicity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Periodicity |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.98.9 AttributeinputRotation as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRotation |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Rotation |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.98.10 AttributeinputStrands as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStrands |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Strands |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 10 |
| MinNumber: | -10 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | -2 |

(Read only property)

### 58.98.11 AttributeinputZoom as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Droste attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputZoom |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Zoom |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 0.01 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0.01 |

(Read only property)

### 58.98.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.98.13 inputInsetPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Inset Point 0
**Notes:**

| | |
|---|---|
| Name: | inputInsetPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Inset Point 0 |
| DisplayName German: | Abstandspunkt 0 |
| DisplayName French: | Point d,Äôinsertion¬†0 |
| DisplayName Italian: | Punto di inserimento 0 |
| DisplayName Spanish: | Punto de inserci√n 0 |
| Type: | CIAttributeTypePosition |

See AttributeinputInsetPoint0 for more details.
(Read and Write property)

### 58.98.14 inputInsetPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Inset Point 1
**Notes:**

See AttributeinputInsetPoint1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputInsetPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Inset Point 1 |
| DisplayName German: | Abstandspunkt 1 |
| DisplayName French: | Point d,Äôinsertion¬†1 |
| DisplayName Italian: | Punto di inserimento 1 |
| DisplayName Spanish: | Punto de inserci√n 1 |
| Type: | CIAttributeTypePosition |

### 58.98.15 inputPeriodicity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Periodicity
**Notes:**

| | |
|---|---|
| Name: | inputPeriodicity |
| Class: | double (NSNumber) |
| DisplayName English: | Periodicity |
| DisplayName German: | Periodicity |
| DisplayName French: | Periodicity |
| DisplayName Italian: | Periodicity |
| DisplayName Spanish: | Periodicity |
| Type: | CIAttributeTypeScalar |

See AttributeinputPeriodicity for more details.
(Read and Write property)

### 58.98.16 inputRotation as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Rotation
**Notes:**

| | |
|---|---|
| Name: | inputRotation |
| Class: | double (NSNumber) |
| DisplayName English: | Rotation |
| DisplayName German: | Rotation |
| DisplayName French: | Rotation |
| DisplayName Italian: | Rotation |
| DisplayName Spanish: | Rotation |
| Type: | CIAttributeTypeAngle |

See AttributeinputRotation for more details.
(Read and Write property)

### 58.98.17 inputStrands as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Strands
**Notes:**

| | |
|---|---|
| Name: | inputStrands |
| Class: | double (NSNumber) |
| DisplayName English: | Strands |
| DisplayName German: | Strands |
| DisplayName French: | Strands |
| DisplayName Italian: | Strands |
| DisplayName Spanish: | Strands |
| Type: | CIAttributeTypeScalar |

See AttributeinputStrands for more details.
(Read and Write property)

### 58.98.18 inputZoom as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Zoom
**Notes:**

| | |
|---|---|
| Name: | inputZoom |
| Class: | double (NSNumber) |
| DisplayName English: | Zoom |
| DisplayName German: | Zoom |
| DisplayName French: | Zoom |
| DisplayName Italian: | Zoom |
| DisplayName Spanish: | Zoom |
| Type: | CIAttributeTypeScalar |

See AttributeinputZoom for more details.
(Read and Write property)

# 58.99 class CIFilterEdgePreserveUpsampleFilterMBS

## 58.99.1 class CIFilterEdgePreserveUpsampleFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Edge Preserve Upsample Filter filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIEdgePreserveUpsampleFilter |
| DisplayName English: | Edge Preserve Upsample Filter |
| DisplayName German: | Kantenerhaltender Upsample-Filter |
| DisplayName French: | Filtre de sur√©chantillonnage pour la pr√©servation des contours |
| DisplayName Italian: | Filtro di ricampionamento per la conservazione dei bordi |
| DisplayName Spanish: | Filtro de interpolaci√n con preservaci√n de bordes |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputSmallImage: Small Image
- inputSpatialSigma: Spatial Sigma
- inputLumaSigma: Luma Sigma

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.99.2 Methods

### 58.99.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.99.4 Properties

### 58.99.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Preserve Upsample Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.99.6 AttributeinputLumaSigma as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Preserve Upsample Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputLumaSigma |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Luma Sigma |
| DisplayName German: | Luma-Sigma |
| DisplayName French: | Sigma de la luminance |
| DisplayName Italian: | Sigma luminanza |
| DisplayName Spanish: | Desviaci√n est√°ndar sigma de luminancia |
| DefaultNumber: | 0.15 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

### 58.99.7 AttributeinputSmallImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Preserve Upsample Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSmallImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Small Image |
| DisplayName German: | Kleines Bild |
| DisplayName French: | Petite image |
| DisplayName Italian: | Immagine di dimensioni ridotte |
| DisplayName Spanish: | Imagen peque√±a |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.99.8 AttributeinputSpatialSigma as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Preserve Upsample Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSpatialSigma |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Spatial Sigma |
| DisplayName German: | R√§umliches Sigma |
| DisplayName French: | Sigma spatial |
| DisplayName Italian: | Sigma spaziale |
| DisplayName Spanish: | Desviaci√n est√°ndar sigma espacial |
| DefaultNumber: | 3 |
| IdentityNumber: | 0 |
| MaxNumber: | 5 |
| MinNumber: | 0 |

### 58.99.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.99.10 inputLumaSigma as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Luma Sigma
**Notes:**

See AttributeinputLumaSigma for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputLumaSigma |
| Class: | double (NSNumber) |
| DisplayName English: | Luma Sigma |
| DisplayName German: | Luma-Sigma |
| DisplayName French: | Sigma de la luminance |
| DisplayName Italian: | Sigma luminanza |
| DisplayName Spanish: | Desviaci√n est√°ndar sigma de luminancia |
| Type: | CIAttributeTypeScalar |

### 58.99.11 inputSmallImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Small Image
**Notes:**

| | |
|---|---|
| Name: | inputSmallImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Small Image |
| DisplayName German: | Kleines Bild |
| DisplayName French: | Petite image |
| DisplayName Italian: | Immagine di dimensioni ridotte |
| DisplayName Spanish: | Imagen peque√±a |
| Type: | CIAttributeTypeImage |

See AttributeinputSmallImage for more details.
(Read and Write property)

### 58.99.12 inputSpatialSigma as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Spatial Sigma
**Notes:**

| | |
|---|---|
| Name: | inputSpatialSigma |
| Class: | double (NSNumber) |
| DisplayName English: | Spatial Sigma |
| DisplayName German: | R√§umliches Sigma |
| DisplayName French: | Sigma spatial |
| DisplayName Italian: | Sigma spaziale |
| DisplayName Spanish: | Desviaci√n est√°ndar sigma espacial |
| Type: | CIAttributeTypeScalar |

See AttributeinputSpatialSigma for more details.
(Read and Write property)

# 58.100 class CIFilterEdgesMBS

## 58.100.1 class CIFilterEdgesMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Edges filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIEdges |
| DisplayName English: | Edges |
| DisplayName German: | Kanten |
| DisplayName French: | Contours |
| DisplayName Italian: | Estremit√† |
| DisplayName Spanish: | Bordes |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.100.2 Methods

### 58.100.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.100.4 Properties

### 58.100.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edges attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.100.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edges attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

### 58.100.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.100.8 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

See AttributeinputIntensity for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

# 58.101 class CIFilterEdgeWorkMBS

## 58.101.1 class CIFilterEdgeWorkMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Edge Work filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIEdgeWork |
| DisplayName English: | Edge Work |
| DisplayName German: | Kontur finden |
| DisplayName French: | Contourage |
| DisplayName Italian: | Lavoro sull'estremit√† |
| DisplayName Spanish: | Trabajo en bordes |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.101.2 Methods

## 58.101.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.101.4 Properties

### 58.101.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Work attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.101.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Edge Work attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.101.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 3 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 20 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.101.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.102 class CIFilterEightfoldReflectedTileMBS

## 58.102.1 class CIFilterEightfoldReflectedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Eightfold Reflected Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIEightfoldReflectedTile |
| DisplayName English: | Eightfold Reflected Tile |
| DisplayName German: | 8-fach reflektierte Kachel |
| DisplayName French: | Mosa√Øque r√©fl√©chie 8 fois |
| DisplayName Italian: | Mosaico riflesso in otto direzioni |
| DisplayName Spanish: | Mosaico reflejado ocho veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.102.2 Methods

### 58.102.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.102.4 Properties

### 58.102.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Eightfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.102.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Eightfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.102.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Eightfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.102.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Eightfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.102.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.102.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.102.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.102.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.103 class CIFilterExclusionBlendModeMBS

## 58.103.1 class CIFilterExclusionBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Exclusion Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIExclusionBlendMode |
| DisplayName English: | Exclusion Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûAusschluss‚Äú |
| DisplayName French: | Mode de fusion Exclusion |
| DisplayName Italian: | Modalit√† sfumatura esclusione |
| DisplayName Spanish: | Modo de mezcla por exclusi√n |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.103.2 Methods

### 58.103.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.103.4 Properties

### 58.103.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Exclusion Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.103.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Exclusion Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.103.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.103.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.104 class CIFilterExposureAdjustMBS

## 58.104.1 class CIFilterExposureAdjustMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Exposure Adjust filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIExposureAdjust |
| DisplayName English: | Exposure Adjust |
| DisplayName German: | Belichtung anpassen |
| DisplayName French: | Ajustement d,Äôexposition |
| DisplayName Italian: | Regolazione esposizione |
| DisplayName Spanish: | Ajuste de exposici√n |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image
- inputEV: EV

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.104.2 Methods

### 58.104.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.104.4 Properties

### 58.104.5 AttributeinputEV as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Exposure Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputEV |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | EV |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | -10 |

(Read only property)

### 58.104.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Exposure Adjust attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.104.7 inputEV as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute EV
**Notes:**

| | |
|---|---|
| Name: | inputEV |
| Class: | double (NSNumber) |
| DisplayName English: | EV |
| DisplayName German: | EV |
| DisplayName French: | EV |
| DisplayName Italian: | EV |
| DisplayName Spanish: | EV |
| Type: | CIAttributeTypeScalar |

See AttributeinputEV for more details.
(Read and Write property)

### 58.104.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.105 class CIFilterFalseColorMBS

## 58.105.1 class CIFilterFalseColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage False Color filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIFalseColor |
| DisplayName English: | False Color |
| DisplayName German: | Falschfarbendarstellung |
| DisplayName French: | Fausse couleur |
| DisplayName Italian: | Colore falso |
| DisplayName Spanish: | Color falso |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputColor0: Color 1
- inputColor1: Color 2

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.105.2 Methods

### 58.105.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.105.4 Properties

### 58.105.5 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the False Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 0.3, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.105.6 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the False Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 1, Green = 0.9, Blue = 0.8, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.105.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the False Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.105.8 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

See AttributeinputColor0 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

### 58.105.9 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor1 for more details.
(Read and Write property)

### 58.105.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.106 class CIFilterFlashTransitionMBS

### 58.106.1 class CIFilterFlashTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Flash filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIFlashTransition |
| DisplayName English: | Flash |
| DisplayName German: | Blinken |
| DisplayName French: | Flash |
| DisplayName Italian: | Flash |
| DisplayName Spanish: | Flash |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputCenter: Center
- inputExtent: Extent
- inputColor: Color
- inputTime: Time
- inputMaxStriationRadius: Maximum Striation Radius
- inputStriationStrength: Striation Strength
- inputStriationContrast: Striation Contrast

- inputFadeThreshold: Fade Threshold

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.106.2 Methods

### 58.106.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.106.4 Properties

### 58.106.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.106.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 0.8, Blue = 0.6, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.106.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.106.8 AttributeinputFadeThreshold as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFadeThreshold |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Fade Threshold |
| DisplayName German: | Schwellenwert f√ºr √úberblenden |
| DisplayName French: | Seuil de d√©coloration |
| DisplayName Italian: | Soglia dissolvenza |
| DisplayName Spanish: | Umbral de desvanecimiento |
| DefaultNumber: | 0.85 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.106.9 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.106.10 AttributeinputMaxStriationRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaxStriationRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Maximum Striation Radius |
| DisplayName German: | Maximaler Radius f√ºr Riffelung |
| DisplayName French: | Rayon maximum des stries |
| DisplayName Italian: | Raggio di massima striatura |
| DisplayName Spanish: | Radio de estriaci√n m√°ximo |
| DefaultNumber: | 2.58 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.106.11 AttributeinputStriationContrast as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.106.12 AttributeinputStriationStrength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| DefaultNumber: | 1.375 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.106.13 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.106.14 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Flash attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.106.15 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.106.16 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.106.17 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.106.18 inputFadeThreshold as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Fade Threshold
**Notes:**

| | |
|---|---|
| Name: | inputFadeThreshold |
| Class: | double (NSNumber) |
| DisplayName English: | Fade Threshold |
| DisplayName German: | Schwellenwert f√ºr √úberblenden |
| DisplayName French: | Seuil de d√©coloration |
| DisplayName Italian: | Soglia dissolvenza |
| DisplayName Spanish: | Umbral de desvanecimiento |
| Type: | CIAttributeTypeScalar |

See AttributeinputFadeThreshold for more details.
(Read and Write property)

### 58.106.19 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.106.20 inputMaxStriationRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Maximum Striation Radius
**Notes:**

| | |
|---|---|
| Name: | inputMaxStriationRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Maximum Striation Radius |
| DisplayName German: | Maximaler Radius f√ºr Riffelung |
| DisplayName French: | Rayon maximum des stries |
| DisplayName Italian: | Raggio di massima striatura |
| DisplayName Spanish: | Radio de estriaci√n m√°ximo |
| Type: | CIAttributeTypeScalar |

See AttributeinputMaxStriationRadius for more details.
(Read and Write property)

### 58.106.21 inputStriationContrast as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Contrast
**Notes:**

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationContrast for more details.
(Read and Write property)

### 58.106.22 inputStriationStrength as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Strength
**Notes:**

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationStrength for more details.
(Read and Write property)

### 58.106.23 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.106.24 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

See AttributeinputTime for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

## 58.107 class CIFilterFourfoldReflectedTileMBS

### 58.107.1 class CIFilterFourfoldReflectedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Fourfold Reflected Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIFourfoldReflectedTile |
| DisplayName English: | Fourfold Reflected Tile |
| DisplayName German: | 4-fach reflektierte Kachel |
| DisplayName French: | Mosa√Øque r√©fl√©chie 4 fois |
| DisplayName Italian: | Mosaico riflesso in quattro direzioni |
| DisplayName Spanish: | Mosaico reflejado cuatro veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width
- inputAcuteAngle: Acute Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.107.2 Methods

### 58.107.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.107.4 Properties

### 58.107.5 AttributeinputAcuteAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| DefaultNumber: | 1.570796 |
| IdentityNumber: | 1.570796 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.107.6 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

### 58.107.7 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.107.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.107.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.107.10 inputAcuteAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Acute Angle
**Notes:**

See AttributeinputAcuteAngle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| Type: | CIAttributeTypeAngle |

### 58.107.11 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.107.12 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.107.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.107.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.108 class CIFilterFourfoldRotatedTileMBS

### 58.108.1 class CIFilterFourfoldRotatedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Fourfold Rotated Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIFourfoldRotatedTile |
| DisplayName English: | Fourfold Rotated Tile |
| DisplayName German: | 4-fach gedrehte Kachel |
| DisplayName French: | Mosa√Øque pivot√©e 4 fois |
| DisplayName Italian: | Mosaico ruotato in quattro direzioni |
| DisplayName Spanish: | Mosaico rotado cuatro veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.108.2 Methods

### 58.108.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.108.4 Properties

### 58.108.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.108.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.108.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.108.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.108.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.108.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.108.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.108.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.109 class CIFilterFourfoldTranslatedTileMBS

### 58.109.1 class CIFilterFourfoldTranslatedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Fourfold Translated Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIFourfoldTranslatedTile |
| DisplayName English: | Fourfold Translated Tile |
| DisplayName German: | 4-fach √ºbersetzte Kachel |
| DisplayName French: | Mosa√Øque d√©plac√©e 4 fois |
| DisplayName Italian: | Mosaico traslato in quattro direzioni |
| DisplayName Spanish: | Mosaico desplazado cuatro veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width
- inputAcuteAngle: Acute Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.109.2 Methods

### 58.109.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.109.4 Properties

### 58.109.5 AttributeinputAcuteAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Translated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| DefaultNumber: | 1.570796 |
| IdentityNumber: | 1.570796 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.109.6 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Translated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

### 58.109.7 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Translated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.109.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Translated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.109.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Fourfold Translated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.109.10 inputAcuteAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Acute Angle
**Notes:**

See AttributeinputAcuteAngle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| Type: | CIAttributeTypeAngle |

### 58.109.11 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.109.12 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.109.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.109.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.110 class CIFilterGaborGradientsMBS

### 58.110.1 class CIFilterGaborGradientsMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Gabor Gradients filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGaborGradients |
| DisplayName English: | Gabor Gradients |
| DisplayName German: | Gabor-Verl√§ufe |
| DisplayName French: | D√©grad√©s Gabor |
| DisplayName Italian: | Gradienti di Gabor |
| DisplayName Spanish: | Gradientes de Gabor |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.110.2 Methods

### 58.110.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.110.4 Properties

### 58.110.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Gabor Gradients attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.110.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.111 class CIFilterGammaAdjustMBS

## 58.111.1 class CIFilterGammaAdjustMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Gamma Adjust filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGammaAdjust |
| DisplayName English: | Gamma Adjust |
| DisplayName German: | Gamma anpassen |
| DisplayName French: | Ajustement gamma |
| DisplayName Italian: | Regolazione gamma |
| DisplayName Spanish: | Ajuste de gama |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputPower: Power

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.111.2 Methods

### 58.111.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.111.4 Properties

### 58.111.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gamma Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.111.6 AttributeinputPower as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gamma Adjust attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPower |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Power |
| DisplayName German: | St√§rke |
| DisplayName French: | Puissance |
| DisplayName Italian: | Energia |
| DisplayName Spanish: | Alimentaci√n |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 4 |
| SliderMinNumber: | 0.25 |

### 58.111.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.111.8 inputPower as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Power
**Notes:**

See AttributeinputPower for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputPower |
| Class: | double (NSNumber) |
| DisplayName English: | Power |
| DisplayName German: | St√§rke |
| DisplayName French: | Puissance |
| DisplayName Italian: | Energia |
| DisplayName Spanish: | Alimentaci√n |
| Type: | CIAttributeTypeScalar |

# 58.112 class CIFilterGaussianBlurMBS

## 58.112.1 class CIFilterGaussianBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Gaussian Blur filter.
**Example:**

```
dim CIFilter as new CIFilterGaussianBlurMBS
dim ROIpic as Picture = LogoMBS(500)
dim CGImage as CGImageMBS = CGCreateImageMBS(ROIpic)
dim ciimage as CIImageMBS = NewCIImagewithCGImageMBS(CGImage)

CIFilter.inputImage = CIImage
cifilter.inputRadius = 10 //the property which holds the blur radius

dim result as CIImageMBS = cifilter.outputImage

dim r as Picture = result.RenderPicture

window1.Backdrop = r
```

**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGaussianBlur |
| DisplayName English: | Gaussian Blur |
| DisplayName German: | Gau√ü,Äôsche Unsch√§rfe |
| DisplayName French: | Flou gaussien |
| DisplayName Italian: | Sfumatura gaussiana |
| DisplayName Spanish: | Difuminado gaussiano |

Categories:

- CICategoryBlur: Blur
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Warning: Due to the blur, the output image may be bigger, so you need to crop space on the border to get back to old size.
Subclass of the CIFilterMBS class.

### 58.112.2 Methods

### 58.112.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.112.4 Properties

### 58.112.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.112.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.112.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.112.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.113 class CIFilterGaussianGradientMBS

## 58.113.1 class CIFilterGaussianGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Gaussian Gradient filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGaussianGradient |
| DisplayName English: | Gaussian Gradient |
| DisplayName German: | Gau√ü,Äôscher Verlauf |
| DisplayName French: | D√©grad√© gaussien |
| DisplayName Italian: | Gradiente gaussiano |
| DisplayName Spanish: | Degradado gaussiano |

Categories:

- CICategoryGradient: Gradient
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor0: Color 1
- inputColor1: Color 2
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter

### 58.113.2 Methods

### 58.113.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.113.4 Properties

### 58.113.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.113.6 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.113.7 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.113.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gaussian Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

### 58.113.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.113.10 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

See AttributeinputColor0 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

### 58.113.11 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor1 for more details.
(Read and Write property)

### 58.113.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.114 class CIFilterGeneratorMBS

## 58.114.1 class CIFilterGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An object that creates and configures chains of individual image filters.
**Notes:** The CIFilterGenerator class provides methods for creating a CIFilter object by chaining together existing CIFilter objects to create complex effects. (A filter chain refers to the CIFilter objects that are connected in the CIFilterGenerator object.) The complex effect can be encapsulated as a CIFilterGenerator object and saved as a file so that it can be used again. The filter generator file contains an archived instance of all the CIFilter objects that are chained together.

Any filter generator files that you copy to /Library/Graphics/Image Units/ are loaded when any of the loading methods provided by the CIPlugIn class are invoked. A CIFilterGenerator object is registered by its filename or, if present, by a class attribute that you supply in its description.

You can create a CIFilterGenerator object programmatically, using the methods provided by the CIFilterGenerator class, or by using the editor view provided by Core Image (see CIFilter Image Kit Additions).
**Blog Entries**

- MBS Xojo Plugins, version 17.2pr3

## 58.114.2 Methods

## 58.114.3 connectObject(sourceObject as Variant, sourceKey as string, targetObject as Variant, targetKey as String)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds an object to the filter chain.
**Notes:** sourceObject: A CIFilterMBS object, a CIImageMBS object, or a the path (an string or folderitem object) to an image.
sourceKey: The key that specifies the source object. For example, if the source is the output image of a filter, pass the outputImage key. Pass nil if the source object is used directly.
targetObject: The object that to link the source object to.
targetKey: The key that specifies the target for the source. For example, if you are connecting the source to the input image of a CIFilterMBS object, you would pass the inputImage key.

## 58.114.4 Constructor

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an empty filter generator object.
**Notes:** You use the returned object to connect two or more CIFilter objects and input images. It is also valid to have only one CIFilter object in a filter generator.
See also:


- 58.114.5 Constructor(File as folderItem) 9888
- 58.114.6 Constructor(Handle as Integer) 9888
- 58.114.7 Constructor(URL as string) 9888


### 58.114.5 Constructor(File as folderItem)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a filter generator object and initializes it with the contents of a filter generator file.
**Notes:** Raises exception on failure.
See also:


- 58.114.4 Constructor 9887
- 58.114.6 Constructor(Handle as Integer) 9888
- 58.114.7 Constructor(URL as string) 9888


### 58.114.6 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes Xojo object with given handle to CIFilterGenerator object.
See also:


- 58.114.4 Constructor 9887
- 58.114.5 Constructor(File as folderItem) 9888
- 58.114.7 Constructor(URL as string) 9888


### 58.114.7 Constructor(URL as string)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a filter generator object and initializes it with the contents of a filter generator file.
**Notes:** Raises exception on failure.
See also:

- 58.114.4 Constructor 9887
- 58.114.5 Constructor(File as folderItem) 9888
- 58.114.6 Constructor(Handle as Integer) 9888


### 58.114.8 copy as CIFilterGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the object.

### 58.114.9 disconnectObject(sourceObject as Variant, sourceKey as string, targetObject as Variant, targetKey as String)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the connection between two objects in the filter chain.
**Notes:** sourceObject: A CIFilterMBS object, a CIImageMBS object, or a the path (an string or folderitem object) to an image.
sourceKey: The key that specifies the source object. Pass nil if the source object is used directly.
targetObject: The object that you want to disconnect the source object from.
targetKey: The key that specifies the target that the source object is currently connected to.

### 58.114.10 exportKey(key as string, targetObject as Variant, exportedKeyName as String)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Exports an input or output key of an object in the filter chain.
**Notes:** key: The key to export from the target object (for example, inputImage).
targetObject: The object associated with the key (for example, the filter).
exportedKeyName: A unique name to use for the exported key. Pass "" to use the original key name.

When you create a CIFilterMBS object from a CIFilterGeneratorMBS object, you might want the filter client to be able to set some of the parameters associated with the filter chain. You can make a parameter settable by exporting the key associated with the parameter. If the exported key represents an input parameter of the filter, the key is exported as an input key. If the key represents an output parameter, it is exported as an output key.

### 58.114.11 filterGenerator as CIFilterGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an empty filter generator object.
**Notes:** You use the returned object to connect two or more CIFilter objects and input images. It is also valid to have only one CIFilter object in a filter generator.

### 58.114.12 filterGeneratorWithContentsOfFile(File as folderItem) as CIFilterGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a filter generator object and initializes it with the contents of a filter generator file.
**Notes:** Returns a CIFilterGeneratorMBS object; returns nil if the file can,Äôt be read.

### 58.114.13 filterGeneratorWithContentsOfURL(URL as string) as CIFilterGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns a filter generator object and initializes it with the contents of a filter generator file.
**Notes:** Returns a CIFilterGeneratorMBS object; returns nil if the file can,Äôt be read.

### 58.114.14 filterWithName(name as String) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries filter based on it's name.
**Notes:** Returns nil in case of error.

### 58.114.15 kCIFilterGeneratorExportedKey as String

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys describing exports.
**Notes:** The key (CIFilterGeneratorExportedKey) for the exported parameter. The associated value is the key name of the parameter you are exporting, such as inputRadius.

### 58.114.16 kCIFilterGeneratorExportedKeyName as String

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys describing exports.
**Notes:** The key (CIFilterGeneratorExportedKey) for the exported parameter. The associated value is the key name of the parameter you are exporting, such as inputRadius.

### 58.114.17 kCIFilterGeneratorExportedKeyTargetObject as String

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the dictionary keys describing exports.
**Notes:** The target object (CIFilterGeneratorExportedKeyTargetObject) for the exported key. The associated value is the name of the object, such as CIMotionBlur.

### 58.114.18 registerFilterName(name as string)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registers the name associated with a filter chain.
**Notes:** name: A unique name for the filter chain you want to register.

This method allows you to register the filter chain as a named filter in the Core Image filter repository. You can then create a CIFilterMBS object from it using the the filterWithName method of the CIFilterMBS class.

### 58.114.19 removeExportedKey(exportedKeyName as string)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes a key that was previously exported.

### 58.114.20 setAttributes(attributes as dictionary, ExportedKey as string)

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a dictionary of attributes for an exported key.
**Notes:** attributes: A dictionary that describes the attributes associated with the specified key.
key: The exported key whose attributes you want to set.

By default, the exported key inherits the attributes from its original key and target object. You can use this method to change one or more of the existing attributes for the key, such as the default value or maximum value. For more information on attributes, see CIFilterMBS and Core Image Programming Guide.

### 58.114.21 writeToFile(File as FolderItem, atomically as Boolean = true) as Boolean

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Archives a filter generator object to a filter generator file.
**Notes:** File: A location for the file generator file.
atomically: Pass true to specify that Core Image should create an interim file to avoid overwriting an existing file.

Returns true if the the object is successfully archived to the file.
Use this method to save your filter chain to a file for later use.

### 58.114.22 writeToURL(URL as String, atomically as Boolean = true) as Boolean

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Archives a filter generator object to a filter generator file.
**Notes:** URL: A location for the file generator file.
atomically: Pass true to specify that Core Image should create an interim file to avoid overwriting an existing file.

Returns true if the the object is successfully archived to the file.
Use this method to save your filter chain to a file for later use.

### 58.114.23 Properties

### 58.114.24 classAttributes as Dictionary

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class attributes associated with the filter.
**Notes:** For more information about class attributes for a filter, see Core Image Programming Guide and the filter attributes key constants defined in CIFilterMBS.
(Read and Write property)

### 58.114.25 exportedKeys as Dictionary

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the exported keys.
**Notes:** An array of dictionaries that describe the exported key and target object. See kCIFilterGenerator-ExportedKey, kCIFilterGeneratorExportedKeyTargetObject, and kCIFilterGeneratorExportedKey for keys used in the dictionary.

This method returns the keys that you exported using the exportKey method or that were exported before being written to the file from which you read the filter chain.
(Read only property)

### 58.114.26 filter as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a filter object based on the filter chain.
**Notes:** The topology of the filter chain is immutable, meaning that any changes you make to the filter chain are not reflected in the filter. The returned filer has the input an output keys that are exported.
(Read only property)

### 58.114.27 Handle as Integer

MBS MacCI Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read only property)

## 58.115 class CIFilterGlassDistortionMBS

### 58.115.1 class CIFilterGlassDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Glass Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGlassDistortion |
| DisplayName English: | Glass Distortion |
| DisplayName German: | Verzerrung ,ÄûGlas,Äú |
| DisplayName French: | D√©formation Verre |
| DisplayName Italian: | Distorsione vetro |
| DisplayName Spanish: | Distorsi√n vidriosa |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTexture: Texture
- inputCenter: Center
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.115.2 Methods

### 58.115.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.115.4 Properties

### 58.115.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.115.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.115.7 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 200 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 500 |
| SliderMinNumber: | 0.01 |

(Read only property)

### 58.115.8 AttributeinputTexture as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTexture |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Texture |
| DisplayName German: | Struktur |
| DisplayName French: | Texture |
| DisplayName Italian: | Trama |
| DisplayName Spanish: | Textura |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.115.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.115.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.115.11 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeDistance |

See AttributeinputScale for more details.
(Read and Write property)

### 58.115.12 inputTexture as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Texture
**Notes:**

| | |
|---|---|
| Name: | inputTexture |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Texture |
| DisplayName German: | Struktur |
| DisplayName French: | Texture |
| DisplayName Italian: | Trama |
| DisplayName Spanish: | Textura |
| Type: | CIAttributeTypeImage |

See AttributeinputTexture for more details.
(Read and Write property)

## 58.116 class CIFilterGlassLozengeMBS

### 58.116.1 class CIFilterGlassLozengeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Glass Lozenge filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGlassLozenge |
| DisplayName English: | Glass Lozenge |
| DisplayName German: | Glasrhombus |
| DisplayName French: | Losange de verre |
| DisplayName Italian: | Losanga vetro |
| DisplayName Spanish: | Romboedro vidrioso |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputPoint0: Point 0
- inputPoint1: Point 1
- inputRadius: Radius
- inputRefraction: Refraction

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.116.2 Methods

### 58.116.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.116.4 Properties

### 58.116.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Lozenge attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.116.6 AttributeinputPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Lozenge attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.116.7 AttributeinputPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Lozenge attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| DefaultVector: | [ 350 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.116.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Lozenge attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0 |

### 58.116.9 AttributeinputRefraction as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glass Lozenge attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRefraction |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Refraction |
| DisplayName German: | Lichtbrechung |
| DisplayName French: | R√©fraction |
| DisplayName Italian: | Rifrazione |
| DisplayName Spanish: | Refracci√n |
| DefaultNumber: | 1.7 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.116.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.116.11 inputPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 0
**Notes:**

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint0 for more details.
(Read and Write property)

### 58.116.12 inputPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 1
**Notes:**

See AttributeinputPoint1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| Type: | CIAttributeTypePosition |

### 58.116.13 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.116.14 inputRefraction as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Refraction
**Notes:**

| | |
|---|---|
| Name: | inputRefraction |
| Class: | double (NSNumber) |
| DisplayName English: | Refraction |
| DisplayName German: | Lichtbrechung |
| DisplayName French: | R√©fraction |
| DisplayName Italian: | Rifrazione |
| DisplayName Spanish: | Refracci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputRefraction for more details.
(Read and Write property)

# 58.117 class CIFilterGlideReflectedTileMBS

## 58.117.1 class CIFilterGlideReflectedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Glide Reflected Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGlideReflectedTile |
| DisplayName English: | Glide Reflected Tile |
| DisplayName German: | Gleitende reflektierte Kachel |
| DisplayName French: | Mosa√Øque r√©fl√©chie ¬´¬†Glide¬†¬ª |
| DisplayName Italian: | Mosaico riflesso di scivolamento |
| DisplayName Spanish: | Mosaico de deslizamiento reflejado |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.117.2 Methods

### 58.117.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.117.4 Properties

### 58.117.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glide Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.117.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glide Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.117.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glide Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.117.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Glide Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.117.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.117.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.117.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.117.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.118 class CIFilterGloomMBS

## 58.118.1 class CIFilterGloomMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Gloom filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGloom |
| DisplayName English: | Gloom |
| DisplayName German: | D√ºster |
| DisplayName French: | T√©n√®bres |
| DisplayName Italian: | Oscurit√† |
| DisplayName Spanish: | Oscurecer |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.118.2 Methods

### 58.118.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.118.4 Properties

### 58.118.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gloom attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.118.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gloom attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.118.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Gloom attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.118.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.118.9 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

### 58.118.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.119 class CIFilterGuidedFilterMBS

### 58.119.1 class CIFilterGuidedFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Guided Filter filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIGuidedFilter |
| DisplayName English: | Guided Filter |
| DisplayName German: | Gef√ºhrter Filter |
| DisplayName French: | Filtre guid√© |
| DisplayName Italian: | Filtro guidato |
| DisplayName Spanish: | Filtro guiado |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputGuideImage: A larger image to use as a guide.
- inputRadius: Radius
- inputEpsilon: Epsilon

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.119.2 Methods

### 58.119.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.119.4 Properties

### 58.119.5 AttributeinputEpsilon as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Guided Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputEpsilon |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Epsilon |
| DisplayName German: | Epsilon |
| DisplayName French: | Epsilon |
| DisplayName Italian: | Ipsilon |
| DisplayName Spanish: | √âpsilon |
| DefaultNumber: | 0.0001 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.1 |
| SliderMinNumber: | 1.000000e-9 |

(Read only property)

### 58.119.6 AttributeinputGuideImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Guided Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputGuideImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | A larger image to use as a guide. |
| DisplayName German: | Gr√√üeres Bild, das als Richtwert verwendet wird. |
| DisplayName French: | Une image plus grande √† utiliser comme guide. |
| DisplayName Italian: | Immagine pi√ grande da utilizzare come guida. |
| DisplayName Spanish: | Una imagen mayor que se usar√° como gu√a. |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.119.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Guided Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.119.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Guided Filter attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 1 |

### 58.119.9 inputEpsilon as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Epsilon
**Notes:**

| | |
|---|---|
| Name: | inputEpsilon |
| Class: | double (NSNumber) |
| DisplayName English: | Epsilon |
| DisplayName German: | Epsilon |
| DisplayName French: | Epsilon |
| DisplayName Italian: | Ipsilon |
| DisplayName Spanish: | √âpsilon |
| Type: | CIAttributeTypeScalar |

See AttributeinputEpsilon for more details.
(Read and Write property)

### 58.119.10 inputGuideImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute A larger image to use as a guide.
**Notes:**

See AttributeinputGuideImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputGuideImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | A larger image to use as a guide. |
| DisplayName German: | Gr√√üeres Bild, das als Richtwert verwendet wird. |
| DisplayName French: | Une image plus grande √† utiliser comme guide. |
| DisplayName Italian: | Immagine pi√ grande da utilizzare come guida. |
| DisplayName Spanish: | Una imagen mayor que se usar√° como gu√a. |
| Type: | CIAttributeTypeImage |

### 58.119.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.119.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

## 58.120 class CIFilterHardLightBlendModeMBS

### 58.120.1 class CIFilterHardLightBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hard Light Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHardLightBlendMode |
| DisplayName English: | Hard Light Blend Mode |
| DisplayName German: | Mischmethode ,ÄûHartes Licht,Äú |
| DisplayName French: | Mode de fusion Lumi√®re crue |
| DisplayName Italian: | Modalit√† sfumatura luce intensa |
| DisplayName Spanish: | Modo de mezcla por luz directa |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.120.2 Methods

### 58.120.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.120.4 Properties

### 58.120.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hard Light Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.120.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hard Light Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.120.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.120.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.121 class CIFilterHatchedScreenMBS

### 58.121.1 class CIFilterHatchedScreenMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hatched Screen filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHatchedScreen |
| DisplayName English: | Hatched Screen |
| DisplayName German: | Schraffierter Bereich |
| DisplayName French: | √âcran √† traits parall√®les |
| DisplayName Italian: | Schermo ombreggiato |
| DisplayName Spanish: | Pantalla tramada |

Categories:

- CICategoryHalftoneEffect: Halftone Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.121.2 Methods

### 58.121.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.121.4 Properties

### 58.121.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hatched Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.121.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hatched Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.121.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hatched Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.121.8 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hatched Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.121.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hatched Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.121.10 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.121.11 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.121.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.121.13 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.121.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.122 class CIFilterHeightFieldFromMaskMBS

## 58.122.1 class CIFilterHeightFieldFromMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Height Field From Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHeightFieldFromMask |
| DisplayName English: | Height Field From Mask |
| DisplayName German: | H√henwerte von Maske |
| DisplayName French: | Champ de hauteur du masque |
| DisplayName Italian: | Altezza campo dalla maschera |
| DisplayName Spanish: | Campo de altura a partir de m√°scara |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.122.2 Methods

## 58.122.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.122.4 Properties

### 58.122.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Height Field From Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.122.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Height Field From Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.122.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 10 |
| SliderMaxNumber: | 300 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.122.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.123 class CIFilterHexagonalPixellateMBS

## 58.123.1 class CIFilterHexagonalPixellateMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hexagonal Pixelate filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHexagonalPixellate |
| DisplayName English: | Hexagonal Pixelate |
| DisplayName German: | Hexagonales Verpixeln |
| DisplayName French: | Pixellisation hexagonale |
| DisplayName Italian: | Effetto pixel esagonale |
| DisplayName Spanish: | Pixelado hexagonal |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.123.2 Methods

### 58.123.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.123.4 Properties

### 58.123.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hexagonal Pixelate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.123.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hexagonal Pixelate attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.123.7 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hexagonal Pixelate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 8 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.123.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.123.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.123.10 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

See AttributeinputScale for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeDistance |

## 58.124 class CIFilterHighlightShadowAdjustMBS

### 58.124.1 class CIFilterHighlightShadowAdjustMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Highlight and Shadow Adjust filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHighlightShadowAdjust |
| DisplayName English: | Highlight and Shadow Adjust |
| DisplayName German: | Helle und dunkle Bereiche anpassen |
| DisplayName French: | Ajuster les lumi√®res et les ombres |
| DisplayName Italian: | Regolazione luce e ombre |
| DisplayName Spanish: | Ajuste de resaltados y sombras |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius
- inputShadowAmount: Shadow Amount
- inputHighlightAmount: Highlight Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.124.2 Methods

### 58.124.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.124.4 Properties

### 58.124.5 AttributeinputHighlightAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Highlight and Shadow Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHighlightAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Highlight Amount |
| DisplayName German: | St√§rke der Hervorhebung |
| DisplayName French: | Quantit√© de surbrillance |
| DisplayName Italian: | Quantit√† luci |
| DisplayName Spanish: | Cantidad de resaltados |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0.3 |

(Read only property)

### 58.124.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Highlight and Shadow Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.124.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Highlight and Shadow Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.124.8 AttributeinputShadowAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Highlight and Shadow Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadowAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Shadow Amount |
| DisplayName German: | Schattenumfang |
| DisplayName French: | Quantit√© d,Äôombre |
| DisplayName Italian: | Quantit√† ombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

(Read only property)

### 58.124.9 inputHighlightAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Highlight Amount
**Notes:**

| | |
|---|---|
| Name: | inputHighlightAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Highlight Amount |
| DisplayName German: | St√§rke der Hervorhebung |
| DisplayName French: | Quantit√© de surbrillance |
| DisplayName Italian: | Quantit√† luci |
| DisplayName Spanish: | Cantidad de resaltados |
| Type: | CIAttributeTypeScalar |

See AttributeinputHighlightAmount for more details.
(Read and Write property)

### 58.124.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.124.11 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.124.12 inputShadowAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Amount
**Notes:**

See AttributeinputShadowAmount for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputShadowAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Shadow Amount |
| DisplayName German: | Schattenumfang |
| DisplayName French: | Quantit√© d,Äôombre |
| DisplayName Italian: | Quantit√† ombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado |
| Type: | CIAttributeTypeScalar |

## 58.125 class CIFilterHistogramDisplayFilterMBS

### 58.125.1 class CIFilterHistogramDisplayFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Histogram Display filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHistogramDisplayFilter |
| DisplayName English: | Histogram Display |
| DisplayName German: | Histogrammanzeige |
| DisplayName French: | Affichage de l,Äôhistogramme |
| DisplayName Italian: | Visualizzazione istogramma |
| DisplayName Spanish: | Visualizaci√n de histograma |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputHeight: Height
- inputHighLimit: High Limit
- inputLowLimit: Low Limit

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.125.2 Methods

### 58.125.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.125.4 Properties

### 58.125.5 AttributeinputHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Histogram Display attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHeight |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Height |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| MaxNumber: | 200 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.125.6 AttributeinputHighLimit as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Histogram Display attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputHighLimit |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | High Limit |
| DisplayName German: | H√chstgrenze |
| DisplayName French: | Limite sup√©rieure |
| DisplayName Italian: | Limite superiore |
| DisplayName Spanish: | L√mite superior |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.125.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Histogram Display attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.125.8 AttributeinputLowLimit as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Histogram Display attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputLowLimit |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Low Limit |
| DisplayName German: | Niedrigste Grenze |
| DisplayName French: | Limite inf√©rieure |
| DisplayName Italian: | Limite inferiore |
| DisplayName Spanish: | L√mite inferior |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.125.9 inputHeight as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Height
**Notes:**

| | |
|---|---|
| Name: | inputHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Height |
| DisplayName German: | Height |
| DisplayName French: | Height |
| DisplayName Italian: | Height |
| DisplayName Spanish: | Height |
| Type: | CIAttributeTypeScalar |

See AttributeinputHeight for more details.
(Read and Write property)

### 58.125.10 inputHighLimit as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute High Limit
**Notes:**

| | |
|---|---|
| Name: | inputHighLimit |
| Class: | double (NSNumber) |
| DisplayName English: | High Limit |
| DisplayName German: | H√chstgrenze |
| DisplayName French: | Limite sup√©rieure |
| DisplayName Italian: | Limite superiore |
| DisplayName Spanish: | L√mite superior |
| Type: | CIAttributeTypeScalar |

See AttributeinputHighLimit for more details.
(Read and Write property)

### 58.125.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.125.12 inputLowLimit as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Low Limit
**Notes:**

See AttributeinputLowLimit for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputLowLimit |
| Class: | double (NSNumber) |
| DisplayName English: | Low Limit |
| DisplayName German: | Niedrigste Grenze |
| DisplayName French: | Limite inf√©rieure |
| DisplayName Italian: | Limite inferiore |
| DisplayName Spanish: | L√mite inferior |
| Type: | CIAttributeTypeScalar |

## 58.126 class CIFilterHoleDistortionMBS

### 58.126.1 class CIFilterHoleDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hole Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHoleDistortion |
| DisplayName English: | Hole Distortion |
| DisplayName German: | Verzerrung ,ÄûLoch,Äú |
| DisplayName French: | D√©formation Orifice |
| DisplayName Italian: | Distorsione foro |
| DisplayName Spanish: | Distorsi√n de orificios |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.126.2 Methods

### 58.126.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.126.4 Properties

### 58.126.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hole Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.126.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hole Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.126.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hole Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 150 |
| IdentityNumber: | 0.1 |
| MaxNumber: | 0 |
| MinNumber: | 0.01 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0.01 |

(Read only property)

### 58.126.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.126.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.126.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

# 58.127 class CIFilterHueAdjustMBS

## 58.127.1 class CIFilterHueAdjustMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hue Adjust filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHueAdjust |
| DisplayName English: | Hue Adjust |
| DisplayName German: | Farbton anpassen |
| DisplayName French: | Ajustement de tonalit√© |
| DisplayName Italian: | Regolazione tonalit√† |
| DisplayName Spanish: | Ajuste de matiz |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.127.2 Methods

### 58.127.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.127.4 Properties

### 58.127.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.127.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue Adjust attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.127.7 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.127.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.128 class CIFilterHueBlendModeMBS

## 58.128.1 class CIFilterHueBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hue Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHueBlendMode |
| DisplayName English: | Hue Blend Mode |
| DisplayName German: | Mischmethode ,ÄûFarbton,Äú |
| DisplayName French: | Mode de fusion Tonalit√© |
| DisplayName Italian: | Modalit√† sfumatura tonalit√† |
| DisplayName Spanish: | Modo de mezcla de matiz |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.128.2 Methods

### 58.128.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.128.4 Properties

### 58.128.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.128.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.128.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.128.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.129 class CIFilterHueSaturationValueGradientMBS

## 58.129.1 class CIFilterHueSaturationValueGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Hue/Saturation/Value Gradient filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIHueSaturationValueGradient |
| DisplayName English: | Hue/Saturation/Value Gradient |
| DisplayName German: | Farbton/S√§ttigung/Wertverlauf |
| DisplayName French: | D√©grad√© de teinte/saturation/valeur |
| DisplayName Italian: | Tonalit√†/saturazione/valore gradiente |
| DisplayName Spanish: | Degradado de matiz/saturaci√n/valor |

Categories:

- CICategoryGradient: Gradient
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputValue: Value
- inputRadius: Radius
- inputSoftness: Softness
- inputDither: Dither
- inputColorSpace: Color Space

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.129.2 Methods

### 58.129.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.129.4 Properties

### 58.129.5 AttributeinputColorSpace as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue/Saturation/Value Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.129.6 AttributeinputDither as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue/Saturation/Value Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputDither |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Dither |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

### 58.129.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue/Saturation/Value Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.129.8 AttributeinputSoftness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue/Saturation/Value Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSoftness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Softness |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.129.9 AttributeinputValue as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Hue/Saturation/Value Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputValue |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Value |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.129.10 inputColorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color Space
**Notes:**

| | |
|---|---|
| Name: | inputColorSpace |
| Class: | CGColorSpaceMBS (NSObject) |
| DisplayName English: | Color Space |
| DisplayName German: | Farbraum |
| DisplayName French: | Espace colorim√©trique |
| DisplayName Italian: | Spazio colore |
| DisplayName Spanish: | Espacio de color |

See AttributeinputColorSpace for more details.
(Read and Write property)

### 58.129.11 inputDither as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Dither
**Notes:**

| | |
|---|---|
| Name: | inputDither |
| Class: | double (NSNumber) |
| DisplayName English: | Dither |
| DisplayName German: | Dither |
| DisplayName French: | Dither |
| DisplayName Italian: | Dither |
| DisplayName Spanish: | Dither |
| Type: | CIAttributeTypeScalar |

See AttributeinputDither for more details.
(Read and Write property)

### 58.129.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.129.13 inputSoftness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Softness
**Notes:**

| | |
|---|---|
| Name: | inputSoftness |
| Class: | double (NSNumber) |
| DisplayName English: | Softness |
| DisplayName German: | Softness |
| DisplayName French: | Softness |
| DisplayName Italian: | Softness |
| DisplayName Spanish: | Softness |
| Type: | CIAttributeTypeScalar |

See AttributeinputSoftness for more details.
(Read and Write property)

### 58.129.14 inputValue as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Value
**Notes:**

| | |
|---|---|
| Name: | inputValue |
| Class: | double (NSNumber) |
| DisplayName English: | Value |
| DisplayName German: | Value |
| DisplayName French: | Value |
| DisplayName Italian: | Value |
| DisplayName Spanish: | Value |
| Type: | CIAttributeTypeScalar |

See AttributeinputValue for more details.
(Read and Write property)

# 58.130 class CIFilterKaleidoscopeMBS

## 58.130.1 class CIFilterKaleidoscopeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Kaleidoscope filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIKaleidoscope |
| DisplayName English: | Kaleidoscope |
| DisplayName German: | Kaleidoskop |
| DisplayName French: | Kal√©idoscope |
| DisplayName Italian: | Caleidoscopio |
| DisplayName Spanish: | Caleidoscopio |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCount: Count
- inputCenter: Center
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.130.2 Methods

### 58.130.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.130.4 Properties

### 58.130.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.130.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Kaleidoscope attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.130.7 AttributeinputCount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 64 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.130.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.130.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.130.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.130.11 inputCount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Count
**Notes:**

| | |
|---|---|
| Name: | inputCount |
| Class: | double (NSNumber) |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| Type: | CIAttributeTypeScalar |

See AttributeinputCount for more details.
(Read and Write property)

### 58.130.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.131 class CIFilterKeystoneCorrectionCombinedMBS

## 58.131.1 class CIFilterKeystoneCorrectionCombinedMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Combined Keystone Correction filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIKeystoneCorrectionCombined |
| DisplayName English: | Combined Keystone Correction |
| DisplayName German: | Kombinierte Trapezkorrektur |
| DisplayName French: | Correction de trap√®ze combin√©e |
| DisplayName Italian: | Correzione trapezio combinata |
| DisplayName Spanish: | Correcci√n trapezoidal combinada |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputFocalLength: Focal Length
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

- outputTransform
- outputRotationFilter

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.131.2 Methods

### 58.131.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.131.4 Properties

### 58.131.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.131.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.131.7 AttributeinputFocalLength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| DefaultNumber: | 28 |
| IdentityNumber: | 0 |

(Read only property)

### 58.131.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.131.9 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.131.10 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Combined Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.131.11 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomLeft for more details.
(Read and Write property)

### 58.131.12 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.
(Read and Write property)

### 58.131.13 inputFocalLength as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Focal Length
**Notes:**

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double (NSNumber) |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| Type: | CIAttributeTypeScalar |

See AttributeinputFocalLength for more details.
(Read and Write property)

### 58.131.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.131.15 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.131.16 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.132 class CIFilterKeystoneCorrectionHorizontalMBS

## 58.132.1 class CIFilterKeystoneCorrectionHorizontalMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Horizontal Keystone Correction filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIKeystoneCorrectionHorizontal |
| DisplayName English: | Horizontal Keystone Correction |
| DisplayName German: | Horizontale Trapezkorrektur |
| DisplayName French: | Correction de trap√®ze horizontale |
| DisplayName Italian: | Correzione trapezio orizzontale |
| DisplayName Spanish: | Correcci√n trapezoidal horizontal |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputFocalLength: Focal Length
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

- outputTransform
- outputRotationFilter

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.132.2 Methods

### 58.132.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.132.4 Properties

### 58.132.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.132.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.132.7 AttributeinputFocalLength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| DefaultNumber: | 28 |
| IdentityNumber: | 0 |

(Read only property)

### 58.132.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.132.9 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.132.10 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Horizontal Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.132.11 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomLeft for more details.
(Read and Write property)

### 58.132.12 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.
(Read and Write property)

### 58.132.13 inputFocalLength as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Focal Length
**Notes:**

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double (NSNumber) |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| Type: | CIAttributeTypeScalar |

See AttributeinputFocalLength for more details.
(Read and Write property)

### 58.132.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.132.15 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.132.16 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.133 class CIFilterKeystoneCorrectionVerticalMBS

## 58.133.1 class CIFilterKeystoneCorrectionVerticalMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vertical Keystone Correction filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIKeystoneCorrectionVertical |
| DisplayName English: | Vertical Keystone Correction |
| DisplayName German: | Vertikale Trapezkorrektur |
| DisplayName French: | Correction de trap√®ze verticale |
| DisplayName Italian: | Correzione trapezio verticale |
| DisplayName Spanish: | Correcci√n trapezoidal vertical |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputFocalLength: Focal Length
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

- outputTransform
- outputRotationFilter

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.133.2 Methods

### 58.133.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.133.4 Properties

### 58.133.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.133.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.133.7 AttributeinputFocalLength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| DefaultNumber: | 28 |
| IdentityNumber: | 0 |

(Read only property)

### 58.133.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.133.9 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.133.10 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vertical Keystone Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | n/a |
| IdentityVector: | n/a |

(Read only property)

### 58.133.11 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomLeft for more details.
(Read and Write property)

### 58.133.12 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.
(Read and Write property)

### 58.133.13 inputFocalLength as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Focal Length
**Notes:**

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double (NSNumber) |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| Type: | CIAttributeTypeScalar |

See AttributeinputFocalLength for more details.
(Read and Write property)

### 58.133.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.133.15 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.133.16 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.134 class CIFilterKMeansMBS

## 58.134.1 class CIFilterKMeansMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage KMeans filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIKMeans |
| DisplayName English: | KMeans |
| DisplayName German: | KMeans |
| DisplayName French: | K-moyennes |
| DisplayName Italian: | KMeans |
| DisplayName Spanish: | KMeans |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent
- inputMeans: Means
- inputCount: Count
- inputPasses: Passes
- inputPerceptual: Perceptual

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.134.2 Methods

### 58.134.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.134.4 Properties

### 58.134.5 AttributeinputCount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCount |
| Class: | double |
| Type: | CIAttributeTypeCount |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| DefaultNumber: | 8 |
| IdentityNumber: | 0 |
| MaxNumber: | 128 |
| MinNumber: | 0 |

(Read only property)

### 58.134.6 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.134.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.134.8 AttributeinputMeans as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMeans |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName: | Means |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.134.9 AttributeinputPasses as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPasses |
| Class: | double |
| Type: | CIAttributeTypeCount |
| DisplayName: | Passes |
| DefaultNumber: | 5 |
| IdentityNumber: | 0 |
| MaxNumber: | 20 |
| MinNumber: | 0 |

(Read only property)

### 58.134.10 AttributeinputPerceptual as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the KMeans attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Perceptual |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

### 58.134.11 inputCount as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Count
**Notes:**

| | |
|---|---|
| Name: | inputCount |
| Class: | double (NSNumber) |
| DisplayName English: | Count |
| DisplayName German: | Anzahl |
| DisplayName French: | Compte |
| DisplayName Italian: | Conteggio |
| DisplayName Spanish: | Recuento |
| Type: | CIAttributeTypeCount |

See AttributeinputCount for more details.
(Read and Write property)

### 58.134.12 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

See AttributeinputExtent for more details.
(Read and Write property)

### 58.134.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.134.14 inputMeans as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Means
**Notes:**

| | |
|---|---|
| Name: | inputMeans |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Means |
| DisplayName German: | Means |
| DisplayName French: | Means |
| DisplayName Italian: | Means |
| DisplayName Spanish: | Means |
| Type: | CIAttributeTypeImage |

See AttributeinputMeans for more details.
(Read and Write property)

### 58.134.15 inputPasses as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Passes
**Notes:**

| | |
|---|---|
| Name: | inputPasses |
| Class: | double (NSNumber) |
| DisplayName English: | Passes |
| DisplayName German: | Passes |
| DisplayName French: | Passes |
| DisplayName Italian: | Passes |
| DisplayName Spanish: | Passes |
| Type: | CIAttributeTypeCount |

See AttributeinputPasses for more details.
(Read and Write property)

### 58.134.16 inputPerceptual as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Perceptual
**Notes:**

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double (NSNumber) |
| DisplayName English: | Perceptual |
| DisplayName German: | Perceptual |
| DisplayName French: | Perceptual |
| DisplayName Italian: | Perceptual |
| DisplayName Spanish: | Perceptual |
| Type: | CIAttributeTypeBoolean |

See AttributeinputPerceptual for more details.
(Read and Write property)

## 58.135 class CIFilterLabDeltaEMBS

### 58.135.1 class CIFilterLabDeltaEMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Lab ,àÜE filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILabDeltaE |
| DisplayName English: | Lab ,àÜE |
| DisplayName German: | Lab ,àÜE |
| DisplayName French: | Lab ,àÜE |
| DisplayName Italian: | Lab ,àÜE |
| DisplayName Spanish: | Valores ,àÜE del espacio de color Lab |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputImage2: Image2

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.135.2 Methods

### 58.135.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.135.4 Properties

### 58.135.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lab ,àÜE attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.135.6 AttributeinputImage2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lab ,àÜE attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage2 |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName: | Image2 |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.135.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.135.8 inputImage2 as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image2
**Notes:**

| | |
|---|---|
| Name: | inputImage2 |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image2 |
| DisplayName German: | Image2 |
| DisplayName French: | Image2 |
| DisplayName Italian: | Image2 |
| DisplayName Spanish: | Image2 |
| Type: | CIAttributeTypeImage |

See AttributeinputImage2 for more details.

(Read and Write property)

## 58.136 class CIFilterLanczosScaleTransformMBS

### 58.136.1 class CIFilterLanczosScaleTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Lanczos Scale Transform filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILanczosScaleTransform |
| DisplayName English: | Lanczos Scale Transform |
| DisplayName German: | Lanczos Skalierungstransformation |
| DisplayName French: | Transformation d,Äô√©chelle de Lanczos |
| DisplayName Italian: | Trasforma scala di Lanczos |
| DisplayName Spanish: | Transformar mediante escala Lanczos |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputScale: Scale
- inputAspectRatio: Aspect Ratio

Output:

- outputImage
- outputImageNewScaleX:scaleY:
- outputImageOldScaleX:scaleY:

Subclass of the CIFilterMBS class.

### 58.136.2 Methods

### 58.136.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.136.4 Properties

### 58.136.5 AttributeinputAspectRatio as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lanczos Scale Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAspectRatio |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Aspect Ratio |
| DisplayName German: | Seitenverh√§ltnis |
| DisplayName French: | Proportions |
| DisplayName Italian: | Proporzioni |
| DisplayName Spanish: | Proporciones |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0.5 |

(Read only property)

### 58.136.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lanczos Scale Transform attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.136.7 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lanczos Scale Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 1.5 |
| SliderMinNumber: | 0.05 |

(Read only property)

### 58.136.8 inputAspectRatio as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Aspect Ratio
**Notes:**

See AttributeinputAspectRatio for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAspectRatio |
| Class: | double (NSNumber) |
| DisplayName English: | Aspect Ratio |
| DisplayName German: | Seitenverh√§ltnis |
| DisplayName French: | Proportions |
| DisplayName Italian: | Proporzioni |
| DisplayName Spanish: | Proporciones |
| Type: | CIAttributeTypeScalar |

### 58.136.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.136.10 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

# 58.137 class CIFilterLenticularHaloGeneratorMBS

## 58.137.1 class CIFilterLenticularHaloGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Lenticular Halo filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILenticularHaloGenerator |
| DisplayName English: | Lenticular Halo |
| DisplayName German: | Linsenf√rmiges Halo |
| DisplayName French: | Halo lenticulaire |
| DisplayName Italian: | Alone lenticolare |
| DisplayName Spanish: | Halo lenticular |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor: Color
- inputHaloRadius: Halo Radius
- inputHaloWidth: Halo Width
- inputHaloOverlap: Halo Overlap
- inputStriationStrength: Striation Strength
- inputStriationContrast: Striation Contrast
- inputTime: Time

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.137.2 Methods

### 58.137.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.137.4 Properties

### 58.137.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.137.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 0.9, Blue = 0.8, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.137.7 AttributeinputHaloOverlap as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHaloOverlap |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Halo Overlap |
| DisplayName German: | Halo √ºberlappen |
| DisplayName French: | Superposition de halo |
| DisplayName Italian: | Sovrapposizione alone |
| DisplayName Spanish: | Superposici√n del halo |
| DefaultNumber: | 0.77 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.137.8 AttributeinputHaloRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHaloRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Halo Radius |
| DisplayName German: | Radius des Halo |
| DisplayName French: | Rayon du halo |
| DisplayName Italian: | Raggio alone |
| DisplayName Spanish: | Radio del halo |
| DefaultNumber: | 70 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.137.9 AttributeinputHaloWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHaloWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Halo Width |
| DisplayName German: | Breite des Halo |
| DisplayName French: | Largeur du halo |
| DisplayName Italian: | Larghezza alone |
| DisplayName Spanish: | Anchura del halo |
| DefaultNumber: | 87 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 300 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.137.10 AttributeinputStriationContrast as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.137.11 AttributeinputStriationStrength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.137.12 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lenticular Halo attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.137.13 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.137.14 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.137.15 inputHaloOverlap as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Halo Overlap
**Notes:**

| | |
|---|---|
| Name: | inputHaloOverlap |
| Class: | double (NSNumber) |
| DisplayName English: | Halo Overlap |
| DisplayName German: | Halo √ºberlappen |
| DisplayName French: | Superposition de halo |
| DisplayName Italian: | Sovrapposizione alone |
| DisplayName Spanish: | Superposici√n del halo |
| Type: | CIAttributeTypeScalar |

See AttributeinputHaloOverlap for more details.
(Read and Write property)

### 58.137.16 inputHaloRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Halo Radius
**Notes:**

| | |
|---|---|
| Name: | inputHaloRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Halo Radius |
| DisplayName German: | Radius des Halo |
| DisplayName French: | Rayon du halo |
| DisplayName Italian: | Raggio alone |
| DisplayName Spanish: | Radio del halo |
| Type: | CIAttributeTypeDistance |

See AttributeinputHaloRadius for more details.
(Read and Write property)

### 58.137.17 inputHaloWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Halo Width
**Notes:**

| | |
|---|---|
| Name: | inputHaloWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Halo Width |
| DisplayName German: | Breite des Halo |
| DisplayName French: | Largeur du halo |
| DisplayName Italian: | Larghezza alone |
| DisplayName Spanish: | Anchura del halo |
| Type: | CIAttributeTypeDistance |

See AttributeinputHaloWidth for more details.
(Read and Write property)

### 58.137.18 inputStriationContrast as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Contrast
**Notes:**

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationContrast for more details.
(Read and Write property)

### 58.137.19 inputStriationStrength as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Strength
**Notes:**

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationStrength for more details.
(Read and Write property)

### 58.137.20 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeScalar |

See AttributeinputTime for more details.
(Read and Write property)

# 58.138 class CIFilterLightenBlendModeMBS

## 58.138.1 class CIFilterLightenBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Lighten Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILightenBlendMode |
| DisplayName English: | Lighten Blend Mode |
| DisplayName German: | Mischmethode ,ÄûAufhellen,Äú |
| DisplayName French: | Mode de fusion √âclaircir |
| DisplayName Italian: | Modalit√† sfumatura chiara |
| DisplayName Spanish: | Aclarar modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.138.2 Methods

### 58.138.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.138.4 Properties

### 58.138.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lighten Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.138.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Lighten Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.138.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.138.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.139 class CIFilterLightTunnelMBS

## 58.139.1 class CIFilterLightTunnelMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Light Tunnel Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILightTunnel |
| DisplayName English: | Light Tunnel Distortion |
| DisplayName German: | Lichttunnelverzerrung |
| DisplayName French: | D√©formation du tunnel lumineux |
| DisplayName Italian: | Distorsione tunnel di luce |
| DisplayName Spanish: | Distorsi√n del t√nel de luz |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRotation: Rotation
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.139.2 Methods

### 58.139.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.139.4 Properties

### 58.139.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Light Tunnel Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.139.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Light Tunnel Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.139.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Light Tunnel Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 500 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.139.8 AttributeinputRotation as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Light Tunnel Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRotation |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Rotation |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1.570796 |
| SliderMinNumber: | 0 |

### 58.139.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.139.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

### 58.139.11 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.139.12 inputRotation as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Rotation
**Notes:**

| | |
|---|---|
| Name: | inputRotation |
| Class: | double (NSNumber) |
| DisplayName English: | Rotation |
| DisplayName German: | Rotation |
| DisplayName French: | Rotation |
| DisplayName Italian: | Rotation |
| DisplayName Spanish: | Rotation |
| Type: | CIAttributeTypeAngle |

See AttributeinputRotation for more details.
(Read and Write property)

## 58.140 class CIFilterLinearBurnBlendModeMBS

### 58.140.1 class CIFilterLinearBurnBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Linear Burn Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILinearBurnBlendMode |
| DisplayName English: | Linear Burn Blend Mode |
| DisplayName German: | Mischmethode ,ÄûLinear nachbelichten,Äú |
| DisplayName French: | Mode de fusion √âclaircissement lin√©aire |
| DisplayName Italian: | Modalit√† sfumatura bruciata lineare |
| DisplayName Spanish: | Modo de mezcla por sobreexposici√n lineal |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.140.2 Methods

### 58.140.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.140.4 Properties

### 58.140.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Burn Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.140.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Burn Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.140.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.140.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.141 class CIFilterLinearDodgeBlendModeMBS

### 58.141.1 class CIFilterLinearDodgeBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Linear Dodge Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILinearDodgeBlendMode |
| DisplayName English: | Linear Dodge Blend Mode |
| DisplayName German: | Mischmethode ,ÄûLinear abwedeln,Äú |
| DisplayName French: | Mode de fusion Assombrissement lin√©aire |
| DisplayName Italian: | Modalit√† sfumatura schermata lineare |
| DisplayName Spanish: | Modo de mezcla por evasi√n lineal |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.141.2 Methods

### 58.141.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.141.4 Properties

### 58.141.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Dodge Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.141.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Dodge Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.141.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.141.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.142 class CIFilterLinearGradientMBS

### 58.142.1 class CIFilterLinearGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Linear Gradient filter.
**Example:**

```
// create gradient
dim vektor1 as CIVectorMBS = CIVectorMBS.vectorWithXY(800,600)
dim vektor2 as CIVectorMBS = CIVectorMBS.vectorWithXY(0,0)

dim CiGradiantFilter as new CIFilterLinearGradientMBS
CiGradiantFilter.SetDefaults
CiGradiantFilter.inputPoint0 = vektor1
CiGradiantFilter.inputPoint1 = vektor2
CiGradiantFilter.inputColor0 = CIColorMBS.colorWithRGB(1,1,1)
CiGradiantFilter.inputColor1 = CIColorMBS.colorWithRGB(1,0.5,0.3)

dim r as CIImageMBS = CiGradiantFilter.outputImage

Backdrop = r.RenderPicture(800, 600)
```

**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILinearGradient |
| DisplayName English: | Linear Gradient |
| DisplayName German: | Linearer Verlauf |
| DisplayName French: | D√©grad√© lin√©aire |
| DisplayName Italian: | Gradiente lineare |
| DisplayName Spanish: | Degradado lineal |

Categories:

- CICategoryGradient: Gradient
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputPoint0: Point 0
- inputPoint1: Point 1
- inputColor0: Color 1
- inputColor1: Color 2

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter

### 58.142.2 Methods

### 58.142.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.142.4 Properties

### 58.142.5 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.142.6 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.142.7 AttributeinputPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| DefaultVector: | [ 0 0 ] |
| IdentityVector: | n/a |

### 58.142.8 AttributeinputPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| DefaultVector: | [ 200 200 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.142.9 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

See AttributeinputColor0 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

### 58.142.10 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor1 for more details.
(Read and Write property)

### 58.142.11 inputPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 0
**Notes:**

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint0 for more details.
(Read and Write property)

### 58.142.12 inputPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 1
**Notes:**

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint1 for more details.
(Read and Write property)

## 58.143 class CIFilterLinearLightBlendModeMBS

### 58.143.1 class CIFilterLinearLightBlendModeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Linear Light Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILinearLightBlendMode |
| DisplayName English: | Linear Light Blend Mode |
| DisplayName German: | Mischmethode ,ÄûLineares Licht,Äú |
| DisplayName French: | Mode de fusion Lumi√®re lin√©aire |
| DisplayName Italian: | Modalit√† sfumatura luce lineare |
| DisplayName Spanish: | Modo de mezcla por luz lineal |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.143.2 Methods

### 58.143.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.143.4 Properties

### 58.143.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Linear Light Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.143.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Linear Light Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.143.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.143.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.144 class CIFilterLinearToSRGBToneCurveMBS

### 58.144.1 class CIFilterLinearToSRGBToneCurveMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Linear to sRGB Tone Curve filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILinearToSRGBToneCurve |
| DisplayName English: | Linear to sRGB Tone Curve |
| DisplayName German: | Lineare Farbtonkurve in eine sRGB-Farbtonkurve |
| DisplayName French: | Lin√©aire vers courbe tonale sRGB |
| DisplayName Italian: | Da lineare a curva tonale sRGB |
| DisplayName Spanish: | Curva tonal de lineal a sRGB |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.144.2 Methods

### 58.144.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.144.4 Properties

### 58.144.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Linear to sRGB Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.144.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.145 class CIFilterLineOverlayMBS

## 58.145.1 class CIFilterLineOverlayMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Line Overlay filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILineOverlay |
| DisplayName English: | Line Overlay |
| DisplayName German: | Linien√ºberlagerung |
| DisplayName French: | Incrustation de lignes |
| DisplayName Italian: | Sovrapposizione linea |
| DisplayName Spanish: | L√nea superpuesta |

Categories:

- CICategoryBuiltIn: Built-In
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryStylize: Stylize

Input:

- inputImage: Image
- inputNRNoiseLevel: NR Noise Level
- inputNRSharpness: NR Sharpness
- inputEdgeIntensity: Edge Intensity
- inputThreshold: Threshold
- inputContrast: Contrast

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.145.2 Methods

### 58.145.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.145.4 Properties

### 58.145.5 AttributeinputContrast as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputContrast |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Contrast |
| DisplayName German: | Kontrast |
| DisplayName French: | Contraste |
| DisplayName Italian: | Contrasto |
| DisplayName Spanish: | Contraste |
| DefaultNumber: | 50 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 0.25 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 0.25 |

(Read only property)

### 58.145.6 AttributeinputEdgeIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputEdgeIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Edge Intensity |
| DisplayName German: | Edge Intensity |
| DisplayName French: | Intensit√© des contours |
| DisplayName Italian: | Intensit√† margini |
| DisplayName Spanish: | Intensidad del borde |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.145.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.145.8 AttributeinputNRNoiseLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputNRNoiseLevel |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | NR Noise Level |
| DisplayName German: | NR Rauschpegel |
| DisplayName French: | Niveau de bruit NR |
| DisplayName Italian: | Livello disturbo NS |
| DisplayName Spanish: | Nivel de ruido NR |
| DefaultNumber: | 0.07 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.145.9 AttributeinputNRSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputNRSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | NR Sharpness |
| DisplayName German: | NR Sch√§rfe |
| DisplayName French: | Nettet√© NR |
| DisplayName Italian: | Nitidezza NR |
| DisplayName Spanish: | Nitidez NR |
| DefaultNumber: | 0.71 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.145.10 AttributeinputThreshold as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Overlay attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputThreshold |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Threshold |
| DisplayName German: | Schwellenwert |
| DisplayName French: | Seuil |
| DisplayName Italian: | Soglia |
| DisplayName Spanish: | Umbral |
| DefaultNumber: | 0.1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.145.11 inputContrast as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Contrast
**Notes:**

| | |
|---|---|
| Name: | inputContrast |
| Class: | double (NSNumber) |
| DisplayName English: | Contrast |
| DisplayName German: | Kontrast |
| DisplayName French: | Contraste |
| DisplayName Italian: | Contrasto |
| DisplayName Spanish: | Contraste |
| Type: | CIAttributeTypeScalar |

See AttributeinputContrast for more details.
(Read and Write property)

### 58.145.12 inputEdgeIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Edge Intensity
**Notes:**

| | |
|---|---|
| Name: | inputEdgeIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Edge Intensity |
| DisplayName German: | Edge Intensity |
| DisplayName French: | Intensit√© des contours |
| DisplayName Italian: | Intensit√† margini |
| DisplayName Spanish: | Intensidad del borde |
| Type: | CIAttributeTypeScalar |

See AttributeinputEdgeIntensity for more details.
(Read and Write property)

### 58.145.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.145.14 inputNRNoiseLevel as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute NR Noise Level
**Notes:**

See AttributeinputNRNoiseLevel for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputNRNoiseLevel |
| Class: | double (NSNumber) |
| DisplayName English: | NR Noise Level |
| DisplayName German: | NR Rauschpegel |
| DisplayName French: | Niveau de bruit NR |
| DisplayName Italian: | Livello disturbo NS |
| DisplayName Spanish: | Nivel de ruido NR |
| Type: | CIAttributeTypeScalar |

### 58.145.15 inputNRSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute NR Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputNRSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | NR Sharpness |
| DisplayName German: | NR Sch√§rfe |
| DisplayName French: | Nettet√© NR |
| DisplayName Italian: | Nitidezza NR |
| DisplayName Spanish: | Nitidez NR |
| Type: | CIAttributeTypeScalar |

See AttributeinputNRSharpness for more details.
(Read and Write property)

### 58.145.16 inputThreshold as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Threshold
**Notes:**

| | |
|---|---|
| Name: | inputThreshold |
| Class: | double (NSNumber) |
| DisplayName English: | Threshold |
| DisplayName German: | Schwellenwert |
| DisplayName French: | Seuil |
| DisplayName Italian: | Soglia |
| DisplayName Spanish: | Umbral |
| Type: | CIAttributeTypeScalar |

See AttributeinputThreshold for more details.
(Read and Write property)

# 58.146 class CIFilterLineScreenMBS

## 58.146.1 class CIFilterLineScreenMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Line Screen filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILineScreen |
| DisplayName English: | Line Screen |
| DisplayName German: | Liniertes Halbtonraster |
| DisplayName French: | √âcran √† traits |
| DisplayName Italian: | Schermo lineare |
| DisplayName Spanish: | Pantalla de l√neas |

Categories:

- CICategoryHalftoneEffect: Halftone Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.146.2 Methods

### 58.146.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.146.4 Properties

### 58.146.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.146.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.146.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.146.8 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Screen attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.146.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Line Screen attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 6 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 2 |

(Read only property)

### 58.146.10 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.146.11 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.146.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.146.13 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.146.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.147 class CIFilterLuminosityBlendModeMBS

### 58.147.1 class CIFilterLuminosityBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Luminosity Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CILuminosityBlendMode |
| DisplayName English: | Luminosity Blend Mode |
| DisplayName German: | Mischmethode ,ÄûLeuchtkraft,Äú |
| DisplayName French: | Mode de fusion Luminosit√© |
| DisplayName Italian: | Modalit√† sfumatura luminosit√† |
| DisplayName Spanish: | Modo de mezcla por luminosidad |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.147.2 Methods

### 58.147.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.147.4 Properties

### 58.147.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Luminosity Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.147.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Luminosity Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.147.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.147.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.148 class CIFilterMaskedVariableBlurMBS

### 58.148.1 class CIFilterMaskedVariableBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Masked Variable Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMaskedVariableBlur |
| DisplayName English: | Masked Variable Blur |
| DisplayName German: | Maskierte variable Weichzeichnung |
| DisplayName French: | Flou variable masqu√© |
| DisplayName Italian: | Sfocatura variabile mascherata |
| DisplayName Spanish: | Desenfoque variable con m√°scara |

Categories:

- CICategoryBlur: Blur
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputMask: Mask
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.148.2 Methods

### 58.148.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.148.4 Properties

### 58.148.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Masked Variable Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.148.6 AttributeinputMask as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Masked Variable Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputMask |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName: | Mask |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.148.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Masked Variable Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.148.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.148.9 inputMask as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Mask
**Notes:**

| | |
|---|---|
| Name: | inputMask |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Mask |
| DisplayName German: | Mask |
| DisplayName French: | Mask |
| DisplayName Italian: | Mask |
| DisplayName Spanish: | Mask |
| Type: | CIAttributeTypeImage |

See AttributeinputMask for more details.
(Read and Write property)

### 58.148.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.149 class CIFilterMaskToAlphaMBS

## 58.149.1 class CIFilterMaskToAlphaMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Mask to Alpha filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMaskToAlpha |
| DisplayName English: | Mask to Alpha |
| DisplayName German: | Mit Alpha-Kanal maskieren |
| DisplayName French: | Masque vers alpha |
| DisplayName Italian: | Maschera ad alfa |
| DisplayName Spanish: | M√°scara a alfa |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.149.2 Methods

### 58.149.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.149.4 Properties

### 58.149.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mask to Alpha attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.149.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.150 class CIFilterMaximumComponentMBS

## 58.150.1 class CIFilterMaximumComponentMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Maximum Component filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMaximumComponent |
| DisplayName English: | Maximum Component |
| DisplayName German: | Maximaler Kanal |
| DisplayName French: | Composante maximum |
| DisplayName Italian: | Componente massimo |
| DisplayName Spanish: | Componente m√°ximo |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.150.2 Methods

### 58.150.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.150.4 Properties

### 58.150.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Maximum Component attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.150.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.151 class CIFilterMaximumCompositingMBS

## 58.151.1 class CIFilterMaximumCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Maximum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMaximumCompositing |
| DisplayName English: | Maximum |
| DisplayName German: | Maximum |
| DisplayName French: | Maximum |
| DisplayName Italian: | Massima |
| DisplayName Spanish: | M√°ximo |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.151.2 Methods

### 58.151.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.151.4 Properties

### 58.151.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Maximum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.151.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Maximum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.151.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.151.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.152 class CIFilterMBS

## 58.152.1 class CIFilterMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** CIFilter are filter objects for CoreImage that encapsulate the filter with its attributes.
**Notes:** Mac OS X 10.4 only.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5
- Load RAW image on MacOS with options
- MBS Real Studio Plugins, version 13.1pr5
- Beware of the plugin limit in Real Studio
- MBS Real Studio Plugins, version 12.1pr5
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3

**Xojo Developer Magazine**

- 21.1, page 9: News

## 58.152.2 Methods

## 58.152.3 attributesDictionary as dictionary

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a dictionary of key-value pairs that describe the filter.
**Example:**

```
dim d as new CIFilterComicEffectMBS
dim a as Dictionary = d.attributesDictionary

break // see values in debugger
```

**Notes:** Returns a dictionary that contains a key for each input and output parameter for the filter. Each key is a dictionary that contains all the attributes of an input or output parameter.

### 58.152.4 AttributesItem(index as Integer) as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the attribute with the given index.
**Notes:** Index is zero based.
Nil on any error.
See also:

- 58.152.5 AttributesItem(name as string) as CIAttributeMBS 10096

### 58.152.5 AttributesItem(name as string) as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the attribute with the given name.
**Notes:** nil on error.
See also:

- 58.152.4 AttributesItem(index as Integer) as CIAttributeMBS 10096

### 58.152.6 AttributesName(index as Integer) as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The name of the attribute with the given index.

### 58.152.7 Categories as string()

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Array of filter category names.
**Notes:** nil on any error.

### 58.152.8 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIFilter* and the object is retained.
Raises UnsupportedOperationException if object is not a CIFilter.

### 58.152.9 copy as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the filter.

### 58.152.10 filterArrayFromSerializedXMP(xmpData as MemoryBlock, extent as CGRectMBS, byref NSError as Variant) as CIFilterMBS()

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns an array of filter objects de-serialized from XMP data.
**Notes:** xmpData: The XMP data created previously by calling serializedXMPFromFilters.
extent: The extent of the image from which the XMP data was extracted.
e: The address of an variant for receiving errors, otherwise nil. This is a NSErrorMBS.

Available in OS X v10.9 and later.

### 58.152.11 FilterNamesInCategories(categories() as String) as string()

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing all published filter names that belong to all listed categories.
**Notes:** categories: string array with the constants kCICategory*.
Returns nil on any error.

### 58.152.12 FilterNamesInCategory(category as String) as string()

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing all published filter names in a category.
**Example:**

```
// load list of filters into Listbox

dim a() as string
dim cf as CIFilterMBS

// get all image categories
a=ciFilterMBS.FilterNamesInCategory(CIFilterMBS.kCICategoryStillImage)

StaticText1.text=str(UBound(a))+" filters."
```

```
for each s as string in a

// add to listbox
Listbox1.AddRow s

// load this filter
cf=CIFilterMBS.FilterWithName(s)

// And look into the attributes for the Displayname
if cf<>nil then
Listbox1.cell(Listbox1.LastIndex,1)=cf.DisplayName
end if
next
```

**Notes:** nil on any error.

### 58.152.13 FilterWithHandle(handle as Integer) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** Creates a new filter object based on the given handle.
**Example:**

```
// some filter
dim x as new CIFilterCropMBS

// create a copy
dim f as CIFilterMBS = CIFilterMBS.FilterWithHandle(x.Handle)

// and show name
MsgBox f.FilterName
```

**Notes:** The object is retained.
Returns nil on error.

### 58.152.14 filterWithImageData(Data as MemoryBlock, options as Dictionary) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns a CIFilter that will in turn return a properly processed CIImage as "outputImage".
**Notes:** Note that when using this initializer, you should pass in a source type identifier hint (kCGImage-

SourceTypeIdentifierHint) key/value pair in order to help the decoder determine the file type, as otherwise confusion and incorrect results are possible.

### 58.152.15 filterWithImageFile(File as FolderItem, options as Dictionary) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns a CIFilter that will in turn return a properly processed CIImage as "outputImage".

### 58.152.16 filterWithImageURL(URL as String, options as Dictionary) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns a CIFilter that will in turn return a properly processed CIImage as "outputImage".

### 58.152.17 FilterWithName(name as String) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new filter of type 'name'. All input values will be undefined.
**Example:**

```
dim cf as CIFilterMBS
// load this filter
cf=CIFilterMBS.FilterWithName("CIAffineTile")
```

**Notes:** Returns filter object for the name if found.
See also:

- 58.152.18 FilterWithName(name as String, options as Dictionary) as CIFilterMBS 10099

### 58.152.18 FilterWithName(name as String, options as Dictionary) as CIFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a new filter of type 'name'.
**Notes:** The filter's input parameters are set from the dictionary of key-value pairs.

On OSX, any of the filter input parameters not specified in the dictionary will be undefined.
On iOS, any of the filter input parameters not specified in the dictionary will be set to default values.
Available in macOS 10.10 or newer.
See also:

- 58.152.17 FilterWithName(name as String) as CIFilterMBS 10099

### 58.152.19 InputKeys as string()

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the names of all inputs in the filter.

### 58.152.20 kCIActiveKeys as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Read-only array containing a list of keys that affect the output image.
Depending on the RAW decoder version (kCIInputDecoderVersionKey) and the input image type, some input keys might have no effect.

### 58.152.21 kCIApplyOptionColorSpace as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the apply options.
**Notes:** If used, the value of the kCIApplyOptionColorSpace key be must be an RGB CGColorSpaceMBS.
Using this option specifies that the output of the kernel is in this color space.
If not specified, the output of the kernel is in the working color space of the rendering CIContextMBS.

### 58.152.22 kCIApplyOptionDefinition as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the apply options.

### 58.152.23 kCIApplyOptionExtent as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the apply options.

### 58.152.24 kCIApplyOptionUserInfo as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the apply options.

### 58.152.25 kCIAttributeClass as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Class name of the filter.
**Notes:** The class name of the filter.

### 58.152.26 kCIAttributeDefault as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Default value for the slider.
**Notes:** The default value, specified as a floating-point value, for a filter parameter.

### 58.152.27 kCIAttributeDescription as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the filter attributes.
**Notes:** The localized description of the filter. This description should inform the end user what the filter does and be short enough to display in the user interface for the filter. It is not intended to be technically detailed.

### 58.152.28 kCIAttributeDisplayName as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Display name of this attribute (localized).
**Notes:** The localized version of the filter name that is displayed in the user interface.

### 58.152.29 kCIAttributeFilterAvailable_iOS as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the filter attributes.
**Notes:** The iOS version in which the filter first became available, specified as a string.

### 58.152.30 kCIAttributeFilterAvailable_Mac as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the filter attributes.
**Notes:** The OS X version in which the filter first became available, specified as a string.

### 58.152.31 kCIAttributeFilterCategories as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Array of filter category names (see below)
**Notes:** An array of filter category keys that specifies all the categories in which the filter is a member.

### 58.152.32 kCIAttributeFilterDisplayName as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Name of the filter intended for UI display (eg. localized).
**Notes:** The localized display name of the attribute.

### 58.152.33 kCIAttributeFilterName as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The constant for the name of the filter.

### 58.152.34 kCIAttributeIdentity as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The identity value for this attribute.
**Notes:** If supplied as a value for a parameter, the parameter has no effect on the input image.

### 58.152.35 kCIAttributeMax as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Maximum value for the attribute.
**Notes:** The maximum value for a filter parameter, specified as a floating-point value.

### 58.152.36 kCIAttributeMin as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Minimum value for the attribute.
**Notes:** The minimum value for a filter parameter, specified as a floating-point value.

### 58.152.37 kCIAttributeName as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the filter attributes.
**Notes:** The name of the attribute.

### 58.152.38 kCIAttributeReferenceDocumentation as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the filter attributes.
**Notes:** The localized reference documentation for the filter. The reference should provide developers with technical details.

### 58.152.39 kCIAttributeSliderMax as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Default value for the slider.
**Notes:** The maximum value, specified as a floating-point value, to use for a slider that controls input values for a filter parameter.

### 58.152.40 kCIAttributeSliderMin as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Minimum value for the slider.
**Notes:** The minimum value, specified as a floating-point value, to use for a slider that controls input values for a filter parameter.

### 58.152.41 kCIAttributeType as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Type of the attribute.
**Notes:** An attribute may have a type which defines what kind this attribute type is.
e.g. a number attribute may be a time or a distance.

### 58.152.42 kCIAttributeTypeAngle as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for numbers.
**Notes:** An angle.

### 58.152.43 kCIAttributeTypeBoolean as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for numbers.
**Notes:** A Boolean value.

### 58.152.44 kCIAttributeTypeColor as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** A Core Image color (CIColor object) that specifies red, green, and blue component values.

### 58.152.45 kCIAttributeTypeCount as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** A positive integer value.

### 58.152.46 kCIAttributeTypeDistance as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for numbers.
**Notes:** A distance.

### 58.152.47 kCIAttributeTypeGradient as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for colors.
**Notes:** An n-by-1 gradient image used to describe a color ramp.

### 58.152.48 kCIAttributeTypeImage as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** A CIImage object.

### 58.152.49 kCIAttributeTypeInteger as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** An integer value.

### 58.152.50 kCIAttributeTypeOffset as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for 2-element vectors.
**Notes:** An offset. (A 2-element vector type.)

### 58.152.51 kCIAttributeTypeOpaqueColor as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for colors.
**Notes:** A Core Image color (CIColor object) that specifies red, green, and blue component values. Use this key for colors with no alpha component. If the key is not present, Core Image assumes color with alpha.

### 58.152.52 kCIAttributeTypePosition as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for 2-element vectors.
**Notes:** A two-dimensional location in the working coordinate space. (A 2-element vector type.)

### 58.152.53 kCIAttributeTypePosition3 as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for 3-element vectors.
**Notes:** A three-dimensional location in the working coordinate space. (A 3-element vector type.)

### 58.152.54 kCIAttributeTypeRectangle as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for 4-element vectors.
**Notes:** A Core Image vector that specifies the x and y values of the rectangle origin, and the width (w) and height (h) of the rectangle. The vector takes the form [ x, y, w, h ] . (A 4-element vector type.)

### 58.152.55 kCIAttributeTypeScalar as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the types for numbers.
**Notes:** A scalar value.

### 58.152.56 kCIAttributeTypeTime as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** A parametric time for transitions, specified as a floating-point value in the range of 0.0 to 1.0.

### 58.152.57 kCIAttributeTypeTransform as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the attribute data types.
**Notes:** An CGAffineTransform is associated with attribute.

### 58.152.58 kCICategoryBlur as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that softens images, decreasing the contrast between the edges in an image. Examples of blur filters are Gaussian blur and zoom blur.

### 58.152.59 kCICategoryBuiltIn as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter provided by Core Image. This distinguishes built-in filters from plug-in filters.

### 58.152.60 kCICategoryColorAdjustment as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that changes color values. Color adjustment filters are used to eliminate color casts, adjust hue, and correct brightness and contrast. Color adjustment filters do not perform color management; ColorSync performs color management. You can use Quartz 2D to specify the color space associated with an image.

### 58.152.61 kCICategoryColorEffect as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that modifies the color of an image to achieve an artistic effect. Examples of color effect filters include filters that change a color image to a sepia image or a monochrome image or that produces such effects as posterizing.

### 58.152.62 kCICategoryCompositeOperation as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter operates on two image sources, using the color values of one image to operate on the other. Composite filters perform computations such as computing maximum values, minimum values, and multiplying values between input images. You can use compositing filters to add effects to an image, crop an image, and achieve a variety of other effects.

### 58.152.63 kCICategoryDistortionEffect as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that reshapes an image by altering its geometry to create a 3D effect. Using distortion filters, you can displace portions of an image, apply lens effects, make a bulge in an image, and perform other operation to achieve an artistic effect.

### 58.152.64 kCICategoryFilterGenerator as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter created by chaining several filters together and then packaged as a CIFilterGenerator object.

### 58.152.65 kCICategoryGenerator as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that generates a pattern, such as a solid color, a checkerboard, or a star shine. The generated output is typically used as input to another filter.

### 58.152.66 kCICategoryGeometryAdjustment as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that changes the geometry of an image. Some of these filters are used to warp an image to achieve an artistic effects, but these filters can also be used to correct problems in the source image. For example, you can apply an affine transform to straighten an image that is rotated with respect to the horizon.

### 58.152.67 kCICategoryGradient as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that generates a fill whose color varies smoothly. Exactly how color varies depends on the type of gradient—linear, radial, or Gaussian.

### 58.152.68 kCICategoryHalftoneEffect as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that simulates a variety of halftone screens, to mimic the halftone process used in print media. The output of these filters has the familiar ‚Äúnewspaper‚Äù look of the various dot patterns. Filters are typically named after the pattern created by the virtual halftone screen, such as circular screen or hatched screen.

### 58.152.69 kCICategoryHighDynamicRange as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that works on high dynamic range pixels.

### 58.152.70 kCICategoryInterlaced as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that works on interlaced images.

### 58.152.71 kCICategoryNonSquarePixels as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that works on non-square pixels.

### 58.152.72 kCICategoryReduction as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that reduces image data. These filters are used to solve image analysis problems.

### 58.152.73 kCICategorySharpen as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that sharpens images, increasing the contrast between the edges in an image. Examples of sharpen filters are unsharp mask and sharpen luminance.

### 58.152.74 kCICategoryStillImage as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that works on still images.

### 58.152.75 kCICategoryStylize as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that makes a photographic image look as if it was painted or sketched. These filters are typically used alone or in combination with other filters to achieve artistic effects.

### 58.152.76 kCICategoryTileEffect as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that typically applies an effect to an image and then create smaller versions of the image (tiles), which are then laid out to create a pattern that,Äôs infinite in extent.

### 58.152.77 kCICategoryTransition as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that provides a bridge between two or more images by applying a motion effect that defines how the pixels of a source image yield to that of the destination image.

### 58.152.78 kCICategoryVideo as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** One of the categories.
**Notes:** A filter that works on video images.

### 58.152.79 kCIInputAllowDraftModeKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Setting Draft Mode to true can improve image decoding speed without minimal loss of quality.
The default value is false.

### 58.152.80 kCIInputAngleKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.81 kCIInputAspectRatioKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.82 kCIInputBackgroundImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.83 kCIInputBaselineExposureKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: A value controlling the amount of baseline exposure applied to the image.
A value of 0 indicates no baseline exposure, i.e. linear response. Default varies from with camera settings.
Available on macOS 10.12 or newer.

### 58.152.84 kCIInputBiasKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.85 kCIInputBoostKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: A value in the range of 0...1, controlling the amount of boost applied to the image.
A value of 0 indicates no boost, i.e. linear response. Default is 1, full boost.

### 58.152.86 kCIInputBoostShadowAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The amount to boost the shadow areas of the image. Can be used to lighten details in shadows.
Has no effect if the image used for initialization was not RAW.

### 58.152.87 kCIInputBrightnessKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.88 kCIInputCenterKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.89 kCIInputColorKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.90 kCIInputColorNoiseReductionAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of color noise reduction applied. Range is 0 to 1.

### 58.152.91 kCIInputContrastKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.92 kCIInputDecoderVersionKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Version string representing the decoder version to be used. A newly initialized object defaults to the newest available decoder version for the given image type. User can request an alternative, older version in order to maintain compatibility with older releases. Must be one of kCISupportedDecoderVersions (below),

otherwise a nil output image will be generated.

### 58.152.93 kCIInputDepthImageKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the common filter parameter keys.
**Notes:** Available on macOS 10.13 or newer.

### 58.152.94 kCIInputDisableGamutMapKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Setting DisableGamutMap to true disables gamut mapping.
The default value is false.

### 58.152.95 kCIInputDisparityImageKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the common filter parameter keys.
**Notes:** Available on macOS 10.13 or newer.

### 58.152.96 kCIInputEnableChromaticNoiseTrackingKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Determines if progressive chromatic noise tracking (based on ISO and exposure time) should be used. default = true. Has no effect if the image used for initialization was not RAW.

### 58.152.97 kCIInputEnableSharpeningKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Determines if the default sharpening should be on. default = true. Has no effect if the image used for initialization was not RAW.

### 58.152.98 kCIInputEnableVendorLensCorrectionKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Determines if the default vendor lens correction be on. default = true if raw image used for initialization contains lens distortion parameters.

### 58.152.99 kCIInputEVKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.100 kCIInputExtentKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.101 kCIInputGradientImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.102 kCIInputIgnoreImageOrientationKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Boolean: Normally, an image is loaded in its proper orientation, given the associated metadata gives an indication about the orientation. For special purposes it may be useful to load the image in its physical orientation. The exact meaning of this is dependent on the image in question. The default value is false.

### 58.152.103 kCIInputImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.104 kCIInputImageOrientationKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Integer: Overriding this value allows the user to change the orientation of the image. The valid values are in range 1...8 and follow the EXIF specification. Changing this value makes for instance rotation in 90-degree increments easy. The value is disregarded when the kCIInputIgnoreImageOrientationKey flag is set.

### 58.152.105 kCIInputIntensityKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.106 kCIInputLinearSpaceFilter as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** CIFilterMBS: CIFilter to be applied to the RAW image while it is in linear space.

### 58.152.107 kCIInputLuminanceNoiseReductionAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of luminance noise reduction applied. Range is 0 to 1.

### 58.152.108 kCIInputMaskImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.109 kCIInputMoireAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of moire reduction applied. Range is 0 to 1.
Available on macOS 10.13

### 58.152.110 kCIInputNeutralChromaticityXKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The X value of the chromaticity. You can always query this value and you'll get the current X value for neutral X,Y.

### 58.152.111 kCIInputNeutralChromaticityYKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The Y value of the chromaticity. You can always query this value and you'll get the current Y value for neutral X,Y.

### 58.152.112 kCIInputNeutralLocationKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** CIVector: (x, y) location in geometric coordinates of the unrotated output image that should be used as neutral.
You can't query this value - it's undefined for reading.

### 58.152.113 kCIInputNeutralTemperatureKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The color temperature to be considered neutral. You can always query this value and you'll get the current value for temperature.

### 58.152.114 kCIInputNeutralTintKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The tint to be considered neutral. You can always query this value and you'll get the current value for tint.

### 58.152.115 kCIInputNoiseReductionAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of noise reduction applied. Range is 0 to 1.

### 58.152.116 kCIInputNoiseReductionContrastAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of noise reduction contrast applied. Range is 0 to 1.

### 58.152.117 kCIInputNoiseReductionDetailAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of noise reduction detail applied. Range is 0 to 1.

### 58.152.118 kCIInputNoiseReductionSharpnessAmountKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Double: The amount of noise reduction sharpness applied. Range is 0 to 1.

### 58.152.119 kCIInputRadiusKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.120 kCIInputRefractionKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.121 kCIInputSaturationKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.122 kCIInputScaleFactorKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Float: The desired scale factor at which the image will be eventually drawn. Setting this value can greatly improve the drawing performance. A value of 1 would mean identity, values smaller than 1 will result in a smaller output image. Changing the Scale Factor with enabled Draft Mode may also improve performance.

### 58.152.123 kCIInputScaleKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.124 kCIInputShadingImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.125 kCIInputSharpnessKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.126 kCIInputTargetImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.127 kCIInputTimeKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.128 kCIInputTransformKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.129 kCIInputVersionKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.130 kCIInputWeightsKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the common filter parameter keys.

### 58.152.131 kCIInputWidthKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the input keys.

### 58.152.132 kCIOutputImageKey as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The key for the output image.

### 58.152.133 kCIOutputNativeSizeKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** CIVector containing the full native size of the unscaled image. The vector's X value is the width, Y is the height.
This is not affected by changing either kCIInputIgnoreImageOrientationKey or kCIInputImageOrientationKey.

### 58.152.134 kCISupportedDecoderVersionsKey as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the options for image filter initialization.
**Notes:** Array of dictionary: Array of all supported decoder versions for the given image type, sorted in increasingly newer order. Each entry is a NSDictionary with a number of key/value pairs. All entries would represent a valid version identifier to be passed in for kCIInputDecoderVersion. This value can be only read; setting this value will raise an exception. Currently, the only defined key is @"version" which has as a value an String uniquely describing a given decoder version. This string may not be suitable for user interface display.

### 58.152.135 kCIUIParameterSet as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Sets of controls for various user scenarios.
**Notes:** The set of input parameters to use. The associated value can be kCIUISetBasic, kCIUISetIntermediate, kCIUISetAdvanced, or kCIUISetDevelopment.

### 58.152.136 kCIUISetAdvanced as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the UI Set constants.
**Notes:** Controls that are appropriate for an advanced user scenario.

### 58.152.137 kCIUISetBasic as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the UI Set constants.
**Notes:** Controls that are appropriate for a basic user scenario, that is, the minimum of settings to control the filter.

### 58.152.138 kCIUISetDevelopment as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the UI Set constants.
**Notes:** Controls that should be visible only for development purposes.

### 58.152.139 kCIUISetIntermediate as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the UI Set constants.
**Notes:** Controls that are appropriate for an intermediate user scenario.

### 58.152.140 localizedDescriptionForFilterName(filterName as String) as String

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the localized description of a filter for display in the user interface.
**Example:**

```
MsgBox CIFilterMBS.localizedDescriptionForFilterName("CIComicEffect")
```

**Notes:** filterName: The filter name.
Returns the localized description of the filter.

Available in OS X v10.5 and later.

### 58.152.141 LocalizedNameForCategory(name as String) as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The localized name of a category.

### 58.152.142 LocalizedNameForFilterName(name as String) as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the localized name of a filter.

### 58.152.143 localizedReferenceDocumentationForFilterName(filterName as String) as String

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns the location of the localized reference documentation that describes the filter.
**Example:**

MsgBox CIFilterMBS.localizedReferenceDocumentationForFilterName("CIComicEffect")

**Notes:** filterName: The filter name.

Returns an URL that specifies the location of the localized documentation, or "" if the filter does not provide localized reference documentation.

The URL can be a local file or a remote document on a web server. Because filters created prior to OS X v10.5 could return nil, you should be make sure that your code handles this case gracefully.

Available in OS X v10.5 and later.

### 58.152.144 OutputKeys as string()

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the names of all outputs in the filter.

### 58.152.145 serializedXMPFromFilters(filters() as CIFilterMBS, extent as CGRectMBS) as Memoryblock

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Serializes filter parameters into XMP form that is suitable for embedding in an image.
**Notes:** filters: The array of filters to serialize. See Discussion for the filters that can be serialized.
extent: The extent of the input image to the filter.

At this time the only filters classes that can be serialized using this method are, CIAffineTransform, CICrop, and the filters returned by the CIImage methods autoAdjustmentFilters and autoAdjustmentFiltersWithOptions. The parameters of other filter classes will not be serialized.

Available in OS X v10.9 and later.

### 58.152.146 SetDefaults

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Sets all inputs to their default values (where default values are defined, other inputs are left as-is).

### 58.152.147 Properties

### 58.152.148 AttributesCount as Integer

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Number of attributes.
**Notes:** (Read only property)

### 58.152.149 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this filter.
**Notes:** (Read only property)

### 58.152.150 DisplayName as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Name of the filter intended for UI display (eg. localized)
**Example:**

```
dim cf as new CIFilterLuminosityBlendModeMBS
MsgBox cf.DisplayName // shows: "Luminosity Blend Mode"
```

**Notes:** (Read only property)

### 58.152.151 Enabled as Boolean

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Whether filter is enabled for animation.
**Notes:** The 'enabled' property is used only by CoreAnimation and is animatable.
In Core Animation, a CIFilter only applied to its input when this property is set to true.
(Read and Write property)

### 58.152.152 FilterName as string

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Name of the filter.
**Notes:** (Read only property)

### 58.152.153 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the internal used CIFilter reference.
**Notes:** (Read only property)

### 58.152.154 Name as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The filter name.
**Notes:** On OSX this property is read-write. This can be useful when using CIFilters with CALayers to construct unique keypaths.
For example, to set an attribute of a filter attached to a layer, a path such as "filters.myExposureFilter.inputEV" could be used.
CALayer animations may also access filter attributes via key-paths.
(Read and Write property)

### 58.152.155 outputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The output image.
**Notes:** Available directly on OS X 10.10 or newer, but our plugin implements it also for older versions by using valueForKey internally.
(Read only property)

### 58.152.156 ValueAsAffineTransform(key as string) as NSAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as an affine transform.
**Notes:** On if attributes classname is NSAffineTransform.
(Read and Write computed property)

### 58.152.157 ValueAsCIColor(key as string) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as a color.
**Notes:** On if attributes classname is CIColor.
(Read and Write computed property)

### 58.152.158 ValueAsCIImage(key as string) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as an image.
**Notes:** On if attributes classname is NSImage.
(Read and Write computed property)

### 58.152.159 ValueAsCIVector(key as string) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as a vector.
**Notes:** On if attributes classname is CIVector.
(Read and Write computed property)

### 58.152.160 ValueAsData(key as string) as memoryblock

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as a memoryblock.
**Notes:** On if attributes classname is memoryblock.
(Read and Write computed property)

### 58.152.161 ValueAsNumber(key as string) as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Get or set a value as a double.
**Notes:** On if attributes classname is number.
(Read and Write computed property)

### 58.152.162 ValueAsString(key as string) as String

MBS MacCI Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set a value as a string.
**Notes:** On if attributes classname is NSString.
(Read and Write computed property)

## 58.153 class CIFilterMedianFilterMBS

### 58.153.1 class CIFilterMedianFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Median filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMedianFilter |
| DisplayName English: | Median |
| DisplayName German: | Median |
| DisplayName French: | M√©dian |
| DisplayName Italian: | Mediana |
| DisplayName Spanish: | Mediano |

Categories:

- CICategoryBlur: Blur
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.153.2 Methods

### 58.153.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.153.4 Properties

### 58.153.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Median attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.153.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.154 class CIFilterMeshGeneratorMBS

## 58.154.1 class CIFilterMeshGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Mesh Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMeshGenerator |
| DisplayName English: | Mesh Generator |
| DisplayName German: | Gittergenerator |
| DisplayName French: | G√©n√©rateur de maillage |
| DisplayName Italian: | Generatore di mesh |
| DisplayName Spanish: | Generador de mallas |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputWidth: Width
- inputColor: Color
- inputMesh: Mesh

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.154.2 Methods

### 58.154.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.154.4 Properties

### 58.154.5 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mesh Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.154.6 AttributeinputMesh as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mesh Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputMesh |
| Class: | Variant |
| DisplayName: | Mesh |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.154.7 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mesh Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 1.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.154.8 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

See AttributeinputColor for more details.
(Read and Write property)

### 58.154.9 inputMesh as Variant

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

**Function:** The attribute Mesh
**Notes:**

| | |
|---|---|
| Name: | inputMesh |
| Class: | Variant (NSArray) |
| DisplayName English: | Mesh |
| DisplayName German: | Mesh |
| DisplayName French: | Mesh |
| DisplayName Italian: | Mesh |
| DisplayName Spanish: | Mesh |

See AttributeinputMesh for more details.
(Read and Write property)

### 58.154.10 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.155 class CIFilterMinimumComponentMBS

## 58.155.1 class CIFilterMinimumComponentMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Minimum Component filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMinimumComponent |
| DisplayName English: | Minimum Component |
| DisplayName German: | Minimaler Kanal |
| DisplayName French: | Composante minimum |
| DisplayName Italian: | Componente minimo |
| DisplayName Spanish: | Componente m√nimo |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.155.2 Methods

### 58.155.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.155.4 Properties

### 58.155.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Minimum Component attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.155.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.156 class CIFilterMinimumCompositingMBS

### 58.156.1 class CIFilterMinimumCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Minimum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMinimumCompositing |
| DisplayName English: | Minimum |
| DisplayName German: | Minimum |
| DisplayName French: | Minimum |
| DisplayName Italian: | Minima |
| DisplayName Spanish: | M√nimo |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.156.2 Methods

### 58.156.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.156.4 Properties

### 58.156.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Minimum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.156.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Minimum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.156.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.156.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.157 class CIFilterMixMBS

### 58.157.1 class CIFilterMixMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Mix filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMix |
| DisplayName English: | Mix |
| DisplayName German: | Mix |
| DisplayName French: | M√©lange |
| DisplayName Italian: | Mix |
| DisplayName Spanish: | Mezcla |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image
- inputAmount: Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.157.2 Methods

### 58.157.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.157.4 Properties

### 58.157.5 AttributeinputAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.157.6 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mix attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.157.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mix attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.157.8 inputAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Amount
**Notes:**

See AttributeinputAmount for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| Type: | CIAttributeTypeScalar |

### 58.157.9 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.157.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.158 class CIFilterModTransitionMBS

## 58.158.1 class CIFilterModTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Mod filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIModTransition |
| DisplayName English: | Mod |
| DisplayName German: | Mod |
| DisplayName French: | Mod |
| DisplayName Italian: | Mod |
| DisplayName Spanish: | Mod |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputCenter: Center
- inputTime: Time
- inputAngle: Angle
- inputRadius: Radius
- inputCompression: Compression

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.158.2 Methods

### 58.158.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.158.4 Properties

### 58.158.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 2 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | -6.283185 |

(Read only property)

### 58.158.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.158.7 AttributeinputCompression as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCompression |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Compression |
| DisplayName German: | Komprimierung |
| DisplayName French: | Compression |
| DisplayName Italian: | Compressione |
| DisplayName Spanish: | Compresi√n |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 100 |

(Read only property)

### 58.158.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.158.9 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 150 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.158.10 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.158.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Mod attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.158.12 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

See AttributeinputAngle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

### 58.158.13 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.158.14 inputCompression as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Compression
**Notes:**

| | |
|---|---|
| Name: | inputCompression |
| Class: | double (NSNumber) |
| DisplayName English: | Compression |
| DisplayName German: | Komprimierung |
| DisplayName French: | Compression |
| DisplayName Italian: | Compressione |
| DisplayName Spanish: | Compresi√n |
| Type: | CIAttributeTypeDistance |

See AttributeinputCompression for more details.
(Read and Write property)

### 58.158.15 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.158.16 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.158.17 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.158.18 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

See AttributeinputTime for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

# 58.159 class CIFilterMorphologyGradientMBS

## 58.159.1 class CIFilterMorphologyGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Morphology Gradient filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMorphologyGradient |
| DisplayName English: | Morphology Gradient |
| DisplayName German: | Morphologischer Verlauf |
| DisplayName French: | Gradient morphologique |
| DisplayName Italian: | Gradiente morfologico |
| DisplayName Spanish: | Gradiente morfol√gico |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.159.2 Methods

### 58.159.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.159.4 Properties

### 58.159.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.159.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

### 58.159.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.159.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

# 58.160 class CIFilterMorphologyMaximumMBS

## 58.160.1 class CIFilterMorphologyMaximumMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Morphology Maximum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMorphologyMaximum |
| DisplayName English: | Morphology Maximum |
| DisplayName German: | Morphologisches Maximum |
| DisplayName French: | Maximum morphologique |
| DisplayName Italian: | Massimo morfologico |
| DisplayName Spanish: | M√°ximo morfol√gico |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.160.2 Methods

### 58.160.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.160.4 Properties

### 58.160.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Maximum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.160.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Maximum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

### 58.160.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.160.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.161 class CIFilterMorphologyMinimumMBS

### 58.161.1 class CIFilterMorphologyMinimumMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Morphology Minimum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMorphologyMinimum |
| DisplayName English: | Morphology Minimum |
| DisplayName German: | Morphologisches Minimum |
| DisplayName French: | Minimum morphologique |
| DisplayName Italian: | Minimo morfologico |
| DisplayName Spanish: | M√nimo morfol√gico |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.161.2 Methods

### 58.161.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.161.4 Properties

### 58.161.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Minimum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.161.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Minimum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

### 58.161.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.161.8 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.162 class CIFilterMorphologyRectangleMaximumMBS

### 58.162.1 class CIFilterMorphologyRectangleMaximumMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Morphology Rectangle Maximum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMorphologyRectangleMaximum |
| DisplayName English: | Morphology Rectangle Maximum |
| DisplayName German: | Maximum des Morphologierechtecks |
| DisplayName French: | Maximum morphologique (rectangulaire) |
| DisplayName Italian: | Massimo morfologico rettangolare |
| DisplayName Spanish: | M√°ximo morfol√gico rectangular |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputWidth: Width
- inputHeight: Height

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.162.2 Methods

### 58.162.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.162.4 Properties

### 58.162.5 AttributeinputHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Maximum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHeight |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName: | Height |
| DefaultNumber: | 5 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 49 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.162.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Maximum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.162.7 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Maximum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 5 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 49 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.162.8 inputHeight as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Height
**Notes:**

See AttributeinputHeight for more details.

| | |
|---|---|
| Name: | inputHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Height |
| DisplayName German: | Height |
| DisplayName French: | Height |
| DisplayName Italian: | Height |
| DisplayName Spanish: | Height |
| Type: | CIAttributeTypeInteger |

(Read and Write property)

### 58.162.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.162.10 inputWidth as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeInteger |

# 58.163 class CIFilterMorphologyRectangleMinimumMBS

## 58.163.1 class CIFilterMorphologyRectangleMinimumMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Morphology Rectangle Minimum filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMorphologyRectangleMinimum |
| DisplayName English: | Morphology Rectangle Minimum |
| DisplayName German: | Minimum des Morphologierechtecks |
| DisplayName French: | Minimum morphologique (rectangulaire) |
| DisplayName Italian: | Minimo morfologico rettangolare |
| DisplayName Spanish: | M√nimo morfol√gico rectangular |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputWidth: Width
- inputHeight: Height

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.163.2 Methods

### 58.163.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.163.4 Properties

### 58.163.5 AttributeinputHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Minimum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputHeight |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName: | Height |
| DefaultNumber: | 5 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 49 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.163.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Minimum attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.163.7 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Morphology Rectangle Minimum attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 5 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 49 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.163.8 inputHeight as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Height
**Notes:**

See AttributeinputHeight for more details.

| | |
|---|---|
| Name: | inputHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Height |
| DisplayName German: | Height |
| DisplayName French: | Height |
| DisplayName Italian: | Height |
| DisplayName Spanish: | Height |
| Type: | CIAttributeTypeInteger |

(Read and Write property)

### 58.163.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.163.10 inputWidth as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeInteger |

## 58.164 class CIFilterMotionBlurMBS

### 58.164.1 class CIFilterMotionBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Motion Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMotionBlur |
| DisplayName English: | Motion Blur |
| DisplayName German: | Bewegungsunsch√§rfe |
| DisplayName French: | Flou mouvement |
| DisplayName Italian: | Sfumatura movimento |
| DisplayName Spanish: | Difuminado de movimiento |

Categories:

- CICategoryBlur: Blur
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.164.2 Methods

### 58.164.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.164.4 Properties

### 58.164.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Motion Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.164.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Motion Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.164.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Motion Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 20 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.164.8 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

See AttributeinputAngle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

### 58.164.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.164.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.165 class CIFilterMultiplyBlendModeMBS

## 58.165.1 class CIFilterMultiplyBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Multiply Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMultiplyBlendMode |
| DisplayName English: | Multiply Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûMultiplizieren‚Äú |
| DisplayName French: | Mode de fusion Multiplication |
| DisplayName Italian: | Modalit√† sfumatura moltiplicata |
| DisplayName Spanish: | Multiplicar modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.165.2 Methods

### 58.165.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.165.4 Properties

### 58.165.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Multiply Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.165.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Multiply Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.165.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.165.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.166 class CIFilterMultiplyCompositingMBS

## 58.166.1 class CIFilterMultiplyCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Multiply filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIMultiplyCompositing |
| DisplayName English: | Multiply |
| DisplayName German: | Multiplizieren |
| DisplayName French: | Multiplier |
| DisplayName Italian: | Moltiplica |
| DisplayName Spanish: | Multiplicar |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.166.2 Methods

### 58.166.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.166.4 Properties

### 58.166.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Multiply attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.166.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Multiply attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.166.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.166.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.167 class CIFilterNinePartStretchedMBS

## 58.167.1 class CIFilterNinePartStretchedMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Nine Part Stretched filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CINinePartStretched |
| DisplayName English: | Nine Part Stretched |
| DisplayName German: | Neun Teile gedehnt |
| DisplayName French: | √âtir√© en neuf parties |
| DisplayName Italian: | Con allungamento in nove parti |
| DisplayName Spanish: | Estirado en nueve partes |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputBreakpoint0: Breakpoint0
- inputBreakpoint1: Breakpoint1
- inputGrowAmount: Grow Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.167.2 Methods

### 58.167.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.167.4 Properties

### 58.167.5 AttributeinputBreakpoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Stretched attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBreakpoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName: | Breakpoint0 |
| DefaultVector: | [ 50 50 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.167.6 AttributeinputBreakpoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Stretched attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.167.7 AttributeinputGrowAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputBreakpoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName: | Breakpoint1 |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

**Function:** Details about the Nine Part Stretched attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGrowAmount |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Grow Amount |
| DisplayName German: | Wachstum |
| DisplayName French: | Degr√© d,Äôagrandissement |
| DisplayName Italian: | Quantit√† di sviluppo |
| DisplayName Spanish: | Cantidad de crecimiento |
| DefaultVector: | [ 100 100 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.167.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Stretched attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.167.9 inputBreakpoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Breakpoint0
**Notes:**

| | |
|---|---|
| Name: | inputBreakpoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Breakpoint0 |
| DisplayName German: | Breakpoint0 |
| DisplayName French: | Breakpoint0 |
| DisplayName Italian: | Breakpoint0 |
| DisplayName Spanish: | Breakpoint0 |
| Type: | CIAttributeTypePosition |

See AttributeinputBreakpoint0 for more details.
(Read and Write property)

### 58.167.10 inputBreakpoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Breakpoint1
**Notes:**

| | |
|---|---|
| Name: | inputBreakpoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Breakpoint1 |
| DisplayName German: | Breakpoint1 |
| DisplayName French: | Breakpoint1 |
| DisplayName Italian: | Breakpoint1 |
| DisplayName Spanish: | Breakpoint1 |
| Type: | CIAttributeTypePosition |

See AttributeinputBreakpoint1 for more details.
(Read and Write property)

### 58.167.11 inputGrowAmount as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Grow Amount
**Notes:**

| | |
|---|---|
| Name: | inputGrowAmount |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Grow Amount |
| DisplayName German: | Wachstum |
| DisplayName French: | Degr√© d,Äôagrandissement |
| DisplayName Italian: | Quantit√† di sviluppo |
| DisplayName Spanish: | Cantidad de crecimiento |
| Type: | CIAttributeTypeOffset |

See AttributeinputGrowAmount for more details.
(Read and Write property)

### 58.167.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.168 class CIFilterNinePartTiledMBS

### 58.168.1 class CIFilterNinePartTiledMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Nine Part Tiled filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CINinePartTiled |
| DisplayName English: | Nine Part Tiled |
| DisplayName German: | Neun Teile gekachelt |
| DisplayName French: | Mosa√Øque en neuf parties |
| DisplayName Italian: | Con schema a mosaico in nove parti |
| DisplayName Spanish: | Mosaico en nueve partes |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputBreakpoint0: Breakpoint0
- inputBreakpoint1: Breakpoint1
- inputGrowAmount: Grow Amount
- inputFlipYTiles: Flip Y Tiles

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.168.2 Methods

### 58.168.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.168.4 Properties

### 58.168.5 AttributeinputBreakpoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Tiled attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBreakpoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName: | Breakpoint0 |
| DefaultVector: | [ 50 50 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.168.6 AttributeinputBreakpoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Tiled attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.168.7 AttributeinputFlipYTiles as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputBreakpoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName: | Breakpoint1 |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

**Function:** Details about the Nine Part Tiled attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFlipYTiles |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Flip Y Tiles |
| DisplayName German: | Y-Kacheln spiegeln |
| DisplayName French: | Retourner les mosa√Øques¬†Y |
| DisplayName Italian: | Capovolge caselle Y |
| DisplayName Spanish: | Voltear teselas en Y |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

(Read only property)

### 58.168.8 AttributeinputGrowAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Tiled attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.168.9 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Nine Part Tiled attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputGrowAmount |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Grow Amount |
| DisplayName German: | Wachstum |
| DisplayName French: | Degr√© d,Äôagrandissement |
| DisplayName Italian: | Quantit√† di sviluppo |
| DisplayName Spanish: | Cantidad de crecimiento |
| DefaultVector: | [ 100 100 ] |
| IdentityVector: | n/a |

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.168.10 inputBreakpoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Breakpoint0
**Notes:**

| | |
|---|---|
| Name: | inputBreakpoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Breakpoint0 |
| DisplayName German: | Breakpoint0 |
| DisplayName French: | Breakpoint0 |
| DisplayName Italian: | Breakpoint0 |
| DisplayName Spanish: | Breakpoint0 |
| Type: | CIAttributeTypePosition |

See AttributeinputBreakpoint0 for more details.

(Read and Write property)

### 58.168.11 inputBreakpoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Breakpoint1
**Notes:**

| | |
|---|---|
| Name: | inputBreakpoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Breakpoint1 |
| DisplayName German: | Breakpoint1 |
| DisplayName French: | Breakpoint1 |
| DisplayName Italian: | Breakpoint1 |
| DisplayName Spanish: | Breakpoint1 |
| Type: | CIAttributeTypePosition |

See AttributeinputBreakpoint1 for more details.
(Read and Write property)

### 58.168.12 inputFlipYTiles as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Flip Y Tiles
**Notes:**

| | |
|---|---|
| Name: | inputFlipYTiles |
| Class: | double (NSNumber) |
| DisplayName English: | Flip Y Tiles |
| DisplayName German: | Y-Kacheln spiegeln |
| DisplayName French: | Retourner les mosa√Øques¬†Y |
| DisplayName Italian: | Capovolge caselle Y |
| DisplayName Spanish: | Voltear teselas en Y |
| Type: | CIAttributeTypeBoolean |

See AttributeinputFlipYTiles for more details.
(Read and Write property)

### 58.168.13 inputGrowAmount as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Grow Amount
**Notes:**

| | |
|---|---|
| Name: | inputGrowAmount |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Grow Amount |
| DisplayName German: | Wachstum |
| DisplayName French: | Degr√© d,Äôagrandissement |
| DisplayName Italian: | Quantit√† di sviluppo |
| DisplayName Spanish: | Cantidad de crecimiento |
| Type: | CIAttributeTypeOffset |

See AttributeinputGrowAmount for more details.
(Read and Write property)

### 58.168.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

## 58.169 class CIFilterNoiseReductionMBS

### 58.169.1 class CIFilterNoiseReductionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Noise Reduction filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CINoiseReduction |
| DisplayName English: | Noise Reduction |
| DisplayName German: | Rauschunterdr√ºckung |
| DisplayName French: | R√©duction du bruit |
| DisplayName Italian: | Riduzione disturbo |
| DisplayName Spanish: | Reducci√n de ruido |

Categories:

- CICategoryBlur: Blur
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputNoiseLevel: Noise Level
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.169.2 Methods

### 58.169.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.169.4 Properties

### 58.169.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Noise Reduction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.169.6 AttributeinputNoiseLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Noise Reduction attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputNoiseLevel |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Noise Level |
| DisplayName German: | Rauschpegel |
| DisplayName French: | Niveau de bruit |
| DisplayName Italian: | Livello disturbo |
| DisplayName Spanish: | Nivel de ruido |
| DefaultNumber: | 0.02 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.1 |
| SliderMinNumber: | 0 |

### 58.169.7 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Noise Reduction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.4 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.169.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.169.9 inputNoiseLevel as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Noise Level
**Notes:**

| | |
|---|---|
| Name: | inputNoiseLevel |
| Class: | double (NSNumber) |
| DisplayName English: | Noise Level |
| DisplayName German: | Rauschpegel |
| DisplayName French: | Niveau de bruit |
| DisplayName Italian: | Livello disturbo |
| DisplayName Spanish: | Nivel de ruido |
| Type: | CIAttributeTypeScalar |

See AttributeinputNoiseLevel for more details.
(Read and Write property)

### 58.169.10 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

See AttributeinputSharpness for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

# 58.170 class CIFilterOpTileMBS

## 58.170.1 class CIFilterOpTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Op Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIOpTile |
| DisplayName English: | Op Tile |
| DisplayName German: | Op kacheln |
| DisplayName French: | Mosa√Øque op√©rationnelle |
| DisplayName Italian: | Mosaico ottico |
| DisplayName Spanish: | Mosaico √ptico |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputScale: Scale
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.170.2 Methods

### 58.170.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.170.4 Properties

### 58.170.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Op Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.170.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Op Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.170.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Op Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.170.8 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Op Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 2.8 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0.1 |

### 58.170.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Op Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 65 |
| IdentityNumber: | 65 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.170.10 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

See AttributeinputAngle for more details.

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

(Read and Write property)

### 58.170.11 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.170.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.170.13 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

### 58.170.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.171 class CIFilterOverlayBlendModeMBS

## 58.171.1 class CIFilterOverlayBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Overlay Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIOverlayBlendMode |
| DisplayName English: | Overlay Blend Mode |
| DisplayName German: | Mischmethode ,Äû√úberlagerung,Äú |
| DisplayName French: | Mode de fusion Superposition |
| DisplayName Italian: | Modalit√† sfumatura sovrapposizione |
| DisplayName Spanish: | Superponer modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.171.2 Methods

### 58.171.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.171.4 Properties

### 58.171.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Overlay Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.171.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Overlay Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.171.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.171.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.172 class CIFilterPageCurlTransitionMBS

### 58.172.1 class CIFilterPageCurlTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Page Curl filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPageCurlTransition |
| DisplayName English: | Page Curl |
| DisplayName German: | Umbl√§ttern |
| DisplayName French: | Repli de page |
| DisplayName Italian: | Ricciolo pagina |
| DisplayName Spanish: | Ondulaci√n de p√°gina |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputBacksideImage: Backside Image
- inputShadingImage: Shading Image
- inputExtent: Extent
- inputTime: Time
- inputAngle: Angle
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.172.2 Methods

### 58.172.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.172.4 Properties

### 58.172.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.172.6 AttributeinputBacksideImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBacksideImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Backside Image |
| DisplayName German: | Bild auf der Hinterseite |
| DisplayName French: | Image arri√®re |
| DisplayName Italian: | Immagine posteriore |
| DisplayName Spanish: | Imagen de reverso |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.172.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.172.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.172.9 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 0.01 |
| SliderMaxNumber: | 400 |
| SliderMinNumber: | 0.01 |

(Read only property)

### 58.172.10 AttributeinputShadingImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,Äôombrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.172.11 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.172.12 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.172.13 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.172.14 inputBacksideImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Backside Image
**Notes:**

| | |
|---|---|
| Name: | inputBacksideImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Backside Image |
| DisplayName German: | Bild auf der Hinterseite |
| DisplayName French: | Image arri√®re |
| DisplayName Italian: | Immagine posteriore |
| DisplayName Spanish: | Imagen de reverso |
| Type: | CIAttributeTypeImage |

See AttributeinputBacksideImage for more details.
(Read and Write property)

### 58.172.15 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.172.16 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.172.17 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.172.18 inputShadingImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shading Image
**Notes:**

See AttributeinputShadingImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,Äôombrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| Type: | CIAttributeTypeImage |

### 58.172.19 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.172.20 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

## 58.173 class CIFilterPageCurlWithShadowTransitionMBS

### 58.173.1 class CIFilterPageCurlWithShadowTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Page Curl With Shadow filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPageCurlWithShadowTransition |
| DisplayName English: | Page Curl With Shadow |
| DisplayName German: | Umbl√§ttern mit Schatten |
| DisplayName French: | Repli de page avec ombre |
| DisplayName Italian: | Piega pagina con ombra |
| DisplayName Spanish: | P√°gina con el borde ondulado y sombra |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputBacksideImage: Backside Image
- inputExtent: Extent
- inputTime: Time
- inputAngle: Angle
- inputRadius: Radius
- inputShadowSize: Shadow Size
- inputShadowAmount: Shadow Amount

- inputShadowExtent: Shadow Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.173.2 Methods

### 58.173.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.173.4 Properties

### 58.173.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.173.6 AttributeinputBacksideImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBacksideImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Backside Image |
| DisplayName German: | Bild auf der Hinterseite |
| DisplayName French: | Image arri√®re |
| DisplayName Italian: | Immagine posteriore |
| DisplayName Spanish: | Imagen de reverso |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.173.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 0 0 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.173.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.173.9 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.173.10 AttributeinputShadowAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 0.01 |
| SliderMaxNumber: | 400 |
| SliderMinNumber: | 0.01 |

| | |
|---|---|
| Name: | inputShadowAmount |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Shadow Amount |
| DisplayName German: | Schattenumfang |
| DisplayName French: | Quantit√© d,Äôombre |
| DisplayName Italian: | Quantit√† ombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado |
| DefaultNumber: | 0.7 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.173.11 AttributeinputShadowExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.173.12 AttributeinputShadowSize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputShadowExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Shadow Extent |
| DisplayName German: | Schattenausdehnung |
| DisplayName French: | √âtendue de l,Äôombre |
| DisplayName Italian: | Estensione ombreggiatura |
| DisplayName Spanish: | Extensi√n de la sombra |
| DefaultVector: | [ 0 0 0 0 ] |
| IdentityVector: | n/a |

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadowSize |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Shadow Size |
| DisplayName German: | Schattengr√√üe |
| DisplayName French: | Taille de l,Äôombre |
| DisplayName Italian: | Dimensioni ombreggiatura |
| DisplayName Spanish: | Tama√±o de la sombra |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.173.13 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.173.14 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Page Curl With Shadow attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.173.15 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

See AttributeinputAngle for more details.

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

(Read and Write property)

### 58.173.16 inputBacksideImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Backside Image
**Notes:**

| | |
|---|---|
| Name: | inputBacksideImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Backside Image |
| DisplayName German: | Bild auf der Hinterseite |
| DisplayName French: | Image arri√®re |
| DisplayName Italian: | Immagine posteriore |
| DisplayName Spanish: | Imagen de reverso |
| Type: | CIAttributeTypeImage |

See AttributeinputBacksideImage for more details.
(Read and Write property)

### 58.173.17 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

See AttributeinputExtent for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

### 58.173.18 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.173.19 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.173.20 inputShadowAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Amount
**Notes:**

| | |
|---|---|
| Name: | inputShadowAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Shadow Amount |
| DisplayName German: | Schattenumfang |
| DisplayName French: | Quantit√© d,Äôombre |
| DisplayName Italian: | Quantit√† ombreggiatura |
| DisplayName Spanish: | Cantidad de sombreado |
| Type: | CIAttributeTypeDistance |

See AttributeinputShadowAmount for more details.
(Read and Write property)

### 58.173.21 inputShadowExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Extent
**Notes:**

| | |
|---|---|
| Name: | inputShadowExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Shadow Extent |
| DisplayName German: | Schattenausdehnung |
| DisplayName French: | √âtendue de l,Äôombre |
| DisplayName Italian: | Estensione ombreggiatura |
| DisplayName Spanish: | Extensi√n de la sombra |
| Type: | CIAttributeTypeRectangle |

See AttributeinputShadowExtent for more details.
(Read and Write property)

### 58.173.22 inputShadowSize as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shadow Size
**Notes:**

| | |
|---|---|
| Name: | inputShadowSize |
| Class: | double (NSNumber) |
| DisplayName English: | Shadow Size |
| DisplayName German: | Schattengr√√üe |
| DisplayName French: | Taille de l,Äôombre |
| DisplayName Italian: | Dimensioni ombreggiatura |
| DisplayName Spanish: | Tama√±o de la sombra |
| Type: | CIAttributeTypeDistance |

See AttributeinputShadowSize for more details.
(Read and Write property)

### 58.173.23 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.173.24 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

## 58.174 class CIFilterPaletteCentroidMBS

### 58.174.1 class CIFilterPaletteCentroidMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Palette Centroid filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPaletteCentroid |
| DisplayName English: | Palette Centroid |
| DisplayName German: | Palettenschwerpunkt |
| DisplayName French: | Centro√Øde de la palette |
| DisplayName Italian: | Centroide tavolozza |
| DisplayName Spanish: | Centroide de la paleta |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputPaletteImage: Palette Image
- inputPerceptual: Perceptual

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.174.2 Methods

### 58.174.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.174.4 Properties

### 58.174.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palette Centroid attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.174.6 AttributeinputPaletteImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palette Centroid attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPaletteImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Palette Image |
| DisplayName German: | Palettenbild |
| DisplayName French: | Image de la palette |
| DisplayName Italian: | Immagine tavolozza |
| DisplayName Spanish: | Imagen de la paleta |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.174.7 AttributeinputPerceptual as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palette Centroid attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Perceptual |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

(Read only property)

### 58.174.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.174.9 inputPaletteImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Palette Image
**Notes:**

| | |
|---|---|
| Name: | inputPaletteImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Palette Image |
| DisplayName German: | Palettenbild |
| DisplayName French: | Image de la palette |
| DisplayName Italian: | Immagine tavolozza |
| DisplayName Spanish: | Imagen de la paleta |
| Type: | CIAttributeTypeImage |

See AttributeinputPaletteImage for more details.
(Read and Write property)

### 58.174.10 inputPerceptual as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Perceptual
**Notes:**

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double (NSNumber) |
| DisplayName English: | Perceptual |
| DisplayName German: | Perceptual |
| DisplayName French: | Perceptual |
| DisplayName Italian: | Perceptual |
| DisplayName Spanish: | Perceptual |
| Type: | CIAttributeTypeBoolean |

See AttributeinputPerceptual for more details.
(Read and Write property)

# 58.175 class CIFilterPalettizeMBS

## 58.175.1 class CIFilterPalettizeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Palettize filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPalettize |
| DisplayName English: | Palettize |
| DisplayName German: | Palettieren |
| DisplayName French: | Indexer |
| DisplayName Italian: | Converti in palette |
| DisplayName Spanish: | Paletizar |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputPaletteImage: Palette Image
- inputPerceptual: Perceptual

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.175.2 Methods

### 58.175.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.175.4 Properties

### 58.175.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palettize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.175.6 AttributeinputPaletteImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palettize attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPaletteImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Palette Image |
| DisplayName German: | Palettenbild |
| DisplayName French: | Image de la palette |
| DisplayName Italian: | Immagine tavolozza |
| DisplayName Spanish: | Imagen de la paleta |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.175.7 AttributeinputPerceptual as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Palettize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Perceptual |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |

(Read only property)

### 58.175.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.175.9 inputPaletteImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Palette Image
**Notes:**

| | |
|---|---|
| Name: | inputPaletteImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Palette Image |
| DisplayName German: | Palettenbild |
| DisplayName French: | Image de la palette |
| DisplayName Italian: | Immagine tavolozza |
| DisplayName Spanish: | Imagen de la paleta |
| Type: | CIAttributeTypeImage |

See AttributeinputPaletteImage for more details.
(Read and Write property)

### 58.175.10 inputPerceptual as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Perceptual
**Notes:**

| | |
|---|---|
| Name: | inputPerceptual |
| Class: | double (NSNumber) |
| DisplayName English: | Perceptual |
| DisplayName German: | Perceptual |
| DisplayName French: | Perceptual |
| DisplayName Italian: | Perceptual |
| DisplayName Spanish: | Perceptual |
| Type: | CIAttributeTypeBoolean |

See AttributeinputPerceptual for more details.
(Read and Write property)

## 58.176 class CIFilterParallelogramTileMBS

### 58.176.1 class CIFilterParallelogramTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Parallelogram Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIParallelogramTile |
| DisplayName English: | Parallelogram Tile |
| DisplayName German: | Parallelogramme |
| DisplayName French: | Mosa√Øque de parall√©logrammes |
| DisplayName Italian: | Mosaico parallelogramma |
| DisplayName Spanish: | Mosaico paralelogramo |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputAcuteAngle: Acute Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.176.2 Methods

### 58.176.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.176.4 Properties

### 58.176.5 AttributeinputAcuteAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Parallelogram Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| DefaultNumber: | 1.570796 |
| IdentityNumber: | 1.570796 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.176.6 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Parallelogram Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

### 58.176.7 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Parallelogram Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.176.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Parallelogram Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.176.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Parallelogram Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.176.10 inputAcuteAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Acute Angle
**Notes:**

See AttributeinputAcuteAngle for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAcuteAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Acute Angle |
| DisplayName German: | Spitzer Winkel |
| DisplayName French: | Angle aigu |
| DisplayName Italian: | Angolo acuto |
| DisplayName Spanish: | √Ångulo agudo |
| Type: | CIAttributeTypeAngle |

### 58.176.11 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.176.12 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.176.13 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.176.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

# 58.177 class CIFilterPDF417BarcodeGeneratorMBS

## 58.177.1 class CIFilterPDF417BarcodeGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage PDF417 Barcode Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPDF417BarcodeGenerator |
| DisplayName English: | PDF417 Barcode Generator |
| DisplayName German: | PDF417 Barcode-Generator |
| DisplayName French: | G√©n√©rateur de code-barres PDF417 |
| DisplayName Italian: | Generatore codice a barre PDF417 |
| DisplayName Spanish: | Generador de c√digos de barras PDF417 |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputMessage: Message
- inputMinWidth: Min Width
- inputMaxWidth: Max Width
- inputMinHeight: Min Height
- inputMaxHeight: Max Height
- inputDataColumns: Data Columns
- inputRows: Rows
- inputPreferredAspectRatio: Preferred Aspect Ratio
- inputCompactionMode: Compaction Mode
- inputCompactStyle: Compact Style

- inputCorrectionLevel: Correction Level
- inputAlwaysSpecifyCompaction: Always Specify Compaction

Output:

- outputImage
- outputCGImage

Subclass of the CIFilterMBS class.
**Videos**

- Presentation from Munich conference about MBS Plugins.

### 58.177.2 Methods

### 58.177.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.177.4 Properties

### 58.177.5 AttributeinputAlwaysSpecifyCompaction as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.177.6 AttributeinputCompactionMode as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAlwaysSpecifyCompaction |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Always Specify Compaction |
| DisplayName German: | Komprimierung immer angeben |
| DisplayName French: | Toujours indiquer le compactage |
| DisplayName Italian: | Specifica sempre la compressione |
| DisplayName Spanish: | Especificar compactaci√n siempre |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputCompactionMode |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Compaction Mode |
| DisplayName German: | Komprimierungsmodus |
| DisplayName French: | Mode de compactage |
| DisplayName Italian: | Modalit√† di compressione |
| DisplayName Spanish: | Modo de compactaci√n |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 3 |
| MinNumber: | 0 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.177.7 AttributeinputCompactStyle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCompactStyle |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName English: | Compact Style |
| DisplayName German: | Komprimierungsstil |
| DisplayName French: | Style compact |
| DisplayName Italian: | Stile compatto |
| DisplayName Spanish: | Estilo compacto |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.177.8 AttributeinputCorrectionLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 8 |
| MinNumber: | 0 |
| SliderMaxNumber: | 8 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.177.9 AttributeinputDataColumns as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputDataColumns |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Data Columns |
| DisplayName German: | Datenspalten |
| DisplayName French: | Colonnes de donn√©es |
| DisplayName Italian: | Colonne dati |
| DisplayName Spanish: | Columnas de datos |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 30 |
| MinNumber: | 1 |
| SliderMaxNumber: | 30 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.177.10 AttributeinputMaxHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaxHeight |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Max Height |
| DisplayName German: | Max. H√he |
| DisplayName French: | Hauteur max. |
| DisplayName Italian: | Altezza massima |
| DisplayName Spanish: | Altura m√°x. |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 283 |
| MinNumber: | 13 |
| SliderMaxNumber: | 283 |
| SliderMinNumber: | 13 |

(Read only property)

### 58.177.11 AttributeinputMaxWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaxWidth |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Max Width |
| DisplayName German: | Max. Breite |
| DisplayName French: | Largeur max. |
| DisplayName Italian: | Larghezza massima |
| DisplayName Spanish: | Anchura m√°x. |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 583 |
| MinNumber: | 56 |
| SliderMaxNumber: | 583 |
| SliderMinNumber: | 56 |

(Read only property)

### 58.177.12 AttributeinputMessage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.177.13 AttributeinputMinHeight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

| | |
|---|---|
| Name: | inputMinHeight |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Min Height |
| DisplayName German: | Min. H√he |
| DisplayName French: | Hauteur min. |
| DisplayName Italian: | Altezza minima |
| DisplayName Spanish: | Altura m√n. |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 283 |
| MinNumber: | 13 |
| SliderMaxNumber: | 283 |
| SliderMinNumber: | 13 |

(Read only property)

### 58.177.14 AttributeinputMinWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.177.15 AttributeinputPreferredAspectRatio as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.

| | |
|---|---|
| Name: | inputMinWidth |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Min Width |
| DisplayName German: | Min. Breite |
| DisplayName French: | Largeur min. |
| DisplayName Italian: | Larghezza minima |
| DisplayName Spanish: | Anchura m√n. |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 583 |
| MinNumber: | 56 |
| SliderMaxNumber: | 583 |
| SliderMinNumber: | 56 |

**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPreferredAspectRatio |
| Class: | double |
| DisplayName English: | Preferred Aspect Ratio |
| DisplayName German: | Bevorzugtes Seitenverh√§ltnis |
| DisplayName French: | Proportions pr√©f√©r√©es |
| DisplayName Italian: | Proporzioni preferite |
| DisplayName Spanish: | Proporciones preferidas |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 9.223372e+18 |
| MinNumber: | 0 |
| SliderMaxNumber: | 9.223372e+18 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.177.16 AttributeinputRows as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the PDF417 Barcode Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRows |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName English: | Rows |
| DisplayName German: | Zeilen |
| DisplayName French: | Rang√©es |
| DisplayName Italian: | Righe |
| DisplayName Spanish: | Filas |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 90 |
| MinNumber: | 3 |
| SliderMaxNumber: | 90 |
| SliderMinNumber: | 3 |

### 58.177.17 inputAlwaysSpecifyCompaction as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Always Specify Compaction
**Notes:**

| | |
|---|---|
| Name: | inputAlwaysSpecifyCompaction |
| Class: | double (NSNumber) |
| DisplayName English: | Always Specify Compaction |
| DisplayName German: | Komprimierung immer angeben |
| DisplayName French: | Toujours indiquer le compactage |
| DisplayName Italian: | Specifica sempre la compressione |
| DisplayName Spanish: | Especificar compactaci√n siempre |
| Type: | CIAttributeTypeBoolean |

See AttributeinputAlwaysSpecifyCompaction for more details.
(Read and Write property)

### 58.177.18 inputCompactionMode as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Compaction Mode
**Notes:**

See AttributeinputCompactionMode for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCompactionMode |
| Class: | double (NSNumber) |
| DisplayName English: | Compaction Mode |
| DisplayName German: | Komprimierungsmodus |
| DisplayName French: | Mode de compactage |
| DisplayName Italian: | Modalit√† di compressione |
| DisplayName Spanish: | Modo de compactaci√n |
| Type: | CIAttributeTypeInteger |

### 58.177.19 inputCompactStyle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Compact Style
**Notes:**

| | |
|---|---|
| Name: | inputCompactStyle |
| Class: | double (NSNumber) |
| DisplayName English: | Compact Style |
| DisplayName German: | Komprimierungsstil |
| DisplayName French: | Style compact |
| DisplayName Italian: | Stile compatto |
| DisplayName Spanish: | Estilo compacto |
| Type: | CIAttributeTypeBoolean |

See AttributeinputCompactStyle for more details.
(Read and Write property)

### 58.177.20 inputCorrectionLevel as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Correction Level
**Notes:**

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | double (NSNumber) |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |
| Type: | CIAttributeTypeInteger |

See AttributeinputCorrectionLevel for more details.
(Read and Write property)

### 58.177.21 inputDataColumns as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Data Columns
**Notes:**

| | |
|---|---|
| Name: | inputDataColumns |
| Class: | double (NSNumber) |
| DisplayName English: | Data Columns |
| DisplayName German: | Datenspalten |
| DisplayName French: | Colonnes de donn√©es |
| DisplayName Italian: | Colonne dati |
| DisplayName Spanish: | Columnas de datos |
| Type: | CIAttributeTypeInteger |

See AttributeinputDataColumns for more details.
(Read and Write property)

### 58.177.22 inputMaxHeight as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Max Height
**Notes:**

| | |
|---|---|
| Name: | inputMaxHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Max Height |
| DisplayName German: | Max. H√he |
| DisplayName French: | Hauteur max. |
| DisplayName Italian: | Altezza massima |
| DisplayName Spanish: | Altura m√°x. |
| Type: | CIAttributeTypeInteger |

See AttributeinputMaxHeight for more details.
(Read and Write property)

### 58.177.23 inputMaxWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Max Width
**Notes:**

| | |
|---|---|
| Name: | inputMaxWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Max Width |
| DisplayName German: | Max. Breite |
| DisplayName French: | Largeur max. |
| DisplayName Italian: | Larghezza massima |
| DisplayName Spanish: | Anchura m√°x. |
| Type: | CIAttributeTypeInteger |

See AttributeinputMaxWidth for more details.
(Read and Write property)

### 58.177.24 inputMessage as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Message
**Notes:**

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |

See AttributeinputMessage for more details.
(Read and Write property)

### 58.177.25 inputMinHeight as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Min Height
**Notes:**

| | |
|---|---|
| Name: | inputMinHeight |
| Class: | double (NSNumber) |
| DisplayName English: | Min Height |
| DisplayName German: | Min. H√he |
| DisplayName French: | Hauteur min. |
| DisplayName Italian: | Altezza minima |
| DisplayName Spanish: | Altura m√n. |
| Type: | CIAttributeTypeInteger |

See AttributeinputMinHeight for more details.
(Read and Write property)

### 58.177.26 inputMinWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Min Width
**Notes:**

| | |
|---|---|
| Name: | inputMinWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Min Width |
| DisplayName German: | Min. Breite |
| DisplayName French: | Largeur min. |
| DisplayName Italian: | Larghezza minima |
| DisplayName Spanish: | Anchura m√n. |
| Type: | CIAttributeTypeInteger |

See AttributeinputMinWidth for more details.
(Read and Write property)

### 58.177.27 inputPreferredAspectRatio as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Preferred Aspect Ratio
**Notes:**

See AttributeinputPreferredAspectRatio for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputPreferredAspectRatio |
| Class: | double (NSNumber) |
| DisplayName English: | Preferred Aspect Ratio |
| DisplayName German: | Bevorzugtes Seitenverh√§ltnis |
| DisplayName French: | Proportions pr√©f√©r√©es |
| DisplayName Italian: | Proporzioni preferite |
| DisplayName Spanish: | Proporciones preferidas |

### 58.177.28 inputRows as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Rows
**Notes:**

| | |
|---|---|
| Name: | inputRows |
| Class: | double (NSNumber) |
| DisplayName English: | Rows |
| DisplayName German: | Zeilen |
| DisplayName French: | Rang√©es |
| DisplayName Italian: | Righe |
| DisplayName Spanish: | Filas |
| Type: | CIAttributeTypeInteger |

See AttributeinputRows for more details.
(Read and Write property)

## 58.178 class CIFilterPersonSegmentationMBS

### 58.178.1 class CIFilterPersonSegmentationMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Person Segmentation filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPersonSegmentation |
| DisplayName English: | Person Segmentation |
| DisplayName German: | Personensegmentierung |
| DisplayName French: | Segmentation des personnes |
| DisplayName Italian: | Segmentazione persone |
| DisplayName Spanish: | Segmentaci√n de personas |

Categories:

- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryStylize: Stylize

Input:

- inputImage: Image
- inputQualityLevel: Quality Level

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.178.2 Methods

### 58.178.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.178.4 Properties

### 58.178.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Person Segmentation attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.178.6 AttributeinputQualityLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Person Segmentation attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputQualityLevel |
| Class: | double |
| DisplayName English: | Quality Level |
| DisplayName German: | Qualit√§tsstufe |
| DisplayName French: | Niveau de qualit√© |
| DisplayName Italian: | Livello qualit√† |
| DisplayName Spanish: | Nivel de calidad |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.178.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.178.8 inputQualityLevel as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Quality Level
**Notes:**

| | |
|---|---|
| Name: | inputQualityLevel |
| Class: | double (NSNumber) |
| DisplayName English: | Quality Level |
| DisplayName German: | Qualit√§tsstufe |
| DisplayName French: | Niveau de qualit√© |
| DisplayName Italian: | Livello qualit√† |
| DisplayName Spanish: | Nivel de calidad |

See AttributeinputQualityLevel for more details.
(Read and Write property)

# 58.179 class CIFilterPerspectiveCorrectionMBS

## 58.179.1 class CIFilterPerspectiveCorrectionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Perspective Correction filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPerspectiveCorrection |
| DisplayName English: | Perspective Correction |
| DisplayName German: | Perspektivenkorrektur |
| DisplayName French: | Correction de la perspective |
| DisplayName Italian: | Correzione prospettiva |
| DisplayName Spanish: | Correcci√n de la perspectiva |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left
- inputCrop: Crop

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.179.2 Methods

### 58.179.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.179.4 Properties

### 58.179.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | [ 155 153 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.179.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | [ 548 140 ] |
| IdentityVector: | n/a |

### 58.179.7 AttributeinputCrop as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCrop |
| Class: | double |
| Type: | CIAttributeTypeBoolean |
| DisplayName: | Crop |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.179.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.179.9 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | [ 118 484 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.179.10 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Correction attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.179.11 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | [ 646 507 ] |
| IdentityVector: | n/a |

**Function:** The attribute Bottom Left
**Notes:**

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomLeft for more details.
(Read and Write property)

### 58.179.12 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.

(Read and Write property)

### 58.179.13 inputCrop as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Crop
**Notes:**

| | |
|---|---|
| Name: | inputCrop |
| Class: | double (NSNumber) |
| DisplayName English: | Crop |
| DisplayName German: | Crop |
| DisplayName French: | Crop |
| DisplayName Italian: | Crop |
| DisplayName Spanish: | Crop |
| Type: | CIAttributeTypeBoolean |

See AttributeinputCrop for more details.
(Read and Write property)

### 58.179.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.179.15 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.179.16 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.180 class CIFilterPerspectiveRotateMBS

## 58.180.1 class CIFilterPerspectiveRotateMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Perspective Rotate filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPerspectiveRotate |
| DisplayName English: | Perspective Rotate |
| DisplayName German: | Perspektivisch drehen |
| DisplayName French: | Rotation en perspective |
| DisplayName Italian: | Rotazione prospettica |
| DisplayName Spanish: | Rotaci√n de perspectiva |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputFocalLength: Focal Length
- inputPitch: Pitch
- inputYaw: Yaw
- inputRoll: Roll

Output:

- outputImage
- outputTransform

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.180.2 Methods

### 58.180.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.180.4 Properties

### 58.180.5 AttributeinputFocalLength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Rotate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| DefaultNumber: | 28 |
| IdentityNumber: | 0 |

(Read only property)

### 58.180.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Rotate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.180.7 AttributeinputPitch as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Rotate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPitch |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Pitch |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.180.8 AttributeinputRoll as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Rotate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRoll |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Roll |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.180.9 AttributeinputYaw as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Rotate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputYaw |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Yaw |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.180.10 inputFocalLength as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Focal Length
**Notes:**

See AttributeinputFocalLength for more details.
(Read and Write property)

### 58.180.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputFocalLength |
| Class: | double (NSNumber) |
| DisplayName English: | Focal Length |
| DisplayName German: | Brennweite |
| DisplayName French: | Longueur focale |
| DisplayName Italian: | Lunghezza focale |
| DisplayName Spanish: | Longitud focal |
| Type: | CIAttributeTypeScalar |

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.180.12 inputPitch as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Pitch
**Notes:**

| | |
|---|---|
| Name: | inputPitch |
| Class: | double (NSNumber) |
| DisplayName English: | Pitch |
| DisplayName German: | Pitch |
| DisplayName French: | Pitch |
| DisplayName Italian: | Pitch |
| DisplayName Spanish: | Pitch |
| Type: | CIAttributeTypeAngle |

See AttributeinputPitch for more details.
(Read and Write property)

### 58.180.13 inputRoll as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Roll
**Notes:**

| | |
|---|---|
| Name: | inputRoll |
| Class: | double (NSNumber) |
| DisplayName English: | Roll |
| DisplayName German: | Roll |
| DisplayName French: | Roll |
| DisplayName Italian: | Roll |
| DisplayName Spanish: | Roll |
| Type: | CIAttributeTypeAngle |

See AttributeinputRoll for more details.
(Read and Write property)

### 58.180.14 inputYaw as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Yaw
**Notes:**

| | |
|---|---|
| Name: | inputYaw |
| Class: | double (NSNumber) |
| DisplayName English: | Yaw |
| DisplayName German: | Yaw |
| DisplayName French: | Yaw |
| DisplayName Italian: | Yaw |
| DisplayName Spanish: | Yaw |
| Type: | CIAttributeTypeAngle |

See AttributeinputYaw for more details.
(Read and Write property)

# 58.181 class CIFilterPerspectiveTileMBS

## 58.181.1 class CIFilterPerspectiveTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Perspective Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPerspectiveTile |
| DisplayName English: | Perspective Tile |
| DisplayName German: | Perspektivisch kacheln |
| DisplayName French: | Mosa√Øque en perspective |
| DisplayName Italian: | Mosaico prospettiva |
| DisplayName Spanish: | Mosaico en perspectiva |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.181.2 Methods

### 58.181.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.181.4 Properties

### 58.181.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | [ 155 153 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.181.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | [ 548 140 ] |
| IdentityVector: | n/a |

### 58.181.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.181.8 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | [ 118 484 ] |
| IdentityVector: | n/a |

### 58.181.9 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | [ 646 507 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.181.10 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

See AttributeinputBottomLeft for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

### 58.181.11 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.
(Read and Write property)

### 58.181.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.181.13 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.181.14 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.182 class CIFilterPerspectiveTransformMBS

## 58.182.1 class CIFilterPerspectiveTransformMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Perspective Transform filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPerspectiveTransform |
| DisplayName English: | Perspective Transform |
| DisplayName German: | Perspektivisch transformieren |
| DisplayName French: | Transformation en perspective |
| DisplayName Italian: | Trasformazione prospettiva |
| DisplayName Spanish: | Transformaci√n en perspectiva |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.182.2 Methods

### 58.182.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.182.4 Properties

### 58.182.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | [ 155 153 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.182.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | [ 548 140 ] |
| IdentityVector: | n/a |

### 58.182.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.182.8 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | [ 118 484 ] |
| IdentityVector: | n/a |

### 58.182.9 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | [ 646 507 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.182.10 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

See AttributeinputBottomLeft for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

### 58.182.11 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomRight for more details.
(Read and Write property)

### 58.182.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.182.13 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.182.14 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

# 58.183 class CIFilterPerspectiveTransformWithExtentMBS

## 58.183.1 class CIFilterPerspectiveTransformWithExtentMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Perspective Transform with Extent filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPerspectiveTransformWithExtent |
| DisplayName English: | Perspective Transform with Extent |
| DisplayName German: | Perspektivische Transformation mit Ausbreitung |
| DisplayName French: | Transformation de perspective avec Extent |
| DisplayName Italian: | Trasformazione prospettiva con ampiezza |
| DisplayName Spanish: | Transformaci√n en perspectiva con amplitud |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputExtent: Extent
- inputTopLeft: Top Left
- inputTopRight: Top Right
- inputBottomRight: Bottom Right
- inputBottomLeft: Bottom Left

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.183.2 Methods

### 58.183.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.183.4 Properties

### 58.183.5 AttributeinputBottomLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| DefaultVector: | [ 155 153 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.183.6 AttributeinputBottomRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| DefaultVector: | [ 548 140 ] |
| IdentityVector: | n/a |

### 58.183.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.183.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.183.9 AttributeinputTopLeft as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| DefaultVector: | [ 118 484 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.183.10 AttributeinputTopRight as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Perspective Transform with Extent attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| DefaultVector: | [ 646 507 ] |
| IdentityVector: | n/a |

### 58.183.11 inputBottomLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Left
**Notes:**

| | |
|---|---|
| Name: | inputBottomLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Left |
| DisplayName German: | Unten links |
| DisplayName French: | En bas √† gauche |
| DisplayName Italian: | In basso a sinistra |
| DisplayName Spanish: | Abajo izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputBottomLeft for more details.
(Read and Write property)

### 58.183.12 inputBottomRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Bottom Right
**Notes:**

See AttributeinputBottomRight for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputBottomRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Bottom Right |
| DisplayName German: | Unten rechts |
| DisplayName French: | En bas √† droite |
| DisplayName Italian: | In basso a destra |
| DisplayName Spanish: | Abajo derecha |
| Type: | CIAttributeTypePosition |

### 58.183.13 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.183.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.183.15 inputTopLeft as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Left
**Notes:**

| | |
|---|---|
| Name: | inputTopLeft |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Left |
| DisplayName German: | Oben links |
| DisplayName French: | En haut √† gauche |
| DisplayName Italian: | In alto a sinistra |
| DisplayName Spanish: | Arriba izquierda |
| Type: | CIAttributeTypePosition |

See AttributeinputTopLeft for more details.
(Read and Write property)

### 58.183.16 inputTopRight as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Top Right
**Notes:**

| | |
|---|---|
| Name: | inputTopRight |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Top Right |
| DisplayName German: | Oben rechts |
| DisplayName French: | En haut √† droite |
| DisplayName Italian: | In alto a destra |
| DisplayName Spanish: | Arriba derecha |
| Type: | CIAttributeTypePosition |

See AttributeinputTopRight for more details.
(Read and Write property)

## 58.184 class CIFilterPhotoEffectChromeMBS

### 58.184.1 class CIFilterPhotoEffectChromeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Chrome filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectChrome |
| DisplayName English: | Photo Effect Chrome |
| DisplayName German: | Fotoeffekt ,ÄûChrom,Äú |
| DisplayName French: | Effet de photo Chrom√© |
| DisplayName Italian: | Effetto foto Chrome |
| DisplayName Spanish: | Efecto fotogr√°fico Chrome |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.184.2 Methods

### 58.184.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.184.4 Properties

### 58.184.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Chrome attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.184.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.185 class CIFilterPhotoEffectFadeMBS

## 58.185.1 class CIFilterPhotoEffectFadeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Fade filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectFade |
| DisplayName English: | Photo Effect Fade |
| DisplayName German: | Fotoeffekt ,ÄûAlt,Äú |
| DisplayName French: | Effet de photo Fondu |
| DisplayName Italian: | Effetto foto Dissolvenza |
| DisplayName Spanish: | Efecto fotogr√°fico Fundido |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.185.2 Methods

### 58.185.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.185.4 Properties

### 58.185.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Fade attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.185.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.186 class CIFilterPhotoEffectInstantMBS

### 58.186.1 class CIFilterPhotoEffectInstantMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Instant filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectInstant |
| DisplayName English: | Photo Effect Instant |
| DisplayName German: | Fotoeffekt ,ÄûSofortbild,Äú |
| DisplayName French: | Effet de photo Instantan√© |
| DisplayName Italian: | Effetto foto Instant |
| DisplayName Spanish: | Efecto fotogr√°fico Instant |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.186.2 Methods

### 58.186.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.186.4 Properties

### 58.186.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Instant attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.186.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.187 class CIFilterPhotoEffectMonoMBS

## 58.187.1 class CIFilterPhotoEffectMonoMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Mono filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectMono |
| DisplayName English: | Photo Effect Mono |
| DisplayName German: | Fotoeffekt ,ÄûS/W hell,Äú |
| DisplayName French: | Effet de photo Mono |
| DisplayName Italian: | Effetto foto Mono |
| DisplayName Spanish: | Efecto fotogr√°fico Mono |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.187.2 Methods

### 58.187.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.187.4 Properties

### 58.187.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Mono attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.187.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.188 class CIFilterPhotoEffectNoirMBS

## 58.188.1 class CIFilterPhotoEffectNoirMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Noir filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectNoir |
| DisplayName English: | Photo Effect Noir |
| DisplayName German: | Fotoeffekt ,ÄûS/W dunkel,Äú |
| DisplayName French: | Effet de photo Noir |
| DisplayName Italian: | Effetto foto Noir |
| DisplayName Spanish: | Efecto fotogr√°fico Noir |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.188.2 Methods

### 58.188.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.188.4 Properties

### 58.188.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Noir attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.188.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.189 class CIFilterPhotoEffectProcessMBS

## 58.189.1 class CIFilterPhotoEffectProcessMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Process filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectProcess |
| DisplayName English: | Photo Effect Process |
| DisplayName German: | Fotoeffekt ,ÄûProzess,Äú |
| DisplayName French: | Effet de photo Traitement |
| DisplayName Italian: | Effetto foto Processing |
| DisplayName Spanish: | Efecto fotogr√°fico Process |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.189.2 Methods

### 58.189.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.189.4 Properties

### 58.189.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Process attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.189.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.190 class CIFilterPhotoEffectTonalMBS

### 58.190.1 class CIFilterPhotoEffectTonalMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Tonal filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectTonal |
| DisplayName English: | Photo Effect Tonal |
| DisplayName German: | Fotoeffekt ,ÄûS/W mittel,Äú |
| DisplayName French: | Effet de photo Tonalit√©s |
| DisplayName Italian: | Effetto foto Tonale |
| DisplayName Spanish: | Efecto fotogr√°fico Tonal |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.190.2 Methods

### 58.190.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.190.4 Properties

### 58.190.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Tonal attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.190.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.191 class CIFilterPhotoEffectTransferMBS

## 58.191.1 class CIFilterPhotoEffectTransferMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Photo Effect Transfer filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPhotoEffectTransfer |
| DisplayName English: | Photo Effect Transfer |
| DisplayName German: | Fotoeffekt ,ÄûTransfer,Äú |
| DisplayName French: | Effet de photo Transfert |
| DisplayName Italian: | Effetto foto Transfer |
| DisplayName Spanish: | Efecto fotogr√°fico Transfer |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.191.2 Methods

### 58.191.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.191.4 Properties

### 58.191.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Photo Effect Transfer attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.191.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.192 class CIFilterPinchDistortionMBS

### 58.192.1 class CIFilterPinchDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Pinch Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPinchDistortion |
| DisplayName English: | Pinch Distortion |
| DisplayName German: | Verzerrung ,ÄûDr√ºcken,Äú |
| DisplayName French: | D√©formation Pincement |
| DisplayName Italian: | Distorsione minima |
| DisplayName Spanish: | Distorsi√n por contracci√n |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.192.2 Methods

### 58.192.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.192.4 Properties

### 58.192.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pinch Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.192.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pinch Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.192.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pinch Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.192.8 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pinch Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

### 58.192.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.192.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.192.11 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.192.12 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

## 58.193 class CIFilterPinLightBlendModeMBS

### 58.193.1 class CIFilterPinLightBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Pin Light Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPinLightBlendMode |
| DisplayName English: | Pin Light Blend Mode |
| DisplayName German: | Mischmethode ,ÄûPunktuelles Licht,Äú |
| DisplayName French: | √âpingler le mode de fusion Lumi√®re |
| DisplayName Italian: | Modalit√† sfumatura luce puntiforme |
| DisplayName Spanish: | Modo de mezcla por luz focal |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.193.2 Methods

### 58.193.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.193.4 Properties

### 58.193.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pin Light Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.193.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pin Light Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.193.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.193.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.194 class CIFilterPixellateMBS

### 58.194.1 class CIFilterPixellateMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Pixelate filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPixellate |
| DisplayName English: | Pixelate |
| DisplayName German: | Pixeln |
| DisplayName French: | Pix√©liser |
| DisplayName Italian: | Suddividi in pixel |
| DisplayName Spanish: | Pixelar |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.194.2 Methods

### 58.194.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.194.4 Properties

### 58.194.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pixelate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.194.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pixelate attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.194.7 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pixelate attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 8 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.194.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.194.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.194.10 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

See AttributeinputScale for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeDistance |

# 58.195 class CIFilterPointillizeMBS

## 58.195.1 class CIFilterPointillizeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Pointillize filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIPointillize |
| DisplayName English: | Pointillize |
| DisplayName German: | Punktieren |
| DisplayName French: | Pointilliste |
| DisplayName Italian: | Divisione in punti |
| DisplayName Spanish: | Puntillear |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputRadius: Radius
- inputCenter: Center

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.195.2 Methods

### 58.195.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.195.4 Properties

### 58.195.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pointillize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.195.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pointillize attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.195.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Pointillize attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 20 |
| IdentityNumber: | 1 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 1 |

(Read only property)

### 58.195.8 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.195.9 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.195.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.196 class CIFilterQRCodeGeneratorMBS

### 58.196.1 class CIFilterQRCodeGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage QR Code Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIQRCodeGenerator |
| DisplayName English: | QR Code Generator |
| DisplayName German: | QR-Code-Generator |
| DisplayName French: | G√©n√©rateur de code¬†QR |
| DisplayName Italian: | Generatore codice QR |
| DisplayName Spanish: | Generador de c√digos QR |

Categories:

- CICategoryGenerator: Generator
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputMessage: Message
- inputCorrectionLevel: Correction Level

Output:

- outputImage
- outputCGImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo plug-ins in version 16.0

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 58.196.2 Methods

### 58.196.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.196.4 Properties

### 58.196.5 AttributeinputCorrectionLevel as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the QR Code Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | String |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.196.6 AttributeinputMessage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the QR Code Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.196.7 inputCorrectionLevel as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Correction Level
**Notes:**

| | |
|---|---|
| Name: | inputCorrectionLevel |
| Class: | String (NSString) |
| DisplayName English: | Correction Level |
| DisplayName German: | Korrekturstufe |
| DisplayName French: | Niveau de correction |
| DisplayName Italian: | Livello di correzione |
| DisplayName Spanish: | Nivel de correcci√n |

See AttributeinputCorrectionLevel for more details.
(Read and Write property)

### 58.196.8 inputMessage as Memoryblock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Message
**Notes:**

| | |
|---|---|
| Name: | inputMessage |
| Class: | Memoryblock (NSData) |
| DisplayName English: | Message |
| DisplayName German: | Nachricht |
| DisplayName French: | Message |
| DisplayName Italian: | Messaggio |
| DisplayName Spanish: | Mensaje |

See AttributeinputMessage for more details.
(Read and Write property)

# 58.197 class CIFilterRadialGradientMBS

## 58.197.1 class CIFilterRadialGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Radial Gradient filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIRadialGradient |
| DisplayName English: | Radial Gradient |
| DisplayName German: | Radialer Verlauf |
| DisplayName French: | D√©grad√© radial |
| DisplayName Italian: | Gradiente radiale |
| DisplayName Spanish: | Degradado radial |

Categories:

- CICategoryGradient: Gradient
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputRadius0: Radius 1
- inputRadius1: Radius 2
- inputColor0: Color 1
- inputColor1: Color 2

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter

### 58.197.2 Methods

### 58.197.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.197.4 Properties

### 58.197.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Radial Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.197.6 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Radial Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.197.7 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Radial Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.197.8 AttributeinputRadius0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Radial Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius0 |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius 1 |
| DisplayName German: | Radius 1 |
| DisplayName French: | Rayon 1 |
| DisplayName Italian: | Raggio 1 |
| DisplayName Spanish: | Radio 1 |
| DefaultNumber: | 5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.197.9 AttributeinputRadius1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Radial Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius1 |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius 2 |
| DisplayName German: | Radius 2 |
| DisplayName French: | Rayon 2 |
| DisplayName Italian: | Raggio 2 |
| DisplayName Spanish: | Radio 2 |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.197.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.197.11 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor0 for more details.
(Read and Write property)

### 58.197.12 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor1 for more details.
(Read and Write property)

### 58.197.13 inputRadius0 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius 1
**Notes:**

| | |
|---|---|
| Name: | inputRadius0 |
| Class: | double (NSNumber) |
| DisplayName English: | Radius 1 |
| DisplayName German: | Radius 1 |
| DisplayName French: | Rayon 1 |
| DisplayName Italian: | Raggio 1 |
| DisplayName Spanish: | Radio 1 |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius0 for more details.
(Read and Write property)

### 58.197.14 inputRadius1 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius 2
**Notes:**

See AttributeinputRadius1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius1 |
| Class: | double (NSNumber) |
| DisplayName English: | Radius 2 |
| DisplayName German: | Radius 2 |
| DisplayName French: | Rayon 2 |
| DisplayName Italian: | Raggio 2 |
| DisplayName Spanish: | Radio 2 |
| Type: | CIAttributeTypeDistance |

# 58.198 class CIFilterRandomGeneratorMBS

## 58.198.1 class CIFilterRandomGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Random Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIRandomGenerator |
| DisplayName English: | Random Generator |
| DisplayName German: | Zufallsmuster |
| DisplayName French: | G√©n√©rateur al√©atoire |
| DisplayName Italian: | Generatore casuale |
| DisplayName Spanish: | Generador aleatorio |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

Output:

- outputImage

Subclass of the CIFilterMBS class.

## 58.198.2 Methods

## 58.198.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

# 58.199 class CIFilterRippleTransitionMBS

## 58.199.1 class CIFilterRippleTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Ripple filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIRippleTransition |
| DisplayName English: | Ripple |
| DisplayName German: | Wellen |
| DisplayName French: | Ondulation |
| DisplayName Italian: | Increspatura |
| DisplayName Spanish: | Ondas |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputShadingImage: Shading Image
- inputCenter: Center
- inputExtent: Extent
- inputTime: Time
- inputWidth: Width
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.199.2 Methods

### 58.199.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.199.4 Properties

### 58.199.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.199.6 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.199.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.199.8 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 50 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | -50 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | -50 |

(Read only property)

### 58.199.9 AttributeinputShadingImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,ÄôOombrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.199.10 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.199.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.199.12 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Ripple attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 1 |
| SliderMaxNumber: | 300 |
| SliderMinNumber: | 10 |

### 58.199.13 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

### 58.199.14 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.199.15 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.199.16 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScale for more details.
(Read and Write property)

### 58.199.17 inputShadingImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shading Image
**Notes:**

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,Äôombrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| Type: | CIAttributeTypeImage |

See AttributeinputShadingImage for more details.
(Read and Write property)

### 58.199.18 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.199.19 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

### 58.199.20 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

## 58.200 class CIFilterRoundedRectangleGeneratorMBS

### 58.200.1 class CIFilterRoundedRectangleGeneratorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Rounded Rectangle Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIRoundedRectangleGenerator |
| DisplayName English: | Rounded Rectangle Generator |
| DisplayName German: | Abgerundetes Rechteck-Generator |
| DisplayName French: | G√©n√©rateur de rectangle aux angles arrondis |
| DisplayName Italian: | Generatore rettangolo arrotondato |
| DisplayName Spanish: | Generador de rect√°ngulos redondeados |

Categories:

- CICategoryGenerator: Generator
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputExtent: Extent
- inputRadius: Radius
- inputColor: Color

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.200.2 Methods

### 58.200.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.200.4 Properties

### 58.200.5 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Rounded Rectangle Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.200.6 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Rounded Rectangle Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 100 100 ] |
| IdentityVector: | n/a |

### 58.200.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Rounded Rectangle Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.200.8 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

See AttributeinputColor for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

### 58.200.9 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.200.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.201 class CIFilterRowAverageMBS

## 58.201.1 class CIFilterRowAverageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Row Average filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIRowAverage |
| DisplayName English: | Row Average |
| DisplayName German: | Zeilendurchschnitt |
| DisplayName French: | Moyenne de rang√©es |
| DisplayName Italian: | Media riga |
| DisplayName Spanish: | Media de la fila |

Categories:

- CICategoryReduction: Reduction
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputExtent: Extent

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.201.2 Methods

### 58.201.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.201.4 Properties

### 58.201.5 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Row Average attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 640 80 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.201.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Row Average attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.201.7 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.201.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.202 class CIFilterSaliencyMapFilterMBS

## 58.202.1 class CIFilterSaliencyMapFilterMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Saliency Map Filter filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISaliencyMapFilter |
| DisplayName English: | Saliency Map Filter |
| DisplayName German: | Salienzkartenfilter |
| DisplayName French: | Filtre de carte de saillance |
| DisplayName Italian: | Filtro mappa di salienza |
| DisplayName Spanish: | Filtro de mapa de notabilidad |

Categories:

- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryStylize: Stylize

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.202.2 Methods

### 58.202.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.202.4 Properties

### 58.202.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Saliency Map Filter attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.202.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.203 class CIFilterSampleNearestMBS

### 58.203.1 class CIFilterSampleNearestMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sample Nearest filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISampleNearest |
| DisplayName English: | Sample Nearest |
| DisplayName German: | Beispiel f√ºr Modus basierend auf Objektn√§he |
| DisplayName French: | √âchantillonnage au plus proche |
| DisplayName Italian: | Campiona elemento pi√ vicino |
| DisplayName Spanish: | Muestra de lo m√°s cercano |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.203.2 Methods

### 58.203.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.203.4 Properties

### 58.203.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sample Nearest attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.203.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.204 class CIFilterSaturationBlendModeMBS

## 58.204.1 class CIFilterSaturationBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Saturation Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISaturationBlendMode |
| DisplayName English: | Saturation Blend Mode |
| DisplayName German: | Mischmethode ,ÄûS√§ttigung,Äú |
| DisplayName French: | Mode de fusion Saturation |
| DisplayName Italian: | Modalit√† sfumatura saturazione |
| DisplayName Spanish: | Modo de mezcla de saturaci√n |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.204.2 Methods

### 58.204.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.204.4 Properties

### 58.204.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Saturation Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.204.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Saturation Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.204.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.204.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.205 class CIFilterScreenBlendModeMBS

## 58.205.1 class CIFilterScreenBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Screen Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIScreenBlendMode |
| DisplayName English: | Screen Blend Mode |
| DisplayName German: | Mischmethode ,ÄûBlende,Äú |
| DisplayName French: | Mode de fusion √âcran |
| DisplayName Italian: | Modalit√† sfumatura schermo |
| DisplayName Spanish: | Modo de mezcla de pantalla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.205.2 Methods

### 58.205.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.205.4 Properties

### 58.205.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Screen Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.205.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Screen Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.205.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.205.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.206 class CIFilterSepiaToneMBS

## 58.206.1 class CIFilterSepiaToneMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sepia Tone filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISepiaTone |
| DisplayName English: | Sepia Tone |
| DisplayName German: | Sepia-Farbt√ne |
| DisplayName French: | Ton s√©pia |
| DisplayName Italian: | Tonalit√† seppia |
| DisplayName Spanish: | Tono sepia |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In
- CICategoryXMPSerializable: CICategoryXMPSerializable

Input:

- inputImage: Image
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.206.2 Methods

### 58.206.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.206.4 Properties

### 58.206.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sepia Tone attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.206.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sepia Tone attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.206.7 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.206.8 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

See AttributeinputIntensity for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

# 58.207 class CIFilterShadedMaterialMBS

## 58.207.1 class CIFilterShadedMaterialMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Shaded Material filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIShadedMaterial |
| DisplayName English: | Shaded Material |
| DisplayName German: | Schattiertes Material |
| DisplayName French: | Mat√©riau ombr√© |
| DisplayName Italian: | Materiale ombreggiato |
| DisplayName Spanish: | Material sombreado |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputShadingImage: Shading Image
- inputScale: Scale

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.207.2 Methods

### 58.207.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.207.4 Properties

### 58.207.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Shaded Material attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.207.6 AttributeinputScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Shaded Material attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScale |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| DefaultNumber: | 10 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 0.5 |

### 58.207.7 AttributeinputShadingImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Shaded Material attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,Äôombrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.207.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.207.9 inputScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale
**Notes:**

| | |
|---|---|
| Name: | inputScale |
| Class: | double (NSNumber) |
| DisplayName English: | Scale |
| DisplayName German: | Skalierung |
| DisplayName French: | √âchelle |
| DisplayName Italian: | Scala |
| DisplayName Spanish: | Escala |
| Type: | CIAttributeTypeDistance |

See AttributeinputScale for more details.
(Read and Write property)

### 58.207.10 inputShadingImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Shading Image
**Notes:**

| | |
|---|---|
| Name: | inputShadingImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Shading Image |
| DisplayName German: | Bild schattieren |
| DisplayName French: | Image d,ÄôOmbrage |
| DisplayName Italian: | Immagine ombreggiatura |
| DisplayName Spanish: | Imagen de sombra |
| Type: | CIAttributeTypeImage |

See AttributeinputShadingImage for more details.
(Read and Write property)

## 58.208 class CIFilterShapeMBS

### 58.208.1 class CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class to represent a filer shape in Xojo.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr5

### 58.208.2 Methods

### 58.208.3 Constructor(cgrect as CGRectMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the smallest integral rect containing 'cgrect'.
See also:

- 58.208.4 Constructor(Handle as Integer) 10404

### 58.208.4 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIFilterShape* and the object is retained.
Raises UnsupportedOperationException if object is not a CIFilterShape.
See also:

- 58.208.3 Constructor(cgrect as CGRectMBS) 10404

### 58.208.5 copy as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the filter shape object.

### 58.208.6 InsetByX(x as Integer, y as Integer) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the shape inset by 'delta'.

### 58.208.7 IntersectWith(s as CIFilterShapeMBS) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the intersection of the shape and 's'.

### 58.208.8 IntersectWithRect(cgrect as CGRectMBS) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the intersection of the shape and the smallest integral rect containing 'cgrect'.

### 58.208.9 shapeWithRect(r as CGRectMBS) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a filter shape object and initializes it with a rectangle.
**Notes:** R: A rectangle. The filter shape object will contain the smallest integral rectangle specified by this argument.

### 58.208.10 TransformBy(CGAffineTransform as NSAffineTransformMBS, flag as boolean) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape from the result of transforming the shape by CGAffineTransform.
**Notes:** If flag is false the new shape will contain all pixels in the transformed shape (and possibly some outside the transformed shape).
If flag is false the new shape will contain a subset of the pixels in the transformed shape (but none of those outside the transformed shape).

### 58.208.11 UnionWith(s as CIFilterShapeMBS) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the union of the shape and 's'.

### 58.208.12 UnionWithRect(cgrect as CGRectMBS) as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a shape representing the union of the shape and the smallest integral rect containing 'cgrect'.

### 58.208.13 Properties

### 58.208.14 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this filter shape.
**Notes:** (Read only property)

### 58.208.15 extent as CGRectMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The extent of the filter shape.
**Notes:** Extent is a rectangle that describes the filter shape in the working coordinate space with a fixed area.
Available in OS X v10.11 and later.
(Read only property)

### 58.208.16 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the internal used CIFilterShape reference.
**Notes:** (Read only property)

# 58.209 class CIFilterSharpenLuminanceMBS

## 58.209.1 class CIFilterSharpenLuminanceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sharpen Luminance filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISharpenLuminance |
| DisplayName English: | Sharpen Luminance |
| DisplayName German: | Luminanz scharfzeichnen |
| DisplayName French: | Renforcer la luminance |
| DisplayName Italian: | Luminosit√† nitidezza |
| DisplayName Spanish: | Agudizar luminancia |

Categories:

- CICategorySharpen: Sharpen
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputSharpness: Sharpness
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.209.2 Methods

### 58.209.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.209.4 Properties

### 58.209.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sharpen Luminance attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.209.6 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sharpen Luminance attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 1.69 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 20 |
| SliderMinNumber: | 0 |

### 58.209.7 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sharpen Luminance attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 0.4 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.209.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.209.9 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

See AttributeinputRadius for more details.
(Read and Write property)

### 58.209.10 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

See AttributeinputSharpness for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

## 58.210 class CIFilterSixfoldReflectedTileMBS

### 58.210.1 class CIFilterSixfoldReflectedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sixfold Reflected Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISixfoldReflectedTile |
| DisplayName English: | Sixfold Reflected Tile |
| DisplayName German: | 6-fach reflektierte Kachel |
| DisplayName French: | Mosa√Øque r√©fl√©chie 6 fois |
| DisplayName Italian: | Mosaico riflesso in sei direzioni |
| DisplayName Spanish: | Mosaico reflejado seis veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.210.2 Methods

### 58.210.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.210.4 Properties

### 58.210.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.210.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.210.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.210.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.210.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.210.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.210.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.210.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.211 class CIFilterSixfoldRotatedTileMBS

### 58.211.1 class CIFilterSixfoldRotatedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sixfold Rotated Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISixfoldRotatedTile |
| DisplayName English: | Sixfold Rotated Tile |
| DisplayName German: | 6-fach gedrehte Kachel |
| DisplayName French: | Mosa√Øque pivot√©e 6 fois |
| DisplayName Italian: | Mosaico ruotato in sei direzioni |
| DisplayName Spanish: | Mosaico rotado seis veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.211.2 Methods

### 58.211.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.211.4 Properties

### 58.211.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.211.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.211.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.211.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sixfold Rotated Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.211.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.211.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.211.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.211.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.212 class CIFilterSmoothLinearGradientMBS

### 58.212.1 class CIFilterSmoothLinearGradientMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Smooth Linear Gradient filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISmoothLinearGradient |
| DisplayName English: | Smooth Linear Gradient |
| DisplayName German: | Glatter linearer Verlauf |
| DisplayName French: | D√©grad√© lin√©aire lisse |
| DisplayName Italian: | Gradiente lineare graduale |
| DisplayName Spanish: | Suavizar el degradado lineal |

Categories:

- CICategoryGradient: Gradient
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputPoint0: Point 0
- inputPoint1: Point 1
- inputColor0: Color 1
- inputColor1: Color 2

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter

### 58.212.2 Methods

### 58.212.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.212.4 Properties

### 58.212.5 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Smooth Linear Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.212.6 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Smooth Linear Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.212.7 AttributeinputPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Smooth Linear Gradient attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| DefaultVector: | [ 0 0 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.212.8 AttributeinputPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Smooth Linear Gradient attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| DefaultVector: | [ 200 200 ] |
| IdentityVector: | n/a |

### 58.212.9 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor0 for more details.
(Read and Write property)

### 58.212.10 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

See AttributeinputColor1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

### 58.212.11 inputPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 0
**Notes:**

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint0 for more details.
(Read and Write property)

### 58.212.12 inputPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 1
**Notes:**

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint1 for more details.
(Read and Write property)

## 58.213 class CIFilterSoftLightBlendModeMBS

### 58.213.1 class CIFilterSoftLightBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Soft Light Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISoftLightBlendMode |
| DisplayName English: | Soft Light Blend Mode |
| DisplayName German: | Mischmethode ‚ÄûWeiches Licht‚Äú |
| DisplayName French: | Mode de fusion Lumi√®re tamis√©e |
| DisplayName Italian: | Modalit√† sfumatura luce soffusa |
| DisplayName Spanish: | Modo de mezcla por luz indirecta |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.213.2 Methods

### 58.213.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.213.4 Properties

### 58.213.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Soft Light Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.213.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Soft Light Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.213.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.213.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.214 class CIFilterSourceAtopCompositingMBS

### 58.214.1 class CIFilterSourceAtopCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Source Atop filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISourceAtopCompositing |
| DisplayName English: | Source Atop |
| DisplayName German: | Quelle obenauf |
| DisplayName French: | Source dessus |
| DisplayName Italian: | Sorgente sopra |
| DisplayName Spanish: | Sobre la fuente |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.214.2 Methods

### 58.214.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.214.4 Properties

### 58.214.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Atop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.214.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Atop attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.214.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.214.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.215 class CIFilterSourceInCompositingMBS

### 58.215.1 class CIFilterSourceInCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Source In filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISourceInCompositing |
| DisplayName English: | Source In |
| DisplayName German: | Quelle innen |
| DisplayName French: | Source √† l,Äôint√©rieur |
| DisplayName Italian: | Sorgente ingresso |
| DisplayName Spanish: | Desde dentro de la fuente |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.215.2 Methods

### 58.215.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.215.4 Properties

### 58.215.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source In attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.215.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source In attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.215.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.215.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.216 class CIFilterSourceOutCompositingMBS

### 58.216.1 class CIFilterSourceOutCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Source Out filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISourceOutCompositing |
| DisplayName English: | Source Out |
| DisplayName German: | Quelle au√üen |
| DisplayName French: | Source √† l,Äôext√©rieur |
| DisplayName Italian: | Sorgente uscita |
| DisplayName Spanish: | Desde fuera de la fuente |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.216.2 Methods

### 58.216.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.216.4 Properties

### 58.216.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Out attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.216.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Out attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.216.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.216.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.217 class CIFilterSourceOverCompositingMBS

### 58.217.1 class CIFilterSourceOverCompositingMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Source Over filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISourceOverCompositing |
| DisplayName English: | Source Over |
| DisplayName German: | Quelle √ºber |
| DisplayName French: | Source au-dessus |
| DisplayName Italian: | Sorgente sovrapposizione |
| DisplayName Spanish: | Alrededor de la fuente |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.217.2 Methods

### 58.217.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.217.4 Properties

### 58.217.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Over attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.217.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Source Over attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.217.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.217.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.218 class CIFilterSpotColorMBS

### 58.218.1 class CIFilterSpotColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Spot Color filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISpotColor |
| DisplayName English: | Spot Color |
| DisplayName German: | Spot-Farbe |
| DisplayName French: | Couleur de la tache |
| DisplayName Italian: | Colore tinta piatta |
| DisplayName Spanish: | Color del punto |

Categories:

- CICategoryBuiltIn: Built-In
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryStylize: Stylize

Input:

- inputImage: Image
- inputCenterColor1: Center Color 1
- inputReplacementColor1: Replacement Color 1
- inputCloseness1: Closeness 1
- inputContrast1: Contrast 1
- inputCenterColor2: Center Color 2
- inputReplacementColor2: Replacement Color 2
- inputCloseness2: Closeness 2
- inputContrast2: Contrast 2

- inputCenterColor3: Center Color 3
- inputReplacementColor3: Replacement Color 3
- inputCloseness3: Closeness 3
- inputContrast3: Contrast 3

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.218.2 Methods

### 58.218.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.218.4 Properties

### 58.218.5 AttributeinputCenterColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.218.6 AttributeinputCenterColor2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenterColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Center Color 1 |
| DisplayName German: | Mittenfarbe 1 |
| DisplayName French: | Couleur centrale 1 |
| DisplayName Italian: | Colore centrale 1 |
| DisplayName Spanish: | Color del centro 1 |
| DefaultColor: | Red = 0.0784, Green = 0.0627, Blue = 0.0706, Alpha = 1 |
| IdentityNumber: | 0 |

| | |
|---|---|
| Name: | inputCenterColor2 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Center Color 2 |
| DisplayName German: | Mittenfarbe 2 |
| DisplayName French: | Couleur centrale 2 |
| DisplayName Italian: | Colore centrale 2 |
| DisplayName Spanish: | Color del centro 2 |
| DefaultColor: | Red = 0.5255, Green = 0.3059, Blue = 0.3451, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.218.7 AttributeinputCenterColor3 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenterColor3 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Center Color 3 |
| DisplayName German: | Mittenfarbe 3 |
| DisplayName French: | Couleur centrale 3 |
| DisplayName Italian: | Colore centrale 3 |
| DisplayName Spanish: | Color del centro 3 |
| DefaultColor: | Red = 0.9216, Green = 0.4549, Blue = 0.3333, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.218.8 AttributeinputCloseness1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCloseness1 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Closeness 1 |
| DisplayName German: | N√§he 1 |
| DisplayName French: | Rapprochement 1 |
| DisplayName Italian: | Distanza 1 |
| DisplayName Spanish: | Acercamiento 1 |
| DefaultNumber: | 0.22 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.5 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.218.9 AttributeinputCloseness2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.218.10 AttributeinputCloseness3 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCloseness2 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Closeness 2 |
| DisplayName German: | N√§he 2 |
| DisplayName French: | Rapprochement 2 |
| DisplayName Italian: | Distanza 2 |
| DisplayName Spanish: | Acercamiento 2 |
| DefaultNumber: | 0.15 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.5 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputCloseness3 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Closeness 3 |
| DisplayName German: | N√§he 3 |
| DisplayName French: | Rapprochement 3 |
| DisplayName Italian: | Distanza 3 |
| DisplayName Spanish: | Acercamiento 3 |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 0.5 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.218.11 AttributeinputContrast1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.218.12 AttributeinputContrast2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputContrast1 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Contrast 1 |
| DisplayName German: | Kontrast 1 |
| DisplayName French: | Contraste 1 |
| DisplayName Italian: | Contrasto 1 |
| DisplayName Spanish: | Contraste 1 |
| DefaultNumber: | 0.98 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputContrast2 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Contrast 2 |
| DisplayName German: | Kontrast 2 |
| DisplayName French: | Contraste 2 |
| DisplayName Italian: | Contrasto 2 |
| DisplayName Spanish: | Contraste 2 |
| DefaultNumber: | 0.98 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.218.13 AttributeinputContrast3 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputContrast3 |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Contrast 3 |
| DisplayName German: | Kontrast 3 |
| DisplayName French: | Contraste 3 |
| DisplayName Italian: | Contrasto 3 |
| DisplayName Spanish: | Contraste 3 |
| DefaultNumber: | 0.99 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.218.14 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.218.15 AttributeinputReplacementColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputReplacementColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Replacement Color 1 |
| DisplayName German: | Ersetzungsfarbe 1 |
| DisplayName French: | Couleur de remplacement 1 |
| DisplayName Italian: | Colore di sostituzione 1 |
| DisplayName Spanish: | Color de reemplazo 1 |
| DefaultColor: | Red = 0.4392, Green = 0.1922, Blue = 0.1961, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.218.16 AttributeinputReplacementColor2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputReplacementColor2 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Replacement Color 2 |
| DisplayName German: | Ersetzungsfarbe 2 |
| DisplayName French: | Couleur de remplacement 2 |
| DisplayName Italian: | Colore di sostituzione 2 |
| DisplayName Spanish: | Color de reemplazo 2 |
| DefaultColor: | Red = 0.9137, Green = 0.5608, Blue = 0.5059, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.218.17 AttributeinputReplacementColor3 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Color attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputReplacementColor3 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Replacement Color 3 |
| DisplayName German: | Ersetzungsfarbe 3 |
| DisplayName French: | Couleur de remplacement 3 |
| DisplayName Italian: | Colore di sostituzione 3 |
| DisplayName Spanish: | Color de reemplazo 3 |
| DefaultColor: | Red = 0.9098, Green = 0.7529, Blue = 0.6078, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.218.18 inputCenterColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center Color 1
**Notes:**

| | |
|---|---|
| Name: | inputCenterColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Center Color 1 |
| DisplayName German: | Mittenfarbe 1 |
| DisplayName French: | Couleur centrale 1 |
| DisplayName Italian: | Colore centrale 1 |
| DisplayName Spanish: | Color del centro 1 |
| Type: | CIAttributeTypeColor |

See AttributeinputCenterColor1 for more details.
(Read and Write property)

### 58.218.19 inputCenterColor2 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center Color 2
**Notes:**

See AttributeinputCenterColor2 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenterColor2 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Center Color 2 |
| DisplayName German: | Mittenfarbe 2 |
| DisplayName French: | Couleur centrale 2 |
| DisplayName Italian: | Colore centrale 2 |
| DisplayName Spanish: | Color del centro 2 |
| Type: | CIAttributeTypeColor |

### 58.218.20 inputCenterColor3 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center Color 3
**Notes:**

| | |
|---|---|
| Name: | inputCenterColor3 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Center Color 3 |
| DisplayName German: | Mittenfarbe 3 |
| DisplayName French: | Couleur centrale 3 |
| DisplayName Italian: | Colore centrale 3 |
| DisplayName Spanish: | Color del centro 3 |
| Type: | CIAttributeTypeColor |

See AttributeinputCenterColor3 for more details.
(Read and Write property)

### 58.218.21 inputCloseness1 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Closeness 1
**Notes:**

| | |
|---|---|
| Name: | inputCloseness1 |
| Class: | double (NSNumber) |
| DisplayName English: | Closeness 1 |
| DisplayName German: | N√§he 1 |
| DisplayName French: | Rapprochement 1 |
| DisplayName Italian: | Distanza 1 |
| DisplayName Spanish: | Acercamiento 1 |
| Type: | CIAttributeTypeScalar |

See AttributeinputCloseness1 for more details.
(Read and Write property)

### 58.218.22 inputCloseness2 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Closeness 2
**Notes:**

| | |
|---|---|
| Name: | inputCloseness2 |
| Class: | double (NSNumber) |
| DisplayName English: | Closeness 2 |
| DisplayName German: | N√§he 2 |
| DisplayName French: | Rapprochement 2 |
| DisplayName Italian: | Distanza 2 |
| DisplayName Spanish: | Acercamiento 2 |
| Type: | CIAttributeTypeScalar |

See AttributeinputCloseness2 for more details.
(Read and Write property)

### 58.218.23 inputCloseness3 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Closeness 3
**Notes:**

| | |
|---|---|
| Name: | inputCloseness3 |
| Class: | double (NSNumber) |
| DisplayName English: | Closeness 3 |
| DisplayName German: | N√§he 3 |
| DisplayName French: | Rapprochement 3 |
| DisplayName Italian: | Distanza 3 |
| DisplayName Spanish: | Acercamiento 3 |
| Type: | CIAttributeTypeScalar |

See AttributeinputCloseness3 for more details.
(Read and Write property)

### 58.218.24 inputContrast1 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Contrast 1
**Notes:**

| | |
|---|---|
| Name: | inputContrast1 |
| Class: | double (NSNumber) |
| DisplayName English: | Contrast 1 |
| DisplayName German: | Kontrast 1 |
| DisplayName French: | Contraste 1 |
| DisplayName Italian: | Contrasto 1 |
| DisplayName Spanish: | Contraste 1 |
| Type: | CIAttributeTypeScalar |

See AttributeinputContrast1 for more details.
(Read and Write property)

### 58.218.25 inputContrast2 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Contrast 2
**Notes:**

| | |
|---|---|
| Name: | inputContrast2 |
| Class: | double (NSNumber) |
| DisplayName English: | Contrast 2 |
| DisplayName German: | Kontrast 2 |
| DisplayName French: | Contraste 2 |
| DisplayName Italian: | Contrasto 2 |
| DisplayName Spanish: | Contraste 2 |
| Type: | CIAttributeTypeScalar |

See AttributeinputContrast2 for more details.
(Read and Write property)

### 58.218.26 inputContrast3 as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Contrast 3
**Notes:**

| | |
|---|---|
| Name: | inputContrast3 |
| Class: | double (NSNumber) |
| DisplayName English: | Contrast 3 |
| DisplayName German: | Kontrast 3 |
| DisplayName French: | Contraste 3 |
| DisplayName Italian: | Contrasto 3 |
| DisplayName Spanish: | Contraste 3 |
| Type: | CIAttributeTypeScalar |

See AttributeinputContrast3 for more details.
(Read and Write property)

### 58.218.27 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.218.28 inputReplacementColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Replacement Color 1
**Notes:**

See AttributeinputReplacementColor1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputReplacementColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Replacement Color 1 |
| DisplayName German: | Ersetzungsfarbe 1 |
| DisplayName French: | Couleur de remplacement 1 |
| DisplayName Italian: | Colore di sostituzione 1 |
| DisplayName Spanish: | Color de reemplazo 1 |
| Type: | CIAttributeTypeColor |

### 58.218.29 inputReplacementColor2 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Replacement Color 2
**Notes:**

| | |
|---|---|
| Name: | inputReplacementColor2 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Replacement Color 2 |
| DisplayName German: | Ersetzungsfarbe 2 |
| DisplayName French: | Couleur de remplacement 2 |
| DisplayName Italian: | Colore di sostituzione 2 |
| DisplayName Spanish: | Color de reemplazo 2 |
| Type: | CIAttributeTypeColor |

See AttributeinputReplacementColor2 for more details.
(Read and Write property)

### 58.218.30 inputReplacementColor3 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Replacement Color 3
**Notes:**

| | |
|---|---|
| Name: | inputReplacementColor3 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Replacement Color 3 |
| DisplayName German: | Ersetzungsfarbe 3 |
| DisplayName French: | Couleur de remplacement 3 |
| DisplayName Italian: | Colore di sostituzione 3 |
| DisplayName Spanish: | Color de reemplazo 3 |
| Type: | CIAttributeTypeColor |

See AttributeinputReplacementColor3 for more details.
(Read and Write property)

# 58.219 class CIFilterSpotLightMBS

## 58.219.1 class CIFilterSpotLightMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Spot Light filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISpotLight |
| DisplayName English: | Spot Light |
| DisplayName German: | Rampenlicht |
| DisplayName French: | Phare |
| DisplayName Italian: | Luminosit√† tinta piatta |
| DisplayName Spanish: | Luz concentrada |

Categories:

- CICategoryStylize: Stylize
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputLightPosition: Light Position
- inputLightPointsAt: Light Points At
- inputBrightness: Brightness
- inputConcentration: Concentration
- inputColor: Color

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.219.2 Methods

### 58.219.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.219.4 Properties

### 58.219.5 AttributeinputBrightness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBrightness |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Brightness |
| DisplayName German: | Helligkeit |
| DisplayName French: | Luminosit√© |
| DisplayName Italian: | Luminosit√† |
| DisplayName Spanish: | Brillo |
| DefaultNumber: | 3 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.219.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeOpaqueColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.219.7 AttributeinputConcentration as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputConcentration |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Concentration |
| DisplayName German: | Konzentration |
| DisplayName French: | Concentration |
| DisplayName Italian: | Concentrazione |
| DisplayName Spanish: | Concentraci√n |
| DefaultNumber: | 0.1 |
| IdentityNumber: | 20 |
| MaxNumber: | 0 |
| MinNumber: | 0.001 |
| SliderMaxNumber: | 1.5 |
| SliderMinNumber: | 0.001 |

(Read only property)

### 58.219.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.219.9 AttributeinputLightPointsAt as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputLightPointsAt |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition3 |
| DisplayName English: | Light Points At |
| DisplayName German: | Lichtpunkte bei |
| DisplayName French: | Points lumineux √† |
| DisplayName Italian: | Punti luce a |
| DisplayName Spanish: | El foco apunta a |
| DefaultVector: | [ 200 200 0 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.219.10 AttributeinputLightPosition as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Spot Light attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputLightPosition |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition3 |
| DisplayName English: | Light Position |
| DisplayName German: | Lichtposition |
| DisplayName French: | Position de la lumi√®re |
| DisplayName Italian: | Posizione luce |
| DisplayName Spanish: | Posici√n de la luz |
| DefaultVector: | [ 400 600 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.219.11 inputBrightness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Brightness
**Notes:**

| | |
|---|---|
| Name: | inputBrightness |
| Class: | double (NSNumber) |
| DisplayName English: | Brightness |
| DisplayName German: | Helligkeit |
| DisplayName French: | Luminosit√© |
| DisplayName Italian: | Luminosit√† |
| DisplayName Spanish: | Brillo |
| Type: | CIAttributeTypeDistance |

See AttributeinputBrightness for more details.
(Read and Write property)

### 58.219.12 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

See AttributeinputColor for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeOpaqueColor |

### 58.219.13 inputConcentration as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Concentration
**Notes:**

| | |
|---|---|
| Name: | inputConcentration |
| Class: | double (NSNumber) |
| DisplayName English: | Concentration |
| DisplayName German: | Konzentration |
| DisplayName French: | Concentration |
| DisplayName Italian: | Concentrazione |
| DisplayName Spanish: | Concentraci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputConcentration for more details.
(Read and Write property)

### 58.219.14 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.219.15 inputLightPointsAt as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Light Points At
**Notes:**

| | |
|---|---|
| Name: | inputLightPointsAt |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Light Points At |
| DisplayName German: | Lichtpunkte bei |
| DisplayName French: | Points lumineux √† |
| DisplayName Italian: | Punti luce a |
| DisplayName Spanish: | El foco apunta a |
| Type: | CIAttributeTypePosition3 |

See AttributeinputLightPointsAt for more details.
(Read and Write property)

### 58.219.16 inputLightPosition as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Light Position
**Notes:**

| | |
|---|---|
| Name: | inputLightPosition |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Light Position |
| DisplayName German: | Lichtposition |
| DisplayName French: | Position de la lumi√®re |
| DisplayName Italian: | Posizione luce |
| DisplayName Spanish: | Posici√n de la luz |
| Type: | CIAttributeTypePosition3 |

See AttributeinputLightPosition for more details.
(Read and Write property)

## 58.220 class CIFilterSRGBToneCurveToLinearMBS

### 58.220.1 class CIFilterSRGBToneCurveToLinearMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage sRGB Tone Curve to Linear filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISRGBToneCurveToLinear |
| DisplayName English: | sRGB Tone Curve to Linear |
| DisplayName German: | sRGB-Farbtonkurve in eine lineare Farbtonkurve |
| DisplayName French: | Courbe tonale sRGB vers lin√©aire |
| DisplayName Italian: | Da curva tonale sRGB a lineare |
| DisplayName Spanish: | Curva tonal de sRGB a lineal |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.220.2 Methods

### 58.220.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.220.4 Properties

### 58.220.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the sRGB Tone Curve to Linear attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.220.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.221 class CIFilterStarShineGeneratorMBS

## 58.221.1 class CIFilterStarShineGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Star Shine filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIStarShineGenerator |
| DisplayName English: | Star Shine |
| DisplayName German: | Sternenlicht |
| DisplayName French: | Brillance d,Äô√©toile |
| DisplayName Italian: | Stella luminosa |
| DisplayName Spanish: | Brillo estrellado |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor: Color
- inputRadius: Radius
- inputCrossScale: Cross Scale
- inputCrossAngle: Cross Angle
- inputCrossOpacity: Cross Opacity
- inputCrossWidth: Cross Width
- inputEpsilon: Epsilon

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.221.2 Methods

### 58.221.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.221.4 Properties

### 58.221.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.221.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 0.8, Blue = 0.6, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.221.7 AttributeinputCrossAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCrossAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Cross Angle |
| DisplayName German: | Cross-Winkel |
| DisplayName French: | Angle crois√© |
| DisplayName Italian: | Angolo incrociato |
| DisplayName Spanish: | √Ångulo cruzado |
| DefaultNumber: | 0.6 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.221.8 AttributeinputCrossOpacity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCrossOpacity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Cross Opacity |
| DisplayName German: | Cross-Deckkraft |
| DisplayName French: | Opacit√© crois√©e |
| DisplayName Italian: | Opacit√† incrociata |
| DisplayName Spanish: | Opacidad cruzada |
| DefaultNumber: | -2 |
| IdentityNumber: | -2 |
| MaxNumber: | 0 |
| MinNumber: | -8 |
| SliderMaxNumber: | 0 |
| SliderMinNumber: | -8 |

(Read only property)

### 58.221.9 AttributeinputCrossScale as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.221.10 AttributeinputCrossWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCrossScale |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Cross Scale |
| DisplayName German: | Cross-Skalierung |
| DisplayName French: | √âchelle crois√©e |
| DisplayName Italian: | Scala incrociata |
| DisplayName Spanish: | Escala cruzada |
| DefaultNumber: | 15 |
| IdentityNumber: | 15 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputCrossWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Cross Width |
| DisplayName German: | Cross-Breite |
| DisplayName French: | Largeur crois√©e |
| DisplayName Italian: | Larghezza incrociata |
| DisplayName Spanish: | Anchura cruzada |
| DefaultNumber: | 2.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0.5 |

### 58.221.11 AttributeinputEpsilon as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.221.12 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Star Shine attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputEpsilon |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Epsilon |
| DisplayName German: | Epsilon |
| DisplayName French: | Epsilon |
| DisplayName Italian: | Ipsilon |
| DisplayName Spanish: | √âpsilon |
| DefaultNumber: | -2 |
| IdentityNumber: | -2 |
| MaxNumber: | 0 |
| MinNumber: | -8 |
| SliderMaxNumber: | 0 |
| SliderMinNumber: | -8 |

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 50 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 300 |
| SliderMinNumber: | 0 |

### 58.221.13 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

### 58.221.14 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.221.15 inputCrossAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cross Angle
**Notes:**

| | |
|---|---|
| Name: | inputCrossAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Cross Angle |
| DisplayName German: | Cross-Winkel |
| DisplayName French: | Angle crois√© |
| DisplayName Italian: | Angolo incrociato |
| DisplayName Spanish: | √Ångulo cruzado |
| Type: | CIAttributeTypeAngle |

See AttributeinputCrossAngle for more details.
(Read and Write property)

### 58.221.16 inputCrossOpacity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cross Opacity
**Notes:**

| | |
|---|---|
| Name: | inputCrossOpacity |
| Class: | double (NSNumber) |
| DisplayName English: | Cross Opacity |
| DisplayName German: | Cross-Deckkraft |
| DisplayName French: | Opacit√© crois√©e |
| DisplayName Italian: | Opacit√† incrociata |
| DisplayName Spanish: | Opacidad cruzada |
| Type: | CIAttributeTypeScalar |

See AttributeinputCrossOpacity for more details.
(Read and Write property)

### 58.221.17 inputCrossScale as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cross Scale
**Notes:**

| | |
|---|---|
| Name: | inputCrossScale |
| Class: | double (NSNumber) |
| DisplayName English: | Cross Scale |
| DisplayName German: | Cross-Skalierung |
| DisplayName French: | √âchelle crois√©e |
| DisplayName Italian: | Scala incrociata |
| DisplayName Spanish: | Escala cruzada |
| Type: | CIAttributeTypeScalar |

See AttributeinputCrossScale for more details.
(Read and Write property)

### 58.221.18 inputCrossWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Cross Width
**Notes:**

| | |
|---|---|
| Name: | inputCrossWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Cross Width |
| DisplayName German: | Cross-Breite |
| DisplayName French: | Largeur crois√©e |
| DisplayName Italian: | Larghezza incrociata |
| DisplayName Spanish: | Anchura cruzada |
| Type: | CIAttributeTypeDistance |

See AttributeinputCrossWidth for more details.
(Read and Write property)

### 58.221.19 inputEpsilon as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Epsilon
**Notes:**

| | |
|---|---|
| Name: | inputEpsilon |
| Class: | double (NSNumber) |
| DisplayName English: | Epsilon |
| DisplayName German: | Epsilon |
| DisplayName French: | Epsilon |
| DisplayName Italian: | Ipsilon |
| DisplayName Spanish: | √âpsilon |
| Type: | CIAttributeTypeScalar |

See AttributeinputEpsilon for more details.
(Read and Write property)

### 58.221.20 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

# 58.222 class CIFilterStraightenFilterMBS

## 58.222.1 class CIFilterStraightenFilterMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Straighten filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIStraightenFilter |
| DisplayName English: | Straighten |
| DisplayName German: | Begradigen |
| DisplayName French: | Redresser |
| DisplayName Italian: | Raddrizza |
| DisplayName Spanish: | Enderezar |

Categories:

- CICategoryGeometryAdjustment: Geometry Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.222.2 Methods

### 58.222.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.222.4 Properties

### 58.222.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Straighten attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.222.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Straighten attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.222.7 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.222.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.223 class CIFilterStretchCropMBS

## 58.223.1 class CIFilterStretchCropMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Stretch Crop filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIStretchCrop |
| DisplayName English: | Stretch Crop |
| DisplayName German: | Schnitt dehnen |
| DisplayName French: | √âtirer le recadrage |
| DisplayName Italian: | Allarga o ritaglia |
| DisplayName Spanish: | Estirar recorte |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputSize: Size
- inputCropAmount: Crop Amount
- inputCenterStretchAmount: Center Stretch Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.223.2 Methods

### 58.223.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.223.4 Properties

### 58.223.5 AttributeinputCenterStretchAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stretch Crop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenterStretchAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Center Stretch Amount |
| DisplayName German: | Zentrale Dehnung |
| DisplayName French: | Degr√© d,Äô√©tirement au centre |
| DisplayName Italian: | Quantit√† di estensione centrale |
| DisplayName Spanish: | Cantidad de estiramiento central |
| DefaultNumber: | 0.25 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.223.6 AttributeinputCropAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stretch Crop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCropAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Crop Amount |
| DisplayName German: | Beschneidungsgrad |
| DisplayName French: | Degr√© de recadrage |
| DisplayName Italian: | Quantit√† di ritaglio |
| DisplayName Spanish: | Cantidad de recorte |
| DefaultNumber: | 0.25 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.223.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stretch Crop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.223.8 AttributeinputSize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stretch Crop attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSize |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName: | Size |
| DefaultVector: | [ 1280 720 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.223.9 inputCenterStretchAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center Stretch Amount
**Notes:**

| | |
|---|---|
| Name: | inputCenterStretchAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Center Stretch Amount |
| DisplayName German: | Zentrale Dehnung |
| DisplayName French: | Degr√© d,Äô√©tirement au centre |
| DisplayName Italian: | Quantit√† di estensione centrale |
| DisplayName Spanish: | Cantidad de estiramiento central |
| Type: | CIAttributeTypeScalar |

See AttributeinputCenterStretchAmount for more details.
(Read and Write property)

### 58.223.10 inputCropAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Crop Amount
**Notes:**

See AttributeinputCropAmount for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCropAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Crop Amount |
| DisplayName German: | Beschneidungsgrad |
| DisplayName French: | Degr√© de recadrage |
| DisplayName Italian: | Quantit√† di ritaglio |
| DisplayName Spanish: | Cantidad de recorte |
| Type: | CIAttributeTypeScalar |

### 58.223.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.223.12 inputSize as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Size
**Notes:**

| | |
|---|---|
| Name: | inputSize |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Size |
| DisplayName German: | Size |
| DisplayName French: | Size |
| DisplayName Italian: | Size |
| DisplayName Spanish: | Size |
| Type: | CIAttributeTypePosition |

See AttributeinputSize for more details.
(Read and Write property)

# 58.224 class CIFilterStripesGeneratorMBS

## 58.224.1 class CIFilterStripesGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Stripes filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIStripesGenerator |
| DisplayName English: | Stripes |
| DisplayName German: | Streifen |
| DisplayName French: | Rayures |
| DisplayName Italian: | Strisce |
| DisplayName Spanish: | Franjas |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor0: Color 1
- inputColor1: Color 2
- inputWidth: Width
- inputSharpness: Sharpness

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.224.2 Methods

### 58.224.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.224.4 Properties

### 58.224.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stripes attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.224.6 AttributeinputColor0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stripes attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

### 58.224.7 AttributeinputColor1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stripes attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| DefaultColor: | Red = 0, Green = 0, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.224.8 AttributeinputSharpness as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stripes attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.224.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Stripes attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 80 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.224.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.224.11 inputColor0 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 1
**Notes:**

| | |
|---|---|
| Name: | inputColor0 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 1 |
| DisplayName German: | Farbe 1 |
| DisplayName French: | Couleur 1 |
| DisplayName Italian: | Colore 1 |
| DisplayName Spanish: | Color 1 |
| Type: | CIAttributeTypeColor |

See AttributeinputColor0 for more details.
(Read and Write property)

### 58.224.12 inputColor1 as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color 2
**Notes:**

See AttributeinputColor1 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputColor1 |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color 2 |
| DisplayName German: | Farbe 2 |
| DisplayName French: | Couleur 2 |
| DisplayName Italian: | Colore 2 |
| DisplayName Spanish: | Color 2 |
| Type: | CIAttributeTypeColor |

### 58.224.13 inputSharpness as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sharpness
**Notes:**

| | |
|---|---|
| Name: | inputSharpness |
| Class: | double (NSNumber) |
| DisplayName English: | Sharpness |
| DisplayName German: | Sch√§rfe |
| DisplayName French: | Nettet√© |
| DisplayName Italian: | Nitidezza |
| DisplayName Spanish: | Nitidez |
| Type: | CIAttributeTypeScalar |

See AttributeinputSharpness for more details.
(Read and Write property)

### 58.224.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.225 class CIFilterSubtractBlendModeMBS

### 58.225.1 class CIFilterSubtractBlendModeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Subtract Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISubtractBlendMode |
| DisplayName English: | Subtract Blend Mode |
| DisplayName German: | Mischmethode ,ÄûSubtrahieren,Äú |
| DisplayName French: | Mode de fusion Soustraction |
| DisplayName Italian: | Modalit√† sfumatura sottrazione |
| DisplayName Spanish: | Restar modo de mezcla |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.225.2 Methods

### 58.225.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.225.4 Properties

### 58.225.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Subtract Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.225.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Subtract Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.225.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.225.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.226 class CIFilterSunbeamsGeneratorMBS

### 58.226.1 class CIFilterSunbeamsGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Sunbeams filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISunbeamsGenerator |
| DisplayName English: | Sunbeams |
| DisplayName German: | Sonnenstrahlen |
| DisplayName French: | Rayons solaires |
| DisplayName Italian: | Raggi di sole |
| DisplayName Spanish: | Rayos de sol |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputCenter: Center
- inputColor: Color
- inputSunRadius: Sun Radius
- inputMaxStriationRadius: Maximum Striation Radius
- inputStriationStrength: Striation Strength
- inputStriationContrast: Striation Contrast
- inputTime: Time

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.226.2 Methods

### 58.226.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.226.4 Properties

### 58.226.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.226.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 0.5, Blue = 0, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.226.7 AttributeinputMaxStriationRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputMaxStriationRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Maximum Striation Radius |
| DisplayName German: | Maximaler Radius f√ºr Riffelung |
| DisplayName French: | Rayon maximum des stries |
| DisplayName Italian: | Raggio di massima striatura |
| DisplayName Spanish: | Radio de estriaci√n m√°ximo |
| DefaultNumber: | 2.58 |
| IdentityNumber: | 2.58 |
| SliderMaxNumber: | 10 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.226.8 AttributeinputStriationContrast as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| DefaultNumber: | 1.375 |
| IdentityNumber: | 1.375 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.226.9 AttributeinputStriationStrength as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0.5 |
| SliderMaxNumber: | 3 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.226.10 AttributeinputSunRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSunRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Sun Radius |
| DisplayName German: | Radius der Sonne |
| DisplayName French: | Rayon du soleil |
| DisplayName Italian: | Raggio del sole |
| DisplayName Spanish: | Radio solar |
| DefaultNumber: | 40 |
| IdentityNumber: | 40 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.226.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Sunbeams attribute.
**Notes:** This attribute should have this content:

(Read only property)

### 58.226.12 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.226.13 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.226.14 inputMaxStriationRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Maximum Striation Radius
**Notes:**

| | |
|---|---|
| Name: | inputMaxStriationRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Maximum Striation Radius |
| DisplayName German: | Maximaler Radius f√ºr Riffelung |
| DisplayName French: | Rayon maximum des stries |
| DisplayName Italian: | Raggio di massima striatura |
| DisplayName Spanish: | Radio de estriaci√n m√°ximo |
| Type: | CIAttributeTypeScalar |

See AttributeinputMaxStriationRadius for more details.
(Read and Write property)

### 58.226.15 inputStriationContrast as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Contrast
**Notes:**

| | |
|---|---|
| Name: | inputStriationContrast |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Contrast |
| DisplayName German: | Kontrast f√ºr Riffelung |
| DisplayName French: | Contraste des stries |
| DisplayName Italian: | Contrasto striatura |
| DisplayName Spanish: | Contraste de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationContrast for more details.
(Read and Write property)

### 58.226.16 inputStriationStrength as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Striation Strength
**Notes:**

| | |
|---|---|
| Name: | inputStriationStrength |
| Class: | double (NSNumber) |
| DisplayName English: | Striation Strength |
| DisplayName German: | St√§rke der Riffelung |
| DisplayName French: | Force des stries |
| DisplayName Italian: | Livello striatura |
| DisplayName Spanish: | Intensidad de la estriaci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputStriationStrength for more details.
(Read and Write property)

### 58.226.17 inputSunRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Sun Radius
**Notes:**

| | |
|---|---|
| Name: | inputSunRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Sun Radius |
| DisplayName German: | Radius der Sonne |
| DisplayName French: | Rayon du soleil |
| DisplayName Italian: | Raggio del sole |
| DisplayName Spanish: | Radio solar |
| Type: | CIAttributeTypeDistance |

See AttributeinputSunRadius for more details.
(Read and Write property)

### 58.226.18 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

See AttributeinputTime for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeScalar |

# 58.227 class CIFilterSwipeTransitionMBS

## 58.227.1 class CIFilterSwipeTransitionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Swipe filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CISwipeTransition |
| DisplayName English: | Swipe |
| DisplayName German: | Wischen |
| DisplayName French: | Balayer |
| DisplayName Italian: | Colpo |
| DisplayName Spanish: | Barrido |

Categories:

- CICategoryTransition: Transition
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputTargetImage: Target Image
- inputExtent: Extent
- inputColor: Color
- inputTime: Time
- inputAngle: Angle
- inputWidth: Width
- inputOpacity: Opacity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.227.2 Methods

### 58.227.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.227.4 Properties

### 58.227.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.227.6 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeOpaqueColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.227.7 AttributeinputExtent as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeRectangle |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| DefaultVector: | [ 0 0 300 300 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.227.8 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.227.9 AttributeinputOpacity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputOpacity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Opacity |
| DisplayName German: | Deckkraft |
| DisplayName French: | Opacit√© |
| DisplayName Italian: | Opacit√† |
| DisplayName Spanish: | Opacidad |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.227.10 AttributeinputTargetImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.227.11 AttributeinputTime as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTime |
| Class: | double |
| Type: | CIAttributeTypeTime |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.227.12 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Swipe attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| MaxNumber: | 0 |
| MinNumber: | 0.1 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0.1 |

(Read only property)

### 58.227.13 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.

(Read and Write property)

### 58.227.14 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeOpaqueColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.227.15 inputExtent as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Extent
**Notes:**

| | |
|---|---|
| Name: | inputExtent |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Extent |
| DisplayName German: | Betrag |
| DisplayName French: | √âtendue |
| DisplayName Italian: | Ampiezza |
| DisplayName Spanish: | Amplitud |
| Type: | CIAttributeTypeRectangle |

See AttributeinputExtent for more details.
(Read and Write property)

### 58.227.16 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.227.17 inputOpacity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Opacity
**Notes:**

| | |
|---|---|
| Name: | inputOpacity |
| Class: | double (NSNumber) |
| DisplayName English: | Opacity |
| DisplayName German: | Deckkraft |
| DisplayName French: | Opacit√© |
| DisplayName Italian: | Opacit√† |
| DisplayName Spanish: | Opacidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputOpacity for more details.
(Read and Write property)

### 58.227.18 inputTargetImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Image
**Notes:**

| | |
|---|---|
| Name: | inputTargetImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Target Image |
| DisplayName German: | Zielbild |
| DisplayName French: | Image cible |
| DisplayName Italian: | Immagine target |
| DisplayName Spanish: | Imagen de destino |
| Type: | CIAttributeTypeImage |

See AttributeinputTargetImage for more details.
(Read and Write property)

### 58.227.19 inputTime as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Time
**Notes:**

| | |
|---|---|
| Name: | inputTime |
| Class: | double (NSNumber) |
| DisplayName English: | Time |
| DisplayName German: | Zeit |
| DisplayName French: | Dur√©e |
| DisplayName Italian: | Tempo |
| DisplayName Spanish: | Tiempo |
| Type: | CIAttributeTypeTime |

See AttributeinputTime for more details.
(Read and Write property)

### 58.227.20 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

See AttributeinputWidth for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

# 58.228 class CIFilterTemperatureAndTintMBS

## 58.228.1 class CIFilterTemperatureAndTintMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Temperature and Tint filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITemperatureAndTint |
| DisplayName English: | Temperature and Tint |
| DisplayName German: | Temperatur und F√§rbung |
| DisplayName French: | Temp√©rature et teinte |
| DisplayName Italian: | Temperatura e tinta |
| DisplayName Spanish: | Temperatura y tinte |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputNeutral: Neutral
- inputTargetNeutral: Target Neutral

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.228.2 Methods

### 58.228.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.228.4 Properties

### 58.228.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Temperature and Tint attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.228.6 AttributeinputNeutral as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Temperature and Tint attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputNeutral |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName: | Neutral |
| DefaultVector: | [ 6500 0 ] |
| IdentityVector: | [ 6500 0 ] |

(Read only property)

### 58.228.7 AttributeinputTargetNeutral as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Temperature and Tint attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputTargetNeutral |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Target Neutral |
| DisplayName German: | Zielneutral |
| DisplayName French: | Couleur neutre cible |
| DisplayName Italian: | Elemento neutro target |
| DisplayName Spanish: | Neutro para el destino |
| DefaultVector: | [ 6500 0 ] |
| IdentityVector: | [ 6500 0 ] |

(Read only property)

### 58.228.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

### 58.228.9 inputNeutral as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Neutral
**Notes:**

| | |
|---|---|
| Name: | inputNeutral |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Neutral |
| DisplayName German: | Neutral |
| DisplayName French: | Neutral |
| DisplayName Italian: | Neutral |
| DisplayName Spanish: | Neutral |
| Type: | CIAttributeTypeOffset |

See AttributeinputNeutral for more details.
(Read and Write property)

### 58.228.10 inputTargetNeutral as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Target Neutral
**Notes:**

See AttributeinputTargetNeutral for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputTargetNeutral |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Target Neutral |
| DisplayName German: | Zielneutral |
| DisplayName French: | Couleur neutre cible |
| DisplayName Italian: | Elemento neutro target |
| DisplayName Spanish: | Neutro para el destino |
| Type: | CIAttributeTypeOffset |

# 58.229 class CIFilterTextImageGeneratorMBS

## 58.229.1 class CIFilterTextImageGeneratorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Text Image Generator filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITextImageGenerator |
| DisplayName English: | Text Image Generator |
| DisplayName German: | Textbildgenerator |
| DisplayName French: | G√©n√©rateur d,Äôimage de texte |
| DisplayName Italian: | Generatore immagine di testo |
| DisplayName Spanish: | Generador de im√°genes con texto |

Categories:

- CICategoryGenerator: Generator
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputText: Text
- inputFontName: Font Name
- inputFontSize: Font Size
- inputScaleFactor: Scale Factor
- inputPadding: Padding

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.229.2 Methods

### 58.229.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.229.4 Properties

### 58.229.5 AttributeinputFontName as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Text Image Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputFontName |
| Class: | String |
| DisplayName English: | Font Name |
| DisplayName German: | Schriftname |
| DisplayName French: | Nom de la police |
| DisplayName Italian: | Nome font |
| DisplayName Spanish: | Nombre de tipo de letra |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.229.6 AttributeinputFontSize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Text Image Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputFontSize |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Font Size |
| DisplayName German: | Schriftgr√√üe |
| DisplayName French: | Taille de la police |
| DisplayName Italian: | Dimensioni font |
| DisplayName Spanish: | Tama√±o de letra |
| DefaultNumber: | 12 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 128 |
| SliderMinNumber: | 9 |

### 58.229.7 AttributeinputPadding as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Text Image Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPadding |
| Class: | double |
| Type: | CIAttributeTypeInteger |
| DisplayName: | Padding |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 200 |
| MinNumber: | 0 |
| SliderMaxNumber: | 50 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.229.8 AttributeinputScaleFactor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Text Image Generator attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 4 |
| SliderMinNumber: | 1 |

### 58.229.9 AttributeinputText as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Text Image Generator attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputText |
| Class: | String |
| DisplayName: | Text |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.229.10 inputFontName as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Font Name
**Notes:**

See AttributeinputFontName for more details.
(Read and Write property)

### 58.229.11 inputFontSize as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputFontName |
| Class: | String (NSString) |
| DisplayName English: | Font Name |
| DisplayName German: | Schriftname |
| DisplayName French: | Nom de la police |
| DisplayName Italian: | Nome font |
| DisplayName Spanish: | Nombre de tipo de letra |

**Function:** The attribute Font Size
**Notes:**

| | |
|---|---|
| Name: | inputFontSize |
| Class: | double (NSNumber) |
| DisplayName English: | Font Size |
| DisplayName German: | Schriftgr√√üe |
| DisplayName French: | Taille de la police |
| DisplayName Italian: | Dimensioni font |
| DisplayName Spanish: | Tama√±o de letra |
| Type: | CIAttributeTypeScalar |

See AttributeinputFontSize for more details.
(Read and Write property)

### 58.229.12 inputPadding as double

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Padding
**Notes:**

| | |
|---|---|
| Name: | inputPadding |
| Class: | double (NSNumber) |
| DisplayName English: | Padding |
| DisplayName German: | Padding |
| DisplayName French: | Padding |
| DisplayName Italian: | Padding |
| DisplayName Spanish: | Padding |
| Type: | CIAttributeTypeInteger |

See AttributeinputPadding for more details.
(Read and Write property)

### 58.229.13 inputScaleFactor as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Scale Factor
**Notes:**

| | |
|---|---|
| Name: | inputScaleFactor |
| Class: | double (NSNumber) |
| DisplayName English: | Scale Factor |
| DisplayName German: | Skalierungsfaktor |
| DisplayName French: | Facteur d,Äô√©chelle |
| DisplayName Italian: | Fattore di scala |
| DisplayName Spanish: | Factor de escala |
| Type: | CIAttributeTypeScalar |

See AttributeinputScaleFactor for more details.
(Read and Write property)

### 58.229.14 inputText as String

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Text
**Notes:**

| | |
|---|---|
| Name: | inputText |
| Class: | String (NSString) |
| DisplayName English: | Text |
| DisplayName German: | Text |
| DisplayName French: | Text |
| DisplayName Italian: | Text |
| DisplayName Spanish: | Text |

See AttributeinputText for more details.
(Read and Write property)

# 58.230 class CIFilterThermalMBS

## 58.230.1 class CIFilterThermalMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Thermal filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIThermal |
| DisplayName English: | Thermal |
| DisplayName German: | W√§rmebild |
| DisplayName French: | Thermique |
| DisplayName Italian: | Termico |
| DisplayName Spanish: | T√©rmica |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.230.2 Methods

### 58.230.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.230.4 Properties

### 58.230.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Thermal attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.230.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.231 class CIFilterToneCurveMBS

## 58.231.1 class CIFilterToneCurveMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Tone Curve filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIToneCurve |
| DisplayName English: | Tone Curve |
| DisplayName German: | Farbtonkurve |
| DisplayName French: | Courbe tonale |
| DisplayName Italian: | Curva tonale |
| DisplayName Spanish: | Curva tonal |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputPoint0: Point 0
- inputPoint1: Point 1
- inputPoint2: Point 2
- inputPoint3: Point 3
- inputPoint4: Point 4

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.231.2 Methods

### 58.231.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.231.4 Properties

### 58.231.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.231.6 AttributeinputPoint0 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| DefaultVector: | [ 0 0 ] |
| IdentityVector: | [ 0 0 ] |

(Read only property)

### 58.231.7 AttributeinputPoint1 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| DefaultVector: | [ 0.25 0.25 ] |
| IdentityVector: | [ 0.25 0.25 ] |

(Read only property)

### 58.231.8 AttributeinputPoint2 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint2 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Point 2 |
| DisplayName German: | Punkt 2 |
| DisplayName French: | Point 2 |
| DisplayName Italian: | Punto 2 |
| DisplayName Spanish: | Punto 2 |
| DefaultVector: | [ 0.5 0.5 ] |
| IdentityVector: | [ 0.5 0.5 ] |

(Read only property)

### 58.231.9 AttributeinputPoint3 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint3 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Point 3 |
| DisplayName German: | Punkt 3 |
| DisplayName French: | Point¬†3 |
| DisplayName Italian: | Punto 3 |
| DisplayName Spanish: | Punto 3 |
| DefaultVector: | [ 0.75 0.75 ] |
| IdentityVector: | [ 0.75 0.75 ] |

(Read only property)

### 58.231.10 AttributeinputPoint4 as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Tone Curve attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint4 |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypeOffset |
| DisplayName English: | Point 4 |
| DisplayName German: | Punkt 4 |
| DisplayName French: | Point¬†4 |
| DisplayName Italian: | Punto 4 |
| DisplayName Spanish: | Punto 4 |
| DefaultVector: | [ 1 1 ] |
| IdentityVector: | [ 1 1 ] |

(Read only property)

### 58.231.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.231.12 inputPoint0 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 0
**Notes:**

| | |
|---|---|
| Name: | inputPoint0 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 0 |
| DisplayName German: | Punkt 0 |
| DisplayName French: | Point¬†0 |
| DisplayName Italian: | Punto 0 |
| DisplayName Spanish: | Punto 0 |
| Type: | CIAttributeTypeOffset |

See AttributeinputPoint0 for more details.
(Read and Write property)

### 58.231.13 inputPoint1 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 1
**Notes:**

| | |
|---|---|
| Name: | inputPoint1 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 1 |
| DisplayName German: | Punkt 1 |
| DisplayName French: | Point 1 |
| DisplayName Italian: | Punto 1 |
| DisplayName Spanish: | Punto 1 |
| Type: | CIAttributeTypeOffset |

See AttributeinputPoint1 for more details.
(Read and Write property)

### 58.231.14 inputPoint2 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 2
**Notes:**

See AttributeinputPoint2 for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputPoint2 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 2 |
| DisplayName German: | Punkt 2 |
| DisplayName French: | Point 2 |
| DisplayName Italian: | Punto 2 |
| DisplayName Spanish: | Punto 2 |
| Type: | CIAttributeTypeOffset |

### 58.231.15 inputPoint3 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 3
**Notes:**

| | |
|---|---|
| Name: | inputPoint3 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 3 |
| DisplayName German: | Punkt 3 |
| DisplayName French: | Point¬†3 |
| DisplayName Italian: | Punto 3 |
| DisplayName Spanish: | Punto 3 |
| Type: | CIAttributeTypeOffset |

See AttributeinputPoint3 for more details.
(Read and Write property)

### 58.231.16 inputPoint4 as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point 4
**Notes:**

| | |
|---|---|
| Name: | inputPoint4 |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point 4 |
| DisplayName German: | Punkt 4 |
| DisplayName French: | Point¬†4 |
| DisplayName Italian: | Punto 4 |
| DisplayName Spanish: | Punto 4 |
| Type: | CIAttributeTypeOffset |

See AttributeinputPoint4 for more details.
(Read and Write property)

# 58.232 class CIFilterTorusLensDistortionMBS

## 58.232.1 class CIFilterTorusLensDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Torus Lens Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITorusLensDistortion |
| DisplayName English: | Torus Lens Distortion |
| DisplayName German: | Verzerrung ,ÄûTorus-Linse,Äú |
| DisplayName French: | D√©formation Lentille torique |
| DisplayName Italian: | Distorsione lenti Torus |
| DisplayName Spanish: | Distorsi√n por lente toroidal |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputWidth: Width
- inputRefraction: Refraction

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.232.2 Methods

### 58.232.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.232.4 Properties

### 58.232.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Torus Lens Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.232.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Torus Lens Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.232.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Torus Lens Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 160 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 500 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.232.8 AttributeinputRefraction as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Torus Lens Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRefraction |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Refraction |
| DisplayName German: | Lichtbrechung |
| DisplayName French: | R√©fraction |
| DisplayName Italian: | Rifrazione |
| DisplayName Spanish: | Refracci√n |
| DefaultNumber: | 1.7 |
| IdentityNumber: | 1 |
| SliderMaxNumber: | 5 |
| SliderMinNumber: | 0 |

### 58.232.9 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Torus Lens Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 80 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.232.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

(Read and Write property)

### 58.232.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.232.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

### 58.232.13 inputRefraction as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Refraction
**Notes:**

| | |
|---|---|
| Name: | inputRefraction |
| Class: | double (NSNumber) |
| DisplayName English: | Refraction |
| DisplayName German: | Lichtbrechung |
| DisplayName French: | R√©fraction |
| DisplayName Italian: | Rifrazione |
| DisplayName Spanish: | Refracci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputRefraction for more details.
(Read and Write property)

### 58.232.14 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.233 class CIFilterTriangleKaleidoscopeMBS

### 58.233.1 class CIFilterTriangleKaleidoscopeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Triangle Kaleidoscope filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITriangleKaleidoscope |
| DisplayName English: | Triangle Kaleidoscope |
| DisplayName German: | Dreieckskaleidoskop |
| DisplayName French: | Kal√©idoscope en forme de triangle |
| DisplayName Italian: | Caleidoscopio triangolare |
| DisplayName Spanish: | Caleidoscopio triangular |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputPoint: Point
- inputSize: Size
- inputRotation: Rotation
- inputDecay: Decay

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.233.2 Methods

### 58.233.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.233.4 Properties

### 58.233.5 AttributeinputDecay as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputDecay |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Decay |
| DefaultNumber: | 0.85 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.233.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Kaleidoscope attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.233.7 AttributeinputPoint as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputPoint |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Point |
| DisplayName German: | Point |
| DisplayName French: | Point |
| DisplayName Italian: | Punto |
| DisplayName Spanish: | Punto |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.233.8 AttributeinputRotation as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Kaleidoscope attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRotation |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName: | Rotation |
| DefaultNumber: | 5.924285 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 6.283185 |
| SliderMinNumber: | 0 |

### 58.233.9 AttributeinputSize as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Kaleidoscope attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputSize |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName: | Size |
| DefaultNumber: | 700 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1000 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.233.10 inputDecay as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Decay
**Notes:**

See AttributeinputDecay for more details.
(Read and Write property)

### 58.233.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

| | |
|---|---|
| Name: | inputDecay |
| Class: | double (NSNumber) |
| DisplayName English: | Decay |
| DisplayName German: | Decay |
| DisplayName French: | Decay |
| DisplayName Italian: | Decay |
| DisplayName Spanish: | Decay |
| Type: | CIAttributeTypeScalar |

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.233.12 inputPoint as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Point
**Notes:**

| | |
|---|---|
| Name: | inputPoint |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Point |
| DisplayName German: | Point |
| DisplayName French: | Point |
| DisplayName Italian: | Punto |
| DisplayName Spanish: | Punto |
| Type: | CIAttributeTypePosition |

See AttributeinputPoint for more details.
(Read and Write property)

### 58.233.13 inputRotation as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Rotation
**Notes:**

| | |
|---|---|
| Name: | inputRotation |
| Class: | double (NSNumber) |
| DisplayName English: | Rotation |
| DisplayName German: | Rotation |
| DisplayName French: | Rotation |
| DisplayName Italian: | Rotation |
| DisplayName Spanish: | Rotation |
| Type: | CIAttributeTypeAngle |

See AttributeinputRotation for more details.
(Read and Write property)

### 58.233.14 inputSize as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Size
**Notes:**

| | |
|---|---|
| Name: | inputSize |
| Class: | double (NSNumber) |
| DisplayName English: | Size |
| DisplayName German: | Size |
| DisplayName French: | Size |
| DisplayName Italian: | Size |
| DisplayName Spanish: | Size |
| Type: | CIAttributeTypeScalar |

See AttributeinputSize for more details.
(Read and Write property)

## 58.234 class CIFilterTriangleTileMBS

### 58.234.1 class CIFilterTriangleTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Triangle Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITriangleTile |
| DisplayName English: | Triangle Tile |
| DisplayName German: | Dreieckig kacheln |
| DisplayName French: | Mosa√Øque de triangles |
| DisplayName Italian: | Mosaico triangolare |
| DisplayName Spanish: | Mosaico triangular |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.234.2 Methods

### 58.234.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.234.4 Properties

### 58.234.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.234.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.234.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.234.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Triangle Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.234.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.234.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.234.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.234.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.235 class CIFilterTwelvefoldReflectedTileMBS

### 58.235.1 class CIFilterTwelvefoldReflectedTileMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Twelvefold Reflected Tile filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITwelvefoldReflectedTile |
| DisplayName English: | Twelvefold Reflected Tile |
| DisplayName German: | 12-fach reflektierte Kachel |
| DisplayName French: | Mosa√Øque r√©fl√©chie 12 fois |
| DisplayName Italian: | Mosaico riflesso in dodici direzioni |
| DisplayName Spanish: | Mosaico reflejado doce veces |

Categories:

- CICategoryTileEffect: Tile Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAngle: Angle
- inputWidth: Width

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.235.2 Methods

### 58.235.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.235.4 Properties

### 58.235.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twelvefold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 3.141593 |
| SliderMinNumber: | -3.141593 |

(Read only property)

### 58.235.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twelvefold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.235.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twelvefold Reflected Tile attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.235.8 AttributeinputWidth as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twelvefold Reflected Tile attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputWidth |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| DefaultNumber: | 100 |
| IdentityNumber: | 100 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | 1 |

### 58.235.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.235.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.235.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.235.12 inputWidth as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Width
**Notes:**

| | |
|---|---|
| Name: | inputWidth |
| Class: | double (NSNumber) |
| DisplayName English: | Width |
| DisplayName German: | Breite |
| DisplayName French: | Largeur |
| DisplayName Italian: | Larghezza |
| DisplayName Spanish: | Anchura |
| Type: | CIAttributeTypeDistance |

See AttributeinputWidth for more details.
(Read and Write property)

## 58.236 class CIFilterTwirlDistortionMBS

### 58.236.1 class CIFilterTwirlDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Twirl Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CITwirlDistortion |
| DisplayName English: | Twirl Distortion |
| DisplayName German: | Verzerrung ,ÄûWirbeln,Äú |
| DisplayName French: | D√©formation Spirale |
| DisplayName Italian: | Distorsione spirale |
| DisplayName Spanish: | Distorsi√n por giro |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.236.2 Methods

### 58.236.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.236.4 Properties

### 58.236.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twirl Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 3.141593 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 12.56637 |
| SliderMinNumber: | -12.56637 |

(Read only property)

### 58.236.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twirl Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.236.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twirl Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.236.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Twirl Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 300 |
| SliderMaxNumber: | 500 |
| SliderMinNumber: | 0 |

### 58.236.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.236.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.236.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.236.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.237 class CIFilterUnsharpMaskMBS

## 58.237.1 class CIFilterUnsharpMaskMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Unsharp Mask filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIUnsharpMask |
| DisplayName English: | Unsharp Mask |
| DisplayName German: | Unscharf maskieren |
| DisplayName French: | Rendre le masque flou |
| DisplayName Italian: | Maschera di contrasto |
| DisplayName Spanish: | Desenfocar m√°scara |

Categories:

- CICategorySharpen: Sharpen
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputRadius: Radius
- inputIntensity: Intensity

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.237.2 Methods

### 58.237.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.237.4 Properties

### 58.237.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Unsharp Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.237.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Unsharp Mask attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.237.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Unsharp Mask attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 2.5 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 100 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.237.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

(Read and Write property)

### 58.237.9 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

### 58.237.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

# 58.238 class CIFilterVibranceMBS

## 58.238.1 class CIFilterVibranceMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vibrance filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIVibrance |
| DisplayName English: | Vibrance |
| DisplayName German: | Lebendigkeit |
| DisplayName French: | Brillance |
| DisplayName Italian: | Vividezza |
| DisplayName Spanish: | Vivacidad |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputAmount: Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr5

### 58.238.2 Methods

### 58.238.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.238.4 Properties

### 58.238.5 AttributeinputAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vibrance attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAmount |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

(Read only property)

### 58.238.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vibrance attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.238.7 inputAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Amount
**Notes:**

| | |
|---|---|
| Name: | inputAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputAmount for more details.
(Read and Write property)

### 58.238.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.239 class CIFilterVignetteEffectMBS

## 58.239.1 class CIFilterVignetteEffectMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vignette Effect filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIVignetteEffect |
| DisplayName English: | Vignette Effect |
| DisplayName German: | Vignetteneffekt |
| DisplayName French: | Effet de vignette |
| DisplayName Italian: | Effetto vignettatura |
| DisplayName Spanish: | Efecto de degradado |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputIntensity: Intensity
- inputFalloff: Falloff

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.239.2 Methods

### 58.239.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.239.4 Properties

### 58.239.5 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

(Read only property)

### 58.239.6 AttributeinputFalloff as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette Effect attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputFalloff |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Falloff |
| DisplayName German: | Nachlassen |
| DisplayName French: | Att√©nuation |
| DisplayName Italian: | Calo |
| DisplayName Spanish: | Disminuci√n |
| DefaultNumber: | 0.5 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | 0 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | 0 |

### 58.239.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.239.8 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

(Read only property)

### 58.239.9 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette Effect attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 150 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 2000 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.239.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.239.11 inputFalloff as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Falloff
**Notes:**

| | |
|---|---|
| Name: | inputFalloff |
| Class: | double (NSNumber) |
| DisplayName English: | Falloff |
| DisplayName German: | Nachlassen |
| DisplayName French: | Att√©nuation |
| DisplayName Italian: | Calo |
| DisplayName Spanish: | Disminuci√n |
| Type: | CIAttributeTypeScalar |

See AttributeinputFalloff for more details.
(Read and Write property)

### 58.239.12 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.239.13 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

### 58.239.14 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

## 58.240 class CIFilterVignetteMBS

### 58.240.1 class CIFilterVignetteMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vignette filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIVignette |
| DisplayName English: | Vignette |
| DisplayName German: | Vignette |
| DisplayName French: | Vignette |
| DisplayName Italian: | Vignettatura |
| DisplayName Spanish: | Degradado |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryStillImage: Still Image
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputIntensity: Intensity
- inputRadius: Radius

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.240.2 Methods

### 58.240.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.240.4 Properties

### 58.240.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.240.6 AttributeinputIntensity as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |
| MaxNumber: | 1 |
| MinNumber: | -1 |
| SliderMaxNumber: | 1 |
| SliderMinNumber: | -1 |

### 58.240.7 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vignette attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeScalar |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 1 |
| IdentityNumber: | 0 |
| MaxNumber: | 2 |
| MinNumber: | 0 |
| SliderMaxNumber: | 2 |
| SliderMinNumber: | 0 |

(Read only property)

### 58.240.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.240.9 inputIntensity as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Intensity
**Notes:**

| | |
|---|---|
| Name: | inputIntensity |
| Class: | double (NSNumber) |
| DisplayName English: | Intensity |
| DisplayName German: | Intensit√§t |
| DisplayName French: | Intensit√© |
| DisplayName Italian: | Intensit√† |
| DisplayName Spanish: | Intensidad |
| Type: | CIAttributeTypeScalar |

See AttributeinputIntensity for more details.
(Read and Write property)

### 58.240.10 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

See AttributeinputRadius for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeScalar |

# 58.241 class CIFilterVividLightBlendModeMBS

## 58.241.1 class CIFilterVividLightBlendModeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vivid Light Blend Mode filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIVividLightBlendMode |
| DisplayName English: | Vivid Light Blend Mode |
| DisplayName German: | Mischmethode ,ÄûStrahlendes Licht,Äú |
| DisplayName French: | Mode de fusion Lumi√®re vive |
| DisplayName Italian: | Modalit√† sfumatura luce vivida |
| DisplayName Spanish: | Modo de mezcla por luz v√vida |

Categories:

- CICategoryCompositeOperation: Composite Operation
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputBackgroundImage: Background Image

Output:

- outputImage

Subclass of the CIFilterMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5

### 58.241.2 Methods

### 58.241.3 Constructor

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.241.4 Properties

### 58.241.5 AttributeinputBackgroundImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vivid Light Blend Mode attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.241.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Details about the Vivid Light Blend Mode attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.241.7 inputBackgroundImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Background Image
**Notes:**

| | |
|---|---|
| Name: | inputBackgroundImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Background Image |
| DisplayName German: | Hintergrundbild |
| DisplayName French: | Image d,Äôarri√®re-plan |
| DisplayName Italian: | Immagine di sfondo |
| DisplayName Spanish: | Imagen de fondo |
| Type: | CIAttributeTypeImage |

See AttributeinputBackgroundImage for more details.
(Read and Write property)

### 58.241.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.242 class CIFilterVortexDistortionMBS

## 58.242.1 class CIFilterVortexDistortionMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Vortex Distortion filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIVortexDistortion |
| DisplayName English: | Vortex Distortion |
| DisplayName German: | Verzerrung ,ÄûVortex,Äú |
| DisplayName French: | D√©formation Tourbillon |
| DisplayName Italian: | Distorsione Vortex |
| DisplayName Spanish: | Distorsi√n por v√rtice |

Categories:

- CICategoryDistortionEffect: Distortion Effect
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputRadius: Radius
- inputAngle: Angle

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.242.2 Methods

### 58.242.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.242.4 Properties

### 58.242.5 AttributeinputAngle as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vortex Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAngle |
| Class: | double |
| Type: | CIAttributeTypeAngle |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| DefaultNumber: | 56.54867 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 94.24778 |
| SliderMinNumber: | -94.24778 |

(Read only property)

### 58.242.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vortex Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.242.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vortex Distortion attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.242.8 AttributeinputRadius as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Vortex Distortion attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputRadius |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| DefaultNumber: | 300 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 800 |
| SliderMinNumber: | 0 |

### 58.242.9 inputAngle as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Angle
**Notes:**

| | |
|---|---|
| Name: | inputAngle |
| Class: | double (NSNumber) |
| DisplayName English: | Angle |
| DisplayName German: | Winkel |
| DisplayName French: | Angle |
| DisplayName Italian: | Angolo |
| DisplayName Spanish: | √Ångulo |
| Type: | CIAttributeTypeAngle |

See AttributeinputAngle for more details.
(Read and Write property)

### 58.242.10 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

See AttributeinputCenter for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

### 58.242.11 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

### 58.242.12 inputRadius as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Radius
**Notes:**

| | |
|---|---|
| Name: | inputRadius |
| Class: | double (NSNumber) |
| DisplayName English: | Radius |
| DisplayName German: | Radius |
| DisplayName French: | Rayon |
| DisplayName Italian: | Raggio |
| DisplayName Spanish: | Radio |
| Type: | CIAttributeTypeDistance |

See AttributeinputRadius for more details.
(Read and Write property)

# 58.243 class CIFilterWhitePointAdjustMBS

## 58.243.1 class CIFilterWhitePointAdjustMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage White Point Adjust filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIWhitePointAdjust |
| DisplayName English: | White Point Adjust |
| DisplayName German: | Wei√üpunkt anpassen |
| DisplayName French: | Ajustement du point blanc |
| DisplayName Italian: | Regolazione punto di bianco |
| DisplayName Spanish: | Ajuste de punto blanco |

Categories:

- CICategoryColorAdjustment: Color Adjustment
- CICategoryVideo: Video
- CICategoryStillImage: Still Image
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryHighDynamicRange: High Dynamic Range
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image
- inputColor: Color

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.243.2 Methods

### 58.243.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.243.4 Properties

### 58.243.5 AttributeinputColor as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the White Point Adjust attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS |
| Type: | CIAttributeTypeColor |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| DefaultColor: | Red = 1, Green = 1, Blue = 1, Alpha = 1 |
| IdentityNumber: | 0 |

(Read only property)

### 58.243.6 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the White Point Adjust attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

### 58.243.7 inputColor as CIColorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Color
**Notes:**

| | |
|---|---|
| Name: | inputColor |
| Class: | CIColorMBS (CIColor) |
| DisplayName English: | Color |
| DisplayName German: | Farbe |
| DisplayName French: | Couleur |
| DisplayName Italian: | Colore |
| DisplayName Spanish: | Color |
| Type: | CIAttributeTypeColor |

See AttributeinputColor for more details.
(Read and Write property)

### 58.243.8 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

# 58.244 class CIFilterXRayMBS

## 58.244.1 class CIFilterXRayMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage X-Ray filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIXRay |
| DisplayName English: | X-Ray |
| DisplayName German: | R√ntgen |
| DisplayName French: | Rayon X |
| DisplayName Italian: | Raggi X |
| DisplayName Spanish: | Rayos X |

Categories:

- CICategoryColorEffect: Color Effect
- CICategoryVideo: Video
- CICategoryInterlaced: Interlaced
- CICategoryNonSquarePixels: Non-Square Pixels
- CICategoryStillImage: Still Image
- CICategoryBuiltIn: Built-In

Input:

- inputImage: Image

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.244.2 Methods

### 58.244.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.244.4 Properties

### 58.244.5 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the X-Ray attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.244.6 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

See AttributeinputImage for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

## 58.245 class CIFilterZoomBlurMBS

### 58.245.1 class CIFilterZoomBlurMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The Xojo class for the CoreImage Zoom Blur filter.
**Notes:** Details for this filter:

| | |
|---|---|
| FilterName: | CIZoomBlur |
| DisplayName English: | Zoom Blur |
| DisplayName German: | Zoom weichzeichnen |
| DisplayName French: | Zoom flou |
| DisplayName Italian: | Sfumatura zoom |
| DisplayName Spanish: | Ampliar difuminado |

Categories:

- CICategoryBlur: Blur
- CICategoryStillImage: Still Image
- CICategoryVideo: Video
- CICategoryBuiltIn: Built-In
- CICategoryHighDynamicRange: High Dynamic Range

Input:

- inputImage: Image
- inputCenter: Center
- inputAmount: Amount

Output:

- outputImage

Subclass of the CIFilterMBS class.

### 58.245.2 Methods

### 58.245.3 Constructor

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** On success the handle property is not zero and the filter has the default values set.

### 58.245.4 Properties

### 58.245.5 AttributeinputAmount as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Zoom Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputAmount |
| Class: | double |
| Type: | CIAttributeTypeDistance |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| DefaultNumber: | 20 |
| IdentityNumber: | 0 |
| SliderMaxNumber: | 200 |
| SliderMinNumber: | -200 |

(Read only property)

### 58.245.6 AttributeinputCenter as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Zoom Blur attribute.
**Notes:** This attribute should have this content:

(Read only property)

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS |
| Type: | CIAttributeTypePosition |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| DefaultVector: | [ 150 150 ] |
| IdentityVector: | n/a |

### 58.245.7 AttributeinputImage as CIAttributeMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Details about the Zoom Blur attribute.
**Notes:** This attribute should have this content:

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS |
| Type: | CIAttributeTypeImage |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| DefaultNumber: | 0 |
| IdentityNumber: | 0 |

(Read only property)

### 58.245.8 inputAmount as double

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Amount
**Notes:**

See AttributeinputAmount for more details.
(Read and Write property)

| | |
|---|---|
| Name: | inputAmount |
| Class: | double (NSNumber) |
| DisplayName English: | Amount |
| DisplayName German: | St√§rke |
| DisplayName French: | Montant |
| DisplayName Italian: | Quantit√† |
| DisplayName Spanish: | Cantidad |
| Type: | CIAttributeTypeDistance |

### 58.245.9 inputCenter as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Center
**Notes:**

| | |
|---|---|
| Name: | inputCenter |
| Class: | CIVectorMBS (CIVector) |
| DisplayName English: | Center |
| DisplayName German: | Mitte |
| DisplayName French: | Centre |
| DisplayName Italian: | Centro |
| DisplayName Spanish: | Centro |
| Type: | CIAttributeTypePosition |

See AttributeinputCenter for more details.
(Read and Write property)

### 58.245.10 inputImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The attribute Image
**Notes:**

| | |
|---|---|
| Name: | inputImage |
| Class: | CIImageMBS (CIImage) |
| DisplayName English: | Image |
| DisplayName German: | Bild |
| DisplayName French: | Image |
| DisplayName Italian: | Immagine |
| DisplayName Spanish: | Imagen |
| Type: | CIAttributeTypeImage |

See AttributeinputImage for more details.
(Read and Write property)

# 58.246 class CIImageMBS

## 58.246.1 class CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The class for a CoreImage Image object.
**Example:**

```
// take a picture and scale it
Dim pic As Picture = LogoMBS(500)
Dim image As CIImageMBS = CIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result
```

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- MBS Real Studio Plugins, version 13.0fc1
- Tip of the day: Rotate image with CoreImage

**Xojo Developer Magazine**

- 11.3, page 8: News

### 58.246.2 Methods

### 58.246.3 AsNSImageMBS as Variant

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a NSImageMBS which references the given CIImage.
**Example:**

```
// make a dummy CIImage
dim Logo as Picture = LogoMBS(500)
dim jpeg as string = PictureToJPEGStringMBS(logo, 80)
dim ci as CIImageMBS = CIImageMBS.imageWithData(jpeg)

// convert to NSImage
dim ni as NSImageMBS = ci.AsNSImageMBS

// and display
Backdrop = ni.CopyPictureWithMask
```

**Notes:** Returns nil on error.
Result declared as Variant to avoid plugin dependencies.

### 58.246.4 autoAdjustmentFilters as CIFilterMBS()

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns all filters that perform auto adjustment.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim image as CIImageMBS = CIImageMBS.imageWithContentsOfFile(f)

dim filters() as CIFilterMBS = image.autoAdjustmentFilters

dim beginImage as CIImageMBS = image
for each filter as CIFilterMBS in filters
filter.ValueAsCIImage("inputImage") = beginImage
beginImage = filter.ValueAsCIImage("outputImage")
next
```

Backdrop = beginImage.RenderPicture

**Notes:** An array of auto adjustment filters to apply to the image. The filters are preset with values for correcting deficiencies in the supplied image.

### 58.246.5 autoAdjustmentFiltersWithOptions(options as dictionary) as CIFilterMBS()

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a subset of the filters that perform auto adjustment.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim image as CIImageMBS = CIImageMBS.imageWithContentsOfFile(f)

dim options as new Dictionary
options.Value(CIImageMBS.kCIImageAutoAdjustEnhance) = true
options.Value(CIImageMBS.kCIImageAutoAdjustRedEye) = true

dim filters() as CIFilterMBS = image.autoAdjustmentFiltersWithOptions(options)

dim beginImage as CIImageMBS = image
for each filter as CIFilterMBS in filters
filter.ValueAsCIImage("inputImage") = beginImage
beginImage = filter.ValueAsCIImage("outputImage")
next

Backdrop = beginImage.RenderPicture
```

**Notes:** options: You can control which filters are returned by supplying one or more of the keys described in "Auto Adjustment Keys."
The options dictionary can also contain a CIDetectorImageOrientation key. This key is a number with the same value as defined by the TIFF and EXIF specifications; values can range from 1 through 8. The value specifies where the origin (0,0) of the image is located. If not present, the default value is 1, which means the origin of the image is top, left. For details on the image origin specified by each value, see kCGImagePropertyOrientation.

Returns an array of auto adjustment filters, filtered by the supplied options, to apply to the image. The filters are preset with values for correcting deficiencies in the supplied image.

### 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a CGImage.
**Notes:** cgcolorspace: Use this colorspace when opening the image.
On success, the handle is not zero.
See also:


- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629


### 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a CGImage.
**Notes:** On success, the handle is not zero.
See also:


- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629

### 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil)

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an image object from the contents supplied by a CGLayer object, using the specified options.
**Notes:** layer: A CGLayer object. For more information see Quartz 2D Programming Guide and CGLayer Reference.
options: A dictionary specifying image options.

Returns an image object initialized with the contents of the layer object and set up with the specified options.
See also:


- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629


### 58.246.9 Constructor(data as memoryblock)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on the image file content stored inside the data string.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim data as string = PictureToPNGStringMBS(p,80)
dim i as new CIImageMBS(data)

dim c as new CIFilterCircularWrapMBS
c.inputImage = i

dim o as CIImageMBS = c.outputImage
Backdrop = o.RenderPicture
```

**Notes:** On success, the handle is not zero.
See also:

- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
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- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629

### 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage from a RAW memory buffer.
**Notes:** Format must be one of this constants: kCIFormatRGBAf, kCIFormatRGBA16 and kCIFormatARGB8.

On success, the handle is not zero.
See also:

- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628

- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629


### 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on the image file content stored inside the data string.
**Notes:** cgcolorspace: Use this colorspace when opening the image.

On success, the handle is not zero.
See also:


- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629


### 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage from a RAW memory buffer.
**Notes:** Data points directly to the row data.
Length is the size of the memoryblock in bytes.
BytesPerRow is the size of a row in bytes.
Width and height are the dimensions of the image.
Format must be one of this constants: kCIFormatRGBAf, kCIFormatRGBA16 and kCIFormatARGB8.
Colorspace is the CoreGraphics Colorspace object to be used.

On success, the handle is not zero.
See also:

- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629

### 58.246.13 Constructor(file as FolderItem)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file.
**Notes:** On success, the handle is not zero.
See also:

- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629
- 58.246.15 Constructor(Handle as Integer) 10629

### 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file.
**Notes:** cgcolorspace: Use this colorspace when opening the image.

On success, the handle is not zero.
See also:


- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.15 Constructor(Handle as Integer) 10629


### 58.246.15 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIImage* and the object is retained.
Raises UnsupportedOperationException if object is not a CIImage.
See also:


- 58.246.6 Constructor(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) 10624
- 58.246.7 Constructor(cgimage as CGImageMBS, options as Dictionary = nil) 10624
- 58.246.8 Constructor(CGLayer as CGLayerMBS, options as Dictionary = nil) 10625
- 58.246.9 Constructor(data as memoryblock) 10625
- 58.246.10 Constructor(data as memoryblock, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10626
- 58.246.11 Constructor(data as memoryblock, cgcolorspace as CGColorSpaceMBS) 10627

- 58.246.12 Constructor(data as Memoryblock, Length as Integer, BytesPerRow as Integer, width as Integer, height as Integer, format as Integer, cgcolorspace as CGColorSpaceMBS) 10627
- 58.246.13 Constructor(file as FolderItem) 10628
- 58.246.14 Constructor(file as FolderItem, cgcolorspace as CGColorSpaceMBS) 10629


### 58.246.16 copy as CIImageMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the image.

### 58.246.17 CreateCGImage(r as CGRectMBS = nil) as CGImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new image with the content of the CIImage.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim ci as CIImageMBS = CIImageMBS.imageWithPicture(logo)
dim cg as CGImageMBS = ci.CreateCGImage
Backdrop = cg.Picture
```

**Notes:** Render the region 'r' of image 'im' into a temporary buffer using the context, then create and return a new CoreGraphics image with the results.
If r is nil, the whole image extent is used.
See also:


- 58.246.18 CreateCGImage(r as CGRectMBS, ColorSpace as CGColorSpaceMBS) as CGImageMBS 10630


### 58.246.18 CreateCGImage(r as CGRectMBS, ColorSpace as CGColorSpaceMBS) as CGImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a new image with the content of the CIImage.
**Notes:** Render the region 'r' of image 'im' into a temporary buffer using the context, then create and return a new CoreGraphics image with the results.
If r is nil, the whole image extent is used.
See also:


- 58.246.17 CreateCGImage(r as CGRectMBS = nil) as CGImageMBS 10630

### 58.246.19 emptyImage as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an empty image object.
**Example:**

```
dim image as CIImageMBS = CIImageMBS.emptyImage
MsgBox str(image.Width) // shows zero
```

**Notes:** Available in OS X v10.5 and later.

### 58.246.20 imageByApplyingOrientation(orientation as Integer) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Returns a new image representing the original image with a transform appied to it based on an orientation value.
**Example:**

```
// use CIImage to rotate to always be top left orientation
Dim ciImage As CIImageMBS = New CIImageMBS(file)

Dim orientation As Integer = ciImage.properties.Lookup("Orientation", 0)
if orientation <>0 then
ciImage = ciImage.imageByApplyingOrientation(orientation)
end if

Dim cgPic As CGImageMBS = ciImage.CreateCGImage
Dim pic As Picture = cgPic.Picture
ImageViewer1.Image = pic
```

**Notes:** Orientation values from 1 to 8 as defined in the TIFF spec are supported.
Returns original image if the image is of infinite extent.

Possible orientation values:

### 58.246.21 ImageByApplyingTransform(transform as NSAffineTransformMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a new image representing the original image with the transform 'matrix' appended to

| Value | orientation | details |
|---|---|---|
| 1 | top left | row 0 top, col 0 lhs |
| 2 | top right | row 0 top, col 0 rhs |
| 3 | bottom right | row 0 bottom, col 0 rhs |
| 4 | bottom left | row 0 bottom, col 0 lhs |
| 5 | left top | row 0 lhs, col 0 top |
| 6 | right top | row 0 rhs, col 0 top |
| 7 | right bottom | row 0 rhs, col 0 bottom |
| 8 | left bottom | row 0 lhs, col 0 bottom |

it.

### 58.246.22 imageByClampingToExtent as CIImageMBS

MBS MacCI Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Return a new infinte image by replicating the pixels of the receiver image's extent.

### 58.246.23 imageByCompositingOverImage(dest as CIImageMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Returns a new image created by compositing the original image over the specified destination image.
**Notes:** dest: An image to serve as the destination of the compositing operation.

Returns an image object representing the result of the compositing operation.

Calling this method is equivalent to using the CISourceOverCompositing filter. To use other compositing operations and blending modes, create a CIFilter object using one of the built-in filters from the CICategoryCompositeOperation category. For details, see Core Image Filter Reference.

Available in OS X v10.4 and later.

### 58.246.24 imageByCroppingToRect(r as CGRectMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns a new image that represents the original image after cropping to a rectangle.

**Notes:** Available in OS X v10.5 and later.

### 58.246.25 imageWithCGImage(CGImage as CGImageMBS, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from a Quartz 2D image using the specified color space.
**Notes:** Returns nil on any error.
See also:

- 58.246.26 imageWithCGImage(CGImage as CGImageMBS, options as Dictionary = nil) as CIImageMBS 10633

### 58.246.26 imageWithCGImage(CGImage as CGImageMBS, options as Dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from a Quartz 2D image.
**Notes:** Returns nil on any error.
See also:

- 58.246.25 imageWithCGImage(CGImage as CGImageMBS, colorspace as CGColorSpaceMBS) as CIImageMBS 10633

### 58.246.27 imageWithCGLayer(CGImage as CGImageMBS, options as Dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates and returns an image object from the contents supplied by a CGLayer object, using the specified options.
**Notes:** layer: A CGLayer object. For more information see Quartz 2D Programming Guide and CGLayer Reference.
options: A dictionary specifying image options.

An image object initialized with the contents of the layer object and set up with the specified options.

### 58.246.28 imageWithColor(color as CIColorMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image of infinite extent that is initialized the specified color.
**Notes:** Returns the image object initialized with the color represented by the CIColorMBS object.
Available in OS X v10.5 and later.

### 58.246.29 imageWithContentsOfFile(file as folderitem) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim image as CIImageMBS = CIImageMBS.imageWithContentsOfFile(file)
Backdrop = image.RenderPicture
```

**Notes:** Returns nil on any error.
See also:

- 58.246.30 imageWithContentsOfFile(file as folderitem, colorspace as CGColorSpaceMBS) as CIImageMBS 10634

### 58.246.30 imageWithContentsOfFile(file as folderitem, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Notes:** Returns nil on any error.
See also:

- 58.246.29 imageWithContentsOfFile(file as folderitem) as CIImageMBS 10634

### 58.246.31 imageWithContentsOfFileMT(file as folderitem) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim image as CIImageMBS = CIImageMBS.imageWithContentsOfFileMT(file)
Backdrop = image.RenderPicture
```

**Notes:** Returns nil on any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 58.246.32 imageWithContentsOfFileMT(file as folderitem, colorspace as CGColorSpaceMBS) as CIImageMBS 10635

### 58.246.32 imageWithContentsOfFileMT(file as folderitem, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("mbs.jpg")
dim cs as CGColorSpaceMBS = CGColorSpaceMBS.CreateDeviceRGB
dim image as CIImageMBS = CIImageMBS.imageWithContentsOfFileMT(file, cs)
Backdrop = image.RenderPicture
```

**Notes:** Returns nil on any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 58.246.31 imageWithContentsOfFileMT(file as folderitem) as CIImageMBS 10634

### 58.246.33 imageWithContentsOfPath(Path as string, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Example:**

```
// load image
dim inputimage as CIImageMBS = CIImageMBS.imageWithContentsOfPath("/Library/Desktop Pictures/Rice Paddy.jpg", nil)

// rotate 90¬∞
dim ScaleXFilter as new CIFilterAffineTransformMBS
ScaleXFilter.inputImage = inputimage
dim af as new NSAffineTransformMBS
af.translate(inputimage.height,0)
af.rotateByDegrees(90)
ScaleXFilter.inputTransform=af

// produce output
dim outputimage as CIImageMBS = ScaleXFilter.outputImage
dim e as CGRectMBS = outputimage.Extent
Backdrop = outputimage.RenderPicture
Title = Str(Backdrop.Width)+" x "+str(Backdrop.Height)

// write to PNG file
dim n as NSImageMBS = outputimage.AsNSImageMBS
dim data as string = n.PNGRepresentation

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write data
b.Close
```

**Notes:** Returns nil on any error.

### 58.246.34 imageWithContentsOfURL(url as String) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Notes:** Returns nil on any error.
See also:

- 58.246.35 imageWithContentsOfURL(URL as string, colorspace as CGColorSpaceMBS) as CIImageMBS



### 58.246.35 imageWithContentsOfURL(URL as string, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from the contents of a file.
**Notes:** Returns nil on any error.
See also:

- 58.246.34 imageWithContentsOfURL(url as String) as CIImageMBS 10636

### 58.246.36 imageWithData(data as memoryblock, Options as Dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object initialized with the supplied image data.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 75)
dim image as CIImageMBS = CIImageMBS.imageWithData(jpegData)
Backdrop = image.RenderPicture
```

**Notes:** data: The data object that holds the contents of an image file (such as TIFF, GIF, JPG, or whatever else the system supports). The image data must be premultiplied.

Returns an image object initialized with the supplied data, or nil if the method cannot create an image representation from the contents of the supplied data object.

### 58.246.37 imageWithDataMT(data as memoryblock, Options as Dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object initialized with the supplied image data.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 75)
dim image as CIImageMBS = CIImageMBS.imageWithDataMT(jpegData)
Backdrop = image.RenderPicture
```

**Notes:** data: The data object that holds the contents of an image file (such as TIFF, GIF, JPG, or whatever else the system supports). The image data must be premultiplied.

Returns an image object initialized with the supplied data, or nil if the method cannot create an image

representation from the contents of the supplied data object.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 58.246.38 imageWithPicture(Pic as Picture) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an image object from a Xojo Picture.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim ci as CIImageMBS = CIImageMBS.imageWithPicture(logo)
dim cg as CGImageMBS = ci.CreateCGImage
Backdrop = cg.Picture
```

**Notes:** Returns nil on any error.

### 58.246.39 kCIImageAutoAdjustCrop as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A key used to specify whether to return a filter that crops the image to focus on detected features.
**Notes:** The value associated with this key is a Boolean value. If true, the returned filters include an operation that crops the image around the features specified with the kCIImageAutoAdjustFeatures option (or any features detected in the image, if that option is not present). Supply false to indicate not to return a crop filter. If you don,Äôt specify this option, Core Image assumes its value is false.

Available in OS X v10.10 and later.

### 58.246.40 kCIImageAutoAdjustEnhance as string

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the Keys used in the options dictionary to control which filters Core Image returns.
**Notes:** A key used to specify whether to return enhancement filters.
The value associated with this key is a CFBoolean value. Supply false to indicate not to return enhancement

filters. If you don't specify this option, Core Image assumes its value is true.

### 58.246.41 kCIImageAutoAdjustFeatures as string

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the Keys used in the options dictionary to control which filters Core Image returns.
**Notes:** A key used to specify an array of features to which to apply enhancement and red eye filter.
The associated value is an array of CIFeatureMBS objects. If you don't supply an array, the receiver will search for features using the CIDetectorMBS class.

### 58.246.42 kCIImageAutoAdjustLevel as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A key used to specify whether to return a filter that rotates the image to keep a level perspective.
**Notes:** The value associated with this key is a Boolean value. If true, Core Image analyzes the image to determine whether it would benefit from rotation—for example, a landscape photo in which the horizon is not horizontal—and returns a filter to perform that rotation. Supply false to indicate not to return a rotation filter. If you don,Äôt specify this option, Core Image assumes its value is false.

Available in OS X v10.10 and later.

### 58.246.43 kCIImageAutoAdjustRedEye as string

MBS MacCI Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the Keys used in the options dictionary to control which filters Core Image returns.
**Notes:** A key used to specify whether to return a red eye filter.
The value associated with this key is a Boolean value. Supply false to indicate not to return a red eye filter. If you don't specify this option, Core Image assumes its value is true.

### 58.246.44 kCIImageTextureFormat as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the keys in the options dictionary when initializing an image.
**Notes:** The key for an OpenGL texture format. The value for this key must be an NSNumber object containing a Core Image pixel format constant. (See "Pixel Formats.") You may only use this key when initializing an image using the initWithTexture method.

Available in OS X v10.9 and later.

### 58.246.45 kCIImageTextureTarget as string

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** One of the keys in the options dictionary when initializing an image.
**Notes:** The key for an OpenGL texture target. The value for this key must be an NSNumber object containing a supported OpenGL texture target constant, either GL_TEXTURE_2D or GL_TEXTURE_RECTANGLE_ARB. You may only use this key when initializing an image using the initWithTexture method.
Available in OS X v10.9 and later.

### 58.246.46 properties as Dictionary

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the metadata properties of an image.
**Notes:** If the image is the output of one or more CIFilters, then the metadata of the root inputImage will be returned.

### 58.246.47 releaseHandle

MBS MacCI Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Decrements the retain count of a CIImage reference.
**Notes:** Each retain must have a release. Too many releases and your app will crash, too many retains and it will leak memory.
Use only if you really know what you are doing.

### 58.246.48 RenderNSImage(UseSoftwareRenderer as boolean = false) as Variant

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a picture based of the CIImage content.
**Example:**

```
dim f as CIFilterEdgesMBS

f=new CIFilterEdgesMBS
f.inputImage=NewCIImagewithFileMBS(SpecialFolder.Desktop.Child("Paris.jpg"))
f.inputIntensity=5
```

```
dim n as NSImageMBS
n=f.outputImage.RenderNSImage(false)
```

**Notes:** Creates a new NSImage, creates a CGContext for it, draws the image into the buffer and returns it as a Xojo object.

Returns nil on failure.
Rendering the image will cause the calculations to be done so this call is quite expensive.

If UseSoftwareRenderer is true, the hardware acceleration is not used.

### 58.246.49 RenderPicture(Width as Integer = 0, Height as Integer = 0, UseSoftwareRenderer as boolean = false) as Picture

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a picture based of the CIImage content.
**Example:**

```
dim f as CIFilterEdgesMBS

f=new CIFilterEdgesMBS
f.inputImage=NewCIImagewithFileMBS(SpecialFolder.Desktop.Child("Paris.jpg"))
f.inputIntensity=5
Backdrop=f.outputImage.RenderPicture
```

**Notes:** Creates a new image buffer, creates a CGContext for it, draws the image into the buffer and returns it as a picture with mask. If you need picture with alpha channel, please use RenderPictureWithAlpha function.

Returns nil on failure.
Rendering the image will cause the calculations to be done so this call is quite expensive.

If UseSoftwareRenderer is true, the hardware acceleration is not used.

### 58.246.50 RenderPictureWithAlpha(Width as Integer = 0, Height as Integer = 0, UseSoftwareRenderer as boolean = false) as Picture

MBS MacCI Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a picture based of the CIImage content.
**Example:**

```
dim f as CIFilterEdgesMBS

f=new CIFilterEdgesMBS
f.inputImage=NewCIImagewithFileMBS(SpecialFolder.Desktop.Child("Paris.jpg"))
f.inputIntensity=5
Backdrop= f.outputImage.RenderPictureWithAlphaMT
```

**Notes:** Creates a new image buffer, creates a CGContext for it, draws the image into the buffer and returns it as a Xojo picture with alpha channel.

Returns nil on failure.
Rendering the image will cause the calculations to be done so this call is quite expensive.

If UseSoftwareRenderer is true, the hardware acceleration is not used.

### 58.246.51 RenderPictureWithAlphaMT(Width as Integer = 0, Height as Integer = 0, UseSoftwareRenderer as boolean = false) as Picture

MBS MacCI Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a picture based of the CIImage content.
**Notes:** Same as the other RenderPictureWithAlpha function, but threaded.

Creates a new image buffer, creates a CGContext for it, draws the image into the buffer and returns it as a Xojo picture with alpha channel.

Returns nil on failure.
Rendering the image will cause the calculations to be done so this call is quite expensive.

If UseSoftwareRenderer is true, the hardware acceleration is not used.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 58.246.52 retainHandle

MBS MacCI Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Increments the retain count of a CIImage reference.
**Notes:** Each retain must have a release. Too many releases and your app will crash, too many retains and it will leak memory.
Use only if you really know what you are doing.

### 58.246.53 scaleTo(width as Integer, height as Integer) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 21.2, Platform: macOS, Targets: All.

**Function:** Scales picture to target size.
**Example:**

```
Dim pic As Picture = LogoMBS(500)
Dim image As CIImageMBS = CIImageMBS.imageWithPicture(pic)

Const targetWidth = 600.0
Const targetHeight = 400.0

#If mbs.VersionNumber <21.2 Then

Dim filter As New CIFilterLanczosScaleTransformMBS

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim outputImage As CIImageMBS = filter.outputImage

#Else

Dim outputImage As CIImageMBS = image.scaleTo(targetWidth, targetHeight)

#EndIf

Dim result As Picture = outputImage.RenderPicture
Backdrop = result
```

**Notes:** We use CILanczosScaleTransform filter internally like in the example code for older plugin versions.

### 58.246.54 Properties

### 58.246.55 colorSpace as CGColorSpaceMBS

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns if possible the color space of the image it was defined in.
**Notes:** This method will return nil, if the color space cannot be determined.
(Read only property)

### 58.246.56 Definition as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Return the Domain of Definition of the image.
**Notes:** Nil on any error.
(Read only property)

### 58.246.57 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim data as string = PictureToPNGStringMBS(p,80)
dim i as new CIImageMBS(data)
MsgBox i.description
```

**Notes:** (Read only property)

### 58.246.58 Extent as CGRectMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The extent of the image in world coordinates.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

dim i as new CIImageMBS(f)
dim r as CGRectMBS = i.Extent

MsgBox str(r.Width)+" x "+str(r.Height)
```

**Notes:** Can be undefined. In that case x/y are -Infinity and width/height are Infinity (3.402823466 * 10^38).
(Read only property)

### 58.246.59 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the CIImage object used internally.
**Notes:** (Read only property)

### 58.246.60 Height as Double

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The height of the image in pixel.
**Notes:** (Read only property)

### 58.246.61 RetainCount as Integer

MBS MacCI Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the retain count of the CIImage reference.
**Notes:** This is useful for debugging.
The retain count is for the CIImage reference, not the CIImageMBS object.
(Read only property)

### 58.246.62 url as string

MBS MacCI Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Returns the URL of a file based image.
**Notes:** Returns the URL of the image when the image was created using the imageWithContentsOfURL

APIs.
This method will return nil, if the URL cannot be determined.
(Read only property)

### 58.246.63 Width as Double

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The width of the image in pixel.
**Notes:** (Read only property)

### 58.246.64 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCIFormatARGB8 | 23 | One of the pixel formats: 32bpp, fixed point. |
| kCIFormatRGBA16 | 27 | One of the pixel formats: 64bpp, fixed point. |
| kCIFormatRGBAf | 34 | One of the pixel formats: 128bpp, floating point. |

# 58.247 class CIPDF417CodeDescriptorMBS

## 58.247.1 class CIPDF417CodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** CIPDF417CodeDescriptor is a concrete subclass of CIBarcodeDescriptor that defines an abstract representation of a PDF417 code symbol.
**Notes:** Refer to the ISO/IEC 15438:2006(E) for the PDF417 symbol specification.
Subclass of the CIBarcodeDescriptorMBS class.

## 58.247.2 Methods

## 58.247.3 Constructor(errorCorrectedPayload as MemoryBlock, isCompact as Boolean, rowCount as Integer, columnCount as Integer)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Initializes a descriptor that can be used as input to CIBarcodeGenerator

## 58.247.4 descriptorWithPayload(errorCorrectedPayload as MemoryBlock, isCompact as Boolean, rowCount as Integer, columnCount as Integer) as CIPDF417CodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a descriptor that can be used as input to CIBarcodeGenerator

## 58.247.5 Properties

## 58.247.6 columnCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Indicates the number of columns in the rectangular matrix, excluding the columns used to indicate the symbol structure.
**Notes:** columnCount values range from 1 to 30.
(Read only property)

### 58.247.7 errorCorrectedPayload as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error-corrected codewords which comprise the PDF417 symbol. The first codeword indicates the number of data codewords in the errorCorrectedPayload.
**Notes:** PDF417 codes are comprised of a start character on the left and a stop character on the right. Each row begins and ends with special characters indicating the current row as well as information about the dimensions of the PDF417 symbol. The errorCorrectedPayload represents the sequence of PDF417 codewords that make up the body of the message. The first codeword indicates the number of codewords in the message. This count includes the "count" codeword and any padding codewords, but does not include the error correction codewords. Each codeword is a 16-bit value in the range of 0...928. The sequence is to be interpreted as described in the PDF417 bar code symbology specification – ISO/IEC 15438:2006(E).
(Read only property)

### 58.247.8 isCompact as Boolean

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** A boolean indicating whether the symbol is compact.
**Notes:** Compact PDF417 symbols have abbreviated right-side guard bars.
(Read only property)

### 58.247.9 rowCount as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Indicates the number of rows in the rectangular matrix.
**Notes:** rowCount values range from 3 to 90.
(Read only property)

# 58.248 class CIQRCodeDescriptorMBS

## 58.248.1 class CIQRCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** CIQRCodeDescriptor is a concrete subclass of CIBarcodeDescriptor that defines an abstract representation of a QR code symbol.
**Notes:** Subclass of the CIBarcodeDescriptorMBS class.

## 58.248.2 Methods

## 58.248.3 Constructor(errorCorrectedPayload as MemoryBlock, symbolVersion as Integer, maskPattern as Integer, errorCorrectionLevel as Integer)

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Initializes a descriptor that can be used as input to CIBarcodeGenerator.

## 58.248.4 descriptorWithPayload(errorCorrectedPayload as MemoryBlock, symbolVersion as Integer, maskPattern as Integer, errorCorrectionLevel as Integer) as CIQRCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a descriptor that can be used as input to CIBarcodeGenerator.

## 58.248.5 Properties

## 58.248.6 errorCorrectedPayload as MemoryBlock

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error-corrected codewords that comprise the QR code symbol.
**Notes:** QR Codes are formally specified in ISO/IEC 18004:2006(E). Section 6.4.10 ”Bitstream to codeword conversion” specifies the set of 8-bit codewords in the symbol immediately prior to splitting the message into blocks and applying error correction.

During decode, error correction is applied and if successful, the message is re-ordered to the state immediately following ”Bitstream to codeword coversion.” The errorCorrectedPayload corresponds to this sequence of 8-bit codewords.

(Read only property)

### 58.248.7 errorCorrectionLevel as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error correction level of the QR code.
**Notes:** QR Codes support four levels of Reed-Solomon error correction, in increasing error correction capability: L, M, Q, and H.
(Read only property)

### 58.248.8 maskPattern as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The data mask pattern for the QR code symbol.
**Notes:** QR Codes support eight data mask patterns, which are used to avoid large black or large white areas inside the symbol body. Valid values range from 0 to 7.
(Read only property)

### 58.248.9 symbolVersion as Integer

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The version property corresponds to the size of the QR Code.
**Notes:** QR Codes are square. ISO/IEC 18004 defines versions from 1 to 40, where a higher symbol version indicates a larger data carrying capacity. This field is required in order to properly interpret the error corrected payload.
(Read only property)

### 58.248.10 Constants

Error Correction

| Constant | Value | Description |
|---|---|---|
| ErrorCorrectionLevelH | 72 | Indicates that approximately 65% of the symbol data is dedicated to error correction. |
| ErrorCorrectionLevelL | 76 | Indicates that approximately 20% of the symbol data is dedicated to error correction. |
| ErrorCorrectionLevelM | 77 | Indicates that approximately 37% of the symbol data is dedicated to error correction. |
| ErrorCorrectionLevelQ | 81 | Indicates that approximately 55% of the symbol data is dedicated to error correction. |

# 58.249 class CIQRCodeFeatureMBS

## 58.249.1 class CIQRCodeFeatureMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The feature for a detected QRCode.
**Notes:** A CIQRCodeFeature describes a Quick Response code (a two-dimensional barcode using the ISO/IEC 18004:2006 standard) detected in a video or still image. The properties of a QR code feature identify the corners of the barcode as it appears in perspective in the image and provide the message decoded from the barcode.

To detect QR codes in an image or video, choose the CIDetectorTypeQRCode type when initializing a CIDetector object.
Subclass of the CIFeatureMBS class.

## 58.249.2 Methods

## 58.249.3 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Initializes an object using the given handle.

## 58.249.4 Properties

## 58.249.5 bottomLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower left corner of the detected barcode, in image coordinates.
**Notes:** (Read only property)

## 58.249.6 bottomRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower right corner of the detected barcode, in image coordinates.
**Notes:** (Read only property)

### 58.249.7 messageString as string

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The string decoded from the detected barcode.
**Notes:** (Read only property)

### 58.249.8 symbolDescriptor as CIQRCodeDescriptorMBS

MBS MacCI Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The QRCode symbol descriptor.
**Notes:** Available on macOS 10.13 or newer.
(Read only property)

### 58.249.9 topLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper left corner of the detected barcode, in image coordinates.
**Notes:** (Read only property)

### 58.249.10 topRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper right corner of the detected barcode, in image coordinates.
**Notes:** (Read only property)

# 58.250 class CIRectangleFeatureMBS

## 58.250.1 class CIRectangleFeatureMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** A CIRectangleFeature object describes a quadrilateral region detected in a video or still image.
**Notes:** A detected rectangle feature is not necessarily rectangular in the plane of the image; rather, the feature identifies a shape that may be rectangular in space but which appears in perspective in the image—for example, a paper or book on a desk. The properties of a rectangle feature identify its corners in image coordinates.

For example, you can use rectangle feature detection together with the CIPerspectiveCorrection filter to detect rectangular objects in an image or video and transform them to their original orientation.

To detect rectangles in an image or video, choose the CIDetectorTypeRectangle type when initializing a CIDetector object, and use the CIDetectorAspectRatio option to specify the approximate shape of rectangular features to search for.
Subclass of the CIFeatureMBS class.

## 58.250.2 Methods

## 58.250.3 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a new object from a handle.

## 58.250.4 Properties

## 58.250.5 bottomLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower left corner of the detected rectangle, in image coordinates.
**Notes:** (Read only property)

## 58.250.6 bottomRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower right corner of the detected rectangle, in image coordinates.
**Notes:** (Read only property)

### 58.250.7 topLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper left corner of the detected rectangle, in image coordinates.
**Notes:** (Read only property)

### 58.250.8 topRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper right corner of the detected rectangle, in image coordinates.
**Notes:** (Read only property)

## 58.251 class CISamplerMBS

### 58.251.1 class CISamplerMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The Xojo class to wrap a CoreImage sampler.

### 58.251.2 Methods

### 58.251.3 Constructor(ciImage as CIImageMBS)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new sampler based on the given image.
**Notes:** On success handle will not be 0.
See also:


- 58.251.4 Constructor(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) 10656
- 58.251.5 Constructor(Handle as Integer) 10657


### 58.251.4 Constructor(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new sampler based on the given image.
**Notes:**

| | |
|---|---|
| matrix: | An affine transformation [ a b c d tx ty ] defining the transformation to be applied to the sampler. |
| wrapmode: | A string defining how pixels outside the sampler's extent are produced. Options include kCISamplerWrapBlack (pixels are transparent black, the default) and kCISamplerWrapClamp (coordinates are clamped to the extent). |
| FilterMode: | A string defining the filter to use when sampling the image. One of kCISamplerFilterNearest (point sampling) or kCISamplerFilterLinear (bilinear interpolation, the default). |

On success handle will not be 0.
See also:

- 58.251.3 Constructor(ciImage as CIImageMBS) 10656
- 58.251.5 Constructor(Handle as Integer) 10657


### 58.251.5 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CISampler* and the object is retained.
Raises UnsupportedOperationException if object is not a CISampler.
See also:


- 58.251.3 Constructor(ciImage as CIImageMBS) 10656
- 58.251.4 Constructor(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) 10656


### 58.251.6 copy as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the sampler.

### 58.251.7 kCISamplerAffineMatrix as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the option keys for creating a sampler.
**Notes:** The key for an affine matrix. The associated value is an NSArray object ( [ a b c d tx ty ] ) that defines the transformation to apply to the sampler.

Available in OS X v10.4 and later.

### 58.251.8 kCISamplerColorSpace as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the option keys for creating a sampler.
**Notes:** The key for the color space to use when sampling the image. The associated value must be an RGB CGColorSpaceRef object. Using this option specifies that samples should be converted to this color space before being passed to a kernel. If not specified, samples will be passed to the kernel in the working color

space of the Core Image context used to render the image.

Available in OS X v10.4 and later.

### 58.251.9 kCISamplerFilterLinear as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the values for filter modes.
**Notes:** Bilinear interpolation.

### 58.251.10 kCISamplerFilterMode as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the option keys for creating a sampler.
**Notes:** The key for the filtering to use when sampling the image. Possible values are kCISamplerFilterNearest and kCISamplerFilterLinear.

Available in OS X v10.4 and later.

### 58.251.11 kCISamplerFilterNearest as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the values for filter modes.
**Notes:** Nearest neighbor sampling.

### 58.251.12 kCISamplerWrapBlack as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the values for wrap modes.
**Notes:** Pixels are transparent black.

### 58.251.13 kCISamplerWrapClamp as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the values for wrap modes.
**Notes:** Coordinates are clamped to the extent.

### 58.251.14 kCISamplerWrapMode as String

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** One of the option keys for creating a sampler.
**Notes:** The key for the sampler wrap mode. The wrap mode specifies how Core Image produces pixels that are outside the extent of the sample. Possible values are kCISamplerWrapBlack and kCISamplerWrapClamp.

Available in OS X v10.4 and later.

### 58.251.15 samplerWithImage(ciImage as CIImageMBS) as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates and returns a sampler that references an image.
**Notes:** A sampler object that references the image specified by the ciImage argument.
See also:

- 58.251.16 samplerWithImage(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS 10659
- 58.251.17 samplerWithImage(ciImage as CIImageMBS, Options as Dictionary) as CISamplerMBS 10660

### 58.251.16 samplerWithImage(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a new sampler based on the given image.
**Notes:**

On success handle will not be nil.
See also:

- 58.251.15 samplerWithImage(ciImage as CIImageMBS) as CISamplerMBS 10659
- 58.251.17 samplerWithImage(ciImage as CIImageMBS, Options as Dictionary) as CISamplerMBS 10660

matrix: An affine transformation [ a b c d tx ty ] defining the transformation to be applied to the sampler.

wrapmode: A string defining how pixels outside the sampler's extent are produced. Options include kCISamplerWrapBlack (pixels are transparent black, the default) and kCISamplerWrapClamp (coordinates are clamped to the extent).

FilterMode: A string defining the filter to use when sampling the image. One of kCISamplerFilterNearest (point sampling) or kCISamplerFilterLinear (bilinear interpolation, the default).

### 58.251.17 samplerWithImage(ciImage as CIImageMBS, Options as Dictionary) as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates and returns a sampler that references an image using options specified in a dictionary.
**Notes:** See kCISampler* shared methods for constants.
See also:

- 58.251.15 samplerWithImage(ciImage as CIImageMBS) as CISamplerMBS 10659
- 58.251.16 samplerWithImage(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS 10659

### 58.251.18 Properties

### 58.251.19 Definiton as CIFilterShapeMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the shape containing the Domain Of Definition (DOD) of the sampler.
**Notes:** The DOD is defined such that it contains all non-transparent pixels produced by referencing the sampler.
(Read only property)

### 58.251.20 description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this sampler.
**Notes:** (Read only property)

### 58.251.21 Extent as CGRectMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the extent of the sampler.
**Notes:** Sampling outside the extent will bring the sampler's wrap mode into action.

Returns nil on any error.
(Read only property)

### 58.251.22 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the internal used CISampler reference.
**Notes:** (Read only property)

## 58.252 class CITextFeatureMBS

### 58.252.1 class CITextFeatureMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The class for a text feature.
**Notes:** A CITextFeature object describes a quadrilateral region likely to contain upright text detected in a video or still image. The properties of a text feature identify its corners in image coordinates.

Use this class to locate areas of text within an image—for example, to extract and perspective-correct those portions of the image before performing your own optical character recognition or other processing tasks.

To detect rectangles in an image or video, choose the CIDetectorTypeText type when initializing a CIDetector object, and use the CIDetectorImageOrientation option to specify the desired orientation for finding upright text.
Subclass of the CIFeatureMBS class.

### 58.252.2 Methods

### 58.252.3 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The constructor to create an object from a handle.

### 58.252.4 subFeatures as CIFeatureMBS()

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** An array containing additional features detected within the feature.
**Notes:** A text detector can identify both a major region that is likely to contain text as well as the areas within that region that likely to contain individual text features. Such features might be single characters, groups of closely-packed characters, or entire words.

Core Image populates this array only if you enable the CIDetectorReturnSubFeatures option when retrieving features.

### 58.252.5 Properties

### 58.252.6 bottomLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower left corner of the detected text region, in image coordinates.
**Notes:** (Read only property)

### 58.252.7 bottomRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The lower right corner of the detected text region, in image coordinates.
**Notes:** (Read only property)

### 58.252.8 topLeft as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper left corner of the detected text region, in image coordinates.
**Notes:** (Read only property)

### 58.252.9 topRight as CGPointMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The upper right corner of the detected text region, in image coordinates.
**Notes:** (Read only property)

## 58.253 class CIVectorMBS

### 58.253.1 class CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class for a vector in the CoreImage world.
**Notes:** May contain one to four floating point values.
**Blog Entries**

- Tip of day: Gradients with CoreImage Filter
- MBS Xojo / Real Studio Plugins, version 16.0pr6
- MBS Real Studio Plugins, version 12.1pr5

### 58.253.2 Methods

### 58.253.3 CGAffineTransformValue as CGAffineTransformMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns the values stored in the CIVector object as an affine transform.
**Example:**

```
dim p as new CGAffineTransformMBS
dim v as new CIVectorMBS(p)
dim x as CGAffineTransformMBS = v.CGAffineTransformValue
MsgBox str(x.A)+" "+str(x.B)+" "+str(x.C)+" "+str(x.D)+" "+str(x.TX)+" "+str(x.TY)
```

**Notes:** The first six values in the vector become the values that comprise the affine transform.
Available in OS X v10.9 and later.

### 58.253.4 CGPointValue as CGPointMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns the values stored in the CIVector object as a point.
**Example:**

```
dim p as new CGPointMBS(10, 20)
dim v as CIVectorMBS = CIVectorMBS.vectorWithCGPoint(p)

dim x as CGPointMBS = v.CGPointValue
MsgBox str(x.x)+" "+str(x.y)
```

**Notes:** The vector's X and Y property values become the CGPoint's X and Y values.
Available in OS X v10.9 and later.

### 58.253.5 CGRectValue as CGRectMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Returns the values stored in the CIVector object as an rect.
**Example:**

```
dim p as new CGRectMBS(10, 20, 30, 40)
dim v as CIVectorMBS = CIVectorMBS.vectorWithCGRect(p)

dim x as CGRectMBS = v.CGRectValue
MsgBox str(x.Origin.X)+" "+str(x.Origin.y)+" "+str(x.Size.Width)+" "+str(x.Size.Height)
```

**Notes:** The vector's X, Y, Z and W property values become the CGRect's X, Y, height and width values.
Available in OS X v10.9 and later.

### 58.253.6 Constructor(Handle as Integer)

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Initializes object with given object reference.
**Notes:** ref should be a CIVector* and the object is retained.
Raises UnsupportedOperationException if object is not a CIVector.
See also:


- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670

- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.7 Constructor(p as CGPointMBS)

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Initializes a vector that is initialized with values provided by a CGPoint.
**Example:**

```
dim p as new CGPointMBS(10, 20)
dim v as new CIVectorMBS(p)

MsgBox str(v.x)+" "+str(v.y)
```

**Notes:** The CGPoint's X and Y values are stored in the vector's X and Y properties.
Available in OS X v10.9 and later.
See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.8 Constructor(r as CGRectMBS)

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Initializes a vector that is initialized with values provided by a CGRect.
**Example:**

```
dim p as new CGRectMBS(10, 20, 30, 40)
dim v as new CIVectorMBS(p)
```

```
dim x as CGRectMBS = v.CGRectValue
MsgBox str(x.Origin.X)+" "+str(x.Origin.y)+" "+str(x.Size.Width)+" "+str(x.Size.Height)
```

**Notes:** The CGRect structure's X, Y, height and width values are stored in the vector's X, Y, Z and W properties.
Available in OS X v10.9 and later.
See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.9 Constructor(StringRepresentation as String)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on content of the string.
**Example:**

```
dim v as CIVectorMBS
v=New CIVectorMBS(" [ 1 2 3 ] ")
```

See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669

- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.10 Constructor(t as CGAffineTransformMBS)

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Initializes a vector that is initialized with values provided by a CGAffineTransform.
**Example:**

```
dim p as new CGAffineTransformMBS
dim v as new CIVectorMBS(p)
dim x as CGAffineTransformMBS = v.CGAffineTransformValue
MsgBox str(x.A)+" "+str(x.B)+" "+str(x.C)+" "+str(x.D)+" "+str(x.TX)+" "+str(x.TY)
```

**Notes:** The six values that comprise the affine transform fill the first six positions of the resulting CIVector object.
Available in OS X v10.9 and later.
See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672

### 58.253.11 Constructor(values() as Double)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Initializes a new vector with given values.
See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.12 Constructor(values() as single)

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Initializes a new vector with given values.
See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672

### 58.253.13 Constructor(x as Double)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on one value.
**Example:**

```
dim x as Double
dim v as CIVectorMBS
v=New CIVectorMBS(x)
```

See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.14 Constructor(x as Double, y as Double)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on two values.
**Example:**

```
dim x,y as Double
dim v as CIVectorMBS
v=New CIVectorMBS(x,y)
```

See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666

- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672


### 58.253.15 Constructor(x as Double, y as Double, z as Double)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on three values.
**Example:**

```
dim x,y,z as Double
dim v as CIVectorMBS
v=New CIVectorMBS(x,y,z)
```

See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double) 10672

### 58.253.16 Constructor(x as Double, y as Double, z as Double, w as Double)

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on 4 values.
**Example:**

```
dim x,y,z,w as Double
dim v as CIVectorMBS
v=New CIVectorMBS(x,y,z,w)
```

See also:


- 58.253.6 Constructor(Handle as Integer) 10665
- 58.253.7 Constructor(p as CGPointMBS) 10666
- 58.253.8 Constructor(r as CGRectMBS) 10666
- 58.253.9 Constructor(StringRepresentation as String) 10667
- 58.253.10 Constructor(t as CGAffineTransformMBS) 10668
- 58.253.11 Constructor(values() as Double) 10669
- 58.253.12 Constructor(values() as single) 10669
- 58.253.13 Constructor(x as Double) 10670
- 58.253.14 Constructor(x as Double, y as Double) 10670
- 58.253.15 Constructor(x as Double, y as Double, z as Double) 10671


### 58.253.17 copy as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the vector object.

### 58.253.18 Value(index as Integer) as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The value with the given index.
**Notes:** Index is zero based.

### 58.253.19 vectorWithCGAffineTransform(t as CGAffineTransformMBS) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a vector that is initialized with values provided by a CGAffineTransform.
**Example:**

```
dim p as new CGAffineTransformMBS
dim v as CIVectorMBS = CIVectorMBS.vectorWithCGAffineTransform(p)
dim x as CGAffineTransformMBS = v.CGAffineTransformValue
MsgBox str(x.A)+" "+str(x.B)+" "+str(x.C)+" "+str(x.D)+" "+str(x.TX)+" "+str(x.TY)
```

**Notes:** t: A transform.
Returns a vector initialized with the specified values.

The six values that comprise the affine transform fill the first six positions of the resulting CIVector object.

### 58.253.20 vectorWithCGPoint(p as CGPointMBS) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a vector that is initialized with values provided by a CGPoint.
**Example:**

```
dim p as new CGPointMBS(10, 20)
dim v as CIVectorMBS = CIVectorMBS.vectorWithCGPoint(p)

MsgBox str(v.x)+" "+str(v.y)
```

**Notes:** p: A point.
A vector initialized with the specified values.

The CGPoint's X and Y values are stored in the vector's X and Y properties.

### 58.253.21 vectorWithCGRect(r as CGRectMBS) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Creates and returns a vector that is initialized with values provided by a CGRect.
**Example:**

```
dim p as new CGRectMBS(10, 20, 30, 40)
dim v as CIVectorMBS = CIVectorMBS.vectorWithCGRect(p)

dim x as CGRectMBS = v.CGRectValue
MsgBox str(x.Origin.X)+" "+str(x.Origin.y)+" "+str(x.Size.Width)+" "+str(x.Size.Height)
```

**Notes:** r: A rect.

Returns a vector initialized with the specified values.
The CGRect's X, Y, height and width values are stored in the vector's X, Y, Z and W properties.

### 58.253.22 vectorWithString(s as string) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on content of the string.

### 58.253.23 vectorWithValues(values() as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on the given values.
See also:

- 58.253.24 vectorWithValues(values() as single) as CIVectorMBS 10674

### 58.253.24 vectorWithValues(values() as single) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on the given values.
See also:

- 58.253.23 vectorWithValues(values() as Double) as CIVectorMBS 10674

### 58.253.25 vectorWithX(x as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on one value.

### 58.253.26 vectorWithXY(x as Double, y as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on two values.

### 58.253.27 vectorWithXYZ(x as Double, y as Double, z as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on three values.

### 58.253.28 vectorWithXYZW(x as Double, y as Double, z as Double, w as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on 4 values.

### 58.253.29 Properties

### 58.253.30 Count as Integer

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Return the number of values stored in the vector.
**Notes:** (Read only property)

### 58.253.31 Description as String

MBS MacCI Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the textual description for this vector.
**Notes:** (Read only property)

### 58.253.32 Handle as Integer

MBS MacCI Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The handle to the CIVector reference used.
**Notes:** (Read only property)

### 58.253.33 StringRepresentation as String

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Returns the vector as a string
**Example:**

```
dim v as CIVectorMBS

v=NewCIVectorWithXYZMBS(1,2,3)

MsgBox v.StringRepresentation // shows " [ 1 2 3 ] "
```

**Notes:** Value is "" on any error.
(Read only property)

### 58.253.34 W as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The W value.
**Notes:** (Read only property)

### 58.253.35 X as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The X value.
**Notes:** (Read only property)

### 58.253.36 Y as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The Y value.
**Notes:** (Read only property)

### 58.253.37 Z as Double

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The Z value.
**Notes:** (Read only property)

## 58.254 class NSAffineTransformMBS

### 58.254.1 class NSAffineTransformMBS

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** A class for transformation.
**Notes:** As being used by CoreImage and by the NS* classes, it is a free plugin class requiring no registration.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr2
- Tip of the day: Rotate image with CoreImage
- CocoaBase needs MacOSXCG
- MBS REALbasic plug-in 9.6

### 58.254.2 Methods

### 58.254.3 appendTransform(transform as NSAffineTransformMBS)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Transforms the transformation by applying the given transform on the current one.

### 58.254.4 CGAffineTransformToNSAffineTransform(CGAffineTransform as Variant) as NSAffineTransformMBS

MBS Main Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Converts NSAffineTransformMBS to CGAffineTransformMBS.
**Example:**

```
dim n as new NSAffineTransformMBS(1,2,3,4,5,6)
dim c as CGAffineTransformMBS = NSAffineTransformMBS.NSAffineTransformToCGAffineTransform(n)
dim r as NSAffineTransformMBS = NSAffineTransformMBS.CGAffineTransformToNSAffineTransform(c)

Break // check in debugger
```

**Notes:** To reduce plugin interdependencies, the parameter is declared as Variant and not as CGAffineTransformMBS.

### 58.254.5 Constructor

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** The constructor to create a new transformation.
**Notes:** On success the handle property will not be 0.
See also:

- 58.254.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double) 10679
- 58.254.7 Constructor(transform as NSAffineTransformMBS) 10679

### 58.254.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double)

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a new NSAffineTransformMBS based on the given values.
See also:

- 58.254.5 Constructor 10679
- 58.254.7 Constructor(transform as NSAffineTransformMBS) 10679

### 58.254.7 Constructor(transform as NSAffineTransformMBS)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new transformation based on the values of an existing transformation.
**Notes:** On success the handle property will not be 0.
See also:

- 58.254.5 Constructor 10679
- 58.254.6 Constructor(m11 as Double, m12 as Double, m21 as Double, m22 as Double, tx as Double, ty as Double) 10679

### 58.254.8 getValues(byref m11 as Double, byref m12 as Double, byref m21 as Double, byref m22 as Double , byref tx as Double, byref tY as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Copies all the values from the internal matrix.

### 58.254.9 invert

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Inverts the transformation.

### 58.254.10 NSAffineTransformToCGAffineTransform(NSAffineTransform as NSAffineTransformMBS) as Variant

MBS Main Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Converts NSAffineTransformMBS to CGAffineTransformMBS.
**Example:**

```
dim n as new NSAffineTransformMBS(1,2,3,4,5,6)
dim c as CGAffineTransformMBS = NSAffineTransformMBS.NSAffineTransformToCGAffineTransform(n)
dim r as NSAffineTransformMBS = NSAffineTransformMBS.CGAffineTransformToNSAffineTransform(c)

Break // check in debugger
```

**Notes:** To reduce plugin interdependencies, the result is declared as Variant and not as CGAffineTransformMBS.

### 58.254.11 Operator_Convert as String

MBS Main Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Returns stringValue.

### 58.254.12 Operator_Multiply(other as NSAffineTransformMBS) as NSAffineTransformMBS

MBS Main Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Multiplies both matrix where self is on the left side.

### 58.254.13 Operator_MultiplyRight(other as NSAffineTransformMBS) as NSAffineTransformMBS

MBS Main Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Multiplies both matrix where self is on the right side.

### 58.254.14 prependTransform(transform as NSAffineTransformMBS)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Transforms the transformation by applying the given transform on the current one.

### 58.254.15 rotateByDegrees(angle as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Rotates transformation by the given angle in degrees.
**Example:**

```
dim t as new NSAffineTransformMBS
t.rotateByDegrees 90 // roatet by 90 degrees
```

### 58.254.16 rotateByRadians(angle as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Rotates transformation by the given angle in radians.
**Example:**

```
const pi=3.14159265
dim t as new NSAffineTransformMBS
t.rotateByDegrees pi // roatet by 180 degrees
```

### 58.254.17 scale(scale as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Scales the transformation.
**Example:**

```
dim t as new NSAffineTransformMBS
t.scale 2.0 // double size
```

See also:

- 58.254.18 scale(scaleX as Double, scaleY as Double) 10682

### 58.254.18 scale(scaleX as Double, scaleY as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Scales transformation.
**Example:**

```
dim t as new NSAffineTransformMBS
t.scale 1,2
```

See also:

- 58.254.17 scale(scale as Double) 10681

### 58.254.19 setValues(m11 as Double, m12 as Double, m21 as Double, m22 as Double , tx as Double, tY as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Sets all the values from the internal matrix.

### 58.254.20 transform as NSAffineTransformMBS

MBS Main Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new NSAffineTransform object initialized to the identity matrix.
**Example:**

```
dim a as NSAffineTransformMBS = NSAffineTransformMBS.transform
MsgBox str(a.m11)+", "+str(a.m12)+", "+str(a.m21)+", "+str(a.m22)+", "+str(a.tx)+", "+str(a.ty)
```

**Notes:** This matrix transforms any point to the same point.

### 58.254.21 transformBezierPath(NSBezierPath as Variant) as Variant

MBS Main Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Transforms a bezier path with current transformation.

### 58.254.22 transformPoint(byref x as Double, byref y as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Transforming the given point.

### 58.254.23 transformSize(byref width as Double, byref height as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Transforming the given size.

### 58.254.24 translate(deltaX as Double, deltaY as Double)

MBS Main Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Translates by the given delta.

### 58.254.25 Properties

### 58.254.26 Data as MemoryBlock

MBS Main Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** The transform data structure.
**Example:**

```
dim n as new NSAffineTransformMBS(1,2,3,4,5,6)
dim m as MemoryBlock = n.Data

Break // check in debugger
```

**Notes:** Returns a copy of the structure as memoryblock.
Can be set with memoryblock of right size and content.

Due to CoreGraphics using 32bit floats in 32bit app, you need to use SingleValue there in the memoryblock which has a size of 24 bytes.

For 64-bit application, the sizes double and you need to use DoubleValue.
(Read and Write property)

### 58.254.27 Handle as Integer

MBS Main Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 58.254.28 m11 as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The matrix value at position 1/1.
**Notes:** (Read only property)

### 58.254.29 m12 as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The matrix value at position 1/2.
**Notes:** (Read only property)

### 58.254.30 m21 as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The matrix value at position 2/1.
**Notes:** (Read only property)

### 58.254.31 m22 as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The matrix value at position 2/2.
**Notes:** (Read only property)

### 58.254.32 StringValue as String

MBS Main Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The string representation.
**Notes:** (Read only property)

### 58.254.33 tx as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The translate X value.
**Notes:** (Read only property)

### 58.254.34 ty as Double

MBS Main Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The translate Y value.
**Notes:** (Read only property)

## 58.255 Globals

### 58.255.1 NewCIColorMBS(red as single, green as single, blue as single, alpha as single=1.0) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new color based on the given values.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.2 NewCIColorWithCGColorMBS(CGColor as Variant) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new CIColor based on the given CoreGraphics color.
**Notes:** CGColor parameter must be a CGColorMBS object.
Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.3 NewCIColorWithStringMBS(s as String) as CIColorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new CIColor based on the given string.
**Example:**

```
dim c as CIColorMBS

c=NewCIColorWithStringMBS("1 0.5 0 1")

MsgBox c.stringRepresentation // shows "1 0.5 0 1"
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.4 NewCIContextMBS(cgcontext as CGContextMBS) as CIContextMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a new CoreImage context object without options, all output will be drawn into the CG

context.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.5 NewCIContextMBS(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) as CIContextMBS 10687

### 58.255.5 NewCIContextMBS(cgcontext as CGContextMBS, OutputColorSpace as CGColorSpaceMBS, WorkingColorSpace as CGColorSpaceMBS, UseSoftwareRenderer as Boolean) as CIContextMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Create a new CoreImage context object with options, all output will be drawn into the CG context.
**Notes:** OutputColorSpace: A CGColorSpaceMBS object defining the color space in which all intermediate operations are performed.
WorkingColorSpace: A CGColorSpaceRef object defining the color space that images are converted to before rendering into the context.
UseSoftwareRenderer: Whether you want software renderer only.

Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.4 NewCIContextMBS(cgcontext as CGContextMBS) as CIContextMBS 10686

### 58.255.6 NewCIImagewithBitmapDataMBS(data as memoryblock, BytesPerRow as Integer, Width as Integer, Height as Integer, Format as Integer, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage from a RAW memory buffer.
**Notes:** Format must be one of this constants: kCIFormatRGBAf, kCIFormatRGBA16 and kCIFormatARGB8.

Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.7 NewCIImagewithBitmapMemoryMBS(data as memoryblock, DataLength as Integer, BytesPerRow as Integer, Width as Integer, Height as Integer, Format as Integer, colorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage from a RAW memory buffer.
**Notes:** Data points directly to the row data.
Length is the size of the memoryblock in bytes.
BytesPerRow is the size of a row in bytes.
Width and height are the dimensions of the image.
Format must be one of this constants: kCIFormatRGBAf, kCIFormatRGBA16 and kCIFormatARGB8.
Colorspace is the CoreGraphics Colorspace object to be used.

Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.8 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a CGImage.
**Notes:** cgcolorspace: Use this colorspace when opening the image.
Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.9 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, options as dictionary = nil) as CIImageMBS 10688

### 58.255.9 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, options as dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a CGImage.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.8 NewCIImagewithCGImageMBS(cgimage as CGImageMBS, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10688

### 58.255.10 NewCIImagewithDataMBS(Data as memoryblock, cgcolorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on the image file content stored inside the data string.
**Notes:** cgcolorspace: Use this colorspace when opening the image.

Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.11 NewCIImagewithDataMBS(Data as Memoryblock, Options as Dictionary = nil) as CIImageMBS 10689

### 58.255.11 NewCIImagewithDataMBS(Data as Memoryblock, Options as Dictionary = nil) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on the image file content stored inside the data string.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.10 NewCIImagewithDataMBS(Data as memoryblock, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10689

### 58.255.12 NewCIImagewithFileMBS(file as folderitem) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

In plugin version 7.5 and Mac OS X 10.4.10 this method leaks the data because of a bug in the framework.
See also:

- 58.255.13 NewCIImagewithFileMBS(file as folderitem, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10690

### 58.255.13 NewCIImagewithFileMBS(file as folderitem, cgcolorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file.
**Notes:** cgcolorspace: Use this colorspace when opening the image.

Returns nil on any error.
Requires Mac OS X 10.4 to work.

In plugin version 7.5 and Mac OS X 10.4.10 this method leaks the data because of a bug in the framework.
See also:

- 58.255.12 NewCIImagewithFileMBS(file as folderitem) as CIImageMBS 10689

### 58.255.14 NewCIImagewithURLMBS(url as String) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file where the URL points to.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.15 NewCIImagewithURLMBS(url as String, cgcolorspace as CGColorSpaceMBS) as CIImageMBS 10690

### 58.255.15 NewCIImagewithURLMBS(url as String, cgcolorspace as CGColorSpaceMBS) as CIImageMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a CIImage based on a the content of the file where the URL points to.
**Notes:** cgcolorspace: Use this colorspace when opening the image.

Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.14 NewCIImagewithURLMBS(url as String) as CIImageMBS 10690

### 58.255.16 NewCISamplerMBS(ciImage as CIImageMBS) as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new sampler based on the given image.
**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.17 NewCISamplerMBS(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS 10691

### 58.255.17 NewCISamplerMBS(ciImage as CIImageMBS, matrix as NSAffineTransformMBS, WrapMode as String, FilterMode as string) as CISamplerMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new sampler based on the given image.
**Notes:**

| | |
|---|---|
| matrix: | An affine transformation [ a b c d tx ty ] defining the transformation to be applied to the sampler. |
| wrapmode: | A string defining how pixels outside the sampler's extent are produced. Options include kCISamplerWrapBlack (pixels are transparent black, the default) and kCISamplerWrapClamp (coordinates are clamped to the extent). |
| FilterMode: | A string defining the filter to use when sampling the image. One of kCISamplerFilterNearest (point sampling) or kCISamplerFilterLinear (bilinear interpolation, the default). |

Returns nil on any error.
Requires Mac OS X 10.4 to work.
See also:

- 58.255.16 NewCISamplerMBS(ciImage as CIImageMBS) as CISamplerMBS 10691

### 58.255.18 NewCIVectorWithStringMBS(s as string) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on content of the string.
**Example:**

```
dim v as CIVectorMBS
v=NewCIVectorWithStringMBS(" [ 1 2 3 ] ")
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.19 NewCIVectorWithXMBS(x as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on one value.
**Example:**

```
dim x as Double = 1
dim v as CIVectorMBS
v=NewCIVectorWithXMBS(x)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr1

### 58.255.20 NewCIVectorWithXYMBS(x as Double, y as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on two values.
**Example:**

```
dim x as Double = 1
dim y as Double = 2
dim v as CIVectorMBS
v=NewCIVectorWithXYMBS(x,y)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.21 NewCIVectorWithXYZMBS(x as Double, y as Double, z as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on three values.
**Example:**

```
dim x as Double = 1
dim y as Double = 2
dim z as Double = 3
dim v as CIVectorMBS
v=NewCIVectorWithXYZMBS(x,y,z)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

### 58.255.22 NewCIVectorWithXYZWMBS(x as Double, y as Double, z as Double, w as Double) as CIVectorMBS

MBS MacCI Plugin, Plugin Version: 7.3, Platform: macOS, Targets: All.

**Function:** Creates a new vector based on 4 values.
**Example:**

```
dim x as Double = 1
dim y as Double = 2
dim z as Double = 3
dim w as Double = 4
dim v as CIVectorMBS
v=NewCIVectorWithXYZWMBS(x,y,z,w)
```

**Notes:** Returns nil on any error.
Requires Mac OS X 10.4 to work.

# Chapter 59

# CoreLocation

## 59.1 class CLGeocodeCompletionHandlerMBS

### 59.1.1 class CLGeocodeCompletionHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The class to receive the Complete event from a geocoder.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.2, page 68: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis
- 18.6, pages 70 to 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 59.1.2 Events

### 59.1.3 Completed(geocoder as CLGeocoderMBS, placemarks() as CLPlacemarkMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** The event to be called when a geocoding request is complete.
**Notes:** Upon completion of a geocoding request, a block of this form is called to give you a chance to process the results. The parameters of this block are as follows:

placemark: Contains an array of CLPlacemark objects. For most geocoding requests, this array should contain only one entry. However, forward-geocoding requests may return multiple placemark objects in situations where the specified address could not be resolved to a single location.
If the request was canceled or there was an error in obtaining the placemark information, this parameter is nil.
error: Contains an error object (if any) indicating why the placemark data was not returned. For a list of possible error codes, see CLLocationManager Class Reference.

Available in OS X v10.8 and later.
Tag parameter added in version 14.2.

## 59.2 class CLGeocoderMBS

### 59.2.1 class CLGeocoderMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The CLGeocoder class provides services for converting between a coordinate (specified as a latitude and longitude) and the user-friendly representation of that coordinate.
**Notes:** A user-friendly representation of the coordinate typically consists of the street, city, state, and country information corresponding to the given location, but it may also contain a relevant point of interest, landmarks, or other identifying information. A geocoder object is a single-shot object that works with a network-based service to look up placemark information for its specified coordinate value.

To use a geocoder object, create it and call one of its forward- or reverse-geocoding methods to begin the request. Reverse-geocoding requests take a latitude and longitude value and find a user-readable address. Forward-geocoding requests take a user-readable address and find the corresponding latitude and longitude value. Forward-geocoding requests may also return additional information about the specified location, such as a point of interest or building at that location. For both types of request, the results are returned using a CLPlacemark object. In the case of forward-geocoding requests, multiple placemark objects may be returned if the provided information yielded multiple possible locations.

To make smart decisions about what types of information to return, the geocoder server uses all the information provided to it when processing the request. For example, if the user is moving quickly along a highway, it might return the name of the overall region, and not the name of a small park that the user is passing through.

Applications should be conscious of how they use geocoding. Here are some rules of thumb for using this class effectively:

Send at most one geocoding request for any one user action.
If the user performs multiple actions that involve geocoding the same location, reuse the results from the initial geocoding request instead of starting individual requests for each action.
When you want to update the user's current location automatically (such as when the user is moving), issue new geocoding requests only when the user has moved a significant distance and after a reasonable amount of time has passed. For example, in a typical situation, you should not send more than one geocoding request per minute.
Do not start a geocoding request at a time when the user will not see the results immediately. For example, do not start a request if your application is inactive or in the background.
The computer or device must have access to the network in order for the geocoder object to return detailed placemark information. Although, the geocoder stores enough information locally to report the localized country name and ISO country code for many locations. If country information is not available for a specific location, the geocoder may still report an error to your completion block.

see also
https://developer.apple.com/library/mac/#documentation/CoreLocation/Reference/CLGeocoder_class/Ref-

erence/Reference.html
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.3
- CoreLocation GeoCoder in Real Studio

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.2, page 69: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis
- 18.6, pages 70 to 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 10.6, page 9: News

### 59.2.2 Methods

### 59.2.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns true if this class is available.

### 59.2.4 cancelGeocode

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Cancels a pending geocoding request.
**Notes:** You can use this method to cancel a pending request and free up the resources associated with that request. Canceling a pending request causes the completion handler event to be called.

If the request is not pending, because it has already returned or has not yet begun, this method does nothing. Available in OS X v10.8 and later.

### 59.2.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 59.2.6 geocodeAddressDictionary(addressDictionary as Dictionary, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Submits a forward-geocoding request using the specified address dictionary.
**Notes:** addressDictionary: An Address Book dictionary containing information about the address to look up.
completionHandler: A handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a forward-geocoding request, do not attempt to initiate another forward- or reverse-geocoding request.
Available in OS X v10.8 and later.

### 59.2.7 geocodeAddressString(addressString as string, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Submits a forward-geocoding request using the specified string.
**Notes:** addressString: A string describing the location you want to look up. For example, you could specify the string "1 Infinite Loop, Cupertino, CA" to locate Apple headquarters.
completionHandler: A handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a forward-geocoding request, do not attempt to initiate another forward- or reverse-geocoding request.
Available in OS X v10.8 and later.
See also:


- 59.2.8 geocodeAddressString(addressString as string, region as CLRegionMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil) 10700
- 59.2.9 geocodeAddressString(addressString as string, region as CLRegionMBS, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil) 10700

### 59.2.8 geocodeAddressString(addressString as string, region as CLRegionMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Submits a forward-geocoding request using the specified string and region information.
**Notes:** addressString: A string describing the location you want to look up. For example, you could specify the string "1 Infinite Loop, Cupertino, CA" to locate Apple headquarters.
region: A geographical region to use as a hint when looking up the specified address. Specifying a region lets you prioritize the returned set of results to locations that are close to some specific geographical area, which is typically the user's current location. If nil and the application is authorized for location services, the set of results is prioritized based on the user's approximate location. Invoking this method does not trigger a location services authorization request.
completionHandler: A handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a forward-geocoding request, do not attempt to initiate another forward- or reverse-geocoding request.
Available in OS X v10.8 and later.
See also:

- 59.2.7 geocodeAddressString(addressString as string, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil) 10699
- 59.2.9 geocodeAddressString(addressString as string, region as CLRegionMBS, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil) 10700

### 59.2.9 geocodeAddressString(addressString as string, region as CLRegionMBS, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Submits a forward-geocoding request using the specified string and region information.
**Notes:** addressString: A string describing the location you want to look up. For example, you could specify the string "1 Infinite Loop, Cupertino, CA" to locate Apple headquarters.
region: A geographical region to use as a hint when looking up the specified address. Specifying a region lets you prioritize the returned set of results to locations that are close to some specific geographical area, which is typically the user's current location. If nil and the application is authorized for location services, the set of results is prioritized based on the user's approximate location. Invoking this method does not trigger a location services authorization request.
completionHandler: A handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a forward-geocoding request, do not attempt to initiate another forward- or reverse-geocoding request.

Available in OS X v10.8 and later.
For macOS 10.13 or newer we can optionally pass preferred locale.
See also:

- 59.2.7 geocodeAddressString(addressString as string, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil) 10699
- 59.2.8 geocodeAddressString(addressString as string, region as CLRegionMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil) 10700

### 59.2.10 geocodePostalAddress(postalAddress as Variant, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries coordinates for postal address.
**Notes:** postalAddress must be a CNPostalAddressMBS.
For macOS 10.13 or newer.
See also:

- 59.2.11 geocodePostalAddress(postalAddress as Variant, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil) 10701

### 59.2.11 geocodePostalAddress(postalAddress as Variant, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries coordinates for postal address.
**Notes:** postalAddress must be a CNPostalAddressMBS.
For macOS 10.13 or newer.
See also:

- 59.2.10 geocodePostalAddress(postalAddress as Variant, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil) 10701

### 59.2.12 isGeocoding as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the receiver is in the middle of geocoding its value. (read-only)
**Notes:** This property contains the value true if the process is ongoing or false if the process is done or has not yet been initiated.
Available in OS X v10.8 and later.

### 59.2.13 reverseGeocodeLocation(location as CLLocationMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Submits a reverse-geocoding request for the specified location.
**Notes:** location: The location object containing the coordinate data to look up.
completionHandler: The handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a reverse-geocoding request, do not attempt to initiate another reverse- or forward-geocoding request.

Available in OS X v10.8 and later.
See also:

- 59.2.14 reverseGeocodeLocation(location as CLLocationMBS, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil) 10702

### 59.2.14 reverseGeocodeLocation(location as CLLocationMBS, preferredLocale as NSLocaleMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Submits a reverse-geocoding request for the specified location.
**Notes:** location: The location object containing the coordinate data to look up.
completionHandler: The handler object containing the code to execute at the end of the request. This code is called whether the request is successful or unsuccessful.

This method submits the specified location data to the geocoding server asynchronously and returns. Your completion handler block will be executed on the main thread. After initiating a reverse-geocoding request, do not attempt to initiate another reverse- or forward-geocoding request.

Available in OS X v10.8 and later.
For macOS 10.13 or newer we can optionally pass preferred locale.

See also:

- 59.2.13 reverseGeocodeLocation(location as CLLocationMBS, completionHandler as CLGeocodeCompletionHandlerMBS, tag as Variant = nil) 10702

### 59.2.15 Properties

### 59.2.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 59.3 class CLHeadingMBS

### 59.3.1 class CLHeadingMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A CLHeading object contains heading data generated by a CLLocationManager object.
**Notes:** The heading data consists of computed values for true and magnetic north. It also includes the raw data for the three-dimensional vector used to compute those values.

Typically, you do not create instances of this class yourself, nor do you subclass it. Instead, you receive instances of this class through the delegate assigned to the CLLocationManager object whose startUpdatingHeading method you called.

Note: If you want heading objects to contain valid data for the trueHeading property, your location manager object should also be configured to deliver location updates. You can start the delivery of these updates by calling the location manager object's startUpdatingLocation method.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 59.3.2 Methods

### 59.3.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns true if this class is available.

### 59.3.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 59.3.5 copy as CLHeadingMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a clone of this object.

### 59.3.6 DateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time at which this heading was determined. (read-only)
**Notes:** Available in OS X v10.7 and later.

### 59.3.7 description as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the heading data in a formatted text string.
**Notes:** A string of the form "magneticHeading <magnetic>trueHeading <heading>accuracy <accuracy>x <x>y <y>z <z>@ <date-time>" where <magnetic>, <heading>, <accuracy>, <x>, <y>, and <z>are formatted floating-point numbers and <date-time>is a formatted date string that includes date, time, and time zone information.

Available in OS X v10.7 and later.

### 59.3.8 headingAccuracy as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The maximum deviation (measured in degrees) between the reported heading and the true geomagnetic heading. (read-only)
**Notes:** A positive value in this property represents the potential error between the value reported by the magneticHeading property and the actual direction of magnetic north. Thus, the lower the value of this property, the more accurate the heading. A negative value means that the reported heading is invalid, which can occur when the device is uncalibrated or there is strong interference from local magnetic fields.

Available in OS X v10.7 and later.

### 59.3.9 kCLHeadingFilterNone as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Special value for heading filter to define that you don't want to filter.

### 59.3.10 magneticHeading as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The heading (measured in degrees) relative to magnetic north. (read-only)
**Notes:** The value in this property represents the heading relative to the magnetic North Pole, which is different from the geographic North Pole. The value 0 means the device is pointed toward magnetic north, 90 means it is pointed east, 180 means it is pointed south, and so on. The value in this property should always be valid.

If the headingAccuracy property contains a negative value, the value in this property should be considered unreliable.

Available in OS X v10.7 and later.

### 59.3.11 timestamp as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time at which this heading was determined. (read-only)
**Notes:** Available in OS X v10.7 and later.

### 59.3.12 trueHeading as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The heading (measured in degrees) relative to true north. (read-only)
**Notes:** The value in this property represents the heading relative to the geographic North Pole. The value 0 means the device is pointed toward true north, 90 means it is pointed due east, 180 means it is pointed due south, and so on. A negative value indicates that the heading could not be determined.

Important This property contains a valid value only if location updates are also enabled for the corresponding location manager object. Because the position of true north is different from the position of magnetic north on the Earth's surface, Core Location needs the current location of the device to compute the value of this property.

Available in OS X v10.7 and later.

### 59.3.13 x as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The geomagnetic data (measured in microteslas) for the x-axis. (read-only)
**Notes:** This value represents the x-axis deviation from the magnetic field lines being tracked by the device. Available in OS X v10.7 and later.

### 59.3.14 y as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The geomagnetic data (measured in microteslas) for the y-axis. (read-only)
**Notes:** This value represents the y-axis deviation from the magnetic field lines being tracked by the device. Available in OS X v10.7 and later.

### 59.3.15 z as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The geomagnetic data (measured in microteslas) for the z-axis. (read-only)
**Notes:** This value represents the z-axis deviation from the magnetic field lines being tracked by the device. Available in OS X v10.7 and later.

### 59.3.16 Properties

### 59.3.17 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 59.4 class CLLocationCoordinate2DMBS

### 59.4.1 class CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The class for a location coordinate.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.1pr3

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 19.4, page 52: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter
- 19.4, pages 47 to 48: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter
- 18.6, page 74: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 61: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.5, pages 83 to 84: Maps (Part 6), A deep dive into Annotations by Markus Winter
- 18.5, page 81: Maps (Part 6), A deep dive into Annotations by Markus Winter
- 18.3, page 79: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 59.4.2 Methods

### 59.4.3 Constructor(latitude as Double = 0.0, longitude as Double = 0.0)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** Initializes a coordinate with values.

### 59.4.4 Properties

### 59.4.5 latitude as Double

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The latitude.
**Notes:** (Read and Write property)

### 59.4.6 longitude as Double

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: All.

**Function:** The longitude.
**Notes:** (Read and Write property)

## 59.5 class CLLocationManagerMBS

### 59.5.1 class CLLocationManagerMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The CoreLocation base class.
**Example:**

```
dim c as new CLLocationManagerMBS

c.startUpdatingLocation
```

**Notes:** The CLLocationManagerMBS class defines the interface for configuring the delivery of location- and heading-related events to your application. You use an instance of this class to establish the parameters that determine when location and heading events should be delivered. You can also a location manager object to retrieve the most recent location data.

To use a CLLocationManagerMBS object to deliver location events, create an instance, configure the desired accuracy and distance filter values, and call the startUpdatingLocation method. The location service returns an initial location as quickly as possible, returning cached information when available. After delivery of the initial event notification, the CLLocationManagerMBS object may deliver additional events if the minimum threshold distance (as specified by the distanceFilter property) is exceeded or a more accurate location value is determined.

Important: The user has the option of denying an application's access to the location service data. During its initial uses by an application, the Core Location framework prompts the user to confirm that using the location service is acceptable. If the user denies the request, the CLLocationManagerMBS object reports an appropriate error to its delegate during future requests.

See also documentation from Apple for the CLLocationManager class:
https://developer.apple.com/library/mac/#documentation/CoreLocation/Reference/CLLocationManager_Class/CLLocationManager/CLLocationManager.html

See WindowsLocationManagerMBS class for Windows.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr4
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- MBS REALbasic plug-in 9.6

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.2, page 68: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis

### 59.5.2 Methods

### 59.5.3 authorizationStatus as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the application's authorization status for using location services.
**Notes:** The authorization status of a given application is managed by the system and determined by several factors. Applications must be explicitly authorized to use location services by the user and location services must themselves currently be enabled for the system. This authorization takes place automatically when your application first attempts to use location services.

Available on Mac OS X 10.7 or later.

### 59.5.4 CheckEvents

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Checks for new events.
**Notes:** This is a helper app to make CoreLocation geocoder work in web projects.
Should not be called in desktop apps.
But for a web app, use a Timer (not WebTimer) to run it on main loop every few milliseconds (e.g. 500 ms).

### 59.5.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim c as new CLLocationManagerMBS

MsgBox str(c.Handle) // not zero on success
```

### 59.5.6 deferredLocationUpdatesAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Returns true if the device supports deferred location updates, otherwise false.
**Notes:** Requires Mac OS X 10.9.

### 59.5.7 Destructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** The destructor.

### 59.5.8 dismissHeadingCalibrationDisplay

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Dismisses the heading calibration view from the screen immediately.
**Notes:** Core Location uses the heading calibration alert to calibrate the available heading hardware as needed. The display of this view is automatic, assuming your delegate supports displaying the view at all. If the view is displayed, you can use this method to dismiss it after an appropriate amount of time to ensure that your application's user interface is not unduly disrupted.

### 59.5.9 headingAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the location manager is able to generate heading-related events.
**Example:**

```
msgbox "headingAvailable available: "+str(CLLocationManagerMBS.headingAvailable)
```

**Notes:** Returns true if heading data is available or false if it is not.

Heading data may not be available on all iOS-based devices. You should check the value returned by this method before asking the location manager to deliver heading-related events.

Available on Mac OS X 10.7 or later.

### 59.5.10 kCLErrorDomain as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The domain for Core Location errors. This value is used in the NSError class.

### 59.5.11 kCLErrorUserInfoAlternateRegionKey as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A key in the user information dictionary of an kCLErrorRegionMonitoringResponseDelayed error whose value is a CLRegionMBS object that the location services can more effectively monitor.

### 59.5.12 locationServicesAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the CoreLocation framework is available.
**Example:**

```
if CLLocationManagerMBS.locationServicesAvailable then
if CLLocationManagerMBS.locationServicesEnabled then
MsgBox "available and enabled"
else
MsgBox "available and not enabled"
end if
else
MsgBox "Not available"
end if
```

**Notes:** Returns true on Mac OS X 10.6 and false on all other systems.

### 59.5.13 locationServicesEnabled as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether location services are enabled on the device.
**Example:**

```
if CLLocationManagerMBS.locationServicesAvailable then
if CLLocationManagerMBS.locationServicesEnabled then
MsgBox "available and enabled"
```

```
else
MsgBox "available and not enabled"
end if
else
MsgBox "Not available"
end if
```

### 59.5.14 monitoredRegions as CLRegionMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The array of shared regions monitored by all location manager objects.
**Notes:** You cannot add regions to this property directly. Instead, you must register regions by calling the startMonitoringForRegion method. The regions in this property are shared by all instances of the CLLocationManagerMBS class in your application.

The objects in this set may not necessarily be the same objects you specified at registration time. Only the region data itself is maintained by the system. Therefore, the only way to uniquely identify a registered region is using its identifier property.

The location manager persists region data between launches of your application. If your application is terminated and then relaunched, the contents of this property are repopulated with region objects that contain the previously registered data.

Available on Mac OS X 10.7 or later.

### 59.5.15 regionMonitoringAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether region monitoring is supported on the current device.
**Example:**

```
msgbox "regionMonitoringAvailable available: "+str(CLLocationManagerMBS.regionMonitoringAvailable)
```

**Notes:** Available on Mac OS X 10.7 or later.

Returns true if region monitoring is available or false if it is not.

Support for region monitoring may not be available on all devices and models. You should check the value of this property before attempting to set up any regions or initiate region monitoring.

Even if region monitoring support is present on a device, it may still be unavailable because the user disabled it for the current application or for all applications.

### 59.5.16 regionMonitoringEnabled as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether region monitoring is currently enabled.
**Notes:** Returns true if region monitoring is available and is currently enabled or false if it is unavailable or not enabled.

The user can enable or disable location services (including region monitoring) altogether from the System Preferences.

You should check the return value of this method before starting region monitoring updates to determine if the user currently allows location services to be used at all. If this method returns false and you start region monitoring updates anyway, the Core Location framework prompts the user with a confirmation panel asking whether location services should be reenabled.

This method does not check to see if region monitoring capabilities are actually supported by the device. Therefore, you should also check the return value of the regionMonitoringAvailable class method before attempting to start region monitoring services.

Available on Mac OS X 10.7 or later.

### 59.5.17 significantLocationChangeMonitoringAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns true if the device supports significant location change monitoring, otherwise false.
**Example:**

msgbox "significantLocationChangeMonitoringAvailable available: "+str(CLLocationManagerMBS.significantLocationChangeMonitoringAvailable)

**Notes:** Available on Mac OS X 10.7 or later.

This method indicates whether the device is able to report updates based on significant location changes only. (This primarily involves detecting changes in the cell tower currently associated with the device.) This capability provides tremendous power savings for applications that want to track a user's approximate location and do not need highly accurate position information.

### 59.5.18 startMonitoringForRegion(region as CLRegionMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Starts monitoring the specified region.
**Notes:** region: The region object that defines the boundary to monitor. This parameter must not be nil.

You must call this method separately for each region you want to monitor. If an existing region with the same identifier is already being monitored by the application, the old region is replaced by the new one. The regions you add using this method are shared by all location manager objects in your application and stored in the monitoredRegions property.

Region events are delivered to the didEnterRegion and didExitRegion events. If there is an error, the location manager calls the monitoringDidFailForRegion event instead.

### 59.5.19 startMonitoringSignificantLocationChanges

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Starts the generation of updates based on significant location changes.
**Example:**

```
dim c as new CLLocationManagerMBS

c.startMonitoringSignificantLocationChanges
```

**Notes:** This method initiates the delivery of location events asynchronously, returning shortly after you call it. Location events are delivered to your delegate's didUpdateToLocation event. The first event to be delivered is usually the most recently cached location event (if any) but may be a newer event in some circumstances. Obtaining a current location fix may take several additional seconds, so be sure to check the timestamps on the location events in your event code.

After returning a current location fix, the receiver generates update events only when a significant change in the user's location is detected. For example, it might generate a new event when the device becomes associated with a different cell tower. It does not rely on the value in the distanceFilter property to generate events. Calling this method several times in succession does not automatically result in new events being generated. Calling stopMonitoringSignificantLocationChanges in between, however, does cause a new initial

event to be sent the next time you call this method.

In addition to your subclass implementing the didUpdateToLocation event, it should also implement the didFailWithError event to respond to potential errors.

Available in Mac OS X 10.7 or later.

### 59.5.20 startUpdatingHeading

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Starts the generation of updates that report the user's current heading.
**Notes:** This method returns immediately. Calling this method when the receiver is stopped causes it to obtain an initial heading and notify your delegate. After that, the receiver generates update events when the value in the headingFilter property is exceeded.

Before calling this method, you should always check the headingAvailable property to see whether heading information is supported on the current device. If heading information is not supported, calling this method has no effect and does not result in the delivery of events to your delegate.

Calling this method several times in succession does not automatically result in new events being generated. Calling stopUpdatingHeading in between, however, does cause a new initial event to be sent the next time you call this method.

If you start this service and your application is suspended, the system stops the delivery of events until your application starts running again (either in the foreground or background). If your application is terminated, the delivery of new heading events stops altogether and must be restarted by your code when the application is relaunched.

Heading events are delivered to the didUpdateHeading event. If there is an error, the location manager calls the
didFailWithError event instead.

### 59.5.21 startUpdatingLocation

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Starts the generation of updates that report the user's current location.
**Example:**

```
dim c as new CLLocationManagerMBS
```

c.startUpdatingLocation

**Notes:** This method returns immediately. Calling this method when the receiver is stopped causes it to obtain an initial location fix (which may take several seconds) and notify your delegate. After that, the receiver generates update events primarily when the value in the distanceFilter property is exceeded. Updates may be delivered in other situations though. For example, the receiver may send another notification if the hardware gathers a more accurate location reading.

Calling this method several times in succession does not automatically result in new events being generated. Calling stopUpdatingLocation in between, however, does cause a new initial event to be sent the next time you call this method.

### 59.5.22 stopMonitoringForRegion(region as CLRegionMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Stops monitoring the specified region.
**Notes:** region: The region object currently being monitored. This parameter must not be nil.

If the specified region object is not currently being monitored, this method has no effect.

Available on Mac OS X 10.7 or later.

### 59.5.23 stopMonitoringSignificantLocationChanges

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Stops the delivery of location events based on significant location changes.
**Notes:** Use this method to stop the delivery of location events that was started using the startMonitoringSignificantLocationChanges method.
Available on Mac OS X 10.7 or later.

### 59.5.24 stopUpdatingHeading

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Stops the generation of heading updates.
**Notes:** Call this method whenever your code no longer needs to receive heading-related events. Disabling event delivery gives the receiver the option of disabling the appropriate hardware (and thereby saving power)

when no clients need location data. You can always restart the generation of heading updates by calling the startUpdatingHeading method again.

### 59.5.25 stopUpdatingLocation

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Stops the generation of location updates.
**Example:**

```
dim c as new CLLocationManagerMBS

c.startUpdatingLocation
// later
c.stopUpdatingLocation
```

**Notes:** You should call this method whenever your code no longer needs to receive location-related events. Disabling event delivery gives the receiver the option of disabling the appropriate hardware (and thereby saving power) when no clients need location data. You can always restart the generation of location updates by calling the startUpdatingLocation method again.

### 59.5.26 Properties

### 59.5.27 desiredAccuracy as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The desired accuracy of the location data.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyBest
```

**Notes:** The receiver does its best to achieve the requested accuracy; however, the actual accuracy is not guaranteed.

You should assign a value to this property that is appropriate for your usage scenario. In other words, if you need only the current location within a few kilometers, you should not specify kCLLocationAccuracyBest for the accuracy. Determining a location with greater accuracy requires more time and more power.

When requesting high accuracy location data, the initial event delivered by the location service may not have the accuracy you requested. The location service delivers the initial event as quickly as possible. It then continues to determine the location with the accuracy you requested and delivers additional events, as necessary, when that data is available.

The default value of this property is kCLLocationAccuracyBest.
(Read and Write property)

### 59.5.28 distanceFilter as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The minimum distance (measured in meters) a device must move laterally before an update event is generated.
**Example:**

```
dim c as new CLLocationManagerMBS
c.distanceFilter=CLLocationMBS.kCLDistanceFilterNone
```

**Notes:** This distance is measured relative to the previously delivered location. Use the value kCLDistanceFilterNone to be notified of all movements.

The default value of this property is kCLDistanceFilterNone.
(Read and Write property)

### 59.5.29 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The internal reference to the CLLocationManager object.
**Example:**

```
dim c as new CLLocationManagerMBS

MsgBox str(c.Handle) // not zero on success
```

**Notes:** (Read and Write property)

### 59.5.30 location as CLLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The most recently retrieved user location.
**Example:**

```
dim c as new CLLocationMBS(1,2,3,4,5,nil)

MsgBox c.description
```

**Notes:** The value of this property is nil if no location data has ever been retrieved.

It is a good idea to check the timestamp of the location that is returned. If the receiver is currently gathering location data, but the minimum distance filter is large, the returned location might be relatively old. If it is, you can stop the receiver and start it again to force an update.
(Read only property)

### 59.5.31 maximumRegionMonitoringDistance as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The largest boundary distance that can be assigned to a region.
**Notes:** This property defines the largest boundary distance allowed from a region's center point. Attempting to monitor a region with a distance larger than this value causes the location manager to send a kCLErrorRegionMonitoringFailure error to the delegate.

If region monitoring is unavailable or not supported, the value in this property is -1.

Available on Mac OS X 10.7 or later.
(Read only property)

### 59.5.32 purpose as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** An application-provided string that describes the reason for using location services.
**Notes:** If this property is not "" and the system needs to ask for the user's consent to use location services, it displays the provided string. You can use this string to explain why your application is using location services.

You must set the value of this property prior to starting any location services. Because the string is ulti-

mately displayed to the user, you should always load it from a localized strings file.

Available on Mac OS X 10.7 or later.
(Read and Write property)

### 59.5.33 Events

### 59.5.34 didChangeAuthorizationStatus(status as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the authorization status for the application changed.
**Notes:** status: The new authorization status for the application.

This method is called whenever the application's ability to use location services changes. Changes can occur because the user allowed or denied the use of location services for your application or for the system as a whole.

### 59.5.35 didEnterRegion(region as CLRegionMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the user entered the specified region.
**Notes:** region: An object containing information about the region that was entered.

The region object provided may not be the same one that was registered. As a result, you should never perform pointer-level comparisons to determine equality. Instead, use the region's identifier string to determine if your delegate should respond.

### 59.5.36 didExitRegion(region as CLRegionMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that the user left the specified region.
**Notes:** manager: The location manager object reporting the event.
region: An object containing information about the region that was exited.

The region object provided may not be the same one that was registered. As a result, you should never perform pointer-level comparisons to determine equality. Instead, use the region's identifier string to determine if your delegate should respond.

### 59.5.37 didFailWithError(error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells you that the location manager was unable to retrieve a location value.
**Notes:** error: The error object containing the reason why the location could not be retrieved.

If the location service is unable to retrieve a location fix right away, it reports a kCLErrorLocationUnknown error and keeps trying. In such a situation, you can simply ignore the error and wait for a new event.

If the user denies your application's use of the location service, this method reports a kCLErrorDenied error. Upon receiving such an error, you should stop the location service.

### 59.5.38 didFinishDeferredUpdatesWithError(error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Invoked when deferred updates will no longer be delivered.
**Notes:** Stopping location, disallowing deferred updates, and meeting a specified criterion are all possible reasons for finishing deferred updates.

An error will be returned if deferred updates end before the specified criteria are met (see CLError).
Requires Mac OS X 10.9.

### 59.5.39 didStartMonitoringForRegion(region as CLRegionMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Tells you that a new region is being monitored.
**Notes:** region: The region that is being monitored.

### 59.5.40 didUpdate(newLocation as CLLocationMBS, oldLocation as CLLocationMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells you that a new location value is available.
**Notes:** newLocation: The new location data.

oldLocation: The location data from the previous update. If this is the first update event delivered by this location manager, this parameter is nil.

By the time this event is called, the new location data is also available directly from the CLLocationManagerMBS object. The newLocation parameter may contain the data that was cached from a previous usage of the location service. You can use the timestamp property of the location object to determine how recent the location data is.

### 59.5.41 didUpdateHeading(newHeading as CLHeadingMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Tells you that the location manager received updated heading information.
**Notes:** Implementation of this method is optional but expected if you start heading updates using the startUpdatingHeading method.

The location manager object calls this method after you initially start the heading service. Subsequent events are delivered when the previously reported value changes by more than the value specified in the headingFilter property of the location manager object.

### 59.5.42 didUpdateLocations(locations() as CLLocationMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Invoked when new locations are available.
**Notes:** Required for delivery of deferred locations.
If implemented, updates will not be delivered to didUpdate.
Requires Mac OS X 10.9.

### 59.5.43 monitoringDidFailForRegion(region as CLRegionMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the delegate that a region monitoring error occurred.
**Notes:** region: The region for which the error occurred.
error: An error object containing the error code that indicates why region monitoring failed.

If an error occurs while trying to monitor a given region, the location manager sends this message to its delegate. Region monitoring might fail because the region itself cannot be monitored or because there was

a more general failure in configuring the region monitoring service.

Although implementation of this event is optional, it is recommended that you implement it if you use region monitoring in your application.

### 59.5.44 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCLErrorDenied | 1 | One of the error codes reported by the location manager error event. Access to the location service was denied by the user. |
| kCLErrorLocationUnknown | 0 | One of the error codes reported by the location manager error event. The location manager was unable to obtain a location value right now. |

Authorization Status Constants.

| Constant | Value | Description |
|---|---|---|
| kCLAuthorizationStatusAuthorized | 3 | This application is authorized to use location services. |
| kCLAuthorizationStatusDenied | 2 | The user explicitly denied the use of location services for this applica location services are currently disabled in Settings. |
| kCLAuthorizationStatusNotDetermined | 0 | The user has not yet made a choice regarding whether this application location services. |
| kCLAuthorizationStatusRestricted | 1 | This application is not authorized to use location services. The user change this application's status, possibly due to active restrictions s parental controls being in place. |

Device Orientation Constants

| Constant | Value | Description |
|---|---|---|
| kCLDeviceOrientationFaceDown | 6 | The device is held parallel to the ground with the screen facing dow |
| kCLDeviceOrientationFaceUp | 5 | The device is held parallel to the ground with the screen facing upw |
| kCLDeviceOrientationLandscapeLeft | 3 | The device is in landscape mode, with the device held upright and button on the right side. |
| kCLDeviceOrientationLandscapeRight | 4 | The device is in landscape mode, with the device held upright and button on the left side. |
| kCLDeviceOrientationPortrait | 1 | The device is in portrait mode, with the device held upright and button at the bottom. |
| kCLDeviceOrientationPortraitUpsideDown | 2 | The device is in portrait mode but upside down, with the device he and the home button at the top. |
| kCLDeviceOrientationUnknown | 0 | The orientation is currently not known. |

Corelocation Error Codes

| Constant | Value | Description |
|---|---|---|
| kCLErrorGeocodeCanceled | 10 | The geocode request was canceled. |
| kCLErrorGeocodeFoundNoResult | 8 | The geocode request yielded no result. |
| kCLErrorGeocodeFoundPartialResult | 9 | The geocode request yielded a partial result. |
| kCLErrorHeadingFailure | 3 | The heading could not be determined. |
| kCLErrorNetwork | 2 | The network was unavailable or a network error occurred. |
| kCLErrorRegionMonitoringDenied | 4 | Access to the region monitoring service was denied by the user. |
| kCLErrorRegionMonitoringFailure | 5 | A registered region cannot be monitored. |
| kCLErrorRegionMonitoringResponseDelayed | 7 | Core Location will deliver events but they may be delayed. |
| kCLErrorRegionMonitoringSetupDelayed | 6 | Core Location could not initialize the region monitoring feature in |

## 59.6 class CLLocationMBS

### 59.6.1 class CLLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A CLLocationMBS object represents the location data generated by a CLLocationManagerMBS object.
**Example:**

```
dim c as new CLLocationMBS(50,7)

MsgBox c.description

// example output: <+50.00000000, +7.00000000>+/- 0.00m (speed -1.00 mps / course -1.00) @ 2009-08-28 23:59:58 +0200
```

**Notes:** This object incorporates the geographical coordinates and altitude of the device's location along with values indicating the accuracy of the measurements and when those measurements were made. On some devices, this class also reports information about the speed and heading in which the device is moving.

Typically, you use a CLLocationManagerMBS object to create instances of this class based on the last known location of the user's device. You can create instances yourself, however, if you want to cache custom location data or get the distance between two different coordinate points.

This class is designed to be used as is and should not be subclassed.

Requires Mac OS X 10.6
**Blog Entries**

- MBS REALbasic plug-in 9.6

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.2, page 68: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis
- 18.6, page 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.3, pages 80 to 81: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 59.6.2 Methods

### 59.6.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns true if this class is available.

### 59.6.4 Constructor(latitude as Double, longitude as Double)

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes and returns a location object with the specified latitude and longitude.
**Example:**

```
dim c as new CLLocationMBS(50,7)

MsgBox c.description

// example output: <+50.00000000, +7.00000000>+/- 0.00m (speed -1.00 mps / course -1.00) @ 2009-08-28 23:59:58 +0200
```

**Notes:** latitude: The latitude of the coordinate point.
longitude: The longitude of the coordinate point.

Typically, you acquire location objects from the location service, but you can use this method to create new location objects for other uses in your application. When using this method, the other properties of the object are initialized to appropriate values. In particular, the altitude and horizontalAccuracy properties are set to 0, the verticalAccuracy property is set to -1 to indicate that the altitude value is invalid, and the timestamp property is set to the time at which the instance was initialized.

Requires Mac OS X 10.6
See also:

- 59.6.5 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, course as Double, speed as Double, timestamp as date) 10729
- 59.6.6 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, course as double, speed as double, timestamp as dateTime) 10729
- 59.6.7 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, timestamp as date) 10730
- 59.6.8 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, timestamp as dateTime) 10731

### 59.6.5 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, course as Double, speed as Double, timestamp as date)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a location object with the specified coordinate and course information.
**Notes:** latitude and longitude: A coordinate structure containing the latitude and longitude values.
altitude: The altitude value for the location.
horizontalAccuracy: The accuracy of the coordinate value. Specifying a negative number indicates that the coordinate value is invalid.
verticalAccuracy: The accuracy of the altitude value. Specifying a negative number indicates that the altitude value is invalid.
course: The direction of travel for the location.
speed: The current speed associated with this location.
timestamp: The time to associate with the location object. Typically, you would set this to the current time.

Typically, you acquire location objects from the location service, but you can use this method to create new location objects for other uses in your application.

Available on Mac OS X 10.7 or newer.
See also:

- 59.6.4 Constructor(latitude as Double, longitude as Double) 10728
- 59.6.6 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, course as double, speed as double, timestamp as dateTime) 10729
- 59.6.7 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, timestamp as date) 10730
- 59.6.8 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, timestamp as dateTime) 10731

### 59.6.6 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, course as double, speed as double, timestamp as dateTime)

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Initializes a location object with the specified coordinate and course information.
See also:

- 59.6.4 Constructor(latitude as Double, longitude as Double) 10728
- 59.6.5 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, course as Double, speed as Double, timestamp as date) 10729

- 59.6.7 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, timestamp as date) 10730

- 59.6.8 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, timestamp as dateTime) 10731


### 59.6.7 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, timestamp as date)

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes and returns a location object with the specified coordinate information.
**Example:**

```
dim c as new CLLocationMBS(1,2,3,4,5,nil)

MsgBox c.description
```

**Notes:** coordinate: A coordinate structure containing the latitude and longitude values.
altitude: The altitude value for the location.
horizontalAccuracy: The accuracy of the coordinate value. Specifying a negative number indicates that the coordinate value is invalid.
verticalAccuracy: The accuracy of the altitude value. Specifying a negative number indicates that the altitude value is invalid.
timestamp: The time to associate with the location object. Typically, you would set this to the current time.

Typically, you acquire location objects from the location service, but you can use this method to create new location objects for other uses in your application.
See also:


- 59.6.4 Constructor(latitude as Double, longitude as Double) 10728

- 59.6.5 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, course as Double, speed as Double, timestamp as date) 10729

- 59.6.6 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, course as double, speed as double, timestamp as dateTime) 10729

- 59.6.8 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, timestamp as dateTime) 10731

### 59.6.8 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, timestamp as dateTime)

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Initializes and returns a location object with the specified coordinate information.
See also:


- 59.6.4 Constructor(latitude as Double, longitude as Double) 10728
- 59.6.5 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, course as Double, speed as Double, timestamp as date) 10729
- 59.6.6 Constructor(latitude as double, longitude as double, altitude as double, horizontalAccuracy as double, verticalAccuracy as double, course as double, speed as double, timestamp as dateTime) 10729
- 59.6.7 Constructor(latitude as Double, longitude as Double, altitude as Double, horizontalAccuracy as Double, verticalAccuracy as Double, timestamp as date) 10730


### 59.6.9 copy as CLLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.
**Example:**

```
dim c as new CLLocationMBS(5,6)

dim n as CLLocationMBS = c.copy

MsgBox n.description
```

**Notes:** Internally a new CLLocation object is created with a copy of the data.

### 59.6.10 distanceFromLocation(location as CLLocationMBS) as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the distance (in meters) between the two locations.
**Example:**

```
// Nickenich 50¬∞ 24' 48" N, 7¬∞ 19' 47" E
// Andernach 50¬∞ 26' 23" N, 7¬∞ 24' 6" E

dim c1 as new CLLocationMBS(50.439722, 7.40167) // Andernach
```

```
dim c2 as new CLLocationMBS(50.413333, 7.32972) // Nickenich

MsgBox str(c1.distanceFromLocation(c2))+" meter"
```

**Notes:** This method measures the distance between the two locations by tracing a line between them that follows the curvature of the Earth. The resulting arc is a smooth curve and does not take into account specific altitude changes between the two locations.

### 59.6.11 kCLDistanceFilterNone as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** This constant indicates the minimum distance required before an event is generated.
**Notes:** All movements are reported.

### 59.6.12 kCLLocationAccuracyBest as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyBest
```

**Notes:** Use the best possible accuracy.

### 59.6.13 kCLLocationAccuracyBestForNavigation as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Notes:** Available on Mac OS X 10.7 or later.

### 59.6.14 kCLLocationAccuracyHundredMeters as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyHundredMeters
```

**Notes:** Accurate to within one hundred meters.

### 59.6.15 kCLLocationAccuracyKilometer as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyKilometer
```

**Notes:** Accurate to the nearest kilometer.

### 59.6.16 kCLLocationAccuracyNearestTenMeters as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyNearestTenMeters
```

**Notes:** Accurate to within ten meters of the desired target.

### 59.6.17 kCLLocationAccuracyThreeKilometers as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** A constant value you can use to specify the accuracy of a location.
**Example:**

```
dim c as new CLLocationManagerMBS

c.desiredAccuracy=CLLocationMBS.kCLLocationAccuracyThreeKilometers
```

**Notes:** Accurate to the nearest three kilometers.

### 59.6.18 Properties

### 59.6.19 altitude as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The altitude in meters.
**Example:**

```
dim c as new CLLocationMBS(1,2,3,4,5,nil)

MsgBox str(c.altitude)
```

**Notes:** Positive values indicate altitudes above sea level. Negative values indicate altitudes below sea level. (Read only property)

### 59.6.20 course as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The direction in which the device is travelling.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location

if l<>Nil then
MsgBox str(l.course)
end if
```

**Notes:** Course values are measured in degrees starting at due north and continuing clockwise around the

compass. Thus, north is 0 degrees, east is 90 degrees, south is 180 degrees, and so on. Course values may not be available on all devices. A negative value indicates that the direction is invalid.
(Read only property)

### 59.6.21 DateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The time at which this location was determined.
**Notes:** (Read only property)

### 59.6.22 description as string

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the location data in a formatted text string.
**Example:**

```
dim c as new CLLocationMBS(50.439722, 7.40167)

MsgBox C.description
// shows for example:
// <+50.43972200, +7.40167000>+/- 0.00m (speed -1.00 mps / course -1.00) @ 2009-08-29 14:22:39 +0200
```

**Notes:** A string of the form "«latitude», <longitude»+/- <accuracy>m (speed <speed>kph / heading <heading>) @ <date-time>", where <latitude>, <longitude>, <accuracy>, <speed>, and <heading>are formatted floating point numbers and <date-time>is a formatted date string that includes date, time, and time zone information.

The returned string is intended for display purposes only.
(Read only property)

### 59.6.23 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The internal reference to the CLLocation object.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location
```

```
if l<>Nil then
MsgBox str(l.handle)
end if
```

**Notes:** (Read and Write property)

### 59.6.24 horizontalAccuracy as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The radius of uncertainty for the location, measured in meters.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location

if l<>Nil then
MsgBox str(l.horizontalAccuracy)
end if
```

**Notes:** The coordinate's latitude and longitude identify the center of the circle and this value indicates the radius of that circle. A negative value indicates that the coordinate's latitude and longitude are invalid. (Read only property)

### 59.6.25 latitude as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The geographical coordinate information.
**Example:**

```
dim c as new CLLocationMBS(50.413333, 7.32972)

MsgBox str(C.latitude) // shows 50.413333
```

**Notes:** (Read only property)

### 59.6.26 longitude as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The geographical coordinate information.
**Example:**

```
dim c as new CLLocationMBS(50.413333, 7.32972)

MsgBox str(C.longitude) // shows 7.32972
```

**Notes:** (Read only property)

### 59.6.27 speed as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The instantaneous speed of the device in meters per second.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location

if l<>Nil then
MsgBox str(l.speed)
end if
```

**Notes:** This value reflects the instantaneous speed of the device in the direction of its current heading. A negative value indicates an invalid speed. Because the actual speed can change many times between the delivery of subsequent location events, you should use this property for informational purposes only.
(Read only property)

### 59.6.28 timestamp as date

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time at which this location was determined.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location
```

```
if l<>Nil then
MsgBox l.timestamp.SQLDateTime
end if
```

**Notes:** (Read only property)

### 59.6.29 verticalAccuracy as Double

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The accuracy of the altitude value in meters.
**Example:**

```
dim c as CLLocationManagerMBS // your global instance

dim l as CLLocationMBS = c.location

if l<>Nil then
MsgBox str(l.verticalAccuracy)
end if
```

**Notes:** The value in the altitude property could be plus or minus the value indicated by this property. A negative value indicates that the altitude value is invalid.
(Read only property)

## 59.7 class CLPlacemarkMBS

### 59.7.1 class CLPlacemarkMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A CLPlacemark object stores placemark data for a given latitude and longitude.
**Notes:** Placemark data includes information such as the country, state, city, and street address associated with the specified coordinate. It can also include points of interest and geographically related data. Placemark objects are typically generated by a CLGeocoder object, although you can also create them explicitly yourself.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr3

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.2, page 69: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis
- 18.6, page 71: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.3, page 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 18.3, page 78: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 59.7.2 Methods

### 59.7.3 areasOfInterest as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The relevant areas of interest associated with the placemark. (read-only)
**Notes:** Examples of an area of interest are the name of a military base or large national park or an attraction such as Eiffel Tower, Disneyland, or Golden Gate Park.
Available in OS X v10.8 and later.

### 59.7.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns true if this class is available.

### 59.7.5 Constructor(placement as CLPlacemarkMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Initializes and returns a placemark object from another placemark object.
**Notes:** You can use this method to transfer information from one placemark object to another placemark object.
Available in OS X v10.8 and later.

### 59.7.6 copy as CLPlacemarkMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Creates a clone of this object.

### 59.7.7 Properties

### 59.7.8 addressDictionary as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** A dictionary containing the Address Book keys and values for the placemark. (read-only)
**Notes:** The keys in this dictionary are those defined by the Address Book framework and used to access address information for a person. For a list of the strings that can be in this dictionary, see the Address Property constants in ABPerson Reference.

You can format the contents of this dictionary to get a full address string as opposed to building the address yourself.

Available in OS X v10.8 and later.
(Read only property)

### 59.7.9 administrativeArea as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The state or province associated with the placemark. (read-only)
**Notes:** If the placemark location is Apple's headquarters, for example, the value for this property would be the string "CA" or "California".
Available in OS X v10.8 and later.
(Read only property)

### 59.7.10 country as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The name of the country associated with the placemark. (read-only)
**Notes:** If the placemark location is Apple's headquarters, for example, the value for this property would be the string "United States".
Available in OS X v10.8 and later.
(Read only property)

### 59.7.11 description as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The description for debugging.
**Notes:** (Read only property)

### 59.7.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 59.7.13 inlandWater as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The name of the inland water body associated with the placemark. (read-only)
**Notes:** For coordinates that lie over an inland body of water, this property contains the name of that water body—the name of a lake, stream, river, or other waterway.
Available in OS X v10.8 and later.

(Read only property)

### 59.7.14 ISOcountryCode as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The abbreviated country name. (read-only)
**Notes:** This string is the standard abbreviation used to refer to the country. For example, if the placemark location is Apple's headquarters, the value for this property would be the string "US".
Available in OS X v10.8 and later.
(Read only property)

### 59.7.15 locality as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The city associated with the placemark. (read-only)
**Notes:** If the placemark location is Apple's headquarters, for example, the value for this property would be the string "Cupertino".
Available in OS X v10.8 and later.
(Read only property)

### 59.7.16 location as CLLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The location object containing latitude and longitude information. (read-only)
**Notes:** This object is used to initialize the placemark object.
Available in OS X v10.8 and later.
(Read only property)

### 59.7.17 name as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The name of the placemark. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 59.7.18 ocean as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The name of the ocean associated with the placemark. (read-only)
**Notes:** For coordinates that lie over an ocean, this property contains the name of the ocean.
Available in OS X v10.8 and later.
(Read only property)

### 59.7.19 postalAddress as variant

MBS MacFrameworks Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The address as CNPostalAddressMBS object.
**Notes:** (Read only property)

### 59.7.20 postalCode as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The postal code associated with the placemark. (read-only)
**Notes:** If the placemark location is Apple's headquarters, for example, the value for this property would be the string "95014".
Available in OS X v10.8 and later.
(Read only property)

### 59.7.21 region as CLRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The geographic region associated with the placemark. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 59.7.22 subAdministrativeArea as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Additional administrative area information for the placemark. (read-only)
**Notes:** Subadministrative areas typically correspond to counties or other regions that are then organized into a larger administrative area or state. For example, if the placemark location is Apple's headquarters, the value for this property would be the string "Santa Clara", which is the county in California that contains

the city of Cupertino.

Available in OS X v10.8 and later.
(Read only property)

### 59.7.23 subLocality as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Additional city-level information for the placemark. (read-only)
**Notes:** This property contains additional information, such as the name of the neighborhood or landmark associated with the placemark. It might also refer to a common name that is associated with the location.
Available in OS X v10.8 and later.
(Read only property)

### 59.7.24 subThoroughfare as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Additional street-level information for the placemark. (read-only)
**Notes:** Subthroughfares provide information such as the street number for the location. For example, if the placemark location is Apple's headquarters (1 Infinite Loop), the value for this property would be the string "1".

Available in OS X v10.8 and later.
(Read only property)

### 59.7.25 thoroughfare as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The street address associated with the placemark. (read-only)
**Notes:** The street address contains the street name. For example, if the placemark location is Apple's headquarters, the value for this property would be the string "Infinite Loop".

Available in OS X v10.8 and later.
(Read only property)

## 59.8 class CLRegionMBS

### 59.8.1 class CLRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The CLRegion class defines a geographical area that can be tracked.
**Example:**

```
dim c as new CLRegionMBS(50.413333, 7.329722, 3000, "Nickenich")

msgbox c.identifier+" "+str(c.latitude)+"/"+str(c.longitude)+", "+str(c.radius)+"m"
```

**Notes:** When an instance of this class is registered with a CLLocationManagerMBS object, the location manager generates an appropriate event whenever the user crosses the boundaries of the defined area.

To use this class, create an instance of it and use the startMonitoringForRegion method of a CLLocationManager object to begin monitoring it.

Please also check the documentation from Apple for the CLRegion class.
Available on Mac OS X 10.7 or later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr11
- Lion arrived

### 59.8.2 Methods

### 59.8.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns true if this class is available.

### 59.8.4 Constructor(latitude as Double, longitude as Double, radius as Double, identifier as string)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Initializes a region object defining a circular area.
**Notes:** latitude and longitude: The center point of the region.
radius: The distance (measured in meters) from the center point that marks the boundary of the region.

identifier: A unique identifier to associate with the region object. You use this identifier to differentiate regions within your application. This value must not be "".

identifier is a description for the region that could be displayed to the user, and ideally should be chosen by the user.

On success the handle property is not zero.

### 59.8.5 containsCoordinate(latitude as Double, longitude as Double) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value indicating whether the region contains the specified coordinate.
**Notes:** latitude and longitude: The coordinate to test against the region.

Returns true if the coordinate lies within the region's boundaries or false if it does not.

### 59.8.6 copy as CLRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the region object.

### 59.8.7 identifier as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The identifier for the region object.
**Example:**

```
dim c as new CLRegionMBS(50.413333, 7.329722, 3000, "Nickenich")
msgbox c.identifier
```

### 59.8.8 latitude as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The position of the center of the region.

### 59.8.9 longitude as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The position of the center of the region.

### 59.8.10 radius as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The radius (measured in meters) that defines the region's outer boundary.

### 59.8.11 Properties

### 59.8.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal CLRegion object reference.
**Notes:** (Read and Write property)

# Chapter 60

# CoreML

## 60.1 class MLArrayBatchProviderMBS

### 60.1.1 class MLArrayBatchProviderMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A convenience wrapper for batches of feature providers.
**Notes:** This batch provider supports an array of feature providers or a dictionary of arrays of feature values.
Available on MacOS 10.14 or newer.
Subclass of the MLBatchProviderMBS class.
**Blog Entries**

- Update Machine Learning Model on Device
- MBS Xojo Plugins, version 19.6pr3

### 60.1.2 Methods

### 60.1.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.14 or newer.

### 60.1.4 Constructor(value as Dictionary, byref Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a batch provider based on feature names and their associated arrays of data.
**Notes:** dictionary: A dictionary which maps feature names to an array of values. The error case occurs when all the arrays do not have the same length or the values in an aray are not expressible as an MLFeatureValueMBS.
See also:


- 60.1.5 Constructor(values() as MLFeatureProviderMBS) 10750


### 60.1.5 Constructor(values() as MLFeatureProviderMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates the batch provider based on the array of feature providers.
**Notes:** array: The array of feature providers for the batch.
See also:


- 60.1.4 Constructor(value as Dictionary, byref Error as NSErrorMBS) 10749


### 60.1.6 values as MLFeatureProviderMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The array of feature providers.

## 60.2 class MLBatchProviderMBS

### 60.2.1 class MLBatchProviderMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** An interface that represents a collection of feature providers.
**Notes:** Similar to the MLFeatureProviderMBS, this interface allows you to define your own batch provider. If you collect your data asynchronously or it is memory intensive, implement this protocol on your data structure to optimize performance with batch processing.

Available on MacOS 10.14 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.2.2 Methods

### 60.2.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.2.4 featuresAtIndex(index as Integer) as MLFeatureProviderMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Returns the feature provider at the given index.

### 60.2.5 Properties

### 60.2.6 Count as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The number of feature providers in this batch.
**Notes:** (Read only property)

### 60.2.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 60.3 class MLDictionaryConstraintMBS

### 60.3.1 class MLDictionaryConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint describing expected NSDictionary properties.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.3.2 Methods

### 60.3.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.13 or newer.

### 60.3.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.3.5 Properties

### 60.3.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.3.7 keyType as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Required key type.
**Notes:** See MLFeatureValueMBS.Type* constants.

(Read only property)

## 60.4 class MLDictionaryFeatureProviderMBS

### 60.4.1 class MLDictionaryFeatureProviderMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** A concrete convenience class conforming to MLFeatureProvider protocol.
**Notes:** Subclass of the MLFeatureProviderMBS class.
**Blog Entries**

- Update Machine Learning Model on Device

### 60.4.2 Methods

### 60.4.3 Constructor(content as Dictionary, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create from a generic dictionary by converting all values to MLFeatureValues or from a dictionary with values already stored as MLFeatureValues.
**Notes:** An error results if the values are not or cannot be represented as MLFeatureValues.

### 60.4.4 objectForKeyedSubscript(script as string) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Get the value for specified feature.

### 60.4.5 Properties

### 60.4.6 Content as Dictionary

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Dictionary holding the feature values.
**Notes:** When you query this, you get a copy of the dictionary, so any modification doesn't go back to the feature provider.
(Read only property)

## 60.5 class MLFeatureDescriptionMBS

### 60.5.1 class MLFeatureDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Description of a feature.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.5.2 Methods

### 60.5.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.5.4 copy as MLFeatureDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a copy.

### 60.5.5 isAllowedValue(value as MLFeatureValueMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Check if MLFeatureValue is valid based on this description.

### 60.5.6 Properties

### 60.5.7 dictionaryConstraint as MLDictionaryConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint for dictionary.
**Notes:** Only set when type is dictionary.
(Read only property)

### 60.5.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.5.9 imageConstraint as MLImageConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint for image.
**Notes:** Only set when type is image.
(Read only property)

### 60.5.10 isOptional as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Whether this feature can take an undefined value or not.
**Notes:** (Read only property)

### 60.5.11 multiArrayConstraint as MLMultiArrayConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint for multi array.
**Notes:** Only set when type is array.
(Read only property)

### 60.5.12 Name as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Name of feature.
**Notes:** (Read only property)

### 60.5.13 sequenceConstraint as MLSequenceConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constraints for a sequence feature.
**Notes:** (Read only property)

### 60.5.14 Type as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Type of data.
**Notes:** (Read only property)

### 60.5.15 Constants

Value Types

| Constant | Value | Description |
|---|---|---|
| TypeDictionary | 6 | Numerically weighted hashable objects (e.g. word counts) |
| TypeDouble | 2 | Continuous values |
| TypeImage | 4 | CVPixelBufferRef or converted by plugin to Xojo picture. |
| TypeInt64 | 1 | Discrete values, sometimes used to hold numeric encoding of a categorical value |
| TypeInvalid | 0 | Undefined type. |
| TypeMultiArray | 5 | An array of values. |
| TypeSequence | 7 | The possible types for feature values, input features, and output features. |
| TypeString | 3 | Text or categorical strings |

## 60.6 class MLFeatureProviderMBS

### 60.6.1 class MLFeatureProviderMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Protocol for accessing a feature value for a feature name.
**Notes:** In Xojo defined as class, but in objective-c just a protocol.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.6.2 Methods

### 60.6.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.6.4 featureNames as String()

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries list of all feature names available.

### 60.6.5 featureValueForName(featureName as String) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries value for feature by name.
**Notes:** Returns nil if the provided featureName is not in the set of featureNames

### 60.6.6 Properties

### 60.6.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 60.7 class MLFeatureValueMBS

### 60.7.1 class MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** An immutable variant holding a data value of a supported MLFeatureType.
**Notes:** MLFeatureValue does not support type conversion in its accessor properties.
It can also have a missing or undefined value of a well defined type.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr2
- Update Machine Learning Model on Device

### 60.7.2 Methods

### 60.7.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.7.4 copy as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates a copy.

### 60.7.5 featureValueWithCGImage(image as variant, orientation as integer = -1, constraint as MLImageConstraintMBS, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps an image as a value for a feature, given an image,Äôs URL and constraints.
**Notes:** Available on macOS 10.15 or newer.
If orientation is in range 1 to 8, we pass that as orientation. Otherwise orientation will come from EXIF
See also:

- 60.7.6 featureValueWithCGImage(image as variant, orientation as integer = -1, pixelsWide as Integer, pixelsHigh as Integer, pixelFormatType as String, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS

### 60.7.6 featureValueWithCGImage(image as variant, orientation as integer = -1, pixelsWide as Integer, pixelsHigh as Integer, pixelFormatType as String, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps an image as a value for a feature, given an image, its width, and its height, in pixels.
**Notes:** Available on macOS 10.15 or newer.
If orientation is in range 1 to 8, we pass that as orientation. Otherwise orientation will come from EXIF
See also:

- 60.7.5 featureValueWithCGImage(image as variant, orientation as integer = -1, constraint as MLImageConstraintMBS, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS 10760

### 60.7.7 featureValueWithDictionary(value as Dictionary, byref error as NSErrorMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Creates new feature based on a dictionary.
**Notes:** Copies the dictionary.
For encoding a sparse feature set or for encoding probabilities. Input keys that are not number or string are rejected on construction and return a MLModelErrorFeatureTypeMismatch error. Further validation for consistency occurs on evaluation.

### 60.7.8 featureValueWithDouble(value as double) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns feature object for given value.

### 60.7.9 featureValueWithImageFile(File as FolderItem, orientation as integer = -1, constraint as MLImageConstraintMBS, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps an image as a value for a feature, given an image and its constraints.
**Notes:** Available on macOS 10.15 or newer.
If orientation is in range 1 to 8, we pass that as orientation. Otherwise orientation will come from EXIF
See also:

- 60.7.10 featureValueWithImageFile(File as FolderItem, orientation as integer = -1, pixelsWide as Integer, pixelsHigh as Integer, pixelFormatType as String, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS 10762

### 60.7.10 featureValueWithImageFile(File as FolderItem, orientation as integer = -1, pixelsWide as Integer, pixelsHigh as Integer, pixelFormatType as String, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps an image as a value for a feature, given an image,Äôs URL, and its width and height, in pixels.
**Notes:** Available on macOS 10.15 or newer.
If orientation is in range 1 to 8, we pass that as orientation. Otherwise orientation will come from EXIF
See also:

- 60.7.9 featureValueWithImageFile(File as FolderItem, orientation as integer = -1, constraint as MLImageConstraintMBS, options as Dictionary = nil, byref error as NSErrorMBS) as MLFeatureValueMBS 10761

### 60.7.11 featureValueWithInt64(value as Int64) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns feature object for given value.

### 60.7.12 featureValueWithMultiArray(value as MLMultiArrayMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns feature object for given value.

### 60.7.13 featureValueWithPicture(value as Picture) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns feature object for given value.

### 60.7.14 featureValueWithPixelBuffer(Handle as Integer) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps a pixel buffer as a value for a feature.

### 60.7.15 featureValueWithSequence(sequence as MLSequenceMBS) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Wraps a sequence as a value for a feature.

### 60.7.16 featureValueWithString(value as string) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Returns feature object for given value.

### 60.7.17 isEqualToFeatureValue(value as MLFeatureValueMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries whether two feature objects are the same.

### 60.7.18 MLFeatureValueImageOptionCropAndScale as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The option you use to crop and scale an image when creating an image feature value.

### 60.7.19 MLFeatureValueImageOptionCropRect as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The option you use to crop an image when creating an image feature value.

### 60.7.20 undefinedFeatureValueWithType(type as Integer) as MLFeatureValueMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Represent an undefined value of a specified type.

### 60.7.21 Properties

### 60.7.22 CIImageValue as Variant

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries image as CIImageMBS object.
**Notes:** (Read only property)

### 60.7.23 dictionaryValue as Dictionary

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeDictionary.
**Notes:** When you query the dictionary, you get a copy.
(Read only property)

### 60.7.24 doubleValue as Double

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeDouble.
**Notes:** (Read only property)

### 60.7.25 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.7.26 imageBufferValue as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The image, or pixelBuffer, wrapped in this feature value.
**Notes:** The handle for a CVPixelBufferMBS object.
(Read only property)

### 60.7.27 int64Value as Int64

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeInt64.
**Notes:** (Read only property)

### 60.7.28 multiArrayValue as MLMultiArrayMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeMultiArray.
**Notes:** (Read only property)

### 60.7.29 PictureHeight as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The picture height.
**Notes:** Populated value if the type is TypeImage.
(Read only property)

### 60.7.30 PictureValue as Picture

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeImage.
**Notes:** (Read only property)

### 60.7.31 PictureWidth as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The picture width.
**Notes:** Populated value if the type is TypeImage.
(Read only property)

### 60.7.32 sequenceValue as MLSequenceMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The sequence wrapped in this feature value.
**Notes:** (Read only property)

### 60.7.33 stringValue as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Populated value if the type is TypeString.
**Notes:** (Read only property)

### 60.7.34 Type as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Type of the value for which the corresponding property below is held.
**Notes:** (Read only property)

### 60.7.35 Undefined as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** True if the value represents a missing or undefined value.
**Notes:** (Read only property)

### 60.7.36 value as Variant

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Queries value as variant.
**Notes:** (Read only property)

### 60.7.37 Constants

Value Types

| Constant | Value | Description |
|---|---|---|
| TypeDictionary | 6 | Numerically weighted hashable objects (e.g. word counts) |
| TypeDouble | 2 | Continuous values |
| TypeImage | 4 | CVPixelBufferRef or converted by plugin to Xojo picture. |
| TypeInt64 | 1 | Discrete values, sometimes used to hold numeric encoding of a categorical value |
| TypeInvalid | 0 | Undefined type. |
| TypeMultiArray | 5 | An array of values. |
| TypeSequence | 7 | The possible types for feature values, input features, and output features. |
| TypeString | 3 | Text or categorical strings |

## 60.8 class MLImageConstraintMBS

### 60.8.1 class MLImageConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint on image properties.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.8.2 Methods

### 60.8.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.8.4 Properties

### 60.8.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.8.6 pixelFormatType as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The accepted kCVPixelFormatType for the image.
**Notes:** (Read only property)

### 60.8.7 pixelsHigh as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The required height of the image.
**Notes:** (Read only property)

### 60.8.8 pixelsWide as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The required width of the image.
**Notes:** (Read only property)

### 60.8.9 sizeConstraint as MLImageSizeConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Additional sizes this image feature supports.
**Notes:** Available on MacOS 10.14 or newer.
(Read only property)

## 60.9 class MLImageSizeConstraintMBS

### 60.9.1 class MLImageSizeConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A list or range of sizes that augment an image constraint's default size.
**Notes:** You use an MLImageSizeConstraint to express what image sizes of an image feature a model will accept as input or produce as output.

Use type to determine which properties describe what image sizes the model's image feature expects as input or produces as output.

If type is:

- TypeRange, the image feature accepts any image that has a width in pixelsWideRange and a height in pixelsHighRange.
- TypeEnumerated, the image feature accepts any image size listed in enumeratedImageSizes.
- TypeUnspecified, the MLImageSizeConstraint instance is not configured and should be ignored. Instead, use the image feature's default image size constraint, defined by pixelsWide and pixelsHigh.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.9.2 Methods

### 60.9.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.14 or newer.

### 60.9.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.9.5 enumeratedImageSizes as MLImageSizeMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** An array of image sizes a model's image feature accepts as input or produces as output.

### 60.9.6 Properties

### 60.9.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.9.8 pixelsHighRange as NSRangeMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The range of heights a model's image feature accepts as input or produces as output.
**Notes:** (Read only property)

### 60.9.9 pixelsWideRange as NSRangeMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The range of widths a model's image feature accepts as input or produces as output.
**Notes:** (Read only property)

### 60.9.10 type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Indicator of which properties to inspect for this image size constraint.
**Notes:** (Read only property)

### 60.9.11 Constants

Types

| Constant | Value | Description |
|---|---|---|
| TypeEnumerated | 2 | The image feature accepts image sizes listed in an array. |
| TypeRange | 3 | The image feature accepts image sizes defined by a range of widths and a range of heights. |
| TypeUnspecified | 0 | The image size constraint is not configured and should be ignored. |

## 60.10 class MLImageSizeMBS

### 60.10.1 class MLImageSizeMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The width and height of an image feature size.
**Notes:** Available on MacOS 10.14 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.10.2 Methods

### 60.10.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.14 or newer.

### 60.10.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.10.5 Properties

### 60.10.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.10.7 pixelsHigh as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The height of an image feature in pixels.
**Notes:** (Read only property)

### 60.10.8 pixelsWide as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The width of an image feature in pixels.
**Notes:** (Read only property)

## 60.11 class MLKeyMBS

### 60.11.1 class MLKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** An abstract base class for machine learning key types.
**Notes:** You don,Äôt create use this class directly. Instead, use a class that inherits from this one, such as MLParameterKey or MLMetricKey.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.11.2 Methods

### 60.11.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

### 60.11.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.11.5 copy as MLKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Copies the object.

### 60.11.6 Properties

### 60.11.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.11.8 Name as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The name of the machine learning key.
**Notes:** (Read only property)

### 60.11.9 Scope as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The scope value.
**Notes:** (Read only property)

## 60.12 class MLMetricKeyMBS

### 60.12.1 class MLMetricKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A key for the metrics dictionary in an update context.
**Notes:** Available in MacOS 10.15 or newer.
Subclass of the MLKeyMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.12.2 Methods

### 60.12.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.12.4 Properties

### 60.12.5 epochIndex as MLMetricKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the epoch index (an Int64 value).
**Notes:** Use this key to fetch the epoch index value in the metrics dictionary.
(Read only property)

### 60.12.6 lossValue as MLMetricKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the current loss (a float value).
**Notes:** Use this key to fetch the loss value in the metrics dictionary.
(Read only property)

### 60.12.7 miniBatchIndex as MLMetricKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the mini-batch index (an Int64 value) within an epoch.
**Notes:** Use this key to fetch the mini-batch index value in the metrics dictionary.
(Read only property)

## 60.13 class MLModelConfigurationMBS

### 60.13.1 class MLModelConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The settings for creating or updating a machine learning model.
**Notes:** Available in MacOS 10.14 or newer.
**Blog Entries**

- Update Machine Learning Model on Device
- MBS Xojo Plugins, version 19.6pr3

### 60.13.2 Methods

### 60.13.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.14 or newer.

### 60.13.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constructor.

### 60.13.5 copy as MLModelConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a copy of the model configuration.

### 60.13.6 Properties

### 60.13.7 allowLowPrecisionAccumulationOnGPU as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether to allow low-precision accumulation on a GPU.
**Notes:** (Read and Write property)

### 60.13.8 computeUnits as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The processing unit or units the model uses to make predictions.
**Notes:** (Read and Write property)

### 60.13.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.13.10 parameters as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Optional dictionary with any requested changes to model or update parameters.
**Notes:** (Read and Write property)

### 60.13.11 preferredMetalDevice as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The metal device you prefer this model use to make predictions (inference) and update the model.
**Notes:** If preferredMetalDevice is 0, the default value, Core ML chooses a metal device for you.
Until we have a class for MLDevice, you pass the handle here directly.
(Read and Write property)

### 60.13.12 Constants

Compute Units

| Constant | Value | Description |
|---|---|---|
| ComputeUnitsAll | 2 | The option you choose to allow the model to use all compute units available, including the neural engine. |
| ComputeUnitsCPUAndGPU | 1 | The option you choose to allow the model to use both the CPU and GPU, but not the neural engine. |
| ComputeUnitsCPUOnly | 0 | The option you choose to limit the model to only use the CPU. |

## 60.14 class MLModelDescriptionMBS

### 60.14.1 class MLModelDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** A description of a model containing input and output feature descriptions, optionally outputted features with special meaning and metadata.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.14.2 Methods

### 60.14.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.14.4 Properties

### 60.14.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.14.6 inputDescriptionsByName as Dictionary

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Description of the inputs to the model.
**Notes:** (Read only property)

### 60.14.7 isUpdatable as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether you can update the model with additional training.
**Notes:** Available on Mac OS 10.15 or newer.
(Read only property)

### 60.14.8 metadata as Dictionary

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Optional metadata describing the model.
**Notes:** (Read only property)

### 60.14.9 outputDescriptionsByName as Dictionary

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Description of the outputs from the model.
**Notes:** (Read only property)

### 60.14.10 parameterDescriptionsByKey as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Allows for access of each parameter as parameter description.
**Notes:** (Read only property)

### 60.14.11 predictedFeatureName as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Name of the primary target / predicted output feature in the output descriptions.
**Notes:** (Read only property)

### 60.14.12 predictedProbabilitiesName as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Key for all predicted probabilities stored as a MLFeatureTypeDictionary in the output descriptions.
**Notes:** (Read only property)

### 60.14.13 trainingInputDescriptionsByName as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Provides access to each training input as a feature description, given the name of the input.
**Notes:** Available on MacOS 101.5 or newer.
(Read only property)

## 60.15 class MLModelMBS

### 60.15.1 class MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a model and evaluate on a specific set of input features.
**Notes:** Inputs and outputs are accessed via the MLFeatureProvider protocol.
Returns a model or nil if there is an error.

Available on macOS 10.13 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Update Machine Learning Model on Device

### 60.15.2 Methods

### 60.15.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Whether CoreML is available.
**Notes:** Should return true on macOS 10.13 or newer.

### 60.15.4 compileModelAtURL(URL as string, byref error as NSErrorMBS) as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Compile a .mlmodel for this device.
**Notes:** URL: URL file path to .mlmodel file you wish to compile
error: Any errors are surfaced here

Returns a URL to the compiled .mlmodelc bundle if successful.
The model is compiled to a temporary location on disk.
You must move the compiled model to a permenant location if you wish to keep it.

### 60.15.5 compileModelFile(File as folderItem, byref error as NSErrorMBS) as folderItem

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Compile a .mlmodel for this device.
**Example:**

```
dim SourceFile as FolderItem = SpecialFolder.Desktop.child("resnet50.MLmodel")
dim Error as NSErrorMBS

dim Tempfile as FolderItem = MLModelMBS.compileModelFile(SourceFile, Error)

if Tempfile <>nil then
tempfile.MoveFileTo SpecialFolder.Desktop
MsgBox "OK"
else
MsgBox Error.localizedDescription
end if
```

**Notes:** File: FolderItem for .mlmodel file you wish to compile
error: Any errors are surfaced here

Returns a folderitem to the compiled .mlmodelc bundle if successful.
The model is compiled to a temporary location on disk.
You must move the compiled model to a permenant location if you wish to keep it.

### 60.15.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.15.7 MLModelAuthorKey as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys for the metadata dictionary.
**Notes:** The author of this model.

### 60.15.8 MLModelCreatorDefinedKey as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys for the metadata dictionary.
**Notes:** Any additional pertinent information specified by the model creator.

### 60.15.9 MLModelDescriptionKey as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys for the metadata dictionary.
**Notes:** A short description of what the model does and/or its purpose

### 60.15.10 MLModelErrorDomain as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The error domain string for the CoreML errors.

### 60.15.11 MLModelLicenseKey as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys for the metadata dictionary.
**Notes:** License information for the model.

### 60.15.12 MLModelVersionStringKey as String

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** One of the keys for the metadata dictionary.
**Notes:** A version number encoded as a string.

### 60.15.13 modelWithContentsOfFile(file as FolderItem, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a model given the location of its on-disk representation.
**Notes:** Returns nil on error.
See also:

- 60.15.14 modelWithContentsOfFile(file as FolderItem, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS 10788

### 60.15.14 modelWithContentsOfFile(file as FolderItem, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a Core ML model object from a compiled model file and a custom configuration.
**Notes:** File: The path to a compiled model file (ModelName.mlmodelc), typically with the URL returned from compileModelAtURL:error:.
configuration: The model settings for a new model object.

However, if the wrapper class doesn't meet your app's needs or you need to customize the model's configuration, then use this initializer to create a model object from any compiled model file your app has access to. Typically, you use this initializer after your app has downloaded and compiled a model, which is one technique for saving space in your app.
See also:

- 60.15.13 modelWithContentsOfFile(file as FolderItem, byref error as NSErrorMBS) as MLModelMBS 10787

### 60.15.15 modelWithContentsOfPath(Path as string, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a model given the location of its on-disk representation.
**Notes:** Returns nil on error.
See also:

- 60.15.16 modelWithContentsOfPath(Path as string, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS 10788

### 60.15.16 modelWithContentsOfPath(Path as string, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a Core ML model object from a compiled model file and a custom configuration.
**Notes:** Path: The path to a compiled model file (ModelName.mlmodelc), typically with the URL returned

from compileModelAtURL:error:.
configuration: The model settings for a new model object.

However, if the wrapper class doesn't meet your app's needs or you need to customize the model's configuration, then use this initializer to create a model object from any compiled model file your app has access to. Typically, you use this initializer after your app has downloaded and compiled a model, which is one technique for saving space in your app.
See also:

- 60.15.15 modelWithContentsOfPath(Path as string, byref error as NSErrorMBS) as MLModelMBS 10788

### 60.15.17 modelWithContentsOfURL(URL as string, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Construct a model given the location of its on-disk representation.
**Notes:** Returns nil on error.
See also:

- 60.15.18 modelWithContentsOfURL(URL as string, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS 10789

### 60.15.18 modelWithContentsOfURL(URL as string, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a Core ML model object from a compiled model file and a custom configuration.
**Notes:** URL: The path to a compiled model file (ModelName.mlmodelc), typically with the URL returned from compileModelAtURL:error:.
configuration: The model settings for a new model object.

However, if the wrapper class doesn't meet your app's needs or you need to customize the model's configuration, then use this initializer to create a model object from any compiled model file your app has access to. Typically, you use this initializer after your app has downloaded and compiled a model, which is one technique for saving space in your app.
See also:

- 60.15.17 modelWithContentsOfURL(URL as string, byref error as NSErrorMBS) as MLModelMBS 10789

### 60.15.19 parameterValueForKey(key as MLParameterKeyMBS, byref error as NSErrorMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Provides value for the given parameter.
**Notes:** Returns nil on error.
Available on MacOS 10.15 or newer.

### 60.15.20 predictionFromFeatures(input as MLFeatureProviderMBS, options as MLPredictionOptionsMBS = nil, byref error as NSErrorMBS) as MLFeatureProviderMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** All models can predict on a specific set of input features.

### 60.15.21 predictionFromFeaturesMT(input as MLFeatureProviderMBS, options as MLPredictionOptionsMBS = nil, byref error as NSErrorMBS) as MLFeatureProviderMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** All models can predict on a specific set of input features.
**Notes:** The work is performed on an extra thread, so this function can yield time to other Xojo threads. And it calles the Working event regularly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 60.15.22 predictionsFromBatch(inputBatch as MLBatchProviderMBS, byref error as NSErrorMBS) as MLBatchProviderMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Predicts output feature values from the given a batch of input feature values.
**Notes:** inputBatch: The batch of feature values the model needs to make its predictions.

Returns a batch provider that represents the model,Äôs predictions for the batch of inputs.
See also:

- 60.15.23 predictionsFromBatch(inputBatch as MLBatchProviderMBS, options as MLPredictionOptionsMBS, byref error as NSErrorMBS) as MLBatchProviderMBS 10791

### 60.15.23 predictionsFromBatch(inputBatch as MLBatchProviderMBS, options as MLPredictionOptionsMBS, byref error as NSErrorMBS) as MLBatchProviderMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Predicts output feature values from the given a batch of input feature values and prediction options.
**Notes:** inputBatch: The batch of feature values the model needs to make its predictions.
options: All the options to be applied to the prediction.

Returns a batch provider that represents the model,Äôs predictions for the batch of inputs.
See also:

- 60.15.22 predictionsFromBatch(inputBatch as MLBatchProviderMBS, byref error as NSErrorMBS) as MLBatchProviderMBS 10790

### 60.15.24 Properties

### 60.15.25 configuration as MLModelConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The configuration of the model set during initialization.
**Notes:** (Read only property)

### 60.15.26 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.15.27 modelDescription as MLModelDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** A model holds a description of its required inputs and expected outputs.
**Notes:** (Read only property)

### 60.15.28 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| ErrorCustomLayer | 4 | An error related to a custom layer in your model. |
| ErrorCustomModel | 5 | An error related to your custom model. |
| ErrorDescriptionMismatch | 2 | Mismatch error. |
| ErrorFeatureType | 1 | Type error. |
| ErrorGeneric | 0 | Generic error. |
| ErrorIO | 3 | I/O file error. |
| ErrorParameters | 7 | An error related to missing or invalid model parameters. |
| ErrorUpdate | 6 | An error related to updating a model. |

## 60.16 class MLMultiArrayConstraintMBS

### 60.16.1 class MLMultiArrayConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Constraint describing expected MLMultiArray properties.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 60.16.2 Methods

### 60.16.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.16.4 shape as Integer()

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Required shape of array.
**Notes:** One value for each dimension.

### 60.16.5 Properties

### 60.16.6 dataType as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Required dataType.
**Notes:** (Read only property)

### 60.16.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.16.8 shape0 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(0) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.16.9 shape1 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(1) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.16.10 shape2 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(2) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.16.11 shapeConstraint as MLMultiArrayShapeConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constraint on the shape of the multiarray.
**Notes:** (Read only property)

## 60.17 class MLMultiArrayMBS

### 60.17.1 class MLMultiArrayMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The class for a Multidimensional Array.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr4

### 60.17.2 Methods

### 60.17.3 Constructor(dataPointer as Ptr, shape() as Integer, dataType as Integer, strides() as Integer, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create by wrapping existing data.
**Notes:** Please make sure that memory is not deallocated too early, e.g. by subclassing and freeing it in destructor.
See also:

- 60.17.4 Constructor(shape() as Integer, dataType as Integer, byref error as NSErrorMBS) 10795

### 60.17.4 Constructor(shape() as Integer, dataType as Integer, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Create by C-style contiguous array by allocating and managing the necessary memory.
See also:

- 60.17.3 Constructor(dataPointer as Ptr, shape() as Integer, dataType as Integer, strides() as Integer, byref error as NSErrorMBS) 10795

### 60.17.5 shape as Integer()

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** An array containing the sizes of each dimension in the multiarray.

### 60.17.6 strides as Integer()

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** An array containing the stride in memory for each dimension.
**Notes:** The element referred to by a multidimensional index is located at an offset equal to sum_d index [ d ] *strides [ d ] . This offset is in the units of the specified dataType.

### 60.17.7 Properties

### 60.17.8 count as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Count of total number of elements.
**Notes:** (Read only property)

### 60.17.9 dataPointer as Ptr

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Unsafe pointer to underlying buffer holding the data.
**Notes:** (Read only property)

### 60.17.10 dataType as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Type of element held.
**Notes:** See DataType* constants.
(Read only property)

### 60.17.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.17.12 shape0 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(0) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.13 shape1 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(1) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.14 shape2 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The shape(2) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.15 strides0 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The strides(0) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.16 strides1 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The strides(1) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.17 strides2 as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The strides(2) value.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 60.17.18 doubleValue(index as Integer) as Double

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for single dimensional array.
**Notes:** Pass the index for the value to query.
(Read and Write computed property)
See also:

- 60.17.19 doubleValue(indexes() as Integer) as Double 10798

### 60.17.19 doubleValue(indexes() as Integer) as Double

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for multi dimensional array.
**Notes:** Pass one index value for each dimension in the array.
(Read and Write computed property)
See also:

- 60.17.18 doubleValue(index as Integer) as Double 10798

### 60.17.20 integerValue(index as Integer) as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for single dimensional array.
**Notes:** Pass the index for the value to query.
(Read and Write computed property)
See also:

- 60.17.21 integerValue(indexes() as Integer) as Integer 10798

### 60.17.21 integerValue(indexes() as Integer) as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for multi dimensional array.
**Notes:** Pass one index value for each dimension in the array.
(Read and Write computed property)
See also:

- 60.17.20 integerValue(index as Integer) as Integer 10798

### 60.17.22 singleValue(index as Integer) as Single

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for single dimensional array.
**Notes:** Pass the index for the value to query.
(Read and Write computed property)
See also:

- 60.17.23 singleValue(indexes() as Integer) as Single 10799

### 60.17.23 singleValue(indexes() as Integer) as Single

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Query or set value for multi dimensional array.
**Notes:** Pass one index value for each dimension in the array.
(Read and Write computed property)
See also:

- 60.17.22 singleValue(index as Integer) as Single 10799

### 60.17.24 Constants

Data Types

| Constant | Value | Description |
|---|---|---|
| DataTypeDouble | &h10040 | Data is double values. |
| DataTypeFloat16 | &h10010 | Data is Float16 values.<br>Sadly Xojo doesn't have a native Float16 data type. |
| DataTypeFloat32 | &h10020 | Data is single values (32-bit). |
| DataTypeFloat64 | &h10040 | Data is Float64 values.<br>Use double in Xojo. |
| DataTypeInt32 | &h20020 | Data is 32-bit integer values. |

## 60.18 class MLMultiArrayShapeConstraintMBS

### 60.18.1 class MLMultiArrayShapeConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The lists of shapes or ranges of shapes that constrain a multiarray feature.
**Notes:** Available in MacOS 10.14 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.18.2 Methods

### 60.18.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.18.4 enumeratedShapes as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Array of allowed shapes for a multiarray feature.

### 60.18.5 sizeRangeForDimension as NSRangeMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The allowable range for a dimention of the multiarray.

### 60.18.6 Properties

### 60.18.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.18.8 type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The type of the shape constraint.
**Notes:** (Read only property)

### 60.18.9 Constants

Types

| Constant | Value | Description |
|---|---|---|
| TypeEnumerated | 2 | The constraint is an array of allowed shapes. |
| TypeRange | 3 | The constraint is a set of ranges allowed for the array shape. |
| TypeUnspecified | 1 | The constraint type is undefined. |

## 60.19 class MLNumericConstraintMBS

### 60.19.1 class MLNumericConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The value limitations of a number.
**Notes:** Available on MacOS 10.15 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.19.2 Methods

### 60.19.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

### 60.19.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.19.5 enumeratedNumbers as Double()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A set of the numbers allowed in this constraint.

### 60.19.6 Properties

### 60.19.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.19.8 maxNumber as Double

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The largest numerical value allowed by this constraint.
**Notes:** (Read only property)

### 60.19.9 minNumber as Double

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The smallest numerical value allowed by this constraint.
**Notes:** (Read only property)

## 60.20 class MLParameterDescriptionMBS

### 60.20.1 class MLParameterDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The description of a model parameter that includes a default value and a constraint, if applicable.
**Notes:** Available for MacOS 10.15 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.20.2 Methods

### 60.20.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

### 60.20.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.20.5 Properties

### 60.20.6 defaultValue as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The default value for the parameter.
**Notes:** (Read only property)

### 60.20.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.20.8 key as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key for this parameter description value.
**Notes:** (Read only property)

### 60.20.9 numericConstraint as MLNumericConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constraints of this paramter description value, if and only if the value is numerical.
**Notes:** (Read only property)

## 60.21 class MLParameterKeyMBS

### 60.21.1 class MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A key for model and update parameter dictionaries.
**Notes:** Subclass of the MLKeyMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.21.2 Methods

### 60.21.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.21.4 scopedTo(scope as String) as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Returns a new MLParameterKey instance after adding additional scoping.

### 60.21.5 Properties

### 60.21.6 beta1 as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the beta1 parameter for the Adam optimizer (a Double value).
**Notes:** Double parameter used to control the beta1 of Adam optimizer. Adjustable at load-time.
(Read only property)

### 60.21.7 beta2 as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the beta2 parameter for the Adam optimizer (a Double value).
**Notes:** Double parameter used to control the beta2 of Adam optimizer. Adjustable at load-time.
(Read only property)

### 60.21.8 biases as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** MLMultiArrayMBS parameter returned when client requests for biases of a particular layer using a scoped parameter.
**Notes:** (Read only property)

### 60.21.9 epochs as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the epochs parameter for the optimizer (an Int64 value).
**Notes:** Int64 parameter used to specify the number of epochs used by optimizer. Adjustable at load-time.
(Read only property)

### 60.21.10 eps as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the eps parameter for the Adam optimizer (a Double value).
**Notes:** Double parameter used to control the epsilon of Adam optimizer. Adjustable at load-time.
(Read only property)

### 60.21.11 learningRate as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the parameter for the optimizer,Äôs learning rate (a Double value).
**Notes:** Double parameter used to control the learning rate of an optimizer. Adjustable in progress.
(Read only property)

### 60.21.12 linkedModelFileName as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the name of the linked model.
**Notes:** (Read only property)

### 60.21.13 linkedModelSearchPath as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the search path for the linked model.
**Notes:** (Read only property)

### 60.21.14 miniBatchSize as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the mini batch-size parameter for the optimizer (an Int64 value).
**Notes:** Int64 parameter used to specify the size of a miniBatch used by optimizer. Adjustable at load-time.
(Read only property)

### 60.21.15 momentum as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The key you use to access the parameter for the optimizer,Äôs momentum gradient (a Double value).
**Notes:** Double parameter used to control the momentum of gradient based optimizers. Adjustable at load-time.
(Read only property)

### 60.21.16 numberOfNeighbors as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Int64 parameter used to specify the number of neighbors to use for class affinity (applicable to kNN).
**Notes:** Not adjustable in progress.
(Read only property)

### 60.21.17 seed as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Int64 parameter used to specify the seed to be used if shuffling data between epochs.
**Notes:** Adjustable at load-time.
(Read only property)

### 60.21.18 shuffle as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Bool parameter used to specify whether to shuffle the data between epochs.
**Notes:** Adjustable at load-time.
(Read only property)

### 60.21.19 weights as MLParameterKeyMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** MLMultiArrayMBS parameter returned when client requests for weights of a particular layer using a scoped parameter.
**Notes:** (Read only property)

## 60.22 class MLPredictionOptionsMBS

### 60.22.1 class MLPredictionOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** An object to hold options / controls / parameters of how model prediction is performed

### 60.22.2 Methods

### 60.22.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 60.22.4 Properties

### 60.22.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.22.6 usesCPUOnly as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Set to true to force computation to be on the CPU only
**Notes:** (Read and Write property)

## 60.23 class MLSequenceConstraintMBS

### 60.23.1 class MLSequenceConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constraints for a sequence feature.
**Notes:** Available on MacOS 10.14 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.23.2 Methods

### 60.23.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.14 or newer.

### 60.23.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.23.5 Properties

### 60.23.6 countRange as NSRangeMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The range of values allowed for the sequence's length.
**Notes:** (Read only property)

### 60.23.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.23.8 valueDescription as MLFeatureDescriptionMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The description that all sequence elements must match.
**Notes:** (Read only property)

## 60.24 class MLSequenceMBS

### 60.24.1 class MLSequenceMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A sequence of data used as a feature input or feature output for a model.
**Notes:** Data from sensors (a time series) or language (a series of words) are often manipulated as sequences by machine learning models. These sequences can have variable lengths depending on their context. MLSequenceMBS explicitly encodes a sequence of strings or integers to support a series of data points as a single input.

If you need to process a sequence of values individually, one at a time, see Making Predictions with a Sequence of Inputs for details.
https://developer.apple.com/documentation/coreml/core_ml_api/making_predictions_with_a_sequence_of_inputs

Available in MacOS 10.14 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.24.2 Methods

### 60.24.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.24.4 emptySequenceWithType(type as Integer) as MLSequenceMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates an empty sequence of the given type.
**Notes:** Type: The MLFeatureType for the sequence. Must be either MLFeatureTypeString or MLFeatureTypeInt64.

### 60.24.5 int64Values as Int64()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The integer elements of the sequence.

### 60.24.6 sequenceWithInt64Array(int64Values() as Int64) as MLSequenceMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a sequence from an array of integers.

### 60.24.7 sequenceWithStringArray(stringValues() as String) as MLSequenceMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates a sequence from an array of strings.

### 60.24.8 stringValues as String()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The string elements of the sequence.

### 60.24.9 Properties

### 60.24.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.24.11 type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The type of value held in the sequence.
**Notes:** (Read only property)

## 60.25 class MLTaskMBS

### 60.25.1 class MLTaskMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** An abstract base class for machine learning tasks.
**Notes:** You don,Äôt create use this class directly. Instead, use a class that inherits from this one, such as MLUpdateTaskMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr3

### 60.25.2 Methods

### 60.25.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

### 60.25.4 cancel

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Cancels a machine learning task before it completes.

### 60.25.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 60.25.6 resume

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Begins or resumes a machine learning task.
**Notes:** Use this method to start a task for the first time or resumes a task that has paused. Tasks pause

when they notify your app,Äôs progress handlers, such as those you provide to an MLUpdateProgressHandlersMBS instance.

### 60.25.7 Properties

### 60.25.8 Error as NSErrorMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The underlying error if the task is in a failed state.
**Notes:** (Read only property)

### 60.25.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.25.10 State as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The current state of the machine learning task.
**Notes:** (Read only property)

### 60.25.11 TaskIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A unique name of the task to distinguish it from all other tasks at runtime.
**Notes:** (Read only property)

### 60.25.12 Constants

Task States

| Constant | Value | Description |
|---|---|---|
| StateCancelling | 3 | The state of a machine learning task that,Äôs in mid-termination, before it could finish successfully. |
| StateCompleted | 4 | The state of a machine learning task that has finished successfully. |
| StateFailed | 5 | The state of a machine learning task that has terminated due to an error. |
| StateRunning | 2 | The state of a machine learning task that,Äôs executing. |
| StateSuspended | 1 | The state of a machine learning task that,Äôs paused. |

## 60.26 class MLUpdateContextMBS

### 60.26.1 class MLUpdateContextMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The context an update task provides to your app,Äôs completion and update progress handlers.
**Blog Entries**

- Update Machine Learning Model on Device
- MBS Xojo Plugins, version 19.6pr3

### 60.26.2 Methods

### 60.26.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

### 60.26.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The constructor.

### 60.26.5 writeToFile(file as FolderItem, byref error as NSErrorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Exports a machine learning file to the file system.
**Notes:** file: The location in the file system where the file should be written.
Error: will return any error message.

Returns true on success or false on failure.
Requires MacOS 10.15 or newer.

### 60.26.6 Properties

### 60.26.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.26.8 Metrics as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The training metrics of the model for the update task, contained in a dictionary.
**Notes:** (Read only property)

### 60.26.9 Model as MLModelMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The underlying Core ML model stored in memory.
**Notes:** (Read only property)

### 60.26.10 Parameters as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The parameters for the update task.
**Notes:** (Read only property)

### 60.26.11 ProgressEvent as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The event type that triggered an update task to notify your app,Äôs completion and update progress handlers.
**Notes:** (Read only property)

### 60.26.12 Task as MLUpdateTaskMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The update task that generated the update context.
**Notes:** (Read only property)

### 60.26.13 Constants

Progress Event Types

| Constant | Value | Description |
|---|---|---|
| ProgressEventEpochEnd | 2 | An event that represents the end of training epoch. |
| ProgressEventMiniBatchEnd | 4 | An event that represents the end of a mini-batch within a training epoch. |
| ProgressEventTrainingBegin | 1 | An event that represents the start of training. |

# 60.27 class MLUpdateProgressHandlersMBS

## 60.27.1 class MLUpdateProgressHandlersMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A collection of closures an update task uses to notify your app of its progress.
**Notes:** Available in MacOS 10.15 or newer.
**Blog Entries**

- Update Machine Learning Model on Device
- MBS Xojo Plugins, version 19.6pr3

## 60.27.2 Methods

## 60.27.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Checks whether class is available.
**Notes:** Returns true in MacOS 10.15 or newer.

## 60.27.4 Constructor(interestedEvents as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates the collection of event handlers for an update task uses to notify your app of its progress.
**Notes:** interestedEvents: The events for which the update task will call your closures for, contained in an option set.

## 60.27.5 Properties

## 60.27.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 60.27.7 Events

### 60.27.8 completionHandler(context as MLUpdateContextMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: .

**Function:** The event that an update tasks uses to notify you when it is complete.

### 60.27.9 progressHandler(context as MLUpdateContextMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: .

**Function:** The event an update task uses to notify your app.
**Notes:** The update task only uses this event for the events you specified in interestedEvents.

### 60.27.10 Constants

Progress Event Types

| Constant | Value | Description |
|---|---|---|
| ProgressEventEpochEnd | 2 | An event that represents the end of training epoch. |
| ProgressEventMiniBatchEnd | 4 | An event that represents the end of a mini-batch within a training epoch. |
| ProgressEventTrainingBegin | 1 | An event that represents the start of training. |

## 60.28 class MLUpdateTaskMBS

### 60.28.1 class MLUpdateTaskMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** A task that updates a model with additional training data.
**Notes:** Use an MLUpdateTaskMBS to update a machine learning model on a user,Äôs device.

Available on MacOS 10.15 or newer.
Subclass of the MLTaskMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- Update Machine Learning Model on Device
- MBS Xojo Plugins, version 19.6pr3

### 60.28.2 Methods

### 60.28.3 Constructor(file as FolderItem, trainingData as MLArrayBatchProviderMBS, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates an update task for your model, given its file URL, training data, and your completion handler.
**Notes:** file: The location in the file system of a model file (ModelName.mlmodelc).
trainingData: The update data for the model, contained in a batch provider.
configuration: The model settings for a updated model object.

Calls later completionHandler event.
See also:

- 60.28.4 Constructor(file as FolderItem, trainingData as MLArrayBatchProviderMBS, configuration as MLModelConfigurationMBS, progressHandlers as MLUpdateProgressHandlersMBS, byref error as NSErrorMBS) 10823

### 60.28.4 Constructor(file as FolderItem, trainingData as MLArrayBatchProviderMBS, configuration as MLModelConfigurationMBS, progressHandlers as MLUpdateProgressHandlersMBS, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Creates an update task for your model, given its file URL, training data, and your progress handlers.
**Notes:** file: The location in the file system of a model file (ModelName.mlmodelc).
trainingData: The update data for the model, contained in a batch provider.
configuration: The model settings for a updated model object.
progressHandlers: The closures the task calls during the update process.
See also:

- 60.28.3 Constructor(file as FolderItem, trainingData as MLArrayBatchProviderMBS, configuration as MLModelConfigurationMBS, byref error as NSErrorMBS) 10823

### 60.28.5 resumeWithParameters(updateParameters as Dictionary)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: All.

**Function:** Resumes a model update with updated parameter values.
**Notes:** updateParameters: Model training parameter values to replace those currently set in the update task.

Use this method to resume the model update task with newer parameter values. You use this method within the closures you provide in an MLUpdateProgressHandlersMBS instance to resume the MLUpdateTaskMBS.

### 60.28.6 Events

### 60.28.7 completionHandler(context as MLUpdateContextMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: .

**Function:** The complete event.
**Notes:** Called only if you use constructor without passing MLUpdateProgressHandlersMBS object, because if you use MLUpdateProgressHandlersMBS, the event is called there.

# Chapter 61

# CoreText

## 61.1 class CoreTextMBS

### 61.1.1 class CoreTextMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The central CoreText class.
**Notes:** Some global methods, constants and events for CoreText.
**Blog Entries**

- CoreText Completed

### 61.1.2 Methods

### 61.1.3 AvailableFontFamilyNames as string()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of visible font family names sorted for user interface display.

### 61.1.4 AvailableFontURLs as string()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of font URLs.

### 61.1.5 AvailablePostScriptNames as string()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of unique PostScript font names for the fonts.

### 61.1.6 CompareFontFamilyNames(name1 as string, name2 as string) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A comparator function to compare font family names and sort them according to Apple guidelines.
**Notes:** family1: The first localized font family name to compare, as a string.
family2: The second localized font family name to compare, as a string.

Returns a CFComparisonResult value indicating the sort order for the two family names. kCFComparisonResultGreatherThan (1) if family1 is greater than family2, kCFComparisonResultLessThan (-1) if family1 is less than family2, and kCFComparisonResultEqualTo (0) if they are equal.

This CFComparatorFunction function compares font family names and sorts them in the Apple preferred order, accounting for foundry prefix. Family names with recognized prefixes are sorted after the unprefixed names in prefix order.

### 61.1.7 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 61.1.8 CoreTextVersion as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the version of the CoreText framework.
**Notes:** This function returns a number indicating the version of the CoreText framework. Note that framework version is not always an accurate indicator of feature availability. The recommended way to use this function is first to check that the function pointer is non nil (plugin will do and raise exceptions), followed by calling it and comparing its result to a defined constant (or constants).
Returns the version number. This value is for comparison with the constants beginning with kCTVersionNumber.

### 61.1.9 CreateFontDescriptorFromData(data as memoryblock) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a font descriptor representing the font in the supplied data.
**Notes:** Note: the font descriptor is not available through font descriptor matching.

data: A memoryblock containing font data.

Returns a font descriptor created from the data, or nil on error.
See also:

- 61.1.10 CreateFontDescriptorFromData(data as string) as CTFontDescriptorMBS 10827

### 61.1.10 CreateFontDescriptorFromData(data as string) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a font descriptor representing the font in the supplied data.
**Notes:** Note: the font descriptor is not available through font descriptor matching.

data: A string containing font data.

Returns a font descriptor created from the data, or nil on error.
See also:

- 61.1.9 CreateFontDescriptorFromData(data as memoryblock) as CTFontDescriptorMBS 10827

### 61.1.11 CreateFontDescriptorsFromFile(file as folderitem) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of font descriptors representing each of the fonts in the specified file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("Didot.ttc")

dim descriptor() as CTFontDescriptorMBS
dim result() as string

descriptor = CoreTextMBS.CreateFontDescriptorsFromFile(file)
```

```
for i as Integer = 0 to descriptor.Ubound
result.append descriptor(i).Displayname
next

MsgBox Join(result, EndOfLine)
```

**Notes:** file: A folderitem referencing a valid font file.

### 61.1.12 CreateFontDescriptorsFromURL(URL as string) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of font descriptors representing each of the fonts in the specified URL.
**Notes:** URL: A file system URL referencing a valid font file.

### 61.1.13 Destructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 61.1.14 EnableFontDescriptors(descriptors() as CTFontDescriptorMBS, enable as boolean)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables or disables the matching font descriptors for font descriptor matching.
**Notes:** descriptors: Array of font descriptors.
enable: Boolean value indicating whether the fonts matching descriptors should be enabled for font descriptor matching.

### 61.1.15 GetScopeForFile(file as folderitem) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the registration scope of the specified folderitem.
**Notes:** The registration scope of the specified file or kCTFontManagerScopeNone if not currently registered.
Available in OS X v10.6 and later.

### 61.1.16 GetScopeForURL(URL as string) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the registration scope of the specified URL.
**Notes:** The registration scope of the specified URL or kCTFontManagerScopeNone if not currently registered.
Available in OS X v10.6 and later.

### 61.1.17 IsSupportedFontFile(file as folderitem) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines whether the referenced font data is supported on the current platform.
**Notes:** Returns true if the folderitem refers to a valid font that can be used on the current platform; false otherwise.

### 61.1.18 IsSupportedFontURL(URL as string) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines whether the referenced font data (usually by file URL) is supported on the current platform.
**Notes:** Returns true if the URL refers to a valid font that can be used on the current platform; false otherwise.

### 61.1.19 kCTBaselineClassAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference a baseline class override.
**Notes:** Value must be one of the kCTBaselineClass constants. Normally, glyphs on the line will be assigned baseline classes according to the 'bsln' or 'BASE' table in the font. This attribute may be used to change this assignment.

see also: kCTBaselineClassRoman, kCTBaselineClassIdeographicCentered, kCTBaselineClassIdeographicLow, kCTBaselineClassIdeographicHigh, kCTBaselineClassHanging, kCTBaselineClassMath.

### 61.1.20 kCTBaselineInfoAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference a baseline info dictionary.
**Notes:** Value must be a CFDictionaryRef. Normally, baseline offsets will be assigned based on the 'bsln' or 'BASE' table in the font. This attribute may be used to assign different offsets. Each key in the dictionary is one of the kCTBaselineClass constants and the value is a number of the baseline offset in points. You only need to specify the offsets you wish to change.

### 61.1.21 kCTBaselineReferenceInfoAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference a baseline info dictionary for the reference baseline.
**Notes:** Value must be a Dictionary. All glyphs in a run are assigned a baseline class and then aligned to the offset for that class in the reference baseline baseline info. See the discussion of kCTBaselineInfoAttributeName for information about the contents of the dictionary. You can also use the kCTBaselineReferenceFont key to specify that the baseline offsets of a particular CTFontMBS should be used as the reference offsets.

### 61.1.22 kCTCharacterShapeAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Controls glyph selection.
**Notes:** Value must be a number. Default is value is 0 (disabled). A non-zero value is interpreted as an SFNT kCharacterShapeType selector + 1; see SFNTLayoutTypes.h for selectors. For example, an attribute value of 1 corresponds to kTraditionalCharactersSelector.

### 61.1.23 kCTFontAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The key for the font.
**Notes:** Value must be a CTFontMBS. Default is Helvetica 12.

### 61.1.24 kCTFontManagerBundleIdentifier as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** CTFontManage bundle identifier.
**Notes:** The CTFontManager bundle identifier to be used with get or set global auto-activation settings.

### 61.1.25 kCTFontManagerErrorDomain as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The error domain for CoreText.
**Notes:** CFError objects with this domain have error codes corresponding to one of the CTFontManagerError errors listed in "Font Registration Errors" and "Font Unregistration Errors."

### 61.1.26 kCTFontManagerErrorFontURLsKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** User info key to be used with CFError references returned from registration functions.
**Notes:** The value associated with this key in the user info dictionary of a CFError object is a CFArray of font URLs that failed with the given error.

### 61.1.27 kCTFontManagerRegisteredFontsChangedNotification as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Notification name for font registry changes.
**Notes:** This is the string to use as the notification name when subscribing to Core Text Font Manager notifications. This notification is posted when fonts are added to the font registry. The client is responsible for registered with the distributed notification center to receive notifications for changes to the session or user scopes, and with a local notification center for changes to the process scope.

### 61.1.28 kCTFontSlantTrait as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Dictionary key to access the slant trait value.
**Notes:** Use this key to access the normalized slant angle from the font traits dictionary. The value returned is a number representing a float value between -1.0 and 1.0 for normalized slant angle. The value or 0.0 corresponds to 0 degree clockwise rotation from the vertical and 1.0 corresponds to 30 degrees clockwise rotation.

### 61.1.29 kCTFontSymbolicTrait as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Dictionary key to access the symbolic traits value.
**Notes:** Use this key to access the symbolic traits value from the font traits dictionary. The value is returned

as a number.

### 61.1.30 kCTFontWeightTrait as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Dictionary key to access the weight trait value.
**Notes:** Use this key to access the normalized weight trait from the font traits dictionary. The value returned is a number representing a float value between -1.0 and 1.0 for normalized weight. The value of 0.0 corresponds to the regular or medium font weight.

### 61.1.31 kCTFontWidthTrait as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Dictionary key to access the width (condense/expand) trait value.
**Notes:** Use this key to access the normalized proportion trait from the font traits dictionary. This value corresponds to the relative inter-glyph spacing for a given font. The value returned is a number representing a float between -1.0 and 1.0. The value of 0.0 corresponds to regular glyph spacing while negative values represent condensed glyph spacing.

### 61.1.32 kCTForegroundColorAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The key for the foreground color..
**Notes:** Value must be a CGColorMBS. Default value is black.

### 61.1.33 kCTForegroundColorFromContextAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Never set a foreground color in the CGContext; use what is set as the context's fill color.

Value must be a boolean. Default is false. The reason why this exists is because an NSAttributedString defaults to a black color if no color attribute is set. This forces CoreText to set the color in the context. This will allow developers to sidestep this, making CoreText set nothing but font information in the CGContext. If set, this attribute also determines the color used by kCTUnderlineStyleAttributeName, in which case it overrides the foreground color.

### 61.1.34 kCTGlyphInfoAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Allows the use of unencoded glyphs.
Value must be a CTGlyphInfoMBS. The glyph specified by this CTGlyphInfo object is assigned to the entire attribute range, provided that its contents match the specified base string and that the specified glyph is available in the font specified by kCTFontAttributeName.

### 61.1.35 kCTKernAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** A kerning adjustment.
Value must be a float. Default is standard kerning. The kerning attribute indicate how many points the following character should be shifted from its default offset as defined by the current character's font in points; a positive kern indicates a shift farther along and a negative kern indicates a shift closer to the current character. If this attribute is not present, standard kerning will be used. If this attribute is set to 0.0, no kerning will be done at all.

### 61.1.36 kCTLanguageAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Specifies text language.

Value must be a String containing a locale identifier. Default is unset. When this attribute is set to a valid identifier, it will be used to select localized glyphs (if supported by the font) and locale-specific line breaking rules.

### 61.1.37 kCTLigatureAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Controls ligature formation.

Value must be a number. Default is int value 1. The ligature attribute determines what kinds of ligatures should be used when displaying the string. A value of 0 indicates that only ligatures essential for proper

rendering of text should be used, 1 indicates that standard ligatures should be used, and 2 indicates that all available ligatures should be used. Which ligatures are standard depends on the script and possibly the font. Arabic text, for example, requires ligatures for many character sequences, but has a rich set of additional ligatures that combine characters. English text has no essential ligatures, and typically has only two standard ligatures, those for "fi" and "fl" – all others being considered more advanced or fancy.

On iOS releases prior to 6.0 essential ligatures are applied if the font contains glyphs for any of U+FB00 through U+FB04 and the font lacks AAT or OpenType shaping tables, but as of 6.0 shaping tables (or the lack thereof) are treated as definitive. This character-based shaping will still be performed if this attribute is explicitly specified with the default value of 1.

### 61.1.38 kCTParagraphStyleAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** A CTParagraphStyle object which is used to specify things like line alignment, tab rulers, writing direction, etc.
Value must be a CTParagraphStyleMBS. Default is an empty CTParagraphStyle object.

### 61.1.39 kCTRunDelegateAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Allows customization of certain aspects of a range of text's appearance.

Value must be a CTRunDelegateMBS. The values returned by the embedded object for an attribute range apply to each glyph resulting from the text in that range. Because an embedded object is only a display-time modification, care should be taken to avoid applying this attribute to a range of text with complex behavior, such as a change of writing direction, combining marks, etc. Consequently, it is recommended that this attribute be applied to a range containing the single character U+FFFC.

### 61.1.40 kCTStrokeColorAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** The stroke color.
Value must be a CGColorMBS. Default is the foreground color.

### 61.1.41 kCTStrokeWidthAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** The stroke width.
Value must be a number. Default value is 0.0, or no stroke. This attribute, interpreted as a percentage of font point size, controls the text drawing mode: positive values effect drawing with stroke only; negative values are for stroke and fill. A typical value for outlined text is 3.0.

### 61.1.42 kCTSuperscriptAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Controls vertical text positioning.
Value must be a number. Default is int value 0. If supported by the specified font, a value of 1 enables superscripting and a value of -1 enables subscripting.

### 61.1.43 kCTUnderlineColorAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** The underline color.
Value must be a CGColorMBS. Default is the foreground color.

### 61.1.44 kCTUnderlineStyleAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Allows the setting of an underline to be applied at render time.

Value must be a number. Default is kCTUnderlineStyleNone. Set a value of something other than kCTUnderlineStyleNone to draw an underline. In addition, the CTUnderlineStyleModifiers can be used to modify the look of the underline. The underline color will be determined by the text's foreground color.

### 61.1.45 kCTVerticalFormsAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Controls glyph orientation.

Value must be a boolean. Default is false. A value of false indicates that horizontal glyph forms are to be used, true indicates that vertical glyph forms are to be used.

### 61.1.46 kCTWritingDirectionAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for font attributes.
**Notes:** Specifies a bidirectional override or embedding.

Value must be a CFArray of CFNumberRefs, each of which should have a value of either kCTWritingDirectionLeftToRight or kCTWritingDirectionRightToLeft, plus one of kCTWritingDirectionEmbedding or kCTWritingDirectionOverride. This array represents a sequence of nested bidirectional embeddings or overrides, in order from outermost to innermost, with (kCTWritingDirectionLeftToRight | kCTTextWritingDirectionEmbedding) corresponding to a LRE/PDF pair in plain text or in HTML, (kCTWritingDirectionRightToLeft | kCTTextWritingDirectionEmbedding) corresponding to a RLE/PDF pair in plain text or a in HTML, (kCTWritingDirectionLeftToRight | kCTTextWritingDirectionOverride) corresponding to a LRO/PDF pair in plain text or <bdo dir="ltr">in HTML, and (kCTWritingDirectionRightToLeft | kCTTextWritingDirectionOverride) corresponding to a RLO/PDF pair in plain text or <bdo dir="rtl">in HTML.

### 61.1.47 MatchFontDescriptorsWithProgressHandler(descriptors() as CTFontDescriptorMBS, mandatoryAttributes() as string, tag as Variant = nil) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Matches font descriptors in background.
**Notes:** This function returns immediately, but can potentially take long time to process. The progress is notified via progress evnet.

descriptors: An array of descriptors to process.
mandatoryAttributes: some mandatory attributes.
Returns false if it couldn't start the work.

### 61.1.48 RegisterFontsForFile(file as folderitem, scope as Integer, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Registers fonts from the specified font URL with the Font Manager. Registered fonts are discoverable through font descriptor matching.
**Notes:** fontURL: The font URL.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
error: a CFError object which, in case of failed registration, contains error information.

Returns true if registration of the fonts was successful, otherwise false.

### 61.1.49 RegisterFontsForFiles(files() as folderitem, scope as Integer, errors() as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Registers fonts from the specified array of font URLs with the Font Manager. Registered fonts are discoverable through font descriptor matching.
**Notes:** files: Array of font files.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
errors: An array of CFError objects which, in case of failed registration, contain error information. Each error contains a CFArray of font URLs corresponding to kCTFontManagerErrorFontURLsKey. These URLs represent the font files that caused the error and were not successfully registered. The array must be released by the caller. Can be nil.

Returns true if registration of all font URLs was successful, otherwise false.

### 61.1.50 RegisterFontsForURL(URL as string, scope as Integer, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Registers fonts from the specified font URL with the Font Manager. Registered fonts are discoverable through font descriptor matching.
**Notes:** fontURL: The font URL.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
error: a CFError object which, in case of failed registration, contains error information.

Returns true if registration of the fonts was successful, otherwise false.
See also:

- 61.1.51 RegisterFontsForURL(URLs() as string, scope as Integer, errors() as CFErrorMBS) as boolean 10838

### 61.1.51 RegisterFontsForURL(URLs() as string, scope as Integer, errors() as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Registers fonts from the specified array of font URLs with the Font Manager. Registered fonts are discoverable through font descriptor matching.
**Notes:** URLs: Array of font URLs.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
errors: Array of CFError objects which, in case of failed registration, contain error information. Each error contains a CFArray of font URLs corresponding to kCTFontManagerErrorFontURLsKey. These URLs represent the font files that caused the error and were not successfully registered. The array must be released by the caller. Can be nil.

Returns true if registration of all font URLs was successful, otherwise false.
See also:

- 61.1.50 RegisterFontsForURL(URL as string, scope as Integer, byref error as CFErrorMBS) as boolean 10837

### 61.1.52 RegisterGraphicsFont(font as CGFontMBS, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Registers the specified graphics font with the font manager.
**Notes:** font: The graphics font to be registered.
error: Returns by indirection an error object in the case of failed registration.

Returns true if registration of the font was successful, otherwise false.

Registered fonts are discoverable through font descriptor matching. Any attempt to register a font that is either already registered or contains the same Postscript of an already registered font will fail. This behavior is useful for fonts that may be embedded in documents or constructed in memory. A graphics font is obtained by calling CGFontMBS.CreateWithDataProvider. Fonts that are backed by files should be registered using CoreTextMBS.RegisterFontsForURL.

### 61.1.53 UnregisterFontsForFile(file as folderitem, scope as Integer, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Unregisters fonts from the specified font URL with the Font Manager. Unregistered fonts are no longer discoverable through font descriptor matching.
**Notes:** URL: The font URL.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
error: A CFError object which, in case of failed registration, contains error information.

Returns true if unregistration of the fonts was successful, otherwise false.

### 61.1.54 UnregisterFontsForFiles(files() as folderitem, scope as Integer, errors() as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Unregisters fonts from the specified array of font URLs with the Font Manager. Unregistered fonts are no longer discoverable through font descriptor matching.
**Notes:** files: Array of font folderitems.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
errors: An array of CFError objects which, in case of failed registration, contain error information. Each error contains a CFArray of font URLs corresponding to kCTFontManagerErrorFontURLsKey. These URLs represent the font files that caused the error and were not successfully registered. The array must be released by the caller.

Returns true if unregistration of all font URLs was successful, otherwise false.

### 61.1.55 UnregisterFontsForURL(URL as string, scope as Integer, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Unregisters fonts from the specified font URL with the Font Manager. Unregistered fonts are no longer discoverable through font descriptor matching.
**Notes:** URL: The font URL.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
error: A CFError object which, in case of failed registration, contains error information.

Returns true if unregistration of the fonts was successful, otherwise false.

### 61.1.56 UnregisterFontsForURLs(URLs() as string, scope as Integer, errors() as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Unregisters fonts from the specified array of font URLs with the Font Manager. Unregistered fonts are no longer discoverable through font descriptor matching.
**Notes:** URLs: Array of font URLs.
scope: Scope constant defining the availability and lifetime of the registration. See "Font Registration Scope" for values to pass for this parameter.
errors: An array of CFError objects which, in case of failed registration, contain error information. Each error contains a CFArray of font URLs corresponding to kCTFontManagerErrorFontURLsKey. These URLs represent the font files that caused the error and were not successfully registered. The array must be released by the caller.

Returns true if unregistration of all font URLs was successful, otherwise false.

### 61.1.57 UnregisterGraphicsFont(font as CGFontMBS, byref error as CFErrorMBS) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Unregisters the specified graphics font with the font manager.
**Notes:** font: The graphics font to be unregistered.
error: Returns by indirection an error object in the case of failed unregistration.

Returns true if unregistration of the font was successful, otherwise false.

Unregistered fonts are no longer discoverable through font descriptor matching. Fonts that are backed by files should be unregistered using CTFontManagerUnregisterFontsForURL.

### 61.1.58 Properties

### 61.1.59 AutoActivationSetting(BundleID as string) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The auto-activation setting for the specified bundle identifier.
**Notes:** bundleID: The bundle identifier used to specify a particular application bundle. If "", the current

application bundle is used. If kCTFontManagerBundleIdentifier is specified, sets global auto-activation. (Read and Write computed property)

### 61.1.60 Events

### 61.1.61 FontCollectionSortDescriptors(first as CTFontDescriptorMBS, second as CTFontDescriptorMBS, tag as Variant) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The event to sort font descriptors..
**Notes:** This callback can be specified to obtain the matching font descriptors of a collection in sorted order. Return the appropriate comparison result of first descriptor to second descriptor.

Return -1 if smaller, 0 if equal or 1 if bigger.

### 61.1.62 Progress(state as Integer, progressParameter as Dictionary, tag as Variant) as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Progress was made for a call to MatchFontDescriptorsWithProgressHandler.
**Notes:** Return true to continue, and return false to cancel the process.

### 61.1.63 Constants

Font Class Constants

| Constant | Value | Description |
|---|---|---|
| kCTFontClassClarendonSerifs | &H040000000 | Clarendon Serifs |
| kCTFontClassFreeformSerifs | &H070000000 | Freeform Serifs |
| kCTFontClassMaskShift | 28 | The font class shift. This is used to shift the font class to the upper most 4 bits of the s traits. |
| kCTFontClassModernSerifs | &H030000000 | Modern Serifs |
| kCTFontClassOldStyleSerifs | &H010000000 | OldStyleSerifs |
| kCTFontClassOrnamentals | &H090000000 | Ornamentals |
| kCTFontClassSansSerif | &H080000000 | Sans Serif |
| kCTFontClassScripts | &H0A0000000 | Scripts |
| kCTFontClassSlabSerifs | &H050000000 | Slab Serifs |
| kCTFontClassSymbolic | &H0C0000000 | Symbolic |
| kCTFontClassTransitionalSerifs | &H020000000 | Transitional Serifs |
| kCTFontClassUnknown | &H000000000 | Unknown |

Font Auto-Activation Settings

| Constant | Value | Description |
|---|---|---|
| kCTFontManagerAutoActivationDefault | 0 | Default auto-activation setting. When specified, the application us setting. |
| kCTFontManagerAutoActivationDisabled | 1 | Disables auto-activation. |
| kCTFontManagerAutoActivationEnabled | 2 | Enables auto-activation. |
| kCTFontManagerAutoActivationPromptUser | 3 | Requires user input for auto-activation. A dialog is presented to confirm auto-activation of the font. |

Font Registration Errors

| Constant | Value | Description |
|---|---|---|
| kCTFontManagerErrorAlreadyRegistered | 105 | The file has already been registered in the specified scope. |
| kCTFontManagerErrorFileNotFound | 101 | The file does not exist at the specified URL. |
| kCTFontManagerErrorInsufficientPermissions | 102 | Cannot access the file due to insufficient permissions. |
| kCTFontManagerErrorInvalidFontData | 104 | The file contains invalid font data that could cause system proble |
| kCTFontManagerErrorUnrecognizedFormat | 103 | The file is not a recognized or supported font file format. |

Font Unregistration Errors

| Constant | Value | Description |
|---|---|---|
| kCTFontManagerErrorInUse | 202 | The font file is actively in use and cannot be unregistered. |
| kCTFontManagerErrorNotRegistered | 201 | The file is not registered in the specified scope. |
| kCTFontManagerErrorSystemRequired | 202 | The file is required by the system and cannot be unregistered. |

Font Registration Scope

| Constant | Value | Description |
|---|---|---|
| kCTFontManagerScopeNone | 0 | No scope is defined. |
| kCTFontManagerScopeProcess | 1 | The font is available to the current process for the duration of the process unless directly unregistered. |
| kCTFontManagerScopeSession | 3 | The font is available to the current user session but will not be available in subsequent sessions. |
| kCTFontManagerScopeUser | 2 | The font is available to all processes for the current user session and will be available in subsequent sessions unless unregistered. |

Font Traits

| Constant | Value | Description |
|---|---|---|
| kCTFontTraitBold | 2 | Bold.<br>Additional detail available via kCTFontWeightTrait |
| kCTFontTraitClassMask | 4026531840 | Mask for the font class |
| kCTFontTraitColorGlyphs | 8192 | Color bitmap glyphs are available. |
| kCTFontTraitComposite | 16384 | Composite<br>The font is a CFR (Composite font reference), a cascade list is expected per font. |
| kCTFontTraitCondensed | 64 | Condensed<br>Additional detail available via kCTFontWidthTrait |
| kCTFontTraitExpanded | 32 | Expanded<br>Expanded and condensed traits are mutually exclusive |
| kCTFontTraitItalic | 1 | Italic<br>Additional detail available via kCTFontSlantTrait |
| kCTFontTraitMonoSpace | 1024 | MonoSpace<br>Use fixed-pitch glyphs if available. May have multiple glyph advances (most CJK glyphs may contain two spaces) |
| kCTFontTraitUIOptimized | 4096 | UI optimized<br>Synthesize appropriate attributes for UI rendering such as control titles if necessary |
| kCTFontTraitVertical | 2048 | Vertical<br>Use vertical glyph variants and metrics. |

Underline Pattern

| Constant | Value | Description |
|---|---|---|
| kCTUnderlinePatternDash | &h0200 | Dash |
| kCTUnderlinePatternDashDot | &h0300 | Dash Dot |
| kCTUnderlinePatternDashDotDot | &h0400 | Dash Dot Dot |
| kCTUnderlinePatternDot | &h0100 | Dot |
| kCTUnderlinePatternSolid | &h0000 | Solid |

Underline style specifiers.

| Constant | Value | Description |
|---|---|---|
| kCTUnderlineStyleDouble | 9 | Double underlined. |
| kCTUnderlineStyleNone | 0 | Not underlined. |
| kCTUnderlineStyleSingle | 1 | Single underlined. |
| kCTUnderlineStyleThick | 2 | Thick underlined. |

Version Constants

| Constant | Value | Description |
|---|---|---|
| kCTVersionNumber10_5 | &h00020000 | Mac OS X 10.5 |
| kCTVersionNumber10_5_2 | &h00020001 | Mac OS X 10.5.2 |
| kCTVersionNumber10_5_3 | &h00020002 | Mac OS X 10.5.3 |
| kCTVersionNumber10_5_5 | &h00020003 | Mac OS X 10.5.5 |
| kCTVersionNumber10_6 | &h00030000 | Mac OS X 10.6 |
| kCTVersionNumber10_7 | &h00040000 | Mac OS X 10.7 |
| kCTVersionNumber10_8 | &h00050000 | Mac OS X 10.8 |
| kCTVersionNumber10_9 | &h00060000 | Mac OS X 10.9 |

Writing Directions

| Constant | Value | Description |
|---|---|---|
| kCTWritingDirectionEmbedding | 0 | |
| kCTWritingDirectionOverride | 1 | |

## 61.2 class CTFontCollectionMBS

### 61.2.1 class CTFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The CTFontCollection opaque type represents a font collection, that is, a group of font descriptors taken together as a single object.
**Notes:** Font collections provide the capabilities of font enumeration, access to global and custom font collections, and access to the font descriptors comprising the collection.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.2.2 Methods

### 61.2.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.2.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 61.2.5 CopyWithFontDescriptors(queryDescriptors() as CTFontDescriptorMBS, options as dictionary) as CTFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a copy of the original collection augmented with the given new font descriptors.
**Notes:** queryDescriptors: An array of font descriptors to augment those of the original collection.
options: The options dictionary.

Returns a copy of the original font collection augmented by the new font descriptors and options.

The new font descriptors are merged with the existing descriptors to create a single set.
Available in OS X v10.5 and later.

### 61.2.6 CreateCopyWithFontDescriptors(original as CTFontCollectionMBS, queryDescriptors() as CTFontDescriptorMBS, options as dictionary) as CTFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a copy of the original collection augmented with the given new font descriptors.
**Notes:** queryDescriptors: An array of font descriptors to augment those of the original collection.
options: The options dictionary.

Returns a copy of the original font collection augmented by the new font descriptors and options.

The new font descriptors are merged with the existing descriptors to create a single set.
Available in OS X v10.5 and later.

### 61.2.7 CreateFromAvailableFonts(options as Dictionary) as CTFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a new font collection containing all available fonts.
**Notes:** options: The options dictionary.

Returns a new collection containing all fonts available to the current application.

### 61.2.8 CreateWithFontDescriptors(queryDescriptors() as CTFontDescriptorMBS, options as dictionary) as CTFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a new collection based on the array of font descriptors.
**Notes:** An array of font descriptors to use for matching.

options: The options dictionary. See constant option keys.
Returns this function creates a new collection based on the provided font descriptors. The contents of this collection is defined by matching the provided descriptors against all available font descriptors.

### 61.2.9 ExclusionDescriptors as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the array of descriptors to exclude from the match.

### 61.2.10 FontAttribute(attributeName as string, options as Integer) as Dictionary()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of font descriptor attribute values.
**Notes:** attributeName: The attribute to retrieve for each descriptor in the collection.
options: Options to alter the return value.

This function returns a retained reference to an array, or nil on error. The caller is responsible for releasing the array. The array contains one value for each descriptor, in the same order as the results from CreateMatchingDescriptors. When the kCTFontCollectionCopyUnique is set, duplicate values will be removed. When kCTFontCollectionCopyStandardSort is set, the values will be sorted in standard UI order.
See also:

- 61.2.11 FontAttribute(attributeNames() as string, options as Integer) as Dictionary() 10847

### 61.2.11 FontAttribute(attributeNames() as string, options as Integer) as Dictionary()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of dictionaries containing font descriptor attribute values.
**Notes:** This function returns a retained reference to a array, or nil on error. The caller is responsible for releasing the array. The array contains one value for each descriptor, in the same order as the results from CreateMatchingDescriptors. When the kCTFontCollectionCopyUnique is set, duplicate values will be removed. When kCTFontCollectionCopyStandardSort is set, the values will be sorted in standard UI order.
See also:

- 61.2.10 FontAttribute(attributeName as string, options as Integer) as Dictionary() 10847

### 61.2.12 kCTFontCollectionDisallowAutoActivationOption as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the Collection Matching Options.
**Notes:** Option key to avoid auto-activating fonts.
Specify this option key in the options dictionary with a non-zero value to disallow searches for missing fonts

(font descriptors returning no results).

### 61.2.13 kCTFontCollectionIncludeDisabledFontsOption as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the Collection Matching Options.
**Notes:** Specify this option key in the options dictionary with a non-zero value to enable matching of disabled fonts. You can pass font descriptors specifying disabled fonts to CTFontManagerEnableFontDescriptors, but you cannot use such a font descriptor to query font attributes from the system database or create a CTFontMBS.

### 61.2.14 kCTFontCollectionRemoveDuplicatesOption as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the Collection Matching Options.
**Notes:** Option key to specify filtering of duplicates.

### 61.2.15 MatchingFontDescriptors(options as dictionary = nil) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of font descriptors matching the collection.

### 61.2.16 MatchingFontDescriptorsForFamily(familyName as string, options as dictionary = nil) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of font descriptors matching the specified family, one descriptor for each style in the collection.

### 61.2.17 MatchingFontDescriptorsSorted(tag as Variant) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the array of matching font descriptors sorted with the callback function.
**Notes:** This function returns an array of font descriptors matching the criteria of the collection and sorted by the results of the sorting callback function.

Calls FontCollectionSortDescriptors in CoreTextMBS class.

### 61.2.18 MutableCopy as CTMutableFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a mutable copy of the original collection.

### 61.2.19 QueryDescriptors as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the array of descriptors to match.

### 61.2.20 Constants

Bulk attribute access

| Constant | Value | Description |
|---|---|---|
| kCTFontCollectionCopyDefaultOptions | 0 | Passing this option indicates that defaults are to be used.<br>Available in OS X v10.7 and later. |
| kCTFontCollectionCopyStandardSort | 2 | Passing this option indicates that the return values should be sorted in st<br>UI order, suitable for display to the user. This is the same sorting be<br>used by NSFontPanel and Font Book.<br>Available in OS X v10.7 and later. |
| kCTFontCollectionCopyUnique | 1 | Passing this option indicates that duplicate values should be removed fr<br>results.<br>Available in OS X v10.7 and later. |

## 61.3 class CTFontDescriptorMBS

### 61.3.1 class CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTFontDescriptor opaque type represents a font descriptor, that is, a dictionary of attributes (such as name, point size, and variation) that can completely specify a font.
**Notes:** A font descriptor can be an incomplete specification, in which case the system chooses the most appropriate font to match the given attributes.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.3.2 Methods

### 61.3.3 AttributeValue(key as string) as Variant

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the value associated with an arbitrary attribute.
**Notes:** key: The requested attribute.

Returns a attribute value, or nil if the requested attribute is not present.

### 61.3.4 AttributeValues as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the attributes dictionary of the font descriptor.
**Notes:** The font descriptor attributes dictionary. This dictionary contains the minimum number of attributes to specify fully this particular font descriptor.

### 61.3.5 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.3.6 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.3.7 CopyWithAttributes(attributeValues as Dictionary) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the original font descriptor with new attributes.
**Notes:** attributes: A dictionary containing arbitrary attributes.

Returns a new copy of the original font descriptor with attributes augmented by those specified. If there are conflicts between attributes, the new attributes replace existing ones.

### 61.3.8 CopyWithFamily(family as String) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor in the specified family based on the traits of the original descriptor.
**Notes:** family: The name of the desired family.

Returns a new font reference with the original traits in the given family, or nil if none found in the system.

### 61.3.9 CopyWithFeature(featureTypeIdentifier as Integer, featureSelectorIdentifier as Integer) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a font descriptor with new feature settings.
**Notes:** featureTypeIdentifier: The feature type identifier.
featureSelectorIdentifier: The feature selector identifier.

Returns a copy of the original font descriptor modified with the given feature settings.
This is a convenience method to toggle more easily the state of individual features.

### 61.3.10 CopyWithSymbolicTraits(symTraitValue as Integer, symTraitMask as Integer) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor based on the original descriptor having the specified symbolic traits.
**Notes:** symTraitValue: The value of the symbolic traits. This bitfield is used to indicate the desired value for the traits specified by the symTraitMask parameter. Used in conjunction, they can allow for trait removal as well as addition.
symTraitMask: The mask bits of the symbolic traits. This bitfield is used to indicate the traits that should be changed.

Returns a new font descriptor reference in the same family with the given symbolic traits, or nil if none found in the system.

### 61.3.11 CopyWithVariation(variationIdentifier as Integer, variationValue as Double) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the original font descriptor with a new variation instance.
**Notes:** variationIdentifier: The variation axis identifier. This is the four-character code of the variation axis as a number.
variationValue: The value corresponding with the variation instance.

Returns a copy of the original font descriptor with a new variation instance.
This is a convenience method for easily creating new variation font instances.

### 61.3.12 CreateCopyWithFamily(orignal as CTFontDescriptorMBS, family as String) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor in the specified family based on the traits of the original descriptor.
**Notes:** original: The original font descriptor reference.
family: The name of the desired family.

Returns a new font reference with the original traits in the given family, or nil if none found in the system.

### 61.3.13 CreateCopyWithSymbolicTraits(orignal as CTFontDescriptorMBS, symTraitValue as Integer, symTraitMask as Integer) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font descriptor based on the original descriptor having the specified symbolic traits.
**Example:**

```
// find PostScript names for a font
const nameOfAFont = "Arial"

dim FontName as string
dim FontFamilyName as string
dim FontPostscriptName as string
dim FontPostscriptNameBold as string
dim FontPostscriptNameItalic as string

dim f as CTFontMBS = CTFontMBS.CreateWithName(nameOfAFont, 13)

if f <>nil then
FontName = f.FullName
FontFamilyName = f.FamilyName
FontPostscriptName = f.PostScriptName

dim d as CTFontDescriptorMBS = f.FontDescriptor

dim db as CTFontDescriptorMBS = CTFontDescriptorMBS.CreateCopyWithSymbolicTraits(d, CoreTextMBS.kCT-
FontTraitBold, CoreTextMBS.kCTFontTraitBold)
dim di as CTFontDescriptorMBS = CTFontDescriptorMBS.CreateCopyWithSymbolicTraits(d, CoreTextMBS.kCT-
FontTraitItalic, CoreTextMBS.kCTFontTraitItalic)

dim fb as CTFontMBS = f.CreateCopyWithAttributes(f.Size, nil, db)
dim fi as CTFontMBS = f.CreateCopyWithAttributes(f.Size, nil, di)

FontPostscriptNameBold = fb.PostScriptName
FontPostscriptNameItalic = fi.PostScriptName

end if

Break // read names in debugger
```

**Notes:** original: The original font descriptor reference.
symTraitValue: The value of the symbolic traits. This bitfield is used to indicate the desired value for the traits specified by the symTraitMask parameter. Used in conjunction, they can allow for trait removal as well as addition.

symTraitMask: The mask bits of the symbolic traits. This bitfield is used to indicate the traits that should be changed.

Returns a new font descriptor reference in the same family with the given symbolic traits, or nil if none found in the system.

Requires Mac OS X 10.9 or newer.

### 61.3.14 CreateWithAttributes(attributeValues as Dictionary) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a new font descriptor reference from a dictionary of attributes.
**Notes:** The provided attribute dictionary can contain arbitrary attributes that are preserved; however, unrecognized attributes are ignored on font creation and and may not be preserved over the round trip from descriptor to font and back to descriptor.

### 61.3.15 CreateWithNameAndSize(Name as string, Size as Double = 0.0) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a new font descriptor with the provided PostScript name and size.
**Example:**

```
dim c as CTFontDescriptorMBS = CTFontDescriptorMBS.CreateWithNameAndSize("Times", 12)
MsgBox c.AttributeValue(c.kCTFontFamilyNameAttribute)
```

**Notes:** name: The PostScript name to be used for the font descriptor as a string.
size: The point size. If 0.0, the font size attribute (kCTFontSizeAttribute) is omitted from the returned font descriptor.

Return sa new font descriptor reference with the given PostScript name and point size.

### 61.3.16 kCTFontBaselineAdjustAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.

**Notes:** Key to specify or obtain the baseline adjustment for a font reference. This is primarily used when defining font descriptors for a cascade list to keep the baseline of all fonts even. The value associated with this is a float represented as a number.

### 61.3.17 kCTFontCascadeListAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the cascade list used for a font reference. The cascade list is a array containing CTFontDescriptorMBS elements. If unspecified, the global cascade list is used.

### 61.3.18 kCTFontCharacterSetAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the Unicode character coverage set for a font reference. The value for this key is a CharacterSetMBS object. If specified, this attribute can be used to restrict the font to a subset of its actual character set. If unspecified, this attribute is ignored and the actual character set is used.

### 61.3.19 kCTFontDescriptorMatchingCurrentAssetSize as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A number. Total downloaded byte size. Valid during Downloading state.

### 61.3.20 kCTFontDescriptorMatchingDescriptors as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** Array of descriptors to be queried.
Valid while downloading or when state is kCTFontDescriptorMatchingWillBeginQuerying.

### 61.3.21 kCTFontDescriptorMatchingError as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A CFErrorMBS; Valid when state kCTFontDescriptorMatchingDidFailWithError.

### 61.3.22 kCTFontDescriptorMatchingPercentage as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A Number; Download progress in 0 - 100. Valid during Downloading state.

### 61.3.23 kCTFontDescriptorMatchingResult as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** Array of matched font descriptors.
Valid when state is kCTFontDescriptorMatchingDidMatch or CTFontDescriptorMatchingEnd.

### 61.3.24 kCTFontDescriptorMatchingSourceDescriptor as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A CTFontDescriptorMBS; The current font descriptor.
Valid when state is kCTFontDescriptorMatchingDidMatch.

### 61.3.25 kCTFontDescriptorMatchingTotalAssetSize as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A Number; Total byte size to download.
Always valid, but may be Zero when information is not available.

### 61.3.26 kCTFontDescriptorMatchingTotalDownloadedSize as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys for progressParameter dictionary.
**Notes:** A Number; Total downloaded byte size. Valid during Downloading state.

### 61.3.27 kCTFontDisplayNameAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the name used to display the font. Most commonly this is the full name. The value associated with this key is a string. If the value is unspecified, it defaults to Helvetica, and if that font is unavailable, it falls back to the global font cascade list.

### 61.3.28 kCTFontDownloadableAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** The font downloadable state.
The value associated with this key is a Boolean. If it is true, CoreText attempts to download a font if necessary when matching a descriptor.

### 61.3.29 kCTFontEnabledAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to obtain the font enabled state. The returned value is an integer represented as a number representing a Boolean value. Unregistered font descriptors return nil, which is equivalent to false.
Available in OS X v10.6 and later.

### 61.3.30 kCTFontFamilyNameAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the font family name from the font descriptor. The value associated with this key is a string.

### 61.3.31 kCTFontFeaturesAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the font features for a font reference. The value associated with this key is a array containing font feature dictionaries. This feature list contains the feature information from the 'feat' table of the font. For more information, see Features.
Available in OS X v10.5 and later.

### 61.3.32 kCTFontFeatureSettingsAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the font features settings for a font reference. The value associated with this key is a CFArrayRef object containing font feature-setting dictionaries. A feature-setting dictionary contains a tuple of a kCTFontFeatureTypeIdentifierKey key-value pair and a kCTFontFeatureSelectorIdentifierKey key-value pair. Each setting dictionary indicates which setting should be turned on. In the case of duplicate or conflicting setting, the last setting in the list takes precedence. It is the caller's responsibility to handle exclusive and nonexclusive settings as necessary.
Available in OS X v10.5 and later.

### 61.3.33 kCTFontFixedAdvanceAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify a fixed advance to be used for a font reference. If present and specified, this attribute is used to specify a constant advance to override any font values. The value associated with this key is a float represented as a number.
Available in OS X v10.5 and later.

### 61.3.34 kCTFontFormatAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the recognized format of the font. The value associated with this key is an integer represented as a number containing one of the constants in "Font Format Constants."
Available in OS X v10.6 and later.

### 61.3.35 kCTFontLanguagesAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain a list of covered languages for a font reference. The value for this key is an array containing string elements. If specified, this attribute restricts the search to matching fonts that support the specified languages. The language identifier string should conform to the RFC 3066bis standard. If unspecified, this attribute is ignored.
Available in OS X v10.5 and later.

### 61.3.36 kCTFontMacintoshEncodingsAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the Macintosh encodings for a font reference. The value associated with this key is a number containing a bit field of the Macintosh encodings. This attribute is provided for legacy compatibility.
Available in OS X v10.5 and later.

### 61.3.37 kCTFontMatrixAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify the font transformation matrix when creating a font. If unspecified it defaults to the unit matrix. The value for this key is a Memoryblock object containing a CGAffineTransform.

### 61.3.38 kCTFontNameAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the PostScript name from the font descriptor. The value associated with this key is a string. If the value is unspecified, it defaults to Helvetica, and if that font is unavailable, it falls back to the global font cascade list.

### 61.3.39 kCTFontOrientationAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify a particular orientation for the glyphs of the font. The value associated with this key is an integer represented as a number containing one of the constants in "Font Orientation Constants." If

you want to receive vertical metrics from a font for vertical rendering, specify kCTFontVerticalOrientation. If unspecified, the font uses its native orientation.

### 61.3.40 kCTFontPriorityAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the font priority used by font descriptors when resolving duplicates and sorting match results. The value associated with this key is an integer represented as a CFNumberRef object containing one of the values enumerated in "Font Priority Constants." The higher the value, the higher the priority of the font. Only registered fonts have a priority. Unregistered font descriptors return nil.
Available in OS X v10.6 and later.

### 61.3.41 kCTFontRegistrationScopeAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to specify or obtain the font descriptor's registration scope. The value associated with this key is an integer represented as a number containing one of the CTFontManagerScope enumerated values. A value of nil can be returned for font descriptors that are not registered.
Available in OS X v10.6 and later.

### 61.3.42 kCTFontSizeAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to obtain or specify the font point size. Creating a font with this unspecified will default to a point size of 12.0. The value for this key is represented as a number.

### 61.3.43 kCTFontStyleNameAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the style name of the font. This name represents the designer's description of the font's style. The value associated with this key is a string.

### 61.3.44 kCTFontTraitsAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the dictionary of font traits for stylistic information. See "Font Traits" for the list of font traits. The value associated with this key is a dictionary.

### 61.3.45 kCTFontURLAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key for accessing the font URL from the font descriptor. The value associated with this key is an URL string.
Available in OS X v10.6 and later.

### 61.3.46 kCTFontVariationAttribute as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants keys for accessing font attributes from a font descriptor.
**Notes:** Key to obtain the font variation dictionary instance as a dictionary object. If specified in a font descriptor, fonts with the specified axes are primary match candidates; if no such fonts exist, this attribute is ignored.

### 61.3.47 LocalizedAttributeValue(key as string, byref lang as string) as Variant

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a localized value for the requested attribute, if available.
**Notes:** key: The requested font attribute.
lang: On output, contains a reference to the matched language. The language identifier will conform to the RFC 3066bis standard.

Returns a localized attribute value based on the global language list.

This function passes back the matched language in language. If localization is not possible for the attribute, the behavior matches the value returned from AttributeValue. Generally, localization of attributes is applicable to name attributes of only a normalized font descriptor.

### 61.3.48 MatchingFontDescriptor(mandatoryAttributes() as String) as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the single preferred matching font descriptor based on the original descriptor and system precedence.
**Notes:** mandatoryAttributes: A set of attribute keys which must be identically matched in any returned font descriptors.

Returns a normalized font descriptor matching the attributes present in descriptor.

The original descriptor may be returned in normalized form. In the context of font descriptors, normalized infers that the input values were matched up with actual existing fonts, and the descriptors for those existing fonts are the returned normalized descriptors.

### 61.3.49 MatchingFontDescriptors(mandatoryAttributes() as String) as CTFontDescriptorMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of normalized font descriptors matching the provided descriptor.
**Notes:** mandatoryAttributes: A set of attribute keys that must be identically matched in any returned font descriptors.

Returns an array of normalized font descriptors matching the attributes present in descriptor.

If descriptor itself is normalized, then the array will contain only one item: the original descriptor. In the context of font descriptors, normalized infers that the input values were matched up with actual existing fonts, and the descriptors for those existing fonts are the returned normalized descriptors.

### 61.3.50 Properties

### 61.3.51 DisplayName as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The display name.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
```

```
MsgBox d.DisplayName
```

**Notes:** (Read only property)

### 61.3.52 FamilyName as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The family name.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
MsgBox d.FamilyName
```

**Notes:** (Read only property)

### 61.3.53 File as FolderItem

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The font file.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
MsgBox d.file.NativePath
```

**Notes:** (Read only property)

### 61.3.54 FontSize as Double

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The font size.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
```

```
MsgBox str(d.FontSize)
```

**Notes:** Can be zero if unknown.
(Read only property)

### 61.3.55 Name as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The PostScript name.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
MsgBox d.Name
```

**Notes:** When matching, this is treated more generically: the system first tries to find fonts with this PostScript name. If none is found, the system tries to find fonts with this family name, and, finally, if still nothing, tries to find fonts with this display name.
(Read only property)

### 61.3.56 StyleName as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The style name.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
MsgBox d.StyleName
```

**Notes:** This name represents the designer's description of the font's style.
Can be empty if unknown.
(Read only property)

### 61.3.57 URL as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The font URL.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
dim d as CTFontDescriptorMBS = f.FontDescriptor
MsgBox d.URL
```

**Notes:** (Read only property)

### 61.3.58 Constants

Font Matching State

| Constant | Value | Description |
|---|---|---|
| kCTFontDescriptorMatchingDidBegin | 0 | called once at the beginning. |
| kCTFontDescriptorMatchingDidFailWithError | 8 | called when an error occurred. (may be called multiple tim |
| kCTFontDescriptorMatchingDidFinish | 1 | called once at the end. |
| kCTFontDescriptorMatchingDidFinishDownloading | 6 | Finished downloading a descriptor. |
| kCTFontDescriptorMatchingDidMatch | 7 | called when font descriptor is matched. |
| kCTFontDescriptorMatchingDownloading | 5 | Downloading a descriptor. |
| kCTFontDescriptorMatchingStalled | 3 | called when stalled. (e.g. while waiting for server response. |
| kCTFontDescriptorMatchingWillBeginDownloading | 4 | Starts downloading a descriptor. Downloading part may be skipped if all the assets are alrea |
| kCTFontDescriptorMatchingWillBeginQuerying | 2 | called once before talking to the server. Skipped if not nec |

Formats

| Constant | Value | Description |
|---|---|---|
| kCTFontFormatBitmap | 5 | The font is a bitmap only format. |
| kCTFontFormatOpenTypePostScript | 1 | The font is an OpenType format containing PostScript data |
| kCTFontFormatOpenTypeTrueType | 2 | The font is an OpenType format containing TrueType data. |
| kCTFontFormatPostScript | 4 | The font is a recognized PostScript format. |
| kCTFontFormatTrueType | 3 | The font is a recognized TrueType format. |
| kCTFontFormatUnrecognized | 0 | The font is not a recognized format |

Orientations

| Constant | Value | Description |
|---|---|---|
| kCTFontOrientationDefault | 0 | Default |
| kCTFontOrientationHorizontal | 1 | Horizontal |
| kCTFontOrientationVertical | 2 | Vertical |

Priorities

| Constant | Value | Description |
|---|---|---|
| kCTFontPriorityComputer | 30000 | Priority of computer local fonts (located in /Library/Fonts). |
| kCTFontPriorityDynamic | 50000 | Priority of fonts registered dynamically, not located in a standard location (either kCTFontManagerScopeUser, or kCTFontManagerScopeSession). |
| kCTFontPriorityNetwork | 20000 | Priority of network fonts (located in /Network/Library/Fonts). |
| kCTFontPriorityProcess | 60000 | Priority of fonts registered for the process (kCTFontManagerScopeProcess). |
| kCTFontPrioritySystem | 10000 | Priority of system fonts (located in /System/Library/Fonts). |
| kCTFontPriorityUser | 40000 | Priority of local fonts (located in user's Library/Fonts). |

## 61.4 class CTFontMBS

### 61.4.1 class CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTFont opaque type represents a Core Text font object.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("times", 10)
MsgBox c.FullName
```

**Notes:** Font objects represent fonts to an application, providing access to characteristics of the font, such as point size, transform matrix, and other attributes. Fonts provide assistance in laying out glyphs relative to one another and are used to establish the current font when drawing in a graphics context.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo Plugins, version 21.6pr1
- Removing 32-bit Carbon GUI classes
- MBS Xojo / Real Studio Plugins, version 15.0pr11
- CoreText Completed

### 61.4.2 Methods

### 61.4.3 AdvancesForGlyphs(orientation as Integer, glyphs() as Integer) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the advances for an array of glyphs and returns the summed advance.
**Notes:** font: The font reference.
orientation
The intended drawing orientation of the glyphs. Used to determined which glyph metrics to return.
glyphs: An array of count number of glyphs.
advances: An array of count number of CGSizeMBS objects to receive the computed glyph advances. Optional.

Returns the summed glyph advance of an array of glyphs.

Individual glyph advances are passed back via the advances parameter. These are the ideal metrics for each glyph scaled and transformed in font space.
See also:

- 61.4.4 AdvancesForGlyphs(orientation as Integer, glyphs() as Integer, boundingRects() as CGSizeMBS) as Double 10868

### 61.4.4 AdvancesForGlyphs(orientation as Integer, glyphs() as Integer, boundingRects() as CGSizeMBS) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the advances for an array of glyphs and returns the summed advance.
**Notes:** font: The font reference.
orientation
The intended drawing orientation of the glyphs. Used to determined which glyph metrics to return.
glyphs: An array of count number of glyphs.
advances: An array of count number of CGSizeMBS objects to receive the computed glyph advances. Optional.

Returns the summed glyph advance of an array of glyphs.

Individual glyph advances are passed back via the advances parameter. These are the ideal metrics for each glyph scaled and transformed in font space.
See also:

- 61.4.3 AdvancesForGlyphs(orientation as Integer, glyphs() as Integer) as Double 10867

### 61.4.5 AttributeValue(key as string) as Variant

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the value associated with an arbitrary attribute of the given font.
**Notes:** key: The requested attribute.

Returns attribute value or nil if the requested attribute is not present.
Available in OS X v10.5 and later.

### 61.4.6 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.4.7 AvailableTables(options as Integer) as String()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of font table tags.
**Notes:** options: The font table options.

Returns an array of Font Table Tag Constants values for the given font and the supplied options.
Available in OS X v10.5 and later.

### 61.4.8 BoundingRectsForGlyphs(orientation as Integer, glyphs() as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the bounding rects for an array of glyphs and returns the overall bounding rectangle for the glyph run.
**Notes:** font: The font reference.
orientation: The intended drawing orientation of the glyphs. Used to determined which glyph metrics to return.
glyphs: An array of count number of glyphs.
boundingRects: Optional. On output, the computed glyph rectangles in an array of count number of CGRect objects.

Returns the overall bounding rectangle for an array or run of glyphs. Returns CGRectNull on error.

The bounding rectangles of the individual glyphs are returned through the boundingRects parameter. These are the design metrics from the font transformed in font space.
See also:

- 61.4.9 BoundingRectsForGlyphs(orientation as Integer, glyphs() as Integer, boundingRects() as CGRectMBS) as CGRectMBS 10869

### 61.4.9 BoundingRectsForGlyphs(orientation as Integer, glyphs() as Integer, boundingRects() as CGRectMBS) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the bounding rects for an array of glyphs and returns the overall bounding rectangle for the glyph run.
**Notes:** font: The font reference.
orientation: The intended drawing orientation of the glyphs. Used to determined which glyph metrics to return.
glyphs: An array of count number of glyphs.
boundingRects: Optional. On output, the computed glyph rectangles in an array of count number of CGRect objects.

Returns the overall bounding rectangle for an array or run of glyphs. Returns CGRectNull on error.

The bounding rectangles of the individual glyphs are returned through the boundingRects parameter. These are the design metrics from the font transformed in font space.
See also:

- 61.4.8 BoundingRectsForGlyphs(orientation as Integer, glyphs() as Integer) as CGRectMBS 10869

### 61.4.10 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.4.11 CreateCopyWithAttributes(size as Double, Matrix as CGAffineTransformMBS, fontAttributes as CTFontDescriptorMBS) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font with additional attributes based on the original font.
**Example:**

```
// find PostScript names for a font
const nameOfAFont = "Arial"

dim FontName as string
dim FontFamilyName as string
dim FontPostscriptName as string
dim FontPostscriptNameBold as string
dim FontPostscriptNameItalic as string

dim f as CTFontMBS = CTFontMBS.CreateWithName(nameOfAFont, 13)

if f <>nil then
FontName = f.FullName
FontFamilyName = f.FamilyName
```

```
FontPostscriptName = f.PostScriptName

dim d as CTFontDescriptorMBS = f.FontDescriptor

dim db as CTFontDescriptorMBS = CTFontDescriptorMBS.CreateCopyWithSymbolicTraits(d, CoreTextMBS.kCT-
FontTraitBold, CoreTextMBS.kCTFontTraitBold)
dim di as CTFontDescriptorMBS = CTFontDescriptorMBS.CreateCopyWithSymbolicTraits(d, CoreTextMBS.kCT-
FontTraitItalic, CoreTextMBS.kCTFontTraitItalic)

dim fb as CTFontMBS = f.CreateCopyWithAttributes(f.Size, nil, db)
dim fi as CTFontMBS = f.CreateCopyWithAttributes(f.Size, nil, di)

FontPostscriptNameBold = fb.PostScriptName
FontPostscriptNameItalic = fi.PostScriptName

end if

Break // read names in debugger
```

**Notes:** size: The point size for the font reference. If 0.0 is specified, the original font,Äôs size is preserved.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil is specified, the original font's matrix is preserved.
fontAttributes: A font descriptor containing additional attributes that the new font should contain.

Returns a new font reference converted from the original with the specified attributes.

This function provides a mechanism to change attributes quickly on a given font reference in response to user actions. For instance, the size can be changed in response to a user manipulating a size slider.
Available in OS X v10.5 and later.

### 61.4.12 CreateForString(text as string, location as Integer, length as Integer) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font reference that can best map the given string range based on the current font.
**Notes:** string: A unicode string containing characters that cannot be encoded by the current font.
location and length: The range of the string that needs to be mapped.

Returns the best substitute font from the cascade list of the current font that can encode the specified string range. If the current font is capable of encoding the string range, then it is retained and returned.

### 61.4.13 CreatePathForGlyph(glyph as Integer, transform as CGAffineTransformMBS) as CGPathMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a path for the specified glyph.
**Notes:** glyph: The glyph.
transform: An affine transform applied to the path. Can be nil. If nil, CGAffineTransformIdentity is used.

Returns a CGPath object containing the glyph outlines, nil on error. Must be released by caller.

Creates a path from the outlines of the glyph for the specified font. The path reflects the font point size, matrix, and transform parameter, applied in that order. The transform parameter is most commonly be used to provide a translation to the desired glyph origin.

### 61.4.14 CreateUIFontForLanguage(Type as Integer, size as Double = 0.0, language as string = "") as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the special user-interface font for the given language and user-interface type.
**Notes:** Type: A constant specifying the intended user-interface use for the requested font reference. See Enumerations for possible values.
size: The point size for the font reference. If 0.0 is specified, the default size for the requested user-interface type is used.
language: Language specifier string to select a font for a particular localization. If "" is specified, the current system language is used. The format of the language identifier should conform to the RFC 3066bis standard.

Returns the correct font for various user-interface uses.
The only required parameter is the Type selector; the other parameters have default values.

### 61.4.15 CreateWithFamily(size as Double, Matrix as CGAffineTransformMBS, family as string) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font in the specified family based on the traits of the original font.
**Notes:** size: The point size for the font reference. If 0.0 is specified, the original font,Äôs size is preserved.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil is specified, the original font's matrix is preserved.
family: The name of the desired family.

Returns a new font reference with the original traits in the given family, or nil if none is found in the system. Available in OS X v10.5 and later.

### 61.4.16 CreateWithFontDescriptor(descriptor as CTFontDescriptorMBS, size as Double = 0.0, matrix as CGAffineTransformMBS = nil, options as Integer = 0) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font reference that best matches the given font descriptor.
**Notes:** descriptor: A font descriptor containing attributes that specify the requested font.
size: The point size for the font reference. If 0.0 is specified, the default font size of 12.0 is used. This parameter is optional.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil is specified, the identity matrix is used. This parameter is optional.

Returns a CTFontMBS that best matches the attributes provided with the font descriptor.

The size and matrix parameters override any specified in the font descriptor unless they are unspecified (0.0 for size and NULL for matrix). A best match font is always returned, and default values are used for any unspecified parameters.

### 61.4.17 CreateWithGraphicsFont(graphicsFont as CGFontMBS, size as Double = 0.0, matrix as CGAffineTransformMBS = nil, attributeValues as CTFontDescriptorMBS = nil) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a new font reference from an existing Core Graphics font reference.
**Notes:** graphicsFont: A valid Core Graphics font reference.
size: The point size for the font reference. If 0.0 is specified the default font size of 12.0 is used.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil, the identity matrix is used. Optional.
attributes: Additional attributes that should be matched. Optional.

Returns a new font reference for an existing CGFontRef object with the specified size, matrix, and additional attributes.

### 61.4.18 CreateWithName(name as string, size as Double = 0.0, matrix as CGAffineTransformMBS = nil, options as Integer = 0) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font reference for the given name.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.FullName
```

**Notes:** name: The font name for which you wish to create a new font reference. A valid PostScript name is preferred, although other font name types are matched in a fallback manner.
size: The point size for the font reference. If 0.0 is specified, the default font size of 12.0 is used. This parameter is optional.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil is specified, the identity matrix is used. This parameter is optional.

Returns a CTFontRef that best matches the name provided with size and matrix attributes.

The name parameter is the only required parameter, and default values are used for unspecified parameters (0.0 for size and nil for matrix). If all parameters cannot be matched identically, a best match is found.

### 61.4.19 CreateWithPlatformFont(ATSFontHandle as Integer, size as Double = 0.0, matrix as CGAffineTransformMBS = nil, attributeValues as CTFontDescriptorMBS = nil) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new font reference from an ATS font reference.
**Notes:** ATSFontHandle: A valid ATSFontRef object.
size: The point size for the font reference. If 0.0 is specified the default font size of 12.0 is used.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil, the identity matrix is used. Optional.
attributes: A CTFontDescriptorMBS containing additional attributes that should be matched. Optional.

Returns a new font reference for an ATSFontRef with the specified size, matrix, and additional attributes.

### 61.4.20 CreateWithSymbolicTraits(size as Double, Matrix as CGAffineTransformMBS, symTraitValue as Integer, symTraitMask as Integer) as CTFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a new font in the same font family as the original with the specified symbolic traits.
**Example:**

```
dim helveticaBold as CTFontMBS = CTFontMBS.CreateWithName("Helvetica-Bold", 12)
MsgBox helveticaBold.FullName

// now create similar fonts with

dim Trait as Integer = CoreTextMBS.kCTFontTraitItalic
dim TraitMask as Integer = CoreTextMBS.kCTFontTraitItalic+CoreTextMBS.kCTFontTraitBold

dim helveticaItalic as CTFontMBS = helveticaBold.CreateWithSymbolicTraits(12, nil, Trait, TraitMask)
MsgBox helveticaItalic.FullName
```

**Notes:** size: The point size for the font reference. If 0.0 is specified, the original font,Äôs size is preserved.
matrix: The transformation matrix for the font. In most cases, set this parameter to be nil. If nil is specified, the original font's matrix is preserved.
symTraitValue: The value of the symbolic traits.
symTraitMask: The mask bits of the symbolic traits.

Returns a new font reference in the same family with the given symbolic traits. or nil if none is found in the system.

Available in OS X v10.5 and later.

### 61.4.21 DefaultCascadeListForLanguages(languagePrefList() as string) as String()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Return an ordered list of CTFontDescriptorMBS's for font fallback derived from the system default fallback region according to the given language preferences.
**Notes:** The style of the given is also matched as well as the weight and width of the font is not one of the system UI font, otherwise the UI font fallback is applied.

languagePrefList: The language preference list - ordered array of CFStringRef's of ISO language codes.

The ordered list of fallback fonts - ordered array of CTFontDescriptors.

### 61.4.22 Draw(glyphs() as Integer, positions() as CGPointMBS, context as CGContextMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Renders the given glyphs of a font at the specified positions in the supplied graphics context.
**Notes:** font: The font with glyphs to render. If the font has a size or matrix attribute, context is set with these values.
glyphs: The glyphs to be rendered. The glyphs should be the result of proper Unicode text layout operations (such as with CTLine). Functions such as CTFontMBS.GetGlyphsForCharacters do not perform any Unicode text layout.
positions: The positions (origins) for each glyph in glyphs. The positions are in user space. The number of positions passed in must match the number of glyphs (in glyphs).
context: The graphics context used to render the glyphs.

This function modifies graphics state including font, text size, and text matrix if these attributes are specified in font. These attributes are not restored.

Available in OS X v10.7 and later.

### 61.4.23 Features as Dictionary()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of font features.
**Notes:** Returns an array of font feature dictionaries for the font reference.

### 61.4.24 FeatureSettings as Dictionary()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of font feature-setting tuples.
**Notes:** Returns a normalized array of font feature-setting dictionaries. The array contains only the non-default settings that should be applied to the font, or nil if the default settings should be used.

A feature-setting dictionary is a tuple of a kCTFontFeatureTypeIdentifierKey key-value pair and a kCTFontFeatureSelectorIdentifierKey key-value pair. Each setting dictionary indicates which setting is enabled. It is the caller's responsibility to handle exclusive and nonexclusive settings as necessary.

The feature settings are verified against those that the font supports and any that do not apply are removed. Further, feature settings that represent a default setting for the font are also removed.

### 61.4.25 GlyphsForCharacters(characters() as Integer) as Integer()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Provides basic Unicode encoding for the given font, returning by reference an array of CGGlyph values corresponding to a given array of Unicode characters for the given font.
**Notes:** If a glyph could not be encoded, a value of 0 is passed back at the corresponding index in the glyphs array and the function returns False. It is the responsibility of the caller to handle the Unicode properties of the input characters.

### 61.4.26 GlyphWithName(name as string) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the CGGlyph value for the specified glyph name in the given font.
**Notes:** Name: The glyph name as a CFString object.

Returns the glyph value for the named glyph as a CGGlyph object, or if the glyph name is not recognized, the .notdef glyph index value.
The returned CGGlyph object can be used with any of the subsequent glyph data accessors or directly with Core Graphics.

### 61.4.27 GraphicsFont(byref fontAttributes as CTFontDescriptorMBS) as CGFontMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a Core Graphics font reference and attributes.
**Notes:** attributes: On output, points to a font descriptor containing additional attributes from the font.

Returns a CGFontMBS object for the given font reference.

### 61.4.28 kCTBaselineClassHanging as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Hanging baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Hanging baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.29 kCTBaselineClassIdeographicCentered as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Ideographic Centered baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Ideographic Centered baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.30 kCTBaselineClassIdeographicHigh as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Ideographic High baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Ideographic High baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.31 kCTBaselineClassIdeographicLow as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Ideographic Low baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Ideographic Low baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.32 kCTBaselineClassMath as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Math baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Math baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.33 kCTBaselineClassRoman as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference the Roman baseline class.
**Notes:** This key can be used with a baseline info dictionary to offset to the Roman baseline as a float. It can also be used as the value for kCTBaselineClassAttributeName.

### 61.4.34 kCTBaselineOriginalFont as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Use the original font for setting the reference baseline.
**Notes:** This constant can be used as the value for kCTBaselineReferenceFont to specify that the original font should be used for the reference baseline.

### 61.4.35 kCTBaselineReferenceFont as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Key to reference a font for the reference baseline.
**Notes:** This key can be used to specify a font for the reference baseline. The value is a CTFontMBS or the kCTBaselineOriginalFont constant.

### 61.4.36 kCTFontCopyrightNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the copyright name.

### 61.4.37 kCTFontDescriptionNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the description name.

### 61.4.38 kCTFontDesignerNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the designer name.

### 61.4.39 kCTFontDesignerURLNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the vendor URL name.

### 61.4.40 kCTFontFamilyNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the family name.

### 61.4.41 kCTFontFeatureSelectorDefaultKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to be used with a selector dictionary to get the default indicator for the selector. This value is a boolean, which if present and true, indicates that this selector is the default setting for the current feature type.

### 61.4.42 kCTFontFeatureSelectorIdentifierKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to be used with a selector dictionary corresponding to a feature type to obtain the selector identifier value as a number.

### 61.4.43 kCTFontFeatureSelectorNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to be used with a selector dictionary to get the localized name string for the selector as a string.

### 61.4.44 kCTFontFeatureSelectorSettingKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to be used with a selector dictionary to get or specify the current setting for the selector. This value is a Boolean to indicate whether this selector is on or off. If this key is not present, the default setting is used.

### 61.4.45 kCTFontFeatureTypeExclusiveKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to get the font feature exclusive setting of the feature as a Boolean. The value associated with this key indicates whether the feature selectors associated with this type should be mutually exclusive.

### 61.4.46 kCTFontFeatureTypeIdentifierKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to get the font feature type value as a number.

### 61.4.47 kCTFontFeatureTypeNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to get the localized font feature type name as a string.

### 61.4.48 kCTFontFeatureTypeSelectorsKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font feature dictionary values.
**Notes:** Key to get the the array of font feature selectors as an array. This is an array of selector dictionaries that contain the values for the font feature selector keys listed in this group.

### 61.4.49 kCTFontFullNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the full name.

### 61.4.50 kCTFontLicenseNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the license name.

### 61.4.51 kCTFontLicenseURLNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the license URL name.

### 61.4.52 kCTFontManufacturerNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the manufacturer name.

### 61.4.53 kCTFontPostScriptCIDNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the PostScript character identifier (CID) font name.

### 61.4.54 kCTFontPostScriptNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the PostScript name.

### 61.4.55 kCTFontSampleTextNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the sample text name string.

### 61.4.56 kCTFontStyleNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the style name.

### 61.4.57 kCTFontSubFamilyNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the subfamily name.

### 61.4.58 kCTFontTrademarkNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the trademark name.

### 61.4.59 kCTFontUniqueNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the unique name.

### 61.4.60 kCTFontVariationAxisDefaultValueKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font variation axis dictionary.
**Notes:** Key to get the variation axis default value as a number.

### 61.4.61 kCTFontVariationAxisIdentifierKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font variation axis dictionary.
**Notes:** Key to get the variation axis identifier value as a number.

### 61.4.62 kCTFontVariationAxisMaximumValueKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font variation axis dictionary.
**Notes:** Key to get the variation axis maximum value as a number.

### 61.4.63 kCTFontVariationAxisMinimumValueKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font variation axis dictionary.
**Notes:** Key to get the variation axis minimum value as a number.

### 61.4.64 kCTFontVariationAxisNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the keys to font variation axis dictionary.
**Notes:** Key to get the localized variation axis name string.

### 61.4.65 kCTFontVendorURLNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the vendor URL name.

### 61.4.66 kCTFontVersionNameKey as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the name specifier constants provide access to the different names associated with a font.
**Notes:** The name specifier for the version name.

### 61.4.67 LigatureCaretPositions(glyph as Integer) as Double()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns caret positions within a glyph.
**Notes:** glyph: A reference to the glyph.

This function is used to obtain caret positions for a specific glyph. The return value is the maximum number of positions possible, and the function will populate the caller's positions buffer with available positions if possible. This function might not be able to produce positions if the font does not have the appropriate data, in which case it will return 0.

### 61.4.68 Name(nameKey as string) as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a reference to the requested name of the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.name(CTFontMBS.kCTFontFullNameKey)
```

**Notes:** nameKey: The name specifier. See Name Specifier Constants for possible values.

Returns The requested name for the font, or "" if the font does not have an entry for the requested name. The Unicode version of the name is preferred, otherwise the first available version is returned.
See also:

- 61.4.69 Name(nameKey as string, byref language as string) as String 10886

### 61.4.69 Name(nameKey as string, byref language as string) as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a reference to a localized name for the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
dim lang as string
MsgBox c.name(CTFontMBS.kCTFontFullNameKey, lang)+EndOfLine+lang
// shows name and "en" as language.
```

**Notes:** nameKey: The name specifier. See Name Specifier Constants for possible values.
language: On output, points to the language string of the returned name string. The format of the language identifier conforms to the RFC 3066bis standard.

Returns a specific localized name from the font reference or "" if the font does not have an entry for the requested name key.

The name is localized based on the user's global language preference precedence. That is, the user,Äôs language preference is a list of languages in order of precedence. So, for example, if the list had Japanese and English, in that order, then a font that did not have Japanese name strings but had English strings would return the English strings.

Available in OS X v10.5 and later.
See also:

- 61.4.68 Name(nameKey as string) as String 10885

### 61.4.70 OpticalBoundsForGlyphs(glyphs() as Integer, boundingRects() as CGRectMBS, options as Integer = 0) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the optical bounding rects for an array of glyphs and returns the overall optical bounding rect for the run.
**Notes:** Fonts may specify the optical edges of glyphs that can be used to make the edges of lines of text line up in a more visually pleasing way. This function returns bounding rects corresponding to this information if present in a font, otherwise it returns typographic bounding rects (composed of the font's ascent and descent and a glyph's advance width).

font: The font reference.
glyphs: An array of count number of glyphs.
boundingRects: An array of count number of CGRects to receive the computed glyph rects. Can be nil, in

which case only the overall bounding rect is calculated.
options: Reserved, set to zero.

This function returns the overall bounding rectangle for an array or run of glyphs. The bounding rects of the individual glyphs are returned through the boundingRects parameter. These are the design metrics from the font transformed in font space.
See also:

- 61.4.71 OpticalBoundsForGlyphs(glyphs() as Integer, options as Integer = 0) as CGRectMBS 10887

### 61.4.71 OpticalBoundsForGlyphs(glyphs() as Integer, options as Integer = 0) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the optical bounding rects for an array of glyphs and returns the overall optical bounding rect for the run.
**Notes:** Fonts may specify the optical edges of glyphs that can be used to make the edges of lines of text line up in a more visually pleasing way. This function returns bounding rects corresponding to this information if present in a font, otherwise it returns typographic bounding rects (composed of the font's ascent and descent and a glyph's advance width).

font: The font reference.
glyphs: An array of count number of glyphs.
boundingRects: An array of count number of CGRects to receive the computed glyph rects. Can be nil, in which case only the overall bounding rect is calculated.
options: Reserved, set to zero.

This function returns the overall bounding rectangle for an array or run of glyphs. The bounding rects of the individual glyphs are returned through the boundingRects parameter. These are the design metrics from the font transformed in font space.
See also:

- 61.4.70 OpticalBoundsForGlyphs(glyphs() as Integer, boundingRects() as CGRectMBS, options as Integer = 0) as CGRectMBS 10886

### 61.4.72 PlatformFont(byref fontAttributes as CTFontDescriptorMBS) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns an ATS font reference and attributes.

### 61.4.73 SupportedLanguages as String()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of languages supported by the font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox Join(c.SupportedLanguages,EndOfLine)
```

### 61.4.74 Table(table as string, options as Integer) as Memoryblock

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a reference to the font table data.
**Notes:** table: The font table identifier as a Font Table Tag Constants constant. See Font Table Tag Constants for possible values.
options: The font table options.

Returns a retained reference to the font table data as a Memoryblock.

### 61.4.75 VariationAxes as Dictionary()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of variation axes.
**Notes:** An array of variation axes dictionaries. Each variation axis dictionary contains the five variation axis keys listed in Font Variation Axis Dictionary Keys.

### 61.4.76 VerticalTranslationsForGlyphs(glyphs() as Integer) as CGSizeMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the offset from the default (horizontal) origin to the vertical origin for an array of glyphs.
**Notes:** glyphs: An array of count number of glyphs.
Returns the computed origin offsets in an array of count number of CGSizeMBS objects.

### 61.4.77 Properties

### 61.4.78 Ascent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled font-ascent metric of the given font.
**Notes:** The font-ascent metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.79 BoundingBox as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled bounding box of the given font.
**Notes:** The design bounding box of the font, which is the rectangle defined by xMin, yMin, xMax, and yMax values for the font. Returns CGRectNull on error.
(Read only property)

### 61.4.80 CapHeight as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the cap-height metric of the given font.
**Notes:** The font cap-height metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.81 CharacterSet as Variant

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the Unicode character set of the font.
**Notes:** Value is a CFCharacterSetMBS object.
The returned character set covers the nominal referenced by the font's Unicode 'cmap,Äô table.
(Read only property)

### 61.4.82 Descent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled font-descent metric of the given font.

**Notes:** The font-descent metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.83 DisplayName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the display name of the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.DisplayName
```

**Notes:** (Read only property)

### 61.4.84 FamilyName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the family name of the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.FamilyName
```

**Notes:** (Read only property)

### 61.4.85 File as FolderItem

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The font file.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
MsgBox f.file.NativePath
```

**Notes:** (Read only property)

### 61.4.86 FontDescriptor as CTFontDescriptorMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the normalized font descriptor for the given font reference.
**Notes:** A normalized font descriptor for a font containing enough information to recreate this font at a later time.
(Read only property)

### 61.4.87 FullName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the full name of the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.FullName
```

**Notes:** (Read only property)

### 61.4.88 GlyphCount as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the number of glyphs of the given font.
**Notes:** (Read only property)

### 61.4.89 Leading as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled font-leading metric of the given font.
**Notes:** The font-leading metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.90 Matrix as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the transformation matrix of the given font.
**Notes:** The transformation matrix for the given font reference. This is the matrix that was provided when the font was created.
(Read only property)

### 61.4.91 PostScriptName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the PostScript name of the given font.
**Example:**

```
dim c as CTFontMBS = CTFontMBS.CreateWithName("Times", 12)
MsgBox c.PostScriptName
```

**Notes:** (Read only property)

### 61.4.92 Size as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the point size of the given font.
**Notes:** This is the point size provided when the font was created.
(Read only property)

### 61.4.93 SlantAngle as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the slant angle of the given font.
**Notes:** The transformed slant angle of the font. This is equivalent to the italic or caret angle with any skew from the transformation matrix applied.
(Read only property)

### 61.4.94 StringEncoding as UInt32

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the best string encoding for legacy format support.
**Notes:** The best string encoding for the font.

(Read only property)

### 61.4.95 SymbolicTraits as UInt32

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the symbolic traits of the given font.
**Notes:** The symbolic traits of the font. This is equivalent to the kCTFontSymbolicTrait value of the traits dictionary.
(Read only property)

### 61.4.96 Traits as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the traits dictionary of the given font.
**Notes:** A retained reference to the font traits dictionary. Individual traits can be accessed with the trait key constants.
(Read only property)

### 61.4.97 UnderlinePosition as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled underline position of the given font.
**Notes:** The font underline-position metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.98 UnderlineThickness as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the scaled underline-thickness metric of the given font.
**Notes:** The font underline-thickness metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.99 UnitsPerEm as UInt64

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the units-per-em metric of the given font.
**Notes:** (Read only property)

### 61.4.100 URL as String

MBS MacCG Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The font URL.
**Example:**

```
dim f as CTFontMBS = CTFontMBS.CreateWithName("Times")
MsgBox f.URL
```

**Notes:** (Read only property)

### 61.4.101 Variation as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns a variation dictionary from the font reference.
**Notes:** The keys for each variation correspond to the variation identifier obtained via kCTFontVariation-AxisIdentifierKey, which represents the four-character axis code as a number.
(Read only property)

### 61.4.102 XHeight as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the x-height metric of the given font.
**Notes:** The font x-height metric scaled according to the point size and matrix of the font reference.
(Read only property)

### 61.4.103 Constants

Font Option Constants

| Constant | Value | Description |
|---|---|---|
| kCTFontOptionsDefault | 0 | Default options are used.<br>Available in OS X v10.6 and later. |
| kCTFontOptionsPreferSystemFont | 4 | Font matching prefers to match Apple system fonts.<br>Available in OS X v10.6 and later. |
| kCTFontOptionsPreventAutoActivation | 1 | Prevents automatic font activation.<br>Available in OS X v10.6 and later. |

Font Table Tag Constants

| Constant | Value | Description |
|---|---|---|
| kCTFontTableAcnt | "acnt" | Font table tag for accent attachment. |
| kCTFontTableAnkr | "ankr" | Anchor points |
| kCTFontTableAvar | "avar" | Font table tag for axis variation. |
| kCTFontTableBASE | "BASE" | Font table tag for the font baseline. |
| kCTFontTableBdat | "bdat" | Font table tag for bitmap data. |
| kCTFontTableBhed | "bhed" | Font table tag for bitmap font header. |
| kCTFontTableBloc | "bloc" | Font table tag for bitmap location. |
| kCTFontTableBsln | "bsln" | Font table tag for baseline. |
| kCTFontTableCFF | "CFF " | Font table tag for a PostScript font program. |
| kCTFontTableCmap | "cmap" | Font table tag for character-to-glyph mapping. |
| kCTFontTableCvar | "cvar" | Font table tag for control value variation, or CVT variation. |
| kCTFontTableCvt | "cvt " | Font table tag for control value table. |
| kCTFontTableDSIG | "DSIG" | Font table tag for a digital signature. |
| kCTFontTableEBDT | "EBDT" | Font table tag for an embedded bitmap. |
| kCTFontTableEBLC | "EBLC" | Font table tag for the embedded bitmap location. |
| kCTFontTableEBSC | "EBSC" | Font table tag for embedded bitmap scaling. |
| kCTFontTableFdsc | "fdsc" | Font table tag for font descriptor. |
| kCTFontTableFeat | "feat" | Font table tag for layout feature. |
| kCTFontTableFmtx | "fmtx" | Font table tag for font metrics. |
| kCTFontTableFpgm | "fpgm" | Font table tag for font program. |
| kCTFontTableFvar | "fvar" | Font table tag for font variation. |
| kCTFontTableGasp | "gasp" | Font table tag for grid-fitting/scan-conversion. |
| kCTFontTableGDEF | "GDEF" | Font table tag for glyph definition. |
| kCTFontTableGlyf | "glyf" | Font table tag for glyph data. |
| kCTFontTableGPOS | "GPOS" | Font table tag for glyph positioning. |
| kCTFontTableGSUB | "GSUB" | Font table tag for glyph substitution. |
| kCTFontTableGvar | "gvar" | Font table tag for glyph variation. |
| kCTFontTableHdmx | "hdmx" | Font table tag for horizontal device metrics. |
| kCTFontTableHead | "head" | Font table tag for font header. |
| kCTFontTableHhea | "hhea" | Font table tag for horizontal header. |
| kCTFontTableHmtx | "hmtx" | Font table tag for horizontal metrics. |
| kCTFontTableHsty | "hsty" | Font table tag for horizontal style. |
| kCTFontTableJSTF | "JSTF" | Font table tag for justification. |
| kCTFontTableJust | "just" | Font table tag for justification. |
| kCTFontTableKern | "kern" | Font table tag for kerning. |
| kCTFontTableKerx | "kerx" | Font table tag for extended kerning. |
| kCTFontTableLcar | "lcar" | Font table tag for ligature caret. |
| kCTFontTableLoca | "loca" | Font table tag for index to location. |
| kCTFontTableLtag | "ltag" | Language tags |
| kCTFontTableLTSH | "LTSH" | Font table tag for linear threshold. |
| kCTFontTableMaxp | "maxp" | Font table tag for maximum profile. |
| kCTFontTableMort | "mort" | Font table tag for morph. |
| kCTFontTableMorx | "morx" | Font table tag for extended morph. |
| kCTFontTableName | "name" | Font table tag for naming table. |
| kCTFontTableOpbd | "opbd" | Font table tag for optical bounds. |
| kCTFontTableOS2 | "OS/2" | Font table tag for OS/2 and Windows-specific metrics. |
| kCTFontTablePCLT | "PCLT" | Font table tag for PCL 5 data. |
| kCTFontTablePost | "post" | Font table tag for PostScript information. |
| kCTFontTablePrep | "prep" | Font table tag for control value program, 'prep' table. |
| kCTFontTableProp | "prop" | Font table tag for properties. |
| kCTFontTableSbit | "sbit" | Font table tag for bitmap data.<br>Available in OS X v10.7 and later. |
| kCTFontTableSbix | "sbix" | Font table tag for extended bitmap data.<br>Available in OS X v10.7 and later. |
| kCTFontTableTrak | "trak" | Font table tag for tracking. |
| kCTFontTableVDMX | "VDMX" | Font table tag for vertical device metrics. |
| kCTFontTableVhea | "vhea" | Font table tag for vertical header. |
| kCTFontTableVmtx | "vmtx" | Font table tag for vertical metrics. |

Font Table Option Constants

| Constant | Value | Description |
|---|---|---|
| kCTFontTableOptionExcludeSynthetic | 1 | The font table excludes synthetic font data.<br>Available in OS X v10.5 and later.<br>Deprecated in OS X v10.8. |
| kCTFontTableOptionNoOptions | 0 | No font table options are specified. |

User Interface Type Constants

| Constant | Value | Description |
|---|---|---|
| kCTFontUIFontAlertHeader | 18 | The font used for alert headers. |
| kCTFontUIFontApplication | 9 | The default font for text documents. |
| kCTFontUIFontControlContent | 26 | The font used for contents of user-interface controls. |
| kCTFontUIFontEmphasizedSystem | 3 | The system font used for emphasis in alerts. |
| kCTFontUIFontEmphasizedSystemDetail | 20 | The system font used for emphasis in details. |
| kCTFontUIFontLabel | 10 | The font used for labels and tick marks on full-size sliders. |
| kCTFontUIFontMenuItem | 12 | The font used for menu items. |
| kCTFontUIFontMenuItemCmdKey | 14 | The font used for menu-item command-key equivalents. |
| kCTFontUIFontMenuItemMark | 13 | The font used to draw menu item marks. |
| kCTFontUIFontMenuTitle | 11 | The font used for menu titles. |
| kCTFontUIFontMessage | 23 | The font used for standard interface items, such as button labels, mer<br>and so on. |
| kCTFontUIFontMiniEmphasizedSystem | 7 | The small system font used for emphasis. |
| kCTFontUIFontMiniSystem | 6 | The standard small system font used for informative text in alerts,<br>headings in lists, help tags, and small controls. |
| kCTFontUIFontNone | -1 | The user-interface font type is not specified. |
| kCTFontUIFontPalette | 24 | The font used in tool palettes. |
| kCTFontUIFontPushButton | 16 | The font used for a push button (a rounded rectangular button wit<br>label on it). |
| kCTFontUIFontSmallEmphasizedSystem | 5 | The system font used for emphasis in alerts. |
| kCTFontUIFontSmallSystem | 4 | The standard small system font used for informative text in alerts,<br>headings in lists, help tags, and small controls. |
| kCTFontUIFontSmallToolbar | 22 | The small font used for labels of toolbar items. |
| kCTFontUIFontSystem | 2 | The system font used for standard user-interface items such as butto<br>menu items, and so on. |
| kCTFontUIFontSystemDetail | 19 | The standard system font used for details. |
| kCTFontUIFontToolbar | 21 | The font used for labels of toolbar items. |
| kCTFontUIFontToolTip | 25 | The font used for tool tips. |
| kCTFontUIFontUser | 0 | The font used by default for documents and other text under the<br>control (that is, text whose font the user can normally change). |
| kCTFontUIFontUserFixedPitch | 1 | The font used by default for documents and other text under the<br>control when that font is fixed-pitch.<br>Available in OS X v10.5 and later. |
| kCTFontUIFontUtilityWindowTitle | 17 | The font used for utility window titles. |
| kCTFontUIFontViews | 8 | The view font used as the default font of text in lists and tables. |
| kCTFontUIFontWindowTitle | 15 | The font used for utility window titles. |

## 61.5 class CTFrameMBS

### 61.5.1 class CTFrameMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTFrame opaque type represents a frame containing multiple lines of text.
**Example:**

```
dim longText as string = "Lorem ipsum dolor sit amet..."

dim ct as new CFStringMBS(longText)
dim s as new CFAttributedStringMBS(ct, nil)

// layout master
dim framesetter as CTFramesetterMBS = CTFramesetterMBS.CreateWithAttributedString(s)

// a column
dim ColumnPath as new CGMutablePathMBS
dim Rect as new CGRectMBS(0, 0, g.Width, g.Height)
ColumnPath.AddRect nil, Rect

// context
#If XojoVersion >= 2019.02 Then
Dim CGContextHandle As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim CGContext As CGContextMBS = CGContextMBS.contextWithCGContext(CGContextHandle)
#Else
Dim CGContextHandle As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim CGContext As CGContextMBS = CGContextMBS.contextWithCGContext(CGContextHandle)
#EndIf

CGContext.SaveGState
// reset text matrix
dim a as CGAffineTransformMBS = CGAffineTransformMBS.Identity
CGContext.TextMatrix = a

dim Frame as CTFrameMBS = framesetter.CreateFrame(0, 0, ColumnPath, nil)

// draw
Frame.Draw(CGContext)

// cleanup
CGContext.RestoreGState
CGContext.Flush
```

**Notes:** The frame object is the output resulting from the text-framing process performed by a framesetter

object.

You can draw the entire text frame directly into the current graphic context. The frame object contains an array of line objects that can be retrieved for individual rendering or to get glyph information.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.5.2 Methods

### 61.5.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.5.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.5.5 Draw(context as CGContextMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Draws an entire frame into a context.
**Notes:** context: The context in which to draw the frame.

If both the frame and the context are valid, the frame is drawn in the context. This call can leave the context in any state and does not flush it after the draw operation.

### 61.5.6 kCTFrameClippingPathsAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the attributes keys.
**Notes:** Specifies array of paths to clip frame.

The value must be a array containing dictionaries. Each dictionary should have a kCTFramePathClipping-PathAttributeName key-value pair, and can have a kCTFramePathFillRuleAttributeName key-value pair and kCTFramePathFillRuleAttributeName key-value pair as optional parameters.
Available in OS X v10.7 and later.

### 61.5.7 kCTFramePathClippingPathAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the attributes keys.
**Notes:** Specifies clipping path. This attribute is valid only in a dictionary contained in an array specified by kCTFrameClippingPathsAttributeName.

The value must be a CGPathMBS specifying a clipping pat. See kCTFrameClippingPathsAttributeName.
Available in OS X v10.7 and later.

### 61.5.8 kCTFramePathFillRuleAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The key used to specify the fill rule for a frame.
**Notes:** he value must be a CFNumberRef object containing a CTFramePathFillRule constant. See CT-FramePathFillRule Constants for more information. The default value is kCTFramePathFillEvenOdd.
Available in OS X v10.7 and later.

### 61.5.9 kCTFramePathWidthAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the attributes keys.
**Notes:** The key used to specify the frame width.
The value must be a number containing a value specifying the frame width. The default width value is zero.
Available in OS X v10.7 and later.

### 61.5.10 kCTFrameProgressionAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the attributes keys.

**Notes:** Specifies progression for a frame.
A number containing a CTFrameProgression constant. The default is kCTFrameProgressionTopToBottom. Available in OS X v10.5 and later.

This value determines the line-stacking behavior for a frame and does not affect the appearance of the glyphs within that frame.

### 61.5.11 LineOrigins(location as Integer, length as Integer) as CGPointMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a range of line origins for a frame.
**Notes:** location and length: The range of line origins you wish to copy. If the length of the range is 0, then the copy operation continues from the start index of the range to the last line origin.

Returns array with CGPoints. Empty array in case of errors.

Special Considerations
In versions of OS X prior to 10.7 and versions of iOS prior to 4.2, this function may function unpredictably if the frame is not rectangular.

### 61.5.12 Lines as CTLineMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an array of lines stored in the frame.

### 61.5.13 Properties

### 61.5.14 FrameAttributes as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the frame attributes used to create the frame.
**Notes:** Returns a reference to a CFDictionary object containing the frame attributes that were used to create the frame, or, if the frame was created without any frame attributes, nil.

You can create a frame with an attributes dictionary to control various aspects of the framing process. These attributes are different from the ones used to create an attributed string.
(Read only property)

### 61.5.15 Path as CGPathMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the path used to create the frame.
**Notes:** (Read only property)

### 61.5.16 StringRangeLength as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the range of characters originally requested to fill the frame.
**Notes:** (Read only property)

### 61.5.17 StringRangeLocation as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the range of characters originally requested to fill the frame.
**Notes:** (Read only property)

### 61.5.18 VisibleStringRangeLength as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the range of characters that actually fit in the frame.
**Notes:** This function can be used to cascade frames, because it returns the range of characters that can be seen in the frame. The next frame would start where this frame ends.
(Read only property)

### 61.5.19 VisibleStringRangeLocation as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the range of characters that actually fit in the frame.
**Notes:** This function can be used to cascade frames, because it returns the range of characters that can be seen in the frame. The next frame would start where this frame ends.
(Read only property)

### 61.5.20 Constants

Fill rules

| Constant | Value | Description |
|---|---|---|
| kCTFramePathFillEvenOdd | 0 | Text is filled in the area that would be painted if the path were given CGContextMBS.EOFillPath.<br>Available in OS X v10.7 and later. |
| kCTFramePathFillWindingNumber | 1 | Text is fill in the area that would be painted if the path were given to CGC textMBS.FillPath.<br>Available in OS X v10.7 and later. |

Frame Progression Types

| Constant | Value | Description |
|---|---|---|
| kCTFrameProgressionLeftToRight | 2 | Lines are stacked left to right for vertical text.<br>The lines of text within a frame may be stacked for either horizontal or vert text. Values are enumerated for each stacking type supported by CTFra Frames created with a progression type specifying vertical text rotate lines degrees counterclockwise when drawing. |
| kCTFrameProgressionRightToLeft | 1 | Lines are stacked right to left for vertical text.<br>The lines of text within a frame may be stacked for either horizontal or vert text. Values are enumerated for each stacking type supported by CTFra Frames created with a progression type specifying vertical text rotate lines degrees counterclockwise when drawing. |
| kCTFrameProgressionTopToBottom | 0 | Lines are stacked top to bottom for horizontal text.<br>The lines of text within a frame may be stacked for either horizontal or vert text. Values are enumerated for each stacking type supported by CTFra Frames created with a progression type specifying vertical text rotate lines degrees counterclockwise when drawing. |

## 61.6 class CTFramesetterMBS

### 61.6.1 class CTFramesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTFramesetter opaque type is used to generate text frames. That is, CTFramesetter is an object factory for CTFrame objects.
**Notes:** The framesetter takes an attributed string object and a shape descriptor object and calls into the typesetter to create line objects that fill that shape. The output is a frame object containing an array of lines. The frame can then draw itself directly into the current graphic context.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.6.2 Methods

### 61.6.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.6.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.6.5 CreateFrame(location as Integer, length as Integer, path as CGPathMBS, frameAttributes as dictionary = nil) as CTFrameMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable frame using a framesetter.
**Notes:** location and length: The range, of the attributed string that was used to create the framesetter, that is to be typeset in lines fitted into the frame. If the length portion of the range is set to 0, then the framesetter continues to add lines until it runs out of text or space.
path: A CGPath object that specifies the shape of the frame. The path may be non-rectangular in versions of OS X v10.7 or later and versions of iOS 4.2 or later.

frameAttributes: Additional attributes that control the frame filling process can be specified here, or nil if there are no such attributes.

Returns a reference to a new CTFrame object if the call was successful; otherwise, nil.

This call creates a frame full of glyphs in the shape of the path provided by the path parameter. The framesetter continues to fill the frame until it either runs out of text or it finds that text no longer fits.

Special Considerations
In versions of OS X prior to 10.7 and versions of iOS prior to 4.2, this function returns NULL if the CGPath specified by the path parameter is not rectangular.

### 61.6.6 CreateWithAttributedString(s as CFAttributedStringMBS) as CTFramesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable framesetter object from an attributed string.
**Notes:** s: The attributed string with which to construct the framesetter object.

Returns a reference to a CTFramesetter object if the call was successful; otherwise, NULL.
The resultant framesetter object can be used to create and fill text frames with the CreateFrame call.

### 61.6.7 SuggestFrameSizeWithConstraints(location as Integer, length as Integer, frameAttributes as dictionary, constraints as CGSizeMBS, byref fitRangeLocation as Integer, byref fitRangeLength as Integer) as CGSizeMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Determines the frame size needed for a string range.
**Notes:** location and length: The string range to which the frame size applies. The string range is a range over the string used to create the framesetter. If the length portion of the range is set to 0, then the framesetter continues to add lines until it runs out of text or space.
frameAttributes: Additional attributes that control the frame filling process, or NULL if there are no such attributes.
constraints: The width and height to which the frame size is constrained. A value of CGFLOAT_MAX for either dimension indicates that it should be treated as unconstrained.
fitRange: On return, contains the range of the string that actually fit in the constrained size.

Returns the actual dimensions for the given string range and constraints.

This function can be used to determine how much space is needed to display a string, optionally by constraining the space along either dimension.
Available in OS X v10.5 and later.

### 61.6.8 Properties

### 61.6.9 TypeSetter as CTTypesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the typesetter object being used by the framesetter.
**Notes:** Return sa reference to a CTTypesetter object if the call was successful; otherwise, nil. The framesetter maintains a reference to the returned object, which should not be released by the caller.

Each framesetter uses a typesetter internally to perform line breaking and other contextual analysis based on the characters in a string; this function returns the typesetter being used by a particular framesetter in case the caller would like to perform other operations on that typesetter.

Available in OS X v10.5 and later.
(Read only property)

## 61.7 class CTGlyphInfoMBS

### 61.7.1 class CTGlyphInfoMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTGlyphInfo opaque type enables you to override a font's specified mapping from Unicode to the glyph ID.
**Notes:** Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.7.2 Methods

### 61.7.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.7.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.7.5 CreateWithCharacterIdentifier(cid as Integer, collection as Integer, baseString as string) as CTGlyphInfoMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable glyph info object with a character identifier.
**Notes:** cid: A character identifier.
collection: A character collection identifier.
baseString: The part of the string the returned object is intended to override.

Returns a valid reference to an immutable CTGlyphInfoMBS object if glyph info creation was successful; otherwise, nil.

This function creates an immutable glyph info object for a character identifier and a character collection.
Available in OS X v10.5 and later.

### 61.7.6 CreateWithGlyph(glyph as Integer, font as CTFontMBS, baseString as string) as CTGlyphInfoMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable glyph info object with a glyph index.
**Notes:** glyph: The index of the glyph.
font: The font to be associated with the returned CTGlyphInfoMBS object.
baseString: The part of the string the returned object is intended to override.

Returns a valid reference to an immutable CTGlyphInfoMBS object, If glyph info creation was successful; otherwise, nil.

This function creates an immutable glyph info object for a glyph index using a specified font.
Available in OS X v10.5 and later.

### 61.7.7 CreateWithGlyphName(glyphName as string, font as CTFontMBS, baseString as string) as CTGlyphInfoMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable glyph info object with a glyph name.
**Notes:** glyphName: The name of the glyph.
font: The font to be associated with the returned CTGlyphInfo object.
baseString: The part of the string the returned object is intended to override.

Returns a valid reference to an immutable CTGlyphInfo object if glyph info creation was successful; otherwise, nil.
This function creates an immutable glyph info object for a glyph name such as copyright using a specified font.
Available in OS X v10.5 and later.

### 61.7.8 Properties

### 61.7.9 CharacterCollection as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the character collection for a glyph info object.
**Notes:** If the glyph info object was created with a glyph name or a glyph index, its character collection is kCTIdentityMappingCharacterCollection.
(Read only property)

### 61.7.10 CharacterIdentifier as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the character identifier for a glyph info object.
**Notes:** (Read only property)

### 61.7.11 GlyphName as String

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the glyph name for a glyph info object if that object exists.
**Notes:** (Read only property)

### 61.7.12 Constants

Character Collection

| Constant | Value | Description |
|---|---|---|
| kCTAdobeCNS1CharacterCollection | 1 | The Adobe-CNS1 mapping. |
| kCTAdobeGB1CharacterCollection | 2 | The Adobe-GB1 mapping. |
| kCTAdobeJapan1CharacterCollection | 3 | The Adobe-Japan1 mapping. |
| kCTAdobeJapan2CharacterCollection | 4 | The Adobe-Japan2 mapping. |
| kCTAdobeKorea1CharacterCollection | 5 | The Adobe-Korea1 mapping. |
| kCTCharacterCollectionAdobeCNS1 | 1 | The Adobe-CNS1 mapping. |
| kCTCharacterCollectionAdobeGB1 | 2 | The Adobe-GB1 mapping. |
| kCTCharacterCollectionAdobeJapan1 | 3 | The Adobe-Japan1 mapping. |
| kCTCharacterCollectionAdobeJapan2 | 4 | The Adobe-Japan2 mapping. |
| kCTCharacterCollectionAdobeKorea1 | 5 | The Adobe-Korea1 mapping. |
| kCTCharacterCollectionIdentityMapping | 0 | The character identifier is equal to the CGGlyph glyph index. |
| kCTIdentityMappingCharacterCollection | 0 | The character identifier is equal to the CGGlyph glyph index. |

## 61.8 class CTLineMBS

### 61.8.1 class CTLineMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTLine opaque type represents a line of text.
**Example:**

```
Sub Paint(g As Graphics)
// inside paint event of a Canvas

// create a font, quasi systemFontWithSize:24.0
dim sysUIFont as CTFontMBS = CTFontMBS.CreateUIFontForLanguage(CTFontMBS.kCTFontUIFontSystem, 24.0)

// create a naked string
dim text as string = "Some Text."

// blue
dim cgColor as CGColorMBS = CGColorMBS.CreateGenericRGB(0.0, 0.0, 1.0)

// single underline
dim underline as Integer = CoreTextMBS.kCTUnderlineStyleSingle

// pack it into attributes dictionary
dim attributesDict as new Dictionary
attributesDict.Value(CoreTextMBS.kCTFontAttributeName) = sysUIFont
attributesDict.Value(CoreTextMBS.kCTForegroundColorAttributeName) = cgColor
attributesDict.Value(CoreTextMBS.kCTUnderlineStyleAttributeName) = underline

// make the attributed string
dim cfDic as new CFDictionaryMBS(attributesDict)
dim cfStr as new CFStringMBS(text)
dim stringToDraw as CFAttributedStringMBS = CFAttributedStringMBS.Create( cfStr, cfDic)

// now for the actual drawing

#If XojoVersion >= 2019.02 Then
Dim CGContextHandle As ptr = g.Handle(Graphics.HandleTypes.CGContextRef)
Dim CGContext As CGContextMBS = CGContextMBS.contextWithCGContext(CGContextHandle)
#Else
Dim CGContextHandle As Integer = g.Handle(g.HandleTypeCGContextRef)
Dim CGContext As CGContextMBS = CGContextMBS.contextWithCGContext(CGContextHandle)
#EndIf

CGContext.SaveGState
```

```
// reset text matrix
dim a as CGAffineTransformMBS = CGAffineTransformMBS.Identity
CGContext.TextMatrix = a

// draw
dim line as CTLineMBS = CTLineMBS.CreateWithAttributedString(stringToDraw)

dim x as Integer = 10
dim y as Integer = 10

// plus text height
y = y + 24

// swap y
y = g.Height - y

CGContext.TextPosition = new CGPointMBS(x, y)
line.Draw(CGContext)

CGContext.RestoreGState
CGContext.Flush
End Sub
```

**Notes:** A CTLine object contains an array of glyph runs. Line objects are created by the typesetter during a framesetting operation and can draw themselves directly into a graphics context.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.8.2 Methods

### 61.8.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.8.4 Bounds(options as Integer = 0) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Queries bounds.

### 61.8.5 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.8.6 CreateJustifiedLine(justificationFactor as Double, justificationWidth as Double) as CTLineMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a justified line from an existing line.
**Notes:** line: The line from which to create a justified line.
justificationFactor: Full or partial justification. When set to 1.0 or greater, full justification is performed. If this parameter is set to less than 1.0, varying degrees of partial justification are performed. If it is set to 0 or less, no justification is performed.
justificationWidth: The width to which the resultant line is justified. If justificationWidth is less than the actual width of the line, then negative justification is performed (that is, glyphs are squeezed together).

Returns a reference to a justified CTLine object if the call was successful; otherwise, nil.
Available in OS X v10.5 and later.

### 61.8.7 CreateTruncatedLine(width as Double, truncationType as Integer, truncationToken as CTLineMBS = nil) as CTLineMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a truncated line from an existing line.
**Notes:** line: The line from which to create a truncated line.
width: The width at which truncation begins. The line is truncated if its width is greater than the width passed in this parameter.
truncationType: The type of truncation to perform if needed. See constants for possible values.
truncationToken: This token is added at the point where truncation took place, to indicate that the line was truncated. Usually, the truncation token is the ellipsis character (U+2026). If this parameter is set to nil, then no truncation token is used and the line is simply cut off.

Returns a reference to a truncated CTLine object if the call was successful; otherwise, NULL.

The line specified in truncationToken should have a width less than the width specified by the width param-

eter. If the width of the line specified in truncationToken is greater than width and truncation is needed, the function returns nil.

Available in OS X v10.5 and later.

### 61.8.8 CreateWithAttributedString(s as CFAttributedStringMBS) as CTLineMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates a single immutable line object directly from an attributed string.
**Notes:** s: The string from which the line is created.

Returns a reference to a CTLine object if the call was successful; otherwise, nil.

This function allows clients who need very simple line generation to create a line without creating a typesetter object. The typesetting is done under the hood. Without a typesetter object, the line cannot be properly broken. However, for simple things like text labels, line breaking is not an issue.
Available in OS X v10.5 and later.

### 61.8.9 Draw(context as CGContextMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Draws a complete line.
**Notes:** context: The context into which the line is drawn.

This is a convenience function because the line could be drawn run-by-run by getting the glyph runs, getting the glyphs out of them, and calling a function such as CGContextMBS.ShowGlyphsAtPositions. This call can leave the graphics context in any state and does not flush the context after the draw operation.

Available in OS X v10.5 and later.

### 61.8.10 GlyphRuns as CTRunMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the array of glyph runs that make up the line object.
**Notes:** Returns an array containing the CTRunMBS objects that make up the line.
Available in OS X v10.5 and later.

### 61.8.11 ImageBounds(context as CGContextMBS) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the image bounds for a line.
**Notes:** context: The context for which the image bounds are calculated. This is required because the context could have settings in it that would cause changes in the image bounds.

Returns a rectangle that tightly encloses the paths of the line's glyphs, or, if the line or context is invalid, CGRectNull.
Available in OS X v10.5 and later.

### 61.8.12 OffsetForStringIndex(charIndex as Integer, byref secondaryOffset as Double) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Determines the graphical offset or offsets for a string index.
**Notes:** charIndex: The string index corresponding to the desired position.
secondaryOffset: On output, the secondary offset along the baseline for charIndex. When a single caret is sufficient for a string index, this value will be the same as the primary offset, which is the return value of this function. May be NULL.

Returns the primary offset along the baseline for charIndex, or 0.0 if the line does not support string access.

This function returns the graphical offset or offsets corresponding to a string index, suitable for movement between adjacent lines or for drawing a custom caret. For moving between adjacent lines, the primary offset can be adjusted for any relative indentation of the two lines; a CGPoint constructed with the adjusted offset for its x value and 0.0 for its y value is suitable for passing to CTLineGetStringIndexForPosition. For drawing a custom caret, the returned primary offset corresponds to the portion of the caret that represents the visual insertion location for a character whose direction matches the line's writing direction.

Available in OS X v10.5 and later.

### 61.8.13 PenOffsetForFlush(flushFactor as Double, flushWidth as Double) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the pen offset required to draw flush text.
**Notes:** flushFactor: Determines the type of flushness. A flushFactor of 0 or less indicates left flush. A flushFactor of 1.0 or more indicates right flush. Flush factors between 0 and 1.0 indicate varying degrees of

center flush, with a value of 0.5 being totally center flush.
flushWidth: Specifies the width to which the flushness operation should apply.

Returns the offset from the current pen position for the flush operation.
Available in OS X v10.5 and later.

### 61.8.14 StringIndexForPosition(position as CGPointMBS) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Performs hit testing.
**Notes:** position: The location of the mouse click relative to the line's origin.

Returns the string index for the position, or if the line does not support string access, kCFNotFound. Relative to the line's string range, this value can be no less than the first string index and no greater than the last string index plus 1.

This function can be used to determine the string index for a mouse click or other event. This string index corresponds to the character before which the next character should be inserted. This determination is made by analyzing the string from which a typesetter was created and the corresponding glyphs as embodied by a particular line.
Available in OS X v10.5 and later.

### 61.8.15 TypographicBounds(byref ascent as Double, byref descent as Double, byref leading as Double) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the typographic bounds of a line.
**Notes:** ascent: On output, the ascent of the line.
descent: On output, the descent of the line.
leading: On output, the leading of the line.

Returns the typographic width of the line. If the line is invalid, this function returns 0.

### 61.8.16 Properties

### 61.8.17 GlyphCount as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the total glyph count for the line object.
**Notes:** The total glyph count is equal to the sum of all of the glyphs in the glyph runs forming the line.
(Read only property)

### 61.8.18 StringRangeLength as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the range of characters that originally spawned the glyphs in the line.
**Notes:** (Read only property)

### 61.8.19 StringRangeLocation as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the range of characters that originally spawned the glyphs in the line.
**Notes:** (Read only property)

### 61.8.20 TrailingWhitespaceWidth as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the trailing whitespace width for a line.
**Notes:** The width of the line's trailing whitespace. If the line is invalid, this function will always return zero.

Creating a line for a width can result in a line that is actually longer than the desired width due to trailing whitespace. Although this is typically not an issue due to whitespace being invisible, this function can be used to determine what amount of a line's width is due to trailing whitespace.
Available in OS X v10.5 and later.
(Read only property)

### 61.8.21 Constants

Line Bounds

| Constant | Value | Description |
|---|---|---|
| kCTLineBoundsExcludeTypographicLeading | 1 | Pass this option to exclude typographic leading. |
| kCTLineBoundsExcludeTypographicShifts | 2 | Pass this option to ignore cross-stream shifts due to positioning (suc or baseline alignment). |
| kCTLineBoundsUseGlyphPathBounds | 8 | Pass this option to use glyph path bounds rather than the default bounds. |
| kCTLineBoundsUseHangingPunctuation | 4 | Normally line bounds include all glyphs; pass this option to tre punctuation hanging off either end of the line as fully hanging. |
| kCTLineBoundsUseOpticalBounds | 16 | Pass this option to use optical bounds. This option overrides kCT sUseGlyphPathBounds. |

Truncate Types

| Constant | Value | Description |
|---|---|---|
| kCTLineTruncationEnd | 1 | Truncate the end of the line, leaving the start portion visible. |
| kCTLineTruncationMiddle | 2 | Truncate the middle of the line, leaving both the start and the end portions visible. |
| kCTLineTruncationStart | 0 | Truncate the beginning of the line, leaving the end portion visible. |

## 61.9 class CTMutableFontCollectionMBS

### 61.9.1 class CTMutableFontCollectionMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The mutable font collection class.
**Notes:** Subclass of the CTFontCollectionMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.9.2 Methods

### 61.9.3 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 61.9.4 SetExclusionDescriptors(descriptors() as CTFontDescriptorMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Replaces the array of descriptors to exclude from the match.

### 61.9.5 SetQueryDescriptors(descriptors() as CTFontDescriptorMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Replaces the array of descriptors to match.

## 61.10 class CTParagraphStyleMBS

### 61.10.1 class CTParagraphStyleMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTParagraphStyle opaque type represents paragraph or ruler attributes in an attributed string.
**Notes:** A paragraph style object represents a complex attribute value in an attributed string, storing a number of subattributes that affect paragraph layout for the characters of the string. Among these subattributes are alignment, tab stops, writing direction, line-breaking mode, and indentation settings.
Subclass of the CFObjectMBS class.
**Blog Entries**

- CoreText Completed

### 61.10.2 Methods

### 61.10.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.10.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable paragraph style.
**Notes:** Returns a valid reference to an immutable CTParagraphStyle object, If the paragraph style creation was successful; otherwise, nil.

Using this function is the easiest and most efficient way to create a paragraph style. Paragraph styles should be kept immutable for totally lock-free operation. If an invalid paragraph style setting specifier is passed into the settings parameter, nothing bad will happen, but you will be unable to query for this value. The reason is to allow backward compatibility with style setting specifiers that may be introduced in future versions.

Available in OS X v10.5 and later.

### 61.10.5 Create as CTParagraphStyleMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable paragraph style.
**Notes:** Returns a valid reference to an immutable CTParagraphStyle object, If the paragraph style creation was successful; otherwise, nil.

Using this function is the easiest and most efficient way to create a paragraph style. Paragraph styles should be kept immutable for totally lock-free operation. If an invalid paragraph style setting specifier is passed into the settings parameter, nothing bad will happen, but you will be unable to query for this value. The reason is to allow backward compatibility with style setting specifiers that may be introduced in future versions.

Available in OS X v10.5 and later.
See also:

- 61.10.6 Create(settings() as CTParagraphStyleSettingMBS) as CTParagraphStyleMBS 10920

### 61.10.6 Create(settings() as CTParagraphStyleSettingMBS) as CTParagraphStyleMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable paragraph style.
**Notes:** settings: The settings with which to preload the paragraph style.

Returns a valid reference to an immutable CTParagraphStyle object, If the paragraph style creation was successful; otherwise, nil.

Using this function is the easiest and most efficient way to create a paragraph style. Paragraph styles should be kept immutable for totally lock-free operation. If an invalid paragraph style setting specifier is passed into the settings parameter, nothing bad will happen, but you will be unable to query for this value. The reason is to allow backward compatibility with style setting specifiers that may be introduced in future versions.

Available in OS X v10.5 and later.
See also:

- 61.10.5 Create as CTParagraphStyleMBS 10920

### 61.10.7 CreateCopy as CTParagraphStyleMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable copy of a paragraph style.
**Notes:** A valid reference to an immutable CTParagraphStyle object that is a copy of the one passed into paragraphStyle, If the paragraphStyle reference is valid; otherwise nil, if any error occurred, including being supplied with an invalid reference.

### 61.10.8 CreateWithAlignment(Alignment as Integer) as CTParagraphStyleMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Creates an immutable paragraph style.
**Example:**

```
dim a as Integer
dim t as CTParagraphStyleMBS

a = CTParagraphStyleMBS.kCTTextAlignmentRight
t = CTParagraphStyleMBS.CreateWithAlignment(a)

MsgBox str(T.Alignment) // shows 1
```

### 61.10.9 TabStops as CTTextTabMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTTextTab objects, sorted by location, that define the tab stops for the paragraph style.
**Notes:** Type: Array of CTTextTabMBS. Default: 12 left-aligned tabs, spaced by 28.0 points. Application: CTFramesetter, CTTypesetter.

### 61.10.10 Properties

### 61.10.11 Alignment as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The text alignment.
**Notes:** Natural text alignment is realized as left or right alignment, depending on the line sweep direction of the first script contained in the paragraph. Type: CTTextAlignment. Default: kCTNaturalTextAlignment. Application: CTFramesetter.
(Read only property)

### 61.10.12 BaseWritingDirection as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The base writing direction of the lines.
**Notes:** Type: CTWritingDirection. Default: kCTWritingDirectionNatural. Application: CTFramesetter, CTTypesetter.
(Read only property)

### 61.10.13 DefaultTabInterval as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The documentwide default tab interval.
**Notes:** Tabs after the last specified by kCTParagraphStyleSpecifierTabStops are placed at integer multiples of this distance (if positive). Type: CGFloat. Default: 0.0. Application: CTFramesetter, CTTypesetter.
(Read only property)

### 61.10.14 FirstLineHeadIndent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The distance, in points, from the leading margin of a frame to the beginning of the paragraph's first line.
**Notes:** This value is always nonnegative. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.15 HeadIndent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The distance, in points, from the leading margin of a text container to the beginning of lines other than the first.
**Notes:** This value is always nonnegative. Type: CGFloat Default: 0.0 Application: CTFramesetter
(Read only property)

### 61.10.16 LineBoundsOptions as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The options controlling the alignment of the line edges with the leading and trailing margins.
**Notes:** Type: CTLineBoundsOptions

Default: 0 (no options)
Application: CTTypesetter
(Read only property)

### 61.10.17 LineBreakMode as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The mode that should be used to break lines when laying out the paragraph's text.
**Notes:** Type: CTLineBreakMode. Default: kCTLineBreakByWordWrapping. Application: CTFramesetter
(Read only property)

### 61.10.18 LineHeightMultiple as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The line height multiple.
**Notes:** The natural line height of the receiver is multiplied by this factor (if positive) before being constrained by minimum and maximum line height. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.19 LineSpacingAdjustment as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The space in points added between lines within the paragraph (commonly known as leading).
**Notes:** Available in OS X v10.7 and later.
(Read only property)

### 61.10.20 MaximumLineHeight as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The maximum height that any line in the frame will occupy, regardless of the font size or size of any attached graphic.
**Notes:** Glyphs and graphics exceeding this height will overlap neighboring lines. A maximum height of 0 implies no line height limit. This value is always nonnegative. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.21 MaximumLineSpacing as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The maximum space in points between lines within the paragraph (commonly known as leading).
**Notes:** This value is always nonnegative.
Available in OS X v10.7 and later.
(Read only property)

### 61.10.22 MinimumLineHeight as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The minimum height that any line in the frame will occupy, regardless of the font size or size of any attached graphic.
**Notes:** This value is always nonnegative. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.23 MinimumLineSpacing as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The minimum space in points between lines within the paragraph (commonly known as leading).
**Notes:** This value is always nonnegative.
Available in OS X v10.7 and later.
(Read only property)

### 61.10.24 ParagraphSpacing as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The space added at the end of the paragraph to separate it from the following paragraph.
**Notes:** This value is always nonnegative and is determined by adding the previous paragraph's kCTParagraphStyleSpecifierParagraphSpacing setting and the current paragraph's kCTParagraphStyleSpecifierParagraphSpacingBefore setting. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.25 ParagraphSpacingBefore as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The distance between the paragraph's top and the beginning of its text content.
**Notes:** Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.26 TailIndent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The distance, in points, from the margin of a frame to the end of lines.
**Notes:** If positive, this value is the distance from the leading margin (for example, the left margin in left-to-right text). If 0 or negative, it's the distance from the trailing margin. Type: CGFloat. Default: 0.0. Application: CTFramesetter.
(Read only property)

### 61.10.27 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCTTextAlignmentCenter | 2 | One of the constants to specify text alignment. Text is visually center aligned. |
| kCTTextAlignmentJustified | 3 | One of the constants to specify text alignment. Text is fully justified. The last line in a paragraph is naturally aligned. |
| kCTTextAlignmentLeft | 0 | One of the constants to specify text alignment. Text is visually left aligned. |
| kCTTextAlignmentNatural | 4 | One of the constants to specify text alignment. Text uses the natural alignment of the text's script. |
| kCTTextAlignmentRight | 1 | One of the constants to specify text alignment. Text is visually right aligned. |

Line Breaking

| Constant | Value | Description |
|---|---|---|
| kCTLineBreakByCharWrapping | 1 | Wrapping occurs before the first character that doesn't fit. |
| kCTLineBreakByClipping | 2 | Lines are simply not drawn past the edge of the frame. |
| kCTLineBreakByTruncatingHead | 3 | Each line is displayed so that the end fits in the frame and the missing text indicated by an ellipsis glyph. |
| kCTLineBreakByTruncatingMiddle | 5 | Each line is displayed so that the beginning and end fit in the container a the missing text is indicated by an ellipsis glyph in the middle. |
| kCTLineBreakByTruncatingTail | 4 | Each line is displayed so that the beginning fits in the container and the missi text is indicated by an ellipsis glyph. |
| kCTLineBreakByWordWrapping | 0 | Wrapping occurs at word boundaries unless the word itself doesn't fit or single line. |

Paragraph Styles

| Constant | Value | Description |
|---|---|---|
| kCTParagraphStyleSpecifierAlignment | 0 | The text alignment. Natural text alignment is realized a ment, depending on the line sweep direction of the first sc paragraph. Type: CTTextAlignment. Default: kCTNa Application: CTFramesetter. Available in OS X v10.5 and later. |
| kCTParagraphStyleSpecifierBaseWritingDirection | 13 | The base writing direction of the lines. Type: CTWritin kCTWritingDirectionNatural. Application: CTFramesette |
| kCTParagraphStyleSpecifierDefaultTabInterval | 5 | The documentwide default tab interval. Tabs after the la ParagraphStyleSpecifierTabStops are placed at integer m tance (if positive). Type: CGFloat. Default: 0.0. Applic ter, CTTypesetter. |
| kCTParagraphStyleSpecifierFirstLineHeadIndent | 1 | The distance, in points, from the leading margin of a fram the paragraph's first line. This value is always nonnegati Default: 0.0. Application: CTFramesetter. |
| kCTParagraphStyleSpecifierHeadIndent | 2 | The distance, in points, from the leading margin of a te beginning of lines other than the first. This value is always CGFloat Default: 0.0 Application: CTFramesetter |
| kCTParagraphStyleSpecifierLineBoundsOptions | 17 | The options controlling the alignment of the line edges w trailing margins. Type: CTLineBoundsOptions Default: 0 (no options) Application: CTTypesetter |
| kCTParagraphStyleSpecifierLineBreakMode | 6 | The mode that should be used to break lines when laying text. Type: CTLineBreakMode. Default: kCTLineBrea Application: CTFramesetter |
| kCTParagraphStyleSpecifierLineHeightMultiple | 7 | The line height multiple. The natural line height of the r by this factor (if positive) before being constrained by mini line height. Type: CGFloat. Default: 0.0. Application: C |
| kCTParagraphStyleSpecifierLineSpacing | 10 | Deprecated. Use kCTParagraphStyleSpecifierMaximum ParagraphStyleSpecifierMinimumLineSpacing, and kCTP fierLineSpaceAdjustment to control space between lines. added between lines within the paragraph (commonly kno value is always nonnegative. Type: CGFloat. Default: 0. Framesetter. |
| kCTParagraphStyleSpecifierLineSpacingAdjustment | 16 | The space in points added between lines within the pa known as leading). Available in OS X v10.7 and later. |
| kCTParagraphStyleSpecifierMaximumLineHeight | 8 | The maximum height that any line in the frame will occu font size or size of any attached graphic. Glyphs and gra height will overlap neighboring lines. A maximum height height limit. This value is always nonnegative. Type: CG Application: CTFramesetter. |
| kCTParagraphStyleSpecifierMaximumLineSpacing | 14 | The maximum space in points between lines within the pa known as leading). This value is always nonnegative. Available in OS X v10.7 and later. |
| kCTParagraphStyleSpecifierMinimumLineHeight | 9 | The minimum height that any line in the frame will occu font size or size of any attached graphic. This value is Type: CGFloat. Default: 0.0. Application: CTFramesette |
| kCTParagraphStyleSpecifierMinimumLineSpacing | 15 | The minimum space in points between lines within the pa known as leading). This value is always nonnegative. Available in OS X v10.7 and later. |
| kCTParagraphStyleSpecifierParagraphSpacing | 11 | The space added at the end of the paragraph to separate i paragraph. This value is always nonnegative and is de the previous paragraph's kCTParagraphStyleSpecifierPa ting and the current paragraph's kCTParagraphStyleSpec ingBefore setting. Type: CGFloat. Default: 0.0. Applicati |
| kCTParagraphStyleSpecifierParagraphSpacingBefore | 12 | The distance between the paragraph's top and the beginnin Type: CGFloat. Default: 0.0. Application: CTFramesette |

Writing Direction

| Constant | Value | Description |
|---|---|---|
| kCTWritingDirectionLeftToRight | 0 | The writing direction is left to right. |
| kCTWritingDirectionNatural | -1 | The writing direction is algorithmically determined using the Unicode Bidirectional Algorithm rules P2 and P3. |
| kCTWritingDirectionRightToLeft | 1 | The writing direction is right to left. |

## 61.11 class CTParagraphStyleSettingMBS

### 61.11.1 class CTParagraphStyleSettingMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** This class is used to alter the paragraph style.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr11
- CoreText Completed

### 61.11.2 Methods

### 61.11.3 SetTextTabs(textTabs() as CTTextTabMBS)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Sets the array of text tabs.
**Notes:** for use with kCTParagraphStyleSpecifierTabStops.

### 61.11.4 Properties

### 61.11.5 doubleValue as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The double value.
**Notes:** (Read and Write property)

### 61.11.6 intValue as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The integer value.
**Notes:** Also used for enumerations.
(Read and Write property)

### 61.11.7 Spec as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The specifier of the setting.
**Notes:** See CTParagraphStyleMBS for possible values.
(Read and Write property)

## 61.12 class CTRunDelegateMBS

### 61.12.1 class CTRunDelegateMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The class to get events for CTRun runs.
**Notes:** The CTRunDelegate opaque type represents a run delegate, which is assigned to a run (attribute range) to control typographic traits such glyph ascent, glyph descent, and glyph width.

The events defined for CTRunDelegate are used to modify glyph metrics during layout. The values returned by the delegate are applied to each glyph in the run or runs corresponding to the attribute with that delegate.
Subclass of the CFObjectMBS class.
**Blog Entries**

- CoreText Completed

### 61.12.2 Methods

### 61.12.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.12.4 Close

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Shuts down the delegate.
**Notes:** Please call this to explicit end the delegate and avoid memory leaks.
See also:

- 61.12.7 Close 10932

### 61.12.5 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable instance of a run delegate.
**Notes:** The run-delegate object can be used for reserving space in a line or for eliding the glyphs for a range of text altogether.

### 61.12.6 Events

### 61.12.7 Close

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Event called when item closes.
See also:

- 61.12.4 Close 10931

### 61.12.8 GetAscent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Event that determines typographic ascent of glyphs in the run.
**Notes:** Returns the typographic ascent of glyphs in the run associated with the run delegate.

### 61.12.9 GetDescent as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Event that determines typographic descent of glyphs in the run.
**Notes:** Returns the typographic descent of glyphs in the run associated with the run delegate.

### 61.12.10 GetWidth as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Event that determines the typographic width of glyphs in the run.
**Notes:** Returns the typographic width of glyphs in the run associated with the run delegate. A value of 0.0 indicates that the glyphs should not be drawn.

## 61.13 class CTRunMBS

### 61.13.1 class CTRunMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTRun opaque type represents a glyph run, which is a set of consecutive glyphs sharing the same attributes and direction.
**Notes:** The typesetter creates glyph runs as it produces lines from character strings, attributes, and font objects. That is, a line is constructed of one or more glyphs runs. Glyph runs can draw themselves into a graphic context, if desired, although most users have no need to interact directly with glyph runs.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr3
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- CoreText Completed

### 61.13.2 Methods

### 61.13.3 Advances as CGSizeMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a range of glyph advances into an array.
**Notes:** Changed in v22.2 to use copy function to get array instead Ptr function, if no pointer is available.

### 61.13.4 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.13.5 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.13.6 Draw(context as CGContextMBS, location as Integer, length as Integer = 0)

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Draws a complete run or part of one.
**Notes:** context: The context into which to draw the run.
range: The portion of the run to draw. If the length of the range is set to 0, then the draw operation continues from the start index of the range to the end of the run.

This is a convenience call, because the run could be drawn by accessing the glyphs. This call can leave the graphics context in any state and does not flush the context after the draw operation.

Available in OS X v10.5 and later.

### 61.13.7 Glyphs as Integer()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a range of glyphs into an array.
**Notes:** Changed in v22.2 to use copy function to get array instead Ptr function, if no pointer is available.

### 61.13.8 ImageBounds(context as CGContextMBS, location as Integer, length as Integer) as CGRectMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calculates the image bounds for a glyph range.
**Notes:** context: The context for the image bounds being calculated. This is required because the context could have settings in it that would cause changes in the image bounds.
range: The portion of the run to measure. If the length of the range is set to 0, then the measure operation continues from the start index of the range to the end of the run.

Returns a rectangle that tightly encloses the paths of the run's glyphs, or, if run, context, or range is invalid, CGRectNull.
Available in OS X v10.5 and later.

### 61.13.9 Positions as CGPointMBS()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a range of glyph positions into an array.
**Notes:** Changed in v22.2 to use copy function to get array instead Ptr function, if no pointer is available.

### 61.13.10 StringIndices as Integer()

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Copies a range of string indices into an array.
**Notes:** The indices are the character indices that originally spawned the glyphs that make up the run. They can be used to map the glyphs in the run back to the characters in the backing store.

Changed in v22.2 to use copy function to get array instead Ptr function, if no pointer is available.

### 61.13.11 TypographicBounds(location as Integer, length as Integer, byref ascent as Double, byref descent as Double, byref leading as Double) as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the typographic bounds of the run.
**Notes:** range: The portion of the run to measure. If the length of the range is set to 0, then the measure operation continues from the range's start index to the end of the run.
ascent: On output, the ascent of the run.
descent: On output, the descent of the run.
leading: On output, the leading of the run.

Returns the typographic width of the run, or if run or range is invalid, 0.
Available in OS X v10.5 and later.

### 61.13.12 Properties

### 61.13.13 AttributeValues as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the attribute dictionary that was used to create the glyph run.
**Notes:** Return a valid Dictionary or nil on error or if the run has no attributes.

The dictionary returned is either the same one that was set as an attribute dictionary on the original attributed string or a dictionary that has been manufactured by the layout engine. Attribute dictionaries can

be manufactured in the case of font substitution or if the run is missing critical attributes.
(Read only property)

### 61.13.14 GlyphCount as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the glyph count for the run.
**Notes:** run: The run for which to return the glyph count.

Returns the number of glyphs that the run contains, or if there are no glyphs in this run, a value of 0.
Available in OS X v10.5 and later.
(Read only property)

### 61.13.15 Status as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the run's status.
**Notes:** Runs have status that can be used to expedite certain operations. Knowing the direction and ordering of a run's glyphs can aid in string index analysis, whereas knowing whether the positions reference the identity text matrix can avoid expensive comparisons. This status is provided as a convenience, because this information is not strictly necessary but can be helpful in some circumstances.
(Read only property)

### 61.13.16 StringRangeLength as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the range of characters that originally spawned the glyphs in the run.
**Notes:** The range of characters that originally spawned the glyphs, of if run is invalid, an empty range.
(Read only property)

### 61.13.17 StringRangeLocation as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Gets the range of characters that originally spawned the glyphs in the run.
**Notes:** The range of characters that originally spawned the glyphs, of if run is invalid, an empty range.
(Read only property)

### 61.13.18 TextMatrix as CGAffineTransformMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the text matrix needed to draw this run.
**Notes:** To properly draw the glyphs in a run, the fields tx and ty of the CGAffineTransform returned by this function should be set to the current text position.
(Read only property)

### 61.13.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCTRunStatusHasNonIdentityMatrix | 4 | One of the possible values for the status bitfield.<br>The run requires a specific text matrix to be set in the current Core Gra<br>context for proper drawing.<br>Use BitwiseAnd() to check if the status has a given value. |
| kCTRunStatusNonMonotonic | 2 | One of the possible values for the status bitfield.<br>The run has been reordered in some way such that the string indices as<br>ated with the glyphs are no longer strictly increasing (for left-to-right run<br>decreasing (for right-to-left runs).<br>Use BitwiseAnd() to check if the status has a given value. |
| kCTRunStatusNoStatus | 0 | One of the possible values for the status bitfield.<br>The run has no special attributes. |
| kCTRunStatusRightToLeft | 1 | One of the possible values for the status bitfield.<br>The run proceeds from right to left.<br>Use BitwiseAnd() to check if the status has a given value. |

## 61.14 class CTTextTabMBS

### 61.14.1 class CTTextTabMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTTextTab opaque type represents a tab in a paragraph style, storing an alignment type and location.
**Notes:** Core Text supports four alignment types: left, center, right, and decimal. These alignment types are absolute, not based on the line sweep direction of text. For example, tabbed text is always positioned to the left of a right-aligned tab, whether the line sweep direction is left to right or right to left. A tab's location, on the other hand, is relative to the back margin. A tab set at 1.5 inches, for example, is at 1.5 inches from the right in right-to-left text.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr7
- CoreText Completed

### 61.14.2 Methods

### 61.14.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.14.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.14.5 Create(alignment as Integer, location as Double, options as Dictionary = nil) as CTTextTabMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates and initializes a new text tab object.
**Notes:** alignment: The tab's alignment. This is used to determine the position of text inside the tab column.

This parameter must be set to a valid CTTextAlignment value or this function returns nil.
location: The tab's ruler location, relative to the back margin.
options: Options to pass in when the tab is created. Currently, the only option available is kCTTabColumnTerminatorsAttributeName. This parameter is optional and can be set to nil if not needed.
Return a reference to a CTTextTab object if the call was successful; otherwise, nil.
Available in OS X v10.5 and later.

### 61.14.6 kCTTabColumnTerminatorsAttributeName as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the options keys.
**Notes:** Specifies the terminating character for a tab column.

The value associated with this attribute is a CFCharacterSet object. The character set is used to determine the terminating character for a tab column. The tab and newline characters are implied even if they don't exist in the character set. This attribute can be used to implement decimal tabs, for instance. This attribute is optional.

### 61.14.7 Properties

### 61.14.8 Alignment as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the text alignment of the tab.
**Notes:** (Read only property)

### 61.14.9 Location as Double

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the tab's ruler location.
**Notes:** The tab's ruler location relative to the back margin.
(Read only property)

### 61.14.10 Options as Dictionary

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns the dictionary of attributes associated with the tab.
**Notes:** The dictionary of attributes associated with the tab, or if no dictionary is present, nil.
(Read only property)

## 61.15 class CTTypesetterMBS

### 61.15.1 class CTTypesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The CTTypesetter opaque type represents a typesetter, which performs line layout.
**Notes:** Line layout includes word wrapping, hyphenation, and line breaking in either vertical or horizontal rectangles. A typesetter object takes as input an attributed string and produces a line of typeset glyphs (composed into glyph runs) in a CTLine object. The typesetter performs character-to-glyph encoding, glyph ordering, and positional operations, such as kerning, tracking, and baseline adjustments. If multiline layout is needed, it is performed by a framesetter object, which calls into the typesetter to generate the typeset lines to fill the frame.

A framesetter encapsulates a typesetter and provides a reference to it as a convenience, but a caller may also choose to create a freestanding typesetter.
Subclass of the CFObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- CoreText Completed

### 61.15.2 Methods

### 61.15.3 Available as boolean

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true in OS X v10.5 and later.

### 61.15.4 Constructor

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 61.15.5 CreateLine(location as Integer, length as Integer, offset as Double = 0.0) as CTLineMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable line from the typesetter at a specified line offset.
**Notes:** location and length: The string range on which the line is based. If the length portion of range is set to 0, then the typesetter continues to add glyphs to the line until it runs out of characters in the string. The location and length of the range must be within the bounds of the string, or the call will fail.
offset: The line position offset.

Returns a reference to a CTLine object if the call was successful; otherwise, nil.
The resultant line consists of glyphs in the correct visual order, ready to draw.
Available in OS X v10.6 and later.

### 61.15.6 CreateWithAttributedString(s as CFAttributedStringMBS) as CTTypesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable typesetter object using an attributed string.
**Notes:** s: The attributed string to typeset. This parameter must be filled in with a valid CFAttributedString object.

Returns a reference to a CTTypesetter object if the call was successful; otherwise, nil.

The resultant typesetter can be used to create lines, perform line breaking, and do other contextual analysis based on the characters in the string.

Available in OS X v10.5 and later.
See also:

- 61.15.7 CreateWithAttributedString(s as CFAttributedStringMBS, options as dictionary) as CTTypesetterMBS 10942

### 61.15.7 CreateWithAttributedString(s as CFAttributedStringMBS, options as dictionary) as CTTypesetterMBS

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates an immutable typesetter object using an attributed string and a dictionary of options.
**Notes:** s: The attributed string to typeset. This parameter must be filled in with a valid CFAttributedString object.
options: A dictionary of typesetter options, or nil if there are none.

Returns a reference to a CTTypesetter object if the call was successful; otherwise, nil.

The resultant typesetter can be used to create lines, perform line breaking, and do other contextual analysis based on the characters in the string.
Available in OS X v10.5 and later.
See also:

- 61.15.6 CreateWithAttributedString(s as CFAttributedStringMBS) as CTTypesetterMBS 10942

### 61.15.8 kCTTypesetterOptionDisableBidiProcessing as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants to control aspects of the typesetter,Äôs bidirectional text processing.
**Notes:** Disables bidirectional processing. Value must be a CFBoolean object. Default value is false. Normally, typesetting applies the Unicode Bidirectional Algorithm as described in Unicode Standard Annex #9. If a typesetter is created with this option set to true, no directional reordering is performed, and any directional control characters are ignored.
Available in OS X v10.5 and later.
Deprecated in OS X v10.8.

### 61.15.9 kCTTypesetterOptionForcedEmbeddingLevel as string

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** One of the constants to control aspects of the typesetter,Äôs bidirectional text processing.
**Notes:** Specifies the embedding level. Value must be a CFNumberRef object. Default is unset. Normally, typesetting applies the Unicode Bidirectional Algorithm as described in Unicode Standard Annex #9. If present, this option specifies the embedding level, and any directional control characters are ignored.
Available in OS X v10.5 and later.

### 61.15.10 SuggestClusterBreak(startIndex as Integer, width as Double) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suggests a cluster line breakpoint based on the width provided.
**Notes:** startIndex: The starting point for the typographic cluster-break calculations. The break calculations include the character starting at startIndex.
width: The requested typographic cluster-break width.

Return a count of the characters from startIndex that would cause the cluster break. The value returned can be used to construct a character range for CTTypesetterCreateLine.

This cluster break is similar to a character break, except that it does not break apart linguistic clusters. No other contextual analysis is done. This can be used by the caller to implement a different line-breaking scheme, such as hyphenation. A typographic cluster break can also be triggered by a hard-break character in the stream. This function is equivalent to SuggestClusterBreakWithOffset with an offset of 0.0.

Available in OS X v10.5 and later.
See also:

- 61.15.11 SuggestClusterBreak(startIndex as Integer, width as Double, offset as Double) as Integer 10944

### 61.15.11 SuggestClusterBreak(startIndex as Integer, width as Double, offset as Double) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suggests a cluster line breakpoint based on the specified width and line offset.
**Notes:** startIndex: The starting point for the typographic cluster-break calculations. The break calculations include the character starting at startIndex.
width: The requested typographic cluster-break width.
offset: The line offset position.

Returns a count of the characters from startIndex that would cause the cluster break. The value returned can be used to construct a character range for CreateLine.

This cluster break is similar to a character break, except that it does not break apart linguistic clusters. No other contextual analysis is done. This can be used by the caller to implement a different line-breaking scheme, such as hyphenation. A typographic cluster break can also be triggered by a hard-break character in the stream.

Available in OS X v10.6 and later.
See also:

- 61.15.10 SuggestClusterBreak(startIndex as Integer, width as Double) as Integer 10943

### 61.15.12 SuggestLineBreak(startIndex as Integer, width as Double) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suggests a contextual line breakpoint based on the width provided.
**Notes:** startIndex: The starting point for the line-break calculations. The break calculations include the character starting at startIndex.
width: The requested line-break width.

Returns a count of the characters from startIndex that would cause the line break. The value returned can be used to construct a character range for CreateLine.

The line break can be triggered either by a hard-break character in the stream or by filling the specified width with characters. This function is equivalent to SuggestLineBreakWithOffset with an offset of 0.0.

Available in OS X v10.5 and later.
See also:

- 61.15.13 SuggestLineBreak(startIndex as Integer, width as Double, offset as Double) as Integer 10945

### 61.15.13 SuggestLineBreak(startIndex as Integer, width as Double, offset as Double) as Integer

MBS MacCG Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suggests a contextual line breakpoint based on the width provided and the specified offset.
**Notes:** startIndex: The starting point for the line-break calculations. The break calculations include the character starting at startIndex.
width: The requested line-break width.
offset: The line position offset.

Returns a count of the characters from startIndex and offset that would cause the line break. The value returned can be used to construct a character range for CreateLine.

The line break can be triggered either by a hard-break character in the stream or by filling the specified width with characters.
Available in OS X v10.6 and later.
See also:

- 61.15.12 SuggestLineBreak(startIndex as Integer, width as Double) as Integer 10944

# Chapter 62

# CPUInfo

## 62.1 class CPUIDMBS

### 62.1.1 class CPUIDMBS

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class around the CPUID command of x86 CPUs.
**Example:**

```
dim c as new CPUIDMBS
MsgBox c.BrandString
```

**Notes:** This class works only on x86 CPUs.
Values returned in the properties have very CPU vendor specific values.
So Intel and AMD use different meanings for a lot of values.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr5

**Xojo Developer Magazine**

- 5.4, page 50: The Case of the Top 20, The mayor is caught in an explosive situation, and our boys are on the case by Toby Rush
- 5.3, page 6: News
- 5.3, page 50: Poetry in Motion, Movin', movin', movin', get those icons movin'... by Toby Rush

### 62.1.2 Methods

### 62.1.3 BrandString as String

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The brand string.
**Notes:** contains the brand string, e.g. "Intel(R) Xeon(TM) CPU 2.40GHz"
See also:

- 62.1.23 BrandString as String 10952

### 62.1.4 CodeName as String

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The brief and human-friendly CPU codename, which was recognized.

### 62.1.5 CPUID(Selector as Integer) as boolean

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls CPUID for the given selector.
**Example:**

```
dim c as new CPUIDMBS

if c.CPUID(0) then
MsgBox hex(c.EDX)
end if
```

**Notes:** Returns true on success and false on failure.
(always true on x86 CPUs and always false on PowerPC CPUs.)
Result values are stored in the four properties EAX, EBX, ECX and EDX.

### 62.1.6 ExtFamily as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CPU extended family.

### 62.1.7 ExtModel as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CPU extended model

### 62.1.8 Family as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CPU family.
See also:

- 62.1.28 Family as Integer 10954

### 62.1.9 FeatureName(index as Integer) as String

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the short textual representation of a CPU flag.
**Notes:** A constant string like "fpu", "tsc", "sse2", etc.
See kFeature* constants.

### 62.1.10 Flags(index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether a given feature is available.
**Example:**

```
dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

**Notes:** See kFeature* constants.

### 62.1.11 L1DataCache as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** L1 data cache size in KB.
**Notes:** Could be zero, if the CPU lacks cache.
If the size cannot be determined, it will be -1.

### 62.1.12 L1InstructionCache as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** L1 instruction cache size in KB.
**Notes:** Could be zero, if the CPU lacks cache. If the size cannot be determined, it will be -1.
On some Intel CPUs, whose instruction cache is in fact a trace cache, the size will be expressed in K uOps.

### 62.1.13 L2Cache as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** L2 cache size in KB.
**Notes:** Could be zero, if the CPU lacks L2 cache.
If the size of the cache could not be determined, it will be -1

### 62.1.14 L3Cache as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** L3 cache size in KB.
**Notes:** Zero on most systems.

### 62.1.15 Model as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CPU model.
See also:

- 62.1.29 Model as Integer 10954

### 62.1.16 NumCores as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of CPU cores on the current processor.

### 62.1.17 NumLogicalCPUs as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of logical processors on the current processor.
**Notes:** Could be more than the number of physical cores, e.g. when the processor has HyperThreading.

### 62.1.18 Stepping as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CPU stepping.
See also:

- 62.1.31 Stepping as Integer 10955

### 62.1.19 TotalLogicalCPUs as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total number of logical processors.
**Notes:** This is num_logical_cpus * { total physical processors in the system }

If you're writing a multithreaded program and you want to run it on all CPUs, this is the number of threads you need.

### 62.1.20 Vendor as Integer

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The recognized CPU vendor.
**Notes:** See kVendor constants.

### 62.1.21 VendorName as String

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The vendor name.
**Notes:** contains the CPU vendor string, e.g. "GenuineIntel"

### 62.1.22 Properties

### 62.1.23 BrandString as String

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string (47 characters maximum) with the brand name of the CPU.
**Example:**

```
dim c as new CPUIDMBS
MsgBox c.BrandString
```

**Notes:** Is "" if not supported.
(Read and Write property)
See also:

- 62.1.3 BrandString as String 10948

### 62.1.24 EAX as UInt32

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The EAX register value after a CPUID function call.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.EAX)
```

**Notes:** (Read and Write property)

### 62.1.25 EBX as UInt32

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The EBX register value after a CPUID function call.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.EBX)
```

**Notes:** (Read and Write property)

### 62.1.26 ECX as UInt32

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ECX register value after a CPUID function call.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.ECX)
```

**Notes:** (Read and Write property)

### 62.1.27 EDX as UInt32

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The EDX register value after a CPUID function call.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.EDX)
```

**Notes:** (Read and Write property)

### 62.1.28 Family as Integer

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Family ID of the CPU.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.Family)
```

**Notes:** e.g. Family 6, Model 14 can be an Intel Core Duo CPU.
(Read and Write property)
See also:

- 62.1.8 Family as Integer 10949

### 62.1.29 Model as Integer

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Model ID of the CPU.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.Model)
```

**Notes:** Every CPU Family has several Models.

e.g. Family 6, Model 14 can be an Intel Core Duo CPU.
(Read and Write property)
See also:

- 62.1.15 Model as Integer 10951

### 62.1.30 ProcessorVendor as String

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Name of the Processor Vendor.
**Example:**

```
dim c as new CPUIDMBS
MsgBox c.ProcessorVendor
```

**Notes:** Possible values:

| | |
|---|---|
| CPUID_VID_INTEL | "GenuineIntel" |
| CPUID_VID_UMC | "UMC UMC UMC " |
| CPUID_VID_AMD | "AuthenticAMD" |
| CPUID_VID_CYRIX | "CyrixInstead" |
| CPUID_VID_NEXGEN | "NexGenDriven" |
| CPUID_VID_CENTAUR | "CentaurHauls" |
| CPUID_VID_RISE | "RiseRiseRise" |
| CPUID_VID_SIS | "SiS SiS SiS " |
| CPUID_VID_TRANSMETA | "GenuineTMx86" |
| CPUID_VID_NSC | "Geode by NSC" |

(Read and Write property)

### 62.1.31 Stepping as Integer

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The stepping ID of the CPU.
**Example:**

```
dim c as new CPUIDMBS
MsgBox str(c.Stepping)
```

**Notes:** Can be seen as a revision number of the processor.
(Read and Write property)
See also:

- 62.1.18 Stepping as Integer 10951

### 62.1.32 Constants

Features

| Constant | Value | Description |
|---|---|---|
| kFeature100MHzSteps | 80 | 100 MHz multiplier control |
| kFeature3DNOW | 56 | AMD 3DNow! instructions supported |
| kFeature3DNOWEXT | 57 | AMD 3DNow! extended instructions supported |
| kFeature3DNOWPrefetch | 68 | PREFETCH/PREFETCHW support |
| kFeatureABM | 65 | LZCNT instruction support |
| kFeatureACPI | 20 | ACPI support (power states) |
| kFeatureAES | 51 | AES* instructions supported |
| kFeatureAPERFMPERF | 91 | MPERF/APERF MSRs support |
| kFeatureAPIC | 9 | APIC support |
| kFeatureAVX | 54 | Advanced vector extensions supported |
| kFeatureCID | 40 | Context ID supported |
| kFeatureCLFLUSH | 18 | CLFLUSH instruction supported |
| kFeatureCMOV | 14 | CMOVxx instructions supported |
| kFeatureCMP_LEGACY | 63 | core multi-processing legacy mode |
| kFeatureConstantTSC | 82 | TSC ticks at constant rate |
| kFeatureCPB | 90 | Core performance boost |
| kFeatureCX16 | 41 | CMPXCHG16B instruction supported |
| kFeatureCX8 | 8 | CMPXCHG8B instruction supported |
| kFeatureDCA | 44 | Direct cache access supported |
| kFeatureDE | 2 | Debugging extension |
| kFeatureDS_CPL | 34 | CPL Qualified Debug Store |
| kFeatureDTS | 19 | Debug store supported |
| kFeatureDTS64 | 32 | 64-bit Debug store supported |
| kFeatureEST | 37 | Enhanced SpeedStep |
| kFeatureF16C | 87 | 16-bit FP convert instruction support |
| kFeatureFID | 75 | Frequency ID control |
| kFeatureFMA3 | 84 | The FMA3 instruction set |
| kFeatureFMA4 | 85 | The FMA4 instruction set |
| kFeatureFPU | 0 | Floating point unit |
| kFeatureFXSR | 22 | FXSAVE / FXRSTOR supported |
| kFeatureFXSR_OPT | 59 | FFXSR: FXSAVE and FXRSTOR optimizations |
| kFeatureHT | 26 | Hyper-threading supported (but might be disabled) |
| kFeatureHWPState | 81 | Hardware P-state control |
| kFeatureIA64 | 28 | IA64 supported (Itanium only) |
| kFeatureIBS | 70 | Instruction-based sampling |
| kFeatureLAHF_LM | 62 | LAHF/SAHF supported in 64-bit mode |
| kFeatureLM | 61 | Long mode (x86_64/EM64T) supported |
| kFeatureMCA | 13 | Machine check architecture |
| kFeatureMCE | 7 | Machine check exception |
| kFeatureMisalignSSE | 66 | Misaligned SSE supported |
| kFeatureMMX | 21 | MMX instruction set supported |
| kFeatureMMXEXT | 55 | AMD MMX-extended instructions supported |
| kFeatureMONITOR | 33 | MONITOR / MWAIT supported |
| kFeatureMOVBE | 49 | MOVBE instruction supported |
| kFeatureMSR | 5 | Model-specific regsisters, RDMSR/WRMSR supported |
| kFeatureMTRR | 10 | Memory type range registers |
| kFeatureNX | 58 | No-execute bit supported |
| kFeatureOSVW | 69 | OS Visible Workaround (AMD) |
| kFeatureOSXSAVE | 53 | non-privileged copy of OSXSAVE supported |
| kFeaturePA | 93 | Processor accumulator |
| kFeaturePAE | 6 | Physical address extension |
| kFeaturePAT | 15 | Page attribute table |
| kFeaturePBE | 29 | Pending-break enable |
| kFeaturePCLMUL | 31 | PCLMULQDQ instruction supported |
| kFeaturePDCM | 43 | Performance capabilities MSR supported |
| kFeaturePFI | 92 | Processor Feedback Interface support |
| kFeaturePGE | 12 | Page global enable |
| kFeaturePN | 17 | Processor serial # implemented (Intel P3 only) |

Vendors

| Constant | Value | Description |
|---|---|---|
| kVendorAMD | 1 | AMD CPU |
| kVendorCentaur | 6 | x86 CPU by IDT |
| kVendorCyrix | 2 | Cyrix CPU |
| kVendorIntel | 0 | Intel CPU |
| kVendorNexGen | 3 | NexGen CPU |
| kVendorNSC | 9 | x86 CPU by National Semiconductor |
| kVendorRISE | 7 | x86 CPU by Rise Technology |
| kVendorSiS | 8 | x86 CPU by SiS |
| kVendorTransmeta | 4 | Transmeta CPU |
| kVendorUMC | 5 | x86 CPU by UMC |
| kVendorUnknown | -1 | Unknown |

# Chapter 63

# CUPS

## 63.1 class CUPSDestinationMBS

### 63.1.1 class CUPSDestinationMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The class for a CUPS destination.
**Example:**

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next

MsgBox Join(lines,EndOfLine)
```

**Blog Entries**

- About plug-in functions returning array

### 63.1.2 Methods

### 63.1.3 Options as CUPSOptionMBS()

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop only.

**Function:** Options values.

### 63.1.4 Properties

### 63.1.5 Instance as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Local instance name or "".
**Notes:** (Read and Write property)

### 63.1.6 isDefault as Boolean

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Is this printer the default?
**Example:**

```
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then
MsgBox c.Name
end if
next
```

**Notes:** (Read and Write property)

### 63.1.7 Name as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The name of the printer.
**Example:**

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

## 63.2 class CUPSErrorExceptionMBS

### 63.2.1 class CUPSErrorExceptionMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The error exception raised by some CUPS functions.
**Notes:** Subclass of the RuntimeException class.

## 63.3 class CUPSJobMBS

### 63.3.1 class CUPSJobMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The class for job details.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", true, CUPSMBS.kWhichJobsActive)

if UBound(jobs)<0 then
MsgBox "no job"
else

dim j as CUPSJobMBS = jobs(0)
dim lines(-1) as string

lines.Append "Title: "+j.Title
lines.Append "User: "+j.User
lines.Append "Format: "+j.Format
lines.Append "Dest: "+j.Dest
lines.Append "ID: "+str(j.ID)
lines.Append "Priority: "+str(j.Priority)
lines.Append "Size: "+str(j.Size)
lines.Append "State: "+str(j.State)

if j.CompletedTime<>nil then
lines.Append "CompletedTime: "+j.CompletedTime.AbbreviatedDate+" "+j.CompletedTime.longtime
else
lines.Append "CompletedTime: nil"
end if

if j.CreationTime<>nil then
lines.Append "CreationTime: "+j.CreationTime.AbbreviatedDate+" "+j.CreationTime.longtime
else
lines.Append "CreationTime: nil"
end if

if j.ProcessingTime<>nil then
lines.Append "ProcessingTime: "+j.ProcessingTime.AbbreviatedDate+" "+j.ProcessingTime.longtime
else
lines.Append "ProcessingTime: nil"
end if

MsgBox join(lines,EndOfLine)

end if
```

### 63.3.2 Properties

### 63.3.3 CompletedDateTime as DateTime

MBS Tools Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was completed.
**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.4 CompletedTime as Date

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was completed.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)

if UBound(jobs)<0 then
MsgBox "no job"
else
dim j as CUPSJobMBS = jobs(0)

MsgBox j.Title+" completed at "+j.CompletedTime.AbbreviatedDate+" "+j.CompletedTime.longtime
end if
```

**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.5 CreationDateTime as DateTime

MBS Tools Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was created.
**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.6 CreationTime as Date

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was created.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)

if UBound(jobs)<0 then
MsgBox "no job"
else
dim j as CUPSJobMBS = jobs(0)

MsgBox j.Title+" completed at "+j.CreationTime.AbbreviatedDate+" "+j.CreationTime.longtime
end if
```

**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.7 Dest as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Printer or class name.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string

for each j as CUPSJobMBS in jobs
lines.Append j.Dest
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

### 63.3.8 Format as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Document format.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", true, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string

for each j as CUPSJobMBS in jobs
lines.Append j.Format
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

### 63.3.9 ID as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The job ID.
**Example:**

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
MsgBox jobs(0).Title+" has ID "+str(jobs(0).ID)
```

**Notes:** (Read and Write property)

### 63.3.10 Priority as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Priority (1-100).
**Example:**

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
MsgBox jobs(0).Title+" has priority "+str(jobs(0).Priority)
```

**Notes:** (Read and Write property)

### 63.3.11 ProcessingDateTime as DateTime

MBS Tools Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was processed.
**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.12 ProcessingTime as Date

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Time the job was processed.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)

if UBound(jobs)<0 then
MsgBox "no job"
else
dim j as CUPSJobMBS = jobs(0)

MsgBox j.Title+" completed at "+j.ProcessingTime.AbbreviatedDate+" "+j.ProcessingTime.longtime
end if
```

**Notes:** Value is nil if the value is not set.
(Read and Write property)

### 63.3.13 Size as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Size in kilobytes.
**Example:**

```
dim sum as Integer
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)

if UBound(jobs)<0 then
MsgBox "no job"
else
for each j as CUPSJobMBS in jobs
sum=sum+j.Size
next
```

```
MsgBox "Total size of all print jobs: "+str(sum)+" KB"
end if
```

**Notes:** (Read and Write property)

### 63.3.14 State as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Job state.
**Example:**

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim state as Integer = jobs(0).State // check state of first job
dim s as string = "?"

Select case state
case CUPSMBS.kJobAborted
s = "Aborted"
case CUPSMBS.kJobCanceled
s = "Canceled"
case CUPSMBS.kJobCompleted
s = "Completed"
case CUPSMBS.kJobHeld
s = "Held"
case CUPSMBS.kJobStopped
s = "Stopped"
case CUPSMBS.kJobPending
s = "Pending"
case CUPSMBS.kJobProcessing
s = "Processing"
end Select

MsgBox str(State)+": "+s
```

**Notes:** (Read and Write property)

### 63.3.15 Title as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Title/job name.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string

for each j as CUPSJobMBS in jobs
lines.Append j.Title
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

### 63.3.16 User as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** User the submitted the job.
**Example:**

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string

for each j as CUPSJobMBS in jobs
lines.Append j.User
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (Read and Write property)

## 63.4 module CUPSMBS

### 63.4.1 module CUPSMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: All.

**Function:** The module to control the CUPS printing system.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 16.5pr2
- MBS Real Studio Plugins, version 12.5pr8
- About plug-in functions returning array

### 63.4.2 Methods

### 63.4.3 CancelJob(name as string, job as Int32)

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Cancel a print job on the default server.
**Notes:** name: Name of printer or class
job: Job ID, kJobIDCurrent for the current job, or kJobIDAll for all jobs

Pass kJobIDAll to cancel all jobs or kJobIDCurrent to cancel the current job on the named destination.

Raises exception on error.

### 63.4.4 GetDefault as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Get the default printer or class for the default server.
**Example:**

MsgBox CUPSMBS.GetDefault

### 63.4.5 GetDestinations as CUPSDestinationMBS()

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Get the list of destinations from the default server.
**Example:**

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Starting with CUPS 1.2, the returned list of destinations include the printer-info, printer-is-accepting-jobs, printer-is-shared, printer-make-and-model, printer-state, printer-state-change-time, printer-state-reasons, and printer-type attributes as options. CUPS 1.4 adds the marker-change-time, marker-colors, marker-high-levels, marker-levels, marker-low-levels, marker-message, marker-names, marker-types, and printer-commands attributes as well.

### 63.4.6 GetJobs(name as string, OnlyMyJobs as boolean, whichjobs as Integer) as CUPSJobMBS()

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Get the jobs from the default server.
**Notes:** name: "" = all destinations, otherwise show jobs for named destination
OnlyMyJobs: false = all users, true = mine
whichjobs: kWhichJobsAll, kWhichJobsActive, or kWhichJobsComplete

A "whichjobs" value of kWhichJobsAll returns all jobs regardless of state, while kWhichJobsActive returns jobs that are pending, processing, or held and kWhichJobsComplete returns jobs that are stopped, canceled, aborted, or completed.

### 63.4.7 GetPassword(prompt as string) as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Get a password from the user.
**Notes:** Returns "" if the user does not provide a password.

### 63.4.8 GetPPD(name as string) as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Get the PPD file for a printer on the default server.
**Example:**

```
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then
MsgBox cupsmbs.GetPPD(c.Name)
end if
next
```

**Notes:** Returns Filename for PPD file.

For classes, cupsGetPPD returns the PPD file for the first printer in the class.

The returned filename is stored in a static buffer and is overwritten with each call to cupsGetPPD or cupsGetPPD2. The caller "owns" the file that is created and must unlink the returned filename.

### 63.4.9 LastError as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Return the last IPP status code.

### 63.4.10 LastErrorString as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Return the last IPP status-message.
**Example:**

```
MsgBox CUPSMBS.LastErrorString
```

**Notes:** Returns status-message text from last request.

### 63.4.11 PrintData(name as string, Data as String, Title as string) as Integer

MBS Tools Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Print a file to a printer or class on the default server.
**Notes:** Name: Destination name

Data: Data to print
Title: Title of job

Returns Job ID or 0 on error

### 63.4.12 PrintFile(name as string, file as folderitem, title as string) as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Print a file to a printer or class on the default server.
**Example:**

```
// Print file on default printer...
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ps")

for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then

call CUPSMBS.PrintFile(c.Name, f, f.Name)

end if
next
```

**Notes:** name: Destination name
filename: File to print
title: Title of job

Returns Job ID or 0 on error
See also:

- 63.4.13 PrintFile(name as string, file as folderitem, title as string, options() as CUPSOptionMBS) as Integer 10972

### 63.4.13 PrintFile(name as string, file as folderitem, title as string, options() as CUPSOptionMBS) as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Print a file to a printer or class on the default server.
**Notes:** name: Destination name
filename: File to print
title: Title of job

options: Options

Returns Job ID or 0 on error
See also:

- 63.4.12 PrintFile(name as string, file as folderitem, title as string) as Integer 10972

### 63.4.14 PrintFiles(name as string, files() as folderitem, title as string) as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Print files to a printer or class on the default server.
**Notes:** name: Destination name
filename: Files to print
title: Title of job

Returns Job ID or 0 on error
See also:

- 63.4.15 PrintFiles(name as string, files() as folderitem, title as string, options() as CUPSOptionMBS) as Integer 10973

### 63.4.15 PrintFiles(name as string, files() as folderitem, title as string, options() as CUPSOptionMBS) as Integer

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Print files to a printer or class on the default server.
**Notes:** name: Destination name
files: Files to print
title: Title of job
options: Options

Returns Job ID or 0 on error
See also:

- 63.4.14 PrintFiles(name as string, files() as folderitem, title as string) as Integer 10973

### 63.4.16 Server as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Return the hostname/address of the default server.
**Example:**

MsgBox CUPSMBS.Server

**Notes:** The returned value can be a fully-qualified hostname, a numeric IPv4 or IPv6 address, or a domain socket pathname.

### 63.4.17 SetDefaultPrinter(printer as string)

MBS Tools Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Sets the default printer.
**Notes:** Name must be one of CUPSDestinationMBS's name.

### 63.4.18 SetServer(server as string)

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Set the default server name.
**Notes:**

server: Server name

The "server" string can be a fully-qualified hostname, a numeric IPv4 or IPv6 address, or a domain socket pathname. Pass "" to restore the default server name.

### 63.4.19 SetUser(user as string)

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Set the default user name.
**Notes:** user: User name

Pass "" to restore the default user name.

### 63.4.20 User as string

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Return the current user's name.
**Example:**

MsgBox CUPSMBS.User

### 63.4.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kJobAborted | 8 | One of the constants for the job state. Job was aborted. |
| kJobCanceled | 7 | One of the constants for the job state. Job was canceled. |
| kJobCompleted | 9 | One of the constants for the job state. Job was completed. |
| kJobHeld | 4 | One of the constants for the job state. Job is held. |
| kJobIDAll | -1 | A job constant for all jobs. |
| kJobIDCurrent | 0 | A job constant for the current job. |
| kJobPending | 3 | One of the constants for the job state. Job is pending |
| kJobProcessing | 5 | One of the constants for the job state. Job is processing. |
| kJobStopped | 6 | One of the constants for the job state. Job is stopped. |
| kPrinterAUTHENTICATED | &h400000 | One of the printer type/capability bit constants. Printer requires authentication |
| kPrinterBIND | &h0400 | One of the printer type/capability bit constants. Can bind output |
| kPrinterBW | &h0004 | One of the printer type/capability bit constants. Can do B&W printing |
| kPrinterCLASS | &h0001 | One of the printer type/capability bit constants. Printer class |
| kPrinterCOLLATE | &h0080 | One of the printer type/capability bit constants. Can collage copies |
| kPrinterCOLOR | &h0008 | One of the printer type/capability bit constants. Can do color printing |
| kPrinterCOMMANDS | &h800000 | One of the printer type/capability bit constants. Printer supports maintenance commands |
| kPrinterCOPIES | &h0040 | One of the printer type/capability bit constants. Can do copies |
| kPrinterCOVER | &h0200 | One of the printer type/capability bit constants. Can cover output |
| kPrinterDEFAULT | &h20000 | One of the printer type/capability bit constants. Default printer on network |
| kPrinterDELETE | &h100000 | One of the printer type/capability bit constants. Delete printer |
| kPrinterDISCOVERED | &h1000000 | One of the printer type/capability bit constants. Printer was automatically discovered and added. |
| kPrinterDUPLEX | &h0010 | One of the printer type/capability bit constants. Can do duplexing |
| kPrinterFAX | &h40000 | One of the printer type/capability bit constants. Fax queue |
| kPrinterIMPLICIT | &h10000 | One of the printer type/capability bit constants. Implicit class |
| kPrinterLARGE | &h4000 | One of the printer type/capability bit constants. Can do D/E/A1/A0 |
| kPrinterLOCAL | &h0000 | One of the printer type/capability bit constants. Local printer or class |
| kPrinterMEDIUM | &h2000 | One of the printer type/capability bit constants. Can do Tabloid/B/C/A3/A2 |
| kPrinterMFP | &h4000000 | One of the printer type/capability bit constants. Printer with scanning capabilities |
| kPrinterNotShared | &h200000 | One of the printer type/capability bit constants. Printer is not shared. |
| kPrinterOPTIONS | &h6fffc | One of the printer type/capability bit constants. |
| kPrinterPUNCH | &h0100 | One of the printer type/capability bit constants. |

## 63.5 class CUPSMissingFunctionExceptionMBS

### 63.5.1 class CUPSMissingFunctionExceptionMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The exception raised if a CUPS function is not found.
**Notes:** On Windows this method is raised for each function you call.
Subclass of the RuntimeException class.

## 63.6 class CUPSOptionMBS

### 63.6.1 class CUPSOptionMBS

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** The class for the options in CUPS.
**Example:**

```
dim options() as CUPSOptionMBS

dim o1 as new CUPSOptionMBS
o1.Name = "media"
o1.Value = "A4"
options.Append o1

dim o2 as new CUPSOptionMBS
o2.Name = "scaling"
o2.Value = "75"
options.Append o2

dim o3 as new CUPSOptionMBS
o3.Name = "Collate"
o3.Value = "True"
options.Append o3

dim o4 as new CUPSOptionMBS
o4.Name = "sides"
o4.Value = "two-sided-long-edge"
options.Append o4
```

### 63.6.2 Properties

### 63.6.3 Name as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Name of option.
**Notes:** (Read and Write property)

### 63.6.4 Value as String

MBS Tools Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Value of option.
**Notes:** (Read and Write property)

# Chapter 64

# CURL

## 64.1 class CURLEmailMBS

### 64.1.1 class CURLEmailMBS

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Our plugin class to help building and sending emails.
**Example:**

```
dim e as new CURLEmailMBS

e.SetFrom "test@test.test", "christian M√ºller"
e.Subject = "Hello World ,òÔè"
e.SMTPPassword = "xxx"
e.SMTPUsername = "xxx"
e.SetServer "smtp.test.test", true
e.AddTo "test@test.test", "Test M√ºller"
e.PlainText = "Hello World," + EndOfLine + "Smilies: ,òÔè üòò üòÑ"

dim c as new CURLSMBS

if c.SetupEmail(e) then

dim er as Integer = c.Perform
if er = 0 then
MsgBox "Email sent"
end if
end if
```

**Notes:** Please make sure you set from, to, subject, plaintext to have a minimum email always.
If your email misses required fields, the email server may silently discard it.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- Sending email via gmail
- Upload email to Sent folder via IMAP
- SMTP Server Settings
- SMTP Server Settings
- Differences between CURLMBS and CURLSMBS classes
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4

**Xojo Developer Magazine**

- 22.2, page 9: News
- 20.1, page 63: Send Your Emails, How to use the MBS Xojo plugins to send emails by Stefanie Juchmes

### 64.1.2 Methods

### 64.1.3 AddAttachment(data as MemoryBlock, name as string, type as string = "", InlineID as string = "", ContentTypeMethod as String = "")

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an attachment to the email.
**Notes:** name: The name for the attachment.
type: Optional, the mime type to use. e.g. "application/pdf" for PDF files. If missing, we use "application/octet-stream".
data: The data to include.

For best results use attachment sizes below 50 MB.
The plugin will encode your data as Base64. If you want to attach a picture, you can use PictureToPNGStringMBS (mime type "image/png") or PictureToJPEGStringMBS (mime type "image/jpeg") to encode a picture.

Version 15.0 of MBS Plugin can encode file name for preserving non AScII characters. Still for compatibility it is recommended to use simply AScII names.

If InlineID is set, we include the attachment for inlining. Please pass content ID (cID).
Empty text or no parameter gives regular attachment.
You can use AddAttachment several times to add several attachments.

The optional ContentTypeMethod parameter allows to specify the method value for the content-type header. Currently only for sending calendar invitiations.
See also:


- 64.1.4 AddAttachment(data as string, name as string, type as string = "", InlineID as string = "", ContentTypeMethod as String = "") 10983
- 64.1.5 AddAttachment(file as FolderItem, name as string = "", type as string = "", InlineID as string = "", ContentTypeMethod as String = "") 10984


### 64.1.4 AddAttachment(data as string, name as string, type as string = "", InlineID as string = "", ContentTypeMethod as String = "")

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an attachment to the email.
**Notes:** name: The name for the attachment.
type: Optional, the mime type to use. e.g. "application/pdf" for PDF files. If missing, we use "application/octet-stream".
data: The data to include.

For best results use attachment sizes below 50 MB.
The plugin will encode your data as Base64. If you want to attach a picture, you can use PictureToPNGStringMBS (mime type "image/png") or PictureToJPEGStringMBS (mime type "image/jpeg") to encode a picture.

Version 15.0 of MBS Plugin can encode file name for preserving non AScII characters. Still for compatibility it is recommended to use simply AScII names.

If InlineID is set, we include the attachment for inlining. Please pass content ID (cID).
Empty text or no parameter gives regular attachment.
You can use AddAttachment several times to add several attachments.

The optional ContentTypeMethod parameter allows to specify the method value for the content-type header. Currently only for sending calendar invitiations.
See also:

- 64.1.3 AddAttachment(data as MemoryBlock, name as string, type as string = """, InlineID as string = """, ContentTypeMethod as String = """) 10982
- 64.1.5 AddAttachment(file as FolderItem, name as string = """, type as string = """, InlineID as string = """, ContentTypeMethod as String = """) 10984


### 64.1.5 AddAttachment(file as FolderItem, name as string = """, type as string = """, InlineID as string = """, ContentTypeMethod as String = """)

MBS CURL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an attachment to the email.
**Notes:** name: The name for the attachment. If empty, version 16.2 uses file name from folderitem.
type: Optional, the mime type to use. e.g. "application/pdf" for PDF files. If missing, we use "application/octet-stream".
file: The file to use. This file is read and content used for attachment.

For best results use attachment sizes below 50 MB.
The plugin will encode your data as Base64. If you want to attach a picture, you can use PictureToPNGStringMBS (mime type "image/png") or PictureToJPEGStringMBS (mime type "image/jpeg") to encode a picture.

Version 15.0 of MBS Plugin can encode file name for preserving non AScII characters. Still for compatibility it is recommended to use simply AScII names.

If InlineID is set, we include the attachment for inlining. Please pass content ID (cID).
Empty text or no parameter gives regular attachment.
You can use AddAttachment several times to add several attachments.

The optional ContentTypeMethod parameter allows to specify the method value for the content-type header.
Currently only for sending calendar invitiations.
See also:


- 64.1.3 AddAttachment(data as MemoryBlock, name as string, type as string = """, InlineID as string = """, ContentTypeMethod as String = """) 10982
- 64.1.4 AddAttachment(data as string, name as string, type as string = """, InlineID as string = """, ContentTypeMethod as String = """) 10983


### 64.1.6 AddBcc(email as string, name as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a blind copy recipient.
**Example:**

```
dim e as new CURLEmailMBS

e.AddBcc "test@monkeybreadsoftware.test", "Test M√ºller"

dim Bccs() as string = e.Bccs
MsgBox Bccs(0)
```

**Notes:** Please pass email and optionally name of recipient.
If this name contains special characters, it will be automatically encoded with UTF-8.

### 64.1.7 Addcc(email as string, name as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a copy recipient.
**Example:**

```
dim e as new CURLEmailMBS

e.Addcc "test@monkeybreadsoftware.test", "Test M√ºller"

dim ccs() as string = e.ccs
MsgBox ccs(0)
```

**Notes:** Please pass email and optionally name of recipient.
If this name contains special characters, it will be automatically encoded with UTF-8.

### 64.1.8 AddHeader(header as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a header entry.
**Example:**

```
dim e as new CURLEmailMBS

e.AddHeader "X-company: My company, Inc."

dim Headers() as string = e.Headers
MsgBox Headers(0)
```

**Notes:** This header is passed as is and not preprocessed.
You can use this function to pass custom headers for "X-Universally-Unique-Identifier:", "Date:", "X-Mailer:", "Message-Id:" and "Mime-Version:".
If you pass header without text following ":", the header is not included.

### 64.1.9 AddReplyTo(email as string, name as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a recipient for a reply.
**Example:**

```
dim e as new CURLEmailMBS

e.AddReplyTo "test@monkeybreadsoftware.test", "Test M√ºller"

dim ReplyTos() as string = e.ReplyTOs
MsgBox ReplyTos(0)
```

**Notes:** Please pass email and optionally name of recipient.
If this name contains special characters, it will be automatically encoded with UTF-8.

### 64.1.10 AddTo(email as string, name as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a recipient.
**Example:**

```
dim e as new CURLEmailMBS

e.AddTo "test@monkeybreadsoftware.test", "Test M√ºller"

dim TOs() as string = e.TOs
MsgBox TOs(0)
```

**Notes:** Please pass email and optionally name of recipient.
If this name contains special characters, it will be automatically encoded with UTF-8.

### 64.1.11 Bccs as String()

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of Bcc recipients.
**Example:**

```
dim e as new CURLEmailMBS

e.AddBcc "test@monkeybreadsoftware.test", "Test M√ºller"

dim Bccs() as string = e.Bccs
MsgBox Bccs(0)
```

**Notes:** Entries may be encoded if necessary.

### 64.1.12 ccs as String()

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of cc recipients.
**Example:**

```
dim e as new CURLEmailMBS

e.Addcc "test@monkeybreadsoftware.test", "Test M√ºller"

dim ccs() as string = e.ccs
MsgBox ccs(0)
```

**Notes:** Entries may be encoded if necessary.

### 64.1.13 clearAttachments

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all attachments from this email.
**Notes:** Useful in case you want to send same email with different attachments to another recipient.

### 64.1.14 ClearHeaders

MBS CURL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all headers from this email.
**Notes:** Useful in case you want to send same email with different headers to another recipient.

### 64.1.15 clearRecipients

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** clears all recipients.
**Notes:** Removes all TO, cc, Bcc and ReplyTO entries.
Useful in case you want to send same email to another recipient.

### 64.1.16 constructor(Encoding as string = "UTF-8")

MBS CURL Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Normally, ignore parameter and use UTF-8.
But alternative you can pass: UTF-8, AScII, MacRoman, Latin1 or Windows.

### 64.1.17 EmailSource as string

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the source code for the email.
**Notes:** This is more for debugging, than for real use.
You can write this into a EML file.

### 64.1.18 Headers as String()

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of extra header entries.
**Example:**

```
dim e as new CURLEmailMBS

e.AddHeader "X-company: My company, Inc."
```

```
dim Headers() as string = e.Headers
MsgBox Headers(0)
```

### 64.1.19 ReplyTOs as String()

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of ReplyTo recipients.
**Example:**

```
dim e as new CURLEmailMBS

e.AddReplyTo "test@monkeybreadsoftware.test", "Test M√ºller"

dim ReplyTos() as string = e.ReplyTOs
MsgBox ReplyTos(0)
```

**Notes:** Entries may be encoded if necessary.

### 64.1.20 SetFrom(email as string, name as string)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the email from address.
**Example:**

```
dim e as new CURLEmailMBS

e.SetFrom "test@test.test", "christian M√ºller"
```

**Notes:** Please pass email and name of the recipient. If this name contains special characters, it will be automatically encoded with UTF-8.

### 64.1.21 SetServer(server as string, UseSSL as boolean = false)

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the server to use.
**Example:**

```
dim e as new CURLEmailMBS

e.SMTPPassword = "rGc3_mdyjR%k"
e.SMTPUsername = "sammler@monkeybreadsoftware.de"
e.SetServer "smtprelaypool.ispgateway.de", true
```

**Notes:** Sets which SMTP server to use.
There are a few combinations possible.
First you can use SetServer with SSL and pass true for UseURL parameter.

Or you pass false for no SSL. Still you can use CURL's OptionFTPSSL set to 3 to allow TLS for an upgrade of the unencrypted connection to SSL later.

Some servers don't support unencrypted, SSL or TLS, so only one may work.

And ports can be difficult, too. You can use CURL OptionPort to set a port explicit or include it in the server with double colon on the end. common ports are 25, 587 or 465.

Port 465 usually Requires UseSSL=true, but other ports need UseSSL=false.
Sets UseSSL property.

### 64.1.22 TOs as String()

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of TO recipients.
**Example:**

```
dim e as new CURLEmailMBS

e.AddTo "test@monkeybreadsoftware.test", "Test M√ºller"

dim TOs() as string = e.TOs
MsgBox TOs(0)
```

**Notes:** Entries may be encoded if necessary.

### 64.1.23 Properties

### 64.1.24 Attachmentcount as Integer

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of attachments.
**Notes:** (Read only property)

### 64.1.25 BoundaryName as String

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional name to use in boundaries for MIME parts.
**Notes:** by default MBS Plugin.
(Read and Write property)

### 64.1.26 EncodingName as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The encoding used.
**Notes:** The property is there for you to inspect in debugger.
Set only via Constructor.
(Read only property)

### 64.1.27 FromEmail as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The from address with name.
**Notes:** The property is there for you to inspect in debugger.
(Read only property)

### 64.1.28 HeaderList as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The list of header entries.
**Notes:** The property is there for you to inspect in debugger.

(Read only property)

### 64.1.29 HTMLText as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The HTML text of the email.
**Notes:** This text is encoded as quoted printable UTF-8 text.
(Read and Write property)

### 64.1.30 InReplyTo as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The in reply to message ID.
**Notes:** Here you can define the message ID of the email you reply to.
(Read and Write property)

### 64.1.31 MessageID as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a custom message ID.
**Notes:** The plugin normally creates one by default when setting from address.
(Read and Write property)

### 64.1.32 PlainText as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The plain text of the email.
**Example:**

```
dim e as new CURLEmailMBS
e.PlainText = "Hello World," + EndOfLine + "Smilies: ,òÔè üòò üòÑ"
```

**Notes:** This text is encoded as quoted printable UTF-8 text.
(Read and Write property)

### 64.1.33 RecipientsBCC as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of Bcc recipients.
**Notes:** The property is there for you to inspect in debugger.
(Read only property)

### 64.1.34 RecipientsCC as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of CC recipients.
**Notes:** The property is there for you to inspect in debugger.
(Read only property)

### 64.1.35 RecipientsReplyTo as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of reply to entries.
**Notes:** The property is there for you to inspect in debugger.
(Read only property)

### 64.1.36 RecipientsTO as String

MBS CURL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of TO recipients.
**Notes:** The property is there for you to inspect in debugger.
(Read only property)

### 64.1.37 RichText as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The enriched text of the email.
**Notes:** This text is encoded as quoted printable UTF-8 text.
This is not to be confused with RTF file format. Enriched text is described here:
http://en.wikipedia.org/wiki/Enriched_text
Please note that most email clients do not support this nowadays.

(Read and Write property)

### 64.1.38 Server as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The effective server URL used.
**Notes:** Only for debugging.
(Read only property)

### 64.1.39 SMTPPassword as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password for SMTP server authentication.
**Example:**

```
dim e as new CURLEmailMBS

e.SMTPPassword = "rGc3_mdyjR%k"
e.SMTPUsername = "sammler@monkeybreadsoftware.de"
e.SetServer "smtprelaypool.ispgateway.de", true
```

**Notes:** (Read and Write property)

### 64.1.40 SMTPServer as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The domain name of the SMTP Server to use.
**Example:**

```
dim e as new CURLEmailMBS

e.SMTPPassword = "rGc3_mdyjR%k"
e.SMTPUsername = "sammler@monkeybreadsoftware.de"
e.SMTPServer = "smtprelaypool.ispgateway.de"
e.UseSSL = true
```

**Notes:** (Read and Write property)

### 64.1.41 SMTPUsername as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The username for SMTP server authentication.
**Example:**

```
dim e as new CURLEmailMBS

e.SMTPPassword = "rGc3_mdyjR%k"
e.SMTPUsername = "sammler@monkeybreadsoftware.de"
e.SetServer "smtprelaypool.ispgateway.de", true
```

**Notes:** (Read and Write property)

### 64.1.42 Subject as String

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The subject line.
**Example:**

```
dim e as new CURLEmailMBS

e.Subject = "Hello World ,òÔè"
```

**Notes:** If subject lines contains special characters, it is automatically encoded as UTF-8.
(Read and Write property)

### 64.1.43 UseSSL as Boolean

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to use SSL or not.
**Example:**

```
dim e as new CURLEmailMBS

e.SMTPPassword = "rGc3_mdyjR%k"
e.SMTPUsername = "sammler@monkeybreadsoftware.de"
e.SMTPServer = "smtprelaypool.ispgateway.de"
e.UseSSL = true
```

**Notes:** When using SSL right, please also check cAInfo, cAPath, OptionSSLVerifyHost and OptionSSLVerifyPeer properties on the CURLSMBS class.

Pass false for TLS and later configure CURL for TLS.
Port 465 usually Requires UseSSL=true, but other ports need UseSSL=false.
(Read and Write property)

## 64.2 class CURLFileInfoMBS

### 64.2.1 class CURLFileInfoMBS

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for file information.
**Notes:** Content of this structure depends on information which is known and is achievable (e.g. by FTP LIST parsing).

### 64.2.2 Properties

### 64.2.3 Date as Date

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 15.2 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property. But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.2.4 DateTime as DateTime

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 20.5 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property. But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.2.5 FileName as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file name.
**Notes:** (Read only property)

### 64.2.6 FileType as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file type.
**Notes:** (Read only property)

### 64.2.7 Flags as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The flags.
**Notes:** Flags define which fields are set.
Also you can just use the Has properties for same information.
(Read only property)

### 64.2.8 GID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The group ID.
**Notes:** (Read only property)

### 64.2.9 GroupString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The group string.
**Notes:** (Read only property)

### 64.2.10 HardLinks as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hard link count.
**Notes:** (Read only property)

### 64.2.11 HasFileName as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if filename property is valid.
**Notes:** (Read only property)

### 64.2.12 HasFileType as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if filetype property is valid.
**Notes:** (Read only property)

### 64.2.13 HasGID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if GID property is valid.
**Notes:** (Read only property)

### 64.2.14 HasHardLinks as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if hardlinks property is valid.
**Notes:** (Read only property)

### 64.2.15 HasPermissions as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if permissions property is valid.
**Notes:** (Read only property)

### 64.2.16 HasSize as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if size property is valid.
**Notes:** (Read only property)

### 64.2.17 HasTime as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if time and date properties have values.
**Notes:** (Read only property)

### 64.2.18 HasUID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if UID field has a value.
**Notes:** (Read only property)

### 64.2.19 IsDirectory as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if entry is a directory.
**Notes:** Same as FileType = FileTypeDirectory.
(Read only property)

### 64.2.20 IsFile as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if entry is a regular file.
**Notes:** Same as FileType = FileTypeFile.
(Read only property)

### 64.2.21 Permissions as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The permission value.
**Notes:** (Read only property)

### 64.2.22 PermissionString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The permission string.
**Notes:** (Read only property)

### 64.2.23 Size as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file size.
**Notes:** (Read only property)

### 64.2.24 Target as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The target for a symlink.
**Notes:** (Read only property)

### 64.2.25 Time as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time value.
**Notes:** (Read only property)

### 64.2.26 TimeString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time string parsed.
**Notes:** (Read only property)

### 64.2.27 UID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user ID.
**Notes:** (Read only property)

### 64.2.28 UserString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user ID as text.
**Notes:** (Read only property)

### 64.2.29 Constants

File Types

| Constant | Value | Description |
|---|---|---|
| FileTypeDeviceBlock | 3 | Block Device |
| FileTypeDeviceChar | 4 | Character Device |
| FileTypeDirectory | 1 | Directory |
| FileTypeDoor | 7 | Door, is possible only on Sun Solaris now. |
| FileTypeFile | 0 | Regular file |
| FileTypeNamedPipe | 5 | Named Pipe |
| FileTypeSocket | 6 | Socket |
| FileTypeSymlink | 2 | Symbolic links |
| FileTypeUnknown | 8 | Unknown file type. Should never occur. |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| FlagKnownFileName | 1 | Filename Known |
| FlagKnownFileType | 2 | File Type Known |
| FlagKnownGID | 32 | GID Known |
| FlagKnownHardLinks | 128 | Hardlink Count Known |
| FlagKnownPermissions | 8 | Permissions Known |
| FlagKnownSize | 64 | Size Known |
| FlagKnownTime | 4 | Time Known |
| FlagKnownUID | 16 | UID Known |

## 64.3 class CURLListMBS

### 64.3.1 class CURLListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to hold a list of strings from the CURL library.
**Notes:** Data is copied for this list, so you can just keep it around.

### 64.3.2 Methods

### 64.3.3 Item(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the item with the given index.
**Notes:** Index is zero based.

### 64.3.4 List as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts list to a string array.

### 64.3.5 Operator_Convert as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts list to a string array.

### 64.3.6 Properties

### 64.3.7 Count as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of items in this list.
**Notes:** (Read only property)

## 64.4 class CURLMBS

### 64.4.1 class CURLMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to wrap libCURL.
**Example:**

```
Dim d As New CURLMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error

ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages
```

**Notes:** We have three variants:

CURLS* classes include a static CURL library with SSL and SSH.
CURLN* classes include a static CURL library with native SSL on Mac and Windows.
CURL* classes without S need you to supply your own CURL library.

All variants can load a custom CURL library or use the one from the system on Mac and Linux.
If no library is loaded or included, the plugin will try to load the system one in constructor.

from the website libCURL website:
https://curl.haxx.se/libcurl/

libCURL is a free and easy-to-use client-side URL transfer library, supporting FTP, FTPS, HTTP, HTTPS, SCP, SFTP, TFTP, TELNET, DICT, FILE and LDAP. libCURL supports SSL certificates, HTTP POST, HTTP PUT, FTP uploading, HTTP form based upload, proxies, cookies, user+password authentication (Basic, Digest, NTLM, Negotiate, Kerberos4), file transfer resume, http proxy tunneling and more!

libCURL is highly portable, it builds and works identically on numerous platforms, including Solaris, NetBSD, FreeBSD, OpenBSD, Darwin, HPUX, IRIX, AIX, Tru64, Linux, UnixWare, HURD, Windows, Amiga, OS/2, BeOs, Mac OS X, Ultrix, QNX, OpenVMS, RISC OS, Novell NetWare, DOS and more...

libCURL is free, thread-safe, IPv6 compatible, feature rich, well supported, fast, thoroughly documented and is already used by many known, big and successful companies and numerous applications.

On Linux you may need to install libraries like ldap: apt-get install libldap-2.4.2:i386
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 21.3
- News from the MBS Xojo Plugins Version 21.1
- News from the MBS Xojo Plugins Version 20.5
- News from the MBS Xojo Plugins Version 20.4
- Adding CURLN* classes to MBS Xojo Plugins
- Differences between CURLMBS and CURLSMBS classes
- MBS REALbasic Plugins Version 10.4 release notes
- APIs change, but don't worry
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 5.3, page 50: Poetry in Motion, Movin', movin', movin', get those icons movin'... by Toby Rush

### 64.4.2 Methods

### 64.4.3 AddMimePart as CURLMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a new blank mime part.
**Notes:** Returns mime object, so you can set properties.

### 64.4.4 AWSPresignURL(AWSAccessKeyId as String, AWSSecretAccessKey as String, Region as String, Service as String, Path as String, Domain as String, Verb as String = "GET", Expires as Integer = 86400, QueryParameters() as String = nil, Headers() as String = nil) as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query predigend URL for Amazon Webservices.
**Example:**

```
Dim URL As String = CURLMBS.AWSPresignURL( _
"AKIAIOSFODNN7EXAMPLE", _
"wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY", _
"us-east-1", _
"s3", _
"/test.txt", _
"examplebucket.s3.amazonaws.com", _
"GET", _
86400 )

Break // see URL in debugger
```

**Notes:** This implements AWS4-HMAC-SHA256 pre-signature for credentials.

Works also for other compatible S3 services beside Amazon's like the one from Wasabi or Dell ECS.

| Parameter | Description | Example |
|---|---|---|
| AWSAccessKeyId | Your access key for AWS. | |
| AWSSecretAccessKey | Your secret. | |
| Region | The region to use. | "us-central-1" |
| Service | The service to use. | "s3" |
| Path | The path for the URL. Should always start with "/". | "/bucketname/test.jpg" |
| Domain | Optional the domain to use. By default we just build it from region and service. | "s3.eu-central-1.amazonaws.com" or "s3-ap-southeast-2.amazonaws.com" |
| Verb | The HTTP Operation to do. Can be POST, PUT, GET or DELETE. Default is GET. | "GET" |
| Expires | Time in seconds. Specifies the time period, in seconds, for which the generated presigned URL is valid. For example, 86400 (24 hours). This value is an integer. The minimum value you can set is 1, and the maximum is 604800 (seven days). A presigned URL can be valid for a maximum of seven days because the signing key you use in signature calculation is valid for up to seven days. Default is 86400 for one day. | |
| QueryParameters | List of query parameters to include. | |
| Headers | Extra HTTP headers to include. Here you can specify various headers to include in signature and request. | "test=abc" |

Returns the pre-signed URL. May raise an exception in case of error.

### 64.4.5 ClearData

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears data properties.
**Notes:** Resets OutputData, DebugMessages and Headers.

### 64.4.6 CloseMTDebugOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the debug output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.4.7 CloseMTHeaderOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the header output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.4.8 CloseMTInputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the input file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.4.9 CloseMTOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.4.10 CreateMTDebugOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.4.11 CreateMTDebugOutputFile(Path as String) as boolean 11010

### 64.4.11 CreateMTDebugOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.4.10 CreateMTDebugOutputFile(file as folderitem) as boolean 11009

### 64.4.12 CreateMTHeaderOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.4.13 CreateMTHeaderOutputFile(Path as String) as boolean 11010

### 64.4.13 CreateMTHeaderOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.4.12 CreateMTHeaderOutputFile(file as folderitem) as boolean 11010

### 64.4.14 CreateMTOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.4.15 CreateMTOutputFile(Path as String) as boolean 11011

### 64.4.15 CreateMTOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.4.14 CreateMTOutputFile(file as folderitem) as boolean 11011

### 64.4.16 FileInfos as CURLFileInfoMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries array with file information.
**Notes:** If you use OptionWildcard, you find after the transfer all CURLFileInfoMBS objects for all the files/folders found.

For MBS Plugin 19.0 or newer you can alternatively run a custom request "MLSD" and than get file infos, too.

### 64.4.17 FinishMime

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Finishes mime data.
**Example:**

```
dim c as new CURLMBS

// add mime
dim p as CURLMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** Please call AddMimePart for each part you like to add and than finally FinishMime before calling perform.

### 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim c as new CURLMBS
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
dim formValues(-1) as string

const CURLFORM_COPYNAME = 1
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues
```

**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020

### 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020

### 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014

- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020


### 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020

### 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020

### 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014

- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020


### 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Several FormAdd methods are there. Send a request to support if you need another parameter combination.

Lasterror is set.

FormAdd() is used to append sections when building a multipart/formdata HTTP POST (sometimes referred to as rfc1867-style posts). Append one section at a time until you've added all the sections you want included and then you call FormFinish.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

First, there are some basics you need to understand about multipart/formdata posts. Each part consists of at least a NAME and a CONTENTS part. If the part is made for file upload, there are also a stored CONTENT-TYPE and a FILENAME. Below, we'll discuss what options you use to set these properties in the parts you want to add to your post.

The options listed first are for making normal parts. The options from CURLFORM_FILE through CURLFORM_BUFFERLENGTH are for file upload parts.

CURLFORM_COPYNAME:
followed by a string which provides the name of this part. libCURL copies the string so your application doesn't need to keep it around after this function call. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_PTRNAME:
followed by a string which provides the name of this part. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_COPYCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL copies the provided data, so your application doesn't need to keep it around after this function call. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set the length of the name with CURLFORM_CONTENTSLENGTH.

CURLFORM_PTRCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_CONTENTSLENGTH.

CURLFORM_CONTENTSLENGTH:
followed by a long giving the length of the contents.

CURLFORM_FILECONTENT:
followed by a filename, causes that file to be read and its contents used as data in this part. This part does not automatically become a file upload part simply because its data was read from a file.

CURLFORM_FILE:
followed by a filename, makes this part a file upload part. It sets the filename field to the basename of the provided filename, it reads the contents of the file and passes them as data and sets the content-type if the given file match one of the internally known file extensions. For CURLFORM_FILE the user may send one or more files in one part by providing multiple CURLFORM_FILE arguments each followed by the filename (and each CURLFORM_FILE is allowed to have a CURLFORM_CONTENTTYPE).

CURLFORM_CONTENTTYPE:
is used in combination with CURLFORM_FILE. Followed a string which provides the content-type for this part, possibly instead of an internally chosen one.

CURLFORM_FILENAME:
is used in combination with CURLFORM_FILE. Followed a string, it tells libCURL to use the given string

as the filename in the file upload part instead of the actual file name.

CURLFORM_BUFFER:
is used for custom file upload parts without use of CURLFORM_FILE. It tells libCURL that the file contents are already present in a buffer. The parameter is a string which provides the filename field in the content header.

CURLFORM_BUFFERPTR:
is used in combination with CURLFORM_BUFFER. The parameter is the string to be uploaded. You must also use CURLFORM_BUFFERLENGTH to set the number of bytes in the buffer. Keep the buffer variable alive till the upload is finished.

CURLFORM_BUFFERLENGTH:
is used in combination with CURLFORM_BUFFER. The parameter is a long which gives the length of the buffer.

CURLFORM_ARRAY:
Another possibility to send options to CURL_formadd() is the CURLFORM_ARRAY option, that passes an Integer Array and a String Array defining its value. Each element in the form is constructed using the option from the integer array and the value from the string array. All available options can be used in an array, except the CURLFORM_ARRAY option itself!

CURLFORM_CONTENTHEADER:
specifies extra headers for the form POST section. This takes a CURL_slist prepared in the usual way using CURL_slist_append and appends the list of headers to those libCURL automatically generates. The list must exist while the POST occurs, if you free it before the post completes you may experience problems.

PS: CURLFORM_FILE does not work in all CURL versions on all platforms due to a bug with integer numbers.
See also:


- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016

- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11020

### 64.4.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string)

MBS CURL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.4.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11012
- 64.4.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11014
- 64.4.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11014
- 64.4.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11015
- 64.4.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11016
- 64.4.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11016
- 64.4.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11017

### 64.4.26 FormAddField(fieldName as String, fieldValue as String, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim d as new CURLMBS
d.FormAddField("company", "Test, Inc.")
```

**Notes:** For fieldName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.
ContentType is optional.

Please call FormFinish method later!

### 64.4.27 FormAddFile(fieldName as String, fileName as String, fileContent as string, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
// read content of some file
dim file as folderitem = specialFolder.desktop.Child("test.txt")
dim b as BinaryStream = binarystream.Open(file)
dim FileContent as String = b.read(b.length)

// init some curl object
dim d as new CURLMBS

// add the file as part of a form
d.FormAddFile("FileAttachment", "test.txt", FileContent, "text/plain")

// later
d.FormFinish
```

**Notes:** For fieldName, fileName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.

Filename is ignored, if empty.
ContentType is optional.

Please call FormFinish method later!

### 64.4.28 FormClear

MBS CURL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears current form data.
**Notes:** You usually don't need to call this as Perform clears form data when transfer is done.

### 64.4.29 FormData as String

MBS CURL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries current form data.
**Notes:** This is more for debugging as it builds form data as if we would send it.

### 64.4.30 FormFinish

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Finishes constructing a form.
**Example:**

```
dim c as new CURLMBS
dim namebuffer as string = "name buffer"
dim namelength as Integer = lenb(namebuffer)
dim buffer as string = "test buffer"
dim htmlbuffer as string = "<HTML>test buffer</HTML>"
dim htmlbufferlength as Integer = lenb(htmlbuffer)
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
dim formValues(-1) as string
dim recordbuffer as string = "record buffer"
dim recordlength as Integer = lenb(recordbuffer)

const CURLFORM_NOTHING = 0
const CURLFORM_COPYNAME = 1
const CURLFORM_PTRNAME = 2
const CURLFORM_NAMELENGTH = 3
const CURLFORM_COPYCONTENTS = 4
const CURLFORM_PTRCONTENTS = 5
const CURLFORM_CONTENTSLENGTH = 6
const CURLFORM_FILECONTENT = 7
```

```
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10
const CURLFORM_BUFFER = 11
const CURLFORM_BUFFERPTR = 12
const CURLFORM_BUFFERLENGTH = 13
const CURLFORM_CONTENTTYPE = 14
const CURLFORM_CONTENTHEADER = 15
const CURLFORM_FILENAME = 16

'/* Add simple name/content section */

c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_COPYCONTENTS, "content"

,
'/* Add simple name/content/contenttype section */

c.FormAdd CURLFORM_COPYNAME, "htmlcode", CURLFORM_COPYCONTENTS, "<HTML></HTML>",CURL-
FORM_CONTENTTYPE,"text/html"

'/* Add name/ptrcontent section */
c.FormAdd CURLFORM_COPYNAME, "name_for_ptrcontent", CURLFORM_PTRCONTENTS, buffer

'/* Add ptrname/ptrcontent section */
c.FormAdd CURLFORM_PTRNAME, namebuffer, CURLFORM_PTRCONTENTS, buffer, CURLFORM_NAME-
LENGTH, namelength


'/* Add name/ptrcontent/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "html_code_with_hole", CURLFORM_PTRCONTENTS, html-
buffer, CURLFORM_CONTENTSLENGTH, htmlbufferlength, CURLFORM_CONTENTTYPE, "text/html"

'/* Add simple file section */
c.FormAdd CURLFORM_COPYNAME, "picture", CURLFORM_FILE, "my-face.jpg"

'/* Add file/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "picture",CURLFORM_FILE, "my-face.jpg",CURLFORM_CONTENTTYPE,
"image/jpeg"

'/* Add two file section */
c.FormAdd CURLFORM_COPYNAME, "pictures",CURLFORM_FILE, "my-face.jpg",CURLFORM_FILE,
"your-face.jpg"

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2
```

```
'/* Add a buffer to upload */
c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_BUFFER, "data", CURLFORM_BUFFERPTR,
recordbuffer, CURLFORM_BUFFERLENGTH, recordlength

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues

'/* Add the content of a file as a normal post text value */
c.FormAdd CURLFORM_COPYNAME, "filecontent", CURLFORM_FILECONTENT, ".bashrc"
'/* Set the form info */

c.FormFinish
```

**Notes:** Lasterror is set.
The form is assigned to the HTTPPost property.

### 64.4.31 GetInfoActiveSocket as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive the active socket used by this curl session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the Destructor closes the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly.

This option was added as a replacement for GetInfoLastSocket since that one isn't working on all platforms.

### 64.4.32 GetInfoAppConnectTime as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time stamp when app connected.

### 64.4.33 GetInfoCAInfo as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries default CAInfo value.

### 64.4.34 GetInfoCAPath as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries default CAPath value.

### 64.4.35 GetInfoCertInfo as CURLListMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries information on the certificate chain.
**Example:**

```
dim c as new CURLMBS

// do some transfer
c.OptionURL = "https://www.mbsplugins.de/"
c.OptionCertInfo = true
dim e as Integer = c.perform

// query certificate info
dim lists() as CURLListMBS = c.GetInfoCertInfo

for each l as CURLListMBS in lists
MsgBox Join(l, EndOfLine)
next

MsgBox c.DebugMessages
```

**Notes:** Please set OptionCertInfo first.

### 64.4.36 GetInfoConditionUnmet as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return if the time condition prevented the document to get transferred.

### 64.4.37 GetInfoConnectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the connect to the remote host (or proxy) was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.38 GetInfoContentLengthDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The content-length of the download.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Length: field.

### 64.4.39 GetInfoContentLengthUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The specified size of the upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.40 GetInfoContentType as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The content-type of the downloaded object.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Type: field. If you get "", it means that the server didn't send a valid Content-Type header or that the protocol used doesn't support this.

### 64.4.41 GetInfoCookieList as CURLListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked-list of all cookies CURL knows (expired ones, too).
**Notes:** The Lasterror property is set. 0 for success.
If there are no cookies (cookies for the handle have not been enabled or simply none have been received) the result is nil.

### 64.4.42 GetInfoEffectiveMethod as string

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the last used effective HTTP method.
**Notes:** In cases when you've asked libcurl to follow redirects, the method may very well not be the same method the first request would use.

### 64.4.43 GetInfoEffectiveURL as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last used effective URL.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.44 GetInfoFileTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the remote time of the retrieved document (in number of seconds since 1 jan 1970 in the GMT/UTC time zone).
**Example:**

```
// init CURL with options
dim d as new CURLMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime
```

```
// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** The Lasterror property is set. 0 for success.
If you get -1, it can be because of many reasons (unknown, the server hides it or the server doesn't support the command that tells document time etc) and the time of the document is unknown. Note that you must tell the server to collect this information before the transfer is made, by using the OptionFileTime option or you will unconditionally get a -1 back. (Added in 7.5)

### 64.4.45 GetInfoFTPEntryPath as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a string holding the path of the entry path.
**Notes:** That is the initial path libCURL ended up in when logging on to the remote FTP server.
Empty string if unknown.

### 64.4.46 GetInfoHeaderSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total size of all the headers received.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.47 GetInfoHTTPAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask indicating the authentication method(s) available.
**Notes:** The Lasterror property is set. 0 for success.
The meaning of the bits is explained in the HTTPAuth option.

### 64.4.48 GetInfoHTTPConnectCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last received proxy response code to a CONNECT request.
**Notes:** The Lasterror property is set. 0 for success.
none

### 64.4.49 GetInfoHTTPVersion as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the http version used in the connection.
**Notes:** The returned value will be kHTTP_VERSION_1_0, kHTTP_VERSION_1_1, or kHTTP_VERSION_2_0, or 0 if the version can't be determined.

### 64.4.50 GetInfoLastSocket as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetInfoActiveSocket instead. **Function:** Receive the last socket used by this CURL session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the destructor will free the handle as usual and let libCURL close the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly. (Added in 7.15.2)

NOTE: this API is not really working on win64, since the SOCKET type on win64 is 64 bit large while its 'long' is only 32 bits.

### 64.4.51 GetInfoLocalIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries local IP.
**Example:**

```
dim c as new CURLMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP
MsgBox c.GetInfoLocalIP
```

### 64.4.52 GetInfoLocalPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the local port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP and port
MsgBox c.GetInfoLocalIP+":"+str(c.GetInfoLocalPort)
```

### 64.4.53 GetInfoNameLookupTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the name resolving was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.54 GetInfoNumConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** How many new connections libCURL had to create to achieve the previous transfer.
**Notes:** The Lasterror property is set. 0 for success.
(only the successful connects are counted)
Combined with RedirectCount you are able to know how many times libCURL successfully reused existing connection(s) or not. See the Connection Options to see how libCURL tries to make persistent connections to save time.

### 64.4.55 GetInfoOSErrno as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The errno variable from a connect failure.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.56 GetInfoPreTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the file transfer is just about to begin.
**Notes:** The Lasterror property is set. 0 for success.
This includes all pre-transfer commands and negotiations that are specific to the particular protocol(s) involved.

### 64.4.57 GetInfoPrimaryIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the ip address of the most recent (primary) connection.
**Example:**

```
dim c as new CURLMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.4.58 GetInfoPrimaryPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the (remote) port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.4.59 GetInfoProtocol as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Get the protocol used in the connection.
**Notes:** See kProtocol* constants.

### 64.4.60 GetInfoProxyAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask indicating the authentication method(s) available for your proxy authentication.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.61 GetInfoProxyError as integer

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries proxy error code.

### 64.4.62 GetInfoProxySSLVerifyResult as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the result of the proxy certificate verification.
**Notes:** receive the result of the certificate verification that was requested (using the OptionProxySSLVeri-

fyPeer option. This is only used for HTTPS proxies.

### 64.4.63 GetInfoRedirectCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total number of redirections that were actually followed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.64 GetInfoRedirectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the total time, in seconds, it took for all redirection steps include name lookup, connect, pre-transfer and transfer before final transaction was started.
**Notes:** The Lasterror property is set. 0 for success.
RedirectTime contains the complete execution time for multiple redirections. (Added in 7.9.7)

### 64.4.65 GetInfoRedirectURL as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The redirection URL.

### 64.4.66 GetInfoReferer as string

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries referrer text.

### 64.4.67 GetInfoRequestSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total size of the issued requests.
**Notes:** The Lasterror property is set. 0 for success.
This is so far only for HTTP requests. Note that this may be more than one request if FOLLOWLOCATION is true.

### 64.4.68 GetInfoResponseCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last received HTTP or FTP code.
**Notes:** The Lasterror property is set. 0 for success.
This will be zero if no server response code has been received. Note that a proxy's CONNECT response should be read with GetInfoHTTPConnectCode and not this.

With HTTP transfer, a successful transfer reports 200 here. If the page is not found, you get 404. Or any other HTTP Response code.

### 64.4.69 GetInfoRetryAfter as integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the Retry-After retry delay.
**Notes:** Receive the number of seconds the HTTP server suggesets the client should wait until the next request is issued.
The information from the "Retry-After:" header.

While the HTTP header might contain a fixed date string, the RetryAfter will always return number of seconds to wait - or zero if there was no header or the header couldn't be parsed.

### 64.4.70 GetInfoRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP Client sequence counter.

### 64.4.71 GetInfoRTSPCSEQRecv as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP sequence counter received.

### 64.4.72 GetInfoRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP Server sequence counter.

### 64.4.73 GetInfoRTSPSessionID as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP session ID.

### 64.4.74 GetInfoScheme as string

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the URL scheme (sometimes called protocol) used in the connection

### 64.4.75 GetInfoSizeDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total amount of bytes that were downloaded.
**Notes:** The Lasterror property is set. 0 for success.
The amount is only for the latest transfer and will be reset again for each new transfer.

### 64.4.76 GetInfoSizeUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total amount of bytes that were uploaded.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.77 GetInfoSpeedDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The average download speed that CURL measured for the complete download.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.78 GetInfoSpeedUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The average upload speed that CURL measured for the complete upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.79 GetInfoSSLEngines as CURLListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive a linked-list of OpenSSL crypto-engines supported.
**Notes:** The Lasterror property is set. 0 for success.
Note that engines are normally implemented in separate dynamic libraries. Hence not all the returned engines may be available at run-time.

### 64.4.80 GetInfoSSLVerifyResult as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the result of the certification verification that was requested (using the SSLVerifyPeer option).
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.81 GetInfoStartTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the time, in seconds, it took from the start until the first byte is just about to be transferred.
**Notes:** The Lasterror property is set. 0 for success.
This includes the pretransfer time and also the time the server needs to calculate the result.

### 64.4.82 GetInfoTotalTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total time in seconds for the previous transfer, including name resolving, TCP connect etc.
**Notes:** The Lasterror property is set. 0 for success.

### 64.4.83 LoadAPI

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the default CURL library.
**Notes:** This method is called by the constructor. So you don't need this except you want to test explicit with APILoaded whether the loading worked before you use the CURLMBS class.

Loads the "libCURL.dll" Windows library (with SSL support this one max require OpenSSL).
Loads on Mac OS X and Linux the libCURL file in /usr/lib.

### 64.4.84 LoadErrorString as string

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error string from the LoadLibrary function.

### 64.4.85 LoadLibrary(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.4.86 LoadLibrary(path as string) as boolean 11038

### 64.4.86 LoadLibrary(path as string) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.4.85 LoadLibrary(file as folderitem) as boolean 11037

### 64.4.87 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens input file for reading data while PerformMT runs.
**Example:**

```
Dim c As New CURLMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If

// do a SFTP upload
```

```
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
c.OptionUsername = "test"
c.OptionPassword = "test"
c.CollectOutputData = false

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the file) and then read all the data in a string and put into the InputData property.
See also:

- 64.4.88 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean 11039

### 64.4.88 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens input file for reading data while PerformMT runs.
**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the

file) and then read all the data in a string and put into the InputData property.
See also:

- 64.4.87 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean 11038

### 64.4.89 Perform as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a file transfer
**Example:**

```
// if you get a curl call like this

'curl -X PATCH "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } " \
'-H "Authorization: Bearer YOUR_TOKEN" \
'-H "Content-Type: application/json" \
'–data ' {
'"fields": {
'"Address": "1 Ferry Building",
'"Name": "Ferry Building",
'"Visited": True
' }
' } '

// you translate it to this:

Dim c As New CURLMBS

Dim Payload As String = _
" { "+_
"""fields"": { "+_
"""Address"": ""1 Ferry Building"","+_
"""Name"": ""Ferry Building"","+_
"""Visited"": True"+_
" } "+_
" } "

c.OptionCustomRequest = "PATCH"
c.OptionURL = "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } "
c.SetOptionHTTPHeader Array("Content-Type: application/json", "Authorization: Bearer YOUR_TOKEN")
c.OptionPostFields = Payload

Dim Error As Integer = c.Perform
Dim ResponseCode As Integer = c.GetInfoResponseCode
Dim DebugLog As String = c.DebugMessages
```

```
Dim Output As String = c.OutputData

Break
```

**Notes:** This function is called after all the options are set, and will perform the transfer as described in the options.

You can do any amount of calls to Perform. If you intend to transfer more than one file, you are even encouraged to do so. libCURL will then attempt to re-use the same connection for the following transfers, thus making the operations faster, less CPU intense and using less network resources. Just note that you will have to use the option properties between the invokes to set options for the following Perform.

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

Possible values for the retun value:

The error value -1 is used from the plugin to report that something is missing like OpenSSL dlls on Windows.

With SFTP, you can get logged error "Upload failed: Operation failed (4/-31)" when upload uses path to folder instead of file in URL.

### 64.4.90 PerformMT as Integer

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a file transfer with preemptive multithreading.
**Example:**

```
Dim c As New CURLMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If

// do a SFTP upload
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
```

```
c.OptionUsername = "test"
c.OptionPassword = "test"

Dim e As Integer = c.PerformMT

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** Same as Perform, but with additional multithreading.

As the actual transfer runs on a preemptive thread, the events Debug, Write, Header and Progress are called asynchrounously and run a few milliseconds later. You can return true in Progress event to stop transfer, but you will get more events before the transfer is stopped.

You can call CreateMTDebugOutputFile, CreateMTHeaderOutputFile and CreateMTOutputFile before PerformMT to have output data be written into files. Call OpenMTInputFile to let the plugin read input data (form post or upload) from an input file.

Do not call other CURL functions on this CURLMBS instance while PerformMT is running!

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

To avoid trouble with app hanging on quit of application, be sure to set cancel property to true in window close event to cancel any pending transfer.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 64.4.91 ProcessRelativeURL(BaseURL as String, RelativeURL as String) as String

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Processes an URL to come from relative URL to a new absolute URL.
**Example:**

```
Dim baseURL As String = "https://monkeybreadsoftware.net/themes.shtml"
Dim RelativeURL As String = "topic-curl.shtml"

Dim URL As String = CURLMBS.ProcessRelativeURL(baseURL, RelativeURL)
Break
```

**Notes:** Raises an UnsuppportedOperationException in case of failure.

### 64.4.92 ReceiveData(byref data as Memoryblock, BytesToRead as Int64) as Int64

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receives raw data on a connection.
**Notes:** This function receives raw data from the established connection. You may use it together with SendData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

The data memoryblock is a reference to your variable that will get the received data. BytesToRead is the maximum amount of data you can get in that buffer. The function returns the number of received bytes.

To establish the connection, set OptionConnectOnly = true before calling Perform. Note that ReceiveData does not work on connections that were created without this option.

The call will return kError_AGAIN if there is no data to read - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, wait for data to arrive.

Wait on the socket only if ReceiveData returns kError_AGAIN. The reason for this is libcurl or the SSL library may internally cache some data, therefore you should call ReceiveData until all data is read which would include any cached data.

Furthermore if you wait on the socket and it tells you there is data to read, ReceiveData may return CURLE_AGAIN if the only data that was read was for internal SSL processing, and no other data is available.

On success, sets lasterror to kError_OK (0), stores the received data into memory block, and returns the number of bytes it actually read.

On failure, returns zero and lasterror is set to the appropriate error code.

The function may return kError_AGAIN. In this case, use your operating system facilities to wait until data can be read, and retry.

Reading exactly 0 bytes indicates a closed connection.

If there's no socket available to use from the previous transfer, this function returns kError_UNSUPPORTED_PROTOCOL.

### 64.4.93 Reset

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Re-initializes all options previously set on a specified CURL handle to the default values.
**Notes:** It does not change the following information kept in the handle: live connections, the Session ID cache, the DNS cache, the cookies and shares.

### 64.4.94 SendData(data as Memoryblock) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.4.95 SendData(data as string) as Integer

### 64.4.95 SendData(data as string) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.4.94 SendData(data as Memoryblock) as Integer 11044

### 64.4.96 SetInputData(data as MemoryBlock)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.4.97 SetInputData(data as string) 11045

### 64.4.97 SetInputData(data as string)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the input data.
**Example:**

```
Dim c As New CURLMBS

c.SetInputData "Hello World"

// do a HTTP Upload with PUT
c.OptionUpload = True
c.OptionURL = "https://monkeybreadsoftware.de/filemaker/examples/echo.php"

// or do a FTP upload
'c.OptionURL = "ftp://monkeybreadsoftware.de/folder/file.txt"

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.4.96 SetInputData(data as MemoryBlock) 11045

### 64.4.98 SetOptionConnectTo(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set list of host:port:connect-to-host:connect-to-port, overrides the URL's host:port (only for the network layer)

### 64.4.99 SetOptionEmptyPassword

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets an empty password.
**Notes:** Normally you have no password unless you set it.
But if you set a password with empty string, the plugin sets CURL to use no password.
This method is to use an empty password.

### 64.4.100 SetOptionHTTP200Aliases(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked list of aliases to be treated as valid HTTP 200 responses.
**Notes:** Some servers respond with a custom header response line. For example, IceCast servers respond with "ICY 200 OK". By including this string in your list of aliases, the response will be treated as a valid HTTP header line such as "HTTP/1.0 200 OK".

The alias itself is not parsed for any version strings. So if your alias is "MYHTTP/9.9", LibCURL will not treat the server as responding with HTTP version 9.9. Instead LibCURL will use the value set by option HTTPVersion.

The Lasterror property is set. 0 for success.

### 64.4.101 SetOptionHTTPHeader(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked list of HTTP headers to pass to the server in your HTTP request.
**Example:**

```
dim c as new CURLMBS
c.SetOptionHTTPHeader array("Expect:", "Content-Type: text/xml", "SOAPAction: ""login""")
```

**Notes:** If you add a header that is otherwise generated and used by libCURL internally, your added one will be used instead. If you add a header with no contents as in 'Accept:' (no data on the right side of the colon), the internally used header will get disabled. Thus, using this option you can add new headers, replace internal headers and remove internal headers. To add a header with no contents, make the contents be two quotes: "". The headers included in the linked list must not be CRLF-terminated, because CURL adds CRLF after each header item. Failure to comply with this will result in strange bugs because the server will most likely ignore part of the headers you specified.

The first line in a request (containing the method, usually a GET or POST) is not a header and cannot be replaced using this option. Only the lines following the request-line are headers. Adding this method line in

this list of headers will only cause your request to send an invalid header.

Pass an empty array to this to reset back to no custom headers.

The Lasterror property is set. 0 for success.

### 64.4.102 SetOptionMailRecipients(list() as string)

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the array of email recipient addresses.

| | | |
|---|---|---|
| const kError_FunctionMissing | = -1 | |
| const kError_OK | = 0 | |
| const kError_UNSUPPORTED_PROTOCOL | = 1 | |
| const kError_FAILED_INIT | = 2 | |
| const kError_URL_MALFORMAT | = 3 | |
| const kError_URL_MALFORMAT_USER | = 4 | (NOT USED) |
| const kError_COULDNT_RESOLVE_PROXY | = 5 | |
| const kError_COULDNT_RESOLVE_HOST | = 6 | |
| const kError_COULDNT_CONNECT | = 7 | |
| const kError_FTP_WEIRD_SERVER_REPLY | = 8 | |
| const kError_FTP_ACCESS_DENIED | = 9 | a service was denied by the FTP server due to lack of access when login fails this is not returned. |
| const kError_FTP_USER_PASSWORD_INCORRECT | = 10 | |
| const kError_FTP_WEIRD_PASS_REPLY | = 11 | |
| const kError_FTP_WEIRD_USER_REPLY | = 12 | |
| const kError_FTP_WEIRD_PASV_REPLY | = 13 | |
| const kError_FTP_WEIRD_227_FORMAT | = 14 | |
| const kError_FTP_CANT_GET_HOST | = 15 | |
| const kError_FTP_CANT_RECONNECT | = 16 | |
| const kError_FTP_COULDNT_SET_BINARY | = 17 | |
| const kError_PARTIAL_FILE | = 18 | |
| const kError_FTP_COULDNT_RETR_FILE | = 19 | |
| const kError_FTP_WRITE_ERROR | = 20 | |
| const kError_FTP_QUOTE_ERROR | = 21 | |
| const kError_HTTP_RETURNED_ERROR | = 22 | |
| const kError_WRITE_ERROR | = 23 | |
| const kError_MALFORMAT_USER | = 24 | NOT USED |
| const kError_FTP_COULDNT_STOR_FILE | = 25 | failed FTP upload |
| const kError_READ_ERROR | = 26 | could open/read from file |
| const kError_OUT_OF_MEMORY | = 27 | |
| const kError_OPERATION_TIMEOUTED | = 28 | the timeout time was reached |
| const kError_FTP_COULDNT_SET_ASCII | = 29 | TYPE A failed |
| const kError_FTP_PORT_FAILED | = 30 | FTP PORT operation failed |
| const kError_FTP_COULDNT_USE_REST | = 31 | the REST command failed |
| const kError_FTP_COULDNT_GET_SIZE | = 32 | the SIZE command failed |
| const kError_HTTP_RANGE_ERROR | = 33 | RANGE "command" didn't work |
| const kError_HTTP_POST_ERROR | = 34 | |
| const kError_SSL_CONNECT_ERROR | = 35 | wrong when connecting with SSL |
| const kError_BAD_DOWNLOAD_RESUME | = 36 | couldn't resume download |
| const kError_FILE_COULDNT_READ_FILE | = 37 | |
| const kError_LDAP_CANNOT_BIND | = 38 | |
| const kError_LDAP_SEARCH_FAILED | = 39 | |
| const kError_LIBRARY_NOT_FOUND | = 40 | |
| const kError_FUNCTION_NOT_FOUND | = 41 | |
| const kError_ABORTED_BY_CALLBACK | = 42 | |
| const kError_BAD_FUNCTION_ARGUMENT | = 43 | |
| const kError_BAD_CALLING_ORDER | = 44 | NOT USED |
| const kError_INTERFACE_FAILED | = 45 | CURLOPT_INTERFACE failed |
| const kError_BAD_PASSWORD_ENTERED | = 46 | NOT USED |
| const kError_TOO_MANY_REDIRECTS | = 47 | catch endless re-direct loops |
| const kError_UNKNOWN_TELNET_OPTION | = 48 | User specified an unknown option |
| const kError_TELNET_OPTION_SYNTAX | = 49 | Malformed telnet option |
| const kError_OBSOLETE | = 50 | NOT USED |
| const kError_SSL_PEER_CERTIFICATE | = 51 | peer's certificate wasn't ok |
| const kError_GOT_NOTHING | = 52 | when this is a specific error |
| const kError_SSL_ENGINE_NOTFOUND | = 53 | SSL crypto engine not found |
| const kError_SSL_ENGINE_SETFAILED | = 54 | can not set SSL crypto engine as default |
| const kError_SEND_ERROR | = 55 | failed sending network data |
| const kError_RECV_ERROR | = 56 | failure in receiving network data |
| const kError_SHARE_IN_USE | = 57 | share is in use |
| const kError_SSL_CERTPROBLEM | = 58 | problem with the local certificate |
| const kError_SSL_CIPHER | = 59 | couldn't use specified cipher |
| const kError_SSL_CACERT | = 60 | problem with the CA cert (path?) |
| const kError_BAD_CONTENT_ENCODING | = 61 | Unrecognized transfer encoding |
| const kError_LDAP_INVALID_URL | = 62 | Invalid LDAP URL |
| const kError_FILESIZE_EXCEEDED | = 63 | Maximum file size exceeded |
| const kError_FTP_SSL_FAILED | = 64 | Requested FTP SSL level failed |
| const kError_SEND_FAIL_REWIND | = 65 | Sending the data requires a rewind that failed |
| const kError_SSL_ENGINE_INITFAILED | = 66 | failed to initialise ENGINE |
| const kError_LOGIN_DENIED | = 67 | user, password or similar was not accepted and we failed to login |

### 64.4.103 SetOptionPostQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array to a list of FTP commands to pass to the server after your ftp transfer request.
**Example:**

```
dim d as CURLMBS // your CURL object

dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"
d.SetOptionPostQuote(ws)
```

**Notes:** Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.
If you want to do a ftp operation instead of download/upload/directory listing, please use SetOptionQuote.

### 64.4.104 SetOptionPreQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array to a list of FTP commands to pass to the server after the transfer type is set.
**Notes:** Disable this operation again by using an empty array for this option. Before version 7.15.6, if you also set Nobody to true, this option didn't work.

The Lasterror property is set. 0 for success.

### 64.4.105 SetOptionProxyHeader(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set list of headers used for proxy requests only.

### 64.4.106 SetOptionQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array or a list of FTP commands to pass to the server prior to your ftp request.
**Example:**

```
dim curl as new CURLMBS
curl.SetOptionQuote array("DELE filename.txt")
```

**Notes:** This will be done before any other FTP commands are issued (even before the CWD command).

Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.

### 64.4.107 SetOptionResolve(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send linked-list of name:port:address sets.

### 64.4.108 SetOptionTelnetOptions(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provide an array of variables to pass to the telnet negotiations.
**Notes:** The variables should be in the format <option=value>. libCURL supports the options 'TTYPE', 'XDISPLOC' and 'NEW_ENV'. See the TELNET standard for details.

The Lasterror property is set. 0 for success.

### 64.4.109 SetPathCAInfo(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A path holding one or more certificates to verify the peer with.
**Example:**

```
dim cacert as FolderItem // your cacert.pem file
dim CURL as new CURLMBS
CURL.OptionSSLVerifyHost = 2 // verify server
CURL.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
CURL.SetPathCAInfo cacert
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.4.110 SetPathCAPath(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A path to the directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLMBS

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
c.SetPathCAPath cacert
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.4.111 SetPathCRLFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)

### 64.4.112 SetPathIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path to a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

### 64.4.113 SetPathNetRCFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file

in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.4.114 SetPathProxyIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the proxy issuer SSL certificate filename.
**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).

### 64.4.115 SetupEmail(email as Variant) as boolean

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Setups existing CURL session for an email transfer.
**Example:**

```
dim e as new CURLEmailMBS

e.SetFrom "test@test.test", "Christian M√ºller"
e.Subject = "Hello World ‚Äòè"
e.SMTPPassword = "xxx"
e.SMTPUsername = "xxx"
e.SetServer "smtp.test.test", true
e.AddTo "test@test.test", "Test M√ºller"
e.PlainText = "Hello World," + EndOfLine + "Smilies: ‚Äòè üòò üòÑ"

dim c as new CURLMBS
```

```
if c.SetupEmail(e) then

dim er as Integer = c.Perform
if er = 0 then
MsgBox "Email sent"
end if
end if
```

**Notes:** You can set your own settings like proxy after this function call.
If you like you can reuse the email and CURL objects after you sent an email, change values and send another email.
Returns true on success or false on failure.

### 64.4.116 UpKeep

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform any connection upkeep checks.
**Notes:** Perform any connection upkeep checks.
Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.
Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
This function must be explicitly called in order to perform the upkeep work. The connection upkeep interval is set with OptionUpkeepIntervalMS.

### 64.4.117 WebSocketMeta as CURLWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries last frame metadata.
**Notes:** Only useful if called in Write event.

### 64.4.118 WebSocketReceive(BufferSize as Integer = 65536) as CURLWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive WebSocket data.
**Example:**

```
dim curl as CURLMBS // your curl handle

dim m as CURLWebSocketFrameMBS = curl.WebSocketReceive

if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
```

**Notes:** Retrieves as much as possible of a received WebSocket data fragment into the buffer, but not more than BufferSize bytes. The bytesReceived property in CURLWebSocketFrameMBS is set to the number of bytes actually stored.

If there is more fragment data to deliver than what fits in the provided buffer, CURL returns a full buffer and the application needs to call this function again to continue draining the buffer.

The returned CURLWebSocketFrameMBS contains the data and the metadata about the received data.

Lasterror property is set.

### 64.4.119 WebSocketSend(Data as MemoryBlock, FrameSize as Integer = 0, SendFlags as Integer = 0) as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send the specific message fragment over an established WebSocket connection.
**Notes:** The buffer holds the data to send.
Returns the number of payload bytes actually sent.

To send a (huge) fragment using multiple calls with partial content per invoke, set the kFlagOffset bit and the FrameSize argument as the total expected size for the first part, then set the kFlagOffset with a zero FrameSize for the following parts.

If not sending a partial fragment or if this is raw mode, FrameSize should be set to zero.

If kWebSocketRaw is enabled in WebSocketOptions, the flags argument should be set to 0.

Lasterror property is set.

### 64.4.120 Properties

### 64.4.121 APILoaded as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the CURL library was loaded.
**Notes:** The CURLMBS constructor loads the library if it was not loaded before.
(Read only property)

### 64.4.122 Cancel as Boolean

MBS CURL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Tells CURL instance to cancel transfer as soon as possible.
**Notes:** Especially when using PerformMT, you may see your app hang if user tries to quit application. To prevent the hang, please set Cancel = true in window close event. So when app quits and windows get destroyed, the PerformMT will see the Cancel being true and returns soon.
(Read and Write property)

### 64.4.123 CollectDebugData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectDebugMessages instead. **Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.4.124 CollectDebugMessages as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and

you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.4.125 CollectHeaderData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectHeaders instead.
**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.

Renamed to CollectHeaders in v23.0.
(Read and Write property)

### 64.4.126 CollectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.4.127 CollectOutputData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect output data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the OutputData Property instead of collecting the pieces yourself in the write event. Of course this is optional and you can still process data in write event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.4.128 DebugData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DebugMessages instead.
**Function:** The debug data from CURL.
**Notes:** If CollectDebugData property is true, the plugin puts the data received in debugMessage event also into this property, so you can grab it after the transfer.

Newer code should use DebugMessages property instead.
(Read only property)

### 64.4.129 DebugMessages as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The debug messages from CURL.
**Notes:** If CollectDebugMessage property is true, the plugin puts the data received in debugMessage event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.4.130 DebugWithData as Boolean

MBS CURL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to include data in debug messages.
**Example:**

```
dim c as new CURLMBS
c.DebugWithData = true
c.OptionVerbose = true
c.CollectDebugMessages = true
```

**Notes:** (Read and Write property)

### 64.4.131 Handle as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle of the CURL object.
**Notes:** (Read and Write property)

### 64.4.132 HeaderData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this property, so you can grab it after the transfer.

Renamed to Headers in v23.0.
(Read only property)

### 64.4.133 Headers as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use Headers instead. **Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.4.134 InputData as String

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to

upload.
(Read and Write property)

### 64.4.135 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The lasterror from the library.
**Example:**

```
Dim d As New CURLMBS

d.OptionSSLVersion = 123

Dim LastError As Integer = d.LastError
// gives 43
Dim LastErrorText As String = d.LastErrorText
// A libcurl function was given a bad argument

Break
```

**Notes:** Set in the constructor while doing initialization as well as by by various curl calls.
Check the kError* constants.
(Read and Write property)

### 64.4.136 LastErrorMessage as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error message.
**Example:**

```
Dim d As New CURLMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** The error message from the transfer.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read only property)

### 64.4.137 LasterrorText as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The text for the lasterror code.
**Example:**

```
Dim d As New CURLMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** Static string matched to the error code, so you have an idea what's wrong.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read and Write property)

### 64.4.138 LibraryUsed as String

MBS CURL Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which library is in use.
**Notes:** This is for debugging only to see which library is in use.
(Read only property)

### 64.4.139 LibVersion as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a human readable string with the version number of libCURL and some of its important components (like OpenSSL version).
**Notes:** (Read only property)

### 64.4.140 OptionAbstractUnixSocket as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Path to an abstract Unix domain socket.
**Notes:** (Read and Write property)
See also ABSTRACT_UNIX_SOCKET option in CURL manual.

### 64.4.141 OptionAcceptEncoding as String

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the contents of the Accept-Encoding: header sent in a HTTP request, and enables decoding of a response when a Content-Encoding: header is received.
**Example:**

```
dim c as new CURLMBS
c.OptionAcceptEncoding = "deflate"
```

**Notes:** Three encodings are supported: identity, which does nothing, deflate which requests the server to compress its response using the zlib algorithm, and gzip which requests the gzip algorithm. If a zero-length

string is set, then an Accept-Encoding: header containing all supported encodings is sent.

This is a request, not an order; the server may or may not do it. This option must be set (to any non-NULL value) or else any unsolicited encoding done by the server is ignored. See the special file README.encoding for details (included with CURL source code).
(Read and Write property)
See also ACCEPT_ENCODING option in CURL manual.

### 64.4.142 OptionAcceptTimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Time-out accept operations (currently for FTP only) after this amount of milliseconds.
**Notes:** (Read and Write property)
See also ACCEPTTIMEOUT_MS option in CURL manual.

### 64.4.143 OptionAddressScope as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer specifying the scope_id value to use when connecting to IPv6 link-local or site-local addresses.
**Notes:** (Added in CURL 7.19.0)
(Read and Write property)
See also ADDRESS_SCOPE option in CURL manual.

### 64.4.144 OptionAppend as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also APPEND option in CURL manual.

### 64.4.145 OptionAutoReferer as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When enabled, libCURL will automatically set the Referer: field in requests where it follows a Location: redirect.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also AUTOREFERER option in CURL manual.

### 64.4.146 OptionAWSSigV4 as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides AWS V4 signature authentication on HTTP(S) header.
**Notes:** Pass a text that is the collection of specific arguments are used for creating outgoing authentication headers. The format of the param option is:

provider1 [ :provider2 [ :region [ :service ] ] ]

provider1, provider2:
The providers arguments are used for generating some authentication parameters such as "Algorithm", "date", "request type" and "signed headers".

region:
The argument is a geographic area of a resources collection. It is extracted from the host name specified in the URL if omitted.

service:
The argument is a function provided by a cloud. It is extracted from the host name specified in the URL if omitted.

Note: This call set CURLOPT_HTTPAUTH to CURLAUTH_AWS_SIGV4. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.

Example with "Test:Try", when curl will do the algorithm, it will generate "TEST-HMAC-SHA256" for "Algorithm", "x-try-date" and "X-Try-Date" for "date", "test4_request" for "request type", "SignedHeaders=content-type;host;x-try-date" for "signed headers"
If you use just "test", instead of "test:try", test will be use for every strings generated

By default, the value of this parameter is empty. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.
(Read and Write property)
See also AWS_SIGV4 option in CURL manual.

### 64.4.147 OptionBufferSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Your preferred size (in bytes) for the receive buffer in libCURL.
**Notes:** The main point of this would be that the write event gets called more often and with smaller chunks. This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size. (Added in 7.10)

This size is by default set as big as possible (OptionMaxWriteSize), so it only makse sense to use this option if you want it smaller.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also BUFFERSIZE option in CURL manual.

### 64.4.148 OptionCACacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the life-time for cached certificate stores.
**Notes:** Pass a number, this sets the timeout in seconds. This tells libcurl the maximum time any cached certificate store it has in memory may be kept and reused for new connections. Once the timeout has expired, a subsequent fetch requiring a certificate store will have to build a new one.
Building a certificate store from a CAINFO file (see OptionCAInfo) is a slow operation so curl may cache the generated certificate store internally to speed up future connections.
Set to zero to completely disable caching, or set to -1 to retain the cached store remain forever. By default, libcurl caches this info for 24 hours.
(Read and Write property)
See also CA_CACHE_TIMEOUT option in CURL manual.

### 64.4.149 OptionCAInfo as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file holding one or more certificates to verify the peer with.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAINFO option in CURL manual.

### 64.4.150 OptionCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CAInfo as blob value.
**Notes:** Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also CAINFO_BLOB option in CURL manual.

### 64.4.151 OptionCAPath as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLMBS
c.OptionCAPath = "/data/MyCertificates"
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAPATH option in CURL manual.

### 64.4.152 OptionCertInfo as boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to enable libCURL's certificate chain info gatherer.
**Notes:** With this enabled, libCURL (if built with OpenSSL) will extract lots of information and data about the certificates in the certificate chain used in the SSL connection. This data is then possible to extract after a transfer using GetInfoCertInfo. (Added in 7.19.1)
(Read and Write property)
See also CERTINFO option in CURL manual.

### 64.4.153 OptionConnectionTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in seconds that you allow the connection to the server to take.
**Example:**

```
dim d as new CURLMBS

d.OptionConnectionTimeOutMS = 5000
d.OptionConnectOnly = 1

// try this URL
d.OptionURL = URL

// try connection
dim e as integer = d.Perform

// check result
dim s as string = d.OutputData
TextArea1.text = FixText(S)

if e = 0 then
MsgBox "Connected"
else
MsgBox "Failed to connect"
end if
```

**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also the OptionTimeout option.
(Read and Write property)
See also CONNECTTIMEOUT option in CURL manual.

### 64.4.154 OptionConnectionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in milli seconds that you allow the connection to the server to take.
**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also

the OptionTimeout option.
(Read and Write property)

### 64.4.155 OptionConnectOnly as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A true tells the library to perform any required proxy authentication and connection setup, but no data transfer.
**Notes:** This option is useful with the CURLMBS.GetInfoLastSocket function. The library can set up the connection and then the application can obtain the most recently used socket for special data transfers. (Added in 7.15.2)

Type changed to integer in v23.0 to enable passing 2 for WebSockets.
(Read and Write property)
See also CONNECT_ONLY option in CURL manual.

### 64.4.156 OptionCookie as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It will be used to set a cookie in the http request.
**Notes:** The format of the string should be NAME=CONTENTS, where NAME is the cookie name and CONTENTS is what the cookie should contain.

If you need to set multiple cookies, you need to set them all using a single option and thus you need to concatenate them all in one single string. Set multiple cookies in one string like this: "name1=content1; name2=content2;" etc.

Using this option multiple times will only make the latest string override the previously ones.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIE option in CURL manual.

### 64.4.157 OptionCookieFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The cookie file content.
**Notes:** It should contain the name of your file holding cookie data to read. The cookie data may be in Netscape / Mozilla cookie data format or just regular HTTP-style headers dumped to a file.

Given an empty or non-existing file or by passing the empty string (""), this option will enable cookies for this CURL handle, making it understand and parse received cookies and then use matching cookies in future request.

If you use this option multiple times, you just add more files to read. Subsequent files will add more cookies.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEFILE option in CURL manual.

### 64.4.158 OptionCookieJar as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** File path where to write the cookies to.
**Notes:** This will make libCURL write all internally known cookies to the specified file, when the object is destroyed. If no cookies are known, no file will be created. Specify "-" to instead have the cookies written to stdout. Using this option also enables cookies for this session, so if you for example follow a location it will make matching cookies get sent accordingly.

If the cookie jar file can't be created or written to, libCURL will not and cannot report an error for this. Using OptionVerbose or DebugFunction event will get a warning to display, but that is the only visible feedback you get about this possibly lethal situation.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For

macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEJAR option in CURL manual.

### 64.4.159 OptionCookieList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The cookie string.
**Notes:** Cookie can be either in Netscape / Mozilla format or just regular HTTP-style header (Set-Cookie: ...) format. If CURL cookie engine was not enabled it will enable its cookie engine. Passing a magic string "ALL" will erase all cookies known by CURL. (Added in 7.14.1) Passing the special string "SESS" will only erase all session cookies known by CURL. (Added in 7.15.4)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIELIST option in CURL manual.

### 64.4.160 OptionCookieSession as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to mark this as a new cookie "session".
**Notes:** It will force libCURL to ignore all cookies it is about to load that are "session cookies" from the previous session. By default, libCURL always stores and loads all cookies, independent if they are session cookies are not. Session cookies are cookies without expiry date and they are meant to be alive and existing for this "session" only.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIESESSION option in CURL manual.

### 64.4.161 OptionCRLF as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Convert Unix newlines to CRLF newlines on transfers.

**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also CRLF option in CURL manual.

### 64.4.162 OptionCRLFile as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)
(Read and Write property)
See also CRLFILE option in CURL manual.

### 64.4.163 OptionCustomRequest as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It will be user instead of GET or HEAD when doing an HTTP request, or instead of LIST or NLST when doing an ftp directory listing.
**Example:**

```
dim c as CURLMBS // your CURL instance

c.URL = "ftp://..."
c.customRequest = "MLSD" // ftp advanced directory listing
```

**Notes:** This is useful for doing DELETE or other more or less obscure HTTP requests. Don't do this at will, make sure your server supports the command first.

Restore to the internal default by setting this to "".

Many people have wrongly used this option to replace the entire request with their own, including multiple headers and POST contents. While that might work in many cases, it will cause libCURL to send invalid requests and it could possibly confuse the remote server badly. Use CURLOPT_POST and OptionPostFields to set POST data. Use OptionHTTPHeader to replace or extend the set of headers sent by libCURL. Use OptionHTTPVersion to change HTTP version.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For WebDAV, you can set this to "MKCOL" to create a folder at the given URL.
(Read and Write property)
See also CUSTOMREQUEST option in CURL manual.

### 64.4.164 OptionDefaultProtocol as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the protocol used when curl is given a URL without a protocol.
**Notes:** (Read and Write property)
See also DEFAULT_PROTOCOL option in CURL manual.

### 64.4.165 OptionDirListOnly as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For FTP and SFTP based URLs a parameter set to true tells the library to list the names of files in a directory, rather than performing a full directory listing that would normally include file sizes, dates etc.
**Notes:** For POP3 a parameter of true tells the library to list the email message or messages on the POP3 server. This can be used to change the default behaviour of libCURL, when combined with a URL that contains a message ID, to perform a "scan listing" which can then be used to determine the size of an email.

Note: For FTP this causes a NLST command to be sent to the FTP server. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

Setting this option to true also implies a directory listing even if the URL doesn't end with a slash, which otherwise is necessary.

Do NOT use this option if you also use OptionWildCardMatch as it will effectively break that feature then.
(Read and Write property)
See also DIRLISTONLY option in CURL manual.

### 64.4.166 OptionDisableUserNameInURL as Boolean

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disallow specifying username/login in URL.
**Notes:** The value true tells the library to not allow URLs that include an username.
(Read and Write property)

### 64.4.167 OptionDNSCacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timeout in seconds.
**Notes:** Name resolves will be kept in memory for this number of seconds. Set to zero (0) to completely disable caching, or set to -1 to make the cached entries remain forever. By default, libCURL caches this info for 60 seconds.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also DNS_CACHE_TIMEOUT option in CURL manual.

### 64.4.168 OptionDNSInterface as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the name of the network interface that the DNS resolver should bind to.
**Notes:** This must be an interface name (not an address). Set this option to "" to use the default setting (don't bind to a specific interface).
(Read and Write property)
See also DNS_INTERFACE option in CURL manual.

### 64.4.169 OptionDNSLocalIPv4 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the local IPv4 address that the resolver should bind to.
**Notes:** The argument should be of string and contain a single numerical IPv4 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP4 option in CURL manual.

### 64.4.170 OptionDNSLocalIPv6 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the local IPv6 address that the resolver should bind to.
**Notes:** The argument should be of type string and contain a single IPv6 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP6 option in CURL manual.

### 64.4.171 OptionDNSServers as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the name servers to use for DNS resolution.
**Notes:** (Read and Write property)
See also DNS_SERVERS option in CURL manual.

### 64.4.172 OptionDNSShuffleAddresses as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to shuffle DNS addresses.
**Notes:** When a name is resolved and more than one IP address is returned, shuffle the order of all returned addresses so that they will be used in a random order. This is similar to the ordering behavior of gethostbyname which is no longer used on most platforms.

Addresses will not be reshuffled if a name resolution is completed using the DNS cache. DNSCacheTimeout property can be used together with this option to reduce DNS cache timeout or disable caching entirely if

frequent reshuffling is needed.

Since the addresses returned will be reordered randomly, their order will not be in accordance with RFC 3484 or any other deterministic order that may be generated by the system's name resolution implementation. This may have performance impacts and may cause IPv4 to be used before IPv6 or vice versa.
Default is false.
(Read and Write property)
See also DNS_SHUFFLE_ADDRESSES option in CURL manual.

### 64.4.173 OptionDOHSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the host name in the DOH (DNS-over-HTTPS) SSL certificate.
**Notes:** Pass a 2 as asking curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyPeer and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1 it is treated the same as 2. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!
(Read and Write property)
See also DOH_SSL_VERIFYHOST option in CURL manual.

### 64.4.174 OptionDOHSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the DOH SSL certificate.
**Notes:** Pass 1 to enable or 0 to disable.
This option tells curl to verify the authenticity of the DOH (DNS-over-HTTPS) server's certificate. A value of 1 means curl verifies; 0 (zero) means it doesn't.
This option is the DOH equivalent of CURL.SetOptionSSLVerifyPeer and only affects requests to the DOH server.
When negotiating a TLS or SSL connection, the server sends a certificate indicating its identity. Curl verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. curl uses a default bundle of CA certificates (the path for that is determined at build time) and you

can specify alternate certificates with the CURL.SetOptionCAInfo option or the CURL.SetOptionCAPath option.
When CURL.SetOptionDOHSSLVerifyPeer is enabled, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the peer certificate verification succeeds regardless.
Authenticating the certificate is not enough to be sure about the server. You typically also want to ensure that the server is the server you mean to be talking to. Use CURL.SetOptionDOHSSLVerifyHost for that. The check that the host name in the certificate is valid for the host name you're connecting to is done independently of the CURL.SetOptionDOHSSLVerifyPeer option.

WARNING: disabling verification of the certificate allows bad guys to man-in-the-middle the communication without you knowing it. Disabling verification makes the communication insecure. Just having encryption on a transfer is not enough as you cannot be sure that you are communicating with the correct end-point.
(Read and Write property)
See also DOH_SSL_VERIFYPEER option in CURL manual.

### 64.4.175 OptionDOHSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the DOH SSL certificate's status.
**Notes:** Pass 2 to ask curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyHost and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1L it is treated the same as 2L. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0L, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!

See also OptionDOHSSLVerifyPeer to verify the digital signature of the DOH server certificate. If libcurl is built against NSS and OptionDOHSSLVerifyPeer is zero, OptionDOHSSLVerifyHost is also set to zero and cannot be overridden.
(Read and Write property)
See also DOH_SSL_VERIFYSTATUS option in CURL manual.

### 64.4.176 OptionDOHURL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the DNS-over-HTTPS URL.
**Notes:** Pass in a string to a URL for the DOH server to use for name resolving. The parameter should be URL-encoded in the following format: "https://host:port/path". It MUST specify a HTTPS URL.

libcurl doesn't validate the syntax or use this variable until the transfer is issued. Even if you set a crazy value here, OptionDOHURL will still return CURLE_OK.

curl sends POST requests to the given DNS-over-HTTPS URL.

To find the DOH server itself, which might be specified using a name, libcurl will use the default name lookup function. You can bootstrap that by providing the address for the DOH server with OptionResolve.

Disable DOH use again by setting this option to "".
(Read and Write property)
See also DOH_URL option in CURL manual.

### 64.4.177 OptionEGDSocket as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The path name to the Entropy Gathering Daemon socket.
**Notes:** It will be used to seed the random engine for SSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.178 OptionExpect100TimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets Expect 100 timeout.
**Notes:** Time to wait in milliseconds for a response to a HTTP request containing an Expect: 100-continue header before sending the data anyway.

(Read and Write property)
See also EXPECT_100_TIMEOUT_MS option in CURL manual.

### 64.4.179 OptionFailOnError as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to fail silently if the HTTP code returned is equal to or larger than 400. The default action would be to return the page normally, ignoring that code.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This method is not fail-safe and there are occasions where non-succesful response codes will slip through, especially when authentication is involved (response codes 401 and 407).

You might get some amounts of headers transferred before this situation is detected, like for when a "100-continue" is received as a response to a POST/PUT and a 401 or 407 is received immediately afterwards.
(Read and Write property)
See also FAILONERROR option in CURL manual.

### 64.4.180 OptionFileTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether filetime should be querried.
**Example:**

```
// init CURL with options
dim d as new CURLMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime

// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** If it is true, libCURL will attempt to get the modification date of the remote document in this operation. This requires that the remote server sends the time or replies to a time querying command.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FILETIME option in CURL manual.

### 64.4.181 OptionFollowLocation as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library to follow any Location: header that the server sends as part of an HTTP header.
**Example:**

```
dim c as new CURLMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** This means that the library will re-send the same request on the new location and follow new Location: headers all the way until no more such headers are returned. OptionMaxRedirs can be used to limit the number of redirects libCURL will follow.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FOLLOWLOCATION option in CURL manual.

### 64.4.182 OptionForbitReuse as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to make the next transfer explicitly close the connection when done.
**Notes:** Normally, libCURL keep all connections alive when done with one transfer in case there comes a succeeding one that can re-use them. This option should be used with caution and only if you understand what it does. Set to false to have libCURL keep the connection open for possibly later re-use (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.183 OptionFreshConnect as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to make the next transfer use a new (fresh) connection by force.
**Example:**

```
dim c as new CURLMBS

c.OptionFreshConnect=True
```

**Notes:** If the connection cache is full before this connection, one of the existing connections will be closed as according to the selected or default policy. This option should be used with caution and only if you understand what it does. Set this to 0 to have libCURL attempt re-using an existing connection (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FRESH_CONNECT option in CURL manual.

### 64.4.184 OptionFTPAccount as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The FTP account name to use.
**Notes:** When an FTP server asks for "account data" after user name and password has been provided, this data is sent off using the ACCT command.
(Read and Write property)
See also FTP_ACCOUNT option in CURL manual.

### 64.4.185 OptionFTPAlternativeToUser as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The alternative username.
**Notes:** Pass a string as parameter, pointing to a string which will be used to authenticate if the usual FTP "USER user" and "PASS password" negotiation fails. This is currently only known to be required when connecting to Tumbleweed's Secure Transport FTPS server using client certificates for authentication. (Added in 7.15.5)
(Read and Write property)
See also FTP_ALTERNATIVE_TO_USER option in CURL manual.

### 64.4.186 OptionFTPAppend as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionAppend instead.
**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.187 OptionFTPCreateMissingDirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is 1, CURL will attempt to create any remote directory that it fails to CWD into.
**Notes:** CWD is the command that changes working directory. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
Newer CURL Library versions allow a value of 2 to do a CWD after the directory was created, so this property changed from boolean to integer.
(Read and Write property)
See also FTP_CREATE_MISSING_DIRS option in CURL manual.

### 64.4.188 OptionFTPFileMethod as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer that should have one of the following values.
**Notes:** This option controls what method libCURL should use to reach a file on a FTP(S) server. The argument should be one of the following alternatives:

URLFTPMETHOD_MULTICWD = 1

libCURL does a single CWD operation for each path part in the given URL. For deep hierarchies this means very many commands. This is how RFC1738 says it should be done. This is the default but the slowest behavior.

CURLFTPMETHOD_NOCWD = 2

libCURL does no CWD at all. libCURL will do SIZE, RETR, STOR etc and give a full path to the server for all these commands. This is the fastest behavior.

CURLFTPMETHOD_SINGLECWD = 3

libCURL does one CWD with the full target directory and then operates on the file "normally" (like in the multicwd case). This is somewhat more standards compliant than 'nocwd' but without the full penalty of 'multicwd'.
(Read and Write property)
See also FTP_FILEMETHOD option in CURL manual.

### 64.4.189 OptionFTPListOnly as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionDirListOnly instead. **Function:** True tells the library to just list the names of an ftp directory, instead of doing a full directory listing that would include file sizes, dates etc.
**Notes:** This causes an FTP NLST command to be sent. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.190 OptionFTPPort as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The port to use for ftp.
**Notes:** It will be used to get the IP address to use for the ftp PORT instruction. The PORT instruction tells the remote server to connect to our specified IP address. The string may be a plain IP address, a host name, an network interface name (under Unix) or just a '-' letter to let the library use your systems default IP address. Default FTP operations are passive, and thus won't use PORT.

You disable PORT again and go back to using the passive version by setting this option to "".

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPPORT option in CURL manual.

### 64.4.191 OptionFTPResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionServerResponseTimeout instead. **Function:** Causes CURL to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to generate a response message for a command before the session is considered hung.
**Notes:** With v22.4 or newer, please use newer property name OptionServerResponseTimeout.

While CURL is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionFTPResponseTimeout to a value smaller than OptionTimeout. (Added in 7.10.8)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.192 OptionFTPSkipPasvIP as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If set to a non-zero value, it instructs libCURL to not use the IP address the server suggests in its 227-response to libCURL's PASV command when libCURL connects the data connection.
**Notes:** Instead libCURL will re-use the same IP address it already uses for the control connection. But it will use the port number from the 227-response. (Added in 7.14.2)

This option has no effect if PORT, EPRT or EPSV is used instead of PASV.
(Read and Write property)
See also FTP_SKIP_PASV_IP option in CURL manual.

### 64.4.193 OptionFTPSSL as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUseSSL instead.
**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)

### 64.4.194 OptionFTPSSLAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What kind of SSL authentication to use for FTP.
**Notes:** Pass an integer using one of the values from below, to alter how libCURL issues "AUTH TLS" or "AUTH SSL" when FTP over SSL is activated (see CURLOPT_FTP_SSL). (Added in 7.12.2)

kFTPAUTH_DEFAULT = 0

Allow libCURL to decide

kFTPAUTH_SSL = 1

Try "AUTH SSL" first, and only if that fails try "AUTH TLS"

kFTPAUTH_TLS = 2

Try "AUTH TLS" first, and only if that fails try "AUTH SSL"

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPSSLAUTH option in CURL manual.

### 64.4.195 OptionFTPSSLCCC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If enabled, this option makes libCURL use CCC (Clear Command Channel).
**Notes:** It shuts down the SSL/TLS layer after authenticating. The rest of the control channel communication will be unencrypted. This allows NAT routers to follow the FTP transaction. Pass a long using one of the values below. (Added in 7.16.1)

| | | |
|---|---|---|
| CURLFTPSSL_CCC_NONE | 0 | Don't attempt to use CCC. |
| CURLFTPSSL_CCC_PASSIVE | 1 | Do not initiate the shutdown, but wait for the server to do it. Do not send a reply. |
| CURLFTPSSL_CCC_ACTIVE | 2 | Initiate the shutdown and wait for a reply. |

(Read and Write property)
See also FTP_SSL_CCC option in CURL manual.

### 64.4.196 OptionFTPUseEPRT as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to use the EPRT (and LPRT) command when doing active FTP downloads (which is enabled by CURLOPT_FTPPORT).
**Notes:** Using EPRT means that it will first attempt to use EPRT and then LPRT before using PORT, but if you pass FALSE (zero) to this option, it will not try using EPRT or LPRT, only plain PORT. (Added in 7.10.5)

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPRT option in CURL manual.

### 64.4.197 OptionFTPUseEPSV as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to use the EPSV command when doing passive FTP downloads (which it always does by default).
**Notes:** Using EPSV means that it will first attempt to use EPSV before using PASV, but if you pass FALSE (zero) to this option, it will not try using EPSV, only plain PASV.

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPSV option in CURL manual.

### 64.4.198 OptionFTPusePret as Boolean

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to send a PRET command before PASV (and EPSV). Certain FTP servers, mainly drftpd, require this non-standard command for directory listings as well as up and downloads in PASV mode.
**Notes:** Has no effect when using the active FTP transfers mode. (Added in 7.20.0)
(Read and Write property)
See also FTP_USE_PRET option in CURL manual.

### 64.4.199 OptionGet as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the true, this forces the HTTP request to get back to GET.
**Notes:** usable if a POST, HEAD, PUT or a custom request have been used previously using the same CURL handle.

When setting OptionGet to a true value, it will automatically set OptionNoBody to true (since 7.14.1).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.200 OptionGSSAPIDelegation as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allow GSSAPI credential delegation.
**Notes:** (Read and Write property)
See also GSSAPI_DELEGATION option in CURL manual.

### 64.4.201 OptionHappyEyeballsTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The happy eyeballs timeout.

**Notes:** Head start in milliseconds to give happy eyeballs.
(Read and Write property)
See also HAPPY_EYEBALLS_TIMEOUT_MS option in CURL manual.

### 64.4.202 OptionHAProxyProtocol as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to send an HAProxy PROXY protocol header.
**Notes:** Set to true to tell the library to send an HAProxy PROXY protocol header at beginning of the connection. The default action is not to send this header.
This option is primarily useful when sending test requests to a service that expects this header.
Most applications do not need this option.
Default false, do not send HAProxy PROXY protocol header.
(Read and Write property)
See also HAPROXYPROTOCOL option in CURL manual.

### 64.4.203 OptionHeader as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to include the header in the body output.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This is only relevant for protocols that actually have headers preceding the data (like HTTP).
(Read and Write property)
See also HEADER option in CURL manual.

### 64.4.204 OptionHeaderOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass in a bitmask of "header options".
**Notes:** (Read and Write property)
See also HEADEROPT option in CURL manual.

### 64.4.205 OptionHTTPAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which http authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use. The available bits are listed below. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the UserPassword option. (Added in 7.10.6)

kAuthBASIC = 1

HTTP Basic authentication. This is the default choice, and the only method that is in wide-spread use and supported virtually everywhere. This is sending the user name and password over the network in plain text, easily captured by others.

kAuthDIGEST = 2

HTTP Digest authentication. Digest authentication is defined in RFC2617 and is a more secure way to do authentication over public networks than the regular old-fashioned Basic method.

kAuthGSSNEGOTIATE = 4

HTTP GSS-Negotiate authentication. The GSS-Negotiate (also known as plain "Negotiate") method was designed by Microsoft and is used in their web applications. It is primarily meant as a support for Kerberos5 authentication but may be also used along with another authentication methods. For more information see IETF draft draft-brezak-spnego-http-04.txt.

You need to build libCURL with a suitable GSS-API library for this to work.

kAuthNTLM = 8

HTTP NTLM authentication. A proprietary protocol invented and used by Microsoft. It uses a challenge-response and hash concept similar to Digest, to prevent the password from being eavesdropped.

You need to build libCURL with OpenSSL support for this option to work, or build libCURL on Windows.

kAuthANY = &hFFFFFFFF

This is a convenience macro that sets all bits and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

kAuthANYSAFE = &hFFFFFFFE

This is a convenience macro that sets all bits except Basic and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPAUTH option in CURL manual.

### 64.4.206 OptionHTTPContentDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a long to tell libCURL how to act on content decoding.
**Notes:** If set to zero, content decoding will be disabled. If set to 1 it is enabled. Note however that libCURL has no default content decoding but requires you to use OptionEncoding for that. (added in 7.16.2)
(Read and Write property)
See also HTTP_CONTENT_DECODING option in CURL manual.

### 64.4.207 OptionHTTPProxyTunnel as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the parameter to true to get the library to tunnel all operations through a given HTTP proxy.
**Notes:** There is a big difference between using a proxy and to tunnel through it. If you don't know what

this means, you probably don't want this tunneling option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPPROXYTUNNEL option in CURL manual.

### 64.4.208 OptionHTTPTransferDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer to tell libCURL how to act on transfer decoding.
**Notes:** If set to zero, transfer decoding will be disabled, if set to 1 it is enabled (default). libCURL does chunked transfer decoding by default unless this option is set to zero. (added in 7.16.2)
(Read and Write property)
See also HTTP_TRANSFER_DECODING option in CURL manual.

### 64.4.209 OptionHTTPVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to one of the values described below.
**Notes:** They force libCURL to use the specific HTTP versions. This is not sensible to do unless you have a good reason.

kHTTP_VERSION_NONE = 0

We don't care about what version the library uses. libCURL will use whatever it thinks fit.

kHTTP_VERSION_1_0 = 1

Enforce HTTP 1.0 requests.

kHTTP_VERSION_1_1 = 2

Enforce HTTP 1.1 requests.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTP_VERSION option in CURL manual.

### 64.4.210 OptionIgnoreContentLength as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to ignore the Content-Length header.
**Notes:** This is useful for Apache 1.x (and similar servers) which will report incorrect content length for files over 2 gigabytes. If this option is used, CURL will not be able to accurately report progress, and will simply stop the download when the server ends the connection. (added in 7.14.1)
(Read and Write property)
See also IGNORE_CONTENT_LENGTH option in CURL manual.

### 64.4.211 OptionInFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INFILESIZE option in CURL manual.

### 64.4.212 OptionInFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionInFileSize instead.
**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** This value should be passed as a CURL_off_t. (Added in 7.11.0)

Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely

by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.213 OptionInterface as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This set the interface name to use as outgoing network interface.
**Notes:** The name can be an interface name, an IP address or a host name.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INTERFACE option in CURL manual.

### 64.4.214 OptionIPResolve as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allows an application to select what kind of IP addresses to use when resolving host names.
**Example:**

```
dim c as new CURLMBS
c.OptionIPResolve = c.kIPRESOLVE_V4
```

**Notes:** This is only interesting when using host names that resolve addresses using more than one version of IP. The allowed values are:

kIPRESOLVE_WHATEVER = 0

Default, resolves addresses to all IP versions that your system allows.

kIPRESOLVE_V4 = 1

Resolve to ipv4 addresses.

kIPRESOLVE_V6 = 2

Resolve to ipv6 addresses.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also IPRESOLVE option in CURL manual.

### 64.4.215 OptionIssuerCert as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file holding a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also ISSUERCERT option in CURL manual.

### 64.4.216 OptionIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one

needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionIssuerCert which instead expects a file name as input.
(Read and Write property)
See also ISSUERCERT_BLOB option in CURL manual.

### 64.4.217 OptionKeepSendingOnError as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to keep sending on error.
**Notes:** Continue to send data if the server responds early with an HTTP status code >= 300
(Read and Write property)
See also KEEP_SENDING_ON_ERROR option in CURL manual.

### 64.4.218 OptionKeyPassword as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set passphrase to private key.
**Notes:** It will be used as the password required to use the OptionSSLKey or OptionSSHPrivateKeyfile private key. You never needed a pass phrase to load a certificate but you need one to load your private key.
(Read and Write property)
See also KEYPASSWD option in CURL manual.

### 64.4.219 OptionKRB4Level as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKRBLevel instead.
**Function:** Set the krb4 security level, this also enables krb4 awareness.

**Notes:** This is a string, 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to "" to disable kerberos4. The kerberos support only works for FTP.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.220 OptionKRBLevel as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** FTP kerberos security level.
**Notes:** Set the kerberos security level for FTP; this also enables kerberos awareness. This is a string that should match one of the following: 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to NULL to disable kerberos support for FTP.
(Read and Write property)
See also KRBLEVEL option in CURL manual.

### 64.4.221 OptionLocalPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This sets the local port number of the socket used for connection.
**Notes:** This can be used in combination with OptionInterface and you are recommended to use OptionLocalPortRange as well when this is set. Note that port numbers are only valid 1 - 65535. (Added in 7.15.2)
(Read and Write property)
See also LOCALPORT option in CURL manual.

### 64.4.222 OptionLocalPortRange as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This is the number of attempts libCURL should do to find a working local port number.
**Notes:** It starts with the given OptionLocalPort and adds one to the number for each retry. Setting this value to 1 or below will make libCURL do only one try for exact port number. Note that port numbers by nature is a scarce resource that will be busy at times so setting this value to something too low might cause unnecessary connection setup failures. (Added in 7.15.2)
(Read and Write property)

See also LOCALPORTRANGE option in CURL manual.

### 64.4.223 OptionLoginOptions as String

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Login options string to use for the transfer.
**Notes:** For more information about the login options please see RFC 2384, RFC5092 and IETF draft draft-earhart-url-smtp-00.txt

CURLOPT_LOGIN_OPTIONS can be used to set protocol specific login options, such as the preferred authentication mechanism via "AUTH=NTLM" or "AUTH=*", and should be used in conjunction with the OptionUserName option.
Only IMAP, POP3 and SMTP support login options.
(Read and Write property)
See also LOGIN_OPTIONS option in CURL manual.

### 64.4.224 OptionLowSpeedLimit as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This property contains the transfer speed in bytes per second that the transfer should be below during OptionLowSpeedTime seconds for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_LIMIT option in CURL manual.

### 64.4.225 OptionLowSpeedTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This property contains the time in seconds that the transfer should be below the OptionLowSpeedLimit for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_TIME option in CURL manual.

### 64.4.226 OptionMailAuth as String

MBS CURL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This string will be used to specify the authentication address (identity) of a submitted message that is being relayed to another server.
**Notes:** This optional parameter allows co-operating agents in a trusted environment to communicate the authentication of individual messages and should only be used by the application program, using libCURL, if the application is itself a mail server acting in such an environment. If the application is operating as such and the AUTH address is not known or is invalid, then an empty string should be used for this parameter.

Unlike OptionMailFrom and SetOptionMailRecipients, the address should not be specified within a pair of angled brackets (<>). However, if an empty string is used then a pair of brackets will be sent by libCURL as required by RFC 2554.
(Read and Write property)
See also MAIL_AUTH option in CURL manual.

### 64.4.227 OptionMailFrom as String

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string that will be used to specify the sender address in a mail when sending an SMTP mail with libCURL.
**Notes:** (Read and Write property)
See also MAIL_FROM option in CURL manual.

### 64.4.228 OptionMaxAgeConn as Integer

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum age the connection should have in seconds.
**Notes:** Older connections are not reused, but discarded.
(Read and Write property)
See also MAXAGE_CONN option in CURL manual.

### 64.4.229 OptionMaxConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The set number will be the persistent connection cache size.
**Notes:** The set amount will be the maximum amount of simultaneously open connections that libCURL may cache. Default is 5, and there isn't much point in changing this value unless you are perfectly aware of how this work and changes libCURL's behaviour. This concerns connection using any of the protocols that support persistent connections.

When reaching the maximum limit, CURL closes the oldest one in the cache to prevent the number of open connections to increase.

If you already have performed transfers with this CURL handle, setting a smaller MAXCONNECTS than before may cause open connections to get closed unnecessarily.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXCONNECTS option in CURL manual.

### 64.4.230 OptionMaxFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EXCEEDED will be returned.

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXFILESIZE option in CURL manual.

### 64.4.231 OptionMaxFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxFileSize instead. **Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EX-

CEEDED will be returned. (Added in 7.11.0)

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.232 OptionMaxLifeTimeConnection as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets maximum lifetime (since creation) allowed for reusing a connection.
**Notes:** Pass a number as parameter containing maxlifetime - the maximum time in seconds, since the creation of the connection, that you allow an existing connection to have to be considered for reuse for this request.

libcurl features a connection cache that holds previously used connections. When a new request is to be done, it will consider any connection that matches for reuse. The MaxLifeTimeConnection limit prevents libcurl from trying too old connections for reuse. This can be used for client-side load balancing. If a connection is found in the cache that is older than this set maxlifetime, it will instead be closed once any in-progress transfers complete.

If set to 0, this behavior is disabled: all connections are eligible for reuse.
(Read and Write property)

### 64.4.233 OptionMaxRecvSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
(Read and Write property)
See also MAX_RECV_SPEED option in CURL manual.

### 64.4.234 OptionMaxRecvSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxRecvSpeed instead. **Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
(Read and Write property)

### 64.4.235 OptionMaxRedirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The set number will be the redirection limit.
**Example:**

```
dim c as new CURLMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** If that many redirections have been followed, the next redirect will cause an error (kError_TOO_MANY_REDIRECTS). This option only makes sense if the CURLOPT_FOLLOWLOCATION is used at the same time. Added in 7.15.1: Setting the limit to 0 will make libCURL refuse any redirect. Set it to -1 for an infinite number of redirects (which is the default)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXREDIRS option in CURL manual.

### 64.4.236 OptionMaxSendSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in

7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)
See also MAX_SEND_SPEED option in CURL manual.

### 64.4.237 OptionMaxSendSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxSendSpeed instead. **Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)

### 64.4.238 OptionMimeOptions as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set MIME option flags.
**Notes:** Pass a number that holds a bitmask of CURLMIMEOPT constants. Each bit is a Boolean flag used while encoding a MIME tree or multipart form data.

Available bits are:

CURLMIMEOPT_FORMESCAPE = 1

Tells libcurl to escape multipart form field and file names using the backslash-escaping algorithm rather than percent-encoding (HTTP only).

Backslash-escaping consists in preceding backslashes and double quotes with a backslash. Percent encoding maps all occurrences of double quote, carriage return and line feed to %22, %0D and %0A respectively.

Before version 7.81.0, percent-encoding was never applied.

HTTP browsers used to do backslash-escaping in the past but have over time transitioned to use percent-encoding. This option allows to address server-side applications that have not yet have been converted.

As an example, consider field or file name strange\name"kind. When the containing multipart form is sent, this is normally transmitted as strange\name%22kind. When this option is set, it is sent as strange\\name\"kind.
(Read and Write property)
See also MIME_OPTIONS option in CURL manual.

### 64.4.239 OptionNetRC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Controls usage of netrc file.
**Notes:** This parameter controls the preference of libCURL between using user names and passwords from your
textasciitilde /.netrc file, relative to user names and passwords in the URL supplied with OptionURL.

libCURL uses a user name (and supplied or prompted password) supplied with OptionUsername and OptionPassword in preference to any of the options controlled by this parameter.

An integer, set to one of the values described below.

kNETRC_OPTIONAL = 1

The use of your
textasciitilde /.netrc file is optional, and information in the URL is to be preferred. The file will be scanned with the host and user name (to find the password only) or with the host only, to find the first user name and password after that machine, which ever information is not specified in the URL.

Undefined values of the option will have this effect.

kNETRC_IGNORED = 0

The library will ignore the file and use only the information in the URL.

This is the default.

kNETRC_REQUIRED = 2

This value tells the library that use of the file is required, to ignore the information in the URL, and to search the file with the host only.

Only machine name, user name and password are taken into account (init macros and similar things aren't supported).

libCURL does not verify that the file has the correct properties set (as the standard Unix ftp client does). It should only be readable by user.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NETRC option in CURL manual.

### 64.4.240 OptionNetRCFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string containing the full path name to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also NETRC_FILE option in CURL manual.

### 64.4.241 OptionNewDirectoryPerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created directories on the remote server.
**Notes:** The default value is 0755, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)

Value must be octal, so use &o prefix for number.
(Read and Write property)
See also NEW_DIRECTORY_PERMS option in CURL manual.

### 64.4.242 OptionNewFilePerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created files on the remote server.
**Notes:** The default value is &o0644, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)
Be aware that you normally specify this in octal values. So use the &o prefix in Xojo.
(Read and Write property)
See also NEW_FILE_PERMS option in CURL manual.

### 64.4.243 OptionNoBody as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to not include the body-part in the output.
**Notes:** This is only relevant for protocols that have separate header and body parts. On HTTP(S) servers, this will make libCURL do a HEAD request.

To change request to GET, you should use OptionGet. Change request to POST with OptionPost etc.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NOBODY option in CURL manual.

### 64.4.244 OptionNoProxy as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string with a comma- separated list of hosts which do not use a proxy, if one is specified.
**Notes:** The only wildcard is a single * character, which matches all hosts, and effectively disables the proxy. Each name in this list is matched as either a domain which contains the hostname, or the hostname itself. For example, local.com would match local.com, local.com:80, and www.local.com, but not www.notlocal.com.

(Added in 7.19.4)
(Read and Write property)
See also NOPROXY option in CURL manual.

### 64.4.245 OptionNoSignal as Integer

MBS CURL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to not use signals.
**Notes:** If it is true, libCURL will not use any functions that install signal handlers or any functions that cause signals to be sent to the process. This option is mainly here to allow multi-threaded unix applications to still set/use all timeout options etc, without risking getting signals. (Added in 7.10)

If this option is set and libCURL has been built with the standard name resolver, timeouts will not occur while the name resolve takes place. Consider building libCURL with c-ares support to enable asynchronous DNS lookups, which enables nice timeouts for name resolves without signals.

Setting OptionNoSignal to true makes libCURL NOT ask the system to ignore SIGPIPE signals, which otherwise are sent by the system when trying to send data to a socket which is closed in the other end. libCURL makes an effort to never cause such SIGPIPEs to trigger, but some operating systems have no way to avoid them and even on those that have there are some corner cases when they may still happen, contrary to our desire. In addition, using CURLAUTH_NTLM_WB authentication could cause a SIGCHLD signal to be raised.
(Read and Write property)
See also NOSIGNAL option in CURL manual.

### 64.4.246 OptionPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The password to use for the transfer.
**Notes:** The OptionPassword option should be used in conjunction with the OptionUsername option.
(Read and Write property)
See also PASSWORD option in CURL manual.

### 64.4.247 OptionPathAsIs as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass path as it is and do not resolve dots.
**Notes:** Do not squash dot-dot sequences.
(Read and Write property)
See also PATH_AS_IS option in CURL manual.

### 64.4.248 OptionPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The public key in DER form used to validate the peer public key.
**Notes:** Native path to key file.
This option is used only if SSLVerifyPeer is true.
(Read and Write property)
See also PINNEDPUBLICKEY option in CURL manual.

### 64.4.249 OptionPipeWait as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Wait/don't wait for pipe/mutex to clarify.
**Notes:** (Read and Write property)
See also PIPEWAIT option in CURL manual.

### 64.4.250 OptionPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The remote port number to connect to, instead of the one specified in the URL or the default port for the used protocol.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PORT option in CURL manual.

### 64.4.251 OptionPost as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library to do a regular HTTP post.
**Notes:** This will also make the library use the a "Content-Type: application/x-www-form-urlencoded" header. (This is by far the most commonly used POST method).

Use the OptionPostFields option to specify what data to post.

Optionally, you can provide data to POST using the Read event but then you must make sure to not set OptionPostFields to anything but "". When providing data with an event, you must transmit it using chunked transfer-encoding.

You can override the default POST Content-Type: header by setting your own with OptionHTTPHeader.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use POST to a HTTP 1.1 server, you can send data without knowing the size before starting the POST if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size in the request.

When setting CURLOPT_POST to a non-zero value, it will automatically set OptionNoBody to 0 (since 7.14.1).

If you issue a POST request and then want to make a HEAD or GET using the same re-used handle, you must explictly set the new request type using OptionNoBody or OptionGet or similar.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also POST option in CURL manual.

### 64.4.252 OptionPostFields as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should be the full data to post in an HTTP POST operation.
**Example:**

```
dim xml as string // XML or JSON to send as payload
dim c as new CURLMBS
```

```
c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
c.OptionPostFields = xml
c.OptionUserAgent = "Test App"
c.OptionPost = true

// for SOAP use right content type
c.SetOptionHTTPHeader array("Content-Type: application/soap+xml; charset=utf-8")
```

**Notes:** You must make sure that the data is formatted the way you want the server to receive it. libCURL will not convert or encode it for you. Most web servers will assume this data to be url-encoded. Take note.

This POST is a normal application/x-www-form-urlencoded kind (and libCURL will set that Content-Type by default when this option is used), which is the most commonly used one by HTML forms. See also the OptionPost. Using OptionPostFields implies OptionPost.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

To make multipart/formdata posts (aka rfc1867-posts), check out the OptionPost option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COPYPOSTFIELDS option in CURL manual.

### 64.4.253 OptionPostFieldSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The size of the post data.
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)
See also POSTFIELDSIZE option in CURL manual.

### 64.4.254 OptionPostFieldSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionPostFieldSize instead. **Function:** The size of the post data. (64 bit version)
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)

### 64.4.255 OptionPostRedir as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask to control how libCURL acts on redirects after POSTs that get a 301 or 302 response back.
**Notes:** A parameter with bit 0 set (value CURL_REDIR_POST_301=1) tells the library to respect RFC 2616/10.3.2 and not convert POST requests into GET requests when following a 301 redirection. Setting bit 1 (value CURL_REDIR_POST_302=2) makes libCURL maintain the request method after a 302 redirect. CURL_REDIR_POST_ALL is a convenience define that sets both bits.

The non-RFC behaviour is ubiquitous in web browsers, so the library does the conversion by default to maintain consistency. However, a server may require a POST to remain a POST after such a redirection. This option is meaningful only when setting OptionFollowLocation. (Added in 7.17.1) (This option was known as CURLOPT_POST301 up to 7.19.0 as it only supported the 301 way before then)
(Read and Write property)
See also POSTREDIR option in CURL manual.

### 64.4.256 OptionPreProxy as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of pre proxy to use.
**Notes:** (Read and Write property)
See also PRE_PROXY option in CURL manual.

### 64.4.257 OptionProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionProtocolsString instead. **Function:** A bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in the transfer. This allows you to have a libCURL built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default libCURL will accept all protocols it supports. See also OptionRedirProtocols. (Added in 7.19.4)
(Read and Write property)

### 64.4.258 OptionProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The protocols allowed-
**Example:**

```
dim c as new CURLMBS
c.OptionProtocolsString = "http,tftp,sftp"
```

**Notes:** Pass a string that holds a comma-separated list of case insensitive protocol names (URL schemes) to allow in the transfer. This option allows applications to use libcurl built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default, libcurl accepts all protocols it was built with support for. See also OptionReditProtocolsString.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

CURLVersionMBS class can be used to get a list of all supported protocols in the current libcurl. GetInfoProtocol function is the recommended way to figure out the protocol used in a previous transfer.
(Read and Write property)

### 64.4.259 OptionProxy as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set HTTP proxy to use.
**Example:**

```
dim c as CURLMBS // your CURL object
dim psAddress as string // your proxy address
dim psPort as Integer // your proxy port

c.OptionProxy=psAddress
c.OptionProxyPort=psPort
c.OptionProxyType=c.kPROXY_HTTP
```

**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a string holding the host name or dotted IP address. To specify port number in this string, append : [ port ] to the end of the host name. The proxy string may be prefixed with [ protocol ] :// since any such prefix will be ignored. The proxy's port number may optionally be specified with the separate option ProxyHost.

When you tell the library to use an HTTP proxy, libCURL will transparently convert operations to HTTP even if you specify an FTP URL etc. This may have an impact on what other features of the library you can use, such as CURLOPT_QUOTE and similar FTP specifics that don't work unless you tunnel through the HTTP proxy. Such tunneling is activated with HTTPProxyTunnel.

libCURL respects the environment variables http_proxy, ftp_proxy, all_proxy etc, if any of those is set. The Proxy option does however override any possibly set environment variables.

Starting with 7.14.1, the proxy host string given in environment variables can be specified the exact same way as the proxy can be set with Proxy, include protocol prefix (http://) and embedded user + password.

You can use WinHTTPClientMBS class on Windows or CFProxyMBS on Mac to discover system proxy settings.
(Read and Write property)
See also PROXY option in CURL manual.

### 64.4.260 OptionProxyAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which proxy authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use for your proxy authentication. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the ProxyUserPassword option. The bitmask can be constructed by or'ing together the bits listed above for the HTTPAuth option. As of this writing, only Basic, Digest and NTLM work. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PROXYAUTH option in CURL manual.

### 64.4.261 OptionProxyCAInfo as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CApath or CAfile used to validate the proxy certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Pass native file path.
This option is used only if CURLMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)

See also PROXY_CAINFO option in CURL manual.

### 64.4.262 OptionProxyCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CAInfo for proxy as blob value.
**Notes:** This option is for connecting to an HTTPS proxy, not an HTTPS server.
Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also PROXY_CAINFO_BLOB option in CURL manual.

### 64.4.263 OptionProxyCAPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CApath directory used to validate the proxy certificate.
**Notes:** Pass native file path.
This option is used only if CURLMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)
See also PROXY_CAPATH option in CURL manual.

### 64.4.264 OptionProxyCRLFile as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CRL file for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_CRLFILE option in CURL manual.

### 64.4.265 OptionProxyIssuerCert as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the proxy issuer SSL certificate filename.

**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).
(Read and Write property)
See also PROXY_ISSUERCERT option in CURL manual.

### 64.4.266 OptionProxyIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set proxy issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionProxyIssuerCert which instead expects a file name as input.
(Read and Write property)
See also PROXY_ISSUERCERT_BLOB option in CURL manual.

### 64.4.267 OptionProxyKeyPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Password for the SSL private key for proxy.

**Notes:** (Read and Write property)
See also PROXY_KEYPASSWD option in CURL manual.

### 64.4.268 OptionProxyPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should be pointing to the password to use for the transfer while connecting to Proxy.
**Notes:** The OptionProxyPassword option should be used in conjunction with the OptionProxyUsername option. (Added in 7.19.1)
(Read and Write property)
See also PROXYPASSWORD option in CURL manual.

### 64.4.269 OptionProxyPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The public key in DER form used to validate the proxy public key.
**Notes:** This option is used only if CURLMBS.OptionProxySSLVerifyPeer is true.
Please path native file path to key file.
(Read and Write property)
See also PROXY_PINNEDPUBLICKEY option in CURL manual.

### 64.4.270 OptionProxyPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The proxy port to connect to unless it is specified in the proxy string OptionProxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

You can use OptionProxy with port, e.g. "12.34.56.78:8080" or pass port here and proxy without port.
For some users it seems like the option with OptionProxy including port works better.
(Read and Write property)
See also PROXYPORT option in CURL manual.

### 64.4.271 OptionProxyServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Proxy Service Name.
**Notes:** (Read and Write property)
See also PROXY_SERVICE_NAME option in CURL manual.

### 64.4.272 OptionProxySSLCert as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of the file keeping your private SSL-certificate for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSLCERT option in CURL manual.

### 64.4.273 OptionProxySSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets private key for proxy cert from memory blob.
**Notes:** Pass data, which contains the private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with CURL.SetOptionProxySSLKeyType.
(Read and Write property)
See also PROXY_SSLCERT_BLOB option in CURL manual.

### 64.4.274 OptionProxySSLCertType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Type of the file keeping your SSL-certificate for proxy.
**Notes:** Value can be "DER", "PEM" or "ENG".
(Read and Write property)
See also PROXY_SSLCERTTYPE option in CURL manual.

### 64.4.275 OptionProxySSLCipherList as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which SSL ciphers to use for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_CIPHER_LIST option in CURL manual.

### 64.4.276 OptionProxySSLKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of the file keeping your private SSL-key for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_SSLKEY option in CURL manual.

### 64.4.277 OptionProxySSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set private key for proxy cert from memory blob.
**Notes:** Pass data, which contains a private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionProxySSLKeyType.

This option is an alternative to OptionProxySSLKey which instead expects a file name as input.
(Read and Write property)
See also PROXY_SSLKEY_BLOB option in CURL manual.

### 64.4.278 OptionProxySSLKeyType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets type of the file keeping your private SSL-key for proxy.
**Notes:** Value is DER, PEM or ENG.
(Read and Write property)
See also PROXY_SSLKEYTYPE option in CURL manual.

### 64.4.279 OptionProxySSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable specific SSL features with a bitmask for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_OPTIONS option in CURL manual.

### 64.4.280 OptionProxySSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable SSL Host verification.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Set if we should verify the Common name from the proxy certificate in ssl handshake, set 1 to check existence, 2 to ensure that it matches the provided hostname.
(Read and Write property)
See also PROXY_SSL_VERIFYHOST option in CURL manual.

### 64.4.281 OptionProxySSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should verify the proxy in ssl handshake.

**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** set 1 to verify.
(Read and Write property)
See also PROXY_SSL_VERIFYPEER option in CURL manual.

### 64.4.282 OptionProxySSLVersion as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What version to specifically try to use for proxy.
**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also PROXY_SSLVERSION option in CURL manual.

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

### 64.4.283 OptionProxyTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which TLS 1.3 ciphers suites to use for proxy.
**Notes:** The list of cipher suites to use for the TLS 1.3 connection to a proxy. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also PROXY_TLS13_CIPHERS option in CURL manual.

### 64.4.284 OptionProxyTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Password for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_PASSWORD option in CURL manual.

### 64.4.285 OptionProxyTLSAuthType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set authentication type for authenticated TLS for proxy
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_TYPE option in CURL manual.

### 64.4.286 OptionProxyTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a username for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_USERNAME option in CURL manual.

### 64.4.287 OptionProxyTransferMode as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If this integer value is set to 1 (one), it tells libCURL to set the transfer mode (binary or ASCII) for FTP transfers done via an HTTP proxy, by appending ;type=a or ;type=i to the URL.
**Notes:** Without this setting, or it being set to 0 (zero, the default), OptionTransferText has no effect when doing FTP via a proxy. Beware that not all proxies support this feature. (Added in 7.18.0)
(Read and Write property)
See also PROXY_TRANSFER_MODE option in CURL manual.

### 64.4.288 OptionProxyType as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This option is to set type of the proxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Available options for this are kPROXY_HTTP, kPROXY_SOCKS4 (added in 7.15.2) kPROXY_SOCKS5.
The HTTP type is default.
(Read and Write property)
See also PROXYTYPE option in CURL manual.

### 64.4.289 OptionProxyUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string, which should be pointing to the user name to use for the transfer while connecting to Proxy.
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionProxyPassword option.
(Read and Write property)
See also PROXYUSERNAME option in CURL manual.

### 64.4.290 OptionPut as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUpload instead.
**Function:** A non-zero parameter tells the library to use HTTP PUT to transfer data.
**Notes:** The data should be set with OptionInFileSize.

This option is deprecated and starting with version 7.12.1 you should instead use OptionUpload.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.291 OptionQuickExit as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to allow to exit quickly.
**Notes:** Pass a number as a parameter, 1 meaning that when recovering from a timeout, libcurl should skip lengthy cleanups that are intended to avoid all kinds of leaks (threads etc.), as the caller program is about to call exit() anyway. This allows for a swift termination after a DNS timeout for example, by canceling and/or forgetting about a resolver thread, at the expense of a possible (though short-lived) leak of associated resources.
(Read and Write property)
See also QUICK_EXIT option in CURL manual.

### 64.4.292 OptionRandomFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A file name for the random file.
**Notes:** The file will be used to read from to seed the random engine for SSL. The more random the specified file is, the more secure the SSL connection will become.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)

### 64.4.293 OptionRange as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should contain the specified range you want.
**Notes:** It should be in the format "X-Y", where X or Y may be left out. HTTP transfers also support several intervals, separated with commas as in "X-Y,N-M". Using this kind of multiple intervals will cause the HTTP server to send the response document in pieces (using standard MIME separation techniques). Pass a NULL to this option to disable the use of ranges.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RANGE option in CURL manual.

### 64.4.294 OptionRedirProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionRedirProtocolsString instead. **Function:** An integer that holds a bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This allows you to limit specific transfers to only be allowed to use a subset of protocols in redirections. By default libCURL will allow all protocols except for FILE and SCP. This is a difference compared to pre-7.19.4 versions which unconditionally would follow to all protocols supported. (Added in 7.19.4)
(Read and Write property)

### 64.4.295 OptionReditProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The protocols allowed to redirect to.
**Example:**

```
dim c as new CURLMBS
c.OptionReditProtocolsString = "http,https"
```

**Notes:** Pass string that holds a comma-separated list of case insensitive protocol names (URL schemes). That list limits what protocols libcurl may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This option allows applications to limit specific transfers to only be allowed to use a subset of protocols in redirections.

Protocols denied by OptionProtocolsString are not overridden by this option.

By default libcurl will allow HTTP, HTTPS, FTP and FTPS on redirects (since 7.65.2). Older versions of libcurl allowed all protocols on redirect except several disabled for security reasons: Since 7.19.4 FILE and SCP are disabled, and since 7.40.0 SMB and SMBS are also disabled.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

Default

HTTP, HTTPS, FTP and FTPS (Added in 7.65.2).

Older versions defaulted to all protocols except FILE, SCP and since 7.40.0 SMB and SMBS.
(Read and Write property)

### 64.4.296 OptionReferer as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The referer to pass to the server.
**Notes:** It will be used to set the Referer: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also REFERER option in CURL manual.

### 64.4.297 OptionRequestTarget as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The request target, instead of extracted from the URL.
**Notes:** (Read and Write property)
See also REQUEST_TARGET option in CURL manual.

### 64.4.298 OptionResumeFrom as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** Set this option to 0 to make the transfer start from the beginning (effectively disabling resume). For FTP, set this option to -1 to make the transfer start from the end of the target file (useful to continue an interrupted upload).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RESUME_FROM option in CURL manual.

### 64.4.299 OptionResumeFromLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionResumeFrom instead. **Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.300 OptionRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manually initialize the client RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_CLIENT_CSEQ option in CURL manual.

### 64.4.301 OptionRTSPRequest as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** RTSP request method (OPTIONS, SETUP, PLAY, etc...).
**Notes:** (Read and Write property)

See also RTSP_REQUEST option in CURL manual.

### 64.4.302 OptionRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manually initialize the server RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_SERVER_CSEQ option in CURL manual.

### 64.4.303 OptionRTSPSessionID as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTSP session identifier.
**Notes:** (Read and Write property)
See also RTSP_SESSION_ID option in CURL manual.

### 64.4.304 OptionRTSPStreamURI as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTSP stream URI.
**Notes:** (Read and Write property)
See also RTSP_STREAM_URI option in CURL manual.

### 64.4.305 OptionRTSPTransport as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Transport: header to use in RTSP requests.
**Notes:** (Read and Write property)
See also RTSP_TRANSPORT option in CURL manual.

### 64.4.306 OptionSASLAuthZID as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The authorisation identity (identity to act as).
**Notes:** Sets the authorisation identity (identity to act as).
Pass a text as parameter, which should be pointing to the authorisation identity (authzid) for the transfer. Only applicable to the PLAIN SASL authentication mechanism where it is optional.
When not specified only the authentication identity (authcid) as specified by the username will be sent to the server, along with the password. The server will derive a authzid from the authcid when not provided, which it will then uses internally.
When the authzid is specified, the use of which is server dependent, it can be used to access another user's inbox, that the user has been granted access to, or a shared mailbox for example.
(Read and Write property)
See also SASL_AUTHZID option in CURL manual.

### 64.4.307 OptionSASLIR as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable SASL initial response.
**Notes:** (Read and Write property)

See also SASL_IR option in CURL manual.

### 64.4.308 OptionServerResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Causes libcurl to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to send a response message for a command before the session is considered dead.
**Notes:** While libcurl is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionServerResponseTimeout to a value smaller than OptionTimeout.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SERVER_RESPONSE_TIMEOUT option in CURL manual.

### 64.4.309 OptionServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Service Name.
**Notes:** (Read and Write property)
See also SERVICE_NAME option in CURL manual.

### 64.4.310 OptionSocks5Auth as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bitmask of allowed auth methods for connections to SOCKS5 proxies.
**Notes:** (Read and Write property)
See also SOCKS5_AUTH option in CURL manual.

### 64.4.311 OptionSocks5GSSAPINEC as Boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to protect SOCKS5 connection is protected.
**Notes:** Set to true to enable or false to disable. As part of the gssapi negotiation a protection mode is negotiated. The rfc1961 says in section 4.3/4.4 it should be protected, but the NEC reference implementation does not. If enabled, this option allows the unprotected exchange of the protection mode negotiation. (Added in 7.19.4).
(Read and Write property)
See also SOCKS5_GSSAPI_NEC option in CURL manual.

### 64.4.312 OptionSocks5GSSAPIService as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A string holding the name of the service.
**Notes:** The default service name for a SOCKS5 server is rcmd/server-fqdn. This option allows you to change it. (Added in 7.19.4)
(Read and Write property)

### 64.4.313 OptionSSHAuthTypes as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Define the SSH authorization types.
**Example:**

```
dim c as CURLMBS // your instance

// only do password
c.OptionSSHAuthTypes = c.kSSHAuthKeyboard or c.kSSHAuthPassword
```

**Notes:** Pass a long set to a bitmask consisting of one or more of CURLSSH_AUTH_PUBLICKEY, CURLSSH_AUTH_PASSWORD, CURLSSH_AUTH_HOST, CURLSSH_AUTH_KEYBOARD. Set CURLSSH_AUTH_ to let libCURL pick one. (Added in 7.16.1)

See kSSHAuth* constants.
(Read and Write property)
See also SSH_AUTH_TYPES option in CURL manual.

### 64.4.314 OptionSSHCompression as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable SSH compression.
**Notes:** (Read and Write property)
See also SSH_COMPRESSION option in CURL manual.

### 64.4.315 OptionSSHHostPublicKeyMD5 as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string containing 32 hexadecimal digits with the 128 bit MD5 checksum of the remote host's public key.
**Notes:** libCURL will reject the connection to the host unless the md5sums match. This option is only for SCP and SFTP transfers. (Added in 7.17.1)
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_MD5 option in CURL manual.

### 64.4.316 OptionSSHHostPublicKeySHA256 as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** SHA256 hash of SSH server public key.
**Notes:** Pass a string containing a Base64-encoded SHA256 hash of the remote host's public key. The transfer will fail if the given hash does not match the hash the remote host provides.
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_SHA256 option in CURL manual.

### 64.4.317 OptionSSHKnownhosts as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string holding the file name of the known_host file to use.
**Notes:** The known_hosts file should use the OpenSSH file format as supported by libssh2. If this file is specified, libCURL will only accept connections with hosts that are known and present in that file, with a matching public key. (Added in 7.19.6)
(Read and Write property)

See also SSH_KNOWNHOSTS option in CURL manual.

### 64.4.318 OptionSSHPrivateKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a path pointing to a file name for your private key.
**Example:**

```
Dim c As New CURLMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using
textasciitilde /.ssh/id_dsa. If the file is password-protected, set the password with OptionSSLKeyPassword.
(Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PRIVATE_KEYFILE option in CURL manual.

### 64.4.319 OptionSSHPublicKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a path pointing to a file name for your public key.
**Example:**

```
Dim c As New CURLMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using
textasciitilde /.ssh/id_dsa.pub. (Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PUBLIC_KEYFILE option in CURL manual.

### 64.4.320 OptionSSLCert as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the file name of your certificate.
**Notes:** The default format is "PEM" and can be changed with OptionSSLCERTTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLCERT option in CURL manual.

### 64.4.321 OptionSSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set SSL client certificate from memory blob.
**Notes:** Pass data, which contains a client certificate. The format must be "P12" on Secure Transport or Schannel. The format must be "P12" or "PEM" on OpenSSL. The string "P12" or "PEM" must be specified with OptionSSLCertType.

This option is an alternative to OptionSSLCert which instead expects a file name as input.
(Read and Write property)
See also SSLCERT_BLOB option in CURL manual.

### 64.4.322 OptionSSLCertPassword as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The certificate password.
**Notes:** (Read and Write property)

### 64.4.323 OptionSSLCertType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the format of your certificate.
**Notes:** Supported formats are "PEM" and "DER". (Added in 7.9.3)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLCERTTYPE option in CURL manual.

### 64.4.324 OptionSSLCipherList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string holding the list of ciphers to use for the SSL connection.
**Example:**

```
// allow lower secure ciphers
curl.OptionSSLCipherList = "DEFAULT@SECLEVEL=0"
```

**Notes:** The list must be syntactically correct, it consists of one or more cipher strings separated by colons. Commas or spaces are also acceptable separators but colons are normally used, !, - and + can be used as operators. Valid examples of cipher lists include 'RC4-SHA', 'SHA1+DES', 'TLSv1' and 'DEFAULT'. The default list is normally set when you compile OpenSSL.

You'll find more details about cipher lists on this URL:

http://www.openssl.org/docs/apps/ciphers.html

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSL_CIPHER_LIST option in CURL manual.

### 64.4.325 OptionSSLEnableALPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable TLS ALPN extension (http2 over ssl might fail without).
**Notes:** (Read and Write property)
See also SSL_ENABLE_ALPN option in CURL manual.

### 64.4.326 OptionSSLEnableNPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Enable/disable TLS NPN extension (http2 over ssl might fail without)
**Notes:** (Read and Write property)

### 64.4.327 OptionSSLEngine as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** It will be used as the identifier for the crypto engine you want to use for your private key.
**Notes:** If the crypto device cannot be loaded, kError_SSL_ENGINE_NOTFOUND is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE option in CURL manual.

### 64.4.328 OptionSSLEngineDefault as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Sets the actual crypto engine as the default for (asymmetric) crypto operations.
**Notes:** If the crypto device cannot be set, kError_SSL_ENGINE_SETFAILED is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE_DEFAULT option in CURL manual.

### 64.4.329 OptionSSLFalseStart as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should enable TLS false start.
**Notes:** (Read and Write property)
See also SSL_FALSESTART option in CURL manual.

### 64.4.330 OptionSSLKey as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the file name of your private key.
**Notes:** The default format is "PEM" and can be changed with OptionSSLKEYTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLKEY option in CURL manual.

### 64.4.331 OptionSSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set private key for client cert from memory blob.
**Notes:** Pass data, which contains a private key. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionSSLKeyType.

This option is an alternative to OptionSSLKey which instead expects a file name as input.
(Read and Write property)
See also SSLKEY_BLOB option in CURL manual.

### 64.4.332 OptionSSLKeyPassword as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The password required to use the OptionSSLKEY private key.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.4.333 OptionSSLKeyType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the format of your private key.
**Notes:** Supported formats are "PEM", "DER" and "ENG".

The format "ENG" enables you to load the private key from a crypto engine. In this case OptionSSLKEY is used as an identifier passed to the engine. You have to set the crypto engine with OptionSSLENGINE. "DER" format key file currently does not work because of a bug in OpenSSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLKEYTYPE option in CURL manual.

### 64.4.334 OptionSSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable specific SSL features with a bitmask.
**Notes:** (Read and Write property)
See also SSL_OPTIONS option in CURL manual.

### 64.4.335 OptionSSLSessionIDCache as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use the SSL session ID cache.
**Notes:** Pass false to disable libCURL's use of SSL session-ID caching. Set this to true to enable it. By default all transfers are done using the cache. Note that while nothing ever should get hurt by attempting to reuse SSL session-IDs, there seem to be broken SSL implementations in the wild that may require you to disable this in order for you to succeed. (Added in 7.16.0)
(Read and Write property)
See also SSL_SESSIONID_CACHE option in CURL manual.

### 64.4.336 OptionSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This option determines whether libCURL verifies that the server cert is for the server it is known as.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
```

```
d.OptionSSLVerifyPeer = 1
```

**Notes:** When negotiating an SSL connection, the server sends a certificate indicating its identity.

When OptionSSLVerifyHost is 2, that certificate must indicate that the server is the server to which you meant to connect, or the connection fails.

CURL considers the server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the URL to which you told CURL to connect.

When the value is 1, the certificate must contain a Common Name field, but it doesn't matter what name it says. (This is not ordinarily a useful setting).

When the value is 0, the connection succeeds regardless of the names in the certificate.

The default, since 7.10, is 2.

The checking this option controls is of the identity that the server claims. The server could be lying. To control lying, see OptionSSLVerifyPeer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYHOST option in CURL manual.

### 64.4.337 OptionSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Configure whether this CURL instance will verify the SSL peer certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLMBS
// your CURL object
```

```
// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This option determines whether CURL verifies the authenticity of the peer's certificate. A value of 1 means CURL verifies; zero means it doesn't. The default is nonzero, but before 7.10, it was zero.

When negotiating an SSL connection, the server sends a certificate indicating its identity. CURL verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. As of 7.10, CURL installs a default bundle of CA certificates and you can specify alternate certificates with the OptionCAINFO option or the OptionCAPATH option.

When OptionSSLVerifyPeer is nonzero, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the connection succeeds regardless.

Authenticating the certificate is not by itself very useful. You typically want to ensure that the server, as authentically identified by its certificate, is the server you mean to be talking to. Use OptionSSLVerifyHost to control that.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYPEER option in CURL manual.

### 64.4.338 OptionSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should verify the certificate status.
**Notes:** (Read and Write property)
See also SSL_VERIFYSTATUS option in CURL manual.

### 64.4.339 OptionSSLVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What version of SSL/TLS to attempt to use.
**Example:**

```
dim c as CURLMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also SSLVERSION option in CURL manual.

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

### 64.4.340 OptionStreamDepends as CURLMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS option in CURL manual.

### 64.4.341 OptionStreamDependsE as CURLMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set E-xclusive stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS_E option in CURL manual.

### 64.4.342 OptionStreamWeight as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set stream weight, 1 - 256.
**Notes:** Default is 16.
(Read and Write property)
See also STREAM_WEIGHT option in CURL manual.

### 64.4.343 OptionSuppressConnectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Suppress proxy CONNECT response headers from events.
**Notes:** (Read and Write property)
See also SUPPRESS_CONNECT_HEADERS option in CURL manual.

### 64.4.344 OptionTCPFastOpen as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set TCP Fast Open.
**Notes:** (Read and Write property)
See also TCP_FASTOPEN option in CURL manual.

### 64.4.345 OptionTCPKeepAlive as Boolean

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If set to true, TCP keepalive probes will be sent.
**Notes:** The delay and frequency of these probes can be controlled by the OptionTCPKeepIdle and OptionTCPKeepInterval options, provided the operating system supports them. Set to false (default behavior) to disable keepalive probes (Added in 7.25.0).
(Read and Write property)
See also TCP_KEEPALIVE option in CURL manual.

### 64.4.346 OptionTCPKeepIdle as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the delay, in seconds, that the operating system will wait while the connection is idle before sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPIDLE option in CURL manual.

### 64.4.347 OptionTCPKeepInterval as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the interval, in seconds, that the operating system will wait between sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPINTVL option in CURL manual.

### 64.4.348 OptionTCPNoDelay as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer specifying whether the TCP_NODELAY option should be set or cleared (true = set, false = clear).
**Notes:** The option is cleared by default. This will have no effect after the connection has been established.

Setting this option will disable TCP's Nagle algorithm. The purpose of this algorithm is to try to minimize the number of small packets on the network (where "small packets" means TCP segments less than the Maximum Segment Size (MSS) for the network).

Maximizing the amount of data sent per TCP segment is good because it amortizes the overhead of the send. However, in some cases (most notably telnet or rlogin) small segments may need to be sent without delay. This is less efficient than sending larger amounts of data at a time, and can contribute to congestion on the network if overdone.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TCP_NODELAY option in CURL manual.

### 64.4.349 OptionTFTPBlockSize as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify block size to use for TFTP data transmission.
**Notes:** Valid range as per RFC 2348 is 8-65464 bytes. The default of 512 bytes will be used if this option is not specified. The specified block size will only be used pending support by the remote server. If the server does not return an option acknowledgement or returns an option acknowledgement with no blksize,

the default of 512 bytes will be used. (added in 7.19.4)
(Read and Write property)
See also TFTP_BLKSIZE option in CURL manual.

### 64.4.350 OptionTFTPNoOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether not send any tftp option requests to the server.
**Notes:** (Read and Write property)
See also TFTP_NO_OPTIONS option in CURL manual.

### 64.4.351 OptionTimeCondition as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Time condition option.
**Notes:** This defines how the OptionTimeValue time value is treated. You can set this parameter to kTimeConditionIfModifiedSince (1) or kTimeConditionIfUnModifiedSince (2). This feature applies to HTTP and FTP.

The last modification time of a file is not always known and in such instances this feature will have no effect even if the given time condition would have not been met.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMECONDITION option in CURL manual.

### 64.4.352 OptionTimeOut as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.

In unix-like systems, this might cause signals to be used unless CURLOPT_NOSIGNAL is set.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEOUT option in CURL manual.

### 64.4.353 OptionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a long as parameter containing the maximum time in milli seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.
(Read and Write property)
See also TIMEOUT_MS option in CURL manual.

### 64.4.354 OptionTimeValue as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This should be the time in seconds since 1 jan 1970, and the time will be used in a condition as specified with OptionTimeCondition.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEVALUE option in CURL manual.

### 64.4.355 OptionTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which TLS 1.3 ciphers suites to use.
**Notes:** string holding the list of cipher suites to use for the TLS 1.3 connection. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also TLS13_CIPHERS option in CURL manual.

### 64.4.356 OptionTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TSL authentication password.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_PASSWORD option in CURL manual.

### 64.4.357 OptionTLSAuthType as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TLS authentication type.
**Notes:** You can set this to "SRP" to use Secure Remote Password authentication.
Please also set username and password.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_TYPE option in CURL manual.

### 64.4.358 OptionTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TSL authentication user name.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

(Read and Write property)
See also TLSAUTH_USERNAME option in CURL manual.

### 64.4.359 OptionTransferEncoding as Boolean

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a request for compressed Transfer Encoding in the outgoing HTTP request.
**Notes:** If the server supports this and so desires, it can respond with the HTTP response sent using a compressed Transfer-Encoding that will be automatically uncompressed by libCURL on reception.

Transfer-Encoding differs slightly from the Content-Encoding you ask for with OptionAcceptEncoding in that a Transfer-Encoding is strictly meant to be for the transfer and thus MUST be decoded before the data arrives in the client. Traditionally, Transfer-Encoding has been much less used and supported by both HTTP clients and HTTP servers.
(Read and Write property)
See also TRANSFER_ENCODING option in CURL manual.

### 64.4.360 OptionTransferText as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to use ASCII mode for ftp transfers, instead of the default binary transfer.
**Notes:** For win32 systems it does not set the stdout to binary mode. This option can be usable when transferring text data between systems with different views on certain characters, such as newlines or similar.

libCURL does not do a complete ASCII conversion when doing ASCII transfers over FTP. This is a known limitation/flaw that nobody has rectified. libCURL simply sets the mode to ascii and performs a standard transfer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TRANSFERTEXT option in CURL manual.

### 64.4.361 OptionUnixSocketPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Path to Unix domain socket.
**Notes:** (Read and Write property)
See also UNIX_SOCKET_PATH option in CURL manual.

### 64.4.362 OptionUnrestrictedAuth as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library it can continue to send authentication (user+password) when following locations, even when hostname changed.
**Notes:** This option is meaningful only when setting FollowOption.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UNRESTRICTED_AUTH option in CURL manual.

### 64.4.363 OptionUpkeepIntervalMS as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Connection upkeep interval.
**Notes:** Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.

The user needs to explicitly call Upkeep in order to perform the upkeep work.

Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
(Read and Write property)
See also UPKEEP_INTERVAL_MS option in CURL manual.

### 64.4.364 OptionUpload as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to prepare for an upload.

**Notes:** The OptionInFileSize or OptionInFileSizeLarge options are also interesting for uploads. If the protocol is HTTP, uploading means using the PUT request unless you tell libCURL otherwise.

Using PUT with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use PUT to a HTTP 1.1 server, you can upload data without knowing the size before starting the transfer if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UPLOAD option in CURL manual.

### 64.4.365 OptionUploadBufferSize as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set preferred upload buffer size.
**Notes:** Pass a long specifying your preferred size (in bytes) for the upload buffer in libcurl. It makes libcurl uses a larger buffer that gets passed to the next layer in the stack to get sent off. In some setups and for some protocols, there's a huge performance benefit of having a larger upload buffer.

This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size.

The upload buffer size is by default 64 kilobytes. The maximum buffer size allowed to be set is 2 megabytes. The minimum buffer size allowed to be set is 16 kilobytes.

Since curl 7.61.1 the upload buffer is allocated on-demand - so if the handle isn't used for upload, this buffer will not be allocated at all.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also UPLOAD_BUFFERSIZE option in CURL manual.

### 64.4.366 OptionURL as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The actual URL to deal with.
**Example:**

```
Dim c As New CURLMBS

// this example sends a xml request to a server
c.OptionURL = "http://www.someserver.com/service"

// some XML for a SOAP request
Dim request As String = "<?xml version=""1.0""?><methodCall><methodName>application.getValue</methodName><params><param><value>info</value></param></params></methodCall>"

c.OptionPostFields = request

Dim header(-1) As String
header.Append "Content-Type: text/xml"
c.SetOptionHTTPHeader header

// this should be c.kError_OK if okay.
Dim result As Integer = c.Perform

Dim output As String = c.OutputData
Dim debugLog As String = c.DebugMessages
Dim HTTPStatus As Integer = c.GetInfoResponseCode

Break
```

**Notes:** If you need to pass username or password, please consider using the OptionUsername and OptionPassword properties. If you username or password contains characters like @ or :, you must use those properties.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a char * to a zero terminated string. The string must remain present until CURL no longer needs it, as it doesn't copy the string.

If the given URL lacks the protocol part ("http://" or "ftp://" etc), it will attempt to guess which protocol to use based on the given host name. If the given protocol of the set URL is not supported, libCURL will return on error (kError_UNSUPPORTED_PROTOCOL) when you call Perform. Use VersionInfo for detailed info on which protocols that are supported.

The string given to CURLOPT_URL must be url-encoded and following the RFC 2396:
http://CURL.haxx.se/rfc/rfc2396.txt

CURLOPT_URL is the only option that must be set before Perform is called.
For file uploads or downloads, please include the file name in the URL.

Please do never include username and passwords in URLs, as those get often written to log files and would reveal your credentials!
Instead use OptionUsername and OptionPassword.

If you miss the protocol in the URL, you may get an error about HTTP/0.9 being used and not allowed.
(Read and Write property)
See also URL option in CURL manual.

### 64.4.367 OptionUserAgent as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user agent string to pass to the server.
**Example:**

```
Dim c As New CURLMBS

// setup request and any options you need
c.OptionURL = URL
c.OptionUserAgent = "MyDownloader 1.0"
```

**Notes:** It will be used to set the User-Agent: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also USERAGENT option in CURL manual.

### 64.4.368 OptionUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user name to be used in protocol authentication
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionPassword option
(Read and Write property)
See also USERNAME option in CURL manual.

### 64.4.369 OptionUseSSL as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)
See also USE_SSL option in CURL manual.

### 64.4.370 OptionVerbose as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether debug messages are sent to the DebugMessage event.
**Notes:** Default is false.
You need to subclass the CURLMBS class to add code in the DebugMessage event.
Or you set CollectDebugMessages = true and later query DebugMessages property.
Or you use CreateMTDebugOutputFile to stream them to a file.

(Read and Write property)
See also VERBOSE option in CURL manual.

### 64.4.371 OptionWildCardMatch as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable wildcard matching.
**Notes:** Set onoff to true if you want to transfer multiple files according to a file name pattern. The pattern can be specified as part of the OptionURL option, using an fnmatch-like pattern (Shell Pattern Matching) in the last part of URL (file name).

By default, libCURL uses its internal wildcard matching implementation. You can provide your own matching function by the CURLMBS.FileNameMatch event.

A brief introduction of its syntax follows:

- - ASTERISK

ftp://example.com/some/path/*.txt (for all txt's from the root directory)

? - QUESTION MARK

Question mark matches any (exactly one) character.

ftp://example.com/some/path/photo?.jpeg

[ - BRACKET EXPRESSION

The left bracket opens a bracket expression. The question mark and asterisk have no special meaning in a bracket expression. Each bracket expression ends by the right bracket and matches exactly one character. Some examples follow:

[ a-zA-Z0-9 ] or [ f-gF-G ] - character interval
[ abc ] - character enumeration
[ ^abc ] or [ !abc ] - negation
[ [ :name: ] ] class expression. Supported classes are alnum,lower, space, alpha, digit, print, upper, blank, graph, xdigit.
[ ] [ -!^] - special case - matches only '-', ' ] ', ' [ ', '!' or '^'. These characters have no special purpose.

[ \[ \] \\] - escape syntax. Matches ' [ ', ' ] ' or '¬¥.

Using the rules above, a file name pattern can be constructed:

ftp://example.com/some/path/ [ a-z [ :upper: ] \\] .jpeg

This feature is only supported for FTP download. Not for SFTP or HTTP.
(Read and Write property)
See also WILDCARDMATCH option in CURL manual.

### 64.4.372 OptionXOAuth2Bearer as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The XOAUTH2 bearer token.
**Notes:** (Read and Write property)
See also XOAUTH2_BEARER option in CURL manual.

### 64.4.373 OutputData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The output data from CURL.
**Example:**

```
Dim d As New CURLMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error
```

```
ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages
```

**Notes:** If CollectOutputData property is true, the plugin puts the data received in write event also into this property, so you can grab it after the transfer. Use ClearData method to clear when reusing CURL object.

Limited to 2 GB. Please stream to file for bigger data with CreateMTOutputFile function.
(Read only property)

### 64.4.374 Paused as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether transfer is paused.
**Notes:** You can set it to true while transfer runs to pause it.
(Read and Write property)

### 64.4.375 ProgressDownloadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes downloaded so far.
**Notes:** (Read only property)

### 64.4.376 ProgressDownloadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes to download in total.
**Notes:** (Read only property)

### 64.4.377 ProgressPercent as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current download/upload progress in percent.
**Notes:** Range from 0 to 100.

(Read only property)

### 64.4.378 ProgressUploadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes uploaded so far.
**Notes:** (Read only property)

### 64.4.379 ProgressUploadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes to upload in total.
**Notes:** (Read only property)

### 64.4.380 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.4.381 Version as CURLVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a version object to a filled with information about various run-time features in libCURL.
**Notes:** (Read only property)

### 64.4.382 WebSocketOptions as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** WebSocket behavior options.
**Notes:** Pass a bitmask to tell libcurl about specific WebSocket behaviors.

To detach a WebSocket connection and use the WebSocketSend and WebSocketReceive functions after the HTTP upgrade procedure, set the OptionConnectOnly option to 2.

Available bits in the bitmask:

kWebSocketRaw:
Deliver "raw" WebSocket traffic to the Write event.

In raw mode, libcurl does not handle pings or any other frame for the application.
(Read and Write property)

### 64.4.383 YieldTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether plugin should yield time.
**Example:**

```
dim curl as new CURLMBS

curl.YieldTime = true
```

**Notes:** If set the plugin will yield time to Xojo back so threads and timers work while you download.

Seems like in RB 2009 this property only has effect if you run CURL in a thread.
(Read and Write property)

### 64.4.384 Events

### 64.4.385 ChunkBegin(FileInfo as CURLFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called on begin of a new chunk.
**Notes:** If splitting of data transfer is enabled, this event is called before download of an individual chunk started. Note that parameter "remains" works only for FTP wildcard downloading (for now), otherwise is

not used.

### 64.4.386 ChunkEnd(FileInfo as CURLFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Download of a chunk ended.
**Notes:** If splitting of data transfer is enabled this event is called after download of an individual chunk finished.
This event is called for skipped or downloaded files.

### 64.4.387 DebugMessage(infotype as Integer, data as string, dataSize as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A debug event to get data of ongoing process.
**Notes:** You may need to set OptionVerbose to true.

infotype constants:

| | | |
|---|---|---|
| kInfo_TEXT | 0 | The data is informational text. |
| kInfo_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kInfo_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kInfo_DATA_IN | 3 | The data is protocol data received from the peer. |
| kInfo_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kInfo_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kInfo_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |

If you set CollectDebugMessages, the plugin will collect the messages and provide them via the DebugMessages property. You can still use this event to write your own log instead of in addition.

### 64.4.388 FileNameMatch(Pattern as String, Name as String) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Match a file against a pattern.
**Notes:** If you don't implement this event, you get the default implementation from CURL.
Return kFileNameMatchNoMatch, kFileNameMatchIsMatch or kFileNameMatchFailed.

### 64.4.389 Finished(Result as Integer)

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when transfer has finished.
**Notes:** For Perform and PerformMT it is called before Perform function returns, so in PerformMT this is called on the thread.
For use with CURLMultiMBS, it is called after TransferFinished event and before TransfersFinished event.
If you want to modify GUI and use PeformMT, you may need to start a timer to do so.

### 64.4.390 Header(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** New Header data was received.
**Notes:** You can get error 23 if you don't return lenb(data) in this event.
Or just leave it emtpy so RB will not include it in your application the plugin will return lenb(data) itself.

If you set CollectHeaderData to true, the plugin will collect the messages and provide them via the HeaderData property. You can still use this event to write your own log instead of in addition.

### 64.4.391 Progress(dltotal as Int64, dlnow as Int64, ultotal as Int64, ulnow as Int64, percent as Double) as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to report progress of ongoing transfers.
**Notes:** This function gets called by libCURL with a frequent interval during operation (roughly once per second) no matter if data is being transfered or not. Unknown/unused argument values passed to the event will be set to zero (like if you only download data, the upload size will remain 0).
Returning a true from this event will cause libCURL to abort the transfer and return kError_ABORTED_BY_CALLBACK.

You can run CURL from a thread to download several things at the same time or keep the GUI more responsive. For better GUI, you can even call a method like app.DoEvents to get the GUI updated more often.

When sending email, ultotal may be zero. In that case use OptionInFileSize to know size of email to upload.

### 64.4.392 Read(count as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as it needs to read data in order to send it to the peer.
**Notes:** Return the number of bytes requested. Never return a string with lenb(string)>count. You can return 0 to inform about end of file.

If you stop the current transfer by returning 0 "pre-maturely" (i.e before the server expected it, like when you've told you will upload N bytes and you upload less than N bytes), you may experience that the server "hangs" waiting for the rest of the data that won't come.

The read event may return CURL_READFUNC_ABORT (&h10000000) to stop the current operation immediately, resulting in a kError_ABORTED_BY_CALLBACK error code from the transfer (Added in 7.12.1)

This event is not called when using PerformMT.

If you provide Input data via SetInputData or OpenMTInputFile method, this event is not called and data is taken from the data you provided.

### 64.4.393 RestartRead() as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to inform you that reading on the file needs to start at the beginning again.
**Notes:** Return true on success.
If you use a binarystream for reading you will have to set position to 0 in this event.

This event is not called when using PerformMT.

### 64.4.394 Seek(pos as Int64, whence as Integer) as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when CURL needs to perform a seek.
**Notes:** Normally only needed if you resume a download (Seek forward) or upload is reset (seek back).
Whence is kSeekOriginCurrent, kSeekOriginEnd or kSeekOriginSet.
Please return one of this constants: kSeekReturnCantSeek, kSeekReturnFail or kSeekReturnOk.

### 64.4.395 SSHKey(KnownKey as string, KnownKeyLength as Integer, KnownKeyType as Integer, FoundKey as string, FoundKeyLength as Integer, FoundKeyType as Integer, MatchStatus as Integer) as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for known hosts event for SFTP and SCP.
**Notes:** KnownKey: The known key as string encoded with base64 if KnownKeyLength is zero, otherwise the "raw" data.
KnownKeyLength: The length of the key. Zero for base64 encoded key.
KnownKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
FoundKey: The found key as string encoded with base64 if FoundKeyLength is zero, otherwise the "raw" data.
FoundKeyLength: The length of the key. Zero for base64 encoded key.
FoundKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
MatchStatus: The status CURL found. (0 = OK, 1 = Mismatch, 2 = Missing)

Return one of the following values:

| | | |
|---|---|---|
| CURLKHSTAT_FINE_ADD_TO_FILE | 0 | Fine and add to file |
| CURLKHSTAT_FINE | 1 | Fine |
| CURLKHSTAT_REJECT | 2 | reject the connection, return an error |
| CURLKHSTAT_DEFER | 3 | do not accept it, but we can't answer right now so this causes a CURLE_DEFER error but otherwise the connection will be left intact etc |

### 64.4.396 Write(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as there is data received that needs to be saved.
**Notes:** Return the number of bytes actually taken care of. If that amount differs from the amount passed to your function, it'll signal an error to the library and it will abort the transfer and return kError_WRITE_ERROR.

This function may be called with zero bytes data if the transfered file is empty.

The event function will be passed as much data as possible in all invokes, but you cannot possibly make any assumptions. It may be one byte, it may be thousands. The maximum amount of data that can be passed to the write event is defined in the CURL.h header file: CURL_MAX_WRITE_SIZE (16384).

If you set CollectOutputData to true, the plugin will automatically collect the data and provide it to you after the transfer with the OutputData property. This collecting feature will only work right, if there is enough free memory. You can of course still process data yourself in this event instead of in addition.

### 64.4.397 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kUpkeepIntervalDefault | 50000 | The default connection upkeep interval in milliseconds. |
| kWebSocketRaw | 1 | One of the options for web sockets.<br>RAW mode for WebSocketOptions. |

Authorization

| Constant | Value | Description |
|---|---|---|
| kAUTH_ANY | &hFFFFFFEF | all types set |
| kAUTH_ANYSAFE | &hFFFFFFEE | |
| kAUTH_AWS_SIGV4 | 128 | AWS Signature v4 |
| kAUTH_BASIC | 1 | Basic (default) |
| kAUTH_Bearer | 64 | HTTP Bearer token authentication |
| kAUTH_DIGEST | 2 | Digest |
| kAUTH_DIGEST_IE | 16 | HTTP Digest authentication with an IE flavor. Digest authentication is de in RFC 2617 and is a more secure way to do authentication over public netw than the regular old-fashioned Basic method. The IE flavor is simply libCURL will use a special "quirk" that IE is known to have used before ve 7 and that some servers require the client to use. |
| kAUTH_GSSNEGOTIATE | 4 | GSS-Negotiate<br>Please check SupportsGSSNEGOTIATE property in CURLVersionMBS whether this is supported/implemented by your copy of the CURL librar |
| kAUTH_NEGOTIATE | 4 | HTTP Negotiate (SPNEGO) authentication. Negotiate authentication i fined in RFC 4559 and is the most secure way to perform authentication HTTP.<br>You need to build libCURL with a suitable GSS-API library or SSPI on dows for this to work. |
| kAUTH_NONE | 0 | |
| kAUTH_NTLM | 8 | |
| kAUTH_NTLM_WB | 32 | NTLM delegating to winbind helper. Authentication is performed by a sep binary application that is executed when needed. The name of the applic is specified at compile time but is typically /usr/bin/ntlm_auth<br>Note that libCURL will fork when necessary to run the winbind applic and kill it when complete, calling waitpid() to await its exit when done POSIX operating systems, killing the process will cause a SIGCHLD s to be raised (regardless of whether OptionNoSignal is set), which mus handled intelligently by the application. In particular, the application not unconditionally call wait() in its SIGCHLD signal handler to avoid subject to a race condition. This behavior is subject to change in future ver of libCURL. |
| kAUTH_Only | &h80000000 | This is a meta symbol. OR this value together with a single specific auth to force libCURL to probe for un-restricted auth and if not, only that s auth algorithm is acceptable. |

ChunkBegin result values

| Constant | Value | Description |
|---|---|---|
| kChunkBeginFailed | 1 | Failed, so we exit downloads. |
| kChunkBeginOK | 0 | OK, download this file. |
| kChunkBeginSkip | 2 | Skip the file. |

ChunkEnd result values

| Constant | Value | Description |
|---|---|---|
| kChunkEndFailed | 1 | Failed, so we exit downloads. |
| kChunkEndOK | 0 | Download success. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kError_ABORTED_BY_CALLBACK | 42 | |
| kError_AGAIN | 81 | socket is not ready for send/recv, wait till it's ready and try ag CURL 7.18.2) |
| kError_Auth_Error | 94 | An authentication function returned an error. |
| kError_BAD_CONTENT_ENCODING | 61 | Unrecognized transfer encoding |
| kError_BAD_DOWNLOAD_RESUME | 36 | couldn't resume download |
| kError_BAD_FUNCTION_ARGUMENT | 43 | |
| kError_CHUNK_FAILED | 88 | Chunk event reported error. |
| kError_CONV_REQD | 76 | Not used with plugin. |
| kError_COULDNT_CONNECT | 7 | Could not connect. Proxy set? Firewall open? |
| kError_COULDNT_RESOLVE_HOST | 6 | |
| kError_COULDNT_RESOLVE_PROXY | 5 | |
| kError_FAILED_INIT | 2 | |
| kError_FILESIZE_EXCEEDED | 63 | Maximum file size exceeded |
| kError_FILE_COULDNT_READ_FILE | 37 | |
| kError_FTP_ACCEPT_FAILED | 10 | While waiting for the server to connect back when an active F used, an error code was sent over the control connection or simi |
| kError_FTP_ACCEPT_TIMEOUT | 12 | During an active FTP session while waiting for the server to OptionAcceptTimeoutMS (or the internal default) timeout expi |
| kError_FTP_BAD_FILE_LIST | 87 | Unable to parse FTP file list. |
| kError_FTP_CANT_GET_HOST | 15 | |
| kError_FTP_COULDNT_RETR_FILE | 19 | |
| kError_FTP_COULDNT_SET_TYPE | 17 | |
| kError_FTP_COULDNT_USE_REST | 31 | the REST command failed |
| kError_FTP_PORT_FAILED | 30 | FTP PORT operation failed |
| kError_FTP_PRET_FAILED | 84 | a PRET command failed |
| kError_FTP_WEIRD_227_FORMAT | 14 | |
| kError_FTP_WEIRD_PASS_REPLY | 11 | |
| kError_FTP_WEIRD_PASV_REPLY | 13 | |
| kError_FTP_WEIRD_SERVER_REPLY | 8 | |
| kError_FUNCTION_NOT_FOUND | 41 | |
| kError_GOT_NOTHING | 52 | when this is a specific error |
| kError_HTTP2 | 16 | A problem was detected in the HTTP2 framing layer. This is som and can be one out of several problems, see the error buffer for |
| kError_HTTP2_STREAM | 92 | stream error in HTTP/2 framing layer |
| kError_HTTP3 | 95 | HTTP3 layer failed. |
| kError_HTTP_POST_ERROR | 34 | |
| kError_HTTP_RETURNED_ERROR | 22 | |
| kError_INTERFACE_FAILED | 45 | |
| kError_LDAP_CANNOT_BIND | 38 | |
| kError_LDAP_INVALID_URL | 62 | Invalid LDAP URL |
| kError_LDAP_SEARCH_FAILED | 39 | |
| kError_LOGIN_DENIED | 67 | user, password or similar was not accepted and we failed to logi |
| kError_NOT_BUILT_IN | 4 | A requested feature, protocol or option was not found built-in in due to a build-time decision. This means that a feature or o enabled or explicitly disabled when libCURL was built and in o to function you have to get a rebuilt libCURL. |
| kError_NO_CONNECTION_AVAILABLE | 89 | For internal use only, will never be returned by libCURL. No connection available, the session will be queued. (added in 7 |
| kError_OK | 0 | |
| kError_OPERATION_TIMEDOUT | 28 | |
| kError_OUT_OF_MEMORY | 27 | |
| kError_PARTIAL_FILE | 18 | |
| kError_PEER_FAILED_VERIFICATION | 60 | |
| kError_Proxy | 96 | Proxy handshake error. |
| kError_Quic_Connect_Error | 96 | Quic had a connect error. |
| kError_QUOTE_ERROR | 21 | |
| kError_RANGE_ERROR | 33 | |

FileNameMatch Event Result Values

| Constant | Value | Description |
|---|---|---|
| kFileNameMatchFailed | 2 | Failed. |
| kFileNameMatchIsMatch | 0 | Is Match. |
| kFileNameMatchNoMatch | 1 | No match. |

Form Constants

| Constant | Value | Description |
|---|---|---|
| kFormArray | 8 | |
| kFormBuffer | 11 | |
| kFormBufferLength | 13 | |
| kFormBufferPtr | 12 | |
| kFormContentHeader | 15 | |
| kFormContentsLength | 6 | |
| kFormContentType | 14 | |
| kFormCopyContents | 4 | |
| kFormCopyName | 1 | |
| kFormEnd | 17 | |
| kFormFile | 10 | |
| kFormFileContent | 7 | |
| kFormFilename | 16 | |
| kFormNameLength | 3 | |
| kFormPtrContents | 5 | |
| kFormPtrName | 2 | |

FTP Authorization

| Constant | Value | Description |
|---|---|---|
| kFTPAUTH_DEFAULT | 0 | Allow libCURL to decide |
| kFTPAUTH_SSL | 1 | Try "AUTH SSL" first, and only if that fails try "AUTH TLS" |
| kFTPAUTH_TLS | 2 | Try "AUTH TLS" first, and only if that fails try "AUTH SSL" |

FTP CWD method

| Constant | Value | Description |
|---|---|---|
| kFTPMethodDefault | 0 | let libcurl pick |
| kFTPMethodMultiCWD | 1 | single CWD operation for each path part |
| kFTPMethodNoCWD | 2 | no CWD at all |
| kFTPMethodSingleCWD | 3 | one CWD to full dir, then work on file |

FTP SSL Option

| Constant | Value | Description |
|---|---|---|
| kFTPSSL_ALL | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_CONTROL | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_NONE | 0 | Don't attempt to use SSL. |
| kFTPSSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |

GSS API delegation modes

| Constant | Value | Description |
|---|---|---|
| kGSSAPIDelegationFlag | 2 | delegate always |
| kGSSAPIDelegationNone | 0 | no delegation (default) |
| kGSSAPIDelegationPolicyFlag | 1 | if permitted by policy |

HTTP Versions

| Constant | Value | Description |
|---|---|---|
| kHTTP_VERSION_1_0 | 1 | Enforce HTTP 1.0 requests. |
| kHTTP_VERSION_1_1 | 2 | Enforce HTTP 1.1 requests. |
| kHTTP_VERSION_2TLS | 4 | use version 2 for HTTPS, version 1.1 for HTTP |
| kHTTP_VERSION_2_0 | 3 | please use HTTP 2 in the request |
| kHTTP_VERSION_2_PRIOR_KNOWLEDGE | 5 | please use HTTP 2 without HTTP/1.1 Upgrade |
| kHTTP_VERSION_3 | 30 | please use HTTP 3 in the request |
| kHTTP_VERSION_3Only | 31 | Use HTTP/3 without fallback. For HTTPS only. For HTTP, t return error. |
| kHTTP_VERSION_NONE | 0 | We don't care about what version the library uses. libCURL it thinks fit. |

Debug Message Info Types

| Constant | Value | Description |
|---|---|---|
| kINFO_DATA_IN | 3 | The data is protocol data received from the peer. |
| kINFO_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kINFO_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kINFO_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kINFO_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kINFO_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |
| kINFO_TEXT | 0 | The data is informational text. |

IP Resolve Modes

| Constant | Value | Description |
|---|---|---|
| kIPRESOLVE_V4 | 1 | |
| kIPRESOLVE_V6 | 2 | |
| kIPRESOLVE_WHATEVER | 0 | |

NetRC Modes

| Constant | Value | Description |
|---|---|---|
| kNETRC_IGNORED | 0 | The .netrc will never be read.<br>This is the default. |
| kNETRC_OPTIONAL | 1 | A user:password in the URL will be preferred to one in the .netrc. |
| kNETRC_REQUIRED | 2 | A user:password in the URL will be ignored. Unless one is set programmatically, the .netrc will be queried. |

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAll | -1 | Enable all protocols. |
| kProtocolDICT | &h200 | DICT |
| kProtocolFILE | &h400 | File |
| kProtocolFTP | 4 | FTP |
| kProtocolFTPS | 8 | FTPS |
| kProtocolGopher | &h2000000 | Gopher |
| kProtocolGophers | &h20000000 | |
| kProtocolHTTP | 1 | HTTP |
| kProtocolHTTPS | 2 | HTTPS |
| kProtocolIMAP | &h1000 | IMAP |
| kProtocolIMAPS | &h2000 | IMAPS |
| kProtocolLDAP | &h80 | LDAP |
| kProtocolLDAPS | &h100 | LDAPS |
| kProtocolMQTT | &h10000000 | MQTT |
| kProtocolPOP3 | &h4000 | POP3 |
| kProtocolPOP3S | &h8000 | POP3S |
| kProtocolRTMP | &h80000 | RTMP |
| kProtocolRTMPE | &h200000 | RTMPE |
| kProtocolRTMPS | &h800000 | RTMPS |
| kProtocolRTMPT | &h100000 | RTMPT |
| kProtocolRTMPTE | &h400000 | RTMPTE |
| kProtocolRTMPTS | &h1000000 | RTMPTS |
| kProtocolRTSP | &h40000 | RTSP |
| kProtocolSCP | &h10 | SCP |
| kProtocolSFTP | &h20 | SFTP |
| kProtocolSMB | &h4000000 | SMB |
| kProtocolSMBS | &h8000000 | SMBS |
| kProtocolSMTP | &h10000 | SMTP |
| kProtocolSMTPS | &h20000 | SMTPS |
| kProtocolTelnet | &h40 | Telnet |
| kProtocolTFTP | &h800 | TFTP |

Proxy Types

| Constant | Value | Description |
|---|---|---|
| kPROXY_HTTP | 0 | |
| kPROXY_HTTP10 | 1 | Force to use CONNECT HTTP/1.0. |
| kPROXY_HTTP11 | 0 | Connect using HTTP/1.1. |
| kPROXY_SOCKS4 | 4 | |
| kPROXY_SOCKS4A | 6 | Using SOCKS 4A. |
| kPROXY_SOCKS5 | 5 | |
| kPROXY_SOCKS5_Hostname | 7 | Use the SOCKS5 protocol but pass along the host name rather than the IP address. added in 7.18.0 |

Seek Origin Constants

| Constant | Value | Description |
|---|---|---|
| kSeekOriginCurrent | 1 | Seek relative to current file position. |
| kSeekOriginEnd | 2 | Seek relative to end of file. |
| kSeekOriginSet | 0 | Seek relative to start of file. |

Seek Event Result Values

| Constant | Value | Description |
|---|---|---|
| kSeekReturnCantSeek | 3 | Return this value if you can't seek as you are not using a file, but for example a stream. |
| kSeekReturnFail | 2 | Returns this value if your seek operation failed. |
| kSeekReturnOk | 1 | Returns this value if your seek operation succeeded. |

SSH Authentication

| Constant | Value | Description |
|---|---|---|
| kSSHAuthAgent | 16 | agent (ssh-agent, pageant...) |
| kSSHAuthAny | -1 | Any allowed |
| kSSHAuthDefault | -1 | Default: Any |
| kSSHAuthGSSAPI | 32 | gssapi (kerberos, ...) |
| kSSHAuthHost | 4 | host key files |
| kSSHAuthKeyboard | 8 | keyboard interactive |
| kSSHAuthNone | 0 | none allowed, silly but complete |
| kSSHAuthPassword | 2 | password |
| kSSHAuthPublicKey | 1 | public/private key files |

SSL Option Flags

| Constant | Value | Description |
|---|---|---|
| kSSLOptionAllowBeast | 1 | tells libcurl to allow the BEAST SSL vulnerability in the name of improving interoperability with older servers. Some SSL libraries have introduced work-arounds for this flaw but those work-arounds sometimes make the SSL communication fail. To regain functionality with those broken servers, a user can this way allow the vulnerability back. |
| kSSLOptionAutoClientCert | 32 | Tells libcurl to automatically locate and use a client certificate for authentication. (Schannel) |
| kSSLOptionNativeCA | 16 | tells libcurl to use standard certificate store of operating system. Currently implemented under MS-Windows. |
| kSSLOptionNoPartialChain | 4 | tells libcurl to *NOT* accept a partial certificate chain if possible. The OpenSSL backend has this ability. |
| kSSLOptionNoRevoke | 2 | tells libcurl to disable certificate revocation checks for those SSL backends where such behavior is present. |
| kSSLOptionRevokeBestEffort | 8 | tells libcurl to ignore certificate revocation offline checks and ignore missing revocation list for those SSL backends where such behavior is present. |

SSL Versions

| Constant | Value | Description |
|---|---|---|
| kSSLVersionDefault | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| kSSLVersionSSLv2 | 2 | SSL v2 (but not SSLv3) |
| kSSLVersionSSLv3 | 3 | SSL v3 (but not SSLv2) |
| kSSLVersionTLSv1 | 1 | TLS v1.0 or later |
| kSSLVersionTLSv10 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| kSSLVersionTLSv11 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| kSSLVersionTLSv12 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| kSSLVersionTLSv13 | 7 | TLS v1.3 or later (Added in 7.52.0) |

Time Conditions

| Constant | Value | Description |
|---|---|---|
| kTimeConditionIfModifiedSince | 1 | |
| kTimeConditionIfUnModifiedSince | 2 | |
| kTimeConditionNone | 0 | No condition. |

SSL Option

| Constant | Value | Description |
|---|---|---|
| kUseSSLall | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kUseSSLcontrol | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kUseSSLnone | 0 | Don't attempt to use SSL. |
| kUseSSLtry | 1 | Try using SSL, proceed as normal otherwise. |

## 64.5 class CURLMimePartMBS

### 64.5.1 class CURLMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for mime parts.
**Notes:** You can provide data via file path, folderitem, data in memoryblock or string.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 64.5.2 Methods

### 64.5.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 64.5.4 Headers as String()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries header.

### 64.5.5 SetHeaders(headers() as String)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets header.

### 64.5.6 Properties

### 64.5.7 DataMemory as Memoryblock

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from memory data.
**Notes:** (Read and Write property)

### 64.5.8 DataString as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from memory data.
**Example:**

```
dim c as new CURLMBS

// add mime
dim p as CURLMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** (Read and Write property)

### 64.5.9 Encoding as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime data transfer encoder.
**Notes:** If set to binary, 8bit, 7bit, base64 or quoted-printable, the matching encoding is applied.
(Read and Write property)

### 64.5.10 File as FolderItem

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file to stream.
**Notes:** When you set property, the plugin will open file and may raise IOException on failure.

(Read and Write property)

### 64.5.11 FileName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part remote file name.
**Notes:** If mime type is not set, we pick extension from file name.
This includes gif, jpg, jpeg, png, svg, txt, htm, html, pdf and xml file extensions.
(Read and Write property)

### 64.5.12 FilePath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from named file.
**Notes:** (Read and Write property)

### 64.5.13 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.5.14 MimeType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part type.
**Notes:** (Read and Write property)

### 64.5.15 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime/form part name.
**Notes:** (Read and Write property)

### 64.5.16 Parent as Variant

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The parent object.
**Notes:** (Read only property)

### 64.5.17 Constants

Encodings

| Constant | Value | Description |
|---|---|---|
| kEncoding7bit | "7bit" | 7bit |
| kEncoding8bit | "8bit" | 8bit |
| kEncodingBase64 | "base64" | Base64 |
| kEncodingBinary | "binary" | Binary mode |
| kEncodingNone | "" | No mode, so data is passed through and header has no encoding defin |
| kEncodingQuotedPrintable | "quoted-printable" | Quoted printable |

Mime Types

| Constant | Value | Description |
|---|---|---|
| kMimeTypeGIF | "image/gif" | GIF |
| kMimeTypeHTML | "text/html" | HTML |
| kMimeTypeJPEG | "image/jpeg" | JPEG |
| kMimeTypePDF | "application/pdf" | PDF |
| kMimeTypePNG | "image/png" | PNG |
| kMimeTypeSVG | "image/svg+xml" | SVG |
| kMimeTypeText | "text/plain" | Text |
| kMimeTypeXML | "application/xml" | XML |

## 64.6 class CURLMissingFunctionExceptionMBS

### 64.6.1 class CURLMissingFunctionExceptionMBS

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An exception raised if a CURL library function is not loaded.
**Notes:** If you call load library before you use the CURLMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.7 class CURLMultiMBS

### 64.7.1 class CURLMultiMBS

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for multiple CURL transfers running in parallel.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2

### 64.7.2 Methods

### 64.7.3 AddCURL(curl as CURLMBS, handler as CURLTransferFinishedMBS = nil) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a standard CURL handle to the multi stack.
**Notes:** Lasterror is set.

We added handler parameter for v23.2 to make it easier to run things asynchronously.

### 64.7.4 CURLs as CURLMBS()

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of current CURL instances.

### 64.7.5 ErrorString(ErrorCode as Integer) as String

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries text message for a given error code.

### 64.7.6 Perform

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks for things to see.
**Notes:** When the app thinks there's data available for CURL it calls this function to read/write whatever there is right now. This returns as soon as the reads and writes are done. This function does not require that there actually is data available for reading or that data can be written, it can be called just in case.

Lasterror is set. This only provides errors etc regarding the whole multi stack. There might still have occurred problems on invidual transfers even when this returns OK.

Sets RunningTransfers property.

### 64.7.7 RemoveAll

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes all curl handles.
**Notes:** Same as looping over CURLs() array and calling RemoveCURL for each.
This effectively cancels all requests.

### 64.7.8 RemoveCURL(CURL as CURLMBS) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes a CURL handle from the multi stack again.
**Notes:** Lasterror is set.
Plugin calls this automatically when TransferFinished event was called.

### 64.7.9 SharedInstance as CURLMultiMBS

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The shared instance.
**Notes:** Either you create a new CURLMultiMBS object, which then takes this place.
Or you don't and the plugin creates an object for you to easily schedule transfers asynchronously.

### 64.7.10 Properties

### 64.7.11 AutoPerform as Boolean

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to run a timer and run Perform automatically for you.
**Notes:** Set to true to run Perform automatically. For this the plugin manages a timer to call perform regularly.
We set this to true for the default shared instance, so it runs without you doing anything.
(Read and Write property)

### 64.7.12 ChunkLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A connection with a chunk length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.7.13 ContentLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A connection with a content-length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.7.14 Handle as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 64.7.15 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.7.16 MaxConcurrentStreams as Integer

MBS CURL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum number of concurrent connections to a server.
**Notes:** Maximum number of concurrent streams to support on a connection.
(Read and Write property)

### 64.7.17 MaxConnects as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of entries in the connection cache.
**Notes:** (Read and Write property)

### 64.7.18 MaxHostConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of (pipelining) connections to one host.
**Notes:** (Read and Write property)

### 64.7.19 MaxPipelineLength as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of requests in a pipeline.
**Notes:** (Read and Write property)

### 64.7.20 MaxTotalConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of open connections in total.
**Notes:** (Read and Write property)

### 64.7.21 Pipelining as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to 1 to enable pipelining for this multi handle.
**Notes:** Only for HTTP protocol.
Used to be a boolean property for 15.0 to 18.1, but changed to integer for 18.2.
(Read and Write property)

### 64.7.22 RunningTransfers as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of running transfers.
**Notes:** Set by Perform method.
(Read only property)

### 64.7.23 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.7.24 Events

### 64.7.25 TransferFinished(CURL as CURLMBS, result as Integer, RemainingFinishedTransfers as Integer)

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One transfer finished.
**Notes:** Query CURL object for details.
Result is the result of the transfer as returned by Perform method of CURL object.
RemainingFinishedTransfers is how many transfers are also finished and will be called right after this event.

This event fires always when the queue is empty.
You may want to turn off the timer calling Perform method when this event fires.
Later you can start timer again if you call Add method.

### 64.7.26 TransfersFinished

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** All pending transfers finished.

### 64.7.27 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAddedAlready | 7 | An easy handle already added to a multi handle was attempted to get added - again. |
| kErrorBadEadyHandle | 2 | An easy handle was not good/valid. |
| kErrorBadFunctionArgument | 10 | A function was called with a bad parameter. |
| kErrorBadHandle | 1 | The passed-in handle is not a valid CURLM handle. |
| kErrorBadSocket | 5 | The passed in socket argument did not match. |
| kErrorCallPerform | -1 | Please call Perform soon to do some tasks. |
| kErrorInternalError | 4 | This is a libCURL bug. |
| kErrorOK | 0 | Everything OK. |
| kErrorOutOfMemory | 3 | Running low on memory. |
| kErrorRecursiveAPICall | 8 | An api function was called from inside an event. |
| kErrorUnknownOption | 6 | Tried to set unsupported option. |
| kErrorWakeupFailure | 9 | Wakeup is unavailable or failed. |

Pipeling options

| Constant | Value | Description |
|---|---|---|
| kPipeHTTP1 | 1 | Pipe with HTTP/1.1. |
| kPipeMultiPlex | 2 | Pipe with multiplex. |
| kPipeNothing | 0 | No piping. |

### 64.7.28 Delegates

### 64.7.29 CURLTransferFinishedMBS(curl as CURLMBS, ErrorCode as Integer)

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate used to indicate a transfer finished.
**Notes:** ErrorCode is zero for a successful.
See kError* constants in CURLSMBS class.
See also:

- 64.7.30 CURLTransferFinishedMBS(curl as CURLMBS, ErrorCode as Integer) 11186

### 64.7.30 CURLTransferFinishedMBS(curl as CURLMBS, ErrorCode as Integer)

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate used to indicate a transfer finished.
**Notes:** ErrorCode is zero for a successful.
See kError* constants in CURLMBS class.
See also:

- 64.7.29 CURLTransferFinishedMBS(curl as CURLMBS, ErrorCode as Integer) 11186

## 64.8 class CURLNFileInfoMBS

### 64.8.1 class CURLNFileInfoMBS

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for file information.
**Notes:** Content of this structure depends on information which is known and is achievable (e.g. by FTP LIST parsing).

### 64.8.2 Properties

### 64.8.3 Date as Date

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 15.2 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property. But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.8.4 DateTime as DateTime

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 20.5 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property. But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.8.5 FileName as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file name.
**Notes:** (Read only property)

### 64.8.6 FileType as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file type.
**Notes:** (Read only property)

### 64.8.7 Flags as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The flags.
**Notes:** Flags define which fields are set.
Also you can just use the Has properties for same information.
(Read only property)

### 64.8.8 GID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The group ID.
**Notes:** (Read only property)

### 64.8.9 GroupString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The group string.
**Notes:** (Read only property)

### 64.8.10 HardLinks as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hard link count.
**Notes:** (Read only property)

### 64.8.11 HasFileName as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if filename property is valid.
**Notes:** (Read only property)

### 64.8.12 HasFileType as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if filetype property is valid.
**Notes:** (Read only property)

### 64.8.13 HasGID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if GID property is valid.
**Notes:** (Read only property)

### 64.8.14 HasHardLinks as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if hardlinks property is valid.
**Notes:** (Read only property)

### 64.8.15 HasPermissions as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if permissions property is valid.
**Notes:** (Read only property)

### 64.8.16 HasSize as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if size property is valid.
**Notes:** (Read only property)

### 64.8.17 HasTime as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if time and date properties have values.
**Notes:** (Read only property)

### 64.8.18 HasUID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if UID field has a value.
**Notes:** (Read only property)

### 64.8.19 IsDirectory as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if entry is a directory.
**Notes:** Same as FileType = FileTypeDirectory.
(Read only property)

### 64.8.20 IsFile as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if entry is a regular file.
**Notes:** Same as FileType = FileTypeFile.
(Read only property)

### 64.8.21 Permissions as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The permission value.
**Notes:** (Read only property)

### 64.8.22 PermissionString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The permission string.
**Notes:** (Read only property)

### 64.8.23 Size as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file size.
**Notes:** (Read only property)

### 64.8.24 Target as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The target for a symlink.
**Notes:** (Read only property)

### 64.8.25 Time as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time value.
**Notes:** (Read only property)

### 64.8.26 TimeString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time string parsed.
**Notes:** (Read only property)

### 64.8.27 UID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user ID.
**Notes:** (Read only property)

### 64.8.28 UserString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user ID as text.
**Notes:** (Read only property)

### 64.8.29 Constants

File Types

| Constant | Value | Description |
|---|---|---|
| FileTypeDeviceBlock | 3 | Block Device |
| FileTypeDeviceChar | 4 | Character Device |
| FileTypeDirectory | 1 | Directory |
| FileTypeDoor | 7 | Door, is possible only on Sun Solaris now. |
| FileTypeFile | 0 | Regular file |
| FileTypeNamedPipe | 5 | Named Pipe |
| FileTypeSocket | 6 | Socket |
| FileTypeSymlink | 2 | Symbolic links |
| FileTypeUnknown | 8 | Unknown file type. Should never occur. |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| FlagKnownFileName | 1 | Filename Known |
| FlagKnownFileType | 2 | File Type Known |
| FlagKnownGID | 32 | GID Known |
| FlagKnownHardLinks | 128 | Hardlink Count Known |
| FlagKnownPermissions | 8 | Permissions Known |
| FlagKnownSize | 64 | Size Known |
| FlagKnownTime | 4 | Time Known |
| FlagKnownUID | 16 | UID Known |

## 64.9 class CURLNListMBS

### 64.9.1 class CURLNListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to hold a list of strings from the CURL library.
**Notes:** Data is copied for this list, so you can just keep it around.

### 64.9.2 Methods

### 64.9.3 Item(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the item with the given index.
**Notes:** Index is zero based.

### 64.9.4 List as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts list to a string array.

### 64.9.5 Operator_Convert as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts list to a string array.

### 64.9.6 Properties

### 64.9.7 Count as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of items in this list.
**Notes:** (Read only property)

## 64.10 class CURLNMBS

### 64.10.1 class CURLNMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to wrap libCURL.
**Example:**

```
Dim d As New CURLNMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error

ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages
```

**Notes:** We have three variants:

CURLS* classes include a static CURL library with SSL and SSH.
CURLN* classes include a static CURL library with native SSL on Mac and Windows.
CURL* classes without S need you to supply your own CURL library.

All variants can load a custom CURL library or use the one from the system on Mac and Linux.
If no library is loaded or included, the plugin will try to load the system one in constructor.

from the website libCURL website:
https://curl.haxx.se/libcurl/

libCURL is a free and easy-to-use client-side URL transfer library, supporting FTP, FTPS, HTTP, HTTPS, SCP, SFTP, TFTP, TELNET, DICT, FILE and LDAP. libCURL supports SSL certificates, HTTP POST, HTTP PUT, FTP uploading, HTTP form based upload, proxies, cookies, user+password authentication (Basic, Digest, NTLM, Negotiate, Kerberos4), file transfer resume, http proxy tunneling and more!

libCURL is highly portable, it builds and works identically on numerous platforms, including Solaris, NetBSD, FreeBSD, OpenBSD, Darwin, HPUX, IRIX, AIX, Tru64, Linux, UnixWare, HURD, Windows, Amiga, OS/2, BeOs, Mac OS X, Ultrix, QNX, OpenVMS, RISC OS, Novell NetWare, DOS and more...

libCURL is free, thread-safe, IPv6 compatible, feature rich, well supported, fast, thoroughly documented and is already used by many known, big and successful companies and numerous applications.

On Linux you may need to install libraries like ldap: apt-get install libldap-2.4.2:i386
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 22.4
- News from the MBS Xojo Plugins Version 22.3
- News from the MBS Xojo Plugins Version 21.3
- News from the MBS Xojo Plugins Version 21.1
- News from the MBS Xojo Plugins Version 20.3
- URLs without UserName and Password please
- CURL conference
- Adding CURLN* classes to MBS Xojo Plugins

**Videos**

- Presentation from London conference about MBS Plugins.

### 64.10.2 Methods

### 64.10.3 AddMimePart as CURLNMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a new blank mime part.
**Notes:** Returns mime object, so you can set properties.

### 64.10.4 AWSPresignURL(AWSAccessKeyId as String, AWSSecretAccessKey as String, Region as String, Service as String, Path as String, Domain as String, Verb as String = "GET", Expires as Integer = 86400, QueryParameters() as String = nil, Headers() as String = nil) as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query predigend URL for Amazon Webservices.
**Example:**

```
Dim URL As String = CURLNMBS.AWSPresignURL( _
"AKIAIOSFODNN7EXAMPLE", _
"wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY", _
"us-east-1", _
"s3", _
"/test.txt", _
"examplebucket.s3.amazonaws.com", _
"GET", _
86400 )

Break // see URL in debugger
```

**Notes:** This implements AWS4-HMAC-SHA256 pre-signature for credentials.

Works also for other compatible S3 services beside Amazon's like the one from Wasabi or Dell ECS.

| Parameter | Description | Example |
|---|---|---|
| AWSAccessKeyId | Your access key for AWS. | |
| AWSSecretAccessKey | Your secret. | |
| Region | The region to use. | "us-central-1" |
| Service | The service to use. | "s3" |
| Path | The path for the URL. Should always start with "/". | "/bucketname/test.jpg" |
| Domain | Optional the domain to use. By default we just build it from region and service. | "s3.eu-central-1.amazonaws.com" or "s3-ap-southeast-2.amazonaws.com" |
| Verb | The HTTP Operation to do. Can be POST, PUT, GET or DELETE. Default is GET. | "GET" |
| Expires | Optional timestamp. Provide the time period, in seconds, for which the generated presigned URL is valid. For example, 86400 (24 hours). This value is an integer. The minimum value you can set is 1, and the maximum is 604800 (seven days). A presigned URL can be valid for a maximum of seven days because the signing key you use in signature calculation is valid for up to seven days. Default is 86400 for one day. | |
| QueryParameters | List of query parameters to include. | |
| Headers | Extra HTTP headers to include. Here you can specify various headers to include in signature and request. | "test=abc" |

Returns the pre-signed URL. May raise an exception in case of error.

### 64.10.5 ClearData

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears data properties.
**Notes:** Resets OutputData, DebugMessages and Headers.

### 64.10.6 CloseMTDebugOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the debug output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.10.7 CloseMTHeaderOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the header output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.10.8 CloseMTInputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the input file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.10.9 CloseMTOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.10.10 CreateMTDebugOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.10.11 CreateMTDebugOutputFile(Path as String) as boolean 11200

### 64.10.11 CreateMTDebugOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.10.10 CreateMTDebugOutputFile(file as folderitem) as boolean 11199

### 64.10.12 CreateMTHeaderOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.10.13 CreateMTHeaderOutputFile(Path as String) as boolean 11200

### 64.10.13 CreateMTHeaderOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.10.12 CreateMTHeaderOutputFile(file as folderitem) as boolean 11200

### 64.10.14 CreateMTOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.10.15 CreateMTOutputFile(Path as String) as boolean 11201

### 64.10.15 CreateMTOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.10.14 CreateMTOutputFile(file as folderitem) as boolean 11201

### 64.10.16 FileInfos as CURLNFileInfoMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries array with file information.
**Notes:** If you use OptionWildcard, you find after the transfer all CURLNFileInfoMBS objects for all the files/folders found.

For MBS Plugin 19.0 or newer you can alternatively run a custom request "MLSD" and than get file infos, too.

### 64.10.17 FinishMime

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Finishes mime data.
**Example:**

```
dim c as new CURLNMBS

// add mime
dim p as CURLNMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** Please call AddMimePart for each part you like to add and than finally FinishMime before calling perform.

### 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim c as new CURLNMBS
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
dim formValues(-1) as string

const CURLFORM_COPYNAME = 1
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues
```

**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210

### 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210

### 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204

- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210


### 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210

### 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210

### 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204

- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210


### 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Several FormAdd methods are there. Send a request to support if you need another parameter combination.

Lasterror is set.

FormAdd() is used to append sections when building a multipart/formdata HTTP POST (sometimes referred to as rfc1867-style posts). Append one section at a time until you've added all the sections you want included and then you call FormFinish.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

First, there are some basics you need to understand about multipart/formdata posts. Each part consists of at least a NAME and a CONTENTS part. If the part is made for file upload, there are also a stored CONTENT-TYPE and a FILENAME. Below, we'll discuss what options you use to set these properties in the parts you want to add to your post.

The options listed first are for making normal parts. The options from CURLFORM_FILE through CURLFORM_BUFFERLENGTH are for file upload parts.

CURLFORM_COPYNAME:
followed by a string which provides the name of this part. libCURL copies the string so your application doesn't need to keep it around after this function call. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_PTRNAME:
followed by a string which provides the name of this part. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_COPYCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL copies the provided data, so your application doesn't need to keep it around after this function call. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set the length of the name with CURLFORM_CONTENTSLENGTH.

CURLFORM_PTRCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_CONTENTSLENGTH.

CURLFORM_CONTENTSLENGTH:
followed by a long giving the length of the contents.

CURLFORM_FILECONTENT:
followed by a filename, causes that file to be read and its contents used as data in this part. This part does not automatically become a file upload part simply because its data was read from a file.

CURLFORM_FILE:
followed by a filename, makes this part a file upload part. It sets the filename field to the basename of the provided filename, it reads the contents of the file and passes them as data and sets the content-type if the given file match one of the internally known file extensions. For CURLFORM_FILE the user may send one or more files in one part by providing multiple CURLFORM_FILE arguments each followed by the filename (and each CURLFORM_FILE is allowed to have a CURLFORM_CONTENTTYPE).

CURLFORM_CONTENTTYPE:
is used in combination with CURLFORM_FILE. Followed a string which provides the content-type for this part, possibly instead of an internally chosen one.

CURLFORM_FILENAME:
is used in combination with CURLFORM_FILE. Followed a string, it tells libCURL to use the given string

as the filename in the file upload part instead of the actual file name.

CURLFORM_BUFFER:
is used for custom file upload parts without use of CURLFORM_FILE. It tells libCURL that the file contents are already present in a buffer. The parameter is a string which provides the filename field in the content header.

CURLFORM_BUFFERPTR:
is used in combination with CURLFORM_BUFFER. The parameter is the string to be uploaded. You must also use CURLFORM_BUFFERLENGTH to set the number of bytes in the buffer. Keep the buffer variable alive till the upload is finished.

CURLFORM_BUFFERLENGTH:
is used in combination with CURLFORM_BUFFER. The parameter is a long which gives the length of the buffer.

CURLFORM_ARRAY:
Another possibility to send options to CURL_formadd() is the CURLFORM_ARRAY option, that passes an Integer Array and a String Array defining its value. Each element in the form is constructed using the option from the integer array and the value from the string array. All available options can be used in an array, except the CURLFORM_ARRAY option itself!

CURLFORM_CONTENTHEADER:
specifies extra headers for the form POST section. This takes a CURL_slist prepared in the usual way using CURL_slist_append and appends the list of headers to those libCURL automatically generates. The list must exist while the POST occurs, if you free it before the post completes you may experience problems.

PS: CURLFORM_FILE does not work in all CURL versions on all platforms due to a bug with integer numbers.
See also:


- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206

- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11210

### 64.10.25 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string)

MBS CURL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.10.18 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11202
- 64.10.19 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11204
- 64.10.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11204
- 64.10.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11205
- 64.10.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11206
- 64.10.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11206
- 64.10.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11207

### 64.10.26 FormAddField(fieldName as String, fieldValue as String, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim d as new CURLNMBS
d.FormAddField("company", "Test, Inc.")
```

**Notes:** For fieldName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.
ContentType is optional.

Please call FormFinish method later!

### 64.10.27 FormAddFile(fieldName as String, fileName as String, fileContent as string, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
// read content of some file
dim file as folderitem = specialFolder.desktop.Child("test.txt")
dim b as BinaryStream = binarystream.Open(file)
dim FileContent as String = b.read(b.length)

// init some curl object
dim d as new CURLNMBS

// add the file as part of a form
d.FormAddFile("FileAttachment", "test.txt", FileContent, "text/plain")

// later
d.FormFinish
```

**Notes:** For fieldName, fileName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.

Filename is ignored, if empty.
ContentType is optional.

Please call FormFinish method later!

### 64.10.28 FormClear

MBS CURL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears current form data.
**Notes:** You usually don't need to call this as Perform clears form data when transfer is done.

### 64.10.29 FormData as String

MBS CURL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries current form data.
**Notes:** This is more for debugging as it builds form data as if we would send it.

### 64.10.30 FormFinish

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Finishes constructing a form.
**Example:**

```
dim c as new CURLNMBS
dim namebuffer as string = "name buffer"
dim namelength as Integer = lenb(namebuffer)
dim buffer as string = "test buffer"
dim htmlbuffer as string = "<HTML>test buffer</HTML>"
dim htmlbufferlength as Integer = lenb(htmlbuffer)
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
dim formValues(-1) as string
dim recordbuffer as string = "record buffer"
dim recordlength as Integer = lenb(recordbuffer)

const CURLFORM_NOTHING = 0
const CURLFORM_COPYNAME = 1
const CURLFORM_PTRNAME = 2
const CURLFORM_NAMELENGTH = 3
const CURLFORM_COPYCONTENTS = 4
const CURLFORM_PTRCONTENTS = 5
const CURLFORM_CONTENTSLENGTH = 6
const CURLFORM_FILECONTENT = 7
```

```
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10
const CURLFORM_BUFFER = 11
const CURLFORM_BUFFERPTR = 12
const CURLFORM_BUFFERLENGTH = 13
const CURLFORM_CONTENTTYPE = 14
const CURLFORM_CONTENTHEADER = 15
const CURLFORM_FILENAME = 16

'/* Add simple name/content section */

c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_COPYCONTENTS, "content"

'
'/* Add simple name/content/contenttype section */

c.FormAdd CURLFORM_COPYNAME, "htmlcode", CURLFORM_COPYCONTENTS, "<HTML></HTML>",CURL-
FORM_CONTENTTYPE,"text/html"

'/* Add name/ptrcontent section */
c.FormAdd CURLFORM_COPYNAME, "name_for_ptrcontent", CURLFORM_PTRCONTENTS, buffer

'/* Add ptrname/ptrcontent section */
c.FormAdd CURLFORM_PTRNAME, namebuffer, CURLFORM_PTRCONTENTS, buffer, CURLFORM_NAME-
LENGTH, namelength


'/* Add name/ptrcontent/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "html_code_with_hole", CURLFORM_PTRCONTENTS, html-
buffer, CURLFORM_CONTENTSLENGTH, htmlbufferlength, CURLFORM_CONTENTTYPE, "text/html"

'/* Add simple file section */
c.FormAdd CURLFORM_COPYNAME, "picture", CURLFORM_FILE, "my-face.jpg"

'/* Add file/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "picture",CURLFORM_FILE, "my-face.jpg",CURLFORM_CONTENTTYPE,
"image/jpeg"

'/* Add two file section */
c.FormAdd CURLFORM_COPYNAME, "pictures",CURLFORM_FILE, "my-face.jpg",CURLFORM_FILE,
"your-face.jpg"

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2
```

```
'/* Add a buffer to upload */
c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_BUFFER, "data", CURLFORM_BUFFERPTR,
recordbuffer, CURLFORM_BUFFERLENGTH, recordlength

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues

'/* Add the content of a file as a normal post text value */
c.FormAdd CURLFORM_COPYNAME, "filecontent", CURLFORM_FILECONTENT, ".bashrc"
'/* Set the form info */

c.FormFinish
```

**Notes:** Lasterror is set.
The form is assigned to the HTTPPost property.

### 64.10.31 GetInfoActiveSocket as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive the active socket used by this curl session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the Destructor closes the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly.

This option was added as a replacement for GetInfoLastSocket since that one isn't working on all platforms.

### 64.10.32 GetInfoAppConnectTime as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time stamp when app connected.

### 64.10.33 GetInfoCAInfo as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries default CAInfo value.

### 64.10.34 GetInfoCAPath as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries default CAPath value.

### 64.10.35 GetInfoCertInfo as CURLNListMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries information on the certificate chain.
**Example:**

```
dim c as new CURLNMBS

// do some transfer
c.OptionURL = "https://www.mbsplugins.de/"
c.OptionCertInfo = true
dim e as Integer = c.perform

// query certificate info
dim lists() as CURLNListMBS = c.GetInfoCertInfo

for each l as CURLNListMBS in lists
MsgBox Join(l, EndOfLine)
next

MsgBox c.DebugMessages
```

**Notes:** Please set OptionCertInfo first.

### 64.10.36 GetInfoConditionUnmet as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return if the time condition prevented the document to get transferred.

### 64.10.37 GetInfoConnectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the connect to the remote host (or proxy) was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.38 GetInfoContentLengthDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The content-length of the download.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Length: field.

### 64.10.39 GetInfoContentLengthUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The specified size of the upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.40 GetInfoContentType as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The content-type of the downloaded object.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Type: field. If you get "", it means that the server didn't send a valid Content-Type header or that the protocol used doesn't support this.

### 64.10.41 GetInfoCookieList as CURLNListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked-list of all cookies CURL knows (expired ones, too).
**Notes:** The Lasterror property is set. 0 for success.
If there are no cookies (cookies for the handle have not been enabled or simply none have been received) the result is nil.

### 64.10.42 GetInfoEffectiveMethod as string

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the last used effective HTTP method.
**Notes:** In cases when you've asked libcurl to follow redirects, the method may very well not be the same method the first request would use.

### 64.10.43 GetInfoEffectiveURL as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last used effective URL.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.44 GetInfoFileTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the remote time of the retrieved document (in number of seconds since 1 jan 1970 in the GMT/UTC time zone).
**Example:**

```
// init CURL with options
dim d as new CURLNMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime
```

```
// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** The Lasterror property is set. 0 for success.
If you get -1, it can be because of many reasons (unknown, the server hides it or the server doesn't support the command that tells document time etc) and the time of the document is unknown. Note that you must tell the server to collect this information before the transfer is made, by using the OptionFileTime option or you will unconditionally get a -1 back. (Added in 7.5)

### 64.10.45 GetInfoFTPEntryPath as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a string holding the path of the entry path.
**Notes:** That is the initial path libCURL ended up in when logging on to the remote FTP server.
Empty string if unknown.

### 64.10.46 GetInfoHeaderSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total size of all the headers received.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.47 GetInfoHTTPAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask indicating the authentication method(s) available.
**Notes:** The Lasterror property is set. 0 for success.
The meaning of the bits is explained in the HTTPAuth option.

### 64.10.48 GetInfoHTTPConnectCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last received proxy response code to a CONNECT request.
**Notes:** The Lasterror property is set. 0 for success.
none

### 64.10.49 GetInfoHTTPVersion as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the http version used in the connection.
**Notes:** The returned value will be kHTTP_VERSION_1_0, kHTTP_VERSION_1_1, or kHTTP_VERSION_2_0, or 0 if the version can't be determined.

### 64.10.50 GetInfoLastSocket as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetInfoActiveSocket instead. **Function:** Receive the last socket used by this CURL session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the destructor will free the handle as usual and let libCURL close the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly. (Added in 7.15.2)

NOTE: this API is not really working on win64, since the SOCKET type on win64 is 64 bit large while its 'long' is only 32 bits.

### 64.10.51 GetInfoLocalIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries local IP.
**Example:**

```
dim c as new CURLNMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP
MsgBox c.GetInfoLocalIP
```

### 64.10.52 GetInfoLocalPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the local port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLNMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP and port
MsgBox c.GetInfoLocalIP+":"+str(c.GetInfoLocalPort)
```

### 64.10.53 GetInfoNameLookupTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the name resolving was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.54 GetInfoNumConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** How many new connections libCURL had to create to achieve the previous transfer.
**Notes:** The Lasterror property is set. 0 for success.
(only the successful connects are counted)
Combined with RedirectCount you are able to know how many times libCURL successfully reused existing connection(s) or not. See the Connection Options to see how libCURL tries to make persistent connections to save time.

### 64.10.55 GetInfoOSErrno as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The errno variable from a connect failure.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.56 GetInfoPreTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, it took from the start until the file transfer is just about to begin.
**Notes:** The Lasterror property is set. 0 for success.
This includes all pre-transfer commands and negotiations that are specific to the particular protocol(s) involved.

### 64.10.57 GetInfoPrimaryIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the ip address of the most recent (primary) connection.
**Example:**

```
dim c as new CURLNMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.10.58 GetInfoPrimaryPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the (remote) port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLNMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.10.59 GetInfoProtocol as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Get the protocol used in the connection.
**Notes:** See kProtocol* constants.

### 64.10.60 GetInfoProxyAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask indicating the authentication method(s) available for your proxy authentication.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.61 GetInfoProxyError as integer

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries proxy error code.

### 64.10.62 GetInfoProxySSLVerifyResult as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the result of the proxy certificate verification.
**Notes:** receive the result of the certificate verification that was requested (using the OptionProxySSLVeri-

fyPeer option. This is only used for HTTPS proxies.

### 64.10.63 GetInfoRedirectCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total number of redirections that were actually followed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.64 GetInfoRedirectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the total time, in seconds, it took for all redirection steps include name lookup, connect, pre-transfer and transfer before final transaction was started.
**Notes:** The Lasterror property is set. 0 for success.
RedirectTime contains the complete execution time for multiple redirections. (Added in 7.9.7)

### 64.10.65 GetInfoRedirectURL as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The redirection URL.

### 64.10.66 GetInfoReferer as string

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries referrer text.

### 64.10.67 GetInfoRequestSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total size of the issued requests.
**Notes:** The Lasterror property is set. 0 for success.
This is so far only for HTTP requests. Note that this may be more than one request if FOLLOWLOCATION is true.

### 64.10.68 GetInfoResponseCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last received HTTP or FTP code.
**Notes:** The Lasterror property is set. 0 for success.
This will be zero if no server response code has been received. Note that a proxy's CONNECT response should be read with GetInfoHTTPConnectCode and not this.

With HTTP transfer, a successful transfer reports 200 here. If the page is not found, you get 404. Or any other HTTP Response code.

### 64.10.69 GetInfoRetryAfter as integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the Retry-After retry delay.
**Notes:** Receive the number of seconds the HTTP server suggesets the client should wait until the next request is issued.
The information from the "Retry-After:" header.

While the HTTP header might contain a fixed date string, the RetryAfter will always return number of seconds to wait - or zero if there was no header or the header couldn't be parsed.

### 64.10.70 GetInfoRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP Client sequence counter.

### 64.10.71 GetInfoRTSPCSEQRecv as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP sequence counter received.

### 64.10.72 GetInfoRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP Server sequence counter.

### 64.10.73 GetInfoRTSPSessionID as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query RTSP session ID.

### 64.10.74 GetInfoScheme as string

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the URL scheme (sometimes called protocol) used in the connection

### 64.10.75 GetInfoSizeDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total amount of bytes that were downloaded.
**Notes:** The Lasterror property is set. 0 for success.
The amount is only for the latest transfer and will be reset again for each new transfer.

### 64.10.76 GetInfoSizeUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total amount of bytes that were uploaded.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.77 GetInfoSpeedDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The average download speed that CURL measured for the complete download.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.78 GetInfoSpeedUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The average upload speed that CURL measured for the complete upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.79 GetInfoSSLEngines as CURLNListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive a linked-list of OpenSSL crypto-engines supported.
**Notes:** The Lasterror property is set. 0 for success.
Note that engines are normally implemented in separate dynamic libraries. Hence not all the returned engines may be available at run-time.

### 64.10.80 GetInfoSSLVerifyResult as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the result of the certification verification that was requested (using the SSLVerifyPeer option).
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.81 GetInfoStartTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** the time, in seconds, it took from the start until the first byte is just about to be transferred.
**Notes:** The Lasterror property is set. 0 for success.
This includes the pretransfer time and also the time the server needs to calculate the result.

### 64.10.82 GetInfoTotalTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The total time in seconds for the previous transfer, including name resolving, TCP connect etc.
**Notes:** The Lasterror property is set. 0 for success.

### 64.10.83 LoadAPI

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the default CURL library.
**Notes:** This method is called by the constructor. So you don't need this except you want to test explicit with APILoaded whether the loading worked before you use the CURLNMBS class.

Loads the "libCURL.dll" Windows library (with SSL support this one max require OpenSSL).
Loads on Mac OS X and Linux the libCURL file in /usr/lib.

### 64.10.84 LoadErrorString as string

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error string from the LoadLibrary function.

### 64.10.85 LoadLibrary(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.10.86 LoadLibrary(path as string) as boolean 11228

### 64.10.86 LoadLibrary(path as string) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.10.85 LoadLibrary(file as folderitem) as boolean 11227

### 64.10.87 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens input file for reading data while PerformMT runs.
**Example:**

```
Dim c As New CURLNMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If

// do a SFTP upload
```

```
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
c.OptionUsername = "test"
c.OptionPassword = "test"
c.CollectOutputData = false

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the file) and then read all the data in a string and put into the InputData property.
See also:

- 64.10.88 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean 11229

### 64.10.88 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens input file for reading data while PerformMT runs.
**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the

file) and then read all the data in a string and put into the InputData property.
See also:

- 64.10.87 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean 11228

### 64.10.89 Perform as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a file transfer
**Example:**

```
// if you get a curl call like this

'curl -X PATCH "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } " \
'-H "Authorization: Bearer YOUR_TOKEN" \
'-H "Content-Type: application/json" \
'–data ' {
'"fields": {
'"Address": "1 Ferry Building",
'"Name": "Ferry Building",
'"Visited": True
' }
' } '

// you translate it to this:

Dim c As New CURLNMBS

Dim Payload As String = _
" { "+_
"""fields"": { "+_
"""Address"": ""1 Ferry Building"","+_
"""Name"": ""Ferry Building"","+_
"""Visited"": True"+_
" } "+_
" } "

c.OptionCustomRequest = "PATCH"
c.OptionURL = "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } "
c.SetOptionHTTPHeader Array("Content-Type: application/json", "Authorization: Bearer YOUR_TOKEN")
c.OptionPostFields = Payload

Dim Error As Integer = c.Perform
Dim ResponseCode As Integer = c.GetInfoResponseCode
Dim DebugLog As String = c.DebugMessages
```

```
Dim Output As String = c.OutputData

Break
```

**Notes:** This function is called after all the options are set, and will perform the transfer as described in the options.

You can do any amount of calls to Perform. If you intend to transfer more than one file, you are even encouraged to do so. libCURL will then attempt to re-use the same connection for the following transfers, thus making the operations faster, less CPU intense and using less network resources. Just note that you will have to use the option properties between the invokes to set options for the following Perform.

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

Possible values for the retun value:

The error value -1 is used from the plugin to report that something is missing like OpenSSL dlls on Windows.

With SFTP, you can get logged error "Upload failed: Operation failed (4/-31)" when upload uses path to folder instead of file in URL.

### 64.10.90 PerformMT as Integer

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a file transfer with preemptive multithreading.
**Example:**

```
Dim c As New CURLNMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If

// do a SFTP upload
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
```

```
c.OptionUsername = "test"
c.OptionPassword = "test"

Dim e As Integer = c.PerformMT

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** Same as Perform, but with additional multithreading.

As the actual transfer runs on a preemptive thread, the events Debug, Write, Header and Progress are called asynchrounously and run a few milliseconds later. You can return true in Progress event to stop transfer, but you will get more events before the transfer is stopped.

You can call CreateMTDebugOutputFile, CreateMTHeaderOutputFile and CreateMTOutputFile before PerformMT to have output data be written into files. Call OpenMTInputFile to let the plugin read input data (form post or upload) from an input file.

Do not call other CURL functions on this CURLNMBS instance while PerformMT is running!

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

To avoid trouble with app hanging on quit of application, be sure to set cancel property to true in window close event to cancel any pending transfer.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 64.10.91 ProcessRelativeURL(BaseURL as String, RelativeURL as String) as String

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Processes an URL to come from relative URL to a new absolute URL.
**Example:**

```
Dim baseURL As String = "https://monkeybreadsoftware.net/themes.shtml"
Dim RelativeURL As String = "topic-curl.shtml"

Dim URL As String = CURLNMBS.ProcessRelativeURL(baseURL, RelativeURL)
Break
```

**Notes:** Raises an UnsuppportedOperationException in case of failure.

### 64.10.92 ReceiveData(byref data as Memoryblock, BytesToRead as Int64) as Int64

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receives raw data on a connection.
**Notes:** This function receives raw data from the established connection. You may use it together with SendData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

The data memoryblock is a reference to your variable that will get the received data. BytesToRead is the maximum amount of data you can get in that buffer. The function returns the number of received bytes.

To establish the connection, set OptionConnectOnly = true before calling Perform. Note that ReceiveData does not work on connections that were created without this option.

The call will return kError_AGAIN if there is no data to read - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, wait for data to arrive.

Wait on the socket only if ReceiveData returns kError_AGAIN. The reason for this is libcurl or the SSL library may internally cache some data, therefore you should call ReceiveData until all data is read which would include any cached data.

Furthermore if you wait on the socket and it tells you there is data to read, ReceiveData may return CURLE_AGAIN if the only data that was read was for internal SSL processing, and no other data is available.

On success, sets lasterror to kError_OK (0), stores the received data into memory block, and returns the number of bytes it actually read.

On failure, returns zero and lasterror is set to the appropriate error code.

The function may return kError_AGAIN. In this case, use your operating system facilities to wait until data can be read, and retry.

Reading exactly 0 bytes indicates a closed connection.

If there's no socket available to use from the previous transfer, this function returns kError_UNSUPPORTED_PROTOCOL.

### 64.10.93 Reset

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Re-initializes all options previously set on a specified CURL handle to the default values.
**Notes:** It does not change the following information kept in the handle: live connections, the Session ID cache, the DNS cache, the cookies and shares.

### 64.10.94 SendData(data as Memoryblock) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.10.95 SendData(data as string) as Integer

### 64.10.95 SendData(data as string) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.10.94 SendData(data as Memoryblock) as Integer 11234

### 64.10.96 SetInputData(data as MemoryBlock)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.10.97 SetInputData(data as string) 11235

### 64.10.97 SetInputData(data as string)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the input data.
**Example:**

```
Dim c As New CURLNMBS

c.SetInputData "Hello World"

// do a HTTP Upload with PUT
c.OptionUpload = True
c.OptionURL = "https://monkeybreadsoftware.de/filemaker/examples/echo.php"

// or do a FTP upload
'c.OptionURL = "ftp://monkeybreadsoftware.de/folder/file.txt"

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.10.96 SetInputData(data as MemoryBlock) 11235

### 64.10.98 SetOptionConnectTo(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set list of host:port:connect-to-host:connect-to-port, overrides the URL's host:port (only for the network layer)

### 64.10.99 SetOptionEmptyPassword

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets an empty password.
**Notes:** Normally you have no password unless you set it.
But if you set a password with empty string, the plugin sets CURL to use no password.
This method is to use an empty password.

### 64.10.100 SetOptionHTTP200Aliases(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked list of aliases to be treated as valid HTTP 200 responses.
**Notes:** Some servers respond with a custom header response line. For example, IceCast servers respond with "ICY 200 OK". By including this string in your list of aliases, the response will be treated as a valid HTTP header line such as "HTTP/1.0 200 OK".

The alias itself is not parsed for any version strings. So if your alias is "MYHTTP/9.9", LibCURL will not treat the server as responding with HTTP version 9.9. Instead LibCURL will use the value set by option HTTPVersion.

The Lasterror property is set. 0 for success.

### 64.10.101 SetOptionHTTPHeader(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A linked list of HTTP headers to pass to the server in your HTTP request.
**Example:**

```
dim c as new CURLNMBS
c.SetOptionHTTPHeader array("Expect:", "Content-Type: text/xml", "SOAPAction: ""login""")
```

**Notes:** If you add a header that is otherwise generated and used by libCURL internally, your added one will be used instead. If you add a header with no contents as in 'Accept:' (no data on the right side of the colon), the internally used header will get disabled. Thus, using this option you can add new headers, replace internal headers and remove internal headers. To add a header with no contents, make the contents be two quotes: "". The headers included in the linked list must not be CRLF-terminated, because CURL adds CRLF after each header item. Failure to comply with this will result in strange bugs because the server will most likely ignore part of the headers you specified.

The first line in a request (containing the method, usually a GET or POST) is not a header and cannot be replaced using this option. Only the lines following the request-line are headers. Adding this method line in

this list of headers will only cause your request to send an invalid header.

Pass an empty array to this to reset back to no custom headers.

The Lasterror property is set. 0 for success.

### 64.10.102 SetOptionMailRecipients(list() as string)

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the array of email recipient addresses.

| | | |
|---|---|---|
| const kError_FunctionMissing | = -1 | |
| const kError_OK | = 0 | |
| const kError_UNSUPPORTED_PROTOCOL | = 1 | |
| const kError_FAILED_INIT | = 2 | |
| const kError_URL_MALFORMAT | = 3 | |
| const kError_URL_MALFORMAT_USER | = 4 | (NOT USED) |
| const kError_COULDNT_RESOLVE_PROXY | = 5 | |
| const kError_COULDNT_RESOLVE_HOST | = 6 | |
| const kError_COULDNT_CONNECT | = 7 | |
| const kError_FTP_WEIRD_SERVER_REPLY | = 8 | |
| const kError_FTP_ACCESS_DENIED | = 9 | a service was denied by the FTP server due to lack of access when login fails this is not returned. |
| const kError_FTP_USER_PASSWORD_INCORRECT | = 10 | |
| const kError_FTP_WEIRD_PASS_REPLY | = 11 | |
| const kError_FTP_WEIRD_USER_REPLY | = 12 | |
| const kError_FTP_WEIRD_PASV_REPLY | = 13 | |
| const kError_FTP_WEIRD_227_FORMAT | = 14 | |
| const kError_FTP_CANT_GET_HOST | = 15 | |
| const kError_FTP_CANT_RECONNECT | = 16 | |
| const kError_FTP_COULDNT_SET_BINARY | = 17 | |
| const kError_PARTIAL_FILE | = 18 | |
| const kError_FTP_COULDNT_RETR_FILE | = 19 | |
| const kError_FTP_WRITE_ERROR | = 20 | |
| const kError_FTP_QUOTE_ERROR | = 21 | |
| const kError_HTTP_RETURNED_ERROR | = 22 | |
| const kError_WRITE_ERROR | = 23 | |
| const kError_MALFORMAT_USER | = 24 | NOT USED |
| const kError_FTP_COULDNT_STOR_FILE | = 25 | failed FTP upload |
| const kError_READ_ERROR | = 26 | could open/read from file |
| const kError_OUT_OF_MEMORY | = 27 | |
| const kError_OPERATION_TIMEOUTED | = 28 | the timeout time was reached |
| const kError_FTP_COULDNT_SET_ASCII | = 29 | TYPE A failed |
| const kError_FTP_PORT_FAILED | = 30 | FTP PORT operation failed |
| const kError_FTP_COULDNT_USE_REST | = 31 | the REST command failed |
| const kError_FTP_COULDNT_GET_SIZE | = 32 | the SIZE command failed |
| const kError_HTTP_RANGE_ERROR | = 33 | RANGE "command" didn't work |
| const kError_HTTP_POST_ERROR | = 34 | |
| const kError_SSL_CONNECT_ERROR | = 35 | wrong when connecting with SSL |
| const kError_BAD_DOWNLOAD_RESUME | = 36 | couldn't resume download |
| const kError_FILE_COULDNT_READ_FILE | = 37 | |
| const kError_LDAP_CANNOT_BIND | = 38 | |
| const kError_LDAP_SEARCH_FAILED | = 39 | |
| const kError_LIBRARY_NOT_FOUND | = 40 | |
| const kError_FUNCTION_NOT_FOUND | = 41 | |
| const kError_ABORTED_BY_CALLBACK | = 42 | |
| const kError_BAD_FUNCTION_ARGUMENT | = 43 | |
| const kError_BAD_CALLING_ORDER | = 44 | NOT USED |
| const kError_INTERFACE_FAILED | = 45 | CURLOPT_INTERFACE failed |
| const kError_BAD_PASSWORD_ENTERED | = 46 | NOT USED |
| const kError_TOO_MANY_REDIRECTS | = 47 | catch endless re-direct loops |
| const kError_UNKNOWN_TELNET_OPTION | = 48 | User specified an unknown option |
| const kError_TELNET_OPTION_SYNTAX | = 49 | Malformed telnet option |
| const kError_OBSOLETE | = 50 | NOT USED |
| const kError_SSL_PEER_CERTIFICATE | = 51 | peer's certificate wasn't ok |
| const kError_GOT_NOTHING | = 52 | when this is a specific error |
| const kError_SSL_ENGINE_NOTFOUND | = 53 | SSL crypto engine not found |
| const kError_SSL_ENGINE_SETFAILED | = 54 | can not set SSL crypto engine as default |
| const kError_SEND_ERROR | = 55 | failed sending network data |
| const kError_RECV_ERROR | = 56 | failure in receiving network data |
| const kError_SHARE_IN_USE | = 57 | share is in use |
| const kError_SSL_CERTPROBLEM | = 58 | problem with the local certificate |
| const kError_SSL_CIPHER | = 59 | couldn't use specified cipher |
| const kError_SSL_CACERT | = 60 | problem with the CA cert (path?) |
| const kError_BAD_CONTENT_ENCODING | = 61 | Unrecognized transfer encoding |
| const kError_LDAP_INVALID_URL | = 62 | Invalid LDAP URL |
| const kError_FILESIZE_EXCEEDED | = 63 | Maximum file size exceeded |
| const kError_FTP_SSL_FAILED | = 64 | Requested FTP SSL level failed |
| const kError_SEND_FAIL_REWIND | = 65 | Sending the data requires a rewind that failed |
| const kError_SSL_ENGINE_INITFAILED | = 66 | failed to initialise ENGINE |
| const kError_LOGIN_DENIED | = 67 | user, password or similar was not accepted and we failed to login |

### 64.10.103 SetOptionPostQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array to a list of FTP commands to pass to the server after your ftp transfer request.
**Example:**

```
dim d as CURLNMBS // your CURL object

dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"
d.SetOptionPostQuote(ws)
```

**Notes:** Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.
If you want to do a ftp operation instead of download/upload/directory listing, please use SetOptionQuote.

### 64.10.104 SetOptionPreQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array to a list of FTP commands to pass to the server after the transfer type is set.
**Notes:** Disable this operation again by using an empty array for this option. Before version 7.15.6, if you also set Nobody to true, this option didn't work.

The Lasterror property is set. 0 for success.

### 64.10.105 SetOptionProxyHeader(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set list of headers used for proxy requests only.

### 64.10.106 SetOptionQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an array or a list of FTP commands to pass to the server prior to your ftp request.
**Example:**

```
dim curl as new CURLNMBS
curl.SetOptionQuote array("DELE filename.txt")
```

**Notes:** This will be done before any other FTP commands are issued (even before the CWD command).

Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.

### 64.10.107 SetOptionResolve(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send linked-list of name:port:address sets.

### 64.10.108 SetOptionTelnetOptions(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provide an array of variables to pass to the telnet negotiations.
**Notes:** The variables should be in the format <option=value>. libCURL supports the options 'TTYPE', 'XDISPLOC' and 'NEW_ENV'. See the TELNET standard for details.

The Lasterror property is set. 0 for success.

### 64.10.109 SetPathCAInfo(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A path holding one or more certificates to verify the peer with.
**Example:**

```
dim cacert as FolderItem // your cacert.pem file
dim CURL as new CURLMBS
CURL.OptionSSLVerifyHost = 2 // verify server
CURL.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
CURL.SetPathCAInfo cacert
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.10.110 SetPathCAPath(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A path to the directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLNMBS

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
c.SetPathCAPath cacert
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.10.111 SetPathCRLFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)

### 64.10.112 SetPathIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path to a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

### 64.10.113 SetPathNetRCFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the path to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file

in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.10.114 SetPathProxyIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the proxy issuer SSL certificate filename.
**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).

### 64.10.115 SetupEmail(email as Variant) as boolean

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Setups existing CURL session for an email transfer.
**Example:**

```
dim e as new CURLEmailMBS

e.SetFrom "test@test.test", "Christian M√ºller"
e.Subject = "Hello World ‚Ôè"
e.SMTPPassword = "xxx"
e.SMTPUsername = "xxx"
e.SetServer "smtp.test.test", true
e.AddTo "test@test.test", "Test M√ºller"
e.PlainText = "Hello World," + EndOfLine + "Smilies: ‚Ôè üòò üòÑ"

dim c as new CURLNMBS
```

```
if c.SetupEmail(e) then

dim er as Integer = c.Perform
if er = 0 then
MsgBox "Email sent"
end if
end if
```

**Notes:** You can set your own settings like proxy after this function call.
If you like you can reuse the email and CURL objects after you sent an email, change values and send another email.
Returns true on success or false on failure.

### 64.10.116 UpKeep

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform any connection upkeep checks.
**Notes:** Perform any connection upkeep checks.
Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.
Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
This function must be explicitly called in order to perform the upkeep work. The connection upkeep interval is set with OptionUpkeepIntervalMS.

### 64.10.117 WebSocketMeta as CURLNWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries last frame metadata.
**Notes:** Only useful if called in Write event.

### 64.10.118 WebSocketReceive(BufferSize as Integer = 65536) as CURLNWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Receive WebSocket data.
**Example:**

```
dim curl as CURLNMBS // your curl handle

dim m as CURLNWebSocketFrameMBS = curl.WebSocketReceive

if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
```

**Notes:** Retrieves as much as possible of a received WebSocket data fragment into the buffer, but not more than BufferSize bytes. The bytesReceived property in CURLNWebSocketFrameMBS is set to the number of bytes actually stored.

If there is more fragment data to deliver than what fits in the provided buffer, CURL returns a full buffer and the application needs to call this function again to continue draining the buffer.

The returned CURLNWebSocketFrameMBS contains the data and the metadata about the received data.

Lasterror property is set.

### 64.10.119 WebSocketSend(Data as MemoryBlock, FrameSize as Integer = 0, SendFlags as Integer = 0) as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send the specific message fragment over an established WebSocket connection.
**Notes:** The buffer holds the data to send.
Returns the number of payload bytes actually sent.

To send a (huge) fragment using multiple calls with partial content per invoke, set the kFlagOffset bit and the FrameSize argument as the total expected size for the first part, then set the kFlagOffset with a zero FrameSize for the following parts.

If not sending a partial fragment or if this is raw mode, FrameSize should be set to zero.

If kWebSocketRaw is enabled in WebSocketOptions, the flags argument should be set to 0.

Lasterror property is set.

### 64.10.120 Properties

### 64.10.121 APILoaded as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the CURL library was loaded.
**Notes:** The CURLNMBS constructor loads the library if it was not loaded before.
(Read only property)

### 64.10.122 Cancel as Boolean

MBS CURL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Tells CURL instance to cancel transfer as soon as possible.
**Notes:** Especially when using PerformMT, you may see your app hang if user tries to quit application. To prevent the hang, please set Cancel = true in window close event. So when app quits and windows get destroyed, the PerformMT will see the Cancel being true and returns soon.
(Read and Write property)

### 64.10.123 CollectDebugData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectDebugMessages instead. **Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.10.124 CollectDebugMessages as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and

you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.10.125 CollectHeaderData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectHeaders instead.
**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.

Renamed to CollectHeaders in v23.0.
(Read and Write property)

### 64.10.126 CollectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.10.127 CollectOutputData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to collect output data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the OutputData Property instead of collecting the pieces yourself in the write event. Of course this is optional and you can still process data in write event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.10.128 DebugData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DebugMessages instead.
**Function:** The debug data from CURL.
**Notes:** If CollectDebugData property is true, the plugin puts the data received in debugMessage event also into this property, so you can grab it after the transfer.

Newer code should use DebugMessages property instead.
(Read only property)

### 64.10.129 DebugMessages as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The debug messages from CURL.
**Notes:** If CollectDebugMessage property is true, the plugin puts the data received in debugMessage event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.10.130 DebugWithData as Boolean

MBS CURL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to include data in debug messages.
**Example:**

```
dim c as new CURLNMBS
c.DebugWithData = true
c.OptionVerbose = true
c.CollectDebugMessages = true
```

**Notes:** (Read and Write property)

### 64.10.131 Handle as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle of the CURL object.
**Notes:** (Read and Write property)

### 64.10.132 HeaderData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this property, so you can grab it after the transfer.

Renamed to Headers in v23.0.
(Read only property)

### 64.10.133 Headers as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use Headers instead. **Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.10.134 InputData as String

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to

upload.
(Read and Write property)

### 64.10.135 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The lasterror from the library.
**Example:**

```
Dim d As New CURLNMBS

d.OptionSSLVersion = 123

Dim LastError As Integer = d.LastError
// gives 43
Dim LastErrorText As String = d.LastErrorText
// A libcurl function was given a bad argument

Break
```

**Notes:** Set in the constructor while doing initialization as well as by by various curl calls.
Check the kError* constants.
(Read and Write property)

### 64.10.136 LastErrorMessage as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error message.
**Example:**

```
Dim d As New CURLNMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** The error message from the transfer.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read only property)

### 64.10.137 LasterrorText as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The text for the lasterror code.
**Example:**

```
Dim d As New CURLNMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** Static string matched to the error code, so you have an idea what's wrong.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read and Write property)

### 64.10.138 LibraryUsed as String

MBS CURL Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which library is in use.
**Notes:** This is for debugging only to see which library is in use.
(Read only property)

### 64.10.139 LibVersion as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a human readable string with the version number of libCURL and some of its important components (like OpenSSL version).
**Notes:** (Read only property)

### 64.10.140 OptionAbstractUnixSocket as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Path to an abstract Unix domain socket.
**Notes:** (Read and Write property)
See also ABSTRACT_UNIX_SOCKET option in CURL manual.

### 64.10.141 OptionAcceptEncoding as String

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the contents of the Accept-Encoding: header sent in a HTTP request, and enables decoding of a response when a Content-Encoding: header is received.
**Example:**

```
dim c as new CURLNMBS
c.OptionAcceptEncoding = "deflate"
```

**Notes:** Three encodings are supported: identity, which does nothing, deflate which requests the server to compress its response using the zlib algorithm, and gzip which requests the gzip algorithm. If a zero-length

string is set, then an Accept-Encoding: header containing all supported encodings is sent.

This is a request, not an order; the server may or may not do it. This option must be set (to any non-NULL value) or else any unsolicited encoding done by the server is ignored. See the special file README.encoding for details (included with CURL source code).
(Read and Write property)
See also ACCEPT_ENCODING option in CURL manual.

### 64.10.142 OptionAcceptTimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Time-out accept operations (currently for FTP only) after this amount of milliseconds.
**Notes:** (Read and Write property)
See also ACCEPTTIMEOUT_MS option in CURL manual.

### 64.10.143 OptionAddressScope as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer specifying the scope_id value to use when connecting to IPv6 link-local or site-local addresses.
**Notes:** (Added in CURL 7.19.0)
(Read and Write property)
See also ADDRESS_SCOPE option in CURL manual.

### 64.10.144 OptionAppend as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also APPEND option in CURL manual.

### 64.10.145 OptionAutoReferer as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When enabled, libCURL will automatically set the Referer: field in requests where it follows a Location: redirect.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also AUTOREFERER option in CURL manual.

### 64.10.146 OptionAWSSigV4 as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides AWS V4 signature authentication on HTTP(S) header.
**Notes:** Pass a text that is the collection of specific arguments are used for creating outgoing authentication headers. The format of the param option is:

provider1 [ :provider2 [ :region [ :service ] ] ]

provider1, provider2:
The providers arguments are used for generating some authentication parameters such as "Algorithm", "date", "request type" and "signed headers".

region:
The argument is a geographic area of a resources collection. It is extracted from the host name specified in the URL if omitted.

service:
The argument is a function provided by a cloud. It is extracted from the host name specified in the URL if omitted.

Note: This call set CURLOPT_HTTPAUTH to CURLAUTH_AWS_SIGV4. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.

Example with "Test:Try", when curl will do the algorithm, it will generate "TEST-HMAC-SHA256" for "Algorithm", "x-try-date" and "X-Try-Date" for "date", "test4_request" for "request type", "SignedHeaders=content-type;host;x-try-date" for "signed headers"
If you use just "test", instead of "test:try", test will be use for every strings generated

By default, the value of this parameter is empty. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.
(Read and Write property)
See also AWS_SIGV4 option in CURL manual.

### 64.10.147 OptionBufferSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Your preferred size (in bytes) for the receive buffer in libCURL.
**Notes:** The main point of this would be that the write event gets called more often and with smaller chunks. This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size. (Added in 7.10)

This size is by default set as big as possible (OptionMaxWriteSize), so it only makse sense to use this option if you want it smaller.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also BUFFERSIZE option in CURL manual.

### 64.10.148 OptionCACacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the life-time for cached certificate stores.
**Notes:** Pass a number, this sets the timeout in seconds. This tells libcurl the maximum time any cached certificate store it has in memory may be kept and reused for new connections. Once the timeout has expired, a subsequent fetch requiring a certificate store will have to build a new one.
Building a certificate store from a CAINFO file (see OptionCAInfo) is a slow operation so curl may cache the generated certificate store internally to speed up future connections.
Set to zero to completely disable caching, or set to -1 to retain the cached store remain forever. By default, libcurl caches this info for 24 hours.
(Read and Write property)
See also CA_CACHE_TIMEOUT option in CURL manual.

### 64.10.149 OptionCAInfo as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file holding one or more certificates to verify the peer with.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAINFO option in CURL manual.

### 64.10.150 OptionCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CAInfo as blob value.
**Notes:** Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also CAINFO_BLOB option in CURL manual.

### 64.10.151 OptionCAPath as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLNMBS
c.OptionCAPath = "/data/MyCertificates"
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAPATH option in CURL manual.

### 64.10.152 OptionCertInfo as boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to enable libCURL's certificate chain info gatherer.
**Notes:** With this enabled, libCURL (if built with OpenSSL) will extract lots of information and data about the certificates in the certificate chain used in the SSL connection. This data is then possible to extract after a transfer using GetInfoCertInfo. (Added in 7.19.1)
(Read and Write property)
See also CERTINFO option in CURL manual.

### 64.10.153 OptionConnectionTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in seconds that you allow the connection to the server to take.
**Example:**

```
dim d as new CURLNMBS

d.OptionConnectionTimeOutMS = 5000
d.OptionConnectOnly = 1

// try this URL
d.OptionURL = URL

// try connection
dim e as integer = d.Perform

// check result
dim s as string = d.OutputData
TextArea1.text = FixText(S)

if e = 0 then
MsgBox "Connected"
else
MsgBox "Failed to connect"
end if
```

**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also the OptionTimeout option.
(Read and Write property)
See also CONNECTTIMEOUT option in CURL manual.

### 64.10.154 OptionConnectionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in milli seconds that you allow the connection to the server to take.
**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also

the OptionTimeout option.
(Read and Write property)

### 64.10.155 OptionConnectOnly as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A true tells the library to perform any required proxy authentication and connection setup, but no data transfer.
**Notes:** This option is useful with the CURLNMBS.GetInfoLastSocket function. The library can set up the connection and then the application can obtain the most recently used socket for special data transfers. (Added in 7.15.2)

Type changed to integer in v23.0 to enable passing 2 for WebSockets.
(Read and Write property)
See also CONNECT_ONLY option in CURL manual.

### 64.10.156 OptionCookie as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It will be used to set a cookie in the http request.
**Notes:** The format of the string should be NAME=CONTENTS, where NAME is the cookie name and CONTENTS is what the cookie should contain.

If you need to set multiple cookies, you need to set them all using a single option and thus you need to concatenate them all in one single string. Set multiple cookies in one string like this: "name1=content1; name2=content2;" etc.

Using this option multiple times will only make the latest string override the previously ones.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIE option in CURL manual.

### 64.10.157 OptionCookieFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The cookie file content.
**Notes:** It should contain the name of your file holding cookie data to read. The cookie data may be in Netscape / Mozilla cookie data format or just regular HTTP-style headers dumped to a file.

Given an empty or non-existing file or by passing the empty string (""), this option will enable cookies for this CURL handle, making it understand and parse received cookies and then use matching cookies in future request.

If you use this option multiple times, you just add more files to read. Subsequent files will add more cookies.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEFILE option in CURL manual.

### 64.10.158 OptionCookieJar as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** File path where to write the cookies to.
**Notes:** This will make libCURL write all internally known cookies to the specified file, when the object is destroyed. If no cookies are known, no file will be created. Specify "-" to instead have the cookies written to stdout. Using this option also enables cookies for this session, so if you for example follow a location it will make matching cookies get sent accordingly.

If the cookie jar file can't be created or written to, libCURL will not and cannot report an error for this. Using OptionVerbose or DebugFunction event will get a warning to display, but that is the only visible feedback you get about this possibly lethal situation.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For

macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEJAR option in CURL manual.

### 64.10.159 OptionCookieList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The cookie string.
**Notes:** Cookie can be either in Netscape / Mozilla format or just regular HTTP-style header (Set-Cookie: ...) format. If CURL cookie engine was not enabled it will enable its cookie engine. Passing a magic string "ALL" will erase all cookies known by CURL. (Added in 7.14.1) Passing the special string "SESS" will only erase all session cookies known by CURL. (Added in 7.15.4)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIELIST option in CURL manual.

### 64.10.160 OptionCookieSession as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to mark this as a new cookie "session".
**Notes:** It will force libCURL to ignore all cookies it is about to load that are "session cookies" from the previous session. By default, libCURL always stores and loads all cookies, independent if they are session cookies are not. Session cookies are cookies without expiry date and they are meant to be alive and existing for this "session" only.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIESESSION option in CURL manual.

### 64.10.161 OptionCRLF as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Convert Unix newlines to CRLF newlines on transfers.

**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also CRLF option in CURL manual.

### 64.10.162 OptionCRLFile as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)
(Read and Write property)
See also CRLFILE option in CURL manual.

### 64.10.163 OptionCustomRequest as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It will be user instead of GET or HEAD when doing an HTTP request, or instead of LIST or NLST when doing an ftp directory listing.
**Example:**

```
dim c as CURLNMBS // your CURL instance

c.URL = "ftp://..."
c.customRequest = "MLSD" // ftp advanced directory listing
```

**Notes:** This is useful for doing DELETE or other more or less obscure HTTP requests. Don't do this at will, make sure your server supports the command first.

Restore to the internal default by setting this to "".

Many people have wrongly used this option to replace the entire request with their own, including multiple headers and POST contents. While that might work in many cases, it will cause libCURL to send invalid requests and it could possibly confuse the remote server badly. Use CURLOPT_POST and OptionPostFields to set POST data. Use OptionHTTPHeader to replace or extend the set of headers sent by libCURL. Use OptionHTTPVersion to change HTTP version.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For WebDAV, you can set this to "MKCOL" to create a folder at the given URL.
(Read and Write property)
See also CUSTOMREQUEST option in CURL manual.

### 64.10.164 OptionDefaultProtocol as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the protocol used when curl is given a URL without a protocol.
**Notes:** (Read and Write property)
See also DEFAULT_PROTOCOL option in CURL manual.

### 64.10.165 OptionDirListOnly as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For FTP and SFTP based URLs a parameter set to true tells the library to list the names of files in a directory, rather than performing a full directory listing that would normally include file sizes, dates etc.
**Notes:** For POP3 a parameter of true tells the library to list the email message or messages on the POP3 server. This can be used to change the default behaviour of libCURL, when combined with a URL that contains a message ID, to perform a "scan listing" which can then be used to determine the size of an email.

Note: For FTP this causes a NLST command to be sent to the FTP server. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

Setting this option to true also implies a directory listing even if the URL doesn't end with a slash, which otherwise is necessary.

Do NOT use this option if you also use OptionWildCardMatch as it will effectively break that feature then.
(Read and Write property)
See also DIRLISTONLY option in CURL manual.

### 64.10.166 OptionDisableUserNameInURL as Boolean

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disallow specifying username/login in URL.
**Notes:** The value true tells the library to not allow URLs that include an username.
(Read and Write property)

### 64.10.167 OptionDNSCacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timeout in seconds.
**Notes:** Name resolves will be kept in memory for this number of seconds. Set to zero (0) to completely disable caching, or set to -1 to make the cached entries remain forever. By default, libCURL caches this info for 60 seconds.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also DNS_CACHE_TIMEOUT option in CURL manual.

### 64.10.168 OptionDNSInterface as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the name of the network interface that the DNS resolver should bind to.
**Notes:** This must be an interface name (not an address). Set this option to "" to use the default setting (don't bind to a specific interface).
(Read and Write property)
See also DNS_INTERFACE option in CURL manual.

### 64.10.169 OptionDNSLocalIPv4 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the local IPv4 address that the resolver should bind to.
**Notes:** The argument should be of string and contain a single numerical IPv4 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP4 option in CURL manual.

### 64.10.170 OptionDNSLocalIPv6 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the local IPv6 address that the resolver should bind to.
**Notes:** The argument should be of type string and contain a single IPv6 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP6 option in CURL manual.

### 64.10.171 OptionDNSServers as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the name servers to use for DNS resolution.
**Notes:** (Read and Write property)
See also DNS_SERVERS option in CURL manual.

### 64.10.172 OptionDNSShuffleAddresses as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to shuffle DNS addresses.
**Notes:** When a name is resolved and more than one IP address is returned, shuffle the order of all returned addresses so that they will be used in a random order. This is similar to the ordering behavior of gethostbyname which is no longer used on most platforms.

Addresses will not be reshuffled if a name resolution is completed using the DNS cache. DNSCacheTimeout property can be used together with this option to reduce DNS cache timeout or disable caching entirely if

frequent reshuffling is needed.

Since the addresses returned will be reordered randomly, their order will not be in accordance with RFC 3484 or any other deterministic order that may be generated by the system's name resolution implementation. This may have performance impacts and may cause IPv4 to be used before IPv6 or vice versa.
Default is false.
(Read and Write property)
See also DNS_SHUFFLE_ADDRESSES option in CURL manual.

### 64.10.173 OptionDOHSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the host name in the DOH (DNS-over-HTTPS) SSL certificate.
**Notes:** Pass a 2 as asking curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyPeer and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1 it is treated the same as 2. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!
(Read and Write property)
See also DOH_SSL_VERIFYHOST option in CURL manual.

### 64.10.174 OptionDOHSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the DOH SSL certificate.
**Notes:** Pass 1 to enable or 0 to disable.
This option tells curl to verify the authenticity of the DOH (DNS-over-HTTPS) server's certificate. A value of 1 means curl verifies; 0 (zero) means it doesn't.
This option is the DOH equivalent of CURL.SetOptionSSLVerifyPeer and only affects requests to the DOH server.
When negotiating a TLS or SSL connection, the server sends a certificate indicating its identity. Curl verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. curl uses a default bundle of CA certificates (the path for that is determined at build time) and you

can specify alternate certificates with the CURL.SetOptionCAInfo option or the CURL.SetOptionCAPath option.
When CURL.SetOptionDOHSSLVerifyPeer is enabled, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the peer certificate verification succeeds regardless.
Authenticating the certificate is not enough to be sure about the server. You typically also want to ensure that the server is the server you mean to be talking to. Use CURL.SetOptionDOHSSLVerifyHost for that. The check that the host name in the certificate is valid for the host name you're connecting to is done independently of the CURL.SetOptionDOHSSLVerifyPeer option.

WARNING: disabling verification of the certificate allows bad guys to man-in-the-middle the communication without you knowing it. Disabling verification makes the communication insecure. Just having encryption on a transfer is not enough as you cannot be sure that you are communicating with the correct end-point.
(Read and Write property)
See also DOH_SSL_VERIFYPEER option in CURL manual.

### 64.10.175 OptionDOHSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to verify the DOH SSL certificate's status.
**Notes:** Pass 2 to ask curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyHost and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1L it is treated the same as 2L. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0L, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!

See also OptionDOHSSLVerifyPeer to verify the digital signature of the DOH server certificate. If libcurl is built against NSS and OptionDOHSSLVerifyPeer is zero, OptionDOHSSLVerifyHost is also set to zero and cannot be overridden.
(Read and Write property)
See also DOH_SSL_VERIFYSTATUS option in CURL manual.

### 64.10.176 OptionDOHURL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the DNS-over-HTTPS URL.
**Notes:** Pass in a string to a URL for the DOH server to use for name resolving. The parameter should be URL-encoded in the following format: "https://host:port/path". It MUST specify a HTTPS URL.

libcurl doesn't validate the syntax or use this variable until the transfer is issued. Even if you set a crazy value here, OptionDOHURL will still return CURLE_OK.

curl sends POST requests to the given DNS-over-HTTPS URL.

To find the DOH server itself, which might be specified using a name, libcurl will use the default name lookup function. You can bootstrap that by providing the address for the DOH server with OptionResolve.

Disable DOH use again by setting this option to "".
(Read and Write property)
See also DOH_URL option in CURL manual.

### 64.10.177 OptionEGDSocket as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The path name to the Entropy Gathering Daemon socket.
**Notes:** It will be used to seed the random engine for SSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.178 OptionExpect100TimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets Expect 100 timeout.
**Notes:** Time to wait in milliseconds for a response to a HTTP request containing an Expect: 100-continue header before sending the data anyway.

(Read and Write property)
See also EXPECT_100_TIMEOUT_MS option in CURL manual.

### 64.10.179 OptionFailOnError as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to fail silently if the HTTP code returned is equal to or larger than 400. The default action would be to return the page normally, ignoring that code.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This method is not fail-safe and there are occasions where non-succesful response codes will slip through, especially when authentication is involved (response codes 401 and 407).

You might get some amounts of headers transferred before this situation is detected, like for when a "100-continue" is received as a response to a POST/PUT and a 401 or 407 is received immediately afterwards.
(Read and Write property)
See also FAILONERROR option in CURL manual.

### 64.10.180 OptionFileTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether filetime should be querried.
**Example:**

```
// init CURL with options
dim d as new CURLNMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime

// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** If it is true, libCURL will attempt to get the modification date of the remote document in this operation. This requires that the remote server sends the time or replies to a time querying command.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FILETIME option in CURL manual.

### 64.10.181 OptionFollowLocation as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library to follow any Location: header that the server sends as part of an HTTP header.
**Example:**

```
dim c as new CURLNMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** This means that the library will re-send the same request on the new location and follow new Location: headers all the way until no more such headers are returned. OptionMaxRedirs can be used to limit the number of redirects libCURL will follow.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FOLLOWLOCATION option in CURL manual.

### 64.10.182 OptionForbitReuse as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to make the next transfer explicitly close the connection when done.
**Notes:** Normally, libCURL keep all connections alive when done with one transfer in case there comes a succeeding one that can re-use them. This option should be used with caution and only if you understand what it does. Set to false to have libCURL keep the connection open for possibly later re-use (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.183 OptionFreshConnect as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to make the next transfer use a new (fresh) connection by force.
**Example:**

```
dim c as new CURLNMBS

c.OptionFreshConnect=True
```

**Notes:** If the connection cache is full before this connection, one of the existing connections will be closed as according to the selected or default policy. This option should be used with caution and only if you understand what it does. Set this to 0 to have libCURL attempt re-using an existing connection (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FRESH_CONNECT option in CURL manual.

### 64.10.184 OptionFTPAccount as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The FTP account name to use.
**Notes:** When an FTP server asks for "account data" after user name and password has been provided, this data is sent off using the ACCT command.
(Read and Write property)
See also FTP_ACCOUNT option in CURL manual.

### 64.10.185 OptionFTPAlternativeToUser as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The alternative username.
**Notes:** Pass a string as parameter, pointing to a string which will be used to authenticate if the usual FTP "USER user" and "PASS password" negotiation fails. This is currently only known to be required when connecting to Tumbleweed's Secure Transport FTPS server using client certificates for authentication. (Added in 7.15.5)
(Read and Write property)
See also FTP_ALTERNATIVE_TO_USER option in CURL manual.

### 64.10.186 OptionFTPAppend as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionAppend instead.
**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.187 OptionFTPCreateMissingDirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is 1, CURL will attempt to create any remote directory that it fails to CWD into.
**Notes:** CWD is the command that changes working directory. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
Newer CURL Library versions allow a value of 2 to do a CWD after the directory was created, so this property changed from boolean to integer.
(Read and Write property)
See also FTP_CREATE_MISSING_DIRS option in CURL manual.

### 64.10.188 OptionFTPFileMethod as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer that should have one of the following values.
**Notes:** This option controls what method libCURL should use to reach a file on a FTP(S) server. The argument should be one of the following alternatives:

URLFTPMETHOD_MULTICWD = 1

libCURL does a single CWD operation for each path part in the given URL. For deep hierarchies this means very many commands. This is how RFC1738 says it should be done. This is the default but the slowest behavior.

CURLFTPMETHOD_NOCWD = 2

libCURL does no CWD at all. libCURL will do SIZE, RETR, STOR etc and give a full path to the server for all these commands. This is the fastest behavior.

CURLFTPMETHOD_SINGLECWD = 3

libCURL does one CWD with the full target directory and then operates on the file "normally" (like in the multicwd case). This is somewhat more standards compliant than 'nocwd' but without the full penalty of 'multicwd'.
(Read and Write property)
See also FTP_FILEMETHOD option in CURL manual.

### 64.10.189 OptionFTPListOnly as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionDirListOnly instead. **Function:** True tells the library to just list the names of an ftp directory, instead of doing a full directory listing that would include file sizes, dates etc.
**Notes:** This causes an FTP NLST command to be sent. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.190 OptionFTPPort as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The port to use for ftp.
**Notes:** It will be used to get the IP address to use for the ftp PORT instruction. The PORT instruction tells the remote server to connect to our specified IP address. The string may be a plain IP address, a host name, an network interface name (under Unix) or just a '-' letter to let the library use your systems default IP address. Default FTP operations are passive, and thus won't use PORT.

You disable PORT again and go back to using the passive version by setting this option to "".

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPPORT option in CURL manual.

### 64.10.191 OptionFTPResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionServerResponseTimeout instead. **Function:** Causes CURL to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to generate a response message for a command before the session is considered hung.
**Notes:** With v22.4 or newer, please use newer property name OptionServerResponseTimeout.

While CURL is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionFTPResponseTimeout to a value smaller than OptionTimeout. (Added in 7.10.8)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.192 OptionFTPSkipPasvIP as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If set to a non-zero value, it instructs libCURL to not use the IP address the server suggests in its 227-response to libCURL's PASV command when libCURL connects the data connection.
**Notes:** Instead libCURL will re-use the same IP address it already uses for the control connection. But it will use the port number from the 227-response. (Added in 7.14.2)

This option has no effect if PORT, EPRT or EPSV is used instead of PASV.
(Read and Write property)
See also FTP_SKIP_PASV_IP option in CURL manual.

### 64.10.193 OptionFTPSSL as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUseSSL instead.
**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLNMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)

### 64.10.194 OptionFTPSSLAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What kind of SSL authentication to use for FTP.
**Notes:** Pass an integer using one of the values from below, to alter how libCURL issues "AUTH TLS" or "AUTH SSL" when FTP over SSL is activated (see CURLOPT_FTP_SSL). (Added in 7.12.2)

kFTPAUTH_DEFAULT = 0

Allow libCURL to decide

kFTPAUTH_SSL = 1

Try "AUTH SSL" first, and only if that fails try "AUTH TLS"

kFTPAUTH_TLS = 2

Try "AUTH TLS" first, and only if that fails try "AUTH SSL"

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPSSLAUTH option in CURL manual.

### 64.10.195 OptionFTPSSLCCC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If enabled, this option makes libCURL use CCC (Clear Command Channel).
**Notes:** It shuts down the SSL/TLS layer after authenticating. The rest of the control channel communication will be unencrypted. This allows NAT routers to follow the FTP transaction. Pass a long using one of the values below. (Added in 7.16.1)

| | | |
|---|---|---|
| CURLFTPSSL_CCC_NONE | 0 | Don't attempt to use CCC. |
| CURLFTPSSL_CCC_PASSIVE | 1 | Do not initiate the shutdown, but wait for the server to do it. Do not send a reply. |
| CURLFTPSSL_CCC_ACTIVE | 2 | Initiate the shutdown and wait for a reply. |

(Read and Write property)
See also FTP_SSL_CCC option in CURL manual.

### 64.10.196 OptionFTPUseEPRT as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to use the EPRT (and LPRT) command when doing active FTP downloads (which is enabled by CURLOPT_FTPPORT).
**Notes:** Using EPRT means that it will first attempt to use EPRT and then LPRT before using PORT, but if you pass FALSE (zero) to this option, it will not try using EPRT or LPRT, only plain PORT. (Added in 7.10.5)

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPRT option in CURL manual.

### 64.10.197 OptionFTPUseEPSV as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to use the EPSV command when doing passive FTP downloads (which it always does by default).
**Notes:** Using EPSV means that it will first attempt to use EPSV before using PASV, but if you pass FALSE (zero) to this option, it will not try using EPSV, only plain PASV.

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPSV option in CURL manual.

### 64.10.198 OptionFTPusePret as Boolean

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the value is true, it tells CURL to send a PRET command before PASV (and EPSV). Certain FTP servers, mainly drftpd, require this non-standard command for directory listings as well as up and downloads in PASV mode.
**Notes:** Has no effect when using the active FTP transfers mode. (Added in 7.20.0)
(Read and Write property)
See also FTP_USE_PRET option in CURL manual.

### 64.10.199 OptionGet as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the true, this forces the HTTP request to get back to GET.
**Notes:** usable if a POST, HEAD, PUT or a custom request have been used previously using the same CURL handle.

When setting OptionGet to a true value, it will automatically set OptionNoBody to true (since 7.14.1).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.200 OptionGSSAPIDelegation as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allow GSSAPI credential delegation.
**Notes:** (Read and Write property)
See also GSSAPI_DELEGATION option in CURL manual.

### 64.10.201 OptionHappyEyeballsTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The happy eyeballs timeout.

**Notes:** Head start in milliseconds to give happy eyeballs.
(Read and Write property)
See also HAPPY_EYEBALLS_TIMEOUT_MS option in CURL manual.

### 64.10.202 OptionHAProxyProtocol as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to send an HAProxy PROXY protocol header.
**Notes:** Set to true to tell the library to send an HAProxy PROXY protocol header at beginning of the connection. The default action is not to send this header.
This option is primarily useful when sending test requests to a service that expects this header.
Most applications do not need this option.
Default false, do not send HAProxy PROXY protocol header.
(Read and Write property)
See also HAPROXYPROTOCOL option in CURL manual.

### 64.10.203 OptionHeader as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to include the header in the body output.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This is only relevant for protocols that actually have headers preceding the data (like HTTP).
(Read and Write property)
See also HEADER option in CURL manual.

### 64.10.204 OptionHeaderOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass in a bitmask of "header options".
**Notes:** (Read and Write property)
See also HEADEROPT option in CURL manual.

### 64.10.205 OptionHTTPAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which http authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use. The available bits are listed below. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the UserPassword option. (Added in 7.10.6)

kAuthBASIC = 1

HTTP Basic authentication. This is the default choice, and the only method that is in wide-spread use and supported virtually everywhere. This is sending the user name and password over the network in plain text, easily captured by others.

kAuthDIGEST = 2

HTTP Digest authentication. Digest authentication is defined in RFC2617 and is a more secure way to do authentication over public networks than the regular old-fashioned Basic method.

kAuthGSSNEGOTIATE = 4

HTTP GSS-Negotiate authentication. The GSS-Negotiate (also known as plain "Negotiate") method was designed by Microsoft and is used in their web applications. It is primarily meant as a support for Kerberos5 authentication but may be also used along with another authentication methods. For more information see IETF draft draft-brezak-spnego-http-04.txt.

You need to build libCURL with a suitable GSS-API library for this to work.

kAuthNTLM = 8

HTTP NTLM authentication. A proprietary protocol invented and used by Microsoft. It uses a challenge-response and hash concept similar to Digest, to prevent the password from being eavesdropped.

You need to build libCURL with OpenSSL support for this option to work, or build libCURL on Windows.

kAuthANY = &hFFFFFFFF

This is a convenience macro that sets all bits and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

kAuthANYSAFE = &hFFFFFFFE

This is a convenience macro that sets all bits except Basic and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPAUTH option in CURL manual.

### 64.10.206 OptionHTTPContentDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a long to tell libCURL how to act on content decoding.
**Notes:** If set to zero, content decoding will be disabled. If set to 1 it is enabled. Note however that libCURL has no default content decoding but requires you to use OptionEncoding for that. (added in 7.16.2)
(Read and Write property)
See also HTTP_CONTENT_DECODING option in CURL manual.

### 64.10.207 OptionHTTPProxyTunnel as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the parameter to true to get the library to tunnel all operations through a given HTTP proxy.
**Notes:** There is a big difference between using a proxy and to tunnel through it. If you don't know what

this means, you probably don't want this tunneling option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPPROXYTUNNEL option in CURL manual.

### 64.10.208 OptionHTTPTransferDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass an integer to tell libCURL how to act on transfer decoding.
**Notes:** If set to zero, transfer decoding will be disabled, if set to 1 it is enabled (default). libCURL does chunked transfer decoding by default unless this option is set to zero. (added in 7.16.2)
(Read and Write property)
See also HTTP_TRANSFER_DECODING option in CURL manual.

### 64.10.209 OptionHTTPVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to one of the values described below.
**Notes:** They force libCURL to use the specific HTTP versions. This is not sensible to do unless you have a good reason.

kHTTP_VERSION_NONE = 0

We don't care about what version the library uses. libCURL will use whatever it thinks fit.

kHTTP_VERSION_1_0 = 1

Enforce HTTP 1.0 requests.

kHTTP_VERSION_1_1 = 2

Enforce HTTP 1.1 requests.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTP_VERSION option in CURL manual.

### 64.10.210 OptionIgnoreContentLength as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to ignore the Content-Length header.
**Notes:** This is useful for Apache 1.x (and similar servers) which will report incorrect content length for files over 2 gigabytes. If this option is used, CURL will not be able to accurately report progress, and will simply stop the download when the server ends the connection. (added in 7.14.1)
(Read and Write property)
See also IGNORE_CONTENT_LENGTH option in CURL manual.

### 64.10.211 OptionInFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INFILESIZE option in CURL manual.

### 64.10.212 OptionInFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionInFileSize instead.
**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** This value should be passed as a CURL_off_t. (Added in 7.11.0)

Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely

by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.213 OptionInterface as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This set the interface name to use as outgoing network interface.
**Notes:** The name can be an interface name, an IP address or a host name.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INTERFACE option in CURL manual.

### 64.10.214 OptionIPResolve as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allows an application to select what kind of IP addresses to use when resolving host names.
**Example:**

```
dim c as new CURLNMBS
c.OptionIPResolve = c.kIPRESOLVE_V4
```

**Notes:** This is only interesting when using host names that resolve addresses using more than one version of IP. The allowed values are:

kIPRESOLVE_WHATEVER = 0

Default, resolves addresses to all IP versions that your system allows.

kIPRESOLVE_V4 = 1

Resolve to ipv4 addresses.

kIPRESOLVE_V6 = 2

Resolve to ipv6 addresses.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also IPRESOLVE option in CURL manual.

### 64.10.215 OptionIssuerCert as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string naming a file holding a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also ISSUERCERT option in CURL manual.

### 64.10.216 OptionIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one

needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionIssuerCert which instead expects a file name as input.
(Read and Write property)
See also ISSUERCERT_BLOB option in CURL manual.

### 64.10.217 OptionKeepSendingOnError as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to keep sending on error.
**Notes:** Continue to send data if the server responds early with an HTTP status code >= 300
(Read and Write property)
See also KEEP_SENDING_ON_ERROR option in CURL manual.

### 64.10.218 OptionKeyPassword as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set passphrase to private key.
**Notes:** It will be used as the password required to use the OptionSSLKey or OptionSSHPrivateKeyfile private key. You never needed a pass phrase to load a certificate but you need one to load your private key.
(Read and Write property)
See also KEYPASSWD option in CURL manual.

### 64.10.219 OptionKRB4Level as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKRBLevel instead.
**Function:** Set the krb4 security level, this also enables krb4 awareness.

**Notes:** This is a string, 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to "" to disable kerberos4. The kerberos support only works for FTP.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.220 OptionKRBLevel as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** FTP kerberos security level.
**Notes:** Set the kerberos security level for FTP; this also enables kerberos awareness. This is a string that should match one of the following: 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to NULL to disable kerberos support for FTP.
(Read and Write property)
See also KRBLEVEL option in CURL manual.

### 64.10.221 OptionLocalPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This sets the local port number of the socket used for connection.
**Notes:** This can be used in combination with OptionInterface and you are recommended to use OptionLocalPortRange as well when this is set. Note that port numbers are only valid 1 - 65535. (Added in 7.15.2)
(Read and Write property)
See also LOCALPORT option in CURL manual.

### 64.10.222 OptionLocalPortRange as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This is the number of attempts libCURL should do to find a working local port number.
**Notes:** It starts with the given OptionLocalPort and adds one to the number for each retry. Setting this value to 1 or below will make libCURL do only one try for exact port number. Note that port numbers by nature is a scarce resource that will be busy at times so setting this value to something too low might cause unnecessary connection setup failures. (Added in 7.15.2)
(Read and Write property)

See also LOCALPORTRANGE option in CURL manual.

### 64.10.223 OptionLoginOptions as String

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Login options string to use for the transfer.
**Notes:** For more information about the login options please see RFC 2384, RFC5092 and IETF draft draft-earhart-url-smtp-00.txt

CURLOPT_LOGIN_OPTIONS can be used to set protocol specific login options, such as the preferred authentication mechanism via "AUTH=NTLM" or "AUTH=*", and should be used in conjunction with the OptionUserName option.
Only IMAP, POP3 and SMTP support login options.
(Read and Write property)
See also LOGIN_OPTIONS option in CURL manual.

### 64.10.224 OptionLowSpeedLimit as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This property contains the transfer speed in bytes per second that the transfer should be below during OptionLowSpeedTime seconds for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_LIMIT option in CURL manual.

### 64.10.225 OptionLowSpeedTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This property contains the time in seconds that the transfer should be below the OptionLowSpeedLimit for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_TIME option in CURL manual.

### 64.10.226 OptionMailAuth as String

MBS CURL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This string will be used to specify the authentication address (identity) of a submitted message that is being relayed to another server.
**Notes:** This optional parameter allows co-operating agents in a trusted environment to communicate the authentication of individual messages and should only be used by the application program, using libCURL, if the application is itself a mail server acting in such an environment. If the application is operating as such and the AUTH address is not known or is invalid, then an empty string should be used for this parameter.

Unlike OptionMailFrom and SetOptionMailRecipients, the address should not be specified within a pair of angled brackets (<>). However, if an empty string is used then a pair of brackets will be sent by libCURL as required by RFC 2554.
(Read and Write property)
See also MAIL_AUTH option in CURL manual.

### 64.10.227 OptionMailFrom as String

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string that will be used to specify the sender address in a mail when sending an SMTP mail with libCURL.
**Notes:** (Read and Write property)
See also MAIL_FROM option in CURL manual.

### 64.10.228 OptionMaxAgeConn as Integer

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum age the connection should have in seconds.
**Notes:** Older connections are not reused, but discarded.
(Read and Write property)
See also MAXAGE_CONN option in CURL manual.

### 64.10.229 OptionMaxConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The set number will be the persistent connection cache size.
**Notes:** The set amount will be the maximum amount of simultaneously open connections that libCURL may cache. Default is 5, and there isn't much point in changing this value unless you are perfectly aware of how this work and changes libCURL's behaviour. This concerns connection using any of the protocols that support persistent connections.

When reaching the maximum limit, CURL closes the oldest one in the cache to prevent the number of open connections to increase.

If you already have performed transfers with this CURL handle, setting a smaller MAXCONNECTS than before may cause open connections to get closed unnecessarily.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXCONNECTS option in CURL manual.

### 64.10.230 OptionMaxFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EXCEEDED will be returned.

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXFILESIZE option in CURL manual.

### 64.10.231 OptionMaxFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxFileSize instead. **Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EX-

CEEDED will be returned. (Added in 7.11.0)

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.232 OptionMaxLifeTimeConnection as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets maximum lifetime (since creation) allowed for reusing a connection.
**Notes:** Pass a number as parameter containing maxlifetime - the maximum time in seconds, since the creation of the connection, that you allow an existing connection to have to be considered for reuse for this request.

libcurl features a connection cache that holds previously used connections. When a new request is to be done, it will consider any connection that matches for reuse. The MaxLifeTimeConnection limit prevents libcurl from trying too old connections for reuse. This can be used for client-side load balancing. If a connection is found in the cache that is older than this set maxlifetime, it will instead be closed once any in-progress transfers complete.

If set to 0, this behavior is disabled: all connections are eligible for reuse.
(Read and Write property)

### 64.10.233 OptionMaxRecvSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
(Read and Write property)
See also MAX_RECV_SPEED option in CURL manual.

### 64.10.234 OptionMaxRecvSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxRecvSpeed instead. **Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
(Read and Write property)

### 64.10.235 OptionMaxRedirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The set number will be the redirection limit.
**Example:**

```
dim c as new CURLNMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** If that many redirections have been followed, the next redirect will cause an error (kError_TOO_MANY_REDIRECTS). This option only makes sense if the CURLOPT_FOLLOWLOCATION is used at the same time. Added in 7.15.1: Setting the limit to 0 will make libCURL refuse any redirect. Set it to -1 for an infinite number of redirects (which is the default)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXREDIRS option in CURL manual.

### 64.10.236 OptionMaxSendSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in

7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)
See also MAX_SEND_SPEED option in CURL manual.

### 64.10.237 OptionMaxSendSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxSendSpeed instead. **Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)

### 64.10.238 OptionMimeOptions as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set MIME option flags.
**Notes:** Pass a number that holds a bitmask of CURLMIMEOPT constants. Each bit is a Boolean flag used while encoding a MIME tree or multipart form data.

Available bits are:

CURLMIMEOPT_FORMESCAPE = 1

Tells libcurl to escape multipart form field and file names using the backslash-escaping algorithm rather than percent-encoding (HTTP only).

Backslash-escaping consists in preceding backslashes and double quotes with a backslash. Percent encoding maps all occurrences of double quote, carriage return and line feed to %22, %0D and %0A respectively.

Before version 7.81.0, percent-encoding was never applied.

HTTP browsers used to do backslash-escaping in the past but have over time transitioned to use percent-encoding. This option allows to address server-side applications that have not yet have been converted.

As an example, consider field or file name strange\name"kind. When the containing multipart form is sent, this is normally transmitted as strange\name%22kind. When this option is set, it is sent as strange\\name\"kind.
(Read and Write property)
See also MIME_OPTIONS option in CURL manual.

### 64.10.239 OptionNetRC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Controls usage of netrc file.
**Notes:** This parameter controls the preference of libCURL between using user names and passwords from your
textasciitilde /.netrc file, relative to user names and passwords in the URL supplied with OptionURL.

libCURL uses a user name (and supplied or prompted password) supplied with OptionUsername and OptionPassword in preference to any of the options controlled by this parameter.

An integer, set to one of the values described below.

kNETRC_OPTIONAL = 1

The use of your
textasciitilde /.netrc file is optional, and information in the URL is to be preferred. The file will be scanned with the host and user name (to find the password only) or with the host only, to find the first user name and password after that machine, which ever information is not specified in the URL.

Undefined values of the option will have this effect.

kNETRC_IGNORED = 0

The library will ignore the file and use only the information in the URL.

This is the default.

kNETRC_REQUIRED = 2

This value tells the library that use of the file is required, to ignore the information in the URL, and to search the file with the host only.

Only machine name, user name and password are taken into account (init macros and similar things aren't supported).

libCURL does not verify that the file has the correct properties set (as the standard Unix ftp client does). It should only be readable by user.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NETRC option in CURL manual.

### 64.10.240 OptionNetRCFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string containing the full path name to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also NETRC_FILE option in CURL manual.

### 64.10.241 OptionNewDirectoryPerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created directories on the remote server.
**Notes:** The default value is 0755, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)

Value must be octal, so use &o prefix for number.
(Read and Write property)
See also NEW_DIRECTORY_PERMS option in CURL manual.

### 64.10.242 OptionNewFilePerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created files on the remote server.
**Notes:** The default value is &o0644, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)
Be aware that you normally specify this in octal values. So use the &o prefix in Xojo.
(Read and Write property)
See also NEW_FILE_PERMS option in CURL manual.

### 64.10.243 OptionNoBody as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to not include the body-part in the output.
**Notes:** This is only relevant for protocols that have separate header and body parts. On HTTP(S) servers, this will make libCURL do a HEAD request.

To change request to GET, you should use OptionGet. Change request to POST with OptionPost etc.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NOBODY option in CURL manual.

### 64.10.244 OptionNoProxy as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string with a comma- separated list of hosts which do not use a proxy, if one is specified.
**Notes:** The only wildcard is a single * character, which matches all hosts, and effectively disables the proxy. Each name in this list is matched as either a domain which contains the hostname, or the hostname itself. For example, local.com would match local.com, local.com:80, and www.local.com, but not www.notlocal.com.

(Added in 7.19.4)
(Read and Write property)
See also NOPROXY option in CURL manual.

### 64.10.245 OptionNoSignal as Integer

MBS CURL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to not use signals.
**Notes:** If it is true, libCURL will not use any functions that install signal handlers or any functions that cause signals to be sent to the process. This option is mainly here to allow multi-threaded unix applications to still set/use all timeout options etc, without risking getting signals. (Added in 7.10)

If this option is set and libCURL has been built with the standard name resolver, timeouts will not occur while the name resolve takes place. Consider building libCURL with c-ares support to enable asynchronous DNS lookups, which enables nice timeouts for name resolves without signals.

Setting OptionNoSignal to true makes libCURL NOT ask the system to ignore SIGPIPE signals, which otherwise are sent by the system when trying to send data to a socket which is closed in the other end. libCURL makes an effort to never cause such SIGPIPEs to trigger, but some operating systems have no way to avoid them and even on those that have there are some corner cases when they may still happen, contrary to our desire. In addition, using CURLAUTH_NTLM_WB authentication could cause a SIGCHLD signal to be raised.
(Read and Write property)
See also NOSIGNAL option in CURL manual.

### 64.10.246 OptionPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The password to use for the transfer.
**Notes:** The OptionPassword option should be used in conjunction with the OptionUsername option.
(Read and Write property)
See also PASSWORD option in CURL manual.

### 64.10.247 OptionPathAsIs as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass path as it is and do not resolve dots.
**Notes:** Do not squash dot-dot sequences.
(Read and Write property)
See also PATH_AS_IS option in CURL manual.

### 64.10.248 OptionPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The public key in DER form used to validate the peer public key.
**Notes:** Native path to key file.
This option is used only if SSLVerifyPeer is true.
(Read and Write property)
See also PINNEDPUBLICKEY option in CURL manual.

### 64.10.249 OptionPipeWait as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Wait/don't wait for pipe/mutex to clarify.
**Notes:** (Read and Write property)
See also PIPEWAIT option in CURL manual.

### 64.10.250 OptionPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The remote port number to connect to, instead of the one specified in the URL or the default port for the used protocol.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PORT option in CURL manual.

### 64.10.251 OptionPost as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library to do a regular HTTP post.
**Notes:** This will also make the library use the a "Content-Type: application/x-www-form-urlencoded" header. (This is by far the most commonly used POST method).

Use the OptionPostFields option to specify what data to post.

Optionally, you can provide data to POST using the Read event but then you must make sure to not set OptionPostFields to anything but "". When providing data with an event, you must transmit it using chunked transfer-encoding.

You can override the default POST Content-Type: header by setting your own with OptionHTTPHeader.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use POST to a HTTP 1.1 server, you can send data without knowing the size before starting the POST if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size in the request.

When setting CURLOPT_POST to a non-zero value, it will automatically set OptionNoBody to 0 (since 7.14.1).

If you issue a POST request and then want to make a HEAD or GET using the same re-used handle, you must explictly set the new request type using OptionNoBody or OptionGet or similar.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also POST option in CURL manual.

### 64.10.252 OptionPostFields as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should be the full data to post in an HTTP POST operation.
**Example:**

```
dim xml as string // XML or JSON to send as payload
dim c as new CURLNMBS
```

```
c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
c.OptionPostFields = xml
c.OptionUserAgent = "Test App"
c.OptionPost = true

// for SOAP use right content type
c.SetOptionHTTPHeader array("Content-Type: application/soap+xml; charset=utf-8")
```

**Notes:** You must make sure that the data is formatted the way you want the server to receive it. libCURL will not convert or encode it for you. Most web servers will assume this data to be url-encoded. Take note.

This POST is a normal application/x-www-form-urlencoded kind (and libCURL will set that Content-Type by default when this option is used), which is the most commonly used one by HTML forms. See also the OptionPost. Using OptionPostFields implies OptionPost.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

To make multipart/formdata posts (aka rfc1867-posts), check out the OptionPost option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COPYPOSTFIELDS option in CURL manual.

### 64.10.253 OptionPostFieldSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The size of the post data.
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)
See also POSTFIELDSIZE option in CURL manual.

### 64.10.254 OptionPostFieldSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionPostFieldSize instead. **Function:** The size of the post data. (64 bit version)
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)

### 64.10.255 OptionPostRedir as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitmask to control how libCURL acts on redirects after POSTs that get a 301 or 302 response back.
**Notes:** A parameter with bit 0 set (value CURL_REDIR_POST_301=1) tells the library to respect RFC 2616/10.3.2 and not convert POST requests into GET requests when following a 301 redirection. Setting bit 1 (value CURL_REDIR_POST_302=2) makes libCURL maintain the request method after a 302 redirect. CURL_REDIR_POST_ALL is a convenience define that sets both bits.

The non-RFC behaviour is ubiquitous in web browsers, so the library does the conversion by default to maintain consistency. However, a server may require a POST to remain a POST after such a redirection. This option is meaningful only when setting OptionFollowLocation. (Added in 7.17.1) (This option was known as CURLOPT_POST301 up to 7.19.0 as it only supported the 301 way before then)
(Read and Write property)
See also POSTREDIR option in CURL manual.

### 64.10.256 OptionPreProxy as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of pre proxy to use.
**Notes:** (Read and Write property)
See also PRE_PROXY option in CURL manual.

### 64.10.257 OptionProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionProtocolsString instead. **Function:** A bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in the transfer. This allows you to have a libCURL built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default libCURL will accept all protocols it supports. See also OptionRedirProtocols. (Added in 7.19.4)
(Read and Write property)

### 64.10.258 OptionProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The protocols allowed-
**Example:**

```
dim c as new CURLNMBS
c.OptionProtocolsString = "http,tftp,sftp"
```

**Notes:** Pass a string that holds a comma-separated list of case insensitive protocol names (URL schemes) to allow in the transfer. This option allows applications to use libcurl built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default, libcurl accepts all protocols it was built with support for. See also OptionReditProtocolsString.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

CURLVersionMBS class can be used to get a list of all supported protocols in the current libcurl. GetInfoProtocol function is the recommended way to figure out the protocol used in a previous transfer.
(Read and Write property)

### 64.10.259 OptionProxy as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set HTTP proxy to use.
**Example:**

```
dim c as CURLNMBS // your CURL object
dim psAddress as string // your proxy address
dim psPort as Integer // your proxy port

c.OptionProxy=psAddress
c.OptionProxyPort=psPort
c.OptionProxyType=c.kPROXY_HTTP
```

**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a string holding the host name or dotted IP address. To specify port number in this string, append : [ port ] to the end of the host name. The proxy string may be prefixed with [ protocol ] :// since any such prefix will be ignored. The proxy's port number may optionally be specified with the separate option ProxyHost.

When you tell the library to use an HTTP proxy, libCURL will transparently convert operations to HTTP even if you specify an FTP URL etc. This may have an impact on what other features of the library you can use, such as CURLOPT_QUOTE and similar FTP specifics that don't work unless you tunnel through the HTTP proxy. Such tunneling is activated with HTTPProxyTunnel.

libCURL respects the environment variables http_proxy, ftp_proxy, all_proxy etc, if any of those is set. The Proxy option does however override any possibly set environment variables.

Starting with 7.14.1, the proxy host string given in environment variables can be specified the exact same way as the proxy can be set with Proxy, include protocol prefix (http://) and embedded user + password.

You can use WinHTTPClientMBS class on Windows or CFProxyMBS on Mac to discover system proxy settings.
(Read and Write property)
See also PROXY option in CURL manual.

### 64.10.260 OptionProxyAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Which proxy authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use for your proxy authentication. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the ProxyUserPassword option. The bitmask can be constructed by or'ing together the bits listed above for the HTTPAuth option. As of this writing, only Basic, Digest and NTLM work. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PROXYAUTH option in CURL manual.

### 64.10.261 OptionProxyCAInfo as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CApath or CAfile used to validate the proxy certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Pass native file path.
This option is used only if CURLNMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)

See also PROXY_CAINFO option in CURL manual.

### 64.10.262 OptionProxyCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CAInfo for proxy as blob value.
**Notes:** This option is for connecting to an HTTPS proxy, not an HTTPS server.
Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also PROXY_CAINFO_BLOB option in CURL manual.

### 64.10.263 OptionProxyCAPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The CApath directory used to validate the proxy certificate.
**Notes:** Pass native file path.
This option is used only if CURLNMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)
See also PROXY_CAPATH option in CURL manual.

### 64.10.264 OptionProxyCRLFile as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** CRL file for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_CRLFILE option in CURL manual.

### 64.10.265 OptionProxyIssuerCert as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the proxy issuer SSL certificate filename.

**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).
(Read and Write property)
See also PROXY_ISSUERCERT option in CURL manual.

### 64.10.266 OptionProxyIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set proxy issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionProxyIssuerCert which instead expects a file name as input.
(Read and Write property)
See also PROXY_ISSUERCERT_BLOB option in CURL manual.

### 64.10.267 OptionProxyKeyPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Password for the SSL private key for proxy.

**Notes:** (Read and Write property)
See also PROXY_KEYPASSWD option in CURL manual.

### 64.10.268 OptionProxyPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should be pointing to the password to use for the transfer while connecting to Proxy.
**Notes:** The OptionProxyPassword option should be used in conjunction with the OptionProxyUsername option. (Added in 7.19.1)
(Read and Write property)
See also PROXYPASSWORD option in CURL manual.

### 64.10.269 OptionProxyPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The public key in DER form used to validate the proxy public key.
**Notes:** This option is used only if CURLNMBS.OptionProxySSLVerifyPeer is true.
Please path native file path to key file.
(Read and Write property)
See also PROXY_PINNEDPUBLICKEY option in CURL manual.

### 64.10.270 OptionProxyPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The proxy port to connect to unless it is specified in the proxy string OptionProxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

You can use OptionProxy with port, e.g. "12.34.56.78:8080" or pass port here and proxy without port.
For some users it seems like the option with OptionProxy including port works better.
(Read and Write property)
See also PROXYPORT option in CURL manual.

### 64.10.271 OptionProxyServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Proxy Service Name.
**Notes:** (Read and Write property)
See also PROXY_SERVICE_NAME option in CURL manual.

### 64.10.272 OptionProxySSLCert as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of the file keeping your private SSL-certificate for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSLCERT option in CURL manual.

### 64.10.273 OptionProxySSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets private key for proxy cert from memory blob.
**Notes:** Pass data, which contains the private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with CURL.SetOptionProxySSLKeyType.
(Read and Write property)
See also PROXY_SSLCERT_BLOB option in CURL manual.

### 64.10.274 OptionProxySSLCertType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Type of the file keeping your SSL-certificate for proxy.
**Notes:** Value can be "DER", "PEM" or "ENG".
(Read and Write property)
See also PROXY_SSLCERTTYPE option in CURL manual.

### 64.10.275 OptionProxySSLCipherList as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which SSL ciphers to use for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_CIPHER_LIST option in CURL manual.

### 64.10.276 OptionProxySSLKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of the file keeping your private SSL-key for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_SSLKEY option in CURL manual.

### 64.10.277 OptionProxySSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set private key for proxy cert from memory blob.
**Notes:** Pass data, which contains a private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionProxySSLKeyType.

This option is an alternative to OptionProxySSLKey which instead expects a file name as input.
(Read and Write property)
See also PROXY_SSLKEY_BLOB option in CURL manual.

### 64.10.278 OptionProxySSLKeyType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets type of the file keeping your private SSL-key for proxy.
**Notes:** Value is DER, PEM or ENG.
(Read and Write property)
See also PROXY_SSLKEYTYPE option in CURL manual.

### 64.10.279 OptionProxySSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable specific SSL features with a bitmask for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_OPTIONS option in CURL manual.

### 64.10.280 OptionProxySSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable SSL Host verification.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Set if we should verify the Common name from the proxy certificate in ssl handshake, set 1 to check existence, 2 to ensure that it matches the provided hostname.
(Read and Write property)
See also PROXY_SSL_VERIFYHOST option in CURL manual.

### 64.10.281 OptionProxySSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should verify the proxy in ssl handshake.

**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** set 1 to verify.
(Read and Write property)
See also PROXY_SSL_VERIFYPEER option in CURL manual.

### 64.10.282 OptionProxySSLVersion as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What version to specifically try to use for proxy.
**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also PROXY_SSLVERSION option in CURL manual.

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

### 64.10.283 OptionProxyTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which TLS 1.3 ciphers suites to use for proxy.
**Notes:** The list of cipher suites to use for the TLS 1.3 connection to a proxy. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also PROXY_TLS13_CIPHERS option in CURL manual.

### 64.10.284 OptionProxyTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Password for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_PASSWORD option in CURL manual.

### 64.10.285 OptionProxyTLSAuthType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set authentication type for authenticated TLS for proxy
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_TYPE option in CURL manual.

### 64.10.286 OptionProxyTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a username for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_USERNAME option in CURL manual.

### 64.10.287 OptionProxyTransferMode as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If this integer value is set to 1 (one), it tells libCURL to set the transfer mode (binary or ASCII) for FTP transfers done via an HTTP proxy, by appending ;type=a or ;type=i to the URL.
**Notes:** Without this setting, or it being set to 0 (zero, the default), OptionTransferText has no effect when doing FTP via a proxy. Beware that not all proxies support this feature. (Added in 7.18.0)
(Read and Write property)
See also PROXY_TRANSFER_MODE option in CURL manual.

### 64.10.288 OptionProxyType as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This option is to set type of the proxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Available options for this are kPROXY_HTTP, kPROXY_SOCKS4 (added in 7.15.2) kPROXY_SOCKS5.
The HTTP type is default.
(Read and Write property)
See also PROXYTYPE option in CURL manual.

### 64.10.289 OptionProxyUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string, which should be pointing to the user name to use for the transfer while connecting to Proxy.
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionProxyPassword option.
(Read and Write property)
See also PROXYUSERNAME option in CURL manual.

### 64.10.290 OptionPut as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUpload instead.
**Function:** A non-zero parameter tells the library to use HTTP PUT to transfer data.
**Notes:** The data should be set with OptionInFileSize.

This option is deprecated and starting with version 7.12.1 you should instead use OptionUpload.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.291 OptionQuickExit as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to allow to exit quickly.
**Notes:** Pass a number as a parameter, 1 meaning that when recovering from a timeout, libcurl should skip lengthy cleanups that are intended to avoid all kinds of leaks (threads etc.), as the caller program is about to call exit() anyway. This allows for a swift termination after a DNS timeout for example, by canceling and/or forgetting about a resolver thread, at the expense of a possible (though short-lived) leak of associated resources.
(Read and Write property)
See also QUICK_EXIT option in CURL manual.

### 64.10.292 OptionRandomFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A file name for the random file.
**Notes:** The file will be used to read from to seed the random engine for SSL. The more random the specified file is, the more secure the SSL connection will become.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)

### 64.10.293 OptionRange as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string which should contain the specified range you want.
**Notes:** It should be in the format "X-Y", where X or Y may be left out. HTTP transfers also support several intervals, separated with commas as in "X-Y,N-M". Using this kind of multiple intervals will cause the HTTP server to send the response document in pieces (using standard MIME separation techniques). Pass a NULL to this option to disable the use of ranges.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RANGE option in CURL manual.

### 64.10.294 OptionRedirProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionRedirProtocolsString instead. **Function:** An integer that holds a bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This allows you to limit specific transfers to only be allowed to use a subset of protocols in redirections. By default libCURL will allow all protocols except for FILE and SCP. This is a difference compared to pre-7.19.4 versions which unconditionally would follow to all protocols supported. (Added in 7.19.4)
(Read and Write property)

### 64.10.295 OptionReditProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The protocols allowed to redirect to.
**Example:**

```
dim c as new CURLNMBS
c.OptionReditProtocolsString = "http,https"
```

**Notes:** Pass string that holds a comma-separated list of case insensitive protocol names (URL schemes). That list limits what protocols libcurl may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This option allows applications to limit specific transfers to only be allowed to use a subset of protocols in redirections.

Protocols denied by OptionProtocolsString are not overridden by this option.

By default libcurl will allow HTTP, HTTPS, FTP and FTPS on redirects (since 7.65.2). Older versions of libcurl allowed all protocols on redirect except several disabled for security reasons: Since 7.19.4 FILE and SCP are disabled, and since 7.40.0 SMB and SMBS are also disabled.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

Default

HTTP, HTTPS, FTP and FTPS (Added in 7.65.2).

Older versions defaulted to all protocols except FILE, SCP and since 7.40.0 SMB and SMBS.
(Read and Write property)

### 64.10.296 OptionReferer as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The referer to pass to the server.
**Notes:** It will be used to set the Referer: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also REFERER option in CURL manual.

### 64.10.297 OptionRequestTarget as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The request target, instead of extracted from the URL.
**Notes:** (Read and Write property)
See also REQUEST_TARGET option in CURL manual.

### 64.10.298 OptionResumeFrom as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** Set this option to 0 to make the transfer start from the beginning (effectively disabling resume). For FTP, set this option to -1 to make the transfer start from the end of the target file (useful to continue an interrupted upload).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RESUME_FROM option in CURL manual.

### 64.10.299 OptionResumeFromLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionResumeFrom instead. **Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.300 OptionRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manually initialize the client RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_CLIENT_CSEQ option in CURL manual.

### 64.10.301 OptionRTSPRequest as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** RTSP request method (OPTIONS, SETUP, PLAY, etc...).
**Notes:** (Read and Write property)

See also RTSP_REQUEST option in CURL manual.

### 64.10.302 OptionRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manually initialize the server RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_SERVER_CSEQ option in CURL manual.

### 64.10.303 OptionRTSPSessionID as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTSP session identifier.
**Notes:** (Read and Write property)
See also RTSP_SESSION_ID option in CURL manual.

### 64.10.304 OptionRTSPStreamURI as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTSP stream URI.
**Notes:** (Read and Write property)
See also RTSP_STREAM_URI option in CURL manual.

### 64.10.305 OptionRTSPTransport as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Transport: header to use in RTSP requests.
**Notes:** (Read and Write property)
See also RTSP_TRANSPORT option in CURL manual.

### 64.10.306 OptionSASLAuthZID as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The authorisation identity (identity to act as).
**Notes:** Sets the authorisation identity (identity to act as).
Pass a text as parameter, which should be pointing to the authorisation identity (authzid) for the transfer. Only applicable to the PLAIN SASL authentication mechanism where it is optional.
When not specified only the authentication identity (authcid) as specified by the username will be sent to the server, along with the password. The server will derive a authzid from the authcid when not provided, which it will then uses internally.
When the authzid is specified, the use of which is server dependent, it can be used to access another user's inbox, that the user has been granted access to, or a shared mailbox for example.
(Read and Write property)
See also SASL_AUTHZID option in CURL manual.

### 64.10.307 OptionSASLIR as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable SASL initial response.
**Notes:** (Read and Write property)

See also SASL_IR option in CURL manual.

### 64.10.308 OptionServerResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Causes libcurl to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to send a response message for a command before the session is considered dead.
**Notes:** While libcurl is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionServerResponseTimeout to a value smaller than OptionTimeout.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SERVER_RESPONSE_TIMEOUT option in CURL manual.

### 64.10.309 OptionServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Service Name.
**Notes:** (Read and Write property)
See also SERVICE_NAME option in CURL manual.

### 64.10.310 OptionSocks5Auth as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bitmask of allowed auth methods for connections to SOCKS5 proxies.
**Notes:** (Read and Write property)
See also SOCKS5_AUTH option in CURL manual.

### 64.10.311 OptionSocks5GSSAPINEC as Boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to protect SOCKS5 connection is protected.
**Notes:** Set to true to enable or false to disable. As part of the gssapi negotiation a protection mode is negotiated. The rfc1961 says in section 4.3/4.4 it should be protected, but the NEC reference implementation does not. If enabled, this option allows the unprotected exchange of the protection mode negotiation. (Added in 7.19.4).
(Read and Write property)
See also SOCKS5_GSSAPI_NEC option in CURL manual.

### 64.10.312 OptionSocks5GSSAPIService as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A string holding the name of the service.
**Notes:** The default service name for a SOCKS5 server is rcmd/server-fqdn. This option allows you to change it. (Added in 7.19.4)
(Read and Write property)

### 64.10.313 OptionSSHAuthTypes as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Define the SSH authorization types.
**Example:**

```
dim c as CURLNMBS // your instance

// only do password
c.OptionSSHAuthTypes = c.kSSHAuthKeyboard or c.kSSHAuthPassword
```

**Notes:** Pass a long set to a bitmask consisting of one or more of CURLSSH_AUTH_PUBLICKEY, CURLSSH_AUTH_PASSWORD, CURLSSH_AUTH_HOST, CURLSSH_AUTH_KEYBOARD. Set CURLSSH_AUTH_ to let libCURL pick one. (Added in 7.16.1)

See kSSHAuth* constants.
(Read and Write property)
See also SSH_AUTH_TYPES option in CURL manual.

### 64.10.314 OptionSSHCompression as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable SSH compression.
**Notes:** (Read and Write property)
See also SSH_COMPRESSION option in CURL manual.

### 64.10.315 OptionSSHHostPublicKeyMD5 as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string containing 32 hexadecimal digits with the 128 bit MD5 checksum of the remote host's public key.
**Notes:** libCURL will reject the connection to the host unless the md5sums match. This option is only for SCP and SFTP transfers. (Added in 7.17.1)
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_MD5 option in CURL manual.

### 64.10.316 OptionSSHHostPublicKeySHA256 as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** SHA256 hash of SSH server public key.
**Notes:** Pass a string containing a Base64-encoded SHA256 hash of the remote host's public key. The transfer will fail if the given hash does not match the hash the remote host provides.
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_SHA256 option in CURL manual.

### 64.10.317 OptionSSHKnownhosts as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string holding the file name of the known_host file to use.
**Notes:** The known_hosts file should use the OpenSSH file format as supported by libssh2. If this file is specified, libCURL will only accept connections with hosts that are known and present in that file, with a matching public key. (Added in 7.19.6)
(Read and Write property)

See also SSH_KNOWNHOSTS option in CURL manual.

### 64.10.318 OptionSSHPrivateKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a path pointing to a file name for your private key.
**Example:**

```
Dim c As New CURLNMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using
textasciitilde /.ssh/id_dsa. If the file is password-protected, set the password with OptionSSLKeyPassword.
(Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PRIVATE_KEYFILE option in CURL manual.

### 64.10.319 OptionSSHPublicKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a path pointing to a file name for your public key.
**Example:**

```
Dim c As New CURLNMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using
textasciitilde /.ssh/id_dsa.pub. (Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PUBLIC_KEYFILE option in CURL manual.

### 64.10.320 OptionSSLCert as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the file name of your certificate.
**Notes:** The default format is "PEM" and can be changed with OptionSSLCERTTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLCERT option in CURL manual.

### 64.10.321 OptionSSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set SSL client certificate from memory blob.
**Notes:** Pass data, which contains a client certificate. The format must be "P12" on Secure Transport or Schannel. The format must be "P12" or "PEM" on OpenSSL. The string "P12" or "PEM" must be specified with OptionSSLCertType.

This option is an alternative to OptionSSLCert which instead expects a file name as input.
(Read and Write property)
See also SSLCERT_BLOB option in CURL manual.

### 64.10.322 OptionSSLCertPassword as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The certificate password.
**Notes:** (Read and Write property)

### 64.10.323 OptionSSLCertType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the format of your certificate.
**Notes:** Supported formats are "PEM" and "DER". (Added in 7.9.3)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLCERTTYPE option in CURL manual.

### 64.10.324 OptionSSLCipherList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A string holding the list of ciphers to use for the SSL connection.
**Example:**

```
// allow lower secure ciphers
curl.OptionSSLCipherList = "DEFAULT@SECLEVEL=0"
```

**Notes:** The list must be syntactically correct, it consists of one or more cipher strings separated by colons. Commas or spaces are also acceptable separators but colons are normally used, !, - and + can be used as operators. Valid examples of cipher lists include 'RC4-SHA', 'SHA1+DES', 'TLSv1' and 'DEFAULT'. The default list is normally set when you compile OpenSSL.

You'll find more details about cipher lists on this URL:

http://www.openssl.org/docs/apps/ciphers.html

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSL_CIPHER_LIST option in CURL manual.

### 64.10.325 OptionSSLEnableALPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable TLS ALPN extension (http2 over ssl might fail without).
**Notes:** (Read and Write property)
See also SSL_ENABLE_ALPN option in CURL manual.

### 64.10.326 OptionSSLEnableNPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Enable/disable TLS NPN extension (http2 over ssl might fail without)
**Notes:** (Read and Write property)

### 64.10.327 OptionSSLEngine as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** It will be used as the identifier for the crypto engine you want to use for your private key.
**Notes:** If the crypto device cannot be loaded, kError_SSL_ENGINE_NOTFOUND is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE option in CURL manual.

### 64.10.328 OptionSSLEngineDefault as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Sets the actual crypto engine as the default for (asymmetric) crypto operations.
**Notes:** If the crypto device cannot be set, kError_SSL_ENGINE_SETFAILED is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE_DEFAULT option in CURL manual.

### 64.10.329 OptionSSLFalseStart as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should enable TLS false start.
**Notes:** (Read and Write property)
See also SSL_FALSESTART option in CURL manual.

### 64.10.330 OptionSSLKey as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the file name of your private key.
**Notes:** The default format is "PEM" and can be changed with OptionSSLKEYTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLKEY option in CURL manual.

### 64.10.331 OptionSSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set private key for client cert from memory blob.
**Notes:** Pass data, which contains a private key. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionSSLKeyType.

This option is an alternative to OptionSSLKey which instead expects a file name as input.
(Read and Write property)
See also SSLKEY_BLOB option in CURL manual.

### 64.10.332 OptionSSLKeyPassword as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The password required to use the OptionSSLKEY private key.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.10.333 OptionSSLKeyType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string should be the format of your private key.
**Notes:** Supported formats are "PEM", "DER" and "ENG".

The format "ENG" enables you to load the private key from a crypto engine. In this case OptionSSLKEY is used as an identifier passed to the engine. You have to set the crypto engine with OptionSSLENGINE. "DER" format key file currently does not work because of a bug in OpenSSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLKEYTYPE option in CURL manual.

### 64.10.334 OptionSSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable/disable specific SSL features with a bitmask.
**Notes:** (Read and Write property)
See also SSL_OPTIONS option in CURL manual.

### 64.10.335 OptionSSLSessionIDCache as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use the SSL session ID cache.
**Notes:** Pass false to disable libCURL's use of SSL session-ID caching. Set this to true to enable it. By default all transfers are done using the cache. Note that while nothing ever should get hurt by attempting to reuse SSL session-IDs, there seem to be broken SSL implementations in the wild that may require you to disable this in order for you to succeed. (Added in 7.16.0)
(Read and Write property)
See also SSL_SESSIONID_CACHE option in CURL manual.

### 64.10.336 OptionSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This option determines whether libCURL verifies that the server cert is for the server it is known as.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
```

```
d.OptionSSLVerifyPeer = 1
```

**Notes:** When negotiating an SSL connection, the server sends a certificate indicating its identity.

When OptionSSLVerifyHost is 2, that certificate must indicate that the server is the server to which you meant to connect, or the connection fails.

CURL considers the server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the URL to which you told CURL to connect.

When the value is 1, the certificate must contain a Common Name field, but it doesn't matter what name it says. (This is not ordinarily a useful setting).

When the value is 0, the connection succeeds regardless of the names in the certificate.

The default, since 7.10, is 2.

The checking this option controls is of the identity that the server claims. The server could be lying. To control lying, see OptionSSLVerifyPeer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYHOST option in CURL manual.

### 64.10.337 OptionSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Configure whether this CURL instance will verify the SSL peer certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLNMBS
// your CURL object
```

```
// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This option determines whether CURL verifies the authenticity of the peer's certificate. A value of 1 means CURL verifies; zero means it doesn't. The default is nonzero, but before 7.10, it was zero.

When negotiating an SSL connection, the server sends a certificate indicating its identity. CURL verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. As of 7.10, CURL installs a default bundle of CA certificates and you can specify alternate certificates with the OptionCAINFO option or the OptionCAPATH option.

When OptionSSLVerifyPeer is nonzero, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the connection succeeds regardless.

Authenticating the certificate is not by itself very useful. You typically want to ensure that the server, as authentically identified by its certificate, is the server you mean to be talking to. Use OptionSSLVerifyHost to control that.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYPEER option in CURL manual.

### 64.10.338 OptionSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if we should verify the certificate status.
**Notes:** (Read and Write property)
See also SSL_VERIFYSTATUS option in CURL manual.

### 64.10.339 OptionSSLVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** What version of SSL/TLS to attempt to use.
**Example:**

```
dim c as CURLNMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also SSLVERSION option in CURL manual.

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

### 64.10.340 OptionStreamDepends as CURLNMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS option in CURL manual.

### 64.10.341 OptionStreamDependsE as CURLNMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set E-xclusive stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS_E option in CURL manual.

### 64.10.342 OptionStreamWeight as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set stream weight, 1 - 256.
**Notes:** Default is 16.
(Read and Write property)
See also STREAM_WEIGHT option in CURL manual.

### 64.10.343 OptionSuppressConnectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Suppress proxy CONNECT response headers from events.
**Notes:** (Read and Write property)
See also SUPPRESS_CONNECT_HEADERS option in CURL manual.

### 64.10.344 OptionTCPFastOpen as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set TCP Fast Open.
**Notes:** (Read and Write property)
See also TCP_FASTOPEN option in CURL manual.

### 64.10.345 OptionTCPKeepAlive as Boolean

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If set to true, TCP keepalive probes will be sent.
**Notes:** The delay and frequency of these probes can be controlled by the OptionTCPKeepIdle and OptionTCPKeepInterval options, provided the operating system supports them. Set to false (default behavior) to disable keepalive probes (Added in 7.25.0).
(Read and Write property)
See also TCP_KEEPALIVE option in CURL manual.

### 64.10.346 OptionTCPKeepIdle as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the delay, in seconds, that the operating system will wait while the connection is idle before sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPIDLE option in CURL manual.

### 64.10.347 OptionTCPKeepInterval as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the interval, in seconds, that the operating system will wait between sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPINTVL option in CURL manual.

### 64.10.348 OptionTCPNoDelay as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An integer specifying whether the TCP_NODELAY option should be set or cleared (true = set, false = clear).
**Notes:** The option is cleared by default. This will have no effect after the connection has been established.

Setting this option will disable TCP's Nagle algorithm. The purpose of this algorithm is to try to minimize the number of small packets on the network (where "small packets" means TCP segments less than the Maximum Segment Size (MSS) for the network).

Maximizing the amount of data sent per TCP segment is good because it amortizes the overhead of the send. However, in some cases (most notably telnet or rlogin) small segments may need to be sent without delay. This is less efficient than sending larger amounts of data at a time, and can contribute to congestion on the network if overdone.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TCP_NODELAY option in CURL manual.

### 64.10.349 OptionTFTPBlockSize as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify block size to use for TFTP data transmission.
**Notes:** Valid range as per RFC 2348 is 8-65464 bytes. The default of 512 bytes will be used if this option is not specified. The specified block size will only be used pending support by the remote server. If the server does not return an option acknowledgement or returns an option acknowledgement with no blksize,

the default of 512 bytes will be used. (added in 7.19.4)
(Read and Write property)
See also TFTP_BLKSIZE option in CURL manual.

### 64.10.350 OptionTFTPNoOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether not send any tftp option requests to the server.
**Notes:** (Read and Write property)
See also TFTP_NO_OPTIONS option in CURL manual.

### 64.10.351 OptionTimeCondition as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Time condition option.
**Notes:** This defines how the OptionTimeValue time value is treated. You can set this parameter to kTimeConditionIfModifiedSince (1) or kTimeConditionIfUnModifiedSince (2). This feature applies to HTTP and FTP.

The last modification time of a file is not always known and in such instances this feature will have no effect even if the given time condition would have not been met.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMECONDITION option in CURL manual.

### 64.10.352 OptionTimeOut as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.

In unix-like systems, this might cause signals to be used unless CURLOPT_NOSIGNAL is set.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEOUT option in CURL manual.

### 64.10.353 OptionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pass a long as parameter containing the maximum time in milli seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.
(Read and Write property)
See also TIMEOUT_MS option in CURL manual.

### 64.10.354 OptionTimeValue as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This should be the time in seconds since 1 jan 1970, and the time will be used in a condition as specified with OptionTimeCondition.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEVALUE option in CURL manual.

### 64.10.355 OptionTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specify which TLS 1.3 ciphers suites to use.
**Notes:** string holding the list of cipher suites to use for the TLS 1.3 connection. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also TLS13_CIPHERS option in CURL manual.

### 64.10.356 OptionTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TSL authentication password.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_PASSWORD option in CURL manual.

### 64.10.357 OptionTLSAuthType as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TLS authentication type.
**Notes:** You can set this to "SRP" to use Secure Remote Password authentication.
Please also set username and password.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_TYPE option in CURL manual.

### 64.10.358 OptionTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the TSL authentication user name.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

(Read and Write property)
See also TLSAUTH_USERNAME option in CURL manual.

### 64.10.359 OptionTransferEncoding as Boolean

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a request for compressed Transfer Encoding in the outgoing HTTP request.
**Notes:** If the server supports this and so desires, it can respond with the HTTP response sent using a compressed Transfer-Encoding that will be automatically uncompressed by libCURL on reception.

Transfer-Encoding differs slightly from the Content-Encoding you ask for with OptionAcceptEncoding in that a Transfer-Encoding is strictly meant to be for the transfer and thus MUST be decoded before the data arrives in the client. Traditionally, Transfer-Encoding has been much less used and supported by both HTTP clients and HTTP servers.
(Read and Write property)
See also TRANSFER_ENCODING option in CURL manual.

### 64.10.360 OptionTransferText as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to use ASCII mode for ftp transfers, instead of the default binary transfer.
**Notes:** For win32 systems it does not set the stdout to binary mode. This option can be usable when transferring text data between systems with different views on certain characters, such as newlines or similar.

libCURL does not do a complete ASCII conversion when doing ASCII transfers over FTP. This is a known limitation/flaw that nobody has rectified. libCURL simply sets the mode to ascii and performs a standard transfer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TRANSFERTEXT option in CURL manual.

### 64.10.361 OptionUnixSocketPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Path to Unix domain socket.
**Notes:** (Read and Write property)
See also UNIX_SOCKET_PATH option in CURL manual.

### 64.10.362 OptionUnrestrictedAuth as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A boolean parameter tells the library it can continue to send authentication (user+password) when following locations, even when hostname changed.
**Notes:** This option is meaningful only when setting FollowOption.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UNRESTRICTED_AUTH option in CURL manual.

### 64.10.363 OptionUpkeepIntervalMS as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Connection upkeep interval.
**Notes:** Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.

The user needs to explicitly call Upkeep in order to perform the upkeep work.

Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
(Read and Write property)
See also UPKEEP_INTERVAL_MS option in CURL manual.

### 64.10.364 OptionUpload as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True tells the library to prepare for an upload.

**Notes:** The OptionInFileSize or OptionInFileSizeLarge options are also interesting for uploads. If the protocol is HTTP, uploading means using the PUT request unless you tell libCURL otherwise.

Using PUT with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use PUT to a HTTP 1.1 server, you can upload data without knowing the size before starting the transfer if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UPLOAD option in CURL manual.

### 64.10.365 OptionUploadBufferSize as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set preferred upload buffer size.
**Notes:** Pass a long specifying your preferred size (in bytes) for the upload buffer in libcurl. It makes libcurl uses a larger buffer that gets passed to the next layer in the stack to get sent off. In some setups and for some protocols, there's a huge performance benefit of having a larger upload buffer.

This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size.

The upload buffer size is by default 64 kilobytes. The maximum buffer size allowed to be set is 2 megabytes. The minimum buffer size allowed to be set is 16 kilobytes.

Since curl 7.61.1 the upload buffer is allocated on-demand - so if the handle isn't used for upload, this buffer will not be allocated at all.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also UPLOAD_BUFFERSIZE option in CURL manual.

### 64.10.366 OptionURL as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The actual URL to deal with.
**Example:**

```
Dim c As New CURLNMBS

// this example sends a xml request to a server
c.OptionURL = "http://www.someserver.com/service"

// some XML for a SOAP request
Dim request As String = "<?xml version=""1.0""?><methodCall><methodName>application.getValue</methodName><params><param><value>info</value></param></params></methodCall>"

c.OptionPostFields = request

Dim header(-1) As String
header.Append "Content-Type: text/xml"
c.SetOptionHTTPHeader header

// this should be c.kError_OK if okay.
Dim result As Integer = c.Perform

Dim output As String = c.OutputData
Dim debugLog As String = c.DebugMessages
Dim HTTPStatus As Integer = c.GetInfoResponseCode

Break
```

**Notes:** If you need to pass username or password, please consider using the OptionUsername and OptionPassword properties. If you username or password contains characters like @ or :, you must use those properties.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a char * to a zero terminated string. The string must remain present until CURL no longer needs it, as it doesn't copy the string.

If the given URL lacks the protocol part ("http://" or "ftp://" etc), it will attempt to guess which protocol to use based on the given host name. If the given protocol of the set URL is not supported, libCURL will return on error (kError_UNSUPPORTED_PROTOCOL) when you call Perform. Use VersionInfo for detailed info on which protocols that are supported.

The string given to CURLOPT_URL must be url-encoded and following the RFC 2396:
http://CURL.haxx.se/rfc/rfc2396.txt

CURLOPT_URL is the only option that must be set before Perform is called.
For file uploads or downloads, please include the file name in the URL.

Please do never include username and passwords in URLs, as those get often written to log files and would reveal your credentials!
Instead use OptionUsername and OptionPassword.

If you miss the protocol in the URL, you may get an error about HTTP/0.9 being used and not allowed.
(Read and Write property)
See also URL option in CURL manual.

### 64.10.367 OptionUserAgent as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user agent string to pass to the server.
**Example:**

```
Dim c As New CURLNMBS

// setup request and any options you need
c.OptionURL = URL
c.OptionUserAgent = "MyDownloader 1.0"
```

**Notes:** It will be used to set the User-Agent: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also USERAGENT option in CURL manual.

### 64.10.368 OptionUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user name to be used in protocol authentication
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionPassword option
(Read and Write property)
See also USERNAME option in CURL manual.

### 64.10.369 OptionUseSSL as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLNMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)
See also USE_SSL option in CURL manual.

### 64.10.370 OptionVerbose as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether debug messages are sent to the DebugMessage event.
**Notes:** Default is false.
You need to subclass the CURLNMBS class to add code in the DebugMessage event.
Or you set CollectDebugMessages = true and later query DebugMessages property.
Or you use CreateMTDebugOutputFile to stream them to a file.

(Read and Write property)
See also VERBOSE option in CURL manual.

### 64.10.371 OptionWildCardMatch as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable wildcard matching.
**Notes:** Set onoff to true if you want to transfer multiple files according to a file name pattern. The pattern can be specified as part of the OptionURL option, using an fnmatch-like pattern (Shell Pattern Matching) in the last part of URL (file name).

By default, libCURL uses its internal wildcard matching implementation. You can provide your own matching function by the CURLNMBS.FileNameMatch event.

A brief introduction of its syntax follows:

- - ASTERISK

ftp://example.com/some/path/*.txt (for all txt's from the root directory)

? - QUESTION MARK

Question mark matches any (exactly one) character.

ftp://example.com/some/path/photo?.jpeg

[ - BRACKET EXPRESSION

The left bracket opens a bracket expression. The question mark and asterisk have no special meaning in a bracket expression. Each bracket expression ends by the right bracket and matches exactly one character. Some examples follow:

[ a-zA-Z0-9 ] or [ f-gF-G ] - character interval
[ abc ] - character enumeration
[ ^abc ] or [ !abc ] - negation
[ [ :name: ] ] class expression. Supported classes are alnum,lower, space, alpha, digit, print, upper, blank, graph, xdigit.
[ ] [ -!^] - special case - matches only '-', ' ] ', ' [ ', '!' or '^'. These characters have no special purpose.

[ \[ \] \\] - escape syntax. Matches ' [ ', ' ] ' or '¬¥.

Using the rules above, a file name pattern can be constructed:

ftp://example.com/some/path/ [ a-z [ :upper: ] \\] .jpeg

This feature is only supported for FTP download. Not for SFTP or HTTP.
(Read and Write property)
See also WILDCARDMATCH option in CURL manual.

### 64.10.372 OptionXOAuth2Bearer as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The XOAUTH2 bearer token.
**Notes:** (Read and Write property)
See also XOAUTH2_BEARER option in CURL manual.

### 64.10.373 OutputData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The output data from CURL.
**Example:**

```
Dim d As New CURLNMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error
```

ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages

**Notes:** If CollectOutputData property is true, the plugin puts the data received in write event also into this property, so you can grab it after the transfer. Use ClearData method to clear when reusing CURL object.

Limited to 2 GB. Please stream to file for bigger data with CreateMTOutputFile function.
(Read only property)

### 64.10.374 Paused as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether transfer is paused.
**Notes:** You can set it to true while transfer runs to pause it.
(Read and Write property)

### 64.10.375 ProgressDownloadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes downloaded so far.
**Notes:** (Read only property)

### 64.10.376 ProgressDownloadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes to download in total.
**Notes:** (Read only property)

### 64.10.377 ProgressPercent as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current download/upload progress in percent.
**Notes:** Range from 0 to 100.

(Read only property)

### 64.10.378 ProgressUploadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes uploaded so far.
**Notes:** (Read only property)

### 64.10.379 ProgressUploadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bytes to upload in total.
**Notes:** (Read only property)

### 64.10.380 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.10.381 Version as CURLNVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a version object to a filled with information about various run-time features in libCURL.
**Notes:** (Read only property)

### 64.10.382 WebSocketOptions as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** WebSocket behavior options.
**Notes:** Pass a bitmask to tell libcurl about specific WebSocket behaviors.

To detach a WebSocket connection and use the WebSocketSend and WebSocketReceive functions after the HTTP upgrade procedure, set the OptionConnectOnly option to 2.

Available bits in the bitmask:

kWebSocketRaw:
Deliver "raw" WebSocket traffic to the Write event.

In raw mode, libcurl does not handle pings or any other frame for the application.
(Read and Write property)

### 64.10.383 YieldTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether plugin should yield time.
**Example:**

```
dim curl as new CURLNMBS

curl.YieldTime = true
```

**Notes:** If set the plugin will yield time to Xojo back so threads and timers work while you download.

Seems like in RB 2009 this property only has effect if you run CURL in a thread.
(Read and Write property)

### 64.10.384 Events

### 64.10.385 ChunkBegin(FileInfo as CURLNFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called on begin of a new chunk.
**Notes:** If splitting of data transfer is enabled, this event is called before download of an individual chunk started. Note that parameter "remains" works only for FTP wildcard downloading (for now), otherwise is

not used.

### 64.10.386 ChunkEnd(FileInfo as CURLNFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Download of a chunk ended.
**Notes:** If splitting of data transfer is enabled this event is called after download of an individual chunk finished.
This event is called for skipped or downloaded files.

### 64.10.387 DebugMessage(infotype as Integer, data as string, dataSize as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A debug event to get data of ongoing process.
**Notes:** You may need to set OptionVerbose to true.

infotype constants:

| | | |
|---|---|---|
| kInfo_TEXT | 0 | The data is informational text. |
| kInfo_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kInfo_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kInfo_DATA_IN | 3 | The data is protocol data received from the peer. |
| kInfo_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kInfo_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kInfo_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |

If you set CollectDebugMessages, the plugin will collect the messages and provide them via the DebugMessages property. You can still use this event to write your own log instead of in addition.

### 64.10.388 FileNameMatch(Pattern as String, Name as String) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Match a file against a pattern.
**Notes:** If you don't implement this event, you get the default implementation from CURL.
Return kFileNameMatchNoMatch, kFileNameMatchIsMatch or kFileNameMatchFailed.

### 64.10.389 Finished(Result as Integer)

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when transfer has finished.
**Notes:** For Perform and PerformMT it is called before Perform function returns, so in PerformMT this is called on the thread.
For use with CURLNMultiMBS, it is called after TransferFinished event and before TransfersFinished event.
If you want to modify GUI and use PeformMT, you may need to start a timer to do so.

### 64.10.390 Header(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** New Header data was received.
**Notes:** You can get error 23 if you don't return lenb(data) in this event.
Or just leave it emtpy so RB will not include it in your application the plugin will return lenb(data) itself.

If you set CollectHeaderData to true, the plugin will collect the messages and provide them via the HeaderData property. You can still use this event to write your own log instead of in addition.

### 64.10.391 Progress(dltotal as Int64, dlnow as Int64, ultotal as Int64, ulnow as Int64, percent as Double) as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to report progress of ongoing transfers.
**Notes:** This function gets called by libCURL with a frequent interval during operation (roughly once per second) no matter if data is being transfered or not. Unknown/unused argument values passed to the event will be set to zero (like if you only download data, the upload size will remain 0).
Returning a true from this event will cause libCURL to abort the transfer and return kError_ABORTED_BY_CALLBACK.

You can run CURL from a thread to download several things at the same time or keep the GUI more responsive. For better GUI, you can even call a method like app.DoEvents to get the GUI updated more often.

When sending email, ultotal may be zero. In that case use OptionInFileSize to know size of email to upload.

### 64.10.392 Read(count as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as it needs to read data in order to send it to the peer.
**Notes:** Return the number of bytes requested. Never return a string with lenb(string)>count. You can return 0 to inform about end of file.

If you stop the current transfer by returning 0 "pre-maturely" (i.e before the server expected it, like when you've told you will upload N bytes and you upload less than N bytes), you may experience that the server "hangs" waiting for the rest of the data that won't come.

The read event may return CURL_READFUNC_ABORT (&h10000000) to stop the current operation immediately, resulting in a kError_ABORTED_BY_CALLBACK error code from the transfer (Added in 7.12.1)

This event is not called when using PerformMT.

If you provide Input data via SetInputData or OpenMTInputFile method, this event is not called and data is taken from the data you provided.

### 64.10.393 RestartRead() as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to inform you that reading on the file needs to start at the beginning again.
**Notes:** Return true on success.
If you use a binarystream for reading you will have to set position to 0 in this event.

This event is not called when using PerformMT.

### 64.10.394 Seek(pos as Int64, whence as Integer) as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when CURL needs to perform a seek.
**Notes:** Normally only needed if you resume a download (Seek forward) or upload is reset (seek back).
Whence is kSeekOriginCurrent, kSeekOriginEnd or kSeekOriginSet.
Please return one of this constants: kSeekReturnCantSeek, kSeekReturnFail or kSeekReturnOk.

### 64.10.395 SSHKey(KnownKey as string, KnownKeyLength as Integer, KnownKeyType as Integer, FoundKey as string, FoundKeyLength as Integer, FoundKeyType as Integer, MatchStatus as Integer) as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for known hosts event for SFTP and SCP.
**Notes:** KnownKey: The known key as string encoded with base64 if KnownKeyLength is zero, otherwise the "raw" data.
KnownKeyLength: The length of the key. Zero for base64 encoded key.
KnownKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
FoundKey: The found key as string encoded with base64 if FoundKeyLength is zero, otherwise the "raw" data.
FoundKeyLength: The length of the key. Zero for base64 encoded key.
FoundKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
MatchStatus: The status CURL found. (0 = OK, 1 = Mismatch, 2 = Missing)

Return one of the following values:

| | | |
|---|---|---|
| CURLKHSTAT_FINE_ADD_TO_FILE | 0 | Fine and add to file |
| CURLKHSTAT_FINE | 1 | Fine |
| CURLKHSTAT_REJECT | 2 | reject the connection, return an error |
| CURLKHSTAT_DEFER | 3 | do not accept it, but we can't answer right now so this causes a CURLE_DEFER error but otherwise the connection will be left intact etc |

### 64.10.396 Write(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as there is data received that needs to be saved.
**Notes:** Return the number of bytes actually taken care of. If that amount differs from the amount passed to your function, it'll signal an error to the library and it will abort the transfer and return kError_WRITE_ERROR.

This function may be called with zero bytes data if the transfered file is empty.

The event function will be passed as much data as possible in all invokes, but you cannot possibly make any assumptions. It may be one byte, it may be thousands. The maximum amount of data that can be passed to the write event is defined in the CURL.h header file: CURL_MAX_WRITE_SIZE (16384).

If you set CollectOutputData to true, the plugin will automatically collect the data and provide it to you after the transfer with the OutputData property. This collecting feature will only work right, if there is enough free memory. You can of course still process data yourself in this event instead of in addition.

### 64.10.397 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kUpkeepIntervalDefault | 50000 | The default connection upkeep interval in milliseconds. |
| kWebSocketRaw | 1 | One of the options for web sockets.<br>RAW mode for WebSocketOptions. |

Authorization

| Constant | Value | Description |
|---|---|---|
| kAUTH_ANY | &hFFFFFFEF | all types set |
| kAUTH_ANYSAFE | &hFFFFFFEE | |
| kAUTH_AWS_SIGV4 | 128 | AWS Signature v4 |
| kAUTH_BASIC | 1 | Basic (default) |
| kAUTH_Bearer | 64 | HTTP Bearer token authentication |
| kAUTH_DIGEST | 2 | Digest |
| kAUTH_DIGEST_IE | 16 | HTTP Digest authentication with an IE flavor. Digest authentication is de in RFC 2617 and is a more secure way to do authentication over public netw than the regular old-fashioned Basic method. The IE flavor is simply libCURL will use a special "quirk" that IE is known to have used before ve 7 and that some servers require the client to use. |
| kAUTH_GSSNEGOTIATE | 4 | GSS-Negotiate<br>Please check SupportsGSSNEGOTIATE property in CURLNVersionMBS whether this is supported/implemented by your copy of the CURL librar |
| kAUTH_NEGOTIATE | 4 | HTTP Negotiate (SPNEGO) authentication. Negotiate authentication i fined in RFC 4559 and is the most secure way to perform authentication HTTP.<br>You need to build libCURL with a suitable GSS-API library or SSPI on dows for this to work. |
| kAUTH_NONE | 0 | |
| kAUTH_NTLM | 8 | |
| kAUTH_NTLM_WB | 32 | NTLM delegating to winbind helper. Authentication is performed by a sep binary application that is executed when needed. The name of the applic is specified at compile time but is typically /usr/bin/ntlm_auth<br>Note that libCURL will fork when necessary to run the winbind applic and kill it when complete, calling waitpid() to await its exit when done POSIX operating systems, killing the process will cause a SIGCHLD s to be raised (regardless of whether OptionNoSignal is set), which mus handled intelligently by the application. In particular, the application not unconditionally call wait() in its SIGCHLD signal handler to avoid subject to a race condition. This behavior is subject to change in future ver of libCURL. |
| kAUTH_Only | &h80000000 | This is a meta symbol. OR this value together with a single specific auth to force libCURL to probe for un-restricted auth and if not, only that s auth algorithm is acceptable. |

ChunkBegin result values

| Constant | Value | Description |
|---|---|---|
| kChunkBeginFailed | 1 | Failed, so we exit downloads. |
| kChunkBeginOK | 0 | OK, download this file. |
| kChunkBeginSkip | 2 | Skip the file. |

ChunkEnd result values

| Constant | Value | Description |
|---|---|---|
| kChunkEndFailed | 1 | Failed, so we exit downloads. |
| kChunkEndOK | 0 | Download success. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kError_ABORTED_BY_CALLBACK | 42 | |
| kError_AGAIN | 81 | socket is not ready for send/recv, wait till it's ready and try ag CURL 7.18.2) |
| kError_Auth_Error | 94 | An authentication function returned an error. |
| kError_BAD_CONTENT_ENCODING | 61 | Unrecognized transfer encoding |
| kError_BAD_DOWNLOAD_RESUME | 36 | couldn't resume download |
| kError_BAD_FUNCTION_ARGUMENT | 43 | |
| kError_CHUNK_FAILED | 88 | Chunk event reported error. |
| kError_CONV_REQD | 76 | Not used with plugin. |
| kError_COULDNT_CONNECT | 7 | Could not connect. Proxy set? Firewall open? |
| kError_COULDNT_RESOLVE_HOST | 6 | |
| kError_COULDNT_RESOLVE_PROXY | 5 | |
| kError_FAILED_INIT | 2 | |
| kError_FILESIZE_EXCEEDED | 63 | Maximum file size exceeded |
| kError_FILE_COULDNT_READ_FILE | 37 | |
| kError_FTP_ACCEPT_FAILED | 10 | While waiting for the server to connect back when an active F used, an error code was sent over the control connection or simi |
| kError_FTP_ACCEPT_TIMEOUT | 12 | During an active FTP session while waiting for the server to OptionAcceptTimeoutMS (or the internal default) timeout expi |
| kError_FTP_BAD_FILE_LIST | 87 | Unable to parse FTP file list. |
| kError_FTP_CANT_GET_HOST | 15 | |
| kError_FTP_COULDNT_RETR_FILE | 19 | |
| kError_FTP_COULDNT_SET_TYPE | 17 | |
| kError_FTP_COULDNT_USE_REST | 31 | the REST command failed |
| kError_FTP_PORT_FAILED | 30 | FTP PORT operation failed |
| kError_FTP_PRET_FAILED | 84 | a PRET command failed |
| kError_FTP_WEIRD_227_FORMAT | 14 | |
| kError_FTP_WEIRD_PASS_REPLY | 11 | |
| kError_FTP_WEIRD_PASV_REPLY | 13 | |
| kError_FTP_WEIRD_SERVER_REPLY | 8 | |
| kError_FUNCTION_NOT_FOUND | 41 | |
| kError_GOT_NOTHING | 52 | when this is a specific error |
| kError_HTTP2 | 16 | A problem was detected in the HTTP2 framing layer. This is som and can be one out of several problems, see the error buffer for |
| kError_HTTP2_STREAM | 92 | stream error in HTTP/2 framing layer |
| kError_HTTP3 | 95 | HTTP3 layer failed. |
| kError_HTTP_POST_ERROR | 34 | |
| kError_HTTP_RETURNED_ERROR | 22 | |
| kError_INTERFACE_FAILED | 45 | |
| kError_LDAP_CANNOT_BIND | 38 | |
| kError_LDAP_INVALID_URL | 62 | Invalid LDAP URL |
| kError_LDAP_SEARCH_FAILED | 39 | |
| kError_LOGIN_DENIED | 67 | user, password or similar was not accepted and we failed to logi |
| kError_NOT_BUILT_IN | 4 | A requested feature, protocol or option was not found built-in in due to a build-time decision. This means that a feature or o enabled or explicitly disabled when libCURL was built and in o to function you have to get a rebuilt libCURL. |
| kError_NO_CONNECTION_AVAILABLE | 89 | For internal use only, will never be returned by libCURL. No connection available, the session will be queued. (added in 7 |
| kError_OK | 0 | |
| kError_OPERATION_TIMEDOUT | 28 | |
| kError_OUT_OF_MEMORY | 27 | |
| kError_PARTIAL_FILE | 18 | |
| kError_PEER_FAILED_VERIFICATION | 60 | |
| kError_Proxy | 96 | Proxy handshake error. |
| kError_Quic_Connect_Error | 96 | Quic had a connect error. |
| kError_QUOTE_ERROR | 21 | |
| kError_RANGE_ERROR | 33 | |

FileNameMatch Event Result Values

| Constant | Value | Description |
|---|---|---|
| kFileNameMatchFailed | 2 | Failed. |
| kFileNameMatchIsMatch | 0 | Is Match. |
| kFileNameMatchNoMatch | 1 | No match. |

Form Constants

| Constant | Value | Description |
|---|---|---|
| kFormArray | 8 | |
| kFormBuffer | 11 | |
| kFormBufferLength | 13 | |
| kFormBufferPtr | 12 | |
| kFormContentHeader | 15 | |
| kFormContentsLength | 6 | |
| kFormContentType | 14 | |
| kFormCopyContents | 4 | |
| kFormCopyName | 1 | |
| kFormEnd | 17 | |
| kFormFile | 10 | |
| kFormFileContent | 7 | |
| kFormFilename | 16 | |
| kFormNameLength | 3 | |
| kFormPtrContents | 5 | |
| kFormPtrName | 2 | |

FTP Authorization

| Constant | Value | Description |
|---|---|---|
| kFTPAUTH_DEFAULT | 0 | Allow libCURL to decide |
| kFTPAUTH_SSL | 1 | Try "AUTH SSL" first, and only if that fails try "AUTH TLS" |
| kFTPAUTH_TLS | 2 | Try "AUTH TLS" first, and only if that fails try "AUTH SSL" |

FTP CWD method

| Constant | Value | Description |
|---|---|---|
| kFTPMethodDefault | 0 | let libcurl pick |
| kFTPMethodMultiCWD | 1 | single CWD operation for each path part |
| kFTPMethodNoCWD | 2 | no CWD at all |
| kFTPMethodSingleCWD | 3 | one CWD to full dir, then work on file |

FTP SSL Option

| Constant | Value | Description |
|---|---|---|
| kFTPSSL_ALL | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_CONTROL | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_NONE | 0 | Don't attempt to use SSL. |
| kFTPSSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |

GSS API delegation modes

| Constant | Value | Description |
|---|---|---|
| kGSSAPIDelegationFlag | 2 | delegate always |
| kGSSAPIDelegationNone | 0 | no delegation (default) |
| kGSSAPIDelegationPolicyFlag | 1 | if permitted by policy |

HTTP Versions

| Constant | Value | Description |
|---|---|---|
| kHTTP_VERSION_1_0 | 1 | Enforce HTTP 1.0 requests. |
| kHTTP_VERSION_1_1 | 2 | Enforce HTTP 1.1 requests. |
| kHTTP_VERSION_2TLS | 4 | use version 2 for HTTPS, version 1.1 for HTTP |
| kHTTP_VERSION_2_0 | 3 | please use HTTP 2 in the request |
| kHTTP_VERSION_2_PRIOR_KNOWLEDGE | 5 | please use HTTP 2 without HTTP/1.1 Upgrade |
| kHTTP_VERSION_3 | 30 | please use HTTP 3 in the request |
| kHTTP_VERSION_3Only | 31 | Use HTTP/3 without fallback. For HTTPS only. For HTTP, t return error. |
| kHTTP_VERSION_NONE | 0 | We don't care about what version the library uses. libCURL it thinks fit. |

Debug Message Info Types

| Constant | Value | Description |
|---|---|---|
| kINFO_DATA_IN | 3 | The data is protocol data received from the peer. |
| kINFO_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kINFO_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kINFO_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kINFO_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kINFO_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |
| kINFO_TEXT | 0 | The data is informational text. |

IP Resolve Modes

| Constant | Value | Description |
|---|---|---|
| kIPRESOLVE_V4 | 1 | |
| kIPRESOLVE_V6 | 2 | |
| kIPRESOLVE_WHATEVER | 0 | |

NetRC Modes

| Constant | Value | Description |
|---|---|---|
| kNETRC_IGNORED | 0 | The .netrc will never be read.<br>This is the default. |
| kNETRC_OPTIONAL | 1 | A user:password in the URL will be preferred to one in the .netrc. |
| kNETRC_REQUIRED | 2 | A user:password in the URL will be ignored. Unless one is set programmatically, the .netrc will be queried. |

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAll | -1 | Enable all protocols. |
| kProtocolDICT | &h200 | DICT |
| kProtocolFILE | &h400 | File |
| kProtocolFTP | 4 | FTP |
| kProtocolFTPS | 8 | FTPS |
| kProtocolGopher | &h2000000 | Gopher |
| kProtocolGophers | &h20000000 | |
| kProtocolHTTP | 1 | HTTP |
| kProtocolHTTPS | 2 | HTTPS |
| kProtocolIMAP | &h1000 | IMAP |
| kProtocolIMAPS | &h2000 | IMAPS |
| kProtocolLDAP | &h80 | LDAP |
| kProtocolLDAPS | &h100 | LDAPS |
| kProtocolMQTT | &h10000000 | MQTT |
| kProtocolPOP3 | &h4000 | POP3 |
| kProtocolPOP3S | &h8000 | POP3S |
| kProtocolRTMP | &h80000 | RTMP |
| kProtocolRTMPE | &h200000 | RTMPE |
| kProtocolRTMPS | &h800000 | RTMPS |
| kProtocolRTMPT | &h100000 | RTMPT |
| kProtocolRTMPTE | &h400000 | RTMPTE |
| kProtocolRTMPTS | &h1000000 | RTMPTS |
| kProtocolRTSP | &h40000 | RTSP |
| kProtocolSCP | &h10 | SCP |
| kProtocolSFTP | &h20 | SFTP |
| kProtocolSMB | &h4000000 | SMB |
| kProtocolSMBS | &h8000000 | SMBS |
| kProtocolSMTP | &h10000 | SMTP |
| kProtocolSMTPS | &h20000 | SMTPS |
| kProtocolTelnet | &h40 | Telnet |
| kProtocolTFTP | &h800 | TFTP |

Proxy Types

| Constant | Value | Description |
|---|---|---|
| kPROXY_HTTP | 0 | |
| kPROXY_HTTP10 | 1 | Force to use CONNECT HTTP/1.0. |
| kPROXY_HTTP11 | 0 | Connect using HTTP/1.1. |
| kPROXY_SOCKS4 | 4 | |
| kPROXY_SOCKS4A | 6 | Using SOCKS 4A. |
| kPROXY_SOCKS5 | 5 | |
| kPROXY_SOCKS5_Hostname | 7 | Use the SOCKS5 protocol but pass along the host name rather than the IP address. added in 7.18.0 |

Seek Origin Constants

| Constant | Value | Description |
|---|---|---|
| kSeekOriginCurrent | 1 | Seek relative to current file position. |
| kSeekOriginEnd | 2 | Seek relative to end of file. |
| kSeekOriginSet | 0 | Seek relative to start of file. |

Seek Event Result Values

| Constant | Value | Description |
|---|---|---|
| kSeekReturnCantSeek | 3 | Return this value if you can't seek as you are not using a file, but for example a stream. |
| kSeekReturnFail | 2 | Returns this value if your seek operation failed. |
| kSeekReturnOk | 1 | Returns this value if your seek operation succeeded. |

SSH Authentication

| Constant | Value | Description |
|---|---|---|
| kSSHAuthAgent | 16 | agent (ssh-agent, pageant...) |
| kSSHAuthAny | -1 | Any allowed |
| kSSHAuthDefault | -1 | Default: Any |
| kSSHAuthGSSAPI | 32 | gssapi (kerberos, ...) |
| kSSHAuthHost | 4 | host key files |
| kSSHAuthKeyboard | 8 | keyboard interactive |
| kSSHAuthNone | 0 | none allowed, silly but complete |
| kSSHAuthPassword | 2 | password |
| kSSHAuthPublicKey | 1 | public/private key files |

SSL Option Flags

| Constant | Value | Description |
|---|---|---|
| kSSLOptionAllowBeast | 1 | tells libcurl to allow the BEAST SSL vulnerability in the name of improving interoperability with older servers. Some SSL libraries have introduced work-arounds for this flaw but those work-arounds sometimes make the SSL communication fail. To regain functionality with those broken servers, a user can this way allow the vulnerability back. |
| kSSLOptionAutoClientCert | 32 | Tells libcurl to automatically locate and use a client certificate for authentication. (Schannel) |
| kSSLOptionNativeCA | 16 | tells libcurl to use standard certificate store of operating system. Currently implemented under MS-Windows. |
| kSSLOptionNoPartialChain | 4 | tells libcurl to *NOT* accept a partial certificate chain if possible. The OpenSSL backend has this ability. |
| kSSLOptionNoRevoke | 2 | tells libcurl to disable certificate revocation checks for those SSL backends where such behavior is present. |
| kSSLOptionRevokeBestEffort | 8 | tells libcurl to ignore certificate revocation offline checks and ignore missing revocation list for those SSL backends where such behavior is present. |

SSL Versions

| Constant | Value | Description |
|---|---|---|
| kSSLVersionDefault | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| kSSLVersionSSLv2 | 2 | SSL v2 (but not SSLv3) |
| kSSLVersionSSLv3 | 3 | SSL v3 (but not SSLv2) |
| kSSLVersionTLSv1 | 1 | TLS v1.0 or later |
| kSSLVersionTLSv10 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| kSSLVersionTLSv11 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| kSSLVersionTLSv12 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| kSSLVersionTLSv13 | 7 | TLS v1.3 or later (Added in 7.52.0) |

Time Conditions

| Constant | Value | Description |
|---|---|---|
| kTimeConditionIfModifiedSince | 1 | |
| kTimeConditionIfUnModifiedSince | 2 | |
| kTimeConditionNone | 0 | No condition. |

SSL Option

| Constant | Value | Description |
|---|---|---|
| kUseSSLall | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kUseSSLcontrol | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kUseSSLnone | 0 | Don't attempt to use SSL. |
| kUseSSLtry | 1 | Try using SSL, proceed as normal otherwise. |

## 64.11 class CURLNMimePartMBS

### 64.11.1 class CURLNMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for mime parts.
**Notes:** You can provide data via file path, folderitem, data in memoryblock or string.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 64.11.2 Methods

### 64.11.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 64.11.4 Headers as String()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries header.

### 64.11.5 SetHeaders(headers() as String)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets header.

### 64.11.6 Properties

### 64.11.7 DataMemory as Memoryblock

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from memory data.
**Notes:** (Read and Write property)

### 64.11.8 DataString as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from memory data.
**Example:**

```
dim c as new CURLNMBS

// add mime
dim p as CURLNMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** (Read and Write property)

### 64.11.9 Encoding as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime data transfer encoder.
**Notes:** If set to binary, 8bit, 7bit, base64 or quoted-printable, the matching encoding is applied.
(Read and Write property)

### 64.11.10 File as FolderItem

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The file to stream.
**Notes:** When you set property, the plugin will open file and may raise IOException on failure.

(Read and Write property)

### 64.11.11 FileName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part remote file name.
**Notes:** If mime type is not set, we pick extension from file name.
This includes gif, jpg, jpeg, png, svg, txt, htm, html, pdf and xml file extensions.
(Read and Write property)

### 64.11.12 FilePath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part data source from named file.
**Notes:** (Read and Write property)

### 64.11.13 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.11.14 MimeType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime part type.
**Notes:** (Read and Write property)

### 64.11.15 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mime/form part name.
**Notes:** (Read and Write property)

### 64.11.16 Parent as Variant

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The parent object.
**Notes:** (Read only property)

### 64.11.17 Constants

Encodings

| Constant | Value | Description |
|---|---|---|
| kEncoding7bit | "7bit" | 7bit |
| kEncoding8bit | "8bit" | 8bit |
| kEncodingBase64 | "base64" | Base64 |
| kEncodingBinary | "binary" | Binary mode |
| kEncodingNone | "" | No mode, so data is passed through and header has no encoding defin |
| kEncodingQuotedPrintable | "quoted-printable" | Quoted printable |

Mime Types

| Constant | Value | Description |
|---|---|---|
| kMimeTypeGIF | "image/gif" | GIF |
| kMimeTypeHTML | "text/html" | HTML |
| kMimeTypeJPEG | "image/jpeg" | JPEG |
| kMimeTypePDF | "application/pdf" | PDF |
| kMimeTypePNG | "image/png" | PNG |
| kMimeTypeSVG | "image/svg+xml" | SVG |
| kMimeTypeText | "text/plain" | Text |
| kMimeTypeXML | "application/xml" | XML |

## 64.12 class CURLNMissingFunctionExceptionMBS

### 64.12.1 class CURLNMissingFunctionExceptionMBS

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An exception raised if a CURL library function is not loaded.
**Notes:** If you call load library before you use the CURLNMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.13 class CURLNMultiMBS

### 64.13.1 class CURLNMultiMBS

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for multiple CURL transfers running in parallel.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2

### 64.13.2 Methods

### 64.13.3 AddCURL(curl as CURLNMBS, handler as CURLNTransferFinishedMBS = nil) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add a standard CURL handle to the multi stack.
**Notes:** Lasterror is set.

We added handler parameter for v23.2 to make it easier to run things asynchronously.

### 64.13.4 CURLs as CURLNMBS()

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of current CURL instances.

### 64.13.5 ErrorString(ErrorCode as Integer) as String

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries text message for a given error code.

### 64.13.6 Perform

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks for things to see.
**Notes:** When the app thinks there's data available for CURL it calls this function to read/write whatever there is right now. This returns as soon as the reads and writes are done. This function does not require that there actually is data available for reading or that data can be written, it can be called just in case.

Lasterror is set. This only provides errors etc regarding the whole multi stack. There might still have occurred problems on invidual transfers even when this returns OK.

Sets RunningTransfers property.

### 64.13.7 RemoveAll

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes all curl handles.
**Notes:** Same as looping over CURLs() array and calling RemoveCURL for each.
This effectively cancels all requests.

### 64.13.8 RemoveCURL(CURL as CURLNMBS) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes a CURL handle from the multi stack again.
**Notes:** Lasterror is set.
Plugin calls this automatically when TransferFinished event was called.

### 64.13.9 SharedInstance as CURLNMultiMBS

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The shared instance.
**Notes:** Either you create a new CURLNMultiMBS object, which then takes this place.
Or you don't and the plugin creates an object for you to easily schedule transfers asynchronously.

### 64.13.10 Properties

### 64.13.11 AutoPerform as Boolean

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether to run a timer and run Perform automatically for you.
**Notes:** Set to true to run Perform automatically. For this the plugin manages a timer to call perform regularly.
We set this to true for the default shared instance, so it runs without you doing anything.
(Read and Write property)

### 64.13.12 ChunkLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A connection with a chunk length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.13.13 ContentLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A connection with a content-length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.13.14 Handle as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 64.13.15 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.13.16 MaxConcurrentStreams as Integer

MBS CURL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum number of concurrent connections to a server.
**Notes:** Maximum number of concurrent streams to support on a connection.
(Read and Write property)

### 64.13.17 MaxConnects as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of entries in the connection cache.
**Notes:** (Read and Write property)

### 64.13.18 MaxHostConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of (pipelining) connections to one host.
**Notes:** (Read and Write property)

### 64.13.19 MaxPipelineLength as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of requests in a pipeline.
**Notes:** (Read and Write property)

### 64.13.20 MaxTotalConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of open connections in total.
**Notes:** (Read and Write property)

### 64.13.21 Pipelining as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to 1 to enable pipelining for this multi handle.
**Notes:** Only for HTTP protocol.
Used to be a boolean property for 15.0 to 18.1, but changed to integer for 18.2.
(Read and Write property)

### 64.13.22 RunningTransfers as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of running transfers.
**Notes:** Set by Perform method.
(Read only property)

### 64.13.23 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.13.24 Events

### 64.13.25 TransferFinished(CURL as CURLNMBS, result as Integer, RemainingFinishedTransfers as Integer)

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One transfer finished.
**Notes:** Query CURL object for details.
Result is the result of the transfer as returned by Perform method of CURL object.
RemainingFinishedTransfers is how many transfers are also finished and will be called right after this event.

This event fires always when the queue is empty.
You may want to turn off the timer calling Perform method when this event fires.
Later you can start timer again if you call Add method.

### 64.13.26 TransfersFinished

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** All pending transfers finished.

### 64.13.27 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAddedAlready | 7 | An easy handle already added to a multi handle was attempted to get added - again. |
| kErrorBadEadyHandle | 2 | An easy handle was not good/valid. |
| kErrorBadFunctionArgument | 10 | A function was called with a bad parameter. |
| kErrorBadHandle | 1 | The passed-in handle is not a valid CURLM handle. |
| kErrorBadSocket | 5 | The passed in socket argument did not match. |
| kErrorCallPerform | -1 | Please call Perform soon to do some tasks. |
| kErrorInternalError | 4 | This is a libCURL bug. |
| kErrorOK | 0 | Everything OK. |
| kErrorOutOfMemory | 3 | Running low on memory. |
| kErrorRecursiveAPICall | 8 | An api function was called from inside an event. |
| kErrorUnknownOption | 6 | Tried to set unsupported option. |
| kErrorWakeupFailure | 9 | Wakeup is unavailable or failed. |

Pipeling options

| Constant | Value | Description |
|---|---|---|
| kPipeHTTP1 | 1 | Pipe with HTTP/1.1. |
| kPipeMultiPlex | 2 | Pipe with multiplex. |
| kPipeNothing | 0 | No piping. |

### 64.13.28 Delegates

### 64.13.29 CURLNTransferFinishedMBS(curl as CURLNMBS, ErrorCode as Integer)

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate used to indicate a transfer finished.
**Notes:** ErrorCode is zero for a successful.
See kError* constants in CURLNMBS class.
See also:

- 64.13.30 CURLNTransferFinishedMBS(curl as CURLNMBS, ErrorCode as Integer) 11376

### 64.13.30 CURLNTransferFinishedMBS(curl as CURLNMBS, ErrorCode as Integer)

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate used to indicate a transfer finished.
**Notes:** ErrorCode is zero for a successful.
See kError* constants in CURLSMBS class.
See also:

- 64.13.29 CURLNTransferFinishedMBS(curl as CURLNMBS, ErrorCode as Integer) 11376

## 64.14 class CURLNNotInitializedExceptionMBS

### 64.14.1 class CURLNNotInitializedExceptionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An exception raised if CURL library is not initialized.
**Notes:** If you call load library before you use the CURLMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.15 class CURLNotInitializedExceptionMBS

### 64.15.1 class CURLNotInitializedExceptionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An exception raised if CURL library is not initialized.
**Notes:** If you call load library before you use the CURLMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.16 class CURLNSSLBackendMBS

### 64.16.1 class CURLNSSLBackendMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a SSL backend.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 64.16.2 Methods

### 64.16.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 64.16.4 List as CURLNSSLBackendMBS()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Lists the backends.
**Example:**

```
dim list() as CURLNSSLBackendMBS = CURLNSSLBackendMBS.List

for each l as CURLNSSLBackendMBS in list
MsgBox l.name
next
```

**Notes:** The list may not be available if called too late.

### 64.16.5 SetSSLBackend(id as Integer) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

- 64.16.6 SetSSLBackend(name as string) as Integer 11380

### 64.16.6 SetSSLBackend(name as string) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

• 64.16.5 SetSSLBackend(id as Integer) as Integer 11379

### 64.16.7 Properties

### 64.16.8 ID as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ID of this SSL backend.
**Notes:** (Read only property)

### 64.16.9 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of this SSL backend.
**Notes:** (Read only property)

### 64.16.10 Constants

Error codes

| Constant | Value | Description |
|---|---|---|
| kErrorNoBackends | 3 | libcurl was built without any SSL support |
| kErrorOK | 0 | OK |
| kErrorTooLate | 2 | You can't set SSL backend after SSL initialization. |
| kErrorUnknownBackend | 1 | Unknown backend name or ID. |

SSL Backend IDs

| Constant | Value | Description |
|---|---|---|
| kSSLBackendDarwinSSL | 9 | DarwinSSL |
| kSSLBackendGNUTLS | 2 | GNUTLS |
| kSSLBackendGSKIT | 5 | GSKIT |
| kSSLBackendMBEDTLS | 11 | MBEDTLS |
| kSSLBackendNone | 0 | |
| kSSLBackendNSS | 3 | NSS |
| kSSLBackendOpenSSL | 1 | OpenSSL or BoringSSL |
| kSSLBackendSChannel | 8 | SChannel |
| kSSLBackendSecureTransport | 9 | DarwinSSL |
| kSSLBackendWolfSSL | 7 | WolfSSL |

## 64.17 class CURLNURLMBS

### 64.17.1 class CURLNURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for CURL's URL parser.
**Example:**

```
dim c as new CURLNURLMBS

c.URL = "www.test.de/Hello World test.pdf"

// setting URL will repair the spaces
c.path = c.Path

MsgBox c.URL
```

### 64.17.2 Methods

### 64.17.3 Clone as CURLNURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Duplicates the object.

### 64.17.4 Constructor

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new URL object.

### 64.17.5 Properties

### 64.17.6 Flags as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The flags to use.
**Notes:** Our default is combination of:

- kFlagsNoDefaultPort
- kFlagsNonSupportScheme
- kFlagsURLDecode
- kFlagsURLEncode
- kFlagsGuessScheme
- kFlagsDefaultScheme

(Read and Write property)

### 64.17.7 Fragment as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set fragment part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.8 Handle as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 64.17.9 Host as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set host part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.10 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported by one of the functions.
**Notes:** This changes while using debugger because getting or setting properties also sets this property.
(Read and Write property)

### 64.17.11 Options as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set options part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.12 Password as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set password part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.13 Path as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set path part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.14 Port as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set port part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.15 Query as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set query part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.16 Scheme as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set scheme part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.17 URL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set full URL.
**Example:**

```
Dim c As New CURLNURLMBS

// load absolute URL
c.URL = "http://domain.com/folder/page1.htm"

// load relative URL
c.URL = "page2.htm"

// get final URL
MsgBox c.URL
```

**Notes:** Sets lasterror property.

(Read and Write property)

### 64.17.18 User as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set user part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.17.19 ZoneID as String

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The zone ID.
**Notes:** (Read and Write property)

### 64.17.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFlagsNoAuthority | 1024 | Allow URLs without authority.<br>Allow empty authority when the scheme is unknown. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kErrorBadFileURL | 19 | The file:// URL is invalid. |
| kErrorBadFragment | 20 | The fragment part of the URL contained bad or invalid characters. |
| kErrorBadHostname | 21 | The hostname contained bad or invalid characters. |
| kErrorBadIPv6 | 22 | The IPv6 address hostname contained bad or invalid characters. |
| kErrorBadLogin | 23 | The login part of the URL contained bad or invalid characters. |
| kErrorBadPassword | 24 | The password part of the URL contained bad or invalid characters. |
| kErrorBadPath | 25 | The path part of the URL contained bad or invalid characters. |
| kErrorBadQuery | 26 | The query part of the URL contained bad or invalid characters. |
| kErrorBadScheme | 27 | The scheme part of the URL contained bad or invalid characters. |
| kErrorBadSlashes | 28 | The URL contained an invalid number of slashes. |
| kErrorBadUser | 29 | The user part of the URL contained bad or invalid characters. |
| kErrorNoZoneID | 18 | There is no zoneid set in the URL. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBadHandle | 1 | An argument that should be a CURLU pointer was passed in as a NULL. Should never happen with plugin as you would get exception. |
| kErrorBadPartpointer | 2 | A NULL pointer was passed to the 'part' argument of curl_url_get. Should never happen with plugin as you would get exception. |
| kErrorBadPortNumber | 4 | The port number was not a decimal number between 0 and 65535. |
| kErrorLacksIDN | 30 | IDN missing. |
| kErrorMalformedInput | 3 | A malformed input was passed to a URL API function. |
| kErrorNoFragment | 17 | There is no fragment part in the URL. |
| kErrorNoHost | 14 | There is no host part in the URL. |
| kErrorNoOptions | 13 | There is no options part in the URL. |
| kErrorNoPassword | 12 | There is no password part in the URL. |
| kErrorNoPort | 15 | There is no port part in the URL. |
| kErrorNoQuery | 16 | There is no query part in the URL. |
| kErrorNoScheme | 10 | There is no scheme part in the URL. |
| kErrorNoUser | 11 | There is no user part in the URL. |
| kErrorOk | 0 | No error. |
| kErrorOutOfMemory | 7 | A memory function failed. |
| kErrorUnknownPart | 9 | An unknown part ID was passed to a URL API function. |
| kErrorUnsupportedScheme | 5 | This libcurl build doesn't support the given URL scheme. |
| kErrorUrlDecode | 6 | |
| kErrorUserNotAllowed | 8 | Credentials was passed in the URL when prohibited. |

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAllowSpace | 2048 | Whether to allow space character in URLs. |
| kFlagsAppendQuery | 256 | Append a form style part. |
| kFlagsDefaultPort | 1 | Return default port number. |
| kFlagsDefaultScheme | 4 | Return default scheme if missing. |
| kFlagsDisallowUser | 32 | No user+password allowed. |
| kFlagsGuessScheme | 512 | Legacy curl-style guessing. |
| kFlagsNoDefaultPort | 2 | Act as if no port number was set, if the port number matches the default for the scheme. |
| kFlagsNonSupportScheme | 8 | Allow non-supported scheme. |
| kFlagsPathAsIs | 16 | Leave dot sequences. |
| kFlagsPunyCode | 4096 | get the host name in pynycode |
| kFlagsURLDecode | 64 | URL decode on get. |
| kFlagsURLEncode | 128 | URL encode on set. |

## 64.18 class CURLNVersionMBS

### 64.18.1 class CURLNVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to hold version information from libCURL.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 21.1

### 64.18.2 Methods

### 64.18.3 Constructor

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 64.18.4 FeatureNames as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the feature names.
**Example:**

```
dim v as new CURLNVersionMBS
dim features() as string = v.FeatureNames
dim Names as string = string.FromArray(features)
MessageBox Names
```

**Notes:** Values are e.g. alt-svc AsynchDNS HSTS HTTPS-proxy IPv6 Largefile libz NTLM NTLM_WB SSL threadsafe TLS-SRP UnixSockets zstd

### 64.18.5 Protocol(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Notes:** The protocol names are the same as would be used in URLs.
Index is zero based.

### 64.18.6 Protocols as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Example:**

```
dim v as new CURLNVersionMBS
dim Protocols() as string = v.Protocols
dim Names as string = string.FromArray(Protocols)
MessageBox Names
```

**Notes:** The protocol names are the same as would be used in URLs.

### 64.18.7 Properties

### 64.18.8 brotliVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Brotli library version string.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.18.9 brotliVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of brotli version.
**Notes:** (Read only property)

### 64.18.10 CAInfo as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The built-in default CURLOPT_CAINFO.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.18.11 CAPath as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The built-in default CURLOPT_CAPATH.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.18.12 Features as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bits which define what features libCURL can and can't.
**Notes:** Use the Supports Boolean properties instead.
Additional feature bits may be found in the libCURL documentation.
(Read only property)

### 64.18.13 gsaslVersion as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version string of the GNU SASL Library version.
**Notes:** (Read only property)

### 64.18.14 Host as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string showing what host information that this libCURL was built for.
**Notes:** As discovered by a configure script or set by the build environment.
e.g. "powerpc-apple-darwin8.0"
(Read only property)

### 64.18.15 hyperVersion as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Human readable string.
**Notes:** (Read only property)

### 64.18.16 iconvVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version number of iconv library.
**Notes:** (Read only property)

### 64.18.17 libidnVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of LibIDN used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.18.18 libsshVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of LibSSH2 used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.18.19 LibZVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string (there is no numerical version).
**Notes:** If libCURL has no libz support, this is "".
e.g. "1.2.3"
(Read only property)

### 64.18.20 nghttp2Version as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version string for nghttp2 library.
**Notes:** (Read only property)

### 64.18.21 nghttp2VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version number for nghttp2.
**Notes:** Numeric nghttp2 version: (MAJOR * 65536) + (MINOR * 256) + PATCH
(Read only property)

### 64.18.22 ProtocolCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of entries in the Protocol array.
**Notes:** (Read only property)

### 64.18.23 quicVersion as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version of quic version.
**Notes:** human readable quic (+ HTTP/3) library version.

(Read only property)

### 64.18.24 SSLVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string for the OpenSSL version used.
**Notes:** If libCURL has no SSL support, this is "".
e.g. " OpenSSL/0.9.7l"
(Read only property)

### 64.18.25 SupportsASYNCHDNS as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for asynchronous name lookups, which allows more exact timeouts (even on Windows) and less blocking when using the multi interface.
**Notes:** (added in 7.10.7)
(Read only property)

### 64.18.26 SupportsBrotli as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Brotli features are present.
**Notes:** (Read only property)

### 64.18.27 SupportsConv as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Character conversions supported.
**Notes:** (Read only property)

### 64.18.28 SupportsGSSAPI as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Built against a GSS-API library.
**Notes:** (Read only property)

### 64.18.29 SupportsGSSNEGOTIATE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP GSS-Negotiate
**Notes:** (added in 7.10.6)
(Read only property)

### 64.18.30 SupportsHTTP2 as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether currently used CURL library supports HTTP2.
**Example:**

```
dim c as new CURLNMBS
dim v as CURLNVersionMBS = c.version

if v.SupportsHTTP2 then
MsgBox "HTTP2 is supported"
else
MsgBox "HTTP2 is not supported"
end if
```

**Notes:** While our CURL Plugin with CURLNMBS plugin may not support this currently, you could use LoadLibrary function to load a CURL library supporting it.
(Read only property)

### 64.18.31 SupportsHTTP3 as Boolean

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether HTTP3 features are present.
**Notes:** (Read only property)

### 64.18.32 SupportsHTTPSProxy as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** HTTPS-proxy support built-in.
**Notes:** (Read only property)

### 64.18.33 SupportsIDN as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for IDNA, domain names with international letters.
**Notes:** (Added in 7.12.0)
(Read only property)

### 64.18.34 SupportsIPV6 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports IPv6
**Notes:** (Read only property)

### 64.18.35 SupportsKERBEROS4 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports kerberos4 (when using FTP).
**Notes:** (Read only property)

### 64.18.36 SupportsKerberos5 as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Kerberos V5 auth is supported.
**Notes:** (Read only property)

### 64.18.37 SupportsLARGEFILE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for large files.
**Notes:** (Added in 7.11.1)
(Read only property)

### 64.18.38 SupportsLIBZ as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP deflate using libz
**Notes:** (Added in 7.10)
(Read only property)

### 64.18.39 SupportsMultiSSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Multiple SSL backends available.
**Notes:** (Read only property)

### 64.18.40 SupportsNTLM as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP NTLM
**Example:**

```
dim c as new CURLNMBS
dim v as CURLNVersionMBS = c.Version

MsgBox "SupportsNTLM: "+str(v.SupportsNTLM)
```

**Notes:** (added in 7.10.6)
(Read only property)

### 64.18.41 SupportsNTLMWB as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NTLM delegation to winbind helper is supported.
**Notes:** (Read only property)

### 64.18.42 SupportsPSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mozilla's Public Suffix List, used for cookie domain verification.
**Notes:** (Read only property)

### 64.18.43 SupportsSPNEGO as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for SPNEGO authentication
**Notes:** (Simple and Protected GSS-API Negotiation Mechanism, defined in RFC 2478.) (added in 7.10.8)
(Read only property)

### 64.18.44 SupportsSSL as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports SSL (HTTPS/FTPS)
**Notes:** (Added in 7.10)

(Read only property)

### 64.18.45 SupportsSSPI as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for SSPI.
**Notes:** This is only available on Windows and makes libCURL use Windows-provided functions for NTLM authentication. It also allows libCURL to use the current user and the current user's password without the app having to pass them on. (Added in 7.13.2)
(Read only property)

### 64.18.46 SupportsTLSAUTHSRP as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** TLS-SRP auth is supported.
**Notes:** (Read only property)

### 64.18.47 SupportsUnicode as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether unicode for Windows is enabled.
**Notes:** libcurl was built with Unicode support on Windows. This makes non-ASCII characters work in filenames and options passed to libcurl. (Added in 7.72.0)
(Read only property)

### 64.18.48 SupportsUnixSockets as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unix domain sockets support.
**Notes:** (Read only property)

### 64.18.49 SupportsZSTD as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Supports HTTP zstd content encoding using zstd library.
**Notes:** Added in CURL 7.72.0
(Read only property)

### 64.18.50 Version as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string for the libCURL version.
**Notes:** e.g. "7.13.1"
(Read only property)

### 64.18.51 VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version of libCURL as number.
**Notes:** a 24 bit number created like this:
<8 bits major number>| <8 bits minor number>| <8 bits patch number>.
Version 7.9.8 is therefore returned as 0x070908.
(Read only property)

### 64.18.52 zstdVersion as String

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Human readable string version for zstd library.
**Notes:** (Read only property)

### 64.18.53 zstdVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Numeric Zstd version.
**Notes:** Major 8 bits, minor 12 bits, Patch 12 bits.
(Read only property)

## 64.19 class CURLNWebSocketFrameMBS

### 64.19.1 class CURLNWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a WebSocket frame.
**Notes:** dim curl as CURLNMBS // your curl handle

dim m as CURLNWebSocketFrameMBS = curl.WebSocketReceive

if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0

### 64.19.2 Properties

### 64.19.3 BytesLeft as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of pending bytes left of the payload.
**Notes:** (Read only property)

### 64.19.4 BytesReceived as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of bytes received.
**Notes:** (Read only property)

### 64.19.5 Data as MemoryBlock

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read.
**Notes:** (Read only property)

### 64.19.6 FlagBinary as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is binary data.
**Notes:** (Read only property)

### 64.19.7 FlagClose as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Close this transfer.
**Notes:** (Read only property)

### 64.19.8 FlagContinue as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set.
**Notes:** (Read only property)

### 64.19.9 FlagOffset as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a partial fragment.
**Notes:** The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls.
(Read only property)

### 64.19.10 FlagPing as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This as a ping.
**Notes:** (Read only property)

### 64.19.11 FlagPong as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a pong.
**Notes:** (Read only property)

### 64.19.12 Flags as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Flags for this packet.
**Notes:** See kFlag* contants.
(Read only property)

### 64.19.13 FlagText as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The buffer contains text data.
**Notes:** Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content.
(Read only property)

### 64.19.14 Offset as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The offset of this data into the frame.
**Notes:** (Read only property)

### 64.19.15 Text as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read as text.
**Notes:** If this is not a binary transfer, we put the text here.
(Read only property)

### 64.19.16 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagBinary | 2 | This is binary data. |
| kFlagClose | 8 | Close this transfer. |
| kFlagContinue | 4 | This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set. |
| kFlagOffset | 32 | This is a partial fragment.<br>The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls. |
| kFlagPing | 16 | This as a ping. |
| kFlagPong | 64 | This is a pong. |
| kFlagText | 1 | The buffer contains text data.<br>Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content. |

## 64.20 class CURLSFileInfoMBS

### 64.20.1 class CURLSFileInfoMBS

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for file information.
**Notes:** Content of this structure depends on information which is known and is achievable (e.g. by FTP LIST parsing).
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr6
- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr5
- MBS Xojo / Real Studio Plugins, version 16.1pr3
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2
- MBS Xojo / Real Studio Plugins, version 15.2pr8
- MBS Xojo / Real Studio Plugins, version 15.2pr7

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 38: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 11: News
- 13.5, page 8: News

### 64.20.2 Properties

### 64.20.3 Date as Date

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 15.2 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property.

But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.20.4 DateTime as DateTime

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The timstamp as a date object.
**Notes:** As of plugin version 20.5 the CURL library does not parse the timestamp.
So for some timestamp formats we have code in our plugin to do the parsing from the TimeString property.
But this is limited. No seconds and the year is a guess. Files newer in the year than today are from last year and other files from current year. The server doesn't provide year details.
(Read only property)

### 64.20.5 FileName as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name.
**Notes:** (Read only property)

### 64.20.6 FileType as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file type.
**Notes:** (Read only property)

### 64.20.7 Flags as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Flags define which fields are set.
Also you can just use the Has properties for same information.
(Read only property)

### 64.20.8 GID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group ID.
**Notes:** (Read only property)

### 64.20.9 GroupString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group string.
**Notes:** (Read only property)

### 64.20.10 HardLinks as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hard link count.
**Notes:** (Read only property)

### 64.20.11 HasFileName as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if filename property is valid.
**Notes:** (Read only property)

### 64.20.12 HasFileType as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if filetype property is valid.
**Notes:** (Read only property)

### 64.20.13 HasGID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if GID property is valid.
**Notes:** (Read only property)

### 64.20.14 HasHardLinks as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if hardlinks property is valid.
**Notes:** (Read only property)

### 64.20.15 HasPermissions as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if permissions property is valid.
**Notes:** (Read only property)

### 64.20.16 HasSize as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if size property is valid.
**Notes:** (Read only property)

### 64.20.17 HasTime as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if time and date properties have values.
**Notes:** (Read only property)

### 64.20.18 HasUID as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if UID field has a value.
**Notes:** (Read only property)

### 64.20.19 IsDirectory as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if entry is a directory.
**Notes:** Same as FileType = FileTypeDirectory.
(Read only property)

### 64.20.20 IsFile as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if entry is a regular file.
**Notes:** Same as FileType = FileTypeFile.
(Read only property)

### 64.20.21 Permissions as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The permission value.
**Notes:** (Read only property)

### 64.20.22 PermissionString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The permission string.
**Notes:** (Read only property)

### 64.20.23 Size as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file size.
**Notes:** (Read only property)

### 64.20.24 Target as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The target for a symlink.
**Notes:** (Read only property)

### 64.20.25 Time as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time value.
**Notes:** (Read only property)

### 64.20.26 TimeString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time string parsed.
**Notes:** (Read only property)

### 64.20.27 UID as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user ID.
**Notes:** (Read only property)

### 64.20.28 UserString as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user ID as text.
**Notes:** (Read only property)

### 64.20.29 Constants

File Types

| Constant | Value | Description |
|---|---|---|
| FileTypeDeviceBlock | 3 | Block Device |
| FileTypeDeviceChar | 4 | Character Device |
| FileTypeDirectory | 1 | Directory |
| FileTypeDoor | 7 | Door, is possible only on Sun Solaris now. |
| FileTypeFile | 0 | Regular file |
| FileTypeNamedPipe | 5 | Named Pipe |
| FileTypeSocket | 6 | Socket |
| FileTypeSymlink | 2 | Symbolic links |
| FileTypeUnknown | 8 | Unknown file type. Should never occur. |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| FlagKnownFileName | 1 | Filename Known |
| FlagKnownFileType | 2 | File Type Known |
| FlagKnownGID | 32 | GID Known |
| FlagKnownHardLinks | 128 | Hardlink Count Known |
| FlagKnownPermissions | 8 | Permissions Known |
| FlagKnownSize | 64 | Size Known |
| FlagKnownTime | 4 | Time Known |
| FlagKnownUID | 16 | UID Known |

## 64.21 class CURLSListMBS

### 64.21.1 class CURLSListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to hold a list of strings from the CURL library.
**Notes:** Data is copied for this list, so you can just keep it around.

### 64.21.2 Methods

### 64.21.3 Item(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the item with the given index.
**Notes:** Index is zero based.

### 64.21.4 List as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts list to a string array.

### 64.21.5 Operator_Convert as String()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts list to a string array.

### 64.21.6 Properties

### 64.21.7 Count as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of items in this list.
**Notes:** (Read only property)

## 64.22 class CURLSMBS

### 64.22.1 class CURLSMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to wrap libCURL.
**Example:**

```
Dim d As New CURLSMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error

ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages
```

**Notes:** We have three variants:

CURLS* classes include a static CURL library with SSL and SSH.
CURLN* classes include a static CURL library with native SSL on Mac and Windows.
CURL* classes without S need you to supply your own CURL library.

All variants can load a custom CURL library or use the one from the system on Mac and Linux.
If no library is loaded or included, the plugin will try to load the system one in constructor.

from the website libCURL website:
https://curl.haxx.se/libcurl/

libCURL is a free and easy-to-use client-side URL transfer library, supporting FTP, FTPS, HTTP, HTTPS, SCP, SFTP, TFTP, TELNET, DICT, FILE and LDAP. libCURL supports SSL certificates, HTTP POST, HTTP PUT, FTP uploading, HTTP form based upload, proxies, cookies, user+password authentication (Basic, Digest, NTLM, Negotiate, Kerberos4), file transfer resume, http proxy tunneling and more!

libCURL is highly portable, it builds and works identically on numerous platforms, including Solaris, NetBSD, FreeBSD, OpenBSD, Darwin, HPUX, IRIX, AIX, Tru64, Linux, UnixWare, HURD, Windows, Amiga, OS/2, BeOs, Mac OS X, Ultrix, QNX, OpenVMS, RISC OS, Novell NetWare, DOS and more...

libCURL is free, thread-safe, IPv6 compatible, feature rich, well supported, fast, thoroughly documented and is already used by many known, big and successful companies and numerous applications.

On Linux you may need to install libraries like ldap: apt-get install libldap-2.4.2:i386
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- News from the MBS Xojo Plugins Version 21.1
- News from the MBS Xojo Plugins Version 20.5
- News from the MBS Xojo Plugins Version 20.4
- Multithreaded plugin functions can increase speed of Xojo application
- Xojo 2018 Release 4 Now Available
- CURL function for OAuth
- The Cancel problem with Threads
- Multithreaded plugin functions can increase speed of Real Studio application
- MBS Plugins 11.1 Release notes

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 21.6, page 8: News
- 21.5, page 9: News
- 21.3, page 9: News
- 21.2, page 9: News
- 21.1, page 9: News
- 20.6, page 9: News
- 20.1, page 67: Send Your Emails, How to use the MBS Xojo plugins to send emails by Stefanie Juchmes
- 19.6, page 10: News
- 16.5, page 9: News
- 16.2, page 9: News

### 64.22.2 Methods

### 64.22.3 AddMimePart as CURLSMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new blank mime part.
**Notes:** Returns mime object, so you can set properties.

### 64.22.4 AWSPresignURL(AWSAccessKeyId as String, AWSSecretAccessKey as String, Region as String, Service as String, Path as String, Domain as String, Verb as String = "GET", Expires as Integer = 86400, QueryParameters() as String = nil, Headers() as String = nil) as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query predigend URL for Amazon Webservices.
**Example:**

```
Dim URL As String = CURLSMBS.AWSPresignURL( _
"AKIAIOSFODNN7EXAMPLE", _
"wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY", _
"us-east-1", _
"s3", _
"/test.txt", _
"examplebucket.s3.amazonaws.com", _
"GET", _
86400 )

Break // see URL in debugger
```

**Notes:** This implements AWS4-HMAC-SHA256 pre-signature for credentials.

Works also for other compatible S3 services beside Amazon's like the one from Wasabi or Dell ECS.

| Parameter | Description | Example |
|---|---|---|
| AWSAccessKeyId | Your access key for AWS. | "xx-central-1" |
| AWSSecretAccessKey | Your secret. | "s3" |
| Region | The region to use. | "/bucketname/test.jpg" |
| Service | The service to use. | "s3.eu-central-1.amazonaws.com" or "s3-ap-southeast-2.amazonaws.com" |
| Path | The path for the URL. Should always start with "/". | "GET" |
| Domain | Optional the domain to use. By default we just build it from region and service. | |
| Verb | The HTTP Operation to do. Can be POST, PUT, GET or DELETE. Default is GET. | "text=abc" |
| Expires | Expiration duration. Provides the time period, in seconds, for which the generated presigned URL is valid. For example, 86400 (24 hours). This value is an integer. The minimum value you can set is 1, and the maximum is 604800 (seven days). A presigned URL can be valid for a maximum of seven days because the signing key you use in signature calculation is valid for up to seven days. Default is 86400 for one day. | |
| QueryParameters | List of query parameters to include. | |
| Headers | Extra HTTP headers to include. Here you can specify various headers to include in signature and request. | |

Returns the pre-signed URL. May raise an exception in case of error.

### 64.22.5 CipherNames as String()

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all cipher algorithms.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = CURLSMBS.CipherNames
dim DigestNames() as string = CURLSMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

### 64.22.6 ClearData

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears data properties.
**Notes:** Resets OutputData, DebugMessages and Headers.

### 64.22.7 CloseMTDebugOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the debug output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.22.8 CloseMTHeaderOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the header output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.22.9 CloseMTInputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the input file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.22.10 CloseMTOutputFile

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the output file for PerformMT.
**Notes:** Call after PerformMT finished.
With 15.2 version of plugin, this also works with Perform.

### 64.22.11 CreateMTDebugOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.22.12 CreateMTDebugOutputFile(Path as String) as boolean 11417

### 64.22.12 CreateMTDebugOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where debug data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.22.11 CreateMTDebugOutputFile(file as folderitem) as boolean 11417

### 64.22.13 CreateMTHeaderOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.22.14 CreateMTHeaderOutputFile(Path as String) as boolean 11418

### 64.22.14 CreateMTHeaderOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where header data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.
See also:

- 64.22.13 CreateMTHeaderOutputFile(file as folderitem) as boolean 11417

### 64.22.15 CreateMTOutputFile(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.22.16 CreateMTOutputFile(Path as String) as boolean 11418

### 64.22.16 CreateMTOutputFile(Path as String) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file where output data is written to.
**Notes:** Returns true on success and false on failure (e.g. permission error).

Must be called before Perform, so we can stream data to the file.
The file is closed automatically when Perform methods finish their work.

You can set CollectOutputData to false in order to disable dat being collected.
See also:

- 64.22.15 CreateMTOutputFile(file as folderitem) as boolean 11418

### 64.22.17 DigestNames as String()

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all digest algorithms.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = CURLSMBS.CipherNames
dim DigestNames() as string = CURLSMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

### 64.22.18 FileInfos as CURLSFileInfoMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array with file information.
**Notes:** If you use OptionWildcard, you find after the transfer all CURLSFileInfoMBS objects for all the files/folders found.

For MBS Plugin 19.0 or newer you can alternatively run a custom request "MLSD" and than get file infos, too.

### 64.22.19 FinishMime

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes mime data.
**Example:**

```
dim c as new CURLSMBS

// add mime
dim p as CURLSMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** Please call AddMimePart for each part you like to add and than finally FinishMime before calling perform.

### 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim c as new CURLSMBS
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
dim formValues(-1) as string

const CURLFORM_COPYNAME = 1
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues
```

**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427

### 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424

- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427


### 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427


### 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427


### 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:


- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424

- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427

### 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427

### 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Several FormAdd methods are there. Send a request to support if you need another parameter combination.

Lasterror is set.

FormAdd() is used to append sections when building a multipart/formdata HTTP POST (sometimes referred to as rfc1867-style posts). Append one section at a time until you've added all the sections you want included and then you call FormFinish.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

First, there are some basics you need to understand about multipart/formdata posts. Each part consists of at least a NAME and a CONTENTS part. If the part is made for file upload, there are also a stored CONTENT-TYPE and a FILENAME. Below, we'll discuss what options you use to set these properties in the parts you want to add to your post.

The options listed first are for making normal parts. The options from CURLFORM_FILE through CURLFORM_BUFFERLENGTH are for file upload parts.

CURLFORM_COPYNAME:
followed by a string which provides the name of this part. libCURL copies the string so your application doesn't need to keep it around after this function call. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_PTRNAME:
followed by a string which provides the name of this part. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the name isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_NAMELENGTH.

CURLFORM_COPYCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL copies the provided data, so your application doesn't need to keep it around after this function call. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set the length of the name with CURLFORM_CONTENTSLENGTH.

CURLFORM_PTRCONTENTS:
followed by a string to the contents of this part, the actual data to send away. libCURL will use the string and refer to the data in your application, so you must make sure it remains until CURL no longer needs it. If the data isn't null terminated, or if you'd like it to contain zero bytes, you must set its length with CURLFORM_CONTENTSLENGTH.

CURLFORM_CONTENTSLENGTH:
followed by a long giving the length of the contents.

CURLFORM_FILECONTENT:

followed by a filename, causes that file to be read and its contents used as data in this part. This part does not automatically become a file upload part simply because its data was read from a file.

CURLFORM_FILE:
followed by a filename, makes this part a file upload part. It sets the filename field to the basename of the provided filename, it reads the contents of the file and passes them as data and sets the content-type if the given file match one of the internally known file extensions. For CURLFORM_FILE the user may send one or more files in one part by providing multiple CURLFORM_FILE arguments each followed by the filename (and each CURLFORM_FILE is allowed to have a CURLFORM_CONTENTTYPE).

CURLFORM_CONTENTTYPE:
is used in combination with CURLFORM_FILE. Followed a string which provides the content-type for this part, possibly instead of an internally chosen one.

CURLFORM_FILENAME:
is used in combination with CURLFORM_FILE. Followed a string, it tells libCURL to use the given string as the filename in the file upload part instead of the actual file name.

CURLFORM_BUFFER:
is used for custom file upload parts without use of CURLFORM_FILE. It tells libCURL that the file contents are already present in a buffer. The parameter is a string which provides the filename field in the content header.

CURLFORM_BUFFERPTR:
is used in combination with CURLFORM_BUFFER. The parameter is the string to be uploaded. You must also use CURLFORM_BUFFERLENGTH to set the number of bytes in the buffer. Keep the buffer variable alive till the upload is finished.

CURLFORM_BUFFERLENGTH:
is used in combination with CURLFORM_BUFFER. The parameter is a long which gives the length of the buffer.

CURLFORM_ARRAY:
Another possibility to send options to CURL_formadd() is the CURLFORM_ARRAY option, that passes an Integer Array and a String Array defining its value. Each element in the form is constructed using the option from the integer array and the value from the string array. All available options can be used in an array, except the CURLFORM_ARRAY option itself!

CURLFORM_CONTENTHEADER:
specifies extra headers for the form POST section. This takes a CURL_slist prepared in the usual way using CURL_slist_append and appends the list of headers to those libCURL automatically generates. The list must exist while the POST occurs, if you free it before the post completes you may experience problems.

PS: CURLFORM_FILE does not work in all CURL versions on all platforms due to a bug with integer numbers.
See also:

- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422
- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string) 11427

### 64.22.27 FormAdd(FormOption1 as integer, Text1 as string, FormOption2 as integer, Text2 as string, FormOption3 as integer, Text3 as string, FormOption4 as integer, Number4 as integer, FormOption5 as integer, Text5 as string)

MBS CURL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Notes:** Lasterror is set.
See other FormAdd methods for details.
See also:

- 64.22.20 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, FormOptions() as Integer, Texts() as string) 11420
- 64.22.21 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string) 11421
- 64.22.22 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer) 11422
- 64.22.23 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Number4 as Integer) 11422

- 64.22.24 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Number3 as Integer, FormOption4 as Integer, Text4 as string) 11423
- 64.22.25 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string) 11424
- 64.22.26 FormAdd(FormOption1 as Integer, Text1 as string, FormOption2 as Integer, Text2 as string, FormOption3 as Integer, Text3 as string, FormOption4 as Integer, Number4 as Integer) 11424


### 64.22.28 FormAddField(fieldName as String, fieldValue as String, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
dim d as new CURLSMBS
d.FormAddField("company", "Test, Inc.")
```

**Notes:** For fieldName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.
ContentType is optional.

Please call FormFinish method later!

### 64.22.29 FormAddFile(fieldName as String, fileName as String, fileContent as string, ContentType as String = "")

MBS CURL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a section to a multipart/formdata HTTP POST.
**Example:**

```
// read content of some file
dim file as folderitem = specialFolder.desktop.Child("test.txt")
dim b as BinaryStream = binarystream.Open(file)
dim FileContent as String = b.read(b.length)

// init some curl object
dim d as new CURLSMBS

// add the file as part of a form
d.FormAddFile("FileAttachment", "test.txt", FileContent, "text/plain")
```

```
// later
d.FormFinish
```

**Notes:** For fieldName, fileName and ContentType, we use UTF8 always. For fieldValue, we pass through whatever is in the string, so please make sure encoding is working.

Filename is ignored, if empty.
ContentType is optional.

Please call FormFinish method later!

### 64.22.30 FormClear

MBS CURL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears current form data.
**Notes:** You usually don't need to call this as Perform clears form data when transfer is done.

### 64.22.31 FormData as String

MBS CURL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current form data.
**Notes:** This is more for debugging as it builds form data as if we would send it.

### 64.22.32 FormFinish

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes constructing a form.
**Example:**

```
dim c as new CURLSMBS
dim namebuffer as string = "name buffer"
dim namelength as Integer = lenb(namebuffer)
dim buffer as string = "test buffer"
dim htmlbuffer as string = "<HTML>test buffer</HTML>"
dim htmlbufferlength as Integer = lenb(htmlbuffer)
dim file1 as string = "my-face.jpg"
dim file2 as string = "your-face.jpg"
dim formOptions(-1) as Integer
```

```
dim formValues(-1) as string
dim recordbuffer as string = "record buffer"
dim recordlength as Integer = lenb(recordbuffer)

const CURLFORM_NOTHING = 0
const CURLFORM_COPYNAME = 1
const CURLFORM_PTRNAME = 2
const CURLFORM_NAMELENGTH = 3
const CURLFORM_COPYCONTENTS = 4
const CURLFORM_PTRCONTENTS = 5
const CURLFORM_CONTENTSLENGTH = 6
const CURLFORM_FILECONTENT = 7
const CURLFORM_ARRAY = 8
const CURLFORM_FILE = 10
const CURLFORM_BUFFER = 11
const CURLFORM_BUFFERPTR = 12
const CURLFORM_BUFFERLENGTH = 13
const CURLFORM_CONTENTTYPE = 14
const CURLFORM_CONTENTHEADER = 15
const CURLFORM_FILENAME = 16

'/* Add simple name/content section */

c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_COPYCONTENTS, "content"

'
'/* Add simple name/content/contenttype section */

c.FormAdd CURLFORM_COPYNAME, "htmlcode", CURLFORM_COPYCONTENTS, "<HTML></HTML>",CURL-
FORM_CONTENTTYPE,"text/html"

'/* Add name/ptrcontent section */
c.FormAdd CURLFORM_COPYNAME, "name_for_ptrcontent", CURLFORM_PTRCONTENTS, buffer

'/* Add ptrname/ptrcontent section */
c.FormAdd CURLFORM_PTRNAME, namebuffer, CURLFORM_PTRCONTENTS, buffer, CURLFORM_NAME-
LENGTH, namelength


'/* Add name/ptrcontent/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "html_code_with_hole", CURLFORM_PTRCONTENTS, html-
buffer, CURLFORM_CONTENTSLENGTH, htmlbufferlength, CURLFORM_CONTENTTYPE, "text/html"

'/* Add simple file section */
c.FormAdd CURLFORM_COPYNAME, "picture", CURLFORM_FILE, "my-face.jpg"

'/* Add file/contenttype section */
c.FormAdd CURLFORM_COPYNAME, "picture",CURLFORM_FILE, "my-face.jpg",CURLFORM_CONTENTTYPE,
```

```
"image/jpeg"

'/* Add two file section */
c.FormAdd CURLFORM_COPYNAME, "pictures",CURLFORM_FILE, "my-face.jpg",CURLFORM_FILE,
"your-face.jpg"

'/* Add two file section using CURLFORM_ARRAY */
formOptions.Append CURLFORM_FILE
formValues.append file1
formOptions.Append CURLFORM_FILE
formValues.append file2

'/* Add a buffer to upload */
c.FormAdd CURLFORM_COPYNAME, "name", CURLFORM_BUFFER, "data", CURLFORM_BUFFERPTR,
recordbuffer, CURLFORM_BUFFERLENGTH, recordlength

'/* no option needed for the end marker */
c.FormAdd CURLFORM_COPYNAME, "pictures", CURLFORM_ARRAY, formOptions, formValues

'/* Add the content of a file as a normal post text value */
c.FormAdd CURLFORM_COPYNAME, "filecontent", CURLFORM_FILECONTENT, ".bashrc"
'/* Set the form info */

c.FormFinish
```

**Notes:** Lasterror is set.
The form is assigned to the HTTPPost property.

### 64.22.33 GetInfoActiveSocket as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receive the active socket used by this curl session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the Destructor closes the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly.

This option was added as a replacement for GetInfoLastSocket since that one isn't working on all platforms.

### 64.22.34 GetInfoAppConnectTime as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time stamp when app connected.

### 64.22.35 GetInfoCAInfo as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries default CAInfo value.

### 64.22.36 GetInfoCAPath as string

MBS CURL Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries default CAPath value.

### 64.22.37 GetInfoCertInfo as CURLSListMBS()

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries information on the certificate chain.
**Example:**

```
dim c as new CURLSMBS

// do some transfer
c.OptionURL = "https://www.mbsplugins.de/"
c.OptionCertInfo = true
dim e as Integer = c.perform

// query certificate info
dim lists() as CURLSListMBS = c.GetInfoCertInfo

for each l as CURLSListMBS in lists
MsgBox Join(l, EndOfLine)
next

MsgBox c.DebugMessages
```

**Notes:** Please set OptionCertInfo first.

### 64.22.38 GetInfoConditionUnmet as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return if the time condition prevented the document to get transferred.

### 64.22.39 GetInfoConnectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time, in seconds, it took from the start until the connect to the remote host (or proxy) was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.40 GetInfoContentLengthDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content-length of the download.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Length: field.

### 64.22.41 GetInfoContentLengthUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The specified size of the upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.42 GetInfoContentType as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content-type of the downloaded object.
**Notes:** The Lasterror property is set. 0 for success.
This is the value read from the Content-Type: field. If you get "", it means that the server didn't send a valid Content-Type header or that the protocol used doesn't support this.

### 64.22.43 GetInfoCookieList as CURLSListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A linked-list of all cookies CURL knows (expired ones, too).
**Notes:** The Lasterror property is set. 0 for success.
If there are no cookies (cookies for the handle have not been enabled or simply none have been received) the result is nil.

### 64.22.44 GetInfoEffectiveMethod as string

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the last used effective HTTP method.
**Notes:** In cases when you've asked libcurl to follow redirects, the method may very well not be the same method the first request would use.

### 64.22.45 GetInfoEffectiveURL as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last used effective URL.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.46 GetInfoFileTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** the remote time of the retrieved document (in number of seconds since 1 jan 1970 in the GMT/UTC time zone).
**Example:**

```
// init CURL with options
dim d as new CURLSMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime
```

```
// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** The Lasterror property is set. 0 for success.
If you get -1, it can be because of many reasons (unknown, the server hides it or the server doesn't support the command that tells document time etc) and the time of the document is unknown. Note that you must tell the server to collect this information before the transfer is made, by using the OptionFileTime option or you will unconditionally get a -1 back. (Added in 7.5)

### 64.22.47 GetInfoFTPEntryPath as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string holding the path of the entry path.
**Notes:** That is the initial path libCURL ended up in when logging on to the remote FTP server.
Empty string if unknown.

### 64.22.48 GetInfoHeaderSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total size of all the headers received.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.49 GetInfoHTTPAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A bitmask indicating the authentication method(s) available.
**Notes:** The Lasterror property is set. 0 for success.
The meaning of the bits is explained in the HTTPAuth option.

### 64.22.50 GetInfoHTTPConnectCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last received proxy response code to a CONNECT request.
**Notes:** The Lasterror property is set. 0 for success.
none

### 64.22.51 GetInfoHTTPVersion as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the http version used in the connection.
**Notes:** The returned value will be kHTTP_VERSION_1_0, kHTTP_VERSION_1_1, or kHTTP_VERSION_2_0, or 0 if the version can't be determined.

### 64.22.52 GetInfoLastSocket as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetInfoActiveSocket instead. **Function:** Receive the last socket used by this CURL session.
**Notes:** If the socket is no longer valid, -1 is returned. When you finish working with the socket, the destructor will free the handle as usual and let libCURL close the socket and cleanup other resources associated with the handle. This is typically used in combination with OptionConnectOnly. (Added in 7.15.2)

NOTE: this API is not really working on win64, since the SOCKET type on win64 is 64 bit large while its 'long' is only 32 bits.

### 64.22.53 GetInfoLocalIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries local IP.
**Example:**

```
dim c as new CURLSMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP
MsgBox c.GetInfoLocalIP
```

### 64.22.54 GetInfoLocalPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the local port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLSMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check local IP and port
MsgBox c.GetInfoLocalIP+":"+str(c.GetInfoLocalPort)
```

### 64.22.55 GetInfoNameLookupTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time, in seconds, it took from the start until the name resolving was completed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.56 GetInfoNumConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How many new connections libCURL had to create to achieve the previous transfer.
**Notes:** The Lasterror property is set. 0 for success.
(only the successful connects are counted)
Combined with RedirectCount you are able to know how many times libCURL successfully reused existing connection(s) or not. See the Connection Options to see how libCURL tries to make persistent connections to save time.

### 64.22.57 GetInfoOSErrno as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The errno variable from a connect failure.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.58 GetInfoPreTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time, in seconds, it took from the start until the file transfer is just about to begin.
**Notes:** The Lasterror property is set. 0 for success.
This includes all pre-transfer commands and negotiations that are specific to the particular protocol(s) involved.

### 64.22.59 GetInfoPrimaryIP as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the ip address of the most recent (primary) connection.
**Example:**

```
dim c as new CURLSMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.22.60 GetInfoPrimaryPort as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the (remote) port of the most recent (primary) connection.
**Example:**

```
dim c as new CURLSMBS

// do some transfer
c.OptionURL = "http://www.mbsplugins.de/"
dim e as Integer = c.perform

// now check primary IP and port
MsgBox c.GetInfoPrimaryIP+":"+str(c.GetInfoPrimaryport)
```

### 64.22.61 GetInfoProtocol as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Get the protocol used in

the connection.
**Notes:** See kProtocol* constants.

### 64.22.62 GetInfoProxyAuthAvail as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A bitmask indicating the authentication method(s) available for your proxy authentication.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.63 GetInfoProxyError as integer

MBS CURL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries proxy error code.

### 64.22.64 GetInfoProxySSLVerifyResult as integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the result of the proxy certificate verification.
**Notes:** receive the result of the certificate verification that was requested (using the OptionProxySSLVerifyPeer option. This is only used for HTTPS proxies.

### 64.22.65 GetInfoRedirectCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total number of redirections that were actually followed.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.66 GetInfoRedirectTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** the total time, in seconds, it took for all redirection steps include name lookup, connect, pretransfer and transfer before final transaction was started.
**Notes:** The Lasterror property is set. 0 for success.
RedirectTime contains the complete execution time for multiple redirections. (Added in 7.9.7)

### 64.22.67 GetInfoRedirectURL as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The redirection URL.

### 64.22.68 GetInfoReferer as string

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries referrer text.

### 64.22.69 GetInfoRequestSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total size of the issued requests.
**Notes:** The Lasterror property is set. 0 for success.
This is so far only for HTTP requests. Note that this may be more than one request if FOLLOWLOCATION is true.

### 64.22.70 GetInfoResponseCode as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last received HTTP or FTP code.
**Notes:** The Lasterror property is set. 0 for success.
This will be zero if no server response code has been received. Note that a proxy's CONNECT response should be read with GetInfoHTTPConnectCode and not this.

With HTTP transfer, a successful transfer reports 200 here. If the page is not found, you get 404. Or any other HTTP Response code.

### 64.22.71 GetInfoRetryAfter as integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the Retry-After retry delay.
**Notes:** Receive the number of seconds the HTTP server suggesets the client should wait until the next request is issued.

The information from the "Retry-After:" header.

While the HTTP header might contain a fixed date string, the RetryAfter will always return number of seconds to wait - or zero if there was no header or the header couldn't be parsed.

### 64.22.72 GetInfoRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query RTSP Client sequence counter.

### 64.22.73 GetInfoRTSPCSEQRecv as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query RTSP sequence counter received.

### 64.22.74 GetInfoRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query RTSP Server sequence counter.

### 64.22.75 GetInfoRTSPSessionID as string

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query RTSP session ID.

### 64.22.76 GetInfoScheme as string

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the URL scheme (sometimes called protocol) used in the connection

### 64.22.77 GetInfoSizeDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total amount of bytes that were downloaded.
**Notes:** The Lasterror property is set. 0 for success.
The amount is only for the latest transfer and will be reset again for each new transfer.

### 64.22.78 GetInfoSizeUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total amount of bytes that were uploaded.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.79 GetInfoSpeedDownload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The average download speed that CURL measured for the complete download.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.80 GetInfoSpeedUpload as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The average upload speed that CURL measured for the complete upload.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.81 GetInfoSSLEngines as CURLSListMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receive a linked-list of OpenSSL crypto-engines supported.
**Notes:** The Lasterror property is set. 0 for success.
Note that engines are normally implemented in separate dynamic libraries. Hence not all the returned engines may be available at run-time.

### 64.22.82 GetInfoSSLVerifyResult as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** the result of the certification verification that was requested (using the SSLVerifyPeer option).
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.83 GetInfoStartTransferTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** the time, in seconds, it took from the start until the first byte is just about to be transferred.
**Notes:** The Lasterror property is set. 0 for success.
This includes the pretransfer time and also the time the server needs to calculate the result.

### 64.22.84 GetInfoTotalTime as Double

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total time in seconds for the previous transfer, including name resolving, TCP connect etc.
**Notes:** The Lasterror property is set. 0 for success.

### 64.22.85 LoadAPI

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the default CURL library.
**Notes:** This method is called by the constructor. So you don't need this except you want to test explicit with APILoaded whether the loading worked before you use the CURLSMBS class.

Loads the "libCURL.dll" Windows library (with SSL support this one max require OpenSSL).
Loads on Mac OS X and Linux the libCURL file in /usr/lib.

### 64.22.86 LoadErrorString as string

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error string from the LoadLibrary function.

### 64.22.87 LoadLibrary(file as folderitem) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.22.88 LoadLibrary(path as string) as boolean 11444

### 64.22.88 LoadLibrary(path as string) as boolean

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the CURL library from the given path.
**Notes:** You only need to use this function if you have your own CURL Library.

Loads a Windows DLL, a Linux shared library or a Mac OS X shared library from the given path.

Returns true on success.
See also:

- 64.22.87 LoadLibrary(file as folderitem) as boolean 11444

### 64.22.89 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens input file for reading data while PerformMT runs.
**Example:**

```
Dim c As New CURLSMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If
```

```
// do a SFTP upload
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
c.OptionUsername = "test"
c.OptionPassword = "test"
c.CollectOutputData = false

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.
With 15.2 version of plugin, this also works with Perform.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the file) and then read all the data in a string and put into the InputData property.
See also:

- 64.22.90 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean 11445

### 64.22.90 OpenMTInputFile(Path as String, Offset as Integer = 0) as boolean

MBS CURL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens input file for reading data while PerformMT runs.
**Notes:** The read event is not called with PerformMT.
Offset is helpful for HTTP PUT requests with range, so you can start with an offset.

Must be called before Perform or PerformMT, so we can stream data from the file.
The file is closed automatically when Perform methods finish their work.

The function returns false in case of an error, e.g. if file is already open by another application, the foleritem/path is invalid, the offset is negative or we can't determinate the file size.
It may be wise to have a fallback in your code to use a binarystream in that case (if that one can read the

file) and then read all the data in a string and put into the InputData property.
See also:

- 64.22.89 OpenMTInputFile(file as folderitem, Offset as Integer = 0) as boolean 11444

### 64.22.91 Perform as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform a file transfer
**Example:**

```
// if you get a curl call like this

'curl -X PATCH "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } " \
'-H "Authorization: Bearer YOUR_TOKEN" \
'-H "Content-Type: application/json" \
'–data ' {
'"fields": {
'"Address": "1 Ferry Building",
'"Name": "Ferry Building",
'"Visited": True
' }
' } '

// you translate it to this:

Dim c As New CURLSMBS

Dim Payload As String = _
" { "+_
"""fields"": { "+_
"""Address"": ""1 Ferry Building"","+_
"""Name"": ""Ferry Building"","+_
"""Visited"": True"+_
" } "+_
" } "

c.OptionCustomRequest = "PATCH"
c.OptionURL = "https://api.airtable.com/v0/ { baseId } / { tableIdOrName } / { recordId } "
c.SetOptionHTTPHeader Array("Content-Type: application/json", "Authorization: Bearer YOUR_TO-
KEN")
c.OptionPostFields = Payload

Dim Error As Integer = c.Perform
Dim ResponseCode As Integer = c.GetInfoResponseCode
Dim DebugLog As String = c.DebugMessages
Dim Output As String = c.OutputData
```

Break

**Notes:** This function is called after all the options are set, and will perform the transfer as described in the options.

You can do any amount of calls to Perform. If you intend to transfer more than one file, you are even encouraged to do so. libCURL will then attempt to re-use the same connection for the following transfers, thus making the operations faster, less CPU intense and using less network resources. Just note that you will have to use the option properties between the invokes to set options for the following Perform.

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

Possible values for the retun value:

The error value -1 is used from the plugin to report that something is missing like OpenSSL dlls on Windows.

With SFTP, you can get logged error "Upload failed: Operation failed (4/-31)" when upload uses path to folder instead of file in URL.

### 64.22.92 PerformMT as Integer

MBS CURL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform a file transfer with preemptive multithreading.
**Example:**

```
Dim c As New CURLSMBS
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")

If c.OpenMTInputFile(file) Then
// okay
Else
MessageBox "Failed to open file to upload."
Return
End If

// do a SFTP upload
c.OptionURL = "sftp://monkeybreadsoftware.de/folder/test.rtf"
c.OptionUpload = True
c.OptionUsername = "test"
c.OptionPassword = "test"
```

```
Dim e As Integer = c.PerformMT

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** Same as Perform, but with additional multithreading.

As the actual transfer runs on a preemptive thread, the events Debug, Write, Header and Progress are called asynchrounously and run a few milliseconds later. You can return true in Progress event to stop transfer, but you will get more events before the transfer is stopped.

You can call CreateMTDebugOutputFile, CreateMTHeaderOutputFile and CreateMTOutputFile before PerformMT to have output data be written into files. Call OpenMTInputFile to let the plugin read input data (form post or upload) from an input file.

Do not call other CURL functions on this CURLSMBS instance while PerformMT is running!

Typical error codes are 6 for a wrong domain name in the URL, 67 for wrong name/password combination, 60 for missing SSL settings, 1 for an unsupported protocol.

To avoid trouble with app hanging on quit of application, be sure to set cancel property to true in window close event to cancel any pending transfer.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 64.22.93 ProcessRelativeURL(BaseURL as String, RelativeURL as String) as String

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes an URL to come from relative URL to a new absolute URL.
**Example:**

```
Dim baseURL As String = "https://monkeybreadsoftware.net/themes.shtml"
Dim RelativeURL As String = "topic-curl.shtml"
```

```
Dim URL As String = CURLSMBS.ProcessRelativeURL(baseURL, RelativeURL)
Break
```

**Notes:** Raises an UnsuppportedOperationException in case of failure.

### 64.22.94 ReceiveData(byref data as Memoryblock, BytesToRead as Int64) as Int64

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receives raw data on a connection.
**Notes:** This function receives raw data from the established connection. You may use it together with SendData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

The data memoryblock is a reference to your variable that will get the received data. BytesToRead is the maximum amount of data you can get in that buffer. The function returns the number of received bytes.

To establish the connection, set OptionConnectOnly = true before calling Perform. Note that ReceiveData does not work on connections that were created without this option.

The call will return kError_AGAIN if there is no data to read - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, wait for data to arrive.

Wait on the socket only if ReceiveData returns kError_AGAIN. The reason for this is libcurl or the SSL library may internally cache some data, therefore you should call ReceiveData until all data is read which would include any cached data.

Furthermore if you wait on the socket and it tells you there is data to read, ReceiveData may return CURLE_AGAIN if the only data that was read was for internal SSL processing, and no other data is available.

On success, sets lasterror to kError_OK (0), stores the received data into memory block, and returns the number of bytes it actually read.

On failure, returns zero and lasterror is set to the appropriate error code.

The function may return kError_AGAIN. In this case, use your operating system facilities to wait until data can be read, and retry.

Reading exactly 0 bytes indicates a closed connection.

If there's no socket available to use from the previous transfer, this function returns kError_UNSUPPORTED_PROTOCOL.

### 64.22.95 Reset

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Re-initializes all options previously set on a specified CURL handle to the default values.
**Notes:** It does not change the following information kept in the handle: live connections, the Session ID cache, the DNS cache, the cookies and shares.

### 64.22.96 SendData(data as Memoryblock) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.22.97 SendData(data as string) as Integer 11450

### 64.22.97 SendData(data as string) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends raw data over a connection.
**Notes:** This function sends arbitrary data over the established connection. You may use it together with ReceiveData to implement custom protocols using libcurl. This functionality can be particularly useful if you use proxies and/or SSL encryption: libcurl will take care of proxy negotiation and connection set-up.

Provide the data to send via parameter. We return the number of bytes sent.

To establish the connection, set OptionConnectOnly = true option before calling Perform methods. Note that SendData will not work on connections that were created without this option.

The call will return kError_AGAIN if it's not possible to send data right now - the socket is used in non-blocking mode internally. When kError_AGAIN is returned, please wait.

Furthermore if you wait on the socket and it tells you it's writable, SendData may return kError_AGAIN if the only data that was sent was for internal SSL processing, and no other data could be sent.
See also:

- 64.22.96 SendData(data as Memoryblock) as Integer 11450

### 64.22.98 SetInputData(data as MemoryBlock)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.22.99 SetInputData(data as string) 11451

### 64.22.99 SetInputData(data as string)

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the input data.
**Example:**

```
Dim c As New CURLSMBS

c.SetInputData "Hello World"
```

```
// do a HTTP Upload with PUT
c.OptionUpload = True
c.OptionURL = "https://monkeybreadsoftware.de/filemaker/examples/echo.php"

// or do a FTP upload
'c.OptionURL = "ftp://monkeybreadsoftware.de/folder/file.txt"

Dim e As Integer = c.Perform

Dim ErrorMessage As String = c.LasterrorMessage
Dim ErrorLog As String = c.DebugMessages
Dim ResultData As String = c.OutputData

Break
```

**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
See also:

- 64.22.98 SetInputData(data as MemoryBlock) 11451

### 64.22.100 SetOptionConnectTo(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set list of host:port:connect-to-host:connect-to-port, overrides the URL's host:port (only for the network layer)

### 64.22.101 SetOptionEmptyPassword

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an empty password.
**Notes:** Normally you have no password unless you set it.
But if you set a password with empty string, the plugin sets CURL to use no password.
This method is to use an empty password.

### 64.22.102 SetOptionHTTP200Aliases(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A linked list of aliases to be treated as valid HTTP 200 responses.
**Notes:** Some servers respond with a custom header response line. For example, IceCast servers respond with "ICY 200 OK". By including this string in your list of aliases, the response will be treated as a valid HTTP header line such as "HTTP/1.0 200 OK".

The alias itself is not parsed for any version strings. So if your alias is "MYHTTP/9.9", LibCURL will not treat the server as responding with HTTP version 9.9. Instead LibCURL will use the value set by option HTTPVersion.

The Lasterror property is set. 0 for success.

| | | |
|---|---|---|
| const kError_FunctionMissing | = -1 | |
| const kError_OK | = 0 | |
| const kError_UNSUPPORTED_PROTOCOL | = 1 | |
| const kError_FAILED_INIT | = 2 | |
| const kError_URL_MALFORMAT | = 3 | |
| const kError_URL_MALFORMAT_USER | = 4 | (NOT USED) |
| const kError_COULDNT_RESOLVE_PROXY | = 5 | |
| const kError_COULDNT_RESOLVE_HOST | = 6 | |
| const kError_COULDNT_CONNECT | = 7 | |
| const kError_FTP_WEIRD_SERVER_REPLY | = 8 | |
| const kError_FTP_ACCESS_DENIED | = 9 | a service was denied by the FTP server due to lack of access when login fails this is not returned. |
| const kError_FTP_USER_PASSWORD_INCORRECT | = 10 | |
| const kError_FTP_WEIRD_PASS_REPLY | = 11 | |
| const kError_FTP_WEIRD_USER_REPLY | = 12 | |
| const kError_FTP_WEIRD_PASV_REPLY | = 13 | |
| const kError_FTP_WEIRD_227_FORMAT | = 14 | |
| const kError_FTP_CANT_GET_HOST | = 15 | |
| const kError_FTP_CANT_RECONNECT | = 16 | |
| const kError_FTP_COULDNT_SET_BINARY | = 17 | |
| const kError_PARTIAL_FILE | = 18 | |
| const kError_FTP_COULDNT_RETR_FILE | = 19 | |
| const kError_FTP_WRITE_ERROR | = 20 | |
| const kError_FTP_QUOTE_ERROR | = 21 | |
| const kError_HTTP_RETURNED_ERROR | = 22 | |
| const kError_WRITE_ERROR | = 23 | |
| const kError_MALFORMAT_USER | = 24 | NOT USED |
| const kError_FTP_COULDNT_STOR_FILE | = 25 | failed FTP upload |
| const kError_READ_ERROR | = 26 | could open/read from file |
| const kError_OUT_OF_MEMORY | = 27 | |
| const kError_OPERATION_TIMEOUTED | = 28 | the timeout time was reached |
| const kError_FTP_COULDNT_SET_ASCII | = 29 | TYPE A failed |
| const kError_FTP_PORT_FAILED | = 30 | FTP PORT operation failed |
| const kError_FTP_COULDNT_USE_REST | = 31 | the REST command failed |
| const kError_FTP_COULDNT_GET_SIZE | = 32 | the SIZE command failed |
| const kError_HTTP_RANGE_ERROR | = 33 | RANGE "command" didn't work |
| const kError_HTTP_POST_ERROR | = 34 | |
| const kError_SSL_CONNECT_ERROR | = 35 | wrong when connecting with SSL |
| const kError_BAD_DOWNLOAD_RESUME | = 36 | couldn't resume download |
| const kError_FILE_COULDNT_READ_FILE | = 37 | |
| const kError_LDAP_CANNOT_BIND | = 38 | |
| const kError_LDAP_SEARCH_FAILED | = 39 | |
| const kError_LIBRARY_NOT_FOUND | = 40 | |
| const kError_FUNCTION_NOT_FOUND | = 41 | |
| const kError_ABORTED_BY_CALLBACK | = 42 | |
| const kError_BAD_FUNCTION_ARGUMENT | = 43 | |
| const kError_BAD_CALLING_ORDER | = 44 | NOT USED |
| const kError_INTERFACE_FAILED | = 45 | CURLOPT_INTERFACE failed |
| const kError_BAD_PASSWORD_ENTERED | = 46 | NOT USED |
| const kError_TOO_MANY_REDIRECTS | = 47 | catch endless re-direct loops |
| const kError_UNKNOWN_TELNET_OPTION | = 48 | User specified an unknown option |
| const kError_TELNET_OPTION_SYNTAX | = 49 | Malformed telnet option |
| const kError_OBSOLETE | = 50 | NOT USED |
| const kError_SSL_PEER_CERTIFICATE | = 51 | peer's certificate wasn't ok |
| const kError_GOT_NOTHING | = 52 | when this is a specific error |
| const kError_SSL_ENGINE_NOTFOUND | = 53 | SSL crypto engine not found |
| const kError_SSL_ENGINE_SETFAILED | = 54 | can not set SSL crypto engine as default |
| const kError_SEND_ERROR | = 55 | failed sending network data |
| const kError_RECV_ERROR | = 56 | failure in receiving network data |
| const kError_SHARE_IN_USE | = 57 | share is in use |
| const kError_SSL_CERTPROBLEM | = 58 | problem with the local certificate |
| const kError_SSL_CIPHER | = 59 | couldn't use specified cipher |
| const kError_SSL_CACERT | = 60 | problem with the CA cert (path?) |
| const kError_BAD_CONTENT_ENCODING | = 61 | Unrecognized transfer encoding |
| const kError_LDAP_INVALID_URL | = 62 | Invalid LDAP URL |
| const kError_FILESIZE_EXCEEDED | = 63 | Maximum file size exceeded |
| const kError_FTP_SSL_FAILED | = 64 | Requested FTP SSL level failed |
| const kError_SEND_FAIL_REWIND | = 65 | Sending the data requires a rewind that failed |
| const kError_SSL_ENGINE_INITFAILED | = 66 | failed to initialise ENGINE |
| const kError_LOGIN_DENIED | = 67 | user, password or similar was not accepted and we failed to login |

### 64.22.103 SetOptionHTTPHeader(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A linked list of HTTP headers to pass to the server in your HTTP request.
**Example:**

```
dim c as new CURLSMBS
c.SetOptionHTTPHeader array("Expect:", "Content-Type: text/xml", "SOAPAction: ""login""")
```

**Notes:** If you add a header that is otherwise generated and used by libCURL internally, your added one will be used instead. If you add a header with no contents as in 'Accept:' (no data on the right side of the colon), the internally used header will get disabled. Thus, using this option you can add new headers, replace internal headers and remove internal headers. To add a header with no contents, make the contents be two quotes: "". The headers included in the linked list must not be CRLF-terminated, because CURL adds CRLF after each header item. Failure to comply with this will result in strange bugs because the server will most likely ignore part of the headers you specified.

The first line in a request (containing the method, usually a GET or POST) is not a header and cannot be replaced using this option. Only the lines following the request-line are headers. Adding this method line in this list of headers will only cause your request to send an invalid header.

Pass an empty array to this to reset back to no custom headers.

The Lasterror property is set. 0 for success.

### 64.22.104 SetOptionMailRecipients(list() as string)

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the array of email recipient addresses.

### 64.22.105 SetOptionPostQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an array to a list of FTP commands to pass to the server after your ftp transfer request.
**Example:**

```
dim d as CURLSMBS // your CURL object

dim ws() As String
```

```
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"
d.SetOptionPostQuote(ws)
```

**Notes:** Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.
If you want to do a ftp operation instead of download/upload/directory listing, please use SetOptionQuote.

### 64.22.106 SetOptionPreQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an array to a list of FTP commands to pass to the server after the transfer type is set.
**Notes:** Disable this operation again by using an empty array for this option. Before version 7.15.6, if you also set Nobody to true, this option didn't work.

The Lasterror property is set. 0 for success.

### 64.22.107 SetOptionProxyHeader(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set list of headers used for proxy requests only.

### 64.22.108 SetOptionQuote(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an array or a list of FTP commands to pass to the server prior to your ftp request.
**Example:**

```
dim curl as new CURLSMBS
curl.SetOptionQuote array("DELE filename.txt")
```

**Notes:** This will be done before any other FTP commands are issued (even before the CWD command).

Disable this operation again by using an empty array for this option.

The Lasterror property is set. 0 for success.

### 64.22.109 SetOptionResolve(list() as string)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Send linked-list of name:port:address sets.

### 64.22.110 SetOptionTelnetOptions(list() as string)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provide an array of variables to pass to the telnet negotiations.
**Notes:** The variables should be in the format <option=value>. libCURL supports the options 'TTYPE', 'XDISPLOC' and 'NEW_ENV'. See the TELNET standard for details.

The Lasterror property is set. 0 for success.

### 64.22.111 SetPathCAInfo(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A path holding one or more certificates to verify the peer with.
**Example:**

```
dim cacert as FolderItem // your cacert.pem file
dim CURL as new CURLMBS
CURL.OptionSSLVerifyHost = 2 // verify server
CURL.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
CURL.SetPathCAInfo cacert
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.

### 64.22.112 SetPathCAPath(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A path to the directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLSMBS

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
c.SetPathCAPath cacert
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.22.113 SetPathCRLFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the path with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)

### 64.22.114 SetPathIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the path to a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

### 64.22.115 SetPathNetRCFile(path as folderitem)

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the path to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

### 64.22.116 SetPathProxyIssuerCert(path as folderitem)

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the proxy issuer SSL certificate filename.
**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProx-

ySSLVerifyPeer has to be set too for the check to fail).

### 64.22.117 SetupAWS(AWSAccessKeyId as String, AWSSecretAccessKey as String, Region as String, Service as String, Path as String, Domain as String, Verb as String, HashedPayload as String = ””, Headers() as String = nil, queryParameters() as string = nil, NoSSL as boolean = false) as boolean

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Setup CURL to transfer to Amazon Webservices.
**Notes:** This implements AWS4-HMAC-SHA256 signature for credentials, sets authentication, URL, HTTP Headers and other parameters.
For upload or post, please set input parameters first.

| | | |
|---|---|---|
| AWSAccessKeyId | Your access key for AWS. | |
| AWSSecretAccessKey | Your secret. | |
| Region | The region to use. | ”eu-central-1” |
| Service | The service to use. | ”s3” |
| Path | The path for the URL. Should always start with ”/”. | ”/test.jpg” |
| Domain | Optional the domain to use. By default we just build it from region and service. | ”s3.eu-central-1.amazonaws.com” or ”s3-ap-southeast-2.amazonaws.com” |
| Verb | The HTTP Operation to do. Can be POST, PUT, PATCH, GET or DELETE. | ”PUT” |
| HashedPayload | The hashed payload. If empty, we calculate it automatically from input data or postfields. This is a lowercase hex SHA256. | |
| Headers | Optional extra HTTP headers to include. | ”x-amz-acl: public-read” |
| queryParameters | Optional query parameter list with entries like ”key=value”, URL encoded. | |

Returns true on success or false on failure.
Throws exceptions when parameters are insufficient (UnsupportedOperationException).

Works also for other compatible S3 services beside Amazon’s like the one from Wasabi or Dell ECS.
Added PATCH as verb in version 23.0.

Please be aware that this function depends on a correct time and date set on the computer. If the time is not set correct, the authentication will fail.

### 64.22.118 SetupEmail(email as Variant) as boolean

MBS CURL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Setups existing CURL session for an email transfer.
**Example:**

```
dim e as new CURLEmailMBS

e.SetFrom ”test@test.test”, ”Christian M√ºller”
e.Subject = ”Hello World ,òÔè”
e.SMTPPassword = ”xxx”
```

```
e.SMTPUsername = "xxx"
e.SetServer "smtp.test.test", true
e.AddTo "test@test.test", "Test M√ºller"
e.PlainText = "Hello World," + EndOfLine + "Smilies: ,òÔè üòò üòÑ"

dim c as new CURLSMBS

if c.SetupEmail(e) then

dim er as Integer = c.Perform
if er = 0 then
MsgBox "Email sent"
end if
end if
```

**Notes:** You can set your own settings like proxy after this function call.
If you like you can reuse the email and CURL objects after you sent an email, change values and send another email.
Returns true on success or false on failure.

### 64.22.119 SetupOAuth(ConsumerKey as String, ConsumerSecret as String, AccessToken as String, AccessTokenSecret as String, HTTPVerb as String, URL as String, Parameters() as String = nil, Headers() as String = nil, Datas() as String = nil, Nonce as String = "", Timestamp as String = "", HMAC as String = "", Verifier as String = "", Realm as String = "") as boolean

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Setups an OAuth signed transfer.
**Notes:** The plugin calculates the signature and adds headers for authorization to the CURL handle.
Sets URL with parameters and optionally data values for POST.

| Parameter | Description | Example |
|---|---|---|
| ConsumerKey | The oauth consumer key. | "xvz1evFS4wEEPTGEFPHBog" |
| ConsumerSecret | The oauth consumer secret. | "kAcSOqF21Fu85e7zjz7ZN2U4ZRhfV3WpwPAoE3Z7kBw" |
| AccessToken | The oauth access token. | "370773112-GmHxMAgYyLbNEtIKZeRNFsMKPR9EyMZeS9weJAEb" |
| AccessTokenSecret | The oauth access token secret. Can be empty if not yet known. | "LswwdoUaIvS8ltyTt5jkRh4J50vUPVVHtR2YPi5kE" |
| HTTPVerb | The HTTP verb. e.g. POST, PUT, GET, DELETE. Default if empty is GET. | "POST" |
| URL | The URL to query without parameters. | "https://api.twitter.com/1.1/statuses/update.json" |
| Parameters | List of parameters. Can be empty. Please pass list with newline as delimiter. Values should be URL encoded already. | "include_entities=true" |
| Headers | List of additional header entries to include. Can be empty. We automatically set Authorization header. | "Accept: application/json¶Content-Type: application/json" |
| Datas | Data value list for POST. | "status=Hello¶others=123" |
| Nonce | The nonce value. If empty, we generate it automatically for you. | "kYjzVBB8Y0ZFabxSWbWovY3uYSQ2pTgmZeNu2VS4cg" |
| Timestamp | The timestamp to use for signature. If empty, we query current timestamp (same as you calling Time.UnixTimeStamp) | 1318622958 |
| HMAC | Which HMAC algorithm to use. Can be HMAC-SHA512, HMAC-SHA256 or HMAC-SHA1. Default is HMAC-SHA1 if parameter is missing or empty. | "HMAC-SHA1" |
| Verifier | The verifier. Usually an ID shown on a website after login to the service and authorization of an app. | "3456789" |

Added Realm parameter for version 20.5.

### 64.22.120 UpKeep

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform any connection upkeep checks.
**Notes:** Perform any connection upkeep checks.
Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.
Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
This function must be explicitly called in order to perform the upkeep work. The connection upkeep interval is set with OptionUpkeepIntervalMS.

### 64.22.121 UseSystemCertificates as Integer

MBS CURL Plugin, Plugin Version: 17.2, Platforms: macOS, Windows, Targets: All.

**Function:** Read certificate from system and installs them in CURL session,.
**Notes:** For macOS and Windows we load the available certificates from keychain or Windows Certificate Store and pass them to CURL. This is better than having no certificates at all.
Even better is normally to provide a cacert.pem file with only the expected certificates.

Returns number of certificates loaded.

### 64.22.122 WebSocketMeta as CURLSWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries last frame metadata.
**Notes:** Only useful if called in Write event.

### 64.22.123 WebSocketReceive(BufferSize as Integer = 65536) as CURLSWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receive WebSocket data.
**Example:**

```
dim curl as CURLSMBS // your curl handle

dim m as CURLSWebSocketFrameMBS = curl.WebSocketReceive
```

```
if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
```

**Notes:** Retrieves as much as possible of a received WebSocket data fragment into the buffer, but not more than BufferSize bytes. The bytesReceived property in CURLSWebSocketFrameMBS is set to the number of bytes actually stored.

If there is more fragment data to deliver than what fits in the provided buffer, CURL returns a full buffer and the application needs to call this function again to continue draining the buffer.

The returned CURLSWebSocketFrameMBS contains the data and the metadata about the received data.

Lasterror property is set.

### 64.22.124 WebSocketSend(Data as MemoryBlock, FrameSize as Integer = 0, SendFlags as Integer = 0) as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Send the specific message fragment over an established WebSocket connection.
**Notes:** The buffer holds the data to send.
Returns the number of payload bytes actually sent.

To send a (huge) fragment using multiple calls with partial content per invoke, set the kFlagOffset bit and the FrameSize argument as the total expected size for the first part, then set the kFlagOffset with a zero FrameSize for the following parts.

If not sending a partial fragment or if this is raw mode, FrameSize should be set to zero.

If kWebSocketRaw is enabled in WebSocketOptions, the flags argument should be set to 0.

Lasterror property is set.

### 64.22.125 Properties

### 64.22.126 APILoaded as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the CURL library was loaded.
**Notes:** The CURLSMBS constructor loads the library if it was not loaded before.
(Read only property)

### 64.22.127 Cancel as Boolean

MBS CURL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tells CURL instance to cancel transfer as soon as possible.
**Notes:** Especially when using PerformMT, you may see your app hang if user tries to quit application. To prevent the hang, please set Cancel = true in window close event. So when app quits and windows get destroyed, the PerformMT will see the Cancel being true and returns soon.
(Read and Write property)

### 64.22.128 CollectDebugData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectDebugMessages instead. **Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.22.129 CollectDebugMessages as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to collect debug message data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the DebugMessages Property instead of collecting the pieces yourself in the DebugMessage event. Of course this is optional and you can still process data in DebugMessage event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.22.130 CollectHeaderData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CollectHeaders instead.
**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.

Renamed to CollectHeaders in v23.0.
(Read and Write property)

### 64.22.131 CollectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to collect headers.
**Notes:** If you set this property to true, you can grab the data from the transfer in the Headers Property instead of collecting the pieces yourself in the header event. Of course this is optional and you can still process data in header event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.22.132 CollectOutputData as Boolean

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to collect output data.
**Notes:** If you set this property to true, you can grab the data from the transfer in the OutputData Property instead of collecting the pieces yourself in the write event. Of course this is optional and you can still process data in write event.
Due to memory limitation, collecting data will not work right if your app is running low on memory.
(Read and Write property)

### 64.22.133 DebugData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use DebugMessages instead.
**Function:** The debug data from CURL.
**Notes:** If CollectDebugData property is true, the plugin puts the data received in debugMessage event also

into this property, so you can grab it after the transfer.

Newer code should use DebugMessages property instead.
(Read only property)

### 64.22.134 DebugMessages as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The debug messages from CURL.
**Notes:** If CollectDebugMessage property is true, the plugin puts the data received in debugMessage event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.22.135 DebugWithData as Boolean

MBS CURL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to include data in debug messages.
**Example:**

```
dim c as new CURLSMBS
c.DebugWithData = true
c.OptionVerbose = true
c.CollectDebugMessages = true
```

**Notes:** (Read and Write property)

### 64.22.136 Handle as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle of the CURL object.
**Notes:** (Read and Write property)

### 64.22.137 HeaderData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this

property, so you can grab it after the transfer.

Renamed to Headers in v23.0.
(Read only property)

### 64.22.138 Headers as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use Headers instead. **Function:** The headers from CURL.
**Notes:** If CollectHeaders property is true, the plugin puts the data received in header event also into this property, so you can grab it after the transfer.
(Read only property)

### 64.22.139 InputData as String

MBS CURL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input data.
**Notes:** If you set input data, you do not need to use Read, RestartRead or Seek events.
The plugin will use the provided data for the upload.
Setting input data size, will also set the input file size (OptionInFileSizeLarge and OptionInFileSize).

Alternatively you can provide data in Read event or use OpenMTInputFile method to open a file on disk to upload.
(Read and Write property)

### 64.22.140 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The lasterror from the library.
**Example:**

```
Dim d As New CURLSMBS

d.OptionSSLVersion = 123

Dim LastError As Integer = d.LastError
// gives 43
Dim LastErrorText As String = d.LastErrorText
```

// A libcurl function was given a bad argument

Break

**Notes:** Set in the constructor while doing initialization as well as by by various curl calls.
Check the kError* constants.
(Read and Write property)

### 64.22.141 LastErrorMessage as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.
**Example:**

```
Dim d As New CURLSMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** The error message from the transfer.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read only property)

### 64.22.142 LasterrorText as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text for the lasterror code.
**Example:**

```
Dim d As New CURLSMBS

d.OptionURL = "http://192.168.2.53"
d.OptionConnectionTimeout = 5

Dim ErrorCode As Integer = d.Perform

Dim LastErrorMessage As String = d.LastErrorMessage
Dim LastErrorText As String = d.LastErrorText

Break
```

**Notes:** Static string matched to the error code, so you have an idea what's wrong.

e.g. Perform may report a timeout with code 28.
Then LasterrorText is "Timeout was reached" looked up for 28.

But LasterrorMessage would be something like "Failed to connect to x.x.x.x port 80 after 5000 ms: Timeout was reached".
(Read and Write property)

### 64.22.143 LibraryUsed as String

MBS CURL Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which library is in use.
**Notes:** This is for debugging only to see which library is in use.
(Read only property)

### 64.22.144 LibVersion as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a human readable string with the version number of libCURL and some of its important components (like OpenSSL version).
**Notes:** (Read only property)

### 64.22.145 OptionAbstractUnixSocket as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Path to an abstract Unix domain socket.
**Notes:** (Read and Write property)
See also ABSTRACT_UNIX_SOCKET option in CURL manual.

### 64.22.146 OptionAcceptEncoding as String

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the contents of the Accept-Encoding: header sent in a HTTP request, and enables decoding of a response when a Content-Encoding: header is received.
**Example:**

```
dim c as new CURLSMBS
c.OptionAcceptEncoding = "deflate"
```

**Notes:** Three encodings are supported: identity, which does nothing, deflate which requests the server to compress its response using the zlib algorithm, and gzip which requests the gzip algorithm. If a zero-length string is set, then an Accept-Encoding: header containing all supported encodings is sent.

This is a request, not an order; the server may or may not do it. This option must be set (to any non-NULL value) or else any unsolicited encoding done by the server is ignored. See the special file README.encoding for details (included with CURL source code).
(Read and Write property)
See also ACCEPT_ENCODING option in CURL manual.

### 64.22.147 OptionAcceptTimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Time-out accept operations (currently for FTP only) after this amount of milliseconds.
**Notes:** (Read and Write property)
See also ACCEPTTIMEOUT_MS option in CURL manual.

### 64.22.148 OptionAddressScope as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an integer specifying the scope_id value to use when connecting to IPv6 link-local or site-local addresses.
**Notes:** (Added in CURL 7.19.0)
(Read and Write property)

See also ADDRESS_SCOPE option in CURL manual.

### 64.22.149 OptionAppend as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also APPEND option in CURL manual.

### 64.22.150 OptionAutoReferer as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** When enabled, libCURL will automatically set the Referer: field in requests where it follows a Location: redirect.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also AUTOREFERER option in CURL manual.

### 64.22.151 OptionAWSSigV4 as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provides AWS V4 signature authentication on HTTP(S) header.
**Notes:** Pass a text that is the collection of specific arguments are used for creating outgoing authentication headers. The format of the param option is:

provider1 [ :provider2 [ :region [ :service ] ] ]

provider1, provider2:
The providers arguments are used for generating some authentication parameters such as "Algorithm", "date", "request type" and "signed headers".

region:
The argument is a geographic area of a resources collection. It is extracted from the host name specified in

the URL if omitted.

service:
The argument is a function provided by a cloud. It is extracted from the host name specified in the URL if omitted.

Note: This call set CURLOPT_HTTPAUTH to CURLAUTH_AWS_SIGV4. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.

Example with "Test:Try", when curl will do the algorithm, it will generate "TEST-HMAC-SHA256" for "Algorithm", "x-try-date" and "X-Try-Date" for "date", "test4_request" for "request type", "SignedHeaders=content-type;host;x-try-date" for "signed headers"
If you use just "test", instead of "test:try", test will be use for every strings generated

By default, the value of this parameter is empty. Calling CURLOPT_HTTPAUTH with CURLAUTH_AWS_SIGV4 is the same as calling this with "aws:amz" in parameter.
(Read and Write property)
See also AWS_SIGV4 option in CURL manual.

### 64.22.152 OptionBufferSize as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Your preferred size (in bytes) for the receive buffer in libCURL.
**Notes:** The main point of this would be that the write event gets called more often and with smaller chunks. This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size. (Added in 7.10)

This size is by default set as big as possible (OptionMaxWriteSize), so it only makse sense to use this option if you want it smaller.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also BUFFERSIZE option in CURL manual.

### 64.22.153 OptionCACacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the life-time for cached certificate stores.
**Notes:** Pass a number, this sets the timeout in seconds. This tells libcurl the maximum time any cached certificate store it has in memory may be kept and reused for new connections. Once the timeout has expired, a subsequent fetch requiring a certificate store will have to build a new one.
Building a certificate store from a CAINFO file (see OptionCAInfo) is a slow operation so curl may cache the generated certificate store internally to speed up future connections.
Set to zero to completely disable caching, or set to -1 to retain the cached store remain forever. By default, libcurl caches this info for 24 hours.
(Read and Write property)
See also CA_CACHE_TIMEOUT option in CURL manual.

### 64.22.154 OptionCAInfo as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string naming a file holding one or more certificates to verify the peer with.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This makes sense only when used in combination with the OptionSSLVerifyPeer option. If OptionSSLVerifyPeer is false, OptionCAINFO need not even indicate an accessible file.

Note that option is by default set to the system path where libCURL's cacert bundle is assumed to be stored, as established at build time.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAINFO option in CURL manual.

### 64.22.155 OptionCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CAInfo as blob value.
**Notes:** Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also CAINFO_BLOB option in CURL manual.

### 64.22.156 OptionCAPath as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string naming a directory holding multiple CA certificates to verify the peer with.
**Example:**

```
dim c as new CURLSMBS
c.OptionCAPath = "/data/MyCertificates"
```

**Notes:** The certificate directory must be prepared using the openssl c_rehash utility. This makes sense only when used in combination with the CURLOPT_SSL_VERIFYPEER option. If OptionSSLVerifyPeer is zero, OptionCAPath need not even indicate an accessible path. The OptionCAPath function apparently does not work in Windows due to some limitation in openssl. This option is OpenSSL-specific and does nothing if libCURL is built to use GnuTLS.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also CAPATH option in CURL manual.

### 64.22.157 OptionCertInfo as boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to true to enable libCURL's certificate chain info gatherer.
**Notes:** With this enabled, libCURL (if built with OpenSSL) will extract lots of information and data about the certificates in the certificate chain used in the SSL connection. This data is then possible to extract after a transfer using GetInfoCertInfo. (Added in 7.19.1)
(Read and Write property)
See also CERTINFO option in CURL manual.

### 64.22.158 OptionConnectionTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum time in seconds that you allow the connection to the server to take.
**Example:**

```
dim d as new CURLSMBS

d.OptionConnectionTimeOutMS = 5000
d.OptionConnectOnly = 1

// try this URL
d.OptionURL = URL

// try connection
dim e as integer = d.Perform

// check result
dim s as string = d.OutputData
TextArea1.text = FixText(S)

if e = 0 then
MsgBox "Connected"
else
MsgBox "Failed to connect"
end if
```

**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also the OptionTimeout option.
(Read and Write property)
See also CONNECTTIMEOUT option in CURL manual.

### 64.22.159 OptionConnectionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum time in milli seconds that you allow the connection to the server to take.
**Notes:** This only limits the connection phase, once it has connected, this option is of no more use. Set to zero to disable connection timeout (it will then only timeout on the system's internal timeouts). See also the OptionTimeout option.
(Read and Write property)

### 64.22.160 OptionConnectOnly as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A true tells the library to perform any required proxy authentication and connection setup, but no data transfer.
**Notes:** This option is useful with the CURLSMBS.GetInfoLastSocket function. The library can set up the connection and then the application can obtain the most recently used socket for special data transfers. (Added in 7.15.2)

Type changed to integer in v23.0 to enable passing 2 for WebSockets.
(Read and Write property)
See also CONNECT_ONLY option in CURL manual.

### 64.22.161 OptionCookie as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** It will be used to set a cookie in the http request.
**Notes:** The format of the string should be NAME=CONTENTS, where NAME is the cookie name and CONTENTS is what the cookie should contain.

If you need to set multiple cookies, you need to set them all using a single option and thus you need to concatenate them all in one single string. Set multiple cookies in one string like this: "name1=content1; name2=content2;" etc.

Using this option multiple times will only make the latest string override the previously ones.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIE option in CURL manual.

### 64.22.162 OptionCookieFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cookie file content.
**Notes:** It should contain the name of your file holding cookie data to read. The cookie data may be in Netscape / Mozilla cookie data format or just regular HTTP-style headers dumped to a file.

Given an empty or non-existing file or by passing the empty string (""), this option will enable cookies for this CURL handle, making it understand and parse received cookies and then use matching cookies in future request.

If you use this option multiple times, you just add more files to read. Subsequent files will add more cookies.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEFILE option in CURL manual.

### 64.22.163 OptionCookieJar as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** File path where to write the cookies to.
**Notes:** This will make libCURL write all internally known cookies to the specified file, when the object is destroyed. If no cookies are known, no file will be created. Specify "-" to instead have the cookies written to stdout. Using this option also enables cookies for this session, so if you for example follow a location it will make matching cookies get sent accordingly.

If the cookie jar file can't be created or written to, libCURL will not and cannot report an error for this. Using OptionVerbose or DebugFunction event will get a warning to display, but that is the only visible feedback you get about this possibly lethal situation.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also COOKIEJAR option in CURL manual.

### 64.22.164 OptionCookieList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cookie string.
**Notes:** Cookie can be either in Netscape / Mozilla format or just regular HTTP-style header (Set-Cookie: ...) format. If CURL cookie engine was not enabled it will enable its cookie engine. Passing a magic string "ALL" will erase all cookies known by CURL. (Added in 7.14.1) Passing the special string "SESS" will only erase all session cookies known by CURL. (Added in 7.15.4)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIELIST option in CURL manual.

### 64.22.165 OptionCookieSession as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to true to mark this as a new cookie "session".
**Notes:** It will force libCURL to ignore all cookies it is about to load that are "session cookies" from the previous session. By default, libCURL always stores and loads all cookies, independent if they are session cookies are not. Session cookies are cookies without expiry date and they are meant to be alive and existing for this "session" only.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COOKIESESSION option in CURL manual.

### 64.22.166 OptionCRLF as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert Unix newlines to CRLF newlines on transfers.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

(Read and Write property)
See also CRLF option in CURL manual.

### 64.22.167 OptionCRLFile as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string naming a file with the concatenation of CRL (in PEM format) to use in the certificate validation that occurs during the SSL exchange.
**Notes:** When CURL is built to use NSS or GnuTLS, there is no way to influence the use of CRL passed to help in the verification process. When libCURL is built with OpenSSL support, X509_V_FLAG_CRL_CHECK and X509_V_FLAG_CRL_CHECK_ALL are both set, requiring CRL check against all the elements of the certificate chain if a CRL file is passed.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option.

A specific error code (CURLE_SSL_CRL_BADFILE) is defined with the option. It is returned when the SSL exchange fails because the CRL file cannot be loaded. Note that a failure in certificate verification due to a revocation information found in the CRL does not trigger this specific error. (Added in 7.19.0)
(Read and Write property)
See also CRLFILE option in CURL manual.

### 64.22.168 OptionCustomRequest as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** It will be user instead of GET or HEAD when doing an HTTP request, or instead of LIST or NLST when doing an ftp directory listing.
**Example:**

```
dim c as CURLSMBS // your CURL instance

c.URL = "ftp://..."
c.customRequest = "MLSD" // ftp advanced directory listing
```

**Notes:** This is useful for doing DELETE or other more or less obscure HTTP requests. Don't do this at will, make sure your server supports the command first.

Restore to the internal default by setting this to "".

Many people have wrongly used this option to replace the entire request with their own, including multiple

headers and POST contents. While that might work in many cases, it will cause libCURL to send invalid requests and it could possibly confuse the remote server badly. Use CURLOPT_POST and OptionPostFields to set POST data. Use OptionHTTPHeader to replace or extend the set of headers sent by libCURL. Use OptionHTTPVersion to change HTTP version.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

For WebDAV, you can set this to "MKCOL" to create a folder at the given URL.
(Read and Write property)
See also CUSTOMREQUEST option in CURL manual.

### 64.22.169 OptionDefaultProtocol as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the protocol used when curl is given a URL without a protocol.
**Notes:** (Read and Write property)
See also DEFAULT_PROTOCOL option in CURL manual.

### 64.22.170 OptionDirListOnly as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** For FTP and SFTP based URLs a parameter set to true tells the library to list the names of files in a directory, rather than performing a full directory listing that would normally include file sizes, dates etc.
**Notes:** For POP3 a parameter of true tells the library to list the email message or messages on the POP3 server. This can be used to change the default behaviour of libCURL, when combined with a URL that contains a message ID, to perform a "scan listing" which can then be used to determine the size of an email.

Note: For FTP this causes a NLST command to be sent to the FTP server. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

Setting this option to true also implies a directory listing even if the URL doesn't end with a slash, which otherwise is necessary.

Do NOT use this option if you also use OptionWildCardMatch as it will effectively break that feature then.
(Read and Write property)
See also DIRLISTONLY option in CURL manual.

### 64.22.171 OptionDisableUserNameInURL as Boolean

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disallow specifying username/login in URL.
**Notes:** The value true tells the library to not allow URLs that include an username.
(Read and Write property)

### 64.22.172 OptionDNSCacheTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The timeout in seconds.
**Notes:** Name resolves will be kept in memory for this number of seconds. Set to zero (0) to completely disable caching, or set to -1 to make the cached entries remain forever. By default, libCURL caches this info for 60 seconds.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also DNS_CACHE_TIMEOUT option in CURL manual.

### 64.22.173 OptionDNSInterface as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the name of the network interface that the DNS resolver should bind to.
**Notes:** This must be an interface name (not an address). Set this option to "" to use the default setting (don't bind to a specific interface).
(Read and Write property)
See also DNS_INTERFACE option in CURL manual.

### 64.22.174 OptionDNSLocalIPv4 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the local IPv4 address that the resolver should bind to.
**Notes:** The argument should be of string and contain a single numerical IPv4 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP4 option in CURL manual.

### 64.22.175 OptionDNSLocalIPv6 as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the local IPv6 address that the resolver should bind to.
**Notes:** The argument should be of type string and contain a single IPv6 address as a string.
Set this option to "" to use the default setting (don't bind to a specific IP address).
(Read and Write property)
See also DNS_LOCAL_IP6 option in CURL manual.

### 64.22.176 OptionDNSServers as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the name servers to use for DNS resolution.
**Notes:** (Read and Write property)
See also DNS_SERVERS option in CURL manual.

### 64.22.177 OptionDNSShuffleAddresses as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to shuffle DNS addresses.
**Notes:** When a name is resolved and more than one IP address is returned, shuffle the order of all returned addresses so that they will be used in a random order. This is similar to the ordering behavior of gethostbyname which is no longer used on most platforms.

Addresses will not be reshuffled if a name resolution is completed using the DNS cache. DNSCacheTimeout property can be used together with this option to reduce DNS cache timeout or disable caching entirely if frequent reshuffling is needed.

Since the addresses returned will be reordered randomly, their order will not be in accordance with RFC 3484 or any other deterministic order that may be generated by the system's name resolution implementation. This may have performance impacts and may cause IPv4 to be used before IPv6 or vice versa.
Default is false.
(Read and Write property)
See also DNS_SHUFFLE_ADDRESSES option in CURL manual.

### 64.22.178 OptionDOHSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to verify the host name in the DOH (DNS-over-HTTPS) SSL certificate.
**Notes:** Pass a 2 as asking curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyPeer and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1 it is treated the same as 2. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!
(Read and Write property)
See also DOH_SSL_VERIFYHOST option in CURL manual.

### 64.22.179 OptionDOHSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to verify the DOH SSL certificate.
**Notes:** Pass 1 to enable or 0 to disable.
This option tells curl to verify the authenticity of the DOH (DNS-over-HTTPS) server's certificate. A value of 1 means curl verifies; 0 (zero) means it doesn't.
This option is the DOH equivalent of CURL.SetOptionSSLVerifyPeer and only affects requests to the DOH server.
When negotiating a TLS or SSL connection, the server sends a certificate indicating its identity. Curl verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. curl uses a default bundle of CA certificates (the path for that is determined at build time) and you can specify alternate certificates with the CURL.SetOptionCAInfo option or the CURL.SetOptionCAPath option.
When CURL.SetOptionDOHSSLVerifyPeer is enabled, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the peer certificate verification succeeds regardless.
Authenticating the certificate is not enough to be sure about the server. You typically also want to ensure that the server is the server you mean to be talking to. Use CURL.SetOptionDOHSSLVerifyHost for that. The check that the host name in the certificate is valid for the host name you're connecting to is done independently of the CURL.SetOptionDOHSSLVerifyPeer option.

WARNING: disabling verification of the certificate allows bad guys to man-in-the-middle the communication without you knowing it. Disabling verification makes the communication insecure. Just having encryption on a transfer is not enough as you cannot be sure that you are communicating with the correct end-point.
(Read and Write property)
See also DOH_SSL_VERIFYPEER option in CURL manual.

### 64.22.180 OptionDOHSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to verify the DOH SSL certificate's status.
**Notes:** Pass 2 to ask curl to verify the DOH (DNS-over-HTTPS) server's certificate name fields against the host name.
This option is the DOH equivalent of OptionSSLVerifyHost and only affects requests to the DOH server.
When OptionDOHSSLVerifyHost is 2, the SSL certificate provided by the DOH server must indicate that the server name is the same as the server name to which you meant to connect to, or the connection fails.
Curl considers the DOH server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the DOH URL to which you told Curl to connect.
When the verify value is set to 1L it is treated the same as 2L. However for consistency with the other VerifyHost options we suggest use 2 and not 1.
When the verify value is set to 0L, the connection succeeds regardless of the names used in the certificate. Use that ability with caution!

See also OptionDOHSSLVerifyPeer to verify the digital signature of the DOH server certificate. If libcurl is built against NSS and OptionDOHSSLVerifyPeer is zero, OptionDOHSSLVerifyHost is also set to zero and cannot be overridden.
(Read and Write property)
See also DOH_SSL_VERIFYSTATUS option in CURL manual.

### 64.22.181 OptionDOHURL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provides the DNS-over-HTTPS URL.
**Notes:** Pass in a string to a URL for the DOH server to use for name resolving. The parameter should be URL-encoded in the following format: "https://host:port/path". It MUST specify a HTTPS URL.

libcurl doesn't validate the syntax or use this variable until the transfer is issued. Even if you set a crazy value here, OptionDOHURL will still return CURLE_OK.

curl sends POST requests to the given DNS-over-HTTPS URL.

To find the DOH server itself, which might be specified using a name, libcurl will use the default name lookup function. You can bootstrap that by providing the address for the DOH server with OptionResolve.

Disable DOH use again by setting this option to "".
(Read and Write property)
See also DOH_URL option in CURL manual.

### 64.22.182 OptionEGDSocket as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The path name to the Entropy Gathering Daemon socket.
**Notes:** It will be used to seed the random engine for SSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.183 OptionExpect100TimeoutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets Expect 100 timeout.
**Notes:** Time to wait in milliseconds for a response to a HTTP request containing an Expect: 100-continue header before sending the data anyway.
(Read and Write property)
See also EXPECT_100_TIMEOUT_MS option in CURL manual.

### 64.22.184 OptionFailOnError as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to fail silently if the HTTP code returned is equal to or larger than 400. The default action would be to return the page normally, ignoring that code.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This method is not fail-safe and there are occasions where non-succesful response codes will slip through, especially when authentication is involved (response codes 401 and 407).

You might get some amounts of headers transferred before this situation is detected, like for when a "100-continue" is received as a response to a POST/PUT and a 401 or 407 is received immediately afterwards.
(Read and Write property)
See also FAILONERROR option in CURL manual.

### 64.22.185 OptionFileTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether filetime should be querried.
**Example:**

```
// init CURL with options
dim d as new CURLSMBS
d.OptionFileTime = true
d.OptionURL = "http://www.monkeybreadsoftware.de/images/mbs.jpg"

// run query
dim e as Integer = d.Perform

// calculate date object
dim da as new date(1970,1,1,0,0,0)
da.TotalSeconds = da.TotalSeconds + d.GetInfoFileTime

// show date
ResultText.text=str(d.GetInfoFileTime)+" "+da.ShortDate+" "+da.ShortTime
```

**Notes:** If it is true, libCURL will attempt to get the modification date of the remote document in this operation. This requires that the remote server sends the time or replies to a time querying command.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FILETIME option in CURL manual.

### 64.22.186 OptionFollowLocation as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A boolean parameter tells the library to follow any Location: header that the server sends as part of an HTTP header.
**Example:**

```
dim c as new CURLSMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** This means that the library will re-send the same request on the new location and follow new Location: headers all the way until no more such headers are returned. OptionMaxRedirs can be used to limit the number of redirects libCURL will follow.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FOLLOWLOCATION option in CURL manual.

### 64.22.187 OptionForbitReuse as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to true to make the next transfer explicitly close the connection when done.
**Notes:** Normally, libCURL keep all connections alive when done with one transfer in case there comes a succeeding one that can re-use them. This option should be used with caution and only if you understand what it does. Set to false to have libCURL keep the connection open for possibly later re-use (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.188 OptionFreshConnect as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to true to make the next transfer use a new (fresh) connection by force.
**Example:**

```
dim c as new CURLSMBS

c.OptionFreshConnect=True
```

**Notes:** If the connection cache is full before this connection, one of the existing connections will be closed as according to the selected or default policy. This option should be used with caution and only if you understand what it does. Set this to 0 to have libCURL attempt re-using an existing connection (default behavior).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

See also FRESH_CONNECT option in CURL manual.

### 64.22.189 OptionFTPAccount as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The FTP account name to use.
**Notes:** When an FTP server asks for "account data" after user name and password has been provided, this data is sent off using the ACCT command.
(Read and Write property)
See also FTP_ACCOUNT option in CURL manual.

### 64.22.190 OptionFTPAlternativeToUser as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alternative username.
**Notes:** Pass a string as parameter, pointing to a string which will be used to authenticate if the usual FTP "USER user" and "PASS password" negotiation fails. This is currently only known to be required when connecting to Tumbleweed's Secure Transport FTPS server using client certificates for authentication.
(Added in 7.15.5)
(Read and Write property)
See also FTP_ALTERNATIVE_TO_USER option in CURL manual.

### 64.22.191 OptionFTPAppend as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionAppend instead.
**Function:** True tells the library to append to the remote file instead of overwrite it.
**Notes:** This is only useful when uploading to an ftp site.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.192 OptionFTPCreateMissingDirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the value is 1, CURL will attempt to create any remote directory that it fails to CWD into.
**Notes:** CWD is the command that changes working directory. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
Newer CURL Library versions allow a value of 2 to do a CWD after the directory was created, so this property changed from boolean to integer.
(Read and Write property)
See also FTP_CREATE_MISSING_DIRS option in CURL manual.

### 64.22.193 OptionFTPFileMethod as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an integer that should have one of the following values.
**Notes:** This option controls what method libCURL should use to reach a file on a FTP(S) server. The argument should be one of the following alternatives:

URLFTPMETHOD_MULTICWD = 1

libCURL does a single CWD operation for each path part in the given URL. For deep hierarchies this means very many commands. This is how RFC1738 says it should be done. This is the default but the slowest behavior.

CURLFTPMETHOD_NOCWD = 2

libCURL does no CWD at all. libCURL will do SIZE, RETR, STOR etc and give a full path to the server for all these commands. This is the fastest behavior.

CURLFTPMETHOD_SINGLECWD = 3

libCURL does one CWD with the full target directory and then operates on the file "normally" (like in the multicwd case). This is somewhat more standards compliant than 'nocwd' but without the full penalty of 'multicwd'.
(Read and Write property)
See also FTP_FILEMETHOD option in CURL manual.

### 64.22.194 OptionFTPListOnly as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionDirListOnly instead. **Function:** True tells the library to just list the names of an ftp directory, instead of doing a full directory listing that would include file sizes, dates etc.
**Notes:** This causes an FTP NLST command to be sent. Beware that some FTP servers list only files in their response to NLST; they might not include subdirectories and symbolic links.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.195 OptionFTPPort as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The port to use for ftp.
**Notes:** It will be used to get the IP address to use for the ftp PORT instruction. The PORT instruction tells the remote server to connect to our specified IP address. The string may be a plain IP address, a host name, an network interface name (under Unix) or just a '-' letter to let the library use your systems default IP address. Default FTP operations are passive, and thus won't use PORT.

You disable PORT again and go back to using the passive version by setting this option to "".

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPPORT option in CURL manual.

### 64.22.196 OptionFTPResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionServerResponseTimeout instead. **Function:** Causes CURL to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to generate a response message for a command before the session is considered hung.
**Notes:** With v22.4 or newer, please use newer property name OptionServerResponseTimeout.

While CURL is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionFTPResponseTimeout to a value smaller than OptionTimeout. (Added in 7.10.8)

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.197 OptionFTPSkipPasvIP as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If set to a non-zero value, it instructs libCURL to not use the IP address the server suggests in its 227-response to libCURL's PASV command when libCURL connects the data connection.
**Notes:** Instead libCURL will re-use the same IP address it already uses for the control connection. But it will use the port number from the 227-response. (Added in 7.14.2)

This option has no effect if PORT, EPRT or EPSV is used instead of PASV.
(Read and Write property)
See also FTP_SKIP_PASV_IP option in CURL manual.

### 64.22.198 OptionFTPSSL as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUseSSL instead.
**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLSMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)

### 64.22.199 OptionFTPSSLAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What kind of SSL authentication to use for FTP.
**Notes:** Pass an integer using one of the values from below, to alter how libCURL issues "AUTH TLS" or "AUTH SSL" when FTP over SSL is activated (see CURLOPT_FTP_SSL). (Added in 7.12.2)

kFTPAUTH_DEFAULT = 0

Allow libCURL to decide

kFTPAUTH_SSL = 1

Try "AUTH SSL" first, and only if that fails try "AUTH TLS"

kFTPAUTH_TLS = 2

Try "AUTH TLS" first, and only if that fails try "AUTH SSL"

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTPSSLAUTH option in CURL manual.

### 64.22.200 OptionFTPSSLCCC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If enabled, this option makes libCURL use CCC (Clear Command Channel).
**Notes:** It shuts down the SSL/TLS layer after authenticating. The rest of the control channel communication will be unencrypted. This allows NAT routers to follow the FTP transaction. Pass a long using one of the values below. (Added in 7.16.1)

| | | |
|---|---|---|
| CURLFTPSSL_CCC_NONE | 0 | Don't attempt to use CCC. |
| CURLFTPSSL_CCC_PASSIVE | 1 | Do not initiate the shutdown, but wait for the server to do it. Do not send a reply. |
| CURLFTPSSL_CCC_ACTIVE | 2 | Initiate the shutdown and wait for a reply. |

(Read and Write property)
See also FTP_SSL_CCC option in CURL manual.

### 64.22.201 OptionFTPUseEPRT as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the value is true, it tells CURL to use the EPRT (and LPRT) command when doing active FTP downloads (which is enabled by CURLOPT_FTPPORT).
**Notes:** Using EPRT means that it will first attempt to use EPRT and then LPRT before using PORT, but if you pass FALSE (zero) to this option, it will not try using EPRT or LPRT, only plain PORT. (Added in 7.10.5)

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPRT option in CURL manual.

### 64.22.202 OptionFTPUseEPSV as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the value is true, it tells CURL to use the EPSV command when doing passive FTP downloads (which it always does by default).
**Notes:** Using EPSV means that it will first attempt to use EPSV before using PASV, but if you pass FALSE (zero) to this option, it will not try using EPSV, only plain PASV.

If the server is an IPv6 host, this option will have no effect as of 7.12.3.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also FTP_USE_EPSV option in CURL manual.

### 64.22.203 OptionFTPusePret as Boolean

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the value is true, it tells CURL to send a PRET command before PASV (and EPSV). Certain FTP servers, mainly drftpd, require this non-standard command for directory listings as well as up and downloads in PASV mode.

**Notes:** Has no effect when using the active FTP transfers mode. (Added in 7.20.0)
(Read and Write property)
See also FTP_USE_PRET option in CURL manual.

### 64.22.204 OptionGet as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the true, this forces the HTTP request to get back to GET.
**Notes:** usable if a POST, HEAD, PUT or a custom request have been used previously using the same CURL handle.

When setting OptionGet to a true value, it will automatically set OptionNoBody to true (since 7.14.1).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.205 OptionGSSAPIDelegation as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allow GSSAPI credential delegation.
**Notes:** (Read and Write property)
See also GSSAPI_DELEGATION option in CURL manual.

### 64.22.206 OptionHappyEyeballsTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The happy eyeballs timeout.
**Notes:** Head start in milliseconds to give happy eyeballs.
(Read and Write property)
See also HAPPY_EYEBALLS_TIMEOUT_MS option in CURL manual.

### 64.22.207 OptionHAProxyProtocol as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to send an HAProxy PROXY protocol header.
**Notes:** Set to true to tell the library to send an HAProxy PROXY protocol header at beginning of the connection. The default action is not to send this header.
This option is primarily useful when sending test requests to a service that expects this header.
Most applications do not need this option.
Default false, do not send HAProxy PROXY protocol header.
(Read and Write property)

See also HAPROXYPROTOCOL option in CURL manual.

### 64.22.208 OptionHeader as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to include the header in the body output.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

This is only relevant for protocols that actually have headers preceding the data (like HTTP).
(Read and Write property)
See also HEADER option in CURL manual.

### 64.22.209 OptionHeaderOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass in a bitmask of "header options".
**Notes:** (Read and Write property)
See also HEADEROPT option in CURL manual.

### 64.22.210 OptionHTTPAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which http authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use. The available bits are listed below. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the UserPassword option. (Added in 7.10.6)

kAuthBASIC = 1

HTTP Basic authentication. This is the default choice, and the only method that is in wide-spread use and supported virtually everywhere. This is sending the user name and password over the network in plain text, easily captured by others.

kAuthDIGEST = 2

HTTP Digest authentication. Digest authentication is defined in RFC2617 and is a more secure way to do authentication over public networks than the regular old-fashioned Basic method.

kAuthGSSNEGOTIATE = 4

HTTP GSS-Negotiate authentication. The GSS-Negotiate (also known as plain "Negotiate") method was designed by Microsoft and is used in their web applications. It is primarily meant as a support for Kerberos5 authentication but may be also used along with another authentication methods. For more information see IETF draft draft-brezak-spnego-http-04.txt.

You need to build libCURL with a suitable GSS-API library for this to work.

kAuthNTLM = 8

HTTP NTLM authentication. A proprietary protocol invented and used by Microsoft. It uses a challenge-response and hash concept similar to Digest, to prevent the password from being eavesdropped.

You need to build libCURL with OpenSSL support for this option to work, or build libCURL on Windows.

kAuthANY = &hFFFFFFFF

This is a convenience macro that sets all bits and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

kAuthANYSAFE = &hFFFFFFFE

This is a convenience macro that sets all bits except Basic and thus makes libCURL pick any it finds suitable. libCURL will automatically select the one it finds most secure.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPAUTH option in CURL manual.

### 64.22.211 OptionHTTPContentDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass a long to tell libCURL how to act on content decoding.
**Notes:** If set to zero, content decoding will be disabled. If set to 1 it is enabled. Note however that libCURL

has no default content decoding but requires you to use OptionEncoding for that. (added in 7.16.2)
(Read and Write property)
See also HTTP_CONTENT_DECODING option in CURL manual.

### 64.22.212 OptionHTTPProxyTunnel as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the parameter to true to get the library to tunnel all operations through a given HTTP proxy.
**Notes:** There is a big difference between using a proxy and to tunnel through it. If you don't know what this means, you probably don't want this tunneling option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTPPROXYTUNNEL option in CURL manual.

### 64.22.213 OptionHTTPTransferDecoding as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass an integer to tell libCURL how to act on transfer decoding.
**Notes:** If set to zero, transfer decoding will be disabled, if set to 1 it is enabled (default). libCURL does chunked transfer decoding by default unless this option is set to zero. (added in 7.16.2)
(Read and Write property)
See also HTTP_TRANSFER_DECODING option in CURL manual.

### 64.22.214 OptionHTTPVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to one of the values described below.
**Notes:** They force libCURL to use the specific HTTP versions. This is not sensible to do unless you have a good reason.

kHTTP_VERSION_NONE = 0

We don't care about what version the library uses. libCURL will use whatever it thinks fit.

kHTTP_VERSION_1_0 = 1

Enforce HTTP 1.0 requests.

kHTTP_VERSION_1_1 = 2

Enforce HTTP 1.1 requests.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also HTTP_VERSION option in CURL manual.

### 64.22.215 OptionIgnoreContentLength as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to ignore the Content-Length header.
**Notes:** This is useful for Apache 1.x (and similar servers) which will report incorrect content length for files over 2 gigabytes. If this option is used, CURL will not be able to accurately report progress, and will simply stop the download when the server ends the connection. (added in 7.14.1)
(Read and Write property)
See also IGNORE_CONTENT_LENGTH option in CURL manual.

### 64.22.216 OptionInFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INFILESIZE option in CURL manual.

### 64.22.217 OptionInFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionInFileSize instead.
**Function:** When uploading a file to a remote site, this option should be used to tell libCURL what the expected size of the infile is.
**Notes:** This value should be passed as a CURL_off_t. (Added in 7.11.0)

Note that this option does not limit how much data libCURL will actually send, as that is controlled entirely by what the read event returns.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.218 OptionInterface as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This set the interface name to use as outgoing network interface.
**Notes:** The name can be an interface name, an IP address or a host name.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also INTERFACE option in CURL manual.

### 64.22.219 OptionIPResolve as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows an application to select what kind of IP addresses to use when resolving host names.
**Example:**

```
dim c as new CURLSMBS
c.OptionIPResolve = c.kIPRESOLVE_V4
```

**Notes:** This is only interesting when using host names that resolve addresses using more than one version of IP. The allowed values are:

kIPRESOLVE_WHATEVER = 0

Default, resolves addresses to all IP versions that your system allows.

kIPRESOLVE_V4 = 1

Resolve to ipv4 addresses.

kIPRESOLVE_V6 = 2

Resolve to ipv6 addresses.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also IPRESOLVE option in CURL manual.

### 64.22.220 OptionIssuerCert as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string naming a file holding a CA certificate in PEM format.
**Notes:** If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail). (Added in 7.19.0)

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also ISSUERCERT option in CURL manual.

### 64.22.221 OptionIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionSSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionSSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionIssuerCert which instead expects a file name as input.
(Read and Write property)
See also ISSUERCERT_BLOB option in CURL manual.

### 64.22.222 OptionKeepSendingOnError as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to keep sending on error.
**Notes:** Continue to send data if the server responds early with an HTTP status code >= 300
(Read and Write property)
See also KEEP_SENDING_ON_ERROR option in CURL manual.

### 64.22.223 OptionKeyPassword as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set passphrase to private key.
**Notes:** It will be used as the password required to use the OptionSSLKey or OptionSSHPrivateKeyfile private key. You never needed a pass phrase to load a certificate but you need one to load your private key.
(Read and Write property)
See also KEYPASSWD option in CURL manual.

### 64.22.224 OptionKRB4Level as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKRBLevel instead.
**Function:** Set the krb4 security level, this also enables krb4 awareness.
**Notes:** This is a string, 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to "" to disable kerberos4. The kerberos support only works for FTP.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.225 OptionKRBLevel as String

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FTP kerberos security level.
**Notes:** Set the kerberos security level for FTP; this also enables kerberos awareness. This is a string that should match one of the following: 'clear', 'safe', 'confidential' or 'private'. If the string is set but doesn't match one of these, 'private' will be used. Set the string to NULL to disable kerberos support for FTP.
(Read and Write property)
See also KRBLEVEL option in CURL manual.

### 64.22.226 OptionLocalPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This sets the local port number of the socket used for connection.
**Notes:** This can be used in combination with OptionInterface and you are recommended to use OptionLocalPortRange as well when this is set. Note that port numbers are only valid 1 - 65535. (Added in 7.15.2)
(Read and Write property)
See also LOCALPORT option in CURL manual.

### 64.22.227 OptionLocalPortRange as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the number of attempts libCURL should do to find a working local port number.
**Notes:** It starts with the given OptionLocalPort and adds one to the number for each retry. Setting this value to 1 or below will make libCURL do only one try for exact port number. Note that port numbers by nature is a scarce resource that will be busy at times so setting this value to something too low might cause

unnecessary connection setup failures. (Added in 7.15.2)
(Read and Write property)
See also LOCALPORTRANGE option in CURL manual.

### 64.22.228 OptionLoginOptions as String

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Login options string to use for the transfer.
**Notes:** For more information about the login options please see RFC 2384, RFC5092 and IETF draft draft-earhart-url-smtp-00.txt

CURLOPT_LOGIN_OPTIONS can be used to set protocol specific login options, such as the preferred authentication mechanism via "AUTH=NTLM" or "AUTH=*", and should be used in conjunction with the OptionUserName option.
Only IMAP, POP3 and SMTP support login options.
(Read and Write property)
See also LOGIN_OPTIONS option in CURL manual.

### 64.22.229 OptionLowSpeedLimit as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This property contains the transfer speed in bytes per second that the transfer should be below during OptionLowSpeedTime seconds for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_LIMIT option in CURL manual.

### 64.22.230 OptionLowSpeedTime as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This property contains the time in seconds that the transfer should be below the OptionLowSpeedLimit for the library to consider it too slow and abort.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also LOW_SPEED_TIME option in CURL manual.

### 64.22.231 OptionMailAuth as String

MBS CURL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This string will be used to specify the authentication address (identity) of a submitted message that is being relayed to another server.
**Notes:** This optional parameter allows co-operating agents in a trusted environment to communicate the authentication of individual messages and should only be used by the application program, using libCURL, if the application is itself a mail server acting in such an environment. If the application is operating as such and the AUTH address is not known or is invalid, then an empty string should be used for this parameter.

Unlike OptionMailFrom and SetOptionMailRecipients, the address should not be specified within a pair of angled brackets (<>). However, if an empty string is used then a pair of brackets will be sent by libCURL as required by RFC 2554.
(Read and Write property)
See also MAIL_AUTH option in CURL manual.

### 64.22.232 OptionMailFrom as String

MBS CURL Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string that will be used to specify the sender address in a mail when sending an SMTP mail with libCURL.
**Notes:** (Read and Write property)
See also MAIL_FROM option in CURL manual.

### 64.22.233 OptionMaxAgeConn as Integer

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum age the connection should have in seconds.
**Notes:** Older connections are not reused, but discarded.
(Read and Write property)
See also MAXAGE_CONN option in CURL manual.

### 64.22.234 OptionMaxConnects as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The set number will be the persistent connection cache size.
**Notes:** The set amount will be the maximum amount of simultaneously open connections that libCURL may cache. Default is 5, and there isn't much point in changing this value unless you are perfectly aware of how this work and changes libCURL's behaviour. This concerns connection using any of the protocols that

support persistent connections.

When reaching the maximum limit, CURL closes the oldest one in the cache to prevent the number of open connections to increase.

If you already have performed transfers with this CURL handle, setting a smaller MAXCONNECTS than before may cause open connections to get closed unnecessarily.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXCONNECTS option in CURL manual.

### 64.22.235 OptionMaxFileSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EXCEEDED will be returned.

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXFILESIZE option in CURL manual.

### 64.22.236 OptionMaxFileSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxFileSize instead. **Function:** This allows you to specify the maximum size (in bytes) of a file to download.
**Notes:** If the file requested is larger than this value, the transfer will not start and kError_FILESIZE_EXCEEDED will be returned. (Added in 7.11.0)

The file size is not always known prior to download, and for such files this option has no effect even if the file transfer ends up being larger than this given limit. This concerns both FTP and HTTP transfers.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.237 OptionMaxLifeTimeConnection as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets maximum lifetime (since creation) allowed for reusing a connection.
**Notes:** Pass a number as parameter containing maxlifetime - the maximum time in seconds, since the creation of the connection, that you allow an existing connection to have to be considered for reuse for this request.

libcurl features a connection cache that holds previously used connections. When a new request is to be done, it will consider any connection that matches for reuse. The MaxLifeTimeConnection limit prevents libcurl from trying too old connections for reuse. This can be used for client-side load balancing. If a connection is found in the cache that is older than this set maxlifetime, it will instead be closed once any in-progress transfers complete.

If set to 0, this behavior is disabled: all connections are eligible for reuse.
(Read and Write property)

### 64.22.238 OptionMaxRecvSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
(Read and Write property)
See also MAX_RECV_SPEED option in CURL manual.

### 64.22.239 OptionMaxRecvSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxRecvSpeed instead. **Function:** Defines the maximum download speed.
**Notes:** If a download exceeds this speed (counted in bytes per second) on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)

(Read and Write property)

### 64.22.240 OptionMaxRedirs as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The set number will be the redirection limit.
**Example:**

```
dim c as new CURLSMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
```

**Notes:** If that many redirections have been followed, the next redirect will cause an error (kError_TOO_MANY_REDIRECTS). This option only makes sense if the CURLOPT_FOLLOWLOCATION is used at the same time. Added in 7.15.1: Setting the limit to 0 will make libCURL refuse any redirect. Set it to -1 for an infinite number of redirects (which is the default)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also MAXREDIRS option in CURL manual.

### 64.22.241 OptionMaxSendSpeed as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)
See also MAX_SEND_SPEED option in CURL manual.

### 64.22.242 OptionMaxSendSpeedLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionMaxSendSpeed instead. **Function:** Defines the maximum upload speed.
**Notes:** If an upload exceeds this speed on cumulative average during the transfer, the transfer will pause to keep the average rate less than or equal to the parameter value. Defaults to unlimited speed. (Added in 7.15.5)
Value is in bytes per second.
Useful if you have a limited pipe and you'd like your transfer not to use your entire bandwidth.
Slowing down the transfer speed is also useful for lowering CPU consumption during transfers.
(Read and Write property)

### 64.22.243 OptionMimeOptions as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set MIME option flags.
**Notes:** Pass a number that holds a bitmask of CURLMIMEOPT constants. Each bit is a Boolean flag used while encoding a MIME tree or multipart form data.

Available bits are:

CURLMIMEOPT_FORMESCAPE = 1

Tells libcurl to escape multipart form field and file names using the backslash-escaping algorithm rather than percent-encoding (HTTP only).

Backslash-escaping consists in preceding backslashes and double quotes with a backslash. Percent encoding maps all occurrences of double quote, carriage return and line feed to %22, %0D and %0A respectively.

Before version 7.81.0, percent-encoding was never applied.

HTTP browsers used to do backslash-escaping in the past but have over time transitioned to use percent-encoding. This option allows to address server-side applications that have not yet have been converted.

As an example, consider field or file name strange\name"kind. When the containing multipart form is sent, this is normally transmitted as strange\name%22kind. When this option is set, it is sent as strange\\name\"kind.
(Read and Write property)
See also MIME_OPTIONS option in CURL manual.

### 64.22.244 OptionNetRC as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Controls usage of netrc file.
**Notes:** This parameter controls the preference of libCURL between using user names and passwords from your
textasciitilde /.netrc file, relative to user names and passwords in the URL supplied with OptionURL.

libCURL uses a user name (and supplied or prompted password) supplied with OptionUsername and OptionPassword in preference to any of the options controlled by this parameter.

An integer, set to one of the values described below.

kNETRC_OPTIONAL = 1

The use of your
textasciitilde /.netrc file is optional, and information in the URL is to be preferred. The file will be scanned with the host and user name (to find the password only) or with the host only, to find the first user name and password after that machine, which ever information is not specified in the URL.

Undefined values of the option will have this effect.

kNETRC_IGNORED = 0

The library will ignore the file and use only the information in the URL.

This is the default.

kNETRC_REQUIRED = 2

This value tells the library that use of the file is required, to ignore the information in the URL, and to search the file with the host only.

Only machine name, user name and password are taken into account (init macros and similar things aren't supported).

libCURL does not verify that the file has the correct properties set (as the standard Unix ftp client does). It should only be readable by user.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NETRC option in CURL manual.

### 64.22.245 OptionNetRCFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string containing the full path name to the file you want libCURL to use as .netrc file.
**Notes:** If this option is omitted, and OptionNETRC is set, libCURL will attempt to find the a .netrc file in the current user's home directory. (Added in 7.10.9)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also NETRC_FILE option in CURL manual.

### 64.22.246 OptionNewDirectoryPerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created directories on the remote server.
**Notes:** The default value is 0755, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)
Value must be octal, so use &o prefix for number.
(Read and Write property)
See also NEW_DIRECTORY_PERMS option in CURL manual.

### 64.22.247 OptionNewFilePerms as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An integer, containing the value of the permissions that will be assigned to newly created files on the remote server.
**Notes:** The default value is &o0644, but any valid value can be used. The only protocols that can use this are sftp://, scp://, and file://. (Added in 7.16.4)
Be aware that you normally specify this in octal values. So use the &o prefix in Xojo.

(Read and Write property)
See also NEW_FILE_PERMS option in CURL manual.

### 64.22.248 OptionNoBody as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to not include the body-part in the output.
**Notes:** This is only relevant for protocols that have separate header and body parts. On HTTP(S) servers, this will make libCURL do a HEAD request.

To change request to GET, you should use OptionGet. Change request to POST with OptionPost etc.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also NOBODY option in CURL manual.

### 64.22.249 OptionNoProxy as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string with a comma- separated list of hosts which do not use a proxy, if one is specified.
**Notes:** The only wildcard is a single * character, which matches all hosts, and effectively disables the proxy. Each name in this list is matched as either a domain which contains the hostname, or the hostname itself. For example, local.com would match local.com, local.com:80, and www.local.com, but not www.notlocal.com. (Added in 7.19.4)
(Read and Write property)
See also NOPROXY option in CURL manual.

### 64.22.250 OptionNoSignal as Integer

MBS CURL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to not use signals.
**Notes:** If it is true, libCURL will not use any functions that install signal handlers or any functions that cause signals to be sent to the process. This option is mainly here to allow multi-threaded unix applications to still set/use all timeout options etc, without risking getting signals. (Added in 7.10)

If this option is set and libCURL has been built with the standard name resolver, timeouts will not occur while the name resolve takes place. Consider building libCURL with c-ares support to enable asynchronous

DNS lookups, which enables nice timeouts for name resolves without signals.

Setting OptionNoSignal to true makes libCURL NOT ask the system to ignore SIGPIPE signals, which otherwise are sent by the system when trying to send data to a socket which is closed in the other end. libCURL makes an effort to never cause such SIGPIPEs to trigger, but some operating systems have no way to avoid them and even on those that have there are some corner cases when they may still happen, contrary to our desire. In addition, using CURLAUTH_NTLM_WB authentication could cause a SIGCHLD signal to be raised.
(Read and Write property)
See also NOSIGNAL option in CURL manual.

### 64.22.251 OptionPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password to use for the transfer.
**Notes:** The OptionPassword option should be used in conjunction with the OptionUsername option.
(Read and Write property)
See also PASSWORD option in CURL manual.

### 64.22.252 OptionPathAsIs as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass path as it is and do not resolve dots.
**Notes:** Do not squash dot-dot sequences.
(Read and Write property)
See also PATH_AS_IS option in CURL manual.

### 64.22.253 OptionPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The public key in DER form used to validate the peer public key.
**Notes:** Native path to key file.
This option is used only if SSLVerifyPeer is true.
(Read and Write property)
See also PINNEDPUBLICKEY option in CURL manual.

### 64.22.254 OptionPipeWait as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wait/don't wait for pipe/mutex to clarify.
**Notes:** (Read and Write property)
See also PIPEWAIT option in CURL manual.

### 64.22.255 OptionPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The remote port number to connect to, instead of the one specified in the URL or the default port for the used protocol.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PORT option in CURL manual.

### 64.22.256 OptionPost as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A boolean parameter tells the library to do a regular HTTP post.
**Notes:** This will also make the library use the a "Content-Type: application/x-www-form-urlencoded" header. (This is by far the most commonly used POST method).

Use the OptionPostFields option to specify what data to post.

Optionally, you can provide data to POST using the Read event but then you must make sure to not set OptionPostFields to anything but "". When providing data with an event, you must transmit it using chunked transfer-encoding.

You can override the default POST Content-Type: header by setting your own with OptionHTTPHeader.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use POST to a HTTP 1.1 server, you can send data without knowing the size before starting the POST if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size in the request.

When setting CURLOPT_POST to a non-zero value, it will automatically set OptionNoBody to 0 (since 7.14.1).

If you issue a POST request and then want to make a HEAD or GET using the same re-used handle, you must explictly set the new request type using OptionNoBody or OptionGet or similar.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also POST option in CURL manual.

### 64.22.257 OptionPostFields as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string which should be the full data to post in an HTTP POST operation.
**Example:**

```
dim xml as string // XML or JSON to send as payload
dim c as new CURLSMBS

c.OptionFollowLocation = true
c.OptionMaxRedirs = 3
c.OptionPostFields = xml
c.OptionUserAgent = "Test App"
c.OptionPost = true

// for SOAP use right content type
c.SetOptionHTTPHeader array("Content-Type: application/soap+xml; charset=utf-8")
```

**Notes:** You must make sure that the data is formatted the way you want the server to receive it. libCURL will not convert or encode it for you. Most web servers will assume this data to be url-encoded. Take note.

This POST is a normal application/x-www-form-urlencoded kind (and libCURL will set that Content-Type by default when this option is used), which is the most commonly used one by HTML forms. See also the OptionPost. Using OptionPostFields implies OptionPost.

Using POST with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with CURLOPT_HTTPHEADER as usual.

To make multipart/formdata posts (aka rfc1867-posts), check out the OptionPost option.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also COPYPOSTFIELDS option in CURL manual.

### 64.22.258 OptionPostFieldSize as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the post data.
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)
See also POSTFIELDSIZE option in CURL manual.

### 64.22.259 OptionPostFieldSizeLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionPostFieldSize instead. **Function:** The size of the post data. (64 bit version)
**Notes:** Optional you can set the size of your post data.
If you specify a postfield string, this size will be set automatically.

If you specify a size and no postfield string, the Read event will request data.
(Read and Write property)

### 64.22.260 OptionPostRedir as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A bitmask to control how libCURL acts on redirects after POSTs that get a 301 or 302 response back.
**Notes:** A parameter with bit 0 set (value CURL_REDIR_POST_301=1) tells the library to respect RFC 2616/10.3.2 and not convert POST requests into GET requests when following a 301 redirection. Setting bit 1 (value CURL_REDIR_POST_302=2) makes libCURL maintain the request method after a 302 redirect.

CURL_REDIR_POST_ALL is a convenience define that sets both bits.

The non-RFC behaviour is ubiquitous in web browsers, so the library does the conversion by default to maintain consistency. However, a server may require a POST to remain a POST after such a redirection. This option is meaningful only when setting OptionFollowLocation. (Added in 7.17.1) (This option was known as CURLOPT_POST301 up to 7.19.0 as it only supported the 301 way before then)
(Read and Write property)
See also POSTREDIR option in CURL manual.

### 64.22.261 OptionPreProxy as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of pre proxy to use.
**Notes:** (Read and Write property)
See also PRE_PROXY option in CURL manual.

### 64.22.262 OptionProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionProtocolsString instead. **Function:** A bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in the transfer. This allows you to have a libCURL built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default libCURL will accept all protocols it supports. See also OptionRedirProtocols. (Added in 7.19.4)
(Read and Write property)

### 64.22.263 OptionProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The protocols allowed-
**Example:**

```
dim c as new CURLSMBS
c.OptionProtocolsString = "http,tftp,sftp"
```

**Notes:** Pass a string that holds a comma-separated list of case insensitive protocol names (URL schemes) to allow in the transfer. This option allows applications to use libcurl built to support a wide range of protocols but still limit specific transfers to only be allowed to use a subset of them. By default, libcurl accepts all

protocols it was built with support for. See also OptionReditProtocolsString.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

CURLVersionMBS class can be used to get a list of all supported protocols in the current libcurl. GetInfoProtocol function is the recommended way to figure out the protocol used in a previous transfer.
(Read and Write property)

### 64.22.264 OptionProxy as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set HTTP proxy to use.
**Example:**

```
dim c as CURLSMBS // your CURL object
dim psAddress as string // your proxy address
dim psPort as Integer // your proxy port

c.OptionProxy=psAddress
c.OptionProxyPort=psPort
c.OptionProxyType=c.kPROXY_HTTP
```

**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a string holding the host name or dotted IP address. To specify port number in this string, append : [ port ] to the end of the host name. The proxy string may be prefixed with [ protocol ] :// since any such prefix will be ignored. The proxy's port number may optionally be specified with the separate option ProxyHost.

When you tell the library to use an HTTP proxy, libCURL will transparently convert operations to HTTP

even if you specify an FTP URL etc. This may have an impact on what other features of the library you can use, such as CURLOPT_QUOTE and similar FTP specifics that don't work unless you tunnel through the HTTP proxy. Such tunneling is activated with HTTPProxyTunnel.

libCURL respects the environment variables http_proxy, ftp_proxy, all_proxy etc, if any of those is set. The Proxy option does however override any possibly set environment variables.

Starting with 7.14.1, the proxy host string given in environment variables can be specified the exact same way as the proxy can be set with Proxy, include protocol prefix (http://) and embedded user + password.

You can use WinHTTPClientMBS class on Windows or CFProxyMBS on Mac to discover system proxy settings.
(Read and Write property)
See also PROXY option in CURL manual.

### 64.22.265 OptionProxyAuth as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which proxy authentication to use.
**Notes:** Pass an integer as parameter, which is set to a bitmask, to tell libCURL what authentication method(s) you want it to use for your proxy authentication. If more than one bit is set, libCURL will first query the site to see what authentication methods it supports and then pick the best one you allow it to use. For some methods, this will induce an extra network round-trip. Set the actual name and password with the ProxyUserPassword option. The bitmask can be constructed by or'ing together the bits listed above for the HTTPAuth option. As of this writing, only Basic, Digest and NTLM work. (Added in 7.10.7)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also PROXYAUTH option in CURL manual.

### 64.22.266 OptionProxyCAInfo as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CApath or CAfile used to validate the proxy certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object
```

```
// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Pass native file path.
This option is used only if CURLSMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)
See also PROXY_CAINFO option in CURL manual.

### 64.22.267 OptionProxyCAInfoBlob as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CAInfo for proxy as blob value.
**Notes:** This option is for connecting to an HTTPS proxy, not an HTTPS server.
Certificate Authority (CA) bundle in PEM format passed PEM encoded content holding one or more certificates to verify the HTTPS server with.
(Read and Write property)
See also PROXY_CAINFO_BLOB option in CURL manual.

### 64.22.268 OptionProxyCAPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CApath directory used to validate the proxy certificate.
**Notes:** Pass native file path.
This option is used only if CURLSMBS.OptionProxySSLVerifyPeer is true
(Read and Write property)
See also PROXY_CAPATH option in CURL manual.

### 64.22.269 OptionProxyCRLFile as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CRL file for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_CRLFILE option in CURL manual.

### 64.22.270 OptionProxyIssuerCert as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the proxy issuer SSL certificate filename.
**Notes:** Pass a string naming a file holding a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option makes sense only when used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).
(Read and Write property)
See also PROXY_ISSUERCERT option in CURL manual.

### 64.22.271 OptionProxyIssuerCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set proxy issuer SSL certificate from memory blob.
**Notes:** Pass data, which contains binary data of a CA certificate in PEM format. If the option is set, an additional check against the peer certificate is performed to verify the issuer of the the HTTPS proxy is indeed the one associated with the certificate provided by the option. This additional check is useful in multi-level PKI where one needs to enforce that the peer certificate is from a specific branch of the tree.

This option should be used in combination with the OptionProxySSLVerifyPeer option. Otherwise, the result of the check is not considered as failure.

A specific error code (CURLE_SSL_ISSUER_ERROR) is defined with the option, which is returned if the setup of the SSL/TLS session has failed due to a mismatch with the issuer of peer certificate (OptionProxySSLVerifyPeer has to be set too for the check to fail).

This option is an alternative to OptionProxyIssuerCert which instead expects a file name as input.

(Read and Write property)
See also PROXY_ISSUERCERT_BLOB option in CURL manual.

### 64.22.272 OptionProxyKeyPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Password for the SSL private key for proxy.
**Notes:** (Read and Write property)
See also PROXY_KEYPASSWD option in CURL manual.

### 64.22.273 OptionProxyPassword as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string which should be pointing to the password to use for the transfer while connecting to Proxy.
**Notes:** The OptionProxyPassword option should be used in conjunction with the OptionProxyUsername option. (Added in 7.19.1)
(Read and Write property)
See also PROXYPASSWORD option in CURL manual.

### 64.22.274 OptionProxyPinnedPublicKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The public key in DER form used to validate the proxy public key.
**Notes:** This option is used only if CURLSMBS.OptionProxySSLVerifyPeer is true.
Please path native file path to key file.
(Read and Write property)
See also PROXY_PINNEDPUBLICKEY option in CURL manual.

### 64.22.275 OptionProxyPort as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The proxy port to connect to unless it is specified in the proxy string OptionProxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

You can use OptionProxy with port, e.g. "12.34.56.78:8080" or pass port here and proxy without port.
For some users it seems like the option with OptionProxy including port works better.
(Read and Write property)
See also PROXYPORT option in CURL manual.

### 64.22.276 OptionProxyServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Proxy Service Name.
**Notes:** (Read and Write property)
See also PROXY_SERVICE_NAME option in CURL manual.

### 64.22.277 OptionProxySSLCert as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of the file keeping your private SSL-certificate for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSLCERT option in CURL manual.

### 64.22.278 OptionProxySSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets private key for proxy cert from memory blob.
**Notes:** Pass data, which contains the private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with CURL.SetOptionProxySSLKeyType.
(Read and Write property)
See also PROXY_SSLCERT_BLOB option in CURL manual.

### 64.22.279 OptionProxySSLCertType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Type of the file keeping your SSL-certificate for proxy.
**Notes:** Value can be "DER", "PEM" or "ENG".
(Read and Write property)
See also PROXY_SSLCERTTYPE option in CURL manual.

### 64.22.280 OptionProxySSLCipherList as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify which SSL ciphers to use for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_CIPHER_LIST option in CURL manual.

### 64.22.281 OptionProxySSLKey as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of the file keeping your private SSL-key for proxy.
**Notes:** Pass native file path.
(Read and Write property)
See also PROXY_SSLKEY option in CURL manual.

### 64.22.282 OptionProxySSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set private key for proxy cert from memory blob.
**Notes:** Pass data, which contains a private key for connecting to the HTTPS proxy. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionProxySSLKeyType.

This option is an alternative to OptionProxySSLKey which instead expects a file name as input.
(Read and Write property)
See also PROXY_SSLKEY_BLOB option in CURL manual.

### 64.22.283 OptionProxySSLKeyType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets type of the file keeping your private SSL-key for proxy.
**Notes:** Value is DER, PEM or ENG.
(Read and Write property)
See also PROXY_SSLKEYTYPE option in CURL manual.

### 64.22.284 OptionProxySSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable specific SSL features with a bitmask for proxy.
**Notes:** (Read and Write property)
See also PROXY_SSL_OPTIONS option in CURL manual.

### 64.22.285 OptionProxySSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable SSL Host verification.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object

// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** Set if we should verify the Common name from the proxy certificate in ssl handshake, set 1 to check existence, 2 to ensure that it matches the provided hostname.
(Read and Write property)
See also PROXY_SSL_VERIFYHOST option in CURL manual.

### 64.22.286 OptionProxySSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set if we should verify the proxy in ssl handshake.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object
```

```
// disable
d.OptionProxySSLVerifyHost = 0
d.OptionProxySSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionProxyCAInfo = cacert.NativePath
d.OptionProxySSLVerifyHost = 2
d.OptionProxySSLVerifyPeer = 1
```

**Notes:** set 1 to verify.
(Read and Write property)
See also PROXY_SSL_VERIFYPEER option in CURL manual.

### 64.22.287 OptionProxySSLVersion as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What version to specifically try to use for proxy.
**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also PROXY_SSLVERSION option in CURL manual.

### 64.22.288 OptionProxyTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify which TLS 1.3 ciphers suites to use for proxy.
**Notes:** The list of cipher suites to use for the TLS 1.3 connection to a proxy. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also PROXY_TLS13_CIPHERS option in CURL manual.

### 64.22.289 OptionProxyTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Password for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_PASSWORD option in CURL manual.

### 64.22.290 OptionProxyTLSAuthType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set authentication type for authenticated TLS for proxy
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_TYPE option in CURL manual.

### 64.22.291 OptionProxyTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set a username for authenticated TLS for proxy.
**Notes:** (Read and Write property)
See also PROXY_TLSAUTH_USERNAME option in CURL manual.

### 64.22.292 OptionProxyTransferMode as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If this integer value is set to 1 (one), it tells libCURL to set the transfer mode (binary or ASCII) for FTP transfers done via an HTTP proxy, by appending ;type=a or ;type=i to the URL.
**Notes:** Without this setting, or it being set to 0 (zero, the default), OptionTransferText has no effect when doing FTP via a proxy. Beware that not all proxies support this feature. (Added in 7.18.0)
(Read and Write property)
See also PROXY_TRANSFER_MODE option in CURL manual.

### 64.22.293 OptionProxyType as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option is to set type of the proxy.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Available options for this are kPROXY_HTTP, kPROXY_SOCKS4 (added in 7.15.2) kPROXY_SOCKS5.
The HTTP type is default.
(Read and Write property)
See also PROXYTYPE option in CURL manual.

### 64.22.294 OptionProxyUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string, which should be pointing to the user name to use for the transfer while connecting to Proxy.
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionProxyPassword option.
(Read and Write property)
See also PROXYUSERNAME option in CURL manual.

### 64.22.295 OptionPut as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionUpload instead.
**Function:** A non-zero parameter tells the library to use HTTP PUT to transfer data.
**Notes:** The data should be set with OptionInFileSize.

This option is deprecated and starting with version 7.12.1 you should instead use OptionUpload.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.296 OptionQuickExit as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to allow to exit quickly.
**Notes:** Pass a number as a parameter, 1 meaning that when recovering from a timeout, libcurl should skip lengthy cleanups that are intended to avoid all kinds of leaks (threads etc.), as the caller program is about to call exit() anyway. This allows for a swift termination after a DNS timeout for example, by canceling and/or forgetting about a resolver thread, at the expense of a possible (though short-lived) leak of associated resources.
(Read and Write property)
See also QUICK_EXIT option in CURL manual.

### 64.22.297 OptionRandomFile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A file name for the random file.
**Notes:** The file will be used to read from to seed the random engine for SSL. The more random the specified file is, the more secure the SSL connection will become.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)

### 64.22.298 OptionRange as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string which should contain the specified range you want.
**Notes:** It should be in the format "X-Y", where X or Y may be left out. HTTP transfers also support several intervals, separated with commas as in "X-Y,N-M". Using this kind of multiple intervals will cause the HTTP server to send the response document in pieces (using standard MIME separation techniques). Pass a NULL to this option to disable the use of ranges.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RANGE option in CURL manual.

### 64.22.299 OptionRedirProtocols as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionRedirProtocolsString instead. **Function:** An integer that holds a bitmask of kProtocol* constants.
**Notes:** If used, this bitmask limits what protocols libCURL may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This allows you to limit specific transfers to only be allowed to use a subset of protocols in redirections. By default libCURL will allow all protocols except for FILE and SCP. This is a difference compared to pre-7.19.4 versions which unconditionally would follow to all protocols supported. (Added in 7.19.4)
(Read and Write property)

### 64.22.300 OptionReditProtocolsString as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The protocols allowed to redirect to.
**Example:**

```
dim c as new CURLSMBS
c.OptionReditProtocolsString = "http,https"
```

**Notes:** Pass string that holds a comma-separated list of case insensitive protocol names (URL schemes). That list limits what protocols libcurl may use in a transfer that it follows to in a redirect when OptionFollowLocation is enabled. This option allows applications to limit specific transfers to only be allowed to use a subset of protocols in redirections.

Protocols denied by OptionProtocolsString are not overridden by this option.

By default libcurl will allow HTTP, HTTPS, FTP and FTPS on redirects (since 7.65.2). Older versions of libcurl allowed all protocols on redirect except several disabled for security reasons: Since 7.19.4 FILE and SCP are disabled, and since 7.40.0 SMB and SMBS are also disabled.

These are the available protocols:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTMPE, RTMPS, RTMPT, RTMPTE, RTMPTS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET, TFTP

You can set "ALL" as a short-cut to enable all protocols. Note that by setting all, you may enable protocols that were not supported the day you write this but are introduced in a future libcurl version.

If trying to set a non-existing protocol or if no matching protocol at all is set, it returns error.

Default

HTTP, HTTPS, FTP and FTPS (Added in 7.65.2).

Older versions defaulted to all protocols except FILE, SCP and since 7.40.0 SMB and SMBS.
(Read and Write property)

### 64.22.301 OptionReferer as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The referer to pass to the server.
**Notes:** It will be used to set the Referer: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also REFERER option in CURL manual.

### 64.22.302 OptionRequestTarget as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The request target, instead of extracted from the URL.
**Notes:** (Read and Write property)
See also REQUEST_TARGET option in CURL manual.

### 64.22.303 OptionResumeFrom as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** Set this option to 0 to make the transfer start from the beginning (effectively disabling resume). For FTP, set this option to -1 to make the transfer start from the end of the target file (useful to continue an interrupted upload).

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also RESUME_FROM option in CURL manual.

### 64.22.304 OptionResumeFromLarge as Int64

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionResumeFrom instead. **Function:** It contains the offset in number of bytes that you want the transfer to start from.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.305 OptionRTSPClientCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Manually initialize the client RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_CLIENT_CSEQ option in CURL manual.

### 64.22.306 OptionRTSPRequest as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RTSP request method (OPTIONS, SETUP, PLAY, etc...).
**Notes:** (Read and Write property)
See also RTSP_REQUEST option in CURL manual.

### 64.22.307 OptionRTSPServerCSEQ as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Manually initialize the server RTSP CSeq for this handle.
**Notes:** (Read and Write property)
See also RTSP_SERVER_CSEQ option in CURL manual.

### 64.22.308 OptionRTSPSessionID as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RTSP session identifier.
**Notes:** (Read and Write property)
See also RTSP_SESSION_ID option in CURL manual.

### 64.22.309 OptionRTSPStreamURI as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RTSP stream URI.
**Notes:** (Read and Write property)
See also RTSP_STREAM_URI option in CURL manual.

### 64.22.310 OptionRTSPTransport as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Transport: header to use in RTSP requests.
**Notes:** (Read and Write property)
See also RTSP_TRANSPORT option in CURL manual.

### 64.22.311 OptionSASLAuthZID as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The authorisation identity (identity to act as).
**Notes:** Sets the authorisation identity (identity to act as).
Pass a text as parameter, which should be pointing to the authorisation identity (authzid) for the transfer. Only applicable to the PLAIN SASL authentication mechanism where it is optional.
When not specified only the authentication identity (authcid) as specified by the username will be sent to the server, along with the password. The server will derive a authzid from the authcid when not provided, which it will then uses internally.
When the authzid is specified, the use of which is server dependent, it can be used to access another user's inbox, that the user has been granted access to, or a shared mailbox for example.
(Read and Write property)
See also SASL_AUTHZID option in CURL manual.

### 64.22.312 OptionSASLIR as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable SASL initial response.
**Notes:** (Read and Write property)
See also SASL_IR option in CURL manual.

### 64.22.313 OptionServerResponseTimeout as Integer

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Causes libcurl to set a timeout period (in seconds) on the amount of time that the server is allowed to take in order to send a response message for a command before the session is considered dead.
**Notes:** While libcurl is waiting for a response, this value overrides OptionTimeout. It is recommended that if used in conjunction with OptionTimeout, you set OptionServerResponseTimeout to a value smaller than OptionTimeout.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SERVER_RESPONSE_TIMEOUT option in CURL manual.

### 64.22.314 OptionServiceName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Service Name.
**Notes:** (Read and Write property)
See also SERVICE_NAME option in CURL manual.

### 64.22.315 OptionSocks5Auth as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitmask of allowed auth methods for connections to SOCKS5 proxies.
**Notes:** (Read and Write property)
See also SOCKS5_AUTH option in CURL manual.

### 64.22.316 OptionSocks5GSSAPINEC as Boolean

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to protect SOCKS5 connection is protected.
**Notes:** Set to true to enable or false to disable. As part of the gssapi negotiation a protection mode is negotiated. The rfc1961 says in section 4.3/4.4 it should be protected, but the NEC reference implementation does not. If enabled, this option allows the unprotected exchange of the protection mode negotiation. (Added in 7.19.4).
(Read and Write property)
See also SOCKS5_GSSAPI_NEC option in CURL manual.

### 64.22.317 OptionSocks5GSSAPIService as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A string holding the name of the service.
**Notes:** The default service name for a SOCKS5 server is rcmd/server-fqdn. This option allows you to change it. (Added in 7.19.4)
(Read and Write property)

### 64.22.318 OptionSSHAuthTypes as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Define the SSH authorization types.
**Example:**

```
dim c as CURLSMBS // your instance

// only do password
c.OptionSSHAuthTypes = c.kSSHAuthKeyboard or c.kSSHAuthPassword
```

**Notes:** Pass a long set to a bitmask consisting of one or more of CURLSSH_AUTH_PUBLICKEY, CURLSSH_AUTH_PASSWORD, CURLSSH_AUTH_HOST, CURLSSH_AUTH_KEYBOARD. Set CURLSSH_AUTH_ to let libCURL pick one. (Added in 7.16.1)

See kSSHAuth* constants.
(Read and Write property)
See also SSH_AUTH_TYPES option in CURL manual.

### 64.22.319 OptionSSHCompression as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable SSH compression.
**Notes:** (Read and Write property)
See also SSH_COMPRESSION option in CURL manual.

### 64.22.320 OptionSSHHostPublicKeyMD5 as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string containing 32 hexadecimal digits with the 128 bit MD5 checksum of the remote host's public key.
**Notes:** libCURL will reject the connection to the host unless the md5sums match. This option is only for SCP and SFTP transfers. (Added in 7.17.1)
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_MD5 option in CURL manual.

### 64.22.321 OptionSSHHostPublicKeySHA256 as String

MBS CURL Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SHA256 hash of SSH server public key.
**Notes:** Pass a string containing a Base64-encoded SHA256 hash of the remote host's public key. The transfer will fail if the given hash does not match the hash the remote host provides.
(Read and Write property)
See also SSH_HOST_PUBLIC_KEY_SHA256 option in CURL manual.

### 64.22.322 OptionSSHKnownhosts as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string holding the file name of the known_host file to use.
**Notes:** The known_hosts file should use the OpenSSH file format as supported by libssh2. If this file is specified, libCURL will only accept connections with hosts that are known and present in that file, with a matching public key. (Added in 7.19.6)
(Read and Write property)
See also SSH_KNOWNHOSTS option in CURL manual.

### 64.22.323 OptionSSHPrivateKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass a path pointing to a file name for your private key.
**Example:**

```
Dim c As New CURLSMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using

textasciitilde /.ssh/id_dsa. If the file is password-protected, set the password with OptionSSLKeyPassword. (Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PRIVATE_KEYFILE option in CURL manual.

### 64.22.324 OptionSSHPublicKeyfile as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass a path pointing to a file name for your public key.
**Example:**

```
Dim c As New CURLSMBS

c.OptionSSHPrivateKeyfile = "/Users/test/.ssh/id_rsa"
c.OptionSSHPublicKeyfile = "/Users/test/.ssh/id_rsa.pub"
c.OptionUsername = "test"
```

**Notes:** If not used, libCURL defaults to using
textasciitilde /.ssh/id_dsa.pub. (Added in 7.16.1)

For a SFTP transfer (= file transfer over SSH), you would tell the plugin your public and private keys, so the plugin can login.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSH_PUBLIC_KEYFILE option in CURL manual.

### 64.22.325 OptionSSLCert as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string should be the file name of your certificate.
**Notes:** The default format is "PEM" and can be changed with OptionSSLCERTTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLCERT option in CURL manual.

### 64.22.326 OptionSSLCertBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set SSL client certificate from memory blob.
**Notes:** Pass data, which contains a client certificate. The format must be "P12" on Secure Transport or Schannel. The format must be "P12" or "PEM" on OpenSSL. The string "P12" or "PEM" must be specified with OptionSSLCertType.

This option is an alternative to OptionSSLCert which instead expects a file name as input.
(Read and Write property)
See also SSLCERT_BLOB option in CURL manual.

### 64.22.327 OptionSSLCertPassword as String

MBS CURL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The certificate password.
**Notes:** (Read and Write property)

### 64.22.328 OptionSSLCertType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string should be the format of your certificate.
**Notes:** Supported formats are "PEM" and "DER". (Added in 7.9.3)

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

See also SSLCERTTYPE option in CURL manual.

### 64.22.329 OptionSSLCipherList as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string holding the list of ciphers to use for the SSL connection.
**Example:**

```
// allow lower secure ciphers
curl.OptionSSLCipherList = "DEFAULT@SECLEVEL=0"
```

**Notes:** The list must be syntactically correct, it consists of one or more cipher strings separated by colons. Commas or spaces are also acceptable separators but colons are normally used, !, - and + can be used as operators. Valid examples of cipher lists include 'RC4-SHA', 'SHA1+DES', 'TLSv1' and 'DEFAULT'. The default list is normally set when you compile OpenSSL.

You'll find more details about cipher lists on this URL:

http://www.openssl.org/docs/apps/ciphers.html

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSL_CIPHER_LIST option in CURL manual.

### 64.22.330 OptionSSLEnableALPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable TLS ALPN extension (http2 over ssl might fail without).
**Notes:** (Read and Write property)
See also SSL_ENABLE_ALPN option in CURL manual.

### 64.22.331 OptionSSLEnableNPN as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Enable/disable TLS NPN extension (http2 over ssl might fail without)

**Notes:** (Read and Write property)

### 64.22.332 OptionSSLEngine as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** It will be used as the identifier for the crypto engine you want to use for your private key.
**Notes:** If the crypto device cannot be loaded, kError_SSL_ENGINE_NOTFOUND is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE option in CURL manual.

### 64.22.333 OptionSSLEngineDefault as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Sets the actual crypto engine as the default for (asymmetric) crypto operations.
**Notes:** If the crypto device cannot be set, kError_SSL_ENGINE_SETFAILED is returned.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLENGINE_DEFAULT option in CURL manual.

### 64.22.334 OptionSSLFalseStart as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set if we should enable TLS false start.
**Notes:** (Read and Write property)
See also SSL_FALSESTART option in CURL manual.

### 64.22.335 OptionSSLKey as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string should be the file name of your private key.
**Notes:** The default format is "PEM" and can be changed with OptionSSLKEYTYPE.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

Starting with version 18.0 the plugin will always use UTF-8 encoding for file path on Linux and macOS. For macOS we also do the unicode character normalization for file names for you.
(Read and Write property)
See also SSLKEY option in CURL manual.

### 64.22.336 OptionSSLKeyBlob as String

MBS CURL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set private key for client cert from memory blob.
**Notes:** Pass data, which contains a private key. Compatible with OpenSSL. The format (like "PEM") must be specified with OptionSSLKeyType.

This option is an alternative to OptionSSLKey which instead expects a file name as input.
(Read and Write property)
See also SSLKEY_BLOB option in CURL manual.

### 64.22.337 OptionSSLKeyPassword as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use OptionKeyPassword instead. **Function:** The password required to use the OptionSSLKEY private key.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)

### 64.22.338 OptionSSLKeyType as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string should be the format of your private key.
**Notes:** Supported formats are "PEM", "DER" and "ENG".

The format "ENG" enables you to load the private key from a crypto engine. In this case OptionSSLKEY is used as an identifier passed to the engine. You have to set the crypto engine with OptionSSLENGINE. "DER" format key file currently does not work because of a bug in OpenSSL.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also SSLKEYTYPE option in CURL manual.

### 64.22.339 OptionSSLOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable specific SSL features with a bitmask.
**Notes:** (Read and Write property)
See also SSL_OPTIONS option in CURL manual.

### 64.22.340 OptionSSLSessionIDCache as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to use the SSL session ID cache.
**Notes:** Pass false to disable libCURL's use of SSL session-ID caching. Set this to true to enable it. By default all transfers are done using the cache. Note that while nothing ever should get hurt by attempting to reuse SSL session-IDs, there seem to be broken SSL implementations in the wild that may require you to disable this in order for you to succeed. (Added in 7.16.0)
(Read and Write property)
See also SSL_SESSIONID_CACHE option in CURL manual.

### 64.22.341 OptionSSLVerifyHost as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option determines whether libCURL verifies that the server cert is for the server it is known as.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object

// disable
```

```
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** When negotiating an SSL connection, the server sends a certificate indicating its identity.

When OptionSSLVerifyHost is 2, that certificate must indicate that the server is the server to which you meant to connect, or the connection fails.

CURL considers the server the intended one when the Common Name field or a Subject Alternate Name field in the certificate matches the host name in the URL to which you told CURL to connect.

When the value is 1, the certificate must contain a Common Name field, but it doesn't matter what name it says. (This is not ordinarily a useful setting).

When the value is 0, the connection succeeds regardless of the names in the certificate.

The default, since 7.10, is 2.

The checking this option controls is of the identity that the server claims. The server could be lying. To control lying, see OptionSSLVerifyPeer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYHOST option in CURL manual.

### 64.22.342 OptionSSLVerifyPeer as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configure whether this CURL instance will verify the SSL peer certificate.
**Example:**

```
// if you use SSL, maybe put in a certificate or disable verification?

dim d as CURLSMBS
// your CURL object

// disable
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// or better provide root certificates:

Dim cacert As FolderItem = GetFolderItem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2
d.OptionSSLVerifyPeer = 1
```

**Notes:** This option determines whether CURL verifies the authenticity of the peer's certificate. A value of 1 means CURL verifies; zero means it doesn't. The default is nonzero, but before 7.10, it was zero.

When negotiating an SSL connection, the server sends a certificate indicating its identity. CURL verifies whether the certificate is authentic, i.e. that you can trust that the server is who the certificate says it is. This trust is based on a chain of digital signatures, rooted in certification authority (CA) certificates you supply. As of 7.10, CURL installs a default bundle of CA certificates and you can specify alternate certificates with the OptionCAINFO option or the OptionCAPATH option.

When OptionSSLVerifyPeer is nonzero, and the verification fails to prove that the certificate is authentic, the connection fails. When the option is zero, the connection succeeds regardless.

Authenticating the certificate is not by itself very useful. You typically want to ensure that the server, as authentically identified by its certificate, is the server you mean to be talking to. Use OptionSSLVerifyHost to control that.

When you don't set the options for certificate path or load system certificates, the MBS Plugin will disable the verify step to let the transfer run.
(Read and Write property)
See also SSL_VERIFYPEER option in CURL manual.

### 64.22.343 OptionSSLVerifyStatus as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set if we should verify the certificate status.
**Notes:** (Read and Write property)
See also SSL_VERIFYSTATUS option in CURL manual.

### 64.22.344 OptionSSLVersion as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What version of SSL/TLS to attempt to use.
**Example:**

```
dim c as CURLSMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** The SSL and TLS versions have typically developed from the most insecure version to be more and more secure in this order through history: SSL v2, SSLv3, TLS v1.0, TLS v1.1, TLS v1.2 and the most recent TLS v1.3.

Use one of the available defines for this purpose. The available options are:

| | | |
|---|---|---|
| Default | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| TLSv1 | 1 | TLS v1.0 or later |
| SSLv2 | 2 | SSL v2 (but not SSLv3) |
| SSLv3 | 3 | SSL v3 (but not SSLv2) |
| TLSv1.0 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| TLSv1.1 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| TLSv1.2 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| TLSv1.3 | 7 | TLS v1.3 or later (Added in 7.52.0) |

See also kSSLVersion* constants.

The maximum TLS version can be set by using one of the CURL_SSLVERSION_MAX_ macros below. It is also possible to OR one of the CURL_SSLVERSION_ macros with one of the CURL_SSLVERSION_MAX_ macros.

| | | |
|---|---|---|
| Default | &h10000 | The flag defines the maximum supported TLS version by libcurl, or the default value from the SSL library is used. libcurl will use a sensible default maximum, which was TLS v1.2 up to before 7.61.0 and is TLS v1.3 since then - assuming the TLS library support it. (Added in 7.54.0) |
| Max TLSv1.0 | &h40000 | The flag defines maximum supported TLS version as TLS v1.0. (Added in 7.54.0) |
| Max TLSv1.1 | &h50000 | The flag defines maximum supported TLS version as TLS v1.1. (Added in 7.54.0) |
| Max TLSv1.2 | &h60000 | The flag defines maximum supported TLS version as TLS v1.2. (Added in 7.54.0) |
| Max TLSv1.3 | &h70000 | The flag defines maximum supported TLS version as TLS v1.3. (Added in 7.54.0) |

Please note that MBS Plugin does not yet support TLS v1.3 now, but may in future.
(Read and Write property)
See also SSLVERSION option in CURL manual.

### 64.22.345 OptionStreamDepends as CURLSMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS option in CURL manual.

### 64.22.346 OptionStreamDependsE as CURLSMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set E-xclusive stream dependency on another CURL handle.
**Notes:** (Read and Write property)
See also STREAM_DEPENDS_E option in CURL manual.

### 64.22.347 OptionStreamWeight as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set stream weight, 1 - 256.
**Notes:** Default is 16.
(Read and Write property)
See also STREAM_WEIGHT option in CURL manual.

### 64.22.348 OptionSuppressConnectHeaders as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Suppress proxy CONNECT response headers from events.
**Notes:** (Read and Write property)
See also SUPPRESS_CONNECT_HEADERS option in CURL manual.

### 64.22.349 OptionTCPFastOpen as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set TCP Fast Open.
**Notes:** (Read and Write property)
See also TCP_FASTOPEN option in CURL manual.

### 64.22.350 OptionTCPKeepAlive as Boolean

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If set to true, TCP keepalive probes will be sent.
**Notes:** The delay and frequency of these probes can be controlled by the OptionTCPKeepIdle and OptionTCPKeepInterval options, provided the operating system supports them. Set to false (default behavior) to disable keepalive probes (Added in 7.25.0).
(Read and Write property)
See also TCP_KEEPALIVE option in CURL manual.

### 64.22.351 OptionTCPKeepIdle as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the delay, in seconds, that the operating system will wait while the connection is idle before sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPIDLE option in CURL manual.

### 64.22.352 OptionTCPKeepInterval as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the interval, in seconds, that the operating system will wait between sending keepalive probes.
**Notes:** Not all operating systems support this option. (Added in 7.25.0)
(Read and Write property)
See also TCP_KEEPINTVL option in CURL manual.

### 64.22.353 OptionTCPNoDelay as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An integer specifying whether the TCP_NODELAY option should be set or cleared (true = set, false = clear).
**Notes:** The option is cleared by default. This will have no effect after the connection has been established.

Setting this option will disable TCP's Nagle algorithm. The purpose of this algorithm is to try to minimize the number of small packets on the network (where "small packets" means TCP segments less than the Maximum Segment Size (MSS) for the network).

Maximizing the amount of data sent per TCP segment is good because it amortizes the overhead of the send. However, in some cases (most notably telnet or rlogin) small segments may need to be sent without delay. This is less efficient than sending larger amounts of data at a time, and can contribute to congestion on the network if overdone.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TCP_NODELAY option in CURL manual.

### 64.22.354 OptionTFTPBlockSize as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify block size to use for TFTP data transmission.
**Notes:** Valid range as per RFC 2348 is 8-65464 bytes. The default of 512 bytes will be used if this option is not specified. The specified block size will only be used pending support by the remote server. If the server does not return an option acknowledgement or returns an option acknowledgement with no blksize, the default of 512 bytes will be used. (added in 7.19.4)
(Read and Write property)
See also TFTP_BLKSIZE option in CURL manual.

### 64.22.355 OptionTFTPNoOptions as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether not send any tftp option requests to the server.
**Notes:** (Read and Write property)
See also TFTP_NO_OPTIONS option in CURL manual.

### 64.22.356 OptionTimeCondition as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Time condition option.
**Notes:** This defines how the OptionTimeValue time value is treated. You can set this parameter to kTimeConditionIfModifiedSince (1) or kTimeConditionIfUnModifiedSince (2). This feature applies to HTTP and FTP.

The last modification time of a file is not always known and in such instances this feature will have no effect even if the given time condition would have not been met.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMECONDITION option in CURL manual.

### 64.22.357 OptionTimeOut as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum time in seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.

In unix-like systems, this might cause signals to be used unless CURLOPT_NOSIGNAL is set.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEOUT option in CURL manual.

### 64.22.358 OptionTimeOutMS as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pass a long as parameter containing the maximum time in milli seconds that you allow the libCURL transfer operation to take.
**Notes:** Normally, name lookups can take a considerable time and limiting operations to less than a few minutes risk aborting perfectly normal operations. This option will cause CURL to use the SIGALRM to enable time-outing system calls.
(Read and Write property)
See also TIMEOUT_MS option in CURL manual.

### 64.22.359 OptionTimeValue as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This should be the time in seconds since 1 jan 1970, and the time will be used in a condition as specified with OptionTimeCondition.
**Notes:** The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TIMEVALUE option in CURL manual.

### 64.22.360 OptionTLS13Ciphers as String

MBS CURL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify which TLS 1.3 ciphers suites to use.
**Notes:** string holding the list of cipher suites to use for the TLS 1.3 connection. The list must be syntactically correct, it consists of one or more cipher suite strings separated by colons.

You'll find more details about cipher lists on this URL:

https://curl.haxx.se/docs/ssl-ciphers.html

The application does not have to keep the string around after setting this option.
(Read and Write property)
See also TLS13_CIPHERS option in CURL manual.

### 64.22.361 OptionTLSAuthPassword as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the TSL authentication password.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_PASSWORD option in CURL manual.

### 64.22.362 OptionTLSAuthType as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the TLS authentication type.
**Notes:** You can set this to "SRP" to use Secure Remote Password authentication.
Please also set username and password.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_TYPE option in CURL manual.

### 64.22.363 OptionTLSAuthUsername as String

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the TSL authentication user name.
**Notes:** Please also set OptionTLSAuthType.
The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TLSAUTH_USERNAME option in CURL manual.

### 64.22.364 OptionTransferEncoding as Boolean

MBS CURL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a request for compressed Transfer Encoding in the outgoing HTTP request.
**Notes:** If the server supports this and so desires, it can respond with the HTTP response sent using a compressed Transfer-Encoding that will be automatically uncompressed by libCURL on reception.

Transfer-Encoding differs slightly from the Content-Encoding you ask for with OptionAcceptEncoding in that a Transfer-Encoding is strictly meant to be for the transfer and thus MUST be decoded before the data arrives in the client. Traditionally, Transfer-Encoding has been much less used and supported by both HTTP clients and HTTP servers.
(Read and Write property)
See also TRANSFER_ENCODING option in CURL manual.

### 64.22.365 OptionTransferText as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to use ASCII mode for ftp transfers, instead of the default binary transfer.
**Notes:** For win32 systems it does not set the stdout to binary mode. This option can be usable when transferring text data between systems with different views on certain characters, such as newlines or similar.

libCURL does not do a complete ASCII conversion when doing ASCII transfers over FTP. This is a known limitation/flaw that nobody has rectified. libCURL simply sets the mode to ascii and performs a standard transfer.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also TRANSFERTEXT option in CURL manual.

### 64.22.366 OptionUnixSocketPath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Path to Unix domain socket.
**Notes:** (Read and Write property)
See also UNIX_SOCKET_PATH option in CURL manual.

### 64.22.367 OptionUnrestrictedAuth as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A boolean parameter tells the library it can continue to send authentication (user+password) when following locations, even when hostname changed.
**Notes:** This option is meaningful only when setting FollowOption.

The Lasterror property is set. 0 for success.

You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UNRESTRICTED_AUTH option in CURL manual.

### 64.22.368 OptionUpkeepIntervalMS as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connection upkeep interval.
**Notes:** Some protocols have "connection upkeep" mechanisms. These mechanisms usually send some traffic on existing connections in order to keep them alive; this can prevent connections from being closed due to overzealous firewalls, for example.

The user needs to explicitly call Upkeep in order to perform the upkeep work.

Currently the only protocol with a connection upkeep mechanism is HTTP/2: when the connection upkeep interval is exceeded and Upkeep is called, an HTTP/2 PING frame is sent on the connection.
(Read and Write property)
See also UPKEEP_INTERVAL_MS option in CURL manual.

### 64.22.369 OptionUpload as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True tells the library to prepare for an upload.
**Notes:** The OptionInFileSize or OptionInFileSizeLarge options are also interesting for uploads. If the protocol is HTTP, uploading means using the PUT request unless you tell libCURL otherwise.

Using PUT with HTTP 1.1 implies the use of a "Expect: 100-continue" header. You can disable this header with OptionHTTPHeader as usual.

If you use PUT to a HTTP 1.1 server, you can upload data without knowing the size before starting the transfer if you use chunked encoding. You enable this by adding a header like "Transfer-Encoding: chunked" with OptionHTTPHeader. With HTTP 1.0 or without chunked transfer, you must specify the size.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also UPLOAD option in CURL manual.

### 64.22.370 OptionUploadBufferSize as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set preferred upload buffer size.
**Notes:** Pass a long specifying your preferred size (in bytes) for the upload buffer in libcurl. It makes libcurl uses a larger buffer that gets passed to the next layer in the stack to get sent off. In some setups and for some protocols, there's a huge performance benefit of having a larger upload buffer.

This is just treated as a request, not an order. You cannot be guaranteed to actually get the given size.

The upload buffer size is by default 64 kilobytes. The maximum buffer size allowed to be set is 2 megabytes. The minimum buffer size allowed to be set is 16 kilobytes.

Since curl 7.61.1 the upload buffer is allocated on-demand - so if the handle isn't used for upload, this buffer will not be allocated at all.

For slow upload/downloads, it may be better to set buffer size to 1 MB with OptionUploadBufferSize or OptionBufferSize properties to make transfers faster.
(Read and Write property)
See also UPLOAD_BUFFERSIZE option in CURL manual.

### 64.22.371 OptionURL as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The actual URL to deal with.
**Example:**

```
Dim c As New CURLSMBS

// this example sends a xml request to a server
c.OptionURL = "http://www.someserver.com/service"

// some XML for a SOAP request
Dim request As String = "<?xml version=""1.0""?><methodCall><methodName>application.getValue</methodName><params><param><value>info</value></param></params></methodCall>"

c.OptionPostFields = request

Dim header(-1) As String
header.Append "Content-Type: text/xml"
c.SetOptionHTTPHeader header
```

```
// this should be c.kError_OK if okay.
Dim result As Integer = c.Perform

Dim output As String = c.OutputData
Dim debugLog As String = c.DebugMessages
Dim HTTPStatus As Integer = c.GetInfoResponseCode

Break
```

**Notes:** If you need to pass username or password, please consider using the OptionUsername and OptionPassword properties. If you username or password contains characters like @ or :, you must use those properties.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.

The parameter should be a char * to a zero terminated string. The string must remain present until CURL no longer needs it, as it doesn't copy the string.

If the given URL lacks the protocol part ("http://" or "ftp://" etc), it will attempt to guess which protocol to use based on the given host name. If the given protocol of the set URL is not supported, libCURL will return on error (kError_UNSUPPORTED_PROTOCOL) when you call Perform. Use VersionInfo for detailed info on which protocols that are supported.

The string given to CURLOPT_URL must be url-encoded and following the RFC 2396:
http://CURL.haxx.se/rfc/rfc2396.txt

CURLOPT_URL is the only option that must be set before Perform is called.
For file uploads or downloads, please include the file name in the URL.

Please do never include username and passwords in URLs, as those get often written to log files and would reveal your credentials!
Instead use OptionUsername and OptionPassword.

If you miss the protocol in the URL, you may get an error about HTTP/0.9 being used and not allowed.
(Read and Write property)
See also URL option in CURL manual.

### 64.22.372 OptionUserAgent as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user agent string to pass to the server.
**Example:**

```
Dim c As New CURLSMBS

// setup request and any options you need
c.OptionURL = URL
c.OptionUserAgent = "MyDownloader 1.0"
```

**Notes:** It will be used to set the User-Agent: header in the http request sent to the remote server. This can be used to fool servers or scripts. You can also set any custom header with OptionHTTPHeader.

The Lasterror property is set. 0 for success.
You can set this value and later you can read it, but you cannot read the default value.
(Read and Write property)
See also USERAGENT option in CURL manual.

### 64.22.373 OptionUsername as String

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user name to be used in protocol authentication
**Notes:** In order to specify the password to be used in conjunction with the user name use the OptionPassword option
(Read and Write property)
See also USERNAME option in CURL manual.

### 64.22.374 OptionUseSSL as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request using SSL / TLS for the transfer.
**Example:**

```
dim c as CURLSMBS
c.OptionUseSSL = c.kFTPSSL_ALL
c.OptionSSLVersion = c.kSSLVersionTLSv12
```

**Notes:** Set to an integer using one of the values from below, to make libCURL use your desired level of SSL for the transfer.
These are all protocols that start out plain text and get "upgraded" to SSL using the STARTTLS command. This is for enabling SSL/TLS when you use FTP, SMTP, POP3, IMAP etc.

| | | |
|---|---|---|
| CURLUSESSL_NONE | 0 | Don't attempt to use SSL. |
| CURLUSESSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |
| CURLUSESSL_CONTROL | 2 | Require SSL for the control connection or fail with CURLE_USE_SSL_FAILED. |
| CURLUSESSL_ALL | 3 | Require SSL for all communication or fail with CURLE_USE_SSL_FAILED. |

(Read and Write property)
See also USE_SSL option in CURL manual.

### 64.22.375 OptionVerbose as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether debug messages are sent to the DebugMessage event.
**Notes:** Default is false.
You need to subclass the CURLSMBS class to add code in the DebugMessage event.
Or you set CollectDebugMessages = true and later query DebugMessages property.
Or you use CreateMTDebugOutputFile to stream them to a file.
(Read and Write property)
See also VERBOSE option in CURL manual.

### 64.22.376 OptionWildCardMatch as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable wildcard matching.
**Notes:** Set onoff to true if you want to transfer multiple files according to a file name pattern. The pattern can be specified as part of the OptionURL option, using an fnmatch-like pattern (Shell Pattern Matching) in the last part of URL (file name).

By default, libCURL uses its internal wildcard matching implementation. You can provide your own matching function by the CURLSMBS.FileNameMatch event.

A brief introduction of its syntax follows:

- - ASTERISK

ftp://example.com/some/path/*.txt (for all txt's from the root directory)

? - QUESTION MARK

Question mark matches any (exactly one) character.

ftp://example.com/some/path/photo?.jpeg

[ - BRACKET EXPRESSION

The left bracket opens a bracket expression. The question mark and asterisk have no special meaning in a bracket expression. Each bracket expression ends by the right bracket and matches exactly one character. Some examples follow:

[ a-zA-Z0-9 ] or [ f-gF-G ] - character interval
[ abc ] - character enumeration
[ ^abc ] or [ !abc ] - negation
[ [ :name: ] ] class expression. Supported classes are alnum,lower, space, alpha, digit, print, upper, blank, graph, xdigit.
[ ] [ -!^] - special case - matches only '-', ' ] ', ' [ ', '!' or '^'. These characters have no special purpose.
[ \[ \] \\] - escape syntax. Matches ' [ ', ' ] ' or '¬¥.

Using the rules above, a file name pattern can be constructed:

ftp://example.com/some/path/ [ a-z [ :upper: ] \\] .jpeg

This feature is only supported for FTP download. Not for SFTP or HTTP.
(Read and Write property)
See also WILDCARDMATCH option in CURL manual.

### 64.22.377 OptionXOAuth2Bearer as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XOAUTH2 bearer token.
**Notes:** (Read and Write property)
See also XOAUTH2_BEARER option in CURL manual.

### 64.22.378 OutputData as String

MBS CURL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output data from CURL.
**Example:**

```
Dim d As New CURLSMBS

// download here
d.OptionURL = URL

// if you use SSL, maybe put in a certificate or disable verification?
d.OptionSSLVerifyHost = 0
d.OptionSSLVerifyPeer = 0

// run download
dim e as integer = d.Perform

// check result
Dim data As String = d.OutputData
Dim DebugMessage As String = d.DebugMessages // check in debugger on error

ResultText.text="Result: "+str(e) // 0 = Okay, others are error codes, so check debug messsages
```

**Notes:** If CollectOutputData property is true, the plugin puts the data received in write event also into this property, so you can grab it after the transfer. Use ClearData method to clear when reusing CURL object.

Limited to 2 GB. Please stream to file for bigger data with CreateMTOutputFile function.
(Read only property)

### 64.22.379 Paused as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether transfer is paused.
**Notes:** You can set it to true while transfer runs to pause it.
(Read and Write property)

### 64.22.380 ProgressDownloadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bytes downloaded so far.
**Notes:** (Read only property)

### 64.22.381 ProgressDownloadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bytes to download in total.
**Notes:** (Read only property)

### 64.22.382 ProgressPercent as Double

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current download/upload progress in percent.
**Notes:** Range from 0 to 100.
(Read only property)

### 64.22.383 ProgressUploadCurrent as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bytes uploaded so far.
**Notes:** (Read only property)

### 64.22.384 ProgressUploadTotal as Int64

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bytes to upload in total.
**Notes:** (Read only property)

### 64.22.385 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.22.386 Version as CURLSVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a version object to a filled with information about various run-time features in libCURL.
**Notes:** (Read only property)

### 64.22.387 WebSocketOptions as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** WebSocket behavior options.
**Notes:** Pass a bitmask to tell libcurl about specific WebSocket behaviors.

To detach a WebSocket connection and use the WebSocketSend and WebSocketReceive functions after the HTTP upgrade procedure, set the OptionConnectOnly option to 2.

Available bits in the bitmask:

kWebSocketRaw:
Deliver "raw" WebSocket traffic to the Write event.

In raw mode, libcurl does not handle pings or any other frame for the application.
(Read and Write property)

### 64.22.388 YieldTime as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether plugin should yield time.
**Example:**

```
dim curl as new CURLSMBS

curl.YieldTime = true
```

**Notes:** If set the plugin will yield time to Xojo back so threads and timers work while you download.

Seems like in RB 2009 this property only has effect if you run CURL in a thread.
(Read and Write property)

### 64.22.389 Events

### 64.22.390 ChunkBegin(FileInfo as CURLSFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called on begin of a new chunk.
**Notes:** If splitting of data transfer is enabled, this event is called before download of an individual chunk started. Note that parameter "remains" works only for FTP wildcard downloading (for now), otherwise is not used.

### 64.22.391 ChunkEnd(FileInfo as CURLSFileInfoMBS, Remains as Integer) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Download of a chunk ended.
**Notes:** If splitting of data transfer is enabled this event is called after download of an individual chunk finished.
This event is called for skipped or downloaded files.

### 64.22.392 DebugMessage(infotype as Integer, data as string, dataSize as Integer)

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A debug event to get data of ongoing process.
**Notes:** You may need to set OptionVerbose to true.

infotype constants:

| | | |
|---|---|---|
| kInfo_TEXT | 0 | The data is informational text. |
| kInfo_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kInfo_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kInfo_DATA_IN | 3 | The data is protocol data received from the peer. |
| kInfo_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kInfo_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kInfo_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |

If you set CollectDebugMessages, the plugin will collect the messages and provide them via the DebugMessages property. You can still use this event to write your own log instead of in addition.

### 64.22.393 FileNameMatch(Pattern as String, Name as String) as Integer

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Match a file against a pattern.
**Notes:** If you don't implement this event, you get the default implementation from CURL.
Return kFileNameMatchNoMatch, kFileNameMatchIsMatch or kFileNameMatchFailed.

### 64.22.394 Finished(Result as Integer)

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when transfer has finished.
**Notes:** For Perform and PerformMT it is called before Perform function returns, so in PerformMT this is called on the thread.
For use with CURLSMultiMBS, it is called after TransferFinished event and before TransfersFinished event.
If you want to modify GUI and use PeformMT, you may need to start a timer to do so.

### 64.22.395 Header(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** New Header data was received.
**Notes:** You can get error 23 if you don't return lenb(data) in this event.
Or just leave it emtpy so RB will not include it in your application the plugin will return lenb(data) itself.

If you set CollectHeaderData to true, the plugin will collect the messages and provide them via the HeaderData property. You can still use this event to write your own log instead of in addition.

### 64.22.396 Progress(dltotal as Int64, dlnow as Int64, ultotal as Int64, ulnow as Int64, percent as Double) as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to report progress of ongoing transfers.
**Notes:** This function gets called by libCURL with a frequent interval during operation (roughly once per second) no matter if data is being transfered or not. Unknown/unused argument values passed to the event will be set to zero (like if you only download data, the upload size will remain 0).
Returning a true from this event will cause libCURL to abort the transfer and return kError_ABORTED_BY_CALL-

BACK.

You can run CURL from a thread to download several things at the same time or keep the GUI more responsive. For better GUI, you can even call a method like app.DoEvents to get the GUI updated more often.

When sending email, ultotal may be zero. In that case use OptionInFileSize to know size of email to upload.

### 64.22.397 Read(count as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as it needs to read data in order to send it to the peer.
**Notes:** Return the number of bytes requested. Never return a string with lenb(string)>count. You can return 0 to inform about end of file.

If you stop the current transfer by returning 0 "pre-maturely" (i.e before the server expected it, like when you've told you will upload N bytes and you upload less than N bytes), you may experience that the server "hangs" waiting for the rest of the data that won't come.

The read event may return CURL_READFUNC_ABORT (&h10000000) to stop the current operation immediately, resulting in a kError_ABORTED_BY_CALLBACK error code from the transfer (Added in 7.12.1)

This event is not called when using PerformMT.

If you provide Input data via SetInputData or OpenMTInputFile method, this event is not called and data is taken from the data you provided.

### 64.22.398 RestartRead() as boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event to inform you that reading on the file needs to start at the beginning again.
**Notes:** Return true on success.
If you use a binarystream for reading you will have to set position to 0 in this event.

This event is not called when using PerformMT.

### 64.22.399 Seek(pos as Int64, whence as Integer) as Integer

MBS CURL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when CURL needs to perform a seek.
**Notes:** Normally only needed if you resume a download (Seek forward) or upload is reset (seek back).
Whence is kSeekOriginCurrent, kSeekOriginEnd or kSeekOriginSet.
Please return one of this constants: kSeekReturnCantSeek, kSeekReturnFail or kSeekReturnOk.

### 64.22.400 SSHKey(KnownKey as string, KnownKeyLength as Integer, KnownKeyType as Integer, FoundKey as string, FoundKeyLength as Integer, FoundKeyType as Integer, MatchStatus as Integer) as Integer

MBS CURL Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for known hosts event for SFTP and SCP.
**Notes:** KnownKey: The known key as string encoded with base64 if KnownKeyLength is zero, otherwise the "raw" data.
KnownKeyLength: The length of the key. Zero for base64 encoded key.
KnownKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
FoundKey: The found key as string encoded with base64 if FoundKeyLength is zero, otherwise the "raw" data.
FoundKeyLength: The length of the key. Zero for base64 encoded key.
FoundKeyType: The type of the key. (0 = Unknown, 1 = RSA1, 2 = RSA, 3 = DSS)
MatchStatus: The status CURL found. (0 = OK, 1 = Mismatch, 2 = Missing)

Return one of the following values:

| | | |
|---|---|---|
| CURLKHSTAT_FINE_ADD_TO_FILE | 0 | Fine and add to file |
| CURLKHSTAT_FINE | 1 | Fine |
| CURLKHSTAT_REJECT | 2 | reject the connection, return an error |
| CURLKHSTAT_DEFER | 3 | do not accept it, but we can't answer right now so this causes a CURLE_DEFER error but otherwise the connection will be left intact etc |

### 64.22.401 Write(data as string, dataSize as Integer) as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event gets called by libCURL as soon as there is data received that needs to be saved.
**Notes:** Return the number of bytes actually taken care of. If that amount differs from the amount passed to your function, it'll signal an error to the library and it will abort the transfer and return kError_WRITE_ERROR.

This function may be called with zero bytes data if the transfered file is empty.

The event function will be passed as much data as possible in all invokes, but you cannot possibly make any assumptions. It may be one byte, it may be thousands. The maximum amount of data that can be passed to the write event is defined in the CURL.h header file: CURL_MAX_WRITE_SIZE (16384).

If you set CollectOutputData to true, the plugin will automatically collect the data and provide it to you after the transfer with the OutputData property. This collecting feature will only work right, if there is enough free memory. You can of course still process data yourself in this event instead of in addition.

### 64.22.402 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kUpkeepIntervalDefault | 50000 | The default connection upkeep interval in milliseconds. |
| kWebSocketRaw | 1 | One of the options for web sockets.<br>RAW mode for WebSocketOptions. |

Authorization

| Constant | Value | Description |
|---|---|---|
| kAUTH_ANY | &hFFFFFFEF | all types set |
| kAUTH_ANYSAFE | &hFFFFFFEE | |
| kAUTH_AWS_SIGV4 | 128 | AWS Signature v4 |
| kAUTH_BASIC | 1 | Basic (default) |
| kAUTH_Bearer | 64 | HTTP Bearer token authentication |
| kAUTH_DIGEST | 2 | Digest |
| kAUTH_DIGEST_IE | 16 | HTTP Digest authentication with an IE flavor. Digest authentication is de in RFC 2617 and is a more secure way to do authentication over public netw than the regular old-fashioned Basic method. The IE flavor is simply libCURL will use a special "quirk" that IE is known to have used before ve 7 and that some servers require the client to use. |
| kAUTH_GSSNEGOTIATE | 4 | GSS-Negotiate<br>Please check SupportsGSSNEGOTIATE property in CURLSVersionMBS whether this is supported/implemented by your copy of the CURL librar |
| kAUTH_NEGOTIATE | 4 | HTTP Negotiate (SPNEGO) authentication. Negotiate authentication i fined in RFC 4559 and is the most secure way to perform authentication HTTP.<br>You need to build libCURL with a suitable GSS-API library or SSPI on dows for this to work. |
| kAUTH_NONE | 0 | |
| kAUTH_NTLM | 8 | |
| kAUTH_NTLM_WB | 32 | NTLM delegating to winbind helper. Authentication is performed by a sep binary application that is executed when needed. The name of the applic is specified at compile time but is typically /usr/bin/ntlm_auth<br>Note that libCURL will fork when necessary to run the winbind applic and kill it when complete, calling waitpid() to await its exit when done POSIX operating systems, killing the process will cause a SIGCHLD s to be raised (regardless of whether OptionNoSignal is set), which mus handled intelligently by the application. In particular, the application not unconditionally call wait() in its SIGCHLD signal handler to avoid subject to a race condition. This behavior is subject to change in future ver of libCURL. |
| kAUTH_Only | &h80000000 | This is a meta symbol. OR this value together with a single specific auth to force libCURL to probe for un-restricted auth and if not, only that s auth algorithm is acceptable. |

ChunkBegin result values

| Constant | Value | Description |
|---|---|---|
| kChunkBeginFailed | 1 | Failed, so we exit downloads. |
| kChunkBeginOK | 0 | OK, download this file. |
| kChunkBeginSkip | 2 | Skip the file. |

ChunkEnd result values

| Constant | Value | Description |
|---|---|---|
| kChunkEndFailed | 1 | Failed, so we exit downloads. |
| kChunkEndOK | 0 | Download success. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kError_ABORTED_BY_CALLBACK | 42 | |
| kError_AGAIN | 81 | socket is not ready for send/recv, wait till it's ready and try ag CURL 7.18.2) |
| kError_Auth_Error | 94 | An authentication function returned an error. |
| kError_BAD_CONTENT_ENCODING | 61 | Unrecognized transfer encoding |
| kError_BAD_DOWNLOAD_RESUME | 36 | couldn't resume download |
| kError_BAD_FUNCTION_ARGUMENT | 43 | |
| kError_CHUNK_FAILED | 88 | Chunk event reported error. |
| kError_CONV_REQD | 76 | Not used with plugin. |
| kError_COULDNT_CONNECT | 7 | Could not connect. Proxy set? Firewall open? |
| kError_COULDNT_RESOLVE_HOST | 6 | |
| kError_COULDNT_RESOLVE_PROXY | 5 | |
| kError_FAILED_INIT | 2 | |
| kError_FILESIZE_EXCEEDED | 63 | Maximum file size exceeded |
| kError_FILE_COULDNT_READ_FILE | 37 | |
| kError_FTP_ACCEPT_FAILED | 10 | While waiting for the server to connect back when an active F used, an error code was sent over the control connection or simi |
| kError_FTP_ACCEPT_TIMEOUT | 12 | During an active FTP session while waiting for the server to OptionAcceptTimeoutMS (or the internal default) timeout expi |
| kError_FTP_BAD_FILE_LIST | 87 | Unable to parse FTP file list. |
| kError_FTP_CANT_GET_HOST | 15 | |
| kError_FTP_COULDNT_RETR_FILE | 19 | |
| kError_FTP_COULDNT_SET_TYPE | 17 | |
| kError_FTP_COULDNT_USE_REST | 31 | the REST command failed |
| kError_FTP_PORT_FAILED | 30 | FTP PORT operation failed |
| kError_FTP_PRET_FAILED | 84 | a PRET command failed |
| kError_FTP_WEIRD_227_FORMAT | 14 | |
| kError_FTP_WEIRD_PASS_REPLY | 11 | |
| kError_FTP_WEIRD_PASV_REPLY | 13 | |
| kError_FTP_WEIRD_SERVER_REPLY | 8 | |
| kError_FUNCTION_NOT_FOUND | 41 | |
| kError_GOT_NOTHING | 52 | when this is a specific error |
| kError_HTTP2 | 16 | A problem was detected in the HTTP2 framing layer. This is som and can be one out of several problems, see the error buffer for |
| kError_HTTP2_STREAM | 92 | stream error in HTTP/2 framing layer |
| kError_HTTP3 | 95 | HTTP3 layer failed. |
| kError_HTTP_POST_ERROR | 34 | |
| kError_HTTP_RETURNED_ERROR | 22 | |
| kError_INTERFACE_FAILED | 45 | |
| kError_LDAP_CANNOT_BIND | 38 | |
| kError_LDAP_INVALID_URL | 62 | Invalid LDAP URL |
| kError_LDAP_SEARCH_FAILED | 39 | |
| kError_LOGIN_DENIED | 67 | user, password or similar was not accepted and we failed to logi |
| kError_NOT_BUILT_IN | 4 | A requested feature, protocol or option was not found built-in in due to a build-time decision. This means that a feature or o enabled or explicitly disabled when libCURL was built and in o to function you have to get a rebuilt libCURL. |
| kError_NO_CONNECTION_AVAILABLE | 89 | For internal use only, will never be returned by libCURL. No connection available, the session will be queued. (added in 7 |
| kError_OK | 0 | |
| kError_OPERATION_TIMEDOUT | 28 | |
| kError_OUT_OF_MEMORY | 27 | |
| kError_PARTIAL_FILE | 18 | |
| kError_PEER_FAILED_VERIFICATION | 60 | |
| kError_Proxy | 96 | Proxy handshake error. |
| kError_Quic_Connect_Error | 96 | Quic had a connect error. |
| kError_QUOTE_ERROR | 21 | |
| kError_RANGE_ERROR | 33 | |

FileNameMatch Event Result Values

| Constant | Value | Description |
|---|---|---|
| kFileNameMatchFailed | 2 | Failed. |
| kFileNameMatchIsMatch | 0 | Is Match. |
| kFileNameMatchNoMatch | 1 | No match. |

Form Constants

| Constant | Value | Description |
|---|---|---|
| kFormArray | 8 | |
| kFormBuffer | 11 | |
| kFormBufferLength | 13 | |
| kFormBufferPtr | 12 | |
| kFormContentHeader | 15 | |
| kFormContentsLength | 6 | |
| kFormContentType | 14 | |
| kFormCopyContents | 4 | |
| kFormCopyName | 1 | |
| kFormEnd | 17 | |
| kFormFile | 10 | |
| kFormFileContent | 7 | |
| kFormFilename | 16 | |
| kFormNameLength | 3 | |
| kFormPtrContents | 5 | |
| kFormPtrName | 2 | |

FTP Authorization

| Constant | Value | Description |
|---|---|---|
| kFTPAUTH_DEFAULT | 0 | Allow libCURL to decide |
| kFTPAUTH_SSL | 1 | Try "AUTH SSL" first, and only if that fails try "AUTH TLS" |
| kFTPAUTH_TLS | 2 | Try "AUTH TLS" first, and only if that fails try "AUTH SSL" |

FTP CWD method

| Constant | Value | Description |
|---|---|---|
| kFTPMethodDefault | 0 | let libcurl pick |
| kFTPMethodMultiCWD | 1 | single CWD operation for each path part |
| kFTPMethodNoCWD | 2 | no CWD at all |
| kFTPMethodSingleCWD | 3 | one CWD to full dir, then work on file |

FTP SSL Option

| Constant | Value | Description |
|---|---|---|
| kFTPSSL_ALL | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_CONTROL | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kFTPSSL_NONE | 0 | Don't attempt to use SSL. |
| kFTPSSL_TRY | 1 | Try using SSL, proceed as normal otherwise. |

GSS API delegation modes

| Constant | Value | Description |
|---|---|---|
| kGSSAPIDelegationFlag | 2 | delegate always |
| kGSSAPIDelegationNone | 0 | no delegation (default) |
| kGSSAPIDelegationPolicyFlag | 1 | if permitted by policy |

HTTP Versions

| Constant | Value | Description |
|---|---|---|
| kHTTP_VERSION_1_0 | 1 | Enforce HTTP 1.0 requests. |
| kHTTP_VERSION_1_1 | 2 | Enforce HTTP 1.1 requests. |
| kHTTP_VERSION_2TLS | 4 | use version 2 for HTTPS, version 1.1 for HTTP |
| kHTTP_VERSION_2_0 | 3 | please use HTTP 2 in the request |
| kHTTP_VERSION_2_PRIOR_KNOWLEDGE | 5 | please use HTTP 2 without HTTP/1.1 Upgrade |
| kHTTP_VERSION_3 | 30 | please use HTTP 3 in the request |
| kHTTP_VERSION_3Only | 31 | Use HTTP/3 without fallback. For HTTPS only. For HTTP, t return error. |
| kHTTP_VERSION_NONE | 0 | We don't care about what version the library uses. libCURL it thinks fit. |

Debug Message Info Types

| Constant | Value | Description |
|---|---|---|
| kINFO_DATA_IN | 3 | The data is protocol data received from the peer. |
| kINFO_DATA_OUT | 4 | The data is protocol data sent to the peer. |
| kINFO_HEADER_IN | 1 | The data is header (or header-like) data received from the peer. |
| kINFO_HEADER_OUT | 2 | The data is header (or header-like) data sent to the peer. |
| kINFO_SSL_DATA_IN | 5 | The data is protocol data received from the peer. |
| kINFO_SSL_DATA_OUT | 6 | The data is protocol data sent to the peer. |
| kINFO_TEXT | 0 | The data is informational text. |

IP Resolve Modes

| Constant | Value | Description |
|---|---|---|
| kIPRESOLVE_V4 | 1 | |
| kIPRESOLVE_V6 | 2 | |
| kIPRESOLVE_WHATEVER | 0 | |

NetRC Modes

| Constant | Value | Description |
|---|---|---|
| kNETRC_IGNORED | 0 | The .netrc will never be read.<br>This is the default. |
| kNETRC_OPTIONAL | 1 | A user:password in the URL will be preferred to one in the .netrc. |
| kNETRC_REQUIRED | 2 | A user:password in the URL will be ignored. Unless one is set programmatically, the .netrc will be queried. |

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAll | -1 | Enable all protocols. |
| kProtocolDICT | &h200 | DICT |
| kProtocolFILE | &h400 | File |
| kProtocolFTP | 4 | FTP |
| kProtocolFTPS | 8 | FTPS |
| kProtocolGopher | &h2000000 | Gopher |
| kProtocolGophers | &h20000000 | |
| kProtocolHTTP | 1 | HTTP |
| kProtocolHTTPS | 2 | HTTPS |
| kProtocolIMAP | &h1000 | IMAP |
| kProtocolIMAPS | &h2000 | IMAPS |
| kProtocolLDAP | &h80 | LDAP |
| kProtocolLDAPS | &h100 | LDAPS |
| kProtocolMQTT | &h10000000 | MQTT |
| kProtocolPOP3 | &h4000 | POP3 |
| kProtocolPOP3S | &h8000 | POP3S |
| kProtocolRTMP | &h80000 | RTMP |
| kProtocolRTMPE | &h200000 | RTMPE |
| kProtocolRTMPS | &h800000 | RTMPS |
| kProtocolRTMPT | &h100000 | RTMPT |
| kProtocolRTMPTE | &h400000 | RTMPTE |
| kProtocolRTMPTS | &h1000000 | RTMPTS |
| kProtocolRTSP | &h40000 | RTSP |
| kProtocolSCP | &h10 | SCP |
| kProtocolSFTP | &h20 | SFTP |
| kProtocolSMB | &h4000000 | SMB |
| kProtocolSMBS | &h8000000 | SMBS |
| kProtocolSMTP | &h10000 | SMTP |
| kProtocolSMTPS | &h20000 | SMTPS |
| kProtocolTelnet | &h40 | Telnet |
| kProtocolTFTP | &h800 | TFTP |

Proxy Types

| Constant | Value | Description |
|---|---|---|
| kPROXY_HTTP | 0 | |
| kPROXY_HTTP10 | 1 | Force to use CONNECT HTTP/1.0. |
| kPROXY_HTTP11 | 0 | Connect using HTTP/1.1. |
| kPROXY_SOCKS4 | 4 | |
| kPROXY_SOCKS4A | 6 | Using SOCKS 4A. |
| kPROXY_SOCKS5 | 5 | |
| kPROXY_SOCKS5_Hostname | 7 | Use the SOCKS5 protocol but pass along the host name rather than the IP address. added in 7.18.0 |

Seek Origin Constants

| Constant | Value | Description |
|---|---|---|
| kSeekOriginCurrent | 1 | Seek relative to current file position. |
| kSeekOriginEnd | 2 | Seek relative to end of file. |
| kSeekOriginSet | 0 | Seek relative to start of file. |

Seek Event Result Values

| Constant | Value | Description |
|---|---|---|
| kSeekReturnCantSeek | 3 | Return this value if you can't seek as you are not using a file, but for example a stream. |
| kSeekReturnFail | 2 | Returns this value if your seek operation failed. |
| kSeekReturnOk | 1 | Returns this value if your seek operation succeeded. |

SSH Authentication

| Constant | Value | Description |
|---|---|---|
| kSSHAuthAgent | 16 | agent (ssh-agent, pageant...) |
| kSSHAuthAny | -1 | Any allowed |
| kSSHAuthDefault | -1 | Default: Any |
| kSSHAuthGSSAPI | 32 | gssapi (kerberos, ...) |
| kSSHAuthHost | 4 | host key files |
| kSSHAuthKeyboard | 8 | keyboard interactive |
| kSSHAuthNone | 0 | none allowed, silly but complete |
| kSSHAuthPassword | 2 | password |
| kSSHAuthPublicKey | 1 | public/private key files |

SSL Option Flags

| Constant | Value | Description |
|---|---|---|
| kSSLOptionAllowBeast | 1 | tells libcurl to allow the BEAST SSL vulnerability in the name of improving interoperability with older servers. Some SSL libraries have introduced work-arounds for this flaw but those work-arounds sometimes make the SSL communication fail. To regain functionality with those broken servers, a user can this way allow the vulnerability back. |
| kSSLOptionAutoClientCert | 32 | Tells libcurl to automatically locate and use a client certificate for authentication. (Schannel) |
| kSSLOptionNativeCA | 16 | tells libcurl to use standard certificate store of operating system. Currently implemented under MS-Windows. |
| kSSLOptionNoPartialChain | 4 | tells libcurl to *NOT* accept a partial certificate chain if possible. The OpenSSL backend has this ability. |
| kSSLOptionNoRevoke | 2 | tells libcurl to disable certificate revocation checks for those SSL backends where such behavior is present. |
| kSSLOptionRevokeBestEffort | 8 | tells libcurl to ignore certificate revocation offline checks and ignore missing revocation list for those SSL backends where such behavior is present. |

SSL Versions

| Constant | Value | Description |
|---|---|---|
| kSSLVersionDefault | 0 | The default acceptable version range. The minimum acceptable version is by default TLS v1.0 since 7.39.0 (unless the TLS library has a stricter rule). |
| kSSLVersionSSLv2 | 2 | SSL v2 (but not SSLv3) |
| kSSLVersionSSLv3 | 3 | SSL v3 (but not SSLv2) |
| kSSLVersionTLSv1 | 1 | TLS v1.0 or later |
| kSSLVersionTLSv10 | 4 | TLS v1.0 or later (Added in 7.34.0) |
| kSSLVersionTLSv11 | 5 | TLS v1.1 or later (Added in 7.34.0) |
| kSSLVersionTLSv12 | 6 | TLS v1.2 or later (Added in 7.34.0) |
| kSSLVersionTLSv13 | 7 | TLS v1.3 or later (Added in 7.52.0) |

Time Conditions

| Constant | Value | Description |
|---|---|---|
| kTimeConditionIfModifiedSince | 1 | |
| kTimeConditionIfUnModifiedSince | 2 | |
| kTimeConditionNone | 0 | No condition. |

SSL Option

| Constant | Value | Description |
|---|---|---|
| kUseSSLall | 3 | Require SSL for all communication or fail with kError_FTP_SSL_FAILED. |
| kUseSSLcontrol | 2 | Require SSL for the control connection or fail with kError_FTP_SSL_FAILED. |
| kUseSSLnone | 0 | Don't attempt to use SSL. |
| kUseSSLtry | 1 | Try using SSL, proceed as normal otherwise. |

## 64.23 class CURLSMimePartMBS

### 64.23.1 class CURLSMimePartMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for mime parts.
**Notes:** You can provide data via file path, folderitem, data in memoryblock or string.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo Plugins, version 18.2pr4

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 64.23.2 Methods

### 64.23.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 64.23.4 Headers as String()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries header.

### 64.23.5 SetHeaders(headers() as String)

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets header.

### 64.23.6 Properties

### 64.23.7 DataMemory as Memoryblock

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime part data source from memory data.
**Notes:** (Read and Write property)

### 64.23.8 DataString as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime part data source from memory data.
**Example:**

```
dim c as new CURLSMBS

// add mime
dim p as CURLSMimePartMBS = c.AddMimePart

p.name = "Text"
p.FileName = "test.txt"
p.MimeType = "text/plain"
p.DataString = "Hello World"

c.FinishMime
// now you can send...
```

**Notes:** (Read and Write property)

### 64.23.9 Encoding as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime data transfer encoder.
**Notes:** If set to binary, 8bit, 7bit, base64 or quoted-printable, the matching encoding is applied.
(Read and Write property)

### 64.23.10 File as FolderItem

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file to stream.
**Notes:** When you set property, the plugin will open file and may raise IOException on failure.
(Read and Write property)

### 64.23.11 FileName as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime part remote file name.
**Notes:** If mime type is not set, we pick extension from file name.
This includes gif, jpg, jpeg, png, svg, txt, htm, html, pdf and xml file extensions.
(Read and Write property)

### 64.23.12 FilePath as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime part data source from named file.
**Notes:** (Read and Write property)

### 64.23.13 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.23.14 MimeType as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime part type.
**Notes:** (Read and Write property)

### 64.23.15 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime/form part name.
**Notes:** (Read and Write property)

### 64.23.16 Parent as Variant

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 64.23.17 Constants

Encodings

| Constant | Value | Description |
|---|---|---|
| kEncoding7bit | "7bit" | 7bit |
| kEncoding8bit | "8bit" | 8bit |
| kEncodingBase64 | "base64" | Base64 |
| kEncodingBinary | "binary" | Binary mode |
| kEncodingNone | "" | No mode, so data is passed through and header has no encoding defin |
| kEncodingQuotedPrintable | "quoted-printable" | Quoted printable |

Mime Types

| Constant | Value | Description |
|---|---|---|
| kMimeTypeGIF | "image/gif" | GIF |
| kMimeTypeHTML | "text/html" | HTML |
| kMimeTypeJPEG | "image/jpeg" | JPEG |
| kMimeTypePDF | "application/pdf" | PDF |
| kMimeTypePNG | "image/png" | PNG |
| kMimeTypeSVG | "image/svg+xml" | SVG |
| kMimeTypeText | "text/plain" | Text |
| kMimeTypeXML | "application/xml" | XML |

## 64.24 class CURLSMissingFunctionExceptionMBS

### 64.24.1 class CURLSMissingFunctionExceptionMBS

MBS CURL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An exception raised if a CURL library function is not loaded.
**Notes:** If you call load library before you use the CURLSMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.25 class CURLSMultiMBS

### 64.25.1 class CURLSMultiMBS

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for multiple CURL transfers running in parallel.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr5
- MBS Xojo Plugins, version 23.3pr1
- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- Easier multi transfer for our Xojo CURL Plugin
- MBS Xojo Plugins, version 23.2pr2
- MBS Xojo Plugins, version 23.0pr6
- MBS Xojo Plugins, version 21.1pr1
- Batch Emailer Application for Xojo as a sample project
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0

**Xojo Developer Magazine**

- 21.4, page 10: News

### 64.25.2 Methods

### 64.25.3 AddCURL(curl as CURLSMBS, handler as CURLSTransferFinishedMBS = nil) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a standard CURL handle to the multi stack.
**Notes:** Lasterror is set.

We added handler parameter for v23.2 to make it easier to run things asynchronously.

### 64.25.4 CURLs as CURLSMBS()

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of current CURL instances.

### 64.25.5 ErrorString(ErrorCode as Integer) as String

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries text message for a given error code.

### 64.25.6 Perform

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks for things to see.
**Notes:** When the app thinks there's data available for CURL it calls this function to read/write whatever there is right now. This returns as soon as the reads and writes are done. This function does not require that there actually is data available for reading or that data can be written, it can be called just in case.

Lasterror is set. This only provides errors etc regarding the whole multi stack. There might still have occurred problems on invidual transfers even when this returns OK.

Sets RunningTransfers property.

### 64.25.7 RemoveAll

MBS CURL Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all curl handles.
**Notes:** Same as looping over CURLs() array and calling RemoveCURL for each.
This effectively cancels all requests.

### 64.25.8 RemoveCURL(CURL as CURLSMBS) as boolean

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a CURL handle from the multi stack again.
**Notes:** Lasterror is set.

Plugin calls this automatically when TransferFinished event was called.

### 64.25.9 SharedInstance as CURLSMultiMBS

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The shared instance.
**Notes:** Either you create a new CURLSMultiMBS object, which then takes this place.
Or you don't and the plugin creates an object for you to easily schedule transfers asynchronously.

### 64.25.10 Properties

### 64.25.11 AutoPerform as Boolean

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to run a timer and run Perform automatically for you.
**Notes:** Set to true to run Perform automatically. For this the plugin manages a timer to call perform regularly.
We set this to true for the default shared instance, so it runs without you doing anything.
(Read and Write property)

### 64.25.12 ChunkLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A connection with a chunk length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.25.13 ContentLengthPenaltySize as Int64

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A connection with a content-length longer than this will not be considered for pipelining.
**Notes:** (Read and Write property)

### 64.25.14 Handle as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 64.25.15 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 64.25.16 MaxConcurrentStreams as Integer

MBS CURL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum number of concurrent connections to a server.
**Notes:** Maximum number of concurrent streams to support on a connection.
(Read and Write property)

### 64.25.17 MaxConnects as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of entries in the connection cache.
**Notes:** (Read and Write property)

### 64.25.18 MaxHostConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of (pipelining) connections to one host.
**Notes:** (Read and Write property)

### 64.25.19 MaxPipelineLength as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of requests in a pipeline.
**Notes:** (Read and Write property)

### 64.25.20 MaxTotalConnections as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of open connections in total.
**Notes:** (Read and Write property)

### 64.25.21 Pipelining as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to 1 to enable pipelining for this multi handle.
**Notes:** Only for HTTP protocol.
Used to be a boolean property for 15.0 to 18.1, but changed to integer for 18.2.
(Read and Write property)

### 64.25.22 RunningTransfers as Integer

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of running transfers.
**Notes:** Set by Perform method.
(Read only property)

### 64.25.23 Tag as Variant

MBS CURL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can store whatever reference value you need.
(Read and Write property)

### 64.25.24 Events

### 64.25.25 TransferFinished(CURL as CURLSMBS, result as Integer, RemainingFinishedTransfers as Integer)

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One transfer finished.
**Notes:** Query CURL object for details.

Result is the result of the transfer as returned by Perform method of CURL object.
RemainingFinishedTransfers is how many transfers are also finished and will be called right after this event.

This event fires always when the queue is empty.
You may want to turn off the timer calling Perform method when this event fires.
Later you can start timer again if you call Add method.

### 64.25.26 TransfersFinished

MBS CURL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** All pending transfers finished.

### 64.25.27 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAddedAlready | 7 | An easy handle already added to a multi handle was attempted to get added - again. |
| kErrorBadEadyHandle | 2 | An easy handle was not good/valid. |
| kErrorBadFunctionArgument | 10 | A function was called with a bad parameter. |
| kErrorBadHandle | 1 | The passed-in handle is not a valid CURLM handle. |
| kErrorBadSocket | 5 | The passed in socket argument did not match. |
| kErrorCallPerform | -1 | Please call Perform soon to do some tasks. |
| kErrorInternalError | 4 | This is a libCURL bug. |
| kErrorOK | 0 | Everything OK. |
| kErrorOutOfMemory | 3 | Running low on memory. |
| kErrorRecursiveAPICall | 8 | An api function was called from inside an event. |
| kErrorUnknownOption | 6 | Tried to set unsupported option. |
| kErrorWakeupFailure | 9 | Wakeup is unavailable or failed. |

Pipeling options

| Constant | Value | Description |
|---|---|---|
| kPipeHTTP1 | 1 | Pipe with HTTP/1.1. |
| kPipeMultiPlex | 2 | Pipe with multiplex. |
| kPipeNothing | 0 | No piping. |

### 64.25.28 Delegates

### 64.25.29 CURLSTransferFinishedMBS(curl as CURLSMBS, ErrorCode as Integer)

MBS CURL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate used to indicate a transfer finished.
**Notes:** ErrorCode is zero for a successful.
See kError* constants in CURLSMBS class.
**Blog Entries**

- Easier multi transfer for our Xojo CURL Plugin

## 64.26 class CURLSNotInitializedExceptionMBS

### 64.26.1 class CURLSNotInitializedExceptionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An exception raised if CURL library is not initialized.
**Notes:** If you call load library before you use the CURLMBS Constructor, you should never see this.
Subclass of the RuntimeException class.

## 64.27 class CURLSSLBackendMBS

### 64.27.1 class CURLSSLBackendMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a SSL backend.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 64.27.2 Methods

### 64.27.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 64.27.4 List as CURLSSLBackendMBS()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Lists the backends.
**Example:**

```
dim list() as CURLSSLBackendMBS = CURLSSLBackendMBS.List

for each l as CURLSSLBackendMBS in list
MsgBox l.name
next
```

**Notes:** The list may not be available if called too late.

### 64.27.5 SetSSLBackend(id as Integer) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

- 64.27.6 SetSSLBackend(name as string) as Integer 11591

### 64.27.6 SetSSLBackend(name as string) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

• 64.27.5 SetSSLBackend(id as Integer) as Integer 11590

### 64.27.7 Properties

### 64.27.8 ID as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ID of this SSL backend.
**Notes:** (Read only property)

### 64.27.9 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of this SSL backend.
**Notes:** (Read only property)

### 64.27.10 Constants

Error codes

| Constant | Value | Description |
|---|---|---|
| kErrorNoBackends | 3 | libcurl was built without any SSL support |
| kErrorOK | 0 | OK |
| kErrorTooLate | 2 | You can't set SSL backend after SSL initialization. |
| kErrorUnknownBackend | 1 | Unknown backend name or ID. |

SSL Backend IDs

| Constant | Value | Description |
|---|---|---|
| kSSLBackendDarwinSSL | 9 | DarwinSSL |
| kSSLBackendGNUTLS | 2 | GNUTLS |
| kSSLBackendGSKIT | 5 | GSKIT |
| kSSLBackendMBEDTLS | 11 | MBEDTLS |
| kSSLBackendNone | 0 | |
| kSSLBackendNSS | 3 | NSS |
| kSSLBackendOpenSSL | 1 | OpenSSL or BoringSSL |
| kSSLBackendSChannel | 8 | SChannel |
| kSSLBackendSecureTransport | 9 | DarwinSSL |
| kSSLBackendWolfSSL | 7 | WolfSSL |

## 64.28 class CURLSSSLBackendMBS

### 64.28.1 class CURLSSSLBackendMBS

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a SSL backend.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.0pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo Plugins, version 18.2pr3

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 21.1, page 9: News

### 64.28.2 Methods

### 64.28.3 Constructor

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 64.28.4 List as CURLSSSLBackendMBS()

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lists the backends.
**Example:**

```
dim list() as CURLSSSLBackendMBS = CURLSSSLBackendMBS.List

for each l as CURLSSSLBackendMBS in list
MsgBox l.name
next
```

**Notes:** The list may not be available if called too late.

### 64.28.5 SetSSLBackend(id as Integer) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

- 64.28.6 SetSSLBackend(name as string) as Integer 11594

### 64.28.6 SetSSLBackend(name as string) as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the SSL backend.
**Notes:** When built with multiple SSL backends, SetSSLBackend() allows to choose one. This function can only be called once, and it must be called *before* CURL constructor().

The backend can be identified by the id (e.g. CURLSSLBACKEND_OPENSSL). The backend can also be specified via the name parameter (passing -1 as id). If both id and name are specified, the name will be ignored. If neither id nor name are specified, the function will fail with CURLSSLSET_UNKNOWN_BACKEND and set the "avail" pointer to the NULL-terminated list of available backends.

Upon success, the function returns kErrorOK.
If the specified SSL backend is not available, the function returns kErrorUnknownBackend.

The SSL backend can be set only once. If it has already been set, a subsequent attempt to change it will result in a kErrorTooLate.

Returns nil, if there are no backends to choose.
See also:

- 64.28.5 SetSSLBackend(id as Integer) as Integer 11594

### 64.28.7 Properties

### 64.28.8 ID as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ID of this SSL backend.
**Notes:** (Read only property)

### 64.28.9 Name as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of this SSL backend.
**Notes:** (Read only property)

### 64.28.10 Constants

Error codes

| Constant | Value | Description |
|---|---|---|
| kErrorNoBackends | 3 | libcurl was built without any SSL support |
| kErrorOK | 0 | OK |
| kErrorTooLate | 2 | You can't set SSL backend after SSL initialization. |
| kErrorUnknownBackend | 1 | Unknown backend name or ID. |

SSL Backend IDs

| Constant | Value | Description |
|---|---|---|
| kSSLBackendDarwinSSL | 9 | DarwinSSL |
| kSSLBackendGNUTLS | 2 | GNUTLS |
| kSSLBackendGSKIT | 5 | GSKIT |
| kSSLBackendMBEDTLS | 11 | MBEDTLS |
| kSSLBackendNone | 0 | |
| kSSLBackendNSS | 3 | NSS |
| kSSLBackendOpenSSL | 1 | OpenSSL or BoringSSL |
| kSSLBackendSChannel | 8 | SChannel |
| kSSLBackendSecureTransport | 9 | DarwinSSL |
| kSSLBackendWolfSSL | 7 | WolfSSL |

## 64.29 class CURLSURLMBS

### 64.29.1 class CURLSURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for CURL's URL parser.
**Example:**

```
dim c as new CURLSURLMBS

c.URL = "www.test.de/Hello World test.pdf"

// setting URL will repair the spaces
c.path = c.Path

MsgBox c.URL
```

**Blog Entries**

- MBS Xojo Plugins, version 19.3pr1
- MBS Xojo Plugins, version 19.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr5

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 38: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 64.29.2 Methods

### 64.29.3 Clone as CURLSURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Duplicates the object.

### 64.29.4 Constructor

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new URL object.

### 64.29.5 Properties

### 64.29.6 Flags as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags to use.
**Notes:** Our default is combination of:

- kFlagsNoDefaultPort
- kFlagsNonSupportScheme
- kFlagsURLDecode
- kFlagsURLEncode
- kFlagsGuessScheme
- kFlagsDefaultScheme

(Read and Write property)

### 64.29.7 Fragment as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set fragment part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.8 Handle as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 64.29.9 Host as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set host part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.10 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported by one of the functions.
**Notes:** This changes while using debugger because getting or setting properties also sets this property.
(Read and Write property)

### 64.29.11 Options as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set options part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.12 Password as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set password part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.13 Path as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set path part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.14 Port as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set port part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.15 Query as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set query part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.16 Scheme as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set scheme part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.17 URL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set full URL.
**Example:**

```
Dim c As New CURLSURLMBS

// load absolute URL
c.URL = "http://domain.com/folder/page1.htm"

// load relative URL
c.URL = "page2.htm"

// get final URL
MsgBox c.URL
```

**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.18 User as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set user part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.29.19 ZoneID as String

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The zone ID.
**Notes:** (Read and Write property)

### 64.29.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFlagsNoAuthority | 1024 | Allow URLs without authority.<br>Allow empty authority when the scheme is unknown. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kErrorBadFileURL | 19 | The file:// URL is invalid. |
| kErrorBadFragment | 20 | The fragment part of the URL contained bad or invalid characters. |
| kErrorBadHostname | 21 | The hostname contained bad or invalid characters. |
| kErrorBadIPv6 | 22 | The IPv6 address hostname contained bad or invalid characters. |
| kErrorBadLogin | 23 | The login part of the URL contained bad or invalid characters. |
| kErrorBadPassword | 24 | The password part of the URL contained bad or invalid characters. |
| kErrorBadPath | 25 | The path part of the URL contained bad or invalid characters. |
| kErrorBadQuery | 26 | The query part of the URL contained bad or invalid characters. |
| kErrorBadScheme | 27 | The scheme part of the URL contained bad or invalid characters. |
| kErrorBadSlashes | 28 | The URL contained an invalid number of slashes. |
| kErrorBadUser | 29 | The user part of the URL contained bad or invalid characters. |
| kErrorNoZoneID | 18 | There is no zoneid set in the URL. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBadHandle | 1 | An argument that should be a CURLU pointer was passed in as a NULL. Should never happen with plugin as you would get exception. |
| kErrorBadPartpointer | 2 | A NULL pointer was passed to the 'part' argument of curl_url_get. Should never happen with plugin as you would get exception. |
| kErrorBadPortNumber | 4 | The port number was not a decimal number between 0 and 65535. |
| kErrorLacksIDN | 30 | IDN missing. |
| kErrorMalformedInput | 3 | A malformed input was passed to a URL API function. |
| kErrorNoFragment | 17 | There is no fragment part in the URL. |
| kErrorNoHost | 14 | There is no host part in the URL. |
| kErrorNoOptions | 13 | There is no options part in the URL. |
| kErrorNoPassword | 12 | There is no password part in the URL. |
| kErrorNoPort | 15 | There is no port part in the URL. |
| kErrorNoQuery | 16 | There is no query part in the URL. |
| kErrorNoScheme | 10 | There is no scheme part in the URL. |
| kErrorNoUser | 11 | There is no user part in the URL. |
| kErrorOk | 0 | No error. |
| kErrorOutOfMemory | 7 | A memory function failed. |
| kErrorUnknownPart | 9 | An unknown part ID was passed to a URL API function. |
| kErrorUnsupportedScheme | 5 | This libcurl build doesn't support the given URL scheme. |
| kErrorUrlDecode | 6 | |
| kErrorUserNotAllowed | 8 | Credentials was passed in the URL when prohibited. |

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAllowSpace | 2048 | Whether to allow space character in URLs. |
| kFlagsAppendQuery | 256 | Append a form style part. |
| kFlagsDefaultPort | 1 | Return default port number. |
| kFlagsDefaultScheme | 4 | Return default scheme if missing. |
| kFlagsDisallowUser | 32 | No user+password allowed. |
| kFlagsGuessScheme | 512 | Legacy curl-style guessing. |
| kFlagsNoDefaultPort | 2 | Act as if no port number was set, if the port number matches the default for the scheme. |
| kFlagsNonSupportScheme | 8 | Allow non-supported scheme. |
| kFlagsPathAsIs | 16 | Leave dot sequences. |
| kFlagsPunyCode | 4096 | get the host name in pynycode |
| kFlagsURLDecode | 64 | URL decode on get. |
| kFlagsURLEncode | 128 | URL encode on set. |

# 64.30 class CURLSVersionMBS

## 64.30.1 class CURLSVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to hold version information from libCURL.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 23.0pr5
- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 20.4pr5
- MBS Xojo Plugins, version 20.2pr6
- MBS Xojo Plugins, version 19.4pr7
- MBS Xojo Plugins, version 18.2pr3

**Xojo Developer Magazine**

- 21.3, page 9: News
- 21.2, page 9: News

## 64.30.2 Methods

## 64.30.3 Constructor

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 64.30.4 FeatureNames as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the feature names.
**Example:**

```
dim v as new CURLSVersionMBS
dim features() as string = v.FeatureNames
```

```
dim Names as string = string.FromArray(features)
MessageBox Names
```

**Notes:** Values are e.g. alt-svc AsynchDNS HSTS HTTPS-proxy IPv6 Largefile libz NTLM NTLM_WB SSL threadsafe TLS-SRP UnixSockets zstd

### 64.30.5 Protocol(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Notes:** The protocol names are the same as would be used in URLs.
Index is zero based.

### 64.30.6 Protocols as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Example:**

```
dim v as new CURLSVersionMBS
dim Protocols() as string = v.Protocols
dim Names as string = string.FromArray(Protocols)
MessageBox Names
```

**Notes:** The protocol names are the same as would be used in URLs.

### 64.30.7 Properties

### 64.30.8 brotliVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Brotli library version string.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.30.9 brotliVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version of brotli version.
**Notes:** (Read only property)

### 64.30.10 CAInfo as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The built-in default CURLOPT_CAINFO.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.30.11 CAPath as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The built-in default CURLOPT_CAPATH.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.30.12 Features as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bits which define what features libCURL can and can't.
**Notes:** Use the Supports Boolean properties instead.
Additional feature bits may be found in the libCURL documentation.
(Read only property)

### 64.30.13 gsaslVersion as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the GNU SASL Library version.
**Notes:** (Read only property)

### 64.30.14 Host as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An ascii string showing what host information that this libCURL was built for.
**Notes:** As discovered by a configure script or set by the build environment.
e.g. "powerpc-apple-darwin8.0"
(Read only property)

### 64.30.15 hyperVersion as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Human readable string.
**Notes:** (Read only property)

### 64.30.16 iconvVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version number of iconv library.
**Notes:** (Read only property)

### 64.30.17 libidnVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version of LibIDN used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.30.18 libsshVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version of LibSSH2 used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.30.19 LibZVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An ascii string (there is no numerical version).
**Notes:** If libCURL has no libz support, this is "".
e.g. "1.2.3"
(Read only property)

### 64.30.20 nghttp2Version as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string for nghttp2 library.
**Notes:** (Read only property)

### 64.30.21 nghttp2VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number for nghttp2.
**Notes:** Numeric nghttp2 version: (MAJOR * 65536) + (MINOR * 256) + PATCH
(Read only property)

### 64.30.22 ProtocolCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of entries in the Protocol array.
**Notes:** (Read only property)

### 64.30.23 quicVersion as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of quic version.
**Notes:** human readable quic (+ HTTP/3) library version.
(Read only property)

### 64.30.24 SSLVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An ascii string for the OpenSSL version used.
**Notes:** If libCURL has no SSL support, this is "".
e.g. " OpenSSL/0.9.7l"
(Read only property)

### 64.30.25 SupportsASYNCHDNS as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL was built with support for asynchronous name lookups, which allows more exact timeouts (even on Windows) and less blocking when using the multi interface.
**Notes:** (added in 7.10.7)
(Read only property)

### 64.30.26 SupportsBrotli as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Brotli features are present.
**Notes:** (Read only property)

### 64.30.27 SupportsConv as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Character conversions supported.
**Notes:** (Read only property)

### 64.30.28 SupportsGSSAPI as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Built against a GSS-API library.
**Notes:** (Read only property)

### 64.30.29 SupportsGSSNEGOTIATE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports HTTP GSS-Negotiate
**Notes:** (added in 7.10.6)
(Read only property)

### 64.30.30 SupportsHTTP2 as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether currently used CURL library supports HTTP2.
**Example:**

```
dim c as new CURLSMBS
dim v as CURLSVersionMBS = c.version

if v.SupportsHTTP2 then
MsgBox "HTTP2 is supported"
else
MsgBox "HTTP2 is not supported"
end if
```

**Notes:** While our CURL Plugin with CURLSMBS plugin may not support this currently, you could use LoadLibrary function to load a CURL library supporting it.
(Read only property)

### 64.30.31 SupportsHTTP3 as Boolean

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether HTTP3 features are present.
**Notes:** (Read only property)

### 64.30.32 SupportsHTTPSProxy as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** HTTPS-proxy support built-in.
**Notes:** (Read only property)

### 64.30.33 SupportsIDN as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL was built with support for IDNA, domain names with international letters.
**Notes:** (Added in 7.12.0)
(Read only property)

### 64.30.34 SupportsIPV6 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports IPv6
**Notes:** (Read only property)

### 64.30.35 SupportsKERBEROS4 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports kerberos4 (when using FTP).
**Notes:** (Read only property)

### 64.30.36 SupportsKerberos5 as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Kerberos V5 auth is supported.
**Notes:** (Read only property)

### 64.30.37 SupportsLARGEFILE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL was built with support for large files.
**Notes:** (Added in 7.11.1)
(Read only property)

### 64.30.38 SupportsLIBZ as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports HTTP deflate using libz
**Notes:** (Added in 7.10)
(Read only property)

### 64.30.39 SupportsMultiSSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiple SSL backends available.
**Notes:** (Read only property)

### 64.30.40 SupportsNTLM as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports HTTP NTLM
**Example:**

```
dim c as new CURLSMBS
dim v as CURLSVersionMBS = c.Version

MsgBox "SupportsNTLM: "+str(v.SupportsNTLM)
```

**Notes:** (added in 7.10.6)
(Read only property)

### 64.30.41 SupportsNTLMWB as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** NTLM delegation to winbind helper is supported.
**Notes:** (Read only property)

### 64.30.42 SupportsPSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mozilla's Public Suffix List, used for cookie domain verification.
**Notes:** (Read only property)

### 64.30.43 SupportsSPNEGO as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL was built with support for SPNEGO authentication
**Notes:** (Simple and Protected GSS-API Negotiation Mechanism, defined in RFC 2478.) (added in 7.10.8)
(Read only property)

### 64.30.44 SupportsSSL as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL supports SSL (HTTPS/FTPS)
**Notes:** (Added in 7.10)
(Read only property)

### 64.30.45 SupportsSSPI as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether libCURL was built with support for SSPI.
**Notes:** This is only available on Windows and makes libCURL use Windows-provided functions for NTLM authentication. It also allows libCURL to use the current user and the current user's password without the app having to pass them on. (Added in 7.13.2)
(Read only property)

### 64.30.46 SupportsTLSAUTHSRP as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TLS-SRP auth is supported.
**Notes:** (Read only property)

### 64.30.47 SupportsUnicode as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether unicode for Windows is enabled.
**Notes:** libcurl was built with Unicode support on Windows. This makes non-ASCII characters work in filenames and options passed to libcurl. (Added in 7.72.0)
(Read only property)

### 64.30.48 SupportsUnixSockets as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unix domain sockets support.
**Notes:** (Read only property)

### 64.30.49 SupportsZSTD as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Supports HTTP zstd content encoding using zstd library.
**Notes:** Added in CURL 7.72.0
(Read only property)

### 64.30.50 Version as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An ascii string for the libCURL version.
**Notes:** e.g. "7.13.1"
(Read only property)

### 64.30.51 VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of libCURL as number.
**Notes:** a 24 bit number created like this:
<8 bits major number>| <8 bits minor number>| <8 bits patch number>.
Version 7.9.8 is therefore returned as 0x070908.
(Read only property)

### 64.30.52 zstdVersion as String

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Human readable string version for zstd library.
**Notes:** (Read only property)

### 64.30.53 zstdVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Numeric Zstd version.
**Notes:** Major 8 bits, minor 12 bits, Patch 12 bits.
(Read only property)

# 64.31 class CURLSWebSocketFrameMBS

## 64.31.1 class CURLSWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a WebSocket frame.
**Notes:** dim curl as CURLSMBS // your curl handle

dim m as CURLSWebSocketFrameMBS = curl.WebSocketReceive

if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr3

## 64.31.2 Properties

## 64.31.3 BytesLeft as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of pending bytes left of the payload.
**Notes:** (Read only property)

## 64.31.4 BytesReceived as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of bytes received.
**Notes:** (Read only property)

## 64.31.5 Data as MemoryBlock

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read.
**Notes:** (Read only property)

### 64.31.6 FlagBinary as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is binary data.
**Notes:** (Read only property)

### 64.31.7 FlagClose as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Close this transfer.
**Notes:** (Read only property)

### 64.31.8 FlagContinue as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set.
**Notes:** (Read only property)

### 64.31.9 FlagOffset as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a partial fragment.
**Notes:** The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls.
(Read only property)

### 64.31.10 FlagPing as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This as a ping.
**Notes:** (Read only property)

### 64.31.11 FlagPong as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a pong.
**Notes:** (Read only property)

### 64.31.12 Flags as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Flags for this packet.
**Notes:** See kFlag* contants.
(Read only property)

### 64.31.13 FlagText as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The buffer contains text data.
**Notes:** Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content.
(Read only property)

### 64.31.14 Offset as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The offset of this data into the frame.
**Notes:** (Read only property)

### 64.31.15 Text as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read as text.
**Notes:** If this is not a binary transfer, we put the text here.

(Read only property)

### 64.31.16 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagBinary | 2 | This is binary data. |
| kFlagClose | 8 | Close this transfer. |
| kFlagContinue | 4 | This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set. |
| kFlagOffset | 32 | This is a partial fragment.<br>The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls. |
| kFlagPing | 16 | This as a ping. |
| kFlagPong | 64 | This is a pong. |
| kFlagText | 1 | The buffer contains text data.<br>Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content. |

## 64.32 class CURLURLMBS

### 64.32.1 class CURLURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for CURL's URL parser.
**Example:**

```
dim c as new CURLURLMBS

c.URL = "www.test.de/Hello World test.pdf"

// setting URL will repair the spaces
c.path = c.Path

MsgBox c.URL
```

### 64.32.2 Methods

### 64.32.3 Clone as CURLURLMBS

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Duplicates the object.

### 64.32.4 Constructor

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new URL object.

### 64.32.5 Properties

### 64.32.6 Flags as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The flags to use.
**Notes:** Our default is combination of:

- kFlagsNoDefaultPort
- kFlagsNonSupportScheme
- kFlagsURLDecode
- kFlagsURLEncode
- kFlagsGuessScheme
- kFlagsDefaultScheme

(Read and Write property)

### 64.32.7 Fragment as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set fragment part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.8 Handle as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 64.32.9 Host as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set host part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.10 Lasterror as Integer

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported by one of the functions.
**Notes:** This changes while using debugger because getting or setting properties also sets this property.
(Read and Write property)

### 64.32.11 Options as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set options part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.12 Password as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set password part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.13 Path as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set path part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.14 Port as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set port part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.15 Query as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set query part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.16 Scheme as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set scheme part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.17 URL as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set full URL.
**Example:**

```
Dim c As New CURLURLMBS

// load absolute URL
c.URL = "http://domain.com/folder/page1.htm"

// load relative URL
c.URL = "page2.htm"

// get final URL
MsgBox c.URL
```

**Notes:** Sets lasterror property.

(Read and Write property)

### 64.32.18 User as String

MBS CURL Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set user part of URL.
**Notes:** Sets lasterror property.
(Read and Write property)

### 64.32.19 ZoneID as String

MBS CURL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The zone ID.
**Notes:** (Read and Write property)

### 64.32.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFlagsNoAuthority | 1024 | Allow URLs without authority.<br>Allow empty authority when the scheme is unknown. |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kErrorBadFileURL | 19 | The file:// URL is invalid. |
| kErrorBadFragment | 20 | The fragment part of the URL contained bad or invalid characters. |
| kErrorBadHostname | 21 | The hostname contained bad or invalid characters. |
| kErrorBadIPv6 | 22 | The IPv6 address hostname contained bad or invalid characters. |
| kErrorBadLogin | 23 | The login part of the URL contained bad or invalid characters. |
| kErrorBadPassword | 24 | The password part of the URL contained bad or invalid characters. |
| kErrorBadPath | 25 | The path part of the URL contained bad or invalid characters. |
| kErrorBadQuery | 26 | The query part of the URL contained bad or invalid characters. |
| kErrorBadScheme | 27 | The scheme part of the URL contained bad or invalid characters. |
| kErrorBadSlashes | 28 | The URL contained an invalid number of slashes. |
| kErrorBadUser | 29 | The user part of the URL contained bad or invalid characters. |
| kErrorNoZoneID | 18 | There is no zoneid set in the URL. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBadHandle | 1 | An argument that should be a CURLU pointer was passed in as a NULL. Should never happen with plugin as you would get exception. |
| kErrorBadPartpointer | 2 | A NULL pointer was passed to the 'part' argument of curl_url_get. Should never happen with plugin as you would get exception. |
| kErrorBadPortNumber | 4 | The port number was not a decimal number between 0 and 65535. |
| kErrorLacksIDN | 30 | IDN missing. |
| kErrorMalformedInput | 3 | A malformed input was passed to a URL API function. |
| kErrorNoFragment | 17 | There is no fragment part in the URL. |
| kErrorNoHost | 14 | There is no host part in the URL. |
| kErrorNoOptions | 13 | There is no options part in the URL. |
| kErrorNoPassword | 12 | There is no password part in the URL. |
| kErrorNoPort | 15 | There is no port part in the URL. |
| kErrorNoQuery | 16 | There is no query part in the URL. |
| kErrorNoScheme | 10 | There is no scheme part in the URL. |
| kErrorNoUser | 11 | There is no user part in the URL. |
| kErrorOk | 0 | No error. |
| kErrorOutOfMemory | 7 | A memory function failed. |
| kErrorUnknownPart | 9 | An unknown part ID was passed to a URL API function. |
| kErrorUnsupportedScheme | 5 | This libcurl build doesn't support the given URL scheme. |
| kErrorUrlDecode | 6 | |
| kErrorUserNotAllowed | 8 | Credentials was passed in the URL when prohibited. |

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAllowSpace | 2048 | Whether to allow space character in URLs. |
| kFlagsAppendQuery | 256 | Append a form style part. |
| kFlagsDefaultPort | 1 | Return default port number. |
| kFlagsDefaultScheme | 4 | Return default scheme if missing. |
| kFlagsDisallowUser | 32 | No user+password allowed. |
| kFlagsGuessScheme | 512 | Legacy curl-style guessing. |
| kFlagsNoDefaultPort | 2 | Act as if no port number was set, if the port number matches the default for the scheme. |
| kFlagsNonSupportScheme | 8 | Allow non-supported scheme. |
| kFlagsPathAsIs | 16 | Leave dot sequences. |
| kFlagsPunyCode | 4096 | get the host name in pynycode |
| kFlagsURLDecode | 64 | URL decode on get. |
| kFlagsURLEncode | 128 | URL encode on set. |

## 64.33 class CURLVersionMBS

### 64.33.1 class CURLVersionMBS

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to hold version information from libCURL.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 21.1

### 64.33.2 Methods

### 64.33.3 Constructor

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 64.33.4 FeatureNames as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the feature names.
**Example:**

```
dim v as new CURLVersionMBS
dim features() as string = v.FeatureNames
dim Names as string = string.FromArray(features)
MessageBox Names
```

**Notes:** Values are e.g. alt-svc AsynchDNS HSTS HTTPS-proxy IPv6 Largefile libz NTLM NTLM_WB SSL threadsafe TLS-SRP UnixSockets zstd

### 64.33.5 Protocol(index as Integer) as string

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Notes:** The protocol names are the same as would be used in URLs.
Index is zero based.

### 64.33.6 Protocols as String()

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An array containing the names protocols that libCURL supports (using lowercase letters).
**Example:**

```
dim v as new CURLVersionMBS
dim Protocols() as string = v.Protocols
dim Names as string = string.FromArray(Protocols)
MessageBox Names
```

**Notes:** The protocol names are the same as would be used in URLs.

### 64.33.7 Properties

### 64.33.8 brotliVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Brotli library version string.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.33.9 brotliVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of brotli version.
**Notes:** (Read only property)

### 64.33.10 CAInfo as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The built-in default CURLOPT_CAINFO.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.33.11 CAPath as String

MBS CURL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The built-in default CURLOPT_CAPATH.
**Notes:** Should be empty within plugin.
(Read only property)

### 64.33.12 Features as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bits which define what features libCURL can and can't.
**Notes:** Use the Supports Boolean properties instead.
Additional feature bits may be found in the libCURL documentation.
(Read only property)

### 64.33.13 gsaslVersion as String

MBS CURL Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version string of the GNU SASL Library version.
**Notes:** (Read only property)

### 64.33.14 Host as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string showing what host information that this libCURL was built for.
**Notes:** As discovered by a configure script or set by the build environment.
e.g. "powerpc-apple-darwin8.0"
(Read only property)

### 64.33.15 hyperVersion as String

MBS CURL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Human readable string.
**Notes:** (Read only property)

### 64.33.16 iconvVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version number of iconv library.
**Notes:** (Read only property)

### 64.33.17 libidnVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of LibIDN used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.33.18 libsshVersion as String

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Version of LibSSH2 used.
**Notes:** Empty if library is not used in the CURL library you use.
(Read only property)

### 64.33.19 LibZVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string (there is no numerical version).
**Notes:** If libCURL has no libz support, this is "".
e.g. "1.2.3"
(Read only property)

### 64.33.20 nghttp2Version as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version string for nghttp2 library.
**Notes:** (Read only property)

### 64.33.21 nghttp2VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version number for nghttp2.
**Notes:** Numeric nghttp2 version: (MAJOR * 65536) + (MINOR * 256) + PATCH
(Read only property)

### 64.33.22 ProtocolCount as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of entries in the Protocol array.
**Notes:** (Read only property)

### 64.33.23 quicVersion as String

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version of quic version.
**Notes:** human readable quic (+ HTTP/3) library version.

(Read only property)

### 64.33.24 SSLVersion as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string for the OpenSSL version used.
**Notes:** If libCURL has no SSL support, this is "".
e.g. " OpenSSL/0.9.7l"
(Read only property)

### 64.33.25 SupportsASYNCHDNS as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for asynchronous name lookups, which allows more exact timeouts (even on Windows) and less blocking when using the multi interface.
**Notes:** (added in 7.10.7)
(Read only property)

### 64.33.26 SupportsBrotli as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Brotli features are present.
**Notes:** (Read only property)

### 64.33.27 SupportsConv as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Character conversions supported.
**Notes:** (Read only property)

### 64.33.28 SupportsGSSAPI as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Built against a GSS-API library.
**Notes:** (Read only property)

### 64.33.29 SupportsGSSNEGOTIATE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP GSS-Negotiate
**Notes:** (added in 7.10.6)
(Read only property)

### 64.33.30 SupportsHTTP2 as Boolean

MBS CURL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether currently used CURL library supports HTTP2.
**Example:**

```
dim c as new CURLMBS
dim v as CURLVersionMBS = c.version

if v.SupportsHTTP2 then
MsgBox "HTTP2 is supported"
else
MsgBox "HTTP2 is not supported"
end if
```

**Notes:** While our CURL Plugin with CURLMBS plugin may not support this currently, you could use LoadLibrary function to load a CURL library supporting it.
(Read only property)

### 64.33.31 SupportsHTTP3 as Boolean

MBS CURL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether HTTP3 features are present.
**Notes:** (Read only property)

### 64.33.32 SupportsHTTPSProxy as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** HTTPS-proxy support built-in.
**Notes:** (Read only property)

### 64.33.33 SupportsIDN as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for IDNA, domain names with international letters.
**Notes:** (Added in 7.12.0)
(Read only property)

### 64.33.34 SupportsIPV6 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports IPv6
**Notes:** (Read only property)

### 64.33.35 SupportsKERBEROS4 as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports kerberos4 (when using FTP).
**Notes:** (Read only property)

### 64.33.36 SupportsKerberos5 as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Kerberos V5 auth is supported.
**Notes:** (Read only property)

### 64.33.37 SupportsLARGEFILE as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for large files.
**Notes:** (Added in 7.11.1)
(Read only property)

### 64.33.38 SupportsLIBZ as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP deflate using libz
**Notes:** (Added in 7.10)
(Read only property)

### 64.33.39 SupportsMultiSSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Multiple SSL backends available.
**Notes:** (Read only property)

### 64.33.40 SupportsNTLM as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports HTTP NTLM
**Example:**

```
dim c as new CURLMBS
dim v as CURLVersionMBS = c.Version

MsgBox "SupportsNTLM: "+str(v.SupportsNTLM)
```

**Notes:** (added in 7.10.6)
(Read only property)

### 64.33.41 SupportsNTLMWB as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NTLM delegation to winbind helper is supported.
**Notes:** (Read only property)

### 64.33.42 SupportsPSL as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mozilla's Public Suffix List, used for cookie domain verification.
**Notes:** (Read only property)

### 64.33.43 SupportsSPNEGO as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for SPNEGO authentication
**Notes:** (Simple and Protected GSS-API Negotiation Mechanism, defined in RFC 2478.) (added in 7.10.8)
(Read only property)

### 64.33.44 SupportsSSL as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL supports SSL (HTTPS/FTPS)
**Notes:** (Added in 7.10)

(Read only property)

### 64.33.45 SupportsSSPI as Boolean

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether libCURL was built with support for SSPI.
**Notes:** This is only available on Windows and makes libCURL use Windows-provided functions for NTLM authentication. It also allows libCURL to use the current user and the current user's password without the app having to pass them on. (Added in 7.13.2)
(Read only property)

### 64.33.46 SupportsTLSAUTHSRP as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** TLS-SRP auth is supported.
**Notes:** (Read only property)

### 64.33.47 SupportsUnicode as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether unicode for Windows is enabled.
**Notes:** libcurl was built with Unicode support on Windows. This makes non-ASCII characters work in filenames and options passed to libcurl. (Added in 7.72.0)
(Read only property)

### 64.33.48 SupportsUnixSockets as Boolean

MBS CURL Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unix domain sockets support.
**Notes:** (Read only property)

### 64.33.49 SupportsZSTD as Boolean

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Supports HTTP zstd content encoding using zstd library.
**Notes:** Added in CURL 7.72.0
(Read only property)

### 64.33.50 Version as String

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An ascii string for the libCURL version.
**Notes:** e.g. "7.13.1"
(Read only property)

### 64.33.51 VersionNumber as Integer

MBS CURL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The version of libCURL as number.
**Notes:** a 24 bit number created like this:
<8 bits major number>| <8 bits minor number>| <8 bits patch number>.
Version 7.9.8 is therefore returned as 0x070908.
(Read only property)

### 64.33.52 zstdVersion as String

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Human readable string version for zstd library.
**Notes:** (Read only property)

### 64.33.53 zstdVersionNumber as Integer

MBS CURL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Numeric Zstd version.
**Notes:** Major 8 bits, minor 12 bits, Patch 12 bits.
(Read only property)

## 64.34 class CURLWebSocketFrameMBS

### 64.34.1 class CURLWebSocketFrameMBS

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a WebSocket frame.
**Notes:** dim curl as CURLMBS // your curl handle

dim m as CURLWebSocketFrameMBS = curl.WebSocketReceive

if m <>nil then
TextAreaLog.AddText "Received: "+m.Text
end if
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0

### 64.34.2 Properties

### 64.34.3 BytesLeft as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of pending bytes left of the payload.
**Notes:** (Read only property)

### 64.34.4 BytesReceived as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of bytes received.
**Notes:** (Read only property)

### 64.34.5 Data as MemoryBlock

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read.
**Notes:** (Read only property)

### 64.34.6 FlagBinary as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is binary data.
**Notes:** (Read only property)

### 64.34.7 FlagClose as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Close this transfer.
**Notes:** (Read only property)

### 64.34.8 FlagContinue as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set.
**Notes:** (Read only property)

### 64.34.9 FlagOffset as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a partial fragment.
**Notes:** The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls.
(Read only property)

### 64.34.10 FlagPing as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This as a ping.
**Notes:** (Read only property)

### 64.34.11 FlagPong as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a pong.
**Notes:** (Read only property)

### 64.34.12 Flags as Integer

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Flags for this packet.
**Notes:** See kFlag* contants.
(Read only property)

### 64.34.13 FlagText as Boolean

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The buffer contains text data.
**Notes:** Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content.
(Read only property)

### 64.34.14 Offset as Int64

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The offset of this data into the frame.
**Notes:** (Read only property)

### 64.34.15 Text as String

MBS CURL Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data read as text.
**Notes:** If this is not a binary transfer, we put the text here.
(Read only property)

### 64.34.16 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagBinary | 2 | This is binary data. |
| kFlagClose | 8 | Close this transfer. |
| kFlagContinue | 4 | This is not the final fragment of the message, which implies that there will be another fragment coming as part of the same message where this bit is not set. |
| kFlagOffset | 32 | This is a partial fragment.<br>The provided data is only a partial fragment and there will be more in a following call to WebSocketSend(). When sending only a piece of the fragment like this, the fragsize must be provided with the total expected fragment size in the first call and it needs to be zero in subsequent calls. |
| kFlagPing | 16 | This as a ping. |
| kFlagPong | 64 | This is a pong. |
| kFlagText | 1 | The buffer contains text data.<br>Note that this makes a difference to WebSocket but CURL itself will not make any verification of the content or precautions that you actually send valid UTF-8 content. |

## 64.35 Globals

### 64.35.1 FileExtensionToMimeTypeMBS(FileExtension as String) as string

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds a mime type for a file extension.
**Example:**

```
dim FileExtension as string = MimeTypeToFileExtensionMBS("application/pdf")
dim MimeType as string = FileExtensionToMimeTypeMBS("pdf")
Break
```

**Notes:** Please report any missing mime type in our lookup table, so we can add more.
See also MimeTypeToFileExtensionMBS.
Returns empty string if not found.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2
- MBS Xojo / Real Studio Plugins, version 15.4pr1

### 64.35.2 MimeTypeToFileExtensionMBS(MimeType as String) as string

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns file extension for given mime type.
**Example:**

```
dim FileExtension as string = MimeTypeToFileExtensionMBS("application/pdf")
dim MimeType as string = FileExtensionToMimeTypeMBS("pdf")
Break
```

**Notes:** Extension is returned with dot prefix.
Please report any missing file extensions in our lookup table, so we can add more.
See also FileExtensionToMimeTypeMBS.
Returns empty string if not found.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr2
- MBS Xojo / Real Studio Plugins, version 15.4pr1

**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

# Chapter 65

# Currency, Date and Time Format

## 65.1 Globals

### 65.1.1 CDblMBS(text as string, byref value as Double, locale as string = "") as boolean

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a double value from a text with given locale.
**Example:**

```
dim value as Double
if CDblMBS("12,345", value, "de_DE") then
MsgBox str(value)
end if
```

**Notes:** Returns true on success and false on failure.
Value is set to the value detected.
Raises exception on invalid locale.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0pr8
- CDbl and Format with locales

**Xojo Developer Magazine**

- 11.2, page 10: News

### 65.1.2 FormatDateMBS(format as string, value as date, locale as string = "") as string

MBS Util Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Formats a date with C time formatting functions.
**Example:**

```
// for Mac, Windows and Linux we usually have different locale names
dim fr as string
#if TargetMacOS then
fr = "fr_FR"
#elseif TargetWin32 then
fr = "fra"
#elseif TargetLinux
fr = "fr_FR.UTF8"
#else
?
#endif

dim d as new date
MsgBox FormatDateMBS("%x %X", d, fr)
```

**Notes:** Please use FormatDateTimeMBS function for iOS.

locale is the name of the locale to use. You can pass empty string to use default/current locale.
Format is a format string like for strftime command in C.

The format specification is a string and may contain special character sequences called conversion specifications, each of which is introduced by a '%' character and terminated by some other character known as a conversion specifier character. All other character sequences are ordinary character sequences.

The characters of ordinary character sequences (including the null byte) are copied verbatim from format to s. However, the characters of conversion specifications are replaced as follows:

Some conversion specifications can be modified by preceding the conversion specifier character by the E or O modifier to indicate that an alternative format should be used. If the alternative format or specification does not exist for the current locale, the behavior will be as if the unmodified conversion specification were used. (SU) The Single UNIX Specification mentions %Ec, %EC, %Ex, %EX, %Ey, %EY, %Od, %Oe, %OH, %OI, %Om, %OM, %OS, %Ou, %OU, %OV, %Ow, %OW, %Oy, where the effect of the O modifier is to use alternative numeric symbols (say, roman numerals), and that of the E modifier is to use a locale-dependent alternative representation.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo Plugins, version 17.3pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo / Real Studio Plugins, version 14.2pr1
- Introducing FormatDateMBS function
- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 65.1.3 FormatDateTimeMBS(format as string, value as dateTime, locale as string = "") as string

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Formats a date with C time formatting functions.
**Notes:** Same as FormatDateMBS, but using DateTime class instead.

### 65.1.4 FormatMBS(format as string, value as Double, locale as string = "") as string

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Formats a double value.
**Example:**

```
MsgBox FormatMBS("%1.2f", 12.345, "de_DE")
```

**Notes:** locale is the name of the locale to use. You can pass empty string to use default/current locale.
Format is a format string like for printf command in C.

The FormatMBS formats the value under control of the format. The format is a character string which contains three types of objects: plain characters, which are simply copied to standard output, character escape sequences which are converted and copied to the standard output, and format specifications, each of which causes printing of the next successive argument.

Character escape sequences are in backslash notation as defined in the ANSI X3.159-1989 ("ANSI C89"), with extensions. The characters and their meanings are as follows:

Each format specification is introduced by the percent character ("%"). The remainder of the format specification includes, in the following order:

Zero or more of the following flags:

**Blog Entries**

- Introducing FormatDateMBS function
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- CDbl and Format with locales
- MBS Real Studio Plugins, version 13.0pr2

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### 65.1.5 ParseDateMBS(format as string, text as string, byref value as date, locale as string = "") as boolean

MBS Util Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Parses a date.
**Example:**

```
dim s as string = "2013-11-12 18:31:01"
dim f as string = "%Y-%m-%d %H:%M:%S"
dim d as date

if ParseDateMBS(f, s, d) then
MsgBox d.LongDate + " "+ d.LongTime
end if
```

**Notes:** Please use ParseDateTimeMBS function for iOS.

locale is the name of the locale to use. You can pass empty string to use default/current locale.
Format is a format string like for strftime command in C.

On success returns true. But even for half parsed dates you can find values in date.
Locale not supported on Windows.
The plugin does not support parsing time zones.

The ParseDateMBS function is the converse function to FormateDateMBS and converts the character string pointed to by s to values which are stored in the date, using the format specified by format. Here format is

a character string that consists of field descriptors and text characters, reminiscent of scanf (in C++). Each field descriptor consists of a % character followed by another character that specifies the replacement for the field descriptor. All other characters in the format string must have a matching character in the input string, except for whitespace, which matches zero or more whitespace characters in the input string. There should be whitespace or other alphanumeric characters between any two field descriptors.

The ParseDateMBS function processes the input string from left to right. Each of the three possible input elements (whitespace, literal, or format) are handled one after the other. If the input cannot be matched to the format string the function stops. The remainder of the format and input strings are not processed.

The supported input field descriptors are listed below. In case a text string (such as a weekday or month name) is to be matched, the comparison is case insensitive. In case a number is to be matched, leading zeros are permitted but not required.

Some field descriptors can be modified by the E or O modifier characters to indicate that an alternative format or specification should be used. If the alternative format or specification does not exist in the current locale, the unmodified field descriptor is used.
The E modifier specifies that the input string may contain alternative locale-dependent versions of the date and time representation:

Returns true on success. If the functions fails to match all of the format string and therefore an error occurred the function returns false.

Before libc 5.4.13 whitespace (and the 'n' and 't' specifications) was not handled, no 'E' and 'O' locale modifier characters were accepted, and the 'C' specification was a synonym for the 'c' specification.

The 'y' (year in century) specification is taken to specify a year in the 20th century by libc4 and libc5. It is taken to be a year in the range 1950-2049 by glibc 2.0. It is taken to be a year in 1969-2068 since glibc 2.1.

For reasons of symmetry, glibc tries to support for ParseDateMBS the same format characters as for FormatDateMBS. (In most cases the corresponding fields are parsed, but no field in tm is changed.) This leads to

Similarly, because of GNU extensions to FormatDateMBS, %k is accepted as a synonym for %H, and %l should be accepted as a synonym for %I, and %P is accepted as a synonym for %p. Finally

The glibc implementation does not require whitespace between two field descriptors.
**Blog Entries**

- MBS Xojo Plugins, version 18.1pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr3

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### 65.1.6 ParseDateTimeMBS(format as string, text as string, byref value as dateTime, locale as string = "") as boolean

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a date.
**Notes:** Same as ParseDateMBS, but using DateTime class instead.

## 65.2 class LocaleMBS

### 65.2.1 class LocaleMBS

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The plugin class which provides parameters for formatting numbers, especially currency values.
**Example:**

```
dim l as LocaleMBS = LocaleMBS.Locale("de_DE")
MsgBox l.CurrencySymbol
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0pr2

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### 65.2.2 Methods

### 65.2.3 Constructor

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 65.2.4 Locale(Locale as string = "") as LocaleMBS

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries C locale for the given locale name.
**Example:**

```
dim l as LocaleMBS = LocaleMBS.Locale("de_DE")
MsgBox l.CurrencySymbol
```

**Notes:** Returns nil if no locale for that name was found.

If name is empty, you get current locale. If you use locale name "C", you get the default C locale.
The locale name depends on the OS. For Mac and Linux you can see available locales in /usr/share/locale directory.
For Windows, please take a look here:
http://msdn.microsoft.com/en-us/library/hzz3tw78(v=vs.71).aspx

### 65.2.5 Properties

### 65.2.6 CurrencySymbol as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The local currency symbol.
**Example:**

```
dim l as LocaleMBS = LocaleMBS.Locale("de_DE")
MsgBox l.CurrencySymbol
```

**Notes:** (Read only property)

### 65.2.7 DecimalPoint as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decimal point character, except for currency values, cannot be an empty string.
**Notes:** (Read only property)

### 65.2.8 FracDigits as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of digits after the decimal point in the local style for currency values.
**Notes:** (Read only property)

### 65.2.9 Grouping as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sizes of the groups of digits, except for currency values.
**Notes:** This is a string where the asc value gives the actual value, representing group size from low order digit groups to high order (right to left). The list may be terminated with 0 or CHAR_MAX. If the list is terminated with 0, the last group size before the 0 is repeated to account for all the digits. If the list is terminated with CHAR_MAX, no more grouping is performed.

See example project for a function to decode.
(Read only property)

### 65.2.10 IntCurrSymbol as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The standardized international currency symbol.
**Notes:** (Read only property)

### 65.2.11 IntFracDigits as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of digits after the decimal point in an international-style currency value.
**Notes:** (Read only property)

### 65.2.12 IntNegCSPrecedes as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the currency symbol precedes the currency value for negative values, false if it follows.
**Notes:** For internationally formatted monetary quantities.
(Read only property)

### 65.2.13 IntNegSepBySpace as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if a space is inserted between the currency symbol and the currency value for negative values, false otherwise.
**Notes:** For internationally formatted monetary quantities.
(Read only property)

### 65.2.14 IntNegSignPosition as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the NegativeSign with respect to a negative quantity and the CurrencySymbol.
**Notes:** For internationally formatted monetary quantities.

Possible values:

(Read only property)

### 65.2.15 IntPosCSPrecedes as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the currency symbol precedes the currency value for nonnegative values, false if it follows.
**Notes:** For internationally formatted monetary quantities.
(Read only property)

### 65.2.16 IntPosSepBySpace as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if a space is inserted between the currency symbol and the currency value for nonnegative values, false otherwise.
**Notes:** For internationally formatted monetary quantities.

(Read only property)

### 65.2.17 IntPosSignPosition as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the PositiveSign with respect to a nonnegative quantity and the CurrencySymbol.
**Notes:** For internationally formatted monetary quantities.

Possible values:

(Read only property)

### 65.2.18 monDecimalPoint as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decimal point character for currency values.
**Notes:** (Read only property)

### 65.2.19 monGrouping as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Like grouping but for currency values.
**Notes:** (Read only property)

### 65.2.20 monThousandsSep as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The separator for digit groups in currency values.
**Notes:** (Read only property)

### 65.2.21 Name as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the locale.
**Notes:** The name may be different to the one you asked for as some locales are mapped to others internally.
(Read only property)

### 65.2.22 NegativeSign as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The character used to denote negative currency values, usually a minus sign.
**Notes:** (Read only property)

### 65.2.23 NegCSPrecedes as Boolean

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the currency symbol precedes the currency value for negative values, false if it follows.
**Notes:** (Read only property)

### 65.2.24 NegSepBySpace as Boolean

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if a space is inserted between the currency symbol and the currency value for negative values, false otherwise.
**Notes:** (Read only property)

### 65.2.25 NegSignPosition as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the NegativeSign with respect to a negative quantity and the CurrencySymbol.
**Notes:** Possible values:

(Read only property)

### 65.2.26 PosCSPrecedes as Boolean

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the currency symbol precedes the currency value for nonnegative values, false if it follows.
**Notes:** (Read only property)

### 65.2.27 PositiveSign as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The character used to denote nonnegative currency values, usually the empty string.
**Notes:** (Read only property)

### 65.2.28 PosSepBySpace as Boolean

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if a space is inserted between the currency symbol and the currency value for nonnegative values, false otherwise.
**Notes:** (Read only property)

### 65.2.29 PosSignPosition as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the PositiveSign with respect to a nonnegative quantity and the CurrencySymbol.
**Notes:** Possible values:

(Read only property)

### 65.2.30 ThousandsSep as String

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The separator between groups of digits before the decimal point, except for currency values.
**Notes:** (Read only property)

%a The abbreviated weekday name according to the current locale.

%A The full weekday name according to the current locale.

%b The abbreviated month name according to the current locale.

%B The full month name according to the current locale.

%c The preferred date and time representation for the current locale.

%C The century number (year/100) as a 2-digit integer. (SU)

%d The day of the month as a decimal number (range 01 to 31).

%D Equivalent to %m/%d/%y. (Yecch-for Americans only. Americans should note that in other countries %d/%m/%y is rather common. This means that in international context this format is ambiguous and should not be used.) (SU)

%e Like %d, the day of the month as a decimal number, but a leading zero is replaced by a space. (SU)

%E Modifier: use alternative format, see below. (SU)

%F Equivalent to %Y-%m-%d (the ISO 8601 date format). (C99)

%G The ISO 8601 week-based year (see NOTES) with century as a decimal number. The 4-digit year corresponding to the ISO week number (see %V). This has the same format and value as %Y, except that if the ISO week number belongs to the previous or next year, that year is used instead. (TZ)

%g Like %G, but without century, that is, with a 2-digit year (00-99). (TZ)

%h Equivalent to %b. (SU)

%H The hour as a decimal number using a 24-hour clock (range 00 to 23).

%I The hour as a decimal number using a 12-hour clock (range 01 to 12).

%j The day of the year as a decimal number (range 001 to 366).

%k The hour (24-hour clock) as a decimal number (range 0 to 23); single digits are preceded by a blank. (See also %H.) (TZ)

%l The hour (12-hour clock) as a decimal number (range 1 to 12); single digits are preceded by a blank. (See also %I.) (TZ)

%m The month as a decimal number (range 01 to 12).

%M The minute as a decimal number (range 00 to 59).

%n A newline character. (SU)

%O Modifier: use alternative format, see below. (SU)

%p Either "AM" or "PM" according to the given time value, or the corresponding strings for the current locale. Noon is treated as "PM" and midnight as "AM".

%P Like %p but in lowercase: "am" or "pm" or a corresponding string for the current locale. (GNU)

%r The time in a.m. or p.m. notation. In the POSIX locale this is equivalent to %I:%M:%S %p. (SU)

%R The time in 24-hour notation (%H:%M). (SU) For a version including the seconds, see %T below.

%s The number of seconds since the Epoch, 1970-01-01 00:00:00 +0000 (UTC). (TZ)

%S The second as a decimal number (range 00 to 60). (The range is up to 60 to allow for occasional leap seconds.)

%t A tab character. (SU)

%T The time in 24-hour notation (%H:%M:%S). (SU)

%u The day of the week as a decimal, range 1 to 7, Monday being 1. See also %w. (SU)

%U The week number of the current year as a decimal number, range 00 to 53, starting with the first Sunday as the first day of week 01. See also %V and

| | |
|---|---|
| \a | Write a <bell>character. |
| \b | Write a <backspace>character. |
| \c | Ignore remaining characters in this string. |
| \f | Write a <form-feed>character. |
| \n | Write a <new-line>character. |
| \r | Write a <carriage return>character. |
| \t | Write a <tab>character. |
| \v | Write a <vertical tab>character. |
| \' | Write a <single quote>character. |
| \\ | Write a backslash character. |
| \num or \0num | Write an 8-bit character whose ASCII value is the 1-, 2-, or 3-digit octal number num. |

| | |
|---|---|
| %% | The % character. |
| %a or %A | The weekday name according to the current locale, in abbreviated form or the full name. |
| %b or %B or %h | The month name according to the current locale, in abbreviated form or the full name. |
| %c | The date and time representation for the current locale. |
| %C | The century number (0-99). |
| %d or %e | The day of month (1-31). |
| %D | Equivalent to %m/%d/%y. (This is the American style date, very confusing to non-Americans, especially since %d/%m/%y is widely used in Europe. The ISO 8601 standard format is %Y-%m-%d.) |
| %H | The hour (0-23). |
| %I | The hour on a 12-hour clock (1-12). |
| %j | The day number in the year (1-366). |
| %m | The month number (1-12). |
| %M | The minute (0-59). |
| %n | Arbitrary whitespace. |
| %p | The locale's equivalent of AM or PM. (Note: there may be none.) |
| %r | The 12-hour clock time (using the locale's AM or PM). In the POSIX locale equivalent to %I:%M:%S %p. If t_fmt_ampm is empty in the LC_TIME part of the current locale then the behavior is undefined. |
| %R | Equivalent to %H:%M. |
| %S | The second (0-60; 60 may occur for leap seconds; earlier also 61 was allowed). |
| %t | Arbitrary whitespace. |
| %T | Equivalent to %H:%M:%S. |
| %U | The week number with Sunday the first day of the week (0-53). The first Sunday of January is the first day of week 1. |
| %w | The weekday number (0-6) with Sunday = 0. |
| %W | The week number with Monday the first day of the week (0-53). The first Monday of January is the first day of week 1. |
| %x | The date, using the locale's date format. |
| %X | The time, using the locale's time format. |
| %y | The year within century (0-99). When a century is not otherwise specified, values in the range 69-99 refer to years in the twentieth century (1969-1999); values in the range 00-68 refer to years in the twenty-first century (2000-2068). |
| %Y | The year, including century (for example, 1991). |

| | |
|---|---|
| %Ec | The locale's alternative date and time representation. |
| %EC | The name of the base year (period) in the locale's alternative representation. |
| %Ex | The locale's alternative date representation. |
| %EX | The locale's alternative time representation. |
| %Ey | The offset from %EC (year only) in the locale's alternative representation. |
| %EY | The full alternative year representation. The O modifier specifies that the numerical input may be in an alternative locale-dependent format: |
| %Od or %Oe | The day of the month using the locale's alternative numeric symbols; leading zeros are permitted but not required. |
| %OH | The hour (24-hour clock) using the locale's alternative numeric symbols. |
| %OI | The hour (12-hour clock) using the locale's alternative numeric symbols. |
| %Om | The month using the locale's alternative numeric symbols. |
| %OM | The minutes using the locale's alternative numeric symbols. |
| %OS | The seconds using the locale's alternative numeric symbols. |
| %OU | The week number of the year (Sunday as the first day of the week) using the locale's alternative numeric symbols. |
| %Ow | The number of the weekday (Sunday=0) using the locale's alternative numeric symbols. |
| %OW | The week number of the year (Monday as the first day of the week) using the locale's alternative numeric symbols. |
| %Oy | The year (offset from %C) using the locale's alternative numeric symbols. |

| | |
|---|---|
| %F | Equivalent to %Y-%m-%d, the ISO 8601 date format. |
| %g | The year corresponding to the ISO week number, but without the century (0-99). |
| %G | The year corresponding to the ISO week number. (For example, 1991.) |
| %u | The day of the week as a decimal number (1-7, where Monday = 1). |
| %V | The ISO 8601:1988 week number as a decimal number (1-53). If the week (starting on Monday) containing 1 January has four or more days in the new year, then it is considered week 1. Otherwise, it is the last week of the previous year, and the next week is week 1. |
| %z | An RFC-822/ISO 8601 standard timezone specification. |
| %Z | The timezone name. |

| | |
|---|---|
| %s | The number of seconds since the Epoch, 1970-01-01 00:00:00 +0000 (UTC). Leap seconds are not counted unless leap second support is available. |

0 Parentheses around the entire string.
1 Before the string.
2 After the string.
3 Just before CurrencySymbol.
4 Just after CurrencySymbol.

0 Parentheses around the entire string.
1 Before the string.
2 After the string.
3 Just before CurrencySymbol.
4 Just after CurrencySymbol.

0 Parentheses around the entire string.
1 Before the string.
2 After the string.
3 Just before CurrencySymbol.
4 Just after CurrencySymbol.

0 Parentheses around the entire string.
1 Before the string.
2 After the string.
3 Just before CurrencySymbol.
4 Just after CurrencySymbol.

## 65.3 class NSLocaleDateMBS

### 65.3.1 class NSLocaleDateMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** A class for a date format.
**Notes:** Should be used with the NSLocaleMBS class, but can be used on its own, too.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo / Real Studio Plugins, version 13.5pr4

### 65.3.2 Methods

### 65.3.3 Constructor

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The default constructor.
**Notes:** Creates a different object than the once you get by the NSLocaleMBS class. But this date information you get than works on Mac OS X 10.0. The NSLocaleMBS class is Mac OS X 10.4 only.
See also:

- 65.3.4 Constructor(locale as NSLocaleMBS) 11662

### 65.3.4 Constructor(locale as NSLocaleMBS)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim n1 as new NSLocaleDateMBS
dim n2 as new NSLocaleDateMBS(NSLocaleMBS.currentLocale)
dim n3 as new NSLocaleDateMBS(NSLocaleMBS.systemLocale)

break // see differences in debugger
```

**Notes:** Initializes the object for a given locale.
See also:

- 65.3.3 Constructor 11662

### 65.3.5 eraSymbols as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the array of era symbols.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.eraSymbols

MsgBox join(s,", ")

// shows for example "v. Chr., n. Chr." (in Germany)
// shows for example "BC, AD" (in USA)
// shows for example "av. J.-C., ap. J.-C." (in France)
```

**Notes:** for example, "BCE", "CE" in the USA.
On error returns an empty array.

### 65.3.6 longEraSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the long era symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.longEraSymbols

MsgBox join(s,", ")

// shows for example "v. Chr., n. Chr." (in Germany)
// shows for example "Before Christ, Anno Domini" (in USA)
// shows for example "avant J√©sus-Christ, apr√®s J√©sus-Christ" (in France)
```

**Notes:** An array containing strings representing the era symbols for the receiver (for example, { "Before Common Era", "Common Era" } ).
Available in Mac OS X v10.5 and later.

### 65.3.7 monthSymbols as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the month symbols.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.monthSymbols

MsgBox join(s,", ")

// shows for example "Januar, Februar, M√§rz, April, Mai, Juni, Juli, August, September, Oktober, November, Dezember" (in Germany)
// shows for example "January, February, March, April, May, June, July, August, September, October, November, December" (in USA)
// shows for example "janvier, f√©vrier, mars, avril, mai, juin, juillet, ao√ªt, septembre, octobre, novembre, d√©cembre" (in France)
```

**Notes:** On error returns an empty array.

### 65.3.8 quarterSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the quarter symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.quarterSymbols

MsgBox join(s,", ")

// shows for example "1. Quartal, 2. Quartal, 3. Quartal, 4. Quartal" (in Germany)
// shows for example "1st quarter, 2nd quarter, 3rd quarter, 4th quarter" (in USA)
// shows for example "1er trimestre, 2e trimestre, 3e trimestre, 4e trimestre" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.9 shortMonthSymbols as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the array of short month.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.shortMonthSymbols

MsgBox join(s,", ")

// shows for example "Jan, Feb, Mrz, Apr, Mai, Jun, Jul, Aug, Sep, Okt, Nov, Dez" (in Germany)
// shows for example "Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec" (in USA)
// shows for example "janv., f√©vr., mars, avr., mai, juin, juil., ao√ªt, sept., oct., nov., d√©c." (in France)
```

**Notes:** On error returns an empty array.

### 65.3.10 shortQuarterSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the short quarter symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.shortQuarterSymbols

MsgBox join(s,", ")

// shows for example "Q1, Q2, Q3, Q4" (in Germany)
// shows for example "Q1, Q2, Q3, Q4" (in USA)
// shows for example "T1, T2, T3, T4" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.11 shortStandaloneMonthSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the short standalone month symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.shortStandaloneMonthSymbols

MsgBox join(s,", ")

// shows for example "Jan, Feb, M√§r, Apr, Mai, Jun, Jul, Aug, Sep, Okt, Nov, Dez" (in Germany)
// shows for example "Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec" (in USA)
// shows for example "janv., f√©vr., mars, avr., mai, juin, juil., ao√ªt, sept., oct., nov., d√©c." (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.12 shortStandaloneQuarterSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the short standalone quarter symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.shortStandaloneQuarterSymbols

MsgBox join(s,", ")

// shows for example "Q1, Q2, Q3, Q4" (in Germany)
// shows for example "Q1, Q2, Q3, Q4" (in USA)
// shows for example "T1, T2, T3, T4" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.13 shortStandaloneWeekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the array of short standalone weekday symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
```

```
dim s(-1) as string = n.shortStandaloneWeekdaySymbols

MsgBox join(s,", ")

// shows for example "So., Mo., Di., Mi., Do., Fr., Sa." (in Germany)
// shows for example "Sun, Mon, Tue, Wed, Thu, Fri, Sat" (in USA)
// shows for example "dim., lun., mar., mer., jeu., ven., sam." (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.14 shortWeekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the short weekday symbols.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.shortWeekdaySymbols

MsgBox join(s,", ")

// shows for example "So., Mo., Di., Mi., Do., Fr., Sa." (in Germany)
// shows for example "Sun, Mon, Tue, Wed, Thu, Fri, Sat" (in USA)
// shows for example "dim., lun., mar., mer., jeu., ven., sam." (in France)
```

**Notes:** On error returns an empty array.

### 65.3.15 standaloneMonthSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the standalone month symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.standaloneMonthSymbols

MsgBox join(s,", ")
```

// shows for example "Januar, Februar, M√§rz, April, Mai, Juni, Juli, August, September, Oktober, November, Dezember" (in Germany)
// shows for example "January, February, March, April, May, June, July, August, September, October, November, December" (in USA)
// shows for example "janvier, f√©vrier, mars, avril, mai, juin, juillet, ao√ªt, septembre, octobre, novembre, d√©cembre" (in France)

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.16 standaloneQuarterSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the standalone quarter symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.standaloneQuarterSymbols

MsgBox join(s,", ")

// shows for example "1. Quartal, 2. Quartal, 3. Quartal, 4. Quartal" (in Germany)
// shows for example "1st quarter, 2nd quarter, 3rd quarter, 4th quarter" (in USA)
// shows for example "1er trimestre, 2e trimestre, 3e trimestre, 4e trimestre" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.17 standaloneWeekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the array of standalone weekday symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.standaloneWeekdaySymbols

MsgBox join(s,", ")

// shows for example "Sonntag, Montag, Dienstag, Mittwoch, Donnerstag, Freitag, Samstag" (in Germany)
```

```
// shows for example "Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday" (in USA)
// shows for example "dimanche, lundi, mardi, mercredi, jeudi, vendredi, samedi" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.18 verySHortMonthSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the very short month symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.verySHortMonthSymbols

MsgBox join(s,", ")

// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in Germany)
// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in USA)
// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.19 verySHortStandaloneMonthSymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the very short month symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.verySHortStandaloneMonthSymbols

MsgBox join(s,", ")

// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in Germany)
// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in USA)
// shows for example "J, F, M, A, M, J, J, A, S, O, N, D" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.20 veryShortStandaloneWeekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the array of very short standalone weekday symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.veryShortStandaloneWeekdaySymbols

MsgBox join(s,", ")

// shows for example "S, M, D, M, D, F, S" (in Germany)
// shows for example "S, M, T, W, T, F, S" (in USA)
// shows for example "D, L, M, M, J, V, S" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.21 veryShortWeekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the array of very short weekday symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.veryShortWeekdaySymbols

MsgBox join(s,", ")

// shows for example "S, M, D, M, D, F, S" (in Germany)
// shows for example "S, M, T, W, T, F, S" (in USA)
// shows for example "D, L, M, M, J, V, S" (in France)
```

**Notes:** Available in Mac OS X v10.5 and later.

### 65.3.22 weekdaySymbols as string()

MBS MacBase Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Returns the array of weekday symbols for the receiver.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong
dim s(-1) as string = n.weekdaySymbols

MsgBox join(s,", ")

// shows for example "Sonntag, Montag, Dienstag, Mittwoch, Donnerstag, Freitag, Samstag" (in Germany)
// shows for example "Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday" (in USA)
// shows for example "dimanche, lundi, mardi, mercredi, jeudi, vendredi, samedi" (in France)
```

**Notes:** Available in Mac OS X v10.4 and later.

### 65.3.23 Properties

### 65.3.24 AMSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the AM symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong

MsgBox n.AMSymbol // shows for example "vorm." (in Germany)
```

**Notes:** (Read only property)

### 65.3.25 dateFormat as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the date format string,
**Example:**

```
dim l as new NSLocaleMBS
```

```
dim n as NSLocaleDateMBS = l.DateLong

MsgBox n.dateFormat // shows for example: "d. MMMM yyyy" (in Germany)
```

**Notes:** Format of this string (if object was made with new):
http://developer.apple.com/documentation/Cocoa/Conceptual/DataFormatting/Articles/dfDateFormatter-Syntax.html#//apple_ref/doc/uid/20000194

If you got this object from NSLocale, it uses a different format.
(Read only property)

### 65.3.26 PMSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the PM symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleDateMBS = l.DateLong

MsgBox n.PMSymbol // shows for example "nachm." (in Germany)
```

**Notes:** (Read only property)

## 65.4 class NSLocaleMBS

### 65.4.1 class NSLocaleMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The class for Cocoas localization data.
**Example:**

```
dim n as NSLocaleMBS

n=NSLocaleMBS.currentLocale

MsgBox n.CountryCode
```

**Notes:** Available in Mac OS X v10.4 and later.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo / Real Studio Plugins, version 13.5pr4
- MBS Real Studio Plugins, version 12.5pr8
- MBS REALbasic plug-in 9.6

### 65.4.2 Methods

### 65.4.3 autoupdatingCurrentLocale as NSLocaleMBS

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns the current logical locale for the current user.
**Notes:** The current logical locale for the current user. The locale is formed from the settings for the current user's chosen system locale overlaid with any custom settings the user has specified in System Preferences.

The object always reflects the current state of the current user's locale settings.

Settings you get from this locale do change as the user's settings change (contrast with currentLocale).

Note that if you cache values based on the locale or related information, those caches will of course not be automatically updated by the updating of the locale object.

Available in Mac OS X v10.5 and later.

### 65.4.4 availableLocaleIdentifiers as string()

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns an array of strings, each of which identifies a locale available on the system.
**Example:**

MsgBox join(NSLocaleMBS.availableLocaleIdentifiers,", ")

```
// shows "zh_Hans_CN, sq_AL, he_IL, uz_Latn, en_CA, zh, kk_Cyrl, sr_Cyrl,
// fr_CA, sr_Cyrl_RS, fr_LU, bg_BG, es_ES, da_DK, el_CY, ja_JP, kok_IN,
// mt_MT, ar_JO, de_LU, uz_Cyrl, pt_PT, af, ms_MY, nl_BE, es_US, en_PH,
// es_HN, be, sr_Latn_BA, es_CR, ca, vi_VN, zh_Hant_HK, bg, gu_IN, si_LK,
// am, or_IN, en_ZA, ar_YE, da, uk_UA, ar_OM, es_PE, cs_CZ, kk_Cyrl_KZ,
// de_AT, lv_LV, en_NZ, ar_BH, ar, en_AU, az_Cyrl, de, as, bn, zh_Hans_SG,
// es_PY, es_EC, ne_IN, pa_Guru_IN, fa, sw_KE, es_AR, az, fr_FR,
// en_US_POSIX, sr_Cyrl_BA, cs, zh_Hans, eu_ES, ga, en_PK, ar_LB, el,
// zh_Hant_TW, et_EE, fi, en, uz_Arab_AF, sw_TZ, it_CH, en_ZW, ha, eo,
// ar_SA, cy, th_TH, bn_BD, te_IN, ml_IN, he, es, fo, en_IN, et, om_KE,
// haw, eu, gl, ta_IN, zh_Hans_MO, id, fr, hi, ja, es_SV, hu_HU, en_SG,
// nn_NO, az_Latn, ii, id_ID, es_DO, fr_CH, ka, es_UY, en_MT, ar_QA, ar_TN,
// gu, de_CH, gv, sk_SK, hr, kn_IN, de_LI, ar_EG, el_GR, ar_SD, hu, af_NA,
// zh_Hant, ti_ER, ar_LY, is, ka_GE, it, om_ET, hy, ii_CN, hr_HR, ps_AF,
// pa_Arab_PK, es_NI, en_TT, pa_Guru, kk, kl, be_BY, km, zh_Hans_HK, kn,
// sv_SE, es_BO, ko, nb, ne_NP, pa_Arab, fr_MC, is_IS, ne, ar_SY, mk,
// uz_Arab, so_KE, ml, it_IT, hy_AM, sl_SI, ti_ET, uz_Latn_UZ, ar_AE,
// lt_LT, kw, pa, lt, nl, lv, so_SO, mr, nn, ru_RU, ms, ga_IE, fo_FO, mt,
// om, ar_MA, ms_BN, pl, ha_Latn, kok, mk_MK, or, uz_Cyrl_UZ, so_ET, de_DE,
// gl_ES, en_BW, en_JM, ar_IQ, ps, az_Latn_AZ, ta, pt, so_DJ, nl_NL, af_ZA,
// nb_NO, en_HK, fr_SN, si, km_KH, te, ro, ko_KR, mr_IN, sk, en_BE, en_MH,
// sl, th, ti, fr_BE, es_CL, pt_BR, en_VI, es_VE, sr_Latn_ME, so, hi_IN,
//as_IN, ru, de_BE, sq, en_GB, sr, fa_AF, es_MX, kw_GB, es_PR, ro_RO, uk,
// cy_GB, en_NA, fi_FI, ca_ES, az_Cyrl_AZ, en_IE, gv_GB, sv, tr, sw, vi,
// en_BZ, en_US, hy_AM_REVISED, ru_UA, ur_PK, ur, sr_Latn_RS, am_ET, bn_IN,
// ar_KW, haw_US, sr_Cyrl_ME, es_PA, es_CO, kl_GL, sr_Latn, uz, ur_IN,
// zh_Hant_MO, ha_Latn_NG, es_GT, tr_TR, fa_IR, pl_PL, sv_FI, ar_DZ"
```

**Notes:** Available in Mac OS X v10.4 and later.

### 65.4.5 canonicalLanguageIdentifierFromString(s as string) as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** eturns a canonical language identifier by mapping an arbitrary locale identification string to the canonical identifier.

**Notes:** s: A string representation of an arbitrary locale identifier.
Returns a string that represents the canonical language identifier for the specified arbitrary locale identifier.
Available in Mac OS X v10.6 and later.

### 65.4.6 canonicalLocaleIdentifierFromString(s as string) as string

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the canonical identifier for a given locale identification string.
**Notes:** Available in Mac OS X v10.4 and later.

### 65.4.7 characterDirectionForLanguage(isoLangCode as string) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the character direction for the specified ISO language code.
**Notes:** Returns the character direction for the language. See constants for possible values. If the appropriate direction can't be determined NSLocaleLanguageDirectionUnknown is returned.

Available in Mac OS X v10.6 and later.

### 65.4.8 commonISOCurrencyCodes as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns an array of common ISO currency codes.
**Example:**

```
MsgBox join(NSLocaleMBS.commonISOCurrencyCodes,", ")

// shows "AED, AFN, ALL, AMD, ANG, AOA, ARS, AUD, AWG, AZN,
// BAM, BBD, BDT, BGN, BHD, BIF, BMD, BND, BOB, BRL, BSD, BTN,
// BWP, BYR, BZD, CAD, CDF, CHF, CLP, CNY, COP, CRC, CUP, CVE,
// CZK, DJF, DKK, DOP, DZD, EEK, EGP, ERN, ETB, EUR, FJD, FKP,
// GBP, GEL, GHS, GIP, GMD, GNF, GTQ, GWP, GYD, HKD, HNL, HRK,
// HTG, HUF, IDR, ILS, INR, IQD, IRR, ISK, JMD, JOD, JPY, KES,
// KGS, KHR, KMF, KPW, KRW, KWD, KYD, KZT, LAK, LBP, LKR, LRD,
// LSL, LTL, LVL, LYD, MAD, MDL, MGA, MKD, MMK, MNT, MOP, MRO,
// MUR, MVR, MWK, MXN, MYR, MZE, MZN, NAD, NGN, NIO, NOK, NPR,
// NZD, OMR, PAB, PEN, PGK, PHP, PKR, PLN, PYG, QAR, RON, RSD,
// RUB, RWF, SAR, SBD, SCR, SDG, SEK, SGD, SHP, SKK, SLL, SOS,
// SRD, STD, SVC, SYP, SZL, THB, TJS, TMM, TND, TOP, TRY, TTD,
// TWD, TZS, UAH, UGX, USD, UYU, UZS, VEF, VND, VUV, WST, XAF,
```

```
// XCD, XOF, XPF, YER, ZAR, ZMK, ZWD"
```

**Notes:** Common codes may include, for example, AED, AUD, BZD, DKK, EUR, GBP, JPY, KES, MXN, OMR, STD, USD, XCD, and ZWD.
Available in Mac OS X v10.5 and later.

### 65.4.9 Constructor

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The default constructor.
**Notes:** Available in Mac OS X v10.4 and later.
Loads the same values for this object as if you just take the object from NSLocaleMBS.currentLocale.
See also:

- 65.4.10 Constructor(Identifier as string) 11676

### 65.4.10 Constructor(Identifier as string)

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim a(-1) as string = NSLocalembs.availableLocaleIdentifiers

// show all identifers:
dim s(-1) as string
s.Append "All available Locale Identifiers:"

dim c as Integer = UBound(a)

for i as Integer=0 to c
dim identifier as string=a(i)
s.Append identifier
next

MsgBox Join(s)

// now show the currency symbols:

redim s(-1)
s.Append "All Currency symbols:"
```

```
c = UBound(a)
for i as Integer=0 to c
dim identifier as string=a(i)
dim n as new NSLocaleMBS(identifier)
s.Append n.CurrencySymbol
next

MsgBox Join(s)
```

**Notes:** Available in Mac OS X v10.4 and later.
Pass in the country identifier which you get with the availableLocaleIdentifiers function.
See also:

- 65.4.9 Constructor 11676

### 65.4.11 currentLocale as NSLocaleMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the logical locale for the current user.
**Notes:** Available in Mac OS X v10.4 and later.

The logical locale for the current user. The locale is formed from the settings for the current user's chosen system locale overlaid with any custom settings the user has specified in System Preferences.

This method may return a retained cached object.

Discussion:
Settings you get from this locale do not change as System Preferences are changed so that your operations are consistent. Typically you perform some operations on the returned object and then allow it to be disposed of. Moreover, since the returned object may be cached, you do not need to hold on to it indefinitely.

### 65.4.12 displayName(key as string, value as string) as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns the display name for the given value.
**Example:**

```
dim displayNameString as string

// The first uses the fr_FR locale.
```

```
dim frLocale as new NSLocaleMBS("fr_FR")

displayNameString = frLocale.displayName(frLocale.NSLocaleIdentifier, "fr_FR")
MsgBox "display name for fr_FR in fr_FR: "+displayNameString
// shows: "display name for fr_FR in fr_FR: fran√ßais (France)"

displayNameString = frLocale.displayName(frLocale.NSLocaleIdentifier, "en_US")
MsgBox "display name for en_US in fr_FR: "+displayNameString
// shows: "display name for en_US in fr_FR: anglais (√âtats-Unis)"

// The following example uses the en_GB locale.

dim gbLocale as new NSLocaleMBS("en_US")

displayNameString = gbLocale.displayName(frLocale.NSLocaleIdentifier, "fr_FR")
MsgBox "display name for fr_FR in en_US: "+displayNameString
// shows: "display name for fr_FR in en_US: French (France)"

displayNameString = gbLocale.displayName(frLocale.NSLocaleIdentifier, "en_US")
MsgBox "display name for en_US in en_US: "+displayNameString
// shows: "display name for en_US in en_US: English (United States)"
```

**Notes:** Not all locale property keys have values with display name values.

You can use the NSLocaleIdentifier key to get the name of a locale in the language of another locale, as illustrated in the example code above.

### 65.4.13 ExemplarCharacterSet as Variant

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The exemplar character set for the locale.
**Example:**

```
dim n as NSLocaleMBS = NSLocaleMBS.currentLocale

MsgBox n.ExemplarCharacterSet.StringValue
// shows "ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz√Ñ√ñ√ú√ü√§√√º" in Germany
```

**Notes:** Returns a NSCharacterSetMBS object.
Available in Mac OS X v10.4 and later.

### 65.4.14 GetString(key as string) as string

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns a string for one of the NSLocate keys.
**Notes:** Available in Mac OS X v10.4 and later.
This keys can be found int he NSLocale reference from Apple.

### 65.4.15 ISOCountryCodes as string()

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns an array of strings that represents all known legal country codes.
**Example:**

```
MsgBox join(NSLocaleMBS.ISOCountryCodes,", ")

// shows "AD, AE, AF, AG, AI, AL, AM, AN, AO, AQ, AR, AS, AT, AU,
// AW, AX, AZ, BA, BB, BD, BE, BF, BG, BH, BI, BJ, BL, BM, BN, BO,
// BR, BS, BT, BV, BW, BY, BZ, CA, CC, CD, CF, CG, CH, CI, CK, CL,
// CM, CN, CO, CR, CU, CV, CX, CY, CZ, DE, DJ, DK, DM, DO, DZ, EC,
// EE, EG, EH, ER, ES, ET, FI, FJ, FK, FM, FO, FR, GA, GB, GD, GE,
// GF, GG, GH, GI, GL, GM, GN, GP, GQ, GR, GS, GT, GU, GW, GY, HK,
// HM, HN, HR, HT, HU, ID, IE, IL, IM, IN, IO, IQ, IR, IS, IT, JE,
// JM, JO, JP, KE, KG, KH, KI, KM, KN, KP, KR, KW, KY, KZ, LA, LB,
// LC, LI, LK, LR, LS, LT, LU, LV, LY, MA, MC, MD, ME, MF, MG, MH,
// MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ,
// NA, NC, NE, NF, NG, NI, NL, false, NP, NR, NU, NZ, OM, PA, PE, PF,
// PG, PH, PK, PL, PM, PN, PR, PS, PT, PW, PY, QA, RE, RO, RS, RU,
// RW, SA, SB, SC, SD, SE, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SR,
// ST, SV, SY, SZ, TC, TD, TF, TG, TH, TJ, TK, TL, TM, TN, TO, TR,
// TT, TV, TW, TZ, UA, UG, UM, US, UY, UZ, VA, VC, VE, VG, VI, VN,
// VU, WF, WS, YE, YT, ZA, ZM, ZW"
```

**Notes:** Available in Mac OS X v10.4 and later.
Note that many of country codes do not have any supporting locale data in Mac OS X.

### 65.4.16 ISOCurrencyCodes as string()

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns an array of strings that represents all known legal ISO currency codes.
**Example:**

```
MsgBox join(NSLocaleMBS.ISOCurrencyCodes,", ")

// shows "ADP, AED, AFA, AFN, ALK, ALL, AMD, ANG, AOA, AOK, AON, AOR,
// ARA, ARP, ARS, ATS, AUD, AWG, AZM, AZN, BAD, BAM, BBD, BDT, BEC,
// BEF, BEL, BGL, BGM, BGN, BHD, BIF, BMD, BND, BOB, BOP, BOV, BRB,
// BRC, BRE, BRL, BRN, BRR, BSD, BTN, BUK, BWP, BYB, BYR, BZD, CAD,
// CDF, CHE, CHF, CHW, CLF, CLP, CNX, CNY, COP, COU, CRC, CSD, CSK,
// CUP, CVE, CYP, CZK, DDM, DEM, DJF, DKK, DOP, DZD, ECS, ECV, EEK,
// EGP, EQE, ERN, ESA, ESB, ESP, ETB, EUR, FIM, FJD, FKP, FRF, GBP,
// GEK, GEL, GHC, GHS, GIP, GMD, GNF, GNS, GQE, GRD, GTQ, GWE, GWP,
// GYD, HKD, HNL, HRD, HRK, HTG, HUF, IDR, IEP, ILP, ILS, INR, IQD,
// IRR, ISK, ITL, JMD, JOD, JPY, KES, KGS, KHR, KMF, KPW, KRW, KWD,
// KYD, KZT, LAK, LBP, LKR, LRD, LSL, LSM, LTL, LTT, LUC, LUF, LUL,
// LVL, LVR, LYD, MAD, MAF, MDL, MGA, MGF, MKD, MLF, MMK, MNT, MOP,
// MRO, MTL, MTP, MUR, MVR, MWK, MXN, MXP, MXV, MYR, MZE, MZM, MZN,
// NAD, NGN, NIC, NIO, NLG, NOK, NPR, NZD, OMR, PAB, PEI, PEN, PES,
// PGK, PHP, PKR, PLN, PLZ, PTE, PYG, QAR, RHD, ROL, RON, RSD, RUB,
// RUR, RWF, SAR, SBD, SCR, SDD, SDG, SDP, SEK, SGD, SHP, SIT, SKK,
// SLL, SOS, SRD, SRG, STD, SUR, SVC, SYP, SZL, THB, TJR, TJS, TMM,
// TND, TOP, TPE, TRL, TRY, TTD, TWD, TZS, UAH, UAK, UGS, UGX, USD,
// USN, USS, UYP, UYI, UYU, UZS, VEB, VEF, VND, VUV, WST, XAF, XAG,
// XAU, XBA, XBB, XBC, XBD, XCD, XDR, XEU, XFO, XFU, XOF, XPD, XPF,
// XPT, XRE, XTS, XXX, YDD, YER, YUD, YUM, YUN, ZAL, ZAR, ZMK, ZRN,
// ZRZ, ZWD"
```

**Notes:** Available in Mac OS X v10.4 and later.

Note that some of the currency codes may not have any supporting locale data in Mac OS X.

### 65.4.17 ISOLanguageCodes as string()

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns an array of strings that represents all known legal ISO language codes.
**Example:**

```
MsgBox join(NSLocaleMBS.ISOLanguageCodes,", ")

// shows "aa, ab, ace, ach, ada, ady, ae, af, afa, afh, ain, ak, akk,
// ale, alg, alt, am, an, ang, anp, apa, ar, arc, arn, arp, art, arw,
// as, ast, ath, aus, av, awa, ay, az, ba, bad, bai, bal, ban, bas,
// bat, be, bej, bem, ber, bg, bh, bho, bi, bik, bin, bla, bm, bn, bnt,
```

// bo, br, bra, bs, btk, bua, bug, byn, ca, cad, cai, car, cau, cch,
// ce, ceb, cel, ch, chb, chg, chk, chm, chn, cho, chp, chr, chy, cmc,
// co, cop, cpe, cpf, cpp, cr, crh, crp, cs, csb, cu, cus, cv, cy, da,
// dak, dar, day, de, del, den, dgr, din, doi, dra, dsb, dua, dum, dv,
// dyu, dz, ee, efi, egy, eka, el, elx, en, enm, eo, es, et, eu, ewo,
// fa, fan, fat, ff, fi, fil, fiu, fj, fo, fon, fr, frm, fro, frr, frs,
// fur, fy, ga, gaa, gay, gba, gd, gem, gez, gil, gl, gmh, gn, goh,
// gon, gor, got, grb, grc, gsw, gu, gv, gwi, ha, hai, haw, he, hi,
// hil, him, hit, hmn, ho, hr, hsb, ht, hu, hup, hy, hz, ia, iba, id,
// ie, ig, ii, ijo, ik, ilo, inc, ine, inh, io, ira, iro, is, it, iu,
// ja, jbo, jpr, jrb, jv, ka, kaa, kab, kac, kaj, kam, kar, kaw, kbd,
// kcg, kfo, kg, kha, khi, kho, ki, kj, kk, kl, km, kmb, kn, ko, kok,
// kos, kpe, kr, krc, krl, kro, kru, ks, ku, kum, kut, kv, kw, ky, la,
// lad, lah, lam, lb, lez, lg, li, ln, lo, lol, loz, lt, lu, lua, lui,
// lun, luo, lus, lv, mad, mag, mai, mak, man, map, mas, mdf, mdr, men,
// mg, mga, mh, mi, mic, min, mis, mk, mkh, ml, mn, mnc, mni, mno, mo,
// moh, mos, mr, ms, mt, mul, mun, mus, mwl, mwr, my, myn, myv, na,
// nah, nai, nap, nb, nd, nds, ne, new, ng, nia, nic, niu, nl, nn, no,
// nog, non, nqo, nr, nso, nub, nv, nwc, ny, nym, nyn, nyo, nzi, oc,
// oj, om, or, os, osa, ota, oto, pa, paa, pag, pal, pam, pap, pau,
// peo, phi, phn, pi, pl, pon, pra, pro, ps, pt, qu, raj, rap, rar, rm,
// rn, ro, roa, rom, ru, rup, rw, sa, sad, sah, sai, sal, sam, sas,
// sat, sc, scn, sco, sd, se, sel, sem, sg, sga, sgn, shn, si, sid,
// sio, sit, sk, sl, sla, sm, sma, smi, smj, smn, sms, sn, snk, so,
// sog, son, sq, sr, srn, srr, ss, ssa, st, su, suk, sus, sux, sv, sw,
// syc, syr, ta, tai, te, tem, ter, tet, tg, th, ti, tig, tiv, tk, tkl,
// tl, tlh, tli, tmh, tn, to, tog, tpi, tr, ts, tsi, tt, tum, tup, tut,
// tvl, tw, ty, tyv, udm, ug, uga, uk, umb, und, ur, uz, vai, ve, vi,
// vo, vot, wa, wak, wal, war, was, wen, wo, xal, xh, yao, yap, yi, yo,
// ypk, za, zap, zbl, zen, zh, znd, zu, zun, zxx, zza"

**Notes:** Available in Mac OS X v10.4 and later.

Note that many of the language codes will not have any supporting locale data in Mac OS X.

### 65.4.18 lineDirectionForLanguage(isoLangCode as string) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the line direction for the specified ISO language code.
**Notes:** Returns the line direction for the language. See constants for possible values. If the appropriate direction can't be determined NSLocaleLanguageDirectionUnknown is returned.

Available in Mac OS X v10.6 and later.

### 65.4.19 localeIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Returns the identifier for the receiver.
**Notes:** The identifier for the receiver. This may not be the same string that the locale was created with, since NSLocale may canonicalize it.

Available in Mac OS X v10.4 and later.

### 65.4.20 localeIdentifierFromWindowsLocaleCode(code as Integer) as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a locale identifier from a Windows locale code.
**Notes:** Available in Mac OS X v10.6 and later.

### 65.4.21 NSBuddhistCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Buddhist calendar.
Available in Mac OS X v10.4 and later.

### 65.4.22 NSChineseCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Chinese calendar (unsupported).

Note that the Chinese calendar is not supported in Mac OS X v10.4-10.5. Although you can create a calendar using this constant, the object will not function correctly.

Available in Mac OS X v10.4 and later.

### 65.4.23 NSGregorianCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Gregorian calendar.
Available in Mac OS X v10.4 and later.

### 65.4.24 NSHebrewCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Hebrew calendar.

Available in Mac OS X v10.4 and later.

### 65.4.25 NSIndianCalendar as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Indian calendar

Available in Mac OS X v10.6 and later.

### 65.4.26 NSIslamicCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Islamic calendar.

Available in Mac OS X v10.4 and later.

### 65.4.27 NSIslamicCivilCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Islamic civil calendar.

Available in Mac OS X v10.4 and later.

### 65.4.28 NSISO8601Calendar as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the ISO8601. The ISO8601 calendar is not yet implemented.

Available in Mac OS X v10.6 and later.

### 65.4.29 NSJapaneseCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Japanese calendar.
Available in Mac OS X v10.4 and later.

### 65.4.30 NSLocaleAlternateQuotationBeginDelimiterKey as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Notes:** The key for the alternating begin quotation symbol associated with the locale. In some locales, when quotations are nested, the quotation characters alternate. Thus, NSLocaleQuotationBeginDelimiterKey, then NSLocaleAlternateQuotationBeginDelimiterKey, etc.

The corresponding value is a string.
Available in Mac OS X v10.6 and later.

### 65.4.31 NSLocaleAlternateQuotationEndDelimiterKey as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Notes:** The key for the alternating enda quotation symbol associated with the locale. In some locales, when

quotations are nested, the quotation characters alternate. Thus, NSLocaleQuotationEndDelimiterKey, then NSLocaleAlternateQuotationEndDelimiterKey, etc.

The corresponding value is a string.

Available in Mac OS X v10.6 and later.

### 65.4.32 NSLocaleCalendar as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.

### 65.4.33 NSLocaleCollationIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.34 NSLocaleCollatorIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Notes:** The key for the collation identifier for the locale.
The corresponding value is a string. If unknown, "" is returned.
Available in Mac OS X v10.6 and later.

### 65.4.35 NSLocaleCountryCode as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.36 NSLocaleCurrencyCode as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.37 NSLocaleCurrencySymbol as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.38 NSLocaleDecimalSeparator as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.39 NSLocaleExemplarCharacterSet as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.40 NSLocaleGroupingSeparator as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.41 NSLocaleIdentifier as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Example:**

```
dim n as new NSLocaleMBS("de")

MsgBox n.displayName(n.NSLocaleIdentifier, "en")
```

### 65.4.42 NSLocaleLanguageCode as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.43 NSLocaleMeasurementSystem as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.44 NSLocaleQuotationBeginDelimiterKey as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Notes:** The key for the begin quotation symbol associated with the locale.
The corresponding value is a string.
Available in Mac OS X v10.6 and later.

### 65.4.45 NSLocaleQuotationEndDelimiterKey as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.
**Notes:** The key for the begin quotation symbol associated with the locale.
The corresponding value is string.
Available in Mac OS X v10.6 and later.

### 65.4.46 NSLocaleScriptCode as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.47 NSLocaleUsesMetricSystem as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.48 NSLocaleVariantCode as string

MBS MacBase Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** One of the constants for the displayName and GetString functions.

### 65.4.49 NSPersianCalendar as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Persian calendar.
Available in Mac OS X v10.6 and later.

### 65.4.50 NSRepublicOfChinaCalendar as string

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the calendar indentifiers.
**Notes:** Identifier for the Republic of China (Taiwan) calendar.

A Chinese calendar can be created, and one can do calendrical calculations with it, but it should not be used for formatting as the necessary underlying functionality is not functioning correctly yet.

Available in Mac OS X v10.6 and later.

### 65.4.51 preferredLanguages as string()

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the user's language preference order as an array of strings.
**Example:**

```
MsgBox join(NSLocaleMBS.preferredLanguages,", ")

// shows "de, en, fr, es, it, pt, pt-PT, nl, sv, nb, da, fi, ru, pl, zh-Hans, ja, zh-Hant, ko"
```

**Notes:** The user's language preference order as an array of String objects, each of which is a canonicalized IETF BCP 47 language identifier.

Available in Mac OS X v10.5 and later.
This is the language the user prefers. To get the country linked to the number and date formats, use the CountryCode property.

### 65.4.52 systemLocale as NSLocaleMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the "root", canonical locale, that contains fixed "backstop" settings that provide values for otherwise undefined keys.
**Notes:** Available in Mac OS X v10.4 and later.

### 65.4.53 windowsLocaleCodeFromLocaleIdentifier(s as string) as Integer

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a Window locale code from the locale identifier.
**Notes:** Available in Mac OS X v10.6 and later.

### 65.4.54 Properties

### 65.4.55 CollationIdentifier as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The collation associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.CollationIdentifier // shows "" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.56 CountryCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The country code.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.CountryCode // shows "DE" in Germany
```

**Notes:** An example value might be "ES".
Available in Mac OS X v10.4 and later.

This code here is the country where the number and date settings belong to. This is not the language the user has. To get the languages, check the preferredLanguages array.
(Read only property)

### 65.4.57 CurrencyCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The currency code associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.CurrencyCode // shows "EUR" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.58 CurrencySymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The currency symbol associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.CurrencySymbol // shows ",Ç¨" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.59 DateFull as NSLocaleDateMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The full date format.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.60 DateLong as NSLocaleDateMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The long date format.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.61 DateMedium as NSLocaleDateMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The medium date format.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.62 DateShort as NSLocaleDateMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The short date format.
**Example:**

```
MsgBox NSLocaleMBS.currentLocale.DateShort.dateFormat
// in Germany: "dd.MM.yy"
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.63 DecimalSeparator as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The decimal separator associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.DecimalSeparator // shows "," in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.64 GroupingSeparator as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The numeric grouping separator associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.GroupingSeparator // shows "." in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.65 Identifier as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The locale identifier.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.Identifier // shows "de_DE" in Germany
```

**Notes:** An example value might be "es_ES_PREEURO".
Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.66 LanguageCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The language code.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.LanguageCode // shows "de" in Germany
```

**Notes:** An example value might be "es".
Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.67 MeasurementSystem as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The measurement system associated with the locale.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.MeasurementSystem // shows "Metric" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.68 NumberCurrency as NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The currency style for number formatting.

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.69 NumberDecimal as NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Specifies a decimal style for numbers.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.70 NumberPercent as NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The percent style for number formatting.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.71 NumberScientific as NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Specifies a scientific style for numbers.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.72 NumberSpellOut as NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Specifies a spell-out format; for numbers, ”23” becomes ”twenty-three”.
**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.73 ScriptCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The locale script code.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.ScriptCode // shows "" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.74 UsesMetricSystem as Boolean

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The flag that indicates whether the locale uses the metric system.
**Example:**

```
dim n as new NSLocaleMBS
dim v as Variant

v=n.UsesMetricSystem
MsgBox v // shows "True" in Germany
```

**Notes:** Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.75 VariantCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The locale variant code.
**Example:**

```
dim n as new NSLocaleMBS

MsgBox n.VariantCode // shows "" in Germany
```

**Notes:** An example value might be "PREEURO".
Available in Mac OS X v10.4 and later.
(Read only property)

### 65.4.76 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSLocaleLanguageDirectionBottomToTop | 4 | One of the constants describing the text direction for a language. The language direction is from bottom to top. Available in Mac OS X v10.6 and later. |
| NSLocaleLanguageDirectionLeftToRight | 1 | One of the constants describing the text direction for a language. The language direction is from left to right. Available in Mac OS X v10.6 and later. |
| NSLocaleLanguageDirectionRightToLeft | 2 | One of the constants describing the text direction for a language. The language direction is from right to left. Available in Mac OS X v10.6 and later. |
| NSLocaleLanguageDirectionTopToBottom | 3 | One of the constants describing the text direction for a language. The language direction is from top to bottom. Available in Mac OS X v10.6 and later. |
| NSLocaleLanguageDirectionUnknown | 0 | One of the constants describing the text direction for a language. The direction of the language is unknown. Available in Mac OS X v10.6 and later. |

## 65.5 class NSLocaleNumberMBS

### 65.5.1 class NSLocaleNumberMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** A class for a number format.
**Notes:** Should be used with the NSLocaleMBS class, but can be used on its own, too.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo / Real Studio Plugins, version 13.5pr4
- MBS Plugins 10.3 Release Notes

### 65.5.2 Methods

### 65.5.3 Constructor

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Loads values.
No the same values as if you get when using this class with NSLocaleMBS.
See also:

- 65.5.4 Constructor(locale as NSLocaleMBS) 11697

### 65.5.4 Constructor(locale as NSLocaleMBS)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The constructor.
**Example:**

```
dim n1 as new NSLocaleNumberMBS
dim n2 as new NSLocaleNumberMBS(NSLocaleMBS.currentLocale)
dim n3 as new NSLocaleNumberMBS(NSLocaleMBS.systemLocale)

break // see differences in debugger
```

**Notes:** Initializes the object for a given locale.
See also:

- 65.5.3 Constructor 11697

### 65.5.5 Properties

### 65.5.6 alwaysShowsDecimalSeparator as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver always shows a decimal separator, even if the number is an integer.
**Notes:** (Read and Write property)

### 65.5.7 currencyCode as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the currency code.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.currencycode
// shows for example: e.g "EUR" (in Germany)
```

**Notes:** A currency code is a three-letter code that is, in most cases, composed of a country's two-character Internet country code plus an extra character to denote the currency unit. For example, the currency code for the Australian dollar is "AUD". Currency codes are based on the ISO 4217 standard.

Available in Mac OS X v10.4 and later.
(Read and Write property)

### 65.5.8 currencyDecimalSeparator as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the currency decimal separator as a string.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.currencyDecimalSeparator
// shows for example: e.g "," (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.9 currencyGroupingSeparator as String

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The currency grouping separator for the receiver.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 65.5.10 currencySymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the local currency symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.currencycode
// shows for example: e.g ",Ç¨" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.11 decimalSeparator as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns a string containing the character to represent decimal separators.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.decimalSeparator
// shows for example: e.g "," (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.12 exponentSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used as an exponent symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.exponentSymbol
// shows for example: e.g "E" (in Germany)
```

**Notes:** The exponent symbol is the "E" or "e" in the scientific notation of numbers, as in 1.0e+56.
(Read and Write property)

### 65.5.13 format as String

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The format used by the receiver.
**Notes:** (Read and Write property)

### 65.5.14 groupingSeparator as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns a string containing the grouping separator.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.groupingSeparator
// shows for example: e.g "." (in Germany)
```

**Notes:** For example, the grouping separator used in the United States is the comma ("10,000") whereas in France it is the period ("10.000").
(Read and Write property)

### 65.5.15 hasThousandSeparators as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver's format includes thousand separators.
**Notes:** (Read and Write property)

### 65.5.16 internationalCurrencySymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the international currency symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.internationalCurrencySymbol
// shows for example: e.g "EUR" (in Germany)
```

**Notes:** A country typically has a local currency symbol and an international currency symbol. The local symbol is used within the country, while the international currency symbol is used in international contexts to specify that country's currency unambiguously. The international currency symbol is often represented by a Unicode code point.
(Read and Write property)

### 65.5.17 Lenient as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver uses heuristics to guess at the date which is intended by a string.
**Notes:** (Read and Write property)

### 65.5.18 localizesFormat as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver localizes formats.
**Notes:** (Read and Write property)

### 65.5.19 minusSign as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used to represent the minus sign.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.minusSign
// shows for example: e.g "-" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.20 negativeFormat as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the format used to display negative numbers.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.negativeFormat
// shows for example: e.g "#,##0.00 ¬§" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.21 negativeInfinitySymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the symbol used to represent negative infinity.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.negativeInfinitySymbol
// shows for example: e.g "" (in Germany)
```

**Notes:** (Read only property)

### 65.5.22 negativePrefix as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string which is inserted as a prefix to negative values.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.negativePrefix
// shows for example: e.g "-" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.23 negativeSuffix as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string which adds as a suffix to negative values.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.negativeSuffix
// shows for example: e.g ",Ç¨" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.24 nilSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used to represent a nil value.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.nilSymbol
// shows for example: e.g "" (in Germany)
```

**Notes:** (Read only property)

### 65.5.25 notANumberSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the symbol used to represent NaN ("not a number") when it converts values.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.notANumberSymbol
// shows for example: e.g "NaN" (in Germany)
```

**Notes:** (Read only property)

### 65.5.26 paddingCharacter as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns a string containing the padding character.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.paddingCharacter
// shows for example: e.g "*" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.27 PartialStringValidationEnabled as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether partial string validation is enabled.
**Notes:** (Read and Write property)

### 65.5.28 percentSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string that is used to represent the percent symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.percentSymbol
// shows for example: e.g "%" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.29 perMillSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string that is used for the per-thousands symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.perMillSymbol
// shows for example: e.g ",Ä∞" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.30 plusSign as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used for the plus sign.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.plusSign
// shows for example: e.g "+" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.31 positiveFormat as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the format used to display positive numbers.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.negativeFormat
// shows for example: e.g "#,##0.00 ¬§" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.32 positiveInfinitySymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used for the positive infinity symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.positiveInfinitySymbol
// shows for example: e.g "" (in Germany)
```

**Notes:** (Read only property)

### 65.5.33 positivePrefix as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used as the prefix for positive values.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.positivePrefix
// shows for example: e.g "" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.34 positiveSuffix as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used as the suffix for positive values.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.positiveSuffix
// shows for example: e.g " ,Ç¨" (in Germany)
```

**Notes:** (Read and Write property)

### 65.5.35 thousandSeparator as String

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver's format includes thousand separators.
**Notes:** (Read and Write property)

### 65.5.36 usesGroupingSeparator as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver uses the grouping separator.
**Notes:** (Read and Write property)

### 65.5.37 usesSignificantDigits as Boolean

MBS MacBase Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the receiver uses significant digits.
**Notes:** (Read and Write property)

### 65.5.38 zeroSymbol as String

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Returns the string used as the zero symbol.
**Example:**

```
dim l as new NSLocaleMBS
dim n as NSLocaleNumberMBS = l.NumberCurrency

MsgBox n.zeroSymbol
// shows for example: e.g "0" (in Germany)
```

**Notes:** (Read and Write property)

## 65.6 class WinLocalizationMBS

### 65.6.1 class WinLocalizationMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for details about the current localization
**Example:**

```
dim l as WinLocalizationMBS
l=new WinLocalizationMBS
```

**Notes:** This class has a constructor to specify whether you want unicode or not.

You may write yourself functions to acquire the details you need in your application from the Windows and from the Mac classes.
Also you may consider to update your values as the user may change them while your application is running.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr4

### 65.6.2 Methods

### 65.6.3 AbbreviatedDayName(index as Integer) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The localized name of the day.
**Notes:** Index from 0 to 6.
e.g. on a German Windows XP system: AbbreviatedDayName(0)="Mo"

### 65.6.4 AbbreviatedMonthName(index as Integer) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The localized month name.
**Notes:** Index from 0 to 12. 0=January, 11=December, 12=13th month if exists.
e.g. on a German Windows XP system: AbbreviatedMonthName(0)="Jan"

### 65.6.5 Constructor

MBS Win Plugin, Plugin Version: 5.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to get the values for the current locale.
**Notes:** There are four constructors:

- You can pass nothing to get the current locale.
- You can pass a Locale Identifier.
- You can pass a LanguageID and a SortID.
- You can pass a PrimaryLanguageID and a SubLanguageID combined with a SortID.

Use the LANG_* constants for the PrimaryLanguageID, the SUBLANG_* constants for the SubLanguageID and the SORT_* constants for the SortID.
See also:


- 65.6.6 Constructor(LanguageID as Integer, SortID as Integer) 11710
- 65.6.7 Constructor(LCID as Integer) 11711
- 65.6.8 Constructor(PrimaryLanguage as Integer, SubLanguage as Integer, SortID as Integer) 11711


### 65.6.6 Constructor(LanguageID as Integer, SortID as Integer)

MBS Win Plugin, Plugin Version: 9.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to query values for a given language.
**Notes:** There are four constructors:

- You can pass nothing to get the current locale.
- You can pass a Locale Identifier.
- You can pass a LanguageID and a SortID.
- You can pass a PrimaryLanguageID and a SubLanguageID combined with a SortID.

Use the LANG_* constants for the PrimaryLanguageID, the SUBLANG_* constants for the SubLanguageID and the SORT_* constants for the SortID.
See also:


- 65.6.5 Constructor 11710
- 65.6.7 Constructor(LCID as Integer) 11711
- 65.6.8 Constructor(PrimaryLanguage as Integer, SubLanguage as Integer, SortID as Integer) 11711

### 65.6.7 Constructor(LCID as Integer)

MBS Win Plugin, Plugin Version: 9.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to query values for a given language.
**Notes:** There are four constructors:

- You can pass nothing to get the current locale.
- You can pass a Locale Identifier.
- You can pass a LanguageID and a SortID.
- You can pass a PrimaryLanguageID and a SubLanguageID combined with a SortID.

Use the LANG_* constants for the PrimaryLanguageID, the SUBLANG_* constants for the SubLanguageID and the SORT_* constants for the SortID.
See also:

- 65.6.5 Constructor 11710
- 65.6.6 Constructor(LanguageID as Integer, SortID as Integer) 11710
- 65.6.8 Constructor(PrimaryLanguage as Integer, SubLanguage as Integer, SortID as Integer) 11711

### 65.6.8 Constructor(PrimaryLanguage as Integer, SubLanguage as Integer, SortID as Integer)

MBS Win Plugin, Plugin Version: 9.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to query values for a given language.
**Notes:** There are four constructors:

- You can pass nothing to get the current locale.
- You can pass a Locale Identifier.
- You can pass a LanguageID and a SortID.
- You can pass a PrimaryLanguageID and a SubLanguageID combined with a SortID.

Use the LANG_* constants for the PrimaryLanguageID, the SUBLANG_* constants for the SubLanguageID and the SORT_* constants for the SortID.
See also:

- 65.6.5 Constructor 11710
- 65.6.6 Constructor(LanguageID as Integer, SortID as Integer) 11710
- 65.6.7 Constructor(LCID as Integer) 11711

### 65.6.9 LongDayName(index as Integer) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The localized name of the day.
**Notes:** Index from 0 to 6.
e.g. on a German Windows XP system: LongDayName(0)="Montag"

### 65.6.10 LongMonthName(index as Integer) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The localized month name.
**Notes:** Index from 0 to 12. 0=January, 11=December, 12=13th month if exists.
e.g. on a German Windows XP system: LongMonthName(0)="Januar"

### 65.6.11 Properties

### 65.6.12 CalendarTypeSpecifier as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Current calendar type.
**Notes:** This type can be one of these values:

| Value | Meaning |
|---|---|
| 1 | Gregorian (as in United States) |
| 2 | Gregorian (English strings always) |
| 3 | Era: Year of the Emperor (Japan) |
| 4 | Era: Year of Taiwan Region |
| 5 | Tangun Era (Korea) |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.13 CalendarTypeSpecifier2 as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Additional calendar types.
**Notes:** This can be a zero-separated list of one or more of these calendars type values:

| Value | Meaning |
|---|---|
| 0 | No additional types valid |
| 1 | Gregorian (as in United States) |
| 2 | Gregorian (English strings always) |
| 3 | Era: Year of the Emperor (Japan) |
| 4 | Era: Year of Taiwan Region |
| 5 | Tangun Era (Korea) |

e.g. on a German Windows XP system: ""
(Read only property)

### 65.6.14 CountryCode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Country code, based on international phone codes, also referred to as IBM country codes.
**Notes:** The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "49"
(Read only property)

### 65.6.15 CountryNameAbbreviated as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Abbreviated name of the country from the ISO Standard 3166.
**Notes:** e.g. on a German Windows XP system: "DEU"
(Read only property)

### 65.6.16 CountryNameAbbreviatedISO as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** ISO abbreviated country name.
**Notes:** e.g. on a German Windows XP system: "DE"
(Read only property)

### 65.6.17 CountryNameEnglish as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Full English name of the country.
**Notes:** This is always restricted to characters mappable into the ASCII 127-character subset.
e.g. on a German Windows XP system: "English"
(Read only property)

### 65.6.18 CountryNameLocalized as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Full localized name of the country.
**Notes:** e.g. on a German Windows XP system: "Deutschland"
(Read only property)

### 65.6.19 CountryNameNative as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Native name of the country.
**Notes:** e.g. on a German Windows XP system: "Deutschland"
(Read only property)

### 65.6.20 CurrencyDecimalSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) used as the monetary decimal separator.
**Notes:** e.g. on a German Windows XP system: ","
(Read only property)

### 65.6.21 CurrencyDigitsInternational as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of fractional digits for the international monetary format.
**Notes:** The maximum number of characters allowed for this string is 3.
e.g. on a German Windows XP system: "2"
(Read only property)

### 65.6.22 CurrencyDigitsLocalized as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of fractional digits for the local monetary format.
**Notes:** The maximum number of characters allowed for this string is 3.
e.g. on a German Windows XP system: "2"
(Read only property)

### 65.6.23 CurrencyGroupingMode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sizes for each group of monetary digits to the left of the decimal.
**Notes:** An explicit size is needed for each group; sizes are separated by semicolons. If the last value is zero, the preceding value is repeated. To group thousands, specify 3;0, for example.
e.g. on a German Windows XP system: "3;0"
(Read only property)

### 65.6.24 CurrencyNameEnglish as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The full English name of the currency associated with the locale.
**Notes:** e.g. on a German Windows XP system: "Euro"
Introduced with Windows 2000.
(Read only property)

### 65.6.25 CurrencyNameNative as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The native name of the currency associated with the locale.
**Notes:** e.g. on a German Windows XP system: "Euro"
Introduced with Windows 2000.
(Read only property)

### 65.6.26 CurrencyNegativeMode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Negative currency mode.
**Notes:** The maximum number of characters allowed for this string is 3. The mode can be one of the following values:

| Value | Example |
|---|---|
| 0 | ($ 1.1) |
| 1 | –$ 1.1 |
| 2 | $ –1.1 |
| 3 | $ 1.1– |
| 4 | (1.1$ ) |
| 5 | –1.1$ |
| 6 | 1.1–$ |
| 7 | 1.1$ – |
| 8 | –1.1 $ (space before $ ) |
| 9 | –$ 1.1 (space after $ ) |
| 10 | 1.1 $ –(space before $ ) |
| 11 | $ 1.1–(space after $ ) |
| 12 | $ –1.1 (space after $ ) |
| 13 | 1.1–$ (space before $ ) |
| 14 | ($ 1.1) (space after $ ) |
| 15 | (1.1 $ ) (space before $ ) |

e.g. on a German Windows XP system: "8"
(Read only property)

### 65.6.27 CurrencyPositiveMode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Positive currency mode.
**Notes:** The maximum number of characters allowed for this string is 2. The mode can be one of the following values:

e.g. on a German Windows XP system: "3"
(Read only property)

| Value | Meaning |
|---|---|
| 0 | Prefix, no separation |
| 1 | Suffix, no separation |
| 2 | Prefix, 1-char. separation |
| 3 | Suffix, 1-char. separation |

### 65.6.28 CurrencySymbolInternational as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Three characters of the international monetary symbol specified in ISO 4217, "Codes for the Representation of Currencies and Funds," followed by the character separating this string from the amount.
**Example:**

```
Dim WinLoc As WinLocalizationMBS
dim s as string

WinLoc=New WinLocalizationMBS

s=WinLoc.CurrencySymbolLocalized
msgbox str(lenb(s))+" "+str(len(s))+" "+s
s=WinLoc.CurrencySymbolInternational
msgbox str(lenb(s))+" "+str(len(s))+" "+s
```

**Notes:** e.g. on a German Windows XP system: "EUR"
(Read only property)

### 65.6.29 CurrencySymbolLocalized as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** String used as the local monetary symbol.
**Example:**

```
Dim WinLoc As WinLocalizationMBS
dim s as string

WinLoc=New WinLocalizationMBS

s=WinLoc.CurrencySymbolLocalized
msgbox str(lenb(s))+" "+str(len(s))+" "+s
s=WinLoc.CurrencySymbolInternational
msgbox str(lenb(s))+" "+str(len(s))+" "+s
```

**Notes:** e.g. on a German Windows XP system: ",Ç¨"
(Read only property)

### 65.6.30 CurrencyThousandSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) used as the monetary separator between groups of digits to the left of the decimal.
**Notes:** e.g. on a German Windows XP system: "."
(Read only property)

### 65.6.31 DateLeadingZerosDay as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for leading zeros in day fields.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | No leading zeros for days |
| 1 | Leading zeros for days |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.32 DateLeadingZerosMonth as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for leading zeros in month fields.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

e.g. on a German Windows XP system: "1"
(Read only property)

| Value | Meaning |
|---|---|
| 0 | No leading zeros for months |
| 1 | Leading zeros for months |

### 65.6.33 DateLongFormatOrdering as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Long date format-ordering specifier.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | Month-Day-Year |
| 1 | Day-Month-Year |
| 2 | Year-Month-Day |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.34 DateLongFormatString as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Long date formatting string for this locale.
**Notes:** The string can consist of a combination of day, month, and year format pictures defined in the Day, Month, Year, and Era Format Pictures table in National Language Support Constants and any string of characters enclosed in single quotes. Characters in single quotes remain as given.
e.g. on a German Windows XP system: "dddd, d. MMMM yyyy"
(Read only property)

### 65.6.35 DateSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) for the date separator.
**Notes:** e.g. on a German Windows XP system: "."
(Read only property)

### 65.6.36 DateShortFormatOrdering as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Short date format-ordering specifier.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | Month-Day-Year |
| 1 | Day-Month-Year |
| 2 | Year-Month-Day |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.37 DateShortFormatString as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Short date formatting string for this locale.
**Example:**

```
dim w as new WinLocalizationMBS

MsgBox w.DateShortFormatString
```

**Notes:** The string can consist of a combination of day, month, and year format pictures defined in Day, Month, Year, and Era Format Pictures table in National Language Support Constants.
e.g. on a German Windows XP system: "dd.MM.yyyy"
(Read only property)

### 65.6.38 DateShortYearMonth as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Year/Month formatting string for the locale.
**Notes:** This string shows the proper format for a date string that contains only the year and the month.
e.g. on a German Windows XP system: "MMMM yyyy"
Introduced with Windows 2000.

(Read only property)

### 65.6.39 DecimalSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) used as the decimal separator.
**Notes:** e.g. on a German Windows XP system: ","
(Read only property)

### 65.6.40 DefaultCodePageANSI as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** American National Standards Institute (ANSI) code page associated with this locale.
**Notes:** The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "1252"
(Read only property)

### 65.6.41 DefaultCodePageEBCDIC as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Default EBCDIC code page associated with the locale.
**Notes:** The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "20273"
Introduced with Windows 2000.
(Read only property)

### 65.6.42 DefaultCodePageMac as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Original equipment manufacturer (OEM) code page associated with the country.
**Notes:** The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "10000"
(Read only property)

### 65.6.43 DefaultCodePageOEM as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Original equipment manufacturer (OEM) code page associated with the locale.
**Notes:** The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "850"
(Read only property)

### 65.6.44 DefaultCountryCode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Country code for the principal country in this locale.
**Notes:** This is provided so that partially specified locales can be completed with default values. The maximum number of characters allowed for this string is 6.
e.g. on a German Windows XP system: "49"
(Read only property)

### 65.6.45 DefaultLanguageID as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Language identifier for the principal language spoken in this locale.
**Notes:** This is provided so that partially specified locales can be completed with default values. The maximum number of characters allowed for this string is 5.
e.g. on a German Windows XP system: "0407"
(Read only property)

### 65.6.46 DigitGrouping as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sizes for each group of digits to the left of the decimal.
**Notes:** An explicit size is needed for each group; sizes are separated by semicolons. If the last value is zero, the preceding value is repeated. To group thousands, specify 3;0, for example.
e.g. on a German Windows XP system: "3;0"
(Read only property)

### 65.6.47 DigitSubstitution as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Unkown.
**Notes:** 0 = context, 1 = none, 2 = national
e.g. on a German Windows XP system: "1"
Introduced with Windows 2000.
(Read only property)

### 65.6.48 FirstDayOfWeek as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for the first day in a week.
**Notes:** Value from 0 to 6.
e.g. on a German Windows XP system: "0"
(Read only property)

### 65.6.49 FirstWeekOfYear as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for the first week of the year.
**Notes:** The specifier can be one of these values:

| Value | Meaning |
|---|---|
| 0 | Week containing 1/1 is the first week of that year. |
| 1 | First full week following 1/1 is the first week of that year. |
| 2 | First week containing at least 4 days is the first week of that year. |

e.g. on a German Windows XP system: "2"
(Read only property)

### 65.6.50 LanguageID as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Language identifier indicating the language.
**Notes:** The maximum number of characters allowed for this string is 5.

e.g. on a German Windows XP system: "0407"
(Read only property)

### 65.6.51 LanguageNameAbbreviated as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Abbreviated name of the language, created by taking the 2-letter language abbreviation from the ISO Standard 639 and adding a third letter, as appropriate, to indicate the sublanguage.
**Notes:** e.g. on a German Windows XP system: "DEU"
(Read only property)

### 65.6.52 LanguageNameAbbreviatedISO as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** ISO abbreviated language name.
**Notes:** e.g. on a German Windows XP system: "de"
(Read only property)

### 65.6.53 LanguageNameEnglish as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Full English name of the language from the International Organization for Standardization (ISO) Standard 639.
**Notes:** This is always restricted to characters mappable into the ASCII 127-character subset.
e.g. on a German Windows XP system: "German"
(Read only property)

### 65.6.54 LanguageNameLocalized as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Full localized name of the language.
**Notes:** e.g. on a German Windows XP system: "Deutsch (Deutschland)"
(Read only property)

### 65.6.55 LanguageNameNativ as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Native name of the language.
**Notes:** e.g. on a German Windows XP system: "Deutsch"
(Read only property)

### 65.6.56 LeadingZeros as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for leading zeros in decimal fields.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | No leading zeros |
| 1 | Leading zeros |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.57 ListItemSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) used to separate list items.
**Notes:** For example, a comma is used in many locales.
e.g. on a German Windows XP system: ";"
(Read only property)

### 65.6.58 MeasureSystem as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** System of measurement.
**Notes:** This value is 0 if the metric system (Syst√©me International d'Unit√©s, or S.I.) is used and 1 if the U.S. system is used. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "0"

(Read only property)

### 65.6.59 NativeASCII0to9 as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Native equivalents to ASCII 0 through 9.
**Notes:** e.g. on a German Windows XP system: "0123456789"
(Read only property)

### 65.6.60 NegativeNumberMode as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Negative number mode.
**Notes:** The mode can be one of these values:

| Value | Meaning |
|---|---|
| 0 | (1.1) |
| 1 | –1.1 |
| 2 | –1.1 |
| 3 | 1.1– |
| 4 | 1.1 – |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.61 NegSepBySpace as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Separation of monetary symbol in a negative monetary value.
**Notes:** This value is 1 if the monetary symbol is separated by a space from the negative amount, 0 if it is not. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.62 NegSymPrecedes as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Position of monetary symbol in a negative monetary value.
**Notes:** This value is 1 if the monetary symbol precedes the negative amount, 0 if it follows it. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "0"
(Read only property)

### 65.6.63 NumberOfFraction as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of fractional digits.
**Notes:** The maximum number of characters allowed for this string is 3.
e.g. on a German Windows XP system: "2"
(Read only property)

### 65.6.64 Papersize as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Default paper size associated with the locale.
**Notes:** Possible values:

| | |
|---|---|
| 1 | Letter |
| 5 | Legal |
| 8 | DIN A3 |
| 9 | DIN A4 |

e.g. on a German Windows XP system: "9"
Introduced with Windows 2000.
(Read only property)

### 65.6.65 PosSepBySpace as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Separation of monetary symbol in a positive monetary value.
**Notes:** This value is 1 if the monetary symbol is separated by a space from a positive amount, 0 if it is not. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.66 PosSymPrecedes as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Position of monetary symbol in a positive monetary value.
**Notes:** This value is 1 if the monetary symbol precedes the positive amount, 0 if it follows it. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "0"
(Read only property)

### 65.6.67 SignNegative as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** String value for the negative sign.
**Notes:** e.g. on a German Windows XP system: "-"
(Read only property)

### 65.6.68 SignNegativePosition as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Formatting index for negative values.
**Notes:** This index uses the same values as SignPositivePosition. The maximum number of characters allowed for this string is 2.
e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.69 SignPositive as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** String value for the positive sign.
**Notes:** e.g. on a German Windows XP system: ""

(Read only property)

### 65.6.70 SignPositivePosition as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Formatting index for positive values.
**Notes:** The maximum number of characters allowed for this string is 2. The index can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | Parentheses surround the amount and the monetary symbol. |
| 1 | The sign string precedes the amount and the monetary symbol. |
| 2 | The sign string succeeds the amount and the monetary symbol. |
| 3 | The sign string immediately precedes the monetary symbol. |
| 4 | The sign string immediately succeeds the monetary symbol. |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.71 Sortname as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The full localized name of the sort for the given locale ID.
**Notes:** e.g. on a German Windows XP system: "W√rterbuch"
Introduced with Windows 2000.
(Read only property)

### 65.6.72 ThousandSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) used to separate groups of digits to the left of the decimal.
**Notes:** e.g. on a German Windows XP system: "."
(Read only property)

### 65.6.73 TimeAM as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** String for the AM designator.
**Notes:** e.g. on a German Windows XP system: ""
(Read only property)

### 65.6.74 TimeCenturyFormatSpecifier as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for full 4-digit century.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | Abbreviated 2-digit century |
| 1 | Full 4-digit century |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.75 TimeFormatSpecifier as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Time format specifier.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | AM / PM 12-hour format |
| 1 | 24-hour format |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.76 TimeLeadingZeros as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifier for leading zeros in time fields.
**Notes:** The maximum number of characters allowed for this string is 2. The specifier can be one of the following values:

| Value | Meaning |
|---|---|
| 0 | No leading zeros for hours |
| 1 | Leading zeros for hours |

e.g. on a German Windows XP system: "1"
(Read only property)

### 65.6.77 TimeMarkerPosition as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Unkown.
**Notes:** e.g. on a German Windows XP system: "0"
(Read only property)

### 65.6.78 TimePM as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** String for the PM designator.
**Notes:** e.g. on a German Windows XP system: ""
(Read only property)

### 65.6.79 TimeSeparator as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Character(s) for the time separator.
**Notes:** e.g. on a German Windows XP system: ":"
(Read only property)

### 65.6.80 TimeShortFormatString as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Time formatting strings for this locale.
**Notes:** The string can consist of a combination of the hour, minute, and second format pictures defined in the Hour, Minute, and Second Format Pictures table in National Language Support Constants.
e.g. on a German Windows XP system: "HH:mm:ss"
(Read only property)

### 65.6.81 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| LANG_AFRIKAANS | &h36 | One of the constants for the LanguageID. |
| LANG_ALBANIAN | &h1c | One of the constants for the LanguageID. |
| LANG_ARABIC | 1 | One of the constants for the LanguageID. |
| LANG_ARMENIAN | &h2b | One of the constants for the LanguageID. |
| LANG_ASSAMESE | &h4d | One of the constants for the LanguageID. |
| LANG_AZERI | &h2c | One of the constants for the LanguageID. |
| LANG_BASQUE | &h2d | One of the constants for the LanguageID. |
| LANG_BELARUSIAN | &h23 | One of the constants for the LanguageID. |
| LANG_BENGALI | &h45 | One of the constants for the LanguageID. |
| LANG_BULGARIAN | 2 | One of the constants for the LanguageID. |
| LANG_CATALAN | 3 | One of the constants for the LanguageID. |
| LANG_CHINESE | 4 | One of the constants for the LanguageID. |
| LANG_CROATIAN | &h1a | One of the constants for the LanguageID. |
| LANG_CZECH | 5 | One of the constants for the LanguageID. |
| LANG_DANISH | 6 | One of the constants for the LanguageID. |
| LANG_DUTCH | &h13 | One of the constants for the LanguageID. |
| LANG_ENGLISH | 9 | One of the constants for the LanguageID. |
| LANG_ESTONIAN | &h25 | One of the constants for the LanguageID. |
| LANG_FAEROESE | &h38 | One of the constants for the LanguageID. |
| LANG_FARSI | &h29 | One of the constants for the LanguageID. |
| LANG_FINNISH | &h0b | One of the constants for the LanguageID. |
| LANG_FRENCH | &h0c | One of the constants for the LanguageID. |
| LANG_GEORGIAN | &h37 | One of the constants for the LanguageID. |
| LANG_GERMAN | 7 | One of the constants for the LanguageID. |
| LANG_GREEK | 8 | One of the constants for the LanguageID. |
| LANG_GUJARATI | &h47 | One of the constants for the LanguageID. |
| LANG_HEBREW | &h0d | One of the constants for the LanguageID. |
| LANG_HINDI | &h39 | One of the constants for the LanguageID. |
| LANG_HUNGARIAN | &h0e | One of the constants for the LanguageID. |
| LANG_ICELANDIC | &h0f | One of the constants for the LanguageID. |
| LANG_INDONESIAN | &h21 | One of the constants for the LanguageID. |
| LANG_ITALIAN | &h10 | One of the constants for the LanguageID. |
| LANG_JAPANESE | &h11 | One of the constants for the LanguageID. |
| LANG_KANNADA | &h4b | One of the constants for the LanguageID. |
| LANG_KASHMIRI | &h60 | One of the constants for the LanguageID. |
| LANG_KAZAK | &h3f | One of the constants for the LanguageID. |
| LANG_KONKANI | &h57 | One of the constants for the LanguageID. |
| LANG_KOREAN | &h12 | One of the constants for the LanguageID. |
| LANG_LATVIAN | &h26 | One of the constants for the LanguageID. |
| LANG_LITHUANIAN | &h27 | One of the constants for the LanguageID. |
| LANG_MACEDONIAN | &h2f | One of the constants for the LanguageID. |
| LANG_MALAY | &h3e | One of the constants for the LanguageID. |
| LANG_MALAYALAM | &h4c | One of the constants for the LanguageID. |
| LANG_MANIPURI | &h58 | One of the constants for the LanguageID. |
| LANG_MARATHI | &h4e | One of the constants for the LanguageID. |
| LANG_NEPALI | &h61 | One of the constants for the LanguageID. |
| LANG_NEUTRAL | 0 | One of the constants for the LanguageID. |
| LANG_NORWEGIAN | &h14 | One of the constants for the LanguageID. |
| LANG_ORIYA | &h48 | One of the constants for the LanguageID. |
| LANG_POLISH | &h15 | One of the constants for the LanguageID. |
| LANG_PORTUGUESE | &h16 | One of the constants for the LanguageID. |
| LANG_PUNJABI | &h46 | One of the constants for the LanguageID. |
| LANG_ROMANIAN | &h18 | One of the constants for the LanguageID. |
| LANG_RUSSIAN | &h19 | One of the constants for the LanguageID. |
| LANG_SANSKRIT | &h4f | One of the constants for the LanguageID. |
| LANG_SERBIAN | &h1a | One of the constants for the LanguageID. |
| LANG_SINDHI | &h59 | One of the constants for the LanguageID. |
| LANG_SLOVAK | &h1b | One of the constants for the LanguageID. |

# Chapter 66

# Data Types

## 66.1 class ComplexDoubleMBS

### 66.1.1 class ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for complex numbers.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(4,7)

dim sum as ComplexDoubleMBS = c+d

MsgBox sum.str
```

**Blog Entries**

- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

### 66.1.2 Methods

### 66.1.3 abs as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The absolute value of the complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.abs)
```

### 66.1.4 Add(c as ComplexDoubleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the given value to this complex number.
See also:

- 66.1.5 Add(x as Double) 11736

### 66.1.5 Add(x as Double)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the given value to this complex number.
See also:

- 66.1.4 Add(c as ComplexDoubleMBS) 11736

### 66.1.6 arg as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return phase angle of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.arg)
```

### 66.1.7 conj as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns complex conjugate.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim e as ComplexDoubleMBS = c.conj
```

MsgBox e.str

### 66.1.8 Constructor(other as ComplexDoubleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the values from the given one.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(c)

d.Add 1 // modify second object
MsgBox "d: "+d.str+", c: "+c.str
```

See also:

- 66.1.9 Constructor(x as Double = 0.0, y as Double = 0.0) 11737

### 66.1.9 Constructor(x as Double = 0.0, y as Double = 0.0)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the given values.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.Real)+" "+str(c.Imag)
```

See also:

- 66.1.8 Constructor(other as ComplexDoubleMBS) 11737

### 66.1.10 cos as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return cosine of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.cos.str
```

### 66.1.11 cosh as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic cosine of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.cosh.str
```

### 66.1.12 Divide(c as ComplexDoubleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides this complex number by the given complex number.
See also:

- 66.1.13 Divide(x as Double) 11738

### 66.1.13 Divide(x as Double)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides this complex number by the given value.
See also:

- 66.1.12 Divide(c as ComplexDoubleMBS) 11738

### 66.1.14 exp as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return exponential of complex.
**Notes:** dim c as new ComplexDoubleMBS(1,2)
MsgBox c.exp.str

### 66.1.15 log as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return natural logarith of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(10,10)
MsgBox c.log.str
```

### 66.1.16 log10 as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return common logarithm of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(10,0)
MsgBox c.log10.str
```

### 66.1.17 Multiply(c as ComplexDoubleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mulitplies this complex number with the given value.
See also:

- 66.1.18 Multiply(x as Double) 11739

### 66.1.18 Multiply(x as Double)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies this complex number with the given value.
See also:

- 66.1.17 Multiply(c as ComplexDoubleMBS) 11739

### 66.1.19 norm as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return norm of complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.norm)
```

### 66.1.20 Operator_Add(c as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to add two complex numbers.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c+d
MsgBox e.str
```

See also:

- 66.1.21 Operator_Add(x as Double) as ComplexDoubleMBS 11740

### 66.1.21 Operator_Add(x as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to add a value to this complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c+2
MsgBox e.str
```

See also:

- 66.1.20 Operator_Add(c as ComplexDoubleMBS) as ComplexDoubleMBS 11740

### 66.1.22 Operator_Compare(c as ComplexDoubleMBS) as Integer

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two complex numbers.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(1,2)
```

```
if c = d then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

### 66.1.23 Operator_Divide(c as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to divide one complex number by another.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c/d
MsgBox e.str
```

See also:

- 66.1.24 Operator_Divide(x as Double) as ComplexDoubleMBS 11741

### 66.1.24 Operator_Divide(x as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to divide a complex number by the given value.
**Example:**

```
dim c as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c/2
MsgBox e.str
```

See also:

- 66.1.23 Operator_Divide(c as ComplexDoubleMBS) as ComplexDoubleMBS 11741

### 66.1.25 Operator_Multiply(c as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to multiply two complex numbers.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c*d
MsgBox e.str
```

See also:

- 66.1.26 Operator_Multiply(x as Double) as ComplexDoubleMBS 11742

### 66.1.26 Operator_Multiply(x as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to multiply a double to a complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c*2
MsgBox e.str
```

See also:

- 66.1.25 Operator_Multiply(c as ComplexDoubleMBS) as ComplexDoubleMBS 11741

### 66.1.27 Operator_Power(x as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to calculate the power of two complex numbers.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c^d
MsgBox e.str
```

### 66.1.28 Operator_Subtract(c as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to subtract one complex number from another.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c-d
MsgBox e.str
```

See also:

- 66.1.29 Operator_Subtract(x as Double) as ComplexDoubleMBS 11743

### 66.1.29 Operator_Subtract(x as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to subtract the given value from this complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(3,4)
dim e as ComplexDoubleMBS = c-2
MsgBox e.str
```

See also:

- 66.1.28 Operator_Subtract(c as ComplexDoubleMBS) as ComplexDoubleMBS 11742

### 66.1.30 PI as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PI constant.
**Example:**

```
MsgBox str(ComplexDoubleMBS.PI)
```

### 66.1.31 polar(rho as Double, theta as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the given polar coordinate.
**Example:**

```
MsgBox ComplexDoubleMBS.polar(10, 0.5).str
```

### 66.1.32 pow(x as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return complex power.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim d as new ComplexDoubleMBS(2,0)
dim m as ComplexDoubleMBS = c.pow(d)

MsgBox "c: "+c.str+EndOfLine+"d: "+d.str+EndOfLine+"c^d: "+m.str
```

See also:

- 66.1.33 pow(x as Double) as ComplexDoubleMBS 11744
- 66.1.34 pow(x as Double, y as ComplexDoubleMBS) as ComplexDoubleMBS 11744

### 66.1.33 pow(x as Double) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return complex power.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim m as ComplexDoubleMBS = c.pow(2)

MsgBox "c: "+c.str+EndOfLine+"c^2: "+m.str
```

See also:

- 66.1.32 pow(x as ComplexDoubleMBS) as ComplexDoubleMBS 11744
- 66.1.34 pow(x as Double, y as ComplexDoubleMBS) as ComplexDoubleMBS 11744

### 66.1.34 pow(x as Double, y as ComplexDoubleMBS) as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the power of the given values.
**Example:**

```
dim x as new ComplexDoubleMBS(2,3)
dim c as ComplexDoubleMBS = ComplexDoubleMBS.pow(2, x)

MsgBox c.str
```

See also:

- 66.1.32 pow(x as ComplexDoubleMBS) as ComplexDoubleMBS 11744
- 66.1.33 pow(x as Double) as ComplexDoubleMBS 11744

### 66.1.35 sin as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return sine of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.sin.str
```

### 66.1.36 sinh as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic sine of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.sinh.str
```

### 66.1.37 sqrt as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return square root of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
dim r as ComplexDoubleMBS = c.sqrt
```

```
dim m as ComplexDoubleMBS = r*r

MsgBox "number: "+c.str+EndOfLine+"root: "+r.str+EndOfLine+"back: "+m.str
```

### 66.1.38 str as string

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows the number in an human readable format.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.str
```

**Notes:** The actual format can change.

### 66.1.39 Subtract(c as ComplexDoubleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts the given complex number from this complex number.
See also:

- 66.1.40 Subtract(x as Double) 11746

### 66.1.40 Subtract(x as Double)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts the given value from this complex number.
See also:

- 66.1.39 Subtract(c as ComplexDoubleMBS) 11746

### 66.1.41 tan as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return tangent of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.tan.str
```

### 66.1.42 tanh as ComplexDoubleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic tangent of complex.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox c.tanh.str
```

### 66.1.43 Properties

### 66.1.44 Imag as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the imaginary part of the complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.Imag)
```

**Notes:** (Read and Write property)

### 66.1.45 Real as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the real part of the complex number.
**Example:**

```
dim c as new ComplexDoubleMBS(1,2)
MsgBox str(c.Real)
```

**Notes:** (Read and Write property)

## 66.2 class ComplexSingleMBS

### 66.2.1 class ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for complex numbers.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(4,7)

dim sum as ComplexSingleMBS = c+d

MsgBox sum.str
```

**Blog Entries**

- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

### 66.2.2 Methods

### 66.2.3 abs as single

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The absolute value of the complex number.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.abs)
```

### 66.2.4 Add(c as ComplexSingleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the given value to this complex number.
See also:

- 66.2.5 Add(x as single)

### 66.2.5 Add(x as single)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the given value to this complex number.
See also:

- 66.2.4 Add(c as ComplexSingleMBS) 11748

### 66.2.6 arg as single

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return phase angle of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.arg)
```

### 66.2.7 conj as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns complex conjugate.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim e as ComplexSingleMBS = c.conj
MsgBox e.str
```

### 66.2.8 Constructor(other as ComplexSingleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the values from the given one.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(c)

d.Add 1 // modify second object
MsgBox "d: "+d.str+", c: "+c.str
```

See also:

- 66.2.9 Constructor(x as single = 0.0, y as single = 0.0) 11750

### 66.2.9 Constructor(x as single = 0.0, y as single = 0.0)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the given values.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.Real)+" "+str(c.Imag)
```

See also:

- 66.2.8 Constructor(other as ComplexSingleMBS) 11749

### 66.2.10 cos as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return cosine of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.cos.str
```

### 66.2.11 cosh as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic cosine of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.cosh.str
```

### 66.2.12 Divide(c as ComplexSingleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides this complex number by the given complex number.
See also:


- 66.2.13 Divide(x as single) 11751


### 66.2.13 Divide(x as single)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides this complex number by the given value.
See also:


- 66.2.12 Divide(c as ComplexSingleMBS) 11750


### 66.2.14 exp as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return exponential of complex.
**Notes:** dim c as new ComplexSingleMBS(1,2)
MsgBox c.exp.str

### 66.2.15 log as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return natural logarith of complex.
**Example:**

```
dim c as new ComplexSingleMBS(10,10)
MsgBox c.log.str
```

### 66.2.16 log10 as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return common logarithm of complex.
**Example:**

```
dim c as new ComplexSingleMBS(10,0)
MsgBox c.log10.str
```

### 66.2.17 Multiply(c as ComplexSingleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mulitplies this complex number with the given value.
See also:

- 66.2.18 Multiply(x as single) 11752

### 66.2.18 Multiply(x as single)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies this complex number with the given value.
See also:

- 66.2.17 Multiply(c as ComplexSingleMBS) 11752

### 66.2.19 norm as single

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return norm of complex number.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.norm)
```

### 66.2.20 Operator_Add(c as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to add two complex numbers.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c+d
MsgBox e.str
```

See also:

- 66.2.21 Operator_Add(x as single) as ComplexSingleMBS 11753

### 66.2.21 Operator_Add(x as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to add a value to this complex number.
**Example:**

```
dim c as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c+2
MsgBox e.str
```

See also:

- 66.2.20 Operator_Add(c as ComplexSingleMBS) as ComplexSingleMBS 11752

### 66.2.22 Operator_Compare(c as ComplexSingleMBS) as Integer

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two complex numbers.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(1,2)

if c = d then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

### 66.2.23 Operator_Divide(c as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to divide one complex number by another.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c/d
MsgBox e.str
```

See also:

- 66.2.24 Operator_Divide(x as single) as ComplexSingleMBS 11754

### 66.2.24 Operator_Divide(x as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to divide a complex number by the given value.
**Example:**

```
dim c as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c/2
MsgBox e.str
```

See also:

- 66.2.23 Operator_Divide(c as ComplexSingleMBS) as ComplexSingleMBS 11753

### 66.2.25 Operator_Multiply(c as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to multiply two complex numbers.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c*d
MsgBox e.str
```

See also:

- 66.2.26 Operator_Multiply(x as single) as ComplexSingleMBS 11754

### 66.2.26 Operator_Multiply(x as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to multiply a single to a complex number.
**Example:**

```
dim c as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c*2
```

MsgBox e.str

See also:

- 66.2.25 Operator_Multiply(c as ComplexSingleMBS) as ComplexSingleMBS 11754

### 66.2.27 Operator_Power(x as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to calculate the power of two complex numbers.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c^d
MsgBox e.str
```

### 66.2.28 Operator_Subtract(c as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to subtract one complex number from another.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c-d
MsgBox e.str
```

See also:

- 66.2.29 Operator_Subtract(x as single) as ComplexSingleMBS 11755

### 66.2.29 Operator_Subtract(x as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This method is called by Xojo in order to subtract the given value from this complex number.
**Example:**

```
dim c as new ComplexSingleMBS(3,4)
dim e as ComplexSingleMBS = c-2
MsgBox e.str
```

See also:

- 66.2.28 Operator_Subtract(c as ComplexSingleMBS) as ComplexSingleMBS 11755

### 66.2.30 PI as Double

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PI constant.
**Example:**

```
MsgBox str(ComplexSingleMBS.PI)
```

### 66.2.31 polar(rho as single, theta as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new complex number with the given polar coordinate.
**Example:**

```
MsgBox ComplexSingleMBS.polar(10, 0.5).str
```

### 66.2.32 pow(x as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return complex power.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim d as new ComplexSingleMBS(2,0)
dim m as ComplexSingleMBS = c.pow(d)

MsgBox "c: "+c.str+EndOfLine+"d: "+d.str+EndOfLine+"c^d: "+m.str
```

See also:

- 66.2.33 pow(x as single) as ComplexSingleMBS 11757
- 66.2.34 pow(x as single, y as ComplexSingleMBS) as ComplexSingleMBS 11757


### 66.2.33 pow(x as single) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return complex power.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim m as ComplexSingleMBS = c.pow(2)

MsgBox "c: "+c.str+EndOfLine+"c^2: "+m.str
```

See also:


- 66.2.32 pow(x as ComplexSingleMBS) as ComplexSingleMBS 11756
- 66.2.34 pow(x as single, y as ComplexSingleMBS) as ComplexSingleMBS 11757


### 66.2.34 pow(x as single, y as ComplexSingleMBS) as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the power of the given values.
**Example:**

```
dim x as new ComplexSingleMBS(2,3)
dim c as ComplexSingleMBS = ComplexSingleMBS.pow(2, x)

MsgBox c.str
```

See also:


- 66.2.32 pow(x as ComplexSingleMBS) as ComplexSingleMBS 11756
- 66.2.33 pow(x as single) as ComplexSingleMBS 11757


### 66.2.35 sin as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return sine of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.sin.str
```

### 66.2.36 sinh as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic sine of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.sinh.str
```

### 66.2.37 sqrt as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return square root of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
dim r as ComplexSingleMBS = c.sqrt
dim m as ComplexSingleMBS = r*r

MsgBox "number: "+c.str+EndOfLine+"root: "+r.str+EndOfLine+"back: "+m.str
```

### 66.2.38 str as string

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows the number in an human readable format.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.str
```

**Notes:** The actual format can change.

### 66.2.39 Subtract(c as ComplexSingleMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts the given complex number from this complex number.
See also:

- 66.2.40 Subtract(x as single) 11759

### 66.2.40 Subtract(x as single)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts the given value from this complex number.
See also:

- 66.2.39 Subtract(c as ComplexSingleMBS) 11759

### 66.2.41 tan as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return tangent of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.tan.str
```

### 66.2.42 tanh as ComplexSingleMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return hyperbolic tangent of complex.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox c.tanh.str
```

### 66.2.43 Properties

### 66.2.44 Imag as single

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the imaginary part of the complex number.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.Imag)
```

**Notes:** (Read and Write property)

### 66.2.45 Real as single

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the real part of the complex number.
**Example:**

```
dim c as new ComplexSingleMBS(1,2)
MsgBox str(c.Real)
```

**Notes:** (Read and Write property)

## 66.3 Globals

### 66.3.1 FFTDoubleAbsMBS(x as MemoryBlock, N as Integer = -1) as Double()

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** Memoryblock contains DoubleValue values (8 byte each).
If N is not provided, the plugin chooses a value.
See also:

- 66.3.2 FFTDoubleAbsMBS(x() as ComplexDoubleMBS, N as Integer = -1) as Double() 11761
- 66.3.3 FFTDoubleAbsMBS(x() as Double, N as Integer = -1) as Double() 11761

### 66.3.2 FFTDoubleAbsMBS(x() as ComplexDoubleMBS, N as Integer = -1) as Double()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** If N is not provided, the plugin chooses a value.
See also:

- 66.3.1 FFTDoubleAbsMBS(x as MemoryBlock, N as Integer = -1) as Double() 11761
- 66.3.3 FFTDoubleAbsMBS(x() as Double, N as Integer = -1) as Double() 11761

### 66.3.3 FFTDoubleAbsMBS(x() as Double, N as Integer = -1) as Double()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** If N is not provided, the plugin chooses a value.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

See also:

- 66.3.1 FFTDoubleAbsMBS(x as MemoryBlock, N as Integer = -1) as Double() 11761
- 66.3.2 FFTDoubleAbsMBS(x() as ComplexDoubleMBS, N as Integer = -1) as Double() 11761

### 66.3.4 FFTDoubleMBS(x() as ComplexDoubleMBS, N as Integer = -1) as ComplexDoubleMBS()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation.
**Notes:** If N is not provided, the plugin chooses a value.
See also:

- 66.3.5 FFTDoubleMBS(x() as Double, N as Integer = -1) as ComplexDoubleMBS() 11762

### 66.3.5 FFTDoubleMBS(x() as Double, N as Integer = -1) as ComplexDoubleMBS()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation.
**Notes:** If N is not provided, the plugin chooses a value.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

See also:

- 66.3.4 FFTDoubleMBS(x() as ComplexDoubleMBS, N as Integer = -1) as ComplexDoubleMBS() 11762

### 66.3.6 FFTSingleAbsMBS(x as MemoryBlock, N as Integer = -1) as single()

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** Memoryblock contains SingleValue values (4 byte each).
If N is not provided, the plugin chooses a value.
See also:

- 66.3.7 FFTSingleAbsMBS(x() as ComplexSingleMBS, N as Integer = -1) as single() 11763
- 66.3.8 FFTSingleAbsMBS(x() as single, N as Integer = -1) as single() 11763

### 66.3.7 FFTSingleAbsMBS(x() as ComplexSingleMBS, N as Integer = -1) as single()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** If N is not provided, the plugin chooses a value.
See also:

- 66.3.6 FFTSingleAbsMBS(x as MemoryBlock, N as Integer = -1) as single() 11762
- 66.3.8 FFTSingleAbsMBS(x() as single, N as Integer = -1) as single() 11763

### 66.3.8 FFTSingleAbsMBS(x() as single, N as Integer = -1) as single()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation and applies abs operation on result.
**Notes:** If N is not provided, the plugin chooses a value.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

See also:

- 66.3.6 FFTSingleAbsMBS(x as MemoryBlock, N as Integer = -1) as single() 11762
- 66.3.7 FFTSingleAbsMBS(x() as ComplexSingleMBS, N as Integer = -1) as single() 11763

### 66.3.9 FFTSingleMBS(x() as ComplexSingleMBS, N as Integer = -1) as ComplexSingleMBS()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation.
See also:

- 66.3.10 FFTSingleMBS(x() as single, N as Integer = -1) as ComplexSingleMBS() 11764

### 66.3.10 FFTSingleMBS(x() as single, N as Integer = -1) as ComplexSingleMBS()

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Performs a Fast Fourier Transformation.
**Notes:** If N is not provided, the plugin chooses a value.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

See also:

- 66.3.9 FFTSingleMBS(x() as ComplexSingleMBS, N as Integer = -1) as ComplexSingleMBS() 11763

## 66.4 class IntegerHashSetIteratorMBS

### 66.4.1 class IntegerHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerHashSet class.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.4.2 Methods

### 66.4.3 isEqual(other as IntegerHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.4.4 isNotEqual(other as IntegerHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
```

```
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.4.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.4.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

## 66.5 class IntegerHashSetMBS

### 66.5.1 class IntegerHashSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash set with integers.
**Example:**

```
dim s as new IntegerHashSetMBS

s.insert 1
s.insert 2

MsgBox str(s.Count) // shows 2
```

**Notes:** You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

### 66.5.2 Methods

### 66.5.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.5.4 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:

- 66.5.5 Constructor(Keys() as Integer) 11767

### 66.5.5 Constructor(Keys() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.

See also:

- 66.5.4 Constructor 11767

### 66.5.6 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.5.7 find(key as Integer) as IntegerHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.5.8 first as IntegerHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.5.9 insert(key as Integer)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.5.10 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.5.11 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerHashSetMBS

m.insert(1)
m.insert(2)

for each v as Integer in m.Keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.5.12 last as IntegerHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new IntegerHashSetMBS
```

```
m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerHashSetIteratorMBS = m.first
dim e as IntegerHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.5.13 lookup(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new IntegerHashSetMBS

set.insert 1
set.insert 2

MsgBox str(set.lookup(3)) // shows false as value is missing
MsgBox str(set.lookup(1)) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.5.14 Remove(first as IntegerHashSetIteratorMBS, last as IntegerHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.5.15 Remove(key as Integer) as Integer 11771
- 66.5.16 Remove(pos as IntegerHashSetIteratorMBS) 11771

### 66.5.15 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.5.14 Remove(first as IntegerHashSetIteratorMBS, last as IntegerHashSetIteratorMBS) 11770
- 66.5.16 Remove(pos as IntegerHashSetIteratorMBS) 11771

### 66.5.16 Remove(pos as IntegerHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.5.14 Remove(first as IntegerHashSetIteratorMBS, last as IntegerHashSetIteratorMBS) 11770
- 66.5.15 Remove(key as Integer) as Integer 11771

### 66.5.17 Properties

### 66.5.18 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new IntegerHashSetMBS

v.insert 1
v.insert 5

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains.
(Read only property)

### 66.5.19 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new IntegerHashSetMBS

set.insert 1
set.insert 2

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.5.20 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.5.21 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

## 66.6 class IntegerOrderedSetIteratorMBS

### 66.6.1 class IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerOrderedSet class.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.6.2 Methods

### 66.6.3 isEqual(other as IntegerOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.6.4 isNotEqual(other as IntegerOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.6.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.6.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.6.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

## 66.7 class IntegerOrderedSetMBS

### 66.7.1 class IntegerOrderedSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered set with integers.
**Example:**

```
dim s as new IntegerOrderedSetMBS

s.insert 1
s.insert 2

MsgBox str(s.Count) // shows 2
```

**Notes:** You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

### 66.7.2 Methods

### 66.7.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.7.4 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:

- 66.7.5 Constructor(Keys() as Integer) 11776

### 66.7.5 Constructor(Keys() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.

See also:

- 66.7.4 Constructor 11776

### 66.7.6 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.7.7 find(key as Integer) as IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.7.8 first as IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.7.9 insert(key as Integer)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.7.10 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.7.11 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerOrderedSetMBS

m.insert(1)
m.insert(2)

for each v as Integer in m.Keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.7.12 last as IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new IntegerOrderedSetMBS
```

```
m.insert(1)
m.insert(2)
m.insert(3)

// get iterators pointing to first and after last element
dim i as IntegerOrderedSetIteratorMBS = m.first
dim e as IntegerOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)
i.MoveNext
wend
```

### 66.7.13 lookup(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new IntegerOrderedSetMBS

set.insert 1
set.insert 2

MsgBox str(set.lookup(3)) // shows false as value is missing
MsgBox str(set.lookup(1)) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.7.14 LowerBound(key as Integer) as IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.7.15 Remove(first as IntegerOrderedSetIteratorMBS, last as IntegerOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.7.16 Remove(key as Integer) as Integer 11780
- 66.7.17 Remove(pos as IntegerOrderedSetIteratorMBS) 11780

### 66.7.16 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.7.15 Remove(first as IntegerOrderedSetIteratorMBS, last as IntegerOrderedSetIteratorMBS) 11780
- 66.7.17 Remove(pos as IntegerOrderedSetIteratorMBS) 11780

### 66.7.17 Remove(pos as IntegerOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.7.15 Remove(first as IntegerOrderedSetIteratorMBS, last as IntegerOrderedSetIteratorMBS) 11780
- 66.7.16 Remove(key as Integer) as Integer 11780

### 66.7.18 UpperBound(key as Integer) as IntegerOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.7.19 Properties

### 66.7.20 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new IntegerOrderedSetMBS

set.insert 1
set.insert 2

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.7.21 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.7.22 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

## 66.8 class IntegerToIntegerHashMapIteratorMBS

### 66.8.1 class IntegerToIntegerHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToIntegerHashMap class.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.8.2 Methods

### 66.8.3 isEqual(other as IntegerToIntegerHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.8.4 isNotEqual(other as IntegerToIntegerHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.8.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.8.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.8.7 Properties

### 66.8.8 Value as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.9 class IntegerToIntegerHashMapMBS

### 66.9.1 class IntegerToIntegerHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash map with integers as keys and values.
**Example:**

```
dim s as new IntegerToIntegerHashMapMBS

s.Value(1)=3
s.Value(2)=4

MsgBox str(s.Count) // shows 2

MsgBox str(s.Value(1)+s.Value(2)) // shows 7
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.9.2 Methods

### 66.9.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.9.4 AddValues(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.9.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.9.6 Clone as IntegerToIntegerHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.9.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.9.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:


- 66.9.9 Constructor(dic as dictionary) 11786
- 66.9.10 Constructor(other as IntegerToIntegerHashMapMBS) 11787


### 66.9.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:


- 66.9.8 Constructor 11786
- 66.9.10 Constructor(other as IntegerToIntegerHashMapMBS) 11787

### 66.9.10 Constructor(other as IntegerToIntegerHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:

- 66.9.8 Constructor 11786
- 66.9.9 Constructor(dic as dictionary) 11786

### 66.9.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.9.12 find(key as Integer) as IntegerToIntegerHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.9.13 first as IntegerToIntegerHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
```

```
i.MoveNext
wend
```

### 66.9.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.9.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.9.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToIntegerHashMapMBS

m.Value(1)=5
m.Value(2)=7

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.9.17 last as IntegerToIntegerHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerHashMapIteratorMBS = m.first
dim e as IntegerToIntegerHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.9.18 lookup(key as Integer, defaultvalue as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToIntegerHashMapMBS

map.value(10)=1
map.value(100)=2
map.value(1000)=3

MsgBox str(map.lookup(5,0)) // shows 0 as value is missing
MsgBox str(map.lookup(10,0)) // shows 1 as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.9.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.9.20 Remove(first as IntegerToIntegerHashMapIteratorMBS, last as IntegerToIntegerHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.9.21 Remove(key as Integer) as Integer 11790
- 66.9.22 Remove(pos as IntegerToIntegerHashMapIteratorMBS) 11790


### 66.9.21 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.9.20 Remove(first as IntegerToIntegerHashMapIteratorMBS, last as IntegerToIntegerHashMapIteratorMBS) 11790
- 66.9.22 Remove(pos as IntegerToIntegerHashMapIteratorMBS) 11790


### 66.9.22 Remove(pos as IntegerToIntegerHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.9.20 Remove(first as IntegerToIntegerHashMapIteratorMBS, last as IntegerToIntegerHashMapIteratorMBS) 11790
- 66.9.21 Remove(key as Integer) as Integer 11790


### 66.9.23 ValueAtIndex(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.9.24 Values as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new IntegerToIntegerHashMapMBS

m.Value(1)=5
m.Value(2)=7

for each v as Integer in m.Values
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.9.25 Properties

### 66.9.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new IntegerToIntegerHashMapMBS

v.value(1)=10
v.value(2)=20

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.9.27 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToIntegerHashMapMBS

map.Value(1)=3
map.Value(2)=4

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.9.28 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.9.29 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.9.30 value(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.10 class IntegerToIntegerOrderedMapIteratorMBS

### 66.10.1 class IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToIntegerOrderedMap class.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.10.2 Methods

### 66.10.3 isEqual(other as IntegerToIntegerOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.10.4 isNotEqual(other as IntegerToIntegerOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.10.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.10.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.10.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.10.8 Properties

### 66.10.9 Value as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.11 class IntegerToIntegerOrderedMapMBS

### 66.11.1 class IntegerToIntegerOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map for integers for keys and values.
**Example:**

```
dim s as new IntegerToIntegerHashMapMBS

s.Value(1)=3
s.Value(2)=4

MsgBox str(s.Count) // shows 2

MsgBox str(s.Value(1)+s.Value(2)) // shows 7
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.11.2 Methods

### 66.11.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.11.4 AddValues(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.11.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.11.6 Clone as IntegerToIntegerOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.11.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.11.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:

- 66.11.9 Constructor(dic as dictionary) 11797
- 66.11.10 Constructor(other as IntegerToIntegerOrderedMapMBS) 11798

### 66.11.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.11.8 Constructor 11797
- 66.11.10 Constructor(other as IntegerToIntegerOrderedMapMBS) 11798

### 66.11.10 Constructor(other as IntegerToIntegerOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.11.8 Constructor 11797
- 66.11.9 Constructor(dic as dictionary) 11797


### 66.11.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.11.12 find(key as Integer) as IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.11.13 first as IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
```

```
i.MoveNext
wend
```

### 66.11.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.11.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.11.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToIntegerOrderedMapMBS

m.Value(1)=5
m.Value(2)=7

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.11.17 last as IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToIntegerOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToIntegerOrderedMapIteratorMBS = m.first
dim e as IntegerToIntegerOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.11.18 lookup(key as Integer, defaultvalue as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToIntegerOrderedMapMBS

map.value(10)=1
map.value(100)=2
map.value(1000)=3

MsgBox str(map.lookup(5,0)) // shows 0 as value is missing
MsgBox str(map.lookup(10,0)) // shows 1 as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.11.19 LowerBound(key as Integer) as IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.11.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.11.21 Remove(first as IntegerToIntegerOrderedMapIteratorMBS, last as IntegerToIntegerOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.11.22 Remove(key as Integer) as Integer 11801
- 66.11.23 Remove(pos as IntegerToIntegerOrderedMapIteratorMBS) 11801

### 66.11.22 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.11.21 Remove(first as IntegerToIntegerOrderedMapIteratorMBS, last as IntegerToIntegerOrderedMapIteratorMBS) 11801
- 66.11.23 Remove(pos as IntegerToIntegerOrderedMapIteratorMBS) 11801

### 66.11.23 Remove(pos as IntegerToIntegerOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.11.21 Remove(first as IntegerToIntegerOrderedMapIteratorMBS, last as IntegerToIntegerOrderedMapIteratorMBS) 11801
- 66.11.22 Remove(key as Integer) as Integer 11801

### 66.11.24 UpperBound(key as Integer) as IntegerToIntegerOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.11.25 ValueAtIndex(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.11.26 Values as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new IntegerToIntegerOrderedMapMBS

m.Value(1)=5
m.Value(2)=7

for each v as Integer in m.Values
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.11.27 Properties

### 66.11.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToIntegerOrderedMapMBS

map.Value(1)=3
map.Value(2)=4

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.11.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.11.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.11.31 value(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.12 class IntegerToStringHashMapIteratorMBS

### 66.12.1 class IntegerToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToStringHashMap class.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.12.2 Methods

### 66.12.3 isEqual(other as IntegerToStringHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.12.4 isNotEqual(other as IntegerToStringHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.12.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.12.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.12.7 Properties

### 66.12.8 Value as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.13 class IntegerToStringHashMapMBS

### 66.13.1 class IntegerToStringHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash map with integers as keys and strings as values.
**Example:**

```
dim s as new IntegerToStringHashMapMBS

s.Value(1)="Hello"
s.Value(2)="World"

MsgBox str(s.Count) // shows 2

MsgBox s.Value(1)+" "+s.Value(2) // shows "Hello World"
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.13.2 Methods

### 66.13.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.13.4 AddValues(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.13.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.13.6 Clone as IntegerToStringHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.13.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.13.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:


- 66.13.9 Constructor(dic as dictionary) 11808
- 66.13.10 Constructor(other as IntegerToStringHashMapMBS) 11809


### 66.13.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:


- 66.13.8 Constructor 11808
- 66.13.10 Constructor(other as IntegerToStringHashMapMBS) 11809

### 66.13.10 Constructor(other as IntegerToStringHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.13.8 Constructor 11808
- 66.13.9 Constructor(dic as dictionary) 11808


### 66.13.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.13.12 find(key as Integer) as IntegerToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.13.13 first as IntegerToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.13.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.13.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.13.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToStringHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.13.17 last as IntegerToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToStringHashMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringHashMapIteratorMBS = m.first
dim e as IntegerToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.13.18 lookup(key as Integer, defaultvalue as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToStringOrderedMapMBS

map.value(10)="Hello"
map.value(100)="World"
map.value(1000)="!"

MsgBox str(map.lookup(5,"?")) // shows "?" as value is missing
MsgBox str(map.lookup(10,"?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.13.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.13.20 Remove(first as IntegerToStringHashMapIteratorMBS, last as IntegerToStringHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.13.21 Remove(key as Integer) as Integer 11812
- 66.13.22 Remove(pos as IntegerToStringHashMapIteratorMBS) 11812


### 66.13.21 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.13.20 Remove(first as IntegerToStringHashMapIteratorMBS, last as IntegerToStringHashMapIteratorMBS) 11812
- 66.13.22 Remove(pos as IntegerToStringHashMapIteratorMBS) 11812


### 66.13.22 Remove(pos as IntegerToStringHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.13.20 Remove(first as IntegerToStringHashMapIteratorMBS, last as IntegerToStringHashMapIteratorMBS) 11812
- 66.13.21 Remove(key as Integer) as Integer 11812


### 66.13.23 ValueAtIndex(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.13.24 Values as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new IntegerToStringHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as string in m.Values
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.13.25 Properties

### 66.13.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new IntegerToStringHashMapMBS

v.value(1)="Hello"
v.value(2)="World"

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.13.27 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToStringHashMapMBS

map.Value(1)="Hello"
map.Value(2)="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.13.28 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.13.29 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.13.30 value(key as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.14 class IntegerToStringOrderedMapIteratorMBS

### 66.14.1 class IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToStringOrderedMap class.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.14.2 Methods

### 66.14.3 isEqual(other as IntegerToStringOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.14.4 isNotEqual(other as IntegerToStringOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.14.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.14.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.14.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.14.8 Properties

### 66.14.9 Value as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.15 class IntegerToStringOrderedMapMBS

### 66.15.1 class IntegerToStringOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map with integer keys and string values.
**Example:**

```
dim s as new IntegerToStringOrderedMapMBS

s.Value(1)="Hello"
s.Value(2)="World"

MsgBox str(s.Count) // shows 2

MsgBox s.Value(1)+" "+s.Value(2) // shows "Hello World"
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.15.2 Methods

### 66.15.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.15.4 AddValues(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.15.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.15.6 Clone as IntegerToStringOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.15.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.15.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:

- 66.15.9 Constructor(dic as dictionary) 11819
- 66.15.10 Constructor(other as IntegerToStringOrderedMapMBS) 11820

### 66.15.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.15.8 Constructor 11819
- 66.15.10 Constructor(other as IntegerToStringOrderedMapMBS) 11820

### 66.15.10 Constructor(other as IntegerToStringOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.15.8 Constructor 11819
- 66.15.9 Constructor(dic as dictionary) 11819


### 66.15.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.15.12 find(key as Integer) as IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.15.13 first as IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.15.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.15.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.15.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToStringOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.15.17 last as IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToStringOrderedMapMBS

m.value(1)="Hello"
m.value(2)="World"
m.value(3)="!"

// get iterators pointing to first and after last element
dim i as IntegerToStringOrderedMapIteratorMBS = m.first
dim e as IntegerToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.15.18 lookup(key as Integer, defaultvalue as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToStringOrderedMapMBS

map.value(10)="Hello"
map.value(100)="World"
map.value(1000)="!"

MsgBox str(map.lookup(5,"?")) // shows "?" as value is missing
MsgBox str(map.lookup(10,"?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.15.19 LowerBound(key as Integer) as IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.15.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.15.21 Remove(first as IntegerToStringOrderedMapIteratorMBS, last as IntegerToStringOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.15.22 Remove(key as Integer) as Integer 11823
- 66.15.23 Remove(pos as IntegerToStringOrderedMapIteratorMBS) 11823

### 66.15.22 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.15.21 Remove(first as IntegerToStringOrderedMapIteratorMBS, last as IntegerToStringOrderedMapIteratorMBS) 11823
- 66.15.23 Remove(pos as IntegerToStringOrderedMapIteratorMBS) 11823

### 66.15.23 Remove(pos as IntegerToStringOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.15.21 Remove(first as IntegerToStringOrderedMapIteratorMBS, last as IntegerToStringOrderedMapIteratorMBS) 11823
- 66.15.22 Remove(key as Integer) as Integer 11823

### 66.15.24 UpperBound(key as Integer) as IntegerToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.15.25 ValueAtIndex(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.15.26 Values as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new IntegerToStringOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as string in m.Values
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.15.27 Properties

### 66.15.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToStringOrderedMapMBS

map.Value(1)="Hello"
map.Value(2)="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.15.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.15.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.15.31 value(key as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.16 class IntegerToVariantHashMapIteratorMBS

### 66.16.1 class IntegerToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToVariantHashMap class.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.16.2 Methods

### 66.16.3 isEqual(other as IntegerToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.16.4 isNotEqual(other as IntegerToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.16.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.16.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.16.7 Properties

### 66.16.8 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.17 class IntegerToVariantHashMapMBS

### 66.17.1 class IntegerToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash map with integers as keys and variants as values.
**Example:**

```
dim s as new IntegerToVariantHashMapMBS

s.Value(1)="Hello"
s.Value(2)="World"

MsgBox str(s.Count) // shows 2

MsgBox s.Value(1)+" "+s.Value(2) // shows "Hello World"
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.17.2 Methods

### 66.17.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.17.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.17.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.17.6 Clone as IntegerToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.17.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.17.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:


- 66.17.9 Constructor(dic as dictionary) 11830
- 66.17.10 Constructor(other as IntegerToVariantHashMapMBS) 11831


### 66.17.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:


- 66.17.8 Constructor 11830
- 66.17.10 Constructor(other as IntegerToVariantHashMapMBS) 11831

### 66.17.10 Constructor(other as IntegerToVariantHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:

- 66.17.8 Constructor 11830
- 66.17.9 Constructor(dic as dictionary) 11830

### 66.17.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.17.12 find(key as Integer) as IntegerToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.17.13 first as IntegerToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.17.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.17.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.17.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToVariantHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.17.17 last as IntegerToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantHashMapIteratorMBS = m.first
dim e as IntegerToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.17.18 lookup(key as Integer, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToVariantHashMapMBS

map.value(10)=1
map.value(100)=2
map.value(1000)=3

MsgBox str(map.lookup(5,0)) // shows 0 as value is missing
MsgBox str(map.lookup(10,0)) // shows 1 as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.17.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.17.20 Remove(first as IntegerToVariantHashMapIteratorMBS, last as IntegerToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.17.21 Remove(key as Integer) as Integer 11834
- 66.17.22 Remove(pos as IntegerToVariantHashMapIteratorMBS) 11834


### 66.17.21 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.17.20 Remove(first as IntegerToVariantHashMapIteratorMBS, last as IntegerToVariantHashMapIteratorMBS) 11834
- 66.17.22 Remove(pos as IntegerToVariantHashMapIteratorMBS) 11834


### 66.17.22 Remove(pos as IntegerToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.17.20 Remove(first as IntegerToVariantHashMapIteratorMBS, last as IntegerToVariantHashMapIteratorMBS) 11834
- 66.17.21 Remove(key as Integer) as Integer 11834


### 66.17.23 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.17.24 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
// Create a map
dim m as new IntegerToVariantHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.17.25 Properties

### 66.17.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new IntegerToVariantHashMapMBS

v.value(1)="Hello"
v.value(2)="World"

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.17.27 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToVariantHashMapMBS

map.Value(1)=3
map.Value(2)=4

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.17.28 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.17.29 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.17.30 value(key as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.18 class IntegerToVariantOrderedMapIteratorMBS

### 66.18.1 class IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the IntegerToVariantOrderedMap class.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.18.2 Methods

### 66.18.3 isEqual(other as IntegerToVariantOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.18.4 isNotEqual(other as IntegerToVariantOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.18.5 Key as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.18.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.18.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.18.8 Properties

### 66.18.9 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.19 class IntegerToVariantOrderedMapMBS

### 66.19.1 class IntegerToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map with integers as keys and variants as values.
**Example:**

```
dim s as new IntegerToVariantOrderedMapMBS

s.Value(1)="Hello"
s.Value(2)="World"

MsgBox str(s.Count) // shows 2

MsgBox s.Value(1)+" "+s.Value(2) // shows "Hello World"
```

**Notes:** You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.

### 66.19.2 Methods

### 66.19.3 AddKeys(targetArray() as Integer)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.19.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.19.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.19.6 Clone as IntegerToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.19.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.19.8 Constructor

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
See also:

- 66.19.9 Constructor(dic as dictionary) 11841
- 66.19.10 Constructor(other as IntegerToVariantOrderedMapMBS) 11842

### 66.19.9 Constructor(dic as dictionary)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.19.8 Constructor 11841
- 66.19.10 Constructor(other as IntegerToVariantOrderedMapMBS) 11842

### 66.19.10 Constructor(other as IntegerToVariantOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:

- 66.19.8 Constructor 11841
- 66.19.9 Constructor(dic as dictionary) 11841

### 66.19.11 CountKey(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.19.12 find(key as Integer) as IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.19.13 first as IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.19.14 hasKey(key as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.19.15 Key(index as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.19.16 Keys as Integer()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new IntegerToVariantOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Integer in m.keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.19.17 last as IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as IntegerToVariantOrderedMapIteratorMBS = m.first
dim e as IntegerToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.19.18 lookup(key as Integer, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new IntegerToVariantOrderedMapMBS

map.value(10)=1
map.value(100)=2
map.value(1000)=3

MsgBox str(map.lookup(5,0)) // shows 0 as value is missing
MsgBox str(map.lookup(10,0)) // shows 1 as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.19.19 LowerBound(key as Integer) as IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.19.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.19.21 Remove(first as IntegerToVariantOrderedMapIteratorMBS, last as IntegerToVariantOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.19.22 Remove(key as Integer) as Integer 11845
- 66.19.23 Remove(pos as IntegerToVariantOrderedMapIteratorMBS) 11845

### 66.19.22 Remove(key as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.19.21 Remove(first as IntegerToVariantOrderedMapIteratorMBS, last as IntegerToVariantOrderedMapIteratorMBS) 11845
- 66.19.23 Remove(pos as IntegerToVariantOrderedMapIteratorMBS) 11845

### 66.19.23 Remove(pos as IntegerToVariantOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.19.21 Remove(first as IntegerToVariantOrderedMapIteratorMBS, last as IntegerToVariantOrderedMapIteratorMBS) 11845
- 66.19.22 Remove(key as Integer) as Integer 11845

### 66.19.24 UpperBound(key as Integer) as IntegerToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.19.25 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.19.26 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
// Create a map
dim m as new IntegerToVariantOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.19.27 Properties

### 66.19.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new IntegerToVariantOrderedMapMBS

map.Value(1)=3
map.Value(2)=4

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.19.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.19.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.19.31 value(key as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.20 class StackDoubleMBS

### 66.20.1 class StackDoubleMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of doubles.
**Example:**

```
dim s as new StackDoubleMBS
call s.Push 5
MsgBox str(s.Top)
```

### 66.20.2 Methods

### 66.20.3 Bottom as Double

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackDoubleMBS
call s.Push 5
MsgBox str(s.Bottom)
```

### 66.20.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackDoubleMBS

call s.Push 5

s.Clear

if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.20.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.20.6 Contains(o as Double) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the items on the stack is equal to the given double value.
**Example:**

```
dim s as new StackDoubleMBS

call s.Push 5

if s.Contains(5) then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.20.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackDoubleMBS

MsgBox str(s.Deep)

call s.Push 5

MsgBox str(s.Deep)
```

### 66.20.8 Pop as Double

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackDoubleMBS
call s.Push 5
MsgBox str(s.pop)
```

**Notes:** Returns 0 on any error.

### 66.20.9 PopBottom as Double

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackDoubleMBS
call s.Push 5
MsgBox str(s.PopBottom)
```

### 66.20.10 Push(o as Double) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackDoubleMBS

call s.Push 5
```

**Notes:** Returns true if successfull.
May fail on low memory.

### 66.20.11 Top as Double

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackDoubleMBS
call s.Push 5
MsgBox str(s.Top)
```

**Notes:** Returns 0 on any error.

### 66.20.12 Properties

### 66.20.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackDoubleMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push 5

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.21 class StackIntegerMBS

### 66.21.1 class StackIntegerMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of integers.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

MsgBox str(S.Top)
```

### 66.21.2 Methods

### 66.21.3 Bottom as Integer

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

MsgBox str(s.Bottom)
```

### 66.21.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

s.Clear
```

```
if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.21.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.21.6 Contains(o as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the items on the stack is equal to the given integer value.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

if s.Contains(5) then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.21.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackIntegerMBS

MsgBox str(s.Deep)

call s.Push 5
```

```
MsgBox str(s.Deep)
```

### 66.21.8 Pop as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

MsgBox str(s.pop)
```

**Notes:** Returns 0 on any error.

### 66.21.9 PopBottom as Integer

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

MsgBox str(s.PopBottom)
```

### 66.21.10 Push(o as Integer) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackIntegerMBS
call s.Push 5
```

**Notes:** Returns true if successfull.
May fail on low memory.

### 66.21.11 Top as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackIntegerMBS

call s.Push 5

MsgBox str(S.Top)
```

**Notes:** Returns 0 on any error.

### 66.21.12 Properties

### 66.21.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackIntegerMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push 5

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.22 class StackObjectMBS

### 66.22.1 class StackObjectMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of objects.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
MsgBox window(s.top).title
```

### 66.22.2 Methods

### 66.22.3 Bottom as object

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
MsgBox window(s.Bottom).title
```

### 66.22.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackObjectMBS

call s.Push window1

s.Clear

if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.22.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.22.6 Contains(o as object) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the object references on the stack is equal to the given object reference.
**Example:**

```
dim s as new StackObjectMBS

call s.Push window1

if s.Contains(window1) then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.22.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackObjectMBS

MsgBox str(s.Deep)

call s.Push window1

MsgBox str(s.Deep)
```

### 66.22.8 Pop as object

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
MsgBox window(s.pop).title
```

**Notes:** Returns nil on any error.

### 66.22.9 PopBottom as object

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
MsgBox window(s.PopBottom).title
```

### 66.22.10 Push(o as object) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
```

**Notes:** Returns true if successfull.
May fail on low memory.
Does not push nil.

### 66.22.11 Top as object

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackObjectMBS
call s.Push window1
MsgBox window(s.top).title
```

**Notes:** Returns nil on any error.

### 66.22.12 Properties

### 66.22.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackObjectMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push window1

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.23 class StackSingleMBS

### 66.23.1 class StackSingleMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of singles.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

MsgBox str(S.Top)
```

### 66.23.2 Methods

### 66.23.3 Bottom as single

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

MsgBox str(s.Bottom)
```

### 66.23.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

s.Clear
```

```
if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.23.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.23.6 Contains(o as single) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the items on the stack is equal to the given single value.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

if s.Contains(5) then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.23.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackSingleMBS

MsgBox str(s.Deep)

call s.Push 5
```

MsgBox str(s.Deep)

### 66.23.8 Pop as single

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

MsgBox str(s.Pop)
```

**Notes:** Returns 0 on any error.

### 66.23.9 PopBottom as single

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

MsgBox str(S.PopBottom)
```

### 66.23.10 Push(o as single) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackSingleMBS
call s.Push 5
```

**Notes:** Returns true if successfull.
May fail on low memory.

### 66.23.11 Top as single

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackSingleMBS

call s.Push 5

MsgBox str(S.Top)
```

**Notes:** Returns 0 on any error.

### 66.23.12 Properties

### 66.23.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackSingleMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push 5

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.24 class StackStringMBS

### 66.24.1 class StackStringMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of strings.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
MsgBox s.pop
```

### 66.24.2 Methods

### 66.24.3 Bottom as string

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
MsgBox s.bottom
```

### 66.24.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackStringMBS

call s.Push "abc"

s.Clear

if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.24.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.24.6 Contains(o as string) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the string references on the stack is equal to the given double reference.
**Example:**

```
dim s as new StackStringMBS

call s.Push "Hello"

if s.Contains("Hello") then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.24.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackStringMBS

MsgBox str(s.Deep)

call s.Push "Hello"

MsgBox str(s.Deep)
```

### 66.24.8 Pop as string

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
MsgBox s.pop
```

**Notes:** Returns "" on any error.

### 66.24.9 PopBottom as string

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
MsgBox s.PopBottom
```

### 66.24.10 Push(o as string) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
```

**Notes:** Returns true if successfull.
May fail on low memory.

### 66.24.11 Top as string

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackStringMBS
call s.Push "Hello"
MsgBox s.Top
```

**Notes:** Returns "" on any error.

### 66.24.12 Properties

### 66.24.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackStringMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push "Hello"

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.25 class StackVariantMBS

### 66.25.1 class StackVariantMBS

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a stack of variants.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

MsgBox s.PopBottom
```

### 66.25.2 Methods

### 66.25.3 Bottom as Variant

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

MsgBox s.Bottom
```

### 66.25.4 clear

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the stack.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

s.Clear
```

```
if s.IsEmpty then
MsgBox "OK"
end if
```

### 66.25.5 close

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 66.25.6 Contains(o as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if one of the variant references on the stack is equal to the given variant reference.
**Example:**

```
dim s as new StackObjectMBS

call s.Push window1

if s.Contains(window1) then
MsgBox "found. OK"
else
MsgBox "not found. Failed"
end if
```

### 66.25.7 Deep as Integer

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how much items are on the stack.
**Example:**

```
dim s as new StackVariantMBS

MsgBox str(s.Deep)

call s.Push window1
```

MsgBox str(s.Deep)

### 66.25.8 Pop as Variant

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the top item of the stack and returns the value.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

MsgBox s.pop
```

**Notes:** Returns nil on any error.

### 66.25.9 PopBottom as Variant

MBS DataTypes Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the bottom item of the stack and returns the value.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

MsgBox s.PopBottom
```

### 66.25.10 Push(o as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pushs a value on the stack.
**Example:**

```
dim s as new StackVariantMBS
call s.Push 5
```

**Notes:** Returns true if successfull.
May fail on low memory.

### 66.25.11 Top as Variant

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the top item on the stack.
**Example:**

```
dim s as new StackVariantMBS

call s.Push 5

MsgBox s.top
```

**Notes:** Returns nil on any error.

### 66.25.12 Properties

### 66.25.13 IsEmpty as Boolean

MBS DataTypes Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the stack is empty.
**Example:**

```
dim s as new StackVariantMBS

if s.IsEmpty then
MsgBox "IsEmpty ok"
else
MsgBox "IsEmpty failed"
end if

call s.Push 5

if s.IsEmpty then
MsgBox "IsEmpty failed"
else
MsgBox "IsEmpty ok"
end if
```

**Notes:** (Read only property)

## 66.26 class StringHashSetIteratorMBS

### 66.26.1 class StringHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringHashSet class.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
dim e as StringHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.26.2 Methods

### 66.26.3 isEqual(other as StringHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
dim e as StringHashSetIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox i.Key
i.MoveNext
wend
```

### 66.26.4 isNotEqual(other as StringHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
dim e as StringHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.26.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.26.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
dim e as StringHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

## 66.27 class StringHashSetMBS

### 66.27.1 class StringHashSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash set with strings.
**Example:**

```
dim s as new StringHashSetMBS

s.insert "test"
s.insert "Test"

MsgBox str(s.Count) // shows 2
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

### 66.27.2 Methods

### 66.27.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.27.4 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.27.5 Constructor(Keys() as string) 11878

### 66.27.5 Constructor(Keys() as string)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Example:**

```
dim s() as string = array("Hello", "World", "test")

dim set as new StringHashSetMBS(s)

MsgBox str(set.Count)+" entries: "+Join(set.keys,", ")
```

**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:

- 66.27.4 Constructor(CaseSensitive as Boolean = true) 11878

### 66.27.6 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.27.7 find(key as string) as StringHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.27.8 first as StringHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
```

```
dim e as StringHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.27.9 insert(key as string)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.27.10 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.27.11 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")

for each v as string in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.27.12 last as StringHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new StringHashSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringHashSetIteratorMBS = m.first
dim e as StringHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.27.13 lookup(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new StringHashSetMBS

set.insert "Hello"
set.insert "World"

MsgBox str(set.lookup("missed")) // shows false as value is missing
MsgBox str(set.lookup("Hello")) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.27.14 Remove(first as StringHashSetIteratorMBS, last as StringHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.27.15 Remove(key as string) as Integer 11882
- 66.27.16 Remove(pos as StringHashSetIteratorMBS) 11882


### 66.27.15 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.27.14 Remove(first as StringHashSetIteratorMBS, last as StringHashSetIteratorMBS) 11882
- 66.27.16 Remove(pos as StringHashSetIteratorMBS) 11882


### 66.27.16 Remove(pos as StringHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.27.14 Remove(first as StringHashSetIteratorMBS, last as StringHashSetIteratorMBS) 11882
- 66.27.15 Remove(key as string) as Integer 11882


### 66.27.17 Properties

### 66.27.18 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new StringHashSetMBS

v.insert "1"
v.insert "Hello"
```

```
MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.27.19 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringHashSetMBS(true)
dim s2 as new StringHashSetMBS(false)

s1.insert "a"
s1.insert "A"

s2.insert "a"
s2.insert "A"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.27.20 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new StringHashSetMBS

set.insert "a"
set.insert "b"

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.27.21 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.27.22 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

# 66.28 class StringOrderedSetIteratorMBS

## 66.28.1 class StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringOrderedSet class.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
dim e as StringOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

## 66.28.2 Methods

## 66.28.3 isEqual(other as StringOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
dim e as StringOrderedSetIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox i.Key
i.MoveNext
wend
```

### 66.28.4 isNotEqual(other as StringOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
dim e as StringOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.28.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.28.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
dim e as StringOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.28.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

## 66.29 class StringOrderedSetMBS

### 66.29.1 class StringOrderedSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered set of strings.
**Example:**

```
dim s as new StringOrderedSetMBS

s.insert "test"
s.insert "Test"

MsgBox str(s.Count) // shows 2
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

### 66.29.2 Methods

### 66.29.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.29.4 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.29.5 Constructor(Keys() as string) 11888

### 66.29.5 Constructor(Keys() as string)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Example:**

```
dim s() as string = array("Hello", "World", "test")

dim set as new StringOrderedSetMBS(s)

MsgBox str(set.Count)+" entries: "+Join(set.keys,", ")
```

**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:

- 66.29.4 Constructor(CaseSensitive as Boolean = true) 11888

### 66.29.6 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.29.7 find(key as string) as StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.29.8 first as StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
```

```
dim e as StringOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.29.9 insert(key as string)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.29.10 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.29.11 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")

for each v as string in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.29.12 last as StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new StringOrderedSetMBS

m.insert("1")
m.insert("2")
m.insert("3")

// get iterators pointing to first and after last element
dim i as StringOrderedSetIteratorMBS = m.first
dim e as StringOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.29.13 lookup(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new StringOrderedSetMBS

set.insert "Hello"
set.insert "World"

MsgBox str(set.lookup("missed")) // shows false as value is missing
MsgBox str(set.lookup("Hello")) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.29.14 LowerBound(key as string) as StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.29.15 Remove(first as StringOrderedSetIteratorMBS, last as StringOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.29.16 Remove(key as string) as Integer 11892
- 66.29.17 Remove(pos as StringOrderedSetIteratorMBS) 11892


### 66.29.16 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.29.15 Remove(first as StringOrderedSetIteratorMBS, last as StringOrderedSetIteratorMBS) 11892
- 66.29.17 Remove(pos as StringOrderedSetIteratorMBS) 11892


### 66.29.17 Remove(pos as StringOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.29.15 Remove(first as StringOrderedSetIteratorMBS, last as StringOrderedSetIteratorMBS) 11892
- 66.29.16 Remove(key as string) as Integer 11892


### 66.29.18 UpperBound(key as string) as StringOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.29.19 Properties

### 66.29.20 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringOrderedSetMBS(true)
dim s2 as new StringOrderedSetMBS(false)

s1.insert "a"
s1.insert "A"

s2.insert "a"
s2.insert "A"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.29.21 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new StringOrderedSetMBS

set.insert "a"
set.insert "b"

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.29.22 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.29.23 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

# 66.30 class StringToStringHashMapIteratorMBS

## 66.30.1 class StringToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringToStringHashMap class.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.30.2 Methods

## 66.30.3 isEqual(other as StringToStringHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"
```

```
// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.30.4 isNotEqual(other as StringToStringHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.30.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.30.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.30.7 Properties

### 66.30.8 Value as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

## 66.31 class StringToStringHashMapMBS

### 66.31.1 class StringToStringHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash map with strings as keys and values.
**Example:**

```
dim s as new StringToStringHashMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

### 66.31.2 Methods

### 66.31.3 AddKeys(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.31.4 AddValues(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys

function returns always nil.

### 66.31.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.31.6 Clone as StringToStringHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.31.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.
**Example:**

```
dim d as new Dictionary
d.Value("Hello") = "World"

// convert o map
dim m as new StringToStringHashMapMBS(d)
MsgBox str(m.Count)

// convert back
dim o as Dictionary = m.CloneDictionary
MsgBox o.Value("Hello")
```

### 66.31.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.31.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11900

• 66.31.10 Constructor(other as StringToStringHashMapMBS) 11900

### 66.31.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
**Example:**

```
dim d as new Dictionary
d.Value("Hello") = "World"

// convert o map
dim m as new StringToStringHashMapMBS(d)
MsgBox str(m.Count)

// convert back
dim o as Dictionary = m.CloneDictionary
MsgBox o.Value("Hello")
```

See also:

• 66.31.8 Constructor(CaseSensitive as Boolean = true) 11899

• 66.31.10 Constructor(other as StringToStringHashMapMBS) 11900

### 66.31.10 Constructor(other as StringToStringHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
**Example:**

```
dim d as new Dictionary
d.Value("Hello") = "World"

// convert o map
dim m as new StringToStringHashMapMBS(d)
MsgBox str(m.Count)

// convert back
dim o as StringToStringHashMapMBS = m.Clone
MsgBox o.Value("Hello")
```

See also:

- 66.31.8 Constructor(CaseSensitive as Boolean = true) 11899
- 66.31.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11900


### 66.31.11 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.31.12 find(key as string) as StringToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.31.13 first as StringToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.31.14 hasKey(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.31.15 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.31.16 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringToStringHashMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.31.17 last as StringToStringHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new StringToStringHashMapMBS
```

```
m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringHashMapIteratorMBS = m.first
dim e as StringToStringHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.31.18 lookup(key as string, defaultvalue as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new StringToStringHashMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"

MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.31.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.
**Example:**

```
dim d as new Dictionary
d.Value("Hello") = "World"
```

```
// convert o map
dim m as StringToStringHashMapMBS = d
MsgBox str(m.Count)

// convert back
dim o as Dictionary = m
MsgBox o.Value("Hello")
```

### 66.31.20 Remove(first as StringToStringHashMapIteratorMBS, last as StringToStringHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.31.21 Remove(key as string) as Integer 11904
- 66.31.22 Remove(pos as StringToStringHashMapIteratorMBS) 11904

### 66.31.21 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.31.20 Remove(first as StringToStringHashMapIteratorMBS, last as StringToStringHashMapIteratorMBS) 11904
- 66.31.22 Remove(pos as StringToStringHashMapIteratorMBS) 11904

### 66.31.22 Remove(pos as StringToStringHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.31.20 Remove(first as StringToStringHashMapIteratorMBS, last as StringToStringHashMapIteratorMBS) 11904
- 66.31.21 Remove(key as string) as Integer 11904

### 66.31.23 ValueAtIndex(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.31.24 Values as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new StringToStringHashMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Values
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.31.25 Properties

### 66.31.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new StringToStringHashMapMBS

v.value("1")="Hello"
v.value("2")="World"

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.31.27 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringToStringHashMapMBS(true)
dim s2 as new StringToStringHashMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.31.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new StringToStringHashMapMBS

map.Value("?")="?"
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.31.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.31.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.31.31 value(key as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.32 class StringToStringOrderedMapIteratorMBS

### 66.32.1 class StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringToStringOrderedMap class.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

### 66.32.2 Methods

### 66.32.3 isEqual(other as StringToStringOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"
```

```
// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.32.4 isNotEqual(other as StringToStringOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.32.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.32.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.32.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.32.8 Properties

### 66.32.9 Value as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

# 66.33 class StringToStringOrderedMapMBS

## 66.33.1 class StringToStringOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map with strings for keys and values.
**Example:**

```
dim s as new StringToStringOrderedMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.33.2 Methods

## 66.33.3 AddKeys(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

## 66.33.4 AddValues(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys

function returns always nil.

### 66.33.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.33.6 Clone as StringToStringOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.33.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.33.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.33.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11912
- 66.33.10 Constructor(other as StringToStringOrderedMapMBS) 11913

### 66.33.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.33.8 Constructor(CaseSensitive as Boolean = true) 11912
- 66.33.10 Constructor(other as StringToStringOrderedMapMBS) 11913

### 66.33.10 Constructor(other as StringToStringOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.33.8 Constructor(CaseSensitive as Boolean = true) 11912
- 66.33.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11912


### 66.33.11 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.33.12 find(key as string) as StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.33.13 first as StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.33.14 hasKey(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.33.15 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.33.16 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringToStringOrderedMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Keys
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.33.17 last as StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new StringToStringOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToStringOrderedMapIteratorMBS = m.first
dim e as StringToStringOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.33.18 lookup(key as string, defaultvalue as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new StringToStringOrderedMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"

MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.33.19 LowerBound(key as string) as StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.33.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.33.21 Remove(first as StringToStringOrderedMapIteratorMBS, last as StringToStringOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.33.22 Remove(key as string) as Integer 11916
- 66.33.23 Remove(pos as StringToStringOrderedMapIteratorMBS) 11916

### 66.33.22 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.33.21 Remove(first as StringToStringOrderedMapIteratorMBS, last as StringToStringOrderedMapIteratorMBS) 11916
- 66.33.23 Remove(pos as StringToStringOrderedMapIteratorMBS) 11916

### 66.33.23 Remove(pos as StringToStringOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.33.21 Remove(first as StringToStringOrderedMapIteratorMBS, last as StringToStringOrderedMapIteratorMBS) 11916
- 66.33.22 Remove(key as string) as Integer 11916

### 66.33.24 UpperBound(key as string) as StringToStringOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.33.25 ValueAtIndex(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.33.26 Values as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new StringToStringOrderedMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Values
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.33.27 Properties

### 66.33.28 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringToStringOrderedMapMBS(true)
dim s2 as new StringToStringOrderedMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.33.29 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new StringToStringOrderedMapMBS

map.Value("?")="?"
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.33.30 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.33.31 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.33.32 value(key as string) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.34 class StringToVariantHashMapIteratorMBS

### 66.34.1 class StringToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringToVariantHashMap class.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

### 66.34.2 Methods

### 66.34.3 isEqual(other as StringToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"
```

```
// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.34.4 isNotEqual(other as StringToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.34.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.34.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.34.7 Properties

### 66.34.8 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

# 66.35 class StringToVariantHashMapMBS

## 66.35.1 class StringToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash map with strings as keys and variants as values.
**Example:**

```
dim s as new StringToVariantHashMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr10
- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.35.2 Methods

## 66.35.3 AddKeys(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

## 66.35.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.35.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.35.6 Clone as StringToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.35.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.35.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.35.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11924
- 66.35.10 Constructor(other as StringToVariantHashMapMBS) 11925

### 66.35.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.35.8 Constructor(CaseSensitive as Boolean = true) 11924
- 66.35.10 Constructor(other as StringToVariantHashMapMBS) 11925


### 66.35.10 Constructor(other as StringToVariantHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.35.8 Constructor(CaseSensitive as Boolean = true) 11924
- 66.35.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11924


### 66.35.11 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.35.12 find(key as string) as StringToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.35.13 first as StringToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
```

```
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.35.14 hasKey(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.35.15 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Example:**

```
dim v as new StringToVariantHashMapMBS
v.Value("Hello") = "World"
MsgBox v.Key(0)+": "+v.ValueAtIndex(0)
```

**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.35.16 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringToVariantHashMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Keys
```

```
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.35.17 last as StringToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new StringToVariantHashMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantHashMapIteratorMBS = m.first
dim e as StringToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.35.18 lookup(key as string, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new StringToVariantHashMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"
```

```
MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.35.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.35.20 Remove(first as StringToVariantHashMapIteratorMBS, last as StringToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.35.21 Remove(key as string) as Integer 11928
- 66.35.22 Remove(pos as StringToVariantHashMapIteratorMBS) 11928

### 66.35.21 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.35.20 Remove(first as StringToVariantHashMapIteratorMBS, last as StringToVariantHashMapIteratorMBS) 11928
- 66.35.22 Remove(pos as StringToVariantHashMapIteratorMBS) 11928

### 66.35.22 Remove(pos as StringToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.35.20 Remove(first as StringToVariantHashMapIteratorMBS, last as StringToVariantHashMapIteratorMBS) 11928

- 66.35.21 Remove(key as string) as Integer 11928


### 66.35.23 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Example:**

```
dim v as new StringToVariantHashMapMBS
v.Value("Hello") = "World"
MsgBox v.Key(0)+": "+v.ValueAtIndex(0)
```

**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.35.24 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new StringToVariantHashMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Values
MsgBox str(v)
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.35.25 Properties

### 66.35.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new StringToVariantHashMapMBS

v.value("1")="Hello"
v.value("2")="World"

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.35.27 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringToVariantHashMapMBS(true)
dim s2 as new StringToVariantHashMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.35.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new StringToVariantHashMapMBS

map.Value("?")="?"
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.35.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.35.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.35.31 value(key as string) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Example:**

```
dim v as new StringToVariantHashMapMBS
v.Value("Hello") = "World"
MsgBox v.Key(0)+": "+v.ValueAtIndex(0)
```

**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.36 class StringToVariantOrderedMapIteratorMBS

### 66.36.1 class StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the StringToVariantOrderedMap class.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

### 66.36.2 Methods

### 66.36.3 isEqual(other as StringToVariantOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"
```

```
// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.36.4 isNotEqual(other as StringToVariantOrderedMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.36.5 Key as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.36.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.36.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.36.8 Properties

### 66.36.9 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

# 66.37 class StringToVariantOrderedMapMBS

## 66.37.1 class StringToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map with strings as keys and variants as values.
**Example:**

```
dim s as new StringToVariantOrderedMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.37.2 Methods

## 66.37.3 AddKeys(targetArray() as string)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

## 66.37.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys

function returns always nil.

### 66.37.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.37.6 Clone as StringToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.37.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.37.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.37.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11936
- 66.37.10 Constructor(other as StringToVariantOrderedMapMBS) 11937

### 66.37.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.37.8 Constructor(CaseSensitive as Boolean = true) 11936
- 66.37.10 Constructor(other as StringToVariantOrderedMapMBS) 11937

### 66.37.10 Constructor(other as StringToVariantOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.37.8 Constructor(CaseSensitive as Boolean = true) 11936
- 66.37.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11936


### 66.37.11 CountKey(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.37.12 find(key as string) as StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.37.13 first as StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
```

```
i.MoveNext
wend
```

### 66.37.14 hasKey(key as string) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.37.15 Key(index as Integer) as string

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.37.16 Keys as string()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new StringToVariantOrderedMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.37.17 last as StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new StringToVariantOrderedMapMBS

m.value("1")="Hello"
m.value("2")="World"
m.value("3")="!"

// get iterators pointing to first and after last element
dim i as StringToVariantOrderedMapIteratorMBS = m.first
dim e as StringToVariantOrderedMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+i.Value
i.MoveNext
wend
```

### 66.37.18 lookup(key as string, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new StringToVariantOrderedMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"

MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.37.19 LowerBound(key as string) as StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.37.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.37.21 Remove(first as StringToVariantOrderedMapIteratorMBS, last as StringToVariantOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.37.22 Remove(key as string) as Integer 11940
- 66.37.23 Remove(pos as StringToVariantOrderedMapIteratorMBS) 11940

### 66.37.22 Remove(key as string) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.37.21 Remove(first as StringToVariantOrderedMapIteratorMBS, last as StringToVariantOrderedMapIteratorMBS) 11940
- 66.37.23 Remove(pos as StringToVariantOrderedMapIteratorMBS) 11940

### 66.37.23 Remove(pos as StringToVariantOrderedMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.37.21 Remove(first as StringToVariantOrderedMapIteratorMBS, last as StringToVariantOrderedMapIteratorMBS) 11940
- 66.37.22 Remove(key as string) as Integer 11940

### 66.37.24 UpperBound(key as string) as StringToVariantOrderedMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.37.25 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.37.26 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
dim m as new StringToVariantOrderedMapMBS

m.Value("1")="Hello"
m.Value("2")="World"

for each v as string in m.Values
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.37.27 Properties

### 66.37.28 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new StringToVariantOrderedMapMBS(true)
dim s2 as new StringToVariantOrderedMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.37.29 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new StringToVariantOrderedMapMBS

map.Value("?")="?"
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.37.30 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.37.31 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.37.32 value(key as string) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.38 class VariantHashSetIteratorMBS

### 66.38.1 class VariantHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the VariantHashSet class.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.38.2 Methods

### 66.38.3 isEqual(other as VariantHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox i.Key
i.MoveNext
wend
```

### 66.38.4 isNotEqual(other as VariantHashSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.38.5 Key as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.38.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

# 66.39 class VariantHashSetMBS

## 66.39.1 class VariantHashSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for a hash set with variants.
**Example:**

```
dim s as new VariantHashSetMBS

s.insert "test"
s.insert "Test"

MsgBox str(s.Count) // shows 2

s.insert ConvertEncoding("test",encodings.UTF16)
s.insert ConvertEncoding("Test",encodings.UTF16)

MsgBox str(s.Count) // shows 4
```

**Notes:** When using variants for keys, you may get better results if all keys used have the same data type to improve comparison.
All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

## 66.39.2 Methods

## 66.39.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

## 66.39.4 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.39.5 Constructor(Keys() as string) 11948
- 66.39.6 Constructor(Keys() as Variant) 11948


### 66.39.5 Constructor(Keys() as string)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:


- 66.39.4 Constructor(CaseSensitive as Boolean = true) 11947
- 66.39.6 Constructor(Keys() as Variant) 11948


### 66.39.6 Constructor(Keys() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:


- 66.39.4 Constructor(CaseSensitive as Boolean = true) 11947
- 66.39.5 Constructor(Keys() as string) 11948


### 66.39.7 CountKey(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.39.8 find(key as Variant) as VariantHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.39.9 first as VariantHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.39.10 insert(key as Variant)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.39.11 Key(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.39.12 Keys as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new VariantHashSetMBS

m.insert("1")
m.insert("2")

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.39.13 last as VariantHashSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new VariantHashSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantHashSetIteratorMBS = m.first
dim e as VariantHashSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.39.14 lookup(key as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new VariantHashSetMBS

set.insert "Hello"
set.insert "World"

MsgBox str(set.lookup("missed")) // shows false as value is missing
MsgBox str(set.lookup("Hello")) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.39.15 Remove(first as VariantHashSetIteratorMBS, last as VariantHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.39.16 Remove(key as Variant) as Integer 11951
- 66.39.17 Remove(pos as VariantHashSetIteratorMBS) 11951


### 66.39.16 Remove(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.39.15 Remove(first as VariantHashSetIteratorMBS, last as VariantHashSetIteratorMBS) 11951
- 66.39.17 Remove(pos as VariantHashSetIteratorMBS) 11951


### 66.39.17 Remove(pos as VariantHashSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:


- 66.39.15 Remove(first as VariantHashSetIteratorMBS, last as VariantHashSetIteratorMBS) 11951

- 66.39.16 Remove(key as Variant) as Integer 11951

### 66.39.18 Properties

### 66.39.19 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new VariantHashSetMBS

v.insert "1"
v.insert "Hello"

MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.39.20 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new VariantHashSetMBS(true)
dim s2 as new VariantHashSetMBS(false)

s1.insert("a")
s1.insert("A")

s2.insert("a")
s2.insert("A")

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.39.21 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new VariantHashSetMBS

set.insert 1
set.insert 2

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.39.22 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.39.23 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

## 66.40 class VariantOrderedSetIteratorMBS

### 66.40.1 class VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the VariantOrderedSet class.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.40.2 Methods

### 66.40.3 isEqual(other as VariantOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox i.Key
i.MoveNext
wend
```

### 66.40.4 isNotEqual(other as VariantOrderedSetIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.40.5 Key as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.40.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.40.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

# 66.41 class VariantOrderedSetMBS

## 66.41.1 class VariantOrderedSetMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered set with variants.
**Example:**

```
dim s as new VariantOrderedSetMBS

s.insert "test"
s.insert "Test"

MsgBox str(s.Count) // shows 2

s.insert ConvertEncoding("test",encodings.UTF16)
s.insert ConvertEncoding("Test",encodings.UTF16)

MsgBox str(s.Count) // shows 4
```

**Notes:** When using variants for keys, you may get better results if all keys used have the same data type to improve comparison.
All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the set ordered using the OrderedSet class or whether you prefer a higher speed with the HashSet class.

## 66.41.2 Methods

## 66.41.3 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

## 66.41.4 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:

- 66.41.5 Constructor(Keys() as string) 11958
- 66.41.6 Constructor(Keys() as Variant) 11958


### 66.41.5 Constructor(Keys() as string)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:


- 66.41.4 Constructor(CaseSensitive as Boolean = true) 11957
- 66.41.6 Constructor(Keys() as Variant) 11958


### 66.41.6 Constructor(Keys() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new set from the values in the array.
**Notes:** If the array has duplicates, the later elements overwrite the earlier keys.
See also:


- 66.41.4 Constructor(CaseSensitive as Boolean = true) 11957
- 66.41.5 Constructor(Keys() as string) 11958


### 66.41.7 CountKey(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this set.

### 66.41.8 find(key as Variant) as VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.41.9 first as VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the set.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.41.10 insert(key as Variant)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to the set.

### 66.41.11 Key(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.41.12 Keys as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
dim m as new VariantOrderedSetMBS

m.insert("1")
m.insert("2")

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.41.13 last as VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the set.
**Example:**

```
// Create a map
dim m as new VariantOrderedSetMBS

m.insert(1.0) // double
m.insert("Hello") // string
m.insert(3) // integer

// get iterators pointing to first and after last element
dim i as VariantOrderedSetIteratorMBS = m.first
dim e as VariantOrderedSetIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox i.Key
i.MoveNext
wend
```

### 66.41.14 lookup(key as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an element with the given key exists in this set.
**Example:**

```
dim set as new VariantOrderedSetMBS

set.insert "Hello"
set.insert "World"

MsgBox str(set.lookup("missed")) // shows false as value is missing
MsgBox str(set.lookup("Hello")) // shows true as value is found
```

**Notes:** Returns true if yes and false if no.

### 66.41.15 LowerBound(key as Variant) as VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.41.16 Remove(first as VariantOrderedSetIteratorMBS, last as VariantOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.41.17 Remove(key as Variant) as Integer 11961
- 66.41.18 Remove(pos as VariantOrderedSetIteratorMBS) 11962


### 66.41.17 Remove(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.41.16 Remove(first as VariantOrderedSetIteratorMBS, last as VariantOrderedSetIteratorMBS) 11961
- 66.41.18 Remove(pos as VariantOrderedSetIteratorMBS) 11962

### 66.41.18 Remove(pos as VariantOrderedSetIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.41.16 Remove(first as VariantOrderedSetIteratorMBS, last as VariantOrderedSetIteratorMBS) 11961
- 66.41.17 Remove(key as Variant) as Integer 11961

### 66.41.19 UpperBound(key as Variant) as VariantOrderedSetIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.41.20 Properties

### 66.41.21 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new VariantOrderedSetMBS(true)
dim s2 as new VariantOrderedSetMBS(false)

s1.insert("a")
s1.insert("A")

s2.insert("a")
s2.insert("A")

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.41.22 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this set.
**Example:**

```
dim set as new VariantOrderedSetMBS

set.insert 1
set.insert 2

MsgBox str(set.Count)
```

**Notes:** (Read only property)

### 66.41.23 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.41.24 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this set.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

## 66.42 class VariantToVariantHashMapIteratorMBS

### 66.42.1 class VariantToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the VariantToVariantHashMap class.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

### 66.42.2 Methods

### 66.42.3 isEqual(other as VariantToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8
```

```
// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.42.4 isNotEqual(other as VariantToVariantHashMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.42.5 Key as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.42.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.42.7 Properties

### 66.42.8 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

# 66.43 class VariantToVariantHashMapMBS

## 66.43.1 class VariantToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an hash map with variants and keys and values.
**Example:**

```
dim s as new VariantToVariantHashMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** Think of this class like the reimplementation for dictionary class with being case sensitive.

When using variants for keys, you may get better results if all keys used have the same data type to improve comparison.
All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.43.2 Methods

## 66.43.3 AddKeys(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.43.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.43.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.43.6 Clone as VariantToVariantHashMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.43.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.43.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:


- 66.43.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11968
- 66.43.10 Constructor(other as VariantToVariantHashMapMBS) 11969


### 66.43.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:

- 66.43.8 Constructor(CaseSensitive as Boolean = true) 11968
- 66.43.10 Constructor(other as VariantToVariantHashMapMBS) 11969

### 66.43.10 Constructor(other as VariantToVariantHashMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:

- 66.43.8 Constructor(CaseSensitive as Boolean = true) 11968
- 66.43.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11968

### 66.43.11 CountKey(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.43.12 find(key as Variant) as VariantToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.43.13 first as VariantToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8
```

```
// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.43.14 hasKey(key as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.43.15 Key(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.43.16 Keys as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.43.17 last as VariantToVariantHashMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantHashMapIteratorMBS = m.first
dim e as VariantToVariantHashMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.43.18 lookup(key as Variant, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new VariantToVariantHashMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"

MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.43.19 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.43.20 Remove(first as VariantToVariantHashMapIteratorMBS, last as VariantToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:

- 66.43.21 Remove(key as Variant) as Integer 11972
- 66.43.22 Remove(pos as VariantToVariantHashMapIteratorMBS) 11972

### 66.43.21 Remove(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:

- 66.43.20 Remove(first as VariantToVariantHashMapIteratorMBS, last as VariantToVariantHashMapIteratorMBS) 11972
- 66.43.22 Remove(pos as VariantToVariantHashMapIteratorMBS) 11972

### 66.43.22 Remove(pos as VariantToVariantHashMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.43.20 Remove(first as VariantToVariantHashMapIteratorMBS, last as VariantToVariantHashMapIteratorMBS) 11972

• 66.43.21 Remove(key as Variant) as Integer 11972

### 66.43.23 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.43.24 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
// Create a map
dim m as new VariantToVariantHashMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Values
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.43.25 Properties

### 66.43.26 BinCount as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bins the hash table uses.
**Example:**

```
dim v as new VariantToVariantHashMapMBS

v.value(1)="Hello"
v.value(2)="World"
```

```
MsgBox str(v.BinCount)
```

**Notes:** This is a measure of the hash table size, independent of the number of items the Dictionary contains. (Read only property)

### 66.43.27 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new VariantToVariantHashMapMBS(true)
dim s2 as new VariantToVariantHashMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.43.28 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new VariantToVariantHashMapMBS

map.Value(1)=true
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.43.29 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.43.30 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.43.31 value(key as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

## 66.44 class VariantToVariantMapIteratorMBS

### 66.44.1 class VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The iterator for the VariantToVariantMap class.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.44.2 Methods

### 66.44.3 isEqual(other as VariantToVariantMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are equal.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last
```

```
// Show all keys and values
while i.isEqual(e) = false
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.44.4 isNotEqual(other as VariantToVariantMapIteratorMBS) as boolean

MBS DataTypes Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if both iterators are not equal.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.44.5 Key as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current key.

### 66.44.6 MoveNext

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the next item.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.44.7 MovePrev

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to the previous item.

### 66.44.8 Properties

### 66.44.9 Value as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the current item in the iterator.
**Notes:** (Read and Write computed property)

# 66.45 class VariantToVariantOrderedMapMBS

## 66.45.1 class VariantToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An alternative dictionary class for an ordered map with variants as keys and values.
**Example:**

```
dim s as new VariantToVariantOrderedMapMBS

s.Value("Test")="Hello"
s.Value("test")="World"

MsgBox str(s.Count) // shows 2

s.Value(ConvertEncoding("test",encodings.UTF16))="Just a"
s.Value(ConvertEncoding("Test",encodings.UTF16))="test"

MsgBox str(s.Count) // shows 4
```

**Notes:** Think of this class like the reimplementation for dictionary class with being case sensitive and with storing items ordered.

When using variants for keys, you may get better results if all keys used have the same data type to improve comparison.
All text comparison is done either case sensitive or insensitive. Defined in constructor.
You can choose whether you want to keep the map ordered using the OrderedMap class or whether you prefer a higher speed with the HashMap class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Plugins 8.2

## 66.45.2 Methods

## 66.45.3 AddKeys(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to keys, but adds keys to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.45.4 AddValues(targetArray() as Variant)

MBS DataTypes Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to values, but adds values to the given array.
**Notes:** For older Xojo version 2007/2008 where the plugin can't create an array, so the values and keys function returns always nil.

### 66.45.5 Clear

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all of the elements.

### 66.45.6 Clone as VariantToVariantOrderedMapMBS

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map.

### 66.45.7 CloneDictionary as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this map as a dictionary.

### 66.45.8 Constructor(CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default constructor.
**Notes:** If CaseSensitive is true, the comparison of texts or strings is case sensitive.
See also:


- 66.45.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11980
- 66.45.10 Constructor(other as VariantToVariantOrderedMapMBS) 11981


### 66.45.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the dictionary.
See also:


- 66.45.8 Constructor(CaseSensitive as Boolean = true) 11980
- 66.45.10 Constructor(other as VariantToVariantOrderedMapMBS) 11981


### 66.45.10 Constructor(other as VariantToVariantOrderedMapMBS)

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new map with the keys and values from the existing map.
See also:


- 66.45.8 Constructor(CaseSensitive as Boolean = true) 11980
- 66.45.9 Constructor(dic as dictionary, CaseSensitive as Boolean = true) 11980


### 66.45.11 CountKey(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how often a key is used in this map.

### 66.45.12 find(key as Variant) as VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the key and returns an interator.
**Notes:** Returns the same value as the last method if the item was not found.

### 66.45.13 first as VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the beginning of the map.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8
```

```
// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.45.14 hasKey(key as Variant) as boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if Key is in the map and False if it is not. Returns a Boolean.

### 66.45.15 Key(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of key for the Indexth sequential item.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.45.16 Keys as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the keys as an array.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Keys
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by the Values method at least until the Dictionary is modified. Use this method with For Each to loop through all the keys.

### 66.45.17 last as VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator pointing to the end of the map.
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.value(1)=2
m.value(2)=4
m.value(3)=8

// get iterators pointing to first and after last element
dim i as VariantToVariantMapIteratorMBS = m.first
dim e as VariantToVariantMapIteratorMBS = m.last

// Show all keys and values
while i.isNotEqual(e)
MsgBox str(i.Key)+" ->"+str(i.Value)
i.MoveNext
wend
```

### 66.45.18 lookup(key as Variant, defaultvalue as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the passed value of Key.
**Example:**

```
dim map as new VariantToVariantOrderedMapMBS

map.value("a")="Hello"
map.value("b")="World"
map.value("c")="!"

MsgBox str(map.lookup("d","?")) // shows "?" as value is missing
MsgBox str(map.lookup("a","?")) // shows "Hello" as value is found
```

**Notes:** If Key is found, it returns the corresponding value. If Key is not found, it returns the passed defaultValue.

### 66.45.19 LowerBound(key as Variant) as VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is not less than k.

### 66.45.20 Operator_Convert as Dictionary

MBS DataTypes Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the map as dictionary.

### 66.45.21 Remove(first as VariantToVariantMapIteratorMBS, last as VariantToVariantMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases all elements in a range.
See also:


- 66.45.22 Remove(key as Variant) as Integer 11984
- 66.45.23 Remove(pos as VariantToVariantMapIteratorMBS) 11985


### 66.45.22 Remove(key as Variant) as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element with the given key.
See also:


- 66.45.21 Remove(first as VariantToVariantMapIteratorMBS, last as VariantToVariantMapIteratorMBS) 11984
- 66.45.23 Remove(pos as VariantToVariantMapIteratorMBS) 11985

### 66.45.23 Remove(pos as VariantToVariantMapIteratorMBS)

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Erases the element pointed to by the pos iterator.
See also:

- 66.45.21 Remove(first as VariantToVariantMapIteratorMBS, last as VariantToVariantMapIteratorMBS) 11984
- 66.45.22 Remove(key as Variant) as Integer 11984

### 66.45.24 UpperBound(key as Variant) as VariantToVariantMapIteratorMBS

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an iterator for the first element whose key is greater than k.

### 66.45.25 ValueAtIndex(index as Integer) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value with the given index.
**Notes:** If there is no Indexth item in the map, a call generates an OutOfBoundsException error. The first item has the index zero.

### 66.45.26 Values as Variant()

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the values as an array
**Example:**

```
// Create a map
dim m as new VariantToVariantOrderedMapMBS

m.Value(1)="Hello"
m.Value(2)="World"

for each v as Variant in m.Values
MsgBox v
next
```

**Notes:** The order is stable and matches the order returned by Keys at least until the Map is modified. Use this method with For Each to loop through all the values.

### 66.45.27 Properties

### 66.45.28 CaseSensitive as Boolean

MBS DataTypes Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether text/string comparison is case sensitive.
**Example:**

```
dim s1 as new VariantToVariantOrderedMapMBS(true)
dim s2 as new VariantToVariantOrderedMapMBS(false)

s1.value("a") = "1"
s1.value("A") = "2"

s2.value("a") = "1"
s2.value("A") = "2"

MsgBox str(s1.Count)+" "+str(s2.Count)
```

**Notes:** (Read only property)

### 66.45.29 Count as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items in this map.
**Example:**

```
dim map as new VariantToVariantOrderedMapMBS

map.Value(1)=true
map.Value("Hello")="World"

MsgBox str(map.Count)
```

**Notes:** (Read only property)

### 66.45.30 Empty as Boolean

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the size is zero.
**Notes:** (Read only property)

### 66.45.31 MaxSize as Integer

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the largest possible size for this map.
**Notes:** Value is -1 if no limit is defined.
(Read only property)

### 66.45.32 value(key as Variant) as Variant

MBS DataTypes Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value associated with the given key.
**Notes:** If you query for a key which does not exist, a KeyNotFoundException is raised.
(Read and Write computed property)

# Chapter 67

# DDE

## 67.1 class DDEBinaryDataMBS

### 67.1.1 class DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Binary Data for DDEMBS conversation.
**Notes:** Be carefully: This objects for data received inside a DDEMBS Event are read only. Passing an object to a function normally destroys it.

### 67.1.2 Methods

### 67.1.3 Mem as memoryblock

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the data as a memoryblock.

### 67.1.4 size as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the size of this data object.

### 67.1.5 Str as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the data as a string.

### 67.1.6 Properties

### 67.1.7 Handle as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for this data.
**Notes:** (Read and Write property)

### 67.1.8 Release as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** whether the destructor will release the data handle or not.
**Notes:** (Read and Write property)

## 67.2 class DDEContextInfoMBS

### 67.2.1 class DDEContextInfoMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Details for a connection.

### 67.2.2 Properties

### 67.2.3 Ansi as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** whether the other side works with Ansi strings (the normal ones).
**Notes:** Currently this DDEMBS Classes are only tested for ANSI Systems. And I'm not sure if Xojo itself does handle Unicode correctly on Windows.
(Read and Write property)

### 67.2.4 CountryID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The country ID for this connection.
**Notes:** Some Windows country constants:

(Read and Write property)

### 67.2.5 Flags as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flags for this connection.
**Notes:** Currently not used by Windows.
(Read and Write property)

### 67.2.6 LangID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The language ID for this connection.
**Notes:** Some Windows language constants:

(Read and Write property)

### 67.2.7 Security as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A user defined security code.
**Notes:** A security value, which may be anything you need.
Maybe a code to verify that it is your app or the encryption code?
(Read and Write property)

### 67.2.8 Unicode as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** whether the other side works with Unicode strings.
**Notes:** Currently this DDEMBS Classes are only tested for ANSI Systems. And I'm not sure if Xojo itself does handle Unicode correctly on Windows.
(Read and Write property)

| | | |
|---|---|---|
| ALBANIA | 355 | Albania |
| ALGERIA | 213 | Algeria |
| ARGENTINA | 54 | Argentina |
| ARMENIA | 374 | Armenia |
| AUSTRALIA | 61 | Australia |
| AUSTRIA | 43 | Austria |
| AZERBAIJAN | 994 | Azerbaijan |
| BAHRAIN | 973 | Bahrain |
| BELARUS | 375 | Belarus |
| BELGIUM | 32 | Belgium |
| BELIZE | 501 | Belize |
| BOLIVIA | 591 | Bolivia |
| BRAZIL | 55 | Brazil |
| BRUNEI_DARUSSALAM | 673 | BruneiDarussalam |
| BULGARIA | 359 | Bulgaria |
| CANADA | 2 | Canada |
| CARIBBEAN | 1 | Caribbean |
| CHILE | 56 | Chile |
| COLOMBIA | 57 | Colombia |
| COSTA_RICA | 506 | CostaRica |
| CROATIA | 385 | Croatia |
| CZECH | 420 | CzechRepublic |
| DENMARK | 45 | Denmark |
| DOMINICAN_REPUBLIC | 1 | DominicanRepublic |
| ECUADOR | 593 | Ecuador |
| EGYPT | 20 | Egypt |
| EL_SALVADOR | 503 | ElSalvador |
| ESTONIA | 372 | Estonia |
| FAEROE_ISLANDS | 298 | FaeroeIslands |
| FINLAND | 358 | Finland |
| FRANCE | 33 | France |
| GEORGIA | 995 | Georgia |
| GERMANY | 49 | Germany |
| GREECE | 30 | Greece |
| GUATEMALA | 502 | Guatemala |
| HONDURAS | 504 | Honduras |
| HONG_KONG | 852 | HongKongS.A.R.,P.R.C. |
| HUNGARY | 36 | Hungary |
| ICELAND | 354 | Iceland |
| INDIA | 91 | India |
| INDONESIA | 62 | Indonesia |
| IRAN | 981 | Iran |
| IRAQ | 964 | Iraq |
| IRELAND | 353 | Ireland |
| ISRAEL | 972 | Israel |
| ITALY | 39 | Italy |
| JAMAICA | 1 | Jamaica |
| JAPAN | 81 | Japan |
| JORDAN | 962 | Jordan |
| KAZAKSTAN | 7 | Kazakstan |
| KENYA | 254 | Kenya |
| KUWAIT | 965 | Kuwait |
| LATVIA | 371 | Latvia |
| LEBANON | 961 | Lebanon |
| LIBYA | 218 | Libya |
| LIECHTENSTEIN | 41 | Liechtenstein |
| LITHUANIA | 370 | Lithuania |
| LUXEMBOURG | 352 | Luxembourg |
| MACAU | 853 | Macau |
| MACEDONIA | 389 | theFormerYugoslavRepublicofMacedonia |
| MALAYSIA | 60 | Malaysia |
| MEXICO | 52 | Mexico |
| MONACO | 33 | PrincipalityofMonaco |
| MOROCCO | 212 | Morocco |
| NETHERLANDS | 31 | Netherlands |

| | |
|---|---|
| NEUTRAL | &h00 |
| AFRIKAANS | &h36 |
| ALBANIAN | &h1c |
| ARABIC | &h01 |
| ARMENIAN | &h2b |
| ASSAMESE | &h4d |
| AZERI | &h2c |
| BASQUE | &h2d |
| BELARUSIAN | &h23 |
| BENGALI | &h45 |
| BULGARIAN | &h02 |
| CATALAN | &h03 |
| CHINESE | &h04 |
| CROATIAN | &h1a |
| CZECH | &h05 |
| DANISH | &h06 |
| DUTCH | &h13 |
| ENGLISH | &h09 |
| ESTONIAN | &h25 |
| FAEROESE | &h38 |
| FARSI | &h29 |
| FINNISH | &h0b |
| FRENCH | &h0c |
| GEORGIAN | &h37 |
| GERMAN | &h07 |
| GREEK | &h08 |
| GUJARATI | &h47 |
| HEBREW | &h0d |
| HINDI | &h39 |
| HUNGARIAN | &h0e |
| ICELANDIC | &h0f |
| INDONESIAN | &h21 |
| ITALIAN | &h10 |
| JAPANESE | &h11 |
| KANNADA | &h4b |
| KASHMIRI | &h60 |
| KAZAK | &h3f |
| KONKANI | &h57 |
| KOREAN | &h12 |
| LATVIAN | &h26 |
| LITHUANIAN | &h27 |
| MACEDONIAN | &h2f |
| MALAY | &h3e |
| MALAYALAM | &h4c |
| MANIPURI | &h58 |
| MARATHI | &h4e |
| NEPALI | &h61 |
| NORWEGIAN | &h14 |
| ORIYA | &h48 |
| POLISH | &h15 |
| PORTUGUESE | &h16 |
| PUNJABI | &h46 |
| ROMANIAN | &h18 |
| RUSSIAN | &h19 |
| SANSKRIT | &h4f |
| SERBIAN | &h1a |

## 67.3 class DDEMBS

### 67.3.1 class DDEMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives access to Windows DDE functions.
**Notes:** DDE on Windows is like AppleEvents on Mac OS, but not so comfortable.

### 67.3.2 Methods

### 67.3.3 clientTransaction(type as Integer,topic as DDEStringMBS) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Notes:** Short version of ClientTransaction with datatype=CF_TEXT and data=nil.
See also:

- 67.3.4 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as DDEBinaryDataMBS 11995
- 67.3.5 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as DDEBinaryDataMBS 11995

### 67.3.4 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Notes:** Shortversion of ClientTransaction with datatype=CF_TEXT.
See also:

- 67.3.3 clientTransaction(type as Integer,topic as DDEStringMBS) as DDEBinaryDataMBS 11995
- 67.3.5 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as DDEBinaryDataMBS 11995

### 67.3.5 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Example:**

```
// List all Excel Topics

dim d as DDEMBS
dim s,topic as DDEStringMBS
dim g as DDEStringMBS
dim m as DDEBinaryDataMBS
dim t,enter,z as string
dim i,c as Integer

list.deleteAllRows
d=new DDEMBS
if d.InitClient then
s=d.newDDEString("Excel")
topic=d.newDDEString("System")
if topic<>nil and s<>nil and d.ConnectToServer(s,topic) then
g=d.newDDEString("Topics")
if g<>nil then
m=d.ClientTransaction(d.XTYP_REQUEST,g)
if m<>nil then
t=m.str
t=left(t,len(t)-1) // remove chr(0) at end
enter=chr(9)
c=countfields(t,Enter)
for i=1 to c
z=nthfield(t,enter,i)

list.addRow z
next
list.listindex=0
else
msgBox "Failed to transfer."
end if
else
msgBox "Fail to create second string."
end if
g=nil // must be released before close
else
msgBox "Fail to create connect."
end if
s=nil // must be released before close
d.close
else
msgBox "Fail to init for Client."
end if
```

**Notes:** Use this ClientTransaction if the application returns a value or ClientTransactionBoolean if it returns a boolean.
Data and Datatype are optional. If no datatype is set, the datatype is set to the value of CF_TEXT.
See also:

- 67.3.3 clientTransaction(type as Integer,topic as DDEStringMBS) as DDEBinaryDataMBS 11995
- 67.3.4 clientTransaction(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as DDEBinaryDataMBS 11995

### 67.3.6 clientTransactionBoolean(type as Integer,topic as DDEStringMBS) as Boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Notes:** Short version of ClientTransactionBoolean with datatype=CF_TEXT and data=nil.
See also:

- 67.3.7 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as Boolean 11997
- 67.3.8 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as Boolean 11997

### 67.3.7 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as Boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Notes:** Short version of ClientTransactionBoolean with Datatype=CF_TEXT.
See also:

- 67.3.6 clientTransactionBoolean(type as Integer,topic as DDEStringMBS) as Boolean 11997
- 67.3.8 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as Boolean 11997

### 67.3.8 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS, datatype as Integer) as Boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a Transaction with the server.
**Notes:** Use this ClientTransaction if the application returns a value or ClientTransactionBoolean if it returns a boolean.
Data and Datatype are optional. If no datatype is set, the datatype is set to the value of CF_TEXT.
See also:

- 67.3.6 clientTransactionBoolean(type as Integer,topic as DDEStringMBS) as Boolean 11997
- 67.3.7 clientTransactionBoolean(type as Integer,topic as DDEStringMBS, data as DDEBinaryDataMBS) as Boolean 11997

### 67.3.9 close

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the running connection.
**Example:**

```
dim d as DDEMBS
// work with dde object

if d<>nil then
d.close
d=nil
end if
```

**Notes:** RB seems to crash, if the object is not destroyed before application is quit.

### 67.3.10 ConnectToServer(appname as DDEStringMBS, topic as DDEStringMBS) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Connects to the application for the given topic.
**Example:**

```
dim a,b as DDEStringMBS
dim d as DDEMBS

d=new DDEMBS
if d.InitClient then
a=d.newDDEString("servicename")
b=d.newDDEString("topicname")
if a<>nil and b<>nil then
if d.ConnectToServer(a,b) then
```

```
msgBox "Connected."
return // ok, so leave before closing.
else
msgBox "Failed to connect."
end if
else
msgBox "Unable to make DDE Strings."
end if
d.close // failed

else
msgBox "Failed to initClient."
end if
```

**Notes:** Using nil for appname or topic you can try to connect to anyone who accepts.
Renamed in v4.3 to ConnectToServer from Connect for better RB 6 compatibility.

### 67.3.11 InitClient as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts DDE, but only for Client stuff.
**Notes:** With plugin version 6.1pr4 and newer you can have eight DDE objects in your application.
With older plugin versions you can only have one instance of the DDEMBS class at all!

### 67.3.12 InitServer as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts DDE for client and server stuff.
**Notes:** With plugin version 6.1pr4 and newer you can have eight DDE objects in your application.
With older plugin versions you can only have one instance of the DDEMBS class at all!

### 67.3.13 NewDDEBinaryData(name as DDEStringMBS,data as memoryblock,offset as Integer,length as Integer,dataformat as Integer) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new binary data object.
See also:

- 67.3.14 NewDDEBinaryData(name as DDEStringMBS,data as string) as DDEBinaryDataMBS 12000
- 67.3.15 NewDDEBinaryData(name as DDEStringMBS,data as string,offset as Integer,length as Integer) as DDEBinaryDataMBS 12000

### 67.3.14 NewDDEBinaryData(name as DDEStringMBS,data as string) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new binary data object.
**Notes:** A short version of NewDDEBinaryData which takes the whole string.
See also:

- 67.3.13 NewDDEBinaryData(name as DDEStringMBS,data as memoryblock,offset as Integer,length as Integer,dataformat as Integer) as DDEBinaryDataMBS 11999
- 67.3.15 NewDDEBinaryData(name as DDEStringMBS,data as string,offset as Integer,length as Integer) as DDEBinaryDataMBS 12000

### 67.3.15 NewDDEBinaryData(name as DDEStringMBS,data as string,offset as Integer,length as Integer) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new binary data object.
**Notes:** The offset and length is optional.
See also:

- 67.3.13 NewDDEBinaryData(name as DDEStringMBS,data as memoryblock,offset as Integer,length as Integer,dataformat as Integer) as DDEBinaryDataMBS 11999
- 67.3.14 NewDDEBinaryData(name as DDEStringMBS,data as string) as DDEBinaryDataMBS 12000

### 67.3.16 NewDDEString(ansistring as string) as DDEStringMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new ANSI DDE string.
**Example:**

```
dim d as DDEMBS // your DDE object
dim a as DDEStringMBS
a=d.newDDEString("servicename")
```

**Notes:** ANSI is the normal string encoding on Windows.

### 67.3.17 NewDDEStringUnicode(unicodestring as string) as DDEStringMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new Unicode DDE string.
**Example:**

```
dim d as DDEMBS // your DDE object
dim a as DDEStringMBS
a=d.NewDDEStringUnicode("servicename")
```

**Notes:** Currently this DDE Classes are only tested for ANSI Systems. And I'm not sure if Xojo itself does handle Unicode correctly on Windows.

### 67.3.18 RegisterService(name as DDEStringMBS) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers a service name.
**Example:**

```
dim d as DDEMBS // your dde object
dim s as DDEStringMBS

if d<>nil then
s=d.newDDEString(editfield1.text)

if s<>nil then
if d.registerService(s) then
msgBox "Registered."
else
msgBox "Register fails."
end if
else
msgBox "Failed on NewDDEString"
end if
else
msgBox "No DDE object!?"
end if
```

### 67.3.19 UnRegisterService(name as DDEStringMBS) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Unregisters a service name.
**Example:**

```
dim d as DDEMBS // your dde object
dim s as DDEStringMBS

if d<>nil then
s=d.newDDEString(editfield1.text)

if s<>nil then
if d.UnRegisterService(s) then
msgBox "Unregistered."
else
msgBox "Unregister fails."
end if
else
msgBox "Failed on NewDDEString"
end if
else
msgBox "No DDE object!?"
end if
```

### 67.3.20 Properties

### 67.3.21 LastError as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read only property)

### 67.3.22 Timeout as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Timeout in milliseconds.
**Example:**

```
dim d as DDEMBS // your DDE object
d.timeout=10000 // 10 Seconds
```

**Notes:** Default is 1000.
(Read and Write property)

### 67.3.23 Events

### 67.3.24 AdviceData(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer,data as DDEBinaryDataMBS) as Integer

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A dynamic data exchange (DDE) client receives the AdviceData event after establishing an advise loop with a server. This transaction informs the client that the value of the data item has changed.

Return Values:
A DDE callback function should return DDE_FACK if it processes this transaction, DDE_FBUSY if it is too busy to process this transaction, or DDE_FNOTPROCESSED if it rejects this transaction.

Remarks:
An application must copy the data associated with the DDEBinaryDataMBS object if the application must process the data after the callback function returns.

### 67.3.25 AdviceRequest(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer,remaincount as Integer) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** The system sends the AdviceRequest event to a server after the server calls the DdePostAdvise function. This transaction informs the server that an advise transaction is outstanding on the specified topic name and item name pair and that data corresponding to the topic name and item name pair has changed.

Return Values:
The server should first call the NewDDEBinaryData function to create a data object that identifies the changed data and then return this object. The server should return nil if it is unable to complete the transaction.

### 67.3.26 AdviceStart(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer) as Boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A client uses this event to establish an advise loop with a server.

### 67.3.27 AdviceStop(topic as DDEStringMBS, item as DDEStringMBS, dataformat as Integer)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A client uses this event to end an advise loop with a server.

### 67.3.28 ConfirmConnect(topic as DDEStringMBS, service as DDEStringMBS, myself as Boolean)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** Your connection was accepted.

### 67.3.29 Connect(topic as DDEStringMBS, service as DDEStringMBS, myself as Boolean,info as DDEContextInfoMBS) as Boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** Return true if you accept this connection.

### 67.3.30 Disconnect(myself as Boolean)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** The connection was closed.

### 67.3.31 Error(errorcode as Integer)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A dynamic data exchange (DDE) object receives the Error event when a critical error occurs.

Possible errors:

| | | |
|---|---|---|
| DMLERR_ADVACKTIMEOUT | &h4000 | |
| DMLERR_BUSY | &h4001 | |
| DMLERR_DATAACKTIMEOUT | &h4002 | |
| DMLERR_DLL_NOT_INITIALIZED | &h4003 | |
| DMLERR_DLL_USAGE | &h4004 | |
| DMLERR_EXECACKTIMEOUT | &h4005 | |
| DMLERR_INVALIDPARAMETER | &h4006 | |
| DMLERR_LOW_MEMORY | &h4007 | Memory is low; advise, poke, or execute data may be lost, or the system may fail. |
| DMLERR_MEMORY_ERROR | &h4008 | |
| DMLERR_NOTPROCESSED | &h4009 | |
| DMLERR_NO_CONV_ESTABLISHED | &h400a | |
| DMLERR_POKEACKTIMEOUT | &h400b | |
| DMLERR_POSTMSG_FAILED | &h400c | |
| DMLERR_REENTRANCY | &h400d | |
| DMLERR_SERVER_DIED | &h400e | |
| DMLERR_SYS_ERROR | &h400f | |
| DMLERR_UNADVACKTIMEOUT | &h4010 | |
| DMLERR_UNFOUND_QUEUE_ID | &h4011 | |

### 67.3.32 Execute(topic as DDEStringMBS,data as DDEBinaryDataMBS) as Integer

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A dynamic data exchange (DDE) server object receives the Execute event when a client specifies XTYP_EXECUTE in the ClientTransaction function. A client uses this transaction to send a command string to the server.

Return Values:
A server should return DDE_FACK if it processes this transaction, DDE_FBUSY if it is too busy to process this transaction, or DDE_FNOTPROCESSED if it rejects this transaction.

The data property is only valid while inside the event.

### 67.3.33 Poke(topic as DDEStringMBS,item as DDEStringMBS,data as DDEBinaryDataMBS) as Integer

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** Return Values:
A server should return DDE_FACK if it processes this transaction, DDE_FBUSY if it is too busy to process this transaction, or DDE_FNOTPROCESSED if it rejects this transaction.

### 67.3.34 Register(application as DDEStringMBS,service as DDEStringMBS)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A service is registered. You may add it to your own list.

### 67.3.35 Request(topic as DDEStringMBS,item as DDEStringMBS,dataformat as Integer) as DDEBinaryDataMBS

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** The server should create a DDEBinaryDataMBS object that identifies the data and then return this object. The server should return nil if it is unable to complete the transaction. If the server returns nil, the client will receive a DDE_FNOTPROCESSED flag.

### 67.3.36 UnRegister(application as DDEStringMBS,service as DDEStringMBS)

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A service was unregistered.

### 67.3.37 WildConnect(topic as DDEStringMBS,service as DDEStringMBS, myself as boolean,info as DDEContextInfoMBS) as DDEStringPairListMBS

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** One of the DDE events.
**Notes:** A connection is tried to all available servers. Return true if you accept.

### 67.3.38 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CF_BITMAP | 2 | A constant for the format parameter.<br>Specifies a Windows bitmap format |
| CF_DIB | 8 | A constant for the format parameter.<br>Specifies the Windows Device Independent Bitmap (DIB) format. |
| CF_DIBV5 | 17 | A constant for the format parameter.<br>Specifies the Windows Device Independent Bitmap (DIB) format of Windows 2000 and newer. |
| CF_DIF | 5 | A constant for the format parameter.<br>Specifies the Windows data interchange format. |
| CF_ENHMETAFILE | 14 | A constant for the format parameter.<br>Specifies the Windows enhanced metafile format. |
| CF_HDROP | 15 | A constant for the format parameter.<br>Specifies the Windows file drop format. |
| CF_LOCALE | 16 | A constant for the format parameter.<br>Specifies the Windows locale format. |
| CF_METAFILEPICT | 3 | A constant for the format parameter.<br>Specifies the Windows metafile format. |
| CF_OEMTEXT | 7 | A constant for the format parameter.<br>Specifies the standard Windows original equipment manufacturer (OEM) text format. |
| CF_PALETTE | 9 | A constant for the format parameter.<br>Specifies the Windows Palette format. |
| CF_PENDATA | 10 | A constant for the format parameter.<br>Specifies the Windows pen data format. |
| CF_RIFF | 11 | A constant for the format parameter.<br>Specifies the Resource Interchange File Format (RIFF) audio format. |
| CF_SYLK | 4 | A constant for the format parameter.<br>Specifies the Windows symbolic link format. |
| CF_TEXT | 1 | A constant for the format parameter.<br>Specifies the standard American National Standards Institute (ANSI) text format. |
| CF_TIFF | 6 | A constant for the format parameter.<br>Specifies the Tagged Image File Format (TIFF). |
| CF_UNICODETEXT | 13 | A constant for the format parameter.<br>Specifies the standard Windows Unicode text format. |
| CF_WAVE | 12 | A constant for the format parameter.<br>Specifies the wave audio format. |
| DDE_FACK | &h8000 | A constant for the return parameter of some events.<br>Return DDE_FACK if everything was handled well. |
| DDE_FBUSY | &h4000 | A constant for the return parameter of some events.<br>Return DDE_FBUSY if your application is busy and can't currently handle the request. |
| DDE_FNOTPROCESSED | 0 | A constant for the return parameter of some events.<br>Return DDE_FNOTPROCESSED if something went wrong will processing this event. |
| XTYP_EXECUTE | &h4050 | A constant for the type parameter of ClientTransaction and ClientTransactionBoolean. |
| XTYP_POKE | &h4090 | A constant for the type parameter of ClientTransaction and ClientTransactionBoolean. |
| XTYP_REQUEST | &h20B0 | A constant for the type parameter of ClientTransaction and ClientTransactionBoolean. |

## 67.4 class DDEStringMBS

### 67.4.1 class DDEStringMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string for DDEMBS conversation.
**Notes:** Be carefully: This objects for data received inside a DDEMBS Event are read only. Passing an object to a function normally destroys it.

### 67.4.2 Methods

### 67.4.3 Len as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the length of this string.

### 67.4.4 Mem as memoryblock

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the content of this DDEMBS String as Xojo Memoryblock.

### 67.4.5 Str as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the content of this DDEMBS String as Xojo string.

### 67.4.6 Properties

### 67.4.7 Handle as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for this data.
**Notes:** (Read and Write property)

### 67.4.8 Release as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** whether the destructor will release the data handle or not.
**Notes:** (Read and Write property)

## 67.5 class DDEStringPairListMBS

### 67.5.1 class DDEStringPairListMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A list of DDE string pairs.
**Notes:** Used for the wild connect event.

### 67.5.2 Methods

### 67.5.3 Append(item as DDEStringPairMBS)

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds another item to the list.

### 67.5.4 Count as Integer

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Counts the number of items in the list.

### 67.5.5 Item(index as Integer) as DDEStringPairMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an item from this list.
**Notes:** Returns nil on any error.
Index is from 0 to count-1.

## 67.6 class DDEStringPairMBS

### 67.6.1 class DDEStringPairMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A pair of topic and service DDEString objects.
**Notes:** Used for the wild connect event.

### 67.6.2 Properties

### 67.6.3 Service as DDEStringMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The service of this pair.
**Notes:** (Read and Write property)

### 67.6.4 Topic as DDEStringMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The topic of this pair.
**Notes:** (Read and Write property)

# Chapter 68

# Declare

## 68.1 class BlockMBS

### 68.1.1 class BlockMBS

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** A class to use blocks on Mac OS X with declares.
**Blog Entries**

- Three new controls for iOS in Xojo
- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio Plugins, version 16.2pr6
- MBS Xojo / Real Studio Plugins, version 13.4pr4

**Xojo Developer Magazine**

- 14.4, page 10: News

### 68.1.2 Methods

### 68.1.3 Close

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Releases all blocks.

### 68.1.4 GetBlockB(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockB event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread. With running the event later, we can of course not return the event result to the block caller, but only the value in the AsyncBoolResult property.

### 68.1.5 GetBlockBI(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockBI event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread. With running the event later, we can of course not return the event result to the block caller, but only the value in the AsyncBoolResult property.

### 68.1.6 GetBlockBII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockBII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread. With running the event later, we can of course not return the event result to the block caller, but only the value in the AsyncBoolResult property.

### 68.1.7 GetBlockBIII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockBIII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread. With running the event later, we can of course not return the event result to the block caller, but only the value

in the AsyncBoolResult property.

### 68.1.8 GetBlockBIIII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockBIIII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread. With running the event later, we can of course not return the event result to the block caller, but only the value in the AsyncBoolResult property.

### 68.1.9 GetBlockV(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockV event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread.

### 68.1.10 GetBlockVI(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockVI event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread.

### 68.1.11 GetBlockVII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockVII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread.

### 68.1.12 GetBlockVIII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockVIII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread.

### 68.1.13 GetBlockVIIII(tag as Variant = nil) as Integer

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Returns the address of a block to pass to a declare.
**Notes:** Tag is passed to the event.
Later when the block is invoked, the BlockVIIII event is called. If the block is invoked on the main thread, we call the event directly. Else we schedule to call the event as soon as possible on the main thread.

### 68.1.14 Properties

### 68.1.15 AsyncBoolResult as Boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** The result for a boolean block called on a non main thread.
**Notes:** If you use one of the BlockB methods to get a block and it's called on another thread but the main thread, we return the value of this property instead of the actual event result.
(Read only property)

### 68.1.16 Synchronous as Boolean

MBS Util Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Whether to call events synchronously.
**Notes:** If the block is called on another thread, the plugin calls the event on the main thread.
If Synchronous is true, we call the main thread synchronously, else asynchronously.
Default is asynchronously to avoid dead locks.
(Read and Write property)

### 68.1.17 Events

### 68.1.18 BlockB(Async_ as boolean, tag as Variant) as boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
If you return a boolean, we pass it to the caller if async=false. For Async = true, the plugin already passed back AsyncBoolResult for you before this event is called.

### 68.1.19 BlockBI(Async_ as boolean, tag as Variant, value as Integer) as boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.
If you return a boolean, we pass it to the caller if async=false. For Async = true, the plugin already passed back AsyncBoolResult for you before this event is called.

### 68.1.20 BlockBII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer) as boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.
If you return a boolean, we pass it to the caller if async=false. For Async = true, the plugin already passed back AsyncBoolResult for you before this event is called.

### 68.1.21 BlockBIII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer, value3 as Integer) as boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.
If you return a boolean, we pass it to the caller if async=false. For Async = true, the plugin already passed back AsyncBoolResult for you before this event is called.

### 68.1.22 BlockBIIII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer) as boolean

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.
If you return a boolean, we pass it to the caller if async=false. For Async = true, the plugin already passed back AsyncBoolResult for you before this event is called.

### 68.1.23 BlockV(Async_ as boolean, tag as Variant)

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.

### 68.1.24 BlockVI(Async_ as boolean, tag as Variant, value as Integer)

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.

### 68.1.25 BlockVII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer)

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.

### 68.1.26 BlockVIII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer, value3 as Integer)

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.

### 68.1.27 BlockVIIII(Async_ as boolean, tag as Variant, value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer)

MBS Util Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** Called when block is invoked.
**Notes:** Async: False if block is invoked directly on main thread. Else true so invoked later on main thread.
Tag: The tag value passed on block creation.
Value properties give the actual values. You may need to cast to Ptr, Boolean or whatever data type you expect.

## 68.2 class SoftDeclareMBS

### 68.2.1 class SoftDeclareMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A way to do soft linking to libraries.
**Example:**

```
// Load the Stuffit Bundle on Mac OS X:
dim f as FolderItem
dim s as SoftDeclareMBS

f=FrameworksFolderMBS(-32765).Child("StuffIt.framework")
s=new SoftDeclareMBS

if s.LoadFrameworkFile(f) then
MsgBox "ok"
end if
```

**Notes:** Deprecated. Please move to newer DeclareLibraryMBS and DeclareFunctionMBS classes.

You can make a declare like this:

Declare Function SpeakString lib "SpeechLib" (SpeakString as pstring) as Integer

But what if the SpeechLib is not installed?
Simple, but your application won't even launch on this machine.
Now you can of course use this MBS Plugin using the SpeechMBS functions, which are all week linked.
But you can also use this class to weak link to the SpeechMBS library like this:

```
dim b as boolean, m,p as memoryblock, c as SoftDeclareMBS

c=new SoftDeclareMBS
p=newmemoryBlock(256) // make the string for the first parameter
p.pstring(0)="Hello World!"

m=newmemoryBlock(4) // make the memoryblock for the parameters
m.long(0)=p.Address(0) // set the first parameter to the address of the string buffer

if c.loadlibrary("SpeechLib") then // Load librarys
if c.loadfunction("SpeakString") then // Load function
b=c.Call(1,m)
end if
```

```
end if
```

This way your application will be loaded, you can call the function, but people who don't have the SpeechLib will also here it.

**Blog Entries**

- LiteSync and Xojo

**Xojo Developer Magazine**

- 5.1, page 45: Detecting Rosetta, Are we running under emulation? by Christian Schmitz

### 68.2.2 Methods

### 68.2.3 CallFunction(param as string,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function.
**Example:**

```
dim c as SoftDeclareMBS
dim m,p,b as memoryBlock
dim f as folderItem
dim path as string

f=ApplicationsFolderMBS(-32766) // get a folder...
path=f.NativePath

MsgBox path

b=newmemoryBlock(1024)
b.long(0)=0 // make empty C string

p=newmemoryBlock(lenb(path)+3)
p.cstring(0)=path

m=newmemoryBlock(12+10)
m.long(0)=p.AddressMBS(0)
m.long(4)=b.AddressMBS(0)
m.long(8)=1023

c=new SoftDeclareMBS
if c.LoadDLL("KERNEL32") then
if c.loadfunction("GetShortPathNameA") then
c.CallingMode=0
MsgBox "found function"
```

```
if c.CallFunction("iii",m) then
msgbox "Short path is: "+b.cstring(0)
else
msgbox "Failed to call function."
end if
else
msgbox "Loading of function "+c.FunctionName+" failed."
end if
else
msgbox "Loading of Kernel32 failed."
end if
```

**Notes:** The param string is a combination of the characters "i" for integer, "l" for 64bit integer, "f" for single (float) and "d" for double.
Use "i" for booleans, shorts and pointers.

the memoryblock must match exactly the parameters you specified.
Returns true on success.
See also:

- 68.2.4 CallFunction(paramcount as Integer,data as memoryblock) as boolean 12022

### 68.2.4 CallFunction(paramcount as Integer,data as memoryblock) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function.
**Example:**

```
dim c as SoftDeclareMBS
dim m,p,b as memoryBlock
dim f as folderItem
dim path as string

f=ApplicationsFolderMBS(-32766) // get a folder...
path=f.NativePath

MsgBox path

b=newmemoryBlock(1024)
b.long(0)=0 // make empty C string

p=newmemoryBlock(lenb(path)+3)
p.cstring(0)=path
```

```
m=newmemoryBlock(12+10)
m.long(0)=p.AddressMBS(0)
m.long(4)=b.AddressMBS(0)
m.long(8)=1023

c=new SoftDeclareMBS
if c.LoadDLL("KERNEL32") then
if c.loadfunction("GetShortPathNameA") then
c.CallingMode=0
MsgBox "found function"
if c.CallFunction(3,m) then
msgbox "Short path is: "+b.cstring(0)
else
msgbox "Failed to call function."
end if
else
msgbox "Loading of function "+c.FunctionName+" failed."
end if
else
msgbox "Loading of Kernel32 failed."
end if
```

**Notes:** If paramtercount is 0, the memoryblock is ignored.
The size of the memoryblock must be minimum 4*paramcount.
Each parameter is set using m.long(n*4) where n=0 is the first parameter.
A parameter may be any integer value or an address of a memoryblock. The address can be read using memoryblock.addressMBS which is part of the plugin. You can even use only one memoryblock for all 3 parameters in the example like this:

```
m=newmemoryBlock(2100)
m.cstring(1024)=path
m.long(0)=m.address(20)
m.long(4)=m.address(1024)
m.long(8)=1024
```

First 12 bytes for the parameter table, the next 1000 bytes for the result buffer and finally a thousand bytes for the input string.

Before RB 3.1 this function was named "Call", but RB5 requires that the word "Call" is no longer valid for a function name.

Softdeclare is limited to only 6 parameters for plugin version 3.2. Plugin version 3.3 extends this to 8 parameters.
See also:

- 68.2.3 CallFunction(param as string,data as memoryblock) as boolean 12021

### 68.2.5 CallFunctionDouble(param as string,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns a double value.
**Notes:** The param string is a combination of the characters "i" for integer, "l" for 64bit integer, "f" for single (float) and "d" for double.
Use "i" for booleans, shorts and pointers.

the memoryblock must match exactly the parameters you specified.
Returns true on success.
See also:

- 68.2.6 CallFunctionDouble(paramcount as Integer,data as memoryblock) as boolean 12024

### 68.2.6 CallFunctionDouble(paramcount as Integer,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns a double value.
**Notes:** Fills the ResultDouble property.

If paramtercount is 0, the memoryblock is ignored.
The size of the memoryblock must be minimum 4*paramcount.
Each parameter is set using m.long(n*4) where n=0 is the first parameter.
A parameter may be any integer value or an address of a memoryblock. The address can be read using memoryblock.addressMBS which is part of the plugin.
Only 10 parameters can currently be used.
See also:

- 68.2.5 CallFunctionDouble(param as string,data as memoryblock) as boolean 12024

### 68.2.7 CallFunctionInteger64(param as string,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns an integer value.
**Notes:** The param string is a combination of the characters "i" for integer, "l" for 64bit integer, "f" for single (float) and "d" for double.
Use "i" for booleans, shorts and pointers.

the memoryblock must match exactly the parameters you specified.
Returns true on success.
See also:

- 68.2.8 CallFunctionInteger64(paramcount as Integer,data as memoryblock) as boolean 12025

### 68.2.8 CallFunctionInteger64(paramcount as Integer,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns an integer value.
**Notes:** Fills the ResultInt64 property.

If paramtercount is 0, the memoryblock is ignored.
The size of the memoryblock must be minimum 4*paramcount.
Each parameter is set using m.long(n*4) where n=0 is the first parameter.
A parameter may be any integer value or an address of a memoryblock. The address can be read using memoryblock.addressMBS which is part of the plugin.
Only 10 parameters can currently be used.
See also:

- 68.2.7 CallFunctionInteger64(param as string,data as memoryblock) as boolean 12024

### 68.2.9 CallMethod(param as string,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns no value.
**Notes:** The param string is a combination of the characters "i" for integer, "l" for 64bit integer, "f" for single (float) and "d" for double.
Use "i" for booleans, shorts and pointers.

the memoryblock must match exactly the parameters you specified.
Returns true on success.
See also:

- 68.2.10 CallMethod(paramcount as Integer,data as memoryblock) as boolean 12025

### 68.2.10 CallMethod(paramcount as Integer,data as memoryblock) as boolean

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a function which returns no value.
**Notes:** If paramtercount is 0, the memoryblock is ignored.

The size of the memoryblock must be minimum 4*paramcount.
Each parameter is set using m.long(n*4) where n=0 is the first parameter.
A parameter may be any integer value or an address of a memoryblock. The address can be read using memoryblock.addressMBS which is part of the plugin.
Only 10 parameters can currently be used.
Returns true on success.
See also:

- 68.2.9 CallMethod(param as string,data as memoryblock) as boolean 12025

### 68.2.11 CopyLibrary(byref target as SoftDeclareMBS)

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the library handle to another softdeclare object.
**Notes:** if target is nil, a new object is created.
The library handle in the target object is set to point to the same library as the original object.

### 68.2.12 FreeLibrary as boolean

MBS Util Plugin, Plugin Version: 5.4, Platform: Windows, Targets: All.

**Function:** Releases the library.
**Notes:** Only for Windows currently this function releases the handles and unloads the library. Windows internally has a reference counter for the library so memory is only released when the last reference is freed. Lasterror is set.

### 68.2.13 LoadConstant(constname as string) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a constant from inside the library.
**Example:**

```
dim c as SoftDeclareMBS
dim s as CFStringMBS
dim m as MemoryBlock
dim handle as Integer

// Test Mac OS X
// Load the constant kABFirstNameProperty from the Addressbook framework

c=new SoftDeclareMBS
```

```
if c.LoadFramework("Addressbook.framework") then
msgbox "Loaded "+c.libname+" to "+format(c.libhandle,"-0")+"."
if c.LoadConstant("kABFirstNameProperty") then
msgbox "Loaded constant "+c.ConstantName+" to "+format(c.ConstantPointer,"-0")+"."

m=NewMemoryBlockFromPtrMBS(c.ConstantPointer) // I hope it's not nil!

handle=m.Long(0)
if handle<>0 then
s=new CFStringMBS
s.Handle=handle

msgbox "Got value: "+s.str
end if
else
msgbox "Loading of constant "+c.ConstantName+" failed."
end if
else
msgbox "Loading of Addressbook.framework failed."
end if
```

**Notes:** Lasterror is set.

### 68.2.14 LoadDLL(libname as string) as boolean

MBS Util Plugin, Plugin Version: 5.4, Platform: Windows, Targets: All.

**Function:** Loads a Windows DLL.
**Notes:** Lasterror is set.
libname can be name (e.g. "KERNEL32"), filename (e.g. "KERNEL32.DLL") or path (e.g. "C:\WINDOWS\KERNEL32.DLL").

### 68.2.15 LoadDLLfromMemory(data as string) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platform: Windows, Targets: All.

**Function:** Loads a Windows DLL from a string.
**Notes:** Some libraries don't like to be loaded from a string.
But else you can pass any DLL file content to this function.

The string is locked so it stays in memory.
On success the handle property is not zero and the function returns true.

### 68.2.16 LoadDylib(path as string) as boolean

MBS Util Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** Loads a library in Mac OS X dylib format.
**Notes:** Lasterror and Liberror are set.

### 68.2.17 LoadFramework(frameworkfilename as string) as boolean

MBS Util Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** Loads a framework in Mac OS X.
**Example:**

```
// A user's question:
// I am trying to call this to Carbon.framework using the softdeclare function:

// UInt32 SwapQDTextFlags(UInt32 newFlags);

// flags are OR'd

// kQDUseDefaultTextRendering = 0
// kQDUseTrueTypeScalerGlyphs = (1 «0)
// kQDUseCGTextRendering = (1 «1)
// kQDUseCGTextMetrics = (1 «2)
// kQDDontChangeFlags = 0xFFFFFFFF

// The call is to make the system use Quartz rendering for QuickDraw text (like the text in my WASTE-
Field). How should I call this?

// The solution code:

dim s as SoftDeclareMBS
dim m as MemoryBlock

const flags=-1 // = 0xFFFFFFFF

s=new SoftDeclareMBS
m=NewMemoryBlock(10)
m.Long(0)=flags

if s.LoadFramework("Carbon.Framework") then
if s.LoadFunction("SwapQDTextFlags") then
if s.CallFunction(1,m) then
```

```
MsgBox str(s.Result) // returns 7 for me (using Silk)
end if
end if
end if

// Without any error checking!
```

**Notes:** frameworkfilename is e.g. "Carbon.framework"
Lasterror is set.

### 68.2.18 LoadFrameworkFile(frameworkpath as folderitem) as boolean

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Loads on Mac OS X a framework from the given file specification.
**Example:**

```
dim f as FolderItem
dim s as SoftDeclareMBS

f=SpecialFolder.Desktop.Child("spellcheck.bundle")
s=new SoftDeclareMBS

if s.LoadFrameworkFile(f) then
MsgBox "OK"
end if
```

**Notes:** Returns true if successfull.
Lasterror is set.

### 68.2.19 LoadFunction(funcname as string) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a function from inside the library.
**Example:**

```
dim s as SoftDeclareMBS
dim m as MemoryBlock

const flags=-1 // = 0xFFFFFFFF
```

```
s=new SoftDeclareMBS
m=NewMemoryBlock(10)
m.Long(0)=flags

if s.LoadLibrary("Carbon.Framework") then
if s.LoadFunction("SwapQDTextFlags") then
if s.CallFunction(1,m) then
MsgBox str(s.Result) // returns 7 for me (using Silk)
end if
end if
end if
```

**Notes:** A user's question:
I am trying to call this to Carbon.framework using the softdeclare function:

UInt32 SwapQDTextFlags(UInt32 newFlags);

flags are OR'd

kQDUseDefaultTextRendering = 0
kQDUseTrueTypeScalerGlyphs = (1 «0)
kQDUseCGTextRendering = (1 «1)
kQDUseCGTextMetrics = (1 «2)
kQDDontChangeFlags = 0xFFFFFFFF

The call is to make the system use Quartz rendering for QuickDraw text (like the text in my WASTEField).
How should I call this?

The solution code is above without any error checking!

Lasterror is set.

### 68.2.20 LoadLibrary(libname as string) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a library.
**Notes:** On Mac OS X e.g. "Carbon.framework" or "System.framework".
On Mac OS Carbon inside Classic e.g. "CarbonLib".
On Windows e.g. "KERNEL32" or "USER32".

Lasterror is set.

### 68.2.21 ParametersSupported(param as string) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tests whether plugin supports the given parameter string.
**Notes:** The param string is a combination of the characters "i" for integer, "l" for 64bit integer, "f" for single (float) and "d" for double.
Use "i" for booleans, shorts and pointers.

Any new parameter string can be added. Please send an email to support to get a new combination added.

### 68.2.22 Properties

### 68.2.23 CallingMode as Integer

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What calling mode to use.
**Notes:** 0 = Pascal (default)
1 = C

The Windows API works with Pascal, but calls to QuickTime DLL use C.
(Read and Write property)

### 68.2.24 ConstantFound as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Was the constant loaded?
**Notes:** Set by the LoadConstant function.
(Read and Write property)

### 68.2.25 ConstantName as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the constant to load.
**Notes:** Set by the LoadConstant function.

(Read and Write property)

### 68.2.26 ConstantPointer as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pointer of the constant loaded.
**Notes:** Set by the LoadConstant function.
(Read and Write property)

### 68.2.27 FunctionFound as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Was the function loaded?
**Notes:** Set by the LoadFunction function.
(Read only property)

### 68.2.28 FunctionName as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the function to load.
**Notes:** Set by the LoadFunction function.
(Read and Write property)

### 68.2.29 FunctionPointer as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pointer of the function loaded.
**Notes:** Set by the LoadFunction function.
(Read and Write property)

### 68.2.30 Lasterror as Integer

MBS Util Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** LoadLibraryFile, LoadLibrary, LoadFunction, LoadConstant and FreeLibrary set this property.

(Read and Write property)

### 68.2.31 Liberror as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An error message from loadlibrary.
**Notes:** Set by the LoadLibrary function.
(Read and Write property)

### 68.2.32 Libfound as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Was the library loaded?
**Notes:** Set by the LoadLibrary function.
(Read only property)

### 68.2.33 Libhandle as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle of the library loaded.
**Notes:** Set by the LoadLibrary function.
On Mac OS Classic a CFragConnectionID.
On Mac OS X a CFBundleRef.
On Windows a HINSTANCE.
(Read and Write property)

### 68.2.34 Libname as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the library to load.
**Notes:** Set by the LoadLibrary function.
(Read and Write property)

### 68.2.35 Result as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The result of the call function.
**Notes:** Set by the Call function.
(Read and Write property)

### 68.2.36 ResultDouble as Double

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The result of the call function CallFunctionDouble.
**Notes:** (Read and Write property)

### 68.2.37 ResultInt64 as MemoryBlock

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The result of the call function CallFunctionInteger64.
**Example:**

```
dim s as SoftDeclareMBS
dim m as MemoryBlock

s=new SoftDeclareMBS
if s.LoadDLL("test64bit.dll") then
if s.LoadFunction("Get64bitNumber") then
if s.CallFunctionInteger64(0,nil) then
MsgBox hex(s.ResultInt64.long(4))+hex(s.ResultInt64.long(0))
end if
end if
end if

' DLL was created with a function like this:
' IMPEXP long long Get64bitNumber()
' {
' return 0x1122334455667788;
' }
```

**Notes:** (Read and Write property)

# Chapter 69

# DirectShow

## 69.1 class DirectShowAMCameraControlMBS

### 69.1.1 class DirectShowAMCameraControlMBS

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This interface provides local or remote control over a camera.
**Example:**

```
dim srcFilter as DirectShowBaseFilterMBS // your device
dim a as DirectShowAMCameraControlMBS = srcFilter.AMCameraControl

// query range for zoom
dim ZoomMin as integer
dim ZoomMax as integer
dim ZoomStep as integer
dim ZoomDefault as Integer
dim ZoomFlags as integer
a.GetRange(a.kPropertyZoom, ZoomMin, ZoomMax, ZoomStep, ZoomDefault, ZoomFlags)
dim ErrorCode as integer = a.Lasterror
dim ErrorText as string = a.LasterrorMessage

Break // check in debugger

// set a minimum value
a.Set(a.kPropertyZoom, (ZoomMax-ZoomMin)/2, 0)
ErrorCode = a.Lasterror
ErrorText = a.LasterrorMessage

Break // check in debugger
```

**Notes:** Applications can use this interface to control camera settings such as zoom, pan, aperture adjustment, or shutter speed. To obtain this interface, query the filter that controls the camera.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr4
- MBS Real Studio Plugins, version 12.4pr9

### 69.1.2 Methods

### 69.1.3 Constructor

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.1.4 Get(PropertySelector as Integer, byref Value as Integer, byref Flags as Integer)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This method retrieves the current setting of a camera property.
**Notes:** PropertySelector: A long value that specifies the property to retrieve, see kProperty* constants.
Value: receives the value of the property.
Flags: Receives a member of the CameraControlFlags enumeration. The returned value indicates whether the setting is controlled manually or automatically.

Lasterror is set.

### 69.1.5 GetRange(PropertySelector as Integer, byref MinValue as Integer, byref MaxValue as Integer, byref SteppingDelta as Integer, byref DefaultValue as Integer, byref CapsFlags as Integer)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This method retrieves the range and default value of a specified camera property.
**Example:**

```
dim srcFilter as DirectShowBaseFilterMBS // your device
dim a as DirectShowAMCameraControlMBS = srcFilter.AMCameraControl
```

```
// query range for zoom
dim ZoomMin as integer
dim ZoomMax as integer
dim ZoomStep as integer
dim ZoomDefault as Integer
dim ZoomFlags as integer
a.GetRange(a.kPropertyZoom, ZoomMin, ZoomMax, ZoomStep, ZoomDefault, ZoomFlags)
dim ErrorCode as integer = a.Lasterror
dim ErrorText as string = a.LasterrorMessage

Break // check in debugger
```

**Notes:** PropertySelector: A long value that specifies the property to query, see kProperty* constants.
MinValue: Receives the minimum value of the property.
MaxValue: Receives the maximum value of the property.
SteppingDelta: Receives the step size for the property. The step size is the smallest increment by which the property can change.
DefaultValue: Receives the default value of the property.
CapsFlags: Receives an element of the CameraControlFlags enumeration, indicating whether the property is controlled automatically or manually.

Lasterror is set.

### 69.1.6 Set(PropertySelector as Integer, Value as Integer, Flags as Integer = 0)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This method sets a specified property on the camera.
**Notes:** PropertySelector: A long value that specifies the property to set, see kProperty* constants.
Value: A long value that specifes the new value of the property.
Flags: A long value that specifies the desired control setting. See kFlags* constants.

Lasterror is set.

### 69.1.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Shows properties dialog.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.

Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.1.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "") 12038

### 69.1.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop only.

**Function:** Shows properties dialog.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.1.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "") 12037

### 69.1.9 Properties

### 69.1.10 Handle as Integer

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IAMCameraControl interface.
(Read and Write property)

### 69.1.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.1.12 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.1.13 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAuto | 1 | The setting is controlled automatically. |
| kFlagsManual | 2 | The setting is controlled manually. |

Properties

| Constant | Value | Description |
|---|---|---|
| kPropertyExposure | 4 | Identifies the exposure setting, in log base 2 seconds. In other words, for values less than zero, the exposure time is 1/2n seconds, and for values zero or above, the exposure time is 2n seconds. For example:<br>Value Seconds<br>-3 1/8<br>-2 1/4<br>-1 1/2<br>0 1<br>1 2<br>2 4 |
| kPropertyFocus | 6 | Specifies the camera's focus setting, as the distance to the optimally focused target, in millimeters. The range and default value are specific to the device. |
| kPropertyIris | 5 | Specifies the camera's iris setting, in units of fstop * 10. |
| kPropertyPan | 0 | Identifies the camera's pan setting, in degrees. Values range from –180 to +180, with the default set to zero. Positive values are clockwise from the origin (the camera rotates clockwise when viewed from above), and negative values are counterclockwise from the origin. |
| kPropertyRoll | 2 | Identifies the camera's roll setting, in degrees. Values range from –180 to +180, with the default set to zero. Positive values cause a clockwise rotation of the camera along the image-viewing axis, and negative values cause a counterclockwise rotation of the camera. |
| kPropertyTilt | 1 | Identifies the camera's tilt setting, in degrees. Values range from –180 to +180, with the default set to zero. Positive values point the imaging plane up, and negative values point the imaging plane down. |
| kPropertyZoom | 3 | Identifies the camera's zoom setting, in millimeters. Values range from 10 to 600, and the default is specific to the device. |

## 69.2 class DirectShowAMCrossbarMBS

### 69.2.1 class DirectShowAMCrossbarMBS

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IAMCrossbar interface routes signals from an analog or digital source to a video capture filter.
**Notes:** This interface is implemented by the Analog Video Crossbar Filter. The Analog Video Crossbar filter is modeled after a general switching matrix, with n inputs and m outputs. For example, a video card might have two external connectors: a coaxial connector for TV, and an S-video input. These would be represented as input pins on the filter. To select one of the inputs, an application would use the IAMCrossbar interface to "route" an input pin to the filter's output pin, by calling the Route method.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd389171(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr4
- MBS Xojo / Real Studio Plugins, version 14.1pr3
- MBS Real Studio Plugins, version 12.5pr1

### 69.2.2 Methods

### 69.2.3 BaseFilter as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the base filter for the crossbar.
**Notes:** See also:
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390991(v=vs.85).aspx

### 69.2.4 CanRoute(OutputPinIndex as Integer, InputPinIndex as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CanRoute method queries whether a specified input pin can be routed to a specified output pin.
**Notes:** OutputPinIndex: Specifies the index of the output pin.
InputPinIndex: Specifies the index of input pin.
Lasterror is set.

Returns true if two pins can be routed.

To route the pins, call the Route method. Output pins and input pins are both indexed from zero. To determine the number of output and input pins, call the getPinCounts method.

### 69.2.5 Constructor

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.2.6 GetCrossbarPinInfo(IsInputPin as boolean, PinIndex as Integer, byref PinIndexRelated as Integer, byref PhysicalType as Integer)

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The getCrossbarPinInfo method retrieves information about a specified pin.
**Notes:** IsInputPin: Specifies the direction of the pin. Use one of the following values.

| Value | Meaning |
|---|---|
| True | Input pin |
| False | Output pin |

PinIndex: Specifies the index of the pin.
PinIndexRelated: Variable that receives the index of the related pin, or –1 if no pin is related to this pin. The related pin is a pin on the same filter, with the same direction; it typically represents the same physical jack or connector. For example, a video tuner and an audio tuner might be related pins. Typically, if two pins are related, you should route them together.
PhysicalType: Variable that receives a member of the PhysicalConnectorType enumeration, indicating the pin's physical type.

Lasterror is set.
Output pins and input pins are both indexed from zero. To determine the number of output and input pins, call the getPinCounts method.

### 69.2.7 GetPinCounts(byref OutputPinCount as Integer, byref InputPinCount as Integer)

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The getPinCounts method retrieves the number of input and output pins on the crossbar filter.
**Notes:** OutputPinCount: Variable that receives the number of output pins.
InputPinCount: Variable that receives the number of input pins.

Lasterror is set.

The other IAMCrossbar methods take parameters that specify pins by index number. For these methods, output pins and input pins are both indexed from zero. Use the getPinCounts method to determine the upper bounds for each.

### 69.2.8 IsRoutedTo(InputPinIndex as Integer) as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IsRoutedTo method retrieves the input pin that is currently routed to the specified output pin.
**Notes:** OutputPinIndex: Specifies the index of the output pin.
InputPinIndex: Variable that receives the index of the input pin, or -1 if no input pin is routed to this output pin.

Output pins and input pins are both indexed from zero. To determine the number of output and input pins, call the getPinCounts method.
Lasterror is set.

### 69.2.9 PhysicalPinName(type as Integer) as string

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the name for a given type.
**Notes:** Just a convenience method to return english names for types.

### 69.2.10 Route(OutputPinIndex as Integer, InputPinIndex as Integer)

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Route method routes an input pin to an output pin.
**Notes:** OutputPinIndex: Specifies the index of the output pin.
InputPinIndex: Specifies the index of the input pin.

Lasterror is set.

Routing two pins causes the output pin to deliver data from that input pin. Only one input pin at a time can be routed to a given output pin.
Output pins and input pins are both indexed from zero. To determine the number of output and input pins, call the getPinCounts method.

### 69.2.11 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.2.12 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "") 12043

### 69.2.12 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Example:**

```
dim Capture as DirectShowCaptureGraphBuilderMBS // your capture graph
dim srcfilter as DirectShowBaseFilterMBS // your source filter

Dim AMCrossbar As DirectShowAMCrossbarMBS = srcfilter.AMCrossbar
If AMCrossbar <>Nil Then
AMCrossbar.ShowPropertyDialog
MsgBox "Result: "+Str(AMCrossbar.Lasterror)+": "+AMCrossbar.LasterrorMessage
Else
MsgBox "No AMCrossbar."
End If
```

**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.2.11 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "") 12043

### 69.2.13 Properties

### 69.2.14 Handle as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IAMCrossbar interface.
(Read and Write property)

### 69.2.15 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.2.16 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.2.17 Constants

Physical Type Constants

| Constant | Value | Description |
|---|---|---|
| PhysConn_Audio_1394 | 4103 | Specifies an IEEE 1394 pin for audio. |
| PhysConn_Audio_AESDigital | 4099 | Specifies an AES/EBU (Audio Engineering Society/European Broadcas Union) digital pin for audio. |
| PhysConn_Audio_AudioDecoder | 4105 | Specifies an audio decoder pin. |
| PhysConn_Audio_AUX | 4102 | Specifies an AUX pin for audio. |
| PhysConn_Audio_Line | 4097 | Specifies a line pin for audio. |
| PhysConn_Audio_Mic | 4098 | Specifies a microphone pin. |
| PhysConn_Audio_SCSI | 4101 | Specifies a SCSI pin for audio. |
| PhysConn_Audio_SPDIFDigital | 4100 | Specifies an S/PDIF (Sony/Philips Digital Interface Format) digital pin fo audio. |
| PhysConn_Audio_Tuner | 4096 | Specifies a tuner pin for audio. |
| PhysConn_Audio_USB | 4104 | Specifies a USB pin for audio. |
| PhysConn_Video_1394 | 10 | Specifies an IEEE 1394 pin for video. |
| PhysConn_Video_AUX | 9 | Specifies an AUX (auxiliary) pin for video. |
| PhysConn_Video_Black | 15 | Not used. |
| PhysConn_Video_Composite | 2 | Specifies a composite pin for video. |
| PhysConn_Video_ParallelDigital | 7 | Specifies a parallel digital pin for video. |
| PhysConn_Video_RGB | 4 | Specifies an RGB pin for video. |
| PhysConn_Video_SCART | 14 | Specifies a SCART (Peritel) pin for video. |
| PhysConn_Video_SCSI | 8 | Specifies a SCSI (Small Computer System Interface) pin for video. |
| PhysConn_Video_SerialDigital | 6 | Specifies a serial digital pin for video. |
| PhysConn_Video_SVideo | 3 | Specifies an S-Video (Y/C video) pin. |
| PhysConn_Video_Tuner | 1 | Specifies a tuner pin for video. |
| PhysConn_Video_USB | 11 | Specifies a USB (Universal Serial Bus) pin for video. |
| PhysConn_Video_VideoDecoder | 12 | Specifies a video decoder pin. |
| PhysConn_Video_VideoEncoder | 13 | Specifies a video encoder pin. |
| PhysConn_Video_YRYBY | 5 | Specifies a YRYBY (Y, R–Y, B–Y) pin for video. |

## 69.3 class DirectShowAMStreamConfigMBS

### 69.3.1 class DirectShowAMStreamConfigMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IAMStreamConfig interface sets the output format on certain capture and compression filters, for both audio and video.
**Notes:** Applications can use this interface to set format properties, such as the output dimensions and frame rate (for video) or the sample rate and number of channels (for audio).
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 19.1pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.3.2 Methods

### 69.3.3 AudioCaps as DirectShowAudioStreamConfigCapsMBS()

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the audio capabilities.
**Notes:** Lasterror is set.
Returns empty array for video streams.

### 69.3.4 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.3.5 MediaTypes as DirectShowMediaTypeMBS()

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries media types.
**Notes:** Lasterror is set.
see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd319787(v=vs.85).aspx

### 69.3.6 NumberOfCapabilities as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number of format capabilities that this pin supports.
**Notes:** Lasterror is set.

### 69.3.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.3.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "") 12047

### 69.3.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Example:**

```
dim Capture as DirectShowCaptureGraphBuilderMBS // your capture graph
dim srcfilter as DirectShowBaseFilterMBS // your source filter

Dim AMStreamConfig2 As DirectShowAMStreamConfigMBS = capture.GetStreamConfig(False, srcfilter)
If AMStreamConfig2 <>Nil Then
AMStreamConfig2.ShowPropertyDialog

MsgBox "Result: "+Str(AMStreamConfig2.Lasterror)+": "+AMStreamConfig2.LasterrorMessage
Else
MsgBox "No AMStreamConfig with srcfilter."
End If
```

**Notes:** Parent: the parent window for the dialog.

X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.3.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "") 12047

### 69.3.9 VideoCaps as DirectShowVideoStreamConfigCapsMBS()

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the video capabilities.
**Notes:** Lasterror is set.
Returns empty array for audio streams.

### 69.3.10 Properties

### 69.3.11 Handle as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 69.3.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.3.13 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.3.14 Format as DirectShowMediaTypeMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the preferred output format.
**Notes:** Lasterror is set.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd319785(v=vs.85).aspx
http://msdn.microsoft.com/en-us/library/windows/desktop/dd319788(v=vs.85).aspx
(Read and Write computed property)

## 69.4 class DirectShowAMVideoCompressionMBS

### 69.4.1 class DirectShowAMVideoCompressionMBS

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IAMVideoCompression interface sets and retrieves video compression properties.
**Notes:** It is supported by some video compression filters, and also by some video capture filters that output compressed video. Filters that support this interface expose it through their output pins.
An application can use this interface to control how video is compressed, including characteristics such as the key-frame rate or the compression quality.
A filter that supports this interface might not support every method. Use the Capabilities property to determine which methods the filter supports.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr4
- MBS Xojo Plugins, version 19.1pr3

**Xojo Developer Magazine**

- 17.5, page 43: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 69.4.2 Methods

### 69.4.3 BaseFilter as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the base filter.
**Notes:** Lasterror and LastErrorMessage are set.

### 69.4.4 Constructor

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.4.5 OverrideFrameSize(FrameNumber as Integer, Size as Integer)

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The frame size of a specified frame.
**Notes:** The first frame that the filter delivers is numbered zero.
If the filter supports this method, the CompressionCaps_CanCrunch flag is in the Capabilities property. However, this flag can also indicate that the filter supports setting the bit rate, so it does not guarantee that the OverrideFrameSize method is supported.

Lasterror and LastErrorMessage are set.

### 69.4.6 OverrideKeyFrame(FrameNumber as Integer)

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The filter to compress a particular frame as a key frame.
**Notes:** The first frame that the filter delivers is numbered zero.
If the filter supports this method, you can use it to override the normal key-frame distribution for a particular frame. After the filter creates a key frame, it might reset its count to determine when the next key frame should occur. For example, if the key-frame rate is 10, and an application uses this method to force frame 5 as a key frame, the filter might wait another 10 frames (until frame 15) before it creates the next key frame.

Lasterror and LastErrorMessage are set.

### 69.4.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.4.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

### 69.4.8 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop only.

**Function:** Shows property dialog.
**Example:**

```
dim Capture as DirectShowCaptureGraphBuilderMBS // your capture graph
dim encoder as DirectShowBaseFilterMBS // your encoder filter

Dim AMVideoCompression As DirectShowAMVideoCompressionMBS = encoder.AMVideoCompression
If AMVideoCompression <>Nil Then
AMVideoCompression.ShowPropertyDialog
MsgBox "Result: "+Str(AMVideoCompression.Lasterror)+": "+AMVideoCompression.LasterrorMessage
Else
MsgBox "No AMVideoCompression."
end if
```

**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.4.7 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "") 12051

### 69.4.9 Properties

### 69.4.10 Capabilities as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives the compression capabilities, as a bitwise combination of zero or more CompressionCaps flags.
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.11 DefaultKeyFrameRate as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives the default key-frame rate.
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.12 DefaultPFramesPerKey as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives the default rate of predicted (P) frames per key frame.
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.13 DefaultQuality as Double

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives the default quality.
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.14 Description as String

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives a description string, such as "My Video Compressor."
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.15 Handle as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 69.4.16 KeyFrameRate as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The key-frame rate.
**Notes:** If the value is negative, the filter will use the default key-frame rate. If the value is zero, only the first frame will be a key frame.

To determine if the filter supports this method, call the Capabilities property and check for the CompressionCaps_CanKeyFrame flag.

Lasterror and LastErrorMessage are set.
(Read and Write property)

### 69.4.17 Lasterror as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.4.18 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.4.19 PFramesPerKeyFrame as Integer

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The rate of predicted (P) frames per key frame.
**Notes:** If the value is negative, the filter will use the default rate.
To determine if the filter supports this method, check for the CompressionCaps_CanBFrame flag in the Capabilities property.

Lasterror and LastErrorMessage are set.
(Read and Write property)

### 69.4.20 Quality as Double

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The compression quality.
**Notes:** Specifies the quality as a value between 0.0 and 1.0, where 1.0 indicates the best quality and 0.0 indicates the worst quality. If the value is negative, the filter will use the default quality.
To determine if the filter supports this method, check for the CompressionCaps_CanQuality flag in the Capabilities property.

Lasterror and LastErrorMessage are set.
(Read and Write property)

### 69.4.21 Version as String

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Receives a version string, such as "Version 2.1.0."
**Notes:** Lasterror and LastErrorMessage are set.
(Read only property)

### 69.4.22 WindowSize as UInt64

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of frames over which the compressor must maintain an average data rate.
**Notes:** For example, assuming a data rate of 100K/sec and a frame rate of 10 frames per second, if the window size is 1, then every frame will be 10K or less. If the window size is 5, then every five consecutive frames must average 10K per frame, but individual frames may exceed this size.
The window size, expressed as a number of frames.

Lasterror and LastErrorMessage are set.
(Read and Write property)

### 69.4.23 Constants

Compression Capabilities

| Constant | Value | Description |
|---|---|---|
| CompressionCapsCanBFrame | &h08 | Video compressor supports the PFramesPerKeyFrame properties. |
| CompressionCapsCanCrunch | &h02 | Video compressor can compress video to a specified data rate. If the compressor has this capability then the output pins media type will contain the data rate in the VIDEOINFOHEADER structure's BitRate member. The only way to set the data rate is to set BitRate. |
| CompressionCapsCanKeyFrame | &h04 | Video compressor supports the KeyFrameRate properties. |
| CompressionCapsCanQuality | &h01 | Video compressor supports the Quality property. |
| CompressionCapsCanWindow | &h10 | Video compressor supports the WindowSize properties. |

## 69.5 class DirectShowAMVideoControlMBS

### 69.5.1 class DirectShowAMVideoControlMBS

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IAMVideoControl interface controls certain video capture operations such as enumerating available frame rates and image orientation.
**Notes:** For Windows Driver Model (WDM) devices, the WDM Video Capture Filter automatically exposes this interface if the WDM driver supports the PROPSETID_VIDCAP_VIDEOCONTROL property set. For more information, see the Windows Driver Kit (WDK) documentation.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr1

**Xojo Developer Magazine**

- 19.3, page 10: News

### 69.5.2 Methods

### 69.5.3 Caps(pin as DirectShowPinMBS) as Integer

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetCaps method retrieves the capabilities of the underlying hardware.
**Notes:** Result is a combination of the flags from the VideoControl Flags, which specify the video control mode.

Possible capabilities include one or more of the following: flipping the picture horizontally, flipping the picture vertically, enabling external triggers, and simulating external triggers.

### 69.5.4 Constructor

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.5.5 CurrentActualFrameRate(pin as DirectShowPinMBS) as Int64

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetCurrentActualFrameRate method retrieves the actual frame rate, expressed as a frame duration in 100-nanosecond units. USB (Universal Serial Bus) and IEEE 1394 cameras may provide lower frame rates than requested because of bandwidth availability. This is only available during video streaming.
**Notes:** Pin: the pin to retrieve the frame rate from.

Lasterror is set.

### 69.5.6 FrameRateList(pin as DirectShowPinMBS, Index as Integer, Width as Integer, Height as Integer) as Int64()

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetFrameRateList method retrieves a list of available frame rates.
**Notes:** Pin: The pin to query for the list of frame rates.
Index: Index of the format to query for frame rates. This index corresponds to the order in which formats are enumerated by DirectShowVideoStreamConfigCapsMBS structures returned by DirectShowAMStreamConfigMBS.NumberOfCapabilities) minus one.
Width and Height: Frame image size (width and height) in pixels.

Returns an array of frame rates in 100-nanosecond units.

Lasterror is set.

### 69.5.7 MaxAvailableFrameRate(pin as DirectShowPinMBS, Index as Integer, Width as Integer, Height as Integer) as Int64

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetMaxAvailableFrameRate method retrieves the maximum frame rate currently available, based on bus bandwidth usage for connections, such as USB and IEEE 1394, where the maximum frame rate may be limited by bandwidth availability.
**Notes:** Pin: The pin to retrieve the maximum frame rate from.
Index: Index of the format to query for maximum frame rate. This index corresponds to the order in which formats are enumerated by GetStreamCaps. The value must range between zero and the number of supported DirectShowVideoStreamConfigCapsMBS returned by DirectShowAMStreamConfigMBS.NumberOfCapabilities) minus one.
Width and Height: Frame image size (width and height) in pixels.
MaxAvailableFrameRate: Pointer to the maximum available frame rate. The frame rate is expressed as frame duration in 100-nanosecond units.

Lasterror is set.

### 69.5.8 Mode(pin as DirectShowPinMBS) as Integer

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetMode method retrieves the video control mode of operation.
**Notes:** Possible modes of operation include one or more of the following: flipping the picture horizontally, flipping the picture vertically, enabling external triggers, and simulating external triggers.

Lasterror is set.

### 69.5.9 SetMode(pin as DirectShowPinMBS, mode as Integer)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetMode method sets the video control mode of operation.
**Example:**

```
dim pin as DirectShowPinMBS // your till image pin
dim filter as DirectShowBaseFilterMBS

dim vc as DirectShowAMVideoControlMBS = filter.AMVideoControl
vc.SetMode(pin, vc.FlagExternalTriggerEnable + vc.FlagTrigger)
```

**Notes:** Value specifying a combination of the flags from the VideoControl Flags to set the video control mode.

Possible modes of operation include one or more of the following: flipping the picture horizontally, flipping the picture vertically, enabling external triggers, and simulating external triggers.

Lasterror is set.

### 69.5.10 Properties

### 69.5.11 Handle as Integer

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IAMVideoControl interface.
(Read and Write property)

### 69.5.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.5.13 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.5.14 Constants

Capabilities Flags

| Constant | Value | Description |
|---|---|---|
| FlagExternalTriggerEnable | 2 | Sets up a stream to capture a trigger from an external source, for example, a push button on a camera. Buffers can be queued to the driver but will not be passed up from the WDM capture driver (for compression, display, or writing to a file) until the external event happens. |
| FlagFlipHorizontal | 0 | Specifies that the picture is flipped horizontally. |
| FlagFlipVertical | 1 | Specifies that the picture is flipped vertically. |
| FlagTrigger | 3 | In software, simulates an external trigger when the stream has the VideoControlFlag_ExternalTriggerEnable flag set. |

## 69.6 class DirectShowAMVideoProcAmpMBS

### 69.6.1 class DirectShowAMVideoProcAmpMBS

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The AMVideoProcAmp interface adjusts the qualities of an incoming video signal, such as brightness, contrast, hue, saturation, gamma, and sharpness.
**Notes:** The WDM Video Capture filter exposes this interface if the hardware supports image adjustment.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr9

### 69.6.2 Methods

### 69.6.3 Constructor

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.6.4 Get(PropertySelector as Integer, byref Value as Integer, byref Flags as Integer)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets video quality for a specified property.
**Notes:** PropertySelector: Specifies the property to retrieve, as a value from the kProperty* constants.
Value: Receives the value of the property.
Flags: Receives the flags. The returned value indicates whether the setting is controlled manually or automatically.
Lasterror is set.

### 69.6.5 GetRange(PropertySelector as Integer, byref MinValue as Integer, byref MaxValue as Integer, byref SteppingDelta as Integer, byref DefaultValue as Integer, byref CapsFlags as Integer)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum, maximum, and default values for setting properties.
**Notes:** PropertySelector: Specifies the property to retrieve, as a value from the kProperty* constants.
MinValue: Receives the minimum value of the property.

MaxValue: Receives the maximum value of the property.
SteppingDelta: Receives the step size for the property. The step size is the smallest increment by which the property can change.
DefaultValue: Receives the default value of the property.
CapsFlags: Receives a member of the VideoProcAmpFlags enumeration, indicating whether the property is controlled automatically or manually.
Lasterror is set.

### 69.6.6 Set(PropertySelector as Integer, Value as Integer, Flags as Integer = 0)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets video quality for a specified property.
**Notes:** PropertySelector: Specifies the property to retrieve, as a value from the kProperty* constants.
Value: The new value of the property.
Flags: The desired control setting. See kFlags* constants.

Lasterror is set.

### 69.6.7 Properties

### 69.6.8 Handle as Integer

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IAMVideoProcAmp interface.
(Read and Write property)

### 69.6.9 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.6.10 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.6.11 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAuto | 1 | The setting is controlled automatically. |
| kFlagsManual | 2 | The setting is controlled manually. |

Properties

| Constant | Value | Description |
|---|---|---|
| kPropertyBacklightCompensation | 8 | Specifies the backlight compensation setting. Possible values are 0 (off) and (on). |
| kPropertyBrightness | 0 | Specifies the brightness, also called the black level. For NTSC, the value i expressed in IRE units * 100. For non-NTSC sources, the units are arbitrary with zero representing blanking and 10,000 representing pure white. Value range from –10,000 to 10,000. |
| kPropertyColorEnable | 6 | Specifies the color enable setting. The possible values are 0 (off) and 1 (on). |
| kPropertyContrast | 1 | Specifies the contrast, expressed as gain factor * 100. Values range from zer to 10,000. |
| kPropertyGain | 9 | Specifies the gain adjustment. Zero is normal. Positive values are brighter an negative values are darker. The range of values depends on the device. |
| kPropertyGamma | 5 | Specifies the gamma, as gamma * 100. Values range from 1 to 500. |
| kPropertyHue | 2 | Specifies the hue, in degrees * 100. Values range from -180,000 to 180,000 (-18 to +180 degrees). |
| kPropertySaturation | 3 | Specifies the saturation. Values range from 0 to 10,000. |
| kPropertySharpness | 4 | Specifies the sharpness. Values range from 0 to 100. |
| kPropertyWhiteBalance | 7 | Specifies the white balance, as a color temperature in degrees Kelvin. Th range of values depends on the device. |

## 69.7 class DirectShowAudioStreamConfigCapsMBS

### 69.7.1 class DirectShowAudioStreamConfigCapsMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes a range of audio formats.
**Notes:** Audio compression and capture filters use this structure to describe the formats they can produce. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.7.2 Methods

### 69.7.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.7.4 Properties

### 69.7.5 BitsPerSampleGranularity as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Granularity of the bits per sample.
**Notes:** For example, the filter might specify 8 bits per sample through 32 bits per sample, in steps of 8.
(Read only property)

### 69.7.6 ChannelsGranularity as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Granularity of the channels.
**Notes:** For example, the filter might specify channels 2 through 4, in steps of 2.
(Read only property)

### 69.7.7 MaximumBitsPerSample as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum sample frequency.
**Notes:** (Read only property)

### 69.7.8 MaximumChannels as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum number of channels.
**Notes:** (Read only property)

### 69.7.9 MaximumSampleFrequency as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum sample frequency.
**Notes:** (Read only property)

### 69.7.10 MinimumBitsPerSample as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum bits per sample.
**Notes:** (Read only property)

### 69.7.11 MinimumChannels as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum number of channels.
**Notes:** (Read only property)

### 69.7.12 MinimumSampleFrequency as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum sample frequency.
**Notes:** (Read only property)

### 69.7.13 SampleFrequencyGranularity as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Granularity of the frequency.
**Notes:** For example, the filter might specify 11025 Hz to 44100 Hz, in steps of 11025 Hz.
(Read only property)

## 69.8 class DirectShowBaseFilterMBS

### 69.8.1 class DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The BaseFilter interface is the primary interface for DirectShow filters.
**Notes:** All DirectShow filters must expose this interface. The Filter Graph Manager uses this interface to control filters. Applications can use this interface to enumerate pins and query for filter information, but should not use it to change the state of a filter. Instead, use the MediaControl interface on the Filter Graph Manager.
Subclass of the DirectShowMediaFilterMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 19.1pr4

### 69.8.2 Methods

### 69.8.3 AMCameraControl as DirectShowAMCameraControlMBS

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries camera control object.
**Example:**

```
dim srcfilter as DirectShowBaseFilterMBS // your basefilter
dim value, flags as Integer
dim c as DirectShowAMCameraControlMBS = srcfilter.AMCameraControl
if c<>nil then

c.Get(c.kPropertyZoom, value, flags)
if c.Lasterror = 0 then
MsgBox "Zoom: "+str(value)
else
MsgBox "Zoom: "+c.LasterrorMessage
end if

c.Get(c.kPropertyFocus, value, flags)
if c.Lasterror = 0 then
MsgBox "Focus: "+str(value)
else
MsgBox "Focus: "+c.LasterrorMessage
end if
```

```
c.Get(c.kPropertyExposure, value, flags)
if c.Lasterror = 0 then
MsgBox "Exposure: "+str(value)
else
MsgBox "Exposure: "+c.LasterrorMessage
end if

end if
```

**Notes:** Returns object when this filter represents a device supporting this interface.
Else returns nil on any error.
Also sets lasterror property.

### 69.8.4 AMCrossbar as DirectShowAMCrossbarMBS

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the IAMCrossbar interface for this filter.
**Notes:** Returns nil if no such interface exists.

### 69.8.5 AMVideoCompression as DirectShowAMVideoCompressionMBS

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries video compression settings for the filter.

### 69.8.6 AMVideoControl as DirectShowAMVideoControlMBS

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the video controls for this filter.
**Notes:** Should work for capture filters.
Lasterror is set.

### 69.8.7 AMVideoProcAmp as DirectShowAMVideoProcAmpMBS

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries video properties object.
**Example:**

```
dim srcfilter as DirectShowBaseFilterMBS // your basefilter
dim value, flags as Integer
dim v as DirectShowAMVideoProcAmpMBS = srcfilter.AMVideoProcAmp
if v<>nil then
v.Get(v.kPropertyHue, value, flags)
if v.Lasterror = 0 then
MsgBox "Hue: "+str(value)
else
MsgBox "Hue: "+v.LasterrorMessage
end if

v.Get(v.kPropertyBrightness, value, flags)
if v.Lasterror = 0 then
MsgBox "Brightness: "+str(value)
else
MsgBox "Brightness: "+v.LasterrorMessage
end if

end if
```

**Notes:** Returns object when this filter represents a device supporting this interface.
Else returns nil on any error.
Also sets lasterror property.

### 69.8.8 ConfigAviMux as DirectShowConfigAviMuxMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the config avimux object.
**Notes:** Lasterorr is set.
Works only with filters which support this interface.

### 69.8.9 ConfigInterleaving as DirectShowConfigInterleavingMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the config interleaving object.
**Notes:** Lasterorr is set.
Works only with filters which support this interface.

### 69.8.10 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.8.11 EnumPins as DirectShowEnumPinsMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The EnumPins method enumerates the pins on this filter.
**Example:**

```
dim filter as DirectShowBaseFilterMBS // your device filter

dim pn as DirectShowEnumPinsMBS = srcfilter.EnumPins

// loop over them and show names of pins
dim p as DirectShowPinMBS = pn.NextObject
while p <>nil
dim name as string = p.Name

MsgBox name

p = pn.NextObject
wend
```

**Notes:** Lasterror is set.

### 69.8.12 FindPin(name as string) as DirectShowPinMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The FindPin method retrieves the pin with the specified identifier.
**Notes:** name: string that identifies the pin.

Returns the pin object.
Lasterror is set.

This method supports graph persistence. Use the DirectShowPinMBS.QueryId method to save a pin's state, and use this method to restore the state. The pin's identifier string is defined by the filter implementation. The identifier must be unique within the filter.

### 69.8.13 Info as DirectShowFilterInfoMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves information about the filter.
**Notes:** Lasterror is set.
Returns nil on error.

### 69.8.14 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Shows properties dialog for the filter.
**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.8.15 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "") 12071

### 69.8.15 ShowPropertyDialog(parent as window = nil, x as integer = 0, y as integer = 0, title as string = "")

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop only.

**Function:** Shows properties dialog for the filter.
**Example:**

```
dim srcfilter as DirectShowBaseFilterMBS // your filter

srcfilter.ShowPropertyDialog
MsgBox "Result: "+Str(srcfilter.Lasterror)+": "+srcfilter.LasterrorMessage
```

**Notes:** Parent: the parent window for the dialog.
X/Y: The offset of the dialog relative to the parent window.
Title: optional title for the dialog.

Sets lasterror property.
See also:

- 69.8.14 ShowPropertyDialog(parent as DesktopWindow, x as integer = 0, y as integer = 0, title as string = "") 12071

### 69.8.16 VendorInfo as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a string containing vendor information.
**Notes:** Lasterror is set.
This method is optional; filters are not required to support it.

## 69.9 class DirectShowBindContextMBS

### 69.9.1 class DirectShowBindContextMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides access to a bind context, which is an object that stores information about a particular moniker binding operation.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr2

### 69.9.2 Methods

### 69.9.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new bind context.

### 69.9.4 Properties

### 69.9.5 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IConfigAviMux interface.
(Read and Write property)

### 69.9.6 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.9.7 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.10 class DirectShowCaptureGraphBuilderMBS

### 69.10.1 class DirectShowCaptureGraphBuilderMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Builds capture graphs and other custom filter graphs.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd376359(v=vs.85).aspx
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr1
- MBS Xojo Plugins, version 18.4pr4
- MBS Xojo / Real Studio Plugins, version 14.1pr3

**Xojo Developer Magazine**

- 19.3, page 10: News

### 69.10.2 Methods

### 69.10.3 AllocCapFile(FilePath as string, Size as UInt64)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The AllocCapFile method preallocates a capture file to a specified size. For best results, always capture to a defragmented, preallocated capture file that is larger than the size of the capture data.
**Notes:** FilePath: a string that contains the name of the file to create or resize.
Size: Size of the file to allocate, in bytes.

Lasterror is set.

This method fails if the file is read-only.
It is best to allocate as much space as possible—ideally, more than needed. However, this can result in a very large file that contains relatively little data. For example, a 1-gigabyte (GB) capture file might contain a few megabytes of captured video. Use the CopyCaptureFile method to copy the data into a new file. That method copies only the data and ignores the empty portion of the original file.
If you use this method to preallocate the file, call SetMode on the file-writer filter with the value zero. If the filter is set to AM_FILE_OVERWRITE, it will delete the preallocated file. Note that some file-writer filters do not support mode 0.

### 69.10.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 69.10.5 Crossbar(filter as DirectShowBaseFilterMBS) as DirectShowAMCrossbarMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds a crossbar in the graph.
**Notes:** See also:
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390991(v=vs.85).aspx

This function implements the FindInterface call with LOOK_UPSTREAM_ONLY and the filter you provide.

### 69.10.6 FindPin(Source as DirectShowBaseFilterMBS, PinDirection as Integer, Category as DirectShowGUIDMBS = nil, Type as DirectShowGUIDMBS = nil, Unconnected as boolean = false, Num as Integer = 0) as DirectShowPinMBS

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The FindPin method retrieves a particular pin on a filter, or determines whether a given pin matches the specified criteria.
**Notes:** Source: an interface on a filter, or to an interface on a pin.
PinDirection: Specifies the pin direction (input or output). See constants in DirectShowPinMBS class.
Category: A GUID that specifies one of the pin categories listed in Pin Property Set. To match any pin, regardless of category, set this parameter to nil.
Type: A major type GUID that specifies the media type. Use nil to match any media type.
Unconnected: Boolean value that specifies whether the pin must be unconnected. If true, the pin must be unconnected. If false, the pin can be connected or unconnected.
num: Zero-based index of the pin to retrieve, from the set of matching pins. If Source is a filter, and more than one pin matches the search criteria, this parameter specifies which pin to retrieve. If Source is a pin, this parameter is ignored.

Returns the pin object.
Lasterror is set.

If Source is a filter, the method searches for the nth pin on that filter that matches the search criteria, where

n is given by the num parameter. If the method finds a matching pin, it returns the pin.
If Source is a pin, the method tests that pin against the search criteria. If the pin matches the criteria, the method returns the pin. Otherwise, it returns nil.

Typically, an application will not need to use this method. It is provided for unusually complex tasks, when the RenderStream method cannot build the filter graph. Use this method to retrieve a desired pin from a capture filter, and then build the rest of the graph manually.
See also:

- 69.10.7 FindPin(Source as DirectShowPinMBS, PinDirection as Integer, Category as DirectShowGUIDMBS = nil, Type as DirectShowGUIDMBS = nil, Unconnected as boolean = false, Num as Integer = 0) as DirectShowPinMBS 12077

### 69.10.7 FindPin(Source as DirectShowPinMBS, PinDirection as Integer, Category as DirectShowGUIDMBS = nil, Type as DirectShowGUIDMBS = nil, Unconnected as boolean = false, Num as Integer = 0) as DirectShowPinMBS

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The FindPin method retrieves a particular pin on a filter, or determines whether a given pin matches the specified criteria.
**Notes:** Source: an interface on a filter, or to an interface on a pin.
PinDirection: Specifies the pin direction (input or output). See constants in DirectShowPinMBS class.
Category: A GUID that specifies one of the pin categories listed in Pin Property Set. To match any pin, regardless of category, set this parameter to nil.
Type: A major type GUID that specifies the media type. Use nil to match any media type.
Unconnected: Boolean value that specifies whether the pin must be unconnected. If true, the pin must be unconnected. If false, the pin can be connected or unconnected.
num: Zero-based index of the pin to retrieve, from the set of matching pins. If Source is a filter, and more than one pin matches the search criteria, this parameter specifies which pin to retrieve. If Source is a pin, this parameter is ignored.

Returns the pin object.
Lasterror is set.

If Source is a filter, the method searches for the nth pin on that filter that matches the search criteria, where n is given by the num parameter. If the method finds a matching pin, it returns the pin.
If Source is a pin, the method tests that pin against the search criteria. If the pin matches the criteria, the method returns the pin. Otherwise, it returns nil.

Typically, an application will not need to use this method. It is provided for unusually complex tasks, when the RenderStream method cannot build the filter graph. Use this method to retrieve a desired pin from a capture filter, and then build the rest of the graph manually.

See also:

- 69.10.6 FindPin(Source as DirectShowBaseFilterMBS, PinDirection as Integer, Category as DirectShowGUIDMBS = nil, Type as DirectShowGUIDMBS = nil, Unconnected as boolean = false, Num as Integer = 0) as DirectShowPinMBS 12076

### 69.10.8 GetFiltergraph as DirectShowGraphBuilderMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the filter graph that the builder is using.
**Notes:** Sets lasterror.

### 69.10.9 GetStreamConfig(Category as DirectShowGUIDMBS, filter as DirectShowBaseFilterMBS) as DirectShowAMStreamConfigMBS

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the stream config object for this graph.
**Example:**

```
dim graph as DirectShowCaptureGraphBuilderMBS // your graph
dim filter as DirectShowBaseFilterMBS // your filter

dim StreamConfig as DirectShowAMStreamConfigMBS
StreamConfig = g.GetStreamConfig(DirectShowPinMBS.PIN_CATEGORY_STILL, filter)
```

**Notes:** Lasterror is set.
e.g. pass PIN_CATEGORY_CAPTURE or PIN_CATEGORY_PREVIEW for category, as defined in PinMBS class.
See also:

- 69.10.10 GetStreamConfig(preview as boolean, filter as DirectShowBaseFilterMBS) as DirectShowAMStreamConfigMBS 12078

### 69.10.10 GetStreamConfig(preview as boolean, filter as DirectShowBaseFilterMBS) as DirectShowAMStreamConfigMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the stream config object for this graph.
**Notes:** Lasterror is set.

Preview: Pass true to get the preview pin or pass false for the capture pin instead.
See also:

- 69.10.9 GetStreamConfig(Category as DirectShowGUIDMBS, filter as DirectShowBaseFilterMBS) as DirectShowAMStreamConfigMBS 12078

### 69.10.11 MEDIATYPE_Audio as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Audio.

### 69.10.12 MEDIATYPE_AUXLine21Data as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Line 21 data. Used by closed captions.

### 69.10.13 MEDIATYPE_Interleaved as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Interleaved audio and video. Used for Digital Video (DV).

### 69.10.14 MEDIATYPE_Midi as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** MIDI format.

### 69.10.15 MEDIATYPE_ScriptCommand as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Data is a script command, used by closed captions.

### 69.10.16 MEDIATYPE_Stream as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Byte stream with no time stamps.

### 69.10.17 MEDIATYPE_Text as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Text.

### 69.10.18 MEDIATYPE_Timecode as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Timecode data. Note: DirectShow does not provide any filters that support this media type.

### 69.10.19 MEDIATYPE_Video as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the media type GUIDs.
**Notes:** Video.

### 69.10.20 RenderStream(category as DirectShowGUIDMBS, Type as DirectShowGUIDMBS, Source as DirectShowBaseFilterMBS, Intermediate as DirectShowBaseFilterMBS = nil, Sink as DirectShowBaseFilterMBS = nil)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The RenderStream method connects an output pin on a source filter to a sink filter, optionally through an intermediate filter.
**Notes:** Lasterror is set:

Category: A GUID that specifies one of the pin categories listed in Pin Property Set. To match any pin, regardless of category, set this parameter to nil. Typical values include the following. PIN_CATE-

GORY_CAPTURE, PIN_CATEGORY_PREVIEW, PIN_CATEGORY_CC.
Type: A major-type GUID that specifies the media type of the output pin; or nil to use any pin, regardless of media type.
Source: Specifies a pointer to the starting filter for the connection, or to an output pin.
Intermediate: BaseFilter interface of an intermediate filter, such as a compression filter. Can be nil.
Sink: BaseFilter interface of a sink filter, such as a renderer or mux filter. If the value is nil, the method uses a default renderer (see Remarks).

see also:
http://msdn.microsoft.com/en-us/library/windows/desktop/dd311924(v=vs.85).aspx
See also:


- 69.10.21 RenderStream(category as DirectShowGUIDMBS, Type as DirectShowGUIDMBS, Source as DirectShowPinMBS, Intermediate as DirectShowBaseFilterMBS = nil, Sink as DirectShowBaseFilterMBS = nil) 12081


### 69.10.21 RenderStream(category as DirectShowGUIDMBS, Type as DirectShowGUIDMBS, Source as DirectShowPinMBS, Intermediate as DirectShowBaseFilterMBS = nil, Sink as DirectShowBaseFilterMBS = nil)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The RenderStream method connects an output pin on a source filter to a sink filter, optionally through an intermediate filter.
**Notes:** Lasterror is set:

Category: A GUID that specifies one of the pin categories listed in Pin Property Set. To match any pin, regardless of category, set this parameter to nil. Typical values include the following. PIN_CATEGORY_CAPTURE, PIN_CATEGORY_PREVIEW, PIN_CATEGORY_CC.
Type: A major-type GUID that specifies the media type of the output pin; or nil to use any pin, regardless of media type.
Source: Specifies a pointer to the starting filter for the connection, or to an output pin.
Intermediate: BaseFilter interface of an intermediate filter, such as a compression filter. Can be nil.
Sink: BaseFilter interface of a sink filter, such as a renderer or mux filter. If the value is nil, the method uses a default renderer (see Remarks).

see also:
http://msdn.microsoft.com/en-us/library/windows/desktop/dd311924(v=vs.85).aspx
See also:


- 69.10.20 RenderStream(category as DirectShowGUIDMBS, Type as DirectShowGUIDMBS, Source as DirectShowBaseFilterMBS, Intermediate as DirectShowBaseFilterMBS = nil, Sink as DirectShowBaseFilterMBS = nil) 12080

### 69.10.22 SetFiltergraph(graph as DirectShowGraphBuilderMBS)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Tells the graph builder object which filter graph to use.
**Notes:** Lasterror is set.

graph: specifies the filter graph to use for subsequent calls to the AddFilter method.

The graph builder will automatically create a filter graph if you don't call this method. If you call this method after the graph builder has created its own filter graph, the call will fail.

### 69.10.23 SetOutputFileName(Type as DirectShowGUIDMBS, FilePath as string)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates the rendering section of the filter graph, which will save bits to disk with the specified file name.
**Notes:** Lasterror is set.

Type: GUID representing the media subtype. Must be MEDIASUBTYPE_Avi.
FilePath: string containing the output file name.
filter: Optional, a filter representing the multiplexer filter.
Sink: Optional, a FileSinkFilter object representing the file writer.

This method inserts the multiplexer and the file writer into the filter graph and calls SetFileName to set the output file name.
See also:

- 69.10.24 SetOutputFileName(Type as DirectShowGUIDMBS, FilePath as string, byref filter as DirectShowBaseFilterMBS, byref sink as DirectShowFileSinkFilterMBS) 12082

### 69.10.24 SetOutputFileName(Type as DirectShowGUIDMBS, FilePath as string, byref filter as DirectShowBaseFilterMBS, byref sink as DirectShowFileSinkFilterMBS)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates the rendering section of the filter graph, which will save bits to disk with the specified file name.
**Notes:** Lasterror is set.

Type: GUID representing the media subtype. Must be MEDIASUBTYPE_Avi.
FilePath: string containing the output file name.
filter: Optional, a filter representing the multiplexer filter.
Sink: Optional, a FileSinkFilter object representing the file writer.

This method inserts the multiplexer and the file writer into the filter graph and calls SetFileName to set the output file name.
See also:

- 69.10.23 SetOutputFileName(Type as DirectShowGUIDMBS, FilePath as string) 12082

### 69.10.25 SetupHighestResolution(videoInputFilter as DirectShowBaseFilterMBS, preview as boolean = false)

MBS Win Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to query stream config and select the one with highest resolution.
**Notes:** Queries internally GetStreamConfig, walks over all VideoCaps, picks best and sets it as format.

### 69.10.26 Properties

### 69.10.27 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an ICaptureGraphBuilder interface.
(Read and Write property)

### 69.10.28 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.10.29 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.11 class DirectShowConfigAviMuxMBS

### 69.11.1 class DirectShowConfigAviMuxMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class configures the AVI Mux filter.
**Notes:** Applications can use this class to set the master stream and to create an AVI 1.0 index.

DirectShowConfigAviMuxMBS provides backward compatibility with older Video for Windows (VFW) Audio-Video Interleaved (AVI) index formats (idx1) as well as extended AVI 2.0 index formats (indx) to allow for file sizes greater than 1 gigabyte (GB). Set and retrieve the compatibility indexes by using the OutputCompatibilityIndex property.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.11.2 Methods

### 69.11.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.11.4 Properties

### 69.11.5 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IConfigAviMux interface.
(Read and Write property)

### 69.11.6 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.

(Read and Write property)

### 69.11.7 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.11.8 MasterStream as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the master stream that will be used to synchronize the other streams in the file.
**Notes:** Specifies the index of the stream, or –1 to indicate no master stream. The AVI Mux writes one stream for each connected input pin. Stream numbers are indexed from zero.
Lasterror is set.

If you are capturing audio and video from two different sources, use this method to synchronize the streams. Streams coming from separate capture sources may be captured at slightly different rates. If you specify a master stream, the AVI Mux adjusts the playback rates for the other streams, to compensate for any drift that might occur.
It is recommended to use the audio stream as the master stream, because minor adjustments to the video playback rate are less noticeable than changes to the audio playback rate. Also, modifying the audio playback rate will cause the audio to be resampled by the audio driver.
This method works by adjusting the dwScale and dwRate values in the AVISTREAMHEADER structure.
(Read and Write computed property)

### 69.11.9 OutputCompatibilityIndex as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the AVI index format.
**Notes:** Lasterror is set.
True: Create an AVI 1.0 index, as well as an AVI 2.0 index.
False: Create an AVI 2.0 index, but not an AVI 1.0 index.

The AVI Mux filter always creates an AVI 2.0 index ('indx' format). If the value given in fOldIndex is TRUE, the AVI Mux also creates an AVI 1.0 index ('idx1' format), for backward compatibility with Video for Windows.
The AVI 2.0 index format allows for larger files, incremental growth of files, and minimized disk seeks.

(Read and Write computed property)

## 69.12 class DirectShowConfigInterleavingMBS

### 69.12.1 class DirectShowConfigInterleavingMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ConfigInterleaving interface controls how the AVI Mux filter interleaves audio and video samples.
**Notes:** Video-authoring applications that handle capturing should use this interface when they need to control how audio samples and video frames will be saved on a disk.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.12.2 Methods

### 69.12.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.12.4 Properties

### 69.12.5 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IConfigInterleaving interface.
(Read and Write property)

### 69.12.6 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.12.7 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.12.8 Mode as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The interleaving quality setting.
**Notes:** Lasterror is set.
See kInterleaving* constants.
(Read and Write computed property)

### 69.12.9 Constants

Interleaving Mode Constants

| Constant | Value | Description |
|---|---|---|
| kInterleaveBuffered | 3 | Noninterleaved.<br>This mode is equivalent to kInterleaveNone but uses less file space and system overhead. |
| kInterleaveCapture | 1 | Approximate interleaving with less overhead than kInterleaveFull.<br>This mode is suitable for video capture. The AVI Mux attempts to use unbuffered, overlapped write operations. Unless the interleaving parameters are configured properly, however, frames may be dropped if one stream blocks while it waits for data from another stream. In particular, audio buffers should be less than .5 second, or else the video stream will block for excessive periods of time. |
| kInterleaveFull | 2 | Full, precise interleaving of audio samples and video frames.<br>Streams will block indefinitely, waiting for equal amounts of data before interleaving. This mode is suitable for authoring and playback. |
| kInterleaveNone | 0 | Noninterleaved.<br>Frames are written in the order they arrive. Files must be interleaved for playback at a later time. In this mode, the AVI Mux filter attempts to use unbuffered, overlapped write operations, to increase throughput. |

## 69.13 class DirectShowDVInfoMBS

### 69.13.1 class DirectShowDVInfoMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes the format of a digital video (DV) stream.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.13.2 Methods

### 69.13.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.13.4 Properties

### 69.13.5 DVAAuxCtl as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the AAUX source control Pack for the first audio block.
**Notes:** (Read and Write property)

### 69.13.6 DVAAuxCtl1 as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the AAUX source control pack for the second audio block.
**Notes:** (Read and Write property)

### 69.13.7 DVAAuxSrc as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the audio auxiliary (AAUX) source pack for the first audio block.
**Notes:** (Read and Write property)

### 69.13.8 DVAAuxSrc1 as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the AAUX source pack for the second audio block.
**Notes:** (Read and Write property)

### 69.13.9 DVVAuxCtl as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the VAUX source control pack.
**Notes:** (Read and Write property)

### 69.13.10 DVVAuxSrc as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the video auxiliary (VAUX) source pack.
**Notes:** (Read and Write property)

## 69.14 class DirectShowEnumMonikerMBS

### 69.14.1 class DirectShowEnumMonikerMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enumerates the monikers in a table of monikers.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr2

### 69.14.2 Methods

### 69.14.3 Clone as DirectShowEnumMonikerMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new enumerator that contains the same enumeration state as the current one.
**Notes:** This method makes it possible to record a particular point in the enumeration sequence and then return to that point at a later time. The caller must release this new enumerator separately from the first enumerator.

Returns nil on any error.
Lasterror is set.

### 69.14.4 CLSID_AudioCompressorCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Audio Compressors

### 69.14.5 CLSID_AudioInputDeviceCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Audio Capture Sources

### 69.14.6 CLSID_AudioRendererCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Audio Renderers

### 69.14.7 CLSID_DeviceControlCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Device Control Filters

### 69.14.8 CLSID_DVDHWDecodersCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** WDM Stream Decompression Devices
This category contains hardware DVD decoders.

### 69.14.9 CLSID_LegacyAmFilterCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** DirectShow Filters

### 69.14.10 CLSID_MidiRendererCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Midi Renderers

### 69.14.11 CLSID_TransmitCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** External Renderers

### 69.14.12 CLSID_VideoCompressorCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Video Compressors

### 69.14.13 CLSID_VideoInputDeviceCategory as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow filter categories.
**Notes:** Video Capture Sources

### 69.14.14 Constructor

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to find filters.
**Notes:** Uses IFilterMapper2::EnumMatchingFilters to find installed filters in the registry.
Lasterror is set on failure.
See also:

- 69.14.15 Constructor(clsidDeviceClass as DirectShowGUIDMBS) 12094

### 69.14.15 Constructor(clsidDeviceClass as DirectShowGUIDMBS)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an enumerator for a specified device category.
**Notes:** This method makes it possible to record a particular point in the enumeration sequence and then return to that point at a later time. The caller must release this new enumerator separately from the first enumerator.

Lasterror is set.
See also:

- 69.14.14 Constructor 12094

### 69.14.16 Destructor

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 69.14.17 NextObject as DirectShowMonikerMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the next item in the enumeration sequence.
**Notes:** Returns nil on any error.
Lasterror is set.

### 69.14.18 Reset

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumeration sequence to the beginning.
**Notes:** Lasterror is set.
There is no guarantee that the same set of objects will be enumerated after the reset operation has completed. A static collection is reset to the beginning, but it can be too expensive for some collections, such as files in a directory, to guarantee this condition.

### 69.14.19 Skip(n as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips over the specified number of items in the enumeration sequence.
**Notes:** Lasterror is set.

### 69.14.20 Properties

### 69.14.21 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IEnumMoniker interface.
(Read and Write property)

### 69.14.22 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.14.23 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.15 class DirectShowEnumPinsMBS

### 69.15.1 class DirectShowEnumPinsMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enumerates pins on a filter.
**Notes:** The BaseFilterMBS.EnumPins method returns this interface. It is based on the standard Component Object Model (COM) enumerators.
The filter graph manager uses this interface when it connects filters. Applications can use it to retrieve pins on a filter. For more information, see Enumerating Objects in a Filter Graph.
If the number of pins on the filter changes, some methods on this interface return VFW_E_ENUM_OUT_OF_SYNC. Call the Reset method to resynchronize the enumerator.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.15.2 Methods

### 69.15.3 Clone as DirectShowEnumPinsMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Clone method makes a copy of the enumerator with the same enumeration state.
**Notes:** Lasterror is set. Returns nil on any error.

If the number of pins changes, the enumerator is no longer consistent with the filter, and the method returns VFW_E_ENUM_OUT_OF_SYNC. Discard any data obtained from previous calls to the enumerator, because it might be invalid. Update the enumerator by calling the IEnumPins::Reset method. You can then call the Clone method safely.

### 69.15.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.15.5 NextObject as DirectShowPinMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Next method retrieves the next pin in the enumeration sequence.
**Notes:** Lasterror is set. Returns nil on any error.

If the number of pins changes, the enumerator is no longer consistent with the filter, and the method returns VFW_E_ENUM_OUT_OF_SYNC. Discard any data obtained from previous calls to the enumerator, because it might be invalid. Update the enumerator by calling the IEnumPins::Reset method. You can then call the Next method safely.

### 69.15.6 Reset

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Reset method resets the enumeration sequence to the beginning.
**Notes:** Lasterror is set.

### 69.15.7 Skip(n as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Skip method skips over a specified number of pins.
**Notes:** n: Number of pins to skip.

Lasterror is set.

If the number of pins changes, the enumerator is no longer consistent with the filter, and the method returns VFW_E_ENUM_OUT_OF_SYNC. Discard any data obtained from previous calls to the enumerator, because it might be invalid. Update the enumerator by calling the IEnumPins::Reset method. You can then call the Skip method safely.

### 69.15.8 Properties

### 69.15.9 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IEnumPins interface.
(Read and Write property)

### 69.15.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.15.11 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.16 class DirectShowFileSinkFilterMBS

### 69.16.1 class DirectShowFileSinkFilterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The FileSinkFilter interface is implemented on filters that write media streams to a file.
**Notes:** A file sink filter in a video capture filter graph, for instance, writes the output of the video compression filter to a file. Typically, the application running this filter graph should enable the user to enter the name of the file to be written to. This interface enables the communication of this information.
If a filter needs the name of an output file, it should expose this interface to allow an application to set the file name. Note that there is currently no base class implementation of this interface.
Any application that must set the name of the file into which the file sink filter will write should use this interface to get and set the file name.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.16.2 Methods

### 69.16.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.16.4 MEDIASUBTYPE_Asf as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media sub type for ASF video files.

### 69.16.5 MEDIASUBTYPE_Avi as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media sub type for AVI video files.

### 69.16.6 Properties

### 69.16.7 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IFileSinkFilter interface.
(Read and Write property)

### 69.16.8 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.16.9 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.17 class DirectShowFilterGraphMBS

### 69.17.1 class DirectShowFilterGraphMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class provides methods for building a filter graph.
**Notes:** An application can use it to add filters to the graph, connect or disconnect filters, remove filters, and perform other basic operations. However, the DirectShowGraphBuilderMBS interface inherits from this interface and provides additional methods that are more sophisticated. Therefore, applications should use DirectShowGraphBuilderMBS rather than using DirectShowFilterGraphMBS directly.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.17.2 Methods

### 69.17.3 AddFilter(SourceFilter as DirectShowBaseFilterMBS, Name as string = "")

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a filter to the graph.
**Notes:** Filter: The filter to add.
Name: name for filter.

Lasterror is set.

The name of the filter can be "", in which case the Filter Graph Manager generates a name. If the name is not "" and is not unique, this method will modify the name in an attempt to generate a new unique name. If this is successful, this method sets lasterror to VFW_S_DUPLICATE_NAME. If it cannot generate a unique name, it sets lasterror to VFW_E_DUPLICATE_NAME.
AddFilter calls the filter's JoinFilterGraph method to inform the filter that it has been added. AddFilter must be called before attempting to use the Connect, ConnectDirect, or Render method to connect or render pins belonging to the added filter.
The Filter Graph Manager holds a reference count on the filter until the filter is removed from the graph or the Filter Graph Manager is released.

### 69.17.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.17.5 SetDefaultSyncSource

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the reference clock to the default clock.
**Notes:** Lasterror is set.

This method instructs the Filter Graph Manager to choose a reference clock using its default algorithm. For more information about the algorithm that it uses, see Reference Clocks.
Usually you do not need to call this method, because the Filter Graph Manager automatically selects a clock. However, if you call SetSyncSource to override the clock, you can use SetDefaultSyncSource to restore the default clock.
This method fails if the filter graph is running or paused.

### 69.17.6 Properties

### 69.17.7 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IFilterGraph interface.
(Read and Write property)

### 69.17.8 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.17.9 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.18 class DirectShowFilterInfoMBS

### 69.18.1 class DirectShowFilterInfoMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for information about a filter.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.18.2 Methods

### 69.18.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.18.4 Properties

### 69.18.5 Graph as DirectShowFilterGraphMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns filter graph.
**Notes:** If the filter is member of a filter graph, this is a reference to the filter graph's FilterGraph interface. If the filter is not a member of a filter graph, this value of this member is nil.
(Read and Write property)

### 69.18.6 Name as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the filter.
**Notes:** (Read and Write property)

# 69.19 class DirectShowGraphBuilderMBS

## 69.19.1 class DirectShowGraphBuilderMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class provides methods that enable an application to build a filter graph.
**Notes:** The GraphBuilder interface inherits from the FilterGraph interface. FilterGraph provides basic operations, such as adding a filter to the graph or connecting two pins. GraphBuilder adds further methods that construct graphs from partial information. For example, the RenderFile method builds a graph for file playback, given the name of the file. The Render method renders data from an output pin by connecting new filters to the pin.

Using these methods, an application does not need to specify every filter and pin connection in the graph. Instead, the Filter Graph Manager selects filters that are registered on the user's system, adds them to the graph, and connects them.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390085(v=vs.85).aspx
Subclass of the DirectShowFilterGraphMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr8

## 69.19.2 Methods

## 69.19.3 Abort

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Abort method requests the Filter Graph Manager to halt its current task as quickly as possible.
**Notes:** The current task may or may not fail to complete. Possibly the fastest option for the Filter Graph Manager is to complete the task.

Lasterror is set.

## 69.19.4 AddSourceFilter(FileName as string, FilterName as string) as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a source filter for a specified file to the filter graph.

**Notes:** FileName: the name of the file to load.
FilterName: name for the source filter.

Lasterror is set.

This method searches for an installed filter that can read the specified file. If it finds one, the method adds it to the filter graph and returns a pointer to the filter's IBaseFilter interface. To determine the media type and compression scheme of the file, the Filter Graph Manager reads the first few bytes of the file, looking for specific patterns of bytes, as documented in the article Registering a Custom File Type.

The application is responsible for building the rest of the filter graph. To do so, call EnumPins to enumerate the output pins on the source filter. Then use either the Connect method or the Render method.

If the method succeeds, the BaseFilter interface has an outstanding reference count. The caller must release the interface.

To render a file for default playback, use the RenderFile method.

The Filter Graph Manager holds a reference count on the filter until the filter is removed from the graph or the Filter Graph Manager is released.

### 69.19.5 Connect(pinOut as DirectShowPinMBS, pinIn as DirectShowPinMBS)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Connects the two pins, using intermediates if necessary.
**Notes:** pinOut: the output pin.
pinIn: the input pin.

Lasterror is set.

This method connects two pins directly or indirectly, adding intermediate filters if necessary. The method starts by attempting a direct connection. If that fails, it tries to use any filters that are already in the filter graph and have unconnected input pins. (It enumerates these in an arbitrary order.) If that fails, it searches for filters in the registry, and tries them in order of merit.

During the connection process, the Filter Graph Manager ignores pins on intermediate filters if the pin name begins with a tilde (
textasciitilde ).

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390088(v=vs.85).aspx

### 69.19.6 ConnectFilters(pinOut as DirectShowPinMBS, dest as DirectShowBaseFilterMBS)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to connect an output pin to a filter.
**Notes:** Lasterror is set.
See also:

- 69.19.7 ConnectFilters(source as DirectShowBaseFilterMBS, dest as DirectShowBaseFilterMBS) 12107
- 69.19.8 ConnectFilters(source as DirectShowBaseFilterMBS, pinIn as DirectShowPinMBS) 12107

### 69.19.7 ConnectFilters(source as DirectShowBaseFilterMBS, dest as DirectShowBaseFilterMBS)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to connect two filters.
**Notes:** Lasterror is set.
See also:

- 69.19.6 ConnectFilters(pinOut as DirectShowPinMBS, dest as DirectShowBaseFilterMBS) 12107
- 69.19.8 ConnectFilters(source as DirectShowBaseFilterMBS, pinIn as DirectShowPinMBS) 12107

### 69.19.8 ConnectFilters(source as DirectShowBaseFilterMBS, pinIn as DirectShowPinMBS)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to connect a filter to an input pin.
**Notes:** Lasterror is set.
See also:

- 69.19.6 ConnectFilters(pinOut as DirectShowPinMBS, dest as DirectShowBaseFilterMBS) 12107
- 69.19.7 ConnectFilters(source as DirectShowBaseFilterMBS, dest as DirectShowBaseFilterMBS) 12107

### 69.19.9 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 69.19.10 MediaControl as DirectShowMediaControlMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries related media control object.
**Notes:** Lasterror is set.

### 69.19.11 MediaEventEx as DirectShowMediaEventExMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries related media event object.
**Notes:** Lasterror is set.

### 69.19.12 Render(pinOut as DirectShowPinMBS)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Render method builds a filter graph that renders the data from a specified output pin.
**Notes:** pinOut: an output pin.
Lasterror is set.

This method renders the data from a specified output pin, adding new filters to the graph as needed. Filters are tried in the same order as for the Connect method. For more information, see Intelligent Connect.
During the connection process, the Filter Graph Manager ignores pins on intermediate filters if the pin name begins with a tilde (
textasciitilde ).

### 69.19.13 RenderFile(FilePath as string)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Builds a filter graph that renders the specified file.
**Notes:** FilePath: string that contains the name of a media file.

Lasterror is set.

If the FilePath parameter specifies a media file, the method builds a filter graph for default playback. First it adds a source filter that can read the file, using the same process as the AddSourceFilter method. Then it renders the output pins on the source filter, adding intermediate filters if necessary. It tries filters in the same order as the Connect method.
During the connection process, the Filter Graph Manager ignores pins on intermediate filters if the pin name begins with a tilde (
textasciitilde ).
Note that the RenderFile method does not remove any filters from the graph. If you call RenderFile twice, the second call simply adds more filters to the graph. When you run the graph, both sources will play at the same time.

### 69.19.14 SetLogFile(FilePath as string)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetLogFile method sets the file for logging actions taken when attempting to perform an operation.
**Notes:** This method is for use in debugging; it is intended to help you determine the cause of any failure to automatically build a filter graph.
Lasterror is set.

### 69.19.15 VideoWindow as DirectShowVideoWindowMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the video window related tot this graph builder.
**Notes:** Lasterror is set.

## 69.20 class DirectShowGUIDMBS

### 69.20.1 class DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a Windows unique ID.
**Notes:** If you need to validate a GUID or UUID, please check the IsGUID function in our FAQ.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr6

### 69.20.2 Methods

### 69.20.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a GUID with only zeros.
**Example:**

```
dim g as new DirectShowGUIDMBS

MsgBox g.DisplayString
```

See also:

- 69.20.4 Constructor(Value as String) 12110
- 69.20.5 Constructor(value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer, value5 as Integer, value6 as Integer, value7 as Integer, value8 as Integer, value9 as Integer, value10 as Integer, value11 as Integer, value12 as Integer, value13 as Integer, value14 as Integer, value15 as Integer, value16 as Integer) 12111

### 69.20.4 Constructor(Value as String)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates GUID based on a text string.
**Notes:** Raises exception if text has wrong format.
See also:

- 69.20.3 Constructor 12110
- 69.20.5 Constructor(value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer, value5 as Integer, value6 as Integer, value7 as Integer, value8 as Integer, value9 as Integer, value10 as Integer, value11 as Integer, value12 as Integer, value13 as Integer, value14 as Integer, value15 as Integer, value16 as Integer) 12111


### 69.20.5 Constructor(value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer, value5 as Integer, value6 as Integer, value7 as Integer, value8 as Integer, value9 as Integer, value10 as Integer, value11 as Integer, value12 as Integer, value13 as Integer, value14 as Integer, value15 as Integer, value16 as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new GUID with the given byte values.
**Example:**

```
dim g as new DirectShowGUIDMBS(&h14, &h3e, &h4e, &h83, &h64, &h97, &h11, &hd2, &ha2, &h31, &h00, &hc0, &h4f, &ha3, &h18, &h09)

MsgBox g.DisplayString
```

See also:


- 69.20.3 Constructor 12110
- 69.20.4 Constructor(Value as String) 12110


### 69.20.6 Equal(other as DirectShowGUIDMBS) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether two GUIDs are equal.
**Notes:** Returns true if both items are equals.

### 69.20.7 Operator_Convert as String

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts GUID to text.
**Notes:** Same as DisplayName.
See also:

• 69.20.8 Operator_Convert(text as String) 12112

### 69.20.8 Operator_Convert(text as String)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts text to GUID.
**Notes:** Same as Constructor.
Raises exception if text has wrong format.
See also:

• 69.20.7 Operator_Convert as String 12111

### 69.20.9 Parse(GUID as String) as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 18.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parses GUID string into a GUID object.

### 69.20.10 Properties

### 69.20.11 Data as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The UID as binary string.
**Notes:** (Read and Write property)

### 69.20.12 DisplayString as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID well formatted.
**Notes:** (Read only property)

### 69.20.13 Memory as MemoryBlock

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set GUID with memory block.
**Notes:** (Read and Write property)

### 69.20.14 Ptr as Ptr

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pointer to raw GUID data.
**Notes:** (Read only property)

### 69.20.15 Byte(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Read or write the byte value.
**Example:**

```
dim g as new DirectShowGUIDMBS

g.Byte(1) = 65

MsgBox str(g.Byte(1)) // shows 65
```

**Notes:** (Read and Write computed property)

## 69.21 class DirectShowMediaControlMBS

### 69.21.1 class DirectShowMediaControlMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides methods for controlling the flow of data through the filter graph.
**Notes:** It includes methods for running, pausing, and stopping the graph. The Filter Graph Manager implements this interface.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.21.2 Methods

### 69.21.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.21.4 GetState(msTimeout as Integer = -1) as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the state of the filter graph—paused, running, or stopped.
**Notes:** msTimeout: Duration of the time-out, in milliseconds, or INFINITE (-1) to specify an infinite time-out.

State transitions are not necessarily synchronous. Therefore, when you call this method, the filter graph might be in transition to a new state. In that case, the method blocks until the transition completes or until the specified time-out elapses.

Lasterror is set.

Applications can use this method to determine whether playback has started after a call to Run. Generally, applications should have their own mechanism for tracking which state they have put the filter graph into. Applications typically use the current state to determine which user interface controls are enabled or disabled. For example, once the graph goes into the running state, the application might disable a "Play" button and enable "Stop" and "Pause" buttons.
If the filter graph is in a transition to a new state, the returned state is the new state, not the previous state.
This method returns an error if there is a call on another thread to change the state while this method is blocked.
Avoid specifying a time-out of INFINITE, because threads cannot process messages while waiting in Get-

State. If you call GetState from the thread that processes Windows messages, specify small wait times on the call in order to remain responsive to user input. This is especially important when the source is streaming over a network or from the Internet because state transitions in these environments can take significantly more time to complete.

### 69.21.5 Pause

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pauses all the filters in the filter graph.
**Notes:** Lasterror is set.

Pausing the filter graph cues the graph for immediate rendering when the graph is next run. While the graph is paused, filters process data but do not render it. Data is pushed through the graph and processed by transform filters as far as buffering permits, but renderer filters do not render the data. However, video renderers display a static poster frame of the first sample.

If the method returns S_FALSE, call the GetState method to wait for the state transition to complete, or to check if the transition has completed. When you call Pause to display the first frame of a video file, always follow it immediately with a call to GetState to ensure that the state transition has completed. Failure to do this can result in the video rectangle being painted black.
If the method fails, it stops the graph before returning.

### 69.21.6 RenderFile(FilePath as string)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Builds a filter graph that renders the specified file.
**Notes:** Lasterror is set.

filePath: Specifies the name of the file to load.

### 69.21.7 Run

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs all the filters in the filter graph.
**Notes:** While the graph is running, data moves through the graph and is rendered.
Lasterror is set.

If the filter graph is stopped, this method pauses the graph before running. If the graph is already running, the method returns S_OK but has no effect.
The graph runs until the application calls the Pause or Stop method. When playback reaches the end of the stream, the graph continues to run, but the filters do not stream any more data. At that point, the application can pause or stop the graph. For information about the end-of-stream event, see Pause and EC_COMPLETE.
This method does not seek to the beginning of the stream. Therefore, if you run the graph, pause it, and then run it again, playback resumes from the paused position. If you run the graph after it has reached the end of the stream, nothing is rendered. To seek the graph, use the MediaSeeking interface.
If method returns S_FALSE, it means that the method returned before all of the filters switched to a running state. The filters will complete the transition after the method returns. Optionally, you can wait for the transition to complete by calling the GetState method with a timeout value. However, this is not required.
If the Run method returns an error code, it means that one or more filters failed to run. However, some filters might be in a running state. In a multistream graph, entire streams might be playing successfully. Typically the application would tear down the graph and report an error in this case.

### 69.21.8 Stop

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stops all the filters in the graph.
**Notes:** Lasterror is set.

If the graph is running, this method pauses the graph before stopping it. While paused, video renderers can copy the current frame to display as a poster frame.

This method does not seek to the beginning of the stream. If you call this method and then call the Run method, playback resumes from the stopped position. To seek, use the IMediaSeeking interface.

The Filter Graph Manager pauses all the filters in the graph, and then calls the Stop method on all filters, without waiting for the pause operations to complete. Therefore, some filters might have their Stop method called before they complete their pause operation. If you develop a custom rendering filter, you might need to handle this case by pausing the filter if it receives a stop command while in a running state. However, most filters do not need to take any special action in this regard.

### 69.21.9 StopWhenReady

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pauses the filter graph, allowing filters to queue data, and then stops the filter graph.
**Notes:** Lasterror is set.

This method is useful if you want to seek the filter graph while the graph is stopped. As long as the filter graph is stopped, changes in the current position do not repaint the video window with a new frame. Therefore, calling SetPositions does not update the video window. To update the window after the seek operation, call StopWhenReady. This method transitions the graph to a paused state, waits for the pause operation to complete, and then transitions the graph back to stopped. The pause operation queues data in the graph, so that the video renderer receives and displays the new frame.

This method is asynchronous. It waits on a separate thread for the pause to complete. The calling thread does not block, which enables the application to respond to user input. When the method returns, the logical state of the graph is stopped, even before the pause operation completes. If you call the GetState method at this point, it returns State_Stopped.

If the application issues another state-change command (such as pause, run, or seek) before the pause operation completes, the new command cancels the pending stop command. The pause operation completes, but the graph does not stop.

### 69.21.10 Properties

### 69.21.11 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IMediaControl interface.
(Read and Write property)

### 69.21.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.21.13 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.21.14 Constants

State Constants

| Constant | Value | Description |
|---|---|---|
| kStatePaused | 1 | Paused |
| kStateRunning | 2 | Running |
| kStateStopped | 0 | Stopped. |

## 69.22 class DirectShowMediaEventExMBS

### 69.22.1 class DirectShowMediaEventExMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for extended options for media event handling.
**Notes:** The DirectShowMediaEventExMBS interface inherits the DirectShowMediaEventMBS interface, which contains methods for retrieving event notifications and for overriding the filter graph's default handling of events. MediaEventEx adds methods that enable an application window to receive messages when events occur.
Subclass of the DirectShowMediaEventMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.22.2 Methods

### 69.22.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.22.4 Properties

### 69.22.5 NotifyFlags as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enables or disables event notifications.
**Notes:** Value indicating whether to enable or disable event notifications. Must be one of the following values: 0 = Enable event notifications or AM_MEDIAEVENT_NONOTIFY = Disable event notifications.

Lasterror is set.

By default, the Filter Graph Manager posts event notifications for the application. If the NotifyFlags parameter is AM_MEDIAEVENT_NONOTIFY, the Filter Graph Manager clears any pending event notifications from the queue, and does not post any new ones.
If event notifications are disabled, the handle returned by the GetEventHandle method is signaled at the end of each stream—that is, whenever the Filter Graph Manager receives an EC_COMPLETE event.
(Read and Write computed property)

### 69.22.6 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AM_MEDIAEVENT_NONOTIFY | 1 | One of the notify flags constant.<br>Pass this value to NotifyFlags to disable event notification. |

# 69.23 class DirectShowMediaEventMBS

## 69.23.1 class DirectShowMediaEventMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for media event handling.
**Notes:** The MediaEvent interface contains methods for retrieving event notifications and for overriding the Filter Graph Manager's default handling of events. The MediaEventEx interface inherits this interface and extends it.

The Filter Graph Manager implements this interface. Applications can use it to respond to events that occur in the filter graph, such as the end of a stream or a rendering error. Filters post events to the filter graph using the IMediaEventSink interface.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 69.23.2 Methods

## 69.23.3 CancelDefaultHandling(eventCode as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Cancels the Filter Graph Manager's default handling for a specified event.
**Notes:** The event notification is passed to the application.
Lasterror is set.

To restore the default handling for an event, call the RestoreDefaultHandling method with the event code.

## 69.23.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 69.23.5 FreeEventParams(eventCode as Integer, Param1 as Integer, Param2 as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Frees resources associated with the parameters of an event.
**Notes:** EventCode: Event code.

Param1: First event parameter.
Param2: Second event parameter.

Lasterorr is set.
After you call the GetEvent method to retrieve an event notification, you must call FreeEventParams. This method frees any resources that were allocated for the event parameters. Pass in the same variables used for the GetEvent call.

### 69.23.6 RestoreDefaultHandling(eventCode as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Restores the Filter Graph Manager's default handling for a specified event.
**Notes:** Lasterror is set.
By default, the Filter Graph Manager handles some events (such as EC_REPAINT) without passing them to the application. If you call the CancelDefaultHandling method to override the default handling for an event, you can restore the default behavior by calling RestoreDefaultHandling with the same event code.

### 69.23.7 Properties

### 69.23.8 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IMediaEvent interface.
(Read and Write property)

### 69.23.9 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.23.10 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.23.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AM_MEDIAEVENT_NONOTIFY | 1 | One of the notify flags constant.<br>Pass this value to NotifyFlags to disable event notification. |

## 69.24 class DirectShowMediaFilterMBS

### 69.24.1 class DirectShowMediaFilterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The MediaFilter interface controls the streaming state of a filter.
**Notes:** All DirectShow filters implement this interface. It provides methods for switching the filter between states (stopped, paused, and running); for retrieving the filter's current state; and for setting a reference clock. Applications should not call MediaFilter methods on filters.

The Filter Graph Manager also exposes this interface. Applications can use the SetSyncSource method to set the graph reference clock, and GetSyncSource to retrieve the clock. Applications should not call the other methods on this interface. Instead, use the corresponding methods on the MediaControl interface.
The BaseFilter interface inherits from MediaFilter.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 69.24.2 Methods

### 69.24.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.24.4 Pause

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Pause method pauses the filter.
**Notes:** Lasterror is set.

When a filter is paused, it can receive, process, and deliver samples. However, a renderer filter will only accept one sample while paused. Therefore, when the filter graph is paused, samples move through the graph until the first sample reaches the renderer. At that point, streaming is paused until the Run method is called. Video renderers display the first sample as a still frame.

Live capture filters do not deliver any samples while paused, only while running.

The state transition might be asynchronous. If the method returns before the transition completes, the lasterror value is 1. A renderer filter does not complete the transition to paused until either (1) it receives one sample, or (2) it receives an end-of-stream notification. While the state transition is pending, State gives

lasterror VFW_S_STATE_INTERMEDIATE.

### 69.24.5 Run(StartTime as Int64)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Run method runs the filter.
**Notes:** StartTime: Reference time corresponding to stream time 0.
Lasterror is set.

When a filter is running, it can receive, process, and deliver samples. Source filters generate new samples, and renderer filters render them.
The state transition might be asynchronous. If the method returns before the transition completes, the lasterror value is 1.
Stream time is calculated as the current reference time minus StartTime. To calculate when a media sample should be rendered, the renderer compares the time stamp with the current stream time. Thus, a media sample with a time stamp of zero should be rendered at time StartTime. For more information, see Time and Clocks in DirectShow.
When an application calls the Run method, the Filter Graph Manager calls Run on each filter. It sets the value of StartTime slightly in the future, to account for graph latency.

### 69.24.6 Stop

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Stop method stops the filter.
**Notes:** Lasterror is set.
When a filter is stopped, it does not process or deliver any samples, and it rejects samples from upstream filters.
The state transition might be asynchronous. If the method returns before the transition completes, the lasterror value is 1.
This method always sets the filter's state to kStateStopped, even if the method returns an error code.

### 69.24.7 Properties

### 69.24.8 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IMediaFilter interface.

(Read and Write property)

### 69.24.9 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.24.10 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.24.11 Constants

Filter State Constants

| Constant | Value | Description |
|---|---|---|
| kStatePaused | 1 | Paused. The filter is processing data, but not rendering it. |
| kStateRunning | 2 | Running. The filter is processing and rendering data. |
| kStateStopped | 0 | Stopped. The filter is not processing data. |

## 69.25 class DirectShowMediaTypeMBS

### 69.25.1 class DirectShowMediaTypeMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes the format of a media sample.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd373477(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.25.2 Methods

### 69.25.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.25.4 SetHeight(value as integer) as boolean

MBS Win Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets height of video info header.
**Notes:** Convenience function which works with VideoInfoHeader and VideoInfoHeader2 to set the value.

### 69.25.5 SetWidth(value as integer) as boolean

MBS Win Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets width of video info header.
**Notes:** Convenience function which works with VideoInfoHeader and VideoInfoHeader2 to set the value.

### 69.25.6 Properties

### 69.25.7 DVINFO as DirectShowDVInfoMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries format data as DVInfo.
**Notes:** Returns nil if format is not a DVInfo.
(Read only property)

### 69.25.8 FixedSizeSamples as Boolean

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** If true, samples are of a fixed size.
**Notes:** This field is informational only. For audio, it is generally set to true. For video, it is usually true for uncompressed video and false for compressed video.
(Read and Write property)

### 69.25.9 FormatType as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** GUID that specifies the structure used for the format block.
**Notes:** (Read and Write property)

### 69.25.10 Handle as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 69.25.11 Height as Integer

MBS Win Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries height of video info header.
**Notes:** Convenience function which works with VideoInfoHeader and VideoInfoHeader2 to query the value.
(Read only property)

### 69.25.12 MajorType as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Globally unique identifier (GUID) that specifies the major type of the media sample. F
**Notes:** or a list of possible major types, see Media Types.
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390670(v=vs.85).aspx
(Read and Write property)

### 69.25.13 SampleSize as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Size of the sample in bytes. For compressed data, the value can be zero.
**Notes:** (Read and Write property)

### 69.25.14 SubType as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** GUID that specifies the subtype of the media sample.
**Notes:** For a list of possible subtypes, see Media Types. For some formats, the value might be MEDIA-SUBTYPE_None, which means the format does not require a subtype.
http://msdn.microsoft.com/en-us/library/windows/desktop/dd390670(v=vs.85).aspx
(Read and Write property)

### 69.25.15 TemporalCompression as Boolean

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** If true, samples are compressed using temporal (interframe) compression.
**Notes:** A value of true indicates that not all frames are key frames. This field is informational only.
(Read and Write property)

### 69.25.16 VideoInfoHeader as DirectShowVideoInfoHeaderMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries format data as VideoInfoHeader.
**Notes:** Returns nil if format is not a VideoInfoHeader.
(Read only property)

### 69.25.17 VideoInfoHeader2 as DirectShowVideoInfoHeader2MBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries format data as VideoInfoHeader2.
**Notes:** Returns nil if format is not a VideoInfoHeader2.
(Read only property)

### 69.25.18 WaveFormat as DirectShowWaveFormatMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries format data as WaveFormat.
**Notes:** Returns nil if format is not a WaveFormat.
(Read only property)

### 69.25.19 Width as Integer

MBS Win Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries width of video info header.
**Notes:** Convenience function which works with VideoInfoHeader and VideoInfoHeader2 to query the value.
(Read only property)

## 69.26 class DirectShowMonikerMBS

### 69.26.1 class DirectShowMonikerMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The moniker class to query information about devices.
**Notes:** In this plugin we use monikers to enumerate filters and devices in order to connect with BindBaseFilter method.

Enables you to use a moniker object, which contains information that uniquely identifies a COM object. An object that has a pointer to the moniker object's IMoniker interface can locate, activate, and get access to the identified object without having any other specific information on where the object is actually located in a distributed system.
Monikers are used as the basis for linking in COM. A linked object contains a moniker that identifies its source. When the user activates the linked object to edit it, the moniker is bound; this loads the link source into memory.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/ms679705(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr2

### 69.26.2 Methods

### 69.26.3 BindBaseFilter as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Binds moniker to a base filter.
**Notes:** Lasterror is set.

This implements the primary function of a moniker, which is to locate the object identified by the moniker and return a pointer to one of its interfaces.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/ms691433(v=vs.85).aspx

### 69.26.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.26.5 DisplayName(BindContext as DirectShowBindContextMBS = nil) as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the display name for the moniker.
**Notes:** BindContext: The DirectShowBindContextMBS interface on the bind context to be used in this operation. The bind context caches objects bound during the binding process, contains parameters that apply to all operations using the bind context, and provides the means by which the moniker implementation should retrieve information about its environment. If you provide nil, the plugin creates a temporary context.

GetDisplayName provides a string that is a displayable representation of the moniker. A display name is not a complete representation of a moniker's internal state; it is simply a form that can be read by users. As a result, it is possible (though rare) for two different monikers to have the same display name.

This is not a text to show to user.

### 69.26.6 EnumMonikers(forward as boolean) as DirectShowEnumMonikerMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves enumerator for the components of a composite moniker.
**Notes:** Lasterror is set.

### 69.26.7 Hash as UInt32

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a hash value using the internal state of the moniker.
**Notes:** Lasterror is set.

### 69.26.8 IsEqual(other as DirectShowMonikerMBS) as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Determines whether this moniker is identical to the specified moniker.
**Notes:** Returns true if both are identical.
Lasterror is set.

### 69.26.9 Properties(BindContext as DirectShowBindContextMBS = nil) as DirectShowPropertyBagMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates property bag with properties of the moniker.
**Notes:** Lasterror is set.

### 69.26.10 Properties

### 69.26.11 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IMoniker interface.
(Read and Write property)

### 69.26.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.26.13 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.27 class DirectShowNullRendererMBS

### 69.27.1 class DirectShowNullRendererMBS

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The null renderer filter.
**Notes:** The Null Renderer filter is a renderer that discards every sample it receives, without displaying or rendering the sample data.

Use this filter when an output pin in the graph requires a downstream connection, but you do not wish to render the data from that pin. By connecting the output pin to the Null Renderer, you complete the connection without rendering the data.
Subclass of the DirectShowBaseFilterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr8

### 69.27.2 Methods

### 69.27.3 Constructor

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new Null filter.
**Notes:** On success the handle property is not zero.

# 69.28 class DirectShowPinMBS

## 69.28.1 class DirectShowPinMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This interface is exposed by all input and output pins.
**Notes:** The filter graph manager uses this interface to connect pins and perform flushing operations. Applications can use this interface to query the pin for information.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 21.0pr8

**Xojo Developer Magazine**

- 21.1, page 35: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

## 69.28.2 Methods

## 69.28.3 Accept(Type as DirectShowMediaTypeMBS) as Boolean

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Accept method determines whether the pin accepts a specified media type.
**Notes:** Lasterror is set.

A return value of true indicates that the pin will accept the media type, either on the next sample, or after a pin reconnection. The implementation should take into account the current state of the filter, including connections on other pins, and any properties that can be set on the filter.

Any other return value, including false, means that the pin rejects the media type. Therefore, test for true explicitly.

If the filter is running, a return value of true is ambiguous. The pin might accept a format change on the next media sample, without reconnecting; or it might need to reconnect. If the pin supports the IPinConnection interface, call the IPinConnection::DynamicQueryAccept method, which specifically tests whether the pin can accept the new type without reconnecting.

### 69.28.4 BaseFilter as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries base filter.
**Notes:** Lasterror is set.

### 69.28.5 ConnectedTo as DirectShowPinMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ConnectedTo method retrieves a pointer to the connected pin, if any.
**Notes:** Lasterror is set.

### 69.28.6 ConnectionMediaType as DirectShowMediaTypeMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ConnectionMediaType method retrieves the media type for the current pin connection, if any.
**Notes:** Lasterror is set.
Returns nil if not connected.

### 69.28.7 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.28.8 Direction as Integer

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The QueryDirection method gets the direction of the pin (input or output).
**Notes:** Lasterror is set.

### 69.28.9 Disconnect

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Disconnect method breaks the current pin connection.
**Notes:** The Filter Graph Manager calls this method when it disconnects two filters. Applications and filters should not call this method. Instead, call the DirectShowFilterGraphMBS.Disconnect method on the Filter Graph Manager.
Sets lasterror.

This method fails if the filter is paused or running. If the pin supports the PinConnection interface, call PinConnection DynamicDisconnect to disconnect the pin when the filter is paused or running.
This method does not disconnect the other pin in the pin connection.

### 69.28.10 Id as String

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Id method retrieves an identifier for the pin.
**Notes:** Returns a string containing the pin identifier.
Lasterror is set.

### 69.28.11 MediaTypes as DirectShowMediaTypeMBS()

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enumerates the pin's preferred media types.
**Notes:** Lasterror is set.

### 69.28.12 Name as String

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries name of the pin.
**Notes:** Lasterror is set.

### 69.28.13 PIN_CATEGORY_ANALOGVIDEOIN as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Input pin of the capture filter that takes analog and digitizes it.

### 69.28.14 PIN_CATEGORY_CAPTURE as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Capture pin.

### 69.28.15 PIN_CATEGORY_CC as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing closed captioning data from Line 21.

### 69.28.16 PIN_CATEGORY_EDS as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing Extended Data Services (Line 21, even fields).

### 69.28.17 PIN_CATEGORY_NABTS as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing North American Videotext Standard data.

### 69.28.18 PIN_CATEGORY_PREVIEW as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Preview pin.

### 69.28.19 PIN_CATEGORY_STILL as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin that provides a still image. The filter's capture pin must be connected before the still-image pin is connected.

### 69.28.20 PIN_CATEGORY_TELETEXT as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing teletext (a closed captioning variant).

### 69.28.21 PIN_CATEGORY_TIMECODE as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing timecode data.

### 69.28.22 PIN_CATEGORY_VBI as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin to be connected to the VBI Surface Allocator, the VBI surface allocator filter that is needed to allocate the correct video memory for things like closed captioning overlays in scenarios where a video port is being used. PCI, IEEE 1394, and USB scenarios do not use this filter.

### 69.28.23 PIN_CATEGORY_VIDEOPORT as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Video output pin to be connected to input pin zero on the Overlay Mixer.

### 69.28.24 PIN_CATEGORY_VIDEOPORT_VBI as DirectShowGUIDMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the DirectShow pin categories.
**Notes:** Pin providing vertical blanking interval data.

### 69.28.25 Properties

### 69.28.26 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IPin interface.
(Read and Write property)

### 69.28.27 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.28.28 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.28.29 Constants

Pin Direction

| Constant | Value | Description |
|---|---|---|
| kPinDirectionInput | 0 | Input |
| kPinDirectionOutput | 1 | Output |

# 69.29 class DirectShowPropertyBagMBS

## 69.29.1 class DirectShowPropertyBagMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides an object with a property bag in which the object can save its properties persistently.
**Notes:** used for Monikers to store properties like description and user friendly name.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MBS Xojo Plugins, version 21.6pr1
- MBS Real Studio Plugins, version 12.1pr2

## 69.29.2 Methods

## 69.29.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 69.29.4 CountProperties as Integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of properties in the property bag.
**Notes:** Sets lasterror.
This fails if the underlaying object doesn't implement the IPropertyBag2 protocol.

## 69.29.5 Description as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience method to read description.
**Notes:** Lasterror is set.

### 69.29.6 DevicePath as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience method to read device path.
**Notes:** Lasterror is set.

### 69.29.7 FriendlyName as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Convenience method to read friendly name.
**Notes:** Lasterror is set.

### 69.29.8 PropertyName(index as Integer) as string

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries name of a property.
**Notes:** Sets lasterror.
This fails if the underlaying object doesn't implement the IPropertyBag2 protocol.

### 69.29.9 Read(name as string) as Variant

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads one of the properties into a variant.
**Notes:** As we only need 3 properties for DirectShowMonikerMBS.Properties, we have direct accessors.
Lasterror is set.

### 69.29.10 Properties

### 69.29.11 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IPropertyBag interface.
(Read and Write property)

### 69.29.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.29.13 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

## 69.30 class DirectShowSampleGrabberMBS

### 69.30.1 class DirectShowSampleGrabberMBS

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a sample grabber.
**Notes:** The Sample Grabber filter provides a way to retrieve samples as they pass through the filter graph. It is a transform filter with one input pin and one output pin. It passes all samples downstream unchanged, so you can insert it into a filter graph without altering the data stream. Your application can then retrieve individual samples from the filter by calling methods on the ISampleGrabber interface.
If you want to retrieve samples without rendering the data, connect the Sample Grabber filter to the Null Renderer filter.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr8

### 69.30.2 Methods

### 69.30.3 BaseFilter as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the filter for this grabber.
**Notes:** So you can add it to a graph builder.

### 69.30.4 ConnectedMediaType as DirectShowBaseFilterMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetConnectedMediaType method retrieves the media type for the connection on the input pin of the Sample Grabber.
**Notes:** Lasterror is set.

### 69.30.5 Constructor

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance of the sample grabber.

### 69.30.6 Current as Picture

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Queries current picture.
**Notes:** This actually makes a copy of the internal buffer into a new picture object.
Lasterror is set.

### 69.30.7 Destructor

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 69.30.8 SetOneShot(OneShot as boolean)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetOneShot method specifies whether the Sample Grabber filter halts after the filter receives a sample.

### 69.30.9 Properties

### 69.30.10 Handle as Integer

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an ISampleGrabber interface.
(Read and Write property)

### 69.30.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.30.12 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.30.13 Events

### 69.30.14 NewFrame(Time as Double)

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: .

**Function:** The event for a new video frame.
**Notes:** time is the starting time of the sample, in seconds.
Use the Current method to get the picture.

# 69.31 class DirectShowVideoInfoHeader2MBS

## 69.31.1 class DirectShowVideoInfoHeader2MBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes the bitmap and color information for a video image, including interlace, copy protection, and pixel aspect ratio information.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407326(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr7

## 69.31.2 Methods

## 69.31.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 69.31.4 Properties

## 69.31.5 AvgTimePerFrame as Int64

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The desired average display time of the video frames, in 100-nanosecond units.
**Notes:** The actual time per frame may be longer.
see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407326(v=vs.85).aspx
(Read and Write property)

## 69.31.6 BitErrorRate as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Data error rate, in bit errors per second.
**Notes:** (Read and Write property)

### 69.31.7 BitRate as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Approximate data rate of the video stream, in bits per second.
**Notes:** (Read and Write property)

### 69.31.8 ControlFlags as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Control flags.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407326(v=vs.85).aspx
(Read and Write property)

### 69.31.9 CopyProtectFlags as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flag set with the AMCOPYPROTECT_RestrictDuplication value (0x00000001) to indicate that the duplication of the stream should be restricted.
**Notes:** If undefined, specify zero or else the connection will be rejected.
(Read and Write property)

### 69.31.10 Height as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bitmap height.
**Notes:** (Read and Write property)

### 69.31.11 InterlaceFlags as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flags that specify how the video is interlaced.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407326(v=vs.85).aspx
(Read and Write property)

### 69.31.12 PictAspectRatioX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The X dimension of picture aspect ratio. For example, 16 for a 16-inch x 9-inch display.
**Notes:** (Read and Write property)

### 69.31.13 PictAspectRatioY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y dimension of picture aspect ratio. For example, 9 for a 16-inch x 9-inch display.
**Notes:** (Read and Write property)

### 69.31.14 SourceBottom as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.31.15 SourceLeft as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.31.16 SourceRight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.31.17 SourceTop as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.31.18 TargetBottom as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.31.19 TargetLeft as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.31.20 TargetRight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.31.21 TargetTop as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.31.22 Width as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bitmap width.
**Notes:** (Read and Write property)

## 69.32 class DirectShowVideoInfoHeaderMBS

### 69.32.1 class DirectShowVideoInfoHeaderMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes the bitmap and color information for a video image.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407325(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.3pr3
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.32.2 Methods

### 69.32.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.32.4 Properties

### 69.32.5 AvgTimePerFrame as Int64

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The desired average display time of the video frames, in 100-nanosecond units.
**Notes:** The actual time per frame may be longer.
see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407325(v=vs.85).aspx
(Read and Write property)

### 69.32.6 BitCount as Integer

MBS Win Plugin, Plugin Version: 16.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bitmap bit count value.
**Notes:** The number of bits-per-pixel. Determines the number of bits that define each pixel and the maximum number of colors in the bitmap. This member must be one of the following values.

Can be 0 for PNG/JPEG images, 1 for B/W, 4 for 16 colors, 8 for 256 colors, 16 for thousands of colors, 24 for millions of colors or 32 for millions of colors with alpha.
(Read and Write property)

### 69.32.7 BitErrorRate as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Data error rate, in bit errors per second.
**Notes:** (Read and Write property)

### 69.32.8 BitRate as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Approximate data rate of the video stream, in bits per second.
**Notes:** (Read and Write property)

### 69.32.9 BMIHeaderPtr as Ptr

MBS Win Plugin, Plugin Version: 16.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns pointer to BITMAPINFOHEADER structure.
**Notes:** You can use this to modify any field directly.
You need to know what you do and know the exact offset. (which can be different in 32-bit vs. 64-bit)
(Read only property)

### 69.32.10 Height as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bitmap height.
**Notes:** (Read and Write property)

### 69.32.11 SourceBottom as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.

(Read and Write property)

### 69.32.12 SourceLeft as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.32.13 SourceRight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.32.14 SourceTop as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the rectangle defining the source video window.
**Notes:** This rectangle can be a clipping rectangle, to select a portion of the source video stream.
(Read and Write property)

### 69.32.15 TargetBottom as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.32.16 TargetLeft as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.32.17 TargetRight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.32.18 TargetTop as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Part of the target rectangle for the destination video window.
**Notes:** (Read and Write property)

### 69.32.19 VideoInfoHeaderPtr as Ptr

MBS Win Plugin, Plugin Version: 16.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns pointer to VIDEOINFOHEADER structure.
**Notes:** You can use this to modify any field directly.
You need to know what you do and know the exact offset. (which can be different in 32-bit vs. 64-bit)
(Read only property)

### 69.32.20 Width as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bitmap width.
**Notes:** (Read and Write property)

## 69.33 class DirectShowVideoStreamConfigCapsMBS

### 69.33.1 class DirectShowVideoStreamConfigCapsMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Describes a range of video formats.
**Notes:** Video compression and video capture filters use this structure to describe what formats they can produce.
Microsoft deprecated this strucutre some time ago in favor of DirectShowMediaTypeMBS class.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd407352(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 69.33.2 Methods

### 69.33.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 69.33.4 Properties

### 69.33.5 CropAlignX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Required horizontal alignment of the source rectangle.
**Notes:** Deprecated.
(Read only property)

### 69.33.6 CropAlignY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Required vertical alignment of the source rectangle.
**Notes:** Deprecated.

(Read only property)

### 69.33.7 CropGranularityX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Horizontal granularity of the source rectangle.
**Notes:** This value specifies the increments that are valid between MinCroppingSize and MaxCroppingSize.
Deprecated.
(Read only property)

### 69.33.8 CropGranularityY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Vertical granularity of the source rectangle.
**Notes:** This value specifies the increments that are valid between MinCroppingSize and MaxCroppingSize.
Note Deprecated.
(Read only property)

### 69.33.9 InputSizeHeight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Native size of the incoming video signal.
**Notes:** For a compressor, the size is taken from the input pin. For a capture filter, the size is the largest signal the filter can digitize with every pixel remaining unique.
Deprecated.
(Read only property)

### 69.33.10 InputSizeWidth as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Native size of the incoming video signal.
**Notes:** For a compressor, the size is taken from the input pin. For a capture filter, the size is the largest signal the filter can digitize with every pixel remaining unique.
Deprecated.
(Read only property)

### 69.33.11 MaxBitsPerSecond as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum data rate this pin can produce.
**Notes:** Deprecated
(Read only property)

### 69.33.12 MaxCroppingSizeHeight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Largest source rectangle allowed.
**Notes:** Deprecated.
(Read only property)

### 69.33.13 MaxCroppingSizeWidth as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Largest source rectangle allowed.
**Notes:** Deprecated.
(Read only property)

### 69.33.14 MaxFrameInterval as Int64

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum frame duration, in 100-nanosecond units.
**Notes:** This value applies only to capture filters.
(Read and Write property)

### 69.33.15 MaxOutputSizeHeight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum output size.
**Notes:** Deprecated.
(Read only property)

### 69.33.16 MaxOutputSizeWidth as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum output size.
**Notes:** Deprecated.
(Read only property)

### 69.33.17 MinBitsPerSecond as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum data rate this pin can produce.
**Notes:** Deprecated.
(Read only property)

### 69.33.18 MinCroppingSizeHeight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Smallest source rectangle allowed.
**Notes:** The source rectangle is defined in the Source rectangle of the DirectShowVideoInfoHeader2MBS or DirectShowVideoInfoHeaderMBS classes.
Note Deprecated.
(Read only property)

### 69.33.19 MinCroppingSizeWidth as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Smallest source rectangle allowed.
**Notes:** The source rectangle is defined in the Source rectangle of the DirectShowVideoInfoHeader2MBS or DirectShowVideoInfoHeaderMBS classes.
Note Deprecated.
(Read only property)

### 69.33.20 MinFrameInterval as Int64

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The minimum frame duration, in 100-nanosecond units. This value applies only to capture filters.

**Notes:** (Read and Write property)

### 69.33.21 MinOutputSizeHeight as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum output size.
**Notes:** Deprecated.
(Read only property)

### 69.33.22 MinOutputSizeWidth as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum output size.
**Notes:** Deprecated.
(Read only property)

### 69.33.23 OutputGranularityX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Granularity of the output width.
**Notes:** This value specifies the increments that are valid between MinOutputSize and MaxOutputSize.
Deprecated.
(Read only property)

### 69.33.24 OutputGranularityY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Granularity of output height.
**Notes:** This value specifies the increments that are valid between MinOutputSize and MaxOutputSize.
Deprecated.
(Read only property)

### 69.33.25 ShrinkTapsX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates how well the filter can shrink the image horizontally.
**Notes:** Deprecated.

| Value | Meaning |
|---|---|
| 0 | Does not support stretching/shrinking. |
| 1 | Uses pixel doubling (stretching) or eliminates pixels (shrinking) |
| 2 | Uses interpolation (2 taps) |
| 3 and higher | Uses interpolation (>2 taps) |

(Read only property)

### 69.33.26 ShrinkTapsY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates how well the filter can shrink the image vertically.
**Notes:** Deprecated.

| Value | Meaning |
|---|---|
| 0 | Does not support stretching/shrinking. |
| 1 | Uses pixel doubling (stretching) or eliminates pixels (shrinking) |
| 2 | Uses interpolation (2 taps) |
| 3 and higher | Uses interpolation (>2 taps) |

(Read only property)

### 69.33.27 StretchTapsX as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates how well the filter can stretch the image horizontally.
**Notes:** Deprecated.

(Read only property)

| Value | Meaning |
|---|---|
| 0 | Does not support stretching/shrinking. |
| 1 | Uses pixel doubling (stretching) or eliminates pixels (shrinking) |
| 2 | Uses interpolation (2 taps) |
| 3 and higher | Uses interpolation (>2 taps) |

### 69.33.28 StretchTapsY as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates how well the filter can stretch the image vertically.
**Notes:** Deprecated.

| Value | Meaning |
|---|---|
| 0 | Does not support stretching/shrinking. |
| 1 | Uses pixel doubling (stretching) or eliminates pixels (shrinking) |
| 2 | Uses interpolation (2 taps) |
| 3 and higher | Uses interpolation (>2 taps) |

(Read only property)

### 69.33.29 VideoStandard as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The analog video standard supported.
**Notes:** The value is a bitwise combination of flags from the AnalogVideoStandard enumeration type, or zero.
(Read only property)

# 69.34 class DirectShowVideoWindowMBS

## 69.34.1 class DirectShowVideoWindowMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The direct show class for a video window.
**Notes:** The DirectShowVideoWindowMBS interface sets properties on the video window. Applications can use it to set the window owner, the position and dimensions of the window, and other properties.

The Video Renderer filter and the Filter Graph Manager both expose this interface. The Filter Graph Manager forwards all method calls to the Video Renderer. It also forwards certain window messages that the Video Renderer needs to receive, such as WM_DISPLAYCHANGE. Because the video window is usually a child of an application window, the filter would not otherwise receive these messages. Therefore it relies on the Filter Graph Manager to forward them.

In most cases, an application should query the Filter Graph Manager for this interface, and not call the filter directly, because of the messaging issue just described. However, if the filter graph has more than one Video Renderer, the Filter Graph Manager only communicates with one of them, selected arbitrarily. Therefore, if your application uses multiple video windows, use the DirectShowVideoWindowMBS interface directly on the filters. In that case, you must forward window messages to each Video Renderer instance, using the NotifyOwnerMessage method.

Properties set on a video renderer persist between successive connections and disconnections.

Error codes: If the video renderer filter is not connected to another filter, all methods return the error code VFW_E_NOT_CONNECTED. For the Filter Graph Manager's implementation, if the graph does not contain a video renderer filter, all methods return E_NOINTERFACE. Note that the Filter Graph Manager exposes the interface even when the graph does not contain a video renderer, so an application can query for the interface before it builds the graph.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 21.0pr7

## 69.34.2 Methods

## 69.34.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor to create a new video window.

### 69.34.4 GetMaxIdealImageSize(byref width as Integer, byref height as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetMaxIdealImageSize method retrieves the maximum ideal image size for the video image.
**Notes:** Width: Receives the maximum ideal width, in pixels.
Height: Receives the maximum ideal height, in pixels.
Lasterror is set.

The maximum ideal size may differ from the native video size, because the video hardware might have specific stretching requirements.

### 69.34.5 GetMinIdealImageSize(byref width as Integer, byref height as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetMinIdealImageSize method retrieves the minimum ideal size for the video image.
**Notes:** Width: Receives the minimum ideal width, in pixels.
Height: Receives the minimum ideal height, in pixels.
Lasterror is set.

The maximum ideal size may differ from the native video size, because the video hardware might have specific stretching requirements.

### 69.34.6 GetRestorePosition(byref left as Integer, byref top as Integer, byref width as Integer, byref height as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetRestorePosition method retrieves the restored window position.
**Notes:** Left: Receives the x-coordinate, in pixels.
Top: Receives the y-coordinate, in pixels.
Width: Receives the width of the window, in pixels.
Height: Receives the height of the window, in pixels.
Lasterror is set.

If the video window is minimized or maximized, you can use this method to get the window's restored position.

### 69.34.7 GetWindowPosition(byref left as Integer, byref top as Integer, byref width as Integer, byref height as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetWindowPosition method retrieves the position of the video window.
**Notes:** Left: Receives the x-coordinate, in pixels.
Top: Receives the y-coordinate, in pixels.
Width: Receives the width of the window, in pixels.
Height: Receives the height of the window, in pixels.

Lasterror is set.
This method has the same effect as querying left, top, width and height methods.

### 69.34.8 HideCursor(hide as boolean)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The HideCursor method shows or hides the cursor when the mouse is positioned over the video window.
**Notes:** Hide: Whether to hide or show the cursor.
Lasterror is set.

### 69.34.9 IsCursorHidden as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IsCursorHidden method queries whether the cursor is hidden.
**Notes:** Lasterror is set.

### 69.34.10 SetWindowForeground(Focus as Boolean)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetWindowForeground method places the video window at the top of the Z order.
**Notes:** Focus: whether to give the window focus.
Lasterror is set.

### 69.34.11 SetWindowPosition(left as Integer, top as Integer, width as Integer, height as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetWindowPosition method sets the position of the video window.
**Notes:** Left: The x-coordinate, in pixels.
Top: The y-coordinate, in pixels.
Width: The width, in pixels.
Height: The height, in pixels.
Lasterror is set.

This method has the same effect as setting the Left, Top, Width, and Height methods.
If resizing the window to the specified dimensions is impossible, this method modifies the window's size and location to make the window fit. Call the GetWindowPosition method to determine the result.

### 69.34.12 Properties

### 69.34.13 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Points to an IVideoWindow interface.
(Read and Write property)

### 69.34.14 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Please check function documentation and also LastErrorMessage property for a human readable error message.
(Read and Write property)

### 69.34.15 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The formatted error message for the last error.
**Notes:** (Read and Write property)

### 69.34.16 MessageDrain as Variant

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The window to receive mouse and keyboard messages from the video window.
**Notes:** Lasterror is set.
This method enables an application to respond to mouse and keyboard events generated within the video window.
If Drain is non-nil, the video renderer forwards certain messages to the specified window, using the PostMessage function. Which messages are forwarded might depend on the video renderer in use.

Can reference a Window or DesktopWindow object.
(Read and Write property)

### 69.34.17 messageDrainControl as Variant

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** The control to receive mouse and keyboard messages from the video window.
**Notes:** Lasterror is set.
This method enables an application to respond to mouse and keyboard events generated within the video window.
If Drain is non-nil, the video renderer forwards certain messages to the specified window, using the PostMessage function. Which messages are forwarded might depend on the video renderer in use.

Can reference a Control or DesktopControl object.
(Read and Write property)

### 69.34.18 Owner as Variant

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The parent window for the video window.
**Notes:** Lasterror is set.
Use this method to display videos in a compound document. This method changes the parent of the video window and sets the WS_CHILD style for the video window.
Reset the owner to nil before releasing the Filter Graph Manager. Otherwise, messages will continue to be sent to this window and errors will likely occur when the application is terminated.

Can reference a Window or DesktopWindow object.
(Read and Write property)

### 69.34.19 OwnerControl as Variant

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** The parent control for the video window.
**Notes:** Lasterror is set.
Use this method to display videos in a compound document. This method changes the parent of the video window and sets the WS_CHILD style for the video window.
Reset the owner to nil before releasing the Filter Graph Manager. Otherwise, messages will continue to be sent to this window and errors will likely occur when the application is terminated.

Can reference a Control or DesktopControl object.
(Read and Write property)

### 69.34.20 AutoShow as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the video renderer automatically shows the video window when it receives video data.
**Notes:** Lasterror is set.
By default, when the filter graph changes state to paused or running, the video renderer shows the video window and moves it to the foreground. If the user closes the window, it will not automatically reappear.
(Read and Write computed property)

### 69.34.21 BackgroundPalette as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the video window realizes its palette in the background.
**Notes:** Lasterror is set.
If BackgroundPalette is true and the video image requires a palette, the video renderer will realize that palette in the background. Any colors that the palette uses will change to their closest match in the display palette prior to drawing. This ensures that an application will not have its palette disturbed. However, it imposes severe performance penalties on the video.
(Read and Write computed property)

### 69.34.22 BorderColor as color

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The color that appears around the edges of the destination rectangle.
**Notes:** Lasterror is set.
If the destination rectangle is smaller than the client area of the video window, a border is exposed around

the edges of the video. The default color is black. Use this method to override the default color. If a palette is in use, a nonsystem color is converted to its closest match.
(Read and Write computed property)

### 69.34.23 Caption as string

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The video window caption.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 69.34.24 FullScreenMode as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enables or disables full-screen video rendering.
**Notes:** Set to true to switch to full-screen mode. Set to false to disable full-screen mode. (Default.)
Lasterror is set.

Depending on the video renderer, the switch to full-screen mode may not be visible until the application runs or pauses the graph. In full-screen mode, if the user switches away from the application (for example, using ALT + TAB), the Filter Graph Manager sends an EC_FULLSCREEN_LOST event.
The following remarks describe how the Filter Graph Manager implements full-screen mode. Application developers can probably ignore this information, but it may be useful if you are writing a custom video renderer.
When an application switches to full-screen mode, the Filter Graph Manager searches for a video renderer that will function most efficiently. In order of preference, these are:

- Any video renderer in the filter graph that natively supports full-screen mode.
- Any video renderer in the filter graph that can stretch the video to full-screen without a significant performance cost.
- The Full Screen Renderer filter.
- Any video renderer in the filter graph that supports DirectShowVideoWindowMBS.

For the first option, the Filter Graph Manager sets FullScreenMode on every video renderer in the graph. Most renderers return E_NOTIMPL, indicating the filter does not natively support full-screen mode. If any renderer returns a value not equal to E_NOTIMPL, the Filter Graph Manager uses that one.
For the second option, the Filter Graph Manager calls GetMaxIdealImageSize and GetMinIdealImageSize on every video renderer in the graph. If the size of the display falls within the filter's reported range, it

indicates that the filter can stretch the video without a significant performance cost.
Note If the graph is stopped, the Filter Graph Manager pauses each renderer before calling these methods. This gives the renderer an opportunity to initialize any resources it needs, because many renderers cannot determine these values while they are stopped.
Except on older hardware, the second option will generally succeed. The third option is to use the Full Screen Renderer filter, adding it to the graph if necessary. The fourth option is simply to find the first renderer in the graph that supports DirectShowVideoWindowMBS, and stretch the video regardless of performance.
(Read and Write computed property)

### 69.34.25 Height as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the video window.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 69.34.26 Left as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The x-coordinate of the video window.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 69.34.27 Top as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The y-coordinate of the video window.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 69.34.28 Visible as Boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shows or hides the video window.
**Notes:** Set to true to show the window or set to false to hide the window.
Lasterror is set.

(Read and Write computed property)

### 69.34.29 Width as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the video window.
**Notes:** (Read and Write computed property)

### 69.34.30 WindowState as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shows, hides, minimizes, or maximizes the video window.
**Notes:** Lasterror is set.

See MSDN page for ShowWindow for SW_* constants:
http://msdn.microsoft.com/en-us/library/windows/desktop/ms633548(v=vs.85).aspx
(Read and Write computed property)

### 69.34.31 WindowStyle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The window styles on the video window.
**Notes:** Lasterror is set.
See MSDN for SetWindowLong for details on the WS_* constants.
(Read and Write computed property)

### 69.34.32 WindowStyleEx as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The window extended styles on the video window.
**Notes:** Lasterror is set.
See MSDN for SetWindowLong for details on the WS_EX_* constants.
(Read and Write computed property)

### 69.34.33 Constants

Window Show Modes

| Constant | Value | Description |
|---|---|---|
| SW_FORCEMINIMIZE | 11 | |
| SW_HIDE | 0 | |
| SW_MAXIMIZE | 3 | |
| SW_MINIMIZE | 6 | |
| SW_NORMAL | 1 | |
| SW_RESTORE | 9 | |
| SW_SHOW | 5 | |
| SW_SHOWDEFAULT | 10 | |
| SW_SHOWMAXIMIZED | 3 | |
| SW_SHOWMINIMIZED | 2 | |
| SW_SHOWMINNOACTIVE | 7 | |
| SW_SHOWNA | 8 | |
| SW_SHOWNOACTIVATE | 4 | |
| SW_SHOWNORMAL | 1 | |

Windows Flags

| Constant | Value | Description |
|---|---|---|
| WS_BORDER | &h00800000 | |
| WS_CAPTION | &h00C00000 | |
| WS_CHILD | &h40000000 | |
| WS_CHILDWINDOW | &h40000000 | |
| WS_CLIPCHILDREN | &h02000000 | |
| WS_CLIPSIBLINGS | &h04000000 | |
| WS_DISABLED | &h08000000 | |
| WS_DLGFRAME | &h00400000 | |
| WS_GROUP | &h00020000 | |
| WS_HSCROLL | &h00100000 | |
| WS_ICONIC | &h20000000 | |
| WS_MAXIMIZE | &h01000000 | |
| WS_MAXIMIZEBOX | &h00010000 | |
| WS_MINIMIZE | &h20000000 | |
| WS_MINIMIZEBOX | &h00020000 | |
| WS_OVERLAPPED | &h00000000 | |
| WS_OVERLAPPEDWINDOW | &h00CF0000 | |
| WS_POPUP | &h80000000 | |
| WS_POPUPWINDOW | &h80880000 | |
| WS_SIZEBOX | &h00040000 | |
| WS_SYSMENU | &h00080000 | |
| WS_TABSTOP | &h00010000 | |
| WS_THICKFRAME | &h00040000 | |
| WS_TILED | &h00000000 | |
| WS_TILEDWINDOW | &h00CF0000 | |
| WS_VISIBLE | &h10000000 | |
| WS_VSCROLL | &h00200000 | |

Windows Extended Flags

| Constant | Value | Description |
|---|---|---|
| WS_EX_ACCEPTFILES | &h00000010 | |
| WS_EX_APPWINDOW | &h00040000 | |
| WS_EX_CLIENTEDGE | &h00000200 | |
| WS_EX_CONTEXTHELP | &h00000400 | |
| WS_EX_CONTROLPARENT | &h00010000 | |
| WS_EX_DLGMODALFRAME | &h00000001 | |
| WS_EX_LAYERED | &h00080000 | |
| WS_EX_LAYOUTRTL | &h00400000 | |
| WS_EX_LEFT | &h00000000 | |
| WS_EX_LEFTSCROLLBAR | &h00004000 | |
| WS_EX_LTRREADING | &h00000000 | |
| WS_EX_MDICHILD | &h00000040 | |
| WS_EX_NOACTIVATE | &h08000000 | |
| WS_EX_NOINHERITLAYOUT | &h00100000 | |
| WS_EX_NOPARENTNOTIFY | &h00000004 | |
| WS_EX_OVERLAPPEDWINDOW | &h00000300 | |
| WS_EX_PALETTEWINDOW | &h00000188 | |
| WS_EX_RIGHT | &h00001000 | |
| WS_EX_RIGHTSCROLLBAR | &h00000000 | |
| WS_EX_RTLREADING | &h00002000 | |
| WS_EX_STATICEDGE | &h00020000 | |
| WS_EX_TOOLWINDOW | &h00000080 | |
| WS_EX_TOPMOST | &h00000008 | |
| WS_EX_TRANSPARENT | &h00000020 | |
| WS_EX_WINDOWEDGE | &h00000100 | |

# 69.35 class DirectShowWaveFormatMBS

## 69.35.1 class DirectShowWaveFormatMBS

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Defines the format of waveform-audio data.
**Notes:** Only format information common to all waveform-audio data formats is included in this structure. For formats that require additional information, this structure is included as the first member in another structure, along with the additional information.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr7

## 69.35.2 Methods

## 69.35.3 Constructor

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 69.35.4 Properties

## 69.35.5 AvgBytesPerSec as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Required average data-transfer rate, in bytes per second, for the format tag.
**Notes:** If wFormatTag is WAVE_FORMAT_PCM, nAvgBytesPerSec must equal nSamplesPerSec x nBlockAlign. For non-PCM formats, this member must be computed according to the manufacturer's specification of the format tag.
(Read and Write property)

## 69.35.6 BitsPerSample as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bits per sample for the FormatTag format type.
**Notes:** If wFormatTag is WAVE_FORMAT_PCM, then BitsPerSample should be equal to 8 or 16. For non-PCM formats, this member must be set according to the manufacturer's specification of the format tag. If FormatTag is WAVE_FORMAT_EXTENSIBLE, this value can be any integer multiple of 8.

Some compression schemes do not define a value for BitsPerSample, so this member can be zero.
(Read and Write property)

### 69.35.7 BlockAlign as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Block alignment, in bytes.
**Notes:** The block alignment is the minimum atomic unit of data for the wFormatTag format type. If wFormatTag is WAVE_FORMAT_PCM, nBlockAlign must equal (nChannels √ó wBitsPerSample) / 8. For non-PCM formats, this member must be computed according to the manufacturer's specification of the format tag.
Software must process a multiple of nBlockAlign bytes of data at a time. Data written to and read from a device must always start at the beginning of a block. For example, it is illegal to start playback of PCM data in the middle of a sample (that is, on a non-block-aligned boundary).
(Read and Write property)

### 69.35.8 Channels as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of channels in the waveform-audio data.
**Notes:** Monaural data uses one channel and stereo data uses two channels.
(Read and Write property)

### 69.35.9 Data as Ptr

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pointer to raw data of WAVEFORMATEX structure.
**Notes:** (Read only property)

### 69.35.10 FormatTag as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Waveform-audio format type.
**Notes:** Format tags are registered with Microsoft Corporation for many compression algorithms. A complete list of format tags can be found in the Mmreg.h header file. For one- or two-channel Pulse Code Modulation (PCM) data, this value should be WAVE_FORMAT_PCM.

- If FormatTag equals WAVE_FORMAT_EXTENSIBLE, the structure is interpreted as a WAVEFORMATEXTENSIBLE structure.
- If FormatTag equals WAVE_FORMAT_MPEG, the structure is interpreted as an MPEG1WAVEFORMAT structure.
- If FormatTag equals WAVE_FORMAT_MPEGLAYER3, the structure is interpreted as an MPEGLAYER3WAVEFORMAT structure.

Before reinterpreting a WAVEFORMATEX structure as one of these extended structures, verify that the actual structure size is sufficiently large and that the cbSize member indicates a valid size.

Please contact MBS if you need the above structures as classes in Xojo.
(Read and Write property)

### 69.35.11 SamplesPerSec as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sample rate, in samples per second (hertz).
**Notes:** If FormatTag is WAVE_FORMAT_PCM, then common values for SamplesPerSec are 8.0 kHz, 11.025 kHz, 22.05 kHz, and 44.1 kHz. For non-PCM formats, this member must be computed according to the manufacturer's specification of the format tag.
(Read and Write property)

### 69.35.12 Size as Integer

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Size, in bytes, of extra format information appended to the end of the WAVEFORMATEX structure.
**Notes:** This information can be used by non-PCM formats to store extra attributes for the wFormatTag. If no extra information is required by the wFormatTag, this member must be set to zero. For WAVE_FORMAT_PCM formats (and only WAVE_FORMAT_PCM formats), this member is ignored. However it is still recommended to set the value.
(Read and Write property)

# Chapter 70

# Disassembler

## 70.1 Globals

### 70.1.1 DisAssembleMBS

MBS Util Plugin, Plugin Version: 3.4, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Disassembles all further instructions from the current method following this command.
**Notes:** The result is stored inside the plugin memory and you can get a copy using the GetDisAssembleMBS function.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 70.1.2 DisAssembleObjectMethodMBS(target as object, Declaration as string)

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Disassembles all instructions from the given method inside the given object.
**Notes:** The result is stored inside the plugin memory and you can get a copy using the GetDisAssembleMBS function.
Requires Xojo 5.5 or newer.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 70.1.3 GetDisAssembleMBS as string

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns a string with the disassembled text.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

# Chapter 71

# DiscRecording

## 71.1 class DRBurnMBS

### 71.1.1 class DRBurnMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A class to perform and monitor the burning of a CD or DVD disc.
**Notes:** Each time you want to burn to a disc, an instance of DRBurnMBS needs to be created.

When an instance is created, you pass in an instance of DRDevice to let the DRBurn object know what device to use. This object is retained for the life of the DRBurn instance. Before burning, you can set several options that control the behavior of the burn and the handling of the disc once the burn completes.

A DRBurn object will send out notifications through the DRNotificationCenter mechanism to broadcast the burn state to any interested observers. However, if for some reason you don't want to use notifications, you can poll the burn object at any time for the current status using the status properties. This is not recommended in any application using a run loop, because it involves polling.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7
- MonkeyBread Software Releases the MBS Plugins 8.2

### 71.1.2 Methods

### 71.1.3 abort

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Stops the burn.
**Notes:** When this method returns the burn might not actually be fully stopped but it has been cancelled and only cleanup is going on. If a burn has not completed writing data to disc, you just made a coaster.

Typically this method is only used as a result of the user hitting a cancel/stop button somewhere in the user interface.

### 71.1.4 burnForDevice(device as DRDeviceMBS) as DRBurnMBS

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an autoreleased burn object.
**Notes:** Once a burn is created with this method, the object is ready to write data to the disc.

### 71.1.5 Constructor(device as DRDeviceMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a burn object.
**Notes:** Once a burn is created with this method, the object is ready to write data to the disc.

### 71.1.6 device as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the device being used for the burn.
**Notes:** Returns nil on any error.

### 71.1.7 DRBurnAppendableKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a boolean indicating if the disc will still be appendable after the burn. If this key is not present, the burn will default to a value of false and the disc will be marked as not

appendable.

### 71.1.8 DRBurnCompletionActionEject as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** An string value for the CompletionAction indicating that the burn object should eject the disc from the drive when the burn completes.

### 71.1.9 DRBurnCompletionActionKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a String containing one of the completion actions possible for the disc handling. If this key is not present, the burn will default to a value of DRBurnCompletionActionEject and the disc will be ejected.

### 71.1.10 DRBurnCompletionActionMount as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** An string value for the CompletionAction property indicating that the burn object should mount the disc on the desktop when the burn completes.

### 71.1.11 DRBurnDoubleLayerL0DataZoneBlocksKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property key whose value is an double containing the number of blocks desired for the layer 0 data zone on a double layer writable disc.

The size of the layer 0 data zone dictates where the transition point is from layer 0 to layer 1. If this key is present, the data zone size will be set prior to the start of the burn using the value for this key. If it is not present, the default layer 0 data zone will be used (half the available blocks on an empty disc).

The transition point can be specified two ways. If the value specified in this key is greater than 1.0, then it will designate an absolute block number for the transition point. In this case, the block number should be a multiple of 16 and at least 40000h per specification. If the value is less than 1.0, it will specify the

percentage of the burn that should reside on layer 0. A typical value is 0.5, designating half the burn for each layer. A value of 0.0 or 1.0 will not change the layer 0 transition point.

### 71.1.12 DRBurnFailureActionEject as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** An string constant for FailureAction indicating that the burn object should eject the disc from the drive if the burn fails.

### 71.1.13 DRBurnFailureActionKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a string containing a one of the failure actions possible for the disc handling.

If this key is not present, the burn will default to a value of DRBurnFailureActionEject and the disc will be ejected.

### 71.1.14 DRBurnFailureActionNone as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** An string constant for FailureAction indicating that the burn object should do nothing with the disc if the burn fails.

### 71.1.15 DRBurnOverwriteDiscKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a boolean indicating if the disc will be overwritten from block zero for the burn. If this key is not present, the burn will default to a value of false and the disc will be appended.

### 71.1.16 DRBurnRequestedSpeedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a number containing the speed at which the burn should run, expressed as a float value of kilobytes per second. If this key is not present, the speed will default to DRDeviceBurnSpeedMax.

### 71.1.17 DRBurnStatusChangedNotification as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** The notification name for a status update on a burn operation.
**Notes:** See the "DataBurn with Events and Notification" example project.

### 71.1.18 DRBurnStrategyBDDAO as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the string constants for the burn strategy.
**Notes:** An string value for DRBurnStrategyKey representing the DAO (disc-at-once) burn strategy for BD (Blu-ray). This strategy applies only to BDs.

### 71.1.19 DRBurnStrategyCDSAO as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the string constants for the burn strategy.
**Notes:** An String value for DRBurnStrategyKey representing the SAO (session-at-once) burn strategy for CD.

### 71.1.20 DRBurnStrategyCDTAO as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the string constants for the burn strategy.
**Notes:** An String value for DRBurnStrategyKey representing the TAO (track-at-once) burn strategy for CD.

### 71.1.21 DRBurnStrategyDVDDAO as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the string constants for the burn strategy.
**Notes:** An String value for DRBurnStrategyKey representing the DAO (disc-at-once) burn strategy for DVD. This strategy applies only to DVDs; it is invalid when burning to CD media.

### 71.1.22 DRBurnStrategyIsRequiredKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a BOOL indicating whether the burn strategy/strategies listed for DRBurnStrategyKey are the only strategies allowed. If this key is not present, the burn will default to a value of false.

If this value is set to true, and the device does not support the type(s) of burn requested, the burn will fail with kDRDeviceBurnStrategyNotAvailableErr .

If this value is set to false, and the device does not support the type(s) of burn requested, the engine will choose an alternate burn strategy automatically - one that will provide an equivalent disc.

### 71.1.23 DRBurnStrategyKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a string, or array of strings, indicating the burn strategy or strategies that are suggested. If this key is not present, the burn engine picks an appropriate burn strategy automatically. Most clients will not need to specify a specific burn strategy.

When more than one strategy is suggested, the burn engine will attempt to use the first strategy in the list which is available. A burn strategy will never be used if it cannot write the required data: for example, TAO cannot be used to write CD-Text.

The presence of this key by itself is just a suggestion, and if the burn engine cannot fulfill the request it will burn using whatever strategy is available. To make the suggestion into a requirement, add DRBurnStrategyIsRequiredKey with a value of true.

### 71.1.24 DRBurnTestingKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a boolean indicating if the burn will run as a test burn.

When this is set and the burn object is sent writeLayout, the entire burn process proceeds as if data would be written to the disc, but the laser is not turned on to full power, so the physical disc is not modified.

If this key is not present or the selected burning device does not support test burning, the burn will default to a value of false and a normal burn will occur.

### 71.1.25 DRBurnUnderrunProtectionKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a boolean indicating if burn underrun protection will be on or off for devices which support it.

For those devices which support it, burn underrun protection is enabled by default.

If the device supports burn underrun protection and this key is not present, the burn will default to a value of true and burn underrun protection will be enabled.

### 71.1.26 DRBurnVerifyDiscKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a boolean indicating if the disc will be verified after being burned. If this key is not present, the burn will default to a value of true and the disc will be verified.

### 71.1.27 DRCDTextKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** This key points to a DRCDTextBlockMBS, or array of DRCDTextBlockMBS objects containing the

CD-Text information for the disc. If this key is not present, the burn will not write CD-Text.

Before using this key, you should to make sure that the device supports CD-Text by checking the value of DRDeviceCanWriteCDTextKey in the device's write capabilities dictionary.

If this value is set to true, and the device does not support writing CD-Text, the burn will fail with kDRDeviceCantWriteCDTextErr.

### 71.1.28 DRErrorStatusAdditionalSenseStringKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String describing the RBC additional sense code and additional sense code qualifier pair returned by the device. If no sense is reported, this key will not be present.

### 71.1.29 DRErrorStatusErrorInfoStringKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String describing extended error information in a user appropriate manner.

### 71.1.30 DRErrorStatusErrorKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number containing the OS error code for the error.

### 71.1.31 DRErrorStatusErrorStringKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String describing the error in a user appropriate manner.

### 71.1.32 DRErrorStatusKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** The key in the status dictionary for the error dictionary.

### 71.1.33 DRErrorStatusSenseCodeStringKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String describing the RBC sense code returned by the device. If no sense is reported, this key will not be present.

### 71.1.34 DRErrorStatusSenseKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String containing the raw RBC sense information structure reported by the device. If no sense is reported, this key will not be present.

### 71.1.35 DRMediaCatalogNumberKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a memoryblock containing exactly 13 bytes of data, which will be written to the disc as the Media Catalog Number. If this key is not present, it will default to all zeroes, indicating that a MCN is not supplied.

This value is the UPC/EAN product number, and should conform to the specifications of the UCC and EAN. See ean-int.org and uc-council.org for more details on the UPC/EAN standard.

http://www.ean-int.org/
http://www.uc-council.org/

### 71.1.36 DRStatusCurrentSessionKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number indicating the current session being burned.

### 71.1.37 DRStatusCurrentSpeedKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number indicating the current burn speed.

### 71.1.38 DRStatusCurrentTrackKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number indicating the current track being burned.

### 71.1.39 DRStatusEraseTypeKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** String indicating the type of erase operation.

### 71.1.40 DRStatusPercentCompleteKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** A key for the status dictionaries.
Number containing the percent complete of the operation expressed as a floating point number from 0 to 1.

### 71.1.41 DRStatusProgressCurrentKPS as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** The current burn speed in kilobytes per second.
**Notes:** This is an optional key within the DRStatusProgressInfoKey dictionary. The value of this key, if present, is a Number containing the write speed of the burn.

### 71.1.42 DRStatusProgressCurrentXFactor as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** The current burn speed in a media appropriate x-factor
**Notes:** This is an optional key within the DRStatusProgressInfoKey dictionary. The value of this key, if present, is a number containing the appropriate x-factor for the media.

### 71.1.43 DRStatusProgressInfoKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** A dictionary of extended progress information.
A key for the status dictionary. The value of this key is a reference to a Dictionary object containing extended progress information.

### 71.1.44 DRStatusStateDone as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey. Indicates the operation is finished and it succeeded.

### 71.1.45 DRStatusStateErasing as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the erase status dictionary.
**Notes:** Indicates the erase is currently in progress.

### 71.1.46 DRStatusStateFailed as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey. Indicates the operation is finished and it failed.

### 71.1.47 DRStatusStateFinishing as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is finishing up (closing the last session, writing the TOC, etc).

### 71.1.48 DRStatusStateKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** A key for the status dictionaries.
String indicating the current state of the operation.

### 71.1.49 DRStatusStateNone as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey. Indicates the operation has not yet begun.

### 71.1.50 DRStatusStatePreparing as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey. Indicates the operation is preparing to begin.

### 71.1.51 DRStatusStateSessionClose as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is closing a session on disc. The exact session being closing is contained in DRStatusCurrentSessionKey.

### 71.1.52 DRStatusStateSessionOpen as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is opening a session on disc. The exact session being opened is contained in DRStatusCurrentSessionKey.

### 71.1.53 DRStatusStateTrackClose as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is closing a track on disc. The exact track being closed is contained in DRStatusCurrentTrackKey.

### 71.1.54 DRStatusStateTrackOpen as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is opening a track on disc. The exact track being opened is contained in DRStatusCurrentTrackKey.

### 71.1.55 DRStatusStateTrackWrite as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey in the burn status dictionary.
**Notes:** Indicates the burn is writing a track on disc. The exact track being written is contained in DRStatusCurrentTrackKey.

### 71.1.56 DRStatusStateVerifying as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One possible value for DRStatusStateKey. Indicates the operation is verifying what it did.

### 71.1.57 DRStatusTotalSessionsKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number indicating the total number of sessions being burned.

### 71.1.58 DRStatusTotalTracksKey as string

MBS MacControls Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop only.

**Function:** One of the dictionary keys for the burn status dictionary.
**Notes:** Number indicating the total number of tracks in the current session being burned.

### 71.1.59 DRSynchronousBehaviorKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property key constants.
**Notes:** The burn property whose value is a BOOL indicating if burn operations will behave synchronously. If this key is not present, it will default to a value of false and burn operations will behave asynchronously.

Synchronous operations do not post status notifications, and will not return until they are completed. Status can still be queried at any time, and will remain valid even after the burn operation has finished.

### 71.1.60 status as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a dictionary describing the status of the burn.
**Notes:** The same dictionary is returned through the DRBurnStatusChangedNotification notification.

### 71.1.61 writeImageFile(ImageFile as FolderItem) as boolean

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Writes the image tracks to the disc.
**Notes:** Requires Mac OS X 10.4.

ImageFile: The path to the image file. This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.

Returns true on success and false on failure.
See also:

• 71.1.62 writeImageFile(ImagePath as String) as boolean 12195

### 71.1.62 writeImageFile(ImagePath as String) as boolean

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Writes the image tracks to the disc.
**Notes:** Requires Mac OS X 10.4.

ImageFile: The path to the image file. This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.

Returns true on success and false on failure.
See also:

• 71.1.61 writeImageFile(ImageFile as FolderItem) as boolean 12194

### 71.1.63 writeLayout(track as DRTrackMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Writes the track to the disc.
**Notes:** A single session disc will be created with the given track.
See also:

• 71.1.64 writeLayout(tracks() as DRTrackMBS) 12195

### 71.1.64 writeLayout(tracks() as DRTrackMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Writes the tracks to the disc.
**Notes:** A multi session disc will be created with the given tracks.
See also:

• 71.1.63 writeLayout(track as DRTrackMBS) 12195

### 71.1.65 Properties

### 71.1.66 appendable as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the burn is appendable.
**Example:**

```
dim b as DRBurnMBS // get a burn object
b.appendable=true
```

**Notes:** When a burn completes, it can mark the disc so that no more data can be written to it. This creates a closed or non-appendable disc (which is the most compatible with audio CD players). If this method returns false, then the disc will be marked as closed and no data can be appended to it. A return value of true indicates further burns can be appended to the disc.
(Read and Write computed property)

### 71.1.67 BurnFailureAction as string

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** What to do on a failure.
**Notes:** The burn property whose value is a string containing a one of the failure actions possible for the disc handling.

If this key is not present, the burn will default to a value of DRBurnFailureActionEject and the disc will be ejected.
(Read and Write computed property)

### 71.1.68 completionAction as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The action to be performed at the end of the burn.
**Notes:** Value must be DRBurnCompletionActionEject, DRBurnCompletionActionMount or empty for default.
(Read and Write computed property)

### 71.1.69 DoubleLayerL0DataZoneBlocks as Double

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** A double containing the number of blocks desired for the layer 0 data zone on a double layer writable disc.
**Notes:** The size of the layer 0 data zone dictates where the transition point is from layer 0 to layer 1. If this key is present, the data zone size will be set prior to the start of the burn using the value for this key.

If it is not present, the default layer 0 data zone will be used (half the available blocks on an empty disc). The transition point can be specified two ways. If the value specified in this key is greater than 1.0, then it will designate an absolute block number for the transition point. In this case, the block number should be a multiple of 16 and at least &h40000 per specification. If the value is less than 1.0, it will specify the percentage of the burn that should reside on layer 0. A typical value is 0.5, designating half the burn for each layer. A value of 0.0 or 1.0 will not change the layer 0 transition point.
(Read and Write computed property)

### 71.1.70 MediaCatalogNumber as memoryblock

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** The media catalog number as a binary data string.
**Notes:** The burn property whose value is a memoryblock containing exactly 13 bytes of data, which will be written to the disc as the Media Catalog Number. If this key is not present, it will default to all zeroes, indicating that a MCN is not supplied.

This value is the UPC/EAN product number, and should conform to the specifications of the UCC and EAN. See
http://www.ean-int.org/
and
http://www.uc-council.org/
for more details on the UPC/EAN standard.
(Read and Write computed property)

### 71.1.71 Overwrite as boolean

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** The burn property whose value is a boolean indicating if the disc will be overwritten from block zero for the burn.
**Notes:** If this key is not present, the burn will default to a value of false and the disc will be appended.
(Read and Write computed property)

### 71.1.72 properties as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The properties dictionary of the burn.
**Notes:** (Read and Write computed property)

### 71.1.73 requestedBurnSpeed as single

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The speed at which this burn will attempt to write data.
**Notes:** The actual speed also depends on the capabilities of the bus the device is on, the maximum speed of the device itself, and the media used.

Value is a float indicating the speed the burn should run at in kilobytes per second.
(Read and Write computed property)

### 71.1.74 Testing as boolean

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the burn will run as a test burn.
**Notes:** When this is set and the burn starts, the entire burn process proceeds as if data would be written to the disc, but the laser is not turned on to full power, so the physical disc is not modified.

If this key is not present or the selected burning device does not support test burning, the burn will default to a value of false and a normal burn will occur.
(Read and Write computed property)

### 71.1.75 UnderrunProtection as boolean

MBS MacControls Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** A boolean indicating if burn underrun protection will be on or off for devices which support it.
**Notes:** For those devices which support it, burn underrun protection is enabled by default.
If the device supports burn underrun protection and this key is not present, the burn will default to a value of trueand burn underrun protection will be enabled.
(Read and Write computed property)

### 71.1.76 verifyDisc as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the resulting disc will be verified.
**Example:**

```
dim b as DRBurnMBS // get a burn object
b.verifyDisc=true
```

**Notes:** After data is written to disc, the data can be verified. The verification process will read the data on the disc back into memory and compare it to the data originally used to write to disc. The type of verification is determined by a track property on a track-by-track basis. See the DRTrackMBS documentation for more information on verification types.
(Read and Write computed property)

## 71.2 class DRBurnProgressPanelMBS

### 71.2.1 class DRBurnProgressPanelMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Run and display progress while burning data to media.
**Example:**

```
dim track as DRTrackMBS
dim bsp as DRBurnSetupPanelMBS
dim bpp as DRBurnProgressPanelMBS

// we need a track
track=CreateTrack

if track<>nil then
bsp=new DRBurnSetupPanelMBS

// set a few options
bsp.setCanSelectAppendableMedia true
bsp.setCanSelectTestBurn true

if bsp.runSetupPanel=bsp.NSOKButton then
bpp=new DRBurnProgressPanelMBS

// And start off the burn itself. This will put up the progress dialog
// and do all the nice pretty things that a happy app does.
bpp.beginProgressPanelForBurn bsp.burnObject, track

else
MsgBox "You pressed cancel."
end if
end if
```

**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the NSPanelMBS class.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

**Xojo Developer Magazine**

- 6.1, pages 29 to 30: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.2.2 Methods

### 71.2.3 beginProgressPanelForBurn(burn as DRBurnMBS, track as DRTrackMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel on screen and begins the burn process.
**Notes:** This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns a single session disc with one track.
See also:

- 71.2.4 beginProgressPanelForBurn(burn as DRBurnMBS, tracks() as DRTrackMBS) 12201

### 71.2.4 beginProgressPanelForBurn(burn as DRBurnMBS, tracks() as DRTrackMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel on screen and begins the burn process.
**Notes:** This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns a multi session disc with several tracks.
See also:

- 71.2.3 beginProgressPanelForBurn(burn as DRBurnMBS, track as DRTrackMBS) 12201

### 71.2.5 beginProgressPanelForImageFile(burn as DRBurnMBS, file as folderitem) as boolean

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel on screen and begins the burn process.
**Notes:** This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns the image file located on the given position.

This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.
See also:

- 71.2.6 beginProgressPanelForImageFile(burn as DRBurnMBS, file as string) as boolean 12202

### 71.2.6 beginProgressPanelForImageFile(burn as DRBurnMBS, file as string) as boolean

MBS MacControls Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel on screen and begins the burn process.
**Notes:** This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns the image file located on the given position.

This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.
See also:

- 71.2.5 beginProgressPanelForImageFile(burn as DRBurnMBS, file as folderitem) as boolean 12201

### 71.2.7 beginProgressSheetForBurn(burn as DRBurnMBS, track as DRTrackMBS, docWindow as NSWindowMBS)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel as a sheet and begins the burn process.
**Notes:** docWindow: The window the sheet will be attached to. If docWindow is not nil, the panel slides down as a sheet running as a document modal window. If owner is nil, this is an error.

This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns a single session disc with one track.
See also:

- 71.2.8 beginProgressSheetForBurn(burn as DRBurnMBS, tracks() as DRTrackMBS, docWindow as NSWindowMBS) 12203

### 71.2.8 beginProgressSheetForBurn(burn as DRBurnMBS, tracks() as DRTrackMBS, docWindow as NSWindowMBS)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel as a sheet and begins the burn process.
**Notes:** docWindow: The window the sheet will be attached to. If docWindow is not nil, the panel slides down as a sheet running as a document modal window. If owner is nil, this is an error.

This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns a multi session disc with several tracks.
See also:

- 71.2.7 beginProgressSheetForBurn(burn as DRBurnMBS, track as DRTrackMBS, docWindow as NSWindowMBS) 12202

### 71.2.9 beginProgressSheetForImageFile(burn as DRBurnMBS, file as folderitem, docWindow as NSWindowMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel as a sheet and begins the burn process.
**Notes:** docWindow: The window the sheet will be attached to. If docWindow is not nil, the panel slides down as a sheet running as a document modal window. If owner is nil, this is an error.

This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns the image file located on the given position.

This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.
See also:

- 71.2.10 beginProgressSheetForImageFile(burn as DRBurnMBS, file as string, docWindow as NSWindowMBS) as boolean 12204

### 71.2.10 beginProgressSheetForImageFile(burn as DRBurnMBS, file as string, docWindow as NSWindowMBS) as boolean

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel as a sheet and begins the burn process.
**Notes:** docWindow: The window the sheet will be attached to. If docWindow is not nil, the panel slides down as a sheet running as a document modal window. If owner is nil, this is an error.

This method returns control to the caller after it has displayed the progress sheet and begun the burn. Once the method has returned the caller can perform other operations while the burn continues.

Burns the image file located on the given position.

This file must be one that can be read by DiscRecording. The supported image types include: .dmg, .iso, .cue, and .toc. For .cue and .toc files the corresponding data files (.bin, .img, etc) must also be present and correctly referenced in the .cue/.toc file.
See also:

- 71.2.9 beginProgressSheetForImageFile(burn as DRBurnMBS, file as folderitem, docWindow as NSWindowMBS) as boolean 12203

### 71.2.11 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new burn progress panel.

### 71.2.12 DRBurnProgressPanelDidFinishNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names for use with a burn progress panel.
**Notes:** Posted when the DRBurnProgressPanel has finished and is about to go away.
This notification contains a notification object but no userInfo dictionary. The notification object is the DRBurnProgressPanel that will be closed.

### 71.2.13 DRBurnProgressPanelWillBeginNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names for use with a burn progress panel.

**Notes:** Posted when the DRBurnProgressPanel is about to begin displaying progress.
This notification contains a notification object but no userInfo dictionary. The notification object is the DRBurnProgressPanel that will be displayed.

### 71.2.14 stopBurn

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's stop button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.2.15 Properties

### 71.2.16 Description as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The description string displayed in the panel.
**Notes:** If no description is explicitly set, this method will return the standard text string.

The panel's description is typically a short text string that gives an indication to the user what operation is being performed. If no description is explicitly set, the progress panel uses a standard text string suitable to the burn.
(Read and Write computed property)

### 71.2.17 VerboseProgressStatus as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The vebosity of the progress feedback.
**Notes:** If verbose is true, the panel will update status for every change. If verbose is false, the panel will filter some status messages and only update for major changes. The default for the panel is filter the status messages.
(Read and Write computed property)

### 71.2.18 Events

### 71.2.19 burnProgressPanelBurnDidFinish(burn as DRBurnMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to handle the end-of-burn feedback.
**Notes:** This method allows the delegate to handle or modify the end-of-burn feedback performed by the progress panel. Return true to indicate the delegate handled the burn completion and the standard feedback should be supressed. If this method returns false, the normal end-of-burn handling is performed (displaying an error if appropriate, playing an "I'm done" sound, etc). The delegate is messaged before the progress panel is ordered out so a sheet may be displayed on a progress panel displayed as a window.

### 71.2.20 burnProgressPanelDidFinish

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Notification sent by the panel after ordering out.
**Notes:** If the delegate implements this method it will receive the message after the panel is removed from display.

### 71.2.21 burnProgressPanelWillBegin

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Notification sent by the panel before display.
**Notes:** If the delegate implements this method it will receive the message immediately before the panel is displayed.

### 71.2.22 Screenshots

### 71.2.23 DiscRecording2.jpg

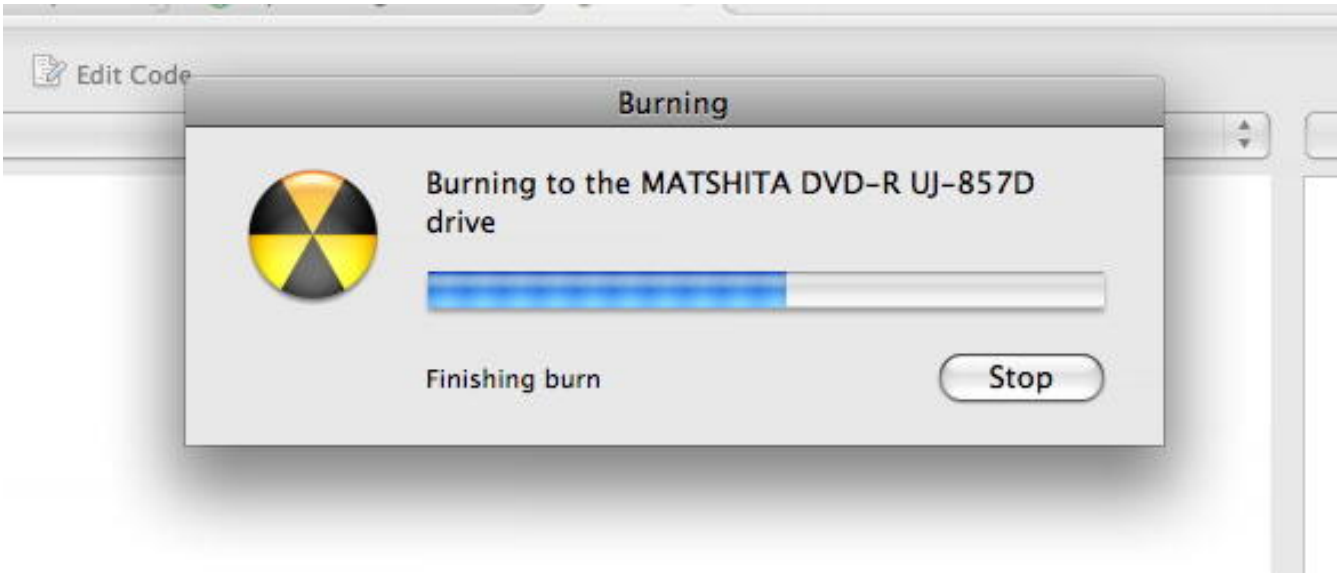


**Function:** The burn progress panel running.

## 71.3 class DRBurnSetupPanelMBS

### 71.3.1 class DRBurnSetupPanelMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Manages a panel that allows users to specify the parameters of an burn.
**Example:**

```
dim track as DRTrackMBS
dim bsp as DRBurnSetupPanelMBS
dim bpp as DRBurnProgressPanelMBS

// we need a track
track=CreateTrack

if track<>nil then
bsp=new DRBurnSetupPanelMBS

// set a few options
bsp.setCanSelectAppendableMedia true
bsp.setCanSelectTestBurn true

if bsp.runSetupPanel=bsp.NSOKButton then
bpp=new DRBurnProgressPanelMBS

// And start off the burn itself. This will put up the progress dialog
// and do all the nice pretty things that a happy app does.
bpp.beginProgressPanelForBurn bsp.burnObject, track

else
MsgBox "You pressed cancel."
end if
end if
```

**Notes:** This class supports choosing the the device to use, whether or not to verify the burned data and how to handle the burned disc when it completes.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the DRSetupPanelMBS class.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr7

**Xojo Developer Magazine**

- 6.1, pages 29 to 30: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.3.2 Methods

### 71.3.3 appendable

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's appendable checkbox.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.4 burnObject as DRBurnMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new DRBurn object that's configured to write data to the currently selected device.
**Notes:** The new DRBurn object is configured based on the settings in the setup panel when the user clicks the OK button.

Do not invoke this method within a modal session because the burn object information is only updated just before the modal session ends.

Returns nil on any error.

### 71.3.5 burnSpeed

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's burn speed popup button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.6 completionAction

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks one of the panel's completion action radio buttons.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.7 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new burn setup panel.

### 71.3.8 DRBurnSetupPanelDefaultButtonDefaultTitle as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The constant to use for the build title so it is replaced by the real default title string.

### 71.3.9 expand

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's expand button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.10 setCanSelectAppendableMedia(flag as boolean)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the user can choose to leave the disc appendable.
**Notes:** This method controls whether the appendable checkbox is enabled.

If the data being writen to disc does not lend itself to having more data appended on to it, you can disable the ability of the user to leave the disc open.

This method must be called before the panel is displayed.

Set to yes to enable the appendable checkbox, false to disable.

### 71.3.11 setCanSelectTestBurn(flag as boolean)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the user can choose to make a test burn.
**Notes:** This method controls whether a checkbox should be added to the receiver that allows the user to set the burn to be a test burn. By default, the test burn button is not displayed.

This method must be called before the panel is displayed.

Set to yes to show the test burn checkbox, false to hide it.

### 71.3.12 setDefaultButtonTitle(title as string)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the title for the receiver's default button to title.
**Example:**

```
dim panel as new DRBurnSetupPanelMBS

panel.setDefaultButtonTitle "Do Burn"
```

**Notes:** Normally, the default button is "Burn".

### 71.3.13 testBurn

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's test burn checkbox.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.14 verifyBurn

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's verify burn checkbox.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.3.15 Screenshots

### 71.3.16 DiscRecording1.jpg

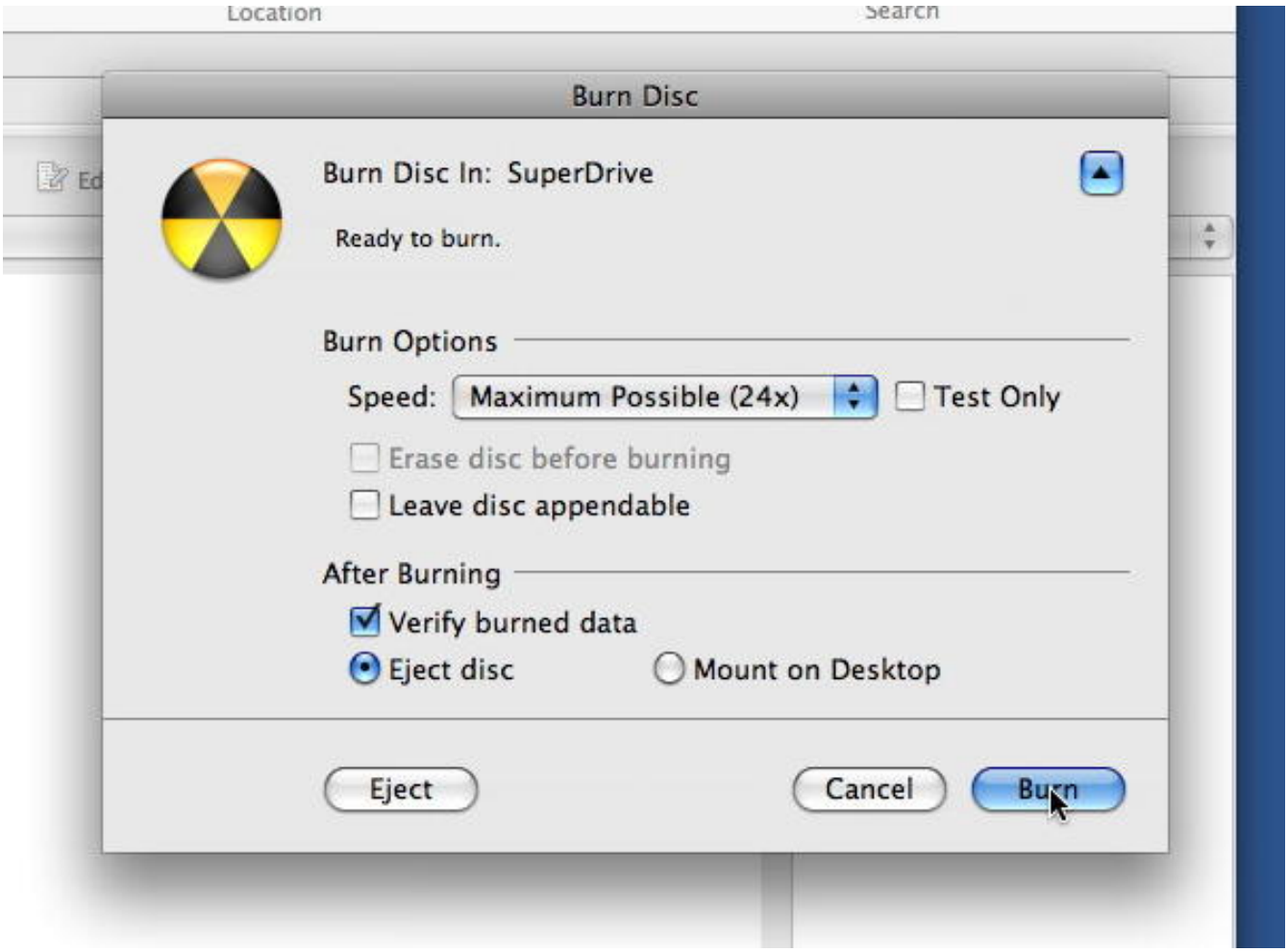


**Function:** The burn setup panel running.

## 71.4 class DRCDTextBlockMBS

### 71.4.1 class DRCDTextBlockMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A class for a Text block.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 71.4.2 Methods

### 71.4.3 Constructor

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 71.4.4 encoding as Integer

MBS MacControls Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** The text encoding to use.

### 71.4.5 language as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The language of this text block.

## 71.5 class DRDeviceMBS

### 71.5.1 class DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Represents a physical CD/DVD drive connected to the computer.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

**Xojo Developer Magazine**

- 6.1, page 30: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.5.2 Methods

### 71.5.3 acquireExclusiveAccess as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Attempts to acquire an exclusive access session with the device.
**Notes:** Acquiring exclusive access to the device prevents any process other than the one acquiring access from communicating with the device. So once exclusive access is granted, the device is unusable by any other process. Because of this all volumes mounted from media in the drive must be unmounted before exclusive access can be granted.

Exclusive access can be acquired multiple times. Each time this method is called, a call to releaseExclusiveAccess must be made at a later time, otherwise the process will never release its exclusive access.

Returns true if the exclusinve access is acquired and false if not.

### 71.5.4 acquireMediaReservation

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Indicate an interest in the blank media reservation.
**Example:**

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

**Notes:** Blank media participates in a reservation system thats allows applications to express their claim on blank media to other applications. Indicating an interest in the reservation isn't enough to assume its been acquired, as there are likely to be other applications in the system whom have also indicated an interest in the blank media reservation.

### 71.5.5 bsdName as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the bsd /dev node name.

### 71.5.6 closeTray as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Commands the device to close its tray.
**Notes:** Does nothing if the device does not have a tray (slotload).
Returns true if the tray could be closed and false if not.

### 71.5.7 Constructor

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 71.5.8 device(index as UInt32) as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries the device with the given index.
**Notes:** Index from 0 to deviceCount-1.

Same as devices(), but if you only need one, this method is more efficient.

### 71.5.9 deviceCount as UInt32

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries the number of devices on this computer.

### 71.5.10 deviceForBSDName(bsdName as string) as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Obtains a DRDevice for the device corresponding to the bsd /dev node.
**Notes:** If the device is not an authoring device (i.e., CDR, CDRW, DVR-R, etc), returns nil.

### 71.5.11 deviceForIORegistryEntryPath(path as string) as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Obtains a DRDevice for the device at the path.
**Notes:** If the device is not an authoring device (i.e., CDR, CDRW, DVR-R, etc), returns nil.

### 71.5.12 devices as DRDeviceMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Obtains a static list of devices connected to the computer.
**Example:**

```
// shows all devices with their product names:
dim devices() as DRDeviceMBS = DRDeviceMBS.devices

for each dd as DRDeviceMBS in devices
MsgBox dd.info.lookup(DRDeviceMBS.DRDeviceProductNameKey, "?")
next
```

**Notes:** Returns all CD/DVD devices connected to the computer at the time this method is called. Since devices can come and go at any time, the output of this method is simply a snapshot of the set of devices connected.

### 71.5.13 displayName as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a string suitable for display in the user interface.

### 71.5.14 DRDeviceAppearedNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used with a DRBurn object.
**Notes:** Posted by a DRNotificationCenter when a device is added to the system.

This notification is registered for only by name.

The object associated with this notification is the the device that has appeared. The userInfo is the same dictionary returned by info for that device.

### 71.5.15 DRDeviceBurnSpeedBD1x as single

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible burn speed values.
**Notes:** 4496.0 KB/sec.

### 71.5.16 DRDeviceBurnSpeedCD1x as single

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible burn speed values.
**Notes:** 176.4 KB/sec.

### 71.5.17 DRDeviceBurnSpeedDVD1x as single

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible burn speed values.
**Notes:** 1385.0 KB/sec.

### 71.5.18 DRDeviceBurnSpeedHDDVD1x as single

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible burn speed values.
**Notes:** 4568.0 KB/sec.

### 71.5.19 DRDeviceBurnSpeedMax as single

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible burn speed values.
**Notes:** A value representing the maximum speed at which a device can burn. The actual speed will vary from device to device.

### 71.5.20 DRDeviceBurnSpeedsKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** An array containing the possible burn speeds available to use. This key may not be present if no media is inserted.

### 71.5.21 DRDeviceCanTestWriteCDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Value for this key is a boolean value indicating whether the device can perform a test burn to CD media.

### 71.5.22 DRDeviceCanTestWriteDVDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** A boolean value indicating whether the device can perform a test burn to DVD media.

### 71.5.23 DRDeviceCanUnderrunProtectCDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports burn underrun protection when writing to CD media.

### 71.5.24 DRDeviceCanUnderrunProtectDVDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports burn underrun protection when writing to DVD media.

### 71.5.25 DRDeviceCanWriteBDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to some type of BD (Blu-ray) based media.

### 71.5.26 DRDeviceCanWriteBDREKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to BD-RE media.

### 71.5.27 DRDeviceCanWriteBDRKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to BD-R media.

### 71.5.28 DRDeviceCanWriteCDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to some type of CD based media.

### 71.5.29 DRDeviceCanWriteCDRawKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports a raw mode burn strategy for CD. Raw mode is sometimes incorrectly referred to as DAO (disc-at-once).

### 71.5.30 DRDeviceCanWriteCDRKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to CD-R media.

### 71.5.31 DRDeviceCanWriteCDRWKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to CD-RW media.

### 71.5.32 DRDeviceCanWriteCDSAOKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports a SAO (session-at-once) burn strategy for CD.

### 71.5.33 DRDeviceCanWriteCDTAOKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports a TAO (track-at-once) burn strategy for CD.

### 71.5.34 DRDeviceCanWriteCDTextKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write CD-Text information to media.

### 71.5.35 DRDeviceCanWriteDVDDAOKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device supports a DAO (disc-at-once) burn strategy on DVD media.

### 71.5.36 DRDeviceCanWriteDVDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to some type of DVD based media.

### 71.5.37 DRDeviceCanWriteDVDPlusRDoubleLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD+R DL media.

### 71.5.38 DRDeviceCanWriteDVDPlusRKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD+R media.

### 71.5.39 DRDeviceCanWriteDVDPlusRWDoubleLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD+RW DL media.

### 71.5.40 DRDeviceCanWriteDVDPlusRWKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD+RW media.

### 71.5.41 DRDeviceCanWriteDVDRAMKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD-RAM media.

### 71.5.42 DRDeviceCanWriteDVDRDualLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD-R DL media.

### 71.5.43 DRDeviceCanWriteDVDRKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD-R media.

### 71.5.44 DRDeviceCanWriteDVDRWDualLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD-RW DL media.

### 71.5.45 DRDeviceCanWriteDVDRWKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to DVD-RW media.

### 71.5.46 DRDeviceCanWriteHDDVDKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to some type of HDDVD based media.

### 71.5.47 DRDeviceCanWriteHDDVDRAMKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to HD DVD-RAM media.

### 71.5.48 DRDeviceCanWriteHDDVDRDualLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to HD DVD-R DL media.

### 71.5.49 DRDeviceCanWriteHDDVDRKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to HD DVD-R media.

### 71.5.50 DRDeviceCanWriteHDDVDRWDualLayerKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to HD DVD-RW DL media.

### 71.5.51 DRDeviceCanWriteHDDVDRWKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to HD DVD-RW media.

### 71.5.52 DRDeviceCanWriteIndexPointsKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write index points to CD media.

### 71.5.53 DRDeviceCanWriteISRCKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write ISRC to CD media.

### 71.5.54 DRDeviceCanWriteKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceWriteCapabilitiesKey dictionary.
**Notes:** Boolean value indicating whether the device can write to some type of media.

### 71.5.55 DRDeviceCurrentWriteSpeedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Number containing the current burning speed of this device.

### 71.5.56 DRDeviceDisappearedNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used with a DRBurn object.
**Notes:** Posted by a DRNotificationCenter when a device is removed from the system.

The object associated with this notification is the the device that has disappeared. The userInfo is the same dictionary returned by info for that device.

### 71.5.57 DRDeviceFirmwareRevisionKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** String containing the firmeware revision extracted from the device.

### 71.5.58 DRDeviceIORegistryEntryPathKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** String containing the path of the device in the IO Registry.
**Notes:** One of the keys in the dictionary returned by the info method.

### 71.5.59 DRDeviceIsBusyKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Number containing a boolean value indicating whether the device is busy or not.

### 71.5.60 DRDeviceIsTrayOpenKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Number containing a boolean value indicating whether the device's tray is open or not.

### 71.5.61 DRDeviceLoadingMechanismCanEjectKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** Number describing if the loading mechanism of the drive can eject.

### 71.5.62 DRDeviceLoadingMechanismCanInjectKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** Number describing if the loading mechanism of the drive can inject.

### 71.5.63 DRDeviceLoadingMechanismCanOpenKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** Number describing if the loading mechanism of the drive can open.

### 71.5.64 DRDeviceMaximumWriteSpeedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Number containing the maximum burning speed of this device.

### 71.5.65 DRDeviceMediaBlocksFreeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the amount of space available (in blocks) on the media to be written to. If the media already contains data and this value will be less than the normal maximum size of the disc. This value will normally only be used if the intent is to append data onto an open disc.

### 71.5.66 DRDeviceMediaBlocksOverwritableKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the total amount of writable space available (in blocks) on the media to be written to - if that media can be overwritten. Media that can be overwitten is designated through the DRDeviceMediaIsOverwritableKey .

The overwritable space is the amount of space on the disc that would be available if any data currently on the disc is first erased.

### 71.5.67 DRDeviceMediaBlocksUsedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the amount of space currently used (in blocks) for exising data.

### 71.5.68 DRDeviceMediaBSDNameKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** String containing the BSD /dev node name assigned to the media in the device.

### 71.5.69 DRDeviceMediaClassBD as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One possible value of the DRDeviceMediaClassKey.
**Notes:** Indicates the media is some type of BD (Blu-ray) based media.

### 71.5.70 DRDeviceMediaClassCD as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One possible value of the DRDeviceMediaClassKey.
**Notes:** Indicates the media is some type of CD based media.

### 71.5.71 DRDeviceMediaClassDVD as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One possible value of the DRDeviceMediaClassKey.
**Notes:** Indicates the media is some type of DVD based media.

### 71.5.72 DRDeviceMediaClassHDDVD as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One possible value of the DRDeviceMediaClassKey.
**Notes:** Indicates the media is some type of HD DVD based media.

### 71.5.73 DRDeviceMediaClassKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** String containing the class of media present in the drive.

### 71.5.74 DRDeviceMediaClassUnknown as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One possible value of the DRDeviceMediaClassKey.
**Notes:** Indicates the media class is unknown.

### 71.5.75 DRDeviceMediaDoubleLayerL0DataZoneBlocksKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the amount of space available (in blocks) on layer 0 of a double layer piece of media.

### 71.5.76 DRDeviceMediaFreeSpaceKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** MSF value of the amount of space available on the media to be written to. If the media already contains data and this value will be less than the normal maximum size of the disc. This value will normally

only be used if the intent is to append data onto an open disc.

### 71.5.77 DRDeviceMediaInfoKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Dictionary of information describing the media currently in the device. This key may not be present if no media is inserted.

### 71.5.78 DRDeviceMediaIsAppendableKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing a boolean value indicating that data can be appended to the exisiting data (if any).

### 71.5.79 DRDeviceMediaIsBlankKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing a boolean value indicating whether data has previously been written to the media.

### 71.5.80 DRDeviceMediaIsErasableKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing a boolean value indicating whether this media can be erased.

### 71.5.81 DRDeviceMediaIsOverwritableKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing a boolean value indicating that the data on the disc (if any) can be overwritten.

Rewritable media can always be erased, and then rewritten in its entirety, so it is always considered overwritable.

Write-once media, if its blank, can also be written in its entirety and is also considered overwritable.

Write-once media, that has been partially written, can never again enter a state where it is entirely writable and will have lost its overwritable designation.

### 71.5.82 DRDeviceMediaIsReservedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing a boolean value indicating whether the media is reserved for exclusive use by the current process.

### 71.5.83 DRDeviceMediaOverwritableSpaceKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** MSF value of the amount of writable space available on the media to be written to - if that media can be overwritten. Media that can be overwitten is designated through the DRDeviceMediaIsOverwritableKey .

The overwritable space is the amount of space on the disc that would be available if any data currently on the disc is first erased.

### 71.5.84 DRDeviceMediaSessionCountKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the current number of sessions present on the media.

### 71.5.85 DRDeviceMediaStateInTransition as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values for the DRDeviceMediaStateKey.

**Notes:** The media is transitioning from one state to another (i.e., being spun up/down).

### 71.5.86 DRDeviceMediaStateKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** String describing the state of the media.

### 71.5.87 DRDeviceMediaStateMediaPresent as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values for the DRDeviceMediaStateKey.
**Notes:** Device contains media of some type.

### 71.5.88 DRDeviceMediaStateNone as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values for the DRDeviceMediaStateKey.
**Notes:** No media is present in the device.

### 71.5.89 DRDeviceMediaTrackCountKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** Number containing the number of tracks present on the media.

### 71.5.90 DRDeviceMediaTypeBDR as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a BD-R.

### 71.5.91 DRDeviceMediaTypeBDRE as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a BD-RE.

### 71.5.92 DRDeviceMediaTypeBDROM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a BD-ROM.

### 71.5.93 DRDeviceMediaTypeCDR as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a CD-R.

### 71.5.94 DRDeviceMediaTypeCDROM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a CD-ROM.

### 71.5.95 DRDeviceMediaTypeCDRW as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a CD-RW.

### 71.5.96 DRDeviceMediaTypeDVDPlusR as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD+R.

### 71.5.97 DRDeviceMediaTypeDVDPlusRDoubleLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD+R Double Layer.

### 71.5.98 DRDeviceMediaTypeDVDPlusRW as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD+RW.

### 71.5.99 DRDeviceMediaTypeDVDPlusRWDoubleLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD+RW Double Layer.

### 71.5.100 DRDeviceMediaTypeDVDR as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD+RW.

### 71.5.101 DRDeviceMediaTypeDVDRAM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD-RAM.

### 71.5.102 DRDeviceMediaTypeDVDRDualLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD-R DL.

### 71.5.103 DRDeviceMediaTypeDVDROM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD-ROM.

### 71.5.104 DRDeviceMediaTypeDVDRW as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD-RW.

### 71.5.105 DRDeviceMediaTypeDVDRWDualLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a DVD-RW DL.

### 71.5.106 DRDeviceMediaTypeHDDVDR as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-R.

### 71.5.107 DRDeviceMediaTypeHDDVDRAM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-RAM.

### 71.5.108 DRDeviceMediaTypeHDDVDRDualLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-R DL.

### 71.5.109 DRDeviceMediaTypeHDDVDROM as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-ROM.

### 71.5.110 DRDeviceMediaTypeHDDVDRW as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-RW.

### 71.5.111 DRDeviceMediaTypeHDDVDRWDualLayer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** Media is a HD DVD-RW DL.

### 71.5.112 DRDeviceMediaTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** String containing the type of media inserted in the device.

### 71.5.113 DRDeviceMediaTypeUnknown as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDeviceMediaTypeKey.
**Notes:** The type of the media cannot be determined.

### 71.5.114 DRDeviceMediaUsedSpaceKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the DRDeviceMediaInfoKey dictionary.
**Notes:** MSF value of the amount of space currently used for exising data.

### 71.5.115 DRDevicePhysicalInterconnectATAPI as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectKey.
**Notes:** Device is connected on an ATAPI interface.

### 71.5.116 DRDevicePhysicalInterconnectFibreChannel as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectKey.
**Notes:** Device is connected through a Fibre Channel interface.

### 71.5.117 DRDevicePhysicalInterconnectFireWire as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectKey.
**Notes:** Device is connected through a Firewire interface.

### 71.5.118 DRDevicePhysicalInterconnectKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** String describing the connection of the device to the computer.

### 71.5.119 DRDevicePhysicalInterconnectLocationExternal as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectLocationKey.
**Notes:** Device is connected to the machine externally.

### 71.5.120 DRDevicePhysicalInterconnectLocationInternal as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectLocationKey.
**Notes:** Device is connected to the machine internally.

### 71.5.121 DRDevicePhysicalInterconnectLocationKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** String describing the location of the device (e.g. internal/external).

### 71.5.122 DRDevicePhysicalInterconnectLocationUnknown as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectLocationKey.
**Notes:** It's not known how the device is connected.

### 71.5.123 DRDevicePhysicalInterconnectSCSI as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectKey.
**Notes:** Device is connected on a SCSI interface.

### 71.5.124 DRDevicePhysicalInterconnectUSB as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the DRDevicePhysicalInterconnectKey.
**Notes:** Device is connected through a USB interface.

### 71.5.125 DRDeviceProductNameKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Example:**

```
// shows all devices with their product names:
dim devices() as DRDeviceMBS = DRDeviceMBS.devices

for each dd as DRDeviceMBS in devices
MsgBox dd.info.lookup(DRDeviceMBS.DRDeviceProductNameKey, "?")
next
```

**Notes:** String containing the product name extracted from the device.

### 71.5.126 DRDeviceStatusChangedNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names used with a DRBurn object.
**Notes:** Posted by a DRNotificationCenter when the media in a device changes state. This can include being ejected, inserted, becoming busy, etc.

The object for this notification is the device who's media is changing state. The userInfo for this notification is the same dictionary returned by status for that device.

### 71.5.127 DRDeviceSupportLevelAppleShipping as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for DRDeviceSupportLevelKey.
**Notes:** This value indicates this device is shipping in some Apple machine.

### 71.5.128 DRDeviceSupportLevelAppleSupported as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for DRDeviceSupportLevelKey.
**Notes:** This value indicates this device has been tested by Apple for support.

### 71.5.129 DRDeviceSupportLevelKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** String describing the support level the device enjoys from the engine.

### 71.5.130 DRDeviceSupportLevelNone as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for DRDeviceSupportLevelKey.
**Notes:** This value indicates this device is not supported.

### 71.5.131 DRDeviceSupportLevelUnsupported as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for DRDeviceSupportLevelKey.
**Notes:** This value indicates the device is unsupported, but the engine will try to use it anyway.

### 71.5.132 DRDeviceSupportLevelVendorSupported as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the values for DRDeviceSupportLevelKey.
**Notes:** This value indicates this device has been tested by a third party for support.

### 71.5.133 DRDeviceTrackInfoKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** Dictionary containing dictionaries describing the tracks. DRTracks from the DRDeviceTrackRefsKey are used as keys into this dictionary.

### 71.5.134 DRDeviceTrackRefsKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the status method.
**Notes:** An array containing a list of DRTrack objects describing any tracks that are already on the disc.

### 71.5.135 DRDeviceVendorNameKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** String containing the vendor name extracted from the device.

### 71.5.136 DRDeviceWriteBufferSizeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** Number containing the size of the write buffer of the device.

### 71.5.137 DRDeviceWriteCapabilitiesKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys in the dictionary returned by the info method.
**Notes:** Dictionary containing the capabilities of the device for writing different kinds of media.

### 71.5.138 ejectMedia as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Commands the device to eject the media.
**Notes:** This command first unmounts any volumes associated with the media and then eject the media from the drive. If the media could not be ejected, most likely this is because a volume associated with the media could not be unmounted.

Returns true if the media could be ejected and false if not.

### 71.5.139 info as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a dictionary of information describing the device.
**Notes:** The information returned include the types of media the device can write to, how it's connected and its identifying information such as the vendor and product name.

### 71.5.140 ioRegistryEntryPath as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the path to the device in the IO Registry.

### 71.5.141 isEqualToDevice(value as DRDeviceMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Compares the receiver to another device.
**Notes:** Returns true if the receiver is equal to otherDevice.

### 71.5.142 isValid as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether or not the device represented by the receiver is still attached to the computer.
**Notes:** Because of the way some physical interconnects work, a device which is unplugged and replugged in does not necessarily look like the same device to the computer and would be invalid in that instance.

Returns true if the device is valid and false if not.

### 71.5.143 mediaIsAppendable as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the media in the device can have more data appended to any existing data.

### 71.5.144 mediaIsBlank as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true the media in the device is blank.

### 71.5.145 mediaIsBusy as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the media is in use by some process - even the one making this call.

### 71.5.146 mediaIsErasable as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the media can be erased (i.e., CD-RW, DVD-RW, etc).

### 71.5.147 mediaIsOverwritable as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the media in the device can be fully (re)written.

### 71.5.148 mediaIsPresent as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Reports the presence of the media.

### 71.5.149 mediaIsReserved as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the application calling this method currently holds the reservation on the media.

### 71.5.150 mediaIsTransitioning as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the media is in transition (spinning up or down for example).

### 71.5.151 mediaSpaceFree as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the amount of free space on the media.

### 71.5.152 mediaSpaceOverwritable as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the amount of writable space on the media.

### 71.5.153 mediaSpaceUsed as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the amount of used space on the media.

### 71.5.154 mediaType as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of media currently inserted into the device.

### 71.5.155 openTray as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Commands the device to open it's tray.
**Notes:** Does nothing if the device does not have a tray (slotload). If there is media in the drive this method will do nothing and return false. In this case use ejectMedia to eject the media and open the tray.

Returns true if the tray could be opened and false if not.

### 71.5.156 PhysicalInterconnect as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The connection of the device to the computer.

### 71.5.157 PhysicalInterconnectLocation as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The location of the device (internal/external/unknown).
**Notes:** Use the DRDevicePhysicalInterconnectLocation* constants.

### 71.5.158 releaseExclusiveAccess

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Releases the latest exclusive access request for the device.
**Notes:** A call to this method must be made for every call to acquireExclusiveAccess, otherwise the process will never release its exclusive access.

### 71.5.159 releaseMediaReservation

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Releases any media reservation that might be in place for the device.
**Notes:** If media is inserted and reserved, then the reservation will be passed on to the next process with a reservation request.

### 71.5.160 status as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a dictionary of information describing the media in the device.
**Notes:** In addition to information about the media (type, space available/used, etc), the dictionary returned includes those pieces of information about the device itself which are in part determined by the media (i.e., maximum burn speed).

### 71.5.161 trayIsOpen as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Reports the tray state of the device.
**Notes:** Returns true if the device has a tray and it is open.

### 71.5.162 writesCD as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Reports the device's ability to burn to CD-type media.
**Notes:** Returns true if the device has the ability to write to CD-R media.

### 71.5.163 writesDVD as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Reports the device's ability to burn to DVD-type media.
**Notes:** Returns true if the device has the ability to write to DVD-R media.

## 71.6 class DREraseMBS

### 71.6.1 class DREraseMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Perform and monitor the erasing a rewritable CD or DVD disc.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 71.6.2 Methods

### 71.6.3 Constructor(device as DRDeviceMBS)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes an erase object.

### 71.6.4 device as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the device being used for the erase.

### 71.6.5 DREraseStatusChangedNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names you can use to register notifications on the erase status.

### 71.6.6 DREraseTypeComplete as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** A constant to be used for the eraseType property.
**Notes:** Configures the erase object to perform a complete erase, erasing every byte on the disk. This oper-

ation is slow (on the order of 30 minutes) to complete.

### 71.6.7 DREraseTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property names in the properties dictionary of the erase object.

### 71.6.8 DREraseTypeQuick as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** A constant to be used for the eraseType property.
**Notes:** Configures the erase object to perform a quick erase, doing the minimal amount of work to make the disc appear blank. This operation typically takes only a minute or two.

### 71.6.9 eraseForDevice(device as DRDeviceMBS) as DREraseMBS

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns an erase object.
**Notes:** Returns nil on any error.

### 71.6.10 start

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Begin the process of erasing media.
**Notes:** This method only kicks off the erase. Once the erasure starts, control returns to the caller.

### 71.6.11 status as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a dictionary containing the status of the erase.
**Notes:** The same dictionary is returned through the DREraseStatusChangedNotification notification.

### 71.6.12 Properties

### 71.6.13 eraseType as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The type of erase to be performed.
**Notes:** (Read and Write computed property)

### 71.6.14 properties as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The properties dictionary of the erase.
**Notes:** (Read and Write computed property)

## 71.7 class DREraseProgressPanelMBS

### 71.7.1 class DREraseProgressPanelMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Panel to display progress while erasing media.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the NSPanelMBS class.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 71.7.2 Methods

### 71.7.3 beginProgressPanelForErase(erase as DREraseMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel on screen and begins the erase process.
**Notes:** This method returns control to the caller after it has displayed the progress sheet and begun the erase. Once the method has returned the caller can perform other operations while the erase continues.

### 71.7.4 beginProgressSheetForErase(erase as DREraseMBS, docWindow as NSWindowMBS)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents the progress panel as a sheet and begins the erase process.
**Notes:** erase: The object performing the erase.
docWindow: The window the sheet will be attached to. If docWindow is not nil, the panel slides down as a sheet running as a document modal window. If owner is nil, this is an error.

This method returns control to the caller after it has displayed the progress sheet and begun the erase. Once the method has returned the caller can perform other operations while the erase continues.

### 71.7.5 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor which creates the erase progress panel.

### 71.7.6 DREraseProgressPanelDidFinishNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names for use with an erase progress panel.
**Notes:** Posted when the DREraseProgressPanel has finished and is about to go away.

This notification contains a notification object but no userInfo dictionary. The notification object is the DREraseProgressPanel that will be closed.

### 71.7.7 DREraseProgressPanelWillBeginNotification as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification names for use with an erase progress panel.
**Notes:** Posted when the DREraseProgressPanel is about to begin displaying progress.

This notification contains a notification object but no userInfo dictionary. The notification object is the DREraseProgressPanel thatwill be displayed.

### 71.7.8 Properties

### 71.7.9 Description as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The description string displayed in the panel.
**Notes:** If no description is explicitly set, this method will return the standard text string.

The panel's description is typically a short text string that gives an indication to the user what operation is being performed. If no description is explicitly set, the progress panel uses a standard text string suitable to the erase.
(Read and Write computed property)

### 71.7.10 Events

### 71.7.11 eraseProgressPanelDidFinish

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Notification sent by the panel after ordering out.

### 71.7.12 eraseProgressPanelEraseDidFinish(erase as DREraseMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to handle the end-of-erase feedback.
**Notes:** This method allows the delegate to handle or modify the end-of-erase feedback performed by the progress panel. Return true to indicate the delegate handled the erase completion and the standard feedback should be supressed. If this method returns false, the normal end-of-erase handling is performed (displaying an error if appropriate, playing an "I'm done" sound, etc). The delegate is messaged before the progress panel is ordered out so a sheet may be displayed on a progress panel displayed as a window.

### 71.7.13 eraseProgressPanelWillBegin

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Notification sent by the panel before display.

## 71.8 class DREraseSetupPanelMBS

### 71.8.1 class DREraseSetupPanelMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Manages a panel that allows users to specify the parameters of an erase.
**Notes:** This class supports choosing the device to use and what sort of erase to perform. When the panel is closed by the user choosing to erase the media in the device, the device is exclusively held by the application for its own use to prevent possible bad or corrupt media from causing problem for the rest of the system. This means that if the erase object obtained from the panel is not used to do an erase, the device will remain unavailable to other applications until the exclusive access is released.
Subclass of the DRSetupPanelMBS class.

### 71.8.2 Methods

### 71.8.3 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create the erase setup panel.
**Example:**

```
dim d as DREraseSetupPanelMBS

d=new DREraseSetupPanelMBS
call d.runSetupPanel
```

### 71.8.4 eraseObject as DREraseMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a new DRErase object that's configured to erase the disc in the currently selected device.
**Notes:** The new DRErase object is configured based on the settings in the setup panel when the user clicks the OK button.

Do not invoke this method within a modal session runSetupPanel because the erase object information is only updated just before the modal session ends.

Returns a new DRErase object.

## 71.9 class DRFileMBS

### 71.9.1 class DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Represents a file to be created on the disc.
**Notes:** A file can be either a pointer to an exiting file (residing on a hard drive for example) or can be created at burn time from data passed into the file object as requested. DRFiles can only exist inside of DRFolder objects.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the DRFSObjectMBS class.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8
- MBS REALbasic Plugins, version 10.4pr7

**Xojo Developer Magazine**

- 6.1, page 47: Finding Work, How to Find Work as a REALbasic Developer
- 6.1, page 31: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.9.2 Methods

### 71.9.3 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Dummy constructor.
See also:


- 71.9.4 Constructor(name as string) 12255
- 71.9.5 Constructor(name as string, data as memoryblock) 12255
- 71.9.6 Constructor(path as folderitem) 12255

### 71.9.4 Constructor(name as string)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a "virtual" file object.
**Notes:** This type of DRFile burns the data produced to the output disc, creating a file with the passed in name.

You need to subclass the DRFileMBS class and handle the events.
See also:


- 71.9.3 Constructor 12254
- 71.9.5 Constructor(name as string, data as memoryblock) 12255
- 71.9.6 Constructor(path as folderitem) 12255


### 71.9.5 Constructor(name as string, data as memoryblock)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a "virtual" file object.
**Notes:** This type of DRFile burns the data passed in to disc, creating a file with the passed in name.
See also:


- 71.9.3 Constructor 12254
- 71.9.4 Constructor(name as string) 12255
- 71.9.6 Constructor(path as folderitem) 12255


### 71.9.6 Constructor(path as folderitem)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a "real" file object
**Notes:** This type of DRFile reads in data from an existing file located at path and burns that data to disc.
See also:


- 71.9.3 Constructor 12254
- 71.9.4 Constructor(name as string) 12255
- 71.9.5 Constructor(name as string, data as memoryblock) 12255

### 71.9.7 DRLinkTypeFinderAlias as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The constant used with linkWithLinkType to create a Finder alias.

### 71.9.8 DRLinkTypeHardLink as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The constant used with linkWithLinkType to create a hard link.

### 71.9.9 DRLinkTypeSymbolicLink as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The constant used with linkWithLinkType to create a symbolic link.

### 71.9.10 fileWithPath(path as folderitem) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a "real" file object.
**Example:**

```
dim file as FolderItem = GetFolderItem("/System/Library/Fonts/Helvetica.dfont", FolderItem.PathTypeShell)
dim f as DRFileMBS = DRFileMBS.fileWithPath(file)

MsgBox f.baseName
```

**Notes:** This type of DRFile reads in data from an existing file located at path and burns that data to disc.
See also:

- 71.9.11 fileWithPath(path as string) as DRFileMBS 12256

### 71.9.11 fileWithPath(path as string) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a "real" file object.
**Example:**

```
dim f as DRFileMBS = DRFileMBS.fileWithPath("/System/Library/Fonts/Helvetica.dfont")

MsgBox f.baseName
```

**Notes:** This type of DRFile reads in data from an existing file located at path and burns that data to disc.
See also:

- 71.9.10 fileWithPath(path as folderitem) as DRFileMBS 12256

### 71.9.12 finderAliasPointingTo(original as DRFSObjectMBS, filesystem as string) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a Finder alias to another file on the output disc.
**Notes:** original: The file to point he hard link to
filesystem: The filesystem this link will exist on.

As with Mac OS X 10.6.4 this method seems to create an empty file only (no alias).

### 71.9.13 hardLinkPointingTo(original as DRFileMBS, filesystem as string) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a hard link to another file on the output disc.
**Notes:** original: The file to point he hard link to
filesystem: The filesystem this link will exist on.

As with Mac OS X 10.6.4 this method seems to crash always.

### 71.9.14 linkWithLinkType(linkType as string, original as DRFSObjectMBS, filesystem as string) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a file object to point to another file on the output disc.
**Example:**

```
dim SomeFolder as new DRFolderMBS("Some new folder")
```

```
// Let's have a file to test

dim data as string = "Hello World" // file content
dim name as string = "test.txt" // file name
dim testfile as DRFileMBS = DRFileMBS.virtualFileWithName(name, data)

// and create a sym link for it
dim SymLink as DRFileMBS = DRFileMBS.linkWithLinkType(DRFileMBS.DRLinkTypeSymbolicLink, testfile, DRFileMBS.DRHFSPlus)
if SymLink = nil then
MsgBox "SymLink is nil!?"
else
SomeFolder.addChild SymLink
end if
```

**Notes:** linkType: The type of link that will be created.
original: The file to point he hard link to
filesystem: The filesystem this link will exist on.

### 71.9.15 symLinkPointingTo(original as DRFSObjectMBS, filesystem as string) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a symbolic link to another file on the output disc.
**Example:**

```
dim SomeFolder as new DRFolderMBS("Some new folder")

// Let's have a file to test

dim data as string = "Hello World" // file content
dim name as string = "test.txt" // file name
dim testfile as DRFileMBS = DRFileMBS.virtualFileWithName(name, data)

// and create a sym link for it
dim SymLink as DRFileMBS = DRFileMBS.symLinkPointingTo(testfile, DRFileMBS.DRHFSPlus)
if SymLink = nil then
MsgBox "SymLink is nil!?"
else
SomeFolder.addChild SymLink
end if
```

**Notes:** original: The file to point he hard link to
filesystem: The filesystem this link will exist on.

As with Mac OS X 10.6.4 this method seems to work just fine.

### 71.9.16 virtualFileWithName(name as string, data as memoryblock) as DRFileMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a "virtual" file object.
**Example:**

```
dim data as string = "Hello World" // file content
dim name as string = "test.txt" // file name

dim f as DRFileMBS = DRFileMBS.virtualFileWithName(name, data)

MsgBox f.baseName
```

**Notes:** This type of DRFile burns the data passed in to disc, creating a file with the passed in name.

### 71.9.17 Events

### 71.9.18 calculateSizeOfFile(fork as Integer, estimating as boolean) as uint64

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Calculates the size of a file's fork.
**Notes:** This method may be sent at any time after the file object has been instantiated. Requests that the recevier calculate the file size of file fork (for instance data or resource).

If estimate is true, you are being asked for an estimate of the final fork size, perhaps to provide an estimate of the track size, and do not have to be exact. Estimates should err on the high side; it's better to overestimate than underestimate.

An estimate call may be made at any time.

If estimate is false, you are being asked for the actual fork size, to be used in the burn. This call is only made in the burn phase.

fork: The fork of the file whose size is to be calculated.
estimate: If the file size should be estimated or exact.

Return the length of the file's fork.

### 71.9.19 cleanupFileAfterBurn

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Cleanup the file once the burn is complete.
**Notes:** Sent to the receiver after the burn completes. This would be an appropriate place to close files, or do any other teardown work needed. This message will always be sent regardless of whether the burn succeeded or failed.

### 71.9.20 prepareFileForBurn as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Prepare the file object for burning.
**Notes:** Sent to the recevier before the burn begins. This would be an appropriate method to open files, or do any other prep work needed. The disc's entire hierarchy is completely in place and can be queried if needed.

After this call, the burn's content is locked down, and you should be able to respond to the calculateSizeOfFile messages with exact values.

### 71.9.21 prepareFileForVerification as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Prepare the file object for verification.
**Notes:** Called during the burn (after production, before the cleanupFileAfterBurn event is called) to indicate that verification is about to begin. Now would be a good time to rewind to the start of the file, reset state machines, or do whatever else is needed to prepare to produce again.

### 71.9.22 produceFile(fork as Integer, buffer as memoryblock, Bufferlen as uint32, address as uint64, blocksize as uint32) as uint32

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Calculates the size of a file's fork.
**Notes:** Sent during the burn (after the prepareFileForBurn message) requesting that the receiver produce the data fork contents.

The recevier should fill up the buffer passed in as full as possible and then return control to the caller. Since while burning, keeping the drive's buffer full is of utmost importance, you should not perform lengthy operations or block for data in this method. This method should return the number of bytes actually in the buffer or 0 to indicate that there was an error producing the data.

You may be asked to produce twice, once during the actual burn and once during verification.

fork: The fork of the file to produce.
buffer: The buffer to produce data into.
bufferLength: The length of the buffer to produce data into
blockSize: The size of the track blocks

Return the number of bytes produced.

### 71.9.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DRFileForkData | 0 | The constant which specifies which fork is currently needed.<br>The data fork contains the primary information for the file and is the fork used for files such as JPEGs, text files, etc.<br>The resource fork contains secondary meta-data, which is not important to the primary content of the file and may safely be ignored when the file is sent to a filesystem or OS which does not support multiple forks. |
| DRFileForkResource | 1 | The constant which specifies which fork is currently needed.<br>The data fork contains the primary information for the file and is the fork used for files such as JPEGs, text files, etc.<br>The resource fork contains secondary meta-data, which is not important to the primary content of the file and may safely be ignored when the file is sent to a filesystem or OS which does not support multiple forks. |

## 71.10 class DRFolderMBS

### 71.10.1 class DRFolderMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A class for folder objects used in filesystem creation.
**Notes:** A DRFile object is a subclass of DRFSObject and represents a folder on the finished disc. DRFolders can be either a pointer to an existing folder (residing on a hard drive for example) or can be a "virtual" folder which existsonly on the resulting burned disc. A DRFolder pointing to an existing folder ("real" folder) cannot have it's contents changed - only those files/folders which are children of the actual folder on disk will be included on the resulting disc. "Virtual" folders are entirely created programatically and any virtual folder structure can exist and be burned to disc. It is possible to convert a "real" folder to a "virtual" folder using the makeVirtual method.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the DRFSObjectMBS class.
**Xojo Developer Magazine**

- 6.1, page 47: Finding Work, How to Find Work as a REALbasic Developer
- 6.1, pages 29 to 31: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.10.2 Methods

### 71.10.3 addChild(child as DRFSObjectMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds an object reference (either a file or folder) as a child of a virtual folder object.
**Notes:** This method only applies to virtual folders. Real folders are considered "leaf nodes" and cannot have children.

### 71.10.4 children as DRFSObjectMBS()

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array containing the children of a virtual folder.
**Notes:** The order of children in the array is arbitrary – since the various filesystems being generated may have different sorting requirements, there is no one true way to sort the children. The ordering will change only when children are added or removed. You should sort the children according to the needs of your display, and in a consistent manner. This function only applies to virtual folders. Real folders are considered

”leaf nodes” and should not be passed into this call.

### 71.10.5 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor.
See also:

- 71.10.6 Constructor(name as string) 12263
- 71.10.7 Constructor(path as folderitem) 12263

### 71.10.6 Constructor(name as string)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a ”virtual” folder object with a name.
See also:

- 71.10.5 Constructor 12263
- 71.10.7 Constructor(path as folderitem) 12263

### 71.10.7 Constructor(path as folderitem)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a DRFolder object that will use the folder contents of the folder located at path as a source.
See also:

- 71.10.5 Constructor 12263
- 71.10.6 Constructor(name as string) 12263

### 71.10.8 count as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of children of a virtual folder.
**Notes:** This method returns a ”shallow” count of only those children that are immediately contained within the virtual folder. This method only applies to virtual folders. Real folders are considered ”leaf nodes” and should not be passed into this call.

### 71.10.9 folderWithPath(path as folderitem) as DRFolderMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a DRFolder object that will use the folder contents of the folder located at path as a source.
See also:

- 71.10.10 folderWithPath(path as string) as DRFolderMBS 12264

### 71.10.10 folderWithPath(path as string) as DRFolderMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a DRFolder object that will use the folder contents of the folder located at path as a source.
See also:

- 71.10.9 folderWithPath(path as folderitem) as DRFolderMBS 12264

### 71.10.11 makeVirtual

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Changes the real DRFolder object into a "virtual" DRFolder object.
**Notes:** The virtual folder created in this way is a snapshot of the on-disk folder at the moment of the call. The newly created virtual folder will contain real folder and file objects corresponding to the on-disk children of the original on-disk folder. If the on-disk folder is modified (eg, if the folder attributes change, or if children are added to or removed from the on-disk tree): during this call, the virtual folder may or may not reflect the changes. If modified after this call, the virtual folder will not reflect the changes.

### 71.10.12 removeChild(child as DRFSObjectMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes an object reference (either a file or folder) as a child of a virtual folder object.
**Notes:** This method only applies to virtual folders. Real folders are considered "leaf nodes" and cannot have children.

### 71.10.13 virtualFolderWithName(name as string) as DRFolderMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a ”virtual” folder object with a name.

## 71.11 class DRFSObjectMBS

### 71.11.1 class DRFSObjectMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A class which defines common features of all filesystem content objects.
**Notes:** Please read Apples documentation for more details.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 71.11.2 Methods

### 71.11.3 Constructor

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 71.11.4 DRAccessDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's last-accessed date.

### 71.11.5 DRAllFilesystems as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the name or properties for the file in all filesystems together.
**Notes:** When this key is used to refer to a name, it refers to the base name (which has no naming restrictions).

### 71.11.6 DRAttributeModificationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's attribute modification date.

### 71.11.7 DRBackupDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's backup date.

### 71.11.8 DRContentModificationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's content modification date.

### 71.11.9 DRCreationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's creation date.

### 71.11.10 DREffectiveDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's effective date.

### 71.11.11 DRExpirationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's expiration date.

### 71.11.12 DRHFSPlus as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the HFS+ name/properties for the file.
**Notes:** HFS+ names can be up to 255 decomposed unicode characters long.

### 71.11.13 DRHFSPlusCatalogNodeID as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing item's catalog node ID (HFS+ only). Currently, this value if set is only a suggestion. The burn engine will attempt to use this node ID, but may use another value if it needs to resolve conflicts. Default behavior is to allocate node IDs incrementally from kHFSFirstUserCatalogNodeID.

### 71.11.14 DRHFSPlusTextEncodingHint as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's text encoding hint (HFS+ only).

This value is used by the MacOS to help when converting the natively UTF-16 filename into an 8-bit-per-character representation (such as MacRoman, Shift-JIS, or UTF8). If not set, default behavior is to call CFStringGetMostCompatibleMacStringEncoding (CFStringGetSmallestEncoding()).

### 71.11.15 DRInvisible as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Boolean indicating whether the item is invisibile or not.

### 71.11.16 DRISO9660 as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the ISO-9660 properties for the file.
**Notes:** This key cannot be used to refer to the name of the file; it is ambiguous, since the name may be in either level 1 or level 2 format.

### 71.11.17 DRISO9660LevelOne as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the ISO-9660 level 1 name for the file.
**Notes:** This key is used to refer specifically to the name generated for ISO-9660 if the ISO level is set to 1. When used for a property, it is equivalent in use to the DRISO9660 key and acts as a synonym for that key.

ISO9660 level 1 names are in the form typically known as 8.3 - eight characters of name and three characters of extension (if it's a file; directories can't have extensions). Character set is limited to A-Z, 0-9, and _.

### 71.11.18 DRISO9660LevelTwo as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the ISO-9660 level 2 name for the file.
**Notes:** This key is used to refer specifically to the name generated for ISO-9660 if the ISO level is set to 2. When used for a property, it is equivalent in use to the DRISO9660 key and acts as a synonym for that key.

ISO9660 level 2 names can be 32 chars long, are limited to a subset of the 7-bit ASCII chars (capital letters, numbers, space, punctuation), and are only allowed one "." character.

### 71.11.19 DRISO9660VersionNumber as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the ISO9660 version number for the object. Default value is 1.

### 71.11.20 DRJoliet as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the Joliet name/properties for the file.
**Notes:** Joliet names can be 64 precomposed unicode characters long, but are only allowed one "." character and many punctuation characters are illegal.

### 71.11.21 DRMacExtendedFinderFlags as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's extended Finder flags (MacOS only).

### 71.11.22 DRMacFileCreator as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** A binary string containing the OSType for the file creator (MacOS only).

### 71.11.23 DRMacFileType as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** A binary string containing the OSType for the file type (MacOS only).

### 71.11.24 DRMacFinderFlags as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's Finder flags (MacOS only). The invisible bit is ignored - use DRInvisible instead.

### 71.11.25 DRMacFinderHideExtension as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** A boolean indicating whether the extension should be hidden in the Finder or not. The default is

false and only applies to files.

### 71.11.26 DRMacIconLocation as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** A binary string containing a Point (not NSPoint) for the item's icon location in its parent folder (MacOS only).

### 71.11.27 DRMacScrollPosition as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Binary string containing a Point (not NSPoint) for the folder's scroll position (MacOS only).

### 71.11.28 DRMacWindowBounds as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Binary string containing a Rect (not NSRect) for the window bounds for a folder (MacOS only).

### 71.11.29 DRMacWindowView as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the folder's window view type (MacOS only).

### 71.11.30 DRPosixFileMode as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's POSIX file mode.

### 71.11.31 DRPosixGID as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's POSIX GID.

### 71.11.32 DRPosixUID as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number containing the item's POSIX UID.

### 71.11.33 DRRecordingDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Date containing the item's recording date.

### 71.11.34 DRUDF as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The key for accessing the UDF name/properties for the file.

### 71.11.35 DRUDFApplicationIdentifierSuffix as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Binary string of up to 8 bytes in length, for application use. The presence of this key requires the DRApplicationIdentifier key.

### 71.11.36 DRUDFExtendedFilePermissions as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number indicating the extended UDF file permissions of this file.

Bit 0: Change attributes for others (low order bit) Bit 1: Delete permissions for others Bit 2: Change attributes for group Bit 3: Delete permissions for group Bit 4: Change attributes for owner Bit 5: Delete permissions for owner Bit 6 & 7: Reserved If this key is not present, DRPosixFileMode will be used with the above bits being set to the corresponding write bit for owner, group, and others. If DRPosixFileMode is not present, the file mode from the file on disc will be used, again using the write bit for these permissions.

### 71.11.37 DRUDFInterchangeLevel as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Number containing the volume interchange level. See the UDF specs for details.

### 71.11.38 DRUDFMaxInterchangeLevel as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Number containing the maximum volume interchange level number. See the UDF specs for details.

### 71.11.39 DRUDFMaxVolumeSequenceNumber as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Number containing the maximum volume sequence number. See the UDF specs for details.

### 71.11.40 DRUDFPrimaryVolumeDescriptorNumber as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Number containing the primary volume sequence number. See the UDF specs for details.

### 71.11.41 DRUDFRealTimeFile as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Number indicating whether the file is a UDF Real-Time file.

### 71.11.42 DRUDFVersion102 as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** This value is used in DRUDFWriteVersion.

### 71.11.43 DRUDFVersion150 as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** This value is used in DRUDFWriteVersion.

### 71.11.44 DRUDFVolumeSequenceNumber as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. Number containing the volume sequence number. See the UDF specs for details.

### 71.11.45 DRUDFVolumeSetIdentifier as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. The Volume Set Identifier for the UDF volume set. If this key is not present, DRVolumeSet will be used if present. The Volume Set Identifier is composed of the Volume Set Timestamp, the Implementation Use, and a the string contained in this property.

### 71.11.46 DRUDFVolumeSetImplementationUse as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. A binary string (8 bytes in length) for implementation use data. See the UDF specs for details.

### 71.11.47 DRUDFVolumeSetTimestamp as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. A date object for the volume set timestamp. See the UDF specs for details.

### 71.11.48 DRUDFWriteVersion as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Optional key. This property key defines the version for the UDF structures written to disk. Values are definde in UDF Version types.

### 71.11.49 effectiveFilesystemMask as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The effective filesystem mask set for the reciever.

### 71.11.50 isVirtual as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the receiver is real or virtual.
**Notes:**

True if the receiver is virtual and false if real.

### 71.11.51 mangledNameForFilesystem(filesystem as string) as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A single mangled filesystem-specific name for this fsobject.
**Notes:** Use DRISO9660LevelOne, DRISO9660, DRHFSPlus, DRUDF, DRJoliet, DRISO9660LevelTwo or

DRAllFilesystems for the filesystem parameter.

### 71.11.52 mangledNames as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a dictionary containing all of the filesystem-specific names for the receiver, each one mangled for uniqueness.
**Notes:** The dictionary will return only the names which are indicated by the receiver's effective mask. If the receiver's effective mask is zero, an empty dictionary is returned.

### 71.11.53 parent as DRFolderMBS

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The parent object.

### 71.11.54 propertiesForFilesystem(filesystem as string, mergeWithOtherFilesystems as boolean) as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns all the filesystem properties set for the specified filesystem.
**Notes:** filesystem: The filesystem to look in.
merge: If true, also look for properties in the umbrella DRAllFilesystems .

Normally you would call this method with merge set to true since you are interested in the set of properties that will be used when writing the object to disc. But if you have a need to determine what properties are set just for a specific filesystem, then pass in false for merge. In this case only the specific filesystem is checked. So if filesystem is set to DRHFSPlus and merge is false then the properties dictionary contains the values set for the HFS+ filesytem only. If no properties have been directly set for HFS+ yet, then this properties dictionary will be empty.

### 71.11.55 propertyForKey(key as string, filesystem as string, mergeWithOtherFilesystems as boolean) as Variant

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a file/folder property specified by key for the specified filesystem.
**Notes:** key: The property to return.

filesystem: The filesystem to look in.
merge: If true, also look for the property in the umbrella DRAllFilesystems .

Returs the value associated with the property.

Normally you would call this method with merge set to true since you are interested in the property that will be used when writing the object to disc. But if you have a need to determine what property is set just for a specific filesystem, then pass in false for merge. In this case only the specific filesystem is checked. So if DRHFSPlus is passed in for filesystem and merge is false then the property returned is the value set for the HFS+ filesytem only. If that property has not been directly set for HFS+ yet, then the returned value will be nil.

### 71.11.56 setProperties(Value as dictionary, filesystem as string)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the value of all the receiver's properties specified by the keys in properties for the specific filesystem.
**Notes:** properties: The value of the property.
filesystem: The filesystem to set the property in.

The properties are set only in the filesystem dictionary specified by filesystem. DRAllFilesystems may be specified as the filesystem in which case he umbrella property affecting all filesystems at once will be set. Setting properties for DRAllFilesystems does not preclude setting a filesystem specific property.

### 71.11.57 setProperty(Value as Variant, key as string, filesystem as string)

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the value of the receiver's property specified by key for the specific filesystem.
**Notes:** property: The value of the property.
key: The property key.
filesystem: The filesystem to set the property in.

The property is set only in the filesystem dictionary specified by filesystem. DRAllFilesystems may be specified as the filesystem in which case the umbrella property affecting all filesystems at once will be set. Setting a property for DRAllFilesystems does not preclude setting a filesystem specific property.

### 71.11.58 sourcePath as string

MBS MacControls Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The source path.

### 71.11.59 Properties

### 71.11.60 baseName as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the base name for the receiver.
**Notes:** The base name is the name from which any necessary filesystem-specific names are automatically generated.

Because the content creation API is able to generate multiple filesystems which require multiple varied naming conventions, a sensible system for naming is required. Thus each file has a "base name" which corresponds to its default name in any filesystem.

Whenever possible, the "base name" will be used in the generated filesystem without modification. If the name cannot be used as-is (if, for example, it contains illegal characters, exceeds the length requirements, doesn't meet the required format, or a name collision is detected) then an acceptable name that meets the filesystem's criteria will be generated automatically from the base name.

The default base name for a real file or folder is the actual on-disk name of the item.
(Read and Write computed property)

### 71.11.61 explicitFilesystemMask as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The explicit filesystem mask set for the reciever.
**Notes:** (Read and Write computed property)

### 71.11.62 specificNameForFilesystem(filesystem as string) as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A single filesystem-specific name for this fsobject.
**Notes:** Use DRISO9660LevelOne, DRISO9660, DRHFSPlus, DRUDF, DRJoliet, DRISO9660LevelTwo or

DRAllFilesystems for the filesystem parameter.
(Read and Write computed property)

### 71.11.63 specificNames as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The names used for the receiver in the different filesystems all at once.
**Notes:** An Dictionary of filesystem keys with corresponding name strings as their values for each specific filesystem name that should be set.

Every effort will be made to use the names passed in. However, if a name is illegal, it will be modified to fit the rules for that filesystem's names. Because of this, you should always call specificNames after setSpecificNames: to ensure that you are always displaying the most current names to the user.
(Read and Write computed property)

### 71.11.64 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DRFilesystemInclusionMaskHFSPlus | 8 | The value which indicates the object should be included in the HFS+ filesy |
| DRFilesystemInclusionMaskISO9660 | 1 | The value which indicates the object should be included in the ISO filesytem. |
| DRFilesystemInclusionMaskJoliet | 2 | The value which indicates the object should be included in the Joliet filesy |
| DRFilesystemInclusionMaskUDF | 4 | The value which indicates the object should be included in the UDF filesy |

## 71.12 class DRMSFMBS

### 71.12.1 class DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Minutes/Seconds/Frames handling.
**Notes:** On CDs, minutes/seconds/frames are used to identify positioning on a disc (which is most useful on an audio disc), but applies to any position on a disc no matter what type of data is present.

A frame is equivalent to a sector or block in normal disk parlance. 75 frames make up one second, so a 2 second pause (typical pregap size) is 150 frames.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.

### 71.12.2 Methods

### 71.12.3 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The dummy constructor.
See also:


- 71.12.4 Constructor(frames as Integer) 12280
- 71.12.5 Constructor(s as string) 12280


### 71.12.4 Constructor(frames as Integer)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an msf object whose length is frames.
See also:


- 71.12.3 Constructor 12280
- 71.12.5 Constructor(s as string) 12280


### 71.12.5 Constructor(s as string)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an msf object initialized to the value represented by string
See also:


- 71.12.3 Constructor 12280
- 71.12.4 Constructor(frames as Integer) 12280


### 71.12.6 description as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a textual representation.

### 71.12.7 descriptionWithFormat(format as string) as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns a textual representation of the receiver.
**Notes:** The format string is very similar to
A printf-style format string with %-escaped formatting characters.

| | |
|---|---|
| %% | A "%" character |
| %m | Minutes as a decimal number |
| %s | Seconds as a decimal number |
| %f | Frames as a decimal number |

In addition to these formatting characters an optional length specifier can come between then % and the formatting character. This length specifier will force the field in question to be at least that wide. For example a format specifier of "%02m:%02s" will cause a DRMSF object representing 3 minutes 9 seconds to be formatted as "03:09".

A formatter is aware of and respects rounding. If a bit of the msf is no zero, but the format does not display that value, the next higher value will be increased by one to reflect that. Extending our example above, an DRMSF with a value of 3 minutes, 9 seconds, 15 frames using a format specfier of "%02m:%02s", will be formatted as "03:10" since the 15 frames rounds up the seconds to the next value

Returns a string containing a textual representation of the object utilizing the specified format.

### 71.12.8 frames as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of frames represented by the receiver.
**Notes:** This method differs from sectors in that it returns to the caller the number of frames remaining in the current second. For example an DRMSF value of 5:30:72 will return 72 from frames.

### 71.12.9 isEqualToMSF(value as DRMSFMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Compares on emsf to another.
**Notes:** True if the two object are equal, false otherwise.

### 71.12.10 minutes as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of minutes represented by the receiver.
**Notes:** If the receiver represents a non integral number of minutes, only the whole minute value is returned. For example an DRMSF value of 5:30:72 will return 5 from a minutes.

### 71.12.11 msf as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an msf object with no length/time.
**Notes:** Returns nil on any error.

### 71.12.12 msfByAdding(value as DRMSFMBS) as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds an msf to the receiver.
**Notes:** Returns nil on any error.

### 71.12.13 msfBySubtracting(value as DRMSFMBS) as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Subtracts an msf to the receiver.
**Notes:** Returns nil on any error.

### 71.12.14 msfWithFrames(frames as Integer) as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an msf object whose length is frames.
**Notes:** Returns nil on any error.

### 71.12.15 msfWithString(s as string) as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an msf object initialized to the value represented by string.
**Notes:** Returns nil on any error.

### 71.12.16 seconds as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of seconds represented by the receiver.
**Notes:** If the receiver represents a non integral number of seconds, only the whole second value is returned.
For example an DRMSF value of 5:30:72 will return 30 from seconds.

### 71.12.17 sectors as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the total number of frames/sectors represented by the receiver.
**Notes:** This method differs from frames in that it returns to the caller the total number of frames/sectors represented by the object.
For example an DRMSF value of 5:30:72 will return 24822 from sectors.

## 71.13 class DRNotificationCenterMBS

### 71.13.1 class DRNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** A class for notifications.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.

### 71.13.2 Methods

### 71.13.3 addObserver(observer as NSNotificationObserverMBS, name as string="", theObject as Variant=nil)

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Adds an entry to the receiver's dispatch table with an observer and optional criteria: notification name and sender.
**Notes:** observer: Object registering as an observer. This value must not be nil.
name: The name of the notification for which to register the observer; that is, only notifications with this name are delivered to the observer. If you pass nil, the notification center doesn't use a notification's name to decide whether to deliver it to the observer.
theObject: The object whose notifications the observer wants to receive; that is, only notifications sent by this sender are delivered to the observer. If you pass nil, the notification center doesn't use a notification's sender to decide whether to deliver it to the observer.

### 71.13.4 Constructor

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new instance of notification center pointing to the default notification center.
**Notes:** A DRNotificationCenter object (or simply, notification center) is essentially a notification dispatch table. It notifies all observers of notifications meeting specific criteria. This information is encapsulated in NSNotification objects, also known as notifications. Client objects register themselves with the notification center as observers of specific notifications posted by DiscRecording. When an event occurs, DiscRecording posts an appropriate notification to the notification center. The notification center dispatches a message to each registered observer, passing the notification as the sole argument.

There are two main differences between a DRNotificationCenter and the NSNotificationCenter from Foundation. First is that only Disc Recording posts notifications received through this mechanism. You use this to

obtain device plug/unplug events, burn status, etc. Second, there can be multple notification centers active at once. Each run loop of your application will have it's own notification center and notifications from that notification center will be posted to the runloop it was created on.

### 71.13.5 removeObserver(observer as NSNotificationObserverMBS, name as string, theObject as Variant=nil)

MBS MacBase Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Removes matching entries from the receiver's dispatch table.
**Notes:** notificationObserver: Observer to remove from the dispatch table. Specify an observer to remove only entries for this observer. Must not be nil, or message will have no effect.
notificationName: Name of the notification to remove from dispatch table. Specify a notification name to remove only entries that specify this notification name. When nil, the receiver does not use notification names as criteria for removal.
notificationSender: Sender to remove from the dispatch table. Specify a notification sender to remove only entries that specify this sender. When nil, the receiver does not use notification senders as criteria for removal.

Be sure to invoke this method before the observer object or any object specified in addObserver is deallocated.

## 71.14 class DRSetupPanelMBS

### 71.14.1 class DRSetupPanelMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Base class for the DiscRecordingUI setup panels.
**Notes:** Provides a base framework for handling device selection, media ejection and confirming or cancelling the panel.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
Subclass of the NSPanelMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 71.14.2 Methods

### 71.14.3 cancel

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's cancel button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.14.4 close

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's close button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.14.5 Constructor

MBS MacControls Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 71.14.6 eject

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's eject button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.14.7 ok

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's default button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.14.8 open

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Invoked when the user clicks the panel's open button.
**Notes:** If you overwrite this method in Xojo, your method will not be called. You can only call this method to trigger the same behavior as if the user clicked the control.

### 71.14.9 runSetupPanel as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Displays the panel and begins its event loop.
**Notes:** Returns NSOKButton (if the user clicks the default button) or NSCancelButton (if the user clicks the Cancel button).

### 71.14.10 Events

### 71.14.11 determineBestDevice(deviceA as DRDeviceMBS, deviceB as DRDeviceMBS) as DRDeviceMBS

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: .

**Function:** Called to let you decide which device is better to use.
**Notes:** Default returns device A.

### 71.14.12 DeviceContainsSuitableMedia(device as DRDeviceMBS, byref prompt as string) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** This delegate method allows the delegate to determine if the media inserted in the device is suitable for whatever operation is to be performed.
**Notes:**

| | |
|---|---|
| device: | The device that contains the media being asked about. |
| prompt: | Pass back a string object describing the media state. |

Return false to disable the default button.

### 71.14.13 DeviceCouldBeTarget(device as DRDeviceMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Allows the delegate to determine if device can be used as a target.
**Notes:** This method is used to limit the menu to only those devices that you want to appear. For example, a DVD burning application might use this to limit the menu to only devices that are capable of writing DVD-Rs.

device: The candidate device.
Returns true if the device is acceptable, false if not.

### 71.14.14 DeviceSelectionChanged(device as DRDeviceMBS)

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Sent by the default notification center when the device selection in the panel has changed.

### 71.14.15 SetupPanelShouldHandleMediaReservations as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** This event allows the delegate to control how media reservations are handled.
**Notes:** Return false to indicate the delegate will handle media reservations. Return true to indicate the setupPanel should handle media reservations itself.

### 71.14.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCancelButton | 0 | The value runSetupPanel returns if the Cancel button is clicked. |
| NSOKButton | 1 | The value runSetupPanel returns if the OK button is clicked. |

## 71.15 class DRTrackMBS

### 71.15.1 class DRTrackMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The DRTrack class represents a track on the burned disc.
**Example:**

```
dim track as DRTrackMBS
dim bsp as DRBurnSetupPanelMBS
dim bpp as DRBurnProgressPanelMBS

// we need a track
track=CreateTrack

if track<>nil then
bsp=new DRBurnSetupPanelMBS

// set a few options
bsp.setCanSelectAppendableMedia true
bsp.setCanSelectTestBurn true

if bsp.runSetupPanel=bsp.NSOKButton then
bpp=new DRBurnProgressPanelMBS

// And start off the burn itself. This will put up the progress dialog
// and do all the nice pretty things that a happy app does.
bpp.beginProgressPanelForBurn bsp.burnObject, track

else
MsgBox "You pressed cancel."
end if
end if
```

**Notes:** A DRTrack provides data to the for the burn and contains a description of the track on disc (length, block type, data format, etc). Data is provided for the burn in a real-time thread. It is up to the track to provide this data in a timely manner, otherwise a burn underrun can occur and ruin a disc.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr7
- MBS Plugins 10.3 Release Notes

**Xojo Developer Magazine**

- 6.1, page 47: Finding Work, How to Find Work as a REALbasic Developer
- 6.1, pages 29 to 31: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

### 71.15.2 Methods

### 71.15.3 Constructor

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Dummy constructor.

### 71.15.4 DRAbstractFile as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** DRFileMBS object pointing to the abstract file for ISO and Joliet volumes. The file must be in the root directory.

### 71.15.5 DRApplicationIdentifier as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the application identifier for ISO, Joliet and UDF volumes.

### 71.15.6 DRAudioFourChannelKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD-DA audio tracks only. This key points to a boolean value indicating whether the track data has four channels, as opposed to the two channels of normal stereo. If this key is not present, the engine will use a default value of false and standard two-channel stereo is assumed.

Note that while four-channel is technically allowed in the Red Book, it never caught on and is probably being replaced by SACD, so you probably shouldn't attempt to use it.

On the media, this key corresponds to bit 3 of the control field in sub-channel Q.

### 71.15.7 DRAudioPreEmphasisKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD-DA audio tracks only. This key points to a boolean value indicating whether the track includes pre-emphasis of 50/15us. If this key is not present, the engine will use a default value of false. On the media, this key corresponds to bit 0 of the control field in sub-channel Q.

### 71.15.8 DRBibliographicFile as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** DRFile pointing to the bibliographic file for ISO and Joliet volumes. The file must be in the root directory.

### 71.15.9 DRBlockSize as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number indicating the block size of the track. Currently always 2048. Do not change.

### 71.15.10 DRBlockSizeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the size in bytes of each track block. See the Mt. Fuji (INF-8090i) specification for CD/DVD devices for possible values for this property.

### 71.15.11 DRBlockTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the type of each track block. See the Mt. Fuji (INF-8090i) specification for CD/DVD devices for possible values for this property.

### 71.15.12 DRCopyrightFile as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** DRFileMBS pointing to the copyright file for ISO and Joliet volumes. The file must be in the root directory.

### 71.15.13 DRDataFormKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the data form of each block in the track. See the Mt. Fuji (INF-8090i) specification for CD/DVD devices for possible values for this property.

### 71.15.14 DRDataPreparer as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the data preparer for ISO and Joliet volumes.

### 71.15.15 DRDefaultDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the default date to use for any unspecified dates in the filesystem. The current date and time is used if unspecified.

### 71.15.16 DRDVDCopyrightInfoKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For DVD tracks only. A binary string containing the DVD copyright info structure sent through the SEND DVD STRUCTURE command. The contents of this will be sent directly to the drive.

### 71.15.17 DRDVDTimestampKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For DVD tracks only. Binary string containing the DVD timestamp structure sent through the SEND DVD STRUCTURE command. The contents of this will be sent directly to the drive.

### 71.15.18 DRFreeBlocksKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the length, in blocks, which is still available in a writable track.

### 71.15.19 DRIndexPointsKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD tracks only. This key points to an NSArray of NSNumbers, indicating the index points inside the track. Each index point is specified as a number of blocks (frames) relative to the start of the track. There are 75 blocks in one second of CD audio. No more than 98 index points may be specified for a track.

Not all drives are capable of writing index points, and not all consumer CD players report or use them. If this key is present in any track and the drive cannot write index points, the burn will fail with kDRDeviceCantWriteIndexPointsErr.

### 71.15.20 DRISOLevel as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the ISO level of the ISO-9660 filesystem on the track. Currently should be 1 or 2.

### 71.15.21 DRISOMacExtensions as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Boolean indicating whether the track should have Mac extensions.

### 71.15.22 DRISORockRidgeExtensions as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Boolean indicating whether the track should have RockRidge (POSIX) extensions.

### 71.15.23 DRMaxBurnSpeedKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the maximum burn speed at which data can be produced. The speed is represented in KB/s (1 KB = 1000 bytes). This key can only be used to limit the speed at which the burn runs.

### 71.15.24 DRNextWritableAddressKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the LBA of the next writable address in the track. This key is not present in closed tracks.

### 71.15.25 DRPreGapIsRequiredKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD tracks only. Number indicating whether the pregap listed for the track is required. If this

key is not present, the track will behave as though the key were false.

If this key's value is set to true and the device does not support the exact pregap length, the burn will fail with a return value of kDRDevicePregapLengthNotAvailableErr .

If this key's value is set to true and the device does not support any of the suggested pregap length, the engine will choose an alternate pregap length.

### 71.15.26 DRPreGapLengthKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD tracks only. Number containing the length of silence or data at the beginning of the track. This defaults to 2 seconds of silence. If this key is present, the track producer will be asked for the pregap data first. If the producer implements the proper selector, then it's the responsibility of the producer to provide data for the pregap, otherwise that length of silence will be produced by Disc Recording.

### 71.15.27 DRPublisher as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the publisher for ISO and Joliet volumes.

### 71.15.28 DRSCMSCopyrightFree as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** One possible value for the DRSerialCopyManagementStateKey. Indicates that the track has no copying restrictions. Copies of this track should also be copyright free.

### 71.15.29 DRSCMSCopyrightProtectedCopy as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** One possible value for the DRSerialCopyManagementStateKey. Indicates that the track is a first-generation copy of an original that was subject to copy protection. No further digital copying should be

allowed.

### 71.15.30 DRSCMSCopyrightProtectedOriginal as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** One possible value for the DRSerialCopyManagementStateKey. Indicates that the track is an original subject to copyright protection. Digital copying of this track should be allowed, but copies should be marked with SCMS.

### 71.15.31 DRSerialCopyManagementStateKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD tracks only. This key points to a string value indicating the SCMS state of the track. If this key is not present, no SCMS data is written.

Not all drives are capable of writing SCMS. If this key is present in any track and the drive cannot write SCMS, the burn will fail with kDRDeviceCantWriteSCMSErr.

### 71.15.32 DRSessionFormatKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the session format of the track. See the Mt. Fuji (INF-8090i) specification for CD/DVD devices for possible values for this property.

### 71.15.33 DRSessionNumberKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the physical session number of a track.

### 71.15.34 DRSubchannelDataFormKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** The property whose value is the data mode of the subchannel data sent to the drive. If this key is not present, the track will default to a value of DRSubchannelDataFormNone and no subchannel information will be requested from the producer.

Subchannel data is returned from the producer in the same production method that produces normal user data. Normally a producer returns user data in chunks of DRBlockSizeKey size. When subchannel data is also produced, the producer is expected to return user data of DRBlockSizeKey in length with an additonal 96 bytes of subchannel data. Depending on the data form specified in this key, the format of this 96 bytes is either in raw or pack format. When subchannel data is requested from the producer, the DRFlagSubchannelDataRequested flag is set in the flags parameter of producePreGapForTrack or produceDataForTrack and blockSize is increased by 96 bytes.

### 71.15.35 DRSubchannelDataFormNone as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** A value for DRSubchannelDataFormKey indicating that the subchannel data will not be provided by the producer.

### 71.15.36 DRSubchannelDataFormPack as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** A value for DRSubchannelDataFormKey indicating that the producer will be asked to provide pack format subchannel data for the track. If this form is selected, the drive will perform P and Q parity calculations on each pack and interleave the packs before writing them to disc. This corresponds to a subchannel data form of 0xC0.

### 71.15.37 DRSubchannelDataFormRaw as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** A value for DRSubchannelDataFormKey indicating that the producer will be asked to provide raw format subchannel data for the track. If this form is selected, the producer must have performed P and Q parity calculations for each pack and done proper interleaving of the subchannel data. The drive will fill in the P-Q subchannel information and write the R-W subchannel data as is to the disc. This corresponds to

a subchannel data form of &h40.

### 71.15.38 DRSuppressMacSpecificFiles as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Boolean indicating whether the track should suppress Mac-specific files from non-HFS filesystems.

### 71.15.39 DRSystemIdentifier as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the system identifier for ISO and Joliet volumes.

### 71.15.40 DRTrackIsEmptyKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing a boolean value and indicates whether the track is empty.

### 71.15.41 DRTrackISRCKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** For CD-DA audio tracks only. This key points to an memoryblock containing exactly 12 bytes, which will be written to the disc as the International Standard Recording Code (ISRC). If this key is not present, no ISRC is written.

The use of this value should conform to the specifications of the IFPI. More details:
http://www.ifpi.org/isrc/

Not all drives are capable of the write modes necessary to write the ISRC. If this key is present in any track and the drive cannot write the ISRC, the burn will fail with kDRDeviceCantWriteISRCErr.

### 71.15.42 DRTrackLengthKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number representing the length of the track.

### 71.15.43 DRTrackModeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the track mode of the track. See the Mt. Fuji (INF-8090i) specification for CD/DVD devices for possible values for this property.

### 71.15.44 DRTrackNumberKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the physical track number of a track.

### 71.15.45 DRTrackPacketSizeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the number of blocks per packet for the disc. It will only be present if the disc contains fixed packets. This key will contain 16 for DVD media, and typically contains either 16 or 32 for CD media.

### 71.15.46 DRTrackPacketTypeFixed as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** If this is the value of the DRTrackPacketTypeKey then the disc is writen with fixed sized packets. When this value is present the DRPacketSizeKey will also be present.

### 71.15.47 DRTrackPacketTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the kind of packets being written.

### 71.15.48 DRTrackPacketTypeVariable as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** If this is the value of the DRTrackPacketTypeKey then the disc is written with sequential variable sized packets. The presence of this value indicates the lack of the DRPacketSizeKey.

### 71.15.49 DRTrackStartAddressKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Number containing the LBA of the start address for the track.

### 71.15.50 DRTrackTypeClosed as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** If this is the value of the DRTrackTypeKey then the track has been written and is closed.

### 71.15.51 DRTrackTypeIncomplete as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** If this is the value of the DRTrackTypeKey then the track is not invisible or reserved and is available for writing.

### 71.15.52 DRTrackTypeInvisible as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** If this is the value of the DRTrackTypeKey then the track is invisible and available to writing. If

it is packet written and not closed, DRPacketTypeKey will be present, along with DRTrackPacketType and DRTrackPacketSize keys.

### 71.15.53 DRTrackTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the type of track. Possible values are: DRTrackTypeInvisible , DRTrackTypeIncomplete , DRTrackTypeReserved or DRTrackTypeClosed.

### 71.15.54 DRTrackTypeReserved as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** If this is the value of the DRTrackTypeKey then the track is reserved for writing.

### 71.15.55 DRVerificationTypeChecksum as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the VerificationType.
**Notes:** The engine will verify the track data with an internally calculated checksum.

### 71.15.56 DRVerificationTypeKey as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the type of verification to be performed. If this is not present, the track will not be verified.

### 71.15.57 DRVerificationTypeNone as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the VerificationType property.
**Notes:** No verification is desired, so verification will be skipped.

### 71.15.58 DRVerificationTypeProduceAgain as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the VerificationType property.
**Notes:** The engine will simply begin another production cycle and start calling produceDataForTrack again.

### 71.15.59 DRVerificationTypeReceiveData as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the possible values of the VerificationType property.
**Notes:** The engine will begin reading data from the disc and calling verifyDataForTrack.

### 71.15.60 DRVolumeCheckedDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the volume-checked date for HFS+ volumes. DRDefaultDate is used if unspecified.

### 71.15.61 DRVolumeCreationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the volume creation date. DRDefaultDate is used if unspecified.

### 71.15.62 DRVolumeEffectiveDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the date and time at which the volume is effective for ISO and Joliet volumes.

### 71.15.63 DRVolumeExpirationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the volume expiration date for ISO and Joliet volumes.

### 71.15.64 DRVolumeModificationDate as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** Date containing the volume modification date. DRDefaultDate is used if unspecified.

### 71.15.65 DRVolumeSet as string

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the key constants for the properties dictionary.
**Notes:** String indicating the volume set name for ISO and Joliet volumes.

### 71.15.66 estimateLength as UInt64

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Asks the track producer for a size estimate.
**Notes:** This method calls the track producer to ask it to estimate the size needed for its data.

For some types of track, this call may be very expensive. For example, a DRFilesystemTrack may need to iterate folders on disk to provide an accurate estimate, which (if a large number of files and folders are involved) can cause this call to take 30 seconds or more. Since your main thread should not be allowed to block for this long, you may wish to call this function on a separate thread.

Requires Mac OS X 10.3.

### 71.15.67 testProductionSpeedForInterval(seconds as Double) as Double

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Tests the production speed for a specified interval.
**Notes:**

Runs a fake "production" cycle, repeatedly asking the receiver for data by calling it's producer's produceDataIntoBuffer for the specified time interval.

Use this function to verify that the the production code can produce data fast enough to satisfy the data throughput requirements of the burn.

Returns the calculated maximum speed the at which the receiver can produce data. This value should be used when setting up a burn to limit the burn speed

### 71.15.68 testProductionSpeedForLength(length as Integer) as Double

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Tests the production speed for a specified byte count.
**Notes:** Runs a fake "production" cycle, repeatedly asking the receiver for data by calling it's producer's produceDataIntoBuffer:length:atAddress:blockSize:ioFlags: until the specified length number of bytes have been produced.

Use this function to verify that the the production code can produce data fast enough to satisfy the data throughput requirements of the burn.

Returns the calculated maximum speed the at which the receiver can produce data. This value should be used when setting up a burn to limit the burn speed

Length: length of test in seconds.

### 71.15.69 trackForAudioFile(path as folderitem) as DRTrackMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an audio track capable of burning RedBook CD audio from a file.
**Example:**

```
dim f as FolderItem
f=SelectFolder
if f<>nil then
// Create tracks for the audio files
dim tracks(-1) as DRTrackMBS
dim c as Integer=f.Count
for i as Integer=1 to c
dim g as FolderItem=f.Item(i)
if g<>nil and g.visible then
dim track as DRTrackMBS=DRTrackMBS.trackForAudioFile(g)
if track<>nil then
tracks.Append track
end if
```

```
end if
next

// display gui
if UBound(tracks)>=0 then
dim bsp as DRBurnSetupPanelMBS=new DRBurnSetupPanelMBS // you may want to use your own subclass to catch events
if bsp.runSetupPanel=bsp.NSOKButton then
dim bpp as new DRBurnProgressPanelMBS // you may want to use your own subclass to catch events
bpp.beginProgressPanelForBurn(bsp.burnObject, tracks)
end if
end if
end if
```

**Notes:** This function creates a track object configured and primed to output RedBook audio CD data. It accepts any file readable by QuickTime and extracts the audio data (if any) from the file, translating that into the correct format for output to the disc.

Returns nil on any error. Requires Mac OS X 10.3.
See also:

- 71.15.70 trackForAudioFile(path as string) as DRTrackMBS 12306

### 71.15.70 trackForAudioFile(path as string) as DRTrackMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates an audio track capable of burning RedBook CD audio from a file.
**Notes:** This function creates a track object configured and primed to output RedBook audio CD data. It accepts any file readable by QuickTime and extracts the audio data (if any) from the file, translating that into the correct format for output to the disc.

Returns nil on any error. Requires Mac OS X 10.3.
See also:

- 71.15.69 trackForAudioFile(path as folderitem) as DRTrackMBS 12305

### 71.15.71 trackForRootFolder(folder as DRFolderMBS) as DRTrackMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a filesystem track capable of burning a folder.
**Notes:** Returns a track which contains the given folder as root.
See also:

- 71.15.72 trackForRootFolder(folder as folderitem) as DRTrackMBS 12307


### 71.15.72 trackForRootFolder(folder as folderitem) as DRTrackMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a filesystem track capable of burning a folder.
**Notes:** Returns a track which contains the given folder as root.
See also:


- 71.15.71 trackForRootFolder(folder as DRFolderMBS) as DRTrackMBS 12306


### 71.15.73 Properties

### 71.15.74 BlockSize as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The size in bytes of each track block.
**Notes:** (Read and Write computed property)

### 71.15.75 BlockType as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The type of each track block.
**Notes:** (Read and Write computed property)

### 71.15.76 DataForm as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The data form of each block in the track.
**Notes:** (Read and Write computed property)

### 71.15.77 length as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Returns the length of the track data.
**Notes:** The length returned does not include the length of the pregap. Only the length of the track data

itself is returned.
(Read and Write computed property)

### 71.15.78 MaxBurnSpeed as Double

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** A number containing the maximum burn speed at which data can be produced.
**Notes:** The speed is represented in KB/s (1 KB = 1000 bytes). This value can only be used to limit the speed at which the burn runs.
(Read and Write computed property)

### 71.15.79 preGap as DRMSFMBS

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The length of the pre gap.
**Notes:** (Read and Write computed property)

### 71.15.80 PreGapIsRequired as boolean

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** A boolean indicating whether the pregap listed for the track is required.
**Notes:** For CD tracks only.
If this value is not set, the track will behave as though the value were false.

If this value is set to true and the device does not support the exact pregap length, the burn will fail with a return value of kDRDevicePregapLengthNotAvailableErr.

If this value is set to true and the device does not support any of the suggested pregap length, the engine will choose an alternate pregap length.

(Read and Write computed property)

### 71.15.81 PreGapLength as Double

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** A number containing the length of silence or data at the beginning of the track.
**Notes:** For CD tracks only.

This defaults to 2 seconds of silence. If this value is set, the track producer will be asked for the pregap data first.
If the producer implements the proper event, then it's the responsibility of the producer to provide data for the pregap, otherwise that length of silence will be produced by Disc Recording.
(Read and Write computed property)

### 71.15.82 properties as dictionary

MBS MacControls Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** The properties dictionary of the track
**Notes:** (Read and Write computed property)

### 71.15.83 SessionFormat as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The session format of the track.
**Notes:** (Read and Write computed property)

### 71.15.84 TrackISRC as memoryblock

MBS MacControls Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** The property for the tracks ISRC data.
**Notes:** For CD-DA audio tracks only. This key points to a memoryblock containing exactly 12 bytes, which will be written to the disc as the International Standard Recording Code (ISRC). If this key is not present, no ISRC is written.

The use of this value should conform to the specifications of the IFPI. See http://www.ifpi.org/isrc/ for more details on the ISRC standard.

Not all drives are capable of the write modes necessary to write the ISRC.
If this key is present in any track and the drive cannot write the ISRC, the burn will fail with kDRDeviceCantWriteISRCErr.
(Read and Write computed property)

### 71.15.85 TrackMode as Integer

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The track mode of the track.
**Notes:** (Read and Write computed property)

### 71.15.86 VerificationType as string

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The type of verification requested.
**Notes:** Value should be DRVerificationTypeReceiveData, DRVerificationTypeProduceAgain, DRVerificationTypeNone or DRVerificationTypeChecksum.
(Read and Write computed property)

### 71.15.87 Events

### 71.15.88 cleanupTrackAfterBurn

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Cleans up the track after the burn completes.
**Notes:** Called after burning is complete. Typically you'll clean up what was setup is prepareTrackForBurn. Since this method is called after the laser is turned off and the burn is finished, this method can perform time consuming tasks.

True to indicate that the burn should proceed and false to indicate a failure occurred.

### 71.15.89 cleanupTrackAfterVerification as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Cleans up the track after the verification completes.
**Notes:** Once the verification phase is complete, this method is called. The class implementing the method has a chance to do anything up to and including failing the verification.

Return true to indicate success, false to indicate failure.

### 71.15.90 estimateLengthOfTrack as uint64

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Estimates the size of the track to be burned.
**Notes:** This message is sent outside of a burn cycle in response to a -estimateLength message sent to the track.

Returns the number of blocks of data that the track will occupy. The estimate should be reasonably accurate, and no smaller than the actual size that will be needed.

Only on Mac OS X 10.3 and newer.

### 71.15.91 prepareTrack(burn as DRBurnMBS) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Prepares the track for burning.
**Notes:** Called before any burning starts. Do any sort of setup that needs to be performed (such as opening files). This method can calculate and update the exact track length that will be burned.

Since this method is called before the laser is turned on, this method can perform time consuming tasks.

burn: The burn object controlling the burn

Return true to indicate that the burn should proceed and false to indicate a failure occurred.

### 71.15.92 prepareTrackForVerification as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Prepare the track to be verified.
**Notes:** This method is called after the burn complets writing data to disc and before verification phase starts. Now would be a good time to prepare to produce data again by rewinding to the start of files, etc.

Return true to indicate that the verification should proceed and false to indicate a failure occurred.

### 71.15.93 produceDataForTrack(buffer as memoryblock, Bufferlen as uint32, address as uint64, blocksize as uint32, byref flags as uint32) as uint32

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Produces the track data.

**Notes:** This method is called many times over the course of a burn to obtain data for the track. The buffer passed in will be a multiple of blockSize (bufferLength == blockSize * N, where N >1) and should be filled as full as possible with data. address is the sector address on the disc from the start of the track that is the buffer will be written to.

Since while burning, keeping the drive's buffer full is of utmost importance, you should not perform lengthy operations or block for data in this method. This method should return the number of bytes actually in the buffer or 0 to indicate that there was an error producing the data..

buffer: The buffer to place data into
bufferLength: The length of buffer
address: The on-disc address of where data will be written
blockSize: the size of each block on the disc. It's best to return a multiple of this size.
flags: Some flags. Not yet used.

Return the number of bytes produced.

### 71.15.94 producePreGapForTrack(buffer as memoryblock, Bufferlen as uint32, address as uint64, blocksize as uint32, byref flags as uint32) as uint32

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Produces the pregap data.
**Notes:** This method is called to obtain data for the track's pregap. If the DRPreGapLengthKey key is present in the track properties, the track producer will be asked for the pregap data first. If the producer implements this selector, then it's the responsibility of the producer to provide data for the pregap, otherwise that length of silence will be produced by DiscRecording.

The buffer passed in will be a multiple of blockSize (bufferLength = blockSize * N, where N >1) and should be filled as full as possible with data. address is the sector address on the disc from the start of the track that is the buffer will be written to.

Since while burning, keeping the drive's buffer full is of utmost importance, you should not perform lengthy operations or block for data in this method. This method should return the number of bytes actually in the buffer or 0 to indicate that there was an error producing the data..

buffer: The buffer to place data into
bufferLength: The length of buffer
address: The on-disc address of where data will be written
blockSize the size of each block on the disc. It's best to return a multiple of this size.
flags: Some flags (not used).

Return the number of bytes produced.

### 71.15.95 verifyDataForTrack(buffer as memoryblock, Bufferlen as uint32, address as uint64, blocksize as uint32, byref flags as uint32) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Cleans up the track after the burn completes.
**Notes:** If the class implementing this method asks for a verification type of DRVerificationTypeReceiveData, then a series of calls to this method will start. It's up to the class to reproduce the data again and compare it to the data passed in buffer. The buffer passed in will be a multiple of blockSize (bufferLength == blockSize * N, where N >1). address is the sector address on the disc from the start of the track that is the buffer was written to.

buffer: The data read in from the track to compare with
bufferLength: The length of buffer
address: The on-disc address of where data will was read from.
blockSize: the size of each block on the disc. It's best to return a multiple of this size.
flags: Some flags. Not used.

Return true to indicate that the data compared successfully and false to indicate a failure occurred.

### 71.15.96 verifyPreGapForTrack(buffer as memoryblock, Bufferlen as uint32, address as uint64, blocksize as uint32, byref flags as uint32) as boolean

MBS MacControls Plugin, Plugin Version: 7.4, Platform: macOS, Targets: .

**Function:** Checks the integrity track pregap after a burn.
**Notes:** If the class implementing this method asks for a verification type of DRVerificationTypeReceiveData, then a series of calls to this method will start. It's up to the class to reproduce the pregap again and compare it to the data passed in buffer. The buffer passed in will be a multiple of blockSize (bufferLength == blockSize * N, where N >1). address is the sector address on the disc from the start of the track that is the buffer was written to.

buffer: The data read in from the track to compare with
bufferLength: The length of buffer
address: The on-disc address of where data will was read from.
blockSize: the size of each block on the disc. It's best to return a multiple of this size.
flags: Some flags. (not used)

Return true to indicate that the data compared successfully and false to indicate a failure occurred.

### 71.15.97 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DRFlagSubchannelDataRequested | 2 | A flag passed to producePreGapForTrack or produceDataForTrack.<br>Indicates that the blockSize passed in includes room for subchannel data.<br>Data producers should check this flag and perform subchannel data productio in addition to user fata production. Each block requested from the produc in this case will be formatted as [ user data (as specified in track properties) [ subchannel data(96 bytes) ] .<br>For example an audio producer callback should repeatedly produce 2352 byt of audio data into bytes 0-2351 of the block and an additional 96 bytes subchannel data into bytes 2352-2447. |
| kDRBlockSizeAudio | 2352 | One of the block size constants.<br>Audio data. |
| kDRBlockSizeDVDData | 2048 | One of the block size constants.<br>DVD data. |
| kDRBlockSizeMode1Data | 2048 | One of the block size constants.<br>Mode 1 data. |
| kDRBlockSizeMode2Data | 2332 | One of the block size constants.<br>Mode 2 data. Photo CD and CD-i use this. |
| kDRBlockSizeMode2Form1Data | 2048 | One of the block size constants.<br>Mode 2 Form 1 data. |
| kDRBlockSizeMode2Form2Data | 2324 | One of the block size constants.<br>Mode 2 Form 2 data. |
| kDRBlockTypeAudio | 0 | One of the block type constants.<br>Audio data. |
| kDRBlockTypeDVDData | 8 | One of the block type constants.<br>DVD data. |
| kDRBlockTypeMode1Data | 8 | One of the block type constants.<br>Mode 1 data. |
| kDRBlockTypeMode2Data | 13 | One of the block type constants.<br>Mode 2 data. Photo CD and CD-i use this. |
| kDRBlockTypeMode2Form1Data | 10 | One of the block type constants.<br>Mode 2 Form 1 data. |
| kDRBlockTypeMode2Form2Data | 12 | One of the block type constants.<br>Mode 2 Form 2 data. |
| kDRDataFormAudio | 0 | One of the data form constants.<br>Audio data. |
| kDRDataFormDVDData | 16 | One of the data form constants.<br>DVD data. |
| kDRDataFormMode1Data | 16 | One of the data form constants.<br>Mode 1 data. |
| kDRDataFormMode2Data | 32 | One of the data form constants.<br>Mode 2 data. Photo CD and CD-i use this. |
| kDRDataFormMode2Form1Data | 32 | One of the data form constants.<br>Mode 2 Form 1 data. |
| kDRDataFormMode2Form2Data | 32 | One of the data form constants.<br>Mode 2 Form 2 data. |
| kDRSessionFormatAudio | 0 | One of the constants for the session format.<br>Audio data. |
| kDRSessionFormatCDI | 16 | One of the constants for the session format.<br>CD-I disc. |
| kDRSessionFormatCDXA | 32 | One of the constants for the session format.<br>CD-ROM XA disc. |
| kDRSessionFormatDVDData | 0 | One of the constants for the session format.<br>DVD data. |
| kDRSessionFormatMode1Data | 0 | One of the constants for the session format.<br>Mode 1 data. |
| kDRTrackMode1Data | 4 | One of the track mode constants.<br>Mode 1 data. |
| kDRTrackMode2Data | 4 | One of the track mode constants. |

## 71.16 class WindowsBurnMBS

### 71.16.1 class WindowsBurnMBS

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Exposes methods that determine whether a system has hardware for writing to CD, the drive letter of a CD writer device, and programmatically initiate a CD writing session.

### 71.16.2 Methods

### 71.16.3 CDBurn

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Instructs data to be copied from the staging area to a writable CD.
**Notes:** The staging area has a default location of %userprofile%\Local Settings\Application Data\Microsoft\CD Burning. Its actual path can be retrieved through WindowsBurnAreaFolderMBS.

This method returns when the CD is done or thre user cancelled.
See also:


- 71.16.4 CDBurn(hostwindow as DesktopWindow) 12316
- 71.16.5 CDBurn(hostwindow as window) 12317


### 71.16.4 CDBurn(hostwindow as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Instructs data to be copied from the staging area to a writable CD.
**Notes:** Hostwindow: parent window of the user interface (UI)

The staging area has a default location of %userprofile%\Local Settings\Application Data\Microsoft\CD Burning. Its actual path can be retrieved through WindowsBurnAreaFolderMBS.

This method returns when the CD is done or thre user cancelled.
See also:


- 71.16.3 CDBurn 12316
- 71.16.5 CDBurn(hostwindow as window) 12317

### 71.16.5 CDBurn(hostwindow as window)

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop only.

**Function:** Instructs data to be copied from the staging area to a writable CD.
**Notes:** Hostwindow: parent window of the user interface (UI)

The staging area has a default location of %userprofile%\Local Settings\Application Data\Microsoft\CD Burning. Its actual path can be retrieved through WindowsBurnAreaFolderMBS.

This method returns when the CD is done or thre user cancelled.
See also:


- 71.16.3 CDBurn 12316
- 71.16.4 CDBurn(hostwindow as DesktopWindow) 12316


### 71.16.6 HasRecordableDrive as boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the system for a CD drive with write-capability, returning true if one is found.
**Notes:** This search does not rely on the state of the Enable cd writing on this drive option found on the drive's property sheet. Instead, the determination is based on IMAPI.

### 71.16.7 RecorderDriveLetter as string

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the drive letter of a CD drive that has been marked as write-enabled.
**Notes:** The drive whose letter designation is returned by this method is the drive that has the Enable cd writing on this drive option selected. This option is found on the drive's property sheet. Only one drive on a system can have this option selected.

If a recordable CD drive is present but that option has been deselected, the method will return ane empty string.

### 71.16.8 Properties

### 71.16.9 Available as boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the Shell extension on Windows for CD Burning is available.
**Notes:** Available should be true on Windows XP and newer.
(Read only property)

### 71.16.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported by one of the methods.
**Notes:** (Read and Write property)

# Chapter 72

# DNS

## 72.1 class DNSAddressRecordMBS

### 72.1.1 class DNSAddressRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for an address record.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.six.heise.de", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
for each d as DNSResourceRecordMBS in r.Answers
if d.A<>Nil then
MsgBox d.A.address
end if
next
end if
```

### 72.1.2 Properties

### 72.1.3 address as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The IPv4 address.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.six.heise.de", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
for each d as DNSResourceRecordMBS in r.Answers
if d.A<>Nil then
MsgBox d.A.address
end if
next
end if
```

**Notes:** (Read and Write property)

## 72.2 class DNSAFSDBRecordMBS

### 72.2.1 class DNSAFSDBRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for an AFSDB record.

### 72.2.2 Properties

### 72.2.3 hostname as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The hostname.
**Notes:** (Read and Write property)

### 72.2.4 subtype as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The sub type.
**Notes:** (Read and Write property)

## 72.3 class DNSDomainNameRecordMBS

### 72.3.1 class DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a domain name record.

### 72.3.2 Properties

### 72.3.3 name as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The queried name.
**Notes:** (Read and Write property)

## 72.4 class DNSHeaderMBS

### 72.4.1 class DNSHeaderMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a header of a DNS query.

### 72.4.2 Properties

### 72.4.3 AdditionalCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of additional items.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "AdditionalCount: "+str(r.Header.AdditionalCount)
end if
```

**Notes:** (Read and Write property)

### 72.4.4 AnswerCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of answers in this query.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "AnswerCount: "+str(r.Header.AnswerCount)
end if
```

**Notes:** (Read and Write property)

### 72.4.5 AuthorityCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of authority records.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "AuthorityCount: "+str(r.Header.AuthorityCount)
end if
```

**Notes:** (Read and Write property)

### 72.4.6 Flags as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The flags.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "Flags: "+str(r.Header.Flags)
end if
```

**Notes:** (Read and Write property)

### 72.4.7 QuestionCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of questions in this query.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
```

```
MsgBox "QuestionCount: "+str(r.Header.QuestionCount)
end if
```

**Notes:** (Read and Write property)

### 72.4.8 xid as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The xid value.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "xid: "+str(r.Header.xid)
end if
```

**Notes:** (Read and Write property)

## 72.5 class DNSHINFORecordMBS

### 72.5.1 class DNSHINFORecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for the host information record.

### 72.5.2 Properties

### 72.5.3 CPU as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The CPU information string.
**Notes:** (Read and Write property)

### 72.5.4 OS as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The operation system name.
**Notes:** (Read and Write property)

## 72.6 class DNSIN6AddressRecordMBS

### 72.6.1 class DNSIN6AddressRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for an IPv6 address record.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.six.heise.de", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeAAAA)

if r<>Nil then
for each d as DNSResourceRecordMBS in r.Answers
if d.AAAA<>Nil then
MsgBox d.AAAA.address
end if
next
end if
```

### 72.6.2 Properties

### 72.6.3 address as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The IPv6 address.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.six.heise.de", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeAAAA)

if r<>Nil then
for each d as DNSResourceRecordMBS in r.Answers
if d.AAAA<>Nil then
MsgBox d.AAAA.address
end if
next
end if
```

**Notes:** (Read and Write property)

### 72.6.4 rawaddress as Memoryblock

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The raw address as a memoryblock.
**Notes:** (Read and Write property)

## 72.7 class DNSISDNRecordMBS

### 72.7.1 class DNSISDNRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for an ISDN record.

### 72.7.2 Properties

### 72.7.3 isdnAddress as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The ISDN address.
**Notes:** (Read and Write property)

### 72.7.4 subAddress as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The subaddress.
**Notes:** (Read and Write property)

## 72.8 class DNSLocRecordMBS

### 72.8.1 class DNSLocRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The location record class.

### 72.8.2 Properties

### 72.8.3 altitude as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The altitude value.
**Notes:** (Read and Write property)

### 72.8.4 horizontalPrecision as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The horizontal precision value.
**Notes:** (Read and Write property)

### 72.8.5 latitude as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The latitude value.
**Notes:** (Read and Write property)

### 72.8.6 longitude as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The longitude value.
**Notes:** (Read and Write property)

### 72.8.7 size as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The size value.
**Notes:** (Read and Write property)

### 72.8.8 version as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The version value.
**Notes:** (Read and Write property)

### 72.8.9 verticalPrecision as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The vertical precision value.
**Notes:** (Read and Write property)

## 72.9 class DNSMINFORecordMBS

### 72.9.1 class DNSMINFORecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The MINFO record class.

### 72.9.2 Properties

### 72.9.3 emailbx as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The emailbx value.
**Notes:** (Read and Write property)

### 72.9.4 rmailbx as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The rmailbx value.
**Notes:** (Read and Write property)

## 72.10 class DNSMXRecordMBS

### 72.10.1 class DNSMXRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a mx (mailbox) record.

### 72.10.2 Properties

### 72.10.3 name as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The name of this email server.
**Notes:** (Read and Write property)

### 72.10.4 preference as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The preference value for this email server.
**Notes:** (Read and Write property)

## 72.11 class DNSQuestionMBS

### 72.11.1 class DNSQuestionMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a DNS query question.

### 72.11.2 Properties

### 72.11.3 dnsclass as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The DNS class value.
**Notes:** See the Class* constants in DNSUtilMBS module.
(Read and Write property)

### 72.11.4 dnstype as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The DNS type value.
**Notes:** See the Type* constants in DNSUtilMBS module.
(Read and Write property)

### 72.11.5 name as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The query in the question.
**Notes:** (Read and Write property)

## 72.12 class DNSRawResourceRecordMBS

### 72.12.1 class DNSRawResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a raw resource record.

### 72.12.2 Properties

### 72.12.3 data as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The data as a string with no encoding set.
**Notes:** Just the raw bytes as string.
(Read and Write property)

### 72.12.4 length as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The length of the data.
**Notes:** (Read and Write property)

## 72.13 class DNSReplyMBS

### 72.13.1 class DNSReplyMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a DNS query reply.

### 72.13.2 Methods

### 72.13.3 Additional(index as Integer) as DNSResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the additional record with the given index.
**Notes:** index is zero based.

### 72.13.4 Additionals as DNSResourceRecordMBS()

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns an array with the additional records.

### 72.13.5 Answer(index as Integer) as DNSResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the answer with the given index.
**Notes:** index is zero based.

### 72.13.6 Answers as DNSResourceRecordMBS()

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns an array with the answer records.

### 72.13.7 Authority(index as Integer) as DNSResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the authority with the given index.
**Notes:** index is zero based.

### 72.13.8 Authoritys as DNSResourceRecordMBS()

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns an array with the authority records.

### 72.13.9 Question(index as Integer) as DNSQuestionMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The question with the given index.
**Notes:** index is zero based.

### 72.13.10 Questions as DNSQuestionMBS()

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns an array with the question records.

### 72.13.11 Properties

### 72.13.12 additionalCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of additional records.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "additionalCount: "+str(r.additionalCount)
end if
```

**Notes:** (Read and Write property)

### 72.13.13 answerCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of answer records.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "answerCount: "+str(r.answerCount)
end if
```

**Notes:** (Read and Write property)

### 72.13.14 authorityCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of authority records.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "authorityCount: "+str(r.authorityCount)
end if
```

**Notes:** (Read and Write property)

### 72.13.15 Header as DNSHeaderMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The header values for this query.
**Notes:** (Read and Write property)

### 72.13.16 questionCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of questions.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "questionCount: "+str(r.questionCount)
end if
```

**Notes:** (Read and Write property)

### 72.13.17 Server as DNSSocketAddressMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The server details from this query.
**Notes:** (Read and Write property)

### 72.13.18 Status as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The status of this query.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "Status: "+str(r.Status)
end if
```

**Notes:** See the Status* constants.
(Read and Write property)

### 72.13.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| StatusBadHandle | 1 | One of the status constants for the status property. |
| StatusConnectionFailed | 6 | One of the status constants for the status property. |
| StatusMalformedQuery | 2 | One of the status constants for the status property. |
| StatusOK | 0 | One of the status constants for the status property. |
| StatusReceiveFailed | 5 | One of the status constants for the status property. |
| StatusSendFailed | 4 | One of the status constants for the status property. |
| StatusTimeout | 3 | One of the status constants for the status property. |
| StatusWrongQuestion | 9 | One of the status constants for the status property. |
| StatusWrongServer | 7 | One of the status constants for the status property. |
| StatusWrongXID | 8 | One of the status constants for the status property. |

## 72.14 class DNSResourceRecordMBS

### 72.14.1 class DNSResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a resource record.
**Notes:** Data contained in unsupported or obsolete Resource Record types may be accessed via RAW as a DNSRawResourceRecordMBS.

### 72.14.2 Properties

### 72.14.3 A as DNSAddressRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.4 AAAA as DNSIN6AddressRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.5 AFSDB as DNSAFSDBRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.6 CNAME as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.7 dnsclass as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The DNS class value.
**Notes:** See the Class* constants in DNSUtilMBS module.
(Read and Write property)

### 72.14.8 dnstype as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The DNS type value.
**Notes:** See the Type* constants in DNSUtilMBS module.
(Read and Write property)

### 72.14.9 HINFO as DNSHINFORecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.10 ISDN as DNSISDNRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.11 LOC as DNSLocRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.12 MB as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.13 MD as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.14 MF as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.15 MG as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.16 MINFO as DNSMINFORecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.17 MR as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.18 MX as DNSMXRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.19 name as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The name.
**Notes:** (Read and Write property)

### 72.14.20 NS as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.21 PTR as DNSDomainNameRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.22 RAW as DNSRawResourceRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** Data contained in unsupported or obsolete Resource Record types may be accessed via RAW as a DNSRawResourceRecordMBS.
(Read and Write property)

### 72.14.23 Record as Variant

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content as a variant.
**Notes:** Each resource record contains only one subrecord. So this record property has a reference to it and the corresponding property.
(Read and Write property)

### 72.14.24 RP as DNSRPRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.25 RT as DNSRTRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.26 SOA as DNSSOARecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.27 SRV as DNSSRVRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.28 ttl as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The time to live value.
**Notes:** (Read and Write property)

### 72.14.29 TXT as DNSTXTRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.30 WKS as DNSWKSRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

### 72.14.31 X25 as DNSX25RecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The record content.
**Notes:** (Read and Write property)

## 72.15 class DNSRPRecordMBS

### 72.15.1 class DNSRPRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a RP record.

### 72.15.2 Properties

### 72.15.3 mailbox as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The mailbox value.
**Notes:** (Read and Write property)

### 72.15.4 txtdname as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The txtdname value.
**Notes:** (Read and Write property)

## 72.16 class DNSRTRecordMBS

### 72.16.1 class DNSRTRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a RT record.

### 72.16.2 Properties

### 72.16.3 intermediate as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The intermediate value.
**Notes:** (Read and Write property)

### 72.16.4 preference as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The preference value.
**Notes:** (Read and Write property)

## 72.17 class DNSServiceQueryRecordMBS

### 72.17.1 class DNSServiceQueryRecordMBS

MBS Network Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: All.

**Function:** The class to query for an arbitrary DNS record.
**Notes:** Subclass of the DNSServiceBaseMBS class.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1

### 72.17.2 Methods

### 72.17.3 QueryRecord(InterfaceIndex as Integer, FullName as string, rrType as Integer, rrClass as Integer, Flags as Integer = 0) as boolean

MBS Network Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: All.

**Function:** Query for an arbitrary DNS record.
**Notes:** Flags: kFlagsForceMulticast or kFlagsLongLivedQuery. Pass kFlagsLongLivedQuery to create a "long-lived" unicast query to a unicast DNS server that implements the protocol. This flag has no effect on link-local multicast queries.
interfaceIndex: If non-zero, specifies the interface on which to issue the query (the index for a given interface is determined via the if_nametoindex() family of calls.) Passing 0 causes the name to be queried for on all interfaces. See "Constants for specifying an interface index" for more details.
fullname: The full domain name of the resource record to be queried for.
rrtype: The numerical type of the resource record to be queried for (e.g. kType_PTR, kType_SRV, etc)
rrclass: The class of the resource record (usually kClass_IN).

Lasterror is set: Returns kErr_NoError on success (any subsequent, asynchronous errors are delivered to the event), otherwise returns an error code indicating the error that occurred.
Returns false in case of error or true in case of success.

You can use DNSServiceBaseMBS.ConstructFullName to build the full name.

### 72.17.4 Events

### 72.17.5 ServiceQueryRecord(flags as Integer, InterfaceIndex as Integer, ErrorCode as Integer, Fullname as string, rrType as Integer, rrClass as Integer, Length as Integer, Data as string, ttl as Integer)

MBS Network Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: .

**Function:** The event called when data is received for DNS query.
**Notes:** flags: Possible values are kFlagsMoreComing and kFlagsAdd. The Add flag is NOT set for PTR records with a ttl of 0, i.e. "Remove" events.
InterfaceIndex: The interface on which the query was resolved.
errorCode: Will be kErr_NoError on success, otherwise will indicate the failure that occurred. Other parameters are undefined if errorCode is nonzero.
fullname: The resource record's full domain name.
rrtype: The resource record's type (e.g. kType_PTR, kType_SRV, etc)
rrclass: The class of the resource record (usually kClass_IN).
Length: The length, in bytes, of the resource record rdata.
Data: The raw record data of the resource record.
ttl: If the client wishes to cache the result for performance reasons, the TTL indicates how long the client may legitimately hold onto this result, in seconds. After the TTL expires, the client should consider the result no longer valid, and if it requires this data again, it should be re-fetched with a new query. Of course, this only applies to clients that cancel the asynchronous operation when they get a result. Clients that leave the asynchronous operation running can safely assume that the data remains valid until they get another callback telling them otherwise.

## 72.18 class DNSSOARecordMBS

### 72.18.1 class DNSSOARecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The SOA record class.
**Notes:** The Start of Authority (SOA) record contains information about the zone.

### 72.18.2 Properties

### 72.18.3 expire as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The expire value.
**Notes:** (Read and Write property)

### 72.18.4 minimum as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The minimum value.
**Notes:** (Read and Write property)

### 72.18.5 mname as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The mname value.
**Notes:** (Read and Write property)

### 72.18.6 refresh as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The refresh delay in seconds before the slave contacts the master.
**Notes:** (Read and Write property)

### 72.18.7 retry as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The retry delay in seconds before the slave contacts the master again.
**Notes:** (Read and Write property)

### 72.18.8 rname as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The name value.
**Notes:** (Read and Write property)

### 72.18.9 serial as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The serial value.
**Notes:** (Read and Write property)

## 72.19 class DNSSocketAddressMBS

### 72.19.1 class DNSSocketAddressMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The DNS socket address class.

### 72.19.2 Properties

### 72.19.3 address as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The address value.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "Server.address: "+r.Server.address
end if
```

**Notes:** This is IPv4 or IPv6.
(Read and Write property)

### 72.19.4 data as Memoryblock

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The raw data of this socket address.
**Notes:** (Read and Write property)

### 72.19.5 Family as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The family value.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "Server.Family: "+str(r.Server.Family)
end if
```

**Notes:** (Read and Write property)

### 72.19.6 Port as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The port for this socket address.
**Example:**

```
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("www.apple.com", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeA)

if r<>Nil then
MsgBox "Server.Port: "+str(r.Server.Port)
end if
```

**Notes:** (Read and Write property)

## 72.20 class DNSSRVRecordMBS

### 72.20.1 class DNSSRVRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a RV record.

### 72.20.2 Properties

### 72.20.3 port as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The port value.
**Notes:** (Read and Write property)

### 72.20.4 priority as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The priority value.
**Notes:** (Read and Write property)

### 72.20.5 target as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The target value.
**Notes:** (Read and Write property)

### 72.20.6 weight as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The weight value.
**Notes:** (Read and Write property)

## 72.21 class DNSTXTRecordMBS

### 72.21.1 class DNSTXTRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a text record.

### 72.21.2 Methods

### 72.21.3 Strings(index as Integer) as string

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The strings by index.
**Notes:** Index is zero based.

### 72.21.4 Properties

### 72.21.5 Count as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of strings in this text record.
**Notes:** (Read only property)

## 72.22 module DNSUtilMBS

### 72.22.1 module DNSUtilMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The module for DNS queries.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.
- Multithreaded plugin functions can increase speed of Real Studio application
- MBS Real Studio Plugins, version 13.0pr10
- MBS REALbasic Plugins, version 10.6pr5
- MBS REALbasic Plugins, version 10.5pr1

### 72.22.2 Methods

### 72.22.3 ClassNumber(dnsClass as string, byref n as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** One of the DNS class constants.
**Example:**

```
dim n as Integer

if DNSUtilMBS.ClassNumber("CH", n) then
MsgBox str(n) // shows 3
end if
```

**Notes:** Returns true on success.

### 72.22.4 ClassString(dnsclass as Integer) as string

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the string name of this class value.
**Example:**

```
MsgBox DNSUtilMBS.ClassString(DNSUtilMBS.ClassCHAOS) // shows "CH"
```

### 72.22.5 Lookup(name as string, dnsclass as Integer, dnsType as Integer) as DNSReplyMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Performs a DNS query.
**Example:**

```
// lookup MX record for email sending
dim r as DNSReplyMBS = DNSUtilMBS.Lookup("macsw.de", DNSUtilMBS.ClassINTERNET, DNSUtilMBS.TypeMX)
if r <>nil then
MsgBox "macsw.de ->"+r.Answer(0).MX.name
end if
```

**Notes:** Use the Class* constants for the dnsclass parameter. And use the Type* constants for the dnsType parameter.

### 72.22.6 LookupMT(name as string, dnsclass as Integer, dnsType as Integer) as DNSReplyMBS

MBS MacOSX Plugin, Plugin Version: 10.5, Platform: macOS, Targets: All.

**Function:** Performs a DNS query.
**Notes:** Use the Class* constants for the dnsclass parameter. And use the Type* constants for the dnsType parameter.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 72.22.7 TypeNumber(dnsType as string, byref n as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** One of the DNS type constants.
**Example:**

```
dim n as Integer

if DNSUtilMBS.TypeNumber("AAAA", n) then
MsgBox str(n) // shows 28
end if
```

**Notes:** Returns true on success.

### 72.22.8 TypeString(dnstype as Integer) as string

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the string name of this type value.
**Example:**

```
MsgBox DNSUtilMBS.TypeString(DNSUtilMBS.TypeMD) // shows "MD"
```

### 72.22.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ClassALL | &hff | One of the DNS class constants. |
| ClassANY | &hff | One of the DNS class constants. |
| ClassCHAOS | 3 | One of the DNS class constants. |
| ClassCSNET | 2 | One of the DNS class constants. |
| ClassHESIOD | 4 | One of the DNS class constants. |
| ClassINTERNET | 1 | One of the DNS class constants. |
| ClassNONE | &hfe | One of the DNS class constants. |
| TypeA | 1 | One of the DNS type constants. |
| TypeAAAA | &h1c | One of the DNS type constants. |
| TypeAFSDB | &h12 | One of the DNS type constants. |
| TypeALL | &hff | One of the DNS type constants. |
| TypeANY | &hff | One of the DNS type constants. |
| TypeATMA | &h22 | One of the DNS type constants. |
| TypeAXFR | &hfc | One of the DNS type constants. |
| TypeCNAME | 5 | One of the DNS type constants. |
| TypeGPOS | &h1b | One of the DNS type constants. |
| TypeHINFO | &h0d | One of the DNS type constants. |
| TypeISDN | &h14 | One of the DNS type constants. |
| TypeIXFR | &hfb | One of the DNS type constants. |
| TypeKEY | &h19 | One of the DNS type constants. |
| TypeLOC | &h1d | One of the DNS type constants. |
| TypeMAILA | &hfe | One of the DNS type constants. |
| TypeMAILB | &hfd | One of the DNS type constants. |
| TypeMB | 7 | One of the DNS type constants. |
| TypeMD | 3 | One of the DNS type constants. |
| TypeMF | 4 | One of the DNS type constants. |
| TypeMG | 8 | One of the DNS type constants. |
| TypeMINFO | &h0e | One of the DNS type constants. |
| TypeMR | 9 | One of the DNS type constants. |
| TypeMX | &h0f | One of the DNS type constants. |
| TypeNS | 2 | One of the DNS type constants. |
| TypeNSAP | &h16 | One of the DNS type constants. |
| TypeNSAPPTR | &h17 | One of the DNS type constants. |
| TypeNULL | &h0a | One of the DNS type constants. |
| TypeNXT | &h1e | One of the DNS type constants. |
| TypePTR | &h0c | One of the DNS type constants. |
| TypePX | &h1a | One of the DNS type constants. |
| TypeRP | &h11 | One of the DNS type constants. |
| TypeRT | &h15 | One of the DNS type constants. |
| TypeSIG | &h18 | One of the DNS type constants. |
| TypeSOA | 6 | One of the DNS type constants. |
| TypeSRV | &h21 | One of the DNS type constants. |
| TypeTEXT | &h10 | One of the DNS type constants. |
| TypeTKEY | &hf9 | One of the DNS type constants. |
| TypeTSIG | &hfa | One of the DNS type constants. |
| TypeWKS | &h0b | One of the DNS type constants. |
| TypeX25 | &h13 | One of the DNS type constants. |

# 72.23 class DNSWKSRecordMBS

## 72.23.1 class DNSWKSRecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a WKS record.

## 72.23.2 Methods

## 72.23.3 Map(index as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The map values.
**Notes:** Index is zero based.

## 72.23.4 Properties

## 72.23.5 address as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The address.
**Notes:** (Read and Write property)

## 72.23.6 maplength as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The number of items in the map array.
**Notes:** (Read and Write property)

## 72.23.7 protocol as Integer

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The protocol.
**Notes:** (Read and Write property)

## 72.24 class DNSX25RecordMBS

### 72.24.1 class DNSX25RecordMBS

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The class for a X25 record.

### 72.24.2 Properties

### 72.24.3 psdnAddress as String

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The psdn address.
**Notes:** (Read and Write property)

# Chapter 73

# Dongle

## 73.1 class HASPHLDMBS

### 73.1.1 class HASPHLDMBS

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class for accessing HASP HL or Sentinel dongles.
**Example:**

```
// Load your vendor library or the demo one
dim LibFile as FolderItem = GetFolderItem("hasp_darwin_12345.dylib")

if HASPHLDMBS.LoadLibrary(LibFile) then
'MsgBox "OK"
else
MsgBox "Failed to load library."
Return
end if

// init dongle
' This method runs the actual tests on the given program number
dim blob as MemoryBlock // container for data for en-/decryption

dim FeatureID = HASPHLDMBS.HASP_DEFAULT_FID
dim VendorCode = "123456" // your vendor code here, some big Base64 encoded block

dim hasp as new HASPHLDMBS(FeatureID, VendorCode)
Select case hasp.Lasterror
case HASPHLDMBS.HASP_STATUS_OK
// ok
```

```
case HASPHLDMBS.HASP_HASP_NOT_FOUND
MsgBox "Dongle not found."
return
case HASPHLDMBS.HASP_INV_VCODE
MsgBox "Invalid vendor code"
Return
else
MsgBox "Error: "+str(hasp.Lasterror)
return
end Select

// read a file ID
dim fileid as Integer = 65524
dim size as Integer = hasp.GetSize( fileid )

if hasp.Lasterror = HASPHLDMBS.HASP_STATUS_OK then // ONLY IF FILE IS SUPPORTED

// read to memoryblock
blob = hasp.ReadMemory( fileid, 0, size )
if hasp.Lasterror = HASPHLDMBS.HASP_STATUS_OK then
// show in MsgBox
s = Blob.stringvalue(0,blob.size)
MsgBox DefineEncoding(s,Encodings.UTF8)
end if
end if
```

**Notes:** Please use HASP Master Wizard Suite to generate your own runtime libraries. Than you get a couple of DLLs which you can load with this class. For the demo keys, you can use the demo DLLs.
The demo DLL for example is named "hasp_windows_x64_demo.dll" or including your vendor code "hasp_windows_x64_12345.dll" (64bit). 32bit Windows DLL is named hasp_windows_12345.dll, hasp_windows_demo.dll or haspvlib_12345.dll.

Now when you have the platform dependent libraries, you can use LoadLibrary() function in this class to load the right one.

HASPHLMBS uses a linked in library. This is okay for older HASP HL versions. But newer versions require you to create your own signed libraries. For them use the HASPHLDMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo / Real Studio Plugins, version 15.5pr3
- MBS Xojo / Real Studio Plugins, version 15.4pr6
- MBS Plugins 11.1 Release notes

- MBS REALbasic Plugins, version 11.1pr5

**Xojo Developer Magazine**

- 9.5, page 11: News

### 73.1.2 Methods

### 73.1.3 Available as boolean

MBS Dongle Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether library was loaded.
**Notes:** Returns true if library was loaded successfully or we use internal library.

### 73.1.4 Close

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Logs out from a context or session.
**Notes:** Called automatically for you by the destructor.

Use this function to end a connection to an API session object. Once logged out from a session, all memory allocated for the session is released.

Lasterror is set.

### 73.1.5 Constructor(FeatureID as Integer, scope as string, VendorCode as string)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Logs into a Feature to establish a session, according to predefined search parameters.
**Notes:** This function is used to specify conditions that describe where login information is to searched for.

The requisite Vendor Codes are stored in a VendorCodes folder in your system. Without the correct Vendor Code, the function call cannot succeed.

You can open up to 512 simultaneous login sessions.

This function does not work with legacy HASP Features.

FeatureID: Unique identifier for a specific Feature stored in a Sentinel HASP protection key
Scope: Definition of the search parameters for this Feature ID. See the additional HASP API Reference documentation for more information about Scope XML Tags.
VendorCode: the vendor code

Lasterror is set. This calls SDK function hasp_login_scope.
See also:


- 73.1.6 Constructor(FeatureID as Integer, VendorCode as string) 12366


### 73.1.6 Constructor(FeatureID as Integer, VendorCode as string)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Logs into a Feature and thereby establishes a session context.
**Notes:** This function establishes a context to a Sentinel HASP protection key containing a license for the requested Feature ID.
The requisite Vendor Codes are stored in a VendorCodes folder in your system. Without the correct Vendor Code, the function call cannot succeed.

You can open up to 512 simultaneous login sessions.

Legacy HASP Remarks
For local prognum Features, concurrency is not handled and each login performs a decrement if it is a counting license.

Network "prognum" features continue to use the old HASP LM login logic, with its inherent limitations.

There is only support for concurrent usage of one server (global server address).

With "Program Number" features (see HASP_FEATURETYPE_MASK), 8 bits are reserved for legacy options (see HASP_PROGNUM_OPT_MASK, currently 5 bits are used):

- only local
- only remote

- login is counted per process ID
- disable terminal server check
- enable access to old (HASP3/HASP4) keys

FeatureID: Unique identifier for a specific Feature stored in a Sentinel HASP protection key
VendorCode: the Vendor Code

Lasterror is set. This calls SDK function hasp_login.
See also:

- 73.1.5 Constructor(FeatureID as Integer, scope as string, VendorCode as string) 12365

### 73.1.7 DateTimeToHaspTime(day as Integer, month as Integer, year as Integer, hour as Integer, minute as Integer, second as Integer) as memoryblock

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts a date and time value to hasptime (the number of elapsed seconds since January 1 1970).
**Notes:** Time values are in UTC.
Memoryblock has 8 bytes.

### 73.1.8 DecryptMemory(Data as Memoryblock, DataOffset as Integer, Size as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decrypts a buffer.
**Notes:** Decrypts data using the decryption engine in the Sentinel HASP protection key.
The specific session handle determines which Sentinel HASP protection key and which Feature ID decrypts the data buffer. The decryption key remains in the Sentinel HASP protection key. If the decryption fails, the buffer is not modified. To encrypt the data buffer, use the Encrypt function.

Data: The data to decrypt.
DataOffset: Start address in Bytes in the memoryblock.
Size: Data size in Bytes in memoryblock. (16 bytes minimum)

Lasterror is set. This calls SDK function hasp_decrypt.

### 73.1.9 DecryptString(Data as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decrypts a buffer.
**Notes:** Decrypts data using the decryption engine in the Sentinel HASP protection key.
The specific session handle determines which Sentinel HASP protection key and which Feature ID decrypts the data buffer. The decryption key remains in the Sentinel HASP protection key. If the decryption fails, the buffer is not modified. To encrypt the data buffer, use the Encrypt function.

Data: The data to decrypt.
Returns the decrypted data.
Lasterror is set. This calls SDK function hasp_decrypt.

### 73.1.10 Detach(detachAction as string, scope as string, VendorCode as string, recipient as string, byref info as string) as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Detaches or cancels an attached license, according to customizable parameters
**Notes:** You do not need to be logged in to a Sentinel HASP Feature in order to use this function.
This function is used to detach a license for a Product (i.e. all Sentinel HASP Features and Memory files which belong to this Product) from a HASP SL Protection key. The function returns a H2R file which must then be applied on the recipient machine using hasp_update() or the ACC.
This function only works with HASP SL Protection Keys; HASP HL Protection Keys are ignored.
This function can also be used on the recipient machine to cancel an attached license. In this case, the recipient parameter is ignored and should be set to NULL. For cancelling, the function returns a R2H file which must be applied on the host machine using hasp_update() or the ACC. If the detached Product is already expired, no R2H file will be returned.
The required Vendor Codes are stored in a VendorCodes folder in your system. Without the correct Vendor Code, the function call cannot succeed.

### 73.1.11 EncryptMemory(Data as Memoryblock, DataOffset as Integer, Size as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encrypts a buffer.
**Notes:** Encrypts data using the encryption engine in the Sentinel HASP protection key.
The specific session handle determines which Sentinel HASP protection key and which Feature ID encrypts the data buffer. The encryption key remains in the Sentinel HASP protection key. If the encryption fails,

| Parameter | Description |
|---|---|
| detachAction: | Parameters for the operation, in XML format. For more information, see the accompanying Sentinel HASP Run-time API help documentation. |
| scope: | Search parameters for the Product that is to be detached |
| VendorCode: | The Vendor Code. |
| recipient: | Definition in XML format of the recipient computer, on which the detached Product will be installed. This information can be retrieved using either GetInfo or GetSessionInfo together with the format specifier HASP_RECIPIENT. Set to "" if an attached protection key is cancelled. |
| info: | The information that is retrieved, in XML format. This information is a V2C, which can then be installed on the recipient computer via Update. |

| Return code | Description |
|---|---|
| HASP_STATUS_OK | Request was successfully completed |
| HASP_INV_DETACH_ACTION | Invalid XML "detach_action" parameter |
| HASP_INV_RECIPIENT | Invalid XML "recipient" parameter |
| HASP_TOO_MANY_PRODUCTS | Scope for Detach does not specify a unique Parameter |
| HASP_TOO_MANY_USERS | Too many users currently connected, or: at least one detachable Feature does not have enough network seats available |
| HASP_ACCESS_DENIED | Request cannot be processed due to ACC restrictions |
| HASP_FEATURE_EXPIRED | All detachable Features are expired |
| HASP_INV_PRODUCT | Invalid Product information |
| HASP_INV_DURATION | In the case of a new detachable license, duration exceeds maximum allowed OR, in the case of a detachable license extension, expiration date earlier than original date or too short (if an existing detached Product is extended, and the new expiration date is earlier than the original expiration date) |
| HASP_INSUF_MEM | Out of memory |
| HASP_DEVICE_ERR | Input/Output error in HASP SL secure storage, OR in case of a HASP HL key,USB communication error |
| HASP_LOCAL_COMM_ERR | Communication error between API and local HASP License Manager |
| HASP_REMOTE_COMM_ERR | Communication error between local and remote HASP License Manager |

the buffer is not modified. To decrypt the data buffer, use the Decrypt function.

Data: The data to encrypt.
DataOffset: Start address in Bytes in the memoryblock.
Size: Data size in Bytes in memoryblock. (16 bytes minimum)

Lasterror is set. This calls SDK function hasp_encrypt.

### 73.1.12 EncryptString(Data as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encrypts a buffer.
**Notes:** Encrypts data using the encryption engine in the Sentinel HASP protection key.
The specific session handle determines which Sentinel HASP protection key and which Feature ID encrypts the data buffer. The encryption key remains in the Sentinel HASP protection key. If the encryption fails, the buffer is not modified. To decrypt the data buffer, use the Decrypt function.

Data: The data to encrypt. (16 bytes minimum)

Returns encrypted string.

Lasterror is set. This calls SDK function hasp_encrypt.

### 73.1.13 GetInfo(scope as string, format as string, VendorCode as string, byref info as string) as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves information about system components, according to customizable search parameters, and presents it according to customizable formats.
**Notes:** You do not need to be logged in to a Sentinel HASP Feature in order to use this function.

This function is used to specify conditions about where to search for information. In addition, it enables you to specify conditions about the format in which the retrieved information is presented. If retrieved information is appropriately formatted, it can be used as a template in the Constructor.

The requisite Vendor Codes are stored in a VendorCodes folder in your system. Without the correct Vendor Code, the function call cannot succeed.

This function cannot be used to retrieve legacy HASP Features.

scope: Definition of the data that is to be searched, in XML format. For more information, see the accompanying Sentinel HASP Run-time API help documentation
format: Definition of the format in which the data is to be displayed, in XML format. For more information, see the accompanying Sentinel HASP Run-time API help documentation.
VendorCode: the Vendor Code
info: The information that is retrieved, in XML format

| Return Code | Description |
|---|---|
| HASP_STATUS_OK | Request was successfully completed |
| HASP_SCOPE_RESULTS_EMPTY | Unable to locate a Feature matching the scope |
| HASP_INSUF_MEM | Out of memory |
| HASP_INV_VCODE | Invalid Vendor Code |
| HASP_UNKNOWN_VCODE | Vendor Code not recognized |
| HASP_INVALID_PARAMETER | Scope or format string too long (max. length 32 kb) |
| HASP_DEVICE_ERR | Input/Output error in HASP SL secure storage, OR in case of a HASP HL key, USB communication error |
| HASP_LOCAL_COMM_ERR | Communication error between API and local HASP License Manager |
| HASP_REMOTE_COMM_ERR | Communication error between local and remote HASP License Manager |
| HASP_INV_FORMAT | Unrecognized format string |
| HASP_INV_SCOPE | Unrecognized scope string |
| HASP_BROKEN_SESSION | Session has been interrupted |

### 73.1.14 GetRTC as memoryblock

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the current time.
**Notes:** Only HASP HL keys with a Real-time clock (rtc) and HASP SL keys can provide the current time.
Primarily used to obtain reliable timestamps that are independent from the system clock.
Time values are returned as the number of seconds that have elapsed since Jan-01-1970 0:00:00 UTC.
This request is only supported on locally accessed keys. Trying to get the time from a remotely accessed key will return HASP_NO_TIME.
Returns time as a 8 byte memoryblock.
Lasterror is set.

### 73.1.15 GetSessionInfo(format as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves information regarding a session context.
**Notes:** format: Definition for the type of output data structure, in XML format.
There are three format options:

- HASP_KEYINFO For retrieving information on the Sentinel HASP protection key
- HASP_SESSIONINFO For retrieving information on the login session
- HASP_UPDATEINFO For retrieving information on a license update usually contained in a C2V file. The retrieved information includes the current state of the key, including update counters, license

availability and memory images

Returns answer. Lasterror is set.

HASP_KEYINFO is ”<haspformat format=””keyinfo””/>”
HASP_SESSIONINFO is ”<haspformat format=””sessioninfo””/>”
HASP_UPDATEINFO is ”<haspformat format=””updateinfo””/>”

### 73.1.16 GetSize(FileID as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the byte size of a memory file from a HASP protection key.
**Notes:** This function is used to determine the file size of a HASP memory file.
FileID: Identifier for the file that is to be queried.
Returns file size. Lasterror is set.

Possible File ID constants: HASP_FILEID_LICENSE, HASP_FILEID_MAIN, HASP_FILEID_RO or HASP_FILEID_RW.

### 73.1.17 GetVersion(byref MajorVersion as Integer, byref MinorVersion as Integer, byref BuildServer as Integer, byref BuildNumber as Integer, VendorCode as string) as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves version and build number of the HASP library.
**Notes:** Returns error code.

### 73.1.18 HaspTimeToDateTime(time as memoryblock, byref day as Integer, byref month as Integer, byref year as Integer, byref hour as Integer, byref minute as Integer, byref second as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts a time value (elapsed seconds since January 1 1970) into a date and time
**Notes:** Memoryblock has 8 bytes.

Time values are in UTC.

### 73.1.19 LegacyDecryptMemory(Data as Memoryblock, DataOffset as Integer, Size as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Legacy HASP4 compatible decryption function.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

Data: The memoryblock where bytes are decrypted.
DataOffset is the start position in Bytes in the memoryblock and size the length of the data block to decrypt.
Size: Size of the data in the memoryblock to decrypt.

Lasterror is set.

### 73.1.20 LegacyDecryptString(Data as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Legacy HASP4 compatible decryption function.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

Lasterror is set.

### 73.1.21 LegacyEncryptMemory(Data as Memoryblock, DataOffset as Integer, Size as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Legacy HASP4 compatible encryption function.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

Data: The memoryblock where bytes are encrypted.
DataOffset is the start position in Bytes in the memoryblock and size the length of the data block to encrypt.
Size: Size of the data in the memoryblock to encrypt.

Lasterror is set.

### 73.1.22 LegacyEncryptString(Data as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Legacy HASP4 compatible encryption function.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

Lasterror is set.

### 73.1.23 LegacySetIdleTime(idletime as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the LM idle time.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

time: The idle time in minutes.

Lasterror is set.

### 73.1.24 LegacySetRTC(time as memoryblock)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes to HASP4-compatible real-time clock.
**Notes:** This object must have been created by calling Constructor() with a "prognum" Feature ID.

This request is only supported on locally accessed keys. Attempting to set the time on a remotely accessed key will return HASP_NO_TIME.

time: The new time value (8 byte Memoryblock)

Lasterror is set.

### 73.1.25 LoadLibrary(file as folderitem) as boolean

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the HASPHL shared library.
**Notes:** Returns true on success and false on failure.

Loads a Windows DLL, a Linux shared library, a Mac OS X shared library or a Mac OS X framework from the given path.
See also:

- 73.1.26 LoadLibrary(path as string) as boolean 12375

### 73.1.26 LoadLibrary(path as string) as boolean

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the HASPHL shared library.
**Notes:** Returns true on success and false on failure.
Path can be an absolute, a relative or just a file name.

Loads a Windows DLL, a Linux shared library, a Mac OS X shared library or a Mac OS X framework from the given path.
See also:

- 73.1.25 LoadLibrary(file as folderitem) as boolean 12375

### 73.1.27 ReadMemory(FileID as Integer, Offset as Integer, Size as Integer) as Memoryblock

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the memory of a Sentinel HASP protection key.
**Notes:** Valid File IDs are HASP_FILEID_RW and HASP_FILEID_RO.

Legacy HASP Remarks
Valid File IDs are HASP_FILEID_LICENSE and HASP_FILEID_MAIN.

FileID: Identifier for the file that is to be read
Offset: Byte offset in the file

Size: Number of bytes to read.

Lasterror is set.

### 73.1.28 ReadString(FileID as Integer, Offset as Integer, Size as Integer) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the memory of a Sentinel HASP protection key.
**Notes:** Valid File IDs are HASP_FILEID_RW and HASP_FILEID_RO.

Legacy HASP Remarks
Valid File IDs are HASP_FILEID_LICENSE and HASP_FILEID_MAIN.

FileID: Identifier for the file that is to be read
Offset: Byte offset in the file
Size: Number of bytes to read.

Lasterror is set.

### 73.1.29 Transfer(action as string, scope as string, VendorCode as string, recipient as string, byref info as string) as Integer

MBS Dongle Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Performs a transfer operation.
**Notes:** Sentinel Licensing API Usage Notes
You do not need to be logged in to a Sentinel Feature in order to use this function.

This function is used to perform the following task as per its
"action" parameter.
for "detach" action: detach a license for a Product (i.e. all Sentinel Features and Memory files which belong to this Product) from a Sentinel SL/SL-AdminMode/SL-UserMode key. The function returns a bufferwhich should be saved as H2R file.

for "cancel" action: This action runs on the recipient machine to cancel an attached license. In this case, the
recipient parameter is ignored and should be set to "". For cancelling, the function returns a buffer which

must be applied on the host machine using Update() or ACC If the detached Product is already expired, no buffer will be returned.

for "rehost" action: create a tranferable a license for given container (i.e. all Sentinel Features and Memory files
which belong to this container) from SL-AdminMode/SL-UserMode Protection key. The function returns buffer on success which must be saved as V2C file. Update() or ACC is used to apply this on destination machine.

This function only works with Sentinel SL/SL-AdminMode/SL-UserMode Protection Keys; Sentinel HL Protection Keys are ignored.

The required Vendor Codes are stored in a VendorCodes folder in your system. Without the correct Vendor Code, the function call cannot succeed.

action: Parameters for the operation, in XML format. For more information, see the accompanying Sentinel Licensing API help documentation.
scope: Search parameters for the conatiner-id that is to be re-hosted. For more information, see the accompanying
Sentinel Licensing API help documentation.
VendorCode: The Vendor Code
recipient: Definition in XML format of the recipient computer, on which the detached Product will be installed.

This information can be retrieved using either GetInfo or GetSessionInfo together with the format specifier

info: String for the information that is retrieved, in XML format. This information is a V2C, which can then be installed on the destination computer via Update.

### 73.1.30 Update(data as string) as string

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates a Sentinel HASP protection key.
**Notes:** This function writes update information. Note that the Sentinel HASP protection key must be locally connected.

The update code contains all necessary data to perform the update on a deployed Sentinel HASP protection key including:

- The Sentinel HASP protection key on which the updated information is to be written
- The necessary Vendor Code that is required to access the Sentinel HASP key
- The actual update information

Depending on the update data, the function returns an acknowledgement code that is signed/encrypted by the key. The code is evidence that an update has been applied to a license.

data: The update data.
Returns the acknowledge data.

Lasterror is set.

### 73.1.31 WriteMemory(FileID as Integer, FileOffset as Integer, Data as Memoryblock, DataOffset as Integer, Size as Integer)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes to the memory of a Sentinel HASP protection key.
**Notes:** Valid File ID is HASP_FILEID_RW.

Depending on the provided session handle (either logged into the default Feature or any other Feature), write access to the FAS memory (HASP_FILEID_LICENSE) is not permitted.

FileID: Identifier for the file that is to be written
FileOffset: Byte offset in the file
Data: the data
DataOffset: Start address in Bytes in the memoryblock.
Size: Data size in Bytes in memoryblock.

Lasterror is set.

### 73.1.32 WriteString(FileID as Integer, FileOffset as Integer, Data as String)

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes to the memory of a Sentinel HASP protection key.
**Notes:** alid File ID is HASP_FILEID_RW.

Depending on the provided session handle (either logged into the default Feature or any other Feature), write access to the FAS memory (HASP_FILEID_LICENSE) is not permitted.

FileID: Identifier for the file that is to be written
FileOffset: Byte offset in the file
Data: the data

Lasterror is set.

### 73.1.33 Properties

### 73.1.34 Handle as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal handle for the session.
**Notes:** (Read and Write property)

### 73.1.35 Lasterror as Integer

MBS Dongle Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error value.
**Notes:** (Read and Write property)

### 73.1.36 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| HASP_DEFAULT_FID | 0 | The HASP default Feature ID.<br>Available in every HASP key. |
| HASP_FEATURETYPE_MASK | &hffff0000 | Legacy HASP HL Run-time API: ”Feature Type” mask.<br>AND-mask used to identify Feature type. |
| HASP_INVALID_HANDLE_VALUE | 0 | Invalid handle value for Handle property. |
| HASP_MIN_BLOCK_SIZE | 16 | Minimum block size for encrypt and decrypt functions. |
| HASP_MIN_BLOCK_SIZE_LEGACY | 8 | Minimum block size for legacy encrypt and legacy decrypt f |
| HASP_PROGNUM_DEFAULT_FID | &hffff0000 | Legacy HASP HL Run-time API: The HASP default Featur<br>Available in every legacy HASP hardware key. |
| HASP_PROGNUM_FEATURETYPE | &hffff0000 | Legacy HASP HL Run-time API: ”Program Number Featur<br>After AND-ing with HASP_FEATURETYPE_MASK the<br>tain this value. |
| HASP_PROGNUM_MASK | &h000000ff | Legacy HASP HL Run-time API: ”Program Number Mask”<br>AND-mask used to extract the Program Number from a ”<br>ID. |
| HASP_PROGNUM_OPT_CLASSIC | &h00001000 | Legacy HASP HL Run-time API: ”Program Number” optio<br>Enables the API to access ”classic” (HASP4 or earlier) keys |
| HASP_PROGNUM_OPT_MASK | &h0000ff00 | Legacy HASP HL Run-time API: ”Program Number Optior<br>AND-mask used to identify Program Number options:<br>* HASP_PROGNUM_OPT_NO_LOCAL<br>* HASP_PROGNUM_OPT_NO_REMOTE<br>* HASP_PROGNUM_OPT_PROCESS<br>* HASP_PROGNUM_OPT_CLASSIC<br>* HASP_PROGNUM_OPT_TS<br>3 bits of the mask are reserved for future extensions and cu<br>Initialize them with zero. |
| HASP_PROGNUM_OPT_NO_LOCAL | &h00008000 | Legacy HASP HL Run-time API: ”Program Number” optio<br>Disables the search for local licenses. |
| HASP_PROGNUM_OPT_NO_REMOTE | &h00004000 | Legacy HASP HL Run-time API: ”Program Number” optio<br>Disables the search for network licenses. |
| HASP_PROGNUM_OPT_PROCESS | &h00002000 | Legacy HASP HL Run-time API: ”Program Number” optio<br>Sets session count of network licenses to ”per-process”. |
| HASP_PROGNUM_OPT_TS | &h00000800 | Legacy HASP HL Run-time API: ”Program Number” optio<br>Ignores the presence of terminal servers. |

HASP Error Codes

| Constant | Value | Description |
|---|---|---|
| HASP_ACCESS_DENIED | 5 | Access to Feature, HASP protection key or functionality denied. |
| HASP_ALREADY_LOGGED_IN | 502 | C++ API: Logging in twice to the same object. |
| HASP_ALREADY_LOGGED_OUT | 503 | C++ API: Logging out twice of the same object |
| HASP_BROKEN_SESSION | 39 | Session been interrupted. |
| HASP_CANNOT_READ_FILE | 72 | File not found or access denied. |
| HASP_CLONE_DETECTED | 64 | Cloned HASP SL secure storage detected. |
| HASP_CONTAINER_NOT_FOUND | 7 | Deprecated - use HASP_HASP_NOT_FOUND. |
| HASP_DETACHED_LICENSE_FOUND | 76 | Format SL-AdminMode or migrate SL-Legacy to SL-AdminMod as container has detached license. |
| HASP_DETACH_DISABLED | 74 | Detach of license not allowed as product. contains VM disabled feature and host machine is a virtual mac |
| HASP_DEVICE_ERR | 43 | Input/Output error occurred in secure storage area of HASP SL l error occurred when communicating with a HASP HL key |
| HASP_DUPLICATE_HOSTNAME | 79 | Duplicate Hostname found while key contains Hostname Finger |
| HASP_ENC_NOT_SUPP | 23 | Sentinel HASP protection key does not support encryption type |
| HASP_EXTENSION_NOT_ALLOWED | 73 | Extension of license not allowed as number of detached. licenses is greater than current concurrency count. |
| HASP_FEATURE_EXPIRED | 41 | Feature expired. |
| HASP_FEATURE_NOT_FOUND | 31 | Requested Feature not available. |
| HASP_FEATURE_TYPE_NOT_IMPL | 28 | Requested Feature type not implemented. |
| HASP_FILEID_DYNAMIC_FIRST | 1 | Sentinel dynamic memory file ID avaliable range File ID lower limit for Sentinel dynamic memory file. |
| HASP_FILEID_DYNAMIC_LAST | &hffbf | Sentinel dynamic memory file ID avaliable range File ID upper limit for Sentinel dynamic memory file. |
| HASP_FIRST_HASP_ACT | 3001 | Reserved for HASP Activation API |
| HASP_FIRST_HELPER | 2001 | Reserved for HASP helper libraries. |
| HASP_HARDWARE_MODIFIED | 52 | HASP SL key incompatible with machine hardware; HASP SL to different hardware. OR: In the case of a V2C file, conflict b SL key data and machine hardware data; HASP SL key locke hardware |
| HASP_HASP_INACTIVE | 66 | Specified Hasp Id is in Inactive state |
| HASP_HASP_NOT_FOUND | 7 | Sentinel HASP protection key not available. |
| HASP_INCOMPAT_FEATURE | 6 | Legacy decryption function cannot work on Feature. |
| HASP_INSUF_MEM | 3 | System is out of memory. |
| HASP_INT_ERR | 699 | Internal error occurred in API. |
| HASP_INVALID_OBJECT | 500 | C++ API: Object incorrectly initialized. |
| HASP_INVALID_PARAMETER | 501 | Invalid function parameter. |
| HASP_INV_ACTION | 59 | Invalid XML "action" parameter |
| HASP_INV_API_DYLIB | 401 | API dispatcher: Unable to load API; DLL possibly corrupt? |
| HASP_INV_DETACH_ACTION | 59 | Invalid XML "action" parameter. |
| HASP_INV_DURATION | 63 | Invalid duration. |
| HASP_INV_FILEID | 10 | Specified File ID not recognized by API. |
| HASP_INV_FORMAT | 15 | Invalid XML format. |
| HASP_INV_HND | 9 | Invalid login handle passed to function. |
| HASP_INV_PORT | 651 | Internal use: invalid port value. |
| HASP_INV_PORT_TYPE | 650 | Internal use: invalid port type. |
| HASP_INV_PRODUCT | 61 | Invalid Product information. |
| HASP_INV_PROGNUM_OPT | 2 | Legacy HASP HL Run-time API: Unknown/Invalid Feature ID |
| HASP_INV_RECIPIENT | 58 | Invalid XML "recipient" parameter. |
| HASP_INV_SCOPE | 36 | Invalid XML scope. |
| HASP_INV_SIG | 30 | Signature verification operation failed. |
| HASP_INV_SPEC | 35 | Invalid XML specification. |
| HASP_INV_TIME | 24 | Passed time value outside supported value range. |
| HASP_INV_UPDATE_CNTR | 21 | Update counter set incorrectly. |
| HASP_INV_UPDATE_DATA | 19 | Required XML tags not found; Contents in binary data are miss |
| HASP_INV_UPDATE_NOTSUPP | 20 | Update request not supported by Sentinel HASP protection key |
| HASP_INV_UPDATE_OBJ | 17 | Binary data passed to function does not contain valid update. |
| HASP_INV_VCODE | 22 | Invalid Vendor Code passed. |

Memory File ID constants

| Constant | Value | Description |
|---|---|---|
| HASP_FILEID_LICENSE | &hfff2 | Legacy HASP HL Run-time API: HASP4 FAS memory file<br>(Dummy) File ID for the license data area of memory contents. |
| HASP_FILEID_MAIN | &hfff0 | Legacy HASP HL Run-time API: HASP4 memory file<br>File ID for HASP4-compatible memory contents w/o FAS. |
| HASP_FILEID_RO | &hfff5 | Sentinel HASP secure read only memory file.<br>File ID for HASP Sentinel HASP read only memory. |
| HASP_FILEID_RW | &hfff4 | Sentinel HASP secure writable memory file<br>File ID for Sentinel HASP secure writable memory. |

## 73.2 class Rockey4NDMBS

### 73.2.1 class Rockey4NDMBS

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to handle calls to the Rockey4ND Dongle API.
**Notes:** Available for:

- macOS
- Linux on Intel
- Linux 64-bit on ARM
- Windows on Intel

Unavailable for:

- iOS
- Linux 32-bit on ARM
- Windows 64-bit on ARM

We may add more targets once we get newer SDK versions with new libraries.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr2
- MBS Xojo Plugins, version 18.3pr1

### 73.2.2 Methods

### 73.2.3 Available as Boolean

MBS Dongle Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether the class is available
**Example:**

```
if Rockey4NDMBS.Available then

// check dongle

else

// can't check dongle

end if
```

**Notes:** Available for:

- macOS
- Linux on Intel
- Linux 64-bit on ARM
- Windows on Intel

Unavailable for:

- iOS
- Linux 32-bit on ARM
- Windows 64-bit on ARM

We may add more targets once we get newer SDK versions with new libraries.

### 73.2.4 Rockey(FunctionCode as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls the Rockey Dongle API.
**Example:**

```
dim r as RockeyMBS
dim e as Integer

r=new RockeyMBS
r.p1=&HC44C
r.p2=&HC8F8
r.p3=0
```

```
r.p4=0

e=r.Rockey(1)

if e=0 then
MsgBox "Found dongle: "+hex(r.lp1)
else
MsgBox "Error: "+str(e)
end if
```

**Notes:** See the Rockey dongle documentation for more details.

Be aware that no endian correction is done!

Error codes from the plugin:
-1 = memoryblock is nil
-2 = library not present

### 73.2.5 RockeyCall(FunctionCode as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Same as Rockey but a different name for compatibility.
**Notes:** The original Rockey dongle calls the function RockeyCall.

### 73.2.6 Properties

### 73.2.7 Buffer as MemoryBlock

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A one KB big buffer.
**Notes:** (Read and Write property)

### 73.2.8 Handle as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The 16bit handle value.
**Notes:** (Read and Write property)

### 73.2.9 LP1 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The first 32bit parameter for the rockey function.
**Notes:** (Read and Write property)

### 73.2.10 LP2 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The second 32bit parameter for the rockey function.
**Notes:** (Read and Write property)

### 73.2.11 P1 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The first 16bit parameter for the rockey function.
**Notes:** (Read and Write property)

### 73.2.12 P2 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The second 16bit parameter for the rockey function.
**Notes:** (Read and Write property)

### 73.2.13 P3 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The third 16bit parameter for the rockey function.
**Notes:** (Read and Write property)

### 73.2.14 P4 as Integer

MBS Dongle Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The forth 16bit parameter for the rockey function.
**Notes:** (Read and Write property)

## 73.3 module SGLockMBS

### 73.3.1 module SGLockMBS

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The MBS Module for using SG-Lock dongles in Xojo.
**Notes:** See website:
https://www.sg-lock.com

Please read manual from SG Intec for details.

Works on all platforms (except iOS) in case you have a matching dylib/dll/so file.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr8

### 73.3.2 Methods

### 73.3.3 Authenticate(AuthentCode as MemoryBlock)

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Authentication of SG-Lock library to the protected application and vice versa.
**Notes:** This function of the SG-Lock API has to be called once first and successfully to enable all other API functions. In the case of dynamic linking the authentication is required after every link procedure (LoadLibrary call).

Every customer get his unique Authentcode when purchasing SG-Lock (non Demo) the first time. Demo kits have an own authentication code (see example source code files).

AuthentCode: 48 byte sequence, that is unique to every SG-Lock customer. As array, it's 12 values in the array.

Lasterror is set to kErrorSuccess on success and an error code otherwise.
See also:

- 73.3.4 Authenticate(AuthentCode() as UInt32) 12389

### 73.3.4 Authenticate(AuthentCode() as UInt32)

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Authentication of SG-Lock library to the protected application and vice versa.
**Notes:** This function of the SG-Lock API has to be called once first and successfully to enable all other API functions. In the case of dynamic linking the authentication is required after every link procedure (LoadLibrary call).

Every customer get his unique Authentcode when purchasing SG-Lock (non Demo) the first time. Demo kits have an own authentication code (see example source code files).

AuthentCode: 48 byte sequence, that is unique to every SG-Lock customer. As array, it's 12 values in the array.

Lasterror is set to kErrorSuccess on success and an error code otherwise.
See also:

- 73.3.3 Authenticate(AuthentCode as MemoryBlock) 12388

### 73.3.5 CloseLibrary

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unloads and closes DLL.

### 73.3.6 CryptLock(ProductId as UInt32, KeyNum as UInt32, CryptMode as UInt32, Data as MemoryBlock) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encrypts or decrypts data on the dongle.
**Notes:** En- or decrypts one or more 64-bit data blocks with 128-bit key. The crypto- graphic algorithm is TEA.

ProductId: Indicates the ProductId of the SG-Lock
KeyNum: Number of key to use 0 to 1 - SG-Lock U3 0 to 15 - SG-Lock U4
CryptMode: Working mode. kCryptModeEncrypt = 0 for Encrypt, kCryptModeDecrypt = 1 for Decrypt.
Data: Input data. Should be multiply of 4 in length.

Returns the output data.

Lasterror property is set.

### 73.3.7 LoadLibraryFile(File as folderItem) as boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the dll/dylib/so file at the give path.
**Notes:** Returns true on success or false on failure.
Please call once on app startup to load library.
Sets LibraryError property in case of error.

### 73.3.8 LoadLibraryPath(Path as String) as boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the dll/dylib/so file at the give path.
**Notes:** Returns true on success or false on failure.
Please call once on app startup to load library.
Sets LibraryError property in case of error.

### 73.3.9 ReadConfig(ProductId as UInt32, Category as UInt32 = 0) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads configuration information about SG-Lock.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
Category: Type of requested information. currently only 0 for Information about SG-Lock modul.

Returns memoryblock with an array of 8 integers of 32-bit. The meaning of the single values are:

Index 0: Type
Index 1: Interface
Index 2: Software Version
Index 3: Hardware Version
Index 4: Serial number

Index 5: Memory size in Dwords
Index 6: Number of counters
Index 7: Number of 128-Bit Keys

Updates HardwareVersion, CounterCount, KeyCount, MemorySize, MemorySizeBytes, SerialNumber, SoftwareVersion, Type and InterfaceType properties.

Lasterror is set.

### 73.3.10 ReadCounter(ProductId as UInt32, CntNum as UInt32) as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads a 32-bit count value from the SG-Lock memory.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
CntNum: Number of counter, 0 to 15 - SG-Lock U3 0 to 63 - SG-Lock U4

Returns the value read.
Lasterror property is set.

Counters are simple 32 bit data values in the SG-Lock memory. If desired, they can also be used for everything a 32 bit read/write variable is suitable for. By doing so you can extend the general purpose memory over the indicated size.

### 73.3.11 ReadData(ProductId as UInt32, Address as UInt32, LongCount as UInt32) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read 32-bit data from the SG-Lock memory.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
Address: Startadress of data value block 0 to 63 - SG-Lock U3 or 0 to 255 - SG-Lock U4
Count: Number of data values to read, each 4 bytes.

Returns memoryblock with data values.
Lasterror property is set.

### 73.3.12 ReadProductId as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the 16-bit ProductId from the SG-Lock.
**Notes:** Lasterror property is set.

The ProductId is an identifier that eases to distinguish between different protected applications of SG-Lock users. For example company X protects its application A and B with SG-Lock and gives all keys for application A the ProductId 1 and the keys for application B the ProductId 2, then all keys of application B are ‚Äùhidden‚Äú for application A and vice versa. This simple mechanism offers an effective way to prevent confusion between keys of different applications. Setting of the ProductId should be integrated into the initial- ization process of the SG-Locks before distributing with the protected software.

Returns the ProductId assigned to dongle.
Lasterror is set.

### 73.3.13 ReadSerialNumber(ProductId as UInt32) as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the for every SG-Lock unique serial number.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock

Returns the serial number will be given back to the calling application

Lasterror property is set.

Every SG-Lock has a serial number that is unique, which is also not depending on type and interface.

### 73.3.14 SearchLock(ProductId as UInt32) as Boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searches for a SG-Lock device.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock looked for

Updates HardwareVersion, CounterCount, KeyCount, MemorySize, MemorySizeBytes, SerialNumber, Soft-

wareVersion, Type and InterfaceType properties.

### 73.3.15 SignData(ProductId as UInt32, AppSignKey as MemoryBlock, LockSignKeyNum as UInt32, LockSignInterval as UInt32 = 0, Data as MemoryBlock) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Signs the data.
**Notes:** The task will will be processed by the SG-Lock and if desired also by the application (PC-CPU) to accelerate the signing process (combined mode). Important condition for combined mode: Both keys (application and SG-Lock internal) have to be different, to ensure highest security! The signature is 64-bit long.

ProductId: Indicates the ProductId of the SG-Lock
AppSignKey: The 128-bit key used by the application for sign- ing and verification. Pointer to an array of 4 in- teger values of 32-bit. Only needed in combined mode otherwise set 0.
LockSignKeyNum: Number of 128-bit key in SG-Lock for signing and verification.
LockSignInterval: Indicates the partitioning of computing power between SG-Lock and application (PC-CPU). 0 is SG-Lock only. If >0 the value is used as the power of 2, where the result of that determines which block index is signed or verified by the SG-Lock. E.g. value= 8, 28ÀÜ=256, that means the first and after that every 256th block is processed by the SG-Lock and all others by the application (PC-CPU). That means 1/256= 0.4% of the task is done by the SG-Lock and 99.6% by the PC- CPU. The result is a very high acceleration of the process.
Data: Pointer to the memoryblock with of 32-bit values to sign or verify.

Returns signature as memoryblock.

Lasterror property is set.

The same value for the parameter LockSignInterval has to be used for signing and verifying a certain data block, when using different 128-bit keys in the SG-Lock and application (highly recommended for highest security). The reasons is, that the 128-bit key in the application is less safe than the 128-bit key in the SG-Lock. When a hacker succeeds to investigate the 128-bit key in the application (which is in principle possible), then he will try that also first for the SG-Lock. That will fail, if a differnt 128-bit key is used in the SG-Lock. For a deeper understanding of the function, please take a look into the SG-Lock include/header file for your programming language. You will find the source code of the function in it.

### 73.3.16 TeaDecipher(data as MemoryBlock, Key as MemoryBlock) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decrypt data.
**Notes:** Encryption happens in plugin using sample code from SG.
Data is memoryblock with 8 bytes of data.
Key is memoryblock with 16 bytes in size.

Lasterror property is set.

### 73.3.17 TeaEncipher(data as MemoryBlock, Key as MemoryBlock) as MemoryBlock

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encrypt data.
**Notes:** Encryption happens in plugin using sample code from SG.
Data is memoryblock with 8 bytes of data.
Key is memoryblock with 16 bytes in size.

Lasterror property is set.

### 73.3.18 VerifyData(ProductId as UInt32, AppSignKey as MemoryBlock, LockSignKeyNum as UInt32, LockSignInterval as UInt32 = 0, Data as MemoryBlock, Signature as MemoryBlock) as Boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Verifies the signature with the data.
**Notes:** The task will will be processed by the SG-Lock and if desired also by the application (PC-CPU) to accelerate the signing process (combined mode). Important condition for combined mode: Both keys (application and SG-Lock internal) have to be different, to ensure highest security! The signature is 64-bit long.

ProductId: Indicates the ProductId of the SG-Lock
AppSignKey: The 128-bit key used by the application for sign- ing and verification. Pointer to an array of 4 in- teger values of 32-bit. Only needed in combined mode otherwise set 0.

LockSignKeyNum: Number of 128-bit key in SG-Lock for signing and verification.
LockSignInterval: Indicates the partitioning of computing power between SG-Lock and application (PC-CPU). 0 is SG-Lock only. If >0 the value is used as the power of 2, where the result of that determines which block index is signed or verified by the SG-Lock. E.g. value= 8, 28ÀÜ=256, that means the first and after that every 256th block is processed by the SG-Lock and all others by the application (PC-CPU). That means 1/256= 0.4% of the task is done by the SG-Lock and 99.6% by the PC- CPU. The result is a very high acceleration of the process.
Data: Pointer to the memoryblock with of 32-bit values to sign or verify.
Signature: The signature as memory block.

Lasterror property is set.

The same value for the parameter LockSignInterval has to be used for signing and verifying a certain data block, when using different 128-bit keys in the SG-Lock and application (highly recommended for highest security). The reasons is, that the 128-bit key in the application is less safe than the 128-bit key in the SG-Lock. When a hacker succeeds to investigate the 128-bit key in the application (which is in principle possible), then he will try that also first for the SG-Lock. That will fail, if a differnt 128-bit key is used in the SG-Lock. For a deeper understanding of the function, please take a look into the SG-Lock include/header file for your programming language. You will find the source code of the function in it.

### 73.3.19 WriteCounter(ProductId as UInt32, CntNum as UInt32, Data as UInt32)

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a 32-bit count value to the SG-Lock memory.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
CntNum: Number of counter, 0 to 63 - SG-Lock U3 0 to 255 - SG-Lock U4
Data: Counter value to be written

Lasterror property is set.

### 73.3.20 WriteData(ProductId as UInt32, Address as UInt32, Data as MemoryBlock)

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes 32-bit data values to SG-Lock memory.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
Address: Startaddress of data value block 0 to 63 - SG-Lock U3, 0 to 255 - SG-Lock U4
Count: Number of data values
Data: Memoryblock, where data values be copied from. (size is multiply of 4)

Lasterror property is set.

### 73.3.21 WriteKey(ProductId as UInt32, Address as UInt32, Key as MemoryBlock)

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a 128-bit key to the SG-Lock key memory.
**Notes:** ProductId: Indicates the ProductId of the SG-Lock
KeyNum: Number of the key to be written 0 to 1 - SG-Lock U3, 0 to 15 - SG-Lock U4
Key: 128-bit Key to be written. Pointer to data array of 4 integer values of 32-bit, that form the 128-bit key

Lasterror property is set.
The 128-bit key of the U2 is read only and not changeable.

### 73.3.22 WriteProductId(OldProductId as UInt32, NewProductId as UInt32) as Boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a new 16-bit ProductId to the SG-Lock.
**Notes:** OldProductId: Indicates the actual ProductId of the SG-Lock
NewProductId: Indicates the new ProductId of the SG-Lock

Returns true on success or false on failure.

Lasterror property is set.

### 73.3.23 Properties

### 73.3.24 Available as Boolean

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether library has been loaded and functions are available.
**Notes:** Returns true if you can call functions without getting a FunctionNotFoundException.

Works on all platforms (except iOS) in case you have a matching dylib/dll/so file.
(Read only property)

### 73.3.25 CounterCount as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of counters.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.26 HardwareVersion as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hardware version number.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.27 InterfaceType as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The type of interface.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.28 KeyCount as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of 128-bit keys.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.29 Lasterror as Integer

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code returned by a function.
**Notes:** (Read and Write property)

### 73.3.30 LibraryError as String

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The error message from loading the library.
**Notes:** (Read only property)

### 73.3.31 MemorySize as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The memory size in data words.
**Notes:** MemorySizeBytes = 4 * MemorySize
Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.32 MemorySizeBytes as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The memory size in bytes.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.33 SerialNumber as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the dongle.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.

(Read only property)

### 73.3.34 SoftwareVersion as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The software version.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.35 Type as UInt32

MBS Dongle Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The type of dongle.
**Notes:** Updated by plugin when you call SearchLock or ReadConfig methods.
(Read only property)

### 73.3.36 Constants

SG-Lock Types

| Constant | Value | Description |
|---|---|---|
| kConfigLockSeries2 | 1 | Series 2 |
| kConfigLockSeries3 | 2 | Series 3 |
| kConfigLockSeries4 | 3 | Series 4 |

Crypto Modes

| Constant | Value | Description |
|---|---|---|
| kCryptModeDecrypt | 1 | Decrypt it |
| kCryptModeEncrypt | 0 | Encrypt it |

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorAuthenticationFailed | 6 | Authentification with Authenticate failed. |
| kErrorAuthenticationRequired | 5 | Authentication with Authenticate function not or not error free processed. |
| kErrorDongleNotFound | 1 | Dongle not found. |
| kErrorFunctionNotSupported | 7 | The called function is not supported by the found SG-Lock. |
| kErrorLPTBusy | 2 | The LPT (printer port) is busy. |
| kErrorLPTOpenError | 3 | The LPT (printer port) could not be opened. |
| kErrorNoLPTPortFound | 4 | The LPT (printer port) was not found. |
| kErrorParameterInvalid | 8 | Parameter of the called function is out of the vaild value range. |
| kErrorSignatureInvalid | 9 | Signature invalid. |
| kErrorSuccess | 0 | All okay. |
| kErrorUSBBusy | 10 | Another application is claming the SG-Lock for more than 5 seconds. |

Interface Types

| Constant | Value | Description |
|---|---|---|
| kInterfaceLPT | 1 | Printer port connection. |
| kInterfaceUSB | 0 | USB connection. |

Sign Modes

| Constant | Value | Description |
|---|---|---|
| kSignModeSign | 0 | Sign the data. |
| kSignModeVerify | 1 | Verify the signature. |

## 73.4 class UnikeyMBS

### 73.4.1 class UnikeyMBS

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to enable Xojo to use Unikey dongles.
**Notes:** Website:
http://www.esecutech.com

Available for:

- MacOS 64-bit on Intel
- MacOS 32-bit on Intel
- Linux 32-bit on ARM
- Linux 32-bit on Intel
- Linux 64-bit on Intel
- Windows 32-bit on Intel
- Windows 64-bit on Intel

Unavailable for:

- iOS
- Windows 64-bit on ARM
- Linux 64-bit on ARM
- MacOS 64-bit on ARM

We may add more targets once we get newer SDK versions with new libraries.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4

### 73.4.2 Methods

### 73.4.3 Calculate1(StartAddress as Integer, Module as Integer, byref RegA as Integer, byref RegB as Integer, byref RegC as Integer, byref RegD as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the results of a calculation performed in UniKey, using input provided by the developer and the CALCULATE1 function.
**Notes:** See Unikey API Reference for details on UniKey_Calculate1 function.
Returns error code.

### 73.4.4 Calculate2(StartAddress as Integer, Seed as Integer, byref RegA as Integer, byref RegB as Integer, byref RegC as Integer, byref RegD as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the results of a calculation performed in UniKey, using input provided by the developer and the CALCULATE2 function.
**Notes:** See Unikey API Reference for details on UniKey_Calculate2 function.
Returns error code.

### 73.4.5 Calculate3(StartAddress as Integer, Module as Integer, byref RegA as Integer, byref RegB as Integer, byref RegC as Integer, byref RegD as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return results of a calculation performed in UniKey, using input provided by the developer and the CALCULATE3 function.
**Notes:** See Unikey API Reference for details on UniKey_Calculate3 function.
Returns error code.

### 73.4.6 CheckModule(Module as Integer, byref Value as Integer, byref Decrease as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the attributes of a specific UniKey license module.
**Notes:** See Unikey API Reference for details on UniKey_Check_Module function.
Returns error code.

### 73.4.7 CheckTimeModule(Module as Integer, byref RemainDays as Integer, Year as Integer, Month as Integer, Day as Integer, Hour as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the attributes of a specific UniKey Time license module.
**Notes:** See Unikey API Reference for details on UniKey_Check_Time_Module function.
Returns error code.

### 73.4.8 CheckTimeModuleNow(Module as Integer, byref RemainDays as Integer, byref RemainHours as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the attributes of a specific UniKey Time license module now.
**Notes:** See Unikey API Reference for details on UniKey_Check_Time_Module_Now function.
Returns error code.

### 73.4.9 CheckTimeModuleNowPC(Module as Integer, byref RemainDays as Integer, byref RemainHours as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the attributes of a specific UniKey Time license module Now PC.
**Notes:** See Unikey API Reference for details on UniKey_Check_Time_Module_Now_PC function.
Returns error code.

### 73.4.10 Decrypt(BufferLength as Integer, KeyNumber as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decrypt an amount of memory with a key.
**Notes:** The length of data must be a multiple of 8.
See Unikey API Reference for details on UniKey_Decrypt function.
Returns error code.

### 73.4.11 Encrypt(BufferLength as Integer, KeyNumber as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encrypt an amount of memory with a key.
**Notes:** The length of data must be a multiple of 8.
See Unikey API Reference for details on UniKey_Encrypt function.
Returns error code.

### 73.4.12 EraseTimeModule(Module as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Erase/Reset a real time module, and all the info in the module will be erased including start, end or duration.
**Notes:** See Unikey API Reference for details on UniKey_Erase_Time_Module function.
Returns error code.

### 73.4.13 Find(byref Setting1 as Integer, byref Setting2 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Check if a specific UniKey is attached to the USB port.
**Notes:** This is the first API to start a UniKey session.
Sets handle property.

See Unikey API Reference for details on UniKey_Find function.

### 73.4.14 FindNext(byref Setting1 as Integer, byref Setting2 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Check if another UniKey is attached to the USB port.
**Notes:** Sets the handle property.
Returns error code.
See Unikey API Reference for details on UniKey_Find_Next function.

### 73.4.15 GenerateKey(KeyNumber as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Generate a new key in the specific key storage.
**Notes:** See Unikey API Reference for details on UniKey_Generate_Key function.
Returns error code.

### 73.4.16 GenerateKeyViaSeed(KeyNumber as Integer, byref Seed1 as Integer, byref Seed2 as Integer, byref Seed3 as Integer, byref Seed4 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Generate a new key in the specific key storage via seed.
**Notes:** See Unikey API Reference for details on UniKey_Generate_Key_Via_Seed function.
Returns error code.

### 73.4.17 GenerateNewPassword(Seed as Integer, byref Password1 as Integer, byref Password2 as Integer, byref Password3 as Integer, byref Password4 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Generate a new password via a seed code; the mapping from the seed code to the password is only one way. Without the seed, you cannot generate the same password.

**Notes:** See Unikey API Reference for details on UniKey_Generate_New_Password function.
Returns error code.

### 73.4.18 GetCliNum(byref Count as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the UniKey client number.
**Notes:** See Unikey API Reference for details on UniKey_Get_Cli_Num function.
Returns error code.

### 73.4.19 GetDongleLocation(byref IP as String) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the Server IP, if it is local, return 127.0.0.1.
**Notes:** See Unikey API Reference for details on UniKey_Get_Dongle_Location function.
Returns error code.

### 73.4.20 GetMaxNum(byref Count as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the maximum client number.
**Notes:** See Unikey API Reference for details on UniKey_Get_Max_Num function.
Returns error code.

### 73.4.21 GetModule(Module as Integer, byref Value as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a value from a specific UniKey license module.
**Notes:** See Unikey API Reference for details on UniKey_Get_Module function.
Returns error code.

### 73.4.22 GetModuleEndTime(Module as Integer, byref Year as Integer, byref Month as Integer, byref Day as Integer, byref Hour as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the end time of a specific UniKey Time license module.
**Notes:** See Unikey API Reference for details on UniKey_Get_Module_End_Time function.
Returns error code.

Not supported for 64-bit Linux and Mac PPC.

### 73.4.23 GetModuleStartTime(Module as Integer, byref Year as Integer, byref Month as Integer, byref Day as Integer, byref Hour as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the start time of a specific UniKey Time license module.
**Notes:** See Unikey API Reference for details on UniKey_Get_Module_Start_Time function.
Returns error code.

Not supported for 64-bit Linux and Mac PPC.

### 73.4.24 GetTime(byref Year as Integer, byref Month as Integer, byref Day as Integer, byref Hour as Integer, byref Minute as Integer, byref Second as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get UniKey Time,Äôs real time clock,Äôs time.
**Notes:** See Unikey API Reference for details on UniKey_Get_Time function.
Returns error code.
Year is 10 for 2010.

### 73.4.25 GetType(byref type as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** GetType can help you get the type of the UniKey dongle.
**Notes:** The return value of type will indicate the type of the UniKey dongle.
UNIKEY_TYPE_TIME 101
UNIKEY_TYPE_PRO 102
UNIKEY_TYPE_STD 103

See Unikey API Reference for details on UniKey_Get_Type function.

### 73.4.26 GetVersion(byref Version as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the current UniKey library version.
**Notes:** See Unikey API Reference for details on UniKey_Get_Version function.
Returns error code.

### 73.4.27 Lock as integer

MBS Dongle Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Locks the unikey.

### 73.4.28 Logoff as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Logoff a UniKey dongle with a specific handle.
**Notes:** This API should be called at the end of UniKey session.
See Unikey API Reference for details on UniKey_Logoff function.
Returns error code.

### 73.4.29 MD5(BufferLength as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Make an MD5 digest for a mount of content or data.
**Notes:** See Unikey API Reference for details on UniKey_MD5 function.
Returns error code.

### 73.4.30 ModuleDecrease(Module as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decrease the value in a specified UniKey license module by ,Äú1,Äù.
**Notes:** See Unikey API Reference for details on UniKey_Module_Decrease function.
Returns error code.

For Linux, does not work on Linux ARM or 32-bit Linux. Works on 64-bit Linux.

### 73.4.31 Random(byref Return1 as Integer, byref Return2 as Integer, byref Return3 as Integer, byref Return4 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Generate a random number from the dongle.
**Notes:** See Unikey API Reference for details on UniKey_Random function.
Returns error code.

### 73.4.32 ReadMemory(StartAddress as Integer, BufferLength as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the contents of the Memory.
**Notes:** This API needs to be called after logon of a UniKey dongle.
See Unikey API Reference for details on UniKey_Read_Memory function.
Returns error code.

### 73.4.33 ReadSoftID(byref SoftID as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the user defined SoftID.
**Notes:** See Unikey API Reference for details on UniKey_Read_SoftID function.
Returns error code.

### 73.4.34 ReadUpdateTag(byref UpdateTag as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read UpdateTag from a specific dongle.
**Notes:** See Unikey API Reference for details on UniKey_Read_UpdateTag function.
Returns error code.

### 73.4.35 Seed(Seed as Integer, byref Return1 as Integer, byref Return2 as Integer, byref Return3 as Integer, byref Return4 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get return codes from the input of a seed code.
**Notes:** This API return for values which are related to Seed and UniKey dongle,Äôs password.
See Unikey API Reference for details on UniKey_Seed function.
Returns error code.

### 73.4.36 SetMaxNum(byref Count as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the maximum client number.
**Notes:** See Unikey API Reference for details on UniKey_Set_Max_Num function.
Returns error code.

Not supported for Mac PPC.

### 73.4.37 SetModule(Module as Integer, Value as Integer, Decrease as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** To write a value to a specific UniKey license module and set the Decrement attribute.
**Notes:** See Unikey API Reference for details on UniKey_Set_Module function.
Returns error code.

### 73.4.38 SetNETINILocation(byref Setting1 as Integer, byref Setting2 as Integer, IniFile as String) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets ini location.
**Notes:** See Unikey API Reference for details on UniKey_SetNETINILocation function.
Returns error code.

### 73.4.39 SetTime(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set UniKey Time,Äôs real time clock,Äôs time.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time function.
Returns error code.
Year is 10 for 2010.

### 73.4.40 SetTimeModuleDuration(Module as Integer, Year as Integer, Day as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the duration time for a specific real time module. The total duration is (Day)*24 + (Hour) in hours.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Module_Duration function.
Returns error code.

### 73.4.41 SetTimeModuleEndTime(Module as Integer, Year as Integer, Month as Integer, Day as Integer, Hour as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a real time module,Äôs end time.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Module_End_Time function.
Returns error code.

### 73.4.42 SetTimeModuleStartTime(Module as Integer, Year as Integer, Month as Integer, Day as Integer, Hour as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a real time module,Äôs start time.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Module_Start_Time function.
Returns error code.

### 73.4.43 SetTimeModuleStartTimeNow(Module as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a real time module,Äôs start time as the now time in UniKey dongle,Äôs clock.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Module_Start_Time_Now function.
Returns error code.

### 73.4.44 SetTimeModuleStartTimeNowPC(Module as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a real time module,Äôs start time as the now time in host computer.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Module_Start_Time_Now_PC function.
Returns error code.

### 73.4.45 SetTimeNow as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set UniKey Time,Äôs real time clock,Äôs time by the host computer,Äôs clock.
**Notes:** See Unikey API Reference for details on UniKey_Set_Time_Now function.
Returns error code.

### 73.4.46 Unikey(FunctionCode as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls the unikey function with the values from this object.
**Notes:** See the unikey documentation for what values to use.

### 73.4.47 UnLock as integer

MBS Dongle Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unlocks the unikey.

### 73.4.48 UserLogon(Password1 as Integer, Password2 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Logon a UniKey dongle with specified passwords.
**Notes:** This API should be called in the released software in order to improve security.
See Unikey API Reference for details on UniKey_User_Logon function.
Returns error code.
Sets handle property.

### 73.4.49 VendorLogon(Password1 as Integer, Password2 as Integer, Password3 as Integer, Password4 as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Logon a UniKey dongle in vendor mode with specified passwords.
**Notes:** This API helps software vendors to logon the UniKey dongle in vendor mode, and get the full

permission to UniKey dongle.
We do NOT advise you to enclose this API in the final released software. This API is only for software vendor,Äôs usage.
If password3 or password4 is wrong while password1 and password2 is correct, the dongle is also logged on in user mode automatically.

Sets handle property.
See Unikey API Reference for details on UniKey_Vender_Logon function.
Returns error code.

Not supported on Linux.

### 73.4.50 WriteArithmetic(StartAddress as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write user-defined mathematical algorithms.
**Notes:** See Unikey API Reference for details on UniKey_Write_Arithmetic function.
Returns error code.

### 73.4.51 WriteMemory(StartAddress as Integer, BufferLength as Integer, Buffer as Ptr) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write data into the memory.
**Notes:** This API needs to be called after logging on to a UniKey dongle.
See Unikey API Reference for details on UniKey_Write_Memory function.
Returns error code.

### 73.4.52 WriteSoftID(SoftID as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write the vendor defined SoftID.
**Notes:** See Unikey API Reference for details on UniKey_Write_SoftID function.
Returns error code.

### 73.4.53 WriteUpdateTag(UpdateTag as Integer) as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write UpdateTag into a specific dongle.
**Notes:** See Unikey API Reference for details on UniKey_Write_UpdateTag function.
Returns error code.

### 73.4.54 Properties

### 73.4.55 Buffer as MemoryBlock

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The memoryblock to use when calling the unikey function.
**Notes:** (Read and Write property)

### 73.4.56 Handle as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the dongle.
**Notes:** (Read and Write property)

### 73.4.57 LP1 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The parameter LP1.
**Notes:** (Read and Write property)

### 73.4.58 LP2 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The parameter LP2.

**Notes:** (Read and Write property)

### 73.4.59 P1 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value for the parameter p1.
**Notes:** (Read and Write property)

### 73.4.60 P2 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value for the parameter p2.
**Notes:** (Read and Write property)

### 73.4.61 P3 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value for the parameter p3.
**Notes:** (Read and Write property)

### 73.4.62 P4 as Integer

MBS Dongle Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value for the parameter p4.
**Notes:** (Read and Write property)

### 73.4.63 Result as Integer

MBS Dongle Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The result of the last function call.
**Notes:** (Read and Write property)

### 73.4.64 Constants

Encryption Modes

| Constant | Value | Description |
|---|---|---|
| CBC_MODE | 2 | CBC Mode |
| | DES1 1 | DES1 |
| | DES2 2 | DES2 |
| | DES3 3 | DES3 |
| DES_KEY | 2 | DES Key |
| DES_KEY_LEN | 24 | DES Key Len |
| ECB_MODE | 1 | ECB Mode |
| RSA | 4 | RSA |
| RSA_KEY | 1 | RSA Key |
| | RSA_KEY_1024 3 | RSA Key 1024 bit. |
| | RSA_KEY_2048 4 | RSA Key 2048 bit. |
| RSA_KEY_LEN | 1408 | RSA Key Len |

Errors

| Constant | Value | Description |
|---|---|---|
| ERROR_KEY_INDEX | 259 | Error with key in |
| ERROR_MAX_KEYS | 258 | Error with max k |
| ERROR_MAX_USERS | 257 | Error with max u |
| ERROR_UNIKEY_ALREADY_LOCKED | 236 | Dongle Already L |
| ERROR_UNIKEY_AR_BAD_COMMAND | 217 | Arithmetic Instru |
| ERROR_UNIKEY_AR_UNKNOWN_OPCODE | 218 | Arithmetic Opera |
| ERROR_UNIKEY_AR_VALUE_OVERFLOW | 221 | Const Number >6 |
| ERROR_UNIKEY_AR_WRONG_BEGIN | 219 | Const Number Ca |
| ERROR_UNIKEY_AR_WRONG_END | 220 | Const Number Ca |
| ERROR_UNIKEY_CALCULATE | 211 | Calculate Failed |
| ERROR_UNIKEY_COMPARE_TIME_MODULE | 233 | The Specific Time |
| ERROR_UNIKEY_DECRYPT_FAILED | 229 | Decrypt Data Fai |
| ERROR_UNIKEY_ENCRYPT_FAILED | 228 | Encrypt Data Fai |
| ERROR_UNIKEY_FILE_LOCK_CLOSE | 261 | close lock file erro |
| ERROR_UNIKEY_FILE_LOCK_OPEN | 260 | open lock file erro |
| ERROR_UNIKEY_FS_ERR_OPEN_FILE | 247 | Can't Open File |
| ERROR_UNIKEY_FS_ERR_SYS_UNINIT | 246 | File Sys Is Not In |
| ERROR_UNIKEY_FS_FILE_EXIST | 245 | File Already Exis |
| ERROR_UNIKEY_FS_FILE_NAME | 240 | Wrong Or Invalid |
| ERROR_UNIKEY_FS_FILE_OFFSET | 242 | Offset Of File Err |
| ERROR_UNIKEY_FS_NO_FILE | 241 | No Such File Nam |
| ERROR_UNIKEY_FS_NO_MEMORY | 244 | Not Enough Free |
| ERROR_UNIKEY_FS_UNKONW | 243 | Unknown Error |
| ERROR_UNIKEY_GENERATE_NEW_PASSWORD | 225 | Generate New Pa |
| ERROR_UNIKEY_GET_TYPE | 256 | Failed to get type |
| ERROR_UNIKEY_INVALID_ADDR_OR_SIZE | 204 | Read/Write Addr |
| ERROR_UNIKEY_INVALID_KEY | 222 | The Key In The I |
| ERROR_UNIKEY_INVALID_KEY_STORE | 224 | Wrong Key Stora |
| ERROR_UNIKEY_INVALID_PASSWORD | 201 | Found UniKey Do |
| ERROR_UNIKEY_INVALID_PASSWORD_OR_ID | 202 | Wrong Password |
| ERROR_UNIKEY_KEY_INDEX | 239 | Dongle Over Keyi |
| ERROR_UNIKEY_LOGOUT | 251 | Logout error? |
| ERROR_UNIKEY_MAX_KEYS | 238 | Dongle Already M |
| ERROR_UNIKEY_MAX_USERS | 237 | Dongle Already M |
| ERROR_UNIKEY_MODULE | 216 | License Module E |
| ERROR_UNIKEY_NEED_FIND | 215 | No Find Before F |
| ERROR_UNIKEY_NEED_OPEN | 212 | Need Open Dongl |
| ERROR_UNIKEY_NOMORE | 214 | No More Dongle |
| | ERROR_UNIKEY_NOTBELEVEL3 206 | Internal Error |
| ERROR_UNIKEY_NOT_FOUND | 200 | No UniKey Dongl |
| ERROR_UNIKEY_NO_ENCYYPT | 248 | No Secure Drive |
| ERROR_UNIKEY_OPEN_OVERFLOW | 213 | Too Many Open I |
| ERROR_UNIKEY_PARAMETER | 254 | Some parameter i |
| ERROR_UNIKEY_PASSWORD | 249 | Password Error |
| ERROR_UNIKEY_RANDOM | 209 | Random Number |
| ERROR_UNIKEY_READ_MEMORY | 207 | Read Memory Fai |
| ERROR_UNIKEY_READ_TIME | 230 | Get UniKey Time |
| ERROR_UNIKEY_READ_UPDATETAG | 226 | Read UpdateTag |
| ERROR_UNIKEY_SEED | 210 | Get Seed Code Fa |
| ERROR_UNIKEY_SET_SOFTID_FAILED | 203 | Set UniKey ID Fa |
| ERROR_UNIKEY_TIME_MODULE_NOT_NULL | 234 | The Real Time M flag is set |
| ERROR_UNIKEY_TIME_MODULE_OVERDUR | 235 | The Specific Time Expired |
| ERROR_UNIKEY_TOO_MUCH_THREAD | 255 | Too many (>100) |
| ERROR_UNIKEY_UNKNOW | 252 | Unknown error |
| ERROR_UNIKEY_UNKNOWN_COMMAND | 205 | No Such Comman |
| ERROR_UNIKEY_USERLOCK | 250 | User Has Been Lo |

NetUniKey Error Codes

| Constant | Value | Description |
|---|---|---|
| NET_UNIKEY_AREADY_START | 111 | The Server Has Already Started |
| NET_UNIKEY_CLIENT_EXSIT | 106 | The Client Already Exists, Per This Mode |
| NET_UNIKEY_DISCARD_BY_SERVER | 118 | The Client Is Discarded By The Server |
| NET_UNIKEY_ERROR_BASE | 100 | NetUniKey Error Base |
| NET_UNIKEY_INIFILE_NOT_EXISTS | 120 | ZhaoHJ: 2015-08-13, INI file not exists |
| NET_UNIKEY_IN_BLACKLIST | 108 | The Client Is In The Black List |
| NET_UNIKEY_MEMORY_ERROR | 101 | Memory Allocation Error |
| NET_UNIKEY_MESSAGE_CHANGE | 110 | The Message Packet Was Changed |
| NET_UNIKEY_MESSAGE_WRONG | 104 | Communication Message Is Modified |
| NET_UNIKEY_NOT_WORKING | 117 | Cannot Connect Remote Netunikey Server |
| NET_UNIKEY_OUT_WHITELIST | 109 | The Client Is Not In The White List |
| NET_UNIKEY_RECEIVE_ERROR | 103 | Receive Error |
| NET_UNIKEY_SEND_ERROR | 102 | Send Error |
| NET_UNIKEY_SERVER_RESOURCE_INADEQUACY | 119 | by lzm |
| NET_UNIKEY_SETUP_SOCKET_ERROR | 105 | Setup Socket Error |
| NET_UNIKEY_SOCKET_BIND_FAILED | 113 | Cannot Bind The Port With The Socket |
| NET_UNIKEY_SOCKET_INIT_FAILED | 112 | Cannot Initialize The Socket |
| NET_UNIKEY_SOCKET_LISTEN_FAILED | 114 | Cannot Start Listening With The Socket |
| NET_UNIKEY_START_UDP_SERVER_FAILED | 115 | Start Udp Server Failed |
| NET_UNIKEY_TOO_LONG_MESSAGE | 116 | Too Long Message |
| NET_UNIKEY_TOO_MANY_CLIENT | 107 | The Number Of Client Reach The Limitation |

Functions

| Constant | Value | Description |
|---|---|---|
| NET_UNIKEY_GET_NUM_CLIENT | 226 | get the number of client for netunikey |
| NET_UNIKEY_SET_NUM_CLIENT | 225 | set the number of client for netunikey |
| UNIKEY_CALCULATE1 | 14 | Calculate 1 |
| UNIKEY_CALCULATE2 | 15 | Calculate 2 |
| UNIKEY_CALCULATE3 | 16 | |
| UNIKEY_CHECK_MODULE | 12 | Check Module |
| UNIKEY_DECRYPT | 21 | Decrypt the Buffer with a Specific Key |
| UNIKEY_ENCRYPT | 20 | Encrypt the Buffer with a Specific Key |
| UNIKEY_FIND | 1 | Find UniKey |
| UNIKEY_FIND_NEXT | 2 | Find next UniKey |
| UNIKEY_GENERATE_KEY | 19 | Generate a New Key in specific Key Store |
| UNIKEY_GET_MODULE | 25 | Get Module. p1 [ in ] Number [ p3 ] out Value |
| UNIKEY_GET_TYPE | 100 | get the Unikey type |
| UNIKEY_LOCK | 41 | Lock |
| UNIKEY_LOGOFF | 4 | Close UniKey |
| UNIKEY_LOGON | 3 | Open UniKey |
| UNIKEY_MD5 | 22 | Make an MD5 Digest for a Certain Content |
| UNIKEY_MODULE_DECREASE | 17 | Decrease Module Unit |
| UNIKEY_RANDOM | 7 | Generate Random Number |
| UNIKEY_READ_MEMORY | 5 | Read UniKey |
| UNIKEY_READ_SOFTID | 10 | Read Software ID |
| UNIKEY_READ_UPDATETAG | 23 | Read UpdateTag from a Specific Key |
| UNIKEY_SEED | 8 | Generate Seed Code |
| UNIKEY_SET_KEY | 222 | |
| UNIKEY_SET_MODULE | 11 | Set Module |
| UNIKEY_SET_NEW_PASSWORD | 18 | Set New Password via a New Seed |
| UNIKEY_UNLOCK | 42 | Unlock |
| UNIKEY_WRITE_ARITHMETIC | 13 | Write Arithmetic |
| UNIKEY_WRITE_MEMORY | 6 | Write UniKey |
| UNIKEY_WRITE_SOFTID | 9 | Write Software ID |
| UNIKEY_WRITE_UPDATETAG | 24 | Write UpdateTag to a Specific Key |
| UNKEY_GET_CLI_NUM | 101 | Get client number now. |
| UNKEY_GET_MAX_NUM | 226 | Get Max number. |

Real Time Clock Functions

| Constant | Value | Description |
|---|---|---|
| UNIKEY_CHECK_TIME_MODULE | 35 | check if a time >START_TIME and START_TIME+DURATION) (p1,p2,p3,p4 = |
| UNIKEY_CHECK_TIME_MODULE_NOW | 36 | check if now >START_TIME a START_TIME+DURATION) use dongle tim |
| UNIKEY_CHECK_TIME_MODULE_NOW_PC | 37 | check if now >START_TIME a START_TIME+DURATION) use host time |
| UNIKEY_ERASE_TIME_MODULE | 29 | ERASE TIME MODULE to NULL. (lp1 = m |
| UNIKEY_GET_MODULE_END_TIME | 39 | get module end time (lp1 = module index) |
| UNIKEY_GET_MODULE_START_TIME | 38 | get module start time (lp1 = module index) |
| UNIKEY_GET_TIME | 26 | read rtc time (lp1,lp2,p1,p2,p3,p4 = year,mon |
| UNIKEY_SET_TIME | 27 | write rtc time (lp1,lp2,p1,p2,p3,p4 = year,mo |
| UNIKEY_SET_TIME_MODULE_DURATION | 34 | write rtc time module duration (lp2,p1 = day |
| UNIKEY_SET_TIME_MODULE_END_TIME | 33 | write rtc time module end time (p1,p2,p3,p4 = |
| UNIKEY_SET_TIME_MODULE_START_TIME | 30 | write rtc time module start time(p1,p2,p3,p4 |
| UNIKEY_SET_TIME_MODULE_START_TIME_NOW | 31 | write rtc time module start time use dongle ti |
| UNIKEY_SET_TIME_MODULE_START_TIME_NOW_PC | 32 | write rtc time module start time use host tim |
| UNIKEY_SET_TIME_NOW | 28 | write rtc time use host time (lp1 = module in |

Types

| Constant | Value | Description |
|---|---|---|
| UNIKEY_TYPE_PRO | 102 | Pro Unikey |
| UNIKEY_TYPE_STD | 103 | Standard Unikey |
| UNIKEY_TYPE_TIME | 101 | Time Unikey |

# Chapter 74

# Drag & Drop

## 74.1 class DragItem

### 74.1.1 class DragItem

Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The dragitem class from Xojo framework.

### 74.1.2 Methods

### 74.1.3 NSDraggingInfoMBS as NSDraggingInfoMBS

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Provides the NSDraggingInfo object for the DragItem.

## 74.2 class NSDraggingImageComponentMBS

### 74.2.1 class NSDraggingImageComponentMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSDraggingImageComponent class represents a single object in a dragging item.
**Notes:** An array of NSDraggingImageComponent instances are composited together to create the dragging image for an NSDraggingItem. NSDraggingImageComponent instances can simply be considered as named images with a location used by an NSDraggingItem instance.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr11

### 74.2.2 Methods

### 74.2.3 Constructor(key as string)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a dragging image component with the specified key.
**Notes:** key: The key.
Available in OS X v10.7 and later.

### 74.2.4 draggingImageComponentWithKey(key as string) as NSDraggingImageComponentMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates and returns a dragging image component with the specified key.
**Notes:** Available in OS X v10.7 and later.

### 74.2.5 NSDraggingImageComponentIconKey as string

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for Constructor.
**Notes:** Key with a corresponding value that is an image of the item being dragged.
Available in OS X v10.7 and later.

### 74.2.6 NSDraggingImageComponentLabelKey as string

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for Constructor.
**Notes:** Key with a corresponding value that represents a textual label associate with the item, for example, a file name.
Available in OS X v10.7 and later.

### 74.2.7 Properties

### 74.2.8 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 74.2.9 contents as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** An object providing the image contents of the component.
**Notes:** Typically you set an NSImage instance as content.
Available in OS X v10.7 and later.
(Read and Write computed property)

### 74.2.10 frame as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The coordinate space is the bounds of the parent dragging item.
**Notes:** The frame is { { 0,0 } , { draggingFrame.size.width, draggingFrame.size.height } } .

The coordinate space is the bounds of the parent NSDraggingItem instance's draggingFrame.
Available in OS X v10.7 and later.
(Read and Write computed property)

### 74.2.11 key as string

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The unique name of this image component instance.
**Notes:** The key must be unique for each component in an NSDraggingItem instance. You can create your own named components, however the keys described in NSDragImage Component Keys have special meanings.

When an NSDraggingItem instances imageComponents are changed by one of the enumerateDraggingItemsWithOptions methods the image associated with this key is morphed into the new image component's image associated with the same key.

Available in OS X v10.7 and later.
(Read and Write computed property)

## 74.3 class NSDraggingInfoMBS

### 74.3.1 class NSDraggingInfoMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSDraggingInfo protocol declares methods that supply information about a dragging session.
**Notes:** NSDraggingInfo protocol methods are designed to be invoked from within a class's implementation of NSDraggingDestination protocol methods. The Application Kit automatically passes an object that conforms to the NSDraggingInfo protocol as the argument to each of the methods defined by NSDraggingDestination. NSDraggingInfo messages should be sent to this object; you never need to create a class that implements the NSDraggingInfo protocol.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr7
- MBS Real Studio Plugins, version 13.1pr9

### 74.3.2 Methods

### 74.3.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
See also:

- 74.3.4 Constructor(Handle as Integer) 12427

### 74.3.4 Constructor(Handle as Integer)

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to build an NSDraggingInfo object with a handle.
**Notes:** Handle should be a Cocoa object reference implementing the NSDraggingInfo protocol.
See also:

- 74.3.3 Constructor 12427

### 74.3.5 namesOfPromisedFilesDroppedAtDestination(dropDestination as FolderItem) as string()

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the drop location for promised files and returns the names of the files that the receiver promises to create there.
**Notes:** dropDestination: A folderitem specifying the drop location for promised files.

Return an array of file names, which are not full paths.

Drag destinations should invoke this method within their performDragOperation method. The source may or may not have created the files by the time this method returns.

### 74.3.6 promisedFilesDroppedAtDestination(dropDestination as FolderItem) as FolderItem()

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the drop location for promised files and returns the files that the receiver promises to create there.
**Notes:** dropDestination: A folderitem specifying the drop location for promised files.

Return an array of folderitems for the files.
The files may not yet exist.

Drag destinations should invoke this method within their performDragOperation method. The source may or may not have created the files by the time this method returns.

### 74.3.7 slideDraggedImageTo(screenPoint as NSPointMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Slides the image to a specified location.
**Notes:** screenPoint: A point that specifies a location in the screen coordinate system.

This method can be used to adjust the location to which the dragged image will slide back if the drag is rejected.
It should only be invoked from within the destination's implementation of prepareForDragOperation, and will only have effect if the destination rejects the drag.
This method is invoked after the user has released the image but before it is removed from the screen.

### 74.3.8 Properties

### 74.3.9 animatesToDestination as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the dragging formation animates while the drag is over this destination.
**Notes:** During the conclusion of an accepted drag, if this property is set to true, the drag manager will animate each dragging image to their NSDraggingFormationNone locations. Otherwise, the drag images are removed without any animation.

This property is inspected between prepareForDragOperation and performDragOperation. You should enumerate through the dragging items during performDragOperation to set the item's draggingFrame to the correct destinations.

Available in OS X v10.7 and later.
(Read and Write property)

### 74.3.10 draggedImage as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image being dragged.
**Notes:** Value is a NSImageMBS object. Returned as Variant to reduce plugin dependencies.

This image object visually represents the data put on the pasteboard during the drag operation; however, it is the pasteboard data and not this image that is ultimately utilized in the dragging operation.

This method returns non-nil for a local drag, but nil for a cross-process drag. With the new multi-image dragging capabilities, a cross-process destination may participate and change the drag image. But it still cannot get the current drag image.
(Read only property)

### 74.3.11 draggedImageLocation as NSPointMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current location of the dragged image's origin.
**Notes:** Returns the dragged image's origin, in the base coordinate system of the destination object's window.
The image moves along with the mouse pointer (the position of which is given by draggingLocation) but may be positioned at some offset.

(Read only property)

### 74.3.12 draggingDestinationWindow as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the destination window for the dragging operation.
**Notes:** Value is a NSWindowMBS object. Returned as Variant to reduce plugin dependencies.

Either this window is the destination itself, or it contains the view object that is the destination.
(Read only property)

### 74.3.13 draggingFormation as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the dragging formation while the drag is over this destination.
**Notes:** Set this property to change the formation of the drag items. This is generally done during the updateDraggingItemsForDrag method or whenever you enumerate the dragging items.

The default value is the current drag formation.

Note: Set this property before or after the NSDraggingInfo or NSDraggingSession class's method enumerateDraggingItemsWithOptions not inside the enumeration Block.

Available in OS X v10.7 and later.
(Read and Write property)

### 74.3.14 draggingLocation as NSPointMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current location of the mouse pointer in the base coordinate system of the destination object's window.
**Notes:** (Read only property)

### 74.3.15 draggingPasteboard as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the pasteboard object that holds the data being dragged.
**Notes:** Value is a NSPasteboardMBS object. Returned as Variant to reduce plugin dependencies.

The dragging operation that is ultimately performed utilizes this pasteboard data and not the image returned by the draggedImage method.
(Read only property)

### 74.3.16 draggingSequenceNumber as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a number that uniquely identifies the dragging session.
**Notes:** (Read only property)

### 74.3.17 draggingSource as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the source, or owner, of the dragged data.
**Notes:** This method returns nil if the source is not in the same application as the destination. The dragging source implements methods from the NSDraggingSource protocol.
(Read only property)

### 74.3.18 draggingSourceOperationMask as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the dragging operation mask of the dragging source.
**Notes:** The dragging operation mask, which is declared by the dragging source through the NSDraggingSource sourceOperationMaskForDraggingContext method (preferred) or the NSDraggingSource draggingSourceOperationMaskForLocal method. If the source does not permit any dragging operations, this method should return NSDragOperationNone.

If the source permits dragging operations, the elements in the mask are one or more of the constants described in "Obtaining Information About the Dragging Session", combined using the C bitwise OR operator.

If the user is holding down a modifier key during the dragging session and the source does not prohibit modifier keys from affecting the drag operation (through its ignoreModifierKeysWhileDragging method), then the operating system combines the dragging operation value that corresponds to the modifier key (see the descriptions below) with the source's mask using the C bitwise AND operator.

The modifier keys are associated with the dragging operation options shown below:

| Modifier Key | Dragging Operation |
|---|---|
| Control | NSDragOperationLink |
| Option | NSDragOperationCopy |
| Command | NSDragOperationGeneric |

(Read only property)

### 74.3.19 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 74.3.20 numberOfValidItemsForDrop as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the number of valid items for a drop operation.
**Notes:** During draggingEntered or draggingUpdated, you are responsible for returning the drag operation. In some cases, you may accept some, but not all items on the dragging pasteboard. (For example, your application may only accept image files.)

If you only accept some of the items, set this property to the number of items accepted so the drag manager can update the drag count badge.

When updateDraggingItemsForDrag is called, you should set the image of non-valid dragging items to nil. If none of the drag items are valid then you should not updateItems, simply return NSDragOperationNone from your implementation of draggingEntered and, or draggingUpdated and do not modify any drag item properties.

Available in OS X v10.7 and later.
(Read and Write property)

### 74.3.21 Constants

Visual Format Constants

| Constant | Value | Description |
|---|---|---|
| NSDraggingFormationDefault | 0 | The system determined formation.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationList | 3 | Drag images are laid out vertically, non-overlapping with the left edges aligned.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationNone | 1 | Drag images maintain their set positions relative to each other/<br>Available in OS X v10.7 and later. |
| NSDraggingFormationPile | 2 | Drag images are placed on top of each other with random rotations.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationStack | 4 | Drag images are laid out overlapping diagonally.<br>Available in OS X v10.7 and later. |

Drag Operations Constants

| Constant | Value | Description |
|---|---|---|
| NSDragOperationAll_Obsolete | 15 | The NSDragOperationAll constant is deprecated. Use NSDragOperationEvery instead. |
| NSDragOperationCopy | 1 | The data represented by the image can be copied. |
| NSDragOperationDelete | 32 | The data can be deleted. |
| NSDragOperationEvery | -1 | All of the above. |
| NSDragOperationGeneric | 4 | The operation can be defined by the destination. |
| NSDragOperationLink | 2 | |
| NSDragOperationMove | 16 | The data can be moved. |
| NSDragOperationNone | 0 | No drag operations are allowed. |
| NSDragOperationPrivate | 8 | The operation is negotiated privately between the source and the destination. |

## 74.4 class NSDraggingItemMBS

### 74.4.1 class NSDraggingItemMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSDraggingItem class encompasses a single dragged item within an NSDraggingSession instance.
**Notes:** See NSDraggingSessionMBS Class Reference for more information

When the NSDraggingSession method beginDraggingSessionWithItems is called, the dragging items passed to the method are consumed immediately and are not retained.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr11

### 74.4.2 Methods

### 74.4.3 Constructor(item as NSPasteboardItemMBS)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a dragging item using the specified content.
**Notes:** item: The object that provides the dragging content.

When the developer creates an NSDraggingItem instance, it is for use with the view method beginDraggingSessionWithItems. During the invocation of that method, the item is placed onto the dragging pasteboard for the NSDraggingSession that contains the dragging item instance.

Available in OS X v10.7 and later.

### 74.4.4 item as Variant

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the pasteboard reader or writer object dependent on the context of where this dragging item is used. (read-only)
**Notes:** When you create an NSDraggingItem instance, item is the pasteboardWriter passed to Constructor.

### 74.4.5 setDraggingFrame(frame as NSRectMBS, contents as Variant)

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the item's dragging frame and contents.
**Notes:** frame: The item content frame in the same coordinate space that the draggingFrame.
contents: The item contents to display when dragging. Typically this is an NSImage, but a CGImageRef will also work.

Alternate single image component setter.

This method simplifies modifying the components of an NSDraggingItem when there is only one component.

This is a convenience method. This method sets the draggingFrame and creates a single NSDraggingImage-Component instance with one image corresponding to the NSDraggingImageComponentIconKey key. You should only use this method under the following conditions: the drag image for this item is composed of a single image., or there are a reasonable number of dragging item instances being created or enumerated.

This method will set the draggingFrame and imageComponents properties.
Available in OS X v10.7 and later.

### 74.4.6 Properties

### 74.4.7 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 74.4.8 draggingFrame as NSRectMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The frame of the dragging item.
**Notes:** The dragging frame provides the spatial relationship between NSDraggingItem instances when the dragging formation is set to NSDraggingFormationNone.

The exact coordinate space of this rectangle is dependent on where it is used. The view that initiated the drag using beginDraggingSessionWithItems or the view your pass to the NSDraggingSession instance implantation of enumerateDraggingItemsWithOptions.

Available in OS X v10.7 and later.
(Read and Write computed property)

## 74.5 class NSDraggingSessionMBS

### 74.5.1 class NSDraggingSessionMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The NSDraggingSession class encompases a drag and drop action and allows modification of the drag while in progress.
**Notes:** You start a new dragging session by calling the NSView method beginDraggingSessionWithItems method. This method immediately returns and you can further modify the properties of the dragging session. The actual drag begins at the next turn of the run loop.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.1pr9

### 74.5.2 Methods

### 74.5.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 74.5.4 draggingLeaderIndex as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The index of the dragging item under the cursor.
**Notes:** The index is to an element in the array passed as the first parameter to the NSView method beginDraggingSessionWithItem.

The default is the NSDraggingItem closest to the location field in the event parameter that was passed to the beginDraggingSessionWithItems method.

Available in OS X v10.7 and later.

### 74.5.5 draggingLocation as NSPointMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The current cursor location of the drag in screen coordinates. (read-only)
**Notes:** Available in OS X v10.7 and later.

### 74.5.6 draggingPasteboard as NSPasteboardMBS

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the pasteboard object that contains the data being dragged. (read-only)
**Notes:** Available in OS X v10.7 and later.

### 74.5.7 draggingSequenceNumber as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a number that uniquely identifies the dragging session. (read-only)
**Notes:** Available in OS X v10.7 and later.

### 74.5.8 Properties

### 74.5.9 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 74.5.10 animatesToStartingPositionsOnCancelOrFail as boolean

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Controls whether the dragging image animates back to its starting point on a cancelled or failed drag.
**Notes:** This property should be set immediately after creating the dragging session.

The default value is true.
Available in OS X v10.7 and later.
(Read and Write computed property)

### 74.5.11 draggingFormation as Integer

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Controls the dragging formation when the drag is not over the source or a valid destination.
**Notes:** Setting this value causes the dragging formation to change immediately, provided a valid destination has not overriden the behavior. If the dragging session hasn't started yet, the dragging items will animate into formation immediately upon start. It is highly recommended to never change the formation when starting a drag.

The default value is NSDraggingFormationNone.
Available in OS X v10.7 and later.
(Read and Write computed property)

### 74.5.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSDraggingContextOutsideApplication | 0 | Whether a drag terminates within or outside the application.<br>The dragging terminates outside the application.<br>Available in OS X v10.7 and later. |
| NSDraggingContextWithinApplication | 1 | Whether a drag terminates within or outside the application.<br>The dragging terminates within the application.<br>Available in OS X v10.7 and later. |

Visual Format Constants

| Constant | Value | Description |
|---|---|---|
| NSDraggingFormationDefault | 0 | The system determined formation.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationList | 3 | Drag images are laid out vertically, non-overlapping with the left edges aligned.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationNone | 1 | Drag images maintain their set positions relative to each other/<br>Available in OS X v10.7 and later. |
| NSDraggingFormationPile | 2 | Drag images are placed on top of each other with random rotations.<br>Available in OS X v10.7 and later. |
| NSDraggingFormationStack | 4 | Drag images are laid out overlapping diagonally.<br>Available in OS X v10.7 and later. |

## 74.6 Globals

### 74.6.1 InstallDragImageMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Install drag image patch.
**Notes:** This allows you to use retina NSImage for drag image with using Xojo's built in drag and drop classes.
So call InstallDragImageMBS once in app.open to initialize.

Than before call DragItem.Drag, call SetNextDragImageMBS and provide a 2x image as NSImageMBS object.
See example project for details.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr5

### 74.6.2 SetNextDragImageMBS(Img as NSImageMBS, DragItemCount as Integer = 1)

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets which image to use for next drag.
**Notes:** Once image has been replaced for Xojo's drag, the image reference is freed by plugin.

Please call setSize on the NSImageMBS to set the size to use.
e.g. half the pixels, so the picture is sharp on a retina screen.

Added DragItemCount parameter for version 23.0 to define how many drag items you have, so all can get the new picture.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr3

## 74.7 class WinDataObjectMBS

### 74.7.1 class WinDataObjectMBS

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a data object for Drag and Drop.
**Example:**

```
// take some picture
dim p as Picture = LogoMBS(500)

// create data object
dim w as new WinDataObjectMBS(p)
```

**Notes:** While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr3
- MBS Xojo Plugins, version 20.3pr9
- MBS Xojo plug-ins in version 16.0
- MBS Xojo / Real Studio Plugins, version 16.0pr8
- More Drag & Drop on Windows
- MBS Xojo / Real Studio Plugins, version 15.5pr3
- MBS Real Studio Plugins, version 11.2pr4
- MBS REALbasic Plugins, version 10.6pr6
- MBS REALbasic Plugins, version 10.6pr5

**Xojo Developer Magazine**

- 18.6, page 10: News

### 74.7.2 Methods

### 74.7.3 AddDragImage(pic as picture, width as Integer, height as Integer, x as Integer, y as Integer)

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop only.

**Function:** Adds a drag image to the data object.
**Notes:** pic: the picture to use.
width and height: The size of the picture.
x and y: The location of the cursor within the drag image. The point should contain the offset from the

upper-left corner of the drag image to the location of the cursor.

Requires Windows 2000 Professional with SP3, Windows XP.
On success the HelperHandle property is not zero.

Turn off antialiasing when drawing text. Otherwise, artifacts could occur at the edges, between the text color and the color key.

This function takes the picture (and it's mask) and turns it in a nice drag picture. This includes applying the mask and passing black for the background color. Dark colors which should be transparent will be made lighter.
See also:

- 74.7.4 AddDragImage(pic as picture, width as Integer, height as Integer, x as Integer, y as Integer, ImageBackgroundColor as color) 12442

### 74.7.4 AddDragImage(pic as picture, width as Integer, height as Integer, x as Integer, y as Integer, ImageBackgroundColor as color)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop only.

**Function:** Adds a drag image to the data object.
**Notes:** pic: the picture to use.
width and height: The size of the picture.
x and y: The location of the cursor within the drag image. The point should contain the offset from the upper-left corner of the drag image to the location of the cursor.
ImageBackgroundColor: The color used by the control to fill the background of the drag image.

Requires Windows 2000 Professional with SP3, Windows XP.
On success the HelperHandle property is not zero.

Turn off antialiasing when drawing text. Otherwise, artifacts could occur at the edges, between the text color and the color key.
See also:

- 74.7.3 AddDragImage(pic as picture, width as Integer, height as Integer, x as Integer, y as Integer) 12441

### 74.7.5 AddFiles(files() as folderitem)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds file references in the format the explorer can understand them.
See also:

- 74.7.6 AddFiles(pathes() as string) 12443


### 74.7.6 AddFiles(pathes() as string)

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds file pathes in the format the explorer can understand them.
**Notes:** Folder pathes should have no backslash on the end.
See also:


- 74.7.5 AddFiles(files() as folderitem) 12442


### 74.7.7 AddPicture(pic as picture)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop only.

**Function:** Adds a picture to the data object.

### 74.7.8 AddRaw(format as Integer, data as string)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds raw data to the data object.
**Notes:** Depending of the format you may need to add chr(0) on the end.

### 74.7.9 AddText(text as string)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds the text to the data object.

### 74.7.10 Constructor

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an empty data object.
See also:


- 74.7.11 Constructor(files() as folderitem) 12444
- 74.7.12 Constructor(pic as picture) 12444
- 74.7.13 Constructor(text as string) 12444

### 74.7.11 Constructor(files() as folderitem)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a data object and adds the files.
See also:


- 74.7.10 Constructor 12443
- 74.7.12 Constructor(pic as picture) 12444
- 74.7.13 Constructor(text as string) 12444


### 74.7.12 Constructor(pic as picture)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop only.

**Function:** Creates a new data object and adds the given picture.
**Example:**

```
// take some picture
dim p as Picture = LogoMBS(500)

// create data object
dim w as new WinDataObjectMBS(p)
```

See also:


- 74.7.10 Constructor 12443
- 74.7.11 Constructor(files() as folderitem) 12444
- 74.7.13 Constructor(text as string) 12444


### 74.7.13 Constructor(text as string)

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new data object and adds the given text.
**Example:**

```
// create data object with text
dim w as new WinDataObjectMBS("Hello World")
```

See also:

- 74.7.10 Constructor 12443
- 74.7.11 Constructor(files() as folderitem) 12444
- 74.7.12 Constructor(pic as picture) 12444


### 74.7.14 Formats as String()

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of formats in the data object.
**Notes:** Helps for debugging to see what is inside.

### 74.7.15 GetFileContents(index as Integer) as string

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries file content for the file with the given index.
**Notes:** Use index from WindowsFileDescriptorMBS.index property.

This works for files up to a few hundred megabytes in size. For larger files we will have to change plugin if you want to receive those.

Only accepts data provided as blob.
See also:


- 74.7.16 GetFileContents(index as integer, byref IsPath as boolean) as string 12445


### 74.7.16 GetFileContents(index as integer, byref IsPath as boolean) as string

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries file content for the file with the given index.
**Notes:** Use index from WindowsFileDescriptorMBS.index property.

This works for files up to a few hundred megabytes in size. For larger files we will have to change plugin if you want to receive those.

IsPath is set to true, when the returned data is a file path instead of data itself.
See also:


- 74.7.15 GetFileContents(index as Integer) as string 12445

### 74.7.17 GetFileDescriptors as WindowsFileDescriptorMBS()

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries file descriptors.
**Example:**

```
dim dataObject as WinDataObjectMBS // your data object

dim des(-1) as WindowsFileDescriptorMBS = dataObject.GetFileDescriptors

for each d as WindowsFileDescriptorMBS in des
// we got file descriptions. Some metadata and the data. No path.
dim data as string = dataObject.GetFileContents(0)
msgbox "File """+d.FileName+""" with "+str(lenb(data))+" bytes data."
next
```

**Notes:** Result array is empty on any error.

### 74.7.18 GetFileName as string

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries filename from data object.
**Notes:** Depending on how the other application works, the drag data object may have either file descriptors, a file path or path strings.

The file name is valid at least as long as this object is alive.

### 74.7.19 GetPaths as folderitem()

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the paths in the data object.
**Example:**

```
dim dataObject as WinDataObjectMBS // your data object

dim files(-1) as FolderItem = dataObject.GetPaths

for each f as FolderItem in files
// we got a file you can use like any other file (e.g. copy)
listbox1.AddRow "Path """+f.NativePath+"""
```

next

**Notes:** Checks for a CF_HDROP type. May return one or more folderitems.

### 74.7.20 GetPathStrings as string()

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the paths in the data object.
**Notes:** Checks for a CF_HDROP type. May return one or more folderitems.

### 74.7.21 GetPicture as picture

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries the picture from the data object.
**Notes:** Supports CF_BITMAP/TYMED_GDI.

### 74.7.22 GetRaw(format as Integer) as string

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the raw data for the given type.

### 74.7.23 GetText as string

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the text from the data object.
**Notes:** Returns unicode or ANSI text depending on what is available. Unicode is preferred.

### 74.7.24 HasFileDescriptors as boolean

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether this data object contains file descriptors.
**Notes:** Returns true if a path is found.

Checks for CF_FILEGROUPDESCRIPTOR.

Windows uses File Descriptors and FileContents for drag and drop operations where the data is not stored in a file. You get the descriptors and if you need you can get the data which is delivered just in time.

### 74.7.25 HasFileName as boolean

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks to see if a filename entry is in the data object.

### 74.7.26 HasPaths as boolean

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether this data object contains file paths.
**Notes:** Returns true if a path is found.
Checks for CF_HDROP.

### 74.7.27 HasPicture as boolean

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks if a picture is part of this data object.
**Notes:** Returns true if a picture is found.
Checks for CF_BITMAP.

### 74.7.28 HasRaw(format as Integer) as boolean

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether this data object contains data in the given format.

### 74.7.29 HasText as boolean

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether this data object contains Text or UnicodeText.
**Notes:** Returns true if text is found.

Checks for CF_UNICODETEXT and CF_TEXT.

### 74.7.30 Properties

### 74.7.31 DragImage as Picture

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The drag image.
**Notes:** Used to show user what he is dragging.
(Read only property)

### 74.7.32 Handle as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle.
**Notes:** (Read and Write property)

### 74.7.33 HelperHandle as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal helper object to handle the drag image.
**Notes:** This value is not zero if the AddDragImage call was successful.
(Read and Write property)

### 74.7.34 Lasterror as Integer

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 74.7.35 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CF_BITMAP | 2 | One of the constants for the data types. |
| CF_DIB | 8 | One of the constants for the data types. |
| CF_DIBV5 | 17 | One of the constants for the data types. |
| CF_DIF | 5 | One of the constants for the data types. |
| CF_ENHMETAFILE | 14 | One of the constants for the data types. |
| CF_HDROP | 15 | One of the constants for the data types. |
| CF_LOCALE | 16 | One of the constants for the data types. |
| CF_METAFILEPICT | 3 | One of the constants for the data types. |
| CF_OEMTEXT | 7 | One of the constants for the data types. |
| CF_PALETTE | 9 | One of the constants for the data types. |
| CF_PENDATA | 10 | One of the constants for the data types. |
| CF_RIFF | 11 | One of the constants for the data types. |
| CF_SYLK | 4 | One of the constants for the data types. |
| CF_TEXT | 1 | One of the constants for the data types. |
| CF_TIFF | 6 | One of the constants for the data types. |
| CF_UNICODETEXT | 13 | One of the constants for the data types. |
| CF_WAVE | 12 | One of the constants for the data types. |

## 74.8 class WindowsDragSourceMBS

### 74.8.1 class WindowsDragSourceMBS

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for Drag and Drop on Windows to create a drag source.
**Notes:** The WindowsDragSourceMBS class is one of the class you implement to provide drag-and-drop operations in your application. It contains methods used in any application used as a data source in a drag-and-drop operation. The data source application in a drag-and-drop operation is responsible for:

- Determining the data being dragged based on the user's selection.
- Initiating the drag-and-drop operation based on the user's mouse actions.
- Generating some of the visual feedback during the drag-and-drop operation, such as setting the cursor and highlighting the data selected for the drag-and-drop operation.
- Canceling or completing the drag-and-drop operation based on the user's mouse actions.
- Performing any action on the original data caused by the drop operation, such as deleting the data on a drag move.

WindowsDragSourceMBS contains the events for generating visual feedback to the end user and for canceling or completing the drag-and-drop operation.

When To Implement

Implement WindowsDragSourceMBS if you are developing a container or server application that can act as a data source for a drag-and-drop operation. The WindowsDragSourceMBS interface is only required during the drag-and-drop operation.

If you implement the WindowsDragSourceMBS class, you must also implement the DataObjectMBS class on the same object to represent the data being transferred.

You can use the same implementation of DataObjectMBS for drag-and-drop data as for the data object offered to the clipboard. After you have implemented clipboard operations in your application, you can add drag-and-drop operations with only a little extra work.

When To Use

You do not usually call the WindowsDragSourceMBS methods directly. Instead, your data source calls the DoDragDrop function when it detects that the user has initiated a drag-and-drop operation. Then, DoDragDrop calls the WindowsDragSourceMBS methods during the drag-and-drop operation.

For example, DoDragDrop calls WindowsDragSourceMBS.GiveFeedback when you need to change the cursor shape or when you need to provide some other visual feedback. DoDragDrop calls WindowsDragSourceMBS.QueryContinueDrag when there is a change in the mouse button state to determine if the drag-and-drop operation was canceled or completed.

While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr5

### 74.8.2 Methods

### 74.8.3 DoDragDrop(dataObject as WinDataObjectMBS, OKEffect as Integer, byref Effect as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Carries out an OLE drag and drop operation.
**Notes:** Parameters:

dataObject: The WinDataObjectMBS data object that contains the data being dragged.
OKEffects: Effects the source allows in the OLE drag-and-drop operation. Most significant is whether it permits a move. The OKEffect and Effect parameters obtain values from the DROPEFFECT* constants.
Effect: Pointer to a value that indicates how the OLE drag-and-drop operation affected the source data. The pdwEffect parameter is set only if the operation is not canceled.

This function returns S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| DRAGDROP_S_DROP | The OLE drag-and-drop operation was successful. |
| DRAGDROP_S_CANCEL | The OLE drag-and-drop operation was canceled. |
| E_UNSPEC | Unexpected error occurred. |

Remarks

If you are developing an application that can act as a data source for an OLE drag-and-drop operation, you must call DoDragDrop when you detect that the user has started an OLE drag-and-drop operation.

The DoDragDrop function enters a loop in which it calls various methods in the WindowsDragSourceMBS and WindowsDropTargetMBS interfaces. (For a successful drag-and-drop operation, the application acting as the data source must also implement WindowsDragSourceMBS, while the target application must imple-

ment WindowsDropTargetMBS.)

The DoDragDrop function determines the window under the current cursor location. It then checks to see if this window is a valid drop target.

If the window is a valid drop target, DoDragDrop calls WindowsDropTargetMBS.DragEnter. This method supplies an effect code indicating what would happen if the drop actually occurred. For a list of valid drop effects, see the DROPEFFECT* constants.

DoDragDrop calls WindowsDragSourceMBS.GiveFeedback with the effect code so that the drop source interface can provide appropriate visual feedback to the user.

DoDragDrop tracks mouse cursor movements and changes in the keyboard or mouse button state.

If the user moves out of a window, DoDragDrop calls WindowsDropTargetMBS.DragLeave.

If the mouse enters another window, DoDragDrop determines if that window is a valid drop target and then calls WindowsDropTargetMBS.DragEnter for that window.

If the mouse moves but stays within the same window, DoDragDrop calls WindowsDropTargetMBS.DragOver.

If there is a change in the keyboard or mouse button state, DoDragDrop calls WindowsDragSourceMBS.QueryContinueDrag and determines whether to continue the drag, to drop the data, or to cancel the operation based on the return value.

If the return value is S_OK, DoDragDrop first calls WindowsDropTargetMBS.DragOver to continue the operation. This method returns a new effect value and DoDragDrop then calls WindowsDragSourceMBS.GiveFeedback with the new effect so appropriate visual feedback can be set. For a list of valid drop effects, see the DROPEFFECT constants. WindowsDropTargetMBS.DragOver and WindowsDragSourceMBS.GiveFeedback are paired so that as the mouse moves across the drop target, the user is given the most up-to-date feedback on the mouse's position.

If the return value is DRAGDROP_S_DROP, DoDragDrop calls WindowsDropTargetMBS.Drop. The DoDragDrop function returns the last effect code to the source, so the source application can perform the appropriate operation on the source data, for example, cut the data if the operation was a move.

If the return value is DRAGDROP_S_CANCEL, the DoDragDrop function calls WindowsDropTargetMBS.DragLeave.

### 74.8.4 Properties

### 74.8.5 Handle as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle.
**Notes:** (Read and Write property)

### 74.8.6 Events

### 74.8.7 GiveFeedback(Effect as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Enables a source application to give visual feedback to the end user during a drag-and-drop operation by providing the DoDragDrop function with an enumeration value specifying the visual effect.
**Notes:** Effect: The drop effect value returned by the most recent call to WindowsDropTargetMBS.DragEnter, WindowsDropTargetMBS.DragOver, or WindowsDropTargetMBS.DragLeave.

Return S_OK on success. Return DRAGDROP_S_USEDEFAULTCURSORS to indicate successful completion of the method, and requests OLE to update the cursor using the OLE-provided default cursors.

When your application detects that the user has started a drag-and-drop operation, it should call the DoDragDrop function. DoDragDrop enters a loop, calling WindowsDropTargetMBS.DragEnter when the mouse first enters a drop target window, WindowsDropTargetMBS.DragOver when the mouse changes its position within the target window, and WindowsDropTargetMBS.DragLeave when the mouse leaves the target window.

For every call to either WindowsDropTargetMBS.DragEnter or WindowsDropTargetMBS.DragOver, DoDragDrop calls WindowsDropTargetMBS.GiveFeedback, passing it the drop effect value returned from the drop target call.

DoDragDrop calls WindowsDropTargetMBS.DragLeave when the mouse has left the target window. Then, DoDragDrop calls WindowsDropTargetMBS.GiveFeedback and passes the DROPEFFECT_NONE value in the dwEffect parameter.

The Effect parameter can include DROPEFFECT_SCROLL, indicating that the source should put up the drag-scrolling variation of the appropriate pointer.

Notes to Implementers

This function is called frequently during the DoDragDrop loop, so you can gain performance advantages if you optimize your implementation as much as possible.

GiveFeedback is responsible for changing the cursor shape or for changing the highlighted source based on the value of the dwEffect parameter. If you are using default cursors, you can return DRAGDROP_S_USEDEFAULTCURSORS, which causes OLE to update the cursor for you, using its defaults.

### 74.8.8 QueryContinueDrag(EscapePressed as boolean, KeyState as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Determines whether a drag-and-drop operation should be continued, canceled, or completed. You do not call this method directly.
**Notes:** The OLE DoDragDrop function calls this method during a drag-and-drop operation.

EscapePressed: Indicates whether the Esc key has been pressed since the previous call to QueryContinueDrag or to DoDragDrop if this is the first call to QueryContinueDrag. A true value indicates the end user has pressed the escape key; a false value indicates it has not been pressed.

KeyState: The current state of the keyboard modifier keys on the keyboard. Possible values can be a combination of any of the flags MK_CONTROL, MK_SHIFT, MK_ALT, MK_BUTTON, MK_LBUTTON, MK_MBUTTON, and MK_RBUTTON.

This event can return the following values.

| Return code | Description |
|---|---|
| S_OK | The drag operation should continue. This result occurs if no errors are detected, the mouse button starting the drag-and-drop operation has not been released, and the Esc key has not been detected. |
| DRAGDROP_S_DROP | The drop operation should occur completing the drag operation. This result occurs if KeyState indicates that the key that started the drag-and-drop operation has been released. |
| DRAGDROP_S_CANCEL | The drag operation should be canceled with no drop operation occurring. This result occurs if EscapePressed is true, indicating the Esc key has been pressed. |

The DoDragDrop function calls QueryContinueDrag whenever it detects a change in the keyboard or mouse button state during a drag-and-drop operation. QueryContinueDrag must determine whether the drag-and-drop operation should be continued, canceled, or completed based on the contents of the parameters KeyState and EscapePressed.

### 74.8.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DRAGDROP_S_CANCEL | &H00040101 | One of the OLE error codes.<br>Drag and Drop was cancelled. |
| DRAGDROP_S_DROP | &h00040100 | One of the OLE error codes.<br>Do the drop operation. |
| DRAGDROP_S_USEDEFAULTCURSORS | &h00040102 | One of the OLE error codes. |
| DROPEFFECT_COPY | 1 | One of the drop effect constants.<br>Drop results in a copy. The original data is untouched by t<br>Your application should always mask drop effect constants<br>ibility with future implementations. Presently, only some<br>in a drop effect value have meaning. In the future, more<br>the bits will be added. Drag sources and drop targets sho<br>these values appropriately before comparing. They shoul<br>drop effect value against, say, DROPEFFECT_COPY by<br>if DropEffect = DROPEFFECT_COPY then<br>Instead, the application should always mask for the value or<br>as using one of the following techniques:<br>if bitwiseAnd(DropEffect, DROPEFFECT_COPY)<br>FECT_COPY then<br>This allows for the definition of new drop effects, while pr<br>compatibility with existing code. |
| DROPEFFECT_LINK | 4 | One of the drop effect constants.<br>Drag source should create a link to the original data. |
| DROPEFFECT_MOVE | 2 | One of the drop effect constants.<br>Drag source should remove the data. |
| DROPEFFECT_NONE | 0 | One of the drop effect constants.<br>Drop target cannot accept the data. |
| DROPEFFECT_SCROLL | &h80000000 | One of the drop effect constants.<br>Scrolling is about to start or is currently occurring in the t<br>used in addition to the other values. |
| MK_CONTROL | 8 | One of the key state constants.<br>The CTRL key is down. |
| MK_LBUTTON | 1 | One of the key state constants.<br>The left mouse button is down. |
| MK_MBUTTON | &h10 | One of the key state constants.<br>The middle mouse button is down. |
| MK_RBUTTON | 2 | One of the key state constants.<br>The right mouse button is down. |
| MK_SHIFT | 4 | One of the key state constants.<br>The SHIFT key is down. |
| MK_XBUTTON1 | &h20 | One of the key state constants.<br>The first X button is down. |
| MK_XBUTTON2 | &h40 | One of the key state constants.<br>The second X button is down. |
| S_FALSE | 1 | One of the OLE error codes. |
| S_OK | 0 | One of the OLE error codes. |

## 74.9 class WindowsDropTargetMBS

### 74.9.1 class WindowsDropTargetMBS

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WindowsDropTargetMBS interface is one of the interfaces you implement to provide drag-and-drop operations in your application.
**Notes:** It contains methods used in any application that can be a target for data during a drag-and-drop operation. A drop-target application is responsible for:

- Determining the effect of the drop on the target application.
- Incorporating any valid dropped data when the drop occurs.
- Communicating target feedback to the source so the source application can provide appropriate visual feedback such as setting the cursor.
- Implementing drag scrolling.
- Registering and revoking its application windows as drop targets.

The WindowsDropTargetMBS class contains methods that handle all these responsibilities except registering and revoking the application window as a drop target, for which you must call the AttachToWindow functions.

When To Implement

Implement the WindowsDropTargetMBS interface if you are developing an application that can act as a target for a drag-and-drop operation. The WindowsDropTargetMBS interface is associated with your application windows and is implemented on your window objects. Call the AttachToWindow function to register your window objects as drop targets.

When To Use

You do not call the methods of WindowsDropTargetMBS directly. The DoDragDrop function calls the WindowsDropTargetMBS methods during the drag-and-drop operation.

For example, DoDragDrop calls WindowsDropTargetMBS.DragEnter when it detects the mouse has moved over a window that is registered as a drag target. After the mouse has entered a drag-target window, DoDragDrop calls WindowsDropTargetMBS.DragOver as the mouse moves through the window and calls WindowsDropTargetMBS.DragLeave if the mouse leaves the target window or if the user cancels or completes the drag-and-drop operation. DoDragDrop calls WindowsDropTargetMBS.Drop if the drop finally occurs.

To see the ghost picture of the drag, please register a WindowsDragSourceMBS for the same window.

While the drag classes compile for Web Edition, they run on the server, so they have no effect on the client browser!
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr5
- MBS REALbasic Plugins, version 10.5pr5

### 74.9.2 Methods

### 74.9.3 AttachToControl(ctl as control, showDragImage as boolean = true) as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop only.

**Function:** Attached the drop target to the control.
**Notes:** This method unregistered any existing drop target on the control (including the one from Xojo).

Registers the specified control as one that can be the target of an OLE drag-and-drop operation and specifies the WindowsDropTargetMBS instance to use for drop operations.

ctl: The control that can be a target for an OLE drag-and-drop operation.
showDragImage: Whether we should support the drag image methods in the newer Windows versions.

This function returns S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| DRAGDROP_E_INVALIDHWND | Invalid handle returned in the hwnd parameter. |
| DRAGDROP_E_ALREADYREGISTERED | The specified window has already been registered as a drop target. |
| E_OUTOFMEMORY | Insufficient memory for the operation. |

If your application can accept dropped objects during OLE drag-and-drop operations, you must call the AttachToControl function. Do this whenever one of your application windows is available as a potential drop target, i.e., when the window appears unobscured on the screen.

AttachToControl must be called on the main thread of your application.

The AttachToControl function only registers one control at a time, so you must call it for each application control capable of accepting dropped objects. For each control, you need your own instance of the WindowsDropTargetMBS class.

As the mouse passes over unobscured portions of the target control during an OLE drag-and-drop operation, the DoDragDrop function calls the specified WindowsDropTargetMBS.DragOver method for the current control. When a drop operation actually occurs in a given control, the DoDragDrop function calls WindowsDropTargetMBS.Drop.
See also:


- 74.9.4 AttachToControl(ctl as DesktopControl, showDragImage as boolean = true) as integer 12460


### 74.9.4 AttachToControl(ctl as DesktopControl, showDragImage as boolean = true) as integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Attached the drop target to the control.
**Notes:** This method unregistered any existing drop target on the control (including the one from Xojo).

Registers the specified control as one that can be the target of an OLE drag-and-drop operation and specifies the WindowsDropTargetMBS instance to use for drop operations.

ctl: The control that can be a target for an OLE drag-and-drop operation.
showDragImage: Whether we should support the drag image methods in the newer Windows versions.

This function returns S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| DRAGDROP_E_INVALIDHWND | Invalid handle returned in the hwnd parameter. |
| DRAGDROP_E_ALREADYREGISTERED | The specified window has already been registered as a drop target. |
| E_OUTOFMEMORY | Insufficient memory for the operation. |

If your application can accept dropped objects during OLE drag-and-drop operations, you must call the AttachToControl function. Do this whenever one of your application windows is available as a potential drop target, i.e., when the window appears unobscured on the screen.

AttachToControl must be called on the main thread of your application.

The AttachToControl function only registers one control at a time, so you must call it for each application control capable of accepting dropped objects. For each control, you need your own instance of the WindowsDropTargetMBS class.

As the mouse passes over unobscured portions of the target control during an OLE drag-and-drop operation, the DoDragDrop function calls the specified WindowsDropTargetMBS.DragOver method for the current control. When a drop operation actually occurs in a given control, the DoDragDrop function calls Windows-

DropTargetMBS.Drop.
See also:

- 74.9.3 AttachToControl(ctl as control, showDragImage as boolean = true) as Integer 12459

### 74.9.5 AttachToWindow(win as DesktopWindow, showDragImage as boolean = true) as integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Attached the drop target to the window.
**Notes:** This method unregistered any existing drop target on the window (including the one from Xojo).

Registers the specified window as one that can be the target of an OLE drag-and-drop operation and specifies the WindowsDropTargetMBS instance to use for drop operations.

Win: The window that can be a target for an OLE drag-and-drop operation.
showDragImage: Whether we should support the drag image methods in the newer Windows versions.

This function returns S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| DRAGDROP_E_INVALIDHWND | Invalid handle returned in the hwnd parameter. |
| DRAGDROP_E_ALREADYREGISTERED | The specified window has already been registered as a drop target. |
| E_OUTOFMEMORY | Insufficient memory for the operation. |

If your application can accept dropped objects during OLE drag-and-drop operations, you must call the AttachToWindow function. Do this whenever one of your application windows is available as a potential drop target, i.e., when the window appears unobscured on the screen.

AttachToWindow must be called on the main thread of your application.

The AttachToWindow function only registers one window at a time, so you must call it for each application window capable of accepting dropped objects. For each window, you need your own instance of the WindowsDropTargetMBS class.

As the mouse passes over unobscured portions of the target window during an OLE drag-and-drop operation, the DoDragDrop function calls the specified WindowsDropTargetMBS.DragOver method for the current window. When a drop operation actually occurs in a given window, the DoDragDrop function calls WindowsDropTargetMBS.Drop.
See also:

- 74.9.6 AttachToWindow(win as window, showDragImage as boolean = true) as Integer 12462

### 74.9.6 AttachToWindow(win as window, showDragImage as boolean = true) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop only.

**Function:** Attached the drop target to the window.
**Notes:** This method unregistered any existing drop target on the window (including the one from Xojo).

Registers the specified window as one that can be the target of an OLE drag-and-drop operation and specifies the WindowsDropTargetMBS instance to use for drop operations.

Win: The window that can be a target for an OLE drag-and-drop operation.
showDragImage: Whether we should support the drag image methods in the newer Windows versions.

This function returns S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| DRAGDROP_E_INVALIDHWND | Invalid handle returned in the hwnd parameter. |
| DRAGDROP_E_ALREADYREGISTERED | The specified window has already been registered as a drop target. |
| E_OUTOFMEMORY | Insufficient memory for the operation. |

If your application can accept dropped objects during OLE drag-and-drop operations, you must call the AttachToWindow function. Do this whenever one of your application windows is available as a potential drop target, i.e., when the window appears unobscured on the screen.

AttachToWindow must be called on the main thread of your application.

The AttachToWindow function only registers one window at a time, so you must call it for each application window capable of accepting dropped objects. For each window, you need your own instance of the WindowsDropTargetMBS class.

As the mouse passes over unobscured portions of the target window during an OLE drag-and-drop operation, the DoDragDrop function calls the specified WindowsDropTargetMBS.DragOver method for the current window. When a drop operation actually occurs in a given window, the DoDragDrop function calls WindowsDropTargetMBS.Drop.
See also:

- 74.9.5 AttachToWindow(win as DesktopWindow, showDragImage as boolean = true) as integer 12461

### 74.9.7 Properties

### 74.9.8 Handle as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle.
**Notes:** (Read and Write property)

### 74.9.9 Helper as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the helper object.
**Notes:** (Read and Write property)

### 74.9.10 Events

### 74.9.11 DragEnter(dataObject as WinDataObjectMBS, keystate as Integer, x as Integer, y as Integer, byref effect as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Indicates whether a drop can be accepted, and, if so, the effect of the drop.
**Notes:** dataObject: This data object contains the data being transferred in the drag-and-drop operation. If the drop occurs, this data object will be incorporated into the target.

KeyState: The current state of the keyboard modifier keys on the keyboard. Possible values can be a combination of any of the flags MK_CONTROL, MK_SHIFT, MK_ALT, MK_BUTTON, MK_LBUTTON, MK_MBUTTON, and MK_RBUTTON.

x and y: A point containing the current cursor coordinates in screen coordinates.

effect: The value of the Effect parameter of the DoDragDrop function. On return, must contain one of the DROPEFFECT flags, which indicates what the result of the drop operation would be.

Return S_OK on success. Other possible values include the following.

You do not call DragEnter directly; instead the DoDragDrop function calls it to determine the effect of a drop the first time the user drags the mouse into the registered window of a drop target.

| Return code | Description |
|---|---|
| E_UNEXPECTED | An unexpected error has occurred. |
| E_INVALIDARG | The Effect parameter is NULL on input. |
| E_OUTOFMEMORY | There was insufficient memory available for this operation. |

To implement DragEnter, you must determine whether the target can use the data in the source data object by checking three things:

- The format and medium specified by the data object
- The input value of Effect
- The state of the modifier keys

To check the format and medium, use the WinDataObjectMBS object.

On entry to WindowsDropTargetMBS.DragEnter, the Effect parameter is set to the effects given to the OkEffect parameter of the DoDragDrop function. The WindowsDropTargetMBS.DragEnter method must choose one of these effects or disable the drop.

The following modifier keys affect the result of the drop.

| Key Combination | User-Visible Feedback | Drop Effect |
|---|---|---|
| CTRL + SHIFT | = | DROPEFFECT_LINK |
| CTRL | + | DROPEFFECT_COPY |
| No keys or SHIFT | None | DROPEFFECT_MOVE |

On return, the method must write the effect, one of the DROPEFFECT flags, to the Effect parameter. DoDragDrop then takes this parameter and writes it to its Effect parameter. You communicate the effect of the drop back to the source through DoDragDrop in the Effect parameter. The DoDragDrop function then calls WindowsDragSourceMBS.GiveFeedback so that the source application can display the appropriate visual feedback to the user through the target window.

### 74.9.12 DragLeave as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Removes target feedback and releases the data object.
**Notes:** Return S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| E_OUTOFMEMORY | There is insufficient memory available for this operation. |

You do not call this method directly. The DoDragDrop function calls this method in either of the following cases:

- When the user drags the cursor out of a given target window.
- When the user cancels the current drag-and-drop operation.

To implement WindowsDropTargetMBS.DragLeave, you must remove any target feedback that is currently displayed. You must also release any references you hold to the data transfer object.

### 74.9.13 DragOver(keystate as Integer, x as Integer, y as Integer, byref effect as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Provides target feedback to the user and communicates the drop's effect to the DoDragDrop function so it can communicate the effect of the drop back to the source.
**Notes:** KeyState: The current state of the keyboard modifier keys on the keyboard. Valid values can be a combination of any of the flags MK_CONTROL, MK_SHIFT, MK_ALT, MK_BUTTON, MK_LBUTTON, MK_MBUTTON, and MK_RBUTTON.
x and y: The point containing the current cursor coordinates in screen coordinates.
Effect: On input, pointer to the value of the Effect parameter of the DoDragDrop function. On return, must contain one of the DROPEFFECT flags, which indicates what the result of the drop operation would be.

Return S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| E_UNEXPECTED | An unexpected error has occurred. |
| E_INVALIDARG | The Effect value is not valid. |
| E_OUTOFMEMORY | There was insufficient memory available for this operation. |

You do not call DragOver directly. The DoDragDrop function calls this method each time the user moves the mouse across a given target window. DoDragDrop exits the loop if the drag-and-drop operation is canceled, if the user drags the mouse out of the target window, or if the drop is completed.

In implementing WindowsDropTargetMBS.DragOver, you must provide features similar to those in WindowsDropTargetMBS.DragEnter. You must determine the effect of dropping the data on the target by

examining the FORMATETC defining the data object's formats and medium, along with the state of the modifier keys. The mouse position may also play a role in determining the effect of a drop. The following modifier keys affect the result of the drop.

| Key Combination | User-Visible Feedback | Drop Effect |
|---|---|---|
| CTRL + SHIFT | = | DROPEFFECT_LINK |
| CTRL | + | DROPEFFECT_COPY |
| No keys or SHIFT | None | DROPEFFECT_MOVE |

You communicate the effect of the drop back to the source through DoDragDrop in Effect. The DoDragDrop function then calls WindowsDragSourceMBS.GiveFeedback so the source application can display the appropriate visual feedback to the user.

On entry to WindowsDropTargetMBS.DragOver, the Effect parameter must be set to the allowed effects passed to the OkEffect parameter of the DoDragDrop function. The WindowsDropTargetMBS.DragOver method must be able to choose one of these effects or disable the drop.

Upon return, Effect is set to one of the DROPEFFECT flags. This value is then passed to the Effect parameter of DoDragDrop. Reasonable values are DROPEFFECT_COPY to copy the dragged data to the target, DROPEFFECT_LINK to create a link to the source data, or DROPEFFECT_MOVE to allow the dragged data to be permanently moved from the source application to the target.

You may also wish to provide appropriate visual feedback in the target window. There may be some target feedback already displayed from a previous call to WindowsDropTargetMBS.DragOver or from the initial WindowsDropTargetMBS.DragEnter. If this feedback is no longer appropriate, you should remove it.

For efficiency reasons, a data object is not passed in WindowsDropTargetMBS.DragOver. The data object passed in the most recent call to WindowsDropTargetMBS.DragEnter is available and can be used.

When WindowsDropTargetMBS.DragOver has completed its operation, the DoDragDrop function calls WindowsDragSourceMBS.GiveFeedback so the source application can display the appropriate visual feedback to the user.

Notes to Implementers

This function is called frequently during the DoDragDrop loop so it makes sense to optimize your implementation of the DragOver method as much as possible.

### 74.9.14 Drop(dataObject as WinDataObjectMBS, keystate as Integer, x as Integer, y as Integer, byref effect as Integer) as Integer

MBS Win Plugin, Plugin Version: 10.5, Platform: Windows, Targets: .

**Function:** Incorporates the source data into the target window, removes target feedback, and releases the data object.
**Notes:** dataObject: The data object being transferred in the drag-and-drop operation.
KeyState: The current state of the keyboard modifier keys on the keyboard. Possible values can be a combination of any of the flags MK_CONTROL, MK_SHIFT, MK_ALT, MK_BUTTON, MK_LBUTTON, MK_MBUTTON, and MK_RBUTTON.
x and y: The point containing the current cursor coordinates in screen coordinates.
Effect: On input, the value of the Effect parameter of the DoDragDrop function. On return, must contain one of the DROPEFFECT flags, which indicates what the result of the drop operation would be.

Return S_OK on success. Other possible values include the following.

| Return code | Description |
|---|---|
| E_UNEXPECTED | An unexpected error has occurred. |
| E_INVALIDARG | The pdwEffect parameter is not valid. |
| E_OUTOFMEMORY | There is insufficient memory available for this operation. |

You do not call this method directly. The DoDragDrop function calls this method when the user completes the drag-and-drop operation.

In implementing Drop, you must incorporate the data object into the target. Use the formats available in WinDataObjectMBS, available through dataObject, along with the current state of the modifier keys to determine how the data is to be incorporated, such as linking or embedding.

In addition to incorporating the data, you must also clean up as you do in the WindowsDropTargetMBS.DragLeave method:

Remove any target feedback that is currently displayed.
Release any references to the data object.
You also pass the effect of this operation back to the source application through DoDragDrop, so the source application can clean up after the drag-and-drop operation is complete:

Remove any source feedback that is being displayed.
Make any necessary changes to the data, such as removing the data if the operation was a move.

### 74.9.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DROPEFFECT_COPY | 1 | One of the drop effect constants.<br>Drop results in a copy. The original data is untouched by the drag source.<br>Your application should always mask drop effect constants to ensure compa ibility with future implementations. Presently, only some of the bit positio in a drop effect value have meaning. In the future, more interpretations f the bits will be added. Drag sources and drop targets should carefully ma these values appropriately before comparing. They should never compare drop effect value against, say, DROPEFFECT_COPY by doing the followin if DropEffect = DROPEFFECT_COPY then<br>Instead, the application should always mask for the value or values being soug as using one of the following techniques:<br>if bitwiseAnd(DropEffect, DROPEFFECT_COPY) = DROPE FECT_COPY then<br>This allows for the definition of new drop effects, while preserving backwar compatibility with existing code. |
| DROPEFFECT_LINK | 4 | One of the drop effect constants.<br>Drag source should create a link to the original data. |
| DROPEFFECT_MOVE | 2 | One of the drop effect constants.<br>Drag source should remove the data. |
| DROPEFFECT_NONE | 0 | One of the drop effect constants.<br>Drop target cannot accept the data. |
| DROPEFFECT_SCROLL | &h80000000 | One of the drop effect constants.<br>Scrolling is about to start or is currently occurring in the target. This value used in addition to the other values. |
| E_INVALIDARG | &h80070057 | One of the OLE error codes.<br>An invalid argument was passed. |
| E_OUTOFMEMORY | &h80000002 | One of the OLE error codes.<br>There was insufficient memory available for this operation. |
| E_UNEXPECTED | &h8000FFFF | One of the OLE error codes.<br>An unexpected error has occurred. |
| MK_CONTROL | 8 | One of the key state constants.<br>The CTRL key is down. |
| MK_LBUTTON | 1 | One of the key state constants.<br>The left mouse button is down. |
| MK_MBUTTON | &h10 | One of the key state constants.<br>The middle mouse button is down. |
| MK_RBUTTON | 2 | One of the key state constants.<br>The right mouse button is down. |
| MK_SHIFT | 4 | One of the key state constants.<br>The SHIFT key is down. |
| MK_XBUTTON1 | &h20 | One of the key state constants.<br>The first X button is down. |
| MK_XBUTTON2 | &h40 | One of the key state constants.<br>The second X button is down. |
| S_FALSE | 1 | One of the OLE error codes. |
| S_OK | 0 | One of the OLE error codes. |

## 74.10 class WindowsFileDescriptorMBS

### 74.10.1 class WindowsFileDescriptorMBS

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a file description.s
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr4

### 74.10.2 Properties

### 74.10.3 ClassID as String

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file type identifier.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_CLSID) <>0 then
MsgBox d.ClassID
end if
```

**Notes:** Only valid if FD_CLSID is set in the flags.
(Read and Write property)

### 74.10.4 CreationTime as Double

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time of file creation.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_CREATETIME) <>0 then
dim da as new date
da.TotalSeconds = d.CreationTime
MsgBox da.LongDate
end if
```

**Notes:** Only valid if FD_CREATETIME is set in the flags.
(Read and Write property)

### 74.10.5 FileAttributes as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** File attribute flags.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_ATTRIBUTES) <>0 then
if BitwiseAnd(d.FileAttributes, d.FILE_ATTRIBUTE_TEMPORARY) = d.FILE_ATTRIBUTE_TEMPORARY then
MsgBox "temp file"
else
MsgBox "no temp file"
end if
end if
```

**Notes:** This will be a combination of the FILE_ATTRIBUTE_* constants.
Only valid if FD_ATTRIBUTES is set in the flags.
(Read and Write property)

### 74.10.6 FileName as String

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that contains the name of the file.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

MsgBox d.FileName
```

**Notes:** (Read and Write property)

### 74.10.7 FileSize as Int64

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file size, in bytes.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_FILESIZE) <>0 then
MsgBox str(d.FileSize)
end if
```

**Notes:** Only valid if FD_FILESIZE is set in flags.
(Read and Write property)

### 74.10.8 Flags as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An array of flags that indicate which of the other structure members contain valid data.
**Notes:** A combination of the FD_* constants.
(Read and Write property)

### 74.10.9 IconHeight as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the file icon.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_SIZEPOINT) <>0 then
MsgBox "file object at "+stR(d.Pointx)+"/"+str(d.Pointy)+" with size "+str(d.IconWidth)+"/"+str(d.Icon-
Height)
end if
```

**Notes:** Only valid if FD_SIZEPOINT is set in the flags.
(Read and Write property)

### 74.10.10 IconWidth as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the file icon.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_SIZEPOINT) <>0 then
MsgBox "file object at "+strR(d.Pointx)+"/"+str(d.Pointy)+" with size "+str(d.IconWidth)+"/"+str(d.IconHeight)
end if
```

**Notes:** Only valid if FD_SIZEPOINT is set in the flags.
(Read and Write property)

### 74.10.11 Index as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The index of the file descriptor.
**Notes:** Use this entry for GetFileContent call.
(Read and Write property)

### 74.10.12 LastAccessTime as Double

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time that the file was last accessed.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_ACCESSTIME) <>0 then
dim da as new date
da.TotalSeconds = d.LastAccessTime
MsgBox da.LongDate
end if
```

**Notes:** Only valid if FD_ACCESSTIME is set in the flags.
(Read and Write property)

### 74.10.13 LastWriteTime as Double

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time of the last write operation.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_WRITESTIME) <>0 then
dim da as new date
da.TotalSeconds = d.LastWriteTime
MsgBox da.LongDate
end if
```

**Notes:** Only valid if FD_WRITESTIME is set in the flags.
(Read and Write property)

### 74.10.14 PointX as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The x screen coordinate of the file object.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_SIZEPOINT) <>0 then
MsgBox "file object at "+strR(d.Pointx)+"/"+str(d.Pointy)+" with size "+str(d.IconWidth)+"/"+str(d.Icon-
Height)
end if
```

**Notes:** Only valid if FD_SIZEPOINT is set in the flags.
(Read and Write property)

### 74.10.15 PointY as Integer

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The y screen coordinate of the file object.
**Example:**

```
dim d as WindowsFileDescriptorMBS // your file description

if BitwiseAnd(d.Flags, d.FD_SIZEPOINT) <>0 then
MsgBox "file object at "+stR(d.Pointx)+"/"+str(d.Pointy)+" with size "+str(d.IconWidth)+"/"+str(d.Icon-
Height)
end if
```

**Notes:** Only valid if FD_SIZEPOINT is set in the flags.
(Read and Write property)

### 74.10.16 Constants

Flag constants

| Constant | Value | Description |
|---|---|---|
| FD_ACCESSTIME | &h0010 | The LastAccessTime member is valid. |
| FD_ATTRIBUTES | 4 | The FileAttributes member is valid. |
| FD_CLSID | 1 | The ClassID member is valid. |
| FD_CREATETIME | 8 | The CreationTime member is valid. |
| FD_FILESIZE | &h0040 | Whether the FileSize member is valid. |
| FD_LINKUI | &h8000 | Treat the operation as a shortcut. |
| FD_PROGRESSUI | &h4000 | A progress indicator is shown with drag-and-drop operations. |
| FD_SIZEPOINT | 2 | The Icon* and point* members are valid. |
| FD_WRITESTIME | &h0020 | Whether the LastWriteTime property is valid. |

File attribute constants

| Constant | Value | Description |
|---|---|---|
| FILE_ATTRIBUTE_ARCHIVE | &h00000020 | A file or directory that is an archive file or directory. Appl use this attribute to mark files for backup or removal . |
| FILE_ATTRIBUTE_ATOMIC_WRITE | &h00000200 | |
| FILE_ATTRIBUTE_COMPRESSED | &h00000800 | A file or directory that is compressed. For a file, all of the compressed. For a directory, compression is the default for n and subdirectories. |
| FILE_ATTRIBUTE_DIRECTORY | &h00000010 | The handle that identifies a directory. |
| FILE_ATTRIBUTE_HIDDEN | &h00000002 | The file or directory is hidden. It is not included in an o listing. |
| FILE_ATTRIBUTE_NORMAL | &h00000080 | A file that does not have other attributes set. This attribute i used alone. |
| FILE_ATTRIBUTE_OFFLINE | &h00001000 | The data of a file is not available immediately. This attribute file data is physically moved to offline storage. This attribute i Storage, which is the hierarchical storage management softw should not arbitrarily change this attribute. |
| FILE_ATTRIBUTE_READONLY | &h00000001 | A file that is read-only. Applications can read the file, but c or delete it. |
| FILE_ATTRIBUTE_SYSTEM | &h00000004 | A file or directory that the operating system uses a part of, o |
| FILE_ATTRIBUTE_TEMPORARY | &h00000100 | A file that is being used for temporary storage. File systems a back to mass storage if sufficient cache memory is available, an application deletes a temporary file after the handle is scenario, the system can entirely avoid writing the data. Ot is written after the handle is closed. |
| FILE_ATTRIBUTE_XACTION_WRITE | &h00000400 | |

# Chapter 75

# DVD Playback

## 75.1 class DVDPlaybackMBS

### 75.1.1 class DVDPlaybackMBS

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** A class for DVD Playback on Mac OS X 10.3
**Notes:** Requires Mac OS X 10.3 or newer.

The DVD Playback application programming interface (API) gives you access to the DVDPlayback framework, allowing you to offer DVD playback functionality from within your application.

During a playback "session," the application must perform specific minimum operations, as follows:

1. Initialize the playback framework with calling Open. The DVDPlayback framework can only be opened by one process at a time. If a second process attempts to initialize it, an error will be returned.

2. Set the playback window with SetPlayWindow.
4. Set the video bounds with SetVideoBounds. This is the bounds within the window and is in port coordinates.
5. Open the media with OpenMediaVolume (DVD disc) or OpenMediaFile (VIDEO_TS folder).
6. Play the media.
7. When finished or switching media, close with the appropriate call (CloseMediaVolume or CloseMediaFile)
8. When quitting or finishing session, tear down the DVDPlayback framework with calling close.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- Removing 32-bit Carbon GUI classes

### 75.1.2 Methods

### 75.1.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** True if the DVD playback is installed on this Mac.
**Notes:** Requires Mac OS X 10.3 or newer.

### 75.1.4 ClearLastPlayBookmark

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the video playback position to the beginning of the disc.
**Notes:** This function sets the video playback position to the beginning of the disc, but does not begin playing the media. Calling this function is equivalent to calling the function DVDStop twice in succession. Before calling this function, media needs to be open.
Available in Mac OS X v10.4 and later.
Lasterror is set.

### 75.1.5 close

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** Call when completely done with playback. Usually when the application is quitting.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.6 CloseMediaFile

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Closes a previously opened VIDEO_TS folder.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.7 CloseMediaVolume

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Closes a previously opened DVD disc.

**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.8 DisplaySubPicture(value as boolean)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Turns the display of subpictures on or off.
**Notes:** value: A Boolean value that specifies whether to display subpictures in the current title. To display subpictures, specify TRUE. To hide subpictures, specify FALSE.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open and video playback started. You can use this function to display or hide additional bitmap graphic elements such as subtitles.

Available in Mac OS X v10.3 and later.

### 75.1.9 DoButtonActivate(inIndex as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Selects and activates a menu button by index.
**Notes:** InIndex: The 1-based index of the menu button the user has selected.

If the index coincides with an active button, this function executes the action corresponding to the button.

Available in Mac OS X v10.4 and later.

### 75.1.10 DoMenuCGClick(x as Double, y as Double) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If the point (in window root view coordinates) coincides with a menu button, it will be selected.
**Notes:** Requires Mac OS X 10.5.
Lasterror is set.

### 75.1.11 DoMenuCGMouseOver(x as Double, y as Double) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If the point (in window root view coordinates) coincides with a menu button, it will be hightlighted.
**Notes:** Requires Mac OS X 10.5.
Lasterror is set.

### 75.1.12 DoMenuClick(x as Integer, y as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If the point (in port coordinates) coincides with a menu button, it will be selected.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.13 DoMenuMouseOver(x as Integer, y as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If the point (in port coordinates) coincides with a menu button, it will be hightlighted and it's index returned in outIndex.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.14 DoUserNavigation(navigation as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Allows the user to navigate between menu buttons.
**Notes:** This is usually done using keyboard keys (arrow keys to move and Enter key to choose a menu item).
Requires Mac OS X 10.3 or newer.
Lasterror is set.

Constants:

### 75.1.15 EnableWebAccess(enable as boolean)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

| | |
|---|---|
| kDVDUserNavigationMoveUp | 1 |
| kDVDUserNavigationMoveDown | 2 |
| kDVDUserNavigationMoveLeft | 3 |
| kDVDUserNavigationMoveRight | 4 |
| kDVDUserNavigationEnter | 5 |

**Function:** Turns DVD@ccess support on or off.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3 or newer.

### 75.1.16 GetAngle as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the camera angle displayed.
**Notes:** Returnsthe integer contains the 1-based index of the current camera angle.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open and video playback started.

Available in Mac OS X v10.3 and later.

### 75.1.17 GetAspectRatio as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the aspect ratio of the current title or menu.
**Notes:** Returns the variable specifies the aspect ratio of the current title. For a list of possible aspect ratios see the aspect ration constants.

Lasterror is set.

The aspect ratio of the video can change whenever a different title or menu is displayed. You can use this function together with GetNativeVideoSize to calculate the bounds of the video area in a window.

Available in Mac OS X v10.3 and later.

### 75.1.18 GetAudioLanguageCode(byref DVDLanguageCode as string, byref DVDSubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current audio language code and extension.
**Notes:** DVDLanguageCode: On return, the variable contains the language code for the current audio stream. For a list of possible values, see the Language Codes constants.

DVDSubpictureExtensionCode: On return, the variable contains the audio extension code for the current audio stream. For a list of possible values, see Audio Extension Codes constants.

Lasterror is set.

Available in Mac OS X v10.3 and later.

### 75.1.19 GetAudioLanguageCodeByStream(StreamIndex as Integer, byref DVDLanguageCode as string, byref DVDSubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the audio language code and extension for a specified stream.
**Notes:** StreamIndex: An integer in the range 1 to 8 that specifies an audio stream in the current title.

DVDLanguageCode: On return, the variable contains the language code for the specified audio stream. For a list of possible values, see Language Codes.

DVDSubpictureExtensionCode: On return, the variable contains the audio extension code for the specified audio stream. For a list of possible values, see Audio Extension Codes.

Lasterror is set.

Available in Mac OS X v10.3 and later.

### 75.1.20 GetAudioOutputMode as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current audio mode setting.

**Notes:** Lasterror is set.

### 75.1.21 GetAudioOutputModeCapabilities as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current possible audio output mode possibilities.
**Notes:** Lasterror is set.

### 75.1.22 GetAudioStream as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the audio stream currently being used.
**Notes:** Returns the number of the current audio stream, or 0 if the current title has no audio streams.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open and video playback started.

### 75.1.23 GetAudioStreamFormat(byref outFormat as Integer, byref outBitsPerSample as Integer, byref outSamplesPerSecond as Integer, byref outChannels as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current audio format (AC3,for example).
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

DVDAudioStreamFormat constants - The different possible audio stream formats.

| | |
|---|---|
| kDVDAudioUnknownFormat | 0 |
| kDVDAudioAC3Format | 1 |
| kDVDAudioMPEG1Format | 2 |
| kDVDAudioMPEG2Format | 3 |
| kDVDAudioPCMFormat | 4 |
| kDVDAudioDTSFormat | 5 |
| kDVDAudioSDDSFormat | 6 |

### 75.1.24 GetAudioStreamFormatByStream(index as Integer, byref outFormat as Integer, byref outBitsPerSample as Integer, byref outSamplesPerSecond as Integer, byref outChannels as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the audio format for a specified stream.
**Notes:** index: An integer that specifies an audio stream in the current title.

outFormat: On return, the variable contains the audio format of the audio stream for the current title. For a list of possible formats, see "Audio Stream Formats."

outBitsPerSample: On return, the integer contains the number of bits per sample in the current audio stream.

outSamplesPerSecond: On return, the integer contains the number of samples per second in the current audio stream.

outChannels: On return, the integer contains the number of audio channels in the current audio stream.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open.

Available in Mac OS X v10.4 and later.

### 75.1.25 GetAudioVolume as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current playback audio volume setting (0 - 255).
**Notes:** Returns the current playback volume in the range 0 to 255.

Lasterror is set.

This function passes back the current playback audio volume setting. For more information, see DVDSetAudioVolume.

Available in Mac OS X v10.3 and later.

### 75.1.26 GetBookmark as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Requests a bookmark to the current play position.
**Notes:** This function is used when playing media on a DVD-Video disc. Before calling this function, the media needs to be open and playing. This function passes back a bookmark to the current play position in the current DVD-Video playback session.

For information about requesting a bookmark when the media is not playing, see GetLastPlayBookmark.

The result is a binary string!

Available in Mac OS X v10.4 and later.

### 75.1.27 GetButtoninfo(byref numberOfButtons as Integer, byref selectedButton as Integer, byref forcedActivateButton as Integer, byref userButtonOffset as Integer, byref numberOfUserButtons as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets information about all available menu buttons in the current title, domain, or content.
**Notes:** numberOfButtons: On return, the integer contains the number of buttons in the current menu.

selectedButton: On return, the integer contains the 1-based index of the selected button.

forcedActivateButton: On return, the integer contains the index of the button whose action is performed when a specified period of time elapses after the menu is first displayed.

userButtonOffset: On return, the integer contains the index of the first user-selectable button. If the number of user-selectable buttons in a menu is smaller than the total number of buttons, this index may be greater than zero.

numberOfUserButtons: On return, the integer contains the number of user-selectable buttons in the current menu.

Lasterror is set.

Available in Mac OS X v10.4 and later.

### 75.1.28 GetButtonPosition(index as Integer, byref x as Double, byref y as Double, byref w as Double, byref h as Double, byref autoAction as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the position and default action of a menu button.
**Notes:** index: The zero-based index of a menu button. If your button index is 1-based, you should decrement the index before you pass it to this function.

x,y,w,h: On return, the rectangle contains the position and dimensions of the specified button in window local coordinates.

autoAction: On return, a value of 1 indicates the button is a forced activate button—that is, the button's action is executed immediately when the button is selected. A value of 0 indicates the button is not a forced activate button.

Lasterror is set.

Available in Mac OS X v10.4 and later.

### 75.1.29 GetChapter as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current chapter.
**Notes:** Lasterror is set.

### 75.1.30 GetCurrentAudioVolume as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current video playback volume.
**Notes:** Lasterror is set.

Currently the minimum and maximum volumes are always 0 and 255.

### 75.1.31 GetDiscRegionCode as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the region codes available on a DVD-Video disc.
**Notes:** Returns a bitfield that specifies one or more region codes. For more information about region codes, see Region Codes.

Lasterror is set.

This function passes back the region codes assigned to the DVD-Video disc that's currently in use. Before calling this function, you need to call the function DVDOpenMediaVolume to open the media folder on the disc.

To test whether a disc is authorized for playback in region n, you need to compute the bitwise AND of outCode with region code n. If the result is equal to region code n, the disc is authorized for playback in region n.

Available in Mac OS X v10.3 and later.

### 75.1.32 GetDriveRegionCode(byref regioncode as Integer, byref NumberChangesLeft as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the region code the drive is set to and how many changes are left.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

Region Codes:
The drive region code must match the DVD disc region code. These calls allow getting the disc region code and getting or setting the drive region code.

NOTE: The drive region code is stored in the drive and can only be set a total of 5 times.

On the last time, the drive will be permanently locked to that region code.

### 75.1.33 GetFormatStandard as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the video broadcast format of current DVD-Video media.
**Notes:** Returns the video broadcast format of the current media. For a list of possible values, see Video

Broadcast Formats.

Lasterror is set.

This function determines which video broadcast format (NTSC or PAL) is used in the current media. Before calling this function, DVD-Video media needs to be open.

Available in Mac OS X v10.3 and later.

### 75.1.34 GetGPRMValue(index as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current value of a general parameter (GPRM) register.
**Notes:** index: An integer index that specifies the desired GPRM register. The valid range is 1 to 16.

Returns the current value of the specified GPRM register.

Lasterror is set.

Available in Mac OS X v10.4 and later.

### 75.1.35 GetLastPlayBookmark as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Requests a bookmark to the last play position.
**Notes:** Returnns a binary string!

Lasterror is set.
Available in Mac OS X v10.4 and later.

### 75.1.36 GetMaxAudioVolume as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the maximum video playback volume
**Notes:** Lasterror is set.

Currently the minimum and maximum volumes are always 0 and 255.

### 75.1.37 GetMediaUniqueID as memoryblock

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets a unique identifier for a media folder.
**Notes:** Returns the unique identifier of the current media.

This function passes back a 64-bit identifier that can help you distinguish between different media folders. While the identifiers generated by this function are not guaranteed to be unique (see below), duplicate identifiers are extremely rare.

There are two known limitations of this function:

Two copies of the same DVD that are produced at different times do not necessarily have the same identifier. This can happen when the two media folders have minor differences.
Two different DVDs with similar content—collections of episodes from a television series, for example—do not always have different identifiers. This can happen when the two media folders are identical.

Available in Mac OS X v10.4 and later.

### 75.1.38 GetMediaVolumeName as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the volume name of the current media.
**Notes:** This function passes back the media volume name as a string. This is the name seen on the desktop when Mac OS X mounts a DVD-Video disc.

Available in Mac OS X v10.4 and later.

### 75.1.39 GetMenuLanguageCode as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the menu language code for the current title.
**Notes:** Returns the menu language code for the current title. For a list of possible values, see Language Codes.

Lasterror is set.

Available in Mac OS X v10.3 and later.

### 75.1.40 GetMinAudioVolume as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the minimum video playback volume.
**Notes:** Lasterror is set.

Currently the minimum and maximum volumes are always 0 and 255.

### 75.1.41 GetNativeVideoHeight as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the native height of the current title.
**Notes:** Available in Mac OS X v10.3 and later.
Lasterror is set.

### 75.1.42 GetNativeVideoSize(byref w as Integer, byref h as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The native video size.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.43 GetNativeVideoWidth as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the native width of the current title.
**Notes:** Available in Mac OS X v10.3 and later.
Lasterror is set.

### 75.1.44 GetNumberOfAngles as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of camera angles currently available.
**Notes:** Returns the number of different camera angles in the current title. DVD-Video media supports up to 9 camera angles.

Lasterror is set.
Available in Mac OS X v10.3 and later.

### 75.1.45 GetNumberOfAudioStreams as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of audio streams currently available.
**Notes:** Returns the number of audio streams available in the current title.
Lasterror is set.
Before calling this function, DVD-Video media needs to be open.
Available in Mac OS X v10.3 and later.

### 75.1.46 GetNumberOfChapters(title as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of chapters in the specified title.
**Notes:** title: An integer in the range 1 to 99 that specifies a title on the current media.
Returns the number of chapters in the specified title.
Lasterror is set.
If the specified chapter does not exist, this function does nothing and returns an error.
Available in Mac OS X v10.3 and later.

### 75.1.47 GetNumberOfSubPictureStreams as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of subpicture streams currently available.
**Notes:** Returns the number of subpicture streams available in the current title. DVD-Video media supports up to 32 subpicture streams per title.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open and video playback started.

Available in Mac OS X v10.3 and later.

### 75.1.48 GetNumberOfTitles as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of titles available on the media.
**Notes:** Returns the number of titles on the current media in the range 0 to 99.
Lasterror is set.
Available in Mac OS X v10.3 and later.

### 75.1.49 GetScanRate(byref scanrate as Integer, byref direction as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current scan direction and rate.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.50 GetSPDIFDataOutDevice as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the selected SPDIF capable audio device.
**Notes:** Lasterror is set.

### 75.1.51 GetSPDIFDataOutDeviceCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of SPDIF capable audio devices.
**Notes:** Lasterror is set.

### 75.1.52 GetSPDIFDataOutDeviceName(index as Integer) as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the name of a SPDIF capable audio device
**Notes:** Lasterror is set.

### 75.1.53 GetState as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current play state of the DVDPlayback framework.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

The current play state of the framework.

Constants:

| | | |
|---|---|---|
| kDVDStateUnknown | 0 | |
| kDVDStatePlaying | 1 | playing 1x or less (slow mo) |
| kDVDStatePlayingStill | 2 | |
| kDVDStatePaused | 3 | pause and step frame |
| kDVDStateStopped | 4 | |
| kDVDStateScanning | 5 | playing greater than 1x |
| kDVDStateIdle | 6 | |

### 75.1.54 GetSubPictureLanguageCode(byref DVDLanguageCode as string, byref DVDSubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the subpicture language code and extension for the current subpicture stream.
**Notes:** DVDLanguageCode: On return, the variable contains the language code for the current subpicture. For a list of possible values, see Language Codes.
DVDSubpictureExtensionCode: On return, the variable contains the extension code for the current subpicture. For a list of possible values, see Subpicture Extension Codes.

If subpictures are not available, this function does nothing and lasterror is set to 0.
Lasterror is set.

Available in Mac OS X v10.3 and later.

### 75.1.55 GetSubPictureLanguageCodeByStream(StreamIndex as Integer, byref DVDLanguageCode as string, byref DVDSubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the subpicture language code and extension for a specified subpicture stream.
**Notes:** StreamIndex: A subpicture stream number in the current title. Subpicture stream numbers range from 1 to 32.

DVDLanguageCode: On return, the variable contains the language code for the subpicture stream. For a list of possible values, see Language Codes.

DVDSubpictureExtensionCode: On return, the variable contains the extension code for the subpicture stream. For a list of possible values, see Subpicture Extension Codes.

Lasterror is set.

If subpictures are not available, this function does nothing and lasterror is not 0.

Available in Mac OS X v10.3 and later.

### 75.1.56 GetSubPictureStream as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current subpicture stream.
**Notes:** Returns the identifier of the current subpicture stream, or 0 if the current title has no subpictures. DVD-Video media supports up to 32 subpicture streams per title.

Lasterror is set.

Before calling this function, DVD-Video media needs to be open and video playback started.

Available in Mac OS X v10.3 and later.

### 75.1.57 GetTime(timecode as Integer, byref time as Integer, byref frames as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the current playback position in the current title in seconds relative to the requested time code (elapsed,remaining).
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

Constants:

| | | |
|---|---|---|
| kDVDTimeCodeUninitialized | 0 | |
| kDVDTimeCodeElapsedSeconds | 1 | |
| kDVDTimeCodeRemainingSeconds | 2 | |
| kDVDTimeCodeTitleDurationSeconds | 3 | only useable for GetTime |
| kDVDTimeCodeChapterElapsedSeconds | 4 | only useable for GetTime |
| kDVDTimeCodeChapterRemainingSeconds | 5 | only useable for GetTime |
| kDVDTimeCodeChapterDurationSeconds | 6 | only useable for GetTime |

### 75.1.58 GetTimeEventRate as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the rate of the time event.
**Notes:** Returns the current interval between time events in milliseconds.

Lasterror is set.
Available in Mac OS X v10.3 and later.

### 75.1.59 GetTitle as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the number of the current title.
**Notes:** Returns the current title number, or 0 if a menu is active. DVD-Video media can contain up to 99 titles.

Lasterror is set.
Available in Mac OS X v10.3 and later.

### 75.1.60 GetVideoBounds(byref x as Integer, byref y as Integer, byref w as Integer, byref h as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns (in port coordinates) the rect used to play video.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

### 75.1.61 GetVideoDisplay as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the graphics display for the current DVD-Video playback session.
**Notes:** Returns the display ID is set to the current video playback display.

Lasterror is set.

Before calling this function, you need to set the video playback display using SetVideoDisplay or SwitchToDisplay.

Available in Mac OS X v10.3 and later.

### 75.1.62 GetVideoKeyColor as color

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the key color used by the video driver.
**Notes:** Available in Mac OS X v10.3 and later.
Deprecated in Mac OS X v10.5.
Not available to 64-bit applications.

This function does nothing and returns the color black.

### 75.1.63 GetVideoWindowID as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Gets the window ID of the Cocoa window in use for DVD-Video playback.
**Notes:** Returns the window ID of the Cocoa window currently in use for DVD-Video playback, or zero if

there is no Cocoa window.

Lasterror is set.
Available in Mac OS X v10.3 and later.

### 75.1.64 GoBackOneLevel

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If a submenu is active, moves up one level in the same domain.
**Notes:** Lasterror is set.

This function is used to navigate one level up in a hierarchical structure in the same domain—for example, from a scene selection menu back to the main menu. This action is comparable to navigating upwards in the directory or folder hierarchy of a file system.

Available in Mac OS X v10.3 and later.

### 75.1.65 GotoBookmark(Bookmark as string)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the video playback position using a bookmark, and resumes play.
**Notes:** This function is used when playing media on a DVD-Video disc. Before calling this function, the media needs to be open. This function uses the specified bookmark to set the video playback position, and begins playing the media.

Bookmark ist a binary string. Make sure you did not destroy it by an encoding conversion!

Requires Mac OS X 10.4 or newer.
Lasterror is set.

### 75.1.66 GoToMenu(menu as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Jump to a particular menu (Root Menu,Sub Picture Menu, etc.).
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.67 HasMedia as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the playback framework has media to play and the framework had received an Open call on the media.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.68 HasMenu(menu as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns if input menu type is available.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.69 HasNextChapter as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if there is a chapter after the current chapter.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.70 HasPreviousChapter as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if there is a chapter before the current chapter.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.71 Idle

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Allows the framework to get a consistent time to process at. (Might be removed in the future).
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.72 IsDisplayingSubPicture as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if subpictures are currently being displayed.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.73 IsMuted as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the mute setting on or off.
**Notes:** Returns true if the playback volume is currently muted.
Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.74 IsOnMenu(byref OnMenu as boolean, byref menu as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Are we currently on a menu, and if so, which one.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.75 IsPaused as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the framework has media and is paused.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.76 IsPlaying as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the framework has media and is playing (even if paused).
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.77 IsSupportedDisplay(CGVideoDisplayHandle as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** True if the display is supported.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3 or newer.
You can use the handle from a CGDisplayMBS object.

### 75.1.78 IsValidMedia(folder as folderitem) as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the folderitem points to a valid media layout.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.79 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** Requires Mac OS X 10.3 or newer.

### 75.1.80 LastErrorString as string

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns an error message for the lasterror code.
**Notes:** Requires Mac OS X 10.3 or newer.

### 75.1.81 Mute(mute as boolean)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the mute setting on or off.
**Notes:** mute: a boolean value that specifies whether to turn the mute setting on or off. To mute the video playback volume, pass TRUE. To restore the previous volume setting, pass FALSE.

Lasterror is set.

| | | |
|---|---|---|
| kDVDErrorUnknown | -70001 | Catch all error |
| kDVDErrorInitializingLib | -70002 | There was an error initializing the playback framework |
| kDVDErrorUninitializedLib | -70003 | The playback framework has not been initialized. |
| kDVDErrorNotAllowedDuringPlayback | -70004 | action is not allowed during playback |
| kDVDErrorUnassignedGrafPort | -70005 | A grafport was not set. |
| kDVDErrorAlreadyPlaying | -70006 | Media is already being played. |
| kDVDErrorNoFatalErrCallBack | -70007 | The application did not install a callback routine for fatal errors returned by the framework. |
| kDVDErrorIsAlreadySleeping | -70008 | The framework has already been notified to sleep. |
| kDVDErrorDontNeedWakeup | -70009 | DVDWakeUp was called when the framework was not asleep. |
| kDVDErrorTimeOutOfRange | -70010 | Time code is outside the valid range for the current title. |
| kDVDErrorUserActionNoOp | -70011 | The operation was not allowed by the media at this time. |
| kDVDErrorMissingDrive | -70012 | The DVD drive is not available. |
| kDVDErrorNotSupportedConfiguration | -70013 | The current system configuration is not supported. |
| kDVDErrorNotSupportedFunction | -70014 | The operation is not supported. For example, trying to slow mo backwards. |
| kDVDErrorNoValidMedia | -70015 | The media was not valid for playback. |
| kDVDErrorWrongParam | -70016 | The invalid parameter was passed. |
| kDVDErrorMissingGraphicsDevice | -70017 | A valid graphics device is not available. |
| kDVDErrorGraphicsDevice | -70018 | A graphics device error was encountered. |
| kDVDErrorPlaybackOpen | -70019 | The framework is already open (probably by another process). |
| kDVDErrorInvalidRegionCode | -70020 | The region code was not valid. |
| kDVDErrorRgnMgrInstall | -70021 | The region manager was not properly installed or missing from the system. |
| kDVDErrorMismatchedRegionCode | -70022 | The disc region code and the drive region code do not match. |
| kDVDErrorNoMoreRegionSets | -70023 | The drive does not have any region changes left. |
| kDVDErrordRegionCodeUninitialized | -70024 | The drive region code was not initialized. |
| kDVDErrorAuthentification | -70025 | The user attempting to change the region code could not be authenticated. |
| kDVDErrorOutOfVideoMemory | -70026 | The video driver does not have enough video memory available to playback the media. |
| kDVDErrorNoAudioOutputDevice | -70027 | An appropriate audio output device could not be found. |
| kDVDErrorSystem | -70028 | A system error was encountered. |
| kDVDErrorNavigation | -70029 | The user has made a selection not supported in the current menu. |

Available in Mac OS X v10.3 and later.

### 75.1.82 NextChapter

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets to the next chapter on the current title.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.83 Open

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** Call when preparing for playback. Usually when the application is initializing.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

Returns an error of kDVDErrorPlaybackOpen if the playback framework is already being used.

### 75.1.84 OpenMediaFile(folder as folderitem)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Opens a VIDEO_TS folder (can be on a hard drive or a dvd disc).
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.85 OpenMediaVolume(disc as folderitem)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Opens a DVD disc for playback.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.86 Pause

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Pauses the media if currently playing.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.87 Play

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts playing the media.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.88 PreviousChapter

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets to the previous chapter on the current title.
**Notes:** Requires Mac OS X 10.3 or newer.

Lasterror is set.

### 75.1.89 Resume

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts playing if currently paused.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.90 ReturnToTitle

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns from the menu back to the current position within the title.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.91 SetAngle(angle as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the camera angle to display.
**Notes:** angle: A 1-based index that specifies the camera angle to display. The angle number of the main angle is 1. DVD-Video media supports up to nine camera angles.

Lasterror is set.
Before calling this function, DVD-Video media needs to be open and video playback started. The DVD-Video author decides how many camera angles are used. If the specified angle does not exist, this function does nothing.

Available in Mac OS X v10.3 and later.

### 75.1.92 SetAspectRatio(AspectRatio as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the aspect ratio for the current title.
**Notes:** AspectRatio: A constant that specifies the desired aspect ratio for the current title. For a list of

possible values, see Aspect Ratios.

Lasterror is set.
This function does nothing and returns noErr.

Available in Mac OS X v10.3 and later.

### 75.1.93 SetAudioOutputMode(Mode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Set the audio mode.
**Notes:** Lasterror is set.

### 75.1.94 SetAudioStream(index as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the audio stream to use.
**Notes:** index: An integer from 1 to 8 that specifies an audio stream in the current title. DVD-Video media supports up to 8 audio streams per title.

Lasterror is set.
Before calling this function, DVD-Video media needs to be open and video playback started.

Available in Mac OS X v10.3 and later.

### 75.1.95 SetAudioVolume(Volume as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the playback audio volume setting (0 - 255).
**Notes:** Volume: An integer in the range 0 to 255 that specifies the new video playback volume setting. Larger values are clamped to 255.

Lasterror is set.

This function changes the current playback audio volume setting, not the system audio volume setting. The actual audio volume experienced by the user is a function of these two settings:

Actual audio volume = system volume * playback audio volume / 255

For example, if you set the playback volume to 127, the actual volume is approximately one-half the current system volume.

Available in Mac OS X v10.3 and later.

### 75.1.96 SetChapter(Chapter as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the chapter to play.
**Notes:** Chapter: An integer that specifies the chapter to play.

Lasterror is set.
This function defines the specified chapter to be the current video playback chapter. If video playback is paused, this function starts playing the chapter immediately. Note that some discs do not allow jumping directly to a chapter.

Available in Mac OS X v10.3 and later.

### 75.1.97 SetDefaultAudioLanguageCode(DVDLanguageCode as string, DVDSubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the default audio language code and extension.
**Notes:** DVDLanguageCode: A constant that specifies the default audio language for the specified audio extension.. For a list of possible values, see Language Codes. If no language is specified—that is, if you pass in kDVDLanguageNoPreference or kDVDLanguageCodeNone—the default audio language is matched to the language setting in the International Preferences Panel.

DVDSubpictureExtensionCode: A constant that specifies an audio extension. For a list of possible values, see Audio Extension Codes.

Lasterror is set.

This function selects an audio language other than the DVD's default language for a specified audio extension. Before calling this function, DVD-Video media needs to be open.

Available in Mac OS X v10.3 and later.

### 75.1.98 SetDefaultMenuLanguageCode(Code as string)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the default menu language code.
**Notes:** Code: An integer code that specifies the default menu language for the current title. For a list of possible values, see "Language Codes." If no language is specified—that is, if you pass in kDVDLanguageNo-Preference or kDVDLanguageCodeNone—the default menu language is matched to the language setting in the International Preferences Panel.

Lasterror is set.

This function selects a language other than the DVD's default language for menus in the current title. Before calling this function, DVD-Video media needs to be open and video playback stopped.

Available in Mac OS X v10.3 and later.

### 75.1.99 SetDefaultSubPictureLanguageCode(DVDLanguageCode as string, DVD-SubpictureExtensionCode as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the default subpicture language and extension when subpictures are enabled.
**Notes:** DVDLanguageCode: A constant that specifies the default language for the specified subpicture extension. For a list of possible values, see "Language Codes." If no language is specified—that is, if you pass in kDVDLanguageNoPreference or kDVDLanguageCodeNone—the default subpicture language code is matched to the language setting in the International Preferences Panel.

DVDSubpictureExtensionCode: A constant that specifies a subpicture extension. For a list of possible values, see "Subpicture Extension Codes."

Lasterror is set.
If the current title is playing, this function does nothing and lasterror is set to kDVDErrorAlreadyPlaying.

This function is used to select a subpicture language other than the system default language. Before calling this function, DVD-Video media needs to be open and video playback stopped.

Available in Mac OS X v10.3 and later.

### 75.1.100 SetDriveRegionCode(regioncode as Integer, AuthorizationHandle as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the drive region code (requires user authentication).
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

DVDRegionCode constants - The different possible region codes (used for both the disc and the drive):

| | |
|---|---|
| kDVDRegionCodeUninitialized | &hff |
| kDVDRegionCode1 | &hfe |
| kDVDRegionCode2 | &hfd |
| kDVDRegionCode3 | &hfb |
| kDVDRegionCode4 | &hf7 |
| kDVDRegionCode5 | &hef |
| kDVDRegionCode6 | &hdf |
| kDVDRegionCode7 | &hbf |
| kDVDRegionCode8 | &h7f |

### 75.1.101 SetLastPlayBookmark(Bookmark as string)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the video playback position using a bookmark.
**Notes:** Lasterror is set.

This function is used when playing media on a DVD-Video disc. Before calling this function, the media needs to be open. This function uses the specified bookmark to set the video playback position, but does not begin playing the media. See also GotoBookmark.

Available in Mac OS X v10.4 and later.

### 75.1.102 SetScanRate(scanrate as Integer, direction as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Fast forwards or rewinds depending on the direction parameter at the speed specified in the scanrate parameter.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

The rate at which to scan:

| | |
|---|---|
| kDVDScanRateOneEigth | -8 |
| kDVDScanRateOneFourth | -4 |
| kDVDScanRateOneHalf | -2 |
| kDVDScanRate1x | 1 |
| kDVDScanRate2x | 2 |
| kDVDScanRate4x | 4 |
| kDVDScanRate8x | 8 |
| kDVDScanRate16x | 16 |
| kDVDScanRate32x | 32 |

Direction constants:

| | |
|---|---|
| kDVDScanDirectionForward | 0 |
| kDVDScanDirectionBackward | 1 |

### 75.1.103 SetSPDIFDataOutDevice(Device as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Selects a SPDIF capable audio device.
**Notes:** Lasterror is set.

### 75.1.104 SetSubPictureStream(index as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the current subpicture stream.
**Notes:** index: A positive integer that specifies the subpicture stream to display. Subpicture stream numbers range from 1 to 32.

Lasterror is set.
Before calling this function, DVD-Video media needs to be open and video playback started.

Available in Mac OS X v10.3 and later.

### 75.1.105 SetTime(timecode as Integer, time as Integer, frames as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the current playback position in the current title based on a time position in seconds relative to the time code (elapsed,remaining).
**Notes:** timecode: A time code constant. You must specify one of two values: kDVDTimeCodeElapsedSeconds or kDVDTimeCodeRemainingSeconds.

time: An integer that specifies the position in seconds.

frames: An integer that specifies the frame number. For the NTSC video format, the range of frame numbers is 0 to 29. For the PAL format, the range is 0 to 24.

his function sets the video playback position in the current title. Not all titles permit this operation, so it's important to check the result code returned by this function.

Before calling this function, DVD-Video media needs to be open and video playback started.

Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.106 SetTimeEventRate(rate as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the rate of the DVD Playback time event.
**Notes:** The new interval between time events, specified in milliseconds.

Lasterror is set.

The default interval between DVD Playback time events is 900 milliseconds. You can use this function to lengthen or shorten the interval between time events. This function is relevant when you have used the function DVDRegisterEventCallBack to register a callback for one or both of the time events: kDVDEvent-TitleTime and kDVDEventChapterTime . Time event callbacks are typically used for tasks such as updating the elapsed time or remaining time displayed in your user interface.

Available in Mac OS X v10.3 and later.

### 75.1.107 SetTitle(Title as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the title to play.
**Notes:** Title: An integer in the range 1 to 99 that specifies the title to play.

Lasterror is set.
If the specified title exists on the current media and the media permits this operation, this function begins playing the title.

Available in Mac OS X v10.3 and later.

### 75.1.108 SetVideoBounds(x as Integer, y as Integer, w as Integer, h as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the bounds in which to display the video.
**Notes:** x,y,w,h: A rectangle that contains the desired bounds in window local coordinates.

Lasterror is set.

This function is used to set the area inside the current window in which to display the video. The video area is not required to fill the entire window. Generally you should set the video area to be smaller than the window whenever the aspect ratio of the current title and window are different. To find the aspect ratio of the current title, use the function GetAspectRatio.

Because the aspect ratios of the titles in a DVD-Video media folder are not always the same, you may need to call this function repeatedly to reset the video area as the user makes different viewing choices.

Available in Mac OS X v10.3 and later.
Deprecated in Mac OS X v10.5.
Not available to 64-bit applications.

### 75.1.109 SetVideoDisplay(CGVideoDisplayHandle as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the graphics display for the current DVD-Video playback session.
**Notes:** The Quartz display ID for the graphics display you want to use for video playback. For information about how to get a display ID, see Quartz Display Services Reference. (or CGDisplayMBS class)

Lasterror is set.

You need to call this function or DVDSetVideoDevice each time you move the video playback window to a new graphics display. To avoid degrading video performance, you should not attempt to draw a video playback window that spans two different displays.

Available in Mac OS X v10.3 and later.

### 75.1.110 SetVideoWindowID(WindowID as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Enables or disables DVD-Video playback in a Cocoa window.
**Notes:** WindowID: The window ID associated with a Cocoa window, or NULL. For information about when to pass 0, see the Discussion below.

Lasterror is set.

If you're using a Cocoa window for DVD-Video playback, you need to use this function in two different

situations:

Immediately after calling the constructor to start a new DVD-Video playback session, you should call this function and pass the window ID associated with the Cocoa window.

When video is not playing and you want to draw into the area of the window you set by calling the function SetVideoBounds, you should call this function and pass 0 in the inVidWindowID parameter.

To learn how to obtain the window number for a Cocoa window, see the description of the windowNumber method in the NSWindow class.

Availability
Available in Mac OS X v10.3 and later.

### 75.1.111 Sleep

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Call when system is putting machine to sleep so playback information can be saved.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.
The client must register for sleep notifications with the system so that it can notify the framework of sleep and wake notifications.

### 75.1.112 StepFrame(direction as Integer)

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Steps one frame in the direction specified in DVDScanDirection.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.
Currently only supports kDVDScanDirectionForward.

### 75.1.113 Stop

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Stops if playing.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.114 SwitchToDisplay(CGVideoDisplayHandle as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Switches the output to the given display.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.
You can use the handle from a CGDisplayMBS object.

### 75.1.115 UpdateVideo

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Forces the video to be updated.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.

### 75.1.116 WakeUp

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Call when system is waking up so playback information can be reset.
**Notes:** Requires Mac OS X 10.3 or newer.
Lasterror is set.
The client must register for sleep notifications with the system so that it can notify the framework of sleep and wake notifications.

### 75.1.117 Events

### 75.1.118 DVDEvent(eventcode as Integer, value1 as Integer, value2 as Integer)

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** A DVD event.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

DVDEventCode constants - The different event a client can register for to get notified (return value: UInt32)

| | | |
|---|---|---|
| kDVDEventTitle | 1 | value1: Title |
| kDVDEventPTT | 2 | value1: Chapter |
| kDVDEventValidUOP | 3 | value1: UOP code mask (DVDUOPCode) |
| kDVDEventAngle | 4 | value1: StreamID |
| kDVDEventAudioStream | 5 | value1: StreamID |
| kDVDEventSubpictureStream | 6 | value1: streamID / (value2 ! 0): visible |
| kDVDEventDisplayMode | 7 | value1: DVDAspectRatio |
| kDVDEventDomain | 8 | value1: DVDDomainCode |
| kDVDEventBitrate | 9 | value1: Bits / sec |
| kDVDEventStill | 10 | value1: On (1) - Off (0) |
| kDVDEventPlayback | 11 | value1: DVDState |
| kDVDEventVideoStandard | 12 | value1: DVDFormat |
| kDVDEventStreams | 13 | value1: None (trigger for general stream change) |
| kDVDEventScanSpeed | 14 | value1: Speed (1x,2x,3x,...) |
| kDVDEventMenuCalled | 15 | value1: DVDMenu |
| kDVDEventParental | 16 | value1: parental level number |
| kDVDEventPGC | 17 | value1: PGC number |
| kDVDEventGPRM | 18 | value1: GPRM index / value2: data |
| kDVDEventRegionMismatch | 19 | value1: disc region |
| kDVDEventTitleTime | 20 | value1: elapsed time / value2: duration of title [ ms ] |
| kDVDEventSubpictureStreamNumbers | 21 | value1: number of subpicture streams in title |
| kDVDEventAudioStreamNumbers | 22 | value1: number of audio streams in title |
| kDVDEventAngleNumbers | 23 | value1: number of angles in title |
| kDVDEventError | 24 | value1: DVDErrorCode |
| kDVDEventCCInfo | 25 | value1: cc event opcode, value2: cc event data |
| kDVDEventChapterTime | 26 | value1: elapsed time / value2: duration of current chapter [ ms ] |

### 75.1.119 FatalError(errorcode as Integer)

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** A fatal error. Quit the application as soon as possible.
**Notes:** Lasterror is set.
Requires Mac OS X 10.3.

### 75.1.120 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDVDAMGMDomain | 5 | A constant that specifies playback domains or m sible actions. Audio Manager Menu domain (DVD-Audio only, |
| kDVDAspectRatio16x9 | 3 | A constant that specifies the current aspect ratio The process of displaying a 16:9 video frame on a ratio. |
| kDVDAspectRatio4x3 | 1 | A constant that specifies the current aspect ratio The process of displaying a 4:3 video frame on a ratio. |
| kDVDAspectRatio4x3PanAndScan | 2 | A constant that specifies the current aspect ratio The process of choosing a sample area of a 16:9 4:3 screen, using center-of-interest information st |
| kDVDAspectRatioLetterBox | 4 | A constant that specifies the current aspect ratio The process of displaying the entire 16:9 video fra ing the frame and adding mattes or black bars al |
| kDVDAspectRatioUninitialized | 0 | A constant that specifies the current aspect ratio Available in Mac OS X v10.3 and later. |
| kDVDAudioAC3Format | 1 | A constant that specifies the audio stream forma The Dolby Digital AC-3 format. |
| kDVDAudioDDPlusFormat | 8 | A constant that specifies an audio mode. |
| kDVDAudioDTSFormat | 5 | A constant that specifies the audio stream forma The Digital Theater Systems (DTS) format. Thi |
| kDVDAudioDTSHDFormat | 9 | A constant that specifies an audio mode. |
| kDVDAudioExtensionCodeDirectorsComment1 | 3 | A constant that specifies the purpose of an audio First audio channel for the artistic director's com |
| kDVDAudioExtensionCodeDirectorsComment2 | 4 | A constant that specifies the purpose of an audio Second audio channel for the artistic director's c |
| kDVDAudioExtensionCodeNormalCaptions | 1 | A constant that specifies the purpose of an audio Audio channel for extended information about th |
| kDVDAudioExtensionCodeNotSpecified | 0 | A constant that specifies the purpose of an audio Audio extension not specified. |
| kDVDAudioExtensionCodeNVisualImpaired | 2 | A constant that specifies the purpose of an audio Audio channel for the visually impaired. |
| kDVDAudioMLPFormat | 7 | A constant that specifies an audio mode. |
| kDVDAudioModeProLogic | 1 | A constant that specifies an audio mode. |
| kDVDAudioModeSPDIF | 2 | A constant that specifies an audio mode. |
| kDVDAudioModeUninitialized | 0 | A constant that specifies an audio mode. |
| kDVDAudioMPEG1Format | 2 | A constant that specifies the audio stream forma The MPEG-1 Layer II digital format. |
| kDVDAudioMPEG2Format | 3 | A constant that specifies the audio stream forma The MPEG-2 digital format. |
| kDVDAudioPCMFormat | 4 | A constant that specifies the audio stream forma The linear pulse-code modulation (PCM) format |
| kDVDAudioSDDSFormat | 6 | A constant that specifies the audio stream forma The Sony Dynamic Digital Sound (SDDS) form ported. |
| kDVDAudioUnknownFormat | 0 | A constant that specifies the audio stream forma An unspecified audio format. |
| kDVDButtonIndexNone | -1 | A constant for an index of the selected menu but |
| kDVDErrorAlreadyPlaying | -70006 | A constant that specify the result codes defined f See kDVDErrorNotAllowedDuringPlayback. |
| kDVDErrorAuthentification | -70025 | A constant that specify the result codes defined f An attempt to change the DVD drive region cod |
| kDVDErrorDontNeedWakeup | -70009 | A constant that specify the result codes defined f DVDWakeUp was called without first calling Slee |
| kDVDErrorGraphicsDevice | -70018 | A constant that specify the result codes defined f A graphics device error was encountered. |
| kDVDErrorInitializingLib | -70002 | A constant that specify the result codes defined f |

## 75.2 class DVDPlaybackMissingFunctionExceptionMBS

### 75.2.1 class DVDPlaybackMissingFunctionExceptionMBS

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The exception raised if a DVDPlayback function is not available on this Mac OS X version.
**Notes:** Check the message property.
Subclass of the RuntimeException class.

## 75.3 class DVDPlaybackNotInitializedExceptionMBS

### 75.3.1 class DVDPlaybackNotInitializedExceptionMBS

MBS MacOSX Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** The exception raised when you use a method on the DVDPlaybackMBS class without initializing it.
**Notes:** Subclass of the RuntimeException class.

# Chapter 76

# DynamicDeclares

## 76.1 class DeclareCallBackMBS

### 76.1.1 class DeclareCallBackMBS

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a callback for use in declares.
**Notes:** Allows you to dynamically create callback functions.
Pass the function pointer to a C function which later calls back your callback.

Please make sure this callback object stays alive, e.g. stored in a global property. When the object is released and the callback later invoked, the application will crash.

When you code sign on macOS, you may need to use the entitlement for just-in-time compiler and for unsigned executable memory, e.g. the com.apple.security.cs.allow-unsigned-executable-memory entitlement.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr7
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Dynamic Declare for Xojo
- MBS Xojo Plugins, version 20.3pr1

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

- 19.3, page 10: News

### 76.1.2 Methods

### 76.1.3 Constructor(Signature as String)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new callback object.
**Notes:** Please pass a valid signature, e.g. "(pi)v" for a function taking one pointer, one integer and return nothing (void).
If the signature doesn't match the values put on the stack, the app may crash.

### 76.1.4 ParameterType(Index as Integer) as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries type of a parameter.
**Notes:** Index in range from 0 to ParameterCount-1.

### 76.1.5 Properties

### 76.1.6 AllowAsync as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the callbacks are allowed to go asynchronously.
**Notes:** For MacOS/iOS only.

Asynchronous callbacks have no chance to return a value as the call to the Xojo event happens later and the C function returns before the Xojo event is started.
Synchronous callbacks would let the callback wait for the Xojo main thread to react to the event and then return the result back.

AllowAsync is set to true automatically for callbacks with void as return automatically.
(Read and Write property)

### 76.1.7 CallCount as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The call counter.
**Notes:** We call how often the callback is called.
(Read only property)

### 76.1.8 FunctionPtr as Ptr

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function pointer for the callback.
**Notes:** Pass this to the C functions to pass a callback function pointer.
(Read only property)

### 76.1.9 Name as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the callback.
**Notes:** You can set this to later read value in debugging.
(Read and Write property)

### 76.1.10 ParameterCount as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of parameters.
**Notes:** We currently limit this to 32 parameters.
(Read only property)

### 76.1.11 Signature as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature used to initialize this object.
**Notes:** (Read only property)

### 76.1.12 SignatureParameters as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature part for the parameters.
**Notes:** (Read only property)

### 76.1.13 SignatureReturn as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature part for the return value.
**Notes:** (Read only property)

### 76.1.14 Tag as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** Store whatever you need to keep referenced.
(Read and Write property)

### 76.1.15 ParameterCFRetain(Index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether a parameter needs to be retained via CFRetain() call.
**Notes:** If the callback is within Apple's frameworks passing a CoreFoundation object, you can set this property to true, so we call CFRetain method on it in the callback and later release when the Xojo event was called.
This allows to avoid crashes with CoreFoundation objects passed from one thread to another thread for multi threaded callbacks.

Parameter must be of type pointer.
(Read and Write computed property)

### 76.1.16 ParameterCopyString(Index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether a parameter needs to be copied as a zero terminated string.
**Notes:** If the callback receives a C string, you can set this property to true, so we copy it in the callback and later release when the Xojo event was called.
This allows to avoid crashes with strings passed from one thread to another thread for multi threaded callbacks.

Parameter must be of type pointer or string.
(Read and Write computed property)

### 76.1.17 ParameterNSRetain(Index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether a parameter needs to be retained via [ NSObject retain ] call.
**Notes:** If the callback is within Apple's frameworks passing a Objective-C object, you can set this property to true, so we call retain method on it in the callback and later release when the Xojo event was called.
This allows to avoid crashes with NSObject objects passed from one thread to another thread for multi threaded callbacks.

Parameter must be of type pointer.
(Read and Write computed property)

### 76.1.18 Events

### 76.1.19 Callback(Parameters() as Variant) as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The callback event.
**Notes:** Parameters are converted to variants and passed as array.
The result is converted to the required data type and returned.

### 76.1.20 Constants

Call Modes

| Constant | Value | Description |
|---|---|---|
| kCallModeARM | "A" | ARM calling |
| kCallModeARMThumb | "a" | ARM calling in thumb mode |
| kCallModeCDecl | "c" | x86 specific CDecl |
| kCallModeDefault | ":" | Default calling conv (platform native) |
| kCallModeEllipsisVarargs | "." | C ellipsis function call (variable/unnamed arguments (after ,Äô...,Äô)) |
| kCallModeSysCall | "$ " | SysCall mode |
| kCallModeThisCallGNU | "#" | x86 specific, GNU C++ this calls are cdecl, but keep specific sig char for clarity. |

Calling Conventions

| Constant | Value | Description |
|---|---|---|
| kCallModeEllipsis | "e" | C ellipsis function call |
| kCallModeFastCallGNU | "f" | C x86 Windows GCC fast call |
| kCallModeFastCallMS | "F" | C x86 Windows Microsoft fast call |
| kCallModePrefix | "_" | The character to indicate that next character in the signature is a calling convention prefix. |
| kCallModeStdCall | "s" | C x86 Windows standard call |
| kCallModeThisCallMS | "+" | C x86 Windows Microsoft this call |

Types

| Constant | Value | Description |
|---|---|---|
| kTypeBool | "B" | bool |
| kTypeChar | "c" | char, 8 bit signed byte |
| kTypeDouble | "d" | Double, 64-bit and 8 bytes big. |
| kTypeEndArg | ")" | end of arguments symbol. |
| kTypeFloat | "f" | Single, 32-bit and 4 bytes big. |
| kTypeInt | "i" | 32-bit signed integer. |
| kTypeInt64 | "l" | 64-bit signed integer. |
| kTypeLong | "j" | 32/64-bit signed integer.<br>64-bit only for MacOS and Linux in 64-bit application.<br>Always 32-bit on Windows. |
| kTypePtr | "p" | Pointer. Maybe a reference to an object or array. |
| kTypeShort | "s" | 16-bit signed integer. |
| kTypeString | "Z" | C String with zero byte as terminator. |
| kTypeStruct | "T" | Structure |
| kTypeUnsignedChar | "C" | 8 bit unsigned byte |
| kTypeUnsignedInt | "I" | 32-bit unsigned integer. |
| kTypeUnsignedInt64 | "L" | 64-bit unsigned integer. |
| kTypeUnsignedLong | "J" | 32/64-bit unsigned integer.<br>64-bit only for MacOS and Linux in 64-bit application.<br>Always 32-bit on Windows. |
| kTypeUnsignedShort | "S" | 16-bit unsigned integer. |
| kTypeVoid | "v" | Nothing to return. |

## 76.2 class DeclareFunctionMBS

### 76.2.1 class DeclareFunctionMBS

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a C function call.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

// zlibVersion
// ZEXTERN Const char * ZEXPORT zlibVersion Of((void));

Dim p As ptr = d.Symbol("zlibVersion")
Dim f As New DeclareFunctionMBS("()Z", p)

Dim n As String = f.Invoke
MsgBox "zlibVersion: "+n
```

**Notes:** Compared to built-in declares in Xojo, those functions allow a much more dynamic calling of functions with various calling conventions.

We have

- more dynamic
- the possibility to define declares at runtime
- more calling conventions
- support for variable arguments in C (dots in argument list)
- thread safe callbacks with DeclareCallBackMBS class.

**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Dynamic Declare for Xojo
- MBS Xojo Plugins, version 20.3pr1

### 76.2.2 Methods

### 76.2.3 ClearParameters

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all parameters.
**Notes:** Sets them all to zero/nil.

### 76.2.4 Constructor(Signature as String, FunctionPtr as Ptr)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

// zlibVersion
// ZEXTERN Const char * ZEXPORT zlibVersion Of((void));

Dim p As ptr = d.Symbol("zlibVersion")
Dim f As New DeclareFunctionMBS("()Z", p)

Dim n As String = f.Invoke
MsgBox "zlibVersion: "+n
```

**Notes:** Pass the signature and function pointer from a C function.
If signature is incorrect, the application will probably crash with stack corruption.

### 76.2.5 Invoke as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Invokes the function.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

// zlibVersion
// ZEXTERN Const char * ZEXPORT zlibVersion Of((void));
```

```
Dim p As ptr = d.Symbol("zlibVersion")
Dim f As New DeclareFunctionMBS("()Z", p)

Dim n As String = f.Invoke
MsgBox "zlibVersion: "+n
```

See also:

- 76.2.6 Invoke(Parameters() as Variant) as Variant 12527

### 76.2.6 Invoke(Parameters() as Variant) as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Invokes the function.
**Notes:** First calls SetParameters with the given array to set parameters.
Then invokes the function.
See also:

- 76.2.5 Invoke as Variant 12526

### 76.2.7 SetParameters(paramArray Parameters as Variant)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set all parameters together with passing arguments to this function.
**Example:**

```
// We try to run sysctlbyname on macOS

Dim d As New DeclareLibraryMBS("/usr/lib/libc.dylib")

// int sysctlbyname(const char *name, void *oldp, size_t *oldlenp, void *newp, size_t newlen);

Dim p As ptr = d.Symbol("sysctlbyname")

'const char* ->CString for name ->Z
'void* ->pointer to data ->p
'size_t * ->pointer to 32/64 bit integer for length ->p
'void* ->pointer to data ->p
'size_t ->32/64bit unsigned int ->L in 64-bit

Dim f As New DeclareFunctionMBS("(ZpppL)i", p)

Dim mData As New MemoryBlock(8)
```

```
Dim mLen As New MemoryBlock(8)
Dim pData As ptr = mData
dim pLen as ptr = mLen

mLen.UInt64Value(0) = mData.Size

f.SetParameters "hw.ncpu", pData, pLen, Nil, 0
Dim n As Integer = f.Invoke
// result is zero on result or -1 on failure

Dim CPUCount As Integer = mData.UInt32Value(0)

If n = 0 Then
MsgBox "CPU count: "+Str(CPUCount)
Else
MsgBox "Failed."
End If

Break // see in debugger
```

See also:

- 76.2.8 SetParameters(Parameters() as Variant) 12528

### 76.2.8 SetParameters(Parameters() as Variant)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets all arguments by passing an array of values.
See also:

- 76.2.7 SetParameters(paramArray Parameters as Variant) 12527

### 76.2.9 Properties

### 76.2.10 CallCount as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The call counter.
**Notes:** We call how often the function is called.
(Read only property)

### 76.2.11 CallMode as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The calling convention mode to use.
**Notes:** Default is to use default mode for the given platform.
(Read and Write property)

### 76.2.12 FunctionPtr as Ptr

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pointer for the C function.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

// zlibVersion
// ZEXTERN Const char * ZEXPORT zlibVersion Of((void));

Dim p As ptr = d.Symbol("zlibVersion")

// call via delegate
' define delgate like this:
' Public Function zlibVersionDelegate() As CString

Dim z As New zlibVersionDelegate(p)
Dim v As String = z.Invoke
MsgBox "zlibVersion: "+v
```

**Notes:** (Read and Write property)

### 76.2.13 Name as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the function.
**Notes:** (Read and Write property)

### 76.2.14 ParameterCount as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of parameters.
**Notes:** We currently limit this to 32 parameters.
(Read only property)

### 76.2.15 Parameters as Dictionary

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all parameters.
**Notes:** Mainly to inspect parameters in debugger.
Keys are indexes and values are the parameter values.
(Read only property)

### 76.2.16 Signature as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature used to initialize this object.
**Notes:** (Read only property)

### 76.2.17 SignatureParameters as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature part for the parameters.
**Notes:** (Read only property)

### 76.2.18 SignatureReturn as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature part for the return value.
**Notes:** (Read only property)

### 76.2.19 StackSize as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stack size to use.
**Notes:** Defaults to 4096 bytes.
(Read and Write property)

### 76.2.20 Tag as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** Store whatever you need to keep referenced.
(Read and Write property)

### 76.2.21 ParameterBoolean(Index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter as boolean.
**Notes:** You can get and set value here.
(Read and Write computed property)

### 76.2.22 ParameterDouble(Index as Integer) as Double

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter value as double.
**Notes:** You can get and set value here.
(Read and Write computed property)

### 76.2.23 ParameterInteger(Index as Integer) as Int64

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter as integer value.
**Notes:** You can get and set value here.
(Read and Write computed property)

### 76.2.24 ParameterPointer(Index as Integer) as Ptr

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter as pointer value.
**Notes:** You can get and set value here.
(Read and Write computed property)

### 76.2.25 ParameterSingle(Index as Integer) as Single

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter as single value.
**Notes:** You can get and set value here.
(Read and Write computed property)

### 76.2.26 ParameterString(Index as Integer) as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter as string value.
**Example:**

```
// We try to run strstr on C Library on macOS to find string in string with strstr as example:

Dim d As New DeclareLibraryMBS("/usr/lib/libc.dylib")

// char *strstr(Const char *__big, Const char *__little);

Dim p As ptr = d.Symbol("strstr")
Dim f As New DeclareFunctionMBS("(ZZ)Z", p)

f.ParameterString(0) = "Hello World!"
f.ParameterString(1) = "World"

Dim n1 As String = f.Invoke
// gives back World! as that was found

f.ParameterString(0) = "Hello World!"
f.ParameterString(1) = "xxx"

Dim n2 As String = f.Invoke
// gives empty string as not found

Break // see in debugger
```

**Notes:** To avoid crashes, we only read strings from parameters with type string or pointer.
But you can assign a string value to all types, which may not make sense for numbers.
You can get and set value here.
(Read and Write computed property)

### 76.2.27 ParameterValue(Index as Integer) as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the value as variant.
**Notes:** We automatically convert values based on the parameter type.
The class stores reference to the variant when setting to make sure strings and MemoryBlocks are not freed too early.
You can get and set value here.
(Read and Write computed property)

### 76.2.28 Constants

Call Modes

| Constant | Value | Description |
|---|---|---|
| kCallModeARM | "A" | ARM calling |
| kCallModeARMThumb | "a" | ARM calling in thumb mode |
| kCallModeCArm64 | 22 | C arm64 call (AArch64) |
| kCallModeCArmArmhf | 30 | C arm call (arm hardÔ¨Çoat - e.g. raspberry pi) |
| kCallModeCDecl | "c" | x86 specific CDecl |
| kCallModeCDefault | 0 | C default function call for current platform |
| kCallModeCDefaultThis | 99 | C default function call for current platform with this pointer. |
| kCallModeCEllipsis | 100 | C ellipsis function call (named arguments (before ,Äô...,Äô)) |
| kCallModeCEllipsisVarargs | 101 | C ellipsis function call (variable/unnamed arguments (after ,Äô...,Äô)) |
| kCallModeCX64Win64 | 7 | C x64 Windows standard call |
| kCallModeCX86Cdecl | 1 | C x86 platforms standard call |
| kCallModeCX86Win32FastGnu | 4 | C x86 Windows GCC fast call |
| kCallModeCX86Win32FastMs | 3 | C x86 Windows Microsoft fast call |
| kCallModeCX86Win32Std | 2 | C x86 Windows standard call |
| kCallModeCX86Win32This | 70 | C ellipsis function call (variable/unnamed arguments (after ,Äô...,Äô)) |
| kCallModeCX86Win32ThisGnu | 1 | C x86 Windows GCC this call |
| kCallModeCX86Win32ThisMs | 5 | C x86 Windows Microsoft this call |
| kCallModeDefault | ":" | Default calling conv (platform native) |
| kCallModeEllipsisVarargs | "." | C ellipsis function call (variable/unnamed arguments (after ,Äô...,Äô)) |
| kCallModeSysCall | "$ " | SysCall mode |
| kCallModeSysDefault | 200 | C default syscall for current platform |
| kCallModeSysX64SyscallSysV | 204 | C syscall for x64 System V platforms |
| kCallModeSysX86Int80HBSD | 202 | C syscall for x86 BSD platforms |
| kCallModeSysX86Int80HLinux | 201 | C syscall for x86 Linux |
| kCallModeThisCallGNU | "#" | x86 specific, GNU C++ this calls are cdecl, but keep specific sig char for clarity. |

Calling Conventions

| Constant | Value | Description |
|---|---|---|
| kCallModeEllipsis | "e" | C ellipsis function call |
| kCallModeFastCallGNU | "f" | C x86 Windows GCC fast call |
| kCallModeFastCallMS | "F" | C x86 Windows Microsoft fast call |
| kCallModePrefix | "_" | The character to indicate that next character in the signature is a calling convention prefix. |
| kCallModeStdCall | "s" | C x86 Windows standard call |
| kCallModeThisCallMS | "+" | C x86 Windows Microsoft this call |

Types

| Constant | Value | Description |
|---|---|---|
| kTypeBool | "B" | bool |
| kTypeChar | "c" | char, 8 bit signed byte |
| kTypeDouble | "d" | Double, 64-bit and 8 bytes big. |
| kTypeEndArg | ")" | end of arguments symbol. |
| kTypeFloat | "f" | Single, 32-bit and 4 bytes big. |
| kTypeInt | "i" | 32-bit signed integer. |
| kTypeInt64 | "l" | 64-bit signed integer. |
| kTypeLong | "j" | 32/64-bit signed integer.<br>64-bit only for MacOS and Linux in 64-bit application.<br>Always 32-bit on Windows. |
| kTypePtr | "p" | Pointer. Maybe a reference to an object or array. |
| kTypeShort | "s" | 16-bit signed integer. |
| kTypeString | "Z" | C String with zero byte as terminator. |
| kTypeStruct | "T" | Structure |
| kTypeUnsignedChar | "C" | 8 bit unsigned byte |
| kTypeUnsignedInt | "I" | 32-bit unsigned integer. |
| kTypeUnsignedInt64 | "L" | 64-bit unsigned integer. |
| kTypeUnsignedLong | "J" | 32/64-bit unsigned integer.<br>64-bit only for MacOS and Linux in 64-bit application.<br>Always 32-bit on Windows. |
| kTypeUnsignedShort | "S" | 16-bit unsigned integer. |
| kTypeVoid | "v" | Nothing to return. |

## 76.3 class DeclareLibraryMBS

### 76.3.1 class DeclareLibraryMBS

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a C library loaded into Xojo.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

Dim lines() As String = d.SymbolNames
Break // look in list of functions
```

**Notes:** Allows you to load a DLL on Windows, dylib on MacOS and shared object (so) on Linux and inspect the available functions and load functions by name.
**Blog Entries**

- MBS Xojo Plugins, version 24.0pr8
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Dynamic Declare for Xojo
- MBS Xojo Plugins, version 20.3pr1

### 76.3.2 Methods

### 76.3.3 Constructor(LibFile as folderItem)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a library.
**Notes:** Pass path to DLL on Windows, dylib on MacOS or so file on Linux.
Raises exception in case of problems.
See also:

- 76.3.4 Constructor(LibPath as string) 12536

### 76.3.4 Constructor(LibPath as string)

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a library.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

Dim lines() As String = d.SymbolNames
Break // look in list of functions
```

**Notes:** Pass path to DLL on Windows, dylib on MacOS or so file on Linux.
Raises exception in case of problems.
See also:

- 76.3.3 Constructor(LibFile as folderItem) 12536

### 76.3.5 Symbol(name as string) as ptr

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries function or data pointer for a symbol.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

// zlibVersion
// ZEXTERN Const char * ZEXPORT zlibVersion Of((void));

Dim p As ptr = d.Symbol("zlibVersion")
Dim f As New DeclareFunctionMBS("()Z", p)

Dim n As String = f.Invoke
MsgBox "zlibVersion: "+n
```

**Notes:** Returns nil if not found.

### 76.3.6 SymbolName(index as Integer) as string

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of a symbol.
**Notes:** Index is in range from 0 to SymbolCount-1.
See also:

• 76.3.7 SymbolName(p as Ptr) as string 12538

### 76.3.7 SymbolName(p as Ptr) as string

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of a symbol from the ptr.
**Notes:** Looks up the symbol table to find the entry with the right pointer and returns the name.
Returns "" if not found.
See also:

• 76.3.6 SymbolName(index as Integer) as string 12537

### 76.3.8 SymbolNames as string()

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of symbols of a library.
**Example:**

```
// change path if you like to try this on Windows or Linux
Dim d As New DeclareLibraryMBS("/usr/lib/libz.1.dylib")

Dim lines() As String = d.SymbolNames
Break // look in list of functions
```

**Notes:** This may show more symbols as defined in public C headers.

### 76.3.9 Properties

### 76.3.10 Handle as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object handle.
**Notes:** (Read only property)

### 76.3.11 Name as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of the library.
**Notes:** (Read only property)

### 76.3.12 Path as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries path of the library.
**Notes:** May return the path used to load the library.
(Read only property)

### 76.3.13 SymbolCount as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of symbols in the library.
**Notes:** (Read only property)

# Chapter 77

# DynaPDF

## 77.1 class DynaPDFAnnotationExMBS

### 77.1.1 class DynaPDFAnnotationExMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for extended annotation information.
**Example:**

```
dim pdf as DynaPDFMBS // your instance

dim c as Integer = pdf.GetAnnotCount

for i as Integer = 0 to c-1
dim a as DynaPDFAnnotationExMBS = pdf.GetAnnotEx(i)

MsgBox str(a.Type)
next
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- MBS Xojo Plugins, version 23.5pr1
- MBS Xojo Plugins, version 21.4pr3
- MBS Real Studio Plugins, version 11.3pr13

- MBS REALbasic Plugins, version 11.1pr5
- MBS REALbasic Plugins, version 11.1pr4

### 77.1.2 Methods

### 77.1.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.1.4 DashPattern(index as UInt32) as single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dash pattern.
**Notes:** If BorderStyle is kbsDashed.

### 77.1.5 InkList(index as UInt32) as Single()

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ink list.
**Notes:** Ink annotations only. Array of array.
Index is from 0 to InkListCount-1.

### 77.1.6 Operator_Convert as DynaPDFAnnotationMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts this annotation object to older DynaPDFAnnotationMBS.
**Example:**

```
Dim d As New DynaPDFMBS

// create a new annotation
Call d.CreateNewPDF
Call d.append
Dim n As Integer = d.WebLink(0, 0, 100, 100, "about:blank")

// now query as old class and convert to new class
Dim a1 As DynaPDFAnnotationMBS = d.GetAnnot(n)
```

```
Dim a2 As DynaPDFAnnotationExMBS = a1

// now query as new class and convert to old class
Dim e1 As DynaPDFAnnotationExMBS = d.GetAnnotEx(n)
Dim e2 As DynaPDFAnnotationMBS = e1

// please update all your code to move to DynaPDFAnnotationExMBS
Break
```

**Notes:** The fields not supported by DynaPDFAnnotationMBS are lost in the conversion.

### 77.1.7 QuadPoints(index as UInt32) as single

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a quad point value.
**Notes:** Index from 0 to QuadPointsCount-1.
Highlight, Link, and Redact annotations only.

### 77.1.8 Vertices(index as UInt32) as single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertices array.
**Notes:** Line, PolyLine, and Polygon annotations only.

### 77.1.9 Properties

### 77.1.10 AnnotFlags as UInt32

MBS DynaPDF Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags for this annotation.
**Notes:** You can use this constants:

(Read only property)

### 77.1.11 Author as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

```
kafNone        = &h0000000
 kafInvisible  = &h0000001
 kafHidden     = &h0000002
 kafPrint      = &h0000004
 kafNoZoom     = &h0000008
 kafNoRotate   = &h0000010
 kafNoView     = &h0000020
 kafReadOnly   = &h0000040
```

**Function:** Annotation's author.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.1.12 BackColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Background color.
**Notes:** (Read only property)

### 77.1.13 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bounding box in bottom-up coordinates.
**Notes:** (Read only property)

### 77.1.14 BorderColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border color.
**Notes:** (Read only property)

### 77.1.15 BorderEffect as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The border effect.
**Notes:** Circle, Square, FreeText, and Polygon annotations.
(Read only property)

### 77.1.16 BorderStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border style.
**Notes:** (Read only property)

### 77.1.17 BorderWidth as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border width.
**Notes:** (Read only property)

### 77.1.18 Caption as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the annotation string Content is used as caption.
**Notes:** The string is shown in a PopUp annotation otherwise.
(Read only property)

### 77.1.19 CaptionOffsetX as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Horizontal offset of the caption from its normal position.
**Notes:** (Read only property)

### 77.1.20 CaptionOffsetY as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical offset of the caption from its normal position.
**Notes:** (Read only property)

### 77.1.21 CaptionPos as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position where the caption should be drawn if present.
**Notes:** (Read only property)

### 77.1.22 Content as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's contents.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.1.23 CreateDate as String

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creation Date ->Optional
**Notes:** (Read only property)

### 77.1.24 DashPatternCount as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the array.
**Notes:** (Read only property)

### 77.1.25 Deleted as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is this annotation marked as deleted?
**Notes:** (Read only property)

### 77.1.26 DestFile as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination file.
**Notes:** For File link or web link annotations.

(Read only property)

### 77.1.27 DestPage as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination page.
**Notes:** For Page link annotations only.

(Read only property)

### 77.1.28 DestPos as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination position.
**Notes:** For Page link annotations only.

(Read only property)

### 77.1.29 DestType as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination type.
**Notes:** For Page link annotations only.

(Read only property)

### 77.1.30 EmbeddedFileHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle for the embedded file.
**Notes:** For FileAttach annotations only. Use the handle with the GetEmbeddedFile function.

(Read only property)

### 77.1.31 Grouped as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Meaningful only if Parent <>-1 and Type <>katPopUp.
**Notes:** If true, the annotation is part of an annotation group. Properties like Content, CreateDate, ModDate, BackColor, Subject, and Open must be taken from the parent annotation.
(Read only property)

### 77.1.32 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 77.1.33 HighlightMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visual effect.
**Notes:** (Read only property)

### 77.1.34 Icon as Integer

MBS DynaPDF Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The icon type for this annotation.
**Notes:** The Icon type depends on the annotation type. If the annotation type is atText then the Icon is of type TAnnotIcon. If the annotation type is atFileAttach then it is of type kTFileAttachIcon. If the annotation type is atStamp then the Icon is the stamp type (kTRubberStamp).
For any other annotion type this value is not set (-1).
(Read only property)

### 77.1.35 InkListCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of ink arrays.
**Notes:** (Read only property)

### 77.1.36 Intent as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Markup annotations only.
**Notes:** The intent allows to distinguish between different uses of an annotation. For example, line annotations have two intents: LineArrow and LineDimension.
(Read only property)

### 77.1.37 LE1 as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Style of the start point ->Line and PolyLine annotations only.
**Notes:** (Read only property)

### 77.1.38 LE2 as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Style of the end point ->Line and PolyLine annotations only.
**Notes:** (Read only property)

### 77.1.39 LeaderLineExtend as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional leader line extend beyond the leader line.
**Notes:** (Read only property)

### 77.1.40 LeaderLineLen as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the leader lines (positive or negative)
**Notes:** (Read only property)

### 77.1.41 LeaderLineOffset as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Amount of space between the endpoints of the annotation and the leader lines.
**Notes:** (Read only property)

### 77.1.42 MarkupAnnot as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the annotation is a markup annotation.
**Notes:** Markup annotations can be flattened separately, see FlattenAnnots function.
(Read only property)

### 77.1.43 ModDate as String

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modification Date ->Optional
**Notes:** (Read only property)

### 77.1.44 Name as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's name.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.1.45 OC as Integer

MBS DynaPDF Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Handle of an OCG or OCMD or -1 if not set.
**Notes:** Annotations can be part of an Optional Content Group (OCG) or Optional Content Membership Dictionary (OCMD). If OC is greater -1 an OCG or OCMD handle was set. To determine whether an OCG handle was set, check whether the value is smaller &h40000000.
(Read only property)

### 77.1.46 Opacity as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The annotation's opacity.
**Notes:** Opacity = 1.0 = Opaque, Opacity <1.0 = Transparent, Markup annotations only
(Read only property)

### 77.1.47 Open as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Meaningful only for annotations which have a corresponding PopUp annotation.
**Notes:** (Read only property)

### 77.1.48 PageIndex as UInt32

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The page index is used to sort form fields.
**Notes:** See SortFieldsByIndex().
(Read only property)

### 77.1.49 PageNum as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Page on which the annotation appears.
**Notes:** (Read only property)

### 77.1.50 Parent as Integer

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parent annotation handle of a PopUp Annotation or the parent annotation if this annotation represents a state of a base annotation.
**Notes:** In this case, the annotation type is always atText and only the following members should be considered:

The PopUp annotation of a text annotation which represent an Annotation State must be ignored.
(Read only property)

| | |
|---|---|
| State | The current state |
| StateModel | Marked, Review, and so on |
| CreateDate | Creation Date |
| ModDate | Modification Date |
| Author | The user who has set the state |
| Content | Not displayed in Adobe's Acrobat... |
| Subject | Not displayed in Adobe's Acrobat... |

### 77.1.51 PopUp as Integer

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Handle of the corresponding PopUp annotation if any.
**Notes:** (Read only property)

### 77.1.52 QuadPointsCount as UInt32

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of quad points.
**Notes:** Highlight, Link, and Redact annotations only.
(Read only property)

### 77.1.53 RD as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rectangular difference between the annotations bounding box and the content area.
**Notes:** Caret, Circle, Square, and FreeText annotations.
(Read only property)

### 77.1.54 RichStyle as String

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional default style string.
**Notes:** For FreeText annotations.

(Read only property)

### 77.1.55 RichText as String

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional rich text string (RC key).
**Notes:** For Markup annotations.
(Read only property)

### 77.1.56 Rotate as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotation for caret annotations.
**Notes:** Caret and FreeText annotations only. Must be zero or a multiple of 90.
(Read only property)

### 77.1.57 StampName as String

MBS DynaPDF Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stamp name.
**Notes:** Set only, if Icon property is rsUserDefined.
(Read only property)

### 77.1.58 State as String

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The state of the annotation.
**Notes:** (Read only property)

### 77.1.59 StateModel as String

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The state model (Marked, Review, and so on).
**Notes:** (Read only property)

### 77.1.60 Subject as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's subject.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.1.61 Subtype as String

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The subtype.
**Notes:** Set only, if Type = katUnknownAnnot.
(Read only property)

### 77.1.62 Type as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation type.
**Notes:** See at* constants.
(Read only property)

### 77.1.63 VerticesCount as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the vertices array.
**Notes:** This is the raw number of floating point values. Since a vertice requires always two coordinate pairs, the number of vertices or points is VerticeCount divided by 2.
(Read only property)

## 77.2 class DynaPDFAnnotationMBS

### 77.2.1 class DynaPDFAnnotationMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for annotation information.
**Example:**

```
dim pdf as DynaPDFMBS // your instance

dim c as Integer = pdf.GetAnnotCount

for i as Integer = 0 to c-1
dim a as DynaPDFAnnotationMBS = pdf.GetAnnot(i)

MsgBox str(a.Type)
next
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- MBS Xojo Plugins, version 23.5pr1
- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 77.2.2 Methods

### 77.2.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.2.4 Operator_Convert as DynaPDFAnnotationExMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts this annotation object to newer DynaPDFAnnotationExMBS.
**Example:**

```
Dim d As New DynaPDFMBS

// create a new annotation
Call d.CreateNewPDF
Call d.append
Dim n As Integer = d.WebLink(0, 0, 100, 100, "about:blank")

// now query as old class and convert to new class
Dim a1 As DynaPDFAnnotationMBS = d.GetAnnot(n)
Dim a2 As DynaPDFAnnotationExMBS = a1

// now query as new class and convert to old class
Dim e1 As DynaPDFAnnotationExMBS = d.GetAnnotEx(n)
Dim e2 As DynaPDFAnnotationMBS = e1

// please update all your code to move to DynaPDFAnnotationExMBS
Break
```

**Notes:** The fields not supported by DynaPDFAnnotationMBS are all zero.

### 77.2.5 Properties

### 77.2.6 Author as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's author.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.2.7 BackColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Background color.
**Notes:** (Read only property)

### 77.2.8 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bounding box in bottom-up coordinates.

**Notes:** (Read only property)

### 77.2.9 BorderColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border color.
**Notes:** (Read only property)

### 77.2.10 BorderStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border style.
**Notes:** (Read only property)

### 77.2.11 BorderWidth as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border width.
**Notes:** (Read only property)

### 77.2.12 Content as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's contents.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.2.13 Deleted as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is this annotation marked as deleted?
**Notes:** (Read only property)

### 77.2.14 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation handle.
**Notes:** (Read only property)

### 77.2.15 HighlightMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visual effect.
**Notes:** See hm* constants.
(Read only property)

### 77.2.16 Name as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's name.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.2.17 PageNum as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Page on which the annotation appears.
**Notes:** (Read only property)

### 77.2.18 Subject as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation's subject.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.2.19 Type as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation type.
**Notes:** See at* constants.
(Read only property)

## 77.3 class DynaPDFBarcode2MBS

### 77.3.1 class DynaPDFBarcode2MBS

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for barcode creation parameters.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr1
- News from the MBS Xojo Plugins Version 20.5

**Xojo Developer Magazine**

- 19.2, pages 30 to 31: Getting Started with DynaPDF, If you've never tried DynaPDF, you don't know how easy it is! by Stefanie Juchmes

### 77.3.2 Properties

### 77.3.3 BarcodeType as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of barcode that should be created.
**Notes:** See kbct* constants.
(Read and Write property)

### 77.3.4 BgColor as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Background color.
**Notes:** Default: NO_COLOR (transparent)
(Read and Write property)

### 77.3.5 BorderWidth as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border width
**Notes:** Default is zero.

(Read and Write property)

### 77.3.6 Data as String

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data in the barcode.
**Notes:** (Read and Write property)

### 77.3.7 DataType as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Data type and escape flag.
**Notes:** Default is kbcdtBinary.
See kbcdt* constants.
(Read and Write property)

### 77.3.8 DotSize as Single

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dotty mode only.
**Notes:** Default is 4.0/5.0.
(Read and Write property)

### 77.3.9 Eci as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extended Channel Interpretation mode.
**Notes:** Default 0.
(Read and Write property)

### 77.3.10 FgColor as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RGB Foreground color
**Notes:** (Read and Write property)

### 77.3.11 FSizeFactor as Single

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font size correction factor.
**Notes:** Default 0.7.
(Read and Write property)

### 77.3.12 Option1 as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Various options, depends on barcode type.
**Notes:** Default value is -1.

For QRCode:
Option1 is the ECC Level with values from 1 = low, 2 = middle, 3 = better, 4 high. Default is low.
Option2 is version code from 1 to 40. Default is 0 to auto select.
For MicroQR you can use ECC Level 1 to 3 as 4 is not supported.

For Data Matrix:
Option2 size from 1 to 30. 0 is auto. See table in zint manual pdf.
Option3 can be 100 to force square size.

For Code 39:
You can set Option2 to 1 to add module 43 checksum.

For MaxiCode:
Option 1 is the mode.

For PDF 417:
Option 1 is a number between 0 and 8 where the number of codewords used for check information is determined by 2^(value + 1).
Option 2 is the number of columns between 1 and 30.
(Read and Write property)

### 77.3.13 Option2 as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Various options, depends on barcode type.
**Notes:** Default value is 0.
(Read and Write property)

### 77.3.14 Option3 as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Various options, depends on barcode type.
**Notes:** Default value is 0.
(Read and Write property)

### 77.3.15 Options as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output options.
**Notes:** See kbco* constants.
(Read and Write property)

### 77.3.16 Orientation as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The orientation of the barcode.
**Notes:** Supported values: 0, 90, -90, 180, -180, 270, -270.
(Read and Write property)

### 77.3.17 OuterBorder as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional border around the scaled barcode measured in user space.
**Notes:** The member OuterBorder can be used to extend the background rectangle. Each side of OuterBorder specifies the line width of the corresponding side of the rectangle. OuterBorder is measured in user space whereas BorderWidth is measured in pixels of the reference grid.

Note that the background rectangle is drawn only if BgColor is set to another value than NO_COLOR (default).
(Read and Write property)

### 77.3.18 Primary as String

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Primary data message (max 127 bytes).
**Notes:** Composite codes only.
Image based barcodes only.
(Read and Write property)

### 77.3.19 Scale as Single

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image based barcodes only.
**Notes:** Default value is 1.0.
(Read and Write property)

### 77.3.20 ShowText as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Show human readable text?
**Notes:** Default is true.
(Read and Write property)

### 77.3.21 SpaceWidth as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whitespace width in pixels
**Notes:** Default value is 0 (auto).
(Read and Write property)

### 77.3.22 SymbHeight as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Symbol height
**Notes:** Default is 50.
(Read and Write property)

### 77.3.23 TextOffsetY as Single

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offset to correct the y-coordinate of text.
**Notes:** The default value is zero.
(Read and Write property)

### 77.3.24 Constants

Data Type Flags

| Constant | Value | Description |
|---|---|---|
| kbcdtBinary | 0 | Binary data. |
| kbcdtEscapeMode | 8 | Scan input data for escape sequences. This is a flag that can be combined with the other constants, e.g. pass EscapeMode and Unicode. |
| kbcdtGS1Mode | 2 | Encodes GS1 data using FNC1 characters. |
| kbcdtUnicode | 1 | UTF-8. |

Output Flags

| Constant | Value | Description |
|---|---|---|
| kbcoBind | 2 | Boundary bars above and below the symbol and between rows if stacking multiple symbols. |
| kbcoBoldText | 64 | Embolden human readable text. |
| kbcoBox | 4 | Add a box surrounding the symbol and whitespace. |
| kbcoDefault | 0 | Use default settings. |
| kbcoDottyMode | &h00000100 | Plot a matrix symbol using dots rather than squares. |
| kbcoGS1_GS_Separator | &h00000200 | Use GS instead FNC1 as GS1 separator. |
| kbcoImageOutput | &h01000000 | Draw the barcode as an image. Images are usually larger than vectors and require more processing time. |
| kbcoNoASCII | 1 | Consider non-ASCII characters when creating the barcode. |
| kbcoReaderInit | 16 | Add a reader initialisation symbol to the data before encoding. |
| kbcoSmallText | 32 | Use a smaller font for human readable text. |
| kbcoUseActiveFont | &h02000000 | Vector output only. If set, text is output with the active font. Helvetica is used otherwise. |

Barcode Types

| Constant | Value | Description |
|---|---|---|
| kbctAustraliaPost | 63 | Australia Post Standard Customer |
| kbctAustraliaRedir | 68 | Australia Post Redirection |
| kbctAustraliaReply | 66 | Australia Post Reply Paid |
| kbctAustraliaRout | 67 | Australia Post Routing |
| kbctAztec | 92 | Aztec Code |
| kbctAztecRunes | &h00000080 | Aztec Runes |
| kbctC2Of5IATA | 4 | Code 2 of 5 IATA |
| kbctC2Of5Industrial | 7 | Code 2 of 5 Industrial |
| kbctC2Of5Interleaved | 3 | Interleaved 2 of 5 |
| kbctC2Of5Logic | 6 | Code 2 of 5 Data Logic |
| kbctC2Of5Matrix | 2 | Standard Code 2 of 5 |
| kbctChannelCode | &h0000008C | Channel Code |
| kbctCodabar | 18 | Codabar |
| kbctCodablockF | 74 | Codablock-F |
| kbctCode11 | 1 | Code 11 |
| kbctCode128 | 20 | Code 128 (automatic subset switching) |
| kbctCode128B | 60 | Code 128 (Subset B) |
| kbctCode16K | 23 | Code 16K |
| kbctCode32 | &h00000081 | Code 32 |
| kbctCode39 | 8 | Code 3 of 9 (Code 39) |
| kbctCode49 | 24 | Code 49 |
| kbctCode93 | 25 | Code 93 |
| kbctCodeOne | &h0000008D | Code One |
| kbctDAFT | 93 | DAFT Code |
| kbctDataBarExpanded | 31 | GS1 DataBar Expanded / RSS_EXP |
| kbctDataBarExpStacked | 81 | GS1 DataBar Expanded Stacked |
| kbctDataBarLimited | 30 | GS1 DataBar Limited / RSS_LTD |
| kbctDataBarOmniTrunc | 29 | GS1 DataBar-14 Omnidirectional and truncated / RSS14 |
| kbctDataBarStacked | 79 | GS1 DataBar-14 Stacked |
| kbctDataBarStackedO | 80 | GS1 DataBar-14 Stacked Omnidirectional |
| kbctDataMatrix | 71 | Data Matrix ECC200 |
| kbctDotCode | &h00000073 | DotCode |
| kbctDPD | 96 | DPD code |
| kbctDPIdentCode | 22 | Deutsche Post Identcode |
| kbctDPLeitcode | 21 | Deutsche Post Leitcode |
| kbctEAN128 | 16 | GS1-128 (UCC.EAN-128) |
| kbctEAN128_CC | &h00000083 | Composite Symbol with GS1-128 linear component |
| kbctEAN14 | 72 | EAN-14 |
| kbctEANX | 13 | EAN in various sizes. |
| kbctEANXCheck | 14 | EAN + Check Digit |
| kbctEANX_CC | &h00000082 | Composite Symbol with EAN linear component |
| kbctExtCode39 | 9 | Extended Code 3 of 9 (Code 39+) |
| kbctFIM | 49 | FIM |
| kbctFlattermarken | 28 | Flattermarken |
| kbctHIBC_Aztec | &h00000070 | HIBC Aztec Code |
| kbctHIBC_CodablockF | &h0000006E | HIBC Codablock-F |
| kbctHIBC_Code128 | 98 | HIBC Code 128 |
| kbctHIBC_Code39 | 99 | HIBC Code 39 |
| kbctHIBC_DataMatrix | &h00000066 | HIBC Data Matrix ECC200 |
| kbctHIBC_MicroPDF417 | &h0000006C | HIBC MicroPDF417 |
| kbctHIBC_PDF417 | &h0000006A | HIBC PDF417 |
| kbctHIBC_QR | &h00000068 | HIBC QR Code |
| kbctISBNX | 69 | ISBN (EAN-13 with verification stage) |
| kbctITF14 | 89 | ITF-14 |
| kbctJapanPost | 76 | Japanese Postal Code |
| kbctKIX | 90 | Dutch Post KIX Code |
| kbctKoreaPost | 77 | Korea Post |
| kbctLOGMARS | 50 | LOGMARS |

## 77.4 class DynaPDFBarcodeMBS

### 77.4.1 class DynaPDFBarcodeMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for detail information on barcode fields.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

### 77.4.2 Properties

### 77.4.3 Caption as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, the caption.
**Notes:** (Read and Write property)

### 77.4.4 ECC as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error correction code.
**Notes:** 0..8 for PDF417, or 0..3 for QRCode
(Read and Write property)

### 77.4.5 Height as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height in inches.
**Notes:** (Read and Write property)

### 77.4.6 nCodeWordCol as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of codewords per barcode coloumn.
**Notes:** Required for PDF417.

(Read and Write property)

### 77.4.7 nCodeWordRow as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of codewords per barcode row.
**Notes:** Required for PDF417.
(Read and Write property)

### 77.4.8 Resolution as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The resolution.
**Notes:** Required. Should be 300.
(Read and Write property)

### 77.4.9 Symbology as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The symbology.
**Notes:** PDF417, QRCode, or DataMatrix.
(Read and Write property)

### 77.4.10 Version as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of this object.
**Notes:** Should be 1
(Read and Write property)

### 77.4.11 Width as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width in inches.
**Notes:** (Read and Write property)

### 77.4.12 XSymHeight as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical distance between two barcode modules, measured in pixels.
**Notes:** Only needed for PDF417.
The ratio XSymHeight/XSymWidth shall be an integer value. For PDF417, the acceptable ratio range is from 1 to 4. For QRCode and DataMatrix, this ratio shall always be 1.
(Read and Write property)

### 77.4.13 XSymWidth as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Required. The horizontal distance, in pixels, between two barcode modules.
**Notes:** (Read and Write property)

## 77.5 class DynaPDFBitmapMBS

### 77.5.1 class DynaPDFBitmapMBS

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a bitmap in DynaPDF.
**Notes:** Currently only used for RenderAnnotOrField function.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.5.2 Methods

### 77.5.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.5.4 Properties

### 77.5.5 Buffer as Memoryblock

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw image buffer.
**Notes:** To avoid problems, this is a copy of the image data.
(Read and Write property)

### 77.5.6 BufSize as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Buffer size in bytes.
**Notes:** (Read and Write property)

### 77.5.7 DestX as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** x-coordinate in the main image (the rendered page)
**Notes:** (Read and Write property)

### 77.5.8 DestY as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** y-coordinate in the main image (the rendered page)
**Notes:** (Read and Write property)

### 77.5.9 Height as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image height in pixels.
**Notes:** (Read and Write property)

### 77.5.10 Stride as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scanline length in bytes.
**Notes:** (Read and Write property)

### 77.5.11 Width as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image width.
**Notes:** (Read and Write property)

## 77.6 class DynaPDFBookmarkMBS

### 77.6.1 class DynaPDFBookmarkMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for bookmark information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr1
- MBS Xojo Plugins, version 18.0pr9
- MBS Real Studio Plugins, version 11.3pr13

### 77.6.2 Methods

### 77.6.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.6.4 Properties

### 77.6.5 ColorValue as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bookmark color (PDF 1.4).
**Notes:** (Read and Write property)

### 77.6.6 DestPage as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination page.
**Notes:** (Read and Write property)

### 77.6.7 DestPos as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination position.
**Notes:** (Read and Write property)

### 77.6.8 DestType as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination type.
**Notes:** (Read and Write property)

### 77.6.9 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bookmark handle.
**Notes:** Index from 0 to GetBookmarkCount-1.
(Read and Write property)

### 77.6.10 Open as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the bookmark appears open.
**Notes:** (Read and Write property)

### 77.6.11 Parent as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parent bookmark if any or -1.
**Notes:** (Read and Write property)

### 77.6.12 Style as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text style (PDF 1.4).
**Notes:** (Read and Write property)

### 77.6.13 Title as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title string.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read and Write property)

### 77.6.14 TitleLen as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title length.
**Notes:** (Read and Write property)

## 77.7 class DynaPDFChoiceValueMBS

### 77.7.1 class DynaPDFChoiceValueMBS

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for choice values in a PDF.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

### 77.7.2 Methods

### 77.7.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.7.4 Properties

### 77.7.5 ExpValue as String

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ExpValue.
**Notes:** (Read and Write property)

### 77.7.6 Selected as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the choice value is selected.
**Notes:** (Read and Write property)

### 77.7.7 Value as String

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value.
**Notes:** (Read and Write property)

## 77.8 class DynaPDFCIDMetricMBS

### 77.8.1 class DynaPDFCIDMetricMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a CID Metric.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.8.2 Methods

### 77.8.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.8.4 Properties

### 77.8.5 Width as Double

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width value.
**Notes:** (Read and Write property)

### 77.8.6 x as Double

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X value.
**Notes:** (Read and Write property)

### 77.8.7 y as Double

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y value.
**Notes:** (Read and Write property)

## 77.9 class DynaPDFCMapMBS

### 77.9.1 class DynaPDFCMapMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a character map in DynaPDF.
**Notes:** This class contains several duplicate fields because CMap files contain usually a DSC comment section which provides Postscript specific initialization code. With exception of DSCResName the strings in the DSC section should not differ from their CMap counterparts. The Identity mapping of a character collection should contain the DSC comment "%%BeginResource: CMap (Identity)". Otherwise the string should be set to the CMap name.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.9.2 Methods

### 77.9.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.9.4 Properties

### 77.9.5 BaseCMap as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If set, this base cmap is required when loading the cmap.
**Notes:** (Read only property)

### 77.9.6 CIDCount as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ID count.
**Notes:** 0 if not set.
(Read only property)

### 77.9.7 CMapName as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMap name.
**Notes:** (Read only property)

### 77.9.8 CMapType as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMap type.
**Notes:** Should be 1!
(Read only property)

### 77.9.9 CMapVersion as Double

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMap version.
**Notes:** (Read only property)

### 77.9.10 DSCBaseCMap as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DSC comment.
**Notes:** (Read only property)

### 77.9.11 DSCCMapVersion as Double

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The DSC CMap version.
**Notes:** (Read only property)

### 77.9.12 DSCResName as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DSC comment.
**Notes:** If the CMap uses an Identity mapping this string should be set to Identity.
(Read only property)

### 77.9.13 DSCTitle as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The DSC title.
**Notes:** DSC comment ->DSC CMap name + Registry + Ordering + Supplement, e.g. "GB-EUC-H Adobe GB1 0"
(Read only property)

### 77.9.14 FileName as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name.
**Notes:** The file name and CMap name should be identical!
(Read only property)

### 77.9.15 FilePath as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path.
**Notes:** (Read only property)

### 77.9.16 Ordering as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ordering.
**Notes:** CIDSystemInfo ->The Character Collection, e.g. Japan1.
(Read only property)

### 77.9.17 Registry as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The registry string.
**Notes:** CIDSystemInfo ->The registrant of the Character Collection is usually Adobe.
(Read only property)

### 77.9.18 Supplement as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Supplement number.
**Notes:** CIDSystemInfo ->The Supplement number should be supported in the used PDF Version.
(Read only property)

### 77.9.19 WritingMode as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The writing mode.
**Notes:** 0 == Horizontal, 1 == Vertical
(Read only property)

## 77.10 class DynaPDFColorProfilesExMBS

### 77.10.1 class DynaPDFColorProfilesExMBS

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A set of ICC profiles for color management.
**Notes:** In general, the DefInXXX profiles are used if no other profile is available for the color space. Possible sources are DefaultGray, DefaultRGB, DefaultCMYK, and the Rendering Intents.
The SoftProof profile emulates the output device. This is typically a printer profile or a default CMYK profile. If no profile is set then no device will be emulated. What you see is maybe not what you get on a printer.
To disable color management set the parameter Profiles of InitColormanagement() to nil.

Please use DynaPDFColorProfilesExMBS when you have profiles in memory and DynaPDFColorProfilesMBS when you have them as files.

### 77.10.2 Properties

### 77.10.3 DefInCMYK as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMYK Profile.
**Notes:** Optional, CMYK colors are the problematic ones.
The other profiles can be created on demand but this is not possible with a CMYK profile. So, this is the most important input profile.
(Read and Write property)

### 77.10.4 DefInGray as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gray profile.
**Notes:** Optional
(Read and Write property)

### 77.10.5 DefInRGB as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RGB profile.
**Notes:** Optional, sRGB is the default.
(Read and Write property)

### 77.10.6 DeviceProfile as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output device profile.
**Notes:** Optional, the output profile must be compatible with the output color space.
At this time only Gray or RGB profiles are supported. This is the monitor profile! Default is sRGB.
(Read and Write property)

### 77.10.7 SoftProof as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The proofing profile.
**Notes:** Optional but very important. This profile emulates the output device.
(Read and Write property)

## 77.11 class DynaPDFColorProfilesMBS

### 77.11.1 class DynaPDFColorProfilesMBS

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A set of ICC profiles for color management.
**Notes:** In general, the DefInXXX profiles are used if no other profile is available for the color space. Possible sources are DefaultGray, DefaultRGB, DefaultCMYK, and the Rendering Intents.
The SoftProof profile emulates the output device. This is typically a printer profile or a default CMYK profile. If no profile is set then no device will be emulated. What you see is maybe not what you get on a printer.
To disable color management set the parameter Profiles of InitColormanagement() to nil.

Please use DynaPDFColorProfilesExMBS when you have profiles in memory and DynaPDFColorProfilesMBS when you have them as files.
**Blog Entries**

- DynaPDF Basics
- MBS Real Studio Plugins, version 11.3pr9

### 77.11.2 Properties

### 77.11.3 DefInCMYK as FolderItem

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMYK Profile.
**Notes:** Optional, CMYK colors are the problematic ones.
The other profiles can be created on demand but this is not possible with a CMYK profile. So, this is the most important input profile.
(Read and Write property)

### 77.11.4 DefInGray as FolderItem

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gray profile.
**Notes:** Optional
(Read and Write property)

### 77.11.5 DefInRGB as FolderItem

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RGB profile.
**Notes:** Optional, sRGB is the default.
(Read and Write property)

### 77.11.6 DeviceProfile as FolderItem

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output device profile.
**Notes:** Optional, the output profile must be compatible with the output color space.
At this time only Gray or RGB profiles are supported. This is the monitor profile! Default is sRGB.
(Read and Write property)

### 77.11.7 SoftProof as FolderItem

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The proofing profile.
**Notes:** Optional but very important. This profile emulates the output device.
(Read and Write property)

## 77.12 class DynaPDFColorSpaceMBS

### 77.12.1 class DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space class.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr6
- MBS REALbasic Plugins, version 11.1pr4

### 77.12.2 Methods

### 77.12.3 BlackPoint(index as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CIE blackpoint.
**Notes:** If set, the array contains exactly 3 values. (index 0 to 2)

### 77.12.4 Colorants(index as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorant names (Separation, DeviceN, and NChannel only).
**Example:**

```
Sub DrawSomething(pdf as DynaPDFMBS)
// draw all colorants with their own color
Dim MyX, MyY as Double

MyX = 10
MyY = 100

// set a font
call pdf.SetFont "Times", pdf.kfsItalic, 10.0, true, pdf.kcp1252

// loop over all color spaces
dim Colorcount as Integer = pdf.GetColorSpaceCount

For j as Integer = 0 to Colorcount-1
MyX = 10
```

```
dim MyColourSpace as DynaPDFColorSpaceMBS = PDF.GetColorSpaceObj(j)
dim ColorantsCount as Integer = MyColourSpace.ColorantsCount
dim c as Integer = MyColourSpace.NumInComponents
Call pdf.SetExtColorSpace j

// draw name of each colorant
for i as Integer = 0 to c-1

// build array with colors and set 100% for the one color we need
dim values() as Double
redim values(c-1)
values(i) = 1.0

// get name
dim name as string = "#"+str(i)
if i <= ColorantsCount then
name = MyColourSpace.Colorants(i)
end if

// seaw name
Call pdf.SetFillColor(values)
call pdf.WriteText(MyX,MyY, name)

// next
MyX = MyX + pdf.GetTextWidth(name) + 20
next

// next
MyY = MyY+20
Next
End Sub
```

**Notes:** This array contains ColorantsCount strings.
The plugin marks the string as UTF-8 and it should contain UTF-8. Be we saw PDF files form other applications which put here WindowsANSI or MacRoman strings.

### 77.12.5 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.12.6 Gamma(index as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gamma values.
**Notes:** If set, one value per component.

### 77.12.7 Matrix(index as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** XYZ matrix.
**Notes:** If set, the array contains exactly 9 values.

### 77.12.8 Range(index as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The range values.
**Notes:** min/max for each component or for the .a and .b components of a Lab color space. Index is zero based.

### 77.12.9 WhitePoint(index as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CIE whitepoint.
**Notes:** If set, the array contains exactly 3 values. (index 0 to 2)

### 77.12.10 Properties

### 77.12.11 Alternate as DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alternative color space.
**Notes:** Only set if the color space contains an alternate or base color space.
(Read only property)

### 77.12.12 AlternateType as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Alternate color space or base space of an Indexed or Pattern color space.
**Notes:** (Read only property)

### 77.12.13 Buffer as string

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Contains either an ICC profile or the color table of an Indexed color space.
**Notes:** (Read only property)

### 77.12.14 BufferSize as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The buffer length in bytes.
**Notes:** (Read only property)

### 77.12.15 ColorantsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of colorants in the array.
**Example:**

```
Sub DrawSomething(pdf as DynaPDFMBS)
// draw all colorants with their own color
Dim MyX, MyY as Double

MyX = 10
MyY = 100

// set a font
call pdf.SetFont "Times", pdf.kfsItalic, 10.0, true, pdf.kcp1252

// loop over all color spaces
dim Colorcount as Integer = pdf.GetColorSpaceCount

For j as Integer = 0 to Colorcount-1
MyX = 10
dim MyColourSpace as DynaPDFColorSpaceMBS = PDF.GetColorSpaceObj(j)
```

```
dim ColorantsCount as Integer = MyColourSpace.ColorantsCount
dim c as Integer = MyColourSpace.NumInComponents
Call pdf.SetExtColorSpace j

// draw name of each colorant
for i as Integer = 0 to c-1

// build array with colors and set 100% for the one color we need
dim values() as Double
redim values(c-1)
values(i) = 1.0

// get name
dim name as string = "#"+str(i)
if i <= ColorantsCount then
name = MyColourSpace.Colorants(i)
end if

// seaw name
Call pdf.SetFillColor(values)
call pdf.WriteText(MyX,MyY, name)

// next
MyX = MyX + pdf.GetTextWidth(name) + 20
next

// next
MyY = MyY+20
Next
End Sub
```

**Notes:** (Read only property)

### 77.12.16 Description as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description text for color space.
**Notes:** For color spaces with valid ICC profile only.
(Read only property)

### 77.12.17 DeviceNAttributes as DynaPDFDeviceNAttributesMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional attributes of DeviceN or NChannel color spaces.
**Notes:** (Read only property)

### 77.12.18 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle for this color space object.
**Notes:** An IColorSpaceObj reference.
(Read only property)

### 77.12.19 HasBlackPoint as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the black point array has values.
**Notes:** (Read only property)

### 77.12.20 HasGamma as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the gamma array has values.
**Notes:** (Read only property)

### 77.12.21 HasMatrix as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the matrix array has values.
**Notes:** (Read only property)

### 77.12.22 HasRange as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the range array has values.
**Notes:** (Read only property)

### 77.12.23 HasWhitePoint as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the white point array has values.
**Notes:** (Read only property)

### 77.12.24 Index as Integer

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index in the color space list for current document.
**Notes:** Can be -1 if not known by plugin.
In that case you would need to get list of all colorspaces and compare handle values to see which entry you got.
(Read only property)

### 77.12.25 Manufacturer as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The manufacturer text for color space.
**Notes:** For color spaces with valid ICC profile only.
(Read only property)

### 77.12.26 MetaData as string

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional XMP metadata stream ->ICCBased only.
**Notes:** (Read only property)

### 77.12.27 MetadataSize as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Metadata length in bytes.
**Notes:** (Read only property)

### 77.12.28 Model as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The model text for color space.
**Notes:** For color spaces with valid ICC profile only.
(Read only property)

### 77.12.29 Name as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the color space.
**Notes:** For color spaces with valid ICC profile only.
The plugin picks name from Model, Description and Manufacturer properties.
(Read only property)

### 77.12.30 NumColors as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of colors in this color space.
**Notes:** HiVal + 1 as specified in the color space. Indexed color space only.
(Read only property)

### 77.12.31 NumInComponents as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of input components.
**Notes:** (Read only property)

### 77.12.32 NumOutComponents as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of output components.
**Notes:** (Read only property)

### 77.12.33 Type as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of this color space.
**Notes:** (Read only property)

### 77.12.34 TypeString as String

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type as string for viewing in debugger.
**Notes:** (Read only property)

## 77.13 class DynaPDFDeviceNAttributesMBS

### 77.13.1 class DynaPDFDeviceNAttributesMBS

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about a Device N.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

### 77.13.2 Methods

### 77.13.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.13.4 ProcessColorants(index as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns process colorants with the given index.
**Notes:** Raises out of bounds exceptions on bad index or if object does not have such an array.
Index is zero based.

### 77.13.5 Separations(index as Integer) as DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional array of separation color spaces.
**Notes:** Raises out of bounds exceptions if used with wrong index parameter.
Index is zero based.

### 77.13.6 Properties

### 77.13.7 ProcessColorantsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of process colorants in the array or zero if not set.
**Notes:** (Read and Write property)

### 77.13.8 ProcessColorSpace as DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The process color space.
**Notes:** (Read and Write property)

### 77.13.9 SeparationsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of color spaces in the Separations array.
**Notes:** (Read and Write property)

## 77.14 class DynaPDFEditTextMBS

### 77.14.1 class DynaPDFEditTextMBS

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text editor.
**Notes:** If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.

FindPattern needs at least Lite license and ReplacePattern needs a Pro license.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr2
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr1

**Xojo Developer Magazine**

- 15.2, page 9: News
- 11.1, page 9: News

### 77.14.2 Methods

### 77.14.3 Constructor(PDF as DynaPDFMBS)

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the edit text class with the given PDF instance.

### 77.14.4 Destructor

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 77.14.5 FindPattern(text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the text on the current PDF page for the given text.
**Notes:** Returns the number of occurrences.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.

FindPattern needs at least Lite license and ReplacePattern needs a Pro license.

### 77.14.6 ReplacePattern(NewText as string)

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the text with a new one or deletes it if the new string is an empty string.
**Notes:** Use the PrepareWrite event.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.

FindPattern needs at least Lite license and ReplacePattern needs a Pro license.

### 77.14.7 Properties

### 77.14.8 Parent as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference of the DynaPDFMBS object.
**Notes:** (Read only property)

### 77.14.9 Events

### 77.14.10 PrepareWrite(M as DynaPDFMatrixMBS, text as string, FillCS as Integer, FillColor as UInt32, StrokeCS as Integer, StrokeColor as UInt32, FontSize as Double, x as Double, y as Double, w as Double, h as Double, font as DynaPDFFontMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called before replace function writes.
**Notes:** Changed font, text size or color here.
If you return true, the text is not written.
Like if you draw it yourself or delete it.

Add new parameters for fill color, stroke color, font size, rectangle and font information in version 17.0.

## 77.15 class DynaPDFEmbFileNodeMBS

### 77.15.1 class DynaPDFEmbFileNodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an embedded file node.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.15.2 Methods

### 77.15.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.15.4 Properties

### 77.15.5 EF as DynaPDFFileSpecMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Embedded file.
**Notes:** (Read only property)

### 77.15.6 Name as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name.
**Notes:** UTF-8 encoded name. This key contains usually a 7 bit ASCII string.
(Read only property)

### 77.15.7 NextObject as DynaPDFEmbFileNodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Next node if any.
**Notes:** (Read only property)

## 77.16 class DynaPDFErrorExceptionMBS

### 77.16.1 class DynaPDFErrorExceptionMBS

MBS DynaPDF Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error exception.
**Notes:** We report errors as exceptions if Error event is not implemented or you return kErrorEventRaise there.
Subclass of the RuntimeException class.
**Blog Entries**

- Quick encrypt or decrypt with DynaPDF
- News from the MBS Xojo Plugins Version 20.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr1
- Improvements for MBS Xojo DynaPDF Plugin
- MBS REALbasic Plugins, version 11.1pr4

**Xojo Developer Magazine**

- 19.6, page 12: Things you can do with DynaPDF, The MBS DynaPDF Plugin is more powerful than you think by Stefanie Juchmes
- 18.6, page 10: News

## 77.17 class DynaPDFErrorMBS

### 77.17.1 class DynaPDFErrorMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an entry in the error log.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr1
- MBS REALbasic Plugins, version 11.1pr4

### 77.17.2 Methods

### 77.17.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.17.4 Properties

### 77.17.5 ErrCode as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code.
**Notes:** ErrCode and ErrType are set if the error mode was set to kemUseErrLog.
See SetErrorMode() for further information.
(Read and Write property)

### 77.17.6 ErrType as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error type.
**Notes:** ErrCode and ErrType are set if the error mode was set to kemUseErrLog.
See SetErrorMode() for further information.
(Read and Write property)

### 77.17.7 Message as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message
**Notes:** (Read and Write property)

### 77.17.8 ObjNum as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Object Number.
**Notes:** -1 if not available
(Read and Write property)

### 77.17.9 Offset as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The offset.
**Notes:** -1 if not available
(Read and Write property)

### 77.17.10 SrcFile as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source file.
**Notes:** (Read and Write property)

### 77.17.11 SrcLine as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Source Line.
**Notes:** (Read and Write property)

## 77.18 class DynaPDFExtGState2MBS

### 77.18.1 class DynaPDFExtGState2MBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The extended graphics state class.

### 77.18.2 Methods

### 77.18.3 BlendMode(index as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blend modes.
**Notes:** See bm* constants.

### 77.18.4 Properties

### 77.18.5 AlphaIsShape as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AlphaIsShape property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.18.6 AutoStrokeAdjust as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AutoStrokeAdjust property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.18.7 BlackGen as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function handle or 0.
**Notes:** (Read and Write property)

### 77.18.8 BlackGen2 as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function handle or 0.
**Notes:** (Read and Write property)

### 77.18.9 BlendModeCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blend mode count.
**Notes:** (Read and Write property)

### 77.18.10 FillAlpha as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill alpha.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.18.11 FlatnessTol as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The FlatnessTol property.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.18.12 Halftone as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The halftone handle or 0.
**Notes:** (Read and Write property)

### 77.18.13 OverPrintFill as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintFill property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.18.14 OverPrintMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintMode property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.18.15 OverPrintStroke as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintStroke property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.18.16 RenderingIntent as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent.
**Notes:** riNone if not set
(Read and Write property)

### 77.18.17 SmoothnessTol as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SmoothnessTol property.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.18.18 SoftMask as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Soft mask handle.
**Notes:** (Read and Write property)

### 77.18.19 SoftMaskNone as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the softmask must be disabled.
**Notes:** (Read and Write property)

### 77.18.20 StrokeAlpha as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stoke alpha value.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.18.21 TextKnockout as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TextKnockout property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

## 77.19 class DynaPDFExtGStateMBS

### 77.19.1 class DynaPDFExtGStateMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The extended graphics state class.
**Blog Entries**

- DynaPDF with gradients in DeviceN colorspace

### 77.19.2 Properties

### 77.19.3 AlphaIsShape as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AlphaIsShape property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.19.4 AutoStrokeAdjust as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The AutoStrokeAdjust property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.19.5 BlendMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blend mode.
**Notes:** See bm* constants.
Default bmNotSet.
(Read and Write property)

### 77.19.6 FillAlpha as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill alpha.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.19.7 FlatnessTol as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The FlatnessTol property.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.19.8 OverPrintFill as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintFill property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.19.9 OverPrintMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintMode property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.19.10 OverPrintStroke as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OverPrintStroke property.
**Notes:** PDF_MAX_INT if not set.
(Read and Write property)

### 77.19.11 RenderingIntent as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent.
**Notes:** riNone if not set
(Read and Write property)

### 77.19.12 SmoothnessTol as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SmoothnessTol property.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.19.13 SoftMask as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Soft mask pointer or nil. See CreateSoftMask for further information.
**Notes:** (Read and Write property)

### 77.19.14 SoftMaskNone as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disables the active soft mask.
**Notes:** (Read and Write property)

### 77.19.15 StrokeAlpha as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stoke alpha value.
**Notes:** -1.0 if not set.
(Read and Write property)

### 77.19.16 TextKnockout as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TextKnockout property.
**Notes:** PDF_MAX_INT if not set.

(Read and Write property)

## 77.20 class DynaPDFFieldExMBS

### 77.20.1 class DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for extended field information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Embracing for each loops
- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo Plugins, version 18.2pr5
- MBS Real Studio Plugins, version 12.1pr6
- MBS REALbasic Plugins, version 11.1pr4

### 77.20.2 Methods

### 77.20.3 Close

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** You can call close to release all values now or simply let it go automatically later.

### 77.20.4 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.20.5 Kids(index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array of child fields.

### 77.20.6 Properties

### 77.20.7 Action as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Action handle or -1 if not set.
**Notes:** This action is executed when the field is activated.
(Read only property)

### 77.20.8 ActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of action.
**Notes:** See kat* constants.
Meaningful only, if Action >= 0.
(Read only property)

### 77.20.9 BackColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Background color.
**Notes:** (Read only property)

### 77.20.10 BackColorSP as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space of the background color.
**Notes:** (Read only property)

### 77.20.11 Barcode as DynaPDFBarcodeMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If present, this field is a barcode field.
**Notes:** The field type is set to kftText since barcode fields are extended text fields.
(Read only property)

### 77.20.12 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bounding box of the field in bottom-up coordinates.
**Notes:** (Read only property)

### 77.20.13 BorderColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Border color.
**Notes:** (Read only property)

### 77.20.14 BorderColorSP as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space of the border color.
**Notes:** (Read only property)

### 77.20.15 BorderStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Border style.
**Notes:** (Read only property)

### 77.20.16 BorderWidth as Single

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Border width.
**Notes:** (Read only property)

### 77.20.17 CaptionPos as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Where to position the caption.
**Notes:** Use constants kbcpCaptionAbove, kbcpCaptionBelow, kbcpCaptionLeft, kbcpCaptionOnly, kbcpCaptionOver, kbcpCaptionRight or kbcpImageOnly.
(Read only property)

### 77.20.18 CharSpacing as Single

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The char spacing.
**Notes:** Text fields only.
(Read only property)

### 77.20.19 CheckBoxChar as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ZapfDingbats character that is used to display the on state.
**Notes:** (Read only property)

### 77.20.20 Checked as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The check value.
**Notes:** Check boxes only
(Read only property)

### 77.20.21 DefState as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default state.
**Notes:** Check boxes only
(Read only property)

### 77.20.22 DefValue as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional default value.
**Notes:** (Read only property)

### 77.20.23 Deleted as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the field was marked as deleted by DeleteField().
**Notes:** (Read only property)

### 77.20.24 DownCaption as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Caption of the down state.
**Notes:** (Read only property)

### 77.20.25 DownImage as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image handle of the down state.
**Notes:** You can use this image handle with GetImageObj to get the image.
(Read only property)

### 77.20.26 EditFont as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Postscript name of the editing font.
**Notes:** (Read only property)

### 77.20.27 Events as DynaPDFObjEventMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The events for this fields.
**Notes:** (Read only property)

### 77.20.28 ExpValCount as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combo and list boxes only.
**Notes:** The values can be accessed with GetFieldExpValueEx().
(Read only property)

### 77.20.29 ExpValue as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exp value.
**Notes:** Check boxes only.
(Read only property)

### 77.20.30 FieldFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field flags.
**Notes:** (Read only property)

### 77.20.31 FieldFont as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Postscript name of the font.
**Notes:** (Read only property)

### 77.20.32 FieldName as String

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field name.
**Notes:** Note that children of a field group or radio button have no name.
(Read only property)

### 77.20.33 FieldType as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field type.
**Notes:** (Read only property)

### 77.20.34 FmtText as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The formatted field value.
**Notes:** Text fields only.
The formatted field value if the field contains an OnFormat Javascript action.
(Read only property)

### 77.20.35 FmtTextColor as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text color for formatting.
**Notes:** Text fields only.
Zero if not set. Usually RGB red otherwise.
(Read only property)

### 77.20.36 FontSize as Double

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font size. 0.0 means auto font size.
**Notes:** (Read only property)

### 77.20.37 FullyQualifiedFieldName as String

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fully qualified name of a field.
**Notes:** Note that children of a radio button, for example, have no name by its own. The export value must be compared to distinguish the children fields in this case.
(Read only property)

### 77.20.38 GroupType as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If GroupType <>FieldType the field is a terminal field of a field group.
**Notes:** (Read only property)

### 77.20.39 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field handle.
**Notes:** (Read only property)

### 77.20.40 HighlightMode as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Highlight mode.
**Notes:** (Read only property)

### 77.20.41 IEditFont as DynaPDFFontMBS

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The edit font object.
**Notes:** The object is created on demand the first time you access and cached.
(Read only property)

### 77.20.42 IEditFontInfo as DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The edit font info object.
**Notes:** The object is created on demand the first time you access and cached.
(Read only property)

### 77.20.43 IFieldFont as DynaPDFFontMBS

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field font object.
**Notes:** The object is created on demand the first time you access and cached.
(Read only property)

### 77.20.44 IFieldFontInfo as DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field font info object.
**Notes:** The object is created on demand the first time you access and cached.
(Read only property)

### 77.20.45 IsCalcField as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the OnCalc event of the field is connected with a JavaScript action.
**Notes:** (Read only property)

### 77.20.46 KidCount as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of fields in the Kids array.
**Notes:** (Read only property)

### 77.20.47 MapName as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional unique mapping name of the field.
**Notes:** (Read only property)

### 77.20.48 MaxLen as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum text length.
**Notes:** Text fields only ->zero means not restricted.

(Read only property)

### 77.20.49 ModDate as String

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modification date.
**Notes:** (Read only property)

### 77.20.50 OC as Integer

MBS DynaPDF Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Handle of an OCG or OCMD or -1.
**Notes:** Fields can be part of an Optional Content Group (OCG) or Optional Content Membership Dictionary (OCMD). If OC is greater -1 an OCG or OCMD handle was set. To determine whether an OCG handle was set, check whether the value is smaller &h40000000.
(Read only property)

### 77.20.51 PageIndex as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array index to change the tab order.
**Notes:** see SortFieldsByIndex().
(Read only property)

### 77.20.52 PageNum as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Page on which the field is used or -1.
**Notes:** (Read only property)

### 77.20.53 RollCaption as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Caption of the roll over state.
**Notes:** (Read only property)

### 77.20.54 RollImage as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image handle of the roll over state.
**Notes:** You can use this image handle with GetImageObj to get the image.
(Read only property)

### 77.20.55 Rotate as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation angle in degrees.
**Notes:** (Read only property)

### 77.20.56 Signature as DynaPDFSigDictMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature details.
**Notes:** Signature fields only. Present only for imported signature fields which which have a value. That means the file was digitally signed. -
Signed signature fields are always marked as deleted!
(Read only property)

### 77.20.57 TextAlign as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text align.
**Notes:** Text fields only.
(Read only property)

### 77.20.58 TextColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text color.
**Notes:** (Read only property)

### 77.20.59 TextColorSP as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space of the field's text.
**Notes:** (Read only property)

### 77.20.60 TextScaling as Single

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text scaling.
**Notes:** Text fields only.
(Read only property)

### 77.20.61 ToolTip as String

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tooltip text.
**Notes:** Optional tool tip.
(Read only property)

### 77.20.62 UniqueName as String

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional unique name (NM key).
**Notes:** (Read only property)

### 77.20.63 UpCaption as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Caption of the up state.
**Notes:** (Read only property)

### 77.20.64 UpImage as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image handle of the up state.
**Notes:** You can use this image handle with GetImageObj to get the image.
(Read only property)

### 77.20.65 Value as String

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the field.
**Notes:** (Read only property)

### 77.20.66 WordSpacing as Single

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The word spacing.
**Notes:** Text fields only.
(Read only property)

# 77.21 class DynaPDFFieldMBS

## 77.21.1 class DynaPDFFieldMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use DynaPDFFieldExMBS instead. **Function:** The class for field information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

## 77.21.2 Methods

## 77.21.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.21.4 Properties

## 77.21.5 BackColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Background color.
**Notes:** (Read only property)

## 77.21.6 BackCS as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space of background / border color
**Notes:** (Read only property)

## 77.21.7 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Bounding box.
**Notes:** (Read only property)

### 77.21.8 BorderColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border color.
**Notes:** (Read only property)

### 77.21.9 Checked as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Only set if the field is a check box.
**Notes:** (Read only property)

### 77.21.10 Deleted as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the field was deleted.
**Notes:** (Read only property)

### 77.21.11 FieldName as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field name.
**Notes:** May be unicode or ASCII encoded.
(Read only property)

### 77.21.12 FieldNameLen as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Field name length in characters.
**Notes:** (Read only property)

### 77.21.13 FieldType as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field type (see ft* constants)
**Notes:** (Read only property)

### 77.21.14 Font as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used font by the field (PostScript name).
**Notes:** (Read only property)

### 77.21.15 FontSize as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font size.
**Notes:** (Read only property)

### 77.21.16 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Field handle.
**Notes:** (Read only property)

### 77.21.17 KidCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Greater zero if the field has childs.
**Notes:** (Read only property)

### 77.21.18 Parent as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parent field handle if any.
**Notes:** (Read only property)

### 77.21.19 TextColor as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text color.
**Notes:** (Read only property)

### 77.21.20 TextCS as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space of text color.
**Notes:** (Read only property)

### 77.21.21 ToolTip as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tool tip if any.
**Notes:** Unicode or ASCII encoded.
(Read only property)

### 77.21.22 Value as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field value.
**Notes:** Unicode or ASCII encoded.
(Read only property)

## 77.22 class DynaPDFFileSpecExMBS

### 77.22.1 class DynaPDFFileSpecExMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an extended file specification.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.22.2 Methods

### 77.22.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.22.4 Properties

### 77.22.5 AFRelationship as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The relationship.
**Notes:** PDF 2.0
(Read and Write property)

### 77.22.6 ColItem as Ptr

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If <>nil the embedded file contains a collection item with user defined data.
**Notes:** This entry can occur in PDF Collections only (PDF 1.7). See "PDF Collections" in the help file for further information.
(Read and Write property)

### 77.22.7 Description as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional description string.
**Notes:** (Read and Write property)

### 77.22.8 DOS as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional DOS file name.
**Notes:** (Read and Write property)

### 77.22.9 EmbFileNode as DynaPDFEmbFileNodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The embedded file node for embedded file.
**Notes:** (Read and Write property)

### 77.22.10 FileName as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** File name as 7 bit ASCII string.
**Notes:** (Read and Write property)

### 77.22.11 FileNameIsURL as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, FileName contains a URL.
**Notes:** (Read and Write property)

### 77.22.12 ID1 as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional file ID.
**Notes:** Meaningful only if FileName points to a PDF file.
(Read and Write property)

### 77.22.13 ID2 as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional file ID.
**Notes:** Meaningful only if FileName points to a PDF file.
(Read and Write property)

### 77.22.14 IsVolatile as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the file changes frequently with time.
**Notes:** (Read and Write property)

### 77.22.15 Mac as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional Mac file name.
**Notes:** (Read and Write property)

### 77.22.16 Thumb as DynaPDFImageMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional thumb nail image.
**Notes:** (Read and Write property)

### 77.22.17 UFileName as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name.
**Notes:** PDF 1.7. Same as FileName but Unicode is allowed.
(Read and Write property)

### 77.22.18 Unix as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional Unix file name.
**Notes:** (Read and Write property)

# 77.23 class DynaPDFFileSpecMBS

## 77.23.1 class DynaPDFFileSpecMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about an embedded file.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 77.23.2 Methods

## 77.23.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.23.4 Properties

## 77.23.5 Buffer as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Buffer of an embedded file.
**Notes:** (Read and Write property)

## 77.23.6 BufferSize as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Buffer size in bytes.
**Notes:** (Read and Write property)

## 77.23.7 Checksum as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** 16 byte MD5 digest if set.
**Notes:** (Read and Write property)

### 77.23.8 ColItem as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pointer to user defined collection item.
**Notes:** (Read and Write property)

### 77.23.9 Compressed as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Should be false if Decompress was true.
**Notes:** (Read and Write property)

### 77.23.10 CreateDate as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creation date as string.
**Notes:** (Read and Write property)

### 77.23.11 Description as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Description.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read and Write property)

### 77.23.12 FileName as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** File name as 7 bit ASCII string.
**Notes:** (Read and Write property)

### 77.23.13 FileSize as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompressed stream size or zero if not known.
**Notes:** (Read and Write property)

### 77.23.14 IsURL as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, FileName contains a URL.
**Notes:** (Read and Write property)

### 77.23.15 MIMEType as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MIME media type name (RFC 2046).
**Notes:** See also MimeTypeToFileExtensionMBS function.
(Read and Write property)

### 77.23.16 ModDate as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modification date as string.
**Notes:** (Read and Write property)

### 77.23.17 Name as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of the file specification in the name tree.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
This value is always present.
(Read and Write property)

### 77.23.18 UnicodeFileName as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as FileName but Unicode is allowed.
**Notes:** PDF 1.7.
This string is either an unicode encoded string or an ASCII encoded string.
(Read and Write property)

## 77.24 class DynaPDFFontInfoMBS

### 77.24.1 class DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for DynaPDF font info.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Improvements for MBS Xojo DynaPDF Plugin
- MBS Xojo Plugins, version 18.1pr3

### 77.24.2 Methods

### 77.24.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.24.4 HorzWidths(index as UInt32) as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Horizontal glyph widths.
**Notes:** Index from 0 ot HorzWidthsCount -1.

### 77.24.5 VertWidths(index as UInt32) as DynaPDFCIDMetricMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical glyph widths array.

### 77.24.6 Properties

### 77.24.7 Ascent as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ascent (optional).
**Notes:** (Read only property)

### 77.24.8 AvgWidth as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average character width (optional).
**Notes:** (Read only property)

### 77.24.9 BaseEncoding as Integer

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The base encoding.
**Notes:** Valid only if HaveEncoding is true.
Can be kbeWinAnsi, kbeStandard, kbeMacRoman or kbeMacExpert.
(Read only property)

### 77.24.10 BaseFont as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** PostScript Name or Family Name.
**Notes:** (Read only property)

### 77.24.11 CapHeight as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cap height (optional).
**Notes:** (Read only property)

### 77.24.12 CharSet as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The charset describes which glyphs are present in the font.
**Notes:** (Read only property)

### 77.24.13 CharSetSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the CharSet in bytes.
**Notes:** (Read only property)

### 77.24.14 CIDOrdering as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SystemInfo ->Character collection.
**Notes:** (Read only property)

### 77.24.15 CIDRegistry as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SystemInfo ->Issuer of the character collection.
**Notes:** (Read only property)

### 77.24.16 CIDSet as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CID fonts only.
**Notes:** This is a table of bits indexed by CIDs.
(Read only property)

### 77.24.17 CIDSetSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the CIDSet in bytes.
**Notes:** (Read only property)

### 77.24.18 CIDSupplement as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CIDSystemInfo ->Supplement number.
**Notes:** (Read only property)

### 77.24.19 CIDToGIDMap as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allowed for embedded TrueType based CID fonts only.
**Notes:** (Read only property)

### 77.24.20 CIDToGIDMapSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the CIDToGIDMap in bytes.
**Notes:** (Read only property)

### 77.24.21 CMapBuf as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMap data.
**Notes:** Only available if the CMap was embedded.
(Read only property)

### 77.24.22 CMapBufSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CMAP Buffer size in bytes.
**Notes:** (Read only property)

### 77.24.23 CMapName as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CID fonts only external CMap name or encoding.
**Notes:** (Read only property)

### 77.24.24 Descent as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Descent (optional).
**Notes:** (Read only property)

### 77.24.25 Encoding as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unicode mapping 0..255.
**Notes:** not available for CID fonts.
(Read only property)

### 77.24.26 FirstChar as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First char (simple fonts only).
**Notes:** (Read only property)

### 77.24.27 Flags as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font flags.
**Notes:** See DynaPDF manual.

The font flags describe certain properties of the font. The most important flags are the following:

| Flag | Description |
|---|---|
| 1 | Fixed pitch font |
| 2 | Serif style |
| 4 | Symbol font |
| 8 | Script style |
| &h20 | Non-symbolic font |
| &h40 | Italic style |
| &h40000 | Force Bold (Type1 fonts only) |

The full set of available flags can be found in the PDF Reference.
(Read only property)

### 77.24.28 FontBBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the size of the largest glyph in this font.
**Notes:** (Read only property)

### 77.24.29 FontBuffer as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font data.
**Notes:** Available if the font was embedded or loaded from a buffer.
(Read only property)

### 77.24.30 FontBufSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font file size in bytes..
**Notes:** (Read only property)

### 77.24.31 FontFamily as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional Font Family (Family Name).
**Notes:** (Read only property)

### 77.24.32 FontFilePath as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font file path.
**Notes:** Only available for system fonts.
(Read only property)

### 77.24.33 FontFileType as Integer

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font file type.
**Notes:** Can be:
kffsType1C, kffsOpenTypeC, kffsOpenType, kffsNoSubtype, kffsCIDFontType2 or kffsCIDFontType0C.
(Read only property)

### 77.24.34 FontName as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font name (should be the same as BaseFont).
**Notes:** (Read only property)

### 77.24.35 FontStretch as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font stretch.
**Notes:** Optional ->Condensed, and so on.
(Read only property)

### 77.24.36 FontType as Integer

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font type.
**Notes:** If ftType0 the font is a CID font.
(Read only property)

### 77.24.37 FontWeight as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font weight (optional).
**Notes:** (Read only property)

### 77.24.38 FullName as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The full name.
**Notes:** System fonts only.
(Read only property)

### 77.24.39 HaveEncoding as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether encoding is known.
**Notes:** If true, BaseEncoding was set from the font's encoding.
(Read only property)

### 77.24.40 HorzWidthsCount as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of horizontal widths in the array.
**Notes:** (Read only property)

### 77.24.41 Imported as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether font is imported.
**Notes:** If true, the font was imported from an external PDF file.
(Read only property)

### 77.24.42 ItalicAngle as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Italic angle.
**Notes:** (Read only property)

### 77.24.43 Lang as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional language code defined by BCP 47.
**Notes:** (Read only property)

### 77.24.44 LastChar as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last char (simple fonts only).
**Notes:** (Read only property)

### 77.24.45 Leading as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Leading (optional).
**Notes:** (Read only property)

### 77.24.46 Length1 as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the clear text portion of a Type1 font.
**Notes:** (Read only property)

### 77.24.47 Length2 as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the encrypted portion of a Type1 font program.
**Notes:** (Read only property)

### 77.24.48 Length3 as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the fixed-content portion of a Type1 font program.
**Notes:** (Read only property)

### 77.24.49 MaxWidth as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum glyph width (optional).
**Notes:** (Read only property)

### 77.24.50 Metadata as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional XMP metadata stream about the font file.
**Notes:** (Read only property)

### 77.24.51 MetadataSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MetaData size in bytes.
**Notes:** (Read only property)

### 77.24.52 MisWidth as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Missing width (default = 0.0).
**Notes:** (Read only property)

### 77.24.53 Panose as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional 12 bytes long Panose string.
**Notes:** CID fonts only.
(Read only property)

### 77.24.54 PostScriptName as String

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** System fonts only.
**Notes:** (Read only property)

### 77.24.55 SpaceWidth as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Space width in font units.
**Notes:** A default value is set if the font contains no space character.
(Read only property)

### 77.24.56 StemH as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The thickness of horizontal stems.
**Notes:** (Read only property)

### 77.24.57 StemV as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The thickness of vertical stems.
**Notes:** (Read only property)

### 77.24.58 ToUnicode as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ToUnicode CMap.
**Notes:** Only available for imported fonts.
(Read only property)

### 77.24.59 ToUnicodeSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ToUnicode CMap size in bytes.
**Notes:** (Read only property)

### 77.24.60 VertDefPos as DynaPDFPointMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default vertical displacement vector.
**Notes:** (Read only property)

### 77.24.61 VertWidthsCount as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of vertical widths in the array.
**Notes:** (Read only property)

### 77.24.62 WMode as UInt32

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writing Mode.
**Notes:** 0: Horizontal
1: Vertical.
(Read only property)

### 77.24.63 XHeight as Single

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of lowercase letters measured from the baseline.
**Notes:** (Read only property)

## 77.25 class DynaPDFFontMBS

### 77.25.1 class DynaPDFFontMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for pdf font information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

### 77.25.2 Methods

### 77.25.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.25.4 Encoding(Index as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unicode mapping 0..255 if set.
**Notes:** Index from 0 to 255.

### 77.25.5 Widths(Index as Integer) as single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Glyph widths.
**Notes:** Index from 0 to WidthsCount-1.

### 77.25.6 Properties

### 77.25.7 Ascent as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ascent of this font.
**Notes:** (Read and Write property)

### 77.25.8 BaseFont as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** PostScript Name or Family Name.
**Notes:** (Read and Write property)

### 77.25.9 CapHeight as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Cap height.
**Notes:** (Read and Write property)

### 77.25.10 DefWidth as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default character widths ->CID fonts only.
**Notes:** (Read and Write property)

### 77.25.11 Descent as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Descent.
**Notes:** (Read and Write property)

### 77.25.12 FirstChar as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first character.
**Notes:** (Read and Write property)

### 77.25.13 Flags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font flags.
**Notes:** (Read and Write property)

### 77.25.14 FontFamily as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional Font Family (Family Name).
**Notes:** Unicode or ASCII encoded.
(Read and Write property)

### 77.25.15 FontFile as Memoryblock

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font file buffer.
**Notes:** Only imported fonts are returned.
(Read and Write property)

### 77.25.16 FontFileType as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font file subtype.
**Notes:** See kffs* constants like those:

| Name | Value | Description |
|---|---|---|
| kffsType1C | 0 | CFF based Type1 font |
| kffsCIDFontType0C | 1 | CFF based Type1 CID font |
| kffsOpenType | 2 | TrueType based OpenType font |
| kffsOpenTypeC | 3 | CFF based OpenType font |
| kffsCIDFontType2 | 4 | TrueType based CID Font |
| kffsNoSubtype | 9 | The font file is in the format of FontType |

(Read and Write property)

### 77.25.17 FontName as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Font name.
**Notes:** (Read and Write property)

### 77.25.18 FontType as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font type.
**Notes:** If ftType0 the font is a CID font.
(Read and Write property)

### 77.25.19 ItalicAngle as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Italic angle.
**Notes:** (Read and Write property)

### 77.25.20 LastChar as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Last char.
**Notes:** (Read and Write property)

### 77.25.21 Length1 as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the clear text portion of the Type1 font, or the length of the entire font program if FontType <>kffType1.
**Notes:** (Read and Write property)

### 77.25.22 Length2 as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the encrypted portion of the Type1 font program (Type1 fonts only).
**Notes:** (Read and Write property)

### 77.25.23 Length3 as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the fixed-content portion of the Type1 font program or zero if not present.
**Notes:** (Read and Write property)

### 77.25.24 SpaceWidth as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Space width in font units or default value.
**Notes:** (Read and Write property)

### 77.25.25 WidthsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of widths in the array.
**Notes:** (Read and Write property)

### 77.25.26 XHeight as Single

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x-height.
**Notes:** (Read and Write property)

## 77.26 class DynaPDFFontMetricsMBS

### 77.26.1 class DynaPDFFontMetricsMBS

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for font metrics.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr2

### 77.26.2 Methods

### 77.26.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.26.4 Properties

### 77.26.5 Ascent as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ascent.
**Notes:** (Read and Write property)

### 77.26.6 AvgWidth as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average character width.
**Notes:** (Read and Write property)

### 77.26.7 CapHeight as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cap height.
**Notes:** (Read and Write property)

### 77.26.8 DefWidth as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default width.
**Notes:** (Read and Write property)

### 77.26.9 Descent as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Descent.
**Notes:** (Read and Write property)

### 77.26.10 FirstChar as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First char.
**Notes:** (Read and Write property)

### 77.26.11 FixedWidth as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of all glyphs in a fixed pitch font.
**Notes:** (Read and Write property)

### 77.26.12 FontBBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font's bounding box.
**Notes:** (Read and Write property)

### 77.26.13 FontStyle as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font style with which the font was loaded.
**Example:**

```
dim pdf as DynaPDFMBS // your instance

// set font
call pdf.SetFont("Helvetica", pdf.kfsNone, 12)

// and check whether it is bold
dim m as DynaPDFFontMetricsMBS = pdf.GetFontMetrics(pdf.GetActiveFont)
if BitwiseAnd(m.FontStyle, pdf.kfsBold) = pdf.kfsBold then
MessageBox "is bold"
else
MessageBox "is not bold"
end if

// set bold font
call pdf.SetFont("Helvetica", pdf.kfsBold, 12)

// and check whether it is bold
m = pdf.GetFontMetrics(pdf.GetActiveFont)
if BitwiseAnd(m.FontStyle, pdf.kfsBold) = pdf.kfsBold then
MessageBox "is bold"
else
MessageBox "is not bold"
end if
```

**Notes:** See kfs* constants in DynaPDFMBS class.
(Read and Write property)

### 77.26.14 IsFixedPitch as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is this a fixed pitch font?
**Notes:** (Read and Write property)

### 77.26.15 IsStdFont as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is this is a standard font?
**Notes:** (Read and Write property)

### 77.26.16 IsSymbolFont as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is this is a symbolic font?
**Notes:** (Read and Write property)

### 77.26.17 ItalicAngle as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Italic angle of italic fonts.
**Notes:** (Read and Write property)

### 77.26.18 LastChar as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last char.
**Notes:** (Read and Write property)

### 77.26.19 LineGap as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Typographic line gap.
**Notes:** (Read and Write property)

### 77.26.20 MacStyle as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** macOS style flags.
**Notes:** (Read and Write property)

### 77.26.21 RealStyle as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the real style of the font (bold and italic styles are maybe emulated)
**Notes:** See kfs* constants in DynaPDFMBS class.
(Read and Write property)

### 77.26.22 StemV as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of vertical stems.
**Notes:** (Read and Write property)

### 77.26.23 StrikeoutPos as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Strikeout position.
**Notes:** (Read and Write property)

### 77.26.24 StrikeoutWidth as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of the strikeout line.
**Notes:** (Read and Write property)

### 77.26.25 TypoAscender as Single

MBS DynaPDF Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** sTypoAscender of the OS/2 table of TrueType and OpenType fonts.
**Notes:** (Read and Write property)

### 77.26.26 TypoLeading as Single

MBS DynaPDF Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Typographic leading or line height of the font. T
**Notes:** This is TypoAscender - Descent + LineGap.
If typographic metrics are not available then TypoAscender is set to Ascent.
(Read and Write property)

### 77.26.27 UnderlinePos as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Underline position.
**Notes:** (Read and Write property)

### 77.26.28 UnderlineWidth as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of the underline.
**Notes:** (Read and Write property)

### 77.26.29 UnicodeRange1 as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitset for unicode ranges.
**Notes:** (Read and Write property)

### 77.26.30 UnicodeRange2 as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitset for unicode ranges.
**Notes:** (Read and Write property)

### 77.26.31 UnicodeRange3 as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitset for unicode ranges.
**Notes:** (Read and Write property)

### 77.26.32 UnicodeRange4 as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitset for unicode ranges.
**Notes:** (Read and Write property)

### 77.26.33 Weight as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font weight.
**Notes:** (Read and Write property)

### 77.26.34 WidthClass as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width class of the font.
**Notes:** (Read and Write property)

### 77.26.35 WinDescent as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** usWinDescent of the OS/2 table of TrueType and OpenType fonts
**Notes:** (Read and Write property)

### 77.26.36 WinStyle as UInt32

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** fsSelection of the OS/2 table of TrueType and OpenType fonts
**Notes:** (Read and Write property)

### 77.26.37 XHeight as Single

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X-height.
**Notes:** (Read and Write property)

### 77.26.38 Constants

Unicode Ranges

| Constant | Value | Description |
|---|---|---|
| kurAlphabeticPresentationForms | &h40000000 | |
| kurAncientGreekNumbers | 64 | |
| kurAncientSymbols | &h00800000 | |
| kurArabic | &h00002000 | |
| kurArabicPresentationFormsA | &h80000000 | |
| kurArabicPresentationFormsB | 8 | |
| kurArmenian | &h00000400 | |
| kurArrows | 32 | |
| kurBalinese | &h08000000 | |
| kurBasicLatin | 1 | |
| kurBengali | &h00010000 | |
| kurBlockElements | &h00001000 | |
| kurBopomofo | &h00080000 | |
| kurBoxDrawing | &h00000800 | |
| kurBraillePatterns | &h00040000 | |
| kurBuginese | 1 | |
| kurCarian | &h02000000 | |
| kurCham | &h00400000 | |
| kurCherokee | &h00001000 | |
| kurCJKCompatibility | &h00800000 | |
| kurCJKStrokes | &h20000000 | |
| kurCJKSymbolsAndPunctuation | &h00010000 | |
| kurCJKUnifiedIdeographs | &h08000000 | |
| kurCombDiacritMarksForSymbols | 4 | |
| kurCombiningDiacriticalMarks | 64 | |
| kurCombiningHalfMarks | 1 | |
| kurControlPictures | &h00000100 | |
| kurCoptic | &h00000100 | |
| kurCountingRodNumerals | &h00008000 | |
| kurCuneiform | &h00004000 | |
| kurCurrencySymbols | 2 | |
| kurCypriotSyllabary | &h00000800 | |
| kurCyrillic | &h00000200 | |
| kurDeseret | &h00800000 | |
| kurDevanagari | &h00008000 | |
| kurDingbats | &h00008000 | |
| kurDominoTiles | &h04000000 | |
| kurEnclosedAlphanumerics | &h00000400 | |
| kurEnclosedCJKLettersAndMonths | &h00400000 | |
| kurEthiopic | &h00000800 | |
| kurGeneralPunctuation | &h80000000 | |
| kurGeometricShapes | &h00002000 | |
| kurGeorgian | &h04000000 | |
| kurGlagolitic | 2 | |
| kurGothic | &h00400000 | |
| kurGreekandCoptic | &h00000080 | |
| kurGreekExtended | &h40000000 | |
| kurGujarati | &h00040000 | |
| kurGurmukhi | &h00020000 | |
| kurHalfwidthAndFullwidthForms | 16 | |
| kurHangulCompatibilityJamo | &h00100000 | |
| kurHangulJamo | &h10000000 | |
| kurHangulSyllables | &h01000000 | |
| kurHebrew | &h00000800 | |
| kurHiragana | &h00020000 | |
| kurIPAExtensions | 16 | |
| kurKannada | &h00400000 | |
| kurKatakana | &h00040000 | |

## 77.27 class DynaPDFGlyphOutlineMBS

### 77.27.1 class DynaPDFGlyphOutlineMBS

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for glyph outline.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.27.2 Methods

### 77.27.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.27.4 Outline(index as Integer) as DynaPDFPointMBS

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries point with given index.
**Notes:** Index from 0 to OutlineCount-1.

### 77.27.5 Outlines as DynaPDFPointMBS()

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array with all points.

### 77.27.6 Properties

### 77.27.7 AdvanceX as Single

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Glyph width in horizontal writing mode.
**Notes:** (Read only property)

### 77.27.8 AdvanceY as Single

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Glyph height in vertical writing mode.
**Notes:** (Read only property)

### 77.27.9 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bounding box of the glyph outline.
**Notes:** (Read and Write property)

### 77.27.10 HaveBBox as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, BBox was computed.
**Notes:** (Read and Write property)

### 77.27.11 Lsb as Integer

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Left side bearing (already applied, info only).
**Notes:** (Read and Write property)

### 77.27.12 OriginX as Single

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Placement vector (vertical writing mode only).
**Notes:** (Read only property)

### 77.27.13 OriginY as Single

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Placement vector (vertical writing mode only).
**Notes:** (Read only property)

### 77.27.14 OutlineCount as Integer

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of points.
**Notes:** (Read and Write property)

### 77.27.15 Tsb as Integer

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Top side bearing (already applied, info only).
**Notes:** (Read and Write property)

## 77.28 class DynaPDFGoToActionMBS

### 77.28.1 class DynaPDFGoToActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for details on a GoTo action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.28.2 Methods

### 77.28.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.28.4 DestPos(index as Integer) as Single

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination position.
**Notes:** Array of 4 floating point values if set.
Index from 0 to 3.

### 77.28.5 Properties

### 77.28.6 DestFile as DynaPDFFileSpecExMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination file.
**Notes:** (Read only property)

### 77.28.7 DestName as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional named destination that shall be loaded when opening the file.
**Notes:** (Read only property)

### 77.28.8 DestPage as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination page (the first page is denoted by 1).
**Notes:** (Read only property)

### 77.28.9 DestType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination type.
**Notes:** (Read only property)

### 77.28.10 NewWindow as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to open a new window.
**Notes:** Meaningful only if the destination file points to a PDF file.
-1 = viewer default, 0 = false, 1 = true.
(Read only property)

### 77.28.11 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of the action.
**Notes:** -1 or next action handle to be executed if any.
(Read only property)

### 77.28.12 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the action.
**Notes:** Only set if NextAction is >= 0.

(Read only property)

# 77.29 class DynapdfGraphicsPathItemMBS

## 77.29.1 class DynapdfGraphicsPathItemMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a path item.
**Notes:** MBS Plugin needs to collect what path items you added, so we can later draw them to the PDF.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr1

## 77.29.2 Properties

## 77.29.3 clockwise as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The clockwise parameter.
**Notes:** For drawing arcs.
(Read only property)

## 77.29.4 cornerHeight as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The corner height.
**Notes:** for round rectangle.
(Read and Write property)

## 77.29.5 cornerWidth as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The corner width.
**Notes:** for round rectangle.
(Read and Write property)

## 77.29.6 cp1X as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First control point X coordinate.
**Notes:** (Read and Write property)

### 77.29.7 cp1Y as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First control point Y coordinate.
**Notes:** (Read and Write property)

### 77.29.8 cp2X as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Second control point X coordinate.
**Notes:** (Read and Write property)

### 77.29.9 cp2Y as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Second control point Y coordinate.
**Notes:** (Read and Write property)

### 77.29.10 cpX as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control point X coordinate.
**Notes:** (Read and Write property)

### 77.29.11 cpY as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control point Y coordinate.
**Notes:** (Read and Write property)

### 77.29.12 endRadian as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radian for the end angle.
**Notes:** (Read and Write property)

### 77.29.13 height as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height parameter.
**Notes:** (Read and Write property)

### 77.29.14 radius as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radius for an arc.
**Notes:** (Read and Write property)

### 77.29.15 startRadian as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radian for the start angle.
**Notes:** (Read and Write property)

### 77.29.16 Type as Integer

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of path item.
**Notes:** See type constants.
(Read only property)

### 77.29.17 width as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width parameter.
**Notes:** (Read and Write property)

### 77.29.18 x as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X coordinate.
**Notes:** (Read and Write property)

### 77.29.19 y as Double

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y coordinate.
**Notes:** (Read and Write property)

### 77.29.20 Constants

Types

| Constant | Value | Description |
|---|---|---|
| TypeAddArc | 1 | Add arc |
| TypeAddCurveToPoint | 2 | Add curve to point |
| TypeAddLineToPoint | 3 | Add line to point |
| TypeAddQuadraticCurveToPoint | 4 | Add quadratic curve to point |
| TypeAddRectangle | 5 | Add rectangle |
| TypeAddRoundRectangle | 6 | Add round rectangle |
| TypeMoveToPoint | 7 | Move to point |
| TypeUnknown | 0 | Unknown type. Only for an uninitialized object. |

# 77.30 class DynapdfGraphicsPathMBS

## 77.30.1 class DynapdfGraphicsPathMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a path.
**Notes:** We subclass the GraphicsPath class in Xojo 2019r2 and newer to be able to record what methods you call.
Subclass of the GraphicsPath class.
**Blog Entries**

- Improvements for MBS Xojo DynaPDF Plugin
- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr1

## 77.30.2 Methods

## 77.30.3 AddArc(x As Double, y As Double, radius As Double, startRadian As Double, endRadian As Double, clockwise As Boolean)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an arc to the path.

## 77.30.4 AddCurveToPoint(cp1X As Double, cp1Y As Double, cp2X As Double, cp2Y As Double, x As Double, y As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a cubic B√©zier curve to the point in the path.

## 77.30.5 AddLineToPoint(x As Double, y As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a line from the Point to the specified point.

### 77.30.6 AddQuadraticCurveToPoint(cpX As Double, cpY As Double, x As Double, y As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a quadratic B√©zier curve to the point in the path.

### 77.30.7 AddRectangle(x As Double, y As Double, width As Double, height As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a rectangle to the path.

### 77.30.8 AddRoundRectangle(x As Double, y As Double, width As Double, height As Double, cornerWidth As Double, cornerHeight As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a rounded rectangle to the path.

### 77.30.9 MoveToPoint(x As Double, y As Double)

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves to the point without drawing anything.

### 77.30.10 PathItems as DynapdfGraphicsPathItemMBS()

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array of path items.

### 77.30.11 Properties

### 77.30.12 Count as Integer

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries count of items.
**Notes:** (Read only property)

## 77.31 class DynaPDFHideActionMBS

### 77.31.1 class DynaPDFHideActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a hide action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.31.2 Methods

### 77.31.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.31.4 Fields(index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array of fields.

### 77.31.5 Properties

### 77.31.6 FieldsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of fields in the array.
**Notes:** (Read only property)

### 77.31.7 Hide as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A flag indicating whether to hide or show the fields in the array.
**Notes:** (Read only property)

### 77.31.8 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle of the next action to use.
**Notes:** -1 or next action handle to be executed if any.
(Read only property)

### 77.31.9 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

## 77.32 class DynaPDFImageMBS

### 77.32.1 class DynaPDFImageMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for dynapdf for passing image data.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr1
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo / Real Studio Plugins, version 16.4pr3
- MBS Xojo / Real Studio Plugins, version 15.0pr8
- MBS REALbasic Plugins, version 11.1pr4

**Xojo Developer Magazine**

- 19.6, page 14: Things you can do with DynaPDF, The MBS DynaPDF Plugin is more powerful than you think by Stefanie Juchmes

### 77.32.2 Methods

### 77.32.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.32.4 Decode as Single()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decode array.
**Notes:** If set, samples must be decoded. The array contains 2 * NumComponents values.
The decode array is never set if the image is returned decompressed since it is already applied during decompression.

### 77.32.5 MaskImage(Flags as UInt32 = 0) as DynaPDFImageMBS

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the image details on the soft mask for this image.
**Notes:** If set, a 1 bit image is used as a transparency mask.
Plugin calls GetImageObjEx with the given flags to decode the image.

### 77.32.6 PictureData(ImageFormat as Integer = 0, ImageFilter as Integer = 0) as String

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Requests images in the given format.
**Notes:** Default for ImageFormat is Tiff (kifmTIFF is zero) and default Image Filter is flate (kcfFlate is zero).
You can pass different constants.
If you request JPEG or JPEG 2000 and the image is already in that format, we pass through.
Else we recompress image.

### 77.32.7 SoftMask(Flags as UInt32 = 0) as DynaPDFImageMBS

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the image details on the soft mask for this image.
**Notes:** If set, a grayscale image is used as alpha channel.
Plugin calls GetImageObjEx with the given flags to decode the image.

### 77.32.8 Properties

### 77.32.9 BitsPerPixel as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bit depth of the image buffer.
**Notes:** Possible values are 1, 2, 4, 8, 24, 32, and 64.

(Read only property)

### 77.32.10 Buffer as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The buffer for the image data as a string.
**Notes:** Each scanline is aligned to a full byte.
(Read only property)

### 77.32.11 BufferPtr as Ptr

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The buffer for the image data.
**Notes:** Each scanline is aligned to a full byte.
(Read only property)

### 77.32.12 BufferSize as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the image buffer in bytes.
**Notes:** (Read only property)

### 77.32.13 ColorCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of colors in the color table.
**Notes:** (Read only property)

### 77.32.14 ColorMask as Memoryblock

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pointer to color mask.
**Notes:** The array contains ranges in the form min/max (2 values per component) for each component before decoding.
(Read only property)

### 77.32.15 ColorSpace as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space refers either to the image buffer or to the color table if set.
**Notes:** Note that 1 bit images can occur with and without a color table.

(Read only property)

### 77.32.16 ColorSpaceObject as DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original color space.
**Notes:** (Read only property)

### 77.32.17 ColorTable as Memoryblock

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color table or nil.
**Notes:** (Read only property)

### 77.32.18 DestHeight as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination height (can be negative).
**Notes:** (Read only property)

### 77.32.19 DestWidth as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destination width (can be negative).
**Notes:** (Read only property)

### 77.32.20 DestX1 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X1 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.21 DestX2 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X2 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.22 DestX3 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X3 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.23 DestX4 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X4 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.24 DestY1 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y1 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.25 DestY2 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y2 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.26 DestY3 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y3 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.27 DestY4 as Single

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y4 coordinate of the parallelogram into which the image is drawn.
**Notes:** (Read only property)

### 77.32.28 FillColor as Integer

MBS DynaPDF Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current fill color.
**Notes:** An image mask is drawn with the current fill color.
(Read only property)

### 77.32.29 FillColorSpace as Integer

MBS DynaPDF Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space in which FillColor is defined.
**Notes:** (Read only property)

### 77.32.30 Filter as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Required decode filter if the image is compressed.
**Notes:** Required decode filter if the image is compressed.
Possible values are dfDCTDecode (JPEG), dfJPXDecode (JPEG2000), and dfJBIG2Decode. Other filters

are already removed by DynaPDF since a conversion to a native file format is then always required.

(Read only property)

### 77.32.31 Height as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image height in pixel.
**Notes:** (Read only property)

### 77.32.32 ImageHandle as Ptr

MBS DynaPDF Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image handle if known.
**Notes:** (Read only property)

### 77.32.33 ImageIndex as Integer

MBS DynaPDF Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image index if known.
**Notes:** (Read only property)

### 77.32.34 IMaskImageHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of the mask image.
**Notes:** This is the index to use with DynaPDFMBS.GetImageObj function.
(Read only property)

### 77.32.35 InlineImage as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the image is an inline image.
**Notes:** (Read only property)

### 77.32.36 Intent as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent.
**Notes:** Default riNone.
(Read only property)

### 77.32.37 Interpolate as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, image interpolation should be performed.
**Notes:** (Read and Write property)

### 77.32.38 ISoftMaskHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index of the soft mask image.
**Notes:** This is the index to use with DynaPDFMBS.GetImageObj function.
(Read only property)

### 77.32.39 JBIG2Globals as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional global page 0 segment (kdfJBIG2Decode filter only).
**Notes:** (Read only property)

### 77.32.40 JBIG2GlobalsSize as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the bit stream in bytes.
**Notes:** (Read only property)

### 77.32.41 Measure as DynaPDFMeasureMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional measure dictionary.
**Notes:** (Read only property)

### 77.32.42 Metadata as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional XML Metadata stream.
**Notes:** (Read only property)

### 77.32.43 MetadataSize as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of Metadata in bytes.
**Notes:** (Read only property)

### 77.32.44 MinIsWhite as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the colors of 1 bit images are reversed.
**Notes:** (Read only property)

### 77.32.45 NumComponents as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of components stored in the image buffer.
**Notes:** (Read only property)

### 77.32.46 OCG as Integer

MBS DynaPDF Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Handle of an OCG or OCMD or -1.
**Notes:** Images can be part of an Optional Content Group (OCG) or Optional Content Membership Dictionary (OCMD). If OC is greater -1 an OCG or OCMD handle was set. To determine whether an OCG handle was set, check whether the value is smaller &h40000000.
(Read only property)

### 77.32.47 OrgFilter as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image was compressed with this filter in the PDF file.
**Notes:** This info is useful to determine which compression filter should be used when creating a new image file from the image buffer.

(Read only property)

### 77.32.48 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the parent DynaPDF object.
**Notes:** (Read and Write property)

### 77.32.49 PtData as DynaPDFPointDataDictionaryMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Point Data dictionary.
**Notes:** (Read only property)

### 77.32.50 ResolutionX as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image resolution on the x-axis.
**Notes:** (Read only property)

### 77.32.51 ResolutionY as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image resolution on the y-axis.
**Notes:** (Read only property)

### 77.32.52 ScanLineLength as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of a scanline in bytes.
**Notes:** (Read only property)

### 77.32.53 SMaskInData as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SMaskInData value.
**Notes:** JPXDecode only, PDF_MAX_INT if not set. See PDF Reference for further information.

(Read only property)

### 77.32.54 Transparent as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The transparent mode.
**Notes:** The meaning is different depending on the bit depth and whether a color table is available. If the image is a 1 bit image and if no color table is available, black pixels must be drawn with the current fill color. If the image contains a color table ColorMask contains the range of indexes in the form min/max index which appears transparent. If no color table is present ColorMask contains the transparent ranges in the form min/max for each component.

(Read only property)

### 77.32.55 Width as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image width in pixel.
**Notes:** (Read only property)

## 77.33 class DynaPDFImportDataActionMBS

### 77.33.1 class DynaPDFImportDataActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an import data action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.33.2 Methods

### 77.33.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.33.4 Properties

### 77.33.5 Data as DynaPDFFileSpecExMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data or file to be loaded.
**Notes:** (Read only property)

### 77.33.6 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.33.7 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

## 77.34 class DynaPDFIteratorMBS

### 77.34.1 class DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The iterator object use for for-each loops in Xojo.
**Notes:** Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 23.5
- Embracing for each loops
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr1

**Xojo Developer Magazine**

- 22.1, page 9: News

Interfaces: Iterator, Iterable

### 77.34.2 Methods

### 77.34.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 77.34.4 Iterator as Iterator

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the iterator object.
**Notes:** Returns self and is used internally by Xojo for the for each loops.
Part of the Iterable interface and needed for for-each loops.

### 77.34.5 MoveNext as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next object for iterator.
**Notes:** Returns true on success and false in case of an error like end of iterator.
Part of the Iterator interface and needed for for-each loops.

### 77.34.6 Value as Variant

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Current value for the iterator.
**Notes:** The type of object depends on what you iterate over.

Part of the Iterator interface and needed for for-each loops.

### 77.34.7 Properties

### 77.34.8 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The object reference to the parent DynaPDFMBS object.
**Notes:** (Read only property)

## 77.35 class DynaPDFJavaScriptActionMBS

### 77.35.1 class DynaPDFJavaScriptActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a javascript action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.35.2 Methods

### 77.35.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.35.4 Properties

### 77.35.5 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.35.6 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

### 77.35.7 Script as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The script.
**Notes:** (Read only property)

## 77.36 class DynaPDFLaunchActionMBS

### 77.36.1 class DynaPDFLaunchActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for details on a launch action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.36.2 Methods

### 77.36.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.36.4 Properties

### 77.36.5 AppName as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional. The name of the application that should be launched.
**Notes:** (Read only property)

### 77.36.6 DefDir as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional default directory.
**Notes:** (Read only property)

### 77.36.7 File as DynaPDFFileSpecExMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file specification for the launch.
**Notes:** (Read only property)

### 77.36.8 NewWindow as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to launch in new window.
**Notes:** -1 = viewer default, 0 = false, 1 = true.
(Read only property)

### 77.36.9 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.36.10 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

### 77.36.11 Operation as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional string specifying the operation to perform (open or print).
**Notes:** (Read only property)

### 77.36.12 Parameter as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional parameter string that shall be passed to the application (AppName).
**Notes:** (Read only property)

## 77.37 class DynaPDFLayerGroupMBS

### 77.37.1 class DynaPDFLayerGroupMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a DynaPDF Layer Group.
**Notes:** Used to link layers in hierarchies.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.37.2 Methods

### 77.37.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.37.4 Properties

### 77.37.5 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 77.37.6 Owner as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The link to the parent DynaPDF object.
**Notes:** (Read only property)

# 77.38 class DynaPDFLineAnnotParameterMBS

## 77.38.1 class DynaPDFLineAnnotParameterMBS

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for line annotation parameters.

## 77.38.2 Properties

## 77.38.3 Caption as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies whether the parameter Content of the function LineAnnot should be used as caption of the measure line.
**Notes:** (Read and Write property)

## 77.38.4 CaptionOffsetX as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Horizontal offset of the caption from its normal position.
**Notes:** (Read and Write property)

## 77.38.5 CaptionOffsetY as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical offset of the caption from its normal position.
**Notes:** (Read and Write property)

## 77.38.6 CaptionPos as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position where the caption should be drawn if present.
**Notes:** (Read and Write property)

### 77.38.7 LeaderLineExtend as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional leader line extend beyond the leader line (must be a positive value or zero).
**Notes:** (Read and Write property)

### 77.38.8 LeaderLineLen as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the leader lines (positive or negative).
**Notes:** (Read and Write property)

### 77.38.9 LeaderLineOffset as Single

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Amount of space between the endpoints of the annotation and the leader lines (must be a positive value or zero)
**Notes:** (Read and Write property)

# 77.39 class DynaPDFMatrixMBS

## 77.39.1 class DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a DynaPDF matrix structure.
**Notes:** in the documentation known as TCTM struct.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr2
- DynaPDF Text Position Examples updated
- DynaPDF Text Position Examples
- MBS Xojo / Real Studio Plugins, version 17.0pr1
- MBS Real Studio Plugins, version 11.1pr8

## 77.39.2 Methods

## 77.39.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new matrix and sets it to identity.
**Example:**

```
dim m as new DynaPDFMatrixMBS
MsgBox m
```

See also:

- 77.39.4 Constructor(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double) 12703
- 77.39.5 Constructor(other as DynaPDFMatrixMBS) 12704

## 77.39.4 Constructor(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double)

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with setting values to the given parameters.
**Example:**

```
dim m as new DynaPDFMatrixMBS(1,2,3,4,5,6)
MsgBox m
```

See also:

- 77.39.3 Constructor 12703
- 77.39.5 Constructor(other as DynaPDFMatrixMBS) 12704

### 77.39.5 Constructor(other as DynaPDFMatrixMBS)

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a matrix object with copying the values.
**Example:**

```
dim m as new DynaPDFMatrixMBS(1,2,3,4,5,6)
dim n as new DynaPDFMatrixMBS(m)
MsgBox n
```

See also:

- 77.39.3 Constructor 12703
- 77.39.4 Constructor(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double) 12703

### 77.39.6 Identity as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates new object with identity matrix.
**Example:**

```
dim m as DynaPDFMatrixMBS = DynapdfMatrixMBS.Identity

MsgBox m // shows [ 1.000000 0.000000 0.000000 1.000000 0.000000 0.000000 ]
```

### 77.39.7 Invert

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the matrix.
**Example:**

```
dim m as new DynaPDFMatrixMBS

m.Invert

MsgBox m // shows [ 1.000000 -0.000000 -0.000000 1.000000 0.000000 0.000000 ]
```

### 77.39.8 LeftMultiply(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the left side.
See also:

- 77.39.9 LeftMultiply(other as DynaPDFMatrixMBS) 12705

### 77.39.9 LeftMultiply(other as DynaPDFMatrixMBS)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the left side.
**Example:**

```
dim m1 as new DynaPDFMatrixMBS
dim m2 as new DynaPDFMatrixMBS

m1.Rotate 0.1
m2.Scale 2.0, 3.0

dim m3 as new DynaPDFMatrixMBS(m1)
m3.LeftMultiply(m2)

MsgBox m1.Str+EndOfLine+m2.Str+EndOfLine+m3.Str
```

See also:

- 77.39.8 LeftMultiply(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double) 12705

### 77.39.10 Operator_Compare(other as DynaPDFMatrixMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two matrix objects whether they have same values.
**Example:**

```
dim m1 as new DynaPDFMatrixMBS
dim m2 as new DynaPDFMatrixMBS

if m1 = m2 then
MsgBox "Equal, same values."
else
MsgBox "Not equal ->Bug in Plugin."
end if

if m1 is m2 then
MsgBox "Equal ->Bug in Xojo."
else
MsgBox "Not equal, different objects."
end if
```

### 77.39.11 Operator_Convert as string

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts matrix into a string for displaying in log files.
**Example:**

```
dim m as new DynaPDFMatrixMBS
MsgBox m // shows [ 1.000000 0.000000 0.000000 1.000000 0.000000 0.000000 ]
```

**Notes:** Added for debugging.

### 77.39.12 Operator_Multiply(other as DynaPDFMatrixMBS) as DynapdfMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the left side.
**Example:**

```
dim m1 as new DynaPDFMatrixMBS
```

```
dim m2 as new DynaPDFMatrixMBS

m1.Rotate 0.1
m2.Scale 2.0, 3.0

dim m3 as DynaPDFMatrixMBS = m1*m2

MsgBox m1.Str+EndOfLine+m2.Str+EndOfLine+m3.Str
```

### 77.39.13 Operator_MultiplyRight(other as DynaPDFMatrixMBS) as DynapdfMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the right side.

### 77.39.14 RightMultiply(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the right side.
See also:

- 77.39.15 RightMultiply(other as DynaPDFMatrixMBS) 12707

### 77.39.15 RightMultiply(other as DynaPDFMatrixMBS)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies both matrix where self is on the right side.
See also:

- 77.39.14 RightMultiply(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double) 12707

### 77.39.16 Rotate(angle as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates matrix with the given angle.
**Example:**

```
dim m as new DynaPDFMatrixMBS

const pi = 3.14159265

dim angle as Double = 30.0/180.0*pi

m.Rotate(angle)

MsgBox m // shows [ 0.866025 0.500000 -0.500000 0.866025 0.000000 0.000000 ]
```

**Notes:** Angle in radians: 2*pi = 360 degree

### 77.39.17 Scale(sx as Double, sy as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the matrix.
**Example:**

```
dim m as new DynaPDFMatrixMBS

m.Scale 2.0, 3.0

MsgBox m // [ 2.000000 0.000000 0.000000 3.000000 0.000000 0.000000 ]
```

### 77.39.18 SetIdentity

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets values back to the identity matrix.
**Example:**

```
dim m as new DynaPDFMatrixMBS

m.Scale 2.0, 3.0 // modify values
m.SetIdentity // and reset

MsgBox m // [ 1.000000 0.000000 0.000000 1.000000 0.000000 0.000000 ]
```

### 77.39.19 SetValues(a as Double, b as Double, c as Double, d as Double, x as Double, y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets all the values in one method
**Example:**

```
dim m as new DynaPDFMatrixMBS

m.SetValues 1,2,3,4,5,6

MsgBox m
```

### 77.39.20 Transform(byref x as Double, byref y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the matrix to the given point.
**Example:**

```
dim m as new DynaPDFMatrixMBS

const pi = 3.14159265
dim angle as Double = 30.0/180.0*pi
m.Rotate(angle)
m.Translate 2.0, 3.0

dim x as Double = 100.0
dim y as Double = 100.0

m.Transform x,y

MsgBox str(x)+" "+str(y) // 36.83459 140.2006
```

### 77.39.21 TransformInv(byref x as Double, byref y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the matrix to the given point in inverse mode.
**Example:**

```
dim m as new DynaPDFMatrixMBS
```

```
const pi = 3.14159265
dim angle as Double = 30.0/180.0*pi
m.Rotate(angle)
m.Translate 2.0, 3.0

dim x as Double = 100.0
dim y as Double = 100.0

// transform
m.Transform x,y

MsgBox str(x)+" "+str(y) // 36.83459 140.2006

// transform back
m.TransformInv x,y

MsgBox str(x)+" "+str(y) // 100 100#
```

**Notes:** Like you have a point and want to know whether it was before the matrix was applied.

### 77.39.22 Translate(x as Double, y as Double)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates matrix by given values.
**Example:**

```
dim m as new DynaPDFMatrixMBS

m.Translate 2,3

MsgBox m // shows [ 1.000000 0.000000 0.000000 1.000000 2.000000 3.000000 ]
```

### 77.39.23 Properties

### 77.39.24 a as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

### 77.39.25 b as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

### 77.39.26 c as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

### 77.39.27 d as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

### 77.39.28 IsIdentity as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether matrix is the identity matrix.
**Example:**

```
dim m as new DynaPDFMatrixMBS

MsgBox str(m.IsIdentity)

m.a = 3.0

MsgBox str(m.IsIdentity)
```

**Notes:** Returns true if a = 1, b = 0, c = 0, d = 1, x = 0 and y = 0.
(Read only property)

### 77.39.29 RotationAngle as Double

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the rotate angle.
**Example:**

```
dim m as DynaPDFMatrixMBS = DynapdfMatrixMBS.Identity

m.Rotate 0.1

MsgBox str(m.GetRotationAngle) // shows 0.1
```

**Notes:** In radians from -pi to pi.
Used to be named GetRotationAngle before.
(Read only property)

### 77.39.30 ScaleFactor as Double

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the scale factor.
**Example:**

```
dim m as DynaPDFMatrixMBS = DynapdfMatrixMBS.Identity

m.Scale 3.0, 4.0

MsgBox str(m.GetScaleFactor) // shows 3.535534
```

**Notes:** Used to be named GetScaleFactor before.
(Read only property)

### 77.39.31 StringValue as string

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts matrix into a string for displaying in log files.
**Example:**

```
dim m as new DynaPDFMatrixMBS
MsgBox m.Str // shows [ 1.000000 0.000000 0.000000 1.000000 0.000000 0.000000 ]
```

**Notes:** Added for debugging.
Used to be named Str.
(Read only property)

### 77.39.32 x as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

### 77.39.33 y as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the matrix properties.
**Notes:** (Read and Write property)

## 77.40 class DynaPDFMBS

### 77.40.1 class DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dynapdf class.
**Notes:** A pdf library to create, modify, import pdf files.
You need a separate dynapdf license key for this class.

Please note that all constants have the prefix k. In the dynapdf_help.pdf file, the constants don't have a k prefix. And the C functions there have IPDF parameters which the plugin automatically passes for you. So

SI32 pdfSetPageCoords(const void* IDPF, TPageCoord PageCoords)

translates in Xojo to

function SetPageCoords(PageCoords as Integer) as Integer

and you call it like this:

call pdf.SetPageCoords pdf.kpcTopDown

where in this sample the DynaPDF object is named pdf.

Pro license is required for the following functions:

- BeginTransparencyGroup
- ConvertColors
- Create3DAnnot
- CreateSoftMask
- FlattenForm
- GetPageText
- ImportPage and ImportPageEx
- ParseContent
- RenderAnnotOrField

- RenderPage
- SetCMapDir
- SetExtColorSpace, SetExtFillColorSpace and SetExtStrokeColorSpace.
- SetUseGlobalImpFiles

Lite is required for:

- AddRenderingIntent and AddRenderingIntentEx
- CreateFormFields
- CloseFileEx
- ConvertEMFSpool
- CreateCollection
- CreateExtGState
- InsertMetafile and InsertMetafileEx
- OpenImportBuffer, OpenImportFile and OpenImportStream
- SetPDFVersion for PDF/A and PDF/X

And all functions relaying on those functions internally.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr2
- News from the MBS Xojo Plugins in version 21.5
- DynaPDF with gradients in DeviceN colorspace
- News from the MBS Xojo Plugins Version 21.4
- News from the MBS Xojo Plugins Version 21.3
- Text Encoding Speedups
- ZUGFeRD 2.0 and Factur-X for Xojo
- DynaPDF Tracing
- PDF Standard Fonts
- MBS Plugins 11.1 Release notes

**Videos**

- MBS Plugin Installation on Windows
- MBS Plugin Installation on macOS
- Xojo and DynaPDF
- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 8.5, page 18: Printing PDFs, Easy PDF printing on Mac and Windows
- 21.6, page 16: Multi-column PDFs, Making Multi-column PDFs with DynaPDF by Stefanie Juchmes
- 21.6, page 12: Multi-column PDFs, Making Multi-column PDFs with DynaPDF by Stefanie Juchmes
- 20.4, page 42: PDF Pie Charts, Adding Xojo Charts to Your PDFs by Stefanie Juchmes
- 20.4, page 10: News
- 19.6, page 12: Things you can do with DynaPDF, The MBS DynaPDF Plugin is more powerful than you think by Stefanie Juchmes
- 19.2, page 31: Getting Started with DynaPDF, If you've never tried DynaPDF, you don't know how easy it is! by Stefanie Juchmes
- 19.2, page 24: Getting Started with DynaPDF, If you've never tried DynaPDF, you don't know how easy it is! by Stefanie Juchmes
- 19.2, page 10: News
- 17.5, page 9: News

### 77.40.2 Methods

### 77.40.3 ActivateAltFontList(FontListHandle as Integer, EnableSysFonts as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Activates or deactivates an alternate font list that was created by CreateAltFontList().
**Notes:** An alternate font list represents a list of fallback fonts which are tested if one or more required glyphs were not found in the current font.
If no compatible font was found in the list, then system fonts are tested if EnableSysFonts was set to true. Although EnableSysFonts should be set to true in most cases, it is sometimes useful to disable system fonts, e.g. to restrict the number of fonts which can be embeded.
In order to disable the current alternate font list set the parameter Handle to -1. The value of EnableSysFonts

is ignored this case. To fully deactivate font substitution disable system fonts with SetUseSystemFonts() before calling a text function.
Please note that alternate font lists are used only, if complex text layout was enabled. This can be done by setting the flag kgfComplexText with SetGStateFlags().
See also ActivateAltFontList function in DynaPDF manual.

### 77.40.4 AddActionToObj(ObjType as Integer, theEvent as Integer, ActHandle as Integer, ObjHandle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds an action to a PDF object.
See also AddActionToObj function in DynaPDF manual.

### 77.40.5 AddAnnotToPage(PageNum as UInt32, Handle as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an annotation to a page.
**Notes:** With exception of PopUp annotations all annotation types can be drawn on multiple pages. Watermark or Stamp annotations are typical annotations which can be placed on multiple pages.
Returns true on success.
See also AddAnnotToPage function in DynaPDF manual.

### 77.40.6 AddArticle(PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a new article and adds it to the currently open article thread that must be created with CreateArticleThread() beforehand.
See also AddArticle function in DynaPDF manual.

### 77.40.7 AddBookmark(title as String, parent as Integer, DestPage as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to unicode.

See also AddBookmark function in DynaPDF manual.

### 77.40.8 AddBookmarkAnsi(title as String, parent as Integer, DestPage as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to ANSI.

### 77.40.9 AddBookmarkEx(title as String, parent as Integer, NamedDest as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to unicode.
See also AddBookmarkEx function in DynaPDF manual.

### 77.40.10 AddBookmarkEx2(title as String, parent as Integer, NamedDest as String, unicode as boolean, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** If unicode is true, the plugin passes NamedDest as unicode, else as Windows ANSI text.
See also AddBookmarkEx2 function in DynaPDF manual.

### 77.40.11 AddBookmarkEx2Ansi(title as String, parent as Integer, NamedDest as String, unicode as boolean, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** If unicode is true, the plugin passes NamedDest as unicode, else as Windows ANSI text.

### 77.40.12 AddBookmarkExAnsi(title as String, parent as Integer, NamedDest as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function adds a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to ANSI.

### 77.40.13 AddButtonImage(BtnHandle as Integer, State as Integer, Caption as string, ImgFile as FolderItem) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds an image to a push button to one or more of the three different states of a button.
See also AddButtonImage function in DynaPDF manual.

### 77.40.14 AddButtonImageEx(BtnHandle as Integer, State as Integer, Caption as string, hbitmap as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds a memory bitmap to a push button in the same ways as AddButtonImage() but accepts a HBITMAP handle as input image.
See also AddButtonImageEx function in DynaPDF manual.

### 77.40.15 AddButtonImageEx2(BtnHandle as integer, State as integer, Caption as string, ImageData as MemoryBlock) as boolean

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds image to a button.
**Notes:** The function adds an image to a push button in the same way as AddButtonImage(), but accepts an image buffer as input.
The function supports all image formats that InsertImageEx() supports, e.g. JPEG or PNG.

If the function succeeds the return value is true. If the function fails the return value is false.
See also AddButtonImageEx2 function in DynaPDF manual.
See also:

- 77.40.16 AddButtonImageEx2(BtnHandle as integer, State as integer, Caption as string, ImageData

as String) as boolean 12720

### 77.40.16 AddButtonImageEx2(BtnHandle as integer, State as integer, Caption as string, ImageData as String) as boolean

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds image to a button.
**Notes:** The function adds an image to a push button in the same way as AddButtonImage(), but accepts an image buffer as input.
The function supports all image formats that InsertImageEx() supports, e.g. JPEG or PNG.

If the function succeeds the return value is true. If the function fails the return value is false.
See also AddButtonImageEx2 function in DynaPDF manual.
See also:

- 77.40.15 AddButtonImageEx2(BtnHandle as integer, State as integer, Caption as string, ImageData as MemoryBlock) as boolean 12719

### 77.40.17 AddContinueText(text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function prints a single text line and adds a line feed.
**Notes:** The text string is converted to Unicode.
See also AddContinueText function in DynaPDF manual.

### 77.40.18 AddContinueTextAnsi(text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function prints a single text line and adds a line feed.
**Notes:** The text string is converted to ANSI.

### 77.40.19 AddDeviceNProcessColorants(DeviceNCS as Integer, Colorants() as string, ProcessCS as Integer, Handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds DeviceN process colorants.
**Notes:** Returns true on success and false on failure.

See also AddDeviceNProcessColorants function in DynaPDF manual.

### 77.40.20 AddDeviceNSeparations(DeviceNCS as Integer, Colorants() as string, SeparationCS() as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds device N seperations.
**Notes:** Same as AddDeviceNSeparationsAnsi, but here the Xojo colorant strings are converted to UTF-8 encoding before they are passed to the DynaPDF library.

ubound(Colorants) must be ubound(SeparationCS).
Returns true on success and false on failure.

Currently limited to 100 colorants on the plugin side.
See also AddDeviceNSeparations function in DynaPDF manual.

### 77.40.21 AddDeviceNSeparationsAnsi(DeviceNCS as Integer, Colorants() as string, SeparationCS() as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds device N seperations.
**Notes:** Same as AddDeviceNSeparations, but here the Xojo colorant strings are converted to ANSI encoding before they are passed to the DynaPDF library.

ubound(Colorants) must be ubound(SeparationCS).
Returns true on success and false on failure.

Currently limited to 100 colorants on the plugin side.

### 77.40.22 AddDPartNode(Parent as Integer, FirstPage as Integer, LastPage as Integer, DPM as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a DPart Node.
**Notes:** DPart nodes can be used to add metadata to a single page or range of pages. In addition, DPart

nodes can be nested to form a tree like structure.

Unlike XMP metadata streams which base on XML, Document Part Metadata (parameter DPM) is stored in PDF syntax. This type of metadata supports dictionaries, arrays, strings, name objects, numbers, and boolean values, or almost the entire range of PDF data types.

DPart nodes require a global root node that must be created with CreateDPartRoot() before this function can be called the first time.
See also AddDPartNode function in DynaPDF manual.

### 77.40.23 AddFieldToFormAction(Action as Integer, Field as Integer, Include as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a field to a form action.
See also AddFieldToFormAction function in DynaPDF manual.

### 77.40.24 AddFieldToHideAction(HideAct as Integer, Field as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a field to a hide action.
See also AddFieldToHideAction function in DynaPDF manual.

### 77.40.25 AddFileComment(Text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds one or more comments to the end of the PDF file.
**Notes:** The text parameter is converted to unicode.
See also AddFileComment function in DynaPDF manual.

### 77.40.26 AddFileCommentAnsi(Text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds one or more comments to the end of the PDF file.

**Notes:** The text parameter is converted to ANSI.

### 77.40.27 AddFontSearchPath(path as folderitem, recursive as boolean = true) as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a search path to the list of available font search paths.
**Example:**

```
dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if
```

**Notes:** This function adds a search path to the list of available font search paths. An arbitrary number of search paths can be added at runtime. Subdirectories are included recursively if the parameter Recursive is true.
DynaPDF requires no separate metric files for Type1 fonts.

The list of search directories can be cleared at runtime with the function ClearHostFonts().

If system fonts are enabled (default) DynaPDF adds the default font directories of the operating system automatically to the list of font search paths (Windows and Mac OSX only, see SetUseSystemFonts() for further information). On Windows this is the %Windows%/Fonts directory as well as fonts listed in the Registry and linked fonts.

On Mac OSX the following directories are added to the list of font search paths (in this order):

- users font folder in
  textasciitilde /Library/Fonts
- /Library/Fonts
- /System/Library/Fonts

If the function succeeds the function returns the number of found font files (this is maybe not the number of available fonts, because the list is cleared each time all fonts in the list are processed during font selection). If the function fails a negative error code is returned.

Please call this method on Linux to get fonts loaded from your font folder.
See also AddFontSearchPath function in DynaPDF manual.
See also:


- 77.40.28 AddFontSearchPath(path as string, recursive as boolean = true) as Integer 12724


### 77.40.28 AddFontSearchPath(path as string, recursive as boolean = true) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a search path to the list of available font search paths.
**Example:**

```
dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if
```

**Notes:** This function adds a search path to the list of available font search paths. An arbitrary number of search paths can be added at runtime. Subdirectories are included recursively if the parameter Recursive is true.
DynaPDF requires no separate metric files for Type1 fonts.

This function is implemented in an ANSI and Unicode compatible version. However, Unicode file paths are converted back to ANSI on Windows. On non-Windows operating systems the path is converted to UTF-8 and passed to the ANSI version of the function.

The list of search directories can be cleared at runtime with the function ClearHostFonts().

If system fonts are enabled (default) DynaPDF adds the default font directories of the operating system automatically to the list of font search paths (Windows and Mac OSX only, see SetUseSystemFonts() for further information). On Windows this is the %Windows%/Fonts directory as well as fonts listed in the Registry and linked fonts.

On Mac OSX the following directories are added to the list of font search paths (in this order):

- users font folder in
  textasciitilde /Library/Fonts
- /Library/Fonts

- /System/Library/Fonts

If the function succeeds the function returns the number of found font files (this is maybe not the number of available fonts, because the list is cleared each time all fonts in the list are processed during font selection). If the function fails a negative error code is returned.

Please call this method on Linux to get fonts loaded from your font folder.
See also AddFontSearchPath function in DynaPDF manual.
See also:

- 77.40.27 AddFontSearchPath(path as folderitem, recursive as boolean = true) as Integer 12723

### 77.40.29 AddImage(Filter as Integer, Flags as Integer, Image as DynaPDFImageMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the current image file.
**Notes:** For the filter you use one of the kcf* constants.
For the flags you use either kicNone of kicUseCCITT4.

TIFF is the only format that supports different compression filters. The Filter parameter of the function AddImage() is ignored if the image format supports only one specific compression filter.
Note that images are automatically converted to the nearest supported color space if the image format does not support the color space of the image.
See also AddImage function in DynaPDF manual.

### 77.40.30 AddInkList(InkAnnot as UInt32, points() as DynaPDFPointMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an array of points or path to an Ink Annotation.
**Notes:** The function must be called within an open page.
An ink annotation can contain an arbitrary number of paths. The points will be connected by curves to achieve a smooth transition between points. The coordinates are treated in current user space. Any transformation that was applied on the coordinate system will be taken into account.
If the number of points is zero then all paths will be deleted from the annotation.

Returns true on success.
See also AddInkList function in DynaPDF manual.

### 77.40.31 AddJavaScript(Name as string, Script as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds a global JavaScript to the PDF file.
**Notes:** The script parameter is converted to unicode.
See also AddJavaScript function in DynaPDF manual.

### 77.40.32 AddJavaScriptAnsi(Name as string, Script as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function adds a global JavaScript to the PDF file.
**Notes:** The script parameter is converted to ANSI.

### 77.40.33 AddLayerToDisplTree(parent as DynaPDFLayerGroupMBS, layer as UInt32, Title as string) as DynaPDFLayerGroupMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a layer to the display tree.
See also AddLayerToDisplTree function in DynaPDF manual.

### 77.40.34 AddLayerToDisplTreeAnsi(parent as DynaPDFLayerGroupMBS, layer as UInt32, Title as string) as DynaPDFLayerGroupMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds a layer to the display tree.

### 77.40.35 AddMaskImage(BaseImage as Integer, Buffer as MemoryBlock, Stride as UInt32, BitsPerPixel as UInt32, Width as UInt32, Height as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds an image mask to a base image.
**Notes:** Please note that this function can be called with Ptr or Memoryblock.
See also AddMaskImage function in dynapdf_help.pdf manual.

See also AddMaskImage function in DynaPDF manual.
See also:

- 77.40.36 AddMaskImage(BaseImage as Integer, Buffer as Ptr, BufSize as UInt32, Stride as UInt32, BitsPerPixel as UInt32, Width as UInt32, Height as UInt32) as boolean 12727

### 77.40.36 AddMaskImage(BaseImage as Integer, Buffer as Ptr, BufSize as UInt32, Stride as UInt32, BitsPerPixel as UInt32, Width as UInt32, Height as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds an image mask to a base image.
**Notes:** Please note that this function can be called with Ptr or Memoryblock.
See also AddMaskImage function in dynapdf_help.pdf manual.
See also AddMaskImage function in DynaPDF manual.
See also:

- 77.40.35 AddMaskImage(BaseImage as Integer, Buffer as MemoryBlock, Stride as UInt32, BitsPerPixel as UInt32, Width as UInt32, Height as UInt32) as boolean 12726

### 77.40.37 AddObjectToLayer(OCG as UInt32, ObjType as Integer, Handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds an object to an Optional Content Group (OCG) or Optional Content Membership dictionary (OCMD).
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.

For ObjectType use the constants: kooAnnotation, kooField, kooImage and kooTemplate.
See also AddObjectToLayer function in DynaPDF manual.

### 77.40.38 AddOCGToAppEvent(Handle as UInt32, Events as Integer, Categories as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an Optional Content Group (OCG) to an application event.
**Notes:** See dynapdf_help.pdf manual for details.
See also AddOCGToAppEvent function in DynaPDF manual.

### 77.40.39 AddOutputIntent(ICCFile as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds an ICC color profile to the PDF file that should be used to render device dependent colors.
**Notes:** This function was named AddRenderingIntent before.
Requires DynaPDF Lite license.
See also AddOutputIntent function in DynaPDF manual.

### 77.40.40 AddOutputIntentEx(buffer as Memoryblock) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds an ICC color profile to the PDF file that should be used to render device dependent colors.
**Notes:** This function was named AddRenderingIntentEx before.
Requires DynaPDF Lite license.
See also AddOutputIntentEx function in DynaPDF manual.
See also:

- 77.40.41 AddOutputIntentEx(buffer as string) as Integer 12728

### 77.40.41 AddOutputIntentEx(buffer as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds an ICC color profile to the PDF file that should be used to render device dependent colors.
**Notes:** This function was named AddRenderingIntentEx before.
Requires DynaPDF Lite license.
See also AddOutputIntentEx function in DynaPDF manual.
See also:

- 77.40.40 AddOutputIntentEx(buffer as Memoryblock) as Integer 12728

### 77.40.42 AddPageLabel(StartRange as UInt32, PageLabelFormat as Integer, Value as string, FirstPageNum as Int32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a page label object.
**Notes:** The Value string is converted to Unicode internally.
See also AddPageLabel function in DynaPDF manual.

### 77.40.43 AddPageLabelAnsi(StartRange as UInt32, PageLabelFormat as Integer, Value as string, FirstPageNum as Int32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a page label object.
**Notes:** The Value string is converted to Windows ANSI internally.

### 77.40.44 AddValToChoiceField(Field as Integer, ExpValue as string, Value as string, Selected as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function adds a value to a choice field.
**Notes:** The Value string is converted to Unicode.
See also AddValToChoiceField function in DynaPDF manual.

### 77.40.45 AofLAB(LAB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns A of a LAB color value.
**Example:**

```
dim lab as Integer = DynaPDFMBS.LAB(1,2,3)
MsgBox str(DynaPDFMBS.AofLAB(lab)) // shows 2
```

### 77.40.46 Append as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function appends an empty page to the document.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// Create a new page
bBool=pdf.Append
```

See also Append function in DynaPDF manual.

### 77.40.47 AppendTraceFile(File as FolderItem) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a trace file with appending.
**Notes:** The plugin writes debug messages to this file so you can check what functions you called.

Improved with 16.2 plugin to really cover over 99% of all calls with parameters and result. Please report if you miss something.

While assignment to TraceFile property or CreateTraceFile() always overwrites existing log file, this method can append to it.

### 77.40.48 ApplyAppEvent(TOCAppEvent as Integer, SaveResult as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The visibility state of optional content groups (OCGs) can be dynamically changed in application events like Export, View, or Print.
**Notes:** DynaPDF loads the view state when rendering PDF pages by default.
The function can be used to apply the visibility state of another event if necessary. The result can optionally be stored in the PDF file but note that this has only an effect in PDF viewers which support layers but no application events since the events will not be deleted from the PDF file. It is also possible to delete the events with DeleteAppEvents().

If the function succeeds the return value is true. If the function fails the return value is false.

See also ApplyAppEvent function in DynaPDF manual.

### 77.40.49 ApplyPattern(PattHandle as Integer, ColorMode as Integer, ColorValue as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function sets a tiling pattern as current fill, stroke or fill, and stroke color.
See also ApplyPattern function in DynaPDF manual.

### 77.40.50 ApplyShading(ShadHandle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function applies a shading to the current clipping path, or if no clipping is active, to the entire page.
See also ApplyShading function in DynaPDF manual.

### 77.40.51 AssociateEmbFile(DestObject as Integer, DestHandle as Integer, Relationship as Integer, EmbFile as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function associates an embedded file with a PDF object.
**Notes:** The parameter DestHandle must be a valid handle of a PDF object. If destination object type is a page, then the page number must be used as handle. The first page is denoted by one. If the destination object is the documents catalog then the parameter DestHandle is ignored. Set the parameter to zero or -1 in this case.
The parameter EmbFile must be a valid handle of an embedded file. See AttachFile() or AttachFileEx() for further information.

Associated files are supported since PDF 2.0 and in PDF/A 3 files. In PDF/A 3 files all embedded files must be associated with a PDF object.

If the function succeeds the return value is true. If the function fails the return value is false.
See also AssociateEmbFile function in DynaPDF manual.

### 77.40.52 AttachFile(File as folderitem, Description as string, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function attaches a file to the document.
**Notes:** On Windows, the description parameter is converted to unicode.
See also AttachFile function in DynaPDF manual.

### 77.40.53 AttachFileEx(Buffer as Memoryblock, Filename as string, Description as string, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function attaches a file to the document in the same way as AttachFile() but accepts a file buffer instead of a file path.
See also AttachFileEx function in DynaPDF manual.
See also:

- 77.40.54 AttachFileEx(Buffer as string, Filename as string, Description as string, Compress as boolean) as Integer 12732

### 77.40.54 AttachFileEx(Buffer as string, Filename as string, Description as string, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function attaches a file to the document in the same way as AttachFile() but accepts a file buffer instead of a file path.
**Example:**

```
dim pdf as DynaPDFMBS // your dynapdf object

// add embedded file to PDF
const Compressed = true
call pdf.AttachFileEx("This is hidden text in an attached file.", "attachment.txt", "", Compressed)
```

See also AttachFileEx function in DynaPDF manual.
See also:

- 77.40.53 AttachFileEx(Buffer as Memoryblock, Filename as string, Description as string, Compress as boolean) as Integer 12731

### 77.40.55 AutoTemplate(Templ as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** To insert a template automatically on newly created pages, use the function AutoTemplate().
See also AutoTemplate function in DynaPDF manual.

### 77.40.56 BeginContinueText(PosX as Double, PosY as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function prepares the output of multiple text lines which use the graphics state parameter Leading as line height, or the font size if Leading is not set.

See also BeginContinueText function in DynaPDF manual.

### 77.40.57 BeginLayer(OCG as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function opens a layer in the current open page or template.
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.

See also BeginLayer function in DynaPDF manual.

### 77.40.58 BeginPageTemplate(Name as String, UseAutoTemplates as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new page template with given name.
**Notes:** This function creates or opens a page template for editing. Page templates are hidden pages which can be added to the document or overlaid on existing pages via JavaScript.

The usage of the function is like Append() or EditPage(). If the template does already exist then it will be opened for editing. Page templates support form fields and annotations but it is not allowed to add article beads to them.
See also BeginPageTemplate function in DynaPDF manual.

### 77.40.59 BeginPattern(PatternType as Integer, TilingType as Integer, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a new tiling pattern.
See also BeginPattern function in DynaPDF manual.

### 77.40.60 BeginTemplate(Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Begins a new template
See also BeginTemplate function in DynaPDF manual.

### 77.40.61 BeginTemplateEx(BBox as DynaPDFRectMBS, Matrix as DynaPDF-MatrixMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Begins a new template
**Notes:** The plugin passes nil to the library for the bbox or the matrix parameter if they are nil.

### 77.40.62 BeginTransparencyGroup(x1 as Double, y1 as Double, x2 as Double, y2 as Double, Isolated as Boolean, Knockout as Boolean, CS as Integer, CSHandle as Int32) as Int32

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Begins a new transparency group.
**Notes:** CS: color space, pass kes* constants.

Requires DynaPDF Pro license.
See also BeginTransparencyGroup function in DynaPDF manual.

### 77.40.63 Bezier_1_2_3(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x3 as Double, y3 as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bezier path to the pdf.
See also Bezier_1_2_3 function in DynaPDF manual.

### 77.40.64 Bezier_1_3(x1 as Double, y1 as Double, x3 as Double, y3 as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bezier path to the pdf.
See also Bezier_1_3 function in DynaPDF manual.

### 77.40.65 Bezier_2_3(x2 as Double, y2 as Double, x3 as Double, y3 as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a bezier path to the pdf.
See also Bezier_2_3 function in DynaPDF manual.

### 77.40.66 BofLAB(LAB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns B of a LAB color value.
**Example:**

```
dim lab as Integer = DynaPDFMBS.LAB(1,2,3)
MsgBox str(DynaPDFMBS.BofLAB(lab)) // shows 3
```

### 77.40.67 BofRGB(RGB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns B of a RGB color value.
**Example:**

```
dim rgb as Integer = DynaPDFMBS.RGB(1,2,3)
MsgBox str(DynaPDFMBS.BofRGB(rgb)) // shows 3
```

### 77.40.68 BuildFamilyNameAndStyle(IFont as Integer, byref name as string, byref style as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a family name and style from a font object.
See also BuildFamilyNameAndStyle function in DynaPDF manual.

### 77.40.69 CalcWidthHeight(OrgWidth as Double, OrgHeight as Double, ScaledWidth as Double, ScaledHeight as Double) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function calculates the scaled width or height of a given size in the same way as InsertImage() or PlaceTemplate().
See also CalcWidthHeight function in DynaPDF manual.

### 77.40.70 CaretAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a caret annotation.
**Notes:** This type of annotation is typically used to mark a position on a page where a user should add or edit text.
If the coordinate system is bottom-up the point PosX, PosY defines the lower left corner of the bounding rectangle. If the coordinate system is top-down it defines the upper left corner.
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also CaretAnnot function in DynaPDF manual.

### 77.40.71 CaretAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates a caret annotation.
**Notes:** This type of annotation is typically used to mark a position on a page where a user should add or edit text.
If the coordinate system is bottom-up the point PosX, PosY defines the lower left corner of the bounding rectangle. If the coordinate system is top-down it defines the upper left corner.
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.

### 77.40.72 ChangeAnnotName(Handle as Integer, Name as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes or deletes the optional name of an annotation.

**Notes:** The Name parameter is converted to unicode.
See also ChangeAnnotName function in DynaPDF manual.

### 77.40.73 ChangeAnnotNameAnsi(Handle as Integer, Name as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function changes or deletes the optional name of an annotation.
**Notes:** The Name parameter is converted to ANSI.

### 77.40.74 ChangeAnnotPos(Handle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the position and size of an annotation.
See also ChangeAnnotPos function in DynaPDF manual.

### 77.40.75 ChangeBookmark(ABmk as Integer, Text as string, Parent as Integer, DestPage as Integer, Open as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes an existing bookmark.
**Notes:** The text parameter is converted to unicode.
See also ChangeBookmark function in DynaPDF manual.

### 77.40.76 ChangeBookmarkAnsi(ABmk as Integer, Text as string, Parent as Integer, DestPage as Integer, Open as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function changes an existing bookmark.
**Notes:** The text parameter is converted to ANSI.

### 77.40.77 ChangeFont(Handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes or sets the font to the one defined by the parameter AHandle.
See also ChangeFont function in DynaPDF manual.

### 77.40.78 ChangeFontEx(Handle as integer, FontSize as double, Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes or sets the font to the one of the parameter Handle.
**Notes:** Handle must be a valid font handle that was returned by SetFont(), SetFontEx(), SetCIDFont(), or LoadFont().
The style flags should be the same as in the initial SetFont() call with exception of the flags fsUnderline or fsStriked which can be used to underline or strikeout text.
The parameter FontSize must be greater zero.

If the function succeeds the return value is true. If the function fails the return value is false.
See also ChangeFontEx function in DynaPDF manual.

### 77.40.79 ChangeFontSize(size as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the font size of the current font.
See also ChangeFontSize function in DynaPDF manual.

### 77.40.80 ChangeFontStyle(Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the style of the current font.
See also ChangeFontStyle function in DynaPDF manual.

### 77.40.81 ChangeFontStyleEx(Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the font style of a font like ChangeFontStyle() but it accepts also the font styles fsBold and fsItalic.
See also ChangeFontStyleEx function in DynaPDF manual.

### 77.40.82 ChangeJavaScript(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function replaces a global JavaScript with a new one.
**Notes:** The text parameter is converted to unicode.
See also ChangeJavaScript function in DynaPDF manual.

### 77.40.83 ChangeJavaScriptAction(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function replaces the script of a JavaScript action with a new one.
**Notes:** The text parameter is converted to unicode.
See also ChangeJavaScriptAction function in DynaPDF manual.

### 77.40.84 ChangeJavaScriptActionAnsi(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function replaces the script of a JavaScript action with a new one.
**Notes:** The text parameter is converted to ANSI.

### 77.40.85 ChangeJavaScriptAnsi(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function replaces a global JavaScript with a new one.
**Notes:** The text parameter is converted to ANSI.

### 77.40.86 ChangeJavaScriptName(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the name of a global JavaScript.
**Notes:** The text parameter is converted to unicode.
See also ChangeJavaScriptName function in DynaPDF manual.

### 77.40.87 ChangeJavaScriptNameAnsi(Handle as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function changes the name of a global JavaScript.
**Notes:** The text parameter is converted to ANSI.

### 77.40.88 ChangeLinkAnnot(Handle as Integer, URL as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the link of a file link or web link annotation.
See also ChangeLinkAnnot function in DynaPDF manual.

### 77.40.89 ChangeNamedDest(ObjType as Integer, Handle as Integer, Name as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the name of a named destination.
**Notes:** ObjType: Object type to which the handle belongs like kotAction, kotAnnotation, kotBookmark or kotPageLink.
Handle: Object handle
Name: New destination name

Named destinations can be accessed by link annotations, bookmarks, and actions. For link annotations the object type otPageLink or otAnnotation can be used.

If the function succeeds the return value is true. If the function fails the return value is false.
See also ChangeNamedDest function in DynaPDF manual.

### 77.40.90 ChangeOCGName(Handle as Integer, Name as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the name of an Optional Content Group (OCG).
**Notes:** Returns true on success and false in case of error.
See also ChangeOCGName function in DynaPDF manual.

### 77.40.91 ChangeSeparationColor(CSHandle as UInt32, NewColor as UInt32, AlternateExtColorSpace as Integer, AltHandle as Integer = -1) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the color of a separation color space.
**Example:**

```
// your instance
dim pdf as DynaPDFMBS

// Create new separation color
dim ColorSpaceHandle as Integer = pdf.CreateSeparationCS("test",DynaPDFMBS.kcsDeviceCMYK,-1,DynapdfMBS.CMYK
call pdf.SetExtColorSpace(ColorSpaceHandle)

// draw something
call pdf.SetfillColor(255) // 100% of the separation color test
call pdf.DrawCircle(193,389,66, pdf.kfmFill)

// change it to red
call pdf.ChangeSeparationColor(ColorSpaceHandle, 255, DynaPDFMBS.kcsDeviceRGB, -1)
```

**Notes:** The new color value must be defined in the alternate color space. The alternate color space can be any device or ICC based color space including Lab. If a non-device color space is used, the parameter AltHandle must be set to the color space handle of the alternate color space.

Returns true on success or false on failure.
CSHandle is the index in the colorspace table, not the reference to the C++ object. So do not pass handle property from DynaPDFColorSpaceMBS, but the Index property.
See also ChangeSeparationColor function in DynaPDF manual.

### 77.40.92 CheckCollection as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

The function checks whether user defined data fields in embedded files are consistently defined with collection fields.
See also CheckCollection function in DynaPDF manual.

### 77.40.93 CheckConformance(ConformanceType as Integer, CheckOptions as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The functions checks whether the PDF file is compatible to a specific PDF standard or PDF version depending the parameter Type and modifies anything that is required to get the file compatible to the standard depending on the check options.
See also CheckConformance function in DynaPDF manual.

### 77.40.94 CheckFieldNames as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function checks all currently defined interactive form fields for invalid duplicate field names.
See also CheckFieldNames function in DynaPDF manual.

### 77.40.95 CircleAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a circle annotation on the current open page.
**Notes:** If the parameters Width and Height are equal the function draws a circle, an ellipse otherwise. If the annotation should be drawn without a border, set the parameter LineWidth zo zero or StrokeColor to the special constant kNO_COLOR.
If the interior should be transparent set FillColor to the special constant kNO_COLOR.
Although the line width can be set to any positive floating point value, Adobe's Acrobat or Reader restrict the line width to 0 through 12 units. The line width should be restricted in the same way to avoid issues in Adobe viewer products.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails, the return value is a negative error code.
See also CircleAnnot function in DynaPDF manual.

### 77.40.96 CircleAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function draws a circle annotation on the current open page.
**Notes:** If the parameters Width and Height are equal the function draws a circle, an ellipse otherwise. If the annotation should be drawn without a border, set the parameter LineWidth zo zero or StrokeColor to the special constant kNO_COLOR.
If the interior should be transparent set FillColor to the special constant kNO_COLOR.
Although the line width can be set to any positive floating point value, Adobe's Acrobat or Reader restrict the line width to 0 through 12 units. The line width should be restricted in the same way to avoid issues in Adobe viewer products.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails, the return value is a negative error code.

### 77.40.97 ClearAutoTemplates as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes the array of templates which are automatically added to newly created pages.
See also ClearAutoTemplates function in DynaPDF manual.

### 77.40.98 ClearErrorLog

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the error log.
See also ClearErrorLog function in DynaPDF manual.

### 77.40.99 ClearHostFonts as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes the array of fonts included in all currently defined font search paths.
See also ClearHostFonts function in DynaPDF manual.

### 77.40.100 ClearPageGraphics

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the page graphics objects.
**Notes:** This method clears graphics object.

As the graphics object keeps a reference to DynaPDFMBS object and the DynaPDF object references the graphics object, this call may be required to make sure the circular reference is cleared.

Automatically called in Append, EndPage, CloseFile, ImportPDFFile, ImportPDFPage and CloseFileEx.

### 77.40.101 ClipPath(ClipMode as Integer, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function marks the current path as clipping path.
See also ClipPath function in DynaPDF manual.

### 77.40.102 CloseAndSignFile(CertFile as folderitem, Password as string, Reason as string, Location as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function finishes the PDF file, digitally signs it, and frees all used resources if the file was not created in memory.
**Notes:** Only for 1024 bit keys. For longer keys, check our custom signature example.
See also CloseAndSignFile function in DynaPDF manual.

### 77.40.103 CloseAndSignFileEx(OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer, CertFile as folderitem, Password as string, Reason as string, Location as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function finishes the PDF file, encrypts it, digitally signs it, and frees all used resources if the file was not created in memory.
**Notes:** If you need more than 1024 bit keys, please check our custom signatur example, which shows how to signatures with 2048 or 4096 bit keys and the CloseAndSignFileExt function.
See also CloseAndSignFileEx function in DynaPDF manual.

### 77.40.104 CloseAndSignFileExt(SigParams as DynaPDFSigParmsMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function closes the PDF file and returns either the file hash or the byte ranges to be signed by an external signature handler.
See also CloseAndSignFileExt function in DynaPDF manual.

### 77.40.105 CloseAndSignPDFFile(OutputFile as FolderItem, CertificateData as String, Password as String, ContactInfo as String = """, Location as String = """, Reason as String = """) as boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Closes and signs file.
**Notes:** This uses pdf_signature.cpp example code from DynaPDF.
The function will on Windows use functions from Crypt DLL on Windows.
Internally calls CloseAndSignFileExt, OpenOutputFile and FinishSignature.
Returns true on success and false on failure.

Loads certificate from provided certificate file data.

Version 15.1 allows OutputFile to be nil.

If you need more than 1024 bit keys, please check our custom signatur example, which shows how to signatures with 2048 or 4096 bit keys and the CloseAndSignFileExt function.

### 77.40.106 CloseAndSignPDFFileWithDialog(OutputFile as FolderItem, StoreName as String = "MY", ContactInfo as String = "", Location as String = "", Reason as String = "") as boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platform: Windows, Targets: All.

**Function:** Closes and signs file.
**Notes:** Picks a certificate from the given certificate store on Windows.

This uses pdf_signature.cpp example code from DynaPDF.
The function will on Windows use functions from Crypt DLL on Windows.
Internally calls CloseAndSignFileExt, OpenOutputFile and FinishSignature.
Returns true on success and false on failure.

Version 15.1 allows OutputFile to be nil.

### 77.40.107 CloseFile as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function finishes the PDF file and frees all used resources if the file was not created in memory.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

bBool=pdf.CloseFile
```

See also CloseFile function in DynaPDF manual.

### 77.40.108 CloseFileEx(OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function finishes the PDF file, encrypts it, and frees all used resources if the file was not created in memory.
**Notes:** Requires DynaPDF Lite license.
See also CloseFileEx function in DynaPDF manual.

### 77.40.109 CloseImage as boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the current open image.
See also CloseImage function in DynaPDF manual.

### 77.40.110 CloseImportFile as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function closes an open import file that was be opened by OpenImportFile() or OpenImportBuffer().
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

bBool=pdf.CloseImportFile
```

See also CloseImportFile function in DynaPDF manual.

### 77.40.111 CloseImportFileEx(Handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function closes a specific import file and deletes the corresponding parser instance.
**Notes:** The parameter Handle must be a valid file handle that was returned by OpenImportFile() or OpenImportBuffer(). See OpenImportFile() for further information in dynapdf_help.pdf.
If the function succeeds the return value is true. If the function fails the return value is false.
See also CloseImportFileEx function in DynaPDF manual.

### 77.40.112 ClosePath(FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the current path.
See also ClosePath function in DynaPDF manual.

### 77.40.113 CloseTag as boolean

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes an open tag.
See also CloseTag function in DynaPDF manual.

### 77.40.114 CMYK(C as Integer, M as Integer, Y as Integer, K as Integer) as UInt32

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a CMYK color value based on the given component values.
**Example:**

```
dim cmyk as Integer = DynaPDFMBS.CMYK(1,2,3,4)
MsgBox hex(cmyk)
```

**Notes:** Returns different values on BigEndian and LittleEndian systems.

### 77.40.115 CofCMYK(CMYK as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns C of a CMYK color value.
**Example:**

```
dim cmyk as Integer = DynaPDFMBS.CMYK(1,2,3,4)
MsgBox str(DynaPDFMBS.CofCMYK(cmyk)) // shows 1
```

**Notes:** Returns different values on BigEndian and LittleEndian systems.

### 77.40.116 ComputeBBox(Flags as Integer) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Computes the bounding box.
See also ComputeBBox function in DynaPDF manual.

### 77.40.117 ConvColor(Colors() as Double, SourceColorSpaceHandle as Integer, DestColorSpace as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a color from one ColorSpace to another.
**Example:**

```
// setup Environment
dim dy as new DynaPDFMBS
call dy.CreateNewPDF(nil)

// create a simple RGB colorspace
dim whitePoint as MemoryBlock = NewMemoryBlock(12)
whitePoint.SingleValue(0)=1.0
whitePoint.SingleValue(4)=1.0
whitePoint.SingleValue(8)=1.0

dim BlackPoint as MemoryBlock = nil // default
dim Gamma as MemoryBlock = nil // default
dim Matrix as MemoryBlock = nil // default

dim h as Integer = dy.CreateCIEColorSpace(dy.kesCalRGB, WhitePoint, BlackPoint, Gamma, Matrix)

// do we have one?
if dy.GetColorSpaceCount=0 then
MsgBox "No color space!"
Return
else
MsgBox str(dy.GetColorSpaceCount)+" Colorspace defined"
end if

// Now get the colorspace information including the Object reference:
dim c as DynaPDFColorSpaceMBS = dy.GetColorSpaceObj(h)

dim d(-1) as Double = array(0.3,0.5,0.7)
dim IColorSpace as Integer = c.Handle
dim DestCS as Integer = DynaPDFMBS.kesDeviceCMYK

// convert a color
dim n as Integer = dy.ConvColor(d, IColorSpace, DestCS)

MsgBox hex(n)
```

**Notes:** Colors: The array of color values. 3 values for RGB, 4 values for CMYK and one value for Gray.
IColorSpaceSource: The source color space object reference.
DestCS: The destination color space. One of the kes* constants.

See also ConvColor function in DynaPDF manual.

### 77.40.118 ConvertColors(Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the colors.
**Notes:** Requires DynaPDF Pro license.
See also ConvertColors function in DynaPDF manual.

### 77.40.119 ConvertEMFSpool(File as folderitem, LeftMargin as Double, TopMargin as Double, Flags as Integer = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an EMF spool file to PDF.
**Notes:** See dynapdf_help.pdf file.
Pass kspc* flags.
Requires DynaPDF Lite license.
See also ConvertEMFSpool function in DynaPDF manual.

### 77.40.120 ConvertStyledText(StyledText as StyledText, LeadingFactor as double = -1) as String

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts styled text to formatting commands.
**Example:**

```
Public Function Convert(s as StyledText) as string
dim d as new DynaPDFMBS

// create dummy in memory pdf
call d.CreateNewPDF(nil)

// create dummy page
call d.Append

// convert
Return d.ConvertStyledText(s)

// destructor will cleanup
```

End Function

**Notes:** You can use the result with WriteFText, WriteFTextEx or DynaPDFTableMBS.SetCellText functions.
Needs an open page as it loads fonts for you. May cause error events if fonts are not found.

LeadingFactor: Added in v21.0. If you pass a value >0, the plugin will add \LD [ ] commands to styled text to set leading relative to font size. This way you define the spacing beteween lines. e.g. 1.2

### 77.40.121 CopyChoiceValues(Source as UInt32, Dest as UInt32, Share as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the list items, default value, and value of the source field to the destination field.
**Notes:** The source and destination field can be combo and list boxes. It is allowed to copy the list items of a list box to a combo box or vice versa.
If Share is true, the function adds just a reference to the list item so that both fields share the same list items. This is still the case if more list items will be added to such a field. If Share is false, the list items will be copied to the destination field. Both fields contain independent list items in this case.
Already existing list items of the destination field will be deleted.
See also CopyChoiceValues function in DynaPDF manual.

### 77.40.122 Create3DAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Name as string, U3DFile as string, Image as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a 3D annotation from a U3D file.
See also Create3DAnnot function in DynaPDF manual.

### 77.40.123 Create3DAnnotAnsi(PosX as double, PosY as double, Width as double, Height as double, Author as string, Name as string, U3DFile as string, Image as string) as integer

MBS DynaPDF Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a 3D annotation from a U3D file.

### 77.40.124 Create3DBackground(IView as Integer, BackColor as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a background dictionary for a 3D annotation that is used to change the annotation's background color.
See also Create3DBackground function in DynaPDF manual.

### 77.40.125 Create3DGotoViewAction(Base3DAnnot as Integer, IView as Integer, Named as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A go to 3D view action can be used to dynamically change the view of a 3D annotation.
See also Create3DGotoViewAction function in DynaPDF manual.

### 77.40.126 Create3DProjection(IView as Integer, ProjType as Integer, ScaleType as Integer, Diameter as Double, FOV as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a projection dictionary for a 3D annotation.
See also Create3DProjection function in DynaPDF manual.

### 77.40.127 Create3DView(Base3DAnnot as Integer, Name as string, SetAsDefault as boolean, Matrix as memoryblock, CamDistance as Double, RenderingMode as Integer, LightingSheme as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a 3D view for a 3D annotation.
**Notes:** The plugin passes nil for the matrix if the matrix memoryblock parameter is nil.
This is the unicode version and you should prefer it.
See also Create3DView function in DynaPDF manual.

### 77.40.128 Create3DViewAnsi(Base3DAnnot as integer, Name as string, SetAsDefault as boolean, Matrix as memoryblock, CamDistance as double, RenderingMode as integer, LightingSheme as integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a 3D view for a 3D annotation.
**Notes:** The plugin passes nil for the matrix if the matrix memoryblock parameter is nil.
This is the older ANSI version of the function.

### 77.40.129 CreateAltFontList as Integer

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an alternate font list, that can be filled with data by SetAltFonts().
**Notes:** It is possible to create an arbitrary number of alternate font lists. Multiple lists can be created because different fonts and languages require different fallback fonts. For example, one could create one list for proportional fonts and another one for fixed pitch fonts, or different lists for different languages.
Each list can be activated or deactivated with ActivateAltFontList() arbitrary often. Changing the active alternate font list is very fast and causes no overhead.
Once a font list was created it can be filled with data with SetAltFonts(). A font list that is no longer needed can be deleted with DeleteAltFontList().
Please note that alternate font lists are used only, if complex text layout was enabled. This can be done by setting the flag kgfComplexText with SetGStateFlags().

If the function succeeds the return value is the handle of the font list, a value greater or equal zero. If the function fails the return value is a negative error code.
See also CreateAltFontList function in DynaPDF manual.

### 77.40.130 CreateAnnotAP(annot as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an annotation appereance stream.
**Notes:** Returns the new annotation handle.
You can draw to this template directly.
You must close it with EndTemplate.

This method helps you to create a custom stamp or change different annotation appearance.
See also CreateAnnotAP function in DynaPDF manual.

### 77.40.131 CreateArticleThread(ThreadName as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a new article thread.
**Notes:** ThreadName string is converted to Unicode.
See also CreateArticleThread function in DynaPDF manual.

### 77.40.132 CreateArticleThreadAnsi(ThreadName as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function creates a new article thread.
**Notes:** ThreadName string is converted to ANSI.

### 77.40.133 CreateAxialShading(sX as Double, sY as Double, eX as Double, eY as Double, SCenter as Double, SColor as Integer, EColor as Integer, Extend1 as Boolean, Extend2 as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Axial shadings define a color blend that varies along a linear axis between two endpoints and extends indefinitely perpendicular to that axis.
**Notes:** Useful to draw gradients.
See also CreateAxialShading function in DynaPDF manual.

### 77.40.134 CreateBarcodeField(Name as string, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, Barcode as DynaPDFBarcodeMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a barcode field.
**Notes:**

Note that users require either the full version of Adobe's Acrobat or a separate license of Adobe's Barcodes Paper Forms Solutions to enable the usage of barcode fields in Adobe's Reader.
See also CreateBarcodeField function in DynaPDF manual.

### 77.40.135 CreateButton(Name As String, Caption as string, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a push button.
**Notes:** The Caption parameter is converted to unicode.
See also CreateButton function in DynaPDF manual.

### 77.40.136 CreateButtonAnsi(Name As String, Caption as string, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function creates a push button.
**Notes:** The Caption parameter is converted to ANSI.

### 77.40.137 CreateCheckBox(Name as string, ExpValue as string, Checked as boolean, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a check box.
See also CreateCheckBox function in DynaPDF manual.

### 77.40.138 CreateCIEColorSpace(Base as Integer, WhitePoint as memoryblock, BlackPoint as memoryblock, Gamma as memoryblock, Matrix as memoryblock) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a CIE based color space.
See also CreateCIEColorSpace function in DynaPDF manual.

### 77.40.139 CreateColItemDate(EmbFile as Integer, Key as string, Value as Integer, Prefix as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a user defined collection item which accepts a date time value.
See also CreateColItemDate function in DynaPDF manual.

### 77.40.140 CreateColItemNumber(EmbFile as Integer, Key as string, Value as Double, Prefix as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a user defined collection item which accepts an arbitrary number as value.
See also CreateColItemNumber function in DynaPDF manual.

### 77.40.141 CreateColItemString(EmbFile as Integer, Key as string, Value as string, Prefix as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a user defined collection item which accepts an arbitrary string as value.
**Notes:** The value and prefix parameters are converted to unicode.
See also CreateColItemString function in DynaPDF manual.

### 77.40.142 CreateColItemStringAnsi(EmbFile as Integer, Key as string, Value as string, Prefix as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a user defined collection item which accepts an arbitrary string as value.
**Notes:** The value and prefix parameters are converted to ANSI.

### 77.40.143 CreateCollection(View as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function marks the current PDF file in memory as PDF collection, also known as PDF Package.

**Notes:** Requires DynaPDF Lite license.
See also CreateCollection function in DynaPDF manual.

### 77.40.144 CreateCollectionField(ColType as Integer, Column as Integer, Name as String, Key as string, Visible as boolean, Editable as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a user defined collection field.
**Notes:** The name parameter is converted to unicode.
See also CreateCollectionField function in DynaPDF manual.

### 77.40.145 CreateCollectionFieldAnsi(ColType as Integer, Column as Integer, Name as String, Key as string, Visible as boolean, Editable as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a user defined collection field.
**Notes:** The name parameter is converted to ANSI.

### 77.40.146 CreateComboBox(Name as string, Sort as boolean, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a combo box.
See also CreateComboBox function in DynaPDF manual.

### 77.40.147 CreateDeviceNColorSpace(Colorants() as string, PostScriptFunc as string, AlternateColorSpace as Integer, Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new colorspace using the given color names.
**Notes:** Strings are passed as UTF-8 Strings in this function to the library.
Currently the function is limited to 100 colorants on the plugin side.

See also CreateDeviceNColorSpace function in DynaPDF manual.

### 77.40.148 CreateDeviceNColorSpaceAnsi(Colorants() as string, PostScriptFunc as string, AlternateColorSpace as Integer, Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates a new colorspace using the given color names.
**Notes:** Strings are passed as Windows ANSI Strings in this function to the library.
Currently the function is limited to 100 colorants on the plugin side.

### 77.40.149 CreateDPartRoot(NodeNameList() as String, RecordLevel as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates the DPartRoot dictionary that must be present before DPart nodes can be created with AddDPartNode().
**Notes:** Note that the function will fail if a DPartRoot dictionary was already imported or created by this function. You can check whether a DPartRoot dictionary exists with HaveDPartRoot().

DPart stands for Document Part. DParts are a feature of PDF/VT, a PDF format for the printing industry.
See also CreateDPartRoot function in DynaPDF manual.

### 77.40.150 CreateExtGState(e as DynaPDFExtGStateMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an extended graphics state dictionary from the structure e.
**Example:**

```
dim h as Integer // handle
dim pdf as DynaPDFMBS
dim state as new DynaPDFExtGStateMBS

' get pdf, set state properties

h=pdf.CreateExtGState(state)

call pdf.SetExtGState(h)
```

**Notes:** Requires DynaPDF Lite license.
See also CreateExtGState function in DynaPDF manual.

### 77.40.151 CreateGeospatialMeasure(Viewport as UInt32, Attributes as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a geospatial measure dictionary.
**Notes:** This kind of measure dictionary can be used to convert PDF units to geographic coordinates.
A measure dictionary is used by the measure tool of Adobe's Acrobat and by other PDF viewers which contain a PDF compatible measure tool.

Notice:
This is a low level function for more experienced users who are familiar with PDF. It is assumed that a copy of the ISO Standard 32000-2 or newer is available by these users.
See also CreateGeospatialMeasure function in DynaPDF manual.

### 77.40.152 CreateGoToAction(DestType as Integer, PageNum as Integer, a as Double, b as Double, c as Double, d as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A go-to action changes the view to a specific destination (page, location, and magnification factor).
See also CreateGoToAction function in DynaPDF manual.
See also:

- 77.40.153 CreateGoToAction(NamedDest as Integer) as Integer 12759

### 77.40.153 CreateGoToAction(NamedDest as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a go√Ö ] to action which uses a named destination to open the target page.
See also CreateGoToAction function in DynaPDF manual.
See also:

- 77.40.152 CreateGoToAction(DestType as Integer, PageNum as Integer, a as Double, b as Double, c as Double, d as Double) as Integer 12759

### 77.40.154 CreateGoToEAction(Location as Integer, Source as string, SrcPage as Integer, Target as string, DestName as string, DestPage as Integer, NewWindow as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an embedded GoTo action.
**Notes:** See also CreateGoToEAction function in dynapdf_help.pdf manual.
See also CreateGoToEAction function in DynaPDF manual.

### 77.40.155 CreateGoToRAction(File as folderitem, PageNum as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a go to remote action.
See also CreateGoToRAction function in DynaPDF manual.
See also:

- 77.40.156 CreateGoToRAction(FilePath as String, PageNum as integer) as integer 12760

### 77.40.156 CreateGoToRAction(FilePath as String, PageNum as integer) as integer

MBS DynaPDF Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a go to remote action.
See also CreateGoToRAction function in DynaPDF manual.
See also:

- 77.40.155 CreateGoToRAction(File as folderitem, PageNum as Integer) as Integer 12760

### 77.40.157 CreateGoToRActionEx(File as folderitem, DestName as String, NewWindow as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a go-to-remote action that opens a named destination in an external PDF file.
See also CreateGoToRActionEx function in DynaPDF manual.
See also:

- 77.40.158 CreateGoToRActionEx(FilePath as String, DestName as String, NewWindow as boolean) as integer 12761

### 77.40.158 CreateGoToRActionEx(FilePath as String, DestName as String, NewWindow as boolean) as integer

MBS DynaPDF Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a go-to-remote action that opens a named destination in an external PDF file.
See also CreateGoToRActionEx function in DynaPDF manual.
See also:

- 77.40.157 CreateGoToRActionEx(File as folderitem, DestName as String, NewWindow as boolean) as Integer 12760

### 77.40.159 CreateGoToRActionExU(File as folderitem, DestName as String, NewWindow as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a go-to-remote action that opens a named destination in an external PDF file.
See also:

- 77.40.160 CreateGoToRActionExU(FilePath as String, DestName as String, NewWindow as boolean) as integer 12761

### 77.40.160 CreateGoToRActionExU(FilePath as String, DestName as String, NewWindow as boolean) as integer

MBS DynaPDF Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a go-to-remote action that opens a named destination in an external PDF file.
See also:

- 77.40.159 CreateGoToRActionExU(File as folderitem, DestName as String, NewWindow as boolean) as Integer 12761

### 77.40.161 CreateGroupField(Name as string, Parent as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a group field.
See also CreateGroupField function in DynaPDF manual.

### 77.40.162 CreateHideAction(Field as Integer, Hide as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A hide action hides or shows one or more interactive form fields on screen by setting or clearing their hidden flags.
See also CreateHideAction function in DynaPDF manual.

### 77.40.163 CreateICCBasedColorSpace(File as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an ICC based color space.
**Notes:** Use the value returned for the SetExtColorSpace method.
See also CreateICCBasedColorSpace function in DynaPDF manual.
See also:

- 77.40.164 CreateICCBasedColorSpace(Path as String) as Integer 12762

### 77.40.164 CreateICCBasedColorSpace(Path as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an ICC based color space.
**Notes:** Use the value returned for the SetExtColorSpace method.
See also CreateICCBasedColorSpace function in DynaPDF manual.
See also:

- 77.40.163 CreateICCBasedColorSpace(File as folderitem) as Integer 12762

### 77.40.165 CreateICCBasedColorSpaceEx(Buffer as Memoryblock) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ICC based color space from ICC file content in a string buffer.
**Notes:** Returns the color space handle.
See also CreateICCBasedColorSpaceEx function in DynaPDF manual.
See also:

- 77.40.166 CreateICCBasedColorSpaceEx(Buffer as string) as Integer 12762

### 77.40.166 CreateICCBasedColorSpaceEx(Buffer as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ICC based color space from ICC file content in a string buffer.
**Notes:** Returns the color space handle.
See also CreateICCBasedColorSpaceEx function in DynaPDF manual.
See also:

- 77.40.165 CreateICCBasedColorSpaceEx(Buffer as Memoryblock) as Integer 12762

### 77.40.167 CreateImage(file as folderitem, format as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an image file with the given image format.
**Notes:** For the format parameter use the kifm* constants.

If file parameter is nil for CreateImage, you create image in memory and can pick it up with GetImageBuffer function later after you closed it.
See also CreateImage function in DynaPDF manual.

### 77.40.168 CreateImpDataAction(DataFile as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An import data action imports FDF data into the document s interactive form.
**Notes:** Also check the dynapdf manual on the pdfCreateImpDataActionA function (pdfCreateImpDataActionW on Windows).

### 77.40.169 CreateIndexedColorSpace(Base as Integer, Handle as Integer, ColorTable as memoryblock, NumColors as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an indexed color space which can be used for vector graphics and text output.
**Notes:** Use the value returned for the SetExtColorSpace method.
See also CreateIndexedColorSpace function in DynaPDF manual.

### 77.40.170 CreateJSAction(Script as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a JavaScript action.
**Notes:** The script parameter is converted to unicode.

See also CreateJSAction function in DynaPDF manual.

### 77.40.171 CreateJSActionAnsi(Script as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function creates a JavaScript action.
**Notes:** The script parameter is converted to ANSI.

### 77.40.172 CreateLaunchAction(OP as Integer, FileName as folderitem, DefDir as string, Param as string, NewWindow as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A launch action launches an application or opens or prints a document.
See also CreateLaunchAction function in DynaPDF manual.

### 77.40.173 CreateLaunchActionEx(FileName as folderitem, NewWindow as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a launch link.
See also CreateLaunchActionEx function in DynaPDF manual.

### 77.40.174 CreateListBox(Name as string, Sort as boolean, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a list box.
See also CreateListBox function in DynaPDF manual.

### 77.40.175 CreateNamedAction(Action as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a named action.
See also CreateNamedAction function in DynaPDF manual.

### 77.40.176 CreateNamedDest(Name as string, DestPage as Integer, DestType as Integer, a as Double, b as Double, c as Double, d as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a named destination that can be accessed from external PDF files.
**Notes:** The name parameter is converted to unicode.
See also CreateNamedDest function in DynaPDF manual.

### 77.40.177 CreateNamedDestAnsi(Name as string, DestPage as Integer, DestType as Integer, a as Double, b as Double, c as Double, d as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a named destination that can be accessed from external PDF files.
**Notes:** The name parameter is converted to ANSI.

### 77.40.178 CreateNewPDF(OutPDF as folderitem = nil) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a new PDF file.
**Example:**

```
dim dest as folderitem // where to save?
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// create new pdf
bBool=pdf.CreateNewPDF(dest)
if bBool=False then
MsgBox "Failed to create pdf file "+dest.NativePath
Return
end if
```

See also CreateNewPDF function in DynaPDF manual.

### 77.40.179 CreateOCG(name as string, DisplayInUI as boolean, Visible as boolean, Intent as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an Optional Content Group (OCG).
**Notes:** CreateOCG stores the name in unicode encoding and CreateOCGAnsi in Windows ANSI encoding.
See also CreateOCG function in DynaPDF manual.

### 77.40.180 CreateOCGAnsi(name as string, DisplayInUI as boolean, Visible as boolean, Intent as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates an Optional Content Group (OCG).
**Notes:** CreateOCG stores the name in unicode encoding and CreateOCGAnsi in Windows ANSI encoding.

### 77.40.181 CreateOCMD(Visibility as Integer, OCGs() as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an Optional Content Membership Dictionary (OCMD).
**Notes:** For Visibility use the constants kovAllOff, kovAllOn, kovAnyOff, kovAnyOn and kovNotSet.
See also CreateOCMD function in DynaPDF manual.

### 77.40.182 CreateRadialShading(sX as Double, sY as Double, R1 as Double, eX as Double, eY as Double, R2 as Double, SCenter as Double, SColor as Integer, EColor as Integer, Extend1 as boolean, Extend2 as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Radial shadings define a color blend that varies between two circles.
**Notes:** Useful to draw gradients.
See also CreateRadialShading function in DynaPDF manual.

### 77.40.183 CreateRadioButton(Name as string, ExpValue as string, Checked as boolean, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A radio button field is a set of related toggle controls (check boxes), at most one of which may be on at any given time; selecting any one of the button automatically deselects all others.
See also CreateRadioButton function in DynaPDF manual.

### 77.40.184 CreateRectilinearMeasure(ViewPort as Integer, Scale as Double, UnitDescription as String, LabelDistance as String, LabelArea as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a rectilinear measure dictionary.
**Notes:** This kind of measure dictionary can be used to convert PDF units to an arbitrary other unit like millimeters, meters, feets, and so on.
A measure dictionary is used by the measure tool of Adobe's Acrobat and by other PDF viewers which contain a PDF compatible measure tool.
The parameter Viewport must be a viewport handle that was returned by CreateViewport(). Scale is the required scaling factor to convert a PDF unit (1/72 inch) to the wished destination unit. The parameters UnitDescription, LabelDistance, and LabelArea are all required and cannot be NULL.
UnitDescription is a description of the coordinate conversion, e.g. "Inch to mm". LabelDistance is the label for the distance tool, e.g. "mm".
LabelArea is the label for the area tool, e.g. "mm2".

If the function succeds the return value is a measure handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also CreateRectilinearMeasure function in DynaPDF manual.

### 77.40.185 CreateRectilinearMeasureAnsi(ViewPort as Integer, Scale as Double, UnitDescription as String, LabelDistance as String, LabelArea as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates a rectilinear measure dictionary.
**Notes:** This kind of measure dictionary can be used to convert PDF units to an arbitrary other unit like millimeters, meters, feets, and so on.
A measure dictionary is used by the measure tool of Adobe's Acrobat and by other PDF viewers which

contain a PDF compatible measure tool.
The parameter Viewport must be a viewport handle that was returned by CreateViewport(). Scale is the required scaling factor to convert a PDF unit (1/72 inch) to the wished destination unit. The parameters UnitDescription, LabelDistance, and LabelArea are all required and cannot be NULL.
UnitDescription is a description of the coordinate conversion, e.g. "Inch to mm". LabelDistance is the label for the distance tool, e.g. "mm".
LabelArea is the label for the area tool, e.g. "mm2".

If the function succeds the return value is a measure handle, a value greater or equal zero. If the function fails the return value is a negative error code.

This is ANSI version, so all strings are converted to ANSI encoding.

### 77.40.186 CreateResetAction as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A reset form action resets all or specific fields of an interactive form to their default values.
See also CreateResetAction function in DynaPDF manual.

### 77.40.187 CreateSeparationCS(Colorant as string, Alternate as Integer, Handle as Integer, ColorValue as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a Separation color space.
**Notes:** This function passes colorant string in UTF-8 encoding to the library.
See also CreateSeparationCS function in DynaPDF manual.

### 77.40.188 CreateSeparationCSAnsi(Colorant as string, Alternate as Integer, Handle as Integer, ColorValue as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a Separation color space.
**Notes:** This function passes colorant string in Windows ANSI encoding to the library.

### 77.40.189 CreateSetOCGStateAction(On() as UInt32, Off() as UInt32, Toggle() as UInt32, PreserveRB as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a SetOCGState action that can be used to change the visibility state of certain Optional Content Groups (OCGs).
See also CreateSetOCGStateAction function in DynaPDF manual.

### 77.40.190 CreateSigField(Name as string, Parent as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates an empty signature field which can be used to digitally sign the PDF file.
**Notes:** If you see errors in Acrobat Reader with signing multiple fields, please try DynaPDF.CreateStructureTree function and test whether it works then.
See also CreateSigField function in DynaPDF manual.

### 77.40.191 CreateSigFieldAP(SigField as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a signature appearance template in the exact size of the base signature field.
See also CreateSigFieldAP function in DynaPDF manual.

### 77.40.192 CreateSoftMask(TranspGroup as UInt32, MaskType as Integer, BackColor as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new soft mask.
**Notes:** MaskType: pass ksmtAlpha or ksmtLuminosity constants.
Requires DynaPDF Pro license.
See also CreateSoftMask function in DynaPDF manual.

### 77.40.193 CreateStdPattern(Pattern as Integer, LineWidth as Double, Distance as Double, LineColor as Integer, BackColor as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a hatch pattern.
See also CreateStdPattern function in DynaPDF manual.

### 77.40.194 CreateStructureTree as boolean

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a global structure tree that is required to create Tagged PDF files.
**Notes:** Tagged PDF files require a root node of type Art, Div, Document, Part, or Sect. This function creates a root node of type Document if nothing else was already imported. Other types can be created with the function CreateStructureTreeEx.

Notice:
DynaPDF is able to extend an existing structure tree that was imported from an external PDF file. However, when editing external PDF files the following rules must be considered:

- The structure information of a PDF file will only be imported when the entire PDF file is imported with ImportPDFFile(). When importing single pages with ImportPage() or ImportPageEx() of a PDF file that contains structure information then tagging will be disabled because DynaPDF is not able to import the structure information of a PDF file on a per page basis.
- Import first the PDF file and call then CreateStructureTree(). The reverse order causes that the structure tree will not be imported and tagging will be disabled!
- Only one PDF file with structure information can be imported without invalidating the structure information.
- Keep in mind that the structure tree of a PDF file is a complex global structure that is difficult to edit. Because of this, probably millions of PDF files exist that contain damages in the structure tree, mostly due to editing actions in certain viewer applications. When opening an existing page with EditPage() the function tries to find the corresonding StructParents array of the page in the ParentTree of the document's Structure Tree. When this action fails then tagging will be disabled for this page. OpenTag() and CloseTag() do not produce further warnings in this case. The function GetIsTaggingEnabled() can be used to determine whether tagging is still enabled after an existing page was opened for editing.

When creating Tagged PDF files it is important to create the PDF file in the logical reading order.

If the function succeeds the return value is true. If the function fails the return value is false.
See also CreateStructureTree function in DynaPDF manual.

### 77.40.195 CreateStructureTreeEx(Tag as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates the global structure tree as described at CreateStructureTree().
**Notes:** The only difference is that the type of the root node can be specified.

Returns true on success and false on failure.
See also CreateStructureTreeEx function in DynaPDF manual.

### 77.40.196 CreateSubmitAction(Flags as Integer, URL as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A submit form action submits the field values of an interactive form to a web server.
See also CreateSubmitAction function in DynaPDF manual.

### 77.40.197 CreateTable(AllocRows as UInt32, NumCols as UInt32, width as Double, DefRowHeight as Double) as DynaPDFTableMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a table with the given size.
**Notes:** Returns a new table object.
See also CreateTable function in DynaPDF manual.

### 77.40.198 CreateTextField(Name as string, Parent as Integer, Multiline as boolean, MaxLen as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a text field.
**Example:**

```
Dim pdf As DynapdfMBS // your PDF environment with open page

// create field on current page
```

```
Dim Field1 As Integer = pdf.CreateTextField("Field1", -1, True, 0, 50.0, 100, 200.0, 100.0)

// and fill value
Call pdf.SetTextFieldValue(Field1, "Hello", "", pdf.ktaLeft)
```

See also CreateTextField function in DynaPDF manual.

### 77.40.199 CreateTraceFile(File as FolderItem) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a trace file.
**Notes:** The plugin writes debug messages to this file so you can check what functions you called.

Improved with 16.2 plugin to really cover over 99% of all calls with parameters and result. Please report if you miss something.

While assignment to TraceFile property or CreateTraceFile() always overwrites existing log file, the AppendTraceFile method can append to it.

### 77.40.200 CreateURIAction(URL as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

A uniform resource identifier (URI) is a string that identifies (resolves to) a resource on the internet - typically a file that is the destination of a hyperlink, although it can also resolve to a query or other entity.
**Notes:**

A URI action causes a URI to be resolved. The parameter URL must be 7√Ö ] bit ASCII string.

See also CreateURIAction function in DynaPDF manual.

### 77.40.201 CreateViewport(Name as String, X1 as Double, Y1 as Double, X2 as Double, Y2 as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a viewport.

**Notes:** A viewport is a rectangular region of a page that can be associated with a measure dictionary. A measure dictionary achieves a coordinate conversion so that the distance and area can be calculated in other units like meters, feets, or millimeters, for example.
This is especially useful for CAD drawings which are not defined in PDF units. A PDF unit represents 1/72 inch.
A page can contain an arbitrary number of viewports and every viewport can be assigned with its own measure dictionary, e.g. to calculate coordinates in different units on the same page.
Viewports should be created in drawing order. Since viewports might overlap a PDF viewer examines the array starting with the last one and itereates in reverse order. The first one whose bounding box contains the point or cursor coordiante is chosen.
See also CreateRectilinearMeasure().
See also CreateViewport function in DynaPDF manual.

### 77.40.202 CreateViewportAnsi(Name as String, X1 as Double, Y1 as Double, X2 as Double, Y2 as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates a viewport.
**Notes:** A viewport is a rectangular region of a page that can be associated with a measure dictionary. A measure dictionary achieves a coordinate conversion so that the distance and area can be calculated in other units like meters, feets, or millimeters, for example.
This is especially useful for CAD drawings which are not defined in PDF units. A PDF unit represents 1/72 inch.
A page can contain an arbitrary number of viewports and every viewport can be assigned with its own measure dictionary, e.g. to calculate coordinates in different units on the same page.
Viewports should be created in drawing order. Since viewports might overlap a PDF viewer examines the array starting with the last one and itereates in reverse order. The first one whose bounding box contains the point or cursor coordiante is chosen.
See also CreateRectilinearMeasure().

This is ANSI version, so all strings are converted to ANSI encoding.

### 77.40.203 CreateXFAStream(Name as String, Buffer as String) as Integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates an XFA stream and adds it to the global XFA resource array.
**Notes:** The parameter Name must be the name of the XFA resource. Buffer must be a valid XFA stream buffer or "", if the buffer should be set later with SetXFAStream().

If the function succeeds the return value is the stream handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also CreateXFAStream function in DynaPDF manual.

### 77.40.204 DecryptPDF(File as folderitem, PwdType as Integer, Password as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function decrypts a PDF file by using the supplied password to decrypt the file.
See also DecryptPDF function in DynaPDF manual.

### 77.40.205 DecryptPDFAnsi(Path as string, PwdType as Integer, Password as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function decrypts a PDF file by using the supplied password to decrypt the file.
**Notes:** Same as DecryptPDF, but takes path name in Windows ANSI encoding.

### 77.40.206 DeleteAcroForm

MBS DynaPDF Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an acrobat reader form.
See also DeleteAcroForm function in DynaPDF manual.

### 77.40.207 DeleteActionFromObj(ObjType as Integer, ActHandle as Integer, ObjHandle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes an action from a PDF object.
See also DeleteActionFromObj function in DynaPDF manual.

### 77.40.208 DeleteActionFromObjEx(ObjType as Integer, ObjHandle as Integer, ActIndex as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to delete an action from an object without using an action handle.
See also DeleteActionFromObjEx function in DynaPDF manual.

### 77.40.209 DeleteAltFontList(FontListHandle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an alternate font list that was created by DynaPDF.CreateAltFontList.
**Notes:** If the parameter Handle was set to -1 all available lists will be deleted.
Returns true on success.
See also DeleteAltFontList function in DynaPDF manual.

### 77.40.210 DeleteAnnotation(Handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes an annotation.
See also DeleteAnnotation function in DynaPDF manual.

### 77.40.211 DeleteAnnotationFromPage(PageNum as UInt32, Handle as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an annotation from a page.
See also DeleteAnnotationFromPage function in DynaPDF manual.

### 77.40.212 DeleteAppEvents(ApplyEvent as Boolean, TOCAppEvent as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes all application events if any.
**Notes:** The function can optionally apply the visibility state of an event before the application events will be deleted. The new visibility state will be stored in the PDF file. To apply the visibility state of a specific event without deletion call ApplyAppEvent() instead.

If the function succeeds and if application events were deleted the return value is 1. If the no application events were defined the return value is 0. If the function fails the return value is a negative error code.

See also DeleteAppEvents function in DynaPDF manual.

### 77.40.213 DeleteBookmark(ABmk as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes a bookmark.
See also DeleteBookmark function in DynaPDF manual.

### 77.40.214 DeleteDPartNode(Handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The deletes a dpart node.
**Notes:** The deletes a dpart node or the entire dpart structure if Handle was set to -1. DPart stands for Document Parts, a feature of PDF/VT. If the dpart node contains children then all child nodes will be deleted too.

If the function succeeds the return value is true. If the function fails the return value is false.
See also DeleteDPartNode function in DynaPDF manual.

### 77.40.215 DeleteEmbeddedFile(handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the embedded file with the given handle.
See also DeleteEmbeddedFile function in DynaPDF manual.

### 77.40.216 DeleteField(Field as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes an interactive form field.
See also DeleteField function in DynaPDF manual.

### 77.40.217 DeleteFieldEx(URL as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes an interactive form field by using its full qualified name, that is the name of any parent group field separated by a period (.) plus the field name.
See also DeleteFieldEx function in DynaPDF manual.

### 77.40.218 DeleteJavaScripts(DelJavaScriptActions as boolean)

MBS DynaPDF Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes java scripts.
See also DeleteJavaScripts function in DynaPDF manual.

### 77.40.219 DeleteNamedDest(Name as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a named destination.
**Notes:** If Name is an empty string all named destinations will be deleted.
See also DeleteNamedDest function in DynaPDF manual.

### 77.40.220 DeleteNamedDestByIndex(Index as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a named destination.
**Notes:** If Index is set to a negative value all named destinations will be deleted.
See also DeleteNamedDestByIndex function in DynaPDF manual.

### 77.40.221 DeleteOCGFromAppEvent(Handle as UInt32, Events as Integer, Categories as Integer, DelCategoryOnly as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an OCG or layer from one or more application events, or it deletes only one or more categories from an application event in which the OCG was found (if DelCategoryOnly is true).
**Notes:** If DelCategoryOnly is true, and if no more categories are left in the application event, then the event will be deleted. See also AddOCGToAppEvent() and SetOCGContUsage() for further information.
If the function succeeds the return value is true. If the function fails the return value is false.
See also DeleteOCGFromAppEvent function in DynaPDF manual.

### 77.40.222 DeleteOCGFromDisplayTree(OCGHandle as UInt32, Recursive as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a layer or OCG (Optional Content Group) from the display tree of the currently active layer configuration.
**Notes:** Notice:
If the PDF file was not imported with ImportPDFFile() the function ImportOCProperties() must be called in order to import the global Optional Content Properties.
It is also required to load a layer configuration with LoadLayerConfig() before the function can be called.

The display tree is a linked list that contains UI nodes. UI stands for User Interface. Every node in this tree can contain an OCG or an array of OCGs with an optional label.
This function can be used to delete an OCG from the display tree without traversing every node of it with GetOCUINode() beforehand. Therefore, the function is suitable for console applications but GUI based applications should use DeleteOCUINode() instead. DeleteOCUINode() can also be used to delete the entire display tree with just one function call.

If the function succeeds the return value is true. If the function fails the return value is false.
See also DeleteOCGFromDisplayTree function in DynaPDF manual.

### 77.40.223 DeleteOCUINode(OCGNodeHandle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an OCUINode.
**Notes:** Deletes an OCUINode (Optional Content User Interface Node) from the display tree of the currently active layer configuration or the entire tree if Node is set to 0.

If the PDF file was not imported with ImportPDFFile() the function ImportOCProperties() must be called in order to import the global Optional Content Properties.
It is also required to load a layer configuration with LoadLayerConfig() before the function can be called.

Note that the deletion of the display tree does not delete any layer or OCG (Optional Content Group). All

OCGs still exists and are fully functional. However, users are not able to change the visibility state of OCGs which are not included in the display tree of the corresponding layer configuration.

If the parameter Node is set then it must be a valid pointer of an OCUINode that was returned by GetOCUINode(). Note that the deletion of a node invalidates all pointers which were previously returned by GetOCUINode().

Return value: If the function succeeds the return value is true. If the function fails the return value is false.
See also DeleteOCUINode function in DynaPDF manual.

### 77.40.224 DeleteOutputIntent(Index as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Can be used to delete a specific or all output intents.
**Notes:** A PDF file can contain more than one output intent. Call GetOutputIntentCount to determine the number of available output intents. If the parameter Index is set to -1 all output intents will be deleted.

If the function succeeds the return value is the remaining number of output intents. If the function fails the return value is a negative error code.
See also DeleteOutputIntent function in DynaPDF manual.

### 77.40.225 DeletePage(PageNum as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes a page.
**Example:**

```
// new PDF
Dim pdf As New MyDynapdfMBS

pdf.SetLicenseKey "Lite" // For this example you can use a Lite, Pro or Enterprise License

// create output file
Dim outFile As folderitem = SpecialFolder.Desktop.Child("NewPDF.pdf")
Call pdf.CreateNewPDF(outFile)

// set flags to import all
Dim flags As Integer = Bitwise.BitOr(pdf.kifImportAsPage, pdf.kifImportAll)
Call pdf.SetImportFlags(flags)

// import PDF
```

```
Dim inFile As folderitem = SpecialFolder.Desktop.Child("test.pdf")

Call pdf.OpenImportFile(inFile)
Call pdf.ImportPDFFile(1)

// now delete one page
Call pdf.DeletePage(2)

// close output file
Call pdf.closefile
```

See also DeletePage function in DynaPDF manual.

### 77.40.226 DeletePageLabels

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes all page labels contained in the current open document, if any.
See also DeletePageLabels function in DynaPDF manual.

### 77.40.227 DeleteSeparationInfo(AllPages as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deleted the separation of the current open page or of all pages if the parameter AllPages is set to true.
See also DeleteSeparationInfo function in DynaPDF manual.

### 77.40.228 DeleteTemplate(handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes a template.
See also DeleteTemplate function in DynaPDF manual.

### 77.40.229 DeleteTemplateEx(index as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function deletes a template by using an index instead of a template handle.
See also DeleteTemplateEx function in DynaPDF manual.

### 77.40.230 DeleteWatermark(PageNum as Integer, InclAnnots as Boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Delete a watermark template.
**Notes:** The function can be used to delete watermarks from a single page or from the entire document if PageNum is set to -1. If InclAnnots is true, watermark annotations will be deleted too, if any.
A watermark in PDF terms is a regular template that has a ADBE_CompoundType property of type Watermark. Such templates can be created with the Watermark tool of Adobes Acrobat, or with DynaPDF, for example. See MarkTemplateAsWatermark() for further information.
Return values:
If the function succeeds the return value is the number of deleted watermarks. Note that deleted watermark annotations do not increment the return value. If the function fails, the return value is a negative error code.
See also DeleteWatermark function in DynaPDF manual.

### 77.40.231 DeleteXFAForm

MBS DynaPDF Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes XFA Form.
See also DeleteXFAForm function in DynaPDF manual.

### 77.40.232 DrawArc(PosX as Double, PosY as Double, Radius as Double, StartAngle as Double, EndAngle as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws an arc by using a start and end angle.
See also DrawArc function in DynaPDF manual.

### 77.40.233 DrawArcEx(PosX as Double, PosY as Double, Width as Double, Height as Double, StartAngle as Double, EndAngle as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws an elliptical arc.
**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License

// create new PDF
call pdf.CreateNewPDF f

// We want to use top-down coordinates
call pdf.SetPageCoords pdf.kpcTopDown

// new page
call pdf.Append

// black
call pdf.SetStrokeColor 0

// draw an arc
call pdf.DrawArcEx 100,100,100,100, 90,180
call pdf.StrokePath

// and a second one
call pdf.DrawArcEx 200,200,100,100, 0,90
call pdf.StrokePath

// and a third one. 0 to 0 gives a full circle
call pdf.DrawArcEx 300,300,100,100, 0,0
call pdf.StrokePath

// finish page
call pdf.EndPage

// Close file
call pdf.CloseFile

// open PDF
f.Launch
```

See also DrawArcEx function in DynaPDF manual.

### 77.40.234 DrawChord(PosX as Double, PosY as Double, Width as Double, Height as Double, StartAngle as Double, EndAngle as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws an elliptical chord (a region bounded by the intersection of an ellipse and a line segment, called a secant).
See also DrawChord function in DynaPDF manual.

### 77.40.235 DrawCircle(PosX as Double, PosY as Double, Radius as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws a circle.
**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with Line.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License

// Create a new PDF
call pdf.CreateNewPDF f

// We want to use top-down coordinates
call pdf.SetPageCoords pdf.kpcTopDown

// Add a page
call pdf.Append

// a circle, filled
call pdf.SetFillColor pdf.RGB(0,255,0) // green
call pdf.DrawCircle(100, 100, 100, pdf.kfmFill)

// a circle, stoked
call pdf.SetStrokeColor pdf.RGB(255,0,0) // red
call pdf.DrawCircle(200, 200, 100, pdf.kfmStroke)

// end page
call pdf.EndPage

// Close page
call pdf.CloseFile
```

```
// Open PDF
f.Launch
```

See also DrawCircle function in DynaPDF manual.

### 77.40.236 DrawNGon(PosX as double, PosY as double, Radius as double, Alpha as double, NumSides as Integer, FillMode as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a n-gon.
**Notes:** PosX: X-Coordinate of the midpoint of the ngon
PosY: Y-Coordinate of the midpoint of the ngon
Radius: The radius.
Alpha: Rotation angle in degrees
NumSides: Number of sides. Must be greater 2.
FillMode: Fill mode, e.g. kfmFillStroke

The function A n-gon is a polygon with "n" number of sides. The minimum number of sides is three.
A n-gon is a closed path that can be filled, stroked or both. It is also possible to draw a n-gon invisible to apply the filling rules nonzero winding number or even-odd. The filling rules are described at ClipPath().
The parameter FillMode is ignored if the circle is drawn inside a clipping path. The fill modes are described at ClosePath().

If the function succeeds the return value is true. If the function fails the return value is false.
See also DrawNGon function in DynaPDF manual.

### 77.40.237 DrawPie(PosX as Double, PosY as Double, Width as Double, Height as Double, StartAngle as Double, EndAngle as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a pie-shaped wedge bounded by the intersection of an ellipse and two angles.
See also DrawPie function in DynaPDF manual.

### 77.40.238 EditPage(PageNum as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function prepares a page for editing.
**Example:**

```
dim pdf as DynaPDFMBS // your dynapdf instance

// edit page 1
call pdf.EditPage(1)
// set a font
call pdf.SetFont( "Times New Roman",pdf.kfsNone,46,True,pdf.kcp1252 )
// set a color
call pdf.SetFillColor(0)

// now add a text annotation
call pdf.FreeTextAnnot( 100, 100, 100, 100, "author", "test", 0 )

// end page
call pdf.EndPage
```

See also EditPage function in DynaPDF manual.

### 77.40.239 EditTemplate(index as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function prepares a template for editing.
See also EditTemplate function in DynaPDF manual.

### 77.40.240 EditTemplate2(handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prepares the template for editing.
See also EditTemplate2 function in DynaPDF manual.

### 77.40.241 Ellipse(PosX as Double, PosY as Double, Width as Double, Height as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws an ellipse.
See also Ellipse function in DynaPDF manual.

### 77.40.242 EnableMutex(Value as boolean)

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to enable mutex or not.

### 77.40.243 EncryptPDF(File as folderitem, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function encrypts a PDF file.
See also EncryptPDF function in DynaPDF manual.

### 77.40.244 EncryptPDFAnsi(Path as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function encrypts a PDF file.
**Notes:** Same as EncryptPDF, but takes path name in Windows ANSI encoding.

### 77.40.245 EndContinueText as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This function finishes a continue text block that was created with the function BeginContinueText() beforehand.
See also EndContinueText function in DynaPDF manual.

### 77.40.246 EndLayer as boolean

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function closes a layer that was opened by BeginLayer.
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.

See also EndLayer function in DynaPDF manual.

### 77.40.247 EndPage as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function closes an open page that was opened by Append() or EditPage().
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

bBool=pdf.EndPage
```

See also EndPage function in DynaPDF manual.

### 77.40.248 EndPattern as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function closes an open pattern that was opened by BeginPattern() or CreateStdPattern().
See also EndPattern function in DynaPDF manual.

### 77.40.249 EndTemplate as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function closes an open template that was opened by BeginTemplate(), EditTemplate() or EditTemplate2().
See also EndTemplate function in DynaPDF manual.

### 77.40.250 EnumDocFonts as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function enumerates all fonts used in the current PDF document.
**Notes:** Will call the EnumDocFont event.
See also EnumDocFonts function in DynaPDF manual.

### 77.40.251 EnumDocFontsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function enumerates all fonts used in the current PDF document and returns the count.
**Notes:** Returns the number of fonts found. Does not call the event.

### 77.40.252 EnumHostFonts as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetSysFontInfos instead.
**Function:** This function enumerates all fonts found in the search directories by passing the font names to a callback function.
**Notes:** Calls the EnumHostFont event.
See also EnumHostFonts function in DynaPDF manual.

### 77.40.253 EnumHostFontsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetSysFontInfos instead.
**Function:** This function enumerates all fonts found in the search directories.
**Notes:** Returns the number of fonts found. Does not call the event.

### 77.40.254 EnumHostFontsEx as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetSysFontInfos instead.
**Function:** The function enumerates all fonts found in the search directories in the same way as EnumHostFonts().
**Notes:** Calls the EnumHostFontEx event.
See also EnumHostFontsEx function in DynaPDF manual.

### 77.40.255 EnumHostFontsExCount as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetSysFontInfos instead.
**Function:** The function enumerates all fonts found in the search directories in the same way as EnumHostFontsCount().
**Notes:** Returns the number of fonts found. Does not call the event.

### 77.40.256 ExchangeBookmarks(Bmk1 as Integer, Bmk2 as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function exchanges two bookmarks.
See also ExchangeBookmarks function in DynaPDF manual.

### 77.40.257 ExchangePages(first as Integer, second as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function exchanges two pages.
See also ExchangePages function in DynaPDF manual.

### 77.40.258 ExtractPageText(RemoveText as boolean = false) as String

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts text of current open page.
**Notes:** This is a convenience function so you don't need to use DynaPDFStackMBS class yourself.
Returns the text of the page. Use EditPage() to open a page and than EndPage() to close it.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.
Requires DynaPDF Pro license.

Deprecated in favor of newer ExtractText function.

### 77.40.259 ExtractPageTextRect(Left as Double, Top as Double, Right as Double, Bottom as Double, RemoveText as boolean = false) as String

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts text of current open page within given rectangle.
**Notes:** Text that starts within the given rectangle is captured.
Be aware that PDF coordinates start on bottom left of page with 0/0.

This is a convenience function so you don't need to use DynaPDFStackMBS class yourself.
Returns the text of the page. Use EditPage() to open a page and than EndPage() to close it.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.
Requires DynaPDF Pro license.

Deprecated in favor of newer ExtractText function.

### 77.40.260 ExtractText(PageNum as Integer, Flags as Integer, rect as DynaPDFRectMBS = nil, byref text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the text of the page PageNum.
**Example:**

```
dim pdf as DynaPDFMBS

dim Page as Integer = 1 // first page
dim Flags as Integer = ktefDefault
dim text as string
dim ok as boolean = pdf.ExtractText(Page, Flags, text)

if ok then
msgbox text
end if
```

**Notes:** The first page is denoted by 1.

Text lines can be sorted in x- and y-direction. The flag ktefDeleteOverlappingText causes that identical text records which are placed on the same position (with a tolerance of 2 units) will be deleted. The records must occur one after the other in order to detect them.

The optional parameter Area can be set to restrict the text extraction to that rectangle. The rectangle must be defined according to the current coordinate system. That means either in bottom up or top down coordinates, see SetPageCoords() for further information. Note also that the function considers the orientation of the page. The width and height of the rectangle must be exchanged if the orientation is 90, -90, 270, or -270 degrees.

If the function succeeds the return value is true. If the function fails the return value is false.
See also ExtractText function in DynaPDF manual.

### 77.40.261 FileAttachAnnot(PosX as Double, PosY as Double, Icon as Integer, Author as string, Desc as string, File as folderitem, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a file attachment annotation on the current open page.
**Notes:** On Windows, the Desc and the Author parameters are converted to unicode.
See also FileAttachAnnot function in DynaPDF manual.

### 77.40.262 FileAttachAnnotEx(PosX as double, PosY as double, Icon as integer, Author as string, Desc as string, Filename as String, FileBuffer as MemoryBlock, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file attachment annotation exactly in the same way as FileAttachAnnot() but accepts a file buffer as input.
**Notes:** See FileAttachAnnot() for further information. The parameter FileName is required. It should contain the file name including extension, e.g. "MyImage.jpg".

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also FileAttachAnnotEx function in DynaPDF manual.
See also:

- 77.40.263 FileAttachAnnotEx(PosX as double, PosY as double, Icon as integer, Author as string, Desc as string, Filename as String, FileBuffer as String, Compress as boolean) as Integer 12791

### 77.40.263 FileAttachAnnotEx(PosX as double, PosY as double, Icon as integer, Author as string, Desc as string, Filename as String, FileBuffer as String, Compress as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file attachment annotation exactly in the same way as FileAttachAnnot() but accepts a file buffer as input.
**Notes:** See FileAttachAnnot() for further information. The parameter FileName is required. It should contain the file name including extension, e.g. "MyImage.jpg".

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also FileAttachAnnotEx function in DynaPDF manual.
See also:

- 77.40.262 FileAttachAnnotEx(PosX as double, PosY as double, Icon as integer, Author as string, Desc as string, Filename as String, FileBuffer as MemoryBlock, Compress as boolean) as Integer 12791

### 77.40.264 FileLink(PosX as Double, PosY as Double, Width as Double, Height as Double, FileLink as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a file link annotation.
**Notes:** Here you can pass a string which may be a relative file path like simply the file name of other pdf file in same folder.
See also FileLink function in DynaPDF manual.

### 77.40.265 FileLinkAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, FileLink as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a file link annotation.
**Notes:** Here you can pass a string which may be a relative file path like simply the file name of other pdf file in same folder.

### 77.40.266 FindBookmark(DestPage as Integer, Text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function searches for a bookmark in the document outline tree.
**Notes:** The text parameter is converted to unicode.
See also FindBookmark function in DynaPDF manual.

### 77.40.267 FindBookmarkAnsi(DestPage as Integer, Text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function searches for a bookmark in the document outline tree.
**Notes:** The text parameter is converted to ANSI.

### 77.40.268 FindEmbeddedFile(Name as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the embedded file Name and returns the handle of it when it can be found.
**Notes:** The file can then be extracted with GetEmbeddedFile().

If the function succeeds the return value is an embedded file handle, a value greater or equal zero. If the file cannot be found the return value is -1.
See also FindEmbeddedFile function in DynaPDF manual.

### 77.40.269 FindField(Name as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function searches for an interactive form field by using the fully qualified field name.
**Notes:** The Name parameter is converted to unicode.
See also FindField function in DynaPDF manual.

### 77.40.270 FindFieldAnsi(Name as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function searches for an interactive form field by using the fully qualified field name.
**Notes:** The Name parameter is converted to ANSI.

### 77.40.271 FindLinkAnnot(URL as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function searches for a file link or web link annotation.
See also FindLinkAnnot function in DynaPDF manual.

### 77.40.272 FindNextBookmark as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function searches for the next bookmark with the same search parameters which were used by a previous call of FindBookmark().

See also FindNextBookmark function in DynaPDF manual.

### 77.40.273 FinishSignature(PKCS7 as Memoryblock) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function writes the PKCS#7 signature object to the PDF file and writes finally the finish PDF file to disk and frees all used resources if the file was not created in memory.
**Notes:** If the file was created in memory GetBuffer() can now be called to obtain the finish PDF buffer. CloseAndSignFileExt() must be called prior this function can be called.

Return values: If the function succeeds the return value is true. If the function fails the return value is false.
See also FinishSignature function in DynaPDF manual.
See also:

- 77.40.274 FinishSignature(PKCS7 as string) as boolean 12794

### 77.40.274 FinishSignature(PKCS7 as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function writes the PKCS#7 signature object to the PDF file and writes finally the finish PDF file to disk and frees all used resources if the file was not created in memory.
**Notes:** If the file was created in memory GetBuffer() can now be called to obtain the finish PDF buffer. CloseAndSignFileExt() must be called prior this function can be called.

Return values: If the function succeeds the return value is true. If the function fails the return value is false.
See also FinishSignature function in DynaPDF manual.
See also:

- 77.40.273 FinishSignature(PKCS7 as Memoryblock) as boolean 12794

### 77.40.275 FlattenAnnotOrField(AnnotationOrFieldHandle as Integer, AnnotFlattenFlags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an annotation or form field on the current open page.
**Notes:** Form fields are annotations of type atWidget. The annotations of a page can be enumerated with GetPageAnnotEx() / GetPageAnnotCount().
The annotation or form field is deleted from the page's annotation array after it was flattened. If the function succeeds the return value is true. If the function fails the return value is false.
See also FlattenAnnotOrField function in DynaPDF manual.

### 77.40.276 FlattenAnnots(AnnotFlattenFlags as Integer = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flattens the annotations.
**Notes:** By default all annotations which have an appearance stream and which have the print flag set are flattened.
All annotations are deleted when the function returns with the exception of file attachment annotations.
If you want to flatten the view state then set the flag affUseViewState.

Annotation flags:

| | | |
|---|---|---|
| kaffNone | 0 | Printable annotations independent of the type |
| kaffUseViewState | 1 | If set, annotations which are visible in a viewer become flattened. |
| kaffMarkupAnnots | 2 | If set, markup annotations are flattened only. Link, Sound, or FileAttach annotations are no markup annotations. These types will be left intact. |

See also FlattenAnnots function in DynaPDF manual.

### 77.40.277 FlattenForm as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts all fields of an Interactive Form to native PDF vector graphics and deletes the form after all fields are converted, incl. all JavaScript actions which are connected with form fields, pages, or the catalog object, and global JavaScript functions.
**Notes:** Requires DynaPDF Pro license.
See also FlattenForm function in DynaPDF manual.

### 77.40.278 FlushPageContent(stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function replaces the content stream of a page or template that was changed with the function ReplacePageText() or ReplacePageTextEx() beforehand.
**Notes:** The function must be called after all changes are made. See GetPageText() for an example application.

Return values:
If the function succeeds the return value is true. If the function fails the return value is false.

See also FlushPageContent function in DynaPDF manual.

### 77.40.279 FlushPages(Flags as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flushes pages.
**Notes:** Do not use FlushPages and SetUseSwapFile together. Use one function.
See also FlushPages function in DynaPDF manual.

### 77.40.280 FlushPagesEx(Flags as integer, LastPage as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the pages in memory to the PDF file exactly like FlushPages().
**Notes:** The only difference is that the last page can be specified. The function calls FlushPages() if LastPage is smaller than 1.
See also FlushPagesEx function in DynaPDF manual.

### 77.40.281 FreeImageBuffer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Frees the current image buffer.
See also FreeImageBuffer function in DynaPDF manual.

### 77.40.282 FreeImageObj(Handle as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function releases memory that was allocated by GetImageObj to decompress the image.
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.
See also FreeImageObj function in DynaPDF manual.

### 77.40.283 FreePDF as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function frees all used resources except the font cache.
See also FreePDF function in DynaPDF manual.

### 77.40.284 FreeTextAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Text as string, Align as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a free text annotation.
**Example:**

```
dim pdf as DynaPDFMBS // your dynapdf instance

// edit page 1
call pdf.EditPage(1)
// set a font
call pdf.SetFont( "Times New Roman",pdf.kfsNone,46,True,pdf.kcp1252 )
// set a color
call pdf.SetFillColor(0)

// now add a text annotation
call pdf.FreeTextAnnot( 100, 100, 100, 100, "author", "test", 0 )

// end page
call pdf.EndPage
```

**Notes:** The Name and Author parameters are converted to unicode.
See also FreeTextAnnot function in DynaPDF manual.

### 77.40.285 FreeTextAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Text as string, Align as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function creates a free text annotation.
**Notes:** The Name and Author parameters are converted to ANSI.

### 77.40.286 Get3DAnnotStream(Annot as UInt32, byref Data as String, byref SubType as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the data stream of a 3D annotation.
**Notes:** At time of publication, PDF supports U3D and PRC files. Check the value of the string SubType to determine the file type. The default format is U3D. SubType can be "" in this case. For PRC files, SubType is required to be present.

Returns true on success and false on failure.
See also Get3DAnnotStream function in DynaPDF manual.

### 77.40.287 GetActionCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of actions contained in a document.
See also GetActionCount function in DynaPDF manual.

### 77.40.288 GetActionHandle(ObjType as Integer, ObjHandle as UInt32, ActIndex as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the handle of an action.
**Notes:** To determine the number of available actions of a specific object call GetObjActionCount. Since the Catalog object contains no handle, the parameter ObjHandle will be ignored for this object type.

If the function succeeds the return value is the action handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also GetActionHandle function in DynaPDF manual.

### 77.40.289 GetActionType(ActHandle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the type of an annotation.
See also GetActionType function in DynaPDF manual.

### 77.40.290 GetActionTypeEx(ObjType as Integer, ObjHandle as Integer, ActIndex as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the action type of an action used by a specific PDF object.
See also GetActionTypeEx function in DynaPDF manual.

### 77.40.291 GetActiveFont as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the handle of the active font or -1 if no font is set.
See also GetActiveFont function in DynaPDF manual.

### 77.40.292 GetAllocBy as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the pre allocated buffer size of page content streams in bytes.
See also GetAllocBy function in DynaPDF manual.

### 77.40.293 GetAnnot(ahandle as Integer) as DynaPDFAnnotationMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetAnnotEx instead.
**Function:** This function retrieves the most important properties of an annotation.
**Example:**

```
dim pdf as DynaPDFMBS // your instance

dim c as Integer = pdf.GetAnnotCount

for i as Integer = 0 to c-1
dim a as DynaPDFAnnotationMBS = pdf.GetAnnot(i)

MsgBox str(a.Type)
next
```

See also GetAnnot function in DynaPDF manual.

### 77.40.294 GetAnnotBBox(ahandle as Integer) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function retrieves the bounding box of an annotation measured in bottom up coordinates.
See also GetAnnotBBox function in DynaPDF manual.

### 77.40.295 GetAnnotCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of annotations currently used in the document.
See also GetAnnotCount function in DynaPDF manual.

### 77.40.296 GetAnnotEx(ahandle as Integer) as DynaPDFAnnotationExMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function retrieves the most important properties of an annotation.
**Example:**

```
dim pdf as DynaPDFMBS // your instance

dim c as Integer = pdf.GetAnnotCount

for i as Integer = 0 to c-1
dim a as DynaPDFAnnotationExMBS = pdf.GetAnnotEx(i)

MsgBox str(a.Type)
next
```

See also GetAnnotEx function in DynaPDF manual.

### 77.40.297 GetAnnotFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the default flags used for newly created annotations.
See also GetAnnotFlags function in DynaPDF manual.

### 77.40.298 GetAnnotLink(Handle as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the URL or file path of a file link annotation.
See also GetAnnotLink function in DynaPDF manual.

### 77.40.299 GetAnnotType(Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the type of a specific annotation.
See also GetAnnotType function in DynaPDF manual.

### 77.40.300 GetAscent as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the ascender of the active font.
See also GetAscent function in DynaPDF manual.

### 77.40.301 GetBBox(boundary as Integer) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a bounding box of a PDF page.
**Example:**

```
// Just set the trim box to the same value as the media box as an example

dim r as DynaPDFRectMBS = pdf.GetBBox(pdf.kpbMediaBox)
call pdf.SetBBox(pdf.kpbTrimBox, r.Left, r.Bottom, r.Right, r.Top)
```

See also GetBBox function in DynaPDF manual.

### 77.40.302 GetBidiMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current bidirectional mode.
**Notes:** Useful constants:

| | | |
|---|---|---|
| kbmLeftToRight | 0 | Apply the bidi algorithm in Left to Right layout |
| kbmRightToLeft | 1 | Apply the bidi algorithm in Right to Left layout |
| kbmNone | 2 | Default ->do not apply the bidi algorithm |

See also GetBidiMode function in DynaPDF manual.

### 77.40.303 GetBookmark(ahandle as Integer) as DynaPDFBookmarkMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the properties of a bookmark.
See also GetBookmark function in DynaPDF manual.

### 77.40.304 GetBookmarkCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of bookmarks defined in the document.
See also GetBookmarkCount function in DynaPDF manual.

### 77.40.305 GetBorderStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the global border style which is used for newly created Interactive Form fields.
See also GetBorderStyle function in DynaPDF manual.

### 77.40.306 GetBuffer as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a pointer to the buffer of a memory based PDF file.
**Notes:** The result string has no encoding set.
See also GetBuffer function in DynaPDF manual.

### 77.40.307 GetBufferMemory as Memoryblock

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a pointer to the buffer of a memory based PDF file.
**Notes:** The result string has no encoding set.

### 77.40.308 GetCapHeight as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the cap height of the active font.
See also GetCapHeight function in DynaPDF manual.

### 77.40.309 GetCharacterSpacing as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current character spacing.
See also GetCharacterSpacing function in DynaPDF manual.

### 77.40.310 GetCheckBoxChar as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the character used for newly created check boxes.
See also GetCheckBoxChar function in DynaPDF manual.

### 77.40.311 GetCheckBoxCharEx(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the check box character for the given field.
See also GetCheckBoxCharEx function in DynaPDF manual.

### 77.40.312 GetCheckBoxDefState(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the default state of a check box, that is 1 == checked or 0 == unchecked.
See also GetCheckBoxDefState function in DynaPDF manual.

### 77.40.313 GetCMap(index as Integer) as DynaPDFCMapMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the CMap object with the given index.
See also GetCMap function in DynaPDF manual.

### 77.40.314 GetCMapCount as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of character maps.
See also GetCMapCount function in DynaPDF manual.

### 77.40.315 GetColorSpace as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the active color space.
See also GetColorSpace function in DynaPDF manual.

### 77.40.316 GetColorSpaceCount as Integer

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of color spaces.
**Example:**

```
Sub DrawSomething(pdf as DynaPDFMBS)
// draw all colorants with their own color
Dim MyX, MyY as Double

MyX = 10
MyY = 100

// set a font
call pdf.SetFont "Times", pdf.kfsItalic, 10.0, true, pdf.kcp1252

// loop over all color spaces
dim Colorcount as Integer = pdf.GetColorSpaceCount

For j as Integer = 0 to Colorcount-1
MyX = 10
dim MyColourSpace as DynaPDFColorSpaceMBS = PDF.GetColorSpaceObj(j)
dim ColorantsCount as Integer = MyColourSpace.ColorantsCount
dim c as Integer = MyColourSpace.NumInComponents
Call pdf.SetExtColorSpace j

// draw name of each colorant
for i as Integer = 0 to c-1

// build array with colors and set 100% for the one color we need
```

```
dim values() as Double
redim values(c-1)
values(i) = 1.0

// get name
dim name as string = "#"+str(i)
if i <= ColorantsCount then
name = MyColourSpace.Colorants(i)
end if

// seaw name
Call pdf.SetFillColor(values)
call pdf.WriteText(MyX,MyY, name)

// next
MyX = MyX + pdf.GetTextWidth(name) + 20
next

// next
MyY = MyY+20
Next
End Sub
```

See also GetColorSpaceCount function in DynaPDF manual.

### 77.40.317 GetColorSpaceObj(index as Integer) as DynaPDFColorSpaceMBS

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a ColorSync Profile for the given index.
**Notes:** Index from 0 to GetColorSpaceCount-1.
See also GetColorSpaceObj function in DynaPDF manual.

### 77.40.318 GetCompressionFilter as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the standard compression filter for images.
See also GetCompressionFilter function in DynaPDF manual.

### 77.40.319 GetCompressionLevel as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the active compression level.
See also GetCompressionLevel function in DynaPDF manual.

### 77.40.320 GetContent as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns a pointer to the content stream of the currently open page or template.
**Notes:** The result string has no encoding set.
See also GetContent function in DynaPDF manual.

### 77.40.321 GetDefBitsPerPixel as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns default color depth in bits per pixel, which determines whether images should be down sampled.
See also GetDefBitsPerPixel function in DynaPDF manual.

### 77.40.322 GetDescent as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the descender of the active font.
See also GetDescent function in DynaPDF manual.

### 77.40.323 GetDocInfo(dinfo as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves a document info entry as Unicode string.
**Notes:** The result is an unicode string.
See also GetDocInfo function in DynaPDF manual.

### 77.40.324 GetDocInfoCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of document info entries defined in the document.
See also GetDocInfoCount function in DynaPDF manual.

### 77.40.325 GetDocInfoEx(index as Integer, byref DInfo as Integer, byref key as string, byref value as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a document info entry.
**Notes:** Key is an ascii string and value an unicode string.
See also GetDocInfoEx function in DynaPDF manual.

### 77.40.326 GetDocumentColorSpaces as DynaPDFColorSpaceMBS()

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries Colorspace objects for all colorspaces in the current working document.

### 77.40.327 GetDocUsesTransparency(Flags as UInt32 = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether this document uses transparency.
**Notes:** Checks whether a PDF file uses native PDF Transparency (PDF 1.4). The file uses transparency when it contains soft masks, blend modes other than Normal, or fill or stroke alpha values smaller than 1.0. The function checks all pages, templates, extended graphics states, images, annotations, and form fields. If the file uses transparency the return value is true. If it uses no transparency the return value is false.
See also GetDocUsesTransparency function in DynaPDF manual.

### 77.40.328 GetDrawDirection as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the actual draw direction for closed vector graphics such as rectangles, circles, ellipses and so on.
See also GetDrawDirection function in DynaPDF manual.

### 77.40.329 GetDynaPDFVersion as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the version string of DynaPDF.
**Notes:** Result is an ASCII string.
See also GetDynaPDFVersion function in DynaPDF manual.

### 77.40.330 GetEmbeddedFile(Handle as Integer, byref FileSpec as DynaPDF-FileSpecMBS, Decompress as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of an embedded file as well as a pointer to the file buffer.
**Example:**

```
// new PDF Environment
dim pdf as new MyDynaPDFMBS
call pdf.CreateNewPDF nil

// import PDF file
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with hidden data.pdf")
call pdf.SetImportFlags(pdf.kifImportAll + pdf.kifImportAsPage)
call pdf.OpenImportFile(f)
call pdf.ImportPDFFile(1)

// walk over list of embedded files and get their data
dim c as Integer = pdf.GetEmbeddedFileCount
for i as Integer = 0 to c-1
dim e as DynaPDFFileSpecMBS
if pdf.GetEmbeddedFile(i, e, true) then
dim data as string = e.Buffer

Break
end if
next

// cleanup
call pdf.CloseFile
```

See also GetEmbeddedFile function in DynaPDF manual.

### 77.40.331 GetEmbeddedFileCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of embedded files available in the PDF file.
**Example:**

```
// new PDF Environment
dim pdf as new MyDynaPDFMBS
call pdf.CreateNewPDF nil

// import PDF file
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with hidden data.pdf")
call pdf.SetImportFlags(pdf.kifImportAll + pdf.kifImportAsPage)
call pdf.OpenImportFile(f)
call pdf.ImportPDFFile(1)

// walk over list of embedded files and get their data
dim c as Integer = pdf.GetEmbeddedFileCount
for i as Integer = 0 to c-1
dim e as DynaPDFFileSpecMBS
if pdf.GetEmbeddedFile(i, e, true) then
dim data as string = e.Buffer

Break
end if
next

// cleanup
call pdf.CloseFile
```

See also GetEmbeddedFileCount function in DynaPDF manual.

### 77.40.332 GetEMFPatternDistance as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the distance between lines of standard patterns during EMF conversion.
See also GetEMFPatternDistance function in DynaPDF manual.

### 77.40.333 GetErrLogMessage(index as Integer) as DynaPDFErrorMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Querties the error message details for the given index.
**Notes:** Index from 0 to GetErrLogMessageCount-1.
See also GetErrLogMessage function in DynaPDF manual.

### 77.40.334 GetErrLogMessageCount as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of error log messages.
See also GetErrLogMessageCount function in DynaPDF manual.

### 77.40.335 GetErrorMessage as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the last error message as a string, or "" if no error occurred.
See also GetErrorMessage function in DynaPDF manual.

### 77.40.336 GetErrorMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current error mode.
See also GetErrorMode function in DynaPDF manual.

### 77.40.337 GetField(index as Integer) as DynaPDFFieldMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetFieldEx instead.
**Function:** The function retrieves the most important properties of a field.
See also GetField function in DynaPDF manual.

### 77.40.338 GetFieldBackColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the default background color used for newly created interactive form fields.
See also GetFieldBackColor function in DynaPDF manual.

### 77.40.339 GetFieldBorderColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the default border color used for newly created interactive form fields.
See also GetFieldBorderColor function in DynaPDF manual.

### 77.40.340 GetFieldBorderStyle(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the border style of a specific form field.
See also GetFieldBorderStyle function in DynaPDF manual.

### 77.40.341 GetFieldBorderWidth(aField as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the line width of the border of a field.
See also GetFieldBorderWidth function in DynaPDF manual.

### 77.40.342 GetFieldCalcOrder as UInt32()

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries field calculation order.
**Notes:** Retrieves the calculation order of form fields which contain an action in the OnCalc event (see AddActionToObj() for further information). This is the order in which their values will be recalculated when the value of any field changes. The retrieved array values are field handles.

To change the calculation order of a specific field call SetFieldCalcOrder().
See also GetFieldCalcOrder function in DynaPDF manual.

### 77.40.343 GetFieldChoiceValue(Field as Integer, ValIndex as Integer) as DynaPDFChoiceValueMBS

MBS DynaPDF Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the choice values for this field.
See also GetFieldChoiceValue function in DynaPDF manual.

### 77.40.344 GetFieldColor(Field as Integer, ColorType as Integer, byref ColorSpace as Integer, byref ColorValue as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves a specific color of an interactive form field.
See also GetFieldColor function in DynaPDF manual.

### 77.40.345 GetFieldCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of fields contained in the document.
See also GetFieldCount function in DynaPDF manual.

### 77.40.346 GetFieldEx(index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the most important properties of a field.
**Example:**

```
dim pdf as new MyDynaPDFMBS

pdf.SetLicenseKey "Lite" // For this example you can use a Lite, Pro or Enterprise License

call pdf.CreateNewPDF(nil)
call pdf.SetImportFlags(BitwiseOr(pdf.kifImportAll, pdf.kifImportAsPage))

dim filePath as FolderItem=SpecialFolder.Desktop.Child("acroform.pdf")
if (pdf.OpenImportFile(filePath, pdf.kptOpen, "") <0) then
MsgBox "Input file """+filePath.name+""" not found!"
quit
end if

// import all pages
dim r as Integer = pdf.ImportPDFFile( 1, 1.0, 1.0)

// now check all fields
dim n as Integer = pdf.GetFieldCount
for i as Integer = 0 to n-1
dim f as DynaPDFFieldExMBS = pdf.GetFieldEx(i)

break // inspect in debugger
next
```

**Notes:** See dynapdf_help.pdf for more details.
See also GetFieldEx function in DynaPDF manual.

### 77.40.347 GetFieldExpValCount(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of values/export values which are defined for a field.
See also GetFieldExpValCount function in DynaPDF manual.

### 77.40.348 GetFieldExpValue(Field as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function retrieves the export value(s) of a check box, list box, or combo box.
See also GetFieldExpValue function in DynaPDF manual.

### 77.40.349 GetFieldExpValueEx(Field as Integer, ValIndex as Integer, byref Value as string, byref ExpValue as string, byref Selected as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to enumerate the choice values of a combo box, list box, or radio button.
See also GetFieldExpValueEx function in DynaPDF manual.

### 77.40.350 GetFieldFlags(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the flags of a specific interactive form field.
See also GetFieldFlags function in DynaPDF manual.

### 77.40.351 GetFieldGroupType(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the base type of a field group.
See also GetFieldGroupType function in DynaPDF manual.

### 77.40.352 GetFieldHighlightMode(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the highlight mode of buttons, checkboxes, and signature fields.
See also GetFieldHighlightMode function in DynaPDF manual.

### 77.40.353 GetFieldIndex(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the index or tab order of the field.
See also GetFieldIndex function in DynaPDF manual.

### 77.40.354 GetFieldMapName(Field as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the mapping name of a specific form field if set.
**Notes:** The result string is in unicode or ASCII encoding.
See also GetFieldMapName function in DynaPDF manual.

### 77.40.355 GetFieldName(Field as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the name of a specific interactive form field.
See also GetFieldName function in DynaPDF manual.

### 77.40.356 GetFieldOrientation(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the orientation of a field.
See also GetFieldOrientation function in DynaPDF manual.

### 77.40.357 GetFieldTextAlign(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the text alignment of a text field or button field.
See also GetFieldTextAlign function in DynaPDF manual.

### 77.40.358 GetFieldTextColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the default text color used for newly created fields.
See also GetFieldTextColor function in DynaPDF manual.

### 77.40.359 GetFieldToolTip(Field as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves a pointer to the tool tip string of a specific interactive form field.
**Notes:** The result string has either unicode or ascii encoding.
See also GetFieldToolTip function in DynaPDF manual.

### 77.40.360 GetFieldType(Field as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the field type.
See also GetFieldType function in DynaPDF manual.

### 77.40.361 GetFillColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current color used for fillings.
See also GetFillColor function in DynaPDF manual.

### 77.40.362 GetFontCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the font count.
See also GetFontCount function in DynaPDF manual.

### 77.40.363 GetFontEx(index as Integer) as DynaPDFFontMBS

MBS DynaPDF Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetFontInfo instead.
**Function:** Queries the font information for the font specified by the index value.
**Example:**

```
// create PDF object with page
dim pdf as new DynaPDFMBS
call pdf.CreateNewPDF(nil)
call pdf.Append

// draw some text
call pdf.SetFont "Times", pdf.kfsItalic, 40.0, true, pdf.kcp1252
call pdf.WriteFText pdf.ktaCenter, "My first Xojo output!"

// and list all fonts:
dim n as Integer = pdf.GetFontCount-1

for i as Integer = 0 to n
MsgBox pdf.GetFontEx(i).FontName
next
```

**Notes:** Returns nil on any error.
Index from 0 to GetFontCount-1.
See also GetFontEx function in DynaPDF manual.

### 77.40.364 GetFontInfoEx(index as Integer) as DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the most important properties of a font.
**Notes:** This function accepts a font handle instead. A font handle is a simple array index. To enumerate all fonts of a document execute the function in a loop from zero to GetFontCount - 1.

If the function succeeds the return value is font info object. If the function fails the return value is nil.
See also GetFontInfoEx function in DynaPDF manual.

### 77.40.365 GetFontMetrics(FontHandle as Integer) as DynaPDFFontMetricsMBS

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries font metrics for a font handle.
See also GetFontMetrics function in DynaPDF manual.

### 77.40.366 GetFontOrigin as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current font origin.
See also GetFontOrigin function in DynaPDF manual.

### 77.40.367 GetFontSearchOrder as Integer()

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the font search order.
**Notes:** The values in the array use this constants:

| | |
|---|---|
| kfbtTrueType | TrueType, TrueType Collections, or OpenType fonts with TrueType outlines |
| kfbtType1 | Type1 font |
| kfbtOpenType | OpenType font with Postscript outlines |
| kfbtStdFont | PDF Standard font |
| kfbtDisabled | This value can be used to disable a specific font format. |

The array has 4 values.
See also GetFontSearchOrder function in DynaPDF manual.

### 77.40.368 GetFontSelMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current font selection mode.
See also GetFontSelMode function in DynaPDF manual.

### 77.40.369 GetFontWeight as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the weight that will be used to emulate a bold font style.
See also GetFontWeight function in DynaPDF manual.

### 77.40.370 GetFTextHeight(Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function measures the height of a formatted text block.
**Notes:** The text parameter is converted to unicode.
See also GetFTextHeight function in DynaPDF manual.

### 77.40.371 GetFTextHeightAnsi(Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function measures the height of a formatted text block.
**Notes:** The text parameter is converted to ANSI.

### 77.40.372 GetFTextHeightEx(Width as Double, Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function measures the height of a formatted text block.
**Notes:** The text parameter is converted to unicode.
See also GetFTextHeightEx function in DynaPDF manual.

### 77.40.373 GetFTextHeightExAnsi(Width as Double, Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function measures the height of a formatted text block.
**Notes:** The text parameter is converted to ANSI.

### 77.40.374 GetGlyphIndex(Index as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the glyph index of the given code page or Unicode index.
**Notes:** How Index must be defined depends on the code page with which the font was loaded. For example, if the font was loaded with a 8 bit code page, then indexes below 256 are treated as index into the code page table. Higher indexes are treated as Unicode value in this case. Note that all Unicode encoded glyphs of the font are accessible in this case, also if the font was loaded with a 8 bit code page!

At time of publication the function does not support CJK code pages which require a conversion to Unicode, e.g. cpCJK_Big5_Uni, cpCJK_EUC_JP_Uni, and so on.

If the function succeeds the return value is greater or equal zero. If the function fails the return value is a negative error code.
See also GetGlyphIndex function in DynaPDF manual.

### 77.40.375 GetGlyphOutline(Index as UInt32) as DynaPDFGlyphOutlineMBS

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the outline of a glyph of the active font.
**Notes:** Note that not all glyphs have an outline. A space character, for example, has no outline and therefore the size can be zero. The function returns normalized outlines scaled to a font size of 1000 units.

Please see dynapdf_help.pdf and our example project on how to process the outline data.
See also GetGlyphOutline function in DynaPDF manual.

### 77.40.376 GetGoToAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFGoToActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a GoToR action.
**Notes:** Index is from 0 to GetActionCount-1.

If Decompress is true, all file specification containing compressed data are uncompressed.
And ImageParseFlags defines how GetImageObj is called internally to decompress image. Default is to only get image info, but you can pass other values to actually get image data.
See also GetGoToAction function in DynaPDF manual.

### 77.40.377 GetGoToRAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFGoToActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a GoTo action.
**Notes:** Index is from 0 to GetActionCount-1.

If Decompress is true, all file specification containing compressed data are uncompressed.
And ImageParseFlags defines how GetImageObj is called internally to decompress image. Default is to only get image info, but you can pass other values to actually get image data.
See also GetGoToRAction function in DynaPDF manual.

### 77.40.378 GetGStateFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current graphics state flags.
See also GetGStateFlags function in DynaPDF manual.

### 77.40.379 GetHideAction(index as Integer) as DynaPDFHideActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a hide action.
**Notes:** Index is from 0 to GetActionCount-1.
See also GetHideAction function in DynaPDF manual.

### 77.40.380 GetIconColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the icon color used for newly created text annotations.
See also GetIconColor function in DynaPDF manual.

### 77.40.381 GetImageBuffer as string

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the image buffer.
See also GetImageBuffer function in DynaPDF manual.

### 77.40.382 GetImageBufferMemory as memoryblock

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the image buffer.

### 77.40.383 GetImageCount(File as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of images contained in a multi page image.
See also GetImageCount function in DynaPDF manual.
See also:

- 77.40.384 GetImageCount(Path as string) as Integer 12822

### 77.40.384 GetImageCount(Path as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of images contained in a multi page image.
See also GetImageCount function in DynaPDF manual.
See also:

- 77.40.383 GetImageCount(File as folderitem) as Integer 12822

### 77.40.385 GetImageCountEx(Buffer as Memoryblock) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function determines the number of images in a multi-page image in the same way as GetImageCount(), but accepts a file buffer as input.
See also GetImageCountEx function in DynaPDF manual.
See also:

• 77.40.386 GetImageCountEx(Buffer as string) as Integer 12823

### 77.40.386 GetImageCountEx(Buffer as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function determines the number of images in a multi-page image in the same way as GetImageCount(), but accepts a file buffer as input.
See also GetImageCountEx function in DynaPDF manual.
See also:

• 77.40.385 GetImageCountEx(Buffer as Memoryblock) as Integer 12822

### 77.40.387 GetImageHeight(Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the height of an image in pixel.
See also GetImageHeight function in DynaPDF manual.

### 77.40.388 GetImageObj(Handle as UInt32, Flags as Integer = 0) as DynaPDFImageMBS

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the properties of an image as well as the decompressed image buffer if needed.
**Notes:** For the flags use the constants: kpfNone, kpfDecomprAllImages, kpfNoJPXDecode, kpfDitherImagesToBW, kpfConvImagesToGray, kpfConvImagesToRGB, kpfConvImagesToCMYK or kpfImageInfoOnly.

By default all images are returned decompressed, with exception of image types which are already stored in a valid file format like JPEG and JPEG 2000 images.
If all image types should be decompressed set the flag kpfDecompressAllImages.
This function allocates memory that should be released with FreeImageObj when finish.
Image handles are simple array indexes. The number of image objects can be determined with GetImageObjCount. Note that this array does not include inline images which are stored in content streams. Such images can only be accessed with ParseContent().

Returns the function succeeds the return value is true. If the function fails the return value is false.
See also GetImageObj function in DynaPDF manual.

### 77.40.389 GetImageObjCount as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of image objects which were loaded with DynaPDF functions or imported from external PDF files.
**Notes:** The images can be accessed with GetImageObj().
The return value is the number of image objects. This function cannot fail.
See also GetImageObjCount function in DynaPDF manual.

### 77.40.390 GetImageWidth(Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the width of an image in pixel.
See also GetImageWidth function in DynaPDF manual.

### 77.40.391 GetImportDataAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFImportDataActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for an import action.
**Notes:** Index is from 0 to GetActionCount-1.

If Decompress is true, all file specification containing compressed data are uncompressed.
And ImageParseFlags defines how GetImageObj is called internally to decompress image. Default is to only get image info, but you can pass other values to actually get image data.
See also GetImportDataAction function in DynaPDF manual.

### 77.40.392 GetImportFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current import flags used to import PDF files.
See also GetImportFlags function in DynaPDF manual.

### 77.40.393 GetImportFlags2 as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries import flags 2.
See also GetImportFlags2 function in DynaPDF manual.

### 77.40.394 GetInBBox(PageNum as Integer, Boundary as Integer) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves a bounding box of an external PDF page.
**Example:**

```
dim pdf as new MyDynaPDFMBS

// open some PDF
call pdf.CreateNewPDF(nil)
call pdf.OpenImportFile(file, 0, "")

// query page size
dim bounds as DynaPDFRectMBS = pdf.GetInBBox(1, pdf.kpbMediaBox)
```

See also GetInBBox function in DynaPDF manual.

### 77.40.395 GetInDocInfo(DInfo as Integer, byref value as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves a document info entry from an external PDF file as Unicode string.
See also GetInDocInfo function in DynaPDF manual.

### 77.40.396 GetInDocInfoCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of available document info entries of the currently opened import file or a negative error code on failure.
See also GetInDocInfoCount function in DynaPDF manual.

### 77.40.397 GetInDocInfoEx(index as Integer, byref DInfo as Integer, byref key as string, byref value as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a document info entry from the currently opened import file.
**Example:**

```
dim p as new DynaPDFMBS

call p.CreateNewPDF(nil)

// Skip anything that is not required
call p.SetImportFlags p.kifImportAll+p.kifImportAsPage

// From which PDF file do you want to extract the information?
call p.OpenImportFile(file, p.kptOpen, "")

// lookup all document information

dim count as integer = p.GetInDocInfoCount
for i as integer = 0 to count-1

dim DInfo as integer
dim key as string
dim value as string
if p.GetInDocInfoEx(i, DInfo, key, value) >= 0 then

dim Type as string
select case dinfo
case p.kdiAuthor
type = "Author"
case p.kdiCreator
type = "Creator"
case p.kdiKeywords
type = "Keywords"
case p.kdiProducer
type = "Producer"
case p.kdiSubject
type = "Subject"
case p.kdiTitle
type = "Title"
case p.kdiCompany
type = "Company"
case p.kdiPDFX_Ver
type = "PDF/X Version"
case p.kdiCustom
type = "Custom"
```

```
case p.kdiPDFX_Conf
type = "PDF/X Config"
case p.kdiCreationDate
type = "Creation Date"
case p.kdiModDate
type = "Modification Date"
else
Break
type = "?"
end Select

List.AddRow type, key, value
end if

next

// close import file
call p.CloseImportFile
```

**Notes:** The key result is an ASCII string.
The value result is an ASCII or Unicode string.
See also GetInDocInfoEx function in DynaPDF manual.

### 77.40.398 GetInEncryptionFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the encryption flags of the currently opened import file.
See also GetInEncryptionFlags function in DynaPDF manual.

### 77.40.399 GetInFieldCount as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of field in open import file.
See also GetInFieldCount function in DynaPDF manual.

### 77.40.400 GetInIsCollection as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function checks whether the currently opened import file is a portable collection.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInIsCollection function in DynaPDF manual.

### 77.40.401 GetInIsEncrypted as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function checks whether the currently opened import file is encrypted.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInIsEncrypted function in DynaPDF manual.

### 77.40.402 GetInIsSigned as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to determine whether a PDF file contains a digital signature.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInIsSigned function in DynaPDF manual.

### 77.40.403 GetInIsTaggedPDF as integer

MBS DynaPDF Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the currently open import file is a Tagged PDF file.
**Notes:** The PDF file must be opened beforehand with OpenImportFile() or OpenImportBuffer().
The return value is a set flags indicating the tagging status of the file.

If the function succeeds, the return value is greater or equal zero. If the function fails, the return value is a negative error code.
See also GetInIsTaggedPDF function in DynaPDF manual.

### 77.40.404 GetInIsTrapped as Integer

MBS DynaPDF Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the input PDF is trapped.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInIsTrapped function in DynaPDF manual.

### 77.40.405 GetInIsXFAForm as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the input PDF is a XFA form.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInIsXFAForm function in DynaPDF manual.

### 77.40.406 GetInMetadata(PageNum as Integer) as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Access the optional metadata streams of pages or the global metadata stream of the current open import file.
**Notes:** Metadata streams are in XMP format that is a superset of XML. The PDF file must be opened with OpenImportImportFile or OpenImportBuffer beforehand.
Although the global XMP stream does usually exist in todays PDF files, metadata streams are optional and maybe not present. The function returns true if no error occurs, also if no metadata stream is present.
See also GetInMetadata function in DynaPDF manual.

### 77.40.407 GetInOrientation(PageNum as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the orientation of a specific page within the currently open import file (see also OpenImportFile()).
See also GetInOrientation function in DynaPDF manual.

### 77.40.408 GetInPageCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of pages contained in an external PDF file.
See also GetInPageCount function in DynaPDF manual.

### 77.40.409 GetInPDFVersion as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the minor PDF version number of an external PDF file.
See also GetInPDFVersion function in DynaPDF manual.

### 77.40.410 GetInPDFVersionEx as DynaPDFVersionInfoMBS

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the version information of the currently open import file.
See also GetInPDFVersionEx function in DynaPDF manual.

### 77.40.411 GetInPrintSettings as DynaPDFPrintSettingsMBS

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the print settings for the imported document.
**Notes:** This is a PDF 1.7 extension.
See also GetInPrintSettings function in DynaPDF manual.

### 77.40.412 GetInRepairMode as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to determine whether the current open import file was opened in repair or normal mode.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetInRepairMode function in DynaPDF manual.

### 77.40.413 GetIsFixedPitch as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns 1 if the active font is a fixed pitch font or 0 if the font is a variable pitch font.
**Notes:** Changed to integer in order to allow returning error codes besides 0 for false and 1 for true.
See also GetIsFixedPitch function in DynaPDF manual.

### 77.40.414 GetIsTaggingEnabled as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether tagging is enabled.
See also GetIsTaggingEnabled function in DynaPDF manual.

### 77.40.415 GetItalicAngle as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the italic angle in degrees that will be used to emulate italic style fonts.
See also GetItalicAngle function in DynaPDF manual.

### 77.40.416 GetJavaScript(Handle as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a global JavaScript as string.
**Notes:** The result text string has either unicode or ASCII encoding.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.

If the JavaScript is attached to a field, please use GetFieldEx functions to get the action handle (DynaPDFFieldExMBS.Action) and then use GetJavaScriptAction instead.

See also GetJavaScript function in DynaPDF manual.

### 77.40.417 GetJavaScriptAction(Handle as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetJavaScriptActionEx instead. **Function:** Returns a java script action value for the given handle.
**Notes:** May return an unicode string.
See also GetJavaScriptAction function in DynaPDF manual.
See also:

- 77.40.418 GetJavaScriptAction(ObjType as Integer, ObjHandle as Integer, ActIndex as Integer, byref ObjEvent as Integer) as string 12832

### 77.40.418 GetJavaScriptAction(ObjType as Integer, ObjHandle as Integer, ActIndex as Integer, byref ObjEvent as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetJavaScriptActionEx instead. **Function:** Returns a java script action value for the given object.
**Notes:** May return an unicode string.

The ObjEvent parameter was added in plugin version 9.3 and contains a value from the koe* constants.
See also GetJavaScriptAction function in DynaPDF manual.
See also:

- 77.40.417 GetJavaScriptAction(Handle as Integer) as string 12832

### 77.40.419 GetJavaScriptActionEx(index as Integer) as DynaPDFJavaScriptActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for an javascript action.
**Notes:** Index is from 0 to GetActionCount-1.
See also GetJavaScriptActionEx function in DynaPDF manual.

### 77.40.420 GetJavaScriptCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of global JavaScripts contained in a document.
See also GetJavaScriptCount function in DynaPDF manual.

### 77.40.421 GetJavaScriptEx(Name as string) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns a global JavaScript as string by using the script s name instead of a handle to identify the script.
**Notes:** The result string is an unicode or an ASCII string.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.

If the JavaScript is attached to a field, please use GetFieldEx functions to get the action handle (DynaPDFFieldExMBS.Action) and then use GetJavaScriptAction instead.
See also GetJavaScriptEx function in DynaPDF manual.

### 77.40.422 GetJavaScriptName(Handle as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the name of a global JavaScript.
**Notes:** The result string has either unicode or ASCII encoding.
See also GetJavaScriptName function in DynaPDF manual.

### 77.40.423 GetJPEGQuality as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current JPEG compression quality in percent used for newly inserted images which are compressed with JPEG.
See also GetJPEGQuality function in DynaPDF manual.

### 77.40.424 GetJPEGVersion as String

MBS DynaPDF Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries JPEG library version.
**Notes:** Currently reporting 9.1 for version 9b.

### 77.40.425 GetLanguage as string

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the language identifier of the document as an ISO 3166 language tag or IANA tag, or "" if not set.
See also GetLanguage function in DynaPDF manual.

### 77.40.426 GetLastTextOffset as UInt32

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns current text offset for WriteFText.
**Notes:** This lets you know how much text is left to write when you get a page break event.

### 77.40.427 GetLastTextPosX as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the x coordinate of the last printed text.

### 77.40.428 GetLastTextPosY as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the y coordinate of the last printed text.

### 77.40.429 GetLaunchAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFLaunchActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a launch action.
**Notes:** Index is from 0 to GetActionCount-1.

If Decompress is true, all file specification containing compressed data are uncompressed.
And ImageParseFlags defines how GetImageObj is called internally to decompress image. Default is to only

get image info, but you can pass other values to actually get image data.
See also GetLaunchAction function in DynaPDF manual.

### 77.40.430 GetLayerConfig(Index as Integer) as DynaPDFOCLayerConfigMBS

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the most important properties of a layer configuration.
**Notes:** A PDF file can contain one or more layer configurations so that different layers can be initially shown or hidden.
A PDF file that contains layers (Optional Content Groups in PDF syntax) contains usually at least a default configuration dictionary. This configuration is loaded by default when the visibility state of a layer or optional content group must be determined, e.g. when rendering a page.
To determine the number of available configurations call GetLayerConfigCount(). The first index is denoted by 0.

If the function succeeds the return value is the object. If the function fails the return value is nil.
See also GetLayerConfig function in DynaPDF manual.

### 77.40.431 GetLayerConfigCount as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of available layer configurations.
**Notes:** Note that it is possible that a document contains layers but no layer configuration. To determine whether a document contains layers or optional content groups use GetOCGCount().
To load a specific layer configuration call LoadLayerConfig().
See also GetLayerConfigCount function in DynaPDF manual.

### 77.40.432 GetLeading as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current leading.
See also GetLeading function in DynaPDF manual.

### 77.40.433 GetLineCapStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current line cap style used for vector graphics.
See also GetLineCapStyle function in DynaPDF manual.

### 77.40.434 GetLineJoinStyle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current line join style used for vector graphics.
See also GetLineJoinStyle function in DynaPDF manual.

### 77.40.435 GetLineWidth as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current line width used for stroked vector graphics and the border of interactive objects.
See also GetLineWidth function in DynaPDF manual.

### 77.40.436 GetLinkHighlightMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current highlight mode used for newly created annotations.
See also GetLinkHighlightMode function in DynaPDF manual.

### 77.40.437 GetLogMetafileSize(FileName as folderitem) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the logical bounding box of an enhanced or Windows metafile.
See also GetLogMetafileSize function in DynaPDF manual.

### 77.40.438 GetLogMetafileSizeEx(Buffer as Memoryblock) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the logical bounding box of an enhanced or Windows metafile.
See also GetLogMetafileSizeEx function in DynaPDF manual.
See also:

• 77.40.439 GetLogMetafileSizeEx(Buffer as string) as DynaPDFRectMBS 12837

### 77.40.439 GetLogMetafileSizeEx(Buffer as string) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the logical bounding box of an enhanced or Windows metafile.
See also GetLogMetafileSizeEx function in DynaPDF manual.
See also:

• 77.40.438 GetLogMetafileSizeEx(Buffer as Memoryblock) as DynaPDFRectMBS 12836

### 77.40.440 GetMatrix(byref Matrix as DynaPDFMatrixMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the current transformation.
See also GetMatrix function in DynaPDF manual.

### 77.40.441 GetMaxFieldLen(TxtField as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the allowed maximum string length of a text field, or zero if the length is not restricted.
See also GetMaxFieldLen function in DynaPDF manual.

### 77.40.442 GetMetaConvFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the conversion flags used to convert enhanced metafiles to PDF.
See also GetMetaConvFlags function in DynaPDF manual.

### 77.40.443 GetMetadata(ObjType as Integer, Handle as Integer) as String

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function can be used to access the optional metadata streams of pages, fonts, images, pages, templates, as well as the global metadata stream that is associated with the Catalog object.
**Notes:** Metadata streams are in XMP format that is a superset of XML.

The global metadata stream will be created when this function is called. The returned stream is a preview of the XMP stream that will be stored in the file when CloseFile or CloseFileEx is called. Note that the creation and modification date will be updated when the file is closed.
The original global XMP stream of external PDF files can be accessed with GetInMetadata().
Metadata streams are optional and maybe not present. The function returns true if no error occurs, also if no metadata stream is present.
See also GetMetadata function in DynaPDF manual.

### 77.40.444 GetMissingGlyphs as UInt32()

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with missing glyphs.
**Notes:** See also GetMissingGlyphsString.
See also GetMissingGlyphs function in DynaPDF manual.

### 77.40.445 GetMissingGlyphsString as String

MBS DynaPDF Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string containing the missing glpyhs characters.
**Notes:** This is a convenience function which builds a string from the array given by pdfGetMissingGlyphs.

See also GetMissingGlyphs.

### 77.40.446 GetMiterLimit as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current miter limit used to draw stroked vector graphics.
See also GetMiterLimit function in DynaPDF manual.

### 77.40.447 GetMovieAction(index as Integer, Decompress as Boolean = false, ImageParseFlags as Integer = &h00000080) as DynaPDFFieldMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a movie action.
**Notes:** Index is from 0 to GetActionCount-1.

If Decompress is true, all file specification containing compressed data are uncompressed.
And ImageParseFlags defines how GetImageObj is called internally to decompress image. Default is to only get image info, but you can pass other values to actually get image data.
See also GetMovieAction function in DynaPDF manual.

### 77.40.448 GetNamedAction(index as Integer) as DynaPDFNamedActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for a named action.
**Notes:** Index is from 0 to GetActionCount-1.
See also GetNamedAction function in DynaPDF manual.

### 77.40.449 GetNamedDest(index as Integer) as DynaPDFNamedDestMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries information about the named destination with the given index.
**Notes:** Index from 0 to GetNamedDestCount-1.
Returns nil on any error.
See also GetNamedDest function in DynaPDF manual.

### 77.40.450 GetNamedDestCount as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of named destination objects.
See also GetNamedDestCount function in DynaPDF manual.

### 77.40.451 GetNeedAppearance as boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether appearance is needed.
See also GetNeedAppearance function in DynaPDF manual.

### 77.40.452 GetObjActionCount(ObjType as Integer, ObjHandle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetObjActions instead.
**Function:** The function returns the number of actions used by an object.
See also GetObjActionCount function in DynaPDF manual.

### 77.40.453 GetObjActions(ObjType as Integer, ObjHandle as Integer, byref Actions as DynaPDFObjActionsMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for an object action.
**Notes:** Index is from 0 to GetActionCount-1.

The function retrieves the first action and additional trigger events that should be executed when a specific event occurs.
If the object type is a page, then use the page number as handle.

Trigger events are supported by the global Catalog object (this is the document root), Pages, and Form Fields. All other objects do not support trigger events.
Actions are defined as a single linked list. That means one action can execute another action (if NextAction of that action is >= 0).
Note that an action can reference itself! The application must check whether an action is already in the execution list before it will be executed.

If an error occurred, the plugin returns nil.
On success, we provide the DynaPDFObjActionsMBS object in Actions parameter.

Return values:

| | |
|---|---|
| <0 | An error occurred, e.g. due to an invalid handle. |
| 0 | The object contains no action or trigger event. |
| 1 | The object contains an action. |
| 2 | The object contains a trigger event. |
| 3 | The object contains an action and a trigger event. |

See also GetObjActions function in DynaPDF manual.

### 77.40.454 GetOCG(Handle as UInt32) as DynaPDFOCGMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the properties of an OCG, also called layer.
**Notes:** An OCG handle is a simple array index. You can loop over all available OCGs from 0 to GetOCGCount - 1.
If the member HaveContUsage is true, the OCG contains a Content Usage dictionary. The contents of this dictionary can be accessed with the function GetOCGContUsage. A Content Usage dictionary contains additional information about a layer or OCG.

If the OCG is also included in an application event, this is the case if AppEvent is non-zero, then the Content Usage dictionary is used to control the visibility state of the layer. The member Categories specifies which categories control the visibility state.

Returns nil on any error.
See also GetOCG function in DynaPDF manual.

### 77.40.455 GetOCGContUsage(Handle as UInt32) as DynaPDFOCGContUsageMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the properties of the Content Usage dictionary that is associated with an OCG or layer.
**Notes:** If the OCG is not included in an application event, then the contents in this dictionary serves as pure information.
If the OCG is included in one or more application events, then these settings control also the visibility state of the OCG. The function GetOCG returns the events and categories which control the layer visibility.
If UserNamesCount is greater zero, the dictionary contains also user names. The user names can be accessed with GetOCGUsageUserName.
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Returns nil on any error.
See also GetOCGContUsage function in DynaPDF manual.

### 77.40.456 GetOCGCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of OCGs or layers which are available in document.
**Notes:** This function cannot fail, the return value is always greater or equal zero.
See also GetOCGCount function in DynaPDF manual.

### 77.40.457 GetOCGUsageUserName(Handle as UInt32, Index as UInt32, byref Name as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a user name of a Content Usage dictionary that is associated with an OCG or layer.
**Notes:** The functions a pointer of the original string that is stored in the PDF file.
If the function succeeds the return value is true. If the function fails the return value is false.
See also GetOCGUsageUserName function in DynaPDF manual.

### 77.40.458 GetOCUINode(Node as Integer) as DynaPDFOCUINodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the most important properties of an Optional Content UI node (UI stands for User Interface).
**Notes:** If the PDF file was not already imported with ImportPDFFile() the function ImportOCProperties() must be called to import the global Optional Content Properties.
UI nodes are part of a layer configuration. Therefore, a layer configuration must be loaded with LoadLayerConfig() before the function can be called.

Optional Content Groups (OCGs) which are returned by this function should be visible in the user interface of a viewer application. All other OCGs should not be shown by default.
UI nodes are stored in a single linked list. To get the pointer of the root node set the parameter Node to 0. The parameter OutNode will be ignored in this case but it is required otherwise.
The next node of the root is in the NextItem property. If no further node is available the return value will be 0.
Every node can contain one or more child nodes, an optional label, or a reference to an OCG.
See also GetOCUINode function in DynaPDF manual.

### 77.40.459 GetOpacity as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the opacity value used to draw the visible appearance of an annotation (requires Acrobat 5 or higher).
See also GetOpacity function in DynaPDF manual.

### 77.40.460 GetOrientation as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the orientation of the current open page if an open page was detected or the default orientation for newly created pages if no open page was detected.
See also GetOrientation function in DynaPDF manual.

### 77.40.461 GetOutputIntent(Index as Integer) as DynaPDFOutputIntentMBS

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an output intent as well as the properties of it.
**Notes:** An output intent is an ICC profile that describes the characteristics of the output device. The profile is mostly embedded but certain standards like PDF/X 4p, for example, allow also the usage of non-embedded profiles.

The parameter Index is the array index of the output intent. To determine the number of available intents call GetOutputIntentCount.

Returns nil in case of error.
See also GetOutputIntent function in DynaPDF manual.

### 77.40.462 GetOutputIntentCount as Integer

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of available output intents.
See also GetOutputIntentCount function in DynaPDF manual.

### 77.40.463 GetPage(PageNum as UInt32) as DynaPDFPageMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the page object for the given page number.
**Notes:** If you like to open a page for editing, please use editpage function.

### 77.40.464 GetPageAnnot(index as Integer) as DynaPDFAnnotationMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetPageAnnotEx instead.
**Function:** Retrieves the page annotation with the given index.

See also GetPageAnnot function in DynaPDF manual.

### 77.40.465 GetPageAnnotCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the page annotation count.
See also GetPageAnnotCount function in DynaPDF manual.

### 77.40.466 GetPageAnnotEx(index as Integer) as DynaPDFAnnotationExMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries an extended annotation with the given index.
See also GetPageAnnotEx function in DynaPDF manual.

### 77.40.467 GetPageColorSpaces as DynaPDFColorSpaceMBS()

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries for current open page the color spaces used.
**Notes:** Color spaces used for drawing colors (Stroke and Fill Color) and for image color space.
The list may be empty if for example everything is drawn in standard color spaces like RGB.

### 77.40.468 GetPageCoords as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the page coordinate system setting.
**Notes:** The native coordinate system of the Portable Document Format is bottom up.
See also GetPageCoords function in DynaPDF manual.

### 77.40.469 GetPageCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of pages of the current PDF file if any.
See also GetPageCount function in DynaPDF manual.

### 77.40.470 GetPageField(Index as Integer) as DynaPDFFieldMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use GetPageFieldEx instead.
**Function:** The function retrieves the most important properties of a field.
See also GetPageField function in DynaPDF manual.

### 77.40.471 GetPageFieldCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of fields used by a page.
See also GetPageFieldCount function in DynaPDF manual.

### 77.40.472 GetPageFieldEx(Index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of a field.
**Notes:** The parameter Index must be a valid index to the page's field array. To enumerate the fields of a page execute the function in a loop from 0 to GetPageFieldCount - 1.
See also GetPageFieldEx function in DynaPDF manual.

### 77.40.473 GetPageHeight as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the height of the currently open page.
See also GetPageHeight function in DynaPDF manual.

### 77.40.474 GetPageLabel(index as Integer, byref Label as DynaPDFPageLabelMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the properties of a page label.
See also GetPageLabel function in DynaPDF manual.

### 77.40.475 GetPageLabelCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of page labels defined in the document.
See also GetPageLabelCount function in DynaPDF manual.

### 77.40.476 GetPageLayout as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the page layout that is used when opening the document with Adobe s Acrobat.
See also GetPageLayout function in DynaPDF manual.

### 77.40.477 GetPageMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the page mode that is used when opening the document with Adobe's Acrobat.
See also GetPageMode function in DynaPDF manual.

### 77.40.478 GetPageNum as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the page number of the currently open page.
See also GetPageNum function in DynaPDF manual.

### 77.40.479 GetPageText(stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to extract the text of a page or template, or to find a specific text that should be replaced or deleted with the function ReplacePageText() or ReplacePageTextEx().
**Notes:** InitStack must be called before you use GetPageText.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.
Requires DynaPDF Pro license.

See also GetPageText function in DynaPDF manual.

### 77.40.480 GetPageWidth as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the width of the currently open page.
See also GetPageWidth function in DynaPDF manual.

### 77.40.481 GetPDFVersion as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the minor version of the output PDF file as Integer value.
**Notes:** Zero stand for PDF 1.0, one for PDF 1.1 and so on.
See also GetPDFVersion function in DynaPDF manual.

### 77.40.482 GetPDFVersionEx as DynaPDFVersionInfoMBS

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the major and minor version of the PDF document as well as the underlying PDF standard, if any.
**Example:**

```
Dim d As New DynaPDFMBS
Dim v As DynaPDFVersionInfoMBS = d.GetPDFVersionEx

Break // check in debugger
```

**Notes:** Result includes:

| | |
|---|---|
| Major | PDF major version, e.g. 1 |
| Minor | PDF minor version, e.g. 7 |
| MainVer | Set only if the file conforms to a specific PDF standard, e.g. "PDF/X // 1a:2003", "PDF/A 3b", and so on. |
| SubVer | e.g. "ZUGFeRD 2.0", "Factur-X", and so on |

Returns nil in case of an error.

See also GetPDFVersionEx function in DynaPDF manual.

### 77.40.483 GetPNGVersion as String

MBS DynaPDF Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries PNG library version used in DynaPDF.

### 77.40.484 GetPrintSettings as DynaPDFPrintSettingsMBS

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the print settings for the current document.
**Notes:** This is a PDF 1.7 extension.
See also GetPrintSettings function in DynaPDF manual.

### 77.40.485 GetResetAction(Handle as UInt32) as DynaPDFResetFormActionMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the properties of a Reset Form Action.
See also GetResetAction function in DynaPDF manual.

### 77.40.486 GetResolution as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the resolution in DPI (Dots per Inch), in which images are stored by DynaPDF.
See also GetResolution function in DynaPDF manual.

### 77.40.487 GetSaveNewImageFormat as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If false, images are not downscaled if necessary.
See also GetSaveNewImageFormat function in DynaPDF manual.

### 77.40.488 GetSeparationInfo(byref Colorant as string, byref ColorSpace as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the separation info stored in the current open page.
See also GetSeparationInfo function in DynaPDF manual.

### 77.40.489 GetSpaceWidth(FontHandle as Integer, FontSize as Double) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the width of the space character of the font depending on the font size.
**Notes:** If the font contains no space character a default size is used to compute the space width.
The parameter FontHandle must be a valid pointer to a PDF font. Such a reference is returned by GetPageText, EnumDocFonts, or by the content parser (see ParseContent).

Returns: If the function succeeds the return value is the space width. If the function fails the return value is zero. This function does not use the exception handling of DynaPDF. No error message is set on failure.

See also GetSpaceWidth function in DynaPDF manual.

### 77.40.490 GetStrokeColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current stroke color.
See also GetStrokeColor function in DynaPDF manual.

### 77.40.491 GetSubmitAction(Handle as UInt32) as DynaPDFSubmitFormActionMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the properties of a Submit Form Action.
**Notes:** Returns nil in case of an error.
See also GetSubmitAction function in DynaPDF manual.

### 77.40.492 GetSysFontInfo as DynaPDFSysFontMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the most important properties of a system font.
**Example:**

```
// list all fonts
dim d as new DynaPDFMBS

dim f as DynaPDFSysFontMBS = d.GetSysFontInfo
while f<>nil
Listbox1.AddRow f.FamilyName

f = f.NextFont
wend
```

**Notes:** The function returns the fonts in the current font search order. That means if the search order is { fbtTrueType, fbtOpenType, fbtType1, fbtStdFont } , for example, then the function returns first all TrueType fonts sorted in ascending order, then all OpenType fonts, and so on.
Since standard fonts are no system fonts, these fonts are not returned.
See also GetSysFontInfo function in DynaPDF manual.
See also:

- 77.40.493 GetSysFontInfo(PostscriptName as String) as DynaPDFSysFontMBS 12850

### 77.40.493 GetSysFontInfo(PostscriptName as String) as DynaPDFSysFontMBS

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries system font with given postscript name.
**Example:**

```
dim d as new DynaPDFMBS

// find one font with postscript name
dim font as DynaPDFSysFontMBS = d.GetSysFontInfo("Verdana-BoldItalic")

// find all with family name
dim fonts() as DynaPDFSysFontMBS = d.GetSysFontInfos("Verdana")

Break // see in debugger
```

**Notes:** Returns nil if font is not found.
See also GetSysFontInfo function in DynaPDF manual.

See also:

- 77.40.492 GetSysFontInfo as DynaPDFSysFontMBS 12850

### 77.40.494 GetSysFontInfos as DynaPDFSysFontMBS()

MBS DynaPDF Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with the most important properties of system fonts.
**Example:**

```
dim pdf as new MyDynaPDFMBS

// get all fonts
dim fonts() as DynaPDFSysFontMBS = pdf.GetSysFontInfos

// add one row for each font
for each f as DynaPDFSysFontMBS in fonts

dim name as string = f.FamilyName

if f.BaseType = pdf.kfbtOpenType and f.CIDOrdering = "" then
// This font cannot be used with Unicode

else
// Anything is ok
end if

next
```

**Notes:** The function returns the fonts in the current font search order. That means if the search order is { fbtTrueType, fbtOpenType, fbtType1, fbtStdFont } , for example, then the function returns first all TrueType fonts sorted in ascending order, then all OpenType fonts, and so on.
Since standard fonts are no system fonts, these fonts are not returned.
See also:

- 77.40.495 GetSysFontInfos(Name as String) as DynaPDFSysFontMBS() 12851

### 77.40.495 GetSysFontInfos(Name as String) as DynaPDFSysFontMBS()

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with the most important properties of system fonts.
**Example:**

```
dim d as new DynaPDFMBS

// find one font with postscript name
dim font as DynaPDFSysFontMBS = d.GetSysFontInfo("Verdana-BoldItalic")

// find all with family name
dim fonts() as DynaPDFSysFontMBS = d.GetSysFontInfos("Verdana")

Break // see in debugger
```

**Notes:** Matchs fonts by family name, full name or Postscript name.

The function returns the fonts in the current font search order. That means if the search order is { fbtTrueType, fbtOpenType, fbtType1, fbtStdFont } , for example, then the function returns first all TrueType fonts sorted in ascending order, then all OpenType fonts, and so on.
Since standard fonts are no system fonts, these fonts are not returned.
See also:

- 77.40.494 GetSysFontInfos as DynaPDFSysFontMBS() 12851

### 77.40.496 GetTabLen as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the tabulator length in spaces that is used to emulate tabulators during text formatting (see WriteFText() for further information).
See also GetTabLen function in DynaPDF manual.

### 77.40.497 GetTemplCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the number of templates used by a page.
See also GetTemplCount function in DynaPDF manual.

### 77.40.498 GetTemplHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the handle of the current open template or a negative error code on failure.
See also GetTemplHandle function in DynaPDF manual.

### 77.40.499 GetTemplHeight(Handle as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the height of a template.
See also GetTemplHeight function in DynaPDF manual.

### 77.40.500 GetTemplWidth(Handle as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the width of a template. The parameter Handle must be a valid template handle.
**Notes:** If the function succeeds the return value is the width of the template. If the function fails the return value is a negative error code.
See also GetTemplWidth function in DynaPDF manual.

### 77.40.501 GetTextDrawMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the text draw mode. Se draw modes are described in detail under SetTextDrawMode().
See also GetTextDrawMode function in DynaPDF manual.

### 77.40.502 GetTextFieldValue(Field as Integer, byref Value as string, byref DefValue as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the text of a field.
**Notes:** The strings may be ANSI or Unicode encoded.
See also GetTextFieldValue function in DynaPDF manual.

### 77.40.503 GetTextHeight(Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function measures the height of a formatted text block.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF instance

dim text as string = "Hello \ul#World"

dim h1 as Integer = pdf.GetTextHeight(pdf.ktaLeft, text)
dim h2 as Integer = pdf.GetFTextHeight(pdf.ktaLeft, text)

dim h3 as Integer = pdf.GetTextHeightEx(150, pdf.ktaLeft, text)
dim h4 as Integer = pdf.GetFTextHeightEx(150, pdf.ktaLeft, text)

// see different heights in debugger.
```

**Notes:** GetTextHeight does escape backslashes so no formatting commands are taken from the string. The text parameter is converted to unicode.

### 77.40.504 GetTextHeightAnsi(Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function measures the height of a formatted text block.
**Notes:** GetTextHeightAnsi does escape backslashes so no formatting commands are taken from the string.

The text parameter is converted to ANSI.

### 77.40.505 GetTextHeightEx(Width as Double, Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function measures the height of a formatted text block.
**Example:**

```
dim pdf as new MyDynaPDFMBS

call pdf.CreateNewPDF nil
```

```
call pdf.Append

call pdf.SetFont("Helvetica", pdf.kfsnone, 12, true, pdf.kcpUnicode)

dim h as Double = pdf.GetTextHeightEx(100, pdf.ktaLeft, "Hello World. Just a test string.")

MsgBox "height: "+str(h)

call pdf.EndPage
call pdf.CloseFile
```

**Notes:** GetTextHeightEx does escape backslashes so no formatting commands are taken from the string. The text parameter is converted to unicode.

### 77.40.506 GetTextHeightExAnsi(Width as Double, Align as Integer, aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function measures the height of a formatted text block.
**Notes:** GetTextHeightExAnsi does escape backslashes so no formatting commands are taken from the string. The text parameter is converted to ANSI.

### 77.40.507 GetTextRect(byref PosX as Double, byref PosY as Double, byref Width as Double, byref Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the bounding rectangle to output formatted text.
See also GetTextRect function in DynaPDF manual.

### 77.40.508 GetTextRise as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current text rise used to output text.
See also GetTextRise function in DynaPDF manual.

### 77.40.509 GetTextScaling as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current value of horizontal text scaling.
See also GetTextScaling function in DynaPDF manual.

### 77.40.510 GetTextWidth(aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function calculates the width of a string.
**Notes:** The text parameter is converted to unicode.
See also GetTextWidth function in DynaPDF manual.
See also:

- 77.40.511 GetTextWidth(FontHandle as integer, Text as String, CharSpacing as Single, WordSpacing as Single, TextScale as Single) as double 12856

### 77.40.511 GetTextWidth(FontHandle as integer, Text as String, CharSpacing as Single, WordSpacing as Single, TextScale as Single) as double

MBS DynaPDF Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates text width.
**Notes:** The function can be used to calculate the width of a sub string that was returned by the content parser (see ParseContent() for further information). The parameter FontHandle must be a valid handle of a font object that was provided in the SetFont event. Note that this function is optimized for speed and does not use the normal error handling of DynaPDF. The parameters CharSpacing, WordSpacing, and TextScale must be taken from the current graphics state.

If the function succeeds the return value is the string width measured in text space. If the parameter FontHandle is set 0 the return value is 0.0.
See also GetTextWidth function in DynaPDF manual.
See also:

- 77.40.510 GetTextWidth(aText as string) as Double 12856

### 77.40.512 GetTextWidthAnsi(aText as string) as Double

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function calculates the width of a string.

**Notes:** The text parameter is converted to ANSI.

### 77.40.513 GetTIFFVersion as String

MBS DynaPDF Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of tiff library.
**Notes:** Should be 3.7.2 on plugins 17.1.
Version is always same on Mac, Windows and Linux.
If you notice a mismatch, something is wrong!

### 77.40.514 GetTransparentColor as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the transparent color value that is used for newly inserted images.
See also GetTransparentColor function in DynaPDF manual.

### 77.40.515 GetTrapped as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the trapped key of the document.
See also GetTrapped function in DynaPDF manual.

### 77.40.516 GetTypoLeading as double

MBS DynaPDF Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the typographic leading or line height of a font.
**Notes:** This is sTypoAscender –sTypoDescender + sTypoLineGap of the OS/2 table of TrueType and OpenType fonts. The value is scaled to the current font size. Type1 fonts do not support these metrics.

The function can be called after a font was activated in the graphics state, e.g. with SetFont(), SetFontEx(), SetCIDFont(), or ChangeFont().

If typographic metrics are not available the return value is Ascent –Descent. If the value is smaller than the font size then the font size is returned.

If the function succeeds the return value is the typographic leading of the active font, this is a value greater zero. If the function fails the return value is a negative error code.
See also GetTypoLeading function in DynaPDF manual.

### 77.40.517 GetURIAction(index as Integer) as DynaPDFURIActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries details for an URI action.
**Notes:** Index is from 0 to GetActionCount-1.
See also GetURIAction function in DynaPDF manual.

### 77.40.518 GetUseExactPwd as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the property UseExactPwd is false, an encrypted PDF file can always be decrypted, if either the open or owner password in the file is an empty string.
See also GetUseExactPwd function in DynaPDF manual.

### 77.40.519 GetUseGlobalImpFiles as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether import files should be loaded permanent into memory, e.g. to enable splitting of large PDF files.
See also GetUseGlobalImpFiles function in DynaPDF manual.

### 77.40.520 GetUserRights as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the encryption flags of an imported PDF file or -1 if the imported PDF file was not encrypted.
See also GetUserRights function in DynaPDF manual.

### 77.40.521 GetUserUnit as single

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the user unit of the current open page.
**Notes:** A user unit acts like a scaling factor. The page format and all page coordinates are multiplied with this factor in a viewer application. The default size of a PDF unit is 1/72 inch and the default user unit is 1.0. User units can be useful if the page format would be too large to be expressed in standard PDF units. The largest page format in PDF is limited to 14400 units or 200 inches. This limit can be extended with the user unit.
The largest value that is supported is 75.0 which results in a maximum page format of 15,000 x 15,000 inches or 1,800,000 units.
See also GetUserUnit function in DynaPDF manual.

### 77.40.522 GetUseStdFonts as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns 1 (true) if the 14 standard fonts are enabled.
See also GetUseStdFonts function in DynaPDF manual.

### 77.40.523 GetUsesTransparency(Page as Integer = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether a page or the entire document uses transparency.
**Notes:** This is no quick check as GetDocUsesTransparency() applies. The function parses the page or pages to determine whether transparent objects are relly used.
To check whether a specific page uses transparency set the parameter PageNum to the wished page number. The first page is denoted by 1. To check the entire PDF file set PageNum to -1.

The return value is a bit mask on success (a positive integer value), or a negative error code on failure.
The following flags are defined:

- 0: The page or document uses no transparency.
- 1: The content stream of a page contains transparent objects.
- 2: A page defines the blending color space (Group dictionary).
- 4: A page contains transparent annotations or form fields.

The above values can occur in any combination. To check whether a specific flag was set use a binary and operator: BitwiseAnd(value, flag)
See also GetUsesTransparency function in DynaPDF manual.

### 77.40.524 GetUseSystemFonts as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether the %Windows%/Fonts directory should be added automatically to the list of available font search paths.
See also GetUseSystemFonts function in DynaPDF manual.

### 77.40.525 GetUseTransparency as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether images should get a transparent background.
See also GetUseTransparency function in DynaPDF manual.

### 77.40.526 GetUseVisibleCoords as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether DynaPDF should consider the crop box to calculate to position of an object.
See also GetUseVisibleCoords function in DynaPDF manual.

### 77.40.527 GetViewerPreferences(byref Preference as Integer, byref AddVal as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the viewer preferences specified in the document.
See also GetViewerPreferences function in DynaPDF manual.

### 77.40.528 GetViewport(Page as UInt32, index as Integer) as DynaPDFViewportMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a viewport that is associated with a page.
**Notes:** A viewport is a rectangular region of a page, that specifies usually a measure coordinate system or points in a geospatical coordinate system.
Since viewports might overlap, to determine the viewport to use for any point on a page, the viewports in the array shall be examined, starting with the last one and iterating in reverse, and the first one whose BBox

entry contains the point shall be chosen.
To determine how viewports and measure dictionaries can be used, please have a look into the PDF Reference 2.0, ISO/DIS 32000-2, Section Measurement properties.
Returns nil on any error.
See also GetViewport function in DynaPDF manual.

### 77.40.529 GetViewportCount(Page as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of viewports which are associated with a page.
**Notes:** The first page has the page number 1.
If the function succeeds the return value is the number of viewports, a number greater or equal zero. If the function fails the return value is a negative error code. The function can only fail if the page number is invalid.
See also GetViewportCount function in DynaPDF manual.

### 77.40.530 GetWMFDefExtent(byref width as Integer, byref height as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the default size which is used to convert non portable WMF files to EMF.
See also GetWMFDefExtent function in DynaPDF manual.

### 77.40.531 GetWMFPixelPerInch as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the default pixels per inch of the y-axis which are used to convert portable WMF files to EMF.
See also GetWMFPixelPerInch function in DynaPDF manual.

### 77.40.532 GetWordSpacing as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the current word spacing.
See also GetWordSpacing function in DynaPDF manual.

### 77.40.533 GetXFAStream(Handle as UInt32) as DynaPDFXFAStreamMBS

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns an XFA stream.
**Notes:** The parameter Index is the array index. The function GetXFAStreamCount() returns the number of available streams.
An XFA form consist of several XML streams. The stream name must be used to determine which stream was returned.
If the function succeeds the return value is 1. If the function fails the return value is 0.
See also GetXFAStream function in DynaPDF manual.

### 77.40.534 GetXFAStreamCount as Integer

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of available XFA streams.
**Notes:** XFA streams are available after a PDF file was imported.
If the function succeeds the return value is the number of available XFA streams. If the function fails the return value is a negative error code.
See also GetXFAStreamCount function in DynaPDF manual.

### 77.40.535 GetZlibVersion as String

MBS DynaPDF Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of zlib library.
**Notes:** Should be 1.2.7 on plugins 17.x.
Version is always same on Mac, Windows and Linux.
If you notice a mismatch, something is wrong!

### 77.40.536 GofRGB(RGB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns G of a RGB color value.
**Example:**

```
dim rgb as Integer = DynaPDFMBS.RGB(1,2,3)
MsgBox str(DynaPDFMBS.GofRGB(rgb)) // shows 2
```

### 77.40.537 HaveDPartRoot as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether the PDF file in memory contains a DPartRoot dictionary.
**Notes:** DPart stands for Document Parts. DParts are a feature of PDF/VT, a PDF format for the printing industry.
The function should be used to determine whether a DPart structure is already in memory, before calling CreateDPartRoot() since the function would fail if this is the case.
An existing DPart structure can be extended with additional DPart nodes, but it is not yet possible to edit existing nodes.

If the document contains a DPartRoot dictionary, the return value is true or false otherwise.
See also HaveDPartRoot function in DynaPDF manual.

### 77.40.538 HaveOpenDoc as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If an error occurred it is not always clear whether the PDF file was already deleted or if it is still in memory.
See also HaveOpenDoc function in DynaPDF manual.

### 77.40.539 HaveOpenPage as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a page is open.
See also HaveOpenPage function in DynaPDF manual.

### 77.40.540 HighlightAnnot(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a highlight annotation with unicode text.
See also HighlightAnnot function in DynaPDF manual.

### 77.40.541 HighlightAnnotAnsi(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, ColorValue as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds a highlight annotation with ANSI text.

### 77.40.542 HighlightOnAllPages(SearchText as string, ColorValue as Color, CaseInsenitive as boolean = false) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Highlights text on all pages of the current document.
**Notes:** If CaseInsenitive is true, the case of letters is ignored (also umlauts and accents)
Searches on all pages in the document.
Returns number of times the text was found.

### 77.40.543 HighlightOnCurrentPage(SearchText as string, ColorValue as Color, CaseInsenitive as boolean = false) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Highlights text on all pages of the current page.
**Notes:** If CaseInsenitive is true, the case of letters is ignored (also umlauts and accents)
Use EditPage function to open the page before you search on it.
Returns number of times the text was found.

### 77.40.544 ImportBookmarks as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function imports the outline tree of the currently opened import file (see OpenImportFile() or OpenImportBuffer()).
See also ImportBookmarks function in DynaPDF manual.

### 77.40.545 ImportCatalogObjects as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function imports global objects of the currently opened import file such as bookmarks, JavaScripts, embedded files, open actions, invisible page templates, rendering intents, the document info entries, and certain other global properties such as the page mode or page layout.
See also ImportCatalogObjects function in DynaPDF manual.

### 77.40.546 ImportDocInfo as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function imports the document info entries from the currently opened import file.
See also ImportDocInfo function in DynaPDF manual.

### 77.40.547 ImportEncryptionSettings as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Imports the encryption settings from the currently open import file (see OpenImportFile() or OpenImportBuffer() for further information).
**Notes:** If the PDF file is not encrypted, the function does nothing. To determine whether the open PDF file is encrypted call GetInIsEncrypted().
The encryption settings should be imported to make sure that the PDF file can be saved with the same settings after it was edited. The user rights should be considered if the file was opened with the open password, also if the password was just an empty string. See GetUserRights() for further information.
If the file was opened with the owner password, then all editing rights should be grated. The PDF file must be closed with CloseFile() or CloseAndSignFile() for example. Don't use
CloseFileEx() for example since this function would override the encryption settings.
If the file should be saved unencrypted call ResetEncryptionSettings() before closing the file. Return values: If the function succeeds the return value is true. If the function fails the return value is false.
See also ImportEncryptionSettings function in DynaPDF manual.

### 77.40.548 ImportOCProperties as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Imports the global Optional Content Properties of the curent open import file.
**Notes:** OC properties are normally automatically imported by functions like ImportPDFFile() or when importing a page that contains layers. However, a viewer application must be able to access the OC properties right after the PDF file was opened so that the layer configuration and the layer tree can be loaded (see LoadLayerConfig() and GetOCUINode() for further information).
The function can be called multiple times without causing unwanted side effects.

If the function succeeds the return value is true. If the function fails the return value is false.

See also ImportOCProperties function in DynaPDF manual.

### 77.40.549 ImportPage(PageNum as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function imports a page of an external PDF file and converts this page to a template.
**Notes:** Requires DynaPDF Pro license.
See also ImportPage function in DynaPDF manual.

### 77.40.550 ImportPageEx(PageNum as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function imports a PDF page of an external PDF file incl. interactive objects such as annotations, form fields and so on, if any.
**Notes:** Requires DynaPDF Pro license.
See also ImportPageEx function in DynaPDF manual.

### 77.40.551 ImportPDFFile(DestPage as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function imports an external PDF file incl. interactive objects such as annotations, bookmarks, form fields and so on.
**Example:**

```
// new PDF
Dim pdf As New MyDynapdfMBS

pdf.SetLicenseKey "Lite" // For this example you can use a Lite, Pro or Enterprise License

// create output file
Dim outFile As folderitem = SpecialFolder.Desktop.Child("NewPDF.pdf")
Call pdf.CreateNewPDF(outFile)

// set flags to import all
Dim flags As Integer = Bitwise.BitOr(pdf.kifImportAsPage, pdf.kifImportAll)
Call pdf.SetImportFlags(flags)

// import PDF
```

```
Dim inFile As folderitem = SpecialFolder.Desktop.Child("test.pdf")

Call pdf.OpenImportFile(inFile)
Call pdf.ImportPDFFile(1)

// now delete one page
Call pdf.DeletePage(2)

// close output file
Call pdf.closefile
```

**Notes:** Scaling factor is ignored if importing as pages (not templates).

This function returns the page number of the last page imported. It does not return how many pages are imported. If you need number of imported pages, please use returned value minus DestPage.
See also ImportPDFFile function in DynaPDF manual.

### 77.40.552 ImportPDFPage(PageNum as Integer, ScaleX as Double = 1.0, ScaleY as Double = 1.0) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Imports a PDF page.
**Notes:** If a page is open, this function calls EndPage.
Than it appends a new page, calls ImportPageEx and Endpage.

On success the return value is zero. If the function fails the return value is a negative error code.
See also ImportPDFPage function in DynaPDF manual.

### 77.40.553 InitColorManagement(profiles as DynaPDFColorProfilesMBS, DestSpace as Integer, Flags as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes color management with the given default profiles.
**Notes:** Pass nil for profiles to disable color management.
DestSpace can be kcsDeviceRGB, kcsDeviceCMYK or kcsDeviceGray.
Flags can be kicmDefault or kicmBPCompensation for:
Black point compensation preserves the black point when converting CMYK colors to different color spaces.

See also InitColorManagement function in DynaPDF manual.

### 77.40.554 InitColorManagementEx(profiles as DynaPDFColorProfilesExMBS, DestSpace as Integer, Flags as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize color management.
**Notes:** The function enables color management in the functions RenderPage(), RenderPageEx(), RenderPageToImage(), and RenderPDFFile() exactly like InitColorManagement() but accepts ICC profile buffers instead of file paths. See InitColorManagement() for further information.

To disable color management set the parameter Profiles to nil.

Initializing the color management requires a considerable amount of processing time. It is strongly recommended to use one PDF instance as long as possible so that it must not be initialized again when another PDF file will be rendered.
The color management can be initialized right after the PDF instance was created.

Returns true on succes or false on failure.
See also InitColorManagementEx function in DynaPDF manual.

### 77.40.555 InitStack(byref stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function initializes the variable Stack with default values and prepares the editing of a content stream.
**Example:**

```
dim s as DynaPDFStackMBS
dim pdf as DynaPDFMBS // get your DynaPDF object

call pdf.InitStack(s)
```

**Notes:** If stack is nil, a new one will be created and stored in the variable.

Return values:
If the function succeeds the return value is true. If the function fails the return value is false.

See also InitStack function in DynaPDF manual.

### 77.40.556 InkAnnot(points() as DynaPDFPointMBS, LineWidth as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an Ink annotation.
**Notes:** An ink annotation (PDF 1.3) represents a freehand "scribble" composed of one or more disjoint paths. The parameter Points represents a stroked path. More paths can be added with AddInkList.
The points are interpreted in currect user space. Any transformation that was applied on the coordinate system will be taken into account.
The points are connected with bezier curves to achieve a smooth transition between points. If the points should be connected with straight lines, then create a PolyLine annotation instead (see PolyLineAnnot).
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState() if necessary.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also InkAnnot function in DynaPDF manual.

### 77.40.557 InkAnnotAnsi(points() as DynaPDFPointMBS, LineWidth as Double, ColorValue as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates an Ink annotation.
**Notes:** An ink annotation (PDF 1.3) represents a freehand "scribble" composed of one or more disjoint paths. The parameter Points represents a stroked path. More paths can be added with AddInkList.
The points are interpreted in currect user space. Any transformation that was applied on the coordinate system will be taken into account.
The points are connected with bezier curves to achieve a smooth transition between points. If the points should be connected with straight lines, then create a PolyLine annotation instead (see PolyLineAnnot).
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState() if necessary.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.

### 77.40.558 InsertBarcode(PosX as double, PosY as double, Width as double, Height as double, HAlign as Integer, VAlign as Integer, Barcode as DynaPDFBarcode2MBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a barcode to the current open page.
**Example:**

```
Dim d As New DynapdfMBS
// create/edit a page, then draw barcode:

// UPCA
Dim b1 As New DynaPDFBarcode2MBS
b1.BarcodeType = b1.kbctUPCA
b1.Data = "72527270270"

Call d.InsertBarcode(100, 100, 200, 50, d.kcoLeft, d.kcoTop, b1)
```

**Notes:** See the kbct* constants for the types supported.

Options are very similar to what we have in our BarcodeGeneratorMBS class as both use the same zint library.
See also InsertBarcode function in DynaPDF manual.

### 77.40.559 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as memoryblock) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use InsertImageFromBuffer instead. **Function:** The function inserts a Device Independent Bitmap from a file buffer.
See also InsertBMPFromBuffer function in DynaPDF manual.
See also:

- 77.40.560 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string) as Integer 12871

- 77.40.561 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, BufferAddress as Integer) as Integer 12871

### 77.40.560 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use InsertImageFromBuffer instead. **Function:** The function inserts a Device Independent Bitmap from a file buffer.
See also InsertBMPFromBuffer function in DynaPDF manual.
See also:

- 77.40.559 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as memoryblock) as Integer 12870
- 77.40.561 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, BufferAddress as Integer) as Integer 12871

### 77.40.561 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, BufferAddress as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use InsertImageFromBuffer instead. **Function:** The function inserts a Device Independent Bitmap from a file buffer.
See also InsertBMPFromBuffer function in DynaPDF manual.
See also:

- 77.40.559 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as memoryblock) as Integer 12870
- 77.40.560 InsertBMPFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string) as Integer 12871

### 77.40.562 InsertBMPFromHandle(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, hBitmap as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function inserts a bitmap in the same way as InsertImage() but accepts a HBITMAP handle as input.
See also InsertBMPFromHandle function in DynaPDF manual.

### 77.40.563 InsertBookmark(title as String, parent as Integer, DestPage as Integer, Open as boolean, AddChildren as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function inserts a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to unicode.
See also InsertBookmark function in DynaPDF manual.

### 77.40.564 InsertBookmarkAnsi(title as String, parent as Integer, DestPage as Integer, Open as boolean, AddChildren as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function inserts a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to ANSI.

### 77.40.565 InsertBookmarkEx(title as String, parent as Integer, NamedDest as Integer, Open as boolean, AddChildren as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function inserts a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to unicode.
See also InsertBookmarkEx function in DynaPDF manual.

### 77.40.566 InsertBookmarkExAnsi(title as String, parent as Integer, NamedDest as Integer, Open as boolean, AddChildren as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function inserts a bookmark to the global outline tree of the document.
**Notes:** The title parameter is converted to ANSI.

### 77.40.567 InsertImage(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, File as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use InsertImage instead.
**Function:** The function inserts an image from a file.
**Example:**

```
dim pdf as DynaPDFMBS

// ... add page

// use transparency from image
call pdf.SetUseTransparency(False)

// max 300 dpi for recompressed images
call pdf.SetResolution(300)

// use JPEG when compressing new pictures
call pdf.SetCompressionFilter(pdf.kcfJPEG)

// pass through JPEGs if possible
call pdf.SetSaveNewImageFormat(false)

// insert image
dim source as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
call pdf.InsertImage(0, 0, 300, 200, source)
```

**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.

DynaPDF 3.0 adds support for pictures with alpha channel for this function.
See also InsertImage function in DynaPDF manual.

### 77.40.568 InsertImageEx(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, File as folderitem, index as Integer = 1) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image from a file.
**Example:**

```
dim pdf as DynaPDFMBS
```

```
// ... add page

// use transparency from image
call pdf.SetUseTransparency(False)

// max 300 dpi for recompressed images
call pdf.SetResolution(300)

// use JPEG when compressing new pictures
call pdf.SetCompressionFilter(pdf.kcfJPEG)

// pass through JPEGs if possible
call pdf.SetSaveNewImageFormat(false)

// insert image
dim source as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
call pdf.InsertImageEx(0, 0, 300, 200, source)
```

**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.

DynaPDF 3.0 adds support for pictures with alpha channel for this function.
See also InsertImageEx function in DynaPDF manual.
See also:

- 77.40.569 InsertImageEx(PosX as double, PosY as double, ScaleWidth as double, ScaleHeight as double, Path as String, index as integer = 1) as integer 12874

### 77.40.569 InsertImageEx(PosX as double, PosY as double, ScaleWidth as double, ScaleHeight as double, Path as String, index as integer = 1) as integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image from a file.
**Example:**

```
Dim d As New DynaPDFMBS

// create PDF in memory
Call d.CreateNewPDF

// add a picture
Call d.Append
```

```
Call d.InsertImageEx(100, 100, 100, 100, "/Users/cs/Pictures/mond.jpg")
Call d.EndPage

// okay?
If d.HaveOpenDoc Then

// open target file
Call d.OpenOutputFile("/Users/cs/Desktop/mond.pdf")

// write and close
Call d.CloseFile

End If
```

**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.

DynaPDF 3.0 adds support for pictures with alpha channel for this function.
See also InsertImageEx function in DynaPDF manual.
See also:

- 77.40.568 InsertImageEx(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, File as folderitem, index as Integer = 1) as Integer 12873

### 77.40.570 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as Memoryblock, index as Integer = 1) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image in exactly the same way as InsertImageEx(), but it accepts a file buffer as input.
**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.

DynaPDF 3.0 adds support for pictures with alpha channel for this function.
Please pass positon and size as doubles. If you use integers, Xojo will give a compile error.
See also InsertImageFromBuffer function in DynaPDF manual.
See also:

- 77.40.571 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string, index as Integer = 1) as Integer 12876

### 77.40.571 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as string, index as Integer = 1) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image in exactly the same way as InsertImageEx(), but it accepts a file buffer as input.
**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.

DynaPDF 3.0 adds support for pictures with alpha channel for this function.
Please pass positon and size as doubles. If you use integers, Xojo will give a compile error.
See also InsertImageFromBuffer function in DynaPDF manual.
See also:

- 77.40.570 InsertImageFromBuffer(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Buffer as Memoryblock, index as Integer = 1) as Integer 12875

### 77.40.572 InsertMetafile(FileName as folderitem, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic.
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafile function in DynaPDF manual.

### 77.40.573 InsertMetafileEx(Buffer as memoryblock, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic in the same way as InsertMetafile().
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileEx function in DynaPDF manual.
See also:

- 77.40.574 InsertMetafileEx(Buffer as string, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12877

### 77.40.574 InsertMetafileEx(Buffer as string, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic in the same way as InsertMetafile().
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileEx function in DynaPDF manual.
See also:

- 77.40.573 InsertMetafileEx(Buffer as memoryblock, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12876

### 77.40.575 InsertMetafileExt(FileName as folderitem, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic in the same way as InsertMetafile().
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileExt function in DynaPDF manual.

### 77.40.576 InsertMetafileExtEx(Buffer as Memoryblock, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic in the same way as InsertMetafileExt().
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileExtEx function in DynaPDF manual.
See also:

- 77.40.577 InsertMetafileExtEx(Buffer as String, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12878

### 77.40.577 InsertMetafileExtEx(Buffer as String, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts an Enhanced Meta File (EMF) or Windows Meta File (WMF) to a native PDF vector graphic in the same way as InsertMetafileExt().
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileExtEx function in DynaPDF manual.
See also:

- 77.40.576 InsertMetafileExtEx(Buffer as Memoryblock, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean 12877

### 77.40.578 InsertMetafileFromHandle(hEnhMetafileHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function inserts an Enhanced Metafile exactly in the same way as InsertMetafile() but accepts a HENHMETAFILE handle as input.
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileFromHandle function in DynaPDF manual.

### 77.40.579 InsertMetafileFromHandleEx(hEnhMetafileHandle as Integer, View as DynaPDFRectMBS, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function inserts an Enhanced Metafile exactly in the same way as InsertMetafileExt() but accepts a HENHMETAFILE handle as input.
**Notes:** Requires DynaPDF Lite license.
See also InsertMetafileFromHandleEx function in DynaPDF manual.

### 77.40.580 InsertPicture(pic as picture, mask as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes a Xojo picture with a mask and adds it to the PDF.
**Example:**

```
// insert MBS Logo with round Mask
dim d as new MyDynaPDFMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

call d.CreateNewPDF file
call d.Append

// get picture
dim p as Picture = LogoMBS(500)

// get mask
dim m as new Picture(500, 500, 32)
m.Graphics.ForeColor = &cFFFFFF
m.Graphics.FillRect 0,0,500,500
m.Graphics.ForeColor = &c000000
m.Graphics.FillOval 0,0,500,500

// add image to pdf
call d.InsertPicture(p, m, 50, 150, 500, 500)

call d.EndPage
call d.CloseFile
```

**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.
This is a convenience function to handle picture with mask.

Internally this calls pdfInsertRawImage so check the documtation on this function in the dynapdf manual.
For images with alpha channel, we pass a PNG via pdfInsertImageFromBuffer.

Usually InsertPicture with the mask/alpha is better.
PosX and PosY are the destination position and ScaledWidth and ScaledHeight is the new size of the image.
See also:

- 77.40.581 InsertPicture(pic as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12879

### 77.40.581 InsertPicture(pic as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes a Xojo picture and adds it to the PDF.
**Notes:** Please call SetUseTransparency(false) before inserting image if you don't like one of the colors (default white) to become transparent.
Internally this calls pdfInsertRawImage so check the documtation on this function in the dynapdf manual.
For images with alpha channel, we pass a PNG via pdfInsertImageFromBuffer.

PosX and PosY are the destination position and ScaledWidth and ScaledHeight is the new size of the image.
See also:

- 77.40.580 InsertPicture(pic as picture, mask as picture, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12878

### 77.40.582 InsertRawImage(Data as String, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image from a raw image buffer which contains no image header.
See also InsertRawImage function in DynaPDF manual.
See also:

- 77.40.583 InsertRawImage(Memory as MemoryBlock, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12880

### 77.40.583 InsertRawImage(Memory as MemoryBlock, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image from a raw image buffer which contains no image header.
See also InsertRawImage function in DynaPDF manual.
See also:

- 77.40.582 InsertRawImage(Data as String, BitsPerPixel as Integer, ColorCount as Integer, ImgWidth as Integer, ImgHeight as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Integer 12880

### 77.40.584 InsertRawImageEx(PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double, Image as DynaPDFRawImageMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts an image from a raw image buffer that contains no image header.
**Notes:** See also InsertRawImageEx in dynapdf_help.pdf manual file.
Returns false if image parameter has invalid values.
See also InsertRawImageEx function in DynaPDF manual.

### 77.40.585 IsBidiText(Text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function returns the position of the first bidirectional character that can be found in the string or -1 if no such character can be found.
**Notes:** The text parameter is converted to unicode.
See also IsBidiText function in DynaPDF manual.

### 77.40.586 IsColorPage(GrayIsColor as Boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function checks whether a page is a color page or if all graphic elements of the page use black & white only.
**Notes:** Value is 0 for false, 1 for true or negative for an error.
See also IsColorPage function in DynaPDF manual.

### 77.40.587 IsEmptyPage as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function checks whether a page is empty.
**Notes:** Value is 0 for false, 1 for true or negative for an error.
See also IsEmptyPage function in DynaPDF manual.

### 77.40.588 IsWrongPwd(errCode as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an error code is for a wrong password.
**Notes:** We have several error codes which result from different password protections and this function considers them all.
See also IsWrongPwd function in DynaPDF manual.

### 77.40.589 IterateAnnotations as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over annotations.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add an annotation

For Each Annotation As DynaPDFAnnotationExMBS In d.IterateAnnotations

Dim Nmae As String = Annotation.Name

Break
Next
```

**Notes:** The value is a DynaPDFAnnotationExMBS object.

### 77.40.590 IterateBookmarks as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over bookmarks.
**Example:**

```
Dim d As New DynaPDFMBS

For Each Bookmark As DynaPDFBookmarkMBS In d.IterateBookmarks

Dim Name As String = Bookmark.Title

Break
Next
```

**Notes:** The value is a DynaPDFBookmarkMBS object.

### 77.40.591 IterateCMaps as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over character maps.
**Example:**

```
Dim d As New DynaPDFMBS

For Each CMap As DynaPDFCMapMBS In d.IterateCMaps

Dim Name As String = CMap.CMapName

Break
Next
```

**Notes:** The value is a DynaPDFCMapMBS object.

### 77.40.592 IterateColorSpaces as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over Colorspaces.
**Example:**

```
Dim d As New DynaPDFMBS

For Each ColorSpace As DynaPDFColorSpaceMBS In d.IterateColorSpaces

Dim Name As String = ColorSpace.Name

Break
Next
```

**Notes:** The value is a DynaPDFColorSpaceMBS object.

### 77.40.593 IterateEmbeddedFiles(Decompress as boolean = false) as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over embedded files.
**Example:**

```
Dim d As New DynaPDFMBS
```

```
For Each fileSpace As DynaPDFFileSpecMBS In d.IterateEmbeddedFiles

Dim Name As String = fileSpace.Name

Break
Next
```

**Notes:** The value is a DynaPDFFileSpecMBS object.

### 77.40.594 IterateErrLogMessages as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over error log messages.
**Example:**

```
Dim d As New DynaPDFMBS

For Each Error As DynaPDFErrorMBS In d.IterateErrLogMessages

Dim Name As String = Error.Message

Break
Next
```

**Notes:** The value is a DynaPDFErrorMBS object.

### 77.40.595 IterateFields as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over fields.
**Example:**

```
Dim d As New DynaPDFMBS

For Each Field As DynaPDFFieldExMBS In d.IterateFields

Dim Name As String = Field.FieldName

Break
Next
```

**Notes:** The value is a DynaPDFFieldExMBS object.

### 77.40.596 IterateFonts as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over fonts.
**Example:**

```
Dim d As New DynaPDFMBS

Call d.CreateNewPDF

Call d.Append
Call d.SetFont("Geneva")

// now we can find fonts like Helvetica (default) and our Geneva
For Each Font As DynaPDFFontMBS In d.IterateFonts

Dim Name As String = Font.FontName

Break
Next
```

**Notes:** The value is a DynaPDFFontMBS object.

### 77.40.597 IterateImages(ImageFlags as Integer = 0) as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over images.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add pages with images

For Each Image As DynaPDFImageMBS In d.IterateImages

Dim Buffer As String = Image.Buffer

Break
Next
```

**Notes:** The value is a DynaPDFImageMBS object.

### 77.40.598 IterateLayerConfigurations as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over layer configurations.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add pages with layers

For Each layer As DynaPDFOCLayerConfigMBS In d.IterateLayerConfigurations

Dim Name As String = layer.Name

Break
Next
```

**Notes:** The value is a DynaPDFOCLayerConfigMBS object.

### 77.40.599 IterateNamedDestinations as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over named destinations.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add pages with named destinations

For Each dest As DynaPDFNamedDestMBS In d.IterateNamedDestinations

Dim Name As String = dest.Name

Break
Next
```

**Notes:** The value is a DynaPDFNamedDestMBS object.

### 77.40.600 IterateOCGs as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over OCGs.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add pages with layers

For Each layer As DynaPDFOCGMBS In d.IterateOCGs

Dim IsVisible As Boolean = layer.IsVisible

Break
Next
```

**Notes:** The value is a DynaPDFOCGMBS object.

### 77.40.601 IterateOutputIntents as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over output intents.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add output intent

For Each OutputIntent As DynaPDFOutputIntentMBS In d.IterateOutputIntents

Dim RegistryName As String = OutputIntent.RegistryName

Break
Next
```

**Notes:** The value is a DynaPDFOutputIntentMBS object.

### 77.40.602 IteratePageAnnotations as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over page annotations.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add annotation

For Each Annotation As DynaPDFAnnotationExMBS In d.IteratePageAnnotations

Dim Name As String = Annotation.Name

Break
Next
```

**Notes:** The value is a DynaPDFAnnotationExMBS object.

### 77.40.603 IteratePageLabels as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over page labels.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add page labels

For Each PageLabel As DynaPDFPageLabelMBS In d.IteratePageAnnotations

Dim Prefix As String = PageLabel.Prefix

Break
Next
```

**Notes:** The value is a DynaPDFPageLabelMBS object.

### 77.40.604 IterateSysFonts as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over system fonts.
**Example:**

```
Dim d As New DynaPDFMBS

For Each Font As DynaPDFSysFontMBS In d.IterateSysFonts

Dim Name As String = Font.FullName

Break
Next
```

**Notes:** The value is a DynaPDFSysFontMBS object.

### 77.40.605 IterateXFAStreams as DynaPDFIteratorMBS

MBS DynaPDF Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterate over XFA Streams.
**Example:**

```
Dim d As New DynaPDFMBS

// load a PDF here or add a XFAStream

For Each XFAStream As DynaPDFXFAStreamMBS In d.IterateXFAStreams

Dim Nmae As String = XFAStream.Name

Break
Next
```

**Notes:** The value is a DynaPDFXFAStreamMBS object.

### 77.40.606 KofCMYK(CMYK as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns K of a CMYK color value.
**Example:**

```
dim cmyk as Integer = DynaPDFMBS.CMYK(1,2,3,4)
MsgBox str(DynaPDFMBS.KofCMYK(cmyk)) // shows 4
```

**Notes:** Returns different values on BigEndian and LittleEndian systems.

### 77.40.607 LAB(L as Integer, A as Integer, B as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a LAB color value based on the given component values.
**Example:**

```
dim lab as Integer = DynaPDFMBS.LAB(1,2,3)
MsgBox hex(lab)
```

### 77.40.608 LineAnnot(x1 as Double, y1 as Double, x2 as Double, y2 as Double, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a line annotation.
See also LineAnnot function in DynaPDF manual.

### 77.40.609 LineAnnotAnsi(x1 as Double, y1 as Double, x2 as Double, y2 as Double, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds a line annotation.

### 77.40.610 LineTo(PosX as Double, PosY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a path from the current position up to the specified point.
**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with Line.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License

// Create a new PDF
call pdf.CreateNewPDF f

// We want to use top-down coordinates
call pdf.SetPageCoords pdf.kpcTopDown

// Add a page
call pdf.Append

// black
```

```
call pdf.SetStrokeColor 0

// line down
call pdf.MoveTo(100,100)
call pdf.LineTo(200,200)
call pdf.StrokePath

// line up
call pdf.MoveTo(200,200)
call pdf.LineTo(300,100)
call pdf.StrokePath

// end page
call pdf.EndPage

// Close page
call pdf.CloseFile

// Open PDF
f.Launch
```

See also LineTo function in DynaPDF manual.

### 77.40.611 LoadCMap(CMapName as string, Embed as Boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a character map.
See also LoadCMap function in DynaPDF manual.

### 77.40.612 LoadError as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message from LoadLibrary call.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.dylib")

if DynaPDFMBS.LoadLibrary(f) then
MsgBox "OK"
else
MsgBox DynaPDFMBS.LoadError
```

end if

### 77.40.613 LoadFDFData(FileName as folderitem, Password as string, Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads PDF form data from the given PDF file.
See also LoadFDFData function in DynaPDF manual.

### 77.40.614 LoadFDFDataEx(Buffer as memoryblock, Password as string, Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads PDF form data from the given PDF file in the buffer.
See also LoadFDFDataEx function in DynaPDF manual.
See also:

- 77.40.615 LoadFDFDataEx(Buffer as string, Password as string, Flags as Integer) as Boolean 12893

### 77.40.615 LoadFDFDataEx(Buffer as string, Password as string, Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads PDF form data from the given PDF file in the buffer.
See also LoadFDFDataEx function in DynaPDF manual.
See also:

- 77.40.614 LoadFDFDataEx(Buffer as memoryblock, Password as string, Flags as Integer) as Boolean 12893

### 77.40.616 LoadFont(Buffer as memoryblock, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font from a file buffer.
**Notes:** Added CollectionIndex parameter in 12.1 plugin version.

See also LoadFont function in DynaPDF manual.
See also:

- 77.40.617 LoadFont(Buffer as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894

### 77.40.617 LoadFont(Buffer as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font from a file buffer.
**Notes:** Added CollectionIndex parameter in 12.1 plugin version.
See also LoadFont function in DynaPDF manual.
See also:

- 77.40.616 LoadFont(Buffer as memoryblock, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12893

### 77.40.618 LoadFontEx(File as folderitem, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font from a font file and activates it in the graphics state if the function was called within an open page or template.
See also LoadFontEx function in DynaPDF manual.
See also:

- 77.40.619 LoadFontEx(Filepath as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894

### 77.40.619 LoadFontEx(Filepath as string, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font from a font file and activates it in the graphics state if the function was called within an open page or template.
See also LoadFontEx function in DynaPDF manual.
See also:

- 77.40.618 LoadFontEx(File as folderitem, Style as Integer, size as Double, Embed as Boolean = false, CodePage as Integer = 2, CollectionIndex as UInt32 = 0) as Integer 12894

### 77.40.620 LoadLayerConfig(Index as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the specified layer configuration.
**Notes:** A PDF file that contains layers (Optional Content Groups in PDF syntax) contains usually at least a default configuration dictionary. This configuration is loaded by default when the visibility state of a layer or optional content group must be determined, e.g. when rendering a page.
Use this function to load another configuration if available. To determine the number of available configurations call GetLayerConfigCount().

The paramter Index can be one of the following:

- -1: Load the default configuration.
- -2: If a configuration was already loaded, leave it unchanged. Load
- the default configuration otherwise.
- 0..Count -1: Load the specified configuration.

If the function succeeds the return value is true. If the function fails the return value is false.
See also LoadLayerConfig function in DynaPDF manual.

### 77.40.621 LoadLibrary(File as FolderItem) as boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dynapdf library file.
**Example:**

```
MsgBox "Version before: "+DynaPDFMBS.DynaPDFVersion

dim f as FolderItem = SpecialFolder.Desktop.Child("dynapdf.dylib")

if DynaPDFMBS.LoadLibrary(f) then
MsgBox "Version after: "+DynaPDFMBS.DynaPDFVersion
else
MsgBox DynaPDFMBS.LoadError
end if
```

**Notes:** Returns true on success or false on failure.

While the plugin comes with an internal dynapdf library, you can use this method to load a different version of the library.
See also:

- 77.40.622 LoadLibrary(Path as string) as boolean 12896

### 77.40.622 LoadLibrary(Path as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dynapdf library file.
**Notes:** Returns true on success or false on failure.

While the plugin comes with an internal dynapdf library, you can use this method to load a different version of the library.
See also:

- 77.40.621 LoadLibrary(File as FolderItem) as boolean 12895

### 77.40.623 LockLayer(layer as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks a layer.
See also LockLayer function in DynaPDF manual.

### 77.40.624 LofLAB(LAB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns L of a LAB color value.
**Example:**

```
dim lab as Integer = DynaPDFMBS.LAB(1,2,3)
MsgBox str(DynaPDFMBS.LofLAB(lab)) // shows 1
```

### 77.40.625 MarkTemplateAsWatermark(TemplateHandle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Marks template as watermark.
**Notes:** The function adds additional metadata to a template (XObject type Form in PDF terms, see BeginTemplate() or BeginTransparencyGroup() for further information) so that PDF editors like Adobe Acrobat are able to identify the template as watermark.

Watermarks can be deleted with Acrobat and many other PDF editors. DynaPDF can delete such watermarks too with DeleteWatermark() or Optimize().

Returns true on success or false on failure.
See also MarkTemplateAsWatermark function in DynaPDF manual.

### 77.40.626 MofCMYK(CMYK as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns M of a CMYK color value.
**Example:**

```
dim cmyk as Integer = DynaPDFMBS.CMYK(1,2,3,4)
MsgBox str(DynaPDFMBS.MofCMYK(cmyk)) // shows 2
```

**Notes:** Returns different values on BigEndian and LittleEndian systems.

### 77.40.627 MovePage(source as Integer, dest as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function moves a page to another position in the document.
See also MovePage function in DynaPDF manual.

### 77.40.628 MoveTo(PosX as Double, PosY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function moves the current position to the point specified by PosX, PosY.
**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with Line.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License
```

```
// Create a new PDF
call pdf.CreateNewPDF f

// We want to use top-down coordinates
call pdf.SetPageCoords pdf.kpcTopDown

// Add a page
call pdf.Append

// black
call pdf.SetStrokeColor 0

// line down
call pdf.MoveTo(100,100)
call pdf.LineTo(200,200)
call pdf.StrokePath

// line up
call pdf.MoveTo(200,200)
call pdf.LineTo(300,100)
call pdf.StrokePath

// end page
call pdf.EndPage

// Close page
call pdf.CloseFile

// Open PDF
f.Launch
```

See also MoveTo function in DynaPDF manual.

### 77.40.629 MultiplyMatrix(M1 as DynaPDFMatrixMBS, M2 as DynapdfMatrixMBS, NewMatrix as DynapdfMatrixMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function multiplies two transformation matrices and stores the result in the parameter NewMatrix.
**Notes:** You must pass three non nil matrix references into the function.
See also MultiplyMatrix function in DynaPDF manual.

### 77.40.630 OpenImportBuffer(Buffer as Memoryblock, PwdType as Integer = 0, Password as string = "") as Integer

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function reads an external PDF from a file buffer so that it can be imported entirely or parts of it.
**Notes:** Requires DynaPDF Lite license.
See also OpenImportBuffer function in DynaPDF manual.
See also:

- 77.40.631 OpenImportBuffer(Buffer as string, PwdType as Integer = 0, Password as string = "") as Integer 12899

### 77.40.631 OpenImportBuffer(Buffer as string, PwdType as Integer = 0, Password as string = "") as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function reads an external PDF from a file buffer so that it can be imported entirely or parts of it.
**Notes:** Requires DynaPDF Lite license.
See also OpenImportBuffer function in DynaPDF manual.
See also:

- 77.40.630 OpenImportBuffer(Buffer as Memoryblock, PwdType as Integer = 0, Password as string = "") as Integer 12899

### 77.40.632 OpenImportFile(File as folderitem, PwdType as Integer = 0, Password as string = "") as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function opens an external PDF file so that it can be imported entirely or parts of it.
**Notes:** Requires DynaPDF Lite license.
See also OpenImportFile function in DynaPDF manual.
See also:

- 77.40.633 OpenImportFile(Path as String, PwdType as integer = 0, Password as string = "") as integer 12899

### 77.40.633 OpenImportFile(Path as String, PwdType as integer = 0, Password as string = "") as integer

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function opens an external PDF file so that it can be imported entirely or parts of it.
**Notes:** Requires DynaPDF Lite license.
See also OpenImportFile function in DynaPDF manual.
See also:

- 77.40.632 OpenImportFile(File as folderitem, PwdType as Integer = 0, Password as string = "") as Integer 12899

### 77.40.634 OpenOutputFile(File as folderitem) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function opens the output file into which the PDF file should be written.
**Example:**

```
Dim d As New DynaPDFMBS

// create PDF in memory
Call d.CreateNewPDF

// add a picture
Call d.Append
Call d.InsertImageEx(100, 100, 100, 100, "/Users/cs/Pictures/mond.jpg")
Call d.EndPage

// okay?
If d.HaveOpenDoc Then

// open target file
Dim f As FolderItem = SpecialFolder.Desktop.Child("mond.pdf")
Call d.OpenOutputFile(f)

// write and close
Call d.CloseFile

End If
```

See also OpenOutputFile function in DynaPDF manual.
See also:

- 77.40.635 OpenOutputFile(Path as String) as Boolean 12900

### 77.40.635 OpenOutputFile(Path as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function opens the output file into which the PDF file should be written.
**Example:**

```
Dim d As New MyDynaPDFMBS

// create PDF in memory
Call d.CreateNewPDF

// add a picture
Call d.Append
Call d.InsertImageEx(100, 100, 100, 100, "/Users/cs/Pictures/mond.jpg")
Call d.EndPage

// okay?
If d.HaveOpenDoc Then

// open target file
Call d.OpenOutputFile("/Users/cs/Desktop/mond.pdf")

// write and close
Call d.CloseFile

End If
```

See also OpenOutputFile function in DynaPDF manual.
See also:

- 77.40.634 OpenOutputFile(File as folderitem) as Boolean 12900

### 77.40.636 OpenOutputFileEncrypted(File as folderitem, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the output file and sets the encryption parameters.
**Notes:** This function enables in combination with FlushPages the creation of very large encrypted PDF files with minimal memory usage.
The function can be called in a while statement, e.g. to display a open file dialog if the file could not be opened. Once the function succeeds the PDF file can be finished with CloseFile.

If the function succeeds the return value is true. If the function fails the return value is false.
See also OpenOutputFileEncrypted function in DynaPDF manual.
See also:

- 77.40.637 OpenOutputFileEncrypted(Path as String, OpenPwd as string, OwnerPwd as string, KeyLen as integer, Restrict as integer) as Boolean 12902

### 77.40.637 OpenOutputFileEncrypted(Path as String, OpenPwd as string, OwnerPwd as string, KeyLen as integer, Restrict as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the output file and sets the encryption parameters.
**Notes:** This function enables in combination with FlushPages the creation of very large encrypted PDF files with minimal memory usage.
The function can be called in a while statement, e.g. to display a open file dialog if the file could not be opened. Once the function succeeds the PDF file can be finished with CloseFile.

If the function succeeds the return value is true. If the function fails the return value is false.
See also OpenOutputFileEncrypted function in DynaPDF manual.
See also:

- 77.40.636 OpenOutputFileEncrypted(File as folderitem, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Boolean 12901

### 77.40.638 OpenTag(Tag as Integer, Lang as string, AltText as string, Expansion as string, BBox as DynaPDFRectMBS = nil) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tag.
**Notes:** Rect: Optional parameter BBox that is required by the tags btFigure and btTable.

BBox must be defined in the current coordinate system that is used to output the corresponding contents. All transformations will be taken into account.
See also OpenTag function in DynaPDF manual.

### 77.40.639 OpenTagAnsi(Tag as Integer, Lang as string, AltText as string, Expansion as string, BBox as DynaPDFRectMBS = nil) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Opens a tag with ANSI encoding.
**Notes:** Rect: Optional parameter BBox that is required by the tags btFigure and btTable.

### 77.40.640 OpenTagEx(Tag as integer, Lang as string, AltText as string, Expansion as string, Attributes as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tag in the very same way as DynaPDF.OpenTag but supports additional parameters which can be set in a JSON (Javascript Object Notation) like format.
**Notes:** The optional parameter Attributes is a JSON like string. The JSON parser in DynaPDF supports a few extensions to make the definition of additional attributes as easy as possible.
See also OpenTagEx function in DynaPDF manual.

### 77.40.641 Optimize(Flags as Integer = 0, Params as DynaPDFOptimizeParamsMBS = nil) as boolean

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optimizes PDF.
**Example:**

```
dim pdf as new DynapdfMBS
// import PDF here

dim flags as integer = Bitwise.BitOr(_
pdf.kofInMemory, _ // Optimize the file fully in memory. Only useful for small PDF files.
pdf.kofScaleImages, _ // Scale images as specified in the DynaPDFOptimizeParamsMBS class.
pdf.kofNewLinkNames, _ // If set, rename all object links to short names like F1, F2 etc.
pdf.kofDeleteInvPaths, _ // Delete invisible paths.
pdf.kofDeletePrivateData, _ // Delete private data objects from pages, templates, and images.
pdf.kofIgnoreZeroLineWidth, _
pdf.kofDeleteAlternateImages, _ // If set, alternate images will be deleted.
pdf.kofDeleteThumbnails) // Thumbnails can be deleted since PDF viewers can create thumbnails easily on demand.


// pdf.kofInMemory // Optimize the file fully in memory. Only useful for small PDF files.
// pdf.kofConvertAllColors // If set, Separation, DeviceN, and NChannel color spaces will be converted to the device space.
// pdf.kofIgnoreICCBased // If set, ICCBased color spaces will be left unchanged.
// pdf.kofScaleImages // Scale all images
// pdf.kofNewLinkNames // If set, rename all object links to short names like F1, F2 etc.
// pdf.kofDeleteInvPaths // Delete invisible paths. An invisible path is a path that was finished with the no-op operator "n".
// more flags in DynaPDF documentation

Dim o As New DynaPDFOptimizeParamsMBS

o.MinColorRes = 100 // scale images with more than 100 dpi
```

```
o.ResColorImages = 150 // down to 150 dpi

call pdf.Optimize(flags, o)
```

**Notes:** This repairs also a lot of errors in the PDF and can shrink the PDF size.
After optimize, please close PDF. If you need to further edit it, please import it again in a new environment.

You need to use InitColorManagement to get color conversion working well if needed.

Note that this function requires the DynaPDF Pro.
See also Optimize function in DynaPDF manual.

### 77.40.642 PageLink(PosX as Double, PosY as Double, Width as Double, Height as Double, DestPage as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a page link onto the current open page.
See also PageLink function in DynaPDF manual.

### 77.40.643 PageLink2(PosX as Double, PosY as Double, Width as Double, Height as Double, NamedDest as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a page link onto the current open page by using a named destination as target.
See also PageLink2 function in DynaPDF manual.

### 77.40.644 PageLink3(PosX as Double, PosY as Double, Width as Double, Height as Double, NamedDest as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds a page link to the current open page by using a named destination as target.
**Notes:** The difference in comparison to PageLink2() is that the named destination can be defined as string. This makes it possible to create the link, also if you don't have the required information to create the named destination at this point. If the named destination does not exist when the file is closed then the link does nothing. See also, CreateNamedDest().

Return values:
If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.

See also PageLink3 function in DynaPDF manual.

### 77.40.645 PageLinkEx(PosX as Double, PosY as Double, Width as Double, Height as Double, DestType as Integer, DestPage as Integer, a as Double = 0.0, b as Double = 0.0, c as Double = 0.0, d as Double = 0.0) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a page link onto the current open page.
See also PageLinkEx function in DynaPDF manual.

### 77.40.646 PageStatistic(page as Integer = -1) as DynaPDFPageStatisticMBS

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries statistics from a page.
**Notes:** If page is -1 the current open page is used. Else the plugin uses editpage(page) to open the page and run the statistics on that.
Returns nil on any error or statistic value.

### 77.40.647 ParseContent(ParseInterface as DynaPDFParseInterfaceMBS, flags as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses the content of a page.
**Notes:** Requires DynaPDF Pro license.
See also ParseContent function in DynaPDF manual.

### 77.40.648 PlaceImage(ImgHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Images can be used multiple times on different positions and with different sizes. This function places an image onto a page or template that was already inserted beforehand by an image function.
See also PlaceImage function in DynaPDF manual.

### 77.40.649 PlaceSigFieldValidateIcon(SigField as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function places the validation icon in a signature field to the whished position.
See also PlaceSigFieldValidateIcon function in DynaPDF manual.

### 77.40.650 PlaceTemplate(TmplHandle as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function places a template onto a page, another open template, or pattern.
See also PlaceTemplate function in DynaPDF manual.

### 77.40.651 PlaceTemplateEx(TmplHandle as Integer, PosX as Double, PosY as Double, ScaleWidth as Double, ScaleHeight as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Places a template.
See also PlaceTemplateEx function in DynaPDF manual.

### 77.40.652 PolygonAnnot(Vertices() as DynaPDFPointMBS, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a Polygon Annotation.
**Notes:** The vertices are connected by straight lines. The path is always closed before it will be drawn. It is not required to close the path explicitly. At least two vertices must be provided.
The coordinates of the vertices are interpretet in current user space. Any transformation that was applied on the coordinate system will be taken into account.
The stroke or fill color can be set to the special constant kNO_COLOR to fill or stroke the polygon. It is

not allowed to set both colors to kNO_COLOR since this would result in an invisible annotation.
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.
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If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also PolygonAnnot function in DynaPDF manual.

### 77.40.653 PolygonAnnotAnsi(Vertices() as DynaPDFPointMBS, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a Polygon Annotation.
**Notes:** The vertices are connected by straight lines. The path is always closed before it will be drawn. It is not required to close the path explicitly. At least two vertices must be provided.
The coordinates of the vertices are interpretet in current user space. Any transformation that was applied on the coordinate system will be taken into account.
The stroke or fill color can be set to the special constant kNO_COLOR to fill or stroke the polygon. It is not allowed to set both colors to kNO_COLOR since this would result in an invisible annotation.
This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.
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If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.

### 77.40.654 PolyLineAnnot(Vertices() as DynaPDFPointMBS, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a PolyLine Annotation.
**Notes:** The vertices are connected by straight lines. At least two vertices must be provided.

The coordinates of the vertices are interpretet in current user space. Any transformation that was applied on the coordinate system will be taken into account.
The parameter FillColor is only used if the line end style of the start or end point has an interior that can be filled. The special constant kNO_COLOR represents a transparent interior.
The stroke color is required and must not be set to kNO_COLOR.

This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.
The parameter LineWidth must be in the range 0 through 12 units. Values outside the valid range will be adjusted to the nearest allowed value. A zero line width produces a 1 pixel wide line.
The line end styles can be changed if necessary with SetAnnotLineEndStyle.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also PolyLineAnnot function in DynaPDF manual.

### 77.40.655 PolyLineAnnotAnsi(Vertices() as DynaPDFPointMBS, LineWidth as Double, StartLineEndStyle as Integer, EndLineEndStyle as Integer, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Content as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a PolyLine Annotation.
**Notes:** The vertices are connected by straight lines. At least two vertices must be provided.
The coordinates of the vertices are interpretet in current user space. Any transformation that was applied on the coordinate system will be taken into account.
The parameter FillColor is only used if the line end style of the start or end point has an interior that can be filled. The special constant kNO_COLOR represents a transparent interior.
The stroke color is required and must not be set to kNO_COLOR.

This annotation type has an associated PopUp annotation that displays the string Content in a floating window. The initial window state of the associated PopUp annotation is closed by default but the state can be changed with SetAnnotOpenState if necessary.
The parameter LineWidth must be in the range 0 through 12 units. Values outside the valid range will be adjusted to the nearest allowed value. A zero line width produces a 1 pixel wide line.
The line end styles can be changed if necessary with SetAnnotLineEndStyle.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.

### 77.40.656 PrintGetDevMode as String

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries last print dev mode.
**Notes:** You can store this in a preferences file for next printing.
This is same data structure as in WindowsDeviceModeMBS class.

### 77.40.657 PrintGetDevNames(byref Driver as String, byref Device as String, byref Output as String, byref DefaultFlag as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries printer device names.
**Notes:** Driver: File name (without the extension) of the device driver.
Device: Name of the device.
Output: Device name for the physical output medium (output port).
DefaultFlag: 1 if the selected printer is the default one.

Returns true on success or false on failure.

### 77.40.658 PrintPDFFile(TempDir as FolderItem, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Prints current PDF file.
**Notes:** Returns true on success and false on failure.
Flags can be a combination of the flag values kpffPrintAsImage, kpffDefault, kpffColor, kpffAutoRotateAndCenter and kpff1Bit.
Margin can be nil. If not nil, specifies the margins to use.
DCHandle is the handle of the graphics context.

If you only want to print a selection of pages, please only import those pages via ImportPDFPage function. Or use DeletePage to remove the pages you don't want to print.

Does not work with a graphics handle from Xojo 2016r4 and newer due to switch to DirectDraw APIs.
Or in other words, you can use a HDC handle from graphics class in Xojo 2016r3 and older to print PDF.
See also PrintPDFFile function in DynaPDF manual.
See also:

- 77.40.659 PrintPDFFile(TempDir as FolderItem, DocName as string, PrinterName as String, Flags as

Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12910

### 77.40.659 PrintPDFFile(TempDir as FolderItem, DocName as string, PrinterName as String, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: All.

**Function:** Prints current PDF file.
**Notes:** Returns true on success and false on failure.
Flags can be a combination of the flag values kpffPrintAsImage, kpffDefault, kpffColor, kpffAutoRotateAndCenter and kpff1Bit.
Margin can be nil. If not nil, specifies the margins to use.
PrinterName is the name of the printer to use. The plugin will open the printer and print PDF there with default settings.

If you only want to print a selection of pages, please only import those pages via ImportPDFPage function. Or use DeletePage to remove the pages you don't want to print.
See also PrintPDFFile function in DynaPDF manual.
See also:

- 77.40.658 PrintPDFFile(TempDir as FolderItem, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12909

### 77.40.660 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Prints current PDF file with dialog.
**Notes:** Returns true on success and false on failure.
Flags can be a combination of the flag values kpffPrintAsImage, kpffDefault, kpffColor, kpffAutoRotateAndCenter and kpff1Bit.
Margin can be nil. If not nil, specifies the margins to use.
Shows print dialog and allows user to set printer.

If you only want to print a selection of pages, please only import those pages via ImportPDFPage function. Or use DeletePage to remove the pages you don't want to print.

After this call you can use PrintGetDevNames and PrintGetDevMode to get printer settings.

And before this call you can use PrintSetDevMode and PrintSetDevNames to restore printer settings.
See also:

- 77.40.661 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean 12911

### 77.40.661 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Prints current PDF file with dialog.
**Notes:** Returns true on success and false on failure.
Flags can be a combination of the flag values kpffPrintAsImage, kpffDefault, kpffColor, kpffAutoRotateAndCenter and kpff1Bit.
Margin can be nil. If not nil, specifies the margins to use.
Shows print dialog and allows user to set printer.

If you only want to print a selection of pages, please only import those pages via ImportPDFPage function.
Or use DeletePage to remove the pages you don't want to print.

After this call you can use PrintGetDevNames and PrintGetDevMode to get printer settings.
And before this call you can use PrintSetDevMode and PrintSetDevNames to restore printer settings.
See also:

- 77.40.660 PrintPDFFileWithDialog(TempDir as FolderItem, DocName as string, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean 12910

### 77.40.662 PrintPDFPage(PageNumber as Integer, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: All.

**Function:** Prints a page.
**Notes:** See PrintPDFFile for details and options.
See also:

- 77.40.663 PrintPDFPage(PageNumber as Integer, DocName as string, PrinterName as String, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12912

### 77.40.663 PrintPDFPage(PageNumber as Integer, DocName as string, PrinterName as String, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: All.

**Function:** Prints a page.
**Notes:** See PrintPDFFile for details and options.

Version 18.4 and newer use device mode set with DynaPDFMBS.PrintSetDevMode method for printer settings.
See also:

- 77.40.662 PrintPDFPage(PageNumber as Integer, DocName as string, DCHandle as integer, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil) as Boolean 12911

### 77.40.664 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer = 0, Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Prints a page with dialog.
**Notes:** See PrintPDFFileWithDialog for details and options.
See also:

- 77.40.665 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean 12912

### 77.40.665 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer, Margin as DynaPDFRectMBS, PrintParams as DynaPDFPrintParamsMBS, parentWindow as DesktopWindow) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Prints a page with dialog.
**Notes:** See PrintPDFFileWithDialog for details and options.
See also:

- 77.40.664 PrintPDFPageWithDialog(PageNumber as Integer, DocName as string, Flags as Integer = 0,

Margin as DynaPDFRectMBS = nil, PrintParams as DynaPDFPrintParamsMBS = nil, parentWindow as Window = nil) as Boolean 12912

### 77.40.666 PrintSetDevMode(data as MemoryBlock) as Boolean

MBS DynaPDF Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop only.

**Function:** Set last print dev mode.
**Notes:** Returns true on success.
This is same data structure as in WindowsDeviceModeMBS class.
See also:

- 77.40.667 PrintSetDevMode(data as String) as Boolean 12913

### 77.40.667 PrintSetDevMode(data as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Set last print dev mode.
**Notes:** Returns true on success.
This is same data structure as in WindowsDeviceModeMBS class.
See also:

- 77.40.666 PrintSetDevMode(data as MemoryBlock) as Boolean 12913

### 77.40.668 PrintSetDevNames(Driver as String, Device as String, Output as String, DefaultFlag as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Sets printer device names.
**Notes:** Driver: File name (without the extension) of the device driver.
Device: Name of the device.
Output: Device name for the physical output medium (output port).
DefaultFlag: 1 if the selected printer is the default one.

Returns true on success or false on failure.

### 77.40.669 ReadImageFormat(FileName as folderitem, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of an image file.
See also ReadImageFormat function in DynaPDF manual.

### 77.40.670 ReadImageFormat2(FileName as folderitem, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of an image file.
**Example:**

```
// read image format and resolution and calculate physical size
dim bits as integer
dim useZip as Boolean
dim resX as integer = 0
dim resY as integer = 0
dim physHeight as integer
dim physWidth as integer
dim w as integer
dim h as integer

call pdf.ReadImageFormat2(Source, 1, w, h, bits, useZip)
call pdf.ReadImageResolution(Source, 1, resX, resY)

if (resX <>resY and resX >0 and resY >0) then
if (resX >resY) then
physWidth = w
physHeight = h \(resX \resY)
else
physWidth = w \(resY \resX)
physHeight = h
end if
else
physHeight = h
physWidth = w
end if
```

See also ReadImageFormat2 function in DynaPDF manual.

### 77.40.671 ReadImageFormatEx(hBitmap as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of a memory bitmap.
See also ReadImageFormatEx function in DynaPDF manual.

### 77.40.672 ReadImageFormatFromBuffer(Buffer as memoryblock, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of an image in the same way as ReadImageFormat2(), but accepts an image buffer as input.
See also ReadImageFormatFromBuffer function in DynaPDF manual.
See also:

- 77.40.673 ReadImageFormatFromBuffer(Buffer as string, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12915

### 77.40.673 ReadImageFormatFromBuffer(Buffer as string, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the most important properties of an image in the same way as ReadImageFormat2(), but accepts an image buffer as input.
See also ReadImageFormatFromBuffer function in DynaPDF manual.
See also:

- 77.40.672 ReadImageFormatFromBuffer(Buffer as memoryblock, Index as Integer, byref Width as Integer, byref Height as Integer, byref BitsPerPixel as Integer, byref UseZip as Boolean) as Boolean 12915

### 77.40.674 ReadImageResolution(FileName as folderitem, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the horizontal and vertical resolution of an image file.
**Example:**

```
// read image format and resolution and calculate physical size
dim bits as integer
dim useZip as Boolean
dim resX as integer = 0
dim resY as integer = 0
dim physHeight as integer
dim physWidth as integer
dim w as integer
dim h as integer

call pdf.ReadImageFormat2(Source, 1, w, h, bits, useZip)
call pdf.ReadImageResolution(Source, 1, resX, resY)

if (resX <>resY and resX >0 and resY >0) then
if (resX >resY) then
physWidth = w
physHeight = h \(resX \resY)
else
physWidth = w \(resY \resX)
physHeight = h
end if
else
physHeight = h
physWidth = w
end if
```

See also ReadImageResolution function in DynaPDF manual.

### 77.40.675 ReadImageResolutionEx(Buffer as Memoryblock, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the horizontal and vertical resolution of an image file in the same way as ReadImageResolution() but accepts an image buffer as input.
See also ReadImageResolutionEx function in DynaPDF manual.
See also:

- 77.40.676 ReadImageResolutionEx(Buffer as string, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean

### 77.40.676 ReadImageResolutionEx(Buffer as string, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function retrieves the horizontal and vertical resolution of an image file in the same way as ReadImageResolution() but accepts an image buffer as input.
See also ReadImageResolutionEx function in DynaPDF manual.
See also:

- 77.40.675 ReadImageResolutionEx(Buffer as Memoryblock, Index as Integer, byref ResX as Integer, byref ResY as Integer) as Boolean 12916

### 77.40.677 Rectangle(PosX as Double, PosY as Double, Width as Double, Height as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function draws a rectangle.
See also Rectangle function in DynaPDF manual.

### 77.40.678 ReEncryptPDF(File as folderitem, PwdType as Integer, InPwd as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function encrypts an already encrypted or unencrypted PDF file.
See also ReEncryptPDF function in DynaPDF manual.

### 77.40.679 ReEncryptPDFAnsi(Path as string, PwdType as Integer, InPwd as string, OpenPwd as string, OwnerPwd as string, KeyLen as Integer, Restrict as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function encrypts an already encrypted or unencrypted PDF file.
**Notes:** Same as ReEncryptPDF, but takes path name in Windows ANSI encoding.

### 77.40.680 RenameSpotColor(Colorant as string, NewName as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renames a colorant.
**Example:**

```
// your instance
dim pdf as DynaPDFMBS

// rename the color
call pdf.RenameSpotColor("Magenta", "Magenta2")
```

**Notes:** Strings are converted to UTF-8.
See also RenameSpotColor function in DynaPDF manual.

### 77.40.681 RenderAnnotOrField(Handle as UInt32, IsAnnot as boolean, State as Integer, Matrix as DynaPDFMatrixMBS, Flags as Integer, PixFmt as Integer, Filter as Integer, byref Out as DynaPDFBitmapMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function renders an annotation or field independent of the page.
**Notes:** Please check dynapdf_help.pdf for details on RenderAnnotOrField function.
Plugin will fill out parameter only if result is zero.
Requires DynaPDF Pro license.
See also RenderAnnotOrField function in DynaPDF manual.

### 77.40.682 RenderPagePicture(PageNum as Integer) as picture

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders a picture for the page with the given page number.
**Example:**

```
dim pdf as new MyDynaPDFMBS

// For this example you can use a Pro or Enterprise License
pdf.SetLicenseKey "Pro"

// create in memory
call pdf.CreateNewPDF nil
```

```
// set import flags
call pdf.SetImportFlags pdf.kifImportAsPage

// open the PDF file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call pdf.OpenImportFile(f, 0, "")

// import all the pages
call pdf.ImportPDFFile(1, 1.0, 1.0)

// and render first page
dim out as Picture = pdf.RenderPagePicture(1)

// display in window
Backdrop = out
```

**Notes:** Please note that for most cases RenderPageToImage and RenderPDFFile are better choices for rendering. Especially if you plan to compress images later anyway. And you avoid trouble with color matching. For this function to work correct you have to initialize DynaPDF with right color space for screen (Generic RGB on Mac and screen profile for Windows).

The picture size is set to the Cropbox. If no crop box is defined, it uses the media box.

Returns nil on any error.

If you render a lot of pages from the same PDF, consider using DynaPDFRasterizerMBS class as it's faster when you reuse the rasterizer.

Currently not available for Linux Desktop apps.
Requires DynaPDF Pro license.

For pages with orientation of 90 or 270 degree, the plugin will take that into account and swap width/height to have rendered picture have the riuht size.
See also:

- 77.40.683 RenderPagePicture(PageNum as Integer, Width as Integer, Height as Integer, DefScale as Integer = 2, matrix as DynaPDFMatrixMBS = nil) as picture 12920

### 77.40.683 RenderPagePicture(PageNum as Integer, Width as Integer, Height as Integer, DefScale as Integer = 2, matrix as DynaPDFMatrixMBS = nil) as picture

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders a picture for the page with the given page number.
**Example:**

```
dim pdf as new MyDynaPDFMBS

// For this example you can use a Pro or Enterprise License
pdf.SetLicenseKey "Pro"

// create in memory
call pdf.CreateNewPDF nil

// set import flags
call pdf.SetImportFlags pdf.kifImportAsPage

// open the PDF file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call pdf.OpenImportFile(f, 0, "")

// import all the pages
call pdf.ImportPDFFile(1, 1.0, 1.0)

// and render first page with window size
dim out as Picture = pdf.RenderPagePicture(1, Width, Height)

// display in window
Backdrop = out
```

**Notes:** Please note that for most cases RenderPageToImage and RenderPDFFile are better choices for rendering. Especially if you plan to compress images later anyway. And you avoid trouble with color matching. For this function to work correct you have to initialize DynaPDF with right color space for screen (Generic RGB on Mac and screen profile for Windows).

The picture is created with the given size. The PDF page is scaled to fit size. You can use the constants kpsFitBest, kpsFitHeight or kpsFitWidth for the DefScale parameter. The matrix allows you to move, rotate or scale the PDF inside the picture.

Returns nil on any error.

If you render a lot of pages from the same PDF, consider using DynaPDFRasterizerMBS class as it's faster

when you reuse the rasterizer.

Currently not available for Linux Desktop apps.
Requires DynaPDF Pro license.

If page is rotated, please swap width and height yourself.
See also:

- 77.40.682 RenderPagePicture(PageNum as Integer) as picture 12918

### 77.40.684 RenderPageToImage(PageNumber as UInt32, OutFile as folderitem, Resolution as UInt32, Width as UInt32, Height as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function renders a PDF page into an image.
**Example:**

```
dim pdf as new MyDynaPDFMBS // your DynaPDF subclass with Error event filled

// where to get PDF page
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// where to write
dim t as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

pdf.SetLicenseKey "Pro" // For this example you can use a Pro or Enterprise License

call pdf.CreateNewPDF nil
call pdf.SetImportFlags(pdf.kifImportAll + pdf.kifImportAsPage)

// open file
call pdf.OpenImportFile(f,0,"")

// add page
call pdf.Append

// import the page
call pdf.ImportPageEx(1,1.0,1.0)
call pdf.EndPage

// render the page
call pdf.RenderPageToImage(1, t, 72, ImageView1.Width, ImageView1.Height, DynaPDFRasterImageMBS.krfDe-
fault, DynaPDFRasterizerMBS.kpxfRGB, DynaPDFMBS.kcfJPEG, DynaPDFMBS.kifmJPEG)
```

**Notes:** PixFmt: pass kpxf* constants like DynaPDFRasterizerMBS.kpxfRGB.
Filter: Pass kcf* constants like DynaPDFMBS.kcfJPEG.
Format: pass kifm* constants like DynaPDFMBS.kifmJPEG.

The page that should be rendered must be closed (Append() or EditPage() open a page and EndPage() closes a page).
If the parameter OutFile is set to nil the image is created in memory. In this case call GetImageBuffer() to retrieve the image buffer and finally FreeImageBuffer() to release it.

The output image size can be calculated in different ways:

- If Resolution is >0 the image width and height is calculated according to the specified resolution. On a 32 bit machine it is possible to render pages in up to 1200 DPI depending on the page format. Larger resolutions require special techniques like banding to restrict the memory usage. However, no such feature is available in DynaPDF.
- If Width >0 and if Height == 0 the image height is calculated according to the given width to archive an image with exact proportions.
- If Width == 0 and if Height >0 then image width is calculated according to the given height to archive an image with exact proportions.
- If Width >0 and if Height >0 the image is scaled to the width and height.

The pixel format and the output image format must be compatible. Because TIFF is the only image format that supports different compression filters, the parameter Filter will be ignored for all other output formats.
If the function succeeds the return value is true. If the function fails the return value is false.
Requires DynaPDF Pro license.
See also RenderPageToImage function in DynaPDF manual.

### 77.40.685 RenderPageToImageMT(PageNumber as UInt32, OutFile as folderitem, Resolution as UInt32, Width as UInt32, Height as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function renders a PDF page into an image.
**Notes:** PixFmt: pass kpxf* constants like DynaPDFRasterizerMBS.kpxfRGB.
Filter: Pass kcf* constants like DynaPDFMBS.kcfJPEG.
Format: pass kifm* constants like DynaPDFMBS.kifmJPEG.

The page that should be rendered must be closed (Append() or EditPage() open a page and EndPage() closes a page).
If the parameter OutFile is set to nil the image is created in memory. In this case call GetImageBuffer() to retrieve the image buffer and finally FreeImageBuffer() to release it.

The output image size can be calculated in different ways:

- If Resolution is >0 the image width and height is calculated according to the specified resolution. On a 32 bit machine it is possible to render pages in up to 1200 DPI depending on the page format. Larger resolutions require special techniques like banding to restrict the memory usage. However, no such feature is available in DynaPDF.
- If Width >0 and if Height == 0 the image height is calculated according to the given width to archive an image with exact proportions.
- If Width == 0 and if Height >0 then image width is calculated according to the given height to archive an image with exact proportions.
- If Width >0 and if Height >0 the image is scaled to the width and height.

The pixel format and the output image format must be compatible. Because TIFF is the only image format that supports different compression filters, the parameter Filter will be ignored for all other output formats.
If the function succeeds the return value is true. If the function fails the return value is false.

Requires DynaPDF Pro license.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 77.40.686 RenderPageToPicture(PageNum as integer, pic as picture, DefScale as integer = 2, matrix as DynaPDFMatrixMBS = nil, RenderWithAlpha as boolean = false) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders the page into the given picture.
**Example:**

```
dim pdf as new MyDynaPDFMBS

// For this example you can use a Pro or Enterprise License
```

```
pdf.SetLicenseKey "Pro"

// create in memory
call pdf.CreateNewPDF nil

// set import flags
call pdf.SetImportFlags pdf.kifImportAsPage

// open the PDF file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call pdf.OpenImportFile(f, 0, "")

// import all the pages
call pdf.ImportPDFFile(1, 1.0, 1.0)

// create picture
dim out as new Picture(800, 600, 32)

// render first page in the existing picture
call pdf.RenderPageToPicture(1, out)

// display in window
Backdrop = out
```

**Notes:** Please note that for most cases RenderPageToImage and RenderPDFFile are better choices for rendering. Especially if you plan to compress images later anyway. And you avoid trouble with color matching. For this function to work correct you have to initialize DynaPDF with right color space for screen (Generic RGB on Mac and screen profile for Windows).

This method draws into an existing picture. The PDF page is scaled to fit size. You can use the constants kpsFitBest, kpsFitHeight or kpsFitWidth for the DefScale parameter. The matrix allows you to move, rotate or scale the PDF inside the picture.

Returns nil on any error.

This does not work on Linux desktop targets as the plugin can't write into a picture there.

If you render a lot of pages from the same PDF, consider using DynaPDFRasterizerMBS class as it's faster when you reuse the rasterizer.
Requires DynaPDF Pro license.

Added RenderWithAlpha parameter in plugin version 19.0.
If RenderWithAlpha is true, we render with alpha channel. If the destination is a picture has alpha chan-

nel, you should get the alpha there. Otherwise for picture without alpha channel, we only copy RGB channels.

### 77.40.687 RenderPDFFile(OutFile as folderitem, Resolution as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use RenderPDFFileEx instead.
**Function:** The function renders all PDF pages which are currently in memory and stores the result in a proprietary image format.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim pdf as new MyDynaPDFMBS

call pdf.CreateNewPDF nil
call pdf.OpenImportFile(file, 0, "")
call pdf.ImportPDFFile(1, 1.0, 1.0)

// create a TIFF file:

dim outfile as FolderItem = SpecialFolder.Desktop.Child("test.tif")

dim Flags as Integer = DynaPDFRasterImageMBS.krfDefault
dim PixFmt as Integer = DynaPDFRasterizerMBS.kpxfRGB
dim Format as Integer = DynaPDFMBS.kifmTIFF // use kifm* constants
dim Filter as Integer = DynaPDFMBS.kcfLZW // pick a compression scheme for the file format

call pdf.RenderPDFFile(outfile, 300, Flags, PixFmt, Filter, Format)

// create a folder of JPEG file:

dim outfolder as FolderItem = SpecialFolder.Desktop.Child("test files")
outfolder.CreateAsFolder

Flags = DynaPDFRasterImageMBS.krfDefault
PixFmt = DynaPDFRasterizerMBS.kpxfRGB
Format = DynaPDFMBS.kifmJPEG // use kifm* constants
Filter = DynaPDFMBS.kcfJPEG

call pdf.RenderPDFFile(outfolder, 300, Flags, PixFmt, Filter, Format)
```

**Notes:** One page PDF can go to e.g. a JPEG file.
Multi page PDF file can go to a TIFF file with several images.

Or you specify a folder and get a folder of JPEG/PNG/TIFF files.
See also RenderPDFFile function in DynaPDF manual.

### 77.40.688 RenderPDFFileEx(OutFile as folderitem, Resolution as UInt32, Width as Integer, Height as Integer, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders all PDF pages which are currently in memory and stores the result in a proprietary image format.
**Notes:** The pages in memory could be imported from one or more external PDF files, e.g. with ImportPDFFile(), created with DynaPDF functions, or a combination of both.

The parameter OutFile can be a path to an existing directory or the file name of the output image. The latter type can be used with TIFF images because this format supports multi-page output. When a file path is used with a single page image format only the first page will be rendered.

The function checks whether the path is a directory or a file name.
The function can render pages in a specific resolution, or scale them to a given width or height.

Depending on which parameters are set the image size is calculated as follows:

- Resolution >0 and Width == 0 and Height == 0: Pages are rendered according to the given resolution. Note that PDF pages can be very large. Therefore, it is maybe not possible to render all pages in the whished resolution.
- Resolution >0 and Width <0 and or Height <0: Pages are rendered according to the given resolution. Negative values of Width and Height are interpreted as maximum width or height if Resolution is greater zero. Since PDF pages can be very large, it is recommended to set the maximum width and height to a value that is low enough so that no out of memory exception occurs, e.g. 5000 x 5000 pixels.
- Resolution == 0 and Width >0 or Height >0: Pages are scaled to the given Width or Height. If Width and Height are greater zero then pages are scaled to that size independent of the original page format (not recommended). It is usually best to set the width or height to zero so that the function can calculate the missing value to preserve the aspect ratio.

On a 32 bit system it is possible to render PDF pages in RGB with up to around 1200 DPI, depending on the page format and available memory. The resolution of gray images can be higher but the encoder must be able to handle such large images. The PNG and bitmap encoders accept images in almost arbitrary resolutions but all other encoders can fail when the resolution is larger than about 2000 DPI.

The function calls the progress events.
Returns true on success or false on failure.

See also RenderPDFFileEx function in DynaPDF manual.

### 77.40.689 RenderPDFFileExMT(OutFile as folderitem, Resolution as UInt32, Width as Integer, Height as Integer, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders all PDF pages which are currently in memory and stores the result in a proprietary image format.
**Notes:** The pages in memory could be imported from one or more external PDF files, e.g. with ImportPDFFile(), created with DynaPDF functions, or a combination of both.

The parameter OutFile can be a path to an existing directory or the file name of the output image. The latter type can be used with TIFF images because this format supports multi-page output. When a file path is used with a single page image format only the first page will be rendered.

The function checks whether the path is a directory or a file name.
The function can render pages in a specific resolution, or scale them to a given width or height.

Depending on which parameters are set the image size is calculated as follows:

- Resolution >0 and Width == 0 and Height == 0: Pages are rendered according to the given resolution. Note that PDF pages can be very large. Therefore, it is maybe not possible to render all pages in the whished resolution.
- Resolution >0 and Width <0 and or Height <0: Pages are rendered according to the given resolution. Negative values of Width and Height are interpreted as maximum width or height if Resolution is greater zero. Since PDF pages can be very large, it is recommended to set the maximum width and height to a value that is low enough so that no out of memory exception occurs, e.g. 5000 x 5000 pixels.
- Resolution == 0 and Width >0 or Height >0: Pages are scaled to the given Width or Height. If Width and Height are greater zero then pages are scaled to that size independent of the original page format (not recommended). It is usually best to set the width or height to zero so that the function can calculate the missing value to preserve the aspect ratio.

On a 32 bit system it is possible to render PDF pages in RGB with up to around 1200 DPI, depending on the page format and available memory. The resolution of gray images can be higher but the encoder must be able to handle such large images. The PNG and bitmap encoders accept images in almost arbitrary

resolutions but all other encoders can fail when the resolution is larger than about 2000 DPI.

The function calls the progress events.
Returns true on success or false on failure.

Same as RenderPDFFile, but multithreaded.

Requires DynaPDF Pro license.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 77.40.690 RenderPDFFileMT(OutFile as folderitem, Resolution as UInt32, Flags as UInt32, PixFmt as UInt32, Filter as UInt32, Format as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use RenderPDFFileEx instead.
**Function:** The function renders all PDF pages which are currently in memory and stores the result in a proprietary image format.
**Notes:** Same as RenderPDFFile, but multithreaded.
Also check the dynapdf manual on the pdfRenderPDFFileA function (pdfRenderPDFFileW on Windows).

Requires DynaPDF Pro license.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 77.40.691 ReOpenImportFile(Handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function re-opens a PDf file so that further contents can be imported from it.
**Notes:** The parameter Handle must be a valid file handle that OpenImportFile() or OpenImportBuffer()

returned.
When the file is no longer needed close the parser instance with CloseImportFileEx().
If the function succeeds the return value is true. If the function fails the return value is false.
See also ReOpenImportFile function in DynaPDF manual.

### 77.40.692 ReplaceFont(PDFFontRef as Integer, Name as string, Style as integer = 0, NameIsFamilyName as boolean = true) as integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces a PDF font with another one.
**Notes:** The function can be called in the OnFontNotFound event of the function CheckConformance(). The return value of the event should be the return value of this function. The parameter PDFFontRef is a parameter of the event. The font reference is required and must be passed unchanged to the function.

On Linux or Unix system fonts must be loaded with AddFontSearchPath() before this function can be called. This should be done before the first PDF file is imported.

If the function succeeds the return value is zero. If the function fails the return value is a negative error code.
See also ReplaceFont function in DynaPDF manual.

### 77.40.693 ReplaceFontAnsi(PDFFontRef as Integer, Name as string, Style as integer = 0, NameIsFamilyName as boolean = true) as integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Replaces a PDF font with another one.
**Notes:** The function can be called in the OnFontNotFound event of the function CheckConformance(). The return value of the event should be the return value of this function. The parameter PDFFontRef is a parameter of the event. The font reference is required and must be passed unchanged to the function.

On Linux or Unix system fonts must be loaded with AddFontSearchPath() before this function can be called. This should be done before the first PDF file is imported.

If the function succeeds the return value is zero. If the function fails the return value is a negative error code.

### 77.40.694 ReplaceFontEx(PDFFontRef as Integer, FontFile as FolderItem, Embed as boolean = true) as integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces a PDF font with another one.
**Notes:** The font file can be loaded directly. It is not required to install the font on the system. The function can be called in the OnFontNotFound event of the function CheckConformance(). The return value of the event should be the return value of this function. The parameter PDFFontRef is a parameter of the event. The font reference is required and must be passed unchanged to the function.

If the function succeeds the return value is zero. If the function fails the return value is a negative error code.
See also ReplaceFontEx function in DynaPDF manual.
See also:

- 77.40.695 ReplaceFontEx(PDFFontRef as Integer, FontFilePath as string, Embed as boolean = true) as integer 12930

### 77.40.695 ReplaceFontEx(PDFFontRef as Integer, FontFilePath as string, Embed as boolean = true) as integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces a PDF font with another one.
**Notes:** The font file can be loaded directly. It is not required to install the font on the system. The function can be called in the OnFontNotFound event of the function CheckConformance(). The return value of the event should be the return value of this function. The parameter PDFFontRef is a parameter of the event. The font reference is required and must be passed unchanged to the function.

If the function succeeds the return value is zero. If the function fails the return value is a negative error code.
See also ReplaceFontEx function in DynaPDF manual.
See also:

- 77.40.694 ReplaceFontEx(PDFFontRef as Integer, FontFile as FolderItem, Embed as boolean = true) as integer 12930

### 77.40.696 ReplaceFontExAnsi(PDFFontRef as Integer, FontFilePath as string, Embed as boolean = true) as integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Replaces a PDF font with another one.

**Notes:** The font file can be loaded directly. It is not required to install the font on the system. The function can be called in the OnFontNotFound event of the function CheckConformance(). The return value of the event should be the return value of this function. The parameter PDFFontRef is a parameter of the event. The font reference is required and must be passed unchanged to the function.

If the function succeeds the return value is zero. If the function fails the return value is a negative error code.

### 77.40.697 ReplaceICCProfile(ColorSpace as Integer, ICCFile as folderitem) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function is used to dynamically create ICC based color spaces within OnReplaceICCProfile event of CheckConformance().
**Notes:** Use in OnReplaceICCProfile event.
See also ReplaceICCProfile function in DynaPDF manual.

### 77.40.698 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as MemoryBlock) as integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces an ICC profile exactly in the same way as ReplaceICCProfile() but accepts a file buffer as input.
**Notes:** If the function succeeds the return value is zero. If the function fails the return value is a negative error code.
Use in OnReplaceICCProfile event.
See also ReplaceICCProfileEx function in DynaPDF manual.
See also:

- 77.40.699 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as String) as integer 12931

### 77.40.699 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as String) as integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces an ICC profile exactly in the same way as ReplaceICCProfile() but accepts a file buffer as input.
**Notes:** If the function succeeds the return value is zero. If the function fails the return value is a negative error code.
Use in OnReplaceICCProfile event.

See also ReplaceICCProfileEx function in DynaPDF manual.
See also:

- 77.40.698 ReplaceICCProfileEx(ColorSpace as integer, ICCFileData as MemoryBlock) as integer 12931

### 77.40.700 ReplaceImage(ImageToReplace as DynaPDFImageMBS, ImageFile as FolderItem, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces an image with another image.
**Notes:** The parameter ImageToReplace must be a valid pointer of an image object which is retrieved by functions like GetImageObj() or ParseContent().
The resolution, aspect ratio, color space and so on can be freely chosen. However, note that this function does not change the output position or size. If the aspect ratio of the new image is different, then it will be stretched or shrinked to fit into the output rectangle.
The parameter ColorSpace specifies the destination color space into which the image should be converted or saved, if the image is already defined in that color space. CSHandle must be the handle of that color space if a non-device space is used. The will be ignored for devices spaces.

The function works in the very same way as InsertImageEx() with the following differences:
,Äc The color of an image mask cannot be set or changed because this would require changes on the content stream in which the image is used. An image mask will be created if the image color depth is 1 bit and if color key masking is enabled (see SetUseTransparency()). SetUseTransparency() should normally be set to false before calling this function.
,Äc The image will never be downscaled, independent of the current resolution, because the size of the output rectangle is not known.

If the image that should be replaced is a soft mask of another base image, then make sure that the destination color space is set to kesDeviceGray, kesCalGray, or to a one channel ICC based color space because a soft mask must not contain more than one color channel.
The flags kgfUseImageColorSpace, kgfIgnoreICCProfiles, kgfRealPassThrough, and kfNoBitmapAlpha are all supported. See SetGStateFlags() for further information.

If the function succeeds the return value is true. If the function fails the return value is false.
See also ReplaceImage function in DynaPDF manual.

### 77.40.701 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as MemoryBlock, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces an image with a new image exactly like ReplaceImage() but accepts a file buffer as input.
**Notes:** See ReplaceImage() for further information.

If the function succeeds the return value is 1. If the function fails the return value is 0.
See also ReplaceImageEx function in DynaPDF manual.
See also:

- 77.40.702 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as String, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean 12933

### 77.40.702 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as String, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces an image with a new image exactly like ReplaceImage() but accepts a file buffer as input.
**Notes:** See ReplaceImage() for further information.

If the function succeeds the return value is 1. If the function fails the return value is 0.
See also ReplaceImageEx function in DynaPDF manual.
See also:

- 77.40.701 ReplaceImageEx(ImageToReplace as DynaPDFImageMBS, ImageData as MemoryBlock, Index as Integer = 1, ColorSpace as Integer = 0, CSHandle as Integer = -1, Flags as Integer = 0) as Boolean 12932

### 77.40.703 ReplacePageText(text as string, stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes or replaces a text string of a content stream that was found by the function GetPageText() beforehand.
**Notes:**

Be aware that ReplacePageText can't always replace text as encoding must match and fonts may not have the characters for the new text. For that better use ReplacePageTextEx.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.
Requires DynaPDF Pro license.
See also ReplacePageText function in DynaPDF manual.

### 77.40.704 ReplacePageTextEx(text as string, stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes or replaces a text string of a content stream that was found by the function GetPageText() beforehand.
**Notes:** The text parameter is converted to unicode.

If you have problems with asian characters, please make sure you use SetCMapDir and load the CMAPs.
Requires DynaPDF Pro license.
See also ReplacePageTextEx function in DynaPDF manual.

### 77.40.705 ReplacePageTextExAnsi(text as string, stack as DynaPDFStackMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function deletes or replaces a text string of a content stream that was found by the function GetPageText() beforehand.
**Notes:** The text parameter is converted to ANSI.
Requires DynaPDF Pro license.

### 77.40.706 ResetAnnotAP(Handle as integer = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Forces a rebuild of the appearance stream of the specified annotation.
**Notes:** If Handle is set to -1 all annotation appearances will be rebuild. This function be useful if an imported annotation has an invalid or empty appearance stream.
See also ResetAnnotAP function in DynaPDF manual.

### 77.40.707 ResetEncryptionSettings as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the encryption settings which were imported from an external PDF file so that the PDF file in memory can be saved unencrypted.
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.
See also ResetEncryptionSettings function in DynaPDF manual.

### 77.40.708 ResetLineDashPattern as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function resets a previously defined line dash pattern to its default value (straight line).
See also ResetLineDashPattern function in DynaPDF manual.

### 77.40.709 RestoreGraphicState as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function restores a previously saved graphics state.
See also RestoreGraphicState function in DynaPDF manual.

### 77.40.710 RGB(R as Integer, G as Integer, B as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a RGB color value based on the given component values.
**Example:**

```
dim rgb as Integer = DynaPDFMBS.RGB(1,2,3)
MsgBox hex(rgb)
```

### 77.40.711 RofRGB(RGB as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns R of a RGB color value.
**Example:**

```
dim rgb as Integer = DynaPDFMBS.RGB(1,2,3)
MsgBox str(DynaPDFMBS.RofRGB(rgb)) // shows 1
```

### 77.40.712 RotateCoords(alpha as Double, OriginX as Double, OriginY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function rotates the coordinate system at the point OriginX, OriginY by applying a transformation matrix.
**Notes:** Please do not try to scale/skew/translate back later. use SaveGraphicState and RestoreGraphicState.
See also RotateCoords function in DynaPDF manual.

### 77.40.713 RotateTemplate(OldTemplate as Integer, Rotation as Integer, RotateCoords as boolean = true) as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates a template.
**Notes:** Returns a new template handle.
This is a convenience function which creates a new template and draws the existing template there with rotation.
Returns negative number for errors. The plugin uses -1 for plugin errors like wrong rotation angle.

RotateCoords: Whether to rotate coordinate system.
This is now done by DynaPDF automatically, so for current version of the library, this must be false. But older versions need the true.

### 77.40.714 RoundRect(PosX as Double, PosY as Double, Width as Double, Height as Double, Radius as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a rectangle with rounded corners.
**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with Round Rectangles.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License

call pdf.CreateNewPDF f
call pdf.Append

dim PosX as Double = 100.0
dim PosY as Double = 100.0
dim Width as Double = 100.0
dim Height as Double = 100.0
dim Radius as Double = 20.0
dim FillMode as Integer = pdf.kfmFill

call pdf.RoundRect(PosX, PosY, Width, Height, Radius, FillMode)

PosX = 300.0
dim RadiusX as Double = 30.0
dim RadiusY as Double = 30.0

call pdf.RoundRectEx(PosX, PosY, Width, Height, RadiusX, RadiusY, FillMode)

call pdf.EndPage
call pdf.CloseFile

f.Launch
```

See also RoundRect function in DynaPDF manual.

### 77.40.715 RoundRectEx(PosX as Double, PosY as Double, Width as Double, Height as Double, rWidth as Double, rHeight as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a rectangle with elliptical corners.

**Example:**

```
dim pdf as new DynaPDFMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("Create PDF with Round Rectangles.pdf")

pdf.SetLicenseKey "Starter" // For this example you can use a Starter, Lite, Pro or Enterprise License

call pdf.CreateNewPDF f
call pdf.Append

dim PosX as Double = 100.0
dim PosY as Double = 100.0
dim Width as Double = 100.0
dim Height as Double = 100.0
dim Radius as Double = 20.0
dim FillMode as Integer = pdf.kfmFill

call pdf.RoundRect(PosX, PosY, Width, Height, Radius, FillMode)

PosX = 300.0
dim RadiusX as Double = 30.0
dim RadiusY as Double = 30.0

call pdf.RoundRectEx(PosX, PosY, Width, Height, RadiusX, RadiusY, FillMode)

call pdf.EndPage
call pdf.CloseFile

f.Launch
```

See also RoundRectEx function in DynaPDF manual.

### 77.40.716 SaveGraphicState as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function saves the current graphics state.
See also SaveGraphicState function in DynaPDF manual.

### 77.40.717 ScaleCoords(sx as Double, sy as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function scales the coordinate system by applying a transformation matrix.
**Notes:** Please do not try to scale/skew/translate back later. use SaveGraphicState and RestoreGraphicState.
See also ScaleCoords function in DynaPDF manual.

### 77.40.718 SelfTest as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function checks the size of all required data types and checks whether the endian configuration of the library is correct.
See also SelfTest function in DynaPDF manual.

### 77.40.719 Set3DAnnotProps(Annot as Integer, ActType as Integer, DeActType as Integer, InstType as Integer, DeInstType as Integer, DisplayToolbar as boolean, DisplayModelTree as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the properties of a 3D Annotation.
See also Set3DAnnotProps function in DynaPDF manual.

### 77.40.720 Set3DAnnotScriptAnsi(Annot as Integer, Value as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Sets the 3D Annoation Script.

### 77.40.721 SetAllocBy(Value as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the size of the memory blocks in kilo bytes, which will be allocated if memory must be allocated for page content streams.
See also SetAllocBy function in DynaPDF manual.

### 77.40.722 SetAltFonts(FontListHandle as Integer, List() as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills an alternate font list created by CreateAltFontList() with data.
**Notes:** Alternate font list are tested if one more glyphs were not found in the current font. Since the fonts in the list are used as fallback they should be compatible to the active font in regard to properties like serif, sans serif, proportional or fixed pitch, and so on.
A list should be sorted by priority and not by name. That means index 0 should contain a font name that is most probably the best match. If this one was not available or incompatible then the next font in the list will be tested until the end of the list was reached. If no suitable font was found then system fonts are tested.
The fonts in the list should support the language that must be output. Otherwise, the fonts can never be selected. An alternate font list can be arbitrary large but it is usually best to restrict the number fonts in a list to speed up processing.
A list can contain font names which are not available on the system. This causes no error. Non existing fonts are simply ignored. This makes it possible to define suitable alternate font lists statically. Such lists can then be loaded on demand.
After a list was filled with data it can be activated with ActivateAltFontList(). If a list is no longer needed delete it with DeleteAltFontList().

Please note that alternate font lists are used only, if complex text layout was enabled. This can be done by setting the flag kgfComplexText with SetGStateFlags().

Returns true on success.
See also SetAltFonts function in DynaPDF manual.

### 77.40.723 SetAnnotBorderEffect(Handle as Integer, BorderEffect as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border effect for an annotation.
**Notes:** Returns true on success.
Handle is in range of 0 to number of annotations - 1.
See also SetAnnotBorderEffect function in DynaPDF manual.

### 77.40.724 SetAnnotBorderStyle(Handle as Integer, BorderStyle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation border style.

See also SetAnnotBorderStyle function in DynaPDF manual.

### 77.40.725 SetAnnotBorderWidth(Handle as Integer, LineWidth as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation border width.
See also SetAnnotBorderWidth function in DynaPDF manual.

### 77.40.726 SetAnnotColor(Handle as Integer, ColorType as Integer, PDFColorSpace as Integer, ColorValue as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation color.
See also SetAnnotColor function in DynaPDF manual.

### 77.40.727 SetAnnotFlags(Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the default flags used for newly created annotations.
See also SetAnnotFlags function in DynaPDF manual.

### 77.40.728 SetAnnotFlagsEx(Handle as Integer, Flags as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation flags.
See also SetAnnotFlagsEx function in DynaPDF manual.

### 77.40.729 SetAnnotHighlightMode(Handle as Integer, HighlightMode as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation highlight mode.
See also SetAnnotHighlightMode function in DynaPDF manual.

### 77.40.730 SetAnnotIcon(Handle as Integer, AnnotIcon as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation icon.
See also SetAnnotIcon function in DynaPDF manual.

### 77.40.731 SetAnnotLineDashPattern(Handle as UInt32, dash as memoryblock, NumValues as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or deletes the line dash pattern of an annotation.
**Notes:** The following annotation types support line dash patterns:

- atCircle
- atInk
- atLine
- atPolygon
- atPolyLine
- atSquare

Memoryblock must contain floating point values (Single).
Returns true on success.

If array is nil, the pattern is removed.
See also SetAnnotLineDashPattern function in DynaPDF manual.
See also:

- 77.40.732 SetAnnotLineDashPattern(Handle as UInt32, dash() as single) as Boolean 12942

### 77.40.732 SetAnnotLineDashPattern(Handle as UInt32, dash() as single) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or deletes the line dash pattern of an annotation.
**Notes:** The following annotation types support line dash patterns:

- atCircle
- atInk
- atLine
- atPolygon
- atPolyLine
- atSquare

Returns true on success.

If array is nil, the pattern is removed.
See also SetAnnotLineDashPattern function in DynaPDF manual.
See also:

- 77.40.731 SetAnnotLineDashPattern(Handle as UInt32, dash as memoryblock, NumValues as integer) as Boolean 12942

### 77.40.733 SetAnnotLineEndStyle(Handle as UInt32, StartLineStyle as Integer, EndLineStyle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the line end styles of a Line or PolyLine Annotation.
**Notes:** If the function succeeds the return value is true. If the function fails the return value is false.
See also SetAnnotLineEndStyle function in DynaPDF manual.

### 77.40.734 SetAnnotMigrationState(Handle as Integer, State as Integer, Name as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a migration state to a markup annotation.
**Notes:** All annotation types with exception of 3D, Link, Movie, Screen, PrinterMark, TrapNet, and Watermark are markup annotations.
Migration states are stored in text annotations as reply to the base annotation. Further states are stored as reply to the last reply; the result is a single linked list. Because the base annotation contains no reference to the last reply or migration state the function must search for it. To speed upÔøºprocessing the function returns the handle of the text annotation so that the next state can directly be added to this annotation.

The migration state is defined since PDF 1.5. The function adjusts the PDF version automatically if it is lower than PDF 1.5.

If the function succeeds the return value is the handle of the text annotation, a value greater or equal zero. If the function fails the return value is a negative error code.

State can be kasNone, kasAccepted, kasRejected, kasCancelled, kasCompleted.
See also SetAnnotMigrationState function in DynaPDF manual.

### 77.40.735 SetAnnotMigrationStateAnsi(Handle as Integer, State as Integer, Name as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Adds a migration state to a markup annotation.
**Notes:** All annotation types with exception of 3D, Link, Movie, Screen, PrinterMark, TrapNet, and Watermark are markup annotations.
Migration states are stored in text annotations as reply to the base annotation. Further states are stored as reply to the last reply; the result is a single linked list. Because the base annotation contains no reference to the last reply or migration state the function must search for it. To speed upÔøºprocessing the function returns the handle of the text annotation so that the next state can directly be added to this annotation.

The migration state is defined since PDF 1.5. The function adjusts the PDF version automatically if it is lower than PDF 1.5.

If the function succeeds the return value is the handle of the text annotation, a value greater or equal zero. If the function fails the return value is a negative error code.

State can be kasNone, kasAccepted, kasRejected, kasCancelled, kasCompleted.

### 77.40.736 SetAnnotOpacity(Handle as Integer, opacity as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the opacity of a markup annotation.
**Notes:** The function GetAnnotEx() or GetPageAnnotEx() can be used to determine whether an annotation is a markup annotation.

Returns true on succes or false on failure.
See also SetAnnotOpacity function in DynaPDF manual.

### 77.40.737 SetAnnotOpenState(Handle as Integer, Open as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the annotation open state.
See also SetAnnotOpenState function in DynaPDF manual.

### 77.40.738 SetAnnotOrFieldDate(CSHandle as UInt32, IsField as Boolean, Type as Integer, DateTime as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the creation or modification date of an annotation or form field.
**Notes:** If the parameter IsField is set to true, a valid field handle must be passed to the parameter Handle. An annotation handle is expected otherwise.
Annotations and form fields support a modification date but a creation date is supported by markup annotations only.
The following annotation types are markup annotations:

- Care
- Circle
- FileAttach
- FreeText
- Highlight, Squiggly, Strikeout, Underline
- Ink
- Line
- Polygon
- Projection
- Redact
- Sound
- Square
- Stamp
- Text

The function GetAnnotEx() or GetPageAnnotEx() can also be used to determine whether an annotation is a markup annotation.

If the function succeeds the return value is 1. If the function fails the return value is 0.
See also SetAnnotOrFieldDate function in DynaPDF manual.

### 77.40.739 SetAnnotQuadPoints(Handle as UInt32, points() as DynaPDFPointMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or changes the quad points defintion of a Highlight, Link, Redakt, Squiggly, atStrikeOut, or Underline annotation.
**Notes:** The function must be called within an open page.
Independent of the used coordinate system (bottom up or top down), the points must be defined in the following order:
x1,y1 x3,y3
x2,y2 x4,y4
ÔøºÔøºÔøº

### 77.40.742 SetAnnotSubject(Handle as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the optional subject string of an annotation.
**Notes:** The value parameter is converted to unicode.
See also SetAnnotSubject function in DynaPDF manual.

### 77.40.743 SetAnnotSubjectAnsi(Handle as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function sets or changes the optional subject string of an annotation.
**Notes:** The value parameter is converted to ANSI.

### 77.40.744 SetBBox(Boundary as Integer, LeftX as Double, LeftY as Double, RightX as Double, RightY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets a specific bounding box of the current open PDF page.
See also SetBBox function in DynaPDF manual.

### 77.40.745 SetBidiMode(BidiMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the bidirectional mode.
See also SetBidiMode function in DynaPDF manual.

### 77.40.746 SetBlack(FillColor as Boolean, StrokeColor as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets black color.
**Notes:** This function is a bit optimized to check the current color space.
Depending on whether it's RGB, Gray, CMYK or Lab, it will set different color values.

And if other color space is active, it switches to Gray colorspace to set black.

### 77.40.747 SetBookmarkDest(ABmk as Integer, DestType as Integer, a as Double, b as Double, c as Double, d as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the destination of a bookmark.
See also SetBookmarkDest function in DynaPDF manual.

### 77.40.748 SetBookmarkStyle(ABmk as Integer, Style as Integer, RGBColor as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the bookmark style.
See also SetBookmarkStyle function in DynaPDF manual.

### 77.40.749 SetBorderStyle(Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function set the global border style which is used for newly created form fields.
See also SetBorderStyle function in DynaPDF manual.

### 77.40.750 SetCharacterSpacing(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the current character spacing. The function requires an open page, template or pattern.
See also SetCharacterSpacing function in DynaPDF manual.

### 77.40.751 SetCheckBoxChar(CheckBoxChar as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the character which should be used for newly created check boxes.
See also SetCheckBoxChar function in DynaPDF manual.

### 77.40.752 SetCheckBoxDefState(Field as Integer, Checked as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function changes the default state of a check box; it can differ from the current visible state of the check box.
See also SetCheckBoxDefState function in DynaPDF manual.

### 77.40.753 SetCheckBoxState(Field as Integer, Checked as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the state of a check box. The parameter Field must be a valid check box handle.
See also SetCheckBoxState function in DynaPDF manual.

### 77.40.754 SetCIDFont(CMapHandle as Integer, Name as string, Style as Integer, Size as Double, Embed as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a CID Font.
See also SetCIDFont function in DynaPDF manual.

### 77.40.755 SetCMapDir(path as folderitem, flags as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the character map directory.
**Example:**

```
dim pdf as DynaPDFMBS // your dynapdf instance
call pdf.SetCMapDir SpecialFolder.Desktop.Child("CMAP"), 3
```

**Notes:** Takes an integer instead of a boolean starting with plugin version 11.2pr6.
See klcmDefault, klcmDelayed and klcmRecursive constants.
Requires DynaPDF Pro license.
See also SetCMapDir function in DynaPDF manual.
See also:

• 77.40.756 SetCMapDir(path as string, flags as Integer) as Integer 12950

### 77.40.756 SetCMapDir(path as string, flags as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the character map directory.
**Example:**

```
dim pdf as DynaPDFMBS // your dynapdf instance
call pdf.SetCMapDir SpecialFolder.Desktop.Child("CMAP"), pdf.klcmRecursive
```

**Notes:** Takes an integer instead of a boolean starting with plugin version 11.2pr6.
See klcmDefault, klcmDelayed and klcmRecursive constants.
Requires DynaPDF Pro license.
See also SetCMapDir function in DynaPDF manual.
See also:

• 77.40.755 SetCMapDir(path as folderitem, flags as Integer) as Integer 12949

### 77.40.757 SetColDefFile(EmbFile as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the initial document of a portable collection that should be opened in the viewer application. See also CreateCollection().
See also SetColDefFile function in DynaPDF manual.

### 77.40.758 SetColorMask(ImageHandle as Integer, Mask as Ptr, Count as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The functions sets or overrides the color mask of an image.
**Notes:** See also SetColorMask function in dynapdf_help.pdf manual.
See also SetColorMask function in DynaPDF manual.
See also:

• 77.40.759 SetColorMask(ImageHandle as Integer, Mask() as Integer) as boolean 12950

### 77.40.759 SetColorMask(ImageHandle as Integer, Mask() as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The functions sets or overrides the color mask of an image.
**Notes:** Same as other SetColorMask function, but values are taken from array.
See also SetColorMask function in dynapdf_help.pdf manual.
See also SetColorMask function in DynaPDF manual.
See also:

- 77.40.758 SetColorMask(ImageHandle as Integer, Mask as Ptr, Count as UInt32) as boolean 12950

### 77.40.760 SetColors(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the fill and stroke color.
See also SetColors function in DynaPDF manual.

### 77.40.761 SetColorSpace(ColorSpace as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the color space.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// get the colorspace of the image file
const DP_csDeviceRGB=0
const DP_csDeviceCMYK=1
const DP_csDeviceGray=2

dim iColorSpace as Integer

iColorSpace=DP_csDeviceRGB

// define color space
bBool=pdf.SetColorSpace(iColorSpace)
```

See also SetColorSpace function in DynaPDF manual.

### 77.40.762 SetColSortField(ColField as Integer, AscendingOrder as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the collection field that should be used to sort the list of embedded files.
See also SetColSortField function in DynaPDF manual.

### 77.40.763 SetCompressionFilter(Filter as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the compression filter which is used to compress images.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// set compression filter
bBool = pdf.SetCompressionFilter(pdf.kcfJPEG)
```

**Notes:** Use kcfCCITT3, kcfCCITT4, kcfFlate, kcfFlateBW, kcfJP2K, kcfJPEG or kcfLZW constants.
See also SetCompressionFilter function in DynaPDF manual.

### 77.40.764 SetCompressionLevel(CompressLevel as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the current compression level.
See also SetCompressionLevel function in DynaPDF manual.

### 77.40.765 SetContent(buffer as memoryblock) as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function replaces the content stream of the currently open page or template with a new one.
See also SetContent function in DynaPDF manual.
See also:

- 77.40.766 SetContent(buffer as string) as Boolean

### 77.40.766 SetContent(buffer as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function replaces the content stream of the currently open page or template with a new one.
See also SetContent function in DynaPDF manual.
See also:

- 77.40.765 SetContent(buffer as memoryblock) as Boolean 12952

### 77.40.767 SetDateTimeFormat(TxtField as Integer, Fmt as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function restricts the allowed value of a text field to a date time format and applies this format if the value was valid.
See also SetDateTimeFormat function in DynaPDF manual.

### 77.40.768 SetDefBitsPerPixel(value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the default color depth in bits per pixel, which determines whether images should be downsampled.
See also SetDefBitsPerPixel function in DynaPDF manual.

### 77.40.769 SetDocInfo(DInfo as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function set or changes a document info entry.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean
dim source as FolderItem // source pdf file?

const diAuthor=0
const diCreator=1
const diKeywords=2
const diProducer=3
const diSubject=4
const diTitle=5
```

```
// Define some pdf properties:
bBool=pdf.SetDocInfo(diAuthor, SystemInformationMBS.Username)
bBool=pdf.SetDocInfo(diCreator, "SysProgName"+" - "+"MetSysProgVer")
bBool=pdf.SetDocInfo(diKeywords, "")
bBool=pdf.SetDocInfo(diProducer, "SysProgName"+" - "+"MetSysProgVer")
bBool=pdf.SetDocInfo(diSubject, "")
bBool=pdf.SetDocInfo(diTitle, source.name)
```

**Notes:** The text parameter is converted to unicode.
See also SetDocInfo function in DynaPDF manual.

### 77.40.770 SetDocInfoAnsi(DInfo as Integer, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function set or changes a document info entry.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean
dim source as FolderItem // source pdf file?

const diAuthor=0
const diCreator=1
const diKeywords=2
const diProducer=3
const diSubject=4
const diTitle=5

// Define some pdf properties:
bBool=pdf.SetDocInfoAnsi(diAuthor, SystemInformationMBS.Username)
bBool=pdf.SetDocInfoAnsi(diCreator, "SysProgName"+" - "+"MetSysProgVer")
bBool=pdf.SetDocInfoAnsi(diKeywords, "")
bBool=pdf.SetDocInfoAnsi(diProducer, "SysProgName"+" - "+"MetSysProgVer")
bBool=pdf.SetDocInfoAnsi(diSubject, "")
bBool=pdf.SetDocInfoAnsi(diTitle, source.name)
```

**Notes:** The text parameter is converted to ANSI.

### 77.40.771 SetDocInfoEx(DInfo as Integer, Key as string, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function set or changes a document info entry.
**Notes:** The Text parameter is converted to unicode.
See also SetDocInfoEx function in DynaPDF manual.

### 77.40.772 SetDocInfoExAnsi(DInfo as Integer, Key as string, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function set or changes a document info entry.
**Notes:** The Text parameter is converted to ANSI.

### 77.40.773 SetDrawDirection(Direction as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the draw direction of closed vector graphics such as rectangles, ellipses, triangles and so on.
See also SetDrawDirection function in DynaPDF manual.

### 77.40.774 SetEMFFrameDPI(DPIX as Integer, DPIY as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to adjust DPI value which is used to calculate the picture size of an EMF file.
See also SetEMFFrameDPI function in DynaPDF manual.

### 77.40.775 SetEMFPatternDistance(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the default distance between lines of standard patterns during EMF conversion.
See also SetEMFPatternDistance function in DynaPDF manual.

### 77.40.776 SetErrorMode(ErrMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error mode specifies which error types should be treated as fatal error.
See also SetErrorMode function in DynaPDF manual.

### 77.40.777 SetExtColorSpace(Handle as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function activates an extended color space in the graphics state.
**Notes:** Requires DynaPDF Pro license.
See also SetExtColorSpace function in DynaPDF manual.

### 77.40.778 SetExtFillColorSpace(Handle as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the colorspace for filling.
**Notes:** Pass Colorspace handle like for SetExtColorSpace.
Requires DynaPDF Pro license.
See also SetExtFillColorSpace function in DynaPDF manual.

### 77.40.779 SetExtGState(Handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function applies an extended graphics state.
See also SetExtGState function in DynaPDF manual.

### 77.40.780 SetExtStrokeColorSpace(Handle as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the colorspace for filling.
**Notes:** Pass Colorspace handle like for SetExtColorSpace.
Requires DynaPDF Pro license.
See also SetExtStrokeColorSpace function in DynaPDF manual.

### 77.40.781 SetFieldBackColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the background color used for newly created interactive form fields and annotations.
See also SetFieldBackColor function in DynaPDF manual.

### 77.40.782 SetFieldBBox(Handle as Integer, rect as DynaPDFRectMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the bounding box of a field.
See also SetFieldBBox function in DynaPDF manual.

### 77.40.783 SetFieldBorderColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the border color used for newly created interactive form fields and annotations.
See also SetFieldBorderColor function in DynaPDF manual.

### 77.40.784 SetFieldBorderStyle(Field as Integer, Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the border style of a specific Interactive Form field.
See also SetFieldBorderStyle function in DynaPDF manual.

### 77.40.785 SetFieldBorderWidth(Field as Integer, LineWidth as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to change the border width of a field.
See also SetFieldBorderWidth function in DynaPDF manual.

### 77.40.786 SetFieldCalcOrder(CurrIndex as UInt32, NewIndex as UInt32) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves a field in the global calc order array.
**Notes:** This is the order in which field values will be recalculated when the value of any field changes. The current calc order can be accessed with GetFieldCalcOrder(). The calc order array contains field handles. A field handle is a simple array index.

Returns true on success.
See also SetFieldCalcOrder function in DynaPDF manual.

### 77.40.787 SetFieldColor(Field as Integer, ColorType as Integer, ColorSpace as Integer, ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets a specific color of an interactive form field.
See also SetFieldColor function in DynaPDF manual.

### 77.40.788 SetFieldExpValue(Field as Integer, ValIndex as Integer, Value as string, ExpValue as string, Selected as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to change the choice values of a combo box, list box, or radio button.
See also SetFieldExpValue function in DynaPDF manual.

### 77.40.789 SetFieldExpValueAnsi(Field as Integer, ValIndex as Integer, Value as string, ExpValue as string, Selected as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** This function can be used to change the choice values of a combo box, list box, or radio button.

### 77.40.790 SetFieldExpValueEx(Field as Integer, ValIndex as Integer, Selected as boolean, DefSelected as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function marks a choice value of a combo or list box as selected or unselected.
**Notes:** It can also be used to change the state of check boxes or the children of a radio button. The parameter ValIndex will be ignored if the field is a normal check box (no child of a redio button or field group).

To enumerate the choice values of a combo box, list box or radio button use the function GetFieldExpValueEx().

Return value:
If the function succeeds the return value is true. If the function fails the return value is false.

See also SetFieldExpValueEx function in DynaPDF manual.

### 77.40.791 SetFieldFlags(Field as Integer, Flags as Integer, Reset as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the flags of a specific interactive form field.
**Example:**

```
Dim pdf As DynapdfMBS // your PDF environment with open page

// create field on current page
Dim Field1 As Integer = pdf.CreateTextField("Field1", -1, True, 0, 50.0, 100, 200.0, 100.0)

// and fill value
Call pdf.SetTextFieldValue(Field1, "Hello", "", pdf.ktaLeft)

// make a field the user should not mess up with
Dim Flags As Integer
flags = Bitwise.BitOr(pdf.kffNoView, pdf.kffInvisible, pdf.kffHidden, pdf.kffReadOnly)
Call pdf.SetFieldFlags(field1, flags, False)
```

See also SetFieldFlags function in DynaPDF manual.

### 77.40.792 SetFieldFont(Field as Integer, Name as string, Style as Integer = 0, Size as double = 12, Embed as boolean = true, CodePage as integer = &h27) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the font of a form field.
**Notes:** See documentation of SetFieldFont function in dynapdf_help manual file for details.
See also SetFieldFont function in DynaPDF manual.

### 77.40.793 SetFieldFontAnsi(Field as Integer, Name as string, Style as Integer = 0, Size as Double = 12, Embed as boolean = true, CodePage as Integer = &h27) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function sets or changes the font of a form field.
**Notes:** See documentation of SetFieldFont function in dynapdf_help manual file for details.

### 77.40.794 SetFieldFontEx(Field as UInt32, Handle as UInt32, FontSize as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or replaces the font of a field.
**Notes:** The function requires a font handle that was returned by SetFieldFont.
Returns true on success and false on failure.
See also SetFieldFontEx function in DynaPDF manual.

### 77.40.795 SetFieldFontSize(aField as Integer, FontSize as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the font size of a specific field.
See also SetFieldFontSize function in DynaPDF manual.

### 77.40.796 SetFieldHighlightMode(Field as Integer, HighlightMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the highlight mode of a specific field.
See also SetFieldHighlightMode function in DynaPDF manual.

### 77.40.797 SetFieldIndex(Field as Integer, Index as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function can be used to set the tab order of interactive form fields.
See also SetFieldIndex function in DynaPDF manual.

### 77.40.798 SetFieldMapName(Field as Integer, Name as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the mapping name of a field.
**Notes:** The parameter name is converted to unicode.
See also SetFieldMapName function in DynaPDF manual.

### 77.40.799 SetFieldMapNameAnsi(Field as Integer, Name as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function sets or changes the mapping name of a field.
**Notes:** The parameter name is converted to ANSI.

### 77.40.800 SetFieldName(Field as Integer, NewName as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the name of an interactive form field.
See also SetFieldName function in DynaPDF manual.

### 77.40.801 SetFieldNameAnsi(Field as Integer, NewName as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function changes the name of an interactive form field.
**Notes:** The text parameter is converted to ANSI.

### 77.40.802 SetFieldOrientation(Field as Integer, Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the orientation of a field.
See also SetFieldOrientation function in DynaPDF manual.

### 77.40.803 SetFieldTextAlign(Field as Integer, Align as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function set or changes the text alignment of a text or button field.
See also SetFieldTextAlign function in DynaPDF manual.

### 77.40.804 SetFieldTextColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the text color which is used for newly created interactive form fields.
See also SetFieldTextColor function in DynaPDF manual.

### 77.40.805 SetFieldToolTip(Field as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function set or changes the tool tip or description string of an interactive form field.
**Notes:** The value parameter is converted to unicode.
See also SetFieldToolTip function in DynaPDF manual.

### 77.40.806 SetFieldToolTipAnsi(Field as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function set or changes the tool tip or description string of an interactive form field.
**Notes:** The value parameter is converted to ANSI.

### 77.40.807 SetFillColor(ColorValue as Color) as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the fill color.
**Notes:** Raises an exception if current color space is CMYK or Gray and not RGB.
The parameter Color must be defined in the current color space.
See also SetFillColor function in DynaPDF manual.
See also:

- 77.40.808 SetFillColor(ColorValue as Integer) as Boolean 12964

- 77.40.809 SetFillColor(values() as Double) as boolean 12965
- 77.40.810 SetFillColor(values() as single) as boolean 12966


### 77.40.808 SetFillColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the fill color.
**Example:**

```
// new DynaPDF Object. Use your own subclass to catch errors in error event
dim pdf as new DynaPDFMBS

// For this example you can use a Starter, Lite, Pro or Enterprise License
pdf.SetLicenseKey "Starter"

// destination pdf file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// create new pdf document
call pdf.CreateNewPDF f

// add new page
call pdf.append

// set red text color
call pdf.SetFillColor pdf.RGB(255,0,0)

// set font
call pdf.SetFont "Times", pdf.kfsItalic, 40.0, true, pdf.kcp1252

// write some text
call pdf.WriteFText pdf.ktaCenter, "My first PDF!"

// close page
call pdf.EndPage

// close file
call pdf.CloseFile

// open in users preferred PDF viewer application
f.Launch
```

**Notes:** The parameter Color must be defined in the current color space.
See also SetFillColor function in DynaPDF manual.
See also:

- 77.40.807 SetFillColor(ColorValue as Color) as Boolean 12963
- 77.40.809 SetFillColor(values() as Double) as boolean 12965
- 77.40.810 SetFillColor(values() as single) as boolean 12966


### 77.40.809 SetFillColor(values() as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets fill color based on an array of floats.
**Example:**

```
// new DynaPDF Object. Use your own subclass to catch errors in error event
dim pdf as new DynaPDFMBS

// For this example you can use a Starter, Lite, Pro or Enterprise License
pdf.SetLicenseKey "Starter"

// destination pdf file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// create new pdf document
call pdf.CreateNewPDF f

// add new page
call pdf.append

// set blue text color with values in memoryblock
dim colorvalues() as Double = array(0.0, 1.0, 0.0)
call pdf.SetFillColor colorvalues

// set font
call pdf.SetFont "Times", pdf.kfsItalic, 40.0, true, pdf.kcp1252

// write some text
call pdf.WriteFText pdf.ktaCenter, "My first PDF!"

// close page
call pdf.EndPage

// close file
call pdf.CloseFile

// open in users preferred PDF viewer application
f.Launch
```

**Notes:** The number of components must match.
See also SetFillColor function in DynaPDF manual.
See also:

- 77.40.807 SetFillColor(ColorValue as Color) as Boolean 12963
- 77.40.808 SetFillColor(ColorValue as Integer) as Boolean 12964
- 77.40.810 SetFillColor(values() as single) as boolean 12966

### 77.40.810 SetFillColor(values() as single) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets fill color based on an array of floats.
**Notes:** The number of components must match.
See also SetFillColor function in DynaPDF manual.
See also:

- 77.40.807 SetFillColor(ColorValue as Color) as Boolean 12963
- 77.40.808 SetFillColor(ColorValue as Integer) as Boolean 12964
- 77.40.809 SetFillColor(values() as Double) as boolean 12965

### 77.40.811 SetFillColorEx(colorvalues as memoryblock, count as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the fill color using the values in parameters.
**Example:**

```
// new DynaPDF Object. Use your own subclass to catch errors in error event
dim pdf as new DynaPDFMBS

// For this example you can use a Starter, Lite, Pro or Enterprise License
pdf.SetLicenseKey "Starter"

// destination pdf file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// create new pdf document
call pdf.CreateNewPDF f

// add new page
call pdf.append

// set blue text color with values in memoryblock
```

```
dim m as new MemoryBlock(3)
m.Byte(0) = 0
m.Byte(1) = 0
m.Byte(2) = 255
call pdf.SetFillColorEx m,3

// set font
call pdf.SetFont "Times", pdf.kfsItalic, 40.0, true, pdf.kcp1252

// write some text
call pdf.WriteFText pdf.ktaCenter, "My first PDF!"

// close page
call pdf.EndPage

// close file
call pdf.CloseFile

// open in users preferred PDF viewer application
f.Launch
```

**Notes:** Pass as many color values as needed for the current color space. 3 for RGB, 4 for CMYK. All values must be in the range of 0 to 255.
See also SetFillColorEx function in DynaPDF manual.
See also:

- 77.40.812 SetFillColorEx(ParamArray colorvalue as Integer) as Boolean 12967

### 77.40.812 SetFillColorEx(ParamArray colorvalue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the fill color using the values in parameters.
**Example:**

```
// new DynaPDF Object. Use your own subclass to catch errors in error event
dim pdf as new DynaPDFMBS

// For this example you can use a Starter, Lite, Pro or Enterprise License
pdf.SetLicenseKey "Starter"

// destination pdf file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// create new pdf document
call pdf.CreateNewPDF f
```

```
// add new page
call pdf.append

// set red text color
call pdf.SetFillColorEx 255,0,0

// set font
call pdf.SetFont "Times", pdf.kfsItalic, 40.0, true, pdf.kcp1252

// write some text
call pdf.WriteFText pdf.ktaCenter, "My first PDF!"

// close page
call pdf.EndPage

// close file
call pdf.CloseFile

// open in users preferred PDF viewer application
f.Launch
```

**Notes:** Pass as many color values as needed for the current color space. 3 for RGB, 4 for CMYK. All values must be in the range of 0 to 255.
See also SetFillColorEx function in DynaPDF manual.
See also:

- 77.40.811 SetFillColorEx(colorvalues as memoryblock, count as Integer) as Boolean 12966

### 77.40.813 SetFillColorSpace(Colorspace as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the fill color space.
See also SetFillColorSpace function in DynaPDF manual.

### 77.40.814 SetFloatPrecision(NumTextDecDigits as UInt32, NumVectDecDigits as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the output precision of text and vector coordinates.
**Notes:** The default precision for text and vector graphics is two decimal digits. This corresponds to 7200

DPI. The output precision of bezier curves is one higher as for vector graphics. The maximum output precision is 5 decimal digits.
Note that higher values increase the resulting file size.

NumTextDecDigits: Number decimal digits for text object.
NumVectDecDigits: Number of decimal digits for vector objects.

Returns boolean, true for success.
See also SetFloatPrecision function in DynaPDF manual.

### 77.40.815 SetFont(Name as string, Style as Integer = 0, Size as Double = 12, Embed as boolean = true, CP as Integer = &h27) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font that can be used for text output and interactive form fields.
**Notes:** The name parameter is converted to unicode.

If font is not found by name, please check SetFontSelMode function.
See also SetFont function in DynaPDF manual.

### 77.40.816 SetFontAnsi(Name as string, Style as integer = 0, Size as double = 12, Embed as boolean = true, CodePage as integer = &h27) as integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function loads a font that can be used for text output and interactive form fields.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF object
call pdf.SetFontAnsi("Helvetica", pdf.kfsNone, 10.0, true, pdf.kcp1252)
```

**Notes:** The name parameter is converted to ANSI.

If font is not found by name, please check SetFontSelMode function.

### 77.40.817 SetFontEx(Name as string, Style as Integer = 0, Size as Double = 12, Embed as boolean = true, CodePage as Integer = &h27) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function loads a font that can be used for text output and interactive form fields.
**Notes:** The name parameter is converted to unicode.

If font is not found by name, please check SetFontSelMode function.
See also SetFontEx function in DynaPDF manual.

### 77.40.818 SetFontExAnsi(Name as string, Style as Integer = 0, Size as Double = 12, Embed as boolean = true, CodePage as Integer = &h27) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function loads a font that can be used for text output and interactive form fields.
**Notes:** The name parameter is converted to ANSI.

If font is not found by name, please check SetFontSelMode function.

### 77.40.819 SetFontOrigin(Origin as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the current font origin that is used to position text strings.
See also SetFontOrigin function in DynaPDF manual.

### 77.40.820 SetFontSearchOrder(Order() as Integer)

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font search order.
**Notes:** The values in the array use this constants:

The array has 4 values.
See also SetFontSearchOrder function in DynaPDF manual.

| | |
|---|---|
| kfbtTrueType | TrueType, TrueType Collections, or OpenType fonts with TrueType outlines |
| kfbtType1 | Type1 font |
| kfbtOpenType | OpenType font with Postscript outlines |
| kfbtStdFont | PDF Standard font |
| kfbtDisabled | This value can be used to disable a specific font format. |

### 77.40.821 SetFontSearchOrderEx(Order1 as Integer, Order2 as Integer, Order3 as Integer, Order4 as Integer)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the font search order in the same way as SetFontSearchOrder() but it does not use an array to set the search order to improve compatibility to programming languages with limited array support.
**Notes:** use the font base constants.
See also SetFontSearchOrderEx function in DynaPDF manual.

### 77.40.822 SetFontSelMode(Mode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the font selection mode.
See also SetFontSelMode function in DynaPDF manual.

### 77.40.823 SetFontWeight(Weight as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font weight specifies the thickness or boldness of a font.
See also SetFontWeight function in DynaPDF manual.

### 77.40.824 SetGStateFlags(Flags as Integer, Reset as boolean)

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets optional flags affecting the graphics state and coordinate handling.
**Example:**

```
// set the flag to use image colorspace:
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
```

See also SetGStateFlags function in DynaPDF manual.

### 77.40.825 SetIconColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The icon color is used for the closed state of a text annotation.
See also SetIconColor function in DynaPDF manual.

### 77.40.826 SetImportFlags(Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets optional flags to control the import of external PDF files.
**Example:**

```
// set flags to import all
Dim flags As Integer = Bitwise.BitOr(pdf.kifImportAsPage, pdf.kifImportAll)
Call pdf.SetImportFlags(flags)
```

See also SetImportFlags function in DynaPDF manual.

### 77.40.827 SetImportFlags2(Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets optional flags to control the import of external PDF files.
See also SetImportFlags2 function in DynaPDF manual.

### 77.40.828 SetItalicAngle(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property ItalicAngle is used to emulate an italic font if the font is not available in an italic style.
See also SetItalicAngle function in DynaPDF manual.

### 77.40.829 SetJPEGQuality(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the quality of JPEG compressed images in percent if JPEG compression is used.
See also SetJPEGQuality function in DynaPDF manual.

### 77.40.830 SetLanguage(ISOTag as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies the language of the document.
See also SetLanguage function in DynaPDF manual.

### 77.40.831 SetLeading(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the leading that will be used by the functions AddContinueText() and WriteFText() to calculate the distance between two text lines.
**Notes:** This is for setting the line height.
See also SetLeading function in DynaPDF manual.

### 77.40.832 SetLicenseKey(Value as string)

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SetLicenseKeyGlobal instead. **Function:** Use this function to enter your license key.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
pdf.SetLicenseKey("1234567890") // enter your code here
```

**Notes:** If the value represents a correct license key the demo string does not longer appear on PDF pages. Once a correct key was set, it will be active until the library is unloaded or the current PDF object is released. Note that the key must be entered for each PDF object or process of a multi-threading application separately.

The license key must not be stored in the registry or other files in an unencrypted form.

You need to buy a license key from MBS.
The key will unlock the library to not run in demo mode.

Pro license is required for the following functions:

- BeginTransparencyGroup
- ConvertColors
- Create3DAnnot
- CreateSoftMask
- FlattenForm
- GetPageText
- ImportPage and ImportPageEx
- ParseContent
- RenderAnnotOrField
- RenderPage
- SetCMapDir
- SetExtColorSpace, SetExtFillColorSpace and SetExtStrokeColorSpace.
- SetUseGlobalImpFiles

Lite is required for:

- AddRenderingIntent and AddRenderingIntentEx
- CreateFormFields
- CloseFileEx
- ConvertEMFSpool
- CreateCollection
- CreateExtGState
- InsertMetafile and InsertMetafileEx
- OpenImportBuffer, OpenImportFile and OpenImportStream
- SetPDFVersion for PDF/A and PDF/X

And all functions relaying on those functions internally.
See also SetLicenseKey function in DynaPDF manual.

### 77.40.833 SetLicenseKeyGlobal(Value as string)

MBS DynaPDF Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Use this function to enter your license key.
**Notes:** This method stores the key for later use. The constructor uses than this key to call SetLicenseKey for any new instance of the DynaPDFMBS class. This way you can register in the app.open event for your whole application.
See also:

- 77.40.834 SetLicenseKeyGlobal(Value as string) 12975

### 77.40.834 SetLicenseKeyGlobal(Value as string)

MBS DynaPDF Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method to avoid you call this on an object.
**Notes:** Please call shared method in app.open.
Because if you make a new object and set key, it's too late.
See also:

- 77.40.833 SetLicenseKeyGlobal(Value as string) 12975

### 77.40.835 SetLineAnnotParms(Handle as UInt32, FontHandle as Integer, FontSize as Double, Params as DynaPDFLineAnnotParameterMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the properties of a line annotation relating to measure lines.
**Notes:** The parameter Parms can be set to nil to delete all measure line specific values. The parameters FontHandle and FontSize will be ignored in this case.
The member Caption specifies whether the parameter Content of the function LineAnnot should be used as caption of the measure line. Although a measure line can display the string in a PopUp annotation like ordinary line annotations, this is not recommended and not fully supported in Adobe's Acrobat or Reader.
If Caption is true (recommended), the caption is drawn horizontally centered either on top or inside the measure line. The text position can be changed from its normal position with the members CaptionOffsetX and CaptionOffsetY.
The parameter FontHandle can be used to specify an arbitrary font that should be used to draw the caption. Although it is possible to use any font or font size greater 0 with DynaPDF, a PDF viewer will change the font and font size to it's default values when the annotation will be edited since line annotations support no property to specify the font or font size.
ÔøºÔøºFunction Reference

The default font to draw the caption is Helvetica and the default font size is 9 units. In order to use the default font set the parameter FontHandle to -1. The default font size is used if the parameter FontSize is

set to to zero.

Returns true on success or false on failure.
See also SetLineAnnotParms function in DynaPDF manual.

### 77.40.836 SetLineCapStyle(Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the line cap style that specifies how the endpoint of a line will be drawn.
See also SetLineCapStyle function in DynaPDF manual.

### 77.40.837 SetLineDashPattern(Dash as string, Phase as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The line dash pattern controls the pattern of dashes and gaps used to stroke paths.
See also SetLineDashPattern function in DynaPDF manual.

### 77.40.838 SetLineDashPattern2(dash() as double, Phase as double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a line dash pattern with a given array.
**Notes:** Returns true on success.
If array is nil, the pattern is removed.
See also SetLineDashPattern2 function in DynaPDF manual.

### 77.40.839 SetLineDashPatternEx(dash as memoryblock, NumValues as Integer, Phase as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SetLineDashPattern2 instead. **Function:** The function sets a line dash pattern in the same way as SetLineDashPattern().
**Notes:** dash is a memoryblock with doubles.
So dash.size=NumValues*8.
See also SetLineDashPatternEx function in DynaPDF manual.
See also:

- 77.40.840 SetLineDashPatternEx(dash() as double, Phase as integer) as Boolean

### 77.40.840 SetLineDashPatternEx(dash() as double, Phase as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SetLineDashPattern2 instead. **Function:** Sets a line dash pattern with a given array.
**Notes:** However, this version accepts an array of doubles instead of a string value.
Returns true on success.
See SetLineDashPattern for more details.

If array is nil, the pattern is removed.
See also SetLineDashPatternEx function in DynaPDF manual.
See also:

- 77.40.839 SetLineDashPatternEx(dash as memoryblock, NumValues as Integer, Phase as Integer) as Boolean 12976

### 77.40.841 SetLineJoinStyle(Style as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the line join style which specifies how two line segments are connected.
See also SetLineJoinStyle function in DynaPDF manual.

### 77.40.842 SetLineWidth(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the line width used to stroke paths.
See also SetLineWidth function in DynaPDF manual.

### 77.40.843 SetLinkHighlightMode(Mode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the highlight mode that is used by link annotations.
See also SetLinkHighlightMode function in DynaPDF manual.

### 77.40.844 SetListFont(Handle as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function marks an arbitrary font as list font.
See also SetListFont function in DynaPDF manual.

### 77.40.845 SetMatrix(Matrix as DynaPDFMatrixMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function left multiplies the current transformation matrix with the new one.
See also SetMatrix function in DynaPDF manual.

### 77.40.846 SetMaxErrLogMsgCount(value as Integer)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the maximum number of error log messages kept in memory.
See also SetMaxErrLogMsgCount function in DynaPDF manual.

### 77.40.847 SetMaxFieldLen(TxtField as Integer, MaxLen as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the maximum count of characters which can be entered into a text field.
**Notes:** A value of zero determines that the string length should not be restricted.

See also SetMaxFieldLen function in DynaPDF manual.

### 77.40.848 SetMetaConvFlags(Flags as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets specific flags to control the conversion of metafiles.
See also SetMetaConvFlags function in DynaPDF manual.

### 77.40.849 SetMetadata(ObjType as Integer, Handle as Integer, Buffer as Memoryblock) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or replaces the XMP metadata stream of a specific object.
**Notes:** The function deletes the XMP stream if empty buffer will be provided.

If the global XMP stream of the Catalog object should be replaced then proceed as follows:

- Set the wished output PDF version with SetPDFVersion.
- Get a preview of the XMP stream with GetMetadata.
- Modify the returned stream as needed and save it with SetMetadata, finished!

The above steps make sure that the XMP metadata and document info contain the same values. This is especially important for PDF standards like PDF/A or PDF/X. DynaPDF makes sure that the creation and modification date will not be changed when closing the file.

Returns true on success and false on failure.
See also SetMetadata function in DynaPDF manual.
See also:

- 77.40.850 SetMetadata(ObjType as Integer, Handle as Integer, Buffer as String) as Boolean 12979

### 77.40.850 SetMetadata(ObjType as Integer, Handle as Integer, Buffer as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or replaces the XMP metadata stream of a specific object.
**Notes:** The function deletes the XMP stream if empty buffer will be provided.

If the global XMP stream of the Catalog object should be replaced then proceed as follows:

- Set the wished output PDF version with SetPDFVersion.
- Get a preview of the XMP stream with GetMetadata.
- Modify the returned stream as needed and save it with SetMetadata, finished!

The above steps make sure that the XMP metadata and document info contain the same values. This is especially important for PDF standards like PDF/A or PDF/X. DynaPDF makes sure that the creation and modification date will not be changed when closing the file.

Returns true on success and false on failure.
See also SetMetadata function in DynaPDF manual.
See also:

- 77.40.849 SetMetadata(ObjType as Integer, Handle as Integer, Buffer as Memoryblock) as Boolean 12978

### 77.40.851 SetMiterLimit(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the miter limit.
See also SetMiterLimit function in DynaPDF manual.

### 77.40.852 SetNeedAppearance(value as boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the appearance flag.
See also SetNeedAppearance function in DynaPDF manual.

### 77.40.853 SetNumberFormat(TxtField as Integer, Sep as Integer, DecPlaces as Integer, NegStyle as Integer, CurrStr as string, Prepend as boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function restricts the allowed input characters of a text field to numbers and formats the resulting string as specified.
See also SetNumberFormat function in DynaPDF manual.

### 77.40.854 SetOCGContUsage(Handle as UInt32, Value as DynaPDFOCGContUsageMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates or changes the Content Usage dictionary of an OCG.
**Notes:** See dynapdf_help.pdf manual for details.
If the function succeeds the return value is true. If the function fails the return value is false.
See also SetOCGContUsage function in DynaPDF manual.

### 77.40.855 SetOCGState(Handle as UInt32, On as Boolean, SaveState as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the visibility state of an OCG or layer.
**Notes:** If the parameter SaveState is true, the new state is also saved in the PDF file. Otherwise, the state is only changed temporarily so that the whished state can be rendered with RenderPage or RenderPageToImage for example.
Note that only the new state of the current OCG will be be saved. If the state of other OCGs were changed beforehand, while SaveState was set to false, then these changes will not be considered.

If the function succeeds the return value is true. If the function fails the return value is false.
See also SetOCGState function in DynaPDF manual.

### 77.40.856 SetOpacity(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the opacity value which is used to render the appearance of a text annotation.
See also SetOpacity function in DynaPDF manual.

### 77.40.857 SetOrientation(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the orientation of a page.
See also SetOrientation function in DynaPDF manual.

### 77.40.858 SetOrientationEx(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the orientation of a page, incl. important page properties such as the width and height, and the coordinate system.
See also SetOrientationEx function in DynaPDF manual.

### 77.40.859 SetPageCoords(PageCoords as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native coordinate system of the Portable Document Format is bottom up.
**Notes:** Value can be kpcTopDown or kpcBottomUp. Default is kpcBottomUp.
See also SetPageCoords function in DynaPDF manual.

### 77.40.860 SetPageFormat(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets a predefined page or paper format.
**Notes:**

Common paper formats and sizes in points:

| Format | Size in units (Width x Height) |
|---|---|
| DIN A3 | 842.0 x 1191.0 |
| DIN A4 | 595.0 x 842.0 |
| DIN A5 | 419.0 x 595.0 |
| DIN B4 | 709.0 x 1001.0 |
| DIN B5 | 499.0 x 709.0 |
| DIN B6 | 354.0 x 499.0 |
| DIN C3 | 918.0 x 1298.0 |
| DIN C4 | 649.0 x 918.0 |
| DIN C5 | 459.0 x 649.0 |
| DIN C6 | 323.0 x 459.0 |
| DIN C65 | 323.0 x 649.0 |
| DIN DL | 312.0 x 624.0 |
| DIN E4 | 623.0 x 879.0 |
| DIN E5 | 439.0 x 624.0 |
| DIN E6 | 312.0 x 439.0 |
| DIN E65 | 312.0 x 624.0 |
| DIN M5 | 439.0 x 632.0 |
| DIN M65 | 317.0 x 632.0 |
| US Legal | 612.0 x 1008.0 |
| US Letter | 612.0 x 792.0 |

See also SetPageFormat function in DynaPDF manual.

### 77.40.861 SetPageHeight(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the height of the currently open page if any, or the default height for newly created pages.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean
dim dWidth as Double = 800 // new width
dim dHeight as Double = 600 // new heihht

// define page size
bBool=pdf.SetPageWidth(dWidth)
bBool=pdf.SetPageHeight(dHeight)
```

**Notes:**

Common paper formats and sizes in points:

| Format | Size in units (Width x Height) |
|---|---|
| DIN A3 | 842.0 x 1191.0 |
| DIN A4 | 595.0 x 842.0 |
| DIN A5 | 419.0 x 595.0 |
| DIN B4 | 709.0 x 1001.0 |
| DIN B5 | 499.0 x 709.0 |
| DIN B6 | 354.0 x 499.0 |
| DIN C3 | 918.0 x 1298.0 |
| DIN C4 | 649.0 x 918.0 |
| DIN C5 | 459.0 x 649.0 |
| DIN C6 | 323.0 x 459.0 |
| DIN C65 | 323.0 x 649.0 |
| DIN DL | 312.0 x 624.0 |
| DIN E4 | 623.0 x 879.0 |
| DIN E5 | 439.0 x 624.0 |
| DIN E6 | 312.0 x 439.0 |
| DIN E65 | 312.0 x 624.0 |
| DIN M5 | 439.0 x 632.0 |
| DIN M65 | 317.0 x 632.0 |
| US Legal | 612.0 x 1008.0 |
| US Letter | 612.0 x 792.0 |

See also SetPageHeight function in DynaPDF manual.

### 77.40.862 SetPageLayout(Layout as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the page layout that is used when opening the document with Adobe's Acrobat.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// define page view
'plSinglePage = 0, // Show one page at time
'plOneColumn = 1, // Show the pages continous
'plTwoColumnLeft = 2, // Two columns, start with left column
'plTwoColumnRight = 3 // Two columns, start with right column
bBool=pdf.SetPageLayout(0)
```

**Notes:** See kpl* constants.
see also SetPageMode and SetViewerPreferences functions.
See also SetPageLayout function in DynaPDF manual.

### 77.40.863 SetPageMode(Mode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the page mode that is used when opening the document with Adobe's Acrobat.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// define page mode
'pmUseNone = 0, // Default
'pmUseOutlines = 1, // Show the outline tree
'pmUseThumbs = 2, // Show the thumb nails
'pmFullScreen = 3 // Open the document in full-screen mode
bBool=pdf.SetPageMode(0)
```

**Notes:** see also SetPageLayout and SetViewerPreferences functions.
See also SetPageMode function in DynaPDF manual.

### 77.40.864 SetPageWidth(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the width of the currently open page if any, or the default width for newly created pages.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean
dim dWidth as Double = 800 // new width
dim dHeight as Double = 600 // new heihht

// define page size
bBool=pdf.SetPageWidth(dWidth)
bBool=pdf.SetPageHeight(dHeight)
```

**Notes:**

Common paper formats and sizes in points:

| Format | Size in units (Width x Height) |
|---|---|
| DIN A3 | 842.0 x 1191.0 |
| DIN A4 | 595.0 x 842.0 |
| DIN A5 | 419.0 x 595.0 |
| DIN B4 | 709.0 x 1001.0 |
| DIN B5 | 499.0 x 709.0 |
| DIN B6 | 354.0 x 499.0 |
| DIN C3 | 918.0 x 1298.0 |
| DIN C4 | 649.0 x 918.0 |
| DIN C5 | 459.0 x 649.0 |
| DIN C6 | 323.0 x 459.0 |
| DIN C65 | 323.0 x 649.0 |
| DIN DL | 312.0 x 624.0 |
| DIN E4 | 623.0 x 879.0 |
| DIN E5 | 439.0 x 624.0 |
| DIN E6 | 312.0 x 439.0 |
| DIN E65 | 312.0 x 624.0 |
| DIN M5 | 439.0 x 632.0 |
| DIN M65 | 317.0 x 632.0 |
| US Legal | 612.0 x 1008.0 |
| US Letter | 612.0 x 792.0 |

See also SetPageWidth function in DynaPDF manual.

### 77.40.865 SetPDFVersion(Version as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the output PDF file version.
**Example:**

```
const pvPDF_1_3=3

dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// ask to create a pdf in version 1.3
bBool=pdf.SetPDFVersion(DynaPDFMBS.kpvPDFA_2005)
```

**Notes:** Requires DynaPDF Lite license for PDF/A and PDF/X versions.
See also SetPDFVersion function in DynaPDF manual.

### 77.40.866 SetPrintSettings(Mode as Integer, PickTrayByPDFSize as Integer, NumCopies as Integer, PrintScaling as Integer, PrintRanges() as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the print settings.
**Notes:** This is a PDF 1.7 extension.

For the Mode use the kdpm* constants.
For the PrintScaling use the kps* constants.
See also SetPrintSettings function in DynaPDF manual.

### 77.40.867 SetRenderingIntent(ImgHandle as Integer, RenderingIntent as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set function sets the rendering intent of an image.
**Notes:** The rendering intent describes how colors should be interpreted.

The parameter ImgHandle must be a valid image handle that was returned by InsertImage or InsertImageFile. Imported images returned in ParseContent, for example, can be changed too.

If the function succeeds the return value is true. If the function fails the return value is false.
See also SetRenderingIntent function in DynaPDF manual.

### 77.40.868 SetResolution(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the resolution in DPI (Dots per Inch), in which images are stored by DynaPDF.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// set maximum resolution
bBool = pdf.SetResolution(150)
```

See also SetResolution function in DynaPDF manual.

### 77.40.869 SetSaveNewImageFormat(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property SaveNewImageFormat specifies whether images should be downscaled if the original resolution of the image is higher than the value of the property resolution (see also SetResolution()).
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// whether you want image to be recompressed
bBool=pdf.SetSaveNewImageFormat(False)
```

See also SetSaveNewImageFormat function in DynaPDF manual.

### 77.40.870 SetSeparationInfo(Handle as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the separation info of the current open page.
See also SetSeparationInfo function in DynaPDF manual.

### 77.40.871 SetStrokeColor(ColorValue as color) as Boolean

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the color used for stroked graphics objects.
**Notes:** Raises an exception if current color space is CMYK or Gray and not RGB.
See also SetStrokeColor function in DynaPDF manual.
See also:


- 77.40.872 SetStrokeColor(ColorValue as Integer) as Boolean 12988
- 77.40.873 SetStrokeColor(values() as Double) as boolean 12988
- 77.40.874 SetStrokeColor(values() as single) as boolean 12989


### 77.40.872 SetStrokeColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the color used for stroked graphics objects.
See also SetStrokeColor function in DynaPDF manual.
See also:


- 77.40.871 SetStrokeColor(ColorValue as color) as Boolean 12988
- 77.40.873 SetStrokeColor(values() as Double) as boolean 12988
- 77.40.874 SetStrokeColor(values() as single) as boolean 12989


### 77.40.873 SetStrokeColor(values() as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets stroke color based on an array of floats.
**Notes:** The number of components must match.
See also SetStrokeColor function in DynaPDF manual.
See also:


- 77.40.871 SetStrokeColor(ColorValue as color) as Boolean 12988
- 77.40.872 SetStrokeColor(ColorValue as Integer) as Boolean 12988
- 77.40.874 SetStrokeColor(values() as single) as boolean 12989

### 77.40.874 SetStrokeColor(values() as single) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets stroke color based on an array of floats.
**Notes:** The number of components must match.
See also SetStrokeColor function in DynaPDF manual.
See also:


- 77.40.871 SetStrokeColor(ColorValue as color) as Boolean 12988
- 77.40.872 SetStrokeColor(ColorValue as Integer) as Boolean 12988
- 77.40.873 SetStrokeColor(values() as Double) as boolean 12988


### 77.40.875 SetStrokeColorEx(colorvalues as memoryblock, count as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the stroke color using the values in parameters.
**Example:**

```
dim p as DynaPDFMBS // get a pdf object

dim colorvalues as memoryblock

colorvalues=NewMemoryBlock(3)
colorvalues.Byte(0)=255
colorvalues.Byte(1)=128
colorvalues.Byte(2)=0

if p.SetStrokeColorEx(colorvalues, 3) then
' ok
else
' failed
end if
```

**Notes:** Pass as many color values as needed for the current color space. 3 for RGB, 4 for CMYK. All values must be in the range of 0 to 255.
See also SetStrokeColorEx function in DynaPDF manual.
See also:


- 77.40.876 SetStrokeColorEx(ParamArray colorvalue as Integer) as Boolean 12990

### 77.40.876 SetStrokeColorEx(ParamArray colorvalue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the stroke color using the values in parameters.
**Example:**

```
dim p as DynaPDFMBS // get a pdf object

if p.SetStrokeColorEx(255,128,0) then
' ok
else
' failed
end if
```

**Notes:** Pass as many color values as needed for the current color space. 3 for RGB, 4 for CMYK. All values must be in the range of 0 to 255.
See also SetStrokeColorEx function in DynaPDF manual.
See also:

- 77.40.875 SetStrokeColorEx(colorvalues as memoryblock, count as Integer) as Boolean 12989

### 77.40.877 SetStrokeColorSpace(Colorspace as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the stroke color space. In PDF, fill and stroke colors use both their own color spaces.
See also SetStrokeColorSpace function in DynaPDF manual.

### 77.40.878 SetTabLen(TabLen as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the tabulator length, specified in number of spaces, which will be used to emulate tabulators during text formatting (see WriteFText() for further information).
See also SetTabLen function in DynaPDF manual.

### 77.40.879 SetTemplBBox(TemplateHandle as Integer, PageBoundary as Integer, BBoxRect as DynaPDFRectMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or changes a bounding box of a template.
**Notes:** Templates support the bounding boxes kpbMediaBox and kpbCropBox only. The latter one is considered by PlaceTemplateEx() only.

A crop box can be set to clip the contents of a template without changing its bounding box. This can be useful when placing imported pages on another page.
If BBox is set to nil, the bounding box is deleted. Note that only the crop box can be deleted.

Returns true on success or false in case of an error.
See also SetTemplBBox function in DynaPDF manual.
See also:

- 77.40.880 SetTemplBBox(TemplateHandle as Integer, PageBoundary as Integer, Left as Double, Top as Double, Right as Double, Bottom as Double) as Boolean 12991

### 77.40.880 SetTemplBBox(TemplateHandle as Integer, PageBoundary as Integer, Left as Double, Top as Double, Right as Double, Bottom as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or changes a bounding box of a template.
**Notes:** Templates support the bounding boxes kpbMediaBox and kpbCropBox only. The latter one is considered by PlaceTemplateEx() only.

A crop box can be set to clip the contents of a template without changing its bounding box. This can be useful when placing imported pages on another page.
If BBox is set to nil, the bounding box is deleted. Note that only the crop box can be deleted.

Returns true on success or false in case of an error.
See also SetTemplBBox function in DynaPDF manual.
See also:

- 77.40.879 SetTemplBBox(TemplateHandle as Integer, PageBoundary as Integer, BBoxRect as DynaPDFRectMBS) as Boolean 12990

### 77.40.881 SetTextDrawMode(Mode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text draw mode specifies how text should be rendered.
See also SetTextDrawMode function in DynaPDF manual.

### 77.40.882 SetTextFieldValue(Field as Integer, Value as string, DefValue as string, Align as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets or changes the value and default value of a text field.
**Notes:** The Value and the DefValue strings are converted to unicode.
See also SetTextFieldValue function in DynaPDF manual.

### 77.40.883 SetTextFieldValueAnsi(Field as Integer, Value as string, DefValue as string, Align as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function sets or changes the value and default value of a text field.
**Notes:** The Value and the DefValue strings are converted to ANSI.

### 77.40.884 SetTextFieldValueAnsiEx(Field as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Sets the text field value.

### 77.40.885 SetTextFieldValueEx(Field as Integer, Value as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text field value.
See also SetTextFieldValueEx function in DynaPDF manual.

### 77.40.886 SetTextRect(PosX as Double, PosY as Double, Width as Double, Height as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function defines the output rectangle that is used to output formatted text by the function WriteFText().
See also SetTextRect function in DynaPDF manual.

### 77.40.887 SetTextRise(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rise specifies the distance, to move the baseline up or down from its default location.
See also SetTextRise function in DynaPDF manual.

### 77.40.888 SetTextScaling(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scaling value adjusts the width of glyphs by stretching or compressing them in the horizontal direction.
See also SetTextScaling function in DynaPDF manual.

### 77.40.889 SetTransparentColor(ColorValue as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the transparent color which is used for newly inserted images.
**Example:**

```
dim pdf as DynaPDFMBS

call pdf.SetTransparentColor pdf.kNO_COLOR
```

See also SetTransparentColor function in DynaPDF manual.

### 77.40.890 SetTrapped(value as boolean)

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the trapped key of the document.
See also SetTrapped function in DynaPDF manual.

### 77.40.891 SetUseExactPwd(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the property UseExactPwd is false, an encrypted PDF file can always be decrypted, if either

the open or owner password in the file is an empty string.
See also SetUseExactPwd function in DynaPDF manual.

### 77.40.892 SetUseGlobalImpFiles(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property can be used to load an external PDF file permanent into memory, e.g. to split a large PDF file into smaller pieces.
**Notes:** Requires DynaPDF Pro license.
See also SetUseGlobalImpFiles function in DynaPDF manual.

### 77.40.893 SetUseImageInterpolation(Index as Integer, Value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables or disables image interpolation explictely for a given image.
**Notes:** If nothing was specified (this is the default), a viewer applications can only use a heuristic to determine whether image interpolation should be enabled or not. The result is then of course application specific. The parameter Handle must be a valid image handle that was returned by a DynaPDF function like InsertImage(), InsertImageEx(), or InsertImageFromBuffer(), for example.

If the function succeeds the return value is true. If the function fails the return value is false.
See also SetUseImageInterpolation function in DynaPDF manual.

### 77.40.894 SetUserUnit(value as single) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the user unit of the current open page.
**Notes:** A user unit acts like a scaling factor. The page format and all page coordinates are multiplied with this factor in a viewer application. The default size of a PDF unit is 1/72 inch. User units can be useful if the page format would be too large to be expressed in standard PDF units. The largest page format in PDF is limited to 14400 units or 200 inches. This limit can be extended with the user unit.
The largest value that is supported is 75.0 which results in a maximum page format of 15,000 x 15,000 inches or 1,800,000 units. Note that all functions which return page coordinates or page properties do not consider the user unit.
The page format must still be in the range 3..14400 units. It is also strongly recommended to set the user unit only if necessary. This is only the case if the required page format is larger 14400 units.
Default value = 1.0

Return values:
If the function succeeds the return value is true. If the function fails the return value is false.
See also SetUserUnit function in DynaPDF manual.

### 77.40.895 SetUseStdFonts(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function can be used to disable the 14 standard fonts temporarily.
See also SetUseStdFonts function in DynaPDF manual.

### 77.40.896 SetUseSwapFile(SwapContents as Boolean, SwapLimit as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** When creating large PDF files with many or large images it is sometimes recommended to page out large objects to a temp file to restrict the memory usage.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object

// define a swap file in case memory is low
dim b as Boolean=pdf.SetUseSwapFile(False, 256*1024*1024)
if b=False then
MsgBox "Failed to create swap file."
Return
end if
```

**Notes:**

Do not use FlushPages and SetUseSwapFile together. Use one function.
See also SetUseSwapFile function in DynaPDF manual.

### 77.40.897 SetUseSwapFileEx(SwapContents as Boolean, SwapLimit as Integer, SwapDir as FolderItem) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This function enables paging out of large objects to restrict the memory usage in the same way as SetUseSwapFile().

See also SetUseSwapFileEx function in DynaPDF manual.

### 77.40.898 SetUseSystemFonts(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether the Windows/Fonts directory should be added automatically to the list of available font search paths.
See also SetUseSystemFonts function in DynaPDF manual.

### 77.40.899 SetUseTransparency(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether images should get a transparent background.
**Example:**

```
dim pdf as DynaPDFMBS // your DynaPDF object
dim bBool as Boolean

// allow transparency for images
bBool=pdf.SetUseTransparency(False)
```

See also SetUseTransparency function in DynaPDF manual.

### 77.40.900 SetUseVisibleCoords(value as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The property specifies whether DynaPDF should consider the crop box to calculate to position of an object.
See also SetUseVisibleCoords function in DynaPDF manual.

### 77.40.901 SetViewerPreferences(Value as Integer, AddVal as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the viewer preferences which can be used to control a few parameter of Adobe's Acrobat, such as hide the toolbar or menu bar.
**Example:**

call pdf.SetViewerPreferences pdf.kvpDisplayDocTitle,pdf.kavNone

**Notes:** See kvp* constants and *kav constants.
See also SetPageLayout and SetPageMode functions.
See also SetViewerPreferences function in DynaPDF manual.

### 77.40.902 SetWhite(FillColor as Boolean, StrokeColor as Boolean) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets white color.
**Notes:** This function is a bit optimized to check the current color space.
Depending on whether it's RGB, Gray, CMYK or Lab, it will set different color values.
And if other color space is active, it switches to Gray colorspace to set white.

### 77.40.903 SetWMFDefExtent(Width as Integer, Height as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the default size which is used to convert non-portable WMF files to EMF. See InsertMetafile() for further information.
See also SetWMFDefExtent function in DynaPDF manual.

### 77.40.904 SetWMFPixelPerInch(Value as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the default pixels per inch of the y-axis which are used to convert portable WMF files to EMF.
See also SetWMFPixelPerInch function in DynaPDF manual.

### 77.40.905 SetWordSpacing(value as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the word spacing.
See also SetWordSpacing function in DynaPDF manual.

### 77.40.906 SetXFAStream(Index as UInt32, Buffer as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function replaces the contents of an XFA stream with new contents.
**Notes:** Index must be a valid XFA resource index. XFA streams can be enumerated with GetXFAStream() / GetXFAStreamCount().
The function does not check whether the provided XFA buffer is valid. The buffer is written to the stream as is.

If the function succeeds the return value is true. If the function fails the return value is false.
See also SetXFAStream function in DynaPDF manual.

### 77.40.907 ShowDifferences(PageIndex1 as Integer, OtherPDF as DynaPDFMBS, PageIndex2 as Integer, CheckMoving as boolean, HighlightColor as UInt32 = &hFFFF, ScaleFactor as Integer = 1, ColorTolerance as Integer = 3, debug as boolean = false) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows differences on two PDF pages by adding highlight annotations.
**Notes:** Please pass page indexes for both pages. OtherPDF can be same as the current instance you call this method on.

CheckMoving: Whether to check for moving parts, e.g. the big part of the page shifted up one line.

Returns number of annotations on success which means that highlight annotations have been added to both pages.
Or returns negative value in case of error.
You can than render a page to show differences to user.
Requires a DynaPDF Pro license. Without a license, the DynaPDF watermark will reduce the accuracy.

Scale: When comparison, scales up the pictures used for comparison. Default is 1 for 72dpi, but you can use 2 for double.
ColorTolerance: The tolerance for color comparison.
Colors where red, green or blue components are within given tolerance are considered equal. So FFFFFF and FFFFFD are equal.
Default is 3.

Debug Parameter: Whether to write debug images to temp folder.
If true, we write png files to temp folder. One image is before the check, one with all similar lines removed and one with result of comparison. Red pixels show you the raster, green equal pixels.

### 77.40.908 SkewCoords(alpha as Double, beta as Double, OriginX as Double, OriginY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function skews the coordinate system and sets the coordinate origin to the point OriginX, OriginY.
**Notes:** Please do not try to scale/skew/translate back later. use SaveGraphicState and RestoreGraphicState.
See also SkewCoords function in DynaPDF manual.

### 77.40.909 SortFieldsByIndex as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sorts the interactive form fields of a page by comparing the internal indices which can be set for each field separately (see SetFieldIndex() for further information).
See also SortFieldsByIndex function in DynaPDF manual.

### 77.40.910 SortFieldsByName as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sorts the interactive form fields of a page in ascending order by field name.
See also SortFieldsByName function in DynaPDF manual.

### 77.40.911 SquareAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a square annotation on the current open page.
**Notes:** If the parameters Width and Height are equal the function draws a square, a rectangle otherwise. If the annotation should beÔøºdrawn without a border, set the parameter LineWidth zo zero or StrokeColor to the special constant kNO_COLOR.
If the interior should be transparent set FillColor to the special constant kNO_COLOR.
Although the line width can be set to any positive floating point value, Adobe's Acrobat or Reader restrict the line width to 0 through 12 units. The line width should be restricted in the same way to avoid issues in Adobe viewer products.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails, the return value is a negative error code.
See also SquareAnnot function in DynaPDF manual.

### 77.40.912 SquareAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, LineWidth as Double, FillColor as UInt32, StrokeColor as UInt32, ColorSpace as Integer, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function draws a square annotation on the current open page.
**Notes:** If the parameters Width and Height are equal the function draws a square, a rectangle otherwise. If the annotation should beÔøºdrawn without a border, set the parameter LineWidth zo zero or StrokeColor to the special constant kNO_COLOR.
If the interior should be transparent set FillColor to the special constant kNO_COLOR.
Although the line width can be set to any positive floating point value, Adobe's Acrobat or Reader restrict the line width to 0 through 12 units. The line width should be restricted in the same way to avoid issues in Adobe viewer products.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails, the return value is a negative error code.

### 77.40.913 StampAnnot(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stamp annotation.
See also StampAnnot function in DynaPDF manual.

### 77.40.914 StampAnnotAnsi(SubType as Integer, PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Subject as string, Comment as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Creates a stamp annotation with ANSI encoded texts.

### 77.40.915 StrokePath as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function strokes the current path without closing it.
See also StrokePath function in DynaPDF manual.

### 77.40.916 TestGlyphs(FontHandle as Integer, Text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function checks whether all glyphs of the text are available in the specified font.
**Example:**

```
// create dummy PDF with one page
dim d as new myDynaPDFMBS

call d.CreateNewPDF
call d.Append

// check this text
dim x as string = "ÊÇ®Â • Ω" // Hello in Chinese

// load 2 fonts to check
dim FontHandle1 as Integer = d.SetFont("Times", 12)
dim FontHandle2 as Integer = d.SetFont("Arial Unicode MS", 12)

dim r1 as Integer = d.TestGlyphs(FontHandle1, x)

if r1 = -1 then
MsgBox "Times supports chinese characters"
else
MsgBox "Times does not support chinese characters"
end if

dim r2 as Integer = d.TestGlyphs(FontHandle2, x)

if r2 = -1 then
MsgBox "Arial Unicode MS supports chinese characters"
else
MsgBox "Arial Unicode MS does not support chinese characters"
end if
```

**Notes:** The return value is the position of the first missing glyph, or -1 if all glyphs are available.
If the font uses a mixed 8/16 bit CJK code page that requires a conversion to Unicode (a code page that ends with "_Uni"), then the return value corresponds to the converted Unicode string and not to the CJK input string.
See also TestGlyphs function in DynaPDF manual.

### 77.40.917 TestGlyphsAnsi(FontHandle as Integer, Text as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function checks whether all glyphs of the text are available in the specified font.
**Notes:** The return value is the position of the first missing glyph, or -1 if all glyphs are available.
If the font uses a mixed 8/16 bit CJK code page that requires a conversion to Unicode (a code page that ends with "_Uni"), then the return value corresponds to the converted Unicode string and not to the CJK input string.
The text parameter is converted to ANSI.

### 77.40.918 TextAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Text as string, Icon as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function creates a text annotation.
**Notes:** The text and the author parameters are converted to unicode.
See also TextAnnot function in DynaPDF manual.

### 77.40.919 TextAnnotAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, Author as string, Text as string, Icon as Integer, Open as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function creates a text annotation.
**Notes:** The text and the author parameters are converted to ANSI.

### 77.40.920 TranslateCoords(OriginX as Double, OriginY as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function translates the coordinate system to the new origin OriginX, OriginY.
See also TranslateCoords function in DynaPDF manual.

### 77.40.921 TranslateRawCode(IFont as Integer, text as string, byref Width as Double, byref Decoded as boolean, CharSpacing as Double, WordSpacing as Double, TextScale as Double) as string

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates a raw code.
**Notes:** Deprecated. Please use other variant with more parameters.
See also TranslateRawCode function in DynaPDF manual.
See also:

- 77.40.922 TranslateRawCode(IFont as integer, text as string, textOffset as Integer, byref Width as double, byref Decoded as boolean, CharSpacing as double, WordSpacing as double, TextScale as double, byref count as integer) as string 13004

### 77.40.922 TranslateRawCode(IFont as integer, text as string, textOffset as Integer, byref Width as double, byref Decoded as boolean, CharSpacing as double, WordSpacing as double, TextScale as double, byref count as integer) as string

MBS DynaPDF Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function converts a source character to Unicode.
**Notes:** The code length of a character depends on the font's encoding. PDF supports encodings with fixed and variable code lengths from one through four bytes per character. The Count parameter provides the number of bytes which were consumed to convert the character to Unicode; this value must be used to increment the textOffset parameter for further calls.
The resulting Unicode character or sequence is returned in function result. The width parameter is used to return the character width.
The parameter Decoded is set to true if the source character could be sucsessfully converted to Unicode. If Decode is false the output string and character width contain no meaningful values.
The function can only fail when processing strings of CID fonts, e.g. if the font depends on an external CMap that could not be loaded, or if the font uses a damaged CMap. The search path(s) to external CMaps should always be set before extracting text from PDF files with SetCMapDir().
Passing an invalid or undefined code sequence to the function does not result in an error. In this case the notdef character is added to the output string (this is usually 0 or 0xFFFD if the font contains a ToUnicode CMap).
Notice:
To improve processing speed the function does not check whether the parameters are valid.
Remarks:
This function was designed to convert raw strings on a per character basis to Unicode which were returned by ParseContent() or GetPageText(). The parameters CharSpacing, WordSpacing, and TextScale must be taken from the current graphics state or from the structure DynaPDFStackMBS.
Return values:
The count value of this function is always greater or equal to one. Check the parameter Decoded to determine whether the function succeed.
See also TranslateRawCode function in DynaPDF manual.
See also:

- 77.40.921 TranslateRawCode(IFont as Integer, text as string, byref Width as Double, byref Decoded as boolean, CharSpacing as Double, WordSpacing as Double, TextScale as Double) as string 13003

### 77.40.923 TranslateString(IFont as Integer, text as string, flags as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates a string.
See also TranslateString function in DynaPDF manual.
See also:


- 77.40.924 TranslateString(stack as DynaPDFStackMBS, flags as Integer) as string 13005


### 77.40.924 TranslateString(stack as DynaPDFStackMBS, flags as Integer) as string

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function translates a binary string returned by GetPageText() to Unicode.
See also TranslateString function in DynaPDF manual.
See also:


- 77.40.923 TranslateString(IFont as Integer, text as string, flags as Integer) as string 13005


### 77.40.925 Triangle(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x3 as Double, y3 as Double, FillMode as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function draws a triangle.
See also Triangle function in DynaPDF manual.

### 77.40.926 UnLockLayer(layer as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks a layer.
See also UnLockLayer function in DynaPDF manual.

### 77.40.927 WatermarkAnnot(PosX as Double, PosY as Double, Width as Double, Height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a Watermark annotation.
**Example:**

```
// create watermark annotation
Dim AnnotHandle As Integer = pdf.WatermarkAnnot(100, 100, 300, 200)

// it's empty initially

// so we create an annotation appearance stream
Dim x As Integer = pdf.CreateAnnotAP(AnnotHandle)

// set a color and draw rectangle
Call pdf.SetFillColor(&cFF7777)
Call pdf.Rectangle 0, 0, 300, 200, pdf.kfmFill

Call pdf.SetStrokeColor(&c000000)
Call pdf.SetFillColor(&c000000)
Call pdf.SetFont("Helvetica", pdf.kfsBold, 30)
Call pdf.WriteText(20, 20, "Hello World")

// close template
Call pdf.EndTemplate
```

**Notes:** Watermark annotations have no interactive elements like other annotation types. This property is useful in many cases because it is usually not possible to select or change the contents of a watermark annotation in viewer applications.
The annotation has no appearance after it was created. Call CreateAnnotAP to create an appearance template for the annotation. After the appearance template was created you can draw text, images or vector graphics into it. The template must be closed with EndTemplate when finished. It is also possible to import an external page or EMF contents into the template.
Watermark annotations can be shared on multiple pages. To place the annotation on other pages call AddAnnotToPage.

If the function succeeds the return value is the annotation handle, a value greater or equal zero. If the function fails the return value is a negative error code.
See also WatermarkAnnot function in DynaPDF manual.

### 77.40.928 WebLink(PosX as Double, PosY as Double, Width as Double, Height as Double, aText as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a web link onto the current open page.
**Notes:** The text parameter is converted to unicode.

See also WebLink function in DynaPDF manual.

### 77.40.929 WebLinkAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, aText as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function inserts a web link onto the current open page.
**Notes:** The text parameter is converted to ANSI.

### 77.40.930 WeightFromStyle(s as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a style value to a weight value.

### 77.40.931 WeightToStyle(s as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a weight value to a style value.

### 77.40.932 WidthFromStyle(s as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a style constant to the width value.

### 77.40.933 WidthToStyle(s as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a width value to a style value.

### 77.40.934 WriteAngleText(aText as string, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a string in a user defined angle around a radius.
**Notes:** The text parameter is converted to unicode.
See also WriteAngleText function in DynaPDF manual.
See also:

- 77.40.935 WriteAngleText(glyphs() as Integer, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean 13008

### 77.40.935 WriteAngleText(glyphs() as Integer, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a string in a user defined angle around a radius.
**Notes:** This version takes an array of integers. So if you are using the kcpUnicode on SetFont, please pass an array of unicode codepoints. If you use kcpGlyphIndexes, please pass an array of glyph values.

See also WriteAngleText function in DynaPDF manual.
See also:

- 77.40.934 WriteAngleText(aText as string, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean 13008

### 77.40.936 WriteAngleTextAnsi(aText as string, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function prints a string in a user defined angle around a radius.
**Notes:** The text parameter is converted to ANSI, so use only with SetFont with kcp1252.

### 77.40.937 WriteAngleTextDirect(aText as string, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a string in a user defined angle around a radius.
**Notes:** The text parameter is not converted, so pass a string in the right encoding.
See also:

- 77.40.938 WriteAngleTextDirect(glyphs() as Integer, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean 13009

### 77.40.938 WriteAngleTextDirect(glyphs() as Integer, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a string in a user defined angle around a radius.
**Notes:** This version takes an array of integers. So pass in values in the encoding you are using. This can be glyph values or bytes in any encoding you selected in the SetFont method.

See also:

- 77.40.937 WriteAngleTextDirect(aText as string, Angle as Double, PosX as Double, PosY as Double, Radius as Double, YOrigin as Double) as Boolean 13008

### 77.40.939 WriteFText(Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Instead of printing text on a line by line basis it is also possible to output text into a rectangle by applying a formatting algorithm.
**Notes:** The text parameter is converted to unicode.

The PageBreak event is called when needed by the plugin.
See also WriteFText function in DynaPDF manual.
See also:

- 77.40.940 WriteFText(Align as Integer, glyphs() as Integer) as Boolean 13009

### 77.40.940 WriteFText(Align as Integer, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Instead of printing text on a line by line basis it is also possible to output text into a rectangle by applying a formatting algorithm.
**Notes:** This version takes an array of integers. So if you are using the kcpUnicode on SetFont, please pass

an array of unicode codepoints. If you use kcpGlyphIndexes, please pass an array of glyph values.

The PageBreak event is called when needed by the plugin.
See also WriteFText function in DynaPDF manual.
See also:

- 77.40.939 WriteFText(Align as Integer, aText as string) as Boolean 13009

### 77.40.941 WriteFTextAnsi(Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** Instead of printing text on a line by line basis it is also possible to output text into a rectangle by applying a formatting algorithm.
**Notes:** The text parameter is converted to ANSI, so use only with SetFont with kcp1252.

The PageBreak event is called when needed by the plugin.

### 77.40.942 WriteFTextDirect(Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Instead of printing text on a line by line basis it is also possible to output text into a rectangle by applying a formatting algorithm.
**Notes:** The text parameter is not converted, so pass a string in the right encoding.

The PageBreak event is called when needed by the plugin.
See also:

- 77.40.943 WriteFTextDirect(Align as Integer, glyphs() as Integer) as Boolean 13010

### 77.40.943 WriteFTextDirect(Align as Integer, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Instead of printing text on a line by line basis it is also possible to output text into a rectangle by applying a formatting algorithm.
**Notes:** This version takes an array of integers. So pass in values in the encoding you are using. This can be glyph values or bytes in any encoding you selected in the SetFont method.

The PageBreak event is called when needed by the plugin.
See also:

- 77.40.942 WriteFTextDirect(Align as Integer, aText as string) as Boolean 13010

### 77.40.944 WriteFTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a formatted text exactly in the same way as WriteFText().
**Notes:** The text parameter is converted to unicode.

The PageBreak event is called when needed by the plugin.
See also WriteFTextEx function in DynaPDF manual.
See also:

- 77.40.945 WriteFTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, glyphs() as Integer) as Boolean 13011

### 77.40.945 WriteFTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a formatted text exactly in the same way as WriteFText().
**Notes:** This version takes an array of integers. So if you are using the kcpUnicode on SetFont, please pass an array of unicode codepoints. If you use kcpGlyphIndexes, please pass an array of glyph values.

The PageBreak event is called when needed by the plugin.
See also WriteFTextEx function in DynaPDF manual.
See also:

- 77.40.944 WriteFTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, aText as string) as Boolean 13011

### 77.40.946 WriteFTextExAnsi(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function prints a formatted text exactly in the same way as WriteFText().
**Notes:** The text parameter is converted to ANSI, so use only with SetFont with kcp1252.

The PageBreak event is called when needed by the plugin.

### 77.40.947 WriteFTextExDirect(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a formatted text exactly in the same way as WriteFText().
**Notes:** The text parameter is not converted, so pass a string in the right encoding.

The PageBreak event is called when needed by the plugin.
See also:

- 77.40.948 WriteFTextExDirect(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, glyphs() as Integer) as Boolean 13012

### 77.40.948 WriteFTextExDirect(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a formatted text exactly in the same way as WriteFText().
**Notes:** This version takes an array of integers. So pass in values in the encoding you are using. This can be glyph values or bytes in any encoding you selected in the SetFont method.

The PageBreak event is called when needed by the plugin.
See also:

- 77.40.947 WriteFTextExDirect(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, aText as string) as Boolean 13012

### 77.40.949 WriteStyledText(Align as Integer, StyledText as StyledText, LeadingFactor as double = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes styled text.
**Notes:** Same as WriteFText, but calls ConvertStyledText for you to convert the styled text to formatting commands.

LeadingFactor: Added in v21.0. If you pass a value >0, the plugin will add \LD [ ] commands to styled text to set leading relative to font size. This way you define the spacing beteween lines. e.g. 1.2.

If you have a problem with the conversion, you can always use ConvertStyledText function directly and inspect what it generates. And you can of course modify it and e.g. convert "* " on a beginning of a line to a list.
See also WriteStyledText function in DynaPDF manual.
See also:

- 77.40.950 WriteStyledText(Align as Integer, TextArea as TextArea, LeadingFactor as double = -1) as Boolean 13013

### 77.40.950 WriteStyledText(Align as Integer, TextArea as TextArea, LeadingFactor as double = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Writes styled text from TextArea.
**Notes:** Same as WriteFText, but calls ConvertStyledText for you to convert the styled text to formatting commands.

LeadingFactor: Added in v21.0. If you pass a value >0, the plugin will add \LD [ ] commands to styled text to set leading relative to font size. This way you define the spacing beteween lines. e.g. 1.2.

If you have a problem with the conversion, you can always use ConvertStyledText function directly and inspect what it generates. And you can of course modify it and e.g. convert "* " on a beginning of a line to a list.
See also WriteStyledText function in DynaPDF manual.
See also:

- 77.40.949 WriteStyledText(Align as Integer, StyledText as StyledText, LeadingFactor as double = -1) as Boolean 13012

### 77.40.951 WriteStyledTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, StyledText as StyledText, LeadingFactor as double = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes styled text.
**Notes:** Same as WriteFTextEx, but calls ConvertStyledText for you to convert the styled text to formatting commands.

LeadingFactor: Added in v21.0. If you pass a value >0, the plugin will add \LD [ ] commands to styled text to set leading relative to font size. This way you define the spacing beteween lines. e.g. 1.2.

If you have a problem with the conversion, you can always use ConvertStyledText function directly and inspect what it generates. And you can of course modify it and e.g. convert "* " on a beginning of a line to a list.
See also WriteStyledTextEx function in DynaPDF manual.
See also:

- 77.40.952 WriteStyledTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, TextArea as TextArea, LeadingFactor as double = -1) as Boolean 13014

### 77.40.952 WriteStyledTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, TextArea as TextArea, LeadingFactor as double = -1) as Boolean

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Writes styled text from TextArea.
**Notes:** Same as WriteFTextEx, but calls ConvertStyledText for you to convert the styled text to formatting commands.

LeadingFactor: Added in v21.0. If you pass a value >0, the plugin will add \LD [ ] commands to styled text to set leading relative to font size. This way you define the spacing beteween lines. e.g. 1.2.

If you have a problem with the conversion, you can always use ConvertStyledText function directly and inspect what it generates. And you can of course modify it and e.g. convert "* " on a beginning of a line to a list.
See also WriteStyledTextEx function in DynaPDF manual.
See also:

- 77.40.951 WriteStyledTextEx(PosX as Double, PosY as Double, Width as Double, Height as Double, Align as Integer, StyledText as StyledText, LeadingFactor as double = -1) as Boolean 13013

### 77.40.953 WriteText(PosX as Double, PosY as Double, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern.
**Notes:** The text parameter is converted to unicode.
See also WriteText function in DynaPDF manual.
See also:

- 77.40.954 WriteText(PosX as Double, PosY as Double, glyphs() as Integer) as Boolean 13015

### 77.40.954 WriteText(PosX as Double, PosY as Double, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern.
**Notes:** This version takes an array of integers. So if you are using the kcpUnicode on SetFont, please pass an array of unicode codepoints. If you use kcpGlyphIndexes, please pass an array of glyph values.

See also WriteText function in DynaPDF manual.
See also:

- 77.40.953 WriteText(PosX as Double, PosY as Double, aText as string) as Boolean 13014

### 77.40.955 WriteTextAnsi(PosX as Double, PosY as Double, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function prints a text onto the current open page, template, or pattern.
**Notes:** The text parameter is converted to ANSI, so use only with SetFont with kcp1252.

### 77.40.956 WriteTextDirect(PosX as Double, PosY as Double, aText as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern.
**Notes:** The text parameter is not converted, so pass a string in the right encoding.
See also:

- 77.40.957 WriteTextDirect(PosX as Double, PosY as Double, glyphs() as Integer) as Boolean 13015

### 77.40.957 WriteTextDirect(PosX as Double, PosY as Double, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern.
**Notes:** This version takes an array of integers. So pass in values in the encoding you are using. This can be glyph values or bytes in any encoding you selected in the SetFont method.

See also:

- 77.40.956 WriteTextDirect(PosX as Double, PosY as Double, aText as string) as Boolean 13015

### 77.40.958 WriteTextMatrix(Matrix as DynaPDFMatrixMBS, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern by using a transformation matrix to calculate the position of the string.
**Notes:** This version takes an array of integers. So if you are using the kcpUnicode on SetFont, please pass an array of unicode codepoints. If you use kcpGlyphIndexes, please pass an array of glyph values.

See also WriteTextMatrix function in DynaPDF manual.
See also:

- 77.40.959 WriteTextMatrix(Matrix as DynaPDFMatrixMBS, Text as string) as Boolean 13016

### 77.40.959 WriteTextMatrix(Matrix as DynaPDFMatrixMBS, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern by using a transformation matrix to calculate the position of the string.
**Notes:** The text parameter is converted to unicode.
See also WriteTextMatrix function in DynaPDF manual.
See also:

- 77.40.958 WriteTextMatrix(Matrix as DynaPDFMatrixMBS, glyphs() as Integer) as Boolean 13016

### 77.40.960 WriteTextMatrixAnsi(Matrix as DynaPDFMatrixMBS, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use the non ANSI function instead. **Function:** The function prints a text onto the current open page, template, or pattern by using a transformation matrix to calculate the position of the string.
**Notes:** The text parameter is converted to ANSI, so use only with SetFont with kcp1252.

### 77.40.961 WriteTextMatrixDirect(Matrix as DynaPDFMatrixMBS, glyphs() as Integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern by using a transformation matrix to calculate the position of the string.
**Notes:** This version takes an array of integers. So pass in values in the encoding you are using. This can be glyph values or bytes in any encoding you selected in the SetFont method.

See also:

- 77.40.962 WriteTextMatrixDirect(Matrix as DynaPDFMatrixMBS, Text as string) as Boolean 13017

### 77.40.962 WriteTextMatrixDirect(Matrix as DynaPDFMatrixMBS, Text as string) as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function prints a text onto the current open page, template, or pattern by using a transformation matrix to calculate the position of the string.
**Notes:** The text parameter is not converted, so pass a string in the right encoding.
See also:

- 77.40.961 WriteTextMatrixDirect(Matrix as DynaPDFMatrixMBS, glyphs() as Integer) as Boolean 13017

### 77.40.963 YofCMYK(CMYK as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns Y of a CMYK color value.
**Example:**

```
dim cmyk as Integer = DynaPDFMBS.CMYK(1,2,3,4)
MsgBox str(DynaPDFMBS.YofCMYK(cmyk)) // shows 3
```

**Notes:** Returns different values on BigEndian and LittleEndian systems.

### 77.40.964 Properties

### 77.40.965 ActiveFontInfo as DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries font info for active font.
**Notes:** Added, so you can see it in debugger.
(Read only property)

### 77.40.966 ClearRectMode as Integer

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ClearRect Mode for Graphics class.
**Example:**

```
dim pdf as new DynaPDFMBS
pdf.ClearRectMode = kClearRectModeIgnoreAll
```

**Notes:** When graphics class is called with ClearRect method, the area in the PDF page is filled with white color.
If you like to ignore such calls, please set value to ignore all or just big rectangles.
(Read and Write property)

### 77.40.967 DynaPDFVersion as String

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The DynaPDF version text.
**Notes:** (Read only property)

### 77.40.968 ErrorCount as Integer

MBS DynaPDF Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of warnings reported by DynaPDF.
**Notes:** Use Error event to track them.
Or catch exceptions.
(Read only property)

### 77.40.969 FontSize as Double

MBS DynaPDF Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the font size of the active font.
**Notes:** The function returns the font size, a value greater zero on success, or a negative error code on failure.

If you set this property, it calls ChangeFontSize internally.
(Read and Write property)

### 77.40.970 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The IPDF handle passed to each API function.
**Notes:** The constructor fills this handle and the destructor frees it.
(Read only property)

### 77.40.971 HasLite as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a lite or pro license is in use.
**Notes:** Relevant for some example projects and graphics class support to know whether CreateExtGState is available.
(Read only property)

### 77.40.972 HasPro as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a pro license is in use.
**Notes:** Relevant for some example projects and graphics class support to know whether Render Engine is available.
(Read only property)

### 77.40.973 ImportFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set import flags.
**Notes:** Same as using GetImportFlags and SetImportFlags.
(Read and Write property)

### 77.40.974 ImportFlags2 as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set import flags 2.
**Notes:** Same as using GetImportFlags2 and SetImportFlags2.
(Read and Write property)

### 77.40.975 JasperVersion as String

MBS DynaPDF Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns version of Jasper library.
**Example:**

MsgBox DynaPDFMBS.JasperVersion

**Notes:** DynaPDF uses customized version of Jasper library, so this may not be the latest public version.
But it's patched to fix a couple of issues seen in PDF context.
(Read only property)

### 77.40.976 PageCoords as Integer

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The page coordinate system setting.
**Notes:** The native coordinate system of the Portable Document Format is bottom up.
Also check the dynapdf manual on the pdfGetPageCoords and pdfSetPageCoords functions.
Value can be kpcTopDown or kpcBottomUp. Default is kpcBottomUp.
(Read and Write property)

### 77.40.977 PageGraphics as Graphics

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The page graphics object.
**Example:**

```
Dim pdf As New DynapdfMBS
// please subclass DynapdfMBS to implement error event

Dim f As FolderItem = SpecialFolder.Desktop.Child("DynaPDF Graphics.pdf")

'pdf.SetLicenseKey "Starter"
// For this example you can use a Starter, Lite, Pro or Enterprise License

// Create new PDF. Use f = nil for in-memory PDF
Call pdf.CreateNewPDF(f)

// append a new page, so we have an open page
Call pdf.Append

// get graphics object to draw on the page
Dim g As Graphics = pdf.PageGraphics

// draw as usual
g.DrawString "Hello World", 105, 100
g.DrawRect 100, 80, 100, 100

// close page and file
Call pdf.EndPage
Call pdf.CloseFile

// for in-memory PDF, use GetBuffer here to grab it.
'Dim PDFData As String = pdf.GetBuffer
```

**Notes:** We create a temporary picture and subclass the graphics to reproduce all drawing commands called on this graphics object to the current PDF Page.

For every drawing command, we apply the following properties from graphics object to DynaPDF:

- ForeColor
- Bold
- Italic
- Underline
- TextUnit
- TextFont

- TextSize
- ScaleX
- ScaleY
- PenHeight
- PenWidth
- CharacterSpacing

Supports the following graphics commands:

- Draw/Fill Oval/Rect/RoundRect/Line/Polygon
- DrawString
- StringHeight and StringWidth
- DrawPicture
- NextPage
- Get/Set Pixel.
- Clip
- Supports vector graphics classes (Object2D)
- Supports report engine

Some notes:

- Handle() function returns handle for picture.
- Pixel reads from temporary picture
- ClearRect draws white rectangle
- DrawCautionIcon, DrawNoteIcon and DrawStopIcon are not supported.
- NextPage method calls NextPage event. If missing, we end page and create a new one. In the event, please call EndPage and maybe Append or import an existing PDF page from import PDF.
- If CMYK, Gray or Lab colorspace is set, the plugin will keep them for white/black colors, but switch to RGB for all other colors.

StyledTextPrinter is not supported, but you can do similar things via WriteStyledText or WriteStyledTextEx methods in DynaPDFMBS class.

If no page is open, call this may append a new page. If no document is open, we call CreateNewPDF for you with nil folderitem, so an in memory PDF get's created.

Seems like reports on Windows may not work for v19.2 of our plugins. This is fixed for 19.3.
(Read only property)

### 77.40.978 PageGraphicsPicture as Picture

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The temporary picture for page graphics.
**Notes:** For debugging it may be useful to see the temporary picture with all the draws made on the PDF page.
This is not 1 to 1 what you will see in rendered PDF Page.

This can be viewed even when graphics object is cleared.
(Read only property)

### 77.40.979 PrintCancelled as Boolean

MBS DynaPDF Plugin, Plugin Version: 20.5, Platform: Windows, Targets: All.

**Function:** Whether last print operation was cancelled.
**Notes:** Set by PrintPDFFileWithDialog and PrintPDFPageWithDialog methods if user presses cancel button.
Otherwise will be false.
(Read and Write property)

### 77.40.980 SpaceWidthFactor as Single

MBS DynaPDF Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The space width factor.
**Notes:** Sets the space width factor that is used by DynaPDF.ExtractText to determine whether the distance between two text records or glyphs should be interpreted as space character.
PDF files do often not contain space characters. Depending on the font type, i.e. fixed pitch or proportional fonts, different default widths are used during text extraction. However, the full space width is mostly too large to find spaces. Therefore, the text extraction algorithm multiplies the default space width with the

space width factor to find suitable values.
The default value is 0.7. Increase the value if too many spaces occur in extracted text and decrease the value if too few spaces were found.
The value must be large zero. Although the upper bound is not restricted, values larger than 2 are mostly not meaningful.
(Read and Write property)

### 77.40.981 TIFFVersion as String

MBS DynaPDF Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of tiff library.
**Example:**

MsgBox DynaPDFMBS.TIFFVersion

**Notes:** DynaPDF uses customized version of tiff library, so this may not be the latest public version.
But it's patched to fix a couple of issues seen in PDF context.
(Read only property)

### 77.40.982 TraceFile as FolderItem

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The trace file.
**Notes:** The plugin writes debug messages to this file so you can check what functions you called.

Improved with 16.2 plugin to really cover over 99% of all calls with parameters and result. Please report if you miss something.

See also AppendTraceFile method to append the log file.
(Read and Write property)

### 77.40.983 TraceHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal file handle for the trace file.
**Notes:** If this is not zero, the tracing option is turned on.
You can set this value indirectly by using the TraceFile property.

(Read only property)

### 77.40.984 ValidateTextEncodings as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to validate text encodings.
**Example:**

```
dim pdf as new DynaPDFMBS

call pdf.CreateNewPDF nil
call pdf.Append

// enable validating
pdf.ValidateTextEncodings = true

// make text without text encoding
dim s as string = "Hello World"
s = DefineEncoding(s, nil) // remove encoding

call pdf.SetFont "Times", pdf.kfsItalic, 20.0, true, pdf.kcp1252
// now cause exception
call pdf.WriteText 50.0, 580.0, s

call pdf.EndPage
call pdf.CloseFile
```

**Notes:** You should enable this for debugging to find bugs with text encodings.
(Read and Write property)

### 77.40.985 WarningCount as Integer

MBS DynaPDF Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of errors reported by DynaPDF.
**Notes:** Use Error event to track them.
Or catch exceptions.
(Read only property)

### 77.40.986 zlibVersion as String

MBS DynaPDF Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of zLib library.
**Example:**

MsgBox DynaPDFMBS.zlibVersion

**Notes:** DynaPDF uses customized version of zlib library, so this may not be the latest public version.
But it's patched to fix a couple of issues seen in PDF context.
(Read only property)

### 77.40.987 Events

### 77.40.988 EnumDocFont(Font as DynaPDFFontMBS, FontInfo as DynaPDFFontInfoMBS, Type as Integer, BaseFont as string, Fontname as string, Embedded as boolean, IsFormFont as boolean, Flags as Integer, FontRef as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event being called if you use the EnumDocFonts function.
**Notes:** Font is deprecated. FontRef is the internal reference to the font.
FontInfo is the new property to use for font details.

### 77.40.989 EnumHostFont(FamilyName as string, PostScriptName as string, Style as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called by EnumHostFonts.

### 77.40.990 EnumHostFontEx(FamilyName as string, PostScriptName as string, Style as Integer, BaseType as Integer, Embeddable as boolean, Flags as Integer, FilePath as string) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called by EnumHostFontsEx.

### 77.40.991 Error(ErrorCode as Integer, ErrorMessage as string, ErrorType as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The error callback.
**Notes:** ErrCode is a positive error number starting at zero; it is an index into the array of error messages. ErrType is a bitmask to determine what kind of error occurred. The following
constants are defined:

const E_WARNING = &h02000000
const E_SYNTAX_ERROR = &h04000000
const E_VALUE_ERROR = &h08000000
const E_FONT_ERROR = &h10000000
const E_FATAL_ERROR = &h20000000
const E_FILE_ERROR = &h40000000

At time of publication only one flag is set at any one time. Future versions may be set multiple flags, e.g. E_SYNTAX_ERROR and E_WARNING. Because of this, it is recommended to mask out the error type with a bitwise and operator.
If the callback function returns a value other than zero (0), processing stops immediately.

You can return kErrorEventRaise (-2), we raise an exception.
We also raise the exception when no Error event is implemented.

### 77.40.992 InitProgress(ProgType as Integer, MaxCount as Integer)

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a progress ist starting.
**Notes:** The return value of the progress callback function must be 0, any other return value breaks processing.

See pt* constants for ProgType.

### 77.40.993 NextPage(g as graphics)

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for graphics.nextpage method.
**Notes:** If you don't implement this event, the plugin will end the page and append a new page.
You can implement this event to do your own code to import e.g. an existing page as background.

### 77.40.994 OnFontNotFound(PDFFontRef as Integer, FontName as string, Style as Integer, StdFontIndex as Integer, IsSymbolFont as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The events called when a font is not found.
**Notes:** Please call one of the ReplaceFont functions here and return their return code from the callback. Or return -1 if your code has an error.
See also OnFontNotFound function in DynaPDF manual.

### 77.40.995 OnReplaceICCProfile(Type as Integer, ColorSpace as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when an ICC profile is replaced.
**Notes:** Please use various ReplaceICCProfile functions to provide replacement profile.
See also OnReplaceICCProfile function in DynaPDF manual.

### 77.40.996 PageBreak(LastPosX as Double, LastPosY as Double, PageBreak as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called on every pagebreak.
**Notes:** The parameter PageBreak of the event specifies why the event was called:

- If true, a page break tag in the string was found (see WriteFText for further information).
- If false, the output rectangle was filled with text entirely.

The usage of the event is described in detail under WriteFText(). However, the following return values of the event can be used the change the text alignment:

A return value of zero indicates that the alignment must not be changed. Negative return values break processing immediately. WriteFText() returns then with a warning.

When the event is called, the coordinate system is always bottom-up, it can be changed to top-down coordinates inside the event if necessary. The current page is still open, the page must be closed with EndPage()

| | |
|---|---|
| New Alignment Left | 1 |
| New Alignment Right | 2 |
| New Alignment Center | 3 |
| New Alignment Justify | 4 |

before a new page can be added or opened with Append() or EditPage(). To determine the current page number, call GetPageNum().

For example SetFont may fail if you try normal font family names. That is because SetFontSelMode is used with postscript names and you may want to set it to ksmPostScriptName using SetFontSelMode for SetFont to accept family names.

### 77.40.997 Progress(ActivePage as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The progress callback.
**Notes:** The return value of the progress callback function must be 0, any other return value breaks processing.

### 77.40.998 RasterShowText(MatrixBefore as DynaPDFMatrixMBS, MatrixAfter as DynapdfMatrixMBS, TextBuffers() as DynaPDFTextRecordAMBS, Texts() as String, Width as Double, Vertical as boolean, FontRef as Integer, textScaling as Double)

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Rastering draws text.
**Notes:** This is experimental and will be replaced later with a better API in a future DynaPDF release. Works only if you have a plugin where this is enabled by us.

If you implement this event, you get an event whenever one of the rasterizers draws some text on a page. MatrixBefore tells you start position, MatrixAfter end position. TextBuffers provide raw text data. Texts array the matching unicode text. Width is length of text in points. Vertical is true for vertical text. FontRef is the internal font reference. You can query fonts with EnumDocFont before to get a list of all fonts and find it in the array. Do not use font functions in the event as that can confuse the rasterizer.

Do not use with MT methods, please.

### 77.40.999 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| katGoToE | 17 | Like katGoToR but refers to an embedded PDF file.<br>PDF 1.6 Like atGoToR but refers to an embedded PDF file. |
| kAV_DIRECTION_MASK | 24 | One of the DynaPDF constants. |
| kAV_NON_FULL_SRC_MASK | 5 | One of the DynaPDF constants. |
| kAV_VIEW_PRINT_MASK | &h000003E0 | One of the DynaPDF constants. |
| kBMK_ADD_CHILDREN | &h40000000 | Special flag for bookmark values. |
| kBMK_INSERT | &h20000000 | Special flag for bookmark values. |
| kDEFAULT_LIST_CHAR | &h0000009F | Default character index of the font Wingdings-Regular to<br>WriteFText()) |
| kDRV_FLOAT_PRECISION | 5 | The precision used for float values. |
| kDYNAPDF_REVISION | "$ Rev: 390 $ " | The version of the dynapdf library. |
| kDYNAPDF_VERSIONSTRING | "4.0.84.246" | The version of the dynapdf library. |
| kE_FATAL_ERROR | &h20000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_FATAL_ERROR)=E_FATAL<br>msgbox "A fatal error occurred!" |
| kE_FILE_ERROR | &h40000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_FILE_ERROR)=E_FILE_ER<br>box "A fatal error occurred!" |
| kE_FONT_ERROR | &h10000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_FONT_ERROR)=E_FONT_E<br>gbox "A fatal error occurred!" |
| kE_SYNTAX_ERROR | &h04000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_SYNTAX_ERROR)=E_SY<br>then msgbox "A fatal error occurred!" |
| kE_VALUE_ERROR | &h08000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_VALUE_ERROR)=E_VALU<br>msgbox "A fatal error occurred!" |
| kE_WARNING | &h02000000 | One of the DynaPDF constants for error types.<br>Note that error codes are negative; to determine the error type<br>value:<br>// if bitwiseand(-errCode,E_WARNING)=E_WARNING th<br>tal error occurred!" |
| kffCommitOnSelCh | &h04000000 | One of the field flags constants.<br>(PDF 1.5) If set, the new value is committed as soon as a<br>with the pointing device. This allows applications to perfor<br>a selection is made, without requiring the user to exit the fi<br>new value is not committed until the user exits the field. Sup<br>boxes and list boxes only. |
| kffRadioIsUnion | &h02000000 | One of the field flags constants.<br>PDF-1.5 check boxes of a radio button field only |
| kicfDefault | 0 | One of the cache initialization flags. |
| kicfIgnoreOpenAction | 1 | One of the cache initialization flags. |
| kNEW_ALIGN_CENTER | 3 | One of the DynaPDF constants. |
| kNEW_ALIGN_JUSTIFY | 4 | One of the DynaPDF constants. |
| kNEW_ALIGN_LEFT | 1 | One of the DynaPDF constants. |
| kNEW_ALIGN_RIGHT | 2 | One of the DynaPDF constants. |
| kNO_COLOR | &hFFFFFFF1 | One of the RGB color constants.<br>This value can be used for form fields, annotations and star |

Destination object type

| Constant | Value | Description |
|---|---|---|
| kadAnnotation | 0 | Destination is annotation handle. |
| kadCatalog | 1 | Destination is root object of document (no handle). |
| kadField | 2 | Destination is field handle. |
| kadImage | 3 | Destination is image handle. |
| kadPage | 4 | Destination is page handle. |
| kadTemplate | 5 | Destination is template handle. |

Application Event Constants

| Constant | Value | Description |
|---|---|---|
| kaeExport | 1 | Export |
| kaePrint | 2 | Print |
| kaeView | 4 | View |

Constants for the annotation flatten flags.

| Constant | Value | Description |
|---|---|---|
| kaffFormFields | 16 | If set, form fields will be flattened too. |
| kaffKeepEmptySigFields | &h00008000 | If set, signature fields which are not already signed will be kept. |
| kaffKeepFileAttach | &h00002000 | If set, file attachment annotations will be kept. |
| kaffKeepLinkAnnots | &h00001000 | If set, link annotations will be kept. |
| kaffKeepTextAnnots | &h00004000 | If set, text annotations will be kept. |
| kaffMarkupAnnots | 2 | If set, markup annotations are flattened only. Link, Sound, or FileAttach annotations are no markup annotations. These types will be left intact. |
| kaffNone | 0 | Printable annotations independent of the type.<br>By default all annotations which have an appearance stream and which have the print flag set are flattened.<br>All annotations are deleted when the function returns with the exception of file attachment annotations.<br>If you want to flatten the view state then set the flag affUseViewState. |
| kaffNonPDFA_1 | 4 | Flatten all annotations which are unsupported in PDF/A 1. |
| kaffNonPDFA_2 | 8 | Flatten all annotations which are unsupported in PDF/A 2/3. |
| kaffNonPDFA_4e | &h00000080 | Flatten annotations which are unsupported in PDF/A 4e. |
| kaffPreserveZOrder | &h00400000 | If set, preserve the z-order under any curcumstances. That means visible overlapping annotations or form fields will be flattened, regardless the type. |
| kaffSigFields | 64 | Meaningful only if affFormFields is not set. If set, signature fields with an appearance stream will be flattened. |
| kaffUseFieldViewState | 32 | Meaningful only if kaffFormFields or kaffSigFields is set. If set, flatten the view state of form fields. Use the print state otherwise. |
| kaffUseViewState | 1 | If set, annotations which are visible in a viewer become flattened. |

Annotation flag constants for SetAnnotFlags

| Constant | Value | Description |
|---|---|---|
| kafHidden | 2 | One of the three options to hide the annotation (see dynapdf manual) |
| kafInvisible | 1 | One of the three options to hide the annotation (see dynapdf manual) |
| kafLocked | &h00000080 | (PDF 1.4) If set, do not allow the annotation to be deleted or its properties (including position and size) to be modified by the user. However, this flag does not restrict changes to the annotation,Äôs contents. |
| kafLockedContents | &h00000200 | (PDF 1.7) If set, do not allow the contents of the annotation to be modified by the user. This flag does not restrict deletion of the annotation or changes to other annotation properties, such as position and size. |
| kafNone | 0 | No flags are set |
| kafNoRotate | 16 | Do not rotate the annotation |
| kafNoView | 32 | One of the three options to hide the annotation (see dynapdf manual) |
| kafNoZoom | 8 | Do not zoom the annotation |
| kafPrint | 4 | Annotation is printable |
| kafReadOnly | 64 | Changes are not allowed. |
| kafToggleNoView | &h00000100 | (PDF 1.5) If set, invert the interpretation of the NoView flag for certain events. |

Constants for annotation icons

| Constant | Value | Description |
|---|---|---|
| kaiComment | 0 | |
| kaiHelp | 1 | |
| kaiInsert | 2 | |
| kaiKey | 3 | |
| kaiNewParagraph | 4 | |
| kaiNote | 5 | |
| kaiParagraph | 6 | |

Relationships

| Constant | Value | Description |
|---|---|---|
| karAlternative | 4 | This key must be used for ZUGFeRD compatible invoices |
| karAssociated | 0 | |
| karData | 1 | |
| karFormData | 5 | |
| karSource | 2 | |
| karSupplement | 3 | |

Annotation Migration State

| Constant | Value | Description |
|---|---|---|
| kasAccepted | 1 | Accepted |
| kasCancelled | 3 | Cancelled |
| kasCompleted | 4 | Completed |
| kasCreateReply | 5 | Don't add a migration state, create a reply instead. Set the contents of the reply with SetAnnotString. |
| kasNone | 0 | Undefined |
| kasRejected | 2 | Rejected |

Annotation string type constants for SetAnnotString.

| Constant | Value | Description |
|---|---|---|
| kasAuthor | 0 | Author |
| kasContent | 1 | Content |
| kasName | 2 | Name |
| kasRichStyle | 4 | Default style string. ->FreeText annotations only. |
| kasRichText | 5 | Rich text string. ->Supported by markup annotations. |
| kasSubject | 3 | Subject |

Constants for annotation types.

| Constant | Value | Description |
|---|---|---|
| kat3D | 19 | PDF 1.6 |
| katCaret | 0 | |
| katCircle | 1 | |
| katFileAttach | 21 | PDF 1.3 |
| katFileLink | 2 | |
| katFreeText | 3 | |
| katHighlight | 4 | |
| katInk | 5 | |
| katLine | 6 | |
| katMovieAnnot | 25 | PDF 1.2 |
| katPageLink | 7 | |
| katPolygon | 8 | |
| katPolyLine | 9 | |
| katPopUp | 10 | |
| katPrinterMark | 26 | PDF 1.4 |
| katProjection | 27 | PDF 1.7 Extension Level 3 |
| katRedact | 22 | PDF 1.7 |
| katRichMedia | 28 | PDF 1.7 Extension Level 3 |
| katScreen | 29 | PDF 1.5 |
| katSoundAnnot | 20 | PDF 1.2 |
| katSquare | 11 | |
| katSquiggly | 12 | Highlight annotation |
| katStamp | 13 | |
| katStrikeOut | 14 | Highlight annotation |
| katText | 15 | Also used as container to store the State Model |
| katTrapNet | 30 | PDF 1.3 |
| katUnderline | 16 | Highlight annotation |
| katUnknown | 24 | Unknown annotation type |
| katWatermark | 23 | PDF 1.6 |
| katWebLink | 17 | A Link annotation with an associated URI action |
| katWidget | 18 | Form Fields are handled separately |

3D Activation Type constants.

| Constant | Value | Description |
|---|---|---|
| kat3D_AppDefault | 0 | Default. |
| kat3D_Explicit | 3 | The annotation should remain inactive until explicitely activated by a script or action (default). |
| kat3D_PageOpen | 1 | The annotaiton should be activated when the page is opened. |
| kat3D_PageVisible | 2 | The annotaiton should be activated when the page becomes visible. |

Constants for action types.

| Constant | Value | Description |
|---|---|---|
| katGoTo | 0 | |
| katGoTo3DView | 16 | PDF 1.6 |
| katGoToR | 1 | |
| katHide | 2 | |
| katImportData | 3 | |
| katJavaScript | 4 | |
| katLaunch | 5 | |
| katMovie | 6 | |
| katNamed | 7 | |
| katRendition | 8 | PDF 1.5 |
| katReset | 9 | Reset Form |
| katRichMediaExec | 18 | PDF 1.7 Extension Level 3 |
| katSetOCGState | 10 | PDF 1.5 |
| katSound | 11 | |
| katSubmit | 12 | Submit Form |
| katThread | 13 | |
| katTransition | 14 | |
| katURI | 15 | |

Constants for parameter of the viewer preference.

| Constant | Value | Description |
|---|---|---|
| kavDirectionL2R | 8 | |
| kavDirectionR2L | 16 | |
| kavNone | 0 | |
| kavNonFullScrUseNone | 1 | |
| kavNonFullScrUseOC | &h00000400 | |
| kavNonFullScrUseOutlines | 2 | |
| kavNonFullScrUseThumbs | 4 | |
| kavViewPrintArtBox | 32 | |
| kavViewPrintBleedBox | 64 | |
| kavViewPrintCropBox | &h00000080 | |
| kavViewPrintMediaBox | &h00000100 | |
| kavViewPrintTrimBox | &h00000200 | |

Button Caption Constants

| Constant | Value | Description |
|---|---|---|
| kbcpCaptionAbove | 3 | Caption above the image |
| kbcpCaptionBelow | 2 | Caption below the image |
| kbcpCaptionLeft | 5 | Caption on the left of the image |
| kbcpCaptionOnly | 0 | Default |
| kbcpCaptionOver | 6 | Caption overlaid directly on the image |
| kbcpCaptionRight | 4 | Caption on the right of the image |
| kbcpImageOnly | 1 | No caption; image only |

Annotation Border Effects

| Constant | Value | Description |
|---|---|---|
| kbeCloudy1 | 1 | Circle diameter 9 units |
| kbeCloudy2 | 2 | Circle diameter 17 units |
| kbeSolid | 0 | Default |

Font Base Encoding

| Constant | Value | Description |
|---|---|---|
| kbeMacExpert | 2 | Mac Expert encoding. |
| kbeMacRoman | 1 | Mac Roman encoding. |
| kbeStandard | 3 | Standard encoding is a special encoding for Type1 fonts. |
| kbeWinAnsi | 0 | This represents the Windows code page 1252. |

Constants for blend modes.

| Constant | Value | Description |
|---|---|---|
| kbmColor | 2 | Color |
| kbmColorBurn | 3 | Color Burn |
| kbmColorDodge | 4 | Color Dodge |
| kbmDarken | 5 | Darken |
| kbmDifference | 6 | Difference |
| kbmExclusion | 7 | Exclusion |
| kbmHardLight | 8 | Hard Light |
| kbmHue | 9 | Hue |
| kbmLighten | 10 | Lighten |
| kbmLuminosity | 11 | Luminosity |
| kbmMultiply | 12 | Multiply |
| kbmNormal | 1 | Normal |
| kbmNotSet | 0 | Non Set. |
| kbmOverlay | 13 | Overlay |
| kbmSaturation | 14 | Saturation |
| kbmScreen | 15 | Screen |
| kbmSoftLight | 16 | Soft Light. |

Constants for bidirectional mode.

| Constant | Value | Description |
|---|---|---|
| kbmLeftToRight | 0 | Apply the bidi algorithm on Unicode strings in Left to Right layout. |
| kbmNone | 2 | Default ->do not apply the bidi algorithm.. |
| kbmRightToLeft | 1 | Apply the bidi algorithm on Unicode strings in Right to Left layout. |

Bookmark Text Style Constants

| Constant | Value | Description |
|---|---|---|
| kbmsBold | 2 | Bold |
| kbmsItalic | 1 | Italic |
| kbmsNormal | 0 | Normal |

Constants for border styles.

| Constant | Value | Description |
|---|---|---|
| kbsBevelled | 1 | |
| kbsDashed | 4 | |
| kbsInset | 2 | |
| kbsSolid | 0 | |
| kbsUnderline | 3 | |

Constants for button states.

| Constant | Value | Description |
|---|---|---|
| kbsDown | 1 | |
| kbsRollOver | 2 | |
| kbsUp | 0 | |

PDF base Tag Constants

| Constant | Value | Description |
|---|---|---|
| kbtAbbr | 41 | |
| kbtAnnot | 2 | An annotation must be inserted to finish the tag! |
| kbtArt | 0 | |
| kbtArtifact | 1 | |
| kbtBibEntry | 3 | BibEntry ->Bibliography entry |
| kbtBlockQuote | 4 | |
| kbtCallout | 42 | |
| kbtCaption | 5 | |
| kbtCL | 37 | |
| kbtCode | 6 | |
| kbtDek | 43 | |
| kbtDiv | 7 | |
| kbtDocument | 8 | |
| kbtEm | 44 | |
| kbtFigure | 9 | |
| kbtForm | 10 | A form field must be inserted to finish the tag! |
| kbtFormula | 11 | |
| kbtH | 12 | |
| kbtH1 | 13 | |
| kbtH2 | 14 | |
| kbtH3 | 15 | |
| kbtH4 | 16 | |
| kbtH5 | 17 | |
| kbtH6 | 18 | |
| kbtIndex | 19 | |
| kbtLabel | 38 | |
| kbtLineNum | 45 | |
| kbtLink | 20 | A link annotation must be inserted to finish the tag (FileLink(), PageLink(), or WebLink()! |
| kbtList | 21 | L |
| kbtListElem | 22 | LI, ->Correct nesting: btList/btListElem |
| kbtListText | 23 | LBody ->Correct nesting: btList/btListElem/btListText |
| kbtNote | 24 | |
| kbtP | 25 | |
| kbtPart | 26 | |
| kbtQuote | 27 | |
| kbtReason | 46 | |
| kbtRedaction | 47 | |
| kbtReference | 28 | |
| kbtRuby | 39 | |
| kbtSection | 29 | Sect |
| kbtSidebar | 48 | |
| kbtSpan | 30 | |
| kbtStrong | 49 | |
| kbtSub | 50 | |
| kbtSup | 51 | |
| kbtTable | 31 | |
| kbtTableDataCell | 32 | TD |
| kbtTableHeader | 33 | TH |
| kbtTableRow | 34 | TR |
| kbtTOC | 35 | |
| kbtTOCEntry | 36 | TOCI |
| kbtWarichu | 40 | |

Checkbox state constants.

| Constant | Value | Description |
|---|---|---|
| kcbChecked | 1 | |
| kcbUnChecked | 2 | |
| kcbUnknown | 0 | |

Flag constants for ComputeBBox

| Constant | Value | Description |
|---|---|---|
| kcbfIgnoreWhiteAreas | 1 | Ignore white vector graphics or text. |
| kcbfNone | 0 | |
| kcbfParse1BitImages | 2 | Find the visible area in 1 bit images. This is the most important case since scanned faxes are usually 1 bit images. |
| kcbfParseAllImages | 14 | Find the visible area in all images. |
| kcbfParseColorImages | 8 | Find the visible area in color images. This is usually not required and slow downs processing a lot. |
| kcbfParseGrayImages | 4 | Find the visible area in gray images. |

Checkbox character constants.

| Constant | Value | Description |
|---|---|---|
| kccCheck | 0 | |
| kccCircle | 1 | |
| kccCross1 | 2 | |
| kccCross2 | 3 | |
| kccCross3 | 4 | |
| kccCross4 | 5 | |
| kccDiamond | 6 | |
| kccSquare | 7 | |
| kccStar | 8 | |

Flag constants for color conversion.

| Constant | Value | Description |
|---|---|---|
| kccfBW_To_Gray | 0 | Default, RGB Black and White set with rg or RG inline operators are converted to gray |
| kccfRGB_To_Gray | 1 | If set, inline color operators rg and RG are converted to gray |
| kccfToGrayAdjust | 2 | Converts RGB and gray inline operators to gray and allows to darken or lighten the colors. |

Compression filter constants

| Constant | Value | Description |
|---|---|---|
| kcfCCITT3 | 2 | PDF or TIFF output ->B&W CCITT Fax G3 compression ->fast but less compression ratio |
| kcfCCITT4 | 3 | PDF or TIFF output ->B&W CCITT Fax G4 compression ->slower but higher compression ratio |
| kcfConvGrayToOtsu | &h00002000 | The Otsu filter is a special filter to produce black & white images. It is very useful if an OCR scan should be applied on the resulting 1 bit image. The flag is considered in AddRasImage(), RenderPDFFile(), and RenderPageToImage() if the pixel format was set to pxfGray. |
| kcfDitherFloydSteinberg | &h00001000 | Floyd Steinberg dithering. Special flags for AddRasImage(). These flags can be combined with the filters cfFlate, cfCCITT3, cfCCITT4, and LZW. |
| kcfFlate | 0 | PDF or TIFF output |
| kcfFlateBW | 6 | TIFF, PNG, or BMP output ->Dithered black & white output. The resulting image will be compressed with Flate or left uncompressed if the output image format is a bitmap. If you want to use CCITT Fax 4 compression (TIFF only) set the flag icUseCCITT4 in the AddImage() function call. Note that this filter is not supported for PDF creation! |
| kcfIgnoreICCProfile | &h00008000 | Meaningful only if color management is enabled. If set, the device ICC profile is not embedded in the image. |
| kcfJBIG2 | 8 | JBIG2 for PDF output only. |
| kcfJP2K | 7 | PDF or JPEG2000 output |
| kcfJPEG | 1 | PDF, JPEG, or TIFF output |
| kcfLZW | 4 | TIFF or GIF output ->Very fast but less compression ratios than flate |
| kcfLZWBW | 5 | TIFF output ->Very fast but less compression ratios than flate. For black and white. |
| kcfNone | &h000000FF | No compression, only for TIFF format. |
| kcfOrderedDithering | &h00004000 | Ordered dithering. The difference in comparison to the pixel format pxf1Bit is that we render into a GrayA buffer instead of a native 1 bit buffer since this one produces incorrect results in certain transparency calculations. |
| kcfPresLosslessFilter | &h00010000 | Preserve loss-less compression filters.<br>Use the specified filter otherwise. |
| kcfPresLossyFilter | &h00020000 | Preserve lossy compression filters.<br>Use the specified filter otherwise. |

Constants for collection columns.

| Constant | Value | Description |
|---|---|---|
| kcisCompressedSize | 8 | The compressed file size.<br>Data value comes from the embedded file. |
| kcisCreationDate | 0 | The creation date of this file.<br>Data value comes from the embedded file. |
| kcisCustomDate | 5 | User defined date. |
| kcisCustomNumber | 6 | User defined number. |
| kcisCustomString | 7 | User defined string. |
| kcisDescription | 1 | The description of the file.<br>Data value comes from the embedded file. |
| kcisFileName | 2 | The file name.<br>Data value comes from the embedded file. |
| kcisModDate | 3 | The modification date.<br>Data value comes from the embedded file. |
| kcisSize | 4 | The file size.<br>Data value comes from the embedded file. |

Collection View Constants

| Constant | Value | Description |
|---|---|---|
| kcivCustom | 4 | Custom: PDF 1.7 Extension Level 3, the collection view is presented by a SWF file. |
| kcivDetails | 1 | Details. |
| kcivHidden | 3 | Hidden. |
| kcivNotSet | 0 | Not set. |
| kcivTile | 2 | Title. |

Compression level constants.

| Constant | Value | Description |
|---|---|---|
| kclDefault | 1 | |
| kclFastest | 2 | |
| kclMax | 3 | |
| kclNone | 0 | |

Clear Rect Modes

| Constant | Value | Description |
|---|---|---|
| kClearRectModeDefault | 0 | Let all ClearRect calls pass through. |
| kClearRectModeIgnoreAll | 2 | Ignore all clearRect calls. |
| kClearRectModeIgnoreBig | 1 | Ignore clear rect calls bigger than half of page size. |

Constants for clipping mode.

| Constant | Value | Description |
|---|---|---|
| kcmEvenOdd | 0 | |
| kcmWinding | 1 | |

Constants for color modes.

| Constant | Value | Description |
|---|---|---|
| kcmFill | 0 | |
| kcmFillStroke | 2 | |
| kcmStroke | 1 | |

Check flag constants for CheckConformance.

| Constant | Value | Description |
|---|---|---|
| kcoAllowDeviceSpaces | &h40000000 | If set, device color spaces will not be replaced with ICC based color s This flag is meaningful for normalization only. |
| kcoApplyExportState | &h00020000 | Meaningful only if coDeleteAppEvents is set. Apply the export state. |
| kcoApplyPrintState | &h00040000 | Meaningful only if coDeleteAppEvents is set. Apply the print state. |
| kcoCheckImages | &h00800000 | Images will be decompressed to identify damages. |
| kcoDefault | &h0010FFFF | Default flags |
| kcoDefault_Normalize | &h50000000 | kcoAllowDeviceSpaces + kcoNoFontEmbedding: Common default flags f ferent PDF/A versions: |
| kcoDefault_PDFA_1 | &h0030FFFF | The ability to flatten layers was added after coDefault was defined. In kcoFlattenLayers |
| kcoDefault_PDFA_2 | &h0050FFFF | Presentations are prohibited in PDF/A 2 and PDF/A 3. Includes kcoDe resentation |
| kcoDefault_PDFA_3 | &h0050FF7F | Embedded files are allowed in PDF/A 3. kcoDefault_PDFA_2, but wi kcoDeleteEmbeddedFiles. |
| kcoDefault_PDFA_4 | &h0050FF7F | Embedded files are allowed in PDF/A 4. |
| kcoDeleteActionsAndScripts | 8 | Delete actions and scripts. Imported files only. |
| kcoDeleteAlternateImages | &h00000800 | Delete alternate images. Alternate images are seldom used and prohibited in PDF/A. |
| kcoDeleteAppEvents | &h00008000 | PDF/A 2 and 3. Application events are prohibited in PDF/A. The view will be applied. |
| kcoDeleteDamagedImages | &h01000000 | Meaningful only if coCheckImages is set. |
| kcoDeleteEmbeddedFiles | &h00000080 | Delete embedded files. Imported files only |
| kcoDeleteHalftones | &h00100000 | Delete halftone screens. |
| kcoDeleteInvRenderingIntent | 16 | Delete rendering intent. Imported files only |
| kcoDeleteMultiMediaContents | 4 | Delete multimedia content. Imported files only. |
| kcoDeleteOPIComments | &h00000100 | Delete OPI comments. Imported files only |
| kcoDeletePostscript | &h00000400 | Delete Postscript XObjects. |
| kcoDeletePresentation | &h00400000 | Presentations are prohibited in PDF/A 2 and 3. |
| kcoDeleteReplies | &h00080000 | Delete annotation replies. If absent, replies will be converted to regula annotations. |
| kcoDeleteSignatures | &h00000200 | Delete signatures. Imported files only |
| kcoDeleteTransferFuncs | 2 | Delete transfer functions. Imported files only |
| kcoEmbedSubsets | 1 | Already done. |
| kcoFlattenFormFields | 32 | Flatten form fields. |
| kcoFlattenLayers | &h00200000 | PDF/A 1b only. Flatten layers if any. |
| kcoFlushPages | &h20000000 | Write converted pages directly into the output file to reduce the memory |
| kcoMakeLayerVisible | &h00004000 | PDF/A 2 and 3 prohibit invisible layers. Layers can also be flattened if no option. |
| kcoNoFontEmbedding | &h10000000 | Normalization only. If this flag is set not PDF/A file will be produced! |
| kcoReComprJPEG2000Images | &h00001000 | Recompresses JPEG 2000 as flate images. Recompression results in lower quality and usually in larger images. It is better to keep such files as is. |
| kcoRepairDamagedImages | &h02000000 | Meaningful only if coCheckImages is set. If set, try to recompress a dar image. The new image is maybe incomplete but error free. This flag c combined with coDeleteDamagedImages to delete the image if recompr fails. |
| kcoReplaceV4ICCProfiles | 64 | Replace V4 ICC Profiles. Imported files only |
| kcoReplCCITTFaxWithFlate | &h00010000 | Replace CCITT Fax compression with Flate. |
| kcoResetAnnotAppearance | &h80000000 | If set, appearance streams of annotations are rebuild before executing C Conformance. |
| kcoResolveOverprint | &h00002000 | PDF/A 2 and 3. Set the overprint mode to 0 if the overprint mode = if overprinting for fill or stroke is true and if a ICCBased CMYK color is used. Note that DeviceCMYK is treated as ICCBased color space c implicit color conversion rules. |

Cell Orientation

| Constant | Value | Description |
|---|---|---|
| kcoBottom | 1 | Bottom |
| kcoCenter | 2 | Center |
| kcoLeft | 0 | Left |
| kcoRight | 1 | Right |
| kcoTop | 0 | Top |

Code Page Constants

| Constant | Value | Description |
|---|---|---|
| kcp1250 | 0 | |
| kcp1251 | 1 | |
| kcp1252 | 2 | |
| kcp1253 | 3 | |
| kcp1254 | 4 | |
| kcp1255 | 5 | |
| kcp1256 | 6 | |
| kcp1257 | 7 | |
| kcp1258 | 8 | |
| kcp437 | 23 | |
| kcp737 | 24 | |
| kcp775 | 25 | |
| kcp850 | 26 | |
| kcp852 | 27 | |
| kcp855 | 28 | |
| kcp857 | 29 | |
| kcp860 | 30 | |
| kcp861 | 31 | |
| kcp862 | 32 | |
| kcp863 | 33 | |
| kcp864 | 34 | |
| kcp865 | 35 | |
| kcp866 | 36 | |
| kcp869 | 37 | |
| kcp874 | 38 | |
| kcp8859_10 | 17 | |
| kcp8859_13 | 18 | |
| kcp8859_14 | 19 | |
| kcp8859_15 | 20 | |
| kcp8859_16 | 21 | |
| kcp8859_2 | 9 | |
| kcp8859_3 | 10 | |
| kcp8859_4 | 11 | |
| kcp8859_5 | 12 | |
| kcp8859_6 | 13 | |
| kcp8859_7 | 14 | |
| kcp8859_8 | 15 | |
| kcp8859_9 | 16 | |
| kcpAdobeStd | 63 | Internal ->not usable |
| kcpBig5 | 58 | Big5 plus HKSCS extension. |
| kcpCJK_2022_CN_Uni | 47 | ISO-2022-CN-EXT (GB-2312 plus ISO-11643 Planes 1-7). |
| kcpCJK_2022_JP_Uni | 48 | ISO-2022-JP. |
| kcpCJK_2022_KR_Uni | 49 | ISO-2022-KR. |
| kcpCJK_646_CN_Uni | 50 | ISO-646-CN (GB-1988-80). |
| kcpCJK_646_JP_Uni | 51 | ISO-646-JP (JIS_C6220-1969-RO). |
| kcpCJK_932_Uni | 53 | Microsoft extended version of SHIFT_JIS. |
| kcpCJK_949_Uni | 54 | EUC-KR extended with UHC (Unified Hangul Codes). |
| kcpCJK_950_Uni | 55 | Microsoft extended version of Big5. |
| kcpCJK_Big5_Uni | 40 | Big5 plus HKSCS extension. |
| kcpCJK_EUC_JP_Uni | 41 | EUC-JP. |
| kcpCJK_EUC_KR_Uni | 42 | EUC-KR. |
| kcpCJK_EUC_TW_Uni | 43 | CNS-11643-1992 (Planes 1-15). |
| kcpCJK_GB12345_Uni | 45 | GB-12345-1990 (Traditional Chinese form of GB-2312). |
| kcpCJK_GBK_Uni | 44 | GBK is the Microsoft code page 936 (GB2312, EUC-CN plus GBK extension). |
| kcpCJK_HZ_Uni | 46 | Mixed ASCII / GB-2312 encoding |
| kcpCJK_IR_165_Uni | 52 | ISO-IR-165 (extended version of GB-2312). |
| kcpCJK_JOHAB_Uni | 56 | JOHAB. |
| kcpDingbats | 68 | Internal ->Special encoding for ZapfDingbats |

Flags for Line Caption Position

| Constant | Value | Description |
|---|---|---|
| kcpInline | 0 | The caption is centered inside the line. |
| kcpTop | 1 | The caption is drawn on top of the line. |

Line cap style constants

| Constant | Value | Description |
|---|---|---|
| kcsButtCap | 0 | Butt cap. |
| kcsRoundCap | 1 | Round cap. |
| kcsSquareCap | 2 | Square cap. |

Colorspace constants.

| Constant | Value | Description |
|---|---|---|
| kcsDeviceCMYK | 1 | |
| kcsDeviceGray | 2 | |
| kcsDeviceRGB | 0 | |

Conformance type constants.

| Constant | Value | Description |
|---|---|---|
| kctFacturX_Basic | 13 | Set the FacturX conformance level to Basic. |
| kctFacturX_Basic_WL | 14 | Set the FacturX conformance level to Basic WL. |
| kctFacturX_Comfort | 15 | Set the FacturX conformance level to Comfort. |
| kctFacturX_Extended | 16 | Set the FacturX conformance level to Extended. |
| kctFacturX_Minimum | 12 | Set the FacturX conformance level to Minimum. |
| kctFacturX_XRechnung | 17 | German XRechnung profile |
| kctNormalize | 1 | Check the file for errors, rebuild all embedded fonts plus options. |
| kctPDFA_1b_2005 | 0 | Convert the file to PDF/A if possible. |
| kctPDFA_2b | 2 | Convert the file to PDF/A 2b if possible |
| kctPDFA_2u | 18 | Convert the file to PDF/A 2u if possible |
| kctPDFA_3b | 3 | Convert the file to PDF/A 3b if possible |
| kctPDFA_3u | 19 | Convert the file to PDF/A 3u if possible |
| kctPDFA_4 | 20 | Convert the file to PDF/A 4 if possible. Embedded files are supported but no file attach annotations. |
| kctPDFA_4e | 21 | Convert the file to PDF/A 4e if possible. This version allows 3D contents in rich media annotations. |
| kctPDFA_4f | 22 | Convert the file to PDF/A 4f if possible. This version allows file attach annotations. |
| kctZUGFeRD2_Basic | 8 | Set the ZUGFeRD 2.0 conformance level to Basic. |
| kctZUGFeRD2_Basic_WL | 9 | Set the ZUGFeRD 2.0 conformance level to Basic WL. |
| kctZUGFeRD2_Comfort | 10 | Set the ZUGFeRD 2.0 conformance level to Comfort (EN 169319). |
| kctZUGFeRD2_Extended | 11 | Set the ZUGFeRD 2.0 conformance level to Extended. |
| kctZUGFeRD2_Minimum | 7 | Set the ZUGFeRD 2.0 conformance level to Minimum. |
| kctZUGFeRD_Basic | 4 | Set the ZUGFeRD conformance level to Basic<br>This constant convert the file to PDF/A 3b and set the whished ZUGFeRD conformance level in the XMP metadata. CheckConformance() does not validate the XML invoice but it checks whether it is present. Setting the correct ZUGFeRD conformance level is very important since this value defines which fields must be present in the XML invoice. |
| kctZUGFeRD_Comfort | 5 | Set the ZUGFeRD conformance level to Comfort<br>This constant convert the file to PDF/A 3b and set the whished ZUGFeRD conformance level in the XMP metadata. CheckConformance() does not validate the XML invoice but it checks whether it is present. Setting the correct ZUGFeRD conformance level is very important since this value defines which fields must be present in the XML invoice. |
| kctZUGFeRD_Extended | 6 | Set the ZUGFeRD conformance level to Extended<br>This constant convert the file to PDF/A 3b and set the whished ZUGFeRD conformance level in the XMP metadata. CheckConformance() does not validate the XML invoice but it checks whether it is present. Setting the correct ZUGFeRD conformance level is very important since this value defines which fields must be present in the XML invoice. |

Constants for draw direction.

| Constant | Value | Description |
|---|---|---|
| kddClockwise | 1 | Clockwise. |
| kddCounterClockwise | 0 | Counter Clockwise. |

PDF Date and Time format constants.

| Constant | Value | Description |
|---|---|---|
| kdf12HR_MM | 15 | e.g. 2pm:59 |
| kdf12HR_MM_SS | 17 | e.g. 2pm:59:59 |
| kdf24HR_MM | 14 | e.g. 14:59 |
| kdf24HR_MM_SS | 16 | e.g. 14:59:59 |
| kdfDD_MMM_YY | 6 | e.g. 24 Dec 99 |
| kdfD_MMM | 4 | e.g. 24 Dec |
| kdfD_MMM_YY | 5 | e.g. 24 Dec 99 |
| kdfMMMM_D_YYYY | 11 | e.g. December 24 1999 |
| kdfMMMM_YY | 9 | e.g. December 99 |
| kdfMMM_D_YYYY | 10 | e.g. Dec 24 1999 |
| kdfMMM_YY | 8 | e.g. Dec 99 |
| kdfMM_D | 0 | e.g. 12/24 |
| kdfMM_DD_YY | 2 | e.g. 12/24/99 |
| kdfMM_YY | 3 | e.g. 12 99 |
| kdfM_D_YY | 1 | e.g. 12 24 99 |
| kdfM_D_YY_HH_MM | 13 | e.g. 12/24/99 14:59 |
| kdfM_D_YY_H_MM_TT | 12 | e.g. 12/24/99 14:59:59 |
| kdfYY_MM_DD | 7 | e.g. 99.12.24 |

Decode Filter constants

| Constant | Value | Description |
|---|---|---|
| kdfASCII85Decode | 1 | |
| kdfASCIIHexDecode | 2 | |
| kdfCCITTFaxDecode | 3 | |
| kdfDCTDecode | 4 | |
| kdfFlateDecode | 5 | |
| kdfJBIG2Decode | 6 | |
| kdfJPXDecode | 7 | |
| kdfLZWDecode | 8 | |
| kdfNone | 0 | |
| kdfRunLengthDecode | 9 | |

De-instantiation type constants for Set3DAnnotProps.

| Constant | Value | Description |
|---|---|---|
| kdi3D_AppDefault | 0 | |
| kdi3D_Instantiated | 2 | The annotation will be instantiated but animations are disabled. |
| kdi3D_Live | 3 | The annotation will be instantiated and animations are enabled (default). |
| kdi3D_UnInstantiated | 1 | The annotation will be uninstantiated (default) |

Document Information Constants

| Constant | Value | Description |
|---|---|---|
| kdiAuthor | 0 | Author Name |
| kdiCompany | 6 | Company Name |
| kdiCreationDate | 10 | Creation Date |
| kdiCreator | 1 | Creator Name |
| kdiCustom | 8 | User defined key |
| kdiKeywords | 2 | Keywords |
| kdiModDate | 11 | Modification date. |
| kdiPDFX_Conf | 9 | |
| kdiPDFX_Ver | 7 | GetInDocInfo() only ->The PDF/X version is set by SetPDFVersion()! |
| kdiProducer | 3 | Producer Name |
| kdiSubject | 4 | Subject line |
| kdiTitle | 5 | Title tag. |

Draw Mode Constants

| Constant | Value | Description |
|---|---|---|
| kdmClipping | 7 | |
| kdmFillClip | 4 | |
| kdmFillStroke | 2 | |
| kdmFillStrokeClip | 6 | |
| kdmInvisible | 3 | |
| kdmNormal | 0 | |
| kdmStroke | 1 | |
| kdmStrokeClip | 5 | |

Constants for Duplex Mode

| Constant | Value | Description |
|---|---|---|
| kdpmFlipLongEdge | 3 | flip long edge |
| kdpmFlipShortEdge | 2 | flip short edge |
| kdpmNone | 0 | Use the default value of the viewer |
| kdpmSimplex | 1 | Simplex |

Constants for thousand and decimal separators.

| Constant | Value | Description |
|---|---|---|
| kdsCommaDot | 0 | 1,234.56 |
| kdsDotComma | 2 | 1.234,56 |
| kdsNoneComma | 3 | 1234,56 |
| kdsNoneDot | 1 | 1234.56 |
| kdsQuoteDot | 4 | Quote with dot. |

3D DeActivateType constants.

| Constant | Value | Description |
|---|---|---|
| kdt3D_AppDefault | 0 | |
| kdt3D_Explicit | 3 | The annotation should remain active until explicitely deactivated by a script or action. |
| kdt3D_PageClosed | 1 | The annotaiton should be deactivated as soon as the page is closed. |
| kdt3D_PageInvisible | 2 | The annotaiton should be deactivated as soon as the page becomes invisible (default). |

Date Types

| Constant | Value | Description |
|---|---|---|
| kdtCreationDate | 0 | Creation Date, Markup annotations only. |
| kdtModDate | 1 | Modification Date, Annotations or form fields. |

Destination type constants for a link

| Constant | Value | Description |
|---|---|---|
| kdtFit | 1 | no parameters |
| kdtFitB | 5 | no parameters |
| kdtFitBH_Top | 6 | one parameter (a) |
| kdtFitBV_Left | 7 | one parameter (a) |
| kdtFitH_Top | 2 | one parameter |
| kdtFitV_Left | 3 | one parameter (a) |
| kdtFit_Rect | 4 | four parameters (a, b, c, d) ->(left, bottom, right, top) |
| kdtXY_Zoom | 0 | Three parameters (a, b, c) ->(X, Y, Zoom) |

Embedded File Location Values

| Constant | Value | Description |
|---|---|---|
| keflChild | 0 | The file is an embedded file in the current document. |
| keflChildAnnot | 1 | The file is located in a file attachment annotion in the current document. |
| keflExternal | 2 | The file is an embedded file in an external document. |
| keflExternalAnnot | 3 | The file is located in a file attachment annotion in an external document. |
| keflParent | 4 | The file is located in the parent document. |
| keflParentAnnot | 5 | The file is located in a file attachment annotion in the parent document. |

Flags for EnumHostFontEx event

| Constant | Value | Description |
|---|---|---|
| kefpAnsiPath | 0 | Code page 1252 on Windows, UTF-8 otherwise. The font has embedding rights. |
| kefpEditable | 4 | If set, the font has editing rights (important for form fields). |
| kefpEmbeddable | 2 | The font has embedding rights. |
| kefpUnicodePath | 1 | FilePath is in Unicode format. Make a typecast to (UI16*) in this case. The plugin handles that for you. |
| kleButt | 1 | Butt |
| kleCircle | 2 | Circle |
| kleClosedArrow | 3 | Left Close Arrow |
| kleDiamond | 4 | Diamond |
| kleNone | 0 | No end |
| kleOpenArrow | 5 | Left Open Arrow |
| kleRClosedArrow | 6 | Right Close Arrow |
| kleROpenArrow | 7 | Right Open Arrow |
| kleSlash | 8 | Slash |
| kleSquare | 9 | Square |

Error mode constants.

| Constant | Value | Description |
|---|---|---|
| kemAllErrors | &h0000FFFF | All errors |
| kemFileError | 8 | File Error |
| kemFontError | 16 | Font Error |
| kemIgnoreAll | 0 | Ignore All |
| kemLogFonts | &h00010000 | If set, CheckConformance() logs which fonts were replaced with system fonts or converted to Type3. |
| kemLogFontsVerbose | &h00020000 | If set, the path to the font file is added to the message too. Use with kemLogFonts. |
| kemNoFuncNames | &h10000000 | Do not print function names in error messages |
| kemSyntaxError | 1 | Syntax Error |
| kemUseErrLog | &h20000000 | Redirect all error messages to the error log. |
| kemValueError | 2 | Value Error |
| kemWarning | 4 | Warning |

Error Event Results

| Constant | Value | Description |
|---|---|---|
| kErrorEventContinue | 0 | Please return zero to ignore the error and continue with your code. |
| kErrorEventRaise | -2 | Please return -2 to raise an exception. |
| kErrorEventStop | -1 | Please return -1 to stop processing. |

Extended color space constants.

| Constant | Value | Description |
|---|---|---|
| kesCalGray | 3 | CIE-based color space |
| kesCalRGB | 4 | CIE-based color space |
| kesDeviceCMYK | 1 | Device color space |
| kesDeviceGray | 2 | Device color space |
| kesDeviceN | 10 | Special color space |
| kesDeviceRGB | 0 | Device color space |
| kesICCBased | 6 | CIE-based color space ->contains an ICC profile |
| kesIndexed | 8 | Special color space |
| kesLab | 5 | CIE-based color space |
| kesNChannel | 11 | Special color space |
| kesPattern | 7 | Special color space |
| kesSeparation | 9 | Special color space |

Fle attach icon constants.

| Constant | Value | Description |
|---|---|---|
| kfaiGraph | 0 | Graph. |
| kfaiPaperClip | 1 | Paper Clip |
| kfaiPushPin | 2 | Push Pin |
| kfaiTag | 3 | Tag |

Font Base Type constants

| Constant | Value | Description |
|---|---|---|
| kfbtDisabled | 4 | This value can be used to disable a specific font format. See SetFontSearchOrder() for further information. |
| kfbtOpenType | 2 | OpenType font with Postscript outlines |
| kfbtStdFont | 3 | PDF Standard font |
| kfbtTrueType | 0 | TrueType, TrueType Collections, or OpenType fonts with TrueType outlines |
| kfbtType1 | 1 | Type1 font |

Field or annotation colors Constants.

| Constant | Value | Description |
|---|---|---|
| kfcBackColor | 0 | |
| kfcBorderColor | 1 | |
| kfcTextColor | 2 | |

Field Flags Constants.

| Constant | Value | Description |
|---|---|---|
| kffComb | &h01000000 | PDF 1.5 Text fields only |
| kffDoNotScroll | &h00800000 | PDF 1.4 Text fields only |
| kffDoNotSpellCheck | &h00400000 | PDF 1.4 Text fields, combo boxes. If the field is a combo box, this flag is meaningful only if ffEdit is also set. |
| kffEdit | &h00040000 | Combo boxes only |
| kffFileSelect | &h00100000 | PDF 1.4 Text fields only |
| kffHidden | 16 | |
| kffInvisible | 8 | |
| kffMultiline | &h00001000 | Text fields only |
| kffMultiSelect | &h00200000 | PDF 1.4 List boxes only |
| kffNoExport | 4 | |
| kffNoRotate | &h00000080 | |
| kffNoToggleToOff | &h00004000 | Radio buttons |
| kffNoView | &h00000100 | |
| kffNoZoom | 64 | |
| kffPassword | &h00002000 | Text fields only |
| kffPrint | 32 | |
| kffReadOnly | 1 | |
| kffRequired | 2 | |
| kffSorted | &h00080000 | Use this flag to change the sort flag of combo boxes or list boxes |

Font File Subtype constants

| Constant | Value | Description |
|---|---|---|
| kffsCIDFontType0C | 1 | CFF based Type1 CID font |
| kffsCIDFontType2 | 4 | TrueType based CID Font |
| kffsNoSubtype | 9 | The font file is in the format of FontType |
| kffsOpenType | 2 | TrueType based OpenType font |
| kffsOpenTypeC | 3 | CFF based OpenType font |
| kffsType1C | 0 | CFF based Type1 font. |

Fillmode constants

| Constant | Value | Description |
|---|---|---|
| kfmClose | 11 | Close the path, but do not fill or stroke it. More vertices are required or stroke the path in a separate step. |
| kfmFill | 3 | Fill path. |
| kfmFillEvOdd | 6 | Fill even odd. |
| kfmFillEvOddNoClose | 8 | Fill even odd and no close. |
| kfmFillNoClose | 0 | Fill, but don't close. |
| kfmFillStroke | 5 | Fill and stroke. |
| kfmFillStrokeEvOdd | 7 | Fill and stroke even odd. |
| kfmFillStrokeEvOddNoClose | 9 | Fill and stroke even odd, no close. |
| kfmFillStrokeNoClose | 2 | Fill, Stroke, but don't close. |
| kfmNoFill | 10 | Don't fill. |
| kfmStroke | 4 | Stroke path. |
| kfmStrokeNoClose | 1 | Stroke, but do not close. |

File operation constants for CreateLaunchAction.

| Constant | Value | Description |
|---|---|---|
| kfoOpen | 0 | Open file. |
| kfoPrint | 1 | Print file. |

Flush constants

| Constant | Value | Description |
|---|---|---|
| kfpfDefault | 0 | Write anything to the file that is possible. |
| kfpfExclLastPage | 2 | If set, the last page is not flushed. |
| kfpfImagesOnly | 1 | If set, only images are written to the file. The pages are still in memory and can be modified with EditPage(). Flushed images can still be referenced in other pages. The image handles remain valid. |

Constants for font style.

| Constant | Value | Description |
|---|---|---|
| kfsBlack | &h38400000 | |
| kfsBold | &h2BC00000 | The old constant 2 is still supported to preserve backward compatibility |
| kfsCondensed | &h00000300 | |
| kfsDblUnderline | 32 | Double underlined text. |
| kfsDemiBold | &h25800000 | |
| kfsExpanded | &h00000700 | |
| kfsExtraBold | &h32000000 | |
| kfsExtraCondensed | &h00000200 | |
| kfsExtraExpanded | &h00000800 | |
| kfsExtraLight | &h0C800000 | |
| kfsItalic | 1 | |
| kfsLight | &h12C00000 | |
| kfsMedium | &h1F400000 | |
| kfsNone | 0 | |
| kfsNormal | &h00000500 | |
| kfsRegular | &h19000000 | Same as fsNone |
| kfsSemiCondensed | &h00000400 | |
| kfsSemiExpanded | &h00000600 | |
| kfsStriked | 8 | |
| kfsThin | &h06400000 | |
| kfsUltraBlack | &h3E800000 | |
| kfsUltraCondensed | &h00000100 | |
| kfsUltraExpanded | &h00000900 | |
| kfsUnderlined | 4 | Underlined text. |
| kfsVerticalMode | 16 | Not considered at this time (v2.5) |

Field Type Constants

| Constant | Value | Description |
|---|---|---|
| kftButton | 0 | Button |
| kftCheckBox | 1 | Checkbox |
| kftComboBox | 3 | Combobox |
| kftGroup | 7 | This is not a real field type, it is just an array of fields. |
| kftListBox | 4 | Listbox |
| kftRadioBtn | 2 | Radio Button |
| kftSignature | 6 | Signature |
| kftText | 5 | Text. |

Font Type Constants

| Constant | Value | Description |
|---|---|---|
| kftMMType1 | 0 | Multiple Master |
| kftTrueType | 1 | TrueType font |
| kftType0 | 2 | CID font ->the descendant font can be a TrueType, Type1 (CFF), or OpenType font |
| kftType1 | 3 | Type1 font |
| kftType3 | 4 | Type3 font |

Graphics state flag constants

| Constant | Value | Description |
|---|---|---|
| kgfAnsiStringIsUTF8 | 32 | If set, single byte strings in Ansi functions are treated as UTF-8 encoded Un code strings.<br>Currently not useable with plugins. |
| kgfCompatible | 0 | Compatible graphics state to earlier DynaPDF versions ->default |
| kgfComplexText | &h00000400 | If set, text is processed with Uniscribe on Windows. |
| kgfDisableBidiCtrls | &h00001000 | Meaningful only if gfComplexText is set too. If set, bidi control characte are ignored. This flag can be useful if the result of web browsers should b emulated since web browsers do not support bidi control characters. This fla is also used internally to create the appearance stream of form fields since for fields do not support bidi control characters. |
| kgfDisableJavascript | &h00000800 | If set, Javascript actions associated with the OnFormat event of text fields a not executed to format the field value. |
| kgfDoNotComprMetadata | &h00002000 | If set, arbitrary metadata stream associated with PDF objects other that th global metadata stream will not be compressed. This can be useful since certa standards prohibit compression of metadata streams. The flag is automatical for PDF/X files. |
| kgfIgnoreICCProfiles | 16 | Meaningful only if the flag kgfUseImageColorSpace is set. If set, an embedde profile is not used to create an ICCBased color space for the image. The imag is inserted in the corresponding device color space instead. |
| kgfNativeBlackWhite | 4 | Do not convert RGB black or white to DeviceGray |
| kgfNoBitmapAlpha | &h00000080 | If set, the alpha channel in 32 bit bitmaps will be ignored. Useful for bitmap with an invalid alpha channel. |
| kgfNoImageDuplCheck | &h00000100 | Disables duplicate check for images. |
| kgfNoObjCompression | &h00000200 | If set, object compression will be disabled. |
| kgfRealPassThrough | 64 | If set, JPEG images are inserted as is. JPEG images are normally rebuild, als in pass-through mode, to avoid issues with certain malformed JPEG imag which cannot be displayed in Adobes Acrobat or Reader. If you know tha your JPEG images work then set this flag to avoid unnecessary processin time. |
| kgfRealTopDownCoords | 2 | If set, the page coordinate system is not reset to bottom-up when transformin the coordinate system. However, real top-down coordinates require a larg internal overhead and where never fully implemented. The usage of this fla should be avoided if possible. |
| kgfRestorePageCoords | 1 | Restore the coordinate system with the graphics state (the value of PageCoord see SetPageCoords()) |
| kgfSkaleAnnotIcons | &h00008000 | If set, icons of text and file attach annotation are scaled with the page lik every other annotation. These annotations have normally a fixed size that indendent of the zoom or scaling factor. |
| kgfUpdatePDFVTModDate | &h00004000 | If set, the key GTS_PDFVTModDate will be set to the file's modification dat |
| kgfUseImageColorSpace | 8 | If set, the active color space is ignored when inserting an image. The col space is taken from the image file instead. |

Highlight Mode Constants

| Constant | Value | Description |
|---|---|---|
| khmInvert | 1 | |
| khmNone | 0 | |
| khmOutline | 2 | |
| khmPush | 3 | |
| khmPushUpd | 4 | Update appearance stream on changes |

Constants for CloseAndSignFileExt.

| Constant | Value | Description |
|---|---|---|
| khtDetached | 0 | Returns the byte ranges of the finish PDF buffer to create a detached signature. |
| khtSHA1 | 1 | Returns the SHA1 hash of the PDF file so that it can be signed. |

Init Cache Flags

| Constant | Value | Description |
|---|---|---|
| kicfIgnorePageLayout | 2 | |

Flags for InitColorManagement

| Constant | Value | Description |
|---|---|---|
| kicmBPCompensation | 1 | Black point compensation preserves the black point when converting CMYK colors to different color spaces. |
| kicmCheckBlackPoint | 2 | If set, soft proofing will be disabled if the black point of the output intent is probably invalid. |
| kicmDefault | 0 | Default rules. |

Image conversion flag constants.

| Constant | Value | Description |
|---|---|---|
| kicNone | 0 | Default value. |
| kicUseCCITT4 | 1 | Use CCITT Fax 4 compression instead of Flate for dithered images. |

Constants for ICC profile types.

| Constant | Value | Description |
|---|---|---|
| kictCMYK | 2 | |
| kictGray | 0 | |
| kictLab | 3 | |
| kictRGB | 1 | |

Constants for ImportFlags2.

| Constant | Value | Description |
|---|---|---|
| kif2CopyEncryptDict | 64 | If set, the encryption settings of an encrypted PDF file are copied to the new PDF file.<br>The flag does nothing if the file is not encrypted. |
| kif2DuplicateCheck | 16 | Perform a duplicate check on color spaces, fonts, images, patterns, and templates when merging PDF files. |
| kif2MergeLayers | 1 | If set, layers with identical name are merged. If this flag is absent DynaPDF imports such layers separately so that each layer refers still to the pages where it was orignally used. |
| kif2NoMetadata | 8 | Ignore metadata streams which are attached to fonts, pages, images, and so on. |
| kif2NoResNameCheck | 32 | Useful in viewer applications |
| kif2Normalize | 2 | Replace LZW compression with Flate, apply limit checks, repair errors if possible. |
| kif2SkipDPartData | &h00000080 | If set, DPart dictionaries are not imported. |
| kif2UseProxy | 4 | Not meaningful for PDF files which are loaded from a memory buffer. If set, all streams are loaded from the file on demand but they are never hold in memory. This reduces drastically the memory usage and enables the processing of almost arbitrary large PDF files with minimal memory usage. The corresponding PDF file must not be deleted before CloseFile() or CloseFileEx() was called. |

Constants for import flags.

| Constant | Value | Description |
|---|---|---|
| kif3DAnnot | &h00100000 | |
| kifAllAnnots | &h009F0000 | |
| kifAllPageObjects | &h40000000 | |
| kifArticles | 16 | |
| kifBookmarks | 8 | |
| kifBoxColorInfo | &h00000200 | |
| kifCatalogAction | 2 | |
| kifContentOnly | 0 | |
| kifDocInfo | &h00008000 | |
| kifEmbeddedFiles | &h00200000 | |
| kifEnumFonts | &h20000000 | |
| kifFileCollections | &h00400000 | |
| kifFormFields | &h01000000 | |
| kifFreeText | &h00010000 | |
| kifImportAll | &h0FFFFFFE | |
| kifImportAsPage | &h80000000 | |
| kifJavaScript | &h00002000 | |
| kifJSActions | &h00004000 | |
| kifLink | &h00040000 | |
| kifNoContent | 1 | |
| kifOtherAnnots | &h00800000 | |
| kifPageActions | 4 | |
| kifPageLabels | 32 | |
| kifPieceInfo | &h02000000 | The PieceInfo dictionary contains arbitrary application defined data. The data in this dictionary is meaningful only for the application that created the data. |
| kifPrepareForPDFA | &h10000000 | |
| kifSearchIndex | &h00001000 | |
| kifSeparationInfo | &h00000100 | Separation info |
| kifStamp | &h00080000 | |
| kifStructureTree | &h00000400 | |
| kifTextAnnot | &h00020000 | |
| kifThumbs | 64 | |
| kifTransition | &h00000800 | |
| kifTranspGroups | &h00000080 | |

Image Format Constants

| Constant | Value | Description |
|---|---|---|
| kifmBMP | 4 | BMP: DeviceGray, DeviceRGB, Black & White ->Uncompressed. |
| kifmJPC | 5 | JPEG 2000: DeviceRGB, DeviceCMYK, DeviceGray ->JPEG2000 compression. |
| kifmJPEG | 1 | JPEG: DeviceRGB, DeviceCMYK, DeviceGray ->JPEG compression. |
| kifmPNG | 2 | PNG: DeviceGray, DeviceRGB, Black & White ->Flate compression. |
| kifmTIFF | 0 | TIFF: DeviceRGB, DeviceCMYK, DeviceGray, Black & White ->CCITT Fax Group 3/4, JPEG, Flate, LZW. |

Instantiation type constants for Set3DAnnotProps

| Constant | Value | Description |
|---|---|---|
| kit3D_AppDefault | 0 | Default |
| kit3D_Instantiated | 1 | The annotation will be instantiated but animations are disabled. |
| kit3D_Live | 2 | The annotation will be instantiated and animations are enabled (default). |

Line Join styles.

| Constant | Value | Description |
|---|---|---|
| kjsBevelJoin | 2 | Bevel Join |
| kjsMiterJoin | 0 | Miter Join |
| kjsRoundJoin | 1 | Round Join |

Key length Constant

| Constant | Value | Description |
|---|---|---|
| kkl128bit | 1 | RC4 Encryption ->Acrobat 5 or higher |
| kkl128bitEx | 2 | RC4 Encryption ->Acrobat 6 or higher |
| kkl40bit | 0 | RC4 Encryption ->Acrobat 3 or higher |
| kklAES128 | 3 | AES Encryption ->Acrobat 7 or higher |
| kklAES256 | 4 | AES Encryption ->Acrobat 9 or higher |
| kklAESRev6 | 5 | AES Encryption ->PDF 2.0, Acrobat X or higher |

Constants for flags to SetCMapDir function.

| Constant | Value | Description |
|---|---|---|
| klcmDefault | 0 | Load the cmaps in the directory now. |
| klcmDelayed | 2 | Load the cmap files only when a font requires an external cmap. |
| klcmRecursive | 1 | Load sub directories recursively. |

Constants for a 3D Rendering mode for Create3DView.

| Constant | Value | Description |
|---|---|---|
| klsArtwork | 0 | Lights from file lsBlue, |
| klsBlue | 1 | |
| klsCAD | 2 | |
| klsCube | 3 | |
| klsDay | 4 | |
| klsHard | 5 | |
| klsHeadlamp | 6 | |
| klsNight | 7 | |
| klsNoLights | 8 | |
| klsNotSet | 12 | |
| klsPrimary | 9 | |
| klsRed | 10 | |
| klsWhite | 11 | |

Metadata Object Constants

| Constant | Value | Description |
|---|---|---|
| kmdoCatalog | 0 | The global XMP stream of the document (no handle needed) |
| kmdoFont | 1 | Parameter Handle must be a font handle. |
| kmdoImage | 2 | Parameter Handle must be an image handle. |
| kmdoPage | 3 | Parameter Handle must be a page number. |
| kmdoTemplate | 4 | Parameter Handle must be a template handle. |

Meta Flags

| Constant | Value | Description |
|---|---|---|
| kmfApplyBidiAlgo | &h00080000 | Apply the bidirectional algorithm on Unicode strings |
| kmfClipRclBounds | &h01000000 | If set, the graphic is drawn into a clipping path with the size of rclBounds. This flag is useful if the graphic contains content outside of its bounding box. |
| kmfClipView | 8 | Draw the file into a clipping rectangle |
| kmfCurrComprFilter | &h20000000 | If set, the currently active compression filter is used to compress the image (see SetCompressionFilter()). This flag is used only if the file is rastered to an image. |
| kmfDebug | 1 | Write debug information into the content stream. |
| kmfDefault | 0 | Default conversion |
| kmfDefBkModeTransp | &h00040000 | Initialize the background mode to transparent (SetBkMode() overrides this state). |
| kmfDisableRasterEMF | &h02000000 | If set, EMF files which use unsupported ROP codes are not rastered. |
| kmfDontSkipROP_DPa | &h10000000 | If set, the ROP code 0x00A000C9 (DPa) is considered in BitBlt, StretchBlt, TranparentBlt, and AlphaBlend records. This kind of ROP code combines a pattern brush with the backdrop. If the flag mfDisableRasterEMF is absent, the usage of such a ROP code causes that the file is rendered to an image. |
| kmfFullScale | &h00010000 | Recommended if 32 bit coordinates are used |
| kmfGDIFontSelection | &h00100000 | Use the GDI to select fonts |
| kmfIgnoreEmbFonts | &h08000000 | If set, embedded fonts in GDIComment records will be ignored. This flag must be set if the fonts of an EMF spool file were pre-loaded with ConvertEMF-Spool(). Spool fonts must always be loaded in a pre-processing step since required fonts are not necessarily embedded in the EMF files. |
| kmfIntersectClipRect | &h00002000 | enabled by default ->can be disabled with mfNoClippingRgn |
| kmfNoBBoxCheck | &h04000000 | Disable the bbox check. |
| kmfNoBmpPatterns | &h00000400 | Ignore bitmap patterns |
| kmfNoClippingRgn | 64 | Disables SelectClippingRegion, IntersectClipRect, and SelectClipPath |
| kmfNoFontEmbedding | &h00000080 | Do not embed fonts ->Fonts should be embedded!!! |
| kmfNoImages | &h00000100 | Ignore image records |
| kmfNoStdPatterns | &h00000200 | Ignore standard patterns |
| kmfNoText | &h00000800 | Ignore text records |
| kmfNoTextClipping | &h00400000 | If set, the ETO_CLIPPED flag in text records is ignored. |
| kmfNoTextScaling | 4 | Do not scale text |
| kmfNoUnicode | &h00008000 | Avoid usage of Unicode fonts ->recommended to enable PDF 1.2 compability |
| kmfRclFrameEx | &h00200000 | |
| kmfShowBounds | 2 | Show the bounding boxes of text strings |
| kmfSrcCopy_Only | &h00800000 | If set, images which use a ROP code other than SRCCOPY are ignored. This is useful when processing Excel 2007 spool files. |
| kmfUseRclBounds | 16 | Use rclBounds instead of rclFrame |
| kmfUseRclFrame | &h00020000 | This flag should be set if the rclFrame rectangle is properly set |
| kmfUseSpacingArray | 32 | enabled by default ->can be disabled with mfUseTextScaling |
| kmfUseTextScaling | &h00004000 | Scale text instead of using the intercharacter spacing array |
| kmfUseUnicode | &h00001000 | Ignore ANSI_CHARSET |

PDFMarkInfo

| Constant | Value | Description |
|---|---|---|
| kmiNotTagged | 0 | This is no Tagged PDF file. |
| kmiSuspects | 2 | The file contains suspect contents that whose ordering does not ordered meet the requirements of the Tagged PDF specifications. |
| kmiTagged | 1 | This is a Tagged PDF file. |
| kmiUserProperties | 4 | A flag indicating that at least one structure element contains user properties. User properties are stored in User Property dictionaries. |

3D named action constants.

| Constant | Value | Description |
|---|---|---|
| knaDefault | 0 | |
| knaFirst | 1 | |
| knaLast | 2 | |
| knaNext | 3 | |
| knaPrevious | 4 | |

Named Action Constants.

| Constant | Value | Description |
|---|---|---|
| knaDeletePages | 13 | |
| knaFirstPage | 0 | |
| knaFitPage | 11 | |
| knaFontsInfo | 8 | |
| knaFullScreen | 12 | |
| knaGeneralInfo | 7 | |
| knaGoBack | 4 | |
| knaLastPage | 1 | |
| knaNextPage | 2 | |
| knaOpenDlg | 5 | |
| knaPrevPage | 3 | |
| knaPrintDlg | 6 | |
| knaQuit | 14 | |
| knaSaveAs | 9 | |
| knaSecurityInfo | 10 | |

Negative number format constants for SetNumberFormat.

| Constant | Value | Description |
|---|---|---|
| knsMinusBlack | 0 | The number is colored black with a minus sign. |
| knsParensBlack | 2 | The number is colored black with parenthesis. |
| knsParensRed | 3 | The number is colored red with parenthesis. |
| knsRed | 1 | The number is colored red. |

Optimization Flags

| Constant | Value | Description |
|---|---|---|
| kof2Default | 0 | Nothing to do |
| kof2DeleteWatermarkAnnots | 2 | If set, watermark annotations will be deleted. |
| kof2DeleteWatermarks | 1 | Delete watermark templates. |
| kof3Default | 0 | Nothing to do |
| kof4Default | 0 | Nothing to do |
| kofAdjZeroLineWidthOnly | &h00002000 | Meaningful only if the parameter MinLineWidth of the optimize parameters greater zero. If set, change the line width of real hairlines only (a hairline i one pixel width line ->LineWidth = 0). |
| kofCompressWithJBIG2 | &h00004000 | If set, 1 bit images are compressed with JBIG2 if not already compressed w this filter. |
| kofConvertAllColors | 2 | If set, Separation, DeviceN, and NChannel color spaces will be converted the device space. |
| kofConvertGrayTo1Bit | &h00010000 | Useful for scanned faxes since many scanners create gray images for black white input. |
| kofConvertToCMYK | &h00080000 | If set, images, text, and vector graphics are converted to DeviceCMYK. |
| kofConvertToGray | &h00020000 | If set, images, text, and vector graphics are converted to DeviceGray. |
| kofConvertToRGB | &h00040000 | If set, images, text, and vector graphics are converted to DeviceRGB. |
| kofConvNonEmbFontsOnly | &h00800000 | Meaningful only, if the flag kofConvTextToOutlines is set. If set, text of no embedded fonts are converted to outlines only. Embedded fonts remain e bedded. |
| kofConvTextToOutlines | &h00400000 | If set, texts of non-Type3 fonts are converted to outlines or vector graphi The resulting file contains no fonts with exception of Type3 fonts, if any. Su files are large but avoid printing issues due to missing or damaged fonts. |
| kofDefault | 0 | Just rebuild the content streams. |
| kofDeleteAlternateImages | &h00000400 | If set, alternate images will be deleted. |
| kofDeleteInvPaths | 64 | Delete invisible paths. An invisible path is a path that was finished with t no-op operator "n". |
| kofDeletePrivateData | &h00000100 | Delete private data objects from pages, templates, and images. For example Indesign may store the original Photoshop image within the PI file. |
| kofDeleteThumbnails | &h00000200 | Thumbnails can be deleted since PDF viewers can create thumbnails easily demand. |
| kofFailOnOverprinting | &h08000000 | Meaningful only if a color conversion flag is set. If set, the function retu with a fatal error if an object with enabled overprinting was found on the pa The appearance of overprinted objects would change and make the page may unusable. Overprinted objects can be left unchanged (set the flag kofSkipOv printedObj in this case) or Optimize() can return with a fatal error to ave the creation of an invalid document. |
| kofFlattenLayers | &h00000080 | Flatten layers if any. |
| kofIgnoreDeviceN | &h01000000 | If set, DeviceN color spaces are left unchanged. |
| kofIgnoreICCBased | 4 | If set, ICCBased color spaces will be left unchanged. |
| kofIgnoreNChannel | &h02000000 | If set, NChannel color spaces are left unchanged. |
| kofIgnoreSeparation | &h04000000 | If set, Separation color spaces are left unchanged. |
| kofIgnoreSeparationAll | &h80000000 | Meaningful only if a color conversion flag is set. If set, Separation color spa with the special colorant "All" will be ignored. |
| kofIgnoreZeroLineWidth | &h00001000 | Meaningful only if the parameter MinLineWidth of the DynaPDFOp mizeParamsMBS class is greater zero. If set, ignore line width operators w a value of zero (zero means one device unit). |
| kofInMemory | 1 | Optimize the file fully in memory. Only useful for small PDF files. |
| kofNewLinkNames | 32 | If set, rename all object links to short names like F1, F2 etc. |
| kofNoFilterCheck | &h00008000 | Meaningful only, if the flag ofCompressWithJBIG2 is set. If set, re-compr all 1 bit images, also if already compressed with JBIG2. |
| kofNoImageSizeCheck | &h00000800 | Meaningful only if ofScaleImages is set. If set, do not check whether the sca image is smaller as the original image. |
| kofRemoveBatesNumbers | &h20000000 | Remove bates numbers if any. The type BatesN can also contain header footers. |
| kofRemoveHeaderFooter | &h40000000 | Remove headers / footers if any. This type is set if no bates numbering w added. |

Object intent constants for CreateOCG.

| Constant | Value | Description |
|---|---|---|
| koiAll | 8 | |
| koiDesign | 2 | |
| koiEmpty | 16 | Internal (refers to koiView if used) |
| koiView | 4 | Default. |
| koiVisible | 32 | Visible |

Object type constants for AddObjectToLayer.

| Constant | Value | Description |
|---|---|---|
| kooAnnotation | 0 | Handle is an annotation handle. |
| kooField | 1 | Handle is a field handle. |
| kooImage | 2 | Handle is a image handle. |
| kooTemplate | 3 | Handle is a template handle. |

Origin constants.

| Constant | Value | Description |
|---|---|---|
| korDownLeft | 0 | |
| korTopLeft | 1 | |

Object type constants.

| Constant | Value | Description |
|---|---|---|
| kotAction | 0 | Action |
| kotAnnotation | 1 | Annotation |
| kotBookmark | 2 | Bookmark |
| kotCatalog | 3 | Catalog. PDF 1.4 |
| kotField | 4 | Field |
| kotPage | 5 | Page |
| kotPageLink | 6 | Page Link. |

Usage Categories

| Constant | Value | Description |
|---|---|---|
| koucExport | 1 | Export |
| koucLanguage | 2 | Language |
| koucNone | 0 | |
| koucPrint | 4 | Print |
| koucUser | 8 | User |
| koucView | 16 | View |
| koucZoom | 32 | Zoom |

Visibility constants for CreateOCMD.

| Constant | Value | Description |
|---|---|---|
| kovAllOff | 0 | All Off |
| kovAllOn | 1 | All On |
| kovAnyOff | 2 | Any Off |
| kovAnyOn | 3 | Any On |
| kovNotSet | 4 | Not Set |

PDF Box Constants

| Constant | Value | Description |
|---|---|---|
| kpbArtBox | 0 | Art box. |
| kpbBleedBox | 1 | Bleed box. |
| kpbCropBox | 2 | Crop Box. |
| kpbMediaBox | 4 | Media Box. |
| kpbTrimBox | 3 | Trim Box. |

Page coordinate constants

| Constant | Value | Description |
|---|---|---|
| kpcBottomUp | 0 | |
| kpcTopDown | 1 | |

Cursor Constants.

| Constant | Value | Description |
|---|---|---|
| kpcrHandClosed | 1 | |
| kpcrHandNormal | 0 | |
| kpcrHandPoint | 2 | |
| kpcrIBeam | 3 | |

Constants for basic RGB colors.

| Constant | Value | Description |
|---|---|---|
| kPDF_AQUA | &h00FFFF00 | aqua |
| kPDF_BLACK | 0 | black |
| kPDF_BLUE | &h00FF0000 | blue |
| kPDF_CREAM | &h00F0FBFF | cream |
| kPDF_DKGRAY | &h00808080 | dark gray |
| kPDF_FUCHSIA | &h00FF00FF | fuchsia |
| kPDF_GRAY | &h00808080 | gray |
| kPDF_GREEN | &h00008000 | green |
| kPDF_LIME | &h0000FF00 | lime |
| kPDF_LTGRAY | &h00C0C0C0 | light gray |
| kPDF_MAROON | &h00000080 | maroon |
| kPDF_MEDGRAY | &h00A4A0A0 | medium gray |
| kPDF_MOGREEN | &h00C0DCC0 | mogreen |
| kPDF_NAVY | &h00800000 | navy |
| kPDF_OLIVE | &h00008080 | olive |
| kPDF_PURPLE | &h00800080 | purple |
| kPDF_RED | &h000000FF | red |
| kPDF_SILVER | &h00C0C0C0 | silver |
| kPDF_SKYBLUE | &h00F0CAA6 | skyblue |
| kPDF_TEAL | &h00808000 | teal |
| kPDF_WHITE | &h00FFFFFF | white |
| kPDF_YELLOW | &h0000FFFF | yellow |

OCG Pagination Artefacts

| Constant | Value | Description |
|---|---|---|
| kpeBackgroundImage | 0 | Background image. |
| kpeForegroundImage | 1 | Foreground Image. |
| kpeHeaderFooter | 2 | Header or Footer |
| kpeLogo | 3 | Logo |
| kpeNone | 4 | |

PDF parser constants.

| Constant | Value | Description |
|---|---|---|
| kpfConvImagesToCMYK | 64 | Convert images to CMYK. |
| kpfConvImagesToGray | 16 | Convert images to grayscale. |
| kpfConvImagesToRGB | 32 | Convert images to RGB. |
| kpfDitherImagesToBW | 8 | Floyd-Steinberg dithering. |
| kpfNoJPXDecode | 4 | Meaningful only if the flag pfDecomprAllImages is set. If set, JPEG2000 images are returned as is so that you can use your own library to decompress such images since the the entire JPEG2000 codec is still marked as experimental. If we find an alternative to the currently used Jasper library then we will replace it immediatly with another one... |
| kpfNone | 0 | |

Page format constants for SetPageFormat

| Constant | Value | Description |
|---|---|---|
| kpfDIN_A0 | 20 | DIN A0 |
| kpfDIN_A1 | 21 | DIN A1 |
| kpfDIN_A10 | 27 | DIN A10 |
| kpfDIN_A2 | 22 | DIN A2 |
| kpfDIN_A3 | 0 | DIN A3 |
| kpfDIN_A4 | 1 | DIN A4 |
| kpfDIN_A5 | 2 | DIN A5 |
| kpfDIN_A6 | 23 | DIN A6 |
| kpfDIN_A7 | 24 | DIN A7 |
| kpfDIN_A8 | 25 | DIN A8 |
| kpfDIN_A9 | 26 | DIN A9 |
| kpfDIN_B4 | 3 | DIN B4 |
| kpfDIN_B5 | 4 | DIN B5 |
| kpfDIN_B6 | 5 | DIN B6 |
| kpfDIN_C3 | 6 | DIN C3 |
| kpfDIN_C4 | 7 | DIN C4 |
| kpfDIN_C5 | 8 | DIN C5 |
| kpfDIN_C6 | 9 | DIN C6 |
| kpfDIN_C65 | 10 | DIN C65 |
| kpfDIN_DL | 11 | DIN DL |
| kpfDIN_E4 | 12 | DIN E4 |
| kpfDIN_E5 | 13 | DIN E5 |
| kpfDIN_E6 | 14 | DIN E6 |
| kpfDIN_E65 | 15 | DIN E65 |
| kpfDIN_M5 | 16 | DIN M5 |
| kpfDIN_M65 | 17 | DIN M65 |
| kpfUS_Legal | 18 | US Legal |
| kpfUS_Letter | 19 | US Letter |

Printing Flags

| Constant | Value | Description |
|---|---|---|
| kpff1Bit | 1 | Print with 1 bit in black and white. |
| kpffAutoCenter | &h00000400 | Automatically scale the page to match printer context. |
| kpffAutoRotate | &h00000200 | Automatically rotate the page to match printer context. |
| kpffAutoRotateAndCenter | 4 | Automatically rotate and scale the page to match printer context. With newer versions you can use kpffAutoRotate and kpffAutoCenter separately. |
| kpffColor | 2 | Print in color. |
| kpffDefault | 0 | Default print settings. |
| kpffNoEndDoc | &h00000080 | Do not call EndDoc on Windows |
| kpffNoStartDoc | 32 | Do not call StartDoc on Windows |
| kpffNoStartPage | 64 | Do not call StartPage on Windows |
| kpffPrintAsImage | 8 | Print by rendering each page as image and drawing it in the graphics context. |
| kpffPrintPageAsIs | &h00000100 | If set, do not scale or rotate a page to fit into the printable area. |
| kpffShrinkToPrintArea | 16 | Shrink PDF to print area. |

PDF Font Flags

| Constant | Value | Description |
|---|---|---|
| kpffAllCap | &h00010000 | All capitals font |
| kpffFixedPitch | 1 | Fixed pitch |
| kpffForceBold | &h00040000 | Bold required |
| kpffItalic | 64 | Italic font |
| kpffNonSymbolic | 32 | Non symbolic font. |
| kpffScriptStyle | 8 | Font in script style. |
| kpffSerifs | 2 | Serif font |
| kpffSmallCap | &h00020000 | Small Caps font |
| kpffSymbolic | 4 | Symbolic font. |

Page layout constants.

| Constant | Value | Description |
|---|---|---|
| kplDefault | 6 | Use viewer's default settings |
| kplOneColumn | 1 | |
| kplSinglePage | 0 | |
| kplTwoColumnLeft | 2 | |
| kplTwoColumnRight | 3 | |
| kplTwoPageLeft | 4 | PDF 1.5 |
| kplTwoPageRight | 5 | PDF 1.5 |

Page Label Format constants.

| Constant | Value | Description |
|---|---|---|
| kplfDecimalArabic | 0 | 1,2,3,4... |
| kplfLowercaseLetters | 4 | a,b,c,d... |
| kplfLowercaseRoman | 2 | i,ii,iii,iv... |
| kplfNone | 5 | |
| kplfUppercaseLetters | 3 | A,B,C,D... |
| kplfUppercaseRoman | 1 | I,II,III,IV... |

Page Mode Constants.

| Constant | Value | Description |
|---|---|---|
| kpmFullScreen | 3 | |
| kpmUseAttachments | 5 | PDF 1.6 |
| kpmUseNone | 0 | |
| kpmUseOC | 4 | PDF 1.5 |
| kpmUseOutlines | 1 | |
| kpmUseThumbs | 2 | |

Print scaling flag constants.

| Constant | Value | Description |
|---|---|---|
| kpsAppDefault | 0 | |
| kpsNone | 1 | |

Constants to specify how the page should be scaled into the image buffer.

| Constant | Value | Description |
|---|---|---|
| kpsFitBest | 2 | Scale the page so that it fits fully into the image buffer. |
| kpsFitHeight | 1 | Scale the page to the height of the image buffer. |
| kpsFitWidth | 0 | Scale the page to the width of the image buffer. |
| kpsFitZoom | 3 | This mode must be used if the scaling factors of the transformation matrix are <>1.0 |

Constants for 3D projection types.

| Constant | Value | Description |
|---|---|---|
| kpt3DOrthographic | 0 | Orthographic |
| kpt3DPerspective | 1 | Perspective |

Pattern type constants.

| Constant | Value | Description |
|---|---|---|
| kptColored | 0 | |
| kptShadingPattern | 2 | |
| kptUnColored | 1 | |

Progress Types

| Constant | Value | Description |
|---|---|---|
| kptConvertPage | 3 | Start converting the PDF file (Optimize(), CheckConformance()) |
| kptImportPage | 0 | This value is for: Start page import |
| kptPrintPage | 2 | Progress for printing a page. |
| kptWritePage | 1 | This value is for: Start writing a page to file or buffer |

Constants for password type to pass when opening files.

| Constant | Value | Description |
|---|---|---|
| kptDontCopyBuf | 4 | If set, OpenImportBuffer() does not copy the PDF buffer to an internal buffer. This increases the processing speed and reduces the memory usage. The PDF buffer must not be released until CloseImportFile() or CloseFile() was called. |
| kptForceRepair | 2 | Meaningful only when opening a PDF file with OpenImportFile() or OpenImportBuffer(). If set, the PDF parser rebuilds the cross-reference table by scanning all the objects in the file. This can be useful if the cross-reference table contains damages while the top level objects are intact. Setting this flag makes only sence if the file was already previously opened in normal mode and if errors occured when importing pages of it. |
| kptOpen | 0 | No password. |
| kptOwner | 1 | Owner password provided. |

PDF Version constants.

| Constant | Value | Description |
|---|---|---|
| kpvFacturX_Basic | &h00100000 | Basic profile for FacturX. |
| kpvFacturX_Basic_WL | &h00200000 | Basic WL profile for FacturX. |
| kpvFacturX_Comfort | &h00400000 | Comfort profile for FacturX. |
| kpvFacturX_Extended | &h00800000 | Extended profile for FacturX. |
| kpvFacturX_Mask | &h02F80000 | Mask for all FacturX variants.<br>Contains kpvFacturX_Minimum, kpvFacturX_Basic, kpvFacturX_Basic_WL, kpvFacturX_Comfort, kpvFacturX_Extended and kpvFacturX_XRechnung, |
| kpvFacturX_Minimum | &h00080000 | Minimum profile for FacturX. |
| kpvPDFA_1a | 16 | PDF/A 1a |
| kpvPDFA_2005 | 14 | PDF/A-1b 2005 |
| kpvPDFA_2a | 17 | PDF/A 2a |
| kpvPDFA_2b | 18 | PDF/A 2b |
| kpvPDFA_2u | 19 | PDF/A 2u |
| kpvPDFA_3a | 20 | PDF/A 3a |
| kpvPDFA_3b | 21 | PDF/A 3b |
| kpvPDFA_3u | 22 | PDF/A 3u |
| kpvPDFA_4 | 31 | PDF/A 4 |
| kpvPDFA_4e | 32 | PDF/A 4e allows 3D contents in rich media annotations. |
| kpvPDFA_4f | 33 | PDF/A 4f allows file attach annotations. |
| kpvPDFUA1 | 29 | PDF/UA-1 |
| kpvPDFUAFlag | &h20000000 | PDF/UA flag. Can be used in addition with other standards.<br>File metadata will contain PDF/A and PDF/UA entries. |
| kpvPDFVT1 | &h10000000 | PDF/VT 1 flag. This is just a flag because PDF/VT requires always a PDF/X base version. |
| kpvPDFVT2 | &h04000000 | PDF/VT 2 flag. This is just a flag because PDF/VT requires always a PDF/X base version. |
| kpvPDFVT3 | &h08000000 | PDF/VT 3 flag. This is just a flag because PDF/VT requires always a PDF/X base version. |
| kpvPDFVTMask | &h1C000000 | Mask for PDF/VT flags |
| kpvPDFX1a_2001 | 10 | PDF/X-1a:2001 |
| kpvPDFX1a_2003 | 11 | PDF/X-1a:2003 |
| kpvPDFX3_2002 | 12 | PDF/X-3:2002 |
| kpvPDFX3_2003 | 13 | PDF/X-3:2003 |
| kpvPDFX4p | 30 | PDF/X-4p |
| kpvPDFX5g | 23 | PDF/X 5g |
| kpvPDFX5n | 24 | PDF/X 5n |
| kpvPDFX5pg | 25 | PDF/X 5pq |
| kpvPDFX6 | 26 | PDF/X 6 |
| kpvPDFX6n | 27 | PDF/X 6n |
| kpvPDFX6p | 28 | PDF/X 6p |
| kpvPDFX_4 | 15 | PDF/X-4 |
| kpvPDF_1_0 | 0 | PDF 1.0 |
| kpvPDF_1_1 | 1 | PDF 1.1 |
| kpvPDF_1_2 | 2 | PDF 1.2 |
| kpvPDF_1_3 | 3 | PDF 1.3 |
| kpvPDF_1_4 | 4 | PDF 1.4 |
| kpvPDF_1_5 | 5 | PDF 1.5 |
| kpvPDF_1_6 | 6 | PDF 1.6 |
| kpvPDF_1_7 | 7 | PDF 1.7 |
| kpvPDF_2_0 | 8 | PDF 2.0 |
| kpvZUGFeRD2_Flag | &h01000000 | The flag to indicate it is a ZUGFeRD PDF and not FacturX. |
| kpvZUGFeRD_Basic | &h00010000 | ZUGFeRD Basic level.<br>This constant are flags which can be combined with kpvPDFA_3a, kpvPDFA_3b, and kpvPDFA_3u. If used stand alone PDF/A 3b with the correspondig ZUGFeRD metadata will be created. |
| kpvZUGFeRD_Comfort | &h00020000 | ZUGFeRD Comfort level.<br>This constant are flags which can be combined with kpvPDFA_3a, |

Pixel formats for raster functions.

| Constant | Value | Description |
|---|---|---|
| kpxf1Bit | 0 | 1 bit per pixel black and white. |
| kpxfABGR | 7 | ABGR. |
| kpxfARGB | 6 | ARGB |
| kpxfBGR | 3 | BGR |
| kpxfBGRA | 5 | BGRA |
| kpxfCMYK | 9 | CMYK without alpha |
| kpxfCMYKA | 10 | CMYK with alpha |
| kpxfGray | 1 | 8 bit grayscale. |
| kpxfGrayA | 8 | 8 bit grayscale with alpha. |
| kpxfRGB | 2 | RGB |
| kpxfRGBA | 4 | RGBA |

Raster Flag Constants

| Constant | Value | Description |
|---|---|---|
| krfClipBoxMask | 28 | The mask for Clip flags. |
| krfClipToArtBox | 4 | Clip the page to the art box if any.<br>Only one of these clip flags must be set at time! |
| krfClipToBleedBox | 8 | Clip the page to the bleed box if any.<br>Only one of these clip flags must be set at time! |
| krfClipToTrimBox | 16 | Clip the page to the bleed box if any.<br>Only one of these clip flags must be set at time! |
| krfCompositeWhite | &h00001000 | Composite pixel formats with an alpha channel finally with a white background. The alpha channel is 255 everywhere after composition. This flag is mainly provided for debug purposes but it can also be useful if the image must be copied on screen with a function that doesn't support alpha blending. |
| krfDefault | 0 | Render the page as usual |
| krfDisableAAClipping | &h00200000 | Disable Anti-Aliasing for clipping paths. This flag is the most important one since clipping paths cause often visible artefacts in PDF files with flattened transparency. |
| krfDisableAAText | &h00400000 | Disable Anti-Aliasing for text. |
| krfDisableAAVector | &h00800000 | Disable Anti-Aliasing for vector graphics. |
| krfDisableAntiAliasing | &h00E00000 | Combination of krfDisableAAVector, krfDisableAAText and krfDisableAAClipping. |
| krfDisableBiLinearFilter | &h01000000 | Disable the BiLevel filter for images. Sometetimes useful if sharp images are needed, e.g. for barcodes. |
| krfEnableBlendCS | &h10000000 | If set, the page is rendered in the color space of the page group, soft proof color space, or output intent (if set), and finally converted to the destination colorspace. |
| krfExclAnnotations | 32 | Don't render annotations. |
| krfExclButtons | &h00004000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude buttons.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclCheckBoxes | &h00008000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude checkboxes.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclComboBoxes | &h00010000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude combobox.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclFormFields | 64 | Don't render form fields. |
| krfExclListBoxes | &h00020000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude listbox.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclPageContent | &h00002000 | If set, only annotations and form fields will be rendered (if any). |
| krfExclSigFields | &h00080000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude signature fields.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclTextFields | &h00040000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude text fields.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfIgnoreCropBox | 2 | Ignore the crop box and render anything inside the media box without clipping. |
| krfInitBlack | &h00000800 | Initialize the image buffer to black before rendering (RGBA or GrayA must be initialized to black) |
| krfRenderInvisibleText | &h02000000 | If set, treat text rendering mode Invisible as Normal. |
| krfRenderPrintState | &h20000000 | If set, the print state of layers, annotations, and form fields will be rendered. |
| krfRotate180 | &h00000200 | Rotate the page 180 degress. |
| krfRotate270 | &h00000400 | Rotate the page 270 degress. |
| krfRotate90 | &h00000100 | Rotate the page 90 degress. |
| krfScaleToBBox | &h00100000 | Meaningful only, if rfClipToArtBox, rfClipToBleedBox, or rfClipToTrimBox is set. If set, the picture size is set to the size of the whished bounding box. |
| krfScaleToMediaBox | 1 | Render the real paper format. Contents outside the crop box is clipped. |
| krfSkipUpdateBG | &h00000080 | Don't generate an update event after initializing the background to white. |

Rendering intent constants

| Constant | Value | Description |
|---|---|---|
| kriAbsoluteColorimetric | 0 | |
| kriPerceptual | 1 | |
| kriRelativeColorimetric | 2 | |
| kriSaturation | 3 | |

Raw Image Flags Constants.

| Constant | Value | Description |
|---|---|---|
| krifByteAligned | &h00001000 | |
| krifCMYKData | &h00004000 | |
| krifRGBData | &h00002000 | |

3D rendering mode constants

| Constant | Value | Description |
|---|---|---|
| krmBoundingBox | 0 | |
| krmHiddenWireframe | 1 | |
| krmIllustration | 2 | |
| krmNotSet | 15 | |
| krmShadedIllustration | 3 | |
| krmShadedVertices | 4 | |
| krmShadedWireframe | 5 | |
| krmSolid | 6 | |
| krmSolidOutline | 7 | |
| krmSolidWireframe | 8 | |
| krmTransparent | 9 | |
| krmTranspBBox | 10 | |
| krmTranspBBoxOutline | 11 | |
| krmTranspWireframe | 12 | |
| krmVertices | 13 | |
| krmWireframe | 14 | |

Restriction constants.

| Constant | Value | Description |
|---|---|---|
| krsAddObj | 32 | |
| krsAssemble | &h00000400 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used. |
| krsCopyObj | 16 | |
| krsDenyAll | &h00000F3C | |
| krsDenyNothing | 0 | |
| krsEmbFilesOnly | &h00002000 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used.<br>PDF 1.6 Encrypt embedded files only ->Requires AES encryption. |
| krsExlMetadata | &h00001000 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used.<br>PDF 1.5 Exclude metadata streams ->128/256 bit encryption bit only. |
| krsExtractObj | &h00000200 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used. |
| krsFillInFormFields | &h00000100 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used. |
| krsModify | 8 | |
| krsPrint | 4 | |
| krsPrintHighRes | &h00000800 | This flag is only used for 128 bit encryption. So this flag is ignored if 40 bit encryption is used. |

Rubber stamp constants for StampAnnotation.

| Constant | Value | Description |
|---|---|---|
| krsApproved | 0 | |
| krsAsIs | 1 | |
| krsConfidential | 2 | |
| krsDepartmental | 3 | |
| krsDraft | 4 | |
| krsExperimental | 5 | |
| krsExpired | 6 | |
| krsFinal | 7 | |
| krsForComment | 8 | |
| krsForPublicRelease | 9 | |
| krsNotApproved | 10 | |
| krsNotForPublicRelease | 11 | |
| krsSold | 12 | |
| krsTopSecret | 13 | |
| krsUserDefined | 14 | |

Submit flag constants for CreateSubmitAction.

| Constant | Value | Description |
|---|---|---|
| ksfCanonicalFormat | &h00000200 | |
| ksfEmbedForm | &h00002000 | PDF 1.5 embed the entire form into a file stream inside the FDF file ->requires the full version of Adobe's Acrobat. |
| ksfExlFKey | &h00000800 | |
| ksfExlNonUserAnnots | &h00000400 | |
| ksfExlude | 1 | If set, the fields in a submit form action are excluded if any. |
| ksfGetMethod | 8 | |
| ksfHTML | 4 | |
| ksfInclAnnots | &h00000080 | |
| ksfInclAppSaves | 64 | Requires the full version of Adobe's Acrobat |
| ksfInclNoValFields | 2 | |
| ksfNone | 0 | The default export format is FDF |
| ksfPDF | &h00000100 | Submit the entire PDF file ->requires the full version of Adobe's Acrobat. |
| ksfSubmCoords | 16 | |
| ksfXML | 36 | |

Constants for font selection modes.

| Constant | Value | Description |
|---|---|---|
| ksmFamilyName | 0 | |
| ksmFullName | 2 | Full name. |
| ksmPostScriptName | 1 | If font selection mode is set to smPostScriptName the font styles fsItalic or fsBold are ignored.<br>The PostScriptName is already a unique font name incl. style information. |

Soft Mask Constants.

| Constant | Value | Description |
|---|---|---|
| ksmtAlpha | 0 | Alpha mode. |
| ksmtLuminosity | 1 | Luminosity mode. |

Constants for ConvertEMFSpool.

| Constant | Value | Description |
|---|---|---|
| kspcDefault | 0 | Default flags. |
| kspcDontAddMargins | 2 | If set, the page format is calculated from the EMF files as is. The current page format is not used to calculate margins which are maybe required. Note that the parameters LeftMargin and TopMargin will still be considered. |
| kspcFlushPages | 8 | If set, the function writes every finish page directly to the output file to reduce the memory usage. This flag is meaningful only if the PDF file is not created in memory. Note also that it is not possible to access already flushed pages again with EditPage(). |
| kspcIgnorePaperFormat | 1 | If set, the current page format is used as is for the entire spool file. |
| kspcLoadSpoolFontsOnly | 4 | If set, only embedded fonts will be loaded. The EMF files must be converted with the flag mfIgnoreEmbFonts in this case. This flag can be useful if you want to use your own code to convert the EMF files of the spool file. |

Standard Pattern Constants

| Constant | Value | Description |
|---|---|---|
| kspCross | 4 | |
| kspDiaCross | 5 | |
| kspHorizontal | 0 | |
| kspLDiagonal | 3 | |
| kspRDiagonal | 2 | |
| kspVertical | 1 | |

Constants for 3D scale type.

| Constant | Value | Description |
|---|---|---|
| kst3DHeight | 2 | |
| kst3DMax | 4 | |
| kst3DMin | 3 | |
| kst3DValue | 0 | |
| kst3DWidth | 1 | |

Shading type constants.

| Constant | Value | Description |
|---|---|---|
| kstAxial | 2 | |
| kstCoonsPatch | 6 | |
| kstFreeFormGouraud | 4 | |
| kstFunctionBased | 1 | |
| kstLatticeFormGouraud | 5 | |
| kstRadial | 3 | |
| kstTensorProduct | 7 | |

Text Alignment Constants

| Constant | Value | Description |
|---|---|---|
| ktaCenter | 1 | Center |
| ktaJustify | 3 | Justify |
| ktaLeft | 0 | Left |
| ktaPlainText | &h10000000 | Added to alignment flag to tell WriteFText to not interpret escape commands. |
| ktaRight | 2 | Right |

Text Extraction Flags

| Constant | Value | Description |
|---|---|---|
| ktefDefault | 0 | Create text lines in the original order. |
| ktefDeleteOverlappingText | 4 | Delete duplicate text records on same position. |
| ktefNoHeuristic | 8 | If set, text is sorted on the x-axis as specified. If absent, a heuristic is used to determine whether it is might be better to leave a line unsorted. |
| ktefSortTextX | 1 | Sort text records in x-direction. |
| ktefSortTextXY | 3 | Sort text records in x and y-direction. |
| ktefSortTextY | 2 | Sort text records in y-direction. |

Tab Order constants.

| Constant | Value | Description |
|---|---|---|
| ktoAnnots | 4 | Annotation order ->PDF 1.7 Extension Level 3 |
| ktoColumn | 1 | Column. |
| ktoFields | 5 | Widget order (Form Fields) ->PDF 1.7 Extension Level 3. |
| ktoNone | 3 | |
| ktoRow | 0 | Row. |
| ktoStructure | 2 | Structure |

Tiling Type Constants

| Constant | Value | Description |
|---|---|---|
| kttConstSpacing | 0 | |
| kttFastConstSpacing | 2 | |
| kttNoDistortion | 1 | |

Scrollbar Update Constants.

| Constant | Value | Description |
|---|---|---|
| kusbCursorHandClosed | 32 | Occurs when the cursor leaves an action field and if the left mouse button is pressed.<br>The cursor constants are set by MouseMove. Since we have only one cursor there is never more than one constant set. |
| kusbCursorHandNormal | 16 | This is the default if the left mouse button is not pressed and if we are not over an action field.<br>The cursor constants are set by MouseMove. Since we have only one cursor there is never more than one constant set. |
| kusbCursorHandPoint | 64 | Occurs when we enter link or button field.<br>The cursor constants are set by MouseMove. Since we have only one cursor there is never more than one constant set. |
| kusbCursorIBeam | &h00000080 | Occurs when we enter an action field that accepts text input.<br>The cursor constants are set by MouseMove. Since we have only one cursor there is never more than one constant set. |
| kusbCursorMask | &h00003FF0 | Bitmask to mask out the cursor constants. |
| kusbHorzRange | 4 | Update the horizontal scroll range. |
| kusbHorzScrollPos | 8 | Update the horizontal scroll position. |
| kusbNoUpdate | 0 | Nothing to do. |
| kusbUpdateAll | 15 | Update both scroll ranges and the scroll positions. |
| kusbVertRange | 1 | Update the vertical scroll range. |
| kusbVertScrollPos | 2 | Update the vertical scroll position. |

Viewer Preference Constants

| Constant | Value | Description |
|---|---|---|
| kvpCenterWindow | 16 | |
| kvpDirection | &h00000080 | |
| kvpDisplayDocTitle | 32 | |
| kvpFitWindow | 8 | |
| kvpHideMenuBar | 2 | |
| kvpHideToolBar | 1 | |
| kvpHideWindowUI | 4 | |
| kvpNonFullScrPageMode | 64 | |
| kvpPrintArea | &h00000400 | |
| kvpPrintClip | &h00000800 | |
| kvpUseNone | 0 | |
| kvpViewArea | &h00000100 | |
| kvpViewClip | &h00000200 | |

### 77.40.1000 Screenshots

### 77.40.1001 DynaPDF1.jpg

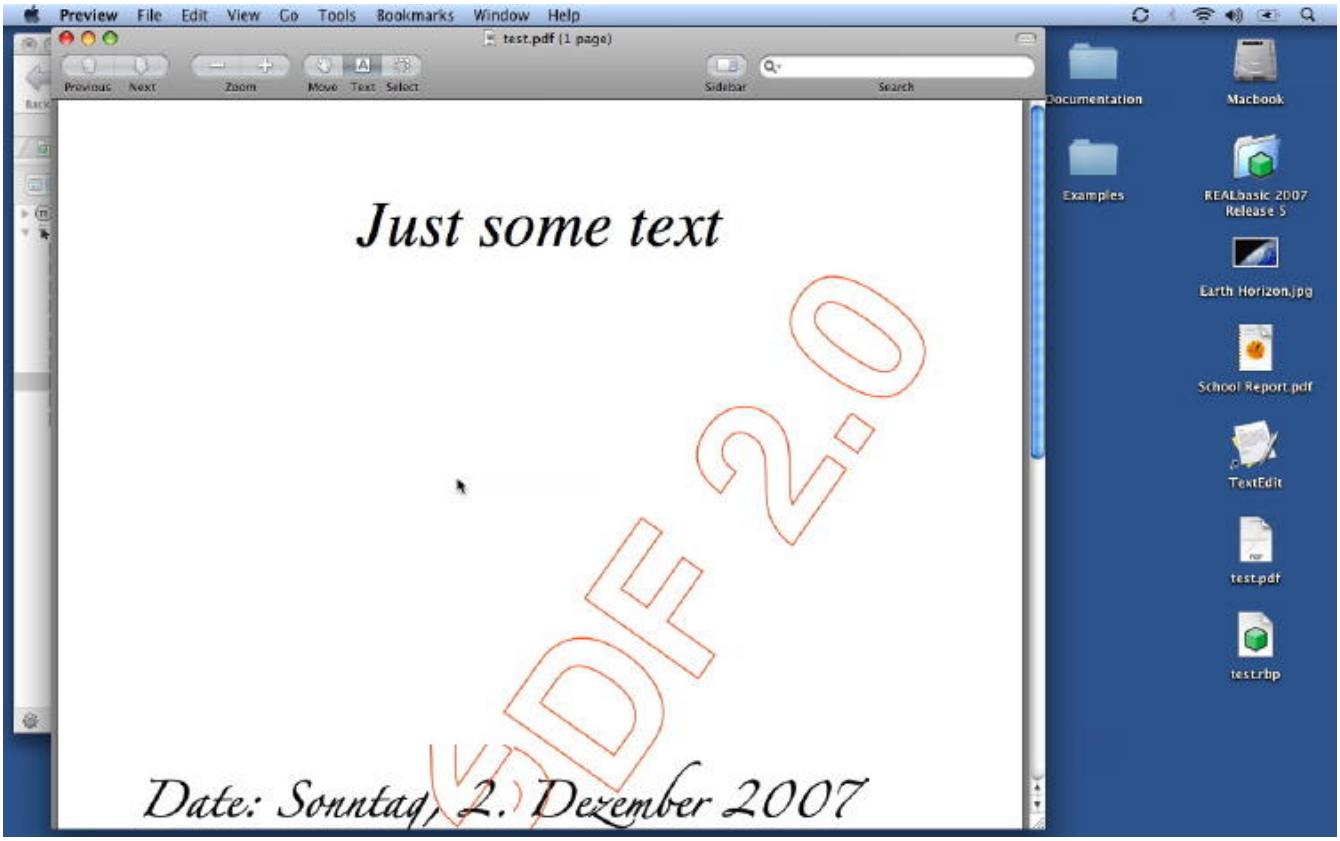


**Function:** A PDF file created with the unregistered DynaPDF plugin.

### 77.40.1002 DynaPDF2.jpg

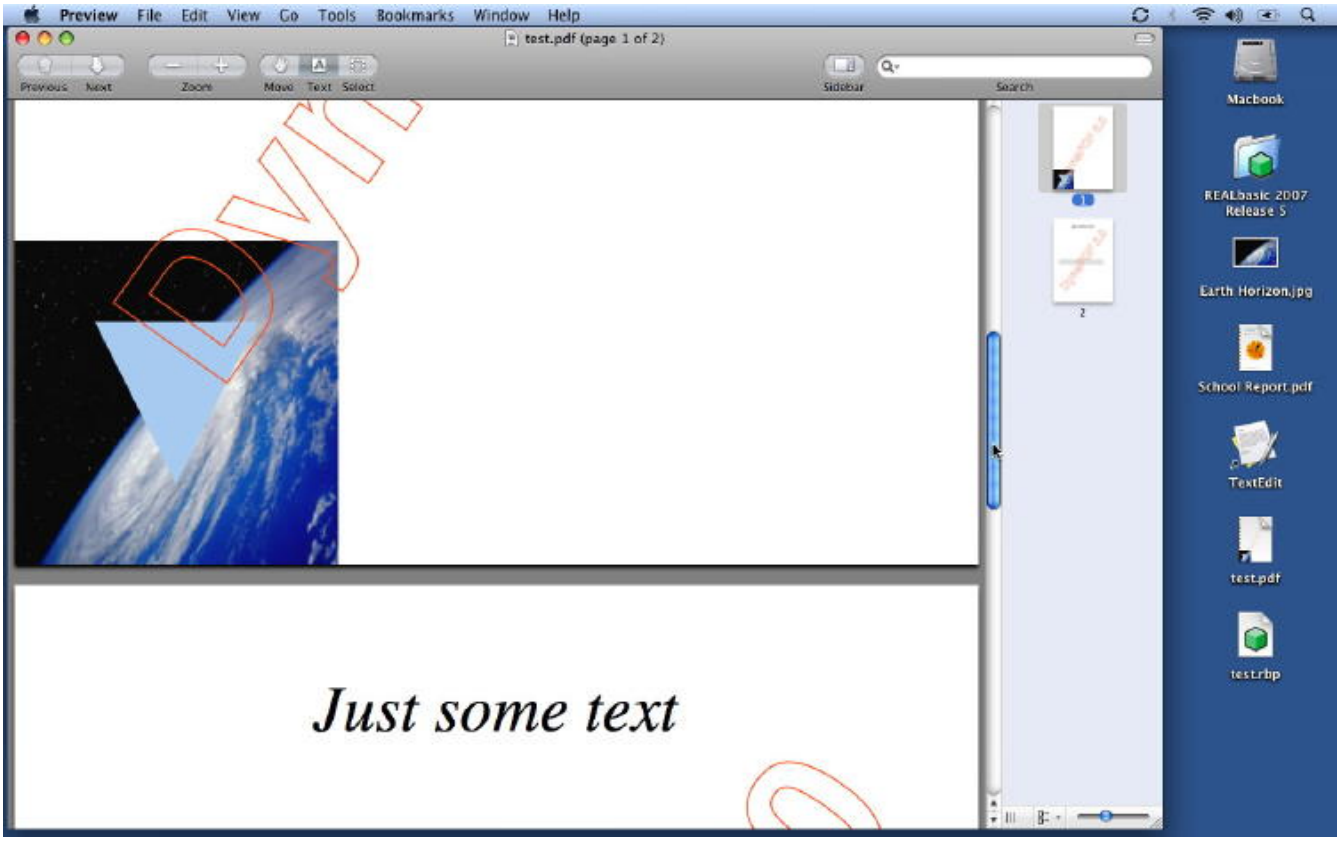


**Function:** A PDF file created with the unregistered DynaPDF plugin showing an embedded picture and a blue triangle on top.

### 77.40.1003 DynaPDF3.jpg

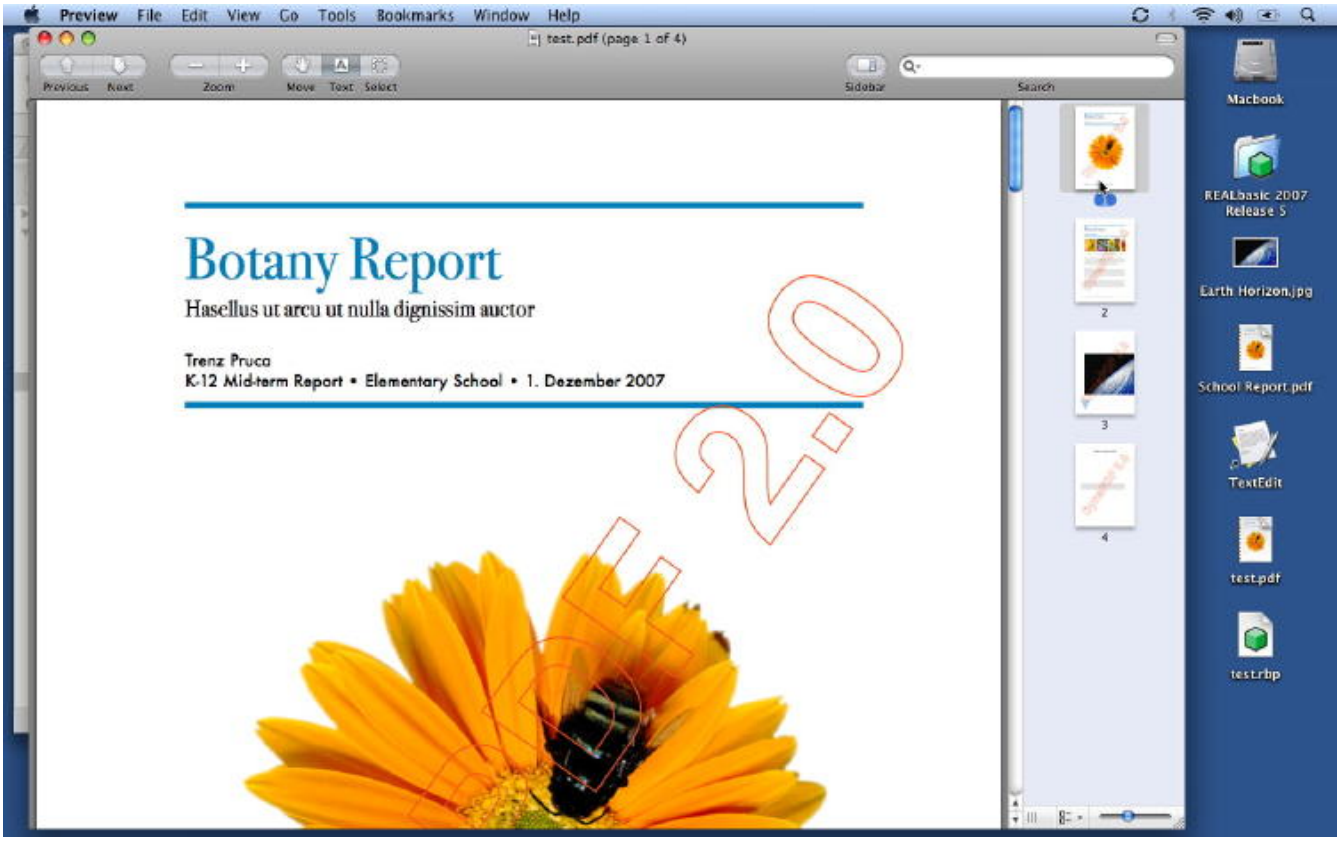


**Function:** A PDF file created with the unregistered DynaPDF plugin showing an embedded PDF.

## 77.41 class DynaPDFMeasureMBS

### 77.41.1 class DynaPDFMeasureMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a measure dictionary.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr2
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 77.41.2 Methods

### 77.41.3 Angles as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array to measure angles.

### 77.41.4 Area as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array to measure areas.

### 77.41.5 Bounds as Double()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array of numbers taken pairwise to describe the bounds for which geospatial transforms are valid.
**Notes:** Changed to double in v24.1.

### 77.41.6 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.41.7 Distance as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array to measure distances.

### 77.41.8 GPTS as Double()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Required, an array of numbers that shall be taken pairwise, defining points in geographic space as degrees of latitude and longitude, respectively.
**Notes:** Changed to double in v24.1.

### 77.41.9 LPTS as Double()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, an array of numbers that shall be taken pairwise to define points in a 2D unit square.
**Notes:** Changed to double in v24.1.

### 77.41.10 Slope as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array for measurement of the slope of a line.

### 77.41.11 X as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array for measurement of change along the x-axis and, if Y is not present, along the y-axis as well.

### 77.41.12 Y as DynaPDFNumberFormatMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number format array for measurement of change along the y-axis.

### 77.41.13 Properties

### 77.41.14 AnglesCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

### 77.41.15 AreaCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

### 77.41.16 BoundCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the array.
**Notes:** Should be a multiple of two.
(Read and Write property)

### 77.41.17 CXY as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, meaningful only when Y is present.
**Notes:** (Read and Write property)

### 77.41.18 DCS_EPSG as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, either EPSG or WKT is set.
**Notes:** (Read and Write property)

### 77.41.19 DCS_IsSet as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the DCS members are set.
**Notes:** (Read and Write property)

### 77.41.20 DCS_Projected as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the DCS values contains a pojected coordinate system.
**Notes:** (Read and Write property)

### 77.41.21 DCS_WKT as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional ASCII string.
**Notes:** (Read and Write property)

### 77.41.22 DistanceCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

### 77.41.23 GCS_EPSG as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, either EPSG or WKT is set.
**Notes:** (Read and Write property)

### 77.41.24 GCS_Projected as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the GCS values contains a pojected coordinate system.
**Notes:** (Read and Write property)

### 77.41.25 GCS_WKT as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional ASCII string.
**Notes:** (Read and Write property)

### 77.41.26 GPTSCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the array.
**Notes:** (Read and Write property)

### 77.41.27 IsRectilinear as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the members of the rectilinear measure dictionary are set.
**Notes:** The geospatial members otherwise.
(Read and Write property)

### 77.41.28 LPTSCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the array.
**Notes:** (Read and Write property)

### 77.41.29 OriginX as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Origin of the measurement coordinate system.
**Notes:** (Read and Write property)

### 77.41.30 OriginY as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Origin of the measurement coordinate system.
**Notes:** (Read and Write property)

### 77.41.31 PDU1 as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional preferred linear display units.
**Notes:** (Read and Write property)

### 77.41.32 PDU2 as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional preferred area display units.
**Notes:** (Read and Write property)

### 77.41.33 PDU3 as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional preferred angular display units.
**Notes:** (Read and Write property)

### 77.41.34 R as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A text string expressing the scale ratio of the drawing.
**Notes:** (Read and Write property)

### 77.41.35 SlopeCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

### 77.41.36 XCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

### 77.41.37 YCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of objects in the array.
**Notes:** (Read and Write property)

## 77.42 class DynaPDFMissingFunctionExceptionMBS

### 77.42.1 class DynaPDFMissingFunctionExceptionMBS

MBS DynaPDF Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception for a missing function.
**Notes:** Only used when DynaPDF library is loaded manually and is an older version and missing a function.
Subclass of the RuntimeException class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr1
- MBS REALbasic Plugins, version 11.1pr4

## 77.43 class DynaPDFMovieActionMBS

### 77.43.1 class DynaPDFMovieActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a movie action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.43.2 Methods

### 77.43.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.43.4 FWPosition(index as Integer) as Single

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position.
**Notes:** Index from 0 to 1.

### 77.43.5 FWScale(index as Integer) as Single

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scaling.
**Notes:** Index from 0 to 1.

### 77.43.6 Properties

### 77.43.7 Annot as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional. The movie annotation handle identifying the movie that shall be played.
**Notes:** Either Annot or Title should be set, but not both.

(Read only property)

### 77.43.8 Mode as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mode.
**Notes:** (Read only property)

### 77.43.9 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.43.10 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

### 77.43.11 Operation as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Operation.
**Notes:** (Read only property)

### 77.43.12 Rate as Single

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The playback rate.
**Notes:** (Read only property)

### 77.43.13 ShowControls as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to show controls.
**Notes:** (Read only property)

### 77.43.14 Synchronous as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronous flag.
**Notes:** (Read only property)

### 77.43.15 Title as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title of a movie annotation that shall be played.
**Notes:** Either Annot or Title should be set, but not both.
(Read only property)

### 77.43.16 Volume as Single

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The volume.
**Notes:** (Read only property)

# 77.44 class DynaPDFNamedActionMBS

## 77.44.1 class DynaPDFNamedActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a named action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 77.44.2 Methods

## 77.44.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.44.4 Properties

## 77.44.5 Name as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the action.
**Notes:** Only set if Type = knaUserDefined.
(Read only property)

## 77.44.6 NewWindow as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to show in a new window or not.
**Notes:** -1 = viewer default, 0 = false, 1 = true.
(Read only property)

## 77.44.7 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.44.8 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

### 77.44.9 Type as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Known pre-defined actions.
**Notes:** See kna* constants.
(Read only property)

# 77.45 class DynaPDFNamedDestMBS

## 77.45.1 class DynaPDFNamedDestMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the Named Destination.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

## 77.45.2 Properties

## 77.45.3 DestFile as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination file.
**Notes:** (Read only property)

## 77.45.4 DestPage as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination page.
**Notes:** (Read only property)

## 77.45.5 DestPos as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination position.
**Notes:** (Read only property)

## 77.45.6 DestType as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination type.
**Notes:** Values can be a kdt* constant.
(Read only property)

### 77.45.7 Name as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of that destination.
**Notes:** This string is either Unicode or ANSI encoded.
(Read only property)

## 77.46 class DynaPDFNotInitializedExceptionMBS

### 77.46.1 class DynaPDFNotInitializedExceptionMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An exception for the case a function is called and the library is not initialized.
**Notes:** Should only happen on the unsupported platforms.
Subclass of the RuntimeException class.

## 77.47 class DynaPDFNumberFormatMBS

### 77.47.1 class DynaPDFNumberFormatMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a number format.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 77.47.2 Methods

### 77.47.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.47.4 Properties

### 77.47.5 C as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The conversion factor used to multiply a value in partial units.
**Notes:** (Read and Write property)

### 77.47.6 D as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A positive integer that shall specify the precision or denominator of a fractional amount.
**Notes:** (Read and Write property)

### 77.47.7 F as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number format.
**Notes:** can be kmnfDecimal, kmnfFractional, kmnfRound or kmnfTruncate.
(Read and Write property)

### 77.47.8 FD as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, a fractional value formatted according to the D entry may not have its denominator reduced or low-order zeros truncated.
**Notes:** (Read and Write property)

### 77.47.9 O as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The label position.
**Notes:** Can be kmlpSuffix or kmlpPrefix.
(Read and Write property)

### 77.47.10 PS as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text to be concatenated to the left of the label specified by U.
**Notes:** (Read and Write property)

### 77.47.11 RD as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text for the decimal position in displaying numerical values.
**Notes:** (Read and Write property)

### 77.47.12 RT as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text to be used between orders of thousands in display of numerical values.
**Notes:** (Read and Write property)

### 77.47.13 SS as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text that shall be concatenated after the label specified by U.
**Notes:** (Read and Write property)

### 77.47.14 U as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Label, should be a universally recognized abbreviation.
**Notes:** (Read and Write property)

### 77.47.15 Constants

Label Position Constants

| Constant | Value | Description |
|---|---|---|
| kmlpPrefix | 1 | Prefix |
| kmlpSuffix | 0 | Suffix |

Number format

| Constant | Value | Description |
|---|---|---|
| kmnfDecimal | 0 | Decimal |
| kmnfFractional | 1 | Fractional |
| kmnfRound | 2 | Round |
| kmnfTruncate | 3 | Truncate |

# 77.48 class DynaPDFObjActionsMBS

## 77.48.1 class DynaPDFObjActionsMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an object action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.0pr9

## 77.48.2 Methods

## 77.48.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.48.4 Properties

## 77.48.5 Action as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the action.
**Notes:** -1 or action handle to be executed if any
(Read only property)

## 77.48.6 ActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the action.
**Notes:** Only set if Action is >= 0.
(Read only property)

### 77.48.7 Events as DynaPDFObjEventMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional events if any.
**Notes:** (Read only property)

# 77.49 class DynaPDFObjEventMBS

## 77.49.1 class DynaPDFObjEventMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class with information about an object event.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 77.49.2 Methods

## 77.49.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.49.4 Properties

## 77.49.5 Action as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Action to be executed.
**Notes:** (Read only property)

## 77.49.6 ActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the action.
**Notes:** See kat* constants.
(Read only property)

## 77.49.7 NextObject as DynaPDFObjEventMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pointer to the next event if any.
**Notes:** (Read only property)

### 77.49.8 ObjEvent as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The event when the action should be executed.
**Notes:** See koe* constants.
(Read only property)

# 77.50 class DynaPDFOCGContUsageMBS

## 77.50.1 class DynaPDFOCGContUsageMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for content usage properties of an optional layer.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.2pr6

## 77.50.2 Methods

## 77.50.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.50.4 Properties

## 77.50.5 ExportState as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The export state.
**Notes:** 0 = Off, 1 = On, PDF_MAX_INT = not set (2147483647)
(Read and Write property)

## 77.50.6 InfoCreator as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The application that created the group.
**Notes:** (Read and Write property)

## 77.50.7 InfoSubtype as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A name defining the type of content, e.g. Artwork, Technical etc.
**Notes:** (Read and Write property)

### 77.50.8 LangPreferred as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The preffered state if there is a partial but no exact match of the lang id.
**Notes:** 0 = Off, 1 = On, PDF_MAX_INT (2147483647) = not set.
(Read and Write property)

### 77.50.9 Language as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A language code as described at DynaPDFMBS.SetLanguage.
**Notes:** (Read and Write property)

### 77.50.10 PageElement as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the group contains a pagination artefact.
**Notes:** (Read and Write property)

### 77.50.11 PrintState as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The print state.
**Notes:** 0 = Off, 1 = On, PDF_MAX_INT = not set (2147483647).
(Read and Write property)

### 77.50.12 PrintSubtype as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of content that is controlled by the OCG, e.g. Trapping, PrintersMarks or Watermark.
**Notes:** (Read and Write property)

### 77.50.13 UserNamesCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user names can be accessed with GetOCGUsageUserName.
**Notes:** (Read and Write property)

### 77.50.14 UserType as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user for whom the OCG is primarily intendet.
**Notes:** Can be kutIndividual, kutOrganization, kutTitle or kutNotSet. (constants defined in DynaPDFMBS)
(Read and Write property)

### 77.50.15 ViewState as Integer

MBS DynaPDF Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The view state.
**Notes:** 0 = Off, 1 = On, PDF_MAX_INT (2147483647) = not set
(Read and Write property)

### 77.50.16 ZoomMax as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum zoom factor at which the OCG should be On.
**Notes:** -1 = not set
(Read and Write property)

### 77.50.17 ZoomMin as Single

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum zoom factor at which the OCG should be On.
**Notes:** -1 = not set
(Read and Write property)

## 77.51 class DynaPDFOCGMBS

### 77.51.1 class DynaPDFOCGMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for details ob OCG layers.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.51.2 Methods

### 77.51.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.51.4 Properties

### 77.51.5 AppEvents as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If non-zero, the layer is included in one or more app events which control the layer state.
**Notes:** Only valid if HaveContUsage is true.
see TOCAppEvent constants: kaeExport, kaePrint and kaeView. (constants defined in DynaPDFMBS)
(Read and Write property)

### 77.51.6 Categories as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Usage Categories which control the layer state.
**Notes:** Only valid if HaveContUsage is true.
See UsageCategory constants: koucNone, koucExport, koucLanguage, koucPrint, koucUser, koucView or oucZoom. (constants defined in DynaPDFMBS)
(Read and Write property)

### 77.51.7 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 77.51.8 HaveContUsage as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the layer contains a Content Usage dictionary.
**Notes:** see GetOCGContUsage function.
(Read and Write property)

### 77.51.9 Intent as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intent.
**Notes:** See intent enumeration. Can be koiDesign, koiView, koiAll or koiEmpty. (constants defined in DynaPDFMBS)
(Read and Write property)

### 77.51.10 IsAll as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An accessor for intent state koiAll.
**Notes:** (Read only property)

### 77.51.11 IsDesign as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An accessor for intent state koiDesign.
**Notes:** (Read only property)

### 77.51.12 IsEmpty as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An accessor for intent state koiEmpty.
**Notes:** (Read only property)

### 77.51.13 IsView as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An accessor for intent state koiView.
**Notes:** (Read only property)

### 77.51.14 IsVisible as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An accessor for intent state koiVisible.
**Notes:** (Read only property)

### 77.51.15 Name as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The layer name.
**Notes:** (Read and Write property)

## 77.52 class DynaPDFOCLayerConfigMBS

### 77.52.1 class DynaPDFOCLayerConfigMBS

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an optional content layer configuration.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr3

### 77.52.2 Methods

### 77.52.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.52.4 Properties

### 77.52.5 Intent as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The object intent.
**Notes:** Possible values koiDesign, koiView, or koiAll.
(Read only property)

### 77.52.6 IsDefault as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, this is the default configuration.
**Notes:** (Read only property)

### 77.52.7 Name as String

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional configuration name.
**Notes:** (Read only property)

### 77.52.8 NameLen as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length in characters.
**Notes:** (Read only property)

# 77.53 class DynaPDFOCUINodeMBS

## 77.53.1 class DynaPDFOCUINodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an optional content user interface node.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr3

## 77.53.2 Methods

## 77.53.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.53.4 Properties

## 77.53.5 Label as String

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional label.
**Notes:** (Read only property)

## 77.53.6 LabelLength as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Label Length in characters.
**Notes:** (Read only property)

## 77.53.7 NewNode as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, a new child node must be created.
**Notes:** (Read only property)

### 77.53.8 NextChild as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If set, the next child node that must be loaded.
**Notes:** (Read only property)

### 77.53.9 NextItem as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next item handle in the list.
**Notes:** (Read only property)

### 77.53.10 OCG as Integer

MBS DynaPDF Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional OCG handle.
**Notes:** -1 if not set. See GetOCG method.
(Read only property)

# 77.54 class DynaPDFOptimizeParamsMBS

## 77.54.1 class DynaPDFOptimizeParamsMBS

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for optimize parameters.
**Example:**

```
dim o as new DynaPDFOptimizeParamsMBS

o.MinColorRes = 100 // scale colored images with more than 100 dpi
o.ResColorImages = 150 // down to 150 dpi
```

**Blog Entries**

- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 21.3pr1
- MBS Xojo / Real Studio Plugins, version 16.4pr1
- MBS Xojo / Real Studio plug-ins in version 16.3
- MBS Xojo / Real Studio Plugins, version 16.3pr1

**Xojo Developer Magazine**

- 19.6, page 19: Things you can do with DynaPDF, The MBS DynaPDF Plugin is more powerful than you think by Stefanie Juchmes

## 77.54.2 Methods

## 77.54.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

## 77.54.4 ExcludeCS as UInt32()

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array of color space handles which should be excluded from color conversion.
**Notes:** Queries array, which you can change.

If you set IncludeCS, this array controls which color spaces will be converted.

### 77.54.5 setExcludeCS(values() as UInt32)

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the array of color space handles which should be excluded from color conversion.
**Notes:** Replaces the current array with a new one.

### 77.54.6 Properties

### 77.54.7 ExcludeCSCount as Integer

MBS DynaPDF Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of color space handles in the array.
**Notes:** This is ExcludeCS.ubound + 1.
(Read only property)

### 77.54.8 Filter1Bit as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter for black & white images.
**Notes:** See kcf* constants. Default is kcfJPEG.
(Read and Write property)

### 77.54.9 FilterColor as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter for multi-channel images.
**Notes:** See kcf* constants. Default is kcfJPEG.
(Read and Write property)

### 77.54.10 FilterGray as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The filter for gray image compression.
**Notes:** See kcf* constants. Default is kcfJPEG.
(Read and Write property)

### 77.54.11 Flags2 as Integer

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional flags.
**Notes:** See kof2* constants.
(Read and Write property)

### 77.54.12 Flags3 as Integer

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional flags.
**Notes:** (Read and Write property)

### 77.54.13 Flags4 as Integer

MBS DynaPDF Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional flags.
**Notes:** (Read and Write property)

### 77.54.14 IncludeCS as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If set, only these color spaces in ExcludeCS will be converted.
**Notes:** If false, the conversion excludes the color spaces in ExcludeCS array.
If true, the conversion only includes the color spaces in ExcludeCS array.
(Read and Write property)

### 77.54.15 JP2KQuality as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The JPEG 2000 quality.
**Notes:** Default is 80.
(Read and Write property)

### 77.54.16 JPEGQuality as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The JPEG quality.
**Notes:** Default is 80.
(Read and Write property)

### 77.54.17 Min1BitRes as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum resolution before scaling for one bit images.
**Notes:** Default is 100.
Can be zero to disable.
(Read and Write property)

### 77.54.18 MinColorRes as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum resolution before scaling for color images.
**Notes:** Default is 100.
Can be zero to disable.
(Read and Write property)

### 77.54.19 MinGrayRes as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum resolution before scaling for gray images.
**Notes:** Default is 100 dpi.
Can be zero to disable.
(Read and Write property)

### 77.54.20 MinLineWidth as Single

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum line width for lines.
**Notes:** Zero means no hair line removal.
(Read and Write property)

### 77.54.21 Res1BitImages as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolution for 1 bit black & white images.
**Notes:** Default is 150.
Can be zero to disable.
(Read and Write property)

### 77.54.22 ResColorImages as Integer

MBS DynaPDF Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolution for images with more than one color channel.
**Notes:** Default is 150.
Can be zero to disable.
(Read and Write property)

### 77.54.23 ResGrayImages as Integer

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolution for Gray images.
**Notes:** Default is 150.
Can be zero to disable.
(Read and Write property)

## 77.55 class DynaPDFOutputIntentMBS

### 77.55.1 class DynaPDFOutputIntentMBS

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for details on an output intent.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.55.2 Methods

### 77.55.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private constructor.

### 77.55.4 Properties

### 77.55.5 Buffer as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ICC profile buffer (optional)
**Notes:** (Read and Write property)

### 77.55.6 BufferSize as Integer

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Buffer size in bytes.
**Notes:** (Read and Write property)

### 77.55.7 Info as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Info string or name of the ICC profile.
**Notes:** (Read and Write property)

### 77.55.8 NumComponents as Integer

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of components.
**Notes:** (Read and Write property)

### 77.55.9 OutputCondition as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Describtion of the output device.
**Notes:** (Read and Write property)

### 77.55.10 OutputConditionID as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Describtion of the output device.
**Notes:** (Read and Write property)

### 77.55.11 RegistryName as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The registry in which OutputConditionID is defined.
**Notes:** (Read and Write property)

### 77.55.12 SubType as String

MBS DynaPDF Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sub type.
**Notes:** GTS_PDFX, GTS_PDFA1, or ISO_PDFE1
(Read and Write property)

## 77.56 class DynaPDFPageLabelMBS

### 77.56.1 class DynaPDFPageLabelMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a Page label.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.3pr2

### 77.56.2 Methods

### 77.56.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.56.4 Properties

### 77.56.5 FirstPageNum as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First page number to be displayed in the page label.
**Notes:** Subsequent pages are numbered sequentially from this value.
(Read only property)

### 77.56.6 Format as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The format of the page label.
**Notes:** (Read only property)

### 77.56.7 Prefix as String

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The prefix.
**Notes:** This string is either an unicode encoded string or an ASCII encoded string.
(Read only property)

### 77.56.8 PrefixLen as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the prefix in characters.
**Notes:** (Read only property)

### 77.56.9 PrefixUni as Boolean

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the prefix is in unicode.
**Notes:** (Read only property)

### 77.56.10 StartRange as Integer

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The start range.
**Notes:** (Read only property)

## 77.57 class DynaPDFPageMBS

### 77.57.1 class DynaPDFPageMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a DynaPDF page.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr5
- Improvements for MBS Xojo DynaPDF Plugin
- MBS Xojo Plugins, version 20.2pr2
- MBS Xojo Plugins, version 18.2pr6

**Xojo Developer Magazine**

- 22.1, page 9: News

### 77.57.2 Methods

### 77.57.3 BBox(type as Integer) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the requested bounding box.
**Notes:** use the constants kpbArtBox, kpbBleedBox, kpbCropBox, kpbMediaBox or kpbTrimBox.

If orientation gives you 90, 270, -90 or -270, you may want to swap width and height of the rectangle.

### 77.57.4 CalcPagePixelSize(DefScale as UInt32, Scale as single, FrameWidth as UInt32, FrameHeight as UInt32, Flags as UInt32, byref Width as UInt32, byref Height as UInt32)

MBS DynaPDF Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function calculates the image size of a page exactly in the way as RenderPage() does, if called with the same parameters.
**Example:**

```
// your PDF environment
dim pdf as new DynaPDFMBS

// some PDF
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

call pdf.CreateNewPDF(nil)

// We import all pages
call pdf.SetImportFlags(pdf.kifImportAsPage)
call pdf.OpenImportFile(file, 0, "")
call pdf.ImportPDFFile(1,1.0,1.0)

// get first page
dim p as DynaPDFPageMBS = pdf.GetPage(1)

// and calculate how big it would be:
dim PageWidth, PageHeight as UInt32

dim DefScale as UInt32 = DynaPDFMBS.kpsFitBest
dim Scale as Single = 1.0
dim Flags as Uint32 = DynaPDFRasterImageMBS.krfDefault

p.CalcPagePixelSize(DefScale, Scale, window1.Width, window1.Height, Flags, PageWidth, PageHeight)

MsgBox "PageWidth: "+str(PageWidth)+EndOfLine+"PageHeight: "+str(PageHeight)
```

**Notes:** This makes it possible to create the image in the required size so that it can be rendered without a border.

### 77.57.5 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.57.6 GetWidthHeight(Flags as UInt32, byref Width as Single, byref Height as Single, Rotate as Integer = 0) as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates page width and height.

### 77.57.7 SetBBox(type as integer, BBox as DynaPDFRectMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or changes the bounding box of a page.
**Notes:** This function is intended to be fast as possible. It requires no open page like DynaPDFMBS.SetBBox(), it does not change the default media or crop box, and it does not adjust the current coordinate system if the media box will be changed.

The function is useful if only one or more bounding boxes must be changed, whithout editing a page, or when a specific area of a page should be rendered. In the latter case change the crop box and restore it to the previous value when finish.
To delete a bounding box set the bounding box to 0, 0, 0, 0. The parameter BBox is required to be present, it cannot be nil.

If the function succeeds the return value is true. If the function fails the return value is false.

### 77.57.8 Properties

### 77.57.9 ArtBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries art box for this page.
**Notes:** May be nil if not defined.
(Read only property)

### 77.57.10 BleedBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries bleed box for this page.
**Notes:** May be nil if not defined.
(Read only property)

### 77.57.11 CropBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries crop box for this page.
**Notes:** May be nil if not defined.

(Read only property)

### 77.57.12 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 77.57.13 MediaBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries media box for this page.
**Notes:** (Read only property)

### 77.57.14 Orientation as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the page orientation.
**Notes:** (Read and Write property)

### 77.57.15 Page as Integer

MBS DynaPDF Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original page number used to query this page.
**Notes:** (Read only property)

### 77.57.16 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference back to parent dynaPDF object.
**Notes:** (Read only property)

### 77.57.17 TrimBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries trim box for this page.
**Notes:** May be nil if not defined.
(Read only property)

### 77.57.18 Constants

PDF Box Constants

| Constant | Value | Description |
|---|---|---|
| kpbArtBox | 0 | Art box. |
| kpbBleedBox | 1 | Bleed box. |
| kpbCropBox | 2 | Crop Box. |
| kpbMediaBox | 4 | Media Box. |
| kpbTrimBox | 3 | Trim Box. |

# 77.58 class DynaPDFPageStatisticMBS

## 77.58.1 class DynaPDFPageStatisticMBS

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for page statistics.
**Notes:** You could count yourself with DynaPDFParseInterfaceMBS class and using the events.
This is just a convenience way to learn about whether for example there is an image on the page.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr13

**Xojo Developer Magazine**

- 11.1, page 9: News

## 77.58.2 Methods

## 77.58.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.58.4 Properties

## 77.58.5 BezierCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bezier curves.
**Notes:** (Read and Write property)

## 77.58.6 ClipPathCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of path clippings.
**Notes:** (Read and Write property)

### 77.58.7 ClosePathCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of paths closed.
**Notes:** (Read and Write property)

### 77.58.8 DrawShadingCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of shading drawings.
**Notes:** (Read and Write property)

### 77.58.9 FontCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of fonts used.
**Notes:** (Read and Write property)

### 77.58.10 ImageCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of images used.
**Notes:** (Read and Write property)

### 77.58.11 LayerCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of layers used.
**Notes:** (Read and Write property)

### 77.58.12 LineCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of lines.
**Notes:** (Read and Write property)

### 77.58.13 PatternCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of patterns used.
**Notes:** (Read and Write property)

### 77.58.14 RectangleCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of rectangles.
**Notes:** (Read and Write property)

### 77.58.15 TemplateCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of templates.
**Notes:** (Read and Write property)

### 77.58.16 TextCount as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of text fragments.
**Notes:** (Read and Write property)

### 77.58.17 TextLength as Integer

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length in characters of the text on the page.
**Notes:** (Read and Write property)

## 77.59 class DynaPDFParseInterfaceMBS

### 77.59.1 class DynaPDFParseInterfaceMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for parsing pdf content.
**Notes:** You need to implement the BeginTemplate event in order to get events for images, vector graphics and text on the templates used on the page.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1
- DynaPDF Text Position Examples updated
- DynaPDF Text Position Examples
- MBS Xojo / Real Studio Plugins, version 15.4pr5
- MBS Xojo / Real Studio Plugins, version 14.2pr7
- MBS Real Studio Plugins, version 13.0fc2
- MBS Real Studio Plugins, version 12.5pr2
- MBS Real Studio Plugins, version 12.4pr9
- MBS REALbasic Plugins, version 11.1pr4

### 77.59.2 Events

### 77.59.3 ApplyPattern(ObjectPtr as Integer, Type as Integer, PatternPtr as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** Type is one of the following constants:

| | |
|---|---|
| kptColored | = 0 |
| kptUnColored | = 1 |
| kptShadingPattern | = 2 |

### 77.59.4 BeginLayer(OCHandle as Integer, InVisible as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when the PDF parser found a begin layer command.
**Notes:** The plugin will process the OCG object for you. So if handle is -1, there is no layer handle. If it is >= 0, you have a handle. If it is <0, something failed.

### 77.59.5 BeginPattern(ObjectPtr as Integer, Fill as Boolean, PatternType as Integer, BBox as DynaPDFRectMBS, Matrix as DynaPDFMatrixMBS, XStep as Double, YStep as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** PatternType is one of the following constants:

| | |
|---|---|
| kptColored | = 0 |
| kptUnColored | = 1 |
| kptShadingPattern | = 2 |

### 77.59.6 BeginTemplate(ObjectPtr as Integer, Handle as Integer, BBox as DynaPDFRectMBS, Matrix as DynaPDFMatrixMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** You need to implement this event in order to get text, images and vector graphics from inside templates.

### 77.59.7 BezierTo1(ObjectPtr as Integer, x1 as Double, y1 as Double, x3 as Double, y3 as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.8 BezierTo2(ObjectPtr as Integer, x2 as Double, y2 as Double, x3 as Double, y3 as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.9 BezierTo3(ObjectPtr as Integer, x1 as Double, y1 as Double, x2 as Double, y2 as Double, x3 as Double, y3 as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.10 ClipPath(ObjectPtr as Integer, EvenOdd as boolean, Mode as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** For the Mode parameter, the kfm* constants are used.

### 77.59.11 ClosePath(ObjectPtr as Integer, Mode as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** For the Mode parameter, the kfm* constants are used.

### 77.59.12 DrawShading(ObjectPtr as Integer, Type as Integer, Shading as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** For the type parameter you use the kst* constants.

### 77.59.13 EndLayer(OCHandle as Integer, InVisible as boolean)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when the PDF parser found an end layer command.

### 77.59.14 EndPattern

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.15 EndTemplate

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.16 InsertImage(image as DynaPDFImageMBS) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** You can return zero on success or 1 to stop processing.

### 77.59.17 LineTo(ObjectPtr as Integer, x as Double, y as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.18 MoveTo(ObjectPtr as Integer, x as Double, y as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.19 MulMatrix(ObjectPtr as Integer, matrix as DynaPDFMatrixMBS)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A matrix multiplication was found.

### 77.59.20 Rectangle(ObjectPtr as Integer, x as Double, y as Double, w as Double, h as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The parser found a rectangle.

### 77.59.21 RestoreGraphicState as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.22 SaveGraphicState as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.23 SetCharSpacing(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.24 SetExtGState(ObjectPtr as Integer, GS as DynaPDFExtGState2MBS)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.25 SetFillColor(ObjectPtr as Integer, NumComps as Integer, Color1 as Double, Color2 as Double, Color3 as Double, Color4 as Double, Colors() as Double, ColorspaceType as Integer, ColorSpace as DynaPDFColorSpaceMBS)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** Colors array contains NumComps color values. First four values are provided directly with Color1, Color2, Color3 and Color4 parameters.
ColorSpaceType uses the kes* constants.
You can use ConvColor to convert colors to RGB or CMYK if needed.

### 77.59.26 SetFont(ObjectPtr as Integer, fontType as Integer, Embedded as boolean, FontName as string, Style as Integer, FontSize as Double, FontHandle as Integer, FontInfo as DynaPDFFontInfoMBS)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.27 SetLeading(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.28 SetLineCapStyle(ObjectPtr as Integer, Style as Integer)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.29 SetLineDashPattern(ObjectPtr as integer, dash() as Double, NumValues as integer, Phase as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.30 SetLineJoinStyle(ObjectPtr as Integer, Style as Integer)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.31 SetLineWidth(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.32 SetMiterLimit(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.33 SetStrokeColor(ObjectPtr as Integer, NumComps as Integer, Color1 as Double, Color2 as Double, Color3 as Double, Color4 as Double, Colors() as Double, ColorspaceType as Integer, ColorSpace as DynaPDFColorSpaceMBS)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.
**Notes:** Colors array contains NumComps color values. First four values are provided directly with Color1, Color2, Color3 and Color4 parameters.
ColorSpaceType uses the kes* constants.
You can use ConvColor to convert colors to RGB or CMYK if needed.

### 77.59.34 SetTextDrawMode(ObjectPtr as Integer, Mode as Integer)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.35 SetTextScale(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.36 SetWordSpacing(ObjectPtr as Integer, Value as Double)

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.37 ShowTextArrayA(ObjectPtr as Integer, Matrix as DynaPDFMatrixMBS, Kerning() as DynapdfTextRecordAMBS, Count as Integer, Width as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

### 77.59.38 ShowTextArrayW(Source() as DynaPDFTextRecordAMBS, Matrix as DynapdfMatrixMBS, Kerning() as DynapdfTextRecordWMBS, Count as Integer, Width as Double, Decoded as boolean) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the parser events.

## 77.60 class DynaPDFParserMBS

### 77.60.1 class DynaPDFParserMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for the DynaPDF Parser.
**Example:**

```
Dim pdf As New MyDynapdfMBS
... load some PDF

Dim FindText As String = "PDF"
Dim ReplaceText As String = "Test"

Dim count As Integer = pdf.GetPageCount
Dim Parser As New DynaPDFParserMBS(pdf)
Dim area As DynaPDFRectMBS = Nil // whole page
Dim SearchType As Integer = DynaPDFParserMBS.kstCaseInSensitive
Dim ContentParsingFlags As Integer = DynaPDFParserMBS.kcpfEnableTextSelection

For i As Integer = 1 To count

Dim needWrite As Boolean

If parser.ParsePage(i, ContentParsingFlags) Then

Dim found As Boolean = Parser.FindText(area, SearchType, FindText)
While found
If Parser.ReplaceSelText(ReplaceText) Then
needWrite = True
End If

found = Parser.FindText(area, SearchType, FindText, True)
Wend

If needWrite Then
Call Parser.WriteToPage
End If
End If
next
```

**Notes:** Allows you to do Find and Replace, text extraction and deletion of text.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- News from the MBS Xojo Plugins Version 24.0

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- DynaPDF Parser for Xojo
- MBS Xojo Plugins, version 23.6pr1

### 77.60.2 Methods

### 77.60.3 Abort

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Cancels parsing.
**Notes:** The function can be used to abort parsing whenever needed. However, parsing can be aborted only if ParsePage() was called in a separate thread. Note that it is not allowed to execute different functions of the same PDF instance in different threads. Every thread requires either its own PDF instance or function calls must be synchronized.

### 77.60.4 ChangeAltFont(FontHandle as integer) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Changes alternative font to use.
**Notes:** Changes the active alternate font that is used by ReplaceSelText() when the original font is not available. The font handle must be a handle that was returned by SetFont(), SetFontEx(), SetCIDFont(), or SetAltFont().

### 77.60.5 Constructor(PDF as DynaPDFMBS, OptimizeFlags as Integer = 0, OptimizeParams as DynaPDFOptimizeParamsMBS = nil)

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Notes:** The function creates a parser context that can be used to edit and extract text, or do delete arbitrary operators of a page.

The content parser is used by Optimize() too. Therefore, the same flags and optimization parameters are supported. Please have a look at Optimize() for a description of the available flags and parameters. The parameter OptimizeParams can be set to nil and OptimizeFlags to kofDefault if nothing special should be achieved.

The flags and parameters for optimize are kept in properties for later review in debugger.

Raises exception in case creating the context fails.

### 77.60.6 DeleteText(area as DynaPDFRectMBS) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Deletes text in the area.
**Example:**

```
Dim pdf As New MyDynapdfMBS
... load some PDF

Dim count As Integer = pdf.GetPageCount
Dim Parser As New DynaPDFParserMBS(pdf)
Dim ContentParsingFlags As Integer = DynaPDFParserMBS.kcpfEnableTextSelection

For i As Integer = 1 To count

If parser.ParsePage(i, ContentParsingFlags) Then

// rectangle at 200x200 with 200x200 size
Dim area As New DynaPDFRectMBS(200, 200+200, 200+200, 200)
Dim needWrite As Boolean = parser.DeleteText(area)

If needWrite Then
Call Parser.WriteToPage
End If
End If

next
```

**Notes:** The function deletes every glyph or character that touches or lies inside the rectangle Area.

Area must be defined as if the page would be viewed in a PDF viewer. That means in bottom up coordinates and the orientation must be considered (see Orientation in DynaPDFPageMBS class). The width and height of a page must be calculated from the crop box if set, or from the media box otherwise (see BBox() in DynaPDFPageMBS class). Note also that the width and height must be exchanged if the orientation is 90, -90, 270, or -270 degrees.

Note that this function deletes text only. Text can also occur in form of images or vector graphics. There are no functions yet to identify and delete text in such objects.

If the function succeeds the return value is true. If the function fails the return value is false.

### 77.60.7 ExtractText(TextExtractionFlags as Integer, byref Text as String, area as DynaPDFRectMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Extracts text from parser.
**Notes:** The function extracts the text of a page with the same algorithm that FindText() uses to find text on a page. In order to get exactly the same result the flag ktefSortTextX must be set.

The function ExtractText() of the PDF instance calles in fact this function internally.

The optional parameter Area can be set to restrict text extraction to that rectangle. The rectangle must be defined as if the page would be viewed in a PDF viewer. That means in bottom up coordinates and the orientation must be considered. The page coordinate system is de-rotated before text extraction starts since this produces better results. The width and height must be calculated from the crop box if set, or from the media box otherwise. Note also that the width and height must be exchanged if the orientation is 90, -90, 270, or -270 degrees.

Returns true on success or false for failure.

### 77.60.8 FindText(area as DynaPDFRectMBS, SearchType as Integer, findText as String, continueSearch as boolean = false) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Searches for text and stores the result so that further editing actions can be applied.
**Notes:** Area must be defined as if the page would be viewed in a PDF viewer. That means in bottom up coordinates and the orientation must be considered (see GetPageOrientation()). The width and height of a page must be calculated from the crop box if set, or from the media box otherwise (see GetPageBBox()). Note also that the width and height must be exchanged if the orientation is 90, -90, 270, or -270 degrees.

The page coordinate system is de-rotated since this produces better results and it is much easier to find the location of text in rotated pages.

FindText() is usually called inside a loop until no more occurrences of the search string can be found. In the first call, continueSearch must be false. That means start at the beginning. The continue searches with continueSearch = true.

### 77.60.9 ParsePage(PageNum as Integer, ContentParseFlags as Integer = 0) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parses a page.
**Notes:** The function parses a page and stores the page contents in a objects internally. Once a page was parsed various functions can be called, e.g. to extract the text of a page, to find and replace text, or to delete arbitrary operators.

The page that should be parsed should be closed, that means it should not be opened for editing beforehand with EditPage() or Append(). The function can parse an open page too but this can lead to errors and is not recommended.

If the function succeeds the return value is true. If the function fails the return value is false.

### 77.60.10 ReplaceSelText(NewText as String) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Replaces text on the page.
**Notes:** The function replaces or deletes the text that was found by FindText(). Coordinates of surrounding text are not changed, this means that the new text can overlap surrounding text if the width of the new text is larger than the original text.

So, text replacement has its limitations since at some point text must might be new formatted or re-aligned. However, replacing placeholders with text is usually no problem as long as there is enough room for the new text.

Note that placeholders should not contain space characters since spaces are often not stored in PDF files and this can lead to issues finding the text.

Font substitution
Text replacement depends on the availability of the fonts which are used in a PDF file. If the original font is not available the function loads an alternate font that matches the characteristics of the original font as close as possible. However, font substitution is not perfect and a substituted font looks sometimes more different as expected.

To improve text replacement it is possible to set one or more alternate fonts which should be used if the original font cannot be found on the system. Alternate fonts can be loaded with SetAltFont(). However, a font loaded by SetFont(), SetFontEx() or SetCIDFont() works too. In order to activate a font loaded by a regular font loading function call ChangeAltFont().

It is possible to load more than one alternate font but only the active font will be used when replacing text. If more than one font must be loaded, store the handle returned by SetAltFont() and change the font with ChangeAltFont() whenever needed.

Returns true on success and false on failure.

### 77.60.11 Reset

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Resets the parser.

### 77.60.12 SelBBox2 as DynaPDFPointMBS()

MBS DynaPDF Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the bounding box as quad points of a single node or glyph of the current selection. This function is useful for rotated text.

### 77.60.13 SetAltFont(Name as string, Style as integer = 0, Size as double = 12, Embed as boolean = true, CP as integer = &h27) as integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the font as alternate font that is used by ReplaceText() if the original font is not available.
**Notes:** Although the parameter Size must be greater zero, the value is in fact not used when replacing text. The parameter is reserved for future use.
Please note that the replacement text must be defined in the code page with which the font was loaded.

To effiently change the font whenever needed, call ChangeAltFont(). It is also possible to call SetAltFont() but this would require more processing time.

If the function succeeds the return value is the font handle, a value greater of equal zero. If the function fails the return value is 0.

### 77.60.14 WriteToPage(OptimizeFlags as Integer = 0, OptimizeParams as DynaPDFOptimizeParamsMBS = nil) as Boolean

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Writes changes back to the page.
**Notes:** Writes the objects, that was created by ParsePage(), back to the page. The flags and optional parameters were taken from Optimize() because Optimize() uses the very same parser to optimize pages. Please have a look at this function to determine which flags and parameters are available.

Unchanged pages can be left unchanged or written back to the page. This is up to you. If WriteToPage() is called then the content stream will be optimized. If nothing special should be achieved set Flags to kofDefault and Parms to nil.

The constructor accepts already its own flags and DynaPDFOptimizeParamsMBS object. The parameters that was passed to this function is used for all pages unless WritePage() contains its own version.

If the OptimizeParams parameters is passes then this parameters becomes the new default until it is overriden again by a WriteToPage() call. The flags are always overriden.
The function makes a copy of the parameters if set.

### 77.60.15 Properties

### 77.60.16 InitMatrix as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The initial matrix to use.
**Notes:** Must be set if kcpfInitMatrix flag is used for ParsePage() function.
(Read and Write property)

### 77.60.17 OperatorCount as Integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of operators in current page.
**Notes:** If zero, the page would be empty.
(Read only property)

### 77.60.18 OptimizeFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The optimize flags used.
**Notes:** Set by Constructor or WritePage if you pass them.

(Read only property)

### 77.60.19 OptimizeParams as DynaPDFOptimizeParamsMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The optimize parmeters used.
**Notes:** Set by Constructor or WritePage if you pass them.
(Read only property)

### 77.60.20 PageNumber as Integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current page number.
**Notes:** Set by ParsePage function to the number you pass.
(Read only property)

### 77.60.21 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The DynaPDFMBS object reference.
**Notes:** (Read only property)

### 77.60.22 SelBBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Computes the bounding box of the current selection created by FindText().
**Notes:** The bounding box is calculated in top down coordinates! This differs in comparison to almost all other functions which return PDF coordinates.

In order to place objects on this position it is usually best to enable visible coordinates with SetUseVisibleCoords() and to rotate the coordinate system with SetOrientationEx() according to the page orientation after the page was opened for editing.
(Read only property)

### 77.60.23 SelText as String

MBS DynaPDF Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves the text and text length of the current selection or found text.
**Notes:** The function is useful if FindText() was called with the search type kstMatchAlways. In this case, and only in this case, it is not known which text FindText() has found.
(Read only property)

### 77.60.24 TextLine as Integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Index of the text line.
**Notes:** Can be called after FindText function found something.
(Read only property)

### 77.60.25 TextMatrix as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Text matrix pre-calculated in user space.
**Notes:** Can be called after FindText function found something.
This defines where the current text is on the page.
(Read only property)

### 77.60.26 TextSelectionLength as Integer

MBS DynaPDF Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** How many characters of this record are selected?
**Notes:** Can be called after FindText function found something.
(Read only property)

### 77.60.27 Constants

Content Parser Flags

| Constant | Value | Description |
|---|---|---|
| kcpfCalcDeviceColors | 32 | Compute device colors of all colors which are set in the content streams. |
| kcpfComputeBBox | 1 | Compute bounding boxes of all objects. |
| kcpfDefault | 0 | Nothing special to do. |
| kcpfEnableTextSelection | &h00000100 | This flag is required to enable text selection and text extraction. |
| kcpfFlattenLayers | 2 | Flatten layers. |
| kcpfFullRecursive | 8 | Parse all objects recursively. |
| kcpfInitMatrix | &h00000200 | Use an initial matrix, which must be set with InitMatrix property. |
| kcpfNoInlineTemplate | 16 | Do not resolve templates with a reference count of 1. |
| kcpfSkipClipPaths | &h00000400 | Useful for debugging purposes. |
| kcpfSkipImages | &h00000800 | Ignore all images. This flag is useful for text extraction. |
| kcpfSkipInvisibleObjects | 4 | Ignore invisible objects. |
| kcpfSkipShadings | &h00001000 | Useful for debugging purposes. |
| kcpfSkipText | &h00002000 | Useful for debugging purposes. |
| kcpfSkipVector | &h00004000 | Useful for debugging purposes. Exclude vector graphics with exception of clipping paths. |

Search Types

| Constant | Value | Description |
|---|---|---|
| kstCaseInSensitive | 2 | Case insensitive search |
| kstDefault | 0 | Case sensitive search |
| kstMatchAlways | 4 | Return on every single character. Text is ignored when this flag is set. |
| kstWholeWord | 1 | Only whole words |

Text Extraction Flags

| Constant | Value | Description |
|---|---|---|
| ktefDefault | 0 | Create text lines in the original order. |
| ktefDeleteOverlappingText | 4 | Delete duplicate text records on same position. |
| ktefNoHeuristic | 8 | If set, text is sorted on the x-axis as specified. If absent, a heuristic is used to determine whether it is might be better to leave a line unsorted. |
| ktefSortTextX | 1 | Sort text records in x-direction. |
| ktefSortTextXY | 3 | Sort text records in x and y-direction. |
| ktefSortTextY | 2 | Sort text records in y-direction. |

## 77.61 class DynaPDFPointDataDictionaryMBS

### 77.61.1 class DynaPDFPointDataDictionaryMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a dictionary with point data.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 77.61.2 Methods

### 77.61.3 Arrays as DynaPDFPointDataMBS()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of entries in the point data dictionary.

### 77.61.4 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.61.5 Properties

### 77.61.6 Count as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of point data arrays
**Notes:** (Read and Write property)

### 77.61.7 Subtype as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sub type for the point data.
**Notes:** Should be Cloud.
(Read and Write property)

## 77.62 class DynaPDFPointDataMBS

### 77.62.1 class DynaPDFPointDataMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data class for point data dictionary entries.
**Notes:** A point data dictionary specifies points in 2D space for geospatical measures. The parameter DataType specifies the type of points, such as LAT for latitude in degrees, LON for longitute in degrees, or ALT for altitude in metres.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 77.62.2 Methods

### 77.62.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.62.4 values as Single()

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array with values.

### 77.62.5 Properties

### 77.62.6 DataType as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Data type as string.
**Notes:** Specifies the type of points, such as LAT for latitude in degrees, LON for longitute in degrees, or ALT for altitude in metres.
(Read and Write property)

### 77.62.7 Index as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index in the dictionary.
**Notes:** (Read and Write property)

### 77.62.8 ValCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of values in the array.
**Notes:** (Read and Write property)

## 77.63 class DynaPDFPointMBS

### 77.63.1 class DynaPDFPointMBS

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a point.

### 77.63.2 Methods

### 77.63.3 Constructor(x as Double = 0.0, y as Double = 0.0)

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 77.63.4 Properties

### 77.63.5 X as Double

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The X value.
**Notes:** (Read and Write property)

### 77.63.6 Y as Double

MBS DynaPDF Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y value.
**Notes:** (Read and Write property)

# 77.64 class DynaPDFPrintParamsMBS

## 77.64.1 class DynaPDFPrintParamsMBS

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for additional print parameters.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr6
- MBS Xojo Plugins, version 17.2pr4

## 77.64.2 Properties

## 77.64.3 Compress as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to compress images sent to printer.
**Notes:** Meaningful only for image output. If true, compressed images are send to the printer.
(Read and Write property)

## 77.64.4 FilterColor as Integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression filter to use for color images.
**Notes:** Meaningful only for image output. Supported filters on Windows: kcfFlate and kcfJPEG.
(Read and Write property)

## 77.64.5 FilterGray as Integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression filter to use for grayscale images.
**Notes:** Meaningful only for image output. Supported filters on Windows: kcfFlate and kcfJPEG.
(Read and Write property)

## 77.64.6 IgnoreDCSize as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, PageSize is used to calculate the output format.
**Notes:** (Read and Write property)

### 77.64.7 JPEGQuality as Integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG Quality in percent (1..100).
**Notes:** Zero means Default, which is 60%.
(Read and Write property)

### 77.64.8 MaxRes as Integer

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum print resolution.
**Notes:** Zero means Default, which is 600 DPI.
(Read and Write property)

### 77.64.9 PageSize as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The page size to use.
**Notes:** Considered only, if IgnoreDCSize is set to true.
(Read and Write property)

# 77.65 class DynaPDFPrintSettingsMBS

## 77.65.1 class DynaPDFPrintSettingsMBS

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the print settings in a PDF document.
**Notes:** This requires PDF 1.7.

## 77.65.2 Methods

## 77.65.3 PrintRanges(index as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of print ranges.
**Notes:** If set, the array contains PrintRangesCount * 2 values. Each pair consists of the first and last pages in the sub-range. The first page in the PDF file is denoted by 0.

## 77.65.4 Properties

## 77.65.5 DuplexMode as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The duplex mode.
**Notes:** Use the kdpm* constants.
(Read only property)

## 77.65.6 NumCopies as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of copies.
**Notes:** -1 means not set. Values larger than 5 are ignored in viewer applications.
(Read only property)

## 77.65.7 PickTrayByPDFSize as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The setting for picking the tray by the PDF size.
**Notes:** -1 means not set. 0 = false, 1 = true.
(Read only property)

### 77.65.8 PrintRangesCount as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of ranges available in PrintRanges.
**Notes:** (Read only property)

### 77.65.9 PrintScaling as Integer

MBS DynaPDF Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The print scaling setting.
**Notes:** kdpmNone means not set.
(Read only property)

## 77.66 class DynaPDFRasterImageMBS

### 77.66.1 class DynaPDFRasterImageMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for advanced rendering options.
**Example:**

```
dim pdf as new DynaPDFMBS // make subclass to catch error event

dim f as FolderItem = SpecialFolder.Desktop.Child("dynapdf_help.pdf")

// create PDF
call pdf.CreateNewPDF(nil)
// set import flags
call pdf.SetImportFlags(pdf.kifImportAll + pdf.kifImportAsPage)

// open import file
call pdf.OpenImportFile(f, 0, "")

// import all pdf pages
call pdf.ImportPDFFile(1, 1.0, 1.0)

dim PageCount as Integer = pdf.GetPageCount

// create rasterizer.
dim r as new DynaPDFRasterizerMBS(pdf, 1000,1000)

// create options
dim o as new DynaPDFRasterImageMBS

// fill white
o.InitWhite = true

// scale to fit
o.DefScale = o.kpsFitBest

// rotate
o.Flags = o.krfRotate90

// render all pages
for i as Integer = 1 to PageCount

dim p as DynaPDFPageMBS = pdf.GetPage(i)
if r.RenderPage(p, o) then
// save to disc
dim outfile as FolderItem = SpecialFolder.Desktop.Child("page "+Format(i,"0")+".jpg")
```

```
call outfile.SaveAsJPEGMBS(r.Pic, 75)
end
next
```

**Notes:** This class is named RasterImage due to the name in the underlying DynaPDF library. A better name would be RasterizerOptions as it includes options for the rasterizer engine.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr3
- MBS Xojo Plugins, version 23.1pr1
- RenderPageToImage
- MBS Real Studio Plugins, version 11.3pr9
- MBS Real Studio Plugins, version 11.2pr5

### 77.66.2 Properties

### 77.66.3 ClipRect as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional clipping rectangle defined in device coordinates (Pixels)
**Notes:** (Read and Write property)

### 77.66.4 DefScale as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies how the page should be scaled into the image buffer.
**Notes:** can be kpsFitBest, kpsFitHeight or kpsFitWidth.
(Read and Write property)

### 77.66.5 DrawFrameRect as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the area outside the page's bounding box is filled with the frame color.
**Notes:** InitWhite can still be used, with or without a clipping rectangle.
(Read and Write property)

### 77.66.6 Flags as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flags for the raster operation.
**Notes:** This is a bit mask. Flags can be combined with a binary or operator.
Use a combination of krf* constants.
(Read and Write property)

### 77.66.7 FrameColor as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color for drawing the frame.
**Notes:** Must be defined in the color space of the pixel format but in the natural component order, e.g. RGB.
(Read and Write property)

### 77.66.8 InitWhite as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to clear the buffer first.
**Notes:** If true, the buffer is initialized with white color (default).
Must be set to false if you want to raster the page over an existing image.

When a clipping rectangle is set, only the area inside the clipping rectangle is initialized to white.
(Read and Write property)

### 77.66.9 Matrix as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional transformation matrix.
**Notes:** The matrix can be used to zoom into the page or to move the picture to a specific area in the image buffer.
(Read and Write property)

### 77.66.10 NumAnnots as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of rendered form annotations (excluding invisible annotation but annotations with no appearance are included)
**Notes:** (Read and Write property)

### 77.66.11 NumBezierCurves as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bezier curves which where rendered. Glyph outlines are not taken into account.
**Notes:** (Read and Write property)

### 77.66.12 NumClipPaths as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of clipping paths used in the page. Should be small as possible!
**Notes:** (Read and Write property)

### 77.66.13 NumFormFields as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of rendered form fields (excluding invisible fields but fields with no appearance are included)
**Notes:** (Read and Write property)

### 77.66.14 NumGlyphs as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** When the number of glyphs equals NumTextRecords then there is probably some room for optimization...
**Notes:** (Read and Write property)

### 77.66.15 NumImages as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of images that were rendered.
**Notes:** (Read and Write property)

### 77.66.16 NumLineTo as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of LineTo operators.
**Notes:** (Read and Write property)

### 77.66.17 NumPaths as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of paths which were processed.
**Notes:** (Read and Write property)

### 77.66.18 NumPatterns as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of pattern which were processed.
**Notes:** (Read and Write property)

### 77.66.19 NumRectangles as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of rectangle operators.
**Notes:** (Read and Write property)

### 77.66.20 NumRestoreGState as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Should be equal to NumSaveGraphicStates.
**Notes:** (Read and Write property)

### 77.66.21 NumSaveGState as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of save graphics state operators.
**Notes:** (Read and Write property)

### 77.66.22 NumShadings as Integer

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of shadings.
**Notes:** (Read and Write property)

### 77.66.23 NumSoftMasks as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of soft masks that were processed.
**Notes:** Alpha channels of images are not taken into account.
(Read and Write property)

### 77.66.24 NumTextRecords as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of independent text records which were rendered.
**Notes:** (Read and Write property)

### 77.66.25 PageSpace as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matrix represents the mapping from page space to device space.
**Notes:** Output parameter.
This matrix is required when further objects should be drawn on the page, e.g. the bounding boxes.
(Read and Write property)

### 77.66.26 UpdateOnImageCoverage as Single

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DynaPDF multiplies the output image area with this factor to determine when the window should be updated.
**Notes:** The factor should be around 0.5 through 5.0. Larger values cause less frequently update events.
(Read and Write property)

### 77.66.27 UpdateOnPathCount as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Call OnUpdateWindow event when the UpdateOnPathCount limit was reached.
**Notes:** Clipping paths increment the number too.
Only full paths are considered, independent of the number of vertices they contain. The value should be larger than 50 and smaller than 10000.
(Read and Write property)

### 77.66.28 Yield as Boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to yield time to other threads.
**Notes:** Set to true if you render page in a thread, so time is given to other threads.
(Read and Write property)

### 77.66.29 Events

### 77.66.30 UpdateWindow(r as DynaPDFRectMBS, pic as Variant) as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called regularly so you can update your GUI.
**Notes:** Please set UpdateOnPathCount and UpdateOnImageCoverage to use this event.
If you draw to a picture, the picture is passed as parameter for your convenience.

Pic is a variant so the plugin compiles in older Xojo versions for console targets.

Returns -1 to stop the processing.

### 77.66.31 Constants

Picture Scaling Constants

| Constant | Value | Description |
|---|---|---|
| kpsFitBest | 2 | Scale the page so that it fits fully into the image buffer. |
| kpsFitHeight | 1 | Scale the page to the height of the image buffer. |
| kpsFitWidth | 0 | Scale the page to the width of the image buffer. |

Raster Flag Constants

| Constant | Value | Description |
|---|---|---|
| krfClipToArtBox | 4 | Clip the page to the art box if any.<br>Only one of these clip flags must be set at time! |
| krfClipToBleedBox | 8 | Clip the page to the bleed box if any.<br>Only one of these clip flags must be set at time! |
| krfClipToTrimBox | 16 | Clip the page to the bleed box if any.<br>Only one of these clip flags must be set at time! |
| krfCompositeWhite | &h00001000 | Composite pixel formats with an alpha channel finally with a white background. The alpha channel is 255 everywhere after composition. This flag is mainly provided for debug purposes but it can also be useful if the image must be copied on screen with a function that doesn't support alpha blending. |
| krfDefault | 0 | Render the page as usual |
| krfDisableAAClipping | &h00200000 | Disable Anti-Aliasing for clipping paths. This flag is the most important one since clipping paths cause often visible artefacts in PDF files with flattened transparency. |
| krfDisableAAText | &h00400000 | Disable Anti-Aliasing for text. |
| krfDisableAAVector | &h00800000 | Disable Anti-Aliasing for vector graphics. |
| krfDisableAntiAliasing | &h00E00000 | Fully disable Anti-Aliasing. |
| krfDisableBiLinearFilter | &h01000000 | Disable the BiLevel filter for images. Sometetimes useful if sharp images are needed, e.g. for barcodes. |
| krfEnableBlendCS | &h10000000 | If set, the page is rendered in the color space of the page group, soft proof color space, or output intent (if set), and finally converted to the destination colorspace. |
| krfExclAnnotations | 32 | Don't render annotations. |
| krfExclButtons | &h00004000 | If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude buttons.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclCheckBoxes | &h00008000 | Exclude check boxes.<br>If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude checkboxes.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclComboBoxes | &h00010000 | Exclude combo boxes.<br>If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude combobox.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclFormFields | 64 | Don't render form fields. |
| krfExclListBoxes | &h00020000 | Exclude listbox fields.<br>If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude listbox.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclPageContent | &h00002000 | If set, only annotations and form fields will be rendered (if any). |
| krfExclSigFields | &h00080000 | Exclude signature fields.<br>If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude signature fields.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfExclTextFields | &h00040000 | Exclude text fields.<br>If you want to render specific field types with RenderAnnotOrField() then use this flag to exclude text fields.<br>If all fields should be skipped then set the flag rfExclFormFields instead. |
| krfForceInterpolation | &h40000000 | If set, image interpolation will be applied. |
| krfIgnoreCropBox | 2 | Ignore the crop box and render anything inside the media box without clipping. |
| krfInitBlack | &h00000800 | Initialize the image buffer to black before rendering (RGBA or GrayA must be initialized to black) |
| krfRenderInvisibleText | &h02000000 | If set, treat text rendering mode Invisible as Normal. |
| krfRenderPrintState | &h20000000 | If set, the print state of layers, annotations, and form fields will be rendered. |
| krfRotate180 | &h00000200 | Rotate the page 180 degress. |
| krfRotate270 | &h00000400 | Rotate the page 270 degress. |
| krfRotate90 | &h00000100 | Rotate the page 90 degress. |
| krfScaleToBBox | &h00100000 | Considered only, if the flag rfClipToArtBox, rfClipToBleedBox, or rfClip- |

## 77.67 class DynaPDFRasterizerMBS

### 77.67.1 class DynaPDFRasterizerMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the rasterizer interface.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3
- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr1
- MBS Xojo Plugins, version 21.4pr3
- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr2
- Problems with killing Xojo threads with plugin calls.
- Multithreaded plugin functions can increase speed of Real Studio application
- RenderPageToImage

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 39: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News

### 77.67.2 Methods

### 77.67.3 Abort

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Aborts raster process.
**Notes:** Stops the function RenderPage as soon as possible when RenderPage() is running in a separate thread.

### 77.67.4 AddRasImage(Filter as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function adds an image from the rasterizer to the current open image file.
**Notes:** The output image must be opened with CreateImage() beforehand.

### 77.67.5 AttachImageBuffer(Pic as Picture, RenderWithAlpha as boolean = false) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Attaches a new image buffer of the same pixelformat.
**Notes:** Returns true on success.
Added RenderWithAlpha parameter in plugin version 19.0.
If RenderWithAlpha is true, we render with alpha channel. If the destination is a picture has alpha channel, you should get the alpha there. Otherwise for picture without alpha channel, we only copy RGB channels.
See also:

- 77.67.6 AttachImageBuffer(Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32) as boolean 13175

### 77.67.6 AttachImageBuffer(Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Attaches a new image buffer of the same pixelformat.
**Notes:** For Pixelformat pass one of the kpx* constants.
You can pass Rows or Buffer, but the other memoryblock should be nil.
Returns true on success.
See also:

- 77.67.5 AttachImageBuffer(Pic as Picture, RenderWithAlpha as boolean = false) as boolean 13175

### 77.67.7 Constructor(PDF as DynaPDFMBS, DeviceContextHandle as Integer, Width as UInt32, Height as UInt32, PixFmt as UInt32)

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes rasterizer targeting a device context.
**Notes:** Special version to simplify rendering into a device context. It creates a DIB Section into which pages can be rendered.

See also:

- 77.67.8 Constructor(PDF as DynaPDFMBS, Pic as Picture, RenderWithAlpha as boolean = false) 13176
- 77.67.9 Constructor(PDF as DynaPDFMBS, Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32) 13176
- 77.67.10 Constructor(PDF as DynaPDFMBS, Width as Integer, Height as Integer) 13177

### 77.67.8 Constructor(PDF as DynaPDFMBS, Pic as Picture, RenderWithAlpha as boolean = false)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new rasterizer object targeting the given picture.
**Notes:** Added RenderWithAlpha parameter in plugin version 19.0.
If RenderWithAlpha is true, we render with alpha channel. If the destination is a picture has alpha channel, you should get the alpha there. Otherwise for picture without alpha channel, we only copy RGB channels.
See also:

- 77.67.7 Constructor(PDF as DynaPDFMBS, DeviceContextHandle as Integer, Width as UInt32, Height as UInt32, PixFmt as UInt32) 13175
- 77.67.9 Constructor(PDF as DynaPDFMBS, Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32) 13176
- 77.67.10 Constructor(PDF as DynaPDFMBS, Width as Integer, Height as Integer) 13177

### 77.67.9 Constructor(PDF as DynaPDFMBS, Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new rasterizer object targeting the given memory area.
**Notes:** For Pixelformat pass one of the kpx* constants.
You can pass Rows or Buffer, but the other memoryblock should be nil.
See also:

- 77.67.7 Constructor(PDF as DynaPDFMBS, DeviceContextHandle as Integer, Width as UInt32, Height as UInt32, PixFmt as UInt32) 13175
- 77.67.8 Constructor(PDF as DynaPDFMBS, Pic as Picture, RenderWithAlpha as boolean = false) 13176
- 77.67.10 Constructor(PDF as DynaPDFMBS, Width as Integer, Height as Integer) 13177

### 77.67.10 Constructor(PDF as DynaPDFMBS, Width as Integer, Height as Integer)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Creates a new picture as buffer for you with the given size.
PDF must not be nil and point to a valid DynaPDF context.
See also:

- 77.67.7 Constructor(PDF as DynaPDFMBS, DeviceContextHandle as Integer, Width as UInt32, Height as UInt32, PixFmt as UInt32) 13175
- 77.67.8 Constructor(PDF as DynaPDFMBS, Pic as Picture, RenderWithAlpha as boolean = false) 13176
- 77.67.9 Constructor(PDF as DynaPDFMBS, Rows as Memoryblock, Buffer as Memoryblock, Width as UInt32, Height as UInt32, ScanlineLen as Int32, PixelFormat as UInt32) 13176

### 77.67.11 Redraw(DeviceContextHandle as Integer, DestX as Integer, DestY as Integer)

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Because there is no direct access to the internal DIB Sesction when rendering into a device context, this function can be used to redraw the bitmap on the device context.
**Notes:** If RenderPageEx() was called in a separate thread then this function can be called after the thread returned. While the thread is running you can change the position by directly manipulating the coordinate variables which were passed to RenderPageEx().
The function calls the system function SetDIBitsToDevice() to copy the image into the device context.

### 77.67.12 RenderPage(page as DynaPDFPageMBS, options as DynaPDFRasterImageMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders a page of a PDF Document with the given options.
**Notes:** Returns true on success and false on failure.

### 77.67.13 RenderPageEx(DeviceContextHandle as Integer, byref DestX as Integer, byref DestY as Integer, page as DynaPDFPageMBS, options as DynaPDFRasterImageMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders a page into a device context.
**Notes:** Only valid if you called Constructor with DeviceContextHandle.
Returns true on success.

### 77.67.14 RenderPageMT(page as DynaPDFPageMBS, options as DynaPDFRasterImageMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders a page of a PDF Document with the given options.
**Notes:** Returns true on success and false on failure.

Same as RenderPage, but with additional multithreading.

As the actual transfer runs on a preemptive thread, the event UpdateWindow is called asynchrounously and run a few milliseconds later.

Do not call other functions on this DynaPDFRasterizerMBS instance while RenderPageMT is running!

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 77.67.15 ResizeBitmap(DeviceContextHandle as Integer, Width as Integer, Height as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of the DIB Section.
**Notes:** Only valid if you called Constructor with DeviceContextHandle.
Returns true on success.

### 77.67.16 Properties

### 77.67.17 Handle as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference to the rasterizer object.
**Notes:** If the constructor is successful, this value is not zero.
(Read only property)

### 77.67.18 Height as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture or buffer.
**Notes:** (Read only property)

### 77.67.19 MinLineWidth as Double

MBS DynaPDF Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum line width in which thin lines are rendered.
**Notes:** The value should be in the range 0.1 through 1.0.
Default value: 0.5
(Read and Write property)

### 77.67.20 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference back to parent dynaPDF object.
**Notes:** (Read only property)

### 77.67.21 Pic as Picture

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The target picture.
**Notes:** (Read only property)

### 77.67.22 PixelFormat as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pixel format of picture.
**Notes:** (Read only property)

### 77.67.23 Premultiply as Boolean

MBS DynaPDF Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to premultiply pixels.
**Notes:** This is used when we render ARGB or ABGR and copy it to the Xojo picture.
Some picture formats in Xojo need pre-multiplied pixel values, so this is turned on automatically when needed.
(Read and Write property)

### 77.67.24 ScanlineLen as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scan line length in bytes of the picture.
**Notes:** (Read only property)

### 77.67.25 ScreenResolution as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the screen resolution in DPI.
**Notes:** The screen resolution is sometimes required, e.g. to render Text annotations correctly. This type of annotation has a fixed size that is independent of the current scaling factor. However, the correct size depends on the screen resolution on which the image is rendered.

Default is zero.
(Read and Write property)

### 77.67.26 TempBuffer as Ptr

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The temporary buffer data pointer.
**Notes:** If the picture pixel format is not directly supported with DynaPDF, we render in a temporary buffer and copy it to the picture.
(Read only property)

### 77.67.27 TempPixelFormat as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The temporary buffer pixel format.
**Notes:** (Read only property)

### 77.67.28 TempScanlineLen as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The temporary buffer scan line length in bytes.
**Notes:** (Read only property)

### 77.67.29 Width as Integer

MBS DynaPDF Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture or buffer.
**Notes:** (Read only property)

### 77.67.30 Constants

Pixel formats for raster functions.

| Constant | Value | Description |
|---|---|---|
| kpxf1Bit | 0 | 1 bit per pixel black and white. |
| kpxfABGR | 7 | ABGR. |
| kpxfARGB | 6 | ARGB |
| kpxfBGR | 3 | BGR |
| kpxfBGRA | 5 | BGRA |
| kpxfCMYK | 9 | CMYK without alpha |
| kpxfCMYKA | 10 | CMYK with alpha |
| kpxfGray | 1 | 8 bit grayscale. |
| kpxfGrayA | 8 | 8 bit grayscale with alpha. |
| kpxfRGB | 2 | RGB |
| kpxfRGBA | 4 | RGBA |

## 77.68 class DynaPDFRawImageMBS

### 77.68.1 class DynaPDFRawImageMBS

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to hold information about a raw image.
**Notes:** Used with InsertRawImageEx.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr4

### 77.68.2 Methods

### 77.68.3 setBuffer(data as MemoryBlock)

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the buffer to point to the bytes in the memoryblock.
**Notes:** Size is optional. Some memoryblocks have no known size and there you need to specify one.
See also:


- 77.68.4 setBuffer(data as MemoryBlock, size as Int64) 13182
- 77.68.5 setBuffer(data as Ptr) 13183
- 77.68.6 setBuffer(data as Ptr, size as Int64) 13183
- 77.68.7 setBuffer(data as string) 13183
- 77.68.8 setBuffer(data as string, size as Int64) 13184


### 77.68.4 setBuffer(data as MemoryBlock, size as Int64)

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the buffer to point to the bytes in the memoryblock.
**Notes:** Size is optional. Some memoryblocks have no known size and there you need to specify one.
See also:


- 77.68.3 setBuffer(data as MemoryBlock) 13182
- 77.68.5 setBuffer(data as Ptr) 13183
- 77.68.6 setBuffer(data as Ptr, size as Int64) 13183
- 77.68.7 setBuffer(data as string) 13183
- 77.68.8 setBuffer(data as string, size as Int64) 13184

### 77.68.5 setBuffer(data as Ptr)

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method to set the buffer using a pointer to some memory.
**Notes:** This is a private method to make sure nobody passes a ptr instead of memoryblock or ptr+size.
See also:


- 77.68.3 setBuffer(data as MemoryBlock) 13182
- 77.68.4 setBuffer(data as MemoryBlock, size as Int64) 13182
- 77.68.6 setBuffer(data as Ptr, size as Int64) 13183
- 77.68.7 setBuffer(data as string) 13183
- 77.68.8 setBuffer(data as string, size as Int64) 13184


### 77.68.6 setBuffer(data as Ptr, size as Int64)

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the buffer using a pointer to some memory.
**Notes:** Please provide the right size.
See also:


- 77.68.3 setBuffer(data as MemoryBlock) 13182
- 77.68.4 setBuffer(data as MemoryBlock, size as Int64) 13182
- 77.68.5 setBuffer(data as Ptr) 13183
- 77.68.7 setBuffer(data as string) 13183
- 77.68.8 setBuffer(data as string, size as Int64) 13184


### 77.68.7 setBuffer(data as string)

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets buffer to point to contents of this string.
**Notes:** If you specify a size, the size can be smaller than thing length to use only first part.
See also:


- 77.68.3 setBuffer(data as MemoryBlock) 13182
- 77.68.4 setBuffer(data as MemoryBlock, size as Int64) 13182
- 77.68.5 setBuffer(data as Ptr) 13183
- 77.68.6 setBuffer(data as Ptr, size as Int64) 13183
- 77.68.8 setBuffer(data as string, size as Int64) 13184

### 77.68.8 setBuffer(data as string, size as Int64)

MBS DynaPDF Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets buffer to point to contents of this string.
**Notes:** If you specify a size, the size can be smaller than thing length to use only first part.
See also:


- 77.68.3 setBuffer(data as MemoryBlock) 13182
- 77.68.4 setBuffer(data as MemoryBlock, size as Int64) 13182
- 77.68.5 setBuffer(data as Ptr) 13183
- 77.68.6 setBuffer(data as Ptr, size as Int64) 13183
- 77.68.7 setBuffer(data as string) 13183


### 77.68.9 Properties

### 77.68.10 BitsPerComponent as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bits per component.
**Notes:** For example 8 for the usual RGB images.
(Read and Write property)

### 77.68.11 Buffer as Ptr

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The buffer as pointer.
**Notes:** Please use setBuffer methods to set this.
(Read only property)

### 77.68.12 BufSize as Int64

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The buffer size.
**Notes:** (Read only property)

### 77.68.13 CS as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image color space.
**Notes:** (Read and Write property)

### 77.68.14 CSHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color space handle or -1.
**Notes:** (Read and Write property)

### 77.68.15 HasAlpha as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image has an alpha channel?
**Notes:** (Read and Write property)

### 77.68.16 Height as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height in pixels.
**Notes:** (Read and Write property)

### 77.68.17 IsBGR as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Windows bitmap format?
**Notes:** (Read and Write property)

### 77.68.18 Memory as MemoryBlock

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock used with setBuffer.
**Notes:** (Read only property)

### 77.68.19 MinIsWhite as Boolean

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether image has value zero for white instead of black.
**Notes:** One bit images only.
(Read and Write property)

### 77.68.20 NumComponents as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of components.
**Notes:** Maximum is 32 for DynaPDF.
(Read and Write property)

### 77.68.21 Stride as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes per row.
**Notes:** A negative value mirrors the image.
(Read and Write property)

### 77.68.22 String as String

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The String used with setBuffer.
**Notes:** (Read only property)

### 77.68.23 Width as Integer

MBS DynaPDF Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width in pixels.
**Notes:** (Read and Write property)

## 77.69 class DynaPDFRectMBS

### 77.69.1 class DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A rectangle for DynaPDF.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- DynaPDF Parser for Xojo
- News from the MBS Xojo Plugins Version 22.3
- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo / Real Studio Plugins, version 13.2pr1
- MBS REALbasic Plugins, version 11.1pr4

**Xojo Developer Magazine**

- 19.6, page 14: Things you can do with DynaPDF, The MBS DynaPDF Plugin is more powerful than you think by Stefanie Juchmes

### 77.69.2 Methods

### 77.69.3 Constructor(left as Double = 0.0, top as Double = 0.0, right as Double = 0.0, bottom as Double = 0.0)

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new rectangle with the given values.

### 77.69.4 Properties

### 77.69.5 Bottom as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bottom coordinate.
**Notes:** (Read and Write property)

### 77.69.6 Left as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The left coordinate.
**Notes:** (Read and Write property)

### 77.69.7 Right as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The right coordinate.
**Notes:** (Read and Write property)

### 77.69.8 Top as Double

MBS DynaPDF Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The top coordinate.
**Notes:** (Read and Write property)

### 77.69.9 Width as Double

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the rectangle.
**Notes:** This is the difference between right and left.

Height property is missing as it depends on the coordinate origin. For top-down coordinates you would calculate bottom - top while for bottom-up coordinates you calculate top - bottom.
(Read and Write property)

## 77.70 class DynaPDFRelFileNodeMBS

### 77.70.1 class DynaPDFRelFileNodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The information on a related file node.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.70.2 Methods

### 77.70.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.70.4 Properties

### 77.70.5 EF as DynaPDFFileSpecMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Embedded file.
**Notes:** (Read only property)

### 77.70.6 Name as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of this file spcification.
**Notes:** (Read only property)

### 77.70.7 NextNode as DynaPDFRelFileNodeMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Next node if any.
**Notes:** (Read only property)

## 77.71 class DynaPDFResetFormActionMBS

### 77.71.1 class DynaPDFResetFormActionMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for reset form action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.71.2 Methods

### 77.71.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.71.4 Fields(index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array of fields.
**Notes:** Index is from 0 to FieldsCount-1.

### 77.71.5 Properties

### 77.71.6 FieldsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of fields in the array.
**Notes:** (Read only property)

### 77.71.7 Include as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Include or exclude given fields?
**Notes:** If true, the fields in the array must be reset. If false, these fields must be excluded.

(Read only property)

### 77.71.8 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next action.
**Notes:** -1 or next action handle to be executed if any.
(Read only property)

### 77.71.9 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** See kat* constants.
(Read only property)

## 77.72 class DynaPDFSigDictMBS

### 77.72.1 class DynaPDFSigDictMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for details on signature fields.
**Blog Entries**

- MBS REALbasic Plugins, version 11.1pr4

### 77.72.2 Properties

### 77.72.3 Cert as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X.509 Certificate when SubFilter is adbe.x509.rsa_sha1.
**Notes:** (Read and Write property)

### 77.72.4 ContactInfo as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional contact info string, e.g. an email address
**Notes:** (Read and Write property)

### 77.72.5 Contents as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature.
**Notes:** This is either a DER encoded PKCS#1 binary data object or a DER-encoded PKCS#7 binary data object depending on the used SubFilter.
(Read and Write property)

### 77.72.6 Filter as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the security handler, usually Adobe.PPKLite.
**Notes:** (Read and Write property)

### 77.72.7 Location as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional location of the signer.
**Notes:** (Read and Write property)

### 77.72.8 Name as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional signers name.
**Notes:** (Read and Write property)

### 77.72.9 PropAuthTime as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional. The number of seconds since the signer was last authenticated.
**Notes:** (Read and Write property)

### 77.72.10 PropAuthType as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional. The method that shall be used to authenticate the signer.
**Notes:** Valid values are PIN, Password, and Fingerprint.
(Read and Write property)

### 77.72.11 Reason as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional reason.
**Notes:** (Read and Write property)

### 77.72.12 Revision as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, The version of the signature handler that was used to create the signature.
**Notes:** (Read and Write property)

### 77.72.13 SignTime as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Date/Time string.
**Notes:** (Read and Write property)

### 77.72.14 SubFilter as String

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A name that describes the encoding of the signature value.
**Notes:** Should be adbe.x509.rsa_sha1, adbe.pkcs7.detached, or adbe.pkcs7.sha1.
(Read and Write property)

### 77.72.15 Version as Integer

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the signature dictionary format.
**Notes:** (Read and Write property)

# 77.73 class DynaPDFSigParmsMBS

## 77.73.1 class DynaPDFSigParmsMBS

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for PDF signature parameters.
**Blog Entries**

- Sign PDF with DynaPDF and your custom signature
- MBS REALbasic Plugins, version 11.1pr4

## 77.73.2 Properties

## 77.73.3 ContactInfo as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, e.g. an email address.
**Notes:** Internally this string is converted to ANSI or Unicode encoding.
(Read and Write property)

## 77.73.4 Encrypt as Boolean

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the file will be encrypted.
**Notes:** (Read and Write property)

## 77.73.5 HashType as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hash type: khtDetached or khtSHA1.
**Notes:** (Read and Write property)

## 77.73.6 KeyLen as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Key length to encrypt the file.
**Notes:** This value is ignored if Encrypt is set to false.
On of the kkl* constants like kkl128bit.
(Read and Write property)

### 77.73.7 Location as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional location of the signer.
**Notes:** Internally this string is converted to ANSI or Unicode encoding.
(Read and Write property)

### 77.73.8 OpenPwd as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional open password.
**Notes:** This value is ignored if Encrypt is set to false.
(Read and Write property)

### 77.73.9 OwnerPwd as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional owner password.
**Notes:** This value is ignored if Encrypt is set to false.
(Read and Write property)

### 77.73.10 PKCS7ObjLen as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Max length of the signed PKCS#7 object.
**Notes:** (Read and Write property)

### 77.73.11 Range1 as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Hash or byte range.
**Notes:** (Read and Write property)

### 77.73.12 Range1Length as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the buffer Range1.
**Notes:** (Read and Write property)

### 77.73.13 Range2 as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Second range value.
**Notes:** Set only if HashType = htDetached.
(Read and Write property)

### 77.73.14 Range2Length as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of buffer Range2.
**Notes:** (Read and Write property)

### 77.73.15 Reason as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional reason why the file was signed.
**Notes:** Internally this string is converted to ANSI or Unicode encoding.
(Read and Write property)

### 77.73.16 Restrict as Integer

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What should be restricted?
**Notes:** This value is ignored if Encrypt is set to false.
A combination of krs* constants.

(Read and Write property)

### 77.73.17 Signer as String

MBS DynaPDF Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, see manual.
**Notes:** Internally this string is converted to ANSI or Unicode encoding.
(Read and Write property)

# 77.74 class DynaPDFStackMBS

## 77.74.1 class DynaPDFStackMBS

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the current text found by GetPageText.
**Notes:** Before you can use it, call InitStack.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr5
- MBS Xojo / Real Studio Plugins, version 16.2pr1
- MBS REALbasic Plugins, version 11.1pr4

## 77.74.2 Methods

## 77.74.3 KerningAdvance(index as UInt32) as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negative values move the cursor to the right.

## 77.74.4 KerningLength(index as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length in characters.

## 77.74.5 KerningText(index as UInt32) as string

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translated Unicode string.
**Notes:** May contain chr(0) characters.
Encoding is UTF8.

## 77.74.6 KerningWidth(index as UInt32) as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** String width measured in text space.

### 77.74.7 RawKernAdvance(index as UInt32) as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negative values move the cursor to the right.

### 77.74.8 RawKernLength(index as UInt32) as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text length in bytes.

### 77.74.9 RawKernText(index as UInt32) as string

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text.

### 77.74.10 Properties

### 77.74.11 CharSP as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current character spacing, info only.
**Notes:** (Read only property)

### 77.74.12 CIDFont as Boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, a CID font is used to render the text.
**Notes:** It is not possible to replace a text with ReplacePageText() in this case. However, it is still possible to delete the text. If the text should be replaced use either ReplacePageTextEx() or WriteTextMatrixEx().
(Read only property)

### 77.74.13 ConvColors as Boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

If true (default), all colors are converted to the destination color space
DestSpace.
**Notes:**

The default color space is DeviceRGB. This variable can be changed after the structure has been initialized with InitStack(). If set to false, colors of complex color spaces are still converted into the alternate color space but the color space can then be changed arbitrary often. See also the description of FillCS.
(Read and Write property)

### 77.74.14 ctm as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The transformation matrix.
**Notes:** Pre-multiplied global transformation matrix.
(Read only property)

### 77.74.15 DeleteKerningAt as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This member can be used in combination with ReplacePageText().
**Notes:** ReplacePageText() deletes or replaces normally always a complete text record but this is often not required especially if a text must be deleted or replaced in the middle or end of a kerning array. To make text replacement easier it is possible to preserve an arbitrary number of kerning records from deletion. The value of DeleteKerningAt represents the first array index which should be deleted. All kerning records above this index will be deleted too. Take a look into the demo examples/edit_text which is delivered with DynaPDF to determine how this member can be used.
(Read and Write property)

### 77.74.16 DestSpace as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination color space in which all colors should be converted.
**Notes:** If
ConvColor is set to false, the value of this member is ignored. If the destination color space should be DeviceCMYK initialize the members FillColor and StrokeColor with PDF_CMYK(0,0,0,255); which represents

black.
(Read and Write property)

### 77.74.17 DrawMode as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The draw mode used to render the text.
**Notes:** See SetTextDrawMode() for further information.
(Read only property)

### 77.74.18 Embedded as Boolean

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the font is embedded.
**Notes:** This information is very important if the text should be replaced. The function ReplacePageText() can be used if the font is not embedded and if the member CIDFont is false. Otherwise, the function ReplacePageTextEx() or WriteTextMatrixEx() must be used to replace the text, see the examples on the following pages for further information.
(Read only property)

### 77.74.19 FillColor as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill color represents the text color if the text draw mode is dmNormal.
**Notes:** Depending on the draw mode the fill and stroke color can be invoked to
render the text.
(Read only property)

### 77.74.20 FillCS as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

This is the current color space in which the color value of FillColor is
defined.
**Notes:**

If ConvColor is set to true (default) the value is always equal to

DestSpace. If ConvColor is set to false the fill color is still returned in a device color space but the color space can be changed arbitrary often. Colors of complex color spaces, such as Separation or DeviceN, are always converted into the alternate color space. If the original or alternate color space is an ICC based color space the color value is returned as is and the color space is set depending on the number of components. The ICC profile is not invoked to calculate the color value in the device color space. Future versions of DynaPDF maybe use the ICC profile to convert the color into device color space.
(Read only property)

### 77.74.21 Font as DynaPDFFontMBS

MBS DynaPDF Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font object used to print the string.
**Notes:** Deprecated. Better use FontInfo property.

Reading this property creates a new object each time.
Please put object in local variable and avoid querying the property value several times.
(Read only property)

### 77.74.22 FontFlags as Integer

MBS DynaPDF Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PDF font flags.
**Notes:** (Read and Write property)

### 77.74.23 FontHandle as Integer

MBS DynaPDF Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal font object handle.
**Notes:** In DynaPDF documentation named IFont, a pointer to the C object for the font.
(Read only property)

### 77.74.24 FontInfo as DynaPDFFontInfoMBS

MBS DynaPDF Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font object used to print the string.
**Notes:** Reading this property creates a new object each time.
Please put object in local variable and avoid querying the property value several times.
(Read only property)

### 77.74.25 FontSize as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font size used to display the text.
**Notes:** (Read only property)

### 77.74.26 HScale as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current horizontal scaling, info only.
**Notes:** (Read only property)

### 77.74.27 KerningCount as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of kerning records.
**Notes:** RawKern and Kerning contain always the same number of records.
(Read only property)

### 77.74.28 Leading as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The leading is already included in the text transformation matrix tm.
**Notes:** The value of leading must not be considered to calculate the text position.
(Read only property)

### 77.74.29 LineWidth as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current line width; it can be ignored if the text is not stroked.
**Notes:** (Read only property)

### 77.74.30 SpaceWidth as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The space width.
**Notes:** The space width can be used to determine whether a space character is emulated at a given position. A default space width is set if the font does not contain a space character. Note that many documents emulate spaces with kerning space. Such documents contain usually no space character. It is usually best to use the half space width to determine whether a space character is emulated. This is especially important if a document uses condensed fonts which contain no space character.
(Read only property)

### 77.74.31 StrokeColor as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stoke color.
**Notes:** The stroke color can be ignored if the text draw mode is not dmStroke, dmFillStroke, dmStrokeClip or dmFillStrokeClip since it is then not used to render the text.
(Read only property)

### 77.74.32 StrokeCS as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

This is the current color space in which the color value of StrokeColor is defined.
**Notes:**

The color space is set in an identical manner like FillCS.
(Read only property)

### 77.74.33 Text as String

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw text line that was found in the content stream.
**Notes:** This string can contain single or multi-byte characters. This member should no longer be used to extract or replace text. Use the Kerning array instead.
(Read only property)

### 77.74.34 TextLen as Integer

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string length in bytes, not characters!
**Notes:** If TextLen is zero no text was found or an error occurred.
(Read only property)

### 77.74.35 TextRise as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text rise is already included in the text transformation matrix tm.
**Notes:** The
value is always 0.0.
(Read only property)

### 77.74.36 TextWidth as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text width measured in text space.
**Notes:** This is the width of the entire kerning array incl. kerning space.
(Read only property)

### 77.74.37 tm as DynaPDFMatrixMBS

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The transformation matrix.
**Notes:** Pre-multiplied text transformation matrix.
(Read only property)

### 77.74.38 WordSP as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current word spacing, info only.
**Notes:** (Read only property)

### 77.74.39 x as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position.
**Notes:** These members are no longer used. All positioning operators are already included in the text transformation matrix tm.
(Read only property)

### 77.74.40 y as Double

MBS DynaPDF Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position.
**Notes:** These members are no longer used. All positioning operators are already included in the text transformation matrix tm.
(Read only property)

## 77.75 class DynaPDFSubmitFormActionMBS

### 77.75.1 class DynaPDFSubmitFormActionMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for submit form action details.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.75.2 Methods

### 77.75.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.75.4 Fields(index as Integer) as DynaPDFFieldExMBS

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array of field.
**Notes:** Index is from 0 to FieldCount-1.

### 77.75.5 Properties

### 77.75.6 CharSet as String

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional charset in which the form should be submitted.
**Notes:** (Read only property)

### 77.75.7 FieldsCount as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of fields in the array.
**Notes:** (Read only property)

### 77.75.8 Flags as Integer

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Various flags.
**Notes:** See CreateSubmitAction() for further information.
(Read only property)

### 77.75.9 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next action.
**Notes:** -1 or next action handle to be executed if any.
(Read only property)

### 77.75.10 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** See kat* constants.
(Read only property)

### 77.75.11 URL as String

MBS DynaPDF Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The URL of the script at the Web server that will process the submission.
**Notes:** (Read only property)

## 77.76 class DynaPDFSysFontMBS

### 77.76.1 class DynaPDFSysFontMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for system font info.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr1
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 77.76.2 Methods

### 77.76.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.76.4 NextFont as DynaPDFSysFontMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries next font in the chain of fonts.
**Notes:** Returns nil on the end of list.

### 77.76.5 Properties

### 77.76.6 BaseType as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font type.
**Notes:** Can be kfbtTrueType, kfbtType1, kfbtOpenType or kfbtStdFont.
(Read and Write property)

### 77.76.7 CIDOrdering as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CID Ordering.
**Notes:** OpenType CID fonts only.
(Read and Write property)

### 77.76.8 CIDRegistry as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CID Registry.
**Notes:** OpenType CID fonts only
(Read and Write property)

### 77.76.9 CIDSupplement as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CID Supplement.
**Notes:** OpenType CID fonts only
(Read and Write property)

### 77.76.10 DataOffset as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Data offset.
**Notes:** (Read and Write property)

### 77.76.11 FamilyName as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Family name.
**Notes:** (Read and Write property)

### 77.76.12 FilePath as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font file path.
**Notes:** (Read and Write property)

### 77.76.13 FileSize as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** File size in bytes.
**Notes:** (Read and Write property)

### 77.76.14 Flags as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Can be combination of kefpAnsiPath, kefpUnicodePath, kefpEmbeddable and kefpEditable. (Read and Write property)

### 77.76.15 FullName as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Full name.
**Notes:** (Read and Write property)

### 77.76.16 Index as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zero based font index if stored in a TrueType collection.
**Notes:** (Read and Write property)

### 77.76.17 IsFixedPitch as Boolean

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the font is a fixed pitch font.
**Notes:** (Read and Write property)

### 77.76.18 Length1 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the clear text portion of a Type1 font.
**Notes:** (Read and Write property)

### 77.76.19 Length2 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of the eexec encrypted binary portion of a Type1 font.
**Notes:** (Read and Write property)

### 77.76.20 PostScriptName as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Postscript mame.
**Notes:** (Read and Write property)

### 77.76.21 Style as Integer

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font style.
**Notes:** See kfs* constants.
(Read and Write property)

### 77.76.22 UnicodeRange1 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Supported unicode ranges, part 1.
**Notes:** (Read and Write property)

### 77.76.23 UnicodeRange2 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Supported unicode ranges, part 2.
**Notes:** (Read and Write property)

### 77.76.24 UnicodeRange3 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Supported unicode ranges, part 3.
**Notes:** (Read and Write property)

### 77.76.25 UnicodeRange4 as UInt32

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Supported unicode ranges, part 4.
**Notes:** (Read and Write property)

### 77.76.26 Constants

Unicode Ranges

| Constant | Value | Description |
|---|---|---|
| kurAlphabeticPresentationForms | &h40000000 | |
| kurAncientGreekNumbers | 64 | |
| kurAncientSymbols | &h00800000 | |
| kurArabic | &h00002000 | |
| kurArabicPresentationFormsA | &h80000000 | |
| kurArabicPresentationFormsB | 8 | |
| kurArmenian | &h00000400 | |
| kurArrows | 32 | |
| kurBalinese | &h08000000 | |
| kurBasicLatin | 1 | |
| kurBengali | &h00010000 | |
| kurBlockElements | &h00001000 | |
| kurBopomofo | &h00080000 | |
| kurBoxDrawing | &h00000800 | |
| kurBraillePatterns | &h00040000 | |
| kurBuginese | 1 | |
| kurCarian | &h02000000 | |
| kurCham | &h00400000 | |
| kurCherokee | &h00001000 | |
| kurCJKCompatibility | &h00800000 | |
| kurCJKStrokes | &h20000000 | |
| kurCJKSymbolsAndPunctuation | &h00010000 | |
| kurCJKUnifiedIdeographs | &h08000000 | |
| kurCombDiacritMarksForSymbols | 4 | |
| kurCombiningDiacriticalMarks | 64 | |
| kurCombiningHalfMarks | 1 | |
| kurControlPictures | &h00000100 | |
| kurCoptic | &h00000100 | |
| kurCountingRodNumerals | &h00008000 | |
| kurCuneiform | &h00004000 | |
| kurCurrencySymbols | 2 | |
| kurCypriotSyllabary | &h00000800 | |
| kurCyrillic | &h00000200 | |
| kurDeseret | &h00800000 | |
| kurDevanagari | &h00008000 | |
| kurDingbats | &h00008000 | |
| kurDominoTiles | &h04000000 | |
| kurEnclosedAlphanumerics | &h00000400 | |
| kurEnclosedCJKLettersAndMonths | &h00400000 | |
| kurEthiopic | &h00000800 | |
| kurGeneralPunctuation | &h80000000 | |
| kurGeometricShapes | &h00002000 | |
| kurGeorgian | &h04000000 | |
| kurGlagolitic | 2 | |
| kurGothic | &h00400000 | |
| kurGreekandCoptic | &h00000080 | |
| kurGreekExtended | &h40000000 | |
| kurGujarati | &h00040000 | |
| kurGurmukhi | &h00020000 | |
| kurHalfwidthAndFullwidthForms | 16 | |
| kurHangulCompatibilityJamo | &h00100000 | |
| kurHangulJamo | &h10000000 | |
| kurHangulSyllables | &h01000000 | |
| kurHebrew | &h00000800 | |
| kurHiragana | &h00020000 | |
| kurIPAExtensions | 16 | |
| kurKannada | &h00400000 | |
| kurKatakana | &h00040000 | |

## 77.77 class DynaPDFTableMBS

### 77.77.1 class DynaPDFTableMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a table in DynaPDF.
**Notes:** This tables are more for doing a layout, but can also be used to show a list or a worksheet like in Excel.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr1
- MBS Xojo Plugins, version 21.5pr3
- Improvements for MBS Xojo DynaPDF Plugin
- Xojo reports with backgrounds on PDF
- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr3
- MBS Xojo Plugins, version 19.3pr3
- MBS Xojo Plugins, version 19.1pr4
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1

**Xojo Developer Magazine**

- 20.1, page 49: Cool Charts and Heatmaps, Using Monkeybread Software's ChartDirector Plugin by Stefanie Juchmes

### 77.77.2 Methods

### 77.77.3 AddColumn(left as boolean, width as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a column to the table.
See also AddColumn function in DynaPDF manual.

### 77.77.4 AddRow(height as Double = 0.0) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a row with given height.
See also AddRow function in DynaPDF manual.

### 77.77.5 AddRows(count as UInt32, height as Double) as Integer

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a couple of rows with given height.
See also AddRows function in DynaPDF manual.

### 77.77.6 ClearColumn(Col as Integer, Types as Integer)

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes the content in the specified column in all rows.
**Notes:** The paramter Types is described in ClearContent() below.
See also ClearColumn function in DynaPDF manual.

### 77.77.7 ClearContent(Types as Integer)

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears content of table.
**Notes:** See kdc constants for possible flags.
See also ClearContent function in DynaPDF manual.

### 77.77.8 ClearRow(Row as Integer, Types as Integer)

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function deletes the content in the specified row.
**Notes:** The paramter Types is described in ClearContent().
See also ClearRow function in DynaPDF manual.

### 77.77.9 Constructor

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.77.10 DeleteColumn(column as UInt32)

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the column.

### 77.77.11 DeleteRow(row as UInt32)

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the row with the given index.
See also DeleteRow function in DynaPDF manual.

### 77.77.12 DeleteRows

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes all rows.
See also DeleteRows function in DynaPDF manual.

### 77.77.13 DrawTable(x as Double, y as Double, MaxHeight as Double = 0.0) as Double

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the table at the given position into the PDF:
**Notes:** The function draws the table on the specified position. The x/y-coordinates specify the top left cornerof the table. The table flows always from top to bottom.

The function must be executed in a while statement if the parameter MaxHeight is set to a value greater than zero.

The function draws the header rows if any and at least one row to avoid an endless loop if themaximum height would be smaller as the first row height.

If the function succeeds the return value is the height of the table that was drawn so that additionalcontents can be drawn below the table if necessary. If the function fails the return value is -1.
See also DrawTable function in DynaPDF manual.

### 77.77.14 GetFirstRow as Integer

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries first row from last draw operation.
See also GetFirstRow function in DynaPDF manual.

### 77.77.15 GetFlags(Row as Integer, Column as Integer) as Integer

MBS DynaPDF Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries flag for a cell, a column or a row.
**Notes:** If Row is -1, only column flags are returned. If Column is -1, the row flags are returned for given row.
See also GetFlags function in DynaPDF manual.

### 77.77.16 GetNextHeight(MaxHeight as Double, byref NextRow as Integer) as Double

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the next row.
**Example:**

```
dim pdf as new DynaPDFMBS
call pdf.CreateNewPDF(nil)
call pdf.Append

// create dummy table with 20 rows, 1 column and 500 points width. 20 points per row by default.
dim table as DynaPDFTableMBS = pdf.CreateTable(20, 1, 500.0, 20.0)

// fill in dummy data
for i as Integer = 1 to 20
dim rowNum as Integer = table.AddRow
call table.SetCellText(rowNum, 0, pdf.ktaLeft, table.kcoCenter, str(i))
next

// and do some calculations
```

```
dim nextrow as Integer
dim h as Double = table.GetNextHeight(0, nextrow)

MsgBox str(h)+" with no limit."

dim h2 as Double = table.GetNextHeight(200, nextrow)

MsgBox str(h2)+" with limit of 200 and rows till "+str(nextrow-1)

break
```

**Notes:** If MaxHeight is zero, returns the height of table.
If MaxHeight is the height of space available, plugin calculates the effective height of table and which row would be the next one.
Returns negative number on error.
See also GetNextHeight function in DynaPDF manual.

### 77.77.17 GetNextRow as Integer

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries next row of last draw operation.
See also GetNextRow function in DynaPDF manual.

### 77.77.18 GetNumCols as Integer

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of columns of last draw operation.
See also GetNumCols function in DynaPDF manual.

### 77.77.19 GetNumRows as Integer

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of rows of last draw operation.
See also GetNumRows function in DynaPDF manual.

### 77.77.20 GetTableHeight as Double

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the table height.
See also GetTableHeight function in DynaPDF manual.

### 77.77.21 GetTableWidth as Double

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates table width.
See also GetTableWidth function in DynaPDF manual.

### 77.77.22 HaveMore as boolean

MBS DynaPDF Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether there are more rows to draw.
**Notes:** If you draw a table, you can loop and fill pages until the whole table is drawn.
See also HaveMore function in DynaPDF manual.

### 77.77.23 SetBackColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back color of the table, a row or cells.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF environment
dim tbl as DynaPDFTableMBS = pdf.CreateTable(3, 3, 500.0, 20.0) // make some table

const allRows = -1
const allColumns = -1

// add a few rows
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)
```

```
// row 0 in 100% Cyan
call tbl.SetBackColor(0, allColumns, array(255,0,0,0), pdf.kcsDeviceCMYK)
// row 1 in 100% Cyan
call tbl.SetBackColor(1, allColumns, array(0, 255, 0, 0), pdf.kcsDeviceCMYK)
// row 2 in 100% Cyan
call tbl.SetBackColor(2, allColumns, array(0, 0, 255, 0), pdf.kcsDeviceCMYK)
// row 3 in RGB red with 50% transparency
call tbl.SetBackColor(3, allColumns, array(255, 0, 0))
```

**Notes:** Default is none (transparent)
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.24 SetBackColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13224

### 77.77.24 SetBackColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back color of the table, a row or cells.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF environment
dim tbl as DynaPDFTableMBS = pdf.CreateTable(3, 3, 500.0, 20.0) // make some table

// now fill all rows and columns with RGB red specified by integer values
const allRows = -1
const allColumns = -1
call tbl.SetBackColor(allRows, allColumns, 255, 0, 0)
```

**Notes:** Default is none (transparent)
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.23 SetBackColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13223

### 77.77.25 SetBackColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back color of the table, a row or cells.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF environment
dim tbl as DynaPDFTableMBS = pdf.CreateTable(3, 3, 500.0, 100.0) // make some table

const allRows = -1
const allColumns = -1

// add a few rows
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)
rowNum = tbl.AddRow(-1.0)

// row 0 in 100% Cyan
call tbl.SetBackColorFloat(0, allColumns, array(1.0, 0.0, 0.0, 0.0), pdf.kcsDeviceCMYK)
// row 1 in 100% Cyan
call tbl.SetBackColorFloat(1, allColumns, array(0.0, 1.0, 0.0, 0.0), pdf.kcsDeviceCMYK)
// row 2 in 100% Cyan
call tbl.SetBackColorFloat(2, allColumns, array(0.0, 0.0, 1.0, 0.0), pdf.kcsDeviceCMYK)
// row 3 in RGB red
call tbl.SetBackColorFloat(3, allColumns, array(1.0, 0.0, 0.0))
```

**Notes:** Default is none (transparent)
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.26 SetBackColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13225

### 77.77.26 SetBackColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back color of the table, a row or cells.

**Example:**

```
dim pdf as DynaPDFMBS // your PDF environment
dim tbl as DynaPDFTableMBS = pdf.CreateTable(3, 3, 500.0, 20.0) // make some table

// now fill all rows and columns with RGB red specified by double values
const allRows = -1
const allColumns = -1
call tbl.SetBackColorFloat(allRows, allColumns, 1.0, 0.0, 0.0)
```

**Notes:** Default is none (transparent)
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.25 SetBackColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13225

### 77.77.27 SetBackColorValue(Row as Integer, Column as Integer, TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the back color of the table, a row or cells.
**Example:**

```
dim pdf as DynaPDFMBS // your PDF environment
dim tbl as DynaPDFTableMBS = pdf.CreateTable(3, 3, 500.0, 20.0) // make some table

// now fill all rows and columns with RGB red specified by RGB() call
const allRows = -1
const allColumns = -1

dim c as Integer = DynaPDFMBS.RGB(255, 0, 0)
call tbl.SetBackColorValue(allRows, allColumns, DynaPDFMBS.kcsDeviceRGB, c)
```

**Notes:** Default is none (transparent)
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.28 SetBorderColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color of the table, a row or cells.
**Example:**

```
// set color in CMYK with cyan (255 = 100%)
Call tbl.SetBorderColor(-1, -1, Array(255, 0, 0, 0), pdf.kesDeviceCMYK)
Call tbl.SetBorderWidth(-1, -1, 2.0, 2.0, 2.0, 2.0)
```

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.29 SetBorderColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13227

### 77.77.29 SetBorderColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color of the table, a row or cells.
**Example:**

```
const AllRows = -1
const AllColumns = -1

// set gray color for all borders to RGB(100,100,100)
call tbl.SetBorderColor(AllRows, AllColumns, 100, 100, 100)

// set border for all cells with fine line
call table.SetBorderWidth(AllRows, AllColumns, 0.5, 0.5, 0.5, 0.5)
```

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.

See also:

- 77.77.28 SetBorderColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13227

### 77.77.30 SetBorderColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color of the table, a row or cells.
**Example:**

```
// set color in CMYK with magenta (1.0 = 100%)
Call tbl.SetBorderColorFloat(-1, -1, Array(0.0, 1.0, 0.0, 0.0), pdf.kesDeviceCMYK)
Call tbl.SetBorderWidth(-1, -1, 2.0, 2.0, 2.0, 2.0)
```

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.31 SetBorderColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13228

### 77.77.31 SetBorderColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color of the table, a row or cells.
**Example:**

```
// set color in RGB with blue (1.0 = 100%)
Call tbl.SetBorderColorFloat(-1, -1, 0.0, 0.0, 1.0)
Call tbl.SetBorderWidth(-1, -1, 2.0, 2.0, 2.0, 2.0)
```

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.30 SetBorderColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13228

### 77.77.32 SetBorderColorValue(Row as Integer, Column as Integer, TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color of the table, a row or cells.
**Example:**

```
// set color in CMYK with magenta (255 = 100%)
Call tbl.SetBorderColorValue(-1, -1, pdf.kesDeviceCMYK, pdf.CMYK(0, 255, 0, 0))
Call tbl.SetBorderWidth(-1, -1, 2.0, 2.0, 2.0, 2.0)

// set color in RGB with green (255 = 100%)
Call tbl.SetBorderColorValue(row, -1, pdf.kesDeviceRGB, pdf.RGB(0, 255, 0))
Call tbl.SetBorderWidth(row, -1, 2.0, 2.0, 2.0, 2.0)
```

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.33 SetBorderWidth(Row as Integer, Column as Integer, left as Double, top as Double, right as Double, bottom as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border width of the table, a row or cells.
**Example:**

```
// set border for a row to right/bottom with fine line
call table.SetBorderWidth(rowNum, -1, 0.0, 0.0, 0.5, 0.5)
```

**Notes:** Default value is 0.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

### 77.77.34 SetCellAction(Row as Integer, Column as Integer, ActionHandle as UInt32, Mode as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an invisible link annotation for the specified cell or table and associates the provided action with that annotation.
**Notes:** The result is an interactive area that executes the action if the user clicks on cell or table.
A cell action is always a background object that is created in the size of the background area when the table is drawn.

Unlike other cell objects like images, text, and so on, a cell link is no persistent object because the action will be deleted when then PDF file in memory will be closed or when destructor will be called.
If the table should be drawn into more than one PDF file then re-create the actions and cell action before drawing the table into the next PDF file.

Actions can be created with functions like CreateGoToAction(), CreateGoToRAction(), and so on.

If the function succeeds the return value is true. If the function fails the return value is false.
See also SetCellAction function in DynaPDF manual.

### 77.77.35 SetCellDashPattern(Row as Integer, Column as Integer, CellSide as Integer, LineCapStyle as Integer, values() as Double, Phase as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply a line dash pattern to cell, row, and table borders.
**Notes:** Pass kcsTop, kcsBottom, kcsLeft or kcsRight for CellSide parameter.
See also SetCellDashPattern function in DynaPDF manual.

### 77.77.36 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as FolderItem, index as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell image.
See also SetCellImage function in DynaPDF manual.

See also:

- 77.77.37 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as string, index as Integer = 0) as boolean 13231

### 77.77.37 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as string, index as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell image.
See also SetCellImage function in DynaPDF manual.
See also:

- 77.77.36 SetCellImage(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as FolderItem, index as Integer = 0) as boolean 13230

### 77.77.38 SetCellImageAnsi(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, path as string, index as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets cell image.

### 77.77.39 SetCellImageData(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, ImageData as MemoryBlock, index as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets cell image.
**Example:**

```
dim PictureData as memoryblock // from database maybe?
dim w as Double = 300 // destination size
dim h as Double = 200
dim row as Integer
dim column as Integer
```

```
dim table as DynaPDFTableMBS // your table

call table.SetCellImageData(row, column, true, table.kcoCenter, table.kcoCenter, w, h, PictureData, 0)
```

**Notes:** Returns true on success.
See also:

- 77.77.40 SetCellImageData(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, ImageData as string, index as Integer = 0) as boolean 13232

### 77.77.40 SetCellImageData(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, ImageData as string, index as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets cell image.
**Example:**

```
dim PictureData as string // from database maybe?
dim w as Double = 300 // destination size
dim h as Double = 200
dim row as Integer
dim column as Integer

dim table as DynaPDFTableMBS // your table

call table.SetCellImageData(row, column, true, table.kcoCenter, table.kcoCenter, w, h, PictureData, 0)
```

See also:

- 77.77.39 SetCellImageData(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as Double, Height as Double, ImageData as MemoryBlock, index as Integer = 0) as boolean 13231

### 77.77.41 SetCellOrientation(Row as Integer, Column as Integer, Orientation as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function sets the cell orientation.

**Notes:** See dynapdf_help.pdf for details.
See also SetCellOrientation function in DynaPDF manual.

### 77.77.42 SetCellPadding(Row as Integer, Column as Integer, left as Double, top as Double, right as Double, bottom as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell padding of the table, a row or cells.
**Notes:** Default is zero.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

### 77.77.43 SetCellPicture(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, Width as double, Height as Double, Pic as Picture) as boolean

MBS DynaPDF Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets cell image with given picture.
**Example:**

```
dim Pic as picture // your picture from database maybe?
dim w as Double = 300 // destination size
dim h as Double = 200
dim row as Integer
dim column as Integer

dim table as DynaPDFTableMBS // your table

call table.SetCellPicture(row, column, true, table.kcoCenter, table.kcoCenter, w, h, Pic)
```

**Notes:** Returns true on success.

### 77.77.44 SetCellSpacing(Row as Integer, Column as Integer, left as Double, top as Double, right as Double, bottom as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell spacing of the table, a row or cells.
**Notes:** Default is zero.

If Row is -1, all rows are modified. If Column is -1, all columns are modified.

### 77.77.45 SetCellTable(Row as Integer, Column as Integer, HAlign as Integer, VAlign as Integer, SubTable as DynaPDFTableMBS) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a sub table into the specfied cell.
**Notes:** A sub table is always a foreground object that has a strong width and height. That means, if the cell is not large enough then it will be expanded.
Note that the function creates no copy of the table. Do not delete the sub table when it is used by another table.
In programming languages which use reference counting like Xojo, it is important to delete the tables in right order. Delete first the tables which contain references to sub tables. Finally, delete the sub tables.

If the function succeeds the return value is true. If the function fails the return value is false.
See dynapdf_help.pdf for details.
See also SetCellTable function in DynaPDF manual.

### 77.77.46 SetCellTemplate(Row as Integer, Column as Integer, ForeGround as boolean, HAlign as Integer, VAlign as Integer, TmplHandle as Integer, Width as Double = 0, Height as Double = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function inserts a template into the specified cell.
**Notes:** See dynapdf_help.pdf for details.
See also SetCellTemplate function in DynaPDF manual.

### 77.77.47 SetCellText(Row as Integer, Column as Integer, HTextAlign as Integer, VAlign as Integer, text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text of a cell.
**Notes:** Use DynaPDFMBS.ktaLeft and similar text align constants for HAlign.
But use DynaPDFTableMBS.kcoCenter and similar cell orientation constants for Valign.
See also SetCellText function in DynaPDF manual.

### 77.77.48 SetCellTextAnsi(Row as Integer, Column as Integer, HTextAlign as Integer, VAlign as Integer, text as string) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text of a cell with ANSI text.
**Notes:** Use DynaPDFMBS.ktaLeft and similar text align constants for HAlign.
But use DynaPDFTableMBS.kcoCenter and similar cell orientation constants for Valign.

### 77.77.49 SetColWidth(column as UInt32, Width as Double, ExtTable as Boolean) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the column width for a column.
See also SetColWidth function in DynaPDF manual.

### 77.77.50 SetFlags(Row as Integer, Column as Integer, Flags as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the flags for a cell.
**Example:**

```
dim table as DynaPDFTableMBS // your table

// mark this row as being a header row, so it's repeated on all pages
call table.SetFlags(rowNum, 0, table.ktfHeaderRow)
```

**Notes:** If Row is -1, all rows are modified. If Column is -1, all columns are modified.
See also SetFlags function in DynaPDF manual.

### 77.77.51 SetFont(Row as Integer, Column as Integer, name as string, Style as Integer = 0, Embed as Boolean = true, CodePage as Integer = &h27) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font of the table, a row or cells.
**Example:**

```
dim tbl as DynaPDFTableMBS // your table

// set font for all cells
call tbl.SetFont -1, -1, "Helvetica", pdf.kfsNone, true, pdf.kcpUnicode
// set bold font for a special cell
call tbl.SetFont rowNum, 2, "Helvetica", pdf.kfsBold, true, pdf.kcpUnicode
```

**Notes:** Default is Helvetica, Code page 1252, Embed false.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.
See also SetFont function in DynaPDF manual.

### 77.77.52 SetFontAnsi(Row as Integer, Column as Integer, name as string, Style as Integer = 0, Embed as Boolean = true, CodePage as Integer = &h27) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font of the table, a row or cells.
**Notes:** Default is Helvetica, Code page 1252, Embed false.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

### 77.77.53 SetFontSelMode(Row as Integer, Column as Integer, value as Int32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font selection mode of the table, a row or cells.
**Notes:** Default is ksmFamilyName.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.
See also SetFontSelMode function in DynaPDF manual.

### 77.77.54 SetFontSize(Row as Integer, Column as Integer, size as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font size of the table, a row or cells.
**Notes:** Default is 10.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.
See also SetFontSize function in DynaPDF manual.

### 77.77.55 SetGridHorizontalColor(channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.56 SetGridHorizontalColor(paramarray channels as Integer) as boolean 13237

### 77.77.56 SetGridHorizontalColor(paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.55 SetGridHorizontalColor(channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13237

### 77.77.57 SetGridHorizontalColorFloat(channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.58 SetGridHorizontalColorFloat(paramarray channels as Double) as boolean 13238

### 77.77.58 SetGridHorizontalColorFloat(paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.57 SetGridHorizontalColorFloat(channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13237

### 77.77.59 SetGridHorizontalColorValue(TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.60 SetGridVerticalColor(channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vertical grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.61 SetGridVerticalColor(paramarray channels as Integer) as boolean 13239

### 77.77.61 SetGridVerticalColor(paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vertical grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.60 SetGridVerticalColor(channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13238

### 77.77.62 SetGridVerticalColorFloat(channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vertical grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.63 SetGridVerticalColorFloat(paramarray channels as Double) as boolean 13239

### 77.77.63 SetGridVerticalColorFloat(paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vertical grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.62 SetGridVerticalColorFloat(channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13239

### 77.77.64 SetGridVerticalColorValue(TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the vertical grid color.
**Notes:** Default is black.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.65 SetGridWidth(h as Double, v as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the grid width.
**Notes:** Default is 0.
See also SetGridWidth function in DynaPDF manual.

### 77.77.66 SetImageColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.67 SetImageColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13240

### 77.77.67 SetImageColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image color of the table, a row or cells.

**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.66 SetImageColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13240

### 77.77.68 SetImageColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.69 SetImageColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13241

### 77.77.69 SetImageColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.68 SetImageColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13241

### 77.77.70 SetImageColorValue(Row as Integer, Column as Integer, TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.71 SetPDF(pdf as DynaPDFMBS)

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the target PDF for this table.

### 77.77.72 SetRowHeight(Row as Integer, value as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the row height of a row.
See also SetRowHeight function in DynaPDF manual.

### 77.77.73 SetTableWidth(Value as single, AdjustType as Integer, MinColWidth as single)

MBS DynaPDF Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function changes the width of the table.
**Notes:** At least one column must be modified when the width will be changed. The parameter AdjustType specifies how the column width should be modified. If the new width is larger, then the difference can be added to the left or right column, or all columns can get a unique width (TableWidth / NumColumns). The parameter MinColWidth is ignored in this case.
If the new width is smaller then the difference must be subtracted from the columns. The parameter MinColWidth specifies in this case the minimum width of columns that must be adjusted. It is only used if AdjustType is not set to kcoaUniqueWidth. The column widths are adjusted starting from the left or right side as specified. If the width of the first column is not large enough to subtract the difference, then the minimum column width is set to the column. This adjustment continues until the gap is zero. If the new table width is smaller as MinColWidth * NumColumns then the widths of the remaining columns will be

set to zero. Such cases should be avoided since the column widths must be adjusted again when the table is drawn.

| | |
|---|---|
| kcoaUniqueWidth | Set the column widths to TableWidth / NumColumns |
| kcoaAdjLeft | Adjust the widths starting from the left side |
| kcoaAdjRight | Adjust the widths starting from the right side |

See dynapdf_help manual for details.
Returns true on success or false on failure.
See also SetTableWidth function in DynaPDF manual.

### 77.77.74 SetTextColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.75 SetTextColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean 13243

### 77.77.75 SetTextColor(Row as Integer, Column as Integer, paramarray channels as Integer) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass an integer for each channel with 0 to 255.
See also:

- 77.77.74 SetTextColor(Row as Integer, Column as Integer, channels() as Integer, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13243

### 77.77.76 SetTextColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.77 SetTextColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean 13244

### 77.77.77 SetTextColorFloat(Row as Integer, Column as Integer, paramarray channels as Double) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text color of the table, a row or cells.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a double value for each channel with range 0.0 to 1.0.
See also:

- 77.77.76 SetTextColorFloat(Row as Integer, Column as Integer, channels() as Double, ExtColorSpace as Integer = 0, ColorSpaceHandle as Integer = 0) as boolean 13244

### 77.77.78 SetTextColorValue(Row as Integer, Column as Integer, TPDFColorSpace as Integer, ColorValue as UInt32) as boolean

MBS DynaPDF Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the horizontal grid color.
**Notes:** Default is black.
If Row is -1, all rows are modified. If Column is -1, all columns are modified.

Pass a color space and a matching color value.
For example kcsDeviceRGB and RGB(r,g,b), kcsDeviceCMYK and CMYK(c,m,y,k) or kcsDeviceGray with gray color.

### 77.77.79 Properties

### 77.77.80 Parent as Variant

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reference to parent object.
**Notes:** (Read only property)

### 77.77.81 PDF as DynaPDFMBS

MBS DynaPDF Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reference to parent PDF object.
**Notes:** (Read only property)

### 77.77.82 Constants

Cell Content Type Constants

| Constant | Value | Description |
|---|---|---|
| kcctAction | 4 | Action |
| kcctImage | 1 | Image. |
| kcctTable | 2 | Table. |
| kcctTemplate | 3 | Template. |
| kcctText | 0 | Text |

Column Adjustment Constants

| Constant | Value | Description |
|---|---|---|
| kcoaAdjLeft | 1 | Adjust the widths starting from the left side. |
| kcoaAdjRight | 2 | Adjust the widths starting from the right side. |
| kcoaUniqueWidth | 0 | Set the column widths to TableWidth / NumColumns. |

Cell Orientation

| Constant | Value | Description |
|---|---|---|
| kcoBottom | 1 | Bottom |
| kcoCenter | 2 | Center |
| kcoLeft | 0 | Left |
| kcoRight | 1 | Right |
| kcoTop | 0 | Top |

Cell Sides

| Constant | Value | Description |
|---|---|---|
| kcsBottom | 1 | Bottom side |
| kcsLeft | 0 | Left side |
| kcsRight | 2 | Right side |
| kcsTop | 3 | Top side |

Delete Content Options

| Constant | Value | Description |
|---|---|---|
| kdcAction | 16 | Delete action. |
| kdcAllCont | 31 | Delete all content types |
| kdcBackGround | &h20000000 | Delete background objects |
| kdcBoth | &h30000000 | Delete both foreground and background objects |
| kdcForeGround | &h10000000 | Delete foreground objects |
| kdcImage | 2 | Delete image. |
| kdcTable | 8 | Delete table. |
| kdcTemplate | 4 | Template table. |
| kdcText | 1 | Delete text.<br>Text is always a foreground object |

Cell flags Constants

| Constant | Value | Description |
|---|---|---|
| ktfAddFlags | 32 | If used when setting flags, the flags are not replacing existing values, but added. This way a call can set one flag and later another call can add a second flag without clearing first one. |
| ktfDefault | 0 | Default flag. |
| ktfFixedTextHeight | 64 | If set, text does not increase the row height if necessary. The row height must be non-zero in this case. The flag is ignored otherwise. |
| ktfHeaderRow | 2 | Header rows are drawn first after a page break occurred |
| ktfNoLineBreak | 4 | Prohibit line breaks in cells whith text ->Can be set to the entire table, columns, rows, and cells. |
| ktfScaleToRect | 8 | If set, the specified output width and height represents the maximum size of the image or template.<br>The image or template is scaled into this rectangle without changing the aspect ratio. |
| ktfStatic | 1 | This flag marks a row, column, or cell as static to avoid the deletion of the content with ClearContent(). |
| ktfUseImageCS | 16 | If set, images are inserted in the native image color space. |

# 77.78 class DynaPDFTextRecordAMBS

## 77.78.1 class DynaPDFTextRecordAMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an ANSI text.
**Blog Entries**

- DynaPDF Text Position Examples updated
- DynaPDF Text Position Examples

## 77.78.2 Properties

## 77.78.3 Advance as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The advance value for this text.
**Notes:** Negative values move the cursor the right, positive to the left

(Read only property)

## 77.78.4 Length as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text length in bytes.
**Notes:** (Read and Write property)

## 77.78.5 Text as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw text.
**Notes:** (Read and Write property)

## 77.79 class DynaPDFTextRecordWMBS

### 77.79.1 class DynaPDFTextRecordWMBS

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an unicode text.
**Blog Entries**

- DynaPDF Text Position Examples updated
- DynaPDF Text Position Examples

### 77.79.2 Properties

### 77.79.3 Advance as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The advance value for this text.
**Notes:** Negative values move the cursor the right, positive to the left

(Read only property)

### 77.79.4 Length as Integer

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length in characters.
**Notes:** (Read and Write property)

### 77.79.5 Text as String

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Already translated Unicode string.
**Notes:** (Read and Write property)

### 77.79.6 Width as Single

MBS DynaPDF Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** String width measured in text space.
**Notes:** (Read only property)

## 77.80 class DynaPDFURIActionMBS

### 77.80.1 class DynaPDFURIActionMBS

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an URL action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 77.80.2 Methods

### 77.80.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 77.80.4 Properties

### 77.80.5 BaseURL as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional, if defined in the Catalog object.
**Notes:** (Read only property)

### 77.80.6 IsMap as Boolean

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A flag specifying whether to track the mouse position when the URI is resolved.
**Notes:** e.g. http://test.org?50,70.
(Read only property)

### 77.80.7 NextAction as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the next action.
**Notes:** -1 or next action handle to be executed if any
(Read only property)

### 77.80.8 NextActionType as Integer

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the next action.
**Notes:** Only set if NextAction is >= 0.
(Read only property)

### 77.80.9 URI as String

MBS DynaPDF Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uniform Resource Identifier.
**Notes:** (Read only property)

## 77.81 class DynaPDFVersionInfoMBS

### 77.81.1 class DynaPDFVersionInfoMBS

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for version information.
**Example:**

```
Dim d As New DynaPDFMBS
Dim v As DynaPDFVersionInfoMBS = d.GetPDFVersionEx

Break // check in debugger
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr1

**Xojo Developer Magazine**

- 21.1, page 20: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 77.81.2 Methods

### 77.81.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 77.81.4 Properties

### 77.81.5 FXConfLevel as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The conformance level for ZUGFeRD, Factur-X or XRechnung.
**Notes:** (Read only property)

### 77.81.6 FXDocName as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The document file name for ZUGFeRD, Factur-X or XRechnung.
**Notes:** (Read only property)

### 77.81.7 FXDocType as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The document type for ZUGFeRD, Factur-X or XRechnung.
**Notes:** (Read only property)

### 77.81.8 FXVersion as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The version for ZUGFeRD, Factur-X or XRechnung.
**Notes:** (Read only property)

### 77.81.9 MainVer as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The main version.
**Notes:** Set only if the file conforms to a specific PDF standard, e.g. "PDF/X // 1a:2003", "PDF/A 3b", and so on.
(Read only property)

### 77.81.10 Major as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** PDF major version.
**Notes:** e.g. 1

(Read only property)

### 77.81.11 Minor as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** PDF minor version.
**Notes:** e.g. 7
(Read only property)

### 77.81.12 PDFAConformance as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/A conformance.
**Notes:** e.g. A, B, E, F, U, or UA.
(Read only property)

### 77.81.13 PDFAVersion as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/A version.
**Notes:** If greater zero, this is a PDF/A file.
(Read only property)

### 77.81.14 PDFEVersion as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/E version.
**Notes:** e.g. PDF/E-1
(Read only property)

### 77.81.15 PDFVTModDate as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/VT Modification date.
**Notes:** e.g. 2016-05-07T15:42:23+01:00

(Read only property)

### 77.81.16 PDFVTVersion as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/VT version.
**Notes:** e.g. PDF/VT-2
(Read only property)

### 77.81.17 PDFXConformance as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/X conformance.
**Notes:** e.g. PDF/X-1a:2001 or PDF/X-1a:2003. PDF/X 3 and above do not set this key anymore.
(Read only property)

### 77.81.18 PDFXVersion as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PDF/X Version string.
**Notes:** e.g. PDF/X-1:2001, PDF/X-1:2003, and so on.
(Read only property)

### 77.81.19 SubVer as String

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The sub version string.
**Notes:** e.g. "ZUGFeRD 2.0", "Factur-X", and so on
(Read only property)

### 77.81.20 VersionConst as Integer

MBS DynaPDF Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The version number constant for DynaPDF.
**Notes:** If >= 0 this is the TPDFVersion constant as integer.

If the version is not supported by DynaPDF, this member is set to -1.
(Read only property)

# 77.82 class DynaPDFViewportMBS

## 77.82.1 class DynaPDFViewportMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The viewport details class.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr8

## 77.82.2 Methods

## 77.82.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.82.4 Properties

## 77.82.5 BBox as DynaPDFRectMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Bounding box.
**Notes:** (Read and Write property)

## 77.82.6 Measure as DynaPDFMeasureMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional measure dictionary.
**Notes:** (Read and Write property)

## 77.82.7 Name as String

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optional name.
**Notes:** (Read and Write property)

### 77.82.8 PtData as DynaPDFPointDataDictionaryMBS

MBS DynaPDF Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Point Data dictionary.
**Notes:** (Read and Write property)

# 77.83 class DynaPDFXFAStreamMBS

## 77.83.1 class DynaPDFXFAStreamMBS

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a XFA stream.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr7

## 77.83.2 Methods

## 77.83.3 Constructor

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 77.83.4 Properties

## 77.83.5 Buffer as String

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** XML Stream.
**Notes:** (Read and Write property)

## 77.83.6 Index as Integer

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stream index.
**Notes:** (Read and Write property)

## 77.83.7 Name as String

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stream name.
**Notes:** (Read and Write property)

### 77.83.8 Size as Integer

MBS DynaPDF Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Buffer size in bytes.
**Notes:** (Read and Write property)

# Chapter 78

# EmailParser

## 78.1 class MimeAddressListMBS

### 78.1.1 class MimeAddressListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a list of addresses.
**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

### 78.1.2 Methods

### 78.1.3 Addresses as MimeAddressMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of addresses.
See also:

- 78.1.4 Addresses(index as Integer) as MimeAddressMBS 13261

### 78.1.4 Addresses(index as Integer) as MimeAddressMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries address by index.
**Notes:** Index is zero based.
See also:

• 78.1.3 Addresses as MimeAddressMBS() 13261

### 78.1.5 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a text with addresses.

### 78.1.6 Properties

### 78.1.7 AddressesVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of addresses.
**Notes:** This property is only to see array in debugger.
(Read only property)

### 78.1.8 Count as Integer

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of addresses in this list.
**Notes:** (Read only property)

### 78.1.9 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address list as a string.
**Notes:** (Read only property)

## 78.2 class MimeAddressMBS

### 78.2.1 class MimeAddressMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an address which can be an email or a group.
**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

### 78.2.2 Methods

### 78.2.3 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an address from text.
**Example:**

```
dim m as new MimeAddressMBS("=?utf-8?Q?M=C3=BCller?= <zivi@mac.com>")
MsgBox m.Mailbox.LabelDecoded
```

### 78.2.4 Properties

### 78.2.5 Group as MimeGroupMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group for this address.
**Notes:** (Read only property)

### 78.2.6 isGroup as Boolean

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this address is a group.
**Notes:** (Read only property)

### 78.2.7 Mailbox as MimeMailboxMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mailbox for this address.
**Notes:** (Read only property)

### 78.2.8 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address as a string.
**Notes:** (Read only property)

## 78.3 class MimeAttachmentMBS

### 78.3.1 class MimeAttachmentMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an attachment.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.6pr3

**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes
- 22.1, page 78: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

### 78.3.2 Methods

### 78.3.3 Constructor

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 78.3.4 Properties

### 78.3.5 Body as MimeBodyMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the body of this attachment.
**Notes:** The StringValue of the body has the attachment's encoded data.
(Read only property)

### 78.3.6 ContentDescription as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content description.
**Notes:** (Read only property)

### 78.3.7 ContentDisposition as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content disposition.
**Notes:** e.g. inline; filename="agb.pdf"
(Read only property)

### 78.3.8 contentId as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content ID for inline graphics.
**Notes:** e.g. c1441531740.48804.1@MacbookPro-Christian.local
(Read only property)

### 78.3.9 ContentTransferEncoding as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content transfer encoding.
**Notes:** e.g. base64
(Read only property)

### 78.3.10 ContentType as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content type.
**Notes:** e.g. text/plain, charset=utf-8 or application/pdf; name="agb.pdf"
(Read only property)

### 78.3.11 Data as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data for this attachment.
**Notes:** Decoded for your convenience.
(Read only property)

### 78.3.12 Filename as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The filename for this attachment.
**Notes:** The class pulls this from various header fields and decodes it if necessary.
The file name may contain invalid characters for your platform.
Like double colons for OS X or backslash for Windows.
(Read only property)

### 78.3.13 Header as MimeHeaderMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header details for this attachment.
**Notes:** (Read only property)

### 78.3.14 MimeType as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime type of the attachment.
**Notes:** e.g. "application/pdf" for a PDF file
See also MimeTypeToFileExtensionMBS function.
(Read only property)

### 78.3.15 MimeVersion as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime version of the attachment.
**Notes:** e.g. "1.0"
(Read only property)

## 78.4 class MimeBodyMBS

### 78.4.1 class MimeBodyMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a body of a mime entity.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 78.4.2 Methods

### 78.4.3 Constructor

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 78.4.4 Parts as MimeEntityMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of parts.
**Notes:** Mime Entities are organized often in a tree. The email is an entity and has sub entities for html, plain text and attachments.
See also:

- 78.4.5 Parts(index as Integer) as MimeEntityMBS 13268

### 78.4.5 Parts(index as Integer) as MimeEntityMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries part by index.
**Notes:** Index is zero based.
See also:

- 78.4.4 Parts as MimeEntityMBS() 13268

### 78.4.6 Properties

### 78.4.7 epilogue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The epilogue of the body.
**Notes:** (Read only property)

### 78.4.8 PartsVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of parts.
**Notes:** Mime Entities are organized often in a tree. The email is an entity and has sub entities for html, plain text and attachments.
This property is only to see array in debugger.
(Read only property)

### 78.4.9 preamble as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The preamble of the body.
**Notes:** This is sometimes a message like: "This is a MIME encoded message."
(Read only property)

### 78.4.10 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string value of the body.
**Notes:** (Read only property)

## 78.5 class MimeEmailMBS

### 78.5.1 class MimeEmailMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an email.
**Notes:** Subclass of the MimeEntityMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3
- MBS Xojo Plugins, version 22.2pr4
- MBS Xojo Plugins, version 21.6pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 20.4pr7
- MBS Xojo Plugins, version 17.5pr2
- MBS Xojo / Real Studio Plugins, version 16.5pr2
- MBS Xojo / Real Studio Plugins, version 16.0pr8
- MBS Xojo / Real Studio plug-ins in version 15.4

**Xojo Developer Magazine**

- 22.1, page 77: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes
- 19.2, page 10: News

### 78.5.2 Methods

### 78.5.3 Attachments as MimeAttachmentMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of attachments.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

MsgBox str(m.Attachments.Ubound+1)+" attachments and "+str(m.Inlines.Ubound+1)+" inlines"
```

```
for each a as MimeAttachmentMBS in m.Inlines
MsgBox "Inline: " + a.Filename
next
```

See also:

- 78.5.4 Attachments(index as Integer) as MimeAttachmentMBS 13271

### 78.5.4 Attachments(index as Integer) as MimeAttachmentMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries attachment by index.
**Notes:** Index is zero based.
See also:

- 78.5.3 Attachments as MimeAttachmentMBS() 13270

### 78.5.5 Constructor(Content as MemoryBlock)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an email from a memoryblock.
See also:

- 78.5.6 Constructor(Content as string) 13271
- 78.5.7 Constructor(File as FolderItem) 13272

### 78.5.6 Constructor(Content as string)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an email from a string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)
dim m as new MimeEmailMBS(s)

MsgBox m.Subject
```

**Notes:** This is to parse raw email text, e.g. eml file.
To parse emlx, open the text file and read the first line. The first line contains the length of the email. Then read the following number of bytes of that value and that is the eml content. Followed by a plist structure.
See also:


- 78.5.5 Constructor(Content as MemoryBlock) 13271
- 78.5.7 Constructor(File as FolderItem) 13272


### 78.5.7 Constructor(File as FolderItem)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an email from a text file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

MsgBox m.Subject
```

**Notes:** You can pass here an EML file.
See also:


- 78.5.5 Constructor(Content as MemoryBlock) 13271
- 78.5.6 Constructor(Content as string) 13271


### 78.5.8 DecodeInline(Text as String) as String

MBS CURL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a text with inline encoded text.
**Example:**

```
dim e,s as string

s = "=?UTF-8?B?WW91ciBBY2NvdW50IFNuYXBzaG90?="
e = MimeEmailMBS.DecodeInline(s)

MsgBox e
```

**Notes:** This is the function our plugin uses to decode names and subject in the email.
You don't need to use it unless you got subject/name encoded from somewhere else.

### 78.5.9 HTMLToPlainText(HTMLText as String) as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts html to plain text.
**Notes:** This is the function our plugin uses internally to fill PlainText field for html only email.
Removes HTML tags, decodes entities and adds returns where appropriated.

### 78.5.10 Inlines as MimeAttachmentMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of inline items.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

MsgBox str(m.Attachments.Ubound+1)+" attachments and "+str(m.Inlines.Ubound+1)+" inlines"

for each a as MimeAttachmentMBS in m.Inlines
MsgBox "Inline: " + a.Filename
next
```

**Notes:** Inline items are like attachments, but shown in the email and normally referenced by ID from the html text.
See also:

- 78.5.11 Inlines(index as Integer) as MimeAttachmentMBS 13273

### 78.5.11 Inlines(index as Integer) as MimeAttachmentMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries inline by index.
**Notes:** Index is zero based.
See also:

- 78.5.10 Inlines as MimeAttachmentMBS() 13273

### 78.5.12 Properties

### 78.5.13 AttachmentsVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of attachments.
**Notes:** This property is only to see array in debugger.
(Read only property)

### 78.5.14 Date as Date

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the sent date of the email.
**Notes:** Can be undefined and return nil.
The plugin looks in email headers for a Date: header and parses the date.
The returned date is normalized to current time zone.
(Read only property)

### 78.5.15 HTMLText as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The html text of the email.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

MsgBox m.HTMLText
```

**Notes:** Decoded for your convenience.
You may want to use ReplaceLineEndings to make sure the line endings are what you need them to be.
(Read only property)

### 78.5.16 InlinesVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of inline items.

**Notes:** Inline items are like attachments, but shown in the email and normally referenced by ID from the html text.
This property is only to see array in debugger.
(Read only property)

### 78.5.17 PlainText as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The plain text of the email.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

MsgBox m.PlainText
```

**Notes:** Decoded for your convenience.
You may want to use ReplaceLineEndings to make sure the line endings are what you need them to be.
(Read only property)

### 78.5.18 RaiseUnknownFormatExceptions as Boolean

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to raise an exception when plugin finds encoding in email which is not in list of known encodings.
**Notes:** Used to find unknown encodings.
(Read and Write property)

### 78.5.19 ReceivedDate as Date

MBS CURL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the receive date of the email.
**Notes:** Can be undefined and return nil.
The plugin looks in email headers for a Receive: header and parses the date.
The returned date is normalized to current time zone.
(Read only property)

### 78.5.20 Source as String

MBS CURL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source code of the email parsed.
**Notes:** (Read only property)

### 78.5.21 Subject as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decoded subject line of the email.
**Notes:** (Read only property)

## 78.6 class MimeEntityMBS

### 78.6.1 class MimeEntityMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a mime entity.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 78.6.2 Methods

### 78.6.3 Constructor

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 78.6.4 Properties

### 78.6.5 Body as MimeBodyMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw content of this entity.
**Notes:** This may be quoted printable, base64 or otherwise encoded.
(Read only property)

### 78.6.6 BodyDecoded as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decoded body content.
**Notes:** (Read only property)

### 78.6.7 Header as MimeHeaderMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header for this entity.
**Notes:** The email itself has header, but each entity in the mime tree has also headers.
(Read only property)

## 78.7 class MimeFieldMBS

### 78.7.1 class MimeFieldMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a header field.

### 78.7.2 Methods

### 78.7.3 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses the text in a field.

### 78.7.4 Properties

### 78.7.5 Name as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field name.
**Notes:** (Read only property)

### 78.7.6 Value as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The field value.
**Notes:** (Read only property)

## 78.8 class MimeGroupMBS

### 78.8.1 class MimeGroupMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an email group.
**Example:**

```
dim g as new MimeGroupMBS("clients:=?utf-8?Q?Josef=20M=C3=BCller?= <josef@test.test>, =?utf-8?Q?Peter=20M=C3=BCller?= <peter@test.test>;")

MsgBox g.NameDecoded+" "+str(g.Count)
MsgBox g.Mailboxes(0).LabelDecoded
MsgBox g.Mailboxes(1).LabelDecoded
```

### 78.8.2 Methods

### 78.8.3 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a group.
**Example:**

```
dim g as new MimeGroupMBS("clients:=?utf-8?Q?Josef=20M=C3=BCller?= <josef@test.test>, =?utf-8?Q?Peter=20M=C3=BCller?= <peter@test.test>;")

MsgBox g.NameDecoded+" "+str(g.Count)
```

### 78.8.4 Mailboxes as MimeMailboxMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of mailboxes in this group.
See also:

- 78.8.5 Mailboxes(index as Integer) as MimeMailboxMBS 13280

### 78.8.5 Mailboxes(index as Integer) as MimeMailboxMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a mailbox in the group.
**Example:**

```
dim g as new MimeGroupMBS("clients:=?utf-8?Q?Josef=20M=C3=BCller?= <josef@test.test>, =?utf-8?Q?Peter=20M=C3=BCller?= <peter@test.test>;")

MsgBox g.Mailboxes(0).LabelDecoded
MsgBox g.Mailboxes(1).LabelDecoded
```

See also:

- 78.8.4 Mailboxes as MimeMailboxMBS() 13280

### 78.8.6 Properties

### 78.8.7 Count as Integer

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of emails in this group.
**Notes:** (Read only property)

### 78.8.8 MailboxesVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of mailboxes in this group.
**Notes:** This property is only to see array in debugger.
(Read only property)

### 78.8.9 Name as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the group.
**Notes:** The name property has the raw name while the NameDecoded property has the decoded version for displaying to user.
(Read only property)

### 78.8.10 NameDecoded as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the group.
**Notes:** The name property has the raw name while the NameDecoded property has the decoded version for displaying to user.
(Read only property)

### 78.8.11 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The group as a string.
**Notes:** (Read only property)

## 78.9 class MimeHeaderMBS

### 78.9.1 class MimeHeaderMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for headers of a mime entity.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

### 78.9.2 Methods

### 78.9.3 Constructor

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 78.9.4 FieldByName(name as string) as MimeFieldMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds a field by name.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.FieldByName("Date").Value
```

**Notes:** e.g. "Sat, 5 Sep 2015 23:52:13 +0200" for the date field.

### 78.9.5 Fields as MimeFieldMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of fields in this header.
See also:

• 78.9.6 Fields(index as Integer) as MimeFieldMBS 13284

### 78.9.6 Fields(index as Integer) as MimeFieldMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries field by index.
**Notes:** Index is zero based.
See also:

• 78.9.5 Fields as MimeFieldMBS() 13283

### 78.9.7 hasField(name as string) as boolean

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a certain field exists.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
if h.hasField("Date") then
MsgBox "Has date: "+h.FieldByName("Date").Value
end if
```

### 78.9.8 Properties

### 78.9.9 bcc as MimeAddressListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The BCC address list.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
// get BCC
dim l as MimeAddressListMBS = h.BCC
// get addresses
dim a() as MimeAddressMBS = l.Addresses
```

```
// get first one
dim b as MimeAddressMBS = a(0)
// assume it's an email and get it
dim x as MimeMailboxMBS = b.Mailbox
// and show to user with name and email
MsgBox x.LabelDecoded+" "+x.Email
```

**Notes:** (Read only property)

### 78.9.10 cc as MimeAddressListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CC address list.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
// get CC
dim l as MimeAddressListMBS = h.CC
// get addresses
dim a() as MimeAddressMBS = l.Addresses
// get first one
dim b as MimeAddressMBS = a(0)
// assume it's an email and get it
dim x as MimeMailboxMBS = b.Mailbox
// and show to user with name and email
MsgBox x.LabelDecoded+" "+x.Email
```

**Notes:** (Read only property)

### 78.9.11 ContentDescription as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content description.
**Notes:** (Read only property)

### 78.9.12 ContentDisposition as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content disposition.
**Notes:** (Read only property)

### 78.9.13 contentId as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content ID for an inline graphic.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.contentId
```

**Notes:** (Read only property)

### 78.9.14 ContentTransferEncoding as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content transfer encoding.
**Notes:** e.g. base64
(Read only property)

### 78.9.15 ContentTransferEncodingMechanism as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content transfer encoding mechanism.
**Notes:** base64
(Read only property)

### 78.9.16 ContentType as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content type.
**Notes:** e.g. "multipart/alternative; boundary="Apple-Mail=_F9738882-571C-4469-8349-574115CE32F4"" (Read only property)

### 78.9.17 from as MimeMailboxListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The from address list.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
// get from
dim l as MimeMailboxListMBS = h.from
// get mailboxes
dim a() as MimeMailboxMBS = l.Mailboxes
// get first one
dim b as MimeMailboxMBS = a(0)
// and show to user with name and email
MsgBox b.LabelDecoded+" "+b.Email
```

**Notes:** (Read only property)

### 78.9.18 messageid as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The message ID for this email.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.messageid
```

**Notes:** e.g. "<599782DA-09A0-4461-8474-2BE9F3197CAF@macsw.de>"
(Read only property)

### 78.9.19 MimeVersion as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime version.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.MimeVersion
```

**Notes:** e.g. "1.0"
(Read only property)

### 78.9.20 replyto as MimeAddressListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The replyto address field.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
// get replyto
dim l as MimeAddressListMBS = h.replyto
// get addresses
dim a() as MimeAddressMBS = l.Addresses
// get first one
dim b as MimeAddressMBS = a(0)
// assume it's an email and get it
dim x as MimeMailboxMBS = b.Mailbox
// and show to user with name and email
MsgBox x.LabelDecoded+" "+x.Email
```

**Notes:** (Read only property)

### 78.9.21 sender as MimeMailboxMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sender of the email.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
dim b as MimeMailboxMBS = h.sender
MsgBox b.Email
```

**Notes:** May be different from "from" field.
(Read only property)

### 78.9.22 subject as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original subject line.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.subject
```

**Notes:** The subject property has the original subject line while the plugin provides the decoded subjected line in the subjectDecoded for display to user.
(Read only property)

### 78.9.23 subjectDecoded as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decoded subject line.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
MsgBox h.subjectDecoded
```

**Notes:** The subject property has the original subject line while the plugin provides the decoded subjected line in the subjectDecoded for display to user.
(Read only property)

### 78.9.24 too as MimeAddressListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TO receivers.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.eml")
dim m as new MimeEmailMBS(f)

dim h as MimeHeaderMBS = m.Header
// get to
dim l as MimeAddressListMBS = h.too
// get addresses
dim a() as MimeAddressMBS = l.Addresses
// get first one
dim b as MimeAddressMBS = a(0)
// assume it's an email and get it
dim x as MimeMailboxMBS = b.Mailbox
// and show to user with name and email
MsgBox x.LabelDecoded+" "+x.Email
```

**Notes:** Named "too" in this class as "to" is a reserved word.
(Read only property)

## 78.10 class MimeMailboxListMBS

### 78.10.1 class MimeMailboxListMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a list of mailboxes.
**Xojo Developer Magazine**

- 22.1, page 80: Parse your Mails in Xojo, Using EmailParser by Stefanie Juchmes

### 78.10.2 Methods

### 78.10.3 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a list of mailboxes.
**Example:**

```
dim m as new MimeMailboxListMBS("=?utf-8?Q?M=C3=BCller?= <test@test.com>")
MsgBox str(m.Count)
```

### 78.10.4 Mailboxes as MimeMailboxMBS()

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of mailboxes.
See also:

- 78.10.5 Mailboxes(index as Integer) as MimeMailboxMBS 13291

### 78.10.5 Mailboxes(index as Integer) as MimeMailboxMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries mailbox by index.
**Notes:** Index is zero based.
See also:

- 78.10.4 Mailboxes as MimeMailboxMBS() 13291

### 78.10.6 Properties

### 78.10.7 Count as Integer

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of mailboxes in list.
**Example:**

```
dim m as new MimeMailboxListMBS("=?utf-8?Q?M=C3=BCller?= <test@test.com>")
MsgBox str(m.Count)
```

**Notes:** (Read only property)

### 78.10.8 MailboxesVariant as Variant

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of mailboxes.
**Notes:** This property is only to see array in debugger.
(Read only property)

### 78.10.9 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of this list as a string.
**Notes:** (Read only property)

## 78.11 class MimeMailboxMBS

### 78.11.1 class MimeMailboxMBS

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an email address.
**Example:**

```
dim m as new MimeMailboxMBS("=?utf-8?Q?M=C3=BCller?= <zivi@mac.com>")
MsgBox m.LabelDecoded+" "+m.Email
```

### 78.11.2 Methods

### 78.11.3 Constructor(TextToParse as String)

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an email address.
**Example:**

```
dim m as new MimeMailboxMBS("=?utf-8?Q?M=C3=BCller?= <zivi@mac.com>")
MsgBox m.LabelDecoded+" "+m.Email
```

### 78.11.4 Properties

### 78.11.5 Domain as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The domain name of the email address.
**Notes:** (Read only property)

### 78.11.6 Email as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The email address.
**Notes:** Mailbox and Domain together.
(Read only property)

### 78.11.7 Label as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The label for this email address.
**Notes:** Label is the raw value and LabelDecoded is the decoded value.
So please use LabelDecoded for display.
(Read only property)

### 78.11.8 LabelDecoded as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The label for this email address.
**Notes:** Label is the raw value and LabelDecoded is the decoded value.
So please use LabelDecoded for display.
(Read only property)

### 78.11.9 Mailbox as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the email mailbox.
**Notes:** (Read only property)

### 78.11.10 Sourceroute as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source route parameter.
**Notes:** (Read only property)

### 78.11.11 StringValue as String

MBS CURL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The email address as a string.
**Notes:** (Read only property)

# Chapter 79

# Encryption and Hash

## 79.1 class AESMBS

### 79.1.1 class AESMBS

MBS Encryption Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use CipherMBS instead.
**Function:** A class for AES encryption.
**Example:**

```
dim a as AESMBS
dim key as MemoryBlock
dim data as MemoryBlock

key=NewMemoryBlock(20)
key.CString(0)="Hello World!1234" // 16 byte key for 128bit

a=new AESMBS

if a.SetKey(key, 128) then

data=NewMemoryBlock(20)
data.StringValue(0,16)="Hello World!"
MsgBox "Before: "+data.StringValue(0,16)
a.Encrypt(data)
MsgBox "After encryption: "+data.StringValue(0,16)
a.Decrypt(data)
MsgBox "After decryption: "+data.StringValue(0,16)
else
MsgBox "Failed"
end if
```

**Notes:** For newer projects we recommend switching to CipherMBS class.

This class has low level functions like Encrypt. It also has mid level functions like EncryptCFB/CBC. For your convenience, we also have high level functions like EncryptString.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr6
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Xojo / Real Studio plug-ins in version 13.4
- MBS Xojo / Real Studio Plugins, version 13.4pr5
- MBS Xojo / Real Studio Plugins, version 13.4pr3
- Encryption Interoperability
- MBS Real Studio Plugins, version 12.0fc1
- MBS REALbasic plug-ins version 9.4

**Xojo Developer Magazine**

- 10.1, page 74: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar
- 10.1, page 72: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar

### 79.1.2 Methods

### 79.1.3 Decrypt(idata as memoryblock, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the first 16 bytes in the input memoryblock at the given offset and stores the result in the output memoryblock at the given offset.
**Notes:** If odata is nil, idata is used for output.
This is ECB mode.

### 79.1.4 DecryptCBC(idata as memoryblock, LengthBytes as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the 16 byte data blocks within LengthBytes bytes in the data.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.

### 79.1.5 DecryptCFB1(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB1 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.
See also:

- 79.1.6 DecryptCFB1(idata as string, IVector as memoryblock=nil) as string 13297

### 79.1.6 DecryptCFB1(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB1 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
dim encrypted as string = a.EncryptCFB1(input)

if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB1(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.
See also:

- 79.1.5 DecryptCFB1(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13297

### 79.1.7 DecryptCFB128(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB128 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.

Older plugin version had problems that they didn't use key at all. So if you want to read old data encrypted with them, you need simply to decrypt without setting key.
See also:

- 79.1.8 DecryptCFB128(idata as string, IVector as memoryblock=nil) as string 13298

### 79.1.8 DecryptCFB128(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB128 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
dim encrypted as string = a.EncryptCFB128(input)

if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB128(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
```

```
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.

Older plugin version had problems that they didn't use key at all. So if you want to read old data encrypted with them, you need simply to decrypt without setting key.
See also:

- 79.1.7 DecryptCFB128(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13298

### 79.1.9 DecryptCFB8(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB8 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.
See also:

- 79.1.10 DecryptCFB8(idata as string, IVector as memoryblock=nil) as string 13299

### 79.1.10 DecryptCFB8(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the data in CFB8 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
dim encrypted as string = a.EncryptCFB8(input)
```

```
if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB8(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.
See also:

- 79.1.9 DecryptCFB8(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13299

### 79.1.11 DecryptECB(idata as memoryblock, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decryptes the 16 byte data block in the data.
**Notes:** If odata is nil, idata is used for output.

### 79.1.12 Encrypt(idata as memoryblock, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the first 16 bytes in the input memoryblock at the given offset and stores the result in the output memoryblock at the given offset.
**Notes:** If odata is nil, idata is used for output.
This is ECB mode.

### 79.1.13 EncryptCBC(idata as memoryblock, LengthBytes as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the 16 byte data blocks within LengthBytes bytes in the data.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.

### 79.1.14 EncryptCFB1(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB1 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.
See also:

- 79.1.15 EncryptCFB1(idata as string, IVector as memoryblock=nil) as string 13301

### 79.1.15 EncryptCFB1(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB1 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
dim encrypted as string = a.EncryptCFB1(input)

if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB1(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
```

```
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.1.14 EncryptCFB1(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13301

### 79.1.16 EncryptCFB128(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB128 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.
See also:

- 79.1.17 EncryptCFB128(idata as string, IVector as memoryblock=nil) as string 13302

### 79.1.17 EncryptCFB128(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB128 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
```

```
dim encrypted as string = a.EncryptCFB128(input)

if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB128(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.1.16 EncryptCFB128(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13302

### 79.1.18 EncryptCFB8(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB8 mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.
See also:

- 79.1.19 EncryptCFB8(idata as string, IVector as memoryblock=nil) as string 13303

### 79.1.19 EncryptCFB8(idata as string, IVector as memoryblock=nil) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in CFB8 mode.
**Example:**

```
dim a as new AESMBS

if a.SetKey("Hello World") then
dim input as string = "Hello World"
dim encrypted as string = a.EncryptCFB8(input)

if a.SetKey("Hello World") then
dim decrypted as string = a.DecryptCFB8(encrypted)

decrypted = DefineEncoding(decrypted, Encodings.ASCII)

if decrypted = input then
MsgBox "OK"
end if
end if
end if
```

**Notes:** If IVector is nil, a vector filled with zeros is used.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.1.18 EncryptCFB8(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0) 13303

### 79.1.20 EncryptECB(idata as memoryblock, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the 16 byte data block in the data.
**Notes:** If odata is nil, idata is used for output.

### 79.1.21 EncryptOFB(idata as memoryblock, LengthBytes as Integer, byref IVectorOffset as Integer, IVector as memoryblock=nil, odata as memoryblock=nil, iOffset as Integer=0, oOffset as Integer=0)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes the data in OFB mode.
**Notes:** If odata is nil, idata is used for output.
If IVector is nil, a vector filled with zeros is used.
IVectorOffset safes the position in the IVector for the next call to this method.
iOffset: offset in idata.
oOffset: offset in odata.
LengthBytes: Length of data in idata and odata.

### 79.1.22 SetKey(key as memoryblock, nBits as Integer) as boolean

MBS Encryption Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the key.
**Notes:** possible values for the bitcount:

| | |
|---|---|
| 128 | key is 16 bytes long |
| 192 | key is 24 bytes long |
| 256 | key is 32 bytes long |

Plugin version 13.4 and newer pads this memoryblock with 00 bytes if string is shorter.
See also:

- 79.1.23 SetKey(key as string) as boolean 13305

### 79.1.23 SetKey(key as string) as boolean

MBS Encryption Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the key.
**Example:**

```
dim x,u,s as string
dim iv as MemoryBlock

s="Hello World"

// encrypt
```

```
s=ConvertEncoding(s,encodings.UTF8)

dim a as new AESMBS

call a.SetKey("1234567890123456")

iv=NewMemoryBlock(16)
x=a.EncryptCFB128(s,iv)

MsgBox x

// decrypt

iv=NewMemoryBlock(16)
u=a.DecryptCFB128(x,iv)

u=DefineEncoding(u,encodings.UTF8)

MsgBox u
```

**Notes:** Please use 16, 24 or 32 byte long key strings.
Plugin version 13.4 and newer pads this string with 00 bytes if string is shorter.
See also:

- 79.1.22 SetKey(key as memoryblock, nBits as Integer) as boolean 13305

## 79.2 class Argon2MBS

### 79.2.1 class Argon2MBS

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to calculate hashes using Argon2.
**Example:**

```
dim a as new Argon2MBS

a.OutputLength = 24
a.Password = "password"
a.Salt = "somesalt"
a.cost = 2
a.MemoryCost = 65536 // 64 Megabytes
a.Lanes = 4
a.Threads = 4

dim hash as string = a.Calc(a.kTypeI)
dim t as string = EncodeHex(hash)

if t = "45d7ac72e76f242b20b77b9bf9bf9d5915894e669a24e6c6" then
// ok
else
Break // failed
end if
```

**Notes:** You can use this class to calculate password hashes.
Due to the cost associated to calculate it, the hash is difficult to brute force.

see
https://github.com/p-h-c/phc-winner-argon2
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr6
- Argon2 password hashing for Xojo

**Xojo Developer Magazine**

- 14.6, page 10: News

### 79.2.2 Methods

### 79.2.3 Calc(type as Integer = 0) as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Function that performs memory-hard hashing with certain degree of parallelism.
**Example:**

```
dim a as new Argon2MBS

a.OutputLength = 24
a.Password = "password"
a.Salt = "somesalt"
a.cost = 2
a.MemoryCost = 65536 // 64 Megabytes
a.Lanes = 4
a.Threads = 4

dim hash as string = a.Calc(a.kTypeI)
dim t as string = EncodeHex(hash)

if t = "45d7ac72e76f242b20b77b9bf9bf9d5915894e669a24e6c6" then
// ok
else
Break // failed
end if
```

**Notes:** Returns hash on success or empty string in case of error.
Lasterror is set.

### 79.2.4 Constructor

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 79.2.5 Destructor

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destructor.

### 79.2.6 Verify(Hash as String, type as Integer = 0) as boolean

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies a password hash.
**Example:**

```
dim a as new Argon2MBS

a.OutputLength = 24
a.Password = "password"
a.Salt = "somesalt"
a.cost = 2
a.MemoryCost = 65536
a.Lanes = 4
a.Threads = 4

dim h as string = DecodeHex("45d7ac72e76f242b20b77b9bf9bf9d5915894e669a24e6c6")
if a.Verify(h, a.kTypeI) then
// ok
break
else
// failed
break
end if
```

**Notes:** Returns true on success.
Lasterror is set.

### 79.2.7 Properties

### 79.2.8 AssociatedData as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The associated data.
**Notes:** (Read and Write property)

### 79.2.9 Cost as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of passes.

**Notes:** (Read and Write property)

### 79.2.10 Flags as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** (Read and Write property)

### 79.2.11 Lanes as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of lanes.
**Notes:** (Read and Write property)

### 79.2.12 LastError as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 79.2.13 LastErrorMessage as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.
**Notes:** (Read and Write property)

### 79.2.14 MemoryCost as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Amount of memory requested (KB).
**Notes:** In kilo bytes. Default is 1 MB.
(Read and Write property)

### 79.2.15 OutputLength as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the hash.
**Notes:** (Read and Write property)

### 79.2.16 Password as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password to hash.
**Notes:** (Read and Write property)

### 79.2.17 Salt as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The salt.
**Notes:** (Read and Write property)

### 79.2.18 Secret as String

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The secret.
**Notes:** (Read and Write property)

### 79.2.19 Threads as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of threads.
**Notes:** (Read and Write property)

### 79.2.20 Version as Integer

MBS Encryption Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of argon to use.
**Notes:** Can be kVersion10 or kVersion13.
(Read and Write property)

### 79.2.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMaxAssociatedDataLength | &hFFFFFFFF | Maximum associated data length in bytes. |
| kMaxLanes | &hFFFFFF | Maximum number of lanes (degree of parallelism) |
| kMaxMemory | &hFFFFFFFF | Maximum memory size. |
| kMaxOutputLength | &hFFFFFFFF | Maximum digest size in bytes. |
| kMaxPasswordLength | &hFFFFFFFF | Maximum password length in bytes. |
| kMaxSaltLength | &hFFFFFFFF | Maximum salt length in bytes |
| kMaxSecretLength | &hFFFFFFFF | Maximum key length in bytes. |
| kMaxThreads | &hFFFFFF | Maximum number of threads. |
| kMaxTime | &hFFFFFFFF | Maximum number of passes. |
| kMinAssociatedDataLength | 0 | Minimum associated data length in bytes. |
| kMinLanes | 1 | Minimum number of lanes (degree of parallelism) |
| kMinMemory | 8 | Minimum and maximum number of memory blocks (each of BLOCK_ bytes) |
| kMinOutputLength | 4 | Minimum digest size in bytes. |
| kMinPasswordLength | 0 | Minimum password length in bytes. |
| kMinSaltLength | 0 | Minimum salt length in bytes |
| kMinSecretLength | 0 | Minimum key length in bytes. |
| kMinThreads | 1 | Minimum number of threads. |
| kMinTime | 1 | Minimum number of passes. |
| kSyncPoints | 4 | Number of synchronization points between lanes per pass. |

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorAdPtrMismatch | -21 | AssociatedData ptr is nil, but size >0. |
| kErrorAdTooLong | -9 | AssociatedData too long. |
| kErrorAdTooShort | -8 | AssociatedData too short. |
| kErrorAllocateMemoryCbkNull | -24 | Allocation failed. |
| kErrorDecodingFail | -32 | Decoding failed. |
| kErrorDecodingLengthFail | -34 | Decoding length failed. |
| kErrorEncodingFail | -31 | Encoding failed. |
| kErrorFreeMemoryCbkNull | -23 | Free memory failed. |
| kErrorIncorrectParameter | -25 | Incorrect parameter. |
| kErrorIncorrectType | -26 | Incorrect type. |
| kErrorLanesTooFew | -16 | Lanes too small. |
| kErrorLanesTooMany | -17 | Too many lanes. |
| kErrorMemoryAllocationError | -22 | Memory allocation failed. |
| kErrorMemoryTooLittle | -14 | Memory too little. |
| kErrorMemoryTooMuch | -15 | Memory too big. |
| kErrorMissingArgs | -30 | Missing Argument. |
| kErrorOk | 0 | Okay. |
| kErrorOutPtrMismatch | -27 | Output ptr is nil, but size >0. |
| kErrorOutputPtrNull | -1 | Output Ptr is nil. |
| kErrorOutputTooLong | -3 | Output too long. |
| kErrorOutputTooShort | -2 | Output too short. |
| kErrorPwdPtrMismatch | -18 | Password ptr is nil, but size >0. |
| kErrorPwdTooLong | -5 | Password too long. |
| kErrorPwdTooShort | -4 | Password too short. |
| kErrorSaltPtrMismatch | -19 | Salt ptr is nil, but size >0. |
| kErrorSaltTooLong | -7 | Salt too long. |
| kErrorSaltTooShort | -6 | Salt too short. |
| kErrorSecretPtrMismatch | -20 | Secret ptr is nil, but size >0. |
| kErrorSecretTooLong | -11 | Secret too long. |
| kErrorSecretTooShort | -10 | Secret too short. |
| kErrorThreadFail | -33 | Threads failed. |
| kErrorThreadsTooFew | -28 | Threads too small. |
| kErrorThreadsTooMany | -29 | Too many threads. |
| kErrorTimeTooLarge | -13 | Time too large. |
| kErrorTimeTooSmall | -12 | Time too small. |
| kErrorVerifyMismatch | -35 | Verify Mismatch |

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagClearMemory | 4 | Clear memory. |
| kFlagClearPassword | 1 | Clear password. |
| kFlagClearSecret | 2 | Clear Secret after hashing. |
| kFlagDefault | 4 | Default flags. |

Type Codes

| Constant | Value | Description |
|---|---|---|
| kTypeD | 0 | Argon2d is faster and uses data-depending memory access, which makes it highly resistant against GPU cracking attacks and suitable for applications with no threats from side-channel timing attacks (eg. cryptocurrencies). |
| kTypeI | 1 | Argon2i instead uses data-independent memory access, which is preferred for password hashing and password-based key derivation, but it is slower as it makes more passes over the memory to protect from tradeoff attacks. |

Version

| Constant | Value | Description |
|---|---|---|
| kVersion10 | &h10 | Version 1.0 |
| kVersion13 | &h13 | Version 1.3 |

## 79.3 module BCryptMBS

### 79.3.1 module BCryptMBS

MBS Encryption Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for bcrypt encryption.
**Blog Entries**

- MBS Xojo Plugins, version 22.0pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr7

**Xojo Developer Magazine**

- 18.3, page 10: News

### 79.3.2 Methods

### 79.3.3 BCrypt(Pass as String, Salt as String) as String

MBS Encryption Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Hashes password with bcrypt based on given salt.
**Example:**

```
Dim salt As String = BCryptMBS.BCryptSalt(11)
Dim hash As String = BCryptMBS.BCrypt("password", salt)
```

Break

### 79.3.4 BCryptSalt(Rounds as Integer) as String

MBS Encryption Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates salt based on given numbers of rounds.

### 79.3.5 Verify(Pass as String, Hash as String) as Boolean

MBS Encryption Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies a hash to be right.
**Example:**

```
// check various levels
For i As Integer = 4 To 15
Dim salt As String = BCryptMBS.BCryptSalt(i)
Dim hash As String = BCryptMBS.BCrypt("password", salt)

Dim b As Boolean = BCryptMBS.Verify("password", hash)

System.DebugLog Str(i)+" "+Str(b)+" "+hash

If Not b Then Break
Next
```

**Notes:** Check is case sensitive!
Returns true on success.

## 79.4 class BlowfishMBS

### 79.4.1 class BlowfishMBS

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for blowfish encryption.
**Example:**

```
dim s as string

// create string with known encoding so we can later define encoding after decryption!
s=ConvertEncoding("Hello",Encodings.UTF8)

// encrypt with a key
s=BlowfishMBS.Encrypt("MyKey",s)

// encoding is not set for the result string, still RB can guess the encoding when displaying
MsgBox s

// decrypt with same key
s=BlowfishMBS.Decrypt("MyKey",s)

// encoding is not set for the result string, so change it back:
s=DefineEncoding(s,encodings.UTF8)

// show original Hello
MsgBox s
```

**Notes:** For newer projects we recommend switching to CipherMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr3
- MBS Xojo / Real Studio plug-ins in version 13.4
- MBS Xojo / Real Studio Plugins, version 13.4pr3
- MBS Real Studio Plugins, version 12.1pr10
- Studio Stable Database 2.2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

### 79.4.2 Methods

### 79.4.3 Decrypt(iodata as memoryblock)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lowest level function to decrypt data in a memoryblock.
**Notes:** input and output are in host endian format.
memoryblock must be not nil and has a size of 8 bytes.
See also:

- 79.4.4 Decrypt(key as string, data as string) as string 13318

### 79.4.4 Decrypt(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts the data using blowfish and the given key.
**Example:**

```
dim s as string

// create string with known encoding so we can later define encoding after decryption!
s=ConvertEncoding("Hello",Encodings.UTF8)

// encrypt with a key
s=BlowfishMBS.Encrypt("MyKey",s)

// encoding is not set for the result string, still RB can guess the encoding when displaying
MsgBox s

// decrypt with same key
s=BlowfishMBS.Decrypt("MyKey",s)

// encoding is not set for the result string, so change it back:
s=DefineEncoding(s,encodings.UTF8)

// show original Hello
MsgBox s
```

**Notes:** This is our convenience function to encode a string quickly. Using CFB64 mode and an all zero initializing vector.
If the lenb(result) is zero and lenb(data) is not zero, the memory was not sufficient.

Key can have any length, but 32 bytes (256 bits) are quite good.

The length of data is limited by the amount of available memory.
See also:

- 79.4.3 Decrypt(iodata as memoryblock) 13318

### 79.4.5 DecryptCBC(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Example:**

```
dim b as new BlowfishMBS

dim s as string = "UTYbBEZSMLfa0kvNDSla/n/GSUcA/545gp7LcA330Nw="
dim x as string = DecodeBase64(s)

dim m as MemoryBlock = nil
b = new BlowfishMBS
b.SetKey "geheim"
dim t1 as string = b.DecryptCBC(x,m)

// shows SD10003$ $ 2012.03.16 11:00
MsgBox t1
```

**Notes:** data: data to be decrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself an eight byte memoryblock with a starting value you want.
Be aware that this CBC method works with data in 8 byte blocks, so you need to unpad data if needed.
See also:

- 79.4.6 DecryptCBC(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock) 13319

### 79.4.6 DecryptCBC(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.

odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.

ivec should be a memoryblock of 8 bytes size which you create before calling the function for the first time. On the next time you passed the same block, so the function can store data inside this memoryblock between function calls.
Be aware that this CBC method works with data in 8 byte blocks, so you need to unpad data if needed.
See also:

- 79.4.5 DecryptCBC(data as string, byref temp as memoryblock) as string 13319

### 79.4.7 DecryptCFB64(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Notes:** data: data to be decrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.
See also:

- 79.4.8 DecryptCFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer) 13320

### 79.4.8 DecryptCFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Example:**

```
dim b as BlowfishMBS

b=new BlowfishMBS
b.SetKey "Key"

dim temp as MemoryBlock
dim s as string
```

```
s=b.EncryptCFB64("Hello World",temp)

MsgBox s

temp=nil // reset
s=b.DecryptCFB64(s,temp)

MsgBox s
```

**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.
num: current position in ivec. Pass 0 as start value and pass the value you get back to the next function call.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.
See also:

- 79.4.7 DecryptCFB64(data as string, byref temp as memoryblock) as string 13320

### 79.4.9 DecryptECB(data as string) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The basic Blowfish decryption function.
**Notes:** This function decrypts only 8 bytes. For more, please use other functions!

data: data to be decrypted
Returns "" on invalid input.
See also:

- 79.4.10 DecryptECB(idata as memoryblock, odata as memoryblock, offset as Integer) 13321

### 79.4.10 DecryptECB(idata as memoryblock, odata as memoryblock, offset as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The basic Blowfish encryption function.
**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
See also:

- 79.4.9 DecryptECB(data as string) as string 13321

### 79.4.11 DecryptOFB64(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Notes:** data: data to be decrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.

This is output feedback mode. Encryption is the same a decryption.
See also:

- 79.4.12 DecryptOFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer) 13322

### 79.4.12 DecryptOFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish decryption function.
**Example:**

```
dim b as BlowfishMBS

b=new BlowfishMBS
b.SetKey "Key"

dim temp as MemoryBlock
dim s as string

s=b.EncryptCFB64("Hello World",temp)
```

MsgBox s

temp=nil // reset
s=b.DecryptCFB64(s,temp)

MsgBox s

**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.
num: current position in ivec. Pass 0 as start value and pass the value you get back to the next function call.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.

This is output feedback mode. Encryption is the same a decryption.
See also:

- 79.4.11 DecryptOFB64(data as string, byref temp as memoryblock) as string 13322

### 79.4.13 Encrypt(iodata as memoryblock)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lowest level function to encrypt data in a memoryblock.
**Notes:** input and output are in host endian format.
memoryblock must be not nil and has a size of 8 bytes.
See also:

- 79.4.14 Encrypt(key as string, data as string) as string 13323

### 79.4.14 Encrypt(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts the data using blowfish and the given key.
**Example:**

dim v as string = "Hello World, this is just a test string"

```
// encrypt CFB64 with BlowfishMBS
dim b as new BlowfishMBS
dim Key as string = "1234567812345678"
dim r as string = b.Encrypt( key , v )
dim h as string = EncodeHex( r )

// and decrypt with OpenSSL
dim c as CipherMBS = CipherMBS.bf_cfb64

c.DecryptInit key
dim d as string = c.ProcessString(r)
d = d + c.FinalizeAsString

Break // see in debugger, v and d have same content
```

**Notes:** This is our convenience function to decode a string quickly. Using CFB64 mode and an all zero initializing vector.
If the lenb(result) is zero and lenb(data) is not zero, the memory was not sufficient.

Key can have any length, but 32 bytes (256 bits) are quite good.
The length of data is limited by the amount of available memory.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.4.13 Encrypt(iodata as memoryblock) 13323

### 79.4.15 EncryptCBC(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Example:**

```
dim m as memoryblock // temporary storage of current state
dim b as blowfishmbs
dim s as string

b=new blowfishmbs
b.SetKey "EinKey1234567890" // some key

s=b.EncryptCBC("Hallo",m)
```

```
s=s+b.EncryptCBC(" ",m)
s=s+b.EncryptCBC("Leute",m)
s=s+b.EncryptCBC("!",m)
```

**Notes:** data: data to be encrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself an eight byte memoryblock with a starting value you want.
Be aware that this CBC method works with data in 8 byte blocks, so you need to pad data if needed.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.4.16 EncryptCBC(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock) 13325

### 79.4.16 EncryptCBC(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Notes:** idata: memoryblock for input data, at least 8 bytes in size and not nil.
odata: memoryblock for output data, at least 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.

ivec should be a memoryblock of 8 bytes size which you create before calling the function for the first time. On the next time you passed the same block, so the function can store data inside this memoryblock between function calls.
Be aware that this CBC method works with data in 8 byte blocks, so you need to pad data if needed.
See also:

- 79.4.15 EncryptCBC(data as string, byref temp as memoryblock) as string 13324

### 79.4.17 EncryptCFB64(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Notes:** data: data to be encrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.4.18 EncryptCFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer) 13326

### 79.4.18 EncryptCFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.
num: current position in ivec. Pass 0 as start value and pass the value you get back to the next function call.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.
See also:

- 79.4.17 EncryptCFB64(data as string, byref temp as memoryblock) as string 13325

### 79.4.19 EncryptECB(data as string) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The basic Blowfish encryption function.
**Notes:** This function encrypts only 8 bytes. For more, please use other functions!

data: data to be encrypted
Returns "" on invalid input.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.4.20 EncryptECB(idata as memoryblock, odata as memoryblock, offset as Integer) 13327

### 79.4.20 EncryptECB(idata as memoryblock, odata as memoryblock, offset as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The basic Blowfish decryption function.
**Notes:** This function encrypts only 8 bytes. For more, please use other functions!

idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
See also:

- 79.4.19 EncryptECB(data as string) as string 13326

### 79.4.21 EncryptOFB64(data as string, byref temp as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Notes:** data: data to be encrypted
temp: memoryblock for temporary data. Is created when called with nil value. Pass on following calls to allow data to be shared between function calls.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.

This is output feedback mode. Encryption is the same a decryption.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text

string.
See also:

- 79.4.22 EncryptOFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer) 13328

### 79.4.22 EncryptOFB64(idata as memoryblock, odata as memoryblock, offset as Integer, length as Integer, ivec as memoryblock, byref num as Integer)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The continuing Blowfish encryption function.
**Notes:** idata: memoryblock for input data, 8 bytes in size and not nil.
odata: memoryblock for output data, 8 bytes in size and not nil.
offset: offset in input and output memoryblocks
length: length of data in memoryblock in bytes. Multiply of 8.
ivec: memoryblock for temporary data, 8 bytes in size and not nil.
num: current position in ivec. Pass 0 as start value and pass the value you get back to the next function call.

Returns "" on invalid input.
You can create yourself a twelve byte memoryblock with a starting value you want. First four bytes are position and next 8 bytes the current vector.

This is output feedback mode. Encryption is the same a decryption.
See also:

- 79.4.21 EncryptOFB64(data as string, byref temp as memoryblock) as string 13327

### 79.4.23 SetKey(key as string)

MBS Encryption Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the key to be used.
**Notes:** The longer the key, the better. Suggested is at least 16 bytes.

## 79.5 Globals

### 79.5.1 CalculateCRC16MemoryMBS(data as MemoryBlock, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided memoryblock.
**Notes:** Start is the start value.
Polynominal is what is xored to the value in each round.
FinalXOR is an XOR we do on the end.
If ReflectInput is true, we swap bits in input.
If ReflectOutput is true, we swap bits in output (before final XOR).

Returns CRC value.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr5

### 79.5.2 CalculateCRC16StringMBS(data as string, Start as UInt16 = 65535, Polynomial as UInt16 = &h1021, FinalXOR as UInt16 = 0, ReflectInput as boolean = false, ReflectOutput as boolean = false) as UInt16

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided string.
**Example:**

```
dim c as string = DecodeHex("3E4400026201000D")
dim p as UInt16 = CalculateCRC16StringMBS(c, &hFFFF, &h1021, 0, true, true)
MsgBox hex(p)+" = 3E5A"
```

**Notes:** Start is the start value.
Polynominal is what is xored to the value in each round.
FinalXOR is an XOR we do on the end.
If ReflectInput is true, we swap bits in input.
If ReflectOutput is true, we swap bits in output (before final XOR).

Returns CRC value.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr5

### 79.5.3 Adler32MemoryMBS(adler as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32

MBS Compression Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The adler32 hash function from the zlib library.
**Notes:** Offset and length must be correct for your memoryblock or you will crash your application!

Update a running Adler-32 checksum with the bytes and return the updated checksum. If buf is nil, this function returns the required initial value for the checksum.
An Adler-32 checksum is almost as reliable as a CRC32 but can be computed much faster.

### 79.5.4 Adler32StringMBS(adler as UInt32, buf as string) as UInt32

MBS Compression Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The adler32 hash function from the zlib library.
**Example:**

```
dim b as binarystream // some stream
dim adler as Integer
dim data as string
dim originalAdler as Integer = 12345

adler=Adler32MemoryMBS(0,nil,0,0)

data=b.read(10000)
while data<>""
adler=Adler32StringMBS(adler, data)
data=b.read(10000)
wend

if adler <>originalAdler then msgbox "Error in checksum!"
```

**Notes:** Update a running Adler-32 checksum with the bytes and return the updated checksum. If buf is nil, this function returns the required initial value for the checksum.
An Adler-32 checksum is almost as reliable as a CRC32 but can be computed much faster.

### 79.5.5 CRC32MemoryMBS(crc as UInt32, buf as memoryblock, offset as Integer, length as Integer) as UInt32

MBS Compression Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The crc32 hash function from the zlib library.
**Notes:** Offset and length must be correct for your memoryblock or you will crash your application!

Update a running crc with the bytes and return the updated crc. If buf is nil, this function returns the required initial value for the crc. Pre- and post-conditioning (one's complement) is performed within this function so it shouldn't be done by the application.

### 79.5.6 CRC32StringMBS(crc as UInt32, buf as string) as UInt32

MBS Compression Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The crc32 hash function from the zlib library.
**Example:**

```
dim originalCrc as Integer// original CRC
dim crc as Integer // new crc
dim data as string
dim b as binarystream

crc=0

data=b.read(10000)
while data<>""
crc=CRC32StringMBS(crc, data)
data=b.read(10000)
wend

if crc <>originalCrc then msgbox "Error in checksum!"
```

**Notes:** Update a running crc with the bytes and return the updated crc. If buf is nil, this function returns the required initial value for the crc. Pre- and post-conditioning (one's complement) is performed within this function so it shouldn't be done by the application.

### 79.5.7 CRC16MBS(data as string) as UInt16

MBS Util Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided string.
**Example:**

```
dim n1 as Integer = CRC16MBS("Hello World")
dim n2 as Integer = CRC16MBS("Hallo World")
```

```
MsgBox str(n1)+" "+str(n2)
```

**Notes:** Please note: Different CRC functions give different result. This is one specific 16 bit CRC function which may be or not be the one you need for your application.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 79.5.8 CRC_32InMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided memory address.

### 79.5.9 CRC_32InMemMBS(address as Ptr, length as Integer) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided memory address.

### 79.5.10 CRC_32OfStrContMBS(s as String, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided block of data.

### 79.5.11 CRC_32OfStrMBS(s as String) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided string.
**Example:**

```
dim n as Integer
n=CRC_32OfStrMBS("Hello World")
' n is now 1243066710
```

**Notes:** See the text "About-CRC" for details about this Checksum things.
This function is also available as part of the memoryblock class.

About Checksums:

These functions calculate CRCs over a range of bytes in a MemoryBlock or in a String.

There are three versions of CRC calculation: One for 16 Bit, one for 32 Bit and one for 16 to 64 Bit wide checksums. If you are free to choose, I suggest that you use the 32 Bit version because of its accuracy and performance.

Some background on using checksums/CRCs:
Checksums, such as CRCs, are used to quickly verify that a chunk of data has not been modified somehow without your control. To use it, you'd calculate the checksum (CRC) of your data, then store that checksum value (which only needs 2 to 8 bytes of storage) somewhere. Later, when retrieving your data, you calculate its checksum again and compare its value with the previously stored value. If it does not match, the data got somehow corrupted. If it matches, that it is quite likely, although not 100% sure, that the data is still in its original state.

There are 3 different CRC algorithms available:

- CRC_CCITT...() as Integer
- CRC_32...() as Integer
- CRC_Dillon...(bitWidth as Integer, ...) as String

The CCITT version calculates a rather classic 16 bit CRC. Unless you need that CRC for legacy data, I recomment not to use it, but rather use the CRC_32 version.

CRC_32 is the most common used algorithm for 32 bit wide CRCs. Be aware there are theoretically many other ways to calculate a CRC 32, however.

The Dillon algorithm is a smart routine to calculate CRCs in any width between 16 and 64 bit. This one is only useful if you find that a 32 bit CRC is not sufficient for your needs. If you can live with a plain 32 bit CRC, you should prefer the CRC_32 routines, because they are faster than the Dillon code.

The result, since it can be up to 64 bit in size, cannot be returned in an Integer (they can only hold 32 bit). Instead, the result is returned as a 8 byte value, stored in a 8 byte long string. To get the value of that string, you can copy the string into a MemoryBlock, and then access the parts opf the 8 byte long value there. The demo project shows how to accomplish this.

The CRC code was developed and published by Matthew Dillon. Here's his web page with more information about it:
http://www.backplane.com/diablo/crc64.html

### 79.5.12 CRC_CCITTInMemContMBS(address as Ptr, length as Integer, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided memory address.

### 79.5.13 CRC_CCITTInMemMBS(address as Ptr, length as Integer) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided memory address.

### 79.5.14 CRC_CCITTOfStrContMBS(s as String, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided string.

### 79.5.15 CRC_CCITTOfStrMBS(s as String) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided string.
**Example:**

```
dim n as Integer
n=CRC_CCITTOfStrMBS("Hello World")
' n is now 39210
```

### 79.5.16 CRC_DillonInMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as String

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided memory address.

### 79.5.17 CRC_DillonOfStrMBS(bitWidth as Integer, s as String) as String

MBS Util Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided string.
**Example:**

```
dim s as string
s=CRC_DillonOfStrMBS(64,"Hello World")
' s has now the 64bit checksum inside an 8 byte binary string
```

### 79.5.18 CRC_DillonUInt64InMemMBS(bitWidth as Integer, address as Ptr, length as Integer) as UInt64

MBS Util Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided memory address.

### 79.5.19 CRC_DillonUInt64OfStrMBS(bitWidth as Integer, s as String) as UInt64

MBS Util Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided string.

### 79.5.20 GetHash32MBS(s as string) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates some special Hash value.
**Example:**

```
MsgBox hex(GetHash32MBS("xskin-b013fafit_01-PELVIS-BODY.skn")) // should show 67A53A4D
```

**Notes:** The 255 char limit was in the original C function, but should be resolved for this plugin, so string longer than 255 chars will work.
The original C code looks like this:

```
static UInt32 GetHash32 (StringPtr inString)
{

  int                                   length = inString [ 0 ] ;
   UInt32        hash = length + 1;
   int                                  i;


for (i = 1; i <= length; i++)
{
hash = ___rlwinm(hash, 3, 0, 31) ^tolower(inString [ i ] );
}

return hash;
}
```

Originally this was added for Cherie Benoit, which describes it like this:

"GetHash32MBS" duplicates the hashing function of Westlake Interactive's "Namer" application which creates LFN-style short filenames for use with the Macintosh version of "The Sims."

### 79.5.21 ModBusCalculateRTUMessageCRCMBS(data as string) as UInt16

MBS Util Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the RTU Message CRC string.
**Example:**

```
dim m as new MemoryBlock(9)

m.UInt8Value(0) = 1 // start of package
m.UInt8Value(1) = 6 // command code
m.UInt8Value(2) = 0 // some data...
m.UInt8Value(3) = 0
m.UInt8Value(4) = 0
m.UInt8Value(5) = &h21
m.UInt8Value(6) = 0 // checksum comes here
m.UInt8Value(7) = 0
m.UInt8Value(8) = 4 // end of package

dim Data as string = m.StringValue(0,6)
dim CheckSum as Int16 = ModBusCalculateRTUMessageCRCMBS(data)
```

```
m.UInt16Value(6) = checksum

MsgBox EncodeHex(m)
```

### 79.5.22 MD5MBS(data as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a memoryblock as 16 byte string.

### 79.5.23 MD5StringMBS(data as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string as hex string.

### 79.5.24 ValidateUUIDMBS(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates the given UUID/GUID.
**Example:**

```
// wrong
dim w1 as string = ValidateUUIDMBS("hello") // wrong due to missing {
dim w2 as string = ValidateUUIDMBS("550e8400-z29b-11d4-a716-446655440000",1) // wrong with, with z
dim w3 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d40716-446655440000 } ") // wrong with missing minus
dim w4 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d4-a716-44665544000 } ") // wrong with being too short
dim w5 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d4-a716-446655440000 } dssdsd",1) // wrong as it has extra chars on end
dim w6 as string = ValidateUUIDMBS("550e8400-e29b-11d4-a716-446655440000",1,4) // wrong as not version 4
dim w7 as string = ValidateUUIDMBS("6a12a4d5-e9e6-4568-ffcc-34c70b24a668",1,4) // wrong as not version 4

// okay
dim o1 as string = ValidateUUIDMBS("550e8400-e29b-11d4-a716-446655440000",1)
dim o2 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d4-a716-446655440000 } ")
dim o3 as string = ValidateUUIDMBS("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 1)
```

```
dim o4 as string = ValidateUUIDMBS("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 3)
dim o5 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d4-a716-446655440000 } ", 2)
dim o6 as string = ValidateUUIDMBS(" { 550e8400e29b11d4a716446655440000 } ", 2)
dim o7 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d40716-446655440000 } ",4) // wrong with missing minus, but fixed
dim o8 as string = ValidateUUIDMBS("550e8400-e29b-11d40716-446655440000 } ",4) // wrong with missing { , but fixed
dim o9 as string = ValidateUUIDMBS("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 4, 4) // is version 4
dim o10 as string = ValidateUUIDMBS("6a12a4d5-e9e6-1568-afcc-34c70b24a668", 4, 1) // is version 1
dim o11 as string = ValidateUUIDMBS(" { 550e8400-e29b-11d4-a716-446655440000 } dssdsd",1+4) // wrong as it has extra chars on end, but fixed

break // check in debugger
```

**Notes:** If the UUID is valid, you get it back.
If the UUID is invalid, you get an empty string back.

Pass 1 in mode to not require braces around UUID. Pass 2 to ignore minus characters. Pass 3 to combine those two.
You can add 4 to have the GUID fixed a bit like adding braces and minus chars if missing.
The requiredVersion parameter can be 1 to 5 to indicate the required GUID version you want to have.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr5
- MBS Real Studio Plugins, version 12.3pr11

### 79.5.25 MD5MBS(data as string) as string

MBS Encryption Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string.
**Example:**

```
// Compare RB5 MD5 to the one from MBS

dim a,b as String

a=MD5("Hallo")

b=MD5MBS("Hallo")

msgbox str(StrComp(a,b,0))
```

**Notes:** Same as the MD5 function in RB5.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr3
- MBS Real Studio Plugins, version 12.5pr12
- Encryption Interoperability
- MBS SQLite Extension 0.9
- REAL Server Plugin 0.2

### 79.5.26 MD5StringMBS(data as string) as string

MBS Encryption Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string as hex string.
**Example:**

```
// Compare RB5 MD5 to the one from MBS

dim a,b as String

a=EncodingToHexMBS(MD5("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern"))
b=MD5StringMBS("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern")

msgbox a+EndOfLine+b+EndOfLine+str(StrComp(a,b,0))
```

**Blog Entries**

- REAL Server Plugin 0.2

### 79.5.27 CRC_DillonUInt64MBS(extends mem as memoryblock, bitWidth as Integer, offset as Integer, numBytes as Integer) as UInt64

MBS Util Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided memory address.
**Notes:** The 64bit integer version for RB 2006r4 and newer.

### 79.5.28 CalculateTOTPMBS(Key as String, timeNow as UInt64, timeStart as UInt64, timeStep as UInt64, digitCount as Integer, DecodeBase32 as Boolean = false) as UInt32

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calculates a Time-based one-time password.
**Notes:** Key is the secret to use.
timeNow the current time in seconds, e.g. pass CurrentUnixTimeMBS.
timeStart the start time in seconds, e.g. zero.
timeStep the duration the code is valid in seconds, e.g. 30 seconds.
digitCount: the number of digits to generate, e.g. 6.

Uses SHA-1 as hash algorithm.
Added DecodeBase32 parameter in v22.5 to specify whether the password is base32 encoded and should be decoded.

The result is returned as number and may miss leading zeros, if you just convert it to text.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr1
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr1

### 79.5.29 CurrentUnixTimeMBS as UInt64

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries unix time stamp.
**Notes:** Seconds since 1970.
Useful for CalculateTOTPMBS function.
**Blog Entries**

- MBS Xojo Plugins, version 22.3pr1

### 79.5.30 DecodeFromBase32MBS(data as string) as String

MBS Util Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Decode a base 32 string.
**Example:**

```
Dim s As String = EncodeToBase32MBS("The quick brown fox jumps over the lazy dog.")
```

```
If s = "KRUGKIDROVUWG2ZAMJZG653OEBTG66BANJ2W24DTEBXXMZLSEB2GQZJANRQXU6JAM-
RXWOLQ=" Then
// okay
Dim d As String = DecodeFromBase32MBS(s)

MessageBox d
Else
Break
End If
```

**Notes:** You may need to use DefineEncoding to specify what encoding the decoded text should have.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MBS Xojo Plugins, version 23.4pr3

### 79.5.31 EncodeToBase32MBS(data as string) as String

MBS Util Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Encode a base32 string.
**Example:**

```
Dim s As String = EncodeToBase32MBS("The quick brown fox jumps over the lazy dog.")

If s = "KRUGKIDROVUWG2ZAMJZG653OEBTG66BANJ2W24DTEBXXMZLSEB2GQZJANRQXU6JAM-
RXWOLQ=" Then
// okay
Dim d As String = DecodeFromBase32MBS(s)

MessageBox d
Else
Break
End If
```

**Notes:** Please check what text encoding you want to use. Especially what the software processing the base32 string expects.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MBS Xojo Plugins, version 23.4pr3

## 79.6 class CCCryptorMBS

### 79.6.1 class CCCryptorMBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Generic interface for symmetric encryption.
**Example:**

```
// initialize
dim h as new CCCryptorMBS(CCCryptorMBS.kCCEncrypt, CCCryptorMBS.kCCAlgorithmAES128, 0,
"Hello12312345678")

if h.Lasterror<>0 then break

// destination memoryblock

dim m as new MemoryBlock(100)
dim Position as Uint64 = 0
dim BytesLeft as UInt64 = m.Size

// add a few bytes
dim q as UInt64 = 0

h.Update "Hello World!1234", m, BytesLeft, q
if h.Lasterror<>0 then break

Position = Position + q
BytesLeft = BytesLeft - q

// now finalize:
q = 0

dim dp as ptr = m.AddressPtrMBS(Position)

h.Final dp, BytesLeft, q
if h.Lasterror<>0 then break

Position = Position + q
BytesLeft = BytesLeft - q

// and show result
dim d as string = m.StringValue(0, Position)
MsgBox EncodingToHexMBS(d)
```

**Notes:** This interface provides access to a number of symmetric encryption algorithms. Symmetric encryp-

tion algorithms come in two ”flavors” - block ciphers, and stream ciphers. Block ciphers process data (while both encrypting and decrypting) in discrete chunks of data called blocks; stream ciphers operate on arbitrary sized data.

The object declared in this interface, CCCryptorMBS, provides access to both block ciphers and stream ciphers with the same API; however some options are available for block ciphers that do not apply to stream ciphers.

The general operation of a CCCryptor is: initialize it with raw key data and other optional fields with Constructor(); process input data via one or more calls to Update(), each of which may result in output data being written to caller-supplied memory; and obtain possible remaining output data with Final(). The CCCryptor is disposed of via Destructor(), or it can be reused (with the same key data as provided to Constructor()) by calling Reset().

One option for block ciphers is padding, as defined in PKCS7; when padding is enabled, the total amount of data encrypted does not have to be an even multiple of the block size, and the actual length of plaintext is calculated during decryption.

Another option for block ciphers is Cipher Block Chaining, known as CBC mode. When using CBC mode, an Initialization Vector (IV) is provided along with the key when starting an encrypt or decrypt operation. If CBC mode is selected and no IV is provided, an IV of all zeroes will be used.

CCCryptorMBS also implements block bufferring, so that individual calls to Update() do not have to provide data whose length is aligned to the block size. (If padding is disabled, encrypting with block ciphers does require that the *total* length of data input to Update() call(s) be aligned to the block size.)

A given CCCryptorMBS can only be used by one thread at a time; multiple threads can use safely different CCCryptors at the same time.

This class uses the CommonCrypto interface which is available on Mac OS X 10.5 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don’t need to apply for an export license for this classes here.

**Blog Entries**

- News from the MBS Xojo Plugins Version 21.4
- Xojo News
- MBS Xojo Plugins, version 21.4pr2
- MBS Real Studio Plugins, version 11.3pr5

### 79.6.2 Methods

### 79.6.3 Constructor(operation as Integer, Algorithm as Integer, options as Integer, key as Ptr, keyLength as UInt64, iv as Ptr = nil)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a cryptographic context.
**Notes:** operation: Defines the basic operation: kCCEncrypt or kCCDecrypt.
Algorithm: Defines the algorithm.
options: A word of flags defining options.
key: Raw key material, length keyLength bytes.

keyLength: Length of key material. Must be appropriate for the selected operation and algorithm. Some algorithms provide for varying key lengths.

iv: Initialization vector, optional. Used by block ciphers when Cipher Block Chaining (CBC) mode is enabled. If present, must be the same length as the selected algorithm's block size. If CBC mode is selected (by the absence of the kCCOptionECBMode bit in the options flags) and no IV is present, a NULL (all zeroes) IV will be used. This parameter is ignored if ECB mode is used or if a stream cipher algorithm is selected.

Possible error is lasterror are kCCParamError and kCCMemoryFailure.
See also:

- 79.6.4 Constructor(operation as Integer, Algorithm as Integer, options as Integer, key as String, iv as Ptr = nil) 13344

### 79.6.4 Constructor(operation as Integer, Algorithm as Integer, options as Integer, key as String, iv as Ptr = nil)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Create a cryptographic context.
**Example:**

```
// key length must be 16 bytes for AES128
dim key as string = "1234567890123456"

dim h as new CCCryptorMBS(CCCryptorMBS.kCCEncrypt, CCCryptorMBS.kCCAlgorithmAES128, 0,
key)

if h.Lasterror<>0 then
MsgBox "error: "+str(h.Lasterror)
else
```

```
MsgBox "OK"
end if
```

**Notes:** operation: Defines the basic operation: kCCEncrypt or kCCDecrypt.
Algorithm: Defines the algorithm.
options: A word of flags defining options.
key: Raw key material, length keyLength bytes.

keyLength: Length of key material. Must be appropriate for the selected operation and algorithm. Some algorithms provide for varying key lengths.

iv: Initialization vector, optional. Used by block ciphers when Cipher Block Chaining (CBC) mode is enabled. If present, must be the same length as the selected algorithm's block size. If CBC mode is selected (by the absence of the kCCOptionECBMode bit in the options flags) and no IV is present, a NULL (all zeroes) IV will be used. This parameter is ignored if ECB mode is used or if a stream cipher algorithm is selected.

Possible error is lasterror are kCCParamError and kCCMemoryFailure.
See also:

- 79.6.3 Constructor(operation as Integer, Algorithm as Integer, options as Integer, key as Ptr, keyLength as UInt64, iv as Ptr = nil) 13344

### 79.6.5 Crypt(Operation as Integer, Algorithm as Integer, Options as Integer, key as Ptr, KeyLength as UInt64, IV as Ptr, DataIn as Ptr, DataInLength as UInt64, DataOut as Ptr, DataOutAvailable as UInt64, byref DataOutMoved as UInt64) as Integer

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Stateless, one-shot encrypt or decrypt operation.
**Example:**

```
dim KeyString as string = "Hello12312345678"
dim InputString as string = "Hello World!1234"

dim InputMemory as MemoryBlock = InputString
dim KeyMemory as MemoryBlock = KeyString
dim IV as ptr = nil // default to zeros
dim OutputMemory as new MemoryBlock(100)
dim Size as UInt64 = 0

dim e as Integer = CCCryptorMBS.Crypt(CCCryptorMBS.kCCEncrypt, CCCryptorMBS.kCCAlgorithmAES128, 0, KeyMemory, KeyMemory.size, IV, InputMemory, InputMemory.size, OutputMemory, Out-
```

```
putMemory.size, size)

if e = CCCryptorMBS.kCCSuccess then
dim result as string = OutputMemory.StringValue(0, size)
MsgBox EncodingToHexMBS(result)
else
MsgBox "Error: "+str(e)
end if
```

**Notes:** This basically performs a sequence of Constructor, Update, Final and Destructor.

Parameters:

| | |
|---|---|
| Operation | Defines the basic operation: kCCEncrypt or kCCDecrypt. |
| Algorithm | Defines the encryption algorithm. |
| Options | A word of flags defining options. See kCCOption constants. |
| Key | Raw key material, length keyLength bytes. |
| keyLength | Length of key material. Must be appropriate for the select algorithm. Some algorithms may provide for varying key lengths. |
| IV | Initialization vector, optional. Used for Cipher Block Chaining (CBC) mode. If present, must be the same length as the selected algorithm's block size. If CBC mode is selected (by the absence of any mode bits in the options flags) and no IV is present, a nil (all zeroes) IV will be used. This is ignored if ECB mode is used or if a stream cipher algorithm is selected. |
| dataIn | Data to encrypt or decrypt, length dataInLength bytes. |
| dataInLength | Length of data to encrypt or decrypt. |
| dataOut | Result is written here. Allocated by caller. Encryption and decryption can be performed "in-place", with the same buffer used for input and output. |
| dataOutAvailable | The size of the dataOut buffer in bytes. |
| dataOutMoved | On successful return, the number of bytes written to dataOut. If kCCBufferTooSmall is returned as a result of insufficient buffer space being provided, the required buffer space is returned here. |

Possible errors in lasterror:
kCCBufferTooSmall indicates insufficent space in the dataOut buffer. In this case, the dataOutMoved parameter will indicate the size of the buffer needed to complete the operation. The operation can be retried with minimal runtime penalty.
kCCAlignmentError indicates that dataInLength was not properly aligned. This can only be returned for block ciphers, and then only when decrypting or when encrypting with block with padding disabled.

See also:

| | |
|---|---|
| kCCDecodeError | Indicates improperly formatted ciphertext or a "wrong key" error; occurs only during decrypt operations. |


- 79.6.6 Crypt(Operation as Integer, Algorithm as Integer, Options as Integer, key as string, IV as Ptr, DataIn as string, byref DataOut as string) as Integer 13347


### 79.6.6 Crypt(Operation as Integer, Algorithm as Integer, Options as Integer, key as string, IV as Ptr, DataIn as string, byref DataOut as string) as Integer

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Stateless, one-shot encrypt or decrypt operation.
**Example:**

```
dim KeyString as string = "Hello12312345678"
dim InputString as string = "Hello World!1234"
dim IV as ptr = nil // default to zeros
dim Output as string = ""

dim e as Integer = CCCryptorMBS.Crypt(CCCryptorMBS.kCCEncrypt, CCCryptorMBS.kCCAlgorithmAES128, 0, KeyString, IV, InputString, Output)

if e = CCCryptorMBS.kCCSuccess then
MsgBox EncodingToHexMBS(Output)
else
MsgBox "Error: "+str(e)
end if
```

**Notes:** This basically performs a sequence of Constructor, Update, Final and Destructor. This is the convenience function for Xojo with using strings instead of data pointers.

Parameters:

Possible errors in lasterror:
kCCBufferTooSmall indicates insufficent space in the dataOut buffer. In this case, the dataOutMoved parameter will indicate the size of the buffer needed to complete the operation. The operation can be retried with minimal runtime penalty.
kCCAlignmentError indicates that dataInLength was not properly aligned. This can only be returned for block ciphers, and then only when decrypting or when encrypting with block with padding disabled.

See also:

| | |
|---|---|
| Operation | Defines the basic operation: kCCEncrypt or kCCDecrypt. |
| Algorithm | Defines the encryption algorithm. |
| Options | A word of flags defining options. See kCCOption constants. |
| Key | Raw Key. |
| IV | Initialization vector, optional. Used for Cipher Block Chaining (CBC) mode. If present, must be the same length as the selected algorithm's block size. If CBC mode is selected (by the absence of any mode bits in the options flags) and no IV is present, a nil (all zeroes) IV will be used. This is ignored if ECB mode is used or if a stream cipher algorithm is selected. |
| dataIn | Data to encrypt or decrypt. |
| dataOut | Result is written here. |

| | |
|---|---|
| kCCDecodeError | Indicates improperly formatted ciphertext or a "wrong key" error; occurs only during decrypt operations. |

- 79.6.5 Crypt(Operation as Integer, Algorithm as Integer, Options as Integer, key as Ptr, KeyLength as UInt64, IV as Ptr, DataIn as Ptr, DataInLength as UInt64, DataOut as Ptr, DataOutAvailable as UInt64, byref DataOutMoved as UInt64) as Integer 13345

### 79.6.7 Final(DataOut as Ptr, dataOutAvailable as UInt64, byref dataOutMoved as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finish an encrypt or decrypt operation, and obtain the (possible) final data output.
**Notes:** dataOut: Result is written here. Allocated by caller. Pass a memoryblock of right size.
dataOutAvailable: The size of the dataOut buffer in bytes.
dataOutMoved: On successful return, the number of bytes written to dataOut.

Lasterror is set to:
kCCBufferTooSmall indicates insufficent space in the dataOut buffer. The caller can use GetOutputLength() to determine the required output buffer size in this case. The operation can be retried; no state is lost when this is returned.

kCCAlignmentError When decrypting, or when encrypting with a block cipher with padding disabled, kCCAlignmentError will be returned if the total number of bytes provided to Update() is not an integral multiple of the current algorithm's block size.

kCCDecodeError Indicates garbled ciphertext or the wrong key during decryption. This can only be returned while decrypting with padding enabled.

Except when kCCBufferTooSmall is returned, the CCCryptorMBS can no longer be used for subsequent operations unless Reset() is called on it.

It is not necessary to call Final() when performing symmetric encryption or decryption if padding is disabled, or when using a stream cipher.

### 79.6.8 GetOutputLength(inputLength as UInt64, Final as Boolean = true) as UInt64

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Determine output buffer size required to process a given input size.
**Example:**

```
dim h as new CCCryptorMBS(CCCryptorMBS.kCCEncrypt, CCCryptorMBS.kCCAlgorithmAES128, 0, "Hello12312345678")

MsgBox str(h.GetOutputLength(1000))
```

**Notes:** inputLength: The length of data which will be provided to Update().

Final: If false, the returned value will indicate the output buffer space needed when 'inputLength' bytes are provided to CCCryptorMBS.Update(). When 'final' is true, the returned value will indicate the total combined buffer space needed when 'inputLength' bytes are provided to CCCryptorMBS.Update() and then CCCryptorMBS.Final() is called.

Returns the maximum buffer space need to perform CCCryptorMBS.Update() and optionally CCCryptorMBS.Final().

Some general rules apply that allow clients of this module to know a priori how much output buffer space will be required in a given situation. For stream ciphers, the output size is always equal to the input size, and CCCryptorMBS.Final() never produces any data. For block ciphers, the output size will always be less than or equal to the input size plus the size of one block. For block ciphers, if the input size provided to each call to CCCryptorMBS.Update() is is an integral multiple of the block size, then the output size for each call to CCCryptorMBS.Update() is less than or equal to the input size for that call to CCCryptorMBS.Update(). CCCryptorMBS.Final() only produces output when using a block cipher with padding enabled.

### 79.6.9 RandomGenerateBytes(data as MemoryBlock) as integer

MBS MacOSX Plugin, Plugin Version: 21.4, Platform: macOS, Targets: All.

**Function:** Return random bytes in a buffer allocated by the caller.
**Example:**

```
Dim m As New MemoryBlock(16)

Dim r As Integer = CCCryptorMBS.RandomGenerateBytes(m)
```

```
If r = CCCryptorMBS.kCCSuccess Then
MessageBox EncodeHex(m)
Else
MessageBox "Error " + Str(r)
End If
```

**Notes:** The PRNG returns cryptographically strong random bits suitable for use as cryptographic keys, IVs, nonces etc.

Return kCCSuccess on success.

### 79.6.10 Reset(iv as Ptr = nil)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Reinitializes an existing CCCryptorRef with a (possibly) new initialization vector.
**Notes:** The key is unchanged. Not implemented for stream ciphers.

iv: Optional initialization vector; if present, must be the same size as the current algorithm's block size.

The the only possible errors are kCCParamError and kCCUnimplemented.
This can be called on a CCCryptorMBS with data pending (i.e. in a padded mode operation before Final is called); however any pending data will be lost in that case.

### 79.6.11 Update(dataIn as Ptr, dataInLength as UInt64, dataOut as Ptr, dataOutAvailable as UInt64, byref dataOutMoved as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Process (encrypt, decrypt) some data.
**Notes:** The result, if any, is written to a caller-provided buffer.

Parameters:

dataOutAvailable The size of the dataOut buffer in bytes.

Possible error codes:
kCCBufferTooSmall indicates insufficent space in the dataOut buffer. The caller can use CCCryptorMBS.GetOut-

| | |
|---|---|
| dataIn | Data to process, length dataInLength bytes. |
| dataInLength | Length of data to process. |
| dataOut | Result is written here. Allocated by caller. Encryption and decryption can be performed "in-place", with the same buffer used for input and output. |
| dataOutMoved | On successful return, the number of bytes written to dataOut. |

putLength() to determine the required output buffer size in this case. The operation can be retried; no state is lost when this is returned.

This routine can be called multiple times. The caller does not need to align input data lengths to block sizes; input is bufferred as necessary for block ciphers. When performing symmetric encryption with block ciphers, and padding is enabled via kCCOptionPKCS7Padding, the total number of bytes provided by all the calls to this function when encrypting can be arbitrary (i.e., the total number of bytes does not have to be block aligned). However if padding is disabled, or when decrypting, the total number of bytes does have to be aligned to the block size; otherwise CCCryptMBS.Final() will return kCCAlignmentError. A general rule for the size of the output buffer which must be provided by the caller is that for block ciphers, the output length is never larger than the input length plus the block size. For stream ciphers, the output length is always exactly the same as the input length. See the discussion for CCCryptorMBS.GetOutputLength() for more information on this topic. Generally, when all data has been processed, call CCCryptorMBS.Final(). In the following cases, the CCCryptorMBS.Final() is superfluous as it will not yield any data nor return an error:
1. Encrypting or decrypting with a block cipher with padding disabled, when the total amount of data provided to CCCryptorMBS.Update() is an integral multiple of the block size.
2. Encrypting or decrypting with a stream cipher.
See also:

- 79.6.12 Update(dataIn as String, dataOut as Ptr, dataOutAvailable as UInt64, byref dataOutMoved as UInt64) 13351

### 79.6.12 Update(dataIn as String, dataOut as Ptr, dataOutAvailable as UInt64, byref dataOutMoved as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Process (encrypt, decrypt) some data.
**Notes:** The result, if any, is written to a caller-provided buffer.

Parameters:

dataOutAvailable The size of the dataOut buffer in bytes.

| | |
|---|---|
| dataIn | Data to process, length dataInLength bytes. |
| dataInLength | Length of data to process. |
| dataOut | Result is written here. Allocated by caller. Encryption and decryption can be performed "in-place", with the same buffer used for input and output. |
| dataOutMoved | On successful return, the number of bytes written to dataOut. |

Possible error codes:
kCCBufferTooSmall indicates insufficent space in the dataOut buffer. The caller can use CCCryptorMBS.GetOutputLength() to determine the required output buffer size in this case. The operation can be retried; no state is lost when this is returned.

This routine can be called multiple times. The caller does not need to align input data lengths to block sizes; input is bufferred as necessary for block ciphers. When performing symmetric encryption with block ciphers, and padding is enabled via kCCOptionPKCS7Padding, the total number of bytes provided by all the calls to this function when encrypting can be arbitrary (i.e., the total number of bytes does not have to be block aligned). However if padding is disabled, or when decrypting, the total number of bytes does have to be aligned to the block size; otherwise CCCryptMBS.Final() will return kCCAlignmentError. A general rule for the size of the output buffer which must be provided by the caller is that for block ciphers, the output length is never larger than the input length plus the block size. For stream ciphers, the output length is always exactly the same as the input length. See the discussion for CCCryptorMBS.GetOutputLength() for more information on this topic. Generally, when all data has been processed, call CCCryptorMBS.Final(). In the following cases, the CCCryptorMBS.Final() is superfluous as it will not yield any data nor return an error:
1. Encrypting or decrypting with a block cipher with padding disabled, when the total amount of data provided to CCCryptorMBS.Update() is an integral multiple of the block size.
2. Encrypting or decrypting with a stream cipher.
See also:

- 79.6.11 Update(dataIn as Ptr, dataInLength as UInt64, dataOut as Ptr, dataOutAvailable as UInt64, byref dataOutMoved as UInt64) 13350

### 79.6.13 Properties

### 79.6.14 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal handle for the crypter instance.
**Notes:** (Read and Write property)

### 79.6.15 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Last error code.
**Notes:** (Read and Write property)

### 79.6.16 Constants

Encryption Algorithms Constants.

| Constant | Value | Description |
|---|---|---|
| kCCAlgorithm3DES | 2 | Triple-DES, three key, EDE configuration |
| kCCAlgorithmAES128 | 0 | Advanced Encryption Standard, 128-bit block. Key length 128 to 256 bits. |
| kCCAlgorithmBlowfish | 6 | Blowfish encryption. |
| kCCAlgorithmCAST | 3 | CAST |
| kCCAlgorithmDES | 1 | Data Encryption Standard |
| kCCAlgorithmRC2 | 5 | RC2 stream cipher |
| kCCAlgorithmRC4 | 4 | RC4 stream cipher |

Error codes.

| Constant | Value | Description |
|---|---|---|
| kCCAlignmentError | -4303 | Input size was not aligned properly. |
| kCCBufferTooSmall | -4301 | Insufficent buffer provided for specified operation. |
| kCCCallSequenceError | -4309 | Functions called in wrong order. |
| kCCDecodeError | -4304 | Input data did not decode or decrypt properly. |
| kCCInvalidKey | -4311 | Key is not valid. |
| kCCKeySizeError | -4310 | The key size is incorrect. |
| kCCMemoryFailure | -4302 | Memory allocation failure. |
| kCCOverflow | -4306 | Buffer overflow. |
| kCCParamError | -4300 | Illegal parameter value. |
| kCCRNGFailure | -4307 | Random number generator failed. |
| kCCSuccess | 0 | Operation completed normally. |
| kCCUnimplemented | -4305 | Function not implemented for the current algorithm. |
| kCCUnspecifiedError | -4308 | An error occurred, but not matching one of the other error codes. |

Block Size Constants.

| Constant | Value | Description |
|---|---|---|
| kCCBlockSize3DES | 8 | Triple DES block size. |
| kCCBlockSizeAES128 | 16 | AES block size (currently, only 128-bit blocks are supported). |
| kCCBlockSizeBlowfish | 8 | Blowfish block size. |
| kCCBlockSizeCAST | 8 | CAST block size. |
| kCCBlockSizeDES | 8 | DES block size. |
| kCCBlockSizeRC2 | 8 | RC2 block size. |

Operation Modes

| Constant | Value | Description |
|---|---|---|
| kCCDecrypt | 1 | Symmetric decryption. |
| kCCEncrypt | 0 | Symmetric encryption. |

Key Size Constants

| Constant | Value | Description |
|---|---|---|
| kCCKeySize3DES | 24 | Triple DES key size.<br>DES and TripleDES have fixed key sizes. |
| kCCKeySizeAES128 | 16 | 128 bit AES key size.<br>AES has three discrete key sizes. |
| kCCKeySizeAES192 | 24 | 192 bit AES key size.<br>AES has three discrete key sizes. |
| kCCKeySizeAES256 | 32 | 256 bit AES key size.<br>AES has three discrete key sizes. |
| kCCKeySizeDES | 8 | DES key size.<br>DES and TripleDES have fixed key sizes. |
| kCCKeySizeMaxBlowfish | 56 | Maximum key size for blowfish. You may better do a hash on the key and use the hash. |
| kCCKeySizeMaxCAST | 16 | CAST maximum key size.<br>CAST and RC4 have variable key sizes. |
| kCCKeySizeMaxRC2 | 128 | RC2 maximum key size.<br>CAST and RC4 have variable key sizes. |
| kCCKeySizeMaxRC4 | 512 | RC4 maximum key size.<br>CAST and RC4 have variable key sizes. |
| kCCKeySizeMinBlowfish | 8 | Minimum key size for blowfish. |
| kCCKeySizeMinCAST | 5 | CAST minimum key size.<br>CAST and RC4 have variable key sizes. |
| kCCKeySizeMinRC2 | 1 | RC2 minimum key size.<br>CAST and RC4 have variable key sizes. |
| kCCKeySizeMinRC4 | 1 | RC4 minimum key size.<br>CAST and RC4 have variable key sizes. |

Option Constants

| Constant | Value | Description |
|---|---|---|
| kCCOptionCBCMode | 0 | Cipher Block Chaining Mode. Default is CBC. |
| kCCOptionECBMode | 2 | Electronic Code Book Mode. Default is CBC.<br>Stream ciphers currently have no options |
| kCCOptionPKCS7Padding | 1 | Perform PKCS7 padding.<br>Stream ciphers currently have no options |

## 79.7 class CCHMacMBS

### 79.7.1 class CCHMacMBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Keyed Message Authentication Code (HMAC) functions.
**Example:**

```
dim h as new CCHMacMBS(CCHMacMBS.kCCHmacAlgSHA1, "Hello")
h.Update "Hello World!"
dim m as MemoryBlock = h.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.5 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr15
- MBS Real Studio Plugins, version 11.3pr5

### 79.7.2 Methods

### 79.7.3 Constructor(algorithm as Integer, key as memoryblock)

MBS MacOSX Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Initializes the hmac engine with the given algorithm and key.
See also:

- 79.7.4 Constructor(algorithm as Integer, key as Ptr, keyLength as UInt64) 13355
- 79.7.5 Constructor(algorithm as Integer, key as string) 13356

### 79.7.4 Constructor(algorithm as Integer, key as Ptr, keyLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hmac engine with the given algorithm and key.
See also:

- 79.7.3 Constructor(algorithm as Integer, key as memoryblock) 13355
- 79.7.5 Constructor(algorithm as Integer, key as string) 13356

### 79.7.5 Constructor(algorithm as Integer, key as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hmac engine with the given algorithm and key.
**Example:**

```
dim h as new CCHMacMBS(CCHMacMBS.kCCHmacAlgMD5, "Hello")
h.Update "Hello World!"
dim m as MemoryBlock = h.Finalize
MsgBox EncodingToHexMBS(m)
```

See also:


- 79.7.3 Constructor(algorithm as Integer, key as memoryblock) 13355
- 79.7.4 Constructor(algorithm as Integer, key as Ptr, keyLength as UInt64) 13355


### 79.7.6 Final(macOut as Ptr)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Obtain the final Message Authentication Code.
**Notes:** Writes mac to given pointer.
Please pass a memoryblock with 16 bytes for MD5 and 20 bytes for SHA1.

### 79.7.7 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Obtain the final Message Authentication Code.
**Notes:** Returns digest. 16 bytes for MD5 and 20 bytes for SHA1.

### 79.7.8 Hmac(algorithm as Integer, key as Ptr, keyLength as Integer, data as Ptr, dataLength as Integer, MacOut as Ptr)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Stateless, one-shot HMAC function.
**Notes:** Make sure your memoryblock for key, data and macout have the right size and are not nil!
keyLength and dataLength are the size of key and data in bytes.
See also:


- 79.7.9 Hmac(algorithm as Integer, key as String, data as String) as String 13357

### 79.7.9 Hmac(algorithm as Integer, key as String, data as String) as String

MBS MacOSX Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Stateless, one-shot HMAC function.
See also:

- 79.7.8 Hmac(algorithm as Integer, key as Ptr, keyLength as Integer, data as Ptr, dataLength as Integer, MacOut as Ptr) 13356

### 79.7.10 Update(data as memoryblock)

MBS MacOSX Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Process some data.
**Notes:** Takes bytes in memoryblock.
See also:

- 79.7.11 Update(data as Ptr, dataLength as UInt64) 13357
- 79.7.12 Update(data as string) 13357

### 79.7.11 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Process some data.
**Notes:** Takes given bytes from pointer. You can pass a memoryblock there and pass the size of the memoryblock as length.
See also:

- 79.7.10 Update(data as memoryblock) 13357
- 79.7.12 Update(data as string) 13357

### 79.7.12 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Process some data.
**Notes:** Takes bytes in string.
See also:

- 79.7.10 Update(data as memoryblock) 13357
- 79.7.11 Update(data as Ptr, dataLength as UInt64) 13357

### 79.7.13 Properties

### 79.7.14 Algorithm as Integer

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The algorithm passed in the constructor.
**Notes:** see kCCHmacAlg* constants.
(Read and Write property)

### 79.7.15 Constants

Algorithms Constants

| Constant | Value | Description |
|---|---|---|
| kCCHmacAlgMD5 | 1 | |
| kCCHmacAlgSHA1 | 0 | |
| kCCHmacAlgSHA224 | 5 | |
| kCCHmacAlgSHA256 | 2 | |
| kCCHmacAlgSHA384 | 3 | |
| kCCHmacAlgSHA512 | 4 | |

Digest Length Constants

| Constant | Value | Description |
|---|---|---|
| kCCMD5DigestLength | 16 | |
| kCCSHA1DigestLength | 20 | |

## 79.8 class CCMD2MBS

### 79.8.1 class CCMD2MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for MD2 hash.
**Example:**

```
dim s as new CCMD2MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.8.2 Methods

### 79.8.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.8.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.8.5 MD2(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD2.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.8.6 MD2(data as String) as Memoryblock 13360

### 79.8.6 MD2(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD2.
**Example:**

```
dim m as MemoryBlock = CCMD2MBS.MD2("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.8.5 MD2(data as Ptr, dataLength as Integer) as Memoryblock 13359

### 79.8.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.8.8 Update(data as string) 13360

### 79.8.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.8.7 Update(data as Ptr, dataLength as UInt64) 13360

## 79.9 class CCMD4MBS

### 79.9.1 class CCMD4MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for MD4 hash.
**Example:**

```
dim s as new CCMD4MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.2pr7
- MBS Real Studio Plugins, version 11.3pr5

### 79.9.2 Methods

### 79.9.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.9.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.9.5 MD4(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD4.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.9.6 MD4(data as String) as Memoryblock 13362

### 79.9.6 MD4(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD4.
**Example:**

```
dim m as MemoryBlock = CCMD4MBS.MD4("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.9.5 MD4(data as Ptr, dataLength as Integer) as Memoryblock 13361

### 79.9.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.9.8 Update(data as string) 13362

### 79.9.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.9.7 Update(data as Ptr, dataLength as UInt64) 13362

## 79.10 class CCMD5MBS

### 79.10.1 class CCMD5MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for MD5 hash.
**Example:**

```
dim s as new CCMD5MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.10.2 Methods

### 79.10.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.10.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.10.5 MD5(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD5.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.10.6 MD5(data as String) as Memoryblock 13364

### 79.10.6 MD5(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with MD5.
**Example:**

```
dim m as MemoryBlock = CCMD5MBS.MD5("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.10.5 MD5(data as Ptr, dataLength as Integer) as Memoryblock 13363

### 79.10.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.10.8 Update(data as string) 13364

### 79.10.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.10.7 Update(data as Ptr, dataLength as UInt64) 13364

## 79.11 class CCSHA1MBS

### 79.11.1 class CCSHA1MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for SHA-1 hash.
**Example:**

```
dim s as new CCSHA1MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.11.2 Methods

### 79.11.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.11.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.11.5 SHA1(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-1.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.11.6 SHA1(data as String) as Memoryblock 13366

### 79.11.6 SHA1(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-1.
**Example:**

```
dim m as MemoryBlock = CCSHA1MBS.SHA1("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.11.5 SHA1(data as Ptr, dataLength as Integer) as Memoryblock 13365

### 79.11.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.11.8 Update(data as string) 13366

### 79.11.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.11.7 Update(data as Ptr, dataLength as UInt64) 13366

## 79.12 class CCSHA224MBS

### 79.12.1 class CCSHA224MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for SHA-224 hash.
**Example:**

```
dim s as new CCSHA224MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.5 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.12.2 Methods

### 79.12.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.12.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.12.5 SHA224(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-256.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.12.6 SHA224(data as String) as Memoryblock 13368

### 79.12.6 SHA224(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-224.
**Example:**

```
dim m as MemoryBlock = CCSHA224MBS.SHA224("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.12.5 SHA224(data as Ptr, dataLength as Integer) as Memoryblock 13367

### 79.12.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.12.8 Update(data as string) 13368

### 79.12.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.12.7 Update(data as Ptr, dataLength as UInt64) 13368

## 79.13 class CCSHA256MBS

### 79.13.1 class CCSHA256MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for SHA-256 hash.
**Example:**

```
dim s as new CCSHA256MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.13.2 Methods

### 79.13.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.13.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.13.5 SHA256(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-256.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.13.6 SHA256(data as String) as Memoryblock 13370

### 79.13.6 SHA256(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-256.
**Example:**

```
dim m as MemoryBlock = CCSHA256MBS.SHA256("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.13.5 SHA256(data as Ptr, dataLength as Integer) as Memoryblock 13369

### 79.13.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.13.8 Update(data as string) 13370

### 79.13.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.13.7 Update(data as Ptr, dataLength as UInt64) 13370

## 79.14 class CCSHA384MBS

### 79.14.1 class CCSHA384MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for SHA-384 hash.
**Example:**

```
dim s as new CCSHA384MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.14.2 Methods

### 79.14.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.14.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.14.5 SHA384(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-384.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.14.6 SHA384(data as String) as Memoryblock 13372

### 79.14.6 SHA384(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-384.
**Example:**

```
dim m as MemoryBlock = CCSHA384MBS.SHA384("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.14.5 SHA384(data as Ptr, dataLength as Integer) as Memoryblock 13371

### 79.14.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.14.8 Update(data as string) 13372

### 79.14.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.14.7 Update(data as Ptr, dataLength as UInt64) 13372

## 79.15 class CCSHA512MBS

### 79.15.1 class CCSHA512MBS

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for SHA-512 hash.
**Example:**

```
dim s as new CCSHA512MBS
s.Update "The quick brown fox jumps over the lazy dog"

dim m as MemoryBlock = s.Finalize
MsgBox EncodingToHexMBS(m)
```

**Notes:** This class uses the CommonCrypto interface which is available on Mac OS X 10.4 or newer and also on iOS. So you can use it to get the same results on both operation systems. Also as you simply use Apple provided encryption, you don't need to apply for an export license for this classes here.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 79.15.2 Methods

### 79.15.3 Constructor

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the hash engine.

### 79.15.4 Finalize as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Finalizes hash and returns digest as memoryblock.
**Notes:** If you want to show the value to a human, please use EncodingToHexMBS function.

### 79.15.5 SHA512(data as Ptr, dataLength as Integer) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-512.
**Notes:** Simply pass in a memoryblock with data and the size in bytes and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.15.6 SHA512(data as String) as Memoryblock 13374

### 79.15.6 SHA512(data as String) as Memoryblock

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One-shot hash calculation with SHA-512.
**Example:**

```
dim m as MemoryBlock = CCSHA512MBS.SHA512("The quick brown fox jumps over the lazy dog")
MsgBox EncodingToHexMBS(m)
```

**Notes:** Simply pass in a string and receive digest as memoryblock. If you need to show digest to human, please use EncodingToHexMBS function.
See also:

- 79.15.5 SHA512(data as Ptr, dataLength as Integer) as Memoryblock 13373

### 79.15.7 Update(data as Ptr, dataLength as UInt64)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass memoryblock and data length in bytes.
See also:

- 79.15.8 Update(data as string) 13374

### 79.15.8 Update(data as string)

MBS MacOSX Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Processes some data.
**Notes:** Pass string with data.
See also:

- 79.15.7 Update(data as Ptr, dataLength as UInt64) 13374

## 79.16 class CipherMBS

### 79.16.1 class CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The high level cipher class using OpenSSL encryption.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_128_cfb128
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

dim a as new AESMBS

call a.SetKey CKey, 128
dim output2 as string = a.EncryptCFB128(data, CIV)

MsgBox EncodeHex(output1)+EndOfLine+EncodeHex(output2)
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- Decrypt data from PHP in Xojo
- Xojo News
- MacOSX plugin for iOS
- Multithreaded plugin functions can increase speed of Xojo application
- Tip of the day: AES 256 CBC on iOS for Xojo
- MBS Xojo plug-ins in version 16.0
- AES in Xojo and PHP
- Doing hash or encryption on several CPUs in Xojo
- MBS Xojo / Real Studio plug-ins in version 13.5

**Xojo Developer Magazine**

- 21.5, page 9: News
- 15.5, page 9: News
- 14.2, page 10: News
- 12.1, page 9: News

### 79.16.2 Methods

### 79.16.3 aes_128_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim key as string = "mysecretkey"
dim encrypted as string = "6IcB9bpDwOjjONErhYQ6c7+Fb4qszsUNZVU0iThLYqOu7chJ7MG2nwSpRBUY0ZC3"

encrypted = DecodeBase64(encrypted)

dim c as CipherMBS = CipherMBS.aes_128_cbc
call c.DecryptInit key

dim s as string = c.ProcessString(Encrypted)+c.FinalizeAsString

Break // "In welcher Stadt steht das Bundeshaus?" is now in s.
```

### 79.16.4 aes_128_cbc_hmac_sha256 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.5 aes_128_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.6 aes_128_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.7 aes_128_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_128_cfb128
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

dim a as new AESMBS

call a.SetKey CKey, 128
dim output2 as string = a.EncryptCFB128(data, CIV)

MsgBox EncodeHex(output1)+EndOfLine+EncodeHex(output2)
```

### 79.16.8 aes_128_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.9 aes_128_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.10 aes_128_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.11 aes_128_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.12 aes_128_ocb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.13 aes_128_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.14 aes_128_wrap as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.15 aes_128_wrap_pad as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.16 aes_128_xts as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.aes_128_xts
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.aes_128_xts
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred via "+c.Name+" as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.17 aes_192_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.18 aes_192_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.19 aes_192_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.20 aes_192_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.21 aes_192_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.22 aes_192_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.23 aes_192_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.24 aes_192_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.25 aes_192_ocb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.26 aes_192_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.27 aes_192_wrap as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.28 aes_192_wrap_pad as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.29 aes_256_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.aes_256_cbc
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.aes_256_cbc
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred via "+c.Name+" as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.30 aes_256_cbc_hmac_sha256 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.31 aes_256_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.32 aes_256_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.33 aes_256_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.aes_256_cfb128
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.aes_256_cfb128
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
```

```
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred via "+c.Name+" as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.34 aes_256_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.35 aes_256_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.36 aes_256_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_256_ecb
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

c = CipherMBS.aes_256_ecb
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString
```

MsgBox "Encrypred as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2

### 79.16.37 aes_256_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.38 aes_256_ocb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.39 aes_256_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.40 aes_256_wrap as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.41 aes_256_wrap_pad as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.42 aes_256_xts as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.43 aria_128_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.44 aria_128_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.45 aria_128_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.46 aria_128_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.47 aria_128_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.48 aria_128_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.49 aria_128_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.50 aria_128_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.51 aria_128_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.52 aria_192_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.53 aria_192_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.54 aria_192_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.55 aria_192_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.56 aria_192_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.57 aria_192_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.58 aria_192_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.59 aria_192_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.60 aria_192_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.61 aria_256_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.62 aria_256_ccm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.63 aria_256_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.64 aria_256_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.65 aria_256_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.66 aria_256_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.67 aria_256_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.68 aria_256_gcm as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.69 aria_256_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.70 bf_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Blowfish with CBC mode.
**Example:**

```
Dim key As String = "Hello World"
Dim iv As MemoryBlock = "12345678"

// encrypt it
Dim c As CipherMBS = CipherMBS.bf_cbc

Call c.EncryptInit(key, iv)
Dim Input As String = "Hello World. Just a test."

Dim encrypted As String = c.ProcessString(Input) + c.FinalizeAsString

// decrypt it
Dim d As CipherMBS = CipherMBS.bf_cbc

Call d.DecryptInit(key, iv)
Dim unencrypted As String = d.ProcessString(encrypted) + d.FinalizeAsString

break // check in debugger
```

### 79.16.71 bf_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Blowfish with CFB64 mode.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.bf_cfb64
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.bf_cfb64
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred via "+c.Name+" as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.72 bf_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Blowfish with ECB mode.

### 79.16.73 bf_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Blowfish with OFB mode.

### 79.16.74 BytesToKey(cipher as CipherMBS, digest as DigestMBS, Salt as MemoryBlock, InputKey as Memoryblock, IterationCount as Integer, byref OutputKey as memoryblock, byref IV as memoryblock) as boolean

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Derives a key and IV from a given input data.
**Notes:** Returns true on success or false on failure.

BytesToKey() derives a key and IV from various parameters. type is the cipher to derive the key and IV for. md is the message digest to use. The salt paramter is used as a salt in the derivation: it should point to an 8 byte buffer or nil if no salt is used. data is a buffer containing datal bytes which is used to derive the keying data. count is the iteration count to use. The derived key and IV will be written to key and iv respectively.

A typical application of this function is to derive keying material for an encryption algorithm from a password in the data parameter.

Increasing the count parameter slows down the algorithm which makes it harder for an attacker to peform a brute force attack using a large number of candidate passwords.

If the total key and IV length is less than the digest length and MD5 is used then the derivation algorithm is compatible with PKCS#5 v1.5 otherwise a non standard extension is used to derive the extra data.

Newer applications should use more standard algorithms such as PBKDF2 as defined in PKCS#5v2.1 for key derivation.

Key Derivation Algorithm

The key and IV is derived by concatenating D_1, D_2, etc until enough data is available for the key and IV. D_i is defined as:

D_i = HASH^count(D_(i-1) | | data | | salt)

where | | denotes concatentaion, D_0 is empty, HASH is the digest algorithm in use, HASH^1(data) is simply HASH(data), HASH^2(data) is HASH(HASH(data)) and so on.

The initial bytes are used for the key and the subsequent bytes for the IV.

### 79.16.75 camellia_128_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.76 camellia_128_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.77 camellia_128_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.78 camellia_128_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.79 camellia_128_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.80 camellia_128_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.81 camellia_128_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.82 camellia_192_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.83 camellia_192_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.84 camellia_192_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.85 camellia_192_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.86 camellia_192_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.87 camellia_192_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.88 camellia_192_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.89 camellia_256_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.camellia_256_cbc
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.camellia_256_cbc
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred via "+c.Name+" as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.90 camellia_256_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.91 camellia_256_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.92 camellia_256_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.93 camellia_256_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.94 camellia_256_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.95 camellia_256_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.96 cast5_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.97 cast5_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.98 cast5_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.99 cast5_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.100 chacha20 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.101 chacha20_poly1305 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.102 CipherByName(name as string) as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds a cipher by name.
**Notes:** Possible names:
AES-128-CFB, BF-CBC, BF-CFB, BF-ECB, BF-OFB, AES-128-CBC, id-aes128-CCM, AES-128-CFB1, AES-128-CFB8, AES-128-CTR, AES-128-ECB, id-aes128-GCM, AES-128-OFB, AES-128-XTS, AES-192-CBC, id-aes192-CCM, AES-192-CFB1, AES-192-CFB8, AES-192-CFB, AES-192-CTR, AES-192-ECB, id-aes192-GCM, AES-192-OFB, AES-256-CBC, id-aes256-CCM, AES-256-CFB1, AES-256-CFB8, AES-256-

CFB, AES-256-CTR, AES-256-ECB, id-aes256-GCM, AES-256-OFB, AES-256-XTS, CAMELLIA-128-CBC, CAMELLIA-128-CFB1, CAMELLIA-128-CFB8, CAMELLIA-128-CFB, CAMELLIA-128-ECB, CAMELLIA-128-OFB, CAMELLIA-192-CBC, CAMELLIA-192-CFB1, CAMELLIA-192-CFB8, CAMELLIA-192-CFB, CAMELLIA-192-ECB, CAMELLIA-192-OFB, CAMELLIA-256-CBC, CAMELLIA-256-CFB1, CAMELLIA-256-CFB8, CAMELLIA-256-CFB, CAMELLIA-256-ECB, CAMELLIA-256-OFB, CAST5-CBC, CAST5-CFB, CAST5-ECB, CAST5-OFB, DES-EDE, DES-EDE-CBC, DES-EDE-CFB, DES-EDE, DES-EDE-OFB, DES-EDE3, DES-EDE3-CBC, DES-EDE3-CFB1, DES-EDE3-CFB8, DES-EDE3-CFB, DES-EDE3, DES-EDE3-OFB, RC2-40-CBC, RC2-64-CBC, RC2-CBC, RC2-CFB, RC2-ECB, RC2-OFB, RC4, RC4-40, RC4-HMAC-MD5, IDEA-CFB, IDEA-ECB, IDEA-OFB, IDEA-CBC, DES-CFB1, DES-CFB8, DES-CFB, DES-OFB, DES-ECB, DES-CBC or DESX-CBC.

### 79.16.103 CipherInit(key as memoryblock, IV as memoryblock, Encrypt as boolean) as Boolean

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the cipher for encryption or decryption.
**Notes:** We added for 17.3 a new boolean result:

Returns true in case of success and key length is okay.
Returns false in case of failures like out of memory, wrong key length.

Even if key length is wrong, we initialize (as with older versions before) but may crop the key length to default length.
AES 128 uses 16 byte key length, AES 256 uses 32 byte key length.
Key and IV are both filled with zeros to reach the minimum length.

key: The key to use.
IV: Optional, the initial vector.

You can use IVLength and KeyLength properties to learn how long those should be.

### 79.16.104 CipherNames as String()

MBS Encryption Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all ciphers.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = CipherMBS.CipherNames
dim DigestNames() as string = DigestMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

Current list:

aes-128-cbc, aes-128-cbc-hmac-sha1, aes-128-ccm, aes-128-cfb, aes-128-cfb1, aes-128-cfb8, aes-128-ctr, aes-128-ecb, aes-128-gcm, aes-128-ocb, aes-128-ofb, aes-128-xts, aes-192-cbc, aes-192-ccm, aes-192-cfb, aes-192-cfb1, aes-192-cfb8, aes-192-ctr, aes-192-ecb, aes-192-gcm, aes-192-ocb, aes-192-ofb, aes-256-cbc, aes-256-cbc-hmac-sha1, aes-256-ccm, aes-256-cfb, aes-256-cfb1, aes-256-cfb8, aes-256-ctr, aes-256-ecb, aes-256-gcm, aes-256-ocb, aes-256-ofb, aes-256-xts, aes128, aes128-wrap, aes192, aes192-wrap, aes256, aes256-wrap, aria-

128-cbc, aria-128-ccm, aria-128-cfb, aria-128-cfb1, aria-128-cfb8, aria-128-ctr, aria-128-ecb, aria-128-gcm, aria-128-ofb, aria-192-cbc, aria-192-ccm, aria-192-cfb, aria-192-cfb1, aria-192-cfb8, aria-192-ctr, aria-192-ecb, aria-192-gcm, aria-192-ofb, aria-256-cbc, aria-256-ccm, aria-256-cfb, aria-256-cfb1, aria-256-cfb8, aria-256-ctr, aria-256-ecb, aria-256-gcm, aria-256-ofb, aria128, aria192, aria256, bf, bf-cbc, bf-cfb, bf-ecb, bf-ofb, blowfish, camellia-128-cbc, camellia-128-cfb, camellia-128-cfb1, camellia-128-cfb8, camellia-128-ctr, camellia-128-ecb, camellia-128-ofb, camellia-192-cbc, camellia-192-cfb, camellia-192-cfb1, camellia-192-cfb8, camellia-192-ctr, camellia-192-ecb, camellia-192-ofb, camellia-256-cbc, camellia-256-cfb, camellia-256-cfb1, camellia-256-cfb8, camellia-256-ctr, camellia-256-ecb, camellia-256-ofb, camellia128, camellia192, camellia256, cast, cast-cbc, cast5-cbc, cast5-cfb, cast5-ecb, cast5-ofb, chacha20, chacha20-poly1305, des, des-cbc, des-cfb, des-cfb1, des-cfb8, des-ecb, des-ede, des-ede-cbc, des-ede-cfb, des-ede-ecb, des-ede-ofb, des-ede3, des-ede3-cbc, des-ede3-cfb, des-ede3-cfb1, des-ede3-cfb8, des-ede3-ecb, des-ede3-ofb, des-ofb, des3, des3-wrap, desx, desx-cbc, id-aes128-CCM, id-aes128-GCM, id-aes128-wrap, id-aes128-wrap-pad, id-aes192-CCM, id-aes192-GCM, id-aes192-wrap, id-aes192-wrap-pad, id-aes256-CCM, id-aes256-GCM, id-aes256-wrap, id-aes256-wrap-pad, id-smime-alg-CMS3DESwrap, idea, idea-cbc, idea-cfb, idea-ecb, idea-ofb, rc2, rc2-128, rc2-40, rc2-40-cbc, rc2-64, rc2-64-cbc, rc2-cbc, rc2-cfb, rc2-ecb, rc2-ofb, rc4, rc4-40, rc4-hmac-md5, RC5, rc5-cbc, rc5-cfb, rc5-ecb, rc5-ofb, seed, seed-cbc, seed-cfb, seed-ecb, seed-ofb, sm4, sm4-cbc, sm4-cfb, sm4-ctr, sm4-ecb, sm4-ofb

### 79.16.105 Clear

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the current state.

### 79.16.106 Constructor

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 79.16.107 Control(Type as Integer, Arg as Integer, Data as Ptr)

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows various cipher specific parameters to be determined and set.
**Notes:** See OpenSSL documentation for EVP_CIPHER_CTX_ctrl function.

### 79.16.108 DecryptInit(key as memoryblock, IV as memoryblock = nil) as Boolean

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the cipher for decrypting.
**Example:**

```
dim key as string = "mysecretkey"
dim encrypted as string = "6IcB9bpDwOjjONErhYQ6c7+Fb4qszsUNZVU0iThLYqOu7chJ7MG2nwSpRBUY0ZC3"

encrypted = DecodeBase64(encrypted)

dim c as CipherMBS = CipherMBS.aes_128_cbc
call c.DecryptInit key

dim s as string = c.ProcessString(Encrypted)+c.FinalizeAsString

Break // "In welcher Stadt steht das Bundeshaus?" is now in s.
```

**Notes:** We added for 17.3 a new boolean result:

Returns true in case of success and key length is okay.
Returns false in case of failures like out of memory, wrong key length.

Even if key length is wrong, we initialize (as with older versions before) but may crop the key length to default length.
AES 128 uses 16 byte key length, AES 256 uses 32 byte key length.
Key and IV are both filled with zeros to reach the minimum length.

key: The key to use.
IV: Optional, the initial vector.

You can use IVLength and KeyLength properties to learn how long those should be.

For AES the length of the key defines whether you get 128, 192 or 256 bit encryption. Pass some other key length will return an error. Best is usually to put a hashing algorithm before to make sure the key has the required bit length, e.g. use SHA256MBS class.

### 79.16.109 desx_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DESX algorithm in CBC mode.

### 79.16.110 des_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in CBC.

### 79.16.111 des_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in CFB.

### 79.16.112 des_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in CFB.

### 79.16.113 des_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in CFB.

### 79.16.114 des_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in ECB.

### 79.16.115 des_ede as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.116 des_ede3 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.117 des_ede3_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.118 des_ede3_cfb1 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.119 des_ede3_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.120 des_ede3_cfb8 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.121 des_ede3_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.122 des_ede3_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.123 des_ede3_wrap as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.124 des_ede_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.125 des_ede_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.126 des_ede_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.127 des_ede_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.128 des_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for DES in OFB.

### 79.16.129 EncryptInit(key as memoryblock, IV as memoryblock = nil) as Boolean

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the cipher for encrypting.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_128_cfb128
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output as string = c.ProcessString(data)
output = output + c.FinalizeAsString

MsgBox EncodeHex(output)
```

**Notes:** We added for 17.3 a new boolean result:

Returns true in case of success and key length is okay.
Returns false in case of failures like out of memory, wrong key length.

Even if key length is wrong, we initialize (as with older versions before) but may crop the key length to default length.
AES 128 uses 16 byte key length, AES 256 uses 32 byte key length.
Key and IV are both filled with zeros to reach the minimum length.

key: The key to use.
IV: Optional, the initial vector.

You can use IVLength and KeyLength properties to learn how long those should be.

For AES the length of the key defines whether you get 128, 192 or 256 bit encryption. Pass some other key length will return an error. Best is usually to put a hashing algorithm before to make sure the key has the

required bit length, e.g. use SHA256MBS class.

### 79.16.130 FinalizeAsMemory as memoryblock

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes en/decryption and returns last data.

### 79.16.131 FinalizeAsString as String

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes en/decryption and returns last data.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_128_cfb128
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output as string = c.ProcessString(data)
output = output + c.FinalizeAsString

MsgBox EncodeHex(output)
```

**Notes:** Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.

### 79.16.132 GetGCMTag(Size as Integer = 16) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries tag value for AES GCM.
**Example:**

```
Dim c As CipherMBS = CipherMBS.aes_256_gcm

// encrypt it
Dim key As String = "12345678"
```

```
Call c.EncryptInit(key)

Dim p1 As String = c.ProcessString("Hello World")
Dim p2 As String = c.FinalizeAsString
Dim encrypted As String = p1 + p2
Dim TagValue As MemoryBlock = c.GetGCMTag

Break

// decrypt it
Dim d As CipherMBS = CipherMBS.aes_256_gcm
Call d.DecryptInit key

Dim d1 As String = d.ProcessString(encrypted)

d.SetGCMTag TagValue

Dim d2 As String = d.FinalizeAsString
Dim decrypted As String = d1 + d2

Break
```

**Notes:** Calls the Control method with type EVP_CTRL_GCM_GET_TAG (16).
Raises exception in case of an error.

### 79.16.133 idea_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for IDEA encryption algorithm in CBC.

### 79.16.134 idea_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for IDEA encryption algorithm in CFB.

### 79.16.135 idea_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for IDEA encryption algorithm in ECB.

### 79.16.136 idea_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for IDEA encryption algorithm in OFB.

### 79.16.137 MaxBlockLength as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum possible block length size for any cipher.

### 79.16.138 MaxIVLength as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum possible IV vector size for any cipher.

### 79.16.139 MaxKeyLength as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum possible key length size for any cipher.

### 79.16.140 ProcessFile(InputFile as FolderItem, OutputFile as FolderItem) as boolean

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes content of file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks and write to output file.
Returns true on success or false on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.

### 79.16.141 ProcessMemory(data as memoryblock) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes data in a memory block.
**Notes:** due to block sizes, the result may be longer or shorter than the input size.

### 79.16.142 ProcessString(data as String) as string

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes data in a string.
**Example:**

```
dim key as string = "mysecretkey"
dim encrypted as string = "6IcB9bpDwOjjONErhYQ6c7+Fb4qszsUNZVU0iThLYqOu7chJ7MG2nwSpRBUY0ZC3"

encrypted = DecodeBase64(encrypted)

dim c as CipherMBS = CipherMBS.aes_128_cbc
call c.DecryptInit key

dim s as string = c.ProcessString(Encrypted)+c.FinalizeAsString

Break // "In welcher Stadt steht das Bundeshaus?" is now in s.
```

**Notes:** due to block sizes, the result may be longer or shorter than the input size.

Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.

### 79.16.143 rc2_40_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.144 rc2_64_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.145 rc2_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.rc2_cbc
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.rc2_cbc
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.146 rc2_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.rc2_cfb64
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString
```

```
CIV = nil
c = CipherMBS.rc2_cfb64
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.147 rc2_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

dim c as CipherMBS = CipherMBS.rc2_ecb
call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

CIV = nil
c = CipherMBS.rc2_ecb
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)+EndOfLine+"Decrypted: "+output2
```

### 79.16.148 rc2_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc2_ofb
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc2_ofb
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

### 79.16.149 rc4 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc4
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc4
CIV = nil

call c.DecryptInit Ckey, CIV
```

```
dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

### 79.16.150 rc4_40 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc4_40
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc4_40
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

### 79.16.151 rc4_hmac_md5 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc4_hmac_md5
dim CKey as MemoryBlock = "1234567812345678"
```

```
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc4_hmac_md5
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

### 79.16.152 rc5_32_12_16_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc5_32_12_16_cbc
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc5_32_12_16_cbc
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString
```

```
MsgBox "Decrypted: "+output2
```

**Notes:** RC5 with CBC. 32 bit word size, 12 rounds, 16 byte key.

### 79.16.153 rc5_32_12_16_cfb64 as CipherMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc5_32_12_16_cfb64
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc5_32_12_16_cfb64
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

**Notes:** RC5 with CFB64. 32 bit word size, 12 rounds, 16 byte key.

### 79.16.154 rc5_32_12_16_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc5_32_12_16_ecb
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc5_32_12_16_ecb
CIV = nil

call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

**Notes:** RC5 with ECB. 32 bit word size, 12 rounds, 16 byte key.

### 79.16.155 rc5_32_12_16_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.
**Example:**

```
dim c as CipherMBS = CipherMBS.rc5_32_12_16_ofb
dim CKey as MemoryBlock = "1234567812345678"
dim CIV as MemoryBlock
dim data as string = "Hello World. Just a test!"

call c.EncryptInit Ckey, CIV

dim output1 as string = c.ProcessString(data)
output1 = output1 + c.FinalizeAsString

MsgBox "Encrypred as hex: "+EncodeHex(output1)

c = CipherMBS.rc5_32_12_16_ofb
CIV = nil
```

```
call c.DecryptInit Ckey, CIV

dim output2 as string = c.ProcessString(output1)
output2 = output2 + c.FinalizeAsString

MsgBox "Decrypted: "+output2
```

**Notes:** RC5 with OFB. 32 bit word size, 12 rounds, 16 byte key.

### 79.16.156 seed_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cipher for a Seed CBC.

### 79.16.157 seed_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Seed cipher for CFB128 mode.

### 79.16.158 seed_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cipher for seed ECB.

### 79.16.159 seed_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Seed cipher for OFB mode.

### 79.16.160 SetGCMTag(Data as MemoryBlock)

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets tag value for AES GCM.
**Example:**

```
Dim c As CipherMBS = CipherMBS.aes_256_gcm

// encrypt it
Dim key As String = "12345678"

Call c.EncryptInit(key)

Dim p1 As String = c.ProcessString("Hello World")
Dim p2 As String = c.FinalizeAsString
Dim encrypted As String = p1 + p2
Dim TagValue As MemoryBlock = c.GetGCMTag

Break

// decrypt it
Dim d As CipherMBS = CipherMBS.aes_256_gcm
Call d.DecryptInit key

Dim d1 As String = d.ProcessString(encrypted)

d.SetGCMTag TagValue

Dim d2 As String = d.FinalizeAsString
Dim decrypted As String = d1 + d2

Break
```

**Notes:** Calls the Control method with type EVP_CTRL_GCM_SET_TAG (17).
Raises exception in case of an error.

### 79.16.161 SetPadding(padding as boolean)

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables padding.
**Notes:** On by default.

### 79.16.162 sm4_cbc as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.163 sm4_cfb128 as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.164 sm4_ctr as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.165 sm4_ecb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.166 sm4_ofb as CipherMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher.

### 79.16.167 Properties

### 79.16.168 BlockSize as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the block size for this cipher.
**Notes:** (Read only property)

### 79.16.169 Encrypting as Boolean

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the class is encrypting or decrypting.
**Notes:** True if encrypting or false for decrypting.
(Read only property)

### 79.16.170 Flags as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the flags for the cipher.
**Notes:** (Read only property)

### 79.16.171 HasVariableKeyLength as Boolean

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this cipher has variable key length.
**Notes:** (Read only property)

### 79.16.172 IVLength as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the size of the initialization vector.
**Notes:** (Read only property)

### 79.16.173 KeyLength as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key length.
**Notes:** (Read and Write property)

### 79.16.174 Mode as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries cipher mode.
**Notes:** (Read only property)

### 79.16.175 Name as String

MBS Encryption Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the cipher engine.
**Notes:** (Read only property)

### 79.16.176 Padding as Boolean

MBS Encryption Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to apply padding or not.
**Example:**

```
dim c as CipherMBS = CipherMBS.aes_256_ctr

call c.EncryptInit "Hello"

MsgBox "default: "+str(c.Padding)
c.Padding = false

MsgBox "set to false: "+str(c.Padding)
c.Padding = true

MsgBox "set to true: "+str(c.Padding)
```

**Notes:** On by default.
(Read and Write property)

### 79.16.177 RC2KeyBits as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bits for RC2.
**Notes:** (Read and Write property)

### 79.16.178 RC5Rounds as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of rounds for RC5.
**Notes:** (Read and Write property)

### 79.16.179 ZeroPaddingKey as Boolean

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to do zero padding for the key to reach minimum/default length.
**Example:**

```
Var AESCipher As CipherMBS = CipherMBS.aes_128_cbc
Var BFCipher As CipherMBS = CipherMBS.bf_cbc
Break // look in debugger
```

**Notes:** Defaults to true, if key is not of variable length for the cipher.
e.g. AES 128 has a 16 byte key size, so we fill up with zeros to reach that.
(Read and Write property)

## 79.17 class DigestMBS

### 79.17.1 class DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OpenSSL class for calculating hashes.
**Example:**

```
dim d as DigestMBS = DigestMBS.MD5
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr3
- MacOSX plugin for iOS
- News from the MBS Xojo Plugins Version 20.3
- MBS Xojo Plugins, version 20.3pr5
- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins, version 18.5pr1
- Doing hash or encryption on several CPUs in Xojo
- MBS Xojo / Real Studio plug-ins in version 13.5

**Xojo Developer Magazine**

- 21.5, page 9: News
- 12.1, page 9: News

### 79.17.2 Methods

### 79.17.3 blake2b512 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Black 2b 512.
**Example:**

```
Dim d As DigestMBS = DigestMBS.blake2b512

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// A8ADD4BDDDFD93E4877D2746E62817B116364A1FA7BC148D95090BC7333B3673F82401CF7AA2E4CB1ECD90296E3
```

**Notes:** see
https://en.wikipedia.org/wiki/BLAKE_(hash_function)

### 79.17.4 blake2s256 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for Black 2s 256.
**Example:**

```
Dim d As DigestMBS = DigestMBS.blake2s256

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// 606BEEEC743CCBEFF6CBCDF5D5302AA855C256C29B88C8ED331EA1A6BF3C8812
```

### 79.17.5 Clear

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the current state.

### 79.17.6 Constructor

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 79.17.7 DigestByName(name as string) as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a digest by name.
**Example:**

```
dim d as DigestMBS = DigestMBS.DigestByName("md5")
MsgBox str(d.Size)
```

**Notes:** Returns nil if name is not registered.
May need string to be in upper case.

### 79.17.8 DigestNames as String()

MBS Encryption Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all digest algorithms.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = CipherMBS.CipherNames
dim DigestNames() as string = DigestMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

Current list:

blake2b512, blake2s256, id-rsassa-pkcs1-v1_5-with-sha3-224, id-rsassa-pkcs1-v1_5-with-sha3-256, id-rsassa-pkcs1-v1_5-with-sha3-384, id-rsassa-pkcs1-v1_5-with-sha3-512, md4, md4WithRSAEncryption, md5, md5-sha1, md5WithRSAEncryption, mdc2, mdc2WithRSA, ripemd, ripemd160, ripemd160WithRSA, rmd160, RSA-MD4, RSA-MD5, RSA-MDC2, RSA-RIPEMD160, RSA-SHA1, RSA-SHA1-2, RSA-SHA224, RSA-SHA256, RSA-SHA3-224, RSA-SHA3-256, RSA-SHA3-384, RSA-SHA3-512, RSA-SHA384, RSA-SHA512, RSA-SHA512/224, RSA-SHA512/256, RSA-SM3, sha1, sha1WithRSAEncryption, sha224, sha224WithRSAEncryption, sha256, sha256WithRSAEncryption, sha3-224, sha3-256, sha3-384, sha3-512, sha384, sha384WithRSAEncryption, sha512, sha512-224, sha512-224WithRSAEncryption, sha512-256, sha512-256WithRSAEncryption, sha512WithRSAEncryption, shake128, shake256, sm3, sm3WithRSAEncryption, ssl3-md5, ssl3-sha1, whirlpool

### 79.17.9 Final as memoryblock

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the hash and returns it.

### 79.17.10 FinalText as String

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finalizes the hash and returns it.
**Notes:** Returns text with hex encoding.

### 79.17.11 MD5 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for MD5.
**Example:**

```
dim d as DigestMBS = DigestMBS.MD5
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.12 MDC2 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for MDC2.
**Example:**

```
dim d as DigestMBS = DigestMBS.MDC2
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.13 Process(data as memoryblock)

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds more data to the hash.
See also:


- 79.17.14 Process(data as string) 13426
- 79.17.15 Process(file as FolderItem) as boolean 13426


### 79.17.14 Process(data as string)

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds more data to the hash.
See also:


- 79.17.13 Process(data as memoryblock) 13425
- 79.17.15 Process(file as FolderItem) as boolean 13426


### 79.17.15 Process(file as FolderItem) as boolean

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes content of file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks.
Returns true on success or false on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.
See also:


- 79.17.13 Process(data as memoryblock) 13425
- 79.17.14 Process(data as string) 13426


### 79.17.16 RipeMD160 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for RipeMD160.
**Example:**

```
dim d as DigestMBS = DigestMBS.RipeMD160
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.17 SHA1 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 1.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA1
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.18 SHA224 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 224.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA224
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.19 SHA256 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 256.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA256
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.20 SHA384 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 384.

**Example:**

```
dim d as DigestMBS = DigestMBS.SHA384
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.21 SHA3_224 as DigestMBS

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA-3 with 224 bits.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA3_224
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.22 SHA3_256 as DigestMBS

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA-3 with 256 bits.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA3_256
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.23 SHA3_384 as DigestMBS

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA-3 with 384 bits.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA3_384
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.24 SHA3_512 as DigestMBS

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA-3 with 512 bits.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA3_512
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.25 SHA512 as DigestMBS

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA512.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA512
d.Process "Hello World"
dim result as string = EncodeHex(d.Final)
MsgBox result
```

### 79.17.26 SHA512_224 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 512 with 224 bit.
**Example:**

```
Dim d As DigestMBS = DigestMBS.SHA512_224

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// 944CD2847FB54558D4775DB0485A50003111C8E5DAA63FE722C6AA37
```

### 79.17.27 SHA512_256 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for SHA 512 with 256 bit.
**Example:**

```
Dim d As DigestMBS = DigestMBS.SHA512_256

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// DD9D67B371519C339ED8DBD25AF90E976A1EEEFD4AD3D889005E532FC5BEF04D
```

### 79.17.28 shake128 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for shake 128 bit.
**Example:**

```
Dim d As DigestMBS = DigestMBS.shake128

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// F4202E3C5852F9182A0430FD8144F0A7
```

### 79.17.29 shake256 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for shake 256.
**Example:**

```
Dim d As DigestMBS = DigestMBS.shake256

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
```

// 2F671343D9B2E1604DC9DCF0753E5FE15C7C64A0D283CBBF722D411A0E36F6CA

### 79.17.30 sm3 as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for sm3.
**Example:**

```
Dim d As DigestMBS = DigestMBS.sm3

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// 5FDFE814B8573CA021983970FC79B2218C9570369B4859684E2E4C3FC76CB8EA
```

### 79.17.31 whirlpool as DigestMBS

MBS Encryption Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the cipher for whirlpool.
**Example:**

```
Dim d As DigestMBS = DigestMBS.whirlpool

d.Process "The quick brown fox jumps over the lazy dog"

Dim hash As String = d.FinalText

Break
// B97DE512E91E3828B40D2B0FDCE9CEB3C4A71F9BEA8D88E75C4FA854DF36725FD2B52EB6544ED-
CACD6F8BEDDFEA403CB55AE31F03AD62A5EF54E42EE82C3FB35
```

**Notes:** see
https://en.wikipedia.org/wiki/Whirlpool_(hash_function)

### 79.17.32 Properties

### 79.17.33 BlockSize as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries block size.
**Example:**

```
dim d as DigestMBS = DigestMBS.DigestByName("md5")
MsgBox str(d.BlockSize)
```

**Notes:** (Read only property)

### 79.17.34 Name as String

MBS Encryption Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the digest engine.
**Notes:** (Read only property)

### 79.17.35 Size as Integer

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries size of digest.
**Example:**

```
dim d as DigestMBS = DigestMBS.SHA512
MsgBox str(d.Size)
```

**Notes:** (Read only property)

# 79.18 class ECDHEMBS

## 79.18.1 class ECDHEMBS

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for ECDH key creation.
**Notes:** Elliptic Curve Diffie Hellman (ECDH) is an Elliptic Curve variant of the standard Diffie Hellman algorithm. See Elliptic Curve Cryptography for an overview of the basic concepts behind Elliptic Curve algorithms. ECDH is used for the purposes of key agreement.

Constructor to create and map functions into the struct.
EC_Curve_NID An Elliptical Curve ID specified in the openssl header <openssl/obj_mac.h>. (e.g. NID_X9_62_prime256v1)
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr5
- MBS Xojo Plugins, version 17.5pr4
- MBS Xojo Plugins, version 17.2pr2
- MBS Xojo / Real Studio Plugins, version 14.2pr10
- MBS Xojo / Real Studio plug-ins in version 13.4
- MBS Xojo / Real Studio Plugins, version 13.4pr2

**Xojo Developer Magazine**

- 16.1, page 10: News
- 11.6, page 8: News

## 79.18.2 Methods

## 79.18.3 Constructor(CurveID as Integer)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Creates a new key with the given CurveID, e.g. NID_X9_62_prime256v1.

### 79.18.4 DeriveSecretKey(peerKey as string) as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** After receiving a public key from your peer, derive the secret key by combining the peer key with yours.
**Notes:** Returns a string (i.e. shared secret) that is the result of the EC DHE secret derivation.
Never use a derived secret directly. Typically it is passed through some hash function to produce a key (e.g. SHA512).
peerKey: A string containing the peer's public key.

### 79.18.5 Destructor

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** Public keys and shared secrets should be copied before freeing memory as ecdhe owns the public key and shared secret.

### 79.18.6 LastError as String

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error string.

### 79.18.7 PublicKey as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the public key.
**Example:**

```
dim EC_Curve_ID as Integer = 415 // NID_X9_62_prime256v1
dim ec_dhe as new ECDHEMBS(EC_Curve_ID)
dim publicKey as string = ec_dhe.PublicKey

MsgBox publicKey
```

**Notes:** Returns a string (i.e. public key) to be shared with your peer; this can be accomplished over the network or by file.
Encoding is PEM, so you can write to a file with .pem file name extension.

### 79.18.8 Properties

### 79.18.9 CurveID as Integer

MBS Encryption Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Curve ID used in constructor.
**Notes:** (Read only property)

### 79.18.10 CurveIDName as String

MBS Encryption Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The textual name of the used curve ID.
**Notes:** (Read only property)

### 79.18.11 ParamsInfo as String

MBS Encryption Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Debug Information on the parameters used.
**Notes:** (Read only property)

### 79.18.12 PeerKeyInfo as String

MBS Encryption Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Debug Information on the peer key used.
**Notes:** (Read only property)

### 79.18.13 PrivateKeyInfo as String

MBS Encryption Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Debug Information on the private key used.
**Notes:** (Read only property)

### 79.18.14 Constants

Curve IDs

| Constant | Value | Description |
|---|---|---|
| NID_secp112r1 | 704 | |
| NID_secp112r2 | 705 | |
| NID_secp128r1 | 706 | |
| NID_secp128r2 | 707 | |
| NID_secp160k1 | 708 | |
| NID_secp160r1 | 709 | |
| NID_secp160r2 | 710 | |
| NID_secp192k1 | 711 | |
| NID_secp224k1 | 712 | |
| NID_secp224r1 | 713 | |
| NID_secp256k1 | 714 | |
| NID_secp384r1 | 715 | |
| NID_secp521r1 | 716 | |
| NID_sect113r1 | 717 | |
| NID_sect113r2 | 718 | |
| NID_sect131r1 | 719 | |
| NID_sect131r2 | 720 | |
| NID_sect163k1 | 721 | |
| NID_sect163r1 | 722 | |
| NID_sect163r2 | 723 | |
| NID_sect193r1 | 724 | |
| NID_sect193r2 | 725 | |
| NID_sect233k1 | 726 | |
| NID_sect233r1 | 727 | |
| NID_sect239k1 | 728 | |
| NID_sect283k1 | 729 | |
| NID_sect283r1 | 730 | |
| NID_sect409k1 | 731 | |
| NID_sect409r1 | 732 | |
| NID_sect571k1 | 733 | |
| NID_sect571r1 | 734 | |
| NID_wap_wsg_idm_ecid_wtls1 | 735 | |
| NID_wap_wsg_idm_ecid_wtls10 | 743 | |
| NID_wap_wsg_idm_ecid_wtls11 | 744 | |
| NID_wap_wsg_idm_ecid_wtls12 | 745 | |
| NID_wap_wsg_idm_ecid_wtls3 | 736 | |
| NID_wap_wsg_idm_ecid_wtls4 | 737 | |
| NID_wap_wsg_idm_ecid_wtls5 | 738 | |
| NID_wap_wsg_idm_ecid_wtls7 | 740 | |
| NID_wap_wsg_idm_ecid_wtls8 | 741 | |
| NID_wap_wsg_idm_ecid_wtls9 | 742 | |
| NID_X9_62_c2pnb163v1 | 684 | |
| NID_X9_62_c2pnb163v2 | 685 | |
| NID_X9_62_c2pnb163v3 | 686 | |
| NID_X9_62_c2pnb176v1 | 687 | |
| NID_X9_62_c2pnb208w1 | 693 | |
| NID_X9_62_c2pnb272w1 | 699 | |
| NID_X9_62_c2pnb304w1 | 700 | |
| NID_X9_62_c2pnb368w1 | 702 | |
| NID_X9_62_c2tnb191v1 | 688 | |
| NID_X9_62_c2tnb191v2 | 689 | |
| NID_X9_62_c2tnb191v3 | 690 | |
| NID_X9_62_c2tnb239v1 | 694 | |
| NID_X9_62_c2tnb239v2 | 695 | |
| NID_X9_62_c2tnb239v3 | 696 | |
| NID_X9_62_c2tnb359v1 | 701 | |
| NID_X9_62_c2tnb431r1 | 703 | |
| NID_X9_62_prime256v1 | 415 | |

## 79.19 class ECKeyMBS

### 79.19.1 class ECKeyMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for Elliptic Curve Digital Signature Algorithm.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

MsgBox key.Description
```

**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr6
- MBS Xojo / Real Studio plug-ins in version 15.4

### 79.19.2 Methods

### 79.19.3 BuiltInCurves as Dictionary

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries built in curves.
**Example:**

```
// show curve IDs with description in listbox
dim d as Dictionary = ECKeyMBS.BuiltInCurves

for each key as Variant in d.keys
Listbox1.AddRow key, d.Value(key)
next
```

**Notes:** The dictionary returned has as key the ID and the description as value.

The list looks like this:

### 79.19.4 Constructor

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 79.19.5 Copy as ECKeyMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the key.

### 79.19.6 Generate as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates new key and stores in the current object.
**Notes:** Returns true on success or false on failure.

### 79.19.7 GetPrivateKey(Hex as Boolean) as String

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries priv key.
**Example:**

```
// make a key
Const NID_secp192k1 = 711
Dim e As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

// show private key
MsgBox e.GetPrivateKey(True)+_
EndOfLine+_
e.GetPrivateKey(False)
```

**Notes:** The private key is a big number, which can be returned as decimal or hexadecimal value.

### 79.19.8 GetPublicKey(byref x as String, byref y as String, Hex as Boolean) as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries X and Y of public key.
**Example:**

```
// make a key
Const NID_secp192k1 = 711
Dim e As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

// show public key
dim x,y as string
If e.GetPublicKey(x, y, False) Then
MsgBox x+EndOfLine+y
End If
```

**Notes:** The public key is made up with two big numbers, which can be returned as decimal or hexadecimal value.
Returns true on success or false on failure.

### 79.19.9 GetPublicKeyPoint as String

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries Public key as hex string.
**Example:**

```
// make a key
Const NID_secp192k1 = 711
Dim e As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

// show public key
msgbox e.GetPublicKeyPoint
```

**Notes:** Can be queried to save/send and later be assigned with SetPublicKeyPoint.

### 79.19.10 KeyByCurveName(CurveID as Integer, Generate as Boolean = true) as ECKeyMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates a new pair of private and public keys.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

MsgBox key.Description
```

**Notes:** You can use ReadPrivateKey and ReadPublicKey functions to get the keys.
If Generate is false, we create an empty object with private and public keys.

Some possible curve IDs:

### 79.19.11 OpenPrivateKey(Data as String) as ECKeyMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a private key.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim PrivateKeyData as string = key.PrivateKey

// read again
dim pub as ECKeyMBS = ECKeyMBS.OpenPrivateKey(PrivateKeyData)
MsgBox pub.Description
```

**Notes:** The key is in binary format and you may need to use EncodeBase64/DecodeBase64.

### 79.19.12 OpenPublicKey(Data as String, CurveID as Integer) as ECKeyMBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a public key.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim pubKeyData as string = key.PublicKey

// read again
```

```
dim pub as ECKeyMBS = ECKeyMBS.OpenPublicKey(pubKeyData, NID_secp192k1)
MsgBox pub.Description
```

### 79.19.13 PrivateKey as String

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the priv key.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim Data as string = key.PrivateKey
MsgBox EncodeBase64(data)
```

### 79.19.14 PublicKey as String

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the public key.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim Data as string = key.PublicKey
MsgBox EncodeBase64(data)
```

### 79.19.15 SetPrivateKey(Value as String, Hex as Boolean) as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the key.
**Example:**

```
// make a key
Const NID_secp192k1 = 711
Dim e As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

MsgBox e.Description

// get hex
```

```
Dim pubk As String = e.GetPublicKeyPoint
Dim priv As String = e.GetPrivateKey(False)


// make new empty key and put in the data
Dim ee As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1, False)

If ee.SetPrivateKey(priv, False) Then
If ee.SetPublicKeyPoint(pubk) Then
MsgBox ee.Description
Else
Break // failed?
End If
Else
Break // failed?
End If
```

**Notes:** Returns true on success or false on failure.

### 79.19.16 SetPublicKey(x as String, y as String, Hex as Boolean) as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets X and Y of public key.
**Example:**

```
// make a key
Const NID_secp192k1 = 711
Dim e As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

MsgBox e.Description

// get hex
Dim pubk As String = e.GetPublicKeyPoint
Dim priv As String = e.GetPrivateKey(False)


// make new empty key and put in the data
Dim ee As ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1, False)

If ee.SetPrivateKey(priv, False) Then
If ee.SetPublicKeyPoint(pubk) Then
MsgBox ee.Description
Else
Break // failed?
```

```
End If
Else
Break // failed?
End If
```

**Notes:** Returns true on success or false on failure.

### 79.19.17 SetPublicKeyPoint(Value as String) as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets public key.
**Notes:** Returns true on success or false on failure.

### 79.19.18 Sign(Data as String) as String

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs the given data.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim text as string = "Hello World"
dim data as string = SHA512MBS.Hash(text)
dim sig as string = key.Sign(data)

if key.Verify(data, sig) then
MsgBox "Signature ok"
end if
```

**Notes:** We highly recommend to use a hash like SHA-512 to preprocess the data.
Returns the signature as string on success.

### 79.19.19 Verify(SignatureData as String, Data as String) as Boolean

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies the digital signature.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)
dim text as string = "Hello World"
dim data as string = SHA512MBS.Hash(text)
dim sig as string = key.Sign(data)

if key.Verify(data, sig) then
MsgBox "Signature ok"
end if
```

**Notes:** Returns true on success. Returns false if data, signature and public key don't belong together. We highly recommend to use a hash like SHA-512 to preprocess the data.

### 79.19.20 Properties

### 79.19.21 CanSign as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Indicates if an ECKey can be used for signing.
**Notes:** Returns true if can can sign and false otherwise.
(Read only property)

### 79.19.22 Description as String

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an user readable description text for the current key.
**Example:**

```
const NID_secp192k1 = 711
dim key as ECKeyMBS = ECKeyMBS.KeyByCurveName(NID_secp192k1)

MsgBox key.Description
```

**Notes:** (Read only property)

### 79.19.23 Flags as Integer

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flag field.
**Notes:** see OpenSSL for details.
(Read and Write property)

### 79.19.24 Size as Integer

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns size of key.
**Notes:** (Read only property)

### 79.19.25 Valid as Boolean

MBS Encryption Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies that a private and/or public key is valid.
**Notes:** Returns true on success and false otherwise.
(Read only property)

704 SECG/WTLS curve over a 112 bit prime field
705 SECG curve over a 112 bit prime field
706 SECG curve over a 128 bit prime field
707 SECG curve over a 128 bit prime field
708 SECG curve over a 160 bit prime field
709 SECG curve over a 160 bit prime field
710 SECG/WTLS curve over a 160 bit prime field
711 SECG curve over a 192 bit prime field
712 SECG curve over a 224 bit prime field
713 NIST/SECG curve over a 224 bit prime field
714 SECG curve over a 256 bit prime field
715 NIST/SECG curve over a 384 bit prime field
716 NIST/SECG curve over a 521 bit prime field
409 NIST/X9.62/SECG curve over a 192 bit prime field
410 X9.62 curve over a 192 bit prime field
411 X9.62 curve over a 192 bit prime field
412 X9.62 curve over a 239 bit prime field
413 X9.62 curve over a 239 bit prime field
414 X9.62 curve over a 239 bit prime field
415 X9.62/SECG curve over a 256 bit prime field
717 SECG curve over a 113 bit binary field
718 SECG curve over a 113 bit binary field
719 SECG/WTLS curve over a 131 bit binary field
720 SECG curve over a 131 bit binary field
721 NIST/SECG/WTLS curve over a 163 bit binary field
722 SECG curve over a 163 bit binary field
723 NIST/SECG curve over a 163 bit binary field
724 SECG curve over a 193 bit binary field
725 SECG curve over a 193 bit binary field
726 NIST/SECG/WTLS curve over a 233 bit binary field
727 NIST/SECG/WTLS curve over a 233 bit binary field
728 SECG curve over a 239 bit binary field
729 NIST/SECG curve over a 283 bit binary field
730 NIST/SECG curve over a 283 bit binary field
731 NIST/SECG curve over a 409 bit binary field
732 NIST/SECG curve over a 409 bit binary field
733 NIST/SECG curve over a 571 bit binary field
734 NIST/SECG curve over a 571 bit binary field
684 X9.62 curve over a 163 bit binary field
685 X9.62 curve over a 163 bit binary field
686 X9.62 curve over a 163 bit binary field
687 X9.62 curve over a 176 bit binary field
688 X9.62 curve over a 191 bit binary field
689 X9.62 curve over a 191 bit binary field
690 X9.62 curve over a 191 bit binary field
693 X9.62 curve over a 208 bit binary field
694 X9.62 curve over a 239 bit binary field
695 X9.62 curve over a 239 bit binary field

| | |
|---|---|
| secp112r1 | 704 |
| secp112r2 | 705 |
| secp128r1 | 706 |
| secp128r2 | 707 |
| secp160k1 | 708 |
| secp160r1 | 709 |
| secp160r2 | 710 |
| secp192k1 | 711 |
| secp224k1 | 712 |
| secp224r1 | 713 |
| secp256k1 | 714 |
| secp384r1 | 715 |
| secp521r1 | 716 |
| sect113r1 | 717 |
| sect113r2 | 718 |
| sect131r1 | 719 |
| sect131r2 | 720 |
| sect163k1 | 721 |
| sect163r1 | 722 |
| sect163r2 | 723 |
| sect193r1 | 724 |
| sect193r2 | 725 |
| sect233k1 | 726 |
| sect233r1 | 727 |
| sect239k1 | 728 |
| sect283k1 | 729 |
| sect283r1 | 730 |
| sect409k1 | 731 |
| sect409r1 | 732 |
| sect571k1 | 733 |
| sect571r1 | 734 |

# 79.20 class MD5DigestMBS

## 79.20.1 class MD5DigestMBS

MBS Encryption Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to calculate the message-digest of a string.
**Notes:** Same class as the one in RB5, so the same documentation:

The MD5Digest class enables you to process a string in segments. Pass each string segment to the Process method. The value property contains the current message digest and the clear method clears the MD5Digest object so that you can repeat the process.

The MD5 message digest algorithm takes a message of any length and produces a 128-bit "fingerprint" or message digest of the input string. The MD5 algorithm is useful for digital signature applications, where a large file must be processed in a secure manner before being encrypted with a secret key under a system such as RSA.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Doing hash or encryption on several CPUs in Xojo
- MBS Real Studio Plugins, version 13.1pr15
- MBS Real Studio Plugins, version 11.3pr11

## 79.20.2 Methods

## 79.20.3 clear

MBS Encryption Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the MD5Digest object so that you can start with a new data stream.

## 79.20.4 HashFile(file as FolderItem, Hex as boolean = true) as string

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates hash from whole file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks.
Returns hash on success or empty string on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.

If hex is true, the result is encoded as hex string.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 79.20.5 HMAC(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the a specific HASH based on the key and the data string.

### 79.20.6 MD5(data as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string.
See also:

- 79.20.7 MD5(data as string) as string 13450

### 79.20.7 MD5(data as string) as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string.
**Example:**

```
// Compare RB5 MD5 to the one from MBS

dim a,b as String

a=MD5("Hallo")

b=MD5DigestMBS.MD5("Hallo")

msgbox str(StrComp(a,b,0))
```

**Notes:** Same as the MD5 function in RB5.
See also:

- 79.20.6 MD5(data as memoryblock) as string 13450


### 79.20.8 MD5String(data as memoryblock) as string

MBS Encryption Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a memoryblock as hex string.
See also:


- 79.20.9 MD5String(data as string) as string 13451


### 79.20.9 MD5String(data as string) as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MD5 message digest value of a string as hex string.
**Example:**

```
// Compare RB5 MD5 to the one from MBS

dim a,b as String

a=EncodingToHexMBS(MD5("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern"))
b=MD5DigestMBS.MD5String("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern")

msgbox a+EndOfLine+b+EndOfLine+str(StrComp(a,b,0))
```

See also:


- 79.20.8 MD5String(data as memoryblock) as string 13451


### 79.20.10 Process(data as memoryblock)

MBS Encryption Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes the given data.
See also:


- 79.20.11 Process(Data as string) 13451


### 79.20.11 Process(Data as string)

MBS Encryption Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Processes the given data.
**Example:**

```
dim f as FolderItem
dim b as BinaryStream
dim s as string
dim m as new MD5DigestMBS
dim lines(-1) as string

// process file part by part (big files)

f=SpecialFolder.Desktop.Child("test.jpg")
b=f.OpenAsBinaryFile(False)

while not b.eof
s=b.Read(1000000)
m.Process s
wend

lines.append EncodingToHexMBS(m.Value)+" using plugin with MD5DigestMBS"

dim d as new MD5Digest

f=SpecialFolder.Desktop.Child("test.jpg")
b=f.OpenAsBinaryFile(False)

while not b.eof
s=b.Read(1000000)
d.Process s
wend

lines.append EncodingToHexMBS(d.Value)+" using RB with MD5Digest"

// process file in one chunk (small files)

f=SpecialFolder.Desktop.Child("test.jpg")
b=f.OpenAsBinaryFile(False)

s=b.Read(b.Length)

lines.append EncodingToHexMBS(MD5MBS(s))+" using plugin with MD5MBS()"

f=SpecialFolder.Desktop.Child("test.jpg")
b=f.OpenAsBinaryFile(False)

s=b.Read(b.length)

lines.append EncodingToHexMBS(MD5(s))+" using RB with MD5()"
```

MsgBox Join(lines,EndOfLine)

See also:

- 79.20.10 Process(data as memoryblock) 13451

### 79.20.12 Properties

### 79.20.13 Value as string

MBS Encryption Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Contains the current message digest.
**Notes:** (Read only property)

## 79.21 class OpenSSLExceptionMBS

### 79.21.1 class OpenSSLExceptionMBS

MBS Encryption Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The OpenSSL class for error exceptions.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr7

## 79.22 module OpenSSLMBS

### 79.22.1 module OpenSSLMBS

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module for OpenSSL functions.
**Notes:** Please request what you miss here.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr7
- JWT RS256 authentication in Xojo
- MBS Xojo Plugins, version 20.0pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr5
- MBS Xojo Plugins, version 18.4pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr7
- Sign PDF with DynaPDF and your custom signature
- MBS Xojo Plugins, version 17.5pr2

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- 17.5, page 9: News

### 79.22.2 Methods

### 79.22.3 ErrorString(ErrorCode as Integer) as string

MBS Encryption Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the human readable error string for an OpenSSL error.
**Example:**

MsgBox OpenSSLMBS.ErrorString(336109761)

### 79.22.4 GeneratePrivateKey(Bits as Integer = 4096, Exp as Integer = 65537, Password as string = """, Algorithm as string = """) as string

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates a new private key.
**Example:**

```
dim privateKey as string = OpenSSLMBS.GeneratePrivateKey
dim publicKey as string = OpenSSLMBS.GetPublicKey(privateKey)

break // got key pair
```

**Notes:** Bit size of key should be high.
See RSA key documentation on the web about details.

In Plugin version 16.2 and later this function yields time to other Xojo threads.
Algorithm specifies the encryption algorithm for key encryption. See CipherMBS for cipher names, e.g. "AES-128-CBC". (new in 17.5)

### 79.22.5 GetPublicKey(PrivateKey as String, PrivateKeyPassword as string = """) as string

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts public key from private key.
**Example:**

```
dim privateKey as string = OpenSSLMBS.GeneratePrivateKey
dim publicKey as string = OpenSSLMBS.GetPublicKey(privateKey)

break // got key pair
```

**Notes:** Optionally you can define a password for private key.

### 79.22.6 OpenSSLVersion as String

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of OpenSSL version.
**Example:**

MsgBox OpenSSLMBS.OpenSSLVersion

### 79.22.7 PKCS7Sign(flags as Integer, InputData as string, SignKey as string, PrivateKey as String, PrivateKeyPassword as string, intermediaCertsData() as string, OutputBinary as boolean) as string

MBS Encryption Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs with SMIME.
**Example:**

```
dim testPrivKey as string = ReadFile("passkey.pem")
dim testCertificate as string = ReadFile("passcertificate.pem")
dim data as string = ReadFile("test.txt")
dim privKeyPassword as string = "12345"

dim intermediateCertificates() as string
intermediateCertificates.Append ReadFile("WWDR.pem")
dim Sign as string = OpenSSLMBS.PKCS7Sign(0, data, testCertificate, testPrivKey, privKeyPassword, intermediateCertificates, true)

// write result
dim f as FolderItem = SpecialFolder.Desktop.Child("output")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write sign
```

**Notes:** Returns the signature. If OutputBinary is true, we use DER output, else text based output.
intermediaCertsData array can be empty if you have no intermediate certificates.

### 79.22.8 PKCS7SignData(Certificate as X509MBS, PrivateKey as PKeyMBS, certs() as X509MBS = nil, data as string, flags as Integer = 0) as string

MBS Encryption Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs with PKCS7.
**Notes:** Returns the signature (binary format = DER).
intermediaCertsData array can be empty or nil if you have no intermediate certificates.

### 79.22.9 PKCS7SignedData(DataP7M as String) as String

MBS Encryption Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads content of signed data in PKCS7 file.
**Example:**

```
// get a file
Dim f As FolderItem = GetFolderItem("/Users/cs/Desktop/p7m/work.xml.p7m", FolderItem.PathTypeNa-
tive)

// read
Dim b As BinaryStream = BinaryStream.Open(f)
Dim s As String = b.Read(b.Length)

// decode
Dim data As String = OpenSSLMBS.PKCS7SignedData(s)

Break
```

**Notes:** Please pass content of a P7M file, so we can read signed content.
Returns data or empty string if this failed.

### 79.22.10 RandomBytes(count as Integer) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates random bytes.
**Example:**

```
Dim m As MemoryBlock = OpenSSLMBS.RandomBytes(16)
MsgBox EncodeHex(m)
```

**Notes:** Puts count cryptographically strong pseudo-random bytes into MemoryBlock.

### 79.22.11 RandomBytesString(count as Integer) as String

MBS Encryption Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates random bytes.
**Example:**

```
Dim p As String = OpenSSLMBS.RandomBytesString(16)
```

MsgBox EncodeHex(p)

**Notes:** Puts count cryptographically strong pseudo-random bytes into string.

### 79.22.12 RSAPrivateDecrypt(data as string, PrivateKey as string, padding as Integer = 1, Password as string = "") as String

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts data using private key.
**Example:**

```
// encrypt with public, decrypt with private key

dim f1 as FolderItem = GetFolderItem("test.pem")
dim b1 as BinaryStream = BinaryStream.Open(f1)
dim PrivKey as string = B1.Read(b1.Length)

dim f2 as FolderItem = GetFolderItem("test.pub")
dim b2 as BinaryStream = BinaryStream.Open(f2)
dim PubKey as string = B2.Read(b2.Length)

dim UnencryptedData as string = "Hello World. This is just a test."
dim EncryptedData as string = OpenSSLMBS.RSAPublicEncrypt(UnencryptedData, PubKey)
dim decryptedData as string = OpenSSLMBS.RSAPrivateDecrypt(EncryptedData, PrivKey)

Break // check in debugger
```

**Notes:** See kPadding constants for Padding parameter.
Password is optional for decrypting encrypted keys.
Returns empty string on failure or raises exceptions.

RSA can only decrypt data if it's <= length of key.

### 79.22.13 RSAPrivateEncrypt(data as string, PrivateKey as string, padding as Integer = 1, Password as string = "") as String

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts data using private key.
**Example:**

```
// encrypt with private, decrypt with public key

dim f1 as FolderItem = GetFolderItem("test.pem")
dim b1 as BinaryStream = BinaryStream.Open(f1)
dim PrivKey as string = B1.Read(b1.Length)

dim f2 as FolderItem = GetFolderItem("test.pub")
dim b2 as BinaryStream = BinaryStream.Open(f2)
dim PubKey as string = B2.Read(b2.Length)

dim UnencryptedData as string = "Hello World. This is just a test."
dim EncryptedData as string = OpenSSLMBS.RSAPrivateEncrypt(UnencryptedData, PrivKey)
dim decryptedData as string = OpenSSLMBS.RSAPublicDecrypt(EncryptedData, PubKey)

Break // check in debugger
```

**Notes:** See kPadding constants for Padding parameter.
Password is optional for decrypting encrypted keys.
Returns empty string on failure or raises exceptions.

RSA can only encrypt data if it's <= length of key.

### 79.22.14 RSAPublicDecrypt(data as string, PublicKey as string, padding as Integer = 1, Password as string = "") as String

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts data using public key.
**Example:**

```
// encrypt with private, decrypt with public key

dim f1 as FolderItem = GetFolderItem("test.pem")
dim b1 as BinaryStream = BinaryStream.Open(f1)
dim PrivKey as string = B1.Read(b1.Length)

dim f2 as FolderItem = GetFolderItem("test.pub")
dim b2 as BinaryStream = BinaryStream.Open(f2)
dim PubKey as string = B2.Read(b2.Length)

dim UnencryptedData as string = "Hello World. This is just a test."
dim EncryptedData as string = OpenSSLMBS.RSAPrivateEncrypt(UnencryptedData, PrivKey)
dim decryptedData as string = OpenSSLMBS.RSAPublicDecrypt(EncryptedData, PubKey)
```

```
Break // check in debugger
```

**Notes:** See kPadding constants for Padding parameter.
Password is optional for decrypting encrypted keys.
Returns empty string on failure or raises exceptions.

RSA can only decrypt data if it's <= length of key.

### 79.22.15 RSAPublicEncrypt(data as string, PublicKey as string, padding as Integer = 1, Password as string = "") as String

MBS Encryption Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts data using public key.
**Example:**

```
// encrypt with public, decrypt with private key

dim f1 as FolderItem = GetFolderItem("test.pem")
dim b1 as BinaryStream = BinaryStream.Open(f1)
dim PrivKey as string = B1.Read(b1.Length)

dim f2 as FolderItem = GetFolderItem("test.pub")
dim b2 as BinaryStream = BinaryStream.Open(f2)
dim PubKey as string = B2.Read(b2.Length)

dim UnencryptedData as string = "Hello World. This is just a test."
dim EncryptedData as string = OpenSSLMBS.RSAPublicEncrypt(UnencryptedData, PubKey)
dim decryptedData as string = OpenSSLMBS.RSAPrivateDecrypt(EncryptedData, PrivKey)

Break // check in debugger
```

**Notes:** See kPadding constants for Padding parameter.
Password is optional for decrypting encrypted keys.
Returns empty string on failure or raises exceptions.

RSA can only encrypt data if it's <= length of key.

### 79.22.16 SignData(data as string, key as string, Password as string = "") as string

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs a piece of data with a given private key.
**Example:**

```
dim data as string // some data
dim test as string // the private key PEM file content
dim Signature as string = OpenSSLMBS.SignData(data, test)
msgbox EncodeHex(Signature)
```

**Notes:** Returns signature. Use EncodeHex or EncodeBase64 to make a text representation.

Internally we make a SHA1 hash of the data, open the private RSA key and do a RSA sign operation. We return the raw key as a string bytes.
On any error, we return an empty string.
Optional you can pass a password to read password protected keys.
See also:

- 79.22.17 SignData(data as string, key as string, Password as string = "", Algorithm as Integer) as string 13462

### 79.22.17 SignData(data as string, key as string, Password as string = "", Algorithm as Integer) as string

MBS Encryption Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs a piece of data with a given private key.
**Example:**

```
dim test_pem as string = ReadFile("test.pem")
dim test_pub as string = ReadFile("test.pub")
dim data as string = ReadFile("Create Keys.rtf") // some data file
dim signature as string

// create signature

Signature = OpenSSLMBS.SignData(data, test_pem, OpenSSLMBS.kAlgorithmSHA512)
if Signature = "" then
// failed
break
end if

// verify with private key
```

```
dim r1 as Boolean = OpenSSLMBS.VerifyData(data, signature, test_pem, OpenSSLMBS.kAlgorithmSHA256)

// verify with public key
dim r2 as Boolean = OpenSSLMBS.VerifyData(data, signature, test_pub, OpenSSLMBS.kAlgorithmSHA256)
```

**Notes:** Returns signature. Use EncodeHex or EncodeBase64 to make a text representation.

Internally we make a hash of the data with given algorithm, open the private RSA key and do a RSA sign operation. We return the raw signature as a string bytes.
On any error, we return an empty string.
Optional you can pass a password to read password protected keys.
See also:

- 79.22.16 SignData(data as string, key as string, Password as string = "") as string 13462

### 79.22.18 SMimePKCS7Decrypt(InputData as string, Certificate as X509MBS, SignKey as PKeyMBS) as String

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts S/Mime PKCS#7 encrypted data.
**Notes:** Raises nil object exception if certificate or key is nil.
Returns empty text on error.

### 79.22.19 SMimePKCS7Encrypt(InputData as string, Certificate as X509MBS) as String

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts data with S/Mime PKCS#7.
**Notes:** Raises nil object exception if certificate is nil.
Returns empty text on error.

### 79.22.20 SMimePKCS7Sign(InputData as string, Certificate as X509MBS, SignKey as PKeyMBS) as String

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Signs data with S/Mime PKCS#7.
**Notes:** Raises nil object exception if certificate or key is nil.

Returns empty text on error.

### 79.22.21 SMimePKCS7Verify(InputData as string, Certificate as X509MBS) as String

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies S/Mime PKCS#7 signature.
**Notes:** Raises nil object exception if certificate is nil.
Returns empty text on error.

### 79.22.22 VerifyData(data as string, Signature as string, Key as string, Password as string = "") as boolean

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies a signature with given data and public key.
**Notes:** Key can be the public or private key, but of course normally you use the public key.
Data is the raw data to compare agains. A SHA1 hash is performed and verified with the signature.
Signature must be the string returned like from SignData function. If you used EncodeHex on it, you now need to do DecodeHex.
Returns true if signature is valid and false on any other error.
Optional you can pass a password to read password protected keys.
See also:

- 79.22.23 VerifyData(data as string, Signature as string, Key as string, Password as string = "", Algorithm as Integer) as boolean 13464

### 79.22.23 VerifyData(data as string, Signature as string, Key as string, Password as string = "", Algorithm as Integer) as boolean

MBS Encryption Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies a signature with given data and public key.
**Example:**

```
dim test_pem as string = ReadFile("test.pem")
dim test_pub as string = ReadFile("test.pub")
dim data as string = ReadFile("Create Keys.rtf") // some data file
dim signature as string

// create signature

Signature = OpenSSLMBS.SignData(data, test_pem, OpenSSLMBS.kAlgorithmSHA512)
```

```
if Signature = "" then
// failed
break
end if

// verify with private key
dim r1 as Boolean = OpenSSLMBS.VerifyData(data, signature, test_pem, OpenSSLMBS.kAlgorithmSHA512)

// verify with public key
dim r2 as Boolean = OpenSSLMBS.VerifyData(data, signature, test_pub, OpenSSLMBS.kAlgorithmSHA512)
```

**Notes:** Key can be the public or private key, but of course normally you use the public key.
Data is the raw data to compare agains. A hash is performed with given algorithm and verified with the signature.
Signature must be the string returned like from SignData function. If you used EncodeHex on it, you now need to do DecodeHex.
Returns true if signature is valid and false on any other error.
Optional you can pass a password to read password protected keys.
See also:

- 79.22.22 VerifyData(data as string, Signature as string, Key as string, Password as string = "") as boolean 13464

### 79.22.24 Constants

Hash Algorithms

| Constant | Value | Description |
|---|---|---|
| kAlgorithmSHA1 | 1 | SHA 1. |
| kAlgorithmSHA224 | 2 | SHA 2 with 224bit. |
| kAlgorithmSHA256 | 3 | SHA 2 with 256bit. |
| kAlgorithmSHA384 | 4 | SHA 2 with 384bit. |
| kAlgorithmSHA512 | 5 | SHA 2 with 512bit. |

Padding Options

| Constant | Value | Description |
|---|---|---|
| kPaddingNone | 3 | Raw RSA encryption. This mode should only be used to implement cryptographically sound padding modes in the application code. Encrypting user data directly with RSA is insecure. |
| kPaddingPKCS1 | 1 | PKCS #1 v1.5 padding. This currently is the most widely used mode. |
| kPaddingPKCS1OAEP | 4 | EME-OAEP as defined in PKCS #1 v2.0 with SHA-1, MGF1 and an empty encoding parameter. This mode is recommended for all new applications. |
| kPaddingSSLv23 | 2 | PKCS #1 v1.5 padding with an SSL-specific modification that denotes that the server is SSL3 capable. |
| kPaddingX931 | 5 | X931 padding. |

## 79.23 module PassSignerMBS

### 79.23.1 module PassSignerMBS

MBS MacExtras Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The module to sign iOS passes from a Mac app.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr7

### 79.23.2 Methods

### 79.23.3 signPass(Pass as folderitem, CertSuffix as String, Output as folderitem, Zip as boolean = true) as boolean

MBS MacExtras Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Sign a pass.
**Notes:** Pass: Input folder with pass files.
CertSuffix: The certificate suffix.
Output: Where to store the new pass.
Zip: If true, we do the last step to zip the pass.
Returns true if signed or false if failed.

### 79.23.4 verifyPassSignature(pass as folderitem) as Boolean

MBS MacExtras Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Verify a pass.
**Notes:** Pass must point to the pass file (a zip archive).
Returns true if verified and false if failed.

## 79.24 class PKeyMBS

### 79.24.1 class PKeyMBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a public/private key.
**Notes:** Currently this class only implements a part of the PKey functionality of OpenSSL. If needed, we could add more.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr1
- Sign PDF with DynaPDF and your custom signature
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr2
- MBS Xojo / Real Studio Plugins, version 17.0pr1

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News
- 15.2, page 9: News

### 79.24.2 Methods

### 79.24.3 Constructor

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
**Notes:** Creates a new empty key.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 79.24.4 Copy as PKeyMBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the key.

### 79.24.5 Open(Data as MemoryBlock) as PKeyMBS

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a private or public key.
**Notes:** Returns key or nil in case of error.
See also:

- 79.24.6 Open(Data as String) as PKeyMBS 13469

### 79.24.6 Open(Data as String) as PKeyMBS

MBS Encryption Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a private or public key.
**Notes:** Returns key or nil in case of error.
See also:

- 79.24.5 Open(Data as MemoryBlock) as PKeyMBS 13469

### 79.24.7 PrivateKeyData as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key as binary representation.
**Notes:** You can write this to a pem file.

### 79.24.8 PublicKeyData as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key as binary representation.
**Notes:** You can write this to a pem file.

### 79.24.9 Properties

### 79.24.10 Bits as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bits of key.
**Notes:** (Read only property)

### 79.24.11 DescriptionParams as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of the parameters.
**Notes:** This is only for human to read.
(Read only property)

### 79.24.12 DescriptionPrivateKey as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of private/public key.
**Notes:** If no private key is there, you only get the public key part here.
This is only for human to read.
(Read only property)

### 79.24.13 DescriptionPublicKey as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of public key.
**Notes:** This is only for human to read.
(Read only property)

### 79.24.14 Handle as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the key.
**Notes:** (Read and Write property)

### 79.24.15 ID as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ID (type) of the key.
**Notes:** (Read only property)

### 79.24.16 PrivateKey as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the private key.
**Notes:** This is the binary representation.
(Read only property)

### 79.24.17 PublicKey as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the public key.
**Notes:** This is the binary representation.
(Read only property)

### 79.24.18 Size as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the key in bytes.
**Notes:** (Read only property)

### 79.24.19 Type as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of key.
**Notes:** (Read only property)

### 79.24.20 TypeString as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of key as string.
**Notes:** EC, DSA, RSA or DH.
(Read only property)

# 79.25 class RC4MBS

## 79.25.1 class RC4MBS

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An implementation of the RC4 algorithem.
**Example:**

```
dim r as RC4MBS

// Encrypt:
r = new RC4MBS("Key")

dim OriginalData as string = ConvertEncoding("Hello World!", encodings.UTF8)
dim EncryptedData as string = r.Crypt(OriginalData)
MsgBox EncodeHex(EncryptedData)

// Same for decrypt:
r = new RC4MBS("Key")

dim UnencryptedData as string = r.Crypt(EncryptedData)
UnencryptedData = DefineEncoding(UnencryptedData, encodings.UTF8)
MsgBox UnencryptedData
```

**Notes:** The source in RB is in the examples folder (see Crypto 1.5 via RB). This implementation inside the plugin is only to make the calculation faster.
In case RS will improve RB more to produce faster code, the plugin may be no longer needed.

## 79.25.2 Methods

## 79.25.3 Constructor(key as MemoryBlock)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the class with the given key.
See also:

- 79.25.4 Constructor(key as string) 13473

## 79.25.4 Constructor(key as string)

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the class with the given key.
**Example:**

```
dim r as new RC4MBS("MyKey")
dim s as string = r.Crypt("MyData")

MsgBox EncodeHex(s)
```

**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
See also:

- 79.25.3 Constructor(key as MemoryBlock) 13473

### 79.25.5 Crypt(data as Memoryblock) as Memoryblock

MBS Encryption Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes or decryptes the given Memoryblock.
See also:

- 79.25.6 Crypt(data as string) as string 13474

### 79.25.6 Crypt(data as string) as string

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encryptes or decryptes the given string.
**Example:**

```
dim r as RC4MBS

// Encrypt:
r = new RC4MBS("Key")

dim OriginalData as string = ConvertEncoding("Hello World!", encodings.UTF8)
dim EncryptedData as string = r.Crypt(OriginalData)
MsgBox EncodeHex(EncryptedData)

// Same for decrypt:
r = new RC4MBS("Key")

dim UnencryptedData as string = r.Crypt(EncryptedData)
UnencryptedData = DefineEncoding(UnencryptedData, encodings.UTF8)
MsgBox UnencryptedData
```

**Notes:** Returned string does not contain text, but binary data.
Please do not store in text fields in database without using EncodeHex or EncodeBase64 to make it a text string.
See also:

- 79.25.5 Crypt(data as Memoryblock) as Memoryblock 13474

## 79.26 class RC5MBS

### 79.26.1 class RC5MBS

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for RC5 encryption.
**Example:**

```
dim r as RC5MBS

// Encrypt:
r = new RC5MBS("Key")

dim iv as MemoryBlock
dim num as Integer
dim OriginalData as string = ConvertEncoding("Hello World!", encodings.UTF8)
dim EncryptedData as string = r.encryptCFB64(OriginalData, iv, num)
MsgBox EncodeHex(EncryptedData)

// Same for decrypt:
r = new RC5MBS("Key")

iv = nil
num = 0
dim UnencryptedData as string = r.decryptCFB64(EncryptedData, iv, num)
UnencryptedData = DefineEncoding(UnencryptedData, encodings.UTF8)
MsgBox UnencryptedData
```

**Notes:** Do use to read existing RC5 encrypted things.
New projects may better use a better encryption.

### 79.26.2 Methods

### 79.26.3 Constructor(key as MemoryBlock, rounds as Integer = 16)

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
dim r as new RC5MBS("MyKey")
dim s as string = r.Encrypt("MyData")

MsgBox EncodeHex(s)
```

See also:

- 79.26.4 Constructor(key as string, rounds as Integer = 16) 13477

### 79.26.4 Constructor(key as string, rounds as Integer = 16)

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
dim r as new RC5MBS("MyKey")
dim s as string = r.Encrypt("MyData")

MsgBox EncodeHex(s)
```

**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
See also:

- 79.26.3 Constructor(key as MemoryBlock, rounds as Integer = 16) 13476

### 79.26.5 decrypt(data as Memoryblock) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Notes:** Low level variant without any block mode.
See also:

- 79.26.6 decrypt(data as string) as string 13477

### 79.26.6 decrypt(data as string) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
Low level variant without any block mode.
See also:

- 79.26.5 decrypt(data as Memoryblock) as Memoryblock 13477

### 79.26.7 decryptCBC(data as Memoryblock, iv as memoryblock = nil) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Notes:** With Cipher Block Chaining mode.
See also:

- 79.26.8 decryptCBC(data as string, iv as memoryblock = nil) as string 13478

### 79.26.8 decryptCBC(data as string, iv as memoryblock = nil) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
With Cipher Block Chaining mode.
See also:

- 79.26.7 decryptCBC(data as Memoryblock, iv as memoryblock = nil) as Memoryblock 13478

### 79.26.9 decryptCFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Example:**

```
dim r as RC5MBS

// Encrypt:
r = new RC5MBS("Key")

dim iv as MemoryBlock
dim num as Integer
dim OriginalData as string = ConvertEncoding("Hello World!", encodings.UTF8)
dim EncryptedData as string = r.encryptCFB64(OriginalData, iv, num)
MsgBox EncodeHex(EncryptedData)

// Same for decrypt:
r = new RC5MBS("Key")

iv = nil
num = 0
dim UnencryptedData as string = r.decryptCFB64(EncryptedData, iv, num)
```

UnencryptedData = DefineEncoding(UnencryptedData, encodings.UTF8)
MsgBox UnencryptedData

**Notes:** with Cipher Feedback mode.
See also:

- 79.26.10 decryptCFB64(data as string, iv as memoryblock, byref num as Integer) as string 13479

### 79.26.10 decryptCFB64(data as string, iv as memoryblock, byref num as Integer) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
with Cipher Feedback mode.
See also:

- 79.26.9 decryptCFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock 13478

### 79.26.11 encrypt(data as Memoryblock) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** Low level variant without any block mode.
See also:

- 79.26.12 encrypt(data as string) as string 13479

### 79.26.12 encrypt(data as string) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
Low level variant without any block mode.
See also:

- 79.26.11 encrypt(data as Memoryblock) as Memoryblock 13479

### 79.26.13 encryptCBC(data as Memoryblock, iv as memoryblock = nil) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** With Cipher Block Chaining mode.
See also:

- 79.26.14 encryptCBC(data as string, iv as memoryblock = nil) as string 13480

### 79.26.14 encryptCBC(data as string, iv as memoryblock = nil) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
With Cipher Block Chaining mode.
See also:

- 79.26.13 encryptCBC(data as Memoryblock, iv as memoryblock = nil) as Memoryblock 13480

### 79.26.15 encryptCFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Example:**

```
dim r as RC5MBS

// Encrypt:
r = new RC5MBS("Key")

dim iv as MemoryBlock
dim num as Integer
dim OriginalData as string = ConvertEncoding("Hello World!", encodings.UTF8)
dim EncryptedData as string = r.encryptCFB64(OriginalData, iv, num)
MsgBox EncodeHex(EncryptedData)

// Same for decrypt:
r = new RC5MBS("Key")

iv = nil
num = 0
dim UnencryptedData as string = r.decryptCFB64(EncryptedData, iv, num)
```

UnencryptedData = DefineEncoding(UnencryptedData, encodings.UTF8)
MsgBox UnencryptedData

**Notes:** with Cipher Feedback mode.
See also:

- 79.26.16 encryptCFB64(data as string, iv as memoryblock, byref num as Integer) as string 13481

### 79.26.16 encryptCFB64(data as string, iv as memoryblock, byref num as Integer) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
with Cipher Feedback mode.
See also:

- 79.26.15 encryptCFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock 13480

### 79.26.17 encryptOFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** with Output Feedback mode.
See also:

- 79.26.18 encryptOFB64(data as string, iv as memoryblock, byref num as Integer) as string 13481

### 79.26.18 encryptOFB64(data as string, iv as memoryblock, byref num as Integer) as string

MBS Encryption Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts some data.
**Notes:** Please make sure the key has right text encoding to avoid unexpected results.
with Output Feedback mode.
See also:

- 79.26.17 encryptOFB64(data as Memoryblock, iv as memoryblock, byref num as Integer) as Memoryblock 13481

## 79.27 class SHA1MBS

### 79.27.1 class SHA1MBS

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An implementation of the SHA1 algorithem to calculate hash values.
**Example:**

```
dim f as FolderItem
dim b as BinaryStream
dim s as string
dim m as new SHA1MBS

// process file part by part (big files)

f=SpecialFolder.Desktop.Child("test.jpg")
b=f.OpenAsBinaryFile(False)

while not b.eof
s=b.Read(1000000)
m.Add s

wend

MsgBox EncodingToHexMBS(m.Result)+" using plugin with SHA1MBS"
```

**Notes:** The source in RB is in the examples folder (see Crypto 1.5 via RB). This implementation inside the plugin is only to make the calculation faster.
In case RS will improve RB more to produce faster code, the plugin may be no longer needed.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins, version 19.4pr3
- Sign PDF with DynaPDF and your custom signature
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Doing hash or encryption on several CPUs in Xojo
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- MBS Real Studio Plugins, version 13.1pr15

**Xojo Developer Magazine**

- 10.4, page 44: HOTP Authentication, Generate one-time passwords with Google Authenticator App and validate them in Real Studio by Mattias Sandstr√m

### 79.27.2 Methods

### 79.27.3 Add(data as string)

MBS Encryption Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds more input bytes to the current hash.
**Example:**

```
dim s as new SHA1MBS
s.Reset
s.Add "Hello"
s.Add "World"
dim e as string=s.Result
```

**Notes:** Lasterror is set.

### 79.27.4 Hash(data as string) as string

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hash string for the given key.
**Example:**

```
MsgBox EncodeHex(SHA1MBS.Hash("Hello World"))
```

**Notes:** The string returned is 20 bytes long (if successfull) and has the 5 integer properties stored inside (in big endian format) which make up the key.
Does change the current hash value stored in the class itself.

### 79.27.5 HashFile(file as FolderItem, Hex as boolean = true) as string

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates hash from whole file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks.
Returns hash on success or empty string on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.

If hex is true, the result is encoded as hex string.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 79.27.6 HashText(data as string) as string

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hash string for the given key.
**Example:**

```
MsgBox EncodeHex(SHA1MBS.Hash("Hello World"))
```

**Notes:** The string returned is 20 bytes long (if successfull) and has the 5 integer properties stored inside (in big endian format) which make up the key.
Does change the current hash value stored in the class itself.
Returns the digest as text string with hexadecimal digits.

### 79.27.7 HMAC(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the a specific HASH based on the key and the data string.
**Example:**

```
Function HMAC(key as string, data as string) As string
// Implementation by Matthijs van Duin
#pragma DisableBackgroundTasks

dim ikey, okey, k as string
dim temp, i as Integer

if (lenB(key) >64) then
k = Hash(key)
else
k = key
end if

for i = 1 to 64
```

```
temp = ascB(midB(k, i, 1))
ikey = ikey + chrB(BitwiseXor(temp, &h36))
okey = okey + chrB(BitwiseXor(temp, &h5C))
next

return Hash(okey + Hash(ikey + data))
End Function

// test code:

// de7c9b85b8b78aa6bc8a7a36f70a90701c9db4d9
dim s as string = SHA1MBS.HMAC("key", "The quick brown fox jumps over the lazy dog")
MsgBox EncodeHex(s)

// fbdb1d1b18aa6c08324b7d64b71fb76370690e1d
s = SHA1MBS.HMAC("", "")
MsgBox EncodeHex(s)
```

**Notes:** Above is the source code of this function.

### 79.27.8 Reset

MBS Encryption Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the current hash value.

### 79.27.9 Result as string

MBS Encryption Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current hash value.
**Notes:** Returns "" on any error.
Lasterror is set.

### 79.27.10 ResultText as string

MBS Encryption Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current hash value.
**Notes:** Returns the digest as text string with hexadecimal digits.
Returns "" on any error.

Lasterror is set.

# 79.28 class SHA256MBS

## 79.28.1 class SHA256MBS

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to calculate SHA-256 hashes.
**Example:**

```
dim s3 as string = SHA256MBS.Hash("")
dim e3 as string = EncodingToHexMBS(s3)
dim e4 as string = SHA256MBS.HashText("")

if e3 <>"e3b0c44298fc1c149afbf4c8996fb92427ae41e4649b934ca495991b7852b855" then
break
elseif e3 <>e4 then
break
else
MsgBox "OK"
end if
```

**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins, version 19.4pr3
- AES in Xojo and PHP
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Doing hash or encryption on several CPUs in Xojo
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Real Studio Plugins, version 13.1pr15
- MBS Real Studio Plugins, version 11.3pr5

## 79.28.2 Methods

## 79.28.3 Add(data as string)

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data to the hash calculation.
**Example:**

```
dim s as new SHA256MBS

s.Add "Franz jagt im komplett"
s.Add " verwahrlosten Taxi quer"
s.Add " durch Bayern"

dim r as string = s.ResultText
if r = "d32b568cd1b96d459e7291ebf4b25d007f275c9f13149beeb782fac0716613f8" then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Using this method you can process huge amounts of data by passing them in small portions.

### 79.28.4 Hash(data as string) as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim s2 as string = SHA256MBS.Hash("Frank jagt im komplett verwahrlosten Taxi quer durch Bayern")
dim e2 as string = EncodingToHexMBS(s2)

if e2 = "78206a866dbb2bf017d8e34274aed01a8ce405b69d45db30bafa00f5eeed7d5e" then
Msgbox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns the digest as binary string.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.28.5 HashFile(file as FolderItem, Hex as boolean = true) as string

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates hash from whole file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks.
Returns hash on success or empty string on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.

If hex is true, the result is encoded as hex string.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 79.28.6 HashText(data as string) as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim s1 as string = SHA256MBS.HashText("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern")

if s1 = "d32b568cd1b96d459e7291ebf4b25d007f275c9f13149beeb782fac0716613f8" then
Msgbox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns the digest as text string with hexadecimal digits.

### 79.28.7 HMAC(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the a specific HASH based on the key and the data string.

### 79.28.8 Reset

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the hash class so you can reuse it for the SHA-256 hash.

### 79.28.9 Result as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash.
**Notes:** Returns the digest as binary string.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.28.10 ResultText as string

MBS Encryption Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash.
**Notes:** Returns the digest as text string with hexadecimal digits.

# 79.29 class SHA3MBS

## 79.29.1 class SHA3MBS

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to calculate SHA-3 hashes.
**Example:**

```
dim t as string = "The quick brown fox jumps over the lazy dog"
dim s as new SHA3MBS(1088, 512)

s.Add t
dim h as string = s.ResultText(32)

// shows 4d741b6f1eb29cb2a9b9911c82f56fa8d73b04959d3d9d222895df6c0b28aa15
MsgBox h
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0fc2

## 79.29.2 Methods

## 79.29.3 Add(data as memoryblock)

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data to the hash calculation.
**Notes:** Using this method you can process huge amounts of data by passing them in small portions.
See also:

- 79.29.4 Add(data as string) 13491

## 79.29.4 Add(data as string)

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data to the hash calculation.
**Notes:** Using this method you can process huge amounts of data by passing them in small portions.
See also:

- 79.29.3 Add(data as memoryblock) 13491

### 79.29.5 Constructor(Rate as UInt32, capacity as UInt32)

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
dim s as new SHA3MBS(1088, 512) // 256 bit

s.Add "Compute Me"
s.Add "Me too"

dim h as string = s.ResultText(256/8)

Break
```

**Notes:** See example project or SHA-3 documentation for useful values for Rate and Capacity.

### 79.29.6 Hash(data as string, Rate as UInt32, capacity as UInt32, outputLength as Integer) as string

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim t as string = "The quick brown fox jumps over the lazy dog"
dim h as string = SHA3MBS.Hash(t, 1088, 512, 32)

// encode as text to display
h = EncodeHex(h)
// shows 4d741b6f1eb29cb2a9b9911c82f56fa8d73b04959d3d9d222895df6c0b28aa15
MsgBox h
```

**Notes:** Returns the digest as text string with hexadecimal digits.
Or empty string in case of any error.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.29.7 HashText(data as string, Rate as UInt32, capacity as UInt32, outputLength as Integer) as string

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim t as string = "The quick brown fox jumps over the lazy dog"
dim h as string = SHA3MBS.HashText(t, 1088, 512, 32)

// shows 4d741b6f1eb29cb2a9b9911c82f56fa8d73b04959d3d9d222895df6c0b28aa15
MsgBox h
```

**Notes:** Returns the digest as text string with hexadecimal digits.
Or empty string in case of any error.

### 79.29.8 Reset(Rate as UInt32, capacity as UInt32)

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the hash class so you can reuse it for another SHA-3 hash.

### 79.29.9 Result(outputLength as Integer) as string

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash in the requested length.
**Notes:** Returns the digest as binary string.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.29.10 ResultText(outputLength as Integer) as string

MBS Encryption Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash in the requested length.
**Example:**

```
dim t as string = "The quick brown fox jumps over the lazy dog"
dim s as new SHA3MBS(1088, 512)

s.Add t
dim h as string = s.ResultText(32)

// shows 4d741b6f1eb29cb2a9b9911c82f56fa8d73b04959d3d9d222895df6c0b28aa15
MsgBox h
```

**Notes:** Returns the digest as text string with hexadecimal digits.

# 79.30 class SHA512MBS

## 79.30.1 class SHA512MBS

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to calculate SHA-512 hashes.
**Example:**

```
dim s3 as string = SHA512MBS.Hash("")
dim e3 as string = EncodingToHexMBS(s3)

if e3 = "CF83E1357EEFB8BDF1542850D66D8007D620E4050B5715DC83F4A921D36CE9CE47D0D13C5D85F2B0FF8318D2
then
Msgbox "OK"
else
MsgBox "Failed"
end if
```

**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr3
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Doing hash or encryption on several CPUs in Xojo
- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Real Studio Plugins, version 12.2pr4

## 79.30.2 Methods

## 79.30.3 Add(data as string)

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data to the hash calculation.
**Example:**

```
dim s as new SHA512MBS
```

```
s.Add "Franz jagt im komplett"
s.Add " verwahrlosten Taxi quer"
s.Add " durch Bayern"

dim r as string = s.ResultText
if r = "AF9ED2DE700433B803240A552B41B5A472A6EF3FE1431A722B2063C75E9F07451F67A28E37D09CDE769424C96A
then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Using this method you can process huge amounts of data by passing them in small portions.

### 79.30.4 Hash(data as string) as string

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim s2 as string = SHA512MBS.Hash("Frank jagt im komplett verwahrlosten Taxi quer durch Bayern")
dim e2 as string = EncodingToHexMBS(s2)

if e2 = "90B30EF9902AE4C4C691D2D78C2F8FA0AA785AFBC5545286B310F68E91DD2299C84A2484F0419FC5EAA7DE5
then
Msgbox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns the digest as binary string.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.30.5 HashFile(file as FolderItem, Hex as boolean = true) as string

MBS Encryption Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates hash from whole file.
**Notes:** Plugin will start a preemptive thread to read in file and process all data in chunks.
Returns hash on success or empty string on failure. May raise OutOfMemoryException or IOException.
This function works best if called from a thread.

If hex is true, the result is encoded as hex string.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 79.30.6 HashText(data as string) as string

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to quickly create a hash for a given string.
**Example:**

```
dim s1 as string = SHA512MBS.HashText("Franz jagt im komplett verwahrlosten Taxi quer durch Bayern")

if s1 = "AF9ED2DE700433B803240A552B41B5A472A6EF3FE1431A722B2063C75E9F07451F67A28E37D09CDE769424C96A
then
Msgbox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns the digest as text string with hexadecimal digits.

### 79.30.7 HMAC(key as string, data as string) as string

MBS Encryption Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the a specific HASH based on the key and the data string.

### 79.30.8 Reset

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the hash class so you can reuse it for the SHA-256 hash.

### 79.30.9 Result as string

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash.
**Notes:** Returns the digest as binary string.
Before you show it to the user, pass it through EncodingToHexMBS.

### 79.30.10 ResultText as string

MBS Encryption Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The final hash.
**Notes:** Returns the digest as text string with hexadecimal digits.

## 79.31 module TwofishMBS

### 79.31.1 module TwofishMBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for Twofish encryption.
**Notes:** You can use this class for compatibility to PHP.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr1

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.2, page 9: News

### 79.31.2 Methods

### 79.31.3 DecryptCBC(Key as MemoryBlock, InputData as MemoryBlock, IV as MemoryBlock) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts with CBC mode and memoryblocks.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as MemoryBlock = "Hello World 1234"
dim IV as MemoryBlock = "1234567812345678" // 16 byte IV

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as MemoryBlock = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as MemoryBlock = TwofishMBS.EncryptCBC(key, InputData, IV)
dim DecryptedData as MemoryBlock = TwofishMBS.DecryptCBC(key, encryptedData, IV)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)
```

```
// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
Decryptedtext = leftb(Decryptedtext, p-1)
end if

// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** IV can be nil for using zeros.
IV size should be 16 bytes.
Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:


- 79.31.4 DecryptCBC(Key as String, InputData as String, IV as String) as String 13500


### 79.31.4 DecryptCBC(Key as String, InputData as String, IV as String) as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts with CBC mode and strings.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as String = "Hello World 1234"
dim IV as String = "1234567812345678" // 16 byte IV

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as String = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as String = TwofishMBS.EncryptCBC(key, InputData, IV)
dim DecryptedData as String = TwofishMBS.DecryptCBC(key, encryptedData, IV)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
```

```
Decryptedtext = leftb(Decryptedtext, p-1)
end if

// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** IV can be empty for using zeros.
IV size should be 16 bytes.
Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.3 DecryptCBC(Key as MemoryBlock, InputData as MemoryBlock, IV as MemoryBlock) as MemoryBlock 13499

### 79.31.5 DecryptECB(Key as MemoryBlock, InputData as MemoryBlock) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts with ECB mode and memoryblocks.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as MemoryBlock = "Hello World 1234"

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as MemoryBlock = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as MemoryBlock = TwofishMBS.EncryptECB(key, InputData)
dim DecryptedData as MemoryBlock = TwofishMBS.DecryptECB(key, encryptedData)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
Decryptedtext = leftb(Decryptedtext, p-1)
end if
```

```
// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.6 DecryptECB(Key as String, InputData as String) as String 13502

### 79.31.6 DecryptECB(Key as String, InputData as String) as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrypts with ECB mode and strings.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as string = "Hello World 1234"

// some UTF-8 input
dim InputData as string = "Just a test. √§√√º"
InputData = ConvertEncoding(InputData, encodings.UTF8)

dim Encrypted as string = TwofishMBS.EncryptECB(key, InputData)
dim Decrypted as string = TwofishMBS.DecryptECB(key, encrypted)

// restore encoding
Decrypted = DefineEncoding(Decrypted, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decrypted, chrb(0))
if p >0 then
Decrypted = leftb(Decrypted, p-1)
end if

// check
if Decrypted = InputData then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.5 DecryptECB(Key as MemoryBlock, InputData as MemoryBlock) as MemoryBlock 13501

### 79.31.7 EncryptCBC(Key as MemoryBlock, InputData as MemoryBlock, IV as MemoryBlock) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts with CBC mode and memoryblocks.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as MemoryBlock = "Hello World 1234"
dim IV as MemoryBlock = "1234567812345678" // 16 byte IV

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as MemoryBlock = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as MemoryBlock = TwofishMBS.EncryptCBC(key, InputData, IV)
dim DecryptedData as MemoryBlock = TwofishMBS.DecryptCBC(key, encryptedData, IV)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
Decryptedtext = leftb(Decryptedtext, p-1)
end if

// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** IV can be nil for using zeros.
IV size should be 16 bytes.
Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.

InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:


- 79.31.8 EncryptCBC(Key as String, InputData as String, IV as String) as String 13504


### 79.31.8 EncryptCBC(Key as String, InputData as String, IV as String) as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts with CBC mode and string.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as String = "Hello World 1234"
dim IV as String = "1234567812345678" // 16 byte IV

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as String = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as String = TwofishMBS.EncryptCBC(key, InputData, IV)
dim DecryptedData as String = TwofishMBS.DecryptCBC(key, encryptedData, IV)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
Decryptedtext = leftb(Decryptedtext, p-1)
end if

// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** IV can be empty for using zeros.
IV size should be 16 bytes.
Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.7 EncryptCBC(Key as MemoryBlock, InputData as MemoryBlock, IV as MemoryBlock) as MemoryBlock 13503

### 79.31.9 EncryptECB(Key as MemoryBlock, InputData as MemoryBlock) as MemoryBlock

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts with ECB mode and memoryblocks.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as MemoryBlock = "Hello World 1234"

// some UTF-8 input
dim InputText as string = "Just a test. √§√√º"
dim InputData as MemoryBlock = ConvertEncoding(InputText, encodings.UTF8)

dim EncryptedData as MemoryBlock = TwofishMBS.EncryptECB(key, InputData)
dim DecryptedData as MemoryBlock = TwofishMBS.DecryptECB(key, encryptedData)

// restore encoding
dim Decryptedtext as String = DefineEncoding(DecryptedData, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decryptedtext, chrb(0))
if p >0 then
Decryptedtext = leftb(Decryptedtext, p-1)
end if

// check
if Decryptedtext = InputText then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.10 EncryptECB(Key as String, InputData as String) as String 13506

### 79.31.10 EncryptECB(Key as String, InputData as String) as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encrypts with ECB mode and strings.
**Example:**

```
// key is 16 bytes, so 128 bit
dim key as string = "Hello World 1234"

// some UTF-8 input
dim InputData as string = "Just a test. √§√√º"
InputData = ConvertEncoding(InputData, encodings.UTF8)

dim Encrypted as string = TwofishMBS.EncryptECB(key, InputData)
dim Decrypted as string = TwofishMBS.DecryptECB(key, encrypted)

// restore encoding
Decrypted = DefineEncoding(Decrypted, encodings.UTF8)

// remove training zeros
dim p as Integer = instrb(Decrypted, chrb(0))
if p >0 then
Decrypted = leftb(Decrypted, p-1)
end if

// check
if Decrypted = InputData then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Key length should be 16 for 128bit, 24 for 192 bit or 32 for 256 bit.
InputData should be aligned to 16byte size. Else the plugin will fill up with zero bytes.
See also:

- 79.31.9 EncryptECB(Key as MemoryBlock, InputData as MemoryBlock) as MemoryBlock 13505

# 79.32 class UUIDMBS

## 79.32.1 class UUIDMBS

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to create Universally Unique Identifier.
**Example:**

```
dim u as UUIDMBS

u=new UUIDMBS

MsgBox EncodingToHexMBS(u.ValueString)
```

**Notes:** This class creates a 128 bit UUID (or UID or GUID) which is random.

On Mac OS X: Uses CoreFoundation system functions from Mac OS X 10.3.
On Linux: Uses unix system functions (libuuid).
On Windows: Uses UUID functions from RPC functions (Rpcrt4.dll).

If you need to validate a GUID or UUID, please check the Validate function.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr1
- MBS Xojo Plugins, version 19.6pr1
- MBS Xojo / Real Studio Plugins, version 15.2pr4
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0pr5
- MBS REALbasic Plugins, version 10.6pr6

## 79.32.2 Methods

## 79.32.3 randomUUID as UUIDMBS

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a random v4 GUID.
**Example:**

```
for i as Integer = 1 to 20
Listbox1.AddRow UUIDMBS.randomUUID.ValueFormattedString
```

next

**Notes:** This is using random numbers.
It is unlikely, but possible to have duplicates.
The UUID function checks for that.

### 79.32.4 UUID as UUIDMBS

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new UUID with system functions.
**Notes:** On Mac OS X: Uses CoreFoundation system functions from Mac OS X 10.3.
On Linux: Uses unix system functions (libuuid).
On Windows: Uses UUID functions from RPC functions (Rpcrt4.dll).

### 79.32.5 Validate(UUID as string, mode as Integer = 0, requiredVersion as Integer = 0) as string

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates the given UUID/GUID.
**Example:**

```
// wrong
dim w1 as string = UUIDMBS.Validate("hello") // wrong due to missing {
dim w2 as string = UUIDMBS.Validate("550e8400-z29b-11d4-a716-446655440000",1) // wrong with, with z
dim w3 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d40716-446655440000 } ") // wrong with missing minus
dim w4 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d4-a716-44665544000 } ") // wrong with being too short
dim w5 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d4-a716-446655440000 } dssdsd",1) // wrong as it has extra chars on end
dim w6 as string = UUIDMBS.Validate("550e8400-e29b-11d4-a716-446655440000",1,4) // wrong as not version 4
dim w7 as string = UUIDMBS.Validate("6a12a4d5-e9e6-4568-ffcc-34c70b24a668",1,4) // wrong as not version 4

// okay
dim o1 as string = UUIDMBS.Validate("550e8400-e29b-11d4-a716-446655440000",1)
dim o2 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d4-a716-446655440000 } ")
dim o3 as string = UUIDMBS.Validate("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 1)
dim o4 as string = UUIDMBS.Validate("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 3)
dim o5 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d4-a716-446655440000 } ", 2)
```

```
dim o6 as string = UUIDMBS.Validate(" { 550e8400e29b11d4a716446655440000 } ", 2)
dim o7 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d40716-446655440000 } ",4) // wrong with missing minus, but fixed
dim o8 as string = UUIDMBS.Validate("550e8400-e29b-11d40716-446655440000 } ",4) // wrong with missing { , but fixed
dim o9 as string = UUIDMBS.Validate("6a12a4d5-e9e6-4568-afcc-34c70b24a668", 4, 4) // is version 4
dim o10 as string = UUIDMBS.Validate("6a12a4d5-e9e6-1568-afcc-34c70b24a668", 4, 1) // is version 1
dim o11 as string = UUIDMBS.Validate(" { 550e8400-e29b-11d4-a716-446655440000 } dssdsd",1+4) // wrong as it has extra chars on end, but fixed

break // check in debugger
```

**Notes:** If the UUID is valid, you get it back.
If the UUID is invalid, you get an empty string back.

Pass 1 in mode to not require braces around UUID. Pass 2 to ignore minus characters. Pass 3 to combine those two.
You can add 4 to have the GUID fixed a bit like adding braces and minus chars if missing.
The requiredVersion parameter can be 1 to 5 to indicate the required GUID version you want to have.

### 79.32.6 ValueFormattedString(WithBrackets as Boolean = true) as String

MBS Util Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The UUID as a 38 character formatted hex string.
**Example:**

```
dim u as new UUIDMBS
MsgBox u.ValueFormattedString
```

**Notes:** example output: { D3ED4292-FC09-11DF-8AC5-7C6D628C4C29 }

Added WithBrackets parameter in version 22.1, so you can turn curly brackets off.

### 79.32.7 ValueHexString as String

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The UUID as a 32 character long hex string.
**Example:**

```
dim u as new UUIDMBS
MsgBox u.ValueHexString
```

**Notes:** example output: DCACAF4EFC0911DF92E37C6D628C4C29

### 79.32.8 ValueMemory as Memoryblock

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The UUID as a sixteen byte big memoryblock.

### 79.32.9 ValueString as String

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The UUID as a sixteen byte big binary string.
**Example:**

```
dim u as new UUIDMBS
MsgBox u.ValueString
```

**Notes:** This string is not for user display as it contains unreadable characters.

### 79.32.10 Properties

### 79.32.11 Lasterror as Integer

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last error code.
**Notes:** -1 is for failure, 0 for okay.
Windows or Mac OS error codes else.
(Read and Write property)

### 79.32.12 Valid as Boolean

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the constructor was able to create an UUID.
**Notes:** (Read and Write property)

## 79.33 class X509MBS

### 79.33.1 class X509MBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a X509 certificate.
**Notes:** Currently this class only implements a part of the X509 functionality of OpenSSL. If needed, we could add more.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr6
- News from the MBS Xojo Plugins Version 20.3
- MBS Xojo Plugins, version 20.3pr9
- Sign PDF with DynaPDF and your custom signature
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr1

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 20.3, page 10: News
- 19.3, page 10: News
- 15.2, page 9: News

### 79.33.2 Methods

### 79.33.3 CheckCertificates(rootCertificates() as X509MBS, certificate as X509MBS, intermediates() as X509MBS = nil) as Boolean

MBS Encryption Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates certificate agains root certificates and may use intermediates for it.
**Notes:** Returns true if valid or false if not.

This function attempts to discover and validate a certificate chain based on parameters in context. The verification context, is constructed using given root certificates.

### 79.33.4 Constructor

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 79.33.5 Copy as X509MBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the certificate.

### 79.33.6 Data as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of the certificate.
**Notes:** You can write this to a PEM file.

### 79.33.7 Open(Data as MemoryBlock) as X509MBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a X509 PEM file.
**Notes:** Line endings must be LF, not CR.
See also:

- 79.33.8 Open(Data as String) as X509MBS 13513

### 79.33.8 Open(Data as String) as X509MBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a X509 PEM file.
**Notes:** Please read file via binarystream and pass here as string.
Line endings must be LF, not CR.
See also:

- 79.33.7 Open(Data as MemoryBlock) as X509MBS 13513

### 79.33.9 ReadFromPkcs12(Data as String, Pass as String, byref PKey as PKeyMBS, byref Cert as X509MBS, byref certs() as X509MBS) as Boolean

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads certificate and private key from a PKCS12 file.
**Example:**

```
dim f as FolderItem = FindFile("test.p12")
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)
dim c as X509MBS
dim p as PKeyMBS
dim others() as X509MBS

if X509MBS.ReadFromPkcs12(s, "HelloWorld", p, c, others) then
MsgBox c.Name
end if
```

**Notes:** Data is the content of the PKCS12 file.
Returns true on success or false on failure.

### 79.33.10 ReadFromPkcs7(Data as String, Pass as String, byref certs() as X509MBS) as Boolean

MBS Encryption Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads certificates from PKCS#7 data.
**Example:**

```
dim contents as string // PKCS#7 file data
Dim certs() As X509MBS
If X509MBS.ReadFromPkcs7(contents, "", certs) Then

Dim x As X509MBS = certs(0)
If x <>Nil Then
// show it
```

```
TextArea1.Text= x.Description
end if
End If
```

**Notes:** Returns true on success.
Only for PKCS#7 data containing signatures.

### 79.33.11 Verify(PublicKey as PKeyMBS) as Integer

MBS Encryption Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies the signature of certificate using given public key.
**Notes:** Returns 1 if valid, 0 if key is not valid, but -1 if format of key is invalid.
Calls X509_verify internally in OpenSSL.

### 79.33.12 Properties

### 79.33.13 Description as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The textual description of the certificate.
**Notes:** This is only for human to read.
(Read only property)

### 79.33.14 Handle as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 79.33.15 IssuerName as Dictionary

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The issuer name.
**Notes:** (Read only property)

### 79.33.16 Name as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the certificate.
**Notes:** (Read only property)

### 79.33.17 PublicKey as PKeyMBS

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts public key.
**Notes:** (Read only property)

### 79.33.18 SerialNumber as String

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The serial number as text.
**Notes:** (Read only property)

### 79.33.19 SubjectName as Dictionary

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The subject name.
**Notes:** (Read only property)

### 79.33.20 ValidNotAfter as Date

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The date where the certificate expires.
**Example:**

```
// read certificate
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.pem")
Dim b As BinaryStream = BinaryStream.Open(f, False)
Dim s As String = b.Read(b.Length)

// parse the certificate
```

```
Dim x As X509MBS = X509MBS.Open(s)

// check dates
MsgBox x.ValidNotBefore.SQLDateTime + EndOfLine + x.ValidNotAfter.SQLDateTime
```

**Notes:** In GMT time zone.
(Read only property)

### 79.33.21 ValidNotAfterDateTime as DateTime

MBS Encryption Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The date where the certificate expires.
**Notes:** In GMT time zone.
(Read only property)

### 79.33.22 ValidNotBefore as Date

MBS Encryption Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The date where the certificate was created.
**Example:**

```
// read certificate
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.pem")
Dim b As BinaryStream = BinaryStream.Open(f, False)
Dim s As String = b.Read(b.Length)

// parse the certificate
Dim x As X509MBS = X509MBS.Open(s)

// check dates
MsgBox x.ValidNotBefore.SQLDateTime + EndOfLine + x.ValidNotAfter.SQLDateTime
```

**Notes:** In GMT time zone.
(Read only property)

### 79.33.23 ValidNotBeforeDateTime as DateTime

MBS Encryption Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The date where the certificate was created.
**Notes:** In GMT time zone.
(Read only property)

### 79.33.24 Version as Integer

MBS Encryption Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the file.
**Notes:** Currently usually 2 for version 3.
(Read only property)

# Chapter 80

# Endian

## 80.1 Globals

### 80.1.1 EndianS16_BtoLMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.2 EndianS16_BtoNMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.

B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.3 EndianS16_LtoBMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.4 EndianS16_LtoNMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.5 EndianS16_NtoBMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.

16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.6 EndianS16_NtoLMBS(n as Int16) as Int16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.7 EndianS32_BtoLMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.8 EndianS32_BtoNMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:

S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.9 EndianS32_LtoBMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.10 EndianS32_LtoNMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.11 EndianS32_NtoBMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.12 EndianS32_NtoLMBS(n as Int32) as Int32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.13 EndianSwap16MBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Swaps a 16 bit integer.

### 80.1.14 EndianSwap32MBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Swaps a 32 bit integer.

### 80.1.15 EndianU16_BtoLMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.16 EndianU16_BtoNMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.17 EndianU16_LtoBMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.18 EndianU16_LtoNMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.19 EndianU16_NtoBMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.20 EndianU16_NtoLMBS(n as UInt16) as UInt16

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.21 EndianU32_BtoLMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.22 EndianU32_BtoNMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.23 EndianU32_LtoBMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.24 EndianU32_LtoNMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Int32) as Int32
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.25 EndianU32_NtoBMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

### 80.1.26 EndianU32_NtoLMBS(n as UInt32) as UInt32

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Notes:** e.g.:
EndianS32_BtoNMBS(n as Integer) as Integer
EndianU16_LtoBMBS(n as Integer) as Integer

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

# Chapter 81

# Exif

## 81.1 class ExifTagMBS

### 81.1.1 class ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a data tag in EXIF.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr3

### 81.1.2 Methods

### 81.1.3 Constructor

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 81.1.4 Destructor

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 81.1.5 Values as Variant()

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all values for the current tag.
**Notes:** Number of entries should be equal to components property.

### 81.1.6 Properties

### 81.1.7 ByteCount as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes used for this tag's data.
**Notes:** (Read only property)

### 81.1.8 Components as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of components.
**Notes:** Some values can be arrays, so components is greater than 1.
(Read only property)

### 81.1.9 DataPointer as Ptr

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pointer to the data.
**Notes:** Points into the MemoryBlock stored in data property of ExifTagsMBS object.
(Read only property)

### 81.1.10 Endian as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting for this value.
**Notes:** See kEndian* constants.

(Read only property)

### 81.1.11 Format as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data format of this entry.
**Notes:** See kFormat* constants.
(Read only property)

### 81.1.12 IsNumeric as Boolean

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this tag is a numeric data type.
**Notes:** False if format is invalid, string or undefined.
(Read only property)

### 81.1.13 StringValue as String

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value as string to display.
**Notes:** Returns list of values with comma separated if there are multiple numeric values.
String or unknown fields are interpreted as text and trimmed.
(Read only property)

### 81.1.14 Tag as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag ID.
**Notes:** See EXIF data format documentation for complete list of possible values.
(Read only property)

### 81.1.15 TagName as String

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the tag.
**Notes:** We have a list of known tags where we lookup the name for you.
(Read only property)

### 81.1.16 Value as Variant

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the tag.
**Notes:** First value for multi value objects (if Components >1).
(Read and Write property)
See also:

- 81.1.17 Value(ComponentIndex as Integer) as Variant 13532

### 81.1.17 Value(ComponentIndex as Integer) as Variant

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the given component.
**Notes:** ComponentIndex is from 0 to Components-1.
e.g. GPS Coordinate may be stored as 3 values (hour, minute and second)
(Read and Write computed property)
See also:

- 81.1.16 Value as Variant 13532

### 81.1.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kTagArtist | &h13B | One of the tag constant. |
| kTagCopyright | &h8298 | One of the tag constant. |
| kTagDateTime | &h132 | One of the tag constant. |
| kTagDescription | &h10E | One of the tag constant. |
| kTagExposureTime | &h829A | One of the tag constant. |
| kTagFlashUsed | &h9209 | One of the tag constant. |
| kTagFNumber | &h829D | One of the tag constant. |
| kTagGPSAltitude | 6 | One of the tag constant. |
| kTagGPSAltitudeRef | 5 | One of the tag constant. |
| kTagGPSAreaInformation | &h1C | One of the tag constant. |
| kTagGPSDateStamp | &h1D | One of the tag constant. |
| kTagGPSDestBearing | &h18 | One of the tag constant. |
| kTagGPSDestBearingRef | &h17 | One of the tag constant. |
| kTagGPSDestDistance | &h1A | One of the tag constant. |
| kTagGPSDestDistanceRef | &h19 | One of the tag constant. |
| kTagGPSDestLatitude | &h14 | One of the tag constant. |
| kTagGPSDestLatitudeRef | &h13 | One of the tag constant. |
| kTagGPSDestLongitude | &h16 | One of the tag constant. |
| kTagGPSDestLongitudeRef | &h15 | One of the tag constant. |
| kTagGPSDifferential | &h1E | One of the tag constant. |
| kTagGPSDOP | 11 | One of the tag constant. |
| kTagGPSImgDirection | &h11 | One of the tag constant. |
| kTagGPSImgDirectionRef | &h10 | One of the tag constant. |
| kTagGPSLatitude | 2 | One of the tag constant. |
| kTagGPSLatitudeRef | 1 | One of the tag constant. |
| kTagGPSLongitude | 4 | One of the tag constant. |
| kTagGPSLongitudeRef | 3 | One of the tag constant. |
| kTagGPSMapDatum | &h12 | One of the tag constant. |
| kTagGPSMeasureMode | 10 | One of the tag constant. |
| kTagGPSProcessingMethod | &h1B | One of the tag constant. |
| kTagGPSSatellites | 8 | One of the tag constant. |
| kTagGPSSpeed | 13 | One of the tag constant. |
| kTagGPSSpeedRef | 12 | One of the tag constant. |
| kTagGPSStatus | 9 | One of the tag constant. |
| kTagGPSTimeStamp | 7 | One of the tag constant. |
| kTagGPSTrack | 15 | One of the tag constant. |
| kTagGPSTrackRef | 14 | One of the tag constant. |
| kTagGPSVersion | 0 | One of the tag constant. |
| kTagImageHeight | &h101 | One of the tag constant. |
| kTagImageWidth | &h100 | One of the tag constant. |
| kTagMake | &h10F | One of the tag constant. |
| kTagModel | &h110 | One of the tag constant. |
| kTagOrientation | &h112 | One of the tag constant. |
| kTagResolutionUnit | &h128 | One of the tag constant. |
| kTagSoftware | &h131 | One of the tag constant. |
| kTagThumbnailLength | &h202 | One of the tag constant. |
| kTagThumbnailOffset | &h201 | One of the tag constant. |
| kTagUserComment | &h9286 | One of the tag constant. |
| kTagXResolution | &h11A | One of the tag constant. |
| kTagYResolution | &h11B | One of the tag constant. |

Endian Mode

| Constant | Value | Description |
|---|---|---|
| kEndianBig | 1 | Value is stored in big endian format. |
| kEndianLittle | 2 | Value is stored in little endian format. |
| kEndianUnknown | 0 | Unknown |

Flash Modes

| Constant | Value | Description |
|---|---|---|
| kFlashAuto | &h18 | Auto |
| kFlashFired | 1 | Fired |
| kFlashFlashFunctionPresent | &h20 | Flash Function Present |
| kFlashNo | 0 | No flash |
| kFlashOff | &h10 | Off |
| kFlashOn | 8 | On |
| kFlashRedEyeReduction | &h40 | Red Eye Reduction |
| kFlashStrobeReturnLightDetected | 6 | Strobe Return Light Detected |

Data Formats

| Constant | Value | Description |
|---|---|---|
| kFormatByte | 1 | Byte data. (UInt8) |
| kFormatDouble | 12 | Double |
| kFormatInvalid | 0 | Invalid |
| kFormatSByte | 6 | Signed byte |
| kFormatSingle | 11 | Single |
| kFormatSLong | 9 | Signed long |
| kFormatSRational | 10 | Signed rational value. |
| kFormatSShort | 8 | Signed short. (Int16) |
| kFormatString | 2 | Text |
| kFormatULong | 4 | Unsigned long. (UInt32) |
| kFormatUndefined | 7 | Undefined |
| kFormatURational | 5 | Unsigned rational value. |
| kFormatUShort | 3 | Unsigned short. (UInt16) |

Orientation

| Constant | Value | Description |
|---|---|---|
| kOrientationBottomLeft | 4 | Bottom Left |
| kOrientationBottomRight | 3 | Bottom Right |
| kOrientationLeftBottom | 8 | Left Bottom |
| kOrientationLeftTop | 5 | Left Top |
| kOrientationRightBottom | 7 | Right Bottom |
| kOrientationRightTop | 6 | Right Top |
| kOrientationTopLeft | 1 | Top Left |
| kOrientationTopRight | 2 | Top Right |

Units

| Constant | Value | Description |
|---|---|---|
| kUnitCentimeter | 3 | Pixel per centimeter |
| kUnitInch | 2 | Pixel per Inches |
| kUnitUndefined | 1 | Undefined. |

## 81.2 class ExifTagsMBS

### 81.2.1 class ExifTagsMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The EXIF class.
**Notes:** This is a home grown class to parse Exif and allow small modifications.
Great to just read values or to update a date field.
This class does not allow to add values or to increase text lengths.
But you can take a template EXIF from one picture, change values and store it with another one.

See also CGImageSourceMBS class for MacOS and iOS for Apple's way to read/write EXIF data.
And see GMImageMBS class to read EXIF via attribute functions in GraphicsMagick.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr3

**Xojo Developer Magazine**

- 18.4, page 11: News

### 81.2.2 Methods

### 81.2.3 Constructor(ExifData as MemoryBlock)

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor taking exif data as memoryblock.
**Notes:** Please use JPEGImporterMBS, GMImageMBS, NSImageMBS, PNGReaderMBS or other classes to get EXIF data block.
See also:

- 81.2.4 Constructor(ExifData as String) 13536

### 81.2.4 Constructor(ExifData as String)

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor taking exif data as string.
**Notes:** Please use JPEGImporterMBS, GMImageMBS, NSImageMBS, PNGReaderMBS or other classes to

get EXIF data block.
See also:

- 81.2.3 Constructor(ExifData as MemoryBlock) 13536

### 81.2.5 TagByID(Tag as integer) as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a tag by ID.
**Notes:** This looks on the Tag property.

### 81.2.6 TagByIndex(index as integer) as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a tag by index.

### 81.2.7 Tags as ExifTagMBS()

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries an array with all tags found.

### 81.2.8 Properties

### 81.2.9 Artist as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Artist.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.10 Copyright as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Copyright.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.11 Count as Integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of tags found.
**Notes:** (Read only property)

### 81.2.12 Data as MemoryBlock

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of the Exif record.
**Notes:** This is a copy of what you passed to the constructor.
It may have been modified if you overwrote a value.
(Read only property)

### 81.2.13 DateTime as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for DateTime.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.14 Description as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Description.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.15 ExposureTime as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ExposureTime.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.16 FlashUsed as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for FlashUsed.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.17 FNumber as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for FNumber.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.18 GPSAltitude as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSAltitude.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.19 GPSAltitudeRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSAltitudeRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.20 GPSAreaInformation as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSAreaInformation.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.21 GPSDateStamp as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDateStamp.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.22 GPSDestBearing as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestBearing.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.23 GPSDestBearingRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestBearingRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.24 GPSDestDistance as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestDistance.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.25 GPSDestDistanceRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestDistanceRef.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.26 GPSDestLatitude as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestLatitude.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.27 GPSDestLatitudeRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestLatitudeRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.28 GPSDestLongitude as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestLongitude.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.29 GPSDestLongitudeRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDestLongitudeRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.30 GPSDifferential as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDifferential.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.31 GPSDOP as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSDOP.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.32 GPSImgDirection as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSImgDirection.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.33 GPSImgDirectionRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSImgDirectionRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.34 GPSLatitude as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSLatitude.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.35 GPSLatitudeRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSLatitudeRef.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.36 GPSLongitude as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSLongitude.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.37 GPSLongitudeRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSLongitudeRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.38 GPSMapDatum as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSMapDatum.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.39 GPSMeasureMode as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSMeasureMode.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.40 GPSProcessingMethod as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSProcessingMethod.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.41 GPSSatellites as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSSatellites.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.42 GPSSpeed as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSSpeed.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.43 GPSSpeedRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSSpeedRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.44 GPSStatus as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSStatus.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.45 GPSTimeStamp as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSTimeStamp.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.46 GPSTrack as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSTrack.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.47 GPSTrackRef as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSTrackRef.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.48 GPSVersion as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for GPSVersion.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.49 ImageHeight as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ImageHeight.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.50 ImageWidth as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ImageWidth.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.51 Make as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Make.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.52 Model as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Model.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.53 Orientation as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Orientation.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.54 ResolutionUnit as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ResolutionUnit.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.55 Software as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for Software.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.56 ThumbnailLength as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ThumbnailLength.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.57 ThumbnailOffset as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for ThumbnailOffset.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.58 ThumnnailData as MemoryBlock

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies thumbnail from the EXIF data.
**Notes:** Returns nil if not thumbnail exists.
(Read only property)

### 81.2.59 UserComment as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for UserComment.
**Notes:** May be nil if not found.
(Read only property)

### 81.2.60 XResolution as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for XResolution.
**Notes:** May be nil if not found.

(Read only property)

### 81.2.61 YResolution as ExifTagMBS

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the tag for YResolution.
**Notes:** May be nil if not found.
(Read only property)

# Chapter 82

# Filemapping and Shared Memory

## 82.1 class FileMappingMBS

### 82.1.1 class FileMappingMBS

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for file mapping and shared memory access.
**Notes:** FilemappingMBS is a clever way to map the content of a file into memory without loading it.
All applications are today loaded via mapping using the virtual memory manager. So your data is inside the file but some memory is used to cache it and you can access it as a memoryblock.

You can use this class in several ways:

1. file mapping read/write: Call the constructor with a file, open the file mapping and map memory in your process to read or write a file.
2. file mapping read/write with temporary files: You can create (multi gigabyte) tempory memory storage to store data too big for your application own address space.
3. a variant of 2 is to pass nil to the constructor on Windows to have the data stored in the swap files.
4. use Constructor without paramaters and call CreateSharedMemory to create a shared memory object.
5. use Constructor without paramaters and call OpenSharedMemory to access a shared memory object from another process.

For shared memory objects, be careful how you design it. Your shared memory should have a flag for editing, so one app does not edit while another app edits. Add a version value to check your application versions. Also add a value for the revision of the content so your apps can see modifications. Finally your app should handle the possibility that the application crashes while writing data. So the data can be in a bad state.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0

- Xojo 2020r2.1 arrived
- MBS Xojo Plugins, version 20.6pr2
- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 18.3pr5
- MBS Real Studio Plugins, version 13.1pr15
- MBS Real Studio Plugins, version 11.3pr14
- MBS REALbasic Plugins, version 10.5pr4

**Xojo Developer Magazine**

- 19.2, page 10: News

### 82.1.2 Methods

### 82.1.3 CloseFile

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the file you used for backstore.
**Notes:** Called by the destructor automatically.

### 82.1.4 CloseFileMapping

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the file mapping.
**Notes:** Called by the destructor automatically.
You close all views, than you close the file mapping and finally the file.

### 82.1.5 Constructor

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dummy constructor used if you create a shared memory object.
**Notes:** Use this constructor if you continue with OpenSharedMemory or CreateSharedMemory.
See also:

- 82.1.6 Constructor(file as folderitem, write as boolean = false)

### 82.1.6 Constructor(file as folderitem, write as boolean = false)

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens or creates a file for file mapping.
**Notes:** On Windows you can pass nil for the file parameter in order to have a file mapping using the swap files for back storage.

If write is true, the file is opened/created for write access.
See also:

- 82.1.5 Constructor 13550

### 82.1.7 CreateSharedMemory(name as string, Size as Int64) as boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a shared memory object with the given name.
**Notes:** Returns true on success and false on failure. The name must be unique on the whole PC.

On success, you can call MapView to access memory.
isWriteable is set to true as shared memory objects are always read and write.

Fails if the shared memory object does exist. In this case, call OpenSharedMemory.
If your application crashes, on the next run the object will still exist on Mac OS X and Linux, so you need to open or delete & create it.

The Size should be a multiply of the page size (4096).
Sets DeleteSharedMemory to true so the object is deleted by the destructor. Set it to false if you don't want that behavior.

### 82.1.8 DeleteSharedMemory(name as string) as boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Targets: All.

**Function:** Deletes the shared memory object.
**Notes:** Returns true on success and false on failure.
Called by the destructor if DeleteSharedMemory property is true.
See also:

- 82.1.20 DeleteSharedMemory as Boolean 13554

### 82.1.9 EnlargeFile(Size as Int64)

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resizes the file to the given size.
**Notes:** This is for file mappings used as temporary storage with a temporary file. You use the Constructor to create a temporary file. This file is enlarged to the size you need. Next you call OpenFileMapping and MapView. To cleanup, you close all views and the file mapping. Now before you close the file, you should call ShrinkFile. ShrinkFile reduces the file size to zero so the operation system doesn't start flushing the shared memory to the file. You can get this automatically if you set ShrinkFileOnClose to true.

### 82.1.10 GetSharedMemoryValue(name as string) as MemoryBlock

MBS Util Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value of shared memory object.
**Notes:** Returns copy of the data.
Since data is stored in blocks of page size (usually 4K), the returned size has additional null bytes on the end to round size up.
If you store text there, you may look for the end of your data, e.g. for JSON do a trim(Chr(0)) to remove the null bytes.

### 82.1.11 HasSharedMemoryValue(name as string) as Boolean

MBS Util Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether shared memory object exists.

### 82.1.12 MapView(mem as MemoryBlock, offset as Int64, Size as Integer) as FileMappingViewMBS

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maps a portion of the file mapping or shared memory object into your application's address space.
**Notes:** Returns nil on any error.
Using invalide offset/size values can lead into a bad mapping.
Here you can pass your own memoryblock for back storage.
Make sure your memory is 4 or 64 KB aligned, depending on platform.
(Windows need 64 KB, Mac only 4 KB)

Changed Size parameter from Int32 to Integer in version 21.0.

Xojo may not handle ptr with offsets >2 GB as of version 2020r2. This is fixed in 2020r2.1.
See also:

- 82.1.13 MapView(offset as Int64, Size as Integer) as FileMappingViewMBS 13553

### 82.1.13 MapView(offset as Int64, Size as Integer) as FileMappingViewMBS

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maps a portion of the file mapping or shared memory object into your application's address space.
**Notes:** Returns nil on any error.
Using invalide offset/size values can lead into a bad mapping.
(Windows need 64 KB, Mac only 4 KB)

Changed Size parameter from Int32 to Integer in version 21.0.
Xojo may not handle ptr with offsets >2 GB as of version 2020r2. This is fixed in 2020r2.1.
See also:

- 82.1.12 MapView(mem as MemoryBlock, offset as Int64, Size as Integer) as FileMappingViewMBS 13552

### 82.1.14 OpenFileMapping(MaxSize as Int64 = 0) as boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file mapping.
**Notes:** If MaxSize is zero, the file size is used for creating the mapping.
The Size should be a multiply of the page size (4096).

Returns true on success.
Do not call after using OpenSharedMemory or CreateSharedMemory as they open the file mapping for you.

### 82.1.15 OpenSharedMemory(name as string) as boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a shared memory object with the given name.
**Notes:** Returns true on success and false on failure.

On success, you can call MapView to access memory.
isWriteable is set to true as shared memory objects are always read and write.

Fails if the shared memory object does not exist. In this case, call CreateSharedMemory.

### 82.1.16 SetSharedMemoryValue(name as string, data as MemoryBlock) as Boolean

MBS Util Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets shared memory value.
**Notes:** Persistent object on Mac/Linux till computer restarts or shuts down.
On Windows object is destroyed when last application referring it quits.

Returns true on success.
Size of the data block will be rounded up to page size.

### 82.1.17 ShrinkFile

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resizes the file to by empty.
**Notes:** Useful if you used EnlargeFile before.

### 82.1.18 Properties

### 82.1.19 DeleteFileOnClose as Boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to delete the file in the destructor.
**Notes:** Useful if a tempory file is used as backstore.
(Read and Write property)

### 82.1.20 DeleteSharedMemory as Boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Targets: All.

**Function:** Whether to delete the shared memory object on closing.
**Notes:** True by default after Creating a shared memory object.

On Windows the shared memory objects exist as long as someone uses them.
On Mac OS X they live until you kill them even if your application is not running.

(Read and Write property)
See also:

- 82.1.8 DeleteSharedMemory(name as string) as boolean 13551

### 82.1.21 File as FolderItem

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file reference used for the backstore.
**Notes:** (Read only property)

### 82.1.22 isWriteable as Boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether opened/created the file mapping with write permission.
**Notes:** Opening files for reading only in order to read inside gives the operation system some optimization possibilities.
(Read only property)

### 82.1.23 Lasterror as Integer

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** On Windows typically a Windows error code.
On Linux and Mac OS X typically 0 for success and other values for errors.
(Read and Write property)

### 82.1.24 LasterrorString as String

MBS Util Plugin, Plugin Version: 10.5, Platform: Windows, Targets: All.

**Function:** The string for the last error code.
**Notes:** Only implemented for Windows.
Returns "" on any error.
(Read only property)

### 82.1.25 Name as String

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name used for a named shared memory object.
**Notes:** (Read only property)

### 82.1.26 SharedMemorySize as Int64

MBS Util Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries shared memory object size.
**Notes:** Only valid for shared memory objects in handle.
(Read only property)

### 82.1.27 ShrinkFileOnClose as Boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to call ShrinkFile automatically from the destructor.
**Notes:** Default false.
(Read and Write property)

## 82.2 class FileMappingViewMBS

### 82.2.1 class FileMappingViewMBS

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a file mapping view.
**Notes:** You can using file mapping with a 10 GB bit file. Your application has only 4 GB of address space and effectively you can only use 2 GB. So you can try to map in a few hundred mega bytes at a given time. But you can move this view on the large file to read the whole file. But remember: File mapping is only efficient if you read a little data form the file and jump a lot. For reading the whole file, use a binarystream.
**Blog Entries**

- MBS REALbasic Plugins, version 10.5pr4

### 82.2.2 Methods

### 82.2.3 FlushView

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flushes all data to the backstore.
**Notes:** For file mappings, the modified pages are written back to the file now. Normally you won't call this and let the operation system decide when to write the data to the file.

### 82.2.4 UnmapView

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Frees the memory allocated by the view.
**Notes:** Called automaticaly be the destructor.

### 82.2.5 Properties

### 82.2.6 FlushOnClose as Boolean

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to call FlushView for you in the destructor.
**Notes:** (Read and Write property)

### 82.2.7 Memory as Memoryblock

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock for this view.
**Example:**

```
dim v as FileMappingViewMBS // your view

v.memory.cstring(0)="Hello World"
```

**Notes:** The memoryblock has no known size and it becomes invalid once this view object is destroyed. So keep a reference around as long as you use the memoryblock.
(Read only property)

### 82.2.8 Offset as Int64

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The offset used to create this view.
**Notes:** (Read only property)

### 82.2.9 Parent as FileMappingMBS

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The owner FileMapping object.
**Notes:** (Read only property)

### 82.2.10 Size as Integer

MBS Util Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size in bytes of this view.
**Notes:** (Read only property)

# Chapter 83

# Files

## 83.1 class ACLEntryMBS

### 83.1.1 class ACLEntryMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The class for an ACL entry.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.0pr1

### 83.1.2 Methods

### 83.1.3 Constructor

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 83.1.4 Copy(dest as ACLEntryMBS)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Copy an ACL entry to another ACL entry.
**Notes:** see also acl_copy_entry man page.

### 83.1.5 GIDtoUUID(GID as Integer) as memoryblock

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries the UUID for a group id.
**Notes:** Returns nil on any error.

### 83.1.6 GroupFromGID(GID as Integer) as string

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries the group name for a Group ID.

### 83.1.7 MaximalPermsetMask as UInt64

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The maximal permset mask.
**Notes:** see also acl_maximal_permset_mask_np man page.

### 83.1.8 UIDtoUUID(UID as Integer) as memoryblock

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries the UUID for an user id.
**Notes:** Returns nil on any error.

### 83.1.9 UserFromUID(UID as Integer) as string

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries the user name for a UID.

### 83.1.10 UUIDtoID(UUID as memoryblock, byref ID as Integer, byref Type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries the GID/UID for an UUID.
**Notes:** Type is 0 for user and 1 for group.

Returns true on success.

### 83.1.11 Properties

### 83.1.12 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 83.1.13 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 83.1.14 Parent as Variant

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 83.1.15 FlagSet as ACLFlagSetMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Get or Set the flag set.
**Notes:** see also acl_get_flagset_np/acl_set_flagset_np man page.
(Read and Write computed property)

### 83.1.16 PermSet as ACLPermSetMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Get/Set the permissions set.
**Notes:** see also acl_get_permset/acl_set_permset man page.

(Read and Write computed property)

### 83.1.17 PermSetMask as UInt64

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Get/Set the permission set mask.
**Notes:** see also acl_get_permset_mask_np/acl_set_permset_mask_np man page.
(Read and Write computed property)

### 83.1.18 Qualifier as Memoryblock

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Get/Set the qualifier.
**Notes:** Value is a 16byte big GUID as memoryblock.
see also acl_set_qualifier/acl_get_qualifier man page.
(Read and Write computed property)

### 83.1.19 TagType as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Sets or gets the the tag type.
**Notes:** see also acl_get_tag_type/acl_set_tag_type man page.
(Read and Write computed property)

### 83.1.20 Constants

ACL entry tag type bits

| Constant | Value | Description |
|---|---|---|
| kACLExtendedAllow | 1 | |
| kACLExtendedDeny | 2 | |
| kACLUndefinedTag | 0 | |

## 83.2 class ACLFlagSetMBS

### 83.2.1 class ACLFlagSetMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The class for an ACL flag set.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 83.2.2 Methods

### 83.2.3 Add(flag as Integer)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Adds a flag to the flag set.
**Notes:** see also acl_add_flag_np man page.

### 83.2.4 Clear

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Clears the flag set.
**Notes:** see also acl_clear_flags_np man page.

### 83.2.5 Constructor

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 83.2.6 Delete(flag as Integer)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Deletes flag from flag set.
**Notes:** see also acl_delete_flag_np man page.

### 83.2.7 HasFlag(flag as Integer) as Boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Checks if a flag is set in this flag set.
**Notes:** see also acl_get_flag_np man page.

### 83.2.8 Properties

### 83.2.9 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 83.2.10 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 83.2.11 Parent as Variant

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 83.2.12 Constants

ACL Entry Flags

| Constant | Value | Description |
|---|---|---|
| kACLEntryDirectoryInherit | 64 | |
| kACLEntryFileInherit | 32 | |
| kACLEntryInherited | 16 | |
| kACLEntryLimitInherit | 128 | |
| kACLEntryOnlyInherit | 256 | |
| kACLFlagDeferInherit | 1 | |
| kACLFlagNoInherit | 131072 | |

## 83.3 class ACLPermSetMBS

### 83.3.1 class ACLPermSetMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The class for an ACL permission set.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 83.3.2 Methods

### 83.3.3 Add(perm as Integer)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Adds a permission.
**Notes:** see also acl_add_perm man page.

### 83.3.4 Clear

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Clears the permission set.
**Notes:** see also acl_clear_perms man page.

### 83.3.5 Constructor

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 83.3.6 Delete(perm as Integer)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Deletes a permission.
**Notes:** see also acl_delete_perm man page.

### 83.3.7 HasPerm(perm as Integer) as Boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Checks if permissions is included in this permission set.
**Notes:** see also acl_get_perm_np man page.

### 83.3.8 Properties

### 83.3.9 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 83.3.10 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 83.3.11 Parent as Variant

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 83.3.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kACLMaxEntries | 128 | Maximum number of entries. |

Individual object access permissions

| Constant | Value | Description |
|---|---|---|
| kACLAddFile | 4 | |
| kACLAddSubDirectory | 32 | |
| kACLAppendData | 32 | |
| kACLChangeOwner | 8192 | |
| kACLDelete | 16 | |
| kACLDeleteChild | 64 | |
| kACLExecute | 8 | |
| kACLListDirectory | 2 | |
| kACLReadAttributes | 128 | |
| kACLReadData | 2 | |
| kACLReadExtraAttributes | 512 | |
| kACLReadSecurity | 2048 | |
| kACLSearch | 8 | |
| kACLWriteAttributes | 256 | |
| kACLWriteData | 4 | |
| kACLWriteExtraAttributes | 1024 | |
| kACLWriteSecurity | 4096 | |

## 83.4 class ACLRightMBS

### 83.4.1 class ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The class for ACL rights.

### 83.4.2 Methods

### 83.4.3 Constructor(count as Integer)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Allocates and initializes the working storage for an ACL of at least count ACL entries.
**Notes:** see also acl_init man page.
See also:

- 83.4.4 Constructor(text as string) 13569

### 83.4.4 Constructor(text as string)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates new ACL from text representation.
**Notes:** see also acl_from_text man page.
See also:

- 83.4.3 Constructor(count as Integer) 13569

### 83.4.5 CopyData(Native as boolean = false) as String

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates external representation.
**Notes:** see also acl_copy_int man page.

### 83.4.6 CreateEntry as ACLEntryMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a new entry.
**Notes:** see also acl_create_entry man page.
See also:


- 83.4.7 CreateEntry(entryIndex as Integer, tag_type as Integer = 1) as ACLEntryMBS 13570


### 83.4.7 CreateEntry(entryIndex as Integer, tag_type as Integer = 1) as ACLEntryMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a new entry.
**Notes:** see also acl_create_entry_np man page.
See also:


- 83.4.6 CreateEntry as ACLEntryMBS 13569


### 83.4.8 DeleteEntry(entry as ACLEntryMBS)

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Deletes an entry.
**Notes:** see also acl_delete_entry man page.

### 83.4.9 Duplicate as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates a duplicate of this right set.
**Notes:** see also acl_dup man page.

### 83.4.10 Entries as ACLEntryMBS()

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Queries array with all entries in this ACL.
**Notes:** Lasterror is set.
see also acl_get_entry man page.

### 83.4.11 Entry(entryIndex as Integer) as ACLEntryMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Queries entry with given index.
**Notes:** You can use constants kACLFirstEntry, kACLLastEntry or kACLNextEntry.
see also acl_get_entry man page.

### 83.4.12 NewACL(count as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Allocates and initializes the working storage for an ACL of at least count ACL entries.
**Notes:** see also acl_init man page.

### 83.4.13 NewACLFromExternal(data as string, native as boolean = false) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates new ACL object from external representation.
**Notes:** see also acl_copy_ext man page.

### 83.4.14 NewACLFromFile(file as folderitem, type as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** Creates ACL object from file.
**Notes:** see also acl_get_file man page.
See also:

- 83.4.15 NewACLFromFile(path as string, type as Integer) as ACLRightMBS 13571

### 83.4.15 NewACLFromFile(path as string, type as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates ACL object from file.
**Notes:** see also acl_get_file man page.
See also:

- 83.4.14 NewACLFromFile(file as folderitem, type as Integer) as ACLRightMBS 13571

### 83.4.16 NewACLFromFilePointer(FilePointer as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates ACL object from FilePointer.
**Notes:** see also acl_get_fd man page.
See also:

- 83.4.17 NewACLFromFilePointer(FilePointer as Integer, type as Integer) as ACLRightMBS 13572

### 83.4.17 NewACLFromFilePointer(FilePointer as Integer, type as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates ACL object from FilePointer.
**Notes:** see also acl_get_fd_np man page.
See also:

- 83.4.16 NewACLFromFilePointer(FilePointer as Integer) as ACLRightMBS 13572

### 83.4.18 NewACLFromLink(path as string, type as Integer) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates ACL object from link.
**Notes:** see also acl_get_link_np man page.

### 83.4.19 NewACLFromText(text as string) as ACLRightMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Creates new ACL from text representation.
**Notes:** see also acl_from_text man page.

### 83.4.20 SetFile(Path as string, type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Applies this ACL to a file.
**Notes:** see also acl_set_file man page.

### 83.4.21 SetFilePointer(FilePointer as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Applies this ACL to a file pointer.
**Notes:** see also acl_set_fd man page.
See also:

- 83.4.22 SetFilePointer(FilePointer as Integer, type as Integer) as boolean 13573

### 83.4.22 SetFilePointer(FilePointer as Integer, type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Applies this ACL to a file pointer.
**Notes:** see also acl_set_fd_np man page.
See also:

- 83.4.21 SetFilePointer(FilePointer as Integer) as boolean 13573

### 83.4.23 SetLink(Path as string, type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Applies this ACL to a link file.
**Notes:** see also acl_set_link_np man page.

### 83.4.24 Size as Int64

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Queries size of binary representation.
**Notes:** see also acl_size man page.

### 83.4.25 Text as String

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Queries text representation of this ACL.
**Notes:** see also acl_to_text man page.

### 83.4.26 Valid as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Checks if ACL is valid in general.
**Notes:** see also acl_valid man page.

### 83.4.27 ValidFile(Path as string, type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Checks if ACL is valid for this file.
**Notes:** see also acl_valid_file_np man page.

### 83.4.28 ValidFilePointer(FilePointer as Integer, type as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Checks if ACL is valid for this file pointer.
**Notes:** see also acl_valid_fd_np man page.

### 83.4.29 Properties

### 83.4.30 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 83.4.31 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 83.4.32 FlagSet as ACLFlagSetMBS

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Get/Set the flag set.
**Notes:** see also acl_get_flagset_np/acl_set_flagset_np man page.
(Read and Write computed property)

### 83.4.33 Constants

ACL Entry Constants

| Constant | Value | Description |
|---|---|---|
| kACLFirstEntry | 0 | Next entry. |
| kACLLastEntry | -2 | Last entry. |
| kACLNextEntry | -1 | Next entry. |

ACL Types

| Constant | Value | Description |
|---|---|---|
| kACLTypeAccess | 0 | Posix 1003.1e type, not supported. |
| kACLTypeAFS | 2 | No supported on Mac OS X, only for Linux/FreeBSD. |
| kACLTypeCODA | 3 | No supported on Mac OS X, only for Linux/FreeBSD. |
| kACLTypeDefault | 1 | Posix 1003.1e type, not supported. |
| kACLTypeExtended | 256 | Extended ACL. |
| kACLTypeNTFS | 4 | No supported on Mac OS X, only for Linux/FreeBSD. |
| kACLTypeNWFS | 5 | No supported on Mac OS X, only for Linux/FreeBSD. |

## 83.5 class CopyFileMBS

### 83.5.1 class CopyFileMBS

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The class for copyfile function.
**Notes:** We provide a class to hold state and get event for progress.
Uses low level copyfile API from MacOS.

See copyfile man page in terminal.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr3

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 54: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 83.5.2 Methods

### 83.5.3 CopyFile(From as FolderItem, Dest as FolderItem, flags as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Copies files or folders.
**Notes:** Copy a file's data and/or metadata. (Metadata consists of permissions, extended attributes, access control lists, and so forth.)

Recursive Copies When given the kFlagsRecursive flag, copyfile() will use the fts(3) functions to recursively descend into the source file-system object. It then calls copyfile() on each of the entries it finds that way. If a progress event is given the event will be called four times for each directory object, and twice for all other objects. (Each directory will be examined twice, once on entry – before copying each of the objects contained in the directory – and once on exit – after copying each object contained in the directory, in order to perform some final cleanup.)

Returns error code or zero for success.
See also:

- 83.5.4 CopyFile(From as String, Dest as String, flags as Integer) as Integer 13577

### 83.5.4 CopyFile(From as String, Dest as String, flags as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Copies files or folders.
**Notes:** Copy a file's data and/or metadata. (Metadata consists of permissions, extended attributes, access control lists, and so forth.)

Recursive Copies When given the kFlagsRecursive flag, copyfile() will use the fts(3) functions to recursively descend into the source file-system object. It then calls copyfile() on each of the entries it finds that way. If a progress event is given the event will be called four times for each directory object, and twice for all other objects. (Each directory will be examined twice, once on entry – before copying each of the objects contained in the directory – and once on exit – after copying each object contained in the directory, in order to perform some final cleanup.)

Returns error code or zero for success.
See also:

- 83.5.3 CopyFile(From as FolderItem, Dest as FolderItem, flags as Integer) as Integer 13576

### 83.5.5 ErrorMessage(error as Integer) as String

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries error message for unix error code.

### 83.5.6 Properties

### 83.5.7 BytesCopied as Int64

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Get the number of data bytes copied so far.
**Notes:** Valid only in Progress event.
If a kFlagsClone or kFlagsCloneForce operation successfully cloned the requested objects, then this value will be 0.
(Read only property)

### 83.5.8 WasCloned as Boolean

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether file was cloned.
**Notes:** Valid only in Progress event.
True if a kFlagsClone or kFlagsCloneForce operation successfully cloned the requested objects.
(Read only property)

### 83.5.9 XAttrName as String

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Get the name of the extended attribute.
**Notes:** Valid only in Progress event.
(Read only property)

### 83.5.10 YieldTicks as Integer

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim t as new CopyFileMBS
t.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

### 83.5.11 Events

### 83.5.12 Progress(What as Integer, Stage as Integer, Source as String, Dest as String) as Integer

MBS MacOSX Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** The progress event called while copying.
**Notes:** What is one of the kWhat* constants.
Stage is one of the kStage* constants.
Source and Dest point to the current files being copied.

Return one of the kReturn* constants.

### 83.5.13 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsACL | 1 | Copy the source file's access control lists. |
| kFlagsAll | 15 | Copy the entire file; equivalent to BitwiseOr(kFlagsMetaData, kFlagsData). |
| kFlagsCheck | &h10000 | Return a bitmask (corresponding to the flags argument) indicating which contents would be copied; no data are actually copied. (E.g., if flags was set to kFlagsCheck + kFlagsMetaData, and the from file had extended attributes but no ACLs, the return value would be kFlagsXAttr.) |
| kFlagsClone | &h1000000 | Try to clone the file instead. This is a best try flag i.e. if cloning fails, fallback to copying the file. This flag is equivalent to BitwiseOr(kFlagsExcl, kFlagsACL, kFlagsStat, kFlagsXAttr, kFlagsData, kFlagsNoFollowSource).<br>Note that if cloning is successful, progress event will not be invoked. Note also that there is no support for cloning directories: if a directory is provided as the source and kFlagsCloneForce is not passed, this will instead copy the directory. Recursive copying however is supported. |
| kFlagsCloneForce | &h2000000 | Clone the file instead. This is a force flag i.e. if cloning fails, an error is returned. This flag is equivalent to BitwiseOr(kFlagsExcl, kFlagsACL, kFlagsStat, kFlagsXAttr, kFlagsData, kFlagsNoFollowSource). Note that if cloning is successful, progress callbacks will not be invoked. Note also that there is no support for cloning directories: if a directory is provided as the source, an error will be returned. |
| kFlagsData | 8 | Copy the source file's data. |
| kFlagsDataSparse | &h8000000 | Copy a file sparsely. This requires that the source and destination file systems support sparse files with hole sizes at least as large as their block sizes.<br>If kFlagsData is also specified, this will fall back to a full copy if sparse copying cannot be performed for any reason; otherwise, an error is returned. |
| kFlagsExcl | &h20000 | Fail if the to file already exists. |
| kFlagsMetaData | 7 | Copy the metadata; equivalent to BitwiseOr(kFlagsSecurity, kFlagsXAttr). |
| kFlagsMove | &h100000 | Unlink (using remove(3)) the from file.<br>No error is returned if remove(3) fails. Note that remove(3) removes a symbolic link itself, not the target of the link. |
| kFlagsNoFollow | &hC00000 | This is a convenience macro, equivalent to BitwiseOr(kFlagsNoFollowDest, kFlagsNoFollowSource). |
| kFlagsNoFollowDest | &h80000 | Do not follow the to file, if it is a symbolic link. |
| kFlagsNoFollowSource | &h40000 | Do not follow the from file, if it is a symbolic link. |
| kFlagsPack | &h400000 | Serialize the from file. The to file is an Apple-Double-format file. |
| kFlagsRecursive | &h8000 | Causes copyfile to recursively copy a hierarchy. |
| kFlagsRunInPlace | &h4000000 | If the src file has quarantine information, add the QTN_FLAG_DO_NOT_TRANSLOCATE flag to the quarantine information of the dst file. This allows a bundle to run in place instead of being translocated. |
| kFlagsSecurity | 3 | Copy the source file's POSIX and ACL information; equivalent to BitwiseOr(kFlagsStat,kFlagsACL). |
| kFlagsStat | 2 | Copy the source file's POSIX information (mode, modification time, etc.). |
| kFlagsUnlink | &h200000 | Unlink the to file before starting. |
| kFlagsUnpack | &h800000 | Unserialize the from file. The from file is an AppleDouble-format file; the to file will have the extended attributes, ACLs, resource fork, and FinderInfo data from the to file, regardless of the flags argument passed in. |
| kFlagsVerbose | &h40000000 | Verbose messages. |
| kFlagsXAttr | 4 | Copy the source file's extended attributes. |

Event Return Values

| Constant | Value | Description |
|---|---|---|
| kReturnContinue | 0 | The copy will continue as expected. |
| kReturnQuit | 2 | The data copy will be aborted; in the case of kStageProgress, result will be set to ECANCELED (89). |
| kReturnSkip | 1 | The data copy will be aborted, but without error. |

Progress

| Constant | Value | Description |
|---|---|---|
| kStageError | 3 | Indicates an error has happened at some stage. |
| kStageFinish | 2 | After copying has successfully finished. |
| kStageProgress | 4 | Copy in progress. |
| kStageStart | 1 | Before copying has begun. |

What

| Constant | Value | Description |
|---|---|---|
| kWhatCopyData | 4 | Data is copied currently. |
| kWhatCopyXAttr | 5 | Extended attributes are copied currently. |
| kWhatRecurseDir | 2 | The object being copied is a directory, and is being entered. (That is, none of the filesystem objects contained within the directory have been copied yet.) |
| kWhatRecurseDirCleanup | 3 | The object being copied is a directory, and all of the objects contained have been copied. At this stage, the destination directory being copied will have any extra permissions that were added to allow the copying will be removed. |
| kWhatRecurseError | 0 | There was an error in processing an element of the source hierarchy; this happens when fts(3) returns an error or unknown file type. |
| kWhatRecurseFile | 1 | The object being copied is a file (or, rather, something other than a directory). |

## 83.6 class DADiskMBS

### 83.6.1 class DADiskMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a disk in Disk Arbitation.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 83.6.2 Methods

### 83.6.3 BSDName as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains the BSD device name for the specified disk.
**Example:**

```
dim session as new DASessionMBS
dim d as DADiskMBS = DADiskMBS.CreateFromVolume(session,volume(0))
MsgBox d.BSDName
```

### 83.6.4 Constructor

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 83.6.5 CreateFromBSDName(session as DASessionMBS, name as string) as DADiskMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new disk object.
**Notes:** session: The DASession in which to contact Disk Arbitration.
name: The BSD device name.

Returns a reference to a new DADisk.

### 83.6.6 CreateFromVolume(session as DASessionMBS, volume as folderitem) as DADiskMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new disk object.
**Notes:** Creates a new disk object.

### 83.6.7 CreateFromVolumePath(session as DASessionMBS, path as string) as DADiskMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new disk object.
**Notes:** session: The DASession in which to contact Disk Arbitration.
path: The BSD mount point.

Available in OS X v10.7 and later.

### 83.6.8 Description as dictionary

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains the Disk Arbitration description of the specified disk.
**Example:**

```
dim session as new DASessionMBS
dim d as DADiskMBS = DADiskMBS.CreateFromVolume(session,volume(0))
dim dic as Dictionary = d.Description
MsgBox dic.Value(d.kDADiskDescriptionVolumeNameKey)
```

**Notes:** This function will contact Disk Arbitration to acquire the latest description of the specified disk, unless this function is called on a disk object passed within the context of an event, in which case the description is current as of that event.
Available in OS X v10.4 and later.

### 83.6.9 kDADiskDescriptionBusNameKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.10 kDADiskDescriptionBusPathKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.11 kDADiskDescriptionDeviceGUIDKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a memoryblock.

### 83.6.12 kDADiskDescriptionDeviceInternalKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.13 kDADiskDescriptionDeviceModelKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.14 kDADiskDescriptionDevicePathKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.15 kDADiskDescriptionDeviceProtocolKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.16 kDADiskDescriptionDeviceRevisionKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.17 kDADiskDescriptionDeviceUnitKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.18 kDADiskDescriptionDeviceVendorKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.19 kDADiskDescriptionMediaBlockSizeKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.20 kDADiskDescriptionMediaBSDMajorKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.21 kDADiskDescriptionMediaBSDMinorKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.22 kDADiskDescriptionMediaBSDNameKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.23 kDADiskDescriptionMediaBSDUnitKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.24 kDADiskDescriptionMediaContentKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.25 kDADiskDescriptionMediaEjectableKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.26 kDADiskDescriptionMediaIconKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Dictionary.

### 83.6.27 kDADiskDescriptionMediaKindKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.28 kDADiskDescriptionMediaLeafKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.29 kDADiskDescriptionMediaNameKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.30 kDADiskDescriptionMediaPathKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.31 kDADiskDescriptionMediaRemovableKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.32 kDADiskDescriptionMediaSizeKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Number.

### 83.6.33 kDADiskDescriptionMediaTypeKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.34 kDADiskDescriptionMediaUUIDKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a CFUUIDMBS.

### 83.6.35 kDADiskDescriptionMediaWholeKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.36 kDADiskDescriptionMediaWritableKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.37 kDADiskDescriptionVolumeKindKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.38 kDADiskDescriptionVolumeMountableKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.39 kDADiskDescriptionVolumeNameKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a String.

### 83.6.40 kDADiskDescriptionVolumeNetworkKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a Boolean.

### 83.6.41 kDADiskDescriptionVolumePathKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a folderitem.

### 83.6.42 kDADiskDescriptionVolumeUUIDKey as string

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the description dictionary.
**Notes:** The value in the dictionary for this key is a CFUUIDMBS.

### 83.6.43 Options as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains the options for the specified disk.

### 83.6.44 SetOptions(options as Integer, value as boolean) as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the options for the specified disk.
**Notes:** options: The options to set or clear.
value: Pass true to set options; otherwise pass false to clear options.
Returns result code.

### 83.6.45 WholeDisk as DADiskMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtain the associated whole disk object for the specified disk.

### 83.6.46 Properties

### 83.6.47 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 83.7 class DADissenterMBS

### 83.7.1 class DADissenterMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for an error.
**Example:**

```
dim d as new DADissenterMBS(11, "Write Error")

MsgBox str(d.Status)+" "+d.StatusString
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 83.7.2 Methods

### 83.7.3 Constructor(status as Integer, s as string)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new dissenter object.
**Example:**

```
dim d as new DADissenterMBS(11, "Write Error")

MsgBox str(d.Status)+" "+d.StatusString
```

**Notes:** status: The return code.
s: The return code string. Pass empty string for no reason.

### 83.7.4 Properties

### 83.7.5 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 83.7.6 Status as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains the return code.
**Notes:** (Read only property)

### 83.7.7 StatusString as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains the return code string.
**Notes:** (Read only property)

### 83.7.8 Constants

Error Constants

| Constant | Value | Description |
|---|---|---|
| kDAReturnBadArgument | &hF8DA0003 | Bad Argument |
| kDAReturnBusy | &hF8DA0002 | Busy |
| kDAReturnError | &hF8DA0001 | Error |
| kDAReturnExclusiveAccess | &hF8DA0004 | Exclusive Access |
| kDAReturnNoResources | &hF8DA0005 | No Resources |
| kDAReturnNotFound | &hF8DA0006 | Not found |
| kDAReturnNotMounted | &hF8DA0007 | Not mounted |
| kDAReturnNotPermitted | &hF8DA0008 | Not permitted |
| kDAReturnNotPrivileged | &hF8DA0009 | Not privileged |
| kDAReturnNotReady | &hF8DA000A | Not ready |
| kDAReturnNotWritable | &hF8DA000B | Not writable |
| kDAReturnSuccess | 0 | Success |
| kDAReturnUnsupported | &hF8DA000C | Unsupported |

## 83.8 class DarwinChmodMBS

### 83.8.1 class DarwinChmodMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class to change the owner or mode of a file on Mac OS X.
**Example:**

```
dim c as DarwinChmodMBS
dim userfolder as FolderItem
dim darwinResult as Integer
dim s as string

c=new DarwinChmodMBS

userFolder=SpecialFolder.Desktop.Child("chmod.rb")
s=userFolder.NativePath

darwinResult = c.chmod( s, &B111111111 ) // all rwx

// 1 = ———x
// 2 = ——wx
// 7 = ——-rwx
// 8 = ——x—

darwinResult=c.lstat(s)

MsgBox s+" "+str(darwinResult)+" "+str(c.error)
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.0pr1
- MBS Real Studio Plugins, version 12.4pr10

### 83.8.2 Methods

### 83.8.3 chflags(path as string, flags as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The file whose name is given by path has its flags changed to flags.
**Notes:** The flags specified are formed by or'ing the following values

| | | |
|---|---|---|
| UF_NODUMP | 0x00000001 | Do not dump the file. |
| UF_IMMUTABLE | 0x00000002 | The file may not be changed. |
| UF_APPEND | 0x00000004 | The file may only be appended to. |
| UF_OPAQUE | 0x00000008 | Directory is opaque wrt. union |

The "UF_IMMUTABLE" and "UF_APPEND" flags may be set or unset by either the owner of a file or the super-user.

The "SF_IMMUTABLE" and "SF_APPEND" flags may only be set or unset by the super-user. They may be set at any time, but normally may only be unset when the system is in single-user mode.

You can type "man 2 chflags" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Chflags() will fail it:

| | |
|---|---|
| ENOTDIR | A component of the path prefix is not a directory. |
| ENAMETOOLONG | A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters. |
| ENOENT | The named file does not exist. |
| EACCES | Search permission is denied for a component of the path prefix. |
| ELOOP | Too many symbolic links were encountered in translating the pathname. |
| EPERM | The effective user ID does not match the owner of the file and the effective user ID is not the super-user. |
| EROFS | The named file resides on a read-only file system. |
| EFAULT | Path points outside the process's allocated address space. |
| EIO | An I/O error occurred while reading from or writing to the file system. |

### 83.8.4 chmod(path as string, mode as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Sets the file permission bits of the file specified by the pathname path to mode.
**Example:**

```
dim f as FolderItem
dim g as FolderItem

f=SpecialFolder.Desktop.Child("test1")
g=SpecialFolder.Desktop.Child("test2")
```

```
dim d as DarwinChmodMBS

d=new DarwinChmodMBS

if d.stat(f.NativePath)=0 then // read mode
if d.chmod(g.NativePath,d.mode)=0 then // set mode
// worked
end if
end if
```

**Notes:** Chmod() verifies that the process owner (user) either owns the file specified by path (or fd), or is the super- user. A mode is created from or'd permission bit masks like this:

| | | |
|---|---|---|
| IRWXU | &o0000700 | RWX mask for owner |
| IRUSR | &o0000400 | R for owner |
| IWUSR | &o0000200 | W for owner |
| IXUSR | &o0000100 | X for owner |
| IRWXG | &o0000070 | RWX mask for group |
| IRGRP | &o0000040 | R for group |
| IWGRP | &o0000020 | W for group |
| IXGRP | &o0000010 | X for group |
| IRWXO | &o0000007 | RWX mask for other |
| IROTH | &o0000004 | R for other |
| IWOTH | &o0000002 | W for other |
| IXOTH | &o0000001 | X for other |
| ISUID | &o0004000 | set user id on execution |
| ISGID | &o0002000 | set group id on execution |
| ISVTX | &o0001000 | save swapped text even after use |

The ISVTX (the sticky bit) indicates to the system which executable files are shareable (the default) and the system maintains the program text of the files in the swap area. The sticky bit may only be set by the super user on shareable executable files.

If mode ISVTX (the 'sticky bit') is set on a directory, an unprivileged user may not delete or rename files of other users in that directory. The sticky bit may be set by any user on a directory which the user owns or has appropriate permissions. For more details of the properties of the sticky bit, see sticky(8).

Writing or changing the owner of a file turns off the set-user-id and set-group-id bits unless the user is the super-user. This makes the system somewhat more secure by protecting set-user-id (set-group-id) files from remaining set-user-id (set-group-id) if they are modified, at the expense of a degree of compatibility.

You can type "man 2 chmod" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Chmod() will fail and the file mode will be unchanged if:

| | |
|---|---|
| ENOTDIR | A component of the path prefix is not a directory. |
| ENAMETOOLONG | A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters. |
| ENOENT | The named file does not exist. |
| EACCES | Search permission is denied for a component of the path prefix. |
| ELOOP | Too many symbolic links were encountered in translating the pathname. |
| EPERM | The effective user ID does not match the owner of the file and the effective user ID is not the super-user. |
| EROFS | The named file resides on a read-only file system. |
| EFAULT | Path points outside the process's allocated address space. |
| EIO | An I/O error occurred while reading from or writing to the file system. |

### 83.8.5 chown(path as string, uid as Integer, gid as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The owner ID and group ID of the file (or link) named by path is changed as specified by the arguments owner (uid) and group (gid).
**Notes:** The owner of a file may change the group to a group of which he or she is a member, but the change owner capability is restricted to the superuser.

Chown() clears the set-user-id and set-group-id bits on the file to prevent accidental or mischievous creation of set-user-id and set-group-id programs.

You can type "man 2 chmod" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Chown() will fail and the file or link will be unchanged if:

| | |
|---|---|
| ENOTDIR | A component of the path prefix is not a directory. |
| ENAMETOOLONG | A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters. |
| ENOENT | The named file does not exist. |
| EACCES | Search permission is denied for a component of the path prefix. |
| ELOOP | Too many symbolic links were encountered in translating the pathname. |
| EPERM | The effective user ID is not the super-user. |
| EROFS | The named file resides on a read-only file system. |
| EFAULT | Path points outside the process's allocated addressspace. |
| EIO | An I/O error occurred while reading from or writing to the file system. |

### 83.8.6 error as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the error code from the last operation.
**Notes:** This function asks the operation system. It's not a property like in other classes.

Error codes:

Returns -2 if function is not available.

### 83.8.7 lstat(path as string) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The stat function obtains information about the file pointed to by path.
**Example:**

```
// we use truechild to not resolve the symbol link
dim f as FolderItem = SpecialFolder.Desktop.trueChild("test.rtf")

dim c as new DarwinChmodMBS
if c.lstat(f.NativePath) = 0 then
// ok

Break // see values in debugger
else
MsgBox "failed"
end if
```

**Notes:** See stat for details.

### 83.8.8 stat(path as string) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The stat function obtains information about the file pointed to by path.
**Example:**

```
dim d as DarwinChmodMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test")
d=new DarwinChmodMBS

if d.stat(f.NativePath)=0 then
MsgBox hex(d.mode)
end if
```

**Notes:** Read, write or execute permission of the named file is not required, but all directories listed in the path name leading to the file must be searchable.

Lstat() is like stat() except in the case where the named file is a symbolic link, in which case lstat() returns information about the link, while stat() returns information about the file the link references. Unlike other filesystem objects, symbolic links do not have an owner, group, access mode, times, etc. Instead, these attributes are taken from the directory that contains the link. The only attributes returned from an lstat() that refer to the symbolic link itself are the file type (S_IFLNK), size, blocks, and link count (always 1).

Information about the file is stored directly into the fields of the class if the function is successfull.

You can type "man 2 stat" on the Mac OS X terminal for more details.

Upon successful completion, a value of 0 is returned. Otherwise, -1 is returned.
Returns -2 on bad parameter or if function is not available.

Stat() and lstat() will fail if:

### 83.8.9 Properties

### 83.8.10 blocks as Double

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Number of blocks allocated for the file.
**Notes:** The actual number of blocks allocated for the file in 512-byte units. As short symbolic links are stored in the inode, this number may be zero.

Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.11 blocksize as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The optimal I/O block size for the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.12 dev as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The device inode where the file resides on.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.13 flags as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** User defined flags for the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.14 gen as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The file generation number.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.15 gid as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The group-id of the owner of the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.16 ino as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The inode's number of the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.17 mode as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The inode protection mode of the file.
**Notes:** Set by the stat and lstat function if it was successfull.

Some Constants:

(Read and Write property)

### 83.8.18 nlink as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The number or hard links to the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.19 rdev as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The device type, for special file inode.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.20 size as Double

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The file size, in bytes.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

### 83.8.21 uid as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The user-id of the owner of the file.
**Notes:** Set by the stat and lstat function if it was successfull.
(Read and Write property)

| | | |
|---|---|---|
| EPERM | 1 | Operation not permitted |
| ENOENT | 2 | No such file or directory |
| ESRCH | 3 | No such process |
| EINTR | 4 | Interrupted system call |
| EIO | 5 | Input/output error |
| ENXIO | 6 | Device not configured |
| E2BIG | 7 | Argument list too long |
| ENOEXEC | 8 | Exec format error |
| EBADF | 9 | Bad file descriptor |
| ECHILD | 10 | No child processes |
| EDEADLK | 11 | Resource deadlock avoided (11 was EAGAIN) |
| ENOMEM | 12 | Cannot allocate memory |
| EACCES | 13 | Permission denied |
| EFAULT | 14 | Bad address |
| ENOTBLK | 15 | Block device required |
| EBUSY | 16 | Device busy |
| EEXIST | 17 | File exists |
| EXDEV | 18 | Cross-device link |
| ENODEV | 19 | Operation not supported by device |
| ENOTDIR | 20 | Not a directory |
| EISDIR | 21 | Is a directory |
| EINVAL | 22 | Invalid argument |
| ENFILE | 23 | Too many open files in system |
| EMFILE | 24 | Too many open files |
| ENOTTY | 25 | Inappropriate ioctl for device |
| ETXTBSY | 26 | Text file busy |
| EFBIG | 27 | File too large |
| ENOSPC | 28 | No space left on device |
| ESPIPE | 29 | Illegal seek |
| EROFS | 30 | Read-only file system |
| EMLINK | 31 | Too many links |
| EPIPE | 32 | Broken pipe |
| | | |
| math software | | |
| EDOM | 33 | Numerical argument out of domain |
| ERANGE | 34 | Result too large |
| | | |
| non-blocking and interrupt i/o | | |
| EAGAIN | 35 | Resource temporarily unavailable |
| EWOULDBLOCK | EAGAIN | Operation would block |
| EINPROGRESS | 36 | Operation now in progress |
| EALREADY | 37 | Operation already in progress |
| | | |
| ipc/network software – argument errors | | |
| ENOTSOCK | 38 | Socket operation on non-socket |
| EDESTADDRREQ | 39 | Destination address required |
| EMSGSIZE | 40 | Message too long |
| EPROTOTYPE | 41 | Protocol wrong type for socket |
| ENOPROTOOPT | 42 | Protocol not available |
| EPROTONOSUPPORT | 43 | Protocol not supported |
| ESOCKTNOSUPPORT | 44 | Socket type not supported |
| ENOTSUP | 45 | Operation not supported |
| EOPNOTSUPP | ENOTSUP | Operation not supported |
| EPFNOSUPPORT | 46 | Protocol family not supported |
| EAFNOSUPPORT | 47 | Address family not supported by protocol family |
| EADDRINUSE | 48 | Address already in use |
| EADDRNOTAVAIL | 49 | Can't assign requested address |
| | | |
| ipc/network software – operational errors | | |
| ENETDOWN | 50 | Network is down |
| ENETUNREACH | 51 | Network is unreachable |
| ENETRESET | 52 | Network dropped connection on reset |
| ECONNABORTED | 53 | Software caused connection abort |
| ECONNRESET | 54 | Connection reset by peer |
| ENOBUFS | 55 | No buffer space available |
| EISCONN | 56 | Socket is already connected |
| ENOTCONN | 57 | Socket is not connected |
| ESHUTDOWN | 58 | Can't send after socket shutdown |
| ETOOMANYREFS | 59 | Too many references: can't splice |
| ETIMEDOUT | 60 | Operation timed out |
| ECONNREFUSED | 61 | Connection refused |
| | | |
| ELOOP | 62 | Too many levels of symbolic links |
| ENAMETOOLONG | 63 | File name too long |
| | | |
| should be rearranged | | |
| EHOSTDOWN | 64 | Host is down |

| | |
|---|---|
| ENOTDIR | A component of the path prefix is not a directory. |
| ENAMETOOLONG | A component of a pathname exceeded { NAME_MAX } characters, or an entire path name exceeded { PATH_MAX } characters. |
| ENOENT | The named file does not exist. |
| EACCES | Search permission is denied for a component of the path prefix. |
| ELOOP | Too many symbolic links were encountered in translating the pathname. |
| EFAULT | Sb or name points to an invalid address. |
| EIO | An I/O error occurred while reading from or writing to the file system. |

| | | |
|---|---|---|
| ISUID | 0004000 | set user id on execution |
| ISGID | 0002000 | set group id on execution |
| ISTXT | 0001000 | sticky bit |
| | | |
| IRWXU | 0000700 | RWX mask for owner |
| IRUSR | 0000400 | R for owner |
| IWUSR | 0000200 | W for owner |
| IXUSR | 0000100 | X for owner |
| | | |
| IRWXG | 0000070 | RWX mask for group |
| IRGRP | 0000040 | R for group |
| IWGRP | 0000020 | W for group |
| IXGRP | 0000010 | X for group |
| | | |
| IRWXO | 0000007 | RWX mask for other |
| IROTH | 0000004 | R for other |
| IWOTH | 0000002 | W for other |
| IXOTH | 0000001 | X for other |

## 83.9 class DarwinIFStatInterfaceMBS

### 83.9.1 class DarwinIFStatInterfaceMBS

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** A class for the statistics of one interface.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox it.name
```

**Notes:** All this integer properties are internally unsigned and they may overflow.
Your application may need to take care for this.
**Blog Entries**

- MacOSX plugin for iOS

### 83.9.2 Properties

### 83.9.3 Baudrate as UInt32

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The linespeed.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.Baudrate)
```

**Notes:** (Read only property)

### 83.9.4 Collisions as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of collisions on csma interfaces.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.Collisions)
```

**Notes:** (Read only property)

### 83.9.5 InputBytes as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Total number of octets received.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.InputBytes)
```

**Notes:** (Read only property)

### 83.9.6 InputErrors as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of input errors on interface.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.InputErrors)
```

**Notes:** (Read only property)

### 83.9.7 InputMulticasts as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of packets received via multicast.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.InputMulticasts)
```

**Notes:** (Read only property)

### 83.9.8 InputPackets as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of packets received.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.InputPackets)
```

**Notes:** (Read only property)

### 83.9.9 MTU as UInt32

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The maximum transmission unit.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.MTU)
```

**Notes:** Maximum size of a packet.

none
(Read only property)

### 83.9.10 Name as String

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The name of the interface.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox it.Name
```

**Notes:** e.g. lo0 for localhost, en0 for the first ethernet interface, fw0 for the first firewire interface, etc.
(Read and Write property)

### 83.9.11 OutputBytes as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Total number of octets sent.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.OutputBytes)
```

**Notes:** (Read only property)

### 83.9.12 OutputErrors as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of output errors.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.OutputErrors)
```

**Notes:** (Read only property)

### 83.9.13 OutputMulticasts as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of packets sent via multicast.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.OutputMulticasts)
```

**Notes:** (Read only property)

### 83.9.14 OutputPackets as UInt64

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of packets sent.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.OutputPackets)
```

**Notes:** (Read only property)

### 83.9.15 PhysicalType as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The physical network type.
**Example:**

```
dim d as new DarwinIFStatMBS
```

```
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.PhysicalType)
```

**Notes:** e.g., AUI, Thinnet, 10base-T, etc

Type is the type of device which includes 1 for ethernet and 6 for Wifi.
(Read and Write property)

### 83.9.16 Type as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The network type.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
dim it as DarwinIFStatInterfaceMBS = d.Item(0)
MsgBox str(it.type)
```

**Notes:** e.g. ethernet, tokenring, etc

from if_types.h:

Interface types for benefit of parsing media address headers.
This list is derived from the SNMP list of ifTypes, currently documented in RFC1573.

(Read and Write property)

| | | |
|---|---|---|
| IFT_OTHER | &h1 | none of the following |
| IFT_1822 | &h2 | old-style arpanet imp |
| IFT_HDH1822 | &h3 | HDH arpanet imp |
| IFT_X25DDN | &h4 | x25 to imp |
| IFT_X25 | &h5 | PDN X25 interface (RFC877) |
| IFT_ETHER | &h6 | Ethernet CSMACD |
| IFT_ISO88023 | &h7 | CMSA CD |
| IFT_ISO88024 | &h8 | Token Bus |
| IFT_ISO88025 | &h9 | Token Ring |
| IFT_ISO88026 | &ha | MAN |
| IFT_STARLAN | &hb | |
| IFT_P10 | &hc | Proteon 10MBit ring |
| IFT_P80 | &hd | Proteon 80MBit ring |
| IFT_HY | &he | Hyperchannel |
| IFT_FDDI | &hf | |
| IFT_LAPB | &h10 | |
| IFT_SDLC | &h11 | |
| IFT_T1 | &h12 | |
| IFT_CEPT | &h13 | E1 - european T1 |
| IFT_ISDNBASIC | &h14 | |
| IFT_ISDNPRIMARY | &h15 | |
| IFT_PTPSERIAL | &h16 | Proprietary PTP serial |
| IFT_PPP | &h17 | RFC 1331 |
| IFT_LOOP | &h18 | loopback |
| IFT_EON | &h19 | ISO over IP |
| IFT_XETHER | &h1a | obsolete 3MB experimental ethernet |
| IFT_NSIP | &h1b | XNS over IP |
| IFT_SLIP | &h1c | IP over generic TTY |
| IFT_ULTRA | &h1d | Ultra Technologies |
| IFT_DS3 | &h1e | Generic T3 |
| IFT_SIP | &h1f | SMDS |
| IFT_FRELAY | &h20 | Frame Relay DTE only |
| IFT_RS232 | &h21 | |
| IFT_PARA | &h22 | parallel-port |
| IFT_ARCNET | &h23 | |
| IFT_ARCNETPLUS | &h24 | |
| IFT_ATM | &h25 | ATM cells |
| IFT_MIOX25 | &h26 | |
| IFT_SONET | &h27 | SONET or SDH |
| IFT_X25PLE | &h28 | |
| IFT_ISO88022LLC | &h29 | |
| IFT_LOCALTALK | &h2a | |
| IFT_SMDSDXI | &h2b | |
| IFT_FRELAYDCE | &h2c | Frame Relay DCE |
| IFT_V35 | &h2d | |
| IFT_HSSI | &h2e | |
| IFT_HIPPI | &h2f | |
| IFT_MODEM | &h30 | Generic Modem |
| IFT_AAL5 | &h31 | AAL5 over ATM |
| IFT_SONETPATH | &h32 | |
| IFT_SONETVT | &h33 | |
| IFT_SMDSICIP | &h34 | SMDS InterCarrier Interface |
| IFT_PROPVIRTUAL | &h35 | Proprietary Virtual/internal |
| IFT_PROPMUX | &h36 | Proprietary Multiplexing |
| IFT_GIF | &h37 | |
| IFT_FAITH | &h38 | |
| IFT_STF | &h39 | |
| IFT_L2VLAN | &h87 | Layer 2 Virtual LAN using 802.1Q |
| IFT_IEEE1394 | &h90 | IEEE1394 High Performance SerialBus*/ |

## 83.10 class DarwinIFStatMBS

### 83.10.1 class DarwinIFStatMBS

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** A class for network interface throughput statistics.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
MsgBox str(d.Count)
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr1

### 83.10.2 Methods

### 83.10.3 Item(index as Integer) as DarwinIFStatInterfaceMBS

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Returns the statistics for the given interface.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
MsgBox str(d.Item(0).InputBytes)
```

**Notes:** Index goes from 0 to count-1.

### 83.10.4 Update as boolean

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** Asks the system for new statistics.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
MsgBox str(d.Count)
```

**Notes:** Returns true on success.

### 83.10.5 Properties

### 83.10.6 Count as Integer

MBS MacOSX Plugin, Plugin Version: 4.0, Platform: macOS, Targets: All.

**Function:** The number of interfaces in the item array.
**Example:**

```
dim d as new DarwinIFStatMBS
call d.Update
MsgBox str(d.Count)
```

**Notes:** (Read only property)

## 83.11 class DASessionMBS

### 83.11.1 class DASessionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The disk arbitration session class from Mac OS X.
**Notes:** The session manages all the events and operations you may do on disks using Apple's Disk Arbitration framework.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr1

### 83.11.2 Methods

### 83.11.3 Constructor

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 83.11.4 Eject(disk as DADiskMBS, options as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Ejects the specified disk object.
**Notes:** disk: The disk object.
options: The eject options.
Calls Ejected event later with result.

### 83.11.5 IsClaimed(disk as DADiskMBS) as boolean

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reports whether or not the disk is claimed.
**Notes:** disk: The disk object.
Returns true if the disk is claimed, otherwise false.

### 83.11.6 Mount(disk as DADiskMBS, path as string, options as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Mounts the volume at the specified disk object.
**Notes:** disk: The disk object.
path: The mount path. Pass empty string for a "standard" mount path.
options: The mount options.
Calls Mounted event later.

### 83.11.7 MountWithArguments(disk as DADiskMBS, path as string, arguments() as string, options as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Mounts the volume at the specified disk object, with the specified mount options.
**Notes:** disk: The disk object.
path: The mount path. Pass empty string for a "standard" mount path.
options: The mount options.
arguments: The list of mount options to pass to /sbin/mount -o.

### 83.11.8 Rename(disk as DADiskMBS, name as string, options as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Renames the volume at the specified disk object.
**Notes:** disk: The disk object.
options: The rename options.
Calls later the Renamed event with result.

### 83.11.9 Unclaim(disk as DADiskMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unclaims the specified disk object.

### 83.11.10 Unmount(disk as DADiskMBS, options as Integer = 0)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unmounts the volume at the specified disk object.
**Notes:** disk: The disk object.
options: The unmount options.
Calles Unmounted event later.

### 83.11.11 Properties

### 83.11.12 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 83.11.13 Events

### 83.11.14 Appeared(disk as DADiskMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called when a disk appears.
**Notes:** disk: A disk object.

### 83.11.15 DescriptionChanged(disk as DADiskMBS, keys() as string)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called whenever a disk description has changed.
**Notes:** disk: A disk object.
keys: A list of changed keys.

### 83.11.16 Disappeared(disk as DADiskMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** The event called whenever a disk has disappeared.

### 83.11.17 Ejected(disk as DADiskMBS, dissenter as DADissenterMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Event called after eject operation finished.
**Notes:** Disk: The disk object.
dissenter A dissenter object on failure or nil on success.

### 83.11.18 Mounted(disk as DADiskMBS, dissenter as DADissenterMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Event called after mount operation finished.
**Notes:** disk: The disk object.
dissenter: A dissenter object on failure or nil on success.

### 83.11.19 Peek(disk as DADiskMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** A disk has been peeked.

### 83.11.20 Renamed(disk as DADiskMBS, dissenter as DADissenterMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called after the rename operation finished.
**Notes:** disk: The disk object.
dissenter: A dissenter object on failure or nil on success.

### 83.11.21 Unmounted(disk as DADiskMBS, dissenter as DADissenterMBS)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: .

**Function:** Called after unmount operation finished.
**Notes:** disk: The disk object.
dissenter: A dissenter object on failure or nil on success.

### 83.11.22 Constants

Claim Options

| Constant | Value | Description |
|---|---|---|
| kDADiskClaimOptionDefault | 0 | Default |

Eject Options

| Constant | Value | Description |
|---|---|---|
| kDADiskEjectOptionDefault | 0 | Default |

Mount Options

| Constant | Value | Description |
|---|---|---|
| kDADiskMountOptionDefault | 0 | Default |
| kDADiskMountOptionWhole | 1 | Mount the volumes tied to the whole disk object. |

Disk Options

| Constant | Value | Description |
|---|---|---|
| kDADiskOptionDefault | 0 | Default |
| kDADiskOptionEjectUponLogout | 1 | Eject the disk upon logout. |
| kDADiskOptionMountAutomatic | 16 | Mount the disk upon appearance. |
| kDADiskOptionMountAutomaticNoDefer | 32 | Mount the disk upon appearance, even if no login. |
| kDADiskOptionPrivate | 256 | Hides the disk from callbacks. |

Rename Options

| Constant | Value | Description |
|---|---|---|
| kDADiskRenameOptionDefault | 0 | Default |

Unmount Options

| Constant | Value | Description |
|---|---|---|
| kDADiskUnmountOptionDefault | 0 | Default |
| kDADiskUnmountOptionForce | &h00080000 | Unmount the volume even if files are still active. |
| kDADiskUnmountOptionWhole | 0 | Unmount the volumes tied to the whole disk object. |

## 83.12 class DirectorySizeMBS

### 83.12.1 class DirectorySizeMBS

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for size information about a folder.
**Example:**

```
// chose a folder
dim f as FolderItem = SelectFolder

// calculate
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)

// display
MsgBox str(d.FilesCount)+" files in "+str(d.FolderCount)+" folder"
```

**Blog Entries**

- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr1
- MBS Plugins updated for Xojo 2019r2
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr4
- MBS Xojo / Real Studio Plugins, version 15.0pr9
- MBS Real Studio Plugins, version 13.1pr13
- MBS Real Studio Plugins, version 13.1pr3
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Plugins 11.1 Release notes

**Videos**

- Presentation from London conference about MBS Plugins.

### 83.12.2 Methods

### 83.12.3 Add(d as DirectorySizeMBS)

MBS Util Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the values of the given directory size object to the current one.
**Notes:** Passing nil is okay and will be ignored.
This method was added to support counting several folders and adding the results to one central object.

### 83.12.4 close

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 83.12.5 Constructor

MBS Util Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 83.12.6 Update(folder as folderitem, recursive as boolean, ticks as Integer) as boolean

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Updates the class.
**Example:**

```
// chose a folder
dim f as FolderItem = SpecialFolder.Applications

// calculate
dim d as new DirectorySizeMBS

// update object
call d.Update(f, true, 0)

// display
MsgBox str(d.FilesCount)+" files and "+str(d.FolderCount)+" folders"
```

**Notes:** The folder specified is searched for files and folders. Normally you'd better use CalculateDirectorySizeMBS.

Ticks is the count of ticks (1/60th second) which must pass till time is given to other threads. (e.g. 10)
Returns true if successfull.

If you call this function in a thread you can set the cancel property in a pushbutton event handler to stop this function.

### 83.12.7 Properties

### 83.12.8 Cancel as Boolean

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the Update function should stop as soon as possible.
**Notes:** (Read and Write property)

### 83.12.9 CompressedSize as UInt64

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: All.

**Function:** The size in bytes of all files.
**Notes:** If a file is compressed, we add here the compressed size.
If a file is not compressed, we add the normal logical size.
Only used on Windows and only with QueryCompressedSizes = true.
(Read only property)

### 83.12.10 CountBundlesAsItem as Boolean

MBS Util Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Whether to cound bundles as files.
**Example:**

```
// chose a folder
dim f as FolderItem = SpecialFolder.Applications

// calculate
dim d1 as new DirectorySizeMBS
d1.CountBundlesAsItem = true

call d1.Update(f, true, 0)

dim d2 as new DirectorySizeMBS
```

```
d2.CountBundlesAsItem = false

call d2.Update(f, true, 0)

// display
MsgBox "Normal count: "+str(D2.FilesCount)+" files and "+str(d2.FolderCount)+" folders"+EndOfLine+_
"With bundles as files: "+str(D1.FilesCount)+" files and "+str(d1.FolderCount)+" folders"
```

**Notes:** Bundles like applications are counted as a single file if this property is true or as a folder with files inside if this property is false.
Default is false.
(Read and Write property)

### 83.12.11 Directory as FolderItem

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The folder which was searched.
**Notes:** (Read and Write property)

### 83.12.12 FilesCount as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of files counted.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.FilesCount)+" files"
```

**Notes:** FilesCount=VisibleFilesCount+HiddenFilesCount
(Read only property)

### 83.12.13 FolderCount as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of folders counted.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.FolderCount)+" folder"
```

**Notes:** FolderCount=VisibleFolderCount+HiddenFolderCount
(Read only property)

### 83.12.14 HiddenCompressedSize as UInt64

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: All.

**Function:** The size in bytes of all hidden files.
**Notes:** If a file is compressed, we add here the compressed size.
If a file is not compressed, we add the normal logical size.
Only used on Windows and only with QueryCompressedSizes = true.
(Read only property)

### 83.12.15 HiddenFilesCount as Integer

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of hidden files counted.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.HiddenFilesCount)+" hidden files"
```

**Notes:** A file is invisible if the Invisible flag is set for this file.
(Read and Write property)

### 83.12.16 HiddenFolderCount as Integer

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of folders.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.HiddenFolderCount)+" hidden folders"
```

**Notes:** A file is invisible if the Invisible flag is set for this file.
(Read and Write property)

### 83.12.17 HiddenItemCount as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of invisible items.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.HiddenItemCount)+" hidden items"
```

**Notes:** An item is invisible if the Invisible flag is set for this file.
HiddenItemCount=HiddenFolderCount+HiddenFilesCount
(Read only property)

### 83.12.18 HiddenLogicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the data forks of all hidden file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical data fork size of hidden files: "+Format(d.HiddenLogicalDataForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.19 HiddenLogicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the resource forks of all hidden file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical resource fork size of hidden files: "+Format(d.HiddenLogicalResourceForkSize/1000000,"0")+" MB"
```

**Notes:** (Read and Write property)

### 83.12.20 HiddenLogicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the all forks of all hidden file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical total size of hidden files: "+Format(d.HiddenLogicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.21 HiddenPhysicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the data forks of all hidden file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical data fork size of hidden files: "+Format(d.HiddenPhysicalDataForkSize/1000000,"0")+" MB"
```

**Notes:** (Read and Write property)

### 83.12.22 HiddenPhysicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the resource forks of all hidden file in Bytes.

**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical resource fork size of hidden files: "+Format(d.HiddenPhysicalResourceForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.23 HiddenPhysicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the both forks of all hidden file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical total size of hidden files: "+Format(d.HiddenPhysicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.24 IgnoreHiddenFolderContent as Boolean

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If this flag is set, the Update method will not count invisible files.
**Notes:** (Read and Write property)

### 83.12.25 ItemCount as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items counted.
**Example:**

```
// chose a folder
dim f as FolderItem = SpecialFolder.Music
// calculate size
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(true,0)
```

```
// show number of files
MsgBox str(d.ItemCount)
```

**Notes:** ItemCount=VisibleItemCount+HiddenItemCount
(Read only property)

### 83.12.26 LogicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical data fork size in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical data fork size of all files: "+Format(d.LogicalDataForkSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.27 LogicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical resource fork size in Bytes.
**Notes:** dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical resource fork size of all files: "+Format(d.LogicalResourceForkSize/1000000,"0")+" MB"
(Read only property)

### 83.12.28 LogicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical total size in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical total size of all files: "+Format(d.LogicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (ResourceFork+DataFork)
(Read only property)

### 83.12.29 PhysicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical data fork size in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical data fork size of all files: "+Format(d.PhysicalDataForkSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.30 PhysicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical resource fork size in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical resource fork size of all files: "+Format(d.PhysicalResourceForkSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.31 PhysicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical total file size in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical total size of all files: "+Format(d.VisiblePhysicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (ResourceFork+DataFork)
That's what the Finder shows you.
(Read only property)

### 83.12.32 QueryCompressedSizes as Boolean

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: All.

**Function:** Whether to query compressed file sizes on Windows.
**Notes:** (Read and Write property)

### 83.12.33 RecursionLimit as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The limit for recursion.
**Notes:** Default is -1 for no limit.
Zero means we do not recurse into subfolders.
Other values define how many recursion levels are allowed.
(Read and Write property)

### 83.12.34 RecursionMaxLevel as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum levels of recursions we had for searching this folder.
**Notes:** (Read and Write property)

### 83.12.35 VisibleCompressedSize as UInt64

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: All.

**Function:** The size in bytes of all visible files.
**Notes:** If a file is compressed, we add here the compressed size.
If a file is not compressed, we add the normal logical size.
Only used on Windows and only with QueryCompressedSizes = true.
(Read only property)

### 83.12.36 VisibleFilesCount as Integer

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of visible files.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.VisibleFilesCount)+" visible files"
```

**Notes:** (Read and Write property)

### 83.12.37 VisibleFolderCount as Integer

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of visible folders.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.VisibleFolderCount)+" visible folders"
```

**Notes:** (Read and Write property)

### 83.12.38 VisibleItemCount as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of visible items.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox str(d.VisibleItemCount)+" visible items"
```

**Notes:** Items are folders or files.
VisibleItemCount=VisibleFolderCount+VisibleFilesCount
(Read only property)

### 83.12.39 VisibleLogicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the data forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical data fork size of visible files: "+Format(d.VisibleLogicalDataForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.40 VisibleLogicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the resource forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical resource fork size of visible files: "+Format(d.VisibleLogicalResourceForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.41 VisibleLogicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical size of the both forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Logical total size of visible files: "+Format(d.VisibleLogicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.42 VisiblePhysicalDataForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the data forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical data fork size of visible files: "+Format(d.VisiblePhysicalDataForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.43 VisiblePhysicalResourceForkSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the resource forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical resource fork size of visible files: "+Format(d.VisiblePhysicalResourceForkSize/1000000,"0")+"
MB"
```

**Notes:** (Read and Write property)

### 83.12.44 VisiblePhysicalTotalSize as UInt64

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical size of the both forks of all visible file in Bytes.
**Example:**

```
dim f as FolderItem = SpecialFolder.desktop
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)
MsgBox "Physical total size of visible files: "+Format(d.VisiblePhysicalTotalSize/1000000,"0")+" MB"
```

**Notes:** (Read only property)

### 83.12.45 YieldTicks as Integer

MBS Util Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim d as DirectorySizeMBS // your DirectorySizeMBS object
d.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another Xojo thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

## 83.13 Globals

### 83.13.1 WindowsEjectVolumeMBS(driveLetter as string, byref status as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Unmounts and ejects the given drive.
**Example:**

```
// editfield1 has the drive letter

dim status as Integer
dim b as Boolean = WindowsEjectVolumeMBS(EditField1.text, status)

if b then
Select case status
case 1
MsgBox "Media in Drive "+EditField1.text+" has been ejected safely."
case 2
MsgBox "Media in Drive "+EditField1.text+" can be safely removed."
else
MsgBox "Failed?"
end Select
else
MsgBox "Failed."
end if
```

**Notes:** Status is set to 1 after an eject or 2 after an unmount without eject.
Returns true on success and false on failure.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr4

### 83.13.2 ExchangeFilesMBS(first as folderitem, second as folderitem) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Windows, Targets: All.

**Function:** Exchanges two files.
**Example:**

```
dim f1 as FolderItem = SpecialFolder.Desktop.Child("some picture.jpg")
dim f2 as FolderItem = SpecialFolder.Desktop.Child("another picture.jpg")

dim e as Integer = ExchangeFilesMBS(f1,f2)
```

```
MsgBox str(e) // show error code (0=no error)
```

**Notes:** On Mac swaps the contents of two files:

The ExchangeFilesMBS function allows programs to implement a "safe save" operation by creating and writing a complete new file and swapping the contents. An folderitem, alias, FSSpec, or FSRef that refers to the old file will now access the new data. The corresponding information in in-memory data structures are also exchanged.

Either or both files may have open access paths. After the exchange, the access path will refer to the opposite file's data (that is, to the same data it originally referred, which is now part of the other file).

On Windows files are renamed so they exchange their paths.

PS: Xojo does not notice the change, so the folderitems you pass should no longer be used. To access the file, please make new folderitem with parent.truechild(filename).
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr3
- MBS REALbasic Plugins, version 10.6pr9
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr12

### 83.13.3 FolderItemToPathMBS(file as folderitem) as string

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** Returns a unix path for the given folderitem.
**Notes:** Works only on Mac OS X.
This function is not very good, as Apple doesn't document for FSRefMakePath what path it returns, which encoding the path uses (maybe UTF8) and when it fails.
(e.g. it currently doesn't work for volumes)
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.13.4 NewFolderItemMBS(vRefNum as Integer, parID as Integer, name as String) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Creates a FolderItem from a specified volume, the item's directory ID and its name.
**Notes:** The vRefNum with value -1 is the boot volume on Mac OS.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.4pr3

### 83.13.5 NewVolumeFolderItemMBS(vRefNum as Integer) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Creates a FolderItem from a specified volume based on the volume reference number.
**Example:**

```
dim f as folderItem

f=NewVolumeFolderItemMBS(-1)
msgBox f.NativePath
```

**Notes:** The vRefNum with value -1 is the boot volume on Mac OS.

Pass in the vRefNum of any mounted volume and it returns the Volume as a FolderItem.
Returns nil if the vRefNum was invalid.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.13.6 PathToFolderItemMBS(path as string) as folderitem

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** Returns a folderitem for the given unix path.
**Notes:** Works only on Mac OS X.
This function is not very good, as Apple doesn't document which path is exspected, which encoding the path should use (maybe UTF8) and when it fails.
(e.g. it currently doesn't work for paths with "
textasciitilde " inside)
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:**

return a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead. The first parameter specified the volume where you want to resolve the ID on.
**Example:**

```
dim f,g as folderItem
f=SpecialFolder.Desktop
g=VolResolveIDMBS(f,f.MacDirID)
msgBox f.NativePath
```

**Notes:**

This function returns a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead.
See also:

- 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem 13636

### 83.13.8 VolResolveIDMBS(vRefNum as Integer, id as Integer) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:**

return a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead. The first parameter specified the volume where you want to resolve the ID on.
**Example:**

```
dim f,g as folderItem
f=SpecialFolder.Desktop
g=VolResolveIDMBS(f.macVRefNum,f.MacDirID)
msgBox f.NativePath
```

**Notes:**

This function returns a FolderItem for a passed FileID or DirID. If the item can not be resolved, nil is returned instead.
The first parameter specified the volume where you want to resolve the ID on.There is a bug in RB which may say "type mistmatch error" in RB. Than use the other variant of that function.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 17.2pr3
- MBS Xojo / Real Studio Plugins, version 16.4pr3

See also:

- 83.13.7 VolResolveIDMBS(volume as FolderItem, id as Integer) as FolderItem 13635

### 83.13.9 AdminToolsMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 13.0, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to the admin tools folder on Windows.
**Notes:** Returns on Windows the common admin tools folder for domain = -32766 and user's admin tools folder if domain = -32763.

### 83.13.10 CookiesMBS as folderitem

MBS Util Plugin, Plugin Version: 13.0, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to the Cookie folder on Windows.

### 83.13.11 HistoryMBS as folderitem

MBS Util Plugin, Plugin Version: 13.0, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to the history folder on Windows.

### 83.13.12 InternetCacheMBS as folderitem

MBS Util Plugin, Plugin Version: 13.0, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to the Internet Cache folder on Windows.

### 83.13.13 WindowsStartMenuMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 13.0, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to the start menu folder on Windows.

### 83.13.14 NewFolderItemFromAbsolutePathMBS(AbsolutePath as string) as FolderItem

MBS MacOSX Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates new folderitem based on absolute path.
**Example:**

```
// test absolute path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.txt")
Dim p As String = f.AbsolutePath

Dim g As FolderItem = NewFolderItemFromAbsolutePathMBS(p)
Dim n As String = g.NativePath

MsgBox p+EndOfLine+n
```

**Blog Entries**

- MBS Xojo Plugins, version 19.5pr8
- AbsolutePath for Xojo

### 83.13.15 SetCurrentWorkingDirectoryMBS(path as folderitem) as boolean

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory for the application.
**Example:**

```
MsgBox SpecialFolder.CurrentWorkingDirectory.NativePath
call SetCurrentWorkingDirectoryMBS(SpecialFolder.Desktop)
MsgBox SpecialFolder.CurrentWorkingDirectory.NativePath
```

**Notes:** This is sometimes needed if some library references files relative to this current working directory.
Returns true on success and false on failure.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3fc

### 83.13.16 VolumeFreeSizePathMBS(Path as String) as Int64

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size of the free space of the volume which the path points to.
**Notes:** See also folderitem.VolumeFreeSizeMBS function.

Returns -1 on error.
For Windows, the path should point to directory and end with a backslash.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr1

### 83.13.17 VolumeSizePathMBS(Path as String) as Int64

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size on the volume which the path points to.
**Notes:** See also folderitem.VolumeSizeMBS function.
Returns -1 on error.
For Windows, the path should point to directory and end with a backslash.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr1

### 83.13.18 MountMBS(URL as String, Dest as string = """, Username as String, Password as String, Interactive as boolean = false, Prompt as boolean = false, byref ErrorCode as Integer, Threaded as boolean = false) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mounts a network share.
**Notes:** Use on Server may require extra work as server runs with a different user account than you being logged in on the server machine. Permissions don't always allow things to be done.

URL: The URL for the network resource.

Dest: The destination path to mount to. If you leave this empty, the system decides. On Mac this can be the path to a folder where to mount new disk inside, e.g. to make a private mount. For Linux destination is required and must exists.
Username: The user name. If none is provided, system can take credentials from keychain, e.g. "test"
Password: The password to use, e.g. "test"
Interactive: Default is false for no dialogs. But you can pass true to have a dialog show up.
Prompt: Pass true on Windows to show dialog always to enter password.

When used on Linux the parameters are a little bit different:
Please pass source (URL), target (Dest), type (Username) and data (Password).
The dest path may need to be created first as new folder.

Returns the new path to the mounted disk.

Examples for URLs:

"afp://Ablage1.local" to mount on Mac via Apple Filesharing Protocol.
"\\myServer\public" to mount a disk on Windows.
"afp://192.168.168.250/Customer%20Data" to mount disk with space in name (URL encoded).
"\\192.168.0.242\ERP" mounts from Windows Server and e.g. pass "SRV2012\bob" as user name.

Threaded: If true and run on a Xojo thread, we yield time to other thread.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 83.13.19 MountPathMBS(Path as String) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Queries mount path for a volume.
**Example:**

MsgBox MountPathMBS("/Volumes/Ablage2")

**Notes:** For a network mounted disk, you can query the original mount point.
May not work on Mac for AFP shares, but for SMB shares.
Returns empty path if no path is known.
See also:

- 83.13.20 MountPathMBS(Volume as FolderItem) as String 13640

### 83.13.20 MountPathMBS(Volume as FolderItem) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Queries mount path for a volume.
**Example:**

```
dim f as FolderItem = Volume(VolumeCount-1)

MsgBox MountPathMBS(f)
```

**Notes:** For a network mounted disk, you can query the original mount point.
May not work on Mac for AFP shares, but for SMB shares.
Returns empty path if no path is known.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr6

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

See also:

- 83.13.19 MountPathMBS(Path as String) as String 13640

### 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean

MBS MacOSX Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unmount a volume.
**Notes:** Path: The local path of the volume, e.g. "/Volumes/Test"
Force: Pass true to force unmount, even if files are still open.

Use on Server may require extra work as server runs with a different user account than you being logged in on the server machine. Permissions don't always allow things to be done.
See also:

- 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean 13641

### 83.13.22 UnmountMBS(Volume as FolderItem, force as boolean = false) as Boolean

MBS MacOSX Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unmount a volume.
**Notes:** Path: The local path of the volume, e.g. "/Volumes/Test"
Force: Pass true to force unmount, even if files are still open.

Use on Server may require extra work as server runs with a different user account than you being logged in on the server machine. Permissions don't always allow things to be done.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

See also:

- 83.13.21 UnmountMBS(Path as String, force as boolean = false) as Boolean 13641

### 83.13.23 GetDriveTypeMBS(path as string) as Integer

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Determines whether a disk drive is a removable, fixed, CD-ROM, RAM disk, or network drive.
**Example:**

```
if GetDriveTypeMBS("E:") = 4 then
msgbox "network drive"
end if
```

**Notes:** Path: The root directory for the drive.

Possible values:

See also IsOnRemoteVolumeMBS, IsEjectableVolume or DarwinMediaClassMBS for macOS.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr2

| | | |
|---|---|---|
| 0 | Unknown | The drive type cannot be determined. |
| 1 | Error | The root path is invalid; for example, there is no volume mounted at the specified path. |
| 2 | Removable | The drive has removable media; for example, a floppy drive, thumb drive, or flash card reader. |
| 3 | Fixed | The drive has fixed media; for example, a hard disk drive or flash drive. |
| 4 | Remote | The drive is a remote (network) drive. |
| 5 | CD-ROM | The drive is a CD-ROM drive. |
| 6 | RAM Disk | The drive is a RAM disk. |

## 83.14 module ExtendedAttributesMBS

### 83.14.1 module ExtendedAttributesMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** The module for working with extended attributes.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")

// keys starting with "com.apple.metadata:" are indexed by Spotlight
call ExtendedAttributesMBS.SetAttribute(f, "com.apple.metadata:test", "testvalue")
```

**Notes:** Linux support added for plugin version 16.4.
For Windows, please use LargeBinaryStreamMBS class to read/write streams.
**Blog Entries**

- Passing an UUID to each app download
- Query URL from downloaded file
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- MBS Xojo / Real Studio Plugins, version 13.5pr6
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr12

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 19.2, page 52: Application Instance, Adding an identifier to your app downloads by Christian Schmitz
- 11.1, page 9: News

### 83.14.2 Methods

### 83.14.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Returns true if extended attribute functions are available.

### 83.14.4 GetAttribute(path as folderitem, name as string, options as Integer = 0) as Variant

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Get an extended attribute value.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.txt")
// query attribute
Dim v As Variant = ExtendedAttributesMBS.GetAttribute(f, "com.apple.metadata:_kMDItemUserTags")

// plugin converts it to Xojo data types with variants
If v <>Nil Then
// tags should be an array of Variant with strings
Dim a() As Variant = v

For Each s As String In a
MsgBox s
Next
End If
```

**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes of files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

The GetAttribute function retrieves all bytes of data from the extended attribute identified by name associated with path.

An extended attribute's name is a simple UTF-8 string. position specifies an offset within the extended attribute. In the current implementation, this argument is only used with the resource fork attribute. For all other extended attributes, this parameter is reserved and should be zero.

On success, returns the data associated with name.

Options specify options for retrieving extended attributes:

kNoFollow Do not follow symbolic links. getxattr() normally returns information from the target of path if it is a symbolic link. With this option, GetAttribute will return extended attribute data from the symbolic link instead.

kShowCompression: GetAttribute will return HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, the value is returned. On failure, nil is returned and lasterror is set.
See also:

- 83.14.5 GetAttribute(path as string, name as string, options as Integer = 0) as Variant 13645

### 83.14.5 GetAttribute(path as string, name as string, options as Integer = 0) as Variant

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Get an extended attribute value.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim v as Variant = ExtendedAttributesMBS.GetAttribute(f, ExtendedAttributesMBS.kAttributeNameFinderComment)
break // see comment string in debugger
```

**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes of files and directories in the file system. They are stored

as name:data pairs associated with file system objects (files, directories, symlinks, etc).

The GetAttribute function retrieves all bytes of data from the extended attribute identified by name associated with path.

An extended attribute's name is a simple UTF-8 string. position specifies an offset within the extended attribute. In the current implementation, this argument is only used with the resource fork attribute. For all other extended attributes, this parameter is reserved and should be zero.

On success, returns the data associated with name.

Options specify options for retrieving extended attributes:

kNoFollow Do not follow symbolic links. getxattr() normally returns information from the target of path if it is a symbolic link. With this option, GetAttribute will return extended attribute data from the symbolic link instead.

kShowCompression: GetAttribute will return HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, the value is returned. On failure, nil is returned and lasterror is set.
See also:

- 83.14.4 GetAttribute(path as folderitem, name as string, options as Integer = 0) as Variant 13644

### 83.14.6 GetRawAttribute(path as folderitem, name as string, options as Integer = 0) as memoryblock

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Get an extended attribute value.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim value as MemoryBlock = ExtendedAttributesMBS.GetRawAttribute(f, ExtendedAttributesMBS.kAttributeNameFinderInfo)
break // see in debugger
```

**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes of files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

The GetRawAttribute function retrieves all bytes of data from the extended attribute identified by name associated with path.

An extended attribute's name is a simple UTF-8 string. position specifies an offset within the extended attribute. In the current implementation, this argument is only used with the resource fork attribute. For all other extended attributes, this parameter is reserved and should be zero.

On success, returns the data associated with name.

Options specify options for retrieving extended attributes:

kNoFollow Do not follow symbolic links. getxattr() normally returns information from the target of path if it is a symbolic link. With this option, GetRawAttribute will return extended attribute data from the symbolic link instead.

kShowCompression: GetRawAttribute will return HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, the value is returned. On failure, nil is returned and lasterror is set.
See also:

- 83.14.7 GetRawAttribute(path as string, name as string, options as Integer = 0) as memoryblock 13647

### 83.14.7 GetRawAttribute(path as string, name as string, options as Integer = 0) as memoryblock

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Get an extended attribute value.
**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes of files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

The GetRawAttribute function retrieves all bytes of data from the extended attribute identified by name associated with path.

An extended attribute's name is a simple UTF-8 string. position specifies an offset within the extended attribute. In the current implementation, this argument is only used with the resource fork attribute. For all other extended attributes, this parameter is reserved and should be zero.

On success, returns the data associated with name.

Options specify options for retrieving extended attributes:

| | |
|---|---|
| kNoFollow | Do not follow symbolic links. getxattr() normally returns information from the target of path if it is a symbolic link. With this option, GetRawAttribute will return extended attribute data from the symbolic link instead. |

kShowCompression: GetRawAttribute will return HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, the value is returned. On failure, nil is returned and lasterror is set.
See also:

- 83.14.6 GetRawAttribute(path as folderitem, name as string, options as Integer = 0) as memoryblock 13646

### 83.14.8 LastError as Integer

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** The last error code.
**Notes:** Possible error values:

### 83.14.9 LastErrorMessage as string

MBS MacOSX Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Targets: All.

**Function:** The error message for the last error.

### 83.14.10 ListAttributes(path as folderitem, Options as Integer = 0) as string()

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** List extended attribute names.
**Example:**

| | | |
|---|---|---|
| EPERM | 1 | Attributes cannot be associated with this type of object. For example, attributes are not allowed for resource forks. |
| EIO | 5 | An I/O error occurred while reading from or writing to the file system. |
| E2BIG | 7 | The data size of the extended attribute is too large. |
| EACCES | 13 | Permissions denied |
| EFAULT | 14 | path or name points to an invalid address. |
| EEXIST | 17 | options contains XATTR_CREATE and the named attribute already exists. |
| ENOTDIR | 20 | A component of path's prefix is not a directory. |
| EISDIR | 21 | path or fd do not refer to a regular file and the attribute in question is only applicable to files. Similar to EPERM. |
| EINVAL | 22 | name or options is invalid. name must be valid UTF-8 and options must make sense. |
| ENOSPC | 28 | Not enough space left on the file system. |
| EROFS | 30 | The file system is mounted read-only. |
| ERANGE | 34 | The data size of the attribute is out of range (some attributes have size restrictions). |
| ENOTSUP | 45 | The file system does not support extended attributes or has the feature disabled. |
| ELOOP | 62 | Too many symbolic links were encountered resolving path. |
| ENAMETOOLONG | 63 | Name exceeded XATTR_MAXNAMELEN UTF-8 bytes, or a component of path exceeded NAME_MAX characters, or the entire path exceeded PATH_MAX characters. |
| ENOATTR | 93 | options is set to kReplace and the named attribute does not exist. |

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim names() as string = ExtendedAttributesMBS.ListAttributes(f, ExtendedAttributesMBS.kNoFollow+ExtendedAttributesMBS.kShowCompression)
MsgBox Join(names, EndOfLine)
```

**Notes:** Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

ListAttributes retrieves a list of names of extended attributes associated with the given path in the file system. The list will only include names of extended attributes to which the calling process has access.

Options controls how the attribute list is generated:

kNoFollow: Do not follow symbolic links. ListAttributes normally lists attributes of the target of path if it is a symbolic link. With this option, ListAttributes will list attributes of the link itself.
kShowCompression: ListAttributes will list HFS Plus Compression extended attribute(s) (if present) for the file referred to by path.

On success returns array with names. If no accessible extended attributes are associated with the given path,

the function returns empty array. Lasterror is set.
See also:

- 83.14.11 ListAttributes(path as string, Options as Integer = 0) as string() 13650

### 83.14.11 ListAttributes(path as string, Options as Integer = 0) as string()

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** List extended attribute names.
**Notes:** Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

ListAttributes retrieves a list of names of extended attributes associated with the given path in the file system. The list will only include names of extended attributes to which the calling process has access.

Options controls how the attribute list is generated:

kNoFollow: Do not follow symbolic links. ListAttributes normally lists attributes of the target of path if it is a symbolic link. With this option, ListAttributes will list attributes of the link itself.
kShowCompression: ListAttributes will list HFS Plus Compression extended attribute(s) (if present) for the file referred to by path.

On success returns array with names. If no accessible extended attributes are associated with the given path, the function returns empty array. Lasterror is set.
See also:

- 83.14.10 ListAttributes(path as folderitem, Options as Integer = 0) as string() 13648

### 83.14.12 RemoveAttribute(path as folderitem, name as string, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Remove an extended attribute value.
**Notes:** Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

RemoveAttribute deletes the extended attribute name associated with path.

An extended attribute's name is a simple UTF-8 string. Options is a bit mask specifying various options:

kNoFollow Do not follow symbolic links. Normally, removexattr() acts on the target of path if it is a symbolic link. With this option, RemoveAttribute will act on the link itself.

kShowCompression: RemoveAttribute will remove HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, true is returned. On failure, false is returned and the lasterror value is set.
See also:

- 83.14.13 RemoveAttribute(path as string, name as string, options as Integer = 0) as boolean 13651

### 83.14.13 RemoveAttribute(path as string, name as string, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Remove an extended attribute value.
**Notes:** Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

RemoveAttribute deletes the extended attribute name associated with path.

An extended attribute's name is a simple UTF-8 string. Options is a bit mask specifying various options:

kNoFollow Do not follow symbolic links. Normally, removexattr() acts on the target of path if it is a symbolic link. With this option, RemoveAttribute will act on the link itself.

kShowCompression: RemoveAttribute will remove HFS Plus Compression extended attribute name (if present) for the file referred to by path or fd.

On success, true is returned. On failure, false is returned and the lasterror value is set.
See also:

- 83.14.12 RemoveAttribute(path as folderitem, name as string, options as Integer = 0) as boolean 13650

### 83.14.14 SetAttribute(path as folderitem, name as string, data as Variant, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Set an extended attribute value.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
call ExtendedAttributesMBS.SetAttribute(f, ExtendedAttributesMBS.kAttributeNameFinderComment, "Test Comment")
```

**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

SetAttribute associates name and data together as an attribute of path.

An extended attribute's name is a simple UTF-8 string. Data is a memoryblock with the data and contains textual or binary data to be associated with the extended attribute. Position specifies the offset within the extended attribute. In the current implementation, only the resource fork extended attribute makes use of this argument. For all others, position is reserved and should be set to zero.

Options controls how the attribute is set:

| | |
|---|---|
| kNoFollow | Do not follow symbolic links. SetAttribute normally sets attributes on the target of path if it is a symbolic link. With this option, SetAttribute will act on the link itself. |
| kCreate | Fail if the named attribute already exists. |
| kReplace | Fail if the named attribute does not exist. Failure to specify kReplace or kCreate allows creation and replacement. |

On some filesystems, such as HFS+, setting the extended attribute com.apple.ResourceFork will update the modification time of the file.

Returns true on success and false on failure. Lasterror is set.
You may need to inform other applications like Finder that file changed and attributes need to be read.
See also:

- 83.14.15 SetAttribute(path as string, name as string, data as Variant, options as Integer = 0) as boolean 13653

### 83.14.15 SetAttribute(path as string, name as string, data as Variant, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Set an extended attribute value.
**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

SetAttribute associates name and data together as an attribute of path.

An extended attribute's name is a simple UTF-8 string. Data is a memoryblock with the data and contains textual or binary data to be associated with the extended attribute. Position specifies the offset within the extended attribute. In the current implementation, only the resource fork extended attribute makes use of this argument. For all others, position is reserved and should be set to zero.

Options controls how the attribute is set:

| | |
|---|---|
| kNoFollow | Do not follow symbolic links. SetAttribute normally sets attributes on the target of path if it is a symbolic link. With this option, SetAttribute will act on the link itself. |
| kCreate | Fail if the named attribute already exists. |
| kReplace | Fail if the named attribute does not exist. Failure to specify kReplace or kCreate allows creation and replacement. |

On some filesystems, such as HFS+, setting the extended attribute com.apple.ResourceFork will update the modification time of the file.

Returns true on success and false on failure. Lasterror is set.
You may need to inform other applications like Finder that file changed and attributes need to be read.
See also:

- 83.14.14 SetAttribute(path as folderitem, name as string, data as Variant, options as Integer = 0) as boolean 13652

### 83.14.16 SetRawAttribute(path as folderitem, name as string, data as memoryblock, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Set an extended attribute value.
**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

SetRawAttribute associates name and data together as an attribute of path.

An extended attribute's name is a simple UTF-8 string. Data is a memoryblock with the data and contains textual or binary data to be associated with the extended attribute. Position specifies the offset within the extended attribute. In the current implementation, only the resource fork extended attribute makes use of this argument. For all others, position is reserved and should be set to zero.

Options controls how the attribute is set:

| | |
|---|---|
| kNoFollow | Do not follow symbolic links. SetRawAttribute normally sets attributes on the target of path if it is a symbolic link. With this option, SetRawAttribute will act on the link itself. |
| kCreate | Fail if the named attribute already exists. |
| kReplace | Fail if the named attribute does not exist. Failure to specify kReplace or kCreate allows creation and replacement. |

On some filesystems, such as HFS+, setting the extended attribute com.apple.ResourceFork will update the modification time of the file.

Returns true on success and false on failure. Lasterror is set.
You may need to inform other applications like Finder that file changed and attributes need to be read.
See also:

- 83.14.17 SetRawAttribute(path as string, name as string, data as memoryblock, options as Integer = 0) as boolean

### 83.14.17 SetRawAttribute(path as string, name as string, data as memoryblock, options as Integer = 0) as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Targets: All.

**Function:** Set an extended attribute value.
**Notes:** On Mac the extended attributes are normally formatted property lists, so please use the high level functions SetAttribute/GetAttribute. Raw functions are better for things like resourcefork or FinderInfo.

Extended attributes extend the basic attributes associated with files and directories in the file system. They are stored as name:data pairs associated with file system objects (files, directories, symlinks, etc).

SetRawAttribute associates name and data together as an attribute of path.

An extended attribute's name is a simple UTF-8 string. Data is a memoryblock with the data and contains textual or binary data to be associated with the extended attribute. Position specifies the offset within the extended attribute. In the current implementation, only the resource fork extended attribute makes use of this argument. For all others, position is reserved and should be set to zero.

Options controls how the attribute is set:

| | |
|---|---|
| kNoFollow | Do not follow symbolic links. SetRawAttribute normally sets attributes on the target of path if it is a symbolic link. With this option, SetRawAttribute will act on the link itself. |
| kCreate | Fail if the named attribute already exists. |
| kReplace | Fail if the named attribute does not exist. Failure to specify kReplace or kCreate allows creation and replacement. |

On some filesystems, such as HFS+, setting the extended attribute com.apple.ResourceFork will update the modification time of the file.

Returns true on success and false on failure. Lasterror is set.
You may need to inform other applications like Finder that file changed and attributes need to be read.
See also:

- 83.14.16 SetRawAttribute(path as folderitem, name as string, data as memoryblock, options as Integer = 0) as boolean 13654

### 83.14.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAttributeNameFinderComment | ”com.apple.metadata:kMDItemFinderComment” | The attribute name for the Finder |
| kAttributeNameFinderInfo | ”com.apple.FinderInfo” | The attribute name for the Finder |
| kAttributeNameResourceFork | ”com.apple.ResourceFork” | The attribute name for the resourc |

Flags

| Constant | Value | Description |
|---|---|---|
| kCreate | 2 | Fail if the named attribute already exists. |
| kNoDefault | 16 | |
| kNoFollow | 1 | Do not follow symbolic links. ListAttributes normally lists attributes of the target of path if it is a symbolic link. With this option, ListAttributes will list attributes of the link itself. |
| kNoSecurity | 8 | |
| kReplace | 4 | Fail if the named attribute does not exist. Failure to specify kReplace or kCreate allows creation and replacement. |
| kShowCompression | 32 | ListAttributes will list HFS Plus Compression extended attribute(s) (if present) for the file referred to by path. |

## 83.15 class FileListMBS

### 83.15.1 class FileListMBS

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a list of files.
**Notes:** This class is made to get a list of files in a folder faster than by using a folderitem.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr7
- MBS Xojo Plugins, version 21.2pr6
- MBS Xojo Plugins, version 21.2pr4
- MBS Xojo Plugins, version 20.6pr4
- MBS Xojo Plugins, version 20.1pr7
- MBS Xojo Plugins in version 19.0
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- MBS REALbasic Plugins Version 10.4 release notes
- NSBundleMBS and NSDirectoryEnumeratorMBS

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.2, page 10: News

### 83.15.2 Methods

### 83.15.3 AttributeModificationDate(index as Integer) as Double

MBS Util Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The attribute modification date of this file or directory.
**Notes:** On Mac OS the UTC date (+0 time zone)
Raises an exception if index is out of bounds. Index is zero based.
See also:

- 83.15.4 AttributeModificationDate(index as Integer, UTC as boolean) as Date 13658

### 83.15.4 AttributeModificationDate(index as Integer, UTC as boolean) as Date

MBS Util Plugin, Plugin Version: 13.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The attribute modification date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.
See also:

- 83.15.3 AttributeModificationDate(index as Integer) as Double 13657

### 83.15.5 AttributeModificationDateTime(index as integer, UTC as boolean) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attribute modification date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.6 BackupDate(index as Integer) as Double

MBS Util Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The backup date of this file or directory.
**Notes:** On Mac OS the UTC date (+0 time zone)
See also:

- 83.15.7 BackupDate(index as Integer, UTC as boolean) as Date 13658

### 83.15.7 BackupDate(index as Integer, UTC as boolean) as Date

MBS Util Plugin, Plugin Version: 13.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The backup date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.
See also:

- 83.15.6 BackupDate(index as Integer) as Double 13658

### 83.15.8 BackupDateTime(index as integer, UTC as boolean) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The backup date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.9 CFURL(index as integer) as Variant

MBS Util Plugin, Plugin Version: 19.0, Platform: macOS, Targets: All.

**Function:** Queries CFURLMBS object for an entry.
**Notes:** Returns nil if no CFURL is kept for this item.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.10 Close

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 83.15.11 Constructor

MBS Util Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Targets: All.

**Function:** A dummy constructor used only for automatic plugin testing.
See also:


- 83.15.12 Constructor(filelist as FileListMBS, index as Integer, WinFilter as string = """, SkipMode as Integer = 0) 13659
- 83.15.13 Constructor(folder as folderitem, WinFilter as string = """, SkipMode as Integer = 0) 13660
- 83.15.14 Constructor(Path as String, WinFilter as string = """, SkipMode as Integer = 0) 13661


### 83.15.12 Constructor(filelist as FileListMBS, index as Integer, WinFilter as string = """, SkipMode as Integer = 0)

MBS Util Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor which creates a new file list based on item in a given file list.
**Example:**

```
dim f1 as new FileListMBS(SpecialFolder.UserHome)
'MsgBox f1.path

// search first index of a visible folder
dim IndexOfDirectory as integer = 0
while f1.Directory(IndexOfDirectory) = false or f1.Visible(IndexOfDirectory) = false
IndexOfDirectory = IndexOfDirectory + 1
wend

// list that folder
dim f2 as new FileListMBS(f1, IndexOfDirectory)
'MsgBox f2.path

// show first file and path
MsgBox f2.Name(0)+EndOfLine+f2.ItemPath(0)
```

**Notes:** If count is 0 after the contrustor the folder is invalid or empty.
On Windows the WinFilter allows you to pass a custom filter like "*.txt" to only find some files there.

SkipMode, added in version 20.1, allows you to skip some files from being part of the file list. Please use BitwiseOr() to combine Skip flags, e.g. BitwiseOr(SkipHidden, SkipFolders) returns only visible files.
See also:

- 83.15.11 Constructor 13659
- 83.15.13 Constructor(folder as folderitem, WinFilter as string = "", SkipMode as Integer = 0) 13660
- 83.15.14 Constructor(Path as String, WinFilter as string = "", SkipMode as Integer = 0) 13661

### 83.15.13 Constructor(folder as folderitem, WinFilter as string = "", SkipMode as Integer = 0)

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor which creates a new file list based on the folder.
**Notes:** If count is 0 after the contrustor the folder is invalid or empty.
On Windows the WinFilter allows you to pass a custom filter like "*.txt" to only find some files there.

SkipMode, added in version 20.1, allows you to skip some files from being part of the file list. Please use BitwiseOr() to combine Skip flags, e.g. BitwiseOr(SkipHidden, SkipFolders) returns only visible files.
See also:

- 83.15.11 Constructor 13659
- 83.15.12 Constructor(filelist as FileListMBS, index as Integer, WinFilter as string = "", SkipMode as Integer = 0) 13659

- 83.15.14 Constructor(Path as String, WinFilter as string = """, SkipMode as Integer = 0) 13661


### 83.15.14 Constructor(Path as String, WinFilter as string = """, SkipMode as Integer = 0)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor which creates a new file list based on the directory path.
**Notes:** If count is 0 after the contrustor the directory path is invalid or empty.
On Windows the WinFilter allows you to pass a custom filter like "*.txt" to only find some files there.

SkipMode, added in version 20.1, allows you to skip some files from being part of the file list. Please use BitwiseOr() to combine Skip flags, e.g. BitwiseOr(SkipHidden, SkipFolders) returns only visible files.
See also:


- 83.15.11 Constructor 13659
- 83.15.12 Constructor(filelist as FileListMBS, index as Integer, WinFilter as string = """, SkipMode as Integer = 0) 13659
- 83.15.13 Constructor(folder as folderitem, WinFilter as string = """, SkipMode as Integer = 0) 13660


### 83.15.15 CreationDate(index as Integer) as Double

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Windows, Targets: All.

**Function:** The creation date.
**Notes:** On Mac OS the UTC date (+0 time zone)
On Windows looks like local timezone.
See also:


- 83.15.16 CreationDate(index as Integer, UTC as boolean) as Date 13661


### 83.15.16 CreationDate(index as Integer, UTC as boolean) as Date

MBS Util Plugin, Plugin Version: 13.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The creation date.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.
See also:


- 83.15.15 CreationDate(index as Integer) as Double 13661

### 83.15.17 CreationDateTime(index as integer, UTC as boolean) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The creation date.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.18 Creator(index as Integer) as string

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The Mac Creator code of the item with the given index.
**Notes:** Always "" on Windows and Linux.
Raises an exception if index is out of bounds. Index is zero based.

Stopped working on macOS Monterey and newer since Apple deprecated the API long ago.

### 83.15.19 Directory(index as Integer) as boolean

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the item with the given index is a folder.
**Notes:** True if it is a folder and false if it is a file.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.20 DisplayName(index as Integer) as string

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The display name of the item with the given index.
**Notes:** Asks the System for the display name of the item. Returns the normal name on any error.

As this call may cost quite some CPU time you may cache the value if you need it more often.

May return a Unicode string, so be carefull with encoding.
Returns "" on any error.

Raises an exception if index is out of bounds. Index is zero based.

### 83.15.21 FinderFlags(index as Integer) as Integer

MBS Util Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Finder flags from Mac OS.
**Notes:** On Windows and Linux value is 0.

The flag value is a set of bits with the following meaning:

| | | |
|---|---|---|
| bit 15 | value &H8000 | isAlias |
| bit 14 | value &H4000 | isInvisible |
| bit 13 | value &H2000 | hasBundle (has a BNDL resource) |
| bit 12 | value &H1000 | nameLocked |
| bit 11 | value &H0800 | isStationary |
| bit 10 | value &H0400 | hasCustomIcon |
| bit 8 | value &H0100 | hasBeenInited (Finder has seen the file since it has been created) |
| bit 7 | value &H0080 | hasNoINITs (there is no INIT rsrc in the Extension file) |
| bit 6 | value &H0040 | isShared |
| bits 1-3 | value &H000E | color (as a 3-bit value from 0-7) |

### 83.15.22 FSRef(index as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The FSRef used for this item.
**Notes:** Returns nil if no FSRef is kept for this item.
On Mac OS there is a FSSpec or (FSRef and HFSUniStr255).
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.23 HFSUniStr255(index as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The HFSUniStr255 used for this item.
**Notes:** Returns nil if no HFSUniStr255 is kept for this item.
On Mac OS there is a FSSpec or (FSRef and HFSUniStr255).
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.24 IsBundle(index as Integer) as Boolean

MBS Util Plugin, Plugin Version: 6.1, Platforms: macOS, Windows, Targets: All.

**Function:** Queries using LaunchServices whether this item is a folder and the root of a bundle.
**Example:**

```
Protected Sub Dir(f as FolderItem)
dim l as FileListMBS
dim i,c as Integer

// search subfolders and find bundles

l=new FileListMBS(f)
c=l.Count-1
for i=0 to c
// if bundle, show it in listbox
if l.IsBundle(i) then
ListBox1.AddRow l.Item(i).NativePath
elseif l.Directory(i) then
// if sub folder, browse it
dir l.Item(i)
end if
next
End Sub
```

**Notes:** On Windows, Linux and Mac OS Classic always false.

### 83.15.25 IsHardLinked(index as Integer) as boolean

MBS Util Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Targets: All.

**Function:** Whether the file is a hard link.
**Notes:** If two directory entries point to the same hard disc space, you have a file which has two directory entries, but only one storage.

This function returns true for files in a Time Machine backup which did not change since the last backup and share their disc space with the other backups.

Raises an exception if index is out of bounds. Index is zero based.

### 83.15.26 Item(index as Integer) as folderitem

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a folderitem for the item with the given index.
**Notes:** Returns nil on any error.
The reason why you use this class is to avoid makeing folderitems which is slow, so don't use this function too often.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.27 ItemPath(index as Integer) as string

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native file path for an item.

### 83.15.28 LastAccessDate(index as Integer) as Double

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last access date of this file or directory.
**Notes:** On Mac OS the UTC date (+0 time zone)
Raises an exception if index is out of bounds. Index is zero based.

To query Spotlight's Last Open day, please check the FAQ for sampel code.
See also:

- 83.15.29 LastAccessDate(index as Integer, UTC as boolean) as Date 13665

### 83.15.29 LastAccessDate(index as Integer, UTC as boolean) as Date

MBS Util Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last access date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.
To query Spotlight's Last Open day, please check the FAQ for sample code.
See also:

- 83.15.28 LastAccessDate(index as Integer) as Double 13665

### 83.15.30 LastAccessDateTime(index as integer, UTC as boolean) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last access date of this file or directory.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.
To query Spotlight's Last Open day, please check the FAQ for sample code.

### 83.15.31 LogicalDataLength(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical file data length for the item with the given index.
**Notes:** Same value as folderitem.length, but works with files >2GB.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.32 LogicalResourceLength(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The logical resource length of the item with the given index.
**Notes:** Raises an exception if index is out of bounds. Index is zero based.

### 83.15.33 ModificationDate(index as Integer) as Double

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The modification date.
**Notes:** On Mac OS the UTC date (+0 time zone)
On Windows looks like local timezone.
Raises an exception if index is out of bounds. Index is zero based.
See also:

- 83.15.34 ModificationDate(index as Integer, UTC as boolean) as Date 13666

### 83.15.34 ModificationDate(index as Integer, UTC as boolean) as Date

MBS Util Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The modification date.
**Notes:** Either in UTC time zone or in local time zone.

Raises an exception if index is out of bounds. Index is zero based.
See also:

- 83.15.33 ModificationDate(index as Integer) as Double 13666

### 83.15.35 ModificationDateTime(index as integer, UTC as boolean) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The modification date.
**Notes:** Either in UTC time zone or in local time zone.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.36 Name(index as Integer) as string

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the item with the given index.
**Notes:** May return a Unicode string, so be carefull with encoding.
Returns "" on any error.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.37 NodeID(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Targets: All.

**Function:** The Mac node ID for the given file or directory.
**Notes:** The node id is zero on Windows and Linux.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.38 ParentDirectoryID(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Targets: All.

**Function:** The Mac ID for the parent directory.
**Notes:** Parent Directory ID is zero on Windows and Linux.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.39 PhysicalDataLength(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical data length of the item with the given index.
**Notes:** Returns 0 on any error.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.40 PhysicalResourceLength(index as Integer) as Int64

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The physical resource length of the item with the given index.
**Notes:** Value is always 0 on Windows.
Returns 0 on any error.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.41 SortByCreationDate

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sorts items in list by creation date.

### 83.15.42 SortByFileName

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sorts items in list by file names.

### 83.15.43 SortByModificationDate

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sorts items in list by modification date.

### 83.15.44 TrueItem(index as Integer) as folderitem

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a folderitem for the item with the given index.
**Notes:** Returns nil on any error.
The reason why you use this class is to avoid makeing folderitems which is slow, so don't use this function too often. e.g. good if you just take 5 folderitems for 20000 files by filtering.

TrueItem will use GetTrueFolderItem so the link/alias files are not resolved by Xojo.
Due to bugs in Xojo, you may still get alias resolved.

### 83.15.45 Type(index as Integer) as string

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The Mac Type code of the item with the given index.
**Notes:** Always "" on Windows and Linux.
Raises an exception if index is out of bounds. Index is zero based.

Stopped working on macOS Monterey and newer since Apple deprecated the API long ago.

### 83.15.46 Visible(index as Integer) as boolean

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the item with the given index is visible.
**Notes:** On Mac OS X, files with name starting with "." are considered to be invisible.
False on any error.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.47 WinFileAttributes(index as Integer) as Integer

MBS Util Plugin, Plugin Version: 6.1, Platforms: macOS, Windows, Targets: All.

**Function:** The file attributes for this file on Windows.
**Notes:** Value is 0 on other platforms.
Raises an exception if index is out of bounds. Index is zero based.

### 83.15.48 Properties

### 83.15.49 Cancel as Boolean

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tells FileListMBS to stop gathering files.
**Notes:** To be used with threaded flag to stop background threads from working on directory listings soon. You may want to set FileListMBS.cancel to true in app.CancelClose when you let the application has a running thread, so you can quit properly.

The constructors set cancel = false to make sure they work.
(Read and Write property)

### 83.15.50 Count as Integer

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items found.
**Notes:** So index goes from 0 to count-1 in all functions.
(Read and Write property)

### 83.15.51 Folder as FolderItem

MBS Util Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The folderitem used in the constructor.
**Notes:** (Read and Write property)

### 83.15.52 OK as Boolean

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the process of reading the directory content in the constructor was successful.
**Notes:** Should be true on success.
(Read and Write property)

### 83.15.53 Path as String

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path for the folder.
**Notes:** The plugin makes sure it ends with slash or backslash.
(Read and Write property)

### 83.15.54 Threaded as Boolean

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want to run FileListMBS constructors threaded.
**Notes:** If you run code in a Xojo thread, which uses FileListMBS, you can set this property to true. We then do the work on a preemptive thread to keep the GUI responsive.
(Read and Write property)

### 83.15.55 TotalLogicalDataLength as Int64

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sum of logical dats length for all items.
**Notes:** (Read only property)

### 83.15.56 TotalLogicalResourceLength as Int64

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sum of logical resource length for all items.
**Notes:** (Read only property)

### 83.15.57 TotalPhysicalDataLength as Int64

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sum of physical data length for all items.
**Notes:** (Read only property)

### 83.15.58 TotalPhysicalResourceLength as Int64

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sum of physical resource length for all items.
**Notes:** (Read only property)

### 83.15.59 YieldTicks as Integer

MBS Util Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

FileListMBS.YieldTicks = 6

**Notes:** If value is greater than zero, the application will yield to another Xojo thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.

For threaded FileListMBS, this property has no effect.
(Read and Write property)

### 83.15.60 Constants

Skip Modes

| Constant | Value | Description |
|---|---|---|
| SkipFiles | 1 | Skip files. |
| SkipFolders | 2 | Skip folders. |
| SkipHidden | 12 | Skip hidden files and folders. |
| SkipHiddenFiles | 4 | Skip hidden files. |
| SkipHiddenFolders | 8 | Skip hidden folders. |
| SkipNone | 0 | Skip no files. |

## 83.16 class FinderSelectionMBS

### 83.16.1 class FinderSelectionMBS

MBS MacClassic Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** A class to query the Finder for the current selection.
**Example:**

```
dim f as new FinderSelectionMBS
dim i,n as Integer
dim a(-1) as string
dim g as FolderItem

f.GetSelection
if f.LastError=0 then
n=f.CountItems

for i=1 to n
g=f.Item(i)
if g<>nil then
a.Append g.DisplayName
end if
next
end if

MsgBox Join(a,EndOfLine)
```

**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MonkeyBread Software Releases the MBS Plugins 8.2

### 83.16.2 Methods

### 83.16.3 CountItems as Integer

MBS MacClassic Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in the Finder selection.
**Example:**

```
dim f as new FinderSelectionMBS

f.GetSelection
```

```
MsgBox str(F.CountItems)
```

**Notes:** Returns 0 on any error.

### 83.16.4 GetSelection

MBS MacClassic Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Asks the Finder for the current selection.
**Example:**

```
dim f as new FinderSelectionMBS

f.GetSelection
```

**Notes:** Lasterror is set.

### 83.16.5 Item(index as Integer) as folderitem

MBS MacClassic Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the item with the given index.
**Example:**

```
dim f as new FinderSelectionMBS

f.GetSelection
MsgBox f.Item(1).DisplayName // display first item's name
```

**Notes:** Index is from 1 to count.
Lasterror is set.

### 83.16.6 Properties

### 83.16.7 LastError as Integer

MBS MacClassic Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Example:**

```
dim f as new FinderSelectionMBS

f.GetSelection
MsgBox str(F.LastError)
```

**Notes:** A Mac OS error code.
(Read and Write property)

## 83.17 class FolderItem

### 83.17.1 class FolderItem

Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of Xojo's base classes.
**Notes:** Handles access to files.

### 83.17.2 Methods

### 83.17.3 AbsolutePath as string

MBS MacOSX Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the absolute path for the file.
**Example:**

```
// test absolute path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.txt")
Dim p As String = f.AbsolutePath

Dim g As FolderItem = NewFolderItemFromAbsolutePathMBS(p)
Dim n As String = g.NativePath

MsgBox p+EndOfLine+n
```

**Notes:** For Xojo we register this function for compatibility to older Xojo and Real Studio versions.
Same as AbsolutePathMBS, but with name AbsolutePath.
On MacOS queries absolute path in MacOS Classic HFS style, but on Windows and Linux just queries native path.

### 83.17.4 AbsolutePathMBS as string

MBS MacOSX Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the absolute path for the file.
**Example:**

```
// test absolute path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.txt")
Dim p As String = f.AbsolutePathMBS
```

```
Dim g As FolderItem = NewFolderItemFromAbsolutePathMBS(p)
Dim n As String = g.NativePath

MsgBox p+EndOfLine+n
```

**Notes:** On MacOS queries absolute path in MacOS Classic HFS style, but on Windows and Linux just queries native path.
Version 20.1 or newer makes sure directories return a path ending in double colon.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr5
- MBS Xojo Plugins, version 19.5pr8
- AbsolutePath for Xojo

### 83.17.5 AliasInfoMBS as AliasInfoMBS

MBS MacClassic Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use CFBookmarkMBS module instead. **Function:** Alias information about the folderitem if it is an alias file.
**Example:**

```
// select an alias file. use TrueChild so it's not resolved
dim f as FolderItem = SpecialFolder.Desktop.TrueChild("Development")

// get alias info
dim a as AliasInfoMBS = f.AliasInfoMBS

// show info
MsgBox "alias points to "+a.TargetName+" in path "+a.PathString+" of volume "+a.VolumeName
```

**Notes:** Returns nil on any error.

### 83.17.6 BackupIsItemExcludedMBS(byref excludeByPath as boolean) as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Report whether or not an item is being excluded from backup.
**Notes:**

excludeByPath: pass a boolean variable to determine whether or not the given item is excluded as an absolute path or whether it is sticky to the item.

Returns true if the item or any of its ancestors are excluded from backup, false otherwise.

Require Mac OS X 10.5.

### 83.17.7 BackupSetItemExcludedMBS(exclude as boolean, excludeByPath as boolean) as Integer

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Add or remove an item from the list of items excluded from backup.
**Notes:** When backing up, the backup daemon skips items marked by this call. If a folder is marked for exclusion, it and its contents are excluded from backup. When specifying by path, it is OK to pass a URL of an item/folder that does not exist yet.

Returns the error code. -1 is the error code in case the function is not available.
Require Mac OS X 10.5.

### 83.17.8 CalculateDirectorySizeMBS(recursive as boolean = false, ticks as Integer = 0, QueryCompressedSizes as boolean = false, RecursionLimit as Integer = -1) as DirectorySizeMBS

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an object with informations about the folder size.
**Example:**

```
// chose a folder
dim f as FolderItem = SelectFolder

// calculate
dim d as DirectorySizeMBS = f.CalculateDirectorySizeMBS(True,0)

// display
MsgBox str(d.FilesCount)+" files in "+str(d.FolderCount)+" folder"
```

**Notes:** recursive: Whether to count items in the subfolders.
ticks: Whether to yield time to other threads. (See YieldTicks property)
QueryCompressedSizes: Whether to query compressed file sizes on Windows.
RecursionLimit: If positive, the recursion limit.

Returns nil on any error.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr9

### 83.17.9 CompressedFileLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the compressed file on disk.
**Example:**

```
filesize.text=format(file.CompressedFileLengthMBS,"0")
```

**Notes:** On Windows files can be compressed and this function returns the size of the compressed file. On Mac and for non compressed files on Windows this function returns the uncompressed size.

### 83.17.10 CountMBS as Integer

MBS MacClassic Plugin, Plugin Version: 3.2, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use folderitem.Count instead.
**Function:** Returns the number of items in this folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop
MsgBox str(F.Count)+" vs. "+str(F.CountMBS)
```

**Notes:** The count property of the Xojo folderitem class is cached.
So if you create a file, the count property may not update.

If you need a more up to date value, you can use the CountMBS function to return the value the Mac OS system software returns.
On any error (e.g. invalid folderitem) the function returns 0.

Windows support added in 4.2dr2.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.11 CreateLargeBinaryStreamMBS(MacType as string, MacCreator as string) as LargeBinaryStreamMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file as a LargeBinaryStreamMBS.
**Example:**

```
dim f as FolderItem // your file
dim l as LargeBinaryStreamMBS

l=f.CreateLargeBinaryStreamMBS("TEXT","ttxt")
```

**Notes:** If there is already a file, it is deleted.
On Windows the parameters are ignored.
Returns nil on any error.

### 83.17.12 CreateResStreamMBS(MacType as string, MacCreator as string) as ResStreamMBS

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Creates a new ResStreamMBS.
**Notes:** If there is already a file, it is deleted.
If the file could not be created it is deleted.
Returns nil on any error.

### 83.17.13 CreatorAppMBS as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns the application that would be launched if you'd call the above Launch method, or NIL if no appropriate app can be located.
**Example:**

```
dim docfile as folderitem // your document file
dim appfile as folderitem
appfile=docfile.CreatorAppMBS
```

**Notes:** This function doesn't work with bundles and should be only used on Mac OS 9.
Use Launch service functions on Mac OS X.
See also:

• 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem 13681

### 83.17.14 CreatorAppMBS(creatorCode as String) as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns a folderitem to the Application which created this file for the given creator code on the volume of the folderitem.
**Example:**

```
dim myvolume as folderitem // your volume
dim theFile as folderitem // your file
dim appfile as folderitem
dim ok as boolean
dim inFront as Boolean


appfile=myvolume.CreatorAppMBS("iCAB")
' or
ok = theFile.OpenWithAppMBS(myvolume.CreatorAppMBS("RSED"), inFront)
```

**Notes:** Returns the application that would be launched if you'd call the above Launch method and if the file had the specified creator code. Returns NIL if no appropriate app can be located.

This method allows you to open a document with a creator code that you specify instead of having to locate the application by your own. Here's an example on how to open any file with ResEdit (whose creator code is 'RSED'):

This function doesn't work with bundles and should be only used on Mac OS 9.
Use Launch service functions on Mac OS X.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

See also:

• 83.17.13 CreatorAppMBS as FolderItem 13680

### 83.17.15 DarwinMediaClassMBS as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the class of the media.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop

MsgBox f.DarwinMediaClassMBS
```

**Notes:** Returns nil on any problem.

Possible values:

| | |
|---|---|
| kIOCDMediaClass | "IOCDMedia" |
| kIODVDMediaClass | "IODVDMedia" |
| kIOMediaClass | "IOMedia" |

See also DarwinMediaInfoMBS function.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.16 DarwinMediaInfoMBS as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 5.1, Platform: macOS, Targets: All.

**Function:** Returns the info dictionary of the media.
**Example:**

```
// info for boot volume
dim info as CFDictionaryMBS = volume(0).DarwinMediaInfoMBS

if info = nil then
beep // error
else
CFShowMBS info // show in console

dim RemovableKey as CFStringMBS = NewCFStringMBS("Removable")
dim RemovableCFO as CFObjectMBS = info.Value(RemovableKey)
dim RemovableCFB as CFBooleanMBS = CFBooleanMBS(RemovableCFO)
dim Removable as Boolean = RemovableCFB.Value

MsgBox "Removable: "+str(Removable)

dim EjectableKey as CFStringMBS = NewCFStringMBS("Ejectable")
dim EjectableCFO as CFObjectMBS = info.Value(EjectableKey)
dim EjectableCFB as CFBooleanMBS = CFBooleanMBS(EjectableCFO)
dim Ejectable as Boolean = EjectableCFB.Value
```

```
MsgBox "Ejectable: "+str(Ejectable)

dim SizeKey as CFStringMBS = NewCFStringMBS("Size")
dim SizeCFO as CFObjectMBS = info.Value(SizeKey)
dim SizeCFN as CFNumberMBS = CFNumberMBS(SizeCFO)
dim Size as Double = SizeCFN.doubleValue / 1000000000.0

MsgBox "Size: "+str(Size, "0.0")+" GB"
end if
```

**Notes:** Returns nil on any problem.

example output for the example code above:
<CFDictionary 0x7d60510 [ 0xa01900e0 ] >{ type = fixed-mutable, count = 14, capacity = 14, pairs = (
0 : <CFString 0x7d5ffe0 [ 0xa01900e0 ] >{ contents = "Leaf" } = <CFBoolean 0xa0190b98 [ 0xa01900e0 ] >{ value = false }
1 : <CFString 0x7d60160 [ 0xa01900e0 ] >{ contents = "Writable" } = <CFBoolean 0xa0190b90 [ 0xa01900e0 ] >{ value = true }
2 : <CFString 0x7d60310 [ 0xa01900e0 ] >{ contents = "BSD Minor" } = <CFNumber 0x7d60300 [ 0xa01900e0 ] >{ value = +0, type = kCFNumberSInt32Type }
6 : <CFString 0x7d60040 [ 0xa01900e0 ] >{ contents = "Preferred Block Size" } = <CFNumber 0x7d5fe90 [ 0xa01900e0 ] >{ value = +512, type = kCFNumberSInt64Type }
11 : <CFString 0x7d604c0 [ 0xa01900e0 ] >{ contents = "BSD Major" } = <CFNumber 0x7d604b0 [ 0xa01900e0 ] >{ value = +14, type = kCFNumberSInt32Type }
13 : <CFString 0x7d603b0 [ 0xa01900e0 ] >{ contents = "BSD Name" } = <CFString 0x7d60110 [ 0xa01900e0 ] >{ contents = "disk0" }
14 : <CFString 0x7d600d0 [ 0xa01900e0 ] >{ contents = "Size" } = <CFNumber 0x7d60090 [ 0xa01900e0 ] >{ value = +163928604672, type = kCFNumberSInt64Type }
15 : <CFString 0x7d5fef0 [ 0xa01900e0 ] >{ contents = "Content Hint" } = <CFString 0xa0196304 [ 0xa01900e0 ] >{ contents = "" }
16 : <CFString 0x7d60020 [ 0xa01900e0 ] >{ contents = "Removable" } = <CFBoolean 0xa0190b98 [ 0xa01900e0 ] >{ value = false }
17 : <CFString 0x7d601b0 [ 0xa01900e0 ] >{ contents = "IOMediaIcon" } = <CFDictionary 0x7d60360 [ 0xa01900e0 ] >{ type = fixed-mutable, count = 2, capacity = 2, pairs = (
2 : <CFString 0x7d60250 [ 0xa01900e0 ] >{ contents = "CFBundleIdentifier" } = <CFString 0x7d602a0 [ 0xa01900e0 ] >{ contents = "com.apple.iokit.IOStorageFamily" }
3 : <CFString 0x7d5ff30 [ 0xa01900e0 ] >{ contents = "IOBundleResourceFile" } = <CFString 0x7d60230 [ 0xa01900e0 ] >{ contents = "Internal.icns" }
) }
19 : <CFString 0x7d603d0 [ 0xa01900e0 ] >{ contents = "BSD Unit" } = <CFNumber 0x7d5ff50 [ 0xa01900e0 ] >{ value = +0, type = kCFNumberSInt32Type }
20 : <CFString 0x7d5ff90 [ 0xa01900e0 ] >{ contents = "Ejectable" } = <CFBoolean 0xa0190b98 [ 0xa01900e0 ] >{ value = false }
21 : <CFString 0x7d5fea0 [ 0xa01900e0 ] >{ contents = "Content" } = <CFString 0x7d5ff10 [ 0xa01900e0 ] >{ contents = "Apple_partition_scheme" }

22 : <CFString 0x7d60120 [ 0xa01900e0 ] >{ contents = "Whole" } = <CFBoolean 0xa0190b90 [ 0xa01900e0 ] >{ value = true }
) }

If you don't like all the CFDictionaryMBS methods, than use Dictionary function it to get a Xojo dictionary.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.17 DarwinVolumeNameMBS as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the name of the volume from the BSD part of Mac OS X.
**Example:**

```
MsgBox Volume(0).DarwinVolumeNameMBS // shows here disk1s10
```

**Notes:** Returns "" on any error.
The returned string is encoded as ASCII.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.18 DeleteDataForkMBS

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Deletes the data fork of a file.
**Notes:** Equal to open the file using a binarystream and setting the length property to 0.
On Mac OS a file can exist without a datafork, with a resource fork or even without any fork.
**Blog Entries**

- MBS Plugins 10.3 Release Notes

### 83.17.19 DeleteResourceForkMBS

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Deletes the resource fork of a file.
**Notes:** Equal to open the file using a ResStreamMBS and setting the length property to 0.
On Mac OS a file can exist without a datafork, with a resource fork or even without any fork.
**Blog Entries**

- MBS Plugins 10.3 Release Notes

### 83.17.20 DisplayPathMBS(delimiter as string = "/") as string

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows display path.
**Example:**

```
// Sample values in German:

// SnowLeopard/Programme/Dienstprogramme/Konsole

MsgBox SpecialFolder.Applications.Child("Utilities").Child("Console.app").DisplayPathMBS("/")

// SnowLeopard/Benutzer/cs/Schreibtisch

MsgBox SpecialFolder.Desktop.DisplayPathMBS("/")

// SnowLeopard ,ûú Programme ,ûú Dienstprogramme ,ûú Konsole

MsgBox SpecialFolder.Applications.Child("Utilities").Child("Console.app").DisplayPathMBS(" ,ûú ")

// SnowLeopard ,ûú Benutzer ,ûú cs ,ûú Schreibtisch

MsgBox SpecialFolder.Desktop.DisplayPathMBS(" ,ûú ")
```

**Notes:** You can pass any string for delimiter. Good looks an arrow or just a slash.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr3

### 83.17.21 EjectVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** This routine ejects the volume specified by folderitem.
**Example:**

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "testvolume" then
```

```
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim pid as Integer
dim e as Integer = disk.EjectVolumeMBS(false, pid)

if e=0 then
msgBox "Volume unmounted."
else

if pid=0 then
msgBox "Failed to unmount with error: "+str(e)
else
dim name as string
dim p as new ProcessMBS // from Util plugin
p.GetFirstProcess

do
if p.ProcessID = pid then
name = p.Name
end if
loop until not p.GetNextProcess

if len(name)>0 then
msgBox "Failed to unmount with error: "+str(e)
else
MsgBox "Failed to unmount."+EndOfLine+EndOfLine+"The application "+name+" is still using this volume."+EndOfLine+"Error: "+str(e)
end if

end if
end if
end if
```

**Notes:** If the volume cannot be ejected the pid of the process which denied the unmount will be returned in the dissenter parameter. This routine returns after the eject is complete. Ejecting a volume will result in the unmounting of other volumes on the same device.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be

reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.

PS: Seems like on my tests the pid is not set by Apple.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Plugins 10.3 Release Notes

### 83.17.22 FilesMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of files in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim files() as FolderItem = folder.FilesMBS
MsgBox str(UBound(files)+1)+" files"
```

**Notes:** Similar to item() function, but returns all files with one call.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0fc1

### 83.17.23 FinderUpdateMBS as Integer

MBS Picture Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Updates the file or folder in the Finder.
**Notes:** Returns 0 for successfull and any Mac OS error code on a problem.
Returns -1 on Windows.
This function is called automatically when adding or removing an icon.
If you add a folder icon, use this function to update the Finder to display it.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4
- MBS Xojo Plugins, version 18.5pr2

### 83.17.24 FlushVolumeMBS as Integer

MBS MacClassic Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Asks the Mac OS to flush all write buffers to the disc.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Plugins 10.3 Release Notes

### 83.17.25 FoldersMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of folders in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim folders() as FolderItem = folder.FoldersMBS
MsgBox str(UBound(folders)+1)+" folders"
```

**Notes:** Similar to item() function, but returns all folders with one call.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr2
- MBS Real Studio Plugins, version 12.0fc1

### 83.17.26 FontActivateMBS(OnlyLocal as boolean) as Integer

MBS Util Plugin, Plugin Version: 4.3, Platforms: macOS, Windows, Targets: All.

**Function:** Activates one font.
**Example:**

```
dim f as folderitem
dim e as Integer

f=SpecialFolder.Desktop.child("MyWonderfulFont.dfont")
e=f.FontActivateMBS(true)

select case e
case 0
msgbox "No error"
case -1
```

```
MsgBox "Parameter error. (Plugin)"
case 1 // Windows error
MsgBox "Parameter error. (System)"
case -43 // Mac error
MsgBox "File not found."
case -50 // Mac error
MsgBox "Parameter error. (System)"
case -108 // Mac error
MsgBox "File is not a font file."
else
MsgBox "Error: "+str(e)
end Select
```

**Notes:** The folderitem used here points to a font file.
If you want the Font Manager to make fonts not visible to all applications installed on the system, use the OnlyLocal property.

Requires Mac OS 9.0 or newer.
Returns -1 if this FontManager function was not found. 0 on success.

Some error codes for Mac:

| | |
|---|---|
| 0 | No error. |
| -43 | File not found. |
| -45 | File locked. |
| -108 | Out of memory. |
| -105 | Already registered. |

Fails in Xojo 2017 on Windows due to changes in Xojo's way to handle fonts. The plugin still activates them, but Xojo doesn't allow you to use fonts which haven't been there earlier. See feedback case 46596.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr3
- MBS Xojo / Real Studio Plugins, version 14.4pr6
- MBS Real Studio Plugins, version 12.1pr5
- MBS REALbasic Plugins, version 10.5pr2
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

**Xojo Developer Magazine**

- 10.1, pages 75 to 76: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar

### 83.17.27 FontDeactivateMBS(OnlyLocal as boolean) as Integer

MBS Util Plugin, Plugin Version: 4.3, Platforms: macOS, Windows, Targets: All.

**Function:** Deactivates one font.
**Notes:** The folderitem used here points to font file.
The OnlyLocal must match the value which was used on registration.

Requires Mac OS 9.0 or newer, Windows 2000/XP.
Returns -1 if this FontManager function was not found. 0 on success.

An user reported that this does not work on Mac OS X 10.4.

Some error codes for Mac:

| | |
|---|---|
| 0 | No error. |
| -43 | File not found. |
| -45 | File locked. |
| -108 | Out of memory. |

On Windows you may need to call this function several times until all references of the file are freed.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr5
- MBS Real Studio Plugins, version 11.2pr3
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr7

### 83.17.28 GetFileFlagsMBS as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Get the file flags for a folderitem.
**Example:**

```
// For example, testing for a file being invible works like this:
dim fdFlags as Integer
```

```
dim fileIsInvisible as boolean
dim f as FolderItem // file

fdFlags = f.GetFileFlagsMBS
if fdFlags <0 then
' ... oops, an error occured
else
fileIsInvisible = BitwiseAnd (fdFlags, &H4000) <>0
end
```

**Notes:** Returns the fdFlags of a file. If you pass in a non-existing file or a folder, a negative error code is returned instead.

The fdFlags is a set of bits with the following meaning:

| | | |
|---|---|---|
| bit 15 | value &H8000 | isAlias |
| bit 14 | value &H4000 | isInvisible |
| bit 13 | value &H2000 | hasBundle (has a BNDL resource) |
| bit 12 | value &H1000 | nameLocked |
| bit 11 | value &H0800 | isStationary |
| bit 10 | value &H0400 | hasCustomIcon |
| bit 8 | value &H0100 | hasBeenInited (Finder has seen the file since it has been created) |
| bit 7 | value &H0080 | hasNoINITs (there is no INIT rsrc in the Extension file) |
| bit 6 | value &H0040 | isShared |
| bits 1-3 | value &H000E | color (as a 3-bit value from 0-7) |

**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.4pr3

### 83.17.29 GetFolderFlagsMBS as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Get the folder flags for the folderitem to the given value. Returns a negative if there is an error.
**Notes:** Returns the frFlags of a folder. If you pass in a non-existing folder, a negative error code is returned instead.
The frFlags are similar to the fdFlags (see GetFileFlags), but only a subset of them is used with folders.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.4pr3

### 83.17.30 GetVolumeRefMBS as Integer

MBS MacClassic Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns the volume reference number.
**Notes:** Returns zero in case of error.
This can replace FolderItem.MacVRefNum for newer Xojo versions.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.31 HasUnresolvedConflictsMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** A boolean that contains true if this item has conflicts outstanding, false otherwise.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.32 IconImageMBS(width as Integer, WindowsFlags as Integer=0) as picture

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Windows, Targets: All.

**Function:** Returns an picture with the icon image of a FolderItem.
**Example:**

```
Backdrop=SpecialFolder.Desktop.IconImageMBS(512)
```

**Notes:** May return a picture which is smaller as requested if the given picture size is not available. (Changed in v5.3 to return the requested size)
On Windows the icon picture is scaled to the requested size. (Actually the plugin can only get 32bit pixels wide icons on Windows as maximum)
Good sizes on Mac OS are 16, 32, 48 and 128 pixels.
Returns nil on low memory.

Version 8.6: Now reads the 32bit image data if possible.

You can pass flags for Windows options:

| | | |
|---|---|---|
| SHGFI_ADDOVERLAYS | = &h20 | Apply the appropriate overlays to the file's icon. |
| SHGFI_LINKOVERLAY | = &h8000 | Adds the link overlay to the file's icon. |
| SHGFI_OPENICON | = 2 | Retrieve the file's open icon |
| SHGFI_SELECTED | = &h10000 | Blend the file's icon with the system highlight color. |

This function can fail if the file does not exist.
Added 1024 pixel support in 12.3 plugins.

On Windows, it may be that you get a 256 pixel icon with small icon on top left. This is simply how windows handles the case when no big icon is available.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo Plugins, version 18.1pr5
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Real Studio Plugins, version 12.1pr2

### 83.17.33 IconMaskMBS(width as Integer, WindowsFlags as Integer=0) as picture

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Windows, Targets: All.

**Function:** Returns an picture with the icon mask of a FolderItem.
**Example:**

Backdrop=SpecialFolder.Desktop.IconMaskMBS(512)

**Notes:** May return a picture which is smaller as requested if the given picture size is not available. (Changed in v5.3 to return the requested size)
On Windows the icon picture is scaled to the requested size. (Actually the plugin can only get 32bit pixels wide icons on Windows as maximum)
Good sizes on Mac OS are 16, 32, 48 and 128 pixels.
Returns nil on low memory.

Please use with IconImageMBS and not with IconMBS function.
Version 8.6: Now reads the 8 bit alpha values if possible.

You can pass flags for Windows options:

This function can fail if the file does not exist.

| | | |
|---|---|---|
| SHGFI_ADDOVERLAYS | = &h20 | Apply the appropriate overlays to the file's icon. |
| SHGFI_LINKOVERLAY | = &h8000 | Adds the link overlay to the file's icon. |
| SHGFI_OPENICON | = 2 | Retrieve the file's open icon |
| SHGFI_SELECTED | = &h10000 | Blend the file's icon with the system highlight color. |

Added 1024 pixel support in 12.3 plugins.

On Windows, it may be that you get a 256 pixel icon with small icon on top left. This is simply how windows handles the case when no big icon is available.
**Blog Entries**

- MBS Xojo Plugins, version 18.1pr5
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Real Studio Plugins, version 12.1pr2
- MBS Real Studio Plugins, version 11.2pr2

### 83.17.34 IconMBS(width as Integer, WindowsFlags as Integer=0) as picture

MBS Picture Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Returns an picture with the icon of a FolderItem for the given iconsize.
**Example:**

```
Backdrop=SpecialFolder.Desktop.IconMBS(512)

// newer way for Mac apps:

// get image
dim n as NSImageMBS = NSWorkspaceMBS.iconForFile(SpecialFolder.desktop)
// set the size we want
n.setSize 512,512
// make a copy as picture
Backdrop = n.CopyPictureWithMask
```

**Notes:** Changed in plugin version 7.7 to return a picture with mask of the given size.

On Windows the icon picture is scaled to the requested size. (Actually the plugin can only get 32bit pixels wide icons on Windows as maximum)

Version 8.6: Now reads the 32bit image data with 8 bit alpha values if possible.

You can pass flags for Windows options:

| | | |
|---|---|---|
| SHGFI_ADDOVERLAYS | = &h20 | Apply the appropriate overlays to the file's icon. |
| SHGFI_LINKOVERLAY | = &h8000 | Adds the link overlay to the file's icon. |
| SHGFI_OPENICON | = 2 | Retrieve the file's open icon |
| SHGFI_SELECTED | = &h10000 | Blend the file's icon with the system highlight color. |

This function can fail if the file does not exist.
Please note that icons on alias files takes much longer to get than normal files.
Added 1024 pixel support in 12.3 plugins.

On Windows, it may be that you get a 256 pixel icon with small icon on top left. This is simply how windows handles the case when no big icon is available.

For Linux, please use LinuxIconMBS module.

### 83.17.35 isApplicationMBS as boolean

MBS MacOSX Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Whether the folderitem points to an application.
**Example:**

```
// try an application
dim file1 as FolderItem = SpecialFolder.Applications.Child("iTunes.app")
MsgBox "Bundle: "+str(file1.isBundleMBS)+EndOfLine+"Application: "+str(file1.isApplicationMBS)

// try some other file
dim file2 as FolderItem = SpecialFolder.Preferences.Child("com.apple.itunes.plist")
MsgBox "Bundle: "+str(file2.isBundleMBS)+EndOfLine+"Application: "+str(file2.isApplicationMBS)
```

**Notes:** Returns true if the folderitem points to an application on Mac.
Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Real Studio Plugins, version 12.1pr2

### 83.17.36 isBundleMBS as boolean

MBS MacOSX Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Whether the folderitem points to a bundle.
**Example:**

```
// try an application
dim file1 as FolderItem = SpecialFolder.Applications.Child("iTunes.app")
MsgBox "Bundle: "+str(file1.isBundleMBS)+EndOfLine+"Application: "+str(file1.isApplicationMBS)

// try some other file
dim file2 as FolderItem = SpecialFolder.Preferences.Child("com.apple.itunes.plist")
MsgBox "Bundle: "+str(file2.isBundleMBS)+EndOfLine+"Application: "+str(file2.isApplicationMBS)
```

**Notes:** Returns true if the folderitem points to a directory which is a bundle/package.
For example an application package (.app).
Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo Plugins, version 19.0pr6

### 83.17.37 IsCompressedFileMBS as Boolean

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Is this file a compressed one?
**Notes:** On Windows you can compress individual files to double your harddisk, but no application may note, because this compression is transparent.

### 83.17.38 IsDownloadedMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** A boolean that contains true if a local copy of this item exists, false otherwise.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.39 IsDownloadingMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** A boolean that contains true if a local copy of this item is currently being downloaded, false otherwise.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.40 IsEjectableVolumeMBS as Boolean

MBS MacClassic Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Returns true if the file is on a ejectable volume.
**Example:**

```
dim bool as Boolean
dim f as FolderItem = volume(0)

bool=f.IsEjectableVolumeMBS
```

**Notes:** If false is returned it may also be possible that the function is not available (on Mac OS X 10.2) or doesn't make sense. So the volume may be ejectable even if false is returned.

For remote volumes, the eject flag is not set from Apple. That makes sense as those volume are not physically ejected, but just unmounted. So check IsOnRemoteVolumeMBS, too.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Plugins 10.3 Release Notes

### 83.17.41 IsEncryptedFileMBS as Boolean

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Is this file an encrypted one?
**Notes:** On Windows you can encrypted individual files to secure your harddisk, but no application may note, because this encryption is transparent to them.

### 83.17.42 IsFileDataForkOpenReadWriteMBS as boolean

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test whether a file is currently opened for read and write by an application.
**Notes:** This method tries to open the file with exclusive access. If this fails for access/permission errors, the function returns true.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.43 IsFileResourceForkOpenReadWriteMBS as boolean

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test whether a file is currently opened for read and write by an application.
**Notes:** This method tries to open the file with exclusive access. If this fails for access/permission errors, the function returns true.
On Windows, the function result is always false.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.44 IsOnRemoteVolumeMBS as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns true if the file is on a remote volume.
**Notes:** See also GetDriveTypeMBS for macOS.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Plugins 10.3 Release Notes

### 83.17.45 IsUbiquitousItemMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
MsgBox "IsUbiquitousItemMBS: "+str(f.IsUbiquitousItemMBS)
```

**Notes:** A boolean that contains true if this item is synchronized to cloud-based storage, false otherwise.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.46 IsUploadedMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** A boolean that contains true if a copy of this item exists in cloud-based storage, false otherwise. Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.47 IsUploadingMBS as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** A boolean that contains true if a local copy of this item is currently being uploaded, false otherwise. Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.48 ItemsMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of items in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim Items() as FolderItem = folder.ItemsMBS
MsgBox str(UBound(Items)+1)+" items"
```

**Notes:** Similar to item() function, but returns all items with one call.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr6
- MBS Real Studio Plugins, version 12.0fc1

### 83.17.49 KindMBS as string

MBS MacClassic Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Returns a string about the kind of the document.
**Example:**

```
dim s as string
dim file as FolderItem = SpecialFolder.Desktop

s=file.KindMBS

MsgBox s
```

**Notes:** e.g. for a Xojo document on Mac OS X "Xojo Document" or on Mac OS 9 something like "Xojo 4.0.2fc6 Mac OS X Document".

This text may be localized.
Added Windows support in 12.4 plugins.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr1
- MBS Real Studio Plugins, version 12.4pr3

### 83.17.50 LaunchMBS(inFront as Boolean) as Boolean

MBS MacClassic Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Launches a file.
**Notes:** In Xojo 4.5 Realsoftware introduces a new Launch variant: "Launch(inFront)". To be compatible I renamed the old Launch method to MBSLaunch and added a Launch method which is compatible to Xojo's.

The return value is true if no immediate error occured. It would be false, for instance, if the FolderItem object does not exists, is a folder, or is not allowed to be opened (can happen with files on network volumes, as well as in Mac OS X environments).
Added Windows support in version 3.4.

### 83.17.51 LaunchServicesApplicationForItemMBS(role as Integer) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the application used to open an item.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")

Const kLSRolesNone = 1 // no claim Is made about support For this type/scheme
```

```
Const kLSRolesViewer = 2 // claim To be able To view this type/scheme
Const kLSRolesEditor = 4 // claim To be able To edit this type/scheme
Const kLSRolesAll = -1 // claim To Do it all

Dim appfile As FolderItem = file.LaunchServicesApplicationForItemMBS(kLSRolesEditor)

// shows Xojo
MsgBox appfile.NativePath
```

**Notes:** Consults the binding tables to return the application that would be used to open the folderitem if it were double-clicked in the Finder. This application will be the user-specified override if appropriate or the default otherwise. If no application is known to LaunchServices suitable for opening this item, nil (kLSApplicationNotFoundErr) will be returned.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.

### 83.17.52 LaunchServicesApplicationsForItemMBS(role as Integer) as LaunchServicesApplicationListMBS

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns a list of folderitems to applications that offer the requested role(s) for the input item.
**Example:**

```
dim l as LaunchServicesApplicationListMBS
dim f as FolderItem

f=GetFolderItem("text file")
l=f.LaunchServicesApplicationsForItemMBS(4)

if l<>nil then
MsgBox str(l.Count)
MsgBox l.Item(0).NativePath
end if
```

**Notes:** Requires Mac OS X 10.3.

If the folderitem is a file reference, it is treated as a document, and applications are selected based on the document's type information. Otherwise, applications are selected based on the folderitem's scheme.

Role:
The role(s) which must intersect with the role provided by an application for the specified item in order for the application to be included in the result. Pass kLSRolesAll if any role is acceptable.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.

### 83.17.53 LaunchServicesCanApplicationAcceptItemMBS(TargetApp as folderitem, role as Integer, flags as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Determine whether an item can accept another item.
**Example:**

```
dim appl,item as FolderItem

appl=LaunchServicesApplicationForInfoMBS("","","rb",-1)
item=GetFolderItem("file.rb")

MsgBox appl.Name

if item.LaunchServicesCanApplicationAcceptItemMBS(appl,-1,1) then
MsgBox "accept"
else
MsgBox "not accepted"
end if
```

**Notes:** Returns whether TargetApp can accept this folderitem as in a drag and drop operation. If role is other than kLSRolesAll then make sure TargetApp claims to fulfill the requested role.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

Values for the flags:

| | | |
|---|---|---|
| kLSAcceptDefault | = 1 | |
| kLSAcceptAllowLoginUI | = 2 | show UI to log in if necessary |

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.

### 83.17.54 LaunchServicesDisplayNameMBS as string

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Get the display name for a folderitem.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")

MsgBox f.LaunchServicesKindStringMBS+EndOfLine+f.LaunchServicesDisplayNameMBS#
```

**Notes:** Return a copy of the display name for a folderitem. Takes into consideration whether this item has a hidden extension or not.
Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 83.17.55 LaunchServicesItemInfoMBS(WhichInfo as Integer) as LaunchServicesItemInfoMBS

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return information about an item.
**Example:**

```
dim l as LaunchServicesItemInfoMBS
dim f as FolderItem

f=SpecialFolder.Applications.Child("Mail.app")
l=f.LaunchServicesItemInfoMBS(-1)

if l.IsApplication then // True for mail.app
MsgBox "is Application"
end if

if l.IsContainer then // True for mail.app
MsgBox "is Container"
end if

if l.IsPackage then // True for mail.app
MsgBox "is Package"
end if
```

**Notes:** Returns as much or as little information as requested about the folderitem. Some information is available in a thread-safe manner, some is not.

Possible values you can combine for the WhichInfo parameter:

| | | |
|---|---|---|
| kLSRequestExtension | = &h01 | Requests the item's filename extension. |
| kLSRequestTypeCreator | = &h02 | Requests the item's file type and creator signature. |
| kLSRequestBasicFlagsOnly | = &h04 | Requests all item-information flags that are not application-specific: that is, all except IsNativeApp, IsClassicApp, AppPrefersNative, AppPrefersClassic and AppIsScriptable. |
| kLSRequestAppTypeFlags | = &h08 | Requests all application-specific item-information flags: that is, IsNativeApp, IsClassicApp, AppPrefersNative, AppPrefersClassic and AppIsScriptable. |
| kLSRequestAllFlags | = &h10 | Requests all item-information flags. |
| kLSRequestIconAndKind | = &h20 | Not used. |
| kLSRequestExtensionFlagsOnly | = &h40 | Requests only the kLSItemInfoExtensionIsHidden item-information flag. |
| kLSRequestAllInfo | = -1 | |

### 83.17.56 LaunchServicesKindStringMBS as string

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Get the kind string for an item.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")

MsgBox f.LaunchServicesKindStringMBS+EndOfLine+f.LaunchServicesDisplayNameMBS
```

**Notes:** Returns the kind string as used in the Finder and elsewhere for the given folderitem.

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 83.17.57 LaunchServicesOpenMBS as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Launches the given item.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")
Dim a As FolderItem = file.LaunchServicesOpenMBS

MsgBox a.NativePath
```

**Notes:** Returns the file or folder which was launched, e.g. the application for a file.
Upgraded in version 19.5 to use CFURL instead of FSRef APIs.

### 83.17.58 LaunchServicesRegisterMBS(update as boolean) as Integer

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** If the specified folderitem refers to an application or other bundle claiming to handle documents or URLs, add the bundle's document and URL claims to the Launch Services database.
**Notes:** Requires Mac OS X 10.3.

Update: When false, LaunchServicesRegisterMBS does not register the item if it has already been registered and the current modification date of the item has not changed from when it was last registered. When true, the item's registered info is updated, even if the modification has not changed.

Returns an error code:
An OSStatus value: noErr (0) - Success kLSNoRegistrationInfoErr (-10824) - The item does not contain info requiring registration kLSDataErr (-10817) - The item's property list info is malformed.
Returns -1 if the function is not available.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.59 LogicalFileDataLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the logical disk space used for this file's data fork.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

dim lines(-1) as string

lines.Append "Length: "+str(F.Length)
lines.Append "ResourceForkLength: "+str(F.ResourceForkLength)
lines.Append "LogicalFileDataLengthMBS: "+str(F.LogicalFileDataLengthMBS)
lines.Append "LogicalFileResLengthMBS: "+str(F.LogicalFileResLengthMBS)
lines.Append "LogicalFileTotalLengthMBS: "+str(F.LogicalFileTotalLengthMBS)
lines.Append "PhysicalFileDataLengthMBS: "+str(F.PhysicalFileDataLengthMBS)
lines.Append "PhysicalFileResLengthMBS: "+str(F.PhysicalFileResLengthMBS)
lines.Append "PhysicalFileTotalLengthMBS: "+str(F.PhysicalFileTotalLengthMBS)

MsgBox Join(lines,EndOfLine)
```

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.

### 83.17.60 LogicalFileResLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the logical disk space used for this file's resourcefork.
**Example:**

```
filesize.text=format(file.LogicalFileResLengthMBS,"0")
```

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.

### 83.17.61 LogicalFileTotalLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the logical disk space used for this file's datafork.
**Example:**

```
filesize.text=format(file.LogicalFileTotalLengthMBS,"0")
```

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.

### 83.17.62 LongPathMBS as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the long path for the file.
**Example:**

```
dim f as folderitem = specialfolder.desktop.child("test.file")
msgbox f.longpathMBS
```

**Notes:** Should be the same as f.NativePath
Works with Windows NT 4 or newer.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

**Xojo Developer Magazine**

- 12.2, page 28: Smart Reporting, Implementing a custom reporting system by Trisha Duke

### 83.17.63 MacCopyObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will copy the source object into the destination directory.
**Notes:** The source object can be a file or directory.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.

DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 83.17.64 MacIsHardLinkedMBS as boolean

MBS MacClassic Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** Whether the file is a hard link.
**Notes:** If two directory entries point to the same hard disc space, you have a file which has two directory entries, but only one storage.

This function returns true for files in a Time Machine backup which did not change since the last backup and share their disc space with the other backups.

### 83.17.65 MacMoveObjectMBS(DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will move the source object into the destination directory.
**Notes:** The source object can be a file or directory. If a destName is provided then the object will be renamed as well as moved. By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 83.17.66 MacMoveObjectToTrashMBS(byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will move the source object into the trash.
**Notes:** The source object can be a file or directory. If the volume the source object resides on does not support a trash folder then this call will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

self: The source object to move to the trash.
result: Upon successful completion a ref the object in the trash. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.5.

Use this constants:

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 83.17.67 MacNodeIDMBS as UInt64

MBS MacClassic Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The node ID for this file or folder.
**Example:**

```
// get some file
dim f as FolderItem = GetTrueFolderItem("/Users/cs/Desktop/test.rtf", folderitem.PathTypeNative)

// get
dim NodeId as UInt64 = f.MacNodeIDMBS
dim ParentId as UInt64 = f.MacParentDirectoryIDMBS
dim p as FolderItem = volume(0).MacResolveNodeIDMBS(NodeId)

MsgBox "Node ID: "+str(NodeId)+EndOfLine+_
"Parent ID: "+str(ParentId)+EndOfLine+_
"Path resolved: "+p.NativePath
```

**Notes:** Upgraded in plugin version 18.4 to use newer APIs for 64-bit IDs on AFS volumes.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr3

### 83.17.68 MacParentDirectoryIDMBS as UInt64

MBS MacClassic Plugin, Plugin Version: 9.1, Platform: macOS, Targets: All.

**Function:** The parent directory node ID for this file or folder.
**Notes:** Upgraded in plugin version 18.4 to use newer APIs for 64-bit IDs on AFS volumes.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr3

### 83.17.69 MacResolveNodeIDMBS(NodeID as UInt64) as folderitem

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Resolves a NodeID by searching for a folderitem on the volume with given NodeID.
**Example:**

```
// get a volume
dim f as FolderItem = volume(0)

// test with desktop
dim d as FolderItem= SpecialFolder.Desktop

// query node
dim NodeID as UInt32 = d.MacNodeIDMBS

// and search back
dim dest as FolderItem = f.MacResolveNodeIDMBS(nodeid)

MsgBox dest.NativePath
```

**Notes:** NodeIDs may not be supported on all volumes.
Returns nil on any error.
Upgraded in plugin version 18.4 to use newer APIs for 64-bit IDs on AFS volumes.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr3
- MBS Real Studio Plugins, version 13.0pr10

### 83.17.70 NameExtensionMBS as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file extension from the file name.
**Example:**

```
dim f as folderitem = SpecialFolder.desktop

MsgBox "Name: "+f.Name+EndOfLine+"Name extension: "+f.NameExtensionMBS+EndOfLine+"Name without extension: "+f.NameWithoutExtensionMBS

dim g as FolderItem = SpecialFolder.Desktop.Child("test.rbp")

MsgBox "Name: "+g.Name+EndOfLine+"Name extension: "+g.NameExtensionMBS+EndOfLine+"Name without extension: "+g.NameWithoutExtensionMBS
```

**Notes:** If there is no extension, this string is empty.
The extension does not include the dot.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr17
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr8

**Xojo Developer Magazine**

- 20.1, page 65: Send Your Emails, How to use the MBS Xojo plugins to send emails by Stefanie Juchmes

### 83.17.71 NameWithoutExtensionMBS as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file name without file extension.
**Example:**

```
dim f as folderitem = SpecialFolder.desktop

MsgBox "Name: "+f.Name+EndOfLine+"Name extension: "+f.NameExtensionMBS+EndOfLine+"Name without extension: "+f.NameWithoutExtensionMBS

dim g as FolderItem = SpecialFolder.Desktop.Child("test.rbp")

MsgBox "Name: "+g.Name+EndOfLine+"Name extension: "+g.NameExtensionMBS+EndOfLine+"Name without extension: "+g.NameWithoutExtensionMBS
```

**Notes:** If there is no extension, the whole name is returned.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr17
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr8

**Xojo Developer Magazine**

- 20.1, page 65: Send Your Emails, How to use the MBS Xojo plugins to send emails by Stefanie Juchmes

### 83.17.72 NativePath as string

MBS MacOSX Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the native path for the file.
**Example:**

```
// test absolute path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.txt")
Dim p As String = f.AbsolutePath

Dim g As FolderItem = NewFolderItemFromAbsolutePathMBS(p)
Dim n As String = g.NativePath

MsgBox p+EndOfLine+n
```

**Notes:** For Real Studio we register this function for compatibility to Xojo.
Same as UnixpathMBS, but with name NativePath.

### 83.17.73 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Example:**

```
// create pdf
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
```

```
dim r as new CGRectMBS(0,0,500,500)
dim c as CGContextMBS = file.NewCGPDFDocumentMBS(r, "My Title", "My Author", "My Creator")

if c<>Nil then

// create page
c.BeginPage r

// draw something
c.SetRGBFillColor(1.0, 0.0, 0.0, 1.0)
c.FillRect CGMakeRectMBS(100,100,100,100)

// close page
c.EndPage

// flush and show in PDF viewer
c = nil
file.Launch
end if
```

**Notes:** Title, author and creator are all optional.
RB 4.5 should do this perfectly, but older RB versions may have problems.
(seems like the file must exist before calling this function)
Requires Mac OS X to work.
See also:

- 83.17.74 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 13714
- 83.17.75 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 13716

### 83.17.74 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Example:**

```
// create pdf
```

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim r as new CGRectMBS(0,0,500,500)
dim c as CGContextMBS = file.NewCGPDFDocumentMBS(r, "My Title", "My Author", "My Creator",
"My Subject", "test,pdf,mac", "","", true, true)

if c<>Nil then

// create page
c.BeginPage r

// draw something
c.SetRGBFillColor(1.0, 0.0, 0.0, 1.0)
c.FillRect CGMakeRectMBS(100,100,100,100)

// close page
c.EndPage

// flush and show in PDF viewer
c = nil
file.Launch
end if
```

**Notes:** Title, Author, Creator, Subject and Keywords parameters can be empty.

If OwnerPassword and UserPassword are filled in the PDF is encrypted and AllowsPrinting/AllowsCopy define what the user can do after he entered his password.

Requires Mac OS X to work.
See also:

- 83.17.73 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 13713

- 83.17.75 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS 13716

### 83.17.75 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean, KeyLength as Integer) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Example:**

```
// create pdf
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim r as new CGRectMBS(0,0,500,500)
dim c as CGContextMBS = file.NewCGPDFDocumentMBS(r, "My Title", "My Author", "My Creator",
"My Subject", "test,pdf,mac", "owner","user", false, false, 128)

if c<>Nil then

// create page
c.BeginPage r

// draw something
c.SetRGBFillColor(1.0, 0.0, 0.0, 1.0)
c.FillRect CGMakeRectMBS(100,100,100,100)

// close page
c.EndPage

// flush and show in PDF viewer
c = nil
file.Launch
end if
```

**Notes:** Title, Author, Creator, Subject and Keywords parameters can be empty.

If OwnerPassword and UserPassword are filled in the PDF is encrypted and AllowsPrinting/AllowsCopy define what the user can do after he entered his password.

Keylength must be a value between 48 bit and 128 bit in 8 bit steps. 0 uses default value.

Requires Mac OS X to work.
**Blog Entries**

- Several ways for picture to PDF in MBS Plugins

See also:

- 83.17.73 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string) as CGPDFContextMBS 13713
- 83.17.74 NewCGPDFDocumentMBS(MediaBox as CGRectMBS, title as string, author as string, creator as string, subject as string, keywords as string, OwnerPassword as string, UserPassword as string, AllowsPrinting as boolean, AllowsCopy as boolean) as CGPDFContextMBS 13714

### 83.17.76 NewCGPDFDocumentWithInfoMBS(MediaBox as CGRectMBS, info as object) as CGPDFContextMBS

MBS MacCG Plugin, Plugin Version: 12.0, Platform: macOS, Targets: All.

**Function:** Creates a PDF document.
**Example:**

```
// create pdf
dim file as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim r as new CGRectMBS(0,0,500,500)

dim d as new CFMutableDictionaryMBS

d.Add NewCFStringMBS("kCGPDFContextTitle"), NewCFStringMBS("My Title")
d.Add NewCFStringMBS("kCGPDFContextAuthor"), NewCFStringMBS("My Author")
d.Add NewCFStringMBS("kCGPDFContextCreator"), NewCFStringMBS("My Creator")
d.Add NewCFStringMBS("kCGPDFContextSubject"), NewCFStringMBS("My Subject")
d.Add NewCFStringMBS("kCGPDFContextKeywords"), NewCFStringMBS("keyword,mac,pdf")

dim c as CGContextMBS = file.NewCGPDFDocumentWithInfoMBS(r, d)

if c<>Nil then

// create page
c.BeginPage r

// draw something
c.SetRGBFillColor(1.0, 0.0, 0.0, 1.0)
c.FillRect CGMakeRectMBS(100,100,100,100)

// close page
c.EndPage

// flush and show in PDF viewer
c = nil
file.Launch
```

end if

**Notes:** The optional info parameter is a CFDictionaryMBS object and contains some information about the PDF file.

Keys for auxiliary info dictionary:

NewCFStringMBS("kCGPDFContextTitle")
The document's title. Optional; if present, the value must be a CFString.

NewCFStringMBS("kCGPDFContextAuthor")
The name of the person who created this document. Optional; if present, the value must be a CFString.

NewCFStringMBS("kCGPDFContextCreator")
The name of the application that created the original data used to create this document. Optional; if present, the value must be a CFString.

NewCFStringMBS("kCGPDFContextOutputIntent")
The document's output intent. Optional; if present, the value must be a CFDictionaryMBS. The dictionary is added to the PDF document in the /OutputIntents entry in the PDF file's document catalog. The keys and values contained in the dictionary must match those specified in section 9.10.4 of the PDF 1.4 specification, ISO/DIS 15930-3 document published by ISO/TC 130, and Adobe Technical Note #5413.

The following keys are supported:

"S" - The output intent subtype. This key is required; the value must be a CFString equal to "GTS_PDFX"; otherwise, the dictionary is ignored.

"OutputConditionIdentifier" - A string identifying the intended output device or production condition in a human- or machine-readable form. This key is required; the value must be a CFString. For best results, the string should be representable losslessly in ASCII encoding.

"OutputCondition" - A text string identifying the intended output device or production condition in a human-readable form. This key is optional; if present, the value must be a CFString.

"RegistryName" - A string identifying the registry in which the condition designated by "OutputCondition-Identifier" is defined. This key is optional; if present, the value must be a CFString. For best results, the string should be representable losslessly in ASCII encoding.

"Info" - A human-readable text string containing additional information or comments about the intended

target device or production condition. This key is required if "OutputConditionIdentifier" does not specify a standard production condition; it is optional otherwise. If present, the value must be a CFString.

"DestOutputProfile" - An ICC profile stream defined the transformation from the PDF document's source colors to output device colorants. This key is required if "OutputConditionIdentifier" does not specify a standard production condition; it is optional otherwise. If present, the value must be a ICC-based CGColorSpaceMBS.

NewCFStringMBS("kCGPDFContextOutputIntents")
The document's output intents. Optional; if present, the value must be a CFArrayMBS containing one or more CFDictionaryMBSs. The array is added to the PDF document in the /OutputIntents entry in the PDF file's document catalog. Each dictionary in the array must be of form specified above for the "kCGPDFContextOutputIntent" key, except that only the first dictionary in the array is required to contain the "S" key with a value of "GTS_PDFX". If both the "kCGPDFContextOutputIntent" and "kCGPDFContextOutputIntents" keys are specified, the former will be ignored.

More keys in CGPDFContext.h coming with Xcode.

### 83.17.77 OpenAsCGPDFDocumentMBS as CGPDFDocumentMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** Opens a PDF document.
**Notes:** RB 4.5 should do this perfectly, but older RB versions may have problems with longer file names.
Requires Mac OS X to work.
**Xojo Developer Magazine**

- 8.5, pages 20 to 21: Printing PDFs, Easy PDF printing on Mac and Windows
- 6.4, page 30: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

### 83.17.78 OpenAsGIFMBS as GIFMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a GIF file.
**Notes:** Returns nil on any error.
QuickTime is not required!
**Blog Entries**

- Tip of day: Load GIF into WebImageView

### 83.17.79 OpenAsJPEGMBS as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a JPEG file.
**Notes:** A short version of OpenAsJPEG with fileposition=0 and allowdamage=false.
See also:


- 83.17.80 OpenAsJPEGMBS(allowdamaged as Boolean) as picture 13720
- 83.17.81 OpenAsJPEGMBS(allowdamaged as Boolean,fileposition as Integer) as picture 13720


### 83.17.80 OpenAsJPEGMBS(allowdamaged as Boolean) as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a JPEG file.
**Notes:** A short version of OpenAsJPEG with fileposition=0.
See also:


- 83.17.79 OpenAsJPEGMBS as picture 13720
- 83.17.81 OpenAsJPEGMBS(allowdamaged as Boolean,fileposition as Integer) as picture 13720


### 83.17.81 OpenAsJPEGMBS(allowdamaged as Boolean,fileposition as Integer) as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a JPEG file.
**Example:**

```
dim f as folderitem
f=SpecialFolder.Desktop.child("a great jpeg picture.jpg")
window1.backdrop=f.openasjpegMBS
```

**Notes:** This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 120 KB big!

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally

you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

See the folder "jpeg load crashtest" in the examples.

The two parameters are both optional. The second is to give a file position to start reading. This way you can load several JPEGs from different file position from one file.
See also:

- 83.17.79 OpenAsJPEGMBS as picture 13720
- 83.17.80 OpenAsJPEGMBS(allowdamaged as Boolean) as picture 13720

### 83.17.82 OpenAsLargeBinaryStreamMBS(write as Boolean) as LargeBinaryStreamMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file as a LargeBinaryStreamMBS.
**Example:**

```
dim l as LargeBinaryStreamMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("testfile")

l=f.OpenAsLargeBinaryStreamMBS(true)
```

**Notes:** Returns nil on any error.

### 83.17.83 OpenAsPNGMBS(gamma as single = 0.0, AllowDamaged as Boolean = false) as PNGPictureMBS

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a PNG file.
**Example:**

```
dim f as folderitem
f=SpecialFolder.Desktop.child("a great picture.png")
window1.backdrop=f.OpenAsPNGMBS(0).pict
```

**Notes:** This methods should read all PNG files you can get.

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 130 KB big!

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
A bad gamma value can give you a black image.

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.

### 83.17.84 OpenAsResStreamMBS(write as Boolean) as ResStreamMBS

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Opens a file's resourcefork as a ResStreamMBS.
**Notes:** Returns nil on any error.

### 83.17.85 OpenAsTiffMBS(HeaderOnly as boolean=false) as TiffPictureMBS

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a TIFF file.
**Example:**

```
dim f as FolderItem
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("008.tiff")
t=f.OpenAsTiffMBS(true)

if t<>Nil then
msgbox str(t.width)+" x "+str(t.height)
else
MsgBox "Problem?"
end if
```

**Notes:** This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 270 KB big!

The plugin supports even more stuff like zlib compressed picture data or JPEGs embedded into TIFFs.

If the function returns nil, you can use a TiffPictureMBS subclass and use the methods there so you get error messages in the error event.

Setting HeaderOnly to true will ignore the actual picture data and load only the header data.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

### 83.17.86 OpenWithAppMBS(TheApplication as FolderItem, inFront as Boolean) as Boolean

MBS MacClassic Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Opens a file using the given application.
**Notes:** Similar to Launch (see FolderItem.Launch), with the additional option to specify the application that should be used to open the FolderItem object. Passing nil in the app parameter is functionally identical to calling Launch.

Works with Graphicconverter, but not with Preview!?
Added Windows support in version 3.4.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.87 ParentVolumeMBS as folderitem

MBS Util Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the folderitem for the volume the folderitem is pointing to.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr7

### 83.17.88 PercentDownloadedMBS as Double

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** An Number in the range 0-100 that tells what percentage of the file has been downloaded.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.89 PercentUploadedMBS as Double

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the iCloud file properties.
**Notes:** An Number in the range 0-100 that tells what percentage of the file has been uploaded.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 83.17.90 PermissionsMBS(OldWay as boolean) as PermissionsMBS

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** Returns an object for the Permissions of a file.
**Example:**

```
dim f as FolderItem
dim p as PermissionsMBS

f=GetOpenFolderItem("special/any")

if f<>nil then
p=f.PermissionsMBS(true)

if p<>Nil then // requires Mac OS X
p.Access=&H6

// &h000006 = -rw——-
// &h000600 = —-rw—-
// &h060000 = ——-rw-

if 0=p.SetPermissions(true) then
MsgBox "Permissions set"
else
MsgBox "Permissions could not be set"
end if
else
MsgBox "We require Mac OS X"
end if
else
' nothing selected
end if
```

**Notes:** You can use old API if you set Oldway=true. Than you set access value like in older version of the plugin.
If you set Oldway = false, you use the newer API which set unix permissions, but not the old ones.
The old way is not supported for 64bit.

### 83.17.91 PhysicalFileDataLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the physical disk space used for this file's data fork.
**Example:**

filesize.text=format(file.PhysicalFileDataLengthMBS,"0")

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.

### 83.17.92 PhysicalFileResLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the physical disk space used for this file's resourcefork.
**Example:**

filesize.text=format(file.PhysicalFileResLengthMBS,"0")

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.

### 83.17.93 PhysicalFileTotalLengthMBS as int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the length of the physical disk space used for this file.
**Example:**

```
filesize.text=format(file.PhysicalFileTotalLengthMBS,"0")
```

**Notes:** This function works for files bigger than 2 GB which RB's built in functions don't.
On Windows the physical size reported is equal to the logical size, because there is no function for the physical size.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr1

### 83.17.94 QuickLookMBS(MaxWidth as Integer = 500, MaxHeight as Integer = 500, IconMode as Boolean = false, ScaleFactor as Double = 1.0) as picture

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: All.

**Function:** Creates a thumbnail for the designated file.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")

// shows the icon in 128x128 scaled by factor 4:
Backdrop=f.QuickLookMBS(128,128,true,4)

// shows the icon in default size:
Backdrop=f.QuickLookMBS(128,128,true,0)

// shows preview of image in 128x128 pixels.
Backdrop=f.QuickLookMBS(128,128,false,0)

// shows preview of image in 512x512 pixels.
Backdrop=f.QuickLookMBS(128,128,false,4)

// shows preview of image in 512x512 pixels.
Backdrop=f.QuickLookMBS(512,512,false,0)

// use Icon function in case no preview is available:
Backdrop=f.iconmbs(512)
```

**Notes:** Returns nil if Quick Look does not support this file type. In that case you may use folderitem.Icon() with the given size.

MaxWidth and MacHeight specify the maximum desired size.
If ScaleFactor is bigger than zero, it is used. Else the default value is used.
If IconMode is true, QL will produce an icon (ie a thumbnail and all the icon decor, like shadows, curled corner, etc.).

If you look for a control to show quicklook preview like the finder, please check the QLPreviewPanelMBS window and the QLPreviewViewMBS control.

QuickLook does not provide images for items in special folders like temporary folders.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr9
- Getting icons from Files

### 83.17.95 QuickLookMTMBS(MaxWidth as Integer = 500, MaxHeight as Integer = 500, IconMode as Boolean = false, ScaleFactor as Double = 1.0) as picture

MBS MacFrameworks Plugin, Plugin Version: 13.2, Platform: macOS, Targets: All.

**Function:** Creates a thumbnail for the designated file.
**Example:**

```
Dim f As FolderItem

f=SpecialFolder.Desktop.Child("test.png")

// shows preview of image in 512x512 pixels.
Backdrop=f.QuickLookMTMBS(512,512,False,0)
```

**Notes:** Same as QuickLookMBS, but thread friendly.

QuickLook does not provide images for items in special folders like temporary folders.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application

- Problems with killing Xojo threads with plugin calls.
- MBS Xojo / Real Studio Plugins, version 13.2pr10

### 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean

MBS Util Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a file to a memory block.
**Example:**

```
Dim f As New FolderItem("/Users/cs/Downloads/Download Archive/Xcode_13_beta_5.xip", FolderItem.PathModes.Native)

Dim m As MemoryBlock
'Dim m As New MemoryBlock(f.Length)

If f.ReadFileMBS(m) Then
// okay
Dim Len As Integer = m.size
Break
Else
// failed
Dim e As Integer = f.LastErrorCode
Break
End If
```

**Notes:** Reads content of file and returns it in data parameter.
Returns true on success of false on failure.

See also WriteFileMBS function.

If the MemoryBlock is nil, we create one.
If the MemoryBlock is not nil and has right size, we use it, otherwise we create a new one.
Not intended for files >2 GB.

Added offset and length parameters in version 23.1.
If byteCount is negative, we read whole file. If byteCount is bigger than file, we only read the available portion.
See also:

- 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean

### 83.17.97 ReadFileMBS(byref data as string, offset As Integer = 0, byteCount As Integer = -1) as boolean

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a file.
**Notes:** Reads content of file and returns it in data parameter.
Returns true on success of false on failure.

See also WriteFileMBS function.

Limited to maximum size of a string (2 GB)
Data must fit in memory, so 32-bit processes may be limited to reading less than 2 GB.

Added offset and length parameters in version 23.1.
If byteCount is negative, we read whole file. If byteCount is bigger than file, we only read the available portion.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr6
- News from the MBS Xojo Plugins Version 21.4
- MBS Xojo Plugins, version 21.4pr5
- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News

See also:

- 83.17.96 ReadFileMBS(byref data as MemoryBlock, offset As Integer = 0, byteCount As Integer = -1) as boolean 13728

### 83.17.98 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a palette based RGB picture as a PNG file with alpha.
**Notes:** Pic should have no mask.
Colors must be an array with 256 values defining the palette.
Alphas must be an array with 256 values specifying the alpha value for each palette entry. 255 is opaque and 0 is transparent.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

- 83.17.99 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13730

### 83.17.99 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a palette based RGB picture as a PNG file with alpha.
**Notes:** Pic should have no mask.
Colors must be an array with 256 values defining the palette.
Alphas must be an array with 256 values specifying the alpha value for each palette entry. 255 is opaque and 0 is transparent.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

See also:

- 83.17.98 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean 13730

### 83.17.100 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a palette based RGB picture as a PNG file.
**Notes:** Pic should have no mask.
Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

- 83.17.101 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13731

### 83.17.101 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a palette based RGB picture as a PNG file.
**Notes:** Pic should have no mask.

Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

See also:

- 83.17.100 SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean 13731

### 83.17.102 SaveAsGIFMBS(data as GIFMBS) as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a gif file.
**Notes:** Returns true on success and false on any error.
QuickTime is not required!
Please check for the lzw patent in your country before using this function as you may need to pay license fees.

### 83.17.103 SaveAsJPEGMBS(pic as picture, quality as Integer = 80) as boolean

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a picture into a file using JPEG compression.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim f as folderitem
f=SpecialFolder.Desktop.child("a great jpeg picture.jpg")
if f.SaveAsJPEGMBS(pic,75) then
msgbox "Picture saved."
end if
```

**Notes:** This methods saves 32bit pictures to a file using JPEG Compression. Using the parameter you can specify the quality in range between 25 and 100%

See the "SaveJPEG without QuickTime" example.

As JPEG does not support alpha channel or mask, those are ignored.
The second parameter is optional. There you can give a file position where to start writing. This way you can save several JPEGs to different file position inside one file.
Use the JPEGExporterMBS class for more options.

### 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves RGB picture as PNG file.
**Notes:** If pic has a mask, it is written to the file as alpha channel.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

- 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
- 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734

- 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

### 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves RGB picture as PNG file.
**Notes:** If pic has a mask, it is written to the file as alpha channel.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

See also:

- 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
- 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734
- 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

### 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves RGB picture as PNG file.
**Example:**

```
// load
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as PNGPictureMBS = f.OpenAsPNGMBS

// save
dim g as FolderItem = SpecialFolder.Desktop.Child("output.png")
if g.SaveAsPNGMBS(p.Pict, p.Mask) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** If mask is nil no alpha channel is written to the file.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

- 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
- 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
- 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13735

### 83.17.107 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves RGB picture as PNG file.
**Notes:** If mask is nil no alpha channel is written to the file.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction

zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

See also:

- 83.17.104 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 13733
- 83.17.105 SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 13734
- 83.17.106 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 13734

### 83.17.108 SetDesktopPictureMBS as Integer

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Windows, Targets: All.

**Function:** Asks the Finder/Explorer to change the desktop picture.
**Notes:** File must be a valid folderitem for an existing file.
Returns a Mac OS or Windows error code or -1 if the function is not available.

### 83.17.109 SetFileFlagsMBS(flags as Integer) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Set the file flags for the folderitem to the given value. Returns 0 if okay.
**Example:**

```
dim f as FolderItem
dim err, fdFlags as Integer

// For example, clearing a file's hasCustomIcon flag works like this:
fdFlags = f.GetFileFlagsMBS
if fdFlags >= 0 then
err = f.SetFileFlagsMBS(BitExclMBS(fdFlags, 10))
```

```
if err <>0 then
// ... oops, an error occured
// (for instance, the disk could be write protected)
end
end
```

**Notes:** Sets the fdFlags of a file. Returns an error code (or zero if no error occured). Possible error conditions include "disk is write protected" and "file not found".
When changing flags of a file, use GetFileFlags to get the original flags, then clear or set the flags by using BitwiseAnd and BitwiseOr and call SetFileFlags to set the new flags.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.110 SetFolderFlagsMBS(flags as Integer) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Set the folder flags for the folderitem to the given value. Returns 0 if okay.
**Example:**

```
Dim f As FolderItem = GetFolderItem("test") // some folder
If f.SetFolderFlagsMBS(BitwiseOr(f.GetFolderFlagsMBS, 4)) <>0 Then
MsgBox "Can't set label to green."
End If
```

**Notes:** Sets the frFlags of a folder. Returns an error code (or zero if no error occured). Possible error conditions include "disk is write protected" and "folder not found".
When changing flags of a folder, use GetFolderFlags to get the original flags, then clear or set the flags by using BitwiseAnd and BitwiseOr and call SetFolderFlags to set the new flags.

with values 2, 4 and 8 in the flags, you control the label color in Finder. Example code above uses 4 which is green by default.

If you need to set bundle bit in newer projects, please use SetResourcePropertyForKey on CFURLMBS class with kCFURLIsPackageKey key.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.111 SetTagNamesMBS(tags() as string) as Integer

MBS MacCF Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Sets file tags.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")

dim Tags() as string = Array("Hello", "World")
dim e as Integer = f.SetTagNamesMBS(tags)

MsgBox "SetTagNamesMBS: "+str(e)
```

**Notes:** tags() is array with new tag names.
Provides error code as return value and details about error in CFErrorMBS object.
Requires Mac OS X 10.9 or newer.
Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.
See also:

- 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer 13738

### 83.17.112 SetTagNamesMBS(tags() as string, byref e as CFErrorMBS) as Integer

MBS MacCF Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Sets file tags.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")

dim Tags() as string = Array("Hello", "World")
dim ce as CFErrorMBS
dim e as Integer = f.SetTagNamesMBS(tags, ce)

if ce <>nil then
MsgBox "SetTagNamesMBS: "+str(e)+EndOfLine+ce.Description
else
MsgBox "SetTagNamesMBS: "+str(e)
end if
```

**Notes:** tags() is array with new tag names.
Provides error code as return value and details about error in CFErrorMBS object.

Requires Mac OS X 10.9 or newer.
Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.
See also:

- 83.17.111 SetTagNamesMBS(tags() as string) as Integer 13738

### 83.17.113 ShortPathMBS as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the short path for the file.
**Example:**

```
dim f as folderitem = specialfolder.desktop.child("test.file")
msgbox f.ShortPathMBS
```

**Notes:** In contrast to long path this is the short 8.3 path for Windows.
You need this for the WindowsMCI object.
Works with Windows NT 4 or newer.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

### 83.17.114 SortedFilesMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem()

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of files in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim Items() as FolderItem = folder.SortedFilesMBS
MsgBox str(UBound(Items)+1)+" items"
```

**Notes:** Checks for whether item is not a directory and returns only those.
We can resolve alias if you like and optionally sort by display name instead of normal name field.
And we can filter to only return visible items.
**Blog Entries**

- Crop a two side page document to a single page document
- New in the MBS Xojo Plugins 20.0

- MBS Xojo Plugins, version 20.0pr6

### 83.17.115 SortedFoldersMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem()

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of folders in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim Items() as FolderItem = folder.SortedFoldersMBS
MsgBox str(UBound(Items)+1)+" items"
```

**Notes:** Similar to item() function, but returns all items with one call.
Checks for whether item is directory and returns only those.
We can resolve alias if you like and optionally sort by display name instead of normal name field.
And we can filter to only return visible items.
**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 20.0pr6

### 83.17.116 SortedItemsMBS(followAlias as Boolean = false, SortByDisplayName as boolean = false, VisibleOnly as boolean = false) as FolderItem()

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of items in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim Items() as FolderItem = folder.SortedItemsMBS
MsgBox str(UBound(Items)+1)+" items"
```

**Notes:** Similar to item() function, but returns all items with one call.
We can resolve alias if you like and optionally sort by display name instead of normal name field.
And we can filter to only return visible items.
**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 20.0pr6

### 83.17.117 SpotLightFileInfoMBS(uti as string = "") as dictionary

MBS MacOSX Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Runs the spotlight metadata importer for this file and returns the dictionary with the metadata found in the file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.numbers")
dim d as Dictionary = f.SpotLightFileInfoMBS

MsgBox "Title: "+d.Value("kMDItemTitle")
MsgBox "Text Content: "+d.Value("kMDItemTextContent")
```

**Notes:** Returns nil on any error.
Works well with PDF, AppleWorks, Pages, Numbers, Word, Excel, Powerpoint and all other files, where you have an importer.
Does currently not find importers inside an application.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 17.5pr2

### 83.17.118 SpotLightLoadMDImporterMBS as boolean

MBS MacOSX Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Loads another MDImporter.
**Example:**

```
dim f as FolderItem = GetFolderItem("/Developer/Applications/Xcode.app/Contents/Library/Spotlight/SourceCode.mdimporter", FolderItem.PathTypeShell)

if f.SpotLightLoadMDImporterMBS then
MsgBox "Loaded SourceCode importer."
end if
```

**Notes:** By default importers are loaded from /Library/Spotlight,
textasciitilde /Library/Spotlight and /System/Library/Spotlight. You can load another importers using this method.
Returns true on success and false on failure.

### 83.17.119 SpotLightTextContentMBS(uti as string = "") as string

MBS MacOSX Plugin, Plugin Version: 10.0, Platform: macOS, Targets: All.

**Function:** Runs the spotlight metadata importer for this file and returns the text content string for the file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
MsgBox f.SpotLightTextContentMBS
```

**Notes:** Returns an empty string on any error.
Works well with PDF, AppleWorks, Pages, Numbers, Word, Excel, Powerpoint and all other files, where you have an importer.
Does currently not find importers inside an application.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Real Studio Plugins, version 11.2pr8
- MBS REALbasic plug-ins version 10.0
- Textpreview for any file using Spotlight

### 83.17.120 TagNamesMBS as string()

MBS MacCF Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Queries tag names for a file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim Tags() as string = f.TagNamesMBS
MsgBox "Tags: "+Join(tags, EndOfLine)
```

**Notes:** Requires Mac OS X 10.9 or newer.
Optionally provides error information in CFErrorMBS object.
Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.
See also:

- 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string() 13742

### 83.17.121 TagNamesMBS(byref e as CFErrorMBS) as string()

MBS MacCF Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Queries tag names for a file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")

dim ce as CFErrorMBS
dim Tags() as string = f.TagNamesMBS(ce)

if ce <>nil then
MsgBox "Failed: "+ce.Description
else
MsgBox "Tags: "+Join(tags, EndOfLine)
end if
```

**Notes:** Requires Mac OS X 10.9 or newer.
Optionally provides error information in CFErrorMBS object.
Please note that some tags may include chr(10) followed by a number to indicate which label color is used for compatibility to older OS X versions.
See also:

- 83.17.120 TagNamesMBS as string() 13742

### 83.17.122 TrueFilesMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of files in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim files() as FolderItem = folder.TrueFilesMBS
MsgBox str(UBound(files)+1)+" files"
```

**Notes:** Similar to trueitem() function, but returns all files with one call.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0fc1

### 83.17.123 TrueFoldersMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of folders in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim folders() as FolderItem = folder.TrueFoldersMBS
MsgBox str(UBound(folders)+1)+" folders"
```

**Notes:** Similar to trueitem() function, but returns all folders with one call.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0fc1

### 83.17.124 TrueItemsMBS as FolderItem()

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array of items in the given folder.
**Example:**

```
dim folder as FolderItem = SpecialFolder.Desktop
dim Items() as FolderItem = folder.TrueItemsMBS
MsgBox str(UBound(Items)+1)+" items"
```

**Notes:** Similar to trueitem() function, but returns all items with one call.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0fc1

### 83.17.125 UnixpathMBS as string

MBS MacOSX Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the native path for the file.
**Example:**

```
dim sh as Shell
dim fi as FolderItem
dim s as String
dim t as TextConverter

sh = new Shell
fi = getfolderitem("test ,àö") // or try some other file name

if fi = nil or fi.exists = false then
beep
return
end if
```

```
s="ls -al """ + fi.Unixpathmbs + """"

sh.Execute s
MsgBox sh.Result
```

**Notes:** test on the Desktop could be this:
On Mac OS X: /Users/cs/Desktop/test
On Mac OS 9: Mac OS 9:Desktop folder:test
On Windows: c:\windows\desktop\test

This function will return an empty string if the path can not be encoded in a Xojo String. For my tests ICQ's path which is includes the folder name "ICQ 3.0 í" can not be converted to MacRoman for some reason.

On Mac OS X this function returns the posix path. So if you are looking for POSIXPathMBS or PosixPath this method is it.
This function should do the same as NativePath in Xojo 2013r1.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr10

### 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer

MBS MacClassic Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** This routine unmounts the volume specified by the folderitem.
**Example:**

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "monikajuchmes" then
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim e as Integer = disk.UnMountVolumeMBS

if e=0 then
```

```
msgBox "Volume unmounted."
else
msgBox "There was an error!"
end if
end if
```

**Notes:** If the volume cannot be unmounted the pid of the process which denied the unmount will be returned in the dissenterPID parameter.
This routine returns after the unmount is complete.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.
See also:

- 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer 13746

### 83.17.127 UnMountVolumeMBS(force as boolean, byref dissenterPID as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** This routine unmounts the volume specified by the folderitem.
**Example:**

```
dim disk as FolderItem

dim c as Integer = VolumeCount-1
for i as Integer = 0 to c
dim v as FolderItem = volume(i)
if v.Name = "testvolume" then
disk = v
exit
end if
next

if disk = nil then
MsgBox "Please change the name in this code."
else
dim pid as Integer
dim e as Integer = disk.UnMountVolumeMBS(false, pid)
```

```
if e=0 then
msgBox "Volume unmounted."
else

if pid=0 then
msgBox "Failed to unmount with error: "+str(e)
else
dim name as string
dim p as new ProcessMBS // from Util plugin
p.GetFirstProcess

do
if p.ProcessID = pid then
name = p.Name
end if
loop until not p.GetNextProcess

if len(name)>0 then
msgBox "Failed to unmount with error: "+str(e)
else
MsgBox "Failed to unmount."+EndOfLine+EndOfLine+"The application "+name+" is still using this volume."+EndOfLine+"Error: "+str(e)
end if

end if
end if
end if
```

**Notes:** If the volume cannot be unmounted the pid of the process which denied the unmount will be returned in the dissenterPID parameter.
This routine returns after the unmount is complete.

force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).
dissenterPID: Optionally, pid of the process which denied the unmount if the unmount is denied.

Returns a Mac OS error code. 0 means no error and -1 is a plugin error if the function can't be called. -47 is returned if the disc is in use.

PS: Seems like on my tests the pid is not set by Apple.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

- MBS Plugins 10.3 Release Notes

See also:

- 83.17.126 UnMountVolumeMBS(force as boolean = false) as Integer 13745

### 83.17.128 VolGetFolderItemIDMBS(createFileIDs as Boolean = true) as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns the unique FileID or DirID of a FolderItem.
**Notes:** Returns the unique FileID or DirID of a FolderItem. This ID is unique over all items on the same volume. The value 2 always identifies the root directory, all negative values and positive ones above 15 are used for user-created files and folders, while the values 3-15 are used internally by the File System (for the Desktop Database, for example).
If the item does not exists, 0 (zero) is returned instead.

IDs for Folders can always be resolved back to a FolderItem using VolResolveID, while resolving FileIDs only works when they've previously been created explicitly. To create a resolvable FileID, pass true to the createFileIDs parameter. But be aware that if the FileID can not be created (because the disk is locked or because the File System Format does not support it), the call will fail and a zero will be returned!

So, if you are just interested in reading the FileID, pass false to the second parameter. This will not fail even there hasn't been created a resolvable ID for that file yet.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 83.17.129 VolSupportsCatSearchMBS as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns true if this volume supports Catalog Search which only HFS(+) volumes does for now.
**Example:**

```
dim v as folderitem
v=volume(0) // boot volume
if v.VolSupportsCatSearchMBS then
msgbox "CatSearchMBS class will be fast!"
end if
```

**Notes:** Returns true if the volume is valid and supports the CatSearchMBS functions. Returns false otherwise. From this you can tell whether a search will be fast or slow when using CatSearchOpen with the

"allowRecursiveSearch" parameter set to true.

### 83.17.130 VolumeFreeSizeKBMBS as Int64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use VolumeFreeSizeMBS instead. **Function:** Returns the size on the free space on volume which the folderitem objects points to.
**Example:**

```
msgBox "The volume with your system folder has "+str(specialfolder.system.volumeFreeSizeKBMBS)+" KBytes free."
```

**Notes:** This can't work with anything bigger than 2048 Gigabytes (until version 10.0).
Return value changed in version 10.0 from integer to SInt64.

Added Linux support in version 16.0.

### 83.17.131 VolumeFreeSizeMBS as Int64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size of the free space of the volume which the folderitem objects points to.
**Example:**

```
// 1. a short:
msgBox "The volume with your system folder has "+str(specialfolder.system.VolumeFreeSizeMBS)+" Bytes free."
// 2. a nicer:
dim d as Double
dim s as string

d=specialfolder.system.VolumeFreeSizeMBS

if d>10000.0 then
if d>10000000.0 then
if d>10000000000.0 then
s=format(d/1024.0/1024.0/1024.0,"0")+" GigaBytes"
else
s=format(d/1024.0/1024.0,"0")+" MegaBytes"
end if
else
s=format(d/1024.0,"0")+" KiloBytes"
```

```
end if
else
s=format(d,"0")+" Bytes"
end if

msgBox "On your drive with the system folder you have "+s+" free."
```

**Notes:** This should be used to handle any volume size.
Return value changed in version 10.0 from double to SInt64.

Added Linux support in version 16.0.
Returns -1 on error.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr1
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MBS Xojo / Real Studio Plugins, version 14.0pr1

**Xojo Developer Magazine**

- 2.1, page 42: Details about disks, Getting the name, the size, and more information about a disc. by Christian Schmitz

### 83.17.132 VolumeInformationMBS as VolumeInformationMBS

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns a VolumeInformationMBS object with detailed information about the volume where the folderitem's file is located on.
**Notes:** May return nil on errors.

### 83.17.133 VolumeSizeKBMBS as Int64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use VolumeSizeMBS instead.
**Function:** Returns the Size on the volume which the folderitem objects points to.
**Example:**

```
msgBox "The volume with your system folder is "+str(specialfolder.system.volumeSizeKBMBS)+" KB big."
```

**Notes:** This can't work with anything bigger than 2048 Gigabytes (until plugin version 10.0).
Return value changed in version 10.0 from integer to SInt64.

Added Linux support in version 16.0.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr1

### 83.17.134 VolumeSizeMBS as Int64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size on the volume which the folderitem objects points to.
**Example:**

```
// 1. a short:
msgBox "The volume with your system folder is "+str(specialfolder.system.volumeSizeMBS)+" big."
// 2. a nicer:
dim d as Double
dim s as string

d=SpecialFolder.System.volumesizeMBS

if d>10000.0 then
if d>10000000.0 then
if d>10000000000.0 then
s=format(d/1024.0/1024.0/1024.0,"0")+" GigaBytes"
else
s=format(d/1024.0/1024.0,"0")+" MegaBytes"
end if
else
s=format(d/1024.0,"0")+" KiloBytes"
end if
else
s=format(d,"0")+" Bytes"
end if

msgBox "Your drive with the system folder is "+s+" big."
```

**Notes:** This should be used to handle any volume size.
Return value changed in version 10.0 from double to SInt64.

Added Linux support in version 16.0.
Returns -1 on error.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr5
- MBS Xojo Plugins, version 20.3pr1
- MBS Xojo Plugins, version 19.4pr1
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MBS Xojo / Real Studio Plugins, version 14.0pr1

**Xojo Developer Magazine**

- 2.1, page 42: Details about disks, Getting the name, the size, and more information about a disc. by Christian Schmitz

### 83.17.135 VolumeSupportsHugeFilesMBS as Integer

MBS MacOSX Plugin, Plugin Version: 13.3, Platform: macOS, Targets: All.

**Function:** Queries whether a volume supports 2 TB file size on Mac OS X.
**Notes:** Some volumes only support 2 GB or 4 GB file size. Some can handle more than that up to 2 TB.
Returns 0 if not supported, 1 if supported and -1 if unknown.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 13.4pr1

### 83.17.136 VolumeUUIDMBS as string

MBS Util Plugin, Plugin Version: 13.0, Platform: macOS, Targets: All.

**Function:** Queries volume UUID.
**Notes:** Requires Mac OS X 10.7 or newer.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 83.17.137 WinThumbnailMBS(preferredSize as Integer = 512) as picture

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries a thumbnail for an item.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
Backdrop = f.WinThumbnailMBS
```

**Notes:** preferredSize is the size you'd like to have. Resulting image can be smaller or bigger.
Returns nil on any error.
If user disabled thumbnails for explorer, the shell also provides none for us, just icons.
Requires Windows Vista or newer.
**Blog Entries**

- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3
- MBS Xojo / Real Studio Plugins, version 14.3pr1

### 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a file.
**Notes:** Faster than TextOutputStream or BinaryStream on MacOS.

Returns true on success or false on failure.
See also ReadFileMBS function.

Limited to maximum size of a string (2 GB)
See also:

- 83.17.139 WriteFileMBS(data as string) as boolean 13753

### 83.17.139 WriteFileMBS(data as string) as boolean

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a file.
**Notes:** Faster than TextOutputStream or BinaryStream on MacOS.

Returns true on success or false on failure.
See also ReadFileMBS function.

Limited to maximum size of a string (2 GB)
**Blog Entries**

- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News

See also:

- 83.17.138 WriteFileMBS(data as MemoryBlock) as boolean 13753

### 83.17.140 Properties

### 83.17.141 AccessDateMBS(UTC as boolean = false) as date

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The access date of the file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim xd as date = f.AccessDateMBS
MsgBox xd.LongDate+" "+xd.LongTime
```

**Notes:** Setting this value is not supported on Linux currently.

To query Spotlight's Last Open day, please check the FAQ for sample code.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.142 AccessDateTimeMBS(UTC as boolean = false) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The access date of the file or folder.
**Notes:** Setting this value is not supported on Linux currently.

To query Spotlight's Last Open day, please check the FAQ for sample code.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.143 AddedToDirectoryDateMBS as date

MBS Util Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the date the file was added to the folder.
**Notes:** Requires OS X 10.10 or newer.
(Read and Write computed property)

### 83.17.144 AddedToDirectoryDateTimeMBS as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the date the file was added to the folder.
**Notes:** Requires OS X 10.10 or newer.
(Read and Write computed property)

### 83.17.145 AttributeModificationDateMBS(UTC as boolean = false) as date

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The attribute modification date of the file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim xd as date = f.AttributeModificationDateMBS
MsgBox xd.LongDate+" "+xd.LongTime
```

**Notes:** Attribute Motification dates are supported only on Mac OS X currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.146 AttributeModificationDateTimeMBS(UTC as boolean = false) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attribute modification date of the file or folder.
**Notes:** Attribute Motification dates are supported only on Mac OS X currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.147 BackupDateMBS(UTC as boolean = false) as date

MBS Util Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The backup date of the file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim xd as date = f.BackupDateMBS
MsgBox xd.LongDate+" "+xd.LongTime
```

**Notes:** Backup dates are supported only on Mac OS X currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.148 BackupDateTimeMBS(UTC as boolean = false) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The backup date of the file or folder.
**Notes:** Backup dates are supported only on Mac OS X currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.149 BackupItemExcludedMBS as boolean

MBS MacFrameworks Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether or not an item is being excluded from backup.
**Notes:** This is the easy method to just query whether a file is marked as being excluded from backup. You can assign a boolean value to exclude (true) or include (false) the file.

Require Mac OS X 10.5. Returns false on all other operation systems.
(Read and Write computed property)

### 83.17.150 CommentMBS as string

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The comment for that file.
**Example:**

```
dim f as folderitem // your file
f.CommentMBS="Hello world!"
```

**Notes:** This function sends an AppleEvent to the Finder. It may take some milliseconds.
(on Mac OS X)

Querying comment is not thread safe.
Your application needs to be allowed to control Finder via AppleScripts.

See DeterminePermissionToAutomateTarget method in NSAppleScriptMBS class.

see also
https://developer.apple.com/documentation/bundleresources/entitlements/com_apple_security_automation_apple-events
(Read and Write computed property)

### 83.17.151 CreationDateMBS(UTC as boolean = false) as date

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The creation date of the file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim xd as date = f.CreationDateMBS
MsgBox xd.LongDate+" "+xd.LongTime
```

**Notes:** Setting this value is not supported on Linux currently.
If UTC is true, you get/set date object where time is UTC.

(Read and Write computed property)

### 83.17.152 CreationDateTimeMBS(UTC as boolean = false) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The creation date of the file or folder.
**Notes:** Setting this value is not supported on Linux currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.153 FinderLabelMBS as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Returns the color code for the file.
**Example:**

file.FinderLabelMBS=2

**Notes:** The file label is a number between 0 and 7 to give the file a color.
Used in the Classic Finder for labels (and on Mac OS X for Finder replacement or Finder extending utilities)
On reading the value you can get negative values like -43 if the file is not found.

To know labels and colors, please use NSWorkspaceMBS.fileLabelColors and NSWorkspaceMBS.fileLabels methods.

Current list:

| | |
|---|---|
| 0 | none |
| 1 | gray |
| 2 | green |
| 3 | violett |
| 4 | blue |
| 5 | yellow |
| 6 | red |
| 7 | orange |

(Read and Write computed property)

### 83.17.154 MacQuarantinePropertiesMBS as MacQuarantinePropertiesMBS

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets or sets the quarantine options for a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")

// read value
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.AgentName

// set value
q = new MacQuarantinePropertiesMBS

q.AgentBundleIdentifier = "test.test"
q.AgentName = "testing app"
q.DataURL="http://www.monkeybreadsoftware.de/test.dmg"
q.OriginURL="http://www.monkeybreadsoftware.de/"
q.Type=q.kTypeWebDownload

f.MacQuarantinePropertiesMBS = q

// clear
f.MacQuarantinePropertiesMBS = nil
```

**Notes:** Requires Mac OS X 10.5.
(Read and Write computed property)

### 83.17.155 ModificationDateMBS(UTC as boolean = false) as date

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The modification date of the file or folder.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim xd as date = f.ModificationDateMBS
MsgBox xd.LongDate+" "+xd.LongTime
```

**Notes:** Setting this value is not supported on Linux currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

### 83.17.156 ModificationDateTimeMBS(UTC as boolean = false) as DateTime

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The modification date of the file or folder.
**Notes:** Setting this value is not supported on Linux currently.
If UTC is true, you get/set date object where time is UTC.
(Read and Write computed property)

## 83.18 class LargeBinaryStreamMBS

### 83.18.1 class LargeBinaryStreamMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows you to access files with more than 2GB in size.
**Notes:** Deprecated in favor of BinaryStream class in Xojo unless you need a feature provided here, so please let us know!
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- Cleanup your C code for MacOS and remove FSCreateFileUnicode
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr6
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- MBS Real Studio Plugins, version 12.5pr2
- MBS Real Studio Plugins, version 12.4pr4
- MBS Real Studio Plugins, version 12.4pr3

**Videos**

- Presentation from London conference about MBS Plugins.

### 83.18.2 Methods

### 83.18.3 Allocate(count as int64, flags as Integer) as int64

MBS Util Plugin, Plugin Version: 7.4, Platform: macOS, Targets: All.

**Function:** Allocates disk space for this file.
**Example:**

```
dim l as LargeBinaryStreamMBS // your stream
dim d as int64

d=l.Allocate(1024*1024*1024,2) // 1 GB
```

**Notes:** Only for Mac OS.
The flags can be like this:

| | | |
|---|---|---|
| AllocDefaultFlags | 0 | as much as possible, not contiguous |
| AllocAllOrNothingMask | 1 | allocate all of the space, or nothing |
| AllocContiguousMask | 2 | new space must be one contiguous piece |
| AllocNoRoundUpMask | 4 | don't round up allocation to clump size |

Note that the length property is not changed because the space is not used.

### 83.18.4 close

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 83.18.5 Create(file as folderitem, MacType as string, MacCreator as string) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file as a LargeBinaryStreamMBS.
**Example:**

```
dim f as FolderItem // your file
dim l as LargeBinaryStreamMBS

l = LargeBinaryStreamMBS.Create(f, "TEXT","ttxt")
```

**Notes:** If there is already a file, it is deleted.
On Windows the parameters are ignored.
Returns nil on any error.
See also:

- 83.18.6 Create(path as string, MacType as string, MacCreator as string, WinShareMode as Integer = 0) as LargeBinaryStreamMBS 13762

### 83.18.6 Create(path as string, MacType as string, MacCreator as string, WinShareMode as Integer = 0) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a file as a LargeBinaryStreamMBS.
**Example:**

```
dim l as LargeBinaryStreamMBS
l = LargeBinaryStreamMBS.Create("C:\test.txt", "", "")
```

**Notes:** If there is already a file, it is deleted.
On Windows the parameters are ignored.
Returns nil on any error.
See also:

- 83.18.5 Create(file as folderitem, MacType as string, MacCreator as string) as LargeBinaryStreamMBS 13762

### 83.18.7 CreateResStream(file as folderitem, MacType as string, MacCreator as string) as ResStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new ResStreamMBS.
**Notes:** If there is already a file, it is deleted.
If the file could not be created it is deleted.
Returns nil on any error.
See also:

- 83.18.8 CreateResStream(path as string, MacType as string, MacCreator as string) as ResStreamMBS 13763

### 83.18.8 CreateResStream(path as string, MacType as string, MacCreator as string) as ResStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Creates a new ResStreamMBS.
**Notes:** If there is already a file, it is deleted.
If the file could not be created it is deleted.
Returns nil on any error.
See also:

- 83.18.7 CreateResStream(file as folderitem, MacType as string, MacCreator as string) as ResStreamMBS 13763

### 83.18.9 DeleteDataFork(file as folderitem)

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Deletes the data fork of a file.
**Notes:** Equal to open the file using a binarystream and setting the length property to 0.
On Mac OS a file can exist without a datafork, with a resource fork or even without any fork.

### 83.18.10 DeleteResourceFork(file as folderitem)

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Deletes the resource fork of a file.
**Notes:** Equal to open the file using a ResStreamMBS and setting the length property to 0.
On Mac OS a file can exist without a datafork, with a resource fork or even without any fork.

### 83.18.11 Flush

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Targets: All.

**Function:** Makes sure every bit of the stream is written to disc.
**Notes:** Only for Mac OS X.

### 83.18.12 LockFileExclusive as boolean

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the file so no other app can access it.
**Notes:** Returns true on success.
It may be possible that there is still a way around the lock.

### 83.18.13 Open(file as folderitem, write as Boolean) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file as a LargeBinaryStreamMBS.
**Example:**

```
dim l as LargeBinaryStreamMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("testfile")

l = LargeBinaryStreamMBS.Open(f, true)
```

**Notes:** Returns nil on any error.
See also:

- 83.18.14 Open(path as string, write as Boolean, WinShareMode as Integer = 0) as LargeBinaryStreamMBS 13765

### 83.18.14 Open(path as string, write as Boolean, WinShareMode as Integer = 0) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file as a LargeBinaryStreamMBS.
**Example:**

```
// write to parallel port:
dim b as LargeBinaryStreamMBS = LargeBinaryStreamMBS.Open("LPT1", true, 3)
b.Write "Hello World"
b.Close
```

**Notes:** Returns nil on any error.
For special cases, you may need to allow Shared Read or Write and for that case, we have WinShareMode parameter.
For WinShareMode, you can pass 1 for shared reading, 2 for shared writing, 4 for shared deletion. Or combine those. Passing zero prevents sharing.
See also:

- 83.18.13 Open(file as folderitem, write as Boolean) as LargeBinaryStreamMBS 13764

### 83.18.15 OpenAsResStream(file as folderitem, write as Boolean) as ResStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Opens a file's resourcefork as a ResStreamMBS.
**Notes:** Returns nil on any error.
See also:

- 83.18.16 OpenAsResStream(path as string, write as Boolean) as ResStreamMBS 13765

### 83.18.16 OpenAsResStream(path as string, write as Boolean) as ResStreamMBS

MBS Util Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Opens a file's resourcefork as a ResStreamMBS.
**Notes:** Returns nil on any error.
See also:

- 83.18.15 OpenAsResStream(file as folderitem, write as Boolean) as ResStreamMBS 13765

### 83.18.17 QueryDiskGeometry(byref Cylinders as Int64, byref MediaType as Integer, byref TracksPerCylinder as Integer, byref SectorsPerTrack as Integer, byref BytesPerSector as Integer) as boolean

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries disk size on Windows.
**Notes:** This function is only useful on Windows and only if you opened a physical disc.
Returns true on success.

### 83.18.18 Read(count as Integer) as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes into a string.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim s as string

s=b.read(5)
```

### 83.18.19 ReadBlock(count as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes into a memoryblock.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim s as memoryblock

s=b.read(5)
```

### 83.18.20 Readbyte as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an 8bit Byte from the stream.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim i as Integer

i=B.readbyte
```

### 83.18.21 ReadLong as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a signed 32bit Integer from the stream.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim i as Integer

i=B.readlong
```

**Notes:** This function is affected by the LittleEndian Setting.

### 83.18.22 ReadShort as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a signed 16bit Integer from the stream.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim i as Integer

i=B.readshort
```

**Notes:** This function is affected by the LittleEndian Setting.

### 83.18.23 UnlockFileExclusive as boolean

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks the file so other applications can possibily access it.
**Notes:** Returns true on success.

### 83.18.24 WinCreateStream(file as folderitem, StreamName as String, WinShareMode as Integer = 0) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 16.4, Platform: Windows, Targets: All.

**Function:** Creates a named stream in a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim l as LargeBinaryStreamMBS = LargeBinaryStreamMBS.WinCreateStream(f, "test")
if l = nil then
MsgBox "Error
else
l.Write "Hello"
l.close
end if
```

**Notes:** Returns nil in case of error.

### 83.18.25 WinDeleteStream(file as folderitem, StreamName as String) as boolean

MBS Util Plugin, Plugin Version: 16.4, Platform: Windows, Targets: All.

**Function:** Deletes a named stream in a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
if LargeBinaryStreamMBS.WinDeleteStream(f) then
MsgBox "OK"
else
MsgBox "Error
end if
```

**Notes:** Returns true on success.

### 83.18.26 WinOpenStream(file as folderitem, StreamName as String, write as Boolean, WinShareMode as Integer = 0) as LargeBinaryStreamMBS

MBS Util Plugin, Plugin Version: 16.4, Platform: Windows, Targets: All.

**Function:** Opens a named stream in a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim l as LargeBinaryStreamMBS = LargeBinaryStreamMBS.WinOpenStream(f, "test", false)
if l = nil then
MsgBox "Error
else
MsgBox l.Read(l.Length)
end if
```

**Notes:** Returns nil in case of error.

### 83.18.27 Write(data as string)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes bytes from a string to file.

### 83.18.28 WriteBlock(data as memoryblock,count as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes count bytes from a memoryblock to file.
**Example:**

```
dim b as LargeBinaryStreamMBS // your stream
dim m as memoryblock

b.writeblock m,m.size
```

### 83.18.29 WriteByte(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a byte to file.

### 83.18.30 WriteLong(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an 32bit integer to file.
**Notes:** This method is affected by the LittleEndian Setting.

### 83.18.31 WriteShort(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an 16bit integer to file.
**Notes:** This method is affected by the LittleEndian Setting.

### 83.18.32 Properties

### 83.18.33 CanWrite as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if you are allowed to write.
**Notes:** Even if you open a file for write you may still not be allowed to write if the permissions of the file don't allow you to write.
(Read only property)

### 83.18.34 EOF as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if you are at the end of the stream.
**Notes:** You can set this property to truncate the file.
(Read only property)

### 83.18.35 Lasterror as Integer

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** The values are platform dependent, but zero is no error everywhere.

(Read and Write property)

### 83.18.36 Length as Int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current length of the file.
**Notes:** You can truncate the stream by setting this property.
Can't be set on Linux currently.
(Read and Write property)

### 83.18.37 LittleEndian as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies if Integers and Shorts shall be converted in their endienness when read or written.
**Notes:** See Xojo's binarystream for more details.
For native platform you may set "littleendian=targetwin32".
(Read and Write property)

### 83.18.38 Position as Int64

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns current position.
**Notes:** You can set the current file stream position using this property.
(Read and Write property)

### 83.18.39 Yield as Boolean

MBS Util Plugin, Plugin Version: 9.5, Platform: macOS, Targets: All.

**Function:** Whether time should be given to other threads.
**Notes:** If true on Mac OS X CPU time will be given to other threads while read or write operations are pending. To have an effect you need to call read/write methods in a thread.
(Read and Write property)

## 83.19 class MacFileOperationMBS

### 83.19.1 class MacFileOperationMBS

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This class allows you to perform asynchronous file operations on Mac OS X 10.4 like copy and move.
**Notes:** Available in Mac OS X 10.4.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- Tip of day: Move file/folder to trash
- Tip of the day: Move to trash
- Tip of the day: Move file to trash, the right way
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 83.19.2 Methods

### 83.19.3 Cancel

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cancels the specified FSFileOperation.
**Notes:** Lasterror is set.

### 83.19.4 CopyObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double)

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will start an asynchronous copy of the object specified by Item to the directory specified by DestinationFolder.
**Notes:** If DestinationName is provided then the new object will be renamed to DestinationName. If DestinationName is empty then the name of the source object will be used.

You will receive StatusChanged events.

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

### 83.19.5 CopyObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will copy the source object into the destination directory.
**Notes:** The source object can be a file or directory.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

### 83.19.6 MoveObject(Item as folderitem, DestinationFolder as folderitem, DestinationName as string, Options as Integer, statusChangeInterval as Double)

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will start an asynchronous move of the object specified by source to the directory specified by DestinationFolder.
**Notes:** If DestinationName is provided then the new object will be renamed to destName. If Destination-

Name is empty then the name of the source object will be used.

By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

### 83.19.7 MoveObjectSync(SourceItem as folderitem, DestinationFolder as folderitem, DestinationName as string, byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will move the source object into the destination directory.
**Notes:** The source object can be a file or directory. If a destName is provided then the object will be renamed as well as moved. By default a move across volumes will result in a copy and deletion of the original source. The kFSFileOperationDoNotMoveAcrossVolumes flag will cause cross volume moves to do nothing and return an error.

self: The source object to copy.
DestinationFolder: The destination directory for the copy.
DestinationName: The name for the new object in the destination directory. Pass "" to use the source object name.
result: Upon successful completion a ref to the newly created object. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.4.

Use this constants:

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle.

### 83.19.8 MoveObjectToTrash(Item as folderitem, Options as Integer, statusChangeInterval as Double)

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** This routine will start an asynchronous move of the object specified by source to the trash.
**Notes:** If the volume the source object resides on does not support a trash folder then the operation will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

Options: One or more FSFileOperation flags
statusChangeInterval: The minimum time between callbacks within a single stage of an operation in seconds.

### 83.19.9 MoveObjectToTrashSync(SourceItem as folderitem, byref Result as folderitem, Options as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine will move the source object into the trash.
**Notes:** The source object can be a file or directory. If the volume the source object resides on does not support a trash folder then this call will return an error (this is the same circumstance that triggers the delete immediately behavior in the Finder).

self: The source object to move to the trash.
result: Upon successful completion a ref the object in the trash. If source is a directory then target will be the corresponding object in the destination directory.
options: One or more FSFileOperation flags

Requires Mac OS X 10.5.

Use this constants:

Returns a Mac OS error code. Error code -1 is from the plugin for invalid parameters or the function not being availanle. Error -5000 means insufficient access privileges for operation.

See WindowsFileCopyMBS for similar function for Windows.

| | | |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | Use the default options - no overwrite, fail if any source item cannot be read, cross volume moves OK. |
| kFSFileOperationOverwrite | 1 | Replace an item in the destDir that has the same name as an item being moved/copied there. |
| kFSFileOperationSkipSourcePermissionErrors | 2 | Skip items that cannot be read and continue copying/moving instead of failing the operation. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | Do not perform a copy/delete to move an item across volume boundries - fail the operation instead. |
| kFSFileOperationSkipPreflight | 8 | Skip the preflight for a directory move/copy. This will limit the status information that can be returned since the totals will not be calculated. |

### 83.19.10 Status as MacFileOperationStatusMBS

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This routine returns the current status of an FileOperation.
**Notes:** Lasterror is set.
Returns nil on any error.

### 83.19.11 Properties

### 83.19.12 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle.
**Notes:** (Read and Write property)

### 83.19.13 LastError as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Users report that you get error -50 (parameter error) if you reuse a file operation object for a new operation.
So maybe create a new instance for each operation?
(Read and Write property)

### 83.19.14 Events

### 83.19.15 StatusChanged(status as MacFileOperationStatusMBS)

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: .

**Function:** This event is called whenever the status changed.

### 83.19.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFSFileOperationDefaultOptions | 0 | One of the file operation flags.<br>Use the default options - no overwrite, fail if any source item ca<br>cross volume moves OK. |
| kFSFileOperationDoNotMoveAcrossVolumes | 4 | One of the file operation flags.<br>Do not perform a copy/delete to move an item across volume bo<br>the operation instead. |
| kFSFileOperationOverwrite | 1 | One of the file operation flags.<br>Replace an item in the destDir that has the same name as a<br>moved/copied there. |
| kFSFileOperationSkipPreflight | 8 | One of the file operation flags.<br>Skip the preflight for a directory move/copy. This will limit the<br>mation that can be returned since the totals will not be calculate |
| kFSFileOperationSkipSourcePermissionErrors | 2 | One of the file operation flags.<br>Skip items that cannot be read and continue copying/moving inst<br>the operation. |
| kFSOperationStageComplete | 3 | One of the constants for the stage.<br>Operation is done. |
| kFSOperationStagePreflighting | 1 | One of the constants for the stage.<br>Operation is calulating sizes and number of items involved in the |
| kFSOperationStageRunning | 2 | One of the constants for the stage.<br>Operation is in progress. |
| kFSOperationStageUndefined | 0 | One of the constants for the stage.<br>Operation has not started yet. |

## 83.20 class MacFileOperationStatusMBS

### 83.20.1 class MacFileOperationStatusMBS

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This class represents the status of a file operation.
**Notes:** Available in Mac OS X 10.4.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr3
- MBS Xojo / Real Studio Plugins, version 16.5pr3
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 83.20.2 Properties

### 83.20.3 BytesComplete as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of bytes that have been moved/copied by this operation at the time the status call was made.
**Notes:** During the preflight stage this value represents the currently known number of bytes that will be copied/moved.
Value is -1 if undefined.
(Read only property)

### 83.20.4 BytesRemaining as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of bytes that remain to be moved/copied by this operation at the time the status call was made.
**Notes:** Value is -1 if undefined.
This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.

Seems like newer MacOS versions like 10.13 don't update this value.
(Read only property)

### 83.20.5 CurrentItem as FolderItem

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A folderitem to item operation is currently processing.
**Notes:** If the operation is complete then currentItem refers to the target item (the new item corresponding to the source item in the destination directory).
(Read and Write property)

### 83.20.6 Dictionary as Dictionary

MBS MacClassic Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** All details in the status object as a dictionary.
**Notes:** You get the internal CFDictionary converted to Xojo dictionary to inspect yourself.
(Read only property)

### 83.20.7 Error as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The error code.
**Notes:** Either noErr (0) or an error value which caused the operation to fail.
(Read and Write property)

### 83.20.8 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries internal object reference.
**Example:**

```
dim status as MacFileOperationStatusMBS // your status object
dim d as CFDictionaryMBS = CFDictionaryMBS.dictionaryWithHandle(status.Handle)
dim dd as Dictionary = d.Dictionary
Break
```

**Notes:** Value is a CFDictionaryRef reference.
(Read and Write property)

### 83.20.9 ObjectsComplete as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of objects that have been moved/copied by this operation at the time the status call was made.
**Notes:** Value is -1 if undefined.
During the preflight stage this value represents the currently known number of objects that will be copied/moved.
(Read only property)

### 83.20.10 ObjectsRemaining as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of objects that remain to be moved/copied by this operation at the time the status call was made
**Notes:** Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
(Read only property)

### 83.20.11 Stage as Integer

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current stage of the operation.
**Notes:** See this constants for possible values:
kFSOperationStageComplete
kFSOperationStagePreflighting
kFSOperationStageRunning
kFSOperationStageUndefined
(Read and Write property)

### 83.20.12 Throughput as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current throughput for the operation in bytes per second.
**Notes:** Value is -1 if undefined.
(Read only property)

### 83.20.13 TotalBytes as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The total number of bytes that will be moved/copied by this operation.
**Notes:** This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
Value is -1 if undefined.
(Read only property)

### 83.20.14 TotalObjects as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The total number of objects that will be moved/copied by this operation.
**Notes:** Value is -1 if undefined.
This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified.
(Read only property)

### 83.20.15 TotalUserVisibleObjects as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The total number of user visibleobjects that will be moved/copied by this operation.
**Notes:** Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified. A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

### 83.20.16 UserVisibleObjectsComplete as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of user visible objects that have been moved/copied by this operation at the time the status call was made.
**Notes:** Value is -1 if undefined.

During the preflight stage this value represents the currently known number of objects that will be copied/moved.
A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

### 83.20.17 UserVisibleObjectsRemaining as Int64

MBS MacClassic Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of user visible objects that remain to be moved/copied by this operation at the time the status call was made
**Notes:** Value is -1 if undefined.

This value is not available for a directory operation if kFSFileOperationSkipPreflight was specified. A packaged application is one user visible object even though it is made up of multiple files and directories.
(Read only property)

## 83.21 class MacQuarantinePropertiesMBS

### 83.21.1 class MacQuarantinePropertiesMBS

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for quarantine options.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")

// read value
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.AgentName

// set value
q = new MacQuarantinePropertiesMBS

q.AgentBundleIdentifier = "test.test"
q.AgentName = "testing app"
q.DataURL="http://www.monkeybreadsoftware.de/test.dmg"
q.OriginURL="http://www.monkeybreadsoftware.de/"
q.Type=q.kTypeWebDownload

f.MacQuarantinePropertiesMBS = q

// clear
f.MacQuarantinePropertiesMBS = nil
```

**Notes:** Requires Mac OS X 10.5.
Since the LSCopyItemAttribute function got deprecated by Apple, please use NSURLMBS class instead to read various properties.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Real Studio Plugins, version 12.4pr3
- Quarantine Properties
- Files in quarantine

### 83.21.2 Properties

### 83.21.3 AgentBundleIdentifier as String

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The bundle identifier of the quarantining agent, if available.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.AgentBundleIdentifier
```

**Notes:** When setting quarantine properties, this value is set automatically if the it is undefined. The automatic value is the main bundle identifier of the current process.
(Read and Write property)

### 83.21.4 AgentName as String

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the quarantining agent (application or program).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.AgentName
```

**Notes:** When setting quarantine properties, this value is set automatically to the current process name if this value is not defined.
(Read and Write property)

### 83.21.5 DataURL as String

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL from which the data for the quarantined item data was actaully streamed or downloaded, if available.
**Notes:** dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.DataURL
(Read and Write property)

### 83.21.6 DateTime as DateTime

MBS MacOSX Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time the item was quarantined.
**Notes:** When setting quarantine properties, this property is set automatically to the current date and time if this value is not set.
(Read and Write property)

### 83.21.7 Dic as Variant

MBS MacOSX Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The original dictionary from Mac OS X.
**Notes:** This is a CFDictionaryMBS object which we provide for debugging.
You can pass it to CFShowMBS to print on console.
(Read and Write property)

### 83.21.8 OriginURL as String

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The URL of the resource originally hosting the quarantined item, from the user's point of view.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.OriginURL
```

**Notes:** For web downloads, this property is the URL of the web page on which the user initiated the download. For attachments, this property is the URL of the resource to which the quarantined item was attached (e.g. the email message, calendar event, etc.). The origin URL may be a file URL for local resources, or a custom URL to which the quarantining application will respond when asked to open it. The quarantining application should respond by displaying the resource to the user. Note: The origin URL should not be set to the data URL, or the quarantining application may start downloading the file again if the user choses to view the origin URL while resolving a quarantine warning.
(Read and Write property)

### 83.21.9 TimeStamp as Date

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time the item was quarantined.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
```

```
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.TimeStamp.LongDate+" "+q.TimeStamp.LongTime
```

**Notes:** When setting quarantine properties, this property is set automatically to the current date and time if this value is not set.
(Read and Write property)

### 83.21.10 Type as String

MBS MacOSX Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A symbolic string identifying the why the item is quarantined, if available.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.app")
dim q as MacQuarantinePropertiesMBS = f.MacQuarantinePropertiesMBS
MsgBox q.Type
```

**Notes:** (Read and Write property)

### 83.21.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kTypeCalendarEventAttachment | "LSQuarantineTypeCalendarEventAttachment" | One of the type constants. |
| kTypeEmailAttachment | "LSQuarantineTypeEmailAttachment" | One of the type constants. |
| kTypeInstantMessageAttachment | "LSQuarantineTypeInstantMessageAttachment" | One of the type constants. |
| kTypeOtherAttachment | "LSQuarantineTypeOtherAttachment" | One of the type constants. |
| kTypeOtherDownload | "LSQuarantineTypeOtherDownload" | One of the type constants. |
| kTypeWebDownload | "LSQuarantineTypeWebDownload" | One of the type constants. |

## 83.22 class NetFSMountMBS

### 83.22.1 class NetFSMountMBS

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Our class for NetFS mounting.
**Notes:** Based on NetFS framework in MacOS 10.8 or later.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 83.22.2 Methods

### 83.22.3 Cancel

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Cancels asynchronous mounting.
**Notes:** MountURLAsyncCompleted event will not run.

### 83.22.4 MountURLAsync(URL as String, MountPath as String = """, User as String = """, Password as String = """, OpenOptions as Dictionary = nil, MountOptions as Dictionary = nil) as Integer

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** MountURLAsync is the same as MountURLSync except it does the mount asynchronously.
**Notes:** The MountURLAsyncCompleted event is run after the mount with an array of POSIX mountpoint paths.

You can call Cancel method to cancel a pending mount request.

### 83.22.5 MountURLSync(URL as String, MountPath as String = """, User as String = """, Password as String = """, OpenOptions as Dictionary = nil, MountOptions as Dictionary = nil, byref MountPoints() as String) as Integer

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a URL that refers to a file server, connect to that server and mount stuff.
**Notes:** If the URL just specifies a server and you can't just mount the "root directory" of the server, the user will be prompted with a window to let them select one or more items to mount from that server, otherwise whatever item the URL specifies to mount will be mounted.
If the mountpath is provided it will be used as the mount point. If the mountpath is set to "", a default mount point will be used.
If the user and passwd are set, they will override any user name or password that may be set in the URL. These calls go through the NetAuth agent. If the URL doesn't specify a password, and one is needed, the user will be prompted with a window requesting password.
Options can be provided for the session open and the mount itself. If the mount is successful, the POSIX path to each mountpoint is returned as a string in mountpoints.
If the return value is zero the mount has succeeded.

A positive non-zero return value represents an errno value (see /usr/include/sys/errno.h). For instance, a missing mountpoint error will be returned as ENOENT (2).

A negative non-zero return value represents an OSStatus error. For instance, error -128 is userCanceledErr, returned when a mount operation is canceled by the user.

### 83.22.6 URLForRemountingVolume(path as String) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a localPathURL that refers to a location on a mounted network share, return the URL needed to remount that volume.
**Example:**

```
dim url as string = NetFSMountMBS.URLForRemountingVolume("/Volumes/Ablage2")

MsgBox url
```

**Notes:** The return value is an URL of the server, or "" if localPathURL isn't a mounted network share.
See also:

• 83.22.7 URLForRemountingVolume(vol as FolderItem) as String 13789

### 83.22.7 URLForRemountingVolume(vol as FolderItem) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a localPathURL that refers to a location on a mounted network share, return the URL needed to remount that volume.
**Example:**

```
dim v as FolderItem = volume(VolumeCount-1)
dim url as string = NetFSMountMBS.URLForRemountingVolume(v)

MsgBox url
```

**Notes:** The return value is an URL of the server, or "" if localPathURL isn't a mounted network share.
See also:

• 83.22.6 URLForRemountingVolume(path as String) as String 13788

### 83.22.8 URLProbe(hostname as String) as String

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Checks what protocol may be used to mount disk from this server.
**Example:**

```
dim protocol as string = NetFSMountMBS.URLProbe("Ablage2.local")

MsgBox protocol
```

**Notes:** The user may enter a hostname in lieu of a full URL. We need to determine an appropriate protocol for this host and return a scheme from which a URL can be derived. For instance, if we determine that it's an SMB server then we return "smb" which the caller can use to build a URL: "smb://hostname".

We start with a list of likely protocols, e.g. "smb", "afp" and initiate a TCP connection to the port for each protocol. These connect attempts run in parallel. Then wait in a select() call to see which connections are successful, or refused, or do not respond. There is a preference order, even if a protocol later in the list responds first, it may lose out if a protocol earlier in the list responds within the timeout.

Returns "smb" for example.

### 83.22.9 Properties

### 83.22.10 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle for a pending request.
**Notes:** (Read and Write property)

### 83.22.11 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 83.22.12 Events

### 83.22.13 MountURLAsyncCompleted(status as Integer, URL as String, mountpoints() as String)

MBS MacOSX Plugin, Plugin Version: 18.3, Platform: macOS, Targets: .

**Function:** The event called when mount is done.

### 83.22.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kNAUIOptionKey | "UIOption" | One of the keys for open options dictionary.<br>Suppress authentication dialog UI. |
| kNetFSAllowLoopbackKey | "AllowLoopback" | One of the keys for open options dictionary.<br>Allow a loopback mount. |
| kNetFSAllowSubMountsKey | "AllowSubMounts" | One of the keys for mount options dictionary.<br>Allow a mount from a dir beneath the share point.<br>Pass boolean value. |
| kNetFSMountAtMountDirKey | "MountAtMountDir" | One of the keys for mount options dictionary.<br>Mount on the specified mountpath instead of below it.<br>Note that if kNetFSSoftMountKey isn't set, then it's set to true |
| kNetFSMountFlagsKey | "MountFlags" | One of the keys for mount options dictionary.<br>Mount flags.<br>e.g. integer with value 1 for read only. |
| kNetFSSoftMountKey | "SoftMount" | One of the keys for mount options dictionary.<br>Mount with "soft" failure semantics.<br>Pass boolean with true. |
| kNetFSUseGuestKey | "Guest" | One of the keys for open options dictionary.<br>Login as a guest user.<br>The value is a string with login name. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAccountRestricted | -5999 | Account is restricted. |
| kErrorMissingMountpoint | 2 | The mount point is missing. |
| kErrorNoAuthMethodSupported | -5997 | No supported auth method found. |
| kErrorNoProtocolVersionSupported | -5996 | No Protocol Version Supported. |
| kErrorNoSharesAvailable | -5998 | No shares available. |
| kErrorPasswordNeedsChange | -5045 | The password needs change. |
| kErrorPasswordPolicy | -5046 | Error with Password policy. |
| kErrorUserCanceled | -128 | User cancelled. |
| kNetAuthErrorAlreadyClosed | -6005 | Already closed. |
| kNetAuthErrorGuestNotSupported | -6004 | Guest login not supported. |
| kNetAuthErrorInternal | -6600 | Internal error. |
| kNetAuthErrorMountFailed | -6602 | Mount failed. |
| kNetAuthErrorNoSharesAvailable | -6003 | No shared available. |

Mount Flags

| Constant | Value | Description |
|---|---|---|
| kMountFlagsReadOnly | 1 | Mount read only. |

UIOption

| Constant | Value | Description |
|---|---|---|
| kNAUIOptionAllowUI | "AllowUI" | Allow user interface. |
| kNAUIOptionForceUI | "ForceUI" | Force user interface. |
| kNAUIOptionNoUI | "NoUI" | No user interface. |

# 83.23 class PermissionsMBS

## 83.23.1 class PermissionsMBS

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** Gives access to the current Permissions of a file.
**Example:**

```
dim p as PermissionsMBS
p=file.PermissionsMBS(false)
```

**Blog Entries**

- MBS Xojo Plugins, version 21.5pr1
- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 14.0pr1

## 83.23.2 Methods

## 83.23.3 SetPermissions(OldWay as boolean) as Integer

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** Sets the Permissions.
**Notes:** Returns -1 if function is not available.
Any other value is a Mac OS error code including 0 for success. You can use the MacErrorString function to get some details on the error code.
You may not have enough Permissions to set Permissions!

You can use old API if you set Oldway=true. Than you read access value like in older version of the plugin.
If you set Oldway = false, you use the newer API which read unix permissions, but not the old ones.
The old way is not supported for 64bit.

## 83.23.4 Properties

## 83.23.5 Access as Integer

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** The access mode for this file.
**Notes:** Only set if you use older API.

Some constants:

| | | |
|---|---|---|
| AccessOwner | &h80000000 | User is owner of directory |
| AccessBlankAccess | &h10000000 | Directory has blank access privileges |
| AccessUserWrite | &h04000000 | User has write privileges |
| AccessUserRead | &h02000000 | User has read privileges |
| AccessUserSearch | &h01000000 | User has search privileges |
| AccessEveryoneWrite | &h00040000 | Everyone has write privileges |
| AccessEveryoneRead | &h00020000 | Everyone has read privileges |
| AccessEveryoneSearch | &h00010000 | Everyone has search privileges |
| AccessGroupWrite | &h00000400 | Group has write privileges |
| AccessGroupRead | &h00000200 | Group has read privileges |
| AccessGroupSearch | &h00000100 | Group has search privileges |
| AccessOwnerWrite | &h00000004 | Owner has write privileges |
| AccessOwnerRead | &h00000002 | Owner has read privileges |
| AccessOwnerSearch | &h00000001 | Owner has search privileges |

(Read and Write property)

### 83.23.6 GroupID as Integer

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** The Group ID for this file.
**Notes:** constants:

| | |
|---|---|
| knoGroup | 0 |

(Read and Write property)

### 83.23.7 Mode as Integer

MBS MacOSX Plugin, Plugin Version: 14.0, Platform: macOS, Targets: All.

**Function:** The unix file mode.
**Notes:** Only set if you use newer API.
(Read and Write property)

### 83.23.8 UserID as Integer

MBS MacOSX Plugin, Platform: macOS, Targets: All.

**Function:** The User ID for this file.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop

MsgBox str(f.PermissionsMBS(true).UserID) // 501
```

**Notes:** e.g. User 501 is normally the first user.

constants:

| | |
|---|---|
| knoUser | 0, |
| kadministratorUser | 1 |

(Read and Write property)

## 83.24 class ResourceForkMBS

### 83.24.1 class ResourceForkMBS

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This class is for reading/writing resource forks on Mac.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
```

**Notes:** It is a replacement for ResourceFork class in Xojo which has been removed for Cocoa and Console targets in Xojo version 2012r2.

Resourcefork methods are deprecated by Apple, but work in 32 and 64-bit applications as of MBS Plugin version 19.5.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5
- MBS Xojo Plugins, version 19.5pr5
- MBS Real Studio Plugins, version 13.1pr1
- MBS Real Studio Plugins, version 13.0pr8

### 83.24.2 Methods

### 83.24.3 AddResource(Data as Memoryblock, ResourceType as String, ID as Integer, Name as String)

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a resource of the Type specified, using the Name and ID specified and fills it with the Data specified.
**Notes:** We added this method to avoid extra conversion from memoryblock to string when adding data.
See also:

- 83.24.4 AddResource(Data as String, ResourceType as String, ID as Integer, Name as String) 13797

### 83.24.4 AddResource(Data as String, ResourceType as String, ID as Integer, Name as String)

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a resource of the Type specified, using the Name and ID specified and fills it with the Data specified.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
```

See also:

- 83.24.3 AddResource(Data as Memoryblock, ResourceType as String, ID as Integer, Name as String) 13796

### 83.24.5 Close

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Closes the open resource fork.
**Notes:** The resource fork will be closed automatically when the instance is destroyed.

### 83.24.6 Constructor

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 83.24.7 Create(file as folderitem, UseDataFork as boolean = false) as ResourceForkMBS

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new ResourceFork.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)
```

```
r.AddResource "Hello World", "TEXT", 128, "just a test"
```

**Notes:** If the file has a resource fork, it is deleted first.
If the file does not exist, it is created.
Returns nil on any error.
If UseDataFork is true, the resources are read/write from data fork.

### 83.24.8 GetIndResource(ResourceType as String, index as Integer) As String

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the specified resource as a string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetIndResource("TEXT", 0)
MsgBox s
```

**Notes:** Index is zero based.

### 83.24.9 GetNamedResource(ResourceType as String, Name as String) As String

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the specified resource as a string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetNamedResource("TEXT", "just a test")
MsgBox s
```

### 83.24.10 GetResource(ResourceType as String, ID as Integer) As String

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the specified resource as a string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as string = r.GetResource("TEXT", 128)
MsgBox s
```

### 83.24.11 GetResourceMemory(ResourceType as String, ID as Integer) As Memoryblock

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the specified resource as a Memoryblock.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

dim s as MemoryBlock = r.GetResourceMemory("TEXT", 128)
MsgBox s
```

### 83.24.12 Open(file as folderitem, Write as boolean, UseDataFork as boolean = false) as ResourceForkMBS

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens the resource fork of the FolderItem.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Open(f, false)
MsgBox str(r.TypeCount)+" types in file"
```

**Notes:** If the FolderItem has no resource fork, OpenResourceFork returns Nil.
Access to the resourcefork is supported only on Macintosh.
If UseDataFork is true, the resources are read/write from data fork.

### 83.24.13 RemoveResource(ResourceType as String, ID as Integer)

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the specified resource from the resource fork.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(r.TypeCount)+" resources"
r.RemoveResource "TEXT", 128
MsgBox str(r.TypeCount)+" resources"
```

### 83.24.14 ResourceCount(ResourceType as String) as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of resources of the specified type.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceCount("TEXT")) // shows 1
```

### 83.24.15 ResourceID(ResourceType as String, index as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the resource ID as an Integer based on the Type and Index passed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)
```

```
r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceID("TEXT", 0)) // shows 128
```

**Notes:** This list is zero-based.

### 83.24.16 ResourceName(ResourceType as String, index as Integer) As String

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the resource name as a string based on the Type and the zero-based index to that type.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox r.ResourceName("TEXT", 0)
```

### 83.24.17 ResourceSizeOnDisk(ResourceType as String, ID as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the size on disk for a given resource.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(r.ResourceSizeOnDisk("TEXT", 128))+" bytes"
```

### 83.24.18 ResourceType(index as Integer) As String

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the resource type as a string based on the Index passed.

**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox r.ResourceType(0)
```

**Notes:** This list is zero-based.

### 83.24.19 UniqueID(ResourceType as String) as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds an unique ID for a given resource type.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

MsgBox str(R.UniqueID("TEXT"))
```

### 83.24.20 Properties

### 83.24.21 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle to the resource fork.
**Notes:** (Read only property)

### 83.24.22 LastError as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Open(f, false) // open read only
```

```
r.AddResource "Hello World", "TEXT", 128, "just a test"
MsgBox str(R.LastError) // shows -61, write permission error
```

**Notes:** All methods set this property.
(Read and Write property)

### 83.24.23 Modified as Boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the resource fork has been modified by you.
**Notes:** (Read only property)

### 83.24.24 TypeCount as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of resource types present in the resource fork.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.TypeCount) // shows 1
```

**Notes:** (Read only property)

### 83.24.25 Writable as Boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the resourcefork was opened writable.
**Notes:** (Read only property)

### 83.24.26 ResourceAttributes(ResourceType as String, ID as Integer) as Integer

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get or set all resource attributes together.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rsrc")
dim r as ResourceForkMBS = ResourceForkMBS.Create(f)

r.AddResource "Hello World", "TEXT", 128, "just a test"

MsgBox str(r.ResourceAttributes("TEXT", 128))
// shows 2 which means it has been changed and need to be written to disk soon
```

**Notes:** (Read and Write computed property)

### 83.24.27 ResourceLocked(ResourceType as String, ID as Integer) as boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Used to get and set the locked attribute of the resource.
**Notes:** (Read and Write computed property)

### 83.24.28 ResourcePreload(ResourceType as String, ID as Integer) as boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Used to get and set the Preload attribute of the resource.
**Notes:** (Read and Write computed property)

### 83.24.29 ResourceProtected(ResourceType as String, ID as Integer) as boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Used to get and set the Protected attribute of the resource.
**Notes:** (Read and Write computed property)

### 83.24.30 ResourcePurgeable(ResourceType as String, ID as Integer) as boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Used to get and set the Purgeable attribute of the resource.
**Notes:** (Read and Write computed property)

### 83.24.31 ResourceSysHeap(ResourceType as String, ID as Integer) as boolean

MBS MacClassic Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Used to get and set the SysHeap attribute of the resource.
**Notes:** (Read and Write computed property)

## 83.25 class ResStreamMBS

### 83.25.1 class ResStreamMBS

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Alows you to access a ressourcefork in its binary representation.
**Notes:** Useful to copy the resourcefork faster from one file to another.
Subclass of the LargeBinaryStreamMBS class.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

## 83.26 class StdinMBS

### 83.26.1 class StdinMBS

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to read from stdin.
**Example:**

```
dim s as new StdoutMBS
dim r as new StdinMBS
dim v,n as Integer

s.Write "Integer: "
n=r.ReadInteger(v)

print "integer read: "+str(v)
print "integer count: "+str(n)

dim d as Double

s.Write "Double: "
n=r.ReadDouble(d)

print "double read: "+str(d)
print "double count: "+str(n)

dim t as string

s.Write "String: "
n=r.ReadString(t)

print "string read: "+t
print "string count: "+str(n)

do
s.Write "Character (type a and return to end): "
n=r.GetCharacter

print "got character: "+str(n)
loop until n=65 or n=97
```

**Blog Entries**

- MBS Xojo Plugins, version 20.5pr2

- Console and GUI in one project
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr6
- MBS Real Studio Plugins, version 12.5pr8
- MBS Real Studio Plugins, version 12.3pr4

### 83.26.2 Methods

### 83.26.3 AttachConsole(ProcessID as Integer = -1) as Integer

MBS Util Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attaches the calling process to the console of the specified process.
**Notes:** ProcessId: The identifier of the process whose console is to be used. This parameter can be one of the following values.

| Value | Meaning |
|---|---|
| pid | Use the console of the specified process. |
| -1 | Use the console of the parent of the current process. |

Returns Windows error code or zero for success.

A process can be attached to at most one console. If the calling process is already attached to a console, the error code returned is ERROR_ACCESS_DENIED (5). If the specified process does not have a console, the error code returned is ERROR_INVALID_HANDLE (6). If the specified process does not exist, the error code returned is ERROR_GEN_FAILURE (31).

### 83.26.4 Flush

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Flushes input.

### 83.26.5 FreeConsole as Integer

MBS Util Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Detaches the calling process from its console.
**Notes:** Returns Windows error code or zero for success.

A process can be attached to at most one console. If the calling process is not already attached to a console, the error code returned is ERROR_INVALID_PARAMETER (87).
A process can use the FreeConsole function to detach itself from its console. If other processes share the console, the console is not destroyed, but the process that called FreeConsole cannot refer to it. A console is closed when the last process attached to it terminates or calls FreeConsole. After a process calls FreeConsole, it can call the AllocConsole function to create a new console or AttachConsole to attach to another console.

### 83.26.6 GetCharacter as Integer

MBS Util Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Reads in one character and returns the ASCII code.
**Notes:** Returns one if a value was read and 0 if not.

### 83.26.7 Read(count as Integer) as string

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from stdin.
**Notes:** Data is returned in binary encoding.

### 83.26.8 ReadDouble(byref value as Double) as Integer

MBS Util Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads a double from the console.
**Notes:** Returns one if a value was read and 0 if not.

### 83.26.9 ReadInteger(byref value as Integer) as Integer

MBS Util Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads an integer from the console.
**Notes:** Returns one if a value was read and 0 if not.

### 83.26.10 ReadString(byref value as string) as Integer

MBS Util Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads a string from the console.
**Notes:** This string is limited to 4095 characters.
Returns one if a value was read and 0 if not.

### 83.26.11 Properties

### 83.26.12 Echo as Boolean

MBS Util Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables/disables echo for stdin.
**Example:**

```
// try this on Mac/Linux GUI/Console app with the app launched from Terminal,
// or in console app on Windows launched from command prompt

dim s as new StdoutMBS

s.Write "Hello World"+chr(10)

dim t as string
dim n as integer = StdinMBS.ReadString(t)
s.Write chr(10)
s.Write "Read with echo: "+t+chr(10)

StdinMBS.Echo = false

n = StdinMBS.ReadString(t)
s.Write chr(10)
s.Write "Read without echo: "+t+chr(10)

StdinMBS.Echo = true
```

**Notes:** You can disable echo for password input.
By default it is enabled.
(Read and Write property)

### 83.26.13 IsReady as boolean

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Checks whether there is data waiting in input buffer to be read.
**Example:**

```
Dim d As New date

Do
// print time if second changed
Dim e As New date
If e.Second <>d.Second Then
Print e.LongTime
d = e
End If

// if ready, read a key
If StdinMBS.IsReady Then
Dim s As String
Dim l As Integer = StdinMBS.ReadString(s)
Print "Input "+Str(l)+": "+s
End If
Loop
```

**Notes:** If IsReady returns false and you would call ReadString method, the app could be blocked until user types something on console.
Added Windows support in version 20.5. We return true, if there is a return in the input buffer, so you can call Read() functions.
(Read only property)

## 83.27 class StdoutMBS

### 83.27.1 class StdoutMBS

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to write to stdout.
**Example:**

```
dim s as new StdoutMBS
dim r as new StdinMBS
dim v,n as Integer

s.Write "Integer: "
n=r.ReadInteger(v)

print "integer read: "+str(v)
print "integer count: "+str(n)

dim d as Double

s.Write "Double: "
n=r.ReadDouble(d)

print "double read: "+str(d)
print "double count: "+str(n)

dim t as string

s.Write "String: "
n=r.ReadString(t)

print "string read: "+t
print "string count: "+str(n)

do
s.Write "Character (type a and return to end): "
n=r.GetCharacter

print "got character: "+str(n)
loop until n=65 or n=97
```

**Blog Entries**

- Console and GUI in one project

- Tip of the day: Console support in GUI app
- MBS Real Studio Plugins, version 12.5pr8
- Tip of the day: Mac Shell Scripting

### 83.27.2 Methods

### 83.27.3 AttachConsole(ProcessID as Integer = -1) as Integer

MBS Util Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attaches the calling process to the console of the specified process.
**Notes:** ProcessId: The identifier of the process whose console is to be used. This parameter can be one of the following values.

| Value | Meaning |
|---|---|
| pid | Use the console of the specified process. |
| -1 | Use the console of the parent of the current process. |

Returns Windows error code or zero for success.

A process can be attached to at most one console. If the calling process is already attached to a console, the error code returned is ERROR_ACCESS_DENIED (5). If the specified process does not have a console, the error code returned is ERROR_INVALID_HANDLE (6). If the specified process does not exist, the error code returned is ERROR_GEN_FAILURE (31).

### 83.27.4 Flush

MBS Util Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Makes sure that all data written using Write is already on the console.

### 83.27.5 FreeConsole as Integer

MBS Util Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Detaches the calling process from its console.
**Notes:** Returns Windows error code or zero for success.

A process can be attached to at most one console. If the calling process is not already attached to a console, the error code returned is ERROR_INVALID_PARAMETER (87).
A process can use the FreeConsole function to detach itself from its console. If other processes share the console, the console is not destroyed, but the process that called FreeConsole cannot refer to it. A console is closed when the last process attached to it terminates or calls FreeConsole. After a process calls FreeConsole, it can call the AllocConsole function to create a new console or AttachConsole to attach to another console.

### 83.27.6 Write(data as string)

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes data to stdout.
**Notes:** You have to make sure your data is in good text encoding.

# 83.28 class VolumeInformationMBS

## 83.28.1 class VolumeInformationMBS

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Detailed information on Mac volumes.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.1pr3
- MBS Xojo / Real Studio Plugins, version 15.4pr3

**Xojo Developer Magazine**

- 2.1, page 42: Details about disks, Getting the name, the size, and more information about a disc. by Christian Schmitz

## 83.28.2 Methods

## 83.28.3 Constructor

MBS MacClassic Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 83.28.4 Properties

## 83.28.5 Blocksize as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The size of an allocation block, in bytes.
**Notes:** This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

## 83.28.6 DataForkClumpSize as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Default data fork clump size.
**Notes:** When a fork is automatically grown as it is written, the File Manager attempts to allocate space that is a multiple of the clump size. This field is zero for volume formats that don't support the notion of a clump size.
(Read only property)

### 83.28.7 DefaultVolume as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Is this the default volume?
**Notes:** Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

### 83.28.8 DriveNumber as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The drive number for the drive (drive queue element) associated with the volume.
**Notes:** (Read only property)

### 83.28.9 DriverRefNum as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The driver reference number for the drive (drive queue element) associated with the volume.
**Notes:** (Read only property)

### 83.28.10 FileCount as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The total number of files on the volume, or 0 if unknown.
**Notes:** (Read only property)

### 83.28.11 FilesOpen as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Are there files open on this volume?
**Notes:** For the boot volume false!?
Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

### 83.28.12 FileSystemID as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Identifies the filesystem implementation that is handling the volume; this is zero for HFS and HFS Plus volumes.
**Notes:** (Read only property)

### 83.28.13 FolderCount as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The total number of folders on the volume, or 0 if unknown. Note that no root directory counts.
**Notes:** (Read only property)

### 83.28.14 freeBlocks as Int64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The number of unused allocation blocks on the volume.
**Notes:** This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

### 83.28.15 Freebytes as Int64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The number of bytes of free space on the volume.
**Notes:** On Mac OS versions before 9.0, this returns never a number bigger than 2 GBytes, even if the disc is bigger.
(Read only property)

### 83.28.16 HardwareLocked as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** is the volume locked by hardware?
**Notes:** Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

### 83.28.17 LimitedInformation as boolean

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** True if some properties are not filled.
**Notes:** Not all values are supported on Mac OS 8.6
(Read only property)

### 83.28.18 Name as String

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The name of the volume.
**Notes:** The name is returned in 16bit Unicode.
RB 4.5 should know how to handle that.
(Read only property)

### 83.28.19 NextAllocation as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** A hint for where to start searching for free space during an allocation.
**Notes:** This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

### 83.28.20 NextCatalogID as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The next unused catalog node ID.
**Notes:** Some volume formats (such as HFS and HFS Plus) use a monotonically increasing number for the catalog node ID (i.e. File ID or Directory ID) of newly created files and directories. For those volume

formats, the nextCatalogID is the next file/directory ID that will be assigned. For other volume formats, this field will be zero.
(Read only property)

### 83.28.21 ResourceForkClumpSize as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** Default resource fork clump size.
**Notes:** When a fork is automatically grown as it is written, the File Manager attempts to allocate space that is a multiple of the clump size. This field is zero for volume formats that don't support the notion of a clump size.
(Read only property)

### 83.28.22 Root as FolderItem

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** A folderitem to the root of this volume.
**Notes:** Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

### 83.28.23 RootFSRef as memoryblock

MBS MacClassic Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The root folderitem as FSRef packed into a memoryblock.
**Notes:** (Read only property)

### 83.28.24 Signature as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** This field is used to distinguish between volume formats supported by a single filesystem implementation.
**Notes:** Example values:

(Read only property)

| | | |
|---|---|---|
| HFS | &h4244 | "BD" |
| HFS+ | &h482B | "H+" |

### 83.28.25 SoftwareLocked as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** is the volume locked by software?
**Notes:** Not supported if LimitedInformation is false.
(This property requires Mac OS 9 or newer)
(Read only property)

### 83.28.26 Totalblocks as Int64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The total number of allocation blocks on the volume.
**Notes:** This field is only appropriate for volume formats (such as HFS and HFS Plus) that allocate space in fixed-size pieces; other volume formats may not have a similar concept, and may set this field to zero.
(Read only property)

### 83.28.27 Totalbytes as Int64

MBS MacClassic Plugin, Platform: macOS, Targets: All.

**Function:** The size of the volume in bytes.
**Notes:** On Mac OS versions before 9.0, this returns never a number bigger than 2 GBytes, even if the disc is bigger.
(Read only property)

# 83.29 class WindowsDiskChangeMBS

## 83.29.1 class WindowsDiskChangeMBS

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to get events for media or devices being added/inserted or removed.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.1pr10

## 83.29.2 Methods

## 83.29.3 Constructor

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 83.29.4 Properties

## 83.29.5 Valid as Boolean

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the constructor registered the events successfully.
**Notes:** (Read and Write property)

## 83.29.6 Events

## 83.29.7 DriveAdded(Path as string)

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: .

**Function:** The event to notify you about drive being added.

## 83.29.8 DriveRemoved(Path as string)

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: .

**Function:** The event to notify you about drive being removed.

### 83.29.9 MediaInserted(Path as string)

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: .

**Function:** The event to notify you about media being added.

### 83.29.10 MediaRemoved(Path as string)

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: .

**Function:** The event to notify you about media being removed.
**Notes:** You may get the event multiple times.

# 83.30 class WindowsDriveNotificationMBS

## 83.30.1 class WindowsDriveNotificationMBS

MBS Win Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to detect devices being mounted/unmounted in Windows.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 14.5pr1

## 83.30.2 Events

## 83.30.3 DeviceArrival(Path as string)

MBS Win Plugin, Plugin Version: 15.0, Platform: Windows, Targets: .

**Function:** A device arrived.
**Notes:** Path my be path to USB device or path to mount point. For USB sticks you get both.

## 83.30.4 DeviceRemoved(Path as string)

MBS Win Plugin, Plugin Version: 15.0, Platform: Windows, Targets: .

**Function:** A device was removed.
**Notes:** Path my be path to USB device or path to mount point. For USB sticks you get both.

## 83.31 module WindowsJunctionMBS

### 83.31.1 module WindowsJunctionMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This module implements various functions for links.
**Notes:** Symbol links (link files), Hard links (several directory entries for one file on disc) and junctions (show content of one folder inside another folder).

Some operations needs Administrator permissions.
Check lasterror in case of trouble.
Error 1314 for example is permissions problem.

See also WindowsShortCutMBS and WindowsInternetShortCutMBS classes.
For Mac see also CFBookmarkMBS and MacAliasMBS classes.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr7
- MBS Real Studio Plugins, version 11.3pr14

### 83.31.2 Methods

### 83.31.3 CreateHardLink(NewFile as folderitem, TargetFile as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Establishes a hard link between an existing file and a new file.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.exe")
dim nfile as FolderItem = SpecialFolder.Desktop.Child("hello.exe")

if WindowsJunctionMBS.CreateHardLink(nfile, file) then
MsgBox "OK"
end if
```

**Notes:** This function is only supported on the NTFS file system, and only for files, not directories.

NewFile: The name of the new file. Function fails if NewFile exists already. This parameter cannot specify the name of a directory.

TargetFile: The name of the existing file. This parameter cannot specify the name of a directory.

Returns true on success. Lasterror is set.

The maximum number of hard links that can be created with this function is 1023 per file. If more than 1023 links are created for a file, an error results.

Any directory entry for a file that is created with CreateFile or CreateHardLink is a hard link to an associated file. An additional hard link that is created with the CreateHardLink function allows you to have multiple directory entries for a file, that is, multiple hard links to the same file, which can be different names in the same directory, or the same or different names in different directories. However, all hard links to a file must be on the same volume.
Because hard links are only directory entries for a file, many changes to that file are instantly visible to applications that access it through the hard links that reference it. However, the directory entry size and attribute information is updated only for the link through which the change was made.
The security descriptor belongs to the file to which a hard link points. The link itself is only a directory entry, and does not have a security descriptor. Therefore, when you change the security descriptor of a hard link, you a change the security descriptor of the underlying file, and all hard links that point to the file allow the newly specified access. You cannot give a file different security descriptors on a per-hard-link basis.

Use DeleteFile to delete hard links (folderitem.delete in Xojo). You can delete them in any order regardless of the order in which they are created.
Flags, attributes, access, and sharing that are specified in CreateFile operate on a per-file basis. That is, if you open a file that does not allow sharing, another application cannot share the file by creating a new hard link to the file.
When you create a hard link on the NTFS file system, the file attribute information in the directory entry is refreshed only when the file is opened, or when GetFileInformationByHandle is called with the handle of a specific file.
Symbolic link behavior—If the path points to a symbolic link, the function creates a hard link to the target.

Lasterror is set. Returns true on success.

### 83.31.4 CreateJunction(JunctionDir as folderitem, TargetDir as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new junction.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test")
dim nfile as FolderItem = SpecialFolder.System
```

```
if WindowsJunctionMBS.CreateJunction(file, nfile) then
MsgBox "OK"
end if
```

**Notes:** Lasterror is set. Returns true on success.

### 83.31.5 CreateSymbolicLink(NewFile as folderitem, TargetFile as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a symbolic link.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.lnk")
dim nfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")

if WindowsJunctionMBS.CreateSymbolicLink(file,nfile) then
MsgBox "Ok"
end if
```

**Notes:** NewFile: The symbolic link to be created.
TargetFile: The name of the target for the symbolic link to be created. If TargetFile has a device name associated with it, the link is treated as an absolute link; otherwise, the link is treated as a relative link.
TargetIsDirectory: Indicates whether the link target, TargetFile, is a directory. (Pass true for a directory).

Returns true on success. False on failure. Lasterror is set.

If the function fails, the return value is zero. To get extended error information, call GetLastError.

Symbolic links can either be absolute or relative links. Absolute links are links that specify each portion of the path name; relative links are determined relative to where relative–link specifiers are in a specified path. Relative links are specified using the following conventions:

- Dot (. and ..) conventions—for example, "..\" resolves the path relative to the parent directory.
- Names with no slashes (\)—for example, "tmp" resolves the path relative to the current directory.
- Root relative—for example, "\Windows\System32" resolves to "current drive:\Windows\System32".
- Current working directory–relative—for example, if the current working directory is C:\Windows\System32, "C:File.txt" resolves to "C:\Windows\System32\File.txt".

If you specify a current working directory–relative link, it is created as an absolute link, due to the way the current working directory is processed based on the user and the thread.

This function can fail due to missing permissions.
See also:

- 83.31.6 CreateSymbolicLink(NewFile as folderitem, TargetFile as string, TargetIsDirectory as Boolean) as boolean 13827

### 83.31.6 CreateSymbolicLink(NewFile as folderitem, TargetFile as string, TargetIsDirectory as Boolean) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a symbolic link.
**Notes:** NewFile: The symbolic link to be created.
TargetFile: The name of the target for the symbolic link to be created. If TargetFile has a device name associated with it, the link is treated as an absolute link; otherwise, the link is treated as a relative link.
TargetIsDirectory: Indicates whether the link target, TargetFile, is a directory. (Pass true for a directory).

Returns true on success. False on failure. Lasterror is set.

If the function fails, the return value is zero. To get extended error information, call GetLastError.

Symbolic links can either be absolute or relative links. Absolute links are links that specify each portion of the path name; relative links are determined relative to where relative–link specifiers are in a specified path. Relative links are specified using the following conventions:

- Dot (. and ..) conventions—for example, "..\" resolves the path relative to the parent directory.
- Names with no slashes (\)—for example, "tmp" resolves the path relative to the current directory.
- Root relative—for example, "\Windows\System32" resolves to "current drive:\Windows\System32".
- Current working directory–relative—for example, if the current working directory is C:\Windows\System32, "C:File.txt" resolves to "C:\Windows\System32\File.txt".

If you specify a current working directory–relative link, it is created as an absolute link, due to the way the current working directory is processed based on the user and the thread.

This function can fail due to missing permissions.
See also:

- 83.31.5 CreateSymbolicLink(NewFile as folderitem, TargetFile as folderitem) as boolean 13826

### 83.31.7 DeleteJunction(JunctionDir as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes the junction.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test")

if WindowsJunctionMBS.DeleteJunction(file) then
MsgBox "Ok"
end if
```

**Notes:** Folder is not deleted.

### 83.31.8 GetJunctionTarget(JunctionDir as folderitem) as string

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether a directory is a directory junction.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test")

msgbox WindowsJunctionMBS.GetJunctionTarget(file)
```

**Notes:** Lasterror is set. Returns path of junction target.

### 83.31.9 HardLinksForFile(path as string) as string()

MBS Win Plugin, Plugin Version: 19.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds all the hard links to the specified file.
**Example:**

```
dim path as string = "C:\Users\Christian\Desktop\test.xojo_binary_project"

dim oldfile as FolderItem = GetFolderItem(path, FolderItem.PathTypeNative)
dim newfile as FolderItem = GetFolderItem(path+".copy", FolderItem.PathTypeNative)

call WindowsJunctionMBS.CreateHardLink(newfile, oldfile)

dim paths() as string = WindowsJunctionMBS.HardLinksForFile(path)
```

MsgBox Join(paths, EndOfLine)

**Notes:** Path: The name of the file.

Array has only one entry if file has no other hard links.

### 83.31.10 IsDirectoryJunction(JunctionDir as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether a directory is a directory junction.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test")

if WindowsJunctionMBS.IsDirectoryJunction(file) then
MsgBox "Is junction."
else
MsgBox "Is no junction."
end if
```

**Notes:** Returns true if this file is a junction.
Lasterror is set.

### 83.31.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the last error code.
**Notes:** Value is 0 for no error
-1 for some parameter error or not implemented inside plugin.
other values are windows error codes.

## 83.32 class WindowsVolumeInformationMBS

### 83.32.1 class WindowsVolumeInformationMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Detailed information on Windows volumes.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr1

### 83.32.2 Methods

### 83.32.3 Constructor

MBS Win Plugin, Plugin Version: 5.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A dummy constructor used only for automatic plugin testing.
**Notes:** Uses "C:" as path and does the same as the other constructor.
See also:

- 83.32.4 Constructor(path as string) 13830

### 83.32.4 Constructor(path as string)

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Fills the class with information about the given volume.
**Example:**

```
Function Window1.ToString(v as Variant) As string
return v
End Function

Sub Window1.Open
dim w as WindowsVolumeInformationMBS

w=new WindowsVolumeInformationMBS("C:\")

pname.text=w.name
pfsName.text=w.FileSystemName
pmaxLen.text=tostring(w.maxNameLength)
pcasePres.text=tostring(w.CaseIsPreserved)
pcasetiv.text=tostring(w.caseSensitive)
punicode.text=tostring(w.SupportsUnicodeFilenames)
pcompressed.text=tostring(w.IsCompressedVolume)
```

```
pfileCompress.text=tostring(w.SupportsFileCompression)
pfileEncrypt.text=tostring(w.SupportsFileEncryption)
pserial.text=hex(w.serial)
End Sub
```

**Notes:** Path must something like "C:\" or "\\MyServer\MyShare\".
See also:

- 83.32.3 Constructor 13830

### 83.32.5 Properties

### 83.32.6 CaseIsPreserved as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file system preserves the case of filenames when it places a name on disk.
**Notes:** (Read only property)

### 83.32.7 CaseSensitive as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file system supports case-sensitive filenames.
**Notes:** (Read only property)

### 83.32.8 FileSystemName as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the filesystem.
**Notes:** For example "FAT" or "NTFS".
(Read only property)

### 83.32.9 IsCompressedVolume as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The specified volume is a compressed volume; for example a DoubleSpace volume.
**Notes:** A volume is only SupportsFileCompression or IsCompressedVolume, but never both together.

(Read only property)

### 83.32.10 MaxNameLength as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum length of a file name on this volume.
**Notes:** Should be 255 on normal Windows disks.
(Read only property)

### 83.32.11 Name as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The volume name or label if the volume is named.
**Notes:** (Read only property)

### 83.32.12 Path as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The path used in the constructor.
**Notes:** (Read only property)

### 83.32.13 Serial as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The volume serial number.
**Example:**

```
dim w as WindowsVolumeInformationMBS

w=new WindowsVolumeInformationMBS("C:\")
MsgBox hex(w.Serial)
```

**Notes:** This serial is set to a random name on formatting and can be changed later using some special tools.
(Read only property)

### 83.32.14 SupportsFileCompression as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file system supports file-based compression.
**Notes:** A volume is only SupportsFileCompression or IsCompressedVolume, but never both together.
(Read only property)

### 83.32.15 SupportsFileEncryption as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file system supports the Encrypted File System (EPS).
**Notes:** (Read only property)

### 83.32.16 SupportsUnicodeFilenames as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file system supports Unicode in filenames as they appear on disk.
**Notes:** (Read only property)

### 83.32.17 Valid as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Was the constructor successfull?
**Notes:** May fail on bad file paths.
(Read only property)

# Chapter 84

# Folder Change Watching

## 84.1 class FolderChangedNotificationMBS

### 84.1.1 class FolderChangedNotificationMBS

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use FSEventsMBS instead.
**Function:** A class to receive notifications
**Notes:** It's only for Mac OS X!
And not every application does send notifications around.
Please use FSEventsMBS for getting better results. This class is deprecated.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 84.1.2 Methods

### 84.1.3 Directory as folderitem

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a folderitem for the directory observed.
**Notes:** Returns nil on any error.
Lasterror is set.

### 84.1.4 Notify(dir as folderitem)

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Notifies the system about a modification you made in the given directory.
**Notes:** Lasterror is set.

### 84.1.5 NotifyAll

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Notifies the system about a modification you made on several directories.
**Notes:** Used by installers which may change hundreds of directories.
Lasterror is set.

### 84.1.6 NotifyByPath(path as string)

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Notifies the system about a modification you made in the given directory.
**Notes:** Path should be a valid Mac OS X path.
Lasterror is set.

### 84.1.7 Subscribe(dir as folderitem)

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Subscribes the class to observe a specified directory.
**Notes:** Lasterror is set.
See also:

- 84.1.8 Subscribe(dir as folderitem, flags as Integer) 13836

### 84.1.8 Subscribe(dir as folderitem, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Subscribes the class to observe a specified directory.
**Notes:** Lasterror is set.

Constants for the flags parameter:

See also:

- 84.1.7 Subscribe(dir as folderitem) 13836

| | | |
|---|---|---|
| kFNNoImplicitAllSubscription | 1 | Specify this option if you do not want to receive notifications on this subscription when FNNotifyAll is called; by default any subscription is also implicitly a subscription to wildcard notifications. |
| kFNNotifyInBackground | 2 | Specify this option if you want to receive notifications on this subscription when your application is in background. By default notifications will be coalesced and and delivered when your application becomes foreground. |

### 84.1.9 SubscribeByPath(path as string)

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Subscribes the class to observe a specified directory.
**Notes:** Lasterror is set.
Path must be a valid Mac OS X path.
See also:

- 84.1.10 SubscribeByPath(path as string, flags as Integer) 13837

### 84.1.10 SubscribeByPath(path as string, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 4.3, Platform: macOS, Targets: Desktop only.

**Function:** Subscribes the class to observe a specified directory.
**Notes:** Lasterror is set.
Path must be a valid Mac OS X path.

Constants for the flags parameter:

| | | |
|---|---|---|
| kFNNoImplicitAllSubscription | 1 | Specify this option if you do not want to receive notifications on this subscription when FNNotifyAll is called; by default any subscription is also implicitly a subscription to wildcard notifications. |
| kFNNotifyInBackground | 2 | Specify this option if you want to receive notifications on this subscription when your application is in background. By default notifications will be coalesced and and delivered when your application becomes foreground. |

See also:

- 84.1.9 SubscribeByPath(path as string) 13837

### 84.1.11 Unsubscribe

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** Unsubscribes the current directory.
**Notes:** Lasterror is set.
This method is called for you by the destructor of the class.

### 84.1.12 Properties

### 84.1.13 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the notification object.
**Notes:** For toolbox development: It's a FNSubscriptionRef.
(Read and Write property)

### 84.1.14 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** 0 if successfull, -1 if the function is not available or parameters are bad.
Else a Mac OS error code.
(Read and Write property)

### 84.1.15 Events

### 84.1.16 DirectoryChanged(message as Integer, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Out directory changed or some directories changed.
**Notes:** An installer application may send a notification without a specified directory. In this case the event is called and the observed directory may not be changed!

message: An indication of what happened
flags: Options about delivery of the notification (typically 0)

Only one message value is defined:
const kFNDirectoryModifiedMessage = 1

## 84.2 class FSEventsMBS

### 84.2.1 class FSEventsMBS

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for the Mac OS X 10.5 feature called FSEvents which can be used to monitor a folder hierarchie for changes.
**Notes:** The text below is from the Apple documentation (With some plugin related modifications). The plugin does currently not support the device related functions, but that can be added later if you need it.

This class provides a mechanism to notify clients about directories they ought to re-scan in order to keep their internal data structures up-to-date with respect to the true state of the file system. (For example, when files or directories are created, modified, or removed.) It sends these notifications "in bulk", possibly notifying the client of changes to several directories in a single callback. By using the API, clients can notice such changes quickly, without needing to resort to recursive polling/scanning of the file system.

Much like kqueues, the FSEvents API allows an application to find near-immediately when the contents of a particular directory has changed. However, unlike kqueues, the FSEvents API allows the application to monitor the whole file system hierarchy rooted at a specified directory (and still get precise per-directory notifications) – to do this with the kqueues API would require the client to monitor each directory individually.

Clients can register interest in a chunk of the filesystem hierarchy and will receive callbacks from their runloop whenever an event occurs that modifies the filesystem therein. The callback will indicate the exact directory in which the event occurred, so the client only has to scan that directory for updated info, not all its children. Clients can supply a "latency" parameter that tells how long to wait after an event occurs before forwarding it; this reduces the volume of events and reduces the chance that the client will see an "intermediate" state, like those that arise when doing a "safe save" of a file, creating a package, or downloading a file via Safari.

The lifecycle of an FSEventStream consists of these stages:

1. new FSEventsMBS(...) ->Creates an FSEventStream.

2. Start() ->Starts receiving events and servicing them from the client's runloop(s) using the callback supplied by the client when the stream was created. If a value was supplied for the sinceWhen parameter then "historical" events will be sent via your callback first, then a HistoryDone event, then "contemporary" events will be sent on an ongoing basis (as though you had supplied kFSEventStreamEventIdSinceNow for sinceWhen).

3. Stop() ->Stops the stream, ensuring the client's callback will not be called again for this stream. After stopping the stream, it can be restarted seamlessly via Start() without missing any events.

Once the event stream has been started, the following calls can be used:

GetLatestEventId() ->Initially, this returns the sinceWhen value supplied when the stream was created; thereafter, it is updated with the highest-numbered event ID mentioned in the current batch of events just before invoking the client's callback. Clients can store this value persistently as long as they also store the UUID for the device (obtained via UUIDForDevice()). Clients can then later supply this event ID as the sinceWhen parameter to Constructor(), as long as its UUID matches what you stored. This works because the FSEvents service stores events in a persistent, per-volume database. In this regard,the stream of event IDs acts like a global, system-wide clock, but bears no relation to any particular timebase.

FlushAsync() ->Requests that the fseventsd daemon send any events it has already buffered (via the latency parameter to one of the constructors). This occurs asynchronously; clients will not have received all the callbacks by the time this call returns to them.

FlushSync() ->Requests that the fseventsd daemon send any events it has already buffered (via the latency parameter to one of the constructors). Then runs the runloop in its private mode till all events that have occurred have been reported (via the clients callback). This occurs synchronously; clients will have received all the callbacks by the time this call returns to them.

GetDeviceBeingWatched() ->Gets the dev_t value supplied when the stream was created with Constructor(), otherwise 0.

PathsBeingWatched() ->Gets the paths supplied when the stream was created with one of the constructors.

Calls that can be made without a stream:

UUIDForDevice() ->Gets a UUID that uniquely identifies the FSEvents database for that volume. If the database gets discarded then its replacement will have a different UUID so that clients will be able to detect this situation and avoid trying to use event IDs that they stored as the sinceWhen parameter to the FSEventStreamCreate...() functions.

GetCurrentEventId() ->Gets the most recently generated event ID, system-wide (not just for one stream).

GetLastEventIdForDeviceBeforeTime() ->Gets the last event ID for the given device that was returned before the given time. This is conservative in the sense that if you then use the returned event ID as the sinceWhen parameter of Constructor() that you will not miss any events that happened since that time. On the other hand, you might receive some (harmless) extra events.

PurgeEventsForDeviceUpToEventId() ->Purges old events from the persistent per-volume database maintained by the service. You can combine this with GetLastEventIdForDeviceBeforeTime(). Can only be called by the root user.

For Windows, you can use WindowsDirectoryWatcherMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr1
- MBS Xojo Plugins, version 19.2pr7
- MBS Real Studio Plugins, version 12.3pr3
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 11.3pr12
- Notes from today
- MBS Real Studio Plugins, version 11.2pr11
- MonkeyBread Software Releases the MBS Plugins 8.1

### 84.2.2 Methods

### 84.2.3 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the FSEvent functions are working.
**Example:**

```
if FSEventsMBS.Available then
MsgBox "available"
else
MsgBox "not available"
end if
```

**Notes:** True on Mac OS X 10.5 and false on other versions and operation systems.

### 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object for a particular device with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start().

deviceToWatch:
A dev_t corresponding to the device which you want to receive notifications from. Use GetDeviceID to get

such a device ID.

pathsToWatchRelativeToDevice:
A string, specifying a relative path to a directory on the device identified by the dev parameter. The path should be relative to the root of the device. For example, if a volume "MyData" is mounted at "/Volumes/MyData" and you want to watch "/Volumes/MyData/Pictures/July", specify a path string of "Pictures/July". To watch the root of a volume pass a path of "" (the empty string).

sinceWhen:
The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.

latency:
The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its event. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks.

flags:
Flags that modify the behavior of the stream being created.

On success the handle property is not 0.
See also:


- 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13842
- 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13843
- 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13845


### 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start.

paths: The folders you want to watch. (more exactly the root folders of the folder hierarchies you want to watch)
sinceWhen: The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.
latency: The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its callback. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks and greater overall efficiency.
flags: Flags that modify the behavior of the stream being created.
See also:


- 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13841
- 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13843
- 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13845


### 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start.

path: The folder you want to watch. (more exactly the root folder of the folder hierarchie you want to watch)
sinceWhen: The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.
latency: The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its callback. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks and greater overall efficiency.
flags: Flags that modify the behavior of the stream being created.
See also:


- 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13841

- 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13842
- 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13845


### 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start.

path: The folder you want to watch. (more exactly the root folder of the folder hierarchie you want to watch)
sinceWhen: The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.
latency: The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its callback. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks and greater overall efficiency.
flags: Flags that modify the behavior of the stream being created.
See also:


- 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13841
- 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13842
- 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13843
- 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13845


### 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start.

paths: The folders you want to watch. (more exactly the root folders of the folder hierarchies you want to watch)
sinceWhen: The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.
latency: The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its callback. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks and greater overall efficiency.
flags: Flags that modify the behavior of the stream being created.
See also:


- 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13841
- 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13842
- 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13843
- 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13845


### 84.2.9 Constructor(paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new FS event stream object for a particular device with the given parameters.
**Notes:** In order to start receiving callbacks you must also call Start().

deviceToWatch:
A dev_t corresponding to the device which you want to receive notifications from. Use GetDeviceID to get such a device ID.

pathsToWatchRelativeToDevice:
An array of strings, each specifying a relative path to a directory on the device identified by the dev parameter. The paths should be relative to the root of the device. For example, if a volume "MyData" is mounted at "/Volumes/MyData" and you want to watch "/Volumes/MyData/Pictures/July", specify a path string of "Pictures/July". To watch the root of a volume pass a path of "" (the empty string).

sinceWhen:
The service will supply events that have happened after the given event ID. To ask for events "since now" pass the constant kFSEventStreamEventIdSinceNow. Often, clients will supply the highest-numbered FSEventStreamEventId they have received in a callback, which they can obtain via the GetLatestEventId() accessor. Do not pass zero for sinceWhen, unless you want to receive events for every directory modified since "the beginning of time" – an unlikely scenario.

latency:
The number of seconds the service should wait after hearing about an event from the kernel before passing it along to the client via its event. Specifying a larger value may result in more effective temporal coalescing, resulting in fewer callbacks.

flags:
Flags that modify the behavior of the stream being created.

On success the handle property is not 0.
See also:


- 84.2.4 Constructor(DeviceToWatch as Integer, path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13841
- 84.2.5 Constructor(DeviceToWatch as Integer, paths() as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13842
- 84.2.6 Constructor(path as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13843
- 84.2.7 Constructor(path as string, sinceWhen as UInt64, latency as Double, flags as Integer) 13844
- 84.2.8 Constructor(paths() as folderitem, sinceWhen as UInt64, latency as Double, flags as Integer) 13844


### 84.2.10 Description as string

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a string containing the description of the stream.
**Notes:** For debugging only.

### 84.2.11 DeviceBeingWatched as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fetches the dev_t supplied when the stream was created using a Device ID.
**Notes:** Returns 0 if there was an error.

### 84.2.12 ExclusionPaths as String()

MBS MacFrameworks Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries exclusion paths.

### 84.2.13 FlushAsync as UInt64

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Flushes all events.
**Notes:** Asks the FS Events service to flush out any events that have occurred but have not yet been delivered, due to the latency parameter that was supplied when the stream was created. This flushing occurs asynchronously – do not expect the events to have already been delivered by the time this call returns. FlushAsync() can only be called after the stream has been started, via Start().

Returns The largest event id of any event ever queued for this stream, otherwise zero if no events have been queued for this stream.

### 84.2.14 FlushSync

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Flushes all events.
**Notes:** Asks the FS Events service to flush out any events that have occurred but have not yet been delivered, due to the latency parameter that was supplied when the stream was created. This flushing occurs synchronously – by the time this call returns, your callback will have been invoked for every event that had already occurred at the time you made this call. FlushSync() can only be called after the stream has been started, via Start().

### 84.2.15 GetAbsoluteTime(theDate as date) as Double

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an absolute time value based on the system time zone and the values in the date object.
**Example:**

```
dim d as new date

MsgBox str(FSEventsMBS.GetAbsoluteTime(d))
```

**Notes:** Returns 0 if the date parameter is nil or invalid.
See also:

- 84.2.16 GetAbsoluteTime(theDate as DateTime) as double 13848

### 84.2.16 GetAbsoluteTime(theDate as DateTime) as double

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an absolute time value based on the system time zone and the values in the date object.
**Notes:** Returns 0 if the date parameter is nil or invalid.
See also:

- 84.2.15 GetAbsoluteTime(theDate as date) as Double 13847

### 84.2.17 GetCurrentEventId as UInt64

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fetches the most recently generated event ID, system-wide (not just for one stream).
**Notes:** By thetime it is returned to your application even newer events may have already been generated.

### 84.2.18 GetDeviceID(volume as folderitem) as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the device ID for the volume the folderitem points to.
**Example:**

```
dim v as FolderItem

v=volume(0)

MsgBox str(FSEventsMBS.GetDeviceID(v))
```

**Notes:** Returns 0 on any error.

### 84.2.19 GetLastEventIdForDeviceBeforeTime(DeviceID as Integer, theTime as Double) as UInt64

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the last event ID for the given device that was returned before the given time.
**Example:**

```
dim d as new date

MsgBox str(FSEventsMBS.GetLastEventIdForDeviceBeforeTime(1,d.TotalSeconds))
```

**Notes:** This is conservative in the sense that if you then use the returned event ID as the sinceWhen parameter of the constructor that you will not miss any events that happened since that time. On the other hand, you might receive some (harmless) extra events. Beware: there are things that can cause this to fail to be accurate. For example, someone might change the system's clock (either backwards or forwards). Or an external drive might be used on different systems without perfectly synchronized clocks.

### 84.2.20 GetLatestEventId as UInt64

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fetches the sinceWhen property of the stream.
**Notes:** Upon receiving an event (and just before invoking the client's callback) this attribute is updated to the highest-numbered event ID mentioned in the event.

### 84.2.21 kFSEventStreamEventIdSinceNow as UInt64

MBS MacFrameworks Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A special value to pass in if you mean the event ID for now.
**Notes:** Returns &hFFFFFFFFFFFFFFFF.

### 84.2.22 PathsBeingWatched as String()

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with the paths being watched.
**Notes:** Works only on the RB Versions which support arry creation in plugins.

### 84.2.23 PurgeEventsForDeviceUpToEventId(DeviceID as Integer, EventID as UInt64) as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Purges old events from the persistent per-volume database maintained by the service.
**Notes:** Can only be called by the root user.

### 84.2.24 SetExclusionPaths(paths() as String) as boolean

MBS MacFrameworks Plugin, Plugin Version: 16.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the exclusion paths.
**Notes:** Sets directories to be filtered from the EventStream.
A maximum of 8 directories maybe specified.

Requires OS X 10.9 or newer.
Returns true on success or false on failure.

### 84.2.25 Show

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Prints a description of the supplied stream to stderr.
**Notes:** For debugging only.

### 84.2.26 Start as boolean

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to register with the FS Events service to receive events per the parameters in the stream.
**Notes:** Once started, the stream can be stopped via Stop().

Returns true if it succeeds, otherwise False if it fails. It ought to always succeed, but in the event it does not then your code should fall back to performing recursive scans of the directories of interest as appropriate.

### 84.2.27 Stop

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unregisters with the FS Events service.
**Notes:** The client callback will not be called for this stream while it is stopped. Stop() can only be called if the stream has been started, via Start(). Once stopped, the stream can be restarted via Start(), at which

point it will resume receiving events from where it left off ("sinceWhen").

### 84.2.28 UUIDForDevice(DeviceID as Integer) as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the UUID associated with a device, or nil if not possible (for example, on read-only device).
**Notes:** A (non-nil) UUID uniquely identifies a given stream of FSEvents. If this (non-nil) UUID is different than one that you stored from a previous run then the event stream is different (for example, because FSEvents were purged, because the disk was erased, or because the event ID counter wrapped around back to zero). A nil return value indicates that "historical" events are not available, i.e., you should not supply a "sinceWhen" value to the constructor other than kFSEventStreamEventIdSinceNow.

### 84.2.29 Properties

### 84.2.30 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal stream handle used.
**Notes:** (Read only property)

### 84.2.31 Running as Boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this object has been started.
**Notes:** This is set to true when you call Start and set to false when you call Stop.
(Read only property)

### 84.2.32 Events

### 84.2.33 Callback(index as Integer, count as Integer, path as string, flags as Integer, eventID as UInt64)

MBS MacFrameworks Plugin, Plugin Version: 8.1, Platform: macOS, Targets: .

**Function:** The callback received when something changed.
**Notes:** The plugin receives count events. This event is called count times with index going from 0 to count-1.

Path is the unix file path for the folder. A path might be "/" if either of these flags is set for the event: kFSEventStreamEventFlagUserDropped, kFSEventStreamEventFlagKernelDropped.
Flags: Flags to specify why the event was called. If no flags are set, then there was some change in the directory at the specific path supplied in this event.
eventID: The event ID for this change. Each event ID comes from the most recent event being reported in the corresponding directory named in the path parameter. Event IDs all come from a single global source. They are guaranteed to always be increasing, usually in leaps and bounds, even across system reboots and moving drives from one machine to another. Just before invoking your callback your stream is updated so that calling the accessor GetLatestEventId() will return the largest of the values passed in the eventIds parameter; if you were to stop processing events from this stream after this callback and resume processing them later from a newly-created FSEventStream, this is the value you would pass for the sinceWhen parameter to constructor.

### 84.2.34 Constants

Creation Flags

| Constant | Value | Description |
|---|---|---|
| kFSEventStreamCreateFlagFileEvents | 16 | Request file-level notifications. Your stream will receive events abo files in the hierarchy you're watching instead of only receiving d notifications. Use this flag with care as it will generate significantl than without it.<br>Available in Mac OS X 10.7 or newer. |
| kFSEventStreamCreateFlagIgnoreSelf | 8 | Don't send events that were triggered by the current process. Thi reducing the volume of events that are sent. It is only useful if might modify the file system hierarchy beneath the path(s) bein Note: this has no effect on historical events, i.e., those delivere HistoryDone sentinel event.<br>Available in Mac OS X 10.7 or newer. |
| kFSEventStreamCreateFlagMarkSelf | 32 | Tag events that were triggered by the current process with the flag. This is only useful if your process might modify the file syst beneath the path(s) being monitored and you wish to know whic triggered by your process. Note: this has no effect on historica those delivered before the HistoryDone sentinel event. |
| kFSEventStreamCreateFlagNoDefer | 2 | Affects the meaning of the latency parameter. If you specify this than latency seconds have elapsed since the last event, your app w event immediately. The delivery of the event resets the latency t further events will be delivered after latency seconds have elapsed useful for apps that are interactive and want to react immediate but avoid getting swamped by notifications when changes are occu succession. If you do not specify this flag, then when an event a period of no events, the latency timer is started. Any even during the next latency seconds will be delivered as one group (i first event). The delivery of the group of events resets the laten any further events will be delivered after latency seconds. This behavior and is more appropriate for background, daemon or bat apps. |
| kFSEventStreamCreateFlagNone | 0 | |
| kFSEventStreamCreateFlagUseCFTypes | 1 | The plugin uses this one internally. |
| kFSEventStreamCreateFlagUseExtendedData | 64 | Requires kFSEventStreamCreateFlagUseCFTypes and instructs t to invoke your callback function with CF types but, instead a CFArrayMBS of CFStringMBSs, a CFArrayMBS of CFDic is passed. Each dictionary will contain the event path and p "extended data" about the event. See the kFSEventStreamEv Data*Key definitions for the set of keys that may be set in the d For macOS 10.13 or newer. |
| kFSEventStreamCreateFlagWatchRoot | 4 | Request notifications of changes along the path to the path(s) ing. For example, with this flag, if you watch "/foo/bar" and it i "/foo/bar.old", you would receive a RootChanged event. The sa the directory "/foo" were renamed. The event you receive is a the path for the event is the original path you specified, the entStreamEventFlagRootChanged is set and event ID is zero. events are useful to indicate that you should rescan a particular cause it changed completely (as opposed to the things inside of If you want to track the current location of a directory, it is bes directory before creating the stream so that you have a file descrip can issue an F_GETPATH fcntl() to find the current path. |

Event flags.

| Constant | Value | Description |
|---|---|---|
| kFSEventStreamEventFlagEventIdsWrapped | 8 | If kFSEventStreamEventFlagEventIdsWrapped is set, it means the ID counter wrapped around. As a result, previously-issued event longer valid arguments for the sinceWhen parameter of the constr |
| kFSEventStreamEventFlagHistoryDone | 16 | Denotes a sentinel event sent to mark the end of the "historical" as a result of specifying a sinceWhen value in the constructor call this event stream. (It will not be sent if kFSEventStreamEven was passed for sinceWhen.) After invoking the client's callback "historical" events that occurred before now, the client's callbac voked with an event where the kFSEventStreamEventFlagHistory set. The client should ignore the path supplied in this callback. |
| kFSEventStreamEventFlagKernelDropped | 4 | The kFSEventStreamEventFlagUserDropped or kFSEventStream ernelDropped flags may be set in addition to the kFSEventStrea MustScanSubDirs flag to indicate that a problem occurred in b events (the particular flag set indicates where the problem occurr the client must do a full scan of any directories (and their subdirec sively) being monitored by this stream. If you asked to monitor m with this stream then you will be notified about all of them. You only check for the kFSEventStreamEventFlagMustScanSubDirs fla (if present) only provide information to help you diagnose the pro |
| kFSEventStreamEventFlagMount | 64 | Denotes a special event sent when a volume is mounted. The event is the path to the newly-mounted volume. You will receive notifications for every volume mount event inside the kernel (inc DiskArbitration). Beware that a newly-mounted volume could con trarily large directory hierarchy. Avoid pitfalls like triggering a re of a non-local filesystem, which you can detect by checking for th the MNT_LOCAL flag in the f_flags returned by statfs(). Also the MNT_DONTBROWSE flag that is set for volumes which sh displayed by user interface elements. |
| kFSEventStreamEventFlagMustScanSubDirs | 1 | Your application must rescan not just the directory given in the e its children, recursively. This can happen if there was a problem wh were coalesced hierarchically. For example, an event in /Users/js and an event in /Users/jsmith/Pictures might be coalesced into a this flag set and path=/Users/jsmith. If this flag is set you ma get an idea of whether the bottleneck happened in the kernel (less your client (more likely) by checking for the presence of the inform kFSEventStreamEventFlagUserDropped or kFSEventStreamEven Dropped. |
| kFSEventStreamEventFlagNone | 0 | |
| kFSEventStreamEventFlagRootChanged | 32 | Denotes a special event sent when there is a change to one of th along the path to one of the directories you asked to watch. Whe set, the event ID is zero and the path corresponds to one of the pat to watch (specifically, the one that changed). The path may no because it or one of its parents was deleted or renamed. Events with will only be sent if you passed the flag kFSEventStreamCreateFla to the constructor when you created the stream. |
| kFSEventStreamEventFlagUnmount | 128 | Denotes a special event sent when a volume is unmounted. The event is the path to the directory from which the volume was You will receive one of these notifications for every volume un inside the kernel. This is not a substitute for the notifications the DiskArbitration framework; you only get notified after the u occurred. Beware that unmounting a volume could uncover an arb directory hierarchy, although Mac OS X never does that. |
| kFSEventStreamEventFlagUserDropped | 2 | The kFSEventStreamEventFlagUserDropped or kFSEventStream ernelDropped flags may be set in addition to the kFSEventStrea MustScanSubDirs flag to indicate that a problem occurred in b events (the particular flag set indicates where the problem occurr the client must do a full scan of any directories (and their subdirec sively) being monitored by this stream. If you asked to monitor m |

File Event Flags

| Constant | Value | Description |
|---|---|---|
| kFSEventStreamEventFlagItemChangeOwner | &h00004000 | File changed owner. |
| kFSEventStreamEventFlagItemCloned | &h00400000 | The file system object at the specific path supplied in th was cloned. (This flag is only ever set if you specified the FileEvents fl stream.) |
| kFSEventStreamEventFlagItemCreated | &h00000100 | File created. |
| kFSEventStreamEventFlagItemFinderInfoMod | &h00002000 | File meta data in Finder info have changed. |
| kFSEventStreamEventFlagItemInodeMetaMod | &h00000400 | File meta data in inode have changed. |
| kFSEventStreamEventFlagItemIsDir | &h00020000 | File is a folder. |
| kFSEventStreamEventFlagItemIsFile | &h00010000 | File is a regular file. |
| kFSEventStreamEventFlagItemIsHardlink | &h00100000 | Indicates the object at the specified path supplied in this (This flag is only ever set if you specified the FileEvents fl stream.) |
| kFSEventStreamEventFlagItemIsLastHardlink | &h00200000 | Indicates the object at the specific path supplied in this ev link. (This flag is only ever set if you specified the FileEvents fl stream.) |
| kFSEventStreamEventFlagItemIsSymlink | &h00040000 | File is a symlink. |
| kFSEventStreamEventFlagItemModified | &h00001000 | File modified. |
| kFSEventStreamEventFlagItemRemoved | &h00000200 | File deleted. |
| kFSEventStreamEventFlagItemRenamed | &h00000800 | File renamed. |
| kFSEventStreamEventFlagItemXattrMod | &h00008000 | Extended attributes changed. |
| kFSEventStreamEventFlagOwnEvent | &h00080000 | Indicates the event was triggered by the current process. (This flag is only ever set if you specified the MarkSelf fl stream.) |

## 84.3 class WindowsDirectoryChangeMBS

### 84.3.1 class WindowsDirectoryChangeMBS

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for directory change information.
**Notes:** For Mac, you can use FSEventsMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 84.3.2 Properties

### 84.3.3 Action as Integer

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The type of change that has occurred.
**Notes:** See kAction constants.
(Read and Write property)

### 84.3.4 Filename as String

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file path.
**Notes:** For speed reasons we give you string, not folderitem.
(Read and Write property)

### 84.3.5 Constants

Type Change Constants

| Constant | Value | Description |
|---|---|---|
| kActionAdded | 1 | The file was added to the directory. |
| kActionModified | 3 | The file was modified. This can be a change in the time stamp or attributes. |
| kActionRemoved | 2 | The file was removed from the directory. |
| kActionRenamedNewName | 5 | The file was renamed and this is the new name. |
| kActionRenamedOldName | 4 | The file was renamed and this is the old name. |

## 84.4 class WindowsDirectoryWatcherMBS

### 84.4.1 class WindowsDirectoryWatcherMBS

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for watching folders on Windows for changes.
**Notes:** Create an object, add a few directories you want to watch and wait for changes being reported by NextChange method.
**Blog Entries**

- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 11.4pr3

**Xojo Developer Magazine**

- 10.3, page 9: News

### 84.4.2 Methods

### 84.4.3 AddDirectory(path as folderitem, Recursive as boolean, Flags as Integer) as Boolean

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Schedules a directory for watching.
**Notes:** path: Path to folder to watch.
Recursive: Whether to watch subdirectories.
Flags: What to watch for. Please combine kNotifyChange* constants with bitwiseOr.

Returns false on error and true on success.
You can add several directories to a watcher.
See also:

- 84.4.4 AddDirectory(path as string, Recursive as boolean, Flags as Integer) as Boolean 13858

### 84.4.4 AddDirectory(path as string, Recursive as boolean, Flags as Integer) as Boolean

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Schedules a directory for watching.
**Notes:** path: Path to folder to watch.
Recursive: Whether to watch subdirectories.

Flags: What to watch for. Please combine kNotifyChange* constants with bitwiseOr.

Returns false on error and true on success.
You can add several directories to a watcher.
See also:

- 84.4.3 AddDirectory(path as folderitem, Recursive as boolean, Flags as Integer) as Boolean 13858

### 84.4.5 Constructor

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 84.4.6 NextChange as WindowsDirectoryChangeMBS

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries changes.
**Notes:** Call this method in a loop in a timer until it returns nil.
This way you can get all the changes.

### 84.4.7 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kNotifyChangeAttributes | 4 | Any attribute change in the watched directory or subtree causes a change notification wait operation to return. |
| kNotifyChangeCreation | 64 | Any change to the creation time of files in the watched directory or subtree causes a change notification wait operation to return. |
| kNotifyChangeDirName | 2 | Any directory-name change in the watched directory or subtree causes a change notification wait operation to return. Changes include creating or deleting a directory. |
| kNotifyChangeFilename | 1 | Any file name change in the watched directory or subtree causes a change notification wait operation to return. Changes include renaming, creating, or deleting a file. |
| kNotifyChangeLastAccess | 32 | Any change to the last access time of files in the watched directory or subtree causes a change notification wait operation to return.<br>Be careful: This flag is very performance consuming as you get a lot of events! |
| kNotifyChangeLastWrite | 16 | Any change to the last write-time of files in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change to the last write-time only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed. |
| kNotifyChangeSecurity | 256 | Any security-descriptor change in the watched directory or subtree causes a change notification wait operation to return. |
| kNotifyChangeSize | 8 | Any file-size change in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change in file size only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed. |

## 84.5 class WindowsFolderChangeMBS

### 84.5.1 class WindowsFolderChangeMBS

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to get notifications for folder changes on Windows.
**Notes:** On Mac OS X 10.5 you can use the FSEventsMBS class and on older Mac OS X the class FolderChangedNotificationMBS.

See also newer WindowsDirectoryWatcherMBS class.
**Blog Entries**

- MBS REALbasic plug-in 9.6

### 84.5.2 Methods

### 84.5.3 Constructor(path as folderitem, subtree as boolean, FilterFlags as Integer)

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor to start the notification service.
**Notes:** path: The full path of the directory to be watched.
subtree: If this parameter is true, the function monitors the directory tree rooted at the specified directory; if it is false, it monitors only the specified directory.
FilterFlags: The filter conditions that satisfy a change notification wait. This parameter can be one or more of the constants in this class.

Requires Windows 2000.

### 84.5.4 Properties

### 84.5.5 ChangeCount as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of calls to the Changed event.
**Notes:** (Read and Write property)

### 84.5.6 Handle as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle of the notification.
**Notes:** (Read and Write property)

### 84.5.7 Events

### 84.5.8 Changed

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: .

**Function:** Something has changed in the given folder.

### 84.5.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ChangeAttribute | 4 | One of the flags for the constructor.<br>Any attribute change in the watched directory or subtree causes a change notification wait operation to return. |
| ChangeDir | 2 | One of the flags for the constructor.<br>Any directory-name change in the watched directory or subtree causes a change notification wait operation to return. Changes include creating or deleting a directory. |
| ChangeFile | 1 | One of the flags for the constructor.<br>Any file name change in the watched directory or subtree causes a change notification wait operation to return. Changes include renaming, creating, or deleting a file name. |
| ChangeSecurity | 256 | One of the flags for the constructor.<br>Any security-descriptor change in the watched directory or subtree causes a change notification wait operation to return. |
| ChangeSize | 8 | One of the flags for the constructor.<br>Any file-size change in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change in file size only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed. |
| ChangeWrite | 16 | One of the flags for the constructor.<br>Any change to the last write-time of files in the watched directory or subtree causes a change notification wait operation to return. The operating system detects a change to the last write-time only when the file is written to the disk. For operating systems that use extensive caching, detection occurs only when the cache is sufficiently flushed. |

# Chapter 85

# Fonts

## 85.1 class WindowsFontDialogMBS

### 85.1.1 class WindowsFontDialogMBS

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The class for the standard font dialog for Windows.
**Notes:** Creates a Font dialog box that enables the user to choose attributes for a logical font. These attributes include a font family and associated font style, a point size, effects (underline, strikeout, and text color), and a script (or character set).

see also
https://msdn.microsoft.com/en-us/library/windows/desktop/ms646914(v=vs.85).aspx
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.3
- MBS Xojo Plugins, version 17.3pr5

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.5, page 9: News

### 85.1.2 Methods

### 85.1.3 ChooseFont as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Creates a Font dialog box that enables the user to choose attributes for a logical font.
**Notes:** Returns true if user pressed OK bitton.
Lasterror is set.
Returns false als sets lasterror to zero for cancel.

### 85.1.4 CloseDialog

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Close the dialog.
**Notes:** Can be called from various events to close the dialog programmatically.

### 85.1.5 Query

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Queries current dialog values into properties.

### 85.1.6 Update

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Updates dialog with current properties.

### 85.1.7 Properties

### 85.1.8 Bold as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The bold value.
**Notes:** (Read and Write property)

### 85.1.9 CurrentFont as WindowsFontFamilyMBS

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Returns current font.
**Notes:** You may need to call Query to get current state from dialog.
This returns a copy, so changes to the font object are not going back.
(Read only property)

### 85.1.10 DialogHandle as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Internal window handle for dialog.
**Notes:** (Read and Write property)

### 85.1.11 Effects as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show text effect controls.
**Notes:** Causes the dialog box to display the controls that allow the user to specify strikeout, underline, and text color options. If this flag is set, you can use the textColor member to specify the initial text color. You can use the StrikeThrough and Underline members to specify the initial settings of the strikeout and underline check boxes. ChooseFont can use these members to return the user's selections.
(Read and Write property)

### 85.1.12 FontName as String

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The font name of current font.
**Notes:** (Read and Write property)

### 85.1.13 FontType as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The type of the selected font when ChooseFont returns.
**Notes:** This member can be one or more of the following values:
FontTypeBold, FontTypeItalic, FontTypePrinter, FontTypeRegular, FontTypeScreen and FontTypeSimulator.

(Read and Write property)

### 85.1.14 ForceFontExist as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to only allow existing fonts.
**Notes:** ChooseFont should indicate an error condition if the user attempts to select a font or style that is not listed in the dialog box.
(Read and Write property)

### 85.1.15 Height as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The height, in logical units, of the font's character cell or character.
**Notes:** The character height value (also known as the em height) is the character cell height value minus the internal-leading value. The font mapper interprets the value specified in lfHeight in the following manner.

| Value | Meaning |
|---|---|
| >0 | The font mapper transforms this value into device units and matches it against the cell height of the available fonts. |
| 0 | The font mapper uses a default height value when it searches for a match. |
| <0 | The font mapper transforms this value into device units and matches its absolute value against the character height of the available fonts. |

For all height comparisons, the font mapper looks for the largest font that does not exceed the requested size.
This mapping occurs when the font is used for the first time.
(Read and Write property)

### 85.1.16 Italic as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether font is italic.
**Notes:** (Read and Write property)

### 85.1.17 LastError as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 85.1.18 LimitSize as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to limit font sizes.
**Notes:** ChooseFont should select only font sizes within the range specified by the MinSize and MaxSize members.
(Read and Write property)

### 85.1.19 MaxSize as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The maximum allowed font size.
**Notes:** Setting this also sets LimitSize to true.
(Read and Write property)

### 85.1.20 MinSize as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The minimum allowed font size.
**Notes:** Setting this also sets LimitSize to true.
(Read and Write property)

### 85.1.21 NoFontSimulations as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether ChooseFont should not display or allow selection of font simulations.
**Notes:** (Read and Write property)

### 85.1.22 NoInitialFaceSelection as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show initial font selection.
**Notes:** When initializing the dialog box controls, use this flag to prevent the dialog box from displaying an initial selection for the font name combo box. This is useful when there is no single font name that applies to the text selection.
(Read and Write property)

### 85.1.23 NoInitialSizeSelection as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show initialize size.
**Notes:** When initializing the dialog box controls, use this flag to prevent the dialog box from displaying an initial selection for the Font Size combo box. This is useful when there is no single font size that applies to the text selection.
(Read and Write property)

### 85.1.24 NoInitialStyleSelection as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show initial style options.
**Notes:** When initializing the dialog box controls, use this flag to prevent the dialog box from displaying an initial selection for the Font Style combo box. This is useful when there is no single font style that applies to the text selection.
(Read and Write property)

### 85.1.25 NoVectorFonts as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether ChooseFont should not allow vector font selections.
**Notes:** (Read and Write property)

### 85.1.26 NoVerticalFonts as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether the Font dialog box lists only horizontally oriented fonts.
**Notes:** (Read and Write property)

### 85.1.27 OnlyFixedPitchFonts as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether ChooseFont should enumerate and allow selection of only fixed-pitch fonts.
**Notes:** (Read and Write property)

### 85.1.28 OnlyTrueTypeFonts as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether ChooseFont should only enumerate and allow the selection of TrueType fonts.
**Notes:** (Read and Write property)

### 85.1.29 Parent as Variant

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The parent window.
**Notes:** The window that owns the dialog box. This member can be any valid window, or it can be nil if the dialog box has no owner.
Can reference a Window or DesktopWindow object.
(Read and Write property)

### 85.1.30 ScalableFontsOnly as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to only allow scalable fonts.
**Notes:** Specifies that ChooseFont should allow only the selection of scalable fonts. Scalable fonts include vector fonts, scalable printer fonts, TrueType fonts, and fonts scaled by other technologies.
(Read and Write property)

### 85.1.31 ShowApply as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show Apply button.
**Notes:** Causes the dialog box to display the Apply button.
Clicking Apply button does trigger Apply event.
(Read and Write property)

### 85.1.32 ShowInactiveFonts as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to display hidden fonts.
**Notes:** ChooseFont can additionally display fonts that are set to Hide in Fonts Control Panel.
(Read and Write property)

### 85.1.33 Size as Double

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The size of the font.
**Notes:** (Read and Write property)

### 85.1.34 Strikethrough as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether font is stroke through.
**Notes:** (Read and Write property)

### 85.1.35 TextColor as Color

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The text color for the font.
**Notes:** Only used if Effects is true.
(Read and Write property)

### 85.1.36 Underline as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether font is underlined.
**Notes:** (Read and Write property)

### 85.1.37 Weight as Integer

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop only.

**Function:** The weight of the font in the range 0 through 1000.
**Notes:** For example, 400 is normal and 700 is bold. If this value is zero, a default weight is used.

The following values are defined for convenience.

| Value | Weight |
|---|---|
| FW_DONTCARE | 0 |
| FW_THIN | 100 |
| FW_EXTRALIGHT | 200 |
| FW_ULTRALIGHT | 200 |
| FW_LIGHT | 300 |
| FW_NORMAL | 400 |
| FW_REGULAR | 400 |
| FW_MEDIUM | 500 |
| FW_SEMIBOLD | 600 |
| FW_DEMIBOLD | 600 |
| FW_BOLD | 700 |
| FW_EXTRABOLD | 800 |
| FW_ULTRABOLD | 800 |
| FW_HEAVY | 900 |
| FW_BLACK | 900 |

(Read and Write property)

### 85.1.38 Events

### 85.1.39 Apply

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The user pressed apply.
**Notes:** Our plugin automatically calls query for you to get current values from dialog into properties.

### 85.1.40 BoundsChanged

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The bounds changed.

### 85.1.41 BoundsChanging

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The bounds are changing.

### 85.1.42 GotFocus

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The window got focus.

### 85.1.43 Hide

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The window is hidden.

### 85.1.44 Init

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The dialog initialized.
**Notes:** You can work with dialog via DialogHandle property.

### 85.1.45 LostFocus

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The window lost focus.

### 85.1.46 Show

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: .

**Function:** The window is shown.

### 85.1.47 Constants

Font Types

| Constant | Value | Description |
|---|---|---|
| FontTypeBold | &h100 | The font weight is bold. |
| FontTypeItalic | &h200 | The italic font attribute is set. |
| FontTypePrinter | &h4000 | The font is a printer font. |
| FontTypeRegular | &h400 | The font weight is normal. |
| FontTypeScreen | &h2000 | The font is a screen font. |
| FontTypeSimulator | &h8000 | The font is simulated by the graphics device interface (GDI). |

## 85.2 class WindowsFontFamilyMBS

### 85.2.1 class WindowsFontFamilyMBS

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for details on Windows fonts.
**Example:**

```
dim lines(-1) as string

for each f as WindowsFontFamilyMBS in WindowsFontFamilyMBS.AllFonts
lines.append f.LogFontFullName
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** The font list is the same as font() function in Xojo as far as we see.
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr3
- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins, version 20.5pr4
- MBS REALbasic Plugins 11.0 released
- MBS REALbasic Plugins, version 10.6pr12

### 85.2.2 Methods

### 85.2.3 AllFonts as WindowsFontFamilyMBS()

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all fonts on this windows machine.
**Example:**

```
dim lines(-1) as string

for each f as WindowsFontFamilyMBS in WindowsFontFamilyMBS.AllFonts
lines.append f.LogFontFullName
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Font list is queried from OS and not cached, so this should update if new fonts are activated.

Uses EnumFontFamiliesW function, see
https://docs.microsoft.com/en-us/windows/win32/api/wingdi/nf-wingdi-enumfontfamiliesw
See also:

- 85.2.4 AllFonts(fonts() as WindowsFontFamilyMBS) as Integer 13877

### 85.2.4 AllFonts(fonts() as WindowsFontFamilyMBS) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all fonts on this windows machine.
**Notes:** Returns the number of fonts found and sets the font objects in the array.
if the array is too short, you get the first ubound(fonts)+1 fonts set there.

Font list is queried from OS and not cached, so this should update if new fonts are activated.
See also:

- 85.2.3 AllFonts as WindowsFontFamilyMBS() 13876

### 85.2.5 AllFontsEx as WindowsFontFamilyMBS()

MBS Win Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all fonts on this windows machine.
**Example:**

```
dim lines(-1) as string

for each f as WindowsFontFamilyMBS in WindowsFontFamilyMBS.AllFontsEx
lines.append f.LogFontFullName
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** Font list is queried from OS and not cached, so this should update if new fonts are activated.

Uses EnumFontFamiliesExW function, see
https://docs.microsoft.com/en-us/windows/win32/api/wingdi/nf-wingdi-enumfontfamiliesexw

### 85.2.6 AxisMaxValue(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value for this axis.
**Notes:** Index is from zero to NumberOfAxes-1.
Only available for truetype fonts.

### 85.2.7 AxisMinValue(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value for this axis.
**Notes:** Index is from zero to NumberOfAxes-1.
Only available for truetype fonts.

### 85.2.8 AxisName(index as Integer) as string

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the axis.
**Notes:** Index is from zero to NumberOfAxes-1.
Only available for truetype fonts.

### 85.2.9 DesignVectorValues(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An array specifying the values of the axes of a multiple master OpenType font.
**Notes:** This array corresponds to the axes* arrays.

### 85.2.10 FontsOfFamily(family as string) as WindowsFontFamilyMBS()

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all fonts of the given font family on this windows machine.
See also:

- 85.2.11 FontsOfFamily(family as string, fonts() as WindowsFontFamilyMBS) as Integer 

### 85.2.11 FontsOfFamily(family as string, fonts() as WindowsFontFamilyMBS) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all fonts of the given font family on this windows machine.
**Notes:** Returns the number of fonts found and sets the font objects in the array.
if the array is too short, you get the first ubound(fonts)+1 fonts set there.
See also:

- 85.2.10 FontsOfFamily(family as string) as WindowsFontFamilyMBS() 13878

### 85.2.12 Properties

### 85.2.13 CodepageBitfield as MemoryBlock

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A 64-bit, code-page bitfield (CPB) that identifies a specific character set or code page. #
**Notes:** Code pages are in the lower 32 bits of this bitfield. The high 32 are used for non-Windows code pages. For more information, see Code Page Bitfields.
http://msdn.microsoft.com/en-us/library/dd317754(v=vs.85).aspx

Only available for truetype fonts.
(Read only property)

### 85.2.14 FontType as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The type of the font.
**Notes:** This parameter can be a combination of these values:

DEVICE_FONTTYPE
RASTER_FONTTYPE
TRUETYPE_FONTTYPE
(Read only property)

### 85.2.15 LogFontBold as Boolean

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether font is bold.
**Notes:** Setting to false, will set Weight to 400, setting to true will set Weight to 700.
Returns true if Weight is equal or more than 700.
(Read only property)

### 85.2.16 LogFontCharSet as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The character set. The following values are predefined.
**Notes:** The following values are predefined.

ANSI_CHARSET
BALTIC_CHARSET
CHINESEBIG5_CHARSET
DEFAULT_CHARSET
EASTEUROPE_CHARSET
GB2312_CHARSET
GREEK_CHARSET
HANGUL_CHARSET
MAC_CHARSET
OEM_CHARSET
RUSSIAN_CHARSET
SHIFTJIS_CHARSET
SYMBOL_CHARSET
TURKISH_CHARSET
VIETNAMESE_CHARSET

Korean language edition of Windows:

JOHAB_CHARSET

Middle East language edition of Windows:

ARABIC_CHARSET
HEBREW_CHARSET

Thai language edition of Windows:

THAI_CHARSET

The OEM_CHARSET value specifies a character set that is operating-system dependent.

DEFAULT_CHARSET is set to a value based on the current system locale. For example, when the system locale is English (United States), it is set as ANSI_CHARSET.

Fonts with other character sets may exist in the operating system. If an application uses a font with an unknown character set, it should not attempt to translate or interpret strings that are rendered with that font.

This parameter is important in the font mapping process. To ensure consistent results, specify a specific character set. If you specify a typeface name in the lfFaceName member, make sure that the lfCharSet value matches the character set of the typeface specified in lfFaceName.
(Read only property)

### 85.2.17 LogFontClipPrecision as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The clipping precision.
**Notes:** The clipping precision defines how to clip characters that are partially outside the clipping region. It can be one or more of the following values.

For more information about the orientation of coordinate systems, see the description of the nOrientation parameter.

| Value | Meaning |
|---|---|
| CLIP_CHARACTER_PRECIS | Not used. |
| CLIP_DEFAULT_PRECIS | Specifies default clipping behavior. |
| CLIP_DFA_DISABLE | Windows XP SP1: Turns off font association for the font. Note that this flag is not guaranteed to have any effect on any platform after Windows Server 2003. |
| CLIP_EMBEDDED | You must specify this flag to use an embedded read-only font. |
| CLIP_LH_ANGLES | When this value is used, the rotation for all fonts depends on whether the orientation of the coordinate system is left-handed or right-handed. If not used, device fonts always rotate counterclockwise, but the rotation of other fonts is dependent on the orientation of the coordinate system. |
| CLIP_MASK | Not used. |
| CLIP_DFA_OVERRIDE | Turns off font association for the font. This is identical to CLIP_DFA_DISABLE, but it can have problems in some situations; the recommended flag to use is CLIP_DFA_DISABLE. |
| CLIP_STROKE_PRECIS | Not used by the font mapper, but is returned when raster, vector, or TrueType fonts are enumerated. For compatibility, this value is always returned when enumerating fonts. |
| CLIP_TT_ALWAYS | Not used. |

(Read only property)

### 85.2.18 LogFontEscapement as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The angle, in tenths of degrees, between the escapement vector and the x-axis of the device.
**Notes:** The escapement vector is parallel to the base line of a row of text.

When the graphics mode is set to GM_ADVANCED, you can specify the escapement angle of the string independently of the orientation angle of the string's characters.

When the graphics mode is set to GM_COMPATIBLE, LogFontEscapement specifies both the escapement and orientation. You should set LogFontEscapement and LogFontOrientation to the same value.
(Read only property)

### 85.2.19 LogFontFaceName as String

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the typeface name of the font.
**Notes:** (Read only property)

### 85.2.20 LogFontFullName as String

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The unique name of the font.
**Notes:** For example, ABC Font Company TrueType Bold Italic Sans Serif.
(Read only property)

### 85.2.21 LogFontHeight as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height, in logical units, of the font's character cell or character.
**Notes:** The character height value (also known as the em height) is the character cell height value minus the internal-leading value. The font mapper interprets the value specified in lfHeight in the following manner.

For all height comparisons, the font mapper looks for the largest font that does not exceed the requested size.

| Value | Meaning |
|---|---|
| >0 | The font mapper transforms this value into device units and matches it against the cell height of the available fonts. |
| 0 | The font mapper uses a default height value when it searches for a match. |
| <0 | The font mapper transforms this value into device units and matches its absolute value against the character height of the available fonts. |

This mapping occurs when the font is used for the first time.
(Read only property)

### 85.2.22 LogFontItalic as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An italic font if set to true.
**Notes:** (Read only property)

### 85.2.23 LogFontOrientation as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The angle, in tenths of degrees, between each character's base line and the x-axis of the device.
**Notes:** (Read only property)

### 85.2.24 LogFontOutPrecision as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The output precision.
**Notes:** The output precision defines how closely the output must match the requested font's height, width, character orientation, escapement, pitch, and font type. It can be one of the following values.

Applications can use the OUT_DEVICE_PRECIS, OUT_RASTER_PRECIS, OUT_TT_PRECIS, and OUT_PS_ONLY_PRECIS values to control how the font mapper chooses a font when the operating system contains more than one font with a specified name. For example, if an operating system contains a font named Symbol in raster and TrueType form, specifying OUT_TT_PRECIS forces the font mapper to choose the TrueType version. Specifying OUT_TT_ONLY_PRECIS forces the font mapper to choose a TrueType font, even if it must substitute a TrueType font of another name.
(Read only property)

| Value | Meaning |
|---|---|
| OUT_CHARACTER_PRECIS | Not used. |
| OUT_DEFAULT_PRECIS | Specifies the default font mapper behavior. |
| OUT_DEVICE_PRECIS | Instructs the font mapper to choose a Device font when the system contains multiple fonts with the same name. |
| OUT_OUTLINE_PRECIS | This value instructs the font mapper to choose from TrueType and other outline-based fonts. |
| OUT_PS_ONLY_PRECIS | Instructs the font mapper to choose from only PostScript fonts. If there are no PostScript fonts installed in the system, the font mapper returns to default behavior. |
| OUT_RASTER_PRECIS | Instructs the font mapper to choose a raster font when the system contains multiple fonts with the same name. |
| OUT_STRING_PRECIS | This value is not used by the font mapper, but it is returned when raster fonts are enumerated. |
| OUT_STROKE_PRECIS | This value is not used by the font mapper, but it is returned when TrueType, other outline-based fonts, and vector fonts are enumerated. |
| OUT_TT_ONLY_PRECIS | Instructs the font mapper to choose from only TrueType fonts. If there are no TrueType fonts installed in the system, the font mapper returns to default behavior. |
| OUT_TT_PRECIS | Instructs the font mapper to choose a TrueType font when the system contains multiple fonts with the same name. |

### 85.2.25 LogFontPitchAndFamily as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pitch and family of the font.
**Notes:** The two low-order bits specify the pitch of the font and can be one of the following values.

DEFAULT_PITCH
FIXED_PITCH
VARIABLE_PITCH

Bits 4 through 7 of the member specify the font family and can be one of the following values.

FF_DECORATIVE
FF_DONTCARE
FF_MODERN
FF_ROMAN
FF_SCRIPT
FF_SWISS

The proper value can be obtained by using the Boolean OR operator to join one pitch constant with one

family constant.

Font families describe the look of a font in a general way. They are intended for specifying fonts when the exact typeface desired is not available. The values for font families are as follows.

| Value | Meaning |
|---|---|
| FF_DECORATIVE | Novelty fonts. Old English is an example. |
| FF_DONTCARE | Use default font. |
| FF_MODERN | Fonts with constant stroke width (monospace), with or without serifs. Monospace fonts are usually modern. Pica, Elite, and CourierNew are examples. |
| FF_ROMAN | Fonts with variable stroke width (proportional) and with serifs. MS Serif is an example. |
| FF_SCRIPT | Fonts designed to look like handwriting. Script and Cursive are examples. |
| FF_SWISS | Fonts with variable stroke width (proportional) and without serifs. MS Sans Serif is an example. |

(Read only property)

### 85.2.26 LogFontQuality as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The output quality.
**Notes:** The output quality defines how carefully the graphics device interface (GDI) must attempt to match the logical-font attributes to those of an actual physical font. It can be one of the following values.

(Read only property)

### 85.2.27 LogFontScript as String

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The script, that is, the character set, of the font. For example, Cyrillic.
**Notes:** (Read only property)

### 85.2.28 LogFontStrikeOut as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

| Value | Meaning |
|---|---|
| ANTIALIASED_QUALITY | Font is always antialiased if the font supports it and the size of the font is not too small or too large. |
| CLEARTYPE_QUALITY | If set, text is rendered (when possible) using ClearType antialiasing method. See Remarks for more information. |
| DEFAULT_QUALITY | Appearance of the font does not matter. |
| DRAFT_QUALITY | Appearance of the font is less important than when PROOF_QUALITY is used. For GDI raster fonts, scaling is enabled, which means that more font sizes are available, but the quality may be lower. Bold, italic, underline, and strikeout fonts are synthesized if necessary. |
| NONANTIALIASED_QUALITY | Font is never antialiased. |
| PROOF_QUALITY | Character quality of the font is more important than exact matching of the logical-font attributes. For GDI raster fonts, scaling is disabled and the font closest in size is chosen. Although the chosen font size may not be mapped exactly when PROOF_QUALITY is used, the quality of the font is high and there is no distortion of appearance. Bold, italic, underline, and strikeout fonts are synthesized if necessary. |

**Function:** A strikeout font if set to true.
**Notes:** (Read only property)

### 85.2.29 LogFontStyle as String

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The style of the font. For example, Bold Italic.
**Notes:** (Read only property)

### 85.2.30 LogFontUnderline as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An underlined font if set to true.
**Notes:** (Read only property)

### 85.2.31 LogFontWeight as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The weight of the font in the range 0 through 1000.
**Notes:** For example, 400 is normal and 700 is bold. If this value is zero, a default weight is used.

The following values are defined for convenience.

| Value | Weight |
|---|---|
| FW_DONTCARE | 0 |
| FW_THIN | 100 |
| FW_EXTRALIGHT | 200 |
| FW_ULTRALIGHT | 200 |
| FW_LIGHT | 300 |
| FW_NORMAL | 400 |
| FW_REGULAR | 400 |
| FW_MEDIUM | 500 |
| FW_SEMIBOLD | 600 |
| FW_DEMIBOLD | 600 |
| FW_BOLD | 700 |
| FW_EXTRABOLD | 800 |
| FW_ULTRABOLD | 800 |
| FW_HEAVY | 900 |
| FW_BLACK | 900 |

(Read only property)

### 85.2.32 LogFontWidth as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The average width, in logical units, of characters in the font.
**Notes:** If LogFontWidth is zero, the aspect ratio of the device is matched against the digitization aspect ratio of the available fonts to find the closest match, determined by the absolute value of the difference.
(Read only property)

### 85.2.33 NumberOfAxes as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of axes for a specified multiple master font.
**Notes:** The axes arrays contains information on all the axes of a multiple master font.
Only available for truetype fonts.
(Read only property)

### 85.2.34 NumberOfDesignVectors as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The design vectors are used by an application to specify values for the axes of a multiple master font.
**Notes:** (Read only property)

### 85.2.35 TextMetricAscent as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ascent (units above the base line) of characters.
**Notes:** (Read only property)

### 85.2.36 TextMetricAverageCharWidth as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The average width of characters in the font (generally defined as the width of the letter x).
**Notes:** This value does not include overhang required for bold or italic characters.
(Read only property)

### 85.2.37 TextMetricAverageWidth as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The average width of characters in the font, in notional units.
**Notes:** This value should be compared with the value of the TextMetricSizeEM member.
Only available for truetype fonts.
(Read only property)

### 85.2.38 TextMetricBreakChar as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value of the character to be used to define word breaks for text justification.
**Notes:** (Read only property)

### 85.2.39 TextMetricCellHeight as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height, in notional units, of the font.
**Notes:** This value should be compared with the value of the TextMetricSizeEM member.
Only available for truetype fonts.
(Read only property)

### 85.2.40 TextMetricCharSet as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The character set of the font.
**Notes:** (Read only property)

### 85.2.41 TextMetricDefaultChar as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value of the character to be substituted for characters that are not in the font.
**Notes:** (Read only property)

### 85.2.42 TextMetricDescent as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The descent (units below the base line) of characters.
**Notes:** (Read only property)

### 85.2.43 TextMetricDigitizedAspectX as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The horizontal aspect of the device for which the font was designed.
**Notes:** (Read only property)

### 85.2.44 TextMetricDigitizedAspectY as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vertical aspect of the device for which the font was designed.
**Notes:** The ratio of the tmDigitizedAspectX and tmDigitizedAspectY members is the aspect ratio of the device for which the font was designed.
(Read only property)

### 85.2.45 TextMetricExternalLeading as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The amount of extra leading (space) that the application adds between rows.
**Notes:** Since this area is outside the font, it contains no marks and is not altered by text output calls in either OPAQUE or TRANSPARENT mode. The designer may set this member to zero.
(Read only property)

### 85.2.46 TextMetricFirstChar as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value of the first character defined in the font.
**Notes:** (Read only property)

### 85.2.47 TextMetricFlags as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies whether the font is italic, underscored, outlined, bold, and so forth.
**Notes:** May be any reasonable combination of the following values.

| Bit | Name | Meaning |
|---|---|---|
| 0 | NTM_ITALIC | italic |
| 5 | NTM_BOLD | bold |
| 8 | NTM_REGULAR | regular |
| 16 | NTM_NONNEGATIVE_AC | no glyph in a font at any size has a negative A or C space. |
| 17 | NTM_PS_OPENTYPE | PostScript OpenType font |
| 18 | NTM_TT_OPENTYPE | TrueType OpenType font |
| 19 | NTM_MULTIPLEMASTER | multiple master font |
| 20 | NTM_TYPE1 | Type 1 font |
| 21 | NTM_DSIG | font with a digital signature. This allows traceability and ensures that the font has been tested and is not corrupted |

Only available for truetype fonts.
(Read only property)

### 85.2.48 TextMetricHeight as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height (ascent + descent) of characters.
**Notes:** (Read only property)

### 85.2.49 TextMetricInternalLeading as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The amount of leading (space) inside the bounds set by the tmHeight member.
**Notes:** Accent marks and other diacritical characters may occur in this area. The designer may set this member to zero.
(Read only property)

### 85.2.50 TextMetricItalic as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An italic font if set to true.
**Notes:** (Read only property)

### 85.2.51 TextMetricLastChar as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value of the last character defined in the font.
**Notes:** (Read only property)

### 85.2.52 TextMetricMaxCharWidth as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the widest character in the font.
**Notes:** (Read only property)

### 85.2.53 TextMetricOverhang as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The extra width per string that may be added to some synthesized fonts.
**Notes:** When synthesizing some attributes, such as bold or italic, graphics device interface (GDI) or a device may have to add width to a string on both a per-character and per-string basis. For example, GDI makes a string bold by expanding the spacing of each character and overstriking by an offset value; it italicizes a font by shearing the string. In either case, there is an overhang past the basic string. For bold strings, the overhang is the distance by which the overstrike is offset. For italic strings, the overhang is the amount the top of the font is sheared past the bottom of the font.

The TextMetricOverhang member enables the application to determine how much of the character width returned by a GetTextExtentPoint32 function call on a single character is the actual character width and how much is the per-string extra width. The actual width is the extent minus the overhang.
(Read only property)

### 85.2.54 TextMetricPitchAndFamily as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pitch and family of the selected font.
**Notes:** The low-order bit (bit 0) specifies the pitch of the font. If it is 1, the font is variable pitch (or proportional). If it is 0, the font is fixed pitch (or monospace). Bits 1 and 2 specify the font type. If both bits are 0, the font is a raster font; if bit 1 is 1 and bit 2 is 0, the font is a vector font; if bit 1 is 0 and bit 2 is set, or if both bits are 1, the font is some other type. Bit 3 is 1 if the font is a device font; otherwise, it is 0.

The four high-order bits designate the font family. The TextMetricPitchAndFamily member can be combined with the hexadecimal value 0xF0 by using the bitwise AND operator and can then be compared with the font family names for an identical match. For more information about the font families, see LogFontPitchAndFamily.
(Read only property)

### 85.2.55 TextMetricSizeEM as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the em square for the font.
**Notes:** This value is in notional units (that is, the units for which the font was designed).
Only available for truetype fonts.
(Read only property)

### 85.2.56 TextMetricStruckOut as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An strikeout font if set to true.
**Notes:** (Read only property)

### 85.2.57 TextMetricUnderlined as Boolean

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An underline font if set to true.
**Notes:** (Read only property)

### 85.2.58 TextMetricWeight as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The weight of the font.
**Notes:** (Read only property)

### 85.2.59 UnicodeSubsetBitfield as MemoryBlock

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A 128-bit Unicode subset bitfield (USB) identifying up to 126 Unicode subranges.
**Notes:** Each bit, except the two most significant bits, represents a single subrange. The most significant bit is always 1 and identifies the bitfield as a font signature; the second most significant bit is reserved and must be 0. Unicode subranges are numbered in accordance with the ISO 10646 standard. For more information, see Unicode Subset Bitfields.
http://msdn.microsoft.com/en-us/library/dd374090(v=vs.85).aspx

Only available for truetype fonts.
(Read only property)

### 85.2.60 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ANSI_CHARSET | 0 | One of the constants for the LogFontCharSet property. |
| ANTIALIASED_QUALITY | 4 | One of the constants for the LogFontQuality property. Enables antialiasing for the font. The display driver must suppo text for this setting to work. |
| ARABIC_CHARSET | 178 | One of the constants for the LogFontCharSet property. |
| BALTIC_CHARSET | 186 | One of the constants for the LogFontCharSet property. |
| CHINESEBIG5_CHARSET | 136 | One of the constants for the LogFontCharSet property. |
| CLIP_CHARACTER_PRECIS | 1 | One of the constants for the LogFontClipPrecision property. Not used. |
| CLIP_DEFAULT_PRECIS | 0 | One of the constants for the LogFontClipPrecision property. Specifies default clipping behavior. |
| CLIP_EMBEDDED | 128 | One of the clip constants. |
| CLIP_LH_ANGLES | 16 | One of the clip constants. |
| CLIP_MASK | &h15 | One of the clip constants. |
| CLIP_STROKE_PRECIS | 2 | One of the constants for the LogFontClipPrecision property. Not used by the font mapper, but is returned when raster, vector, fonts are enumerated. |
| CLIP_TT_ALWAYS | 32 | One of the clip constants. |
| DEFAULT_CHARSET | 1 | One of the constants for the LogFontCharSet property. |
| DEFAULT_PITCH | 0 | One of the pitch constants. |
| DEFAULT_QUALITY | 0 | One of the constants for the LogFontQuality property. Appearance of the font does not matter. |
| DEVICE_FONTTYPE | &h002 | One of the constants for the FontType property. |
| DRAFT_QUALITY | 1 | One of the constants for the LogFontQuality property. For GDI raster fonts, scaling is enabled, which means that more available, but the quality may be lower. Bold, italic, underline, a fonts are synthesized if necessary. |
| EASTEUROPE_CHARSET | 238 | One of the constants for the LogFontCharSet property. |
| FF_DECORATIVE | 80 | One of the constants for the LogFontPitchAndFamily property. Novelty fonts, for example, Old English. |
| FF_DONTCARE | 0 | One of the constants for the LogFontPitchAndFamily property. Do not care or do not know. |
| FF_MODERN | 48 | One of the constants for the LogFontPitchAndFamily property. Fonts with constant stroke width (monospace), with or wi Monospace fonts are usually modern, for example, Pica, Elite, New. |
| FF_ROMAN | 16 | One of the constants for the LogFontPitchAndFamily property. Fonts with variable stroke width (proportional) and with serifs, Serif. |
| FF_SCRIPT | 64 | One of the constants for the LogFontPitchAndFamily property. Fonts designed to look like handwriting, for example, Script and |
| FF_SWISS | 32 | One of the constants for the LogFontPitchAndFamily property. Fonts with variable stroke width (proportional) and without serifs, Sans Serif. |
| FIXED_PITCH | 1 | One of the pitch constants. |
| FW_BLACK | 900 | One of the constants for the LogFontWeight property. |
| FW_BOLD | 700 | One of the constants for the LogFontWeight property. |
| FW_DEMIBOLD | 600 | One of the constants for the LogFontWeight property. |
| FW_DONTCARE | 0 | One of the constants for the LogFontWeight property. |
| FW_EXTRABOLD | 800 | One of the constants for the LogFontWeight property. |
| FW_EXTRALIGHT | 200 | One of the constants for the LogFontWeight property. |
| FW_HEAVY | 900 | One of the constants for the LogFontWeight property. |
| FW_LIGHT | 300 | One of the constants for the LogFontWeight property. |
| FW_MEDIUM | 500 | One of the constants for the LogFontWeight property. |
| FW_NORMAL | 400 | One of the constants for the LogFontWeight property. |
| FW_REGULAR | 400 | One of the constants for the LogFontWeight property. |
| FW_SEMIBOLD | 600 | One of the constants for the LogFontWeight property. |
| FW_THIN | 100 | One of the constants for the LogFontWeight property. |

# Chapter 86

# GameKit

## 86.1 class GameKitMBS

### 86.1.1 class GameKitMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The central plugin class for GameKit.
**Notes:** Events from various objects end here, so you can implement them in a central subclass of GameKitMBS.
For most events, we carry a "tag as Variant" parameter, so you can pass a window, some object or whatever value you need.

Also we defined that matchdata is a dictionary. This way you can store various values inside including arrays (e.g. array of variant). As data is serialized over the network, you can't pass Xojo objects.

The plugin makes sure that all events run on the main thread, so please make sure you don't block main thread.
Please create only one instance of your GameKitMBS subclass.

GameKit classes are available in OS X v10.8 and later.
Please review Apple's documentation for more details and a guide.
**Blog Entries**

- GameKit for Real Studio

**Xojo Developer Magazine**

- 12.4, page 30: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner

### 86.1.2 Methods

### 86.1.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.1.4 GKErrorDomain as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The Game Kit framework error domain.
**Notes:** For NSErrorMBS.

### 86.1.5 showBannerWithTitle(title as string, message as string, duration as Double, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Displays a banner to the player for a specified period of time.
**Notes:** title: The title of the banner.
message: A secondary message to be displayed.
duration: The amount of time that the banner should be displayed to the player.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.NotificationBannerCompleted event.
See also:

- 86.1.6 showBannerWithTitle(title as string, message as string, tag as Variant) 13896

### 86.1.6 showBannerWithTitle(title as string, message as string, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Displays a banner to the player.
**Notes:** title: The title of the banner.
message: A secondary message to be displayed.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.Notification-

BannerCompleted event.
See also:

- 86.1.5 showBannerWithTitle(title as string, message as string, duration as Double, tag as Variant) 13896

### 86.1.7 Events

### 86.1.8 acceptInviteCompleted(match as GKTurnBasedMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the match is successfully created.
**Notes:** match: A newly initialized match object that contains a list of players for the match. If an error occurred, this value is nil.
error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

Called by GKTurnBasedMatchMBS.acceptInvite.
Available on Mac OS X 10.8.2 and newer.

### 86.1.9 achievementViewControllerDidFinish(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the user dismisses the achievements screen. (required)
**Notes:** viewController: The achievement view controller whose interface was dismissed by the player. (GKAchievementViewControllerMBS)

Your should dismiss the view controller. If your game paused any gameplay or other activities, it can restart those services in this method.

### 86.1.10 addPlayersToMatchCompleted(MatchMaker as GKMatchmakerMBS, match as GKMatchMBS, matchRequest as GKMatchRequestMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKMatchmakerMBS.addPlayersToMatch when matchmaking completes.
**Notes:** error: If matchmaking was successful, this parameter contains nil. Otherwise, this parameter holds

an error object that describes the error that occurred.

### 86.1.11 authenticateCompleted(localPlayer as GKLocalPlayerMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKLocalPlayerMBS.authenticate when the player has authenticated or when an error occurs.
**Notes:** error: This parameter is nil if the player successfully authenticated. Otherwise, it contains an error object that describes the error that occurred.

### 86.1.12 authenticateHandler(LocalPlayer as GKLocalPlayerMBS, viewController as NSViewControllerMBS, error as NSErrorMBS, tag as Variant, viewControllerHandle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event called when game center needs authentication.
**Notes:** viewController: This parameter is nil if the authentication process is complete. Otherwise, it contains a view controller that your game should display to the player.
error: This parameter contains an error object that describes any error that occurred.

Your game should authenticate the player as early as possible after launching, ideally as soon as you can present a user interface to the player. For example, your game may be launched because the player accepted an invitation to join a match or to take a turn in a turn-based match, so you want your game to authenticate the player and process the match invitation as quickly as possible. After you set a handler, authentication begins automatically and is repeated when your game moves to the background and then back to the foreground.

During the authentication process, Game Kit calls your handler one or more times to handle specific authentication events. Your handler must handle three kinds of events:

- If the device does not have an authenticated player, Game Kit passes a view controller to your authenticate handler. When presented, this view controller displays the authentication user interface. Your game should pause other activities that require user interaction (such as your game loop), present this view controller and then return. When the player finishes interacting with it, the view controller is dismissed automatically.
- If the authentication process succeeded, theGKLocalPlayer singleton object's authenticated property is set to true and the object's other properties are set to match those of the connected player.
- If the authentication process failed, the GKLocalPlayer singleton object's authenticated property is set to false and the object's other properties are cleared.

Each time the authentication handler is called, the data stored in the local player singleton object may have changed. A new player may have logged into the device or the player may have simply logged out from Game Center. Because of both of these possibilities, your authentication handler must be prepared to update any other objects that assume that a particular player is logged in. For more information, see "Authenticating the Local Player in a Multitasking Application" in Game Center Programming Guide.

Available on Mac OS X 10.8.2 and newer.

### 86.1.13 challengesViewControllerDidFinish(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The challengesViewController did finish.
**Notes:** Called by GKChallengesViewControllerMBS if needed.
Available on Mac OS X 10.8.2 and newer.

### 86.1.14 chooseBestHostPlayerCompleted(match as GKMatchMBS, playerID as string, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when GKMatchMBS.chooseBestHostPlayer completes.
**Notes:** playerID: The player identifier for the player with the best estimated network performance, or nil if a player could not currently be determined.

Available on Mac OS X 10.8.2 and newer.

### 86.1.15 declineInviteCompleted(match as GKTurnBasedMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the match is successfully created.
**Notes:** error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

Called by GKTurnBasedMatchMBS.declineInvite.
Available on Mac OS X 10.8.2 and newer.

### 86.1.16 didRequestMatchWithOtherPlayers(players() as GKPlayerMBS)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Initiates a match from Game Center with the requested players. (required)
**Notes:** player: The GKPlayer object containing the current player,Äôs information.
playersToInvite: An array of GKPlayer objects containing the player identifiers to invite to the match.

When this method is called, you should create a new match using the player identifiers provided and present a GKTurnBasedMatchmakerViewController.

Available in OS X v10.10 and later.

### 86.1.17 endMatchInTurnWithMatchDataCompleted(match as GKTurnBasedMatchMBS, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.endMatchInTurnWithMatchData after the match is successfully ended.
**Notes:** If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.18 endTurnWithNextParticipant(match as GKTurnBasedMatchMBS, nextParticipant as GKTurnBasedParticipantMBS, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.endTurnWithNextParticipant after the data is uploaded to Game Center.
**Notes:** If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.19 endTurnWithNextParticipantsCompleted(match as GKTurnBasedMatchMBS, nextParticipants() as GKTurnBasedParticipantMBS, timeout as Double, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the data is uploaded to the server.
**Notes:** Called by GKTurnBasedMatchMBS.participantQuitInTurnWithOutcome.

error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.20 findMatchForRequestCompleted(MatchMaker as GKMatchmakerMBS, request as GKMatchRequestMBS, match as GKMatchMBS, TurnBasedMatch as GKTurnBasedMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the match has been created.
**Notes:** This is either called by GKMatchmakerMBS.findMatchForRequest or GKTurnBasedMatchMBS.findMatchForRequest.

match: If matchmaking was successful, this parameter contains the created match. Otherwise, this parameter is nil.
error: If matchmaking was successful, this parameter contains nil. Otherwise, this parameter holds an error object that describes the error that occurred.

### 86.1.21 findPlayersForHostedMatchRequestCompleted(MatchMaker as GKMatchmakerMBS, request as GKMatchRequestMBS, playerIDs() as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKMatchmakerMBS.findPlayersForHostedMatchRequest when the match has been created.
**Notes:** players: If matchmaking was successful, this parameter contains an array of players to connect into the match. Otherwise, this parameter is nil.
error: If matchmaking was successful, this parameter contains nil. Otherwise, this parameter holds an error object that describes the error that occurred.

### 86.1.22 friendRequestComposeViewControllerDidFinish(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** The compose view has finished.
**Notes:** viewController: The GKFriendRequestComposeViewControllerMBS object.

### 86.1.23 gameCenterViewControllerDidFinish(gameCenterViewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when gameCenterViewController did finish.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.24 handleInviteFromGameCenter(playersToInvite() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent when the local player receives an invitation to join a new turn-based match.
**Notes:** playersToInvite: An array of player identifiers for the players to initially invite to the game.

When you receive this message, your game should create a new GKMatchRequestMBS object and assign the playersToInvite parameter to the match request's playersToInvite property. Then, your game can either call the GKTurnBasedMatchMBS class method findMatchForRequest to find a match programmatically or it can use the request to instantiate a new GKTurnBasedMatchmakerViewControllerMBS object to show a user interface to the player.

### 86.1.25 handleMatchEnded(match as GKTurnBasedMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent when a match the local player is participating in has ended.
**Notes:** match: The match that just ended.

When you receive this message, it should display the match's final results to the player and allow the player the option of saving or removing the match data from Game Center.

### 86.1.26 handleTurnEventForMatch(match as GKTurnBasedMatchMBS, didBecomeActive as boolean)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent when it is the local player's turn to act in a turn-based match.
**Notes:** match: A match object containing the current state of the match.

When you receive this message, the player has accepted a push notification for a match already in progress. Your game should end whatever task it was performing and switch to the match information provided by the match object. For more information on handling player actions in a turn-based match, see GKTurnBasedMatch Class Reference.

didBecomeActive: New parameter valid on Mac OS X 10.8.2 and newer.

### 86.1.27 Invited(MatchMaker as GKMatchmakerMBS, acceptedInvite as GKInviteMBS, playersToInvite() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKMatchmakerMBS when an invitation is received from another player.
**Notes:** acceptedInvite: The invitation accepted by the player.
playersToInvite: A list of player identifiers for additional players to invite into the game.

An game responds to an invitation by allocating and initializing a GKMatchmakerViewControllerMBS object, passing the invitation object and the list of player identifiers as parameters. For more information, see Game Kit Programming Guide.

If your game receives an invitation while your game is running, it should clean up any existing gameplay (including disconnecting from any current matches) and then process the invitation.

### 86.1.28 inviteeResponseHandler(MatchRequest as GKMatchRequestMBS, PlayerID as string, response as Integer, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event called when an response from an invited player is returned to your game.
**Notes:** playerID: The identifier for the player.
response: The nature of the response. See GKInviteeResponse* constants.

Available on Mac OS X 10.8.2 and newer.

### 86.1.29 leaderboardViewControllerDidFinish(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** The leaderboard view has finished.
**Notes:** viewController: The GKLeaderboardViewControllerMBS object.

### 86.1.30 loadAchievementDescriptionsCompleted(achievements() as GKAchievementDescriptionMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKAchievementDescriptionMBS.loadAchievementDescriptions when the download is completed.
**Notes:** descriptions: An array of description objects for the achievements in your game. If an error occurred, this value may be non-empty. In this case, the array holds whatever descriptions were downloaded by Game Kit before the error occurred.
error: If an error occurred, this error object describes the error. If the operation completed successfully, this value is nil.

### 86.1.31 loadAchievementsCompleted(achievements() as GKAchievementMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKAchievementMBS.loadAchievements when the download is completed.
**Notes:** achievements: An array of achievement objects that represents all progress reported to Game Center for the local player. If an error occurred, this parameter may be non-empty, in which case the array holds whatever achievement information Game Kit was able to fetch.
error: If an error occurred, this object describes the error. If the operation completed successfully, this value is nil.

### 86.1.32 loadCategoriesCompleted(categories() as string, titles() as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKLeaderboardMBS.loadCategories when the categories have been retrieved from the server.
**Notes:** categories: An array of strings that provides the categories to your game. If an error occurred, this

value may be non-empty. In this case, the array holds whatever data Game Kit was able to download before the error occurred.
titles: An array of strings that provides localized titles for each category. If an error occurred, this value may be non-empty. In this case, the array holds whatever data Game Kit was able to download before the error occurred.
error: If an error occurred, this error object describes the error. If the operation completed successfully, the value is nil.

### 86.1.33 loadDefaultLeaderboardCategoryIDCompleted(LocalPlayer as GKLocalPlayerMBS, categoryID as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The loadDefaultLeaderboardCategoryID method completed.
**Notes:** categoryID: The category ID string for the local player's default leaderboard.
error: If an error occurred, this parameter holds an error object that explains the error. Otherwise, the value of this parameter is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.34 loadFriendPlayersCompleted(localPlayer as GKLocalPlayerMBS, friendPlayers() as GKPlayerMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** The event called by GKLocalPlayerMBS.loadFriendPlayers.
**Notes:** friendPlayers: An array of GKPlayer objects containing the player identifiers for the players that are friends of the local player. If an error occurred, this value can be non-nil. In that case, the array contains the data that Game Kit was able to download before the error occurred.
error: If an error occurred, this parameter holds an error object that explains the error. Otherwise, the value of this parameter is nil.

### 86.1.35 loadFriendsCompleted(localPlayer as GKLocalPlayerMBS, friends() as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKLocalPlayerMBS.loadFriends when the request completes.
**Notes:** friends: An array of player identifiers for the players that are friends of the local player. If an error occurred, this value can be non-empty. In that case, the array contains the data that Game Kit was able to download before the error occurred.

error: If an error occurred, this parameter holds an error object that explains the error. Otherwise, the value of this parameter is nil.

### 86.1.36 loadImageCompleted(description as GKAchievementDescriptionMBS, image as NSImageMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKAchievementDescriptionMBS.loadImage when the download is completed.
**Notes:** image: The downloaded image. If an error occurred, this value is nil.
error: If an error occurred, this error object describes the error. If the operation completed successfully, this value is nil.

### 86.1.37 loadLeaderboardsCompleted(Leaderboards() as GKLeaderboardMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Leaderboards have been loaded.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.38 loadMatchDataCompleted(match as GKTurnBasedMatchMBS, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.loadMatchData after the match data has been retrieved from the server.
**Notes:** matchData: The data stored on Game Center that reflects the current state of the match. If an error occurred, this value is nil.
error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.39 loadMatchesCompleted(matches() as GKTurnBasedMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.loadMatches after the matches are retrieved from the server.
**Notes:** matches: An array of match objects that hold the requested matches. If an error occurred, this value may be non-empty. In this case, the array holds whatever match data could be retrieved from Game

Center before the error occurred.
error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.40 loadMatchWithIDCompleted(TurnBasedMatch as GKTurnBasedMatchMBS, matchID as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the match is retrieved from the server.
**Notes:** Called when GKTurnBasedMatchMBS.loadMatchWithID finishes.

matchID: The identifier for the turn-based match.
match: If the operation completed successfully, this parameter holds the match. If an error occurred, the value is nil.
error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.41 loadPhotoForSizeCompleted(player as GKPlayerMBS, size as Integer, photo as NSImageMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKPlayerMBS.loadPhotoForSize when the player data is retrieved from Game Center.
**Notes:** photo: An image for the player. If an error occurred, this may still be non-nil. In this case, the image reflects an image cached by Game Kit on the device.
error: If an error occurred, this error object describes the error. If the operation completed successfully, this is nil.

### 86.1.42 loadPlayersForIdentifiersCompleted(identifiers() as string, players() as GKPlayerMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKPlayerMBS.loadPlayersForIdentifiers when the player data is retrieved from Game Center.
**Notes:** players: An array of GKPlayer objects, one per identifier. If an error occurred, this may be non-empty. In that case, the array holds whatever data Game Kit was able to retrieve for the requested players.
error: If an error occurred, this error object describes the error. If the operation completed successfully, this

is nil.

### 86.1.43 loadReceivedChallengesCompleted(challenges() as GKChallengeMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when loadReceivedChallenges finished.
**Notes:** challenges: An array of challenge objects that represents all challenges made to the local player. If an error occurred, this parameter may be non-nil, in which case the array holds whatever challenge information Game Kit was able to fetch.
error: If an error occurred, this object describes the error. If the operation completed successfully, this value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.44 loadScoresCompleted(Leaderboard as GKLeaderboardMBS, scores() as GKScoreMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKLeaderboardMBS.loadScores after the scores are retrieved from the server.
**Notes:** scores: An array of score objects that hold the requested scores. If an error occurred, this value may be non-nil. In this case, the array holds whatever score data could be retrieved from Game Center before the error occurred.
error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.45 localPlayerDidCompleteChallenge(challenge as GKChallengeMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when the local player has completed one of their challenges, triggered by a push notification from the server.
**Notes:** Received only while the game is running.
Available on Mac OS X 10.8.2 and newer.

### 86.1.46 localPlayerDidReceiveChallenge(challenge as GKChallengeMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when the local player has received a challenge, triggered by a push notification from the server.
**Notes:** Received only while the game is running.
Available on Mac OS X 10.8.2 and newer.

### 86.1.47 localPlayerDidSelectChallenge(challenge as GKChallengeMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when the user clicks a challenge notification banner or the "Play Now" button for a challenge inside Game Center, causing the game to launch.
**Notes:** Also called when the user clicks a challenge banner inside the game.
Available on Mac OS X 10.8.2 and newer.

### 86.1.48 matchConnectionWithPlayerFailed(match as GKMatchMBS, playerID as string, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the match fails to connect to a player.
**Notes:** match: The match that received the error.
player: The identifier for the player whose connection failed.
error: The error that occurred.

This method is called if the match was unable to send a transmission to another player in the match.

### 86.1.49 matchDidChangeState(match as GKMatchMBS, playerID as string, state as Integer)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a player connects to or disconnects from the match.
**Notes:** match: The match that the player is connected to.
player: The identifier for the player whose state changed.
state: The state the player moved to. (see constants in GKMatchMBS)

Your game implements this method to be notified when players connect to or disconnect from the match.one

### 86.1.50 matchDidFailWithError(match as GKMatchMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the match cannot connect to any other players.
**Notes:** match: The match that received the error.
error: The error that occurred.

This method is called if the match cannot connect to any other players associated with the match. It usually means a serious networking error has occurred.

### 86.1.51 matchDidReceiveData(match as GKMatchMBS, data as Dictionary, playerID as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when data is received from a player. (required)
**Notes:** match: The match that received the data.
data: The data sent by the player.
player: The string identifier for the player that sent the data.

Important: Data received from other players should be treated as untrusted data. Be sure to validate the data you receive from the match and write your code carefully to avoid security vulnerabilities. See the Secure Coding Guide for more information.

### 86.1.52 matchEnded(player as GKPlayerMBS, match as GKTurnBasedMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Called when the match has ended. (required)
**Notes:** player: The GKPlayer object containing the current player,Äôs information.
match: The GKTurnBasedMatch object containing the current game data.

Available in OS X v10.10 and later.

### 86.1.53 matchForInviteCompleted(Matchmaker as GKMatchmakerMBS, invite as GKInviteMBS, match as GKMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called by matchForInvite on completion.
**Notes:** Match provides the new match object on success.

Possible reasons for error:
1. Communications failure.
2. Invite cancelled.
Available on Mac OS X 10.8.2 and newer.

### 86.1.54 matchmakerViewControllerDidFailWithError(viewController as Variant, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the view controller encounters an unrecoverable error. (required)
**Notes:** viewController: The view controller that received the error. (GKMatchmakerViewControllerMBS)
error: An error object that describes the error.

### 86.1.55 matchmakerViewControllerDidFindMatch(viewController as Variant, match as GKMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a peer-to-peer match is found.
**Notes:** viewController: The view controller that performed the matchmaking. (GKMatchmakerViewControllerMBS)
match: A completed match.

This method is called when the view controller's hosted property is false. Although optional in the protocol, if your game attaches a delegate to the view controller for a peer-to-peer match, the view controller expects your game to provide an implementation of this method.

### 86.1.56 matchmakerViewControllerDidFindPlayers(viewController as Variant, playerIDs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a hosted match is found.
**Notes:** viewController: The view controller that performed the matchmaking. (GKMatchmakerViewControllerMBS)
players: An array of identifier strings for the matched players.

This method is called when the view controller's hosted property is true. Although optional in the protocol, if your game attaches a delegate to the view controller for a hosted match, the view controller expects your game to provide an implementation of this method.

The view controller returns the list of players to your game by calling this method. Your game is responsible for connecting these players to your own server and then using that server to relay messages between the players.

### 86.1.57 matchmakerViewControllerDidReceiveAcceptFromHostedPlayer(viewController as Variant, playerID as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a player in a hosted match accepts the invitation.
**Notes:** viewController: The view controller that accepted the invitation. (GKMatchmakerViewControllerMBS)
playerID: The identifier of the accepting player.

After a player accepts an invitation, that player's device should connect to your server. Once the connection is established, your game should call the view controller's setHostedPlayer method to update the player's connection status.

### 86.1.58 matchmakerViewControllerWasCancelled(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the user cancels the matchmaking request (required)
**Notes:** viewController: The view controller that received the cancellation. (GKMatchmakerViewControllerMBS)

### 86.1.59 matchShouldReinvitePlayer(match as GKMatchMBS, playerID as string) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a player in a two-player match was disconnected.
**Notes:** match: The match that lost the player.
playerID: The identifier for the player whose connection failed.

Your game should return true if it wants Game Kit to attempt to reconnect the player, false if it wants to terminate the match.

Occasionally, players may get disconnected from a match. If your game implements this method in the match delegate and the match only contains two players, Game Kit calls this method after a player gets disconnected. If your delegate allows Game Kit to reconnect to the other player, it reconnects the other player. Your matchDidChangeState event is called when the other player is reconnected.

### 86.1.60 NotificationBannerCompleted(title as string, message as string, duration as Double, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GameKitMBS.showBannerWithTitle after the banner is reported.
**Notes:** Duration is only passed if it was sent with the newer method on Mac OS X 10.8.2 and newer.

### 86.1.61 participantQuitInTurnWithOutcomeCompleted(match as GKTurnBasedMatchMBS, matchOutcome as Integer, nextParticipant as GKTurnBasedParticipantMBS, nextParticipants() as GKTurnBasedParticipantMBS, timeout as Double, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the data is uploaded to the server.
**Notes:** Called by GKTurnBasedMatchMBS.participantQuitInTurnWithOutcome.

error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.62 participantQuitOutOfTurnWithOutcomeCompleted(match as GKTurnBasedMatchMBS, matchOutcome as Integer, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.participantQuitOutOfTurnWithOutcome called after the data is uploaded to the server.
**Notes:** If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.63 PlayerAuthenticationDidChange(player as GKPlayerMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Player's authentication changed.

### 86.1.64 playerChanged(player as GKPlayerMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** The player changed.

### 86.1.65 playerStateUpdate(playerID as string, state as Integer, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the state of any participant in the chat changes (including the local player).
**Notes:** player: The player identifier for the player whose status changed.
state: The new state of the player.
You need to call enablePlayerStateUpdate to receive events.

### 86.1.66 queryActivityCompleted(MatchMaker as GKMatchmakerMBS, activity as Integer, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKMatchmakerMBS.queryActivity when query is done.
**Notes:** activity: The amount of activity in the player group.
error: If the search completed successfully, this parameter is nil; otherwise, this parameter holds an error object that describes the error that occurred.

### 86.1.67 queryPlayerGroupActivityCompleted(MatchMaker as GKMatchmakerMBS, playerGroup as Integer, activity as Integer, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKMatchmakerMBS.queryPlayerGroupActivity when the search completes.
**Notes:** activity: The amount of activity in the player group.
error: If the search completed successfully, this parameter is nil; otherwise, this parameter holds an error object that describes the error that occurred.

### 86.1.68 receivedTurnEventForMatch(player as GKPlayerMBS, match as GKTurnBasedMatchMBS, didBecomeActive as boolean)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** Activates the player,Äôs turn. (required)
**Notes:** This method is called when the it becomes the player,Äôs turn. It is also called when any of the following events happen:

- The current turn has a time-out associated with it and the turn is about to expire.
- Player accepts an invite from another player.
- Turn was passed to another player. In this case, didBecomeActive is false.
- Match data is saved by another player.
- Player receives a reminder.

Available in OS X v10.10 and later.

### 86.1.69 recipientResponseHandler(MatchRequest as GKMatchRequestMBS, Player as GKPlayerMBS, response as Integer, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:** This event is called whenever you programmatically invite specific players to join a match.
**Notes:** It is called once for each player invited to the match. Typically, your game uses the responses to update the custom user interface. For example, you want the player to be able to perform any of the following tasks:

- Start the match.
- Invite an additional set of specific players.
- Use matchmaking to fill the remaining match slots.

Available in OS X v10.10 and later.

### 86.1.70 rematchCompleted(TurnMatch as GKTurnBasedMatchMBS, match as GKMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when GKMatchMBS.rematch completes.
**Notes:** match: The new match. If an error occurred, this parameter's value is nil.
error: If an error occurred, this parameter holds an error object that describes the problem. If the match was successfully recreated, this parameter's value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.71 remotePlayerDidCompleteChallenge(challenge as GKChallengeMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when a non-local player has completed a challenge issued by the local player.
**Notes:** Triggered by a push notification from the server. Received when a challenge notification banner is clicked, or while the game is running.
Available on Mac OS X 10.8.2 and newer.

### 86.1.72 removeCompleted(match as GKTurnBasedMatchMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKTurnBasedMatchMBS.remove on completion.
**Notes:** If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.
Tag is the parameter you passed to remove method.

### 86.1.73 reportAchievementCompleted(score as GKAchievementMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKAchievementMBS.reportAchievement after the operation completes.
**Notes:** error: If the operation was successful, this value is nil; otherwise, this parameter holds an object that describes the problem that occurred.

### 86.1.74 reportAchievementsCompleted(achievements() as GKAchievementMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when GKAchievementMBS.reportAchievements completes.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.75 reportScoreCompleted(score as GKScoreMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKScoreMBS.reportScore after the score is reported.
**Notes:** error: If an error occurred, this parameter holds an error object that describes the problem. If the score was successfully reported, this parameter's value is nil.

### 86.1.76 reportScoresCompleted(Scores() as GKScoreMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Reporting scores completed.
**Notes:** scores: An array of score objects to report to Game Center.
error: If an error occurred, this parameter holds an error object that describes the problem. If the score was successfully reported, this parameter's value is nil.

Available on Mac OS X 10.8.2 and newer.

### 86.1.77 resetAchievementsCompleted(error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKAchievementMBS.resetAchievements when the reset action is completed.
**Notes:** error: If the operation was successful, this value is nil; otherwise, this parameter holds an object that describes the problem that occurred.

### 86.1.78 saveCurrentTurnWithMatchDataCompleted(match as GKTurnBasedMatchMBS, matchData as Dictionary, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** The event to be called after the data is uploaded to Game Center.
**Notes:** error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.
matchData: The game-specific state for the match.

Available on Mac OS X 10.8.2 and newer.

### 86.1.79 selectChallengeablePlayerIDsCompleted(Achievement as GKAchievementMBS, playerIDs() as string, challengeablePlayerIDs() as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called by GKAchievementMBS.selectChallengeablePlayerIDs on completion
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.80 setDefaultLeaderboardCategoryIDCompleted(LocalPlayer as GKLocalPlayerMBS, categoryID as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called by GKLocalPlayerMBS.setDefaultLeaderboardCategoryID when completed.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.81 setDefaultLeaderboardCompleted(categoryID as string, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called by GKLeaderboardMBS.setDefaultLeaderboard after the scores are retrieved from the server.
**Notes:** error: If an error occurred, this error object describes the error. If the operation was completed successfully, the value is nil.

### 86.1.82 shouldShowBannerForLocallyCompletedChallenge(challenge as GKChallengeMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Whether to show banner for locally completed challenge.
**Notes:** If the method returns true, a challenge banner (like an achievement or welcome banner – not a notification center banner) is displayed. If false, then no banner is displayed. Default behavior for non-implementing apps is true.
Available on Mac OS X 10.8.2 and newer.

### 86.1.83 shouldShowBannerForLocallyReceivedChallenge(challenge as GKChallengeMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Whether to show banner for locally received challenge.
**Notes:** If the method returns true, a challenge banner (like an achievement or welcome banner – not a notification center banner) is displayed when a challenge is received in-game for the local player. If false, then no banner is displayed, and localPlayerDidSelectChallenge will not be called for that challenge. Default behavior for non-implementing apps is true.

Available on Mac OS X 10.8.2 and newer.

### 86.1.84 shouldShowBannerForRemotelyCompletedChallenge(challenge as GKChallengeMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Whether to show banner for remotely completed challenge.
**Notes:** If the method returns true, a challenge banner (like an achievement or welcome banner – not a notification center banner) is displayed. If false, then no banner is displayed. Default behavior for non-implementing apps is true.
Available on Mac OS X 10.8.2 and newer.

### 86.1.85 startBrowsingForNearbyPlayersCompleted(Matchmaker as GKMatchmakerMBS, playerID as string, reachable as boolean, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: .

**Function:** Called when startBrowsingForNearbyPlayers method found a player.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.1.86 turnBasedMatchmakerViewControllerDidFailWithError(viewController as Variant, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when an error occurs. (required)
**Notes:** viewController: The view controller that received an error. (GKTurnBasedMatchmakerViewControllerMBS)
error: An error object that describes the error.

Your game should dismiss the view controller.

### 86.1.87 turnBasedMatchmakerViewControllerDidFindMatch(viewController as Variant, match as GKTurnBasedMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the player selected a match to view. (required)
**Notes:** viewController: The view controller that found a match. (GKTurnBasedMatchmakerViewControllerMBS)
match: The match that the player selected.

Your game should dismiss the view controller and use the match object to show the current state of the match to the player.

### 86.1.88 turnBasedMatchmakerViewControllerPlayerQuitForMatch(viewController as Variant, match as GKTurnBasedMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when a player chooses to quit the match. (required)
**Notes:** viewController: The view controller that the player interacted with. (GKTurnBasedMatchmakerViewControllerMBS)
match: The match the player has chosen to quit.

When this method is called, the player is the current participant in the match, but that player has chosen to resign the match instead of taking a turn. Your game should dismiss the view controller, set an outcome for the player, and then call the match's participantQuitInTurnWithOutcome method.

### 86.1.89 turnBasedMatchmakerViewControllerWasCancelled(viewController as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when the player cancels matchmaking. (required)
**Notes:** viewController: The view controller that the player canceled. (GKTurnBasedMatchmakerViewControllerMBS)

Your game should dismiss the view controller.

### 86.1.90 Constants

GameKit Error Constants

| Constant | Value | Description |
|---|---|---|
| GKErrorAuthenticationInProgress | 7 | The local player is currently authenticating. |
| GKErrorCancelled | 2 | The requested operation was canceled. |
| GKErrorChallengeInvalid | 19 | The challenge was invalid.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorCommunicationsFailure | 3 | An error occurred when communicating with Game Center. |
| GKErrorGameUnrecognized | 15 | nGame Center does not recognize the application that made the reques<br>sure the bundle identifier is set properly for the application.one |
| GKErrorInvalidCredentials | 5 | The operation failed because the player's user name or password or b<br>incorrect. |
| GKErrorInvalidParameter | 17 | One or more of the parameters was incorrect.<br>For example, this error code may be returned if your application atte<br>post a score and provides a category string that does not match a categ<br>configured for your leaderboards on iTunes Connect. |
| GKErrorInvalidPlayer | 8 | A player object or identifier is invalid. |
| GKErrorMatchRequestInvalid | 13 | The match request's properties are impossible to fulfill. For example, th<br>mum number of players cannot be larger than the maximum number of |
| GKErrorNotAuthenticated | 6 | The local player has not been authenticated. |
| GKErrorNotSupported | 16 | The device does not support Game Center. |
| GKErrorOffline | 25 | The user went offline.<br>In Mac OS X 10.8.2 and newer this constant has value 25. In older ve<br>has value 19. |
| GKErrorParentalControlsBlocked | 10 | The feature has been blocked by the user. |
| GKErrorScoreNotSet | 9 | A score value was not set before attempting to post the score. |
| GKErrorTurnBasedInvalidParticipant | 22 | One of the participant objects you provided was invalid.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorTurnBasedInvalidState | 24 | The requested operation could not be completed because the session<br>invalid state.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorTurnBasedInvalidTurn | 23 | The requested operation could not be completed because the specified<br>pant does not have the required turn state.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorTurnBasedMatchDataTooLarge | 20 | Your game submitted data that exceeded the maximum size that Game<br>permits for a turn-based game.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorTurnBasedTooManySessions | 21 | The requested operation could not be completed because it would exc<br>maximum number of sessions.<br>Available on Mac OS X 10.8.2 and newer. |
| GKErrorUnderage | 14 | The feature is disabled because the local player is underage. |
| GKErrorUnexpectedConnection | 18 | An unexpected player has connected to a match. |
| GKErrorUnknown | 1 | An unexpected error occurred. |
| GKErrorUserDenied | 4 | The operation was denied by the user. |

Response Constants

| Constant | Value | Description |
|---|---|---|
| GKInviteeResponseAccepted | 0 | The player accepted the invitation.<br>Available on Mac OS X 10.8.2 and newer. |
| GKInviteeResponseDeclined | 1 | The player rejected the invitation.<br>Available on Mac OS X 10.8.2 and newer. |
| GKInviteeResponseFailed | 2 | The invitation was unable to be delivered.<br>Available on Mac OS X 10.8.2 and newer. |
| GKInviteeResponseIncompatible | 3 | The invitee is not running a compatible version of your game.<br>Available on Mac OS X 10.8.2 and newer. |
| GKInviteeResponseNoAnswer | 5 | The invitation timed out without an answer.<br>Available on Mac OS X 10.8.2 and newer. |
| GKInviteeResponseUnableToConnect | 4 | The invitee could not be contacted.<br>Available on Mac OS X 10.8.2 and newer. |

Invite Responses

| Constant | Value | Description |
|---|---|---|
| GKInviteRecipientResponseAccepted | 0 | The player accepted the invitation.<br>Available in OS X v10.10 and later. |
| GKInviteRecipientResponseDeclined | 1 | The player rejected the invitation.<br>Available in OS X v10.10 and later. |
| GKInviteRecipientResponseFailed | 2 | The invitation was unable to be delivered.<br>Available in OS X v10.10 and later. |
| GKInviteRecipientResponseIncompatible | 3 | The invitee is not running a compatible version of your game.<br>Available in OS X v10.10 and later. |
| GKInviteRecipientResponseNoAnswer | 5 | The invitation timed out without an answer.<br>Available in OS X v10.10 and later. |
| GKInviteRecipientResponseUnableToConnect | 4 | The invitee could not be contacted.<br>Available in OS X v10.10 and later. |

## 86.2 class GKAchievementChallengeMBS

### 86.2.1 class GKAchievementChallengeMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** A GKAchievementChallenge is a challenge to a player to complete a specific achievement.
**Notes:** Subclass of the GKChallengeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 86.2.2 Methods

### 86.2.3 achievement as GKAchievementMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The achievement the player must complete.
**Notes:** (read-only)

### 86.2.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

## 86.3 class GKAchievementDescriptionMBS

### 86.3.1 class GKAchievementDescriptionMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An GKAchievementDescription object holds text and images used to display an achievement to the player.
**Notes:** During development, you create achievement descriptions by editing them in iTunes Connect. At runtime, your game retrieve these descriptions from Game Center. Usually, your game only needs to download achievement descriptions when it wants to present a custom achievement user interface to the player.

see also
http://developer.apple.com/library/ios/#documentation/GameKit/Reference/GKAchievementDescription_Ref/Reference/Reference.html
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 86.3.2 Methods

### 86.3.3 achievedDescription as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A localized description of the completed achievement. (read-only)

### 86.3.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.3.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 86.3.6 groupIdentifier as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The group identifier for the achievement, if one exists.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.3.7 identifier as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A unique string used to identify the achievement. (read-only)
**Notes:** The GKAchievementDescription property holds the identifier string you created for the achievement on iTunes Connect.

### 86.3.8 image as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An image to display for the completed achievement. (read-only)
**Notes:** The value of this property is undefined until after the image is loaded. See loadImage.

### 86.3.9 incompleteAchievementImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A common image for incomplete achievements.

### 86.3.10 isHidden as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether this achievement should be visible to players. (read-only)
**Notes:** If the value of this property is false, this achievement is always visible to the user. If true, the achievement is not displayed in any of the standard achievement user interface screens. It remains hidden until the first time your game reports progress towards completing this achievement.

### 86.3.11 isReplayable as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the achievement will be reported by the game when the user earns it again.
**Notes:** This allows the achievement to be used for challenges when the recipient has previously earned it. Available on Mac OS X 10.8.2 and newer.

### 86.3.12 loadAchievementDescriptions(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Downloads the achievement descriptions from Game Center.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadAchievementDescriptionsCompleted event.

### 86.3.13 loadImage(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads the image property for a completed achievement.
**Notes:** Your game should call loadImage for each achievement the user has completed. Your game should display the placeholder image until the image is successfully downloaded. After the event is called, the description's image property holds the same image object that is returned to the event.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadImageCompleted event.

### 86.3.14 maximumPoints as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The number of points earned by completing this achievement. (read-only)

### 86.3.15 placeholderCompletedAchievementImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A common image for completed achievements.
**Notes:** When an achievement is completed, your game can display this image until the custom image for an achievement finishes loading.

### 86.3.16 title as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A localized title for the achievement. (read-only)

### 86.3.17 unachievedDescription as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A localized description of the achievement, to be used when the achievement has not been completed. (read-only)

### 86.3.18 Properties

### 86.3.19 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 86.4 class GKAchievementMBS

### 86.4.1 class GKAchievementMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Your game uses a GKAchievement object to communicate with Game Center about a local player's progress towards completing an achievement.
**Notes:** see also
http://developer.apple.com/library/ios/#documentation/GameKit/Reference/GKAchievement_Ref/Reference/Reference.html

### 86.4.2 Methods

### 86.4.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.4.4 Constructor(identifier as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a new achievement object.
**Notes:** identifier: A string that identifies the achievement you want to update.

Your game initializes a new achievement object only when it has not previously reported progress for that achievement. If your game has previously reported progress on an achievement, you should retrieve the achievement object by calling the loadAchievementsWithCompletionHandler class method and update the progress on that object instead.

### 86.4.5 isCompleted as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether the player has completed the achievement. (read-only)
**Notes:** The value of this property is true if the percentComplete property is equal to 100.0; otherwise, it is false.

### 86.4.6 isHidden as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether this achievement is normally kept secret from the player. (read-only)
**Notes:** On a newly initialized achievement object, the property's value is invalid. If the achievement object was returned to your game by the loadAchievementsWithCompletionHandler class method, the value of this property matches the value you set in iTunes Connect for that achievement. The value in this property is identical to the value found in the hidden property for an GKAchievementDescriptionMBS object that shares the same achievement identifier.

### 86.4.7 issueChallengeToPlayers(playerIDs() as string, message as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Use this method to issue GKScoreChallenges and GKAchievementChallenges to an array of playerIDs.
**Notes:** Players may not issue challenges to themselves nor to non-friends. Please see the GameKit reference documentation for further details on these methods.
Available on Mac OS X 10.8.2 and newer.

### 86.4.8 lastReportedDate as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The last time that the achievement was successfully reported to Game Center. (read-only)
**Notes:** On a newly initialized achievement object, this property holds the current date.

### 86.4.9 loadAchievements(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves previously submitted achievement progress from Game Center.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadAchievementsCompleted event.

### 86.4.10 reportAchievement(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Reports the player's progress to Game Center.
**Notes:** When the player makes progress towards completing an achievement, your game should communicate the player's progress to Game Center by calling this method. An achievement object is implicitly tied to the local player that was authenticated when the object was created; your game should only report progress when the same local player is still authenticated on the device.

Note: To avoid using network bandwidth unnecessarily, only report an achievement when the user has actually advanced the progress they have made towards completing it.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.reportAchievementCompleted.

When the progress is successfully reported, the achievement is made visible if it was previously hidden. The percentComplete and lastReportedDate property values stored on Game Center are updated if the new percentComplete value is greater than the value previously stored on Game Center. if the value of the percentComplete property was equal to 100.0, then the achievement is marked as completed and a banner may be shown to the player.

If the error is a network error and your game is running on iOS 4.3 or earlier, your game should periodically attempt to report the progress until the achievement is successfully reported. On iOS 5.0 and later and on OS X, the background reporting task automatically handles network errors on your game's behalf.

### 86.4.11 reportAchievements(achievements() as GKAchievementMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Report an array of achievements to the server.
**Notes:** Percent complete is required. Points, completed state are set based on percentComplete. isHidden is set to false anytime this method is invoqued. Date is optional. Error will be nil on success.

Possible reasons for error:
1. Local player not authenticated.
2. Communications failure.
3. Reported Achievement does not exist.

Later calls GameKitMBS.reportAchievementsCompleted event.
Available on Mac OS X 10.8.2 and newer.

### 86.4.12 resetAchievements(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Resets all achievement progress for the local player.
**Notes:** Calling this class method deletes all progress towards achievements previously reported for the local player. Hidden achievements that were previously visible are now hidden again.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.resetAchievementsCompleted event.

### 86.4.13 selectChallengeablePlayerIDs(playerIDs() as string, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Given a list of playerIDs, return a subset of that list containing only playerIDs that are eligible to receive a challenge for the achievement.
**Notes:** Available on Mac OS X 10.8.2 and newer.
Calls later GameKitMBS.selectChallengeablePlayerIDsCompleted event when completed.

### 86.4.14 Properties

### 86.4.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.4.16 identifier as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A string used to uniquely identify the specific achievement the object refers to.
**Notes:** The identifier property must match the identifier string for an achievement you created for your game on iTunes Connect.
(Read and Write computed property)

### 86.4.17 percentComplete as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A percentage value that states how far the player has progressed on this achievement.
**Notes:** The default value for a newly initialized achievement object is 0.0. The range of legal values is between 0.0 and 100.0, inclusive.
(Read and Write computed property)

### 86.4.18 showsCompletionBanner as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether a banner is displayed when the achievement is completed.
**Notes:** When an achievement is completed and the value of this property is true, a notification banner is displayed to the player to inform them of the completed achievement. If the value of this property is false, there is no visual indication that the achievement is completed. Your game should set this property to false only when it wants to provide its own visual indicator that the achievement was earned. The default value is false.
(Read and Write computed property)

## 86.5 class GKAchievementViewControllerMBS

### 86.5.1 class GKAchievementViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An GKAchievementViewController object provides a standard user interface to display achievement progress for the local player.
**Notes:** see also
http://developer.apple.com/library/ios/#documentation/GameKit/Reference/GKAchievementViewController_Ref/Reference/Reference.html
Subclass of the NSViewControllerMBS class.

### 86.5.2 Methods

### 86.5.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

## 86.6 class GKChallengeMBS

### 86.6.1 class GKChallengeMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** A GKChallenge object represents a challenge issued by a player to another player.
**Notes:** Important: Your game must authenticate a local player before you can use any Game Center classes. If there is no authenticated player, your game receives a GKErrorNotAuthenticated error. For more information on authentication see Game Center Programming Guide.

Players use the Game Center app to issue and view challenges. However, your game can also customize its challenge behaviors in a number of ways:

- You can load the list of challenges issued to the local player by calling the loadReceivedChallenges shared method. For example, you might do this to display the challenges in your game's user interface.
- Your app can issue challenges using a GKScoreMBS or GKAchievementMBS object. Your game should only issue challenges when the local player initiates the action in your user interface.
- Your game can be notified when new challenge events are received. See GameKitMBS events.

You never subclass the GKChallengeMBS class directly. However, subclasses of GKChallengeMBS represent specific kinds of challenges. Two challenge types exist:

A GKScoreChallengeMBS is a challenge to beat a score the local player earned in a leaderboard.
A GKAchievementChallengeMBS is a challenge to complete an achievement that the local player has already completed.

Available on Mac OS X 10.8.2 and newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 86.6.2 Methods

### 86.6.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.8.2 and newer.

### 86.6.4 completionDate as date

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The date the challenge was completed. (read-only).
**Notes:** If the challenge is not complete, this value is nil.
Available on Mac OS X 10.8.2 and newer.

### 86.6.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
**Notes:** Available on Mac OS X 10.8.2 and newer.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 86.6.6 decline

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Declines a challenge.
**Notes:** If your game implements a custom user interface to display challenges, it should include controls that allow a player to decline a challenge. If the player uses your user interface to decline a challenge, call this method.

Available on Mac OS X 10.8.2 and newer.

### 86.6.7 issueDate as date

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The date the challenge was issued. (read-only).
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.6.8 issuingPlayerID as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The player identifier for the player who issued the challenge. (read-only).
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.6.9 loadReceivedChallenges(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Loads the list of outstanding challenges.
**Notes:** Available on Mac OS X 10.8.2 and newer.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKit.loadReceivedChallengesCompleted event.

### 86.6.10 message as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** A text message that describes the challenge. (read-only).
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.6.11 receivingPlayerID as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The player identifier for the player who received the challenge. (read-only).
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.6.12 state as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The current state of the challenge. (read-only).
**Notes:** See GKChallengeState* constants.
Available on Mac OS X 10.8.2 and newer.

### 86.6.13 Properties

### 86.6.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** Available on Mac OS X 10.8.2 and newer.
(Read and Write property)

### 86.6.15 Constants

State Constants

| Constant | Value | Description |
|---|---|---|
| GKChallengeStateCompleted | 2 | The receiving player successfully completed the challenge. Available on Mac OS X 10.8.2 and newer. |
| GKChallengeStateDeclined | 3 | The receiving player declined the challenge. Available on Mac OS X 10.8.2 and newer. |
| GKChallengeStateInvalid | 0 | An error occurred. The state of this challenge is not valid. Available on Mac OS X 10.8.2 and newer. |
| GKChallengeStatePending | 1 | The challenge has been issued, but is not yet completed nor declined. Available on Mac OS X 10.8.2 and newer. |

## 86.7 class GKChallengesViewControllerMBS

### 86.7.1 class GKChallengesViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** View controller that provides the standard user interface for challenges.
**Notes:** Present modally from the top view controller.
Calls GameKit.challengesViewControllerDidFinish if needed.
Available on Mac OS X 10.8.2 and newer.
Subclass of the NSViewControllerMBS class.

### 86.7.2 Methods

### 86.7.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

## 86.8 class GKDialogControllerMBS

### 86.8.1 class GKDialogControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKDialogController class provides the ability to present Game Center view controller classes on OS X.
**Notes:** To present a view controller, instantiate a new GKDialogControllerMBS object or use the singleton object provided by the sharedDialogController class method. Set the parentWindow property of the dialog controller to the window that should display the view controller's contents. Then, call the dialog controller's presentViewController* methods, passing in the view controller object to be presented. Later, when the view controller's contents should be hidden, call the dialog controller's dismiss method.

see also
https://developer.apple.com/library/prerelease/mac/#documentation/GameKit/Reference/GKDialogController_Ref/Reference/Reference.html
Subclass of the NSResponderMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr1

**Xojo Developer Magazine**

- 12.5, page 33: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, page 29: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.4, page 31: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner

### 86.8.2 Methods

### 86.8.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.8.4 dismiss

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Dismisses the currently displayed view controller.

### 86.8.5 parentWindow as NSWindowMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The window that view controllers presented by the dialog controller are displayed in.
**Notes:** Your app must set this property before presenting a view controller. The window must be at least 800 x 600.

### 86.8.6 presentViewController(GKViewController as NSViewControllerMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Presents a view controller in the dialog controller's window.
**Notes:** viewController: A Game Center view controller.

Returns true if the view controller was presented, false if an error occurred.
The contents of the window are covered by the view controller's contents until the view controller is dismissed.

### 86.8.7 setParentWindow(parentWindow as NSWindowMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the parent window.
See also:

- 86.8.8 setParentWindow(parentWindow as Window) 13941

### 86.8.8 setParentWindow(parentWindow as Window)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the parent window to the given Xojo Window.
**Notes:** Should work fine in Cocoa, but may fail in Carbon.
See also:

- 86.8.7 setParentWindow(parentWindow as NSWindowMBS) 13941

### 86.8.9 sharedDialogController as GKDialogControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves the shared instance of the dialog controller.
**Notes:** Game Kit provides the shared dialog controller as a convenience. Your game can either use the shared dialog controller provided by this method, or it can instantiate its own GKDialogController object and configure it. You might create multiple GKDialogController objects when each should be presented in its own window.

## 86.9 class GKFriendRequestComposeViewControllerMBS

### 86.9.1 class GKFriendRequestComposeViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Your game uses the GKFriendRequestComposeViewController class to present a screen that allows the local player to send friend requests to other players.
**Notes:** see also
https://developer.apple.com/library/prerelease/mac/#documentation/GameKit/Reference/GKFriendRequestComposeViewController_Ref/Reference/Reference.html
Subclass of the NSViewControllerMBS class.

### 86.9.2 Methods

### 86.9.3 addRecipientsWithEmailAddresses(playerIDs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Add recipients to the request.
**Notes:** If you don't specify at least one recipient before presenting the view, the recipients field will be made firstResponder, to encourage the user to add some.
If you add more than maxNumberOfRecipients recipients, these methods will throw an exception.

### 86.9.4 addRecipientsWithPlayerIDs(playerIDs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Add recipients to the request.
**Notes:** If you don't specify at least one recipient before presenting the view, the recipients field will be made firstResponder, to encourage the user to add some.
If you add more than maxNumberOfRecipients recipients, these methods will throw an exception.

### 86.9.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.9.6 maxNumberOfRecipients as UInt64

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Get the maximum number of recipients permitted.

### 86.9.7 setMessage(message as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specify the message sent to the invitee. A default message will be used if you don't specify one.

## 86.10 class GKGameCenterViewControllerMBS

### 86.10.1 class GKGameCenterViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The GKGameCenterViewControllerMBS class aggregates many common Game Center features into a single user interface.
**Notes:** It replaces GKAchievementViewControllerMBS and GKLeaderboardViewControllerMBS as the preferred way to show Game Center content in your game.

Important: Your application must authenticate a local player before you can use any Game Center classes. If there is no authenticated player, your application receives a GKErrorNotAuthenticated error. For more information on authentication, see Game Center Programming Guide.

To display the Game Center screen, initialize a new GKGameCenterViewController object and set its delegate. Optionally, you can choose to configure the view controller further to specify which content is initially displayed. Then present the view controller. Your delegate is called when the user dismisses the screen.

Your game should pause other activities before presenting the Game Center user interface.

Available on Mac OS X 10.8.2 and newer.
Subclass of the NSViewControllerMBS class.

### 86.10.2 Methods

### 86.10.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.10.4 Properties

### 86.10.5 leaderboardCategory as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The named leaderboard that is displayed by the view controller.
**Notes:** The category property must either be empty or it must match a category identifier you defined

when you created your leaderboards on iTunes Connect. If empty, the view displays scores for the aggregate leaderboard. Default is empty.

When the leaderboard is presented, the value of this property determines which leaderboard content is displayed to the player. As the player changes which leaderboard content they view, the leaderboardCategory property is automatically updated. For example, to preserve the player's selections, you can read the leaderboardCategory property after the screen is dismissed, and set that value the next time you initialize the view controller.

Available on Mac OS X 10.8.2 and newer.
(Read and Write computed property)

### 86.10.6 leaderboardTimeScope as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** A time filter used to restrict which scores are displayed to the player.
**Notes:** This property determines which tab view of the scores screen is displayed to the player. The default value is GKLeaderboardTimeScopeAllTime, which shows the best score each player has earned. For more information on time scopes, see GKLeaderboardMBS Class.

When the leaderboard is presented, the value of this property determines the initial tab that is displayed to the player. As the player changes which tab they view, the leaderboardTimeScope property is automatically updated. For example, to preserve the player's selections, you can read the leaderboardTimeScope property after the screen is dismissed, and set that value the next time you initialize the view controller.

Available on Mac OS X 10.8.2 and newer.
(Read and Write computed property)

### 86.10.7 viewState as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The content displayed by the Game Center controller.
**Notes:** See State* constants for possible values. When you first present the Game Center view controller, the content displayed by the view controller is determined by this property. If the player navigates to different content, the view state is automatically updated. For example, to preserve the player's selections, you can read the viewState property after the screen is dismissed, and set that value the next time you initialize the view controller.

Available on Mac OS X 10.8.2 and newer.
(Read and Write computed property)

### 86.10.8 Constants

State Values

| Constant | Value | Description |
|---|---|---|
| StateAchievements | 1 | Indicates that the view controller presents achievements content.<br>Available on Mac OS X 10.8.2 and newer. |
| StateChallenges | 2 | Indicates that the view controller presents challenges content.<br>Available on Mac OS X 10.8.2 and newer. |
| StateDefault | -1 | Indicates that the view controller should present the default screen.<br>Available on Mac OS X 10.8.2 and newer. |
| StateLeaderboards | 0 | Indicates that the view controller presents leaderboard content. The leaderboardCategory and leaderboardTimeScope properties affect the appearance of this view state.<br>Available on Mac OS X 10.8.2 and newer. |

## 86.11 class GKInviteMBS

### 86.11.1 class GKInviteMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Your game receives invitations from other players through the GKInvite class.
**Notes:** Your game never directly creates GKInvite objects. Instead, invitations are created by Game Kit and delivered to your game. To receive invitations from Game Center, your game sets an invitation handler.

The properties of the invitation object describe the match the local player is being invited to join.
**Xojo Developer Magazine**

- 12.5, page 31: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, page 29: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

### 86.11.2 Methods

### 86.11.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.11.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.11.5 inviter as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The identifier for the player who invited the local user to join a match. (read-only)

### 86.11.6 isHosted as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether the game is hosted. (read-only)
**Notes:** If the value of the hosted property is true, this is a hosted match. If the value is false, this is a peer-to-peer match. The default is false.

### 86.11.7 playerAttributes as UInt32

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Player attributes from inviter's match request.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.11.8 playerGroup as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Player group from inviter's match request.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.11.9 Properties

### 86.11.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 86.12 class GKLeaderboardMBS

### 86.12.1 class GKLeaderboardMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKLeaderboard object represents a programmatic query to retrieve scores from Game Center.
**Notes:** Your game uses GKLeaderboard objects when it wants to analyze scoring information or when it wants to create its own custom leaderboard screens.

see also
https://developer.apple.com/library/prerelease/mac/#documentation/GameKit/Reference/GKLeaderboard_Ref/Reference/Reference.html

### 86.12.2 Methods

### 86.12.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.12.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a default leaderboard request.
**Notes:** A leaderboard object initialized with this method uses the playerScope, timeScope, and range properties to search Game Center for scores.
See also:

- 86.12.5 Constructor(playerIDs() as string) 13950

### 86.12.5 Constructor(playerIDs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a leaderboard request to retrieve the scores of a specific group of players.
**Notes:** playerIDs: An array of strings that holds the player identifier strings of the players to retrieve.

A leaderboard object initialized with this method ignores the playerScope and range properties. Instead, it retrieves scores for the specific list of players whose IDs are included in the playerIDs parameter.
See also:

- 86.12.4 Constructor 13950

### 86.12.6 groupIdentifier as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Set when leaderboards have been designated a game group; set when loadLeaderboards has been called for leaderboards that support game groups.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.12.7 isLoading as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the leaderboard object is retrieving scores. (read-only)
**Notes:** The value of the loading property is true if the leaderboard object has any pending requests for scores.

### 86.12.8 loadCategories(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads the list of leaderboard categories along with their corresponding localized titles.
**Notes:** You use this class method to retrieve the category identifiers and titles you configured for your leaderboards on iTunes Connect. To create a leaderboard query that targets a particular category, set the category property to one of the strings returned by this method.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadCategoriesCompleted event.

### 86.12.9 loadLeaderboards(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Loads the leaderboards.
**Notes:** Calls GameKitMBS.loadLeaderboardsCompleted later when completed.
Available on Mac OS X 10.8.2 and newer.

### 86.12.10 loadScores(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves a set of scores from Game Center.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadScoresCompleted event.

You can call this method multiple times; each call represents a different query against the scores stored on Game Center. If you post multiple load operations using the same leaderboard object, any properties that are updated by loading scores reflect the last query that completed. The order that achievement queries are processed is arbitrary.

### 86.12.11 localPlayerScore as GKScoreMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The score earned by the local player. (read-only)
**Notes:** This property is invalid until a call to loadScores is completed. Afterward, it contains a score object representing the local player's score on the leaderboard.

### 86.12.12 maxRange as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The size of the leaderboard. (read-only)
**Notes:** This property is invalid until a call to loadScores is completed. Afterward, it contains the total number of entries available to return to your game given the filters you applied to the query.

### 86.12.13 scores as GKScoreMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The list of scores returned by the search. (read-only)
**Notes:** This property is invalid until a call to loadScores is complete. Afterward, it contains the same score objects that were returned to the completion handler.

### 86.12.14 setDefaultLeaderboard(categoryID as string, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the default leaderboard for the local player.
**Notes:** categoryID: The named leaderboard that should be the new default leaderboard for the local player.

The default leaderboard is used whenever your game uses a GKScore object to report a score to Game Center without explicitly setting the score object's category property. The default leaderboard is normally set in iTunes Connect when you configure your game. However, your game can use this class method to override the default leaderboard that appears for the local player.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.setDefaultLeaderboardCompleted event.

If an error occurs and was a network error, your game should periodically resend the request until it completes.

### 86.12.15 title as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The localized title for the leaderboard. (read-only)
**Notes:** This property is invalid until a call to loadScores is complete. Afterward, it contains the localized title that matches the category property of the leaderboard object.

### 86.12.16 Properties

### 86.12.17 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.12.18 category as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The named leaderboard to retrieve information from.
**Notes:** If non-empty, Game Center only returns scores with a matching category value. If empty, this property is ignored. Default is empty.
(Read and Write computed property)

### 86.12.19 playerScope as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A filter used to restrict the search to a subset of the players on Game Center.
**Notes:** The playerScope property is ignored if the leaderboard request was initialized using the Constructor method. Otherwise, the playerScope property determines which players are included in the request for high scores. The default is GKLeaderboardPlayerScopeGlobal. See Leaderboard Player Scope constants for more information.
(Read and Write computed property)

### 86.12.20 range as NSRangeMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The numerical score rankings to return from the search.
**Notes:** The range property is ignored if the leaderboard request was initialized using the Constructor method. Otherwise, the range property is used to filter which scores are returned to your game. For example, if you specified a range of [ 1,10 ] , after the search is complete, your game receives the top ten scores. The default range is [ 1,25 ] .

The minimum index is 1. The maximum length is 100.
(Read and Write computed property)

### 86.12.21 timeScope as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A filter used to restrict the search to scores that were posted within a specific period of time.
**Notes:** This property determines how far back in time the search looks for scores. The default value is GKLeaderboardTimeScopeAllTime. See Leaderboard Time Scope for more information.
(Read and Write computed property)

### 86.12.22 Constants

Leaderboard Player Scope

| Constant | Value | Description |
|---|---|---|
| GKLeaderboardPlayerScopeFriendsOnly | 1 | Only friends of the local player should be considered when generating of scores. |
| GKLeaderboardPlayerScopeGlobal | 0 | All players on Game Center should be considered when generating th scores. |

Leaderboard Time Scope

| Constant | Value | Description |
|---|---|---|
| GKLeaderboardTimeScopeAllTime | 2 | Each player's best score is returned. |
| GKLeaderboardTimeScopeToday | 0 | Each player is restricted to scores recorded in the past 24 hours. |
| GKLeaderboardTimeScopeWeek | 1 | Each player is restricted to scores recorded in the past week. |

## 86.13 class GKLeaderboardViewControllerMBS

### 86.13.1 class GKLeaderboardViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKLeaderboardViewController class provides a standard user interface that displays high scores to the player.
**Notes:** see also
https://developer.apple.com/library/prerelease/mac/#documentation/GameKit/Reference/GKLeaderboardViewController_Ref/Reference/Reference.html
Subclass of the NSViewControllerMBS class.

### 86.13.2 Methods

### 86.13.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.13.4 Properties

### 86.13.5 category as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The category.
**Notes:** (Read and Write computed property)

### 86.13.6 timeScope as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The time scope.
**Notes:** (Read and Write computed property)

## 86.14 class GKLocalPlayerMBS

### 86.14.1 class GKLocalPlayerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKLocalPlayer class is a special subclass of GKPlayer that represents the authenticated player running your game on the local device.
**Notes:** At any given time, only one player may be authenticated on the device; this player must log out before another player can log in.

Your game must authenticate the local player before using any Game Center features. Authenticating the player ensures that the player has created an account and is connected to Game Center. To authenticate the local player, retrieve the shared instance of the local player by calling the localPlayer class method, and then call the authenticateWithCompletionHandler: method.

You can see whether the local player is authenticated by reading the local player's authenticated property. If authenticated is true, then the local player's other properties are valid, and you can call other Game Center methods.

Call the loadFriendsWithCompletionHandler: method to retrieve the player identifiers for the local player's friends.
Subclass of the GKPlayerMBS class.
**Xojo Developer Magazine**

- 12.6, page 27: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.4, pages 30 to 31: Writing OS X Apps for Game Center, Getting started by authenticating the local player with the Game Center Sandbox testing facility by Tom Baumgartner

### 86.14.2 Methods

### 86.14.3 authenticate(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use SetAuthenticateHandler instead. **Function:** Prompts the player to confirm their identity.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.authenticateCompleted event.

Your game should authenticate the player as early as possible after launching, ideally as soon as you can present a user interface to the player. For example, your game may be launched because the player accepted an invitation to join a match or to take a turn in a turn-based match, so you want your game to authenticate

the player and process the match invitation as quickly as possible.

If there is not an authenticated player on the device when your game calls this method, Game Kit displays a user interface that allows the player to sign in with their credentials (or to create a new account if he or she has never used Game Center). Your game should pause other activities that require user interaction (such as a real time game loop) before attempting to authenticate the local player.

Each time the completion handler is called, the data stored in the the GKLocalPlayer singleton object may have changed. A new player may have logged into the device or the player may have simply logged out from Game Center. Because of both of these possibilities, your completion handler must be prepared update any state of the game that assumes that a particular player is logged in if it discovers that the local player has changed. For more information, see "Authenticating the Local Player in a Multitasking Application" in Game Kit Programming Guide.

Deprecated in Mac OS X 10.9.

### 86.14.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates new object pointing to the shared instance of the local player.

### 86.14.5 friends as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A list of player identifiers for the local player's friends. (read-only)
**Notes:** This property is invalid until a call to loadFriends succeeds.

### 86.14.6 GKPlayerAuthenticationDidChangeNotificationName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The notificartion name fo the notification to inform about an authentication change.
**Notes:** Posted after the authenticated property of the shared local player object changes.

### 86.14.7 loadDefaultLeaderboardCategoryID(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Loads the category identifier for the local player's default leaderboard.
**Notes:** Calls later GameKitMBS.loadDefaultLeaderboardCategoryIDCompleted event.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadDefaultLeaderboardCategoryIDCompleted event.

Available on Mac OS X 10.8.2 and newer.

### 86.14.8 loadFriendPlayers(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves a list of player identifiers for the local player,Äôs friends.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your completion handler. The completion handler is always called on the main thread.

Available in OS X v10.10 and later.
Calls later loadFriendPlayersCompleted event in GameKitMBS class.

### 86.14.9 loadFriends(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves a list of player identifiers for the local player's friends.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadFriendsCompleted.

Once this call is completed, the friends property is set to the same list of players returned in the completion event.

### 86.14.10 localPlayer as GKLocalPlayerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves the shared instance of the local player.
**Notes:** You never directly create a local player object. Instead, you retrieve the singleton object by calling this method.

### 86.14.11 SetAuthenticateHandler(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the handler called to process an authentication-related event with GameKitMBS.authenticateHandler.
**Notes:** Calls later GameKitMBS.authenticateHandler.
Available on Mac OS X 10.8.2 and newer.

### 86.14.12 setDefaultLeaderboardCategoryID(categoryID as string, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the category identifier for the local player's default leaderboard.
**Notes:** categoryID: The category ID string for one of your game's leaderboards.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.setDefaultLeaderboardCategoryIDCompleted event.

The default leaderboard is configured in iTunes Connect as part of configuring your game's leaderboards. All players normally start with this leaderboard as the default leaderboard. Calling this method changes the default leaderboard only for the local player.

Available on Mac OS X 10.8.2 and newer.

### 86.14.13 Properties

### 86.14.14 isAuthenticated as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether a local player is currently signed in to Game Center. (read-only)
**Notes:** Before using other Game Center features, your game must authenticate the local player. Your game can read this property elsewhere in your game to confirm that the local player is authenticated.

Important Even after the local player has successfully authenticated their credentials, the value of this property can change. For example, if your game is switched into the background, the player could launch the Game Center game and sign out of Game Center. To be notified when the value of this property changes, your game should register to receive the GKPlayerAuthenticationDidChangeNotificationName notification

(or use GameKitMBS.PlayerAuthenticationDidChange event).
(Read only property)

### 86.14.15 isUnderage as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that declares whether the local player is underage. (read-only)
**Notes:** Some Game Center features are disabled if the local player is underage. Your game can test this property if it wants to disable some of its own features based on the player's age.
(Read only property)

## 86.15 class GKMatchmakerMBS

### 86.15.1 class GKMatchmakerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKMatchmaker class is used to programmatically create matches to other players and to receive match invitations sent by other players.
**Notes:** see also
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKMatchmaker_Ref/Reference/Reference.html
**Xojo Developer Magazine**

- 12.5, pages 31 to 32: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, page 29: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

### 86.15.2 Methods

### 86.15.3 addPlayersToMatch(match as GKMatchMBS, matchRequest as GKMatchRequestMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds players to an existing match.
**Notes:** match: A previously created match.
matchRequest: The parameters for the new match request.

This method updates an existing match object by adding additional players.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.addPlayersToMatchCompleted event.

### 86.15.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.15.5 cancel

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Cancels a pending matchmaking request.
**Notes:** The completion event receives a callback with a GKErrorCancelled error.

### 86.15.6 cancelInviteToPlayer(playerID as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Cancel a pending invitation to a player.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.15.7 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.15.8 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 86.15.9 findMatchForRequest(request as GKMatchRequestMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a request to find players for a peer-to-peer match.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.findMatchForRequestCompleted event.

The match request's playersToInvite property is ignored; to invite a specific set of players to the match, you must display the standard user interface.

### 86.15.10 findPlayersForHostedMatchRequest(request as GKMatchRequestMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a request to find players for a hosted match.
**Notes:** request: The configuration for the desired match.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.findPlayersForHostedMatchRequestCompleted event. When the event is called, your game should connect those players to your own server.

The match request's playersToInvite property is ignored; to invite a specific set of players to the match, you must display the standard user interface.

### 86.15.11 finishMatchmakingForMatch(match as GKMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Call this when finished with all programmatic P2P invites/matchmaking, for compatability with connected players using GKMatchmakerViewController.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.15.12 matchForInvite(invite as GKInviteMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Get a match for an accepted invite.
**Notes:** Calls later GameKitMBS.matchForInviteCompleted eventg.

Possible reasons for error:
1. Communications failure.
2. Invite cancelled.

Available on Mac OS X 10.8.2 and newer.

### 86.15.13 maxPlayersAllowedForMatchOfType(type as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** To determine the maximum allowed players for each type of match supported.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.15.14 queryActivity(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initiates a search for activity in all player groups.
**Notes:** A query allows your game to see how many players have recently searched for a match, across all player groups.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.queryActivityCompleted.

### 86.15.15 queryPlayerGroupActivity(playerGroup as Integer, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries Game Center for the activity in a player group.
**Notes:** playerGroup: A number that uniquely identifies a subset of players of your game.

A query allows your game to see how many players have recently searched for a match. As a result, you can present a user interface that shows the relative activity in each player group. For example, if one group sees less activity than others, you might display a warning so that players are aware that finding a match may take longer.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.queryPlayerGroupActivityCompleted event.

### 86.15.16 sharedMatchmaker as GKMatchmakerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the singleton matchmaker instance.
**Notes:** Games do not create a GKMatchmaker object. Instead, they retrieve the shared singleton by calling this method.

### 86.15.17 startBrowsingForNearbyPlayers(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Start browsing for nearby players that can be invited to a match.
**Notes:** The GameKitMBS.startBrowsingForNearbyPlayersCompleted event will be called for each player found with a compatible game. It may be called more than once for the same player if that player ever becomes unreachable (e.g. moves out of range). You should call stopBrowsingForNearbyPlayers when finished browsing.

Available on Mac OS X 10.8.2 and newer.

### 86.15.18 stopBrowsingForNearbyPlayers

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Stop browsing for nearby players.
**Notes:** Available on Mac OS X 10.8.2 and newer.

### 86.15.19 Properties

### 86.15.20 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.15.21 Constants

Match Types

| Constant | Value | Description |
|---|---|---|
| GKMatchTypeHosted | 1 | Hosted Match<br>Available on Mac OS X 10.8.2 and newer. |
| GKMatchTypePeerToPeer | 0 | Peer to Peer Match.<br>Available on Mac OS X 10.8.2 and newer. |
| GKMatchTypeTurnBased | 2 | Turn based match.<br>Available on Mac OS X 10.8.2 and newer. |

## 86.16 class GKMatchmakerViewControllerMBS

### 86.16.1 class GKMatchmakerViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKMatchmakerViewController class is used to present a standard user interface to the player.
**Notes:** This interface allows them to invite friends to a match or to allow Game Center to fill the remaining players needed for a match.

see also:
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKMatchmakerViewController_Ref/Reference/Reference.html
Subclass of the NSViewControllerMBS class.
**Xojo Developer Magazine**

- 12.5, page 33: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, page 29: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

### 86.16.2 Methods

### 86.16.3 addPlayersToMatch(match as GKMatchMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds a player to the match.
**Notes:** match: An existing match that you want to add players to.

Your game calls this method prior to presenting the view controller to the player. Calling this method instructs the view controller to add new players to the provided match rather than creating a new match.

When called, this method sets the delegate on the match to nil and updates the view controller's user interface to display the players already connected to the match.

Important Only one device connected to the match should call this method.

### 86.16.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
See also:


- 86.16.5 Constructor(invite as GKInviteMBS) 13968
- 86.16.6 Constructor(request as GKMatchRequestMBS) 13968


### 86.16.5 Constructor(invite as GKInviteMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a matchmaker view controller to respond to an invitation received from another player.
**Notes:** invite: The invitation received from the other player.

The user is allowed to join the match that the user was invited to, but is not allowed to invite others to the match.
See also:


- 86.16.4 Constructor 13967
- 86.16.6 Constructor(request as GKMatchRequestMBS) 13968


### 86.16.6 Constructor(request as GKMatchRequestMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a matchmaker view controller to create a new match.
**Notes:** request: A request containing the characteristics for the desired match.
Your game uses this Constructor when it wants the local user to create a new match.
See also:


- 86.16.4 Constructor 13967
- 86.16.5 Constructor(invite as GKInviteMBS) 13968


### 86.16.7 matchRequest as GKMatchRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The configuration for the desired match. (read-only)

### 86.16.8 setHostedPlayer(playerID as string, connected as boolean)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Updates a player's status on the view to show that the player has connected or disconnected from your server.
**Notes:** playerID: The identifier string for a player that connected to the external server.
connected: Optional, a Boolean value that states whether the player is connected to the hosted match.

When setting up a hosted match, each device should instantiate a matchmaker view controller and display it to the player. Then, when a new player connects to your server, your server should notify all participating devices already connected to your server. Each participating device should then call this method to update that player's status in the matchmaking interface. Similarly, if a player disconnects from the server, your server should inform each device so that the devices can update their user interface.

### 86.16.9 Properties

### 86.16.10 DefaultInvitationMessage as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The default invitation message used to initialize an invitation.
**Notes:** Your game sets this property to change the default invitation text displayed when the local player creates a new invitation. The local player may edit the text before sending the invitation.
(Read and Write computed property)

### 86.16.11 Hosted as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the match is hosted or peer-to-peer.
**Notes:** The value of the hosted property determines which events of GameKitMBS are called when the match is complete. If true, this is a hosted match, and the delegate's matchmakerViewControllerDidFind-Players method is to provide the list of players to your game. If false, this is a peer-to-peer match, and matchmakerViewControllerDidCreateMatch is called with a GKMatch object. The default value is false.

Hosted matches require you to provide a server that hosts the participants in the match.
(Read and Write computed property)

## 86.17 class GKMatchMBS

### 86.17.1 class GKMatchMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKMatch object provides a peer-to-peer connection between a group of players that are connected through Game Center.
**Notes:** Matches provide both data and voice services. Your application never directly allocates GKMatch objects. Instead, your application uses the GKMatchmaker class to programmatically find a match with other interested players or a GKMatchmakerViewController object to display a user interface to the player.

After your application receives a match object, you must set a delegate and then wait until the other participants are connected to the match. You can read the expectedPlayerCount property to determine how many players have not connected to the match.

Your application transmits data to other players by calling either the sendDataToAllPlayers method or the sendDataToPlayer method. To transmit and receive voice data, call voiceChatWithName to create one or more voice channels.

When you are finished with the match, call the match's disconnect method.
**Xojo Developer Magazine**

- 12.5, page 34: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, pages 31 to 32: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

### 86.17.2 Methods

### 86.17.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.17.4 chooseBestHostPlayer(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Determines the best player in the game to act as the server for a client-server match.
**Notes:** Calling this method causes Game Kit to attempt to estimate which player has the best overall

network connection using a variety of metrics such as bandwidth, latency and network reliability. Typically, you call this method when your game implements a client-server model on top of the match's peer-to-peer connection. See "Designing Your Network Game" in Game Center Programming Guide.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GKMatchMBS.chooseBestHostPlayerCompleted event.

### 86.17.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.17.6 disconnect

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Disconnects the local player from the match.
**Notes:** Your application should call disconnect before releasing the match object. Calling disconnect notifies other players that you have left the match.

### 86.17.7 expectedPlayerCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The remaining number of players who have not yet connected to the match. (read-only)
**Notes:** The value of this property is decremented whenever a player connects to the match. When its value reaches zero, all expected players are connected, and your game can begin the match.

### 86.17.8 playerIDs as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The player identifiers for the players in the match. (read-only)
**Notes:** The playerIDs property initially includes the player identifiers for any players already connected to the match; the array may initially be empty. As each player connects to the match, that player's player identifier is added to the array.

### 86.17.9 rematch(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Create a new match with the list of players from an existing match.
**Notes:** Calling this method uses auto-matching to recreate a previous match. A new match with the same set of players is created and returned. If your game attempts to recreate matches using this method, each instance of your game on each device should call this method.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GKGameKitMBS.rematchCompleted event.

### 86.17.10 sendDataToAllPlayers(data as Dictionary, mode as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Transmits data to all players connected to the match.
**Notes:** data: The game data to send.
mode: The mechanism used to send the data.
error: If the data could not be queued, on return, this parameter holds an NSError object describing the error.

Return true if the data was successfully queued for transmission; false if the match was unable to queue the data.
The match queues the data and transmits it when the network becomes available.

### 86.17.11 sendDataToPlayers(players() as string, data as Dictionary, mode as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Transmits data to a list of connected players.
**Notes:** data: The game data to be sent.
players: An array containing the identifier strings for the list of players who should receive the data.
mode: The mechanism used to send the data.
error: If the data could not be queued, on return, this parameter holds an NSError object describing the error.

Returns true if the data was successfully queued for transmission; false if the match was unable to queue the data.
The match queues the data and transmits it when the network becomes available.

### 86.17.12 voiceChatWithName(name as string) as GKVoiceChatMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Joins a voice channel.
**Notes:** Returns an voice chat object for the voice channel, or nil if an error occurred.

Calling this method joins a voice channel, creating it if necessary. Your application should retain the voice chat object returned by this method. All participants who join a channel with the same name are connected to each other.

A single match can have multiple voice chat channels, and any player in the match can join multiple channels simultaneously. For example, a team-based game might create a channel for each team, and a single channel that includes all of the players.

Voice chat objects are dependent on the network connection provided by the match. When the player disconnects from the match, all voice channels associated with that match stop working. Typically, you should release any voice channels you joined before calling calling disconnect on the match.

Parental controls may prevent a player from joining a voice chat. If the player is not permitted to join the voice channel, a nil object is returned to your application.

### 86.17.13 Properties

### 86.17.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.17.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| GKMatchSendDataReliable | 0 | One of the mechanism constants used to transmit data to other players.<br>The data is sent continuously until it is successfully received by the intended recipients or the connection times out.<br>Reliable transmissions are delivered in the order they were sent. Use this when you need to guarantee delivery. |
| GKMatchSendDataUnreliable | 1 | One of the mechanism constants used to transmit data to other players.<br>The data is sent once and is not sent again if a transmission error occurs.<br>Data transmitted unreliably may be received out of order by recipients. Use this for small packets of data that must arrive quickly to be useful to the recipient. |

Match State Constants

| Constant | Value | Description |
|---|---|---|
| GKPlayerStateConnected | 1 | Connected to the match. |
| GKPlayerStateDisconnected | 2 | Disconnected from the match. |
| GKPlayerStateUnknown | 0 | Initial player state. |

## 86.18 class GKMatchRequestMBS

### 86.18.1 class GKMatchRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKMatchRequest object is used to specify the parameters for a new match.
**Notes:** A GKMatchRequest object is passed to the GKMatchmaker object to programmatically search for other players, or to a GKMatchmakerViewController (GKMatchmakerPanel on OS X) object when your game wants to present the default user interface to the player.
**Xojo Developer Magazine**

- 12.6, pages 28 to 29: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.5, pages 32 to 33: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner
- 12.5, page 29: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

### 86.18.2 Methods

### 86.18.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.18.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.18.5 playersToInvite as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A list of players to invite to the match.
**Notes:** If empty (the default), no players are invited. If non-empty, Game Kit populates the match with the provided list of players.

### 86.18.6 recipients as GKPlayerMBS()

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** A list of player identifiers for players to invite to the match.
**Notes:** The property holds an array of GKPlayer objects, each of which contains an identifier for a player on Game Center. If the value of the property is non-nil, when you use the request to create a match, Game Center invites those players to the match. No automatching is done and the GKMatchRequestmaxPlayers and minPlayers properties are ignored. If nil (the default), no players are invited. The exact behavior for matchmaking depends on the kind of match being created and the class used to create the match. For more information, see Game Center Programming Guide.

Available in OS X v10.10 and later.

### 86.18.7 SetInviteeResponseHandler(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the invitee response handler for this match request.
**Notes:** An invitee response handler is called whenever you programmatically invite specific players to join a match. It is called once for each player invited to the match. Typically, your game uses the responses to update the custom user interface. For example, you want the player to be able to perform any of the following tasks:

- Start the match.
- Invite an additional set of specific players.
- Use matchmaking to fill the remaining match slots.

Available on Mac OS X 10.8.2 and newer.

### 86.18.8 setPlayersToInvite(playerIDs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the list of players to invite to the match.
**Notes:** If empty (the default), no players are invited. If non-empty, Game Kit populates the match with the provided list of players.

### 86.18.9 SetRecipientResponseHandler(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the event to be called when a response from an invited player is returned to your game.
**Notes:** Once event is installed, the plugin can call GameKitMBS.recipientResponseHandler event for this match request.

### 86.18.10 setRecipients(players() as GKPlayerMBS)

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the list of player identifiers for players to invite to the match.
**Notes:** The property holds an array of GKPlayer objects, each of which contains an identifier for a player on Game Center. If the value of the property is non-nil, when you use the request to create a match, Game Center invites those players to the match. No automatching is done and the GKMatchRequestmaxPlayers and minPlayers properties are ignored. If nil (the default), no players are invited. The exact behavior for matchmaking depends on the kind of match being created and the class used to create the match. For more information, see Game Center Programming Guide.

Available in OS X v10.10 and later.

### 86.18.11 Properties

### 86.18.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.18.13 defaultNumberOfPlayers as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The default number of players for the match.
**Notes:** If this property is not set, then the default number of players is equal to the value stored in the maxPlayers property. The default number of players determines the number of invitees shown in the standard matchmaking user interface. The player can choose to override this to add or remove slots.

Available on Mac OS X 10.8.2 and newer.
(Read and Write computed property)

### 86.18.14 inviteMessage as string

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Message sent to invited players, may be modified if using Game Center UI.
**Notes:** Available on Mac OS X 10.8.2 and newer.
(Read and Write computed property)

### 86.18.15 maxPlayers as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum number of players to join the match.
**Notes:** The maximum number of players must be equal or greater than the minimum number of players. The maximum number of players may be no more than 4 for a peer-to-peer match and no more than 16 for a hosted match.
(Read and Write computed property)

### 86.18.16 minPlayers as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum number of players to join the match.
**Notes:** The minimum number of players must be at least 2.
(Read and Write computed property)

### 86.18.17 playerAttributes as UInt32

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A mask that specifies the role that the local player would like to play in the game.
**Notes:** If this value is 0 (the default), this property is ignored. If the value is nonzero, then automatching uses the value as a mask that restricts the role the player can play in the group. Automatching with player attributes follows two rules:

A new player can only be added to the match if the bitwise AND of that player's mask and the mask of any player already in the match equals &h00000000.
Players are added to the match until the bitwise OR of the masks of all the players in the match equals &hFFFFFFFF.

(Read and Write computed property)

### 86.18.18 playerGroup as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A number identifying a subset of players allowed to join the match.
**Notes:** If your game sets the playerGroup property, only players whose requests share the same playerGroup value are automatched by Game Center. You can use any values you want for player groups. For example, you could define different playerGroup values to implement any of the following filters:

- A game could restrict players based on skill level.
- A game that provides multiple games could use it to filter players into the specific game they want to play.
- A game with multiple victory conditions (for example, Capture-The-Flag, Survival) could match players to others interested in the same rules.
- A game that provides bonus content through in-app purchase could match players who own the same content with each other.

(Read and Write computed property)

## 86.19 class GKPlayerMBS

### 86.19.1 class GKPlayerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** GKPlayer objects provide information about a player connected to Game Center.
**Notes:** see also
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKPlayer_Ref/Reference/Reference.html
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 86.19.2 Methods

### 86.19.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.19.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 86.19.5 GKPlayerDidChangeNotificationName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the notification posted when a player object's data changes.
**Notes:** Used internally for GameKitMBS.playerChanged event.

### 86.19.6 loadPhotoForSize(size as Integer, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads a photo depicting this player from Game Center.
**Notes:** size: A constant that determines the size of the photo to load.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadPhotoForSizeCompleted.

Important The size of the image returned to your game is dependent on both the constant you provided in the initial request and the user interface idiom of the device your game is running on.

### 86.19.7 loadPlayersForIdentifiers(identifiers() as string, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads information from Game Center about a list of players.
**Notes:** identifiers: An array of strings, each a unique identifier for a Game Center player.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadPlayersForIdentifiersCompleted event.

### 86.19.8 Properties

### 86.19.9 alias as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A string chosen by the player to identify themselves to other players. (read-only)
**Notes:** Your game uses the alias property when it wants to display a user-visible string for a particular player.
(Read only property)

### 86.19.10 displayName as String

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** A string to display for the player.
**Notes:** The display name for a player depends on whether the player is a friend of the local player authenticated on the device. If the player is a friend of the local player, then the display name is the actual name of the player. If the player is not a friend, then the display name is the player,Äôs alias.
Available in Mac OS X 10.8 and newer.
(Read only property)

### 86.19.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.19.12 isFriend as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the local player has identified this player as a friend. (read-only)
**Notes:** The Game Center application allows players to declare other players as friends.
(Read only property)

### 86.19.13 playerID as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A string assigned by Game Center to uniquely identify a player. (read-only)
**Notes:** The player identifier should not be displayed to the user. Your game should use this string whenever it needs to persistently store information for a specific player.

Do not make assumptions about the contents of the player identifier string. Its format and length are subject to change.
(Read only property)

### 86.19.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| GKPhotoSizeNormal | 1 | One of the size constants of a photo loaded by Game Center. Load a normal sized photo. |
| GKPhotoSizeSmall | 0 | One of the size constants of a photo loaded by Game Center. Load a small photo. |

## 86.20 class GKScoreChallengeMBS

### 86.20.1 class GKScoreChallengeMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** A GKScoreChallenge object represents a challenge based on a score in a leaderboard.
**Notes:** To complete the challenge, the player must score an equal or better score than the score used to create the challenge. When a player beats a score challenge, a new score challenge is automatically issued to the player that issued the challenge unless there is already a pending score challenge that requires a better score.

Available on Mac OS X 10.8.2 and newer.
Subclass of the GKChallengeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 86.20.2 Methods

### 86.20.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
**Notes:** Available on Mac OS X 10.8.2 and newer.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 86.20.4 score as GKScoreMBS

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The score to beat. (read-only)
**Notes:** Available on Mac OS X 10.8.2 and newer.

## 86.21 class GKScoreMBS

### 86.21.1 class GKScoreMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKScore class holds information for a score that was earned by the player.
**Notes:** Your game creates GKScore objects to post scores to a leaderboard on Game Center. When your game retrieves score information from a leaderboard those scores are returned as GKScore objects.

see also
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKScore_Ref/Reference/Reference.html

### 86.21.2 Methods

### 86.21.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.21.4 Constructor(category as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a score object.
**Notes:** Category: A category identifier for a specific leaderboard you've configured on iTunes Connect. Must not be "".

Your game explicitly allocates and initializes a score object when it needs to report a new score to Game Center.

### 86.21.5 date as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The date and time when the score was earned. (read-only)
**Notes:** When you initialize the new score object, the date property is automatically set to the current date

and time.

### 86.21.6 formattedValue as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the player's score as a localized string. (read-only)
**Notes:** This property is invalid on a newly initialized score object. On a score returned from Game Kit, it contains a formatted string based on the player's score. You control the formatting of this string by configuring your leaderboards on iTunes Connect.

Never convert the value property into a string; always configure your leaderboard and call this method to receive the formatted string.

### 86.21.7 issueChallengeToPlayers(playerIDs() as string, message as string)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Use this method to issue GKScoreChallenges and GKAchievementChallenges to an array of playerIDs.
**Notes:** Players may not issue challenges to themselves nor to non-friends. Please see the GameKit reference documentation for further details on these methods.
Available on Mac OS X 10.8.2 and newer.

### 86.21.8 playerID as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The player identifier for the player that earned the score. (read-only)
**Notes:** When you initialize a new score object, the playerID property is set to the identifier for the local player. If you read the property on a score object retrieved from Game Center, playerID identifies the player who recorded that score.

### 86.21.9 rank as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The position of the score in the results of a leaderboard search. (read-only)
**Notes:** The value of this property is undefined on a newly initialized GKScore object. It is only valid on score objects received from Game Center. The rank property represents the position of the score in the

returned results, with 1 being the best score, 2 being the second best, and so on.

### 86.21.10 reportScore(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Reports a score to Game Center.
**Notes:** The value property must be set before calling this method.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.reportScoreCompleted.

If the score object successfully reports progress to Game Center, your game may release it. Otherwise, your game should inspect the error. If the error is a network error and your game is running on iOS 4.3 or earlier, your game should periodically attempt to report the progress until the score is successfully reported. On iOS 5.0 and later and on OS X, the background reporting task automatically handles network errors on your game's behalf.

### 86.21.11 reportScores(scores() as GKScoreMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Reports a list of scores to Game Center.
**Notes:** scores: An array of score objects to report to Game Center.

Calls later GameKitMBS.reportScoresCompleted on completion.

Use this class method whenever you need to submit multiple scores at the same time. Calling this method reports each of the scores, exactly as if you called the reportScore method on each score object in the array. However, the entire operation can typically be processed more efficiently using this method, and the completion handler is only called once.
Available on Mac OS X 10.8.2 and newer.

### 86.21.12 Properties

### 86.21.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 86.21.14 category as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The leaderboard that this score belongs to.
**Notes:** The category string must match an identifier you created when you defined your leaderboards on iTunes Connect.
(Read and Write computed property)

### 86.21.15 context as UInt64

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An integer value used by your game.
**Notes:** The context property allows your game to associate an arbitrary 64-bit unsigned integer value with the score data reported to Game Center. You decide how this integer value is interpreted by your game. For example, your game might use the context property to store flags that provide game-specific details about a player's score, or it might use the context as a key to some other data stored on the device or on your own server. In either case, your game typically uses this information when it displays a custom leaderboard to the player.
(Read and Write computed property)

### 86.21.16 shouldSetDefaultLeaderboard as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether this score should also update the default leaderboard.
**Notes:** If the value of this property is true, when the score is reported to Game Center, Game Center also updates the default leaderboard to match the value stored in the category property of the score object. This matches the behavior of the GKLeaderboardMBS class's setDefaultLeaderboard class method. If the value of this property is true, the default leaderboard is not changed by reporting the score. The default value of this property is false.
(Read and Write computed property)

### 86.21.17 value as Int64

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The score earned by the player.

**Notes:** You can use any algorithm you want to to calculate scores in your game. The value provided by a score object must match the formatting string configured for your leaderboard on iTunes Connect. Your game must set the value property before reporting a score, otherwise an error is returned.
(Read and Write computed property)

## 86.22 class GKTurnBasedMatchmakerViewControllerMBS

### 86.22.1 class GKTurnBasedMatchmakerViewControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKTurnBasedMatchmakerViewController class displays a user interface that allows players to manage the turn-based matches that they are participating in.
**Notes:** see also
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKTurnBasedMatchmakerViewController_Ref/Reference/Reference.html

See also GameKitMBS.turnBasedMatchmakerViewController* events.
Subclass of the NSViewControllerMBS class.

### 86.22.2 Methods

### 86.22.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.
See also:

- 86.22.4 Constructor(request as GKMatchRequestMBS) 13989

### 86.22.4 Constructor(request as GKMatchRequestMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a new matchmaker view controller.
**Notes:** request: A match request with parameters for the match.
See also:

- 86.22.3 Constructor 13989

### 86.22.5 Properties

### 86.22.6 showExistingMatches as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether the view controller shows existing matches.
**Notes:** If the value of this property is true, the view controller shows matches that are already in progress.

If the value of this property is false, the view controller only offers the ability to create new matches. The default value is true.
(Read and Write computed property)

# 86.23 class GKTurnBasedMatchMBS

## 86.23.1 class GKTurnBasedMatchMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The GKTurnBasedMatch class allows your game to implement turn-based matches between sets of players on Game Center.
**Notes:** A turn-based match uses a store-and-forward approach to share data between the participants. When a player participating in the match performs actions to advance the state of the match, your game uploads data to Game Center that defines the new state of the match and tells Game Center which player act next in the match. Later, when the next player launches your game, it downloads the match data from Game Center and continues the match. Players continue to take turns acting (based on whatever internal logic your game implements) until the match ends. A key advantage of turn-based matches is that a player may participate in multiple matches simultaneously.

see also
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKTurnBasedMatch_Ref/Reference/Reference.html
**Xojo Developer Magazine**

- 12.6, pages 33 to 35: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.6, page 29: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.6, page 25: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.5, page 32: Writing OS X Apps for Game Center, Part 2: Requesting a Match by Tom Baumgartner

## 86.23.2 Methods

## 86.23.3 acceptInvite(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Programmatically accept an invitation to a turn-based match.
**Notes:** When this method is called, it creates a background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.acceptInviteCompleted event.

Available on Mac OS X 10.8.2 and newer.

### 86.23.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.23.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 86.23.6 creationDate as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The date that the match was created. (read-only)

### 86.23.7 currentParticipant as GKTurnBasedParticipantMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The participant whose turn it is to act next. (read-only)
**Notes:** After a match starts and until it ends, the current player is the one who needs to take action to drive the match to completion. Other players are not allowed to change the state of the match.

### 86.23.8 declineInvite(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Programmatically decline an invitation to a turn-based match.
**Notes:** When this method is called, it creates a background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.declineInviteCompleted event.

Available on Mac OS X 10.8.2 and newer.

### 86.23.9 endMatchInTurnWithMatchData(matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Ends the match.
**Notes:** matchData: The end state for the match.

Calling this method ends the match for all players. This method may only be called by the current participant. Before your game calls this method, the matchOutcome property on each participant object stored in the participants property must have been set to a value other than GKTurnBasedMatchOutcomeNone.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.endMatchInTurnWithMatchDataCompleted event.

### 86.23.10 endTurnWithNextParticipant(nextParticipant as GKTurnBasedParticipantMBS, matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Updates the data stored on Game Center for the current match.
**Notes:** nextParticipant: The next player in the match who needs to take an action. It must be one of the object's stored in the match's participants property.
matchData: The game-specific state for the match.
completionHandler

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls the GameKitMBS.endTurnWithNextParticipant event.

### 86.23.11 endTurnWithNextParticipants(nextParticipants() as GKTurnBasedParticipantMBS, timeout as Double, matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Updates the data stored on Game Center for the current match.
**Notes:** nextParticipants: An array of participant objects reflecting the order in which the players should act next. Each object in the array must be one of the objects stored in the match's participants property.
timeout: The length of time the next player has to complete their turn.
matchData: The game-specific state for the match.

If the next player to act does not take their turn in the specified interval, the next player in the array receives a notification to act. This process continues until a player takes a turn or the last player in the list is notified.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.endTurnWithNextParticipantsCompleted event.

Available on Mac OS X 10.8.2 and newer.

### 86.23.12 findMatchForRequest(request as GKMatchRequestMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Programmatically searches for a new match to join.
**Notes:** request: A match request that specifies the properties that the new match must fulfill.

When this method is called, it creates a background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.findMatchForRequest2Completed event.

This method may either create a new match or it may place the player into an existing match that does not yet have its full complement of players and needs a new player to advance the match further. Regardless of how the player is placed in the match, the local player is always the current participant in the returned match. Your game should immediately display the match in its user interface and allow the player to take a turn.

### 86.23.13 loadMatchData(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads the game-specific data associated with a match.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadMatchDataCompleted event.

### 86.23.14 loadMatches(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Loads the set of turn-based matches involving the local player and creates a match object for each match.
**Notes:** When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.loadMatchesCompleted event.

### 86.23.15 loadMatchWithID(matchID as string, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Loads a specific match.
**Notes:** matchID: The identifier for the turn-based match.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.loadMatchWithIDCompleted event.

Available on Mac OS X 10.8.2 and newer.

### 86.23.16 matchData as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Game-specific data that reflects the details of the match. (read-only)
**Notes:** Although Game Center knows who is participating in the match and who is expected to act next, it does not know anything about your game's internal logic. Your game provides the match data and all the programming logic required to interpret it. This data should include the current state of the game and provide any necessary details about what actions the current player is expected to take. It can also be helpful for your game to record information about recent moves made by other players. The game can then replay those moves visually for the player to show exactly how the match reached the state it is in now.

Your game never directly updates the match state associated with this property. Instead, when the data is updated to reflect the actions of the current player, your game serializes the updated state into dictionary and calls one of the match's instance methods that transmit the updated state to Game Center.

The value of this property is nil until after your game calls the loadMatchDataWithCompletionHandler: method and the load task is complete. After this task completes, the matchData property holds the data that the last player to act transmitted to Game Center.

### 86.23.17 matchDataMaximumSize as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Returns the limit the Game Center servers place on the size of the match data. (read-only)
**Notes:** Game Kit returns an error if your game sends updated data larger than this value.
Available on Mac OS X 10.8.2 and newer.

### 86.23.18 matchID as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A string that uniquely identifies the match. (read-only)
**Notes:** This string is not intended to be displayed to players. Your game should use this string whenever it needs to refer to a specific match. For example, if you want your game to store additional information on a device, it might store it in a database using the match ID as a key.

### 86.23.19 message as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A message displayed to all players in the match.
**Notes:** The message property is displayed by the standard user interface; this allows your game to use the message to inform players of the current state of the match.

Important This property can be changed only by an instance of your game associated with the current player. If an instance of your game associated with another player in the match attempts to write to this property, an exception is thrown.

### 86.23.20 participantQuitInTurnWithOutcome(matchOutcome as Integer, nextParticipant as GKTurnBasedParticipantMBS, matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Resigns the current player from the match without ending the match.
**Notes:** matchOutcome: The end outcome of the current player in the match.
nextParticipant: The next player in the match who needs to take an action. It must be one of the object's stored in the match's participants property.

matchData: A dictionary the game-specific state for the match.

Your game calls this method on an instance of your game that is processing the current player's turn, but that player has left the match. For example, the player may have willingly resigned from the match or that player may have been eliminated by the other players (based on your game's internal logic).

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.participantQuitInTurnWithOutcome event.
See also:

- 86.23.21 participantQuitInTurnWithOutcome(matchOutcome as Integer, nextParticipants() as GKTurnBasedParticipantMBS, timeout as Double, matchData as Dictionary, tag as Variant = nil) 13997

### 86.23.21 participantQuitInTurnWithOutcome(matchOutcome as Integer, nextParticipants() as GKTurnBasedParticipantMBS, timeout as Double, matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Resigns the current player from the match without ending the match.
**Notes:** matchOutcome: The end outcome of the current player in the match.
nextParticipants: An array of participant objects reflecting the order in which the players should act next. Each object in the array must be one of the objects stored in the match's participants property.
timeout: The length of time the next player has to complete their turn.
matchData: The game-specific state for the match.

Your game calls this method on an instance of your game that is processing the current player's turn, but that player has left the match. For example, the player may have willingly resigned from the match or that player may have been eliminated by the other players (based on your game's internal logic).

If the next player to act does not take their turn in the specified interval, the next player in the array receives a notification to act. This process continues until a player takes a turn or the last player in the list is notified.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.participantQuitInTurnWithOutcomeCompleted event.

Available on Mac OS X 10.8.2 and newer.
See also:

- 86.23.20 participantQuitInTurnWithOutcome(matchOutcome as Integer, nextParticipant as GKTurnBasedParticipantMBS, matchData as Dictionary, tag as Variant = nil) 13996

### 86.23.22 participantQuitOutOfTurnWithOutcome(matchOutcome as Integer, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Resigns the player from the match when that player is not the current player. This action does not end the match.
**Notes:** matchOutcome: The end outcome of the current player in the match.

If the local player decided they wanted to resign from the match but is not the current participant in the match, your game calls this method.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.participantQuitOutOfTurnWithOutcomeCompleted event.

### 86.23.23 participants as GKTurnBasedParticipantMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Information about the players participating in the match. (read-only)
**Notes:** The elements of this array are GKTurnBasedParticipantMBS objects representing each participant in the match. Your game uses these objects to retrieve more information about the participants in the match. Your game also uses one of the objects in this array as a parameter whenever it calls a method that sets a different participant to act in the match.

The size of the array and the order in which the participants appear in the array are set when the match is first created, and never changes. When a match is first created, some participants may not hold actual players yet. Game Center searches for a player to fill that spot in the match only after your game sets that participant as the current player.

### 86.23.24 rematch(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Create a new match with the list of players from an existing match.
**Notes:** Calling this method uses auto-matching to recreate a previous match. A new match with the same set of players is created and returned. If your game attempts to recreate matches using this method, each instance of your game on each device should call this method.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GKGameKitMBS.rematch-

Completed event.

### 86.23.25 remove(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Programmatically removes a match from Game Center.
**Notes:** Even after a player's participation in a match ends, the data associated with the match continues to be stored on Game Center. Storing the data on Game Center allows the player to continue to watch the match's progress, or even see the final state of the match when it ends. However, players may also want to delete matches that they have finished playing. If you choose not to use the standard matchmaker user interface, your game should offer the ability to delete a finished match from Game Center. When a player chooses to delete a match from Game Center, call this method. It is a programming error to call this method on a match that has the local player as an active participant.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls GameKitMBS.removeCompleted event passing the tag. Keep in mind that the completion handler may be called on a thread other than the one originally used to invoke the method. This means that the code in your block needs to be thread-safe.

When the task completes, the match is no longer visible to the local player whose device made the call. Other players involved in the match still see the match.

### 86.23.26 saveCurrentTurnWithMatchData(matchData as Dictionary, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Update the match data without advancing the game to another player.
**Notes:** Available on Mac OS X 10.8.2 and newer.

matchData: The game-specific state for the match.

This method updates the match data stored on Game Center. Call this method when the current player takes an action that advances the state of the match but does not end the player's turn. For example, if your game has a fog-of-war mechanic, you might call this method when the player revealed new information on the map.

When this method is called, it creates a new background task to handle the request. The method then returns control to your game. Later, when the task is complete, Game Kit calls your GameKitMBS.saveCurrentTurnWithMatchDataCompleted event.

### 86.23.27 status as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The current state of the match. (read-only)

### 86.23.28 TimeoutDefault as Double

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the player has one week to take a turn.
**Example:**

MsgBox str(GKTurnBasedMatchMBS.TimeoutDefault)

**Notes:** One of the common values for turn timeouts.
Available on Mac OS X 10.8.2 and newer.
Currently this function returns 604800 seconds (7 weeks), but this may change in the future.

### 86.23.29 TimeoutNone as Double

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the player's turn never times out.
**Example:**

MsgBox str(GKTurnBasedMatchMBS.TimeoutNone)

**Notes:** One of the common values for turn timeouts.
Available on Mac OS X 10.8.2 and newer.
Currently this function returns 0 seconds, but this may change in the future.

### 86.23.30 Properties

### 86.23.31 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.23.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| GKTurnBasedMatchStatusEnded | 2 | One of the states a match can enter.<br>The match has been completed. |
| GKTurnBasedMatchStatusMatching | 3 | One of the states a match can enter.<br>The match is currently being played. |
| GKTurnBasedMatchStatusOpen | 1 | One of the states a match can enter.<br>Game Center is still searching for other players to join the match. |
| GKTurnBasedMatchStatusUnknown | 0 | One of the states a match can enter.<br>The match is in an unexpected state. |
| GKTurnBasedParticipantStatusActive | 4 | One of the states the participant is in during the match.<br>The participant has joined the match and is an active player in it. |
| GKTurnBasedParticipantStatusDeclined | 2 | One of the states the participant is in during the match.<br>The participant declined the invitation to join the match. When<br>ticipant declines an invitation to join a match, the match is auto<br>terminated. |
| GKTurnBasedParticipantStatusDone | 5 | One of the states the participant is in during the match.<br>The participant has exited the match. Your game sets the match<br>property to state why the participant left the match. |
| GKTurnBasedParticipantStatusInvited | 1 | One of the states the participant is in during the match.<br>The participant was invited to the match, but has not responded to<br>tation. |
| GKTurnBasedParticipantStatusMatching | 3 | One of the states the participant is in during the match.<br>The participant is an unfilled position in the match that Game Center<br>to fill when needed. When your game sets this participant as the<br>participant in the match, Game Center fills the position and updates t<br>and playerID properties. |
| GKTurnBasedParticipantStatusUnknown | 0 | One of the states the participant is in during the match.<br>The participant is in an unexpected state. |

## 86.24 class GKTurnBasedParticipantMBS

### 86.24.1 class GKTurnBasedParticipantMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKTurnBasedParticipant object stores information for a participant in a turn-based match.
**Notes:** Your game never creates objects of this class directly; instead it retrieves an array of GKTurnBasedParticipant objects from an GKTurnBasedMatch object.

Most information stored by a GKTurnBasedParticipant object is read-only, and is provided by Game Kit to assist you in implementing your game logic. However, the matchOutcome property is quite important; before your game may end a match, it must set the matchOutcome property in every GKTurnBasedParticipant object associated with the match.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr5

**Xojo Developer Magazine**

- 12.6, pages 33 to 35: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner
- 12.6, page 29: Writing OS X Apps for Game Center, Part 3: Turn-Based Games by Tom Baumgartner

### 86.24.2 Methods

### 86.24.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 86.24.4 Properties

### 86.24.5 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.24.6 lastTurnDate as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The date and time that this participant last took a turn in the game. (read-only)
**Notes:** The value of this property is invalid until the participant first takes a turn in the match.
(Read only property)

### 86.24.7 lastTurnDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time that this participant last took a turn in the game. (read-only)
**Notes:** The value of this property is invalid until the participant first takes a turn in the match.
(Read only property)

### 86.24.8 matchOutcome as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The end-state of this participant in the match.
**Notes:** Initially, this property holds GKTurnBasedMatchOutcomeNone. Before your game can end a match, it must set the match outcome to some other value that reflects the outcome of this participant when he or she left the match. Your game must use any of the values provided in the "GKTurnBasedMatchOutcome" enumerated type. Optionally, it may also use an OR operation to include a custom match outcome for your specific game. Game Center does not use the custom value; it exists to allow your game to provide additional information at the end of the match. The custom value must fit in the range provided by the GKTurnBasedMatchOutcomeCustomRange constant.
(Read and Write property)

### 86.24.9 player as GKPlayerMBS

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The GKPlayer object that identifies this participant. (read-only)
**Notes:** The value of this property may be nil if this slot in the match has not yet been filled by an actual player.
Available in OS X v10.10 and later.
(Read only property)

### 86.24.10 playerID as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The player identifier for this participant. (read-only)
**Notes:** The value of this property may be nil if this slot in the match has not been filled by an actual player.
(Read only property)

### 86.24.11 status as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The current status of the participant. (read-only)
**Notes:** This property is updated by Game Kit to reflect the status of the participant.
(Read only property)

### 86.24.12 timeoutDate as date

MBS MacFrameworks Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** The date and time that the participant's turn times out. (read-only)
**Notes:** If a timeout was set when the turn state was advanced, this property holds when the player's turn expires. Otherwise, this property is nil.
Available on Mac OS X 10.8.2 and newer.
(Read only property)

### 86.24.13 timeoutDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time that the participant's turn times out. (read-only)
**Notes:** If a timeout was set when the turn state was advanced, this property holds when the player's turn expires. Otherwise, this property is nil.
Available on Mac OS X 10.8.2 and newer.
(Read only property)

### 86.24.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| GKTurnBasedMatchOutcomeCustomRange | &h00FF0000 | One of the states the participant was in when they left the<br>A mask used to allow your game to provide its own custo<br>custom value must fit inside the mask. |
| GKTurnBasedMatchOutcomeFirst | 6 | One of the states the participant was in when they left the<br>The participant finished first. |
| GKTurnBasedMatchOutcomeFourth | 9 | One of the states the participant was in when they left the<br>The participant finished fourth. |
| GKTurnBasedMatchOutcomeLost | 3 | One of the states the participant was in when they left the<br>The participant lost the match. |
| GKTurnBasedMatchOutcomeNone | 0 | One of the states the participant was in when they left the<br>The participant's outcome has not been set yet (typically l<br>is still in progress). |
| GKTurnBasedMatchOutcomeQuit | 1 | One of the states the participant was in when they left the<br>The participant forfeited the match. |
| GKTurnBasedMatchOutcomeSecond | 7 | One of the states the participant was in when they left the<br>The participant finished second. |
| GKTurnBasedMatchOutcomeThird | 8 | One of the states the participant was in when they left the<br>The participant finished third. |
| GKTurnBasedMatchOutcomeTied | 4 | One of the states the participant was in when they left the<br>The participant tied the match. |
| GKTurnBasedMatchOutcomeTimeExpired | 5 | One of the states the participant was in when they left the<br>The participant was ejected from the match because he or s<br>timely fashion. |
| GKTurnBasedMatchOutcomeWon | 2 | One of the states the participant was in when they left the<br>The participant won the match. |
| GKTurnBasedParticipantStatusActive | 4 | One of the states the participant is in during the match.<br>The participant has joined the match and is an active playe |
| GKTurnBasedParticipantStatusDeclined | 2 | One of the states the participant is in during the match.<br>The participant declined the invitation to join the match<br>ticipant declines an invitation to join a match, the matc<br>terminated. |
| GKTurnBasedParticipantStatusDone | 5 | One of the states the participant is in during the match.<br>The participant has exited the match. Your game sets t<br>property to state why the participant left the match. |
| GKTurnBasedParticipantStatusInvited | 1 | One of the states the participant is in during the match.<br>The participant was invited to the match, but has not resp<br>tation. |
| GKTurnBasedParticipantStatusMatching | 3 | One of the states the participant is in during the match.<br>The participant is an unfilled position in the match that Gam<br>to fill when needed. When your game sets this participa<br>participant in the match, Game Center fills the position and<br>and playerID properties. |
| GKTurnBasedParticipantStatusUnknown | 0 | One of the states the participant is in during the match.<br>The participant is in an unexpected state. |

## 86.25 class GKVoiceChatMBS

### 86.25.1 class GKVoiceChatMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A GKVoiceChat object provides a voice channel that allows a set of players in a match to speak with each other.
**Notes:** see also:
https://developer.apple.com/library/mac/#documentation/GameKit/Reference/GKVoiceChat_Ref/Reference/Reference.html

Available in OS X v10.8 and later.

### 86.25.2 Methods

### 86.25.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** True if the class is available.
**Notes:** Should always be true on Mac OS X 10.8 and newer.

### 86.25.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new voice chat.

### 86.25.5 enablePlayerStateUpdate(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Enables player state update event in GameKitMBS class.
**Notes:** You enable GameKit.playerStateUpdate event to be called when the state of any participant in the chat changes (including the local player). The event receives the following parameters:

player: The player identifier for the player whose status changed.
state: The new state of the player.

### 86.25.6 isVoIPAllowed as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether voice chat is allowed to be used on the device.
**Notes:** True if voice chat is available to the game.

Some countries or phone carriers may restrict the availability of voice over IP services. Before retrieving a GKVoiceChat object, your game should first check to see whether voice over IP is permitted on the device.

### 86.25.7 name as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The name of the voice chat (read-only).

### 86.25.8 playerIDs as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of player identifiers for the players connected to the channel. (read-only)

### 86.25.9 setMute(mute as boolean, playerID as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Mutes a participant in the chat.
**Notes:** isMuted: Determines whether the player is to be muted or not.
player: The player identifier string for a player in the match.

While a player is muted, the local player does not hear voice data transmitted by that player.

### 86.25.10 start

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Starts communication with other participants in the voice chat.
**Notes:** When start is called, the voice chat connects to the channel and notifies other connected players that the local player joined the chat. When the voice chat object is connected, it plays voice data from other

participants in the channel. It sends voice data to other participants when its active property is true.

A device only connects to the channel when the device has a microphone and is connected via wi-fi. However, your game may configure and start a voice chat channel when the device is not currently capable of using voice chat. If conditions change to allow voice chat—for example, the device connects to a wi-fi network—the GKVoiceChat object automatically connects to the channel.

### 86.25.11 stop

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Ends communication with other participants in the voice chat.
**Notes:** When stop is called, the voice chat object disconnects from the other players. You should call stop on a channel before releasing it.

### 86.25.12 Properties

### 86.25.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 86.25.14 active as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that states whether the channel is sampling the microphone.
**Notes:** When active is true, the voice chat samples the microphone and transmits the voice data to other players connected to the channel. Default value is false.

Only one GKVoiceChat object is allowed to sample the microphone at any given time. When your game sets the active property to true on a voice chat object, the previous voice chat object that owned the microphone (if there was one) sets its active property to false.

Available in OS X v10.8 and later.
(Read and Write computed property)

### 86.25.15 volume as Double

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The volume level for the voice channel.
**Notes:** All voice data received from other participants is mixed and then scaled by the volume property. The volume property has a range between 0.0 and 1.0, inclusive. A volume level of 0.0 means the entire channel is muted; a value of 1.0 plays voice samples at full volume. The default value is 1.0.
(Read and Write computed property)

### 86.25.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| GKVoiceChatPlayerConnected | 0 | One of the states returned to your game about other players in a voice chat. A new player connected to the chat. |
| GKVoiceChatPlayerConnecting | 4 | One of the states returned to your game about other players in a voice chat. A new player is connecting to the chat. |
| GKVoiceChatPlayerDisconnected | 1 | One of the states returned to your game about other players in a voice chat. A player left the chat. |
| GKVoiceChatPlayerSilent | 3 | One of the states returned to your game about other players in a voice chat. A player stopped speaking. |
| GKVoiceChatPlayerSpeaking | 2 | One of the states returned to your game about other players in a voice chat. A player began speaking. |

# Chapter 87

# GIF

## 87.1 Globals

### 87.1.1 GifStringToGifMBS(data as string) as GIFMBS

MBS Images Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a Gif GIFPictureMBS from memory.
**Notes:** Returns nil on any error.
Else it should be identical to the folderitem function.

There is a link bug in RB. So if this function always returns nil, you may need a line like "dim g as new GifMBS" to fix it.

### 87.1.2 GifStringToPictureMBS(data as string) as Picture

MBS Images Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a Gif picture from memory and returns first picture with mask.
**Notes:** Returns nil on any error.
Not always a mask is available.

There is a link bug in RB. So if this function always returns nil, you may need a line like "dim g as new GifMBS" to fix it.

## 87.2 class GifBlockMBS

### 87.2.1 class GifBlockMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a gif block.
**Notes:** May have a GIFPictureMBS or an extension, but not both.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.2.2 Methods

### 87.2.3 Clone as GifBlockMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.2.4 Properties

### 87.2.5 Extension as GifExtensionMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The extension data of this gif block.
**Notes:** (Read and Write property)

### 87.2.6 Intro as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intro value of the gif block.
**Notes:** The type of data.
(Read and Write property)

### 87.2.7 Picture as GifPictureMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The GIFPictureMBS data of this gif block.
**Notes:** Not all blocks have a picture, so this property can be nil.
(Read and Write property)

## 87.3 class GifDataMBS

### 87.3.1 class GifDataMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for binary data in a gif image.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.3.2 Methods

### 87.3.3 Clone as GifDataMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.3.4 Properties

### 87.3.5 DataMemory as Memoryblock

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data as a memoryblock.
**Notes:** (Read and Write property)

### 87.3.6 DataString as String

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data as a string.
**Notes:** (Read and Write property)

### 87.3.7 Length as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length in bytes of this data.
**Notes:** Returns 0 on any error.
(Read only property)

## 87.4 class GifExtensionMBS

### 87.4.1 class GifExtensionMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a gif extension.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.4.2 Methods

### 87.4.3 Add(data as GifDataMBS)

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data object to this extension.

### 87.4.4 Clone as GifExtensionMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.4.5 Data(index as Integer) as GifDataMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of this extension.
**Notes:** Index is 0 based.

### 87.4.6 Properties

### 87.4.7 Count as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of data objects attached to this extension.
**Notes:** Returns 0 on any error.

(Read only property)

### 87.4.8 FirstData as GifDataMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first data.
**Notes:** Same as calling Data(0), but this property is visible in the debugger which makes debugging easier.
(Read only property)

### 87.4.9 Marker as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The marker field of this extension.
**Notes:** (Read and Write property)

## 87.5 class GIFMBS

### 87.5.1 class GIFMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for reading or writing gif files.
**Notes:** There are patents on the lzw compression used in this class for writing gif files. This patents may be timeout out for some countries, but please check for your target countries.
**Blog Entries**

- Tip of day: Load GIF into WebImageView
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.5.2 Methods

### 87.5.3 Add(block as GifBlockMBS)

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a block to this gif object.

### 87.5.4 Block(index as Integer) as GifBlockMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blocks attached to this gif object.
**Notes:** Index is 0 based.

### 87.5.5 Clone as GIFMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.5.6 MakeFirstMask as picture

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the first picture in this gif object and returns the matching mask.
**Notes:** Returns nil on any error.

### 87.5.7 MakeFirstPicture as picture

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the first picture in this gif object and returns this picture.
**Notes:** Returns nil on any error.
There is not always a mask available!

### 87.5.8 MakeFirstPictureWithMask as picture

MBS Images Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the first picture in this gif object and returns this picture with mask (if exists).
**Notes:** Returns nil on any error.
There is not always a mask available!

### 87.5.9 Properties

### 87.5.10 Count as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of blocks attached to this gif object.
**Notes:** Not every block has a picture attached, so this is not the picture count.
(Read only property)

### 87.5.11 FirstBlock as GifBlockMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first block.
**Notes:** Same as calling Block(0), but this property is visible in the debugger which makes debugging easier.
(Read only property)

### 87.5.12 Header as String

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header string for this gif object.
**Notes:** e.g. "GIF89a"
(Read and Write property)

### 87.5.13 Screen as GifScreenMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The screen object attached to this gif object.
**Notes:** (Read and Write property)

## 87.6 class GifPaletteMBS

### 87.6.1 class GifPaletteMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a color palette.
**Example:**

```
dim p as new GifPaletteMBS

p.Count = 256

p.Value(0)=&cFFEECC

MsgBox hex(p.red(0))+" "+hex(p.Green(0))+" "+hex(p.Blue(0))
```

**Notes:** Maximum 256 colors.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.6.2 Methods

### 87.6.3 Clone as GifPaletteMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.6.4 Properties

### 87.6.5 Count as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of colors in this palette.
**Example:**

```
dim p as new GifPaletteMBS
```

```
p.Count = 256
```

**Notes:** Value is 2, 4, 16 or 256.
(Read and Write property)

### 87.6.6 Blue(index as Integer) as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of the blue color components in this color palette.
**Example:**

```
dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.blue(0))
```

**Notes:** Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

### 87.6.7 Green(index as Integer) as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of the green color components in this color palette.
**Example:**

```
dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.green(0))
```

**Notes:** Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

### 87.6.8 Red(index as Integer) as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The array of the red color components in this color palette.
**Example:**

```
dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.red(0))
```

**Notes:** Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

### 87.6.9 Value(index as Integer) as color

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The colors in this palette.
**Example:**

```
dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox hex(p.value(0))
```

**Notes:** Index from 0 to count-1. (ignores bad indexes)
(Read and Write computed property)

## 87.7 class GIFPictureMBS

### 87.7.1 class GIFPictureMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a gif GIFPictureMBS.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.7.2 Methods

### 87.7.3 Clone as GifPictureMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.7.4 CopyData as memoryblock

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the data of this picture object.
**Notes:** Returns a new memoryblock with a copy of the data so you can modify it.

### 87.7.5 MakeMask as picture

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the matching mask for this picture and returns it as picture.
**Notes:** May return nil.
See also:

- 87.7.6 MakeMask(TransparentColorIndex as Integer) as picture 14024

### 87.7.6 MakeMask(TransparentColorIndex as Integer) as picture

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a mask for this picture based on the current transparent color index.
**Notes:** Returns nil on low memory.
See also:

- 87.7.5 MakeMask as picture 14024

### 87.7.7 MakePicture as picture

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the picture and returns it.
**Notes:** Returns nil on any error.

### 87.7.8 PixelData(row as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw Pixel data for a given row.
**Notes:** Row is 0 based.
Returns nil on any error.

### 87.7.9 Properties

### 87.7.10 Data as Memoryblock

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of this GIFPictureMBS as a big memoryblock.
**Notes:** (Read and Write property)

### 87.7.11 HasPalette as Boolean

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether we have a color map (palette).
**Notes:** This property was named HasCMap in older plugin versions.
(Read and Write property)

### 87.7.12 Height as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height in pixels.
**Notes:** (Read and Write property)

### 87.7.13 Interlace as Boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the GIFPictureMBS is interlaced.
**Notes:** Interlacing makes GIFPictureMBS loading faster in a browser, but requires the newer GIF format 89a.
(Read and Write property)

### 87.7.14 Left as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x position of the GIFPictureMBS.
**Notes:** On an animation gif each GIFPictureMBS may have it's own position.
(Read and Write property)

### 87.7.15 Palette as GifPaletteMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The palette for this GIFPictureMBS.
**Notes:** (Read and Write property)

### 87.7.16 PaletteDepth as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The depth of the palette of this GIFPictureMBS.
**Notes:** Value should be 2, 4, 16 or 256.
(Read and Write property)

### 87.7.17 Sorted as Boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the color palette is sorted.
**Notes:** (Read and Write property)

### 87.7.18 Top as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y position of this GIFPictureMBS.
**Notes:** On an animation gif each GIFPictureMBS may have it's own position.
(Read and Write property)

### 87.7.19 Width as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the GIFPictureMBS in pixels.
**Notes:** (Read and Write property)

## 87.8 class GifScreenMBS

### 87.8.1 class GifScreenMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the gif screen information.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

### 87.8.2 Methods

### 87.8.3 Clone as GifScreenMBS

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of the object.

### 87.8.4 Properties

### 87.8.5 Aspect as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The aspect ration of this GIFPictureMBS.
**Notes:** (Read and Write property)

### 87.8.6 BackgroundColor as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Index of the background color for this GIFPictureMBS.
**Notes:** (Read and Write property)

### 87.8.7 ColorResolution as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color resolution of the screen area.
**Notes:** (Read and Write property)

### 87.8.8 HasPalette as Boolean

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this screen defines a palette.
**Notes:** (Read and Write property)

### 87.8.9 Height as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the screen area used.
**Notes:** (Read and Write property)

### 87.8.10 Palette as GifPaletteMBS

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color palette to use for the screen area used.
**Notes:** (Read and Write property)

### 87.8.11 PaletteDepth as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The palette depth of the screen area used.
**Notes:** (Read and Write property)

### 87.8.12 Sorted as Boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the color palette is sorted.
**Notes:** (Read and Write property)

### 87.8.13 Width as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the screen area used.
**Notes:** (Read and Write property)

# Chapter 88

# Graphics & Pictures

## 88.1 class Graphics

### 88.1.1 class Graphics

Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends Xojo's Graphics Class.

### 88.1.2 Methods

### 88.1.3 DrawCGPDFDocumentMBS(pdf as CGPDFDocumentMBS, r as CGRectMBS, page as Integer)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Draws a PDF on the graphics object inside the given rectangle.
**Notes:** Requires Mac OS X to work.

If destination is scaled page size, you need to also scale the rectangle here.

Seems broken in MacOS Mojave for us with drawing in print context.
See also:

- 88.1.4 DrawCGPDFDocumentMBS(pdf as CGPDFDocumentMBS, r as CGRectMBS, page as Integer, InterpolationQuality as Integer, Antialias as boolean, FontSmoothing as Boolean) 14032

### 88.1.4 DrawCGPDFDocumentMBS(pdf as CGPDFDocumentMBS, r as CGRectMBS, page as Integer, InterpolationQuality as Integer, Antialias as boolean, FontSmoothing as Boolean)

MBS MacCG Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Draws a PDF on the graphics object inside the given rectangle.
**Notes:** Requires Mac OS X to work.

You can pass for interpolation:

| | |
|---|---|
| 0 | Let the context decide. |
| 1 | Never interpolate. |
| 2 | Low quality, fast interpolation. |
| 4 | Medium quality, slower than kCGInterpolationLow. |
| 3 | Highest quality, slower than kCGInterpolationMedium. |

Set Antialias to true to allow anti aliasing and to false to disallow.
Set FontSmoothing to true to allow font smoothing and false to disallow it.

If destination is scaled page size, you need to also scale the rectangle here.

Seems broken in MacOS Mojave for us with drawing in print context.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo Plugins, version 19.1pr7
- MBS Real Studio Plugins, version 12.3pr8
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr10

**Xojo Developer Magazine**

- 8.5, pages 20 to 22: Printing PDFs, Easy PDF printing on Mac and Windows
- 6.4, page 30: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz

See also:

- 88.1.3 DrawCGPDFDocumentMBS(pdf as CGPDFDocumentMBS, r as CGRectMBS, page as Integer) 14031

### 88.1.5 DrawRotatedTextMBS(Rotation as Double, text as string, x as Integer, y as Integer, Center as Boolean = false, alpha as Double = 1.0, NoSwapY as boolean = false, FontWidth as Integer = 0)

MBS Util Plugin, Plugin Version: 11.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Draws rotated text.
**Example:**

```
Sub Paint(g As Graphics)

g.DrawRotatedTextMBS 45, "Hello World", 100, 100

End Sub
```

**Notes:** Rotation is the angle in degree.
Currently only supported for Mac OS X and Windows in GUI applications.

The plugin does not see the clipping offset for the graphics object. So for graphics objects from printer or canvas, you need to offset the position. Seems like with a Canvas the coordinates are relative to canvas in Cocoa, but relative to Windows in Carbon.

We have the optional parameter Center which tells the plugin to center the rotated text, so the rotation point is in the middle of the text.
The plugin queries Bold, Italic, Underline, ForeColor, TextUnit, TextSize or TextFont.

Alpha gives the alpha value for Mac OS X. Can be 1.0 (Full color) to 0.0 (no color).

On Mac targets the Y coordinate needs to be swapped internally from top down coordinates to bottom up coordinates. As this does not work 100% correct on printers (the plugin doesn't know page margins), you can provide correct Y coordinate yourself and pass NoSwapY = true. (added in plugin version 13.1)
On Windows the OS function used (ExtTextOut) does not support multiple lines.

FontWidth is only for Windows to define the width of the font. Default is 0 to use default width.
The average width, in logical units, of characters in the font. If FontWidth is zero, the aspect ratio of the device is matched against the digitization aspect ratio of the available fonts to find the

On Windows for drawing in a picture, make sure the font size and font name are set. Else it may not draw.
For Windows, we only use HDC for drawing, so if you have a graphics context not using a HDC, this function

doesn't draw. The function is not updated for DirectDraw.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MBS Xojo Plugins, version 18.2pr1
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr4
- MBS Real Studio Plugins, version 13.1pr1
- MBS Real Studio Plugins, version 11.4pr2
- MBS Real Studio Plugins, version 11.3fc
- MBS Real Studio Plugins, version 11.3pr8
- Rotated text
- MBS REALbasic Plugins, version 11.2pr1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 42: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 15.2, page 10: News
- 10.1, page 75: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar

### 88.1.6 DrawWindowsIconMBS(file as folderitem, IconID as Integer, x as Integer, y as Integer, w as Integer, h as Integer) as boolean

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop only.

**Function:** Draws a windows icon on the given rectangle.
**Notes:** The folderitem should point to a file with icons (exe, dll, ico or something else). If IconID is zero, the first icon is used. Else IconID is the id of the icon.
If w or h is 0, the default size is used.
Returns true on success and false on failure.

### 88.1.7 MeasureRotatedTextMBS(text as string, byref Width as Double, byref Height as Double, FontWidth as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 17.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Measure size of text.
**Notes:** This is compatible to text drawing in DrawRotatedTextMBS, so you can use it to calculate the required space.
No rotation is used for measurement.
Returns true on success and false on failure.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.1
- MBS Xojo Plugins, version 18.1pr1
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr3

**Xojo Developer Magazine**

- 15.2, page 10: News

### 88.1.8 PaintdesktopMBS

MBS Picture Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Draws on Windows the desktop into the current graphics port.
**Notes:** May not draw a desktop picture.

### 88.1.9 StretchBltMBS(nXOriginDest as Integer, nYOriginDest as Integer, nWidthDest as Integer, nHeightDest as Integer, source as graphics, nXOriginSrc as Integer, nYOriginSrc as Integer, nWidthSrc as Integer, nHeightSrc as Integer, dwRop as Integer) as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop only.

**Function:** The StretchBlt function copies a bitmap from a source rectangle into a destination rectangle, stretching or compressing the bitmap to fit the dimensions of the destination rectangle, if necessary.
**Notes:** This is just a wrapper to the StretchBlt function from the Windows API.

The system stretches or compresses the bitmap according to the stretching mode currently set in the destination device context.

Parameters:

| | |
|---|---|
| nXOriginDest | Specifies the x-coordinate, in logical units, of the upper-left corner of the destination rectangle. |
| nYOriginDest | Specifies the y-coordinate, in logical units, of the upper-left corner of the destination rectangle. |
| nWidthDest | Specifies the width, in logical units, of the destination rectangle. |
| nHeightDest | Specifies the height, in logical units, of the destination rectangle. |
| hdcSrc | The source device context. |
| nXOriginSrc | Specifies the x-coordinate, in logical units, of the upper-left corner of the source rectangle. |
| nYOriginSrc | Specifies the y-coordinate, in logical units, of the upper-left corner of the source rectangle. |
| nWidthSrc | Specifies the width, in logical units, of the source rectangle. |
| nHeightSrc | Specifies the height, in logical units, of the source rectangle. |
| dwRop | Specifies the raster operation to be performed. Raster operation codes define how the system combines colors in output operations that involve a brush, a source bitmap, and a destination bitmap. See BitBlt for a list of common raster operation codes (ROPs). Note that the CAPTUREBLT ROP generally cannot be used for printing device contexts. |

Return Values

If the function succeeds, the return value is true.
If the function fails, the return value is false.

Possible operation modes:

### 88.1.10 StretchDIBitsMBS(XDest as Integer, YDest as Integer, DestWidth as Integer, DestHeight as Integer, XSource as Integer, YSource as Integer, SourceWidth as Integer, SourceHeight as Integer, Bits as memoryblock, ImageWidth as Integer, ImageHeight as Integer, ImageBitCount as Integer) as boolean

MBS Picture Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop only.

**Function:** The StretchDIBits function copies the color data for a rectangle of pixels in a DIB image to the

| | | | |
|---|---|---|---|
| SRCCOPY | &h00CC0020 | dest = source | Copies the source rectangle directly to the destination rectangle. |
| SRCPAINT | &h00EE0086 | dest = source OR dest | Combines the colors of the source and destination rectangles by using the Boolean OR operator. |
| SRCAND | &h008800C6 | dest = source AND dest | Combines the colors of the source and destination rectangles by using the Boolean AND operator. |
| SRCINVERT | &h00660046 | dest = source XOR dest | Combines the colors of the source and destination rectangles by using the Boolean XOR operator. |
| SRCERASE | &h00440328 | dest = source AND (NOT dest ) | Combines the inverted colors of the destination rectangle with the colors of the source rectangle by using the Boolean AND operator. |
| NOTSRCCOPY | &h00330008 | dest = (NOT source) | Copies the inverted source rectangle to the destination. |
| NOTSRCERASE | &h001100A6 | dest = (NOT src) AND (NOT dest) | Combines the colors of the source and destination rectangles by using the Boolean OR operator and then inverts the resultant color. |
| MERGECOPY | &h00C000CA | dest = (source AND pattern) | Merges the colors of the source rectangle with the brush currently selected in hdcDest, by using the Boolean AND operator. |
| MERGEPAINT | &h00BB0226 | dest = (NOT source) OR dest | Merges the colors of the inverted source rectangle with the colors of the destination rectangle by using the Boolean OR operator. |
| PATCOPY | &h00F00021 | dest = pattern | Copies the brush currently selected in hdcDest, into the destination bitmap. |
| PATPAINT | &h00FB0A09 | dest = DPSnoo | Combines the colors of the brush currently selected in hdcDest, with the colors of the inverted source rectangle by using the Boolean OR operator. The result of this operation is combined with the colors of the destination rectangle by using the Boolean OR operator. |
| PATINVERT | &h005A0049 | dest = pattern XOR dest | Combines the colors of the brush currently selected in hdcDest, with the colors of the destination rectangle by using the Boolean XOR operator. |
| DSTINVERT | &h00550009 | dest = (NOT dest) | Inverts the destination rectangle. |
| BLACKNESS | &h00000042 | dest = BLACK | Fills the destination rectangle using the color associated with index 0 in the physical palette. (This color is black for the default physical palette.) |
| WHITENESS | &h00FF0062 | dest = WHITE | Fills the destination rectangle using the color associated with index 1 in the physical palette. (This color is white for the default physical palette.) |
| NOMIRRORBITMAP | &h80000000 | Do not Mirror the bitmap in this call. | Prevents the bitmap from being mirrored. |
| CAPTUREBLT | &h40000000 | Include layered windows. | Includes any windows that are layered on top of your window in the resulting image. By default, the image only contains your window. Note that this generally cannot be used for printing device contexts. |

specified destination rectangle.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*3) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyBGRtoMemoryblockMBS(m,0) then

dim XDest as Integer = 0
dim YDest as Integer = 0
dim DestWidth as Integer = 100
dim DestHeight as Integer = 100
dim XSource as Integer = 0
dim YSource as Integer = 0
dim SourceWidth as Integer = 100
dim SourceHeight as Integer = 100
dim Bits as memoryblock = m
```

```
dim ImageWidth as Integer = 100
dim ImageHeight as Integer = 100
dim ImageBitCount as Integer = 24

call g.StretchDIBitsMBS(XDest, YDest, DestWidth, DestHeight, XSource, YSource, SourceWidth, Source-
Height, bits, ImageWidth, ImageHeight, ImageBitCount)

end if
```

**Notes:** If the destination rectangle is larger than the source rectangle, this function stretches the rows and columns of color data to fit the destination rectangle. If the destination rectangle is smaller than the source rectangle, this function compresses the rows and columns by using the specified raster operation.

You specify the dest rectangle in the graphics object, the source rectangle in the picture, the memoryblock with the bits, the size of the image and the bit count of the image (24 or 32).

The origin of a bottom-up DIB is the bottom-left corner; the origin of a top-down DIB is the upper-left corner.

StretchDIBits creates a mirror image of a bitmap if the signs of the nSrcWidth and nDestWidth parameters, or if the nSrcHeight and nDestHeight parameters differ. If nSrcWidth and nDestWidth have different signs, the function creates a mirror image of the bitmap along the x-axis. If nSrcHeight and nDestHeight have different signs, the function creates a mirror image of the bitmap along the y-axis.

Returns true on success and false on failure.

### 88.1.11 WinApplyDevModeMBS(devmode as WindowsDeviceModeMBS) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Updates the specified printer or plotter device context (graphics) using the specified information.
**Notes:** Returns true on success.

This function cannot be used to change the driver name, device name, or the output port. When the user changes the port connection or device name, the application must delete the original graphics and create a new graphics object with the new information.

Windows seems not to allow changing graphics object for printer while a page is open, so use WinEndPageMBS to close page before changing settings.

Does not work for Xojo 2016r4 and newer due to switch to DirectDraw for printing.

**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6
- More on printing on Windows

### 88.1.12 WindowsGraphicsInfoMBS as WindowsGraphicsInfoMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Query information about graphics object on Windows.
**Notes:** Returns nil on any error.

### 88.1.13 WinEndPageMBS as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The EndPage function notifies the device that the application has finished writing to a page.
**Notes:** This function is typically used to direct the device driver to advance to a new page.

Returns true on success.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation-factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

Use the WinApplyDevModeMBS function to change the device mode, if necessary, after calling the EndPage function. Note that a call to WinApplyDevModeMBS resets all device context attributes back to default values. Neither EndPage nor StartPage resets the device context attributes. Device context attributes remain constant across subsequent pages. You do not need to re-select objects and set up the mapping mode again before printing the next page; however, doing so will produce the same results and reduce code differences between versions of Windows.

When a page in a spooled file exceeds approximately 350 MB, it may fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.

Does not work for Xojo 2016r4 and newer due to switch to DirectDraw for printing.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6

- More on printing on Windows

### 88.1.14 WinStartPageMBS as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The StartPage function prepares the printer driver to accept data.
**Notes:** Returns true on success.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation-factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

The system disables the WinApplyDevModeMBS function between calls to the StartPage and EndPage functions. This means that you cannot change the device mode except at page boundaries. After calling EndPage, you can call WinApplyDevModeMBS to change the device mode, if necessary. Note that a call to WinApplyDevModeMBS resets all device context attributes back to default values.

Neither EndPage nor StartPage resets the device context attributes. Device context attributes remain constant across subsequent pages. You do not need to re-select objects and set up the mapping mode again before printing the next page; however, doing so will produce the same results and reduce code differences between versions of Windows.

Does not work for Xojo 2016r4 and newer due to switch to DirectDraw for printing.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6
- More on printing on Windows

## 88.2 module iOSPictureMBS

### 88.2.1 module iOSPictureMBS

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Global helper functions for pictures on iOS.
**Blog Entries**

- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr8

**Videos**

- MBS Xojo Plugins 21.1

**Xojo Developer Magazine**

- 19.3, page 10: News

### 88.2.2 Methods

### 88.2.3 SaveImageAtPathToSavedPhotosAlbum(ImageFile as FolderItem, CompletionDelegate as ImageSaveCompletedMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Adds the specified image to the user,Äôs Camera Roll album.
**Notes:** ImageFile: The image file to write to the Camera Roll album.
CompletionDelegate: Optionally, the delegate which should be called after the image has been written to the Camera Roll album.

The use of the CompletionDelegate parameter is optional and necessary only if you want to be notified asynchronously when the function finishes writing the image to the user,Äôs Camera Roll or Saved Photos album. If you do not want to be notified, pass nil for these parameters.
When used on an iOS device without a camera, this method adds the image to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.4 SaveImageAtPathToSavedPhotosAlbum(ImagePath as String, CompletionDelegate as ImageSaveCompletedMBS) 14042

### 88.2.4 SaveImageAtPathToSavedPhotosAlbum(ImagePath as String, CompletionDelegate as ImageSaveCompletedMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Adds the specified image to the user,Äôs Camera Roll album.
**Notes:** ImagePath: The image path to write to the Camera Roll album.
CompletionDelegate: Optionally, the delegate which should be called after the image has been written to the Camera Roll album.

The use of the CompletionDelegate parameter is optional and necessary only if you want to be notified asynchronously when the function finishes writing the image to the user,Äôs Camera Roll or Saved Photos album. If you do not want to be notified, pass nil for these parameters.
When used on an iOS device without a camera, this method adds the image to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.3 SaveImageAtPathToSavedPhotosAlbum(ImageFile as FolderItem, CompletionDelegate as ImageSaveCompletedMBS) 14041

### 88.2.5 SaveVideoAtPathToSavedPhotosAlbum(VideoFile as FolderItem, CompletionDelegate as VideoSaveCompletedMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Adds the movie from the specified path to the user,Äôs Camera Roll album.
**Notes:** videoPath: The filesystem path to the movie file you want to save to the Camera Roll album.
CompletionDelegate: Optionally, the delegate which should be called after the movie has been written to the Camera Roll album.

Before calling this function, call the VideoAtPathIsCompatibleWithSavedPhotosAlbum function to determine if it is possible to save movies to the Camera Roll album. For a code example, refer to Camera Programming Topics for iOS.

The use of the CompletionDelegate parameter is optional and necessary only if you want to be notified asynchronously when the function finishes writing the movie to the user,Äôs Camera Roll or Saved Photos album. If you do not want to be notified, pass nil for these parameters.

When used on an iOS device without a camera, this method adds the movie to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.6 SaveVideoAtPathToSavedPhotosAlbum(VideoPath as String, CompletionDelegate as VideoSaveCompletedMBS) 14043

### 88.2.6 SaveVideoAtPathToSavedPhotosAlbum(VideoPath as String, CompletionDelegate as VideoSaveCompletedMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Adds the movie from the specified path to the user,Äôs Camera Roll album.
**Notes:** videoPath: The filesystem path to the movie file you want to save to the Camera Roll album.
CompletionDelegate: Optionally, the delegate which should be called after the movie has been written to the Camera Roll album.

Before calling this function, call the VideoAtPathIsCompatibleWithSavedPhotosAlbum function to determine if it is possible to save movies to the Camera Roll album. For a code example, refer to Camera Programming Topics for iOS.

The use of the CompletionDelegate parameter is optional and necessary only if you want to be notified asynchronously when the function finishes writing the movie to the user,Äôs Camera Roll or Saved Photos album. If you do not want to be notified, pass nil for these parameters.

When used on an iOS device without a camera, this method adds the movie to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.5 SaveVideoAtPathToSavedPhotosAlbum(VideoFile as FolderItem, CompletionDelegate as VideoSaveCompletedMBS) 14042

### 88.2.7 VideoAtPathIsCompatibleWithSavedPhotosAlbum(VideoFile as FolderItem) as Boolean

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Returns a Boolean value that indicates whether the specified video is compatible to save to the user,Äôs Camera Roll album.
**Notes:** VideoFile: The folderitem to the movie file you want to save.

Returns true if the video can be saved to the Camera Roll album or false if it cannot.

Not all devices are able to play video files placed in the user,Äôs Camera Roll album. Before attempting to save a video, call this function and check its return value to ensure that saving the video is supported for the current device. For a code example, refer to Camera Programming Topics for iOS.
When used on an iOS device without a camera, this method indicates whether the specified movie can be saved to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.8 VideoAtPathIsCompatibleWithSavedPhotosAlbum(VideoPath as String) as Boolean 14044

### 88.2.8 VideoAtPathIsCompatibleWithSavedPhotosAlbum(VideoPath as String) as Boolean

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Returns a Boolean value that indicates whether the specified video is compatible to save to the user,Äôs Camera Roll album.
**Notes:** videoPath: The filesystem path to the movie file you want to save.

Returns true if the video can be saved to the Camera Roll album or false if it cannot.

Not all devices are able to play video files placed in the user,Äôs Camera Roll album. Before attempting to save a video, call this function and check its return value to ensure that saving the video is supported for the current device. For a code example, refer to Camera Programming Topics for iOS.
When used on an iOS device without a camera, this method indicates whether the specified movie can be saved to the Saved Photos album rather than to the Camera Roll album.
See also:

- 88.2.7 VideoAtPathIsCompatibleWithSavedPhotosAlbum(VideoFile as FolderItem) as Boolean 14043

### 88.2.9 WriteImageToSavedPhotosAlbum(Pic as Picture, CompletionDelegate as ImageSaveCompletedMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** Adds the specified image to the user,Äôs Camera Roll album.
**Example:**

```
Dim pic As Picture = LogoMBS(500)

iOSPictureMBS.WriteImageToSavedPhotosAlbum(pic, AddressOf ImageSaved)
```

**Notes:** Pic: The image to write to the Camera Roll album.
CompletionDelegate: Optionally, the delegate which should be called after the image has been written to the Camera Roll album.

The use of the CompletionDelegate parameter is optional and necessary only if you want to be notified asynchronously when the function finishes writing the image to the user,Äôs Camera Roll or Saved Photos album. If you do not want to be notified, pass nil for these parameters.
When used on an iOS device without a camera, this method adds the image to the Saved Photos album rather than to the Camera Roll album.

### 88.2.10 Delegates

### 88.2.11 ImageSaveCompletedMBS(error as NSErrorMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** The delegate called when image saving is done.
**Example:**

```
// sample method you could reference via AddressOf
Sub ImageSaved(error as NSErrorMBS)
If error <>Nil Then
MessageBox "Failed to save"+EndOfLine+EndOfLine+error.LocalizedDescription
Else
MessageBox "Saved."
End If
End Sub
```

**Notes:** If error is nil, the save was successful.

### 88.2.12 VideoSaveCompletedMBS(videoPath as String, error as NSErrorMBS)

MBS Picture Plugin, Plugin Version: 21.1, Platform: iOS, Targets: iOS only.

**Function:** The delegate called when video saving is done.
**Notes:** If error is nil, the save was successful.

## 88.3 Globals

### 88.3.1 NewPictureReaderMBS(pic as picture) as PictureReaderMBS

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture reader.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim p as PictureReaderMBS
dim m as MemoryBlock
dim r,g,b,rRow,gRow,bRow,h1,w1,x,y,bpp as Integer

// Create a new picture reader
p=NewPictureReaderMBS(pic)

h1=p.Height-1
w1=p.Width-1

bpp=p.BytesPerPixel
rRow=p.RedOffset
gRow=p.GreenOffset
bRow=p.BlueOffset
// in each row the red, blue and green channels have different offsets.
// but offsets are platform dependend

dim sum as Double

for y=0 to h1
// Get data in memory. This Memoryblock has a size property of 0!
m=p.Data(y)
r=rRow
g=gRow
b=bRow

for x=0 to w1

sum = sum + m.UInt8Value(r)
sum = sum + m.UInt8Value(g)
sum = sum + m.UInt8Value(b)

r=r+bpp
g=g+bpp
b=b+bpp
next

next
```

```
// show the sum of all pixels:
MsgBox "Sum with plugin is: "+str(sum)


// now try same in RB code:

dim surface as RGBSurface = pic.RGBSurface
dim c as color

sum = 0.0

for y=0 to h1
for x=0 to w1
c = surface.Pixel(x,y)

sum = sum + c.red
sum = sum + c.Green
sum = sum + c.Blue

next

next

surface = nil

MsgBox "Sum with RB Code is: "+str(sum)
quit
```

**Notes:** Returns nil on failure.
Please report if nil is returned as it should work always (except for low memory).

### 88.3.2 NewPictureWriterMBS(width as Integer, height as Integer, AlphaChannel as boolean = false) as PictureWriterMBS

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture writer.
**Example:**

```
dim p as PictureWriterMBS
dim m as MemoryBlock
dim r,g,b,rRow,gRow,bRow,h1,w1,x,y,bpp as Integer

// Create a new picture writer
```

```
p=NewPictureWriterMBS(512,512)

h1=p.Height-1
w1=p.Width-1

bpp=p.BytesPerPixel
rRow=p.RedOffset
gRow=p.GreenOffset
bRow=p.BlueOffset
// in each row the red, blue and green channels have different offsets.
// but offsets are platform dependend

for y=0 to h1
// Get data in memory. This Memoryblock has a size property of 0!
m=p.Data(y)
r=rRow
g=gRow
b=bRow

for x=0 to w1

m.UInt8Value(r)=x\2
m.UInt8Value(g)=y\2
m.UInt8Value(b)=x*y\2

r=r+bpp
g=g+bpp
b=b+bpp
next

next

// Use Render to make a picture object
dim pic as Picture = p.Render
Backdrop = pic
```

**Notes:** Returns nil on failure (low memory).
If alpha is requested, but not possible in the given version of Xojo (or Xojo), we return a picture without.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr12

### 88.3.3 MemoryblockARGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture

MBS Picture Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
const kAlphaOffset=0 ' (BigEndian) and 3 (LittleEndian)
dim m as MemoryBlock
dim p,q,k as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100
p.mask.Graphics.ForeColor=rgb(127,127,127)
p.mask.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
'MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// copy green channel from mask image into Memoryblock
if p.mask.CopyGtoMemoryblockMBS(m,kAlphaOffset,4) then
'MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// make the picture from this Memoryblock
q=MemoryblockARGBtoPictureMBS(m,0,100,100,false)

// make the mask from this Memoryblock
k=MemoryblockGrayToPictureMBS(m,kAlphaOffset,100,100,4)

// combine picture and mask
q.Mask.Graphics.DrawPicture k,0,0

Backdrop=q
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.

LittleEndian specifies whether the image is stored in ARGB (BigEndian) or BGRA (LittleEndian) mode.

### 88.3.4 MemoryblockRGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*3) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyRGBtoMemoryblockMBS(m,0) then

q=MemoryblockRGBtoPictureMBS(m,0,100,100)

Backdrop=q

end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*3 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.

### 88.3.5 BlendPicturesMBS(source as picture, sourcepercent as Double, dest as picture, destpercent as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blends two pictures.
**Example:**

```
dim a,b,c as picture

a=New Picture(100,100,32)
b=New Picture(100,100,32)
' ... draw something in a and b
c=New Picture(100,100,32)
c=BlendPicturesMBS(a,0.5,b,0.5)
```

**Notes:** Percent is in range from 0 to 1. Values out of this range may work, but you get strange results.

Reason for returning nil:
- One of the two pictures used is nil.
- One of the pictures is not a 32bit bitmap picture.
- The two parameter pictures have not the same size as the others.

### 88.3.6 BlendPicturesWithMaskMBS(source as picture, dest as picture, mask as picture) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blends two pictures.
**Example:**

```
dim a,b,c,m as picture

a=New Picture(100,100,32)
b=New Picture(100,100,32)
m=New Picture(100,100,32)
' ... draw something in a and b
c=BlendPicturesWithMaskMBS(a,b,m)
```

**Notes:** The mask defines how much from one picture is used.

Reason for returning false:
- One of the three pictures used is nil.
- One of the pictures is not a 32bit bitmap picture.
- The three parameter pictures have not the same size as the others.

### 88.3.7 CombinePicturesMBS(red as picture, blue as picture, green as picture) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines the red, green and blue channels of three images into the a new one.
**Notes:** Returns nil on any error.

### 88.3.8 MergePictureMBS(source1 as picture, source2 as picture) as picture

MBS Picture Plugin, Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Merges the two pictures into one.
**Example:**

```
// in RB this method would work like this:

dim i,j as Integer
dim col2 as color
dim r1,r2,g1,g2,b1,b2 as Integer
dim dest as Picture // destination
dim source1, source2 as Picture // source pictures

col2 = source1.graphics.pixel(i,j)
r1 = col2.red
g1 = col2.green
b1 = col2.blue
col2 = source2.graphics.pixel(i,j)
r2 = col2.red
g2 = col2.green
b2 = col2.blue

dest.graphics.pixel(i,j) = RGB(max(r1,r2), max(g1,g2), max(b1,b2))
```

**Notes:** Masks are ignored.
Returns nil on low memory.
Both pictures must have the same size and not be nil.

### 88.3.9 NewPictureWithColorMBS(width as Integer, height as Integer, c as color) as picture

MBS Picture Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture and fills it with the given color.
**Example:**

window1.backdrop = NewPictureWithColorMBS(200, 200, &c3366CC)

**Notes:** This function is mostly to check if the picture writer code in our plugins work.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr4

### 88.3.10 RenderSamplesMBS(Samples as memoryblock, SampleCount as Integer, Smooth as Integer, Width as Integer, Height as Integer, outlinewidth as Integer, BackColor as color=&c88B5C4, ForeColor as color=&c274C5A OutLineColor as color=&c203F4E, Bits as Integer = 8, AutoScale as boolean = false) as Picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renders audio samples into a picture.
**Notes:** Samples has one byte for each audio value and 2 bytes for each stereo sample.
SampleCount: Number of Samples. = Samples.size/2
Smooth: How smooth the samples should be made.
Width: Width of picture
Height: Height of picture
outlinewidth: The width of the outline (0=no outline)
BackColor: The back color.
ForeColor: the fore color.
OutLineColor: The color for the outline.
Bits: Pass 7 for signed bytes, 8 for unsigned bytes, 15 for signed shorts and 16 for unsigned short values. Pass -32 for Float32 and -64 for Float64.
AutoScale: Whether to scale automatically depending on highest values.

See SoundFileMBS class to get samples cross platform.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr1

- MBS Xojo / Real Studio Plugins, version 14.2pr10
- MBS Real Studio Plugins, version 12.5pr7

### 88.3.11 TintPictureMBS(source as picture, GreyBase as color, SepiaBase as color) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tints the image.
**Example:**

```
// The code does the same thing as this Xojo code:

Sub TintPicture(theImg as Picture, pGreyBase as Color, pSepiaBase as Color)
Dim theRGBSurface as RGBSurface
Dim theWidth, theHeight as Integer
Dim pColor as Color
Dim x, y as Integer
Dim theGrey as Integer

dim SepiaBaseR as Double
dim SepiaBaseG as Double
dim SepiaBaseB as Double

dim GreyBaseR as Double
dim GreyBaseG as Double
dim GreyBaseB as Double

SepiaBaseR=pSepiaBase.Red / 255.0
SepiaBaseG=pSepiaBase.Green / 255.0
SepiaBaseB=pSepiaBase.Blue / 255.0

GreyBaseR=pGreyBase.Red / 255.0
GreyBaseG=pGreyBase.Green / 255.0
GreyBaseB=pGreyBase.Blue / 255.0

theRGBSurface = theImg.RGBSurface

theWidth = theImg.Width-1
theHeight = theImg.Height-1

For x = 0 to theWidth
For y = 0 to theHeight
pColor = theImg.RGBSurface.Pixel( x, y )

theGrey = ( GreyBaseR * pColor.Red ) + ( GreyBaseG * pColor.Green ) + ( GreyBaseB * pColor.Blue )
theImg.RGBSurface.Pixel( x, y ) = RGB( theGrey * SepiaBaseR, theGrey * SepiaBaseG, theGrey * Sepi-
```

```
aBaseB )

Next
Next
End Sub
```

**Notes:** You can use the code to do something like a Sepia effect.
Returns a new picture on success.

### 88.3.12 BlendPicturesMBS(result as picture, source as picture, sourcepercent as Double, dest as picture, destpercent as Double, x as Integer, y as Integer, width as Integer, height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Blends two pictures.
**Example:**

```
dim a,b,c as picture

a=New Picture(100,100,32)
b=New Picture(100,100,32)
' ... draw something in a and b
c=New Picture(100,100,32)
call BlendPicturesMBS(c, a,0.5,b,0.5, 0, 0, 100, 100)
```

**Notes:** Percent is in range from 0 to 1. Values out of this range may work, but you get strange results.

Reason for returning false:
- One of the pictures used is nil.
- The result picture must be a 24 bit or a 32 bit picture.
- The two parameter pictures have not the same size as the others.

### 88.3.13 BlendPicturesWithMaskMBS(result as picture, source as picture, dest as picture, mask as picture, x as Integer, y as Integer, width as Integer, height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Blends two pictures.
**Example:**

```
dim a,b,c,m as picture

a=New Picture(100,100,32)
b=New Picture(100,100,32)
m=New Picture(100,100,32)
' ... draw something in a and b
call BlendPicturesWithMaskMBS(c,a,b,m,0,0,a.width,a.height)
```

**Notes:** The mask defines how much from one picture is used.

Reason for returning false:
- One of the pictures used is nil.
- The result picture must be a 24 bit or a 32 bit picture.
- The three parameter pictures have not the same size as the others.

### 88.3.14 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Blends a picture with another picture.
**Notes:** If DestImage is nil, white is used for the background.
If no mask is specified, a full black mask is used.
Result must be valid picture of right size.

Result must be a 24bit or 32bit picture.
See also:

- 88.3.15 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackgroundColour As Color) as boolean 14056

### 88.3.15 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackgroundColour As Color) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Blends a picture with another picture.
**Notes:** If DestImage is nil, BackgroundColour is used for the background.

If no mask is specified, a full black mask is used.
Result must be valid picture of right size.

Result must be a 24bit or 32bit picture.
See also:

- 88.3.14 BlendPicturesWithMaskWithBackgroundMBS(SourceImage As Picture, DestImage As Picture, Mask As Picture, Result As Picture, X as Integer, Y as Integer, Width as Integer, Height as Integer) as boolean 14056

### 88.3.16 DiffPicturesMBS(source as picture, dest as picture, square as boolean) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the difference between two pictures.
**Example:**

```
// our test Picture
dim p as Picture = LogoMBS(500)

// compress with JPEG and 10%
dim d as string = PictureToJPEGStringMBS(p, 10)

// decompress
dim q as Picture = JPEGStringToPictureMBS(d, true)

// compare them
window1.Backdrop = DiffPicturesMBS(p, q, true)
```

**Notes:** Source and dest pictures must have same size. If square, the error is squared, so you see it much better.

Returns nil in case not enough memory is available or pictures do not have same size or are nil.

If both pictures are equal, all pixels in the returned picture are black.
See also Picture.isBlackMBS, and Picture.CompareMBS.
**Blog Entries**

- MBS Plugins 11.1 Release notes

- MBS Real Studio Plugins, version 11.1pr10

### 88.3.17 ColorizePictureMBS(Pict As Picture, Mask As Picture, foreR as Double, foreG as Double, foreB as Double, foreA as Double, backR as Double, backG as Double, backB as Double, backA as Double) as boolean

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Colorizes a picture.
**Example:**

```
dim p as Picture = SpecialFolder.Pictures.Child("test2.tif").OpenAsPicture

if ColorizePictureMBS(p, p.mask, 1.0, 0.0, 0.0, 1.0, 0.0, 0.0, 1.0, 0.1) then
Backdrop=p
end if
```

**Notes:** The given pictures are edited. As editing pictures works only on Mac and Windows if the pictures are 24 or 32 bit, this does not work on Linux.
Returns true on success and false on failure.

### 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071

- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075


### 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As Picture
dim Image As Picture
dim Mask As Picture
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=LogoMBS(500)
Mask=nil
DestImage=New Picture(700,700,32)

if PictureCombineMBS(DestImage, image, Mask, DestX, DestY, SourceX, SourceY, Width, Height, true,&c777777,&c777777)
then
window1.Backdrop=DestImage
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068

- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075


### 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.

DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073

- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075

### 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:


- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075


### 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As Picture
dim Image As Picture
dim Mask As Picture
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=LogoMBS(500)
Mask=nil
DestImage=New Picture(700,700,32)

if PictureCombineMBS(DestImage,image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,true,&h777777,&h777777)
then
window1.Backdrop=DestImage
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position

Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075

### 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as

Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058

- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075

### 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as

Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064

- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075

### 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068

- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075


### 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position

Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14075

### 88.3.27 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr13
- MBS REALbasic plug-ins version 9.5

See also:


- 88.3.18 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14058
- 88.3.19 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14060
- 88.3.20 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14062
- 88.3.21 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14064
- 88.3.22 PictureCombineMBS(DestImage As Picture, Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14065
- 88.3.23 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14068
- 88.3.24 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14069
- 88.3.25 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14071
- 88.3.26 PictureCombineMBS(DestImage As Picture, Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14073


### 88.3.28 PictureCopyPixelFastMBS(DestImage As Picture, Source As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
const x=100 // mouse coordinates for example
const y=100

dim p,logo as picture

logo=LogoMBS(500)

p=New Picture(800,800,32)

p.Graphics.ForeColor=&cFFFFFF
p.Graphics.FillRect 0,0,p.Width,p.Height

if PictureCopyPixelFastMBS(p, logo, x-logo.Width/2, y-logo.Height/2, 0, 0, logo.Width, logo.Height) then
' ok
else
beep
end if

window1.Backdrop=p
```

**Notes:** Returns true on success and false on failure.

Parameters:
Source: the source picture, must not be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy

The destination image (self) can be either 24 bit or 32 bit.
The source image can have any bit depth and may be converted to 24 or 32 bit.

### 88.3.29 NewPictureEditorMBS(pic as picture) as PictureEditorMBS

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture editor editing the given picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as PictureEditorMBS

p = NewPictureEditorMBS(l)
```

**Notes:** Returns nil on failure.
Works only for bitmap images.

### 88.3.30 NewPictureMBS(width as Integer, height as Integer, pixeltype as Integer, buffer as memoryblock, rowbytes as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a picture from a memory block.
**Notes:** This wraps the REALBuildPictureFromBuffer plugin function and copies the pixels.

rowbytes must be the number of bytes per row. Typical width*3 or width*4.

Pixeltype constants:

| | | |
|---|---|---|
| kRBPixelRGB24 | = 1 | 3 bytes/pixel: Red, Green, Blue |
| kRBPixelBGR24 | = 2 | 3 bytes/pixel: Blue, Green, Red |
| kRBPixelXRGB32 | = 3 | 4 bytes/pixel: Unused, Red, Green, Blue |
| kRBPixelBGRX32 | = 4 | 4 bytes/pixel: Blue, Green, Red, Unused |

**Blog Entries**

- MBS Xojo Plugins, version 19.3pr4
- MonkeyBread Software Releases the MBS Plugins 8.3

### 88.3.31 NewPictureWriterMBS(pic as picture, width as Integer, height as Integer) as PictureWriterMBS

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture writer.
**Notes:** Returns nil on failure (low memory).
If you provide an existing picture we reuse it if it has the right size. But you can pass nil to get a new one always.

### 88.3.32 GetMBfromPictureMBS(pic as picture, mask as picture, mode as string) as memoryblock

MBS Picture Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock from the picture data with the given format.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim m as MemoryBlock = GetMBfromPictureMBS(p, p.mask, "RGB32")
```

**Notes:** Returns nil on any error.
Mode can be a string with the following strings: RGB16, ARGB16, RGB16_565, ARGB32, RGB32, RGB24 or MASK8.
See the example project "Picture To Memoryblock.rbp" for the RB code matching the plugin code.
See also:

- 88.3.33 GetMBfromPictureMBS(pic as picture, mode as string) as memoryblock 14079

### 88.3.33 GetMBfromPictureMBS(pic as picture, mode as string) as memoryblock

MBS Picture Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock from the picture data with the given format.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim m as MemoryBlock = GetMBfromPictureMBS(p, "RGB32")
```

**Notes:** Same as the other GetMBfromPictureMBS function, but takes the mask from the picture.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

See also:

- 88.3.32 GetMBfromPictureMBS(pic as picture, mask as picture, mode as string) as memoryblock 14079

### 88.3.34 MemoryblockABGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.35 MemoryblockABGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14080

### 88.3.35 MemoryblockABGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyABGRtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockABGRtoPictureMBS(m, 0, p.Width, p.Height)
```

```
break // look into memoryblock with debugger
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.34 MemoryblockABGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14080

### 88.3.36 MemoryblockARGBtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyARGBtoMemoryblockMBS(m,0,0) then

dim x as Picture = New Picture(100,100,32)

q=MemoryblockARGBtoPictureMBS(x, m,0,100,100)

Backdrop=q

if x=q then
```

```
window1.Title = "reused picture"
else
window1.Title = "created new picture"
end if
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.37 MemoryblockARGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14082

### 88.3.37 MemoryblockARGBtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyARGBtoMemoryblockMBS(m, 0, p.Mask) then
```

```
// convert back
Backdrop = MemoryblockARGBtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.36 MemoryblockARGBtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14081

### 88.3.38 MemoryblockBGRAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyBGRAtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockBGRAtoPictureMBS(nil, m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
```

```
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.39 MemoryblockBGRAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14084

### 88.3.39 MemoryblockBGRAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyBGRAtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockBGRAtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
```

```
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.38 MemoryblockBGRAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14083

### 88.3.40 MemoryblockBGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*3) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyBGRtoMemoryblockMBS(m,0) then

dim x as Picture = New Picture(100,100,32)

q=MemoryblockBGRtoPictureMBS(x, m,0,100,100)

Backdrop=q

if x=q then
window1.Title = "reused picture"
else
```

```
window1.Title = "created new picture"
end if

end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*3 bytes in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.41 MemoryblockBGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14086

### 88.3.41 MemoryblockBGRtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*3 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.40 MemoryblockBGRtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture 14085

### 88.3.42 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture

MBS Picture Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
const kAlphaOffset=0 ' (BigEndian) and 3 (LittleEndian)
dim m as MemoryBlock
dim p,q,k as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100
p.mask.Graphics.ForeColor=rgb(127,127,127)
p.mask.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
'MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// copy green channel from mask image into Memoryblock
if p.mask.CopyGtoMemoryblockMBS(m,kAlphaOffset,4) then
'MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// make the picture from this Memoryblock
q=MemoryblockARGBtoPictureMBS(m,0,100,100,false)

// make the mask from this Memoryblock
k=MemoryblockGrayToPictureMBS(m,kAlphaOffset,100,100,4)

// combine picture and mask
q.Mask.Graphics.DrawPicture k,0,0

Backdrop=q
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*PixelByteSize bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.43 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14088
- 88.3.44 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14089

### 88.3.43 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Notes:** This variantion of this method Multiplies the gray value with Red, Blue and Green and divided by 256.

Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*PixelByteSize bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.42 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14087
- 88.3.44 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14089

### 88.3.44 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Notes:** This variantion of this method lookups the Red, Green and Blue values for the next pixel by using the gray value as index.

The arrays should have 256 elements.

Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*PixelByteSize bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.42 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14087
- 88.3.43 MemoryblockGrayToPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14088

### 88.3.45 MemoryblockRGBAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height
```

```
g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyRGBAtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockRGBAtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

If FlipVertically is true the image is flipped. New in version 9.4.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.46 MemoryblockRGBAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14090

### 88.3.46 MemoryblockRGBAtoPictureMBS(source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
// some memory with pixel data
dim m as MemoryBlock = NewMemoryBlock(100*100*32)
```

```
for i as Integer = 1 to 1000
// place random pixels
m.Int8Value(rnd*m.size) = rnd*256
next

// and make a picture
dim l as Picture = MemoryBlockRGBAtoPictureMBS(m, 0, 100, 100)

// display in window
window1.backdrop = l
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs width*height*4 bytes in the memoryblock.

If FlipVertically is true the image is flipped. New in version 9.4.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.45 MemoryblockRGBAtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14089

### 88.3.47 MemoryblockRGBtoPictureMBS(dest as picture, source as memoryblock, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a memoryblock into a picture object.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*3) // 3 bytes per Pixel
```

```
// Copy RGB without alpha
if p.CopyRGBtoMemoryblockMBS(m,0) then

dim x as Picture = New Picture(100,100,32)

q=MemoryblockRGBtoPictureMBS(x, m,0,100,100)

Backdrop=q

if x=q then
window1.Title = "reused picture"
else
window1.Title = "created new picture"
end if
end if
```

**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

The function will crash if the memoryblock is too small. Needs width*height*3 bytes in the memoryblock.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.

### 88.3.48 PtrABGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.49 PtrABGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093

### 88.3.49 PtrABGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.48 PtrABGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14092

### 88.3.50 PtrARGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.51 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14094
- 88.3.52 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture 14094

### 88.3.51 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.50 PtrARGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093
- 88.3.52 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture 14094

### 88.3.52 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, LittleEndian as boolean) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.

offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.

LittleEndian specifies whether the image is stored in ARGB (BigEndian) or BGRA (LittleEndian) mode.
See also:

- 88.3.50 PtrARGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14093

- 88.3.51 PtrARGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14094

### 88.3.53 PtrBGRAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.54 PtrBGRAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096

### 88.3.54 PtrBGRAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.53 PtrBGRAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14095

### 88.3.55 PtrBGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*3 bytes in the memory pointed to by pointer plus offset.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.56 PtrBGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14097

### 88.3.56 PtrBGRtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*3 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.55 PtrBGRtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14096

### 88.3.57 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*PixelByteSize bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.58 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14098

- 88.3.59 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14098

### 88.3.58 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** This variantion of this method Multiplies the gray value with Red, Blue and Green and divided by 256.

Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*PixelByteSize bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.57 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14097
- 88.3.59 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture 14098

### 88.3.59 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red() as Integer, Blue() as Integer, Green() as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** This variantion of this method lookups the Red, Green and Blue values for the next pixel by using the gray value as index.

The arrays should have 256 elements.

Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*PixelByteSize bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.57 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer) as picture 14097
- 88.3.58 PtrGrayToPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, PixelByteSize as Integer, Red as Integer, Blue as Integer, Green as Integer) as picture 14098

### 88.3.60 PtrRGBAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

If FlipVertically is true the image is flipped. New in version 9.4.

Does not access the mask inside the image!
See also:

- 88.3.61 PtrRGBAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099

### 88.3.61 PtrRGBAtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*4 bytes in the memory pointed to by pointer plus offset.

If FlipVertically is true the image is flipped. New in version 9.4.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.60 PtrRGBAtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer, FlipVertically as boolean=false) as picture 14099

### 88.3.62 PtrRGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

In the dest picture parameter you can provide a picture to draw in. If the picture is no big enough or nil, a new one is created.

The function will crash if the data is too small where the pointer points to. Needs width*height*3 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.63 PtrRGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14101

### 88.3.63 PtrRGBtoPictureMBS(source as Ptr, offset as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data from a pointer into a picture object.
**Notes:** Returns nil on any error.
source should not be nil.
offset should be 0 or bigger and is the start position in the data the pointer points to.

The function will crash if the data is too small where the pointer points to. Needs width*height*3 bytes in the memory pointed to by pointer plus offset.

Does not access the mask inside the image!
Data is copied from memory block to the new picture, not referenced.
See also:

- 88.3.62 PtrRGBtoPictureMBS(dest as picture, source as Ptr, offset as Integer, width as Integer, height as Integer) as picture 14100

### 88.3.64 MandelbrotSetMBS(Threaded as Integer, width as Integer, height as Integer, fx as Double = 4.0, fy as Double = 4.0, dx as Double = -2.0, dy as Double = -2.0, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the mandelbrot picture.
**Example:**

```
Backdrop = MandelbrotSetMBS(0,300,300)
```

**Notes:** Threaded parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

Width & Height specifiy the output image size.
fx and fy are the scale values and dx/dy specify the the position of the mandelbrot image.

You can pass destination picture. If dest is not nil and size matches, the plugin reuses the picture object which increases performance as no new picture is created.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will

block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.

### 88.3.65 BinaryStringtoPictureMBS(data as String) as Picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use PNG format instead.
**Function:** Creates the picture back from the binary data inside the string.
**Example:**

```
dim pic as Picture = LogoMBS(500)

// encode
dim s as string = PicturetoBinaryStringMBS(pic)

// decode
Backdrop = BinaryStringtoPictureMBS(s)
```

**Notes:** Deprecated. Please do not use for old projects and convert existing images into a new format, e.g. PNG.

The format of the binary encoded picture data:

+ 0 Kenn, PPIC for Packed Picture
+ 4 Length of whole block
+ 8 Width (BigEndian)
+12 Height (BigEndian)
+16 Depth (BigEndian, 32 for 32bit)
+20 Offset of the binary data. maybe 40.
+24 Reserved for future use. Should be 0.
+40 Pixel Data, packed R, G, B in one byte per Subpixel.

300x300 Pixels will make up 300*300+40 ->270040 Bytes.

This method does not require Quicktime or any other OS Service, but it does no compression.

May be a good way to store pictures crossplatform inside a database. As Valentina can do its own Zip based compression, this may be a wonderfull way to store pictures uncompressed (or lossless compressed) inside the database.
Does not handle mask or alpha channel.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.0pr1

### 88.3.66 PicturetoBinaryStringMBS(p as picture) as string

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use PNG format instead.
**Function:** Creates a string with the picture content for saving.
**Example:**

```
dim s as string
dim pic as picture = LogoMBS(100)

s=PicturetoBinaryStringMBS(pic)
```

**Notes:** Deprecated. Please do not use for old projects and convert existing images into a new format, e.g. PNG.

The format of the binary encoded picture data:

+ 0 Kenn, PPIC for Packed Picture
+ 4 Length of whole block
+ 8 Width (BigEndian)
+12 Height (BigEndian)
+16 Depth (BigEndian, 32 for 32bit)
+20 Offset of the binary data. maybe 40.
+24 Reserved for future use. Should be 0.
+40 Pixel Data, packed R, G, B in one byte per Subpixel.

300x300 Pixels will make up 300*300+40 ->270040 Bytes.

This method does not require Quicktime or any other OS Service, but it does no compression.
Does not handle mask or alpha channel.

May be a good way to store pictures crossplatform inside a database. As Valentina can do its own Zip based compression, this may be a wonderfull way to store pictures uncompressed (or lossless compressed) inside the database.

The returned string has the encoding set to binary (no encoding). If you want to concat the string with another you should check the encoding. If you don't handle that RB may convert the JPEG data to UTF8 (Unicode) which will destroy it.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.0pr1

### 88.3.67 WindowsDrawPictureIntoDeviceContextMBS(pic as picture, HDC as Integer, x as Integer, y as Integer, w as Integer, h as Integer, Transparent as boolean)

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Draws a Xojo Picture into a HDC on Windows.
**Example:**

```
// get a picture
dim logo as Picture = LogoMBS(500)

// get HDC
dim h as Integer = g.Handle(g.HandleTypeHDC)

// and draw into it
WindowsDrawPictureIntoDeviceContextMBS(logo, h, 0, 0, 500, 500, false)
```

**Notes:** Some SDKs from other companies give you sometimes HDC value to draw your stuff inside. You can prepare a Xojo picture and copy it into the HDC.
Specify rectangle and whether to use transparency.

## 88.4 class PaletteCalculatorMBS

### 88.4.1 class PaletteCalculatorMBS

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class allows you to calculate an 8 bit image from a RGB image and back.
**Notes:** You can create the best matching palette for a given image.
If you have several images which should share the same palette, you can draw them first on one big picture before calculating the
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr1

- MBS Xojo Plugins, version 18.5pr2
- MBS Xojo / Real Studio Plugins, version 15.4pr4
- MBS Real Studio Plugins, version 12.3pr3

### 88.4.2 Methods

### 88.4.3 CountColors as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts how many different colors are in the palette.

### 88.4.4 CreatePicturePalette(Pic as picture) as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a picture palette based on the picture.
**Notes:** This function checks which colors are very often used in the image and builds a palette which may be better for this image than the default system palette.

### 88.4.5 GetIndexOfColor(col as color) as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the index in the palette for the given color.
**Notes:** Returns -1 if the color is not found.
See also:

- 88.4.6 GetIndexOfColor(r as Integer, g as Integer, b as Integer) as Integer 14105

### 88.4.6 GetIndexOfColor(r as Integer, g as Integer, b as Integer) as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the index in the palette for the given color.
**Notes:** Returns -1 if the color is not found.
See also:

- 88.4.5 GetIndexOfColor(col as color) as Integer 14105

### 88.4.7 GetNearestIndexOfColor(col as color) as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the index in the palette for the best matching color.
**Notes:** The best color is the color with the lowest value:
value=(r-col(index).red)^2+(g-col(index).green)^2+(b-col(index).blue)^2

Returns -1 if the color is not found (should never happen).
See also:

- 88.4.8 GetNearestIndexOfColor(r as Integer, g as Integer, b as Integer) as Integer 14106

### 88.4.8 GetNearestIndexOfColor(r as Integer, g as Integer, b as Integer) as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the index in the palette for the best matching color.
**Notes:** The best color is the color with the lowest value:
value=(r-col(index).red)^2+(g-col(index).green)^2+(b-col(index).blue)^2

Returns -1 if the color is not found (should never happen).
See also:

- 88.4.7 GetNearestIndexOfColor(col as color) as Integer 14106

### 88.4.9 Transform(mem as memoryblock, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms a 8 bit picture to a RGB picture.
**Notes:** The memoryblock must have the 8 bit picture data inside with each row being width bytes big. The memoryblock must have at least width*height bytes.

Returns nil on any error.
See also:

- 88.4.10 Transform(Pic as picture) as memoryblock 14106

### 88.4.10 Transform(Pic as picture) as memoryblock

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock with 8 bit picture data.
**Notes:** The resulting memoryblock has width*height bytes.
Each RGB color in the picture is looked up in the palette and used to fill the memoryblock.
See also:

- 88.4.9 Transform(mem as memoryblock, width as Integer, height as Integer) as picture 14106

### 88.4.11 TransformBetterDithering(Pic as picture) as memoryblock

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock with 8 bit picture data.
**Notes:** The resulting memoryblock has width*height bytes.
Each RGB color in the picture is looked up in the palette and used to fill the memoryblock.
This method uses dithering to make the picture looking better than with a better transform using code like Floyd-Steinberg.

### 88.4.12 TransformFastDithering(Pic as picture) as memoryblock

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock with 8 bit picture data.
**Notes:** The resulting memoryblock has width*height bytes.
Each RGB color in the picture is looked up in the palette and used to fill the memoryblock.
This method uses dithering to make the picture looking better than with a simple transform.

### 88.4.13 Properties

### 88.4.14 Count as Integer

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How many colors are inside this PaletteMBS.
**Notes:** This property should be 2, 4, 16 or 256.
Default is 256.
(Read and Write property)

### 88.4.15 Col(i as Integer) as color

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color array.
**Notes:** Index goes from 0 to count-1.
(Read and Write computed property)

## 88.5 class Picture

### 88.5.1 class Picture

Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends Xojo's Picture Class.

### 88.5.2 Methods

### 88.5.3 AddSteganographyMBS(flags as Integer, data as Memoryblock) as Picture

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds steganography to a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
// this example uses chr(0) as end marker
dim s as string = "Hello World. This is just a test." + chr(0)
dim pic as Picture = p.AddSteganographyMBS(1, s)

dim data as MemoryBlock = pic.SteganographyMBS(1)
dim d as string = data.CString(0)

MsgBox d
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
Returns a new picture or nil. The existing picture is not modified.

If you like to store data, please encrypt them and include some way that you find your data again, detect length of data, verify it's okay via checksum and than decrypt your data.
Please store image in a loss less format like PNG.
Function does not handle mask or alpha channel.

### 88.5.4 AddSteganographyPictureMBS(flags as Integer, data as Picture) as Picture

MBS Picture Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds steganography to a new picture.

**Example:**

```
const AllChannels = &h111

dim p as new Picture(500, 500, 32)

dim w as new window1
w.Title = "white"
w.Backdrop = p

dim l as Picture = LogoMBS(500)

w = new window1
w.Title = "Logo"
w.Backdrop = l

// adds picture. You will normally not see the modification
dim x as Picture = p.AddSteganographyPictureMBS(AllChannels, l)

w = new window1
w.Title = "Logo hidden in white picture"
w.Backdrop = x

// as we store in lowest bit, this picture will look strange
dim y as Picture = x.SteganographyPictureMBS(AllChannels)

w = new window1
w.Title = "Logo extracted"
w.Backdrop = y
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
Returns a new picture or nil. The existing picture is not modified.

Function does not handle mask or alpha channel.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 88.5.5 AutoLevelCopyMBS as picture

MBS Picture Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies auto levels on the picture.
**Notes:** The histogram is built, white and back points are searched and all pixels adjusted.
Returns nil on any error.

Thanks to Jeff Thoman for his code.

This version of the method makes a copy of the picture so it works on any kind of picture.

Renamed in version 9.2 from AutoLevelMBS to AutoLevelCopyMBS.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr4

### 88.5.6 AutoLevelMBS as boolean

MBS Picture Plugin, Plugin Version: 9.1, Platforms: macOS, Windows, Targets: All.

**Function:** Applies auto levels on the picture.
**Notes:** The histogram is built, white and back points are searched and all pixels adjusted.
Returns true on success and false on any error.
Thanks to Jeff Thoman for his code.

This version of the method modifies the pixels on the picture. Works on 32bit and 24bit pictures.

If you get a type mismatch error on using this function, you may want to use AutoLevelCopyMBS which is the old behavior.
**Blog Entries**

- Using zbar library with Xojo

### 88.5.7 BitmapMBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the picture as a bitmap picture.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.BitmapMBS
canvas1.backdrop=p
```

**Notes:** A Xojo picture object may contain an icon, a bitmap, a picture handle or something else what Xojo will support as a picture in the future.
The picture editing functions of this plugin can only work with bitmap pictures and this clone function creates such pictures for you.
This function takes a look on the picture and returns it unchanged if it is allready a bitmap, but if not, the

picture is Cloned as a bitmap. If you prefer to get a copy of the picture as a bitmap picture, use clone instead.

The Cloned picture does not have a mask.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr12

### 88.5.8 BlueChannelMBS as picture

MBS Picture Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue channel of the picture copied into a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
Backdrop = p.BlueChannelMBS
```

**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr4

### 88.5.9 BlurMBS(Radius as Double, yield as Integer = 0) as picture

MBS Picture Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a blur effect to the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
window1.Backdrop = p.BlurMBS(2)
```

**Notes:** This is not a gaussian blur, but a faster box blur.
Returns nil on any error.

Does ignore mask or alpha channel.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr3
- MBS REALbasic Plugins, version 10.6pr10
- MBS Plugins 10.3 Release Notes

- MBS REALbasic Plugins, version 10.3pr7

### 88.5.10 BMPDataMBS(ResolutionValueDPI as Integer=72) as string

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a String with the BMP File content for the given picture.
**Example:**

```
// Make a picture
dim p as Picture = LogoMBS(100)

// Encode as BMP
dim s as string = p.BMPDataMBS

// display length in title
Title = str(lenb(s))

// and display picture
Backdrop= BMPStringtoPictureMBS(s)
```

**Notes:** Does not handle masks.
Returns an empty string on any error.

### 88.5.11 CalcSteganographyMBS(flags as Integer) as Integer

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the steganography size.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim size1 as Integer = p.CalcSteganographyMBS(&h100)
MsgBox "Red only: "+str(size1)

dim size2 as Integer = p.CalcSteganographyMBS(&h111)
MsgBox "RGB only: "+str(size2)
```

**Notes:** Returns number of bytes that can be stored in an image of the size of this picture.
Flags can be a combination of red (&h100), green (&h010) and blue (&h001).

### 88.5.12 CGColorSpaceMBS as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Queries the colorspace profile for a picture.
**Example:**

```
dim p as new Picture(32,32,32)
dim c as CGColorSpaceMBS = p.CGColorSpaceMBS
MsgBox c.Name
```

**Notes:** Only for Cocoa targets.

In Version 19.3 changed to default to Generic RGB, which Xojo uses if none is set.

### 88.5.13 ChangeBrightnessAbsoluteMBS(Brightness as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness of an image.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeBrightnessAbsoluteMBS(30)

// show in window
window1.Backdrop = n
```

**Notes:** To every pixel component the value is added.
Returns nil if the picture is no bitmap picture.
See also:

- 88.5.14 ChangeBrightnessAbsoluteMBS(BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture 14114

### 88.5.14 ChangeBrightnessAbsoluteMBS(BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness of an image.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeBrightnessAbsoluteMBS(10,20,30)

// show in window
window1.Backdrop = n
```

**Notes:** To every pixel component the value is added.
Returns nil if the picture is no bitmap picture.

PS: This function may be optimized, if someone needs it to be faster.

Basicly Picture.ChangeBrightnessAbsoluteMBS does this:

```
for each pixel in picture
pixel.red = pixel.red + r
pixel.green = pixel.green + g
pixel.blue = pixel.blue + b
next
```

and it limits the pixel values to the range 0 to 255.
See also:

- 88.5.13 ChangeBrightnessAbsoluteMBS(Brightness as Double) as picture 14114

### 88.5.15 ChangeBrightnessLinearMBS(Brightness as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness of an image linear.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeBrightnessLinearMBS(30)

// show in window
window1.Backdrop = n
```

**Notes:** Value is fraction of change. Range -255 to 255. For example 127 would move all colors half the way to white.
Returns nil if the picture is no bitmap picture.
See also:

- 88.5.16 ChangeBrightnessLinearMBS(BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture 14116

### 88.5.16 ChangeBrightnessLinearMBS(BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness of an image linear.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeBrightnessLinearMBS(10,20,30)

// show in window
window1.Backdrop = n
```

**Notes:** Returns nil if the picture is no bitmap picture.
PS: This function may be optimized, if someone needs it to be faster (e.g. using Altivec).
**Blog Entries**

- MBS Xojo Plugins, version 18.0pr9

See also:

- 88.5.15 ChangeBrightnessLinearMBS(Brightness as Double) as picture 14115

### 88.5.17 ChangeContrastBrightnessAbsoluteMBS(Contrast as Double, Brightness as Double) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness and contrast of an image.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)
```

```
dim n as Picture = p.ChangeContrastBrightnessAbsoluteMBS(0.5,30)

// show in window
window1.Backdrop = n
```

**Notes:** Returns nil if the picture is no bitmap picture.
See also:

- 88.5.18 ChangeContrastBrightnessAbsoluteMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double, BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture 14117

### 88.5.18 ChangeContrastBrightnessAbsoluteMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double, BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness and contrast of an image.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeContrastBrightnessAbsoluteMBS(0.5, 0.5, 0.5, 10, 20, 30)

// show in window
window1.Backdrop = n
```

**Notes:** Returns nil if the picture is no bitmap picture.
See also:

- 88.5.17 ChangeContrastBrightnessAbsoluteMBS(Contrast as Double, Brightness as Double) as picture 14116

### 88.5.19 ChangeContrastBrightnessLinearMBS(Contrast as Double, Brightness as Double) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness and contrast of an image linear.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeContrastBrightnessLinearMBS(0.5,30)

// show in window
window1.Backdrop = n
```

**Notes:** Returns nil if the picture is no bitmap picture.
Contrast range is 0 to 1.0.
Brightness range is -255 to 255.
See also:

- 88.5.20 ChangeContrastBrightnessLinearMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double, BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture 14118

### 88.5.20 ChangeContrastBrightnessLinearMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double, BrightnessRed as Double, BrightnessGreen as Double, BrightnessBlue as Double) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the bightness and contrast of an image linear.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeContrastBrightnessLinearMBS(0.5, 0.5, 0.5, 10, 20, 30)

// show in window
window1.Backdrop = n
```

**Notes:** Returns nil if the picture is no bitmap picture.
Contrast range is 0 to 1.0.
Brightness range is -255 to 255.
See also:

- 88.5.19 ChangeContrastBrightnessLinearMBS(Contrast as Double, Brightness as Double) as picture 14117

### 88.5.21 ChangeContrastMBS(Contrast as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the contrast of the picture.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeContrastMBS(-0.5)

// show in window
window1.Backdrop = n
```

**Notes:** All three color channels are handled with the same contrast change.
Returns a picture on success or nil on any error.
Parameters can have any value.
(values >=0.0 will add contrast, values below 0.0 will reduce contrast till gray picture at -1.0, values below -1.0 will add contrast again and also invert the picture)
See also:

- 88.5.22 ChangeContrastMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double) as picture 14119

### 88.5.22 ChangeContrastMBS(ContrastRed as Double, ContrastGreen as Double, ContrastBlue as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the contrast of the picture.
**Example:**

```
// get test picture
dim p as Picture = LogoMBS(500)

dim n as Picture = p.ChangeContrastMBS(-0.5,0.0,0.5)

// show in window
window1.Backdrop = n
```

**Notes:** Three different values, one for each channel.
Returns a picture on success or nil on any error.
(values >=0.0 will add contrast, values below 0.0 will reduce contrast till gray picture at -1.0, values below -1.0 will add contrast again and also invert the picture)

See also:

- 88.5.21 ChangeContrastMBS(Contrast as Double) as picture 14119

### 88.5.23 ChangeCustomMBS(a as Double, b as Double) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the picture with custom values.
**Notes:** Uses this formular:
NewPixelComponent=OldPixelComponent*a+b
See also:

- 88.5.24 ChangeCustomMBS(Ra as Double, Rb as Double, Ga as Double, Gb as Double, Ba as Double, Bb as Double) as picture 14120

### 88.5.24 ChangeCustomMBS(Ra as Double, Rb as Double, Ga as Double, Gb as Double, Ba as Double, Bb as Double) as picture

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the picture with custom values.
**Notes:** Uses this formular:
NewPixelComponent=OldPixelComponent*a+b
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr5

See also:

- 88.5.23 ChangeCustomMBS(a as Double, b as Double) as picture 14120

### 88.5.25 ChangeSaturationMBS(Amount as Integer) as picture

MBS Picture Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the picture with a changed saturation.
**Notes:** Range of amount is from -255 to 255.

Value 0 does nothing.
Value -255 returns a gray level picture.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 88.5.26 cloneMBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the picture as a bitmap.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.clonembs
canvas1.backdrop=p
```

**Notes:** A Xojo picture object may contain an icon, a bitmap, a picture handle or something else what Xojo will support as a picture in the future.
The picture editing functions of this plugin can only work with bitmap pictures and this clone function creates such pictures for you.
If a picture is a bitmap can be easily tested with the graphics property like this:

```
if p.graphics=nil then // if no bitmap
p = p.clonembs // make one
end if
```

The Cloned picture does include the mask, if one exists.
See FAQ entry "How to duplicate a picture with mask or alpha channel?" on how to duplicate with mask.
See also:


- 88.5.27 CloneMBS(NewMask as Picture) as picture 14121
- 88.5.28 CloneMBS(NewMask as Picture, width as Integer, height as Integer) as picture 14122
- 88.5.29 CloneMBS(width as Integer, height as Integer) as picture 14122


### 88.5.27 CloneMBS(NewMask as Picture) as picture

MBS Picture Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the picture as a bitmap.
**Notes:** Same as CloneMBS, but adds the mask.
See also:


- 88.5.26 cloneMBS as picture 14121
- 88.5.28 CloneMBS(NewMask as Picture, width as Integer, height as Integer) as picture 14122
- 88.5.29 CloneMBS(width as Integer, height as Integer) as picture 14122

### 88.5.28 CloneMBS(NewMask as Picture, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the picture as a bitmap.
**Notes:** Same as CloneMBS, but adds the mask.
See also:

- 88.5.26 cloneMBS as picture 14121
- 88.5.27 CloneMBS(NewMask as Picture) as picture 14121
- 88.5.29 CloneMBS(width as Integer, height as Integer) as picture 14122

### 88.5.29 CloneMBS(width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the picture as a bitmap with given size.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.clonembs(100,100)
canvas1.backdrop=p
```

**Notes:** A Xojo picture object may contain an icon, a bitmap, a picture handle or something else what Xojo will support as a picture in the future.
The picture editing functions of this plugin can only work with bitmap pictures and this clone function creates such pictures for you.
If a picture is a bitmap can be easily tested with the graphics property like this:

```
if p.graphics=nil then // if no bitmap
p=p.clonembs // make one
end if
```

The Cloned picture does not have a mask or alpha channel.
See FAQ entry "How to duplicate a picture with mask or alpha channel?" on how to duplicate with mask.
See also:

- 88.5.26 cloneMBS as picture 14121
- 88.5.27 CloneMBS(NewMask as Picture) as picture 14121
- 88.5.28 CloneMBS(NewMask as Picture, width as Integer, height as Integer) as picture 14122

### 88.5.30 ColorizeMBS(hue as Double, sat as Double, light as Double) as picture

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorizes a picture.
**Notes:** Hue, Sat and Light in range 0.0 to 1.0 please.
Returns new picture.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

### 88.5.31 ColornessMBS(threshold as Integer = 10) as Double

MBS Picture Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the color coverage of the picture.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim pic as Picture = Picture.Open(file)

MsgBox str(pic.ColornessMBS)
```

**Notes:** Counts how many pixels have color and returns percentage depending on a given threshold.
Changed in 12.3pr5 to ignore nearly black pictures when counting.

This function loops over all pixels to calculate the difference between green and red channel and green and blue channel. If the differences are greater than the threshold, the pixel counts as colored.

Threshold is between 0 and 255. The value of 10 makes sure almost gray pictures don't count as colored ones.

Finally we calculate the percentage of colored pixels vs total pixels.
**Blog Entries**

- MBS Real Studio Plugins, version 11.4pr3

### 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129

- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As Picture
dim Image As Picture
dim Mask As Picture
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500
dim UseColours as Boolean = true
dim ForeColour as color = &cFF0000
```

```
image=LogoMBS(500)
Mask=nil
DestImage=New Picture(700,700,32)

if DestImage.CombineMBS(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,UseColours,ForeColour)
then
window1.Backdrop=DestImage
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour

as Integer, MaskColour as Integer) as boolean 14131

- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142

### 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138

- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As Picture
dim Image As Picture
dim Mask As Picture
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=LogoMBS(500)
Mask=nil
DestImage=New Picture(700,700,32)

if DestImage.CombineMBS(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,true,&h777777,&h777777)
then
window1.Backdrop=DestImage
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer,

UseColours As Boolean, ForeColour As color) as boolean 14135

- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142

### 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position

SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140

- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:


- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX

as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127

- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142

### 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133

- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142


### 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Picture Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position

SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The destination image (self) can be either 24 bit or 32 bit.
See also:

- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture 14142

### 88.5.42 CombineMBS(Mode as Integer, SecondPicture As Picture, X as Integer = 0, Y as Integer = 0, Width as Integer = 0, Height as Integer = 0) as picture

MBS Picture Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines pixels of two images with the given mode.
**Example:**

```
dim pic as picture // some picture
dim other as picture // some other picture
dim result as picture = pic.CombineMBS(1, other)

// effects are made like this. If you have a suggestion for a new effect,
// send your suggestion to MBS support:
Function Combine(x as Integer, y as Integer) as Integer
Return BitwiseXor(x,y)
End Function
```

**Notes:** Each pixel is sent through an operation for each channel.
X, Y, Width and Height can limit effect of a certain portion of the source image.

Modes:

| | |
|---|---|
| 1 | Bitwise XOR |
| 2 | Bitwise OR |
| 3 | Bitwise AND |
| 4 | Min |
| 5 | Max |
| 6 | AddPin (add with limit) |
| 7 | AddOver (add with overflow) |
| 8 | Difference |
| 9 | Difference squared (with limit 255) |
| 10 | Sub Pin (sub with limit) |

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr1
- MBS Real Studio Plugins, version 12.5pr13
- MBS REALbasic plug-ins version 9.5

See also:


- 88.5.32 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14123
- 88.5.33 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14125
- 88.5.34 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14127
- 88.5.35 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14129
- 88.5.36 CombineMBS(Image As Picture, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14131
- 88.5.37 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 14133
- 88.5.38 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 14135
- 88.5.39 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 14136
- 88.5.40 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 14138
- 88.5.41 CombineMBS(Image As Picture, PreMultipliedSource as boolean, Mask As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 14140


### 88.5.43 CombinePixelMBS(Mode as Integer, SecondPicture As Picture) as picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines pixels of two images with the given mode.
**Example:**

```
dim pic as picture // some picture
dim other as picture // some other picture
dim result as picture = pic.CombinePixelMBS(1, other)

// effects are made like this. If you have a suggestion for a new effect,
// send your suggestion to MBS support:
Function Combine(x as color, y as color) As color
Return rgb(x.red+y.red, x.green+y.green, x.blue+y.blue)
End Function
```

**Notes:** Each pixel is sent through an operation.

Modes:

1. Average (50% first and 50% second picture)
2. Gray
3. LighterPixel
4. DarkerPixel
5. Difference Max
6. Difference Max Squared

### 88.5.44 CompareBrightnessMBS(other as picture, mode as Integer, threshold as Integer) as Double

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two pictures in brightness.
**Example:**

```
dim p as picture = New Picture(100,100,32)
dim q as Picture = New Picture(100,100,32)

dim diff as Double = p.CompareBrightnessMBS(q, 0, 0)

MsgBox str(Diff) // shows 0 = equal
```

**Notes:** Returns the percent of difference: Number of pixels where the squared color difference is bigger than the threshold divided by the total number of pixels.
If width and height are not equal, the result is 1.0.
If you need to check the mask also, please call this method a second time for the masks.

Modes:

| | | |
|---|---|---|
| 0 | y = 0.33 * R + 0.5 * G + 0.16 * B | Faster version of 3 |
| 1 | y = 0.375 * R + 0.5 * G + 0.125 * B | Faster version of 3 |
| 2 | y = 0.2126 * R + 0.7152 * G + 0.0722 * B | Photometric/digital ITU-R |
| 3 | y = 0.299 * R + 0.587 * G + 0.114 * B | Digital CCIR601 |

Mode 2 and 3 uses doubles and mode 0 and 1 use integers so they should be faster.
Still Mode 0 and 1 are just approximation formulas which trade accuracy for perfomance.

Only compares raw pixels without checking mask or alpha channel.

### 88.5.45 CompareMBS(other as picture, threshold as Integer) as Double

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two pictures.
**Example:**

```
dim p as picture = New Picture(100,100,32)
dim q as Picture = New Picture(100,100,32)

dim diff as Double = p.CompareMBS(q, 0)

MsgBox str(Diff) // shows 0 = equal

p.Graphics.ForeColor = &cFF0000
p.Graphics.FillRect 0, 0, p.Width, p.Height

q.Graphics.ForeColor = &cFF0001
q.Graphics.FillRect 0, 0, q.Width, q.Height

dim diff1 as Double = p.CompareMBS(q, 0)
dim diff2 as Double = p.CompareMBS(q, 2)

MsgBox str(Diff1)+" "+str(Diff2) // shows 1 (all pixels different) and shows 0 (all equal)
```

**Notes:** Returns the percent of difference: Number of pixels where the squared color difference is bigger than the threshold divided by the total number of pixels.
If width and height are not equal, the result is 1.0.
If you need to check the mask also, please call this method a second time for the masks.

Only compares raw pixels without checking mask or alpha channel.

### 88.5.46 CopyABGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
See also:

- 88.5.47 CopyABGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14146

### 88.5.47 CopyABGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyABGRtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockABGRtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
MaskForAlpha should not be nil and be the mask for this image.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock. Mask and Picture must have equal size.
The mask is used to fill alpha channel.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

See also:

- 88.5.46 CopyABGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14146

### 88.5.48 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
dim m as MemoryBlock
dim p,q as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyARGBtoMemoryblockMBS(m,0,0) then

dim x as Picture = New Picture(100,100,32)

q=MemoryblockARGBtoPictureMBS(x, m,0,100,100)

Backdrop=q

if x=q then
window1.Title = "reused picture"
else
window1.Title = "created new picture"
end if
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the

memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line. See also:


- 88.5.49 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, LittleEndian as boolean, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14149
- 88.5.50 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14150


### 88.5.49 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, LittleEndian as boolean, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
dim m as MemoryBlock
dim p as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
```

```
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

LittleEndian specifies whether the image is stored in ARGB (BigEndian) or BGRA (LittleEndian) mode.

If Alphavalue is in range of 0 to 255 the alpha value of all pixel is set to this value. If the AlphaValue is outside this range the alpha value is not touched for all pixels.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
See also:

- 88.5.48 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14148
- 88.5.50 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14150

### 88.5.50 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyARGBtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockARGBtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
MaskForAlpha should not be nil and be the mask for this image.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock. Mask and Picture must have equal size.
The mask is used to fill alpha channel.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

See also:

- 88.5.48 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14148

- 88.5.49 CopyARGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, LittleEndian as boolean, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14149

### 88.5.51 CopyBGRAtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
See also:

- 88.5.52 CopyBGRAtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14153

### 88.5.52 CopyBGRAtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyBGRAtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockBGRAtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
MaskForAlpha should not be nil and be the mask for this image.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock. Mask and Picture must have equal size.
The mask is used to fill alpha channel.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other

threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

See also:

- 88.5.51 CopyBGRAtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14152

### 88.5.53 CopyBGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*3 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.54 CopyBGRXtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.

destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.55 CopyBtoMemoryblockMBS(destination as memoryblock, offset as Integer, PixelByteSize as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
const kAlphaOffset=0 ' (BigEndian) and 3 (LittleEndian)
dim m as MemoryBlock
dim p as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100
p.mask.Graphics.ForeColor=rgb(127,127,127)
p.mask.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
```

```
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// copy Blue channel from mask image into Memoryblock
if p.mask.CopyBtoMemoryblockMBS(m,kAlphaOffset,4) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
PixelByteSize is normally 4 for 32bit per Pixel.
By using a different offset you can have this function working correctly on non BigEndian platforms.
The function will crash if the memoryblock is too small. Needs picture.width*picture.height*PixelByteSize bytes in the memoryblock.
Mask images in RB are all gray so it does not matter which channel you copy to get the alpha channel. This function takes the blue channel from the source image.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.56 CopyGtoMemoryblockMBS(destination as memoryblock, offset as Integer, PixelByteSize as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
const kAlphaOffset=0 ' (BigEndian) and 3 (LittleEndian)
dim m as MemoryBlock
dim p as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
```

```
p.Graphics.FillRect 0,0,100,100
p.mask.Graphics.ForeColor=rgb(127,127,127)
p.mask.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// copy green channel from mask image into Memoryblock
if p.mask.CopyGtoMemoryblockMBS(m,kAlphaOffset,4) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
PixelByteSize is normally 4 for 32bit per Pixel.
By using a different offset you can have this function working correctly on non BigEndian platforms.
The function will crash if the memoryblock is too small. Needs picture.width*picture.height*PixelByteSize bytes in the memoryblock.
Mask images in RB are all gray so it does not matter which channel you copy to get the alpha channel. This function takes the green channel from the source image.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.57 CopyMaskMBS as picture

MBS Picture Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the mask of the picture into a new and independend picture object.
**Example:**

```
dim p as Picture
```

```
p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,300,300

p.mask.Graphics.ForeColor=&cFFFFFF
p.mask.Graphics.Fillrect 0,0,300,300

p.mask.Graphics.ForeColor=&c000000
p.mask.Graphics.Filloval 0,0,300,300

Backdrop=p.CopyMaskMBS
```

**Notes:** Returns nil on low memory.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 88.5.58 CopyPictureMBS as picture

MBS Picture Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a clone of picture.
**Notes:** Can duplicate mask and alpha channel.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 88.5.59 CopyPictureWithMaskMBS as picture

MBS Picture Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the the picture into a new and independend picture object with mask.
**Example:**

```
dim p as Picture

p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,300,300

p.mask.Graphics.ForeColor=&cFFFFFF
p.mask.Graphics.Fillrect 0,0,300,300
```

```
p.mask.Graphics.ForeColor=&c000000
p.mask.Graphics.Filloval 0,0,300,300

Backdrop=p.CopyPictureWithMaskMBS
```

**Notes:** Returns nil on low memory.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 88.5.60 CopyPictureWithoutMaskMBS as picture

MBS Picture Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the the picture into a new and independend picture object without the mask.
**Example:**

```
dim p as Picture

p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,300,300

p.mask.Graphics.ForeColor=&cFFFFFF
p.mask.Graphics.Fillrect 0,0,300,300

p.mask.Graphics.ForeColor=&c000000
p.mask.Graphics.Filloval 0,0,300,300

Backdrop=p.CopyPictureWithoutMaskMBS
```

**Notes:** Returns nil on low memory.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 88.5.61 CopyPixelFastMBS(Source As Picture, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
const x=100 // mouse coordinates for example
const y=100

dim p,logo as picture

logo=LogoMBS(500)

p=New Picture(800,800,32)

p.Graphics.ForeColor=&cFFFFFF
p.Graphics.FillRect 0,0,p.Width,p.Height

if p.CopyPixelFastMBS(logo, x-logo.Width/2, y-logo.Height/2, 0, 0, logo.Width, logo.Height) then
' ok
else
beep
end if

window1.Backdrop=p
```

**Notes:** Returns true on success and false on failure.

Parameters:
Source: the source picture, must not be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy

The destination image (self) can be either 24 bit or 32 bit.
The source image can have any bit depth and may be converted to 24 or 32 bit.

### 88.5.62 CopyRGBAtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
// get some picture
dim pic as Picture = LogoMBS(500)
// and a memoryblock of 1000 by 1000 pixels with 4 bytes per pixel
dim m as new MemoryBlock(1000* 1000 *4)

// calculate some offset for the image with 50 rows from top and 60 pixels from left
dim Offset50Lines as Integer = 1000*4 *50 +60*4

// copy picture to memoryblock
if pic.CopyRGBAtoMemoryblockMBS(m, Offset50Lines, 127, 0, pic.Height-1, 0, 4*1000) then

// show MemoryBlock content
Backdrop = MemoryblockRGBAtoPictureMBS(nil, m, 0, 1000, 1000)
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
See also:

- 88.5.63 CopyRGBAtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14162

### 88.5.63 CopyRGBAtoMemoryblockMBS(destination as memoryblock, offset as Integer, MaskForAlpha as picture, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

// convert to memoryblock
dim m as new MemoryBlock(4 * p.Width * p.Height)

if p.CopyRGBAtoMemoryblockMBS(m, 0, p.Mask) then
// convert back
Backdrop = MemoryblockRGBAtoPictureMBS(m, 0, p.Width, p.Height)

break // look into memoryblock with debugger
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
MaskForAlpha should not be nil and be the mask for this image.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock. Mask and Picture must have equal size.
The mask is used to fill alpha channel.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other

threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr2
- MBS Real Studio Plugins, version 13.0pr6

See also:

- 88.5.62 CopyRGBAtoMemoryblockMBS(destination as memoryblock, offset as Integer, AlphaValue as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean 14160

### 88.5.64 CopyRGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
dim m as MemoryBlock
dim p as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*3) // 3 bytes per Pixel

// Copy RGB without alpha
if p.CopyRGBtoMemoryblockMBS(m,0) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*3 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.65 CopyRGBXtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.66 CopyRtoMemoryblockMBS(destination as memoryblock, offset as Integer, PixelByteSize as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Example:**

```
const kAlphaOffset=0 ' (BigEndian) and 3 (LittleEndian)
dim m as MemoryBlock
dim p as Picture

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,128,1)
p.Graphics.FillRect 0,0,100,100
p.mask.Graphics.ForeColor=rgb(127,127,127)
p.mask.Graphics.FillRect 0,0,100,100

// Make a new MemoryBlock
m=NewMemoryBlock(100*100*4) // 4 bytes per Pixel

// copy RGB and leave room for alpha
if p.CopyARGBtoMemoryblockMBS(m,0,false,-1) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if

// copy Red channel from mask image into Memoryblock
if p.mask.CopyRtoMemoryblockMBS(m,kAlphaOffset,4) then
MsgBox EncodingToHexMBS(m.StringValue(0,99))
end if
```

**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.
PixelByteSize is normally 4 for 32bit per Pixel.
By using a different offset you can have this function working correctly on non BigEndian platforms.
The function will crash if the memoryblock is too small. Needs picture.width*picture.height*PixelByteSize bytes in the memoryblock.
Mask images in RB are all gray so it does not matter which channel you copy to get the alpha channel. This function takes the red channel from the source image.

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.67 CopyXBGRtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.
offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.68 CopyXRGBtoMemoryblockMBS(destination as memoryblock, offset as Integer, StartLine as Integer = 0, EndLine as Integer = -1, Yield as Integer = 0, DestRowBytes as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies raw image data into a memoryblock.
**Notes:** Returns true on success.
destination should not be nil.

offset should be 0 or bigger and is the start position in the memoryblock.

The function will crash if the memoryblock is too small. Needs picture.width*picture.height*4 bytes in the memoryblock.

Does not access the mask inside the image!

This method was written for speed, so the creation of the memoryblock is your part. You can of course reuse memoryblocks for batch processing images as long as the memoryblock is big enough.

The X variant of this method does not touch the alpha channel in the memoryblock and the A variant changes the alpha value to the given value.

StartLine and Endline define the range of source lines from picture. Range is from 0 to picture.height-1. if Endline is -1, we use picture.height-1 internally. Yield specifies how much CPU time is given to other threads. If yield = 0, we give no CPU time away. If yield is >0, we yield every yield/60th second to other threads. If DestRowBytes is not zero, it specifies the bytes per row in the target memoryblock for each line.

### 88.5.69 CountColorMBS(col as color) as Integer

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts the pixels with the given colors.
**Example:**

```
dim p as Picture
dim n1,n2 as Integer

p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,100,100

n1=p.CountColorMBS(&cFF0000)
n2=p.CountColorMBS(&cFFFFFF)

if n1=100*100 then
if n2=300*300-100*100 then
MsgBox "OK"
else
MsgBox "white failed"
end if
else
MsgBox "red failed"
```

```
end if
```

**Notes:** Returns the number of pixels found.
**Blog Entries**

- Tipp of the day: Blank HTMLViewer

### 88.5.70 CountColorsMBS(byref red as memoryblock, byref blue as memoryblock, byref green as memoryblock, byref count as Integer)

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts the color parts of each pixel.
**Notes:** red, blue and green are filled with 1024 bytes big memoryblocks. One 4 byte integer for each color value possible.
Count is filled with the number of pixels processed.

### 88.5.71 DrawPictureFMBS(pic as picture, x as Double, y as Double, alpha as Double = 1.0, yield as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws picture with floating point coordinates.
**Notes:** Supports a mask on the picture.
Returns true on success.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr3

### 88.5.72 ExtractColorMBS(SearchColor as color, ReplaceWithColor as color, BackGroundColor as color) as picture

MBS Picture Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the first color and writes matching pixels with the secon color.
**Example:**

```
dim p as Picture

p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 000,100,100,100
```

```
p.Graphics.ForeColor=&c00FF00
p.Graphics.FillRect 100,100,100,100

p.Graphics.ForeColor=&c0000FF
p.Graphics.FillRect 200,100,100,100

p.Graphics.ForeColor=&c777700
p.Graphics.FillRect 100,200,100,100

// shows just a violet box on the left
backdrop=p.ExtractColorMBS(&cFF0000,&cFF00FF,&c000000)
```

**Notes:** All pixels which do not match the search color are written to the new picture using the given background color.
Returns nil on any error.

### 88.5.73 ExtractColorRectangleMaskMBS as picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a mask picture with all the rectangles marked visible which contain color.
**Example:**

```
dim invertedpic as picture
dim pic as Picture

pic=New Picture(300,300,32)
pic.graphics.drawpicture LogoMBS(100), 150,50

Backdrop=pic.ExtractColorRectangleMaskMBS
// marks black where the logo is drawn
```

**Notes:** If you have a picture which is mostly gray and you need to find a color picture inside, this method can be helpful.

In the returned picture all pixels are black which belong to a rectangle which contains color pixels in the original picture.
See also:

- 88.5.74 ExtractColorRectangleMaskMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture 

### 88.5.74 ExtractColorRectangleMaskMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a mask picture with all the rectangles marked visible which contain color.
**Notes:** If you have a picture which is mostly gray and you need to find a color picture inside, this method can be helpful.

In the returned picture all pixels are black which belong to a rectangle which contains color pixels in the original picture.

All pixel outside the rectangle specified will be white.
See also:

- 88.5.73 ExtractColorRectangleMaskMBS as picture 14169

### 88.5.75 FindPictureMBS(pic as picture, byref x as Integer, byref y as Integer, StartX as Integer = 0, StartY as Integer = 0, Tolerance as Integer = 3) as boolean

MBS Picture Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the given picture inside the picture.
**Example:**

```
// this is search image
dim p as new Picture(20,20,32)
p.Graphics.ForeColor = &c0000FF
p.Graphics.FillRect 0, 0, 20, 20

// this is target image
dim q as new Picture(500, 500, 32)

// with some color at Random position
q.Graphics.ForeColor = &c0000FF
q.Graphics.FillRect rnd*480, rnd*480, 30, 30

// do a search
dim x, y as Integer

if q.FindPictureMBS(p, x,y) then
// found image, so draw rectangle there

q.Graphics.ForeColor = &cFF0000
q.Graphics.DrawRect x, y, p.Width, p.Height
```

```
end if

window1.Backdrop = q
```

**Notes:** Returns true on success and fills x/y variables.
Pixels are compared exactly, so a little bit color correction and make the picture being not found.

StartX/StartY can give start position. Tolerance defines how much two pixel component values can differ and still be considered the same. This helps with color matching and other drawings which may alter pixels a little bit.
If function returns true, you can use x+1, y as the new start position and search again.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr3
- MBS Xojo / Real Studio Plugins, version 13.4pr5

### 88.5.76 GetMaskMBS(create as boolean = true) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the mask for that picture.
**Notes:** Same as Picture.Mask in Xojo, but over the Plugin API.
We added it to test for leaks in plugin API.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr3

### 88.5.77 GrayScale2MBS(mode as Integer) as boolean

MBS Picture Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Turns picture into grayscale.
**Example:**

```
dim l as Picture = LogoMBS(500)
if l.GrayScale2MBS(0) then
Backdrop = l
end if
```

**Notes:** Returns true on success and false on failure.

Modes:

| | | |
|---|---|---|
| 0 | y = 0.33 * R + 0.5 * G + 0.16 * B | Faster version of 3 |
| 1 | y = 0.375 * R + 0.5 * G + 0.125 * B | Faster version of 3 |
| 2 | y = 0.2126 * R + 0.7152 * G + 0.0722 * B | Photometric/digital ITU-R |
| 3 | y = 0.299 * R + 0.587 * G + 0.114 * B | Digital CCIR601 |

Mode 2 and 3 uses doubles and mode 0 and 1 use integers so they should be faster.
Still Mode 0 and 1 are just approximation formulas which trade accuracy for perfomance.

GrayScaleMBS makes a copy of the picture while GrayScale2MBS edits in-place.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr3

### 88.5.78 GrayScaleMBS(mode as Integer) as picture

MBS Picture Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a grayscale copy of the picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
Backdrop = l.GrayScaleMBS(0)
```

**Notes:** If you have a mask on the picture, you need to draw that mask in the new picture's mask if you want to keep it.

Modes:

| | | |
|---|---|---|
| 0 | y = 0.33 * R + 0.5 * G + 0.16 * B | Faster version of 3 |
| 1 | y = 0.375 * R + 0.5 * G + 0.125 * B | Faster version of 3 |
| 2 | y = 0.2126 * R + 0.7152 * G + 0.0722 * B | Photometric/digital ITU-R |
| 3 | y = 0.299 * R + 0.587 * G + 0.114 * B | Digital CCIR601 |

Mode 2 and 3 uses doubles and mode 0 and 1 use integers so they should be faster.
Still Mode 0 and 1 are just approximation formulas which trade accuracy for perfomance.

GrayScaleMBS makes a copy of the picture while GrayScale2MBS edits in-place.

### 88.5.79 GreenChannelMBS as picture

MBS Picture Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green channel of the picture copied into a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
Backdrop = p.GreenChannelMBS
```

**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr4

### 88.5.80 HashMBS as UInt32

MBS Picture Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates CRC 32 over all pixels.
**Example:**

```
dim p as new Picture(100, 100, 32)

dim hash1 as UInt32 = p.HashMBS

// one black pixel
p.Graphics.Pixel(50, 50) = &c000000

dim hash2 as UInt32 = p.HashMBS

MsgBox hex(hash1)+" "+hex(hash2)
```

**Notes:** You can use hash to see if two pictures have 100% identical pixel values. Changing just one pixel should give different number.
Does not include alpha channel or mask for the hash, but only RGB channels.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr4

### 88.5.81 HasMaskMBS as boolean

MBS Picture Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this picture has a mask or not.

**Notes:** Returns true if yes or false if not.

### 88.5.82 HMirrorMBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture horizontally (flip).
**Example:**

```
// load picture
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as PNGPictureMBS = f.OpenAsPNGMBS

// get parts
dim pic as Picture = p.Pict.HMirrorMBS
dim mask as Picture = p.mask.HMirrorMBS

// save as png
dim g as FolderItem = SpecialFolder.Desktop.Child("output.png")
call g.SaveAsPNGMBS(pic, mask, 0)

// now apply mask to show it
pic.Mask = mask
Backdrop = pic
```

**Notes:** This method returns a copy of the picture mirrored.
Returns nil on low memory.

### 88.5.83 HMirrorPictureMBS as boolean

MBS Picture Plugin, Plugin Version: 7.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture horizontally (flip).
**Example:**

```
if pic.HMirrorPictureMBS then // mirror picture
canvas1.backdrop=pic
else
canvas1.backdrop=pic.HMirrorMBS // mirror a copy
end if
```

**Notes:** This methods mirrors the picture data itself. Returns true on success and false on failure. Only

bitmap pictures can be mirrored this way.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr6
- MBS Real Studio Plugins, version 11.4pr1

### 88.5.84 InvertGrayMBS as picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the gray pixels inside the picture.
**Example:**

```
dim invertedpic as picture
dim pic as picture

pic=LogoMBS(500)
invertedpic=pic.InvertGrayMBS

Backdrop=invertedpic
```

**Notes:** Returns nil on any error.
See also:

- 88.5.85 InvertGrayMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture 14175

### 88.5.85 InvertGrayMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture

MBS Picture Plugin, Plugin Version: 9.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the gray pixels inside the picture.
**Example:**

```
dim invertedpic as picture
dim pic as picture

pic=LogoMBS(500)
invertedpic=pic.InvertGrayMBS(0,0,250,250)

Backdrop=invertedpic
```

**Notes:** Returns nil on any error.
The part of the picture which is not inverted will be all black.
See also:

- 88.5.84 InvertGrayMBS as picture 14175

### 88.5.86 InvertMBS as picture

MBS Picture Plugin, Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the whole picture.
**Example:**

```
dim invertedpic as picture
dim pic as picture

pic=LogoMBS(500)
invertedpic=pic.InvertMBS

Backdrop=invertedpic
```

**Notes:** Supports RGB and RGBA pictures, but does not look into a mask as that is not needed.
Alpha stays untouched as only RGB is inverted.
Returns nil on any error.
See also:

- 88.5.87 InvertMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture 14176

### 88.5.87 InvertMBS(left as Integer,top as Integer,width as Integer,height as Integer) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the picture.
**Example:**

```
dim invertedpic as picture
dim pic as picture

pic=LogoMBS(500)
invertedpic=pic.InvertMBS(0,0,250,250)

Backdrop=invertedpic
```

**Notes:** Returns nil on any error.
The part of the picture which is not inverted will be all black.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr7

See also:

- 88.5.86 InvertMBS as picture 14176

### 88.5.88 isBlackMBS as boolean

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the picture has only black pixels.
**Example:**

```
dim p as Picture

// test white
p=New Picture(100,100,32)

MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)

// test black
p.Graphics.ForeColor=&c000000
p.Graphics.FillRect 0,0,100,100
MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)

// test red
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,100,100
MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)
```

See also:

- 88.5.89 isBlackMBS(left as Integer,top as Integer,width as Integer,height as Integer) as boolean 14177

### 88.5.89 isBlackMBS(left as Integer,top as Integer,width as Integer,height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the picture has only black pixels in the given rectangle.
See also:

- 88.5.88 isBlackMBS as boolean 14177

### 88.5.90 isGrayMBS(tolerance as Integer = 0) as boolean

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a picture has only shades of gray in all pixels.
**Example:**

```
dim p as new Picture(100,100,32)

// 1. test white picture

if p.isGrayMBS then
MsgBox "white picture is gray."
end if

// 2. test gray picture
dim g as Graphics = p.Graphics
g.ForeColor = &c777777
g.FillRect 0, 0, 100, 100

if p.isGrayMBS then
MsgBox "gray picture is gray."
end if

// 3. test gray picture with tolerance
g.ForeColor = &c777778
g.FillRect 0, 0, 100, 100

if p.isGrayMBS(0) then
MsgBox "gray (not correct)"
else
MsgBox "not gray (correct)"
end if

if p.isGrayMBS(1) then
MsgBox "gray (correct)"
else
MsgBox "not gray (not correct)"
end if

// 4. test gray picture with over tolerance
g.ForeColor = &c777779
g.FillRect 0, 0, 100, 100

if p.isGrayMBS(0) then
MsgBox "gray (not correct)"
```

```
else
MsgBox "not gray (correct)"
end if

if p.isGrayMBS(1) then
MsgBox "gray (not correct)"
else
MsgBox "not gray (correct)"
end if
```

**Notes:** Tolerance defines how big the difference between two channels can be. Typically a value smaller than 5. Pass 0 if you need exact gray scales.
Like the difference between &c000000 and &c000001 is not visible to most people, it can be ignored often.
See also:

- 88.5.91 isGrayMBS(tolerance as Integer, left as Integer,top as Integer,width as Integer,height as Integer) as boolean 14179

### 88.5.91 isGrayMBS(tolerance as Integer, left as Integer,top as Integer,width as Integer,height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a picture has only shades of gray in all pixels.
**Notes:** Tolerance defines how big the difference between two channels can be. Typically a value smaller than 5. Pass 0 if you need exact gray scales.
Like the difference between &c000000 and &c000001 is not visible to most people, it can be ignored often.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

See also:

- 88.5.90 isGrayMBS(tolerance as Integer = 0) as boolean 14178

### 88.5.92 isWhiteMBS as boolean

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the picture has only white pixels.
**Example:**

```
dim p as Picture

// test white
```

```
p=New Picture(100,100,32)

MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)

// test black
p.Graphics.ForeColor=&c000000
p.Graphics.FillRect 0,0,100,100
MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)

// test red
p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 0,0,100,100
MsgBox "isBlackMBS: "+str(p.isBlackMBS)+EndOfLine+"isWhiteMBS: "+str(p.isWhiteMBS)
```

See also:

- 88.5.93 isWhiteMBS(left as Integer,top as Integer,width as Integer,height as Integer) as boolean 14180

### 88.5.93 isWhiteMBS(left as Integer,top as Integer,width as Integer,height as Integer) as boolean

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the picture has only white pixels in the given rectangle.
See also:

- 88.5.92 isWhiteMBS as boolean 14179

### 88.5.94 MakeHBITMAPMBS as Ptr

MBS Picture Plugin, Platform: Windows, Targets: All.

**Function:** Returns a HBITMAP handle to the picture.
**Notes:** Warning: This function works only right on HDIB pictures.

The picture is cloned but both pictures may use the same binary data in background.

You will have to free this handle with DeleteObject:
Declare Function DeleteObject Lib "gdi32" (hObject as Integer) as Integer
**Xojo Developer Magazine**

- 4.6, page 48: Drag, Drop, and Roll, How to add a huge amount of functionality with no bloat by Toby Rush

- 4.6, pages 42 to 43: Menu Glyphs, Icons for menu entries by Christian Schmitz

### 88.5.95 MirrorMBS as picture

MBS Picture Plugin, Plugin Version: 7.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture vertically and horizontally.
**Example:**

```
canvas1.backdrop=pic.MirrorMBS
```

**Notes:** Same as rotation by 180 degree.
This method returns a copy of the picture mirrored.
Returns nil on low memory.

### 88.5.96 MirrorPictureMBS as boolean

MBS Picture Plugin, Plugin Version: 7.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture vertically and horizontally.
**Example:**

```
if pic.MirrorPictureMBS then // mirror picture
canvas1.backdrop=pic
else
canvas1.backdrop=pic.MirrorMBS // mirror a copy
end if
```

**Notes:** Same as rotation by 180 degree.
This methods mirrors the picture data itself. Returns true on success and false on failure. Only bitmap pictures can be mirrored this way.
**Blog Entries**

- MBS Real Studio Plugins, version 11.4pr1

### 88.5.97 RedChannelMBS as picture

MBS Picture Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red channel of the picture copied into a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
Backdrop = p.RedChannelMBS
```

**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr4

### 88.5.98 ReplaceBlueChannelMBS(BlueChannel as picture) as picture

MBS Picture Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the picture with the blue channel replaced with the blue channel of the given picture.
**Notes:** Returns nil on low memory.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 88.5.99 ReplaceColorMBS(SearchColor as color, ReplaceWithColor as color) as picture

MBS Picture Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the given color and replaces it with the second color.
**Example:**

```
dim p as Picture

p=New Picture(300,300,32)

p.Graphics.ForeColor=&cFF0000
p.Graphics.FillRect 000,100,100,100

p.Graphics.ForeColor=&c00FF00
p.Graphics.FillRect 100,100,100,100

p.Graphics.ForeColor=&c0000FF
p.Graphics.FillRect 200,100,100,100

p.Graphics.ForeColor=&c777700
p.Graphics.FillRect 100,200,100,100

// shows a violet box on the left. Other pixels unchanged
backdrop=p.ReplaceColorMBS(&cFF0000,&cFF00FF)
```

**Notes:** All other pixels are copied to the new picture.
Returns nil on any error.

### 88.5.100 ReplaceGreenChannelMBS(GreenChannel as picture) as picture

MBS Picture Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the picture with the green channel replaced with the green channel of the given picture.
**Notes:** Returns nil on low memory.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 88.5.101 ReplaceRedChannelMBS(RedChannel as picture) as picture

MBS Picture Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the picture with the red channel replaced with the red channel of the given picture.
**Notes:** Returns nil on low memory.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 88.5.102 Rotate180MBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 180¬∞ counter clockwise.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.cloneMBS
canvas1.backdrop=p.Rotate180MBS
```

**Notes:** You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr1

### 88.5.103 Rotate270MBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 270¬∞ counter clockwise.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.cloneMBS
canvas1.backdrop=p.Rotate270MBS
```

**Notes:** You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr1

### 88.5.104 Rotate90MBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 90¬∞ counter clockwise.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.cloneMBS
canvas1.backdrop=p.Rotate90MBS
```

**Notes:** You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr6
- The difference between WebPicture and Picture classes
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr1

### 88.5.105 RotateImageAndMaskMBS(angle as Double, cut as boolean = False) as picture

MBS Picture Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by angle¬∞ counter clockwise.
**Notes:** Internally uses RotateMBS.
Works with masked and alpha channel pictures, but is faster with masked pictures.
Returns nil on any error.
if cut is true, the image is cut to the original size.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr5

### 88.5.106 RotateMBS(angle as Double, background as color = &cFFFFFFFF) as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by angle¬∞ counter clockwise.
**Example:**

```
dim p,r as picture
r=LogoMBS(500)
p=r.cloneMBS
canvas1.backdrop=p.RotateMBS(42.3,rgb(255,255,255))
```

**Notes:** The area around the picture is filled using the backcolor.

You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.

Alpha channel support is half done. If it's working for you, please enjoy it. If not, please report.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr14
- MBS Real Studio Plugins, version 12.0pr6
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr1

### 88.5.107 RotateMemoryMBS(angle as Double) as Int64

MBS Picture Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the memory needed to roatet the picture with the given angle.
**Notes:** RotateMBS needs temporary buffers and fails if somewhere between memory is low.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr2

### 88.5.108 ScaleImageAndMaskMBS(width as Integer, height as Integer, AntiAlias as boolean=false, YieldTicks as Integer=0) as picture

MBS Picture Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the picture to the new size including mask (in case one exists).
**Notes:** This is a self made algorithm which produces nice pictures on all platforms.
It is slower than QuickDraw on Mac OS, but nicer than drawpicture on Windows.
Returns nil on low memory or invalid width and height values.

AntiAlias is set to false if width<=self.width or height<=self.height.

If YieldTicks is 0, no time is given to other threads in your application. If it is a value >0, this time is waited before a thread switch is done. Setting it to 1 will give away control to another thread after 1/60th of a second. We recommend a value of 3 to 5 for a good reponsibility of your application.

Version 19.4 or newer of our plugin includes scaling for pictures with alpha channel.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr7
- MBS Real Studio Plugins, version 12.0pr4

### 88.5.109 ScaleMBS(width as Integer, height as Integer, AntiAlias as boolean=false, YieldTicks as Integer=0) as picture

MBS Picture Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the picture to the new size.
**Example:**

```
dim pic as new Picture(100,100,32)

pic.Graphics.ForeColor=&cFF0000
```

```
pic.Graphics.FillOval 0,0,100,100

dim scaledPic as picture = pic.ScaleMBS(200,200)

// show scaledPic
window1.backdrop = scaledPic
```

**Notes:** This is a self made algorithm which produces nice pictures on all platforms.
It is slower than QuickDraw on Mac OS, but nicer than drawpicture on Windows.
Returns nil on low memory or invalid width and height values.

AntiAlias is set to false if width<=self.width or height<=self.height.

If YieldTicks is 0, no time is given to other threads in your application. If it is a value >0, this time is waited before a thread switch is done. Setting it to 1 will give away control to another thread after 1/60th of a second. We recommend a value of 3 to 5 for a good reponsibility of your application.

Scaling down does not use antialias. If you need full antialias, please use ScalingMBS function.

If input and output size is equal, you get your picture back unchanged.
This function does not handle masks. Please use pictures with mask and scale image and mask separately.

Version 19.4 or newer of our plugin includes scaling for pictures with alpha channel.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr7
- MBS Real Studio Plugins, version 12.0pr4
- MBS Real Studio Plugins, version 11.4pr3
- MBS Real Studio Plugins, version 11.2pr2
- MBS REALbasic Plugins, version 10.6pr10
- MBS REALbasic Plugins, version 10.6pr8
- MBS REALbasic Plugins, version 10.4pr9

### 88.5.110 ScalingMBS(mode as Integer, width as Integer, height as Integer, yield as Integer = 0) as picture

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the picture to the given size.
**Example:**

```
dim p as Picture

p=LogoMBS(1000)

p=p.ScalingMBS(2, 4000, 4000)

backdrop=p
```

**Notes:** On low memory this function can return nil or the image may look bad. (e.g. all black)
The memory used for the temporary storage is original height * new width * 12 bytes plus some extra.
For scaling with the same size as the picture already has, the scaling is still performed.

Returns nil ony error. (e.g. destwidth=0)

Modes:

| | |
|---|---|
| 1 | triangle |
| 2 | box, nereast neighbor |
| 3 | lanczos 3 |
| 4 | lanczos 8 |
| 5 | mitchell |
| 6 | poly 3 |
| 7 | cubic |

This function does not handle mask. Please use pictures with mask and scale image and mask separately.

Version 19.4 or newer of our plugin includes scaling for pictures with alpha channel.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr7
- MBS Xojo / Real Studio Plugins, version 13.5pr3
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MBS Real Studio Plugins, version 11.3pr14
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 88.5.111 ScrollHorizontalMBS(delta as Integer, wrap as boolean, scrollmask as boolean) as boolean

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Windows, Targets: All.

**Function:** Scrolls the image data horizontally.
**Example:**

```
dim p as Picture

p=LogoMBS(500) // any bitmap image

if p.ScrollHorizontalMBS(100,true,false) then
Title="ok"
end if

Backdrop=p
```

**Notes:** Returns true on success and false on failure.
Works only on Mac OS and Windows with 32bit bitmap images.
scrollmask defines whether a mask (if one exists) is also scrolled.
Wrap will define whether the image will wrap on the edges. If wrap is enabled on Mac, the whole thing speeds up.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr1

### 88.5.112 ScrollMBS(deltaX as Integer, deltaY as Integer, wrap as boolean, scrollmask as boolean) as boolean

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Windows, Targets: All.

**Function:** Combines calls to ScrollHorizontalMBS and ScrollVerticalMBS.
**Notes:** Returns true on success and false on failure.
Works only on Mac OS and Windows with 32bit bitmap images.
scrollmask defines whether a mask (if one exists) is also scrolled.
Wrap will define whether the image will wrap on the edges. If wrap is enabled on Mac, the whole thing speeds up.

### 88.5.113 ScrollVerticalMBS(delta as Integer, wrap as boolean, scrollmask as boolean) as boolean

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Windows, Targets: All.

**Function:** Scrolls the image data vertically.
**Example:**

```
dim p as Picture

p=LogoMBS(500) // any bitmap image

if p.ScrollVerticalMBS(100,true,false) then
Title="ok"
end if

Backdrop=p
```

**Notes:** Returns true on success and false on failure.
Works only on Mac OS and Windows with 32bit bitmap images.
scrollmask defines whether a mask (if one exists) is also scrolled.
Wrap will define whether the image will wrap on the edges. If wrap is enabled on Mac, the whole thing speeds up.

### 88.5.114 SetSteganographyMBS(flags as Integer, data as Memoryblock) as boolean

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds steganography to an existing picture.
**Example:**

```
dim p as Picture = LogoMBS(500)

// this example uses chr(0) as end marker
dim s as string = "Hello World. This is just a test." + chr(0)
if p.SetSteganographyMBS(1, s) then

dim data as MemoryBlock = p.SteganographyMBS(1)
dim d as string = data.CString(0)

Backdrop = p
Break
end if
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
Returns true on success or false on failure.
If memoryblock provided is nil, this function fails.

If you like to store data, please encrypt them and include some way that you find your data again, detect length of data, verify it's okay via checksum and than decrypt your data.
Please store image in a loss less format like PNG.
Function does not handle mask or alpha channel.

### 88.5.115 SetSteganographyPictureMBS(flags as Integer, data as Picture) as boolean

MBS Picture Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds steganography to an existing picture.
**Example:**

```
const AllChannels = &h111

dim p as new Picture(500, 500, 32)
dim l as Picture = LogoMBS(500)

dim w as new window1
w.Title = "Logo"
w.Backdrop = l

// adds picture. You will normally not see the modification
if p.SetSteganographyPictureMBS(AllChannels, l) then

w = new window1
w.Title = "Logo hidden in white picture"
w.Backdrop = p

// as we store in lowest bit, this picture will look strange
dim y as Picture = p.SteganographyPictureMBS(AllChannels)

w = new window1
w.Title = "Logo extracted"
w.Backdrop = y
end if
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
Returns true on success or false on failure.

Function does not handle mask or alpha channel.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 88.5.116 SobelChannelsMBS(Red as boolean, Green as Boolean, Blue as boolean, direction1 as Integer = 1, direction2 as Integer = 3, swap as boolean = false) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the sobel operator.
**Example:**

```
dim m as Picture = LogoMBS(500)

// only green
Backdrop = m.SobelChannelsMBS(false, true, false)
```

**Notes:** Useful for edge detection.
See also SobelMBS function which takes similar operators.
You can set Red/Blue/Green parameters to define which channel is modified and which channel is just copied.
Pictures look quite funny. The channel who got the edge detection has bigger areas black or white so other colors in other channels have much more visible effect.
**Blog Entries**

- MBS Plugins 11.1 Release notes

### 88.5.117 SobelMBS(direction1 as Integer = 1, direction2 as Integer = 3, swap as boolean = false, gray as boolean = true) as picture

MBS Picture Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the sobel operator.
**Example:**

```
dim m as Picture = LogoMBS(500)

Backdrop = m.SobelMBS
```

**Notes:** Useful for edge detection.

direction1: The direction for first matrix.
direction2: The direction for first matrix.
swap: If false, you get white on black. If true you get black on white.
gray: whether to output gray image instead of RGB image.

Possible Matrix values:
-1: negative identity:
0: identity
1: west
2: east
3: north
4: south
5: south east
6: north west
7: north east
8: south west

You can add 10 to the 8 direction matrixes to get more weight.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr7
- MBS Plugins 11.1 Release notes

### 88.5.118 SteganographyMBS(flags as Integer) as Memoryblock

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries steganography information inside the picture.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim s as string = "Hello World. This is just a test." + chr(0)
if p.SetSteganographyMBS(1, s) then

dim data as MemoryBlock = p.SteganographyMBS(1)
dim d as string = data.CString(0)

Backdrop = p
Break
end if
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1

### 88.5.119 SteganographyPictureMBS(flags as Integer) as Picture

MBS Picture Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries steganography information inside the picture.
**Example:**

```
const AllChannels = &h111

dim p as new Picture(500, 500, 32)

dim w as new window1
w.Title = "white"
w.Backdrop = p

dim l as Picture = LogoMBS(500)

w = new window1
w.Title = "Logo"
w.Backdrop = l

// adds picture. You will normally not see the modification
dim x as Picture = p.AddSteganographyPictureMBS(AllChannels, l)

w = new window1
w.Title = "Logo hidden in white picture"
w.Backdrop = x

// as we store in lowest bit, this picture will look strange
dim y as Picture = x.SteganographyPictureMBS(AllChannels)

w = new window1
w.Title = "Logo extracted"
w.Backdrop = y
```

**Notes:** Flags can be a combination of red (&h100), green (&h010) and blue (&h001).
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 88.5.120 ThreadedTransformMBS(Threaded as Integer, Map() as color, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a transformation to the picture.

**Example:**

```
dim p as Picture = LogoMBS(500)

dim map(-1) as color

for r as Integer = 0 to 255
for g as Integer = 0 to 255
for b as Integer = 0 to 255
// index is r*65536+g*256+b

// we swap colors: r gives g, g gives b, b gives r
map.Append rgb(g,b,r)
next
next
next

Backdrop=p.ThreadedTransformMBS(0, map)
```

**Notes:** Threaded parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

For each color in the source picture the red, blue and green values are used as index (blue+green*256+blue*65536) in the arrays to get the new color value.

The arrays should have 2^24 entries.

You can pass destination picture. If dest is not nil and size matches, the plugin reuses the picture object which increases performance as no new picture is created.
See also:


- 88.5.121 ThreadedTransformMBS(Threaded as Integer, Map() as Integer, dest as picture = nil) as picture 14196
- 88.5.122 ThreadedTransformMBS(Threaded as Integer, RedMap as memoryblock, GreenMap as memoryblock, BlueMap as memoryblock, dest as picture = nil) as picture 14198
- 88.5.123 ThreadedTransformMBS(Threaded as Integer, RedMap() as Integer, GreenMap() as Integer, BlueMap() as Integer, dest as picture = nil) as picture 14199


### 88.5.121 ThreadedTransformMBS(Threaded as Integer, Map() as Integer, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a transformation to the picture.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim map(-1) as Integer

for r as Integer = 0 to 255
for g as Integer = 0 to 255
for b as Integer = 0 to 255
// index is r*65536+g*256+b

// we swap colors: r gives g, g gives b, b gives r
map.Append g*65536+b*256+r
next
next
next

Backdrop=p.ThreadedTransformMBS(0, map)
```

**Notes:** Threaded parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

For each color in the source picture the red, blue and green values are used as index (blue+green*256+blue*65536) in the arrays to get the new color value.

The arrays should have 2^24 entries.

You can pass destination picture. If dest is not nil and size matches, the plugin reuses the picture object which increases performance as no new picture is created.
See also:

- 88.5.120 ThreadedTransformMBS(Threaded as Integer, Map() as color, dest as picture = nil) as picture 14195
- 88.5.122 ThreadedTransformMBS(Threaded as Integer, RedMap as memoryblock, GreenMap as memoryblock, BlueMap as memoryblock, dest as picture = nil) as picture 14198
- 88.5.123 ThreadedTransformMBS(Threaded as Integer, RedMap() as Integer, GreenMap() as Integer, BlueMap() as Integer, dest as picture = nil) as picture 14199

### 88.5.122 ThreadedTransformMBS(Threaded as Integer, RedMap as memoryblock, GreenMap as memoryblock, BlueMap as memoryblock, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a transformation to the picture.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim red as MemoryBlock = NewMemoryBlock(256)
dim green as MemoryBlock = NewMemoryBlock(256)
dim blue as MemoryBlock = NewMemoryBlock(256)

for i as Integer=0 to 255
red.Byte(i)=i/2
green.Byte(i)=i/2
blue.Byte(i)=i/2
next

Backdrop=p.ThreadedTransformMBS(0, red, green, blue)
```

**Notes:** Threaded parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

For each color in the source picture the red, blue and green values are used as index in the memoryblocks to get the new color value.

The memoryblocks must have a size of 256 Bytes.

You can pass destination picture. If dest is not nil and size matches, the plugin reuses the picture object which increases performance as no new picture is created.
See also:

- 88.5.120 ThreadedTransformMBS(Threaded as Integer, Map() as color, dest as picture = nil) as picture 14195
- 88.5.121 ThreadedTransformMBS(Threaded as Integer, Map() as Integer, dest as picture = nil) as picture 14196
- 88.5.123 ThreadedTransformMBS(Threaded as Integer, RedMap() as Integer, GreenMap() as Integer, BlueMap() as Integer, dest as picture = nil) as picture 14199

### 88.5.123 ThreadedTransformMBS(Threaded as Integer, RedMap() as Integer, GreenMap() as Integer, BlueMap() as Integer, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a transformation to the picture.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim red(-1) as Integer
dim green(-1) as Integer
dim blue(-1) as Integer

for i as Integer=0 to 255
red.Append i/2
green.Append i/2
blue.Append i/2
next

Backdrop=p.ThreadedTransformMBS(0, red, green, blue)
```

**Notes:** Threaded parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

For each color in the source picture the red, blue and green values are used as index in the arrays to get the new color value.

The arrays should have 256 entries.

You can pass destination picture. If dest is not nil and size matches, the plugin reuses the picture object which increases performance as no new picture is created.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1
- Multithreading

See also:

- 88.5.120 ThreadedTransformMBS(Threaded as Integer, Map() as color, dest as picture = nil) as picture 14195

- 88.5.121 ThreadedTransformMBS(Threaded as Integer, Map() as Integer, dest as picture = nil) as picture 14196
- 88.5.122 ThreadedTransformMBS(Threaded as Integer, RedMap as memoryblock, GreenMap as memoryblock, BlueMap as memoryblock, dest as picture = nil) as picture 14198


### 88.5.124 ThresholdMBS(Threshold as integer) as picture

MBS Picture Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates black and white picture.
**Notes:** With threshold value you define threshold in range from 0 to 255.
Normally you use 127 for turning picture to black & white.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr5

**Xojo Developer Magazine**

- 16.1, page 10: News

### 88.5.125 TransformColorsMBS(red as memoryblock, blue as memoryblock, green as memoryblock, dest as picture = nil) as picture

MBS Picture Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a transform table to the pixels.
**Notes:** Red, blue and green are 256 byte big memoryblocks with one byte for each value.

In RB the function does this:
color=rgb(red.byte [ color.red ] , green.byte [ color.green ] , blue.byte [ color.blue ] )

If you pass a destination picture and it has right size, the plugin will recycle that instead of creating a new one to increase performance.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 88.5.126 TrimMBS(left as Integer, top as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trims the picture to the given rectangle.
**Example:**

```
dim p as Picture = LogoMBS(500)

Backdrop = p.TrimMBS(100,100,300,300)
```

**Notes:** This method does not handle the mask.
So p.Trim(0,0,p.width,p.height) will give you a copy of the image pixels without mask.
left and top are zero based.

Use TrimWithMaskMBS if you need the mask to be trimmed.
Returns nil on low memory or bad parameters.

### 88.5.127 TrimWithMaskMBS(left as Integer, top as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trims the picture to the given rectangle.
**Example:**

```
dim p as picture
dim someimage as Picture = LogoMBS(100)

p=someimage.TrimWithMaskMBS(100,200,300,400)
```

**Notes:** left and top are zero based.
Returns nil on low memory or bad parameters.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 88.5.128 VMirrorMBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture vertically.
**Example:**

```
canvas1.backdrop=pic.VMirrorMBS
```

**Notes:** This method returns a copy of the picture mirrored.
Returns nil on low memory.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr10

### 88.5.129 VMirrorPictureMBS as boolean

MBS Picture Plugin, Plugin Version: 7.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the picture vertically.
**Example:**

```
if pic.VMirrorPictureMBS then // mirror picture
canvas1.backdrop=pic
else
canvas1.backdrop=pic.VMirrorMBS // mirror a copy
end if
```

**Notes:** This methods mirrors the picture data itself. Returns true on success and false on failure. Only bitmap pictures can be mirrored this way.
**Blog Entries**

- MBS Real Studio Plugins, version 11.4pr1

### 88.5.130 Properties

### 88.5.131 EmbeddedMaskMBS(swap as boolean) as picture

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Targets: All.

**Function:** Read or write a picture mask.
**Example:**

```
// Export a mask picture:

dim f as FolderItem
dim t as TiffPictureMBS
dim m,p as Picture
dim q as QTGraphicsExporterMBS

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(100,100,100)
p.Graphics.fillrect 0,0,100,100
p.Graphics.ForeColor=rgb(255,0,0)
```

```
p.Graphics.fillrect 20,20,80,30

m=New Picture(100,100,32)
m.Graphics.ForeColor=rgb(255,255,255)
m.Graphics.FillRect 0,0,30,100
m.Graphics.ForeColor=rgb(200,200,200)
m.Graphics.FillRect 30,0,30,100
m.Graphics.ForeColor=rgb(100,100,100)
m.Graphics.FillRect 60,0,30,100

p.EmbeddedMaskMBS(true)=m
p.Mask.Graphics.DrawPicture m,0,0 // just for showing as a backdrop

q=new QTGraphicsExporterMBS

q.OpenExporter("TIFF")
q.Depth=32
q.InputPicture=p
q.CompressionQuality=1024
q.OutputFile=SpecialFolder.Desktop.Child("Hello.tif")
title=str(q.Export)

Backdrop=p
```

**Notes:** Only useful on 32bit images.
Xojo takes white for transparent, so you may need to swap this to black using the swap parameter.

Windows support removed somewhere in version 10.4 with internal changes. If you need this, please tell us.
(Read and Write computed property)

## 88.6 class PictureConvolutionMBS

### 88.6.1 class PictureConvolutionMBS

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a Picture Convolution.
**Example:**

```
// blur

dim l as Picture = LogoMBS(500)
dim p as new PictureConvolutionMBS

p.hor(0) = 0.2
p.hor(1) = 0.2
p.hor(2) = 0.2
p.hor(3) = 0.2
p.hor(4) = 0.2

p.ver(0) = 0.2
p.ver(1) = 0.2
p.ver(2) = 0.2
p.ver(3) = 0.2
p.ver(4) = 0.2

p.ValueCount=5

p.SourcePicture=l

dim t as Integer=ticks
call p.run(7)
t=ticks-t

Title=str(t)

Backdrop=p.DestinationPicture
```

**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr1

### 88.6.2 Methods

### 88.6.3 close

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 88.6.4 Run(channels as Integer) as boolean

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the picture effect.
**Notes:** Fails if the pictures are not bitmap pictures. Source and Destination can be equal. If you provide a destination picture, the dimenstions of source and destination must be equal.

Channels is a combination of 1, 2 and 4. 1 for Red, 2 for Green and 4 for Blue.
The border (one pixel thick) is not filled in the destination picture.

This method does the following for each pixel:

```
// first horizontal fill the temporary picture
r=0
g=0
b=0

if RedChannel then
r = r + sourcepicture.pixel(x-1,y).red * Hor(0)
r = r + sourcepicture.pixel(x ,y).red * Hor(1)
r = r + sourcepicture.pixel(x+1,y).red * Hor(2)
else
r = sourcepicture.pixel(x,y)
end if

if GreenChannel then
g = g + sourcepicture.pixel(x-1,y).green * Hor(0)
g = g + sourcepicture.pixel(x ,y).green * Hor(1)
g = g + sourcepicture.pixel(x+1,y).green * Hor(2)
else
g = sourcepicture.pixel(x,y)
end if
```

```
if BlueChannel then
b = b + sourcepicture.pixel(x-1,y).blue * Hor(0)
b = b + sourcepicture.pixel(x ,y).blue * Hor(1)
b = b + sourcepicture.pixel(x+1,y).blue * Hor(2)
else
b = sourcepicture.pixel(x,y)
end if

temppicture.pixel(x,y)=rgb(r,g,b)

// now back from temporary picture to the destination picture

r=0
g=0
b=0

if RedChannel then
r = r + temppicture.pixel(x,y-1).red * Ver(0)
r = r + temppicture.pixel(x,y ).red * Ver(1)
r = r + temppicture.pixel(x,y+1).red * Ver(2)
else
r = temppicture.pixel(x,y)
end if

if GreenChannel then
g = g + temppicture.pixel(x,y-1).green * Ver(0)
g = g + temppicture.pixel(x,y ).green * Ver(1)
g = g + temppicture.pixel(x,y+1).green * Ver(2)
else
g = temppicture.pixel(x,y)
end if

if BlueChannel then
b = b + temppicture.pixel(x,y-1).blue * Ver(0)
b = b + temppicture.pixel(x,y ).blue * Ver(1)
b = b + temppicture.pixel(x,y+1).blue * Ver(2)
else
b = temppicture.pixel(x,y)
end if

destinationpicture.pixel(x,y)=rgb(r,g,b)
```

### 88.6.5 Properties

### 88.6.6 DestinationPicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination picture.
**Notes:** If you set this property, use a bitmap picture equal in size to the source picture.
If this property is nil, the Run method will create a picture.
(Read and Write property)

### 88.6.7 SourcePicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source picture.
**Notes:** Must be a bitmap picture.
(you can use the picture.BitmapMBS function for this)
(Read and Write property)

### 88.6.8 ValueCount as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of values set in the Hor and Ver array.
**Example:**

```
dim p as new PictureConvolutionMBS

p.Hor(0)=0.25
p.Hor(1)=0.5
p.Hor(2)=0.25
p.ValueCount=3
```

**Notes:** The index in the arrays goes from 0 to ValueCount-1.
Default is 3.
Use values like 1, 3, 5, 7, 9, 11, 13, 15, 17 or 19.
(Read and Write property)

### 88.6.9 Hor(index as UInt32) as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal factors.
**Notes:** Index from 0 to 19.
(Read and Write computed property)

### 88.6.10 Ver(index as UInt32) as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical factors.
**Notes:** Index from 0 to 19.
(Read and Write computed property)

## 88.7 class PictureEditorMBS

### 88.7.1 class PictureEditorMBS

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** class to edit picture data as a memoryblock in place.
**Notes:** This is the same code the plugin uses to edit pictures.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0fc1
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS REALbasic plug-in 9.6

### 88.7.2 Methods

### 88.7.3 Data(Row as Integer) as MemoryBlock

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the original image data of the given row.
**Notes:** Changes here will be visible in the picture.
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.

### 88.7.4 Properties

### 88.7.5 AllData as Memoryblock

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the original image data.
**Notes:** Changes here will be visible in the picture.
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.

Returns nil for console pictures.
(Read only property)

### 88.7.6 AllDataCopy as Memoryblock

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the data for the current picture into a new memoryblock.
**Notes:** Changes to this memoryblock will not be visible in the original picture.
(Read only property)

### 88.7.7 BlueOffset as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the blue channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.7.8 BytesPerPixel as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes per pixel.
**Notes:** Most times 4, but for some platforms 3.
(Read only property)

### 88.7.9 DataPtr as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memory address where the data is stored.
**Notes:** Maybe useful for declares.
Returns nil for console pictures.
(Read only property)

### 88.7.10 GreenOffset as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the green channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.7.11 HasAlphaChannel as Boolean

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether an alpha channel exists.
**Notes:** (Read only property)

### 88.7.12 Height as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image in pixels.
**Notes:** (Read only property)

### 88.7.13 Picture as Picture

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original picture reference.
**Notes:** (Read only property)

### 88.7.14 RedOffset as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the red channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.7.15 RowBytes as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of an image row in bytes.
**Notes:** RowBytes can be width*bytesPerPixel, but often it is not.
(Read only property)

### 88.7.16 Width as Integer

MBS Picture Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image in pixels.
**Notes:** (Read only property)

## 88.8 class PictureLut3DMBS

### 88.8.1 class PictureLut3DMBS

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for doing a LUT 3D on a picture.

### 88.8.2 Methods

### 88.8.3 close

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 88.8.4 Run as boolean

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the picture effect.
**Notes:** Fails if the pictures are not bitmap pictures. Source and Destination can be equal. If you provide a destination picture, the dimenstions of source and destination must be equal.

### 88.8.5 Properties

### 88.8.6 DestinationPicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination picture.
**Notes:** If you set this property, use a bitmap picture equal in size to the source picture.
If this property is nil, the Run method will create a picture.
(Read and Write property)

### 88.8.7 MaxX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal x coordinate to use.
**Notes:** If 0 the width of the source picture defines this value.
(Read and Write property)

### 88.8.8 MaxY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal y coordinate to use.
**Notes:** If 0 the height of the source picture defines this value.
(Read and Write property)

### 88.8.9 MinX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal x coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.8.10 MinY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal y coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.8.11 SourcePicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source picture.
**Notes:** Must be a bitmap picture.
(you can use the picture.BitmapMBS function for this)
(Read and Write property)

### 88.8.12 Table(r as UInt32, g as UInt32, b as UInt32, x as UInt32) as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The lut table.
**Notes:** Indexes r, g and b go from 0 to 16 while x goes from 0 to 2.
(Read and Write computed property)

## 88.9 class PictureMatrix3DMBS

### 88.9.1 class PictureMatrix3DMBS

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for doing a 3D picture matrix.

### 88.9.2 Methods

### 88.9.3 close

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 88.9.4 Run as boolean

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the picture effect.
**Notes:** Fails if the pictures are not bitmap pictures. Source and Destination can be equal. If you provide a destination picture, the dimenstions of source and destination must be equal.

### 88.9.5 Properties

### 88.9.6 DestinationPicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination picture.
**Notes:** If you set this property, use a bitmap picture equal in size to the source picture.
If this property is nil, the Run method will create a picture.
(Read and Write property)

### 88.9.7 MaxX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal x coordinate to use.
**Notes:** If 0 the width of the source picture defines this value.
(Read and Write property)

### 88.9.8 MaxY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal y coordinate to use.
**Notes:** If 0 the height of the source picture defines this value.
(Read and Write property)

### 88.9.9 MinX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal x coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.9.10 MinY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal y coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.9.11 SourcePicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source picture.
**Notes:** Must be a bitmap picture.
(you can use the picture.BitmapMBS function for this)
(Read and Write property)

### 88.9.12 Matrix(x as UInt32, y as UInt32) as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matrix to use.
**Notes:** The indexes x and y are 0 based.
(Read and Write computed property)

## 88.10 class PictureMatrixMBS

### 88.10.1 class PictureMatrixMBS

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for matrix operations on a picture.
**Notes:** Can be used e.g. to sharpen a picture.
**Blog Entries**

- Better OutOfBoundsException

### 88.10.2 Methods

### 88.10.3 close

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 88.10.4 Run as boolean

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the process.
**Notes:** Returns true on success.

### 88.10.5 RunRGB(red as boolean, green as boolean, blue as boolean) as boolean

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the process for the given channels.
**Notes:** Returns true on success.
A few combinations are optimized for faster processing.
Still more optimization is possible.

### 88.10.6 Properties

### 88.10.7 DestinationPicture as Picture

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination picture.
**Notes:** If this property is nil, a new picture will be placed here inside the Run method.
If you place a picture here, please use one created with New Picture with a 32bit depth.
(Read and Write property)

### 88.10.8 Displacement as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The displacement value.
**Notes:** See the example project for details.
(Read and Write property)

### 88.10.9 MaxX as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum x coordinate to use.
**Notes:** Just for limiting the working area to a part of the picture.
(Read and Write property)

### 88.10.10 MaxY as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum y coordinate to use.
**Notes:** Just for limiting the working area to a part of the picture.
(Read and Write property)

### 88.10.11 MinX as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum x coordinate to use.
**Notes:** Just for limiting the working area to a part of the picture.

(Read and Write property)

### 88.10.12 MinY as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum y coordinate to use.
**Notes:** Just for limiting the working area to a part of the picture.
(Read and Write property)

### 88.10.13 ScaleFactor as Double

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A scaling factor.
**Notes:** See the example project for details.
(Read and Write property)

### 88.10.14 SourcePicture as Picture

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source picture.
**Notes:** The run method will fail if this picture is not a 32bit deep picture created with New Picture.
(Read and Write property)

### 88.10.15 Matrix(x as UInt32, y as UInt32) as Integer

MBS Picture Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matrix used.
**Notes:** X and Y are in range from 0 to 4.
Values >255 are used for empty cells.
(Read and Write computed property)

## 88.11 class PictureMinMaxMBS

### 88.11.1 class PictureMinMaxMBS

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to find the minimum/maximum pixel values.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim m as new PictureMinMaxMBS

if m.FindAll(pic) then
break // check values in debugger
end if
```

**Notes:** This class offers several Find functions.
Please choose carefully which one you use as it's faster to use e.g. FindRed instead of FindMinRed and FindMaxRed together.

### 88.11.2 Methods

### 88.11.3 FindAll(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum and maximum pixels.
**Notes:** Sets all fields.

### 88.11.4 FindBlue(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum and maximum blue pixels.
**Notes:** Sets BlueMaxX, BlueMax, BlueMinX, BlueMinY, BlueMin and BlueMaxY.

### 88.11.5 FindGreen(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum and maximum green pixels.

**Notes:** Sets GreenMaxX, GreenMax, GreenMinX, GreenMinY, GreenMin and GreenMaxY.

### 88.11.6 FindMaxAll(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the maximum pixels.
**Notes:** Sets RedMaxX, RedMax, RedMaxY, GreenMaxX, GreenMax, GreenMaxY, BlueMaxX, BlueMax and BlueMaxY.

### 88.11.7 FindMaxBlue(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the maximum blue pixel.
**Notes:** Sets BlueMaxX, BlueMax and BlueMaxY.

### 88.11.8 FindMaxGreen(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the maximum green pixel.
**Notes:** Sets GreenMaxX, GreenMax and GreenMaxY.

### 88.11.9 FindMaxRed(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the maximum red pixel.
**Notes:** Sets RedMaxX, RedMax and RedMaxY.

### 88.11.10 FindMaxSum(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the maximum sum pixel.
**Notes:** The sum of a pixel is the sum of all color channels of this pixel (red+Sum+blue).
Sets SumMaxX, SumMax and SumMaxY.

### 88.11.11 FindMinAll(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum pixels.
**Notes:** Sets RedMinX, RedMin, RedMinY, GreenMinX, GreenMin, GreenMinY, BlueMinX, BlueMin and BlueMinY.

### 88.11.12 FindMinBlue(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum blue pixel.
**Notes:** Sets BlueMinX, BlueMin and BlueMinY.

### 88.11.13 FindMinGreen(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum green pixel.
**Notes:** Sets GreenMinX, GreenMin and GreenMinY.

### 88.11.14 FindMinRed(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum red pixel.
**Notes:** Sets RedMinX, RedMin and RedMinY.

### 88.11.15 FindMinSum(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum sum pixel.
**Notes:** The sum of a pixel is the sum of all color channels of this pixel (red+green+blue).
Sets SumMinX, SumMin and SumMinY.

### 88.11.16 FindRed(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum and maximum red pixels.
**Notes:** Sets RedMaxX, RedMax, RedMinX, RedMinY, RedMin and RedMaxY.

### 88.11.17 FindSum(p as picture) as boolean

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for the minimum and maximum sum pixels.
**Notes:** The sum of a pixel is the sum of all color channels of this pixel (red+Sum+blue).
Sets SumMaxX, SumMax, SumMinX, SumMinY, SumMin and SumMaxY.

### 88.11.18 Properties

### 88.11.19 BlueMax as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum blue color value.
**Notes:** Range: 0 to 255.
(Read and Write property)

### 88.11.20 BlueMaxX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum blue value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.21 BlueMaxY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum blue value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.22 BlueMin as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum blue color value.
**Notes:** Range: 0 to 255.
(Read and Write property)

### 88.11.23 BlueMinX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum blue value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.24 BlueMinY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum blue value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.25 GreenMax as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum green color value.
**Notes:** Range: 0 to 255
(Read and Write property)

### 88.11.26 GreenMaxX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum green value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.27 GreenMaxY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum green value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.28 GreenMin as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum green color value.
**Notes:** Range: 0 to 255
(Read and Write property)

### 88.11.29 GreenMinX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum green value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.30 GreenMinY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum green value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.31 RedMax as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum red color value.
**Notes:** Range: 0 to 255
(Read and Write property)

### 88.11.32 RedMaxX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum red value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.33 RedMaxY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum red value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.34 RedMin as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum red color value.
**Notes:** Range: 0 to 255
(Read and Write property)

### 88.11.35 RedMinX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum red value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.36 RedMinY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum red value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.37 SumMax as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum sum color value.
**Notes:** sum=red+blue+green
Range: 0 to 765
(Read and Write property)

### 88.11.38 SumMaxX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum sum value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.39 SumMaxY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the maximum sum value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

### 88.11.40 SumMin as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum sum color value.
**Notes:** sum=red+blue+green
Range: 0 to 765
(Read and Write property)

### 88.11.41 SumMinX as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum sum value.
**Notes:** Range: 0 to Picture.Width-1. Set to -1 on any error.
(Read and Write property)

### 88.11.42 SumMinY as Integer

MBS Picture Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The location of the pixel with the minimum sum value.
**Notes:** Range: 0 to Picture.Height-1. Set to -1 on any error.
(Read and Write property)

## 88.12 class PictureReaderMBS

### 88.12.1 class PictureReaderMBS

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to read picture data as a memoryblock.
**Example:**

```
dim pic as Picture = LogoMBS(500)
dim p as PictureReaderMBS
dim m as MemoryBlock
dim r,g,b,rRow,gRow,bRow,h1,w1,x,y,bpp as Integer

// Create a new picture reader
p=NewPictureReaderMBS(pic)

h1=p.Height-1
w1=p.Width-1

bpp=p.BytesPerPixel
rRow=p.RedOffset
gRow=p.GreenOffset
bRow=p.BlueOffset
// in each row the red, blue and green channels have different offsets.
// but offsets are platform dependend

dim sum as Double

for y=0 to h1
// Get data in memory. This Memoryblock has a size property of 0!
m=p.Data(y)
r=rRow
g=gRow
b=bRow

for x=0 to w1

sum = sum + m.UInt8Value(r)
sum = sum + m.UInt8Value(g)
sum = sum + m.UInt8Value(b)

r=r+bpp
g=g+bpp
b=b+bpp
next

next
```

```
// show the sum of all pixels:
MsgBox "Sum with plugin is: "+str(sum)


// now try same in RB code:

dim surface as RGBSurface = pic.RGBSurface
dim c as color

sum = 0.0

for y=0 to h1
for x=0 to w1
c = surface.Pixel(x,y)

sum = sum + c.red
sum = sum + c.Green
sum = sum + c.Blue

next

next

surface = nil

MsgBox "Sum with RB Code is: "+str(sum)
quit
```

**Notes:** This is the same code the plugin uses to read pictures.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0fc1
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Xojo / Real Studio Plugins, version 14.2pr5
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8
- MBS REALbasic plug-in 9.6

### 88.12.2 Methods

### 88.12.3 Data(Row as Integer) as MemoryBlock

MBS Picture Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the original image data for this row.
**Notes:** Changes here will be visible in the picture. (except for platforms where a copy is made of the data)
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.
See also:

- 88.12.7 Data as Memoryblock 14233

### 88.12.4 Properties

### 88.12.5 BlueOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the blue channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.12.6 BytesPerPixel as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes per pixel.
**Notes:** Most times 4, but for some platforms 3.
(Read only property)

### 88.12.7 Data as Memoryblock

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the original image data.
**Notes:** Changes here will be visible in the picture. (except for platforms where a copy is made of the data)
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.
Returns nil for console pictures.
(Read only property)
See also:

• 88.12.3 Data(Row as Integer) as MemoryBlock 14233

### 88.12.8 DataCopy as Memoryblock

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the data for the current picture into a new memoryblock.
**Notes:** (Read only property)

### 88.12.9 DataPtr as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memory address where the data is stored.
**Notes:** Maybe useful for declares.
Returns nil for console pictures.
(Read only property)

### 88.12.10 GreenOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the green channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.12.11 HasAlphaChannel as Boolean

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether an alpha channel exists.
**Notes:** (Read only property)

### 88.12.12 Height as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image in pixels.
**Notes:** (Read only property)

### 88.12.13 Picture as Picture

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original picture reference.
**Notes:** (Read only property)

### 88.12.14 RedOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The platform dependend offset of the red channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.12.15 RowBytes as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of an image row in bytes.
**Notes:** RowBytes can be width*bytesPerPixel, but often it is not.
(Read only property)

### 88.12.16 Width as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image in pixels.
**Notes:** (Read only property)

## 88.13 class PictureSepiaMBS

### 88.13.1 class PictureSepiaMBS

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for doing a sepia effect.

### 88.13.2 Methods

### 88.13.3 close

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 88.13.4 Run as boolean

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the picture effect.
**Notes:** Fails if the pictures are not bitmap pictures. Source and Destination can be equal. If you provide a destination picture, the dimenstions of source and destination must be equal.

For each pixel this method does:

sourcepixel=sourcepicture.pixel(x,y)
r=sourcepixel.red
g=sourcepixel.green
b=sourcepixel.blue

sum = r * RedFactor + g * GreenFactor + b * BlueFactor

r = sum + SepiaColor.red
g = sum + SepiaColor.green
b = sum + SepiaColor.blue

destinationpicture.pixel(x,y) = rgb(r,g,b)

### 88.13.5 Properties

### 88.13.6 DestinationPicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination picture.
**Notes:** If you set this property, use a bitmap picture equal in size to the source picture.
If this property is nil, the Run method will create a picture.
(Read and Write property)

### 88.13.7 FactorBlue as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue factor.
**Notes:** (Read and Write property)

### 88.13.8 FactorGreen as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green factor.
**Notes:** (Read and Write property)

### 88.13.9 FactorRed as Double

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red factor.
**Notes:** (Read and Write property)

### 88.13.10 MaxX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal x coordinate to use.
**Notes:** If 0 the width of the source picture defines this value.
(Read and Write property)

### 88.13.11 MaxY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximal y coordinate to use.
**Notes:** If 0 the height of the source picture defines this value.
(Read and Write property)

### 88.13.12 MinX as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal x coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.13.13 MinY as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimal y coordinate to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.13.14 SepiaBlue as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sepia color to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.13.15 SepiaGreen as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sepia color to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.13.16 SepiaRed as Integer

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sepia color to use.
**Notes:** Default is 0.
(Read and Write property)

### 88.13.17 SourcePicture as Picture

MBS Picture Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source picture.
**Notes:** Must be a bitmap picture.
(you can use the picture.BitmapMBS function for this)
(Read and Write property)

## 88.14 class PictureWriterMBS

### 88.14.1 class PictureWriterMBS

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to build a picture by filling a memoryblock.
**Example:**

```
dim p as PictureWriterMBS
dim m as MemoryBlock
dim r,g,b,rRow,gRow,bRow,h1,w1,x,y,bpp as Integer

// Create a new picture writer
p=NewPictureWriterMBS(512,512)

h1=p.Height-1
w1=p.Width-1

bpp=p.BytesPerPixel
rRow=p.RedOffset
gRow=p.GreenOffset
bRow=p.BlueOffset
// in each row the red, blue and green channels have different offsets.
// but offsets are platform dependend

for y=0 to h1
// Get data in memory. This Memoryblock has a size property of 0!
m=p.Data(y)
r=rRow
g=gRow
b=bRow

for x=0 to w1

m.UInt8Value(r)=x\2
m.UInt8Value(g)=y\2
m.UInt8Value(b)=x*y\2

r=r+bpp
g=g+bpp
b=b+bpp
next

next

// Use Render to make a picture object
dim pic as Picture = p.Render
```

Backdrop = pic

**Notes:** This is the same code the plugin uses to create pictures.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0fc1
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8
- MBS REALbasic plug-in 9.6

### 88.14.2 Methods

### 88.14.3 Data(Row as Integer) as MemoryBlock

MBS Picture Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The memoryblock with the original image data for the given row.
**Notes:** Changes here will be visible in the picture.
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.
See also:

- 88.14.8 Data as Memoryblock 14242

### 88.14.4 Render as picture

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates and returns a picture for this writer.
**Notes:** The writer is destroyed with this call, so do not use it any more.
(one picture can be created with one writer currently)

### 88.14.5 Properties

### 88.14.6 BlueOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The platform dependend offset of the blue channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.14.7 BytesPerPixel as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Number of bytes per pixel.
**Notes:** Most times 4, but for some platforms 3.
(Read only property)

### 88.14.8 Data as Memoryblock

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The memoryblock with the original image data.
**Notes:** Changes here will be visible in the picture.
This memoryblock has a size property with value 0!
No bound checking can be done by Xojo on this memoryblock.
Returns nil for console pictures.
(Read only property)
See also:

- 88.14.3 Data(Row as Integer) as MemoryBlock 14241

### 88.14.9 DataCopy as Memoryblock

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies the data for the current picture into a new memoryblock.
**Notes:** Changes to this memoryblock will not be visible in the rendered picture.
(Read only property)

### 88.14.10 DataPtr as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The memory address where the data is stored.
**Notes:** Maybe useful for declares.
Returns nil for console pictures.

(Read only property)

### 88.14.11 GreenOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The platform dependend offset of the green channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.14.12 HasAlphaChannel as Boolean

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether an alpha channel exists.
**Example:**

```
dim p as PictureWriterMBS = NewPictureWriterMBS(200, 200, true)

MsgBox "Alpha: "+str(p.HasAlphaChannel)

// get pointer to bytes
dim m as MemoryBlock = p.Data

// fill all with 127
m.FillBytesMBS 0, p.RowBytes * p.Height, 127

dim x as Picture = p.Render
Break
```

**Notes:** (Read only property)

### 88.14.13 Height as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The height of the image in pixels.
**Notes:** (Read only property)

### 88.14.14 Picture as Picture

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The buffer picture reference.
**Notes:** If the writer uses a RB picture as buffer it is available here.
(depends on the actual implementation for a given platform whether this property is used)
(Read only property)

### 88.14.15 RedOffset as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The platform dependend offset of the red channel in the RGB data.
**Notes:** A value between 0 and 3.
(Read only property)

### 88.14.16 RowBytes as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of an image row in bytes.
**Notes:** RowBytes can be width*bytesPerPixel, but often it is not.
(Read only property)

### 88.14.17 Width as Integer

MBS Picture Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the image in pixels.
**Notes:** (Read only property)

# Chapter 89

# GraphicsMagick

## 89.1 class GM16BlobMBS

### 89.1.1 class GM16BlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for binary large objects.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GM16ImageMBS
dim blob as new GM16BlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

**Notes:** Blob provides the means to contain any opaque data. It is named after the term "Binary Large OBject" commonly used to describe unstructured data (such as encoded images) which is stored in a database. While the function of Blob is very simple (store a pointer and and size associated with allocated data), the Blob class provides some very useful capabilities. In particular, it is fully reference counted just like the Image class.

The Blob class supports value assignment while preserving any outstanding earlier versions of the object. Since assignment is via a pointer internally, Blob is efficient enough to be stored directly in an STL container or any other data structure which requires assignment. In particular, by storing a Blob in an associative container (such as STL's 'map') it is possible to create simple indexed in-memory "database" of Blobs.

Magick++ currently uses Blob to contain encoded images (e.g. JPEG) as well as ICC and IPTC profiles. Since Blob is a general-purpose class, it may be used for other purposes as well.

### 89.1.2 Methods

### 89.1.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor creating an empty blob object.
See also:


- 89.1.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14246
- 89.1.5 Constructor(data as string) 14246
- 89.1.6 Constructor(other as GM16BlobMBS) 14247


### 89.1.4 Constructor(data as memoryblock, offset as Integer, size as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct object with data, making a copy of the supplied data.
See also:


- 89.1.3 Constructor 14246
- 89.1.5 Constructor(data as string) 14246
- 89.1.6 Constructor(other as GM16BlobMBS) 14247


### 89.1.5 Constructor(data as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct object with data, making a copy of the supplied data.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GM16ImageMBS
dim blob as new GM16BlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

See also:


- 89.1.3 Constructor 14246
- 89.1.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14246
- 89.1.6 Constructor(other as GM16BlobMBS) 14247


### 89.1.6 Constructor(other as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy constructor (reference counted).
See also:


- 89.1.3 Constructor 14246
- 89.1.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14246
- 89.1.5 Constructor(data as string) 14246


### 89.1.7 CopyMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the data as a memoryblock.
**Notes:** Returns nil on any error like low memory.

### 89.1.8 CopyString as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the data as a string.

### 89.1.9 Data as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A memoryblock with the data from this blob.
**Example:**

```
dim b as new GM16BlobMBS("Hello")

dim m as memoryblock = b.Data
MsgBox m.StringValue(0,5) // shows "Hello"
```

**Notes:** This is a memoryblock referencing the data of the blob. It has no size set. The memoryblock can only be used as long as the blob object exists. if you use it after you destroyed the blob object, you can crash you application.

### 89.1.10 Update(data as memoryblock, offset as Integer, size as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the content of this blob with a copy of the bytes in the memoryblock.
See also:

- 89.1.11 Update(data as string) 14248

### 89.1.11 Update(data as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the content of this blob with a copy of the bytes in the string.
**Notes:** Offset is zero based.
See also:

- 89.1.10 Update(data as memoryblock, offset as Integer, size as Integer) 14248

### 89.1.12 Properties

### 89.1.13 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle of the blob object.
**Notes:** (Read and Write property)

### 89.1.14 length as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain data length in bytes.
**Example:**

```
dim b as new GM16BlobMBS("Hello")

MsgBox str(B.length) // shows 5
```

**Notes:** (Read only property)

### 89.1.15 base64 as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blob content as a string in Base64 format.
**Example:**

```
dim b as new GM16BlobMBS("Hello")

MsgBox b.base64 // shows "SGVsbG8="
```

**Notes:** (Read and Write computed property)

## 89.2 class GM16CoderInfoMBS

### 89.2.1 class GM16CoderInfoMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class used to get information about all registered coders.
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GM16CoderInfoMBS in coders
names.Append coder.name
next

MsgBox Join(names,EndOfLine)
```

**Notes:** The CoderInfo class provides the means to provide information regarding GraphicsMagick support for an image format (designated by a magick string). It may be used to provide support for a specific named format (provided as an argument to the constructor), or as an element of a container when format support is queried using the coderInfoList() templated function.

### 89.2.2 Methods

### 89.2.3 CoderInfoList as GM16CoderInfoMBS()

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a list of all coders.
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
```

### 89.2.4 Properties

### 89.2.5 description as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format description (e.g. "CompuServe graphics interchange format").
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GM16CoderInfoMBS in coders
names.Append coder.name+" "+coder.description
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.2.6 isMultiFrame as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format supports multiple frames.
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GM16CoderInfoMBS in coders
names.Append coder.name+" "+str(coder.isMultiFrame)
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.2.7 isReadable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format is readable.
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GM16CoderInfoMBS in coders
names.Append coder.name+" "+str(coder.isReadable)
next
```

```
MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.2.8 isWritable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format is writeable.
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GM16CoderInfoMBS in coders
names.Append coder.name+" "+str(coder.isWritable)
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.2.9 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of loadable module.
**Notes:** (Read and Write property)

### 89.2.10 name as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format name (e.g. "GIF").
**Example:**

```
dim coders(-1) as GM16CoderInfoMBS = GM16CoderInfoMBS.CoderInfoList
dim coder as GM16CoderInfoMBS = coders(0) // pick first one

MsgBox coder.name
```

**Notes:** (Read and Write property)

### 89.2.11 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Usage note for user.
**Notes:** (Read and Write property)

### 89.2.12 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Support library version.
**Notes:** (Read and Write property)

## 89.3 class GM16ColorGrayMBS

### 89.3.1 class GM16ColorGrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color subclass for a grayscale color.
**Example:**

```
dim g as new GM16ColorGrayMBS(0.5)
MsgBox str(g.shade)
```

**Notes:** Representation of grayscale RGB color.
Equal parts red, green, and blue specified as a ratio (0 to 1).
Subclass of the GM16ColorMBS class.

### 89.3.2 Methods

### 89.3.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorGrayMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.3.4 Constructor(other as GM16ColorMBS) 14254
- 89.3.5 Constructor(shade as Double) 14255


### 89.3.4 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GM16ColorGrayMBS(0.5)
dim o as new GM16ColorGrayMBS(g)
```

MsgBox str(o.shade)

See also:

- 89.3.3 Constructor 14254
- 89.3.5 Constructor(shade as Double) 14255

### 89.3.5 Constructor(shade as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given value.
**Example:**

```
dim g as new GM16ColorGrayMBS(1.0)
MsgBox str(g.colorValue)
```

**Notes:** Range is 0.0 to 1.0.
See also:

- 89.3.3 Constructor 14254
- 89.3.4 Constructor(other as GM16ColorMBS) 14254

### 89.3.6 Properties

### 89.3.7 shade as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gray value for this color.
**Example:**

```
dim g as new GM16ColorGrayMBS(1.0)
MsgBox str(g.shade)
```

**Notes:** Range is 0.0 to 1.0
(Read and Write property)

## 89.4 class GM16ColorHSLMBS

### 89.4.1 class GM16ColorHSLMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a HSL color.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.colorValue)
```

**Notes:** Subclass of the GM16ColorMBS class.

### 89.4.2 Methods

### 89.4.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorHSLMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.4.4 Constructor(hue as Double, saturation as Double, luminosity as Double) 14256
- 89.4.5 Constructor(other as GM16ColorMBS) 14257


### 89.4.4 Constructor(hue as Double, saturation as Double, luminosity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.hue)+" "+str(g.saturation)+" "+str(g.luminosity)
```

See also:


- 89.4.3 Constructor 14256
- 89.4.5 Constructor(other as GM16ColorMBS) 14257


### 89.4.5 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
dim o as new GM16ColorHSLMBS(g)

MsgBox str(o.colorValue)
```

See also:


- 89.4.3 Constructor 14256
- 89.4.4 Constructor(hue as Double, saturation as Double, luminosity as Double) 14256


### 89.4.6 Properties

### 89.4.7 hue as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hue value.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.hue)
```

**Notes:** (Read and Write property)

### 89.4.8 luminosity as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The luminosity value.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.luminosity)
```

**Notes:** (Read and Write property)

### 89.4.9 saturation as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The saturation value.
**Example:**

```
dim g as new GM16ColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.saturation)
```

**Notes:** (Read and Write property)

## 89.5 class GM16ColorMBS

### 89.5.1 class GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color is the base color class.
**Example:**

```
dim c as new GM16ColorMBS(127,255,127) // light green
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** It is a simple container class for the pixel red, green, blue, and alpha values scaled to fit GraphicsMagick's Quantum size. Normally users will instantiate a class derived from Color which supports the color model that fits the needs of the application. The Color class may be constructed directly from an X11-style color string. As a perhaps odd design decision, the value transparent black is considered to represent an unset value (invalid color) in many cases. This choice was made since it avoided using more memory. The default Color constructor constructs an invalid color (i.e. transparent black) and may be used as a parameter in order to remove a color setting.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.0pr7

### 89.5.2 Methods

### 89.5.3 Black as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a black color.
**Example:**

```
dim black as GM16ColorMBS = GM16ColorMBS.Black

MsgBox str(black.colorValue)
```

### 89.5.4 Color(ColorValue as Color) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color from Xojo to GM16ColorMBS.
**Example:**

```
dim c as GM16ColorMBS = GM16ColorMBS.Color(&cFF0000)

MsgBox str(c.colorValue)
```

See also:


- 89.5.5 Color(ColorValue as Color, alpha as Integer) as GM16ColorMBS 14260
- 89.5.6 Color(red as integer, green as integer, blue as integer) as GM16ColorMBS 14260
- 89.5.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GM16ColorMBS 14261


### 89.5.5 Color(ColorValue as Color, alpha as Integer) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color from Xojo to GM16ColorMBS with separate alpha value.
**Example:**

```
dim c as GM16ColorMBS = GM16ColorMBS.Color(&cFF0000, 128)

MsgBox str(c.colorValue)+" "+str(c.alpha)
```

**Notes:** Alpha in range from 0 to 255.
See also:


- 89.5.4 Color(ColorValue as Color) as GM16ColorMBS 14259
- 89.5.6 Color(red as integer, green as integer, blue as integer) as GM16ColorMBS 14260
- 89.5.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GM16ColorMBS 14261


### 89.5.6 Color(red as integer, green as integer, blue as integer) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates color with RGB values.
**Example:**

```
dim c as GM16ColorMBS = GM16ColorMBS.Color(127, 191, 255)

MsgBox str(c.colorValue)
```

**Notes:** Range in 0 to 255 for 8bit and 0 to 65535 for 16bit class.
See also:

- 89.5.4 Color(ColorValue as Color) as GM16ColorMBS 14259
- 89.5.5 Color(ColorValue as Color, alpha as Integer) as GM16ColorMBS 14260
- 89.5.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GM16ColorMBS 14261

### 89.5.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates color with RGB values.
**Example:**

```
dim c as GM16ColorMBS = GM16ColorMBS.Color(127, 191, 255, 127)

MsgBox str(c.colorValue)+" "+str(c.alphaQuantum)
```

**Notes:** Range in 0 to 255 for 8bit and 0 to 65535 for 16bit class.
See also:

- 89.5.4 Color(ColorValue as Color) as GM16ColorMBS 14259
- 89.5.5 Color(ColorValue as Color, alpha as Integer) as GM16ColorMBS 14260
- 89.5.6 Color(red as integer, green as integer, blue as integer) as GM16ColorMBS 14260

### 89.5.8 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:

- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265


### 89.5.9 Constructor(ColorName as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color based on the X11 color name.
**Example:**

```
dim c as new GM16ColorMBS("red")

MsgBox str(c.redQuantum)+"-"+str(c.greenQuantum)+"-"+str(c.blueQuantum) // shows "255-0-0"

dim d as new GM16ColorMBS("#77FF00")

MsgBox str(d.redQuantum)+"-"+str(d.greenQuantum)+"-"+str(d.blueQuantum) // shows "119-255-0"
```

**Notes:** An alternate way to construct the class is via an X11-compatible color specification string (e.g. Color("red") or Color ("#FF0000")). Since the class may be constructed from a string, convenient strings may be passed in place of an explicit Color object in methods which accept a reference to Color. Color may also be converted to a std::string for convenience in user interfaces, and for saving settings to a text file.
See also:


- 89.5.8 Constructor 14261
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265

### 89.5.10 Constructor(ColorValue as color)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GM16ColorMBS(&cFF0000)
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.5.8 Constructor 14261
- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265


### 89.5.11 Constructor(ColorValue as color, alpha as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GM16ColorMBS(&cFF0102, 127)
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)+" "+str(c.alpha)
```

See also:


- 89.5.8 Constructor 14261
- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265

### 89.5.12 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim r as new GM16ColorMBS(1,2,3)
dim c as new GM16ColorMBS(r)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.5.8 Constructor 14261
- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265


### 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
See also:


- 89.5.8 Constructor 14261
- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14265

### 89.5.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3,4)

// display color, alpha is double...
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)+" "+str(c.alpha)
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
See also:


- 89.5.8 Constructor 14261
- 89.5.9 Constructor(ColorName as string) 14262
- 89.5.10 Constructor(ColorValue as color) 14263
- 89.5.11 Constructor(ColorValue as color, alpha as Integer) 14263
- 89.5.12 Constructor(other as GM16ColorMBS) 14264
- 89.5.13 Constructor(red as Integer, green as Integer, blue as Integer) 14264


### 89.5.15 QuantumByteSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum byte size.
**Example:**

```
MsgBox str(GM16ColorMBS.QuantumByteSize)
```

**Notes:** As the plugin uses 8 bit this value should be 1.

### 89.5.16 scaleDoubleToQuantum(value as Double) as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a double value to a value in the range of a quantum.
**Example:**

```
dim d as Double = 1.0
dim v as Integer = GM16ColorMBS.scaleDoubleToQuantum(d)
MsgBox str(v)
```

**Notes:** As the plugin uses 8 bit quantums, this is basicly a multiplication by 255.0

### 89.5.17 scaleQuantumToDouble(value as Integer) as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a quantum to a double value.
**Example:**

```
dim v as Integer = 255
dim d as Double = GM16ColorMBS.scaleQuantumToDouble(v)
MsgBox str(d)
```

**Notes:** The plugin uses 8bit quantums, so this is basicly the division of value by 255.0

### 89.5.18 White as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a white color.
**Example:**

```
dim White as GM16ColorMBS = GM16ColorMBS.White

MsgBox str(White.colorValue)
```

### 89.5.19 Properties

### 89.5.20 alpha as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha value of this color.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3,1.0)
MsgBox str(c.alpha)
```

**Notes:** Range is 0.0 to 1.0. If you pass values higher, they are divided by 255.
(Read and Write property)

### 89.5.21 alphaQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha color value.
**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.5.22 blueQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color value.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3)
MsgBox str(c.redQuantum) // 3
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.5.23 colorValue as color

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Xojo color for the GraphicsMagick color.
**Example:**

```
dim c as new GM16ColorMBS(&cFF0102)
MsgBox str(c.ColorValue)
```

**Notes:** (Read and Write property)

### 89.5.24 greenQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color value.
**Example:**

```
dim r as new GM16ColorMBS(1,2,3)
MsgBox str(r.greenQuantum) // shows 2
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.5.25 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal color reference.
**Example:**

```
dim r as new GM16ColorMBS(1,2,3)
MsgBox str(r.handle)
```

**Notes:** (Read and Write property)

### 89.5.26 intensity as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intensity of this color.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3)
MsgBox str(c.intensity)
```

**Notes:** (Read only property)

### 89.5.27 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain valid color?
**Example:**

```
dim c as new GM16ColorMBS(1,2,3)
MsgBox str(c.isValid)
```

**Notes:** (Read and Write property)

### 89.5.28 redQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color value.
**Example:**

```
dim c as new GM16ColorMBS(1,2,3)
MsgBox str(c.redQuantum) // 1
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

## 89.6 class GM16ColorMonoMBS

### 89.6.1 class GM16ColorMonoMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Representation of a black/white color (true/false)
**Example:**

```
dim g as new GM16ColorMonoMBS(false)
MsgBox str(g.colorValue)
```

**Notes:** Subclass of the GM16ColorMBS class.

### 89.6.2 Methods

### 89.6.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorMonoMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.6.4 Constructor(mono as boolean) 14270
- 89.6.5 Constructor(other as GM16ColorMBS) 14271


### 89.6.4 Constructor(mono as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GM16ColorMonoMBS(false)
MsgBox str(g.mono)
```

See also:


- 89.6.3 Constructor 14270
- 89.6.5 Constructor(other as GM16ColorMBS) 14271


### 89.6.5 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GM16ColorMonoMBS(false)
dim o as new GM16ColorMonoMBS(g)
MsgBox str(o.mono)
```

See also:


- 89.6.3 Constructor 14270
- 89.6.4 Constructor(mono as boolean) 14270


### 89.6.6 Properties

### 89.6.7 mono as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value.
**Example:**

```
dim g as new GM16ColorMonoMBS(true)
MsgBox str(g.mono)
```

**Notes:** (Read and Write property)

## 89.7 class GM16ColorRGBMBS

### 89.7.1 class GM16ColorRGBMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color class for RGB colors.
**Example:**

```
dim c as new GM16ColorRGBMBS(1.0,0.0,0.0) // red
MsgBox str(C.red)+" "+str(c.green)+" "+str(c.blue)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** Representation of RGB color with red, green, and blue specified as ratios (0 to 1)
Subclass of the GM16ColorMBS class.

### 89.7.2 Methods

### 89.7.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorRGBMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.7.4 Constructor(other as GM16ColorMBS) 14272
- 89.7.5 Constructor(red as Double, green as Double, blue as Double) 14273


### 89.7.4 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GM16ColorRGBMBS(1,2,3)
dim o as new GM16ColorRGBMBS(g)
```

MsgBox str(o.colorValue)

See also:

- 89.7.3 Constructor 14272
- 89.7.5 Constructor(red as Double, green as Double, blue as Double) 14273

### 89.7.5 Constructor(red as Double, green as Double, blue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GM16ColorRGBMBS(0.1,0.2,0.3)
```

**Notes:** Range is 0.0 to 1.0.
See also:

- 89.7.3 Constructor 14272
- 89.7.4 Constructor(other as GM16ColorMBS) 14272

### 89.7.6 Properties

### 89.7.7 blue as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color component.
**Example:**

```
dim c as new GM16ColorRGBMBS(0.0,0.0,1.0)
MsgBox str(c.blue)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

### 89.7.8 green as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color component.
**Example:**

```
dim c as new GM16ColorRGBMBS(0.0,1.0,0.0)
MsgBox str(c.green)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

### 89.7.9 red as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color component.
**Example:**

```
dim c as new GM16ColorRGBMBS(1.0,0.0,0.0) // red
MsgBox str(C.red)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

## 89.8 class GM16ColorYUVMBS

### 89.8.1 class GM16ColorYUVMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Representation of a color in the YUV colorspace
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.y)+" "+str(g.u)+" "+str(g.v)
```

**Notes:** Subclass of the GM16ColorMBS class.

### 89.8.2 Methods

### 89.8.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GM16ColorYUVMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.8.4 Constructor(other as GM16ColorMBS) 14275
- 89.8.5 Constructor(y as Double, u as Double, v as Double) 14276


### 89.8.4 Constructor(other as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
dim o as new GM16ColorYUVMBS(g)
MsgBox str(o.colorValue)
```

See also:


- 89.8.3 Constructor 14275
- 89.8.5 Constructor(y as Double, u as Double, v as Double) 14276


### 89.8.5 Constructor(y as Double, u as Double, v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
```

See also:


- 89.8.3 Constructor 14275
- 89.8.4 Constructor(other as GM16ColorMBS) 14275


### 89.8.6 Properties

### 89.8.7 u as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The u color component.
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.u)
```

**Notes:** Range is -0.5 to +0.5.
(Read and Write property)

### 89.8.8 v as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The v color component.
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.v)
```

**Notes:** Range is -0.5 to +0.5.
(Read and Write property)

### 89.8.9 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y color component.
**Example:**

```
dim g as new GM16ColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.y)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

## 89.9 class GM16ConvertMBS

### 89.9.1 class GM16ConvertMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to convert images thread friendly.
**Notes:** This class is intended to process lots of images in several instances in several threads.
If you for example use 8 Xojo threads, to process thousands of images to scale them down for thumbnails, you can easily keep 8 CPU cores busy.

Please make a new instance, set options and call run method. When run is done, please read output properties.
Do not modify properties while thread is running.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2

### 89.9.2 Methods

### 89.9.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.9.4 Run

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts converter.
**Notes:** The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 89.9.5 Properties

### 89.9.6 AutoOrient as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to call autoOrient method to change orientation of image data to 0¬∞.
**Notes:** (Read and Write property)

### 89.9.7 Enhance as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to run enhance command.
**Notes:** If true, we call enhance on the image to minimize noise.
(Read and Write property)

### 89.9.8 Equalize as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to run equalize command.
**Notes:** If set to true, we call equalize command on image (histogram equalization).
(Read and Write property)

### 89.9.9 ImageType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image type.
**Notes:** If value is >0, the image type is change to the given type.
(Read and Write property)

### 89.9.10 InputData as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input data string.
**Notes:** If set, we read image from this data.
(Read and Write property)

### 89.9.11 InputFile as FolderItem

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input folderitem.
**Notes:** If set input file to read.
(Read and Write property)

### 89.9.12 InputGeometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input geometry.
**Notes:** Some formats can be loaded with different scales, so this geometry is passed to read method to define the format requested.
(Read and Write property)

### 89.9.13 InputImage as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input image.
**Notes:** (Read and Write property)

### 89.9.14 InputMagick as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image magick type.
**Notes:** If empty, the type of file is automatically determined.
(Read and Write property)

### 89.9.15 InputMemory as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input data memoryblock.
**Notes:** If set, we read image from this data.
(Read and Write property)

### 89.9.16 InputPath as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input file path.
**Notes:** If set input file to read.
(Read and Write property)

### 89.9.17 OutputData as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output data as string.
**Notes:** (Read and Write property)

### 89.9.18 OutputFile as FolderItem

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The folderitem where to write file.
**Notes:** If set, the image will be written to this file.
(Read and Write property)

### 89.9.19 OutputImage as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output image object.
**Notes:** (Read and Write property)

### 89.9.20 OutputMagick as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output magick.
**Notes:** You can set this to a magick codec type to define output format, e.g. ”jpeg”.
(Read and Write property)

### 89.9.21 OutputMemory as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output data as memory block.
**Notes:** (Read and Write property)

### 89.9.22 OutputPath as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native file path for output.
**Notes:** If set, the image will be written to this path.
(Read and Write property)

### 89.9.23 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quality of images in range 1 to 100.
**Notes:** If value is >0, we assign it to the image for setting image quality.
(Read and Write property)

### 89.9.24 Running as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this converter is running.
**Notes:** Set to true while Run method runs.
(Read only property)

### 89.9.25 ScaleGeometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry for call to scale method.
**Notes:** scale method is called with this geometry (if set) to reduce image size.
(Read and Write property)

### 89.9.26 Strip as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to remove all profiles and text attributes from the image.
**Notes:** (Read and Write property)

### 89.9.27 ThumbnailGeometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry for call to thumbnail method.
**Notes:** thumbnail method is called with this geometry (if set) to reduce image size.
(Read and Write property)

### 89.9.28 Trim as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether trim command is called on image to remove extra blank space around image.
**Notes:** (Read and Write property)

### 89.9.29 WantOutputData as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want image compressed and stored in OutputData property.
**Notes:** (Read and Write property)

### 89.9.30 WantOutputMemory as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want image compressed and stored in OutputMemory property.
**Notes:** (Read and Write property)

## 89.10 class GM16CoordinateMBS

### 89.10.1 class GM16CoordinateMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Graphics Magick class for a coordinate.
**Example:**

```
dim c as new GM16CoordinateMBS(5,6)
MsgBox str(c.x)+" "+str(c.y)
```

### 89.10.2 Methods

### 89.10.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new coordinate.
See also:

- 89.10.4 Constructor(x as Double, y as Double) 14284

### 89.10.4 Constructor(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new coordinate.
**Example:**

```
dim c as new GM16CoordinateMBS(5,6)
MsgBox str(c.x)+" "+str(c.y)
```

See also:

- 89.10.3 Constructor 14284

### 89.10.5 Properties

### 89.10.6 x as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Example:**

```
dim c as new GM16CoordinateMBS
c.x = 5
MsgBox str(c.x)
```

**Notes:** (Read and Write property)

### 89.10.7 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Example:**

```
dim c as new GM16CoordinateMBS
c.y = 5
MsgBox str(c.y)
```

**Notes:** (Read and Write property)

## 89.11 class GM16ErrorExceptionMBS

### 89.11.1 class GM16ErrorExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception to report errors in the GraphicMagick plugin.
**Notes:** Check the message property for details.
Subclass of the RuntimeException class.

## 89.12 class GM16GeometryMBS

### 89.12.1 class GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Geometry provides a convenient means to specify a geometry argument.
**Example:**

```
dim g as new GM16GeometryMBS(300,400)
MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** The object may be initialized from a string containing a geometry specification. It may also be initialized by more efficient parameterized constructors.
**Xojo Developer Magazine**

- 20.2, page 83: Wifi QR Code, Embedding your Wifi password in a QR code by Stefanie Juchmes

### 89.12.2 Methods

### 89.12.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates empty geometry.
**Example:**

```
dim g as new GM16GeometryMBS
MsgBox str(G.width)+" "+str(G.height)
```

See also:


- 89.12.4 Constructor(geometry as string) 14287
- 89.12.5 Constructor(other as GM16GeometryMBS) 14288
- 89.12.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14288


### 89.12.4 Constructor(geometry as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct geometry from string.
**Example:**

```
dim g as new GM16GeometryMBS("600x600")

MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** See the GraphicsMagick website for details.
http://www.graphicsmagick.org/Magick++/Geometry.html
See also:


- 89.12.3 Constructor 14287
- 89.12.5 Constructor(other as GM16GeometryMBS) 14288
- 89.12.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14288


### 89.12.5 Constructor(other as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new geometry object by copying an existing one.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
dim h as new GM16GeometryMBS(g)
MsgBox str(h.width)
```

See also:


- 89.12.3 Constructor 14287
- 89.12.4 Constructor(geometry as string) 14287
- 89.12.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14288


### 89.12.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates geometry with the given values.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.width)
```

See also:


- 89.12.3 Constructor 14287
- 89.12.4 Constructor(geometry as string) 14287
- 89.12.5 Constructor(other as GM16GeometryMBS) 14288


### 89.12.7 Make(geometry as string) as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct geometry from string.
**Example:**

```
dim g as GM16GeometryMBS = GM16GeometryMBS.Make("600x600")

MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** See the GraphicsMagick website for more details:
http://www.graphicsmagick.org/Magick++/Geometry.html
See also:


- 89.12.8 Make(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) as GM16GeometryMBS 14289


### 89.12.8 Make(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates geometry with the given values.
**Example:**

```
dim g as GM16GeometryMBS = GM16GeometryMBS.Make(600,600)
MsgBox str(g.width)
```

See also:

• 89.12.7 Make(geometry as string) as GM16GeometryMBS 14289

### 89.12.9 Properties

### 89.12.10 aspect as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize without preserving aspect ratio (!).
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.aspect)
```

**Notes:** (Read and Write property)

### 89.12.11 fillArea as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image to fit total pixel area specified by dimensions.
**Notes:** Same as @ in the geometry specification.
(Read and Write property)

### 89.12.12 greater as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize if image is greater than size (>).
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.greater)
```

**Notes:** (Read and Write property)

### 89.12.13 height as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height value.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.height)
```

**Notes:** (Read and Write property)

### 89.12.14 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain a valid geometry?
**Example:**

```
dim g as new GM16GeometryMBS(100,200)
MsgBox str(G.isValid)
```

**Notes:** May be set to false in order to invalidate an existing geometry object.
(Read and Write property)

### 89.12.15 less as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize if image is less than size (<).
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.less)
```

**Notes:** (Read and Write property)

### 89.12.16 limitPixels as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dimensions are treated as minimum rather than maximum values.
**Notes:** Same as ^in the geometry specification.

(Read and Write property)

### 89.12.17 percent as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height are expressed as percentages.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.percent)
```

**Notes:** (Read and Write property)

### 89.12.18 StringValue as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string representation of the geometry object.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.StringValue)
```

**Notes:** (Read and Write property)

### 89.12.19 width as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width value.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
MsgBox str(g.width)
```

**Notes:** (Read and Write property)

### 89.12.20 xNegative as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sign of X offset negative? (X origin at right)
**Example:**

```
dim g as new GM16GeometryMBS(100,200,30,40,true,false)
MsgBox str(G.xNegative)
```

**Notes:** (Read and Write property)

### 89.12.21 xOff as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X offset from origin.
**Example:**

```
dim g as new GM16GeometryMBS(100,200,30,40,true,true)
MsgBox str(G.xOff)+" "+str(G.yOff)
```

**Notes:** (Read and Write property)

### 89.12.22 yNegative as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sign of Y offset negative? (Y origin at bottom)
**Example:**

```
dim g as new GM16GeometryMBS(100,200,30,40,false,true)
MsgBox str(G.yNegative)
```

**Notes:** (Read and Write property)

### 89.12.23 yOff as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y offset from origin
**Example:**

```
dim g as new GM16GeometryMBS(100,200,30,40,true,true)
MsgBox str(G.xOff)+" "+str(G.yOff)
```

**Notes:** (Read and Write property)

## 89.13 class GM16GraphicsMBS

### 89.13.1 class GM16GraphicsMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for drawing commands targeting a GM16ImageMBS.
**Notes:** Please remember that all commands are collected till you call the Draw method.

### 89.13.2 Methods

### 89.13.3 Arc(startX as Double, startY as Double, endX as Double, endY as Double, startDegrees as Double, endDegrees as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arc using the stroke color and based on the circle starting at coordinates startX,startY, and ending with coordinates endX,endY, and bounded by the rotational arc startDegrees,endDegrees.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.type = image.TrueColorType
image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.arc(250, 250, 100, 100,50,300)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.4 Bezier(values() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a bezier curve using the stroke color and based on the coordinates specified by the coordinates array.

### 89.13.5 Circle(originX as Double, originY as Double, perimX as Double, perimY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a circle using the stroke color and thickness using specified origin and perimeter coordinates.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.type = image.TrueColorType
image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.13.6 ClipPath(id as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Select a drawing clip path matching id.

### 89.13.7 ColorPixel(x as Double, y as Double, paintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color image according to paintMethod.
**Notes:** The point method recolors the target pixel. The replace method recolors any pixel that matches the color of the target pixel. Floodfill recolors any pixel that matches the color of the target pixel and is a neighbor, whereas filltoborder recolors any neighbor pixel that is not the border color. Finally, reset recolors all pixels.

### 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300

- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.10 CompositeImage(x as Double, y as Double, path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:

- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302

### 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298

- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302


### 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14302

### 89.13.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.13.8 CompositeImage(x as Double, y as Double, file as folderitem) 14297
- 89.13.9 CompositeImage(x as Double, y as Double, image as GM16ImageMBS) 14297
- 89.13.10 CompositeImage(x as Double, y as Double, path as string) 14298
- 89.13.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14298
- 89.13.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14299
- 89.13.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS) 14300
- 89.13.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GM16ImageMBS, CompositeOperator as Integer) 14300
- 89.13.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14301


### 89.13.17 Constructor(image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object referencing the given image.

### 89.13.18 DashArray(values() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the pattern of dashes and gaps used to stroke paths.
**Notes:** The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.13.19 DashOffset(offset as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the distance into the dash pattern to start the dash.
**Notes:** See documentation on SVG's stroke-dashoffset property for usage details.

### 89.13.20 Draw

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws all draw commands collected.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.type = image.TrueColorType
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.21 DrawPath

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw on image using vector path.
**Example:**

```
// new picture, 500x500 and filled with white
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)


dim draw as GM16GraphicsMBS = image.Graphics

// Draw path
```

```
dim cr as new GM16ColorRGBMBS("red")
dim gr as new GM16ColorRGBMBS("green")
draw.StrokeColor cr
draw.FillColor gr
draw.PathMovetoAbs(30,10)
draw.PathLinetoAbs(20,55)
draw.PathLinetoAbs(70,50)
draw.PathLinetoAbs(80,5)
draw.DrawPath

draw.Draw

// show picture
image.type = image.TrueColorType // make sure it's a bitmap
Backdrop=image.CopyPicture
```

### 89.13.22 Ellipse(originX as Double, originY as Double, perimX as Double, perimY as Double, arcStart as Double, arcEnd as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an ellipse using the stroke color and thickness, specified origin, x & y radius, as well as specified start and end of arc in degrees.
**Notes:** If a fill color is specified, then the object is filled.

### 89.13.23 FillColor(c as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify drawing object fill color.

### 89.13.24 FillOpacity(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify opacity to use when drawing using fill color.

### 89.13.25 FillRule(fillRule as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the algorithm which is to be used to determine what parts of the canvas are included inside the shape.
**Notes:** See documentation on SVG's fill-rule property for usage details.

### 89.13.26 Font(fontname as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify font name to use when drawing text.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

dim draw as GM16GraphicsMBS = image.Graphics

// draw red text
draw.strokeColor(new GM16ColorRGBMBS("red")) // Outline color
draw.strokeWidth(1)
draw.Font("/Library/Fonts/Verdana.ttf")
draw.Text(50, 50, "Hello", "")
draw.Draw

Backdrop=image.CopyPicture
```

See also:

- 89.13.27 Font(fontname as string, StyleType as Integer, weight as Integer, StretchType as Integer) 14305

### 89.13.27 Font(fontname as string, StyleType as Integer, weight as Integer, StretchType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font.
**Notes:** Specify font family, style, weight (one of the set { 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 } with 400 being the normal size), and stretch to be used to select the font used when drawing text. Wildcard matches may be applied to style via the AnyStyle enumeration, applied to weight if weight is zero,

and applied to stretch via the AnyStretch enumeration.
See also:

- 89.13.26 Font(fontname as string) 14305

### 89.13.28 Gravity(GravityType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify text positioning gravity.

### 89.13.29 Line(startX as Double, startY as Double, endX as Double, endY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a line using stroke color and thickness using starting and ending coordinates
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a line
draw.Line(100,100,400,400)
draw.Draw

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

### 89.13.30 Matte(x as Double, y as Double, paintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the pixel matte value to transparent.
**Notes:** The point method changes the matte value of the target pixel. The replace method changes the matte value of any pixel that matches the color of the target pixel. Floodfill changes the matte value of any

pixel that matches the color of the target pixel and is a neighbor, whereas filltoborder changes the matte value of any neighbor pixel that is not the border color, Finally reset changes the matte value of all pixels.

### 89.13.31 MiterLimit(miterlimit as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify miter limit.
**Notes:** When two line segments meet at a sharp angle and miter joins have been specified for 'lineJoin', it is possible for the miter to extend far beyond the thickness of the line stroking the path. The miterLimit' imposes a limit on the ratio of the miter length to the 'lineWidth'. The default value of this parameter is 4.

### 89.13.32 PathArcAbs(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GM16PathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.13.33 PathArcAbs(c() as GM16PathArgsMBS) 14307
- 89.13.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14308


### 89.13.33 PathArcAbs(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then

draw the arc matching a clock-wise rotation.

In the GM16PathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:

- 89.13.32 PathArcAbs(c as GM16PathArgsMBS) 14307
- 89.13.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14308

### 89.13.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw an arc

draw.PathMovetoAbs 100,100
draw.PathArcAbs(100,100, 0, false, false, 200,200)
draw.DrawPath
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.
See also:

- 89.13.32 PathArcAbs(c as GM16PathArgsMBS) 14307
- 89.13.33 PathArcAbs(c() as GM16PathArgsMBS) 14307


### 89.13.35 PathArcRel(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GM16PathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.13.36 PathArcRel(c() as GM16PathArgsMBS) 14309
- 89.13.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14310


### 89.13.36 PathArcRel(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GM16PathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.13.35 PathArcRel(c as GM16PathArgsMBS) 14309
- 89.13.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14310

### 89.13.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.
See also:


- 89.13.35 PathArcRel(c as GM16PathArgsMBS) 14309
- 89.13.36 PathArcRel(c() as GM16PathArgsMBS) 14309


### 89.13.38 PathClosePath

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the current subpath by drawing a straight line from the current point to current subpath's most recent starting point (usually, the most recent moveto point).

### 89.13.39 PathCurvetoAbs(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:


- 89.13.40 PathCurvetoAbs(c() as GM16PathArgsMBS) 14311
- 89.13.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14311

### 89.13.40 PathCurvetoAbs(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.13.39 PathCurvetoAbs(c as GM16PathArgsMBS) 14310
- 89.13.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14311

### 89.13.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.13.39 PathCurvetoAbs(c as GM16PathArgsMBS) 14310
- 89.13.40 PathCurvetoAbs(c() as GM16PathArgsMBS) 14311

### 89.13.42 PathCurvetoRel(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.13.43 PathCurvetoRel(c() as GM16PathArgsMBS) 14312
- 89.13.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14312


### 89.13.43 PathCurvetoRel(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:


- 89.13.42 PathCurvetoRel(c as GM16PathArgsMBS) 14311
- 89.13.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14312


### 89.13.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.13.42 PathCurvetoRel(c as GM16PathArgsMBS) 14311
- 89.13.43 PathCurvetoRel(c() as GM16PathArgsMBS) 14312


### 89.13.45 PathLinetoAbs(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various ”lineto” commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point.

PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.13.46 PathLinetoAbs(c() as GM16CoordinateMBS) 14313
- 89.13.47 PathLinetoAbs(x as Double, y as Double) 14313


### 89.13.46 PathLinetoAbs(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.13.45 PathLinetoAbs(c as GM16CoordinateMBS) 14312
- 89.13.47 PathLinetoAbs(x as Double, y as Double) 14313


### 89.13.47 PathLinetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.13.45 PathLinetoAbs(c as GM16CoordinateMBS) 14312
- 89.13.46 PathLinetoAbs(c() as GM16CoordinateMBS) 14313


### 89.13.48 PathLinetoHorizontalAbs(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a horizontal line from the current point (cpx, cpy) to (x, cpy). PathLinetoHorizontalAbs indicates that absolute coordinates are supplied; PathLinetoHorizontalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (x, cpy) for the final value of x.

### 89.13.49 PathLinetoHorizontalRel(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a horizontal line from the current point (cpx, cpy) to (x, cpy). PathLinetoHorizontalAbs indicates that absolute coordinates are supplied; PathLinetoHorizontalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (x, cpy) for the final value of x.

### 89.13.50 PathLinetoRel(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.13.51 PathLinetoRel(c() as GM16CoordinateMBS) 14314
- 89.13.52 PathLinetoRel(x as Double, y as Double) 14314


### 89.13.51 PathLinetoRel(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.13.50 PathLinetoRel(c as GM16CoordinateMBS) 14314
- 89.13.52 PathLinetoRel(x as Double, y as Double) 14314


### 89.13.52 PathLinetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Example:**

```
// new picture, 500x500 and filled with white
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)


dim draw as GM16GraphicsMBS = image.Graphics

// Draw path

dim cr as new GM16ColorRGBMBS("red")
dim gr as new GM16ColorRGBMBS("green")
draw.StrokeColor cr
draw.FillColor gr
draw.PathMovetoAbs(30,10)
draw.PathLinetoAbs(20,55)
draw.PathLinetoAbs(70,50)
draw.PathLinetoAbs(80,5)
draw.DrawPath

draw.Draw

// show picture
image.type = image.TrueColorType // make sure it's a bitmap
Backdrop=image.CopyPicture
```

**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:

- 89.13.50 PathLinetoRel(c as GM16CoordinateMBS) 14314
- 89.13.51 PathLinetoRel(c() as GM16CoordinateMBS) 14314

### 89.13.53 PathLinetoVerticalAbs(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a vertical line from the current point (cpx, cpy) to (cpx, y). PathLinetoVerticalAbs indicates that absolute coordinates are supplied; PathLinetoVerticalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (cpx, y) for the final value of y.

### 89.13.54 PathLinetoVerticalRel(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a vertical line from the current point (cpx, cpy) to (cpx, y). PathLinetoVerticalAbs indicates that absolute coordinates are supplied; PathLinetoVerticalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (cpx, y) for the final value of y.

### 89.13.55 PathMovetoAbs(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.13.56 PathMovetoAbs(x as Double, y as Double) 14316

### 89.13.56 PathMovetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.13.55 PathMovetoAbs(c as GM16CoordinateMBS) 14316

### 89.13.57 PathMovetoRel(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.13.58 PathMovetoRel(x as Double, y as Double) 14317

### 89.13.58 PathMovetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.13.57 PathMovetoRel(c as GM16CoordinateMBS) 14317

### 89.13.59 PathQuadraticCurvetoAbs(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.60 PathQuadraticCurvetoAbs(c() as GM16PathArgsMBS) 14318
- 89.13.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double) 14318


### 89.13.60 PathQuadraticCurvetoAbs(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.59 PathQuadraticCurvetoAbs(c as GM16PathArgsMBS) 14317
- 89.13.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double) 14318


### 89.13.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.13.59 PathQuadraticCurvetoAbs(c as GM16PathArgsMBS) 14317
- 89.13.60 PathQuadraticCurvetoAbs(c() as GM16PathArgsMBS) 14318


### 89.13.62 PathQuadraticCurvetoRel(c as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.63 PathQuadraticCurvetoRel(c() as GM16PathArgsMBS) 14319
- 89.13.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double) 14319


### 89.13.63 PathQuadraticCurvetoRel(c() as GM16PathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.62 PathQuadraticCurvetoRel(c as GM16PathArgsMBS) 14318
- 89.13.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double) 14319


### 89.13.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.13.62 PathQuadraticCurvetoRel(c as GM16PathArgsMBS) 14318

- 89.13.63 PathQuadraticCurvetoRel(c() as GM16PathArgsMBS) 14319

### 89.13.65 PathSmoothCurvetoAbs(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.13.66 PathSmoothCurvetoAbs(c() as GM16CoordinateMBS) 14320
- 89.13.67 PathSmoothCurvetoAbs(x as Double, y as Double) 14321

### 89.13.66 PathSmoothCurvetoAbs(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.13.65 PathSmoothCurvetoAbs(c as GM16CoordinateMBS) 14320
- 89.13.67 PathSmoothCurvetoAbs(x as Double, y as Double) 14321

### 89.13.67 PathSmoothCurvetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.13.65 PathSmoothCurvetoAbs(c as GM16CoordinateMBS) 14320
- 89.13.66 PathSmoothCurvetoAbs(c() as GM16CoordinateMBS) 14320

### 89.13.68 PathSmoothCurvetoRel(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.13.69 PathSmoothCurvetoRel(c() as GM16CoordinateMBS) 14321
- 89.13.70 PathSmoothCurvetoRel(x as Double, y as Double) 14322

### 89.13.69 PathSmoothCurvetoRel(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was

not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:


- 89.13.68 PathSmoothCurvetoRel(c as GM16CoordinateMBS) 14321
- 89.13.70 PathSmoothCurvetoRel(x as Double, y as Double) 14322


### 89.13.70 PathSmoothCurvetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.13.68 PathSmoothCurvetoRel(c as GM16CoordinateMBS) 14321
- 89.13.69 PathSmoothCurvetoRel(c() as GM16CoordinateMBS) 14321


### 89.13.71 PathSmoothQuadraticCurvetoAbs(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:

- 89.13.72 PathSmoothQuadraticCurvetoAbs(c() as GM16CoordinateMBS) 14323
- 89.13.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double) 14323

### 89.13.72 PathSmoothQuadraticCurvetoAbs(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:

- 89.13.71 PathSmoothQuadraticCurvetoAbs(c as GM16CoordinateMBS) 14322
- 89.13.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double) 14323

### 89.13.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.13.71 PathSmoothQuadraticCurvetoAbs(c as GM16CoordinateMBS) 14322
- 89.13.72 PathSmoothQuadraticCurvetoAbs(c() as GM16CoordinateMBS) 14323

### 89.13.74 PathSmoothQuadraticCurvetoRel(c as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.75 PathSmoothQuadraticCurvetoRel(c() as GM16CoordinateMBS) 14324
- 89.13.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double) 14324


### 89.13.75 PathSmoothQuadraticCurvetoRel(c() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GM16PathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.13.74 PathSmoothQuadraticCurvetoRel(c as GM16CoordinateMBS) 14324
- 89.13.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double) 14324


### 89.13.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous

command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.13.74 PathSmoothQuadraticCurvetoRel(c as GM16CoordinateMBS) 14324
- 89.13.75 PathSmoothQuadraticCurvetoRel(c() as GM16CoordinateMBS) 14324

### 89.13.77 Point(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a point using stroke color and thickness at coordinate.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.fillColor = new GM16ColorRGBMBS("red") // set color

dim draw as GM16GraphicsMBS = image.Graphics

// draw cross with pixels
for x as Integer = 240 to 260
draw.Point(x, 250)
next
for y as Integer = 240 to 260
draw.Point(250,y)
next
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.78 PointSize(pointSize as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set font point size.

### 89.13.79 Polygon(values() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arbitrary polygon using stroke color and thickness consisting of three or more coordinates contained in an array.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.fillColor = new GM16ColorRGBMBS("red") // set color
image.strokeColor = new GM16ColorRGBMBS("green") // set color

dim draw as GM16GraphicsMBS = image.Graphics
dim coordinates(-1) as GM16CoordinateMBS

coordinates.Append new GM16CoordinateMBS(70,70)
coordinates.Append new GM16CoordinateMBS(100,340)
coordinates.Append new GM16CoordinateMBS(380,200)
coordinates.Append new GM16CoordinateMBS(70,70)

draw.Polygon coordinates
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.13.80 Polyline(values() as GM16CoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arbitrary polyline using stroke color and thickness consisting of three or more coordinates contained in an array.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("green") // set color

dim draw as GM16GraphicsMBS = image.Graphics
dim coordinates(-1) as GM16CoordinateMBS
```

```
coordinates.Append new GM16CoordinateMBS(70,70)
coordinates.Append new GM16CoordinateMBS(100,340)
coordinates.Append new GM16CoordinateMBS(380,200)

draw.Polyline coordinates
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.13.81 PopClipPath

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pop (terminate) clip path definition started by PushClipPath.

### 89.13.82 PopGraphicContext

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pop Graphic Context.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorMBS() // transparent fillcolor
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a Rectangle
draw.PushGraphicContext
draw.Translation(250,250)
draw.Rotation(50)
draw.Rectangle(0, 0, 100, 100) // rotated
draw.PopGraphicContext
draw.Rectangle(0, 0, 100, 100) // not rotated
draw.Draw
```

Backdrop=image.CopyPicture

**Notes:** Removing the current graphic context from the graphic context stack restores the options to the values they had prior to the preceding PushGraphicContext operation.

### 89.13.83 PopPattern

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminate a pattern definition started via PushPattern.

### 89.13.84 PushClipPath(id as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Push (create) clip path definition with id.
**Notes:** Clip patch definition consists of subsequent drawing commands, terminated by PopClipPath.

### 89.13.85 PushGraphicContext

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Push Graphic Context.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorMBS() // transparent fillcolor
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a Rectangle
draw.PushGraphicContext
draw.Translation(250,250)
draw.Rotation(50)
draw.Rectangle(0, 0, 100, 100) // rotated
draw.PopGraphicContext
```

```
draw.Rectangle(0, 0, 100, 100) // not rotated
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** When a graphic context is pushed, options set after the context is pushed (such as coordinate transformations, color settings, etc.) are saved to a new graphic context. This allows related options to be saved on a graphic context "stack" in order to support heirarchical nesting of options. When PopGraphicContext is used to pop the current graphic context, the options in effect during the last PushGraphicContext operation are restored.

### 89.13.86 PushPattern(id as string, x as Integer, y as Integer, width as Integer, height as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Start a pattern definition with arbitrary pattern name specified by id, pattern offset specified by x and y, and pattern size specified by width and height.
**Notes:** The pattern is defined within the coordinate system defined by the specified offset and size. Arbitrary drawing objects (including DrawableCompositeImage) may be specified between PushPattern and PopPattern in order to draw the pattern. Normally the pair PushGraphicContext & PopGraphicContext are used to enclose a pattern definition. Pattern definitions are terminated by a PopPattern object.

### 89.13.87 Rectangle(upperLeftX as Double, upperLeftY as Double, lowerRightX as Double, lowerRightY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a rectangle using stroke color and thickness from upper-left coordinates to lower-right coordinates.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a rectangle
```

```
draw.Rectangle(250, 250, 100, 100)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.13.88 Rotation(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set rotation to use when drawing (coordinate transformation).
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Rotation 5
draw.StrokeColor new GM16ColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.89 RoundRectangle(centerX as Double, centerY as Double, width as Double, height as Double, cornerWidth as Double, cornerHeight as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a rounded rectangle using stroke color and thickness, with specified center coordinate, specified width and height, and specified corner width and height.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
```

```
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a round rectangle
draw.RoundRectangle(250, 250, 100, 100,20,20)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.13.90 Scaling(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply scaling in x and y direction while drawing objects (coordinate transformation).
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics
draw.FillColor new GM16ColorRGBMBS("red")

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.StrokeColor new GM16ColorRGBMBS("blue")
draw.Scaling 1.2,1.1
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.91 SkewX(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Skew in X direction (coordinate transformation)
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.SkewX 5
draw.StrokeColor new GM16ColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.92 SkewY(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Skew in Y direction.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.SkewY 5
draw.StrokeColor new GM16ColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw
```

```
Backdrop=image.CopyPicture
```

### 89.13.93 StrokeAntialias(flag as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Antialias while drawing lines or object outlines.

### 89.13.94 StrokeColor(c as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set color to use when drawing lines or object outlines.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.95 StrokeLineCap(LineCap as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the end of open subpaths when they are stroked.
**Notes:** Values of LineCap are UndefinedCap, ButtCap, RoundCap, and SquareCap.

### 89.13.96 StrokeLineJoin(LineJoin as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the corners of paths (or other vector shapes) when they are stroked.
**Notes:** Values of LineJoin are UndefinedJoin, MiterJoin, RoundJoin, and BevelJoin.

### 89.13.97 StrokeOpacity(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opacity to use when drawing lines or object outlines.

### 89.13.98 StrokeWidth(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set width to use when drawing lines or object outlines.

### 89.13.99 Text(x as Double, y as Double, text as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate image with text using stroke color, font, font pointsize, and box color (text background color), at specified coordinates.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

dim draw as GM16GraphicsMBS = image.Graphics

// draw red text
draw.strokeColor(new GM16ColorRGBMBS("red")) // Outline color
draw.strokeWidth(1)
draw.Font("/Library/Fonts/Verdana.ttf")
draw.Text(50, 50, "Hello")
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If text contains special format characters the image filename, type, width, height, or other image attributes may be incorporated in the text (see label).
See also:

- 89.13.100 Text(x as Double, y as Double, text as string, encoding as string) 14335

### 89.13.100 Text(x as Double, y as Double, text as string, encoding as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate image with text represented with text encoding, using current stroke color, font, font pointsize, and box color (text background color), at specified coordinates.
**Notes:** If text contains special format characters the image filename, type, width, height, or other image attributes may be incorporated in the text (see label()).

The text encoding specifies the code set to use for text annotations. The only character encoding which may be specified at this time is "UTF-8" for representing Unicode as a sequence of bytes. Specify an empty string to set text encoding to the system's default. Successful text annotation using Unicode may require fonts designed to support Unicode.

Seems like you need ghostscript or the DPS library for text handling, so it may no be available for you.
See also:

- 89.13.99 Text(x as Double, y as Double, text as string) 14334

### 89.13.101 TextAntialias(flag as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Antialias while drawing text (default true).
**Notes:** The main reason to disable text antialiasing is to avoid adding new colors to the image.

### 89.13.102 TextDecoration(DecorationType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify decoration (e.g. UnderlineDecoration) to apply to text.

### 89.13.103 TextUnderColor(c as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a box under rendered text using the specified color.

### 89.13.104 Translation(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply coordinate translation (set new coordinate origin).
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

draw.StrokeColor new GM16ColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Translation 5,5
draw.StrokeColor new GM16ColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.13.105 Viewbox(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dimensions of the output viewbox.
**Notes:** If the image is to be written to a vector format (e.g. MVG or SVG), then a PushGraphicContext() object should be pushed to the head of the list, followed by a Viewbox() statement to establish the output canvas size. A matching PopGraphicContext() object should be pushed to the tail of the list.

### 89.13.106 Properties

### 89.13.107 Image as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image this graphics object belongs to.
**Notes:** (Read only property)

## 89.14 class GM16ImageArrayMBS

### 89.14.1 class GM16ImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an array of images in GraphicsMagick.
**Example:**

```
// extract all layers of photoshop file
dim file as FolderItem = SpecialFolder.Desktop.Child("test.psd")
dim images as new GM16ImageArrayMBS

images.readImages(file.NativePath)

dim c as Integer = images.size
for i as Integer = 0 to c-1
dim image as GM16ImageMBS = images.Image(i)
file = SpecialFolder.Desktop.Child(image.FileName+"."+str(i)+".png")
image.write(file)
next
```

**Notes:** Can be used to assemble/disassemble gif images.

### 89.14.2 Methods

### 89.14.3 animateImages

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Animate a sequence of image frames.
**Notes:** Image frames are displayed in succession, creating an animated effect. The animation options are taken from the first image frame. This feature is only supported under X11 at the moment.

### 89.14.4 append(image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the end of the array.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
```

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// put copy of first image on the back
dim n as GM16ImageMBS = g.FirstImage
g.append n

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Instead of gif, you can also use tif files.

### 89.14.5 appendImages(stack as boolean = false) as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Append a sequence of image frames, writing the result to new image.
**Notes:** All the input image frames must have the same width or height. Image frames of the same width are stacked top-to-bottom. Image frames of the same height are stacked left-to-right. If the stack parameter is false, rectangular image frames are stacked left-to-right otherwise top-to-bottom.

### 89.14.6 averageImages as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average a sequence of image frames, writing the result to averagedImage.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// averageImages
dim n as GM16ImageMBS = g.averageImages
Backdrop = n.CopyPicture
```

**Notes:** All the input image frames must be the same size in pixels.

### 89.14.7 coalesceImages as GM16ImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a coalesced image sequence obtained by "playing" the image sequence (observing page offsets and disposal methods) to create a new image sequence in which all frames are full size and completely rendered.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// deconstruct
g = g.coalesceImages

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** Note that if the original image sequence relied on page offsets and disposal methods that the resulting sequence will be larger (perhaps much larger) then the original. This is useful for GIF animation sequences that have page offsets and disposal methods. The resuting image sequence is returned.

### 89.14.8 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty image array.

### 89.14.9 deconstructImages as GM16ImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Break down an image sequence into constituent parts.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// deconstruct
```

```
g = g.deconstructImages

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** This is useful for creating GIF or MNG animation sequences.

### 89.14.10 displayImages

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Display a sequence of image frames.
**Notes:** Through use of a pop-up menu, image frames may be selected in succession. This feature is fully supported under X11 but may have only limited support in other environments.
Caution: if an image format is is not compatable with the display visual (e.g. JPEG on a colormapped display) then the original image will be altered. Use a copy of the original if this is a problem.

display methods are not supported currently.

### 89.14.11 FirstImage as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns first image in array.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// show first image
dim img as GM16ImageMBS = g.FirstImage

// convert to true color for CopyPicture to work
const TrueColorType=6
img.type=TrueColorType

Backdrop = img.CopyPicture
```

### 89.14.12 flattenImages as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Merge a sequence of image frames which represent image layers into a single composited representation.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// put copy of first image on the back
dim n as GM16ImageMBS = g.flattenImages

Backdrop = n.CopyPicture
```

**Notes:** Returns the flattened image. This function is useful for combining Photoshop layers into a single image.

### 89.14.13 Image(index as Integer) as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image with given index.

### 89.14.14 insert(image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts an image on the front.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// put copy of first image on the front
dim n as GM16ImageMBS = g.FirstImage
g.insert n

// write to file
```

```
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

### 89.14.15 LastImage as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns last image in array.

### 89.14.16 mapImages(map as GM16ImageMBS, dither as boolean = true, measureError as boolean = false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace the colors of a sequence of images with the closest color from a reference image.
**Notes:** Set dither to true to enable dithering. Set measureError to true in order to evaluate quantization error.

### 89.14.17 montageImages(options as GM16MontageMBS) as GM16ImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a composite image by combining several separate image frames.
**Example:**

```
// build montage
dim StackingMontage as New GM16MontageMBS
StackingMontage.backgroundColor = New GM16ColorMBS(&cE7E7E7)
StackingMontage.fillColor = New GM16ColorMBS(&c000000)
StackingMontage.tile = New GM16GeometryMBS("1x20")
StackingMontage.geometry = New GM16GeometryMBS("160x120+5+5")
StackingMontage.font = "Helvetica"
StackingMontage.pointSize = 12
StackingMontage.title = "Title goes here"

// make picture
dim logo as Picture = LogoMBS(500)
dim image as New GM16ImageMBS(logo)

image.label("Sample label")
```

```
// Put the current image into the array
Dim StackingFrames As new GM16ImageArrayMBS
StackingFrames.insert(image)

// show result
dim resultImages as GM16ImageArrayMBS = StackingFrames.montageImages(StackingMontage)
Backdrop = resultImages.Image(0).CopyPicture
```

**Notes:** Multiple frames may be generated in the output array depending on the tile setting and the number of image frames montaged. Montage options are provided via the parameter options. Options set in the first image frame (backgroundColor, borderColor, matteColor, fillColor, strokeColor, font and fontPointsize) are also used as options by montageImages().

### 89.14.18 morphImages(frames as Integer) as GM16ImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Morph a seqence of image frames.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// coalesce to make sure we have full images
g = g.coalesceImages
// morph to 10 pictures
g = g.morphImages(10)

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** This algorithm expands the number of image frames (output to the new image array) by adding the number of intervening frames specified by frames such that the original frames morph (blend) into each other when played as an animation.

### 89.14.19 mosaicImages as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inlay a number of images to form a single coherent picture.
**Notes:** The result image argument is updated with a mosaic constructed from the image sequence.

### 89.14.20 quantizeImages(measureError as boolean = false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quantize colors in images using current quantization settings.
**Notes:** Set measureError to true in order to measure quantization error.

### 89.14.21 readImages(blob as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read a sequence of image frames into existing container (appending to array) from blob.
See also:

- 89.14.22 readImages(imageSpec as string) 14345

### 89.14.22 readImages(imageSpec as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read a sequence of image frames into existing container (appending to array) with image names specified in the string imageSpec.
See also:

- 89.14.21 readImages(blob as GM16BlobMBS) 14345

### 89.14.23 remove(index as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the image with the given index.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)
```

```
// remove first
g.remove 0

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Index should be between 0 and size-1.

### 89.14.24 reverse

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the order of images in the array.

### 89.14.25 writeImages(blob as GM16BlobMBS, adjoin as boolean = true)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes images to the given blob object.
**Notes:** Write images in container to in-memory BLOB specified by Blob blob. Set adjoin to false to write a set of image frames via a wildcard imageSpec (e.g. image%02d.miff).
Caution: if an image format is selected which is capable of supporting fewer colors than the original image or quantization has been requested, the original image will be quantized to fewer colors. Use a copy of the original if this is a problem.
See also:

- 89.14.26 writeImages(imageSpec as string, adjoin as boolean = true) 14346

### 89.14.26 writeImages(imageSpec as string, adjoin as boolean = true)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes images to the given path.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)
```

```
// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Write images in container to file specified by string imageSpec. Set adjoin_ to false to write a set of image frames via a wildcard imageSpec (e.g. image%02d.miff).
The wildcard must be one of %0Nd, %0No, or %0Nx.
Caution: if an image format is selected which is capable of supporting fewer colors than the original image or quantization has been requested, the original image will be quantized to fewer colors. Use a copy of the original if this is a problem.
See also:

- 89.14.25 writeImages(blob as GM16BlobMBS, adjoin as boolean = true) 14346

### 89.14.27 Properties

### 89.14.28 empty as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether image array is empty.
**Notes:** Returns true if array is empty or false if not.
(Read only property)

### 89.14.29 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle of the image array.
**Notes:** Should always be non zero.
(Read and Write property)

### 89.14.30 size as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of images in this array.
**Example:**

```
// read gif
dim g as new GM16ImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// display number of images
MsgBox str(g.size)
```

**Notes:** (Read only property)

## 89.15 class GM16ImageChannelStatisticsMBS

### 89.15.1 class GM16ImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The statistics for image channel.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim stat as GM16ImageStatisticsMBS = g.statistics
dim gs as GM16ImageChannelStatisticsMBS = stat.blue

MsgBox "blue channel: "+str(gs.minimum)+"-"+str(Gs.maximum)+", mean "+str(gs.mean)
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 89.15.2 Methods

### 89.15.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 89.15.4 Properties

### 89.15.5 maximum as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value observed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim stat as GM16ImageStatisticsMBS = g.statistics
dim gs as GM16ImageChannelStatisticsMBS = stat.green

MsgBox "maximum green color: "+str(gs.maximum)
```

**Notes:** (Read only property)

### 89.15.6 mean as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average (mean) value observed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim stat as GM16ImageStatisticsMBS = g.statistics
dim r as GM16ImageChannelStatisticsMBS = stat.red

MsgBox "mean red color: "+str(R.mean)
```

**Notes:** (Read only property)

### 89.15.7 minimum as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value observed.
**Notes:** (Read only property)

### 89.15.8 standardDeviation as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Standard deviation, sqrt(variance).
**Notes:** (Read only property)

### 89.15.9 variance as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Variance.

**Notes:** (Read only property)

## 89.16 class GM16ImageMBS

### 89.16.1 class GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image is the primary object in Magick++ and represents a single image frame (see image design).
**Example:**

```
dim c as new GM16ColorMBS("white")
dim g as new GM16GeometryMBS(100,100)
dim image as new GM16ImageMBS(g, c)
```

**Notes:** With MBS Plugin 14.0 we offer this classes in 8bit (GM prefix) or 16bit (GM16 prefix).

The GM16ImageArrayMBS class must be used to operate on image sequences or images (e.g. of format GIF, TIFF, MIFF, Postscript, & MNG) which are comprized of multiple image frames. Individual frames of a multi-frame image may be requested by adding array-style notation to the end of the file name (e.g. "animation.gif [ 3 ] " retrieves the fourth frame of a GIF animation. Various image manipulation operations may be applied to the image. Attributes may be set on the image to influence the operation of the manipulation operations. The GM16PixelsMBS class provides low-level access to image pixels.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- News from the MBS Xojo Plugins Version 23.2
- Change brightness saturation and hue by Magick
- News from the MBS Xojo Plugins Version 20.4
- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr5
- MBS Xojo / Real Studio Plugins, version 15.1pr4
- MBS Xojo / Real Studio Plugins, version 15.0pr9

**Xojo Developer Magazine**

- 20.2, pages 82 to 83: Wifi QR Code, Embedding your Wifi password in a QR code by Stefanie Juchmes

### 89.16.2 Methods

### 89.16.3 adaptiveThreshold(width as UInt32, height as UInt32, offset as double = 0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply adaptive thresholding to the image.
**Notes:** see:
http://www.dai.ed.ac.uk/HIPR2/adpthrsh.htm

Adaptive thresholding is useful if the ideal threshold level is not known in advance, or if the illumination gradient is not constant across the image. Adaptive thresholding works by evaulating the mean (average) of a pixel region (size specified by width and height) and using the mean as the thresholding value. In order to remove residual noise from the background, the threshold may be adjusted by subtracting a constant offset (default zero) from the mean to compute the threshold.

### 89.16.4 addNoise(noise as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add noise to image with the specified noise type.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.addNoise(image.GaussianNoise)

Backdrop=image.CopyPicture
```

**Notes:** Use one of this constants: GaussianNoise, ImpulseNoise, LaplacianNoise, MultiplicativeGaussianNoise, PoissonNoise, UniformNoise.

### 89.16.5 addNoiseChannel(channel as Integer, noise as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add noise to an image channel with the specified noise type. The channel parameter specifies the channel to add noise to.
**Example:**

```
dim p as Picture = LogoMBS(500)
```

```
dim image as new GM16ImageMBS(p)

image.addNoiseChannel(image.BlueChannel, image.ImpulseNoise)

Backdrop=image.CopyPicture
```

**Notes:** The noiseType parameter specifies the type of noise.
Use one of this constants: GaussianNoise, ImpulseNoise, LaplacianNoise, MultiplicativeGaussianNoise, PoissonNoise, UniformNoise.

### 89.16.6 affineTransform(sx as Double, sy as Double, rx as Double, ry as Double, tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies an affine transformation to the drawing matrix.
**Notes:** Specify a transformation matrix to adjust scaling, rotation, and translation (coordinate transformation) for subsequently drawn objects in the same or decendent drawing context. The sx & sy parameters represent the x & y scale factors, the rx & ry parameters represent the x & y rotation, and the tx & ty parameters represent the x & y translation.

### 89.16.7 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate using specified text, bounding area, and placement gravity.
**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:


- 89.16.8 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer, degrees as Double) 14355
- 89.16.9 annotate(text as string, gravity as Integer) 14356
- 89.16.10 annotate(text as string, location as GM16GeometryMBS) 14357


### 89.16.8 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer, degrees as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate with text using specified text, bounding area, placement gravity, and rotation.
**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:


- 89.16.7 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer) 14354
- 89.16.9 annotate(text as string, gravity as Integer) 14356
- 89.16.10 annotate(text as string, location as GM16GeometryMBS) 14357


### 89.16.9 annotate(text as string, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate with text (bounding area is entire image) and placement gravity.
**Example:**

```
dim White as new GM16ColorGrayMBS(1)
dim Black as new GM16ColorGrayMBS(0)
dim geo as new GM16GeometryMBS("300x200")

dim g as new GM16ImageMBS(geo, White)

g.antiAlias = False
g.fillColor = Black
g.lineWidth = 1
g.strokeColor = Black
g.font = "@/Library/Fonts/Tahoma.ttf"
g.fontPointsize = 15

g.annotate("Hello World", g.SouthGravity)

Backdrop = g.CopyPicture
```

**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:


- 89.16.7 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer) 14354
- 89.16.8 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer, degrees as Double) 14355
- 89.16.10 annotate(text as string, location as GM16GeometryMBS) 14357


### 89.16.10 annotate(text as string, location as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate using specified text, and placement location.
**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:

- 89.16.7 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer) 14354
- 89.16.8 annotate(text as string, boundingArea as GM16GeometryMBS, gravity as Integer, degrees as Double) 14355
- 89.16.9 annotate(text as string, gravity as Integer) 14356

### 89.16.11 attributeValues as dictionary

MBS GraphicsMagick Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A dictionary with all attributes.
**Notes:** As attributes are created on demand, this will only return all so far generated attributes.

### 89.16.12 autoOrient

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Orient image to be right-side up based on its current orientation attribute.
**Notes:** This allows the image to be viewed correctly when the orientation attribute is not available, or is not respected.

### 89.16.13 blur(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur an image with the specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.blur(30,10)

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.14 blurChannel(channel as Integer, radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur an image channel with the specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.blurChannel(image.BlueChannel, 30,10)

Backdrop=image.CopyPicture
```

**Notes:** The channel parameter specifies the channel to modify. The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.15 border

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border image (add border to image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.border

Backdrop=image.CopyPicture
```

**Notes:** The color of the border is specified by the borderColor attribute.
See also:

- 89.16.16 border(geometry as GM16GeometryMBS) 14360

### 89.16.16 border(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border image (add border to image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.border GM16GeometryMBS.Make(10,10)

Backdrop=image.CopyPicture
```

**Notes:** The color of the border is specified by the borderColor attribute.
See also:

- 89.16.15 border 14360

### 89.16.17 borderGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for border.

### 89.16.18 cacheThreshold(threshold as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pixel cache threshold in megabytes.
**Notes:** Once this memory threshold is exceeded, all subsequent pixels cache operations are to/from disk. This setting is shared by all Image objects.

### 89.16.19 cdl(cdl as string)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bake in the ASC-CDL.
**Notes:** Bake in the ASC-CDL, which is a convention for the for the exchange of basic primary color grading information between for the exchange of basic primary color grading information between equipment and software from different manufacturers. It is a useful transform for other purposes as well.

### 89.16.20 channel(channel as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract channel from image.
**Notes:** Use this option to extract a particular channel from the image. MatteChannel for example, is useful for extracting the opacity values from an image.

### 89.16.21 charcoal(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Charcoal effect image (looks like charcoal sketch).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.charcoal

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.22 chop(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chop image (remove vertical or horizontal subregion of image).

### 89.16.23 colorHistogram as dictionary

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates histogram.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim d as Dictionary = g.colorHistogram

MsgBox str(d.Count)+" color"

// check first color
dim c as GM16ColorMBS = d.key(0)

MsgBox "Color "+str(c.colorValue)+": "+str(d.Value(c))
```

**Notes:** The dictionary has a GM16ColorMBS/GMColor16MBS object as key for each color and an unsigned integer as value.

### 89.16.24 colorize(opacity as UInt32, penColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorize image with pen color, using specified percent opacity.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.colorize(10, new GM16ColorMBS("red"))

Backdrop=image.CopyPicture
```

See also:

- 89.16.25 colorize(opacityRed as UInt32, opacityGreen as UInt32, opacityBlue as UInt32, penColor as GM16ColorMBS) 14363


### 89.16.25 colorize(opacityRed as UInt32, opacityGreen as UInt32, opacityBlue as UInt32, penColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorize image with pen color, using specified percent opacity for red, green, and blue quantums.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.colorize(10, 0, 5, new GM16ColorMBS("red"))

Backdrop=image.CopyPicture
```

See also:


- 89.16.24 colorize(opacity as UInt32, penColor as GM16ColorMBS) 14362


### 89.16.26 colorMap as GM16ColorMBS()

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array with all colors in color map.
See also:


- 89.16.309 colorMap(index as UInt32) as GM16ColorMBS 14464


### 89.16.27 colorMatrix(order as Integer, ColorMatrix() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply a color matrix to the image channels.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

dim m(8) as Double

m(0) = 0.25
m(1) = 0
```

```
m(2) = 0.25

m(3) = 0
m(4) = 0
m(5) = 0

m(6) = 0.25
m(7) = 0
m(8) = 0.25

g.colorMatrix 3, m

Backdrop = g.CopyPicture
```

**Notes:** The user supplied matrix may be of order 1 to 5 (1x1 through 5x5).

### 89.16.28 CombinePictureWithMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image with mask.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

dim c as new GM16ColorMBS("white")
image.transparent(c)

Backdrop=image.CombinePictureWithMask
```

**Notes:** Internally this calls Width and Height, CopyPicture and CopyMask.

### 89.16.29 compare(image as GM16ImageMBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compare current image with another image.
**Notes:** Sets meanErrorPerPixel, normalizedMaxError, and normalizedMeanError in the current image. False is returned if the images are identical. An ErrorOption exception is thrown if the reference image columns, rows, colorspace, or matte differ from the current image:

### 89.16.30 composite(compositeImage as GM16ImageMBS, gravity as Integer, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.16.31 compositeAt(compositeImage as GM16ImageMBS, offset as GM16GeometryMBS, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.16.32 compositeXY(compositeImage as GM16ImageMBS, xOffset as Integer, yOffset as Integer, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.16.33 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GM16ImageMBS
dim blob as new GM16BlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

See also:


- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.34 Constructor(blob as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image from in-memory Blob.
See also:


- 89.16.33 Constructor 14365
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373

### 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size from in-memory Blob.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size and depth from in-memory Blob.
See also:


- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370

- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size, depth, and format from in-memory Blob.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size, depth, and format from in-memory Blob.
**Example:**

```
// first open file and read data in blob
SVG_File = FolderItem.ShowOpenFileDialog("")
If SVG_File = Nil Then Return
```

```
dim stream as BinaryStream = BinaryStream.Open(SVG_File)
dim data as string = stream.Read(stream.Length)
dim blob as new GM16BlobMBS(data)

// 400 width and 400 height
Dim geo As New GM16GeometryMBS(400, 400, 0, 0)

// pass type here to have GraphicsMagick know it since there is no file name in blob:
dim g as New GM16ImageMBS(blob, geo, "svg")
```

See also:

- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373

### 89.16.39 Constructor(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct from image file.
See also:

- 89.16.33 Constructor 14365
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367

- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.40 Constructor(other as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an image by making a copy of the existing one.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373

### 89.16.41 Constructor(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct from image file or image specification.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.42 Constructor(pic as picture)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new GMImage with the given picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)
Backdrop=image.CopyPicture
```

**Notes:** Pixels from both the picture and picture's mask.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367

- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct a blank image canvas of specified size and color.
**Example:**

```
dim g as new GM16GeometryMBS(600,600)
dim c as new GM16ColorRGBMBS(1.0,0.0,0.0) // red
dim image as new GM16ImageMBS(g, c)

const TrueColorType=6

// Ensure that there are no other references to this image.
image.modifyImage
// Set the image type to TrueColor DirectClass representation.
image.type=TrueColorType

Backdrop=image.CopyPicture(0,0,600,600)
```

See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367

- 89.16.37 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14373


### 89.16.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes single image frame from an array of raw pixels, with specified storage type (ConstituteImage).
**Example:**

```
dim data as new memoryblock(2048*2048) // your data
dim image as new GM16ImageMBS(2048, 2048, "I", GM16ImageMBS.StorageTypeCharPixel, data)
```

**Notes:** Returns an Image corresponding to an image stored in a raw memory array format. The pixel data must be in scanline order top-to-bottom. The data can be unsigned char, unsigned short int, unsigned int, unsigned long, float, or double. Float and double require the pixels to be normalized to the range [ 0..1 ] , otherwise the range is [ 0..MaxVal ] where MaxVal is the maximum possible value for that type.

Note that for most 32-bit architectures the size of an unsigned long is the same as unsigned int, but for 64-bit architectures observing the LP64 standard, an unsigned long is 64 bits, while an unsigned int remains 32 bits. This should be considered when deciding if the data should be described as "Integer" or "Long".

For example, to create a 640x480 image from unsigned red-green-blue character data, use

image = new GM16ImageMBS(640, 480, "RGB", GM16ImageMBS.StorageTypeCharPixel, pixels);

width: width in pixels of the image.
height: height in pixels of the image.
map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (same as Transparency), O = Opacity, T = Transparency, C = cyan, Y = yellow, M = magenta, K = black, or I = intensity (for grayscale). Specify "P" = pad, to skip over a quantum which is intentionally ignored. Creation of an alpha channel for CMYK images is currently

not supported.
type: Define the data type of the pixels. Float and double types are expected to be normalized [ 0..1 ] otherwise [ 0..MaxRGB ] . Choose from these types: StorageTypeCharPixel, StorageTypeShortPixel, StorageTypeIntegerPixel, StorageTypeLongPixel, StorageTypeFloatPixel, or StorageTypeDoublePixel.
pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.
See also:


- 89.16.33 Constructor 14365
- 89.16.34 Constructor(blob as GM16BlobMBS) 14366
- 89.16.35 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS) 14367
- 89.16.36 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, depth as UInt32) 14367
- 89.16.38 Constructor(blob as GM16BlobMBS, geometry as GM16GeometryMBS, Magick as string) 14368
- 89.16.39 Constructor(file as folderitem) 14369
- 89.16.40 Constructor(other as GM16ImageMBS) 14370
- 89.16.41 Constructor(Path as string) 14371
- 89.16.42 Constructor(pic as picture) 14371
- 89.16.43 Constructor(size as GM16GeometryMBS, ColorValue as GM16ColorMBS) 14372


### 89.16.45 contrast(sharpen as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Contrast image (enhance intensity differences in image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.contrast(10)

Backdrop=image.CopyPicture
```

### 89.16.46 convolve(order as Integer, ColorMatrix() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convolve image.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

dim m(8) as Double

m(0) = 0.25
m(1) = 0
m(2) = 0.25

m(3) = 0
m(4) = 0
m(5) = 0

m(6) = 0.25
m(7) = 0
m(8) = 0.25

g.convolve 3, m

Backdrop = g.CopyPicture
```

**Notes:** Applies a user-specified convolution to the image.
order represents the number of columns and rows in the filter kernel.
kernel is an array of doubles representing the convolution kernel.

### 89.16.47 CopyPicture as picture

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image and returns it as a new picture.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics
```

```
// Draw a circle
draw.Rectangle(250, 250, 100, 100)

Backdrop=image.CopyPicture
```

**Notes:** You may need to set image type to RGB to get it working.
See also:

- 89.16.48 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 14376

### 89.16.48 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image and returns it as a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.threshold 127

// convert to RGB so CopyPicture works
image.type = image.TrueColorType
Backdrop=image.CopyPicture(0,0,250,250)
```

**Notes:** You may need to set image type to RGB to get it working.
See also:

- 89.16.47 CopyPicture as picture 14375

### 89.16.49 CopyPictureMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image's mask and returns it as a new picture.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim g As New GM16ImageMBS(f)

// get image with mask
Dim p As picture = g.CopyPicture
```

p.mask = g.CopyPictureMask

window1.Backdrop = p

See also:

- 89.16.50 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 14377

### 89.16.50 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image's mask and returns it as a new picture.
See also:

- 89.16.49 CopyPictureMask as picture 14376

### 89.16.51 CopyPixelsMemory as Memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the pixels as they are into a memoryblock.
**Notes:** Optional specify rectangle.
Returns nil on low memory or bad parameter. Image must be of type class direct (not palette picture).
Order of pixel data is normally Red, Green, Blue, Opacity. Or Cyan, Magenta, Yellow, Black for CMYK images.
For GM16ImageMBS, the data is 8bit per channel. For GMImage16MBS, the data is 16bit per channel.
See also:

- 89.16.52 CopyPixelsMemory(x as Integer, y as Integer, width as Integer, height as Integer) as Memoryblock 14377

### 89.16.52 CopyPixelsMemory(x as Integer, y as Integer, width as Integer, height as Integer) as Memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the pixels as they are into a memoryblock.
**Notes:** Optional specify rectangle.
Returns nil on low memory or bad parameter. Image must be of type class direct (not palette picture).
Order of pixel data is normally Red, Green, Blue, Opacity. Or Cyan, Magenta, Yellow, Black for CMYK

images.
For GM16ImageMBS, the data is 8bit per channel. For GMImage16MBS, the data is 16bit per channel.
See also:

- 89.16.51 CopyPixelsMemory as Memoryblock 14377

### 89.16.53 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Creates a HBITMAP for the image for use with Windows Declares.
**Example:**

```
// get test image
dim logo as Picture = LogoMBS(500)

// create GraphicsMagick image
dim g as new GM16ImageMBS(logo)

// make a HBitmap
dim hBitmap as ptr = g.CreateHBITMAP

// convert back to Xojo picture
dim pic as Picture = WindowsBitmapMBS.HBitmapToPicture(hBitmap, true)

// show in window
Backdrop = pic

// and cleanup memory
WindowsBitmapMBS.DeleteBitmap(hBitmap)
```

**Notes:** The HBITMAP returned needs to be freed when you are done with it or you risk having a memory leak.

### 89.16.54 crop(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop image (return subregion of original image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.crop GM16GeometryMBS.Make(100,200)
```

Backdrop=image.CopyPicture

### 89.16.55 cycleColormap(amount as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cycle (rotate) image colormap.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.cycleColormap(5)

image.type = image.TrueColorType

Backdrop=image.CopyPicture
```

### 89.16.56 Describe(verbose as Integer = 1) as String

MBS GraphicsMagick Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Describes an image by printing its attributes.
**Example:**

```
Dim f As FolderItem = FindFile("test.jpg")

Dim g As New GM16ImageMBS(f)
Dim s As String = g.Describe(2)
Break
```

**Notes:** Attributes include the image width, height, size, and others.

verbose: Whether output should be verbose.
Default is 1. Pass 0 to get a shorted output.
Pass 2 to count the number of colors in the image.

### 89.16.57 despeckle

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Despeckle image (reduce speckle noise).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.despeckle

Backdrop=image.CopyPicture
```

### 89.16.58 display

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Display image on screen.
**Notes:** Caution: if an image format is is not compatible with the display visual (e.g. JPEG on a colormapped display) then the original image will be altered. Use a copy of the original if this is a problem.

The plugin is not compiled with X11 so this call may not be useful.

### 89.16.59 edge(radius as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Edge image (hilight edges in image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.edge

Backdrop=image.CopyPicture
```

**Notes:** The radius is the radius of the pixel neighborhood. Specify a radius of zero for automatic radius selection.

### 89.16.60 emboss(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Emboss image (hilight edges with 3D effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.emboss

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.61 enhance

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhance image (minimize noise).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.enhance

Backdrop=image.CopyPicture
```

### 89.16.62 erase

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set all image pixels to the current background color.

### 89.16.63 extent(geo as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// extend image to fit
dim geo as new GM16GeometryMBS(500,500)
image.extent geo

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.16.64 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS) 14382
- 89.16.65 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS, gravity as Integer) 14383
- 89.16.66 extent(geo as GM16GeometryMBS, gravity as Integer) 14383


### 89.16.64 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// extend image to fit
dim geo as new GM16GeometryMBS(500,500)
dim col as GM16ColorMBS = GM16ColorMBS.Black
image.extent geo, col

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.16.63 extent(geo as GM16GeometryMBS) 14381
- 89.16.65 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS, gravity as Integer) 14383
- 89.16.66 extent(geo as GM16GeometryMBS, gravity as Integer) 14383


### 89.16.65 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// extend image to fit
dim geo as new GM16GeometryMBS(500,500)
dim col as GM16ColorMBS = GM16ColorMBS.Black
image.extent geo, col

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.16.63 extent(geo as GM16GeometryMBS) 14381
- 89.16.64 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS) 14382
- 89.16.66 extent(geo as GM16GeometryMBS, gravity as Integer) 14383


### 89.16.66 extent(geo as GM16GeometryMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// resize proportionally to fit
dim geo as new GM16GeometryMBS(500,500)
image.extent geo, image.CenterGravity

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:

- 89.16.63 extent(geo as GM16GeometryMBS) 14381
- 89.16.64 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS) 14382
- 89.16.65 extent(geo as GM16GeometryMBS, backgroundColor as GM16ColorMBS, gravity as Integer) 14383

### 89.16.67 flip

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip image (reflect each scanline in the vertical direction).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.flip

Backdrop=image.CopyPicture
```

### 89.16.68 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:


- 89.16.69 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14385
- 89.16.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14385
- 89.16.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14386


### 89.16.69 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match:
See also:


- 89.16.68 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14384
- 89.16.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14385
- 89.16.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14386


### 89.16.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:


- 89.16.68 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14384
- 89.16.69 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14385
- 89.16.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14386

### 89.16.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match:
See also:


- 89.16.68 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14384
- 89.16.69 floodFillColor(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14385
- 89.16.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14385


### 89.16.72 floodFillOpacity(x as UInt32, y as UInt32, opacity as UInt32, PaintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill pixels matching color (within fuzz factor) of target pixel(x,y) with replacement opacity value using method.

### 89.16.73 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:


- 89.16.74 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387
- 89.16.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14387
- 89.16.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387

### 89.16.74 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.16.73 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14386
- 89.16.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14387
- 89.16.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387

### 89.16.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.16.73 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14386
- 89.16.74 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387
- 89.16.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387

### 89.16.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.16.73 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS) 14386
- 89.16.74 floodFillTexture(point as GM16GeometryMBS, fillColor as GM16ColorMBS, borderColor as GM16ColorMBS) 14387
- 89.16.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GM16ColorMBS) 14387

### 89.16.77 flop

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flop image (reflect each scanline in the horizontal direction).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.flop

Backdrop=image.CopyPicture
```

### 89.16.78 FontMap as string

MBS GraphicsMagick Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current font map in use.
**Notes:** The MBS Plugin provides to GraphicsMagick the font map to use.
This is a XML defining which fonts are available.
Use this function to learn what fonts may be available or debug to see why a font doesn't load.

### 89.16.79 fontTypeMetrics(name as string) as GM16TypeMetricMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain font metrics for text string given current font, pointsize, and density settings.

### 89.16.80 formatExpression(expression as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format the specified expression similar to command line '-format'.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** For example "%wx%h" is converted to a string containing image WIDTHxHEIGHT like "640x480".

### 89.16.81 frame

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.frame

Backdrop=image.CopyPicture
```

See also:

- 89.16.82 frame(geometry as GM16GeometryMBS) 14389
- 89.16.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6) 14390

### 89.16.82 frame(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.frame(GM16GeometryMBS.Make("10x10"))

Backdrop=image.CopyPicture
```

See also:

- 89.16.81 frame 14389
- 89.16.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6) 14390

### 89.16.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.frame(15,15)

Backdrop=image.CopyPicture
```

See also:


- 89.16.81 frame 14389
- 89.16.82 frame(geometry as GM16GeometryMBS) 14389


### 89.16.84 frameGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for frame.

### 89.16.85 gamma(gammaRed as Double, gammaGreen as Double, gammaBlue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma correct the image or individual image channels.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.gamma(1,2,3)

Backdrop=image.CopyPicture
```

See also:

• 89.16.252 gamma as Double 14447

### 89.16.86 gaussianBlur(width as Double, sigma as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gaussian blur image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.gaussianBlur(30, 10)

Backdrop=image.CopyPicture
```

**Notes:** The number of neighbor pixels to be included in the convolution mask is specified by width. The standard deviation of the gaussian bell curve is specified by sigma

### 89.16.87 gaussianBlurChannel(channel as Integer, width as Double, sigma as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gaussian blur image channel.
**Notes:** The number of neighbor pixels to be included in the convolution mask is specified by width. The standard deviation of the gaussian bell curve is specified by sigma.

### 89.16.88 getChromaBluePrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity blue primary point.

### 89.16.89 getchromaGreenPrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity green primary point.
**Notes:** e.g. x=0.3, y=0.6

### 89.16.90 getchromaRedPrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity red primary point
**Notes:** e.g. x=0.64, y=0.33

### 89.16.91 getchromaWhitePoint(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity white point
**Notes:** e.g. x=0.3127, y=0.329

### 89.16.92 getConstPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers read-only pixels from the image to the pixel cache as defined by the specified region

### 89.16.93 GetEXIFOrientation(byref orientation as integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries orientation from EXIF.
**Notes:** Orientation is set to number from 0 to 8 depending on rotation. -1 if unknown.
This function can only read orientation, if there is an EXIF block in image.
Returns true for success and false for failure.

For new development, please use ExifTagsMBS class instead.

### 89.16.94 getPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers pixels from the image to the pixel cache as defined by the specified region.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

// get pointer to some pixels to write
dim x as ptr = g.getPixels(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
g.syncPixels

// show
me.Backdrop = g.CopyPicture
```

**Notes:** Modified pixels may be subsequently transferred back to the image via syncPixels. This method is valid for DirectClass images.

### 89.16.95 Graphics as GM16GraphicsMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a graphics object for this image.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** Using the graphics object you can draw on the image.

### 89.16.96 haldClut(image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply a color lookup table (Hald CLUT) to the image.

### 89.16.97 Hash(Size as Integer = 8) as String

MBS GraphicsMagick Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a hash of the image.
**Example:**

```
Dim p As Picture = LogoMBS(500)
Dim g As New GM16ImageMBS(p)
msgbox g.Hash
```

**Notes:** Hash is returned as 64 characters being 1 or 0.
We convert image to 8x8, turn grayscale and check if pixels are above or below mean value.
This hash is quite immune against resizing, compression artifacts and hue changes.
You can use LevenshteinDistanceMBS or JaroWinklerDistanceMBS to compare two hashes.

Added size parameter for version 22.4:
The size of the bitmap. Value from 8 to 1024. Default is 8.

### 89.16.98 implode(factor as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Implode image (special effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.implode(0.3)

Backdrop=image.CopyPicture
```

### 89.16.99 IsLoggingEnabled as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether logging is enabled.
**Notes:** Returns true if we log GraphicsMagick usage.

### 89.16.100 JasperLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for jasper library.

### 89.16.101 label(text as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assign a label to an image.
**Notes:** Use this option to assign a specific label to the image. Optionally you can include the image filename, type, width, height, or scene number in the label by embedding special format characters. If the first character of string is @, the image label is read from a file titled by the remaining characters in the string. When converting to Postscript, use this option to specify a header string to print above the image.
See also:

- 89.16.263 label as string 14450

### 89.16.102 level(black_point as Double, white_point as Double, mid_point as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Level image to increase image contrast, and/or adjust image gamma.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.level(0, 127.0)

Backdrop=image.CopyPicture
```

**Notes:** Adjust the levels of the image by scaling the colors falling between specified white and black points to the full available quantum range. The parameters provided represent the black, mid (gamma), and white

points. The black point specifies the darkest color in the image. Colors darker than the black point are set to zero. Mid point (gamma) specifies a gamma correction to apply to the image. White point specifies the lightest color in the image. Colors brighter than the white point are set to the maximum quantum value. The black and white point have the valid range 0 to MaxRGB while mid (gamma) has a useful range of 0 to ten:

### 89.16.103 levelChannel(channel as Integer, black_point as Double, white_point as Double, mid_point as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Level image channel to increase image contrast, and/or adjust image gamma.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.levelChannel(image.BlueChannel, 0, 127.0)

Backdrop=image.CopyPicture
```

**Notes:** Adjust the levels of the image channel by scaling the colors falling between specified white and black points to the full available quantum range. The parameters provided represent the black, mid (gamma), and white points. The black point specifies the darkest color in the image. Colors darker than the black point are set to zero. Mid point (gamma) specifies a gamma correction to apply to the image. White point specifies the lightest color in the image. Colors brighter than the white point are set to the maximum quantum value. The black and white point have the valid range 0 to MaxRGB while mid (gamma) has a useful range of 0 to ten.

### 89.16.104 LibVersion as String

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the version string of the GraphicsMagick library.

### 89.16.105 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The GraphicsMagick classes may use libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 89.16.106 MagickVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version text of the GraphicsMagick library.

### 89.16.107 magnify

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Magnify image by integral size (double the dimensions)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.magnify

Backdrop=image.CopyPicture
```

### 89.16.108 map(mapImage as GM16ImageMBS, dither as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remap image colors with closest color from a reference image.
**Example:**

```
// some picture we want to map colors
dim pic as Picture = LogoMBS(500)

// build a picture with palette
dim backgroundColor as new GM16ColorMBS(255,255,255) // white
dim size as new GM16GeometryMBS(10,10)

dim i as new GM16ImageMBS(pic)
dim x as new GM16ImageMBS(size, backgroundColor)

x.pixelColor(0,0) = new GM16ColorMBS(0 ,0 ,0 ) // black
x.pixelColor(0,1) = new GM16ColorMBS(255,0 ,0 ) // red
x.pixelColor(0,2) = new GM16ColorMBS(0 ,255,0 ) // green
x.pixelColor(0,3) = new GM16ColorMBS(0 ,0 ,255) // blue
x.pixelColor(0,4) = new GM16ColorMBS(255,255,0 ) // yellow
x.pixelColor(0,5) = new GM16ColorMBS(0 ,255,255) // cyan
x.pixelColor(0,6) = new GM16ColorMBS(255,0 ,255) // magenta
```

```
// do the map
i.map(x, false)

// convert result from palette picture to bitmap picture
i.type = i.TrueColorType

// and copy picture to backdrop
Backdrop = i.CopyPicture
```

**Notes:** Set dither to true in to apply Floyd/Steinberg error diffusion to the image. By default, color reduction chooses an optimal set of colors that best represent the original image. Alternatively, you can choose a particular set of colors from an image file with this option.

### 89.16.109 matteFloodfill(target as GM16ColorMBS, opacity as UInt32, x as Integer, y as Integer, PaintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Floodfill designated area with a replacement opacity value.

### 89.16.110 medianFilter(radius as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter image by replacing each pixel component with the median color in a circular neighborhood.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.medianFilter(10)

Backdrop=image.CopyPicture
```

### 89.16.111 minify

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce image by integral (half) size.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.minify

Backdrop=image.CopyPicture
```

### 89.16.112 modequalizeifyImage

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Not documented.

### 89.16.113 modifyImage

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prepare to update image (copy if reference >1).
**Notes:** Normally Magick++'s implicit reference counting takes care of all instance management. In the rare case that the automatic instance management does not work, use this method to assure that there is only one reference to the image to be modified. It should be used in the cases where a GraphicsMagick C function is used directly on an image which may have multiple references:

### 89.16.114 modulate(brightness as Double, saturation as Double, hue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulate percent hue, saturation, and brightness of an image.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(logo)

image.type = image.TrueColorType

// brightness 150%
image.modulate(150,100,100)
backdrop = image.CopyPicture
```

**Notes:** Modulation of saturation and brightness is as a ratio of the current value (100 for no change). Modulation of hue is an absolute rotation of -180 degrees to +180 degrees from the current position corresponding

to an argument range of 0 to 200 (100 for no change).

### 89.16.115 montageGeometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile size and offset within an image montage.
**Notes:** Only valid for montage images.

### 89.16.116 motionBlur(radius as Double, sigma as Double, angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Motion blur image with specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.motionBlur(30,10,90)

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels. The angle parameter specifies the angle the object appears to be comming from (zero degrees is from the right).

### 89.16.117 negate(grayscale as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negate colors in image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.negate

Backdrop=image.CopyPicture
```

**Notes:** Set grayscale to only negate grayscale values in image.

### 89.16.118 normalize

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Normalize image (increase contrast by normalizing the pixel values to span the full range of color values).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.normalize

Backdrop=image.CopyPicture
```

### 89.16.119 oilPaint(radius as Double=3.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Oilpaint image (image looks like an oil painting).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.oilPaint

Backdrop=image.CopyPicture
```

### 89.16.120 opacity(opacity as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or attenuate the opacity channel in the image.
**Notes:** If the image pixels are opaque then they are set to the specified opacity value, otherwise they are blended with the supplied opacity value. The value of opacity ranges from 0 (completely opaque) to MaxRGB. The defines OpaqueOpacity and TransparentOpacity are available to specify completely opaque or completely transparent, respectively.

### 89.16.121 opaque(opaqueColor as GM16ColorMBS, penColor as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change color of specified opaque pixel to specified pen color.

### 89.16.122 ping(data as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the blob.
**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:


- 89.16.123 ping(file as folderitem) 14403
- 89.16.124 ping(Path as string) 14404


### 89.16.123 ping(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

// try with Constructor (same as read)
dim t1 as Double = Microseconds
dim g1 as new GM16ImageMBS(f)

// now just ping
dim t2 as Double = Microseconds
dim g2 as new GM16ImageMBS
g2.ping(f)

// or read
dim t3 as Double = Microseconds
dim g3 as new GM16ImageMBS
g3.read(f)

dim t4 as Double = Microseconds

// show speeds
MsgBox str(T4-t3)+" ¬µs for read"+EndOfLine+_
```

```
str(T3-t2)+" ¬µs for ping"+EndOfLine+_
str(T2-t1)+" ¬µs for Constructor"
```

**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:

- 89.16.122 ping(data as GM16BlobMBS) 14403
- 89.16.124 ping(Path as string) 14404

### 89.16.124 ping(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the image specification.
**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:

- 89.16.122 ping(data as GM16BlobMBS) 14403
- 89.16.123 ping(file as folderitem) 14403

### 89.16.125 PNGLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries PNG library version string.

### 89.16.126 quantize(measureError as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quantize image (reduce number of colors).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.quantize
```

```
image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** Set measureError to true in order to calculate error attributes.

### 89.16.127 QuantumDepth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the quantum depth.

### 89.16.128 quantumOperator(channel as Integer, Operator as Integer, rvalue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply an arithmetic or bitwise operator to the image pixel quantums.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

const AddQuantumOp = 1
const ThresholdQuantumOp = 10

g.quantumOperator( g.AllChannels, AddQuantumOp, 100)

// show
me.Backdrop = g.CopyPicture
```

See also:

- 89.16.129 quantumOperator(x as Integer, y as Integer, columns as Integer, rows as Integer, channel as Integer, Operator as Integer, rvalue as Double) 14405

### 89.16.129 quantumOperator(x as Integer, y as Integer, columns as Integer, rows as Integer, channel as Integer, Operator as Integer, rvalue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply an arithmetic or bitwise operator to the image pixel quantums.
See also:

- 89.16.128 quantumOperator(channel as Integer, Operator as Integer, rvalue as Double) 14405

### 89.16.130 raiseGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for raise.

### 89.16.131 raiseImage

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raise image (lighten or darken the edges of an image to give a 3-D raised or lowered effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.raiseImage

Backdrop=image.CopyPicture
```

See also:

- 89.16.132 raiseImage(geometry as GM16GeometryMBS, raisedFlag as boolean=false) 14406

### 89.16.132 raiseImage(geometry as GM16GeometryMBS, raisedFlag as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raise image (lighten or darken the edges of an image to give a 3-D raised or lowered effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.raiseImage(GM16GeometryMBS.Make(5,8))

Backdrop=image.CopyPicture
```

See also:

- 89.16.131 raiseImage 14406

### 89.16.133 randomThreshold(thresholds as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Random threshold image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.randomThreshold(GM16GeometryMBS.make("50x200"))

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** Changes the value of individual pixels based on the intensity of each pixel compared to a random threshold. The result is a low-contrast, two color image. The thresholds argument is a geometry containing LOWxHIGH thresholds. If the string contains 2x2, 3x3, or 4x4, then an ordered dither of order 2, 3, or 4 will be performed instead. If a channel argument is specified then only the specified channel is altered. This is a very fast alternative to 'quantize' based dithering.

### 89.16.134 randomThresholdChannel(thresholds as GM16GeometryMBS, channel as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Random threshold image channel.
**Notes:** Changes the value of individual pixels based on the intensity of each pixel compared to a random threshold. The result is a low-contrast, two color image. The thresholds argument is a geometry containing LOWxHIGH thresholds. If the string contains 2x2, 3x3, or 4x4, then an ordered dither of order 2, 3, or 4 will be performed instead. If a channel argument is specified then only the specified channel is altered. This is a very fast alternative to 'quantize' based dithering.

### 89.16.135 read(blob as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame from in-memory Blob.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GM16ImageMBS
dim blob as new GM16BlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

See also:


- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size from in-memory Blob.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409

- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size and depth from in-memory Blob.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size, depth, and format from in-memory Blob.
See also:

- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size, and format from in-memory Blob.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413

### 89.16.140 read(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame into current object.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.141 read(path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame into current object.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413

### 89.16.142 read(size as GM16GeometryMBS, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size into current object.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413


### 89.16.143 read(size as GM16GeometryMBS, Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size into current object.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411
- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14413

### 89.16.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame from an array of raw pixels, with specified storage type (ConstituteImage).
**Notes:** Returns an Image corresponding to an image stored in a raw memory array format. The pixel data must be in scanline order top-to-bottom. The data can be unsigned char, unsigned short int, unsigned int, unsigned long, float, or double. Float and double require the pixels to be normalized to the range [ 0..1 ] , otherwise the range is [ 0..MaxVal ] where MaxVal is the maximum possible value for that type.

Note that for most 32-bit architectures the size of an unsigned long is the same as unsigned int, but for 64-bit architectures observing the LP64 standard, an unsigned long is 64 bits, while an unsigned int remains 32 bits. This should be considered when deciding if the data should be described as "Integer" or "Long".

For example, to create a 640x480 image from unsigned red-green-blue character data, use

image = new GM16ImageMBS(640, 480, "RGB", GM16ImageMBS.StorageTypeCharPixel, pixels);

width: width in pixels of the image.
height: height in pixels of the image.
map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (same as Transparency), O = Opacity, T = Transparency, C = cyan, Y = yellow, M = magenta, K = black, or I = intensity (for grayscale). Specify "P" = pad, to skip over a quantum which is intentionally ignored. Creation of an alpha channel for CMYK images is currently not supported.
type: Define the data type of the pixels. Float and double types are expected to be normalized [ 0..1 ] otherwise [ 0..MaxRGB ] . Choose from these types: StorageTypeCharPixel, StorageTypeShortPixel, StorageTypeIntegerPixel, StorageTypeLongPixel, StorageTypeFloatPixel, or StorageTypeDoublePixel.
pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.
See also:


- 89.16.135 read(blob as GM16BlobMBS) 14407
- 89.16.136 read(blob as GM16BlobMBS, size as GM16GeometryMBS) 14408
- 89.16.137 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer) 14409
- 89.16.138 read(blob as GM16BlobMBS, size as GM16GeometryMBS, depth as Integer, magick as string) 14409
- 89.16.139 read(blob as GM16BlobMBS, size as GM16GeometryMBS, magick as string) 14410
- 89.16.140 read(file as folderitem) 14411
- 89.16.141 read(path as string) 14411

- 89.16.142 read(size as GM16GeometryMBS, file as folderitem) 14412
- 89.16.143 read(size as GM16GeometryMBS, Path as string) 14412


### 89.16.145 reduceNoise

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce noise in image using a noise peak elimination filter.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.reduceNoise

Backdrop=image.CopyPicture
```

See also:


- 89.16.146 reduceNoise(order as Double) 14414


### 89.16.146 reduceNoise(order as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce noise in image using a noise peak elimination filter.
See also:


- 89.16.145 reduceNoise 14414


### 89.16.147 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the release date of the used graphics magick library.
**Notes:** We update the library only when someone needs an update, so if you need, please contact us.

### 89.16.148 repage

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image page canvas and position.

### 89.16.149 resize(geo as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying only geometry, with filter and blur obtained from Image default.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// resize proportionally to fit
dim geo as new GM16GeometryMBS(500,500)
image.resize geo

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Same result as 'zoom' method.
See also:

- 89.16.150 resize(geo as GM16GeometryMBS, filterType as Integer) 14415
- 89.16.151 resize(geo as GM16GeometryMBS, filterType as Integer, blur as double) 14416

### 89.16.150 resize(geo as GM16GeometryMBS, filterType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying geometry and filter, with blur using Image default.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// resize proportionally to fit
dim geo as new GM16GeometryMBS(500,500)
image.resize geo, image.CubicFilter

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

See also:

- 89.16.149 resize(geo as GM16GeometryMBS) 14415
- 89.16.151 resize(geo as GM16GeometryMBS, filterType as Integer, blur as double) 14416

### 89.16.151 resize(geo as GM16GeometryMBS, filterType as Integer, blur as double)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying geometry, filter, and blur.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GM16ImageMBS(f)

// resize proportionally to fit
dim geo as new GM16GeometryMBS(500,500)
image.resize geo, image.CubicFilter, 3

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

See also:

- 89.16.149 resize(geo as GM16GeometryMBS) 14415
- 89.16.150 resize(geo as GM16GeometryMBS, filterType as Integer) 14415

### 89.16.152 roll(columns as UInt32, rows as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll image (rolls image vertically and horizontally) by specified number of columnms and rows).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.roll(30,30)

Backdrop=image.CopyPicture
```

See also:

- 89.16.153 roll(roll as GM16GeometryMBS) 14416

### 89.16.153 roll(roll as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll image (rolls image vertically and horizontally) by specified number of columnms and rows).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.roll(GM16GeometryMBS.Make(0,0,30,30))

Backdrop=image.CopyPicture
```

See also:

- 89.16.152 roll(columns as UInt32, rows as UInt32) 14416

### 89.16.154 rotate(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotate image counter-clockwise by specified number of degrees.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.rotate(30)

Backdrop=image.CopyPicture
```

### 89.16.155 sample(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image by using pixel sampling algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.sample GM16GeometryMBS.make(100,100)

Backdrop=image.CopyPicture
```

### 89.16.156 scale(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image by using simple ratio algorithm which provides good quality.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.scale new GM16GeometryMBS(100,100)

Backdrop=image.CopyPicture
```

### 89.16.157 segment(clusterThreshold as Double=1.0, smoothingThreshold as Double=1.5)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Segment (coalesce similar image components) by analyzing the histograms of the color components and identifying units that are homogeneous with the fuzzy c-means technique.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.segment

image.type = image.TrueColorType

Backdrop=image.CopyPicture
```

**Notes:** A histogram is built for the image. This histogram is filtered to reduce noise and a second derivative of the histogram plot is built and used to identify potential cluster colors (peaks in the histogram). The cluster colors are then validated by scanning through all of the pixels to see how many pixels fall within each cluster. Some candidate cluster colors may not match any of the image pixels at all and should be discarded. Specify clusterThreshold, as the number of pixels matching a cluster color in order for the cluster to be considered valid. SmoothingThreshold eliminates noise in the second derivative of the histogram. As the value is increased, you can expect a smoother second derivative. The default is 1.5.

### 89.16.158 setChromaBluePrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity blue primary point.
**Notes:** e.g. x=0.15, y=0.06

### 89.16.159 setchromaGreenPrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity green primary point.
**Notes:** e.g. x=0.3, y=0.6

### 89.16.160 setchromaRedPrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity red primary point
**Notes:** e.g. x=0.64, y=0.33

### 89.16.161 setchromaWhitePoint(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity white point
**Notes:** e.g. x=0.3127, y=0.329

### 89.16.162 SetEXIFOrientation(orientation as integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets orientation for EXIF.
**Notes:** Changing orientation may need to set orientation via SetOrientation and SetEXIFOrientation. With a JPEG you have orientation both in JPEG header and in EXIF metadata.
Returns true for success and false for failure.

For new development, please use ExifTagsMBS class instead.

### 89.16.163 SetLogEventMask(events as String)

MBS GraphicsMagick Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set log event mask.
**Example:**

```
GM16ImageMBS.SetLogEventMask("coder,annotate")
```

**Notes:** Defines which events are logged.
By default logging goes to stderr, so on macOS you may need to run your app via Terminal to see logs there.

List of events includes: none, Configure, Annotate, Render, Transform, Locale, Coder, X11, Cache, Blob, Deprecate, User, Resource, TemporaryFile, Exception, Option, Information, Warning, Error, FatalError and All.

### 89.16.164 SetPicture(pic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture into the Image at the given position.

### 89.16.165 SetPictureMask(maskpic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture into the Image's mask at the given position.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GM16ImageMBS( new GM16GeometryMBS(p.Width, p.Height), new GM16ColorGrayMBS(1.0))

g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

### 89.16.166 setPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates a pixel cache region to store image pixels as defined by the region rectangle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

// get pointer to some pixels to write
dim x as ptr = g.setPixels(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
g.syncPixels

// show
me.Backdrop = g.CopyPicture
```

**Notes:** This area is subsequently transferred from the pixel cache to the image via syncPixels.

### 89.16.167 setStrokeDashArray(values() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets stroke dash pattern.
**Notes:** Specify the pattern of dashes and gaps used to stroke paths. The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.16.168 shade(azimuth as Double=30.0, elevation as Double=30.0, colorShading as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shade image using distant light source.
**Notes:** Specify azimuth and elevation as the position of the light source. By default, the shading results as a grayscale image.. Set colorShading to true to shade the red, green, and blue components of the image.

### 89.16.169 sharpen(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpen pixels in image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.sharpen

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.170 sharpenChannel(channel as Integer, radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpen pixels in image channel.
**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.16.171 shave(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shave pixels from image edges.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.shave(new GM16GeometryMBS(200,200))

Backdrop=image.CopyPicture
```

### 89.16.172 shear(xShearAngle as Double, yShearAngle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shear image (create parallelogram by sliding image by X or Y axis).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.shear(10,20)

Backdrop=image.CopyPicture
```

**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, x degrees is measured relative to the Y axis, and similarly, for Y direction shears y degrees is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the color defined as borderColor.

### 89.16.173 signature(force as boolean=false) as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image textual signature.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

MsgBox image.signature

Backdrop=image.CopyPicture
```

**Notes:** Set force to true in order to re-calculate the signature regardless of whether the image data has been modified.

### 89.16.174 solarize(factor as Double=50.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Solarize image (similar to effect seen when exposing a photographic film to light during the development process)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.solarize

Backdrop=image.CopyPicture
```

### 89.16.175 spread(amount as UInt32=3)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Spread pixels randomly within image by specified ammount
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.spread 5

Backdrop=image.CopyPicture
```

### 89.16.176 statistics as GM16ImageStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain image statistics.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim stat as GM16ImageStatisticsMBS = g.statistics
```

```
dim gs as GM16ImageChannelStatisticsMBS = stat.blue

MsgBox "blue channel: "+str(gs.minimum)+"-"+str(Gs.maximum)+", mean "+str(gs.mean)
```

**Notes:** Statistics are normalized to the range of 0.0 to 1.0 and are output to the specified ImageStatistics structure.

### 89.16.177 stegano(watermark as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a digital watermark to the image (based on second image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim p1 as Picture = New Picture(550,500,32)
dim p2 as Picture = New Picture(550,500,32)

p1.Graphics.DrawPicture p, 0,0
p2.Graphics.DrawPicture p,50,0

dim image1 as new GM16ImageMBS(p1)
dim image2 as new GM16ImageMBS(p2)

image2.zoom(new GM16GeometryMBS(100,100)) // scale down

// add watermark
image1.stegano(image2)

// now make a threshold so you see the difference
image1.threshold 254

image1.type = image1.TrueColorType
Backdrop=image1.CopyPicture
```

### 89.16.178 stereo(rightImage as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image which appears in stereo when viewed with red-blue glasses (Red image on left, blue on right)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim p1 as Picture = New Picture(550,500,32)
dim p2 as Picture = New Picture(550,500,32)

p1.Graphics.DrawPicture p, 0,0
p2.Graphics.DrawPicture p,50,0

dim image1 as new GM16ImageMBS(p1)
dim image2 as new GM16ImageMBS(p2)

image1.stereo(IMAGE2)

Backdrop=image1.CopyPicture
```

### 89.16.179 strip

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remove all profiles and text attributes from the image.

### 89.16.180 strokeDashArray as Double()

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries stroke dash pattern.
**Notes:** Specify the pattern of dashes and gaps used to stroke paths. The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.16.181 swirl(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swirl image (image pixels are rotated by degrees).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.swirl 200
```

Backdrop=image.CopyPicture

### 89.16.182 syncPixels

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers the image cache pixels to the image.

### 89.16.183 texture(texture as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Channel a texture on pixels matching image background color.

### 89.16.184 threshold(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Threshold image channels (below threshold becomes black, above threshold becomes white).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.threshold 127

// convert to RGB so CopyPicture works
image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** The range of the threshold parameter is 0 to MaxRGB.

### 89.16.185 thumbnail(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image using several algorithms to make smaller images very quickly.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)

// make thumbnail
dim geo as new GM16GeometryMBS(100, 100)
g.thumbnail(geo)

// show
me.Backdrop = g.CopyPicture
```

### 89.16.186 TIFFLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for tiff library.

### 89.16.187 transform(imageGeometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image based on image and crop geometries.
**Notes:** Crop geometry is optional.
See also:

- 89.16.188 transform(imageGeometry as GM16GeometryMBS, cropGeometry as GM16GeometryMBS) 14428

### 89.16.188 transform(imageGeometry as GM16GeometryMBS, cropGeometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image based on image and crop geometries.
**Notes:** Crop geometry is optional.
See also:

- 89.16.187 transform(imageGeometry as GM16GeometryMBS) 14428

### 89.16.189 transformOrigin(tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Origin of coordinate system to use when annotating with text or drawing.

### 89.16.190 transformReset

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset transformation parameters to default.

### 89.16.191 transformRotation(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation to use when annotating with text or drawing.

### 89.16.192 transformScale(tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scale to use when annotating with text or drawing.

### 89.16.193 transformSkewX(x as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skew to use in X axis when annotating with text or drawing.

### 89.16.194 transformSkewY(y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skew to use in Y axis when annotating with text or drawing.

### 89.16.195 transparent(color as GM16ColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add matte channel to image, setting pixels matching color to transparent.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

dim c as new GM16ColorMBS("white")
image.transparent(c)

Backdrop=image.CombinePictureWithMask
```

### 89.16.196 trim

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim edges that are the background color from the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
// make the logo picture bigger
dim q as Picture = New Picture(700,700,32)

q.Graphics.DrawPicture p,100,100

dim image as new GM16ImageMBS(q)

// now trim the white border away
image.trim

Backdrop=image.CopyPicture
```

**Notes:** See ColorFuzz property for how far the pixel value can differentiate.

### 89.16.197 unregisterId

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Not documented.

### 89.16.198 unsharpmask(radius as Double, sigma as Double, amount as Double, threshold as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace image with a sharpened version of the original image using the unsharp mask algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.unsharpmask(10,1,0.5,50)

Backdrop=image.CopyPicture
```

**Notes:** radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.
amount: the percentage of the difference between the original and the blur image that is added back into the original.
threshold: the threshold in pixels needed to apply the diffence amount.

### 89.16.199 unsharpmaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace image channel with a sharpened version of the original image using the unsharp mask algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.unsharpmaskChannel(Image.RedChannel, 10,1,0.5,50)

Backdrop=image.CopyPicture
```

**Notes:**

### 89.16.200 wave(amplitude as Double=25.0, wavelength as Double=150.0)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| channel: | image channel to modify. |
| radius: | the radius of the Gaussian, in pixels, not counting the center pixel. |
| sigma: | the standard deviation of the Gaussian, in pixels. |
| amount: | the percentage of the difference between the original and the blur image that is added back into the original. |
| threshold: | the threshold in pixels needed to apply the diffence amount. |

**Function:** Map image pixels to a sine wave.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.wave

Backdrop=image.CopyPicture
```

### 89.16.201 WebPVersion as String

MBS GraphicsMagick Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of WebP library.
**Notes:** Should be a version string like "1.3.0".

### 89.16.202 write(blob as GM16BlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.16.203 write(blob as GM16BlobMBS, magick as string) 14433
- 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32) 14433
- 89.16.205 write(file as folderitem) 14433
- 89.16.206 write(Path as string) 14434
- 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14434

### 89.16.203 write(blob as GM16BlobMBS, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.16.202 write(blob as GM16BlobMBS) 14432
- 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32) 14433
- 89.16.205 write(file as folderitem) 14433
- 89.16.206 write(Path as string) 14434
- 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14434


### 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.16.202 write(blob as GM16BlobMBS) 14432
- 89.16.203 write(blob as GM16BlobMBS, magick as string) 14433
- 89.16.205 write(file as folderitem) 14433
- 89.16.206 write(Path as string) 14434
- 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14434


### 89.16.205 write(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to a file.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GM16ImageMBS( new GM16GeometryMBS(p.Width, p.Height), new GM16ColorGrayMBS(1.0))
```

```
g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

See also:


- 89.16.202 write(blob as GM16BlobMBS) 14432
- 89.16.203 write(blob as GM16BlobMBS, magick as string) 14433
- 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32) 14433
- 89.16.206 write(Path as string) 14434
- 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14434


### 89.16.206 write(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to a file.
See also:


- 89.16.202 write(blob as GM16BlobMBS) 14432
- 89.16.203 write(blob as GM16BlobMBS, magick as string) 14433
- 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32) 14433
- 89.16.205 write(file as folderitem) 14433
- 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14434


### 89.16.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to an array of pixels with storage type specified by user (DispatchImage).
**Notes:** e.g. image.write( 0, 0, 640, 1, "RGB", 0, pixels )
See also:

- 89.16.202 write(blob as GM16BlobMBS) 14432
- 89.16.203 write(blob as GM16BlobMBS, magick as string) 14433
- 89.16.204 write(blob as GM16BlobMBS, magick as string, depth as UInt32) 14433
- 89.16.205 write(file as folderitem) 14433
- 89.16.206 write(Path as string) 14434


### 89.16.208 ZLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for zlib library.

### 89.16.209 zoom(geometry as GM16GeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zoom (resize) image to specified size.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.zoom(new GM16GeometryMBS(200,200))

Backdrop=image.CopyPicture
```

### 89.16.210 ZPL(Header as boolean = true) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image as ZPL hex image.
**Notes:** This is for sending data to a receipt printer. The picture is taken as black & white image and we build the hex string, you can send to the printer.
Picture needs to have a width dividable by 8.

Set Header to false for skipping header and footer.

### 89.16.211 Properties

### 89.16.212 adjoin as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Join images into a single multi-image file.
**Notes:** (Read and Write property)

### 89.16.213 animationDelay as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Time in 1/100ths of a second (0 to 65535) which must expire before displaying the next image in an animated sequence.
**Notes:** This option is useful for regulating the animation of a sequence of GIF images within Netscape.
(Read and Write property)

### 89.16.214 animationIterations as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of iterations to loop an animation (e.g. Netscape loop extension) for.
**Notes:** (Read and Write property)

### 89.16.215 antiAlias as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control antialiasing of rendered Postscript and Postscript or TrueType fonts.
**Notes:** Enabled by default.
(Read and Write property)

### 89.16.216 backgroundColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Example:**

```
// make a red and turn it to 100% transparent
Dim red As New GM16ColorRGBMBS("red")
```

```
red.alpha = 1

// now make image and make it RGBA with the transparnet background
dim RastoredVectorImage as New GM16ImageMBS
RastoredVectorImage.type = GM16ImageMBS.TrueColorMatteType
RastoredVectorImage.backgroundColor = red

// now read SVG, so we get a transparent background
dim SVG_File as FolderItem = SpecialFolders.desktop.Child("test.svg")
RastoredVectorImage.read(SVG_File)
```

**Notes:** (Read and Write property)

### 89.16.217 backgroundTexture as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image file name to use as the background texture.
**Notes:** Does not modify image pixels.
(Read and Write property)

### 89.16.218 baseColumns as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image width (before transformations)
**Notes:** (Read only property)

### 89.16.219 baseFilename as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image filename (before transformations)
**Notes:** (Read only property)

### 89.16.220 baseRows as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image height (before transformations).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

Title = str(image.baseRows)+" x "+str(image.baseColumns)
```

**Notes:** (Read only property)

### 89.16.221 borderColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 89.16.222 boundingBox as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return smallest bounding box enclosing non-border pixels.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.fillColor = new GM16ColorRGBMBS("red") // set color
image.strokeColor = new GM16ColorRGBMBS("green") // set color

image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle

draw.Circle(250, 250, 120, 150)
draw.Draw

draw = nil
image.type = image.TrueColorType

Backdrop = image.CopyPicture
```

MsgBox image.boundingBox.StringValue

**Notes:** The current fuzz value is used when discriminating between pixels. This is the crop bounding box used by crop(Geometry(0,0)).
(Read only property)

### 89.16.223 boxColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base color that annotation text is rendered on (default none).
**Notes:** (Read and Write property)

### 89.16.224 classType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image class (DirectClass or PseudoClass).
**Notes:** NOTE: setting a DirectClass image to PseudoClass will result in the loss of color information if the number of colors in the image is greater than the maximum palette size (either 256 or 65536 entries depending on the value of QuantumDepth when ImageMagick was built):
(Read and Write property)

### 89.16.225 clipMask as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Associate a clip mask image with the current image.
**Notes:** The clip mask image must have the same dimensions as the current image or an exception is thrown. Clipping occurs wherever pixels are transparent in the clip mask image. Clipping Pass an invalid image to unset an existing clip mask.
(Read and Write property)

### 89.16.226 colorFuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this

option to match colors that are close to the target color in RGB space.

e.g. set to 50 for 8 bit class and 50 * 257 for the 16 bit class to allow 20% divagation in pixel values.
(Read and Write property)

### 89.16.227 colorMapSize as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of entries in the colormap.
**Notes:** Setting the colormap size may extend or truncate the colormap. The maximum number of supported entries is specified by the MaxColormapSize constant, and is dependent on the value of QuantumDepth when GraphicsMagick is compiled. An exception is thrown if more entries are requested than may be supported. Care should be taken when truncating the colormap to ensure that the image colormap indexes reference valid colormap entries.
(Read and Write property)

### 89.16.228 colorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The colorspace (e.g. CMYK) used to represent the image pixel colors.
**Notes:**

| | |
|---|---|
| UndefinedColorspace | = 0 |
| RGBColorspace | = 1 (Plain old RGB colorspace) |
| GRAYColorspace | = 2 (Plain old full-range grayscale) |
| TransparentColorspace | = 3 (RGB but preserve matte channel during quantize) |
| OHTAColorspace | = 4 |
| XYZColorspace | = 5 (CIE XYZ) |
| YCCColorspace | = 6 (Kodak PhotoCD PhotoYCC) |
| YIQColorspace | = 7 |
| YPbPrColorspace | = 8 |
| YUVColorspace | = 9 |
| CMYKColorspace | = 10 (Cyan, magenta, yellow, black, alpha) |
| sRGBColorspace | = 11 (Kodak PhotoCD sRGB) |
| HSLColorspace | = 12 (Hue, saturation, luminosity) |
| HWBColorspace | = 13 (Hue, whiteness, blackness) |
| LABColorspace | = 14 (LAB colorspace not supported yet other than via lcms) |
| CineonLogRGBColorspace | = 15 (RGB data with Cineon Log scaling, 2.048 density range) |
| Rec601LumaColorspace | = 16 (Luma (Y) according to ITU-R 601) |
| Rec601YCbCrColorspace | = 17 (YCbCr according to ITU-R 601) |
| Rec709LumaColorspace | = 18 (Luma (Y) according to ITU-R 709) |
| Rec709YCbCrColorspace | = 19 (YCbCr according to ITU-R 709) |

(Read and Write property)

### 89.16.229 columns as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image width.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

Title = str(image.columns)+" x "+str(image.rows)
Backdrop=image.CopyPicture
```

**Notes:** (Read only property)

### 89.16.230 comment as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image comment.
**Notes:** When you set this property, you add comment string to image.
By default, each image is commented with its file name. Use this method to assign a specific comment to the image. Optionally you can include the image filename, type, width, height, or other image attributes by embedding special format characters:
(Read and Write property)

### 89.16.231 compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composition operator to be used when composition is implicitly used (such as for image flattening).
**Notes:** (Read and Write property)

### 89.16.232 compressType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.
**Notes:** The default is the compression type of the input image file.
(Read and Write property)

### 89.16.233 debug as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable printing of debug messages from GraphicsMagick as it executes.
**Notes:** (Read and Write property)

### 89.16.234 density as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical and horizontal resolution in pixels of the image.
**Example:**

```
dim p as new GM16ImageMBS

dim item as FolderItem = SpecialFolder.Desktop.Child("input.png")
p.read(item)
p.scale new GM16GeometryMBS(3750,3750)
p.quality = 95
p.resolutionUnits = p.PixelsPerInchResolution
p.density = new GM16GeometryMBS(300, 300)
dim out as FolderItem = SpecialFolder.Desktop.Child("output.png")
p.write out
```

**Notes:** This option specifies an image density when decoding a Postscript or Portable Document page. Often used with psPageSize.
(Read and Write property)

### 89.16.235 depth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (bits allocated to red/green/blue components).
**Notes:** Used to specify the bit depth when reading or writing raw images or when the output format supports multiple depths. Defaults to the quantum depth that GraphicsMagick is compiled with.
(Read and Write property)

### 89.16.236 directory as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile names from within an image montage.
**Notes:** (Read only property)

### 89.16.237 endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian mode.
**Notes:** Endianness (LSBEndian like Intel, MSBEndian like SPARC, or NativeEndian for what this computer uses) for image formats which support endian-specific options.
(Read and Write property)

### 89.16.238 ExifThumbnail as String

MBS GraphicsMagick Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts an embedded thumbnail in EXIF data.
**Example:**

```
Dim g As New GM16ImageMBS

// not load, but just read header & metadata
g.ping("/Users/cs/Desktop/test.JPG")

// get thumbnail
Dim Thumbnail As String = g.ExifThumbnail

// show it
window1.Backdrop = picture.FromData(Thumbnail)
```

**Notes:** Returns string containing JPEG compressed image data.

For new development, please use ExifTagsMBS class instead.
(Read only property)

### 89.16.239 fileName as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image file name.
**Notes:** (Read and Write property)

### 89.16.240 fileSize as Int64

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes of the image on disk.
**Notes:** (Read only property)

### 89.16.241 fillColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color to use when filling drawn objects.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.16.242 fillPattern as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pattern to use while filling drawn objects.
**Notes:** (Read and Write property)

### 89.16.243 fillRule as Integer

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rule to use when filling drawn objects
**Notes:** (Read and Write property)

### 89.16.244 filterType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reduction filter employed has a sigificant effect on the time required to resize an image and the resulting quality. The default filter is Lanczos which has been shown to produce high quality results when reducing most images.
**Notes:** Filter to use when resizing image.
(Read and Write property)

### 89.16.245 font as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font.
**Notes:** If the font is a fully qualified X server font name, the font is obtained from an X server. To use a TrueType font, precede the TrueType filename with an @. Otherwise, specify a Postscript font name (e.g. "helvetica").
(Read and Write property)

### 89.16.246 FontFamily as String

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font family to use.
**Notes:** The plugin will look through the list to find best match for combination of family, style, stretch and weight.
You can use either FontFamily or Font property, but not both.
Setting font family clears font.
(Read and Write property)

### 89.16.247 fontPointsize as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font point size.
**Notes:** (Read and Write property)

### 89.16.248 FontStretch as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font stretch.
**Notes:** Can be Normal, UltraCondensed, ExtraCondensed, Condensed, SemiCondensed, SemiExpanded, Expanded, ExtraExpanded, UltraExpanded or Any.
See stretch constants.
(Read and Write property)

### 89.16.249 FontStyle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font style to use.
**Notes:** Can be Normal, Italic, Oblique or Any.
See font style constants.
(Read and Write property)

### 89.16.250 FontWeight as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font weight.
**Notes:** The font weight in range from 0 to 1000.
400 is normal and 800 bold.
(Read and Write property)

### 89.16.251 format as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Long image format description.
**Notes:** (Read only property)

### 89.16.252 gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma correct the image or individual image channels.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.gamma = 3.0

Backdrop=image.CopyPicture
```

**Notes:** If you get the value, it is the gamma level of the image. Gamma is a pow() function which converts between the linear light representation and the representation for the computer display. Most computer images are gamma corrected to 2.2 (1/0.4545) so that each step results in a visually linear step on a computer or video display:
(Read and Write property)
See also:

- 89.16.85 gamma(gammaRed as Double, gammaGreen as Double, gammaBlue as Double) 14390

### 89.16.253 geometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size of the image when encoding.
**Notes:** (Read only property)

### 89.16.254 getConstIndexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain immutable image pixel indexes (valid for PseudoClass images)
**Notes:** (Read only property)

### 89.16.255 getIndexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain mutable image pixel indexes (valid for PseudoClass images)
**Notes:** (Read only property)

### 89.16.256 gifDisposeMethod as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GIF disposal method.
**Notes:** This option (specific to the GIF file format) is used to control how successive frames are rendered (how the preceding frame is disposed of) when creating a GIF animation.

| Constant | Disposal | Description |
|---|---|---|
| UndefinedDispose | 0 | No disposal specified. |
| NoneDispose | 1 | Do not dispose between frames. |
| BackgroundDispose | 2 | Overwrite frame with background color from header. |
| PreviousDispose | 3 | Overwrite with previous frame. |

(Read and Write property)

### 89.16.257 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Example:**

```
dim c as new GM16ColorMBS("white")
dim g as new GM16GeometryMBS(100,100)
dim image as new GM16ImageMBS(g, c)
MsgBox hex(Image.handle) // valid if not zero
```

**Notes:** (Read and Write property)

### 89.16.258 height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image.
**Example:**

```
dim c as new GM16ColorRGBMBS(1.0,0.0,0.0)
dim size as new GM16GeometryMBS(100,100)
dim g as new GM16ImageMBS(size, c)
```

```
MsgBox str(g.width)+" "+str(g.height)
```

**Notes:** This is a convenience function for you which calls size.height.
(Read only property)

### 89.16.259 iccColorProfile as GM16BlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ICC color profile.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("IMG_0793.tif")
dim Image as new GM16ImageMBS(f)
dim ProfileBlob as GM16BlobMBS = Image.iccColorProfile
dim ProfileData as string = ProfileBlob.CopyString
dim cm as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromString(ProfileData)
dim name as string = cm.Name

Break // check data in debugger
```

**Notes:** Supplied via a Blob since Magick++/ and GraphicsMagick do not currently support formating this data structure directly. Specifications are available from the International Color Consortium for the format of ICC color profiles.
(Read and Write property)

### 89.16.260 interlaceType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace ).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.
(Read and Write property)

### 89.16.261 iptcProfile as GM16BlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** IPTC profile.
**Notes:** Supplied via a Blob since Magick++ and GraphicsMagick do not currently support formating this data structure directly. Specifications are available from the International Press Telecommunications Council for IPTC profiles.
(Read and Write property)

### 89.16.262 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain valid image?
**Notes:** Set to false in order to invalidate the image. Images constructed via the default constructor are invalid images and isValid() will return false.
(Read and Write property)

### 89.16.263 label as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image label.
**Notes:** (Read only property)
See also:

- 89.16.101 label(text as string) 14395

### 89.16.264 lineWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stroke width for drawing vector objects (default one)
**Notes:** This method is now deprecated. Please use strokeWidth instead.
(Read and Write property)

### 89.16.265 magick as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the codec to use for compression.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GM16ImageMBS( new GM16GeometryMBS(p.Width, p.Height), new GM16ColorGrayMBS(1.0))

g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

**Notes:** (Read and Write property)

### 89.16.266 matte as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image supports transparency (matte channel)
**Notes:** (Read and Write property)

### 89.16.267 matteColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (frame) color.
**Notes:** (Read and Write property)

### 89.16.268 meanErrorPerPixel as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mean error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.16.269 modulusDepth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image modulus depth (minimum number of bits required to support red/green/blue components without loss of accuracy).
**Notes:** The pixel modulus depth may be decreased by supplying a value which is less than the current value, updating the pixels (reducing accuracy) to the new depth. The pixel modulus depth can not be increased over the current value using this method.
(Read and Write property)

### 89.16.270 monochrome as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image to black and white while color reducing (quantizing).
**Notes:** (Read and Write property)

### 89.16.271 normalizedMaxError as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The normalized max error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.16.272 normalizedMeanError as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The normalized mean error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.16.273 orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image orientation. Supported by some file formats such as DPX and TIFF. Useful for turning the right way up.
**Notes:** (Read and Write property)

### 89.16.274 page as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size and location of an image canvas.
**Notes:** Use this option to specify the dimensions and position of the Postscript page in dots per inch or a TEXT page in pixels. This option is typically used in concert with density .

Page may also be used to position a GIF image (such as for a scene in an animation).
(Read and Write property)

### 89.16.275 penColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pen color.
**Notes:** (Read and Write property)

### 89.16.276 quality as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level (default 75).
**Notes:** (Read and Write property)

### 89.16.277 quantizeColors as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of colors to quantize to.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.quantizeColors = 10
image.quantize

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.16.278 quantizeColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorspace to quantize in (default RGB).
**Example:**

```
// load a picture
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim pic as Picture = Picture.Open(f)

const GrayColorSpace = 2

Dim Converter As New GM16ImageMBS(Pic)

// quantize with dither
Converter.type = GM16ImageMBS.BilevelType
Converter.quantizeColorSpace = GrayColorSpace
Converter.quantizeColors = 2
Converter.quantizeDither = True
Converter.quantize

// convert back to Xojo
Converter.type = GM16ImageMBS.TrueColorType
Backdrop = Converter.CopyPicture
```

**Notes:** Empirical evidence suggests that distances in color spaces such as YUV or YIQ correspond to perceptual color differences more closely than do distances in RGB space. These color spaces may give better results when color reducing an image.
(Read and Write property)

### 89.16.279 quantizeDither as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Floyd/Steinberg error diffusion to the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.quantizeColors = 10
```

image.quantizeDither = true
image.quantize

image.type = image.TrueColorType
Backdrop=image.CopyPicture

**Notes:** The basic strategy of dithering is to trade intensity resolution for spatial resolution by averaging the intensities of several neighboring pixels. Images which suffer from severe contouring when reducing colors can be improved with this option. The quantizeColors or monochrome option must be set for this option to take effect.
(Read and Write property)

### 89.16.280 quantizeTreeDepth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Depth of the quantization color classification tree.
**Notes:** Values of 0 or 1 allow selection of the optimal tree depth for the color reduction algorithm. Values between 2 and 8 may be used to manually adjust the tree depth.
(Read and Write property)

### 89.16.281 Quiet as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Suppress all warning messages.
**Notes:** Error messages are still reported.
(Read and Write property)

### 89.16.282 renderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of rendering intent (used when applying an ICC color profile).
**Notes:** (Read and Write property)

### 89.16.283 resolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Example:**

```
Dim item As FolderItem = SpecialFolder.Desktop.Child("test.jpeg")
Dim p As New GM16ImageMBS(item)

// scale image
p.quality = 95
p.scale New GM16GeometryMBS(1000,1000)

// change resolution
p.density = New GM16GeometryMBS(300, 300)
p.resolutionUnits = p.PixelsPerInchResolution

// remove metadata
Dim empty As New GM16BlobMBS
p.profile("EXIF") = empty
p.profile("IPTC") = empty
p.profile("XMP") = empty

Dim out As FolderItem = SpecialFolder.Desktop.Child("output.jpeg")
p.write out
```

**Notes:** (Read and Write property)

### 89.16.284 rows as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of pixel rows in the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

Title = str(image.columns)+" x "+str(image.rows)
Backdrop=image.CopyPicture
```

**Notes:** (Read only property)

### 89.16.285 scene as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image scene number.
**Notes:** (Read and Write property)

### 89.16.286 size as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height of a raw image (an image which does not support width and height information).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

MsgBox image.size.StringValue

image.size = new GM16GeometryMBS(200,200)

Backdrop=image.CopyPicture
```

**Notes:** Size may also be used to affect the image size read from a multi-resolution format (e.g. Photo CD, JBIG, or JPEG.
(Read and Write property)

### 89.16.287 strokeAntiAlias as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable stroke anti-aliasing.
**Notes:** (Read and Write property)

### 89.16.288 strokeColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color to use when drawing object outlines.
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)
```

```
image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.16.289 strokeDashOffset as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** While drawing using a dash pattern, specify distance into the dash pattern to start the dash (default 0).
**Notes:** (Read and Write property)

### 89.16.290 strokeLineCap as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the end of open subpaths when they are stroked. #
**Notes:** Values of LineCap are UndefinedCap, ButtCap, RoundCap, and SquareCap.
(Read and Write property)

### 89.16.291 strokeLineJoin as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the corners of paths (or other vector shapes) when they are stroked. Values of LineJoin are UndefinedJoin, MiterJoin, RoundJoin, and BevelJoin.
**Notes:** (Read and Write property)

### 89.16.292 strokeMiterLimit as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify miter limit.
**Notes:** When two line segments meet at a sharp angle and miter joins have been specified for 'lineJoin', it is possible for the miter to extend far beyond the thickness of the line stroking the path. The miterLimit' imposes a limit on the ratio of the miter length to the 'lineWidth'. The default value of this parameter is 4. (Read and Write property)

### 89.16.293 strokePattern as GM16ImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pattern image to use while stroking object outlines.
**Notes:** (Read and Write property)

### 89.16.294 strokeWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stroke width for drawing vector objects (default one).
**Example:**

```
dim g as new GM16GeometryMBS(500,500)
dim c as new GM16ColorRGBMBS("white") // white
dim image as new GM16ImageMBS(g, c)

image.strokeColor = new GM16ColorRGBMBS("red") // Outline color
image.fillColor = new GM16ColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GM16GraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.16.295 subImage as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subimage of an image sequence.
**Notes:** (Read and Write property)

### 89.16.296 subRange as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of images relative to the base image.
**Notes:** (Read and Write property)

### 89.16.297 textEncoding as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation text encoding (e.g. "UTF-16").
**Notes:** (Read and Write property)

### 89.16.298 tileName as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile name.
**Notes:** (Read and Write property)

### 89.16.299 totalColors as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of colors in the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

Title = str(image.totalColors) // shows 5284
Backdrop=image.CombinePictureWithMask
```

**Notes:** (Read only property)

### 89.16.300 type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of this image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)

image.type = image.GrayscaleType

Backdrop=image.CopyPicture
```

**Notes:** You can set this value to convert the image to the type.

Convert the image representation to the specified type or retrieve the current image type. If the image is reduced to an inferior type, then image information may be lost (e.g. color changed to grayscale).

Available enumerations for the type parameter:

| | | |
|---|---|---|
| BilevelType | 1 | black/white |
| GrayscaleType | 2 | grayscale |
| GrayscaleMatteType | 3 | grayscale with alpha (opacity) channel |
| PaletteType | 4 | colormapped |
| PaletteMatteType | 5 | colormapped with transparency |
| TrueColorType | 6 | true (full) color |
| TrueColorMatteType | 7 | true (full) color with alpha (opacity) channel |
| ColorSeparationType | 8 | Cyan, magenta, yellow, and black |
| ColorSeparationMatteType | 9 | Cyan, magenta, yellow, and black with alpha (opacity) channel |
| OptimizeType | 10 | Optimize the image type to best represent the existing pixels |

(Read and Write property)

### 89.16.301 verbose as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print detailed information about the image.

**Notes:** (Read and Write property)

### 89.16.302 view as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlashPix viewing parameters.
**Notes:** (Read and Write property)

### 89.16.303 width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image.
**Example:**

```
dim c as new GM16ColorRGBMBS(1.0,0.0,0.0)
dim size as new GM16GeometryMBS(100,100)
dim g as new GM16ImageMBS(size, c)

MsgBox str(g.width)+" "+str(g.height)
```

**Notes:** This is a convenience function for you which calls size.width.
(Read only property)

### 89.16.304 x11Display as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X11 display to display to, obtain fonts from, or to capture image from.
**Notes:** (Read and Write property)

### 89.16.305 XResolution as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** x resolution of the image.
**Notes:** See also density functions.
Settable with version 19.0.
(Read and Write property)

### 89.16.306 YResolution as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** y resolution of the image.
**Notes:** Settable with version 19.0.
(Read and Write property)

### 89.16.307 attributeValue(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Access an arbitrary named image attribute.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("IMG_4048.jpg")
dim g as new GM16ImageMBS(f)
dim a as string = g.attributeValue("EXIF:DateTime")
MsgBox a
```

**Notes:** Any number of named attributes may be attached to the image. For example, the image comment is a named image attribute with the name "comment". EXIF tags are attached to the image as named attributes. Use the syntax "EXIF:<tag>" to request an EXIF tag similar to "EXIF:DateTime":
(Read and Write computed property)

### 89.16.308 channelDepth(channel as Integer) as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain modulus channel depth.
**Notes:** (Read and Write computed property)

### 89.16.309 colorMap(index as UInt32) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color at colormap position index.
**Notes:** (Read and Write computed property)
See also:

- 89.16.26 colorMap as GM16ColorMBS() 14363

### 89.16.310 defineSet(magick as string, key as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain a definition flag to applied when encoding or decoding the specified format.
**Notes:** Similar to the defineValue() method except that passing the flag value 'true' creates a value-less define with that format and key. Passing the flag value 'false' removes any existing matching definition. The method returns 'true' if a matching key exists, and 'false' if no matching key exists.
(Read and Write computed property)

### 89.16.311 defineValue(magick as string, key as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain a definition string to applied when encoding or decoding the specified format.
**Notes:** The meanings of the definitions are format specific. The format is designated by the magick argument, the format-specific key is designated by key, and the associated value is specified by value. See the defineSet() method if the key must be removed entirely.
(Read and Write computed property)

### 89.16.312 pixelColor(x as UInt32, y as UInt32) as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set pixel color at location x & y.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GM16ImageMBS(p)
dim c as new GM16ColorMBS("red")

for x as Integer = 240 to 260
image.pixelColor(x,250)=c
next

for y as Integer = 240 to 260
image.pixelColor(250,y)=c
next

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write computed property)

### 89.16.313 profile(name as string) as GM16BlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a named profile.
**Example:**

```
Dim item As FolderItem = SpecialFolder.Desktop.Child("test.jpeg")
Dim p As New GM16ImageMBS(item)

// scale image
p.quality = 95
p.scale New GM16GeometryMBS(1000,1000)

// change resolution
p.density = New GM16GeometryMBS(300, 300)
p.resolutionUnits = p.PixelsPerInchResolution

// remove metadata
Dim empty As New GM16BlobMBS
p.profile("EXIF") = empty
p.profile("IPTC") = empty
p.profile("XMP") = empty

Dim out As FolderItem = SpecialFolder.Desktop.Child("output.jpeg")
p.write out
```

**Notes:** Add or remove a named profile to/from the image. Remove the profile by passing an empty Blob

(e.g. Blob()). Valid names are "*", "8BIM", "ICM", "IPTC", or a user/format-defined profile name.

Retrieve a named profile from the image. Valid names are: "8BIM", "8BIMTEXT", "APP1", "APP1JPEG", "ICC", "ICM", & "IPTC" or an existing user/format-defined profile name
(Read and Write computed property)

### 89.16.314 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AbsoluteIntent | 3 | One of the intent type constants. |
| AddCompositeOp | 8 | One of the composite type constants. |
| AllChannels | 10 | One of the possible channel constants. |
| AllCompliance | &hffff | One of the Compliance type constants. |
| AssociatedAlpha | 1 | One of the possible alpha type constants. |
| AtopCompositeOp | 4 | One of the composite type constants. |
| BackgroundDispose | 2 | One of the gif dispose type constants. |
| BesselFilter | 14 | One of the filter type constants. |
| BilevelType | 1 | One of the image type constants. |
| BlackChannel | 8 | One of the possible channel constants. |
| BlackmanFilter | 7 | One of the filter type constants. |
| BlueChannel | 5 | One of the possible channel constants. |
| BottomLeftOrientation | 4 | One of the orientation type constants.<br>Line direction: Left to right<br>Frame Direction: Bottom to top |
| BottomRightOrientation | 3 | One of the orientation type constants.<br>Line direction: Right to left<br>Frame Direction: Bottom to top |
| BoxFilter | 2 | One of the filter type constants. |
| BumpmapCompositeOp | 12 | One of the composite type constants. |
| BZipCompression | 2 | One of the compression type constants. |
| CatromFilter | 11 | One of the filter type constants. |
| CenterGravity | 5 | One of the possible gravity constants. |
| ClearCompositeOp | 18 | One of the composite type constants. |
| ColorizeCompositeOp | 28 | One of the composite type constants. |
| ColorSeparationMatteType | 9 | One of the image type constants. |
| ColorSeparationType | 8 | One of the image type constants. |
| ConcatenateMode | 3 | One of the image type constants. |
| CopyBlackCompositeOp | 35 | One of the composite type constants. |
| CopyBlueCompositeOp | 16 | One of the composite type constants. |
| CopyCompositeOp | 13 | One of the composite type constants. |
| CopyCyanCompositeOp | 32 | One of the composite type constants. |
| CopyGreenCompositeOp | 15 | One of the composite type constants. |
| CopyMagentaCompositeOp | 33 | One of the composite type constants. |
| CopyOpacityCompositeOp | 17 | One of the composite type constants. |
| CopyRedCompositeOp | 14 | One of the composite type constants. |
| CopyYellowCompositeOp | 34 | One of the composite type constants. |
| CubicFilter | 10 | One of the filter type constants. |
| CyanChannel | 2 | One of the possible channel constants. |
| DarkenCompositeOp | 24 | One of the composite type constants. |
| DifferenceCompositeOp | 10 | One of the composite type constants. |
| DirectClass | 1 | One of the class type constants. |
| DisplaceCompositeOp | 20 | One of the composite type constants. |
| DissolveCompositeOp | 19 | One of the composite type constants. |
| DivideCompositeOp | 36 | One of the composite type constants. |
| EastGravity | 6 | One of the possible gravity constants. |
| FaxCompression | 3 | One of the compression type constants. |
| ForgetGravity | 0 | One of the possible gravity constants. |
| FrameMode | 1 | One of the mode type constants. |
| GaussianFilter | 8 | One of the filter type constants. |
| GaussianNoise | 1 | One of the possible noise constants. |
| GrayChannel | 11 | One of the possible channel constants. |
| GrayscaleMatteType | 3 | One of the image type constants. |
| GrayscaleType | 2 | One of the image type constants. |
| GreenChannel | 3 | One of the possible channel constants. |
| Group4Compression | 4 | One of the compression type constants. |
| HammingFilter | 6 | One of the filter type constants. |
| HanningFilter | 5 | One of the filter type constants. |

Font Stretch

| Constant | Value | Description |
|---|---|---|
| AnyStretch | 9 | Don't care. |
| CondensedStretch | 3 | Condensed |
| ExpandedStretch | 6 | Expanded |
| ExtraCondensedStretch | 2 | Extra Condensed |
| ExtraExpandedStretch | 7 | Extra Expanded |
| NormalStretch | 0 | Normal (Default) |
| SemiCondensedStretch | 4 | Semi Condensed |
| SemiExpandedStretch | 5 | Semi Expanded |
| UltraCondensedStretch | 1 | Ultra Condensed |
| UltraExpandedStretch | 8 | Ultra Expanded |

Font Style

| Constant | Value | Description |
|---|---|---|
| AnyStyle | 3 | Don't care. |
| ItalicStyle | 1 | Italic font. |
| NormalStyle | 0 | Normal (Default) |
| ObliqueStyle | 2 | Oblique font. |

Storage Types

| Constant | Value | Description |
|---|---|---|
| StorageTypeCharPixel | 0 | 8bit numbers. |
| StorageTypeDoublePixel | 5 | 64bit floating numbers. |
| StorageTypeFloatPixel | 4 | 32bit floating numbers. |
| StorageTypeIntegerPixel | 2 | 32bit numbers. |
| StorageTypeLongPixel | 3 | 64bit numbers. |
| StorageTypeShortPixel | 1 | 16bit numbers. |

## 89.17 class GM16ImageStatisticsMBS

### 89.17.1 class GM16ImageStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for image statistics.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 89.17.2 Methods

### 89.17.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 89.17.4 Properties

### 89.17.5 blue as GM16ImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue channel statistics.
**Notes:** (Read only property)

### 89.17.6 green as GM16ImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green channel statistics.
**Notes:** (Read only property)

### 89.17.7 opacity as GM16ImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity channel statistics.
**Notes:** (Read only property)

### 89.17.8 red as GM16ImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red channel statistics.
**Notes:** (Read only property)

# 89.18 class GM16LockMBS

## 89.18.1 class GM16LockMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for locking a certain resource.
**Notes:** The idea is to pass the constructor a mutexlock and keep the only reference to this new lock object on the stack. On the end of the method, the destructor is called by Xojo and releases the mutexlock automatically.

## 89.18.2 Methods

## 89.18.3 Constructor(mutexlock as GM16MutexLockMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Lock based on the given mutexlock.

## 89.18.4 Properties

## 89.18.5 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 89.18.6 target as GM16MutexLockMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mutexlock this lock is referencing to.
**Notes:** (Read and Write property)

## 89.19 class GM16MontageFramedMBS

### 89.19.1 class GM16MontageFramedMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MontageFramed provides the means to specify montage options when it is desired to have decorative frames around the image thumbnails.
**Notes:** MontageFramed inherits from Montage and therefore provides all the methods of Montage as well as those shown in the table "MontageFramed Methods".

Framed thumbnails consist of four components: the thumbnail image, the thumbnail frame, the thumbnail border, an optional thumbnail shadow, and an optional thumbnail label area.
Subclass of the GM16MontageMBS class.

### 89.19.2 Methods

### 89.19.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.19.4 Properties

### 89.19.5 borderColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the background color within the thumbnail frame.
**Notes:** (Read and Write computed property)

### 89.19.6 borderWidth as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the border (in pixels) to place between a thumbnail and its surrounding frame.
**Notes:** This option only takes effect if thumbnail frames are enabled (via frameGeometry) and the thumbnail geometry specification doesn't also specify the thumbnail border width.
(Read and Write computed property)

### 89.19.7 frameGeometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the geometry specification for frame to place around thumbnail.
**Notes:** If this parameter is not specified, then the montage is unframed.
(Read and Write computed property)

### 89.19.8 matteColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail frame color.
**Notes:** (Read and Write computed property)

## 89.20 class GM16MontageMBS

### 89.20.1 class GM16MontageMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Montage is the base class to provide montage options and provides methods to set all options required to render simple (unframed) montages.
**Example:**

```
// build montage
dim StackingMontage as New GM16MontageMBS
StackingMontage.backgroundColor = New GM16ColorMBS(&cE7E7E7)
StackingMontage.fillColor = New GM16ColorMBS(&c000000)
StackingMontage.tile = New GM16GeometryMBS("1x20")
StackingMontage.geometry = New GM16GeometryMBS("160x120+5+5")
StackingMontage.font = "Helvetica"
StackingMontage.pointSize = 12
StackingMontage.title = "Title goes here"

// make picture
dim logo as Picture = LogoMBS(500)
dim image as New GM16ImageMBS(logo)

image.label("Sample label")

// Put the current image into the array
Dim StackingFrames As new GM16ImageArrayMBS
StackingFrames.insert(image)

// show result
dim resultImages as GM16ImageArrayMBS = StackingFrames.montageImages(StackingMontage)
Backdrop = resultImages.Image(0).CopyPicture
```

**Notes:** See GM16MontageFramedMBS if you would like to create a framed montage.

Unframed thumbnails consist of four components: the thumbnail image, the thumbnail border, an optional thumbnail shadow, and an optional thumbnail label area.

### 89.20.2 Methods

### 89.20.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.20.4 Properties

### 89.20.5 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 89.20.6 backgroundColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the background color that thumbnails are imaged upon.
**Notes:** (Read and Write computed property)

### 89.20.7 compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the image composition algorithm for thumbnails.
**Notes:** This controls the algorithm by which the thumbnail image is placed on the background. Use of OverCompositeOp is recommended for use with images that have transparency. This option may have negative side-effects for images without transparency.
(Read and Write computed property)

### 89.20.8 fileName as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the image filename to be used for the generated montage images.
**Notes:** To handle the case were multiple montage images are generated, a printf-style format may be embedded within the filename. For example, a filename specification of image%02d.miff names the montage

images as image00.miff, image01.miff, etc.
(Read and Write computed property)

### 89.20.9 fillColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the fill color to use for the label text.
**Notes:** (Read and Write computed property)

### 89.20.10 font as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail label font.
**Notes:** (Read and Write computed property)

### 89.20.11 geometry as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the size of the generated thumbnail.
**Notes:** (Read and Write computed property)

### 89.20.12 gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail positioning within the specified geometry area.
**Notes:** If the thumbnail is smaller in any dimension than the geometry, then it is placed according to this specification.
See Gravity constants in GM16ImageMBS class.
(Read and Write computed property)

### 89.20.13 label as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the format used for the image label.
**Notes:** Special format characters may be embedded in the format string to include information about the

image.
(Read and Write computed property)

### 89.20.14 penColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the pen color to use for the label text (same as fill).
**Notes:** (Read and Write computed property)

### 89.20.15 pointSize as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail label font size.
**Notes:** (Read and Write computed property)

### 89.20.16 shadow as boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable drop-shadow on thumbnails.
**Notes:** (Read and Write computed property)

### 89.20.17 strokeColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the stroke color to use for the label text.
**Notes:** (Read and Write computed property)

### 89.20.18 texture as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a texture image to use as montage background.
**Notes:** The built-in textures "granite:" and "plasma:" are available. A texture is the same as a background image.
(Read and Write computed property)

### 89.20.19 tile as GM16GeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the maximum number of montage columns and rows in the montage.
**Notes:** The montage is built by filling out all cells in a row before advancing to the next row. Once the montage has reached the maximum number of columns and rows, a new montage image is started.
(Read and Write computed property)

### 89.20.20 title as string

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the montage title.
**Notes:** (Read and Write computed property)

### 89.20.21 transparentColor as GM16ColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a montage color to set transparent.
**Notes:** This option can be set the same as the background color in order for the thumbnails to appear without a background when rendered on an HTML page. For best effect, ensure that the transparent color selected does not occur in the rendered thumbnail colors.
(Read and Write computed property)

## 89.21 class GM16MutexLockMBS

### 89.21.1 class GM16MutexLockMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mutex class for GraphicsMagick.

### 89.21.2 Methods

### 89.21.3 lock

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the lock.
**Notes:** Only one thread at a time can get the lock. The other threads will wait when lock is called.

### 89.21.4 unlock

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks the lock.

### 89.21.5 Properties

### 89.21.6 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 89.22 class GM16NotInitializedExceptionMBS

### 89.22.1 class GM16NotInitializedExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception raised if you access a method/property in an object and the object was not initialized propertly.
**Notes:** Check the message property for details.
Subclass of the GM16ErrorExceptionMBS class.

# 89.23 class GM16PathArgsMBS

## 89.23.1 class GM16PathArgsMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a class for arguments to the path arc/curve methods in GM16GraphicsMBS.
**Example:**

```
dim g as new GM16PathArgsMBS(1,2,3,4) // for a QuadraticCurveto

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

**Notes:** Due we use this class for three different ways, we have three constructors to fill in the value you need for the calls.

## 89.23.2 Methods

## 89.23.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for creating an empty object.
See also:


- 89.23.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14481
- 89.23.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14482
- 89.23.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14482


## 89.23.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the PathArc methods in GM16GraphicsMBS.
See also:


- 89.23.3 Constructor 14481

- 89.23.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14482
- 89.23.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14482


### 89.23.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the QuadraticCurveto methods in GM16GraphicsMBS.
**Example:**

```
dim g as new GM16PathArgsMBS(1,2,3,4)

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

See also:


- 89.23.3 Constructor 14481
- 89.23.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14481
- 89.23.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14482


### 89.23.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the Curveto methods in GM16GraphicsMBS.
**Example:**

```
dim g as new GM16PathArgsMBS(1,2,3,4,5,6)

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x2)+EndOfLine+str(g.y2)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

See also:


- 89.23.3 Constructor 14481
- 89.23.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14481

• 89.23.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14482

### 89.23.7 Properties

### 89.23.8 largeArcFlag as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The large arc flag.
**Notes:** Draw longer of the two matching arcs
(Read and Write property)

### 89.23.9 radiusX as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radius x value.
**Notes:** (Read and Write property)

### 89.23.10 radiusY as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radius y value.
**Notes:** (Read and Write property)

### 89.23.11 sweepFlag as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sweep flag value.
**Notes:** Draw arc matching clock-wise rotation.
(Read and Write property)

### 89.23.12 x as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Notes:** For an arc: End-point X

(Read and Write property)

### 89.23.13 x1 as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x1 value.
**Notes:** (Read and Write property)

### 89.23.14 x2 as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x2 value.
**Notes:** (Read and Write property)

### 89.23.15 xAxisRotation as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x Axis Rotation value.
**Notes:** Rotation relative to X axis.
(Read and Write property)

### 89.23.16 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Notes:** for an arc: End-point Y
(Read and Write property)

### 89.23.17 y1 as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y1 value.
**Notes:** (Read and Write property)

### 89.23.18 y2 as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y2 value.
**Notes:** (Read and Write property)

## 89.24 class GM16PixelsMBS

### 89.24.1 class GM16PixelsMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty pixels object.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim p as new GM16PixelsMBS(g)

// get pointer to some pixels to read/write
dim x as ptr = p.get(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

### 89.24.2 Methods

### 89.24.3 Constructor(Image as GM16ImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Pixels object with the pixels from an image.

### 89.24.4 get(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfer pixels from the image to the pixel view as defined by the specified region.

**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim p as new GM16PixelsMBS(g)

// get pointer to some pixels
dim x as ptr = p.get(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

**Notes:** Modified pixels may be subsequently transferred back to the image via sync.

### 89.24.5 getConst(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfer read-only pixels from the image to the pixel view as defined by the specified region.

### 89.24.6 indexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return pixel colormap index array.

### 89.24.7 set(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocate a pixel view region to store image pixels as defined by the region rectangle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim p as new GM16PixelsMBS(g)

// get pointer to some pixels to write
dim x as ptr = p.set(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

**Notes:** This area is subsequently transferred from the pixel view to the image via sync.

### 89.24.8 sync

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers the image cache pixels to the image.

### 89.24.9 Properties

### 89.24.10 columns as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of view.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GM16ImageMBS(f)
dim p as new GM16PixelsMBS(g)
```

```
// get pointer to some pixels
dim x as ptr = p.get(0, 0, 100, 100)

// and show size
MsgBox str(p.columns)+" x "+str(p.rows)
```

**Notes:** (Read only property)

### 89.24.11 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 89.24.12 rows as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height of view.
**Notes:** (Read only property)

### 89.24.13 x as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Left ordinate of view.
**Notes:** (Read only property)

### 89.24.14 y as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Top ordinate of view.
**Notes:** (Read only property)

## 89.25 class GM16TypeMetricMBS

### 89.25.1 class GM16TypeMetricMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TypeMetric class provides the means to pass data from the Image class's TypeMetric method to the user.
**Notes:** It provides information regarding font metrics such as ascent, descent, text width, text height, and maximum horizontal advance. The units of these font metrics are in pixels, and that the metrics are dependent on the current Image font (default Ghostscript's "Helvetica"), pointsize (default 12 points), and x/y resolution (default 72 DPI) settings.

The pixel units may be converted to points (the standard resolution-independent measure used by the typesetting industry) via the following equation:

size_points = (size_pixels * 72)/resolution
where resolution is in dots-per-inch (DPI). This means that at the default image resolution, there is one pixel per point.

Note that a font's pointsize is only a first-order approximation of the font height (ascender + descender) in points. The relationship between the specified pointsize and the rendered font height is determined by the font designer.

See FreeType Glyph Conventions for a detailed description of font metrics related issues.

### 89.25.2 Methods

### 89.25.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.25.4 Properties

### 89.25.5 ascent as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the distance in pixels from the text baseline to the highest/upper grid coordinate used

to place an outline point.
**Notes:** Always a positive value.
(Read only property)

### 89.25.6 descent as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the the distance in pixels from the baseline to the lowest grid coordinate used to place an outline point.
**Notes:** Always a negative value.
(Read only property)

### 89.25.7 maxHorizontalAdvance as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the maximum horizontal advance (advance from the beginning of a character to the beginning of the next character) in pixels.
**Notes:** (Read only property)

### 89.25.8 textHeight as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns text height in pixels.
**Notes:** (Read only property)

### 89.25.9 textWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns text width in pixels.
**Notes:** (Read only property)

## 89.26 class GM16UnsupportedExceptionMBS

### 89.26.1 class GM16UnsupportedExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An exception raised if you call the GM functions on an unsupported platform.
**Notes:** Check the message property for details.
This exception is currently only used on Windows.
(Windows support may come later)
Subclass of the GM16ErrorExceptionMBS class.

# 89.27 class GMBlobMBS

## 89.27.1 class GMBlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for binary large objects.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GMImageMBS
dim blob as new GMBlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

**Notes:** Blob provides the means to contain any opaque data. It is named after the term "Binary Large OBject" commonly used to describe unstructured data (such as encoded images) which is stored in a database. While the function of Blob is very simple (store a pointer and and size associated with allocated data), the Blob class provides some very useful capabilities. In particular, it is fully reference counted just like the Image class.

The Blob class supports value assignment while preserving any outstanding earlier versions of the object. Since assignment is via a pointer internally, Blob is efficient enough to be stored directly in an STL container or any other data structure which requires assignment. In particular, by storing a Blob in an associative container (such as STL's 'map') it is possible to create simple indexed in-memory "database" of Blobs.

Magick++ currently uses Blob to contain encoded images (e.g. JPEG) as well as ICC and IPTC profiles. Since Blob is a general-purpose class, it may be used for other purposes as well.
**Blog Entries**

- Tip of the day: Render SVG with GraphicsMagick Plugin

### 89.27.2 Methods

### 89.27.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor creating an empty blob object.
See also:


- 89.27.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14494
- 89.27.5 Constructor(data as string) 14494
- 89.27.6 Constructor(other as GMBlobMBS) 14495


### 89.27.4 Constructor(data as memoryblock, offset as Integer, size as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct object with data, making a copy of the supplied data.
See also:


- 89.27.3 Constructor 14494
- 89.27.5 Constructor(data as string) 14494
- 89.27.6 Constructor(other as GMBlobMBS) 14495


### 89.27.5 Constructor(data as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct object with data, making a copy of the supplied data.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GMImageMBS
dim blob as new GMBlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
```

Backdrop=mp.CombinePictureWithMask

See also:


- 89.27.3 Constructor 14494
- 89.27.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14494
- 89.27.6 Constructor(other as GMBlobMBS) 14495


### 89.27.6 Constructor(other as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy constructor (reference counted).
See also:


- 89.27.3 Constructor 14494
- 89.27.4 Constructor(data as memoryblock, offset as Integer, size as Integer) 14494
- 89.27.5 Constructor(data as string) 14494


### 89.27.7 CopyMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the data as a memoryblock.
**Notes:** Returns nil on any error like low memory.

### 89.27.8 CopyString as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the data as a string.

### 89.27.9 Data as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A memoryblock with the data from this blob.
**Example:**

```
dim b as new GMBlobMBS("Hello")

dim m as memoryblock = b.Data
MsgBox m.StringValue(0,5) // shows "Hello"
```

**Notes:** This is a memoryblock referencing the data of the blob. It has no size set. The memoryblock can only be used as long as the blob object exists. if you use it after you destroyed the blob object, you can crash you application.

### 89.27.10 Update(data as memoryblock, offset as Integer, size as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the content of this blob with a copy of the bytes in the memoryblock.
See also:

- 89.27.11 Update(data as string) 14496

### 89.27.11 Update(data as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the content of this blob with a copy of the bytes in the string.
**Notes:** Offset is zero based.
See also:

- 89.27.10 Update(data as memoryblock, offset as Integer, size as Integer) 14496

### 89.27.12 Properties

### 89.27.13 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle of the blob object.
**Notes:** (Read and Write property)

### 89.27.14 length as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain data length in bytes.
**Example:**

```
dim b as new GMBlobMBS("Hello")

MsgBox str(B.length) // shows 5
```

**Notes:** (Read only property)

### 89.27.15 base64 as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blob content as a string in Base64 format.
**Example:**

```
dim b as new GMBlobMBS("Hello")

MsgBox b.base64 // shows "SGVsbG8="
```

**Notes:** (Read and Write computed property)

## 89.28 class GMCoderInfoMBS

### 89.28.1 class GMCoderInfoMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class used to get information about all registered coders.
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GMCoderInfoMBS in coders
names.Append coder.name
next

MsgBox Join(names,EndOfLine)
```

**Notes:** The CoderInfo class provides the means to provide information regarding GraphicsMagick support for an image format (designated by a magick string). It may be used to provide support for a specific named format (provided as an argument to the constructor), or as an element of a container when format support is queried using the coderInfoList() templated function.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr1

### 89.28.2 Methods

### 89.28.3 CoderInfoList as GMCoderInfoMBS()

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a list of all coders.
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
```

### 89.28.4 Properties

### 89.28.5 description as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format description (e.g. "CompuServe graphics interchange format").
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GMCoderInfoMBS in coders
names.Append coder.name+" "+coder.description
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.28.6 isMultiFrame as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format supports multiple frames.
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GMCoderInfoMBS in coders
names.Append coder.name+" "+str(coder.isMultiFrame)
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.28.7 isReadable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format is readable.
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GMCoderInfoMBS in coders
```

```
names.Append coder.name+" "+str(coder.isReadable)
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.28.8 isWritable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format is writeable.
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim names(-1) as string

for each coder as GMCoderInfoMBS in coders
names.Append coder.name+" "+str(coder.isWritable)
next

MsgBox Join(names,EndOfLine)
```

**Notes:** (Read and Write property)

### 89.28.9 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of loadable module.
**Notes:** (Read and Write property)

### 89.28.10 name as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format name (e.g. "GIF").
**Example:**

```
dim coders(-1) as GMCoderInfoMBS = GMCoderInfoMBS.CoderInfoList
dim coder as GMCoderInfoMBS = coders(0) // pick first one
```

MsgBox coder.name

**Notes:** (Read and Write property)

### 89.28.11 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Usage note for user.
**Notes:** (Read and Write property)

### 89.28.12 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Support library version.
**Notes:** (Read and Write property)

## 89.29 class GMColorGrayMBS

### 89.29.1 class GMColorGrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color subclass for a grayscale color.
**Example:**

```
dim g as new GMColorGrayMBS(0.5)
MsgBox str(g.shade)
```

**Notes:** Representation of grayscale RGB color.
Equal parts red, green, and blue specified as a ratio (0 to 1).
Subclass of the GMColorMBS class.

### 89.29.2 Methods

### 89.29.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorGrayMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.29.4 Constructor(other as GMColorMBS) 14502
- 89.29.5 Constructor(shade as Double) 14503


### 89.29.4 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GMColorGrayMBS(0.5)
dim o as new GMColorGrayMBS(g)
```

MsgBox str(o.shade)

See also:

- 89.29.3 Constructor 14502
- 89.29.5 Constructor(shade as Double) 14503

### 89.29.5 Constructor(shade as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given value.
**Example:**

```
dim g as new GMColorGrayMBS(1.0)
MsgBox str(g.colorValue)
```

**Notes:** Range is 0.0 to 1.0.
See also:

- 89.29.3 Constructor 14502
- 89.29.4 Constructor(other as GMColorMBS) 14502

### 89.29.6 Properties

### 89.29.7 shade as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gray value for this color.
**Example:**

```
dim g as new GMColorGrayMBS(1.0)
MsgBox str(g.shade)
```

**Notes:** Range is 0.0 to 1.0
(Read and Write property)

## 89.30 class GMColorHSLMBS

### 89.30.1 class GMColorHSLMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a HSL color.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.colorValue)
```

**Notes:** Subclass of the GMColorMBS class.

### 89.30.2 Methods

### 89.30.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorHSLMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.30.4 Constructor(hue as Double, saturation as Double, luminosity as Double) 14504
- 89.30.5 Constructor(other as GMColorMBS) 14505


### 89.30.4 Constructor(hue as Double, saturation as Double, luminosity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.hue)+" "+str(g.saturation)+" "+str(g.luminosity)
```

See also:


- 89.30.3 Constructor 14504
- 89.30.5 Constructor(other as GMColorMBS) 14505


### 89.30.5 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
dim o as new GMColorHSLMBS(g)

MsgBox str(o.colorValue)
```

See also:


- 89.30.3 Constructor 14504
- 89.30.4 Constructor(hue as Double, saturation as Double, luminosity as Double) 14504


### 89.30.6 Properties

### 89.30.7 hue as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hue value.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.hue)
```

**Notes:** (Read and Write property)

### 89.30.8 luminosity as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The luminosity value.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.luminosity)
```

**Notes:** (Read and Write property)

### 89.30.9 saturation as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The saturation value.
**Example:**

```
dim g as new GMColorHSLMBS(0.1,0.2,0.3)
MsgBox str(g.saturation)
```

**Notes:** (Read and Write property)

# 89.31 class GMColorMBS

## 89.31.1 class GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color is the base color class.
**Example:**

```
dim c as new GMColorMBS(127,255,127) // light green
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** It is a simple container class for the pixel red, green, blue, and alpha values scaled to fit GraphicsMagick's Quantum size. Normally users will instantiate a class derived from Color which supports the color model that fits the needs of the application. The Color class may be constructed directly from an X11-style color string. As a perhaps odd design decision, the value transparent black is considered to represent an unset value (invalid color) in many cases. This choice was made since it avoided using more memory. The default Color constructor constructs an invalid color (i.e. transparent black) and may be used as a parameter in order to remove a color setting.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1
- Gradients in GraphicsMagick

## 89.31.2 Methods

## 89.31.3 Black as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a black color.
**Example:**

```
dim black as GMColorMBS = GMColorMBS.Black

MsgBox str(black.colorValue)
```

## 89.31.4 Color(ColorValue as Color) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color from Xojo to GMColorMBS.
**Example:**

```
dim c as GMColorMBS = GMColorMBS.Color(&cFF0000)

MsgBox str(c.colorValue)
```

See also:


- 89.31.5 Color(ColorValue as Color, alpha as Integer) as GMColorMBS 14508
- 89.31.6 Color(red as integer, green as integer, blue as integer) as GMColorMBS 14508
- 89.31.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GMColorMBS 14509


### 89.31.5 Color(ColorValue as Color, alpha as Integer) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color from Xojo to GMColorMBS with separate alpha value.
**Example:**

```
dim c as GMColorMBS = GMColorMBS.Color(&cFF0000, 128)

MsgBox str(c.colorValue)+" "+str(c.alpha)
```

**Notes:** Alpha in range from 0 to 255.
See also:


- 89.31.4 Color(ColorValue as Color) as GMColorMBS 14507
- 89.31.6 Color(red as integer, green as integer, blue as integer) as GMColorMBS 14508
- 89.31.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GMColorMBS 14509


### 89.31.6 Color(red as integer, green as integer, blue as integer) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates color with RGB values.
**Example:**

```
dim c as GMColorMBS = GMColorMBS.Color(127, 191, 255)

MsgBox str(c.colorValue)
```

**Notes:** Range in 0 to 255 for 8bit and 0 to 65535 for 16bit class.
See also:


- 89.31.4 Color(ColorValue as Color) as GMColorMBS 14507
- 89.31.5 Color(ColorValue as Color, alpha as Integer) as GMColorMBS 14508
- 89.31.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GMColorMBS 14509


### 89.31.7 Color(red as integer, green as integer, blue as integer, alpha as Integer) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates color with RGB values.
**Example:**

```
dim c as GMColorMBS = GMColorMBS.Color(127, 191, 255, 127)

MsgBox str(c.colorValue)+" "+str(c.alphaQuantum)
```

**Notes:** Range in 0 to 255 for 8bit and 0 to 65535 for 16bit class.
See also:


- 89.31.4 Color(ColorValue as Color) as GMColorMBS 14507
- 89.31.5 Color(ColorValue as Color, alpha as Integer) as GMColorMBS 14508
- 89.31.6 Color(red as integer, green as integer, blue as integer) as GMColorMBS 14508


### 89.31.8 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.31.9 Constructor(ColorName as string) 14510

- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513


### 89.31.9 Constructor(ColorName as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color based on the X11 color name.
**Example:**

```
dim c as new GMColorMBS("red")

MsgBox str(c.redQuantum)+"-"+str(c.greenQuantum)+"-"+str(c.blueQuantum) // shows "255-0-0"

dim d as new GMColorMBS("#77FF00")

MsgBox str(d.redQuantum)+"-"+str(d.greenQuantum)+"-"+str(d.blueQuantum) // shows "119-255-0"
```

**Notes:** An alternate way to construct the class is via an X11-compatible color specification string (e.g. Color("red") or Color ("#FF0000")). Since the class may be constructed from a string, convenient strings may be passed in place of an explicit Color object in methods which accept a reference to Color. Color may also be converted to a std::string for convenience in user interfaces, and for saving settings to a text file.
See also:


- 89.31.8 Constructor 14509
- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513


### 89.31.10 Constructor(ColorValue as color)

MBS GraphicsMagick Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GMColorMBS(&cFF0000)
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.31.8 Constructor 14509
- 89.31.9 Constructor(ColorName as string) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513


### 89.31.11 Constructor(ColorValue as color, alpha as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GMColorMBS(&cFF0102, 127)
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)+" "+str(c.alpha)
```

See also:


- 89.31.8 Constructor 14509
- 89.31.9 Constructor(ColorName as string) 14510
- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513


### 89.31.12 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim r as new GMColorMBS(1,2,3)
dim c as new GMColorMBS(r)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.31.8 Constructor 14509
- 89.31.9 Constructor(ColorName as string) 14510
- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513


### 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GMColorMBS(1,2,3)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
See also:


- 89.31.8 Constructor 14509
- 89.31.9 Constructor(ColorName as string) 14510
- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer) 14513

### 89.31.14 Constructor(red as Integer, green as Integer, blue as Integer, alpha as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GMColorMBS(1,2,3,4)

// display color, alpha is double...
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)+" "+str(c.alpha)
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
See also:


- 89.31.8 Constructor 14509
- 89.31.9 Constructor(ColorName as string) 14510
- 89.31.10 Constructor(ColorValue as color) 14510
- 89.31.11 Constructor(ColorValue as color, alpha as Integer) 14511
- 89.31.12 Constructor(other as GMColorMBS) 14511
- 89.31.13 Constructor(red as Integer, green as Integer, blue as Integer) 14512


### 89.31.15 QuantumByteSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum byte size.
**Example:**

```
MsgBox str(GMColorMBS.QuantumByteSize)
```

**Notes:** As the plugin uses 8 bit this value should be 1.

### 89.31.16 scaleDoubleToQuantum(value as Double) as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a double value to a value in the range of a quantum.
**Example:**

```
dim d as Double = 1.0
dim v as Integer = GMColorMBS.scaleDoubleToQuantum(d)
MsgBox str(v)
```

**Notes:** As the plugin uses 8 bit quantums, this is basicly a multiplication by 255.0

### 89.31.17 scaleQuantumToDouble(value as Integer) as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a quantum to a double value.
**Example:**

```
dim v as Integer = 255
dim d as Double = GMColorMBS.scaleQuantumToDouble(v)
MsgBox str(d)
```

**Notes:** The plugin uses 8bit quantums, so this is basicly the division of value by 255.0

### 89.31.18 White as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a white color.
**Example:**

```
dim White as GMColorMBS = GMColorMBS.White

MsgBox str(White.colorValue)
```

### 89.31.19 Properties

### 89.31.20 alpha as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha value of this color.
**Example:**

```
dim c as new GMColorMBS(1,2,3,1.0)
MsgBox str(c.alpha)
```

**Notes:** Range is 0.0 to 1.0. If you pass values higher, they are divided by 255.
(Read and Write property)

### 89.31.21 alphaQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha color value.
**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.31.22 blueQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color value.
**Example:**

```
dim c as new GMColorMBS(1,2,3)
MsgBox str(c.redQuantum) // 3
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.31.23 colorValue as color

MBS GraphicsMagick Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Xojo color for the GraphicsMagick color.
**Example:**

```
dim c as new GMColorMBS(&cFF0102)
MsgBox str(c.ColorValue)
```

**Notes:** (Read and Write property)

### 89.31.24 greenQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color value.
**Example:**

```
dim r as new GMColorMBS(1,2,3)
MsgBox str(r.greenQuantum) // shows 2
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

### 89.31.25 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal color reference.
**Example:**

```
dim r as new GMColorMBS(1,2,3)
MsgBox str(r.handle)
```

**Notes:** (Read and Write property)

### 89.31.26 intensity as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intensity of this color.
**Example:**

```
dim c as new GMColorMBS(1,2,3)
MsgBox str(c.intensity)
```

**Notes:** (Read only property)

### 89.31.27 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain valid color?
**Example:**

```
dim c as new GMColorMBS(1,2,3)
MsgBox str(c.isValid)
```

**Notes:** (Read and Write property)

### 89.31.28 redQuantum as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color value.
**Example:**

```
dim c as new GMColorMBS(1,2,3)
MsgBox str(c.redQuantum) // 1
```

**Notes:** For 8-bit range is 0 to 255.
For 16-bit range is 0 to 65535.
(Read and Write property)

## 89.32 class GMColorMonoMBS

### 89.32.1 class GMColorMonoMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Representation of a black/white color (true/false)
**Example:**

```
dim g as new GMColorMonoMBS(false)
MsgBox str(g.colorValue)
```

**Notes:** Subclass of the GMColorMBS class.

### 89.32.2 Methods

### 89.32.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorMonoMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.32.4 Constructor(mono as boolean) 14518
- 89.32.5 Constructor(other as GMColorMBS) 14519


### 89.32.4 Constructor(mono as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GMColorMonoMBS(false)
MsgBox str(g.mono)
```

See also:


- 89.32.3 Constructor 14518
- 89.32.5 Constructor(other as GMColorMBS) 14519


### 89.32.5 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GMColorMonoMBS(false)
dim o as new GMColorMonoMBS(g)
MsgBox str(o.mono)
```

See also:


- 89.32.3 Constructor 14518
- 89.32.4 Constructor(mono as boolean) 14518


### 89.32.6 Properties

### 89.32.7 mono as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color value.
**Example:**

```
dim g as new GMColorMonoMBS(true)
MsgBox str(g.mono)
```

**Notes:** (Read and Write property)

## 89.33 class GMColorRGBMBS

### 89.33.1 class GMColorRGBMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color class for RGB colors.
**Example:**

```
dim c as new GMColorRGBMBS(1.0,0.0,0.0) // red
MsgBox str(C.red)+" "+str(c.green)+" "+str(c.blue)
MsgBox str(C.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

**Notes:** Representation of RGB color with red, green, and blue specified as ratios (0 to 1)
Subclass of the GMColorMBS class.
**Blog Entries**

- Crop a two side page document to a single page document

### 89.33.2 Methods

### 89.33.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorRGBMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.33.4 Constructor(other as GMColorMBS) 14520
- 89.33.5 Constructor(red as Double, green as Double, blue as Double) 14521


### 89.33.4 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GMColorRGBMBS(1,2,3)
dim o as new GMColorRGBMBS(g)
MsgBox str(o.colorValue)
```

See also:


- 89.33.3 Constructor 14520
- 89.33.5 Constructor(red as Double, green as Double, blue as Double) 14521


### 89.33.5 Constructor(red as Double, green as Double, blue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim c as new GMColorRGBMBS(0.1,0.2,0.3)
```

**Notes:** Range is 0.0 to 1.0.
See also:


- 89.33.3 Constructor 14520
- 89.33.4 Constructor(other as GMColorMBS) 14520


### 89.33.6 Properties

### 89.33.7 blue as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color component.
**Example:**

```
dim c as new GMColorRGBMBS(0.0,0.0,1.0)
MsgBox str(c.blue)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

### 89.33.8 green as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color component.
**Example:**

```
dim c as new GMColorRGBMBS(0.0,1.0,0.0)
MsgBox str(c.green)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

### 89.33.9 red as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color component.
**Example:**

```
dim c as new GMColorRGBMBS(1.0,0.0,0.0) // red
MsgBox str(C.red)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

# 89.34 class GMColorYUVMBS

## 89.34.1 class GMColorYUVMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Representation of a color in the YUV colorspace
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.y)+" "+str(g.u)+" "+str(g.v)
```

**Notes:** Subclass of the GMColorMBS class.

## 89.34.2 Methods

## 89.34.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with transparent black.
**Example:**

```
dim c as new GMColorYUVMBS
MsgBox str(c.redQuantum)+" "+str(c.greenQuantum)+" "+str(c.blueQuantum)
```

See also:


- 89.34.4 Constructor(other as GMColorMBS) 14523
- 89.34.5 Constructor(y as Double, u as Double, v as Double) 14524


## 89.34.4 Constructor(other as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color copying the existing color.
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
dim o as new GMColorYUVMBS(g)
MsgBox str(o.colorValue)
```

See also:


- 89.34.3 Constructor 14523
- 89.34.5 Constructor(y as Double, u as Double, v as Double) 14524


### 89.34.5 Constructor(y as Double, u as Double, v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color with the given values.
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
```

See also:


- 89.34.3 Constructor 14523
- 89.34.4 Constructor(other as GMColorMBS) 14523


### 89.34.6 Properties

### 89.34.7 u as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The u color component.
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.u)
```

**Notes:** Range is -0.5 to +0.5.
(Read and Write property)

### 89.34.8 v as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The v color component.
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.v)
```

**Notes:** Range is -0.5 to +0.5.
(Read and Write property)

### 89.34.9 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y color component.
**Example:**

```
dim g as new GMColorYUVMBS(0.1, 0.2, 0.3)
MsgBox str(g.y)
```

**Notes:** Range is 0.0 to 1.0.
(Read and Write property)

## 89.35 class GMConvertMBS

### 89.35.1 class GMConvertMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to convert images thread friendly.
**Notes:** This class is intended to process lots of images in several instances in several threads.
If you for example use 8 Xojo threads, to process thousands of images to scale them down for thumbnails, you can easily keep 8 CPU cores busy.

Please make a new instance, set options and call run method. When run is done, please read output properties.
Do not modify properties while thread is running.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr7
- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2
- CGImageSourceMBS CreateThumbnailMT method for Xojo

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 39: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.3, page 11: News

### 89.35.2 Methods

### 89.35.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.35.4 Run

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts converter.
**Notes:** The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 89.35.5 Properties

### 89.35.6 AutoOrient as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to call autoOrient method to change orientation of image data to 0¬∞.
**Notes:** (Read and Write property)

### 89.35.7 Enhance as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to run enhance command.
**Notes:** If true, we call enhance on the image to minimize noise.
(Read and Write property)

### 89.35.8 Equalize as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to run equalize command.
**Notes:** If set to true, we call equalize command on image (histogram equalization).
(Read and Write property)

### 89.35.9 ImageType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image type.

**Notes:** If value is >0, the image type is change to the given type.
(Read and Write property)

### 89.35.10 InputData as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input data string.
**Notes:** If set, we read image from this data.
(Read and Write property)

### 89.35.11 InputFile as FolderItem

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input folderitem.
**Notes:** If set input file to read.
(Read and Write property)

### 89.35.12 InputGeometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input geometry.
**Notes:** Some formats can be loaded with different scales, so this geometry is passed to read method to define the format requested.
(Read and Write property)

### 89.35.13 InputImage as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input image.
**Notes:** (Read and Write property)

### 89.35.14 InputMagick as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image magick type.
**Notes:** If empty, the type of file is automatically determined.
(Read and Write property)

### 89.35.15 InputMemory as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input data memoryblock.
**Notes:** If set, we read image from this data.
(Read and Write property)

### 89.35.16 InputPath as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input file path.
**Notes:** If set input file to read.
(Read and Write property)

### 89.35.17 OutputData as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output data as string.
**Notes:** (Read and Write property)

### 89.35.18 OutputFile as FolderItem

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The folderitem where to write file.
**Notes:** If set, the image will be written to this file.
(Read and Write property)

### 89.35.19 OutputImage as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output image object.
**Notes:** (Read and Write property)

### 89.35.20 OutputMagick as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output magick.
**Notes:** You can set this to a magick codec type to define output format, e.g. "jpeg".
(Read and Write property)

### 89.35.21 OutputMemory as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output data as memory block.
**Notes:** (Read and Write property)

### 89.35.22 OutputPath as String

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native file path for output.
**Notes:** If set, the image will be written to this path.
(Read and Write property)

### 89.35.23 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quality of images in range 1 to 100.
**Notes:** If value is >0, we assign it to the image for setting image quality.
(Read and Write property)

### 89.35.24 Running as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this converter is running.
**Notes:** Set to true while Run method runs.

(Read only property)

### 89.35.25 ScaleGeometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry for call to scale method.
**Notes:** scale method is called with this geometry (if set) to reduce image size.
(Read and Write property)

### 89.35.26 Strip as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to remove all profiles and text attributes from the image.
**Notes:** (Read and Write property)

### 89.35.27 ThumbnailGeometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry for call to thumbnail method.
**Notes:** thumbnail method is called with this geometry (if set) to reduce image size.
(Read and Write property)

### 89.35.28 Trim as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether trim command is called on image to remove extra blank space around image.
**Notes:** (Read and Write property)

### 89.35.29 WantOutputData as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want image compressed and stored in OutputData property.
**Notes:** (Read and Write property)

### 89.35.30 WantOutputMemory as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want image compressed and stored in OutputMemory property.
**Notes:** (Read and Write property)

## 89.36 class GMCoordinateMBS

### 89.36.1 class GMCoordinateMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Graphics Magick class for a coordinate.
**Example:**

```
dim c as new GMCoordinateMBS(5,6)
MsgBox str(c.x)+" "+str(c.y)
```

### 89.36.2 Methods

### 89.36.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new coordinate.
See also:

- 89.36.4 Constructor(x as Double, y as Double) 14533

### 89.36.4 Constructor(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new coordinate.
**Example:**

```
dim c as new GMCoordinateMBS(5,6)
MsgBox str(c.x)+" "+str(c.y)
```

See also:

- 89.36.3 Constructor 14533

### 89.36.5 Properties

### 89.36.6 x as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Example:**

```
dim c as new GMCoordinateMBS
c.x = 5
MsgBox str(c.x)
```

**Notes:** (Read and Write property)

### 89.36.7 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Example:**

```
dim c as new GMCoordinateMBS
c.y = 5
MsgBox str(c.y)
```

**Notes:** (Read and Write property)

## 89.37 class GMErrorExceptionMBS

### 89.37.1 class GMErrorExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception to report errors in the GraphicMagick plugin.
**Notes:** Check the message property for details.
Subclass of the RuntimeException class.

## 89.38 class GMGeometryMBS

### 89.38.1 class GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Geometry provides a convenient means to specify a geometry argument.
**Example:**

```
dim g as new GMGeometryMBS(300,400)
MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** The object may be initialized from a string containing a geometry specification. It may also be initialized by more efficient parameterized constructors.
**Blog Entries**

- Auto crop a signature picture
- Crop a two side page document to a single page document
- MBS Xojo Plugins, version 19.0pr6
- Gradients in GraphicsMagick
- Tip of the day: Render SVG with GraphicsMagick Plugin

**Xojo Developer Magazine**

- 19.6, page 74: Fun with GraphicsMagick, Cool methods from the GMImageMBS class by Stefanie Juchmes

### 89.38.2 Methods

### 89.38.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates empty geometry.
**Example:**

```
dim g as new GMGeometryMBS
MsgBox str(G.width)+" "+str(G.height)
```

See also:

- 89.38.4 Constructor(geometry as string) 14537
- 89.38.5 Constructor(other as GMGeometryMBS) 14537
- 89.38.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14538


### 89.38.4 Constructor(geometry as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct geometry from string.
**Example:**

```
dim g as new GMGeometryMBS("600x600")

MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** See the GraphicsMagick website for details.
http://www.graphicsmagick.org/Magick++/Geometry.html
See also:


- 89.38.3 Constructor 14536
- 89.38.5 Constructor(other as GMGeometryMBS) 14537
- 89.38.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14538


### 89.38.5 Constructor(other as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new geometry object by copying an existing one.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
dim h as new GMGeometryMBS(g)
MsgBox str(h.width)
```

See also:


- 89.38.3 Constructor 14536
- 89.38.4 Constructor(geometry as string) 14537

- 89.38.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) 14538

### 89.38.6 Constructor(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates geometry with the given values.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.width)
```

See also:

- 89.38.3 Constructor 14536
- 89.38.4 Constructor(geometry as string) 14537
- 89.38.5 Constructor(other as GMGeometryMBS) 14537

### 89.38.7 Make(geometry as string) as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct geometry from string.
**Example:**

```
dim g as GMGeometryMBS = GMGeometryMBS.Make("600x600")

MsgBox str(G.width)+" "+str(G.height)
```

**Notes:** See the GraphicsMagick website for more details:
http://www.graphicsmagick.org/Magick++/Geometry.html
See also:

- 89.38.8 Make(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) as GMGeometryMBS 14539

### 89.38.8 Make(Width as UInt32, Height as UInt32, XOffset as UInt32=0, YOffset as UInt32=0, xNegative as boolean=false, yNegative as boolean=false) as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates geometry with the given values.
**Example:**

```
dim g as GMGeometryMBS = GMGeometryMBS.Make(600,600)
MsgBox str(g.width)
```

See also:

- 89.38.7 Make(geometry as string) as GMGeometryMBS 14538

### 89.38.9 Properties

### 89.38.10 aspect as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize without preserving aspect ratio (!).
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.aspect)
```

**Notes:** (Read and Write property)

### 89.38.11 fillArea as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image to fit total pixel area specified by dimensions.
**Notes:** Same as @ in the geometry specification.
(Read and Write property)

### 89.38.12 greater as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize if image is greater than size (>).
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.greater)
```

**Notes:** (Read and Write property)

### 89.38.13 height as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height value.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.height)
```

**Notes:** (Read and Write property)

### 89.38.14 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain a valid geometry?
**Example:**

```
dim g as new GMGeometryMBS(100,200)
MsgBox str(G.isValid)
```

**Notes:** May be set to false in order to invalidate an existing geometry object.
(Read and Write property)

### 89.38.15 less as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize if image is less than size (<).
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.less)
```

**Notes:** (Read and Write property)

### 89.38.16 limitPixels as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dimensions are treated as minimum rather than maximum values.
**Notes:** Same as ^in the geometry specification.
(Read and Write property)

### 89.38.17 percent as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height are expressed as percentages.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.percent)
```

**Notes:** (Read and Write property)

### 89.38.18 StringValue as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string representation of the geometry object.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.StringValue)
```

**Notes:** (Read and Write property)

### 89.38.19 width as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width value.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
MsgBox str(g.width)
```

**Notes:** (Read and Write property)

### 89.38.20 xNegative as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sign of X offset negative? (X origin at right)
**Example:**

```
dim g as new GMGeometryMBS(100,200,30,40,true,false)
MsgBox str(G.xNegative)
```

**Notes:** (Read and Write property)

### 89.38.21 xOff as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X offset from origin.
**Example:**

```
dim g as new GMGeometryMBS(100,200,30,40,true,true)
MsgBox str(G.xOff)+" "+str(G.yOff)
```

**Notes:** (Read and Write property)

### 89.38.22 yNegative as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sign of Y offset negative? (Y origin at bottom)
**Example:**

```
dim g as new GMGeometryMBS(100,200,30,40,false,true)
MsgBox str(G.yNegative)
```

**Notes:** (Read and Write property)

### 89.38.23 yOff as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y offset from origin
**Example:**

```
dim g as new GMGeometryMBS(100,200,30,40,true,true)
MsgBox str(G.xOff)+" "+str(G.yOff)
```

**Notes:** (Read and Write property)

## 89.39 class GMGraphicsMBS

### 89.39.1 class GMGraphicsMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for drawing commands targeting a GMImageMBS.
**Notes:** Please remember that all commands are collected till you call the Draw method.
**Blog Entries**

- Crop a two side page document to a single page document
- MBS Real Studio Plugins, version 12.5pr13

### 89.39.2 Methods

### 89.39.3 Arc(startX as Double, startY as Double, endX as Double, endY as Double, startDegrees as Double, endDegrees as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arc using the stroke color and based on the circle starting at coordinates startX,startY, and ending with coordinates endX,endY, and bounded by the rotational arc startDegrees,endDegrees.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.type = image.TrueColorType
image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.arc(250, 250, 100, 100,50,300)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.4 Bezier(values() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a bezier curve using the stroke color and based on the coordinates specified by the coordinates array.

### 89.39.5 Circle(originX as Double, originY as Double, perimX as Double, perimY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a circle using the stroke color and thickness using specified origin and perimeter coordinates.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.type = image.TrueColorType
image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.39.6 ClipPath(id as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Select a drawing clip path matching id.

### 89.39.7 ColorPixel(x as Double, y as Double, paintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color image according to paintMethod.
**Notes:** The point method recolors the target pixel. The replace method recolors any pixel that matches

the color of the target pixel. Floodfill recolors any pixel that matches the color of the target pixel and is a neighbor, whereas filltoborder recolors any neighbor pixel that is not the border color. Finally, reset recolors all pixels.

### 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547

- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.10 CompositeImage(x as Double, y as Double, path as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.

**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549

- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:

- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551


### 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
- 89.39.13 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS) 14549
- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer) 14551

### 89.39.16 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string, CompositeOperator as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composite current image with contents of specified image, rendered with specified width and height, using specified composition algorithm, at specified coordinates.
**Notes:** If the matte attribute is set to true, then the image composition will consider an alpha channel, or transparency, present in the image file so that non-opaque portions allow part (or all) of the composite image to show through. If the specified width or height is zero, then the image is composited at its natural size, without enlargement or reduction.
See also:


- 89.39.8 CompositeImage(x as Double, y as Double, file as folderitem) 14546
- 89.39.9 CompositeImage(x as Double, y as Double, image as GMImageMBS) 14546
- 89.39.10 CompositeImage(x as Double, y as Double, path as string) 14547
- 89.39.11 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem) 14547
- 89.39.12 CompositeImage(x as Double, y as Double, w as Double, h as Double, file as folderitem, CompositeOperator as Integer) 14548
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- 89.39.14 CompositeImage(x as Double, y as Double, w as Double, h as Double, image as GMImageMBS, CompositeOperator as Integer) 14549
- 89.39.15 CompositeImage(x as Double, y as Double, w as Double, h as Double, path as string) 14550


### 89.39.17 Constructor(image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object referencing the given image.

### 89.39.18 DashArray(values() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the pattern of dashes and gaps used to stroke paths.
**Notes:** The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.39.19 DashOffset(offset as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the distance into the dash pattern to start the dash.
**Notes:** See documentation on SVG's stroke-dashoffset property for usage details.

### 89.39.20 Draw

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws all draw commands collected.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.type = image.TrueColorType
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.21 DrawPath

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw on image using vector path.
**Example:**

```
// new picture, 500x500 and filled with white
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)


dim draw as GMGraphicsMBS = image.Graphics

// Draw path
```

```
dim cr as new GMColorRGBMBS("red")
dim gr as new GMColorRGBMBS("green")
draw.StrokeColor cr
draw.FillColor gr
draw.PathMovetoAbs(30,10)
draw.PathLinetoAbs(20,55)
draw.PathLinetoAbs(70,50)
draw.PathLinetoAbs(80,5)
draw.DrawPath

draw.Draw

// show picture
image.type = image.TrueColorType // make sure it's a bitmap
Backdrop=image.CopyPicture
```

### 89.39.22 Ellipse(originX as Double, originY as Double, perimX as Double, perimY as Double, arcStart as Double, arcEnd as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an ellipse using the stroke color and thickness, specified origin, x & y radius, as well as specified start and end of arc in degrees.
**Notes:** If a fill color is specified, then the object is filled.

### 89.39.23 FillColor(c as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify drawing object fill color.

### 89.39.24 FillOpacity(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify opacity to use when drawing using fill color.

### 89.39.25 FillRule(fillRule as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the algorithm which is to be used to determine what parts of the canvas are included inside the shape.
**Notes:** See documentation on SVG's fill-rule property for usage details.

### 89.39.26 Font(fontname as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify font name to use when drawing text.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

dim draw as GMGraphicsMBS = image.Graphics

// draw red text
draw.strokeColor(new GMColorRGBMBS("red")) // Outline color
draw.strokeWidth(1)
draw.Font("/Library/Fonts/Verdana.ttf")
draw.Text(50, 50, "Hello", "")
draw.Draw

Backdrop=image.CopyPicture
```

See also:

- 89.39.27 Font(fontname as string, StyleType as Integer, weight as Integer, StretchType as Integer) 14554

### 89.39.27 Font(fontname as string, StyleType as Integer, weight as Integer, StretchType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font.
**Notes:** Specify font family, style, weight (one of the set { 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 } with 400 being the normal size), and stretch to be used to select the font used when drawing text. Wildcard matches may be applied to style via the AnyStyle enumeration, applied to weight if weight is zero,

and applied to stretch via the AnyStretch enumeration.
See also:

- 89.39.26 Font(fontname as string) 14554

### 89.39.28 Gravity(GravityType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify text positioning gravity.

### 89.39.29 Line(startX as Double, startY as Double, endX as Double, endY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a line using stroke color and thickness using starting and ending coordinates
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a line
draw.Line(100,100,400,400)
draw.Draw

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

### 89.39.30 Matte(x as Double, y as Double, paintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the pixel matte value to transparent.
**Notes:** The point method changes the matte value of the target pixel. The replace method changes the matte value of any pixel that matches the color of the target pixel. Floodfill changes the matte value of any

pixel that matches the color of the target pixel and is a neighbor, whereas filltoborder changes the matte value of any neighbor pixel that is not the border color, Finally reset changes the matte value of all pixels.

### 89.39.31 MiterLimit(miterlimit as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify miter limit.
**Notes:** When two line segments meet at a sharp angle and miter joins have been specified for 'lineJoin', it is possible for the miter to extend far beyond the thickness of the line stroking the path. The miterLimit' imposes a limit on the ratio of the miter length to the 'lineWidth'. The default value of this parameter is 4.

### 89.39.32 PathArcAbs(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GMPathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.39.33 PathArcAbs(c() as GMPathArgsMBS) 14556
- 89.39.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14557


### 89.39.33 PathArcAbs(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then

draw the arc matching a clock-wise rotation.

In the GMPathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.39.32 PathArcAbs(c as GMPathArgsMBS) 14556
- 89.39.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14557


### 89.39.34 PathArcAbs(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw an arc

draw.PathMovetoAbs 100,100
draw.PathArcAbs(100,100, 0, false, false, 200,200)
draw.DrawPath
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.
See also:

- 89.39.32 PathArcAbs(c as GMPathArgsMBS) 14556
- 89.39.33 PathArcAbs(c() as GMPathArgsMBS) 14556


### 89.39.35 PathArcRel(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GMPathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.39.36 PathArcRel(c() as GMPathArgsMBS) 14558
- 89.39.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14559


### 89.39.36 PathArcRel(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.

In the GMPathArgsMBS, set the following properties: radiusX, radiusY, xAxisRotation, bool largeArcFlag, sweepFlag, x and y.
See also:


- 89.39.35 PathArcRel(c as GMPathArgsMBS) 14558
- 89.39.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14559

### 89.39.37 PathArcRel(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws an elliptical arc from the current point to (x, y).
**Notes:** The size and orientation of the ellipse are defined by two radii (radiusX, radiusY) and an xAxisRotation, which indicates how the ellipse as a whole is rotated relative to the current coordinate system. The center (cx, cy) of the ellipse is calculated automatically to satisfy the constraints imposed by the other parameters. largeArcFlag and sweepFlag contribute to the automatic calculations and help determine how the arc is drawn. If largeArcFlag is true then draw the larger of the available arcs. If sweepFlag is true, then draw the arc matching a clock-wise rotation.
See also:


- 89.39.35 PathArcRel(c as GMPathArgsMBS) 14558
- 89.39.36 PathArcRel(c() as GMPathArgsMBS) 14558


### 89.39.38 PathClosePath

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close the current subpath by drawing a straight line from the current point to current subpath's most recent starting point (usually, the most recent moveto point).

### 89.39.39 PathCurvetoAbs(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:


- 89.39.40 PathCurvetoAbs(c() as GMPathArgsMBS) 14560
- 89.39.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14560

### 89.39.40 PathCurvetoAbs(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.39 PathCurvetoAbs(c as GMPathArgsMBS) 14559
- 89.39.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14560

### 89.39.41 PathCurvetoAbs(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.39.39 PathCurvetoAbs(c as GMPathArgsMBS) 14559
- 89.39.40 PathCurvetoAbs(c() as GMPathArgsMBS) 14560

### 89.39.42 PathCurvetoRel(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.43 PathCurvetoRel(c() as GMPathArgsMBS) 14561
- 89.39.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14561


### 89.39.43 PathCurvetoRel(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:


- 89.39.42 PathCurvetoRel(c as GMPathArgsMBS) 14560
- 89.39.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14561


### 89.39.44 PathCurvetoRel(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point at the beginning of the curve and (x2,y2) as the control point at the end of the curve.
**Notes:** PathCurvetoAbs indicates that absolutecoordinates will follow; PathCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.39.42 PathCurvetoRel(c as GMPathArgsMBS) 14560
- 89.39.43 PathCurvetoRel(c() as GMPathArgsMBS) 14561


### 89.39.45 PathLinetoAbs(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various ”lineto” commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point.

PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.39.46 PathLinetoAbs(c() as GMCoordinateMBS) 14562
- 89.39.47 PathLinetoAbs(x as Double, y as Double) 14562


### 89.39.46 PathLinetoAbs(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.39.45 PathLinetoAbs(c as GMCoordinateMBS) 14561
- 89.39.47 PathLinetoAbs(x as Double, y as Double) 14562


### 89.39.47 PathLinetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.39.45 PathLinetoAbs(c as GMCoordinateMBS) 14561
- 89.39.46 PathLinetoAbs(c() as GMCoordinateMBS) 14562


### 89.39.48 PathLinetoHorizontalAbs(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a horizontal line from the current point (cpx, cpy) to (x, cpy). PathLinetoHorizontalAbs indicates that absolute coordinates are supplied; PathLinetoHorizontalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (x, cpy) for the final value of x.

### 89.39.49 PathLinetoHorizontalRel(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a horizontal line from the current point (cpx, cpy) to (x, cpy). PathLinetoHorizontalAbs indicates that absolute coordinates are supplied; PathLinetoHorizontalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (x, cpy) for the final value of x.

### 89.39.50 PathLinetoRel(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.39.51 PathLinetoRel(c() as GMCoordinateMBS) 14563
- 89.39.52 PathLinetoRel(x as Double, y as Double) 14563


### 89.39.51 PathLinetoRel(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:


- 89.39.50 PathLinetoRel(c as GMCoordinateMBS) 14563
- 89.39.52 PathLinetoRel(x as Double, y as Double) 14563


### 89.39.52 PathLinetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Example:**

```
// new picture, 500x500 and filled with white
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)


dim draw as GMGraphicsMBS = image.Graphics

// Draw path

dim cr as new GMColorRGBMBS("red")
dim gr as new GMColorRGBMBS("green")
draw.StrokeColor cr
draw.FillColor gr
draw.PathMovetoAbs(30,10)
draw.PathLinetoAbs(20,55)
draw.PathLinetoAbs(70,50)
draw.PathLinetoAbs(80,5)
draw.DrawPath

draw.Draw

// show picture
image.type = image.TrueColorType // make sure it's a bitmap
Backdrop=image.CopyPicture
```

**Notes:** Draw a line from the current point to the given coordinate which becomes the new current point. PathLinetoAbs indicates that absolute coordinates are used; PathLinetoRel indicates that relative coordinates are used. A number of coordinates pairs may be specified in a list to draw a polyline. At the end of the command, the new current point is set to the final set of coordinates provided.
See also:

- 89.39.50 PathLinetoRel(c as GMCoordinateMBS) 14563
- 89.39.51 PathLinetoRel(c() as GMCoordinateMBS) 14563

### 89.39.53 PathLinetoVerticalAbs(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a vertical line from the current point (cpx, cpy) to (cpx, y). PathLinetoVerticalAbs indicates that absolute coordinates are supplied; PathLinetoVerticalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (cpx, y) for the final value of y.

### 89.39.54 PathLinetoVerticalRel(v as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The various "lineto" commands draw straight lines from the current point to a new point.
**Notes:** Draws a vertical line from the current point (cpx, cpy) to (cpx, y). PathLinetoVerticalAbs indicates that absolute coordinates are supplied; PathLinetoVerticalRel indicates that relative coordinates are supplied. At the end of the command, the new current point becomes (cpx, y) for the final value of y.

### 89.39.55 PathMovetoAbs(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.39.56 PathMovetoAbs(x as Double, y as Double) 14565

### 89.39.56 PathMovetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.39.55 PathMovetoAbs(c as GMCoordinateMBS) 14565

### 89.39.57 PathMovetoRel(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.39.58 PathMovetoRel(x as Double, y as Double) 14566

### 89.39.58 PathMovetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "moveto" commands establish a new current point.
**Notes:** The effect is as if the "pen" were lifted and moved to a new location. A path data segment must begin with either one of the "moveto" commands or one of the "arc" commands. Subsequent "moveto" commands (i.e., when the "moveto" is not the first command) represent the start of a new subpath.

Start a new sub-path at the given coordinate. PathMovetoAbs indicates that absolute coordinates will follow; PathMovetoRel indicates that relative coordinates will follow. If a relative moveto appears as the first element of the path, then it is treated as a pair of absolute coordinates. If a moveto is followed by multiple pairs of coordinates, the subsequent pairs are treated as implicit lineto commands.
See also:

- 89.39.57 PathMovetoRel(c as GMCoordinateMBS) 14566

### 89.39.59 PathQuadraticCurvetoAbs(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.60 PathQuadraticCurvetoAbs(c() as GMPathArgsMBS) 14567
- 89.39.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double) 14567


### 89.39.60 PathQuadraticCurvetoAbs(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.59 PathQuadraticCurvetoAbs(c as GMPathArgsMBS) 14566
- 89.39.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double) 14567


### 89.39.61 PathQuadraticCurvetoAbs(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.39.59 PathQuadraticCurvetoAbs(c as GMPathArgsMBS) 14566
- 89.39.60 PathQuadraticCurvetoAbs(c() as GMPathArgsMBS) 14567


### 89.39.62 PathQuadraticCurvetoRel(c as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.63 PathQuadraticCurvetoRel(c() as GMPathArgsMBS) 14568
- 89.39.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double) 14568


### 89.39.63 PathQuadraticCurvetoRel(c() as GMPathArgsMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.62 PathQuadraticCurvetoRel(c as GMPathArgsMBS) 14567
- 89.39.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double) 14568


### 89.39.64 PathQuadraticCurvetoRel(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y) using (x1,y1) as the control point.
**Notes:** PathQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathQuadraticCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.39.62 PathQuadraticCurvetoRel(c as GMPathArgsMBS) 14567

- 89.39.63 PathQuadraticCurvetoRel(c() as GMPathArgsMBS) 14568

### 89.39.65 PathSmoothCurvetoAbs(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.66 PathSmoothCurvetoAbs(c() as GMCoordinateMBS) 14569
- 89.39.67 PathSmoothCurvetoAbs(x as Double, y as Double) 14570

### 89.39.66 PathSmoothCurvetoAbs(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.65 PathSmoothCurvetoAbs(c as GMCoordinateMBS) 14569
- 89.39.67 PathSmoothCurvetoAbs(x as Double, y as Double) 14570

### 89.39.67 PathSmoothCurvetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.39.65 PathSmoothCurvetoAbs(c as GMCoordinateMBS) 14569
- 89.39.66 PathSmoothCurvetoAbs(c() as GMCoordinateMBS) 14569

### 89.39.68 PathSmoothCurvetoRel(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.69 PathSmoothCurvetoRel(c() as GMCoordinateMBS) 14570
- 89.39.70 PathSmoothCurvetoRel(x as Double, y as Double) 14571

### 89.39.69 PathSmoothCurvetoRel(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was

not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x2, y2, x and y.
See also:

- 89.39.68 PathSmoothCurvetoRel(c as GMCoordinateMBS) 14570
- 89.39.70 PathSmoothCurvetoRel(x as Double, y as Double) 14571

### 89.39.70 PathSmoothCurvetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a cubic B√©zier curve from the current point to (x,y).
**Notes:** The first control point is assumed to be the reflection of the second control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not an PathCurvetoAbs, PathCurvetoRel, PathSmoothCurvetoAbs or PathSmoothCurvetoRel, assume the first control point is coincident with the current point.) (x2,y2) is the second control point (i.e., the control point at the end of the curve). PathSmoothCurvetoAbs indicates that absolute coordinates will follow; PathSmoothCurvetoRel indicates that relative coordinates will follow. Multiple sets of coordinates may be specified to draw a polybezier. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.39.68 PathSmoothCurvetoRel(c as GMCoordinateMBS) 14570
- 89.39.69 PathSmoothCurvetoRel(c() as GMCoordinateMBS) 14570

### 89.39.71 PathSmoothQuadraticCurvetoAbs(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.72 PathSmoothQuadraticCurvetoAbs(c() as GMCoordinateMBS) 14572
- 89.39.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double) 14572


### 89.39.72 PathSmoothQuadraticCurvetoAbs(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:


- 89.39.71 PathSmoothQuadraticCurvetoAbs(c as GMCoordinateMBS) 14571
- 89.39.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double) 14572


### 89.39.73 PathSmoothQuadraticCurvetoAbs(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:


- 89.39.71 PathSmoothQuadraticCurvetoAbs(c as GMCoordinateMBS) 14571
- 89.39.72 PathSmoothQuadraticCurvetoAbs(c() as GMCoordinateMBS) 14572

### 89.39.74 PathSmoothQuadraticCurvetoRel(c as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:

- 89.39.75 PathSmoothQuadraticCurvetoRel(c() as GMCoordinateMBS) 14573
- 89.39.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double) 14573

### 89.39.75 PathSmoothQuadraticCurvetoRel(c() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.

In the GMPathArgsMBS object, set the following properties: x1, y1, x and y.
See also:

- 89.39.74 PathSmoothQuadraticCurvetoRel(c as GMCoordinateMBS) 14573
- 89.39.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double) 14573

### 89.39.76 PathSmoothQuadraticCurvetoRel(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a quadratic B√©zier curve from the current point to (x,y).
**Notes:** The control point is assumed to be the reflection of the control point on the previous

command relative to the current point. (If there is no previous command or if the previous command was not a PathQuadraticCurvetoAbs, PathQuadraticCurvetoRel, PathSmoothQuadraticCurvetoAbs or PathSmoothQuadraticCurvetoRel, assume the control point is coincident with the current point.) PathSmoothQuadraticCurvetoAbs indicates that absolute coordinates will follow; PathSmoothQuadraticCurvetoRel indicates that relative coordinates will follow. At the end of the command, the new current point becomes the final (x,y) coordinate pair used in the polybezier.
See also:

- 89.39.74 PathSmoothQuadraticCurvetoRel(c as GMCoordinateMBS) 14573
- 89.39.75 PathSmoothQuadraticCurvetoRel(c() as GMCoordinateMBS) 14573

### 89.39.77 Point(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a point using stroke color and thickness at coordinate.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.fillColor = new GMColorRGBMBS("red") // set color

dim draw as GMGraphicsMBS = image.Graphics

// draw cross with pixels
for x as Integer = 240 to 260
draw.Point(x, 250)
next
for y as Integer = 240 to 260
draw.Point(250,y)
next
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.78 PointSize(pointSize as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set font point size.

### 89.39.79 Polygon(values() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arbitrary polygon using stroke color and thickness consisting of three or more coordinates contained in an array.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.fillColor = new GMColorRGBMBS("red") // set color
image.strokeColor = new GMColorRGBMBS("green") // set color

dim draw as GMGraphicsMBS = image.Graphics
dim coordinates(-1) as GMCoordinateMBS

coordinates.Append new GMCoordinateMBS(70,70)
coordinates.Append new GMCoordinateMBS(100,340)
coordinates.Append new GMCoordinateMBS(380,200)
coordinates.Append new GMCoordinateMBS(70,70)

draw.Polygon coordinates
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.39.80 Polyline(values() as GMCoordinateMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw an arbitrary polyline using stroke color and thickness consisting of three or more coordinates contained in an array.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("green") // set color

dim draw as GMGraphicsMBS = image.Graphics
dim coordinates(-1) as GMCoordinateMBS
```

```
coordinates.Append new GMCoordinateMBS(70,70)
coordinates.Append new GMCoordinateMBS(100,340)
coordinates.Append new GMCoordinateMBS(380,200)

draw.Polyline coordinates
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.39.81 PopClipPath

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pop (terminate) clip path definition started by PushClipPath.

### 89.39.82 PopGraphicContext

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pop Graphic Context.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorMBS() // transparent fillcolor
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a Rectangle
draw.PushGraphicContext
draw.Translation(250,250)
draw.Rotation(50)
draw.Rectangle(0, 0, 100, 100) // rotated
draw.PopGraphicContext
draw.Rectangle(0, 0, 100, 100) // not rotated
draw.Draw
```

Backdrop=image.CopyPicture

**Notes:** Removing the current graphic context from the graphic context stack restores the options to the values they had prior to the preceding PushGraphicContext operation.

### 89.39.83 PopPattern

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminate a pattern definition started via PushPattern.

### 89.39.84 PushClipPath(id as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Push (create) clip path definition with id.
**Notes:** Clip patch definition consists of subsequent drawing commands, terminated by PopClipPath.

### 89.39.85 PushGraphicContext

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Push Graphic Context.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorMBS() // transparent fillcolor
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a Rectangle
draw.PushGraphicContext
draw.Translation(250,250)
draw.Rotation(50)
draw.Rectangle(0, 0, 100, 100) // rotated
draw.PopGraphicContext
```

```
draw.Rectangle(0, 0, 100, 100) // not rotated
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** When a graphic context is pushed, options set after the context is pushed (such as coordinate transformations, color settings, etc.) are saved to a new graphic context. This allows related options to be saved on a graphic context "stack" in order to support heirarchical nesting of options. When PopGraphicContext is used to pop the current graphic context, the options in effect during the last PushGraphicContext operation are restored.

### 89.39.86 PushPattern(id as string, x as Integer, y as Integer, width as Integer, height as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Start a pattern definition with arbitrary pattern name specified by id, pattern offset specified by x and y, and pattern size specified by width and height.
**Notes:** The pattern is defined within the coordinate system defined by the specified offset and size. Arbitrary drawing objects (including DrawableCompositeImage) may be specified between PushPattern and PopPattern in order to draw the pattern. Normally the pair PushGraphicContext & PopGraphicContext are used to enclose a pattern definition. Pattern definitions are terminated by a PopPattern object.

### 89.39.87 Rectangle(upperLeftX as Double, upperLeftY as Double, lowerRightX as Double, lowerRightY as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a rectangle using stroke color and thickness from upper-left coordinates to lower-right coordinates.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a rectangle
```

```
draw.Rectangle(250, 250, 100, 100)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.39.88 Rotation(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set rotation to use when drawing (coordinate transformation).
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Rotation 5
draw.StrokeColor new GMColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.89 RoundRectangle(centerX as Double, centerY as Double, width as Double, height as Double, cornerWidth as Double, cornerHeight as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a rounded rectangle using stroke color and thickness, with specified center coordinate, specified width and height, and specified corner width and height.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
```

```
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a round rectangle
draw.RoundRectangle(250, 250, 100, 100,20,20)
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If a fill color is specified, then the object is filled.

### 89.39.90 Scaling(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply scaling in x and y direction while drawing objects (coordinate transformation).
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics
draw.FillColor new GMColorRGBMBS("red")

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.StrokeColor new GMColorRGBMBS("blue")
draw.Scaling 1.2,1.1
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.91 SkewX(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Skew in X direction (coordinate transformation)
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.SkewX 5
draw.StrokeColor new GMColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.92 SkewY(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Skew in Y direction.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.SkewY 5
draw.StrokeColor new GMColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw
```

Backdrop=image.CopyPicture

### 89.39.93 StrokeAntialias(flag as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Antialias while drawing lines or object outlines.

### 89.39.94 StrokeColor(c as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set color to use when drawing lines or object outlines.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.95 StrokeLineCap(LineCap as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the end of open subpaths when they are stroked.
**Notes:** Values of LineCap are UndefinedCap, ButtCap, RoundCap, and SquareCap.

### 89.39.96 StrokeLineJoin(LineJoin as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the corners of paths (or other vector shapes) when they are stroked.
**Notes:** Values of LineJoin are UndefinedJoin, MiterJoin, RoundJoin, and BevelJoin.

### 89.39.97 StrokeOpacity(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opacity to use when drawing lines or object outlines.

### 89.39.98 StrokeWidth(opacity as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set width to use when drawing lines or object outlines.

### 89.39.99 Text(x as Double, y as Double, text as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate image with text using stroke color, font, font pointsize, and box color (text background color), at specified coordinates.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

dim draw as GMGraphicsMBS = image.Graphics

// draw red text
draw.strokeColor(new GMColorRGBMBS("red")) // Outline color
draw.strokeWidth(1)
draw.Font("/Library/Fonts/Verdana.ttf")
draw.Text(50, 50, "Hello")
draw.Draw

Backdrop=image.CopyPicture
```

**Notes:** If text contains special format characters the image filename, type, width, height, or other image attributes may be incorporated in the text (see label).
See also:

• 89.39.100 Text(x as Double, y as Double, text as string, encoding as string) 14584

### 89.39.100 Text(x as Double, y as Double, text as string, encoding as string)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate image with text represented with text encoding, using current stroke color, font, font pointsize, and box color (text background color), at specified coordinates.
**Notes:** If text contains special format characters the image filename, type, width, height, or other image attributes may be incorporated in the text (see label()).

The text encoding specifies the code set to use for text annotations. The only character encoding which may be specified at this time is "UTF-8" for representing Unicode as a sequence of bytes. Specify an empty string to set text encoding to the system's default. Successful text annotation using Unicode may require fonts designed to support Unicode.

Seems like you need ghostscript or the DPS library for text handling, so it may no be available for you.
See also:

• 89.39.99 Text(x as Double, y as Double, text as string) 14583

### 89.39.101 TextAntialias(flag as boolean)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Antialias while drawing text (default true).
**Notes:** The main reason to disable text antialiasing is to avoid adding new colors to the image.

### 89.39.102 TextDecoration(DecorationType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify decoration (e.g. UnderlineDecoration) to apply to text.

### 89.39.103 TextUnderColor(c as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a box under rendered text using the specified color.

### 89.39.104 Translation(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply coordinate translation (set new coordinate origin).
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

draw.StrokeColor new GMColorRGBMBS("red")
draw.Line(100,100,400,400)
draw.Translation 5,5
draw.StrokeColor new GMColorRGBMBS("blue")
draw.Line(100,100,400,400)
draw.Draw

Backdrop=image.CopyPicture
```

### 89.39.105 Viewbox(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dimensions of the output viewbox.
**Notes:** If the image is to be written to a vector format (e.g. MVG or SVG), then a PushGraphicContext() object should be pushed to the head of the list, followed by a Viewbox() statement to establish the output canvas size. A matching PopGraphicContext() object should be pushed to the tail of the list.

### 89.39.106 Properties

### 89.39.107 Image as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image this graphics object belongs to.
**Notes:** (Read only property)

# 89.40 class GMImageArrayMBS

## 89.40.1 class GMImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an array of images in GraphicsMagick.
**Example:**

```
// extract all layers of photoshop file
dim file as FolderItem = SpecialFolder.Desktop.Child("test.psd")
dim images as new GMImageArrayMBS

images.readImages(file.NativePath)

dim c as Integer = images.size
for i as Integer = 0 to c-1
dim image as GMImageMBS = images.Image(i)
file = SpecialFolder.Desktop.Child(image.FileName+"."+str(i)+".png")
image.write(file)
next
```

**Notes:** Can be used to assemble/disassemble gif images.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr4

## 89.40.2 Methods

## 89.40.3 animateImages

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Animate a sequence of image frames.
**Notes:** Image frames are displayed in succession, creating an animated effect. The animation options are taken from the first image frame. This feature is only supported under X11 at the moment.

## 89.40.4 append(image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the end of the array.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// put copy of first image on the back
dim n as GMImageMBS = g.FirstImage
g.append n

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Instead of gif, you can also use tif files.

### 89.40.5 appendImages(stack as boolean = false) as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Append a sequence of image frames, writing the result to new image.
**Notes:** All the input image frames must have the same width or height. Image frames of the same width are stacked top-to-bottom. Image frames of the same height are stacked left-to-right. If the stack parameter is false, rectangular image frames are stacked left-to-right otherwise top-to-bottom.

### 89.40.6 averageImages as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average a sequence of image frames, writing the result to averagedImage.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// averageImages
dim n as GMImageMBS = g.averageImages
Backdrop = n.CopyPicture
```

**Notes:** All the input image frames must be the same size in pixels.

### 89.40.7 coalesceImages as GMImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a coalesced image sequence obtained by "playing" the image sequence (observing page offsets and disposal methods) to create a new image sequence in which all frames are full size and completely rendered.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// deconstruct
g = g.coalesceImages

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** Note that if the original image sequence relied on page offsets and disposal methods that the resulting sequence will be larger (perhaps much larger) then the original. This is useful for GIF animation sequences that have page offsets and disposal methods. The resuting image sequence is returned.

### 89.40.8 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty image array.

### 89.40.9 deconstructImages as GMImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Break down an image sequence into constituent parts.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
```

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// deconstruct
g = g.deconstructImages

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** This is useful for creating GIF or MNG animation sequences.

### 89.40.10 displayImages

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Display a sequence of image frames.
**Notes:** Through use of a pop-up menu, image frames may be selected in succession. This feature is fully supported under X11 but may have only limited support in other environments.
Caution: if an image format is is not compatable with the display visual (e.g. JPEG on a colormapped display) then the original image will be altered. Use a copy of the original if this is a problem.

display methods are not supported currently.

### 89.40.11 FirstImage as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns first image in array.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// show first image
dim img as GMImageMBS = g.FirstImage

// convert to true color for CopyPicture to work
const TrueColorType=6
img.type=TrueColorType
```

```
Backdrop = img.CopyPicture
```

### 89.40.12 flattenImages as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Merge a sequence of image frames which represent image layers into a single composited representation.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// put copy of first image on the back
dim n as GMImageMBS = g.flattenImages

Backdrop = n.CopyPicture
```

**Notes:** Returns the flattened image. This function is useful for combining Photoshop layers into a single image.

### 89.40.13 Image(index as Integer) as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image with given index.

### 89.40.14 insert(image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts an image on the front.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)
```

```
// put copy of first image on the front
dim n as GMImageMBS = g.FirstImage
g.insert n

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

### 89.40.15 LastImage as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns last image in array.

### 89.40.16 mapImages(map as GMImageMBS, dither as boolean = true, measureError as boolean = false)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace the colors of a sequence of images with the closest color from a reference image.
**Notes:** Set dither to true to enable dithering. Set measureError to true in order to evaluate quantization error.

### 89.40.17 montageImages(options as GMMontageMBS) as GMImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a composite image by combining several separate image frames.
**Example:**

```
// build montage
dim StackingMontage as New GM16MontageMBS
StackingMontage.backgroundColor = New GM16ColorMBS(&cE7E7E7)
StackingMontage.fillColor = New GM16ColorMBS(&c000000)
StackingMontage.tile = New GM16GeometryMBS("1x20")
StackingMontage.geometry = New GM16GeometryMBS("160x120+5+5")
StackingMontage.font = "Helvetica"
StackingMontage.pointSize = 12
StackingMontage.title = "Title goes here"
```

```
// make picture
dim logo as Picture = LogoMBS(500)
dim image as New GM16ImageMBS(logo)

image.label("Sample label")

// Put the current image into the array
Dim StackingFrames As new GM16ImageArrayMBS
StackingFrames.insert(image)

// show result
dim resultImages as GM16ImageArrayMBS = StackingFrames.montageImages(StackingMontage)
Backdrop = resultImages.Image(0).CopyPicture
```

**Notes:** Multiple frames may be generated in the output array depending on the tile setting and the number of image frames montaged. Montage options are provided via the parameter options. Options set in the first image frame (backgroundColor, borderColor, matteColor, fillColor, strokeColor, font and fontPointsize) are also used as options by montageImages().

### 89.40.18 morphImages(frames as Integer) as GMImageArrayMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Morph a seqence of image frames.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// coalesce to make sure we have full images
g = g.coalesceImages
// morph to 10 pictures
g = g.morphImages(10)

// write gif
dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")
g.writeImages output.NativePath
```

**Notes:** This algorithm expands the number of image frames (output to the new image array) by adding the number of intervening frames specified by frames such that the original frames morph (blend) into each other when played as an animation.

### 89.40.19 mosaicImages as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inlay a number of images to form a single coherent picture.
**Notes:** The result image argument is updated with a mosaic constructed from the image sequence.

### 89.40.20 quantizeImages(measureError as boolean = false)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quantize colors in images using current quantization settings.
**Notes:** Set measureError to true in order to measure quantization error.

### 89.40.21 readImages(blob as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read a sequence of image frames into existing container (appending to array) from blob.
See also:

- 89.40.22 readImages(imageSpec as string) 14594

### 89.40.22 readImages(imageSpec as string)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read a sequence of image frames into existing container (appending to array) with image names specified in the string imageSpec.
See also:

- 89.40.21 readImages(blob as GMBlobMBS) 14594

### 89.40.23 remove(index as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the image with the given index.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// remove first
g.remove 0

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Index should be between 0 and size-1.

### 89.40.24 reverse

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses the order of images in the array.

### 89.40.25 writeImages(blob as GMBlobMBS, adjoin as boolean = true)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes images to the given blob object.
**Notes:** Write images in container to in-memory BLOB specified by Blob blob. Set adjoin to false to write a set of image frames via a wildcard imageSpec (e.g. image%02d.miff).
Caution: if an image format is selected which is capable of supporting fewer colors than the original image or quantization has been requested, the original image will be quantized to fewer colors. Use a copy of the original if this is a problem.
See also:

- 89.40.26 writeImages(imageSpec as string, adjoin as boolean = true) 14595

### 89.40.26 writeImages(imageSpec as string, adjoin as boolean = true)

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes images to the given path.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// write to file

dim output as FolderItem = SpecialFolder.Desktop.Child("output.gif")

g.writeImages(output.NativePath)
```

**Notes:** Write images in container to file specified by string imageSpec. Set adjoin_ to false to write a set of image frames via a wildcard imageSpec (e.g. image%02d.miff).
The wildcard must be one of %0Nd, %0No, or %0Nx.
Caution: if an image format is selected which is capable of supporting fewer colors than the original image or quantization has been requested, the original image will be quantized to fewer colors. Use a copy of the original if this is a problem.
See also:

- 89.40.25 writeImages(blob as GMBlobMBS, adjoin as boolean = true) 14595

### 89.40.27 Properties

### 89.40.28 empty as boolean

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether image array is empty.
**Notes:** Returns true if array is empty or false if not.
(Read only property)

### 89.40.29 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle of the image array.
**Notes:** Should always be non zero.
(Read and Write property)

### 89.40.30 size as Integer

MBS GraphicsMagick Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of images in this array.
**Example:**

```
// read gif
dim g as new GMImageArrayMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.gif")
g.readImages(file.NativePath)

// display number of images
MsgBox str(g.size)
```

**Notes:** (Read only property)

## 89.41 class GMImageChannelStatisticsMBS

### 89.41.1 class GMImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The statistics for image channel.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim stat as GMImageStatisticsMBS = g.statistics
dim gs as GMImageChannelStatisticsMBS = stat.blue

MsgBox "blue channel: "+str(gs.minimum)+"-"+str(Gs.maximum)+", mean "+str(gs.mean)
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 89.41.2 Methods

### 89.41.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 89.41.4 Properties

### 89.41.5 maximum as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value observed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim stat as GMImageStatisticsMBS = g.statistics
dim gs as GMImageChannelStatisticsMBS = stat.green

MsgBox "maximum green color: "+str(gs.maximum)
```

**Notes:** (Read only property)

### 89.41.6 mean as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average (mean) value observed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim stat as GMImageStatisticsMBS = g.statistics
dim r as GMImageChannelStatisticsMBS = stat.red

MsgBox "mean red color: "+str(R.mean)
```

**Notes:** (Read only property)

### 89.41.7 minimum as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value observed.
**Notes:** (Read only property)

### 89.41.8 standardDeviation as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Standard deviation, sqrt(variance).
**Notes:** (Read only property)

### 89.41.9 variance as Double

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Variance.

**Notes:** (Read only property)

## 89.42 class GMImageMBS

### 89.42.1 class GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image is the primary object in Magick++ and represents a single image frame (see image design).
**Example:**

```
dim c as new GMColorMBS("white")
dim g as new GMGeometryMBS(100,100)
dim image as new GMImageMBS(g, c)
```

**Notes:** With MBS Plugin 14.0 we offer this classes in 8bit (GM prefix) or 16bit (GM16 prefix).

The GMImageArrayMBS class must be used to operate on image sequences or images (e.g. of format GIF, TIFF, MIFF, Postscript, & MNG) which are comprized of multiple image frames. Individual frames of a multi-frame image may be requested by adding array-style notation to the end of the file name (e.g. "animation.gif [ 3 ] " retrieves the fourth frame of a GIF animation. Various image manipulation operations may be applied to the image. Attributes may be set on the image to influence the operation of the manipulation operations. The GMPixelsMBS class provides low-level access to image pixels.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- News from the MBS Xojo Plugins Version 23.2
- Several ways for picture to PDF in MBS Plugins
- News from the MBS Xojo Plugins Version 20.4
- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- Crop a two side page document to a single page document
- Four ways to save picture as Tiff in Xojo
- Gradients in GraphicsMagick

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 21.5, page 10: News
- 19.6, page 73: Fun with GraphicsMagick, Cool methods from the GMImageMBS class by Stefanie Juchmes
- 19.6, pages 68 to 69: Fun with GraphicsMagick, Cool methods from the GMImageMBS class by Stefanie Juchmes
- 19.3, page 10: News
- 18.6, page 10: News
- 18.3, page 10: News
- 17.5, page 39: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 89.42.2 Methods

### 89.42.3 adaptiveThreshold(width as UInt32, height as UInt32, offset as double = 0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply adaptive thresholding to the image.
**Notes:** see:
http://www.dai.ed.ac.uk/HIPR2/adpthrsh.htm

Adaptive thresholding is useful if the ideal threshold level is not known in advance, or if the illumination gradient is not constant across the image. Adaptive thresholding works by evaulating the mean (average) of a pixel region (size specified by width and height) and using the mean as the thresholding value. In order to remove residual noise from the background, the threshold may be adjusted by subtracting a constant offset (default zero) from the mean to compute the threshold.

### 89.42.4 addNoise(noise as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add noise to image with the specified noise type.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.addNoise(image.GaussianNoise)

Backdrop=image.CopyPicture
```

**Notes:** Use one of this constants: GaussianNoise, ImpulseNoise, LaplacianNoise, MultiplicativeGaussianNoise, PoissonNoise, UniformNoise.

### 89.42.5 addNoiseChannel(channel as Integer, noise as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add noise to an image channel with the specified noise type. The channel parameter specifies the channel to add noise to.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.addNoiseChannel(image.BlueChannel, image.ImpulseNoise)

Backdrop=image.CopyPicture
```

**Notes:** The noiseType parameter specifies the type of noise.
Use one of this constants: GaussianNoise, ImpulseNoise, LaplacianNoise, MultiplicativeGaussianNoise, PoissonNoise, UniformNoise.

### 89.42.6 affineTransform(sx as Double, sy as Double, rx as Double, ry as Double, tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies an affine transformation to the drawing matrix.
**Notes:** Specify a transformation matrix to adjust scaling, rotation, and translation (coordinate transformation) for subsequently drawn objects in the same or decendent drawing context. The sx & sy parameters represent the x & y scale factors, the rx & ry parameters represent the x & y rotation, and the tx & ty parameters represent the x & y translation.

### 89.42.7 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate using specified text, bounding area, and placement gravity.

**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:


- 89.42.8 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer, degrees as Double) 14604
- 89.42.9 annotate(text as string, gravity as Integer) 14605
- 89.42.10 annotate(text as string, location as GMGeometryMBS) 14607


### 89.42.8 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer, degrees as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate with text using specified text, bounding area, placement gravity, and rotation.
**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:


- 89.42.7 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer) 14603
- 89.42.9 annotate(text as string, gravity as Integer) 14605
- 89.42.10 annotate(text as string, location as GMGeometryMBS) 14607


### 89.42.9 annotate(text as string, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate with text (bounding area is entire image) and placement gravity.
**Example:**

```
dim White as new GMColorGrayMBS(1)
dim Black as new GMColorGrayMBS(0)
dim geo as new GMGeometryMBS("300x200")

dim g as new GMImageMBS(geo, White)
```

```
g.antiAlias = False
g.fillColor = Black
g.lineWidth = 1
g.strokeColor = Black
g.font = "@/Library/Fonts/Tahoma.ttf"
g.fontPointsize = 15

g.annotate("Hello World", g.SouthGravity)

Backdrop = g.CopyPicture
```

**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:

- 89.42.7 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer) 14603
- 89.42.8 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer, degrees as Double) 14604

• 89.42.10 annotate(text as string, location as GMGeometryMBS) 14607

### 89.42.10 annotate(text as string, location as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotate using specified text, and placement location.
**Notes:** Annotate image (draw text on image)

Gravity effects text placement in bounding area according to these rules:

| | |
|---|---|
| NorthWestGravity | text bottom-left corner placed at top-left |
| NorthGravity | text bottom-center placed at top-center |
| NorthEastGravity | text bottom-right corner placed at top-right |
| WestGravity | text left-center placed at left-center |
| CenterGravity | text center placed at center |
| EastGravity | text right-center placed at right-center |
| SouthWestGravity | text top-left placed at bottom-left |
| SouthGravity | text top-center placed at bottom-center |
| SouthEastGravity | text top-right placed at bottom-right |

Annotate annotates an image with text. Optionally you can include any of the following bits of information about the image by embedding the appropriate special characters:

%b file size in bytes. %c comment. %d directory in which the image resides. %e extension of the image file. %f original filename of the image. %h height of image. %i filename of the image. %k number of unique colors. %l image label. %m image file format. %n number of images in a image sequence. %o output image filename. %p page number of the image. %q image depth (8 or 16). %p page number of the image. %q image depth (8 or 16). %s image scene number. %t image filename without any extension. %u a unique temporary filename. %w image width. %x x resolution of the image. %y y resolution of the image.

Set a font with full path and @ in front. e.g. "@/Library/Fonts/Arial.ttf". This way the plugin loads it directly.
See also:

• 89.42.7 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer) 14603

• 89.42.8 annotate(text as string, boundingArea as GMGeometryMBS, gravity as Integer, degrees as Double) 14604

• 89.42.9 annotate(text as string, gravity as Integer) 14605

### 89.42.11 attributeValues as dictionary

MBS GraphicsMagick Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A dictionary with all attributes.
**Notes:** As attributes are created on demand, this will only return all so far generated attributes.

### 89.42.12 autoOrient

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Orient image to be right-side up based on its current orientation attribute.
**Notes:** This allows the image to be viewed correctly when the orientation attribute is not available, or is not respected.

### 89.42.13 blur(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur an image with the specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.blur(30,10)

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.14 blurChannel(channel as Integer, radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur an image channel with the specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
```

image.blurChannel(image.BlueChannel, 30,10)

Backdrop=image.CopyPicture

**Notes:** The channel parameter specifies the channel to modify. The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.15 border

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border image (add border to image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.border

Backdrop=image.CopyPicture
```

**Notes:** The color of the border is specified by the borderColor attribute.
See also:

- 89.42.16 border(geometry as GMGeometryMBS) 14609

### 89.42.16 border(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Border image (add border to image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.border GMGeometryMBS.Make(10,10)

Backdrop=image.CopyPicture
```

**Notes:** The color of the border is specified by the borderColor attribute.
See also:

- 89.42.15 border 14609

### 89.42.17 borderGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for border.

### 89.42.18 cacheThreshold(threshold as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pixel cache threshold in megabytes.
**Notes:** Once this memory threshold is exceeded, all subsequent pixels cache operations are to/from disk. This setting is shared by all Image objects.

### 89.42.19 cdl(cdl as string)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bake in the ASC-CDL.
**Notes:** Bake in the ASC-CDL, which is a convention for the for the exchange of basic primary color grading information between for the exchange of basic primary color grading information between equipment and software from different manufacturers. It is a useful transform for other purposes as well.

### 89.42.20 channel(channel as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract channel from image.
**Notes:** Use this option to extract a particular channel from the image. MatteChannel for example, is useful for extracting the opacity values from an image.

### 89.42.21 charcoal(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Charcoal effect image (looks like charcoal sketch).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.charcoal

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.22 chop(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chop image (remove vertical or horizontal subregion of image).

### 89.42.23 colorHistogram as dictionary

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates histogram.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim d as Dictionary = g.colorHistogram

MsgBox str(d.Count)+" color"

// check first color
dim c as GMColorMBS = d.key(0)

MsgBox "Color "+str(c.colorValue)+": "+str(d.Value(c))
```

**Notes:** The dictionary has a GMColorMBS/GMColor16MBS object as key for each color and an unsigned integer as value.

### 89.42.24 colorize(opacity as UInt32, penColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorize image with pen color, using specified percent opacity.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.colorize(10, new GMColorMBS("red"))

Backdrop=image.CopyPicture
```

See also:

- 89.42.25 colorize(opacityRed as UInt32, opacityGreen as UInt32, opacityBlue as UInt32, penColor as GMColorMBS) 14612

### 89.42.25 colorize(opacityRed as UInt32, opacityGreen as UInt32, opacityBlue as UInt32, penColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorize image with pen color, using specified percent opacity for red, green, and blue quantums.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.colorize(10, 0, 5, new GMColorMBS("red"))

Backdrop=image.CopyPicture
```

See also:

- 89.42.24 colorize(opacity as UInt32, penColor as GMColorMBS) 14612

### 89.42.26 colorMap as GMColorMBS()

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array with all colors in color map.
See also:

• 89.42.309 colorMap(index as UInt32) as GMColorMBS 14712

### 89.42.27 colorMatrix(order as Integer, ColorMatrix() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply a color matrix to the image channels.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

dim m(8) as Double

m(0) = 0.25
m(1) = 0
m(2) = 0.25

m(3) = 0
m(4) = 0
m(5) = 0

m(6) = 0.25
m(7) = 0
m(8) = 0.25

g.colorMatrix 3, m

Backdrop = g.CopyPicture
```

**Notes:** The user supplied matrix may be of order 1 to 5 (1x1 through 5x5).

### 89.42.28 CombinePictureWithMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image with mask.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

dim c as new GMColorMBS("white")
image.transparent(c)
```

Backdrop=image.CombinePictureWithMask

**Notes:** Internally this calls Width and Height, CopyPicture and CopyMask.

### 89.42.29 compare(image as GMImageMBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compare current image with another image.
**Notes:** Sets meanErrorPerPixel, normalizedMaxError, and normalizedMeanError in the current image. False is returned if the images are identical. An ErrorOption exception is thrown if the reference image columns, rows, colorspace, or matte differ from the current image:

### 89.42.30 composite(compositeImage as GMImageMBS, gravity as Integer, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.42.31 compositeAt(compositeImage as GMImageMBS, offset as GMGeometryMBS, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.42.32 compositeXY(compositeImage as GMImageMBS, xOffset as Integer, yOffset as Integer, CompositeOperator as Integer = 2)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose an image onto another at specified x and y offset and using a specified algorithm.

### 89.42.33 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GMImageMBS
dim blob as new GMBlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

See also:


- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.34 Constructor(blob as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image from in-memory Blob.
See also:


- 89.42.33 Constructor 14614

- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621


### 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size from in-memory Blob.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622

### 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size and depth from in-memory Blob.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size, depth, and format from in-memory Blob.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620

- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct Image of specified size, depth, and format from in-memory Blob.
**Example:**

```
// first open file and read data in blob
SVG_File = FolderItem.ShowOpenFileDialog("")
If SVG_File = Nil Then Return

dim stream as BinaryStream = BinaryStream.Open(SVG_File)
dim data as string = stream.Read(stream.Length)
dim blob as new GMBlobMBS(data)

// 400 width and 400 height
Dim geo As New GMGeometryMBS(400, 400, 0, 0)

// pass type here to have GraphicsMagick know it since there is no file name in blob:
dim g as New GMImageMBS(blob, geo, "svg")
```

See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622

### 89.42.39 Constructor(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct from image file.
See also:


- 89.42.33 Constructor 14614
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.40 Constructor(other as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an image by making a copy of the existing one.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621

### 89.42.41 Constructor(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct from image file or image specification.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.42 Constructor(pic as picture)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new GMImage with the given picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
Backdrop=image.CopyPicture
```

**Notes:** Pixels from both the picture and picture's mask.
See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617

- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct a blank image canvas of specified size and color.
**Example:**

```
dim g as new GMGeometryMBS(600,600)
dim c as new GMColorRGBMBS(1.0,0.0,0.0) // red
dim image as new GMImageMBS(g, c)

const TrueColorType=6

// Ensure that there are no other references to this image.
image.modifyImage
// Set the image type to TrueColor DirectClass representation.
image.type=TrueColorType

Backdrop=image.CopyPicture(0,0,600,600)
```

See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.37 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32, Magick as string) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619

- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14622


### 89.42.44 Constructor(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes single image frame from an array of raw pixels, with specified storage type (ConstituteImage).
**Example:**

```
dim data as new memoryblock(2048*2048) // your data
dim image as new GMImageMBS(2048, 2048, "I", GMImageMBS.StorageTypeCharPixel, data)
```

**Notes:** Returns an Image corresponding to an image stored in a raw memory array format. The pixel data must be in scanline order top-to-bottom. The data can be unsigned char, unsigned short int, unsigned int, unsigned long, float, or double. Float and double require the pixels to be normalized to the range [ 0..1 ] , otherwise the range is [ 0..MaxVal ] where MaxVal is the maximum possible value for that type.

Note that for most 32-bit architectures the size of an unsigned long is the same as unsigned int, but for 64-bit architectures observing the LP64 standard, an unsigned long is 64 bits, while an unsigned int remains 32 bits. This should be considered when deciding if the data should be described as "Integer" or "Long".

For example, to create a 640x480 image from unsigned red-green-blue character data, use

image = new GMImageMBS(640, 480, "RGB", GMImageMBS.StorageTypeCharPixel, pixels);

width: width in pixels of the image.
height: height in pixels of the image.
map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (same as Transparency), O = Opacity, T = Transparency, C = cyan, Y = yellow, M = magenta, K = black, or I = intensity (for grayscale). Specify "P" = pad, to skip over a quantum which is intentionally ignored. Creation of an alpha channel for CMYK images is currently not supported.
type: Define the data type of the pixels. Float and double types are expected to be normalized [ 0..1 ] otherwise [ 0..MaxRGB ] . Choose from these types: StorageTypeCharPixel, StorageTypeShortPixel, StorageTypeIntegerPixel, StorageTypeLongPixel, StorageTypeFloatPixel, or StorageTypeDoublePixel.
pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.

See also:


- 89.42.33 Constructor 14614
- 89.42.34 Constructor(blob as GMBlobMBS) 14615
- 89.42.35 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS) 14616
- 89.42.36 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, depth as UInt32) 14617
- 89.42.38 Constructor(blob as GMBlobMBS, geometry as GMGeometryMBS, Magick as string) 14618
- 89.42.39 Constructor(file as folderitem) 14619
- 89.42.40 Constructor(other as GMImageMBS) 14619
- 89.42.41 Constructor(Path as string) 14620
- 89.42.42 Constructor(pic as picture) 14620
- 89.42.43 Constructor(size as GMGeometryMBS, ColorValue as GMColorMBS) 14621


### 89.42.45 contrast(sharpen as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Contrast image (enhance intensity differences in image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.contrast(10)

Backdrop=image.CopyPicture
```

### 89.42.46 convolve(order as Integer, ColorMatrix() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convolve image.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

dim m(8) as Double
```

```
m(0) = 0.25
m(1) = 0
m(2) = 0.25

m(3) = 0
m(4) = 0
m(5) = 0

m(6) = 0.25
m(7) = 0
m(8) = 0.25

g.convolve 3, m

Backdrop = g.CopyPicture
```

**Notes:** Applies a user-specified convolution to the image.
order represents the number of columns and rows in the filter kernel.
kernel is an array of doubles representing the convolution kernel.

### 89.42.47 CopyPicture as picture

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image and returns it as a new picture.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Rectangle(250, 250, 100, 100)

Backdrop=image.CopyPicture
```

**Notes:** You may need to set image type to RGB to get it working.

See also:

- 89.42.48 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 14625

### 89.42.48 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image and returns it as a new picture.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.threshold 127

// convert to RGB so CopyPicture works
image.type = image.TrueColorType
Backdrop=image.CopyPicture(0,0,250,250)
```

**Notes:** You may need to set image type to RGB to get it working.
See also:

- 89.42.47 CopyPicture as picture 14624

### 89.42.49 CopyPictureMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image's mask and returns it as a new picture.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim g As New GMImageMBS(f)

// get image with mask
Dim p As picture = g.CopyPicture
p.mask = g.CopyPictureMask

window1.Backdrop = p
```

See also:

- 89.42.50 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 14626

### 89.42.50 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the image's mask and returns it as a new picture.
See also:

- 89.42.49 CopyPictureMask as picture 14625

### 89.42.51 CopyPixelsMemory as Memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the pixels as they are into a memoryblock.
**Notes:** Optional specify rectangle.
Returns nil on low memory or bad parameter. Image must be of type class direct (not palette picture).
Order of pixel data is normally Red, Green, Blue, Opacity. Or Cyan, Magenta, Yellow, Black for CMYK images.
For GMImageMBS, the data is 8bit per channel. For GMImage16MBS, the data is 16bit per channel.
See also:

- 89.42.52 CopyPixelsMemory(x as Integer, y as Integer, width as Integer, height as Integer) as Memoryblock 14626

### 89.42.52 CopyPixelsMemory(x as Integer, y as Integer, width as Integer, height as Integer) as Memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the pixels as they are into a memoryblock.
**Notes:** Optional specify rectangle.
Returns nil on low memory or bad parameter. Image must be of type class direct (not palette picture).
Order of pixel data is normally Red, Green, Blue, Opacity. Or Cyan, Magenta, Yellow, Black for CMYK images.
For GMImageMBS, the data is 8bit per channel. For GMImage16MBS, the data is 16bit per channel.
See also:

- 89.42.51 CopyPixelsMemory as Memoryblock 14626

### 89.42.53 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Creates a HBITMAP for the image for use with Windows Declares.
**Example:**

```
// get test image
dim logo as Picture = LogoMBS(500)

// create GraphicsMagick image
dim g as new GMImageMBS(logo)

// make a HBitmap
dim hBitmap as ptr = g.CreateHBITMAP

// convert back to Xojo picture
dim pic as Picture = WindowsBitmapMBS.HBitmapToPicture(hBitmap, true)

// show in window
Backdrop = pic

// and cleanup memory
WindowsBitmapMBS.DeleteBitmap(hBitmap)
```

**Notes:** The HBITMAP returned needs to be freed when you are done with it or you risk having a memory leak.

### 89.42.54 crop(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop image (return subregion of original image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.crop GMGeometryMBS.Make(100,200)

Backdrop=image.CopyPicture
```

### 89.42.55 cycleColormap(amount as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cycle (rotate) image colormap.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.cycleColormap(5)

image.type = image.TrueColorType

Backdrop=image.CopyPicture
```

### 89.42.56 Describe(verbose as Integer = 1) as String

MBS GraphicsMagick Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Describes an image by printing its attributes.
**Example:**

```
Dim f As FolderItem = FindFile("test.jpg")

Dim g As New GMImageMBS(f)
Dim s As String = g.Describe(2)
Break
```

**Notes:** Attributes include the image width, height, size, and others.

verbose: Whether output should be verbose.
Default is 1. Pass 0 to get a shorted output.
Pass 2 to count the number of colors in the image.

### 89.42.57 despeckle

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Despeckle image (reduce speckle noise).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
```

image.despeckle

Backdrop=image.CopyPicture

### 89.42.58 display

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Display image on screen.
**Notes:** Caution: if an image format is is not compatible with the display visual (e.g. JPEG on a colormapped display) then the original image will be altered. Use a copy of the original if this is a problem.

The plugin is not compiled with X11 so this call may not be useful.

### 89.42.59 edge(radius as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Edge image (hilight edges in image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.edge

Backdrop=image.CopyPicture
```

**Notes:** The radius is the radius of the pixel neighborhood. Specify a radius of zero for automatic radius selection.

### 89.42.60 emboss(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Emboss image (hilight edges with 3D effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
```

image.emboss

Backdrop=image.CopyPicture

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.61 enhance

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhance image (minimize noise).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.enhance

Backdrop=image.CopyPicture
```

### 89.42.62 erase

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set all image pixels to the current background color.

### 89.42.63 extent(geo as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// extend image to fit
dim geo as new GMGeometryMBS(500,500)
```

```
image.extent geo

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.42.64 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS) 14631
- 89.42.65 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS, gravity as Integer) 14632
- 89.42.66 extent(geo as GMGeometryMBS, gravity as Integer) 14632


### 89.42.64 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// extend image to fit
dim geo as new GMGeometryMBS(500,500)
dim col as GMColorMBS = GMColorMBS.Black
image.extent geo, col

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.42.63 extent(geo as GMGeometryMBS) 14630
- 89.42.65 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS, gravity as Integer) 14632
- 89.42.66 extent(geo as GMGeometryMBS, gravity as Integer) 14632

### 89.42.65 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// extend image to fit
dim geo as new GMGeometryMBS(500,500)
dim col as GMColorMBS = GMColorMBS.Black
image.extent geo, col

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:


- 89.42.63 extent(geo as GMGeometryMBS) 14630
- 89.42.64 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS) 14631
- 89.42.66 extent(geo as GMGeometryMBS, gravity as Integer) 14632


### 89.42.66 extent(geo as GMGeometryMBS, gravity as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image canvas using background color sized according to geometry and composite existing image on it, with image placement controlled by gravity.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// resize proportionally to fit
dim geo as new GMGeometryMBS(500,500)
image.extent geo, image.CenterGravity

window1.Title = image.formatExpression("%wx%h")
```

window1.Backdrop = image.CopyPicture

**Notes:** Parameters are obtained from existing image properties if they are not specified via a method parameter. Parameters which are supported by image properties (gravity and backgroundColor) update those image properties as a side-effect.
See also:

- 89.42.63 extent(geo as GMGeometryMBS) 14630
- 89.42.64 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS) 14631
- 89.42.65 extent(geo as GMGeometryMBS, backgroundColor as GMColorMBS, gravity as Integer) 14632

### 89.42.67 flip

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip image (reflect each scanline in the vertical direction).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.flip

Backdrop=image.CopyPicture
```

### 89.42.68 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.69 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634
- 89.42.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14634
- 89.42.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634

### 89.42.69 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match:
See also:

- 89.42.68 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS) 14633
- 89.42.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14634
- 89.42.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634

### 89.42.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.68 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS) 14633
- 89.42.69 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634
- 89.42.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634

### 89.42.71 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill color across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match:
See also:

- 89.42.68 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS) 14633
- 89.42.69 floodFillColor(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14634
- 89.42.70 floodFillColor(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14634

### 89.42.72 floodFillOpacity(x as UInt32, y as UInt32, opacity as UInt32, PaintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill pixels matching color (within fuzz factor) of target pixel(x,y) with replacement opacity value using method.

### 89.42.73 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.74 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14635
- 89.42.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14635
- 89.42.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14636

### 89.42.74 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.73 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS) 14635
- 89.42.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14635
- 89.42.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14636

### 89.42.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels that match the color of the target pixel and are neighbors of the target pixel.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.73 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS) 14635
- 89.42.74 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14635
- 89.42.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS) 14636

### 89.42.76 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS, borderColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flood-fill texture across pixels starting at target-pixel and stopping at pixels matching specified border color.
**Notes:** Uses current fuzz setting when determining color match.
See also:

- 89.42.73 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS) 14635
- 89.42.74 floodFillTexture(point as GMGeometryMBS, fillColor as GMColorMBS, borderColor as GMColorMBS) 14635
- 89.42.75 floodFillTexture(x as UInt32, y as UInt32, fillColor as GMColorMBS) 14635

### 89.42.77 flop

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flop image (reflect each scanline in the horizontal direction).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.flop

Backdrop=image.CopyPicture
```

### 89.42.78 FontMap as string

MBS GraphicsMagick Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current font map in use.
**Notes:** The MBS Plugin provides to GraphicsMagick the font map to use.
This is a XML defining which fonts are available.
Use this function to learn what fonts may be available or debug to see why a font doesn't load.

### 89.42.79 fontTypeMetrics(name as string) as GMTypeMetricMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain font metrics for text string given current font, pointsize, and density settings.

### 89.42.80 formatExpression(expression as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Format the specified expression similar to command line '-format'.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** For example "%wx%h" is converted to a string containing image WIDTHxHEIGHT like "640x480".

### 89.42.81 frame

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.frame
```

Backdrop=image.CopyPicture

See also:

- 89.42.82 frame(geometry as GMGeometryMBS) 14638
- 89.42.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6) 14638

### 89.42.82 frame(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.frame(GMGeometryMBS.Make("10x10"))

Backdrop=image.CopyPicture
```

See also:

- 89.42.81 frame 14637
- 89.42.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6) 14638

### 89.42.83 frame(width as UInt32, height as UInt32, innerBevel as Integer=6, outerBevel as Integer=6)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draw a decorative frame around the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.frame(15,15)

Backdrop=image.CopyPicture
```

See also:


- 89.42.81 frame 14637
- 89.42.82 frame(geometry as GMGeometryMBS) 14638


### 89.42.84 frameGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for frame.

### 89.42.85 gamma(gammaRed as Double, gammaGreen as Double, gammaBlue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma correct the image or individual image channels.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.gamma(1,2,3)

Backdrop=image.CopyPicture
```

See also:


- 89.42.252 gamma as Double 14695


### 89.42.86 gaussianBlur(width as Double, sigma as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gaussian blur image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
```

image.gaussianBlur(30, 10)

Backdrop=image.CopyPicture

**Notes:** The number of neighbor pixels to be included in the convolution mask is specified by width. The standard deviation of the gaussian bell curve is specified by sigma

### 89.42.87 gaussianBlurChannel(channel as Integer, width as Double, sigma as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gaussian blur image channel.
**Notes:** The number of neighbor pixels to be included in the convolution mask is specified by width. The standard deviation of the gaussian bell curve is specified by sigma.

### 89.42.88 getChromaBluePrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity blue primary point.

### 89.42.89 getchromaGreenPrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity green primary point.
**Notes:** e.g. x=0.3, y=0.6

### 89.42.90 getchromaRedPrimary(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity red primary point
**Notes:** e.g. x=0.64, y=0.33

### 89.42.91 getchromaWhitePoint(byref x as Double, byref y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity white point
**Notes:** e.g. x=0.3127, y=0.329

### 89.42.92 getConstPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers read-only pixels from the image to the pixel cache as defined by the specified region

### 89.42.93 GetEXIFOrientation(byref orientation as integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries orientation from EXIF.
**Notes:** Orientation is set to number from 0 to 8 depending on rotation. -1 if unknown.
This function can only read orientation, if there is an EXIF block in image.
Returns true for success and false for failure.

For new development, please use ExifTagsMBS class instead.

### 89.42.94 getPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers pixels from the image to the pixel cache as defined by the specified region.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

// get pointer to some pixels to write
dim x as ptr = g.getPixels(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
```

```
x.UInt32(o * 4) = &hFFFF0000
next

// write back
g.syncPixels

// show
me.Backdrop = g.CopyPicture
```

**Notes:** Modified pixels may be subsequently transferred back to the image via syncPixels. This method is valid for DirectClass images.

### 89.42.95 Graphics as GMGraphicsMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a graphics object for this image.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** Using the graphics object you can draw on the image.

### 89.42.96 haldClut(image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply a color lookup table (Hald CLUT) to the image.

### 89.42.97 Hash(Size as Integer = 8) as String

MBS GraphicsMagick Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a hash of the image.
**Example:**

```
Dim p As Picture = LogoMBS(500)
Dim g As New GMImageMBS(p)
msgbox g.Hash
```

**Notes:** Hash is returned as 64 characters being 1 or 0.
We convert image to 8x8, turn grayscale and check if pixels are above or below mean value.
This hash is quite immune against resizing, compression artifacts and hue changes.
You can use LevenshteinDistanceMBS or JaroWinklerDistanceMBS to compare two hashes.

Added size parameter for version 22.4:
The size of the bitmap. Value from 8 to 1024. Default is 8.

### 89.42.98 implode(factor as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Implode image (special effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.implode(0.3)

Backdrop=image.CopyPicture
```

### 89.42.99 IsLoggingEnabled as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether logging is enabled.
**Notes:** Returns true if we log GraphicsMagick usage.

### 89.42.100 JasperLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for jasper library.

### 89.42.101 label(text as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assign a label to an image.
**Notes:** Use this option to assign a specific label to the image. Optionally you can include the image filename, type, width, height, or scene number in the label by embedding special format characters. If the first character of string is @, the image label is read from a file titled by the remaining characters in the string. When converting to Postscript, use this option to specify a header string to print above the image.
See also:

- 89.42.263 label as string 14698

### 89.42.102 level(black_point as Double, white_point as Double, mid_point as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Level image to increase image contrast, and/or adjust image gamma.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.level(0, 127.0)

Backdrop=image.CopyPicture
```

**Notes:** Adjust the levels of the image by scaling the colors falling between specified white and black points to the full available quantum range. The parameters provided represent the black, mid (gamma), and white points. The black point specifies the darkest color in the image. Colors darker than the black point are set to zero. Mid point (gamma) specifies a gamma correction to apply to the image. White point specifies the lightest color in the image. Colors brighter than the white point are set to the maximum quantum value. The black and white point have the valid range 0 to MaxRGB while mid (gamma) has a useful range of 0 to ten:

### 89.42.103 levelChannel(channel as Integer, black_point as Double, white_point as Double, mid_point as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Level image channel to increase image contrast, and/or adjust image gamma.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.levelChannel(image.BlueChannel, 0, 127.0)

Backdrop=image.CopyPicture
```

**Notes:** Adjust the levels of the image channel by scaling the colors falling between specified white and black points to the full available quantum range. The parameters provided represent the black, mid (gamma), and white points. The black point specifies the darkest color in the image. Colors darker than the black point are set to zero. Mid point (gamma) specifies a gamma correction to apply to the image. White point specifies the lightest color in the image. Colors brighter than the white point are set to the maximum quantum value. The black and white point have the valid range 0 to MaxRGB while mid (gamma) has a useful range of 0 to ten.

### 89.42.104 LibVersion as String

MBS GraphicsMagick Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the version string of the GraphicsMagick library.

### 89.42.105 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The GraphicsMagick classes may use libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 89.42.106 MagickVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version text of the GraphicsMagick library.

### 89.42.107 magnify

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Magnify image by integral size (double the dimensions)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.magnify

Backdrop=image.CopyPicture
```

### 89.42.108 map(mapImage as GMImageMBS, dither as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remap image colors with closest color from a reference image.
**Example:**

```
// some picture we want to map colors
dim pic as Picture = LogoMBS(500)

// build a picture with palette
dim backgroundColor as new GMColorMBS(255,255,255) // white
dim size as new GMGeometryMBS(10,10)

dim i as new GMImageMBS(pic)
dim x as new GMImageMBS(size, backgroundColor)

x.pixelColor(0,0) = new GMColorMBS(0 ,0 ,0 ) // black
x.pixelColor(0,1) = new GMColorMBS(255,0 ,0 ) // red
x.pixelColor(0,2) = new GMColorMBS(0 ,255,0 ) // green
x.pixelColor(0,3) = new GMColorMBS(0 ,0 ,255) // blue
x.pixelColor(0,4) = new GMColorMBS(255,255,0 ) // yellow
x.pixelColor(0,5) = new GMColorMBS(0 ,255,255) // cyan
x.pixelColor(0,6) = new GMColorMBS(255,0 ,255) // magenta
```

```
// do the map
i.map(x, false)

// convert result from palette picture to bitmap picture
i.type = i.TrueColorType

// and copy picture to backdrop
Backdrop = i.CopyPicture
```

**Notes:** Set dither to true in to apply Floyd/Steinberg error diffusion to the image. By default, color reduction chooses an optimal set of colors that best represent the original image. Alternatively, you can choose a particular set of colors from an image file with this option.

### 89.42.109 matteFloodfill(target as GMColorMBS, opacity as UInt32, x as Integer, y as Integer, PaintMethod as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Floodfill designated area with a replacement opacity value.

### 89.42.110 medianFilter(radius as Double=0.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter image by replacing each pixel component with the median color in a circular neighborhood.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.medianFilter(10)

Backdrop=image.CopyPicture
```

### 89.42.111 minify

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce image by integral (half) size.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.minify

Backdrop=image.CopyPicture
```

### 89.42.112 modequalizeifyImage

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Not documented.

### 89.42.113 modifyImage

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prepare to update image (copy if reference >1).
**Notes:** Normally Magick++'s implicit reference counting takes care of all instance management. In the rare case that the automatic instance management does not work, use this method to assure that there is only one reference to the image to be modified. It should be used in the cases where a GraphicsMagick C function is used directly on an image which may have multiple references:

### 89.42.114 modulate(brightness as Double, saturation as Double, hue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulate percent hue, saturation, and brightness of an image.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim image as new GMImageMBS(logo)

image.type = image.TrueColorType

// brightness 150%
image.modulate(150,100,100)
backdrop = image.CopyPicture
```

**Notes:** Modulation of saturation and brightness is as a ratio of the current value (100 for no change). Modulation of hue is an absolute rotation of -180 degrees to +180 degrees from the current position corresponding

to an argument range of 0 to 200 (100 for no change).

### 89.42.115 montageGeometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile size and offset within an image montage.
**Notes:** Only valid for montage images.

### 89.42.116 motionBlur(radius as Double, sigma as Double, angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Motion blur image with specified blur factor.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.motionBlur(30,10,90)

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels. The angle parameter specifies the angle the object appears to be comming from (zero degrees is from the right).

### 89.42.117 negate(grayscale as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negate colors in image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.negate

Backdrop=image.CopyPicture
```

**Notes:** Set grayscale to only negate grayscale values in image.

### 89.42.118 normalize

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Normalize image (increase contrast by normalizing the pixel values to span the full range of color values).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.normalize

Backdrop=image.CopyPicture
```

### 89.42.119 oilPaint(radius as Double=3.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Oilpaint image (image looks like an oil painting).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.oilPaint

Backdrop=image.CopyPicture
```

### 89.42.120 opacity(opacity as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or attenuate the opacity channel in the image.
**Notes:** If the image pixels are opaque then they are set to the specified opacity value, otherwise they are blended with the supplied opacity value. The value of opacity ranges from 0 (completely opaque) to MaxRGB. The defines OpaqueOpacity and TransparentOpacity are available to specify completely opaque or completely transparent, respectively.

### 89.42.121 opaque(opaqueColor as GMColorMBS, penColor as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change color of specified opaque pixel to specified pen color.

### 89.42.122 ping(data as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the blob.
**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:


- 89.42.123 ping(file as folderitem) 14651
- 89.42.124 ping(Path as string) 14652


### 89.42.123 ping(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

// try with Constructor (same as read)
dim t1 as Double = Microseconds
dim g1 as new GMImageMBS(f)

// now just ping
dim t2 as Double = Microseconds
dim g2 as new GMImageMBS
g2.ping(f)

// or read
dim t3 as Double = Microseconds
dim g3 as new GMImageMBS
g3.read(f)

dim t4 as Double = Microseconds

// show speeds
MsgBox str(T4-t3)+" ¬µs for read"+EndOfLine+_
```

```
str(T3-t2)+" ¬µs for ping"+EndOfLine+_
str(T2-t1)+" ¬µs for Constructor"
```

**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:

- 89.42.122 ping(data as GMBlobMBS) 14651
- 89.42.124 ping(Path as string) 14652

### 89.42.124 ping(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads information for an image from the image specification.
**Notes:** Ping is similar to read except only enough of the image is read to determine the image columns, rows, and filesize. Access the columns, rows, and fileSize attributes after invoking ping. The image pixels are not valid after calling ping.
See also:

- 89.42.122 ping(data as GMBlobMBS) 14651
- 89.42.123 ping(file as folderitem) 14651

### 89.42.125 PNGLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries PNG library version string.

### 89.42.126 quantize(measureError as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Quantize image (reduce number of colors).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.quantize
```

```
image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** Set measureError to true in order to calculate error attributes.

### 89.42.127 QuantumDepth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the quantum depth.

### 89.42.128 quantumOperator(channel as Integer, Operator as Integer, rvalue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply an arithmetic or bitwise operator to the image pixel quantums.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

const AddQuantumOp = 1
const ThresholdQuantumOp = 10

g.quantumOperator( g.AllChannels, AddQuantumOp, 100)

// show
me.Backdrop = g.CopyPicture
```

See also:

- 89.42.129 quantumOperator(x as Integer, y as Integer, columns as Integer, rows as Integer, channel as Integer, Operator as Integer, rvalue as Double) 14653

### 89.42.129 quantumOperator(x as Integer, y as Integer, columns as Integer, rows as Integer, channel as Integer, Operator as Integer, rvalue as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply an arithmetic or bitwise operator to the image pixel quantums.
See also:

- 89.42.128 quantumOperator(channel as Integer, Operator as Integer, rvalue as Double) 14653

### 89.42.130 raiseGeometryDefault as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default geometry description for raise.

### 89.42.131 raiseImage

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raise image (lighten or darken the edges of an image to give a 3-D raised or lowered effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.raiseImage

Backdrop=image.CopyPicture
```

See also:

- 89.42.132 raiseImage(geometry as GMGeometryMBS, raisedFlag as boolean=false) 14654

### 89.42.132 raiseImage(geometry as GMGeometryMBS, raisedFlag as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raise image (lighten or darken the edges of an image to give a 3-D raised or lowered effect).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.raiseImage(GMGeometryMBS.Make(5,8))

Backdrop=image.CopyPicture
```

See also:

- 89.42.131 raiseImage 14654

### 89.42.133 randomThreshold(thresholds as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Random threshold image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.randomThreshold(GMGeometryMBS.make("50x200"))

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** Changes the value of individual pixels based on the intensity of each pixel compared to a random threshold. The result is a low-contrast, two color image. The thresholds argument is a geometry containing LOWxHIGH thresholds. If the string contains 2x2, 3x3, or 4x4, then an ordered dither of order 2, 3, or 4 will be performed instead. If a channel argument is specified then only the specified channel is altered. This is a very fast alternative to 'quantize' based dithering.

### 89.42.134 randomThresholdChannel(thresholds as GMGeometryMBS, channel as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Random threshold image channel.
**Notes:** Changes the value of individual pixels based on the intensity of each pixel compared to a random threshold. The result is a low-contrast, two color image. The thresholds argument is a geometry containing LOWxHIGH thresholds. If the string contains 2x2, 3x3, or 4x4, then an ordered dither of order 2, 3, or 4 will be performed instead. If a channel argument is specified then only the specified channel is altered. This is a very fast alternative to 'quantize' based dithering.

### 89.42.135 read(blob as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame from in-memory Blob.
**Example:**

```
// get some image data (e.g. from blob in database)
dim logo as Picture = LogoMBS(500)
dim jpegData as string = PictureToJPEGStringMBS(logo, 80)

// new image
Dim mp as new GMImageMBS
dim blob as new GMBlobMBS(jpegData)

// read data from blob into this image object
mp.Read blob

// sometimes you need to explicit convert to RGB/RGBA
'mp.type = mp.TrueColorMatteType
Backdrop=mp.CombinePictureWithMask
```

See also:


- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size from in-memory Blob.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657

- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size and depth from in-memory Blob.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size, depth, and format from in-memory Blob.
See also:

- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size, and format from in-memory Blob.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661

### 89.42.140 read(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame into current object.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.141 read(path as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame into current object.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661

### 89.42.142 read(size as GMGeometryMBS, file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size into current object.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661


### 89.42.143 read(size as GMGeometryMBS, Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame of specified size into current object.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659
- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr) 14661

### 89.42.144 read(width as UInt32, height as UInt32, map as string, StorageType as Integer, data as ptr)

MBS GraphicsMagick Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read single image frame from an array of raw pixels, with specified storage type (ConstituteImage).
**Notes:** Returns an Image corresponding to an image stored in a raw memory array format. The pixel data must be in scanline order top-to-bottom. The data can be unsigned char, unsigned short int, unsigned int, unsigned long, float, or double. Float and double require the pixels to be normalized to the range [ 0..1 ] , otherwise the range is [ 0..MaxVal ] where MaxVal is the maximum possible value for that type.

Note that for most 32-bit architectures the size of an unsigned long is the same as unsigned int, but for 64-bit architectures observing the LP64 standard, an unsigned long is 64 bits, while an unsigned int remains 32 bits. This should be considered when deciding if the data should be described as "Integer" or "Long".

For example, to create a 640x480 image from unsigned red-green-blue character data, use

image = new GMImageMBS(640, 480, "RGB", GMImageMBS.StorageTypeCharPixel, pixels);

width: width in pixels of the image.
height: height in pixels of the image.
map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (same as Transparency), O = Opacity, T = Transparency, C = cyan, Y = yellow, M = magenta, K = black, or I = intensity (for grayscale). Specify "P" = pad, to skip over a quantum which is intentionally ignored. Creation of an alpha channel for CMYK images is currently not supported.
type: Define the data type of the pixels. Float and double types are expected to be normalized [ 0..1 ] otherwise [ 0..MaxRGB ] . Choose from these types: StorageTypeCharPixel, StorageTypeShortPixel, StorageTypeIntegerPixel, StorageTypeLongPixel, StorageTypeFloatPixel, or StorageTypeDoublePixel.
pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.
See also:


- 89.42.135 read(blob as GMBlobMBS) 14655
- 89.42.136 read(blob as GMBlobMBS, size as GMGeometryMBS) 14656
- 89.42.137 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer) 14657
- 89.42.138 read(blob as GMBlobMBS, size as GMGeometryMBS, depth as Integer, magick as string) 14657
- 89.42.139 read(blob as GMBlobMBS, size as GMGeometryMBS, magick as string) 14658
- 89.42.140 read(file as folderitem) 14659
- 89.42.141 read(path as string) 14659

- 89.42.142 read(size as GMGeometryMBS, file as folderitem) 14660
- 89.42.143 read(size as GMGeometryMBS, Path as string) 14660


### 89.42.145 reduceNoise

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce noise in image using a noise peak elimination filter.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.reduceNoise

Backdrop=image.CopyPicture
```

See also:


- 89.42.146 reduceNoise(order as Double) 14662


### 89.42.146 reduceNoise(order as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduce noise in image using a noise peak elimination filter.
See also:


- 89.42.145 reduceNoise 14662


### 89.42.147 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the release date of the used graphics magick library.
**Notes:** We update the library only when someone needs an update, so if you need, please contact us.

### 89.42.148 repage

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image page canvas and position.

### 89.42.149 resize(geo as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying only geometry, with filter and blur obtained from Image default.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// resize proportionally to fit
dim geo as new GMGeometryMBS(500,500)
image.resize geo

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

**Notes:** Same result as 'zoom' method.
See also:

- 89.42.150 resize(geo as GMGeometryMBS, filterType as Integer) 14663
- 89.42.151 resize(geo as GMGeometryMBS, filterType as Integer, blur as double) 14664

### 89.42.150 resize(geo as GMGeometryMBS, filterType as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying geometry and filter, with blur using Image default.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// resize proportionally to fit
dim geo as new GMGeometryMBS(500,500)
image.resize geo, image.CubicFilter

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

See also:

- 89.42.149 resize(geo as GMGeometryMBS) 14663
- 89.42.151 resize(geo as GMGeometryMBS, filterType as Integer, blur as double) 14664

### 89.42.151 resize(geo as GMGeometryMBS, filterType as Integer, blur as double)

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image, specifying geometry, filter, and blur.
**Example:**

```
dim f as folderitem = SpecialFolder.Desktop.Child("test.jpg")
dim image as new GMImageMBS(f)

// resize proportionally to fit
dim geo as new GMGeometryMBS(500,500)
image.resize geo, image.CubicFilter, 3

window1.Title = image.formatExpression("%wx%h")
window1.Backdrop = image.CopyPicture
```

See also:

- 89.42.149 resize(geo as GMGeometryMBS) 14663
- 89.42.150 resize(geo as GMGeometryMBS, filterType as Integer) 14663

### 89.42.152 roll(columns as UInt32, rows as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll image (rolls image vertically and horizontally) by specified number of columnms and rows).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.roll(30,30)

Backdrop=image.CopyPicture
```

See also:

- 89.42.153 roll(roll as GMGeometryMBS) 14664

### 89.42.153 roll(roll as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll image (rolls image vertically and horizontally) by specified number of columnms and rows).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.roll(GMGeometryMBS.Make(0,0,30,30))

Backdrop=image.CopyPicture
```

See also:

- 89.42.152 roll(columns as UInt32, rows as UInt32) 14664

### 89.42.154 rotate(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotate image counter-clockwise by specified number of degrees.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.rotate(30)

Backdrop=image.CopyPicture
```

### 89.42.155 sample(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image by using pixel sampling algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.sample GMGeometryMBS.make(100,100)

Backdrop=image.CopyPicture
```

### 89.42.156 scale(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image by using simple ratio algorithm which provides good quality.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.scale new GMGeometryMBS(100,100)

Backdrop=image.CopyPicture
```

### 89.42.157 segment(clusterThreshold as Double=1.0, smoothingThreshold as Double=1.5)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Segment (coalesce similar image components) by analyzing the histograms of the color components and identifying units that are homogeneous with the fuzzy c-means technique.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.segment

image.type = image.TrueColorType

Backdrop=image.CopyPicture
```

**Notes:** A histogram is built for the image. This histogram is filtered to reduce noise and a second derivative of the histogram plot is built and used to identify potential cluster colors (peaks in the histogram). The cluster colors are then validated by scanning through all of the pixels to see how many pixels fall within each cluster. Some candidate cluster colors may not match any of the image pixels at all and should be discarded. Specify clusterThreshold, as the number of pixels matching a cluster color in order for the cluster to be considered valid. SmoothingThreshold eliminates noise in the second derivative of the histogram. As the value is increased, you can expect a smoother second derivative. The default is 1.5.

### 89.42.158 setChromaBluePrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity blue primary point.
**Notes:** e.g. x=0.15, y=0.06

### 89.42.159 setchromaGreenPrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity green primary point.
**Notes:** e.g. x=0.3, y=0.6

### 89.42.160 setchromaRedPrimary(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity red primary point
**Notes:** e.g. x=0.64, y=0.33

### 89.42.161 setchromaWhitePoint(x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromaticity white point
**Notes:** e.g. x=0.3127, y=0.329

### 89.42.162 SetEXIFOrientation(orientation as integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets orientation for EXIF.
**Notes:** Changing orientation may need to set orientation via SetOrientation and SetEXIFOrientation. With a JPEG you have orientation both in JPEG header and in EXIF metadata.
Returns true for success and false for failure.

For new development, please use ExifTagsMBS class instead.

### 89.42.163 SetLogEventMask(events as String)

MBS GraphicsMagick Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set log event mask.
**Example:**

```
GMImageMBS.SetLogEventMask("coder,annotate")
```

**Notes:** Defines which events are logged.
By default logging goes to stderr, so on macOS you may need to run your app via Terminal to see logs there.

List of events includes: none, Configure, Annotate, Render, Transform, Locale, Coder, X11, Cache, Blob, Deprecate, User, Resource, TemporaryFile, Exception, Option, Information, Warning, Error, FatalError and All.

### 89.42.164 SetPicture(pic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture into the Image at the given position.

### 89.42.165 SetPictureMask(maskpic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture into the Image's mask at the given position.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GMImageMBS( new GMGeometryMBS(p.Width, p.Height), new GMColorGrayMBS(1.0))

g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

### 89.42.166 setPixels(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates a pixel cache region to store image pixels as defined by the region rectangle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

// get pointer to some pixels to write
dim x as ptr = g.setPixels(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
g.syncPixels

// show
me.Backdrop = g.CopyPicture
```

**Notes:** This area is subsequently transferred from the pixel cache to the image via syncPixels.

### 89.42.167 setStrokeDashArray(values() as Double)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets stroke dash pattern.
**Notes:** Specify the pattern of dashes and gaps used to stroke paths. The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.42.168 shade(azimuth as Double=30.0, elevation as Double=30.0, colorShading as boolean=false)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shade image using distant light source.
**Notes:** Specify azimuth and elevation as the position of the light source. By default, the shading results as a grayscale image.. Set colorShading to true to shade the red, green, and blue components of the image.

### 89.42.169 sharpen(radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpen pixels in image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.sharpen

Backdrop=image.CopyPicture
```

**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.170 sharpenChannel(channel as Integer, radius as Double=0.0, sigma as Double=1.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpen pixels in image channel.
**Notes:** The radius parameter specifies the radius of the Gaussian, in pixels, not counting the center pixel. The sigma parameter specifies the standard deviation of the Laplacian, in pixels.

### 89.42.171 shave(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shave pixels from image edges.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.shave(new GMGeometryMBS(200,200))

Backdrop=image.CopyPicture
```

### 89.42.172 shear(xShearAngle as Double, yShearAngle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shear image (create parallelogram by sliding image by X or Y axis).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.shear(10,20)

Backdrop=image.CopyPicture
```

**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, x degrees is measured relative to the Y axis, and similarly, for Y direction shears y degrees is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the color defined as borderColor.

### 89.42.173 signature(force as boolean=false) as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image textual signature.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

MsgBox image.signature

Backdrop=image.CopyPicture
```

**Notes:** Set force to true in order to re-calculate the signature regardless of whether the image data has been modified.

### 89.42.174 solarize(factor as Double=50.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Solarize image (similar to effect seen when exposing a photographic film to light during the development process)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.solarize

Backdrop=image.CopyPicture
```

### 89.42.175 spread(amount as UInt32=3)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Spread pixels randomly within image by specified ammount
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.spread 5

Backdrop=image.CopyPicture
```

### 89.42.176 statistics as GMImageStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain image statistics.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim stat as GMImageStatisticsMBS = g.statistics
```

```
dim gs as GMImageChannelStatisticsMBS = stat.blue

MsgBox "blue channel: "+str(gs.minimum)+"-"+str(Gs.maximum)+", mean "+str(gs.mean)
```

**Notes:** Statistics are normalized to the range of 0.0 to 1.0 and are output to the specified ImageStatistics structure.

### 89.42.177 stegano(watermark as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add a digital watermark to the image (based on second image).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim p1 as Picture = New Picture(550,500,32)
dim p2 as Picture = New Picture(550,500,32)

p1.Graphics.DrawPicture p, 0,0
p2.Graphics.DrawPicture p,50,0

dim image1 as new GMImageMBS(p1)
dim image2 as new GMImageMBS(p2)

image2.zoom(new GMGeometryMBS(100,100)) // scale down

// add watermark
image1.stegano(image2)

// now make a threshold so you see the difference
image1.threshold 254

image1.type = image1.TrueColorType
Backdrop=image1.CopyPicture
```

### 89.42.178 stereo(rightImage as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an image which appears in stereo when viewed with red-blue glasses (Red image on left, blue on right)
**Example:**

```
dim p as Picture = LogoMBS(500)
dim p1 as Picture = New Picture(550,500,32)
dim p2 as Picture = New Picture(550,500,32)

p1.Graphics.DrawPicture p, 0,0
p2.Graphics.DrawPicture p,50,0

dim image1 as new GMImageMBS(p1)
dim image2 as new GMImageMBS(p2)

image1.stereo(IMAGE2)

Backdrop=image1.CopyPicture
```

### 89.42.179 strip

MBS GraphicsMagick Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remove all profiles and text attributes from the image.

### 89.42.180 strokeDashArray as Double()

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries stroke dash pattern.
**Notes:** Specify the pattern of dashes and gaps used to stroke paths. The strokeDashArray represents a zero-terminated array of numbers that specify the lengths of alternating dashes and gaps in pixels. If an odd number of values is provided, then the list of values is repeated to yield an even number of values. A typical strokeDashArray array might contain the members 5 3 2 0, where the zero value indicates the end of the pattern array.

### 89.42.181 swirl(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swirl image (image pixels are rotated by degrees).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.swirl 200
```

```
Backdrop=image.CopyPicture
```

### 89.42.182 syncPixels

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers the image cache pixels to the image.

### 89.42.183 texture(texture as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Channel a texture on pixels matching image background color.

### 89.42.184 threshold(degree as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Threshold image channels (below threshold becomes black, above threshold becomes white).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.threshold 127

// convert to RGB so CopyPicture works
image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** The range of the threshold parameter is 0 to MaxRGB.

### 89.42.185 thumbnail(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image using several algorithms to make smaller images very quickly.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)

// make thumbnail
dim geo as new GMGeometryMBS(100, 100)
g.thumbnail(geo)

// show
me.Backdrop = g.CopyPicture
```

### 89.42.186 TIFFLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for tiff library.

### 89.42.187 transform(imageGeometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image based on image and crop geometries.
**Notes:** Crop geometry is optional.
See also:

- 89.42.188 transform(imageGeometry as GMGeometryMBS, cropGeometry as GMGeometryMBS) 14676

### 89.42.188 transform(imageGeometry as GMGeometryMBS, cropGeometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image based on image and crop geometries.
**Notes:** Crop geometry is optional.
See also:

- 89.42.187 transform(imageGeometry as GMGeometryMBS) 14676

### 89.42.189 transformOrigin(tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Origin of coordinate system to use when annotating with text or drawing.

### 89.42.190 transformReset

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset transformation parameters to default.

### 89.42.191 transformRotation(angle as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation to use when annotating with text or drawing.

### 89.42.192 transformScale(tx as Double, ty as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scale to use when annotating with text or drawing.

### 89.42.193 transformSkewX(x as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skew to use in X axis when annotating with text or drawing.

### 89.42.194 transformSkewY(y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skew to use in Y axis when annotating with text or drawing.

### 89.42.195 transparent(color as GMColorMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add matte channel to image, setting pixels matching color to transparent.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

dim c as new GMColorMBS("white")
image.transparent(c)

Backdrop=image.CombinePictureWithMask
```

### 89.42.196 trim

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim edges that are the background color from the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
// make the logo picture bigger
dim q as Picture = New Picture(700,700,32)

q.Graphics.DrawPicture p,100,100

dim image as new GMImageMBS(q)

// now trim the white border away
image.trim

Backdrop=image.CopyPicture
```

**Notes:** See ColorFuzz property for how far the pixel value can differentiate.

### 89.42.197 unregisterId

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Not documented.

### 89.42.198 unsharpmask(radius as Double, sigma as Double, amount as Double, threshold as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace image with a sharpened version of the original image using the unsharp mask algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.unsharpmask(10,1,0.5,50)

Backdrop=image.CopyPicture
```

**Notes:** radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.
amount: the percentage of the difference between the original and the blur image that is added back into the original.
threshold: the threshold in pixels needed to apply the diffence amount.

### 89.42.199 unsharpmaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replace image channel with a sharpened version of the original image using the unsharp mask algorithm.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.unsharpmaskChannel(Image.RedChannel, 10,1,0.5,50)

Backdrop=image.CopyPicture
```

**Notes:**

### 89.42.200 wave(amplitude as Double=25.0, wavelength as Double=150.0)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| channel: | image channel to modify. |
| radius: | the radius of the Gaussian, in pixels, not counting the center pixel. |
| sigma: | the standard deviation of the Gaussian, in pixels. |
| amount: | the percentage of the difference between the original and the blur image that is added back into the original. |
| threshold: | the threshold in pixels needed to apply the diffence amount. |

**Function:** Map image pixels to a sine wave.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.wave

Backdrop=image.CopyPicture
```

### 89.42.201 WebPVersion as String

MBS GraphicsMagick Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of WebP library.
**Notes:** Should be a version string like "1.3.0".

### 89.42.202 write(blob as GMBlobMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.42.203 write(blob as GMBlobMBS, magick as string) 14681
- 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32) 14681
- 89.42.205 write(file as folderitem) 14681
- 89.42.206 write(Path as string) 14682
- 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14682

### 89.42.203 write(blob as GMBlobMBS, magick as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.42.202 write(blob as GMBlobMBS) 14680
- 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32) 14681
- 89.42.205 write(file as folderitem) 14681
- 89.42.206 write(Path as string) 14682
- 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14682


### 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to in-memory Blob, with optional format and adjoin parameters.
See also:


- 89.42.202 write(blob as GMBlobMBS) 14680
- 89.42.203 write(blob as GMBlobMBS, magick as string) 14681
- 89.42.205 write(file as folderitem) 14681
- 89.42.206 write(Path as string) 14682
- 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14682


### 89.42.205 write(file as folderitem)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to a file.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GMImageMBS( new GMGeometryMBS(p.Width, p.Height), new GMColorGrayMBS(1.0))
```

```
g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

See also:


- 89.42.202 write(blob as GMBlobMBS) 14680
- 89.42.203 write(blob as GMBlobMBS, magick as string) 14681
- 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32) 14681
- 89.42.206 write(Path as string) 14682
- 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14682


### 89.42.206 write(Path as string)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to a file.
See also:


- 89.42.202 write(blob as GMBlobMBS) 14680
- 89.42.203 write(blob as GMBlobMBS, magick as string) 14681
- 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32) 14681
- 89.42.205 write(file as folderitem) 14681
- 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr) 14682


### 89.42.207 write(x as Integer, y as Integer, columns as Integer, rows as Integer, map as string, type as Integer, Pixels as Ptr)

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write single image frame to an array of pixels with storage type specified by user (DispatchImage).
**Notes:** e.g. image.write( 0, 0, 640, 1, "RGB", 0, pixels )
See also:

- 89.42.202 write(blob as GMBlobMBS) 14680
- 89.42.203 write(blob as GMBlobMBS, magick as string) 14681
- 89.42.204 write(blob as GMBlobMBS, magick as string, depth as UInt32) 14681
- 89.42.205 write(file as folderitem) 14681
- 89.42.206 write(Path as string) 14682


### 89.42.208 ZLibVersion as string

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version string for zlib library.

### 89.42.209 zoom(geometry as GMGeometryMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Zoom (resize) image to specified size.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.zoom(new GMGeometryMBS(200,200))

Backdrop=image.CopyPicture
```

### 89.42.210 ZPL(Header as boolean = true) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image as ZPL hex image.
**Notes:** This is for sending data to a receipt printer. The picture is taken as black & white image and we build the hex string, you can send to the printer.
Picture needs to have a width dividable by 8.

Set Header to false for skipping header and footer.

### 89.42.211 Properties

### 89.42.212 adjoin as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Join images into a single multi-image file.
**Notes:** (Read and Write property)

### 89.42.213 animationDelay as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Time in 1/100ths of a second (0 to 65535) which must expire before displaying the next image in an animated sequence.
**Notes:** This option is useful for regulating the animation of a sequence of GIF images within Netscape.
(Read and Write property)

### 89.42.214 animationIterations as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of iterations to loop an animation (e.g. Netscape loop extension) for.
**Notes:** (Read and Write property)

### 89.42.215 antiAlias as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control antialiasing of rendered Postscript and Postscript or TrueType fonts.
**Notes:** Enabled by default.
(Read and Write property)

### 89.42.216 backgroundColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Example:**

```
// make a red and turn it to 100% transparent
Dim red As New GMColorRGBMBS("red")
```

```
red.alpha = 1

// now make image and make it RGBA with the transparnet background
dim RastoredVectorImage as New GMImageMBS
RastoredVectorImage.type = GMImageMBS.TrueColorMatteType
RastoredVectorImage.backgroundColor = red

// now read SVG, so we get a transparent background
dim SVG_File as FolderItem = SpecialFolders.desktop.Child("test.svg")
RastoredVectorImage.read(SVG_File)
```

**Notes:** (Read and Write property)

### 89.42.217 backgroundTexture as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image file name to use as the background texture.
**Notes:** Does not modify image pixels.
(Read and Write property)

### 89.42.218 baseColumns as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image width (before transformations)
**Notes:** (Read only property)

### 89.42.219 baseFilename as String

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image filename (before transformations)
**Notes:** (Read only property)

### 89.42.220 baseRows as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base image height (before transformations).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

Title = str(image.baseRows)+" x "+str(image.baseColumns)
```

**Notes:** (Read only property)

### 89.42.221 borderColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 89.42.222 boundingBox as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return smallest bounding box enclosing non-border pixels.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.fillColor = new GMColorRGBMBS("red") // set color
image.strokeColor = new GMColorRGBMBS("green") // set color

image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle

draw.Circle(250, 250, 120, 150)
draw.Draw

draw = nil
image.type = image.TrueColorType

Backdrop = image.CopyPicture
```

MsgBox image.boundingBox.StringValue

**Notes:** The current fuzz value is used when discriminating between pixels. This is the crop bounding box used by crop(Geometry(0,0)).
(Read only property)

### 89.42.223 boxColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Base color that annotation text is rendered on (default none).
**Notes:** (Read and Write property)

### 89.42.224 classType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image class (DirectClass or PseudoClass).
**Notes:** NOTE: setting a DirectClass image to PseudoClass will result in the loss of color information if the number of colors in the image is greater than the maximum palette size (either 256 or 65536 entries depending on the value of QuantumDepth when ImageMagick was built):
(Read and Write property)

### 89.42.225 clipMask as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Associate a clip mask image with the current image.
**Notes:** The clip mask image must have the same dimensions as the current image or an exception is thrown. Clipping occurs wherever pixels are transparent in the clip mask image. Clipping Pass an invalid image to unset an existing clip mask.
(Read and Write property)

### 89.42.226 colorFuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this

option to match colors that are close to the target color in RGB space.

e.g. set to 50 for 8 bit class and 50 * 257 for the 16 bit class to allow 20% divagation in pixel values.
(Read and Write property)

### 89.42.227 colorMapSize as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of entries in the colormap.
**Notes:** Setting the colormap size may extend or truncate the colormap. The maximum number of supported entries is specified by the MaxColormapSize constant, and is dependent on the value of QuantumDepth when GraphicsMagick is compiled. An exception is thrown if more entries are requested than may be supported. Care should be taken when truncating the colormap to ensure that the image colormap indexes reference valid colormap entries.
(Read and Write property)

### 89.42.228 colorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The colorspace (e.g. CMYK) used to represent the image pixel colors.
**Notes:**

| | |
|---|---|
| UndefinedColorspace | = 0 |
| RGBColorspace | = 1 (Plain old RGB colorspace) |
| GRAYColorspace | = 2 (Plain old full-range grayscale) |
| TransparentColorspace | = 3 (RGB but preserve matte channel during quantize) |
| OHTAColorspace | = 4 |
| XYZColorspace | = 5 (CIE XYZ) |
| YCCColorspace | = 6 (Kodak PhotoCD PhotoYCC) |
| YIQColorspace | = 7 |
| YPbPrColorspace | = 8 |
| YUVColorspace | = 9 |
| CMYKColorspace | = 10 (Cyan, magenta, yellow, black, alpha) |
| sRGBColorspace | = 11 (Kodak PhotoCD sRGB) |
| HSLColorspace | = 12 (Hue, saturation, luminosity) |
| HWBColorspace | = 13 (Hue, whiteness, blackness) |
| LABColorspace | = 14 (LAB colorspace not supported yet other than via lcms) |
| CineonLogRGBColorspace | = 15 (RGB data with Cineon Log scaling, 2.048 density range) |
| Rec601LumaColorspace | = 16 (Luma (Y) according to ITU-R 601) |
| Rec601YCbCrColorspace | = 17 (YCbCr according to ITU-R 601) |
| Rec709LumaColorspace | = 18 (Luma (Y) according to ITU-R 709) |
| Rec709YCbCrColorspace | = 19 (YCbCr according to ITU-R 709) |

(Read and Write property)

### 89.42.229 columns as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image width.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

Title = str(image.columns)+" x "+str(image.rows)
Backdrop=image.CopyPicture
```

**Notes:** (Read only property)

### 89.42.230 comment as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image comment.
**Notes:** When you set this property, you add comment string to image.
By default, each image is commented with its file name. Use this method to assign a specific comment to the image. Optionally you can include the image filename, type, width, height, or other image attributes by embedding special format characters:
(Read and Write property)

### 89.42.231 compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composition operator to be used when composition is implicitly used (such as for image flattening).
**Notes:** (Read and Write property)

### 89.42.232 compressType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.
**Notes:** The default is the compression type of the input image file.
(Read and Write property)

### 89.42.233 debug as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable printing of debug messages from GraphicsMagick as it executes.
**Notes:** (Read and Write property)

### 89.42.234 density as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical and horizontal resolution in pixels of the image.
**Example:**

```
dim p as new GMImageMBS

dim item as FolderItem = SpecialFolder.Desktop.Child("input.png")
p.read(item)
p.scale new GMGeometryMBS(3750,3750)
p.quality = 95
p.resolutionUnits = p.PixelsPerInchResolution
p.density = new GMGeometryMBS(300, 300)
dim out as FolderItem = SpecialFolder.Desktop.Child("output.png")
p.write out
```

**Notes:** This option specifies an image density when decoding a Postscript or Portable Document page. Often used with psPageSize.
(Read and Write property)

### 89.42.235 depth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (bits allocated to red/green/blue components).
**Notes:** Used to specify the bit depth when reading or writing raw images or when the output format supports multiple depths. Defaults to the quantum depth that GraphicsMagick is compiled with.
(Read and Write property)

### 89.42.236 directory as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile names from within an image montage.
**Notes:** (Read only property)

### 89.42.237 endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian mode.
**Notes:** Endianness (LSBEndian like Intel, MSBEndian like SPARC, or NativeEndian for what this computer uses) for image formats which support endian-specific options.
(Read and Write property)

### 89.42.238 ExifThumbnail as String

MBS GraphicsMagick Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts an embedded thumbnail in EXIF data.
**Example:**

```
Dim g As New GMImageMBS

// not load, but just read header & metadata
g.ping("/Users/cs/Desktop/test.JPG")

// get thumbnail
Dim Thumbnail As String = g.ExifThumbnail

// show it
window1.Backdrop = picture.FromData(Thumbnail)
```

**Notes:** Returns string containing JPEG compressed image data.

For new development, please use ExifTagsMBS class instead.
(Read only property)

### 89.42.239 fileName as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image file name.
**Notes:** (Read and Write property)

### 89.42.240 fileSize as Int64

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes of the image on disk.
**Notes:** (Read only property)

### 89.42.241 fillColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color to use when filling drawn objects.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.42.242 fillPattern as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pattern to use while filling drawn objects.
**Notes:** (Read and Write property)

### 89.42.243 fillRule as Integer

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rule to use when filling drawn objects
**Notes:** (Read and Write property)

### 89.42.244 filterType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reduction filter employed has a sigificant effect on the time required to resize an image and the resulting quality. The default filter is Lanczos which has been shown to produce high quality results when reducing most images.
**Notes:** Filter to use when resizing image.
(Read and Write property)

### 89.42.245 font as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font.
**Notes:** If the font is a fully qualified X server font name, the font is obtained from an X server. To use a TrueType font, precede the TrueType filename with an @. Otherwise, specify a Postscript font name (e.g. "helvetica").
(Read and Write property)

### 89.42.246 FontFamily as String

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font family to use.
**Notes:** The plugin will look through the list to find best match for combination of family, style, stretch and weight.
You can use either FontFamily or Font property, but not both.
Setting font family clears font.
(Read and Write property)

### 89.42.247 fontPointsize as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font point size.
**Notes:** (Read and Write property)

### 89.42.248 FontStretch as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font stretch.
**Notes:** Can be Normal, UltraCondensed, ExtraCondensed, Condensed, SemiCondensed, SemiExpanded, Expanded, ExtraExpanded, UltraExpanded or Any.
See stretch constants.
(Read and Write property)

### 89.42.249 FontStyle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font style to use.
**Notes:** Can be Normal, Italic, Oblique or Any.
See font style constants.
(Read and Write property)

### 89.42.250 FontWeight as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font weight.
**Notes:** The font weight in range from 0 to 1000.
400 is normal and 800 bold.
(Read and Write property)

### 89.42.251 format as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Long image format description.
**Notes:** (Read only property)

### 89.42.252 gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma correct the image or individual image channels.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.gamma = 3.0

Backdrop=image.CopyPicture
```

**Notes:** If you get the value, it is the gamma level of the image. Gamma is a pow() function which converts between the linear light representation and the representation for the computer display. Most computer images are gamma corrected to 2.2 (1/0.4545) so that each step results in a visually linear step on a computer or video display:
(Read and Write property)
See also:

- 89.42.85 gamma(gammaRed as Double, gammaGreen as Double, gammaBlue as Double) 14639

### 89.42.253 geometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size of the image when encoding.
**Notes:** (Read only property)

### 89.42.254 getConstIndexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain immutable image pixel indexes (valid for PseudoClass images)
**Notes:** (Read only property)

### 89.42.255 getIndexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain mutable image pixel indexes (valid for PseudoClass images)
**Notes:** (Read only property)

### 89.42.256 gifDisposeMethod as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GIF disposal method.
**Notes:** This option (specific to the GIF file format) is used to control how successive frames are rendered (how the preceding frame is disposed of) when creating a GIF animation.

| Constant | Disposal | Description |
|---|---|---|
| UndefinedDispose | 0 | No disposal specified. |
| NoneDispose | 1 | Do not dispose between frames. |
| BackgroundDispose | 2 | Overwrite frame with background color from header. |
| PreviousDispose | 3 | Overwrite with previous frame. |

(Read and Write property)

### 89.42.257 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Example:**

```
dim c as new GMColorMBS("white")
dim g as new GMGeometryMBS(100,100)
dim image as new GMImageMBS(g, c)
MsgBox hex(Image.handle) // valid if not zero
```

**Notes:** (Read and Write property)

### 89.42.258 height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image.
**Example:**

```
dim c as new GMColorRGBMBS(1.0,0.0,0.0)
dim size as new GMGeometryMBS(100,100)
dim g as new GMImageMBS(size, c)
```

```
MsgBox str(g.width)+" "+str(g.height)
```

**Notes:** This is a convenience function for you which calls size.height.
(Read only property)

### 89.42.259 iccColorProfile as GMBlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ICC color profile.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("IMG_0793.tif")
dim Image as new GMImageMBS(f)
dim ProfileBlob as GMBlobMBS = Image.iccColorProfile
dim ProfileData as string = ProfileBlob.CopyString
dim cm as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromString(ProfileData)
dim name as string = cm.Name

Break // check data in debugger
```

**Notes:** Supplied via a Blob since Magick++/ and GraphicsMagick do not currently support formating this data structure directly. Specifications are available from the International Color Consortium for the format of ICC color profiles.
(Read and Write property)

### 89.42.260 interlaceType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace ).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.
(Read and Write property)

### 89.42.261 iptcProfile as GMBlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** IPTC profile.
**Notes:** Supplied via a Blob since Magick++ and GraphicsMagick do not currently support formating this data structure directly. Specifications are available from the International Press Telecommunications Council for IPTC profiles.
(Read and Write property)

### 89.42.262 isValid as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does object contain valid image?
**Notes:** Set to false in order to invalidate the image. Images constructed via the default constructor are invalid images and isValid() will return false.
(Read and Write property)

### 89.42.263 label as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image label.
**Notes:** (Read only property)
See also:

- 89.42.101 label(text as string) 14644

### 89.42.264 lineWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stroke width for drawing vector objects (default one)
**Notes:** This method is now deprecated. Please use strokeWidth instead.
(Read and Write property)

### 89.42.265 magick as string

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the codec to use for compression.
**Example:**

```
// this converts 32 bit PNG with alpha channel to BMP

dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as Picture = Picture.Open(f)

dim g as new GMImageMBS( new GMGeometryMBS(p.Width, p.Height), new GMColorGrayMBS(1.0))

g.type = g.TrueColorMatteType
g.matte = True
g.magick = "BMP"

g.SetPicture(p, 0, 0)
g.SetPictureMask(p.mask.invertMBS, 0, 0)

f = SpecialFolder.Desktop.Child("test.bmp")
g.write(f)
```

**Notes:** (Read and Write property)

### 89.42.266 matte as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image supports transparency (matte channel)
**Notes:** (Read and Write property)

### 89.42.267 matteColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (frame) color.
**Notes:** (Read and Write property)

### 89.42.268 meanErrorPerPixel as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mean error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.42.269 modulusDepth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image modulus depth (minimum number of bits required to support red/green/blue components without loss of accuracy).
**Notes:** The pixel modulus depth may be decreased by supplying a value which is less than the current value, updating the pixels (reducing accuracy) to the new depth. The pixel modulus depth can not be increased over the current value using this method.
(Read and Write property)

### 89.42.270 monochrome as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform image to black and white while color reducing (quantizing).
**Notes:** (Read and Write property)

### 89.42.271 normalizedMaxError as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The normalized max error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.42.272 normalizedMeanError as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The normalized mean error per pixel computed when an image is color reduced.
**Notes:** This parameter is only valid if verbose is set to true and the image has just been quantized.
(Read only property)

### 89.42.273 orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image orientation. Supported by some file formats such as DPX and TIFF. Useful for turning the right way up.
**Notes:** (Read and Write property)

### 89.42.274 page as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size and location of an image canvas.
**Notes:** Use this option to specify the dimensions and position of the Postscript page in dots per inch or a TEXT page in pixels. This option is typically used in concert with density .

Page may also be used to position a GIF image (such as for a scene in an animation).
(Read and Write property)

### 89.42.275 penColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pen color.
**Notes:** (Read and Write property)

### 89.42.276 quality as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level (default 75).
**Notes:** (Read and Write property)

### 89.42.277 quantizeColors as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum number of colors to quantize to.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.quantizeColors = 10
image.quantize

image.type = image.TrueColorType
Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.42.278 quantizeColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorspace to quantize in (default RGB).
**Example:**

```
// load a picture
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim pic as Picture = Picture.Open(f)

const GrayColorSpace = 2

Dim Converter As New GMImageMBS(Pic)

// quantize with dither
Converter.type = GMImageMBS.BilevelType
Converter.quantizeColorSpace = GrayColorSpace
Converter.quantizeColors = 2
Converter.quantizeDither = True
Converter.quantize

// convert back to Xojo
Converter.type = GMImageMBS.TrueColorType
Backdrop = Converter.CopyPicture
```

**Notes:** Empirical evidence suggests that distances in color spaces such as YUV or YIQ correspond to perceptual color differences more closely than do distances in RGB space. These color spaces may give better results when color reducing an image.
(Read and Write property)

### 89.42.279 quantizeDither as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Apply Floyd/Steinberg error diffusion to the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.quantizeColors = 10
```

image.quantizeDither = true
image.quantize

image.type = image.TrueColorType
Backdrop=image.CopyPicture

**Notes:** The basic strategy of dithering is to trade intensity resolution for spatial resolution by averaging the intensities of several neighboring pixels. Images which suffer from severe contouring when reducing colors can be improved with this option. The quantizeColors or monochrome option must be set for this option to take effect.
(Read and Write property)

### 89.42.280 quantizeTreeDepth as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Depth of the quantization color classification tree.
**Notes:** Values of 0 or 1 allow selection of the optimal tree depth for the color reduction algorithm. Values between 2 and 8 may be used to manually adjust the tree depth.
(Read and Write property)

### 89.42.281 Quiet as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Suppress all warning messages.
**Notes:** Error messages are still reported.
(Read and Write property)

### 89.42.282 renderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of rendering intent (used when applying an ICC color profile).
**Notes:** (Read and Write property)

### 89.42.283 resolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Example:**

```
Dim item As FolderItem = SpecialFolder.Desktop.Child("test.jpeg")
Dim p As New GMImageMBS(item)

// scale image
p.quality = 95
p.scale New GMGeometryMBS(1000,1000)

// change resolution
p.density = New GMGeometryMBS(300, 300)
p.resolutionUnits = p.PixelsPerInchResolution

// remove metadata
Dim empty As New GMBlobMBS
p.profile("EXIF") = empty
p.profile("IPTC") = empty
p.profile("XMP") = empty

Dim out As FolderItem = SpecialFolder.Desktop.Child("output.jpeg")
p.write out
```

**Notes:** (Read and Write property)

### 89.42.284 rows as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of pixel rows in the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

Title = str(image.columns)+" x "+str(image.rows)
Backdrop=image.CopyPicture
```

**Notes:** (Read only property)

### 89.42.285 scene as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image scene number.
**Notes:** (Read and Write property)

### 89.42.286 size as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height of a raw image (an image which does not support width and height information).
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

MsgBox image.size.StringValue

image.size = new GMGeometryMBS(200,200)

Backdrop=image.CopyPicture
```

**Notes:** Size may also be used to affect the image size read from a multi-resolution format (e.g. Photo CD, JBIG, or JPEG.
(Read and Write property)

### 89.42.287 strokeAntiAlias as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable stroke anti-aliasing.
**Notes:** (Read and Write property)

### 89.42.288 strokeColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color to use when drawing object outlines.
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)
```

```
image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.42.289 strokeDashOffset as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** While drawing using a dash pattern, specify distance into the dash pattern to start the dash (default 0).
**Notes:** (Read and Write property)

### 89.42.290 strokeLineCap as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the end of open subpaths when they are stroked. #
**Notes:** Values of LineCap are UndefinedCap, ButtCap, RoundCap, and SquareCap.
(Read and Write property)

### 89.42.291 strokeLineJoin as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify the shape to be used at the corners of paths (or other vector shapes) when they are stroked. Values of LineJoin are UndefinedJoin, MiterJoin, RoundJoin, and BevelJoin.
**Notes:** (Read and Write property)

### 89.42.292 strokeMiterLimit as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specify miter limit.
**Notes:** When two line segments meet at a sharp angle and miter joins have been specified for 'lineJoin', it is possible for the miter to extend far beyond the thickness of the line stroking the path. The miterLimit' imposes a limit on the ratio of the miter length to the 'lineWidth'. The default value of this parameter is 4. (Read and Write property)

### 89.42.293 strokePattern as GMImageMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pattern image to use while stroking object outlines.
**Notes:** (Read and Write property)

### 89.42.294 strokeWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stroke width for drawing vector objects (default one).
**Example:**

```
dim g as new GMGeometryMBS(500,500)
dim c as new GMColorRGBMBS("white") // white
dim image as new GMImageMBS(g, c)

image.strokeColor = new GMColorRGBMBS("red") // Outline color
image.fillColor = new GMColorRGBMBS("green") // Fill color
image.strokeWidth = 5

dim draw as GMGraphicsMBS = image.Graphics

// Draw a circle
draw.Circle(250, 250, 120, 150)

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write property)

### 89.42.295 subImage as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subimage of an image sequence.
**Notes:** (Read and Write property)

### 89.42.296 subRange as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of images relative to the base image.
**Notes:** (Read and Write property)

### 89.42.297 textEncoding as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Annotation text encoding (e.g. "UTF-16").
**Notes:** (Read and Write property)

### 89.42.298 tileName as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile name.
**Notes:** (Read and Write property)

### 89.42.299 totalColors as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of colors in the image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

Title = str(image.totalColors) // shows 5284
Backdrop=image.CombinePictureWithMask
```

**Notes:** (Read only property)

### 89.42.300 type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of this image.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)

image.type = image.GrayscaleType

Backdrop=image.CopyPicture
```

**Notes:** You can set this value to convert the image to the type.

Convert the image representation to the specified type or retrieve the current image type. If the image is reduced to an inferior type, then image information may be lost (e.g. color changed to grayscale).

Available enumerations for the type parameter:

| | | |
|---|---|---|
| BilevelType | 1 | black/white |
| GrayscaleType | 2 | grayscale |
| GrayscaleMatteType | 3 | grayscale with alpha (opacity) channel |
| PaletteType | 4 | colormapped |
| PaletteMatteType | 5 | colormapped with transparency |
| TrueColorType | 6 | true (full) color |
| TrueColorMatteType | 7 | true (full) color with alpha (opacity) channel |
| ColorSeparationType | 8 | Cyan, magenta, yellow, and black |
| ColorSeparationMatteType | 9 | Cyan, magenta, yellow, and black with alpha (opacity) channel |
| OptimizeType | 10 | Optimize the image type to best represent the existing pixels |

(Read and Write property)

### 89.42.301 verbose as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print detailed information about the image.

**Notes:** (Read and Write property)

### 89.42.302 view as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlashPix viewing parameters.
**Notes:** (Read and Write property)

### 89.42.303 width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image.
**Example:**

```
dim c as new GMColorRGBMBS(1.0,0.0,0.0)
dim size as new GMGeometryMBS(100,100)
dim g as new GMImageMBS(size, c)

MsgBox str(g.width)+" "+str(g.height)
```

**Notes:** This is a convenience function for you which calls size.width.
(Read only property)

### 89.42.304 x11Display as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X11 display to display to, obtain fonts from, or to capture image from.
**Notes:** (Read and Write property)

### 89.42.305 XResolution as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** x resolution of the image.
**Notes:** See also density functions.
Settable with version 19.0.
(Read and Write property)

### 89.42.306 YResolution as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** y resolution of the image.
**Notes:** Settable with version 19.0.
(Read and Write property)

### 89.42.307 attributeValue(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Access an arbitrary named image attribute.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("IMG_4048.jpg")
dim g as new GMImageMBS(f)
dim a as string = g.attributeValue("EXIF:DateTime")
MsgBox a
```

**Notes:** Any number of named attributes may be attached to the image. For example, the image comment is a named image attribute with the name "comment". EXIF tags are attached to the image as named attributes. Use the syntax "EXIF:<tag>" to request an EXIF tag similar to "EXIF:DateTime":
(Read and Write computed property)

### 89.42.308 channelDepth(channel as Integer) as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain modulus channel depth.
**Notes:** (Read and Write computed property)

### 89.42.309 colorMap(index as UInt32) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color at colormap position index.
**Notes:** (Read and Write computed property)
See also:

- 89.42.26 colorMap as GMColorMBS() 14612

### 89.42.310 defineSet(magick as string, key as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain a definition flag to applied when encoding or decoding the specified format.
**Notes:** Similar to the defineValue() method except that passing the flag value 'true' creates a value-less define with that format and key. Passing the flag value 'false' removes any existing matching definition. The method returns 'true' if a matching key exists, and 'false' if no matching key exists.
(Read and Write computed property)

### 89.42.311 defineValue(magick as string, key as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or obtain a definition string to applied when encoding or decoding the specified format.
**Notes:** The meanings of the definitions are format specific. The format is designated by the magick argument, the format-specific key is designated by key, and the associated value is specified by value. See the defineSet() method if the key must be removed entirely.
(Read and Write computed property)

### 89.42.312 pixelColor(x as UInt32, y as UInt32) as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set pixel color at location x & y.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim image as new GMImageMBS(p)
dim c as new GMColorMBS("red")

for x as Integer = 240 to 260
image.pixelColor(x,250)=c
next

for y as Integer = 240 to 260
image.pixelColor(250,y)=c
next

Backdrop=image.CopyPicture
```

**Notes:** (Read and Write computed property)

### 89.42.313 profile(name as string) as GMBlobMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a named profile.
**Example:**

```
Dim item As FolderItem = SpecialFolder.Desktop.Child("test.jpeg")
Dim p As New GMImageMBS(item)

// scale image
p.quality = 95
p.scale New GMGeometryMBS(1000,1000)

// change resolution
p.density = New GMGeometryMBS(300, 300)
p.resolutionUnits = p.PixelsPerInchResolution

// remove metadata
Dim empty As New GMBlobMBS
p.profile("EXIF") = empty
p.profile("IPTC") = empty
p.profile("XMP") = empty

Dim out As FolderItem = SpecialFolder.Desktop.Child("output.jpeg")
p.write out
```

**Notes:** Add or remove a named profile to/from the image. Remove the profile by passing an empty Blob

(e.g. Blob()). Valid names are "*", "8BIM", "ICM", "IPTC", or a user/format-defined profile name.

Retrieve a named profile from the image. Valid names are: "8BIM", "8BIMTEXT", "APP1", "APP1JPEG", "ICC", "ICM", & "IPTC" or an existing user/format-defined profile name
(Read and Write computed property)

### 89.42.314 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AbsoluteIntent | 3 | One of the intent type constants. |
| AddCompositeOp | 8 | One of the composite type constants. |
| AllChannels | 10 | One of the possible channel constants. |
| AllCompliance | &hffff | One of the Compliance type constants. |
| AssociatedAlpha | 1 | One of the possible alpha type constants. |
| AtopCompositeOp | 4 | One of the composite type constants. |
| BackgroundDispose | 2 | One of the gif dispose type constants. |
| BesselFilter | 14 | One of the filter type constants. |
| BilevelType | 1 | One of the image type constants. |
| BlackChannel | 8 | One of the possible channel constants. |
| BlackmanFilter | 7 | One of the filter type constants. |
| BlueChannel | 5 | One of the possible channel constants. |
| BottomLeftOrientation | 4 | One of the orientation type constants.<br>Line direction: Left to right<br>Frame Direction: Bottom to top |
| BottomRightOrientation | 3 | One of the orientation type constants.<br>Line direction: Right to left<br>Frame Direction: Bottom to top |
| BoxFilter | 2 | One of the filter type constants. |
| BumpmapCompositeOp | 12 | One of the composite type constants. |
| BZipCompression | 2 | One of the compression type constants. |
| CatromFilter | 11 | One of the filter type constants. |
| CenterGravity | 5 | One of the possible gravity constants. |
| ClearCompositeOp | 18 | One of the composite type constants. |
| ColorizeCompositeOp | 28 | One of the composite type constants. |
| ColorSeparationMatteType | 9 | One of the image type constants. |
| ColorSeparationType | 8 | One of the image type constants. |
| ConcatenateMode | 3 | One of the image type constants. |
| CopyBlackCompositeOp | 35 | One of the composite type constants. |
| CopyBlueCompositeOp | 16 | One of the composite type constants. |
| CopyCompositeOp | 13 | One of the composite type constants. |
| CopyCyanCompositeOp | 32 | One of the composite type constants. |
| CopyGreenCompositeOp | 15 | One of the composite type constants. |
| CopyMagentaCompositeOp | 33 | One of the composite type constants. |
| CopyOpacityCompositeOp | 17 | One of the composite type constants. |
| CopyRedCompositeOp | 14 | One of the composite type constants. |
| CopyYellowCompositeOp | 34 | One of the composite type constants. |
| CubicFilter | 10 | One of the filter type constants. |
| CyanChannel | 2 | One of the possible channel constants. |
| DarkenCompositeOp | 24 | One of the composite type constants. |
| DifferenceCompositeOp | 10 | One of the composite type constants. |
| DirectClass | 1 | One of the class type constants. |
| DisplaceCompositeOp | 20 | One of the composite type constants. |
| DissolveCompositeOp | 19 | One of the composite type constants. |
| DivideCompositeOp | 36 | One of the composite type constants. |
| EastGravity | 6 | One of the possible gravity constants. |
| FaxCompression | 3 | One of the compression type constants. |
| ForgetGravity | 0 | One of the possible gravity constants. |
| FrameMode | 1 | One of the mode type constants. |
| GaussianFilter | 8 | One of the filter type constants. |
| GaussianNoise | 1 | One of the possible noise constants. |
| GrayChannel | 11 | One of the possible channel constants. |
| GrayscaleMatteType | 3 | One of the image type constants. |
| GrayscaleType | 2 | One of the image type constants. |
| GreenChannel | 3 | One of the possible channel constants. |
| Group4Compression | 4 | One of the compression type constants. |
| HammingFilter | 6 | One of the filter type constants. |
| HanningFilter | 5 | One of the filter type constants. |

Font Stretch

| Constant | Value | Description |
|---|---|---|
| AnyStretch | 9 | Don't care. |
| CondensedStretch | 3 | Condensed |
| ExpandedStretch | 6 | Expanded |
| ExtraCondensedStretch | 2 | Extra Condensed |
| ExtraExpandedStretch | 7 | Extra Expanded |
| NormalStretch | 0 | Normal (Default) |
| SemiCondensedStretch | 4 | Semi Condensed |
| SemiExpandedStretch | 5 | Semi Expanded |
| UltraCondensedStretch | 1 | Ultra Condensed |
| UltraExpandedStretch | 8 | Ultra Expanded |

Font Style

| Constant | Value | Description |
|---|---|---|
| AnyStyle | 3 | Don't care. |
| ItalicStyle | 1 | Italic font. |
| NormalStyle | 0 | Normal (Default) |
| ObliqueStyle | 2 | Oblique font. |

Storage Types

| Constant | Value | Description |
|---|---|---|
| StorageTypeCharPixel | 0 | 8bit numbers. |
| StorageTypeDoublePixel | 5 | 64bit floating numbers. |
| StorageTypeFloatPixel | 4 | 32bit floating numbers. |
| StorageTypeIntegerPixel | 2 | 32bit numbers. |
| StorageTypeLongPixel | 3 | 64bit numbers. |
| StorageTypeShortPixel | 1 | 16bit numbers. |

# 89.43 class GMImageStatisticsMBS

## 89.43.1 class GMImageStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for image statistics.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 89.43.2 Methods

## 89.43.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 89.43.4 Properties

## 89.43.5 blue as GMImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue channel statistics.
**Notes:** (Read only property)

## 89.43.6 green as GMImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green channel statistics.
**Notes:** (Read only property)

## 89.43.7 opacity as GMImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity channel statistics.
**Notes:** (Read only property)

### 89.43.8 red as GMImageChannelStatisticsMBS

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red channel statistics.
**Notes:** (Read only property)

## 89.44 class GMLockMBS

### 89.44.1 class GMLockMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for locking a certain resource.
**Notes:** The idea is to pass the constructor a mutexlock and keep the only reference to this new lock object on the stack. On the end of the method, the destructor is called by Xojo and releases the mutexlock automatically.

### 89.44.2 Methods

### 89.44.3 Constructor(mutexlock as GMMutexLockMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Lock based on the given mutexlock.

### 89.44.4 Properties

### 89.44.5 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 89.44.6 target as GMMutexLockMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mutexlock this lock is referencing to.
**Notes:** (Read and Write property)

## 89.45 class GMMontageFramedMBS

### 89.45.1 class GMMontageFramedMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MontageFramed provides the means to specify montage options when it is desired to have decorative frames around the image thumbnails.
**Notes:** MontageFramed inherits from Montage and therefore provides all the methods of Montage as well as those shown in the table "MontageFramed Methods".

Framed thumbnails consist of four components: the thumbnail image, the thumbnail frame, the thumbnail border, an optional thumbnail shadow, and an optional thumbnail label area.
Subclass of the GMMontageMBS class.

### 89.45.2 Methods

### 89.45.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.45.4 Properties

### 89.45.5 borderColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the background color within the thumbnail frame.
**Notes:** (Read and Write computed property)

### 89.45.6 borderWidth as Uint32

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the border (in pixels) to place between a thumbnail and its surrounding frame.
**Notes:** This option only takes effect if thumbnail frames are enabled (via frameGeometry) and the thumbnail geometry specification doesn't also specify the thumbnail border width.
(Read and Write computed property)

### 89.45.7 frameGeometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the geometry specification for frame to place around thumbnail.
**Notes:** If this parameter is not specified, then the montage is unframed.
(Read and Write computed property)

### 89.45.8 matteColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail frame color.
**Notes:** (Read and Write computed property)

## 89.46 class GMMontageMBS

### 89.46.1 class GMMontageMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Montage is the base class to provide montage options and provides methods to set all options required to render simple (unframed) montages.
**Example:**

```
// build montage
dim StackingMontage as New GM16MontageMBS
StackingMontage.backgroundColor = New GM16ColorMBS(&cE7E7E7)
StackingMontage.fillColor = New GM16ColorMBS(&c000000)
StackingMontage.tile = New GM16GeometryMBS("1x20")
StackingMontage.geometry = New GM16GeometryMBS("160x120+5+5")
StackingMontage.font = "Helvetica"
StackingMontage.pointSize = 12
StackingMontage.title = "Title goes here"

// make picture
dim logo as Picture = LogoMBS(500)
dim image as New GM16ImageMBS(logo)

image.label("Sample label")

// Put the current image into the array
Dim StackingFrames As new GM16ImageArrayMBS
StackingFrames.insert(image)

// show result
dim resultImages as GM16ImageArrayMBS = StackingFrames.montageImages(StackingMontage)
Backdrop = resultImages.Image(0).CopyPicture
```

**Notes:** See GMMontageFramedMBS if you would like to create a framed montage.

Unframed thumbnails consist of four components: the thumbnail image, the thumbnail border, an optional thumbnail shadow, and an optional thumbnail label area.

### 89.46.2 Methods

### 89.46.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.46.4 Properties

### 89.46.5 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 89.46.6 backgroundColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the background color that thumbnails are imaged upon.
**Notes:** (Read and Write computed property)

### 89.46.7 compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the image composition algorithm for thumbnails.
**Notes:** This controls the algorithm by which the thumbnail image is placed on the background. Use of OverCompositeOp is recommended for use with images that have transparency. This option may have negative side-effects for images without transparency.
(Read and Write computed property)

### 89.46.8 fileName as string

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the image filename to be used for the generated montage images.
**Notes:** To handle the case were multiple montage images are generated, a printf-style format may be embedded within the filename. For example, a filename specification of image%02d.miff names the montage

images as image00.miff, image01.miff, etc.
(Read and Write computed property)

### 89.46.9 fillColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the fill color to use for the label text.
**Notes:** (Read and Write computed property)

### 89.46.10 font as string

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail label font.
**Notes:** (Read and Write computed property)

### 89.46.11 geometry as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the size of the generated thumbnail.
**Notes:** (Read and Write computed property)

### 89.46.12 gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail positioning within the specified geometry area.
**Notes:** If the thumbnail is smaller in any dimension than the geometry, then it is placed according to this specification.
See Gravity constants in GMImageMBS class.
(Read and Write computed property)

### 89.46.13 label as string

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the format used for the image label.
**Notes:** Special format characters may be embedded in the format string to include information about the

image.
(Read and Write computed property)

### 89.46.14 penColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the pen color to use for the label text (same as fill).
**Notes:** (Read and Write computed property)

### 89.46.15 pointSize as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the thumbnail label font size.
**Notes:** (Read and Write computed property)

### 89.46.16 shadow as boolean

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable/disable drop-shadow on thumbnails.
**Notes:** (Read and Write computed property)

### 89.46.17 strokeColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the stroke color to use for the label text.
**Notes:** (Read and Write computed property)

### 89.46.18 texture as string

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a texture image to use as montage background.
**Notes:** The built-in textures "granite:" and "plasma:" are available. A texture is the same as a background image.
(Read and Write computed property)

### 89.46.19 tile as GMGeometryMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the maximum number of montage columns and rows in the montage.
**Notes:** The montage is built by filling out all cells in a row before advancing to the next row. Once the montage has reached the maximum number of columns and rows, a new montage image is started.
(Read and Write computed property)

### 89.46.20 title as string

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the montage title.
**Notes:** (Read and Write computed property)

### 89.46.21 transparentColor as GMColorMBS

MBS GraphicsMagick Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies a montage color to set transparent.
**Notes:** This option can be set the same as the background color in order for the thumbnails to appear without a background when rendered on an HTML page. For best effect, ensure that the transparent color selected does not occur in the rendered thumbnail colors.
(Read and Write computed property)

# 89.47 class GMMutexLockMBS

## 89.47.1 class GMMutexLockMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mutex class for GraphicsMagick.

## 89.47.2 Methods

## 89.47.3 lock

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the lock.
**Notes:** Only one thread at a time can get the lock. The other threads will wait when lock is called.

## 89.47.4 unlock

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks the lock.

## 89.47.5 Properties

## 89.47.6 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 89.48 class GMNotInitializedExceptionMBS

### 89.48.1 class GMNotInitializedExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception raised if you access a method/property in an object and the object was not initialized propertly.
**Notes:** Check the message property for details.
Subclass of the GMErrorExceptionMBS class.

# 89.49 class GMPathArgsMBS

## 89.49.1 class GMPathArgsMBS

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a class for arguments to the path arc/curve methods in GMGraphicsMBS.
**Example:**

```
dim g as new GMPathArgsMBS(1,2,3,4) // for a QuadraticCurveto

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

**Notes:** Due we use this class for three different ways, we have three constructors to fill in the value you need for the calls.

## 89.49.2 Methods

## 89.49.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for creating an empty object.
See also:


- 89.49.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14729
- 89.49.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14730
- 89.49.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14730


## 89.49.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the PathArc methods in GMGraphicsMBS.
See also:


- 89.49.3 Constructor 14729

- 89.49.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14730
- 89.49.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14730


### 89.49.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the QuadraticCurveto methods in GMGraphicsMBS.
**Example:**

```
dim g as new GMPathArgsMBS(1,2,3,4)

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

See also:


- 89.49.3 Constructor 14729
- 89.49.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14729
- 89.49.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double) 14730


### 89.49.6 Constructor(x1 as Double, y1 as Double, x2 as Double, y2 as Double, x as Double, y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create the arguments object for the Curveto methods in GMGraphicsMBS.
**Example:**

```
dim g as new GMPathArgsMBS(1,2,3,4,5,6)

MsgBox str(g.x1)+EndOfLine+str(g.y1)+EndOfLine+str(g.x2)+EndOfLine+str(g.y2)+EndOfLine+str(g.x)+EndOfLine+str(g.y)
```

See also:


- 89.49.3 Constructor 14729
- 89.49.4 Constructor(radiusX as Double, radiusY as Double, xAxisRotation as Double, largeArcFlag as boolean, sweepFlag as Boolean, x as Double, y as Double) 14729

• 89.49.5 Constructor(x1 as Double, y1 as Double, x as Double, y as Double) 14730

### 89.49.7 Properties

### 89.49.8 largeArcFlag as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The large arc flag.
**Notes:** Draw longer of the two matching arcs
(Read and Write property)

### 89.49.9 radiusX as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radius x value.
**Notes:** (Read and Write property)

### 89.49.10 radiusY as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The radius y value.
**Notes:** (Read and Write property)

### 89.49.11 sweepFlag as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sweep flag value.
**Notes:** Draw arc matching clock-wise rotation.
(Read and Write property)

### 89.49.12 x as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Notes:** For an arc: End-point X

(Read and Write property)

### 89.49.13 x1 as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x1 value.
**Notes:** (Read and Write property)

### 89.49.14 x2 as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x2 value.
**Notes:** (Read and Write property)

### 89.49.15 xAxisRotation as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x Axis Rotation value.
**Notes:** Rotation relative to X axis.
(Read and Write property)

### 89.49.16 y as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Notes:** for an arc: End-point Y
(Read and Write property)

### 89.49.17 y1 as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y1 value.
**Notes:** (Read and Write property)

### 89.49.18 y2 as Double

MBS GraphicsMagick Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y2 value.
**Notes:** (Read and Write property)

## 89.50 class GMPixelsMBS

### 89.50.1 class GMPixelsMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty pixels object.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim p as new GMPixelsMBS(g)

// get pointer to some pixels to read/write
dim x as ptr = p.get(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

### 89.50.2 Methods

### 89.50.3 Constructor(Image as GMImageMBS)

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Pixels object with the pixels from an image.

### 89.50.4 get(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfer pixels from the image to the pixel view as defined by the specified region.

**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim p as new GMPixelsMBS(g)

// get pointer to some pixels
dim x as ptr = p.get(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

**Notes:** Modified pixels may be subsequently transferred back to the image via sync.

### 89.50.5 getConst(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfer read-only pixels from the image to the pixel view as defined by the specified region.

### 89.50.6 indexes as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return pixel colormap index array.

### 89.50.7 set(x as Integer, y as Integer, columns as Integer, rows as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocate a pixel view region to store image pixels as defined by the region rectangle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim p as new GMPixelsMBS(g)

// get pointer to some pixels to write
dim x as ptr = p.set(0, 0, 100, 100)

// draw a red line to the pixel buffer
dim o as Integer
for i as Integer = 0 to 99
o = 100 * i + i
x.UInt32(o * 4) = &hFFFF0000
next

// write back
p.sync

// show
window1.Backdrop = g.CopyPicture
```

**Notes:** This area is subsequently transferred from the pixel view to the image via sync.

### 89.50.8 sync

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers the image cache pixels to the image.

### 89.50.9 Properties

### 89.50.10 columns as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width of view.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim g as new GMImageMBS(f)
dim p as new GMPixelsMBS(g)
```

```
// get pointer to some pixels
dim x as ptr = p.get(0, 0, 100, 100)

// and show size
MsgBox str(p.columns)+" x "+str(p.rows)
```

**Notes:** (Read only property)

### 89.50.11 handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 89.50.12 rows as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Height of view.
**Notes:** (Read only property)

### 89.50.13 x as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Left ordinate of view.
**Notes:** (Read only property)

### 89.50.14 y as Integer

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Top ordinate of view.
**Notes:** (Read only property)

## 89.51 class GMTypeMetricMBS

### 89.51.1 class GMTypeMetricMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TypeMetric class provides the means to pass data from the Image class's TypeMetric method to the user.
**Notes:** It provides information regarding font metrics such as ascent, descent, text width, text height, and maximum horizontal advance. The units of these font metrics are in pixels, and that the metrics are dependent on the current Image font (default Ghostscript's "Helvetica"), pointsize (default 12 points), and x/y resolution (default 72 DPI) settings.

The pixel units may be converted to points (the standard resolution-independent measure used by the typesetting industry) via the following equation:

size_points = (size_pixels * 72)/resolution
where resolution is in dots-per-inch (DPI). This means that at the default image resolution, there is one pixel per point.

Note that a font's pointsize is only a first-order approximation of the font height (ascender + descender) in points. The relationship between the specified pointsize and the rendered font height is determined by the font designer.

See FreeType Glyph Conventions for a detailed description of font metrics related issues.

### 89.51.2 Methods

### 89.51.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 89.51.4 Properties

### 89.51.5 ascent as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the distance in pixels from the text baseline to the highest/upper grid coordinate used

to place an outline point.
**Notes:** Always a positive value.
(Read only property)

### 89.51.6 descent as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the the distance in pixels from the baseline to the lowest grid coordinate used to place an outline point.
**Notes:** Always a negative value.
(Read only property)

### 89.51.7 maxHorizontalAdvance as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the maximum horizontal advance (advance from the beginning of a character to the beginning of the next character) in pixels.
**Notes:** (Read only property)

### 89.51.8 textHeight as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns text height in pixels.
**Notes:** (Read only property)

### 89.51.9 textWidth as Double

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns text width in pixels.
**Notes:** (Read only property)

## 89.52 class GMUnsupportedExceptionMBS

### 89.52.1 class GMUnsupportedExceptionMBS

MBS GraphicsMagick Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An exception raised if you call the GM functions on an unsupported platform.
**Notes:** Check the message property for details.
This exception is currently only used on Windows.
(Windows support may come later)
Subclass of the GMErrorExceptionMBS class.

# Chapter 90

# Hotkey

## 90.1 class HotKeyMBS

### 90.1.1 class HotKeyMBS

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The class for registering hotkeys.
**Notes:** This is a crossplatform replacement for our CarbonHotKeyMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr6
- MBS Xojo Plugins, version 18.4pr2
- MBS Xojo / Real Studio Plugins, version 15.3pr1
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2
- MBS Xojo / Real Studio Plugins, version 15.2pr6

**Xojo Developer Magazine**

- 18.6, page 10: News
- 13.5, page 8: News

### 90.1.2 Methods

### 90.1.3 Close

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Closes hotkey.
**Notes:** Same as destructor, but to unregister hotkey now.

### 90.1.4 Constructor(KeyCode as Integer, Modifiers as Integer, Exclusive as Boolean = false)

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Registers a new keycode.
**Notes:** The plugin may not check if combination is allowed, makes sense or can be pressed.

### 90.1.5 KeyCodeForText(name as string) as Integer

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Queries a keycode for a character.
**Example:**

```
MsgBox "Return: "+str(HotKeyMBS.KeyCodeForText("return"))
```

**Notes:** Helper function to return platform specific key codes for various keys.
Plugin has a list based on the constants defined by Apple and Microsoft for keys.

### 90.1.6 Properties

### 90.1.7 Exclusive as Boolean

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Whether exclusive ownership of hotkey was requested.
**Notes:** (Read only property)

### 90.1.8 Handle as Integer

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Only used on Mac OS X.
(Read only property)

### 90.1.9 ID as Integer

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The internal ID of the hotkey.
**Notes:** (Read only property)

### 90.1.10 KeyCode as Integer

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The keycode registered.
**Notes:** (Read only property)

### 90.1.11 Modifiers as Integer

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The modifiers used at registration.
**Notes:** (Read only property)

### 90.1.12 Events

### 90.1.13 KeyDown

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Windows, Targets: .

**Function:** The key down event.

### 90.1.14 KeyUp

MBS Util Plugin, Plugin Version: 15.2, Platform: macOS, Targets: .

**Function:** The key up event.

### 90.1.15 Constants

Modifier Flags

| Constant | Value | Description |
|---|---|---|
| AlphaKey | &h400 | Alpha Lock |
| CommandKey | &h100 | Command Key on Mac, Windows Key on Windows. |
| ControlKey | &h1000 | Control Key |
| OptionKey | &h800 | Option/Alt Key |
| ShiftKey | &h200 | Shift Key |

# Chapter 91

# HTMLViewer

## 91.1 class DesktopHTMLViewer

### 91.1.1 class DesktopHTMLViewer

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Class in Xojo for HTML rendering.
**Notes:** We have multiple methods for macOS, Windows and Linux, so please check each method.

### 91.1.2 Methods

### 91.1.3 ChromiumBrowserMBS as ChromiumBrowserMBS

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries browser object for htmlviewer.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox b.MainFrame.URL
```

**Notes:** Works only on Windows if Webkit is chosen as renderer.
Returns nil on any error.

Please call all chromium functions only on main thread.
Do not call in open event of HTMLViewer as browser control is not yet initialized there.

### 91.1.4 WKWebViewMBS as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries WKWebViewMBS associated to HTMLViewer.
**Notes:** Returns WKWebView for Xojo when used in HTMLViewer.

# Chapter 92

# HTMLViewer Linux

## 92.1 class HTMLViewer

### 92.1.1 class HTMLViewer

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Class in Xojo 2005 for HTML rendering.
**Notes:** We have multiple methods for macOS, Windows and Linux, so please check each method.

### 92.1.2 Methods

### 92.1.3 ChromiumBrowserMBS as ChromiumBrowserMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries browser object for htmlviewer.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox b.MainFrame.URL
```

**Notes:** Works only on Windows if Webkit is chosen as renderer.
Returns nil on any error.

Please call all chromium functions only on main thread.
Do not call in open event of HTMLViewer as browser control is not yet initialized there.

May not work in Xojo 2021r3 due to changes inside the control.

### 92.1.4 IEContinueFindTextMBS(text as string, count as Integer, flags as Integer, selectText as boolean) as boolean

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Continues a search started with IEFindTextMBS.
**Notes:** Parameters are the same as for IEFindTextMBS.

### 92.1.5 IEDocumentMBS as IEDocumentMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries web document object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.

Not available for DesktopHTMLViewer control since there is no support for Internet Explorer for that control.

### 92.1.6 IEDrawToHDCMBS(HDC as Ptr, PrinterName as string = "") as boolean

MBS Win Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Draws the content of the html document into the graphics context.
**Notes:** As of Windows Internet Explorer 9, this method is deprecated and should not be used.
Returns true on success and false on failure.

With some printers, running DrawToDC may cause problems. You can ensure that DrawToDC works properly on all printers by running SetDocumentPrinter method first, and then passing the modified device context to DrawToDC. The plugin calls SetDocumentPrinter for you when you provide a printer name.

### 92.1.7 IEFileCreationDateMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the date the file was created.

**Notes:** Example value: "09/13/2007"

### 92.1.8 IEFileModifiedDateMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the date the file was last modified.
**Notes:** Example value: "12/03/2007"

### 92.1.9 IEFileSizeMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the file size.
**Notes:** Example value: "12475"

### 92.1.10 IEFileUpdatedDateMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the date the file was last updated.
**Notes:** Example value: "01/01/1601"

### 92.1.11 IEFindTextMBS(text as string, count as Integer, flags as Integer, selectText as boolean) as boolean

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Finds text on the current website.
**Notes:** text: the string that specifies the text to find.
count: long that specifies the number of characters to search from the starting point of the range. A positive integer indicates a forward search; a negative integer indicates a backward search.
Flags: integer that specifies one or more of the following flags to indicate the type of search:

Returns true: The search text was found.
Returns false: The search text was not found.

| | |
|---|---|
| 0 | Default. Match partial words. |
| 1 | Match backwards. |
| 2 | Match whole words only. |
| 4 | Match case. |
| 131072 | Match bytes. |
| 536870912 | Match diacritical marks. |
| 1073741824 | Match Kashida character. |
| 2147483648 | Match AlefHamza character. |

### 92.1.12 IEGetTextAreaMBS(FormName as String, FieldName as String) as String

MBS Win Plugin, Plugin Version: 16.3, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Queries text for a textarea.
**Notes:** FormName can be "" to look for any field with given name.
Raises exception if field is not found.
Returns text from textarea.
**Blog Entries**

- HTMLViewer JavaScript communication for Xojo
- HTMLViewer JavaScript communication for Xojo

### 92.1.13 IEHandleMBS as Integer

MBS Win Plugin, Plugin Version: 8.0, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** The handle to the windows browser object.
**Notes:** If this value is zero, the plugin htmlviewer functions for Windows will not work.

### 92.1.14 IEHistoryBackMBS

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEHistoryMBS class instead. **Function:** Loads a previous URL from the History list.

### 92.1.15 IEHistoryForwardMBS

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEHistoryMBS class instead. **Function:** Loads the next URL from the History list.

### 92.1.16 IEHistoryLengthMBS as Integer

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEHistoryMBS class instead. **Function:** Retrieves the number of elements in the History list.
**Notes:** Example value: "0"

### 92.1.17 IEHTMLTextMBS as string

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Returns a copy of the html source code of the current webpage.
**Example:**

msgbox htmlviewer1.IEHTMLTextMBS

**Notes:** Improved in plugin version 12.2 to return better HTML text. This is the html generated from current web content and not the page we originally loaded. So this works with IEEditableMBS property. Returns "" on any error.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr3
- MBS Real Studio Plugins, version 12.2pr1

### 92.1.18 IEImageMBS as picture

MBS Win Plugin, Plugin Version: 9.5, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Copies the picture from the htmlviewer.
**Example:**

```
Sub Action()
ClearFocus
```

```
Dim picWeb As Picture

// Get image from IE
picWeb = HTMLViewer1.IEImageMBS

canvas1.backdrop = picWeb
End Sub
```

**Notes:** You may want to resize the htmlviewer to get a picture without scrollbars. (See example projects) You may need to call ClearFocus as it seems like if the focus is on the htmlviewer it does not draw itself in our picture.
**Blog Entries**

- Picture from HTMLViewer
- MBS REALbasic Plugins, version 10.6pr5
- Render Image from a HTMLViewer
- MBS REALbasic plug-ins version 9.5

### 92.1.19 IELastModifiedMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Gets the date that the page was last modified, if the page supplies one. **Notes:** Example value: "12/03/2007 20:08:17"

### 92.1.20 IELoadHTMLMBS(HTMLText as string) as boolean

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Loads the HTML text into the htmlviewer.
**Example:**

```
// in window open event, load blank page
HTMLViewer1.LoadURL "about:blank"

// later somewhere in app load HTML:
HTMLViewer1.IELoadHTMLMBS "<html><body>Hello World</body></html>"
```

**Notes:** Does not use a temp file like Xojo's built in method.
Returns true on success.
On Windows you may need to reset webviewer before or load "about:blank" to initialize the webviewer by Xojo (or Xojo).
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr5

### 92.1.21 IEMimeTypeMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the MIME type for the file.
**Notes:** Example value: "HTM-Datei"
See also MimeTypeToFileExtensionMBS function.

### 92.1.22 IENamePropMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Gets the title of the document file.
**Notes:** Example value: "Apple"

### 92.1.23 IENavigatorAppMinorVersionMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves the application's minor version value.
**Notes:** Example value: ";SP2;"

### 92.1.24 IENavigatorAppNameMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves the name of the browser.
**Notes:** Example value: "Microsoft Internet Explorer"

### 92.1.25 IENavigatorAppVersionMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves the platform and version of the browser.
**Notes:** Example value: "4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50727)"

### 92.1.26 IENavigatorBrowserLanguageMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves the current browser language.
**Notes:** Example value: "de"

### 92.1.27 IENavigatorCookieEnabledMBS as boolean

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves whether client-side persistent cookies are enabled in the browser.
**Notes:** Persistent cookies are those that are stored on the client-side computer.
Example value: "True"

### 92.1.28 IENavigatorJavaEnabledMBS as boolean

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Returns whether Java is enabled.
**Notes:** Example value: "True"

### 92.1.29 IENavigatorOnLineMBS as boolean

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves a value indicating whether the system is in global offline mode.
**Notes:** The user can modify the global offline state by choosing Work Offline from the File menu in Microsoft Internet Explorer version 4.0 or later. This property does not indicate whether the system is connected to

the network.

Example value: "True"

### 92.1.30 IENavigatorUserAgentMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves a string equivalent to the HTTP user-agent request header.
**Notes:** The HTTP user-agent request header contains information about compatibility, the browser, and the platform name. For more information about the browser, see the IENavigatorappNameMBS property. For more information about the platform, see the IENavigatorappVersionMBS property.

The IENavigatoruserAgentMBS property dynamically returns a different value depending on the browser and platform versions. For example, Microsoft Internet Explorer 6 returns the following string for Microsoft Windows XP.

Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1)

Example value: "Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50727)"

Like other plugin function, this can only work if a page has been loaded. Xojo won't create the internal htmlviewer object before you load a page.

### 92.1.31 IENavigatorUserLanguageMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IENavigatorMBS class instead. **Function:** Retrieves the operating system's natural language setting.
**Notes:** Example value: "de"

### 92.1.32 IEPrintMBS as boolean

MBS Win Plugin, Plugin Version: 9.5, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEWindowMBS class instead. **Function:** Opens the normal print dialog for the Internet Explorer.

**Notes:** Returns false on failure.
**Blog Entries**

- MBS REALbasic plug-ins version 9.5

### 92.1.33 IEPrintPreviewMBS as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Commands Internet Explorer to show the print preview dialog for this htmlviewer.
**Example:**

```
call htmlviewer1.IEPrintPreviewMBS
```

**Notes:** Returns true on success. Returns false if function is not supported.
The function returns directly while the preview dialog is still running.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6

### 92.1.34 IEProtocolMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or retrieves the protocol portion of a URL.
**Notes:** Example value: "HTTP (HyperText Transfer-Protokoll)"

### 92.1.35 IEReadyStateMBS as string

MBS Win Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves a value that indicates the current state of the htmlviewer.
**Notes:** uninitialized: Object is not initialized with data.
loading: Object is loading its data.
loaded: Object has finished loading its data.
interactive: User can interact with the object even though it is not fully loaded.
complete: Object is completely initialized.

An object's state is initially set to uninitialized, and then to loading. When data loading is complete, the state of the link object passes through the loaded and interactive states to reach the complete state.

The states through which an object passes are determined by that object; an object can skip certain states (for example, interactive) if the state does not apply to that object.

Data source objects and databound elements are normally populated asynchronously, and certain programmatic operations can only be performed reliably on databound objects when they are ready for use. Therefore, the appropriate code should be written to confirm the readyState of objects prior to performing certain operations on them. For example, walking the rows of a table should not be attempted until after the table has reached the complete state.

The readyState property enables the status of an object to be tested. The correct place to test the readyState property is in the event handler for onreadystatechange. Similarly, a data source object (DSO) fires the ondatasetcomplete event to notify the document that the dataset is ready for programmatic operation.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr1

### 92.1.36 IERefCountMBS as Integer

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Queries the reference count of the IE browser object.
**Notes:** Useful to check if references are leaked.

### 92.1.37 IEReferrerMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Gets the URL of the location that referred the user to the current page.
**Notes:** Example value: "http://www.apple.com/"

### 92.1.38 IEReloadMBS(Force as boolean = false) as boolean

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Reloads the current page.
**Notes:** Boolean that specifies one of the following possible values:

False: Default. Reloads the document from the cache.
True: Reloads the document from the server.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr7
- MBS Real Studio Plugins, version 12.0pr5

### 92.1.39 IERunJavaScriptMBS(JavaScript as string) as boolean

MBS Win Plugin, Plugin Version: 8.0, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEWindowMBS class instead. **Function:** Runs a given javascript code.
**Example:**

```
// shows current user agent string which the control sends to website
call htmlviewer1.IERunJavaScriptMBS("document.title=navigator.userAgent;")
MsgBox htmlviewer1.IETitleMBS

// load a dummy page:
HTMLViewer1.LoadPage "<html><head></head><body></body></html>", nil

// shows an error message because of the navigator having a 6 inside:
call htmlviewer1.IERunJavaScriptMBS("document.title=navig6ator.userAgent;")

// uses try to avoid error message

dim script as string = "document.title=navig6ator.userAgent;"
dim s as string = "try { "+SCRIPT+" } catch(err) { document.title = err.description; } "

call htmlviewer1.IERunJavaScriptMBS(s)
MsgBox HTMLViewer1.IETitleMBS // shows "navig6ator is undefined"
```

**Notes:** Returns true if the javascript code was sent to the browser.
Returns false on any error.

The IE API does not allow to return values from Javascript. So you need to store your result in window.title and access it later using IETitleMBS.

IERunJavaScriptMBS fails if the htmlviewer is empty. You can load a dummy page like above.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.

See IEDocumentMBS.Eval for newer version which can return result.
**Blog Entries**

- HTMLViewer JavaScript communication for Xojo
- MBS Real Studio Plugins, version 12.1pr2
- Webviewer Tip
- Tipp of the day: Jump to anchor in htmlviewer

### 92.1.40 IEScrollHeightMBS as Integer

MBS Win Plugin, Plugin Version: 9.5, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Queries the height of the html viewer content.
**Notes:** Returns 0 on any error.
**Blog Entries**

- Picture from HTMLViewer
- MBS REALbasic plug-ins version 9.5

### 92.1.41 IEScrollWidthMBS as Integer

MBS Win Plugin, Plugin Version: 9.5, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Queries the width of the html viewer content.
**Notes:** Returns 0 on any error.
**Blog Entries**

- Picture from HTMLViewer
- MBS REALbasic plug-ins version 9.5

### 92.1.42 IESecurityMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves the security state.
**Notes:** Example value: "F√ºr diesen Dokumententyp gibt es kein Sicherheitszertifikat."

### 92.1.43 IESetTextAreaMBS(FormName as String, FieldName as String, Value as String) as Boolean

MBS Win Plugin, Plugin Version: 16.3, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets text for a textarea.
**Notes:** FormName can be "" to look for any field with given name.
Raises exception if field is not found.
Returns true if text is set or false on failure.
**Blog Entries**

- HTMLViewer JavaScript communication for Xojo
- HTMLViewer JavaScript communication for Xojo

### 92.1.44 IEStopMBS as boolean

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEWebBrowserMBS class instead. **Function:** Stops loading.
**Notes:** Returns true on success and false on failure.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr7

### 92.1.45 IETextMBS as string

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Returns a copy of the text of the current webpage.
**Example:**

msgbox htmlviewer1.IETextMBS

**Notes:** Asks Internet Explorer for a selection of the whole document and asks selection about the text content.
Returns "" on any error.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr3

### 92.1.46 IEToStringMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Retrieves a string representation of the object.
**Notes:** Example value: " [ object ] "

### 92.1.47 IEWebBrowserMBS as IEWebBrowserMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries web browser object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.

Not available for DesktopHTMLViewer control since there is no support for Internet Explorer for that control.

### 92.1.48 IEWindowMBS as IEWindowMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries web window object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.

Not available for DesktopHTMLViewer control since there is no support for Internet Explorer for that control.

### 92.1.49 IEZoomMBS(factor as Integer) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEWebBrowserMBS class instead. **Function:** Zooms the web content.
**Notes:** Factor can be 50 for 50%.
Returns true on success.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

### 92.1.50 LinuxWebViewMBS as LinuxWebViewMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Queries the linux WebKit web view for the given htmlviewer.
**Notes:** Requires a recent Xojo version (2011?). And libwekit-1.0 must be installed, so Xojo uses it for browsing.
Check Also the Available shared method on LinuxWebViewMBS class.

### 92.1.51 WKWebViewMBS as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries WKWebViewMBS associated to HTMLViewer.
**Notes:** Returns WKWebView for Xojo when used in HTMLViewer.

### 92.1.52 Properties

### 92.1.53 IECharSetMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or retrieves the character set used to encode the object.
**Notes:** Example value: "utf-8"
(Read and Write computed property)

### 92.1.54 IECookieMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or gets the string value of a cookie.
**Notes:** Example value: "s_vi= [ CS ] v1 | 427CA13500002D10-A000B5B00000001 [ CE ] ; s_cc=true; s_nr=1196708888562; s_sq=%5B%5BB%5D%5D"
(Read and Write computed property)

### 92.1.55 IEDefaultCharsetMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Gets the default character set from the current regional language settings.
**Notes:** Example value: "windows-1252"
(Read and Write computed property)

### 92.1.56 IEDomainMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or gets the security domain of the document.
**Notes:** Example value: "www.apple.com"
(Read and Write computed property)

### 92.1.57 IEEditableMBS as boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Makes the htmlviewer editable on Windows.
**Notes:** (Read and Write computed property)

### 92.1.58 IETitleMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or gets the title of the document.
**Notes:** Example value: "Apple"
(Read and Write computed property)

### 92.1.59 IEURLMBS as string

MBS Win Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use methods in IEDocumentMBS class instead. **Function:** Sets or gets the URL for the current document.
**Notes:** Example value: "http://www.apple.com/"
(Read and Write computed property)

## 92.2 class LinuxJavaScriptContextMBS

### 92.2.1 class LinuxJavaScriptContextMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The class for a javascript context.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- HTMLViewer JavaScript communication for Xojo
- HTMLViewer JavaScript communication for Xojo

### 92.2.2 Methods

### 92.2.3 CheckScriptSyntax(script as string, sourceURL as string = """, StartLineNumber as Integer = 0) as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Checks for syntax errors in a string of JavaScript.
**Notes:** script: A string containing the script to check for syntax errors.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions.
exception: A string in which to store a syntax error exception, if any.
Returns true if the script is syntactically correct, otherwise false.
See also:

- 92.2.4 CheckScriptSyntax(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as boolean 14764

### 92.2.4 CheckScriptSyntax(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Checks for syntax errors in a string of JavaScript.
**Notes:** script: A string containing the script to check for syntax errors.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions.

exception: A string in which to store a syntax error exception, if any.
Returns true if the script is syntactically correct, otherwise false.
See also:

- 92.2.3 CheckScriptSyntax(script as string, sourceURL as string = """, StartLineNumber as Integer = 0) as boolean 14764

### 92.2.5 Constructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The private constructor.

### 92.2.6 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.2.7 EvaluateScript(script as string, sourceURL as string = """, StartLineNumber as Integer = 0) as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Evaluates a string of JavaScript.
**Notes:** script A string containing the script to evaluate.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions.
exception A string in which to store an exception, if any.
Returns the value as string that results from evaluating script, or "" if an exception is thrown.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.
See also:

- 92.2.8 EvaluateScript(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as string 14766

### 92.2.8 EvaluateScript(script as string, sourceURL as string, StartLineNumber as Integer, byref JSException as string) as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Evaluates a string of JavaScript.
**Notes:** script A string containing the script to evaluate.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions.
exception A string in which to store an exception, if any.
Returns the value as string that results from evaluating script, or "" if an exception is thrown.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.
See also:

- 92.2.7 EvaluateScript(script as string, sourceURL as string = "", StartLineNumber as Integer = 0) as string 14765

### 92.2.9 GarbageCollect

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Performs a JavaScript garbage collection.
**Notes:** You should not need to call this.

### 92.2.10 Properties

### 92.2.11 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.2.12 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The reference to the parent HTMLViewer.
**Notes:** (Read and Write property)

## 92.3 class LinuxWebBackForwardListMBS

### 92.3.1 class LinuxWebBackForwardListMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The history of a WebView.

### 92.3.2 Methods

### 92.3.3 AddItem(item as LinuxWebHistoryItemMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Adds the item to the WebBackForwardList.

### 92.3.4 BackItem as LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the item that precedes the current item.

### 92.3.5 BackLength as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the number of items that preced the current item.

### 92.3.6 Clear

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Clears the webBackForwardList by removing all its elements.
**Notes:** Note that not even the current page is kept in list when cleared so you would have to add it later. This method also clears the list of visited links which means that all links will appear unvisited.

### 92.3.7 Constructor(webview as LinuxWebViewMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates an instance of the back forward list with a controlling WebView.

### 92.3.8 ContainsItem(item as LinuxWebHistoryItemMBS) as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Checks if item is in the back forward list.

### 92.3.9 CurrentItem as LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The current item.
**Notes:** Returns a nil value if the back forward list is empty.

### 92.3.10 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.3.11 ForwardItem as LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The next item forward in the list.
**Notes:** Returns a nil value if there nothing that succeeds the current item.

### 92.3.12 ForwardLength as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the number of items that succeed the current item.

### 92.3.13 GoBack

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Steps backward in the back forward list

### 92.3.14 GoForward

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Steps forward in the back forward list.

### 92.3.15 GoToItem(item as LinuxWebHistoryItemMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Go to the specified item in the back forward list.

### 92.3.16 Item(index as Integer) as LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the item at a given index relative to the current item.

### 92.3.17 Properties

### 92.3.18 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.3.19 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent htmlviewer.
**Notes:** (Read and Write property)

### 92.3.20 Limit as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The maximum limit of the back forward list.
**Notes:** (Read and Write computed property)

## 92.4 class LinuxWebCookieMBS

### 92.4.1 class LinuxWebCookieMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The class for a cookie used with WebKit on Linux.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAgeWeek)
MsgBox c.Expires.ShortDate+" "+c.Expires.ShortTime
```

**Notes:** LinuxWebCookieMBS implements HTTP cookies, primarily as described by the original Netscape cookie specification, but with slight modifications based on RFC 2109, Microsoft's HttpOnly extension attribute, and observed real-world usage (and, in particular, based on what Firefox does).

An HTTP cookie.

name and value will be set for all cookies. If the cookie is generated from a string that appears to have no name, then name will be the empty string.

domain and path give the host or domain, and path within that host/domain, to restrict this cookie to. If domain starts with ".", that indicates a domain (which matches the string after the ".", or any hostname that has domain as a suffix). Otherwise, it is a hostname and must match exactly.

expires will be non-nil if the cookie uses either the original "expires" attribute, or the "max-age" attribute specified in RFC 2109. If expires is nil, it indicates that neither "expires" nor "max-age" was specified, and the cookie expires at the end of the session.

If http_only is set, the cookie should not be exposed to untrusted code (eg, javascript), so as to minimize the danger posed by cross-site scripting attacks.
**Blog Entries**

- Cookies in HTMLViewer

### 92.4.2 Methods

### 92.4.3 Constructor(name as string, value as string, domain as string, path as string, maxAge as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new cookie with the given attributes.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox str(c.Name)
```

**Notes:** Use Secure and HTTPOnly properties if you need to set those attributes on the returned cookie.

maxAge is used to set the "expires" attribute on the cookie; pass -1 to not include the attribute (indicating that the cookie expires with the current session), 0 for an already-expired cookie, or a lifetime in seconds. You can use the constants kMaxAgeHour, kMaxAgeDay, kMaxAgeWeek and kMaxAgeYear (or multiples thereof) to calculate this value. (If you really care about setting the exact time that the cookie will expire, use Expire property.)

name: cookie name
value: cookie value
domain: cookie domain or hostname
path: cookie path, or ""
maxage: max age of the cookie, or -1 for a session cookie

### 92.4.4 Copy as LinuxWebCookieMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Creates a copy.
**Notes:** If you want to edit an existing cookie, please make a copy first.

### 92.4.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.4.6 Equal(other as LinuxWebCookieMBS) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Compares two cookies.
**Notes:** Returns true if they are equal.

### 92.4.7 SetMaxAge(value as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Sets cookie's max age to value.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Hour)
c.SetMaxAge(c.kMaxAgeWeek)
MsgBox c.ToSetCookieHeader
```

**Notes:** If max_age is -1, the cookie is a session cookie, and will expire at the end of the client's session. Otherwise, it is the number of seconds until the cookie expires. You can use the constants kMaxAgeHour, kMaxAgeDay, kMaxAgeWeek and kMaxAgeYear (or multiples thereof) to calculate this value. (A value of 0 indicates that the cookie should be considered already-expired.)

(This sets the same property as Expire.)

### 92.4.8 ToCookieHeader as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Serializes cookie in the format used by the Cookie header (ie, for returning a cookie from to a server).
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox c.ToCookieHeader
```

### 92.4.9 ToSetCookieHeader as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Serializes cookie in the format used by the Set-Cookie header (ie, for sending a cookie from to a client).
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox c.ToSetCookieHeader
```

### 92.4.10 Properties

### 92.4.11 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.4.12 Owner as Variant

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The owner of this object.
**Notes:** (Read and Write property)

### 92.4.13 Domain as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The domain text.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox str(c.Domain)
```

**Notes:** (Read and Write computed property)

### 92.4.14 Expires as date

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The expiration time.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox c.Expires.ShortDate+" "+c.Expires.ShortTime
```

**Notes:** If expires is nil, cookie will be a session cookie and will expire at the end of the client's session.
(Read and Write computed property)

### 92.4.15 ExpiresDateTime as DateTime

MBS Linux Plugin, Plugin Version: 20.5, Platform: Linux, Targets: Desktop only.

**Function:** The expiration time.
**Notes:** (Read and Write computed property)

### 92.4.16 HTTPOnly as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The httponly attribute.
**Notes:** If true, cookie will be marked as "http only", meaning it should not be exposed to web page scripts or other untrusted code.
(Read and Write computed property)

### 92.4.17 Name as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The name of the cookie.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAge-
Week)
MsgBox str(c.Name)
```

**Notes:** (Read and Write computed property)

### 92.4.18 Path as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The path of the cookie.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "test", LinuxWebCookieMBS.kMaxAgeWeek)
MsgBox str(c.Path)
```

**Notes:** (Read and Write computed property)

### 92.4.19 Secure as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The secure attribute.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAgeWeek)
MsgBox str(c.Secure)
c.Secure = true
MsgBox str(c.Secure)
```

**Notes:** Cookie will only be transmitted from the client to the server over secure (https) connections if secure is true.
(Read and Write computed property)

### 92.4.20 Value as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The value of the cookie.
**Example:**

```
dim c as new LinuxWebCookieMBS("test", "12345", "mbsplugins.de", "", LinuxWebCookieMBS.kMaxAgeWeek)
MsgBox str(c.Value)
```

**Notes:** (Read and Write computed property)

### 92.4.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMaxAgeDay | 86400 | A constant for one day in seconds. |
| kMaxAgeHour | 3600 | A constant for one hour in seconds. |
| kMaxAgeWeek | 604800 | A constant for one week in seconds. |
| kMaxAgeYear | 31556926 | A constant for one year in seconds. |

## 92.5 class LinuxWebCookieStoreMBS

### 92.5.1 class LinuxWebCookieStoreMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The store for cookies.
**Example:**

```
dim store as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
dim cookies() as LinuxWebCookieMBS = store.AllCookies
MsgBox str(UBound(cookies)+1)+" cookies"
```

**Blog Entries**

- Cookies in HTMLViewer

### 92.5.2 Methods

### 92.5.3 AddCookie(cookie as LinuxWebCookieMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Adds cookie to store.

### 92.5.4 AllCookies as LinuxWebCookieMBS()

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns an array with all cookies.
**Example:**

```
// show all cookies
dim store as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
dim cookies(-1) as LinuxWebCookieMBS = store.AllCookies
dim lines() as string

for each c as LinuxWebCookieMBS in cookies
lines.Append c.ToSetCookieHeader
next

MsgBox Join(lines,EndOfLine)
```

### 92.5.5 Available as Boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns true if the plugin found all functions for the web cookie store.

### 92.5.6 Constructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new cookie store.
**Notes:** The base LinuxWebCookieStoreMBS class does not support persistent storage of cookies; use a subclass for that.

### 92.5.7 CookieStore as LinuxWebCookieStoreMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Queries the default cookie store.
**Example:**

```
dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore

MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
w.AcceptPolicy = w.kAcceptNoThirdParty
MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
```

### 92.5.8 DeleteAllCookies

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Deletes all cookies.
**Example:**

```
dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore
w.DeleteAllCookies
```

### 92.5.9 DeleteCookie(cookie as LinuxWebCookieMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Deletes cookie.

### 92.5.10 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.5.11 SetCookieStore(newStore as LinuxWebCookieStoreMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Makes the given cookie store the default one.

### 92.5.12 Properties

### 92.5.13 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.5.14 Owner as Variant

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The owner of this object.
**Notes:** (Read and Write property)

### 92.5.15 AcceptPolicy as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Get/set the policy for accepting cookies.
**Example:**

```
dim w as LinuxWebCookieStoreMBS = LinuxWebCookieStoreMBS.CookieStore

MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
```

```
w.AcceptPolicy = w.kAcceptNoThirdParty
MsgBox "AcceptPolicy: "+str(w.AcceptPolicy)
```

**Notes:** (Read and Write computed property)

### 92.5.16 Constants

Cookie Accept Modes

| Constant | Value | Description |
|---|---|---|
| kAcceptAlways | 0 | Accept all cookies unconditionally. |
| kAcceptNever | 1 | Reject all cookies unconditionally. |
| kAcceptNoThirdParty | 2 | No Third party cookies.<br>Accept all cookies set by the main document loaded in the application using libsoup. An example of the most common case, web browsers, would be: If http://www.example.com is the page loaded, accept all cookies set by example.com, but if a resource from http://www.third-party.com is loaded from that page reject any cookie that it could try to set. For libsoup to be able to tell apart first party cookies from the rest, the application must call soup_message_set_first_party() on each outgoing SoupMessage, setting the SoupURI of the main document. If no first party is set in a message when this policy is in effect, cookies will be assumed to be third party by default. (this is done by webkit) |

## 92.6 class LinuxWebDataSourceMBS

### 92.6.1 class LinuxWebDataSourceMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Data source encapsulates the content of a WebFrame.
**Notes:** A WebFrame has a main resource and subresources and the data source provides access to these resources. When a request gets loaded initially, it is set to a provisional state. The application can request for the request that initiated the load by asking for the provisional data source and invoking the InitialRequest method of DataSource. This data source may not have enough data and some methods may return empty values. To get a "full" data source with the data and resources loaded, you need to get the non-provisional data source through WebFrame's DataSource method. This data source will have the data after everything was loaded. Make sure that the data source was finished loading before using any of its methods. You can do this via IsLoading.

### 92.6.2 Methods

### 92.6.3 Constructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new WebKitWebDataSource instance.
**Notes:** The URL of the WebKitWebDataSource will be set to "about:blank".
See also:

- 92.6.4 Constructor(request as LinuxWebNetworkRequestMBS) 14783

### 92.6.4 Constructor(request as LinuxWebNetworkRequestMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new data source with the given network request.
See also:

- 92.6.3 Constructor 14783

### 92.6.5 Data as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the raw data that represents the the frame's content.
**Notes:** The data will be incomplete until the data has finished loading. Returns "" if the web frame hasn't loaded any data. Use isLoading to test if data source is in the process of loading.

### 92.6.6 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.6.7 Encoding as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the text encoding name as set in the WebView, or if not, the text encoding of the response.

### 92.6.8 InitialRequest as LinuxWebNetworkRequestMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns a reference to the original request that was used to load the web content.
**Notes:** The NetworkRequest returned by this method is the request prior to the "committed" load state. See Request for getting the "committed" request.

### 92.6.9 IsLoading as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Determines whether the data source is in the process of loading its content.
**Notes:** Returns true if loading or false if not.

### 92.6.10 MainResource as LinuxWebResourceMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the main resource of the data source.

### 92.6.11 Request as LinuxWebNetworkRequestMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns a NetworkRequest that was used to create this DataSource.
**Notes:** The NetworkRequest returned by this method is the request that was "committed", and hence,

different from the request you get from the InitialRequest method.

### 92.6.12 Subresources as LinuxWebResourceMBS()

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Gives you a list of WebKitWebResource objects that compose the WebView to which this DataSource is attached.

### 92.6.13 UnrechableURI as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Return the unreachable URI of data_source.
**Notes:** The data source will have an unreachable URL if it was created using WebFrame's LoadAlternateHtmlString method.

### 92.6.14 WebFrame as LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the WebFrame that represents this data source.
**Notes:** The WebFrame is owned by WebKit and should not be freed or destroyed.
This will return nil if the data_source is not attached to a frame.

### 92.6.15 Properties

### 92.6.16 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.6.17 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)

## 92.7 class LinuxWebFrameMBS

### 92.7.1 class LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The class for a WebKit WebFrame on Linux.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr3
- Linux WebKit Support for Real Studio's HTMLViewer control

### 92.7.2 Methods

### 92.7.3 Constructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 92.7.4 DataSource as LinuxWebDataSourceMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the committed data source.

### 92.7.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.7.6 FindFrame(name as string) as LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Searches a frame by name.
**Notes:** For pre-defined names, returns frame if name is "_self" or "_current", returns frame's parent frame

if name is "_parent", and returns the main frame if name is "_top". Also returns frame if it is the main frame and name is either "_parent" or "_top". For other names, this function returns the first frame that matches name. This function searches frame and its descendents first, then frame's parent and its children moving up the hierarchy until a match is found. If no match is found in frame's hierarchy, this function will search for a matching frame in other main frame hierarchies. Returns nil if no match is found.

name: the name of the frame to be found
Returns the found WebKitWebFrame or nil in case none is found.

### 92.7.7 JSContext as LinuxJavaScriptContextMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Queries the javascript context for this webframe.

### 92.7.8 LoadAlternateString(content as string, BaseURL as string, unreachableURL as string)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Request loading of an alternate content for a URL that is unreachable.
**Notes:** Using this method will preserve the back-forward list. The URI passed in base url has to be an absolute URI.

### 92.7.9 LoadRequest(request as LinuxWebNetworkRequestMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Connects to a given URI by initiating an asynchronous client request.
**Notes:** Creates a provisional data source that will transition to a committed data source once any data has been received. Use StopLoading to stop the load. This function is typically invoked on the main frame.

### 92.7.10 LoadStatus as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the current load state.

### 92.7.11 LoadString(content as string, MimeType as String, Encoding as String, BaseURL as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Requests loading of the given content with the specified MimeType, encoding and BaseURL.
**Notes:** If mime_type is "", "text/html" is assumed.
If encoding is "", "UTF-8" is assumed.

Content: an URI string
MimeType: the MIME type, or "".
Encoding: the encoding, or "".
BaseURL: the base URI for relative locations.
See also FileExtensionToMimeTypeMBS function.

### 92.7.12 LoadURL(URL as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Requests loading of the specified URI string.

### 92.7.13 Name as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the frame's name

### 92.7.14 NetworkResponse as LinuxWebNetworkResponseMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the network response.
**Notes:** Returns a NetworkResponse object representing the response that was given to the request for the given frame, or nil if the frame was not created by a load. You must unref the object when you are done with it.

### 92.7.15 Parent as LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the frame's parent frame, or nil if it has none.

### 92.7.16 Print

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Asks the control to print it's content.

### 92.7.17 ProvisionalDataSource as LinuxWebDataSourceMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** You use the LoadRequest method to initiate a request that creates a provisional data source.
**Notes:** The provisional data source will transition to a committed data source once any data has been received. Use DataSource to get the committed data source.

Returns the provisional WebDataSource or nil if a load request is not in progress.

### 92.7.18 Reload

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Reloads the initial request.

### 92.7.19 StopLoading

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Stops any pending loads on frame's data source, and those of its children.

### 92.7.20 Title as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the frame's document title

### 92.7.21 URL as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the current URI of the contents displayed by the frame.

### 92.7.22 Properties

### 92.7.23 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.7.24 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)

### 92.7.25 WebView as LinuxWebViewMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The reference to the parent webview.
**Notes:** (Read and Write property)

### 92.7.26 Constants

Load State Constants

| Constant | Value | Description |
|---|---|---|
| kLoadCommitted | 1 | The first data chunk has arrived, meaning that the necessary transport req ments are stabilished, and the load is being performed. |
| kLoadFailed | 4 | This state means that some error occurred during the page load that preve it from being completed. You can connect to the error event if you war know precisely what kind of error occurred. |
| kLoadFinished | 2 | This state means that everything that was required to display the page been loaded. |
| kLoadFirstVisuallyNonEmptyLayout | 3 | The first layout with actual visible content happened; one or more layouts have happened before that caused nothing to be visible on the screen, bec the data available at the time was not significant enough. |
| kLoadProvisional | 0 | No data has been received yet, empty structures have been allocated to perf the load; the load may still fail for transport issues such as not being ab resolve a name, or connect to a port. |

## 92.8 class LinuxWebHistoryItemMBS

### 92.8.1 class LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** One item of the WebBackForwardList and or global history.
**Notes:** A history item consists out of a title and a uri. It can be part of the WebBackForwardList and the global history. The global history is used for coloring the links of visited sites. WebHistoryItem's constructed with Constructor() are automatically added to the global history.

### 92.8.2 Methods

### 92.8.3 Constructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new WebHistoryItem instance.
See also:

- 92.8.4 Constructor(URI as string, Title as string) 14793

### 92.8.4 Constructor(URI as string, Title as string)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new WebHistoryItem with the given URI and title.
See also:

- 92.8.3 Constructor 14793

### 92.8.5 Copy as LinuxWebHistoryItemMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Makes a copy of the item for use with other WebView objects.

### 92.8.6 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.8.7 LastVisitedTime as Double

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The last visited timestamp.

### 92.8.8 OriginalURI as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The original URL of this item.

### 92.8.9 Title as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The title of this item.

### 92.8.10 URI as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The URL of this item.

### 92.8.11 Properties

### 92.8.12 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.8.13 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent htmlviewer.
**Notes:** (Read and Write property)

### 92.8.14 AlternateTitle as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The alternate title.
**Notes:** (Read and Write computed property)

## 92.9 class LinuxWebInspectorMBS

### 92.9.1 class LinuxWebInspectorMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The WebKit Inspector is a graphical tool to inspect and change the content of a WebKitWebView.
**Notes:** It also includes an interactive JavaScriptDebugger. Using this class one can get a GtkWidget which can be embedded into an application to show the inspector.

The inspector is available when the WebKitWebSettings of the WebKitWebView has set the "enable-developer-extras" to true otherwise no inspector is available.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 92.9.2 Methods

### 92.9.3 Close

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Causes the Web Inspector to be closed.

### 92.9.4 Constructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The private constructor.

### 92.9.5 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.9.6 InspectCoordinates(x as Double, y as Double)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Causes the Web Inspector to inspect the node that is located at the given coordinates of the widget.
**Notes:** The coordinates should be relative to the WebKitWebView widget, not to the scrollable content, and may be obtained from a GdkEvent directly. This means x, and y being zero doesn't guarantee you will hit the left-most top corner of the content, since the contents may have been scrolled.

x: the X coordinate of the node to be inspected
y: the Y coordinate of the node to be inspected

### 92.9.7 InspectedURI as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Obtains the URI that is currently being inspected.

### 92.9.8 Show

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Causes the Web Inspector to be shown.

### 92.9.9 WebView as LinuxWebViewMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Obtains the WebKitWebView that is used to render the inspector.

### 92.9.10 Properties

### 92.9.11 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.9.12 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The reference to the parent HTMLViewer.
**Notes:** (Read and Write property)

## 92.10 class LinuxWebNetworkRequestMBS

### 92.10.1 class LinuxWebNetworkRequestMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** This class represents the network related aspects of a navigation request.
**Notes:** It is used whenever WebKit wants to provide information about a request that will be sent, or has been sent. Inside it you can find the URI of the request, and, for valid URIs, a SoupMessage object, which provides access to further information such as headers.

### 92.10.2 Methods

### 92.10.3 Constructor(url as string)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new NetworkRequest initialized with an URI.

### 92.10.4 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.10.5 Properties

### 92.10.6 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.10.7 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)

### 92.10.8 URL as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Get or set the URL for this request.
**Notes:** (Read and Write computed property)

## 92.11 class LinuxWebNetworkResponseMBS

### 92.11.1 class LinuxWebNetworkResponseMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** This class represents the network related aspects of a navigation response.

### 92.11.2 Methods

### 92.11.3 Constructor(url as string)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new response object with the given URL.

### 92.11.4 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.11.5 Properties

### 92.11.6 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.11.7 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)

### 92.11.8 URL as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Get or set the URL for this request.
**Notes:** (Read and Write computed property)

## 92.12 class LinuxWebResourceMBS

### 92.12.1 class LinuxWebResourceMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** A web resource encapsulates the data of the download as well as the URI, MIME type and frame name of the resource.

### 92.12.2 Methods

### 92.12.3 Constructor(data as string, uri as string, mimeType as string, encoding as string = "", FrameName as string = "")

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new WebKitWebResource.
**Notes:** The encoding can be "". The FrameName argument can be used if the resource represents contents of an entire HTML frame, otherwise pass "".
See also FileExtensionToMimeTypeMBS function.

### 92.12.4 Data as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the data of the webResource.

### 92.12.5 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.12.6 Encoding as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the encoding for this resource.

### 92.12.7 FrameName as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Queries the frame name.

### 92.12.8 MimeType as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The MIME Type for this resource.
**Notes:** See also MimeTypeToFileExtensionMBS function.

### 92.12.9 URL as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The URL for this resource.

### 92.12.10 Properties

### 92.12.11 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.12.12 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent HTMLViewer.
**Notes:** (Read and Write property)

## 92.13 class LinuxWebSettingsMBS

### 92.13.1 class LinuxWebSettingsMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** WebSettings can be applied to a WebKitWebView to control text encoding, color, font sizes, printing mode, script support, loading of images and various other things.
**Notes:** After creation, a WebSettings object contains default settings.

### 92.13.2 Methods

### 92.13.3 Constructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new WebSettings instance with default values.
**Notes:** It must be manually attached to a WebView.

### 92.13.4 Copy as LinuxWebSettingsMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Copies an existing WebSettings instance.

### 92.13.5 Destructor

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.13.6 UserAgent as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns the User-Agent string currently used by the web view(s) associated with the web_settings.

### 92.13.7 Properties

### 92.13.8 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.13.9 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The parent htmlviewer.
**Notes:** (Read and Write property)

## 92.14 class LinuxWebViewMBS

### 92.14.1 class LinuxWebViewMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The class for a WebKit WebView on Linux.
**Notes:** With MBS Plugin 19.3 and Xojo 2018r2 and later, this plugin will try to load WebKit 2.0 (libwebkit2gtk-4.0.so.37) instead of WebKit 1.0 (libwebkitgtk-3.0.so).

Most functions still work for WebKit 1.x only. Let us know if you need something for WebKit 2.x.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- HTMLViewer JavaScript communication for Xojo
- Upgrading our HTMLViewer functions for Internet Explorer
- MBS Xojo Plugins, version 19.3pr6
- HTMLViewer JavaScript communication for Xojo
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr3
- Linux WebKit Support for Real Studio's HTMLViewer control

### 92.14.2 Methods

### 92.14.3 Available as Boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether the plugin found libwebkit on linux.
**Notes:** Returns true on linux if the class can work. Else it returns false.

### 92.14.4 BackForwardList as LinuxWebBackForwardListMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Obtains the BackForwardList associated with the given WebView.
**Notes:** The BackForwardList is owned by the WebView.

### 92.14.5 CanCopyClipboard as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether copy is possible.

### 92.14.6 CanCutClipboard as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether cut is possible.

### 92.14.7 CanGoBack as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Determines whether web_view has a previous history item.
**Notes:** Returns true if able to move back, false otherwise.

### 92.14.8 CanGoBackOrForward(steps as Integer) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Determines whether web_view has a history item of steps.
**Notes:** Negative values represent steps backward while positive values represent steps forward.
steps: the number of steps
Returns true if able to move back or forward the given number of steps, false otherwise.

### 92.14.9 CanGoForward as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Determines whether web_view has a next history item.
**Notes:** Returns true if able to move forward, false otherwise

### 92.14.10 CanPasteClipboard as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether paste is possible.

### 92.14.11 CanRedo as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether redo is possible.

### 92.14.12 CanShowMimeType(MimeType as string) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** This functions returns whether or not a MIME type can be displayed using this view.
**Notes:** MimeType: a MIME type

Return boolean indicating if the MIME type can be displayed.
See also FileExtensionToMimeTypeMBS function.

### 92.14.13 CanUndo as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether undo is possible.

### 92.14.14 Constructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The private constructor.

### 92.14.15 CookieStore as LinuxWebCookieStoreMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Queries the default cookie store.

### 92.14.16 CopyClipboard

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Copies the current selection inside the web_view to the clipboard.

### 92.14.17 CutClipboard

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Cuts the current selection inside the web_view to the clipboard.

### 92.14.18 DeleteSelection

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Deletes the current selection inside the web_view.

### 92.14.19 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The destructor.

### 92.14.20 Encoding as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the default encoding of the WebKitWebView.

### 92.14.21 EvaluateScript(script as string) as string

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Evaluates a string of JavaScript.
**Notes:** script A string containing the script to evaluate.
Returns the value as string that results from evaluating script, or "" if an exception is thrown.

### 92.14.22 ExecuteScript(script as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Executes java script.

### 92.14.23 FocusedFrame as LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the frame that has focus or an active text selection.
**Notes:** Returns the focused frame or nil if no frame is focused

### 92.14.24 GoBack

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Loads the previous history item.

### 92.14.25 GoBackOrForward(steps as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Loads the history item that is the number of steps away from the current item.
**Notes:** Negative values represent steps backward while positive values represent steps forward.

### 92.14.26 GoForward

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Loads the next history item.

### 92.14.27 GoToItem(item as LinuxWebHistoryItemMBS) as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Go to the specified history item.
**Notes:** Returns true if loading of item is successful, false if not.

### 92.14.28 HasSelection as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Determines whether text was selected.
**Notes:** Returns true if there is selected text, false if not

### 92.14.29 IconURL as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the favorite icon URL for the current website.

### 92.14.30 Inspector as LinuxWebInspectorMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Obtains the WebKitWebInspector associated with the WebKitWebView.
**Notes:** Every WebKitWebView object has a WebKitWebInspector object attached to it as soon as it is created, so this function will only return nil if the argument is not a valid WebKitWebView.

### 92.14.31 IsLoading as Boolean

MBS Linux Plugin, Plugin Version: 19.3, Platform: Linux, Targets: Desktop only.

**Function:** Returns true while web view is loading.
**Notes:** Works for WebKit 1.x and 2.x.

### 92.14.32 JSContext as LinuxJavaScriptContextMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Queries the javascript context for the main webframe.

### 92.14.33 LoadHTMLString(HTMLString as string, BaseURL as string = "")

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Loads a HTML string.

### 92.14.34 LoadRequest(request as LinuxWebNetworkRequestMBS)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Requests loading of the specified asynchronous client request.
**Notes:** Creates a provisional data source that will transition to a committed data source once any data has been received. Use StopLoading to stop the load.

### 92.14.35 LoadStatus as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the current load state.
**Notes:** Works for WebKit 1.x and 2.x.

| Name | Value | Description |
|---|---|---|
| WEBKIT_LOAD_PROVISIONAL | 0 | No data has been received yet, empty structures have been allocated to perform the load; the load may still fail for transport issues such as not being able to resolve a name, or connect to a port. |
| WEBKIT_LOAD_COMMITTED | 1 | The first data chunk has arrived, meaning that the necessary transport requirements are stabilished, and the load is being performed. |
| WEBKIT_LOAD_FINISHED | 2 | This state means that everything that was required to display the page has been loaded. |
| WEBKIT_LOAD_FIRST_VISUALLY_NON_EMPTY_LAYOUT | 3 | The first layout with actual visible content happened; one or more layouts may have happened before that caused nothing to be visible on the screen, because the data available at the time was not significant enough. |
| WEBKIT_LOAD_FAILED | 4 | This state means that some error occurred during the page load that prevented it from being completed. You can connect to the #WebKitWebView::load-error signal if you want to know precisely what kind of error occurred. |

### 92.14.36 LoadString(content as string, MimeType as String, Encoding as String, BaseURL as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Requests loading of the given content with the specified MimeType, encoding and BaseURL.
**Notes:** If mime_type is "", "text/html" is assumed.
If encoding is "", "UTF-8" is assumed.

Content: an URI string
MimeType: the MIME type, or "".
Encoding: the encoding, or "".
BaseURL: the base URI for relative locations.

See also FileExtensionToMimeTypeMBS function.

### 92.14.37 LoadURL(URL as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Requests loading of the specified URI string.

### 92.14.38 MainFrame as LinuxWebFrameMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the main frame of the document.

### 92.14.39 MajorVersion as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns major version of webkit.

### 92.14.40 MarkTextMatches(text as string, caseSensitive as boolean = false, limit as Integer = 99) as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Attempts to highlight all occurances of string inside webview.
**Notes:** string: a string to look for
case_sensitive: whether to respect the case of text
limit: the maximum number of strings to look for or 0 for all
Returns the number of strings highlighted.

### 92.14.41 MicroVersion as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns micro version of webkit.

### 92.14.42 MinorVersion as Integer

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Returns minor version of webkit.

### 92.14.43 PasteClipboard

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Pastes the current contents of the clipboard to the webview.

### 92.14.44 Progress as Double

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The global locating progress in percent.
**Notes:** 1.0 is full progress.

### 92.14.45 Redo

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Redos last action if possible.

### 92.14.46 Reload

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Reloads the initial request.

### 92.14.47 ReloadIgnoreCache

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Reloads the webview without using any cached data.

### 92.14.48 SearchText(text as string, caseSensitive as boolean = false, forward as boolean = true, wrap as boolean = true) as boolean

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Looks for a specified string inside webview.
**Notes:** text: a string to look for.
case_sensitive: whether to respect the case of text.
forward: whether to find forward or not.
wrap: whether to continue looking at the beginning after reaching the end.
Returns trueT on success or false on failure.

### 92.14.49 SelectAll

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Attempts to select everything inside the webview.

### 92.14.50 SetCookieStore(newStore as LinuxWebCookieStoreMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Makes the given cookie store the default one.

### 92.14.51 SetHighlightTextMatches(highlight as boolean)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Highlights text matches previously marked by MarkTextMatches.

### 92.14.52 SetMaintainsBackForwardList(flag as boolean)

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** Set the view to maintain a back or forward list of history items.

### 92.14.53 StopLoading

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Stops any pending loads on frame's data source, and those of its children.

### 92.14.54 Title as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The title of the website.

### 92.14.55 Undo

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Undos last action if possible.

### 92.14.56 UnmarkTextMatches

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Unmarks text matches from search.

### 92.14.57 URL as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the current URL.

### 92.14.58 ZoomIn

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Increases the zoom level of web_view.
**Notes:** The current zoom level is incremented by the value of the "zoom-step" property of the settings associated with webview.

### 92.14.59 ZoomOut

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Decreases the zoom level of webview.
**Notes:** The current zoom level is decremented by the value of the "zoom-step" property of the settings associated with webview.

### 92.14.60 Properties

### 92.14.61 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 92.14.62 HTMLViewer as HTMLViewer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The reference to the parent HTMLViewer.
**Notes:** (Read and Write property)

### 92.14.63 CacheModel as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The cache model for the htmlviewer.
**Notes:** (Read and Write computed property)

### 92.14.64 CustomEncoding as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The current WebKitWebView encoding.
**Notes:** (Read and Write computed property)

### 92.14.65 Editable as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether the user is allowed to edit the document.
**Notes:** If flag is true, webview allows the user to edit the document. If flag is false, an element in webview's document can only be edited if the CONTENTEDITABLE attribute has been set on the element or one of its parent elements. You can change webview's document programmatically regardless of this setting. By default a WebKitWebView is not editable.

Normally, an HTML document is not editable unless the elements within the document are editable. This function provides a low-level way to make the contents of a WebKitWebView editable without altering the document or DOM structure.
(Read and Write computed property)

### 92.14.66 FullContentZoom as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether the zoom level affects only text or all elements.
**Notes:** False if only text should be scaled (the default), true if the full content of the view should be scaled.
(Read and Write computed property)

### 92.14.67 ProxyURL as String

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** The proxy URL setting.
**Notes:** (Read and Write computed property)

### 92.14.68 Settings as LinuxWebSettingsMBS

MBS Linux Plugin, Plugin Version: 13.5, Platform: Linux, Targets: Desktop only.

**Function:** The settings for this webview.
**Notes:** (Read and Write computed property)

### 92.14.69 Transparent as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether the WebKitWebView has a transparent background.
**Notes:** False when the WebKitWebView draws a solid background (the default), otherwise true.
(Read and Write computed property)

### 92.14.70 ViewSourceMode as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Whether we are viewing the source code.
**Notes:** (Read and Write computed property)

### 92.14.71 ZoomLevel as Double

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop only.

**Function:** Returns the zoom level of web_view, i.e. the factor by which elements in the page are scaled with respect to their original size.
**Notes:** If the "full-content-zoom" property is set to false (the default) the zoom level changes the text size, or if true, scales all elements in the page.
(Read and Write computed property)

### 92.14.72 Constants

Cache Model Constants

| Constant | Value | Description |
|---|---|---|
| kCacheModelDocumentViewer | 1 | Cache in Document Viewer. |
| kCacheModelWebBrowser | 2 | Cache in Web Browser. |

Load State Constants

| Constant | Value | Description |
|---|---|---|
| kLoadCommitted | 1 | The first data chunk has arrived, meaning that the necessary transport req ments are stabilished, and the load is being performed. |
| kLoadFailed | 4 | This state means that some error occurred during the page load that preve it from being completed. You can connect to the error event if you war know precisely what kind of error occurred. |
| kLoadFinished | 2 | This state means that everything that was required to display the page been loaded. |
| kLoadFirstVisuallyNonEmptyLayout | 3 | The first layout with actual visible content happened; one or more layouts have happened before that caused nothing to be visible on the screen, bec the data available at the time was not significant enough. |
| kLoadProvisional | 0 | No data has been received yet, empty structures have been allocated to perf the load; the load may still fail for transport issues such as not being abl resolve a name, or connect to a port. |

# Chapter 93

# HTMLViewer Win

## 93.1 class ChromiumBrowserMBS

### 93.1.1 class ChromiumBrowserMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The class for a WebKit browser on Windows.
**Notes:** Supports Xojo 2019r3 with MBS Plugin 20.1.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Upgrading WebKit for Windows support
- MBS Xojo Plugins, version 21.6pr3
- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr1
- HTMLViewer JavaScript communication for Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr6
- Upgrading our HTMLViewer functions for Internet Explorer
- HTMLViewer JavaScript communication for Xojo
- MBS Xojo / Real Studio plug-ins in version 14.2

**Xojo Developer Magazine**

- 18.3, page 9: News
- 12.4, page 8: News

### 93.1.2 Methods

### 93.1.3 AddCrossOriginWhitelist(SourceOrigin as String, TargetProtocol as String, TargetDomain as String, AllowTargetSubdomains as Boolean) as Boolean

MBS Win Plugin, Plugin Version: 21.3, Platform: Windows, Targets: Desktop only.

**Function:** Add an entry to the cross-origin access whitelist.
**Example:**

```
dim r as Boolean = ChromiumBrowserMBS.AddCrossOriginWhitelist("http://side1.mydomain.com", "http",
"side2.mydomain.com", false)
```

**Notes:** The same-origin policy restricts how scripts hosted from different origins (scheme + domain + port) can communicate. By default, scripts can only access resources with the same origin. Scripts hosted on the HTTP and HTTPS schemes (but no other schemes) can use the "Access-Control-Allow-Origin" header to allow cross-origin requests. For example, https://source.example.com can make XMLHttpRequest requests on http://target.example.com if the http://target.example.com request returns an "Access-Control-Allow-Origin: https://source.example.com" response header.

Scripts in separate frames or iframes and hosted from the same protocol and domain suffix can execute cross-origin JavaScript if both pages set the document.domain value to the same domain suffix. For example, scheme://foo.example.com and scheme://bar.example.com can communicate using JavaScript if both domains set document.domain="example.com".

This function is used to allow access to origins that would otherwise violate the same-origin policy. Scripts hosted underneath the fully qualified SourceOrigin URL (like http://www.example.com) will be allowed access to all resources hosted on the specified TargetProtocol and TargetDomain.
If TargetDomain is non-empty and AllowTargetSubdomains if false only exact domain matches will be allowed. If TargetDomain contains a top-level domain component (like "example.com") and AllowTargetSubdomains is true (1) sub-domain matches will be allowed. If TargetDomain is empty and AllowTargetSubdomains if true (1) all domains and IP addresses will be allowed.

This function cannot be used to bypass the restrictions on local or display isolated schemes. See the comments on CefRegisterCustomScheme for more information.

This function may be called on any thread. Returns true on success or false if SourceOrigin is invalid or the whitelist cannot be accessed.

### 93.1.4 CanGoBack as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the browser can navigate backwards.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.CanGoBack)
```

### 93.1.5 CanGoForward as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the browser can navigate forwards.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.CanGoForward)
```

### 93.1.6 ClearCrossOriginWhitelist as Boolean

MBS Win Plugin, Plugin Version: 21.3, Platform: Windows, Targets: Desktop only.

**Function:** Remove all entries from the cross-origin access whitelist.
**Example:**

```
dim r as Boolean = ChromiumBrowserMBS.ClearCrossOriginWhitelist
```

**Notes:** Returns true on success or false if the whitelist cannot be accessed.

### 93.1.7 ClearFocus

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Clears focus.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.ClearFocus
```

### 93.1.8 ClearHistory

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Clear the back/forward browsing history.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.ClearHistory
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.

### 93.1.9 CloseDevTools

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Explicitly close the developer tools window if one exists for this browser instance.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.CloseDevTools
```

### 93.1.10 Constructor

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 93.1.11 Destructor

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 93.1.12 ExecuteJavaScript(jsCode as string, scriptUrl as string = """, startLine as Integer = 0)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop only.

**Function:** Execute a string of JavaScript code in this frame.
**Example:**

```
// go back to last page via javascript
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.ExecuteJavaScript "window.history.back();"
```

**Notes:** The scriptUrl parameter is the URL where the script in question can be found, if any. The renderer may request this URL to show the developer the source of the error. The startLine parameter is the base line number to use for error reporting.

### 93.1.13 Find(identifier as Integer, searchText as string, forward as boolean, MatchCase as boolean, FindNext as boolean)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Search for searchText.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.Find 1, "Hello", true, false, false

// later
m.Find 1, "Hello", true, false, true
```

**Notes:** Identifier can be used to have multiple searches running simultaniously. forward indicates whether to search forward or backward within the page. matchCase indicates whether the search should be case-sensitive. findNext indicates whether this is the first request or a follow-up.

### 93.1.14 Frame(ID as Int64) as ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the frame with the specified identifier, or nil if not found.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
if b<>Nil then
```

```
dim idn() as Int64= b.FrameIdentifiers
dim ids() as string
for each n as Int64 in idn
dim f as ChromiumFrameMBS = b.Frame(n)

ids.Append str(n)+" "+f.Name
next
MsgBox "FrameIdentifiers: "+EndOfLine+EndOfLine+Join(ids, EndOfLine)
end if
```

See also:

- 93.1.15 Frame(name as string) as ChromiumFrameMBS 14826

### 93.1.15 Frame(name as string) as ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the frame with the specified name, or nil if not found.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.Frame("TopFrame")
dim s as string = f.Name
MsgBox s
```

See also:

- 93.1.14 Frame(ID as Int64) as ChromiumFrameMBS 14825

### 93.1.16 FrameIdentifiers as Int64()

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries list of frame identifiers.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
if b<>Nil then
dim idn() as Int64= b.FrameIdentifiers
dim ids() as string
for each n as Int64 in idn
dim f as ChromiumFrameMBS = b.Frame(n)
```

```
ids.Append str(n)+" "+f.Name
next
MsgBox "FrameIdentifiers: "+EndOfLine+EndOfLine+Join(ids, EndOfLine)
end if
```

### 93.1.17 FrameNames as String()

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries list of frame names.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
if b<>Nil then
dim Names() as string = b.FrameNames
MsgBox "FrameNames: "+EndOfLine+EndOfLine+Join(Names, EndOfLine)
end if
```

**Notes:** Often frames are unnamed, so named is generic.

### 93.1.18 GoBack

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Navigate backwards.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.GoBack
```

### 93.1.19 GoForward

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Navigate forwards.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.GoForward
```

### 93.1.20 HidePopup

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Hide the currently visible popup, if any.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.HidePopup
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.

### 93.1.21 Image(width as Integer, height as Integer) as Picture

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Get the raw image data contained in the specified element without performing validation.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim p as picture = m.Image(600, 800)
window1.backdrop = p
```

**Notes:** The specified width and height dimensions must match the current element size.

Only supported for Chromium 2.x, but not 3.x.

### 93.1.22 invalidate(x as Integer, y as Integer, width as Integer, height as Integer)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Invalidate the rectangle region of the view.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.invalidate 0, 0, 600, 800
```

**Notes:** This function is only used when window rendering is disabled and will result in a call to Handle-

Paint().

### 93.1.23 IsLoading as boolean

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop only.

**Function:** Checks loading state.
**Notes:** Returns true while page is loading.
Only available for Xojo 2017 and newer.

### 93.1.24 LibVersion as Integer

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop only.

**Function:** Returns revision number of the Chromium library.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(b.LibVersion)
```

**Notes:** up to Xojo 2014r1 this is 607.
Xojo 2014r2 uses 1562.

### 93.1.25 RegisterExtension(ExtensionName as String, javascriptCode as String) as Boolean

MBS Win Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Register a new V8 extension with the specified JavaScript extension code.
**Notes:** Returns true on success.

### 93.1.26 Release

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop only.

**Function:** Releases the browser object.
**Notes:** You don't need this normally.
This method can be used for working around Feedback case 33565.

### 93.1.27 Reload

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Reload the current page.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.Reload
```

### 93.1.28 ReloadIgnoreCache

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Reload the current page ignoring any cached data.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.ReloadIgnoreCache
```

### 93.1.29 RemoveCrossOriginWhitelist(SourceOrigin as String, TargetProtocol as String, TargetDomain as String, AllowTargetSubdomains as Boolean) as Boolean

MBS Win Plugin, Plugin Version: 21.3, Platform: Windows, Targets: Desktop only.

**Function:** Remove an entry from the cross-origin access whitelist.
**Example:**

```
dim r as Boolean = ChromiumBrowserMBS.AddCrossOriginWhitelist("http://side1.mydomain.com", "http",
"side2.mydomain.com", false)
```

**Notes:** Returns true on success or false if SourceOrigin is invalid or the whitelist cannot be accessed.

### 93.1.30 Retain

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop only.

**Function:** Retains the browser object.
**Notes:** You don't need this normally.

### 93.1.31 SetFocus(enableFocus as boolean = true)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Set focus for the browser window.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.SetFocus
```

**Notes:** If enable is true focus will be set to the window. Otherwise, focus will be removed.

### 93.1.32 setSize(width as Integer, height as Integer)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Set the size of the specified element.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.setSize 600, 800
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.

### 93.1.33 ShowDevTools

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Open developer tools in its own window.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.ShowDevTools
```

### 93.1.34 StopFinding(clearSelection as boolean)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Cancel all searches that are currently going on.

### 93.1.35 StopLoad

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Stop loading the page.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
m.StopLoad
```

### 93.1.36 Properties

### 93.1.37 FocusedFrame as ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the focused frame for the browser window.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.FocusedFrame
dim s as string = f.URL
MsgBox s
```

**Notes:** (Read only property)

### 93.1.38 FrameCount as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries frame count.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
if b<>Nil then
MsgBox "FrameCount: "+str(b.FrameCount)
end if
```

**Notes:** Only available in Xojo 2017 and newer.
(Read only property)

### 93.1.39 Handle as Integer

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.1.40 HasDocument as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if a document has been loaded in the browser.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.HasDocument)
```

**Notes:** (Read only property)

### 93.1.41 Height as Integer

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries height of the browser.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.Width) + " x " + str(m.Height)
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.
(Read only property)

### 93.1.42 Identifier as Integer

MBS Win Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Unique identifier.
**Notes:** (Read only property)

### 93.1.43 IsPopup as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the window is a popup window.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.IsPopup)
```

**Notes:** (Read only property)

### 93.1.44 MainFrame as ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the main (top-level) frame for the browser window.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.MainFrame
dim s as string = f.URL
MsgBox s
```

**Notes:** (Read only property)

### 93.1.45 Parent as Variant

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The owner htmlviewer.
**Notes:** Can reference a Window or DesktopWindow object.
(Read only property)

### 93.1.46 PopupVisible as Boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if a popup is currently visible.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
msgbox str(m.PopupVisible)
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.
(Read only property)

### 93.1.47 Width as Integer

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries width of the browser.
**Example:**

```
dim m as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
MsgBox str(m.Width) + " x " + str(m.Height)
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.
(Read only property)

### 93.1.48 WindowRenderingDisabled as Boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if window rendering is disabled.
**Notes:** Only supported for Chromium 2.x, but not 3.x.
(Read only property)

### 93.1.49 ZoomLevel as Double

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Get/Set the zoom level.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.ZoomLevel = 2
```

**Notes:** Change the zoom level to the specified value.
(Read and Write property)

## 93.2 class ChromiumCookieManagerMBS

### 93.2.1 class ChromiumCookieManagerMBS

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The class to manage cookies for Chromium on Windows.
**Notes:** May need to have a HTMLViewer first being initialized by Xojo before the Chromium DLLs can work properly.

Supports Xojo 2019r3 with MBS Plugin 20.1.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3
- Upgrading WebKit for Windows support
- Upgrading WebKit for Windows support
- MBS Xojo Plugins, version 20.1pr4
- Cookies in HTMLViewer
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2
- MBS Xojo / Real Studio Plugins, version 15.2pr2
- Cookies for Chromium in HTMLViewer on Windows

### 93.2.2 Methods

### 93.2.3 AllCookies as ChromiumCookieMBS()

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Visit all cookies.
**Example:**

```
dim m as new ChromiumCookieManagerMBS
dim cookies() as ChromiumCookieMBS = m.AllCookies
MsgBox str(cookies.Ubound+1)+" cookies"
```

**Notes:** The returned cookies are ordered by longest path, then by earliest creation date. Returns false (0) if cookies cannot be accessed.

### 93.2.4 Constructor

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Can raise exception if no cookie manager is available, e.g. when calling on Linux or Mac OS X or Windows if you don't have the dlls.
May not work if the Chromium was not initialized before by Xojo.
See also:

- 93.2.5 Constructor(path as string, PersistSessionCookies as Boolean) 14838

### 93.2.5 Constructor(path as string, PersistSessionCookies as Boolean)

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a new cookie manager.
**Notes:** Can raise exception if no cookie manager is available, e.g. when calling on Linux or Mac OS X or Windows if you don't have the dlls.
May not work if the Chromium was not initialized before by Xojo.
See also:

- 93.2.4 Constructor 14838

### 93.2.6 DeleteAllCookies as Integer

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Deletes all cookies.
**Notes:** Returns number of deleted cookies.

### 93.2.7 DeleteCookie(URL as string, CookieName as string) as boolean

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Delete all cookies that match the specified parameters.
**Notes:** If both url and values cookieName are specified all host and domain cookies matching both will be deleted. If only | url | is specified all host cookies (but not domain cookies) irrespective of path will be deleted. If url is empty all cookies for all hosts and domains will be deleted. Returns false if a non-empty invalid URL is specified or if cookies cannot be accessed.
Returns true on success.

### 93.2.8 DeleteCookies(URLs() as string, CookieNames() as string) as Integer

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Deletes several cookies.
**Notes:** Same as DeleteCookie, but with arrays for parameters.
Returns number of successful delete attempts.

### 93.2.9 DeleteURLCookies(URL as String, HTTPOnly as boolean = false) as Integer

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Deletes all cookies for a given URL.
**Notes:** The cookies to delete are filtered by the given url scheme, host, domain and path. If includeHttpOnly is true HTTP-only cookies will also be included in the deletion.
Returns number of cookies deleted.

### 93.2.10 Destructor

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 93.2.11 SetCookie(URL as string, cookie as ChromiumCookieMBS) as boolean

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Sets a cookie given a valid URL and explicit user-provided cookie attributes.
**Example:**

```
dim d as new date
dim c as new ChromiumCookieMBS

c.Domain = "www.mbsplugins.de"
c.Path = "/"
c.CreationDate = d
c.LastAccessDate = d
c.ExpirationDate = nil
c.Value = "test "+d.SQLDateTime
c.Name = "test"
c.Secure = false
c.HTTPonly = false
```

```
if CookieManager.SetCookie(c.URL, c) then
msgbox "OK"
else
MsgBox "Failed to add cookie"
end if
```

**Notes:** This function expects each attribute to be well-formed. It will check for disallowed characters (e.g. the ';' character is disallowed within the cookie value attribute) and will return false without setting the cookie if such characters are found.

### 93.2.12 SetCookies(URL() as string, cookies() as ChromiumCookieMBS) as Integer

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Sets a lot of cookies.
**Notes:** Same as SetCookie, but with arrays of URLs and cookie objects.
Returns number of cookies created successfully.

### 93.2.13 SetStoragePath(Path as string) as boolean

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Sets the directory path that will be used for storing cookie data.
**Example:**

```
dim CookieManager as ChromiumCookieManagerMBS // property of window/app

dim f as FolderItem = SpecialFolder.Desktop.Child("cookies")
f.CreateAsFolder

CookieManager = new ChromiumCookieManagerMBS

if CookieManager.SetStoragePath(f.NativePath) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** If path is empty data will be stored in memory only.
Returns false if cookies cannot be accessed.

### 93.2.14 URLCookies(URL as String, HTTPOnly as boolean = false) as ChromiumCookieMBS()

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Queries a subset of cookies.
**Notes:** The results are filtered by the given url scheme, host, domain and path. If includeHttpOnly is true HTTP-only cookies will also be included in the results. The returned cookies are ordered by longest path, then by earliest creation date. Returns empty array if cookies cannot be accessed.
Returns nil on any error like low memory.

### 93.2.15 Properties

### 93.2.16 Handle as Integer

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The internal object refernce.
**Notes:** (Read only property)

## 93.3 class ChromiumCookieMBS

### 93.3.1 class ChromiumCookieMBS

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The class for a cookie with WebKit on Windows.
**Notes:** Supports Xojo 2019r3 with MBS Plugin 20.1.
**Blog Entries**

- Upgrading WebKit for Windows support
- Cookies in HTMLViewer
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2
- MBS Xojo / Real Studio Plugins, version 15.2pr2
- Cookies for Chromium in HTMLViewer on Windows

### 93.3.2 Methods

### 93.3.3 Constructor

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 93.3.4 Destructor

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 93.3.5 Properties

### 93.3.6 CreationDate as Date

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The cookie creation date.
**Notes:** This is automatically populated by the system on cookie creation.
(Read and Write property)

### 93.3.7 Domain as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The domain for this cookie.
**Notes:** If domain is empty a host cookie will be created instead of a domain cookie. Domain cookies are stored with a leading "." and are visible to sub-domains whereas host cookies are not.
(Read and Write property)

### 93.3.8 ExpirationDate as Date

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The cookie expiration date.
**Notes:** Can be nil to have no expiration date.
(Read and Write property)

### 93.3.9 HTTPonly as Boolean

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The HTTP only state.
**Notes:** If httponly is true the cookie will only be sent for HTTP requests.
(Read and Write property)

### 93.3.10 LastAccessDate as Date

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The cookie last access date.
**Notes:** This is automatically populated by the system on access.
(Read and Write property)

### 93.3.11 Name as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The cookie name.
**Notes:** (Read and Write property)

### 93.3.12 Path as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The path.
**Notes:** If path is non-empty only URLs at or below the path will get the cookie value.
(Read and Write property)

### 93.3.13 Scheme as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The scheme.
**Notes:** Depends on secure setting only.
Can be "http://" or "https://".
(Read only property)

### 93.3.14 Secure as Boolean

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** Whether this is a HTTPS only cookie.
**Notes:** If secure is true the cookie will only be sent for HTTPS requests.
(Read and Write property)

### 93.3.15 URL as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The URL of the cookie.
**Notes:** Build from Secure, Path and Domain.
(Read only property)

### 93.3.16 Value as String

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop only.

**Function:** The cookie value.
**Notes:** (Read and Write property)

## 93.4 class ChromiumFrameMBS

### 93.4.1 class ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The class for a webframe with WebKit on Windows.
**Notes:** Supports Xojo 2019r3 with MBS Plugin 20.1.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Upgrading WebKit for Windows support
- MBS Xojo Plugins, version 21.5pr1
- HTMLViewer JavaScript communication for Xojo
- HTMLViewer JavaScript communication for Xojo
- MBS Xojo Plugins, version 17.1pr4
- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr7

### 93.4.2 Methods

### 93.4.3 Constructor

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 93.4.4 copy

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute copy in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.copy
```

### 93.4.5 cut

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute cut in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.cut
```

### 93.4.6 delete

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute delete in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.delete
```

### 93.4.7 Destructor

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 93.4.8 ExecuteJavaScript(jsCode as string, scriptUrl as string = """, startLine as Integer = 0)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute a string of JavaScript code in this frame.
**Example:**

```
// go back to last page via javascript
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
m.ExecuteJavaScript "window.history.back();"
```

**Notes:** The scriptUrl parameter is the URL where the script in question can be found, if any. The renderer may request this URL to show the developer the source of the error. The startLine parameter is the base

line number to use for error reporting.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.

### 93.4.9 LoadString(StringValue as string, URL as string)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Load the contents of StringValue with the optional dummy target URL.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
m.LoadString "<p>Hello</p>", "blank:about"
```

**Notes:** Since this was deprecated in Chromium and removed in newer function, it won't work for Xojo 2021r3 or newer. Please use data URL there or load html file URL.

### 93.4.10 LoadURL(URL as string)

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Load the specified url.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
m.LoadURL "http://www.macrumors.com"
```

### 93.4.11 paste

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute paste in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.paste
```

### 93.4.12 print

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Execute printing in the this frame. The user will be prompted with the print dialog appropriate to the operating system.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.print
```

**Notes:** Only supported for Chromium 2.x, but not 3.x.

### 93.4.13 redo

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute redo in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.redo
```

### 93.4.14 SelectAll

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute select all in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
m.SelectAll
```

### 93.4.15 undo

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Execute undo in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
b.MainFrame.undo
```

### 93.4.16 ViewSource

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Save this frame's HTML source to a temporary file and open it in the default text viewing application.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
m.ViewSource
```

### 93.4.17 Properties

### 93.4.18 Browser as ChromiumBrowserMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the browser that this frame belongs to.
**Notes:** (Read only property)

### 93.4.19 Handle as Integer

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.4.20 identifier as Int64

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the globally unique identifier for this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
MsgBox str(m.identifier)
```

**Notes:** (Read only property)

### 93.4.21 IsFocused as Boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this is the focused frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
MsgBox str(m.IsFocused)
```

**Notes:** (Read only property)

### 93.4.22 IsMain as Boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this is the main (top-level) frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
MsgBox str(m.IsMain)
```

**Notes:** (Read only property)

### 93.4.23 Name as String

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the name for this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim m as ChromiumFrameMBS = b.mainFrame
MsgBox m.Name
```

**Notes:** If the frame has an assigned name (for example, set via the iframe "name" attribute) then that value will be returned. Otherwise a unique name will be constructed based on the frame parent hierarchy. The main (top-level) frame will always have an empty name value.
(Read only property)

### 93.4.24 Parent as Variant

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** The owner htmlviewer.
**Notes:** Can reference a Window or DesktopWindow object.
(Read only property)

### 93.4.25 ParentFrame as ChromiumFrameMBS

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the parent of this frame or nil if this is the main (top-level) frame.
**Notes:** (Read only property)

### 93.4.26 Source as String

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns this frame's HTML source as a string.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.MainFrame
dim s as string = f.Source
Break // view in debugger
```

**Notes:** (Read only property)

### 93.4.27 Text as String

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns this frame's display text as a string.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.MainFrame
dim s as string = f.Text
Break // view in debugger
```

**Notes:** (Read only property)

### 93.4.28 URL as String

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop only.

**Function:** Returns the URL currently loaded in this frame.
**Example:**

```
dim b as ChromiumBrowserMBS = HTMLViewer1.ChromiumBrowserMBS
dim f as ChromiumFrameMBS = b.MainFrame
dim s as string = f.URL
MsgBox s
```

**Notes:** (Read only property)

## 93.5 class ChromiumWebPluginInfoMBS

### 93.5.1 class ChromiumWebPluginInfoMBS

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for details on installed plugins.
**Notes:** Supports Xojo 2019r3 with MBS Plugin 20.1.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Upgrading WebKit for Windows support
- Upgrading WebKit for Windows support
- MBS Xojo Plugins, version 20.1pr4
- MBS Xojo / Real Studio Plugins, version 16.0pr6

### 93.5.2 Methods

### 93.5.3 Constructor

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 93.5.4 Destructor

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 93.5.5 Plugins as ChromiumWebPluginInfoMBS()

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries list of plugins.
**Notes:** Those are the plugins Chromium found on the Windows PC.
e.g. 5 different versions of QuickTime Plugin.

### 93.5.6 Properties

### 93.5.7 Description as String

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** A description of the plugin from the version information.
**Notes:** (Read only property)

### 93.5.8 Name as String

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The plugin name (i.e. Flash).
**Notes:** (Read only property)

### 93.5.9 Path as String

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The plugin file path (DLL/bundle/library).
**Notes:** (Read only property)

### 93.5.10 Version as String

MBS Win Plugin, Plugin Version: 16.0, Platform: Windows, Targets: Desktop only.

**Function:** The version of the plugin (may be OS-specific).
**Notes:** (Read only property)

## 93.6 class IEDocumentMBS

### 93.6.1 class IEDocumentMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for the web document.
**Notes:** For HTMLViewer based on Internet Explorer on Windows.
All the methods and properties may raise IEExceptionMBS exceptions in case of failure.

Based on IHTMLDocument2 interface:
https://docs.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/platform-apis/aa752574(v=vs.8

Let us know if you miss something.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 21.0pr7
- MBS Xojo Plugins, version 20.5pr8
- HTMLViewer JavaScript communication for Xojo
- MBS Xojo Plugins, version 20.2pr3
- New in the MBS Xojo Plugins 20.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 20.0pr6
- MBS Xojo Plugins, version 20.0pr5
- Upgrading our HTMLViewer functions for Internet Explorer

**Xojo Developer Magazine**

- 19.2, page 10: News
- 18.3, page 53: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 93.6.2 Methods

### 93.6.3 CallFunction(FunctionName as string, paramArray params as variant) as variant

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Calls a JavaScript function.
**Example:**

```
dim doc as IEDocumentMBS = htmlviewer1.IEDocumentMBS

dim v as variant = doc.CallFunctiom("test", 2, 3)
```

**Notes:** Returns result as variant.
You can pass as many parameters as needed.

Our plugin converts Xojo data types to JavaScript data types like boolean, number, text or NULL. This could be extended in future to convert arrays, too.

FunctionName should be the name of a global function defined in JavaScript.
See also:

- 93.6.4 CallFunction(FunctionName as string, params() as variant) as variant 14856

### 93.6.4 CallFunction(FunctionName as string, params() as variant) as variant

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Calls a JavaScript function.
**Example:**

```
dim doc as IEDocumentMBS = htmlviewer1.IEDocumentMBS

dim Params() as Variant
Params.append 2
Params.append 3

dim v as variant = doc.CallFunctiom("test", Params)
```

**Notes:** Returns result as variant.
You can pass parameters for the function as array.

Our plugin converts Xojo data types to JavaScript data types like boolean, number, text or NULL. This could be extended in future to convert arrays, too.

FunctionName should be the name of a global function defined in JavaScript.
See also:

- 93.6.3 CallFunction(FunctionName as string, paramArray params as variant) as variant 14855

### 93.6.5 ClearBrowserSession as boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Ends browser session.
**Notes:** For HTMLViewer using Internet Explorer engine. If you close one by closing the window with HTMLViewer control, this method should end session and a new window would start fresh again.

Flushes entries not in use from the password cache on the hard disk drive. Also resets the cache time used when the synchronization mode is once-per-session.
This should clear current session cookies.

### 93.6.6 Constructor(DesktopHTMLViewer as DesktopHTMLViewer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates new web document object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.
See also:

- 93.6.7 Constructor(HTMLViewer as HTMLViewer) 14857

### 93.6.7 Constructor(HTMLViewer as HTMLViewer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates new web document object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.
See also:

- 93.6.6 Constructor(DesktopHTMLViewer as DesktopHTMLViewer) 14857

### 93.6.8 ContinueFindText(text as string, count as integer, flags as integer, selectText as boolean) as boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Continues a search started with IEFindTextMBS.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS

// find first
```

```
dim found as boolean = d.FindText("Xojo", 0, 0, true)

msgbox "Found Xojo: "+str(found)

if found then
// find next
found = d.ContinueFindText("Xojo", 0, 0, true)
end if
```

**Notes:** Parameters are the same as for IEFindTextMBS.

### 93.6.9 DrawToHDC(HDC as Ptr, PrinterName as string = "")

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Draws the content of the html document into the graphics context.
**Notes:** As of Windows Internet Explorer 9, this method is deprecated and should not be used.
Returns true on success and false on failure.

With some printers, running DrawToDC may cause problems. You can ensure that DrawToDC works properly on all printers by running SetDocumentPrinter method first, and then passing the modified device context to DrawToDC. The plugin calls SetDocumentPrinter for you when you provide a printer name.

### 93.6.10 Evaluate(expression as string) as variant

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Evaluates a JavaScript expression.
**Example:**

```
dim doc as IEDocumentMBS = htmlviewer1.IEDocumentMBS

dim v as variant = doc.Evaluate("1+2")
Msgbox v
```

**Notes:** In contrast to IEWindowMBS.RunJavaScript this function returns the result on Windows, but needs IE 9 or newer.

Our plugin converts Xojo data types to JavaScript data types like boolean, number, text or NULL. This could be extended in future to convert arrays, too.

### 93.6.11 FindText(text as string, count as integer, flags as integer, selectText as boolean) as boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Finds text on the current website.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS

// find first
dim found as boolean = d.FindText("Xojo", 0, 0, true)

msgbox "Found Xojo: "+str(found)

if found then
// find next
found = d.ContinueFindText("Xojo", 0, 0, true)
end if
```

**Notes:** text: the string that specifies the text to find.
count: long that specifies the number of characters to search from the starting point of the range. A positive integer indicates a forward search; a negative integer indicates a backward search.
Flags: integer that specifies one or more of the following flags to indicate the type of search:

| | |
|---|---|
| 0 | Default. Match partial words. |
| 1 | Match backwards. |
| 2 | Match whole words only. |
| 4 | Match case. |
| 131072 | Match bytes. |
| 536870912 | Match diacritical marks. |
| 1073741824 | Match Kashida character. |
| 2147483648 | Match AlefHamza character. |

Returns true: The search text was found.
Returns false: The search text was not found.

### 93.6.12 Frames as IEWindowMBS()

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries the collection of frames.

**Example:**

```
Dim hdoc As IEDocumentMBS = HTMLViewer1.IEDocumentMBS
Dim frames() As IEWindowMBS = hdoc.Frames

For Each frame As IEWindowMBS In frames
Dim doc As IEDocumentMBS = frame.Document

Dim URL As String = doc.URL
Dim Name As String = doc.NameProp
Dim HTMLText As String = doc.HTMLText

Break // read in debugger
Next
```

**Notes:** MBS Plugin will return the window objects for each frame as an array.

### 93.6.13 GetTextArea(FormName as String, FieldName as String) as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries text for a textarea.
**Notes:** FormName can be "" to look for any field with given name.
Raises exception if field is not found.
Returns text from textarea.

### 93.6.14 HTMLText as string

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Returns a copy of the html source code of the current webpage.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim htmlText as string = d.HTMLText
dim PlainText as string = d.text
dim toString as string = d.ToString

Break // see in debug
```

**Notes:** Improved in plugin version 12.2 to return better HTML text. This is the html generated from current web content and not the page we originally loaded. So this works with Editable property.

Returns "" on any error.

### 93.6.15 Image as picture

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Copies the picture from the document.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim p as Picture = d.Image
canvas1.Backdrop = p
```

**Notes:** You may want to resize the htmlviewer to get a picture without scrollbars. (See example projects)
You may need to call ClearFocus as it seems like if the focus is on the htmlviewer it does not draw itself in our picture.

### 93.6.16 LoadHTML(HTMLText as string)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Loads the HTML text into the htmlviewer.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS

d.LoadHTML "<p>Hello World</p>"
```

**Notes:** Does not use a temp file like Xojo's built in method.
Returns true on success.
On Windows you may need to reset webviewer before or load "about:blank" to initialize the webviewer by Xojo (or Xojo).

### 93.6.17 PrintPreview as boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Commands Internet Explorer to show the print preview dialog for this htmlviewer.
**Notes:** Returns true on success. Returns false if function is not supported.
The function returns directly while the preview dialog is still running.

### 93.6.18 Reload(Force as boolean = false)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Reloads the current page.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
d.Reload
```

**Notes:** Boolean that specifies one of the following possible values:
False: Default. Reloads the document from the cache.
True: Reloads the document from the server.

### 93.6.19 SetTextArea(FormName as String, FieldName as String, Value as String) as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets text for a textarea.
**Notes:** FormName can be "" to look for any field with given name.
Raises exception if field is not found.
Returns true if text is set or false on failure.

### 93.6.20 Text as string

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Returns a copy of the text of the current webpage.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim htmlText as string = d.HTMLText
dim PlainText as string = d.text
dim toString as string = d.ToString

Break // see in debug
```

**Notes:** Asks Internet Explorer for a selection of the whole document and asks selection about the text content.
Returns "" on any error.

### 93.6.21 Properties

### 93.6.22 CharSet as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or retrieves the character set used to encode the object.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.CharSet
```

**Notes:** Example value: "utf-8"
(Read and Write property)

### 93.6.23 Cookie as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets the string value of a cookie.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.Cookie
```

**Notes:** Example value: "s_vi= [ CS ] v1 | 427CA13500002D10-A000B5B00000001 [ CE ] ; s_cc=true; s_nr=1196708888562; s_sq=%5B%5BB%5D%5D"
(Read and Write property)

### 93.6.24 DefaultCharset as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the default character set from the current regional language settings.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.DefaultCharset
```

**Notes:** Example value: "windows-1252"
(Read and Write property)

### 93.6.25 Domain as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets the security domain of the document.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.Domain
```

**Notes:** Example value: "www.apple.com"
(Read and Write property)

### 93.6.26 Editable as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Whether the htmlviewer is editable on Windows.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
d.Editable = true
```

**Notes:** (Read and Write property)

### 93.6.27 FileCreationDate as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the date the file was created.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.FileCreationDate
```

**Notes:** Example value: "09/13/2007"
(Read only property)

### 93.6.28 FileModifiedDate as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the date the file was last modified.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.FileModifiedDate
```

**Notes:** Example value: "12/03/2007"
(Read only property)

### 93.6.29 FileSize as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the file size.
**Notes:** Example value: "12475"
(Read only property)

### 93.6.30 FileUpdatedDate as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the date the file was last updated.
**Notes:** Example value: "01/01/1601"
(Read only property)

### 93.6.31 Handle as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.6.32 History as IEHistoryMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries history object for web document.
**Notes:** (Read only property)

### 93.6.33 LastModified as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the date that the page was last modified, if the page supplies one.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.LastModified
```

**Notes:** Example value: "12/03/2007 20:08:17"
(Read only property)

### 93.6.34 MimeType as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the MIME type for the file.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.MimeType
```

**Notes:** Example value: "HTM-Datei"
See also MimeTypeToFileExtensionMBS function.
(Read only property)

### 93.6.35 NameProp as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the title of the document file.
**Notes:** Example value: "Apple"
(Read only property)

### 93.6.36 Navigator as IENavigatorMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries navigator object for web document.
**Notes:** (Read only property)

### 93.6.37 ParentWindow as IEWindowMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries parent window for this document.
**Notes:** (Read only property)

### 93.6.38 Protocol as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or retrieves the protocol portion of a URL.
**Notes:** Example value: "HTTP (HyperText Transfer-Protokoll)"
(Read only property)

### 93.6.39 ReadyState as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a value that indicates the current state of the htmlviewer.
**Notes:** uninitialized: Object is not initialized with data.
loading: Object is loading its data.
loaded: Object has finished loading its data.
interactive: User can interact with the object even though it is not fully loaded.
complete: Object is completely initialized.

An object's state is initially set to uninitialized, and then to loading. When data loading is complete, the state of the link object passes through the loaded and interactive states to reach the complete state.

The states through which an object passes are determined by that object; an object can skip certain states (for example, interactive) if the state does not apply to that object.

Data source objects and databound elements are normally populated asynchronously, and certain programmatic operations can only be performed reliably on databound objects when they are ready for use. There-

fore, the appropriate code should be written to confirm the readyState of objects prior to performing certain operations on them. For example, walking the rows of a table should not be attempted until after the table has reached the complete state.

The readyState property enables the status of an object to be tested. The correct place to test the readyState property is in the event handler for onreadystatechange. Similarly, a data source object (DSO) fires the ondatasetcomplete event to notify the document that the dataset is ready for programmatic operation.
(Read only property)

### 93.6.40 Referrer as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URL of the location that referred the user to the current page.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.Referrer
```

**Notes:** Example value: "http://www.apple.com/"
(Read only property)

### 93.6.41 ScrollHeight as integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries the height of the html viewer content.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS

msgbox str(d.ScrollWidth)+" "+str(d.ScrollHeight)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 93.6.42 ScrollWidth as integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries the width of the html viewer content.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS

msgbox str(d.ScrollWidth)+" "+str(d.ScrollHeight)
```

**Notes:** Returns 0 on any error.
(Read only property)

### 93.6.43 Security as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the security state.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.Security
```

**Notes:** Example value: "F√ºr diesen Dokumententyp gibt es kein Sicherheitszertifikat."
(Read only property)

### 93.6.44 Title as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets the title of the document.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.Title
```

**Notes:** Example value: "Apple"
(Read and Write property)

### 93.6.45 ToString as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a string representation of the object.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim htmlText as string = d.HTMLText
dim PlainText as string = d.text
dim toString as string = d.ToString

Break // see in debug
```

**Notes:** Example value: " [ object ] "
(Read only property)

### 93.6.46 URL as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets the URL for the current document.
**Example:**

```
dim d as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
msgbox d.URL
```

**Notes:** Example value: "http://www.apple.com/"
(Read and Write property)

## 93.7 class IEExceptionMBS

### 93.7.1 class IEExceptionMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an error in one of the IE classes.
**Notes:** See errorNumber and message properties.
Subclass of the RuntimeException class.
**Blog Entries**

- Upgrading our HTMLViewer functions for Internet Explorer

## 93.8 class IEHistoryMBS

### 93.8.1 class IEHistoryMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for the web history.
**Notes:** For HTMLViewer based on Internet Explorer on Windows.
All the methods and properties may raise IEExceptionMBS exceptions in case of failure.

Based on IOmHistory interface:
https://docs.microsoft.com/en-us/previous-versions/aa703740(v=vs.85)

Let us know if you miss something.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr9
- MBS Xojo Plugins, version 20.0pr5
- Upgrading our HTMLViewer functions for Internet Explorer

### 93.8.2 Methods

### 93.8.3 Back

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Loads a previous URL from the History list.

### 93.8.4 Constructor(DesktopHTMLViewer as DesktopHTMLViewer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the history for a HTMLViewer easily.
See also:

- 93.8.5 Constructor(HTMLViewer as HTMLViewer) 14872

### 93.8.5 Constructor(HTMLViewer as HTMLViewer)

MBS Win Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the history for a HTMLViewer easily.
See also:

- 93.8.4 Constructor(DesktopHTMLViewer as DesktopHTMLViewer) 14872

### 93.8.6 Forward

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Loads the next URL from the History list.

### 93.8.7 Go(index as Integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Loads a URL from the History list.
**Notes:** index: An integer indicates the relative position of a URL in the History list.

An error does not occur if the user tries to go beyond the beginning or end of the history. Instead, the user remains at the current page.

### 93.8.8 Properties

### 93.8.9 Handle as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.8.10 Length as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the number of elements in the History list.
**Notes:** Example value: 0
(Read only property)

## 93.9 class IENavigatorMBS

### 93.9.1 class IENavigatorMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for a navigator object.
**Notes:** For HTMLViewer based on Internet Explorer on Windows.
All the methods and properties may raise IEExceptionMBS exceptions in case of failure.

Based on IOmNavigator interface:
https://docs.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/platform-apis/hh774262(v=vs.8

Let us know if you miss something.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr9
- MBS Xojo Plugins, version 20.0pr5
- Upgrading our HTMLViewer functions for Internet Explorer

### 93.9.2 Methods

### 93.9.3 Constructor(DesktopHTMLViewer as DesktopHTMLViewer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the navigator for a HTMLViewer easily.
See also:

- 93.9.4 Constructor(HTMLViewer as HTMLViewer) 14874

### 93.9.4 Constructor(HTMLViewer as HTMLViewer)

MBS Win Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the navigator for a HTMLViewer easily.
See also:

- 93.9.3 Constructor(DesktopHTMLViewer as DesktopHTMLViewer) 14874

### 93.9.5 Properties

### 93.9.6 AppCodeName as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the code name.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.AppCodeName
```

**Notes:** Returns "Mozilla". Returned by Internet Explorer and Netscape Navigator.
(Read only property)

### 93.9.7 AppMinorVersion as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the application's minor version value.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.AppMinorVersion
```

**Notes:** Example value: ";SP2;"
e.g. "0"
(Read only property)

### 93.9.8 AppName as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the name of the browser.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator
```

msgbox a.AppName

**Notes:** Example value: "Microsoft Internet Explorer"
(Read only property)

### 93.9.9 AppVersion as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the platform and version of the browser.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.AppVersion
```

**Notes:** Example value: "4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50727)"
(Read only property)

### 93.9.10 BrowserLanguage as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the current browser language.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.BrowserLanguage
```

**Notes:** Example value: "de"
(Read only property)

### 93.9.11 CookieEnabled as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves whether client-side persistent cookies are enabled in the browser.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

if a.CookieEnabled then
msgbox "Cookie enabled"
else
msgbox "Cookie disabled"
end if
```

**Notes:** Persistent cookies are those that are stored on the client-side computer.
Example value: True
(Read only property)

### 93.9.12 CPUClass as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a string denoting the CPU class.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.CPUClass
```

**Notes:** Returns "x86" for Intel processor.
(Read only property)

### 93.9.13 Handle as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.9.14 JavaEnabled as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Returns whether Java is enabled.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

if a.JavaEnabled then
msgbox "Java enabled"
else
msgbox "Java disabled"
end if
```

**Notes:** Example value: True
(Read only property)

### 93.9.15 OnLine as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a value indicating whether the system is in global offline mode.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.OnLine
```

**Notes:** The user can modify the global offline state by choosing Work Offline from the File menu in Microsoft Internet Explorer version 4.0 or later. This property does not indicate whether the system is connected to the network.

Example value: True
(Read only property)

### 93.9.16 Platform as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the name of the user's operating system.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.Platform
```

**Notes:** Returns "Win64" for Windows 64-bit platform.
Returns "Win32" for Windows 32-bit platform.
(Read only property)

### 93.9.17 SystemLanguage as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the default language used by the operating system.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.SystemLanguage

msgbox a.AppCodeName
```

**Notes:** The systemLanguage property reflects the language edition of the installed operating system.
e.g. de-DE
(Read only property)

### 93.9.18 UserAgent as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a string equivalent to the HTTP user-agent request header.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.UserAgent
```

**Notes:** The HTTP user-agent request header contains information about compatibility, the browser, and

the platform name. For more information about the browser, see the IENavigatorappNameMBS property. For more information about the platform, see the IENavigatorappVersionMBS property.

The IENavigatoruserAgentMBS property dynamically returns a different value depending on the browser and platform versions. For example, Microsoft Internet Explorer 6 returns the following string for Microsoft Windows XP.

Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1)

Example value: "Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50727)"

Like other plugin function, this can only work if a page has been loaded. Xojo won't create the internal htmlviewer object before you load a page.
(Read only property)

### 93.9.19 UserLanguage as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the operating system's natural language setting.
**Example:**

```
dim w as IEDocumentMBS = HTMLViewer1.IEDocumentMBS
dim a as IENavigatorMBS = w.Navigator

msgbox a.AppCodeName
```

**Notes:** Example value: "de-DE"
(Read only property)

## 93.10 class IEWebBrowserMBS

### 93.10.1 class IEWebBrowserMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for a web browser.
**Notes:** For HTMLViewer based on Internet Explorer on Windows.
All the methods and properties may raise IEExceptionMBS exceptions in case of failure.

Based on IWebBrowser2 interface:
https://docs.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/platform-apis/aa752127(v=vs.8

Let us know if you miss something.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 20.5pr9
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Using DebugBar in Xojo for IE HTMLViewer
- HTMLViewer JavaScript communication for Xojo
- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- New in the MBS Xojo Plugins 20.0
- Upgrading our HTMLViewer functions for Internet Explorer

**Xojo Developer Magazine**

- 18.3, page 53: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 18.3, page 10: News

### 93.10.2 Methods

### 93.10.3 Constructor(DesktopHTMLViewer as DesktopHTMLViewer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the browser for a HTMLViewer easily.
See also:

- 93.10.4 Constructor(HTMLViewer as HTMLViewer) 14882

### 93.10.4 Constructor(HTMLViewer as HTMLViewer)

MBS Win Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Constructor to get the browser for a HTMLViewer easily.
See also:

- 93.10.3 Constructor(DesktopHTMLViewer as DesktopHTMLViewer) 14881

### 93.10.5 GetInternetExplorerHiDPI as Integer

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** Query whether HiDPI handling is enabled.
**Notes:** We can opt-in for your application to let HTMLviewer use proper resolution handling for web content.

### 93.10.6 GetInternetExplorerVersion as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries IE version used for this application.
**Notes:** Queries the Internet Explorer version to use for HTMLViewer.

### 93.10.7 GoBack

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Navigates backward one item in the history list.

### 93.10.8 GoForward

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Navigates forward one item in the history list.

### 93.10.9 GoHome

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Navigates to the current home or start page.
**Notes:** The user can indicate the URL to use for the home page from the Internet Options dialog box, which is accessible from the Tools menu of Windows Internet Explorer, or in the Control Panel.
Internet Explorer 7 and later. This method navigates to the first URL in the home tabs group.

### 93.10.10 GoSearch

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Navigates to the current search page.
**Notes:** The user can indicate the URL to use for the search page with the Internet Options dialog box, which is accessible from the Tools menu of Windows Internet Explorer, or in the Control Panel.
Internet Explorer 7 and later. GoSearch navigates to the default search provider. For more information, see Windows Search Guide.

### 93.10.11 Navigate(URL as string, Flags as Integer = 0, TargetFrameName as String = "", PostData as String = "", Headers as String = "")

MBS Win Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Navigates to a resource identified by a URL or to a file identified by a full path.
**Notes:** URL: The URL, full path, or Universal Naming Convention (UNC) location and name of the resource to display.
Flags: The combination of Navigate* constants.
TargetFrameName: Optional, the name of the frame in which to display the resource.
PostData: The post data that is sent to the server as part of a HTTP POST transaction. A POST transaction is typically used to send data gathered by an HTML form. If this parameter does not specify any post data, this method issues an HTTP GET transaction. This parameter is ignored if the URL is not an HTTP URL.
Headers: The text list that contains additional HTTP headers to send to the server. These headers are added to the default headers. For example, headers can specify the action required of the server, the type of data being passed to the server, or a status code. This parameter is ignored if the URL is not an HTTP URL.

The possible values for the TargetFrameName parameter are:

### 93.10.12 Refresh

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

| | |
|---|---|
| _blank | Load the link into a new unnamed window. |
| _parent | Load the link into the immediate parent of the document the link is in. |
| _self | Load the link into the same window the link was clicked in. |
| _top | Load the link into the full body of the current window. |
| WindowName | A named HTML frame. If no frame or window exists that matches the specified target name, a new window is opened for the specified link. |

**Function:** Reloads the file that is currently displayed in the object.
**Notes:** This method is the same as clicking the Refresh button or pressing F5 in Windows Internet Explorer. To save time and network bandwidth, the WebBrowser control and InternetExplorer application store pages from recently visited sites in cached memory on the user's hard disk. When you revisit a Web site, the page is reloaded from the local disk instead of being downloaded again from the server. To ensure that you are viewing the most current version of the page, you can force a fresh download by using the Refresh method. This method adds the "Pragma: No-cache" HTTP header to the request.
See also:

- 93.10.13 Refresh(Level as Integer) 14884

### 93.10.13 Refresh(Level as Integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Reloads the file that is currently displayed with the specified refresh level.
See also:

- 93.10.12 Refresh 14883

### 93.10.14 SetInternetExplorerHiDPI(Enable as Boolean) as Boolean

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop only.

**Function:** Sets whether HiDPI handling is enabled.
**Notes:** We can opt-in for your application to let HTMLviewer use proper resolution handling for web content.
You may just call this in your app.open event.

### 93.10.15 SetInternetExplorerVersion(version as Integer) as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets IE version used for this application.
**Example:**

```
// make sure we don't end up with Internet Explorer in version 7, which is default.
Dim v As Integer = IEWebBrowserMBS.GetInternetExplorerVersion

If v <11000 Then // below version 11.0

Dim b As Boolean = IEWebBrowserMBS.SetInternetExplorerVersion(11000)
If b Then
MsgBox "Requested Internet Explorer version 11.0."
Else
MsgBox "Failed to set IE version?"
End If
End If
```

**Notes:** By default Xojo uses IE7 for the HTMLViewer, even if you have version 11 enabled.

In a test on Windows 10, we get by default this browser version:

Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 6.2; Win64; x64; Trident/7.0; .NET4.0C; .NET4.0E; Tablet PC 2.0; .NET CLR 2.0.50727; .NET CLR 3.0.30729; .NET CLR 3.5.30729)

and with setting it to 11000, we get this:

Mozilla/5.0 (Windows NT 6.2; Win64; x64; Trident/7.0; rv:11.0) like Gecko

### 93.10.16 ShowDebugBar(NoScale as Boolean = false, x as Integer = 0, y as Integer = 0, width as Integer = 0, Height as Integer = 0, TopMost as Boolean = false) as Boolean

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Shows the DebugBar for the web viewer on Windows.
**Notes:** With DebugBar you can inspect HTML elements, see scripts and modify elements on the fly.
There is a JavaScript console to quickly edit something if needed.

Please download and install DebugBar extension for Internet Explorer:
https://www.debugbar.com

You may need to buy a license for it to use all features.

Known issues:

- The toolbar has a gear button, where you can pick locations. Choosing a location there may crash the application.
- If application runs on a screen with >100% scaling, the picker may not work correctly unless you pass 1 for Flags parameter, but then icons may be smaller.
- HTTPs tab shows no data.
- You may need to click reload in the DebugBar (orange arrow in toolbar) when switching to another page.
- Running JavaScript works, but doesn't show errors or results.
- The inspect element in context menu command does not work.

Returns true on success or false on failure.

NoScale: disable scaling on >100% screen.
TopMost: Put the window always on top of other windows.
X, Y, width and height allow to position the window. Default is near center of screen with 600x400 in size.

### 93.10.17 Stop

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Stops loading.
**Notes:** Returns true on success and false on failure.

### 93.10.18 Zoom(factor as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Zooms the web content.
**Notes:** Factor can be 50 for 50%.
Returns true on success.

### 93.10.19 Properties

### 93.10.20 AddressBar as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the address bar of the object is visible or hidden.
**Notes:** (Read and Write property)

### 93.10.21 Busy as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the object is engaged in a navigation or downloading operation.
**Notes:** If the control is busy, you can use the Stop method to cancel the navigation or download operation before it is completed.
(Read only property)

### 93.10.22 FullName as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the fully qualified path of the Windows Internet Explorer executable.
**Notes:** Internet Explorer 8 and later. Always returns an empty string.
This method also updates the window list.
(Read only property)

### 93.10.23 FullScreen as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether Windows Internet Explorer is in full-screen mode or normal window mode.
**Notes:** True: Internet Explorer is in full-screen mode.
False: Default. Internet Explorer is in normal window mode.

In full-screen mode, the Internet Explorer main window is maximized, and the status bar, toolbar, menu bar, and title bar are hidden.
Setting FullScreen (even to false) resets the values of the AddressBar and ToolBar properties to true. Disable the address bar and toolbars after you set the FullScreen property.
The WebBrowser object saves the value of this property, but otherwise ignores it.
(Read and Write property)

### 93.10.24 Handle as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.10.25 LocationName as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the path or title of the resource that is currently displayed.
**Notes:** If the resource is an HTML webpage, the name is the title of the document. If the resource is a folder or file on the network or local computer, the name is the full file system path of the folder or file in Universal Naming Convention (UNC) format.
If this method is called before the first navigation is complete, InternetExplorer returns an empty string.
(Read only property)

### 93.10.26 LocationURL as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URL of the resource that is currently displayed.
**Example:**

```
dim w as IEWebBrowserMBS = HTMLViewer1.IEWebBrowserMBS
msgbox w.LocationURL
```

**Notes:** If the resource is a folder or file on the network or local computer, the name is the full path of the folder or file in the Universal Naming Convention (UNC) format.
If this method is called before the first navigation is complete, InternetExplorer returns an empty string.
(Read only property)

### 93.10.27 MenuBar as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the Windows Internet Explorer menu bar is visible.
**Notes:** True: Default. Menu bar is visible.
False: Menu bar is hidden.
(Read and Write property)

### 93.10.28 Name as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The frame name or application name of the object.
**Example:**

```
dim w as IEWebBrowserMBS = HTMLViewer1.IEWebBrowserMBS
msgbox w.Name
```

**Notes:** (Read only property)

### 93.10.29 Offline as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the object is operating in offline mode.
**Notes:** In offline mode, the browser is forced to read HTML pages from the local cache instead of reading from the source document online.
The WebBrowser object delegates this method to the top-level frame. If no frame exists, it returns false.
(Read and Write property)

### 93.10.30 ReadyState as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the ready state of the object.
**Notes:** (Read only property)

### 93.10.31 RegisterAsBrowser as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the object is registered as a top-level browser window.
**Notes:** The architecture of Windows Internet Explorer allows for multiple instances of the IWebBrowser2 object. A "top-level" IWebBrowser2 object is the parent of all other IWebBrowser2 objects. Only top-level objects can register as a browser with this method.
By setting this property to True, Internet Explorer and Windows can locate other top-level IWebBrowser2 objects that can participate in frame name resolution. For example, if the user clicks on a hyperlink that specifies a target attribute that is not in the current window, Internet Explorer searches all registered IWebBrowser2 objects in an attempt to resolve the target name.
After the window is registered as a top-level browser, it cannot be unregistered.

(Read and Write property)

### 93.10.32 RegisterAsDropTarget as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the object is registered as a drop target for navigation.
**Notes:** A drop target is an object that has been registered to accept data from a drag-and-drop operation. The WebBrowser object delegates this method to the top-level frame. If no frame exists, it raises exception.
(Read and Write property)

### 93.10.33 Silent as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the object can display dialog boxes.
**Notes:** False: Default. Dialog boxes and messages can be displayed. Critical errors and security alerts are not suppressed.
True: Dialog boxes are not displayed.

The WebBrowser object delegates this method to the top-level frame. If no frame exists, it raises exception.
(Read and Write property)

### 93.10.34 StatusBar as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets a value that indicates whether the status bar for the object is visible.
**Notes:** The WebBrowser object saves the value of this property, but otherwise ignores it.
(Read and Write property)

### 93.10.35 StatusText as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets the text in the status bar for the object.
**Example:**

```
dim w as IEWebBrowserMBS = HTMLViewer1.IEWebBrowserMBS
msgbox w.StatusText
```

**Notes:** Windows Internet Explorer 7 and later. The security settings that restrict access to the status bar from script do not apply to this method.
(Read and Write property)

### 93.10.36 TheaterMode as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets whether the object is in theater mode.
**Notes:** True: Object is in theater mode.
False: Default. Object is in normal mode.

In theater mode, the object's main window fills the entire screen and displays a toolbar that has a minimal set of navigational buttons. A status bar is also provided in the upper-right corner of the screen. Explorer bars, such as History and Favorites , are displayed as an autohide pane on the left edge of the screen in theater mode.

Setting TheaterMode (even to false) resets the values of the AddressBar and ToolBar properties to true. Disable the address bar and toolbars after you set the TheaterMode property.
The WebBrowser object saves the value of this property, but otherwise ignores it.
(Read and Write property)

### 93.10.37 ToolBar as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or gets whether toolbars for the object are visible.
**Notes:** False: Toolbar is hidden.
True: Default. Toolbar is visible.

When the ToolBar property is set to falsde, it is not equivalent to the "toolbar=no" feature of window.open. Instead, it turns off all user interface elements that can be considered toolbars, leaving Windows Internet Explorer in a blank state.
The WebBrowser object saves the value of this property, but otherwise ignores it.
(Read and Write property)

### 93.10.38 Type as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Gets the user type name of the contained document object.
**Notes:** For example, this method returns "HTML Document" if the document supports the IHTMLDocument2 interface.

The WebBrowser object delegates this method to the top-level frame. If no frame exists, it returns empty text.
(Read only property)

### 93.10.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| RefreshIfExpired | 1 | One of the Refresh levels.<br>Not currently implemented. |
| RefreshNormal | 0 | One of the Refresh levels.<br>Refresh without sending a "Pragma:no-cache" HTTP header to the server. |

Navigation Flags

| Constant | Value | Description |
|---|---|---|
| NavigateAllowAutosearch | &h10 | If the navigation fails, the autosearch functionality attempts to navigate c mon root domains (.com, .edu, and so on). If this also fails, the URL is pa to a search engine. |
| NavigateBlockRedirectsXDomain | &h8000 | Internet Explorer 8. Block cross-domain redirect requests. |
| NavigateBrowserBar | &h20 | Causes the current Explorer Bar to navigate to the given item, if possible |
| NavigateEnforceRestricted | &h80 | Internet Explorer 6 for Windows XP SP2 and later. Force the URL intc restricted zone. |
| NavigateHyperlink | &h40 | Internet Explorer 6 for Windows XP SP2 and later. If the navigation fails w a hyperlink is being followed, this constant specifies that the resource sh then be bound to the moniker using the BINDF_HYPERLINK flag. |
| NavigateKeepWordWheelText | &h2000 | Internet Explorer 7. Maintain state for dynamic navigation based on the f string entered in the search band text box (wordwheel). Restore the wordw text when the navigation completes. |
| NavigateNewWindowsManaged | &h100 | Internet Explorer 6 for Windows XP SP2 and later. Use the default Po Manager to block pop-up windows. |
| NavigateNoHistory | 2 | Do not add the resource or file to the history list. The new page replaces current page in the list. |
| NavigateNoReadFromCache | 4 | Not implemented. |
| NavigateNoWriteToCache | 8 | Not implemented. |
| NavigateOpenInBackgroundTab | &h1000 | Internet Explorer 7. Open the resource or file in a new background tab; currently active window and/or tab remains open on top. |
| NavigateOpenInNewTab | &h800 | Internet Explorer 7. Open the resource or file in a new tab. Allow the d nation window to come to the foreground, if necessary. |
| NavigateOpenNewForegroundTab | &h10000 | Internet Explorer 8 and later. Open the resource in a new tab that beco the foreground tab. |
| NavigateTrustedForActiveX | &h400 | Internet Explorer 6 for Windows XP SP2 and later. Prompt for the installa of ActiveX controls. |
| NavigateUntrustedForDownload | &h200 | Internet Explorer 6 for Windows XP SP2 and later. Block files that norm trigger a file download dialog box. |
| NavigateVirtualTab | &h4000 | Internet Explorer 8. Open the resource as a replacement for the curren target tab. The existing tab is closed while the new tab takes its place in the bar and replaces it in the tab group, if any. Browser history is copied forv to the new tab. On Windows Vista, this flag is implied if the navigation w cross integrity levels and navOpenInNewTab, navOpenInBackgroundTab navOpenInNewWindow is not specified. |

Ready States

| Constant | Value | Description |
|---|---|---|
| ReadyStateComplete | 4 | Object has received all of its data. |
| ReadyStateInteractive | 3 | Object is interactive, but not all of its data is available. |
| ReadyStateLoaded | 2 | Object has been initialized. |
| ReadyStateLoading | 1 | Object is currently loading its properties. |
| ReadyStateUninitialized | 0 | Default initialization state. |

Refresh Levels

| Constant | Value | Description |
|---|---|---|
| RefreshCompletely | 2 | Refresh without forced cache validation by sending a "Pragma:no-cache" header to the server (HTTP URLs only). Same as pressing Ctrl+F5 in Microsoft Internet Explorer. |

| Value | Description |
|---|---|
| 11001 | Internet Explorer 11. Webpages are displayed in IE11 edge mode, regardless of the declared !DOCTYPE directive. Failing to declare a !DOCTYPE directive causes the page to load in Quirks. |
| 11000 | IE11. Webpages containing standards-based !DOCTYPE directives are displayed in IE11 edge mode. Default value for IE11. |
| 10001 | Internet Explorer 10. Webpages are displayed in IE10 Standards mode, regardless of the !DOCTYPE directive. |
| 10000 | Internet Explorer 10. Webpages containing standards-based !DOCTYPE directives are displayed in IE10 Standards mode. Default value for Internet Explorer 10. |
| 9999 | Windows Internet Explorer 9. Webpages are displayed in IE9 Standards mode, regardless of the declared !DOCTYPE directive. Failing to declare a !DOCTYPE directive causes the page to load in Quirks. |
| 9000 | Internet Explorer 9. Webpages containing standards-based !DOCTYPE directives are displayed in IE9 mode. Default value for Internet Explorer 9. In Internet Explorer 10, Webpages containing standards-based !DOCTYPE directives are displayed in IE10 Standards mode. |
| 8888 | Webpages are displayed in IE8 Standards mode, regardless of the declared !DOCTYPE directive. Failing to declare a !DOCTYPE directive causes the page to load in Quirks. |
| 8000 | Webpages containing standards-based !DOCTYPE directives are displayed in IE8 mode. Default value for Internet Explorer 8. In Internet Explorer 10, Webpages containing standards-based !DOCTYPE directives are displayed in IE10 Standards mode. |
| 7000 | Webpages containing standards-based !DOCTYPE directives are displayed in IE7 Standards mode. Default value for applications hosting the WebBrowser Control. |

## 93.11 class IEWindowMBS

### 93.11.1 class IEWindowMBS

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The class for a web window.
**Notes:** For HTMLViewer based on Internet Explorer on Windows.
All the methods and properties may raise IEExceptionMBS exceptions in case of failure.

Based on IHTMLWindow2 interface:
https://docs.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/platform-apis/aa741505(v=vs.8

Let us know if you miss something.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 21.0pr7
- HTMLViewer JavaScript communication for Xojo
- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 20.0pr5
- Upgrading our HTMLViewer functions for Internet Explorer

**Xojo Developer Magazine**

- 19.2, page 10: News
- 18.3, page 53: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 93.11.2 Methods

### 93.11.3 Alert(Message as string)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box containing an application-defined message.
**Example:**

```
dim w as IEWindowMBS = HTMLViewer1.IEWindowMBS
w.Alert("Hello Alert!")
```

### 93.11.4 Blur

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Causes the element to lose focus and fires the onblur event.

### 93.11.5 Confirm(Message as string) as Boolean

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a confirmation dialog box that contains an optional message as well as OK and Cancel buttons.
**Example:**

```
dim w as IEWindowMBS = HTMLViewer1.IEWindowMBS

dim b as Boolean = w.Confirm("Like Xojo?")
Break
```

**Notes:** Message: that specifies the message to display in the confirmation dialog box.
If no value is provided, the dialog box does not contain a message.

The title bar of the confirmation dialog box cannot be changed.

### 93.11.6 Constructor(DesktopHTMLViewer as DesktopHTMLViewer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates new web window object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.
See also:

- 93.11.7 Constructor(HTMLViewer as HTMLViewer) 14897

### 93.11.7 Constructor(HTMLViewer as HTMLViewer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates new web window object for this HTMLViewer.
**Notes:** For browser based on Internet Explorer on Windows.
Raises exception on failure.
See also:

• 93.11.6 Constructor(DesktopHTMLViewer as DesktopHTMLViewer) 14897

### 93.11.8 ExecScript(Code as string, language as String)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Executes the specified script in the provided language.
**Example:**

```
dim w as IEWindowMBS = HTMLViewer1.IEWindowMBS

w.ExecScript("alert('Hello');", "JavaScript")
```

**Notes:** code: specifies the code to be executed.
language: specifies the language in which the code is executed. The language defaults to JScript.

Script executed through the execScript method can access all global variables available to the calling script. This can be useful when you want the functionality of another scripting language that would not otherwise be available in JScript, such as the Microsoft Visual Basic Scripting Edition (VBScript) MsgBox function.

### 93.11.9 Frames as IEWindowMBS()

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries the collection of frames.
**Example:**

```
Dim win As IEWindowMBS = HTMLViewer1.IEWindowMBS
Dim frames() As IEWindowMBS = win.Frames

For Each frame As IEWindowMBS In frames
Dim doc As IEDocumentMBS = frame.Document

Dim URL As String = doc.URL
Dim Name As String = doc.NameProp
Dim HTMLText As String = doc.HTMLText

Break // read in debugger
Next
```

**Notes:** MBS Plugin will return the window objects for each frame as an array.

### 93.11.10 MoveBy(x as integer, y as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Moves the screen position of the window by the specified x and y offset values.
**Notes:** x: long that specifies the horizontal scroll offset in pixels. The value can be either positive or negative.
y: long that specifies the vertical scroll offset in pixels. The value can be either positive or negative.

### 93.11.11 MoveTo(x as integer, y as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Moves the screen position of the upper-left corner of the window to the specified x and y position.
**Notes:** x: long that specifies the horizontal scroll offset in pixels. The value can be either positive or negative.
y: long that specifies the vertical scroll offset in pixels. The value can be either positive or negative.

### 93.11.12 Navigate(URL as string)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Loads the specified URL to the current window.
**Notes:** URL: that specifies the URL to display.

### 93.11.13 Print

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Opens the normal print dialog for the Internet Explorer.
**Notes:** Raises exception on failure.

### 93.11.14 RunJavaScript(JavaScript as string)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Executes the specified script in the provided language.
**Example:**

```
dim w as IEWindowMBS = HTMLViewer1.IEWindowMBS

w.RunJavaScript("alert('Hello');")
```

**Notes:** Same as ExecScript with language JavaScript.
Raises exception on failure.

The IE API does not allow to return values from Javascript. So you need to store your result in window.title and access it later using IETitleMBS.

IERunJavaScriptMBS fails if the htmlviewer is empty. You can load a dummy page like above.

You can use JavaScriptEngineMBS class to execute JavaScript without HTMLViewer in our own cross platform JavaScript engine.

See IEDocumentMBS.Evaluate for newer version which can return result.

### 93.11.15 Scroll(x as integer, y as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Causes the window to scroll to the specified x- and y-offset at the upper-left corner of the window.
**Notes:** x: long that specifies the horizontal scroll offset, in pixels.
y: long that specifies the vertical scroll offset, in pixels.

This method is provided for backward compatibility only. The recommended way to scroll a window is to use the scrollTo method.

### 93.11.16 ScrollBy(x as integer, y as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Causes the window to scroll relative to the current scrolled position by the specified x- and y-pixel offset.
**Example:**

```
dim w as IEWindowMBS = HTMLViewer1.IEWindowMBS

w.ScrollBy 0, 1000
```

**Notes:** x: long that specifies the horizontal scroll offset, in pixels. Positive values scroll the window right, and negative values scroll it left.

y: long that specifies the vertical scroll offset, in pixels. Positive values scroll the window down, and negative values scroll it up.

### 93.11.17 ScrollTo(x as integer, y as integer)

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Scrolls the window to the specified x- and y-offset.
**Notes:** x: long that specifies the horizontal scroll offset, in pixels.
y: long that specifies the vertical scroll offset, in pixels.

### 93.11.18 Properties

### 93.11.19 DefaultStatus as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or retrieves the default message displayed in the status bar at the bottom of the window.
**Notes:** (Read and Write property)

### 93.11.20 Document as IEDocumentMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries the document for this window.
**Notes:** May be nil if no document is loaded yet.
(Read only property)

### 93.11.21 Handle as Integer

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 93.11.22 Name as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or retrieves a value that indicates the window name.
**Notes:** (Read and Write property)

### 93.11.23 Status as String

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets or retrieves the message in the status bar at the bottom of the window.
**Notes:** (Read and Write property)

## 93.12 Globals

### 93.12.1 IEClearBrowserSessionMBS as boolean

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop only.

**Function:** Ends browser session.
**Notes:** For HTMLViewer using Internet Explorer engine. If you close one by closing the window with HTMLViewer control, this method should end session and a new window would start fresh again.

Flushes entries not in use from the password cache on the hard disk drive. Also resets the cache time used when the synchronization mode is once-per-session.
This should clear current session cookies.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr7

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

# Chapter 94

# iCloud

## 94.1 class NSComparisonPredicateMBS

### 94.1.1 class NSComparisonPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** NSComparisonPredicateMBS is a subclass of NSPredicateMBS that you use to compare expressions.
**Example:**

```
dim n1 as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(4)
dim n2 as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(9)

dim modifier as Integer = NSComparisonPredicateMBS.NSDirectPredicateModifier
dim type as Integer = NSComparisonPredicateMBS.NSGreaterThanPredicateOperatorType
dim options as Integer = 0

dim c as new NSComparisonPredicateMBS(n1, n2, Modifier, type, options)

MsgBox c.predicateFormat
```

**Notes:** You use comparison predicates to compare the results of two expressions. You create a comparison predicate with an operator, a left expression, and a right expression. You represent the expressions using instances of the NSExpressionMBS class. When you evaluate the predicate, it returns as a BOOL value the result of invoking the operator with the results of evaluating the expressions.
Subclass of the NSPredicateMBS class.
**Blog Entries**

- More notes

- MBS Real Studio Plugins, version 11.3pr10

### 94.1.2 Methods

### 94.1.3 comparisonPredicateModifier as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the comparison predicate modifier for the receiver.
**Notes:** Available in Mac OS X v10.4 and later.
The default value is NSDirectPredicateModifier.

### 94.1.4 Constructor(LeftExpression as NSExpressionMBS, rightExpression as NSExpressionMBS, modifier as UInt32, type as UInt32, options as UInt32)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes a predicate to a given type formed by combining given left and right expressions using a given modifier and options.
**Example:**

```
dim n1 as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(4)
dim n2 as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(9)

dim modifier as Integer = NSComparisonPredicateMBS.NSDirectPredicateModifier
dim type as Integer = NSComparisonPredicateMBS.NSGreaterThanPredicateOperatorType
dim options as Integer = 0

dim c as new NSComparisonPredicateMBS(n1, n2, Modifier, type, options)

MsgBox c.predicateFormat
```

**Notes:** LeftExpression: The left hand expression.
rightExpression: The right hand expression.
modifier: The modifier to apply.
type: The predicate operator type.
options: The options to apply (see constants). For no options, pass 0.

The receiver, initialized to a predicate of type type formed by combining the left and right expressions using the modifier and options.
Available in Mac OS X v10.4 and later.

### 94.1.5 leftExpression as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the left expression for the receiver, or nil if there is none.

### 94.1.6 options as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the options that are set for the receiver.

### 94.1.7 predicate(LeftExpression as NSExpressionMBS, rightExpression as NSExpressionMBS, modifier as UInt32, type as UInt32, options as UInt32) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a predicate of a given type formed by combining given left and right expressions using a given modifier and options.
**Notes:** LeftExpression: The left hand expression.
rightExpression: The right hand expression.
modifier: The modifier to apply.
type: The predicate operator type.
options: The options to apply (see "NSComparisonPredicate Options"). For no options, pass 0.

Returns a new predicate of type type formed by combining the given left and right expressions using the modifier and options.
Available in Mac OS X v10.4 and later.

### 94.1.8 predicateOperatorType as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the predicate type for the receiver.

### 94.1.9 rightExpression as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the right expression for the receiver, or nil if there is none.

### 94.1.10 Constants

Modifier Type Constants

| Constant | Value | Description |
|---|---|---|
| NSAllPredicateModifier | 1 | A predicate to compare all entries in the destination of a to-many relationship. The left hand side must be a collection. The corresponding predicate compares each value in the left hand side with the right hand side, and returns false when it finds the first mismatch—¬Ä¬îor true if all match.<br>Available in Mac OS X v10.4 and later. |
| NSAnyPredicateModifier | 2 | A predicate to match with any entry in the destination of a to-many relationship.<br>The left hand side must be a collection. The corresponding predicate compares each value in the left hand side against the right hand side and returns true when it finds the first match—or false if no match is found<br>Available in Mac OS X v10.4 and later. |
| NSDirectPredicateModifier | 0 | A predicate to compare directly the left and right hand sides.<br>Available in Mac OS X v10.4 and later. |

Comparison Type Constants

| Constant | Value | Description |
|---|---|---|
| NSBeginsWithPredicateOperatorType | 8 | A begins-with predicate.<br>Available in Mac OS X v10.4 and later. |
| NSBetweenPredicateOperatorType | 100 | A predicate to determine if the right hand side lies at or specified by the left hand side.<br>Returns true if [ lhs between rhs ] ; the right hand side mu which the first element sets the lower bound and the second e inclusive. Comparison is performed using compare: or the equivalent.<br>Available in Mac OS X v10.5 and later. |
| NSContainsPredicateOperatorType | 99 | A predicate to determine if the left hand side contains the r Returns true if [ lhs contains rhs ] ; the left hand side must be object that evaluates to a collection<br>Available in Mac OS X v10.5 and later. |
| NSCustomSelectorPredicateOperatorType | 11 | A predicate that uses a custom selector that takes a single arg a BOOL value.<br>The selector is invoked on the left hand side with the right argument.<br>Available in Mac OS X v10.4 and later. |
| NSEndsWithPredicateOperatorType | 9 | An ends-with predicate.<br>Available in Mac OS X v10.4 and later. |
| NSEqualToPredicateOperatorType | 4 | An equal-to predicate.<br>Available in Mac OS X v10.4 and later. |
| NSGreaterThanOrEqualToPredicateOperatorType | 3 | A greater-than-or-equal-to predicate.<br>Available in Mac OS X v10.4 and later. |
| NSGreaterThanPredicateOperatorType | 2 | A greater-than predicate.<br>Available in Mac OS X v10.4 and later. |
| NSInPredicateOperatorType | 10 | A predicate to determine if the left hand side is in the right For strings, returns true if the left hand side is a substring side . For collections, returns true if the left hand side is in t .<br>Available in Mac OS X v10.4 and later. |
| NSLessThanOrEqualToPredicateOperatorType | 1 | A less-than-or-equal-to predicate.<br>Available in Mac OS X v10.4 and later. |
| NSLessThanPredicateOperatorType | 0 | A less-than predicate.<br>Available in Mac OS X v10.4 and later. |
| NSLikePredicateOperatorType | 7 | A simple subset of the MATCHES predicate, similar in behav<br>Available in Mac OS X v10.4 and later. |
| NSMatchesPredicateOperatorType | 6 | A full regular expression matching predicate.<br>Available in Mac OS X v10.4 and later. |
| NSNotEqualToPredicateOperatorType | 5 | A not-equal-to predicate.<br>Available in Mac OS X v10.4 and later. |

String Comparison Types

| Constant | Value | Description |
|---|---|---|
| NSCaseInsensitivePredicateOption | 1 | A case-insensitive predicate.<br>You represent this option in a predicate format string using a [ c ] follov<br>string operation (for example, ”NeXT” like [ c ] ”next”).<br>Available in Mac OS X v10.4 and later.<br>These options are supported for LIKE as well as all of the equality/comp<br>operators. |
| NSDiacriticInsensitivePredicateOption | 2 | A diacritic-insensitive predicate.<br>You represent this option in a predicate format string using a [ d ] follov<br>string operation (for example, ”na√Øve” like [ d ] ”naive”).<br>Available in Mac OS X v10.4 and later.<br>These options are supported for LIKE as well as all of the equality/comp<br>operators. |
| NSNormalizedPredicateOption | 4 | Indicates that the strings to be compared have been preprocessed.<br>This option supersedes NSCaseInsensitivePredicateOption and NSDiacr<br>sensitivePredicateOption, and is intended as a performance optimizatio<br>tion.<br>You represent this option in a predicate format string using a [ n ] follov<br>string operation (for example, ”WXYZlan” matches [ n ] ”.lan”).<br>Available in Mac OS X v10.7 and later.<br>These options are supported for LIKE as well as all of the equality/comp<br>operators. |

## 94.2 class NSCompoundPredicateMBS

### 94.2.1 class NSCompoundPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** NSCompoundPredicate is a subclass of NSPredicate used to represent logical "gate" operations (AND/OR/NOT) and comparison operations.
**Example:**

```
dim n1 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(true)
dim n2 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(false)

dim n as NSPredicateMBS = NSCompoundPredicateMBS.orPredicateWithSubpredicates(array(n1,n2))
MsgBox n.predicateFormat
```

**Notes:** Comparison operations are based on two expressions, as represented by instances of the NSExpression class. Expressions are created for constant values, key paths, and so on.

In Mac OS X v10.5 and later and in iOS, you can use NSCompoundPredicate to create an AND or OR compound predicate (but not a NOT compound predicate) using an array with 0, 1, or more elements:

- An AND predicate with no subpredicates evaluates to TRUE.
- An OR predicate with no subpredicates evaluates to FALSE.
- A compound predicate with one or more subpredicates evaluates to the truth of its subpredicates.

Subclass of the NSPredicateMBS class.
**Blog Entries**

- More notes
- MBS Real Studio Plugins, version 11.3pr10

### 94.2.2 Methods

### 94.2.3 andPredicateWithSubpredicates(predicates() as NSPredicateMBS) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new predicate formed by AND-ing the predicates in a given array.
**Example:**

```
dim n1 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(true)
dim n2 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(false)

dim n as NSPredicateMBS = NSCompoundPredicateMBS.andPredicateWithSubpredicates(array(n1,n2))

MsgBox n.predicateFormat
```

**Notes:** subpredicates: An array of NSPredicate objects.

Returns a new predicate formed by AND-ing the predicates specified by subpredicates.
An AND predicate with no subpredicates evaluates to TRUE.

### 94.2.4 compoundPredicateType as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the predicate type for the receiver.

### 94.2.5 Constructor(type as Integer, predicates() as NSPredicateMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver initialized to a given type using predicates from a given array.
**Example:**

```
dim n1 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(true)
dim n2 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(false)

dim n as NSPredicateMBS = new NSCompoundPredicateMBS(NSCompoundPredicateMBS.kAnd, array(n1,n2))
MsgBox n.predicateFormat
```

**Notes:** type: The type of the new predicate.
subpredicates: An array of NSPredicate objects.

### 94.2.6 notPredicateWithSubpredicate(predicate as NSPredicateMBS) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new predicate formed by NOT-ing a given predicate.
**Notes:** predicate: A predicate.

Returns a new predicate formed by NOT-ing the predicate specified by predicate.

### 94.2.7 orPredicateWithSubpredicates(predicates() as NSPredicateMBS) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new predicate formed by OR-ing the predicates in a given array.
**Notes:** subpredicates: An array of NSPredicate objects.

Returns a new predicate formed by OR-ing the predicates specified by subpredicates.

An OR predicate with no subpredicates evaluates to FALSE.

### 94.2.8 subpredicates as NSPredicateMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the array of the receiver's subpredicates.
**Example:**

```
dim n1 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(true)
dim n2 as NSPredicateMBS = NSPredicateMBS.predicateWithValue(false)

dim n as new NSCompoundPredicateMBS(NSCompoundPredicateMBS.kAnd, array(n1,n2))

for each x as NSPredicateMBS in n.subpredicates
MsgBox x.predicateFormat
next
```

### 94.2.9 Constants

Compound Predicate Types

| Constant | Value | Description |
|---|---|---|
| kAnd | 1 | A logical AND predicate. |
| kNot | 0 | A logical NOT predicate. |
| kOR | 2 | A logical OR predicate. |

## 94.3 class NSExpressionMBS

### 94.3.1 class NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** NSExpression is used to represent expressions in a predicate.
**Notes:** Comparison operations in an NSPredicate are based on two expressions, as represented by instances of the NSExpression class. Expressions are created for constant values, key paths, and so on.

Generally, anywhere in the NSExpression class hierarchy where there is composite API and subtypes that may only reasonably respond to a subset of that API, invoking a method that does not make sense for that subtype will cause an exception to be thrown.

See NSException class documentation on apple.com.
**Blog Entries**

- More notes
- MBS Real Studio Plugins, version 11.3pr10

### 94.3.2 Methods

### 94.3.3 arguments as Variant()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the arguments for the receiver.
**Example:**

```
dim args() as Variant
args.Append 5.0
dim n as NSExpressionMBS = NSExpressionMBS.expressionForFunction("abs:", args)

// query arguments
dim theargs() as Variant = n.arguments
MsgBox theargs(0)
```

**Notes:** Returns the arguments for the receiver—that is, the array of expressions that will be passed as parameters during invocation of the selector on the operand of a function expression.

This method raises an exception if it is not applicable to the receiver.

### 94.3.4 constantValue as Variant

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the constant value of the receiver.
**Example:**

```
dim n as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(5)
dim v as Variant = n.constantValue
MsgBox v.StringValue // shows 5
```

**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.4 and later.

### 94.3.5 Constructor(Type as Integer)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the receiver with the specified expression type.
**Notes:** Available in Mac OS X v10.4 and later.

### 94.3.6 expressionForAggregate(subexpressions() as NSExpressionMBS) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new aggregate expression for a given collection.
**Notes:** collection: A collection object that contains further expressions.
Returns a new expression that contains the expressions in collection.

### 94.3.7 expressionForConstantValue(value as Variant) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new expression that represents a given constant value.
**Example:**

```
dim n as NSExpressionMBS = NSExpressionMBS.expressionForConstantValue(5)
dim v as Variant = n.constantValue
MsgBox v.StringValue // shows 5
```

**Notes:** obj: The constant value the new expression is to represent.

Returns a new expression that represents the constant value, obj.
Available in Mac OS X v10.4 and later.

### 94.3.8 expressionForEvaluatedObject as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new expression that represents the object being evaluated.
**Notes:** Available in Mac OS X v10.4 and later.

### 94.3.9 expressionForFunction(FunctionName as string, arguments() as Variant) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new expression that will invoke one of the predefined functions.
**Notes:** name: The name of the function to invoke.
parameters: An array containing NSExpression objects that will be used as parameters during the invocation of selector.
For a selector taking no parameters, the array should be empty. For a selector taking one or more parameters, the array should contain one NSExpression object which will evaluate to an instance of the appropriate type for each parameter.
If there is a mismatch between the number of parameters expected and the number you provide during evaluation, an exception may be raised or missing parameters may simply be replaced by nil (which occurs depends on how many parameters are provided, and whether you have over- or underflow).

Returns a new expression that invokes the function name using the parameters in parameters.
The name parameter can be one of the following predefined functions.

See NSExpression class documentation on apple.com for details.

### 94.3.10 expressionForIntersectSet(LeftExpression as NSExpressionMBS, rightExpression as NSExpressionMBS) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new NSExpression object that represent the intersection of a given set and collection.
**Notes:** LeftExpression: An expression that evaluates to an NSSet object.
rightExpression: An expression that evaluates to a collection object (an instance of NSArray, NSSet, or

NSDictionary).

Returns a new NSExpression object that represents the intersection of left and right.
Available in Mac OS X v10.5 and later.

### 94.3.11 expressionForKeyPath(name as string) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new expression that invokes valueForKeyPath: with a given key path.
**Notes:** keyPath: The key path that the new expression should evaluate.

Returns a new expression that invokes valueForKeyPath: with keyPath.
Available in Mac OS X v10.4 and later.

### 94.3.12 expressionForMinusSet(LeftExpression as NSExpressionMBS, rightExpression as NSExpressionMBS) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new NSExpression object that represent the subtraction of a given collection from a given set.
**Notes:** LeftExpression: An expression that evaluates to an NSSet object.
rightExpression: An expression that evaluates to a collection object (an instance of NSArray, NSSet, or NSDictionary).

Returns a new NSExpression object that represents the subtraction of right from left.
Available in Mac OS X v10.5 and later.

### 94.3.13 expressionForUnionSet(LeftExpression as NSExpressionMBS, rightExpression as NSExpressionMBS) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new NSExpression object that represent the union of a given set and collection.
**Notes:** LeftExpression: An expression that evaluates to an NSSet object.
rightExpression: An expression that evaluates to a collection object (an instance of NSArray, NSSet, or NSDictionary).

Returns an new NSExpression object that represents the union of left and right.

Available in Mac OS X v10.5 and later.

### 94.3.14 expressionForVariable(name as string) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a new expression that extracts a value from the variable bindings dictionary for a given key.
**Notes:** name: The key for the variable to extract from the variable bindings dictionary.

Returns a new expression that extracts from the variable bindings dictionary the value for the key string.
Available in Mac OS X v10.4 and later.

### 94.3.15 expressionType as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the expression type for the receiver.
**Example:**

```
dim n as NSExpressionMBS = NSExpressionMBS.expressionForVariable("hello")
MsgBox str(n.expressionType) // = NSVariableExpressionType
```

**Notes:** This method raises an exception if it is not applicable to the receiver.

### 94.3.16 expressionWithFormat(format as string) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates an expression with the given format.
See also:

- 94.3.17 expressionWithFormat(format as string, arguments() as Variant) as NSExpressionMBS 14919

### 94.3.17 expressionWithFormat(format as string, arguments() as Variant) as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates an expression with the given format.
See also:

• 94.3.16 expressionWithFormat(format as string) as NSExpressionMBS 14919

### 94.3.18 functionName as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the function for the receiver.
**Example:**

```
dim args() as Variant
args.Append "World"
args.Append 5.0
dim n as NSExpressionMBS = NSExpressionMBS.expressionForFunction("Hello", args)

MsgBox n.functionName
```

**Notes:** This method raises an exception if it is not applicable to the receiver.

### 94.3.19 keyPath as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the key path for the receiver.
**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.4 and later.

### 94.3.20 leftExpression as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the left expression of an aggregate expression.
**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.5 and later.

### 94.3.21 operand as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the operand for the receiver.
**Notes:** The operand for the receiver—that is, the object on which the selector will be invoked.
The object is the result of evaluating a key path or one of the defined functions. This method raises an

exception if it is not applicable to the receiver.
Available in Mac OS X v10.4 and later.

### 94.3.22 predicate as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Return the predicate of a subquery expression.
**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.5 and later.

### 94.3.23 rightExpression as NSExpressionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the right expression of an aggregate expression.
**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.5 and later.

### 94.3.24 variable as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the variable for the receiver.
**Example:**

```
dim n as NSExpressionMBS = NSExpressionMBS.expressionForVariable("hello")
MsgBox n.variable
```

**Notes:** This method raises an exception if it is not applicable to the receiver.
Available in Mac OS X v10.4 and later.

### 94.3.25 Properties

### 94.3.26 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSExpression object.
**Notes:** (Read and Write property)

### 94.3.27 Constants

Expression Type Constants

| Constant | Value | Description |
|---|---|---|
| NSAggregateExpressionType | 14 | An expression that defines an aggregate of NSExpression objects.<br>Available in Mac OS X v10.5 and later. |
| NSBlockExpressionType | 19 | An expression that uses an Block.<br>Available in Mac OS X v10.6 and later. |
| NSConstantValueExpressionType | 0 | An expression that always returns the same value.<br>Available in Mac OS X v10.4 and later. |
| NSEvaluatedObjectExpressionType | 1 | An expression that always returns the parameter object itself.<br>Available in Mac OS X v10.4 and later. |
| NSFunctionExpressionType | 4 | An expression that returns the result of evaluating a function.<br>Available in Mac OS X v10.4 and later. |
| NSIntersectSetExpressionType | 6 | An expression that creates an intersection of the results of two nested expr<br>sions.<br>Available in Mac OS X v10.5 and later. |
| NSKeyPathExpressionType | 3 | An expression that returns something that can be used as a key path.<br>Available in Mac OS X v10.4 and later. |
| NSMinusSetExpressionType | 7 | An expression that combines two nested expression results by set subtracti<br>Available in Mac OS X v10.5 and later. |
| NSSubqueryExpressionType | 13 | An expression that filters a collection using a subpredicate.<br>Available in Mac OS X v10.5 and later. |
| NSUnionSetExpressionType | 5 | An expression that creates a union of the results of two nested expressions.<br>Available in Mac OS X v10.5 and later. |
| NSVariableExpressionType | 2 | An expression that always returns whatever value is associated with the l<br>specified by ‚Äòvariable' in the bindings dictionary.<br>Available in Mac OS X v10.4 and later. |

## 94.4 class NSFileCoordinatorMBS

### 94.4.1 class NSFileCoordinatorMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The class for file coordinating.
**Notes:** Please also check the documentation from Apple for the NSFileCoordinator class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr10
- MBS Real Studio Plugins, version 13.1pr9
- MBS Real Studio Plugins, version 11.3pr9

### 94.4.2 Methods

### 94.4.3 addFilePresenter(filePresenter as NSFilePresenterMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Adds a new file presenter.
**Notes:** If you invoke addFilePresenter: you have to do a balancing invocation of removeFilePresenter before the file presenter is deallocated, even in a garbage-collected application.

If your application reads an item and then registers a file presenter for it there is a possible race condition in which between those two steps another process does coordinated reading or writing of the item, without any messages sent to your not-quite-registered file presenter. This can leave your file presenter ignorant of the fact that what it knows about the item it just read is already out of date, or under the misconception that just because it hasn't received a relinquish... method it owns the item. To avoid that race condition you can invoke addFilePresenter in the same block that you pass to coordinateReadingItemAtURL to read what the file presenter will present.

### 94.4.4 cancel

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Cancel all invocations of coordinate... and prepare... methods for the receiver.
**Notes:** Any current invocation of one of those methods will stop waiting and return immediately, unless it has already invoked the passed-in block, in which case it will return when the passed-in block returns. Subsequent invocations of those methods will not invoke the blocks passed into them at all. When an invocation of coordinate... or prepare... returns without invoking the passed-in block because this method was invoked it instead returns an error whose domain is NSCocoaErrorDomain and whose code is NSUserCancelledError. Messages that have already been sent to NSFilePresenters will not be cancelled but the file coordination

machinery will stop waiting for the replies.

This method this can be invoked from any thread. It always returns immediately, without waiting for anything. Cancellation is racy; you usually cannot assume that no block passed into a coordinate... or prepare... method is already being invoked, so the code inside those blocks typically still has to check for cancellation, whatever that means in your application.

### 94.4.5 Constructor(filePresenter as NSFilePresenterMBS = nil)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** The designated initializer. If an NSFilePresenter is provided then the receiver is considered to have been created by that NSFilePresenter, or on its behalf.

NSFileCoordinator is meant to be instantiated on a per-file-operation basis, where a file operation is something like the opening or saving of a document, or the copying or moving of a batch of folders and files. There is no benefit to keeping an instance of it alive in your application for much more time than it takes to actually perform the file operation. Doing so can be harmful, or at least wasteful of memory, because NSFileCoordinators may retain NSFilePresenters.

You pass an NSFilePresenter to this initializer when the operation whose file access is to be coordinated is being performed by that NSFilePresenter. Associating an NSFileCoordinator with an NSFilePresenter accomplishes a few important things:
- It prevents the NSFileCoordinator from sending messages to that NSFilePresenter, so the NSFilePresenter does not have to somehow filter out messages about its own file operations. The exception to this rule is that messages about versions of the presented item being added, remove, or resolved during coordinated writing are sent to every relevant NSFilePresenter, even the one passed to Constructor.
- It allows the file coordination mechanism to determine when coordinated writing is being done in response to an NSFilePresenter receiving a savePresentedItemChangesWithCompletionHandler message, and not deadlock. Usually coordinated writing done by one NSFileCoordinator must wait for coordinated reading of the same file or directory done by another NSFileCoordinator. But, for example, when coordinated reading is begun with one NSFileCoordinator, and that causes an NSFilePresenter to do coordinated writing using another NSFileCoordinator, the writing done with the second NSFileCoordinator should not wait for the completion of the first NSFileCoordinator's reading, it should instead happen while the first NSFileCoordinator is waiting to read.
- It allows the file coordination mechanism to handle a race condition that can occur when it has sent an NSFilePresenter a presentedItemDidMoveToURL message in the NSFilePresenter's operation queue but before that message is dequeued the NSFilePresenter enqueues, on a different queue, an operation using the old URL. For this to be effective however the NSFileCoordinator must be initialized in the same operation queue in which NSFilePresenter messages are received.
- It allows the file coordination mechanism to gracefully handle your application's registration of an NSFilePresenter that at first returns nil when sent presentedItemURL but can later return non-nil at the end of doing a coordinated write that creates the presented item in the file system for the very first time. AppKit

for example takes advantage of this by registering brand new untitled NSDocuments as NSFilePresenters immediately, instead of waiting until after the first time the user causes the document to be saved to a file, which would be more complicated.

For example, NSDocument creates a single NSFileCoordinator for all of the coordinated reading and writing it does during the saving of a document. It always creates the NSFileCoordinator in the main queue even when it is doing the actual coordinated reading and writing in a background queue to implement asynchronous saving.

### 94.4.6 coordinateReadingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a read operation on a single file or directory using the specified options.
**Notes:** file: A URL identifying the file or directory to read. If other objects or processes are acting on the item at the URL, the actual URL passed to reader parameter may be different than the one in this parameter. The plugin converts the folderitem to an URL for you.
options: One of the reading options (see constants). If you pass 0 for this parameter, the savePresentedItemChangesWithCompletionHandler method of relevant file presenters is called before your block executes.
Error: If a file presenter encounters an error while preparing for this read operation, that error is returned in this parameter and the block in the reader parameter is not executed. If you cancel this operation before the reader block is executed, this parameter contains an error object on output.

The coordinateReadingItemAtURL event performs the file operations in a coordinated manner. This block receives an url and folderitem of the item and returns no value. Always use the URL/folderitem passed into the event instead of the value in the url parameter.

You use this method to perform read-related operations on a file or directory in a coordinated manner. This method executes synchronously, blocking the current thread until the reader event finishes executing. Before executing that event, though, the file coordinator waits until other relevant file presenter objects finish in-progress actions. Similarly, your read operation may cause pending actions for other file presenters to wait until your operations are complete. Whether or not the file coordinator waits depends on whether the item being read is a file or directory and also depends on other related operations.

If the url parameter specifies a file:

- This method waits for other writers of the exact same file to finish in-progress actions.
- This method waits if the file is a file package and other writers are writing to items in the package directory.
- This method does not wait for other readers of the file.

- This method does not wait for writers that are manipulating the parent directory of the file, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

If the url parameter specifies a directory:

- This method waits if other write operations are occurring on the exact same directory.
- This method does not wait if write operations are occurring on items inside the directory (but not on the directory itself).
- This method does not wait for other readers of the directory.
- This method does not wait for writers that are manipulating the parent directory of the directory, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

This method calls the relinquishPresentedItemToReader method of any relevant file presenters. This method is called both for file presenters in the current process and in other processes. Depending on the options you specify, other methods of the file presenters may also be called. When reading a file package directory, file presenter objects that are currently reading the contents of that file package also receive these notifications. All of the called methods must return successfully before the file coordinator executes your block. If multiple file presenters are operating on the item, the order in which those presenters are notified is undefined.

Do not nest calls to file coordinator methods inside the event. If you call this method or any of the other file coordination methods from inside your event, the file coordinator object throws an exception. If you want to perform a write operation from inside a read block, use the coordinateWritingItemAtURL method instead. If you want to perform a batch read operation on multiple files, use the prepareForReadingItemsAtURLs method.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.22 coordinateReadingItemAtURL(url as string, file as folderitem, tag as Variant) 14937
- 94.4.7 coordinateReadingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14926

### 94.4.7 coordinateReadingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a read operation on a single file or directory using the specified options.
**Notes:** url: A URL identifying the file or directory to read. If other objects or processes are acting on the item at the URL, the actual URL passed to reader parameter may be different than the one in this

parameter.
options: One of the reading options (see constants). If you pass 0 for this parameter, the savePresentedItemChangesWithCompletionHandler method of relevant file presenters is called before your block executes.
Error: If a file presenter encounters an error while preparing for this read operation, that error is returned in this parameter and the block in the reader parameter is not executed. If you cancel this operation before the reader block is executed, this parameter contains an error object on output.

The coordinateReadingItemAtURL event performs the file operations in a coordinated manner. This block receives an url and folderitem of the item and returns no value. Always use the URL/folderitem passed into the event instead of the value in the url parameter.

You use this method to perform read-related operations on a file or directory in a coordinated manner. This method executes synchronously, blocking the current thread until the reader event finishes executing. Before executing that event, though, the file coordinator waits until other relevant file presenter objects finish in-progress actions. Similarly, your read operation may cause pending actions for other file presenters to wait until your operations are complete. Whether or not the file coordinator waits depends on whether the item being read is a file or directory and also depends on other related operations.

If the url parameter specifies a file:

- This method waits for other writers of the exact same file to finish in-progress actions.
- This method waits if the file is a file package and other writers are writing to items in the package directory.
- This method does not wait for other readers of the file.
- This method does not wait for writers that are manipulating the parent directory of the file, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

If the url parameter specifies a directory:

- This method waits if other write operations are occurring on the exact same directory.
- This method does not wait if write operations are occurring on items inside the directory (but not on the directory itself).
- This method does not wait for other readers of the directory.
- This method does not wait for writers that are manipulating the parent directory of the directory, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

This method calls the relinquishPresentedItemToReader method of any relevant file presenters. This method is called both for file presenters in the current process and in other processes. Depending on the options

you specify, other methods of the file presenters may also be called. When reading a file package directory, file presenter objects that are currently reading the contents of that file package also receive these notifications. All of the called methods must return successfully before the file coordinator executes your block. If multiple file presenters are operating on the item, the order in which those presenters are notified is undefined.

Do not nest calls to file coordinator methods inside the event. If you call this method or any of the other file coordination methods from inside your event, the file coordinator object throws an exception. If you want to perform a write operation from inside a read block, use the coordinateWritingItemAtURL method instead. If you want to perform a batch read operation on multiple files, use the prepareForReadingItemsAtURLs method.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.6 coordinateReadingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14925
- 94.4.22 coordinateReadingItemAtURL(url as string, file as folderitem, tag as Variant) 14937

### 94.4.8 coordinateReadingItemAtURLwritingItemAtURL(readingFile as folderitem, readingOptions as Integer, writingItemAtFile as folderitem, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a read operation that contains a follow-up write operation.
**Notes:** readingFile: A URL identifying the file or directory to read. If other objects or processes are acting on the item at the URL, the actual URL passed to the block in the readerWriter parameter may be different than the one in this parameter.
readingOptions: One of the reading options (see constants). If you pass 0 for this parameter, the savePresentedItemChangesWithCompletionHandler: method of relevant file presenters is called before your block executes.
writingItemAtFile: A URL identifying the file or directory to write. If other objects or processes are acting on the item at the URL, the actual URL passed to the block in the readerWriter parameter may be different than the one in this parameter.
writingOptions: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your block.
Error: If a file presenter encounters an error while preparing for this operation, that error is returned in this parameter and the event is not executed. If you cancel this operation before the readerWriter event is executed, this parameter contains an error object on output.

The coordinateReadingItemAtURLwritingItemAtURL event performs the read and write operations in a coordinated manner. This event receives URLs of the items to read and write and returns no value. Always use the URLs passed into the block instead of the values in the readingURL and writingURL parameters.

You use this method to perform a read operation that might also contain a write operation that needs to be coordinated. This method executes synchronously, blocking the current thread until the readerWriter event finishes executing. When performing the write operation, you may call the coordinateWritingItemAtURL method from your readerWriter block. This method does the canonical lock ordering that is required to prevent a potential deadlock of the file operations.

This method makes the same calls to file presenters, and has the same general wait behavior as the coordinateReadingItemAtURL method.

Available in Mac OS X v10.7 and later.
See also:


- 94.4.23 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingFile as folderitem, writingURL as string, writingFile as folderitem, tag as Variant) 14937
- 94.4.9 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingOptions as Integer, writingItemAtURL as string, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14929


### 94.4.9 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingOptions as Integer, writingItemAtURL as string, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a read operation that contains a follow-up write operation.
**Notes:** readingURL: A URL identifying the file or directory to read. If other objects or processes are acting on the item at the URL, the actual URL passed to the block in the readerWriter parameter may be different than the one in this parameter.
readingOptions: One of the reading options (see constants). If you pass 0 for this parameter, the savePresentedItemChangesWithCompletionHandler: method of relevant file presenters is called before your block executes.
writingItemAtURL: A URL identifying the file or directory to write. If other objects or processes are acting on the item at the URL, the actual URL passed to the block in the readerWriter parameter may be different than the one in this parameter.
writingOptions: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your block.
Error: If a file presenter encounters an error while preparing for this operation, that error is returned in this parameter and the event is not executed. If you cancel this operation before the readerWriter event is executed, this parameter contains an error object on output.

The coordinateReadingItemAtURLwritingItemAtURL event performs the read and write operations in a coordinated manner. This event receives URLs of the items to read and write and returns no value. Always use the URLs passed into the block instead of the values in the readingURL and writingURL parameters.

You use this method to perform a read operation that might also contain a write operation that needs to be coordinated. This method executes synchronously, blocking the current thread until the readerWriter event finishes executing. When performing the write operation, you may call the coordinateWritingItemAtURL method from your readerWriter block. This method does the canonical lock ordering that is required to prevent a potential deadlock of the file operations.

This method makes the same calls to file presenters, and has the same general wait behavior as the coordinateReadingItemAtURL method.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.8 coordinateReadingItemAtURLwritingItemAtURL(readingFile as folderitem, readingOptions as Integer, writingItemAtFile as folderitem, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14928
- 94.4.23 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingFile as folderitem, writingURL as string, writingFile as folderitem, tag as Variant) 14937

### 94.4.10 coordinateWritingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a write operation on a single file or directory using the specified options.
**Notes:** File: A URL identifying the file or directory to write. If other objects or processes are acting on the item at the URL, the actual URL passed to writer parameter may be different than the one in this parameter. (plugin converts from folderitem to URL for you)
options: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your coordinateWritingItemAtURL event.
error: If a file presenter encounters an error while preparing for this write operation, that error is returned in this parameter and the event in the writer parameter is not executed. If you cancel this operation before the writer event is executed, this parameter contains an error object on output.

The coordinateWritingItemAtURL event performs the file operations in a coordinated manner. This event receives the file reference containing the URL of the item and returns no value. Always use the UR passed into the block instead of the value in the url parameter.

You use this method to perform write-related operations on a file or directory in a coordinated manner. This method executes synchronously, blocking the current thread until the writer block finishes executing. Before executing the block, though, the file coordinator waits until other relevant file presenter objects finish in-progress actions. Similarly, your write operation may cause pending actions for other file presenters to wait until your operations are complete. Whether or not the file coordinator waits depends on whether the item being written is a file or directory and also depends on other related operations.

If the url parameter specifies a file:

- This method waits for other readers and writers of the exact same file to finish in-progress actions.
- This method waits if the file is a file package and other writers are reading or writing items in the package directory.
- This method does not wait for readers or writers that are manipulating the parent directory of the file, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

If the url parameter specifies a directory:

- This method waits if other read or write operations are occurring on the exact same directory.
- This method does not wait if read or write operations are occurring on items inside the directory (but not on the directory itself).
- This method does not wait for readers or writers that are manipulating the parent directory of the directory, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

This method calls the relinquishPresentedItemToWriter method of any relevant file presenters. This method is called both for file presenters in the current process and in other processes. Depending on the options you specify, other methods of the file presenters may also be called. When writing a file package directory, file presenter objects that are currently reading or writing the contents of that file package also receive these notifications. All of the called methods must return successfully before the file coordinator executes your block. If multiple file presenters are operating on the item, the order in which those presenters are notified is undefined.

Note: When deleting an item inside a file package using the NSFileCoordinatorWritingForDeleting option, the file coordinator does not call the accommodatePresentedItemDeletionWithCompletionHandler method of any file presenters monitoring the file package directory itself. Instead, the delete operation is treated as a write operation on the file package.
With one exception, do not nest calls to file coordinator methods inside the block you pass to this method. You may call the coordinateReadingItemAtURL method to read the file if you discover through modification-date checking that the contents of the file have changed. However, if you call this method from inside your block, the file coordinator object throws an exception.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.24 coordinateWritingItemAtURL(url as string, file as folderitem, tag as Variant) 14938
- 94.4.11 coordinateWritingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14932

### 94.4.11 coordinateWritingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initiates a write operation on a single file or directory using the specified options.
**Notes:** url: A URL identifying the file or directory to write. If other objects or processes are acting on the item at the URL, the actual URL passed to writer parameter may be different than the one in this parameter.
options: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your coordinateWritingItemAtURL event.
error: If a file presenter encounters an error while preparing for this write operation, that error is returned in this parameter and the event in the writer parameter is not executed. If you cancel this operation before the writer event is executed, this parameter contains an error object on output.

The coordinateWritingItemAtURL event performs the file operations in a coordinated manner. This event receives the file reference containing the URL of the item and returns no value. Always use the UR passed into the block instead of the value in the url parameter.

You use this method to perform write-related operations on a file or directory in a coordinated manner. This method executes synchronously, blocking the current thread until the writer block finishes executing. Before executing the block, though, the file coordinator waits until other relevant file presenter objects finish in-progress actions. Similarly, your write operation may cause pending actions for other file presenters to wait until your operations are complete. Whether or not the file coordinator waits depends on whether the item being written is a file or directory and also depends on other related operations.

If the url parameter specifies a file:

- This method waits for other readers and writers of the exact same file to finish in-progress actions.
- This method waits if the file is a file package and other writers are reading or writing items in the package directory.
- This method does not wait for readers or writers that are manipulating the parent directory of the file, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

If the url parameter specifies a directory:

- This method waits if other read or write operations are occurring on the exact same directory.
- This method does not wait if read or write operations are occurring on items inside the directory (but not on the directory itself).

- This method does not wait for readers or writers that are manipulating the parent directory of the directory, unless one of those writers specified the NSFileCoordinatorWritingForDeleting or NSFileCoordinatorWritingForMoving option.

This method calls the relinquishPresentedItemToWriter method of any relevant file presenters. This method is called both for file presenters in the current process and in other processes. Depending on the options you specify, other methods of the file presenters may also be called. When writing a file package directory, file presenter objects that are currently reading or writing the contents of that file package also receive these notifications. All of the called methods must return successfully before the file coordinator executes your block. If multiple file presenters are operating on the item, the order in which those presenters are notified is undefined.

Note: When deleting an item inside a file package using the NSFileCoordinatorWritingForDeleting option, the file coordinator does not call the accommodatePresentedItemDeletionWithCompletionHandler method of any file presenters monitoring the file package directory itself. Instead, the delete operation is treated as a write operation on the file package.
With one exception, do not nest calls to file coordinator methods inside the block you pass to this method. You may call the coordinateReadingItemAtURL method to read the file if you discover through modification-date checking that the contents of the file have changed. However, if you call this method from inside your block, the file coordinator object throws an exception.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.10 coordinateWritingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14930

- 94.4.24 coordinateWritingItemAtURL(url as string, file as folderitem, tag as Variant) 14938

### 94.4.12 filePresenters as NSFilePresenterMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The process' file presenters.

### 94.4.13 FileURL(file as folderitem) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Convenience method to give you an URL for a folderitem.

### 94.4.14 itemAtURLdidMoveToURL(oldURL as string, newURL as string)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Announce that the item located by a URL is now located by another URL.
**Notes:** This triggers the sending of messages to NSFilePresenters that implement the corresponding optional methods, even those in other processes, except the one specified when -initWithFilePresenter: was invoked:
- presentedItemDidMoveToURL: is sent to NSFilePresenters of the item.
- If the item is a directory then presentedItemDidMoveToURL is sent to NSFilePresenters of each item contained by it.
- presentedSubitemAtURL is sent to NSFilePresenters of each directory that contains the item, unless that method is not implemented but presentedItemDidChange is, and the directory is actually a file package, in which case presentedItemDidChange is sent instead.

Useless invocations of this method are harmless, so you don't have to write code that compares NSURLs for equality, which is not straightforward. This method must be invoked from within the block passed to an invocation of coordinateWritingItemAtURL.

### 94.4.15 itemAtURLwillMoveToURL(oldURL as string, newURL as string)

MBS MacCloud Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Announce that the item located by a URL is going to be located by another URL.
**Notes:** Support for App Sandbox on OS X. Some applications can rename files while saving them. For example, when a user adds attachments to a rich text document, TextEdit changes the document's extension from .rtf to .rtfd. A sandboxed application like TextEdit must ordinarily prompt the user for approval before renaming a document. You can invoke this method to make your process declare its intent to rename a document without user approval. After the renaming succeeds you must invoke itemAtURLdidMoveToURL, with the same arguments, for the process to keep access to the file with its new name and to give up access to any file that appears with the old name. If the renaming fails you should probably not invoke itemAtURLwillMoveToURL.

There is no reason to invoke this method from applications that do not use App Sandbox. Invoking it does nothing on iOS.

### 94.4.16 prepareForReadingItemsAtURLs(readingFiles() as folderitem, readingOptions as Integer, writingItemsAtFiles() as folderitem, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Prepare to read or write from multiple files in a single batch operation.

**Notes:** readingFiles: An array of folderitems identifying the items you want to read.
readingOptions: One of the reading options (see constants). If you pass 0 for this parameter, the savePresentedItemChangesWithCompletionHandler method of relevant file presenters is called before the prepareComplete event executes.
writingItemsAtFiles: An array of folderitems identifying the items you want to write.
writingOptions: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your block.

Error: If a file presenter encounters an error while preparing for this operation, that error is returned in this parameter and the block in the writer parameter is not executed. If you cancel this operation before the batchAccessor block is executed, this parameter contains an error object on output.

The prepareComplete event is called and receives a completion handler that it must execute when it has finished its read and write calls.

You use this method to prepare the file coordinator for multiple read and write operations. This method executes synchronously, blocking the current thread until the prepareComplete event finishes executing. The event does not perform the actual operations itself but calls the coordinateReadingItemAtURL and coordinateWritingItemAtURL methods to perform them. The reason to call this method first is to improve performance when reading and writing large numbers of files or directories.

Because file coordination requires interprocess communication, it is much more efficient to batch changes to large numbers of files and directories than to change each item individually. The file coordinator uses the values in the readingURLs and writingURLs parameters together with reading and writing options to prepare any relevant file presenters for the upcoming operations. Specifically, it uses these parameters in the same way as the coordinateReadingItemAtURL and coordinateWritingItemAtURL methods to determine which file presenter methods to call.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.17 prepareForReadingItemsAtURLs(readingURLs() as string, readingOptions as Integer, writingItemsAtURLs() as string, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14935

### 94.4.17 prepareForReadingItemsAtURLs(readingURLs() as string, readingOptions as Integer, writingItemsAtURLs() as string, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Prepare to read or write from multiple files in a single batch operation.
**Notes:** readingURLs: An array of url strings identifying the items you want to read.
readingOptions: One of the reading options (see constants). If you pass 0 for this parameter, the savePre-

sentedItemChangesWithCompletionHandler method of relevant file presenters is called before the prepareComplete event executes.
writingItemsAtURLs: An array of url strings identifying the items you want to write.
writingOptions: One of the writing options (see constants). The options you specify partially determine how file presenters are notified and how this file coordinator object waits to execute your block.

Error: If a file presenter encounters an error while preparing for this operation, that error is returned in this parameter and the block in the writer parameter is not executed. If you cancel this operation before the batchAccessor block is executed, this parameter contains an error object on output.

The prepareComplete event is called and receives a completion handler that it must execute when it has finished its read and write calls.

You use this method to prepare the file coordinator for multiple read and write operations. This method executes synchronously, blocking the current thread until the prepareComplete event finishes executing. The event does not perform the actual operations itself but calls the coordinateReadingItemAtURL and coordinateWritingItemAtURL methods to perform them. The reason to call this method first is to improve performance when reading and writing large numbers of files or directories.

Because file coordination requires interprocess communication, it is much more efficient to batch changes to large numbers of files and directories than to change each item individually. The file coordinator uses the values in the readingURLs and writingURLs parameters together with reading and writing options to prepare any relevant file presenters for the upcoming operations. Specifically, it uses these parameters in the same way as the coordinateReadingItemAtURL and coordinateWritingItemAtURL methods to determine which file presenter methods to call.

Available in Mac OS X v10.7 and later.
See also:

- 94.4.16 prepareForReadingItemsAtURLs(readingFiles() as folderitem, readingOptions as Integer, writingItemsAtFiles() as folderitem, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14934

### 94.4.18 removeFilePresenter(filePresenter as NSFilePresenterMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Removes the file presenter.

### 94.4.19 Properties

### 94.4.20 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSFileCoordinator object.
**Notes:** (Read and Write property)

### 94.4.21 Events

### 94.4.22 coordinateReadingItemAtURL(url as string, file as folderitem, tag as Variant)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The event called from coordinateReadingItemAtURL method.
**Notes:** The plugin provides the URL and for your convenience a folderitem.
See also:

- 94.4.6 coordinateReadingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14925
- 94.4.7 coordinateReadingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14926

### 94.4.23 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingFile as folderitem, writingURL as string, writingFile as folderitem, tag as Variant)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The event called from coordinateReadingItemAtURLwritingItemAtURL method.
**Notes:** The plugin provides the URLs and for your convenience also folderitems.
See also:

- 94.4.8 coordinateReadingItemAtURLwritingItemAtURL(readingFile as folderitem, readingOptions as Integer, writingItemAtFile as folderitem, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14928
- 94.4.9 coordinateReadingItemAtURLwritingItemAtURL(readingURL as string, readingOptions as Integer, writingItemAtURL as string, writingOptions as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14929

### 94.4.24 coordinateWritingItemAtURL(url as string, file as folderitem, tag as Variant)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The event called from coordinateWritingItemAtURL method.
**Notes:** The plugin provides the URL and for your convenience a folderitem.
See also:

- 94.4.10 coordinateWritingItemAtURL(File as folderitem, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14930

- 94.4.11 coordinateWritingItemAtURL(URL as string, options as Integer, byref error as NSErrorMBS, tag as Variant = nil) 14932

### 94.4.25 prepareComplete(Complete as NSFilePresenterHandlerMBS, tag as Variant)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** This event is called by prepareForReadingItemsAtURLs.
**Notes:** You must call the complete handler when you are done.

### 94.4.26 Constants

Reading flag constants.

| Constant | Value | Description |
|---|---|---|
| NSFileCoordinatorReadingResolvesSymbolicLink | 2 | Whether reading of an item that might be a symbolic link fil olution of the link if it is. This affects the URL passed to the an invocation of one of the coordinateReadingItemAtURL... not a valid option to use with prepareForReadingItemsAtURI |
| NSFileCoordinatorReadingWithoutChanges | 1 | Whether reading does _not_ trigger sending of sav ChangesWithCompletionHandler to certain NSFilePresenter and waiting for those NSFilePresenters to respond. The defau ing coordinated reading is to send savePresentedItemChangesV Handler to NSFilePresenters. |

Writing flag constants.

| Constant | Value | Description |
|---|---|---|
| NSFileCoordinatorWritingForDeleting | 1 | Whether the writing to be done is actually the deletion of the item. T fects how the writing waits for previously scheduled coordinated readi writing, how the writing causes subsequently scheduled reading and to wait, and what NSFilePresenter messaging is done. See the comm the Single File Coordination section below. This option is how you sending of accommodatePresentedItemDeletionWithCompletionHandle commodatePresentedSubitemDeletionAtURL messages to NSFilePrese For example, Finder uses this when it's emptying the trash to give N resenters a chance to close documents before their files disappear, or disappear if the files weren't still open. |
| NSFileCoordinatorWritingForMerging | 4 | Whether coordinated writing triggers sending of savePresente ChangesWithCompletionHandler to certain NSFilePresenters in the and waiting for those NSFilePresenters to respond. |
| NSFileCoordinatorWritingForMoving | 2 | Whether the writing to be done is actually the moving or renaming of th This affects how the writing waits for previously scheduled coordinated and writing, how the writing causes subsequently scheduled reading and to wait, and what NSFilePresenter messaging is done. See the comment Single File Coordination section below. This option has no effect when being moved is a plain file so you can use it in code that moves file items without checking whether the items are files or directories. A check would invite a race condition anyway. For example, Finder uses this when it's moving items that the user has and dropped so as not to yank files contained by moved folders out fr derneath applications that are reading or writing those files. |
| NSFileCoordinatorWritingForReplacing | 8 | Whether the writing to be done is actually the replacement of the ite a different item. It causes the same behavior as NSFileCoordinatorW ForDeleting except that when the item being written to is renamed or while the writer is being made to wait the item is considered to have different item, so the writer is not passed an updated URL to reflect the ing or moving. Use this when the moving or creation of an item will any item that gets in its way. To avoid a race condition use it regar whether there is actually an item in the way before the writing begins. use this when simply updating the contents of a file, even if the way that is writing the contents to another file and renaming it into place. not a valid option to use with prepareForReadingItemsAtURLs. For example, NSDocument uses this for NSSaveAsOperation and NSS Operation to announce that it is possibly overwriting an item with a new file or file package. This gives any NSFilePresenter of the over item, including perhaps a different instance of NSDocument, perhaps same application, a chance to close itself before the item is overwritten For another example, the most accurate and safe way to coordinate a to invoke coordinateWritingItemAtURL using the NSFileCoordinatorW ForMoving option with the source URL and NSFileCoordinatorWriting placing with the destination URL. |

## 94.5 class NSFileManagerMBS

### 94.5.1 class NSFileManagerMBS

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The NSFileManager class enables you to perform many generic file-system operations and insulates an application from the underlying file system.
**Notes:** In Xojo you can do the same with folderitem. But for some iCloud related tasks you need to use this class.

In Cocoa applications, a file manager object is usually your first interaction with the file system. You use this object to locate, create, copy, and move files and directories. You also use this object to get information about files and directories, such as its size, modification date, and BSD permissions. You can also use a file manager object to change the values of many file and directory attributes.

The NSFileManagerMBS class supports both the folderitem and path string as ways to specify the location of a file or directory. The use of the folderitem is generally preferred for specifying file-system items because they can convert path information to a more efficient representation internally. You can also obtain a bookmark from an folderitem, which is similar to an alias and offers a more sure way of locating the file or directory later.

In iOS 5.0 and later and in Mac OS X v10.7 and later, NSFileManager includes methods for managing items stored in the cloud. Files and directories tagged for cloud storage are synced to the user's MobileMe account so that they can be made available to the user's iOS devices and Macintosh computers. Changes to an item in one location are propagated to all other locations to ensure the items stay in sync.
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- 17.5, page 10: News

### 94.5.2 Methods

### 94.5.3 attributesOfFileSystemForPath(item as folderitem, byref error as NSErrorMBS) as Dictionary

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns a dictionary that describes the attributes of the mounted file system on which a given path resides.
**Notes:** path: A folderitem pointing to the mounted file system.
error: On input, a pointer to an error object. If an error occurs, this pointer is set to an actual error object containing the error information. You may specify nil for this parameter if you do not want the error information.

Returns an Dictionary object that describes the attributes of the mounted file system on which path resides, or nil if an error occurs. See File-System Attribute Keys for a description of the keys available in the dictionary.
See also:

- 94.5.4 attributesOfFileSystemForPath(path as string, byref error as NSErrorMBS) as Dictionary 14941

### 94.5.4 attributesOfFileSystemForPath(path as string, byref error as NSErrorMBS) as Dictionary

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns a dictionary that describes the attributes of the mounted file system on which a given path resides.
**Notes:** path: Any pathname within the mounted file system.
error: On input, a pointer to an error object. If an error occurs, this pointer is set to an actual error object containing the error information. You may specify nil for this parameter if you do not want the error information.

Returns an Dictionary object that describes the attributes of the mounted file system on which path resides, or nil if an error occurs. See File-System Attribute Keys for a description of the keys available in the dictionary.
See also:

- 94.5.3 attributesOfFileSystemForPath(item as folderitem, byref error as NSErrorMBS) as Dictionary 14941

### 94.5.5 attributesOfItemAtPath(item as folderitem, byref error as NSErrorMBS) as Dictionary

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the attributes of the item at a given path.
**Example:**

```
dim n as new NSFileManagerMBS
dim e as NSErrorMBS
dim d as Dictionary = n.attributesOfItemAtPath(SpecialFolder.Desktop, e)

break // check dictionary in debugger
```

**Notes:** item: The folderitem of a file or directory.
Error: If an error occurs, this is set to an actual error object containing the error information.

Return a Dictionary object that describes the attributes (file, directory, symlink, and so on) of the file specified by path. The keys in the dictionary are described in File Attribute Keys. (see NSFile* methods)

Special Considerations
This method does not traverse symbolic links. If the item at the path is a symbolic link—that is, the value of the NSFileType key in the attributes dictionary is NSFileTypeSymbolicLink—you can use the destinationOfSymbolicLinkAtPath method to retrieve the path of the item pointed to by the link. You can also use the stringByResolvingSymlinksInPath method of NSString to resolve links in the path before retrieving the item's attributes.

Available in Mac OS X v10.5 and later.
See also:

- 94.5.6 attributesOfItemAtPath(path as string, byref error as NSErrorMBS) as Dictionary 14942

### 94.5.6 attributesOfItemAtPath(path as string, byref error as NSErrorMBS) as Dictionary

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Returns the attributes of the item at a given path.
**Notes:** path: The path of a file or directory.
Error: If an error occurs, this is set to an actual error object containing the error information.

Return a Dictionary object that describes the attributes (file, directory, symlink, and so on) of the file specified by path. The keys in the dictionary are described in File Attribute Keys. (see NSFile* methods)

Special Considerations
This method does not traverse symbolic links. If the item at the path is a symbolic link—that is, the value of the NSFileType key in the attributes dictionary is NSFileTypeSymbolicLink—you can use the destinationOfSymbolicLinkAtPath method to retrieve the path of the item pointed to by the link. You can also use

the stringByResolvingSymlinksInPath method of NSString to resolve links in the path before retrieving the item's attributes.

Available in Mac OS X v10.5 and later.
See also:

- 94.5.5 attributesOfItemAtPath(item as folderitem, byref error as NSErrorMBS) as Dictionary 14941

### 94.5.7 changeCurrentDirectory(folder as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Changes the path of the current working directory to the specified path.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Applications
if m.changeCurrentDirectory(f) then
MsgBox m.currentDirectory.NativePath
end if
```

**Notes:** folder: The path of the directory to which to change.

Returns true if successful, otherwise false.

All relative pathnames refer implicitly to the current working directory. Changing the current working directory affects only paths created in the current process.
See also:

- 94.5.8 changeCurrentDirectory(path as string) as boolean 14943

### 94.5.8 changeCurrentDirectory(path as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Changes the path of the current working directory to the specified path.
**Example:**

```
dim m as new NSFileManagerMBS
if m.changeCurrentDirectory("/Users") then
MsgBox m.currentDirectoryPath
end if
```

**Notes:** path: The path of the directory to which to change.

Returns true if successful, otherwise false.

All relative pathnames refer implicitly to the current working directory. Changing the current working directory affects only paths created in the current process.
See also:

- 94.5.7 changeCurrentDirectory(folder as folderitem) as boolean 14943

### 94.5.9 Constructor

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 94.5.10 containerFolderForSecurityApplicationGroupIdentifier(groupIdentifier as string) as folderItem

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns the container directory associated with the specified security application group ID.
**Notes:** As explained in App Sandbox Design Guide, groups of sandboxed apps that need to share files and other information can request a container directory as part of their entitlements. These directories are stored in
textasciitilde /Library/Group Containers/.

When called with a valid group identifier, this method returns the location of that directory as an folderitem. This method also creates the directory if it does not yet exist.

Important: Your app must have a com.apple.security.application-groups entitlement for the specified application group.

Available in OS X v10.8 and later.

### 94.5.11 containerURLForSecurityApplicationGroupIdentifier(groupIdentifier as string) as string

MBS MacCocoa Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns the container directory associated with the specified security application group ID.
**Notes:** As explained in App Sandbox Design Guide, groups of sandboxed apps that need to share files and other information can request a container directory as part of their entitlements. These directories are stored in
textasciitilde /Library/Group Containers/.

When called with a valid group identifier, this method returns the location of that directory as an URL. This method also creates the directory if it does not yet exist.

Important: Your app must have a com.apple.security.application-groups entitlement for the specified application group.

Available in OS X v10.8 and later.

### 94.5.12 contentsEqual(path1 as folderitem, path2 as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the files or directories in specified paths have the same contents.
**Notes:** path1: The path of a file or directory to compare with the contents of path2.
path2: The path of a file or directory to compare with the contents of path1.

Returns true if file or directory specified in path1 has the same contents as that specified in path2, otherwise false.

If path1 and path2 are directories, the contents are the list of files and subdirectories each contains—contents of subdirectories are also compared. For files, this method checks to see if they,Äôre the same file, then compares their size, and finally compares their contents. This method does not traverse symbolic links, but compares the links themselves.

### 94.5.13 copyItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Copies the item at the specified path to a new location synchronously.
**Notes:** Source: The path to the file or directory you want to move.
Dest: The path at which to place the copy of srcPath. This path must include the name of the file or directory in its new location.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was copied successfully or the file manager's delegate aborted the operation deliberately. Returns false if an error occurred.

When copying items, the current process must have permission to read the file or directory at Source and write the parent directory of Dest. If the item at Source is a directory, this method copies the directory and all of its contents, including any hidden files. If a file with the same name already exists at Dest, this method aborts the copy attempt and returns an appropriate error. If the last component of srcPath is a symbolic link, only the link is copied to the new path.

Available in OS X v10.5 and later.
See also:

- 94.5.14 copyItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean 14946

### 94.5.14 copyItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 19.5, Platform: macOS, Targets: All.

**Function:** Copies the item at the specified path to a new location synchronously.
**Notes:** Source: The path to the file or directory you want to move.
Dest: The path at which to place the copy of srcPath. This path must include the name of the file or directory in its new location.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was copied successfully or the file manager's delegate aborted the operation deliberately. Returns false if an error occurred.

When copying items, the current process must have permission to read the file or directory at Source and write the parent directory of Dest. If the item at Source is a directory, this method copies the directory and all of its contents, including any hidden files. If a file with the same name already exists at Dest, this method aborts the copy attempt and returns an appropriate error. If the last component of srcPath is a symbolic link, only the link is copied to the new path.

Available in OS X v10.5 and later.
See also:

- 94.5.13 copyItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean 14945

### 94.5.15 copyItemMT(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.2, Platform: macOS, Targets: All.

**Function:** Copies the item at the specified path to a new location synchronously.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim d as FolderItem = SpecialFolder.Desktop.Child("output.rtf")
dim e as NSErrorMBS

if not NSFileManagerMBS.defaultManager.copyItemMT(f,d,e) then
MsgBox e.LocalizedDescription
else
MsgBox "OK"
end if
```

**Notes:** Source: The path to the file or directory you want to move.
Dest: The path at which to place the copy of srcPath. This path must include the name of the file or directory in its new location.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was copied successfully or the file manager's delegate aborted the operation deliberately. Returns false if an error occurred.

When copying items, the current process must have permission to read the file or directory at Source and write the parent directory of Dest. If the item at Source is a directory, this method copies the directory and all of its contents, including any hidden files. If a file with the same name already exists at Dest, this method aborts the copy attempt and returns an appropriate error. If the last component of srcPath is a symbolic link, only the link is copied to the new path.

Available in OS X v10.5 and later.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 94.5.16 copyItemMT(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean 14948

### 94.5.16 copyItemMT(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 19.5, Platform: macOS, Targets: All.

**Function:** Copies the item at the specified path to a new location synchronously.
**Notes:** Source: The path to the file or directory you want to move.
Dest: The path at which to place the copy of srcPath. This path must include the name of the file or directory in its new location.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was copied successfully or the file manager's delegate aborted the operation deliberately. Returns false if an error occurred.

When copying items, the current process must have permission to read the file or directory at Source and write the parent directory of Dest. If the item at Source is a directory, this method copies the directory and all of its contents, including any hidden files. If a file with the same name already exists at Dest, this method aborts the copy attempt and returns an appropriate error. If the last component of srcPath is a symbolic link, only the link is copied to the new path.

Available in OS X v10.5 and later.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 94.5.15 copyItemMT(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean 14947

### 94.5.17 createDirectory(Path as folderItem, createIntermediates as boolean = true, attrs as Dictionary = nil, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a directory with given attributes at the specified path.
**Notes:** path: A folderitme identifying the directory to create. You may specify a full path or a path that is relative to the current working directory. This parameter must not be nil.
createIntermediates: If true, this method creates any non-existent parent directories as part of creating the directory in path. If NO, this method fails if any of the intermediate parent directories does not exist. This method also fails if any of the intermediate path elements corresponds to a file and not a directory.
attributes: The file attributes for the new directory and any newly created intermediate directories. You can set the owner and group numbers, file permissions, and modification date. If you specify nil for this parameter or omit a particular value, one or more default values are used as described in the discussion. For a list of keys you can include in this dictionary, see Constants. Some of the keys, such as NSFileHFSCreatorCode

and NSFileHFSTypeCode, do not apply to directories.
error: If an error occurs, this variable is set to an actual error object containing the error information.

Returns true if the directory was created, true if createIntermediates is set and the directory already exists, or false if an error occurred.

If you specify nil for the attributes parameter, this method uses a default set of values for the owner, group, and permissions of any newly created directories in the path. Similarly, if you omit a specific attribute, the default value is used. The default values for newly created directories are as follows:

- Permissions are set according to the umask of the current process. For more information, see umask.
- The owner ID is set to the effective user ID of the process.
- The group ID is set to that of the parent directory.

See also:

- 94.5.18 createDirectory(Path as String, createIntermediates as boolean = true, attrs as Dictionary = nil, byref error as NSErrorMBS) as boolean 14949

### 94.5.18 createDirectory(Path as String, createIntermediates as boolean = true, attrs as Dictionary = nil, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a directory with given attributes at the specified path.
**Notes:** path: A path string identifying the directory to create. You may specify a full path or a path that is relative to the current working directory. This parameter must not be nil.
createIntermediates: If true, this method creates any non-existent parent directories as part of creating the directory in path. If NO, this method fails if any of the intermediate parent directories does not exist. This method also fails if any of the intermediate path elements corresponds to a file and not a directory.
attributes: The file attributes for the new directory and any newly created intermediate directories. You can set the owner and group numbers, file permissions, and modification date. If you specify nil for this parameter or omit a particular value, one or more default values are used as described in the discussion. For a list of keys you can include in this dictionary, see Constants. Some of the keys, such as NSFileHFSCreatorCode and NSFileHFSTypeCode, do not apply to directories.
error: If an error occurs, this variable is set to an actual error object containing the error information.

Returns true if the directory was created, true if createIntermediates is set and the directory already exists, or false if an error occurred.

If you specify nil for the attributes parameter, this method uses a default set of values for the owner, group, and permissions of any newly created directories in the path. Similarly, if you omit a specific attribute, the

default value is used. The default values for newly created directories are as follows:

- Permissions are set according to the umask of the current process. For more information, see umask.
- The owner ID is set to the effective user ID of the process.
- The group ID is set to that of the parent directory.

See also:

- 94.5.17 createDirectory(Path as folderItem, createIntermediates as boolean = true, attrs as Dictionary = nil, byref error as NSErrorMBS) as boolean 14948

### 94.5.19 createFile(Path as folderItem, contents as MemoryBlock, attrs as Dictionary = nil) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a file with the specified content and attributes at the given location.
**Notes:** path: The folderitem for the new file.
contents: A data object containing the contents of the new file.
attributes: A dictionary containing the attributes to associate with the new file. You can use these attributes to set the owner and group numbers, file permissions, and modification date. For a list of keys, see NSFileAttributeKey. If you specify nil for attributes, the file is created with a set of default attributes.

Returns true if the operation was successful or if the item already exists, otherwise false.

If you specify nil for the attributes parameter, this method uses a default set of values for the owner, group, and permissions of any newly created directories in the path. Similarly, if you omit a specific attribute, the default value is used. The default values for newly created files are as follows:

- Permissions are set according to the umask of the current process. For more information, see umask.
- The owner ID is set to the effective user ID of the process.
- The group ID is set to that of the parent directory.

If a file already exists at path, this method overwrites the contents of that file if the current process has the appropriate privileges to do so.
See also:

- 94.5.20 createFile(Path as String, contents as MemoryBlock, attrs as Dictionary = nil) as boolean 14951

### 94.5.20 createFile(Path as String, contents as MemoryBlock, attrs as Dictionary = nil) as boolean

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a file with the specified content and attributes at the given location.
**Notes:** path: The path for the new file.
contents: A data object containing the contents of the new file.
attributes: A dictionary containing the attributes to associate with the new file. You can use these attributes to set the owner and group numbers, file permissions, and modification date. For a list of keys, see NSFileAttributeKey. If you specify nil for attributes, the file is created with a set of default attributes.

Returns true if the operation was successful or if the item already exists, otherwise false.

If you specify nil for the attributes parameter, this method uses a default set of values for the owner, group, and permissions of any newly created directories in the path. Similarly, if you omit a specific attribute, the default value is used. The default values for newly created files are as follows:

- Permissions are set according to the umask of the current process. For more information, see umask.
- The owner ID is set to the effective user ID of the process.
- The group ID is set to that of the parent directory.

If a file already exists at path, this method overwrites the contents of that file if the current process has the appropriate privileges to do so.
See also:

- 94.5.19 createFile(Path as folderItem, contents as MemoryBlock, attrs as Dictionary = nil) as boolean 14950

### 94.5.21 createSymbolicLink(file as folderitem, destFile as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates a symbolic link at the specified URL that points to an item at the given URL.
**Example:**

```
dim m as new NSFileManagerMBS
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim error as NSErrorMBS

if m.createSymbolicLink(file, destfile, error) then
MsgBox "OK"
```

```
else
MsgBox "Error: "+error.localizedDescription
end if
```

**Notes:** file: The path at which to create the new symbolic link. The last path component is used as the name of the link.
destFile: The path that contains the item to be pointed to by the link. In other words, this is the destination of the link.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true if the symbolic link was created or false if an error occurred. This method also returns false if a file, directory, or link already exists at path.

This method does not traverse symbolic links contained in either path or destPath.

Available in Mac OS X v10.5 and later.
As of Mac OS X 10.7 tests here, it seems like an alias file is created, not a symbolic link.
See also:

- 94.5.22 createSymbolicLink(path as string, destPath as string, byref error as NSErrorMBS) as boolean 14952

### 94.5.22 createSymbolicLink(path as string, destPath as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates a symbolic link that points to the specified destination.
**Notes:** path: The path at which to create the new symbolic link. The last path component is used as the name of the link.
destPath: The path that contains the item to be pointed to by the link. In other words, this is the destination of the link.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns true if the symbolic link was created or false if an error occurred. This method also returns false if a file, directory, or link already exists at path.

This method does not traverse symbolic links contained in either path or destPath.

Available in Mac OS X v10.5 and later.
As of Mac OS X 10.7 tests here, it seems like an alias file is created, not a symbolic link.
See also:

- 94.5.21 createSymbolicLink(file as folderitem, destFile as folderitem, byref error as NSErrorMBS) as boolean 14951


### 94.5.23 destinationOfSymbolicLinkAtPath(file as folderitem, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the path of the item pointed to by a symbolic link.
**Notes:** file: The folderitem of a file or directory. Be aware that Xojo may already have resolved the symlink!
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns a string containing the path of the directory or file to which the symbolic link path refers, or "" upon failure. If the symbolic link is specified as a relative path, that relative path is returned.
See also:


- 94.5.24 destinationOfSymbolicLinkAtPath(path as string, byref error as NSErrorMBS) as string 14953


### 94.5.24 destinationOfSymbolicLinkAtPath(path as string, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 16.5, Platform: macOS, Targets: All.

**Function:** Returns the path of the item pointed to by a symbolic link.
**Example:**

```
dim f as new NSFileManagerMBS
dim e as NSErrorMBS

dim p as string = f.destinationOfSymbolicLinkAtPath("/tmp", e)

if e = nil then
MsgBox p
else
MsgBox e.LocalizedDescription
end if
```

**Notes:** path: The path of a file or directory.
error: If an error occurs, upon return contains an NSError object that describes the problem.

Returns a string containing the path of the directory or file to which the symbolic link path refers, or "" upon failure. If the symbolic link is specified as a relative path, that relative path is returned.
See also:

- 94.5.23 destinationOfSymbolicLinkAtPath(file as folderitem, byref error as NSErrorMBS) as string 14953

### 94.5.25 displayName(path as folderitem) as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the display name of the file or directory at a specified path.
**Notes:** path: The path of a file or directory.

The name of the file or directory at path in a localized form appropriate for presentation to the user. If there is no file or directory at path, or if an error occurs, returns path as is.

Display names are user-friendly names for files. They are typically used to localize standard file and directory names according to the user's language settings. They may also reflect other modifications, such as the removal of filename extensions. Such modifications are used only when displaying the file or directory to the user and do not reflect the actual path to the item in the file system. For example, if the current user's preferred language is French, the following code fragment logs the name Biblioth√®que and not the name Library, which is the actual name of the directory.

### 94.5.26 evictUbiquitousItem(item as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Removes the local copy of the specified cloud-based item.
**Notes:** item: Specify the file or directory in iCloud storage.
error: If an error occurs, this pointer is set to an NSError object containing information about the error.

Returns true if the local item was removed successfully or false if it was not. If false is returned, an NSError object describing the error is returned in the error parameter.

This method does not remove the item from the cloud. It removes only the local version. You can use this method to force iCloud to download a new version of the file or directory from the server.

To delete a file permanently from the user's iCloud storage, use the regular NSFileManager routines for deleting files and directories. Remember that deleting items from iCloud cannot be undone. Once deleted, the item is gone forever.

Available in Mac OS X v10.7 and later.

### 94.5.27 fileExists(path as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a file or directory exists at a specified path.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "File exists: "+str(m.fileExists(f))
```

**Notes:** path: The path of the file or directory. I

Returns true if a file at the specified path exists or false if the file's does not exist or its existence could not be determined.

If the file at path is inaccessible to your application, perhaps because one or more parent directories are inaccessible, this method returns false. If the final element in path specifies a symbolic link, this method traverses the link and returns true or false based on the existence of the file at the link destination.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide.
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/RaceConditions.html#//apple_ref/doc/uid/TP40002585
See also:

- 94.5.28 fileExists(path as folderitem, byref isDirectory as boolean) as boolean 14955

### 94.5.28 fileExists(path as folderitem, byref isDirectory as boolean) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether a file or directory exists at a specified path.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop

dim directory as Boolean
MsgBox "File exists: "+str(m.fileExists(f, directory))+" and is Directory: "+str(Directory)
```

**Notes:** path: The path of a file or directory.
isDirectory: Upon return, contains true if path is a directory or if the final path element is a symbolic link that points to a directory, otherwise contains false. If path doesn't exist, the return value is undefined.

Returns true if a file at the specified path exists or false if the file's does not exist or its existence could not be determined.

If the file at path is inaccessible to your application, perhaps because one or more parent directories are inaccessible, this method returns false. If the final element in path specifies a symbolic link, this method traverses the link and returns true or false based on the existence of the file at the link destination.

If you need to further determine if path is a package, use the isFilePackageAtPath method of NSWorkspaceMBS.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide.
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/RaceConditions.html#//apple_ref/doc/uid/TP40002585
See also:

- 94.5.27 fileExists(path as folderitem) as boolean 14955

### 94.5.29 FileForUbiquityContainerIdentifier(containerIdentifier as string) as folderitem

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the iCloud directory associated with the specified container ID.
**Notes:** containerID: Specify the container ID of the cloud-based storage container. The string you specify must not contain wildcards and must be of the form <TEAMID>.<CONTAINER>, where <TEAMID>is your development team ID and <CONTAINER>describes the bundle identifier of the container you want to access. The container identifiers for your application must be declared in the com.apple.developer.ubiquity-container-identifiers entitlement.
If you specify "", this method returns the first container listed in the com.apple.developer.ubiquity-container-identifiers entitlement.

Returns a folderitem pointing to the specified container directory or nil if the container could not be located or if iCloud storage is unavailable for the current user or device.

You can use the folderitem returned by this method to build paths to files and directories in the user's iCloud storage. Each application that syncs documents to the cloud must have at least one associated container directory in which to put those files. This container directory can be unique to the application or shared by multiple applications. You use this method to retrieve the folderitem for that container directory.

In addition to writing to its own container directory, an application can write to any container directory for which it has the appropriate permission. Each additional container directory should be listed as an additional value in the com.apple.developer.ubiquity-container-identifiers entitlement.

Note: The development team ID that precedes each container ID string is the unique identifier associated with your development team. You can find this string in the Member Center of the Apple Developer website (http://developer.apple.com/membercenter). From the Member Center home page, select the Your Account tab and then select Organization Profile from the column on the left of that tab. Your team's identifier is in the Company/Organization ID field.
The first time you call this method for a given container directory, iOS extends your application sandbox to include that container directory. Thus, it is important that you call this method at least once before trying to search for files in iCloud. And if your application accesses multiple container directories, you should call the method once for each directory.

Available in Mac OS X v10.7 and later.
FileForUbiquityContainerIdentifier returns folderitem while URLForUbiquityContainerIdentifier returns URL string.

### 94.5.30 fileManagerWithAuthorization(authorization as NSWorkspaceAuthorizationMBS) as NSFileManagerMBS

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a file manager object that is authorized to perform privileged file system operations.
**Notes:** Returns nil in case of errors.

This method returns an NSFileManagerMBS instance that can perform file system operations previously allowed by the user via NSWorkspaceMBS.requestAuthorization. Each NSWorkspaceAuthorizationMBS you receive requires creating a new NSFileManagerMBS instance using this method.

Only the following NSFileManagerMBS methods currently take advantage of an authorization:

- createSymbolicLink (NSWorkspaceAuthorizationTypeCreateSymbolicLink)
- setAttributes (NSWorkspaceAuthorizationTypeSetAttributes)
- replaceItem (NSWorkspaceAuthorizationTypeReplaceFile)

Note that an NSWorkspaceAuthorizationTypeSetAttributes authorization only enables setAttributes to modify the following attributes:

- NSFileOwnerAccountID
- NSFileGroupOwnerAccountID
- NSFilePosixPermissions

Also note that for replaceItem, the backupItemName and options parameters will be ignored.

These methods may also fail with any of the following errors:

- NSWorkspaceAuthorizationInvalidError: The provided NSWorkspaceAuthorization expired or is invalid.
- NSFileWriteUnknownError: The application failed to communicate with a helper process, or a file system error occurred.
- NSFileWriteNoPermissionError: The operation failed for any other reason, including the user denying access to the resource, or access to a resource is denied by system policy.

All other NSFileManager methods invoked on this instance will behave normally.
The app using this may need code signature with com.apple.developer.security.privileged-file-operations entitlement for the sandboxed application and may need to be in applications folder.

### 94.5.31 homeDirectoryForUser(Name as string) as FolderItem

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the home directory for the specified user.
**Notes:** userName: The username of the owner of the desired home directory.

Returns the folderitem containing the location of the specified user,Äôs home directory, or nil if no such user exists or the user,Äôs home directory is not available.

### 94.5.32 isDeletableFile(path as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the invoking object appears able to delete a specified file.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "Can delete: "+str(m.isDeletableFile(f))
```

**Notes:** path: A file path.

Returns true if the current process has delete privileges for the file at path; otherwise false if the process does not have delete privileges or the existence of the file could not be determined.

For a directory or file to be deletable, the current process must either be able to write to the parent directory of path or it must have the same owner as the item at path. If path is a directory, every item contained in path must be deletable by the current process.

If the file at path is inaccessible to your application, perhaps because it does not have search privileges for one or more parent directories, this method returns false. This method does not traverse symbolic links in the path.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide.
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/RaceConditions.html#//apple_ref/doc/uid/TP40002585

### 94.5.33 isExecutableFile(path as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the operating system appears able to execute a specified file.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "Can execute: "+str(m.isExecutableFile(f))
```

**Notes:** path: A file path.

Returns true if the current process has execute privileges for the file at path; otherwise false if the process does not have execute privileges or the existence of the file could not be determined.

If the file at path is inaccessible to your application, perhaps because it does not have search privileges for one or more parent directories, this method returns false. This method traverses symbolic links in the path. This method also uses the real user ID and group ID, as opposed to the effective user and group IDs, to determine if the file is executable.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide:
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/RaceConditions.html#//apple_ref/doc/uid/TP40002585

### 94.5.34 isReadableFile(path as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the invoking object appears able to read a specified file.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "Can read: "+str(m.isReadableFile(f))
```

**Notes:** path: A file path.

Returns true if the current process has read privileges for the file at path; otherwise false if the process does not have read privileges or the existence of the file could not be determined.

If the file at path is inaccessible to your application, perhaps because it does not have search privileges for one or more parent directories, this method returns false. This method traverses symbolic links in the path. This method also uses the real user ID and group ID, as opposed to the effective user and group IDs, to determine if the file is readable.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide.
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/RaceConditions.html#//apple_ref/doc/uid/TP40002585

### 94.5.35 isUbiquitousItem(item as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether the item is targeted for storage in iCloud.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "Is in iCloud: "+str(m.isUbiquitousItem(f))
```

**Notes:** item: Specify the folderitem for the file or directory whose status you want to check.

Returns true if the item is targeted for iCloud storage or false if it is not. This method also returns false if no item exists at url.

This method reflects only whether the item should be stored in iCloud because a call was made to the setUbiquitous method with a value of true for its flag parameter. This method does not reflect whether the file has actually been uploaded to any iCloud servers. To determine a file's upload status, check the IsUploadedMBS function in the folderitem class.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.36 isUbiquitousItem(URL as string) as boolean 14961

### 94.5.36 isUbiquitousItem(URL as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a Boolean indicating whether the item is targeted for storage in iCloud.
**Notes:** item: Specify the URL for the file or directory whose status you want to check.

Returns true if the item is targeted for iCloud storage or false if it is not. This method also returns false if no item exists at url.

This method reflects only whether the item should be stored in iCloud because a call was made to the setUbiquitous method with a value of true for its flag parameter. This method does not reflect whether the file has actually been uploaded to any iCloud servers. To determine a file's upload status, check the IsUploadedMBS function in the folderitem class.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.35 isUbiquitousItem(item as folderitem) as boolean 14961

### 94.5.37 isWritableFile(path as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the invoking object appears able to write to a specified file.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("notes.rtf")

MsgBox "Can write: "+str(m.isWritableFile(f))
```

**Notes:** path: A file path.

Returns true if the current process has write privileges for the file at path; otherwise false if the process does not have write privileges or the existence of the file could not be determined.

If the file at path is inaccessible to your application, perhaps because it does not have search privileges for one or more parent directories, this method returns false. This method traverses symbolic links in the path. This method also uses the real user ID and group ID, as opposed to the effective user and group IDs, to determine if the file is writable.

Note: Attempting to predicate behavior based on the current state of the file system or a particular file on the file system is not recommended. Doing so can cause odd behavior or race conditions. It's far better to attempt an operation (such as loading a file or creating a directory), check for errors, and handle those errors gracefully than it is to try to figure out ahead of time whether the operation will succeed. For more information on file system race conditions, see Race Conditions, File Operations, and Interprocess Communication in Secure Coding Guide:
http://developer.apple.com/library/mac/documentation/Security/Conceptual/SecureCodingGuide/Articles/Race-

Conditions.html#//apple_ref/doc/uid/TP40002585

### 94.5.38 lastPathComponent(pathOrURL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the last path component of a file URL or file path.
**Notes:** Available in Mac OS X v10.6 and later.

### 94.5.39 linkItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a hard link between the items at the specified paths.
**Notes:** Source: The path that specifies the item you wish to link to. The value in this parameter must not be nil.
Dest: The path that identifies the location where the link will be created. The value in this parameter must not be nil.
error: If an error occurs, this pointer is set to an actual error object containing the error information.

Returns true if the hard link was created or NO if an error occurred. This method also returns false if a file, directory, or link already exists at dstPath.

Use this method to create hard links between files in the current file system. If Source is a directory, this method creates a new directory at Dest and then creates hard links for the items in that directory. If Source is (or contains) a symbolic link, the symbolic link is copied to the new location and not converted to a hard link.

Available in OS X v10.5 and later.
See also:

- 94.5.40 linkItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean 14963

### 94.5.40 linkItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 19.5, Platform: macOS, Targets: All.

**Function:** Creates a hard link between the items at the specified paths.
**Notes:** Source: The path that specifies the item you wish to link to. The value in this parameter must not be nil.

Dest: The path that identifies the location where the link will be created. The value in this parameter must not be nil.
error: If an error occurs, this pointer is set to an actual error object containing the error information.

Returns true if the hard link was created or NO if an error occurred. This method also returns false if a file, directory, or link already exists at dstPath.

Use this method to create hard links between files in the current file system. If Source is a directory, this method creates a new directory at Dest and then creates hard links for the items in that directory. If Source is (or contains) a symbolic link, the symbolic link is copied to the new location and not converted to a hard link.

Available in OS X v10.5 and later.
See also:

- 94.5.39 linkItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean 14963

### 94.5.41 moveItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Moves the file or directory at the specified path to a new location synchronously.
**Notes:** source: The path to the file or directory you want to move. This parameter must not be nil.
dest: The new path for the item in Source. This path must include the name of the file or directory in its new location. This parameter must not be nil.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was moved successfully or the file manager's delegate aborted the operation deliberately. Returns NO if an error occurred.

When moving items, the current process must have permission to read the item at Source and write the parent directory of Dest. If the item at Source is a directory, this method moves the directory and all of its contents, including any hidden files. If an item with the same name already exists at Dest, this method aborts the move attempt and returns an appropriate error. If the last component of Source is a symbolic link, only the link is moved to the new path; the item pointed to by the link remains at its current location.

If the source and destination of the move operation are not on the same volume, this method copies the item first and then removes it from its current location. This behavior may trigger additional delegate notifications related to copying and removing individual items.

Available in OS X v10.5 and later.
See also:

- 94.5.42 moveItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean 14965

### 94.5.42 moveItem(sourcePath as String, destPath as String, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 19.5, Platform: macOS, Targets: All.

**Function:** Moves the file or directory at the specified path to a new location synchronously.
**Notes:** source: The path to the file or directory you want to move. This parameter must not be nil.
dest: The new path for the item in Source. This path must include the name of the file or directory in its new location. This parameter must not be nil.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was moved successfully or the file manager's delegate aborted the operation deliberately. Returns NO if an error occurred.

When moving items, the current process must have permission to read the item at Source and write the parent directory of Dest. If the item at Source is a directory, this method moves the directory and all of its contents, including any hidden files. If an item with the same name already exists at Dest, this method aborts the move attempt and returns an appropriate error. If the last component of Source is a symbolic link, only the link is moved to the new path; the item pointed to by the link remains at its current location.

If the source and destination of the move operation are not on the same volume, this method copies the item first and then removes it from its current location. This behavior may trigger additional delegate notifications related to copying and removing individual items.

Available in OS X v10.5 and later.
See also:

- 94.5.41 moveItem(source as folderItem, dest as folderItem, byref error as NSErrorMBS) as boolean 14964

### 94.5.43 NSFileAppendOnly as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file is read-only.
The corresponding value is a number containing a Boolean value.
Available in Mac OS X v10.2 and later.

### 94.5.44 NSFileBusy as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file is busy.
The corresponding value is a number containing a Boolean value.
Available in Mac OS X v10.4 and later.

### 94.5.45 NSFileCreationDate as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's creation date.
The corresponding value is a date.
Available in Mac OS X v10.2 and later.

### 94.5.46 NSFileDeviceIdentifier as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the identifier for the device on which the file resides.
The corresponding value is a number containing an Int32.
Available in Mac OS X v10.0 and later.

### 94.5.47 NSFileExtensionHidden as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates whether the file's extension is hidden.
The corresponding value is a number containing a Boolean value.
Available in Mac OS X v10.1 and later.

### 94.5.48 NSFileGroupOwnerAccountID as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim fileManager As New NSFileManagerMBS

dim error as NSErrorMBS
Dim Values As Dictionary = fileManager.attributesOfItemAtPath(file, error)
Dim Permissions As Integer = Values.Value(fileManager.NSFilePosixPermissions)

MsgBox "Group: "+_
values.Value(fileManager.NSFileGroupOwnerAccountID)+_
" "+_
values.Value(fileManager.NSFileGroupOwnerAccountName)
```

**Notes:** The key in a file attribute dictionary whose value indicates the file's group ID.
The corresponding value is a number containing an Int32.
Available in Mac OS X v10.2 and later.

### 94.5.49 NSFileGroupOwnerAccountName as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim fileManager As New NSFileManagerMBS

dim error as NSErrorMBS
Dim Values As Dictionary = fileManager.attributesOfItemAtPath(file, error)
Dim Permissions As Integer = Values.Value(fileManager.NSFilePosixPermissions)

MsgBox "Group: "+_
values.Value(fileManager.NSFileGroupOwnerAccountID)+_
" "+_
values.Value(fileManager.NSFileGroupOwnerAccountName)
```

**Notes:** The key in a file attribute dictionary whose value indicates the group name of the file's owner.
The corresponding value is a string.
Available in Mac OS X v10.0 and later.

### 94.5.50 NSFileHFSCreatorCode as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's HFS creator code.
The corresponding value is a number containing an Int32. See "HFS File Types" for possible values.
Available in Mac OS X v10.1 and later.

### 94.5.51 NSFileHFSTypeCode as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's HFS type code.
The corresponding value is a number containing an Int32. See "HFS File Types" for possible values.
Available in Mac OS X v10.1 and later.

### 94.5.52 NSFileImmutable as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim n As New NSFileManagerMBS
dim e as NSErrorMBS
Dim d As Dictionary = n.attributesOfItemAtPath("/Users/cs/Desktop/test.rtf", e)
dim locked as Boolean = d.Lookup(n.NSFileImmutable, false)

Break // inspect in debugger
```

**Notes:** The key in a file attribute dictionary whose value indicates whether the file is mutable.
The corresponding value is a number containing a Boolean value.

Available in Mac OS X v10.2 and later.

### 94.5.53 NSFileManagerUnmountDissentingProcessIdentifierErrorKey as string

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The key for the error dictionary containing process ID of the process blocking the unmount.

### 94.5.54 NSFileModificationDate as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's last modified date.
The corresponding value is a date.
Available in Mac OS X v10.0 and later.

### 94.5.55 NSFileOwnerAccountID as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim fileManager As New NSFileManagerMBS

dim error as NSErrorMBS
Dim Values As Dictionary = fileManager.attributesOfItemAtPath(file, error)
Dim Permissions As Integer = Values.Value(fileManager.NSFilePosixPermissions)

MsgBox "Owner: "+_
values.Value(fileManager.NSFileOwnerAccountID)+_
" "+_
values.Value(fileManager.NSFileOwnerAccountName)
```

**Notes:** The key in a file attribute dictionary whose value indicates the file's owner's account ID.
The corresponding value is a number containing an Int32.
Available in Mac OS X v10.2 and later.

### 94.5.56 NSFileOwnerAccountName as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim fileManager As New NSFileManagerMBS

dim error as NSErrorMBS
Dim Values As Dictionary = fileManager.attributesOfItemAtPath(file, error)
Dim Permissions As Integer = Values.Value(fileManager.NSFilePosixPermissions)

'MsgBox "POSIX Permissions: "+Oct(Permissions)
MsgBox "Owner: "+_
values.Value(fileManager.NSFileOwnerAccountID)+_
" "+_
values.Value(fileManager.NSFileOwnerAccountName)
```

**Notes:** The key in a file attribute dictionary whose value indicates the name of the file's owner.
The corresponding value is a string.
Available in Mac OS X v10.0 and later.

### 94.5.57 NSFilePosixPermissions as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim fileManager As New NSFileManagerMBS

dim error as NSErrorMBS
Dim Values As Dictionary = fileManager.attributesOfItemAtPath(file, error)
Dim Permissions As Integer = Values.Value(fileManager.NSFilePosixPermissions)

MsgBox "POSIX Permissions: "+oct(Permissions)
```

**Notes:** The key in a file attribute dictionary whose value indicates the file's Posix permissions.
The corresponding value is a number.

Available in Mac OS X v10.0 and later.

### 94.5.58 NSFileReferenceCount as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's reference count.
The corresponding value is a number containing an Int32.
The number specifies the number of hard links to a file.
Available in Mac OS X v10.0 and later.

### 94.5.59 NSFileSize as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's size in bytes.
The corresponding value is a number containing an Int64.
Important If the file has a resource fork, the returned value does not include the size of the resource fork.

### 94.5.60 NSFileSystemFileNumber as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's filesystem file number.
The corresponding value is a number containing an Int32. The value corresponds to the value of st_ino, as returned by stat(2).
Available in Mac OS X v10.0 and later.

### 94.5.61 NSFileSystemFreeNodes as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access the file attribute values contained in the dictionary object returned from the attributesOfFileSystemForPath function.
**Notes:** The key in a file system attribute dictionary dictionary whose value indicates the number of free

nodes in the file system.
The corresponding value is a number that specifies the number of free nodes in the file system.
Available in Mac OS X v10.0 and later.

### 94.5.62 NSFileSystemFreeSize as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access the file attribute values contained in the dictionary object returned from the attributesOfFileSystemForPath function.
**Notes:** The key in a file system attribute dictionary whose value indicates the amount of free space on the file system.
The corresponding value is a number that specifies the amount of free space on the file system in bytes. The value is determined by statfs().
Available in Mac OS X v10.0 and later.

### 94.5.63 NSFileSystemNodes as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access the file attribute values contained in the dictionary object returned from the attributesOfFileSystemForPath function.
**Notes:** The key in a file system attribute dictionary whose value indicates the number of nodes in the file system.
The corresponding value is a number that specifies the number of nodes in the file system.
Available in Mac OS X v10.0 and later.

### 94.5.64 NSFileSystemNumber as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access the file attribute values contained in the dictionary object returned from the attributesOfFileSystemForPath function.
**Notes:** The key in a file system attribute dictionary dictionary whose value indicates the filesystem number of the file system.
The corresponding value is a number that specifies the filesystem number of the file system. The value corresponds to the value of st_dev, as returned by stat(2).
Available in Mac OS X v10.0 and later.

### 94.5.65 NSFileSystemSize as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access the file attribute values contained in the dictionary object returned from the attributesOfFileSystemForPath function.
**Notes:** The key in a file system attribute dictionary whose value indicates the size of the file system.
The corresponding value is a number that specifies the size of the file system in bytes. The value is determined by statfs().
Available in Mac OS X v10.0 and later.

### 94.5.66 NSFileType as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the keys to access file attribute values contained in dictionary used by setAttributes, attributesOfItemAtPath, createDirectory, and createFile.
**Notes:** The key in a file attribute dictionary whose value indicates the file's type.
The corresponding value is a string (see NSFileType* shared methods for possible values).
Available in Mac OS X v10.0 and later.

### 94.5.67 NSFileTypeBlockSpecial as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Example:**

```
// check first hard disc
dim e as NSErrorMBS
dim n as new NSFileManagerMBS
dim d as Dictionary = n.attributesOfItemAtPath("/dev/disk0", e)
MsgBox d.Value(n.NSFileType)
```

**Notes:** Block special file (e.g. hard disk)

### 94.5.68 NSFileTypeCharacterSpecial as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Notes:** Character special file

### 94.5.69 NSFileTypeDirectory as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Example:**

```
dim e as NSErrorMBS
dim n as new NSFileManagerMBS
dim d as Dictionary = n.attributesOfItemAtPath("/System", e)
MsgBox d.Value(n.NSFileType)
```

**Notes:** Directory

### 94.5.70 NSFileTypeRegular as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Notes:** Regular file

### 94.5.71 NSFileTypeSocket as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Notes:** Socket (a socket visible in file system as a file)

### 94.5.72 NSFileTypeSymbolicLink as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Notes:** Symbolic link

### 94.5.73 NSFileTypeUnknown as string

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** One of the possible NSFileType values.
**Notes:** Unknown

### 94.5.74 NSUbiquityIdentityDidChangeNotification as string

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sent after the iCloud (‚Äúubiquity‚Äù) identity has changed.
**Notes:** The system generates this notification when the user logs into or out of an iCloud account or enables or disables the syncing of documents and data. This notification is your cue to update caches and any interface elements displaying iCloud–related content. For example, hide all references to iCloud files when the user logs out of iCloud.
When your app receives this notification, get the new token from the NSURLRelationship property. The value of that token is nil if the user disabled iCloud or logged out. There is no userInfo dictionary.

### 94.5.75 pathExtension(pathOrURL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the path extension of a file URL or file path.
**Notes:** Available in Mac OS X v10.6 and later.

### 94.5.76 removeItem(file as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Removes the file or directory at the specified path.
**Notes:** path: A path string indicating the file or directory to remove. If the path specifies a directory, the contents of that directory are recursively removed.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was removed successfully or if path was nil. Returns false if an error occurred. If the delegate aborts the operation for a file, this method returns true. However, if the delegate aborts the operation for a directory, this method returns false.

Available in OS X v10.5 and later.
See also:

• 94.5.77 removeItem(path as string, byref error as NSErrorMBS) as boolean 14976

### 94.5.77 removeItem(path as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Removes the file or directory at the specified path.
**Notes:** path: A path string indicating the file or directory to remove. If the path specifies a directory, the contents of that directory are recursively removed.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if the item was removed successfully or if path was nil. Returns false if an error occurred. If the delegate aborts the operation for a file, this method returns true. However, if the delegate aborts the operation for a directory, this method returns false.

Available in OS X v10.5 and later.
See also:

• 94.5.76 removeItem(file as folderitem, byref error as NSErrorMBS) as boolean 14975

### 94.5.78 replaceItem(originalItem as FolderItem, newItem as FolderItem, backupItemName as String, options as integer, byref resultingItem as FolderItem, byref error as NSErrorMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: All.

**Function:** Replaces the contents of the item at the specified URL in a manner that ensures no data loss occurs.
**Example:**

```
Dim fileManager As New NSFileManagerMBS

Dim source As FolderItem = SpecialFolder.Desktop.Child("test.rtf")
Dim dest As FolderItem = SpecialFolder.Desktop.Child("dest.rtf")

Dim result As Boolean
Dim output As FolderItem
Dim error As NSErrorMBS

result = fileManager.replaceItemAtURL(dest, source, "", 0, output, error)

If result Then
MsgBox output.NativePath
Else
MsgBox error.LocalizedDescription
```

End If

**Notes:** originalItem: The item containing the content you want to replace.
newItem: The item containing the new content for originalItem. It is recommended that you put this item in a temporary directory as provided by the OS. If a temporary directory is not available, put this item in a uniquely named directory that is in the same directory as the original item.
backupItemName: If provided, the name used to create a backup of the original item.
The backup is automatically placed in the same directory as the original item. If an error occurs during the creation of the backup item, the operation fails. If there is already an item with the same name as the backup item, that item will be removed.
The backup item will be removed in the event of success unless the NSFileManagerItemReplacementWithoutDeletingBackupItem option is provided in options.
options: The options to use during the replacement. Typically, you pass NSFileManagerItemReplacementUsingNewMetadataOnly for this parameter, which uses only the metadata from the new item. You can also combine the options described in NSFileManagerItemReplacementOptions using the C-bitwise OR operator.
resultingItem: On input, a variale for a folderitem variable. When the item is replaced, this variable is set to the folderitem of the new item. If no new file system object is required, the folderitem in this parameter may be the same passed to the originalItem parameter. However, if a new file system object is required, the folderitem may be different. For example, replacing an RTF document with an RTFD document requires the creation of a new file.
error: On input, a variable for an error object. If an error occurs, this variable is set to an error object containing the error information.

Returns true if the replacement was successful or false if an error occurred.

By default, the creation date, permissions, Finder label and color, and Spotlight comments of the original item are preserved on the new item. You can configure which metadata is preserved using the options parameter.
This method works only when the originalItem and newItem parameters are located on the same volume. Attempting to call this method by passing originalItem and newItem parameters that have locations on different volumes results in an error. Instead, you can call the URLForDirectory method, passing NSItemReplacementDirectory as the search path directory, to get a temporary URL on the destination's volume that is suitable for use with this method.
If an error occurs and the original item is not in the original location or a temporary location, the resulting error object contains a user info dictionary with the key "NSFileOriginalItemLocationKey". The value assigned to that key is an URL with the location of the item. The error code is one of the file-related errors described in NSError Codes.

### 94.5.79 replaceItemAtURL(originalItemURL as string, newItemURL as String, backupItemName as String, options as integer, byref resultingURL as String, byref error as NSErrorMBS) as Boolean

MBS MacCocoa Plugin, Plugin Version: 19.3, Platform: macOS, Targets: All.

**Function:** Replaces the contents of the item at the specified URL in a manner that ensures no data loss occurs.
**Notes:** originalItemURL: The item containing the content you want to replace.
newItemURL: The item containing the new content for originalItemURL. It is recommended that you put this item in a temporary directory as provided by the OS. If a temporary directory is not available, put this item in a uniquely named directory that is in the same directory as the original item.
backupItemName: If provided, the name used to create a backup of the original item.
The backup is automatically placed in the same directory as the original item. If an error occurs during the creation of the backup item, the operation fails. If there is already an item with the same name as the backup item, that item will be removed.
The backup item will be removed in the event of success unless the NSFileManagerItemReplacementWithoutDeletingBackupItem option is provided in options.
options: The options to use during the replacement. Typically, you pass NSFileManagerItemReplacementUsingNewMetadataOnly for this parameter, which uses only the metadata from the new item. You can also combine the options described in NSFileManagerItemReplacementOptions using the C-bitwise OR operator.
resultingURL: On input, a variale for an URL variable. When the item is replaced, this variable is set to the URL of the new item. If no new file system object is required, the URL object in this parameter may be the same passed to the originalItemURL parameter. However, if a new file system object is required, the URL object may be different. For example, replacing an RTF document with an RTFD document requires the creation of a new file.
error: On input, a variable for an error object. If an error occurs, this variable is set to an error object containing the error information.

Returns true if the replacement was successful or false if an error occurred.

By default, the creation date, permissions, Finder label and color, and Spotlight comments of the original item are preserved on the new item. You can configure which metadata is preserved using the options parameter.
This method works only when the originalItemURL and newItemURL parameters are located on the same volume. Attempting to call this method by passing originalItemURL and newItemURL parameters that have locations on different volumes results in an error. Instead, you can call the URLForDirectory method, passing NSItemReplacementDirectory as the search path directory, to get a temporary URL on the destination's volume that is suitable for use with this method.
If an error occurs and the original item is not in the original location or a temporary location, the resulting error object contains a user info dictionary with the key "NSFileOriginalItemLocationKey". The value assigned to that key is an URL with the location of the item. The error code is one of the file-related errors described in NSError Codes.

### 94.5.80 setAttributes(attributesDic as dictionary, item as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Sets the attributes of the specified file or directory.
**Notes:** attributes: A dictionary containing as keys the attributes to set for path and as values the corre-

sponding value for the attribute. You can set the following attributes: NSFileBusy, NSFileCreationDate, NSFileExtensionHidden, NSFileGroupOwnerAccountID, NSFileGroupOwnerAccountName, NSFileHFSCreatorCode, NSFileHFSTypeCode, NSFileImmutable, NSFileModificationDate, NSFileOwnerAccountID, NSFileOwnerAccountName, NSFilePosixPermissions. You can change single attributes or any combination of attributes; you need not specify keys for all attributes.
item: The folderitem of a file or directory.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if all changes succeed. If any change fails, returns false, but it is undefined whether any changes actually occurred.

Discussion
As in the POSIX standard, the application either must own the file or directory or must be running as superuser for attribute changes to take effect. The method attempts to make all changes specified in attributes and ignores any rejection of an attempted modification. If the last component of the path is a symbolic link it is traversed.

The NSFilePosixPermissions value must be initialized with the code representing the POSIX file-permissions bit pattern. NSFileHFSCreatorCode and NSFileHFSTypeCode will only be heeded when path specifies a file.

Available in Mac OS X v10.5 and later.
See also:

- 94.5.81 setAttributes(attributesDic as dictionary, path as string, byref error as NSErrorMBS) as boolean 14979

### 94.5.81 setAttributes(attributesDic as dictionary, path as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** Sets the attributes of the specified file or directory.
**Notes:** attributes: A dictionary containing as keys the attributes to set for path and as values the corresponding value for the attribute. You can set the following attributes: NSFileBusy, NSFileCreationDate, NSFileExtensionHidden, NSFileGroupOwnerAccountID, NSFileGroupOwnerAccountName, NSFileHFSCreatorCode, NSFileHFSTypeCode, NSFileImmutable, NSFileModificationDate, NSFileOwnerAccountID, NSFileOwnerAccountName, NSFilePosixPermissions. You can change single attributes or any combination of attributes; you need not specify keys for all attributes.
path: The path of a file or directory.
error: If an error occurs, this is set to an actual error object containing the error information.

Returns true if all changes succeed. If any change fails, returns false, but it is undefined whether any changes actually occurred.

Discussion
As in the POSIX standard, the application either must own the file or directory or must be running as superuser for attribute changes to take effect. The method attempts to make all changes specified in attributes and ignores any rejection of an attempted modification. If the last component of the path is a symbolic link it is traversed.

The NSFilePosixPermissions value must be initialized with the code representing the POSIX file-permissions bit pattern. NSFileHFSCreatorCode and NSFileHFSTypeCode will only be heeded when path specifies a file.

Available in Mac OS X v10.5 and later.
See also:

- 94.5.80 setAttributes(attributesDic as dictionary, item as folderitem, byref error as NSErrorMBS) as boolean 14978

### 94.5.82 setUbiquitous(flag as boolean, item as folderitem, destitem as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets whether the item at the specified URL should be stored in the cloud.
**Notes:** flag: Specify true to move the item to iCloud or false to remove it from iCloud (if it is there currently).
item: Specify the folderitem of the item (file or directory) that you want to store in iCloud.
destitem: Specify the location in iCloud at which to store the file or directory. This folderitem must be constructed from a folderitem returned by the URLForUbiquityContainerIdentifier method, which you use to retrieve the desired iCloud container directory. The folderitem you specify may contain additional subdirectories so that you can organize your files hierarchically in iCloud. However, you are responsible for creating those intermediate subdirectories (using the NSFileManagerMBS or folderitem class) in your iCloud container directory.
error: If an error occurs, this pointer is set to an NSError object containing information about the error. You may specify nil for this parameter if you do not want the error information.

Returns yes if the item's status was updated successfully or false if an error occurred. If this method returns false and you specified a value for the error parameter, this method returns an error object.

Use this method to move a file from its current location to iCloud. For files located in an application's sandbox, this involves physically removing the file from the sandbox directory. (The system extends your application's sandbox privileges to give it access to files it moves to iCloud.) You can also use this method to move files out of iCloud and back into a local directory.

Your application must have an active file presenter object configured to monitor the specified file or directory before calling this method. When you specify true for the flag parameter, this method attempts to move the file or directory to the cloud and returns true if it is successful. This method also notifies your file presenter

of the new location of the file so that your application can continue to operate on it.

Important: Do not call this method from your application's main thread. This method performs a coordinated write operation on the file you specify, and calling this method from the main thread can trigger a deadlock with the file presenter you have monitoring the file. Instead, use a dispatch queue (other than the main thread queue) to perform the method call on a secondary thread. You can always message your main thread after the call finishes to update the rest of your application's data structures.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.83 setUbiquitous(flag as boolean, item as folderitem, destURL as string, byref error as NSErrorMBS) as boolean 14981

### 94.5.83 setUbiquitous(flag as boolean, item as folderitem, destURL as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Sets whether the item at the specified URL should be stored in the cloud.
**Notes:** flag: Specify true to move the item to iCloud or false to remove it from iCloud (if it is there currently).
item: Specify the folderitem of the item (file or directory) that you want to store in iCloud.
destitem: Specify the location in iCloud at which to store the file or directory. This folderitem must be constructed from a folderitem returned by the URLForUbiquityContainerIdentifier method, which you use to retrieve the desired iCloud container directory. The folderitem you specify may contain additional subdirectories so that you can organize your files hierarchically in iCloud. However, you are responsible for creating those intermediate subdirectories (using the NSFileManagerMBS or folderitem class) in your iCloud container directory.
error: If an error occurs, this pointer is set to an NSError object containing information about the error. You may specify nil for this parameter if you do not want the error information.

Returns yes if the item's status was updated successfully or false if an error occurred. If this method returns false and you specified a value for the error parameter, this method returns an error object.

Use this method to move a file from its current location to iCloud. For files located in an application's sandbox, this involves physically removing the file from the sandbox directory. (The system extends your application's sandbox privileges to give it access to files it moves to iCloud.) You can also use this method to move files out of iCloud and back into a local directory.

Your application must have an active file presenter object configured to monitor the specified file or directory before calling this method. When you specify true for the flag parameter, this method attempts to move the file or directory to the cloud and returns true if it is successful. This method also notifies your file presenter of the new location of the file so that your application can continue to operate on it.

Important: Do not call this method from your application's main thread. This method performs a coordinated write operation on the file you specify, and calling this method from the main thread can trigger a deadlock with the file presenter you have monitoring the file. Instead, use a dispatch queue (other than the main thread queue) to perform the method call on a secondary thread. You can always message your main thread after the call finishes to update the rest of your application's data structures.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.82 setUbiquitous(flag as boolean, item as folderitem, destitem as folderitem, byref error as NSErrorMBS) as boolean 14980

### 94.5.84 startDownloadingUbiquitousItem(item as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Starts downloading (if necessary) the specified item to the local system.
**Notes:** item: Specify the folderitem for the file or directory in the cloud that you want to download.
error: On input, a pointer to variable for an NSError object. If an error occurs, this pointer is set to an NSError object containing information about the error. Y

Returns true if the download started successfully or was not necessary, otherwise false. If false is returned and error is not nil, an NSError object describing the error is returned in that parameter.

If a cloud-based file or directory has not been downloaded yet, calling this method starts the download process. If the item exists locally, calling this method synchronizes the local copy with the version in the cloud.

For a given folderitem, you can determine if a file is downloaded by getting the value of the IsDownloaded method. You can also use related methods to determine the current progress in downloading the file.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.85 startDownloadingUbiquitousItem(URL as string, byref error as NSErrorMBS) as boolean 14982

### 94.5.85 startDownloadingUbiquitousItem(URL as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Starts downloading (if necessary) the specified item to the local system.
**Notes:** item: Specify the URL for the file or directory in the cloud that you want to download.
error: On input, a pointer to variable for an NSError object. If an error occurs, this pointer is set to an NSError object containing information about the error. Y

Returns true if the download started successfully or was not necessary, otherwise false. If false is returned and error is not nil, an NSError object describing the error is returned in that parameter.

If a cloud-based file or directory has not been downloaded yet, calling this method starts the download process. If the item exists locally, calling this method synchronizes the local copy with the version in the cloud.

For a given folderitem, you can determine if a file is downloaded by getting the value of the IsDownloaded method. You can also use related methods to determine the current progress in downloading the file.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.84 startDownloadingUbiquitousItem(item as folderitem, byref error as NSErrorMBS) as boolean 14982

### 94.5.86 stringByAbbreviatingWithTildeInPath(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string that replaces the current home directory portion of the current path with a tilde (
textasciitilde ) character.
**Notes:** A new string based on the current string object. If the new string specifies a file in the current home directory, the home directory portion of the path is replaced with a tilde (
textasciitilde ) character. If the string does not specify a file in the current home directory, this method returns a new string object whose path is unchanged from the path in the current string.

Note that this method only works with file paths. It does not work for string representations of URLs.

For sandboxed apps in OS X, the current home directory is not the same as the user,Äôs home directory. For a sandboxed app, the home directory is the app,Äôs home directory. So if you specified a path of /Users/<current_user>/file.txt for a sandboxed app, the returned path would be unchanged from the original. However, if you specified the same path for an app not in a sandbox, this method would replace the /Users/<current_user>portion of the path with a tilde.

### 94.5.87 stringByAppendingPathComponent(path as string, Component as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by appending to the receiver a given string.
**Notes:** The following table illustrates the effect of this method on a variety of different paths, assuming that aString is supplied as ,Äúscratch.tiff,Äù:

| Receiver,Äôs String Value | Resulting String |
|---|---|
| ,Äú/tmp,Äù | ,Äú/tmp/scratch.tiff,Äù |
| ,Äú/tmp/,Äù | ,Äú/tmp/scratch.tiff,Äù |
| ,Äú/,Äù | ,Äú/scratch.tiff,Äù |
| ,Äú,Äù (an empty string) | ,Äúscratch.tiff,Äù |

Note that this method only works with file paths (not, for example, string representations of URLs).

### 94.5.88 stringByAppendingPathExtension(path as string, Extension as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by appending to the receiver an extension separator followed by a given extension.
**Notes:** The following table illustrates the effect of this method on a variety of different paths, assuming that ext is supplied as "tiff":

| Receiver,Äôs String Value | Resulting String |
|---|---|
| ,Äú/tmp/scratch.old,Äù | ,Äú/tmp/scratch.old.tiff,Äù |
| ,Äú/tmp/scratch.,Äù | ,Äú/tmp/scratch..tiff,Äù |
| ,Äú/tmp/,Äù | ,Äú/tmp.tiff,Äù |
| ,Äúscratch,Äù | ,Äúscratch.tiff,Äù |

Note that adding an extension to "/tmp/" causes the result to be "/tmp.tiff" instead of "/tmp/.tiff". This difference is because a file named ".tiff" is not considered to have an extension, so the string is appended to the last nonempty path component.

Note that this method only works with file paths (not, for example, string representations of URLs).

Special Considerations
Prior to OS X v10.9 this method did not allow you to append file extensions to filenames starting with the tilde character (

textasciitilde ).

### 94.5.89 stringByDeletingLastPathComponent(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by deleting the last path component from the receiver, along with any final path separator.
**Notes:** A new string made by deleting the last path component from the receiver, along with any final path separator. If the receiver represents the root path it is returned unaltered.

The following table illustrates the effect of this method on a variety of different paths:

| Receiver,Äôs String Value | Resulting String |
|---|---|
| ,Äú/tmp/scratch.tiff,Äù | ,Äú/tmp,Äù |
| ,Äú/tmp/lock/,Äù | ,Äú/tmp,Äù |
| ,Äú/tmp/,Äù | ,Äú/,Äù |
| ,Äú/tmp,Äù | ,Äú/,Äù |
| ,Äú/,Äù | ,Äú/,Äù |
| ,Äúscratch.tiff,Äù | ,Äú,Äù (an empty string) |

Note that this method only works with file paths (not, for example, string representations of URLs).

### 94.5.90 stringByDeletingPathExtension(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by deleting the extension (if any, and only the last) from the receiver.
**Notes:** A new string made by deleting the extension (if any, and only the last) from the receiver. Strips any trailing path separator before checking for an extension. If the receiver represents the root path, it is returned unaltered.

The following table illustrates the effect of this method on a variety of different paths:

Note that attempting to delete an extension from ".tiff" causes the result to be @".tiff" instead of an empty string. This difference is because a file named ".tiff" is not considered to have an extension, so nothing is deleted. Note also that this method only works with file paths (not, for example, string representations of URLs).

| Receiver,Äôs String Value | Resulting String |
|---|---|
| ,Äú/tmp/scratch.tiff,Äù | ,Äú/tmp/scratch,Äù |
| ,Äú/tmp/,Äù | ,Äú/tmp,Äù |
| ,Äúscratch.bundle/,Äù | ,Äúscratch,Äù |
| ,Äúscratch..tiff,Äù | ,Äúscratch.,Äù |
| ,Äú.tiff,Äù | ,Äú.tiff,Äù |
| ,Äú/,Äù | ,Äú/,Äù |

### 94.5.91 stringByExpandingTildeInPath(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by expanding the initial component of the receiver to its full path value.
**Notes:** A new string made by expanding the initial component of the receiver, if it begins with ,Äú textasciitilde ,Äù or ,Äú
textasciitilde user,Äù, to its full path value. Returns a new string matching the receiver if the receiver,Äôs initial component can,Äôt be expanded.

Note that this method only works with file paths (not, for example, string representations of URLs).

### 94.5.92 stringByResolvingSymlinksInPath(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made from the receiver by resolving all symbolic links and standardizing path.
**Notes:** A new string made by resolving all symbolic links, then removing extraneous path components. For absolute paths, all symbolic links are guaranteed to be removed. For relative paths, symbolic links that can,Äôt be resolved are left unresolved in the returned string.

Returns self if an error occurs.

Note that this method only works with file paths (not, for example, string representations of URLs).

### 94.5.93 stringByStandardizingPath(path as string) as string

MBS MacCocoa Plugin, Plugin Version: 16.4, Platform: macOS, Targets: All.

**Function:** Returns a new string made by removing extraneous path components from the receiver.
**Notes:** A new string made by performing the following operations:

- Expanding an initial tilde expression using stringByExpandingTildeInPath.
- Removing an initial component of ‚Äú/private/var/automount‚Äù, ‚Äú/var/automount‚Äù, or ‚Äú/private‚Äù from the path, if the result still indicates an existing file or directory (checked by consulting the file system).
- Reducing empty components and references to the current directory (that is, the sequences ‚Äú//‚Äù and ‚Äú/./‚Äù) to single path separators.
- Removing a trailing slash from the last component.
- For absolute paths only, resolving references to the parent directory (that is, the component ‚Äú..‚Äù) to the real parent directory if possible using stringByResolvingSymlinksInPath. For relative paths, references to the parent directory are left in place.
- Returns self if an error occurs.

Note that the path returned by this method may still have symbolic link components in it. Note also that this method only works with file paths (not, for example, string representations of URLs).

### 94.5.94 trashItem(file as folderItem, byref Resulting as folderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Moves an item to the trash.
**Notes:** Returns true if the item at url was successfully moved to the trash. Since the operation may require renaming the item to avoid a file name collision, this method returns, by reference, the resulting folderitem that the item was moved to.

If this method returns false, the item was not moved to the trash; the error parameter then contains information about the error.

Available in OS X v10.8 and later.
See also:

- 94.5.95 trashItem(Path as String, byref Resulting as FolderItem, byref error as NSErrorMBS) as boolean 14987

### 94.5.95 trashItem(Path as String, byref Resulting as FolderItem, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 19.5, Platform: macOS, Targets: All.

**Function:** Moves an item to the trash.
**Notes:** Returns true if the item at url was successfully moved to the trash. Since the operation may require

renaming the item to avoid a file name collision, this method returns, by reference, the resulting folderitem that the item was moved to.

If this method returns false, the item was not moved to the trash; the error parameter then contains information about the error.

Available in OS X v10.8 and later.
See also:

- 94.5.94 trashItem(file as folderItem, byref Resulting as folderItem, byref error as NSErrorMBS) as boolean 14987

### 94.5.96 URLByAppendingPathComponent(URL as string, pathComponent as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path component to the original URL.
**Notes:** pathComponent: The path component to add to the URL.

Returns a new URL with pathComponent appended.

If the original URL does not end with a forward slash and pathComponent does not begin with a forward slash, a forward slash is inserted between the two parts of the returned URL, unless the original URL is the empty string.

Available in Mac OS X v10.6 and later.
See also:

- 94.5.97 URLByAppendingPathComponent(URL as string, pathComponent as string, isDirectory as boolean) as string 14988

### 94.5.97 URLByAppendingPathComponent(URL as string, pathComponent as string, isDirectory as boolean) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path component to the original URL, along with a trailing slash if the component is designated a directory.
**Notes:** pathComponent: The path component to add to the URL.
isDirectory: If true, a trailing slash is appended after pathComponent.
Returns a new URL with pathComponent appended.

If the original URL does not end with a forward slash and pathComponent does not begin with a forward slash, a forward slash is inserted between the two parts of the returned URL, unless the original URL is the empty string.

Available in Mac OS X v10.7 and later.
See also:

- 94.5.96 URLByAppendingPathComponent(URL as string, pathComponent as string) as string 14988

### 94.5.98 URLByAppendingPathExtension(URL as string, pathExtension as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by appending a path extension to the original URL.
**Notes:** pathExtension: The path extension to add to the URL.

Returns a new URL with pathExtension appended.

If the original URL ends with one or more forward slashes, these are removed from the returned URL. A period is inserted between the two parts of the new URL.
Available in Mac OS X v10.6 and later.

### 94.5.99 URLByDeletingLastPathComponent(URL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by deleting the last path component from the original URL.
**Notes:** If the original URL represents the root path, the returned URL is identical. Otherwise, if the original URL has only one path component, the new URL is the empty string.
Available in Mac OS X v10.6 and later.

### 94.5.100 URLByDeletingPathExtension(URL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL made by deleting the path extension, if any, from the original URL.
**Notes:** If the original URL represents the root path, the returned URL is identical. If the URL has multiple path extensions, only the last one is removed.
Available in Mac OS X v10.6 and later.

### 94.5.101 URLByResolvingSymlinksInPath(URL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL that points to the same resource as the original URL and includes no symbolic links.
**Notes:** If the original URL has no symbolic links, the returned URL is identical to the original URL.

This method only works on URLs with the file: path scheme. This method will return an identical URL for all other URLs.

Available in Mac OS X v10.6 and later.

### 94.5.102 URLByStandardizingPath(URL as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns a new URL that points to the same resource as the original URL and is an absolute path.
**Notes:** This method only works on URLs with the file: path scheme. This method will return an identical URL for all other URLs.

Available in Mac OS X v10.6 and later.

### 94.5.103 URLForPublishingUbiquitousItem(item as folderitem, byref expirationDate as date, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a URL that can be emailed to users to allow them to download a copy of a cloud-based item.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")

dim error as NSErrorMBS
dim exdate as date
dim url as string = m.URLForPublishingUbiquitousItem(f, exdate, error)

// always fails as desktop folder is not in cloud
if error<>nil then
MsgBox error.localizedDescription
end if
```

**Notes:** url: Specify the URL of the item in the cloud that you want to share. The URL must be prefixed with the base URL returned from the URLForUbiquityContainerIdentifier method that corresponds to the item's location.
expirationDate: On output, this parameter contains the date after which the item is no longer available at the returned URL.
error: If an error occurs, this pointer is set to an NSError object containing information about the error.

Returns an URL with which users can download a copy of the item at url. Returns nil if the URL could not be created for any reason.

Discussion
This method creates a snapshot of the specified file and places that copy in a temporary iCloud location where it can be accessed by other users using the returned URL. The snapshot reflects the contents of the file at the time the URL was generated and is not updated when subsequent changes are made to the original file in the user's iCloud storage. The snapshot file remains available at the specified URL until the date specified in the outDate parameter, after which it is automatically deleted.

Your application must have access to the network for this call to succeed.
Available in Mac OS X v10.7 and later.
See also:

- 94.5.104 URLForPublishingUbiquitousItem(URL as string, byref expirationDate as date, byref error as NSErrorMBS) as string 14992

### 94.5.104 URLForPublishingUbiquitousItem(URL as string, byref expirationDate as date, byref error as NSErrorMBS) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a URL that can be emailed to users to allow them to download a copy of a cloud-based item.
**Notes:** url: Specify the URL of the item in the cloud that you want to share. The URL must be prefixed with the base URL returned from the URLForUbiquityContainerIdentifier method that corresponds to the item's location.
expirationDate: On output, this parameter contains the date after which the item is no longer available at the returned URL.
error: If an error occurs, this pointer is set to an NSError object containing information about the error.

Returns an URL with which users can download a copy of the item at url. Returns nil if the URL could not be created for any reason.

Discussion
This method creates a snapshot of the specified file and places that copy in a temporary iCloud location where it can be accessed by other users using the returned URL. The snapshot reflects the contents of the file at the time the URL was generated and is not updated when subsequent changes are made to the original file in the user's iCloud storage. The snapshot file remains available at the specified URL until the date specified in the outDate parameter, after which it is automatically deleted.

Your application must have access to the network for this call to succeed.
Available in Mac OS X v10.7 and later.
See also:

- 94.5.103 URLForPublishingUbiquitousItem(item as folderitem, byref expirationDate as date, byref error as NSErrorMBS) as string 14991

### 94.5.105 URLForUbiquityContainerIdentifier(containerIdentifier as string) as string

MBS MacCocoa Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Returns the iCloud directory associated with the specified container ID.
**Notes:** containerID: Specify the container ID of the cloud-based storage container. The string you specify must not contain wildcards and must be of the form <TEAMID>.<CONTAINER>, where <TEAMID>is your development team ID and <CONTAINER>describes the bundle identifier of the container you want to access. The container identifiers for your application must be declared in the com.apple.developer.ubiquity-container-identifiers entitlement.
If you specify "", this method returns the first container listed in the com.apple.developer.ubiquity-container-identifiers entitlement.

Returns a folderitem pointing to the specified container directory or nil if the container could not be located or if iCloud storage is unavailable for the current user or device.

You can use the folderitem returned by this method to build paths to files and directories in the user's iCloud storage. Each application that syncs documents to the cloud must have at least one associated container directory in which to put those files. This container directory can be unique to the application or shared by multiple applications. You use this method to retrieve the folderitem for that container directory.

In addition to writing to its own container directory, an application can write to any container directory for which it has the appropriate permission. Each additional container directory should be listed as an additional value in the com.apple.developer.ubiquity-container-identifiers entitlement.

Note: The development team ID that precedes each container ID string is the unique identifier associated with your development team. You can find this string in the Member Center of the Apple Developer website (http://developer.apple.com/membercenter). From the Member Center home page, select the Your Account tab and then select Organization Profile from the column on the left of that tab. Your team's identifier is in the Company/Organization ID field.
The first time you call this method for a given container directory, iOS extends your application sandbox to include that container directory. Thus, it is important that you call this method at least once before trying to search for files in iCloud. And if your application accesses multiple container directories, you should call the method once for each directory.

Available in Mac OS X v10.7 and later.
FileForUbiquityContainerIdentifier returns folderitem while URLForUbiquityContainerIdentifier returns URL string.

### 94.5.106 Properties

### 94.5.107 currentDirectory as folderitem

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the path of the program's current directory.
**Example:**

```
dim m as new NSFileManagerMBS
dim f as FolderItem = SpecialFolder.Applications
if m.changeCurrentDirectory(f) then
MsgBox m.currentDirectory.NativePath
end if
```

**Notes:** Returns the path of the program's current directory. If the program's current working directory

isn't accessible, returns nil.

The string returned by this method is initialized to the current working directory; you can change the working directory by invoking changeCurrentDirectoryPath.

Relative pathnames refer implicitly to the current directory. For example, if the current directory is /tmp, and the relative pathname reports/info.txt is specified, the resulting full pathname is /tmp/reports/info.txt.
(Read only property)

### 94.5.108 currentDirectoryPath as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the path of the program's current directory as string.
**Example:**

```
dim m as new NSFileManagerMBS
MsgBox m.currentDirectoryPath
```

**Notes:** Returns the path of the program's current directory. If the program's current working directory isn't accessible, returns "".

The string returned by this method is initialized to the current working directory; you can change the working directory by invoking changeCurrentDirectoryPath.

Relative pathnames refer implicitly to the current directory. For example, if the current directory is /tmp, and the relative pathname reports/info.txt is specified, the resulting full pathname is /tmp/reports/info.txt.
(Read only property)

### 94.5.109 defaultManager as NSFileManagerMBS

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The default manager.
**Notes:** This is just one global property, so we only create instance on first call and than return the same instance again.
(Read only property)

### 94.5.110 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 94.5.111 homeDirectoryForCurrentUser as FolderITem

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the home directory for the current user.
**Notes:** (Read only property)

### 94.5.112 temporaryDirectory as FolderITem

MBS MacCocoa Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the temporary directory for the current user.
**Notes:** (Read only property)

### 94.5.113 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSDirectoryEnumerationSkipsHiddenFiles | 4 | One of the option constants for enumerating the<br>the contentsOfDirectoryAtURL method.<br>Do not enumerate hidden files.<br>Available in Mac OS X v10.6 and later. |
| NSDirectoryEnumerationSkipsPackageDescendants | 2 | One of the option constants for enumerating the<br>the contentsOfDirectoryAtURL method.<br>Do not descend into packages.<br>Available in Mac OS X v10.6 and later. |
| NSDirectoryEnumerationSkipsSubdirectoryDescendants | 1 | One of the option constants for enumerating the<br>the contentsOfDirectoryAtURL method.<br>Perform a shallow enumeration; do not descend i<br>Available in Mac OS X v10.6 and later. |
| NSFileManagerItemReplacementUsingNewMetadataOnly | 1 | One of the options constants to specify the repla<br>anagerItemReplacementWithoutDeletingBackupI<br>Causes NSFileManagerItemReplacementWithou<br>metadata from the new item only and not to a<br>from the original item.<br>Available in Mac OS X v10.6 and later. |
| NSFileManagerItemReplacementWithoutDeletingBackupItem | 2 | One of the options constants to specify the repla<br>anagerItemReplacementWithoutDeletingBackupI<br>Causes NSFileManagerItemReplacementWithout<br>the backup item in place after a successful replac<br>is to remove the item.<br>Available in Mac OS X v10.6 and later. |
| NSVolumeEnumerationProduceFileReferenceURLs | 4 | One of the option constants for enumerating mou<br>edVolumeURLsIncludingResourceValuesForKeys<br>The enumeration produces file reference URLs ra<br>Available in Mac OS X v10.6 and later. |
| NSVolumeEnumerationSkipHiddenVolumes | 2 | One of the option constants for enumerating mou<br>edVolumeURLsIncludingResourceValuesForKeys<br>The enumeration skips hidden volumes.<br>Available in Mac OS X v10.6 and later. |

Unmount options

| Constant | Value | Description |
|---|---|---|
| NSFileManagerUnmountAllPartitionsAndEjectDisk | 1 | Unmount all partitions of this disk and eject it. |
| NSFileManagerUnmountWithoutUI | 2 | Unmount without user interface. |

Relationships

| Constant | Value | Description |
|---|---|---|
| NSURLRelationshipContains | 0 | The directory contains the specified item. |
| NSURLRelationshipOther | 2 | The directory does not contain the item and is not the same as the item. |
| NSURLRelationshipSame | 1 | The directory and the item are the same. This relationship occurs when the value of the NSURLFileResourceIdentifierKey is the same for the directory and item. |

## 94.6 class NSFilePresenterHandlerMBS

### 94.6.1 class NSFilePresenterHandlerMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The class for a callback.
**Notes:** Some iCloud related functions in NSFileCoordinatorMBS or NSFilePresenterMBS require that you call a function to notify the caller that you are finished doing some work.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 94.6.2 Methods

### 94.6.3 Destructor

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Cleans up.

### 94.6.4 Run(errorOrNil as NSErrorMBS = nil)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Calls the callback.
**Notes:** As some callbacks ask for an error object in case of an error, you can pass one.
Other callbacks don't take a parameter.

## 94.7 class NSFilePresenterMBS

### 94.7.1 class NSFilePresenterMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The plugin class to implement the NSFilePresenter protocol.
**Notes:** A protocol to be implemented by objects that present the contents of files or directories to the user for viewing or editing. The objects can take an active role in operations that access those files or directories, even operations performed by other processes in the system. For an NSFilePresenter to be aware of such file access it must be "coordinated" file access. Starting in version 10.7 many components of Mac OS X use NSFileCoordinatorMBS, including AppKit, Finder, and various applications. NSDocument conforms to the NSFilePresenter protocol and has useful implementations of all of its methods. You are unlikely to have to implement NSFilePresenter yourself in an NSDocument-based application.

See the comments for NSFileCoordinator.Constructor for information about how an NSFilePresenter can avoid receiving messages about its own reading and writing.

You can consider "item" in method names in this header file to be an abbreviation of "fileOrDirectory." As always, a directory might actually be a file package.

Please also check the documentation from Apple for the NSFilePresenter protocol.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9
- MBS Real Studio Plugins, version 11.3pr9

### 94.7.2 Methods

### 94.7.3 Constructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 94.7.4 Destructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 94.7.5 Properties

### 94.7.6 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSFilePresenter object.
**Notes:** (Read and Write property)

### 94.7.7 Events

### 94.7.8 accommodatePresentedItemDeletionWithCompletionHandler(Complete as NSFilePresenterHandlerMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells your object that its presented item is about to be deleted.
**Notes:** Complete: The complete handler object to call after updating your data structures. Pass nil to the run method's errorOrNil parameter if you were able to successfully prepare for the deletion of the item. Pass an error object if your object could not prepare itself properly.

A file coordinator calls this method when your object's presented item is about to be deleted. You can use this method to perform any actions that are needed to prepare for the deletion. For example, document objects typically use this method to close the document.

Important: If you implement this method, you must execute the run method in the complete parameter at the end of your implementation. The system waits for you to execute that method before allowing the other object to delete the file or directory. Therefore, failure to execute the method could stall threads in your application or other processes.

Available in Mac OS X v10.7 and later.

### 94.7.9 accommodatePresentedSubitemDeletionAtURL(URL as string, file as FolderItem, Complete as NSFilePresenterHandlerMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that some entity wants to delete an item that is inside of a presented directory. (required)
**Notes:** url: The URL of the item being deleted from the presented directory. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
file: URL as folderitem.

complete: The complete handler object to call after updating your data structures. Pass nil to the run method's errorOrNil parameter if you were able to successfully prepare for the deletion of the item. Pass an error object if your object could not prepare itself properly.

This method is relevant for applications that present directories. This might occur if the delegate manages the contents of a directory or manages a file that is implemented as a file package. When called, your implementation of this method should take whatever actions needed to update your application to handle the deletion of the specified file.

Important: If you implement this method, you must execute the run method in the Complete parameter at the end of your implementation. The system waits for you to execute that method before allowing the other object to delete the item at the specified URL. Therefore, failure to execute the method could stall threads in your application or in other processes.

Available in Mac OS X v10.7 and later.

### 94.7.10 presentedItemDidChange

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called when the item changed.
**Notes:** Be notified that the file or file package's contents or attributes have been been written to. Because this method may be be invoked when the attributes have changed but the contents have not, implementations that read the contents must use modification date checking to avoid needless rereading. They should check that the modification date has changed since the receiver most recently read from or wrote to the item. To avoid race conditions, getting the modification date should typically be done within invocations of one of the NSFileCoordinatorMBS.coordinate... methods.

For example, NSDocument implements this method to react to both contents changes (like the user overwriting the document file with another application) and attribute changes (like the user toggling the "Hide extension" checkbox in a Finder info panel). It uses modification date checking as described above.

Not all programs use file coordination. Your NSFileProvider may be sent this message without being sent relinquishPresentedItemToWriter first. Make your application do the best it can in that case.

### 94.7.11 presentedItemDidGainVersion(version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Be notified that something in the system has added a version of the file or file package.

### 94.7.12 presentedItemDidLoseVersion(version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Be notified that something in the system has removed a version of the file or file package.

### 94.7.13 presentedItemDidMoveToURL(url as string, file as folderitem)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Be notified that the file or directory has been moved or renamed, or a directory containing it has been moved or renamed.
**Notes:** A typical implementation of this method will cause subsequent invocations of presentedItemURL to return the new URL.

The new URL may have a different file name extension than the current value of the presentedItemURL property.

For example, NSDocument implements this method to handle document file moving and renaming. A shoebox application would only implement this method to be robust against surprising things like the user moving its data directory while the application is running.

Not all programs use file coordination. Your NSFileProvider may be sent this message without being sent relinquishPresentedItemToWriter first. Make your application do the best it can in that case.

### 94.7.14 presentedItemDidResolveConflictVersion(version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Be notified that something in the system has resolved a version of the file or file package.

### 94.7.15 presentedItemURL as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The URL that locates the file or directory that the receiver is presenting to the user.
**Notes:** Implementations of this method must be prepared to be invoked by Cocoa in any queue, at any time, including from within invocations of NSFileCoordinator methods. A nil value is valid and means that the presented item does not exist yet. An NSFilePresenter with a nil presentedItemURL will be asked for its presentedItemURL again when coordinated file access on behalf of that NSFilePresenter completes, in case the presented item was just created.

For example, NSDocument has a -presentedItemURL method that usually returns self.fileURL. In a shoebox application that stores the user's data in files somewhere on the user's computer you can implement this method to specify the directory that contains those files.

### 94.7.16 presentedSubitemAtURLdidGainVersion(URL as string, file as FolderItem, version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that the item inside the presented directory gained a new version. (required)
**Notes:** url: The URL of the item inside the presented directory that gained a new version. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
file: url as folderitem.
version: The file version object containing information about the new file version.

Your delegate can use this method to determine how to incorporate data from the new version of the item. This might involve incorporating the version silently or asking the user about how to proceed.

Available in Mac OS X v10.7 and later.

### 94.7.17 presentedSubitemAtURLdidLoseVersion(URL as string, file as FolderItem, version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that the item inside the presented directory lost an existing version. (required)
**Notes:** url: The URL of the item inside the presented directory that lost a version. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
file: URL as folderitem.
version: The file version object containing information about the version that was removed.

Your delegate can use this method to determine how to handle the loss of the specified file version. For an old version, you might not have to do anything. However, if your application is currently using the lost version, you would need to update your application's user interface or prompt the user about how to proceed.

Available in Mac OS X v10.7 and later.

### 94.7.18 presentedSubitemAtURLdidMoveToURL(oldURL as string, newURL as string, oldFile as folderitem, newFile as folderitem)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that an item in the presented directory moved to a new location. (required)
**Notes:** oldURL: The original URL of the item inside the presented directory. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
newURL: The new URL for the item. This URL may or may not be located inside the presented directory.
oldFile: oldURL as folderitem.
newFile: newURL as folderitem.

This method is relevant for applications that present directories. This might occur if the delegate manages the contents of a directory or manages a file that is implemented as a file package. Your implementation of this method should take whatever actions necessary to handle the change in location of the specified item. For example, you might update references to the item in your application's data structures and refresh your user interface.

If the presented directory is a file package, the system calls the presentedItemDidChange method if your delegate does not implement this method.

Available in Mac OS X v10.7 and later.

### 94.7.19 presentedSubitemAtURLdidResolveConflictVersion(URL as string, file as FolderItem, version as NSFileVersionMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that the item inside the presented directory had a version conflict resolved by an outside entity. (required)
**Notes:** url: The URL of the item inside the presented directory that was in conflict. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
file: URL as folderitem.
version: The version object containing the conflicting change.

Your delegate can use this method to respond to the resolution of a version conflict by a different file presenter. This might occur if a version of your application running on another device resolves the conflict first. You might then use this method to update your user interface to indicate that there is no longer a conflict.

Available in Mac OS X v10.7 and later.

### 94.7.20 presentedSubitemDidAppearAtURL(URL as string, file as FolderItem)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that an item was added to the presented directory. (required)
**Notes:** url: The URL of the item being added to the presented directory. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.
file: URL as a folderitem.

This method is relevant for applications that present directories. This might occur if the delegate manages the contents of a directory or manages a file that is implemented as a file package. Your implementation of this method should take whatever actions necessary to incorporate the new file or directory into the presented content. For example, you might add the new item to your application's data structures and refresh your user interface.

If the presented directory is a file package, the system calls the presentedItemDidChange method if your delegate does not implement this method.

Available in Mac OS X v10.7 and later.

### 94.7.21 presentedSubitemDidChangeAtURL(URL as string, file as FolderItem)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells the delegate that the contents or attributes of the specified item changed. (required)
**Notes:** url: The URL of the item in the presented directory that changed. The item need not be at the top level of the presented directory but may itself be inside a nested subdirectory.

This method is relevant for applications that present directories. This might occur if the delegate manages the contents of a directory or manages a file that is implemented as a file package. Your implementation of this method should take whatever actions necessary to handle the change in content or attributes of the specified item.

If the presented directory is a file package, the system calls the presentedItemDidChange method if your delegate does not implement this method.

Available in Mac OS X v10.7 and later.

### 94.7.22 primaryPresentedItemURL as string

MBS MacCloud Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** The URL of a secondary item's primary presented file or directory. (read-only)
**Notes:** This property supports App Sandbox in OS X.

Some apps require access to secondary files or directories with names that are related to the primary, user-selected file. For example, a subtitle file, by convention, has the same name as its corresponding movie file, but with a different filename extension. If a movie player is sandboxed, an NSOpenPanel object will grant access only to the user-selected movie file (the primary item) and not its associated subtitle file (the secondary item).

To gain access to a secondary item, first register an NSFilePresenter object for it. At any point in its existence, a secondary item must be able to return an NSURL object to its primary item. This is done by using this property. When done accessing the secondary item, unregister the file presenter object.

Available in OS X v10.8 and later.

### 94.7.23 reacquirer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** The reacquirer event.
**Notes:** Called when you can reacquire an object.
e.g. called by relinquishPresentedItemToReader method.

### 94.7.24 relinquishPresentedItemToReader(reader as NSFilePresenterHandlerMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Notifies your object that another object or process wants to read the presented file or directory.
**Notes:** reader: A handler object. The reacquirer event is called to notify when the reader is done. If your object does not need to be notified, it can pass nil for the reacquirer block.

You use this method to provide an appropriate response when another object wants to read from your presented URL. For example, when this method is called, you might temporarily stop making changes to the file or directory. After taking any appropriate steps, you must execute the block in the reader parameter to let the waiting object know that it may now proceed with its task. If you want to be notified when the reader has completed its task, pass your own block to the reader and use that block to reacquire the file or URL for your own uses.

Important: If you implement this method, you must execute the run method in the reader parameter as part of your implementation. The system waits for you to execute that method before allowing the reader to operate on the file. Therefore, failure to execute the method could stall threads in your application or

other processes until the user takes corrective actions.

Your implementation of this method is executed using the queue in the presentedItemOperationQueue property. Your reacquirer event is executed on the queue associated with the reader.

Available in Mac OS X v10.7 and later.

### 94.7.25 relinquishPresentedItemToWriter(writer as NSFilePresenterHandlerMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Notifies your object that another object or process wants to write to the presented file or directory.
**Notes:** writer: A complete handler object. The reacquirer event is called so that your object can be notified when the writer is done.

You use this method to provide an appropriate response when another object wants to write to your presented URL. For example, when this method is called, you would likely stop making changes to the file or directory. After taking any appropriate steps, you must execute the run method in the writer parameter to let the waiting object know that it may now proceed with its task.

Important: If you implement this method, you must execute the run method in the writer parameter at the end of your implementation. The system waits for you to execute that block before allowing the writer to operate on the file. Therefore, failure to execute the run method could stall threads in your application or other processes.
If the writer changes the file or directory, you do not need to incorporate those changes in your reacquirer block. Instead, implement the presentedItemDidChange method and use it to detect when a writer actually wrote its changes to disk.

Your implementation of this method is executed using the queue in the presentedItemOperationQueue property. Your reacquirer event is executed on the queue associated with the writer.

Available in Mac OS X v10.7 and later.

### 94.7.26 savePresentedItemChangesWithCompletionHandler(Complete as NSFilePresenterHandlerMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Tells your object to save any unsaved changes for the presented item.
**Notes:** Complete: The handler object to call after you save your changes. If you saved your changes suc-

cessfully, pass nil for the run's errorOrNil parameter; otherwise, pass an error object indicating why the changes could not be saved.

The file coordinator calls this method to ensure that all objects trying to access the file or directory see the same contents. Implement this method if your object can change the presented item in a way that requires you to write those changes back to disk. If your presenter object does not make changes that need to be saved, you do not need to implement this method.

Important: If you implement this method, you must execute the run method in the Complete parameter at the end of your implementation. The system waits for you to execute that block before allowing other objects to operate on the file. Therefore, failure to execute the run method could stall threads in your application or other processes.

Available in Mac OS X v10.7 and later.

## 94.8 class NSFileVersionMBS

### 94.8.1 class NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The class for different file versions on Mac OS X 10.7.
**Notes:** Instances of NSFileVersionMBS for the same version of the same file are equal, and instances of NSFileVersionMBS for different versions of the same file are not equal, but the equality of NSFileVersionMBSs for different files is undefined. Repeated invocations of the methods that return NSFileVersionMBSs do not necessarily return the exact same instance of NSFileVersionMBS.

An NSFileVersion object represents a snapshot of a file at a specific point in time. You use the NSFileVersion class to access and create and manage file revisions in your application. Each instance of this class contains meta information about a single revision, such as the location of the file containing the revision data, the modification date of the revision, and whether the revision is discardable.

In Mac OS X applications, you can use file version objects to track changes to a local file over time and to prevent the loss of data during editing. When managing local versions, the document architecture creates versions at specific points in the lifetime of your application. Your application can also create versions explicitly at times that your application designates as appropriate.

In addition to managing local files, the system also uses this class to manage cloud-based files. For files in the cloud, there is usually only one version of the file at any given time. However, additional file versions may be created in cases where two different computers attempt to save the file to the cloud at the same time. In that case, one file is chosen as the current version and any other versions are tagged as being in conflict with the original. Conflict versions are reported to the appropriate file presenter objects and should be resolved as soon as possible so that the corresponding files can be removed from the cloud.

Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the NSFileVersion class.

Works also well with files in backup (Time Machine) to find older versions.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Lion features for Real Studio

### 94.8.2 Methods

### 94.8.3 addVersionOfItemAtURL(url as string, withContentsOfURL as string, options as Integer, byref error as NSErrorMBS) as NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Add a new version of the file located by a URL, with the contents coming from a file located by either the same or a different URL, and return a new instance that represents the version if successful.
**Notes:** If not successful, return false after setting Error to an NSErrorMBS that encapsulates why not.

You can add versions only on Mac OS X.

When adding or removing versions of a file you should do it as part of a "coordinated" write to the file. see NSFileCoordinatorMBS class. Using it properly ensures that NSFilePresenters of the file, or directories that contain the file, receive accurate notifications about versions being added or removed. For example, use NSFileCoordinatorMBS.coordinateWritingItemAtURL when the file URL and the contents url are the same. (NSFileVersion doesn't simply use NSFileCoordinator itself because that would be insufficient when the adding or removing of versions is part of a larger operation that should be treated as one coordinated file access.)

### 94.8.4 Conflict as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Whether the version was created as a result of the discovery of a conflict between two writers of the versioned file.
**Notes:** When two or more versions of a file are written at the same time, perhaps because the file is saved in the cloud and one or more of the writers were offline when they were writing, the system attempts to resolve the conflict automatically. It does this by picking one of the file versions to be the current file and setting this property to true for the other file version that are in conflict.

### 94.8.5 Constructor

MBS MacCloud Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 94.8.6 currentVersionOfItemAtURL(file as folderitem) as NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Convenience variant of currentVersionOfItemAtURL which takes folderitem.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim n as NSFileVersionMBS = NSFileVersionMBS.currentVersionOfItemAtURL(f)

MsgBox n.localizedName
```

See also:

- 94.8.7 currentVersionOfItemAtURL(url as string) as NSFileVersionMBS 15011

### 94.8.7 currentVersionOfItemAtURL(url as string) as NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return an NSFileVersionMBS that represents the contents of the file located by a URL, or nil if there is no such file.
See also:

- 94.8.6 currentVersionOfItemAtURL(file as folderitem) as NSFileVersionMBS 15010

### 94.8.8 File as folderitem

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The location of the receiver's storage.
**Notes:** Or possibly nil if the receiver's storage has been deleted. The storage is read-only. The URL will have an arcane path. You must not derive user-presentable text from it.
If the URL does not represent a folderitem, this function gives nil.

### 94.8.9 FileURL(file as folderitem) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns URL for a folderitem.
**Notes:** Call is method in case you need to provide an URL for a folderitem.

### 94.8.10 localizedName as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The user-presentable name of the version, or possibly "" if the receiver's storage has been deleted.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim n as NSFileVersionMBS = NSFileVersionMBS.currentVersionOfItemAtURL(f)
MsgBox n.localizedName
```

**Notes:** This will be different from the user-presentable name of the versioned file if, for example, the file has been renamed since the version was added.

### 94.8.11 localizedNameOfSavingComputer as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The user-presentable name of the computer on which the version was saved, or possibly "" if the receiver's storage has been deleted, or "" if no computer name was recorded.
**Notes:** The computer name is guaranteed to have been recorded only if the version is a conflict version. This will be different from that computer's current name if the computer's name has been changed since the version was retrieved from that computer.

### 94.8.12 modificationDate as date

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The modification date of the version, or possibly nil if the receiver's storage has been deleted.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim n as NSFileVersionMBS = NSFileVersionMBS.currentVersionOfItemAtURL(f)

MsgBox n.modificationDate.SQLDateTime
```

### 94.8.13 modificationDateTime as dateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The modification date of the version, or possibly nil if the receiver's storage has been deleted.

### 94.8.14 otherVersionsOfItemAtURL(file as folderitem) as NSFileVersionMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Convenience variant of otherVersionsOfItemAtURL taking a folderitem.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim n() as NSFileVersionMBS = NSFileVersionMBS.otherVersionsOfItemAtURL(f)

// shows all time stamps of this file.
dim lines() as string
for each x as NSFileVersionMBS in n
lines.Append x.modificationDate.SQLDateTime
next
MsgBox Join(lines,EndOfLine)
```

See also:

- 94.8.15 otherVersionsOfItemAtURL(url as string) as NSFileVersionMBS() 15013

### 94.8.15 otherVersionsOfItemAtURL(url as string) as NSFileVersionMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return an array of NSFileVersionMBS objects associated with the file located by a URL, or an empty array if there is no such file.
**Notes:** The array never contains an NSFileVersionMBS equal to what currentVersionOfItemAtURL would return.
See also:

- 94.8.14 otherVersionsOfItemAtURL(file as folderitem) as NSFileVersionMBS() 15013

### 94.8.16 persistentIdentifier as Memoryblock

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The identifier for this version of the file. (read-only)
**Example:**

```
// get a file version
dim f as FolderItem = SpecialFolder.Desktop.Child("Notes.rtf")
dim n as NSFileVersionMBS = NSFileVersionMBS.currentVersionOfItemAtURL(f)

// get persistent identifier
dim m as MemoryBlock = n.persistentIdentifier
```

```
// later find version again
dim x as NSFileVersionMBS = NSFileVersionMBS.versionOfItemAtURLforPersistentIdentifier(f, m)

// and show something
MsgBox x.localizedName
```

**Notes:** You can save the value of this property persistently and use it to recreate the version object later. When recreating the version object using the versionOfItemAtURLforPersistentIdentifier method, the version object returned is equivalent to the current object.

The plugin encodes the identifier for you into a memoryblock, so you can store it somewhere in your preferences.

### 94.8.17 removeAndReturnError(byref error as NSErrorMBS) as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Delete the receiver's storage, and return true if successful.
**Notes:** If not successful, return false after setting Error to an NSErrorMBS that encapsulates why not. Subsequent invocations of versionsOfItemAtURL won't include an NSFileVersion for a successfully removed version.

You cannot use this method to delete the versioned file itself. This method always throws an exception when sent to the result of invoking currentVersionOfItemAtURL. Use NSFileManagerMBS.removeItemAtURL for that instead.

When removing versions of a file you should do it as part of a coordinated write to the file. The advice about this for addVersionOfItemAtURL applies here too.

### 94.8.18 removeOtherVersionsOfItemAtURL(file as folderitem, byref error as NSErrorMBS) as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Convenience variant of removeOtherVersionsOfItemAtURL which takes folderitem.
See also:

- 94.8.19 removeOtherVersionsOfItemAtURL(url as string, byref error as NSErrorMBS) as boolean 15015

### 94.8.19 removeOtherVersionsOfItemAtURL(url as string, byref error as NSErrorMBS) as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Delete all of the versions associated with the file located by a URL, except for the current one, and return true if successful.
**Notes:** If not successful, return false after setting error to an NSErrorMBS that encapsulates why not.

When removing versions of a file you should do it as part of a coordinated write to the file. The advice about this for addVersionOfItemAtURL applies here too.
See also:

- 94.8.18 removeOtherVersionsOfItemAtURL(file as folderitem, byref error as NSErrorMBS) as boolean 15014

### 94.8.20 replaceItemAtURL(file as folderitem, options as Integer, byref error as NSErrorMBS) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Convenience variant of replaceItemAtURL which takes a folderitem.
See also:

- 94.8.21 replaceItemAtURL(url as string, options as Integer, byref error as NSErrorMBS) as string 15015

### 94.8.21 replaceItemAtURL(url as string, options as Integer, byref error as NSErrorMBS) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** If the passed-in URL locates a file, replace the file with a file whose contents are taken from the version but whose display name is taken from the file.
**Notes:** If the passed-in URL does not locate a file then simply write one. If successful, return a URL that locates the resulting file; it may be different from the passed-in URL. The one exception to taking the display name from an existing file is if the version is of a different type than the overwritten file. In that case the file name extension will be taken from the version. (When file name extensions are being hidden in a user-friendly way this is not actually an exception.) If not successful, return false after setting *outError to an NSError that encapsulates why not.

When you use NSFileVersionReplacingByMoving you remove a version of the file, and should do it as part of a coordinated write to the file. The advice about this for addVersionOfItemAtURL applies here too. When you use it to promote a version to a separate file you actually write to two files, and should do it as part of a coordinated write to two files, using NSFileCoordinatorMBS.coordinateWritingItemAtURL, most likely

using NSFileCoordinatorWritingForReplacing for the file you're promoting the version to.
See also:

- 94.8.20 replaceItemAtURL(file as folderitem, options as Integer, byref error as NSErrorMBS) as string 15015

### 94.8.22 temporaryDirectoryURLForNewVersionOfItemAtURL(url as string) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a URL, create a new directory that is suitable for using as the container of a new temporary file that you will create and use with NSFileVersionAddingByMoving.
**Notes:** This is useful when you want to create a new version of a file out of something other than the file's current contents, for example, the contents in memory of a document that has not yet been saved to its file. You must remove this directory when you are done with it, using NSFileManagerMBS.removeItemAtURL for example.

### 94.8.23 unresolvedConflictVersionsOfItemAtURL(file as folderitem) as NSFileVersionMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return an array of NSFileVersions that represent unresolved conflicts for the file located by a URL, or nil if there is no such file.
See also:

- 94.8.24 unresolvedConflictVersionsOfItemAtURL(url as string) as NSFileVersionMBS() 15016

### 94.8.24 unresolvedConflictVersionsOfItemAtURL(url as string) as NSFileVersionMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return an array of NSFileVersions that represent unresolved conflicts for the file located by a URL, or nil if there is no such file.
See also:

- 94.8.23 unresolvedConflictVersionsOfItemAtURL(file as folderitem) as NSFileVersionMBS() 15016

### 94.8.25 URL as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The location of the receiver's storage.
**Notes:** Or possibly "" if the receiver's storage has been deleted. The storage is read-only. The URL will have an arcane path. You must not derive user-presentable text from it.

### 94.8.26 versionOfItemAtURLforPersistentIdentifier(file as folderitem, PersistentIdentifier as Memoryblock) as NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the version of the file that has the specified persistent ID.
**Notes:** url: The URL of the file whose version you want.
persistentIdentifier: The persistent ID of the NSFileVersion object you want. The plugin decodes it for you from the memoryblock.

Returns the file version object with the specified ID or nil if no such version object exists.
See also:

- 94.8.27 versionOfItemAtURLforPersistentIdentifier(URL as string, PersistentIdentifier as Memoryblock) as NSFileVersionMBS 15017

### 94.8.27 versionOfItemAtURLforPersistentIdentifier(URL as string, PersistentIdentifier as Memoryblock) as NSFileVersionMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the version of the file that has the specified persistent ID.
**Notes:** url: The URL of the file whose version you want.
persistentIdentifier: The persistent ID of the NSFileVersion object you want. The plugin decodes it for you from the memoryblock.

Returns the file version object with the specified ID or nil if no such version object exists.
See also:

- 94.8.26 versionOfItemAtURLforPersistentIdentifier(file as folderitem, PersistentIdentifier as Memoryblock) as NSFileVersionMBS 15017

### 94.8.28 Properties

### 94.8.29 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSFileVersion object.
**Notes:** (Read and Write property)

### 94.8.30 Discardable as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the system is allowed to automatically delete the receiver's storage in the future, at an unpredictable time.
**Notes:** Setting this to true can fail so you must not depend on discarding for correct operation.

Once you have indicated that a version is discardable you cannot make it undiscardable again. Setting this to false causes an exception to be thrown.

You cannot make the versioned file itself discardable. Setting the value of this property always throws an exception when sent to the result of invoking currentVersionOfItemAtURL.

Versions can be discardable only on Mac OS X.
(Read and Write computed property)

### 94.8.31 Resolved as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** If the version is a conflict version, whether the conflict has been resolved.
**Notes:** If the version is not a conflict version, simply true.

The operating system's reaction to your setting this to true is complicated and subject to change in future releases. One result however is that the version won't appear in arrays returned by unresolvedConflictVersionsOfItemAtURL anymore, unless setting fails.

Once you have indicated that a conflict has been resolved you cannot make it unresolved again. Setting this to false causes an exception to be thrown.
(Read and Write computed property)

### 94.8.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSFileVersionAddingByMoving | 1 | One of the constants for addVersionOfItemAtURL.<br>Whether addVersionOfItemAtURL can move the new version contents file int the version store instead of copying it. Moving is much faster. See the com ment for temporaryDirectoryURLForNewVersionOfItemAtURL for an exampl of when this useful. |
| NSFileVersionReplacingByMoving | 1 | One of the constants for replaceItemAtURL.<br>Whether replaceItemAtURL must move the version's contents out of the ve sion store instead of copying it. This is useful when you want to promote version's contents to a separate file. You wouldn't use this to restore a versio of a file. |

## 94.9 class NSMetadataItemMBS

### 94.9.1 class NSMetadataItemMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The NSMetadataItem class represents the metadata associated with a file, providing a simple interface to retrieve the available attribute names and values.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- More notes
- MBS Real Studio Plugins, version 11.3pr9

### 94.9.2 Methods

### 94.9.3 attributeKeys as string()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the attribute names of the receiver's values.

### 94.9.4 Constructor

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Private constructor.

### 94.9.5 DisplayName as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The display name of the item, which may be different then the file system name.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.6 File as folderitem

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The file reference.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.7 FileContentChangeDate as date

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time that the file contents last changed.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.8 FileContentChangeDateTime as dateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date and time that the file contents last changed.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.9 FileCreationDate as date

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time that the file was created.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.10 FileCreationDateTime as dateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date and time that the file was created.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.11 FileName as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The name of the item as seen in the file system.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.12 FileSize as UInt64

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The size (in bytes) of the file on disk.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.13 IsUbiquitous as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the item is stored in the cloud.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.14 NSMetadataItemDisplayNameKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a string with the display name of the item, which may be different then the file system name.
Available in Mac OS X v10.7 and later.

### 94.9.15 NSMetadataItemFSContentChangeDateKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a date object that contains the date and time that the file contents last changed.
Available in Mac OS X v10.7 and later.

### 94.9.16 NSMetadataItemFSCreationDateKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a date object that contains the date and time that the file was created.
Available in Mac OS X v10.7 and later.

### 94.9.17 NSMetadataItemFSNameKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a string with the name of the item as seen in the file system.
Available in Mac OS X v10.7 and later.

### 94.9.18 NSMetadataItemFSSizeKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a number that indicates the size (in bytes) of the file on disk.
Available in Mac OS X v10.7 and later.

### 94.9.19 NSMetadataItemIsUbiquitousKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a boolean indicating whether the item is stored in the cloud.
Available in Mac OS X v10.7 and later.

### 94.9.20 NSMetadataItemPathKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is a string object that contains the full path to the file
Available in Mac OS X v10.7 and later.

### 94.9.21 NSMetadataItemURLKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that may be associated with an item.
**Notes:** The value is an URL string that you can use to open the file.
Available in Mac OS X v10.7 and later.

### 94.9.22 NSMetadataUbiquitousItemHasUnresolvedConflictsKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a Boolean indicating whether the item is currently in conflict with another version of the file somewhere else.
Available in Mac OS X v10.7 and later.

### 94.9.23 NSMetadataUbiquitousItemIsDownloadedKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a Boolean indicating whether the current version of the item has been downloaded and is available locally.
Available in Mac OS X v10.7 and later.

### 94.9.24 NSMetadataUbiquitousItemIsDownloadingKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a Boolean indicating whether the item is currently being downloaded to the local device.
Available in Mac OS X v10.7 and later.

### 94.9.25 NSMetadataUbiquitousItemIsUploadedKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a Boolean indicating whether the item has been uploaded to the cloud.
Available in Mac OS X v10.7 and later.

### 94.9.26 NSMetadataUbiquitousItemIsUploadingKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a Boolean indicating whether the current version of the item is currently being uploaded to the cloud.

Available in Mac OS X v10.7 and later.

### 94.9.27 NSMetadataUbiquitousItemPercentDownloadedKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a number that contains the percentage of the file that has already been downloaded from the cloud. The value is a double in the range 0.0 to 100.0.
Available in Mac OS X v10.7 and later.

### 94.9.28 NSMetadataUbiquitousItemPercentUploadedKey as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the possible attribute keys that describe cloud-related information about the item.
**Notes:** The value is a number that contains the percentage of the file that has already been uploaded to the cloud. The value is a double in the range 0.0 to 100.0.
Available in Mac OS X v10.7 and later.

### 94.9.29 Path as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The file path.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.30 UbiquitousItemHasUnresolvedConflicts as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the item is currently in conflict with another version of the file somewhere else.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.31 UbiquitousItemIsDownloaded as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the current version of the item has been downloaded and is available locally.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.32 UbiquitousItemIsDownloading as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the item is currently being downloaded to the local device.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.33 UbiquitousItemIsUploaded as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the item has been uploaded to the cloud.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.34 UbiquitousItemIsUploading as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Whether the current version of the item is currently being uploaded to the cloud.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.35 UbiquitousItemPercentDownloaded as Double

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The percentage of the file that has already been downloaded from the cloud. The value is a double in the range 0.0 to 100.0.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.36 UbiquitousItemPercentUploaded as Double

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The percentage of the file that has already been uploaded to the cloud. The value is a double in the range 0.0 to 100.0.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.37 URL as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The file URL.
**Notes:** Available in Mac OS X v10.7 and later.

### 94.9.38 valueForAttribute(key as string) as Variant

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's metadata attribute name specified by a given key.
**Notes:** key: The name of a metadata attribute.
Returns value as Variant.

### 94.9.39 valuesForAttributes(keys() as string) as dictionary

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a dictionary containing the key-value pairs for the attribute names specified by a given array of keys.
**Notes:** keys: An array containing strings that specify the names of a metadata attributes.

A dictionary containing the key-value pairs for the attribute names specified by keys.

### 94.9.40 Properties

### 94.9.41 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal reference to the metadata item.
**Notes:** Available in Mac OS X v10.7 and later.
(Read and Write property)

## 94.10 class NSMetadataQueryMBS

### 94.10.1 class NSMetadataQueryMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The NSMetadataQuery class encapsulates the functionality provided by the MDQuery opaque type for querying the Spotlight metadata.
**Notes:** You may prefer MDQueryMBS class from our plugins. NSMetadataQueryMBS exists as it supports iCloud search.

NSMetadataQuery objects provide metadata query results in several ways:

- As individual attribute values for requested attributes.
- As value lists that contain the distinct values for given attributes in the query results.
- A result array proxy, containing all the query results. This is suitable for use with Cocoa bindings.
- As a hierarchical collection of results, grouping together items with the same values for specified grouping attributes. This is also suitable for use with Cocoa bindings.

Queries have two phases: the initial gathering phase that collects all currently matching results and a second live-update phase.
By default the receiver has no limitation on its search scope. Use setSearchScopes to customize.
By default, notification of updated results occurs at 1.0 seconds. Use setNotificationBatchingInterval to customize.
You must set a predicate with the setPredicate method before starting a query.
**Blog Entries**

- More notes
- MBS Real Studio Plugins, version 11.3pr9

### 94.10.2 Methods

### 94.10.3 Constructor

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes the NSMetadataQuery object.

### 94.10.4 Destructor

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 94.10.5 disableUpdates

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Disables updates to the query results.
**Notes:** You should invoke this method before iterating over query results that could change due to live updates.

### 94.10.6 enableUpdates

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Enables updates to the query results.
**Notes:** You should invoke this method after you're done iterating over the query results.

### 94.10.7 groupedResults as NSMetadataQueryResultGroupMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing hierarchical groups of query results based on the receiver's grouping attributes.

### 94.10.8 groupingAttributes as string()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's grouping attributes.

### 94.10.9 indexOfResult(item as NSMetadataItemMBS) as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the index of a query result object in the receiver's results array.

### 94.10.10 isGathering as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver is in the initial gathering phase of the query.
**Notes:** Returns true when the query is in the initial gathering phase; false otherwise.

### 94.10.11 isStarted as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver has started the query.
**Notes:** Returns true when the receiver has executed the startQuery method; false otherwise.

### 94.10.12 isStopped as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver has stopped the query.
**Notes:** Returns true when the receiver has stopped the query, false otherwise.

### 94.10.13 NSMetadataQueryDidFinishGatheringNotification as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the query notification names.
**Notes:** Posted when the receiver has finished with the initial result-gathering phase of the query.

### 94.10.14 NSMetadataQueryDidStartGatheringNotification as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the query notification names.
**Notes:** Posted when the receiver begins with the initial result-gathering phase of the query.

### 94.10.15 NSMetadataQueryDidUpdateNotification as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the query notification names.
**Notes:** Posted when the receiver's results have changed during the live-update phase of the query.

### 94.10.16 NSMetadataQueryGatheringProgressNotification as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the query notification names.
**Notes:** Posted as the receiver's is collecting results during the initial result-gathering phase of the query.

### 94.10.17 NSMetadataQueryLocalComputerScope as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the scope constants you can use with setSearchScopes.

### 94.10.18 NSMetadataQueryNetworkScope as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the scope constants you can use with setSearchScopes.
**Notes:** Search all user-mounted remote volumes.

### 94.10.19 NSMetadataQueryResultContentRelevanceAttribute as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** In addition to the requested metadata attributes, a query result also includes content relevance, accessed with this key.
**Notes:** Key used to retrieve a number with a floating point value between 0.0 and 1.0 inclusive. The relevance value indicates the relevance of the content of a result object. The relevance is computed based on the value of the result itself, not on its relevance to the other results returned by the query. If the value is not computed, it is treated as an attribute on the item that does not exist.
Available in Mac OS X v10.4 and later.

### 94.10.20 NSMetadataQueryUbiquitousDataScope as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the scope constants you can use with setSearchScopes.
**Notes:** Search all files not in the Documents directories of the application's iCloud container directories.
vailable in Mac OS X v10.7 and later.

### 94.10.21 NSMetadataQueryUbiquitousDocumentsScope as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** One of the scope constants you can use with setSearchScopes.
**Notes:** Search all files in the Documents directories of the application's iCloud container directories.
vailable in Mac OS X v10.7 and later.

### 94.10.22 NSMetadataQueryUserHomeScope as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the scope constants you can use with setSearchScopes.
**Notes:** Search all local mounted volumes, including the user home directory. The user's home directory is searched even if it is a remote volume.

### 94.10.23 resultAtIndex(index as Integer) as NSMetadataItemMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the query result at a specific index.
**Notes:** index: Index of the desired result in the query result array.
Returns query result at the position specified by index.

For performance reasons, you should use this method when retrieving a specific result, rather than they array returned by results.

### 94.10.24 resultCount as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the number of results returned by the receiver.
**Notes:** For performance reasons, you should use this method, rather than invoking count on results array.

### 94.10.25 results as NSMetadataItemMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the result objects for the receiver.
**Notes:** The results array is a proxy object that is primarily intended for use with Cocoa bindings. While it is possible to copy the proxy array and receive a "snapshot" of the complete current query results, it is generally not recommended due to performance and memory issues. To access individual result array elements you should instead use the resultCount and resultAtIndex methods.

### 94.10.26 searchScopes as string()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the receiver's search scopes.
**Notes:** The array can contain strings that represent file system directories or the search scopes specified in Constants. An empty array indicates that there is no limitation on where the receiver searches.

### 94.10.27 setGroupingAttributes(attributeNames() as string)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the receiver's grouping attributes to specific attribute names.
**Notes:** Invoking this method on a receiver while it's running a query, stops the query and discards current results, and immediately starts a new query.
Available in Mac OS X v10.4 and later.

### 94.10.28 setSearchScopes(folders() as folderitem)

MBS MacCloud Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Restrict the search scope of the receiver.
**Notes:** You can pass paths as folderitem.
See also:


- 94.10.29 setSearchScopes(paths() as string) 15033
- 94.10.30 setSearchScopes(paths() as string, folders() as folderitem) 15034


### 94.10.29 setSearchScopes(paths() as string)

MBS MacCloud Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Restrict the search scope of the receiver.
**Notes:** You can pass paths as strings and with the string array also the special scope strings from this class.
See also:

- 94.10.28 setSearchScopes(folders() as folderitem) 15033
- 94.10.30 setSearchScopes(paths() as string, folders() as folderitem) 15034

### 94.10.30 setSearchScopes(paths() as string, folders() as folderitem)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Restrict the search scope of the receiver.
**Example:**

```
dim m as new NSMetadataQueryMBS
dim paths() as string
dim folders() as FolderItem

// you can specify where to search either by path or by FolderItem
'paths.Append "/Applications"
folders.Append SpecialFolder.Applications

m.setSearchScopes paths, folders
```

**Notes:** You can pass paths as strings, paths as folderitem and with the string array also the special scope strings from this class.
See also:

- 94.10.28 setSearchScopes(folders() as folderitem) 15033
- 94.10.29 setSearchScopes(paths() as string) 15033

### 94.10.31 setSortDescriptor(sortDescriptor as NSSortDescriptorMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the sort descriptors to be used by the receiver.
**Example:**

```
dim m as new NSMetadataQueryMBS
m.setSortDescriptor NSSortDescriptorMBS.sortDescriptorWithKey(NSMetadataItemMBS.NSMetadataItemDisplayNameKey, true)
```

**Notes:** Invoking this method on the receiver running a query causes the existing query to stop, all current results are discarded, and a new query is started immediately.

### 94.10.32 setSortDescriptors(sortDescriptors() as NSSortDescriptorMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Sets the sort descriptors to be used by the receiver.
**Notes:** Invoking this method on the receiver running a query causes the existing query to stop, all current results are discarded, and a new query is started immediately.

### 94.10.33 sortDescriptors as NSSortDescriptorMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the receiver's sort descriptors.
**Notes:** Available in Mac OS X v10.4 and later.

### 94.10.34 startQuery as boolean

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Attempts to start the query.
**Notes:** Returns true when successful; false otherwise.

A query can't be started if the receiver is already running a query or no predicate has been specified.

### 94.10.35 stopQuery

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Stops the receiver's current query from gathering any further results.
**Notes:** The receiver first completes gathering any unprocessed results. If a query is stopped before the gathering phase finishes, it will not post an NSMetadataQueryDidStartGatheringNotification notification.

You would call this function to stop a query that is generating too many results to be useful but still want to access the available results. If the receiver is sent a startQuery message after performing this method, the existing results are discarded.

### 94.10.36 Properties

### 94.10.37 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSMetadataQuery object.
**Notes:** (Read and Write property)

### 94.10.38 notificationBatchingInterval as Double

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The interval that the receiver provides notification of updated query results.
**Notes:** in seconds.
(Read and Write computed property)

### 94.10.39 predicate as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The predicate used by the receiver to filter the query results.
**Example:**

```
dim m as new NSMetadataQueryMBS
m.predicate = NSPredicateMBS.predicateWithFormat("kMDItemContentType=""com.apple.application-bundle""")
```

**Notes:** Setting the predicate on a receiver running a query causes the existing query to stop, all current results are discarded, and a new query is started immediately.
(Read and Write computed property)

### 94.10.40 Events

### 94.10.41 DidFinishGathering(n as NSNotificationMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Called as the query has finished with the initial result-gathering phase of the query.

### 94.10.42 DidStartGathering(n as NSNotificationMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Called as the query begins with the initial result-gathering phase of the query.

### 94.10.43 DidUpdate(n as NSNotificationMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Called as the query's results have changed during the live-update phase of the query.

### 94.10.44 GatheringProgress(n as NSNotificationMBS)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: .

**Function:** Called as the query is collecting results during the initial result-gathering phase of the query.

## 94.11 class NSMetadataQueryResultGroupMBS

### 94.11.1 class NSMetadataQueryResultGroupMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The NSMetadataQueryResultGroupMBS class represents a collection of grouped attribute results returned by an NSMetadataQueryMBS object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- More notes
- MBS Real Studio Plugins, version 11.3pr10

### 94.11.2 Methods

### 94.11.3 attributeName as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the attribute name for the receiver's result group.

### 94.11.4 Constructor

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 94.11.5 resultAtIndex(index as Integer) as NSMetadataItemMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the query result at a specific index.
**Notes:** index: The index of the desired result.

For performance reasons, you should use this method when retrieving a specific result, rather than they array returned by results.

### 94.11.6 resultCount as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the number of results returned by the receiver.
**Notes:** For performance reasons, you should use this method, rather than invoking count on results.

### 94.11.7 results as NSMetadataItemMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the result objects for the receiver.
**Notes:** The results array is a proxy object that is primarily intended for use with Cocoa bindings. While it is possible to copy the proxy array to get a "snapshot" of the complete current query results, it is generally not recommended due to performance and memory issues. To access individual result array elements you should instead use the resultCount and resultAtIndex methods.

### 94.11.8 subgroups as NSMetadataQueryResultGroupMBS()

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing the subgroups of the receiver.

### 94.11.9 value as Variant

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the value of the attribute name for the receiver.

### 94.11.10 Properties

### 94.11.11 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal handle to the NSMetadataQueryResultGroup object.
**Notes:** (Read and Write property)

## 94.12 class NSPredicateMBS

### 94.12.1 class NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The NSPredicate class is used to define logical conditions used to constrain a search either for a fetch or for in-memory filtering.
**Notes:** You use predicates to represent logical conditions, used for describing objects in persistent stores and in-memory filtering of objects. Although it is common to create predicates directly from instances of NSComparisonPredicate, NSCompoundPredicate, and NSExpression, you often create predicates from a format string which is parsed by the class methods on NSPredicate. Examples of predicate format strings include:

- Simple comparisons, such as grade == "7" or firstName like "Shaffiq"
- Case and diacritic insensitive lookups, such as name contains [ cd ] "itroen"
- Logical operations, such as (firstName like "Mark") OR (lastName like "Adderley")
- In Mac OS X v10.5 and later, you can create ¬Ä¬úbetween¬Ä¬ù predicates such as date between { $ YESTERDAY, $ TOMORROW } .

You can create predicates for relationships, such as:

- group.name like "work*"
- ALL children.age >12
- ANY children.age >12

You can create predicates for operations, such as @sum.items.price <1000. For a complete syntax reference, refer to the Predicate Programming Guide:
http://developer.apple.com/library/mac/#documentation/Cocoa/Conceptual/Predicates/predicates.html#//apple_ref/doc/uid/TP40001789
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr5
- More notes
- MBS Real Studio Plugins, version 11.3pr10

### 94.12.2 Methods

### 94.12.3 Constructor(predicateFormat as string)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a new predicate by substituting the values in a given array into a format string and parsing the result.
**Example:**

```
dim n as new NSPredicateMBS("kMDItemContentType=""com.apple.application-bundle""")
MsgBox n.predicateFormat
```

**Notes:** predicateFormat: The format string for the new predicate.
arguments: Optional, the arguments to substitute into predicateFormat. Values are substituted into predicateFormat in the order they appear in the array.

You get a new predicate by substituting the values in arguments into predicateFormat, and parsing the result.
For details of the format of the format string and of limitations on variable substitution, see Predicate Format String Syntax:
http://developer.apple.com/library/mac/documentation/Cocoa/Conceptual/Predicates/Articles/pSyntax.html#//apple_ref/doc/uid/TP40001795

Available in Mac OS X v10.4 and later.
See also:

- 94.12.4 Constructor(predicateFormat as string, arguments() as Variant) 15041
- 94.12.5 Constructor(value as boolean) 15042

### 94.12.4 Constructor(predicateFormat as string, arguments() as Variant)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a new predicate by substituting the values in a given array into a format string and parsing the result.
**Example:**

```
// we use one parameter here
dim s() as Variant
s.Append "com.apple.application-bundle"

dim n as new NSPredicateMBS("kMDItemContentType=%@", s)

// shows final string
```

MsgBox n.predicateFormat

**Notes:** predicateFormat: The format string for the new predicate.
arguments: Optional, the arguments to substitute into predicateFormat. Values are substituted into predicateFormat in the order they appear in the array.

You get a new predicate by substituting the values in arguments into predicateFormat, and parsing the result.
For details of the format of the format string and of limitations on variable substitution, see Predicate Format String Syntax:
http://developer.apple.com/library/mac/documentation/Cocoa/Conceptual/Predicates/Articles/pSyntax.html#//apple_ref/doc/uid/TP40001795

Available in Mac OS X v10.4 and later.
See also:

- 94.12.3 Constructor(predicateFormat as string) 15041
- 94.12.5 Constructor(value as boolean) 15042

### 94.12.5 Constructor(value as boolean)

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a predicate that always evaluates to a given value.
**Example:**

```
dim n as new NSPredicateMBS(true)
MsgBox n.predicateFormat
```

See also:

- 94.12.3 Constructor(predicateFormat as string) 15041
- 94.12.4 Constructor(predicateFormat as string, arguments() as Variant) 15041

### 94.12.6 description as string

MBS MacCloud Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The descriptor for this event.
**Example:**

```
dim args() as Variant
args.Append NSMetadataItemMBS.NSMetadataItemFSNameKey
dim pred as NSPredicateMBS = NSPredicateMBS.predicateWithFormat("%K LIKE '*'", args)
MsgBox pred.description
```

**Notes:** This is a text representation for debugging.

### 94.12.7 predicateFormat as string

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's format string.
**Notes:** The string returned by this method is not guaranteed to be the same as a string used to create the predicate.

### 94.12.8 predicateWithFormat(predicateFormat as string) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a new predicate by substituting the values in a given array into a format string and parsing the result.
**Example:**

```
dim n as NSPredicateMBS
n = NSPredicateMBS.predicateWithFormat("kMDItemContentType=""com.apple.application-bundle""")
MsgBox n.predicateFormat
```

**Notes:** predicateFormat: The format string for the new predicate.
arguments: Optional, the arguments to substitute into predicateFormat. Values are substituted into predicateFormat in the order they appear in the array.

Returns a new predicate by substituting the values in arguments into predicateFormat, and parsing the result.
For details of the format of the format string and of limitations on variable substitution, see Predicate Format String Syntax:
http://developer.apple.com/library/mac/documentation/Cocoa/Conceptual/Predicates/Articles/pSyntax.html#//apple_ref/doc/uid/TP40001795

Available in Mac OS X v10.4 and later.
See also:

- 94.12.9 predicateWithFormat(predicateFormat as string, arguments() as Variant) as NSPredicateMBS 15044

### 94.12.9 predicateWithFormat(predicateFormat as string, arguments() as Variant) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a new predicate by substituting the values in a given array into a format string and parsing the result.
**Example:**

```
dim args() as Variant
args.Append NSMetadataItemMBS.NSMetadataItemFSNameKey
dim pred as NSPredicateMBS = NSPredicateMBS.predicateWithFormat("%K LIKE '*'", args)
MsgBox pred.description
```

**Notes:** predicateFormat: The format string for the new predicate.
arguments: Optional, the arguments to substitute into predicateFormat. Values are substituted into predicateFormat in the order they appear in the array.

Returns a new predicate by substituting the values in arguments into predicateFormat, and parsing the result.
For details of the format of the format string and of limitations on variable substitution, see Predicate Format String Syntax:
http://developer.apple.com/library/mac/documentation/Cocoa/Conceptual/Predicates/Articles/pSyntax.html#//apple_ref/doc/uid/TP40001795

Available in Mac OS X v10.4 and later.
See also:

- 94.12.8 predicateWithFormat(predicateFormat as string) as NSPredicateMBS 15043

### 94.12.10 predicateWithValue(value as boolean) as NSPredicateMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns a predicate that always evaluates to a given value.
**Example:**

```
dim p as NSPredicateMBS = NSPredicateMBS.predicateWithValue(true)
MsgBox p.predicateFormat
```

### 94.12.11 Print

MBS MacCloud Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Writes description for this event descriptor to the console.
**Notes:** You can see result in Console.app.

### 94.12.12 Properties

### 94.12.13 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal handle to the NSPredicate object.
**Notes:** (Read and Write property)

## 94.13 class NSSortDescriptorMBS

### 94.13.1 class NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The cocoa class for sort descriptions.
**Example:**

```
dim n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

**Notes:** An instance of NSSortDescriptor describes a basis for ordering objects by specifying the property to use to compare the objects, the method to use to compare the properties, and whether the comparison should be ascending or descending. Instances of NSSortDescriptor are immutable.

You construct an instance of NSSortDescriptor by specifying the key path of the property to be compared, the order of the sort (ascending or descending), and (optionally) a selector to use to perform the comparison. The three-argument constructor allows you to specify other comparison selectors such as caseInsensitive-Compare: and localizedCompare:. Sorting raises an exception if the objects to be sorted do not respond to the sort descriptor's comparison selector.

Note: Many of the descriptions of NSSortDescriptor methods refer to "property key". This, briefly, is a string (key) that identifies a property (an attribute or relationship) of an object. You can find a discussion of this terminology in "Object Modeling" in Cocoa Fundamentals Guide and in Key-Value Coding Programming Guide.
There are a number of situations in which you can use sort descriptors, for example:

- To sort an array (an instance of NSArray or NSMutableArray—see sortedArrayUsingDescriptors and sortUsingDescriptors)
- To directly compare two objects (see compareObject method)
- To specify how the elements in a table view should be arranged (see sortDescriptors)
- To specify how the elements managed by an array controller should be arranged (see sortDescriptors)
- If you are using Core Data, to specify the ordering of objects returned from a fetch request (see sortDescriptors)

**Blog Entries**

- MBS Xojo Plugins, version 17.1pr5
- MBS Xojo / Real Studio Plugins, version 14.2pr10

- More notes
- MBS Real Studio Plugins, version 11.3pr10

### 94.13.2 Methods

### 94.13.3 compareObject(obj1 as variant, obj2 as variant) as Integer

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Compares two objects.
**Notes:** Returns 1, -1 or 0 (zero for equal).

### 94.13.4 Constructor(key as string, ascending as boolean)

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Initializes an NSSortDescriptor object initialized with a given property key path and sort order, and with the default comparison selector.
**Example:**

```
dim n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

On success the handle property is not zero.
Available in Mac OS X v10.3 and later.
If you implement the Compare event, we use it on OS X 10.6 and newer.
See also:

- 94.13.5 Constructor(key as string, ascending as boolean, SelectorName as String) 15047

### 94.13.5 Constructor(key as string, ascending as boolean, SelectorName as String)

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Initializes an NSSortDescriptor object initialized with a given property key path and sort order, and with the default comparison selector.
**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.

ascending: True if the receiver specifies sorting in ascending order, otherwise false.

On success the handle property is not zero.
Please pass valid name of a selector for the objects. Wrong selector causes trouble, e.g. "localizedCompare:".
Available in Mac OS X v10.3 and later.
See also:

- 94.13.4 Constructor(key as string, ascending as boolean) 15047

### 94.13.6 reversedSortDescriptor as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a copy of the receiver with the sort order reversed.
**Example:**

```
dim n as NSSortDescriptorMBS
n = NSSortDescriptorMBS.sortDescriptorWithKey("Hello", true)

dim x as NSSortDescriptorMBS = n.reversedSortDescriptor
MsgBox x.key+" "+str(x.ascending)
```

### 94.13.7 sortDescriptorWithKey(key as string, ascending as boolean) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKey("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering.
Available in Mac OS X 10.3 and newer.

### 94.13.8 sortDescriptorWithKeyComparator(key as string, ascending as boolean, Comparator as NSComparatorDelegateMBS, tag as Variant = nil) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor object initialized to do with the given ordering and comparator delegate.
**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding (see Key-Value Coding Programming Guide).
ascending: true if the receiver specifies sorting in ascending order, otherwise false.
Comparator: the comparator to use with delegate declaration "NSComparatorDelegateMBS(obj1 as Variant, obj2 as Variant, tag as Variant) as Integer".

### 94.13.9 sortDescriptorWithKeyWithCaseInsensitiveCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCaseInsensitiveCompare("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. With case insensitive string comparison.
Available in Mac OS X 10.3 and newer.

### 94.13.10 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCompare("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. Uses selector "compare:".
Available in Mac OS X 10.3 and newer.
See also:

- 94.13.11 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean, Options as Integer) as NSSortDescriptorMBS 15050

### 94.13.11 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean, Options as Integer) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKeyWithCompare("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. Uses selector "compare:options:".
Please pass options for NSString comparison. e.g. NSNumericSearch
Available in Mac OS X 10.3 and newer.
See also:

- 94.13.10 sortDescriptorWithKeyWithCompare(key as string, ascending as boolean) as NSSortDescriptorMBS 15049

### 94.13.12 sortDescriptorWithKeyWithLocalizedCaseInsensitiveCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKeyWithLocalizedCaseInsensitiveCompare("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. With localized string comparison. With case insensitive string comparison.
Available in Mac OS X 10.3 and newer.

### 94.13.13 sortDescriptorWithKeyWithLocalizedCompare(key as string, ascending as boolean) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified key and ordering.
**Example:**

```
dim n as NSSortDescriptorMBS

n = NSSortDescriptorMBS.sortDescriptorWithKeyWithLocalizedCompare("Hello", true)
MsgBox n.key
```

**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering. With localized string comparison.
Available in Mac OS X 10.3 and newer.

### 94.13.14 sortDescriptorWithKeyWithSelector(key as string, ascending as boolean, SelectorName as String) as NSSortDescriptorMBS

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** Creates and returns an NSSortDescriptor with the specified selector, key and ordering.
**Notes:** key: The property key to use when performing a comparison. In the comparison, the property is accessed using key-value coding.
ascending: True if the receiver specifies sorting in ascending order, otherwise false.

Returns an NSSortDescriptorMBS object initialized with the specified key and ordering.
Please pass valid name of a selector for the objects. Wrong selector causes trouble, e.g. "localizedCompare:".
Available in Mac OS X 10.3 and newer.

### 94.13.15 Properties

### 94.13.16 ascending as boolean

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a Boolean value that indicates whether the receiver specifies sorting in ascending order.
**Example:**

```
dim n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.ascending)
```

**Notes:** (Read only property)

### 94.13.17 Handle as Integer

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** The internal handle to the NSSortDescriptor object.
**Notes:** (Read and Write property)

### 94.13.18 key as string

MBS Main Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns the receiver's property key path.
**Example:**

```
dim n as new NSSortDescriptorMBS("Hello", true)
MsgBox str(n.key)
```

**Notes:** This key path specifies the property that is compared during sorting.
(Read only property)

### 94.13.19 selector as String

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: All.

**Function:** The selector used to sort.
**Notes:** (Read only property)

### 94.13.20 Events

### 94.13.21 Comparator(obj1 as Variant, obj2 as Variant) as Integer

MBS Main Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The compare event.

### 94.13.22 Delegates

### 94.13.23 NSComparatorDelegateMBS(obj1 as Variant, obj2 as Variant, tag as variant) as Integer

MBS Main Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate for use with sortDescriptorWithKeyComparator method.

## 94.14 class NSUbiquitousKeyValueStoreMBS

### 94.14.1 class NSUbiquitousKeyValueStoreMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The iCloud class to store key value data.
**Notes:** Size of data is limited to 64 KB per application and 4 KB per value.
Do not store data here. Better store some configuration data, bookmarks or highscores.

Please also check the documentation from Apple for the NSUbiquitousKeyValueStore class. Seems like you need your app to be signed with iCloud Storage Entitlements.
**Blog Entries**

- Lion features for Real Studio
- Lion arrived

### 94.14.2 Methods

### 94.14.3 ArrayValue(key as string) as Variant()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get the value for this key as a variant.
**Example:**

```
dim values() as Variant

values.Append "Hello"
values.Append "World"

dim u as new NSUbiquitousKeyValueStoreMBS

u.ArrayValue("key")=values

// later read back
dim nvalues() as Variant = u.ArrayValue("key")
```

See also:

- 94.14.4 ArrayValue(key as string, assigns values() as Variant) 

### 94.14.4 ArrayValue(key as string, assigns values() as Variant)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Set the value for this key as a variant.
**Example:**

```
dim u as new NSUbiquitousKeyValueStoreMBS
dim nvalues() as Variant = u.ArrayValue("key")
```

See also:

- 94.14.3 ArrayValue(key as string) as Variant() 15054

### 94.14.5 available as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Example:**

```
msgbox "iCloud Key Value Store available: "+str(NSUbiquitousKeyValueStoreMBS.available)
```

**Notes:** This does not tell you whether Apple switched on their servers.

### 94.14.6 Constructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The constructor.

### 94.14.7 defaultStore as NSUbiquitousKeyValueStoreMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a reference to the default key store.

### 94.14.8 Destructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 94.14.9 dictionaryRepresentation as dictionary

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The key value store as a dictionary.

### 94.14.10 NSUbiquitousKeyValueStoreChangedKeysKey as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** A key name for the userinfo dictionary when you receive the NSUbiquitousKeyValueStoreDidChangeExternallyNotification notification.
**Notes:** Value for this key in the dictionary in an array of strings.

### 94.14.11 NSUbiquitousKeyValueStoreChangeReasonKey as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** A key name for the userinfo dictionary when you receive the NSUbiquitousKeyValueStoreDidChangeExternallyNotification notification.
**Notes:** Value for this key in the dictionary in an integer.

### 94.14.12 NSUbiquitousKeyValueStoreDidChangeExternallyNotification as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The notification name for the notification sent when the .
**Notes:** You can observe this notification with the NSNotificationObserverMBS class or simply subclass NSUbiquitousKeyValueStoreMBS and use the DidChangeExternally event.

### 94.14.13 removeObjectForKey(key as string)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Removes the value for the key.

### 94.14.14 synchronize as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Synchronizes the key value store.
**Example:**

```
dim u as NSUbiquitousKeyValueStoreMBS = NSUbiquitousKeyValueStoreMBS.defaultStore

// safe something
u.StringValue("Font") = "Times"

if u.synchronize then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns true on success.

### 94.14.15 Properties

### 94.14.16 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for this object.
**Notes:** (Read and Write property)

### 94.14.17 BooleanValue(key as string) as Boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as a boolean.
**Notes:** (Read and Write computed property)

### 94.14.18 DataValue(key as string) as memoryblock

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as a memoryblock.
**Notes:** (Read and Write computed property)

### 94.14.19 DictionaryValue(key as string) as Dictionary

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as a dictionary.
**Notes:** (Read and Write computed property)

### 94.14.20 DoubleValue(key as string) as Double

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as a double.
**Example:**

```
dim u as new NSUbiquitousKeyValueStoreMBS

u.DoubleValue("HighScore") = 3456
```

**Notes:** (Read and Write computed property)

### 94.14.21 IntegerValue(key as string) as Int64

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as an integer.
**Example:**

```
dim u as new NSUbiquitousKeyValueStoreMBS

// query highscore value
MsgBox str(u.IntegerValue("HighScore"))
```

**Notes:** (Read and Write computed property)

### 94.14.22 StringValue(key as string) as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the string value for the given key.
**Example:**

```
dim u as NSUbiquitousKeyValueStoreMBS = NSUbiquitousKeyValueStoreMBS.defaultStore

// safe something
u.StringValue("Font") = "Times"
```

**Notes:** (Read and Write computed property)

### 94.14.23 VariantValue(key as string) as Variant

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Get or set the value for this key as a variant.
**Notes:** (Read and Write computed property)

### 94.14.24 Events

### 94.14.25 DidChangeExternally(ChangeReason as Integer, ChangedKeys() as string, notification as Variant)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called when the ubiquitious key value store changed.
**Notes:** ChangeReason gives the reason.
Can be NSUbiquitousKeyValueStoreServerChange, NSUbiquitousKeyValueStoreInitialSyncChange or NSUbiquitousKeyValueStoreQuotaViolationChange.

### 94.14.26 Constants

Change Reason Constants

| Constant | Value | Description |
|---|---|---|
| NSUbiquitousKeyValueStoreInitialSyncChange | 1 | |
| NSUbiquitousKeyValueStoreQuotaViolationChange | 2 | |
| NSUbiquitousKeyValueStoreServerChange | 0 | |

# Chapter 95

# Icon Service

## 95.1 Globals

### 95.1.1 CompositeIconsMBS(ForeGround as IconMBS, BackGround as IconMBS) as IconMBS

MBS Picture Plugin, Plugin Version: 5.1, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Combines two icons.
**Example:**

```
dim i as IconMBS // global

Sub Open()
dim a,b as IconMBS

b=new IconMBS(SpecialFolder.Desktop)
a=new IconMBS(app.ApplicationFileMBS)

i=CompositeIconsMBS(a,b)

End Sub

Sub Paint(g As Graphics)
i.DrawIcon(g,0,0,128,128)
End Sub
```

**Notes:** Returns nil on any error (e.g. one of the two icons is invalid or nil).
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

## 95.2 class IconMBS

### 95.2.1 class IconMBS

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for an icon on Mac OS.
**Notes:** For Linux, please use LinuxIconMBS module.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- Removing 32-bit Carbon GUI classes
- IconFamilyMBS class deprecated
- MBS Xojo Plugins, version 17.6pr1
- MBS Xojo / Real Studio Plugins, version 15.4pr3
- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS Real Studio Plugins, version 12.1pr2
- Getting icons from Files
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2
- MonkeyBread Software Releases the MBS Plugins 8.1

### 95.2.2 Methods

### 95.2.3 Constructor(f as folderitem, NoBadge as boolean = false)

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads the icon for this file/folder/volume.
**Example:**

```
// in a paint event:

dim i as new IconMBS(SpecialFolder.Desktop)

i.DrawIcon(g, 0, 0, 128, 128)
```

**Notes:** The example "GetIcon.rb" shows how to get the file icons.
A custom icon is preferred (ID -16455).

NoBadge can be set to true to have no badges on the icon.
See also:

- 95.2.4 Constructor(type as string, creator as string) 15063
- 95.2.5 Constructor(type as string, creator as string, extension as string, mime as string) 15063

### 95.2.4 Constructor(type as string, creator as string)

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads the icon for this type and creator code combination.
**Example:**

```
// in a paint event:

dim i as new IconMBS("FNDR", "MACS")

i.DrawIcon(g, 0, 0, 128, 128)
```

**Notes:** The example "GetIcon.rb" shows how to get the predefined icons from the system.
See also:

- 95.2.3 Constructor(f as folderitem, NoBadge as boolean = false) 15062
- 95.2.5 Constructor(type as string, creator as string, extension as string, mime as string) 15063

### 95.2.5 Constructor(type as string, creator as string, extension as string, mime as string)

MBS Picture Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Loads the icon base on the given information.
**Example:**

```
Sub Paint(g As Graphics)
// in a window paint event:

dim i as IconMBS
dim type, creator, extension, mime as string

type=""
```

```
creator=""
extension="jpg"
mime=""

i=new iconmbs(type, creator, extension, mime)
// draws jpeg icon
i.DrawIcon(g,0,0,128,128)

type=""
creator=""
extension=""
mime="video/quicktime"

i=new iconmbs(type, creator, extension, mime)
// draws quicktime movie icon
i.DrawIcon(g,128,0,128,128)

type="TEXT"
creator="MSWD"
extension=""
mime=""

i=new iconmbs(type, creator, extension, mime)
// draws microsoft word text file icon
i.DrawIcon(g,0,128,128,128)

type=""
creator="GKON"
extension="jpg"
mime=""

i=new iconmbs(type, creator, extension, mime)
// draws graphic converter jpeg file icon
i.DrawIcon(g,128,128,128,128)

End Sub
```

**Notes:** All parameters can be empty strings if you don't know this information.
Requires Mac OS X 10.3 to work properly.
See also:

- 95.2.3 Constructor(f as folderitem, NoBadge as boolean = false) 15062

- 95.2.4 Constructor(type as string, creator as string) 15063

### 95.2.6 DrawIconCGContext(CGContextHandle as Integer,x as Integer,y as Integer,width as Integer,height as Integer, align as Integer, transform as Integer, flags as Integer, labelColor as color)

MBS Picture Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draws the icon in a CoreGraphics Context.
**Example:**

```
Function GetIconImage(i as iconmbs, w as Integer, h as Integer) As picture
dim c as new CGPictureContextMBS(w,h)

const DrawNormal=0
const DrawNoImage=2
const DrawNoMask=4
const DrawSelected=&h8000

i.DrawIconCGContext(c.Handle, 0,0,w,h,0,0,DrawNoMask,&c000000)

c.Flush

Return c.CopyPicture
End Function
```

**Notes:** You must make sure that the CGContext handle you pass in is valid. You can use CGContextMBS class for this and use GetCurrentCGContextMBS or Window.CGContextMBS to get a context. Please note that coordinates have the origin typically on the lower left.

Flags:

| | |
|---|---|
| DrawNormal | 0 |
| DrawNoImage | 2 |
| DrawNoMask | 4 |
| DrawSelected | 32768 |

Align constants:

Transform constants:

| | |
|---|---|
| None | 0 |
| VerticalCenter | 1 |
| Top | 2 |
| Bottom | 3 |
| HorizontalCenter | 4 |
| AbsoluteCenter | 5 |
| CenterTop | 6 |
| CenterBottom | 7 |
| Left | 8 |
| CenterLeft | 9 |
| TopLeft | 10 |
| BottomLeft | 11 |
| Right | 12 |
| CenterRight | 13 |
| TopRight | 14 |
| BottomRight | 15 |

### 95.2.7 GetBackground as IconMBS

MBS Picture Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the icon is a composited one, this function returns the icon used for the background.
**Notes:** Returns nil on any error.
Lasterror ist set.

### 95.2.8 GetForeground as IconMBS

MBS Picture Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** If the icon is a composited one, this function returns the icon used for the foreground.
**Notes:** Returns nil on any error.
Lasterror ist set.

### 95.2.9 IsIconRefMaskEmpty as boolean

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the mask of the icon is empty.
**Example:**

```
dim i as new IconMBS("FNDR", "MACS")

MsgBox str(i.IsIconRefMaskEmpty)
```

| | |
|---|---|
| None | 0 |
| Disabled | 1 |
| Offline | 2 |
| Open | 3 |
| Label1 | &h0100 |
| Label2 | &h0200 |
| Label3 | &h0300 |
| Label4 | &h0400 |
| Label5 | &h0500 |
| Label6 | &h0600 |
| Label7 | &h0700 |
| Selected | &h4000 |
| SelectedDisabled | &h4001 |
| SelectedOffline | &h4002 |
| SelectedOpen | &h4003 |

**Notes:** Lasterror is set.

### 95.2.10 PointInIcon(pointx as Integer,pointy as Integer,x as Integer,y as Integer,width as Integer,height as Integer,align as Integer) as boolean

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tests whether a point is inside the icon's picture.
**Notes:** The coordinates for pointx/pointy and x/y must be in the same system.

Align constants:

### 95.2.11 RectInIcon(rectx as Integer,recty as Integer,rectwidth as Integer,rectheight as Integer,x as Integer,y as Integer,width as Integer,height as Integer,align as Integer) as boolean

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tests whether a rectangle is inside the icon's picture.
**Notes:** The coordinates for both rectangles must be in the same coordinate system.

Align constants:

| | |
|---|---|
| None | 0 |
| VerticalCenter | 1 |
| Top | 2 |
| Bottom | 3 |
| HorizontalCenter | 4 |
| AbsoluteCenter | 5 |
| CenterTop | 6 |
| CenterBottom | 7 |
| Left | 8 |
| CenterLeft | 9 |
| TopLeft | 10 |
| BottomLeft | 11 |
| Right | 12 |
| CenterRight | 13 |
| TopRight | 14 |
| BottomRight | 15 |

This call may fail in some RB versions because of the count of parameters.

### 95.2.12 RetainCount as Integer

MBS Picture Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** How many references to this icon are hold on this Mac.
**Example:**

```
dim i as new IconMBS("FNDR", "MACS") // Finder Icon

MsgBox str(i.RetainCount)
```

### 95.2.13 Properties

### 95.2.14 handle as Integer

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle of this icon in memory.
**Example:**

```
dim i as new IconMBS("FNDR", "MACS") // Finder Icon
```

| | |
|---|---|
| None | 0 |
| VerticalCenter | 1 |
| Top | 2 |
| Bottom | 3 |
| HorizontalCenter | 4 |
| AbsoluteCenter | 5 |
| CenterTop | 6 |
| CenterBottom | 7 |
| Left | 8 |
| CenterLeft | 9 |
| TopLeft | 10 |
| BottomLeft | 11 |
| Right | 12 |
| CenterRight | 13 |
| TopRight | 14 |
| BottomRight | 15 |

```
MsgBox str(i.handle)
```

**Notes:** (Read and Write property)

### 95.2.15 LastError as Integer

MBS Picture Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Example:**

```
dim i as new IconMBS("FNDR", "MACS") // Finder Icon

MsgBox str(i.LastError)
```

**Notes:** The last function was successfull if lasterror is 0.
If the last function was not available on this machine, the value is set to -1.
Other values are Mac OS error codes.
(Read and Write property)

### 95.2.16 Release as boolean

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** whether the destructor will release the handle.
**Example:**

```
dim i as new IconMBS("FNDR", "MACS") // Finder Icon

MsgBox str(i.Release)
```

**Notes:** (Read and Write property)

### 95.2.17 valid as boolean

MBS Picture Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Were the constructors successfull?
**Example:**

```
dim i as new IconMBS("FNDR", "MACS") // Finder Icon

MsgBox str(i.valid)
```

**Notes:** (Read and Write property)

# Chapter 96

# Image Capture

## 96.1 control DesktopIKCameraDeviceViewControlMBS

### 96.1.1 control DesktopIKCameraDeviceViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Camera Device View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.1.2 Properties

### 96.1.3 View as IKCameraDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The camera device view used in this control.
**Notes:** (Read only property)

### 96.1.4 Events

### 96.1.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.1.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.1.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.1.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.1.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.1.10 DidDownloadFile(CameraFile as ICCameraFileMBS, URL as string, File as folderItem, data as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent for each file that gets downloaded.
**Notes:** Based on the IKCameraDeviceViewDisplayMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.1.11 DidEncounterError(Error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent every time the camera device reports an error.

### 96.1.12 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.1.13 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.1.14 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.1.15 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.1.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.1.17 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.1.18 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.1.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.1.20 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.1.21 SelectionDidChange

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.

### 96.1.22 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 96.2 control DesktopIKDeviceBrowserViewControlMBS

### 96.2.1 control DesktopIKDeviceBrowserViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Device Browser View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.2.2 Properties

### 96.2.3 View as IKDeviceBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The device browser view used in this control.
**Notes:** (Read only property)

### 96.2.4 Events

### 96.2.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.2.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.2.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.2.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.2.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.2.10 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent every time the device browser reports an error.

### 96.2.11 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.2.12 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.2.13 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.2.14 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.2.15 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.2.16 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.2.17 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.2.18 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.2.19 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.2.20 SelectionDidChange(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.
**Notes:** The device may be a ICCameraDeviceMBS or a ICScannerDeviceMBS.

### 96.2.21 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 96.3 control DesktopIKScannerDeviceViewControlMBS

### 96.3.1 control DesktopIKScannerDeviceViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Scanner Device View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.3.2 Properties

### 96.3.3 View as IKScannerDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scanner view used in this control.
**Notes:** For Xojo with Cocoa target.
(Read only property)

### 96.3.4 Events

### 96.3.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.3.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.3.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.3.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.3.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.3.10 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event is sent every time the scanner device reports an error.

### 96.3.11 DidScanToBandData(data as ICScannerBandDataMBS, scanInfo as Dictionary, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** For memory a based transfer this event is sent for every time an image band of data was scanned.
**Notes:** The 'data' parameter describes the scanned image data. Note that rotation/cropping/image adjustments are not applied yet. The 'scanInfo' parameter contains additional information (rotation angle, ...) that should be applied once the scan is completed.

### 96.3.12 DidScanToURL(url as String, file as FolderItem, fileData as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** For file based transfer this event is sent for each image that gets scanned.
**Notes:** Based on the IKScannerDeviceViewTransferMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.3.13 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.3.14 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.3.15 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.3.16 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.3.17 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.3.18 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.3.19 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.3.20 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.3.21 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.3.22 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 96.4 class ICCameraDeviceMBS

### 96.4.1 class ICCameraDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICCameraDeviceMBS is a concrete subclass of ICDeviceMBS class.
**Notes:** ICDeviceBrowserMBS creates instances of this class.
Subclass of the ICDeviceMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.4.2 Methods

### 96.4.3 cancelDelete

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Cancels the current delete operation started by sending a requestDeleteFiles.

### 96.4.4 cancelDownload

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Cancels the current download operation.

### 96.4.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.4.6 contents as ICCameraItemMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Contents of the camera.
**Notes:** The structure of the elements in this array will reflect the folder structure of the storage reported by the camera. Each item in this array will correspond to a storage on the camera.

### 96.4.7 filesOfType(fileUTType as string) as ICCameraFileMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method returns an array of files on the camera of type fileType.
**Notes:** The fileType string is one of the following Uniform Type Identifier strings: kUTTypeImage, kUTTypeMovie, kUTTypeAudio, or kUTTypeData.
See UTTypeMBS module.

### 96.4.8 ICCameraDeviceCanAcceptPTPCommands as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can accept PTP commands.

### 96.4.9 ICCameraDeviceCanDeleteAllFiles as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can delete all files in a single operation while it is connected.

### 96.4.10 ICCameraDeviceCanDeleteOneFile as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can delete a file at a time while it is connected.

### 96.4.11 ICCameraDeviceCanReceiveFile as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the host can upload files to the camera.

### 96.4.12 ICCameraDeviceCanSyncClock as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can synchronize its date and time with that of the host computer.

### 96.4.13 ICCameraDeviceCanTakePicture as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can capture a picture while it is connected, if the client sends a requestTakePicture message to it.

### 96.4.14 ICCameraDeviceCanTakePictureUsingShutterReleaseOnCamera as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a camera.
**Notes:** Indicates that the camera can capture a picture while it is connected, if the user presses the shutter release on the camera.

### 96.4.15 ICDeleteAfterSuccessfulDownload as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key should be a boolean value. If this value is true, the file will be deleted from the device after it is succcessfully downloaded.

### 96.4.16 ICDownloadsDirectoryURL as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key should be an CFURLMBS referencing a writable directory.
The downloaded files will be saved in that directory.

### 96.4.17 ICDownloadSidecarFiles as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key should be a boolean value. If this value is true, all sidecar files will be downloaded along with the media file.

### 96.4.18 ICOverwrite as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key should be a boolean value. If this value is true, the downloaded file will overwrite an existing file with the same name and extension.

### 96.4.19 ICSaveAsFilename as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key should be a string containing the name to be used for the downloaded file.

### 96.4.20 ICSavedAncillaryFiles as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key will be an array containing names of files associated with the primary file that is downloaded. The options dictionary returned in didDownloadFile may have this key.

### 96.4.21 ICSavedFilename as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for options dictionary.
**Notes:** The value for this key will be a string containing the actual name of the saved file. The options dictionary returned in didDownloadFile will have this key.

### 96.4.22 mediaFiles as ICCameraFileMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The property mediaFiles represents all image, movie and audio files on the camera.
**Notes:** These files are returned as a single array without regard to the folder hierarchy used to store these files on the camera.

If no files show up, try again a second later as the framework may not yet have the list loaded.

### 96.4.23 requestDeleteFiles(files() as ICCameraFileMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Deletes files.

### 96.4.24 requestDisableTethering

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Send this message to disable tethered capture on the camera device if the camera has the 'ICCameraDeviceCanTakePicture' capability and if your process has already sent a 'requestEnableTethering' to it.

### 96.4.25 requestDownloadFile(file as ICCameraFileMBS, options as dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Download a file from the camera. Please refer to the top of this header for information about the options.
**Notes:** Calls cameraDeviceDidDownloadFile event later.
The content of error returned should be examined to determine if the request completed successfully.

### 96.4.26 requestEnableTethering

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Send this message to enable tethered capture on the camera device if the camera has the 'ICCameraDeviceCanTakePicture' capability.

### 96.4.27 requestReadDataFromFile(file as ICCameraFileMBS, offset as UInt64, Length as UInt64)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method asynchronously reads data of a specified length from a specified offset.
**Notes:** Calls later ImageCaptureEventsMBS.cameraDeviceDidReadData event.
The content of error returned should be examined to determine if the request completed successfully.

### 96.4.28 requestSendPTPCommand(command as MemoryBlock, dataOut as MemoryBlock)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method asynchronously sends a PTP command to a camera.
**Notes:** The content of error returned should be examined to determine if the request completed successfully.

### 96.4.29 requestSyncClock

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Synchronize camera's clock with the computer's clock.
**Notes:** You should send this request only if the camera has the 'ICCameraDeviceCanSyncClock' capability.

### 96.4.30 requestTakePicture

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Capture a new image using the camera, the camera capabilities include 'ICCameraDeviceCanTakePicture'.
**Notes:** You MUST send 'requestEnableTethering' message to the camera before sending 'requestTakePicture' message.

### 96.4.31 requestUploadFile(file as folderitem, options as dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Upload a file at fileURL to the camera.
**Notes:** The options dictionary is not used in this version.
Calls later ImageCaptureEventsMBS.cameraDeviceDidUploadFile event.

The content of error returned should be examined to determine if the request completed successfully.

### 96.4.32 Properties

### 96.4.33 batteryLevel as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates the battery charge level.
**Notes:** Its value ranges from 0 to 100.
(Read only property)

### 96.4.34 batteryLevelAvailable as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the device has reported battery charge levelÔøº.
**Notes:** (Read only property)

### 96.4.35 contentCatalogPercentCompleted as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates the percentage of content cataloging completed on the device.
**Notes:** Its value ranges from 0 to 100.
(Read only property)

### 96.4.36 isAccessRestrictedAppleDevice as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Set to true if the device is made by Apple and is pass-coded locked and connected to an untrusted host.
**Notes:** (Read only property)

### 96.4.37 mountPoint as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Filesystem mount point for a device with transportType of ICTransportTypeMassStorage.
**Notes:** This will be "" for all other devices.
(Read only property)

### 96.4.38 tetheredCaptureEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This property is set to YES when tethered capture is enabled on the device.
**Notes:** Use 'requestEnableTethering' and 'requestDisableTethering' to enable or disable tethered capture on the device.
(Read only property)

### 96.4.39 timeOffset as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates the time offset, in seconds, between the camera's clock and the computer's clock.
**Notes:** This value is positive if the camera's clock is ahead of the computer's clock. This property should be ignored if the camera's capabilities property does not contain ICCameraDeviceCanSyncClock.
(Read only property)

## 96.5 class ICCameraFileMBS

### 96.5.1 class ICCameraFileMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This class represents a file on an ICCameraDevice object.
**Notes:** Subclass of the ICCameraItemMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.5.2 Methods

### 96.5.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.5.4 sidecarFiles as ICCameraFileMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns array of sidecar files.
**Notes:** This property is an empty array if there are no sidecar files associated with this file. Otherwise it is an array of ICCameraFile instances of sidecar files associated with this file. An example of a sidecar file is a file with the same base name as this file and having an extension XMP.

### 96.5.5 Properties

### 96.5.6 Duration as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Duration of audio/video file in seconds.
**Notes:** (Read only property)

### 96.5.7 FileSize as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Size of file in bytes.
**Notes:** (Read only property)

### 96.5.8 Orientation as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Desired orientation of image to use when it is downloaded.
**Notes:** This property is set to ICEXIFOrientation1 initially. If the format of this file supports EXIF orientation tag, then this property will be updated to match the value of that tag, when the thumbnail or metadata for this file is received.

Possible values:

| | | |
|---|---|---|
| ICEXIFOrientation1 | 1 | Normal |
| ICEXIFOrientation2 | 2 | Flipped horizontally |
| ICEXIFOrientation3 | 3 | Rotated 180¬∞ |
| ICEXIFOrientation4 | 4 | Flipped vertically |
| ICEXIFOrientation5 | 5 | Rotated 90¬∞ CCW and flipped vertically |
| ICEXIFOrientation6 | 6 | Rotated 90¬∞ CCW |
| ICEXIFOrientation7 | 7 | Rotated 90¬∞ CW and flipped vertically |
| ICEXIFOrientation8 | 8 | Rotated 90¬∞ CW |

(Read and Write property)

## 96.6 class ICCameraFolderMBS

### 96.6.1 class ICCameraFolderMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This class represents a folder on an ICCameraDevice object.
**Notes:** Subclass of the ICCameraItemMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.6.2 Methods

### 96.6.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.6.4 contents as ICCameraItemMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A list of items contained by this folder.

## 96.7 class ICCameraItemMBS

### 96.7.1 class ICCameraItemMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICCameraItem is an abstract class that represents an item in an ICCameraDevice object.
**Notes:** ICCameraDevice object creates instances of two concrete subclasses of ICCameraItem: ICCameraFolder and ICCameraFile.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.7.2 Methods

### 96.7.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.7.4 Properties

### 96.7.5 addedAfterContentCatalogCompleted as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This property is set if the file is captured on the device after the device's content is fully enumerated.
**Notes:** This does not apply to files added as a result of adding a new store to the device.
(Read only property)

### 96.7.6 CreationDate as Date

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creation date of this file.
**Notes:** This information is usually the same as the EXIF creation date.
(Read only property)

### 96.7.7 CreationDateTime as DateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Creation date of this file.
**Notes:** This information is usually the same as the EXIF creation date.
(Read only property)

### 96.7.8 Device as ICCameraDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Parent device of this folder.
**Notes:** (Read only property)

### 96.7.9 FileSystemPath as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The file system path of the item for items on a device with transportType of ICTransportTypeMassStorage.
**Notes:** (Read only property)

### 96.7.10 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 96.7.11 InTemporaryStore as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if this folder is in a temporary store.
**Notes:** A temporary store may be used by the device when images are captures on the device when it is tethered to the computer.
(Read only property)

### 96.7.12 largeThumbnailIfAvailable as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Large thumbnail for the item if one is readily available.
**Notes:** Value is a CGImageMBS.
If one is not readily available, accessing this property will send a message to the device requesting a thumbnail for the file. The ImageCaptureEventsMBS subclass will be notified via event cameraDeviceDidReceiveThumbnailForItem.
(Read only property)

### 96.7.13 Locked as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates the protection state of this item.
**Notes:** It is locked if the storage card in the camera is locked.
(Read only property)

### 96.7.14 MetadataIfAvailable as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Metadata for the file if one is readily available.
**Notes:** If one is not readily available, accessing this property will send a message to the device requesting a thumbnail for the file. The ImageCaptureEventsMBS subclass will be notified via event cameraDeviceDidReceiveMetadataForItem.
(Read only property)

### 96.7.15 ModificationDate as Date

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Modification date of this file.
**Notes:** This information is usually the same as the EXIF modification date.
(Read only property)

### 96.7.16 ModificationDateTime as DateTime

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Modification date of this file.
**Notes:** This information is usually the same as the EXIF modification date.
(Read only property)

### 96.7.17 Name as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Name of this file or folder.
**Notes:** (Read only property)

### 96.7.18 ParentFolder as ICCameraFolderMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Parent folder of this folder. The root folder's parentFolder is nil.
**Notes:** (Read only property)

### 96.7.19 ptpObjectHandle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** PTP object handle value if the item is on a camera that uses PTP protocol.
**Notes:** The value of this property is set to 0 if the camera does not use PTP protocol.
(Read only property)

### 96.7.20 Raw as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the file is a raw image file.
**Notes:** (Read only property)

### 96.7.21 thumbnailIfAvailable as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Thumbnail for the item if one is readily available.
**Notes:** Value is a CGImageMBS.
If one is not readily available, accessing this property will send a message to the device requesting a

thumbnail for the file. The ImageCaptureEventsMBS subclass will be notified via event cameraDeviceDidReceiveThumbnailForItem.
(Read only property)

### 96.7.22 UserData as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A mutable dictionary to store arbitrary key-value pairs associated with a camera item object.
**Notes:** This can be used by view objects that bind to this object to store "house-keeping" information.
In Xojo, please query dictionary, modify it and assign back to this property.
(Read and Write property)

### 96.7.23 UTI as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Item UTI.
**Notes:** This is an Uniform Type Identifier string. It is one of: kUTTypeFolder, kUTTypeImage, kUTTypeMovie, kUTTypeAudio, or kUTTypeData.
See UTTypeMBS module.
(Read only property)

## 96.8 class ICDeviceBrowserMBS

### 96.8.1 class ICDeviceBrowserMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The ICDeviceBrowser object is used to find devices such as digital cameras and scanners that are supported by Image Capture.
**Notes:** These device may be directly attached to the USB or FireWire bus on the host computer, shared by other computers, or available over a TCP/IP network. This object communicates with an Image Capture agent process asynchronously to accomplish this.
**Blog Entries**

- MBS Xojo Plugins, version 19.0pr8
- MBS Xojo / Real Studio Plugins, version 16.4pr1
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.8.2 Methods

### 96.8.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 96.8.4 Destructor

MBS AVFoundation Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 96.8.5 devices as ICDeviceMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** All devices found by the browser.
**Notes:** This property will change as devices appear and disappear. This array is empty before the first invocation of the deviceBrowserDidAddDevice event.

### 96.8.6 Start

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This message tells the receiver to start looking for devices.
**Notes:** Please use ImageCaptureEventsMBS class to receive events.

### 96.8.7 Stop

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method tells the receiver to stop looking for devices.
**Notes:** This will free all device instances that are not in use.

### 96.8.8 Properties

### 96.8.9 browsedDeviceTypeMask as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The device type mask.
**Notes:** A mask whose set bits indicate the type of device(s) being browsed after the receiver receives the start message. This property can be changed while the browser is browsing for devices. This property can be constructed by OR'd values of ICDeviceTypeMask with values of ICDeviceLocationTypeMask.
(Read and Write property)

### 96.8.10 Browsing as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the device browser is browsing for devices.
**Notes:** (Read only property)

### 96.8.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 96.8.12 preferredDevice as ICDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method returns a device object that should be selected by the client application when it is launched.
**Notes:** If the client application that calls this method is the auto-launch application associated with a device and that device is the last device attached (through USB, FireWire or network), then that device will be the preferred device. The best place to call this method is in the event deviceBrowserDidAddDevice, if the "moreComing" parameter passed to the delegate is false; or in the event deviceBrowserDidEnumerateLocalDevices.
(Read only property)

### 96.8.13 Events

### 96.8.14 DeviceDidChangeName(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent if the name of a device changes.
**Notes:** This happens if the device module overrides the default name of the device reported by the device's transport layer, or if the name of the filesystem volume mounted by the device is changed by the user.

### 96.8.15 DeviceDidChangeSharingState(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the sharing state of a device has changes.
**Notes:** Any Image Capture client application can choose to share the device over the network using the sharing or webSharing facility in Image Capture.

### 96.8.16 DidAddDevice(device as ICDeviceMBS, moreComing as boolean)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to inform that a device has been added.
**Notes:** If several devices are found during the initial search, then this event is sent once for each device with the value of 'moreComing' set to true in each event except the last one.

### 96.8.17 DidEnumerateLocalDevices

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent after the device browser completes sending deviceBrowser:didAddDevice event for all local devices.
**Notes:** Detecting locally connected devices (USB and FireWire devices) is faster than detecting devices connected using a network protocol. An Image Capture client application may use this event to update its user interface to let the user know that it has completed looking for locally connected devices and then start looking for network devices.

### 96.8.18 DidRemoveDevice(device as ICDeviceMBS, moreGoing as boolean)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to inform that a device has been removed.
**Notes:** If several devices are removed at the same time, then this event is sent once for each device with the value of 'moreGoing' set to true in each event except the last one.

### 96.8.19 RequestsSelectDevice(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an event that occurred on the device may be of interest to the client application.
**Notes:** In Mac OS X 10.6, this event is sent when a button is pressed on a device and the current application is the target for that button press. In the case of the button-press event, if a session is open on the device, this event will not be sent, instead the deviceDidReceiveButtonPress event is sent.

## 96.9 class ICDeviceMBS

### 96.9.1 class ICDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICDevice is an abstract class that represents a device supported by Image Capture.
**Notes:** ImageCaptureCore defines two concrete subclasses of ICDeviceMBS, ICCameraDeviceMBS and ICScannerDeviceMBS. ICDeviceBrowserMBS creates instances of these two subclasses to represent cameras and scanners it finds.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr10

### 96.9.2 Methods

### 96.9.3 capabilities as Variant()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The capabilities of the device as reported by the device module.

### 96.9.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.9.5 ICButtonTypeCopy as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Copy" button on the device was pressed.

### 96.9.6 ICButtonTypeMail as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Mail" button on the device was pressed.

### 96.9.7 ICButtonTypePrint as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Print" button on the device was pressed.

### 96.9.8 ICButtonTypeScan as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Scan" button on the device was pressed.

### 96.9.9 ICButtonTypeTransfer as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Transfer" button on the device was pressed.

### 96.9.10 ICButtonTypeWeb as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to identify button-press on a device.
**Notes:** Indicates that the "Web" button on the device was pressed.

### 96.9.11 ICDeviceCanEjectOrDisconnect as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used to describe capabilities of a device.
**Notes:** Indicates either the device is mounted as a mass-storage volume and can be ejected or the it is a remote device with an active connection that can be disconnected.

### 96.9.12 ICDeviceLocationDescriptionBluetooth as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This description is returned for locationDescription property of a device connected via Bluetooth.

### 96.9.13 ICDeviceLocationDescriptionFireWire as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This description is returned for locationDescription property of a device connected to a FireWire port.

### 96.9.14 ICDeviceLocationDescriptionMassStorage as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This description is returned for locationDescription property of a device that is mounted as a mass-storage volume.

### 96.9.15 ICDeviceLocationDescriptionUSB as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This description is returned for locationDescription property of a device connected to a USB port.

### 96.9.16 ICLocalizedStatusNotificationKey as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used for device status notifications.
**Notes:** Key for a localized notification string.

### 96.9.17 ICStatusCodeKey as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used for device status notifications.
**Notes:** One of values defined in ICReturnCode.

### 96.9.18 ICStatusNotificationKey as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants used for device status notifications.
**Notes:** Key for a non-localized notification string.

### 96.9.19 ICTransportTypeBluetooth as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the device uses Bluetooth transport.

### 96.9.20 ICTransportTypeFireWire as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the device uses FireWire transport.

### 96.9.21 ICTransportTypeMassStorage as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the device use mounts as a mass-storage volume.

### 96.9.22 ICTransportTypeTCPIP as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the device uses TCP/IP transport.
**Notes:** These devices are discovered using Bonjour.

### 96.9.23 ICTransportTypeUSB as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates that the device uses USB transport.

### 96.9.24 requestCloseSession

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This message requests to close a previously opened session on this device.
**Notes:** This request is completed when the ImageCaptureEventsMBS subclass receives a deviceDidCloseSessionWithError event.

### 96.9.25 requestEjectOrDisconnect

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Eject the media if permitted by the device, or disconnect from a remote device.

### 96.9.26 requestOpenSession

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This message requests to open a session on the device.
**Notes:** A client MUST open a session on a device in order to use the device.
This request is completed when the ImageCaptureEventsMBS subclass receives a deviceDidOpenSessionWithError event. No more events will be sent to the delegate if this request fails.

### 96.9.27 requestSendMessage(messageCode as UInt32, data as MemoryBlock, maxReturnedDataSize as UInt64)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This method asynchronously sends an arbitrary message with optional data to a device.
**Notes:** This method allows developers to send a private message from a client application to a device module. This method is the functional equivalent of calling ICAObjectSendMessage() found in ImageCapture.framework, which has been deprecated in Mac OS X 10.6. The response to this command will be delivered using deviceDidSendMessage event.
The content of error returned should be examined to determine if the request completed successfully.
NOTE: This method SHOULD NOT BE USED to send PTP pass-through commands to a PTP camera. Please refer to requestSendPTPCommand defined in ICCameraDeviceMBS for sending PTP pass-through commands.

### 96.9.28 requestYield

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This message requests the device module in control of this device to yield control.
**Notes:** This message should be used only if the client is planning on communiting with the device directly. The device module may not yield control of the device if it has an open session.

### 96.9.29 Properties

### 96.9.30 AutolaunchApplicationPath as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Filesystem path of an application that is to be automatically launched when this device is added.
**Notes:** (Read and Write property)

### 96.9.31 BonjourServiceType as String

MBS AVFoundation Plugin, Plugin Version: 17.0, Platform: macOS, Targets: Desktop only.

**Function:** Service type if device was found via Bonjour..
**Notes:** (Read only property)

### 96.9.32 BskonjourServiceName as String

MBS AVFoundation Plugin, Plugin Version: 17.0, Platform: macOS, Targets: Desktop only.

**Function:** Service name if device was found via Bonjour..
**Notes:** (Read only property)

### 96.9.33 ButtonPressed as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A string object with one of the ICButtonType* values defined above.
**Notes:** (Read only property)

### 96.9.34 canDeleteAllFiles as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** If all files can be deleted.
**Notes:** (Read only property)

### 96.9.35 canDeleteOneFile as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether a file can be deleted.
**Notes:** (Read only property)

### 96.9.36 canEject as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this device can be ejected.
**Notes:** (Read only property)

### 96.9.37 canReceiveFile as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this device can receive a file.
**Notes:** (Read only property)

### 96.9.38 canSyncClock as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this device can sync clock.
**Notes:** (Read only property)

### 96.9.39 canTakePicture as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this device can take pictures.
**Notes:** (Read only property)

### 96.9.40 fwGUID as Int64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The FireWire GUID of a FireWire device in the IOKit registry.
**Notes:** This will be 0 for non-FireWire devices.
(Read only property)

### 96.9.41 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 96.9.42 HasConfigurableWiFiInterface as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the device can be configured for use on a WiFi network.
**Notes:** (Read only property)

### 96.9.43 HasOpenSession as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the device has an open session.
**Notes:** (Read only property)

### 96.9.44 Icon as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Icon image for the device.
**Notes:** Value is a CGImageMBS.
(Read only property)

### 96.9.45 IconPath as String

MBS AVFoundation Plugin, Plugin Version: 17.0, Platform: macOS, Targets: Desktop only.

**Function:** Path to icon file.
**Notes:** (Read only property)

### 96.9.46 IPAddress as String

MBS AVFoundation Plugin, Plugin Version: 17.0, Platform: macOS, Targets: Desktop only.

**Function:** IP Address.
**Notes:** (Read only property)

### 96.9.47 IsRemote as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the device is a remote device published by Image Capture device sharing facility.
**Notes:** (Read only property)

### 96.9.48 IsShared as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the device is shared using the Image Capture device sharing facility.
**Notes:** This value will change when sharing of this device is enabled or disabled.
(Read only property)

### 96.9.49 LocationDescription as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A non-localized location description string for the device.
**Notes:** The value returned in one of the location description strings defined above, or location obtained from the Bonjour TXT record of a network device.
(Read only property)

### 96.9.50 ModuleExecutableArchitecture as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Executable Architecture of the device module in control of this device.
**Notes:** Possible values:

| | |
|---|---|
| I386 | &h00000007 |
| PPC | &h00000012 |
| X86_64 | &h01000007 |
| PPC64 | &h01000012 |

(Read only property)

### 96.9.51 ModulePath as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Filesystem path of the device module that is associated with this device.
**Notes:** Camera-specific capabilities are defined in ICCameraDeviceMBS class and scanner-specific capabilities are defined in ICScannerDeviceMBS class.
(Read only property)

### 96.9.52 ModuleVersion as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The bundle version of the device module associated with this device.
**Notes:** This may change if an existing device module associated with this device is updated or a new device module for this device is installed.
(Read only property)

### 96.9.53 Name as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Name of the device as reported by the device module or by the device transport when a device module is not in control of this device.
**Notes:** This name may change if the device module overrides the default name of the device reported by the device's transport, or if the name of the filesystem volume mounted by the device is changed by the user.
(Read only property)

### 96.9.54 PersistentIDString as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A string representation of the persistent ID of the device.
**Notes:** (Read only property)

### 96.9.55 ProductKind as String

MBS AVFoundation Plugin, Plugin Version: 17.0, Platform: macOS, Targets: Desktop only.

**Function:** Product kind.
**Notes:** (Read only property)

### 96.9.56 SerialNumberString as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The serial number of the device.
**Notes:** This will be "" if the device does not provide a serial number.
(Read only property)

### 96.9.57 SystemSymbolName as String

MBS AVFoundation Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** systemSymbolName allows to query standard system symbol used to represent the device class.
**Notes:** New for macOS 11.0.
Using the symbol to render an appropriate device icon will ensure proper scaling for high resolution devices.
(Read only property)

### 96.9.58 TransportType as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The transport type used by the device.
**Notes:** The possible values are: ICTransportTypeUSB, ICTransportTypeFireWire, ICTransportTypeBluetooth, ICTransportTypeTCPIP, or ICTransportTypeMassStorage.
(Read only property)

### 96.9.59 type as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The type of the device as defined by ICDeviceType OR'd with its ICDeviceLocationType.
**Notes:** The type of this device can be obtained by AND'ing the value retuned by this property with an appropriate ICDeviceTypeMask. The location type of this device can be obtained by AND'ing the value retuned by this property with an appropriate ICDeviceLocationTypeMask.
(Read only property)

### 96.9.60 usbLocationID as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The USB location ID of a USB device in the IOKit registry.
**Notes:** This will be 0 for non-USB devices.
(Read only property)

### 96.9.61 usbProductID as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The USB product ID of a USB device in the IOKit registry.
**Notes:** This will be 0 for non-USB devices.
(Read only property)

### 96.9.62 usbVendorID as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The USB vendor ID of a USB device in the IOKit registry.
**Notes:** This will be 0 for non-USB devices.
(Read only property)

### 96.9.63 UserData as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A mutable dictionary to store arbitrary key-value pairs associated with a device object.
**Notes:** This can be used by view objects that bind to this object to store "house-keeping" information.
In Xojo, please query dictionary, modify it and assign back to this property.

(Read and Write property)

### 96.9.64 UUIDString as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** A string representation of the Universally Unique ID of the device.
**Notes:** (Read only property)

### 96.9.65 Constants

Device Types

| Constant | Value | Description |
|---|---|---|
| ICDeviceLocationTypeBluetooth | &h00000800 | Device found as a paired Bluetooth device. |
| ICDeviceLocationTypeBonjour | &h00000400 | Device found over the network by searching for Bonjour services suppor Image Capture. |
| ICDeviceLocationTypeLocal | &h00000100 | Device found directly attached to the Macintosh via its USB or FireWir |
| ICDeviceLocationTypeShared | &h00000200 | Device found over the network by searching for devices shared by othe intosh hosts. |

Image Capture Device Location Type Mask

| Constant | Value | Description |
|---|---|---|
| ICDeviceLocationTypeMaskBluetooth | &h00000800 | Mask to detect paired Bluetooth device. |
| ICDeviceLocationTypeMaskBonjour | &h00000400 | Mask to detect a network device that publishes a Bonjour service |
| ICDeviceLocationTypeMaskLocal | &h00000100 | Mask to detect a local (e.g., USB or FireWire) device. |
| ICDeviceLocationTypeMaskRemote | &h0000FE00 | Mask to detect a remote (shared, Bonjour, Bluetooth) device. |
| ICDeviceLocationTypeMaskShared | &h00000200 | Mask to detect a device by another Macintosh host. |

Image Capture Device Types

| Constant | Value | Description |
|---|---|---|
| ICDeviceTypeCamera | &h00000001 | Camera device. |
| ICDeviceTypeScanner | &h00000002 | Scanner device. |

Image Capture Device Type Mask

| Constant | Value | Description |
|---|---|---|
| ICDeviceTypeMaskCamera | &h00000001 | Mask to detect a camera device. |
| ICDeviceTypeMaskScanner | &h00000002 | Mask to detect a scanner device. |

## 96.10 class ICScannerBandDataMBS

### 96.10.1 class ICScannerBandDataMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for band data from scanner.
**Notes:** If image is too big to be transferred in one big block, it's sent in little chunks using this class.

Only uses when transfermode is ICScannerTransferModeMemoryBased.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MBS Xojo Plugins, version 19.4pr7

### 96.10.2 Methods

### 96.10.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.10.4 Properties

### 96.10.5 bigEndian as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes if the banded image data is reported in big endian.
**Notes:** (Read only property)

### 96.10.6 bitsPerComponent as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the number of bits per component for the banded image.
**Notes:** (Read only property)

### 96.10.7 bitsPerPixel as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the number of bits per pixel for banded the image.
**Notes:** (Read only property)

### 96.10.8 bytesPerRow as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Descries how many bytes are in each image band row.
**Notes:** (Read only property)

### 96.10.9 CGImage as CGImageMBS

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Builds CGImageMBS object with the data of this band.
**Notes:** Returns nil if data can't be represented easily as CGImage.
This function is designed for RGB or Grayscale.
(Read only property)

### 96.10.10 colorSyncProfilePath as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the path to the color profile matching the banded data.
**Notes:** (Read only property)

### 96.10.11 dataBuffer as Memoryblock

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The pointer to the data buffer object.
**Notes:** Plugin returns a copy of the data when you query this property.
(Read only property)

### 96.10.12 dataNumRows as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the number of rows contained in the image band.
**Notes:** (Read only property)

### 96.10.13 dataSize as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the actual data size of the image band buffer.
**Notes:** (Read only property)

### 96.10.14 dataStartRow as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the start row of the image band.
**Notes:** (Read only property)

### 96.10.15 fullImageHeight as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the full image height of the banded image.
**Notes:** (Read only property)

### 96.10.16 fullImageWidth as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes the full image width of the banded image.
**Notes:** (Read only property)

### 96.10.17 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 96.10.18 numComponents as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Describes how many components are contained within the banded image.
**Notes:** (Read only property)

### 96.10.19 Picture as Picture

MBS AVFoundation Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Builds Picture object with the data of this band.
**Notes:** Returns nil if data can't be represented easily as CGImage.
This function is designed for RGB or Grayscale.
(Read only property)

### 96.10.20 pixelDataType as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Type of pixel data that is contained in the band.
**Notes:** See ICScannerFunctionalUnitMBS.ICScannerPixelDataType* constants.
(Read only property)

# 96.11 class ICScannerDeviceMBS

## 96.11.1 class ICScannerDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a scanner device.
**Notes:** ICScannerDeviceMBS is a concrete subclass of ICDeviceMBS class. ICDeviceBrowserMBS creates instances of this class. In this release, an instance of ICScannerDeviceMBS class is intended to be used by the IKScannerDeviceViewMBS object. The IKScannerDeviceView class encapsulates the complexities of setting scan parameters, performing scans and saving the result. The developer should consider using IKScannerDeviceViewMBS instead of building their own views using the ICScannerDeviceMBS object.
Subclass of the ICDeviceMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 96.11.2 Methods

## 96.11.3 availableFunctionalUnitTypes as Integer()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of functional unit types available on this scanner device.
**Notes:** This is an array of numbers whose values are of type ICScannerFunctionalUnitType.

## 96.11.4 cancelScan

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Cancels the current scan operation started by sending a 'requestOverviewScan' or 'requestScan'.

## 96.11.5 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

## 96.11.6 ICScannerStatusRequestsOverviewScan as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Constants used for device status notifications.
**Notes:** A non-localized notification string to indicate that the scanner is requesting an overview scan to be performed.

### 96.11.7 ICScannerStatusWarmingUp as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Constants used for device status notifications.
**Notes:** A non-localized notification string to indicate that the scanner is warming up.

### 96.11.8 ICScannerStatusWarmUpDone as string

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Constants used for device status notifications.
**Notes:** A non-localized notification string to indicate that the scanner has warmed up.

### 96.11.9 requestOverviewScan

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Starts an overview scan on selectedFunctionalUnit.
**Notes:** When this request is completed, the delegate will be notified using the scannerDeviceDidCompleteOverviewScanWithError event. The content of error returned should be examined to determine if the request completed successfully.

### 96.11.10 requestScan

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Starts a scan on selectedFunctionalUnit.
**Notes:** When this request is completed, the delegate will be notified using the scannerDeviceDidCompleteScanWithError event. The content of error returned should be examined to determine if the request completed successfully.

### 96.11.11 requestSelectFunctionalUnit(type as Integer)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Requests the scanner device to select a functional unit.
**Notes:** When this request is completed, the delegate will be notified using the scannerDeviceDidSelectFunctionalUnit.

### 96.11.12 Properties

### 96.11.13 documentName as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The document name.
**Notes:** (Read and Write property)

### 96.11.14 documentUTI as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The document UTI.
**Notes:** Currently supported UTIs are: kUTTypeJPEG, kUTTypeJPEG2000, kUTTypeTIFF, kUTTypePNG etc.
see UTTypeMBS module.
(Read and Write property)

### 96.11.15 downloadsDirectory as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.11.16 downloadsFolder as FolderItem

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.11.17 maxMemoryBandSize as UInt64

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The total maximum band size requested when performing a ICScannerTransferModeMemory-Based.
**Notes:** (Read and Write property)

### 96.11.18 selectedFunctionalUnit as ICScannerFunctionalUnitMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The currently selected functional unit on the scanner device.
**Notes:** (Read only property)

### 96.11.19 transferMode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The transfer mode for scanned document.
**Notes:** (Read and Write property)

### 96.11.20 Constants

Transfer Modes

| Constant | Value | Description |
|---|---|---|
| ICScannerTransferModeFileBased | 0 | Save the scan as a file. |
| ICScannerTransferModeMemoryBased | 1 | Transfer the scan as data. |

## 96.12 class ICScannerFeatureBooleanMBS

### 96.12.1 class ICScannerFeatureBooleanMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFeatureBoolean object is used to represent a property of a scanner functional unit whose value can be true or false.
**Notes:** Subclass of the ICScannerFeatureMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.12.2 Methods

### 96.12.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.12.4 Properties

### 96.12.5 value as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The value of this feature.
**Notes:** (Read and Write property)

## 96.13 class ICScannerFeatureEnumerationMBS

### 96.13.1 class ICScannerFeatureEnumerationMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFeatureEnumeration object is used to represent a feature of a scanner functional unit that can have one of several discrete values.
**Notes:** Subclass of the ICScannerFeatureMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.13.2 Methods

### 96.13.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.13.4 menuItemLabels as String()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The human readable menu item labels to be used in a menu to allow the user to select the current value from an array of possible values.

### 96.13.5 menuItemLabelsTooltips as String()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Tooltip text associated with the menu items.

### 96.13.6 values as Variant()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of possible values. All items in this array must be of same type.

### 96.13.7 Properties

### 96.13.8 currentValue as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The current value.
**Notes:** The current value can be set to one of the possible values in the "values" property below.
(Read and Write property)

### 96.13.9 defaultValue as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The default value.
**Notes:** The default value can be set to one of the possible values in the "values" property below.
(Read only property)

## 96.14 class ICScannerFeatureMBS

### 96.14.1 class ICScannerFeatureMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFeature class is an abstract base class used to describe a scanner feature.
**Notes:** ImageCaptureCore defines three concrete subclasses of ICScannerFeatureMBS: ICScannerFeatureEnumerationMBS, ICScannerFeatureRangeMBS and ICScannerFeatureBooleanMBS.
The scanner functional units may have one or more instances of these classes to allow users to choose scanner-specific settings or operations before performing a scan.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.14.2 Methods

### 96.14.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.14.4 Properties

### 96.14.5 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 96.14.6 humanReadableName as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The human readable name of this feature.
**Notes:** (Read only property)

### 96.14.7 internalName as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal name of this feature.
**Notes:** (Read only property)

### 96.14.8 tooltip as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Tooltip text describing the feature.
**Notes:** (Read only property)

### 96.14.9 type as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Scanner feature type.
**Notes:** See ICScannerFeatureType* constants.
(Read only property)

### 96.14.10 Constants

Feature Types

| Constant | Value | Description |
|---|---|---|
| ICScannerFeatureTypeBoolean | 2 | The value of this feature can be true or false. |
| ICScannerFeatureTypeEnumeration | 0 | This feature can have one of several discrete values, strings or numbers. |
| ICScannerFeatureTypeRange | 1 | This value of this feature lies within a range. |
| ICScannerFeatureTypeTemplate | 3 | A group of features. |

## 96.15 class ICScannerFeatureRangeMBS

### 96.15.1 class ICScannerFeatureRangeMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFeatureRange object is used to represent a property of a scanner functional unit whose value lies within a range.
**Notes:** Subclass of the ICScannerFeatureMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.15.2 Methods

### 96.15.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.15.4 Properties

### 96.15.5 currentValue as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The current value.
**Notes:** Attempting to set the current value to a value that is not coincident with a step will result in a value corresponding to the nearest step being assigned to the current value.
(Read only property)

### 96.15.6 defaultValue as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The default value.
**Notes:** Attempting to set the default value to a value that is not coincident with a step will result in a value corresponding to the nearest step being assigned to the default value.
(Read only property)

### 96.15.7 maxValue as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value.
**Notes:** (Read only property)

### 96.15.8 minValue as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum value.
**Notes:** (Read only property)

### 96.15.9 stepSize as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The step size.
**Notes:** (Read only property)

## 96.16 class ICScannerFeatureTemplateMBS

### 96.16.1 class ICScannerFeatureTemplateMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFeatureTemplate object is used to define a group of one or more rectangular scan areas that can be used with a scanner functional unit.
**Notes:** Subclass of the ICScannerFeatureMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.16.2 Methods

### 96.16.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.16.4 targets as ICScannerFeatureMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The target features.

## 96.17 class ICScannerFunctionalUnitDocumentFeederMBS

### 96.17.1 class ICScannerFunctionalUnitDocumentFeederMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFunctionalUnitDocumentFeeder is a concrete subclass of ICScannerFunctionalUnit class.
**Notes:** ICScannerDevice creates instances of this class.
This represents the document feeder unit on the scanner.
Subclass of the ICScannerFunctionalUnitMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.17.2 Methods

### 96.17.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.17.4 Properties

### 96.17.5 documentLoaded as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the feeder has documents to scan.
**Notes:** This value will change when the document is loaded or removed from the feeder, if the scanner module has the capability to detect this state.
(Read only property)

### 96.17.6 duplexScanningEnabled as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether duplex scanning is enabled.
**Notes:** (Read and Write property)

### 96.17.7 evenPageOrientation as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Desired orientation of the even pages of the scanned document.
**Notes:** This property is set to ICEXIFOrientation1 initially.

Possible values:

| | | |
|---|---|---|
| ICEXIFOrientation1 | 1 | Normal |
| ICEXIFOrientation2 | 2 | Flipped horizontally |
| ICEXIFOrientation3 | 3 | Rotated 180¬∞ |
| ICEXIFOrientation4 | 4 | Flipped vertically |
| ICEXIFOrientation5 | 5 | Rotated 90¬∞ CCW and flipped vertically |
| ICEXIFOrientation6 | 6 | Rotated 90¬∞ CCW |
| ICEXIFOrientation7 | 7 | Rotated 90¬∞ CW and flipped vertically |
| ICEXIFOrientation8 | 8 | Rotated 90¬∞ CW |

(Read and Write property)

### 96.17.8 oddPageOrientation as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Desired orientation of the odd pages of the scanned document.
**Notes:** This property is set to ICEXIFOrientation1 initially.

Possible values:

| | | |
|---|---|---|
| ICEXIFOrientation1 | 1 | Normal |
| ICEXIFOrientation2 | 2 | Flipped horizontally |
| ICEXIFOrientation3 | 3 | Rotated 180¬∞ |
| ICEXIFOrientation4 | 4 | Flipped vertically |
| ICEXIFOrientation5 | 5 | Rotated 90¬∞ CCW and flipped vertically |
| ICEXIFOrientation6 | 6 | Rotated 90¬∞ CCW |
| ICEXIFOrientation7 | 7 | Rotated 90¬∞ CW and flipped vertically |
| ICEXIFOrientation8 | 8 | Rotated 90¬∞ CW |

(Read and Write property)

### 96.17.9 reverseFeederPageOrder as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether the document feeder reads pages from back to front.
**Notes:** (Read only property)

### 96.17.10 supportsDuplexScanning as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether duplex scanning is supported.
**Notes:** (Read only property)

## 96.18 class ICScannerFunctionalUnitFlatbedMBS

### 96.18.1 class ICScannerFunctionalUnitFlatbedMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFunctionalUnitFlatbedMBS is a concrete subclass of ICScannerFunctionalUnitMBS class.
**Notes:** ICScannerDevice creates instances of this class.
This represents the flatbed unit on the scanner.
Subclass of the ICScannerFunctionalUnitMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.18.2 Methods

### 96.18.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

## 96.19 class ICScannerFunctionalUnitMBS

### 96.19.1 class ICScannerFunctionalUnitMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFunctionalUnit is an abstract class that represents a scanner functiona unit.
**Notes:** ImageCaptureCore defines three concrete subclasses of ICScannerFunctionalUnit: ICScannerFunctionalUnitFlatbed, ICScannerFunctionalUnitPositiveTransparency, ICScannerFunctionalUnitNegativeTransparency and ICScannerFunctionalUnitDocumentFeeder. ICScannerDevice creates instances of these concrete subclasses.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.19.2 Methods

### 96.19.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 96.19.4 templates as ICScannerFeatureTemplateMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of objects of type ICScannerFeatureTemplate.

### 96.19.5 vendorFeatures as ICScannerFeatureMBS()

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of objects of type ICScannerFeature.

### 96.19.6 Properties

### 96.19.7 acceptsThresholdForBlackAndWhiteScanning as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if this functional unit accepts threshold value to be used when performing a scan in black & white.
**Notes:** (Read only property)

### 96.19.8 bitDepth as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The bit depth to use when performing the final scan.
**Notes:** This will always be one of the supported bit depths.
(Read and Write property)

### 96.19.9 canPerformOverviewScan as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if this functional unit can perfrom an overview scan.
**Notes:** Not all functional units can perform an overview scan. For example, a document feeder or a sheet feeder unit cannot perform an overview scan.
(Read only property)

### 96.19.10 defaultThresholdForBlackAndWhiteScanning as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Default threshold value used when performing a scan in black & white.
**Notes:** This value is from 0 to 255.
(Read only property)

### 96.19.11 documentSize as NSSizeMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Document size of the current document type expressed in current measurement unit.
**Notes:** (Read only property)

### 96.19.12 documentType as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current document type.
**Notes:** This will always be one of the supported document types.
(Read and Write property)

### 96.19.13 measurementUnit as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current measurement unit. This will always be one of the supported measurement units.
**Notes:** (Read and Write property)

### 96.19.14 nativeXResolution as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Optical resolution along the X axis.
**Notes:** (Read only property)

### 96.19.15 nativeYResolution as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Optical resolution along the Y axis.
**Notes:** (Read only property)

### 96.19.16 overviewImage as Variant

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Overview scan image.
**Notes:** This property will be nil for functional units that do not support overview scans.
Value is a CGImageMBS.
(Read only property)

### 96.19.17 overviewResolution as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Overview image resolution.
**Notes:** Value assigned to this will be contrained by resolutions allowed by the device.

(Read and Write property)

### 96.19.18 overviewScanInProgress as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if an overview scan is in progress.
**Notes:** (Read only property)

### 96.19.19 physicalSize as NSSizeMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Physical size of the scan area in current measurement unit.
**Notes:** (Read only property)

### 96.19.20 pixelDataType as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The pixel data type.
**Notes:** See ICScannerPixelDataType* constants.
(Read and Write property)

### 96.19.21 preferredResolutions as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current scan resolution.
**Notes:** This will always be one of the supported resolution values.
(Read only property)

### 96.19.22 preferredScaleFactors as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Preferred scale factors in percentage.
**Notes:** (Read only property)

### 96.19.23 resolution as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current scan resolution.
**Notes:** This will always be one of the supported resolution values.
(Read and Write property)

### 96.19.24 scaleFactor as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current scale factor.
**Notes:** This will always be one of the supported scale factor values.
(Read only property)

### 96.19.25 scanArea as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** This property along with scanAreaOrientation describes the area to be scanned.
**Notes:** (Read and Write property)

### 96.19.26 scanAreaOrientation as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Desired orientation of the scan area.
**Notes:** This property along with scanArea describes the area to be scanned.
This property is set to ICEXIFOrientation1 initially. This property is not used by the ICScannerFunctionalUnitDocumentFeeder subclass.

Possible values:

(Read and Write property)

### 96.19.27 scanInProgress as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

| | | |
|---|---|---|
| ICEXIFOrientation1 | 1 | Normal |
| ICEXIFOrientation2 | 2 | Flipped horizontally |
| ICEXIFOrientation3 | 3 | Rotated 180¬∞ |
| ICEXIFOrientation4 | 4 | Flipped vertically |
| ICEXIFOrientation5 | 5 | Rotated 90¬∞ CCW and flipped vertically |
| ICEXIFOrientation6 | 6 | Rotated 90¬∞ CCW |
| ICEXIFOrientation7 | 7 | Rotated 90¬∞ CW and flipped vertically |
| ICEXIFOrientation8 | 8 | Rotated 90¬∞ CW |

**Function:** Indicates if a scan is in progress.
**Notes:** (Read only property)

### 96.19.28 scanProgressPercentDone as Double

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates percentage of scan completed.
**Notes:** (Read only property)

### 96.19.29 state as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates the current state of the functional unit.
**Notes:** See ICScannerFunctionalUnitState* constants.
(Read only property)

### 96.19.30 supportedBitDepths as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Supported bit depths.
**Notes:** The values in this set are valid values defined by ICScannerBitDepth.
(Read only property)

### 96.19.31 supportedDocumentTypes as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Supported document types.
**Notes:** The values in this set are valid values defined by ICScannerDocumentType.
(Read only property)

### 96.19.32 supportedMeasurementUnits as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Supported measurement units. The values in this set are valid values defined by ICScannerMeasurementUnit.
**Notes:** (Read only property)

### 96.19.33 supportedResolutions as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Supported scan resolutions in DPI.
**Notes:** (Read only property)

### 96.19.34 supportedScaleFactors as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Supported scale factors in percentage.
**Notes:** (Read only property)

### 96.19.35 thresholdForBlackAndWhiteScanning as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Threshold value to be used when performing a scan in black & white.
**Notes:** This value should be from 0 to 255.
(Read and Write property)

### 96.19.36 type as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Functional unit type.
**Notes:** See ICScannerFunctionalUnitType* constants.

(Read only property)

### 96.19.37 usesThresholdForBlackAndWhiteScanning as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if this functional unit uses threshold value to be used when performing a scan in black & white.
**Notes:** (Read only property)

### 96.19.38 Constants

Bit Depths

| Constant | Value | Description |
|---|---|---|
| ICScannerBitDepth16Bits | 16 | Image with 16 bits per channel. |
| ICScannerBitDepth1Bit | 1 | 1-bit image. |
| ICScannerBitDepth8Bits | 8 | Image with 8 bits per channel. |

Color Data Formats

| Constant | Value | Description |
|---|---|---|
| ICScannerColorDataFormatTypeChunky | 0 | For multi-channel data (e.g., RGB) data from all channels are interlea Identifies color data formats. Only relevant for multi-channel data. sponds to "ICAP_PLANARCHUNKY" of the TWAIN Specification. |
| ICScannerColorDataFormatTypePlanar | 1 | For multi-channel data (e.g., RGB) each channel is transferred sequen Identifies color data formats. Only relevant for multi-channel data. sponds to "ICAP_PLANARCHUNKY" of the TWAIN Specification. |

Document Types

| Constant | Value | Description |
|---|---|---|
| ICScannerDocumentType10 | 25 | A10, 26.00 mm x 37.00 mm |
| ICScannerDocumentType10R | 67 | 10R, 10” x 12” 254.00 mm x 304.80 mm 5:6 |
| ICScannerDocumentType110 | 72 | Instamatic 110, 13.00 mm x 17.00 mm |
| ICScannerDocumentType11R | 69 | 11R, 11” x 14” 279.40 mm x 355.60 mm 11:14 |
| ICScannerDocumentType12R | 70 | 12R, 12” x 15” 304.80 mm x 381.00 mm 4:5 |
| ICScannerDocumentType135 | 76 | Standard 35 mm, 36.00 mm x 24.00 mm |
| ICScannerDocumentType2A0 | 18 | 2A0, 1189.00 mm x 1682.00 mm |
| ICScannerDocumentType3R | 61 | 3R, 3.5” x 5” 88.90 mm x 127.00 mm 7:10 |
| ICScannerDocumentType4A0 | 17 | 4A0, 1682.00 mm x 2378.00 mm |
| ICScannerDocumentType4R | 62 | 4R, 4” x 6” 101.60 mm x 152.40 mm 2:3 |
| ICScannerDocumentType5R | 63 | 5R, 5” x 7” 127.00 mm x 177.80 mm 5:7 |
| ICScannerDocumentType6R | 64 | 6R, 6” x 8” 152.40 mm x 203.20 mm 3:4 |
| ICScannerDocumentType8R | 65 | 8R, 8” x 10” 203.20 mm x 254.00 mm 4:5 |
| ICScannerDocumentTypeA0 | 19 | A0, 841.00 mm x 1189.00 mm |
| ICScannerDocumentTypeA1 | 20 | A1, 594.00 mm x 841.00 mm |
| ICScannerDocumentTypeA2 | 21 | A2, 420.00 mm x 594.00 mm |
| ICScannerDocumentTypeA3 | 11 | A3, 297.00 mm x 420.00 mm |
| ICScannerDocumentTypeA4 | 1 | A4, 210.00 mm x 297.00 mm |
| ICScannerDocumentTypeA5 | 5 | A5, 148.00 mm x 210.00 mm |
| ICScannerDocumentTypeA6 | 13 | A6, 105.00 mm x 148.00 mm |
| ICScannerDocumentTypeA7 | 22 | A7, 74.00 mm x 105.00 mm |
| ICScannerDocumentTypeA8 | 23 | A8, 52.00 mm x 74.00 mm |
| ICScannerDocumentTypeA9 | 24 | A9, 37.00 mm x 52.00 mm |
| ICScannerDocumentTypeAPSC | 74 | APS Classic, 25.10 mm x 16.70 mm |
| ICScannerDocumentTypeAPSH | 73 | APS High Definition, 30.20 mm x 16.70 mm |
| ICScannerDocumentTypeAPSP | 75 | APS Panoramic, 30.20 mm x 9.50 mm |
| ICScannerDocumentTypeB5 | 2 | B5/JIS B5, 182.00 mm x 257.00 mm |
| ICScannerDocumentTypeBusinessCard | 53 | Business Card, 90.00 mm x 55.00 mm |
| ICScannerDocumentTypeC0 | 44 | C0, 917.00 mm x 1297.00 mm |
| ICScannerDocumentTypeC1 | 45 | C1, 648.00 mm x 917.00 mm |
| ICScannerDocumentTypeC10 | 51 | C10, 28.00 mm x 40.00 mm |
| ICScannerDocumentTypeC2 | 46 | C2, 458.00 mm x 648.00 mm |
| ICScannerDocumentTypeC3 | 47 | C3, 324.00 mm x 458.00 mm |
| ICScannerDocumentTypeC4 | 14 | C4, 229.00 mm x 324.00 mm |
| ICScannerDocumentTypeC5 | 15 | C5, 162.00 mm x 229.00 mm |
| ICScannerDocumentTypeC6 | 16 | C6, 114.00 mm x 162.00 mm |
| ICScannerDocumentTypeC7 | 48 | C7, 81.00 mm x 114.00 mm |
| ICScannerDocumentTypeC8 | 49 | C8, 57.00 mm x 81.00 mm |
| ICScannerDocumentTypeC9 | 50 | C9, 40.00 mm x 57.00 mm |
| ICScannerDocumentTypeDefault | 0 | This is the platten size. Not valid for scanners without a platten. |
| ICScannerDocumentTypeE | 60 | Japanese E, 3.25” x 4.75” 82.55 mm x 120.65 mm 11:16 |
| ICScannerDocumentTypeISOB0 | 26 | ISO B0, 1000.00 mm x 1414.00 mm |
| ICScannerDocumentTypeISOB1 | 27 | ISO B1, 707.00 mm x 1000.00 mm |
| ICScannerDocumentTypeISOB10 | 33 | ISO B10, 31.00 mm x 44.00 mm |
| ICScannerDocumentTypeISOB2 | 28 | ISO B2, 500.00 mm x 707.00 mm |
| ICScannerDocumentTypeISOB3 | 12 | B3/ISO B3, 353.00 mm x 500.00 mm |
| ICScannerDocumentTypeISOB4 | 6 | B4/ISO B4, 250.00 mm x 353.00 mm |
| ICScannerDocumentTypeISOB5 | 29 | ISO B5, 176.00 mm x 250.00 mm |
| ICScannerDocumentTypeISOB6 | 7 | B6/ISO B6, 125.00 mm x 176.00 mm |
| ICScannerDocumentTypeISOB7 | 30 | ISO B7, 88.00 mm x 125.00 mm |
| ICScannerDocumentTypeISOB8 | 31 | ISO B8, 62.00 mm x 88.00 mm |
| ICScannerDocumentTypeISOB9 | 32 | ISO B9, 44.00 mm x 62.00 mm |
| ICScannerDocumentTypeJISB0 | 34 | JIS B0, 1030.00 mm x 1456.00 mm |
| ICScannerDocumentTypeJISB1 | 35 | JIS B1, 728.00 mm x 1030.00 mm |
| ICScannerDocumentTypeJISB10 | 43 | JIS B10, 32.00 mm x 45.00 mm |
| ICScannerDocumentTypeJISB2 | 36 | JIS B2, 515.00 mm x 728.00 mm |
| ICScannerDocumentTypeJISB3 | 37 | JIS B3, 364.00 mm x 515.00 mm |
| ICScannerDocumentTypeJISB4 | 38 | JIS B4, 257.00 mm x 364.00 mm |

Scanner States

| Constant | Value | Description |
|---|---|---|
| ICScannerFunctionalUnitStateOverviewScanInProgress | 4 | The scanner functional unit is performing an overview s |
| ICScannerFunctionalUnitStateReady | 1 | The scanner functional unit is ready for operation. |
| ICScannerFunctionalUnitStateScanInProgress | 2 | The scanner functional unit is performing a scan. |

Scanner Functional Unit Types

| Constant | Value | Description |
|---|---|---|
| ICScannerFunctionalUnitTypeDocumentFeeder | 3 | Document feeder functional unit. |
| ICScannerFunctionalUnitTypeFlatbed | 0 | Flatbed functional unit. |
| ICScannerFunctionalUnitTypeNegativeTransparency | 2 | Transparency functional unit for scanning negatives. |
| ICScannerFunctionalUnitTypePositiveTransparency | 1 | Transparency functional unit for scanning positives. |

Measurement Units

| Constant | Value | Description |
|---|---|---|
| ICScannerMeasurementUnitCentimeters | 1 | 1 cm = 1.00 cm or 1/2.54 inches |
| ICScannerMeasurementUnitInches | 0 | 1 inch = 2.54 cm |
| ICScannerMeasurementUnitPicas | 2 | 1 pica = .42333333 cm or 1/6 inches |
| ICScannerMeasurementUnitPixels | 5 | |
| ICScannerMeasurementUnitPoints | 3 | 1 point = .0352777775 cm or 1/72 inches |
| ICScannerMeasurementUnitTwips | 4 | 1 twip = .0001763888 cm or 1/1440 inches |

Pixel data types

| Constant | Value | Description |
|---|---|---|
| ICScannerPixelDataTypeBW | 0 | Monochrome 1 bit pixel image. |
| ICScannerPixelDataTypeCIEXYZ | 8 | Color image in CIEXYZ color space. |
| ICScannerPixelDataTypeCMY | 4 | Color image in CMY color space. |
| ICScannerPixelDataTypeCMYK | 5 | Color image in CMYK color space. |
| ICScannerPixelDataTypeGray | 1 | 8 bit pixel Gray color space. |
| ICScannerPixelDataTypePalette | 3 | Indexed Color image. |
| ICScannerPixelDataTypeRGB | 2 | Color image RGB color space. |
| ICScannerPixelDataTypeYUV | 6 | Color image in YUV color space. |
| ICScannerPixelDataTypeYUVK | 7 | Color image in YUVK color space. |

## 96.20 class ICScannerFunctionalUnitNegativeTransparencyMBS

### 96.20.1 class ICScannerFunctionalUnitNegativeTransparencyMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFunctionalUnitNegativeTransparencyMBS is a concrete subclass of ICScannerFunctionalUnitMBS class.
**Notes:** ICScannerDeviceMBS creates instances of this class.
This represents the transparency unit on the scanner for scanning negatives.
Subclass of the ICScannerFunctionalUnitMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.20.2 Methods

### 96.20.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

## 96.21 class ICScannerFunctionalUnitPositiveTransparencyMBS

### 96.21.1 class ICScannerFunctionalUnitPositiveTransparencyMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** ICScannerFunctionalUnitPositiveTransparencyMBS is a concrete subclass of ICScannerFunctionalUnitMBS class.
**Notes:** ICScannerDeviceMBS creates instances of this class.
This represents the transparency unit on the scanner for scanning postives.
Subclass of the ICScannerFunctionalUnitMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 96.21.2 Methods

### 96.21.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

## 96.22 control IKCameraDeviceViewControlMBS

### 96.22.1 control IKCameraDeviceViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Camera Device View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.22.2 Properties

### 96.22.3 View as IKCameraDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The camera device view used in this control.
**Notes:** (Read only property)

### 96.22.4 Events

### 96.22.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.22.6 Close

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 96.22.7 Closing

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.22.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.22.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.22.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.22.11 DidDownloadFile(CameraFile as ICCameraFileMBS, URL as string, File as folderItem, data as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent for each file that gets downloaded.
**Notes:** Based on the IKCameraDeviceViewDisplayMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.22.12 DidEncounterError(Error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the camera device reports an error.

### 96.22.13 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 96.22.14 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.22.15 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.22.16 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.22.17 GotFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.22.18 LostFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.22.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.22.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.

Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.22.21 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.22.22 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.22.23 Open

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 96.22.24 Opening

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.22.25 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.22.26 SelectionDidChange

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.

### 96.22.27 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

# 96.23 class IKCameraDeviceViewMBS

## 96.23.1 class IKCameraDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Displays content of a Image Capture supported camera.
**Notes:** Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr2

## 96.23.2 Methods

## 96.23.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new IKCameraDeviceViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 96.23.4 Constructor(Handle as Integer) 15157
- 96.23.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15158


## 96.23.4 Constructor(Handle as Integer)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new IKCameraDeviceViewMBS(0, 0, 100, 100)
dim v as new IKCameraDeviceViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a IKCameraDeviceView and the plugin retains this handle.
See also:

- 96.23.3 Constructor 15157
- 96.23.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15158


### 96.23.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new IKCameraDeviceViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:


- 96.23.3 Constructor 15157
- 96.23.4 Constructor(Handle as Integer) 15157


### 96.23.6 deleteSelectedItems

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Delete selected items.

### 96.23.7 downloadAllItems

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Download all items.

### 96.23.8 downloadSelectedItems

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Download selected items.

### 96.23.9 rotateLeft

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Rotate selected items left.

### 96.23.10 rotateRight

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Rotate selected items right.

### 96.23.11 selectIndexes(indexes as NSIndexSetMBS, extend as boolean)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Setting current user selection.

### 96.23.12 Properties

### 96.23.13 cameraDevice as ICCameraDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The camera device.
**Notes:** (Read and Write property)

### 96.23.14 canDeleteSelectedItems as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the user selected items can be deleted.
**Notes:** (Read only property)

### 96.23.15 canDownloadSelectedItems as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the user selected items can be downloaded.
**Notes:** (Read only property)

### 96.23.16 canRotateSelectedItemsLeft as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the user selected items can be rotated left.
**Notes:** (Read only property)

### 96.23.17 canRotateSelectedItemsRight as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Indicates if the user selected items can be rotated right.
**Notes:** (Read only property)

### 96.23.18 displaysDownloadsDirectoryControl as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Show a downloads directory control.
**Notes:** (Read and Write property)

### 96.23.19 displaysPostProcessApplicationControl as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Show a postprocessing application control.
**Notes:** (Read and Write property)

### 96.23.20 downloadAllControlLabel as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Label for the 'Download All' control - allows for example renaming to 'Import All'.
**Notes:** (Read and Write property)

### 96.23.21 downloadsDirectory as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.23.22 downloadSelectedControlLabel as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Label for the 'Download Selected' control.
**Notes:** (Read and Write property)

### 96.23.23 downloadsFolder as FolderItem

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.23.24 hasDisplayModeIcon as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Support icon view display mode.
**Notes:** (Read and Write property)

### 96.23.25 hasDisplayModeTable as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Support table view display mode.
**Notes:** (Read and Write property)

### 96.23.26 iconSize as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** in icon mode: size of the image thumbnails.
**Notes:** (Read and Write property)

### 96.23.27 mode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current display mode.
**Notes:** see IKCameraDeviceViewDisplayMode constants.
(Read and Write property)

### 96.23.28 postProcessApplication as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Postprocessing application.
**Notes:** A file URL to application.
(Read and Write property)

### 96.23.29 selectedIndexes as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current user selection.
**Notes:** (Read only property)

### 96.23.30 transferMode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Transfer mode either file based - or - in memory.
**Notes:** See IKCameraDeviceViewTransferMode constants.
(Read and Write property)

### 96.23.31 Events

### 96.23.32 DidDownloadFile(CameraFile as ICCameraFileMBS, URL as string, File as folderItem, data as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent for each file that gets downloaded.
**Notes:** Based on the IKCameraDeviceViewDisplayMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.23.33 DidEncounterError(Error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the camera device reports an error.

### 96.23.34 SelectionDidChange

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.

### 96.23.35 Constants

Display Modes

| Constant | Value | Description |
|---|---|---|
| IKCameraDeviceViewDisplayModeIcon | 1 | Show Icons |
| IKCameraDeviceViewDisplayModeTable | 0 | Show Table |

Transfer Modes

| Constant | Value | Description |
|---|---|---|
| IKCameraDeviceViewTransferModeFileBased | 0 | File based download. |
| IKCameraDeviceViewTransferModeMemoryBased | 1 | Memory based download. |

## 96.24 control IKDeviceBrowserViewControlMBS

### 96.24.1 control IKDeviceBrowserViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Device Browser View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.24.2 Properties

### 96.24.3 View as IKDeviceBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The device browser view used in this control.
**Notes:** (Read only property)

### 96.24.4 Events

### 96.24.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.24.6 Close

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 96.24.7 Closing

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.24.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.24.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.24.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.24.11 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the device browser reports an error.

### 96.24.12 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 96.24.13 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.24.14 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.24.15 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.24.16 GotFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.24.17 LostFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.24.18 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.24.19 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.24.20 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.24.21 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.24.22 Open

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 96.24.23 Opening

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.24.24 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.24.25 SelectionDidChange(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.
**Notes:** The device may be a ICCameraDeviceMBS or a ICScannerDeviceMBS.

### 96.24.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 96.25 class IKDeviceBrowserViewMBS

### 96.25.1 class IKDeviceBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Displays Image Capture cameras and scanners.
**Notes:** Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.25.2 Methods

### 96.25.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new IKDeviceBrowserViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 96.25.4 Constructor(Handle as Integer) 15170
- 96.25.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15171

### 96.25.4 Constructor(Handle as Integer)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new IKDeviceBrowserViewMBS(0, 0, 100, 100)
dim v as new IKDeviceBrowserViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a IKDeviceBrowserView and the plugin retains this handle.
See also:

- 96.25.3 Constructor 15170
- 96.25.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15171


### 96.25.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new IKDeviceBrowserViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:


- 96.25.3 Constructor 15170
- 96.25.4 Constructor(Handle as Integer) 15170


### 96.25.6 Properties

### 96.25.7 displaysLocalCameras as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** For device filtering - indicates that the IKDeviceBrowserView should include local cameras.
**Notes:** (Read and Write property)

### 96.25.8 displaysLocalScanners as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** for device filtering - indicates that the IKDeviceBrowserView should include local scanners.
**Notes:** (Read and Write property)

### 96.25.9 displaysNetworkCameras as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** for device filtering - indicates that the IKDeviceBrowserView should include network/shared cameras.
**Notes:** (Read and Write property)

### 96.25.10 displaysNetworkScanners as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** for device filtering - indicates that the IKDeviceBrowserView should include network/shared scanners.
**Notes:** (Read and Write property)

### 96.25.11 mode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the supported display modes (table, outline, or icon mode).
**Notes:** (Read and Write property)

### 96.25.12 selectedDevice as ICDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** User selected device (ICCameraDevice or ICScannerDevice).
**Notes:** (Read only property)

### 96.25.13 Events

### 96.25.14 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the device browser reports an error.

### 96.25.15 SelectionDidChange(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.
**Notes:** The device may be a ICCameraDeviceMBS or a ICScannerDeviceMBS.

### 96.25.16 Constants

Display Modes

| Constant | Value | Description |
|---|---|---|
| IKDeviceBrowserViewDisplayModeIcon | 2 | Icon |
| IKDeviceBrowserViewDisplayModeOutline | 1 | Outline |
| IKDeviceBrowserViewDisplayModeTable | 0 | Table |

## 96.26 control IKScannerDeviceViewControlMBS

### 96.26.1 control IKScannerDeviceViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a Scanner Device View.
**Notes:** For Xojo with Cocoa target.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.26.2 Properties

### 96.26.3 View as IKScannerDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The scanner view used in this control.
**Notes:** For Xojo with Cocoa target.
(Read only property)

### 96.26.4 Events

### 96.26.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 96.26.6 Close

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 96.26.7 Closing

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 96.26.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 96.26.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 96.26.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 96.26.11 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the scanner device reports an error.

### 96.26.12 DidScanToBandData(data as ICScannerBandDataMBS, scanInfo as Dictionary, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For memory a based transfer this event is sent for every time an image band of data was scanned.
**Notes:** The 'data' parameter describes the scanned image data. Note that rotation/cropping/image adjustments are not applied yet. The 'scanInfo' parameter contains additional information (rotation angle, ...) that should be applied once the scan is completed.

### 96.26.13 DidScanToURL(url as String, file as FolderItem, fileData as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For file based transfer this event is sent for each image that gets scanned.
**Notes:** Based on the IKScannerDeviceViewTransferMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.26.14 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 96.26.15 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.26.16 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.26.17 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 96.26.18 GotFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 96.26.19 LostFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 96.26.20 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 96.26.21 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 96.26.22 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 96.26.23 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 96.26.24 Open

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 96.26.25 Opening

Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 96.26.26 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 96.26.27 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 96.27 class IKScannerDeviceViewMBS

### 96.27.1 class IKScannerDeviceViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** IKScannerDeviceView displays a UI to work with Image Capture supported scanners.
**Notes:** Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 96.27.2 Methods

### 96.27.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new IKScannerDeviceViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 96.27.4 Constructor(Handle as Integer) 15180
- 96.27.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15181


### 96.27.4 Constructor(Handle as Integer)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new IKScannerDeviceViewMBS(0, 0, 100, 100)
dim v as new IKScannerDeviceViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a IKScannerDeviceView and the plugin retains this handle.
See also:

- 96.27.3 Constructor 15180
- 96.27.5 Constructor(left as Double, top as Double, width as Double, height as Double) 15181


### 96.27.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new IKScannerDeviceViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:


- 96.27.3 Constructor 15180
- 96.27.4 Constructor(Handle as Integer) 15180


### 96.27.6 Properties

### 96.27.7 displaysDownloadsDirectoryControl as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Show a downloads directory control.
**Notes:** (Read and Write property)

### 96.27.8 displaysPostProcessApplicationControl as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Show a postprocessing application control.
**Notes:** (Read and Write property)

### 96.27.9 documentName as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Document name.
**Notes:** (Read and Write property)

### 96.27.10 downloadsDirectory as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.27.11 downloadsFolder as FolderItem

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Downloads directory.
**Notes:** Download location can be provided as file URL with downloadsDirectory property or as folderitem with downloadsFolder property.
(Read and Write property)

### 96.27.12 hasDisplayModeAdvanced as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Support advanced scanning UI.
**Notes:** (Read and Write property)

### 96.27.13 hasDisplayModeSimple as Boolean

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Support a simple scanning UI.
**Notes:** (Read and Write property)

### 96.27.14 mode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Current display mode.
**Notes:** See IKScannerDeviceViewDisplayMode constants.
(Read and Write property)

### 96.27.15 overviewControlLabel as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Label for the 'Overview' control.
**Notes:** (Read and Write property)

### 96.27.16 postProcessApplication as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Postprocessing application.
**Notes:** (Read and Write property)

### 96.27.17 scanControlLabel as String

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** label for the 'Scan' control.
**Notes:** (Read and Write property)

### 96.27.18 scannerDevice as ICScannerDeviceMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The scanner device.
**Notes:** (Read and Write property)

### 96.27.19 transferMode as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** transfer mode either file based - or - in memory.
**Notes:** See IKScannerDeviceViewTransferMode constants.
(Read and Write property)

### 96.27.20 Events

### 96.27.21 DidEncounterError(error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the scanner device reports an error.

### 96.27.22 DidScanToBandData(data as ICScannerBandDataMBS, scanInfo as Dictionary, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For memory a based transfer this event is sent for every time an image band of data was scanned.
**Notes:** The 'data' parameter describes the scanned image data. Note that rotation/cropping/image adjustments are not applied yet. The 'scanInfo' parameter contains additional information (rotation angle, ...) that should be applied once the scan is completed.

### 96.27.23 DidScanToURL(url as String, file as FolderItem, fileData as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For file based transfer this event is sent for each image that gets scanned.
**Notes:** Based on the IKScannerDeviceViewTransferMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.27.24 Constants

Display Modes

| Constant | Value | Description |
|---|---|---|
| IKScannerDeviceViewDisplayModeAdvanced | 1 | Advanced |
| IKScannerDeviceViewDisplayModeSimple | 0 | Simple |

Transfer Modes

| Constant | Value | Description |
|---|---|---|
| IKScannerDeviceViewTransferModeFileBased | 0 | File based scan. |
| IKScannerDeviceViewTransferModeMemoryBased | 1 | Memory based scan. |

# 96.28 class ImageCaptureEventsMBS

## 96.28.1 class ImageCaptureEventsMBS

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Central class for Image Capture events.
**Notes:** Whenever you have an ICA object, the plugin will register a delegate for it and dispatch all events here.
For some view classes, events are in addition dispatched to the controls.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr4
- MBS Xojo / Real Studio Plugins, version 15.4pr6

**Xojo Developer Magazine**

- 18.6, page 10: News

## 96.28.2 Properties

## 96.28.3 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 96.28.4 Events

## 96.28.5 cameraDeviceDidAddItem(camera as ICCameraDeviceMBS, item as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an object is added to the device.
**Notes:** The object may be an instance of ICCameraFolder or ICCameraFile class.

### 96.28.6 cameraDeviceDidAddItems(camera as ICCameraDeviceMBS, items() as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an object or objects are added to the device.
**Notes:** Instead of receive one event per object, an array of objects is sent.
The objects may be instances of ICCameraFolder or ICCameraFile class.

### 96.28.7 cameraDeviceDidBecomeReadyWithCompleteContentCatalog(camera as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the camera device is done enumerating its content and is ready to receive requests.
**Notes:** A session must be opened on the device in order to enumerate its content and make it ready to receive requests.

### 96.28.8 cameraDeviceDidChangeCapability(camera as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the capability of a device changes.
**Notes:** This usually happens when the device module takes control or yields control of the device.

### 96.28.9 cameraDeviceDidCompleteDeleteFilesWithError(camera as ICCameraDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Files have been deleted.
**Notes:** This event is sent after the camera device completes a delete operation initiated by sending a requestDeleteFiles event to that device.

### 96.28.10 cameraDeviceDidDownloadFile(file as ICCameraFileMBS, error as NSErrorMBS, options as Dictionary, device as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Download of file finished.

### 96.28.11 cameraDeviceDidEnableAccessRestriction(camera as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Tells the client when an Apple device has been locked, and media is unavailable until the restriction has been removed.
**Notes:** For macOS 10.15 or newer.

### 96.28.12 cameraDeviceDidReadData(data as Memoryblock, file as ICCameraFileMBS, error as NSErrorMBS, device as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Reading file data finished.

### 96.28.13 cameraDeviceDidReceiveDownloadProgressForFile(file as ICCameraFileMBS, downloadedBytes as UInt64, maxBytes as UInt64)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to provide status of the download operation.

### 96.28.14 cameraDeviceDidReceiveMetadataForItem(camera as ICCameraDeviceMBS, item as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the metadata requested for an item on a device is available.

### 96.28.15 cameraDeviceDidReceivePTPEvent(camera as ICCameraDeviceMBS, eventData as MemoryBlock)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to convey a PTP event.

### 96.28.16 cameraDeviceDidReceiveThumbnailForItem(camera as ICCameraDeviceMBS, item as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the thumbnail requested for an item on a device is available.

### 96.28.17 cameraDeviceDidRemoveAccessRestriction(camera as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Tells the client when an Apple device has been unlocked, paired to the host, and media is available.
**Notes:** For macOS 10.15 or newer.

### 96.28.18 cameraDeviceDidRemoveItem(camera as ICCameraDeviceMBS, item as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an object is removed from the device.
**Notes:** The object may be an instance of ICCameraFolder or ICCameraFile class.

### 96.28.19 cameraDeviceDidRemoveItems(camera as ICCameraDeviceMBS, items() as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an object or objects are removed from the device.
**Notes:** The objects may be instances of ICCameraFolder or ICCameraFile class. This method supercedes cameraDeviceDidRemoveItem method described above.

### 96.28.20 cameraDeviceDidRenameItems(camera as ICCameraDeviceMBS, items() as ICCameraItemMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an object or objects are renamed on the device.
**Notes:** The objects may be instances of ICCameraFolder or ICCameraFile class.

### 96.28.21 cameraDeviceDidSendPTPCommand(command as Memoryblock, data as Memoryblock, response as MemoryBlock, error as NSErrorMBS, device as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** Called when a requestSendPTPCommand event got a response or error.

### 96.28.22 cameraDeviceDidUploadFile(fileURL as string, file as FolderItem, error as NSErrorMBS, device as ICCameraDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** A file upload was completed.

### 96.28.23 cameraDeviceViewDidDownloadFile(cameraDeviceView as IKCameraDeviceViewMBS, CameraFile as ICCameraFileMBS, URL as string, File as folderItem, data as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent for each file that gets downloaded.
**Notes:** Based on the IKCameraDeviceViewDisplayMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.28.24 cameraDeviceViewDidEncounterError(cameraDeviceView as IKCameraDeviceViewMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the camera device reports an error.

### 96.28.25 cameraDeviceViewSelectionDidChange(cameraDeviceView as IKCameraDeviceViewMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.

### 96.28.26 deviceBrowserDeviceDidChangeName(browser as ICDeviceBrowserMBS, device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent if the name of a device changes.
**Notes:** This happens if the device module overrides the default name of the device reported by the device's transport layer, or if the name of the filesystem volume mounted by the device is changed by the user.

### 96.28.27 deviceBrowserDeviceDidChangeSharingState(browser as ICDeviceBrowserMBS, device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the sharing state of a device has changes.
**Notes:** Any Image Capture client application can choose to share the device over the network using the sharing or webSharing facility in Image Capture.

### 96.28.28 deviceBrowserDidAddDevice(browser as ICDeviceBrowserMBS, device as ICDeviceMBS, moreComing as boolean)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to inform that a device has been added.
**Notes:** If several devices are found during the initial search, then this event is sent once for each device with the value of 'moreComing' set to true in each event except the last one.

### 96.28.29 deviceBrowserDidEnumerateLocalDevices(browser as ICDeviceBrowserMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent after the device browser completes sending deviceBrowserDidAddDevice event for all local devices.
**Notes:** Detecting locally connected devices (USB and FireWire devices) is faster than detecting devices connected using a network protocol. An Image Capture client application may use this event to update its user interface to let the user know that it has completed looking for locally connected devices and then start looking for network devices.

### 96.28.30 deviceBrowserDidRemoveDevice(browser as ICDeviceBrowserMBS, device as ICDeviceMBS, moreGoing as boolean)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to inform that a device has been removed.
**Notes:** If several devices are removed at the same time, then this event is sent once for each device with the value of 'moreGoing' set to true in each event except the last one.

### 96.28.31 deviceBrowserRequestsSelectDevice(browser as ICDeviceBrowserMBS, device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when an event that occurred on the device may be of interest to the client application.
**Notes:** In Mac OS X 10.6, this event is sent when a button is pressed on a device and the current application is the target for that button press. In the case of the button-press event, if a session is open on the device, this event will not be sent, instead the deviceDidReceiveButtonPress event is sent.

### 96.28.32 deviceBrowserViewDidEncounterError(deviceBrowserView as IKDeviceBrowserViewMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the device browser reports an error.

### 96.28.33 deviceBrowserViewSelectionDidChange(deviceBrowserView as IKDeviceBrowserViewMBS, device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the user selection did change.
**Notes:** The device may be a ICCameraDeviceMBS or a ICScannerDeviceMBS.

### 96.28.34 deviceDidBecomeReady(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the device is ready to receive requests.
**Notes:** A camera device is ready, when it is ready to receive requests. A scanner device is ready when its

functional units are found and the default functional unit is selected for use and is ready to receive requests. The device will become ready to receive requests only after a session is opened.

### 96.28.35 deviceDidChangeName(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent if the name of a device changes.
**Notes:** This happens if the device module overrides the default name of the device reported by the device's transport layer, or if the name of the filesystem volume mounted by the device is changed by the user.

### 96.28.36 deviceDidChangeSharingState(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the sharing state of a device has changes.
**Notes:** Any Image Capture client application can choose to share the device over the network using the sharing or webSharing facility in Image Capture.

### 96.28.37 deviceDidCloseSessionWithError(device as ICDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when a session is closed on a device.
**Notes:** This event completes the process initiated by the message "requestCloseSession" sent to the device object. This event is also sent if the device module in control of the device ceases to control the device.

### 96.28.38 deviceDidEncounterError(device as ICDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the device delegate when a camera or scanner device encounters an error.

### 96.28.39 deviceDidOpenSessionWithError(device as ICDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when a session is opened on a device.
**Notes:** This event completes the process initiated by the requestOpenSession sent to the device object.

### 96.28.40 deviceDidReceiveButtonPress(device as ICDeviceMBS, buttonType as String)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the device delegate if a button is pressed on the device.
**Notes:** This event is sent only if a session is open on the device. The value of 'buttonType' argument is one of the ICButtonType* values defined above.

### 96.28.41 deviceDidReceiveCustomNotification(device as ICDeviceMBS, notification as Dictionary, data as Memoryblock)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the device delegate the device sends a custom notification 'notification' with an arbitrary byte buffer 'data'.
**Notes:** This event is sent only if a session is open on the device.

### 96.28.42 deviceDidReceiveStatusInformation(device as ICDeviceMBS, status as Dictionary)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when status information is received from a camera or a scanner.
**Notes:** In Mac OS X 10.6 this event is not called for camera devices. This may change in the future releases of Mac OS X.
The 'status' dictionary contains two keys, ICStatusNotificationKey and ICLocalizedStatusNotificationKey, which are defined above. If type of 'device' is ICDeviceTypeScanner, the value of ICStatusNotificationKey will be one of the values defined in ICScannerDevice.h (e.g., ICScannerStatusWarmingUp, ICScannerStatusWarmUpDone, or ICScannerStatusRequestsOverviewScan); the value of ICLocalizedStatusNotificationKey will be a localized status information string suitable for displaying to the user.

### 96.28.43 deviceDidRemove(device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent to the delegate to inform that a device has been removed.

### 96.28.44 deviceDidSendMessage(messageCode as UInt32, data as Memoryblock, error as NSErrorMBS, device as ICDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** The call to requestSendMessage was successful.

### 96.28.45 scannerDeviceDidBecomeAvailable(scanner as ICScannerDeviceMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when another client closes an open session on the scanner.
**Notes:** Scanners require exclusive access, only one client can open a session on a scanner. The scanner is available if it does not have a session opened by another client. Attempting to open a session on a scanner that already has an open session for another client will result in an error. A client that wants to open a session on a scanner as soon as it is available should implement this method and send "requestOpenSession" message to scanner object from that method.

### 96.28.46 scannerDeviceDidCompleteOverviewScanWithError(scanner as ICScannerDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent after the scanner device completes an overview scan.

### 96.28.47 scannerDeviceDidCompleteScanWithError(scanner as ICScannerDeviceMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent after the scanner device completes a scan.

### 96.28.48 scannerDeviceDidScanToBandData(scanner as ICScannerDeviceMBS, Data as ICScannerBandDataMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the scanner device receives the requested scan progress notification and a band of data is sent for each notification received.
**Notes:** In memory transfer mode, this will send a band of size that has been selected by the client via the

maxMemoryBandSize property.

### 96.28.49 scannerDeviceDidScanToURL(scanner as ICScannerDeviceMBS, URL as string, file as folderitem, data as MemoryBlock)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when the scanner device receives the requested scan.
**Notes:** If selectedFunctionalUnit is a document feeder, then this event will be sent once for each scanned page.
This event is sent when the scanner device receives the requested scan. If selectedFunctionalUnit is a document feeder, then this event will be sent once for each scanned page.

### 96.28.50 scannerDeviceDidSelectFunctionalUnit(scanner as ICScannerDeviceMBS, functionalUnit as Variant, Error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent when a functional unit is selected on the scanner device.
**Notes:** A functional unit is selected immediately after the scanner device is instantiated and in response to requestSelectFunctionalUnit method.

### 96.28.51 scannerDeviceViewDidEncounterError(scannerDeviceView as IKScannerDeviceViewMBS, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** This event is sent every time the scanner device reports an error.

### 96.28.52 scannerDeviceViewDidScanToBandData(scannerDeviceView as IKScannerDeviceViewMBS, data as ICScannerBandDataMBS, scanInfo as Dictionary, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For memory a based transfer this event is sent for every time an image band of data was scanned.
**Notes:** The 'data' parameter describes the scanned image data. Note that rotation/cropping/image adjustments are not applied yet. The 'scanInfo' parameter contains additional information (rotation angle, ...) that should be applied once the scan is completed.

Only called if transfermode is ICScannerTransferModeMemoryBased.

### 96.28.53 scannerDeviceViewDidScanToURL(scannerDeviceView as IKScannerDeviceViewMBS, url as String, file as FolderItem, fileData as MemoryBlock, error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 14.3, Platform: macOS, Targets: .

**Function:** For file based transfer this event is sent for each image that gets scanned.
**Notes:** Based on the IKScannerDeviceViewTransferMode the downloaded file will be saved on disk using the 'url', or returned in memory as Memoryblock.

### 96.28.54 Constants

Error Constants

| Constant | Value | Description |
|---|---|---|
| ICReturnCommunicationTimedOut | -9923 | Communication between different components of Image Cap |
| ICReturnDeleteFilesCanceled | -9942 | A request to delete files was canceled. |
| ICReturnDeleteFilesFailed | -9941 | A request to delete files failed. |
| ICReturnDeviceFailedToCloseSession | -9928 | Failed to close a session on a specified device. |
| ICReturnDeviceFailedToOpenSession | -9927 | Failed to open a session on a specified device. |
| ICReturnDeviceFailedToTakePicture | -9944 | Failed to take a tethered-capture picture on a camera devic |
| ICReturnDeviceIsPasscodeLocked | -9943 | The device is locked with a passcode. Its contents cannot b unlocked. |
| ICReturnDeviceSoftwareInstallationCanceled | -9948 | Software installation for the device has been canceled. |
| ICReturnDeviceSoftwareInstallationCompleted | -9947 | Software installation for the device has completed successfu |
| ICReturnDeviceSoftwareInstallationFailed | -9949 | Software installation for the device failed. |
| ICReturnDeviceSoftwareIsBeingInstalled | -9946 | Failed to open session because software to communicate with installed. |
| ICReturnDeviceSoftwareNotAvailable | -9950 | Software for the device is not available from Apple. |
| ICReturnDeviceSoftwareNotInstalled | -9945 | Failed to open session because software to communicate wit installed. |
| ICReturnDownloadCanceled | -9937 | A download operation was canceled. |
| ICReturnDownloadFailed | -9934 | A non-specific error occurred while downloading a file. |
| ICReturnFailedToCompletePassThroughCommand | -9936 | Failed to complete a pass-through (e.g., PTP pass-through) |
| ICReturnFailedToCompleteSendMessageRequest | -9940 | A request to send a event to a device failed. |
| ICReturnFailedToDisabeTethering | -9939 | Failed to disable tethered-capture on a camera device. |
| ICReturnFailedToEnabeTethering | -9938 | Failed to enable tethered-capture on a camera device. |
| ICReturnInvalidParam | -9922 | An invalid parameter was found. |
| ICReturnReceivedUnsolicitedScannerErrorInfo | -9933 | An unsolicited error information was received from a scanne |
| ICReturnReceivedUnsolicitedScannerStatusInfo | -9932 | An unsolicited status information was received from a scann |
| ICReturnScannerFailedToCompleteOverviewScan | -9930 | Overview scan operation failed to complete on the specified |
| ICReturnScannerFailedToCompleteScan | -9931 | Scan operation failed to complete on the specified scanner. |
| ICReturnScannerFailedToSelectFunctionalUnit | -9929 | Failed to select a functional unit on the specified scanner. |
| ICReturnScannerInUseByLocalUser | -9925 | Scanner is being used by a remote user. |
| ICReturnScannerInUseByRemoteUser | -9926 | Scanner is being used by a local user. |
| ICReturnScanOperationCanceled | -9924 | The scan operation is canceled. |
| ICReturnSuccess | 0 | Operation successful. |
| ICReturnUploadFailed | -9935 | A non-specific error occurred while updownloading a file. |

## 96.29 class ImageCaptureMBS

### 96.29.1 class ImageCaptureMBS

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use ICDeviceMBS instead.
**Function:** The base class to start with image capture.
**Example:**

```
dim m as new ImageCaptureMBS
dim list as ImageCaptureObjectMBS = m.DeviceList

if List<>Nil then
// look into properties
dim dic as Dictionary = list.PropertyDictionary

// take the devices array there
if dic<>Nil and dic.HasKey(ImageCaptureObjectMBS.kICADevicesArrayKey) then
dim a(-1) as Variant = dic.Value(ImageCaptureObjectMBS.kICADevicesArrayKey)

// display device name
for each properties as Dictionary in a
MsgBox Properties.Value("ifil")
next
end if
end if
```

**Notes:** Deprecated. Please stop using this class soon.
On Mac OS X 10.8 some functions stop working as Apple does no longer provide 32 bit libraries.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr2
- MBS Xojo / Real Studio Plugins, version 15.4pr5

### 96.29.2 Methods

### 96.29.3 DeviceList as ImageCaptureObjectMBS

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the object with the device list.
**Example:**

```
dim m as new ImageCaptureMBS
```

```
dim list as ImageCaptureObjectMBS = m.DeviceList

if List<>Nil then
// look into properties
dim dic as Dictionary = list.PropertyDictionary

// take the devices array there
if dic<>Nil and dic.HasKey(ImageCaptureObjectMBS.kICADevicesArrayKey) then
dim a(-1) as Variant = dic.Value(ImageCaptureObjectMBS.kICADevicesArrayKey)

// display device name
for each properties as Dictionary in a
MsgBox Properties.Value("ifil")
next
end if
end if
```

**Notes:** Returns nil on any error.
Lasterror is set.

### 96.29.4 ImportImage(flags as Integer) as string()

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** This method displays a Common User Interface panel similar to the user interface of Image Capture Application.
**Example:**

```
dim m as new ImageCaptureMBS
dim flags as Integer = ImageCaptureObjectMBS.kICAAllowMultipleImages + ImageCaptureObjectMBS.kI-
CADownloadAndReturnPathArray

// do the import and allow all file types
dim files(-1) as string = m.ImportImage(flags)

for each path as string in files
// show path
MsgBox path

// open that picture file in preview
dim f as FolderItem = GetFolderItem(path, FolderItem.PathTypeShell)
f.Launch
next
```

**Notes:** Use this method to allow the user to work a camera or a scanner.

The behavior:
(a) if no device is connected, a panel saying that there's no device connected is displayed,
(b) if a single device is connected, an appropriate user interface to access that device will be displayed,
(c) if several devices are connected, a device selector panel will be displayed.

filetypes: Optional an array of file extension strings such as "jpg", "tif", etc., that are of interest to the calling application. If no array is provided, all files are displayed.

Flag values that can be used in ImportImage:

| | | |
|---|---|---|
| kICAAllowMultipleImages | = 1 | Use this constant to allow users to select multiple images in the Import Image dialog. |
| kICADownloadAndReturnPathArray | = 2 | Use this constant to download the images to a temporary location and return an array of paths to the downloaded images. |

Returns an array of Strings for the imported images if the kICADownloadAndReturnPathArray flag is not specified. Otherwise returns an array of Strings holding the paths of the images that are downloaded.
See also:

- 96.29.5 ImportImage(flags as Integer, filetypes() as string) as string() 15200

### 96.29.5 ImportImage(flags as Integer, filetypes() as string) as string()

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** This method displays a Common User Interface panel similar to the user interface of Image Capture Application.
**Example:**

```
dim m as new ImageCaptureMBS
dim flags as Integer = ImageCaptureObjectMBS.kICAAllowMultipleImages + ImageCaptureObjectMBS.kICADownloadAndReturnPathArray

// the file types we accept:
dim types(-1) as string

types.Append "tif"
types.Append "tiff"
types.Append "jpg"
types.Append "png"

dim files(-1) as string = m.ImportImage(flags, types)
```

```
for each path as string in files
// show path
MsgBox path

// open that picture file in preview
dim f as FolderItem = GetFolderItem(path, FolderItem.PathTypeShell)
f.Launch
next
```

**Notes:** Use this method to allow the user to work a camera or a scanner.

The behavior:
(a) if no device is connected, a panel saying that there's no device connected is displayed,
(b) if a single device is connected, an appropriate user interface to access that device will be displayed,
(c) if several devices are connected, a device selector panel will be displayed.

filetypes: Optional an array of file extension strings such as "jpg", "tif", etc., that are of interest to the calling application. If no array is provided, all files are displayed.

Flag values that can be used in ImportImage:

| | | |
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| kICAAllowMultipleImages | = 1 | Use this constant to allow users to select multiple images in the Import Image dialog. |
| kICADownloadAndReturnPathArray | = 2 | Use this constant to download the images to a temporary location and return an array of paths to the downloaded images. |

Returns an array of Strings for the imported images if the kICADownloadAndReturnPathArray flag is not specified. Otherwise returns an array of Strings holding the paths of the images that are downloaded.
See also:

- 96.29.4 ImportImage(flags as Integer) as string() 15199

### 96.29.6 kICABluetoothAddressKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.7 kICABluetoothTransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.8 kICADeviceBrowserDeviceRefKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.9 kICADeviceIconPathKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.10 kICADeviceModulePathKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.11 kICAErrorKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.12 kICAFireWireGUIDKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.13 kICAFireWireTransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.14 kICAIOServicePathKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.15 kICAIPAddressKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.16 kICAIPGUIDKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.17 kICAIPNameKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.18 kICANotificationClassKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.19 kICANotificationClassProprietary as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the notification classes.
**Notes:** A possible value for kICANotificationClassKey.

### 96.29.20 kICANotificationClassPTPStandard as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the notification classes.
**Notes:** A possible value for kICANotificationClassKey.

### 96.29.21 kICANotificationClassPTPVendor as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the notification classes.
**Notes:** A possible value for kICANotificationClassKey.

### 96.29.22 kICANotificationDataCookieKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.23 kICANotificationDataKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.24 kICANotificationDataSizeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.25 kICANotificationDeviceICAObjectKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.26 kICANotificationDeviceListICAObjectKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.27 kICANotificationICAObjectKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.28 kICANotificationImageBytesPerRowKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.29 kICANotificationImageDataKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.30 kICANotificationImageDataSizeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.31 kICANotificationImageHeightKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.32 kICANotificationImageKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.33 kICANotificationImageNumberOfRowsKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.34 kICANotificationImageStartRowKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.35 kICANotificationImageWidthKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.36 kICANotificationNumerOfImagesRemainingKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.37 kICANotificationPercentDownloadedKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.38 kICANotificationRawEventKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.39 kICANotificationScannerButtonTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.40 kICANotificationScannerDocumentNameKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.41 kICANotificationSubTypeDocumentLoaded as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.42 kICANotificationSubTypeDocumentNotLoaded as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.43 kICANotificationSubTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.44 kICANotificationSubTypePerformOverviewScan as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.45 kICANotificationSubTypeWarmUpDone as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.46 kICANotificationSubTypeWarmUpStarted as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.47 kICANotificationTypeCaptureComplete as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.48 kICANotificationTypeDeviceAdded as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.49 kICANotificationTypeDeviceConnectionProgress as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.50 kICANotificationTypeDeviceInfoChanged as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.51 kICANotificationTypeDevicePropertyChanged as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.52 kICANotificationTypeDeviceRemoved as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.53 kICANotificationTypeDeviceStatusError as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.54 kICANotificationTypeDeviceStatusInfo as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.55 kICANotificationTypeDeviceWasReset as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.56 kICANotificationTypeDownloadProgressStatus as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.57 kICANotificationTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.
**Notes:** The type of notification. See kICANotificationType* constants.

### 96.29.58 kICANotificationTypeObjectAdded as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.59 kICANotificationTypeObjectInfoChanged as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.60 kICANotificationTypeObjectRemoved as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.61 kICANotificationTypeProprietary as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.62 kICANotificationTypeRequestObjectTransfer as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.63 kICANotificationTypeScannerButtonPressed as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.64 kICANotificationTypeScannerOverviewOverlayAvailable as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.65 kICANotificationTypeScannerPageDone as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.66 kICANotificationTypeScannerScanDone as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.67 kICANotificationTypeScannerSessionClosed as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.68 kICANotificationTypeScanProgressStatus as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.69 kICANotificationTypeStoreAdded as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.70 kICANotificationTypeStoreFull as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.71 kICANotificationTypeStoreInfoChanged as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.72 kICANotificationTypeStoreRemoved as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.73 kICANotificationTypeTransactionCanceled as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.74 kICANotificationTypeUnreportedStatus as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification types for the notification event.

### 96.29.75 kICANotificationVendorErrorCodeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.76 kICARefconKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the notification dictionary.

### 96.29.77 kICASCSITransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.78 kICATCPIPTransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.79 kICATransportTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.80 kICATWAINDSPathKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.81 kICATWAINTransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.82 kICAUSBLocationIDKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the parameter dictionary for LoadDeviceModule.

### 96.29.83 kICAUSBTransportType as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the transport type constants.

### 96.29.84 kICAUserAssignedDeviceNameKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the device properties keys.
**Notes:** This key may be present in the property dictionary of a device if the device has a user-assigned name.

### 96.29.85 LoadDeviceModule(params as dictionary)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads a device module.
**Notes:** Typically, connecting a FireWire or an USB device will automatically load an appropriate device module. This API is needed only for loading a device module manually for devices that do not use a hot-plug interface, such as Bluetooth, SCSI, or TCP/IP.

Legal Key-Value pairs for populating paramDictionary:

| Key | Value | Comment |
|---|---|---|
| kICADeviceModulePathKey | String | Path to the device module bundle that needs to be launched. |
| kICATransportTypeKey | String | Should be one of the six predifined transport types. |
| kICABluetoothAddressKey | String | Bluetooth device address string formatted as "00-11-22-33-44-55". |
| kICAUSBLocationIDKey | Number (integer) | 32 bit USB location ID. |
| kICAFireWireGUIDKey | Number (Int64) | 64 bit FireWire GUID. |
| kICAIOServicePathKey | String | IO service path to the device obtained from the IO registry. |
| kICAIPAddressKey | String | IP address of the device. This can be a host address ("camera.apple.com"), ipv4 address ('192.168.123.10") or ipv6 address ("3ff3:0000:0000:0000:0123:4567:89ab:cdef") |
| kICAIPPortKey | Number (integer) | IP port number of the device. |
| kICAIPNameKey | String | Human readable device name. |
| kICAIPGUIDKey | String | 16 byte GUID string of the device formatted as "01234567-89ab-cdef-0123-456789abcdef". |
| kICATWAINDSPathKey | String | Path to TWAIN DS bundle. |

Lasterror is set.

### 96.29.86 RegisterForEventNotification(objectOfInterest as ImageCaptureObjectMBS, eventsOfInterest() as string, options as dictionary)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Register with Image Capture framework to receive notification about events of interest.

### 96.29.87 SendNotification(notificationDictionary as dictionary) as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Sends notification.
**Notes:** Returns the reply code.
Lasterror is set.

### 96.29.88 SendNotificationAndWaitForReply(notificationDictionary as dictionary) as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Sends notification and wait for reply.
**Notes:** Returns the reply code.
Lasterror is set.

### 96.29.89 ShowDeviceBrowser

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Displays a device browser user interface from any Image Capture client application.
**Notes:** The device browser user interface allows the user to do the following:

- enable and disable sharing of locally connected cameras and scanners.
- connect to or disconnect from cameras and scanners shared by other computers.
- configure WiFi capable cameras for use over the WiFi network.

Lasterror is set.

### 96.29.90 UnloadDeviceModule(deviceObject as ImageCaptureObjectMBS)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Unloads a device module.
**Notes:** The device module providing this object will be unloaded, if this is the last device object provided by the device module.
Lasterror is set.

### 96.29.91 Properties

### 96.29.92 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last function used.
**Notes:** Value is 0 if the function was successfull, -1 if the function is not available, one of the following values or a Mac OS error code:

Possible values:

kICACommunicationErr = -9900
kICADeviceNotFoundErr = -9901
kICADeviceNotOpenErr = -9902
kICAFileCorruptedErr = -9903
kICAIOPendingErr = -9904
kICAInvalidObjectErr = -9905
kICAInvalidPropertyErr = -9906

kICAIndexOutOfRangeErr = -9907
kICAPropertyTypeNotFoundErr = -9908
kICACannotYieldDevice = -9909
kICADataTypeNotFoundErr = -9910
kICADeviceMemoryAllocationErr = -9911
kICADeviceInternalErr = -9912
kICADeviceInvalidParamErr = -9913
kICADeviceAlreadyOpenErr = -9914
kICADeviceLocationIDNotFoundErr = -9915
kICADeviceGUIDNotFoundErr = -9916
kICADeviceIOServicePathNotFoundErr = -9917
kICADeviceUnsupportedErr = -9918
kICAFrameworkInternalErr = -9919
kICAExtensionInternalErr = -9920
kICAInvalidSessionErr = -9921
(Read and Write property)

### 96.29.93 Events

### 96.29.94 Notification(notificationType as string, notificationDictionary as dictionary)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: .

**Function:** The event called for all events coming from Image Capture.
**Notes:** Use RegisterForEventNotification to register for events.

The Image Capture notification event will be called with a notificationDictionary that may contain one or more key-value pairs as defined below:

| Key | Value Type | Comments |
|---|---|---|
| kICANotificationICAObjectKey | Number | An object associated with the notification. |
| kICANotificationDeviceICAObjectKey | Number | A device object associated with the notification. |
| kICANotificationClassKey | String | See below. |
| kICANotificationTypeKey | String | See below. |
| kICANotificationRawEventKey | Number | The unprocesssed event code sent by a device. |
| kICANotificationDataKey | Data String | Data associated with the event. |
| kICANotificationDataSizeKey | Number | Size of data associated with the event. This is used if the data is not sent with the notification. [ Needed for backward compatiblity with pre-Leopard device modules ] . |
| kICANotificationDataCookieKey | Number | A token identifying the data associated with this event. This data can be retrieved by calling SendMessage with messageType set to kICAMessageGetEventData, dataType set to value of kICANotificationDataCookieKeyand dataSize set to value of kICANotificationDataSizeKey. |

The following keys are present if the value of kICANotificationDataKey represents image data. The values of these keys are Numbers representing the width, height, bytes per row, start row, and number of rows of

the image:

| | | |
|---|---|---|
| kICANotificationImageKey | Dictionary | A dictionary that describes an Image associated with the notification. |
| kICANotificationImageDataKey | Data String | Image data |
| kICANotificationImageWidthKey | Number | Image width in pixels |
| kICANotificationImageHeightKey | Number | Image height in pixels |
| kICANotificationImageBytesPerRowKey | Number | Bytes per row in image |
| kICANotificationImageStartRowKey | Number | Starting row number of the image. |
| kICANotificationImageNumberOfRowsKey | Number | Number of rows of image data sent in this notification. |

# 96.30 class ImageCaptureObjectMBS

## 96.30.1 class ImageCaptureObjectMBS

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use ICDeviceMBS instead.
**Function:** An image capture object.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 19.3pr2

## 96.30.2 Methods

## 96.30.3 CloseSession

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Close a session on a camera device.
**Notes:** Lasterror is set.
For a scanner device use the ScannerCloseSession.

## 96.30.4 Constructor

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new image capture object.
See also:

- 96.30.5 Constructor(handle as Integer) 15219

## 96.30.5 Constructor(handle as Integer)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new image capture object with the given handle.
See also:

- 96.30.4 Constructor 15219

### 96.30.6 CopyData(startByte as int64, requestedSize as int64) as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Get a copy of data associated with a file object.
**Example:**

```
dim o as ImageCaptureObjectMBS // your object pointing to an image file.

dim d2 as Dictionary = o.PropertyDictionary
dim size as Integer = d2.Value(o.kICAPropertyImageSize)

dim data as string = o.CopyData(0, size)

if lenb(data)>0 then
// you got the data, now process it.
end if
```

**Notes:** startByte: Starting byte offset of the data in the file object.
requestedSize: Requested data size in bytes.

If you want to get all bytes of an object, pass startByte = 0 and requestedSize = filesize.
Lasterror is set.

### 96.30.7 CopyThumbnail(format as string) as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Get a thumbnail associated with an object.
**Notes:** This is the recommended way to get the thumbnail of an object.

Use the constants for the format: kICAThumbnailFormatJPEG, kICAThumbnailFormatTIFF or kICAThumbnailFormatPNG
Lasterror is set.

### 96.30.8 DownloadFile(dir as folderitem, flags as Integer, MacType as string, MacCreator as string, angle as Double) as folderitem

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Downloads a file to disk.
**Notes:** This API is a convenient way to download a file to disk. To receive the image data in memory use

CopyObjectData.

Constants for flags:

| | | |
|---|---|---|
| kDeleteAfterDownload | = 1 | Delete file after a successful download. |
| kCreateCustomIcon | = 2 | Create a custom icon for Finder. |
| kAddMetaDataToFinderComment | = 4 | Add basic metadata to finder comment field. |
| kAdjustCreationDate | = 8 | Set creation date of the downloaded file same as the creation date for the file as reported by the device. |
| kSetFileTypeAndCreator | = &h10 | Set 4-char file type and creator code. |
| kEmbedColorSyncProfile | = &h20 | Embed ColorSync profile to the image if one was not already embedded. |
| kRotateImage | = &h40 | Rotate the image. |
| kDontEmbedColorSyncProfile | = &h80 | Do not embed ColorSync profile to the image. |

Lasterror is set.

### 96.30.9 ImportImage(flags as Integer) as string()

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** This method displays a Common User Interface panel similar to the user interface of Image Capture Application.
**Notes:** Use this method to allow the user to work a camera or a scanner.
The ImageCaptureObjectMBS object you use for this call, should point to a camera or scanner device.

filetypes: Optional an array of file extension strings such as "jpg", "tif", etc., that are of interest to the calling application. If no array is provided, all files are displayed.

Flag values that can be used in ImportImage:

| | | |
|---|---|---|
| kICAAllowMultipleImages | = 1 | Use this constant to allow users to select multiple images in the Import Image dialog. |
| kICADownloadAndReturnPathArray | = 2 | Use this constant to download the images to a temporary location and return an array of paths to the downloaded images. |

Returns an array of Strings for the imported images if the kICADownloadAndReturnPathArray flag is not specified. Otherwise returns an array of Strings holding the paths of the images that are downloaded.
See also:

- 96.30.10 ImportImage(flags as Integer, filetypes() as string) as string() 15222

### 96.30.10 ImportImage(flags as Integer, filetypes() as string) as string()

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** This method displays a Common User Interface panel similar to the user interface of Image Capture Application.
**Notes:** Use this method to allow the user to work a camera or a scanner.
The ImageCaptureObjectMBS object you use for this call, should point to a camera or scanner device.

filetypes: Optional an array of file extension strings such as "jpg", "tif", etc., that are of interest to the calling application. If no array is provided, all files are displayed.

Flag values that can be used in ImportImage:

| | | |
|---|---|---|
| kICAAllowMultipleImages | = 1 | Use this constant to allow users to select multiple images in the Import Image dialog. |
| kICADownloadAndReturnPathArray | = 2 | Use this constant to download the images to a temporary location and return an array of paths to the downloaded images. |

Returns an array of Strings for the imported images if the kICADownloadAndReturnPathArray flag is not specified. Otherwise returns an array of Strings holding the paths of the images that are downloaded.
See also:

- 96.30.9 ImportImage(flags as Integer) as string() 15221

### 96.30.11 kICABonjourServiceNameKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.12 kICABonjourServiceTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.13 kICABonjourTXTRecordKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.14 kICACreationDateStringKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.15 kICADataPropertyKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.16 kICADataSizeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.17 kICADataTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.18 kICADeviceCapabilitiesKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.19 kICADevicePropArtist as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.20 kICADevicePropBatteryLevel as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.21 kICADevicePropBurstInterval as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.22 kICADevicePropBurstNumber as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.23 kICADevicePropCaptureDelay as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.24 kICADevicePropCompressionSetting as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.25 kICADevicePropContrast as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.26 kICADevicePropCopyrightInfo as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.27 kICADevicePropDateTime as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.28 kICADevicePropDigitalZoom as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.29 kICADevicePropEffectMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.30 kICADevicePropExposureBiasCompensation as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.31 kICADevicePropExposureIndex as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.32 kICADevicePropExposureMeteringMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.33 kICADevicePropExposureProgramMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.34 kICADevicePropExposureTime as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.35 kICADevicePropFlashMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.36 kICADevicePropFNumber as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.37 kICADevicePropFocalLength as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.38 kICADevicePropFocusDistance as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.39 kICADevicePropFocusMeteringMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.40 kICADevicePropFocusMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.41 kICADevicePropFunctionalMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.42 kICADevicePropImageSize as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.43 kICADevicePropRGBGain as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.44 kICADevicePropSharpness as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.45 kICADevicePropStillCaptureMode as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.46 kICADevicePropTimelapseInterval as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.47 kICADevicePropTimelapseNumber as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.48 kICADevicePropUndefined as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.49 kICADevicePropUploadURL as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.50 kICADevicePropWhiteBalance as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the device properties.

### 96.30.51 kICADevicesArrayKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.
**Example:**

```
dim m as new ImageCaptureMBS
dim list as ImageCaptureObjectMBS = m.DeviceList

if List<>Nil then
// look into properties
dim dic as Dictionary = list.PropertyDictionary

// take the devices array there
if dic<>Nil and dic.HasKey(ImageCaptureObjectMBS.kICADevicesArrayKey) then
dim a(-1) as Variant = dic.Value(ImageCaptureObjectMBS.kICADevicesArrayKey)

// display device name
for each properties as Dictionary in a
MsgBox Properties.Value("ifil")
next
end if
end if
```

### 96.30.52 kICADeviceSharedKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.53 kICADeviceTypeCamera as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the device type constants.

### 96.30.54 kICADeviceTypeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.55 kICADeviceTypeScanner as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the device type constants.

### 96.30.56 kICADeviceUsedKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.57 kICADeviceWebSharedKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.58 kICAExecutableArchitectureKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.59 kICALockStatusKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.60 kICAMediaDurationInSecondsKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.61 kICAMediaHeightKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.
**Notes:** Value for this key in the dictionary is a number.

### 96.30.62 kICAMediaWidthKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.
**Notes:** Value for this key in the dictionary is a number.

### 96.30.63 kICAModificationDateStringKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.64 kICAObjectKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.

### 96.30.65 kICAObjectNameKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.

### 96.30.66 kICARawKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.67 kICARemoteDeviceKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.68 kICAThumbnailPropertyKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.69 kICAThumbnailSizeKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.70 kICAUSBProductIDKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.

### 96.30.71 kICAUSBVendorIDKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys for a device.

### 96.30.72 kMetaDataDictionaryKey as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the keys in the dictionaries.

### 96.30.73 OpenSession(device as ImageCaptureObjectMBS)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Opens a session on a camera device.
**Notes:** Lasterror is set.
For a scanner device use the ScannerOpenSession method.

### 96.30.74 PropertyDictionary as dictionary

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Get a dictionary containing all the properties for an object specified.
**Example:**

```
dim m as new ImageCaptureMBS
dim list as ImageCaptureObjectMBS = m.DeviceList

if List<>Nil then
// look into properties
dim dic as Dictionary = list.PropertyDictionary

// take the devices array there
if dic<>Nil and dic.HasKey(ImageCaptureObjectMBS.kICADevicesArrayKey) then
dim a(-1) as Variant = dic.Value(ImageCaptureObjectMBS.kICADevicesArrayKey)

// display device name
for each properties as Dictionary in a
MsgBox Properties.Value("ifil")
next
end if
end if
```

**Notes:** Lasterror is set.

### 96.30.75 PropertyDictionaryText as string

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Get a dictionary containing all the properties for an object specified.
**Example:**

```
dim m as new ImageCaptureMBS
dim list as ImageCaptureObjectMBS = m.DeviceList

if List<>Nil then
MsgBox List.PropertyDictionaryText
end if
```

**Notes:** Lasterror is set.
This is for debugging and may be removed soon.
The format of the text is the plist file format.

### 96.30.76 ScannerCloseSession

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Closes a session on a scanner device.
**Notes:** Lasterror is set.
For a camera device use the CloseSession method.

### 96.30.77 ScannerGetParameters as dictionary

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Query scanner parameters.
**Notes:** Use this method to get information about the scanner such as resolution, scanning area, etc.
Lasterror is set.

### 96.30.78 ScannerInitialize

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a scanner device.
**Notes:** Lasterror is set.

### 96.30.79 ScannerOpenSession(device as ImageCaptureObjectMBS)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Opens a session on a scanner device.
**Notes:** Lasterror is set.
For a camera device use the OpenSession method.

### 96.30.80 ScannerSetParameters(dic as dictionary)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Configures a scanner.
**Notes:** Use this method to specify scan parameters that will be used when a scan is initiated via ScannerStart.
Lasterror is set.

### 96.30.81 ScannerStart

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Starts scanning.
**Notes:** Use this method to start a scan based on the parameters that were specified in a previous ScannerSetParameters call.
Lasterror is set.

### 96.30.82 ScannerStatus as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scanner status.
**Notes:** Lasterror is set.

### 96.30.83 SendMessageMemory(messageType as string, startByte as UInt32, data as memoryblock, dataType as string) as UInt32

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Sends a message to a device object.
**Notes:** Use this API to send a message to a device object. All devices do not respond to all the messages

defined above.

messageType: A message type. e.g., kICAMessageCameraCaptureNewImage.
startByte: Offset in dataPtr from where data access for read/write should occur.
data: The data to send.
dataType: Data type.

Lasterror is set.
Retruns the result from this message.

### 96.30.84 SendMessageString(messageType as string, startByte as UInt32, data as string, dataType as string) as UInt32

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Sends a message to a device object.
**Notes:** Use this API to send a message to a device object. All devices do not respond to all the messages defined above.

messageType: A message type. e.g., kICAMessageCameraCaptureNewImage.
startByte: Offset in dataPtr from where data access for read/write should occur.
data: The data to send.
dataType: Data type.

Lasterror is set.
Retruns the result from this message.

### 96.30.85 UploadFile(file as folderitem, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Uploads a file to a device that supports this capability.
**Notes:** The device choses an appropriate destination location for the uploaded image and sends a kICANotificationTypeObjectAdded notification.
Lasterror is set.

Flag values that can be used in UploadFile:

| | |
|---|---|
| kICAUploadFileAsIs | Use this constant to upload a file as is. |
| kICAUploadFileScaleToFit | Use this constant to upload a file after scaling to fit a specified bounding rect. |

### 96.30.86 Properties

### 96.30.87 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 96.30.88 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last function used.
**Notes:** Value is 0 if the function was successfull, -1 if the function is not available, one of the following values or a Mac OS error code:

Possible values:

kICACommunicationErr = -9900
kICADeviceNotFoundErr = -9901
kICADeviceNotOpenErr = -9902
kICAFileCorruptedErr = -9903
kICAIOPendingErr = -9904
kICAInvalidObjectErr = -9905
kICAInvalidPropertyErr = -9906
kICAIndexOutOfRangeErr = -9907
kICAPropertyTypeNotFoundErr = -9908
kICACannotYieldDevice = -9909
kICADataTypeNotFoundErr = -9910
kICADeviceMemoryAllocationErr = -9911
kICADeviceInternalErr = -9912
kICADeviceInvalidParamErr = -9913
kICADeviceAlreadyOpenErr = -9914
kICADeviceLocationIDNotFoundErr = -9915
kICADeviceGUIDNotFoundErr = -9916
kICADeviceIOServicePathNotFoundErr = -9917
kICADeviceUnsupportedErr = -9918
kICAFrameworkInternalErr = -9919
kICAExtensionInternalErr = -9920

kICAInvalidSessionErr = -9921
(Read and Write property)

### 96.30.89 ScannerSessionHandle as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal handle for a scanner session.
**Notes:** Lasterror is set.
(Read and Write property)

### 96.30.90 SessionHandle as Integer

MBS MacOSX Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the session.
**Notes:** (Read and Write property)

### 96.30.91 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAddMetaDataToFinderComment | 4 | One of the flag constants for DownloadFile.<br>Add basic metadata to finder comment field. |
| kAdjustCreationDate | 8 | One of the flag constants for DownloadFile.<br>Set creation date of the downloaded file same as the crea<br>as reported by the device. |
| kCreateCustomIcon | 2 | One of the flag constants for DownloadFile.<br>Create a custom icon for Finder. |
| kDeleteAfterDownload | 1 | One of the flag constants for DownloadFile.<br>Delete file after a successful download. |
| kDontEmbedColorSyncProfile | &h80 | One of the flag constants for DownloadFile.<br>Do not embed ColorSync profile to the image. |
| kEmbedColorSyncProfile | &h20 | One of the flag constants for DownloadFile.<br>Embed ColorSync profile to the image if one was not alre |
| kICAAccessReadOnly | 1 | One of the constant values for kICAPropertyCameraAcce<br>Read-only without object deletion. |
| kICAAccessReadOnlyWithObjectDeletion | 2 | One of the constant values for kICAPropertyCameraAcce<br>Read-only with object deletion. |
| kICAAccessReadWrite | 0 | One of the constant values for kICAPropertyCameraAcce<br>Read-write. |
| kICAAllowMultipleImages | 1 | One of the flag constants for ImportImage.<br>Use this constant to allow users to select multiple images<br>dialog.<br>Seems like Image Capture in Mac OS X 10.6 ignores this fla<br>images always. |
| kICAButtonCopy | "copy" | One of the constants for scanner buttons.<br>Copy button. |
| kICAButtonEMail | "mail" | One of the constants for scanner buttons.<br>Email button. |
| kICAButtonScan | "scan" | One of the constants for scanner buttons.<br>Scan button. |
| kICAButtonWeb | "web " | One of the constants for scanner buttons.<br>Web button. |
| kICACameraPassThruNotUsed | 2 | One of the flag constants associated with Image Capture F<br>Use this constant when using a pass-through command<br>sending or receiving data. |
| kICACameraPassThruReceive | 1 | One of the flag constants associated with Image Capture F<br>Use this constant when receiving data from a device using<br>mand. |
| kICACameraPassThruSend | 0 | One of the flag constants associated with Image Capture F<br>Use this constant when sending data to a device using a pas |
| kICACannotYieldDevice | -9909 | One of the image capture specific error constants.<br>The device module cannot yield the specified device to th |
| kICACapabilityCanCameraCaptureNewImage | "ccni" | One of the Camera capabilities constants.<br>Can capture a new image using the camera. |
| kICACapabilityCanCameraDeleteAll | "dela" | One of the Camera capabilities constants.<br>Can delete all images stored in the camera. |
| kICACapabilityCanCameraDeleteOne | "del1" | One of the Camera capabilities constants.<br>Can delete one image stored in the camera. |
| kICACapabilityCanCameraSyncClock | "sclk" | One of the Camera capabilities constants.<br>Can synchronize camera's clock with the computer's cloc |
| kICACapabilityCanCameraUploadData | "load" | One of the Camera capabilities constants.<br>Can upload data to the camera. |
| kICACapabilityMayStoreNewImagesInTempStore | "temp" | One of the Camera capabilities constants. |
| kICACommunicationErr | -9900 | One of the image capture specific error constants.<br>An error occurred in communication between different c<br>Capture framework. |
| kICADataTypeNotFoundErr | -9910 | One of the image capture specific error constants.<br>Data with the specified data type is not found. |

## 96.31 class WIADataCallbackMBS

### 96.31.1 class WIADataCallbackMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides an application callback mechanism during data transfers from Windows Image Acquisition (WIA) hardware devices to applications.
**Notes:** Works on Windows 2000 Professional, Windows XP and Windows Server 2003.

### 96.31.2 Properties

### 96.31.3 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.31.4 Events

### 96.31.5 BandedDataCallback(message as Integer, Status as Integer, PercentComplete as Integer, Offset as Integer, Length as Integer, Buffer as memoryblock) as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: .

**Function:** Provides data transfer status notifications.
**Notes:** Windows Image Acquisition (WIA) data transfer methods of the WiaDataTransfer interface periodically call this method.

Message: Specifies a constant that indicates the reason for the callback. Can be one of the kMessage* constants.
Status: Specifies a constant that indicates the status of the WIA device. Can be set to a combination of the kStatus* constants.
PercentComplete: Specifies the percentage of the total data that has been transferred so far.
Offset: Specifies an offset, in bytes, from the beginning of the buffer where the current band of data begins.
Length: Specifies the length, in bytes, of the current band of data.
Buffer: The data buffer.

Lasterror is set.

Your application must provide the BandedDataCallback event. This event is periodically invoked by the data transfer methods of the WiaDataTransferMBS interface. It provides status messages to the application during the data transfer. By returning false, your program can also use this method to prematurely terminate the data transfer.

When this method is invoked, the Message parameter will contain the reason for the call. Not all parameters will contain data on all calls. For example, when BandedDataCallback is invoked with a message of kMessageTermination, it should not attempt to use the values in the Buffer, Offset, and Length parameters.

If the value of Message is kMessageData, the buffer contains a band of image data. The Offset parameter contains an offset in bytes from the beginning of the buffer where the current band of data begins. The Length parameter specified the length in bytes of the current band of data.

During calls where Message is set to kMessageData or kMessageStatus, the Status parameter contains a valid value. Its contents should not be used when Message contains other values.

If Message is kMessageDataHeader, the Buffer parameter points to a WIA_DATA_CALLBACK_HEADER structure.

When an error has occurred during an image data transfer, the driver sets Message to IT_MSG_DEVICE_STATUS. The proxy callback object calls ReportStatus, which handles the error and displays messages to the user.

### 96.31.6 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMessageData | 2 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The WIA system is transferring data to the application. |
| kMessageDataHeader | 1 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The application is receiving a header prior to receiving the actual data. |
| kMessageFilePreviewData | 6 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The WIA system is transferring preview data to the application. |
| kMessageFilePreviewDataHeader | 7 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The application is receiving a header prior to receiving the actual preview data |
| kMessageNewPage | 5 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The data transfer is beginning a new page. |
| kMessageStatus | 3 | One of the constants for the message parameter in the BandedDataCallback callback.<br>This invocation of the callback is sending only status information. |
| kMessageTermination | 4 | One of the constants for the message parameter in the BandedDataCallback callback.<br>The data transfer is complete. |
| kStatusProcessingData | 2 | One of the constants for the status parameter in the BandedDataCallback callback.<br>Data is currently being processed. |
| kStatusTransferFromDevice | 1 | One of the constants for the status parameter in the BandedDataCallback callback.<br>Data is currently being transferred from the WIA device. |
| kStatusTransferToClient | 4 | One of the constants for the status parameter in the BandedDataCallback callback.<br>Data is currently being transferred to the client's data buffer. |

# 96.32 class WIADataTransferInfoMBS

## 96.32.1 class WIADataTransferInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADataTransferInfoMBS class is used by applications to describe the buffer used to retrieve bands of data from Windows Image Acquisition (WIA) devices.
**Notes:** It is primarily used in conjunction with the methods of the IWiaDataTransfer interface.

## 96.32.2 Properties

## 96.32.3 BufferSize as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size in bytes of the buffer that is used for the data transfer.
**Notes:** (Read and Write property)

## 96.32.4 DoubleBuffer as Boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains true if the device is double buffered, false if the device is not double buffered.
**Notes:** (Read and Write property)

## 96.32.5 Section as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies an optional handle to a shared section of memory allocated by the application. If this member is set to nil, GetBandedData allocates the shared memory itself.
**Notes:** (Read and Write property)

## 96.32.6 Size as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the size of this structure.
**Notes:** (Read and Write property)

## 96.33 class WIADataTransferMBS

### 96.33.1 class WIADataTransferMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADataTransferMBS interface is a high performance data transfer interface.
**Notes:** This interface supports a shared memory window to transfer data from the device object to the application, and eliminates unnecessary data copies during marshalling. A callback mechanism is provided in the form of the WiaDataCallbackMBS interface. It enables applications to obtain data transfer status notification, transfer data from the Windows Image Acquisition (WIA) device to the application, and cancel pending data transfers.

For Windows Vista applications, use IWiaTransfer instead of IWiaDataTransfer.

### 96.33.2 Methods

### 96.33.3 EnumerateFormatInfo as WIAFormatInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an enumerator for the format information.
**Notes:** Lasterror is set.

### 96.33.4 GetBandedData(DataTransInfo as WIADataTransferInfoMBS, DataCallback as WIADataCallbackMBS)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetBandedData method transfers a band of data from a hardware device to an application.
**Notes:** For efficiency, applications retrieve data from Windows Image Acquisition (WIA) hardware devices in successive bands.
Lasterror is set.

### 96.33.5 GetDataFile(DataCallback as WIADataCallbackMBS) as folderitem

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetData method retrieves complete files from a Windows Image Acquisition (WIA) device.
**Notes:** Lasterror is set.
Returns the folderitem for the new file. Copy or load the file as this temporary file is deleted as soon as the

object is destroyed.

### 96.33.6 GetDataPath(DataCallback as WIADataCallbackMBS) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetData method retrieves complete files from a Windows Image Acquisition (WIA) device.
**Notes:** Lasterror is set.
Returns the folderitem for the new file. Copy or load the file as this temporary file is deleted as soon as the object is destroyed.

### 96.33.7 GetExtendedTransferInfo as WIAExtendedTransferInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetExtendedTransferInfo retrieves extended information relating to data transfer buffers in the case of banded data transfers.
**Notes:** Applications typically use this method to retrieve driver recommended settings for minimum buffer size, maximum buffer size, and optimal buffer size for banded data transfers.

Lasterror is set.

### 96.33.8 QueryGetData as WIAFormatInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The QueryGetData method is used by applications to query a Windows Image Acquisition (WIA) device to determine what types of data formats it supports.
**Notes:** Lasterror is set.

### 96.33.9 Properties

### 96.33.10 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.33.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 96.34 class WIADeviceCapabilitiesEnumeratorMBS

### 96.34.1 class WIADeviceCapabilitiesEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADeviceCapabilitiesEnumeratorMBS class enumerates the currently available Windows Image Acquisition (WIA) hardware device capabilities.
**Notes:** Device capabilities include commands and events that the device supports.

### 96.34.2 Methods

### 96.34.3 Clone as WIADeviceCapabilitiesEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the WIADeviceCapabilitiesEnumeratorMBS object.
**Notes:** Lasterror is set.

### 96.34.4 Count as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of items in the enumeration.
**Notes:** Lasterror is set.

### 96.34.5 NextItem as WIADeviceCapabilitiesMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next item in the enumeration.
**Notes:** Lasterror is set.

### 96.34.6 Reset

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumeration.
**Notes:** Lasterror is set.

### 96.34.7 Skip(celt as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips the given number of entries in the enumeration.
**Notes:** Lasterror is set.

### 96.34.8 Properties

### 96.34.9 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.34.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

# 96.35 class WIADeviceCapabilitiesMBS

## 96.35.1 class WIADeviceCapabilitiesMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for device capabilities.

## 96.35.2 Properties

## 96.35.3 Commandline as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a string that represents command line arguments.
**Notes:** (Read and Write property)

## 96.35.4 Description as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a string that contains a description of the capability that is displayed to the user.
**Notes:** (Read and Write property)

## 96.35.5 Flags as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flags for this capability
**Notes:** (Read and Write property)

## 96.35.6 GUID as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a GUID that identifies the device capability.
**Notes:** This member can be set to any of the values specified in WIAItemMBS constants for Device Commands (kCommand*) or WIA Event Identifiers (kEvent*).
(Read and Write property)

### 96.35.7 Icon as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a string that represents the location and resource ID of the icon that represents this capability or handler.
**Notes:** The string must be of the following form: drive:\path\module,n, where n is the icon's negated resource ID (that is, if the resource ID of the icon is 100, then n is -100).
(Read and Write property)

### 96.35.8 Name as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a string that contains a short version of the capability name.
**Notes:** (Read and Write property)

# 96.36 class WIADeviceInfoEnumeratorMBS

## 96.36.1 class WIADeviceInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADeviceInfoEnumeratorMBS class enumerates the currently available Windows Image Acquisition (WIA) hardware devices and their properties.
**Notes:** Device information properties describe the installation and configuration of WIA hardware devices.

## 96.36.2 Methods

## 96.36.3 Clone as WIADeviceInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the enumerator.
**Notes:** Lasterror is set.

## 96.36.4 Count as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of items in the enumeration.
**Notes:** Lasterror is set.

## 96.36.5 NextItem as WIAPropertyStorageMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next item in the enumeration.
**Notes:** Lasterror is set.

## 96.36.6 Reset

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumeration.
**Notes:** Lasterror is set.

### 96.36.7 Skip(celt as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips the given number of entries in the enumeration.
**Notes:** Lasterror is set.

### 96.36.8 Properties

### 96.36.9 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.36.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

# 96.37 class WIADeviceManager1MBS

## 96.37.1 class WIADeviceManager1MBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADeviceManager1MBS interface is used to create and manage image acquisition devices and to register to receive device events.
**Notes:** WIA 1.x is available on Windows 2000 and newer
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1
- MBS Plugins 10.3 Release Notes
- Check the WIA Plugin part today
- MBS REALbasic Plugins, version 10.3pr4

## 96.37.2 Methods

## 96.37.3 Constructor

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new WIA 1.0 manager object.
**Example:**

```
dim DeviceManager as new WIADeviceManager1MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
MsgBox "OK"
end if
```

## 96.37.4 CreateDevice(DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a hierarchical tree of WiaItem objects for a Windows Image Acquisition device.
**Notes:** DeviceID: Specifies the unique identifier of the WIA device.

Lasterror is set.

Applications use the CreateDevice method to create a device object for the WIA devices specified by the DeviceID parameter.

Returns the WIAItemMBS object for the root item. Applications can use this tree of objects to control and retrieve data from the WIA device.

### 96.37.5 EnumDeviceInfo(flags as Integer = &h10) as WIADeviceInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an enumerator of property information for each available Windows Image Acquisition device.
**Example:**

```
dim DeviceManager1 as new WIADeviceManager1MBS

// Enumerate all local devices
dim e as WIADeviceInfoEnumeratorMBS = DeviceManager1.EnumDeviceInfo(DeviceManager1.kEnumLocal)
if e<>Nil then

dim p as WIAPropertyStorageMBS = e.NextItem
while p<>Nil

// display the name of the device in a listbox
Listbox1.AddFolder p.Read(p.kDevicePropertyDevNameString)

p = e.NextItem
wend
end if
```

**Notes:** Flags: Specifies the types of WIA devices to enumerate. Should be set to kEnumLocal.
Lasterror is set.

### 96.37.6 GetImageDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, Intent as integer, file as folderitem, rootitem as WIAItemMBS=nil)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire an

image from a Windows Image Acquisition (WIA) device and write the image to a specified file.
**Notes:** Lasterror is set.

This method combines the functionality of SelectDeviceDialog to completely encapsulate image acquisition within a single API call.

parentWindowHandle: Handle of the window that owns the Get Image dialog box.
DeviceType: Specifies which type of WIA device to use. Is set to kDeviceTypeDefault, kDeviceTypeScanner, or kDeviceTypeDigitalCamera.
Flags: Specifies dialog box behavior. Can be set to the following constants: kSelectDeviceNoDefault, kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. Use kIntent* constants.
rootitem: Returns the interface of the hierarchical tree of WiaItem objects returned by CreateDevice.
file: Specifies the name of the file to which the image data is written.

Invoking this method displays a dialog box that enables users to acquire images. It can also display the Select Device dialog box created by the SelectDeviceDlg method.

If the application passes nil for the value of the rootitem parameter, GetImageDlg displays the Select Device dialog box that lets the user select the WIA input device. If the application specifies a WIA input device by passing a pointer to the device's item tree through the pItemRoot parameter, GetImageDlg does not display the Select Device dialog box. Instead, it will use the specified input device to acquire the image.

When using the Select Device dialog box, applications can specify types of WIA input devices. To do so, they must set the rootitem parameter to NULL and pass the appropriate constants through the DeviceType parameter. If more than one device of the specified type is present, the GetImageDlg displays the Select Device dialog box to let the user select which device will be used.

If GetImageDlg finds only one matching device, it will not display the Select Device dialog box. Instead, it will select the matching device. You can override this behavior and force GetImageDlg to display the Select Device dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.

The dialog must have sufficient rights to the folder for file that it can save the file with a unique file name. The folder should also be protected with an access control list (ACL) because it contains user data.
See also:

- 96.37.7 GetImageDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil) 15256
- 96.37.8 GetImageDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil) 15257

### 96.37.7 GetImageDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire an image from a Windows Image Acquisition (WIA) device and write the image to a specified file.
**Notes:** Lasterror is set.

This method combines the functionality of SelectDeviceDialog to completely encapsulate image acquisition within a single API call.

parentWindowHandle: Handle of the window that owns the Get Image dialog box.
DeviceType: Specifies which type of WIA device to use. Is set to kDeviceTypeDefault, kDeviceTypeScanner, or kDeviceTypeDigitalCamera.
Flags: Specifies dialog box behavior. Can be set to the following constants: kSelectDeviceNoDefault, kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. Use kIntent* constants.
rootitem: Returns the interface of the hierarchical tree of WiaItem objects returned by CreateDevice.
file: Specifies the name of the file to which the image data is written.

Invoking this method displays a dialog box that enables users to acquire images. It can also display the Select Device dialog box created by the SelectDeviceDlg method.

If the application passes nil for the value of the rootitem parameter, GetImageDlg displays the Select Device dialog box that lets the user select the WIA input device. If the application specifies a WIA input device by passing a pointer to the device's item tree through the pItemRoot parameter, GetImageDlg does not display the Select Device dialog box. Instead, it will use the specified input device to acquire the image.

When using the Select Device dialog box, applications can specify types of WIA input devices. To do so, they must set the rootitem parameter to NULL and pass the appropriate constants through the DeviceType parameter. If more than one device of the specified type is present, the GetImageDlg displays the Select Device dialog box to let the user select which device will be used.

If GetImageDlg finds only one matching device, it will not display the Select Device dialog box. Instead, it will select the matching device. You can override this behavior and force GetImageDlg to display the Select Device dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.

The dialog must have sufficient rights to the folder for file that it can save the file with a unique file name. The folder should also be protected with an access control list (ACL) because it contains user data.

See also:


- 96.37.6 GetImageDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, Intent as integer, file as folderitem, rootitem as WIAItemMBS=nil) 15254
- 96.37.8 GetImageDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil) 15257


### 96.37.8 GetImageDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire an image from a Windows Image Acquisition (WIA) device and write the image to a specified file.
**Notes:** Lasterror is set.

This method combines the functionality of SelectDeviceDialog to completely encapsulate image acquisition within a single API call.

parentWindowHandle: Handle of the window that owns the Get Image dialog box.
DeviceType: Specifies which type of WIA device to use. Is set to kDeviceTypeDefault, kDeviceTypeScanner, or kDeviceTypeDigitalCamera.
Flags: Specifies dialog box behavior. Can be set to the following constants: kSelectDeviceNoDefault, kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. Use kIntent* constants.
rootitem: Returns the interface of the hierarchical tree of WiaItem objects returned by CreateDevice.
file: Specifies the name of the file to which the image data is written.

Invoking this method displays a dialog box that enables users to acquire images. It can also display the Select Device dialog box created by the SelectDeviceDlg method.

If the application passes nil for the value of the rootitem parameter, GetImageDlg displays the Select Device dialog box that lets the user select the WIA input device. If the application specifies a WIA input device by passing a pointer to the device's item tree through the pItemRoot parameter, GetImageDlg does not display the Select Device dialog box. Instead, it will use the specified input device to acquire the image.

When using the Select Device dialog box, applications can specify types of WIA input devices. To do so, they must set the rootitem parameter to NULL and pass the appropriate constants through the DeviceType parameter. If more than one device of the specified type is present, the GetImageDlg displays the Select Device dialog box to let the user select which device will be used.

If GetImageDlg finds only one matching device, it will not display the Select Device dialog box. Instead, it

will select the matching device. You can override this behavior and force GetImageDlg to display the Select Device dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.

The dialog must have sufficient rights to the folder for file that it can save the file with a unique file name. The folder should also be protected with an access control list (ACL) because it contains user data.
See also:

- 96.37.6 GetImageDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, Intent as integer, file as folderitem, rootitem as WIAItemMBS=nil) 15254
- 96.37.7 GetImageDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, Intent as Integer, file as folderitem, rootitem as WIAItemMBS=nil) 15256

### 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15259
- 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15260
- 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15261
- 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15262
- 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15263


### 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15258
- 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15260
- 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15261
- 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15262
- 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15263


### 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Example:**

```
dim DeviceManager as new WIADeviceManager1MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
dim it as WIAItemMBS = DeviceManager.SelectDeviceDialog(window1, DeviceManager.kDeviceTypeDefault, DeviceManager.kSelectDeviceNoDefault)

if it<>Nil then
dim p as WIAPropertyStorageMBS = it.PropertyStorage
dim name as string = p.Read(p.kItemPropertyItemNameString)
MsgBox name
end if
end if
```

**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault

DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15258
- 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15259
- 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15261
- 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15262
- 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15263


### 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.

Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15258
- 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15259
- 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15260
- 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15262
- 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15263

### 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of

possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15258
- 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15259
- 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15260
- 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15261
- 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15263


### 96.37.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.

DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.37.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15258
- 96.37.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15259
- 96.37.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15260
- 96.37.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15261
- 96.37.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15262

### 96.37.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.37.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string 15265
- 96.37.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string 15266


### 96.37.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.37.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string 15264
- 96.37.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string 15266

### 96.37.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device

types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.37.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string 15264
- 96.37.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string 15265

### 96.37.18 Properties

### 96.37.19 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 1.x.
(Read and Write property)

### 96.37.20 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.37.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceDialogSingleImage | 2 | One of the constants for the GetImageDialog method.<br>Restrict image selection to a single image in the device image acquisition dialog box.<br>Only for WIA 2.x. |
| kDeviceDialogUseCommonUI | 4 | One of the constants for the GetImageDialog method.<br>Use the system UI, if available, rather than the vendor-supplied UI. If the system UI is not available, the vendor UI is used. If neither UI is available, the function returns E_NOTIMPL. |
| kDeviceTypeDefault | 0 | One of the device type constants. |
| kDeviceTypeDigitalCamera | 2 | One of the device type constants. |
| kDeviceTypeScanner | 1 | One of the device type constants. |
| kDeviceTypeStreamingVideo | 3 | One of the device type constants. |
| kEnumAll | 15 | One of the constants for EnumDeviceInfo flags parameter.<br>All devices are enumerated, both locally and remote, including inactive (disconnected) devices and legacy STI-only devices. |
| kEnumLocal | 16 | One of the constants for EnumDeviceInfo flags parameter.<br>Only locally connected active scanner devices are enumerated. |
| kIntentBestPreview | &h40000 | One of the intent constants for GetImageDialog.<br>Specifies the best quality preview. |
| kIntentImageTypeColor | 1 | One of the intent constants for GetImageDialog.<br>Preset properties for color content. |
| kIntentImageTypeGrayscale | 2 | One of the intent constants for GetImageDialog.<br>Preset properties for grayscale content. |
| kIntentImageTypeMask | &hF | One of the intent constants for GetImageDialog.<br>Mask for all of the image type flags. |
| kIntentImageTypeText | 4 | One of the intent constants for GetImageDialog.<br>Preset properties for text content. |
| kIntentMaximizeQuality | &h20000 | One of the intent constants for GetImageDialog.<br>Preset properties to maximize image quality. |
| kIntentMinimizeSize | &h10000 | One of the intent constants for GetImageDialog.<br>Preset properties to minimize image size. |
| kIntentNone | 0 | One of the intent constants for GetImageDialog.<br>Default value. Do not preset any properties. |
| kIntentSizeMask | &hF0000 | One of the intent constants for GetImageDialog.<br>Mask for all of the size/quality flags. |
| kSelectDeviceNoDefault | 1 | One of the constants for the GetImageDialog method.<br>Force this method to display the Select Device dialog box.<br>Only for WIA 2.x. |

# 96.38 class WIADeviceManager2MBS

## 96.38.1 class WIADeviceManager2MBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIADeviceManager2MBS interface is used to create and manage image acquisition devices and to register to receive device events.
**Notes:** WIA 2.x is available on Windows Vista and newer.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1
- MBS Plugins 10.3 Release Notes
- Check the WIA Plugin part today
- MBS REALbasic Plugins, version 10.3pr4

## 96.38.2 Methods

## 96.38.3 Constructor

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new WIA 2.0 manager object.
**Example:**

```
dim DeviceManager as new WIADeviceManager2MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
MsgBox "OK"
end if
```

## 96.38.4 CreateDevice(DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a hierarchical tree of WiaItem objects for a Windows Image Acquisition device.
**Notes:** DeviceID: Specifies the unique identifier of the WIA device.

Lasterror is set.

Applications use the CreateDevice method to create a device object for the WIA devices specified by the DeviceID parameter.

Returns the WIAItemMBS object for the root item. Applications can use this tree of objects to control and retrieve data from the WIA device.

### 96.38.5 EnumDeviceInfo(flags as Integer = &h10) as WIADeviceInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an enumerator of property information for each available Windows Image Acquisition device.
**Example:**

```
dim DeviceManager2 as new WIADeviceManager2MBS

// Enumerate all local devices
dim e as WIADeviceInfoEnumeratorMBS = DeviceManager2.EnumDeviceInfo(DeviceManager2.kEnumLocal)
if e<>Nil then

dim p as WIAPropertyStorageMBS = e.NextItem
while p<>Nil

// display the name of the device in a listbox
Listbox1.AddFolder p.Read(p.kDevicePropertyDevNameString)

p = e.NextItem
wend
end if
```

**Notes:** Flags: Specifies the types of WIA devices to enumerate. Should be set to kEnumLocal or kEnumAll. Lasterror is set.

### 96.38.6 GetImageDialog(Flags as integer, DeviceID as string, parentWindow as DesktopWindow, FolderName as String, Filename as String, byref item as WIAItemMBS) as string()

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire

an image from a Windows Image Acquisition (WIA) 2.0 device and write the image to a specified file. This method extends the functionality of SelectDeviceDlg to encapsulate image acquisition within a single API call.
**Notes:** Lasterror is set.

Flags: Specifies dialog box behavior. Can be set to the following values: kDeviceDialogUseCommonUI
DeviceID: Specifies the scanner to use.
parentWindowHandle: A handle of the window that owns the Get Image dialog box.
FolderName: Specifies the name of the folder ito store the scanned files in.
Filename: Specifies the name of the file to write the image data to.
item: The variable to return the WiaItem that the images were scanned from.

Returns an array with paths to the files that have been scanned.

If the application passes an emapty string for the value of the DeviceID parameter, GetImageDialog displays the Select Device dialog box so that the user can select the WIA 2.0 input device.

Use a menu item named From scanner on the File menu so that device and image selections are available in your application.

The dialog box must have sufficient rights to FolderName so that it can save the files with unique file names. Protect the folder with an access control list (ACL) because it contains user data.
See also:


- 96.38.7 GetImageDialog(Flags as Integer, DeviceID as string, parentWindow as window, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15271
- 96.38.8 GetImageDialog(Flags as Integer, DeviceID as string, parentWindowHandle as Integer, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15272


### 96.38.7 GetImageDialog(Flags as Integer, DeviceID as string, parentWindow as window, FolderName as String, Filename as String, byref item as WIAItemMBS) as string()

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire an image from a Windows Image Acquisition (WIA) 2.0 device and write the image to a specified file. This method extends the functionality of SelectDeviceDlg to encapsulate image acquisition within a single API call.
**Notes:** Lasterror is set.

Flags: Specifies dialog box behavior. Can be set to the following values: kDeviceDialogUseCommonUI
DeviceID: Specifies the scanner to use.

parentWindowHandle: A handle of the window that owns the Get Image dialog box.
FolderName: Specifies the name of the folder ito store the scanned files in.
Filename: Specifies the name of the file to write the image data to.
item: The variable to return the WiaItem that the images were scanned from.

Returns an array with paths to the files that have been scanned.

If the application passes an emapty string for the value of the DeviceID parameter, GetImageDialog displays the Select Device dialog box so that the user can select the WIA 2.0 input device.

Use a menu item named From scanner on the File menu so that device and image selections are available in your application.

The dialog box must have sufficient rights to FolderName so that it can save the files with unique file names. Protect the folder with an access control list (ACL) because it contains user data.
See also:

- 96.38.6 GetImageDialog(Flags as integer, DeviceID as string, parentWindow as DesktopWindow, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15270
- 96.38.8 GetImageDialog(Flags as Integer, DeviceID as string, parentWindowHandle as Integer, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15272

### 96.38.8 GetImageDialog(Flags as Integer, DeviceID as string, parentWindowHandle as Integer, FolderName as String, Filename as String, byref item as WIAItemMBS) as string()

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetImageDialog method displays one or more dialog boxes that enable a user to acquire an image from a Windows Image Acquisition (WIA) 2.0 device and write the image to a specified file. This method extends the functionality of SelectDeviceDlg to encapsulate image acquisition within a single API call.
**Notes:** Lasterror is set.

Flags: Specifies dialog box behavior. Can be set to the following values: kDeviceDialogUseCommonUI
DeviceID: Specifies the scanner to use.
parentWindowHandle: A handle of the window that owns the Get Image dialog box.
FolderName: Specifies the name of the folder ito store the scanned files in.
Filename: Specifies the name of the file to write the image data to.
item: The variable to return the WiaItem that the images were scanned from.

Returns an array with paths to the files that have been scanned.

If the application passes an empty string for the value of the DeviceID parameter, GetImageDialog displays the Select Device dialog box so that the user can select the WIA 2.0 input device.

Use a menu item named From scanner on the File menu so that device and image selections are available in your application.

The dialog box must have sufficient rights to FolderName so that it can save the files with unique file names. Protect the folder with an access control list (ACL) because it contains user data.
See also:

- 96.38.6 GetImageDialog(Flags as integer, DeviceID as string, parentWindow as DesktopWindow, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15270
- 96.38.7 GetImageDialog(Flags as Integer, DeviceID as string, parentWindow as window, FolderName as String, Filename as String, byref item as WIAItemMBS) as string() 15271

### 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15274
- 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15275
- 96.38.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15276
- 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15277
- 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15278


### 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15273
- 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15275
- 96.38.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15276
- 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15277
- 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15278


### 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Example:**

```
dim DeviceManager as new WIADeviceManager2MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
dim it as WIAItemMBS = DeviceManager.SelectDeviceDialog(window1, DeviceManager.kDeviceTypeDefault, DeviceManager.kSelectDeviceNoDefault)

if it<>Nil then
dim p as WIAPropertyStorageMBS = it.PropertyStorage
dim name as string = p.Read(p.kItemPropertyItemNameString)
MsgBox name
end if
end if
```

**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault

DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15273
- 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15274
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- 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15277
- 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15278


### 96.38.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.

Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15273
- 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15274
- 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15275
- 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15277
- 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15278


### 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of

possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15273
- 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15274
- 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15275
- 96.38.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15276
- 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15278

### 96.38.14 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** parentWindow: Specifies the parent window of the Select Device dialog box.

DeviceType: Specifies which type of WIA 2.0 device to use. See WIA Device Type Specifiers for a list of possible values.
Flags: Specifies the behavior of the dialog box. The value can be one of the following constants: kSelectDeviceNoDefault
DeviceID: Optional, On output, receives a string which contains the device's identifier string. On input, pass the address of a pointer if this information is needed, or "" if it is not needed.

Returns the WIAItem which was selected.
Lasterror is set.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialog method creates a hierarchical tree of IWiaItem2 objects for the device. It returns the WiaItemMBS object of the root item.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialog does not display the Select Device dialog box. Instead it returns the WiaItemMBS tree for the device. You can override this behavior and force SelectDeviceDialog to display the dialog box by specifying kSelectDeviceNoDefault as the value for the Flags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the Select Device dialog box so the user may choose one.

It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:


- 96.38.9 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as WIAItemMBS 15273
- 96.38.10 SelectDeviceDialog(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer, byref DeviceID as string) as WIAItemMBS 15274
- 96.38.11 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15275
- 96.38.12 SelectDeviceDialog(parentWindow as window, DeviceType as Integer, Flags as Integer, byref DeviceID as string) as WIAItemMBS 15276
- 96.38.13 SelectDeviceDialog(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as WIAItemMBS 15277


### 96.38.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.38.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string 15280
- 96.38.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string 15281

### 96.38.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.38.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string 15279
- 96.38.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string 15281

### 96.38.17 SelectDeviceDialogID(parentWindowHandle as Integer, DeviceType as Integer, Flags as Integer) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box that enables the user to select a hardware device for image acquisition.
**Notes:** Lasterror is set.

parentWindow: Specifies the parent window of the Select Device dialog box.
DeviceType: Specifies which type of WIA device to use. See kDeviceType* constants.
Flags: Specifies the behavior of the dialog box. You can pass the following constant: kSelectDeviceNoDefault

Returns the selected DeviceID.

This method creates and displays the Select Device dialog box so the user can select a WIA device for image acquisition. If a device is successfully selected, the SelectDeviceDialogID method retruns its identifier string to the application.

The application can restrict the devices displayed to the user to particular types by specifying the device

types through the DeviceType parameter. If only one device meets the specification, SelectDeviceDialogID does not display the Select Device dialog box. Instead it passes the device's identifier string to the application without displaying the dialog box. You can override this behavior and force SelectDeviceDialogID to display the dialog box by passing kSelectDeviceNoDefault as the value for the lFlags parameter. If more than one WIA device matches the specification, all matching devices are displayed in the SelectDevice dialog box so the user may choose one.

Note It is recommended that applications make device and image selection available through a menu item named From scanner on the File menu.
See also:

- 96.38.15 SelectDeviceDialogID(parentWindow as DesktopWindow, DeviceType as integer, Flags as integer) as string 15279
- 96.38.16 SelectDeviceDialogID(parentWindow as window, DeviceType as Integer, Flags as Integer) as string 15280

### 96.38.18 Properties

### 96.38.19 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 2.x.
(Read and Write property)

### 96.38.20 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.38.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceDialogSingleImage | 2 | One of the constants for the GetImageDialog method.<br>Restrict image selection to a single image in the device image acquisition dialog box.<br>Only for WIA 2.x. |
| kDeviceDialogUseCommonUI | 4 | One of the constants for the GetImageDialog method.<br>Use the system UI, if available, rather than the vendor-supplied UI. If the system UI is not available, the vendor UI is used. If neither UI is available, the function returns E_NOTIMPL. |
| kDeviceTypeDefault | 0 | One of the device type constants. |
| kDeviceTypeDigitalCamera | 2 | One of the device type constants. |
| kDeviceTypeScanner | 1 | One of the device type constants. |
| kDeviceTypeStreamingVideo | 3 | One of the device type constants. |
| kEnumAll | 15 | One of the constants for EnumDeviceInfo flags parameter.<br>All devices are enumerated, both locally and remote, including inactive (disconnected) devices and legacy STI-only devices. |
| kEnumLocal | 16 | One of the constants for EnumDeviceInfo flags parameter.<br>Only locally connected active scanner devices are enumerated. |
| kIntentBestPreview | &h40000 | One of the intent constants for GetImageDialog.<br>Specifies the best quality preview. |
| kIntentImageTypeColor | 1 | One of the intent constants for GetImageDialog.<br>Preset properties for color content. |
| kIntentImageTypeGrayscale | 2 | One of the intent constants for GetImageDialog.<br>Preset properties for grayscale content. |
| kIntentImageTypeMask | &hF | One of the intent constants for GetImageDialog.<br>Mask for all of the image type flags. |
| kIntentImageTypeText | 4 | One of the intent constants for GetImageDialog.<br>Preset properties for text content. |
| kIntentMaximizeQuality | &h20000 | One of the intent constants for GetImageDialog.<br>Preset properties to maximize image quality. |
| kIntentMinimizeSize | &h10000 | One of the intent constants for GetImageDialog.<br>Preset properties to minimize image size. |
| kIntentNone | 0 | One of the intent constants for GetImageDialog.<br>Default value. Do not preset any properties. |
| kIntentSizeMask | &hF0000 | One of the intent constants for GetImageDialog.<br>Mask for all of the size/quality flags. |
| kSelectDeviceNoDefault | 1 | One of the constants for the GetImageDialog method.<br>Force this method to display the Select Device dialog box. |

## 96.39 class WIAExtendedTransferInfoMBS

### 96.39.1 class WIAExtendedTransferInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAExtendedTransferInfoMBS class specifies extended transfer information for the GetExtendedTransferInfo method.
**Notes:** Requires Windows 2000 Professional, Windows XP or Windows Server 2003.

### 96.39.2 Properties

### 96.39.3 MaxBufferSize as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Driver-recommended maximum buffer size the application could request in a call to GetBandedData.
**Notes:** Going over this limit is not detrimental, however, the driver can simply not use the whole buffer and limit each band of data to this maximum size.
(Read and Write property)

### 96.39.4 MinBufferSize as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Minimum buffer size the application should request in a call to GetBandedData.
**Notes:** (Read and Write property)

### 96.39.5 NumBuffers as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This value is not used and should be ignored.
**Notes:** (Read and Write property)

### 96.39.6 OptimalBufferSize as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Driver-recommended buffer size the application should request in a call to GetBandedData.
**Notes:** (Read and Write property)

### 96.39.7 Size as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Size of this structure.
**Notes:** (Read and Write property)

## 96.40 class WIAFormatInfoEnumeratorMBS

### 96.40.1 class WIAFormatInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Use the WIAFormatInfoEnumeratorMBS class to enumerate the format and media type information for a device.

### 96.40.2 Methods

### 96.40.3 Clone as WIAFormatInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Clones this enumerator.
**Notes:** Lasterror is set.

### 96.40.4 Count as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of elements stored by this enumerator.
**Notes:** Lasterror is set.

### 96.40.5 NextItem as WIAFormatInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next item in the enumeration.

### 96.40.6 Reset

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumerator.
**Notes:** Lasterror is set.

### 96.40.7 Skip(celt as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips the specified number of structures in the enumeration.
**Notes:** Lasterror is set.

### 96.40.8 Properties

### 96.40.9 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.40.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 96.41 class WIAFormatInfoMBS

### 96.41.1 class WIAFormatInfoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAFormatInfoMBS class specifies valid format and media type pairs for a device.
**Notes:** Requires Windows 2000 Professional, Windows XP or Windows Server 2003.

### 96.41.2 Properties

### 96.41.3 FormatID as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** GUID that identifies the format.
**Notes:** (Read and Write property)

### 96.41.4 Tymed as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media type that corresponds to the guidFormatID member.
**Notes:** (Read and Write property)

## 96.42 class WIAGUIDMBS

### 96.42.1 class WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a Windows unique ID.
**Example:**

```
dim w as WIAGUIDMBS = WIAPropertyStorageMBS.kImageFormatTIFF

MsgBox w.DisplayString
```

**Notes:** If you need to validate a GUID or UUID, please check the IsGUID function in our FAQ.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr6
- MBS Plugins 11.1 Release notes

### 96.42.2 Methods

### 96.42.3 Constructor

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a GUID with only zeros.
**Example:**

```
dim g as new WIAGUIDMBS

MsgBox g.DisplayString
```

See also:

- 96.42.4 Constructor(value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer, value5 as Integer, value6 as Integer, value7 as Integer, value8 as Integer, value9 as Integer, value10 as Integer, value11 as Integer, value12 as Integer, value13 as Integer, value14 as Integer, value15 as Integer, value16 as Integer)

### 96.42.4 Constructor(value1 as Integer, value2 as Integer, value3 as Integer, value4 as Integer, value5 as Integer, value6 as Integer, value7 as Integer, value8 as Integer, value9 as Integer, value10 as Integer, value11 as Integer, value12 as Integer, value13 as Integer, value14 as Integer, value15 as Integer, value16 as Integer)

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new GUID with the given byte values.
**Example:**

```
dim g as new WIAGUIDMBS(&h14, &h3e, &h4e, &h83, &h64, &h97, &h11, &hd2, &ha2, &h31, &h00, &hc0, &h4f, &ha3, &h18, &h09)

MsgBox g.DisplayString
```

See also:

- 96.42.3 Constructor 15289

### 96.42.5 DisplayString as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID well formatted.
**Example:**

```
dim w as WIAGUIDMBS = WIAPropertyStorageMBS.kImageFormatTIFF

MsgBox w.DisplayString
```

### 96.42.6 Equal(other as WIAGUIDMBS) as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether two GUIDs are equal.
**Example:**

```
dim w as WIAGUIDMBS = WIAPropertyStorageMBS.kImageFormatTIFF
dim v as WIAGUIDMBS = WIAPropertyStorageMBS.kImageFormatTIFF

if w.Equal(v) then
MsgBox "Equal, right."
else
```

```
MsgBox "not equal, a bug."
end if

v = WIAPropertyStorageMBS.kImageFormatBMP

if w.Equal(v) then
MsgBox "Equal, a bug."
else
MsgBox "not equal, right."
end if
```

**Notes:** Returns true if both items are equals.

### 96.42.7 Parse(GUID as String) as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 18.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parses GUID string into a GUID object.

### 96.42.8 Properties

### 96.42.9 Byte(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Read or write the byte value.
**Example:**

```
dim g as new WIAGUIDMBS

g.Byte(1) = 65

MsgBox str(g.Byte(1)) // shows 65
```

**Notes:** (Read and Write computed property)

### 96.42.10 Data as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The UID as binary string.
**Example:**

```
dim w as WIAGUIDMBS = WIAPropertyStorageMBS.kImageFormatTIFF
MsgBox EncodeBase64(w.Data)
```

**Notes:** (Read and Write computed property)

# 96.43 class WIAItemEnumeratorMBS

## 96.43.1 class WIAItemEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAItemEnumeratorMBS class is used by applications to enumerate WiaItemMBS objects in the tree's current folder.
**Example:**

```
Sub EnumerateItems(root as WIAItemMBS)
dim e as WIAItemEnumeratorMBS = Root.EnumerateChildItems

if e<>Nil then
dim it as WIAItemMBS = e.NextItem

while it<>nil

// do something with item

it = e.NextItem
wend

end if
End Sub
```

**Notes:** The Windows Image Acquisition (WIA) run-time system represents every WIA hardware device to applications as a hierarchical tree of WiaItemMBS objects.

## 96.43.2 Methods

## 96.43.3 Clone as WIAItemEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an additional instance of the WIAItemEnumeratorMBS object.
**Notes:** Lasterror is set.

## 96.43.4 Count as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of elements stored by this enumerator.

**Notes:** Lasterror is set.

### 96.43.5 NextItem as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next item in the enumeration.
**Example:**

```
Sub EnumerateItems(root as WIAItemMBS)
dim e as WIAItemEnumeratorMBS = Root.EnumerateChildItems

if e<>Nil then
dim it as WIAItemMBS = e.NextItem

while it<>nil

// do something with item

it = e.NextItem
wend

end if
End Sub
```

**Notes:** Lasterror is set.

### 96.43.6 Reset

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumeration.
**Notes:** Lasterror is set.

### 96.43.7 Skip(celt as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips the specified number of items during an enumeration of available WiaItemMBS objects.
**Notes:** Lasterror is set.

### 96.43.8 Properties

### 96.43.9 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 1.x or 2.x.
(Read and Write property)

### 96.43.10 Handle1 as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 1.x.
(Read and Write property)

### 96.43.11 Handle2 as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 2.x.
(Read and Write property)

### 96.43.12 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 96.44 class WIAItemMBS

### 96.44.1 class WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an item.
**Notes:** Each Windows Image Acquisition (WIA) hardware device is represented to an application as a hierarchical tree of WiaItem objects. The WiaItem interface provides applications with the ability to query devices to discover their capabilities. It also provides access to data transfer interfaces and item properties. In addition, the WiaItem interface provides methods to enable applications to control the device.

This class encapsulates transparently the system classes for WIA 1.x and 2.x.
**Blog Entries**

- MBS Plugins 10.3 Release Notes

- MBS REALbasic Plugins, version 10.3pr4

### 96.44.2 Methods

### 96.44.3 AnalyzeItem

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The AnalyzeItem method causes the Windows Image Acquisition (WIA) hardware device to acquire and try to detect what data types are present.
**Notes:** This method is used with scanners to detect what type of data is on a page. When an application calls this method, the WIA hardware device driver scans and analyzes the current page. For each data type it detects, it creates an WiaItem object to represent the region on the page the data occupies.

Image processing and OCR software can use this capability to detect graphics and text on a page. This method adds the regions it creates into the WIA device's WiaItem tree. The application can select the individual regions and use the standard data transfer methods to acquire data from them.

If necessary, applications can override the regions created by this method.

Works only on WIA 1.x.
Lasterror is set.

### 96.44.4 CreateChildItem(ItemFlags as Integer, CreationFlags as Integer, ItemName as string, FullItemName as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateChildItem method is used by applications to add WiaItem objects to the WiaItem tree of a device.
**Notes:** ItemFlags: Specifies the WIA item type.
CreationFlags: Specifies how to create the new item. Only for WIA 2.x. Can be 0 to set the default values for the properties of the child. Can be &H40000000 to copy the values of all Read/Write properties from the parent.
ItemName: Specifies the WIA item name, such as "Top". You can think of this parameter as being equivalent to a file name.
FullItemName: Specifies the full WIA item name. You can think of this parameter as equivalent to a full path to a file, such as "003\Root\Top". Only for WIA 1.x.

Lasterror is set.
Returns nil on any error and the new item object on success.

Some WIA hardware devices allow applications to create new items in the WiaItem tree that represents the device. Applications must test the devices to see if they support this capability. Use the EnumerateDeviceCapabilities function to enumerate the current device's capabilities.

If the device allows the creation of new items in the WiaItem tree, invoking CreateChildItem creates a new WiaItem that is a child of the current node.

### 96.44.5 DataTransfer as WIADataTransferMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Data transfer object.
**Notes:** Lasterror is set.
Only for WIA 1.x.
Returns nil on any error.

### 96.44.6 DeleteItem

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes the current IWiaItem object from the object tree of the device.
**Notes:** Lasterror is set.
Available on both WIA 1.x and 2.x.

The Windows Image Acquisition (WIA) run-time system represents each WIA hardware device connected to the user's computer as a hierarchical tree of IWiaItem objects. A given WIA device may or may not allow applications to delete IWiaItem objects from its tree. Use the EnumerateDeviceCapabilities function to query the device for item deletion capability.

If the device supports item deletion in its WiaItem tree, invoke the DeleteItem method to remove the WiaItem object. Note that this method will only delete an object after all references to the object have been released.

### 96.44.7 DeviceCommand(command as WIAGUIDMBS) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Issues a command to a Windows Image Acquisition (WIA) hardware device.
**Example:**

```
dim targetItem as WIAItemMBS // your item
dim resultItem as WIAItemMBS
resultItem = targetItem.DeviceCommand(targetItem.kCommandTakePicture)
```

**Notes:** Command: Specifies the command to send to the WIA 2.0 device. See kCommand* constants.
Works with WIA 1.x and 2.x.

Applications use this method to send WIA commands to hardware devices.

When the application sends the kCommandTakePicture command to the device, the WIA run-time system creates the WiaItem object to represent the image. The DeviceCommand method returns this new WIAItemMBS object.

### 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box to the user to prepare for image acquisition.
**Notes:** Lasterror is set.
Only for WIA 2.x.

Flags: Specifies a set of flags that control the dialog box's operation. The value can be either 0 to represent the default behavior or any of the following flags: kDeviceDialogSingleImage, kDeviceDialogUseCommonUI and kSelectDeviceNoDefault
Win: A handle to the parent window.

FolderName: Specifies the folder name where the files are to be transferred.
Filename: Specifies the template file name.
paths: An array to be filled with the file paths.
items: An array to be filled with the wia item objects.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. It is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaTransferMBS class to acquire the image.
See also:


- 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15299
- 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15300
- 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS() 15301
- 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302
- 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302


### 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box to the user to prepare for image acquisition.
**Notes:** Lasterror is set.
Only for WIA 2.x.

Flags: Specifies a set of flags that control the dialog box's operation. The value can be either 0 to represent the default behavior or any of the following flags: kDeviceDialogSingleImage, kDeviceDialogUseCommonUI and kSelectDeviceNoDefault
Win: A handle to the parent window.
FolderName: Specifies the folder name where the files are to be transferred.
Filename: Specifies the template file name.
paths: An array to be filled with the file paths.
items: An array to be filled with the wia item objects.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. It is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaTransferMBS class to acquire the image.
See also:

- 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15298
- 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15300
- 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS() 15301
- 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302
- 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302

### 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays a dialog box to the user to prepare for image acquisition.
**Notes:** Lasterror is set.
Only for WIA 2.x.

Flags: Specifies a set of flags that control the dialog box's operation. The value can be either 0 to represent the default behavior or any of the following flags: kDeviceDialogSingleImage, kDeviceDialogUseCommonUI and kSelectDeviceNoDefault
WindowHandle: A handle to the parent window.
FolderName: Specifies the folder name where the files are to be transferred.
Filename: Specifies the template file name.
paths: An array to be filled with the file paths.
items: An array to be filled with the wia item objects.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. It is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaTransferMBS class to acquire the image.
See also:

- 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15298
- 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15299

- 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS() 15301
- 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302
- 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302


### 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS()

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The DeviceDialog method is used by applications to display a dialog box to the user to prepare for image acquisition.
**Notes:** win: Handle of the parent window of the dialog box.
Flags: Specifies a set of flags that control the dialog box's operation. Can be set to any of the following values: kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. For a list of image intent values, kIntent* constants.

Lasterror is set.
Only for WIA 1.x.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. For instance, this dialog box enables the user to select images to download from a camera. When using a scanner, it is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaDataTransferMBS interface to acquire the image.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.
See also:


- 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15298
- 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15299
- 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15300
- 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302
- 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302

### 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS()

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The DeviceDialog method is used by applications to display a dialog box to the user to prepare for image acquisition.
**Notes:** win: Handle of the parent window of the dialog box.
Flags: Specifies a set of flags that control the dialog box's operation. Can be set to any of the following values: kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. For a list of image intent values, kIntent* constants.

Lasterror is set.
Only for WIA 1.x.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. For instance, this dialog box enables the user to select images to download from a camera. When using a scanner, it is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaDataTransferMBS interface to acquire the image.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.
See also:

- 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15298
- 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15299
- 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15300
- 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS() 15301
- 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302

### 96.44.13 DeviceDialog(WindowHandle as Integer, Flags as Integer, Intent as Integer) as WIAItemMBS()

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DeviceDialog method is used by applications to display a dialog box to the user to prepare for image acquisition.
**Notes:** WindowHandle: Handle of the parent window of the dialog box.
Flags: Specifies a set of flags that control the dialog box's operation. Can be set to any of the following values: kDeviceDialogUseCommonUI and kDeviceDialogSingleImage.
Intent: Specifies what type of data the image is intended to represent. For a list of image intent values, kIntent* constants.

Lasterror is set.
Only for WIA 1.x.

This method displays a dialog box to the user that an application uses to gather all the information required for image acquisition. For instance, this dialog box enables the user to select images to download from a camera. When using a scanner, it is also used to specify image scan properties such as brightness and contrast.

After this method returns, the application can use the WiaDataTransferMBS interface to acquire the image.

It is recommended that applications make device and image selection available through a menu item named From scanner or camera on the File menu.
See also:

- 96.44.8 DeviceDialog(Flags as integer, Win as DesktopWindow, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15298
- 96.44.9 DeviceDialog(Flags as Integer, Win as window, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15299
- 96.44.10 DeviceDialog(Flags as Integer, WindowHandle as Integer, FolderName as string, Filename as string, paths() as string, items() as WIAItemMBS) 15300
- 96.44.11 DeviceDialog(Win as DesktopWindow, Flags as integer, Intent as integer) as WIAItemMBS() 15301
- 96.44.12 DeviceDialog(Win as window, Flags as Integer, Intent as Integer) as WIAItemMBS() 15302

### 96.44.14 EnumerateChildItems(CategoryGUID as WIAGUIDMBS=nil) as WIAItemEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates and returns an enumerator object for non-empty folders in a WiaItem tree of a Windows Image Acquisition (WIA) device.
**Example:**

```
Sub EnumerateItems(root as WIAItemMBS)
dim e as WIAItemEnumeratorMBS = Root.EnumerateChildItems
```

```
if e<>Nil then
dim it as WIAItemMBS = e.NextItem

while it<>nil

// do something with item

it = e.NextItem
wend

end if
End Sub
```

**Notes:** Lasterror is set.
Works for WIA 1.x and WIA 2.x.

CategoryGUID: Specifies a category for which child nodes are enumerated. If nil, then all child nodes are enumerated. This parameter is only used on WIA 2.x.

The WIA run-time system represents each WIA hardware device as a hierarchical tree of WiaItem objects. The EnumerateChildItems method enables applications to enumerate child items in the current item. However, it can only be applied to items that are folders.

If the folder is not empty, it contains a subtree of WiaItem objects. The EnumerateChildItems method enumerates all of the items contained in the folder.

### 96.44.15 EnumerateDeviceCapabilities(Flags as Integer) as WIADeviceCapabilitiesEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an enumerator that is used to ascertain the commands and events a Windows Image Acquisition (WIA) device supports.
**Notes:** Flags: Specifies a flag that selects the type of capabilities to enumerate. Can be a combination of kDeviceCommands and kDeviceEvents.

Works for both WIA 1.x and 2.x
Lasterror is set.

Use this method to create an enumerator object to obtain the set of commands and events that a WIA device

supports. You can use the Flags parameter to specify which kinds of device capabilities to enumerate.

### 96.44.16 FindItemByName(name as string) as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Searches an item's tree of subitems using the name as the search key.
**Notes:** name: Specifies the name fo the item to search for.

Lasterror is set.
Works with WIA 1.x and 2.x.

This method searches the current item's tree of sub-items using the name as the search key. If FindItemByName finds the item specified by name, it retruns the WiaItem object.

### 96.44.17 ItemCategory as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets an item's category information.
**Notes:** Lasterror is set. Only for WIA 2.x.

Every WiaItemMBS object in the hierarchical tree of objects associated with a Windows Image Acquisition (WIA) 2.0 hardware device has a specific category. This method enables applications to identify the category of any item in a hierarchical tree of item objects in a device.

Requires Windows Vista or Windows Server 2008.

### 96.44.18 ItemType as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets an item's type information.
**Example:**

```
dim it as WIAItemMBS // your item
if BitwiseAnd(it.ItemType,it.kTypeFolder)=it.kTypeFolder or BitwiseAnd(it.ItemType, it.kTypeHasAttachments)=it.kTypeHasAttachments then
msgbox "may have children."
else
msgbox "no children."
```

end if

**Notes:** Works with WIA 1.x and 2.x.
Lasterror is set.

Every WiaItemMBS object in the hierarchical tree of objects associated with a Windows Image Acquisition (WIA) 2.0 hardware device has a specific data type. Item objects represent folders and files. Folders contain file objects. File objects contain data acquired by the device such as images and sounds. This method enables applications to identify the type of any item in a hierarchical tree of item objects in a device.

An item may have more than one type. For example, an item that represents an audio file will have the type attributes WiaItemTypeAudio bitwiseor WiaItemTypeFile.

### 96.44.19 kCategoryFeeder as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFeeder.DisplayString

### 96.44.20 kCategoryFeederBack as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFeederBack.DisplayString

### 96.44.21 kCategoryFeederFront as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFeederFront.DisplayString

### 96.44.22 kCategoryFilm as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFilm.DisplayString

### 96.44.23 kCategoryFinishedFile as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFinishedFile.DisplayString

### 96.44.24 kCategoryFlatbed as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFlatbed.DisplayString

### 96.44.25 kCategoryFolder as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryFolder.DisplayString

### 96.44.26 kCategoryRoot as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA IPA item category constants
**Example:**

MsgBox WIAItemMBS.kCategoryRoot.DisplayString

### 96.44.27 kCommandChangeDocument as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.
**Example:**

MsgBox WIAItemMBS.kCommandChangeDocument.DisplayString

### 96.44.28 kCommandDeleteAllItems as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.
**Example:**

MsgBox WIAItemMBS.kCommandDeleteAllItems.DisplayString

### 96.44.29 kCommandDiagnostic as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.
**Example:**

MsgBox WIAItemMBS.kCommandDiagnostic.DisplayString

### 96.44.30 kCommandSynchronize as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.
**Example:**

MsgBox WIAItemMBS.kCommandSynchronize.DisplayString

### 96.44.31 kCommandTakePicture as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.

### 96.44.32 kCommandUnloadDocument as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA command constants.
**Example:**

MsgBox WIAItemMBS.kCommandUnloadDocument.DisplayString

### 96.44.33 ParentItem as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the parent item in the tree that represents a Windows Image Acquisition (WIA) 2.0 hardware device.
**Notes:** Works only in WIA 2.x. Lasterror is set.
Given any WiaItem object in the object tree of a WIA 2.0 hardware device, the application retrieves a pointer to the parent item by calling this function.

### 96.44.34 PropertyStorage as WIAPropertyStorageMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries properties for this item.
**Example:**

```
Sub ListProperties(it as WIAItemMBS, plist as listbox)
// enumerate properties into a given listbox
```

```
// clear list
PList.DeleteAllRows

// get properties
dim p as WIAPropertyStorageMBS = it.PropertyStorage
if p<>Nil then
dim e as WIAPropertyEnumeratorMBS = p.Enumerate

if e<>nil then
dim ps as WIAPropertyMBS = e.NextItem

while ps<>Nil
// read the property value
dim v as Variant = p.Read(ps)

// get some identifier string for the listbox, name or id
dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if

PList.AddRow k

if v.Type = v.TypeObject then
if v isa WIAGUIDMBS then
dim g as WIAGUIDMBS = v
PList.Cell(PList.LastIndex,1)=g.DisplayString
else
PList.Cell(PList.LastIndex,1)="? some object" // should never happen
end if
else
PList.Cell(PList.LastIndex,1)=v.StringValue
end if

ps = e.NextItem
wend

end if
end if
End Sub
```

**Notes:** Lasterror is set.
Returns nil on any error.

### 96.44.35 RootItem as WIAItemMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the root item of a tree of item objects used to represent a Windows Image Acquisition (WIA) hardware device.
**Notes:** Lasterror is set.
Works with WIA 1.x and 2.x.

Given any WiaItem object in the object tree of a WIA hardware device, the application retrieves a pointer to the root item by calling this function.

### 96.44.36 Transfer as WIATransferMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a transfer object for this item.
**Notes:** Only available on WIA 2.x.
Lasterror is set.
Returns nil on any error.

### 96.44.37 Properties

### 96.44.38 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 1.x or 2.x.
(Read and Write property)

### 96.44.39 Handle1 as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 1.x.
(Read and Write property)

### 96.44.40 Handle2 as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** The handle for WIA 2.x.
(Read and Write property)

### 96.44.41 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.44.42 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceCommands | 1 | One of the flag constants for the EnumerateDeviceCapabilities function. Enumerate device commands. |
| kDeviceDialogSingleImage | 2 | One of the DeviceDialog and ImageDialog flag constants. Only allow one image to be selected |
| kDeviceDialogUseCommonUI | 4 | One of the DeviceDialog and ImageDialog flag constants. Give preference to the system-provided UI, if available. |
| kDeviceEvents | 2 | One of the flag constants for the EnumerateDeviceCapabilities function. Enumerate device events. |
| kIntentBestPreview | &h40000 | One of the intent constants for GetImageDialog. Specifies the best quality preview. |
| kIntentImageTypeColor | 1 | One of the intent constants for GetImageDialog. Preset properties for color content. |
| kIntentImageTypeGrayscale | 2 | One of the intent constants for GetImageDialog. Preset properties for grayscale content. |
| kIntentImageTypeMask | &hF | One of the intent constants for GetImageDialog. Mask for all of the image type flags. |
| kIntentImageTypeText | 4 | One of the intent constants for GetImageDialog. Preset properties for text content. |
| kIntentMaximizeQuality | &h20000 | One of the intent constants for GetImageDialog. Preset properties to maximize image quality. |
| kIntentMinimizeSize | &h10000 | One of the intent constants for GetImageDialog. Preset properties to minimize image size. |
| kIntentNone | 0 | One of the intent constants for GetImageDialog. Default value. Do not preset any properties. |
| kIntentSizeMask | &hF0000 | One of the intent constants for GetImageDialog. Mask for all of the size/quality flags. |
| kSelectDeviceNoDefault | 1 | One of the Select Device Dialog and Image Dialog flag constants. |
| kTypeAnalyze | &h00000010 | One of the WIA item type constants. |
| kTypeAudio | &h00000020 | One of the WIA item type constants. |
| kTypeBurst | &h00000800 | One of the WIA item type constants. |
| kTypeDeleted | &h00000080 | One of the WIA item type constants. |
| kTypeDevice | &h00000040 | One of the WIA item type constants. |
| kTypeDisconnected | &h00000100 | One of the WIA item type constants. |
| kTypeFile | &h00000002 | One of the WIA item type constants. |
| kTypeFolder | &h00000004 | One of the WIA item type constants. |
| kTypeFree | &h00000000 | One of the WIA item type constants. |
| kTypeGenerated | &h00004000 | One of the WIA item type constants. |
| kTypeHasAttachments | &h00008000 | One of the WIA item type constants. |
| kTypeHPanorama | &h00000200 | One of the WIA item type constants. |
| kTypeImage | &h00000001 | One of the WIA item type constants. |
| kTypeRoot | &h00000008 | One of the WIA item type constants. |
| kTypeStorage | &h00001000 | One of the WIA item type constants. |
| kTypeTransfer | &h00002000 | One of the WIA item type constants. |
| kTypeVideo | &h00010000 | One of the WIA item type constants. |
| kTypeVPanorama | &h00000400 | One of the WIA item type constants. |

## 96.45 class WIAPropertyEnumeratorMBS

### 96.45.1 class WIAPropertyEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a property enumerator.
**Example:**

```
Sub ListProperties(it as WIAItemMBS, plist as listbox)
// enumerate properties into a given listbox

// clear list
PList.DeleteAllRows

// get properties
dim p as WIAPropertyStorageMBS = it.PropertyStorage
if p<>Nil then
dim e as WIAPropertyEnumeratorMBS = p.Enumerate

if e<>nil then
dim ps as WIAPropertyMBS = e.NextItem

while ps<>Nil
// read the property value
dim v as Variant = p.Read(ps)

// get some identifier string for the listbox, name or id
dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if

PList.AddRow k

if v.Type = v.TypeObject then
if v isa WIAGUIDMBS then
dim g as WIAGUIDMBS = v
PList.Cell(PList.LastIndex,1)=g.DisplayString
else
PList.Cell(PList.LastIndex,1)="? some object" // should never happen
end if
else
PList.Cell(PList.LastIndex,1)=v.StringValue
end if

ps = e.NextItem
wend
```

```
end if
end if
End Sub
```

### 96.45.2 Methods

### 96.45.3 Clone as WIAPropertyEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the enumerator.
**Notes:** Lasterror is set.

### 96.45.4 NextItem as WIAPropertyMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next item.
**Example:**

```
Sub ListProperties(it as WIAItemMBS, plist as listbox)
// enumerate properties into a given listbox

// clear list
PList.DeleteAllRows

// get properties
dim p as WIAPropertyStorageMBS = it.PropertyStorage
if p<>Nil then
dim e as WIAPropertyEnumeratorMBS = p.Enumerate

if e<>nil then
dim ps as WIAPropertyMBS = e.NextItem

while ps<>Nil
// read the property value
dim v as Variant = p.Read(ps)

// get some identifier string for the listbox, name or id
dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if
```

```
PList.AddRow k

if v.Type = v.TypeObject then
if v isa WIAGUIDMBS then
dim g as WIAGUIDMBS = v
PList.Cell(PList.LastIndex,1)=g.DisplayString
else
PList.Cell(PList.LastIndex,1)="? some object" // should never happen
end if
else
PList.Cell(PList.LastIndex,1)=v.StringValue
end if

ps = e.NextItem
wend

end if
end if
End Sub
```

**Notes:** Lasterror is set.

### 96.45.5 Reset

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the enumerator.
**Notes:** Lasterror is set.

### 96.45.6 Skip(celt as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Skips the next items.
**Notes:** Lasterror is set.

### 96.45.7 Properties

### 96.45.8 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.45.9 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 96.46 class WIAPropertyMBS

### 96.46.1 class WIAPropertyMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAPropertyMBS class contains data about a single property in a property set. This data is the property ID and type tag, and the optional string name that may be associated with the property.
**Example:**

```
Sub ListProperties(it as WIAItemMBS, plist as listbox)
// enumerate properties into a given listbox

// clear list
PList.DeleteAllRows

// get properties
dim p as WIAPropertyStorageMBS = it.PropertyStorage
if p<>Nil then
dim e as WIAPropertyEnumeratorMBS = p.Enumerate

if e<>nil then
dim ps as WIAPropertyMBS = e.NextItem

while ps<>Nil
// read the property value
dim v as Variant = p.Read(ps)

// get some identifier string for the listbox, name or id
dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if

PList.AddRow k

if v.Type = v.TypeObject then
if v isa WIAGUIDMBS then
dim g as WIAGUIDMBS = v
PList.Cell(PList.LastIndex,1)=g.DisplayString
else
PList.Cell(PList.LastIndex,1)="? some object" // should never happen
end if
else
PList.Cell(PList.LastIndex,1)=v.StringValue
end if

ps = e.NextItem
```

```
wend

end if
end if
End Sub
```

### 96.46.2 Properties

### 96.46.3 ID as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A 32-bit identifier that uniquely identifies the property within the property set.
**Example:**

```
dim ps as WIAPropertyMBS // your property

dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if

MsgBox k
```

**Notes:** All properties within property sets must have unique property identifiers.
(Read and Write property)

### 96.46.4 Name as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that contains the optional string name associated with the property
**Example:**

```
dim ps as WIAPropertyMBS // your property

dim k as string = ps.Name
if len(k)=0 then
k = str(ps.ID)
end if

MsgBox k
```

**Notes:** (Read and Write property)

### 96.46.5 Type as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The property type.
**Notes:** (Read and Write property)

# 96.47 class WIAPropertyStorageMBS

## 96.47.1 class WIAPropertyStorageMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAPropertyStorageMBS class manages the persistent properties of a single property set.
**Example:**

```
dim DeviceManager as new WIADeviceManager1MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
dim it as WIAItemMBS = DeviceManager.SelectDeviceDialog(window1, DeviceManager.kDeviceTypeDefault, DeviceManager.kSelectDeviceNoDefault)

if it<>Nil then
dim p as WIAPropertyStorageMBS = it.PropertyStorage
dim name as string = p.Read(p.kItemPropertyItemNameString)
MsgBox name
end if
end if
```

**Notes:** Persistent properties consist of information that can be stored persistently in a property set, such as the summary information associated with a file. This contrasts with run-time properties associated with Controls and Automation, which can be used to affect system behavior. Use the methods of the WIAPropertyStorageMBS interface to create or open a persistent property set. An instance of the WIAPropertyStorageMBS interface can manage zero or more WIAPropertyStorageMBS instances.

Each property within a property set is identified by a property identifier (ID), a integer value unique to that set. You can also assign a string name to a property through the WIAPropertyStorageMBS interface.

The automatic conversion to variant supports:
nil, integer, uint32, int64, uint64, single, double, boolean, string and WIAGUIDMBS.

The automatic conversion from variant supports:
integer, boolean, single, double, Int64, string and WIAGUIDMBS.

### 96.47.2 Methods

### 96.47.3 Commit(flags as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Saves changes made to a property storage object to the parent storage object.
**Notes:** See kCommit* flags for the flags parameter.
Lasterror is set.

### 96.47.4 Count as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of properties stored in the property storage.
**Notes:** Lasterror is set.

### 96.47.5 Delete(id as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes an item by ID.
**Notes:** Lasterror is set.
See also:

- 96.47.6 Delete(name as string) 15322

### 96.47.6 Delete(name as string)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes an item by name.
**Notes:** Lasterror is set.
See also:

- 96.47.5 Delete(id as Integer) 15322

### 96.47.7 DeletePropertyName(id as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes specified string names from the current property set.
**Notes:** Lasterror is set.

id: Property identifier for which string name are to be deleted.

For each property identifier in rgpropid, DeletePropertyName removes any corresponding name-to-property ID mapping. An attempt is silently ignored to delete the name of a property that either does not exist or does not currently have a string name associated with it. This method has no effect on the properties themselves.

### 96.47.8 Enumerate as WIAPropertyEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enumerates the properties on this property storage.
**Notes:** Returns nil on any error. Lasterror is set.

### 96.47.9 kAudioFormatAIFF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kAudioFormatAIFF.DisplayString

### 96.47.10 kAudioFormatMP3 as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kAudioFormatMP3.DisplayString

### 96.47.11 kAudioFormatWAV as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kAudioFormatWAV.DisplayString

### 96.47.12 kAudioFormatWMA as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kAudioFormatWMA.DisplayString

### 96.47.13 kImageFormatASF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA misc format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatASF.DisplayString

### 96.47.14 kImageFormatAVI as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatAVI.DisplayString

### 96.47.15 kImageFormatBMP as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatBMP.DisplayString

### 96.47.16 kImageFormatCIFF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatCIFF.DisplayString

### 96.47.17 kImageFormatDPOF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA misc format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatDPOF.DisplayString

### 96.47.18 kImageFormatEMF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatEMF.DisplayString

### 96.47.19 kImageFormatExec as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA misc format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatExec.DisplayString

### 96.47.20 kImageFormatEXIF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatEXIF.DisplayString

### 96.47.21 kImageFormatFlashPix as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatFlashPix.DisplayString

### 96.47.22 kImageFormatGIF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatGIF.DisplayString

### 96.47.23 kImageFormatHTML as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA document format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatHTML.DisplayString

### 96.47.24 kImageFormatICO as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatICO.DisplayString

### 96.47.25 kImageFormatJPEG as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatJPEG.DisplayString

### 96.47.26 kImageFormatJPEG2K as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatJPEG2K.DisplayString

### 96.47.27 kImageFormatJPEG2KX as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatJPEG2KX.DisplayString

### 96.47.28 kImageFormatMemoryBMP as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatMemoryBMP.DisplayString

### 96.47.29 kImageFormatMPG as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA audio format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatMPG.DisplayString

### 96.47.30 kImageFormatPhotoCD as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatPhotoCD.DisplayString

### 96.47.31 kImageFormatPICT as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatPICT.DisplayString

### 96.47.32 kImageFormatPNG as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatPNG.DisplayString

### 96.47.33 kImageFormatRawRGB as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatRawRGB.DisplayString

### 96.47.34 kImageFormatRTF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA document format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatRTF.DisplayString

### 96.47.35 kImageFormatScript as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA misc format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatScript.DisplayString

### 96.47.36 kImageFormatTIFF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatTIFF.DisplayString

### 96.47.37 kImageFormatTXT as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA document format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatTXT.DisplayString

### 96.47.38 kImageFormatUndefined as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatUndefined.DisplayString

### 96.47.39 kImageFormatUnicode16 as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA misc format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatUnicode16.DisplayString

### 96.47.40 kImageFormatWMF as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA image format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatWMF.DisplayString

### 96.47.41 kImageFormatXML as WIAGUIDMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** One of the WIA document format constants.
**Example:**

MsgBox WIAPropertyStorageMBS.kImageFormatXML.DisplayString

### 96.47.42 Read(id as Integer) as Variant

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a property by id.
**Notes:** Lasterror is set.
See also:

- 96.47.43 Read(name as string) as Variant 15331
- 96.47.44 Read(p as WIAPropertyMBS) as Variant 15331

### 96.47.43 Read(name as string) as Variant

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a property by name.
**Example:**

```
dim DeviceManager as new WIADeviceManager1MBS

if 0 = DeviceManager.Handle then
MsgBox "Failed to initialize device manager."
else
dim it as WIAItemMBS = DeviceManager.SelectDeviceDialog(window1, DeviceManager.kDeviceTypeDefault, DeviceManager.kSelectDeviceNoDefault)

if it<>Nil then
dim p as WIAPropertyStorageMBS = it.PropertyStorage
dim name as string = p.Read(p.kItemPropertyItemNameString)
MsgBox name
end if
end if
```

**Notes:** Lasterror is set.
See also:

- 96.47.42 Read(id as Integer) as Variant 15331
- 96.47.44 Read(p as WIAPropertyMBS) as Variant 15331

### 96.47.44 Read(p as WIAPropertyMBS) as Variant

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a property by a property specification.
**Notes:** Lasterror is set.
See also:

- 96.47.42 Read(id as Integer) as Variant 15331
- 96.47.43 Read(name as string) as Variant 15331

### 96.47.45 ReadPropertyName(id as Integer) as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves any existing string name for the specified property ID.
**Notes:** Lasterror is set.

### 96.47.46 Revert

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Revert method discards all changes to the named property set since it was last opened or discards changes that were last committed to the property set.
**Notes:** This method has no effect on a direct-mode property set.
Lasterror is set.

### 96.47.47 Write(id as Integer, value as Variant)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes a property by id.
**Notes:** Lasterror is set.
See also:

- 96.47.48 Write(name as string, value as Variant, id as Integer = 0) 15332
- 96.47.49 Write(p as WIAPropertyMBS, value as Variant) 15333

### 96.47.48 Write(name as string, value as Variant, id as Integer = 0)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes a property by name with optional id.
**Notes:** Lasterror is set.
See also:

- 96.47.47 Write(id as Integer, value as Variant) 15332
- 96.47.49 Write(p as WIAPropertyMBS, value as Variant) 15333


### 96.47.49 Write(p as WIAPropertyMBS, value as Variant)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes a property by property specification.
**Notes:** Lasterror is set.
See also:


- 96.47.47 Write(id as Integer, value as Variant) 15332
- 96.47.48 Write(name as string, value as Variant, id as Integer = 0) 15332


### 96.47.50 WritePropertyName(id as Integer, name as string)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Assigns string names to a specified array of property IDs in the current property set.
**Notes:** id: the property ID for which name is to be set.
name: The new name to be assigned to the corresponding property ID in the id parameter. This name may not exceed 255 characters.

Lasterror is set.

### 96.47.51 Properties

### 96.47.52 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.47.53 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.47.54 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCameraDevicePropertyArtist | 2090 | One of the WI |
| kCameraDevicePropertyArtistString | "Artist" | One of the WI |
| kCameraDevicePropertyBatteryStatus | 2065 | One of the WI |
| kCameraDevicePropertyBatteryStatusString | "Battery Status" | One of the WI |
| kCameraDevicePropertyBurstInterval | 2075 | One of the WI |
| kCameraDevicePropertyBurstIntervalString | "Burst Interva" | One of the WI |
| kCameraDevicePropertyBurstNumber | 2076 | One of the WI |
| kCameraDevicePropertyBurstNumberString | "Burst Number" | One of the WI |
| kCameraDevicePropertyCaptureDelay | 2082 | One of the WI |
| kCameraDevicePropertyCaptureDelayString | "Capture Delay" | One of the WI |
| kCameraDevicePropertyCaptureMode | 2081 | One of the WI |
| kCameraDevicePropertyCaptureModeString | "Capture Mode" | One of the WI |
| kCameraDevicePropertyCompressionSetting | 2071 | One of the WI |
| kCameraDevicePropertyCompressionSettingString | "Compression Setting" | One of the WI |
| kCameraDevicePropertyContrast | 2080 | One of the WI |
| kCameraDevicePropertyContrastString | "Contrast" | One of the WI |
| kCameraDevicePropertyCopyrightInfo | 2091 | One of the WI |
| kCameraDevicePropertyCopyrightInfoString | "Copyright Info" | One of the WI |
| kCameraDevicePropertyDigitalZoom | 2078 | One of the WI |
| kCameraDevicePropertyDigitalZoomString | "Digital Zoom" | One of the WI |
| kCameraDevicePropertyDimension | 2070 | One of the WI |
| kCameraDevicePropertyDimensionString | "Dimension" | One of the WI |
| kCameraDevicePropertyEffectMode | 2077 | One of the WI |
| kCameraDevicePropertyEffectModeString | "Effect Mode" | One of the WI |
| kCameraDevicePropertyExposureComp | 2053 | One of the WI |
| kCameraDevicePropertyExposureCompString | "Exposure Compensation" | One of the WI |
| kCameraDevicePropertyExposureIndex | 2083 | One of the WI |
| kCameraDevicePropertyExposureIndexString | "Exposure Index" | One of the WI |
| kCameraDevicePropertyExposureMeteringMode | 2084 | One of the WI |
| kCameraDevicePropertyExposureMeteringModeString | "Exposure Metering Mode" | One of the WI |
| kCameraDevicePropertyExposureMode | 2052 | One of the WI |
| kCameraDevicePropertyExposureModeString | "Exposure Mode" | One of the WI |
| kCameraDevicePropertyExposureTime | 2054 | One of the WI |
| kCameraDevicePropertyExposureTimeString | "Exposure Time" | One of the WI |
| kCameraDevicePropertyFlashMode | 2056 | One of the WI |
| kCameraDevicePropertyFlashModeString | "Flash Mode" | One of the WI |
| kCameraDevicePropertyFnumber | 2055 | One of the WI |
| kCameraDevicePropertyFnumberString | "F Number" | One of the WI |
| kCameraDevicePropertyFocalLength | 2086 | One of the WI |
| kCameraDevicePropertyFocalLengthString | "Focus Length" | One of the WI |
| kCameraDevicePropertyFocusDistance | 2085 | One of the WI |
| kCameraDevicePropertyFocusDistanceString | "Focus Distance" | One of the WI |
| kCameraDevicePropertyFocusManualDist | 2058 | One of the WI |
| kCameraDevicePropertyFocusManualDistString | "Focus Manual Dist" | One of the WI |
| kCameraDevicePropertyFocusMeteringMode | 2072 | One of the WI |
| kCameraDevicePropertyFocusMeteringModeString | "Focus Metering Mode" | One of the WI |
| kCameraDevicePropertyFocusMode | 2057 | One of the WI |
| kCameraDevicePropertyFocusModeString | "Focus Mode" | One of the WI |
| kCameraDevicePropertyPanPosition | 2060 | One of the WI |
| kCameraDevicePropertyPanPositionString | "Pan Position" | One of the WI |
| kCameraDevicePropertyPictHeight | 2069 | One of the WI |
| kCameraDevicePropertyPictHeightString | "Picture Height" | One of the WI |
| kCameraDevicePropertyPicturesRemaining | 2051 | One of the WI |
| kCameraDevicePropertyPicturesRemainingString | "Pictures Remaining" | One of the WI |
| kCameraDevicePropertyPicturesTaken | 2050 | One of the WI |
| kCameraDevicePropertyPicturesTakenString | "Pictures Taken" | One of the WI |
| kCameraDevicePropertyPictWidth | 2068 | One of the WI |
| kCameraDevicePropertyPictWidthString | "Picture Width" | One of the WI |

## 96.48 class WIAStreamMBS

### 96.48.1 class WIAStreamMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIAStreamMBS interface lets you read and write data to stream objects.
**Example:**

```
dim ItemName as string = "Hello.jpg"
dim f as FolderItem = SpecialFolder.Desktop.Child(ItemName)
dim s as new WIAStreamMBS(WIAStreamMBS.kModeWrite + WIAStreamMBS.kModeCreate, f)
```

**Notes:** Stream objects contain the data in a structured storage object, where storages provide the structure. Simple data can be written directly to a stream but, most frequently, streams are elements nested within a storage object. They are similar to standard files.

### 96.48.2 Methods

### 96.48.3 Clone as WIAStreamMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Clone method creates a new stream object with its own seek pointer that references the same bytes as the original stream.
**Notes:** The Clone method creates a new stream object for accessing the same bytes but using a separate seek pointer. The new stream object sees the same data as the source-stream object. Changes written to one object are immediately visible in the other. Range locking is shared between the stream objects.

The initial setting of the seek pointer in the cloned stream instance is the same as the current setting of the seek pointer in the original stream at the time of the clone operation.

Lasterror is set.

### 96.48.4 Commit(flags as Integer)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Commit method ensures that any changes made to a stream object open in transacted mode are reflected in the parent storage.
**Notes:** If the stream object is open in direct mode, Commit has no effect other than flushing all memory

buffers to the next-level storage object. The COM compound file implementation of streams does not support opening streams in transacted mode.
Lasterror is set.

Possible flags: kCommitConsolidate, kCommitDangerouslyCommitMerelyToDiskCache, kCommitDefault, kCommitOnlyIfCurrent and kCommitOverwrite.

### 96.48.5 Constructor(mode as Integer, file as folderitem)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens or creates a file and retrieves a stream to read or write to that file.
**Example:**

```
dim ItemName as string = "Hello.jpg"
dim f as FolderItem = SpecialFolder.Desktop.Child(ItemName)
dim s as new WIAStreamMBS(WIAStreamMBS.kModeWrite + WIAStreamMBS.kModeCreate, f)
```

**Notes:** mode: the flags. Use the kMode* constants.
path: the file path.

Lasterror is set.
See also:

- 96.48.6 Constructor(mode as Integer, path as string) 15337

### 96.48.6 Constructor(mode as Integer, path as string)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens or creates a file and retrieves a stream to read or write to that file.
**Notes:** mode: the flags. Use the kMode* constants.
path: the file path.

Lasterror is set.
See also:

- 96.48.5 Constructor(mode as Integer, file as folderitem) 15337

### 96.48.7 CopyTo(other as WIAStreamMBS, length as UInt64)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CopyTo method copies a specified number of bytes from the current seek pointer in the stream to the current seek pointer in another stream.
**Notes:** other: The destination stream. The stream pointed to by pstm can be a new stream or a clone of the source stream.
length: The number of bytes to copy from the source stream.
ReadSize: Optional, a variable where the actual number of bytes read from the source.
WriteSize: Optional, a variable where the actual number of bytes written to the destination.

Lasterror is set.

The CopyTo method copies the specified bytes from one stream to another. It can also be used to copy a stream to itself. The seek pointer in each stream instance is adjusted for the number of bytes read or written. This method is equivalent to reading cb bytes into memory using Read and then immediately writing them to the destination stream using Write, although CopyTo will be more efficient.

The destination stream can be a clone of the source stream created by calling the Clone method.

If CopyTo returns an error, you cannot assume that the seek pointers are valid for either the source or destination. Additionally, the values of pcbRead and pcbWritten are not meaningful even though they are returned.

If CopyTo returns successfully, the actual number of bytes read and written are the same.

To copy the remainder of the source from the current seek pointer, specify the maximum large integer value for the cb parameter. If the seek pointer is the beginning of the stream, this operation copies the entire stream.
See also:

- 96.48.8 CopyTo(other as WIAStreamMBS, length as UInt64, byref ReadSize as UInt64, byref WriteSize as UInt64) 15338

### 96.48.8 CopyTo(other as WIAStreamMBS, length as UInt64, byref ReadSize as UInt64, byref WriteSize as UInt64)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CopyTo method copies a specified number of bytes from the current seek pointer in the stream to the current seek pointer in another stream.
**Notes:** other: The destination stream. The stream pointed to by pstm can be a new stream or a clone of the source stream.
length: The number of bytes to copy from the source stream.
ReadSize: Optional, a variable where the actual number of bytes read from the source.
WriteSize: Optional, a variable where the actual number of bytes written to the destination.

Lasterror is set.

The CopyTo method copies the specified bytes from one stream to another. It can also be used to copy a stream to itself. The seek pointer in each stream instance is adjusted for the number of bytes read or written. This method is equivalent to reading cb bytes into memory using Read and then immediately writing them to the destination stream using Write, although CopyTo will be more efficient.

The destination stream can be a clone of the source stream created by calling the Clone method.

If CopyTo returns an error, you cannot assume that the seek pointers are valid for either the source or destination. Additionally, the values of pcbRead and pcbWritten are not meaningful even though they are returned.

If CopyTo returns successfully, the actual number of bytes read and written are the same.

To copy the remainder of the source from the current seek pointer, specify the maximum large integer value for the cb parameter. If the seek pointer is the beginning of the stream, this operation copies the entire stream.
See also:

- 96.48.7 CopyTo(other as WIAStreamMBS, length as UInt64) 15337

### 96.48.9 Revert

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Revert method discards all changes that have been made to a transacted stream since the last Commit call.
**Notes:** On streams open in direct mode and streams using the COM compound file implementation of Revert, this method has no effect.
Lasterror is set.

### 96.48.10 Seek(value as Int64, Origin as Integer) as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Seek method changes the seek pointer to a new location.
**Notes:** The new location is relative to either the beginning of the stream, the end of the stream, or the current seek pointer.

value: The displacement to be added to the location indicated by the dwOrigin parameter. If dwOrigin is kSeekSet, this is interpreted as an unsigned value rather than a signed value.

Origin: The origin for the displacement specified in value. The origin can be the beginning of the file (kSeekSet), the current seek pointer (kSeekCur), or the end of the file (kSeekEnd). For more information about values, see the kSeek* constants.

Retruns the new seek pointer from the beginning of the stream.

Seek changes the seek pointer so that subsequent read and write operations can be performed at a different location in the stream object. It is an error to seek before the beginning of the stream. It is not, however, an error to seek past the end of the stream. Seeking past the end of the stream is useful for subsequent write operations, as the stream byte range will be extended to the new seek position immediately before the write is complete.

You can also use this method to obtain the current value of the seek pointer by calling this method with the Origin parameter set to kSeekCur and the value parameter set to 0 so that the seek pointer is not changed. The current seek pointer is returned.

Lasterror is set.

### 96.48.11 SetSize(size as UInt64)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetSize method changes the size of the stream object.
**Notes:** SetSize changes the size of the stream object. Call this method to preallocate space for the stream. If the size parameter is larger than the current stream size, the stream is extended to the indicated size by filling the intervening space with bytes of undefined value. This operation is similar to the Write method if the seek pointer is past the current end of stream.

If the size parameter is smaller than the current stream, the stream is truncated to the indicated size.

The seek pointer is not affected by the change in stream size.

Calling SetSize can be an effective way to obtain a large chunk of contiguous space.

Lasterror is set.

### 96.48.12 Properties

### 96.48.13 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.48.14 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.48.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCommitConsolidate | 8 | One of the flags for commit.<br>Windows 2000 and Windows XP: Indicates that a stor<br>dated after it is committed, resulting in a smaller file on<br>only on the outermost storage object that has been open<br>It is not valid for streams. The kCommitConsolidate flag<br>any other kCommit* flags. |
| kCommitDangerouslyCommitMerelyToDiskCache | 4 | One of the flags for commit.<br>Commits the changes to a write-behind disk cache, but d<br>to the disk. In a write-behind disk cache, the operati<br>actually writes to a disk cache, thus increasing perfor<br>eventually written to the disk, but usually not until aft<br>has already returned. The performance increase comes<br>increased risk of losing data if a problem occurs before<br>the data in the cache is lost.<br>If you do not specify this value, then committing chang<br>objects is robust even if a disk cache is used. The two-<br>ensures that data is stored on the disk and not just to t |
| kCommitDefault | 0 | One of the flags for commit.<br>You can specify this condition with kCommitConsolidate<br>of the other three flags in this list of elements. Use thi<br>readability of code. |
| kCommitOnlyIfCurrent | 2 | One of the flags for commit.<br>Prevents multiple users of a storage object from ove<br>changes. The commit operation occurs only if there<br>to the saved storage object because the user most rece<br>the saved version of the storage object is the same ver<br>been editing. If other users have changed the storage o<br>eration fails and returns the STG_E_NOTCURRENT<br>behavior, call the Commit method again using the kCo |
| kCommitOverwrite | 1 | One of the flags for commit.<br>The commit operation can overwrite existing data to r<br>quirements. This value is not recommended for typic<br>not as robust as the default value. In this case, it is p<br>operation to fail after the old data is overwritten, but<br>completely committed. Then, neither the old version n<br>the storage object will be intact.<br>You can use this value in the following cases:<br>* The user is willing to risk losing the data.<br>* The low-memory save sequence will be used to safely s<br>to a smaller file.<br>* A previous commit returned STG_E_MEDIUMFULL<br>existing data would provide enough space to commit o<br>object.<br>Be aware that the commit operation verifies that adequ<br>any overwriting occurs. Thus, even with this value sp<br>operation fails due to space requirements, the old data<br>however, for data loss to occur with the kCommitOver<br>the commit operation fails for any reason other than lac |
| kModeConvert | &h20000 | One of the mode constants for the file stream.<br>Creates the new object while preserving existing data in<br>tents". In the case of a storage object or a byte array, th<br>into a stream regardless of whether the existing file or by<br>tains a layered storage object. This flag can only be use<br>storage object. It cannot be used within a storage objec<br>ateStream. It is also not valid to use this flag and the k<br>flag simultaneously. |
| kModeCreate | &h1000 | One of the mode constants for the file stream.<br>Undicates that an existing storage object or stream sho |

# 96.49 class WIATransferCallbackMBS

## 96.49.1 class WIATransferCallbackMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for transfering data from the device into your application.
**Notes:** This class is only used for WIA 2.x.

## 96.49.2 Properties

## 96.49.3 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

## 96.49.4 Events

## 96.49.5 GetNextStream(ItemName as string, FullItemName as string) as WIAStreamMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: .

**Function:** Gets a new stream for the specified item.
**Notes:** ItemName: Specifies the name of the item to create stream for.
FullItemName: Specifies the full name of the item to create stream for.

Returns a new WIAStreamMBS object or nil for an error.

When this method is implemented by an image processing filter, the Windows Image Acquisition (WIA) 2.0 minidriver calls it during image acquisition to get the destination stream from the client.

A filter's WIATransferCallbackMBS.GetNextStream must delegate to the application's callback method. The filter uses the stream returned by the application callback's WIATransferCallbackMBS.GetNextStream implementation to create its own stream that it passes back to the WIA 2.0 service. The filtering is done when the filter's stream calls the IStream::Write method.

The filter's stream cannot make any assumptions on the number of bytes that are written to it on each write, since the unfiltered image data may come from the WIA 2.0 Preview Component rather than the driver.

The WIA 2.0 Preview Component always writes the whole unfiltered image data into the filter's stream only once, which means that the filter's stream has one source writing into it. If both the driver and the preview component write into the filter's stream, the filter's stream cannot assume, for example, that it will receive the full header the first time IStream::Write is called although its corresponding driver always writes the header data first in one write. Nor can it assume that a subsequent write contains exactly one scan line. So the filtering stream may have to count the number of bytes written to it to determine, for example, where the image data starts.

The image processing filter's WIATransferCallbackMBS.GetNextStream implementation should read the properties needed for its image processing from the item for which the image is being acquired. The filter does not read the properties directly from the pWiaItem2 passed into InitializeFilter. Instead the filter must call FindItemByName on this WIA 2.0 item to obtain the actual WIA 2.0 item. The reason for this is that the image being acquired may actually be a child item of pWiaItem2. For example, during a folder acquisition the filter uses pWiaItem2 to obtain pWiaItem2's child items in WIATransferCallbackMBS.GetNextStream (during a folder acquisition the driver returns the images represented by the child items of WiaItemMBS). The same is true when the WIA 2.0 Preview Component calls into the image processing filter passing a child WIA 2.0 item.

### 96.49.6 TransferCallback(w as WIATransferParamsMBS) as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: .

**Function:** Provides progress and other notifications during a transfer.
**Notes:** Returns an error value or zero on success.

## 96.50 class WIATransferMBS

### 96.50.1 class WIATransferMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WIATransferMBS class provides stream-based transfer of data.
**Notes:** This class is for WIA 2.x.

### 96.50.2 Methods

### 96.50.3 Cancel

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Cancels the current transfer operation.
**Notes:** Lasterror is set.

### 96.50.4 Download(TransferCallback as WIATransferCallbackMBS)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initiates a data download to the caller.
**Notes:** TransferCallback: The WIATransferCallbackMBS object to receive progress details and specify the destination.

If a folder is downloaded, then all the child items of that folder are also transferred. Each item is transferred in a separate stream.

Lasterror is set.

### 96.50.5 EnumerateFormatInfo as WIAFormatInfoEnumeratorMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an enumerator for the transfer formats that the Windows Image Acquisition (WIA) 2.0 device supports.
**Notes:** Lasterror is set.

### 96.50.6 Upload(Source as WIAStreamMBS, TransferCallback as WIATransferCallbackMBS)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initiates a data upload of a single item from the caller.
**Notes:** Source: Specifies a pointer to the Stream data.
TransferCallback: Specifies a pointer to the caller's WIATransferCallbackMBS interface.

Lasterror is set.

### 96.50.7 Properties

### 96.50.8 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.50.9 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 96.51 class WIATransferParamsMBS

### 96.51.1 class WIATransferParamsMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class you subclass to get progress of the image transfer.
**Notes:** The WiaTransferParams is transmitted to an application during a data transfer by the Windows Image Acquisition (WIA) run-time system to the WiaTransferCallbackMBS.TransferCallback method.

### 96.51.2 Properties

### 96.51.3 ErrorStatus as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The status, or error state, of the device set by the driver; for example, "warming up".
**Notes:** (Read and Write property)

### 96.51.4 Message as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the status of the data transfer.
**Notes:** See the kMessage* constants
(Read and Write property)

### 96.51.5 PercentComplete as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the progress of the data transfer as a percentage.
**Example:**

```
dim w as WIATransferParamsMBS // your parameters
Progressbar1.maximum = 100
Progressbar1.value = w.PercentComplete
```

**Notes:** (Read and Write property)

### 96.51.6 TransferredBytes as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the amount of data transferred.
**Notes:** (Read and Write property)

### 96.51.7 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMessageDeviceStatus | 4 | One of the message constants. |
| kMessageEndOfStream | 2 | One of the message constants. |
| kMessageEndOfTransfer | 3 | One of the message constants. |
| kMessageNewPage | 5 | One of the message constants. |
| kMessageStatus | 1 | One of the message constants. |

# 96.52 class WIAVideoMBS

## 96.52.1 class WIAVideoMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IWiaVideo interface provides methods that allow an application that uses Windows Image Acquisition (WIA) services to acquire still images from a streaming video device.
**Notes:** Note WIA does not support video devices in Windows Server 2003, Windows Vista, and later. For those versions of the Windows, use DirectShow to acquire images from video.

## 96.52.2 Methods

## 96.52.3 Constructor

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Requires Windows XP or Windows Server 2003.

## 96.52.4 CreateVideoByDevNum(DeviceNumber as integer, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByDevNum method creates a connection to a streaming video device with the device number obtained from a Directshow enumeration.
**Notes:** DeviceNumber: Specifies the video device's Directshow device number.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.
See also:

- 96.52.5 CreateVideoByDevNum(DeviceNumber as Integer, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15350

- 96.52.6 CreateVideoByDevNum(DeviceNumber as Integer, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15350

### 96.52.5 CreateVideoByDevNum(DeviceNumber as Integer, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByDevNum method creates a connection to a streaming video device with the device number obtained from a Directshow enumeration.
**Notes:** DeviceNumber: Specifies the video device's Directshow device number.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.
See also:

- 96.52.4 CreateVideoByDevNum(DeviceNumber as integer, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15349
- 96.52.6 CreateVideoByDevNum(DeviceNumber as Integer, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15350

### 96.52.6 CreateVideoByDevNum(DeviceNumber as Integer, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateVideoByDevNum method creates a connection to a streaming video device with the device number obtained from a Directshow enumeration.
**Notes:** DeviceNumber: Specifies the video device's Directshow device number.
WindowHandle: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to

TRUE, the video display fills the window.
See also:

- 96.52.4 CreateVideoByDevNum(DeviceNumber as integer, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15349
- 96.52.5 CreateVideoByDevNum(DeviceNumber as Integer, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15350

### 96.52.7 CreateVideoByName(FriendlyName as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByName method creates a connection to a streaming video device with the friendly device name obtained from a Directshow enumeration.
**Notes:** FriendlyName: Specifies the video device's friendly name obtained from a Directshow device enumeration.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.
See also:

- 96.52.8 CreateVideoByName(FriendlyName as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15351
- 96.52.9 CreateVideoByName(FriendlyName as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15352

### 96.52.8 CreateVideoByName(FriendlyName as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByName method creates a connection to a streaming video device with the friendly device name obtained from a Directshow enumeration.
**Notes:** FriendlyName: Specifies the video device's friendly name obtained from a Directshow device enumeration.
win: Specifies the window in which to display the streaming video.

StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.
See also:

- 96.52.7 CreateVideoByName(FriendlyName as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15351

- 96.52.9 CreateVideoByName(FriendlyName as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15352

### 96.52.9 CreateVideoByName(FriendlyName as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateVideoByName method creates a connection to a streaming video device with the friendly device name obtained from a Directshow enumeration.
**Notes:** FriendlyName: Specifies the video device's friendly name obtained from a Directshow device enumeration.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to TRUE to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.
See also:

- 96.52.7 CreateVideoByName(FriendlyName as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15351

- 96.52.8 CreateVideoByName(FriendlyName as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15351

### 96.52.10 CreateVideoByWiaDevID(WiaDeviceID as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByWiaDevID method creates a connection to a streaming video device from its DeviceID.
**Notes:** WiaDeviceID: Specifies the value of the video device's DeviceID property.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to true to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.

In order for the function to succeed, the ImagesDirectory property must be specified first.
See also:

- 96.52.11 CreateVideoByWiaDevID(WiaDeviceID as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15353
- 96.52.12 CreateVideoByWiaDevID(WiaDeviceID as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15354

### 96.52.11 CreateVideoByWiaDevID(WiaDeviceID as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop only.

**Function:** The CreateVideoByWiaDevID method creates a connection to a streaming video device from its DeviceID.
**Notes:** WiaDeviceID: Specifies the value of the video device's DeviceID property.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to true to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to

TRUE, the video display fills the window.

In order for the function to succeed, the ImagesDirectory property must be specified first.
See also:

- 96.52.10 CreateVideoByWiaDevID(WiaDeviceID as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15353
- 96.52.12 CreateVideoByWiaDevID(WiaDeviceID as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15354

### 96.52.12 CreateVideoByWiaDevID(WiaDeviceID as string, WindowHandle as Integer, StretchToFitParent as boolean, AutoBeginPlayback as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateVideoByWiaDevID method creates a connection to a streaming video device from its DeviceID.
**Notes:** WiaDeviceID: Specifies the value of the video device's DeviceID property.
win: Specifies the window in which to display the streaming video.
StretchToFitParent: Specifies whether the video display is stretched to fit the parent window. Set this parameter to true if the display should be stretched to fit the parent window; otherwise, set to false.
AutoBeginPlayback: Specifies whether the streaming video begins playback as soon as this method returns. Set this parameter to true to cause immediate playback; set it to false to require a call to Play before video playback begins.

Lasterror is set.
By default, the video is displayed in the video device's default resolution. If bStretchToFitParent is set to TRUE, the video display fills the window.

In order for the function to succeed, the ImagesDirectory property must be specified first.
See also:

- 96.52.10 CreateVideoByWiaDevID(WiaDeviceID as string, win as DesktopWindow, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15353
- 96.52.11 CreateVideoByWiaDevID(WiaDeviceID as string, win as window, StretchToFitParent as boolean, AutoBeginPlayback as boolean) 15353

### 96.52.13 CurrentState as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the state of the video stream.
**Notes:** See the kState* constants.

### 96.52.14 DestroyVideo

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DestroyVideo method shuts down the streaming video.
**Notes:** To restart video playback, the application must call one of the CreateVideo methods again.
Lasterror is set.

Call this method only after a successful call to CreateVideoByWiaDevID, CreateVideoByDevNum, or CreateVideoByName.

### 96.52.15 Pause

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Pause method pauses video playback.
**Notes:** Call this method only after a successful call to CreateVideoByWiaDevID, CreateVideoByDevNum, or CreateVideoByName.
Lasterror is set.

### 96.52.16 Play

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Begins playback of streaming video.
**Notes:** Call this method only after a successful call to CreateVideoByWiaDevID, CreateVideoByDevNum, or CreateVideoByName.
Lasterror is set.

### 96.52.17 ResizeVideo(StretchToFitParent as boolean)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ResizeVideo method resizes the video playback to the largest supported resolution that fits inside the parent window.
**Notes:** Call this method whenever the parent window is moved or resized.

By default, the video is displayed in a supported resolution smaller than the parent window. If bStretchToFitParent is set to true, the video display fills the window.

Lasterror is set.

### 96.52.18 TakePicture as folderitem

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The TakePicture method extracts a still image from the video stream, and saves the image as a JPEG file.
**Notes:** Returns the full path and filename of the JPEG file that this method creates.
Lasterror is set.

The path and directory where the image file is saved are specified by the ImagesDirectory or ImageFolder property.
See also:

- 96.52.19 TakePicture as string 15356

### 96.52.19 TakePicture as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The TakePicture method extracts a still image from the video stream, and saves the image as a JPEG file.
**Notes:** Returns the full path and filename of the JPEG file that this method creates.
Lasterror is set.

The path and directory where the image file is saved are specified by the ImagesDirectory or ImageFolder property.
See also:

- 96.52.18 TakePicture as folderitem 15356

### 96.52.20 Properties

### 96.52.21 Handle as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** (Read and Write property)

### 96.52.22 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 96.52.23 ImagesDirectory as string

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the full path and directory where images are stored when calling the TakePicture method.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 96.52.24 ImagesFolder as folderitem

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the folder where TakePicture stores the images.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 96.52.25 PreviewVisible as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The PreviewVisible property specifies whether the video playback is visible in its parent window.
**Notes:** This does not affect the state of the video.
Lasterror is set.
(Read and Write computed property)

### 96.52.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kStateCreatingVideo | 2 | One of the constants for the video state.<br>One of the WiaVideoMBS CreateVideo methods was called and WIA is in the process of creating the video stream. |
| kStateDestroyingVideo | 6 | One of the constants for the video state.<br>The application called DestroyVideo method, and WIA is in the process of destroying the video stream. |
| kStateNoVideo | 1 | One of the constants for the video state.<br>No video stream exists. Call CreateVideoByWiaDevID, CreateVideoByDevNum, or CreateVideoByName to create a video. |
| kStateVideoCreated | 3 | One of the constants for the video state.<br>A video stream has been successfully created, but playback has not yet started. |
| kStateVideoPaused | 5 | One of the constants for the video state.<br>A video stream has been successfully created, and the video is paused. The application can now call the TakePicture method. |
| kStateVideoPlaying | 4 | One of the constants for the video state.<br>A video stream has been successfully created, and the video is playing. The application can now call the TakePicture method. |

# Chapter 97

# Image Magick

## 97.1 class ImageMagickQ16MBS

### 97.1.1 class ImageMagickQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for global functions from the Image Magick library
**Notes:** Before using this class you need to load the ImageMagick dylib or dll.

Not all functions from the library are available through the plugin. If you need something special, please ask.

For Mac OS X you need the ImageMagick dylib/bundle and for Windows the normal ImageMagick installation with the DLL.

For more details please check the ImageMagick documentation.

The plugin implements three versions of this ImageMagick classes. One with Q8 for 8 bit quantum depth, one with Q16 for 16 bit depth and Q32 for 32 bit depth.

### 97.1.2 Methods

### 97.1.3 Copyright as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copyright notice for this format.

**Notes:** For more details please check the ImageMagick documentation.

### 97.1.4 Features as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick features.
**Notes:** For example whether library is compiled with OpenMP for faster performance.

### 97.1.5 HomeURL as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the home url of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.6 InitializeMagick(path as string = "")

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the ImageMagick environment.
**Example:**

```
dim i as new ImageMagickQ16MBS
i.InitializeMagick("")
```

**Notes:** Path: The execution path of the current ImageMagick client.

For more details please check the ImageMagick documentation.
You need to call LoadLibrary functions to load the library before calling this.

### 97.1.7 IsMagickInstantiated as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the ImageMagick environment is currently instantiated.
**Notes:** In other words: True if InitializeMagick has been called before.

For more details please check the ImageMagick documentation.

### 97.1.8 LoadErrorString as string

MBS GraphicsMagick Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message from loading the image magick library.

### 97.1.9 LoadLibrary(path as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ16MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

On Windows you can just pass the name of the library and the system will search it on the paths in the environment variable "PATH" (or the Windows folder).

On Linux, pass the path or name of the library and the system will search for it.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a path to a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.1.10 LoadLibraryFile(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ16MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

This is the preferred way for Mac OS X as paths may not be unique.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a folderitem for a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.1.11 MagickInfoList as IMMagickInfoListQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the list of known image formats.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.1.12 MagickToMime(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the officially registered (or de facto) MIME media-type corresponding to a magick string.
**Notes:** If there is no registered media-type, then the string "image/x-magick" (all lower case) is returned.

For more details please check the ImageMagick documentation.

### 97.1.13 NewImageInfo as IMImageInfoQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ImageInfo object.
**Notes:** Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.1.14 NewImageList as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.15 PackageName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The package name of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.16 QuantumDepth as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Quantum Depth of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.17 QuantumDepthLibrary as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum depth used to compile the library.
**Notes:** QuantumDepthLibrary and QuantumDepthPlugin must be equal for the plugin to work correctly. Currently it is compiled for 16bit support.

### 97.1.18 QuantumRange as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum range used by this library.
**Notes:** Should be a string like "Q16".

### 97.1.19 ReadImage(info as IMImageInfoQ16MBS) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a file.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.1.20 ReadImageFromString(info as IMImageInfoQ16MBS, data as string) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a string.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.1.21 ReadImageHeaderFromString(info as IMImageInfoQ16MBS, data as string) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the image header.
**Notes:** Same as ReadImageFromString except the pixel data is not read.
Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.1.22 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The release date of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.23 SetCurrentDirectory(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is needed for most installations to point to the folder with the libraries in order for LoadLibrary to find the dependencies.

### 97.1.24 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.1.25 Properties

### 97.1.26 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.
(Read and Write property)

### 97.1.27 LastException as IMExceptionQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

## 97.2 class ImageMagickQ32MBS

### 97.2.1 class ImageMagickQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for global functions from the Image Magick library
**Notes:** Before using this class you need to load the ImageMagick dylib or dll.

Not all functions from the library are available through the plugin. If you need something special, please ask.

For Mac OS X you need the ImageMagick dylib/bundle and for Windows the normal ImageMagick installation with the DLL.

For more details please check the ImageMagick documentation.

The plugin implements three versions of this ImageMagick classes. One with Q8 for 8 bit quantum depth, one with Q16 for 16 bit depth and Q32 for 32 bit depth.

### 97.2.2 Methods

### 97.2.3 Copyright as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copyright notice for this format.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.4 Features as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick features.
**Notes:** For example whether library is compiled with OpenMP for faster performance.

### 97.2.5 HomeURL as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the home url of the library.

**Notes:** For more details please check the ImageMagick documentation.

### 97.2.6 InitializeMagick(path as string = "")

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the ImageMagick environment.
**Example:**

```
dim i as new ImageMagickQ32MBS
i.InitializeMagick("")
```

**Notes:** Path: The execution path of the current ImageMagick client.

For more details please check the ImageMagick documentation.
You need to call LoadLibrary functions to load the library before calling this.

### 97.2.7 IsMagickInstantiated as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the ImageMagick environment is currently instantiated.
**Notes:** In other words: True if InitializeMagick has been called before.

For more details please check the ImageMagick documentation.

### 97.2.8 LoadErrorString as string

MBS GraphicsMagick Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message from loading the image magick library.

### 97.2.9 LoadLibrary(path as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ32MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

On Windows you can just pass the name of the library and the system will search it on the paths in the environment variable "PATH" (or the Windows folder).

On Linux, pass the path or name of the library and the system will search for it.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a path to a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.2.10 LoadLibraryFile(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ32MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

This is the preferred way for Mac OS X as paths may not be unique.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a folderitem for a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.2.11 MagickInfoList as IMMagickInfoListQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the list of known image formats.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.2.12 MagickToMime(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the officially registered (or de facto) MIME media-type corresponding to a magick string.
**Notes:** If there is no registered media-type, then the string "image/x-magick" (all lower case) is returned.

For more details please check the ImageMagick documentation.

### 97.2.13 NewImageInfo as IMImageInfoQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ImageInfo object.
**Notes:** Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.2.14 NewImageList as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.15 PackageName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The package name of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.16 QuantumDepth as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Quantum Depth of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.17 QuantumDepthLibrary as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum depth used to compile the library.
**Notes:** QuantumDepthLibrary and QuantumDepthPlugin must be equal for the plugin to work correctly. Currently it is compiled for 16bit support.

### 97.2.18 QuantumRange as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum range used by this library.
**Notes:** Should be a string like "Q16".

### 97.2.19 ReadImage(info as IMImageInfoQ32MBS) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a file.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.2.20 ReadImageFromString(info as IMImageInfoQ32MBS, data as string) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a string.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.2.21 ReadImageHeaderFromString(info as IMImageInfoQ32MBS, data as string) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the image header.
**Notes:** Same as ReadImageFromString except the pixel data is not read.
Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.2.22 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The release date of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.23 SetCurrentDirectory(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is needed for most installations to point to the folder with the libraries in order for LoadLibrary to find the dependencies.

### 97.2.24 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.2.25 Properties

### 97.2.26 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.

(Read and Write property)

### 97.2.27 LastException as IMExceptionQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

## 97.3 class ImageMagickQ8MBS

### 97.3.1 class ImageMagickQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for global functions from the Image Magick library
**Notes:** Before using this class you need to load the ImageMagick dylib or dll.

Not all functions from the library are available through the plugin. If you need something special, please ask.

For Mac OS X you need the ImageMagick dylib/bundle and for Windows the normal ImageMagick installation with the DLL.

For more details please check the ImageMagick documentation.

The plugin implements three versions of this ImageMagick classes. One with Q8 for 8 bit quantum depth, one with Q16 for 16 bit depth and Q32 for 32 bit depth.

### 97.3.2 Methods

### 97.3.3 Copyright as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copyright notice for this format.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.4 Features as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick features.
**Notes:** For example whether library is compiled with OpenMP for faster performance.

### 97.3.5 HomeURL as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the home url of the library.

**Notes:** For more details please check the ImageMagick documentation.

### 97.3.6 InitializeMagick(path as string = "")

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the ImageMagick environment.
**Example:**

```
dim i as new ImageMagickQ8MBS
i.InitializeMagick("")
```

**Notes:** Path: The execution path of the current ImageMagick client.

For more details please check the ImageMagick documentation.
You need to call LoadLibrary functions to load the library before calling this.

### 97.3.7 IsMagickInstantiated as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the ImageMagick environment is currently instantiated.
**Notes:** In other words: True if InitializeMagick has been called before.

For more details please check the ImageMagick documentation.

### 97.3.8 LoadErrorString as string

MBS GraphicsMagick Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message from loading the image magick library.

### 97.3.9 LoadLibrary(path as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ8MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

On Windows you can just pass the name of the library and the system will search it on the paths in the environment variable "PATH" (or the Windows folder).

On Linux, pass the path or name of the library and the system will search for it.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a path to a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.3.10 LoadLibraryFile(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the dll/bundle on the give path.
**Example:**

```
dim i as new ImageMagickQ8MBS

if TargetLinux then
if i.LoadLibrary("libMagick.so.6") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
elseif TargetWin32 then
if i.LoadLibrary("CORE_RL_magick_.dll") then
//MsgBox "library loaded."
else
MsgBox "library failed."
end if
else
// Mac OS X
if i.LoadLibraryFile(GetFolderItem("ImageMagick.bundle")) then
//MsgBox "library loaded."
else
MsgBox "The library failed to load."
end if
end if
```

**Notes:** In case the loading fails the library may be linked to some other libraries (e.g. X11) and you need to install them to get it working.

This is the preferred way for Mac OS X as paths may not be unique.

For more details please check the ImageMagick documentation.

With plugin version 6.1 the Mac OS X part accepts a folderitem for a dylib file, too.
Changed to a shared method in plugin version 10.4.

### 97.3.11 MagickInfoList as IMMagickInfoListQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the list of known image formats.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.3.12 MagickToMime(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the officially registered (or de facto) MIME media-type corresponding to a magick string.
**Notes:** If there is no registered media-type, then the string "image/x-magick" (all lower case) is returned.

For more details please check the ImageMagick documentation.

### 97.3.13 NewImageInfo as IMImageInfoQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ImageInfo object.
**Notes:** Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.3.14 NewImageList as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.15 PackageName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The package name of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.16 QuantumDepth as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Quantum Depth of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.17 QuantumDepthLibrary as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum depth used to compile the library.
**Notes:** QuantumDepthLibrary and QuantumDepthPlugin must be equal for the plugin to work correctly. Currently it is compiled for 16bit support.

### 97.3.18 QuantumRange as String

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum range used by this library.
**Notes:** Should be a string like "Q16".

### 97.3.19 ReadImage(info as IMImageInfoQ8MBS) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a file.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.3.20 ReadImageFromString(info as IMImageInfoQ8MBS, data as string) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image from a string.
**Notes:** Sets the last exception property.
Returns nil on any error.
You need to pass in an info object to describe the image.

For more details please check the ImageMagick documentation.

### 97.3.21 ReadImageHeaderFromString(info as IMImageInfoQ8MBS, data as string) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the image header.
**Notes:** Same as ReadImageFromString except the pixel data is not read.
Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.3.22 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The release date of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.23 SetCurrentDirectory(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is needed for most installations to point to the folder with the libraries in order for LoadLibrary to find the dependencies.

### 97.3.24 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the library.
**Notes:** For more details please check the ImageMagick documentation.

### 97.3.25 Properties

### 97.3.26 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.

(Read and Write property)

### 97.3.27 LastException as IMExceptionQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

## 97.4 class IMColorQ16MBS

### 97.4.1 class IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image Magick class to represent a color.
**Example:**

```
dim i as IMImageInfoQ16MBS
dim c as IMColorQ16MBS

c=i.BackgroundColor
c.red=65535 // full red
i.BackgroundColor=c
```

**Notes:** As you see above the IMColorQ16MBS object does not reference the original values, but contains a copy, so you must assign the modified color back to store it.
(Same as on the Xojo color class)

### 97.4.2 Methods

### 97.4.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color object where all four properties are zero.
See also:


- 97.4.4 Constructor(c as color) 15383
- 97.4.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15384


### 97.4.4 Constructor(c as color)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color value and fills it with the given Xojo color.
See also:


- 97.4.3 Constructor 15383
- 97.4.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15384

### 97.4.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color object with the given values.
See also:


- 97.4.3 Constructor 15383
- 97.4.4 Constructor(c as color) 15383


### 97.4.6 Properties

### 97.4.7 Blue as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.4.8 ColorValue as Color

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color as a Xojo color.
**Notes:** Please note that Xojo colors are 8 bit. So for Q16 and Q32 classes the colors are scaled up or down. This reads/writes the red, green and blue property, but not the opacity property.
(Read and Write property)

### 97.4.9 Green as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.4.10 Opacity as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.4.11 Red as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

## 97.5 class IMColorQ32MBS

### 97.5.1 class IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image Magick class to represent a color.
**Example:**

```
dim i as IMImageInfoQ32MBS
dim c as IMColorQ32MBS

c=i.BackgroundColor
c.red=65535 // full red
i.BackgroundColor=c
```

**Notes:** As you see above the IMColorQ32MBS object does not reference the original values, but contains a copy, so you must assign the modified color back to store it.
(Same as on the Xojo color class)

### 97.5.2 Methods

### 97.5.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color object where all four properties are zero.
See also:

- 97.5.4 Constructor(c as color) 15386
- 97.5.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15387

### 97.5.4 Constructor(c as color)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color value and fills it with the given Xojo color.
See also:

- 97.5.3 Constructor 15386
- 97.5.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15387

### 97.5.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color object with the given values.
See also:


- 97.5.3 Constructor 15386
- 97.5.4 Constructor(c as color) 15386


### 97.5.6 Properties

### 97.5.7 Blue as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.5.8 ColorValue as Color

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color as a Xojo color.
**Notes:** Please note that Xojo colors are 8 bit. So for Q16 and Q32 classes the colors are scaled up or down. This reads/writes the red, green and blue property, but not the opacity property.
(Read and Write property)

### 97.5.9 Green as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.5.10 Opacity as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.5.11 Red as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

## 97.6 class IMColorQ8MBS

### 97.6.1 class IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image Magick class to represent a color.
**Example:**

```
dim i as IMImageInfoQ8MBS
dim c as IMColorQ8MBS

c=i.BackgroundColor
c.red=65535 // full red
i.BackgroundColor=c
```

**Notes:** As you see above the IMColorQ8MBS object does not reference the original values, but contains a copy, so you must assign the modified color back to store it.
(Same as on the Xojo color class)

### 97.6.2 Methods

### 97.6.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color object where all four properties are zero.
See also:


- 97.6.4 Constructor(c as color) 15389
- 97.6.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15390


### 97.6.4 Constructor(c as color)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color value and fills it with the given Xojo color.
See also:


- 97.6.3 Constructor 15389
- 97.6.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0) 15390

### 97.6.5 Constructor(red as UInt32, green as UInt32, blue as UInt32, Opacity as UInt32 = 0)

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new color object with the given values.
See also:


- 97.6.3 Constructor 15389
- 97.6.4 Constructor(c as color) 15389


### 97.6.6 Properties

### 97.6.7 Blue as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.6.8 ColorValue as Color

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color as a Xojo color.
**Notes:** Please note that Xojo colors are 8 bit. So for Q16 and Q32 classes the colors are scaled up or down. This reads/writes the red, green and blue property, but not the opacity property.
(Read and Write property)

### 97.6.9 Green as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.6.10 Opacity as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color.
**Notes:** Value from 0 to 65535.
(Read and Write property)

### 97.6.11 Red as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red component.
**Notes:** Value from 0 to 65535.
(Read and Write property)

## 97.7 class IMExceptionQ16MBS

### 97.7.1 class IMExceptionQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about an Image Magick Exception.
**Notes:** Some functions can throw an exception and you find this exception object after calling the function inside the class. For Example after calling IMImageQ16MBS.resize, the IMImageQ16MBS.LastException property will be nil for no exception or just contain the exception from the resize operation.

For more details please check the ImageMagick documentation.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr10

### 97.7.2 Methods

### 97.7.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.7.4 Properties

### 97.7.5 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.7.6 Reason as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reason of the exception.
**Notes:** For more details please check the ImageMagick documentation.

(Read and Write property)

### 97.7.7 Severity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception type.
**Notes:** some usefull constants:

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.7.8 Signature as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

```
const UndefinedException          = 0
const WarningException            = 300
const ResourceLimitWarning        = 300
const TypeWarning                 = 305
const OptionWarning               = 310
const DelegateWarning             = 315
const MissingDelegateWarning      = 320
const CorruptImageWarning         = 325
const FileOpenWarning             = 330
const BlobWarning                 = 335
const StreamWarning               = 340
const CacheWarning                = 345
const CoderWarning                = 350
const ModuleWarning               = 355
const DrawWarning                 = 360
const ImageWarning                = 365
const XServerWarning              = 380
const MonitorWarning              = 385
const RegistryWarning             = 390
const ConfigureWarning            = 395
const ErrorException              = 400
const ResourceLimitError          = 400
const TypeError                   = 405
const OptionError                 = 410
const DelegateError               = 415
const MissingDelegateError        = 420
const CorruptImageError           = 425
const FileOpenError               = 430
const BlobError                   = 435
const StreamError                 = 440
const CacheError                  = 445
const CoderError                  = 450
const ModuleError                 = 455
const DrawError                   = 460
const ImageError                  = 465
const XServerError                = 480
const MonitorError                = 485
const RegistryError               = 490
const ConfigureError              = 495
const FatalErrorException         = 700
const ResourceLimitFatalError     = 700
const TypeFatalError              = 705
const OptionFatalError            = 710
const DelegateFatalError          = 715
const MissingDelegateFatalError   = 720
const CorruptImageFatalError      = 725
const FileOpenFatalError          = 730
const BlobFatalError              = 735
const StreamFatalError            = 740
const CacheFatalError             = 745
const CoderFatalError             = 750
const ModuleFatalError            = 755
const DrawFatalError              = 760
const ImageFatalError             = 765
const XServerFatalError           = 780
const MonitorFatalError           = 785
const RegistryFatalError          = 790
const ConfigureFatalError         = 795
```

## 97.8 class IMExceptionQ32MBS

### 97.8.1 class IMExceptionQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about an Image Magick Exception.
**Notes:** Some functions can throw an exception and you find this exception object after calling the function inside the class. For Example after calling IMImageQ32MBS.resize, the IMImageQ32MBS.LastException property will be nil for no exception or just contain the exception from the resize operation.

For more details please check the ImageMagick documentation.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr10

### 97.8.2 Methods

### 97.8.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.8.4 Properties

### 97.8.5 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.8.6 Reason as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reason of the exception.
**Notes:** For more details please check the ImageMagick documentation.

(Read and Write property)

### 97.8.7 Severity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception type.
**Notes:** some usefull constants:

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.8.8 Signature as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

const UndefinedException = 0
const WarningException = 300
const ResourceLimitWarning = 300
const TypeWarning = 305
const OptionWarning = 310
const DelegateWarning = 315
const MissingDelegateWarning = 320
const CorruptImageWarning = 325
const FileOpenWarning = 330
const BlobWarning = 335
const StreamWarning = 340
const CacheWarning = 345
const CoderWarning = 350
const ModuleWarning = 355
const DrawWarning = 360
const ImageWarning = 365
const XServerWarning = 380
const MonitorWarning = 385
const RegistryWarning = 390
const ConfigureWarning = 395
const ErrorException = 400
const ResourceLimitError = 400
const TypeError = 405
const OptionError = 410
const DelegateError = 415
const MissingDelegateError = 420
const CorruptImageError = 425
const FileOpenError = 430
const BlobError = 435
const StreamError = 440
const CacheError = 445
const CoderError = 450
const ModuleError = 455
const DrawError = 460
const ImageError = 465
const XServerError = 480
const MonitorError = 485
const RegistryError = 490
const ConfigureError = 495
const FatalErrorException = 700
const ResourceLimitFatalError = 700
const TypeFatalError = 705
const OptionFatalError = 710
const DelegateFatalError = 715
const MissingDelegateFatalError = 720
const CorruptImageFatalError = 725
const FileOpenFatalError = 730
const BlobFatalError = 735
const StreamFatalError = 740
const CacheFatalError = 745
const CoderFatalError = 750
const ModuleFatalError = 755
const DrawFatalError = 760
const ImageFatalError = 765
const XServerFatalError = 780
const MonitorFatalError = 785
const RegistryFatalError = 790
const ConfigureFatalError = 795

## 97.9 class IMExceptionQ8MBS

### 97.9.1 class IMExceptionQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about an Image Magick Exception.
**Notes:** Some functions can throw an exception and you find this exception object after calling the function inside the class. For Example after calling IMImageQ8MBS.resize, the IMImageQ8MBS.LastException property will be nil for no exception or just contain the exception from the resize operation.

For more details please check the ImageMagick documentation.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr10

### 97.9.2 Methods

### 97.9.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.9.4 Properties

### 97.9.5 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.9.6 Reason as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reason of the exception.
**Notes:** For more details please check the ImageMagick documentation.

(Read and Write property)

### 97.9.7 Severity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception type.
**Notes:** some usefull constants:

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.9.8 Signature as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The signature of the exception.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

```
const UndefinedException          = 0
const WarningException            = 300
const ResourceLimitWarning        = 300
const TypeWarning                 = 305
const OptionWarning               = 310
const DelegateWarning             = 315
const MissingDelegateWarning      = 320
const CorruptImageWarning         = 325
const FileOpenWarning             = 330
const BlobWarning                 = 335
const StreamWarning               = 340
const CacheWarning                = 345
const CoderWarning                = 350
const ModuleWarning               = 355
const DrawWarning                 = 360
const ImageWarning                = 365
const XServerWarning              = 380
const MonitorWarning              = 385
const RegistryWarning             = 390
const ConfigureWarning            = 395
const ErrorException              = 400
const ResourceLimitError          = 400
const TypeError                   = 405
const OptionError                 = 410
const DelegateError               = 415
const MissingDelegateError        = 420
const CorruptImageError           = 425
const FileOpenError               = 430
const BlobError                   = 435
const StreamError                 = 440
const CacheError                  = 445
const CoderError                  = 450
const ModuleError                 = 455
const DrawError                   = 460
const ImageError                  = 465
const XServerError                = 480
const MonitorError                = 485
const RegistryError               = 490
const ConfigureError              = 495
const FatalErrorException         = 700
const ResourceLimitFatalError     = 700
const TypeFatalError              = 705
const OptionFatalError            = 710
const DelegateFatalError          = 715
const MissingDelegateFatalError   = 720
const CorruptImageFatalError      = 725
const FileOpenFatalError          = 730
const BlobFatalError              = 735
const StreamFatalError            = 740
const CacheFatalError             = 745
const CoderFatalError             = 750
const ModuleFatalError            = 755
const DrawFatalError              = 760
const ImageFatalError             = 765
const XServerFatalError           = 780
const MonitorFatalError           = 785
const RegistryFatalError          = 790
const ConfigureFatalError         = 795
```

## 97.10 class IMImageAffineMatrixQ16MBS

### 97.10.1 class IMImageAffineMatrixQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an Image Magick affine transformation matrix.

### 97.10.2 Methods

### 97.10.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an identity matrix.

### 97.10.4 Properties

### 97.10.5 RX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate x value.
**Notes:** (Read and Write property)

### 97.10.6 RY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate y value.
**Notes:** (Read and Write property)

### 97.10.7 SX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale x value.
**Notes:** (Read and Write property)

### 97.10.8 SY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale y value.
**Notes:** (Read and Write property)

### 97.10.9 TX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

### 97.10.10 TY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

## 97.11 class IMImageAffineMatrixQ32MBS

### 97.11.1 class IMImageAffineMatrixQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an Image Magick affine transformation matrix.

### 97.11.2 Methods

### 97.11.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an identity matrix.

### 97.11.4 Properties

### 97.11.5 RX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate x value.
**Notes:** (Read and Write property)

### 97.11.6 RY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate y value.
**Notes:** (Read and Write property)

### 97.11.7 SX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale x value.
**Notes:** (Read and Write property)

### 97.11.8 SY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale y value.
**Notes:** (Read and Write property)

### 97.11.9 TX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

### 97.11.10 TY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

## 97.12 class IMImageAffineMatrixQ8MBS

### 97.12.1 class IMImageAffineMatrixQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an Image Magick affine transformation matrix.

### 97.12.2 Methods

### 97.12.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an identity matrix.

### 97.12.4 Properties

### 97.12.5 RX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate x value.
**Notes:** (Read and Write property)

### 97.12.6 RY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotate y value.
**Notes:** (Read and Write property)

### 97.12.7 SX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale x value.
**Notes:** (Read and Write property)

### 97.12.8 SY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale y value.
**Notes:** (Read and Write property)

### 97.12.9 TX as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

### 97.12.10 TY as Double

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate y value.
**Notes:** (Read and Write property)

## 97.13 class IMImageAttributeQ16MBS

### 97.13.1 class IMImageAttributeQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an image attribute.
**Notes:** Used only for reading the attributes.
Do not keep references over long times as memory of key/value pairs may be released.

### 97.13.2 Properties

### 97.13.3 Compression as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether compression is used.
**Notes:** (Read only property)

### 97.13.4 Key as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

### 97.13.5 Value as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

## 97.14 class IMImageAttributeQ32MBS

### 97.14.1 class IMImageAttributeQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an image attribute.
**Notes:** Used only for reading the attributes.
Do not keep references over long times as memory of key/value pairs may be released.

### 97.14.2 Properties

### 97.14.3 Compression as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether compression is used.
**Notes:** (Read only property)

### 97.14.4 Key as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

### 97.14.5 Value as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

## 97.15 class IMImageAttributeQ8MBS

### 97.15.1 class IMImageAttributeQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an image attribute.
**Notes:** Used only for reading the attributes.
Do not keep references over long times as memory of key/value pairs may be released.

### 97.15.2 Properties

### 97.15.3 Compression as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether compression is used.
**Notes:** (Read only property)

### 97.15.4 Key as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The key of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

### 97.15.5 Value as String

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of this attribute.
**Notes:** String is in binary text encoding.
(Read only property)

## 97.16 class IMImageInfoQ16MBS

### 97.16.1 class IMImageInfoQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about an image.
**Notes:** For more details please check the ImageMagick documentation.

### 97.16.2 Methods

### 97.16.3 Clone as IMImageInfoQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the ImageInfo object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.16.4 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.16.5 DestroyImageInfo

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image info and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.16.6 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.16.7 Properties

### 97.16.8 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Join images into a single multi-image file.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.9 Affirm as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.10 Antialias as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control antialiasing of rendered Postscript and Postscript or TrueType fonts.
**Notes:** Enabled by default.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.11 Authenticate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.12 BackgroundColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.16.13 BorderColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.16.14 Channel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel to use.
**Notes:** Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

(Read and Write property)

### 97.16.15 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.16 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Example:**

```
dim im as ImageMagickQ16MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ16MBS
dim imageinfo as IMImageInfoQ16MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ16MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
```

```
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.16.17 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.

**Notes:** useful constants:

```
const UndefinedCompression        = 0
const NoCompression               = 1
const BZipCompression             = 2
const FaxCompression              = 3
const Group4Compression           = 4
const JPEGCompression             = 5
const LosslessJPEGCompression     = 6
const LZWCompression              = 7
const RLECompression              = 8
const ZipCompression              = 9
```

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.18 Density as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical and horizontal resolution in pixels of the image.
**Notes:** This option specifies an image density when decoding a Postscript or Portable Document page.
(Read and Write property)

### 97.16.19 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.16.20 Dither as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.21 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.16.22 Extract as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.23 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.24 Font as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font.
**Notes:** If the font is a fully qualified X server font name, the font is obtained from an X server. To use a TrueType font, precede the TrueType filename with an @. Otherwise, specify a Postscript font name (e.g. "helvetica").
(Read and Write property)

### 97.16.25 Group as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.26 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a ImageInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.27 HeaderOnly as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if only the header was read from the image data.
**Notes:** (Read and Write property)

### 97.16.28 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

(Read and Write property)

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

### 97.16.29 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Example:**

```
dim imageinfo as IMImageInfoQ16MBS
dim blob as string
dim image as IMImageQ16MBS

// Now lets convert to tiff
imageinfo.Filename = "image"
imageinfo.Magick="JPEG"
imageinfo.Quality = 10 //since we are displaying, lets use highest quality, lowest compression
blob = image.ImageToBlob(imageinfo)
```

**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.30 MatteColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.16.31 Monochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform the image to black and white.
**Notes:** (Read and Write property)

### 97.16.32 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.33 Page as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Equivalent size of Postscript page.
**Notes:** (Read and Write property)

### 97.16.34 PointSize as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font point size.
**Notes:** (Read and Write property)

### 97.16.35 Preview as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image manipulation preview option.
**Notes:** Used by 'display'.

constants:

| | |
|---|---|
| UndefinedPreview | 0 |
| RotatePreview | 1 |
| ShearPreview | 2 |
| RollPreview | 3 |
| HuePreview | 4 |
| SaturationPreview | 5 |
| BrightnessPreview | 6 |
| GammaPreview | 7 |
| SpiffPreview | 8 |
| DullPreview | 9 |
| GrayscalePreview | 10 |
| QuantizePreview | 11 |
| DespecklePreview | 12 |
| ReduceNoisePreview | 13 |
| AddNoisePreview | 14 |
| SharpenPreview | 15 |
| BlurPreview | 16 |
| ThresholdPreview | 17 |
| EdgeDetectPreview | 18 |
| SpreadPreview | 19 |
| SolarizePreview | 20 |
| ShadePreview | 21 |
| RaisePreview | 22 |
| SegmentPreview | 23 |
| SwirlPreview | 24 |
| ImplodePreview | 25 |
| WavePreview | 26 |
| OilPaintPreview | 27 |
| CharcoalDrawingPreview | 28 |
| JPEGPreview | 29 |

(Read and Write property)

### 97.16.36 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Notes:** Default value is 75.
(Read and Write property)

### 97.16.37 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.16.38 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

(Read and Write property)

### 97.16.39 SamplingFactor as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.40 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.41 SceneCount as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.42 Scenes as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.16.43 ServerName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X11 display to display to.
**Notes:** obtain fonts from, or to capture image from.
(Read and Write property)

### 97.16.44 Size as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height of a raw image (an image which does not support width and height information).
**Notes:** Size may also be used to affect the image size read from a multi-resolution format (e.g. Photo CD, JBIG, or JPEG.
(Read and Write property)

### 97.16.45 Temporary as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.16.46 Texture as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image filename to use as background texture.
**Notes:** (Read and Write property)

### 97.16.47 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image type.
**Notes:** constants:

| | |
|---|---|
| UndefinedType | 0 |
| BilevelType | 1 |
| GrayscaleType | 2 |
| GrayscaleMatteType | 3 |
| PaletteType | 4 |
| PaletteMatteType | 5 |
| TrueColorType | 6 |
| TrueColorMatteType | 7 |
| ColorSeparationType | 8 |
| ColorSeparationMatteType | 9 |
| OptimizeType | 10 |

(Read and Write property)

### 97.16.48 Verbose as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print detailed information about the image if True.
**Notes:** (Read and Write property)

### 97.16.49 View as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlashPix viewing parameters.
**Notes:** (Read and Write property)

## 97.17 class IMImageInfoQ32MBS

### 97.17.1 class IMImageInfoQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about an image.
**Notes:** For more details please check the ImageMagick documentation.

### 97.17.2 Methods

### 97.17.3 Clone as IMImageInfoQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the ImageInfo object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.17.4 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.17.5 DestroyImageInfo

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image info and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.17.6 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.17.7 Properties

### 97.17.8 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Join images into a single multi-image file.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.9 Affirm as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.10 Antialias as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control antialiasing of rendered Postscript and Postscript or TrueType fonts.
**Notes:** Enabled by default.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.11 Authenticate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.12 BackgroundColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.17.13 BorderColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.17.14 Channel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel to use.
**Notes:** Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

(Read and Write property)

### 97.17.15 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.16 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Example:**

```
dim im as ImageMagickQ32MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ32MBS
dim imageinfo as IMImageInfoQ32MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ32MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
```

```
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.17.17 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.

**Notes:** useful constants:

```
const UndefinedCompression        = 0
const NoCompression               = 1
const BZipCompression             = 2
const FaxCompression              = 3
const Group4Compression           = 4
const JPEGCompression             = 5
const LosslessJPEGCompression     = 6
const LZWCompression              = 7
const RLECompression              = 8
const ZipCompression              = 9
```

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.18 Density as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical and horizontal resolution in pixels of the image.
**Notes:** This option specifies an image density when decoding a Postscript or Portable Document page.
(Read and Write property)

### 97.17.19 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.17.20 Dither as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.21 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.17.22 Extract as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.23 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.24 Font as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font.
**Notes:** If the font is a fully qualified X server font name, the font is obtained from an X server. To use a TrueType font, precede the TrueType filename with an @. Otherwise, specify a Postscript font name (e.g. "helvetica").
(Read and Write property)

### 97.17.25 Group as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.26 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a ImageInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.27 HeaderOnly as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if only the header was read from the image data.
**Notes:** (Read and Write property)

### 97.17.28 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

(Read and Write property)

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

### 97.17.29 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Example:**

```
dim imageinfo as IMImageInfoQ32MBS
dim blob as string
dim image as IMImageQ32MBS

// Now lets convert to tiff
imageinfo.Filename = "image"
imageinfo.Magick="JPEG"
imageinfo.Quality = 10 //since we are displaying, lets use highest quality, lowest compression
blob = image.ImageToBlob(imageinfo)
```

**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.30 MatteColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.17.31 Monochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform the image to black and white.
**Notes:** (Read and Write property)

### 97.17.32 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.33 Page as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Equivalent size of Postscript page.
**Notes:** (Read and Write property)

### 97.17.34 PointSize as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font point size.
**Notes:** (Read and Write property)

### 97.17.35 Preview as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image manipulation preview option.
**Notes:** Used by 'display'.

constants:

| | |
|---|---|
| UndefinedPreview | 0 |
| RotatePreview | 1 |
| ShearPreview | 2 |
| RollPreview | 3 |
| HuePreview | 4 |
| SaturationPreview | 5 |
| BrightnessPreview | 6 |
| GammaPreview | 7 |
| SpiffPreview | 8 |
| DullPreview | 9 |
| GrayscalePreview | 10 |
| QuantizePreview | 11 |
| DespecklePreview | 12 |
| ReduceNoisePreview | 13 |
| AddNoisePreview | 14 |
| SharpenPreview | 15 |
| BlurPreview | 16 |
| ThresholdPreview | 17 |
| EdgeDetectPreview | 18 |
| SpreadPreview | 19 |
| SolarizePreview | 20 |
| ShadePreview | 21 |
| RaisePreview | 22 |
| SegmentPreview | 23 |
| SwirlPreview | 24 |
| ImplodePreview | 25 |
| WavePreview | 26 |
| OilPaintPreview | 27 |
| CharcoalDrawingPreview | 28 |
| JPEGPreview | 29 |

(Read and Write property)

### 97.17.36 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Notes:** Default value is 75.
(Read and Write property)

### 97.17.37 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.17.38 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

(Read and Write property)

### 97.17.39 SamplingFactor as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.40 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.41 SceneCount as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.42 Scenes as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.17.43 ServerName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X11 display to display to.
**Notes:** obtain fonts from, or to capture image from.
(Read and Write property)

### 97.17.44 Size as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height of a raw image (an image which does not support width and height information).
**Notes:** Size may also be used to affect the image size read from a multi-resolution format (e.g. Photo CD, JBIG, or JPEG.
(Read and Write property)

### 97.17.45 Temporary as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.17.46 Texture as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image filename to use as background texture.
**Notes:** (Read and Write property)

### 97.17.47 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image type.
**Notes:** constants:

| | |
|---|---|
| UndefinedType | 0 |
| BilevelType | 1 |
| GrayscaleType | 2 |
| GrayscaleMatteType | 3 |
| PaletteType | 4 |
| PaletteMatteType | 5 |
| TrueColorType | 6 |
| TrueColorMatteType | 7 |
| ColorSeparationType | 8 |
| ColorSeparationMatteType | 9 |
| OptimizeType | 10 |

(Read and Write property)

### 97.17.48 Verbose as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print detailed information about the image if True.
**Notes:** (Read and Write property)

### 97.17.49 View as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlashPix viewing parameters.
**Notes:** (Read and Write property)

## 97.18 class IMImageInfoQ8MBS

### 97.18.1 class IMImageInfoQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about an image.
**Notes:** For more details please check the ImageMagick documentation.

### 97.18.2 Methods

### 97.18.3 Clone as IMImageInfoQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the ImageInfo object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.18.4 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.18.5 DestroyImageInfo

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image info and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.18.6 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.18.7 Properties

### 97.18.8 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Join images into a single multi-image file.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.9 Affirm as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.10 Antialias as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Control antialiasing of rendered Postscript and Postscript or TrueType fonts.
**Notes:** Enabled by default.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.11 Authenticate as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.12 BackgroundColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.18.13 BorderColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.18.14 Channel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel to use.
**Notes:** Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

(Read and Write property)

### 97.18.15 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.16 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Example:**

```
dim im as ImageMagickQ8MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ8MBS
dim imageinfo as IMImageInfoQ8MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ8MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
```

```
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.18.17 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.

**Notes:** useful constants:

```
const UndefinedCompression        = 0
const NoCompression               = 1
const BZipCompression             = 2
const FaxCompression              = 3
const Group4Compression           = 4
const JPEGCompression             = 5
const LosslessJPEGCompression     = 6
const LZWCompression              = 7
const RLECompression              = 8
const ZipCompression              = 9
```

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.18 Density as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Vertical and horizontal resolution in pixels of the image.
**Notes:** This option specifies an image density when decoding a Postscript or Portable Document page.
(Read and Write property)

### 97.18.19 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.18.20 Dither as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.21 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.18.22 Extract as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.23 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.24 Font as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font.
**Notes:** If the font is a fully qualified X server font name, the font is obtained from an X server. To use a TrueType font, precede the TrueType filename with an @. Otherwise, specify a Postscript font name (e.g. "helvetica").
(Read and Write property)

### 97.18.25 Group as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.26 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a ImageInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.27 HeaderOnly as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if only the header was read from the image data.
**Notes:** (Read and Write property)

### 97.18.28 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

(Read and Write property)

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

### 97.18.29 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Example:**

```
dim imageinfo as IMImageInfoQ8MBS
dim blob as string
dim image as IMImageQ8MBS

// Now lets convert to tiff
imageinfo.Filename = "image"
imageinfo.Magick="JPEG"
imageinfo.Quality = 10 //since we are displaying, lets use highest quality, lowest compression
blob = image.ImageToBlob(imageinfo)
```

**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.30 MatteColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.18.31 Monochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transform the image to black and white.
**Notes:** (Read and Write property)

### 97.18.32 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.33 Page as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Equivalent size of Postscript page.
**Notes:** (Read and Write property)

### 97.18.34 PointSize as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text rendering font point size.
**Notes:** (Read and Write property)

### 97.18.35 Preview as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image manipulation preview option.
**Notes:** Used by 'display'.

constants:

| | |
|---|---|
| UndefinedPreview | 0 |
| RotatePreview | 1 |
| ShearPreview | 2 |
| RollPreview | 3 |
| HuePreview | 4 |
| SaturationPreview | 5 |
| BrightnessPreview | 6 |
| GammaPreview | 7 |
| SpiffPreview | 8 |
| DullPreview | 9 |
| GrayscalePreview | 10 |
| QuantizePreview | 11 |
| DespecklePreview | 12 |
| ReduceNoisePreview | 13 |
| AddNoisePreview | 14 |
| SharpenPreview | 15 |
| BlurPreview | 16 |
| ThresholdPreview | 17 |
| EdgeDetectPreview | 18 |
| SpreadPreview | 19 |
| SolarizePreview | 20 |
| ShadePreview | 21 |
| RaisePreview | 22 |
| SegmentPreview | 23 |
| SwirlPreview | 24 |
| ImplodePreview | 25 |
| WavePreview | 26 |
| OilPaintPreview | 27 |
| CharcoalDrawingPreview | 28 |
| JPEGPreview | 29 |

(Read and Write property)

### 97.18.36 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Notes:** Default value is 75.
(Read and Write property)

### 97.18.37 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.18.38 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

(Read and Write property)

### 97.18.39 SamplingFactor as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.40 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.41 SceneCount as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.42 Scenes as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.18.43 ServerName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X11 display to display to.
**Notes:** obtain fonts from, or to capture image from.
(Read and Write property)

### 97.18.44 Size as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width and height of a raw image (an image which does not support width and height information).
**Notes:** Size may also be used to affect the image size read from a multi-resolution format (e.g. Photo CD, JBIG, or JPEG.
(Read and Write property)

### 97.18.45 Temporary as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.18.46 Texture as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image filename to use as background texture.
**Notes:** (Read and Write property)

### 97.18.47 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Image type.
**Notes:** constants:

| | |
|---|---|
| UndefinedType | 0 |
| BilevelType | 1 |
| GrayscaleType | 2 |
| GrayscaleMatteType | 3 |
| PaletteType | 4 |
| PaletteMatteType | 5 |
| TrueColorType | 6 |
| TrueColorMatteType | 7 |
| ColorSeparationType | 8 |
| ColorSeparationMatteType | 9 |
| OptimizeType | 10 |

(Read and Write property)

### 97.18.48 Verbose as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print detailed information about the image if True.
**Notes:** (Read and Write property)

### 97.18.49 View as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlashPix viewing parameters.
**Notes:** (Read and Write property)

## 97.19 class IMImageQ16MBS

### 97.19.1 class IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an Image Magick Image in memory.
**Notes:** Can exist with or without pixel data.

For more details please check the ImageMagick documentation.
**Blog Entries**

- ImageMagick 7 for Xojo
- MBS Xojo / Real Studio Plugins, version 15.1pr4

### 97.19.2 Methods

### 97.19.3 AdaptiveThreshold(width as Integer, height as Integer, offset as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AdaptiveThreshold selects an individual threshold for each pixel based on the range of intensity values in its local neighborhood.
**Notes:** This allows for thresholding of an image whose global intensity histogram doesn't contain distinctive peaks.
Sets the last exception property.

width: The width of the local neighborhood.
height: The height of the local neighborhood.
offset: The mean offset.

For more details please check the ImageMagick documentation.

### 97.19.4 AddNoise(NoiseType as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds random noise to the image.
**Notes:** Constants

| | |
|---|---|
| UndefinedNoise | =0 |
| UniformNoise | =1 |
| GaussianNoise | =2 |
| MultiplicativeGaussianNoise | =3 |
| ImpulseNoise | =4 |
| LaplacianNoise | =5 |
| PoissonNoise | =6 |

For more details please check the ImageMagick documentation.
Sets the last exception property.

### 97.19.5 AffineTransformImage(matrix as IMImageAffineMatrixQ16MBS) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms an image as dictated by the affine matrix.

### 97.19.6 AppendImageToList(img as IMImageQ16MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.7 AutoGammaImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** Returns true on success or false on failure.

### 97.19.8 AutoGammaImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.

**Notes:** Returns true on success or false on failure.

channelType: The channels to auto-level. If the special 'SyncChannels' flag is set all given channels is adjusted in the same way using the mean average of those channels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.9 AutoLevelImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

### 97.19.10 AutoLevelImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.11 Average as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Average() method takes a set of images and averages them together.
**Notes:** Each image in the set must have the same width and height. Average() returns a single image with each corresponding pixel component of each image averaged. On failure, a nil image is returned and exception describes the reason for the failure.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.12 BilevelChannel(channel as Integer, threshold as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the value of individual pixels based on the intensity of each pixel channel.
**Notes:** The result is a high-contrast image.

channel: The channel type.
threshold: define the threshold values.

Constants for channel:

For more details please check the ImageMagick documentation.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.13 BlackThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** BlackThreshold is like Threshold but forces all pixels below the threshold into black while leaving all pixels above the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.19.14 BlobSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The expected size for this image written to a file.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.15 Blur(radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImage selects a suitable radius for you.

radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

For more details please check the ImageMagick documentation.

### 97.19.16 BlurImageChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImageChannel selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.19.17 BorderImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Surrounds the image with a border of the color defined by the bordercolor member of the image.
**Notes:** The width and height of the border are defined by the corresponding parameters.

### 97.19.18 BrightnessContrastImage(brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).

### 97.19.19 BrightnessContrastImageChannel(ChannelType as Integer, brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).
ChannelType: The channels to use.

Constants for channel:

### 97.19.20 Charcoal(radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Charcoal creates a new image that is a copy of an existing one with the edge highlighted.
**Notes:** radius: the radius of the pixel neighborhood.
sigma: The standard deviation of the Gaussian, in pixels.

Returns nil on any error.
Sets the last exception property.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.21 Chop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chop removes a region of an image and collapses the image to occupy the removed portion.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.22 ClipPath(path as string, inside as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image clip mask based any clipping path information if it exists.
**Notes:**

| | |
|---|---|
| pathname: | name of clipping path resource. If name is preceded by #, use clipping path numbered by name. |
| inside: | if true, later operations take effect inside clipping path. Otherwise later operations take effect outside clipping path. |

Returns true on success and false on any error.

### 97.19.23 Clone as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this image object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.24 CloneImageAttributes(image as IMImageAttributeQ16MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CloneImageAttributes() clones one or more image attributes.
**Notes:** Returns false on any error.

### 97.19.25 CloneImageProfiles(SourceImage as IMImageQ16MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones one or more image profiles.
**Notes:** Returns false on any error and true on success.

### 97.19.26 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.19.27 ClutImage(clutImage as IMImageQ16MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either

for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.

Returns true on success or false on failure.

### 97.19.28 ClutImageChannel(ChannelType as Integer, clutImage as IMImageQ16MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.
ChannelType: The channels to use.

Returns true on success or false on failure.

Constants for channel:

### 97.19.29 CoalesceImages as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CoalesceImages composites a set of images while respecting any page offsets and disposal meth-

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

ods.
**Notes:** GIF, MIFF, and MNG animation sequences typically start with an image background and each subsequent image varies in size and offset. CoalesceImages() returns a new sequence where each image in the sequence is the same size as the first and composited with the next image in the sequence.

Returns nil on any error.
Sets the last exception property.

### 97.19.30 Colorize(opacity as string, PenColorRed as Integer, PenColorGreen as Integer, PenColorBlue as Integer, PenColorOpacity as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ColorizeImage creates a new image that is a copy of an existing one with the image pixels colorized.
**Notes:** The colorization is controlled with the pen color and the opacity levels.

opacity: A character string indicating the level of opacity as a percentage (0-100).
PenColorRed, PenColorGreen, PenColorBlue and PenColorOpacity define the pen color used.

Returns nil on any error.
Sets the last exception property.

### 97.19.31 Combine(channel as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines one or more images into a single image.
**Notes:** The grayscale value of the pixels of each image in the sequence is assigned in order to the specified channels of the combined image. The typical ordering would be image 1 =>Red, 2 =>Green, 3 =>Blue, etc.

The lastexception property is set.

### 97.19.32 CompareImageLayers(ImageLayerMethod as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CompareImageLayers() compares each image with the next in a sequence and returns the minimum bounding region of all the pixel differences (of the mageLayerMethod specified) it discovers.
**Notes:** Images do NOT have to be the same size, though it is best that all the images are 'coalesced' (images are all the same size, on a flattened canvas, so as to represent exactly how an specific frame should look).

No GIF dispose methods are applied, so GIF animations must be coalesced before applying this image operator to find differences to them.

ImageLayerMethod:
the layers type to compare images with. Must be one of... CompareAnyLayer, CompareClearLayer, CompareOverlayLayer.

Can raise an exception.

### 97.19.33 Composite(ComposeOperator as Integer, Image as IMImageQ16MBS, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the second image composited onto the first at the specified offsets.
**Notes:** compose: Specifies an image composite operator.
Image: The second image.
x: An integer that specifies the column offset of the composited image.
y: An integer that specifies the row offset of the composited image.

No error code and exception!

### 97.19.34 ConsolidateCMYKImages as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Consolidates a sequence of CMYK images.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.35 ContrastImage(sharpen as boolean) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the intensity differences between the lighter and darker elements of the image.
**Notes:** Returns true on success or false on failure.
Set sharpen to true to increase the image contrast otherwise the contrast is reduced.

### 97.19.36 CopyPicture as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ16MBS // your image
Canvas1.Backdrop=image.CopyPicture
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.19.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15464

### 97.19.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ16MBS // your image
Canvas1.Backdrop=image.CopyPicture(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

- 97.19.36 CopyPicture as picture 15464

### 97.19.38 CopyPictureMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ16MBS // your image
Canvas1.Backdrop=image.CopyPictureMask
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.19.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15465

### 97.19.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ16MBS // your image
Canvas1.Backdrop=image.CopyPictureMask(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

• 97.19.38 CopyPictureMask as picture 15465

### 97.19.40 CopyPixel(x as Integer, y as Integer) as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a pixel.
**Notes:** Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.

### 97.19.41 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Creates a HBITMAP for the image for use with Windows Declares.
**Notes:** The HBITMAP returned needs to be freed when you are done with it or you risk having a memory leak.

### 97.19.42 Crop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop extracts a region of the image starting at the offset defined by geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.43 CropImageToTiles(CropGeometry as string) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crops a single image, into a possible list of tiles.
**Notes:** This may include a single sub-region of the image. This basically applies all the normal geometry flags for Crop.

### 97.19.44 CycleColormap(displace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Displaces an image's colormap by a given number of positions.
**Notes:** If you cycle the colormap a number of times you can produce a psychodelic effect.
Returns true on success.
displace: displace the colormap this amount.

### 97.19.45 DecipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts cipher pixels to plain pixels.
**Notes:** Passkey: decipher cipher pixels with this passphrase.
Returns true on success.

### 97.19.46 DeconstructImages as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeconstructImages() compares each image with the next in a sequence and returns the minimum bounding region of all differences from the first image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.47 DeleteImageAttribute(key as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteImageAttribute() deletes an attribute from the image.
**Notes:** Returns false on any error.

### 97.19.48 Despeckle() as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the speckle noise in an image while perserving the edges of the original image.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.49 DestroyImage

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases the memory used for this image and sets handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.19.50 DestroyImageAttributes

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deallocates memory associated with the image attribute list.

### 97.19.51 DestroyImageList

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image list and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.19.52 DestroyImageProfiles

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases memory associated with an image profile map.

### 97.19.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DistortImage() distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

A description of each parameter follows:
self: the image to be distorted.
m: the method of image distortion. ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center. Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided. Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.
values: arguments given.
bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

See also:

- 97.19.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS 15469

### 97.19.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DistortImage() distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

A description of each parameter follows:
self: the image to be distorted.
m: the method of image distortion. ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center. Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided. Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.
values: arguments given.
bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

See also:

- 97.19.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ16MBS 15468

### 97.19.55 Edge(radius as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds edges in an image.
**Notes:** Radius defines the radius of the convolution filter. Use a radius of 0 and Edge selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.56 Emboss(radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a grayscale image with a three-dimensional effect.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Emboss selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.57 EncipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts pixels to cipher-pixels.
**Notes:** passkey: encipher pixels with this passphrase.
Returns true on success.

### 97.19.58 EqualizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

### 97.19.59 EqualizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.60 ExcerptImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a excerpt of the image as defined by the geometry.
**Notes:** Define the region of the image to extend with x, y, width, and height.

### 97.19.61 ExtentImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends the image as defined by the geometry, gravity, and image background color.
**Notes:** Define the region of the image to extend with x, y, width, and height.

Set the (x,y) offset of the geometry to move the original image relative to the extended image.

### 97.19.62 FlattenImages as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flatten composites all images from the current image pointer to the end of the image list and returns a single flattened image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.63 Flip as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip creates a vertical mirror image by reflecting the pixels around the central x-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.64 Flop as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flop creates a horizontal mirror image by reflecting the pixels around the central y-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.65 FrameImage(x as Integer, y as Integer, width as Integer, height as Integer, innerBevel as Integer, OuterBevel as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a simulated three-dimensional border around the image.
**Notes:** The color of the border is defined by the MatteColor of image. Width and height specify the border width of the vertical and horizontal sides of the frame. innerBevel and OuterBevel indicate the width of the inner and outer shadows of the frame.

### 97.19.66 FxImage(expression as string) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FxImage() applies a mathematical expression to the specified image.
**Notes:** Can raise an exception.

### 97.19.67 GaussianBlurChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and GaussianBlur selects a suitable radius for you.
Sets the last exception property.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
channel: The channel type.
sigma: the standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.19.68 GetImageAttribute(key as string) as IMImageAttributeQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageAttribute searches the list of image attributes and returns a reference to the attribute if it exists otherwise nil.

### 97.19.69 GetImageClippingPathAttribute as IMImageAttributeQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageClippingPathAttribute searches the list of image attributes and returns a reference to a clipping path if it exists otherwise nil.

### 97.19.70 GetImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a profile associated with an image by name.
**Notes:** Returns "" on any error.

### 97.19.71 GetNextImageAttribute as IMImageAttributeQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetNextImageAttribute() gets the next image attribute.
**Notes:** Returns nil on any error.

### 97.19.72 GetNextImageProfile as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the next profile name for an image.
**Notes:** Returns "" on any error.

### 97.19.73 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole Image structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.19.74 ImagesToBlob(info as IMImageInfoQ16MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.
For more details please check the ImageMagick documentation.

### 97.19.75 ImageToBlob(info as IMImageInfoQ16MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Example:**

```
dim im as ImageMagickQ16MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ16MBS
dim imageinfo as IMImageInfoQ16MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ16MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
```

```
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.
For more details please check the ImageMagick documentation.

### 97.19.76 Implode(factor as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ImplodeImage creates a new image that is a copy of an existing one with the image pixels "implode" by the specified percentage.
**Notes:** factor: A double value that defines the extent of the implosion.

Returns nil on any error.
Sets the last exception property.

### 97.19.77 IsBlobExempt as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is exempt.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.78 IsBlobSeekable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is seekable.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.79 IsBlobTemporary as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is temporary.
**Notes:** For more details please check the ImageMagick documentation.

### 97.19.80 Magnify as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to twice its size.
**Notes:** Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.81 MedianFilter(radius as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a digital filter that improves the quality of a noisy image.
**Notes:** Each pixel is replaced by the median in a set of neighboring pixels as defined by radius.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.82 MergeImageLayers(ImageLayerMethod as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MergeImageLayers() composes all the image layers from the current given image onward to produce a single image of the merged layers.
**Notes:** The inital canvas's size depends on the given ImageLayerMethod, and is initialized using the first images images background color. The images are then compositied onto that image in sequence using the given composition that has been assigned to each individual image.

ImageLayerMethod:
the method of selecting the size of the initial canvas.

MergeLayer: Merge all layers onto a canvas just large enough to hold all the actual images. The virtual canvas of the first image is preserved but otherwise ignored.

FlattenLayer: Use the virtual canvas size of first image. Images which fall outside this canvas is clipped. This can be used to 'fill out' a given virtual canvas.

MosaicLayer: Start with the virtual canvas of the first image, enlarging left and right edges to contain all images. Images with negative offsets will be clipped.

Can raise an exception.

### 97.19.83 Minify as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to half its size.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.84 MosaicImages as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MosaicImages inlays an image sequence to form a single coherent picture.
**Notes:** It returns a single image with each image in the sequence composited at the location defined by the page member of the image structure.
Returns nil on any error.
Sets the last exception property.

### 97.19.85 MotionBlur(radius as Double, sigma as Double, angle as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simulates motion blur.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and MotionBlur selects a suitable radius for you. Angle gives the angle of the blurring motion.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.86 NegateImage(gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

gray: If true, only negate grayscale pixels within the image.

### 97.19.87 NegateImageChannel(ChannelType as Integer, gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

ChannelType: The channels to use.
gray: If true, only negate grayscale pixels within the image.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.88 NewImage(info as IMImageInfoQ16MBS, width as Integer, height as Integer, background as IMMagickPixelPacketQ16MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image.
**Example:**

```
dim im as ImageMagickQ16MBS // global
dim p as picture
dim imageinfo as IMImageInfoQ16MBS
dim image as IMImageQ16MBS
dim b as new IMMagickPixelPacketQ16MBS
b.Blue=65535
b.ColorSpace=1 // RGB
b.Depth=16
```

```
imageinfo = im.NewImageInfo
imageinfo.Depth=16
imageinfo.ColorSpace=1

//this should read any image IM understands
image = new IMImageQ16MBS
if image.NewImage(imageinfo,500,500,b) then
p=New Picture(300,300,32)
p.Graphics.ForeColor=Rgb(255,0,0)
p.Graphics.FillOval 0,0,300,300
image.SetPicture p,0,0
else
MsgBox "failed"
end if
```

**Notes:** Returns false on failure and true on success.

### 97.19.89 NormalizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

### 97.19.90 NormalizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.19.91 OilPaint(radius as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method OilPaintImage creates a new image that is a copy of an existing one with each pixel component replaced with the color of greatest frequency in a circular neighborhood.
**Notes:** radius parameter: radius of the circular neighborhood.
Returns nil on any error.
Sets the last exception property.

### 97.19.92 OptimizeImageLayers as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageLayers() compares each image the GIF disposed forms of the previous image in the sequence.
**Notes:** From this it attempts to select the smallest cropped image to replace each frame, while preserving the results of the GIF animation.

Can raise an exception.

### 97.19.93 OptimizeImageTransparency

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageTransparency() takes a frame optimized GIF animation, and compares the overlayed pixels against the disposal image resulting from all the previous frames in the animation.
**Notes:** Any pixel that does not change the disposal image (and thus does not effect the outcome of an

overlay) is made transparent.

WARNING: This modifies the current images directly, rather than generate a new image sequence.

Can raise an exception.

### 97.19.94 OptimizePlusImageLayers as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImagePlusLayers() is exactly as OptimizeImageLayers(), but may also add or even remove extra frames in the animation, if it improves the total number of pixels in the resulting GIF animation.
**Notes:** Can raise an exception.

### 97.19.95 ProfileImage(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds or removes a ICC, IPTC, or generic profile from an image.
**Notes:** If the ProfileData is "", it is removed from the image otherwise added. Use a name of '*' and a ProfileData of "" to remove all profiles from the image.

Returns false on any error and true on success.

### 97.19.96 RadialBlur(angle as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RadialBlur applies a radial blur to the image.
**Notes:** angle: The angle of the radial blur.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.97 RaiseImage(x as Integer, y as Integer, width as Integer, height as Integer, raise as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a simulated three-dimensional button-like effect by lightening and darkening the edges of the image.
**Notes:** Width and height define the width of the vertical and horizontal edge of the effect.
raise: A value other than zero creates a 3-D raise effect, otherwise it has a lowered effect.

### 97.19.98 RandomThresholdChannel(channel as Integer, thresholds as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Canges the value of individual pixels based on the intensity of each pixel compared to a random threshold.
**Notes:** The result is a low-contrast, two color image.

channel: The channel or channels to be thresholded.
thresholds: a geometry string containing low,high thresholds. If the string contains 2x2, 3x3, or 4x4, an ordered dither of order 2, 3, or 4 is performed instead. (ASCII string)

Sets the last exception property.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.19.99 ReduceNoise(radius as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Smooths the contours of an image while still preserving edge information.
**Notes:** The algorithm works by replacing each pixel with its neighbor closest in value. A neighbor is defined by radius. Use a radius of 0 and ReduceNoise selects a suitable radius for you.

For more details please check the ImageMagick documentation.

### 97.19.100 RemoveDuplicateLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that is exactly the same as the next image in the given image list.
**Notes:** Image size and virtual canvas offset must also match, though not the virtual canvas size itself.

No check is made with regards to image disposal setting, though it is the dispose setting of later image that is kept. Also any time delays are also added together. As such coalesced image animations should still produce the same result, though with duplicte frames merged into a single frame.

### 97.19.101 RemoveFirstImageFromList as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the first image from the image list and returns the image.
**Notes:** Returns nil on any error.
For more details please check the ImageMagick documentation.

### 97.19.102 RemoveImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a profile from the image-map by its name.

### 97.19.103 RemoveZeroDelayLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that as a zero delay time.
**Notes:** Such images generally represent intermediate or partial updates in GIF animations used for file optimization. They are not ment to be displayed to users of the animation. Viewable images in an animation should have a time delay of 3 or more centi-seconds (hundredths of a second).

However if all the frames have a zero time delay, then either the animation is as yet incomplete, or it is not a GIF animation. This is a non-sensible situation, so no image will be removed and a 'Zero Time Animation' warning (exception) given.

No warning will be given if no image was removed because all images had an appropriate non-zero time delay set.

Due to the special requirements of GIF disposal handling, GIF animations should be coalesced first, before calling this function, though that is not a requirement.

### 97.19.104 ResetImageAttributeIterator

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ResetImageAttributeIterator() resets the image attributes iterator.
**Notes:** Use it in conjunction with GetNextImageAttribute() to iterate over all the values associated with an image.

### 97.19.105 ResetImageProfileIterator

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image profile iterator.
**Notes:** Use it in conjunction with GetNextImageProfile() to iterate over all the profiles associated with an image.

### 97.19.106 Resize(width as Integer, height as Integer, FilterID as Integer, blur as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions.

**Notes:** Constants for the FilterID:

```
const PointFilter      =1
const BoxFilter        =2
const TriangleFilter   =3
const HermiteFilter    =4
const HanningFilter    =5
const HammingFilter    =6
const BlackmanFilter   =7
const GaussianFilter   =8
const QuadraticFilter  =9
const CubicFilter      =10
const CatromFilter     =11
const MitchellFilter   =12
const LanczosFilter    =13
const BesselFilter     =14
const SincFilter       =15
```

Most of the filters are FIR (finite impulse response), however, Bessel, Gaussian, and Sinc are IIR (infinite impulse response). Bessel and Sinc are windowed (brought down to zero) with the Blackman filter.
Sets the last exception property.

### 97.19.107 RGBTransformImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method RGBTransformImage converts the reference image from RGB to an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates which colorspace to transform the image.

Returns false on any error and true on success.

constants:

### 97.19.108 Roll(x as Integer, y as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll offsets an image as defined by x and y.

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.109 Rotate(degrees as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation of an image.
**Notes:** Method RotateImage creates a new image that is a rotated copy of an existing one. Positive angles rotate counter-clockwise (right-hand rule), while negative angles rotate clockwise. Rotated images are usually larger than the originals and have 'empty' triangular corners. X axis. Empty triangles left over from shearing the image are filled with the color specified by the image background_color. RotateImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Method RotateImage is based on the paper "A Fast Algorithm for General Raster Rotatation" by Alan W. Paeth. RotateImage is adapted from a similar method based on the Paeth paper written by Michael Halle of the Spatial Imaging Group, MIT Media Lab.

degrees: Specifies the number of degrees to rotate the image.

Sets the lastexception property.
Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.19.110 Sample(width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions with pixel sampling.
**Notes:** Unlike other scaling methods, this method does not introduce any additional color into the scaled image.
For more details please check the ImageMagick documentation.
Sets the last exception property.

### 97.19.111 Scale(width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Example:**

```
dim image as IMImageQ16MBS // your image
image=Image.Scale(100,80)
```

**Notes:** This method was designed by Bob Friesenhahn as a low cost thumbnail generator.

columns: The number of columns in the scaled image.
rows: The number of rows in the scaled image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.112 SetImageAttribute(key as string, value as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetImageAttribute searches the list of image attributes and replaces the attribute value.
**Notes:** If it is not found in the list, the attribute name and value is added to the list. If the attribute exists in the list, the value is concatenated to the attribute. SetImageAttribute returns True if the attribute is successfully concatenated or added to the list, otherwise False. If the value is "", the matching key is deleted from the list.

### 97.19.113 SetImageColorspace(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colorspace member of the Image structure.
**Notes:** Returns false on any error and true on success.

### 97.19.114 SetImageProfile(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a named profile to the image.
**Notes:** If a profile with the same name already exists, it is replaced. This method differs from the ProfileImage() method in that it does not apply CMS color profiles.

name: The profile name.
profiledata: The binary data of the profile.

Returns false on any error and true on success.

### 97.19.115 SetPicture(pic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the Image Magick Image at the given location.
**Example:**

```
dim image as IMImageQ16MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

image.SetPicture(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.

### 97.19.116 SetPictureMask(maskpic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the mask of the Image Magick Image at the given location.
**Example:**

```
dim i as IMImageQ16MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

i.SetPictureMask(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.
You may need to set matte=True after this.

### 97.19.117 SetPixel(x as Integer, y as Integer, newPixel as IMColorQ16MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a pixel value.
**Example:**

```
dim image as IMImageQ16MBS // your image
dim co as IMColorQ16MBS

co=new IMColorQ16MBS
co.blue=65535 // max value
image.SetPixel 50,50,co // Makes Pixel 50/50 blue
```

**Notes:** The method will fail silently if the values are out of bounds or the image is not a bitmap image.
This method works only for bitmap images.
x and y are zero based.

### 97.19.118 Shade(gray as boolean, azimuth as Double, elevation as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shines a distant light on an image to create a three-dimensional effect.
**Notes:** You control the positioning of the light with azimuth and elevation; azimuth is measured in degrees off the x axis and elevation is measured in pixels above the Z axis.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.119 SharpenChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Sharpen selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Laplacian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.120 Shave(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shave shaves pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.
Returns nil on any error.
Sets the last exception property.

### 97.19.121 Shear(Xshear as Double, Yshear as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ShearImage creates a new image that is a shear_image copy of an existing one.
**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, x_shear is measured relative to the Y axis, and similarly, for Y direction shears y_shear is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the color defined by the pixel at location (0,0). ShearImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Xshear and YYshear specify the number of degrees to shear the image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.122 Solarize(factor as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SolarizeImage produces a 'solarization' effect seen when exposing a photographic film to light during the development process.
**Notes:** factor: An double value that defines the extent of the solarization.
Returns nil on any error.
Sets the last exception property.

### 97.19.123 Splice(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splice splices a solid color into the image as defined by the geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.124 Spread(radius as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a special effects method that randomly displaces each pixel in a block defined by the radius parameter.
**Notes:** radius: Choose a random pixel in a neighborhood of this extent.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.19.125 Stegano(watermarkImage as IMImageQ16MBS) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SteganoImage hides a digital watermark within the image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.19.126 Stereo(otherImage as IMImageQ16MBS) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method StereoImage combines two images and produces a single image that is the composite of a left and right image of a stereo pair.
**Notes:** The left image is converted to gray scale and written to the red channel of the stereo image. The right image is converted to gray scale and written to the blue channel of the stereo image. View the composite image with red-blue glasses to create a stereo effect.

left image = self
right image = otherImage parameter

Returns nil on any error.
Sets the last exception property.

### 97.19.127 Swirl(degrees as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SwirlImage creates a new image that is a copy of an existing one with the image pixels "swirl" at a specified angle.
**Notes:** degrees: An double value that defines the tightness of the swirling.

Returns nil on any error.
Sets the last exception property.

### 97.19.128 Thumbnail(width as Integer, height as Integer) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Notes:** Sets the last exception property.
This method was designed by Bob Friesenhahn as a low cost thumbnail generator.
For more details please check the ImageMagick documentation.

### 97.19.129 TransformImage(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.
**Notes:** This should only be used for single images.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.19.130 TransformImages(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImages() calls TransformImage() on each image of a sequence.
**Notes:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.19.131 TransformRGBImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method TransformRGBImage converts the reference image from an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates the colorspace the image is currently in. On return the image is in the RGB color space.

Returns false on any error and true on success.

constants:

### 97.19.132 TransposeImage as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransposeImage() creates a horizontal mirror image by reflecting the pixels around the central y-axis while rotating them by 90 degrees.

### 97.19.133 TransverseImage as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

**Function:** TransverseImage() creates a vertical mirror image by reflecting the pixels around the central x-axis while rotating them by 270 degrees.

### 97.19.134 Trim as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim trims pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Returns nil on any error.
Sets the last exception property.

### 97.19.135 UnsharpMaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and UnsharpMask selects a suitable radius for you.

Constants for channel:

```
const UndefinedChannel = 0
const RedChannel = &h0001
const GrayChannel = &h0001
const CyanChannel = &h0001
const GreenChannel = &h0002
const MagentaChannel = &h0002
const BlueChannel = &h0004
const YellowChannel = &h0004
const AlphaChannel = &h0008
const OpacityChannel = &h0008
const BlackChannel = &h0020
const IndexChannel = &h0020
const AllChannels = &h7fffffff
```

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.19.136 Wave(amplitude as Double, wavelength as Double) as IMImageQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method Wave creates a new image that is a copy of an existing one with the image pixels altered along a sine wave.
**Notes:** Parameters are double values that indicates the amplitude and wavelength of the sine wave.
Returns nil on any error.
Sets the last exception property.

### 97.19.137 WhiteThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** WhiteThreshold is like Threshold but forces all pixels above the threshold into white while leaving all pixels below the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.19.138 WriteImage(info as IMImageInfoQ16MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method WriteImage writes an image to a file as defined by image.filename.
**Notes:** You can specify a particular image format by prefixing the file with the image type and a colon (i.e. ps:image) or specify the image type as the filename suffix (i.e. image.ps). The image may be modified to adapt it to the requirements of the image format. For example, DirectClass images must be color-reduced to PseudoClass if the format is GIF.

WriteImage returns True if the image is written. False is returned if there is a memory shortage or if the image file fails to write.

### 97.19.139 Properties

### 97.19.140 BackgroundColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.19.141 Bias as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.19.142 BlurFactor as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur factor to apply to the image when zooming. Default is 1.0 (no blur).
**Notes:** (Read and Write property)

### 97.19.143 BorderColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.19.144 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The desired number of colors.
**Notes:** Used by Quantize().
(Read and Write property)

### 97.19.145 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.19.146 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.
**Notes:** useful constants:

```
const UndefinedCompression      = 0
const NoCompression             = 1
const BZipCompression           = 2
const FaxCompression            = 3
const Group4Compression         = 4
const JPEGCompression           = 5
const LosslessJPEGCompression   = 6
const LZWCompression            = 7
const RLECompression            = 8
const ZipCompression            = 9
```

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.147 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.19.148 Directory as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile names from within an image montage.
**Notes:** Only valid after calling MontageImages() or reading a MIFF file which contains a directory.
(Read and Write property)

### 97.19.149 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.19.150 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.151 Filter as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter to use when resizing image.
**Notes:** Constants:

The reduction filter employed has a sipngicant effect on the time required to resize an image and the resulting quality. The default filter is Lanczos which has been shown to produce high quality results when reducing most images.
(Read and Write property)

### 97.19.152 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

```
const PointFilter      =1
const BoxFilter        =2
const TriangleFilter   =3
const HermiteFilter    =4
const HanningFilter    =5
const HammingFilter    =6
const BlackmanFilter   =7
const GaussianFilter   =8
const QuadraticFilter  =9
const CubicFilter      =10
const CatromFilter     =11
const MitchellFilter   =12
const LanczosFilter    =13
const BesselFilter     =14
const SincFilter       =15
```

### 97.19.153 Gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma level of the image.
**Notes:** The same color image displayed on two different workstations may look different due to differences in the display monitor. Use gamma correction to adjust for this color difference.
(Read and Write property)

### 97.19.154 Geometry as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size of the image when encoding.
**Notes:** (Read and Write property)

### 97.19.155 Gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.19.156 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an Image structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.157 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.158 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

(Read and Write property)

### 97.19.159 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.
(Read and Write property)

### 97.19.160 LastException as IMExceptionQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.161 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Notes:** (Read and Write property)

### 97.19.162 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.19.163 MatteColor as IMColorQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.19.164 Montage as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile size and offset within an image montage. Only valid for montage images.
**Notes:** (Read and Write property)

### 97.19.165 Offset as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of initial bytes to skip over when reading raw image.
**Notes:** (Read and Write property)

### 97.19.166 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.167 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Example:**

```
dim im as ImageMagickQ16MBS // global
```

```
Function TestJPEG(f as folderitem) As picture
// Reads an image, compresses in memory to JPEG, decompresses using JPEGlib and returns the image
// if quality setting works, you see it in the result.
// no error checking included!

// needs: im as ImageMagickQ16MBS ready initialized

dim image as IMImageQ16MBS
dim imageinfo as IMImageInfoQ16MBS
dim s,blob as string
dim p as Picture
dim i as Integer

if f = nil then
Return nil
end if

imageinfo = im.NewImageInfo

imageinfo.Filename = f.NativePath

//this should read any image IM understands
image = im.ReadImage(imageinfo)
//check for error
if im.lastexception <>nil and im.LastException.Severity >= 400 then
s = "LastError: "+Format(im.LastError,"-0")+" - Severity: "+str(im.LastException.Severity)+EndOfLine+im.Las-
tException.Reason
MsgBox s
Return nil
elseif image = nil then
MsgBox "image=nil"
Return nil
end if

// Now lets convert to jpeg
imageinfo.Filename = "image.jpg"
imageinfo.Quality = 10 // 100 is max
blob = image.ImageToBlob(imageinfo)

// It may fail
if blob.lenb = 0 then
Return nil
end if
p = JPEGStringToPictureMBS(blob,true)

image.DestroyImage
imageinfo.DestroyImageInfo
```

```
Return p
Exception
Return nil
End Function
```

**Notes:** Default value is 75.
(Read and Write property)

### 97.19.168 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.19.169 RenderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent to use.
**Notes:** constants:

| | |
|---|---|
| UndefinedIntent | 0 |
| SaturationIntent | 1 |
| PerceptualIntent | 2 |
| AbsoluteIntent | 3 |
| RelativeIntent | 4 |

(Read and Write property)

### 97.19.170 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

(Read and Write property)

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

### 97.19.171 ResolutionX as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution of the image.
**Notes:** The unit for resolution must be specified.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.172 ResolutionY as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution of the image.
**Notes:** The unit for resolution must be specified.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.173 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.19.174 StorageClass as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image storage class.
**Notes:** If DirectClass then the image packets contain valid RGB or CMYK colors. If PseudoClass then the image has a colormap referenced by pixel's index member.

constants:

| | | |
|---|---|---|
| UndefinedClass | 0 | Unset value. |
| DirectClass | 1 | Image is composed of pixels which represent literal color values. |
| PseudoClass | 2 | Image is composed of pixels which specify an index in a color palette. |

(Read and Write property)

### 97.19.175 Taint as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to True if the image pixels have been modified.
**Notes:** (Read and Write property)

### 97.19.176 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.19.177 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kBackgroundDispose | 2 | One of the Image layer Dispose Types. |
| kCoalesceLayer | 1 | One of the Image layer method constants. |
| kCompareAnyLayer | 2 | One of the Image layer method constants. |
| kCompareClearLayer | 3 | One of the Image layer method constants. |
| kCompareOverlayLayer | 4 | One of the Image layer method constants. |
| kCompositeLayer | 12 | One of the Image layer method constants. |
| kDisposeLayer | 5 | One of the Image layer method constants. |
| kFlattenLayer | 14 | One of the Image layer method constants. |
| kMergeLayer | 13 | One of the Image layer method constants. |
| kMosaicLayer | 15 | One of the Image layer method constants. |
| kNoneDispose | 1 | One of the Image layer Dispose Types. |
| kOptimizeImageLayer | 7 | One of the Image layer method constants. |
| kOptimizeLayer | 6 | One of the Image layer method constants. |
| kOptimizePlusLayer | 8 | One of the Image layer method constants. |
| kOptimizeTransLayer | 9 | One of the Image layer method constants. |
| kPreviousDispose | 3 | One of the Image layer Dispose Types. |
| kRemoveDupsLayer | 10 | One of the Image layer method constants. |
| kRemoveZeroLayer | 11 | One of the Image layer method constants. |
| kUndefinedDispose | 0 | One of the Image layer Dispose Types. |
| kUndefinedLayer | 0 | One of the Image layer method constants. |
| kUnrecognizedDispose | 0 | One of the Image layer Dispose Types. |

Distortion Effects

| Constant | Value | Description |
|---|---|---|
| kAffineDistortion | 1 | |
| kAffineDistortion | 1 | |
| kAffineProjectionDistortion | 2 | |
| kAffineProjectionDistortion | 2 | |
| kArcDistortion | 9 | |
| kArcDistortion | 9 | |
| kBarrelDistortion | 14 | |
| kBarrelDistortion | 14 | |
| kBarrelInverseDistortion | 15 | |
| kBarrelInverseDistortion | 15 | |
| kBilinearDistortion | 6 | |
| kBilinearDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearReverseDistortion | 7 | |
| kBilinearReverseDistortion | 7 | |
| kCylinder2PlaneDistortion | 12 | |
| kCylinder2PlaneDistortion | 12 | |
| kDePolarDistortion | 11 | |
| kDePolarDistortion | 11 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPlane2CylinderDistortion | 13 | |
| kPlane2CylinderDistortion | 13 | |
| kPolarDistortion | 10 | |
| kPolarDistortion | 10 | |
| kPolynomialDistortion | 8 | |
| kPolynomialDistortion | 8 | |
| kResizeDistortion | 17 | |
| kResizeDistortion | 17 | |
| kScaleRotateTranslateDistortion | 3 | |
| kScaleRotateTranslateDistortion | 3 | |
| kSentinelDistortion | 18 | |
| kSentinelDistortion | 18 | |
| kShepardsDistortion | 16 | |
| kShepardsDistortion | 16 | |
| kUndefinedDistortion | 0 | |
| kUndefinedDistortion | 0 | |

Interpolate Modes

| Constant | Value | Description |
|---|---|---|
| kBarycentricColorInterpolate | 1 | |
| kBarycentricColorInterpolate | 1 | |
| kBilinearColorInterpolate | 7 | |
| kBilinearColorInterpolate | 7 | |
| kInverseColorInterpolate | 19 | |
| kInverseColorInterpolate | 19 | |
| kPolynomialColorInterpolate | 8 | |
| kPolynomialColorInterpolate | 8 | |
| kShepardsColorInterpolate | 16 | |
| kShepardsColorInterpolate | 16 | |
| kUndefinedColorInterpolate | 0 | |
| kUndefinedColorInterpolate | 0 | |
| kVoronoiColorInterpolate | 18 | |
| kVoronoiColorInterpolate | 18 | |

# 97.20 class IMImageQ32MBS

## 97.20.1 class IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an Image Magick Image in memory.
**Notes:** Can exist with or without pixel data.

For more details please check the ImageMagick documentation.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr4

## 97.20.2 Methods

## 97.20.3 AdaptiveThreshold(width as Integer, height as Integer, offset as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AdaptiveThreshold selects an individual threshold for each pixel based on the range of intensity values in its local neighborhood.
**Notes:** This allows for thresholding of an image whose global intensity histogram doesn't contain distinctive peaks.
Sets the last exception property.

width: The width of the local neighborhood.
height: The height of the local neighborhood.
offset: The mean offset.

For more details please check the ImageMagick documentation.

## 97.20.4 AddNoise(NoiseType as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds random noise to the image.
**Notes:** Constants

For more details please check the ImageMagick documentation.
Sets the last exception property.

| | |
|---|---|
| UndefinedNoise | =0 |
| UniformNoise | =1 |
| GaussianNoise | =2 |
| MultiplicativeGaussianNoise | =3 |
| ImpulseNoise | =4 |
| LaplacianNoise | =5 |
| PoissonNoise | =6 |

### 97.20.5 AffineTransformImage(matrix as IMImageAffineMatrixQ32MBS) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms an image as dictated by the affine matrix.

### 97.20.6 AppendImageToList(img as IMImageQ32MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.7 AutoGammaImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** Returns true on success or false on failure.

### 97.20.8 AutoGammaImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** Returns true on success or false on failure.

channelType: The channels to auto-level. If the special 'SyncChannels' flag is set all given channels is adjusted in the same way using the mean average of those channels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.9 AutoLevelImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

### 97.20.10 AutoLevelImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.11 Average as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Average() method takes a set of images and averages them together.
**Notes:** Each image in the set must have the same width and height. Average() returns a single image with each corresponding pixel component of each image averaged. On failure, a nil image is returned and exception describes the reason for the failure.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.12 BilevelChannel(channel as Integer, threshold as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the value of individual pixels based on the intensity of each pixel channel.
**Notes:** The result is a high-contrast image.

channel: The channel type.
threshold: define the threshold values.

Constants for channel:

For more details please check the ImageMagick documentation.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.13 BlackThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** BlackThreshold is like Threshold but forces all pixels below the threshold into black while leaving all pixels above the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.20.14 BlobSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The expected size for this image written to a file.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.15 Blur(radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImage selects a suitable radius for you.

radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

For more details please check the ImageMagick documentation.

### 97.20.16 BlurImageChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImageChannel selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.20.17 BorderImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Surrounds the image with a border of the color defined by the bordercolor member of the image.
**Notes:** The width and height of the border are defined by the corresponding parameters.

### 97.20.18 BrightnessContrastImage(brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).

### 97.20.19 BrightnessContrastImageChannel(ChannelType as Integer, brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).
ChannelType: The channels to use.

Constants for channel:

### 97.20.20 Charcoal(radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Charcoal creates a new image that is a copy of an existing one with the edge highlighted.
**Notes:** radius: the radius of the pixel neighborhood.
sigma: The standard deviation of the Gaussian, in pixels.

Returns nil on any error.
Sets the last exception property.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.21 Chop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chop removes a region of an image and collapses the image to occupy the removed portion.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.22 ClipPath(path as string, inside as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image clip mask based any clipping path information if it exists.
**Notes:**

| | |
|---|---|
| pathname: | name of clipping path resource. If name is preceded by #, use clipping path numbered by name. |
| inside: | if true, later operations take effect inside clipping path. Otherwise later operations take effect outside clipping path. |

Returns true on success and false on any error.

### 97.20.23 Clone as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this image object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.24 CloneImageAttributes(image as IMImageAttributeQ32MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CloneImageAttributes() clones one or more image attributes.
**Notes:** Returns false on any error.

### 97.20.25 CloneImageProfiles(SourceImage as IMImageQ32MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones one or more image profiles.
**Notes:** Returns false on any error and true on success.

### 97.20.26 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.20.27 ClutImage(clutImage as IMImageQ32MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either

for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.

Returns true on success or false on failure.

### 97.20.28 ClutImageChannel(ChannelType as Integer, clutImage as IMImageQ32MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.
ChannelType: The channels to use.

Returns true on success or false on failure.

Constants for channel:

### 97.20.29 CoalesceImages as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CoalesceImages composites a set of images while respecting any page offsets and disposal meth-

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

ods.
**Notes:** GIF, MIFF, and MNG animation sequences typically start with an image background and each subsequent image varies in size and offset. CoalesceImages() returns a new sequence where each image in the sequence is the same size as the first and composited with the next image in the sequence.

Returns nil on any error.
Sets the last exception property.

### 97.20.30 Colorize(opacity as string, PenColorRed as Integer, PenColorGreen as Integer, PenColorBlue as Integer, PenColorOpacity as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ColorizeImage creates a new image that is a copy of an existing one with the image pixels colorized.
**Notes:** The colorization is controlled with the pen color and the opacity levels.

opacity: A character string indicating the level of opacity as a percentage (0-100).
PenColorRed, PenColorGreen, PenColorBlue and PenColorOpacity define the pen color used.

Returns nil on any error.
Sets the last exception property.

### 97.20.31 Combine(channel as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines one or more images into a single image.
**Notes:** The grayscale value of the pixels of each image in the sequence is assigned in order to the specified channels of the combined image. The typical ordering would be image 1 =>Red, 2 =>Green, 3 =>Blue, etc.

The lastexception property is set.

### 97.20.32 CompareImageLayers(ImageLayerMethod as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CompareImageLayers() compares each image with the next in a sequence and returns the minimum bounding region of all the pixel differences (of the mageLayerMethod specified) it discovers.
**Notes:** Images do NOT have to be the same size, though it is best that all the images are 'coalesced' (images are all the same size, on a flattened canvas, so as to represent exactly how an specific frame should look).

No GIF dispose methods are applied, so GIF animations must be coalesced before applying this image operator to find differences to them.

ImageLayerMethod:
the layers type to compare images with. Must be one of... CompareAnyLayer, CompareClearLayer, CompareOverlayLayer.

Can raise an exception.

### 97.20.33 Composite(ComposeOperator as Integer, Image as IMImageQ32MBS, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the second image composited onto the first at the specified offsets.
**Notes:** compose: Specifies an image composite operator.
Image: The second image.
x: An integer that specifies the column offset of the composited image.
y: An integer that specifies the row offset of the composited image.

No error code and exception!

### 97.20.34 ConsolidateCMYKImages as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Consolidates a sequence of CMYK images.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.35 ContrastImage(sharpen as boolean) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the intensity differences between the lighter and darker elements of the image.
**Notes:** Returns true on success or false on failure.
Set sharpen to true to increase the image contrast otherwise the contrast is reduced.

### 97.20.36 CopyPicture as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ32MBS // your image
Canvas1.Backdrop=image.CopyPicture
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.20.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15527

### 97.20.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ32MBS // your image
Canvas1.Backdrop=image.CopyPicture(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

- 97.20.36 CopyPicture as picture 15527

### 97.20.38 CopyPictureMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ32MBS // your image
Canvas1.Backdrop=image.CopyPictureMask
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.20.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15528

### 97.20.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ32MBS // your image
Canvas1.Backdrop=image.CopyPictureMask(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

• 97.20.38 CopyPictureMask as picture 15528

### 97.20.40 CopyPixel(x as Integer, y as Integer) as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a pixel.
**Notes:** Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.

### 97.20.41 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Creates a HBITMAP for the image for use with Windows Declares.
**Notes:** The HBITMAP returned needs to be freed when you are done with it or you risk having a memory leak.

### 97.20.42 Crop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop extracts a region of the image starting at the offset defined by geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.43 CropImageToTiles(CropGeometry as string) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crops a single image, into a possible list of tiles.
**Notes:** This may include a single sub-region of the image. This basically applies all the normal geometry flags for Crop.

### 97.20.44 CycleColormap(displace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Displaces an image's colormap by a given number of positions.
**Notes:** If you cycle the colormap a number of times you can produce a psychodelic effect.
Returns true on success.
displace: displace the colormap this amount.

### 97.20.45 DecipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts cipher pixels to plain pixels.
**Notes:** Passkey: decipher cipher pixels with this passphrase.
Returns true on success.

### 97.20.46 DeconstructImages as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeconstructImages() compares each image with the next in a sequence and returns the minimum bounding region of all differences from the first image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.47 DeleteImageAttribute(key as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteImageAttribute() deletes an attribute from the image.
**Notes:** Returns false on any error.

### 97.20.48 Despeckle() as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the speckle noise in an image while perserving the edges of the original image.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.49 DestroyImage

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases the memory used for this image and sets handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.20.50 DestroyImageAttributes

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deallocates memory associated with the image attribute list.

### 97.20.51 DestroyImageList

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image list and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.20.52 DestroyImageProfiles

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases memory associated with an image profile map.

### 97.20.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DistortImage() distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

A description of each parameter follows:
self: the image to be distorted.
m: the method of image distortion. ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center. Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided. Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.
values: arguments given.
bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

See also:

- 97.20.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS 15532

### 97.20.54 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DistortImage() distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

A description of each parameter follows:
self: the image to be distorted.
m: the method of image distortion. ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center. Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided. Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.
values: arguments given.
bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

See also:

- 97.20.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ32MBS 15531

### 97.20.55 Edge(radius as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds edges in an image.
**Notes:** Radius defines the radius of the convolution filter. Use a radius of 0 and Edge selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.56 Emboss(radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a grayscale image with a three-dimensional effect.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Emboss selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.57 EncipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts pixels to cipher-pixels.
**Notes:** passkey: encipher pixels with this passphrase.
Returns true on success.

### 97.20.58 EqualizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

### 97.20.59 EqualizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

Constants for channel:

```
const UndefinedChannel  = 0
const RedChannel        = &h0001
const GrayChannel       = &h0001
const CyanChannel       = &h0001
const GreenChannel      = &h0002
const MagentaChannel    = &h0002
const BlueChannel       = &h0004
const YellowChannel     = &h0004
const AlphaChannel      = &h0008
const OpacityChannel    = &h0008
const BlackChannel      = &h0020
const IndexChannel      = &h0020
const AllChannels       = &h7fffffff
```

### 97.20.60 ExcerptImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a excerpt of the image as defined by the geometry.
**Notes:** Define the region of the image to extend with x, y, width, and height.

### 97.20.61 ExtentImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends the image as defined by the geometry, gravity, and image background color.
**Notes:** Define the region of the image to extend with x, y, width, and height.

Set the (x,y) offset of the geometry to move the original image relative to the extended image.

### 97.20.62 FlattenImages as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flatten composites all images from the current image pointer to the end of the image list and returns a single flattened image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.63 Flip as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip creates a vertical mirror image by reflecting the pixels around the central x-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.64 Flop as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flop creates a horizontal mirror image by reflecting the pixels around the central y-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.65 FrameImage(x as Integer, y as Integer, width as Integer, height as Integer, innerBevel as Integer, OuterBevel as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a simulated three-dimensional border around the image.
**Notes:** The color of the border is defined by the MatteColor of image. Width and height specify the border width of the vertical and horizontal sides of the frame. innerBevel and OuterBevel indicate the width of the inner and outer shadows of the frame.

### 97.20.66 FxImage(expression as string) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FxImage() applies a mathematical expression to the specified image.
**Notes:** Can raise an exception.

### 97.20.67 GaussianBlurChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and GaussianBlur selects a suitable radius for you.
Sets the last exception property.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
channel: The channel type.
sigma: the standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.20.68 GetImageAttribute(key as string) as IMImageAttributeQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageAttribute searches the list of image attributes and returns a reference to the attribute if it exists otherwise nil.

### 97.20.69 GetImageClippingPathAttribute as IMImageAttributeQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageClippingPathAttribute searches the list of image attributes and returns a reference to a clipping path if it exists otherwise nil.

### 97.20.70 GetImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a profile associated with an image by name.
**Notes:** Returns "" on any error.

### 97.20.71 GetNextImageAttribute as IMImageAttributeQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetNextImageAttribute() gets the next image attribute.
**Notes:** Returns nil on any error.

### 97.20.72 GetNextImageProfile as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the next profile name for an image.
**Notes:** Returns "" on any error.

### 97.20.73 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole Image structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.20.74 ImagesToBlob(info as IMImageInfoQ32MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.
For more details please check the ImageMagick documentation.

### 97.20.75 ImageToBlob(info as IMImageInfoQ32MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Example:**

```
dim im as ImageMagickQ32MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ32MBS
dim imageinfo as IMImageInfoQ32MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ32MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
```

```
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.
For more details please check the ImageMagick documentation.

### 97.20.76 Implode(factor as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ImplodeImage creates a new image that is a copy of an existing one with the image pixels "implode" by the specified percentage.
**Notes:** factor: A double value that defines the extent of the implosion.

Returns nil on any error.
Sets the last exception property.

### 97.20.77 IsBlobExempt as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is exempt.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.78 IsBlobSeekable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is seekable.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.79 IsBlobTemporary as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is temporary.
**Notes:** For more details please check the ImageMagick documentation.

### 97.20.80 Magnify as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to twice its size.
**Notes:** Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.81 MedianFilter(radius as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a digital filter that improves the quality of a noisy image.
**Notes:** Each pixel is replaced by the median in a set of neighboring pixels as defined by radius.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.82 MergeImageLayers(ImageLayerMethod as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MergeImageLayers() composes all the image layers from the current given image onward to produce a single image of the merged layers.
**Notes:** The inital canvas's size depends on the given ImageLayerMethod, and is initialized using the first images images background color. The images are then compositied onto that image in sequence using the given composition that has been assigned to each individual image.

ImageLayerMethod:
the method of selecting the size of the initial canvas.

MergeLayer: Merge all layers onto a canvas just large enough to hold all the actual images. The virtual canvas of the first image is preserved but otherwise ignored.

FlattenLayer: Use the virtual canvas size of first image. Images which fall outside this canvas is clipped. This can be used to 'fill out' a given virtual canvas.

MosaicLayer: Start with the virtual canvas of the first image, enlarging left and right edges to contain all images. Images with negative offsets will be clipped.

Can raise an exception.

### 97.20.83 Minify as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to half its size.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.84 MosaicImages as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MosaicImages inlays an image sequence to form a single coherent picture.
**Notes:** It returns a single image with each image in the sequence composited at the location defined by the page member of the image structure.
Returns nil on any error.
Sets the last exception property.

### 97.20.85 MotionBlur(radius as Double, sigma as Double, angle as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simulates motion blur.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and MotionBlur selects a suitable radius for you. Angle gives the angle of the blurring motion.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.86 NegateImage(gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

gray: If true, only negate grayscale pixels within the image.

### 97.20.87 NegateImageChannel(ChannelType as Integer, gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

ChannelType: The channels to use.
gray: If true, only negate grayscale pixels within the image.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.88 NewImage(info as IMImageInfoQ32MBS, width as Integer, height as Integer, background as IMMagickPixelPacketQ32MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image.
**Example:**

```
dim im as ImageMagickQ32MBS // global
dim p as picture
dim imageinfo as IMImageInfoQ32MBS
dim image as IMImageQ32MBS
dim b as new IMMagickPixelPacketQ32MBS
b.Blue=65535
b.ColorSpace=1 // RGB
b.Depth=16
```

```
imageinfo = im.NewImageInfo
imageinfo.Depth=16
imageinfo.ColorSpace=1

//this should read any image IM understands
image = new IMImageQ32MBS
if image.NewImage(imageinfo,500,500,b) then
p=New Picture(300,300,32)
p.Graphics.ForeColor=Rgb(255,0,0)
p.Graphics.FillOval 0,0,300,300
image.SetPicture p,0,0
else
MsgBox "failed"
end if
```

**Notes:** Returns false on failure and true on success.

### 97.20.89 NormalizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

### 97.20.90 NormalizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.20.91 OilPaint(radius as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method OilPaintImage creates a new image that is a copy of an existing one with each pixel component replaced with the color of greatest frequency in a circular neighborhood.
**Notes:** radius parameter: radius of the circular neighborhood.
Returns nil on any error.
Sets the last exception property.

### 97.20.92 OptimizeImageLayers as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageLayers() compares each image the GIF disposed forms of the previous image in the sequence.
**Notes:** From this it attempts to select the smallest cropped image to replace each frame, while preserving the results of the GIF animation.

Can raise an exception.

### 97.20.93 OptimizeImageTransparency

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageTransparency() takes a frame optimized GIF animation, and compares the overlayed pixels against the disposal image resulting from all the previous frames in the animation.
**Notes:** Any pixel that does not change the disposal image (and thus does not effect the outcome of an

overlay) is made transparent.

WARNING: This modifies the current images directly, rather than generate a new image sequence.

Can raise an exception.

### 97.20.94 OptimizePlusImageLayers as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImagePlusLayers() is exactly as OptimizeImageLayers(), but may also add or even remove extra frames in the animation, if it improves the total number of pixels in the resulting GIF animation.
**Notes:** Can raise an exception.

### 97.20.95 ProfileImage(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds or removes a ICC, IPTC, or generic profile from an image.
**Notes:** If the ProfileData is "", it is removed from the image otherwise added. Use a name of '*' and a ProfileData of "" to remove all profiles from the image.

Returns false on any error and true on success.

### 97.20.96 RadialBlur(angle as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RadialBlur applies a radial blur to the image.
**Notes:** angle: The angle of the radial blur.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.97 RaiseImage(x as Integer, y as Integer, width as Integer, height as Integer, raise as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a simulated three-dimensional button-like effect by lightening and darkening the edges of the image.
**Notes:** Width and height define the width of the vertical and horizontal edge of the effect.
raise: A value other than zero creates a 3-D raise effect, otherwise it has a lowered effect.

### 97.20.98 RandomThresholdChannel(channel as Integer, thresholds as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Canges the value of individual pixels based on the intensity of each pixel compared to a random threshold.
**Notes:** The result is a low-contrast, two color image.

channel: The channel or channels to be thresholded.
thresholds: a geometry string containing low,high thresholds. If the string contains 2x2, 3x3, or 4x4, an ordered dither of order 2, 3, or 4 is performed instead. (ASCII string)

Sets the last exception property.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.20.99 ReduceNoise(radius as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Smooths the contours of an image while still preserving edge information.
**Notes:** The algorithm works by replacing each pixel with its neighbor closest in value. A neighbor is defined by radius. Use a radius of 0 and ReduceNoise selects a suitable radius for you.

For more details please check the ImageMagick documentation.

### 97.20.100 RemoveDuplicateLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that is exactly the same as the next image in the given image list.
**Notes:** Image size and virtual canvas offset must also match, though not the virtual canvas size itself.

No check is made with regards to image disposal setting, though it is the dispose setting of later image that is kept. Also any time delays are also added together. As such coalesced image animations should still produce the same result, though with duplicte frames merged into a single frame.

### 97.20.101 RemoveFirstImageFromList as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the first image from the image list and returns the image.
**Notes:** Returns nil on any error.
For more details please check the ImageMagick documentation.

### 97.20.102 RemoveImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a profile from the image-map by its name.

### 97.20.103 RemoveZeroDelayLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that as a zero delay time.
**Notes:** Such images generally represent intermediate or partial updates in GIF animations used for file optimization. They are not ment to be displayed to users of the animation. Viewable images in an animation should have a time delay of 3 or more centi-seconds (hundredths of a second).

However if all the frames have a zero time delay, then either the animation is as yet incomplete, or it is not a GIF animation. This is a non-sensible situation, so no image will be removed and a 'Zero Time Animation' warning (exception) given.

No warning will be given if no image was removed because all images had an appropriate non-zero time delay set.

Due to the special requirements of GIF disposal handling, GIF animations should be coalesced first, before calling this function, though that is not a requirement.

### 97.20.104 ResetImageAttributeIterator

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ResetImageAttributeIterator() resets the image attributes iterator.
**Notes:** Use it in conjunction with GetNextImageAttribute() to iterate over all the values associated with an image.

### 97.20.105 ResetImageProfileIterator

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image profile iterator.
**Notes:** Use it in conjunction with GetNextImageProfile() to iterate over all the profiles associated with an image.

### 97.20.106 Resize(width as Integer, height as Integer, FilterID as Integer, blur as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions.

**Notes:** Constants for the FilterID:

```
const PointFilter      =1
const BoxFilter        =2
const TriangleFilter   =3
const HermiteFilter    =4
const HanningFilter    =5
const HammingFilter    =6
const BlackmanFilter   =7
const GaussianFilter   =8
const QuadraticFilter  =9
const CubicFilter      =10
const CatromFilter     =11
const MitchellFilter   =12
const LanczosFilter    =13
const BesselFilter     =14
const SincFilter       =15
```

Most of the filters are FIR (finite impulse response), however, Bessel, Gaussian, and Sinc are IIR (infinite impulse response). Bessel and Sinc are windowed (brought down to zero) with the Blackman filter.
Sets the last exception property.

### 97.20.107 RGBTransformImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method RGBTransformImage converts the reference image from RGB to an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates which colorspace to transform the image.

Returns false on any error and true on success.

constants:

### 97.20.108 Roll(x as Integer, y as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll offsets an image as defined by x and y.

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.109 Rotate(degrees as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation of an image.
**Notes:** Method RotateImage creates a new image that is a rotated copy of an existing one. Positive angles rotate counter-clockwise (right-hand rule), while negative angles rotate clockwise. Rotated images are usually larger than the originals and have 'empty' triangular corners. X axis. Empty triangles left over from shearing the image are filled with the color specified by the image background_color. RotateImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Method RotateImage is based on the paper "A Fast Algorithm for General Raster Rotatation" by Alan W. Paeth. RotateImage is adapted from a similar method based on the Paeth paper written by Michael Halle of the Spatial Imaging Group, MIT Media Lab.

degrees: Specifies the number of degrees to rotate the image.

Sets the lastexception property.
Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.20.110 Sample(width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions with pixel sampling.
**Notes:** Unlike other scaling methods, this method does not introduce any additional color into the scaled image.
For more details please check the ImageMagick documentation.
Sets the last exception property.

### 97.20.111 Scale(width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Example:**

```
dim image as IMImageQ32MBS // your image
image=Image.Scale(100,80)
```

**Notes:** This method was designed by Bob Friesenhahn as a low cost thumbnail generator.

columns: The number of columns in the scaled image.
rows: The number of rows in the scaled image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.112 SetImageAttribute(key as string, value as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetImageAttribute searches the list of image attributes and replaces the attribute value.
**Notes:** If it is not found in the list, the attribute name and value is added to the list. If the attribute exists in the list, the value is concatenated to the attribute. SetImageAttribute returns True if the attribute is successfully concatenated or added to the list, otherwise False. If the value is "", the matching key is deleted from the list.

### 97.20.113 SetImageColorspace(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colorspace member of the Image structure.
**Notes:** Returns false on any error and true on success.

### 97.20.114 SetImageProfile(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a named profile to the image.
**Notes:** If a profile with the same name already exists, it is replaced. This method differs from the ProfileImage() method in that it does not apply CMS color profiles.

name: The profile name.
profiledata: The binary data of the profile.

Returns false on any error and true on success.

### 97.20.115 SetPicture(pic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the Image Magick Image at the given location.
**Example:**

```
dim image as IMImageQ32MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

image.SetPicture(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.

### 97.20.116 SetPictureMask(maskpic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the mask of the Image Magick Image at the given location.
**Example:**

```
dim i as IMImageQ32MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

i.SetPictureMask(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.
You may need to set matte=True after this.

### 97.20.117 SetPixel(x as Integer, y as Integer, newPixel as IMColorQ32MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a pixel value.
**Example:**

```
dim image as IMImageQ32MBS // your image
dim co as IMColorQ32MBS

co=new IMColorQ32MBS
co.blue=65535 // max value
image.SetPixel 50,50,co // Makes Pixel 50/50 blue
```

**Notes:** The method will fail silently if the values are out of bounds or the image is not a bitmap image.
This method works only for bitmap images.
x and y are zero based.

### 97.20.118 Shade(gray as boolean, azimuth as Double, elevation as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shines a distant light on an image to create a three-dimensional effect.
**Notes:** You control the positioning of the light with azimuth and elevation; azimuth is measured in degrees off the x axis and elevation is measured in pixels above the Z axis.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.119 SharpenChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Sharpen selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Laplacian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.120 Shave(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shave shaves pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.
Returns nil on any error.
Sets the last exception property.

### 97.20.121 Shear(Xshear as Double, Yshear as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ShearImage creates a new image that is a shear_image copy of an existing one.
**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, x_shear is measured relative to the Y axis, and similarly, for Y direction shears y_shear is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the color defined by the pixel at location (0,0). ShearImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Xshear and YYshear specify the number of degrees to shear the image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.122 Solarize(factor as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SolarizeImage produces a 'solarization' effect seen when exposing a photographic film to light during the development process.
**Notes:** factor: An double value that defines the extent of the solarization.
Returns nil on any error.
Sets the last exception property.

### 97.20.123 Splice(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splice splices a solid color into the image as defined by the geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.124 Spread(radius as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a special effects method that randomly displaces each pixel in a block defined by the radius parameter.
**Notes:** radius: Choose a random pixel in a neighborhood of this extent.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.20.125 Stegano(watermarkImage as IMImageQ32MBS) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SteganoImage hides a digital watermark within the image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.20.126 Stereo(otherImage as IMImageQ32MBS) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method StereoImage combines two images and produces a single image that is the composite of a left and right image of a stereo pair.
**Notes:** The left image is converted to gray scale and written to the red channel of the stereo image. The right image is converted to gray scale and written to the blue channel of the stereo image. View the composite image with red-blue glasses to create a stereo effect.

left image = self
right image = otherImage parameter

Returns nil on any error.
Sets the last exception property.

### 97.20.127 Swirl(degrees as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SwirlImage creates a new image that is a copy of an existing one with the image pixels "swirl" at a specified angle.
**Notes:** degrees: An double value that defines the tightness of the swirling.

Returns nil on any error.
Sets the last exception property.

### 97.20.128 Thumbnail(width as Integer, height as Integer) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Notes:** Sets the last exception property.
This method was designed by Bob Friesenhahn as a low cost thumbnail generator.
For more details please check the ImageMagick documentation.

### 97.20.129 TransformImage(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.
**Notes:** This should only be used for single images.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.20.130 TransformImages(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImages() calls TransformImage() on each image of a sequence.
**Notes:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.20.131 TransformRGBImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method TransformRGBImage converts the reference image from an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates the colorspace the image is currently in. On return the image is in the RGB color space.

Returns false on any error and true on success.

constants:

### 97.20.132 TransposeImage as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransposeImage() creates a horizontal mirror image by reflecting the pixels around the central y-axis while rotating them by 90 degrees.

### 97.20.133 TransverseImage as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

**Function:** TransverseImage() creates a vertical mirror image by reflecting the pixels around the central x-axis while rotating them by 270 degrees.

### 97.20.134 Trim as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim trims pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Returns nil on any error.
Sets the last exception property.

### 97.20.135 UnsharpMaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and UnsharpMask selects a suitable radius for you.

Constants for channel:

```
const UndefinedChannel = 0
const RedChannel = &h0001
const GrayChannel = &h0001
const CyanChannel = &h0001
const GreenChannel = &h0002
const MagentaChannel = &h0002
const BlueChannel = &h0004
const YellowChannel = &h0004
const AlphaChannel = &h0008
const OpacityChannel = &h0008
const BlackChannel = &h0020
const IndexChannel = &h0020
const AllChannels = &h7fffffff
```

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.20.136 Wave(amplitude as Double, wavelength as Double) as IMImageQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method Wave creates a new image that is a copy of an existing one with the image pixels altered along a sine wave.
**Notes:** Parameters are double values that indicates the amplitude and wavelength of the sine wave.
Returns nil on any error.
Sets the last exception property.

### 97.20.137 WhiteThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** WhiteThreshold is like Threshold but forces all pixels above the threshold into white while leaving all pixels below the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.20.138 WriteImage(info as IMImageInfoQ32MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method WriteImage writes an image to a file as defined by image.filename.
**Notes:** You can specify a particular image format by prefixing the file with the image type and a colon (i.e. ps:image) or specify the image type as the filename suffix (i.e. image.ps). The image may be modified to adapt it to the requirements of the image format. For example, DirectClass images must be color-reduced to PseudoClass if the format is GIF.

WriteImage returns True if the image is written. False is returned if there is a memory shortage or if the image file fails to write.

### 97.20.139 Properties

### 97.20.140 BackgroundColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.20.141 Bias as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.20.142 BlurFactor as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur factor to apply to the image when zooming. Default is 1.0 (no blur).
**Notes:** (Read and Write property)

### 97.20.143 BorderColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.20.144 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The desired number of colors.
**Notes:** Used by Quantize().
(Read and Write property)

### 97.20.145 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.20.146 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.
**Notes:** useful constants:

```
const UndefinedCompression        = 0
const NoCompression               = 1
const BZipCompression             = 2
const FaxCompression              = 3
const Group4Compression           = 4
const JPEGCompression             = 5
const LosslessJPEGCompression     = 6
const LZWCompression              = 7
const RLECompression              = 8
const ZipCompression              = 9
```

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.147 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.20.148 Directory as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile names from within an image montage.
**Notes:** Only valid after calling MontageImages() or reading a MIFF file which contains a directory.
(Read and Write property)

### 97.20.149 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.20.150 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.151 Filter as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter to use when resizing image.
**Notes:** Constants:

The reduction filter employed has a sipngicant effect on the time required to resize an image and the resulting quality. The default filter is Lanczos which has been shown to produce high quality results when reducing most images.
(Read and Write property)

### 97.20.152 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

| | |
|---|---|
| const PointFilter | =1 |
| const BoxFilter | =2 |
| const TriangleFilter | =3 |
| const HermiteFilter | =4 |
| const HanningFilter | =5 |
| const HammingFilter | =6 |
| const BlackmanFilter | =7 |
| const GaussianFilter | =8 |
| const QuadraticFilter | =9 |
| const CubicFilter | =10 |
| const CatromFilter | =11 |
| const MitchellFilter | =12 |
| const LanczosFilter | =13 |
| const BesselFilter | =14 |
| const SincFilter | =15 |

### 97.20.153 Gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma level of the image.
**Notes:** The same color image displayed on two different workstations may look different due to differences in the display monitor. Use gamma correction to adjust for this color difference.
(Read and Write property)

### 97.20.154 Geometry as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size of the image when encoding.
**Notes:** (Read and Write property)

### 97.20.155 Gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.20.156 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an Image structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.157 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.158 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

(Read and Write property)

### 97.20.159 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.
(Read and Write property)

### 97.20.160 LastException as IMExceptionQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.161 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Notes:** (Read and Write property)

### 97.20.162 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.20.163 MatteColor as IMColorQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.20.164 Montage as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile size and offset within an image montage. Only valid for montage images.
**Notes:** (Read and Write property)

### 97.20.165 Offset as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of initial bytes to skip over when reading raw image.
**Notes:** (Read and Write property)

### 97.20.166 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.167 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Example:**

```
dim im as ImageMagickQ32MBS // global
```

```
Function TestJPEG(f as folderitem) As picture
// Reads an image, compresses in memory to JPEG, decompresses using JPEGlib and returns the image
// if quality setting works, you see it in the result.
// no error checking included!

// needs: im as ImageMagickQ32MBS ready initialized

dim image as IMImageQ32MBS
dim imageinfo as IMImageInfoQ32MBS
dim s,blob as string
dim p as Picture
dim i as Integer

if f = nil then
Return nil
end if

imageinfo = im.NewImageInfo

imageinfo.Filename = f.NativePath

//this should read any image IM understands
image = im.ReadImage(imageinfo)
//check for error
if im.lastexception <>nil and im.LastException.Severity >= 400 then
s = "LastError: "+Format(im.LastError,"-0")+" - Severity: "+str(im.LastException.Severity)+EndOfLine+im.Las-
tException.Reason
MsgBox s
Return nil
elseif image = nil then
MsgBox "image=nil"
Return nil
end if

// Now lets convert to jpeg
imageinfo.Filename = "image.jpg"
imageinfo.Quality = 10 // 100 is max
blob = image.ImageToBlob(imageinfo)

// It may fail
if blob.lenb = 0 then
Return nil
end if
p = JPEGStringToPictureMBS(blob,true)

image.DestroyImage
imageinfo.DestroyImageInfo
```

```
Return p
Exception
Return nil
End Function
```

**Notes:** Default value is 75.
(Read and Write property)

### 97.20.168 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.20.169 RenderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent to use.
**Notes:** constants:

| | |
|---|---|
| UndefinedIntent | 0 |
| SaturationIntent | 1 |
| PerceptualIntent | 2 |
| AbsoluteIntent | 3 |
| RelativeIntent | 4 |

(Read and Write property)

### 97.20.170 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

(Read and Write property)

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

### 97.20.171 ResolutionX as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution of the image.
**Notes:** The unit for resolution must be specified.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.172 ResolutionY as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution of the image.
**Notes:** The unit for resolution must be specified.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.173 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.20.174 StorageClass as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image storage class.
**Notes:** If DirectClass then the image packets contain valid RGB or CMYK colors. If PseudoClass then the image has a colormap referenced by pixel's index member.

constants:

| | | |
|---|---|---|
| UndefinedClass | 0 | Unset value. |
| DirectClass | 1 | Image is composed of pixels which represent literal color values. |
| PseudoClass | 2 | Image is composed of pixels which specify an index in a color palette. |

(Read and Write property)

### 97.20.175 Taint as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to True if the image pixels have been modified.
**Notes:** (Read and Write property)

### 97.20.176 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.20.177 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kBackgroundDispose | 2 | One of the Image layer Dispose Types. |
| kCoalesceLayer | 1 | One of the Image layer method constants. |
| kCompareAnyLayer | 2 | One of the Image layer method constants. |
| kCompareClearLayer | 3 | One of the Image layer method constants. |
| kCompareOverlayLayer | 4 | One of the Image layer method constants. |
| kCompositeLayer | 12 | One of the Image layer method constants. |
| kDisposeLayer | 5 | One of the Image layer method constants. |
| kFlattenLayer | 14 | One of the Image layer method constants. |
| kMergeLayer | 13 | One of the Image layer method constants. |
| kMosaicLayer | 15 | One of the Image layer method constants. |
| kNoneDispose | 1 | One of the Image layer Dispose Types. |
| kOptimizeImageLayer | 7 | One of the Image layer method constants. |
| kOptimizeLayer | 6 | One of the Image layer method constants. |
| kOptimizePlusLayer | 8 | One of the Image layer method constants. |
| kOptimizeTransLayer | 9 | One of the Image layer method constants. |
| kPreviousDispose | 3 | One of the Image layer Dispose Types. |
| kRemoveDupsLayer | 10 | One of the Image layer method constants. |
| kRemoveZeroLayer | 11 | One of the Image layer method constants. |
| kUndefinedDispose | 0 | One of the Image layer Dispose Types. |
| kUndefinedLayer | 0 | One of the Image layer method constants. |
| kUnrecognizedDispose | 0 | One of the Image layer Dispose Types. |

Distortion Effects

| Constant | Value | Description |
|---|---|---|
| kAffineDistortion | 1 | |
| kAffineDistortion | 1 | |
| kAffineProjectionDistortion | 2 | |
| kAffineProjectionDistortion | 2 | |
| kArcDistortion | 9 | |
| kArcDistortion | 9 | |
| kBarrelDistortion | 14 | |
| kBarrelDistortion | 14 | |
| kBarrelInverseDistortion | 15 | |
| kBarrelInverseDistortion | 15 | |
| kBilinearDistortion | 6 | |
| kBilinearDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearReverseDistortion | 7 | |
| kBilinearReverseDistortion | 7 | |
| kCylinder2PlaneDistortion | 12 | |
| kCylinder2PlaneDistortion | 12 | |
| kDePolarDistortion | 11 | |
| kDePolarDistortion | 11 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPlane2CylinderDistortion | 13 | |
| kPlane2CylinderDistortion | 13 | |
| kPolarDistortion | 10 | |
| kPolarDistortion | 10 | |
| kPolynomialDistortion | 8 | |
| kPolynomialDistortion | 8 | |
| kResizeDistortion | 17 | |
| kResizeDistortion | 17 | |
| kScaleRotateTranslateDistortion | 3 | |
| kScaleRotateTranslateDistortion | 3 | |
| kSentinelDistortion | 18 | |
| kSentinelDistortion | 18 | |
| kShepardsDistortion | 16 | |
| kShepardsDistortion | 16 | |
| kUndefinedDistortion | 0 | |
| kUndefinedDistortion | 0 | |

Interpolate Modes

| Constant | Value | Description |
|---|---|---|
| kBarycentricColorInterpolate | 1 | |
| kBarycentricColorInterpolate | 1 | |
| kBilinearColorInterpolate | 7 | |
| kBilinearColorInterpolate | 7 | |
| kInverseColorInterpolate | 19 | |
| kInverseColorInterpolate | 19 | |
| kPolynomialColorInterpolate | 8 | |
| kPolynomialColorInterpolate | 8 | |
| kShepardsColorInterpolate | 16 | |
| kShepardsColorInterpolate | 16 | |
| kUndefinedColorInterpolate | 0 | |
| kUndefinedColorInterpolate | 0 | |
| kVoronoiColorInterpolate | 18 | |
| kVoronoiColorInterpolate | 18 | |

## 97.21 class IMImageQ8MBS

### 97.21.1 class IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for an Image Magick Image in memory.
**Notes:** Can exist with or without pixel data.

For more details please check the ImageMagick documentation.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr4

### 97.21.2 Methods

### 97.21.3 AdaptiveThreshold(width as Integer, height as Integer, offset as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AdaptiveThreshold selects an individual threshold for each pixel based on the range of intensity values in its local neighborhood.
**Notes:** This allows for thresholding of an image whose global intensity histogram doesn't contain distinctive peaks.
Sets the last exception property.

width: The width of the local neighborhood.
height: The height of the local neighborhood.
offset: The mean offset.

For more details please check the ImageMagick documentation.

### 97.21.4 AddNoise(NoiseType as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds random noise to the image.
**Notes:** Constants

For more details please check the ImageMagick documentation.
Sets the last exception property.

| | |
|---|---|
| UndefinedNoise | =0 |
| UniformNoise | =1 |
| GaussianNoise | =2 |
| MultiplicativeGaussianNoise | =3 |
| ImpulseNoise | =4 |
| LaplacianNoise | =5 |
| PoissonNoise | =6 |

### 97.21.5 AffineTransformImage(matrix as IMImageAffineMatrixQ8MBS) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms an image as dictated by the affine matrix.

### 97.21.6 AppendImageToList(img as IMImageQ8MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an image to the image list.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.7 AutoGammaImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** Returns true on success or false on failure.

### 97.21.8 AutoGammaImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoGammaImage extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** Returns true on success or false on failure.

channelType: The channels to auto-level. If the special 'SyncChannels' flag is set all given channels is adjusted in the same way using the mean average of those channels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.21.9 AutoLevelImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

### 97.21.10 AutoLevelImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** AutoLevelImage adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.21.11 Average as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Average() method takes a set of images and averages them together.
**Notes:** Each image in the set must have the same width and height. Average() returns a single image with each corresponding pixel component of each image averaged. On failure, a nil image is returned and exception describes the reason for the failure.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.12 BilevelChannel(channel as Integer, threshold as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the value of individual pixels based on the intensity of each pixel channel.
**Notes:** The result is a high-contrast image.

channel: The channel type.
threshold: define the threshold values.

Constants for channel:

For more details please check the ImageMagick documentation.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.21.13 BlackThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** BlackThreshold is like Threshold but forces all pixels below the threshold into black while leaving all pixels above the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.21.14 BlobSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The expected size for this image written to a file.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.15 Blur(radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImage selects a suitable radius for you.

radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

For more details please check the ImageMagick documentation.

### 97.21.16 BlurImageChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and BlurImageChannel selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.
sigma: The standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.21.17 BorderImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Surrounds the image with a border of the color defined by the bordercolor member of the image.
**Notes:** The width and height of the border are defined by the corresponding parameters.

### 97.21.18 BrightnessContrastImage(brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).

### 97.21.19 BrightnessContrastImageChannel(ChannelType as Integer, brightness as Double, contrast as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image. It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.
**Notes:** Returns true on success or false on failure.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).
ChannelType: The channels to use.

Constants for channel:

### 97.21.20 Charcoal(radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Charcoal creates a new image that is a copy of an existing one with the edge highlighted.
**Notes:** radius: the radius of the pixel neighborhood.
sigma: The standard deviation of the Gaussian, in pixels.

Returns nil on any error.
Sets the last exception property.

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.21.21 Chop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chop removes a region of an image and collapses the image to occupy the removed portion.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.22 ClipPath(path as string, inside as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the image clip mask based any clipping path information if it exists.
**Notes:**

| | |
|---|---|
| pathname: | name of clipping path resource. If name is preceded by #, use clipping path numbered by name. |
| inside: | if true, later operations take effect inside clipping path. Otherwise later operations take effect outside clipping path. |

Returns true on success and false on any error.

### 97.21.23 Clone as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this image object.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.24 CloneImageAttributes(image as IMImageAttributeQ8MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CloneImageAttributes() clones one or more image attributes.
**Notes:** Returns false on any error.

### 97.21.25 CloneImageProfiles(SourceImage as IMImageQ8MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones one or more image profiles.
**Notes:** Returns false on any error and true on success.

### 97.21.26 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

### 97.21.27 ClutImage(clutImage as IMImageQ8MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either

for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.

Returns true on success or false on failure.

### 97.21.28 ClutImageChannel(ChannelType as Integer, clutImage as IMImageQ8MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

ClutImage: the color lookup table image for replacement color values.
ChannelType: The channels to use.

Returns true on success or false on failure.

Constants for channel:

### 97.21.29 CoalesceImages as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CoalesceImages composites a set of images while respecting any page offsets and disposal meth-

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

ods.
**Notes:** GIF, MIFF, and MNG animation sequences typically start with an image background and each subsequent image varies in size and offset. CoalesceImages() returns a new sequence where each image in the sequence is the same size as the first and composited with the next image in the sequence.

Returns nil on any error.
Sets the last exception property.

### 97.21.30 Colorize(opacity as string, PenColorRed as Integer, PenColorGreen as Integer, PenColorBlue as Integer, PenColorOpacity as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ColorizeImage creates a new image that is a copy of an existing one with the image pixels colorized.
**Notes:** The colorization is controlled with the pen color and the opacity levels.

opacity: A character string indicating the level of opacity as a percentage (0-100).
PenColorRed, PenColorGreen, PenColorBlue and PenColorOpacity define the pen color used.

Returns nil on any error.
Sets the last exception property.

### 97.21.31 Combine(channel as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines one or more images into a single image.
**Notes:** The grayscale value of the pixels of each image in the sequence is assigned in order to the specified channels of the combined image. The typical ordering would be image 1 =>Red, 2 =>Green, 3 =>Blue, etc.

The lastexception property is set.

### 97.21.32 CompareImageLayers(ImageLayerMethod as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CompareImageLayers() compares each image with the next in a sequence and returns the minimum bounding region of all the pixel differences (of the mageLayerMethod specified) it discovers.
**Notes:** Images do NOT have to be the same size, though it is best that all the images are 'coalesced' (images are all the same size, on a flattened canvas, so as to represent exactly how an specific frame should look).

No GIF dispose methods are applied, so GIF animations must be coalesced before applying this image operator to find differences to them.

ImageLayerMethod:
the layers type to compare images with. Must be one of... CompareAnyLayer, CompareClearLayer, CompareOverlayLayer.

Can raise an exception.

### 97.21.33 Composite(ComposeOperator as Integer, Image as IMImageQ8MBS, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the second image composited onto the first at the specified offsets.
**Notes:** compose: Specifies an image composite operator.
Image: The second image.
x: An integer that specifies the column offset of the composited image.
y: An integer that specifies the row offset of the composited image.

No error code and exception!

### 97.21.34 ConsolidateCMYKImages as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Consolidates a sequence of CMYK images.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.35 ContrastImage(sharpen as boolean) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the intensity differences between the lighter and darker elements of the image.
**Notes:** Returns true on success or false on failure.
Set sharpen to true to increase the image contrast otherwise the contrast is reduced.

### 97.21.36 CopyPicture as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ8MBS // your image
Canvas1.Backdrop=image.CopyPicture
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.21.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15590

### 97.21.37 CopyPicture(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ8MBS // your image
Canvas1.Backdrop=image.CopyPicture(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

- 97.21.36 CopyPicture as picture 15590

### 97.21.38 CopyPictureMask as picture

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ8MBS // your image
Canvas1.Backdrop=image.CopyPictureMask
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
See also:

- 97.21.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture 15591

### 97.21.39 CopyPictureMask(x as Integer, y as Integer, width as Integer, height as Integer) as picture

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a portion of the mask of the Image Magick Image and returns a Xojo picture.
**Example:**

```
dim image as IMImageQ8MBS // your image
Canvas1.Backdrop=image.CopyPictureMask(0,0,image.Width,image.Height)
```

**Notes:** Sets the last exception property.
Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.
See also:

• 97.21.38 CopyPictureMask as picture 15591

### 97.21.40 CopyPixel(x as Integer, y as Integer) as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a pixel.
**Notes:** Returns nil on any error.
This method works only for bitmap images.
x and y are zero based.

### 97.21.41 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Creates a HBITMAP for the image for use with Windows Declares.
**Notes:** The HBITMAP returned needs to be freed when you are done with it or you risk having a memory leak.

### 97.21.42 Crop(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop extracts a region of the image starting at the offset defined by geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.43 CropImageToTiles(CropGeometry as string) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crops a single image, into a possible list of tiles.
**Notes:** This may include a single sub-region of the image. This basically applies all the normal geometry flags for Crop.

### 97.21.44 CycleColormap(displace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Displaces an image's colormap by a given number of positions.
**Notes:** If you cycle the colormap a number of times you can produce a psychodelic effect.
Returns true on success.
displace: displace the colormap this amount.

### 97.21.45 DecipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts cipher pixels to plain pixels.
**Notes:** Passkey: decipher cipher pixels with this passphrase.
Returns true on success.

### 97.21.46 DeconstructImages as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeconstructImages() compares each image with the next in a sequence and returns the minimum bounding region of all differences from the first image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.47 DeleteImageAttribute(key as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteImageAttribute() deletes an attribute from the image.
**Notes:** Returns false on any error.

### 97.21.48 Despeckle() as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the speckle noise in an image while perserving the edges of the original image.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.49 DestroyImage

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases the memory used for this image and sets handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.21.50 DestroyImageAttributes

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deallocates memory associated with the image attribute list.

### 97.21.51 DestroyImageList

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys the image list and sets the handle to 0.
**Notes:** For more details please check the ImageMagick documentation.
The destructor will call this for you if release=true.

### 97.21.52 DestroyImageProfiles

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases memory associated with an image profile map.

### 97.21.53 DistortImage(DistortImageMethod as Integer, values() as Double, bestfit as boolean) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DistortImage() distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

A description of each parameter follows:
self: the image to be distorted.
m: the method of image distortion. ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center. Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided. Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.
values: arguments given.
bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

### 97.21.54 Edge(radius as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds edges in an image.
**Notes:** Radius defines the radius of the convolution filter. Use a radius of 0 and Edge selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.55 Emboss(radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a grayscale image with a three-dimensional effect.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Emboss selects a suitable radius for you.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.56 EncipherImage(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts pixels to cipher-pixels.
**Notes:** passkey: encipher pixels with this passphrase.
Returns true on success.

### 97.21.57 EqualizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

### 97.21.58 EqualizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to use.

Constants for channel:

```
const UndefinedChannel = 0
const RedChannel = &h0001
const GrayChannel = &h0001
const CyanChannel = &h0001
const GreenChannel = &h0002
const MagentaChannel = &h0002
const BlueChannel = &h0004
const YellowChannel = &h0004
const AlphaChannel = &h0008
const OpacityChannel = &h0008
const BlackChannel = &h0020
const IndexChannel = &h0020
const AllChannels = &h7fffffff
```

### 97.21.59 ExcerptImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a excerpt of the image as defined by the geometry.
**Notes:** Define the region of the image to extend with x, y, width, and height.

### 97.21.60 ExtentImage(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends the image as defined by the geometry, gravity, and image background color.
**Notes:** Define the region of the image to extend with x, y, width, and height.

Set the (x,y) offset of the geometry to move the original image relative to the extended image.

### 97.21.61 FlattenImages as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flatten composites all images from the current image pointer to the end of the image list and returns a single flattened image.
**Notes:** Returns nil on any error.

Sets the last exception property.

### 97.21.62 Flip as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flip creates a vertical mirror image by reflecting the pixels around the central x-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.63 Flop as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flop creates a horizontal mirror image by reflecting the pixels around the central y-axis.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.64 FrameImage(x as Integer, y as Integer, width as Integer, height as Integer, innerBevel as Integer, OuterBevel as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a simulated three-dimensional border around the image.
**Notes:** The color of the border is defined by the MatteColor of image. Width and height specify the border width of the vertical and horizontal sides of the frame. innerBevel and OuterBevel indicate the width of the inner and outer shadows of the frame.

### 97.21.65 FxImage(expression as string) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FxImage() applies a mathematical expression to the specified image.
**Notes:** Can raise an exception.

### 97.21.66 GaussianBlurChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, the radius should be larger than sigma. Use a radius of 0 and GaussianBlur selects a suitable radius for you.
Sets the last exception property.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
channel: The channel type.
sigma: the standard deviation of the Gaussian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.21.67 GetImageAttribute(key as string) as IMImageAttributeQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageAttribute searches the list of image attributes and returns a reference to the attribute if it exists otherwise nil.

### 97.21.68 GetImageClippingPathAttribute as IMImageAttributeQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetImageClippingPathAttribute searches the list of image attributes and returns a reference to a clipping path if it exists otherwise nil.

### 97.21.69 GetImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a profile associated with an image by name.
**Notes:** Returns "" on any error.

### 97.21.70 GetNextImageAttribute as IMImageAttributeQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetNextImageAttribute() gets the next image attribute.
**Notes:** Returns nil on any error.

### 97.21.71 GetNextImageProfile as string

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the next profile name for an image.
**Notes:** Returns "" on any error.

### 97.21.72 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole Image structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.21.73 ImagesToBlob(info as IMImageInfoQ8MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.

For more details please check the ImageMagick documentation.

### 97.21.74 ImageToBlob(info as IMImageInfoQ8MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImagesToBlob implements direct to memory image formats.
**Example:**

```
dim im as ImageMagickQ8MBS // global

Function IMPictureToString(p as picture, magick as string, quality as Integer) As string
dim image as new IMImageQ8MBS
dim imageinfo as IMImageInfoQ8MBS
dim s,data as string
dim impp as new IMMagickPixelPacketQ8MBS

// empty string for nil picture
if p = nil then
Return ""
end if

// create a new picture info

imageinfo = im.NewImageInfo
imageinfo.ColorSpace=1
// only color space is needed. 1 for RGB.

// background color of image
impp.red = 0
impp.Green = 0
impp.Blue = 0

// creates a new image object
if not image.NewImage(imageinfo,p.Width,p.Height,impp) then
Return ""
end if

// copy RB picture into IM Image at position 0/0
image.ColorSpace = 1
image.SetPicture(p,0,0)

// set compression data
imageinfo.Magick = magick
imageinfo.Quality = quality

// and rendering intent: 2=PerceptualIntent
```

```
'image.RenderingIntent = 2

// create image data
data = image.ImageToBlob(imageinfo)

// release memory
image.DestroyImage
imageinfo.DestroyImageInfo

// return result
Return data

Exception
// in case of an exception return nothing
Return ""


End Function
```

**Notes:** It returns the image sequence as a string. The magick member of the ImageInfo structure determines the format of the returned blob ( GIF, JPEG, PNG, etc. )

Note, some image formats do not permit multiple images to the same image stream (e.g. JPEG). in this instance, just the first image of the sequence is returned as a blob.

Sets the last exception property and returns "" on any error.
For more details please check the ImageMagick documentation.

### 97.21.75 Implode(factor as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ImplodeImage creates a new image that is a copy of an existing one with the image pixels "implode" by the specified percentage.
**Notes:** factor: A double value that defines the extent of the implosion.

Returns nil on any error.
Sets the last exception property.

### 97.21.76 IsBlobExempt as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is exempt.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.77 IsBlobSeekable as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is seekable.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.78 IsBlobTemporary as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is temporary.
**Notes:** For more details please check the ImageMagick documentation.

### 97.21.79 Magnify as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to twice its size.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.80 MedianFilter(radius as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a digital filter that improves the quality of a noisy image.
**Notes:** Each pixel is replaced by the median in a set of neighboring pixels as defined by radius.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.81 MergeImageLayers(ImageLayerMethod as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MergeImageLayers() composes all the image layers from the current given image onward to produce a single image of the merged layers.
**Notes:** The inital canvas's size depends on the given ImageLayerMethod, and is initialized using the first images images background color. The images are then compositied onto that image in sequence using the given composition that has been assigned to each individual image.

ImageLayerMethod:
the method of selecting the size of the initial canvas.

MergeLayer: Merge all layers onto a canvas just large enough to hold all the actual images. The virtual canvas of the first image is preserved but otherwise ignored.

FlattenLayer: Use the virtual canvas size of first image. Images which fall outside this canvas is clipped. This can be used to 'fill out' a given virtual canvas.

MosaicLayer: Start with the virtual canvas of the first image, enlarging left and right edges to contain all images. Images with negative offsets will be clipped.

Can raise an exception.

### 97.21.82 Minify as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A convenience method that scales an image proportionally to half its size.
**Notes:** Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.83 MosaicImages as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** MosaicImages inlays an image sequence to form a single coherent picture.
**Notes:** It returns a single image with each image in the sequence composited at the location defined by the page member of the image structure.
Returns nil on any error.
Sets the last exception property.

### 97.21.84 MotionBlur(radius as Double, sigma as Double, angle as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simulates motion blur.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and MotionBlur selects a suitable radius for you. Angle gives the angle of the blurring motion.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.85 NegateImage(gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

gray: If true, only negate grayscale pixels within the image.

### 97.21.86 NegateImageChannel(ChannelType as Integer, gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** Returns true on success or false on failure.
The grayscale option means that only grayscale values within the image are negated.

ChannelType: The channels to use.
gray: If true, only negate grayscale pixels within the image.

Constants for channel:

```
const UndefinedChannel = 0
const RedChannel = &h0001
const GrayChannel = &h0001
const CyanChannel = &h0001
const GreenChannel = &h0002
const MagentaChannel = &h0002
const BlueChannel = &h0004
const YellowChannel = &h0004
const AlphaChannel = &h0008
const OpacityChannel = &h0008
const BlackChannel = &h0020
const IndexChannel = &h0020
const AllChannels = &h7fffffff
```

### 97.21.87 NewImage(info as IMImageInfoQ8MBS, width as Integer, height as Integer, background as IMMagickPixelPacketQ8MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image.
**Example:**

```
dim im as ImageMagickQ8MBS // global
dim p as picture
dim imageinfo as IMImageInfoQ8MBS
dim image as IMImageQ8MBS
dim b as new IMMagickPixelPacketQ8MBS
b.Blue=65535
b.ColorSpace=1 // RGB
b.Depth=16

imageinfo = im.NewImageInfo
imageinfo.Depth=16
imageinfo.ColorSpace=1

//this should read any image IM understands
image = new IMImageQ8MBS
if image.NewImage(imageinfo,500,500,b) then
p=New Picture(300,300,32)
p.Graphics.ForeColor=Rgb(255,0,0)
p.Graphics.FillOval 0,0,300,300
image.SetPicture p,0,0
else
MsgBox "failed"
end if
```

**Notes:** Returns false on failure and true on success.

### 97.21.88 NormalizeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

### 97.21.89 NormalizeImageChannel(ChannelType as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** Returns true on success or false on failure.

ChannelType: The channels to auto-level. If the special 'SyncChannels' flag is set the min/max/mean value of all given channels is used for all given channels, to all channels in the same way.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

### 97.21.90 OilPaint(radius as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method OilPaintImage creates a new image that is a copy of an existing one with each pixel component replaced with the color of greatest frequency in a circular neighborhood.
**Notes:** radius parameter: radius of the circular neighborhood.
Returns nil on any error.
Sets the last exception property.

### 97.21.91 OptimizeImageLayers as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageLayers() compares each image the GIF disposed forms of the previous image in the sequence.
**Notes:** From this it attempts to select the smallest cropped image to replace each frame, while preserving the results of the GIF animation.

Can raise an exception.

### 97.21.92 OptimizeImageTransparency

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImageTransparency() takes a frame optimized GIF animation, and compares the overlayed pixels against the disposal image resulting from all the previous frames in the animation.
**Notes:** Any pixel that does not change the disposal image (and thus does not effect the outcome of an overlay) is made transparent.

WARNING: This modifies the current images directly, rather than generate a new image sequence.

Can raise an exception.

### 97.21.93 OptimizePlusImageLayers as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizeImagePlusLayers() is exactly as OptimizeImageLayers(), but may also add or even remove extra frames in the animation, if it improves the total number of pixels in the resulting GIF animation.
**Notes:** Can raise an exception.

### 97.21.94 ProfileImage(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds or removes a ICC, IPTC, or generic profile from an image.
**Notes:** If the ProfileData is "", it is removed from the image otherwise added. Use a name of '*' and a ProfileData of "" to remove all profiles from the image.

Returns false on any error and true on success.

### 97.21.95 RadialBlur(angle as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RadialBlur applies a radial blur to the image.
**Notes:** angle: The angle of the radial blur.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.96 RaiseImage(x as Integer, y as Integer, width as Integer, height as Integer, raise as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a simulated three-dimensional button-like effect by lightening and darkening the edges of the image.
**Notes:** Width and height define the width of the vertical and horizontal edge of the effect.
raise: A value other than zero creates a 3-D raise effect, otherwise it has a lowered effect.

### 97.21.97 RandomThresholdChannel(channel as Integer, thresholds as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Canges the value of individual pixels based on the intensity of each pixel compared to a random threshold.
**Notes:** The result is a low-contrast, two color image.

channel: The channel or channels to be thresholded.
thresholds: a geometry string containing low,high thresholds. If the string contains 2x2, 3x3, or 4x4, an

ordered dither of order 2, 3, or 4 is performed instead. (ASCII string)

Sets the last exception property.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

For more details please check the ImageMagick documentation.

### 97.21.98 ReduceNoise(radius as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Smooths the contours of an image while still preserving edge information.
**Notes:** The algorithm works by replacing each pixel with its neighbor closest in value. A neighbor is defined by radius. Use a radius of 0 and ReduceNoise selects a suitable radius for you.

For more details please check the ImageMagick documentation.

### 97.21.99 RemoveDuplicateLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that is exactly the same as the next image in the given image list.
**Notes:** Image size and virtual canvas offset must also match, though not the virtual canvas size itself.

No check is made with regards to image disposal setting, though it is the dispose setting of later image that is kept. Also any time delays are also added together. As such coalesced image animations should still

produce the same result, though with duplicte frames merged into a single frame.

### 97.21.100 RemoveFirstImageFromList as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the first image from the image list and returns the image.
**Notes:** Returns nil on any error.
For more details please check the ImageMagick documentation.

### 97.21.101 RemoveImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a profile from the image-map by its name.

### 97.21.102 RemoveZeroDelayLayers

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that as a zero delay time.
**Notes:** Such images generally represent intermediate or partial updates in GIF animations used for file optimization. They are not ment to be displayed to users of the animation. Viewable images in an animation should have a time delay of 3 or more centi-seconds (hundredths of a second).

However if all the frames have a zero time delay, then either the animation is as yet incomplete, or it is not a GIF animation. This is a non-sensible situation, so no image will be removed and a 'Zero Time Animation' warning (exception) given.

No warning will be given if no image was removed because all images had an appropriate non-zero time delay set.

Due to the special requirements of GIF disposal handling, GIF animations should be coalesced first, before calling this function, though that is not a requirement.

### 97.21.103 ResetImageAttributeIterator

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ResetImageAttributeIterator() resets the image attributes iterator.
**Notes:** Use it in conjunction with GetNextImageAttribute() to iterate over all the values associated with an image.

### 97.21.104 ResetImageProfileIterator

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image profile iterator.
**Notes:** Use it in conjunction with GetNextImageProfile() to iterate over all the profiles associated with an image.

### 97.21.105 Resize(width as Integer, height as Integer, FilterID as Integer, blur as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions.
**Notes:** Constants for the FilterID:

```
const PointFilter      =1
const BoxFilter        =2
const TriangleFilter   =3
const HermiteFilter    =4
const HanningFilter    =5
const HammingFilter    =6
const BlackmanFilter   =7
const GaussianFilter   =8
const QuadraticFilter  =9
const CubicFilter      =10
const CatromFilter     =11
const MitchellFilter   =12
const LanczosFilter    =13
const BesselFilter     =14
const SincFilter       =15
```

Most of the filters are FIR (finite impulse response), however, Bessel, Gaussian, and Sinc are IIR (infinite impulse response). Bessel and Sinc are windowed (brought down to zero) with the Blackman filter.

Sets the last exception property.

### 97.21.106 RGBTransformImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method RGBTransformImage converts the reference image from RGB to an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates which colorspace to transform the image.

Returns false on any error and true on success.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

### 97.21.107 Roll(x as Integer, y as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Roll offsets an image as defined by x and y.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.108 Rotate(degrees as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotation of an image.
**Notes:** Method RotateImage creates a new image that is a rotated copy of an existing one. Positive angles rotate counter-clockwise (right-hand rule), while negative angles rotate clockwise. Rotated images are usually larger than the originals and have 'empty' triangular corners. X axis. Empty triangles left over from shearing the image are filled with the color specified by the image background_color. RotateImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Method RotateImage is based on the paper "A Fast Algorithm for General Raster Rotatation" by Alan W. Paeth. RotateImage is adapted from a similar method based on the Paeth paper written by Michael Halle of the Spatial Imaging Group, MIT Media Lab.

degrees: Specifies the number of degrees to rotate the image.

Sets the lastexception property.
Returns nil on low memory.
For more details please check the ImageMagick documentation.

### 97.21.109 Sample(width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions with pixel sampling.
**Notes:** Unlike other scaling methods, this method does not introduce any additional color into the scaled image.
For more details please check the ImageMagick documentation.
Sets the last exception property.

### 97.21.110 Scale(width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Example:**

```
dim image as IMImageQ8MBS // your image
image=Image.Scale(100,80)
```

**Notes:** This method was designed by Bob Friesenhahn as a low cost thumbnail generator.

columns: The number of columns in the scaled image.
rows: The number of rows in the scaled image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.111 SetImageAttribute(key as string, value as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetImageAttribute searches the list of image attributes and replaces the attribute value.
**Notes:** If it is not found in the list, the attribute name and value is added to the list. If the attribute exists in the list, the value is concatenated to the attribute. SetImageAttribute returns True if the attribute is successfully concatenated or added to the list, otherwise False. If the value is "", the matching key is deleted from the list.

### 97.21.112 SetImageColorspace(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colorspace member of the Image structure.
**Notes:** Returns false on any error and true on success.

### 97.21.113 SetImageProfile(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a named profile to the image.
**Notes:** If a profile with the same name already exists, it is replaced. This method differs from the ProfileImage() method in that it does not apply CMS color profiles.

name: The profile name.
profiledata: The binary data of the profile.

Returns false on any error and true on success.

### 97.21.114 SetPicture(pic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the Image Magick Image at the given location.
**Example:**

```
dim image as IMImageQ8MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

image.SetPicture(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.

### 97.21.115 SetPictureMask(maskpic as picture, x as Integer, y as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the pixels from a given Xojo picture into the mask of the Image Magick Image at the given location.
**Example:**

```
dim i as IMImageQ8MBS // your image
dim p as picture

p=New Picture(32,32,32)
p.Graphics.ForeColor=rgb(0,255,0)
p.Graphics.FillRect 0,0,32,32

i.SetPictureMask(p,30,30)
```

**Notes:** Sets the last exception property.
The method will do nothing on bad bounds.
This method works only for bitmap images.
x and y are zero based.
You may need to set matte=True after this.

### 97.21.116 SetPixel(x as Integer, y as Integer, newPixel as IMColorQ8MBS)

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a pixel value.
**Example:**

```
dim image as IMImageQ8MBS // your image
dim co as IMColorQ8MBS

co=new IMColorQ8MBS
co.blue=65535 // max value
image.SetPixel 50,50,co // Makes Pixel 50/50 blue
```

**Notes:** The method will fail silently if the values are out of bounds or the image is not a bitmap image.
This method works only for bitmap images.
x and y are zero based.

### 97.21.117 Shade(gray as boolean, azimuth as Double, elevation as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shines a distant light on an image to create a three-dimensional effect.
**Notes:** You control the positioning of the light with azimuth and elevation; azimuth is measured in degrees off the x axis and elevation is measured in pixels above the Z axis.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.118 SharpenChannel(channel as Integer, radius as Double, sigma as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma) . For reasonable results, radius should be larger than sigma. Use a radius of 0 and Sharpen selects a suitable radius for you.

channel: The channel type.
radius: The radius of the Gaussian, in pixels, not counting the center pixel.

sigma: The standard deviation of the Laplacian, in pixels.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.119 Shave(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shave shaves pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.
Returns nil on any error.
Sets the last exception property.

### 97.21.120 Shear(Xshear as Double, Yshear as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method ShearImage creates a new image that is a shear_image copy of an existing one.
**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, x_shear is measured relative to the Y axis, and similarly, for Y direction shears y_shear is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the color defined by the pixel at location (0,0). ShearImage

allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Xshear and YYshear specify the number of degrees to shear the image.

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.121 Solarize(factor as Double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SolarizeImage produces a 'solarization' effect seen when exposing a photographic film to light during the development process.
**Notes:** factor: An double value that defines the extent of the solarization.
Returns nil on any error.
Sets the last exception property.

### 97.21.122 Splice(x as Integer, y as Integer, width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splice splices a solid color into the image as defined by the geometry.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.123 Spread(radius as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a special effects method that randomly displaces each pixel in a block defined by the radius parameter.
**Notes:** radius: Choose a random pixel in a neighborhood of this extent.
Sets the last exception property.

For more details please check the ImageMagick documentation.

### 97.21.124 Stegano(watermarkImage as IMImageQ8MBS) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SteganoImage hides a digital watermark within the image.
**Notes:** Returns nil on any error.
Sets the last exception property.

### 97.21.125 Stereo(otherImage as IMImageQ8MBS) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method StereoImage combines two images and produces a single image that is the composite of a left and right image of a stereo pair.
**Notes:** The left image is converted to gray scale and written to the red channel of the stereo image. The right image is converted to gray scale and written to the blue channel of the stereo image. View the composite image with red-blue glasses to create a stereo effect.

left image = self
right image = otherImage parameter

Returns nil on any error.
Sets the last exception property.

### 97.21.126 Swirl(degrees as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method SwirlImage creates a new image that is a copy of an existing one with the image pixels "swirl" at a specified angle.
**Notes:** degrees: An double value that defines the tightness of the swirling.

Returns nil on any error.
Sets the last exception property.

### 97.21.127 Thumbnail(width as Integer, height as Integer) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Notes:** Sets the last exception property.

This method was designed by Bob Friesenhahn as a low cost thumbnail generator.
For more details please check the ImageMagick documentation.

### 97.21.128 TransformImage(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.
**Notes:** This should only be used for single images.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.21.129 TransformImages(CropGeometry as string, ImageGeometry as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransformImages() calls TransformImage() on each image of a sequence.
**Notes:** TransformImage() is a convenience method that behaves like ResizeImage() or CropImage() but accepts scaling and/or cropping information as a region geometry specification. If the operation fails, the original image handle is left as is.

CropGeometry: A crop geometry string. This geometry defines a subregion of the image to crop.
ImageGeometry: An image geometry string. This geometry defines the final size of the image.

Returns true on success.

### 97.21.130 TransformRGBImage(Colorspace as Integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method TransformRGBImage converts the reference image from an alternate colorspace.
**Notes:** The transformation matrices are not the standard ones: the weights are rescaled to normalized the range of the transformed values to be [ 0..MaxRGB ] .

colorspace: An integer value that indicates the colorspace the image is currently in. On return the image is in the RGB color space.

Returns false on any error and true on success.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

### 97.21.131 TransposeImage as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransposeImage() creates a horizontal mirror image by reflecting the pixels around the central y-axis while rotating them by 90 degrees.

### 97.21.132 TransverseImage as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** TransverseImage() creates a vertical mirror image by reflecting the pixels around the central x-axis while rotating them by 270 degrees.

### 97.21.133 Trim as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim trims pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Returns nil on any error.
Sets the last exception property.

### 97.21.134 UnsharpMaskChannel(channel as Integer, radius as Double, sigma as Double, amount as Double, threshold as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and UnsharpMask selects a suitable radius for you.

Constants for channel:

```
const UndefinedChannel   = 0
const RedChannel         = &h0001
const GrayChannel        = &h0001
const CyanChannel        = &h0001
const GreenChannel       = &h0002
const MagentaChannel     = &h0002
const BlueChannel        = &h0004
const YellowChannel      = &h0004
const AlphaChannel       = &h0008
const OpacityChannel     = &h0008
const BlackChannel       = &h0020
const IndexChannel       = &h0020
const AllChannels        = &h7fffffff
```

Sets the last exception property.
For more details please check the ImageMagick documentation.

### 97.21.135 Wave(amplitude as Double, wavelength as Double) as IMImageQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method Wave creates a new image that is a copy of an existing one with the image pixels altered along a sine wave.
**Notes:** Parameters are double values that indicates the amplitude and wavelength of the sine wave.
Returns nil on any error.
Sets the last exception property.

### 97.21.136 WhiteThreshold(threshold as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** WhiteThreshold is like Threshold but forces all pixels above the threshold into white while leaving all pixels below the threshold unchanged.
**Notes:** No exceptions are generated.
threshold: Define the threshold value. (ASCII string)
For more details please check the ImageMagick documentation.

### 97.21.137 WriteImage(info as IMImageInfoQ8MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method WriteImage writes an image to a file as defined by image.filename.
**Notes:** You can specify a particular image format by prefixing the file with the image type and a colon (i.e. ps:image) or specify the image type as the filename suffix (i.e. image.ps). The image may be modified to adapt it to the requirements of the image format. For example, DirectClass images must be color-reduced to PseudoClass if the format is GIF.

WriteImage returns True if the image is written. False is returned if there is a memory shortage or if the image file fails to write.

### 97.21.138 Properties

### 97.21.139 BackgroundColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image background color.
**Notes:** (Read and Write property)

### 97.21.140 Bias as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.21.141 BlurFactor as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blur factor to apply to the image when zooming. Default is 1.0 (no blur).
**Notes:** (Read and Write property)

### 97.21.142 BorderColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image border color.
**Notes:** (Read and Write property)

### 97.21.143 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The desired number of colors.
**Notes:** Used by Quantize().
(Read and Write property)

### 97.21.144 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

(Read and Write property)

### 97.21.145 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image compresion type.
**Notes:** useful constants:

| | |
|---|---|
| const UndefinedCompression | = 0 |
| const NoCompression | = 1 |
| const BZipCompression | = 2 |
| const FaxCompression | = 3 |
| const Group4Compression | = 4 |
| const JPEGCompression | = 5 |
| const LosslessJPEGCompression | = 6 |
| const LZWCompression | = 7 |
| const RLECompression | = 8 |
| const ZipCompression | = 9 |

The default is the compression type of the specified image file.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.146 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** QuantumLeap must be defined before a depth of 16 is valid.
(Read and Write property)

### 97.21.147 Directory as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile names from within an image montage.
**Notes:** Only valid after calling MontageImages() or reading a MIFF file which contains a directory.
(Read and Write property)

### 97.21.148 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The endian setting to use.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedEndian | 0 | |
| LSBEndian | 1 | (Windows) |
| MSBEndian | 2 | (Mac) |

e.g. tiff files support different endian settings.
(Read and Write property)

### 97.21.149 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path/name.
**Notes:** The string must be in the encoding of the library and is limited to 4000 bytes.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.150 Filter as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filter to use when resizing image.
**Notes:** Constants:

```
const PointFilter      =1
const BoxFilter        =2
const TriangleFilter   =3
const HermiteFilter    =4
const HanningFilter    =5
const HammingFilter    =6
const BlackmanFilter   =7
const GaussianFilter   =8
const QuadraticFilter  =9
const CubicFilter      =10
const CatromFilter     =11
const MitchellFilter   =12
const LanczosFilter    =13
const BesselFilter     =14
const SincFilter       =15
```

The reduction filter employed has a sipngicant effect on the time required to resize an image and the resulting quality. The default filter is Lanczos which has been shown to produce high quality results when reducing most images.
(Read and Write property)

### 97.21.151 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

### 97.21.152 Gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma level of the image.
**Notes:** The same color image displayed on two different workstations may look different due to differences

in the display monitor. Use gamma correction to adjust for this color difference.
(Read and Write property)

### 97.21.153 Geometry as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Preferred size of the image when encoding.
**Notes:** (Read and Write property)

### 97.21.154 Gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.21.155 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an Image structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.156 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.157 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of interlacing scheme (default NoInterlace).
**Notes:** This option is used to specify the type of interlacing scheme for raw image formats such as RGB

or YUV. NoInterlace means do not interlace, LineInterlace uses scanline interlacing, and PlaneInterlace uses plane interlacing. PartitionInterlace is like PlaneInterlace except the different planes are saved to individual files (e.g. image.R, image.G, and image.B). Use LineInterlace or PlaneInterlace to create an interlaced GIF or progressive JPEG image.

constants:

| | | |
|---|---|---|
| UndefinedInterlace | 0 | Unset value. |
| NoInterlace | 1 | Don't interlace image (RGBRGBRGBRGBRGBRGB...) |
| LineInterlace | 2 | Use scanline interlacing (RRR...GGG...BBB...RRR...GGG...BBB...) |
| PlaneInterlace | 3 | Use plane interlacing (RRRRRR...GGGGGG...BBBBBB...) |
| PartitionInterlace | 4 | Similar to plane interlaing except that the different planes are saved to individual files (e.g. image.R, image.G, and image.B) |

(Read and Write property)

### 97.21.158 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** If an exception is raised and it is not a warning exception, this exception code is saved in this property.
(Read and Write property)

### 97.21.159 LastException as IMExceptionQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception thrown by the Image Magick library.
**Notes:** You should check this value after every call to the library, process the error and set the property to nil.

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.160 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image encoding format (e.g. "GIF").
**Notes:** (Read and Write property)

### 97.21.161 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.21.162 MatteColor as IMColorQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image matte (transparent) color.
**Notes:** (Read and Write property)

### 97.21.163 Montage as String

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tile size and offset within an image montage. Only valid for montage images.
**Notes:** (Read and Write property)

### 97.21.164 Offset as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of initial bytes to skip over when reading raw image.
**Notes:** (Read and Write property)

### 97.21.165 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image orientation.
**Notes:** constants:

```
const UndefinedOrientation      = 0
const TopLeftOrientation        = 1
const TopRightOrientation       = 2
const BottomRightOrientation    = 3
const BottomLeftOrientation     = 4
const LeftTopOrientation        = 5
const RightTopOrientation       = 6
const RightBottomOrientation    = 7
const LeftBottomOrientation     = 8
```

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.166 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG/MIFF/PNG compression level.
**Example:**

```
dim im as ImageMagickQ8MBS // global

Function TestJPEG(f as folderitem) As picture
// Reads an image, compresses in memory to JPEG, decompresses using JPEGlib and returns the image
// if quality setting works, you see it in the result.
// no error checking included!

// needs: im as ImageMagickQ8MBS ready initialized

dim image as IMImageQ8MBS
dim imageinfo as IMImageInfoQ8MBS
dim s,blob as string
dim p as Picture
dim i as Integer

if f = nil then
Return nil
end if

imageinfo = im.NewImageInfo

imageinfo.Filename = f.NativePath

//this should read any image IM understands
image = im.ReadImage(imageinfo)
//check for error
```

```
if im.lastexception <>nil and im.LastException.Severity >= 400 then
s = "LastError: "+Format(im.LastError,"-0")+" - Severity: "+str(im.LastException.Severity)+EndOfLine+im.LastException.Reason
MsgBox s
Return nil
elseif image = nil then
MsgBox "image=nil"
Return nil
end if

// Now lets convert to jpeg
imageinfo.Filename = "image.jpg"
imageinfo.Quality = 10 // 100 is max
blob = image.ImageToBlob(imageinfo)

// It may fail
if blob.lenb = 0 then
Return nil
end if
p = JPEGStringToPictureMBS(blob,true)

image.DestroyImage
imageinfo.DestroyImageInfo

Return p
Exception
Return nil
End Function
```

**Notes:** Default value is 75.
(Read and Write property)

### 97.21.167 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, the destructor will release the handle.
**Notes:** (Read and Write property)

### 97.21.168 RenderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent to use.
**Notes:** constants:

| | |
|---|---|
| UndefinedIntent | 0 |
| SaturationIntent | 1 |
| PerceptualIntent | 2 |
| AbsoluteIntent | 3 |
| RelativeIntent | 4 |

(Read and Write property)

### 97.21.169 ResolutionUnits as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units of image resolution.
**Notes:** constants:

| | | |
|---|---|---|
| UndefinedResolution | 0 | Unset value. |
| PixelsPerInchResolution | 1 | Density specifications are specified in units of pixels per inch (english units). |
| PixelsPerCentimeterResolution | 2 | Density specifications are specified in units of pixels per centimeter (metric units). |

(Read and Write property)

### 97.21.170 ResolutionX as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution of the image.
**Notes:** The unit for resolution must be specified.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.171 ResolutionY as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution of the image.
**Notes:** The unit for resolution must be specified.

For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.21.172 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An undocumented property.
**Notes:** (Read and Write property)

### 97.21.173 StorageClass as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image storage class.
**Notes:** If DirectClass then the image packets contain valid RGB or CMYK colors. If PseudoClass then the image has a colormap referenced by pixel's index member.

constants:

| | | |
|---|---|---|
| UndefinedClass | 0 | Unset value. |
| DirectClass | 1 | Image is composed of pixels which represent literal color values. |
| PseudoClass | 2 | Image is composed of pixels which specify an index in a color palette. |

(Read and Write property)

### 97.21.174 Taint as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set to True if the image pixels have been modified.
**Notes:** (Read and Write property)

### 97.21.175 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the image in pixels.
**Notes:** For more details please check the ImageMagick documentation.

(Read and Write property)

### 97.21.176 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kBackgroundDispose | 2 | One of the Image layer Dispose Types. |
| kCoalesceLayer | 1 | One of the Image layer method constants. |
| kCompareAnyLayer | 2 | One of the Image layer method constants. |
| kCompareClearLayer | 3 | One of the Image layer method constants. |
| kCompareOverlayLayer | 4 | One of the Image layer method constants. |
| kCompositeLayer | 12 | One of the Image layer method constants. |
| kDisposeLayer | 5 | One of the Image layer method constants. |
| kFlattenLayer | 14 | One of the Image layer method constants. |
| kMergeLayer | 13 | One of the Image layer method constants. |
| kMosaicLayer | 15 | One of the Image layer method constants. |
| kNoneDispose | 1 | One of the Image layer Dispose Types. |
| kOptimizeImageLayer | 7 | One of the Image layer method constants. |
| kOptimizeLayer | 6 | One of the Image layer method constants. |
| kOptimizePlusLayer | 8 | One of the Image layer method constants. |
| kOptimizeTransLayer | 9 | One of the Image layer method constants. |
| kPreviousDispose | 3 | One of the Image layer Dispose Types. |
| kRemoveDupsLayer | 10 | One of the Image layer method constants. |
| kRemoveZeroLayer | 11 | One of the Image layer method constants. |
| kUndefinedDispose | 0 | One of the Image layer Dispose Types. |
| kUndefinedLayer | 0 | One of the Image layer method constants. |
| kUnrecognizedDispose | 0 | One of the Image layer Dispose Types. |

Distortion Effects

| Constant | Value | Description |
|---|---|---|
| kAffineDistortion | 1 | |
| kAffineProjectionDistortion | 2 | |
| kArcDistortion | 9 | |
| kBarrelDistortion | 14 | |
| kBarrelInverseDistortion | 15 | |
| kBilinearDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearReverseDistortion | 7 | |
| kCylinder2PlaneDistortion | 12 | |
| kDePolarDistortion | 11 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPlane2CylinderDistortion | 13 | |
| kPolarDistortion | 10 | |
| kPolynomialDistortion | 8 | |
| kResizeDistortion | 17 | |
| kScaleRotateTranslateDistortion | 3 | |
| kSentinelDistortion | 18 | |
| kShepardsDistortion | 16 | |
| kUndefinedDistortion | 0 | |

Interpolate Modes

| Constant | Value | Description |
|---|---|---|
| kBarycentricColorInterpolate | 1 | |
| kBilinearColorInterpolate | 7 | |
| kInverseColorInterpolate | 19 | |
| kPolynomialColorInterpolate | 8 | |
| kShepardsColorInterpolate | 16 | |
| kUndefinedColorInterpolate | 0 | |
| kVoronoiColorInterpolate | 18 | |

## 97.22 class IMMagickInfoListQ16MBS

### 97.22.1 class IMMagickInfoListQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class with the list of the image formats supported in Image Magick.
**Notes:** For more details please check the ImageMagick documentation.

### 97.22.2 Methods

### 97.22.3 Item(index as Integer) as IMMagickInfoQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The items inside this list.
**Notes:** Index goes from 0 to count-1.
Returns nil on invalid index.

### 97.22.4 Properties

### 97.22.5 Count as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items.
**Notes:** Index goes from 0 to count-1.
(Read only property)

### 97.22.6 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo list.
For more details please check the ImageMagick documentation.
(Read only property)

# 97.23 class IMMagickInfoListQ32MBS

## 97.23.1 class IMMagickInfoListQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class with the list of the image formats supported in Image Magick.
**Notes:** For more details please check the ImageMagick documentation.

## 97.23.2 Methods

## 97.23.3 Item(index as Integer) as IMMagickInfoQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The items inside this list.
**Notes:** Index goes from 0 to count-1.
Returns nil on invalid index.

## 97.23.4 Properties

## 97.23.5 Count as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items.
**Notes:** Index goes from 0 to count-1.
(Read only property)

## 97.23.6 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo list.
For more details please check the ImageMagick documentation.
(Read only property)

## 97.24 class IMMagickInfoListQ8MBS

### 97.24.1 class IMMagickInfoListQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class with the list of the image formats supported in Image Magick.
**Notes:** For more details please check the ImageMagick documentation.

### 97.24.2 Methods

### 97.24.3 Item(index as Integer) as IMMagickInfoQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The items inside this list.
**Notes:** Index goes from 0 to count-1.
Returns nil on invalid index.

### 97.24.4 Properties

### 97.24.5 Count as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of items.
**Notes:** Index goes from 0 to count-1.
(Read only property)

### 97.24.6 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo list.
For more details please check the ImageMagick documentation.
(Read only property)

# 97.25 class IMMagickInfoQ16MBS

## 97.25.1 class IMMagickInfoQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about a file import/export format Image Magick can handle.
**Notes:** For more details please check the ImageMagick documentation.

## 97.25.2 Methods

## 97.25.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

## 97.25.4 Properties

## 97.25.5 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if this file format supports multi-frame images.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

## 97.25.6 BlobSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the encoder and decoder for this format supports operating on arbitrary BLOBs (rather than only disk files).
**Notes:** As currently disc read/write does not work with the 5.1 plugins, we really need that to use the classes.
Returns false for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.

(Read only property)

### 97.25.7 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Long form image format description (e.g. "CompuServe graphics interchange format").
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.8 EndianSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether endian support is available.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.9 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.25.10 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of module (e.g. "GIF") which registered this format.
**Notes:** Value is "" if format is not registered by a module.
For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.11 Name as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Magick string (e.g. "GIF") which identifies this format.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.12 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional notes for this format.
**Notes:** e.g. compilation parameters or copyright notices.
Returns "" for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.
(Read only property)

### 97.25.13 Raw as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if Image format does not contain size (must be specified in ImageInfo).
**Notes:** Returns false for an invalid MagickInfo (handle=0).
For more details please check the ImageMagick documentation.
(Read only property)

### 97.25.14 SeekableStream as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if the magick supports a seekable stream.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.15 Stealth as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.16 ThreadSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if threading is supported.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.25.17 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version string.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

# 97.26 class IMMagickInfoQ32MBS

## 97.26.1 class IMMagickInfoQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about a file import/export format Image Magick can handle.
**Notes:** For more details please check the ImageMagick documentation.

## 97.26.2 Methods

## 97.26.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

## 97.26.4 Properties

## 97.26.5 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if this file format supports multi-frame images.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

## 97.26.6 BlobSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the encoder and decoder for this format supports operating on arbitrary BLOBs (rather than only disk files).
**Notes:** As currently disc read/write does not work with the 5.1 plugins, we really need that to use the classes.
Returns false for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.

(Read only property)

### 97.26.7 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Long form image format description (e.g. "CompuServe graphics interchange format").
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.8 EndianSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether endian support is available.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.9 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.26.10 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of module (e.g. "GIF") which registered this format.
**Notes:** Value is "" if format is not registered by a module.
For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.11 Name as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Magick string (e.g. "GIF") which identifies this format.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.12 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional notes for this format.
**Notes:** e.g. compilation parameters or copyright notices.
Returns "" for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.
(Read only property)

### 97.26.13 Raw as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if Image format does not contain size (must be specified in ImageInfo).
**Notes:** Returns false for an invalid MagickInfo (handle=0).
For more details please check the ImageMagick documentation.
(Read only property)

### 97.26.14 SeekableStream as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if the magick supports a seekable stream.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.15 Stealth as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.16 ThreadSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if threading is supported.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.26.17 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version string.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

# 97.27 class IMMagickInfoQ8MBS

## 97.27.1 class IMMagickInfoQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for information about a file import/export format Image Magick can handle.
**Notes:** For more details please check the ImageMagick documentation.

## 97.27.2 Methods

## 97.27.3 Close

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources used by this object now without waiting for Xojo to do it for you.

## 97.27.4 Properties

## 97.27.5 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if this file format supports multi-frame images.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

## 97.27.6 BlobSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if the encoder and decoder for this format supports operating on arbitrary BLOBs (rather than only disk files).
**Notes:** As currently disc read/write does not work with the 5.1 plugins, we really need that to use the classes.
Returns false for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.

(Read only property)

### 97.27.7 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Long form image format description (e.g. "CompuServe graphics interchange format").
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.8 EndianSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether endian support is available.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.9 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to a MagickInfo structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.27.10 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of module (e.g. "GIF") which registered this format.
**Notes:** Value is "" if format is not registered by a module.
For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.11 Name as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Magick string (e.g. "GIF") which identifies this format.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.12 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional notes for this format.
**Notes:** e.g. compilation parameters or copyright notices.
Returns "" for an invalid MagickInfo (handle=0).

For more details please check the ImageMagick documentation.
(Read only property)

### 97.27.13 Raw as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if Image format does not contain size (must be specified in ImageInfo).
**Notes:** Returns false for an invalid MagickInfo (handle=0).
For more details please check the ImageMagick documentation.
(Read only property)

### 97.27.14 SeekableStream as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns True if the magick supports a seekable stream.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.15 Stealth as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unknown.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.16 ThreadSupport as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if threading is supported.
**Notes:** For more details please check the ImageMagick documentation.
Returns false for an invalid MagickInfo (handle=0).
(Read only property)

### 97.27.17 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Version string.
**Notes:** For more details please check the ImageMagick documentation.
Returns "" for an invalid MagickInfo (handle=0).
(Read only property)

# 97.28 class IMMagickPixelPacketQ16MBS

## 97.28.1 class IMMagickPixelPacketQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to describe a picture background.
**Notes:** Needed for IMImageQ16MBS.NewImage function.

## 97.28.2 Methods

## 97.28.3 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

## 97.28.4 Properties

## 97.28.5 Blue as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color value.
**Notes:** (Read and Write property)

## 97.28.6 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

(Read and Write property)

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

### 97.28.7 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** (Read and Write property)

### 97.28.8 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

### 97.28.9 Green as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color value.
**Notes:** (Read and Write property)

### 97.28.10 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an MagickPixelPacket structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.28.11 Index as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index color value.
**Notes:** Only for indexed color spaces.
(Read and Write property)

### 97.28.12 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.28.13 Opacity as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color value.
**Notes:** (Read and Write property)

### 97.28.14 Red as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color value.
**Notes:** (Read and Write property)

## 97.29 class IMMagickPixelPacketQ32MBS

### 97.29.1 class IMMagickPixelPacketQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to describe a picture background.
**Notes:** Needed for IMImageQ32MBS.NewImage function.

### 97.29.2 Methods

### 97.29.3 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

### 97.29.4 Properties

### 97.29.5 Blue as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color value.
**Notes:** (Read and Write property)

### 97.29.6 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

(Read and Write property)

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

### 97.29.7 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** (Read and Write property)

### 97.29.8 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

### 97.29.9 Green as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color value.
**Notes:** (Read and Write property)

### 97.29.10 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an MagickPixelPacket structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.29.11 Index as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index color value.
**Notes:** Only for indexed color spaces.
(Read and Write property)

### 97.29.12 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.29.13 Opacity as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color value.
**Notes:** (Read and Write property)

### 97.29.14 Red as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color value.
**Notes:** (Read and Write property)

# 97.30 class IMMagickPixelPacketQ8MBS

## 97.30.1 class IMMagickPixelPacketQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to describe a picture background.
**Notes:** Needed for IMImageQ8MBS.NewImage function.

## 97.30.2 Methods

## 97.30.3 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of the whole ImageInfo structure copied into a memoryblock.
**Notes:** Returns nil on any error.

## 97.30.4 Properties

## 97.30.5 Blue as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color value.
**Notes:** (Read and Write property)

## 97.30.6 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image pixel interpretation.
**Notes:** If the colorspace is RGB the pixels are red, green, blue. If matte is true, then red, green, blue, and index. If it is CMYK, the pixels are cyan, yellow, magenta, black. Otherwise the colorspace is ignored.

constants:

(Read and Write property)

| | |
|---|---|
| UndefinedColorspace | 0 |
| RGBColorspace | 1 |
| GRAYColorspace | 2 |
| TransparentColorspace | 3 |
| OHTAColorspace | 4 |
| LABColorspace | 5 |
| XYZColorspace | 6 |
| YCbCrColorspace | 7 |
| YCCColorspace | 8 |
| YIQColorspace | 9 |
| YPbPrColorspace | 10 |
| YUVColorspace | 11 |
| CMYKColorspace | 12 |
| sRGBColorspace | 13 |
| HSBColorspace | 14 |
| HSLColorspace | 15 |
| HWBColorspace | 16 |

### 97.30.7 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image depth (8 or 16).
**Notes:** (Read and Write property)

### 97.30.8 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colors within this distance are considered equal.
**Notes:** A number of algorithms search for a target color. By default the color must be exact. Use this to match colors that are close to the target color in RGB space.
(Read and Write property)

### 97.30.9 Green as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color value.
**Notes:** (Read and Write property)

### 97.30.10 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle used internally by the plugin.
**Notes:** A pointer to an MagickPixelPacket structure.
For more details please check the ImageMagick documentation.
(Read and Write property)

### 97.30.11 Index as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index color value.
**Notes:** Only for indexed color spaces.
(Read and Write property)

### 97.30.12 Matte as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an alpha channel is used/present.
**Notes:** Set to true to enable masks.
(Read and Write property)

### 97.30.13 Opacity as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The opacity part of the color value.
**Notes:** (Read and Write property)

### 97.30.14 Red as Single

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color value.
**Notes:** (Read and Write property)

## 97.31 class IMMissingFunctionExceptionQ16MBS

### 97.31.1 class IMMissingFunctionExceptionQ16MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A class for an exception in Image Magick.
**Notes:** This exception is raised on every IM function if the library function behind is not available.
(this can be a plugin bug or a bad compiled library or simply a too old library.)
Subclass of the RuntimeException class.

## 97.32 class IMMissingFunctionExceptionQ32MBS

### 97.32.1 class IMMissingFunctionExceptionQ32MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A class for an exception in Image Magick.
**Notes:** This exception is raised on every IM function if the library function behind is not available.
(this can be a plugin bug or a bad compiled library or simply a too old library.)
Subclass of the RuntimeException class.

## 97.33 class IMMissingFunctionExceptionQ8MBS

### 97.33.1 class IMMissingFunctionExceptionQ8MBS

MBS GraphicsMagick Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A class for an exception in Image Magick.
**Notes:** This exception is raised on every IM function if the library function behind is not available.
(this can be a plugin bug or a bad compiled library or simply a too old library.)
Subclass of the RuntimeException class.

# Chapter 98

# ImageKit

## 98.1 control DesktopIKImageBrowserViewControlMBS

### 98.1.1 control DesktopIKImageBrowserViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control to wrap a IKImageBrowserViewMBS.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 16.5pr2
- MBS Xojo / Real Studio Plugins, version 14.2pr3

### 98.1.2 Properties

### 98.1.3 Scrollview as NSScrollViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview we embed the image browser view inside.
**Notes:** (Read only property)

### 98.1.4 View as IKImageBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The image browser view.
**Notes:** (Read only property)

### 98.1.5 Events

### 98.1.6 backgroundWasRightClickedWithEvent(e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks the image browser view background.
**Notes:** event: The event that invoked the method.

This method signals that the user either right-clicked the background or left-clicked it with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.1.7 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 98.1.8 cellWasDoubleClickedAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user double-clicks an item in the image browser view.
**Notes:** index: The index of the cell.

This method signals that the user double-clicked an item in the image browser view. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.1.9 cellWasRightClickedAtIndex(index as Integer, e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks an item in the image browser view.
**Notes:** index: The index of the cell.

event: The event that invoked the method.

This method signals that the user either right-clicked an item in the browser or left-clicked the item with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time. Available in OS X v10.5 and later.

### 98.1.10 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 98.1.11 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 98.1.12 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 98.1.13 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 98.1.14 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 98.1.15 draggingEnded(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 98.1.16 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated: and draggingExited: even if NSDragOperationNone is returned by this method.

### 98.1.17 draggingExited(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 98.1.18 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 98.1.19 FocusLost

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.1.20 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.1.21 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 98.1.22 groupAtIndex(index as Integer) as Dictionary

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the group at the specified index.
**Notes:** index: The index of the group you want to retrieve.

Returns a dictionary that defines the group. The keys in this dictionary can be any of the following constants: IKImageBrowserGroupStyle, IKImageBrowserGroupBackgroundColorKey, IKImageBrowserGroupTitleKey, and IKImageBrowserGroupRangeKey. For more information on these constants, see IKImageBrowserView Class Reference.

This method is optional.
Available in OS X v10.5 and later.

### 98.1.23 itemAtIndex(index as Integer) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns an object for the item in an image browser view that corresponds to the specified index.
**Notes:** index: The index of the item you want to retrieve.

Return an IKImageBrowserItem object.

Your data source must implement this method. The returned object must implement the required methods of the IKImageBrowserItem protocol.
Available in OS X v10.5 and later.

### 98.1.24 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 98.1.25 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.

- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 98.1.26 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 98.1.27 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 98.1.28 moveItemsAtIndexes(indexes as NSIndexSetMBS, destinationIndex as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Signals that the specified items should be moved to the specified destination.
**Notes:** indexes: The indexes of the items that should be reordered.
destinationIndex: The starting index of the destination the items should be moved to.

Returns true if successful; false otherwise.

This method is optional. It is invoked by the image browser view after Image Kit determines that a reordering operation should be applied. The data source should update itself by reordering its elements.
Available in OS X v10.5 and later.

### 98.1.29 numberOfGroups as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the number of groups in an image browser view.
**Notes:** Return the number of groups.

This method is optional.
Available in OS X v10.5 and later.

### 98.1.30 numberOfItems as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Returns the number of records managed by the data source object.
**Notes:** Return the number of records managed by the image browser view.

Your data source must implement this method. An IKImageView object uses this method to determine how many cells it should create and display.
Available in OS X v10.5 and later.

### 98.1.31 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 98.1.32 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 98.1.33 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return true if the receiver agrees to perform the drag operation and false if not.

This method is invoked only if the most recent draggingEntered or draggingUpdated event returned an acceptable drag-operation value.

If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this event.

### 98.1.34 removeItemsAtIndexes(indexes as NSIndexSetMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Signals that a remove operation should be applied to the specified items.
**Notes:** indexes: The indexes of the items that should be removed.

This method is optional. It is invoked by the image browser after Image Kit determines that a remove operation should be applied. In response, the data source should update itself by removing the specified items.
Available in OS X v10.5 and later.

### 98.1.35 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 98.1.36 selectionDidChange

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the selection changes.
**Notes:** This method signals that the user changes the selection in the image browser view. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.1.37 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

During enumerateDraggingItemsWithOptions you may set non-acceptable drag items images to nil to hide them or use the enumeration option of NSDraggingItemEnumerationClearNonenumeratedImages If there are items that you hide, then after enumeration, you need to set the numberOfValidItemsForDrop to the number of non-hidden drag items. However, if the valid item count is 0, then it is better to return NSDragOperationNone from your implementation of draggingEntered and, or draggingUpdated instead of hiding all drag items during enumeration.
Available in OS X v10.7 and later.

### 98.1.38 wantsPeriodicDraggingUpdates as boolean

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated events.
**Notes:** Returns true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated events even if nothing changes.

### 98.1.39 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 98.1.40 writeItemsAtIndexes(indexes as NSIndexSetMBS, pasteboard as NSPasteboardMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Signals that a drag should begin.
**Notes:** itemIndexes: The indexes of the items that should be dragged.
pasteboard: The pasteboard to copy the items to.

Returns the number of items written to the pasteboard.

This method is optional. It is invoked after Image Kit determines that a drag should begin, but before the drag has been started.
Available in OS X v10.5 and later.

## 98.2 control DesktopIKImageViewControlMBS

### 98.2.1 control DesktopIKImageViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a IKImageView.

### 98.2.2 Properties

### 98.2.3 View as IKImageViewMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The image view used in this control.
**Notes:** (Read only property)

### 98.2.4 Events

### 98.2.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 98.2.6 Closing

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 98.2.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 98.2.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 98.2.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 98.2.10 FocusLost

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.2.11 FocusReceived

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.2.12 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 98.2.13 MenuBarSelected

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 98.2.14 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 98.2.15 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 98.2.16 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 98.2.17 Opening

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 98.2.18 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 98.2.19 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 98.3 class IKImageBrowserCellMBS

### 98.3.1 class IKImageBrowserCellMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for an image browser cell.
**Notes:** The IKImageBrowserCell class is used to display a cell conforming to the IKImageBrowserItem Protocol protocol in an IKImageBrowserView.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9

### 98.3.2 Methods

### 98.3.3 cellState as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current cell state of the receiver.
**Notes:** The IKImageBrowserView creates thumbnails asynchronously. This method returns the current state.
Available in OS X v10.6 and later.

### 98.3.4 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 98.3.5 frame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's frame rectangle, which defines its position in its IKImageBrowserView.
**Notes:** Available in OS X v10.6 and later.

### 98.3.6 IKImageBrowserCellBackgroundLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layer types you can pass to layerForType.
**Notes:** Layer displayed in the background.
Available in OS X v10.6 and later.

### 98.3.7 IKImageBrowserCellForegroundLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layer types you can pass to layerForType.
**Notes:** Layer displayed in the foreground.
Available in OS X v10.6 and later.

### 98.3.8 IKImageBrowserCellPlaceHolderLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layer types you can pass to layerForType.
**Notes:** Layer displayed as a placeholder when an image is not yet available.
Available in OS X v10.6 and later.

### 98.3.9 IKImageBrowserCellSelectionLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the layer types you can pass to layerForType.
**Notes:** Layer displayed as the selection.
Available in OS X v10.6 and later.

### 98.3.10 imageAlignment as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the position of the cell's image in the frame.

### 98.3.11 imageBrowserView as IKImageBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the view the receiver uses to display the cell.
**Notes:** Available in OS X v10.6 and later.

### 98.3.12 imageContainerFrame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's image container frame rectangle, which defines the position of the container of the thumbnail.
**Notes:** The coordinates of image container frame, in the IKImageBrowserView coordinate space.
The image frame is computed automatically from the image container frame by taking in account the image alignment and the image aspect ratio.
Subclasses can override this method to customize the position of the thumbnail container.
Available in OS X v10.6 and later.

### 98.3.13 imageFrame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's image frame rectangle, which defines the position of the thumbnail in its IKImageBrowserView.
**Notes:** Returns the coordinates of the frame, in the IKImageBrowserView coordinate space.
It is the developer's responsibility to compute the imageFrame such that it lies entirely within the cell's frame rectangle.
Subclasses can override this method to customize the position of the thumbnail.
Available in OS X v10.6 and later.

### 98.3.14 indexOfRepresentedItem as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the receiver's represented object in the datasource.
**Notes:** Available in OS X v10.6 and later.

### 98.3.15 isSelected as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the cell is selected.
**Notes:** Returns true if the cell is selected, otherwise false.
Subclasses should not override this method.
Available in OS X v10.6 and later.

### 98.3.16 layerForType(type as string) as CALayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a layer for the specified position.
**Notes:** type: A string representing the layer location. See Cell Layer Positions for possible values.
Return the CALayer to display in the specified position.
Subclasses can override this method to add a Core Animation layer to the cell
Available in OS X v10.6 and later.

### 98.3.17 opacity as Double

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the opacity of the receiver.
**Notes:** Possible values are between 0.0 (transparent) and 1.0 (opaque).
Subclasses can override this method to customize the opacity of the cell.
Available in OS X v10.6 and later.

### 98.3.18 representedItem as Variant

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's represented object.
**Notes:** Subclasses should not override this method.
Available in OS X v10.6 and later.

### 98.3.19 selectionFrame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's selection frame rectangle, which defines the position of the selection rectangle in its IKImageBrowserView.
**Notes:** Subclasses can override this method to customize the position of the selection frame.
Available in OS X v10.6 and later.

### 98.3.20 subtitleFrame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's subtitle frame rectangle.
**Notes:** The coordinates of the subtitle frame, in the IKImageBrowserView coordinate space.

It is the developer's responsibility to compute the subtitleFrame such that it lies entirely within the cell's frame rectangle.
Subclasses can override this method to customize the position of the subtitle.

Available in OS X v10.6 and later.

### 98.3.21 titleFrame as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the receiver's title frame rectangle.
**Notes:** The coordinates of the title frame, in the IKImageBrowserView coordinate space.

It is the developer's responsibility to compute the titleFrame such that it lies entirely within the cell's frame rectangle.
Subclasses can override this method to customize the position of the title.

Available in OS X v10.6 and later.

### 98.3.22 Properties

### 98.3.23 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 98.3.24 Constants

Cell States

| Constant | Value | Description |
|---|---|---|
| IKImageStateInvalid | 1 | The thumbnail is invalid. For example, an unsupported image is provided. Available in OS X v10.6 and later. |
| IKImageStateNoImage | 0 | Returned until a thumbnail has been created from the represented object. Available in OS X v10.6 and later. |
| IKImageStateReady | 2 | The receiver's represented object has been set and the cell is ready to display. Available in OS X v10.6 and later. |

## 98.4 class IKImageBrowserItemMBS

### 98.4.1 class IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for items in image browser.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9

### 98.4.2 Methods

### 98.4.3 Constructor(imageUID as string, imageRepresentationType as string, imageRepresentation as Variant, imageVersion as Integer = 1, imageTitle as string = """, imageSubtitle as string = """, isSelectable as boolean = true)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given values.

### 98.4.4 ItemWithCGImage(imageUID as string, Image as Variant, imageVersion as Integer = 1, imageTitle as string = """, imageSubtitle as string = """, isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given image.

### 98.4.5 ItemWithData(imageUID as string, Data as Memoryblock, imageVersion as Integer = 1, imageTitle as string = """, imageSubtitle as string = """, isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given data.

### 98.4.6 ItemWithFile(imageUID as string, file as folderitem, imageVersion as Integer = 1, imageTitle as string = "", imageSubtitle as string = "", isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given file.

### 98.4.7 ItemWithNSImage(imageUID as string, Image as NSImageMBS, imageVersion as Integer = 1, imageTitle as string = "", imageSubtitle as string = "", isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given image.

### 98.4.8 ItemWithPath(imageUID as string, path as string, imageVersion as Integer = 1, imageTitle as string = "", imageSubtitle as string = "", isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given path.

### 98.4.9 ItemWithURL(imageUID as string, URL as string, imageVersion as Integer = 1, imageTitle as string = "", imageSubtitle as string = "", isSelectable as boolean = true) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new item with given URL.

### 98.4.10 Properties

### 98.4.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 98.4.12 imageRepresentation as Variant

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image to display.
**Notes:** (Read and Write computed property)

### 98.4.13 imageRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the representation type of the image to display.
**Notes:** (Read and Write computed property)

### 98.4.14 imageSubtitle as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the display subtitle of the image.
**Notes:** (Read and Write computed property)

### 98.4.15 imageTitle as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the display title of the image.
**Notes:** (Read and Write computed property)

### 98.4.16 imageUID as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a unique string that identifies the data source item.
**Notes:** The image browser view uses this identifier to associate the data source item and its cache.
(Read and Write computed property)

### 98.4.17 imageVersion as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the version of the item.
**Notes:** The receiver can return a new version to let the image browser know that it should not use its cache for the item.
(Read and Write computed property)

### 98.4.18 isSelectable as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether this item is selectable.
**Notes:** True if the item is selectable; false otherwise.
(Read and Write computed property)

## 98.5 control IKImageBrowserViewControlMBS

### 98.5.1 control IKImageBrowserViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The control to wrap a IKImageBrowserViewMBS.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 16.5pr2
- MBS Xojo / Real Studio Plugins, version 14.2pr3

### 98.5.2 Properties

### 98.5.3 Scrollview as NSScrollViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The scrollview we embed the image browser view inside.
**Notes:** (Read only property)

### 98.5.4 View as IKImageBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** The image browser view.
**Notes:** (Read only property)

### 98.5.5 Events

### 98.5.6 backgroundWasRightClickedWithEvent(e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks the image browser view background.
**Notes:** event: The event that invoked the method.

This method signals that the user either right-clicked the background or left-clicked it with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time.

Available in OS X v10.5 and later.

### 98.5.7 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 98.5.8 cellWasDoubleClickedAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user double-clicks an item in the image browser view.
**Notes:** index: The index of the cell.

This method signals that the user double-clicked an item in the image browser view. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.5.9 cellWasRightClickedAtIndex(index as Integer, e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks an item in the image browser view.
**Notes:** index: The index of the cell.
event: The event that invoked the method.

This method signals that the user either right-clicked an item in the browser or left-clicked the item with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.5.10 Close

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 98.5.11 Closing

Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 98.5.12 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 98.5.13 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 98.5.14 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or

false to give others a chance.

### 98.5.15 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 98.5.16 draggingEnded(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 98.5.17 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated: and draggingExited: even if NSDragOperationNone is returned by this method.

### 98.5.18 draggingExited(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 98.5.19 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 98.5.20 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 98.5.21 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.5.22 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.5.23 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 98.5.24 GotFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.5.25 groupAtIndex(index as Integer) as Dictionary

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Returns the group at the specified index.
**Notes:** index: The index of the group you want to retrieve.

Returns a dictionary that defines the group. The keys in this dictionary can be any of the following constants: IKImageBrowserGroupStyle, IKImageBrowserGroupBackgroundColorKey, IKImageBrowserGroupTitleKey, and IKImageBrowserGroupRangeKey. For more information on these constants, see IKImageBrowserView Class Reference.

This method is optional.
Available in OS X v10.5 and later.

### 98.5.26 itemAtIndex(index as Integer) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Returns an object for the item in an image browser view that corresponds to the specified index.
**Notes:** index: The index of the item you want to retrieve.

Return an IKImageBrowserItem object.

Your data source must implement this method. The returned object must implement the required methods of the IKImageBrowserItem protocol.
Available in OS X v10.5 and later.

### 98.5.27 LostFocus

MBS AVFoundation Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.5.28 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 98.5.29 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 98.5.30 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 98.5.31 MouseUp(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 98.5.32 moveItemsAtIndexes(indexes as NSIndexSetMBS, destinationIndex as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Signals that the specified items should be moved to the specified destination.
**Notes:** indexes: The indexes of the items that should be reordered.
destinationIndex: The starting index of the destination the items should be moved to.

Returns true if successful; false otherwise.

This method is optional. It is invoked by the image browser view after Image Kit determines that a reordering operation should be applied. The data source should update itself by reordering its elements.
Available in OS X v10.5 and later.

### 98.5.33 numberOfGroups as Integer

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Returns the number of groups in an image browser view.
**Notes:** Return the number of groups.

This method is optional.
Available in OS X v10.5 and later.

### 98.5.34 numberOfItems as Integer

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Returns the number of records managed by the data source object.
**Notes:** Return the number of records managed by the image browser view.

Your data source must implement this method. An IKImageView object uses this method to determine how

many cells it should create and display.
Available in OS X v10.5 and later.

### 98.5.35 Open

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 98.5.36 Opening

Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 98.5.37 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 98.5.38 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return true if the receiver agrees to perform the drag operation and false if not.

This method is invoked only if the most recent draggingEntered or draggingUpdated event returned an acceptable drag-operation value.

If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this event.

### 98.5.39 removeItemsAtIndexes(indexes as NSIndexSetMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Signals that a remove operation should be applied to the specified items.
**Notes:** indexes: The indexes of the items that should be removed.

This method is optional. It is invoked by the image browser after Image Kit determines that a remove operation should be applied. In response, the data source should update itself by removing the specified items.
Available in OS X v10.5 and later.

### 98.5.40 ScaleFactorChanged(NewFactor as Double)

MBS AVFoundation Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 98.5.41 selectionDidChange

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the selection changes.
**Notes:** This method signals that the user changes the selection in the image browser view. You can implement this method if you want to perform custom tasks at that time.

Available in OS X v10.5 and later.

### 98.5.42 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

During enumerateDraggingItemsWithOptions you may set non-acceptable drag items images to nil to hide them or use the enumeration option of NSDraggingItemEnumerationClearNonenumeratedImages If there are items that you hide, then after enumeration, you need to set the numberOfValidItemsForDrop to the number of non-hidden drag items. However, if the valid item count is 0, then it is better to return NSDragOperationNone from your implementation of draggingEntered and, or draggingUpdated instead of hiding all drag items during enumeration.
Available in OS X v10.7 and later.

### 98.5.43 wantsPeriodicDraggingUpdates as boolean

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated events.
**Notes:** Returns true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated events even if nothing changes.

### 98.5.44 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 98.5.45 writeItemsAtIndexes(indexes as NSIndexSetMBS, pasteboard as NSPasteboardMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Signals that a drag should begin.
**Notes:** itemIndexes: The indexes of the items that should be dragged.
pasteboard: The pasteboard to copy the items to.

Returns the number of items written to the pasteboard.

This method is optional. It is invoked after Image Kit determines that a drag should begin, but before the drag has been started.
Available in OS X v10.5 and later.

## 98.6 class IKImageBrowserViewMBS

### 98.6.1 class IKImageBrowserViewMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The IKImageBrowserView class is a view for displaying and browsing a large amount of images and movies efficiently.
**Notes:** Available in OS X v10.5 and later.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr14
- MBS Real Studio Plugins, version 13.1pr9

### 98.6.2 Methods

### 98.6.3 cellForItemAtIndex(index as Integer) as IKImageBrowserCellMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the browser cell for the item at the specified index.
**Notes:** Subclasses must not override this method.
Available in OS X v10.6 and later.

### 98.6.4 collapseGroupAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Collapses a group at the specified index.
**Notes:** index: The index of the group you want to collapse.

### 98.6.5 columnIndexesInRect(rect as NSRectMBS) as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the column indexes in the specified rectangle.
**Notes:** rect: The rectangle in the view's coordinate system.
Returns an index set containing the cell indexes.
Available in OS X v10.6 and later.

### 98.6.6 Constructor

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with size 100/100 and position 0/0
**Example:**

```
dim t as new IKImageBrowserViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 98.6.7 Constructor(Handle as Integer) 15704
- 98.6.8 Constructor(left as Double, top as Double, width as Double, height as Double) 15704

### 98.6.7 Constructor(Handle as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given IKImageBrowserView handle.
**Example:**

```
dim t as new IKImageBrowserViewMBS(0, 0, 100, 100)
dim v as new IKImageBrowserViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a IKImageBrowserView and the plugin retains this handle.
See also:

- 98.6.6 Constructor 15704
- 98.6.8 Constructor(left as Double, top as Double, width as Double, height as Double) 15704

### 98.6.8 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim x as new IKImageBrowserViewMBS(0, 0, 100, 20)
```

**Notes:** On success the handle property is not zero.
See also:

- 98.6.6 Constructor 15704
- 98.6.7 Constructor(Handle as Integer) 15704

### 98.6.9 Destructor

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 98.6.10 dropOperation as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current drop operation.
**Notes:** Returns IKImageBrowserDropOn if the drop occurs on an item, otherwise IKImageBrowserDropBefore.
The returned value is valid when a drop occurred and until next drop.
For example, given a browser with N cells , a cell of N-1 and operation of IKImageBrowserDropOn would specify a drop on the last cell. To specify a drop after the last cell, one would use an index of N and IKImageBrowserDropBefore for the operation.
Available in OS X v10.6 and later.

### 98.6.11 expandGroupAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Expands a group at the specified index.
**Notes:** index: The index of the group you want to expand.
Available in OS X v10.5 and later.

### 98.6.12 getValue(name as String) as Variant

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries a value for a given key.

### 98.6.13 IKImageBrowserBackgroundColorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Notes:** A key for the background color of the image browser view. The associated value is a NSColorMBS object.
Available in OS X v10.5 and later.

### 98.6.14 IKImageBrowserCellsHighlightedTitleAttributesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Notes:** A key for the highlighted title attribute for an item in the image browser view. The associated value is a Dictionary.
Available in OS X v10.5 and later.

### 98.6.15 IKImageBrowserCellsOutlineColorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Notes:** A key for the outline color for an item in the image browser view. The associated value is an NSColorMBS object.
Available in OS X v10.5 and later.

### 98.6.16 IKImageBrowserCellsSubtitleAttributesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Notes:** A key for a subtitle attribute for an item in the image browser view. The associated value is a dictionary.
Available in OS X v10.5 and later.

### 98.6.17 IKImageBrowserCellsTitleAttributesKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Example:**

```
dim Imagebrowser as IKImageBrowserViewMBS // your control
dim d as new Dictionary
d.Value(NSAttributedStringMBS.NSForegroundColorAttributeName) = NSColorMBS.redColor

Imagebrowser.setValue Imagebrowser.IKImageBrowserCellsTitleAttributesKey, d
```

**Notes:** A key for title attribute of an item in the image browser view. The associated value is a dDictionary.
Available in OS X v10.5 and later.

### 98.6.18 IKImageBrowserCGImageRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A CGImageRef object.

### 98.6.19 IKImageBrowserCGImageSourceRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A CGImageSourceRef object.

### 98.6.20 IKImageBrowserGroupBackgroundColorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the background color of a group. The associated value is an NSColor object. This color is used only for the bezel style.
Available in OS X v10.5 and later.

### 98.6.21 IKImageBrowserGroupFooterLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the header layer of the group. The associated value is a CALayer.
Available in OS X v10.6 and later.

### 98.6.22 IKImageBrowserGroupHeaderLayer as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the header layer of the group. The associated value is a CALayer.
Available in OS X v10.6 and later.

### 98.6.23 IKImageBrowserGroupRangeKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the range of a group. The associated value is a NSRangeMBS. This is required if the view uses grouping
Available in OS X v10.5 and later.

### 98.6.24 IKImageBrowserGroupStyleKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the style of a group. The associated value is one of the constants defined in "Group Style Attributes".
Available in OS X v10.5 and later.

### 98.6.25 IKImageBrowserGroupTitleKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the group attribute keys.
**Notes:** A key for the title of a group. The associated value is a string. This string is used for the disclosure style only.
Available in OS X v10.5 and later.

### 98.6.26 IKImageBrowserIconRefPathRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A path to an icon.

### 98.6.27 IKImageBrowserIconRefRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** An icon.

### 98.6.28 IKImageBrowserNSBitmapImageRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** An NSBitmapImageRep object.

### 98.6.29 IKImageBrowserNSDataRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** Value for this key is a memoryblock.

### 98.6.30 IKImageBrowserNSImageRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** An NSImage object.

### 98.6.31 IKImageBrowserNSURLRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** An NSURL object.

### 98.6.32 IKImageBrowserPathRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A path representation (string).

### 98.6.33 IKImageBrowserPDFPageRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A PDFPage instance or a CGPDFPageRef.

### 98.6.34 IKImageBrowserQCCompositionPathRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A path (String) or URL (NSURL) to a Quartz Composer composition.

### 98.6.35 IKImageBrowserQCCompositionRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A QCComposition object.

### 98.6.36 IKImageBrowserQTMoviePathRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A path (string) or URL to a QuickTime movie.

### 98.6.37 IKImageBrowserQTMovieRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A QTMovie object.

### 98.6.38 IKImageBrowserQuickLookPathRepresentationType as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the image representation types.
**Notes:** A path (string) or URL (NSURL) to load data using QuickLook.

### 98.6.39 IKImageBrowserSelectionColorKey as string

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for image browser view options.
**Notes:** A key for the color that indicates a selection. The associated value is an NSColorMBS object.
Available in OS X v10.5 and later.

### 98.6.40 indexAtLocationOfDroppedItem as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the cell where the drop operation occurred.
**Notes:** Returns the index of the cell where the drop operation occurred.
The returned index is valid until the next drop occurs.
Available in OS X v10.5 and later.

### 98.6.41 indexOfItemAtPoint(point as NSPointMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the index of the item at the specified location.
**Notes:** Returns the index of the item or NSNotFound (-1) if no item at this location.

### 98.6.42 isGroupExpandedAtIndex(index as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the group at the provided index is expanded.
**Notes:** Return true if the group is expanded; false otherwise.

### 98.6.43 itemFrameAtIndex(index as Integer) as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the frame rectangle for the item located at the specified index.
**Notes:** index: The index of the item whose frame rectangle you want to obtain.
Return the frame rectangle of the item.

### 98.6.44 newCellForRepresentedItem(item as IKImageBrowserItemMBS) as IKImageBrowserCellMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the cell to use for the specified item.
**Notes:** Subclasses can override this method to customize the appearance of the cell that will represent anItem.
Available in OS X v10.6 and later.

### 98.6.45 numberOfColumns as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current number of columns.
**Notes:** Available in OS X v10.6 and later.

### 98.6.46 numberOfRows as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current number of rows.
**Notes:** Available in OS X v10.6 and later.

### 98.6.47 rectOfColumn(columnIndex as Integer) as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle containing the specified column.
**Notes:** Return a rectangle containing the column. Specified in the view's coordinate system.
Available in OS X v10.6 and later.

### 98.6.48 rectOfRow(rowIndex as Integer) as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the rectangle containing the specified row.
**Notes:** Returns a rectangle containing the column. Specified in the view's coordinate system.
Available in OS X v10.6 and later.

### 98.6.49 reloadData

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Marks the receiver as needing its data reloaded.

### 98.6.50 rowIndexesInRect(rect as NSRectMBS) as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the row indexes in the specified rectangle.
**Notes:** rect: A rectangle in the view's coordinate system.
Returns an index set containing the item indexes.
Available in OS X v10.6 and later.

### 98.6.51 scrollIndexToVisible(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the receiver to the item at the specified index.

### 98.6.52 selectionIndexes as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indexes of the selected cells.

### 98.6.53 setDropIndex(index as Integer, operation as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Allows the class to retarget the drop action.
**Notes:** index: The requested drop index.
operation: The requested drop operation. The possible values are described in IKImageBrowserDropOperation.

For example, To specify a drop on the second item, one would specify index as 1, and operation as IKImageBrowserDropOn. To specify a drop after the last item, one would specify index as the number of items and operation as IKImageBrowserDropBefore.

Passing a value of –1 for index, and IKImageBrowserDropOn as the operation causes the entire browser view to be highlighted rather than a specific item. This is useful if the data displayed by the receiver does not allow the user to drop items at a specific item location.

### 98.6.54 setSelectionIndexes(indexes as NSIndexSetMBS, extendSelection as boolean = false)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Selects cells at the specified indexes.
**Notes:** indexes: The indexes of the cells you want to select.
extendSelection: A boolean value that specifies whether to extend the current selection. Pass true to extends the selection; false replaces the current selection.
Available in OS X v10.5 and later.

### 98.6.55 setValue(name as String, value as Variant)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets a value for a given key.

### 98.6.56 visibleItemIndexes as NSIndexSetMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the indexes of the view's currently visible items.
**Notes:** Available in OS X v10.6 and later.

### 98.6.57 Properties

### 98.6.58 allowsDroppingOnItems as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can drop on items.
**Notes:** True if the user is able to drop on items, otherwise false.
Available in OS X v10.6 and later.
(Read and Write computed property)

### 98.6.59 allowsEmptySelection as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether an empty selection is allowed.
**Notes:** (Read and Write computed property)

### 98.6.60 allowsMultipleSelection as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can select more than one cell at a time.
**Notes:** (Read and Write computed property)

### 98.6.61 allowsReordering as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can reorder items.
**Notes:** (Read and Write computed property)

### 98.6.62 animates as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver animates reordering and changes of the data source.
**Notes:** (Read and Write computed property)

### 98.6.63 backgroundLayer as CALayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The Core Animation layer used as the view's background.
**Notes:** The background layer can have sublayers. Additionally, the layers can also contain animations. The layer is optional.
Available in OS X v10.6 and later.
(Read and Write computed property)

### 98.6.64 canControlQuickLookPanel as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the view can automatically take control of the QuickLook panel.
**Notes:** When the browser view displays the QuickLook panel it sets itself as the QuickLook datasource. If the browser cells returned by the datasource return items that are URLs or paths, then the QuickLook panel will display the image at that location. Otherwise, the browser cell must implement the QLPreviewItem protocol and return the requested URL for the custom cell.
Available in OS X v10.6 and later.
(Read and Write computed property)

### 98.6.65 cellSize as NSSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The cell size.
**Notes:** You must use CellSize or ZoomValue, but not both. Setting the zoom value changes the cell size, and vice versa.
Available in OS X v10.5 and later.
(Read and Write computed property)

### 98.6.66 cellsStyleMask as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The appearance style of the cells.
**Notes:** (Read and Write computed property)

### 98.6.67 constrainsToOriginalSize as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver constrains the cell's image to its original size.
**Notes:** The default value is false.
(Read and Write computed property)

### 98.6.68 contentResizingMask as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The content resizing mask, which determines how its content is resized while zooming.
**Notes:** You specify a mask by combining any of the following options using the bitwise OR operator: NSViewWidthSizable (2), NSViewHeightSizable (16). Other values are ignored.
(Read and Write computed property)

### 98.6.69 foregroundLayer as CALayerMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the foreground Core Animation layer
**Notes:** Returns a CALayer instance.
Available in OS X v10.6 and later.
(Read and Write computed property)

### 98.6.70 intercellSpacing as NSSizeMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the spacing between cells in the view.
**Notes:** Returns the vertical and horizontal spacing between cells.
Available in OS X v10.6 and later.
(Read and Write computed property)

### 98.6.71 zoomValue as Double

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The zoom value.
**Notes:** The zoom value. This value should be greater or equal to zero and less or equal than one. A zoom value of zero corresponds to the minimum size (40x40 pixels). A zoom value of one means images fits the

browser bounds. Other values are interpolated.
Discussion
You must use ZoomValue or CellSize, but not both. Setting the zoom value changes the cell size, and vice versa.
Available in OS X v10.5 and later.
(Read and Write computed property)

### 98.6.72 Events

### 98.6.73 backgroundWasRightClickedWithEvent(e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks the image browser view background.
**Notes:** event: The event that invoked the method.

This method signals that the user either right-clicked the background or left-clicked it with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.6.74 cellWasDoubleClickedAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user double-clicks an item in the image browser view.
**Notes:** index: The index of the cell.

This method signals that the user double-clicked an item in the image browser view. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.6.75 cellWasRightClickedAtIndex(index as Integer, e as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the user right-clicks an item in the image browser view.
**Notes:** index: The index of the cell.
event: The event that invoked the method.

This method signals that the user either right-clicked an item in the browser or left-clicked the item with the Alt key pressed. You can implement this method if you want to perform custom tasks at that time.

Available in OS X v10.5 and later.

### 98.6.76 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 98.6.77 draggingEnded(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 98.6.78 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated: and draggingExited: even if NSDragOperationNone is returned by this method.

### 98.6.79 draggingExited(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 98.6.80 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered: message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the

time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 98.6.81 groupAtIndex(index as Integer) as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns the group at the specified index.
**Notes:** index: The index of the group you want to retrieve.

Returns a dictionary that defines the group. The keys in this dictionary can be any of the following constants: IKImageBrowserGroupStyle, IKImageBrowserGroupBackgroundColorKey, IKImageBrowserGroupTitleKey, and IKImageBrowserGroupRangeKey. For more information on these constants, see IKImageBrowserView Class Reference.

This method is optional.
Available in OS X v10.5 and later.

### 98.6.82 itemAtIndex(index as Integer) as IKImageBrowserItemMBS

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns an object for the item in an image browser view that corresponds to the specified index.
**Notes:** index: The index of the item you want to retrieve.

Return an IKImageBrowserItem object.

Your data source must implement this method. The returned object must implement the required methods of the IKImageBrowserItem protocol.
Available in OS X v10.5 and later.

### 98.6.83 moveItemsAtIndexes(indexes as NSIndexSetMBS, destinationIndex as Integer) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Signals that the specified items should be moved to the specified destination.
**Notes:** indexes: The indexes of the items that should be reordered.
destinationIndex: The starting index of the destination the items should be moved to.

Returns true if successful; false otherwise.

This method is optional. It is invoked by the image browser view after Image Kit determines that a reordering operation should be applied. The data source should update itself by reordering its elements.
Available in OS X v10.5 and later.

### 98.6.84 numberOfGroups as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns the number of groups in an image browser view.
**Notes:** Return the number of groups.

This method is optional.
Available in OS X v10.5 and later.

### 98.6.85 numberOfItems as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns the number of records managed by the data source object.
**Notes:** Return the number of records managed by the image browser view.

Your data source must implement this method. An IKImageView object uses this method to determine how many cells it should create and display.
Available in OS X v10.5 and later.

### 98.6.86 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to

import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Returns if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 98.6.87 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return true if the receiver agrees to perform the drag operation and false if not.

This method is invoked only if the most recent draggingEntered or draggingUpdated event returned an acceptable drag-operation value.

If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this event.

### 98.6.88 removeItemsAtIndexes(indexes as NSIndexSetMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Signals that a remove operation should be applied to the specified items.
**Notes:** indexes: The indexes of the items that should be removed.

This method is optional. It is invoked by the image browser after Image Kit determines that a remove operation should be applied. In response, the data source should update itself by removing the specified items.
Available in OS X v10.5 and later.

### 98.6.89 selectionDidChange

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Performs custom tasks when the selection changes.
**Notes:** This method signals that the user changes the selection in the image browser view. You can implement this method if you want to perform custom tasks at that time.
Available in OS X v10.5 and later.

### 98.6.90 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

During enumerateDraggingItemsWithOptions you may set non-acceptable drag items images to nil to hide them or use the enumeration option of NSDraggingItemEnumerationClearNonenumeratedImages If there are items that you hide, then after enumeration, you need to set the numberOfValidItemsForDrop to the number of non-hidden drag items. However, if the valid item count is 0, then it is better to return NSDragOperationNone from your implementation of draggingEntered and, or draggingUpdated instead of hiding all drag items during enumeration.
Available in OS X v10.7 and later.

### 98.6.91 wantsPeriodicDraggingUpdates as boolean

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated events.
**Notes:** Returns true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated events even

if nothing changes.

### 98.6.92 writeItemsAtIndexes(indexes as NSIndexSetMBS, pasteboard as NSPasteboardMBS) as Integer

MBS AVFoundation Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Signals that a drag should begin.
**Notes:** itemIndexes: The indexes of the items that should be dragged.
pasteboard: The pasteboard to copy the items to.

Returns the number of items written to the pasteboard.

This method is optional. It is invoked after Image Kit determines that a drag should begin, but before the drag has been started.
Available in OS X v10.5 and later.

### 98.6.93 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| IKImageBrowserDropBefore | 1 | One of the constants to specify the locations for dropping items onto the browser view.<br>Drop the item before the cell.<br>Available in OS X v10.6 and later.<br>Used by the method setDropIndex. |
| IKImageBrowserDropOn | 0 | One of the constants to specify the locations for dropping items onto the browser view.<br>Drop the item on the cell.<br>Available in OS X v10.6 and later.<br>Used by the method setDropIndex. |

Cell Styles

| Constant | Value | Description |
|---|---|---|
| IKCellsStyleNone | 0 | No style. |
| IKCellsStyleOutlined | 2 | Cells are outlined. |
| IKCellsStyleShadowed | 1 | Cells use shadows. |
| IKCellsStyleSubtitled | 8 | Cells display a subtitle. |
| IKCellsStyleTitled | 4 | Cells display a title. |

Bevel Styles

| Constant | Value | Description |
|---|---|---|
| IKGroupBezelStyle | 0 | A bezel style.<br>Available in OS X v10.5 and later. |
| IKGroupDisclosureStyle | 1 | A disclosure triangle.<br>Available in OS X v10.5 and later. |

## 98.7 class IKImageEditPanelMBS

### 98.7.1 class IKImageEditPanelMBS

MBS AVFoundation Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** The class for the image edit panel from Mac OS X 10.5.
**Notes:** Subclass of the NSPanelMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr8
- MonkeyBread Software Releases the MBS Plugins 8.1

### 98.7.2 Methods

### 98.7.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new image edit panel.

### 98.7.4 reloadData

MBS AVFoundation Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Requests the panel to reload the image.
**Notes:** Do call this if you have a new image to return in the image event.

### 98.7.5 Properties

### 98.7.6 LastImage as Picture

MBS AVFoundation Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** The last image passed to you or requested from you.
**Notes:** This property is set with the picture you return with the image event and is set with the image sent to you useing the Changed event.
(Read and Write property)

### 98.7.7 Events

### 98.7.8 Changed(pic as picture, CGImageHandle as Integer, metaData as dictionary)

MBS AVFoundation Plugin, Plugin Version: 8.1, Platform: macOS, Targets: .

**Function:** The image changed and you should update your GUI.
**Notes:** pic: The image as a picture.
CGImageHandle: The internal handle to the original CGImage which is used to make the picture.
metaData: additional image data.

### 98.7.9 hasAdjustMode as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Returns whether the adjust mode view tab should be displayed.
**Notes:** Return true if the tab should be displayed, otherwise false.
Available on Mac OS X 10.6 or newer.

### 98.7.10 hasDetailsMode as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Returns whether the details mode view tab should be displayed.
**Notes:** True if the tab should be displayed, otherwise false.
Available on Mac OS X 10.6 or newer.

### 98.7.11 hasEffectsMode as Boolean

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Returns whether the effects mode view tab should be displayed.
**Notes:** True if the tab should be displayed, otherwise false.
Available on Mac OS X 10.6 or newer.

### 98.7.12 Image as picture

MBS AVFoundation Plugin, Plugin Version: 8.1, Platform: macOS, Targets: .

**Function:** The panel needs an image to start with.
**Notes:** Return your image in this event whenever the panel needs it.

### 98.7.13 imageProperties as Dictionary

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Returns a dictionary of the image properties associated with the image in the image edit panel.
**Notes:** Available on Mac OS X 10.5 or newer.

### 98.7.14 thumbnailWithMaximumSize(Width as Double, Height as Double) as picture

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Returns a thumbnail image whose size is no larger than the specified size.
**Notes:** Available in OS X v 10.5 and later.

## 98.8 control IKImageViewControlMBS

### 98.8.1 control IKImageViewControlMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control to host a IKImageView.

### 98.8.2 Properties

### 98.8.3 View as IKImageViewMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** The image view used in this control.
**Notes:** (Read only property)

### 98.8.4 Events

### 98.8.5 BoundsChanged

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 98.8.6 Close

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 98.8.7 Closing

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 98.8.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 98.8.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 98.8.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 98.8.11 EnableMenuItems

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 98.8.12 FocusLost

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.8.13 FocusReceived

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.8.14 FrameChanged

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 98.8.15 GotFocus

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 98.8.16 LostFocus

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 98.8.17 MenuBarSelected

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 98.8.18 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 98.8.19 MouseDrag(x as Integer, y as Integer)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 98.8.20 MouseUp(x As Integer, y As Integer)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 98.8.21 Open

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 98.8.22 Opening

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 98.8.23 ScaleFactorChanged(NewFactor as double)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 98.8.24 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 98.9 class IKImageViewMBS

### 98.9.1 class IKImageViewMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** An advanced image view in ImageKit.
**Notes:** The IKImageViewMBS class provides an efficient way to display images in a view while at the same time supporting a number of image editing operations such as rotating, zooming, and cropping. It supports drag and drop for the NSFilenamesPboardType flavor so that the user can drag an image to the view. If possible, image rendering uses hardware acceleration to achieve optimal performance. The IKImageViewMBS class is implemented as a subclass of NSView. Similar to NSImageViewMBS, the IKImageViewMBS class is used to display a single image.
Subclass of the NSViewMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.1

### 98.9.2 Methods

### 98.9.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new IKImageViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 98.9.4 Constructor(Handle as Integer) 15735
- 98.9.5 Constructor(left as double, top as double, width as double, height as double) 15736

### 98.9.4 Constructor(Handle as Integer)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new IKImageViewMBS(0, 0, 100, 100)
dim v as new IKImageViewMBS(t.handle)
```

```
MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a IKImageView and the plugin retains this handle.
See also:

- 98.9.3 Constructor 15735
- 98.9.5 Constructor(left as double, top as double, width as double, height as double) 15736

### 98.9.5 Constructor(left as double, top as double, width as double, height as double)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new IKImageViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:

- 98.9.3 Constructor 15735
- 98.9.4 Constructor(Handle as Integer) 15735

### 98.9.6 convertImagePointToViewPoint(imagePoint as NSPointMBS) as NSPointMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Converts an image coordinate to an image view coordinate.
**Notes:** imagePoint: A point specified in coordinates relative to the image.

Returns a point specified in coordinates relative to the image view.

### 98.9.7 convertImageRectToViewRect(ImageRect as NSRectMBS) as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Converts an image rectangle to an image view rectangle.
**Notes:** ImageRect: An rectangle specified in coordinates relative to the image.

Returns an rectangle specified in coordinates relative to the image view.

### 98.9.8 convertViewPointToImagePoint(viewPoint as NSPointMBS) as NSPointMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Converts an image view coordinate to an image coordinate.
**Notes:** viewPoint: A point specified in coordinates relative to the image view.

Returns the point specified in coordinates relative to the image.

### 98.9.9 convertViewRectToImageRect(viewRect as NSRectMBS) as NSRectMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Converts an image view rectangle to an image rectangle.
**Notes:** viewRect: An rectangle specified in coordinates relative to the image view.

The rectangle specified in coordinates relative to the image.

### 98.9.10 crop

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Crops the image using the current selection.

### 98.9.11 flipImageHorizontal

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Flips an image along the horizontal axis.

### 98.9.12 flipImageVertical

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Flips an image along the vertical axis.

### 98.9.13 IKOverlayTypeBackground as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** A layer level.
**Notes:** A background.

### 98.9.14 IKOverlayTypeImage as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** A layer level.
**Notes:** An image.

### 98.9.15 IKToolModeAnnotate as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The annotation tool.

### 98.9.16 IKToolModeCrop as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The crop tool.

### 98.9.17 IKToolModeMove as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The move tool.

### 98.9.18 IKToolModeNone as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** No tool is set.

### 98.9.19 IKToolModeRotate as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The rotation tool.

### 98.9.20 IKToolModeSelect as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The selection tool.

### 98.9.21 IKToolModeSelectEllipse as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The selection ellipse.

### 98.9.22 IKToolModeSelectLasso as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** The selection lasso.

### 98.9.23 IKToolModeSelectRect as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the tool modes.
**Notes:** Same as IKToolModeSelect.

### 98.9.24 rotateImageLeft

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Rotates the image left (counter-clockwise).

### 98.9.25 rotateImageRight

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Rotates the image right (clockwise).

### 98.9.26 scrollToPoint(point as NSPointMBS)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the view to the specified point.
**Notes:** point: The point to scroll to.

### 98.9.27 scrollToRect(rect as NSRectMBS)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Scrolls the view so that it includes the provided rectangular area.
**Notes:** Rect: The rectangular area to include in the view.

### 98.9.28 SetImage(image as CGImageMBS, metaData as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the image to display in an image view.
**Notes:** image: The image to set.
metaData: A dictionary that contains metadata that describes the image.

### 98.9.29 SetImageFile(File as FolderItem)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Initializes an image view with the image specified by a folderitem.
**Notes:** File: The file that specifies the location of the image.

This method is the preferred initializer for RAW images. If you use this method for a TIFF file that contains multiple images, only the first image is displayed.

### 98.9.30 SetImageURL(URL as String)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Initializes an image view with the image specified by a URL.
**Notes:** url: The URL that specifies the location of the image.

This method is the preferred initializer for RAW images. If you use this method for a TIFF file that contains multiple images, only the first image is displayed.

### 98.9.31 setImageZoomFactor(zoomFactor as Double, centerPoint as NSPointMBS)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the zoom factor at the provided origin.
**Notes:** zoomFactor: The zoom factor to apply to the image.
centerPoint: The point that specifies the origin of the zoom factor.

### 98.9.32 SetPicture(picture as Picture, metaData as Dictionary = nil)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the picture to display in an image view.
**Notes:** picture: The picture to set.
metaData: A dictionary that contains metadata that describes the image.

### 98.9.33 setRotationAngle(rotationAngle as Double, centerPoint as NSPointMBS)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the rotation angle at the provided origin.
**Notes:** rotationAngle: The rotation angle to apply to the image.
centerPoint: The point that specifies the origin of the rotation angle.

### 98.9.34 zoomImageToActualSize

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Zooms the image so that it is displayed using its true size.

### 98.9.35 zoomImageToFit

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Zooms the image so that it fits in the image view.

### 98.9.36 zoomImageToRect(rect as NSRectMBS)

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Zooms the image so that it fits in the specified rectangle.
**Notes:** rect: The rectangle to fit the image in.

### 98.9.37 zoomIn

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Zooms the image in.

### 98.9.38 zoomOut

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Zooms the image out.

### 98.9.39 Properties

### 98.9.40 autohidesScrollers as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the automatic-hiding scroll bar state for the image view.
**Notes:** (Read and Write property)

### 98.9.41 autoresizes as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the automatic resizing state for the image view.
**Notes:** (Read and Write property)

### 98.9.42 backgroundColor as NSColorMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the background color for the image view.
**Notes:** (Read and Write property)

### 98.9.43 currentToolMode as String

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the current tool mode for the image view.
**Notes:** (Read and Write property)

### 98.9.44 doubleClickOpensImageEditPanel as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the image-opening state of the editing pane in the image view.
**Notes:** (Read and Write property)

### 98.9.45 editable as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the editable state for the image view.
**Notes:** (Read and Write property)

### 98.9.46 hasHorizontalScroller as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the horizontal scroll bar state for the image view.
**Notes:** (Read and Write property)

### 98.9.47 hasVerticalScroller as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the vertical scroll bar state for the image view.
**Notes:** (Read and Write property)

### 98.9.48 Image as CGImageMBS

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image associated with the view, after any image corrections.
**Notes:** (Read only property)

### 98.9.49 imageCorrection as Variant

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies a Core Image filter for image correction.
**Notes:** (Read and Write property)

### 98.9.50 imageHeight as Integer

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the height of the image in the image view.
**Notes:** The image size changes whenever an image is rotates or cropped.
(Read only property)

### 98.9.51 imageProperties as Dictionary

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the metadata for the image in the view.
**Notes:** A dictionary of metadata that specifies the image properties.
(Read only property)

### 98.9.52 imageWidth as Integer

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the width of the image in the image view.
**Notes:** The image size changes whenever an image is rotates or cropped.
(Read only property)

### 98.9.53 Picture as Picture

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image associated with the view, after any image corrections.
**Notes:** Converted to picture for your convenience.
(Read only property)

### 98.9.54 rotationAngle as Double

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the rotation angle for the image view.
**Notes:** (Read and Write property)

### 98.9.55 supportsDragAndDrop as Boolean

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the drag-and-drop support state for the image view.
**Notes:** (Read and Write property)

### 98.9.56 zoomFactor as Double

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the zoom factor for the image view.
**Notes:** (Read and Write property)

### 98.9.57 Overlay(layerType as string) as Variant

MBS AVFoundation Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the overlay layer.
**Notes:** The Core Animation layer associated with a layer type.
Value is a CALayerMBS object.
(Read and Write computed property)

## 98.10 class IKPictureTakerMBS

### 98.10.1 class IKPictureTakerMBS

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** An IKPictureTaker object is a panel that allows users to choose and crop an image.
**Notes:** It supports browsing of the file system and includes a recents popup-menu. The IKPictureTaker lets the user to crop a choosen image or to take snapshot from a camera like the built-in iSight.

Requires Mac OS X 10.5.
Subclass of the NSPanelMBS class.

### 98.10.2 Methods

### 98.10.3 Available as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether the picture taker is available on that platform or not.
**Example:**

```
dim n as Integer

dim p as new IKPictureTakerMBS

if not p.Available then
MsgBox "This application requires Mac OS X 10.5 and a Macho Target"
Return
end if
```

**Notes:** True on Mac OS X 10.5.

### 98.10.4 beginPictureTaker as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Launch the PictureTaker.
**Example:**

```
dim p as IKPictureTakerMBS // your picture taker
```

```
if not p.beginPictureTaker then
MsgBox "Can't show picture taker!?"
end if
```

**Notes:** You will later receive an event for the case the user clicks on OK or Cancel buttons.
Returns true on success and false on failure.

### 98.10.5 beginPictureTakerSheet(parent as DesktopWindow) as boolean

MBS AVFoundation Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Opens a picture taker as a sheet whose parent is the specified window.
**Notes:** parent: The parent window of the picture taker sheet.

You will later receive an event for the case the user clicks on OK or Cancel buttons.

Available in Mac OS X v10.5 and later.
See also:

- 98.10.6 beginPictureTakerSheet(parent as NSWindowMBS) as boolean 15748
- 98.10.7 beginPictureTakerSheet(parent as window) as boolean 15748

### 98.10.6 beginPictureTakerSheet(parent as NSWindowMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Opens a picture taker as a sheet whose parent is the specified window.
**Notes:** parent: The parent window of the picture taker sheet.

You will later receive an event for the case the user clicks on OK or Cancel buttons.

Available in Mac OS X v10.5 and later.
See also:

- 98.10.5 beginPictureTakerSheet(parent as DesktopWindow) as boolean 15748
- 98.10.7 beginPictureTakerSheet(parent as window) as boolean 15748

### 98.10.7 beginPictureTakerSheet(parent as window) as boolean

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Opens a picture taker as a sheet whose parent is the specified window.
**Notes:** parent: The parent window of the picture taker sheet.

You will later receive an event for the case the user clicks on OK or Cancel buttons.

Available in Mac OS X v10.5 and later.
See also:


- 98.10.5 beginPictureTakerSheet(parent as DesktopWindow) as boolean 15748
- 98.10.6 beginPictureTakerSheet(parent as NSWindowMBS) as boolean 15748


### 98.10.8 Constructor

MBS AVFoundation Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new picture taker panel.

### 98.10.9 CropAreaSizeHeight as Double

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The height of the crop area.

### 98.10.10 CropAreaSizeWidth as Double

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The width of the crop area.

### 98.10.11 outputImage as NSImageMBS

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Return the edited image.

### 98.10.12 OutputImageMaxSizeKeyHeight as Double

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The maximum height of the output image.

### 98.10.13 OutputImageMaxSizeKeyWidth as Double

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The maximum width of the output image.

### 98.10.14 popUpRecentsMenuForView(parent as NSViewMBS) as boolean

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Displays the Open Recent popup menu associated with the picture taker.
**Notes:** You will later receive an event for the case the user clicks on OK or Cancel buttons.

Available in Mac OS X v10.5 and later.

### 98.10.15 runModal as Integer

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Launches a modal PictureTaker session.
**Example:**

```
dim p as IKPictureTakerMBS // global property
dim n as Integer

p=new IKPictureTakerMBS

if not p.Available then
MsgBox "This application requires Mac OS X 10.5 and a Macho Target"
Return
end if

p.AllowsFileChoosing=true
p.AllowsEditing=true
p.AllowsVideoCapture=true
p.ShowEffects=FALSE // disable if you run modal!
p.ShowRecentPicture=true
p.UpdateRecentPicture=true
p.InformationalText="Please take a picture"

n=p.runModal
```

```
if n=1 then // ok
Backdrop=p.outputImage.CopyPictureWithMask
else
Title=Str(n)
end if
```

**Notes:** Returns NSOKButton (1) if the user edits or chooses an image and confirm panel, NSCancelButton (0) if the user canceled or didn't change the image.

You may want to disable effects as they won't work in Xojo in a modal picture taker dialog.

### 98.10.16 SetCropAreaSize(width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the crop area.

### 98.10.17 SetOutputImageMaxSize(width as Double, height as Double)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the maximum output image size.

### 98.10.18 Properties

### 98.10.19 AllowsEditing as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether editing is allowed or not.
**Notes:** (Read and Write computed property)

### 98.10.20 AllowsFileChoosing as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether choosing a file is allowed or not.
**Notes:** (Read and Write computed property)

### 98.10.21 AllowsVideoCapture as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether video capture is allowed or not.
**Notes:** (Read and Write computed property)

### 98.10.22 InformationalText as NSAttributedStringMBS

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The information text as a plain string.
**Notes:** On getting the value the plugin will check whether the value is a formatted or a plain text. if it is a plain text, it will return the plain text as a NSAttributedStringMBS.
(Read and Write computed property)
See also:

- 98.10.23 InformationalText as string 15752

### 98.10.23 InformationalText as string

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The information text as a plain string.
**Example:**

```
dim p as IKPictureTakerMBS // your picture taker
p.InformationalText="Please take a picture"
```

**Notes:** On getting the value the plugin will check whether the value is a formatted or a plain text. if it is a formatted text, it will return the formatted text as plain text.
(Read and Write computed property)
See also:

- 98.10.22 InformationalText as NSAttributedStringMBS 15752

### 98.10.24 inputImage as NSImageMBS

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The input image.
**Notes:** The input image is never modified by the PictureTaker.
(Read and Write computed property)

### 98.10.25 mirroring as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** True if video mirroring is enabled, false otherwise.
**Notes:** Controls whether the receiver enable/disable video mirroring durring snapshots (default is true).
(Read and Write computed property)

### 98.10.26 RemainOpenAfterValidate as boolean

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the picture taker reamins open.
**Notes:** Requires Mac OS X 10.6.
(Read and Write computed property)

### 98.10.27 ShowAddressBookPicture as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether the addressbook picture is shown or not.
**Notes:** (Read and Write computed property)

### 98.10.28 ShowEffects as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether effects are shown or not.
**Notes:** (Read and Write computed property)

### 98.10.29 ShowEmptyPicture as NSImageMBS

MBS AVFoundation Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The image to use for an empty image.
**Notes:** (Read and Write computed property)

### 98.10.30 ShowRecentPicture as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether recent pictures should be shown.
**Notes:** (Read and Write computed property)

### 98.10.31 UpdateRecentPicture as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether recent pictures should be updated.
**Notes:** (Read and Write computed property)

### 98.10.32 Events

### 98.10.33 Finished(returnCode as Integer)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** beginPictureTaker has finished work.
**Notes:** ReturnCode is 1 if the user clicked OK and 0 if the user clicked false.

### 98.10.34 Screenshots

### 98.10.35 PictureTaker1.jpg

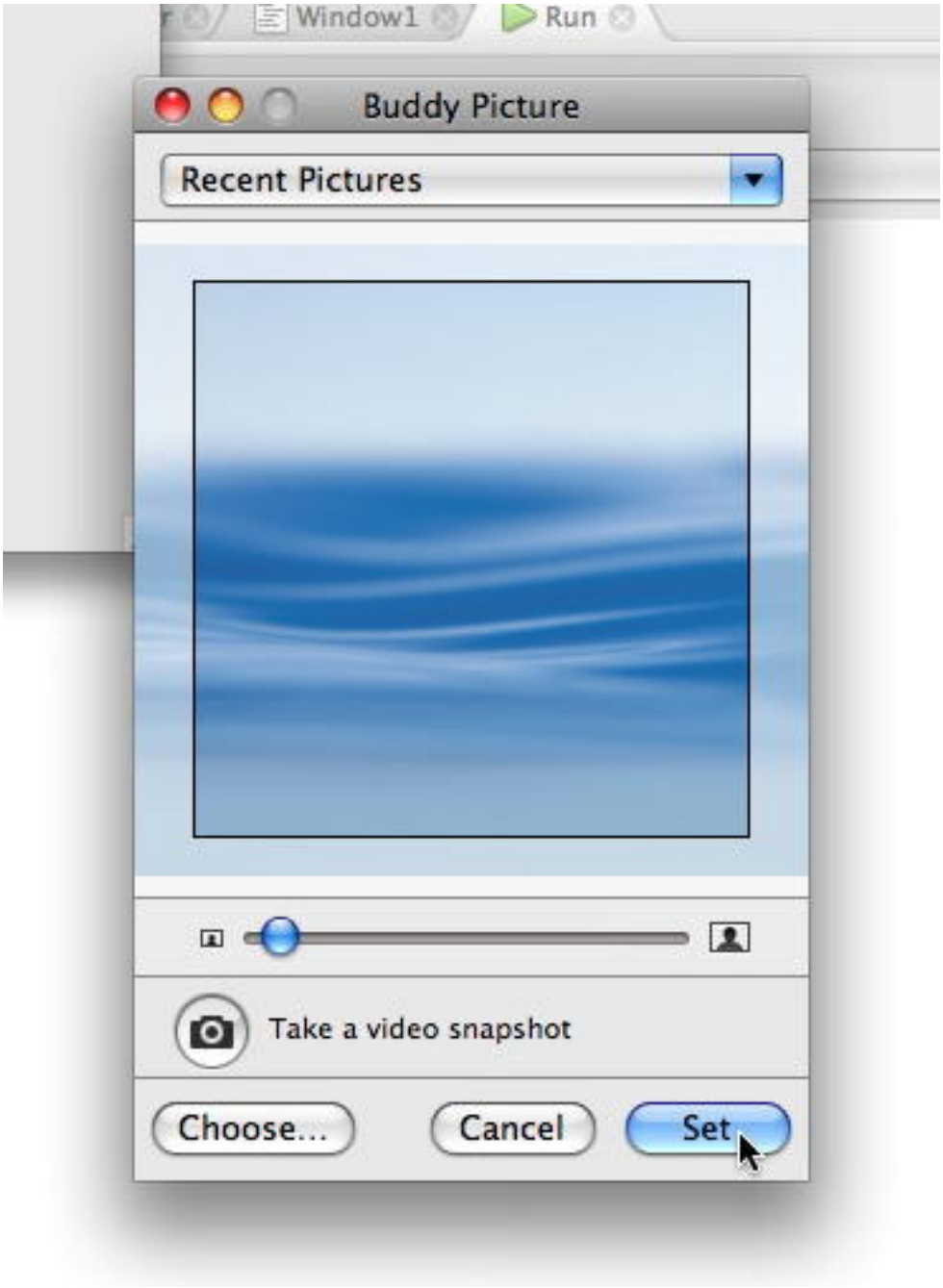


**Function:** The picture taker with an image choosed.

### 98.10.36 PictureTaker2.jpg

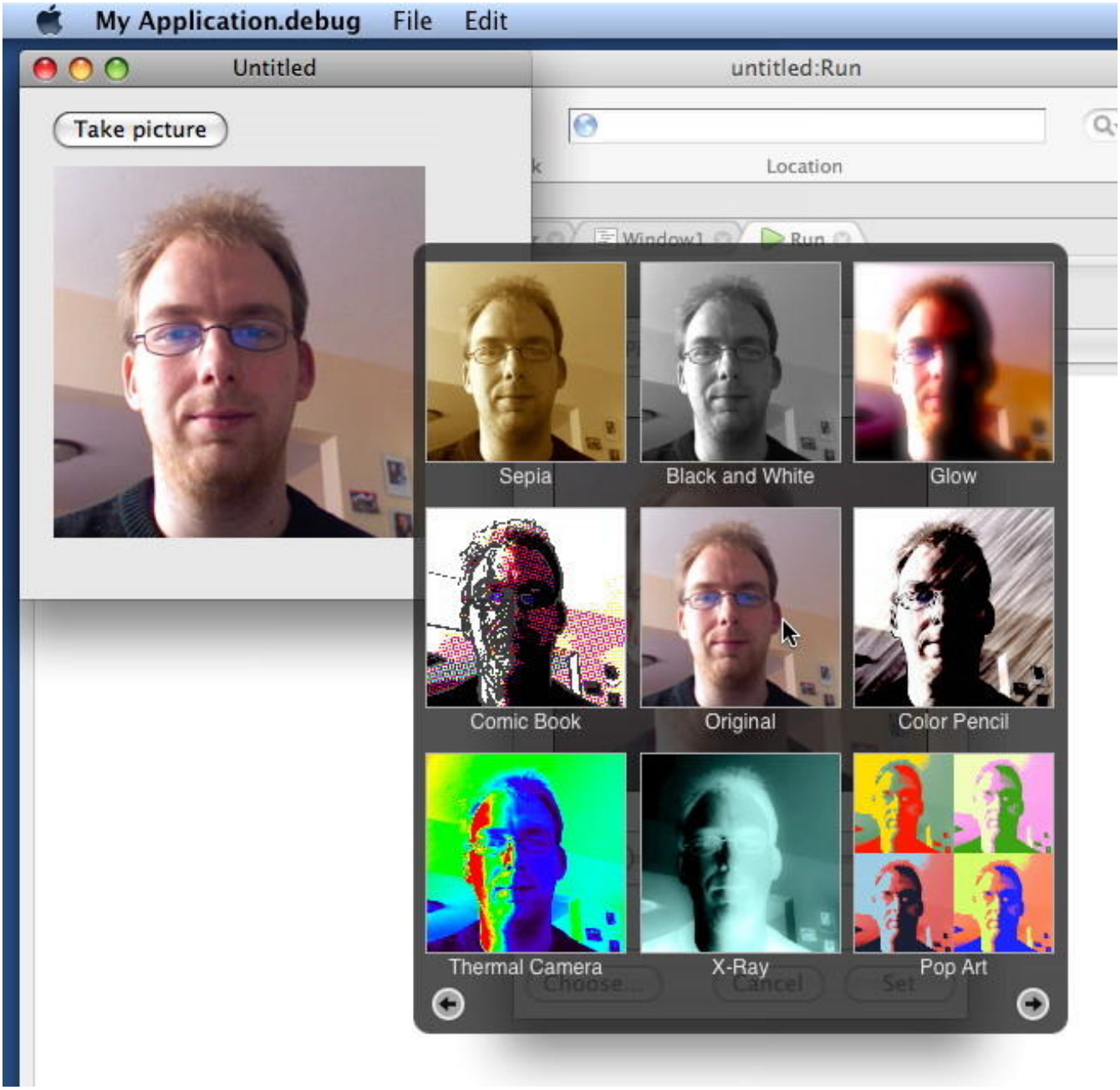


**Function:** The picture taker doing effects on a photo taken with the iSight.

### 98.10.37 QuartzFilterPanel.jpg

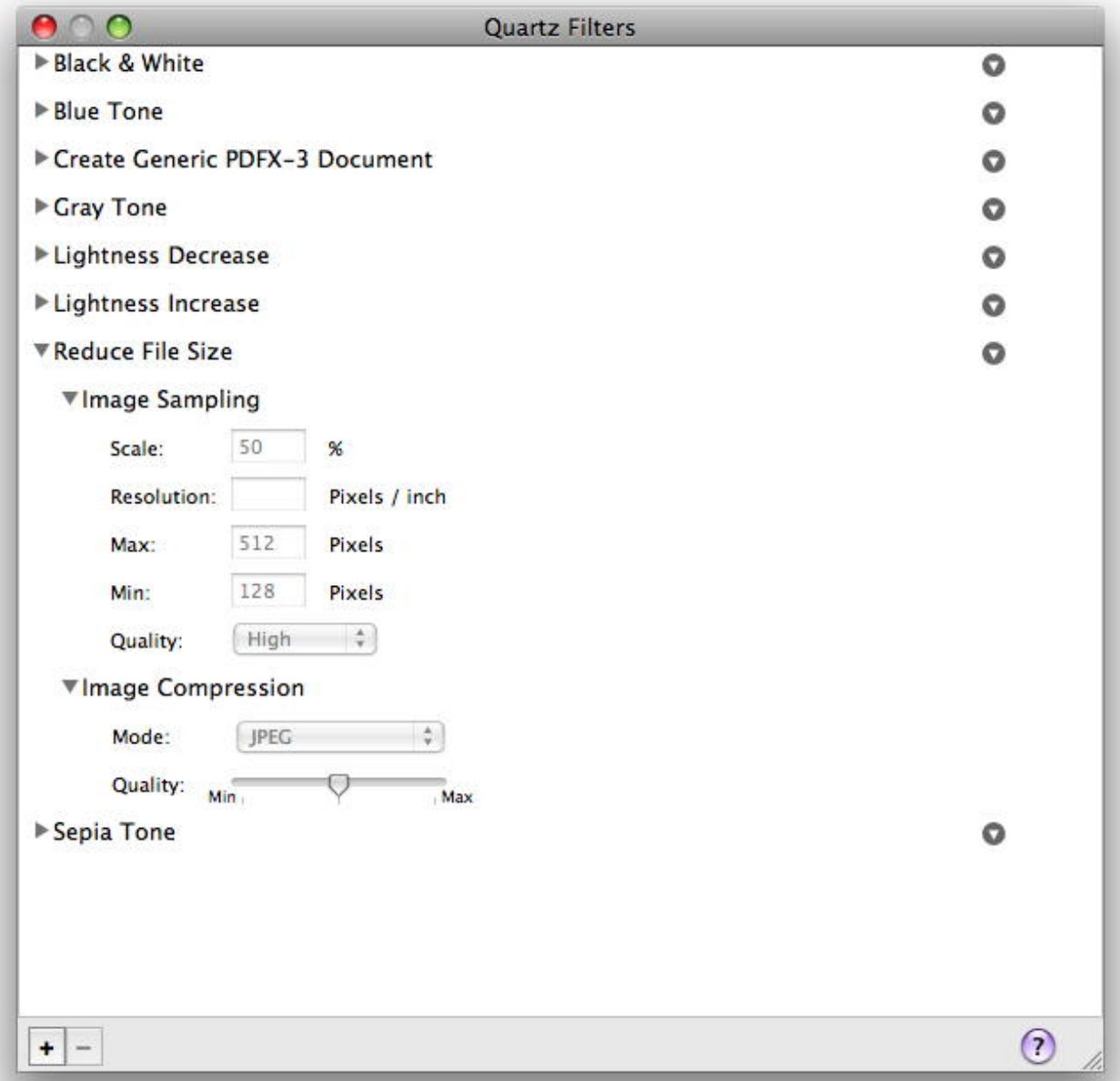


**Function:** The Quartz filter manager panel.

## 98.11 class IKSlideshowMBS

### 98.11.1 class IKSlideshowMBS

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The ImageKit class for a slideshow.
**Notes:** Requires Mac OS X 10.5.
Slideshows can be only with pictures, with PDF pages or with file references.
Those files can be picture files, pdf files or anything you want.
**Blog Entries**

- MBS REALbasic plug-in 9.6

### 98.11.2 Methods

### 98.11.3 addFile(file as folderitem, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Adds a file to the items list.

### 98.11.4 addImage(image as NSImageMBS, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Adds an image to the items list.
**Example:**

```
dim p as picture
dim n as NSImageMBS
dim s as new IKSlideshowMBS

// get picture to p
n=new NSImageMBS(p)
s.addImage n
```

### 98.11.5 addPage(page as Variant, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Adds a PDF page to the items list.
**Notes:** Page must be a PDFPageMBS object.

### 98.11.6 Available as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether the slide show functions are available.
**Example:**

```
if IKSlideshowMBS.Available=False then
MsgBox "You need Mac OS X 10.5 for this and a MachO application."
quit
end if
```

**Notes:** Value is true for Mac OS X 10.5.

### 98.11.7 canExportToApplication(applicationBundleIdentifier as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** is exporting to a given application possible?
**Notes:** (application installed?, right version?, ...)

### 98.11.8 exportSlideshowItems(applicationBundleIdentifier as string)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Export items to the given application.
**Example:**

```
dim i,c as Integer
dim s as new IKSlideshowMBS

// add items here

if false=IKSlideshowMBS.canExportToApplication(IKSlideshowMBS.iPhotoBundleIdentifier) then
MsgBox "Can't export to iPhoto."
else

if s.itemcount>0 then

s.exportSlideshowItems IKSlideshowMBS.iPhotoBundleIdentifier
```

```
else
MsgBox "no slides?"
end if
end if
```

### 98.11.9 indexOfCurrentSlideshowItem as Integer

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The index of the current slide.
**Notes:** Index is from 0 to count-1.

### 98.11.10 ItemCount as Integer

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items.

### 98.11.11 reloadData

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Reloads all slides.

### 98.11.12 reloadSlideshowItemAtIndex(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the slide show with the given index.

### 98.11.13 removeItem(index as Integer)

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Removes an item from the item list.

### 98.11.14 removeItems

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Removes all items from the item list.

### 98.11.15 runSlideshow

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Start the slideshow.
**Example:**

```
dim s as new IKSlideshowMBS
// add items
s.runSlideshow
```

**Notes:** You may want to set all the properties before.

### 98.11.16 setFile(index as Integer, file as folderitem, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the file in the items list with the given index.

### 98.11.17 setImage(index as Integer, image as NSImageMBS, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the image in the items list with the given index.

### 98.11.18 setPage(index as Integer, page as Variant, name as string="")

MBS AVFoundation Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets a PDF page in the items list with the given index.
**Notes:** Page must be a PDFPageMBS object.

### 98.11.19 stopSlideshow

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Stops the slideshow.

### 98.11.20 Properties

### 98.11.21 AudioFile as FolderItem

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Optional audio file to play while running slide show.
**Notes:** Only used for Mac OS X 10.6.
(Read and Write property)

### 98.11.22 PDFDisplayBox as Integer

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The PDF display box mode to use.
**Notes:** Default value is -1 which means that we use the framework default mode.
(Read and Write property)

### 98.11.23 PDFDisplayMode as Integer

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The PDF display mode you want.
**Notes:** Default value is -1 which means that we use the framework default mode.
(Read and Write property)

### 98.11.24 PDFDisplaysAsBook as Boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether PDF should display as book.
**Notes:** Default value is false.
(Read and Write property)

### 98.11.25 ScreenIndex as Integer

MBS AVFoundation Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The screen to use.
**Notes:** Default is main screen.
Only used for Mac OS X 10.6.
(Read and Write property)

### 98.11.26 StartIndex as Integer

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The index of the first slide to show.
**Notes:** Index is from 0 to count-1.
Default value is -1 which means that we use the framework default mode.
(Read and Write property)

### 98.11.27 StartPaused as Boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether to start paused.
**Notes:** Default is false.
(Read and Write property)

### 98.11.28 WrapAround as Boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Whether to wrap around when the slideshow runs.
**Notes:** Default is false.
(Read and Write property)

### 98.11.29 autoPlayDelay as Double

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** The time to wait before the slideshow will start automatically.
**Notes:** Value is in seconds.
(Read and Write computed property)

### 98.11.30 Events

### 98.11.31 canExportSlideshowItemAtIndex(index as Integer, applicationBundleIdentifier as string) as boolean

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Should the export button be enabled for a given item at index?
**Notes:** This event is optional.

### 98.11.32 slideshowDidChangeCurrentIndex(newIndex as Integer)

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Slideshow did change current item index.

### 98.11.33 slideshowDidStop

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Slideshow did stop
**Notes:** This event is optional.

### 98.11.34 slideshowWillStart

MBS AVFoundation Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** Slideshow will start.
**Notes:** This event is optional.

### 98.11.35 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| iPhotoBundleIdentifier | "com.apple.iPhoto" | The iPhoto application identifier.<br>May be used on the export functions. |
| kPDFDisplayBoxArtBox | 4 | One of the possible values for the PDFDisplayBox property. |
| kPDFDisplayBoxBleedBox | 2 | One of the possible values for the PDFDisplayBox property. |
| kPDFDisplayBoxCropBox | 1 | One of the possible values for the PDFDisplayBox property. |
| kPDFDisplayBoxMediaBox | 0 | One of the possible values for the PDFDisplayBox property. |
| kPDFDisplayBoxTrimBox | 3 | One of the possible values for the PDFDisplayBox property. |
| kPDFDisplaySinglePage | 0 | One of the PDF display mode constants. |
| kPDFDisplaySinglePageContinuous | 1 | One of the PDF display mode constants. |
| kPDFDisplayTwoUp | 2 | One of the PDF display mode constants. |
| kPDFDisplayTwoUpContinuous | 3 | One of the PDF display mode constants. |

# Chapter 99

# ImageMagick7

## 99.1 module ImageMagick7MBS

### 99.1.1 module ImageMagick7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for global functions.
**Notes:** The MBS Plugin can load 8, 16, 32 or 64 bit ImageMagick libraries with or without HDRI support. We detect what library is loaded and adjust in various functions. Check QuantumDepth, QuantumSize and HDRI properties.

All class names have currently 7 in the class name to give users of the older classes time for the transition. Currently we use ImageMagick 7.0.9. The plugin may work with older/newer versions of 7.x.

We do have functions to use Xojo pictures with CopyPicture and SetPicture. Those move pixels as they are, so it is up to you to do proper color management. As Xojo pictures are just 8bit RGB, you may loose information on conversion. ExportPixels and ImportPixels functions can move pixel data into/from memory blocks.

Best to avoid Xojo pictures and load image here, modify it and save it again.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1

### 99.1.2 Methods

### 99.1.3 ClampToQuantum(value as Double) as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clamps given value to the range for quantum.
**Notes:** Limits range between 0 and QuantumRange and for non-HDRI rounds value.

### 99.1.4 InitializeMagick(path as string = "")

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the MagickCore environment.
**Notes:** path: the execution path of the current ImageMagick client.

See MagickCoreGenesis function in ImageMagick documentation.

### 99.1.5 LoadLibrary(path as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the MagickCore library file.
**Example:**

```
#If TargetMacOS Then

// installed via homebrew
Dim f As New FolderItem("/opt/homebrew/Cellar/imagemagick/7.1.1-6/lib/libMagickCore-7.Q16HDRI.10.dylib",
FolderItem.PathModes.Native)

If ImageMagick7MBS.LoadLibraryFile(f) Then

'MsgBox "loaded"

Else

MsgBox "failed to load: "+ImageMagick7MBS.LoadErrorString

End If

#Else
If ImageMagick7MBS.LoadLibrary("CORE_RL_MagickCore_.dll") Then
```

```
'MsgBox "loaded"

Else

MsgBox "failed to load: "+ImageMagick7MBS.LoadErrorString

End If
#EndIf
```

**Notes:** Returns true on success and false on failure.
LoadErrorString is set with error string if available.

### 99.1.6 LoadLibraryFile(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the MagickCore library file.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("libMagickCore-7.Q16HDRI.7.dylib")

If ImageMagick7MBS.LoadLibraryFile(f) Then

MsgBox "loaded"

Else

MsgBox "failed to load: "+ImageMagick7MBS.LoadErrorString

End If
```

**Notes:** Returns true on success and false on failure.
LoadErrorString is set with error string if available.

### 99.1.7 MagickInfoList as IMMagickInfoList7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of MagickInfo objects.
**Notes:** See GetMagickInfoList function in ImageMagick documentation.

### 99.1.8 MagickToMime(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the officially registered (or de facto) MIME media-type corresponding to a magick string.
**Notes:** If there is no registered media-type, then the string "image/x-magick" (all lower case) is returned.

See MagickToMime function in ImageMagick documentation.

### 99.1.9 NewImageInfo as IMImageInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates new image info object.
**Notes:** See CloneImageInfo function in ImageMagick documentation.

### 99.1.10 NewImageList as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty image list.
**Notes:** See NewImageList function in ImageMagick documentation.

### 99.1.11 PrintMagickVersion

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Identifies the ImageMagick version by printing its attributes to the file. Attributes include the copyright, features, and delegates.
**Notes:** See ListMagickVersion function in ImageMagick documentation.

### 99.1.12 ScaleQuantumToChar(value as Double) as UInt8

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a quantum value to 8 bit unsigned integer.
**Notes:** Depending on which library is loaded a quantum is an UInt8, UInt16, UInt32, Single or Double value.
This function normalizes and rounds values to nearest 8 bit integer value.

### 99.1.13 SetCurrentDirectory(path as folderitem) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is needed for most installations to point to the folder with the libraries in order for LoadLibrary to find the dependencies.

### 99.1.14 Properties

### 99.1.15 Copyright as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick API copyright as a string.
**Notes:** See GetMagickCopyright function in ImageMagick documentation.
(Read only property)

### 99.1.16 Delegates as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick delegate libraries.
**Notes:** See GetMagickDelegates function in ImageMagick documentation.
(Read only property)

### 99.1.17 Epsilon as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Small value.
**Notes:** Two values are considered equal if the difference is smaller than epsilon.
(Read only property)

### 99.1.18 Features as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick features.
**Example:**

MsgBox ImageMagick7MBS.Features

**Notes:** See GetMagickFeatures function in ImageMagick documentation.
e.g. "Cipher DPC Modules OpenCL OpenMP(2.0)".
(Read only property)

### 99.1.19 HDRI as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether HDRI is used.
**Notes:** If the plugin detects HDRI mode for the library, we use floats (8 and 16 bit depth) or doubles (32 and 64 bit depth).
(Read only property)

### 99.1.20 HomeURL as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick home URL.
**Notes:** See GetMagickHomeURL function in ImageMagick documentation.
(Read only property)

### 99.1.21 Huge as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Huge value.
**Notes:** Values bigger than Huge are far over the range of a quantum.
(Read only property)

### 99.1.22 License as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick API license as a string.
**Notes:** See GetMagickLicense function in ImageMagick documentation.
(Read only property)

### 99.1.23 LoadErrorString as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error from LoadLibrary call.
**Notes:** (Read only property)

### 99.1.24 MagickPrecision as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the maximum number of significant digits to be printed.
**Notes:** See GetMagickPrecision function in ImageMagick documentation.
(Read and Write property)

### 99.1.25 MagickSignature as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a signature that uniquely encodes the MagickCore libary version, quantum depth, HDRI status, OS word size, and endianness.
**Notes:** See GetMagickSignature function in ImageMagick documentation.
(Read only property)

### 99.1.26 MaxColormapSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum size of a color map.
**Notes:** Value is 256 for 8 bit or 65536 for higher bit depths.
(Read only property)

### 99.1.27 MaxMap as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum index in a color map.
**Notes:** Either 255 for 8 bit or 65535 for 16 bit or higher.
(Read only property)

### 99.1.28 PackageName as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick package name.
**Notes:** See GetMagickPackageName function in ImageMagick documentation.
(Read only property)

### 99.1.29 QuantumDepth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quantum depth.
**Notes:** Can be 8, 16, 32 or 64 bit depending on the loaded image magick library.
(Read only property)

### 99.1.30 QuantumDepthString as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick quantum depth.
**Notes:** Returns the quantum depth is returned as a number.
See GetMagickQuantumDepth function in ImageMagick documentation.
(Read only property)

### 99.1.31 QuantumRange as UInt32

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum value for the range of quantums.
**Notes:** Depending on quantum depth ranges from 255 to &hFFFFFFFF.
(Read only property)

### 99.1.32 QuantumRangeString as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick quantum range.
**Notes:** See GetMagickQuantumRange function in ImageMagick documentation.
e.g. "((Quantum) 65535)"
(Read only property)

### 99.1.33 QuantumSize as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of a quantum value in bytes.
**Notes:** Used to allocate memoryblocks of right size.
e.g. Width * Height * QuantumSize * ChannelCount.
(Read only property)

### 99.1.34 ReleaseDate as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick release date.
**Notes:** See GetMagickReleaseDate function in ImageMagick documentation.
(Read only property)

### 99.1.35 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick API version as a string.
**Example:**

```
MsgBox ImageMagick7MBS.Version
// e.g. "ImageMagick 7.0.9-2 Q16 x86 2019-10-30 http://www.imagemagick.org"
```

**Notes:** See GetMagickVersion function in ImageMagick documentation.
(Read only property)

### 99.1.36 VersionNumber as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the ImageMagick API version as a number.
**Notes:** See GetMagickVersion function in ImageMagick documentation.
e.g. &h709 for 7.0.9.
(Read only property)

## 99.2 class IMChannelStatistics7MBS

### 99.2.1 class IMChannelStatistics7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for channel statistics.
**Notes:** Obtain image statistics. Statistics are normalized to the range of 0.0 to 1.0 and are output into this class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 99.2.2 Methods

### 99.2.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 99.2.4 Properties

### 99.2.5 Area as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Area.
**Notes:** (Read only property)

### 99.2.6 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The depth.
**Notes:** (Read only property)

### 99.2.7 Entropy as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Entropy.
**Notes:** (Read only property)

### 99.2.8 Kurtosis as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Kurtosis
**Notes:** (Read only property)

### 99.2.9 Maxima as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value observed.
**Notes:** (Read only property)

### 99.2.10 Mean as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Average (mean) value observed.
**Notes:** (Read only property)

### 99.2.11 Minima as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value observed.
**Notes:** (Read only property)

### 99.2.12 Skewness as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skewness.
**Notes:** (Read only property)

### 99.2.13 StandardDeviation as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Standard deviation, sqrt(variance)
**Notes:** (Read only property)

### 99.2.14 Sum as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sum.
**Notes:** (Read only property)

### 99.2.15 SumCubed as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sum cubed
**Notes:** (Read only property)

### 99.2.16 SumFourthPower as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sum fourth power.
**Notes:** (Read only property)

### 99.2.17 SumSquared as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sum squared.
**Notes:** (Read only property)

### 99.2.18 Variance as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Variance.
**Notes:** (Read only property)

## 99.3 class IMException7MBS

### 99.3.1 class IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an exception.
**Notes:** Subclass of the RuntimeException class.

### 99.3.2 Properties

### 99.3.3 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description text.
**Notes:** (Read and Write property)

### 99.3.4 Reason as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reason text.
**Notes:** (Read and Write property)

### 99.3.5 Severity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code for exception.
**Notes:** (Read and Write property)

### 99.3.6 Constants

Error Types

| Constant | Value | Description |
|---|---|---|
| BlobError | 435 | |
| BlobFatalError | 735 | |
| BlobWarning | 335 | |
| CacheError | 445 | |
| CacheFatalError | 745 | |
| CacheWarning | 345 | |
| CoderError | 450 | |
| CoderFatalError | 750 | |
| CoderWarning | 350 | |
| ConfigureError | 495 | |
| ConfigureFatalError | 795 | |
| ConfigureWarning | 395 | |
| CorruptImageError | 425 | |
| CorruptImageFatalError | 725 | |
| CorruptImageWarning | 325 | |
| DelegateError | 415 | |
| DelegateFatalError | 715 | |
| DelegateWarning | 315 | |
| DrawError | 460 | |
| DrawFatalError | 760 | |
| DrawWarning | 360 | |
| ErrorException | 400 | |
| FatalErrorException | 700 | |
| FileOpenError | 430 | |
| FileOpenFatalError | 730 | |
| FileOpenWarning | 330 | |
| FilterError | 452 | |
| FilterFatalError | 752 | |
| FilterWarning | 352 | |
| ImageError | 465 | |
| ImageFatalError | 765 | |
| ImageWarning | 365 | |
| MissingDelegateError | 420 | |
| MissingDelegateFatalError | 720 | |
| MissingDelegateWarning | 320 | |
| ModuleError | 455 | |
| ModuleFatalError | 755 | |
| ModuleWarning | 355 | |
| MonitorError | 485 | |
| MonitorFatalError | 785 | |
| MonitorWarning | 385 | |
| OptionError | 410 | |
| OptionFatalError | 710 | |
| OptionWarning | 310 | |
| PolicyError | 499 | |
| PolicyFatalError | 799 | |
| PolicyWarning | 399 | |
| RandomError | 475 | |
| RandomFatalError | 775 | |
| RandomWarning | 375 | |
| RegistryError | 490 | |
| RegistryFatalError | 790 | |
| RegistryWarning | 390 | |
| ResourceLimitError | 400 | |
| ResourceLimitFatalError | 700 | |
| ResourceLimitWarning | 300 | |
| StreamError | 440 | |
| StreamFatalError | 740 | |

## 99.4 class IMFrameInfo7MBS

### 99.4.1 class IMFrameInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a frame.

### 99.4.2 Methods

### 99.4.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with zero values.
See also:

- 99.4.4 Constructor(X as Integer, Y as Integer, Width as Integer, Heigth as Integer) 15782

### 99.4.4 Constructor(X as Integer, Y as Integer, Width as Integer, Heigth as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with given values.
See also:

- 99.4.3 Constructor 15782

### 99.4.5 Properties

### 99.4.6 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the rectangle.
**Notes:** (Read and Write property)

### 99.4.7 InnerBevel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The inner bevel size.
**Notes:** (Read and Write property)

### 99.4.8 OuterBevel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The outer bevel size.
**Notes:** (Read and Write property)

### 99.4.9 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the rectangle.
**Notes:** (Read and Write property)

### 99.4.10 X as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x coordinate of the rectangle.
**Notes:** (Read and Write property)

### 99.4.11 Y as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y coordinate of the rectangle.
**Notes:** (Read and Write property)

## 99.5 class IMGeometryInfo7MBS

### 99.5.1 class IMGeometryInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for geometry info.

### 99.5.2 Methods

### 99.5.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 99.5.4 Properties

### 99.5.5 chi as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The chi value.
**Notes:** (Read and Write property)

### 99.5.6 psi as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The psi value.
**Notes:** (Read and Write property)

### 99.5.7 rho as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rho value.
**Notes:** (Read and Write property)

### 99.5.8 sigma as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sigma value.
**Notes:** (Read and Write property)

### 99.5.9 xi as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The xi value.
**Notes:** (Read and Write property)

## 99.6 class IMImage7MBS

### 99.6.1 class IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an ImageMagick image.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.2 Methods

### 99.6.3 AcquireImageColormap(count as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates an image colormap and initializes it to a linear gray colorspace.
**Notes:** If the image already has a colormap, it is replaced. AcquireImageColormap() returns true if successful, otherwise false if there is not enough memory.

colors: the number of colors in the image colormap.

See AcquireImageColormap function in ImageMagick documentation.

### 99.6.4 AdaptiveBlur(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adaptively blurs the image by blurring less intensely near image edges and more intensely far from edges.
**Notes:** We blur the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and AdaptiveBlur selects a suitable radius for you.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Laplacian, in pixels.

See AdaptiveBlurImage function in ImageMagick documentation.

### 99.6.5 AdaptiveResize(columns as Integer, Rows as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adaptively resize image with pixel resampling.
**Notes:** This is shortcut function for a fast interpolative resize using mesh interpolation. It works well for small resizes of less than +/- 50 of the original image size. For larger resizing on images a full filtered and slower resize function should be used instead.

columns: the number of columns in the resized image.
rows: the number of rows in the resized image.

See AdaptiveResizeImage function in ImageMagick documentation.

### 99.6.6 AdaptiveSharpen(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adaptively sharpens the image by sharpening more intensely near image edges and less intensely far from edges.
**Notes:** We sharpen the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and AdaptiveSharpen selects a suitable radius for you.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Laplacian, in pixels.

See AdaptiveSharpenImage function in ImageMagick documentation.

### 99.6.7 AdaptiveThreshold(width as Integer, height as integer, bias as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selects an individual threshold for each pixel based on the range of intensity values in its local neighborhood.
**Notes:** This allows for thresholding of an image whose global intensity histogram doesn't contain distinctive peaks.

width: the width of the local neighborhood.
height: the height of the local neighborhood.

bias: the mean bias.

See AdaptiveThresholdImage function in ImageMagick documentation.

### 99.6.8 AddNoise(NoiseType as integer, value as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds random noise to the image.
**Notes:** channel: the channel type.
noise_type: The type of noise: Uniform, Gaussian, Multiplicative, Impulse, Laplacian, or Poisson.
attenuate: attenuate the random distribution.

See AddNoiseImage function in ImageMagick documentation.

### 99.6.9 AffineTransform(matrix as IMImageAffineMatrix7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms an image as dictated by the affine matrix.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

See xx function in ImageMagick documentation.

### 99.6.10 AppendImageToList(img as IMImage7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends the second image list to the end of the first list. The given image list pointer is left unchanged, unless it was empty.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.11 AuthenticPixels(X as Integer, Y as Integer, Width as Integer, Height as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtains a pixel region for read/write access.

**Notes:** If the region is successfully accessed, a pointer to a Quantum array representing the region is returned, otherwise NULL is returned.

The returned pointer may point to a temporary working copy of the pixels or it may point to the original pixels in memory. Performance is maximized if the selected region is part of one row, or one or more full rows, since then there is opportunity to access the pixels in-place (without a copy) if the image is in memory, or in a memory-mapped file. The returned pointer must *never* be deallocated by the user.

Pixels accessed via the returned pointer represent a simple array of type Quantum. If the image has corresponding metacontent,call GetAuthenticMetacontent() after invoking GetAuthenticPixels() to obtain the meta-content corresponding to the region. Once the Quantum array has been updated, the changes must be saved back to the underlying image using SyncAuthenticPixels() or they may be lost.

See xx function in ImageMagick documentation.

### 99.6.12 AutoGamma as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract the 'mean' from the image and adjust the image to try make set its gamma appropriatally.
**Notes:** See AutoGammaImage function in ImageMagick documentation.

### 99.6.13 AutoLevel as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the levels of a particular image channel by scaling the minimum and maximum values to the full quantum range.
**Notes:** See AutoLevelImage function in ImageMagick documentation.

### 99.6.14 AutoOrient(OrientationType as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts an image so that its orientation is suitable for viewing (i.e. top-left orientation).
**Notes:** orientation: Current image orientation.

See AutoOrientImage function in ImageMagick documentation.

### 99.6.15 AutoThreshold(autoThresholdMethod as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Automatically performs image thresholding dependent on which method you specify.
**Notes:** method: choose from Kapur, OTSU, or Triangle.

See AutoThresholdImage function in ImageMagick documentation.

### 99.6.16 Bilevel(threshold as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the value of individual pixels based on the intensity of each pixel channel.
**Notes:** The result is a high-contrast image.

More precisely each channel value of the image is 'thresholded' so that if it is equal to or less than the given value it is set to zero, while any value greater than that give is set to it maximum or QuantumRange.

This function is what is used to implement the "-threshold" operator for the command line API.

If the default channel setting is given the image is thresholded using just the gray 'intensity' of the image, rather than the individual channels.

threshold: define the threshold values.

See BilevelImage function in ImageMagick documentation.

### 99.6.17 BlackThreshold(thresholds as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is like Threshold but forces all pixels below the threshold into black while leaving all pixels at or above the threshold unchanged.
**Notes:** threshold: define the threshold value.

See BlackThresholdImage function in ImageMagick documentation.

### 99.6.18 BlueShift(factor as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mutes the colors of the image to simulate a scene at nighttime in the moonlight.
**Notes:** factor: the shift factor.

See BlueShiftImage function in ImageMagick documentation.

### 99.6.19 Blur(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, the radius should be larger than sigma. Use a radius of 0 and Blur selects a suitable radius for you.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.

See BlurImage function in ImageMagick documentation.

### 99.6.20 Border(rectangle as IMRectangleInfo7MBS, CompositeOperator as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Surrounds the image with a border of the color defined by the bordercolor member of the image structure.
**Notes:** The width and height of the border are defined by the corresponding members of the rectangle.

rectangle: define the width and height of the border.
CompositeOperator: the composite operator.

See BorderImage function in ImageMagick documentation.

### 99.6.21 BrightnessContrast(brightness as double, contrast as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the brightness and/or contrast of an image.
**Notes:** It converts the brightness and contrast parameters into slope and intercept and calls a polynomical function to apply to the image.

brightness: the brightness percent (-100 .. 100).
contrast: the contrast percent (-100 .. 100).

See BrightnessContrastImage function in ImageMagick documentation.

### 99.6.22 Charcoal(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image that is a copy of an existing one with the edge highlighted.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

radius: the radius of the pixel neighborhood.
sigma: the standard deviation of the Gaussian, in pixels.

See CharcoalImage function in ImageMagick documentation.

### 99.6.23 Chop(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a region of an image and collapses the image to occupy the removed portion.
**Notes:** rect: Define the region of the image to chop.

See ChopImage function in ImageMagick documentation.

### 99.6.24 CLAHE(Width as Integer, Height as Integer, NumberBins as Integer, ClipLimit as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is a variant of adaptive histogram equalization in which the contrast amplification is limited, so as to reduce this problem of noise amplification.
**Notes:** width: the width of the tile divisions to use in horizontal direction.
height: the height of the tile divisions to use in vertical direction.

NumberBins: number of bins for histogram ("dynamic range").
ClipLimit: contrast limit for localised changes in contrast. A limit less than 1 results in standard non-contrast limited AHE.

See CLAHEImage function in ImageMagick documentation.

### 99.6.25 Clamp as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clamps image pixels.
**Notes:** Set each pixel whose value is below zero to zero and any the pixel whose value is above the quantum range to the quantum range (e.g. 65535) otherwise the pixel value remains unchanged.

See xx function in ImageMagick documentation.

### 99.6.26 ClampToQuantum(value as Double) as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clamps given value to the range for quantum.
**Notes:** Limits range between 0 and QuantumRange and for non-HDRI rounds value.

### 99.6.27 Clip as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clips along the first path from the 8BIM profile, if present.
**Notes:** See ClipImage function in ImageMagick documentation.

### 99.6.28 Clone as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies an image and returns the copy as a new image object.
**Notes:** See CloneImage function in ImageMagick documentation.

### 99.6.29 CloneImageProfiles(SourceImage as IMImage7MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones one or more image profiles.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.30 CloneProperties(Source as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones all the image properties from source image to current image.
**Notes:** See CloneImageProperties function in ImageMagick documentation.

### 99.6.31 Clut(clutImage as IMImage7MBS, pixelInterpolateMethod as integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces each color value in the given image, by using it as an index to lookup a replacement color value in a Color Look UP Table in the form of an image.
**Notes:** The values are extracted along a diagonal of the CLUT image so either a horizontal or vertial gradient image can be used.

Typically this is used to either re-color a gray-scale image according to a color gradient in the CLUT image, or to perform a freeform histogram (level) adjustment according to the (typically gray-scale) gradient in the CLUT image.

When the 'channel' mask includes the matte/alpha transparency channel but one image has no such channel it is assumed that that image is a simple gray-scale image that will effect the alpha channel values, either for gray-scale coloring (with transparent or semi-transparent colors), or a histogram adjustment of existing alpha channel values. If both images have matte channels, direct and normal indexing is applied, which is rarely used.

clutImage: the color lookup table image for replacement color values.
method: the pixel interpolation method.

See ClutImage function in ImageMagick documentation.

### 99.6.32 CoalesceImages as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composites a set of images while respecting any page offsets and disposal methods.
**Notes:** GIF, MIFF, and MNG animation sequences typically start with an image background and each subsequent image varies in size and offset. A new image sequence is returned with all images the same size as the first images virtual canvas and composited with the next image in the sequence.

See CoalesceImages function in ImageMagick documentation.

### 99.6.33 ColorDecisionList(ColorCorrectionCollection as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Accepts a lightweight Color Correction Collection (CCC) file which solely contains one or more color corrections and applies the correction to the image.
**Notes:** Here is a sample CCC file:

<ColorCorrectionCollection xmlns="urn:ASC:CDL:v1.2">
<ColorCorrection id="cc03345">
<SOPNode>
<Slope>0.9 1.2 0.5 </Slope>
<Offset>0.4 -0.5 0.6 </Offset>
<Power>1.0 0.8 1.5 </Power>
</SOPNode>
<SATNode>
<Saturation>0.85 </Saturation>
</SATNode>
</ColorCorrection>
</ColorCorrectionCollection>
which includes the slop, offset, and power for each of the RGB channels as well as the saturation.

ColorCorrectionCollection: the color correction collection in XML.

See ColorDecisionListImage function in ImageMagick documentation.

### 99.6.34 Colorize(opacity as string, pixelInfo as IMPixelInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blends the fill color with each pixel in the image.
**Notes:** A percentage blend is specified with opacity. Control the application of different color components by specifying a different percentage for each component (e.g. 90/100/10 is 90 red, 100 green, and 10 blue).

blend: A character string indicating the level of blending as a percentage.
colorize: A color value.

See ColorizeImage function in ImageMagick documentation.

### 99.6.35 ColorspaceType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the potential type of image: sRGBColorspaceType, RGBColorspaceType, GRAYColorspaceType, etc.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.36 Combine(Colorspace as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines one or more images into a single image.
**Notes:** The grayscale value of the pixels of each image in the sequence is assigned in order to the specified channels of the combined image. The typical ordering would be image 1 =>Red, 2 =>Green, 3 =>Blue, etc.

See CombineImages function in ImageMagick documentation.

### 99.6.37 CompareImagesLayers(ImageLayerMethod as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares each image with the next in a sequence and returns the minimum bounding region of all the pixel differences (of the LayerMethod specified) it discovers.
**Notes:** Images do NOT have to be the same size, though it is best that all the images are 'coalesced' (images are all the same size, on a flattened canvas, so as to represent exactly how an specific frame should look).

No GIF dispose methods are applied, so GIF animations must be coalesced before applying this image operator to find differences to them.

method: the layers type to compare images with. Must be one of... CompareAnyLayer, CompareClearLayer,

CompareOverlayLayer.

See xx function in ImageMagick documentation.

### 99.6.38 ComplexImages(ComplexOperator as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs complex mathematics on an image sequence.
**Notes:** See ComplexImages function in ImageMagick documentation.

### 99.6.39 Composite(ComposeOperator as integer, Image as IMImage7MBS, ClipToSelf as boolean, xOffset as integer, yOffset as integer)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the second image composited onto the first at the specified offset, using the specified composite method.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.40 CompositeLayers(CompositeOperator as Integer, Source as IMImage7MBS, XOffset as Integer, YOffset as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the source image sequence over the destination image sequence, starting with the current image in both lists.
**Notes:** Each layer from the two image lists are composted together until the end of one of the image lists is reached. The offset of each composition is also adjusted to match the virtual canvas offsets of each layer. As such the given offset is relative to the virtual canvas, and not the actual image.

Composition uses given x and y offsets, as the 'origin' location of the source images virtual canvas (not the real image) allowing you to compose a list of 'layer images' into the destiantioni images. This makes it well sutiable for directly composing 'Clears Frame Animations' or 'Coaleased Animations' onto a static or other 'Coaleased Animation' destination image list. GIF disposal handling is not looked at.

Special case:- If one of the image sequences is the last image (just a single image remaining), that image is repeatally composed with all the images in the other image list. Either the source or destination lists may be the single image, for this situation.

In the case of a single destination image (or last image given), that image will ve cloned to match the number of images remaining in the source image list.

This is equivelent to the "-layer Composite" Shell API operator.

See xx function in ImageMagick documentation.

### 99.6.41 CompressColormap as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** compresses an image colormap by removing any duplicate or unused color entries.
**Notes:** Returns true on success.
See CompressImageColormap function in ImageMagick documentation.

### 99.6.42 ConsolidateCMYKImages as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Consolidates separate C, M, Y, and K planes into a single image.
**Notes:** See ConsolidateCMYKImages function in ImageMagick documentation.

### 99.6.43 Constructor(columns as Integer, Rows as Integer, map as String, StorageType as Integer, Pixels as MemoryBlock)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an image from the pixel data you supply.
**Notes:** The pixel data must be in scanline order top-to-bottom. The data can be char, short int, int, float, or double. Float and double require the pixels to be normalized [ 0..1 ] , otherwise [ 0..QuantumRange ] . For example, to create a 640x480 image from unsigned red-green-blue character data, use:

image = new IMImage7MBS(640,480,"RGB", kCharPixel, pixels)

columns: width in pixels of the image.
rows: height in pixels of the image.
map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (0 is transparent), O = opacity (0 is opaque), C = cyan, Y = yellow, M = magenta, K = black, I = intensity (for grayscale), P = pad.
storage: Define the data type of the pixels. Float and double types are expected to be normalized [ 0..1 ]

otherwise [ 0..QuantumRange ] . Choose from these types: CharPixel, DoublePixel, FloatPixel, IntegerPixel, LongPixel, QuantumPixel, or ShortPixel.
pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.

See ConstituteImage function in ImageMagick documentation.
See also:


- 99.6.44 Constructor(info as IMImageInfo7MBS) 15799
- 99.6.45 Constructor(info as IMImageInfo7MBS, width as integer, height as integer, background as IMPixelInfo7MBS) 15799
- 99.6.46 Constructor(Pic as Picture) 15800


### 99.6.44 Constructor(info as IMImageInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image.
**Notes:** Returns a pointer to an image initialized to default values.
Many of the image default values are set from the image info. For example, filename, compression, depth, background color, and others.

See AcquireImage function in ImageMagick documentation.
See also:


- 99.6.43 Constructor(columns as Integer, Rows as Integer, map as String, StorageType as Integer, Pixels as MemoryBlock) 15798
- 99.6.45 Constructor(info as IMImageInfo7MBS, width as integer, height as integer, background as IMPixelInfo7MBS) 15799
- 99.6.46 Constructor(Pic as Picture) 15800


### 99.6.45 Constructor(info as IMImageInfo7MBS, width as integer, height as integer, background as IMPixelInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a blank image canvas of the specified size and background color.
**Notes:** info: the image details.
width: the image width.
height: the image height.
background: the image color.

See NewMagickImage function in ImageMagick documentation.
See also:

- 99.6.43 Constructor(columns as Integer, Rows as Integer, map as String, StorageType as Integer, Pixels as MemoryBlock) 15798
- 99.6.44 Constructor(info as IMImageInfo7MBS) 15799
- 99.6.46 Constructor(Pic as Picture) 15800

### 99.6.46 Constructor(Pic as Picture)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture based on Xojo picture.
**Notes:** Creates a new image and uses SetPicture method to fill it.

See NewMagickImage function in ImageMagick documentation.
See also:

- 99.6.43 Constructor(columns as Integer, Rows as Integer, map as String, StorageType as Integer, Pixels as MemoryBlock) 15798
- 99.6.44 Constructor(info as IMImageInfo7MBS) 15799
- 99.6.45 Constructor(info as IMImageInfo7MBS, width as integer, height as integer, background as IMPixelInfo7MBS) 15799

### 99.6.47 Contrast(sharpen as boolean) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enhances the intensity differences between the lighter and darker elements of the image.
**Notes:** Set sharpen to a True to increase the image contrast otherwise the contrast is reduced.

sharpen: Increase or decrease image contrast.

See ContrastImage function in ImageMagick documentation.

### 99.6.48 ContrastStretch(BlackPoint as double, WhitePoint as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is a simple image enhancement technique that attempts to improve the contrast in an image by 'stretching' the range of intensity values it contains to span a desired range of values.

**Notes:** It differs from the more sophisticated histogram equalization in that it can only apply a linear scaling function to the image pixel values. As a result the 'enhancement' is less harsh.

BlackPoint: the black point.
WhitePoint: the white point.

See ContrastStretchImage function in ImageMagick documentation.

### 99.6.49 Convolve(kernelInfo as IMKernelInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a custom convolution kernel to the image.
**Notes:** See ConvolveImage function in ImageMagick documentation.

### 99.6.50 CopyPicture as Picture

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies RGB or gray pixels into a new Xojo picture.
**Notes:** You must make sure you have the right color space to make this work well with colorspaces. Xojo on Mac uses Generic RGB, while Windows may use the colorspace of the display.

As conversion between various quantum depths can be slow, please use rarely.

See also ExportPixels and ImportPixels to read/write pixel data to/from memory blocks.
See GetAuthenticPixels function in ImageMagick documentation.

### 99.6.51 CreateHBITMAP as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a Windows HBITMAP from an image.
**Notes:** See ImageToHBITMAP function in ImageMagick documentation.

### 99.6.52 Crop(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts a region of the image starting at the offset defined by geometry.
**Notes:** Region must be fully defined, and no special handling of geometry flags is performed.

See CropImage function in ImageMagick documentation.

### 99.6.53 CropToTiles(CropGeometry as string) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crops a single image, into a possible list of tiles.
**Notes:** This may include a single sub-region of the image. This basically applies all the normal geometry flags for Crop.

CropGeometry: A crop geometry string.

See CropImageToTiles function in ImageMagick documentation.

### 99.6.54 CycleColormap(displace as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Displaces an image's colormap by a given number of positions.
**Notes:** If you cycle the colormap a number of times you can produce a psychodelic effect.

WARNING: this assumes an images colormap is in a well know and defined order. Currently Imagemagick has no way of setting that order.

displace: displace the colormap this amount.

See CycleColormap function in ImageMagick documentation.

### 99.6.55 Decipher(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts cipher pixels to plain pixels.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.56 DefineProperty(PropertyKeyValue as String) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Associates an assignment string of the form "key=value" with an artifact or options.
**Notes:** It is equivelent to SetProperty().
See DefineImageProperty function in ImageMagick documentation.

### 99.6.57 DeleteImageProfile(Name as String) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a profile from the image by its name.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.58 DeleteProperty(Key as String) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an image property.
**Notes:** key: the image property.
See DeleteImageProperty function in ImageMagick documentation.

### 99.6.59 Deskew(x as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes skew from the image.
**Notes:** Skew is an artifact that occurs in scanned images because of the camera being misaligned, imperfections in the scanning or surface, or simply because the paper was not placed completely flat when scanned.

The result will be auto-croped if the artifact "deskew:auto-crop" is defined, while the amount the image is to be deskewed, in degrees is also saved as the artifact "deskew:angle".

threshold: separate background from foreground.

See DeskewImage function in ImageMagick documentation.

### 99.6.60 Despeckle as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the speckle noise in an image while perserving the edges of the original image.
**Notes:** A speckle removing filter uses a complementary hulling technique (raising pixels that are darker than their surrounding neighbors, then complementarily lowering pixels that are brighter than their surrounding neighbors) to reduce the speckle index of that image (reference Crimmins speckle removal).

See DespeckleImage function in ImageMagick documentation.

### 99.6.61 DestroyImageList

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys an image list.
**Notes:** See DestroyImageList function in ImageMagick documentation.

### 99.6.62 DestroyImageProfiles

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases memory associated with an image profile map.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.63 DestroyProperties

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys all properties and associated memory attached to the given image.
**Notes:** See DestroyImageProperties function in ImageMagick documentation.

### 99.6.64 DisposeImages as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the coalesced frames of a GIF animation as it would appear after the GIF dispose method of that frame has been applied.
**Notes:** That is it returned the appearance of each frame before the next is overlaid.

See DisposeImages function in ImageMagick documentation.

### 99.6.65 Distort(DistortImageMethod as integer, values() as double, bestfit as boolean) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Distorts an image using various distortion methods, by mapping color lookups of the source image to a new destination image usally of the same size as the source image, unless 'bestfit' is set to true.
**Notes:** If 'bestfit' is enabled, and distortion allows it, the destination image is adjusted to ensure the whole source 'image' will just fit within the final destination image, which will be sized and offset accordingly. Also in many cases the virtual offset of the source image will be taken into account in the mapping.

If the '-verbose' control option has been set print to standard error the equicelent '-fx' formula with coefficients for the function, if practical.

method: the method of image distortion.
ArcDistortion always ignores source image offset, and always 'bestfit' the destination image with the top left corner offset relative to the polar mapping center.
Affine, Perspective, and Bilinear, do least squares fitting of the distrotion when more than the minimum number of control point pairs are provided.
Perspective, and Bilinear, fall back to a Affine distortion when less than 4 control point pairs are provided. While Affine distortions let you use any number of control point pairs, that is Zero pairs is a No-Op (viewport only) distortion, one pair is a translation and two pairs of control points do a scale-rotate-translate, without any shearing.

values: an array of floating point arguments for this method.

bestfit: Attempt to 'bestfit' the size of the resulting image. This also forces the resulting image to be a 'layered' virtual canvas image. Can be overridden using 'distort:viewport' setting.

Extra Controls from Image meta-data (artifacts)...

- "verbose" Output to stderr alternatives, internal coefficents, and FX equivalents for the distortion operation (if feasible). This forms an extra check of the distortion method, and allows users access to the internal constants IM calculates for the distortion.
- "distort:viewport" Directly set the output image canvas area and offest to use for the resulting image, rather than use the original images canvas, or a calculated 'bestfit' canvas.
- "distort:scale" Scale the size of the output canvas by this amount to provide a method of Zooming, and for super-sampling the results.

Other settings that can effect results include

- 'interpolate' For source image lookups (scale enlargements)
- 'filter' Set filter to use for area-resampling (scale shrinking). Set to 'point' to turn off and use 'interpolate' lookup instead

See DistortImage function in ImageMagick documentation.

### 99.6.66 DistortResize(x as Integer, y as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image using the equivalent but slower image distortion operator.
**Notes:** The filter is applied using a EWA cylindrical resampling. But like resize the final image size is limited to whole pixels with no effects by virtual-pixels on the result.

Note that images containing a transparency channel will be twice as slow to resize as images one without transparency.

See DistortResizeImage function in ImageMagick documentation.

### 99.6.67 Edge(radius as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds edges in an image.
**Notes:** Radius defines the radius of the convolution filter. Use a radius of 0 and Edge selects a suitable radius for you.

radius: the radius of the pixel neighborhood.

See EdgeImage function in ImageMagick documentation.

### 99.6.68 Emboss(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a grayscale image with a three-dimensional effect.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma).

For reasonable results, radius should be larger than sigma. Use a radius of 0 and Emboss() selects a suitable radius for you.

radius: the radius of the pixel neighborhood.
sigma: the standard deviation of the Gaussian, in pixels.

See EmbossImage function in ImageMagick documentation.

### 99.6.69 Encipher(passkey as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts pixels to cipher-pixels.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.70 Enhance as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a digital filter that improves the quality of a noisy image.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.71 Equalize as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a histogram equalization to the image.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.72 Excerpt(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a excerpt of the image as defined by the geometry.
**Notes:** geometry: Define the region of the image to extend with members x, y, width, and height.

See ExcerptImage function in ImageMagick documentation.

### 99.6.73 ExportPixels(x as integer, y as integer, width as integer, height as integer, map as string, storageType as integer, data as Ptr) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts pixel data from an image and returns it to you.
**Notes:** The method returns MagickTrue on success otherwise MagickFalse if an error is encountered. The data is returned as char, short int, Quantum, unsigned int, unsigned long long, float, or double in the order specified by map.

Suppose you want to extract the first scanline of a 640x480 image as character data in red-green-blue order:

image.ExportImagePixels(0, 0, 640, 480, "RGB", kCharPixel, pixels)

- x,y,width,height: These values define the perimeter of a region of pixels you want to extract.
- map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (0 is transparent), O = opacity (0 is opaque), C = cyan, Y = yellow, M = magenta, K = black, I = intensity (for grayscale), P = pad.
- type: Define the data type of the pixels. Float and double types are normalized to [ 0..1 ] otherwise [ 0..QuantumRange ] . Choose from these types: CharPixel (char *), DoublePixel (double *), FloatPixel (float *), LongPixel (unsigned int *), LongLongPixel (unsigned long long *), QuantumPixel (Quantum *), or ShortPixel (unsigned short *).

pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.

See ExportImagePixels function in ImageMagick documentation.

### 99.6.74 Extent(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends the image as defined by the geometry, gravity, and image background color.
**Notes:** Set the (x,y) offset of the geometry to move the original image relative to the extended image.

rect: Define the region of the image to extend with members x, y, width, and height.

See ExtentImage function in ImageMagick documentation.
See also:

- 99.6.235 extent as Integer 15856

### 99.6.75 Flip as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a vertical mirror image by reflecting the pixels around the central x-axis.
**Notes:** See FlipImage function in ImageMagick documentation.

### 99.6.76 Flop as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a horizontal mirror image by reflecting the pixels around the central y-axis.
**Notes:** See FlopImage function in ImageMagick documentation.

### 99.6.77 ForwardFourierTransformImage(modulus as Boolean) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Implements the discrete Fourier transform (DFT) of the image either as a magnitude / phase or real / imaginary image pair.
**Notes:** modulus: if true, return as transform as a magnitude / phase pair otherwise a real / imaginary image pair.
See ForwardFourierTransformImage function in ImageMagick documentation.

### 99.6.78 Frame(frameInfo as IMFrameInfo7MBS, CompositeOperator as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a simulated three-dimensional border around the image.
**Notes:** The color of the border is defined by the matte_color member of image. Members width and height of frame_info specify the border width of the vertical and horizontal sides of the frame. Members inner and outer indicate the width of the inner and outer shadows of the frame.

frameInfo: Define the width and height of the frame and its bevels.
CompositeOperator: the composite operator.

See FrameImage function in ImageMagick documentation.

### 99.6.79 Fx(expression as string) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a mathematical expression to the specified image.
**Notes:** expression: A mathematical expression.

See FxImage function in ImageMagick documentation.

### 99.6.80 Gamma(level as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gamma-corrects a particular image channel.
**Notes:** The same image viewed on different devices will have perceptual differences in the way the image's intensities are represented on the screen. Specify individual gamma levels for the red, green, and blue channels, or adjust all three with the gamma parameter. Values typically range from 0.8 to 2.3.

You can also reduce the influence of a particular channel with a gamma value of 0.

level: the image gamma as a string (e.g. 1.6,1.2,1.0).

See GammaImage function in ImageMagick documentation.
See also:

- 99.6.240 Gamma as Double 15857

### 99.6.81 GaussianBlur(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blurs an image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, the radius should be larger than sigma. Use a radius of 0 and GaussianBlur selects a suitable radius for you

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.

See GaussianBlurImage function in ImageMagick documentation.

### 99.6.82 GetImageDynamicThreshold(clusterThreshold as Double, smoothThreshold as Double, byref pixelinfo as IMPixelInfo7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the dynamic threshold for an image.
**Notes:** clusterThreshold: This double represents the minimum number of pixels contained in a hexahedra before it can be considered valid (expressed as a percentage).
smoothThreshold: the smoothing threshold eliminates noise in the second derivative of the histogram. As the value is increased, you can expect a smoother second derivative.
pixelinfo: return the dynamic threshold here.

Returns true on success.
See GetImageDynamicThreshold function in ImageMagick documentation.

### 99.6.83 GetImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a profile associated with an image by name.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.84 GetImageQuantizeError as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Measures the difference between the original and quantized images.
**Notes:** This difference is the total quantization error.
The error is computed by summing over all pixels in an image the distance squared in RGB space between each reference pixel value and its quantized value. These values are computed:

- mean_error_per_pixel: This value is the mean error for any single pixel in the image.
- normalized_mean_square_error: This value is the normalized mean quantization error for any single pixel in the image. This distance measure is normalized to a range between 0 and 1. It is independent of the range of red, green, and blue values in the image.
- normalized_maximum_square_error: This value is the normalized maximum quantization error for any single pixel in the image. This distance measure is normalized to a range between 0 and 1. It is independent of the range of red, green, and blue values in your image.

See GetImageQuantizeError function in ImageMagick documentation.

### 99.6.85 GetMagickProperty(ImageInfo as IMImageInfo7MBS = nil, embedText as String) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets attributes or calculated values that is associated with a fixed known property name, or single letter property.
**Notes:** It may be called if no image is defined (IMv7), in which case only global ImageInfo values are available:

\n newline
\r carriage return
<less-than character.
>greater-than character.
& ampersand character.
%% a percent sign
%b file size of image read in
%c comment meta-data property
%d directory component of path
%e filename extension or suffix
%f filename (including suffix)
%g layer canvas page geometry (equivalent to "%Wx%H%X%Y")
%h current image height in pixels
%i image filename (note: becomes output filename for "info:")
%k CALCULATED: number of unique colors
%l label meta-data property
%m image file format (file magic)
%n number of images in current image sequence
%o output filename (used for delegates)
%p index of image in current image list
%q quantum depth (compile-time constant)
%r image class and colorspace
%s scene number (from input unless re-assigned)
%t filename without directory or extension (suffix)
%u unique temporary filename (used for delegates)
%w current width in pixels
%x x resolution (density)
%y y resolution (density)
%z image depth (as read in unless modified, image save depth)
%A image transparency channel enabled (true/false)
%B file size of image in bytes
%C image compression type
%D image GIF dispose method
%G original image size (%wx%h; before any resizes)
%H page (canvas) height
%M Magick filename (original file exactly as given, including read mods)
%O page (canvas) offset ( = %X%Y )

%P page (canvas) size ( = %Wx%H )
%Q image compression quality ( 0 = default )
%S ?? scenes ??
%T image time delay (in centi-seconds)
%U image resolution units
%W page (canvas) width
%X page (canvas) x offset (including sign)
%Y page (canvas) y offset (including sign)
%Z unique filename (used for delegates)
%@ CALCULATED: trim bounding box (without actually trimming)
%# CALCULATED: 'signature' hash of image values

This routine only handles specifically known properties. It does not handle special prefixed properties, profiles, or expressions. Nor does it return any free-form property strings.

The returned string is stored in a structure somewhere, and should not be directly freed. If the string was generated (common) the string will be stored as as either as artifact or option 'get-property'. These may be deleted (cleaned up) when no longer required, but neither artifact or option is guranteed to exist.
See GetMagickProperty function in ImageMagick documentation.

### 99.6.86 GetNextImageProfile as string

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the next profile name for an image.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.87 GetNextImageProperty as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the next free-form string property name.
**Notes:** See GetNextImageProperty function in ImageMagick documentation.

### 99.6.88 GetProperty(PropertyKey as String) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a value associated with an image property.
**Notes:** This includes, profile prefixes, such as "exif:", "iptc:" and "8bim:" It does not handle non-prifile prefixes, such as "fx:", "option:", or "artifact:".

The returned string is stored as a properity of the same name for faster lookup later.
See GetImageProperty function in ImageMagick documentation.

### 99.6.89 Grayscale(PixelIntensityMethod as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the image to grayscale.
**Notes:** PixelIntensityMethod: the pixel intensity method.

See GrayscaleImage function in ImageMagick documentation.

### 99.6.90 HaldClut(clutImage as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a Hald color lookup table to the image.
**Notes:** A Hald color lookup table is a 3-dimensional color cube mapped to 2 dimensions. Create it with the HALD coder. You can apply any color transformation to the Hald image and then use this method to apply the transform to the image.

clutImage: the color lookup table image for replacement color values.

See HaldClutImage function in ImageMagick documentation.

### 99.6.91 HandleMemory as memoryblock

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with a copy of the internal image structure.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.92 Histogram as IMPixelInfo7MBS()

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the unique colors in an image.
**Notes:** Returns array of colors.
See GetImageHistogram function in ImageMagick documentation.

### 99.6.93 IdentifyImageGray as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns grayscale if all the pixels in the image have the same red, green, and blue intensities, and bi-level is the intensity is either 0 or QuantumRange.
**Notes:** Returns one of the image type constants.
Otherwise undefined is returned.
See IdentifyImageGray function in ImageMagick documentation.

### 99.6.94 IdentifyImageMonochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if all the pixels in the image have the same red, green, and blue intensities and the intensity is either 0 or QuantumRange.
**Notes:** See IdentifyImageMonochrome function in ImageMagick documentation.

### 99.6.95 IdentifyImageType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the potential type of image.
**Notes:** Bilevel Grayscale GrayscaleMatte Palette PaletteMatte TrueColor TrueColorMatte ColorSeparation ColorSeparationMatte

To ensure the image type matches its potential, use SetImageType.

See IdentifyImageType function in ImageMagick documentation.

### 99.6.96 IdentifyPaletteImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the image has 256 unique colors or less.
**Notes:** See IdentifyPaletteImage function in ImageMagick documentation.

### 99.6.97 ImageDepth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the depth of a particular image channel.
**Notes:** See GetImageDepth function in ImageMagick documentation.

### 99.6.98 ImageQuantumDepth(constrain as Boolean = false) as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the depth of the image rounded to a legal quantum depth: 8, 16, or 32.
**Notes:** constrain: A value other than false, constrains the depth to a maximum of MAGICKCORE_QUANTUM_DEPTH.

See GetImageQuantumDepth function in ImageMagick documentation.

### 99.6.99 ImageStatistics as IMChannelStatistics7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns statistics for each channel in the image.
**Notes:** The statistics include the channel depth, its minima, maxima, mean, standard deviation, kurtosis and skewness.

See GetImageStatistics function in ImageMagick documentation.

### 99.6.100 ImagesToBlob(info as IMImageInfo7MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImageToBlobs saves multiple images in a blob.
**Notes:** It returns the image as a formatted blob. The magick member of the Image determines the format of the returned blob (GIF, JPEG, PNG, etc.). This method is the equivalent of WriteImage, but writes the formatted "file" to a memory buffer rather than to an actual file.
See ImagesToBlob function in ImageMagick documentation.

### 99.6.101 ImageToBlob(info as IMImageInfo7MBS) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ImageToBlob implements direct to memory image formats.
**Notes:** It returns the image as a formatted blob. The magick member of the Image determines the format of the returned blob (GIF, JPEG, PNG, etc.). This method is the equivalent of WriteImage, but writes the

formatted "file" to a memory buffer rather than to an actual file.
See ImageToBlob function in ImageMagick documentation.

### 99.6.102 Implode(amount as double, pixelInterpolateMethod as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image that is a copy of an existing one with the image pixels "implode" by the specified percentage.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Method ImplodeImage returns a pointer to the image after it is implode. A null image is returned if there is a memory shortage.

amount: Define the extent of the implosion.
method: the pixel interpolation method.

See ImplodeImage function in ImageMagick documentation.

### 99.6.103 ImportPixels(x as integer, y as integer, width as integer, height as integer, map as string, storageType as integer, data as Ptr) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Accepts pixel data and stores in the image at the location you specify.
**Notes:** The method returns true on success otherwise false if an error is encountered. The pixel data can be either char, Quantum, short int, unsigned int, unsigned long long, float, or double in the order specified by map.

Suppose your want to upload the first scanline of a 640x480 image from character data in red-green-blue order:

image.ImportImagePixels(0, 0, 640, 480, "RGB", kCharPixel, pixels)

- x,y,width,height: These values define the perimeter of a region of pixels you want to define.
- map: This string reflects the expected ordering of the pixel array. It can be any combination or order of R = red, G = green, B = blue, A = alpha (0 is transparent), O = opacity (0 is opaque), C = cyan, Y = yellow, M = magenta, K = black, I = intensity (for grayscale), P = pad.
- type: Define the data type of the pixels. Float and double types are normalized to [ 0..1 ] otherwise [ 0..QuantumRange ] . Choose from these types: CharPixel (char *), DoublePixel (double *), FloatPixel (float *), LongPixel (unsigned int *), LongLongPixel (unsigned long long *), QuantumPixel (Quantum *), or ShortPixel (unsigned short *).
- pixels: This array of values contain the pixel components as defined by map and type. You must preallocate this array where the expected length varies depending on the values of width, height, map, and type.

See ImportImagePixels function in ImageMagick documentation.

### 99.6.104 IntegralRotate(degrees as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the image an integral of 90 degrees.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the rotated image.

rotations: Specifies the number of 90 degree rotations.

See IntegralRotateImage function in ImageMagick documentation.

### 99.6.105 InterpolativeResize(columns as Integer, Rows as Integer, PixelInterpolateMethod as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resizes an image using the specified interpolation method.
**Notes:** columns: the number of columns in the resized image.
rows: the number of rows in the resized image.
method: the pixel interpolation method.

See xx function in ImageMagick documentation.

### 99.6.106 InterpretProperties(ImageInfo as IMImageInfo7MBS = nil, embedText as String) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces any embedded formatting characters with the appropriate image property and returns the interpreted text.
**Notes:** This searches for and replaces \n \r \replaced by newline, return, and percent resp. < > & replaced by '<', '>', '&' resp. replaced by percent

x [ x ] where 'x' is a single letter properity, case sensitive). [ type:name ] where 'type' a is special and known prefix. [ name ] where 'name' is a specifically known attribute, calculated value, or a per-image property string name, or a per-image 'artifact' (as generated from a global option). It may contain ':' as long as the prefix is not special.

Single letter substitutions will only happen if the character before the percent is NOT a number. But braced substitutions will always be performed. This prevents the typical usage of percent in a interpreted geometry argument from being substituted when the percent is a geometry flag.

If 'glob-expresions' ('*' or '?' characters) is used for 'name' it may be used as a search pattern to print multiple lines of "name=value\n" pairs of the associacted set of properties.

ImageInfo: the image info. (required)
image: the image.
embedText: the address of a character string containing the embedded formatting characters.
See InterpretImageProperties function in ImageMagick documentation.

### 99.6.107 InverseFourierTransformImage(phaseImage as IMImage7MBS, modulus as Boolean) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Implements the inverse discrete Fourier transform (DFT) of the image either as a magnitude / phase or real / imaginary image pair.
**Notes:** self: the magnitude or real image.
phaseImage: the phase or imaginary image.
modulus: if true, return transform as a magnitude / phase pair otherwise a real / imaginary image pair.
See InverseFourierTransformImage function in ImageMagick documentation.

### 99.6.108 IsEqual(other as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compare the pixels of two images and returns immediately if any pixel is not identical.
**Notes:** See IsImagesEqual function in ImageMagick documentation.

### 99.6.109 IsHighDynamicRangeImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns MagickTrue if any pixel component is non-integer or exceeds the bounds of the quantum depth.
**Notes:** e.g. for Q16 0..65535.

See IsHighDynamicRangeImage function in ImageMagick documentation.

### 99.6.110 IsHistogram as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns MagickTrue if the image has 1024 unique colors or less.
**Notes:** See IsHistogramImage function in ImageMagick documentation.

### 99.6.111 IsImageOpaque as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if none of the pixels in the image have an alpha value other than OpaqueAlpha (QuantumRange).
**Notes:** Will return true immediatally if alpha channel is not available.

See IsImageOpaque function in ImageMagick documentation.

### 99.6.112 Kuwahara(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Kuwahara is an edge preserving noise reduction filter.
**Notes:** radius: the square window radius.
sigma: the standard deviation of the Gaussian, in pixels.

See KuwaharaImage function in ImageMagick documentation.

### 99.6.113 Level(BlackPoint as double, WhitePoint as double, gamma as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the levels of a particular image channel by scaling the colors falling between specified white and black points to the full available quantum range.
**Notes:** The parameters provided represent the black, and white points. The black point specifies the darkest color in the image. Colors darker than the black point are set to zero. White point specifies the lightest color in the image. Colors brighter than the white point are set to the maximum quantum value.

If a '!' flag is given, map black and white colors to the given levels rather than mapping those levels to black and white. See LevelizeImage() below.

Gamma specifies a gamma correction to apply to the image.

BlackPoint: The level to map zero (black) to.
WhitePoint: The level to map QuantumRange (white) to.

See LevelImage function in ImageMagick documentation.

### 99.6.114 LevelImageColors(BlackColor as IMPixelInfo7MBS, WhiteColor as IMPixelInfo7MBS, invert as Boolean) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Levels image colors.
**Notes:** Maps the given color to "black" and "white" values, linearly spreading out the colors, and level values on a channel by channel bases, as per LevelImage(). The given colors allows you to specify different level ranges for each of the color channels separately.

If the boolean 'invert' is set true the image values will modifyed in the reverse direction. That is any existing "black" and "white" colors in the image will become the color values given, with all other values compressed appropriatally. This effectively maps a greyscale gradient into the given color gradient.

BlackColor: The color to map black to/from
WhiteColor: The color to map white to/from
invert: if true map the colors (levelize), rather than from (level)

See LevelImageColors function in ImageMagick documentation.

### 99.6.115 Levelize(BlackPoint as double, WhitePoint as double, gamma as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the reversed LevelImage() operation to just the specific channels specified.
**Notes:** It compresses the full range of color values, so that they lie between the given black and white points. Gamma is applied before the values are mapped.

LevelizeImage() can be called with by using a +level command line API option, or using a '!' on a -level or LevelImage() geometry string.

It can be used to de-contrast a greyscale image to the exact levels specified. Or by using specific levels for each channel of an image you can convert a gray-scale image to any linear color gradient, according to those levels.

BlackPoint: The level to map zero (black) to.
WhitePoint: The level to map QuantumRange (white) to.
gamma: adjust gamma by this factor before mapping values.

See LevelizeImage function in ImageMagick documentation.

### 99.6.116 LinearStretch(BlackPoint as double, WhitePoint as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Discards any pixels below the black point and above the white point and levels the remaining pixels.
**Notes:** blackPoint: the black point.
whitePoint: the white point.

See LinearStretchImage function in ImageMagick documentation.

### 99.6.117 LiquidRescale(columns as Integer, Rows as Integer, deltaX as Double, rigidity as Double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rescales image with seam carving.
**Notes:** columns: the number of columns in the rescaled image.
rows: the number of rows in the rescaled image.
deltaX: maximum seam transversal step (0 means straight seams).
rigidity: introduce a bias for non-straight seams (typically 0).

See LiquidRescaleImage function in ImageMagick documentation.

### 99.6.118 LocalContrast(radius as double, strength as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Attempts to increase the appearance of large-scale light-dark transitions.
**Notes:** Local contrast enhancement works similarly to sharpening with an unsharp mask, however the mask is instead created using an image with a greater blur distance.

radius: the radius of the Gaussian blur, in percentage with 100 resulting in a blur radius of 20 of largest dimension.
strength: the strength of the blur mask in percentage.

See LocalContrastImage function in ImageMagick documentation.

### 99.6.119 Magnify as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Doubles the size of the image with a pixel art scaling algorithm.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.120 MergeImageLayers(ImageLayerMethod as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composes all the image layers from the current given image onward to produce a single image of the merged layers.
**Notes:** The inital canvas's size depends on the given LayerMethod, and is initialized using the first images background color. The images are then compositied onto that image in sequence using the given composition that has been assigned to each individual image.

method: the method of selecting the size of the initial canvas.
MergeLayer: Merge all layers onto a canvas just large enough to hold all the actual images. The virtual canvas of the first image is preserved but otherwise ignored.
FlattenLayer: Use the virtual canvas size of first image. Images which fall outside this canvas is clipped. This can be used to 'fill out' a given virtual canvas.
MosaicLayer: Start with the virtual canvas of the first image, enlarging left and right edges to contain all images. Images with negative offsets will be clipped.
TrimBoundsLayer: Determine the overall bounds of all the image layers just as in "MergeLayer", then adjust the the canvas and offsets to be relative to those bounds, without overlaying the images.
WARNING: a new image is not returned, the original image sequence page data is modified instead.

See MergeImageLayers function in ImageMagick documentation.

### 99.6.121 Minify as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is a convenience method that scales an image proportionally to half its size.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.122 MinMaxStretch(black as double, white as double, gamma as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stretches image colors.
**Notes:** Uses the exact minimum and maximum values found in each of the channels given, as the BlackPoint and WhitePoint to linearly stretch the colors (and histogram) of the image. The stretch points are also moved further inward by the adjustment values given.

If the adjustment values are both zero this function is equivalent to a perfect normalization (or autolevel) of the image.

Each channel is stretched independantally of each other (producing color distortion) unless the special 'SyncChannels' flag is also provided in the channels setting. If this flag is present the minimum and maximum point will be extracted from all the given channels, and those channels will be stretched by exactly the same amount (preventing color distortion).

In the special case that only ONE value is found in a channel of the image that value is not stretched, that value is left as is.

The 'SyncChannels' is turned on in the 'DefaultChannels' setting by default.

See MinMaxStretchImage function in ImageMagick documentation.

black, white: move the black / white point inward from the minimum and maximum points by this color value.
gamma: the gamma.

### 99.6.123 Modify as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ensures that there is only a single reference to the image to be modified, updating the provided image pointer to point to a clone of the original image if necessary.
**Notes:** See ModifyImage function in ImageMagick documentation.

### 99.6.124 Modulate(modulate as String) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lets you control the brightness, saturation, and hue of an image.
**Notes:** Modulate represents the brightness, saturation, and hue as one parameter (e.g. 90,150,100). If the image colorspace is HSL, the modulation is lightness, saturation, and hue. For HWB, use blackness, whiteness, and hue. And for HCL, use chrome, luma, and hue.

modulate: Define the percent change in brightness, saturation, and hue.

See ModulateImage function in ImageMagick documentation.

### 99.6.125 Morphology(MorphologyMethod as Integer, iterations as Integer, kernel as IMKernelInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a user supplied kernel to the image according to the given mophology method.
**Notes:** This function applies any and all user defined settings before calling the above internal function MorphologyApply().

User defined settings include... * Output Bias for Convolution and correlation (”-define convolve:bias=??”) * Kernel Scale/normalize settings (”-define convolve:scale=??”) This can also includes the addition of a scaled unity kernel. * Show Kernel being applied (”-define morphology:showKernel=1”)

Other operators that do not want user supplied options interfering, especially ”convolve:bias” and ”morphology:showKernel” should use MorphologyApply() directly.

See MorphologyImage function in ImageMagick documentation.

### 99.6.126 MotionBlur(radius as double, sigma as double, angle as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simulates motion blur.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and MotionBlurImage() selects a suitable radius for you. Angle gives the angle of the blurring motion.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.
angle: Apply the effect along this angle.

See MotionBlurImage function in ImageMagick documentation.

### 99.6.127 Negate(gray as boolean = false) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the colors in the reference image.
**Notes:** The grayscale option means that only grayscale values within the image are negated.

grayscale: If True, only negate grayscale pixels within the image.

See xx function in ImageMagick documentation.

### 99.6.128 Normalize as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Normalize method enhances the contrast of a color image by mapping the darkest 2 percent of all pixel to black and the brightest 1 percent to white.
**Notes:** See NormalizeImage function in ImageMagick documentation.

### 99.6.129 NumberColors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of unique colors in an image.
**Notes:** See GetNumberColors function in ImageMagick documentation.

### 99.6.130 OilPaint(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a special effect filter that simulates an oil painting.
**Notes:** Each pixel is replaced by the most frequent color occurring in a circular region defined by radius.

radius: the radius of the circular neighborhood.
sigma: the standard deviation of the Gaussian, in pixels.

See xx function in ImageMagick documentation.

### 99.6.131 OneAuthenticPixel(X as Integer, Y as Integer) as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a single pixel at the specified (x,y) location.
**Notes:** The image background color is returned if an error occurs.
See GetOneAuthenticPixel function in ImageMagick documentation.

Memoryblock should have size of ChannelCount * QuantumSize.
Format of pixel values depend on what quantum size/type your library copy uses!

Use OneVirtualPixelInfo for a type independent color information.

### 99.6.132 OneVirtualPixel(X as Integer, Y as Integer) as MemoryBlock

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a single virtual pixel at the specified (x,y) location.
**Notes:** The image background color is returned if an error occurs.
If you plan to modify the pixel, use GetOneAuthenticPixel() instead.
See GetOneVirtualPixel function in ImageMagick documentation.

Memoryblock should have size of ChannelCount * QuantumSize.
Format of pixel values depend on what quantum size/type your library copy uses!

Use OneVirtualPixelInfo for a type independent color information.

### 99.6.133 OneVirtualPixelInfo(virtualPixelMethod as Integer, X as Integer, Y as Integer) as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a single pixel at the specified (x,y) location.
**Notes:** The image background color is returned if an error occurs.
If you plan to modify the pixel, use GetOneAuthenticPixel() instead.
See GetOneVirtualPixelInfo function in ImageMagick documentation.

### 99.6.134 OptimizeImageLayers as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares each image the GIF disposed forms of the previous image in the sequence.
**Notes:** From this it attempts to select the smallest cropped image to replace each frame, while preserving the results of the GIF animation.

See OptimizeImageLayers function in ImageMagick documentation.

### 99.6.135 OptimizeImageTransparency

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes a frame optimized GIF animation, and compares the overlayed pixels against the disposal image resulting from all the previous frames in the animation.
**Notes:** Any pixel that does not change the disposal image (and thus does not effect the outcome of an overlay) is made transparent.

WARNING: This modifies the current images directly, rather than generate a new image sequence.

See OptimizeImageTransparency function in ImageMagick documentation.

### 99.6.136 OptimizePlusImageLayers as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OptimizePlusImageLayers is exactly as OptimizeImageLayers(), but may also add or even remove extra frames in the animation, if it improves the total number of pixels in the resulting GIF animation.
**Notes:** See OptimizeImagePlusLayers function in ImageMagick documentation.

### 99.6.137 OrderedDither(threshold as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Will perform a ordered dither based on a number of pre-defined dithering threshold maps, but over multiple intensity levels, which can be different for different channels, according to the input argument.
**Notes:** threshold: A string containing the name of the threshold dither map to use, followed by zero or more numbers representing the number of color levels tho dither between.
Any level number less than 2 will be equivalent to 2, and means only binary dithering will be applied to each color channel.
No numbers also means a 2 level (bitmap) dither will be applied to all channels, while a single number is the number of levels applied to each channel in sequence. More numbers will be applied in turn to each of the color channels.
For example: "o3x3,6" will generate a 6 level posterization of the image with a ordered 3x3 diffused pixel

dither being applied between each level. While checker,8,8,4 will produce a 332 colormaped image with only a single checkerboard hash pattern (50 grey) between each color level, to basically double the number of color levels with a bare minimim of dithering.

See OrderedDitherImage function in ImageMagick documentation.

### 99.6.138 Perceptible(epsilon as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set each pixel whose value is less than | epsilon | to epsilon or -epsilon (whichever is closer) otherwise the pixel value remains unchanged.
**Notes:** epsilon: the epsilon threshold (e.g. 1.0e-9).

See PerceptibleImage function in ImageMagick documentation.

### 99.6.139 Ping(path as string) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the properties of an image or image sequence except for the pixels.
**Notes:** It is much faster and consumes far less memory than Read(). On failure, a nil image is returned and exception describes the reason for the failure.

See PingImage function in ImageMagick documentation.
See also:

- 99.6.273 Ping as Boolean 15864

### 99.6.140 Posterize(levels as Integer, DitherMethod as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reduces the image to a limited number of colors for a "poster" effect.
**Notes:** levels: Number of color levels allowed in each channel. Very low values (2, 3, or 4) have the most visible effect.
DitherMethod: choose from UndefinedDitherMethod, NoDitherMethod, RiemersmaDitherMethod, Floyd-SteinbergDitherMethod.

Returns true on success.
See PosterizeImage function in ImageMagick documentation.

### 99.6.141 Preview(PreviewType as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tiles 9 thumbnails of the specified image with an image processing operation applied with varying parameters.
**Notes:** This may be helpful pin-pointing an appropriate parameter for a particular image processing operation.

preview: the image processing operation. See preview constants.

See xx function in ImageMagick documentation.

### 99.6.142 Profile(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Associates, applies, or removes an ICM, IPTC, or generic profile with / to / from an image.
**Notes:** If the profile is nil, it is removed from the image otherwise added or applied. Use a name of '*' and a profile of nil to remove all profiles from the image.

ICC and ICM profiles are handled as follows: If the image does not have an associated color profile, the one you provide is associated with the image and the image pixels are not transformed. Otherwise, the colorspace transform defined by the existing and new profile are applied to the image pixels and the new profile is associated with the image.

name: Name of profile to add or remove: ICC, IPTC, or generic profile.
ProfileData: the profile data.

See ProfileImage function in ImageMagick documentation.

### 99.6.143 Properties as Dictionary

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all properties with values.
**Example:**

```
Dim f As FolderItem = GetFolderItem("/Users/cs/Pictures/IMG_3625.jpg", FolderItem.PathTypeNative)
Dim i As New IMImageInfo7MBS

i.Filename = f.NativePath
```

```
Dim p As IMImage7MBS = i.ReadImage
Dim d As Dictionary = p.Properties
Break // see in debugger
```

**Notes:** See ResetImagePropertyIterator, GetNextImageProperty and GetImageProperty functions in ImageMagick documentation.

### 99.6.144 Quantize(quantizeInfo as IMQuantizeInfo7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Analyzes the colors within a reference image and chooses a fixed number of colors to represent the image.
**Notes:** The goal of the algorithm is to minimize the color difference between the input and output image while minimizing the processing time.

quantizeInfo: Specifies a QuantizeInfo object.

Returns true on success.
See QuantizeImage function in ImageMagick documentation.

### 99.6.145 QuantizeImages(quantizeInfo as IMQuantizeInfo7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** analyzes the colors within a set of reference images and chooses a fixed number of colors to represent the set.
**Notes:** The goal of the algorithm is to minimize the color difference between the input and output images while minimizing the processing time.

quantizeInfo: Specifies an QuantizeInfo structure.
self: Specifies a list of Images.
See QuantizeImages function in ImageMagick documentation.

### 99.6.146 QueueAuthenticPixels(X as Integer, Y as Integer, Width as Integer, Height as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queues a mutable pixel region.
**Notes:** If the region is successfully initialized a pointer to a Quantum array representing the region is returned, otherwise nil is returned. The returned pointer may point to a temporary working buffer for the pixels or it may point to the final location of the pixels in memory.

Write-only access means that any existing pixel values corresponding to the region are ignored. This is useful if the initial image is being created from scratch, or if the existing pixel values are to be completely replaced without need to refer to their pre-existing values. The application is free to read and write the pixel buffer returned by QueueAuthenticPixels() any way it pleases. QueueAuthenticPixels() does not initialize the pixel array values. Initializing pixel array values is the application's responsibility.

Performance is maximized if the selected region is part of one row, or one or more full rows, since then there is opportunity to access the pixels in-place (without a copy) if the image is in memory, or in a memory-mapped file. The returned pointer must *never* be deallocated by the user.

Pixels accessed via the returned pointer represent a simple array of type Quantum. If the image type is CMYK or the storage class is PseudoClass, call GetAuthenticMetacontent() after invoking GetAuthenticPixels() to obtain the meta-content (of type void) corresponding to the region. Once the Quantum (and/or Quantum) array has been updated, the changes must be saved back to the underlying image using SyncAuthenticPixels() or they may be lost.

x, y, width and height define the perimeter of a region of pixels.

See QueueAuthenticPixels function in ImageMagick documentation.
Format of pixel values depend on what quantum size/type your library copy uses!

### 99.6.147 RaiseImage(rectangle as IMRectangleInfo7MBS, raise as boolean) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a simulated three-dimensional button-like effect by lightening and darkening the edges of the image.
**Notes:** Members width and height of raise_info define the width of the vertical and horizontal edge of the effect.

rectangle: Define the width and height of the raise area.
raise: A value other than zero creates a 3-D raise effect, otherwise it has a lowered effect.

See RaiseImage function in ImageMagick documentation.

### 99.6.148 RandomThreshold(minThreshold as Double, maxThreshold as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the value of individual pixels based on the intensity of each pixel compared to a random threshold.
**Notes:** The result is a low-contrast, two color image.

low,high: Specify the high and low thresholds. These values range from 0 to QuantumRange.

See xx function in ImageMagick documentation.

### 99.6.149 RangeThreshold(lowBlack as Double, lowWhite as double, highWhite as double, highBlack as double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies soft and hard thresholding.
**Notes:** lowBlack: Define the minimum black threshold value.
lowWhite: Define the minimum white threshold value.
highWhite: Define the maximum white threshold value.
highBlack: Define the maximum black threshold value.

See RangeThresholdImage function in ImageMagick documentation.

### 99.6.150 Read(path as string) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image or image sequence from a file or file handle.
**Notes:** The method returns a nil if there is a memory shortage or if the image cannot be read. On failure, a nil image is returned and exception describes the reason for the failure.

See ReadImage function in ImageMagick documentation.

### 99.6.151 Remap(quantizeInfo as IMQuantizeInfo7MBS, remapImage as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the colors of an image with the closest of the colors from the reference image.
**Notes:** quantizeInfo: Specifies an QuantizeInfo object.
remapImage: the reference image.

Returns true on success.
See RemapImage function in ImageMagick documentation.

### 99.6.152 RemapImages(quantizeInfo as IMQuantizeInfo7MBS, remapImage as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the colors of a sequence of images with the closest color from a reference image.
**Notes:** quantizeInfo: Specifies an QuantizeInfo object.
remapImage: the reference image.

Returns true on success.
See RemapImages function in ImageMagick documentation.

### 99.6.153 RemoveDuplicateLayers

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that is exactly the same as the next image in the given image list.
**Notes:** Image size and virtual canvas offset must also match, though not the virtual canvas size itself.

No check is made with regards to image disposal setting, though it is the dispose setting of later image that is kept. Also any time delays are also added together. As such coalesced image animations should still produce the same result, though with duplicte frames merged into a single frame.

See xx function in ImageMagick documentation.

### 99.6.154 RemoveFirstImageFromList as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes and returns the first image in the list.
**Notes:** If the given image list pointer pointed to the removed first image, it is set to the new first image of list, or nil if list was emptied, otherwise it is left as is.

See RemoveFirstImageFromList function in ImageMagick documentation.

### 99.6.155 RemoveImageProfile(name as string) as string

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a named profile from the image and returns its value.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.156 RemoveProperty(Key as String)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a property from the image and returns its value.
**Notes:** See RemoveImageProperty function in ImageMagick documentation.

### 99.6.157 RemoveZeroDelayLayers

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any image that as a zero delay time.
**Notes:** Such images generally represent intermediate or partial updates in GIF animations used for file optimization. They are not ment to be displayed to users of the animation. Viewable images in an animation should have a time delay of 3 or more centi-seconds (hundredths of a second).

However if all the frames have a zero time delay, then either the animation is as yet incomplete, or it is not a GIF animation. This a non-sensible situation, so no image will be removed and a 'Zero Time Animation' warning (exception) given.

No warning will be given if no image was removed because all images had an appropriate non-zero time delay set.

Due to the special requirements of GIF disposal handling, GIF animations should be coalesced first, before calling this function, though that is not a requirement.

See RemoveZeroDelayLayers function in ImageMagick documentation.

### 99.6.158 Resample(xResolution as Double, yResolution as Double, filter as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize image in terms of its pixel size, so that when displayed at the given resolution it will be the same size in terms of real world units as the original image at the original resolution.
**Notes:** xResolution: the new image x resolution.
yResolution: the new image y resolution.
filter: Image filter to use.

See ResampleImage function in ImageMagick documentation.

### 99.6.159 ResetImageProfileIterator

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image profile iterator.
**Notes:** Use it in conjunction with GetNextImageProfile to iterate over all the profiles associated with an image.

See ResetImageProfileIterator function in ImageMagick documentation.

### 99.6.160 ResetPropertyIterator

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the image properties iterator.
**Notes:** Use it in conjunction with GetNextImageProperty() to iterate over all the values associated with an image property.
See ResetImagePropertyIterator function in ImageMagick documentation.

### 99.6.161 Resize(columns as integer, rows as integer, FilterID as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions, using the given filter (see AcquireFilterInfo()).
**Notes:** If an undefined filter is given the filter defaults to Mitchell for a colormapped image, a image with a matte channel, or if the image is enlarged. Otherwise the filter defaults to a Lanczos.

columns: the number of columns in the scaled image.
rows: the number of rows in the scaled image.
filterID: Image filter to use.

See ResizeImage function in ImageMagick documentation.

### 99.6.162 Roll(x as integer, y as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Offsets an image as defined by x and y offsets.
**Notes:** x: the number of columns to roll in the horizontal direction.
y: the number of rows to roll in the vertical direction.

See RollImage function in ImageMagick documentation.

### 99.6.163 Rotate(degrees as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image that is a rotated copy of an existing one.
**Notes:** Positive angles rotate counter-clockwise (right-hand rule), while negative angles rotate clockwise. Rotated images are usually larger than the originals and have 'empty' triangular corners. X axis. Empty triangles left over from shearing the image are filled with the background color defined by member 'background_color' of the image. RotateImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

degrees: Specifies the number of degrees to rotate the image.

See RotateImage function in ImageMagick documentation.

### 99.6.164 RotationalBlur(Angle as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a radial blur to the image.
**Notes:** angle: the angle of the radial blur.
blur: the blur.

See RotationalBlurImage function in ImageMagick documentation.

### 99.6.165 Sample(columns as integer, rows as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales an image to the desired dimensions with pixel sampling.
**Notes:** Unlike other scaling methods, this method does not introduce any additional color into the scaled image.

columns: the number of columns in the sampled image.
rows: the number of rows in the sampled image.

See SampleImage function in ImageMagick documentation.

### 99.6.166 Scale(columns as integer, rows as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions.
**Notes:** columns: the number of columns in the scaled image.
rows: the number of rows in the scaled image.

See ScaleImage function in ImageMagick documentation.

### 99.6.167 ScaleQuantumToChar(value as Double) as UInt8

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales a quantum value to 8 bit unsigned integer.
**Notes:** Depending on which library is loaded a quantum is an UInt8, UInt16, UInt32, Single or Double value.
This function normalizes and rounds values to nearest 8 bit integer value.

### 99.6.168 Segment(colorspaceType as Integer, verbose as Boolean, clusterThreshold as Double, smoothThreshold as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Segment an image by analyzing the histograms of the color components and identifying units

that are homogeneous with the fuzzy C-means technique.
**Notes:** colorspace: Indicate the colorspace.
verbose: Set to true to print detailed information about the identified classes.
clusterThreshold: This represents the minimum number of pixels contained in a hexahedra before it can be considered valid (expressed as a percentage).
smoothThreshold: the smoothing threshold eliminates noise in the second derivative of the histogram. As the value is increased, you can expect a smoother second derivative.

Returns true on success.
See SegmentImage function in ImageMagick documentation.

### 99.6.169 SelectiveBlur(radius as double, sigma as double, threshold as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Selectively blur pixels within a contrast threshold.
**Notes:** It is similar to the unsharpen mask that sharpens everything with contrast above a certain threshold.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.
threshold: only pixels within this contrast threshold are included in the blur operation.

See SelectiveBlurImage function in ImageMagick documentation.

### 99.6.170 Separate(ChannelType as Integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Separates a channel from the image and returns it as a grayscale image.
**Notes:** See ChannelType constants for parameter.
See SeparateImage function in ImageMagick documentation.

### 99.6.171 SeparateImages as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a separate grayscale image for each channel specified.
**Notes:** See SeparateImages function in ImageMagick documentation.

### 99.6.172 SetGray as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if all the pixels in the image have the same red, green, and blue intensities and changes the type of the image to bi-level or grayscale.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.173 SetImageAlphaChannel(AlphaChannelOption as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Activates, deactivates, resets, or sets the alpha channel.
**Notes:** The alpha channel types: ActivateAlphaChannel, AssociateAlphaChannel, CopyAlphaChannel, DeactivateAlphaChannel, DisassociateAlphaChannel, ExtractAlphaChannel, OffAlphaChannel, OnAlphaChannel, OpaqueAlphaChannel, SetAlphaChannel, ShapeAlphaChannel, and TransparentAlphaChannel.

see AlphaChannel constants.

See SetImageAlphaChannel function in ImageMagick documentation.

### 99.6.174 SetImageColorMetric(other as IMImage7MBS) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Measures the difference between colors at each pixel location of two images.
**Notes:** A value other than 0 means the colors match exactly. Otherwise an error measure is computed by summing over all pixels in an image the distance squared in RGB space between each image pixel and its corresponding pixel in the reconstruct image. The error measure is assigned to these image members:

- mean_error_per_pixel: The mean error for any single pixel in the image.
- normalized_mean_error: The normalized mean quantization error for any single pixel in the image. This distance measure is normalized to a range between 0 and 1. It is independent of the range of red, green, and blue values in the image.
- normalized_maximum_error: The normalized maximum quantization error for any single pixel in the image. This distance measure is normalized to a range between 0 and 1. It is independent of the range of red, green, and blue values in your image.

A small normalized mean square error, accessed as image->normalized_mean_error, suggests the images are very similar in spatial layout and color.

See SetImageColorMetric function in ImageMagick documentation.

### 99.6.175 SetImageColorspace(Colorspace as integer) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the colorspace member of the Image object.
**Notes:** See SetImageColorspace function in ImageMagick documentation.

### 99.6.176 SetImageDepth(depth as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the depth of the image.
**Notes:** See SetImageDepth function in ImageMagick documentation.

### 99.6.177 SetImageProfile(name as string, ProfileData as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a named profile to the image.
**Notes:** If a profile with the same name already exists, it is replaced. This method differs from the ProfileImage() method in that it does not apply CMS color profiles.

name: the profile name, for example icc, exif, and 8bim (8bim is the Photoshop wrapper for iptc profiles).
profile: A String that contains the named profile.

See SetImageProfile function in ImageMagick documentation.

### 99.6.178 SetImageType(type as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the type of image.
**Notes:** Choose from these types:
Bilevel Grayscale GrayscaleMatte Palette PaletteMatte TrueColor TrueColorMatte ColorSeparation ColorSeparationMatte OptimizeType

See SetImageType function in ImageMagick documentation.

### 99.6.179 SetMonochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if image is monochrome and changes type to black & white.
**Notes:** Returns true if all the pixels in the image have the same red, green, and blue intensities and the intensity is either 0 or QuantumRange and changes the type of the image to bi-level.

See SetImageMonochrome function in ImageMagick documentation.

### 99.6.180 SetPicture(pic as Picture) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets pixel to the values in the picture.
**Notes:** You must make sure you have the right color space to make this work well with colorspaces.
Xojo on Mac uses Generic RGB, while Windows may use the colorspace of the display.

Returns true in case of success and false in case of failure.
As conversion between various quantum depths can be slow, please use rarely.

See also ExportPixels and ImportPixels to read/write pixel data to/from memory blocks.
See GetAuthenticPixels and SyncAuthenticPixels functions in ImageMagick documentation.

### 99.6.181 SetProperty(PropertyKey as String, Value as String) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves the given string value either to specific known attribute or to a freeform property string.
**Notes:** Attempting to set a property that is normally calculated will produce an exception.
See SetImageProperty function in ImageMagick documentation.

### 99.6.182 Shade(gray as boolean, azimuth as double, elevation as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shines a distant light on an image to create a three-dimensional effect.
**Notes:** You control the positioning of the light with azimuth and elevation; azimuth is measured in degrees off the x axis and elevation is measured in pixels above the Z axis.

gray: A value other than zero shades the intensity of each pixel.
azimuth, elevation: Define the light source direction.

See ShadeImage function in ImageMagick documentation.

### 99.6.183 Sharpen(radius as double, sigma as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens the image.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and Sharpen selects a suitable radius for you.

Using a separable kernel would be faster, but the negative weights cancel out on the corners of the kernel producing often undesirable ringing in the filtered result; this can be avoided by using a 2D gaussian shaped image sharpening kernel instead.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Laplacian, in pixels.

See SharpenImage function in ImageMagick documentation.

### 99.6.184 Shave(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shaves pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

Shave returns a pointer to the shaved image. A null image is returned if there is a memory shortage or if the image width or height is zero.

rect: Specifies a RectangleInfo which defines the region of the image to crop.

See ShaveImage function in ImageMagick documentation.

### 99.6.185 Shear(Xshear as double, Yshear as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image that is an image copy of an existing one.
**Notes:** Shearing slides one edge of an image along the X or Y axis, creating a parallelogram. An X direction shear slides an edge along the X axis, while a Y direction shear slides an edge along the Y axis. The amount of the shear is controlled by a shear angle. For X direction shears, Xshear is measured relative to the Y axis, and similarly, for Y direction shears Yshear is measured relative to the X axis. Empty triangles left over from shearing the image are filled with the background color defined by member 'backgroundColor' of the image.. Shear() allocates the memory necessary for the new Image structure and returns a pointer to the new image.

See ShearImage function in ImageMagick documentation.

### 99.6.186 ShearRotate(degrees as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new image that is a rotated copy of an existing one.
**Notes:** Positive angles rotate counter-clockwise (right-hand rule), while negative angles rotate clockwise. Rotated images are usually larger than the originals and have 'empty' triangular corners. X axis. Empty triangles left over from shearing the image are filled with the background color defined by member 'background_color' of the image. ShearRotateImage allocates the memory necessary for the new Image structure and returns a pointer to the new image.

degrees: Specifies the number of degrees to rotate the image.

See ShearRotateImage function in ImageMagick documentation.

### 99.6.187 SigmoidalContrast(sharpen as boolean, contrast as Double, midpoint as Double) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** adjusts the contrast of an image with a non-linear sigmoidal contrast algorithm.
**Notes:** Increase the contrast of the image using a sigmoidal transfer function without saturating highlights or shadows. Contrast indicates how much to increase the contrast (0 is none; 3 is typical; 20 is pushing it); mid-point indicates where midtones fall in the resultant image (0 is white; 50 is middle-gray; 100 is black). Set sharpen to MagickTrue to increase the image contrast otherwise the contrast is reduced.

sharpen: Increase or decrease image contrast.

contrast: strength of the contrast, the larger the number the more 'threshold-like' it becomes.
midpoint: midpoint of the function as a color value 0 to QuantumRange.

See SigmoidalContrastImage function in ImageMagick documentation.

### 99.6.188 Solarize(threshold as double) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a special effect to the image, similar to the effect achieved in a photo darkroom by selectively exposing areas of photo sensitive paper to light.
**Notes:** Threshold ranges from 0 to QuantumRange and is a measure of the extent of the solarization.

threshold: Define the extent of the solarization.

See SolarizeImage function in ImageMagick documentation.

### 99.6.189 SortColormapByIntensity as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** sorts the colormap of a PseudoClass image by decreasing color intensity.
**Notes:** See SortColormapByIntensity function in ImageMagick documentation.

### 99.6.190 SparseColor(SparseColorMethod as Integer, arguments() as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Given a set of coordinates, interpolates the colors found at those coordinates, across the whole image, using various methods.
**Notes:** method: the method to fill in the gradient between the control points.
The methods used for SparseColor() are often simular to methods used for DistortImage(), and even share the same code for determination of the function coefficents, though with more dimensions (or resulting values).
values: array of floating point arguments for this method– x,y,color_values– with color_values given as normalized values.

See SparseColorImage function in ImageMagick documentation.

### 99.6.191 Splice(rect as IMRectangleInfo7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splices a solid color into the image as defined by the geometry.
**Notes:** rect: Define the region of the image to splice with members x, y, width, and height.

See SpliceImage function in ImageMagick documentation.

### 99.6.192 Spread(pixelInterpolateMethod as integer, radius as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is a special effects method that randomly displaces each pixel in a square area defined by the radius parameter.
**Notes:** method: intepolation method.
radius: choose a random pixel in a neighborhood of this extent.

See SpreadImage function in ImageMagick documentation.

### 99.6.193 Stegano(watermarkImage as IMImage7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Hides a digital watermark within the image.
**Notes:** Recover the hidden watermark later to prove that the authenticity of an image. Offset defines the start position within the image to hide the watermark.

See SteganoImage function in ImageMagick documentation.

### 99.6.194 Stereo(otherImage as IMImage7MBS) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines two images and produces a single image that is the composite of a left and right image of a stereo pair.
**Notes:** Special red-green stereo glasses are required to view this effect.

See StereoImage function in ImageMagick documentation.

### 99.6.195 Strip as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Strips an image of all profiles and comments.
**Notes:** See StripImage function in ImageMagick documentation.

### 99.6.196 Swirl(degrees as double, pixelInterpolateMethod as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swirls the pixels about the center of the image, where degrees indicates the sweep of the arc through which each pixel is moved.
**Notes:** You get a more dramatic effect as the degrees move from 1 to 360.

degrees: Define the tightness of the swirling effect.
method: the pixel interpolation method.

See xx function in ImageMagick documentation.

### 99.6.197 Sync as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Synchronizes image properties.
**Notes:** See SyncImage function in ImageMagick documentation.

### 99.6.198 SyncAuthenticPixels as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves the image pixels to the in-memory or disk cache.
**Notes:** The method returns MagickTrue if the pixel region is flushed, otherwise MagickFalse.
See SyncAuthenticPixels function in ImageMagick documentation.

### 99.6.199 Texture(Image as IMImage7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Layer a texture on pixels matching image background color.
**Notes:** See xx function in ImageMagick documentation.

### 99.6.200 Thumbnail(columns as integer, rows as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the size of an image to the given dimensions and removes any associated profiles.
**Notes:** The goal is to produce small low cost thumbnail images suited for display on the Web.

columns: the number of columns in the scaled image.
rows: the number of rows in the scaled image.

See ThumbnailImage function in ImageMagick documentation.

### 99.6.201 TransformColorspace(ColorSpace as Integer) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transforms an image colorspace, changing the image data to reflect the new colorspace.
**Notes:** See TransformImageColorspace function in ImageMagick documentation.

### 99.6.202 Transpose as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a horizontal mirror image by reflecting the pixels around the central y-axis while rotating them by 90 degrees.
**Notes:** See TransposeImage function in ImageMagick documentation.

### 99.6.203 Transverse as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a vertical mirror image by reflecting the pixels around the central x-axis while rotating them by 270 degrees.
**Notes:** See TransverseImage function in ImageMagick documentation.

### 99.6.204 Trim as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trims pixels from the image edges.
**Notes:** It allocates the memory necessary for the new Image structure and returns a pointer to the new image.

See TrimImage function in ImageMagick documentation.

### 99.6.205 UniqueColors as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the unique colors of an image.
**Notes:** See UniqueImageColors function in ImageMagick documentation.

### 99.6.206 UnsharpMask(radius as double, sigma as double, amount as double, threshold as double) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sharpens one or more image channels.
**Notes:** We convolve the image with a Gaussian operator of the given radius and standard deviation (sigma). For reasonable results, radius should be larger than sigma. Use a radius of 0 and UnsharpMask selects a suitable radius for you.

radius: the radius of the Gaussian, in pixels, not counting the center pixel.
sigma: the standard deviation of the Gaussian, in pixels.
gain: the percentage of the difference between the original and the blur image that is added back into the original.
threshold: the threshold in pixels needed to apply the diffence gain.

See UnsharpMaskImage function in ImageMagick documentation.

### 99.6.207 VirtualPixels(X as Integer, Y as Integer, Width as Integer, Height as Integer) as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an immutable pixel region.
**Notes:** If the region is successfully accessed, a pointer to it is returned, otherwise nil is returned. The returned pointer may point to a temporary working copy of the pixels or it may point to the original pixels in memory. Performance is maximized if the selected region is part of one row, or one or more full rows, since there is opportunity to access the pixels in-place (without a copy) if the image is in memory, or in a memory-mapped file. The returned pointer must *never* be deallocated by the user.

Pixels accessed via the returned pointer represent a simple array of type Quantum. If the image type is CMYK or the storage class is PseudoClass, call AuthenticMetacontent after invoking AuthenticPixels to access the meta-content (of type void) corresponding to the the region.

If you plan to modify the pixels, use GetAuthenticPixels() instead.

Note, the VirtualPixels() and AuthenticPixels() methods are not thread-safe. In a threaded environment, use CacheViewVirtualPixels() or CacheViewAuthenticPixels() instead.

See GetVirtualPixels function in ImageMagick documentation.
Format of pixel values depend on what quantum size/type your library copy uses!

### 99.6.208 Wave(amplitude as double, wavelength as double, pixelInterpolateMethod as integer) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a "ripple" effect in the image by shifting the pixels vertically along a sine wave whose amplitude and wavelength is specified by the given parameters.
**Notes:** amplitude, wavelength: Define the amplitude and wave length of the sine wave.
pixelInterpolateMethod: the pixel interpolation method.

See WaveImage function in ImageMagick documentation.

### 99.6.209 WhiteThreshold(thresholds as string) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is like ThresholdImage() but forces all pixels above the threshold into white while leaving all pixels at or below the threshold unchanged.
**Notes:** threshold: Define the threshold value.

See WhiteThresholdImage function in ImageMagick documentation.

### 99.6.210 Properties

### 99.6.211 AlphaColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha color.
**Notes:** When you query this value, you get a copy in a new object.
To modify, you need to change copy and assign back.
(Read and Write property)

### 99.6.212 AlphaTrait as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pixel trait for alpha channel.
**Notes:** Is transparency channel defined and active?
(Read and Write property)

### 99.6.213 AuthenticMetacontent as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the authentic metacontent corresponding with the last call to QueueAuthenticPixels() or GetVirtualPixels().
**Notes:** Nil is returned if the associated pixels are not available.
See GetAuthenticMetacontent function in ImageMagick documentation.
(Read only property)

### 99.6.214 AuthenticPixelQueue as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the authentic pixels associated corresponding with the last call to QueueAuthenticPixels or GetAuthenticPixels.
**Notes:** See GetAuthenticPixelQueue function in ImageMagick documentation.
(Read only property)

### 99.6.215 BackgroundColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current background color attribute.
**Notes:** When you query this value, you get a copy in a new object.
To modify, you need to change copy and assign back.
(Read and Write property)

### 99.6.216 BlackPointCompensation as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to enable black point compensation for color space conversions.
**Notes:** (Read and Write property)

### 99.6.217 BlobSize as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the blob.
**Notes:** (Read only property)

### 99.6.218 BorderColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current bordercolor attribute.
**Notes:** When you query this value, you get a copy in a new object.
To modify, you need to change copy and assign back.
(Read and Write property)

### 99.6.219 ChannelMask as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel mask field.
**Notes:** See Channel constants.
(Read and Write property)

### 99.6.220 Channels as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel mask.
**Notes:** (Read and Write property)

### 99.6.221 Colors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Size of color table, or actual color count.
**Notes:** Only valid if image is not DirectClass.
(Read only property)

### 99.6.222 Colorspace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorspace of image data.
**Notes:** (Read only property)

### 99.6.223 Columns as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Physical width of image in pixel.
**Notes:** (Read only property)

### 99.6.224 Compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Alpha composition method for layered images.
**Notes:** (Read and Write property)

### 99.6.225 CompositeMask as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to composite with mask.
**Notes:** (Read and Write property)

### 99.6.226 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression of image when read/write.
**Notes:** (Read and Write property)

### 99.6.227 Debug as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Debug output attribute.
**Notes:** (Read and Write property)

### 99.6.228 Delay as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Animation delay time.
**Notes:** (Read and Write property)

### 99.6.229 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Depth of image on read/write.
**Notes:** (Read only property)

### 99.6.230 Directory as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The directory.
**Notes:** (Read and Write property)

### 99.6.231 Dispose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GIF animation disposal method.
**Notes:** (Read and Write property)

### 99.6.232 Dither as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dithering on/off.
**Notes:** (Read and Write property)

### 99.6.233 Duration as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Total animation duration.
**Notes:** sum(delay*iterations)
(Read and Write property)

### 99.6.234 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raw data integer ordering on read/write.
**Notes:** (Read and Write property)

### 99.6.235 extent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Size of image read from disk.
**Notes:** (Read only property)
See also:

- 99.6.74 Extent(rect as IMRectangleInfo7MBS) as IMImage7MBS 15808

### 99.6.236 ExtractInfo as IMRectangleInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract Info.
**Notes:** (Read and Write property)

### 99.6.237 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path of the image.
**Notes:** (Read and Write property)

### 99.6.238 Filter as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resize/distort filter to apply.
**Notes:** (Read and Write property)

### 99.6.239 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current color fuzz attribute.
**Notes:** (Read and Write property)

### 99.6.240 Gamma as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gamme of the image.
**Notes:** (Read only property)
See also:

- 99.6.80 Gamma(level as double) as Boolean 15810

### 99.6.241 Geometry as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geomtry.
**Notes:** (Read and Write property)

### 99.6.242 Gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gravity attribute for positioning in image.
**Notes:** (Read and Write property)

### 99.6.243 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 99.6.244 HasAlphaChannel as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns false if the image alpha channel is not activated.
**Notes:** That is, the image is RGB rather than RGBA or CMYK rather than CMYKA.
See GetImageAlphaChannel function in ImageMagick documentation.
(Read only property)

### 99.6.245 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Physical height of image in pixel.
**Notes:** (Read only property)

### 99.6.246 ImageExtent as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image extent.
**Notes:** See GetImageExtent function in ImageMagick documentation.
(Read only property)

### 99.6.247 ImageType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image type.
**Notes:** See Type constants like TrueColorType for RGB images.
(Read only property)

### 99.6.248 Intensity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Method to generate an intensity value from a pixel.
**Notes:** (Read and Write property)

### 99.6.249 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The interlace setting.
**Notes:** (Read and Write property)

### 99.6.250 Interpolate as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Interpolation of color for between pixel lookups.
**Notes:** (Read and Write property)

### 99.6.251 IsBlobExempt as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is exempt.
**Notes:** See IsBlobExempt function in ImageMagick documentation.
(Read only property)

### 99.6.252 IsBlobSeekable as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is seekable.
**Notes:** See IsBlobSeekable function in ImageMagick documentation.
(Read only property)

### 99.6.253 IsBlobTemporary as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the blob is temporary.
**Notes:** See IsBlobTemporary function in ImageMagick documentation.
(Read only property)

### 99.6.254 IsImageGray as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the type of the image is grayscale or bi-level.
**Notes:** See IsImageGray function in ImageMagick documentation.
(Read only property)

### 99.6.255 IsImageMonochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if type of the image is bi-level.
**Notes:** See IsImageMonochrome function in ImageMagick documentation.
(Read only property)

### 99.6.256 IsImageObject as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the image sequence contains a valid set of image objects.
**Notes:** See IsImageObject function in ImageMagick documentation.
(Read only property)

### 99.6.257 IsPaletteImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns MagickTrue if the image is PseudoClass and has 256 unique colors or less.
**Notes:** See IsPaletteImage function in ImageMagick documentation.
(Read only property)

### 99.6.258 IsTaintImage as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true any pixel in the image has been altered since it was first constituted.
**Notes:** has image been modified since reading
(Read only property)

### 99.6.259 Iterations as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of interations for GIF animations.
**Notes:** (Read and Write property)

### 99.6.260 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 99.6.261 LastException as IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception raised.
**Notes:** (Read and Write property)

### 99.6.262 ListImage as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image list links.
**Notes:** (Read only property)

### 99.6.263 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The magick module to use for encode/decode.
**Notes:** (Read and Write property)

### 99.6.264 MaskTrait as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pixel trait for the mask.
**Notes:** Apply the clip or composite mask .
(Read and Write property)

### 99.6.265 MatteColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matte color.
**Notes:** When you query this value, you get a copy in a new object.
To modify, you need to change copy and assign back.
(Read and Write property)

### 99.6.266 MetacontentExtent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of meta content.
**Notes:** (Read only property)

### 99.6.267 Montage as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The montage setting.
**Notes:** (Read and Write property)

### 99.6.268 NextImage as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image list links.
**Notes:** (Read only property)

### 99.6.269 NumberChannels as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of channels.
**Notes:** (Read only property)

### 99.6.270 NumberMetaChannels as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of meta channels..
**Notes:** (Read only property)

### 99.6.271 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Photo orientation of image.
**Notes:** (Read and Write property)

### 99.6.272 Page as IMRectangleInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Virtual canvas size and offset of image.
**Notes:** (Read and Write property)

### 99.6.273 Ping as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** No image data read, just attributes.
**Notes:** (Read only property)
See also:

- 99.6.139 Ping(path as string) as IMImage7MBS 15830

### 99.6.274 PixelCacheFilename as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries file path for cache file.
**Notes:** See GetPixelCacheFilename function in ImageMagick documentation.
(Read only property)

### 99.6.275 PixelCacheType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries pixel cache type.
**Notes:** See GetImagePixelCacheType function in ImageMagick documentation.
(Read only property)

### 99.6.276 PreviousImage as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image list links.
**Notes:** (Read only property)

### 99.6.277 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression quality setting, meaning varies.
**Notes:** (Read and Write property)

### 99.6.278 ReadMask as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to read mask.
**Notes:** (Read and Write property)

### 99.6.279 ReferenceCount as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns reference count for this image.
**Notes:** Several image objects can share pixel memory.
Calling Modify function makes sure you have your own pixels to modify.
(Read only property)

### 99.6.280 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to release the object in destructor.
**Notes:** (Read and Write property)

### 99.6.281 RenderingIntent as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rendering intent.
**Notes:** (Read and Write property)

### 99.6.282 Resolution as IMPointInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image resolution/density.
**Notes:** See also Units property for the resolution unit.

(Read and Write property)

### 99.6.283 Rows as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Physical height of image in pixel.
**Notes:** (Read only property)

### 99.6.284 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Index of image in multi-image file.
**Notes:** (Read and Write property)

### 99.6.285 StartLoop as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The start loop value.
**Notes:** For GIF.
(Read and Write property)

### 99.6.286 StorageClass as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The storage class of the image.
**Notes:** (Read only property)

### 99.6.287 Taint as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Has image been modified since reading.
**Notes:** (Read and Write property)

### 99.6.288 TicksPerSecond as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Units for delay time, default 100 for GIF.
**Notes:** (Read and Write property)

### 99.6.289 TileOffset as IMRectangleInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tile offset.
**Notes:** (Read and Write property)

### 99.6.290 TotalColors as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Total number of colors.
**Notes:** (Read and Write property)

### 99.6.291 TransparentColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Color for 'transparent' color index in GIF.
**Notes:** When you query this value, you get a copy in a new object.
To modify, you need to change copy and assign back.
(Read and Write property)

### 99.6.292 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image type.
**Notes:** (Read only property)

### 99.6.293 Units as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolution/density ppi or ppc.
**Notes:** (Read and Write property)

### 99.6.294 VirtualMetacontent as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the virtual metacontent corresponding with the last call to QueueAuthenticPixels or GetVirtualPixels.
**Notes:** Nil is returned if the meta-content are not available.
See GetVirtualMetacontent function in ImageMagick documentation.
(Read only property)

### 99.6.295 VirtualPixelQueue as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the virtual pixels associated corresponding with the last call to QueueAuthenticPixels or GetVirtualPixels.
**Notes:** See GetVirtualPixelQueue function in ImageMagick documentation.
(Read only property)

### 99.6.296 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Physical width of image in pixel.
**Notes:** (Read only property)

### 99.6.297 WriteMask as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to write mask.
**Notes:** (Read and Write property)

### 99.6.298 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kTransparentAlpha | 0 | The value for transparent alpha. |

Intent

| Constant | Value | Description |
|---|---|---|
| kAbsoluteIntent | 3 | |
| kPerceptualIntent | 2 | |
| kRelativeIntent | 4 | |
| kSaturationIntent | 1 | |
| kUndefinedIntent | 0 | |

Alpha Channel

| Constant | Value | Description |
|---|---|---|
| kActivateAlphaChannel | 1 | |
| kAssociateAlphaChannel | 2 | |
| kBackgroundAlphaChannel | 3 | |
| kCopyAlphaChannel | 4 | |
| kDeactivateAlphaChannel | 5 | |
| kDisassociateAlphaChannel | 7 | |
| kDiscreteAlphaChannel | 6 | |
| kExtractAlphaChannel | 8 | |
| kOffAlphaChannel | 9 | |
| kOnAlphaChannel | 10 | |
| kOpaqueAlphaChannel | 11 | |
| kRemoveAlphaChannel | 12 | |
| kSetAlphaChannel | 13 | |
| kShapeAlphaChannel | 14 | |
| kTransparentAlphaChannel | 15 | |
| kUndefinedAlphaChannel | 0 | |

Complex Operators

| Constant | Value | Description |
|---|---|---|
| kAddComplexOperator | 1 | Add |
| kConjugateComplexOperator | 2 | ConjugateC |
| kDivideComplexOperator | 3 | Divide |
| kMagnitudePhaseComplexOperator | 4 | Magnitude Phase |
| kMultiplyComplexOperator | 5 | Multiply |
| kRealImaginaryComplexOperator | 6 | Real Imaginary |
| kSubtractComplexOperator | 7 | Subtract |
| kUndefinedComplexOperator | 0 | Undefined |

Preview

| Constant | Value | Description |
|---|---|---|
| kAddNoisePreview | 14 | |
| kBlurPreview | 16 | |
| kBrightnessPreview | 6 | |
| kCharcoalDrawingPreview | 28 | |
| kDespecklePreview | 12 | |
| kDullPreview | 9 | |
| kEdgeDetectPreview | 18 | |
| kGammaPreview | 7 | |
| kGrayscalePreview | 10 | |
| kHuePreview | 4 | |
| kImplodePreview | 25 | |
| kJPEGPreview | 29 | |
| kOilPaintPreview | 27 | |
| kQuantizePreview | 11 | |
| kRaisePreview | 22 | |
| kReduceNoisePreview | 13 | |
| kRollPreview | 3 | |
| kRotatePreview | 1 | |
| kSaturationPreview | 5 | |
| kSegmentPreview | 23 | |
| kShadePreview | 21 | |
| kSharpenPreview | 15 | |
| kShearPreview | 2 | |
| kSolarizePreview | 20 | |
| kSpiffPreview | 8 | |
| kSpreadPreview | 19 | |
| kSwirlPreview | 24 | |
| kThresholdPreview | 17 | |
| kUndefinedPreview | 0 | |
| kWavePreview | 26 | |

Distortion

| Constant | Value | Description |
|---|---|---|
| kAffineDistortion | 1 | |
| kAffineProjectionDistortion | 2 | |
| kArcDistortion | 9 | |
| kBarrelDistortion | 14 | |
| kBarrelInverseDistortion | 15 | |
| kBilinearDistortion | 6 | |
| kBilinearForwardDistortion | 6 | |
| kBilinearReverseDistortion | 7 | |
| kCylinder2PlaneDistortion | 12 | |
| kDePolarDistortion | 11 | |
| kPerspectiveDistortion | 4 | |
| kPerspectiveProjectionDistortion | 5 | |
| kPlane2CylinderDistortion | 13 | |
| kPolarDistortion | 10 | |
| kPolynomialDistortion | 8 | |
| kResizeDistortion | 17 | |
| kScaleRotateTranslateDistortion | 3 | |
| kSentinelDistortion | 18 | |
| kShepardsDistortion | 16 | |
| kUndefinedDistortion | 0 | |

Composite Operators

| Constant | Value | Description |
|---|---|---|
| kAlphaCompositeOp | 1 | |
| kAtopCompositeOp | 2 | |
| kBlendCompositeOp | 3 | |
| kBlurCompositeOp | 4 | |
| kBumpmapCompositeOp | 5 | |
| kChangeMaskCompositeOp | 6 | |
| kClearCompositeOp | 7 | |
| kColorBurnCompositeOp | 8 | |
| kColorDodgeCompositeOp | 9 | |
| kColorizeCompositeOp | 10 | |
| kCopyAlphaCompositeOp | 17 | |
| kCopyBlackCompositeOp | 11 | |
| kCopyBlueCompositeOp | 12 | |
| kCopyCompositeOp | 13 | |
| kCopyCyanCompositeOp | 14 | |
| kCopyGreenCompositeOp | 15 | |
| kCopyMagentaCompositeOp | 16 | |
| kCopyRedCompositeOp | 18 | |
| kCopyYellowCompositeOp | 19 | |
| kDarkenCompositeOp | 20 | |
| kDarkenIntensityCompositeOp | 21 | |
| kDifferenceCompositeOp | 22 | |
| kDisplaceCompositeOp | 23 | |
| kDissolveCompositeOp | 24 | |
| kDistortCompositeOp | 25 | |
| kDivideDstCompositeOp | 26 | |
| kDivideSrcCompositeOp | 27 | |
| kDstAtopCompositeOp | 28 | |
| kDstCompositeOp | 29 | |
| kDstInCompositeOp | 30 | |
| kDstOutCompositeOp | 31 | |
| kDstOverCompositeOp | 32 | |
| kExclusionCompositeOp | 33 | |
| kHardLightCompositeOp | 34 | |
| kHardMixCompositeOp | 35 | |
| kHueCompositeOp | 36 | |
| kInCompositeOp | 37 | |
| kIntensityCompositeOp | 38 | |
| kLightenCompositeOp | 39 | |
| kLightenIntensityCompositeOp | 40 | |
| kLinearBurnCompositeOp | 41 | |
| kLinearDodgeCompositeOp | 42 | |
| kLinearLightCompositeOp | 43 | |
| kLuminizeCompositeOp | 44 | |
| kMathematicsCompositeOp | 45 | |
| kMinusDstCompositeOp | 46 | |
| kMinusSrcCompositeOp | 47 | |
| kModulateCompositeOp | 48 | |
| kModulusAddCompositeOp | 49 | |
| kModulusSubtractCompositeOp | 50 | |
| kMultiplyCompositeOp | 51 | |
| kNoCompositeOp | 52 | |
| kOutCompositeOp | 53 | |
| kOverCompositeOp | 54 | |
| kOverlayCompositeOp | 55 | |
| kPegtopLightCompositeOp | 56 | |
| kPinLightCompositeOp | 57 | |
| kPlusCompositeOp | 58 | |

Dispose

| Constant | Value | Description |
|---|---|---|
| kBackgroundDispose | 2 | |
| kNoneDispose | 1 | |
| kPreviousDispose | 3 | |
| kUndefinedDispose | 0 | |
| kUnrecognizedDispose | 0 | |

Color Interpolate

| Constant | Value | Description |
|---|---|---|
| kBarycentricColorInterpolate | 1 | |
| kBilinearColorInterpolate | 7 | |
| kInverseColorInterpolate | 19 | |
| kManhattanColorInterpolate | 20 | |
| kPolynomialColorInterpolate | 8 | |
| kShepardsColorInterpolate | 16 | |
| kUndefinedColorInterpolate | 0 | |
| kVoronoiColorInterpolate | 18 | |

Color Types

| Constant | Value | Description |
|---|---|---|
| kBilevelType | 1 | |
| kColorSeparationAlphaType | 9 | |
| kColorSeparationType | 8 | |
| kGrayscaleAlphaType | 3 | |
| kGrayscaleType | 2 | |
| kOptimizeType | 10 | |
| kPaletteAlphaType | 5 | |
| kPaletteBilevelAlphaType | 11 | |
| kPaletteType | 4 | |
| kTrueColorAlphaType | 7 | |
| kTrueColorType | 6 | |
| kUndefinedType | 0 | |

Orientations

| Constant | Value | Description |
|---|---|---|
| kBottomLeftOrientation | 4 | |
| kBottomRightOrientation | 3 | |
| kLeftBottomOrientation | 8 | |
| kLeftTopOrientation | 5 | |
| kRightBottomOrientation | 7 | |
| kRightTopOrientation | 6 | |
| kTopLeftOrientation | 1 | |
| kTopRightOrientation | 2 | |
| kUndefinedOrientation | 0 | |

Color Spaces

| Constant | Value | Description |
|---|---|---|
| kCMYColorspace | 1 | |
| kCMYKColorspace | 2 | |
| kGRAYColorspace | 3 | |
| kHCLColorspace | 4 | |
| kHCLpColorspace | 5 | |
| kHSBColorspace | 6 | |
| kHSIColorspace | 7 | |
| kHSLColorspace | 8 | |
| kHSVColorspace | 9 | |
| kHWBColorspace | 10 | |
| kLabColorspace | 11 | |
| kLCHabColorspace | 13 | |
| kLCHColorspace | 12 | |
| kLCHuvColorspace | 14 | |
| kLinearGRAYColorspace | 33 | |
| kLMSColorspace | 16 | |
| kLogColorspace | 15 | |
| kLuvColorspace | 17 | |
| kOHTAColorspace | 18 | |
| kRec601YCbCrColorspace | 19 | |
| kRec709YCbCrColorspace | 20 | |
| kRGBColorspace | 21 | |
| kscRGBColorspace | 22 | |
| ksRGBColorspace | 23 | |
| kTransparentColorspace | 24 | |
| kUndefinedColorspace | 0 | |
| kxyYColorspace | 25 | |
| kXYZColorspace | 26 | |
| kYCbCrColorspace | 27 | |
| kYCCColorspace | 28 | |
| kYDbDrColorspace | 29 | |
| kYIQColorspace | 30 | |
| kYPbPrColorspace | 31 | |
| kYUVColorspace | 32 | |

Layers

| Constant | Value | Description |
|---|---|---|
| kCoalesceLayer | 1 | |
| kCompareAnyLayer | 2 | |
| kCompareClearLayer | 3 | |
| kCompareOverlayLayer | 4 | |
| kCompositeLayer | 12 | |
| kDisposeLayer | 5 | |
| kFlattenLayer | 14 | |
| kMergeLayer | 13 | |
| kMosaicLayer | 15 | |
| kOptimizeImageLayer | 7 | |
| kOptimizeLayer | 6 | |
| kOptimizePlusLayer | 8 | |
| kOptimizeTransLayer | 9 | |
| kRemoveDupsLayer | 10 | |
| kRemoveZeroLayer | 11 | |
| kTrimBoundsLayer | 16 | |
| kUndefinedLayer | 0 | |

Cache

| Constant | Value | Description |
|---|---|---|
| kDiskCache | 1 | |
| kDistributedCache | 2 | |
| kMapCache | 3 | |
| kMemoryCache | 4 | |
| kPingCache | 5 | |
| kUndefinedCache | 0 | |

Interlace

| Constant | Value | Description |
|---|---|---|
| kGIFInterlace | 5 | |
| kJPEGInterlace | 6 | |
| kLineInterlace | 2 | |
| kNoInterlace | 1 | |
| kPartitionInterlace | 4 | |
| kPlaneInterlace | 3 | |
| kPNGInterlace | 7 | |
| kUndefinedInterlace | 0 | |

Threshold Methods

| Constant | Value | Description |
|---|---|---|
| kKapurThresholdMethod | 1 | |
| kOTSUThresholdMethod | 2 | |
| kTriangleThresholdMethod | 3 | |
| kUndefinedThresholdMethod | 0 | |

Resolutions

| Constant | Value | Description |
|---|---|---|
| kPixelsPerCentimeterResolution | 2 | |
| kPixelsPerInchResolution | 1 | |
| kUndefinedResolution | 0 | |

## 99.7 class IMImageAffineMatrix7MBS

### 99.7.1 class IMImageAffineMatrix7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an affine transformation matrix.

### 99.7.2 Methods

### 99.7.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Initializes with an identity matrix.

### 99.7.4 Properties

### 99.7.5 RX as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotation-x part of the affine transformation.
**Notes:** (Read and Write property)

### 99.7.6 RY as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The rotation-y part of the affine transformation.
**Notes:** (Read and Write property)

### 99.7.7 SX as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale-x part of the affine transformation.
**Notes:** (Read and Write property)

### 99.7.8 SY as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale-y part of the affine transformation.
**Notes:** (Read and Write property)

### 99.7.9 TX as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate-x part of the affine transformation.
**Notes:** (Read and Write property)

### 99.7.10 TY as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The translate-y part of the affine transformation.
**Notes:** (Read and Write property)

## 99.8 class IMImageInfo7MBS

### 99.8.1 class IMImageInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for image info.
**Notes:** This represents usually an image you want to load or save.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5

### 99.8.2 Methods

### 99.8.3 BlobToImage(Data as MemoryBlock) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** BlobToImage implements direct to memory image formats. It returns the blob as an image.
**Notes:** See BlobToImage function in ImageMagick documentation.
See also:

- 99.8.4 BlobToImage(Data as String) as IMImage7MBS 15880

### 99.8.4 BlobToImage(Data as String) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** BlobToImage implements direct to memory image formats. It returns the blob as an image.
**Notes:** See BlobToImage function in ImageMagick documentation.
See also:

- 99.8.3 BlobToImage(Data as MemoryBlock) as IMImage7MBS 15880

### 99.8.5 Clone as IMImageInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Makes a copy of the given image info object.
**Notes:** See CloneImageInfo function in ImageMagick documentation.

### 99.8.6 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty image info.
**Notes:** See CloneImageInfo function in ImageMagick documentation.
See also:

- 99.8.7 Constructor(ImageInfo as IMImageInfo7MBS) 15881

### 99.8.7 Constructor(ImageInfo as IMImageInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of an existing image info.
**Notes:** See CloneImageInfo function in ImageMagick documentation.
See also:

- 99.8.6 Constructor 15880

### 99.8.8 PingBlob(Data as MemoryBlock) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pings a blob.
**Notes:** Reads image attributes, but not image data.
See PingBlob function in ImageMagick documentation.
See also:

- 99.8.9 PingBlob(Data as String) as IMImage7MBS 15881

### 99.8.9 PingBlob(Data as String) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pings a blob.
**Notes:** Reads image attributes, but not image data.
See PingBlob function in ImageMagick documentation.
See also:

- 99.8.8 PingBlob(Data as MemoryBlock) as IMImage7MBS 15881

### 99.8.10 PingImage as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all the properties of an image or image sequence except for the pixels.
**Notes:** It is much faster and consumes far less memory than ReadImage. On failure, a nil image is returned

and exception describes the reason for the failure.

See PingImage function in ImageMagick documentation.

### 99.8.11 PingImages(filename as String) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Pings one or more images and returns them as an image list.
**Notes:** See xx function in ImageMagick documentation.

### 99.8.12 ReadImage as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image or image sequence from a file or file handle.
**Notes:** The method returns a nil if there is a memory shortage or if the image cannot be read. On failure, a nil image is returned and exception describes the reason for the failure.

See ReadImage function in ImageMagick documentation.

### 99.8.13 ReadImages(filename as String) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads one or more images and returns them as an image list.
**Notes:** See xx function in ImageMagick documentation.

### 99.8.14 ReadInlineImage(filename as String) as IMImage7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a Base64-encoded inline image or image sequence.
**Notes:** The method returns a nil if there is a memory shortage or if the image cannot be read. On failure, a nil image is returned and exception describes the reason for the failure.

See ReadInlineImage function in ImageMagick documentation.

### 99.8.15 WriteImage(image as IMImage7MBS) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an image or an image sequence to a file or file handle.
**Notes:** If writing to a file is on disk, the name is defined by the filename member of the image object. WriteImage returns False is there is a memory shortage or if the image cannot be written. Check the exception member of image to determine the cause for any failure.

See WriteImage function in ImageMagick documentation.

### 99.8.16 WriteImages(image as IMImage7MBS, filename as String) as boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an image sequence into one or more files.
**Notes:** While WriteImage can write an image sequence, it is limited to writing the sequence into a single file using a format which supports multiple frames. WriteImages, however, does not have this limitation, instead it generates multiple output files if necessary (or when requested). When ImageInfo's adjoin flag is set to False, the file name is expected to include a printf-style formatting string for the frame number (e.g. "image02d.png").

See WriteImages function in ImageMagick documentation.

### 99.8.17 Properties

### 99.8.18 Adjoin as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save images to separate scene files.
**Notes:** (Read and Write property)

### 99.8.19 Affirm as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Affirm flag.
**Notes:** (Read and Write property)

### 99.8.20 AlphaColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha color value.
**Notes:** (Read and Write property)

### 99.8.21 Antialias as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The anti alias flag.
**Notes:** (Read and Write property)

### 99.8.22 BackgroundColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The background color.
**Notes:** (Read and Write property)

### 99.8.23 BorderColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The border color.
**Notes:** (Read and Write property)

### 99.8.24 Channel as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The channel types.
**Notes:** See ChannelType constants.
(Read and Write property)

### 99.8.25 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorspace of image data.
**Notes:** See Colorspace constants.
(Read and Write property)

### 99.8.26 Compose as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Alpha composition method for layered images.
**Notes:** (Read and Write property)

### 99.8.27 Compression as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression of image when read/write.
**Notes:** (Read and Write property)

### 99.8.28 Debug as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Debug enabled.
**Notes:** (Read and Write property)

### 99.8.29 Density as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DUP for image and draw_info.
**Notes:** (Read and Write property)

### 99.8.30 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Depth of image on read/write.
**Notes:** (Read and Write property)

### 99.8.31 Dither as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** dithering on/off.
**Notes:** (Read and Write property)

### 99.8.32 Endian as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** raw data integer ordering on read/write.
**Notes:** (Read and Write property)

### 99.8.33 Extract as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crop/resize string on image read.
**Notes:** (Read and Write property)

### 99.8.34 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path of the image.
**Notes:** (Read and Write property)

### 99.8.35 Font as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Font name for drawing functions.
**Notes:** (Read and Write property)

### 99.8.36 Fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current color fuzz attribute.
**Notes:** (Read and Write property)

### 99.8.37 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 99.8.38 Interlace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Interlace for image write.
**Notes:** See Interlace constants.
(Read and Write property)

### 99.8.39 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 99.8.40 LastException as IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception raised.
**Notes:** (Read and Write property)

### 99.8.41 Length as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of data.
**Notes:** (Read and Write property)

### 99.8.42 Magick as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The magick module to use for encode/decode.
**Notes:** (Read and Write property)

### 99.8.43 MatteColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matte color.
**Notes:** (Read and Write property)

### 99.8.44 Monochrome as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to read/write pcl,pdf,ps,xps as monocrome image.
**Notes:** (Read and Write property)

### 99.8.45 Orientation as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The orientation of the image.
**Notes:** See orientation constants.
(Read and Write property)

### 99.8.46 Page as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The page number.
**Notes:** (Read and Write property)

### 99.8.47 Ping as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If enabled only fast read image attributes, not image data.
**Notes:** (Read and Write property)

### 99.8.48 PointSize as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The point size.
**Notes:** (Read and Write property)

### 99.8.49 Quality as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compression quality setting, meaning varies.
**Notes:** (Read and Write property)

### 99.8.50 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wether to release the object in destructor.
**Notes:** (Read and Write property)

### 99.8.51 SamplingFactor as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** JPEG write sampling factor.
**Notes:** (Read and Write property)

### 99.8.52 Scene as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starting value for image save numbering.
**Notes:** (Read and Write property)

### 99.8.53 SceneCount as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Total number of images in list - for escapes.
**Notes:** (Read and Write property)

### 99.8.54 Scenes as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scene numbers that is to be read in.
**Notes:** (Read and Write property)

### 99.8.55 ServerName as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X windows server name - display/animate.
**Notes:** (Read and Write property)

### 99.8.56 Size as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Image generation size.
**Notes:** (Read and Write property)

### 99.8.57 Synchronize as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Synchronize flag.
**Notes:** (Read and Write property)

### 99.8.58 Temporary as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether image file is temporary.
**Notes:** image file to be deleted after read "empemeral:".
(Read and Write property)

### 99.8.59 Texture as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** montage/display background tile.
**Notes:** (Read and Write property)

### 99.8.60 TransparentColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** color for transparent index in color tables.
**Notes:** (Read and Write property)

### 99.8.61 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image type.
**Notes:** e.g. TrueColorAlphaType.
(Read and Write property)

### 99.8.62 Unique as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unique tempory filename - delegates.
**Notes:** (Read and Write property)

### 99.8.63 Units as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The resolution unit.
**Notes:** Density pixels/inch or pixel/cm.
Either kPixelsPerInchResolution or kPixelsPerCentimeterResolution.

(Read and Write property)

### 99.8.64 Verbose as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verbose output enable/disable.
**Notes:** (Read and Write property)

## 99.9 class IMKernelInfo7MBS

### 99.9.1 class IMKernelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The kernel information details.

### 99.9.2 Methods

### 99.9.3 Clone as IMKernelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the kernel info object.
**Notes:** Creates a new clone of the given Kernel List so that its can be modified without effecting the original.

### 99.9.4 Constructor(KernelInfo as IMKernelInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the kernel.
See also:


- 99.9.5 Constructor(kernelString as String) 15893
- 99.9.6 Constructor(Type as Integer, GeometryInfo as IMGeometryInfo7MBS) 15895


### 99.9.5 Constructor(kernelString as String)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes the given string (generally supplied by the user) and converts it into a Morphology/Convolution Kernel.
**Notes:** This allows users to specify a kernel from a number of pre-defined kernels, or to fully specify their own kernel for a specific Convolution or Morphology Operation.

The kernel so generated can be any rectangular array of floating point values (doubles) with the 'control point' or 'pixel being affected' anywhere within that array of values.

Previously IM was restricted to a square of odd size using the exact center as origin, this is no longer the case, and any rectangular kernel with any value being declared the origin. This in turn allows the use of

highly asymmetrical kernels.

The floating point values in the kernel can also include a special value known as 'nan' or 'not a number' to indicate that this value is not part of the kernel array. This allows you to shaped the kernel within its rectangular area. That is 'nan' values provide a 'mask' for the kernel shape. However at least one non-nan value must be provided for correct working of a kernel.

The returned kernel should be freed using the DestroyKernelInfo() when you are finished with it. Do not free this memory yourself.

Input kernel defintion strings can consist of any of three types.

"name:args [ [ @><] " Select from one of the built in kernels, using the name and geometry arguments supplied. See AcquireKernelBuiltIn()

"WxH [ +X+Y ] [ @><] :num, num, num ..." a kernel of size W by H, with W*H floating point numbers following. the 'center' can be optionally be defined at +X+Y (such that +0+0 is top left corner). If not defined the pixel in the center, for odd sizes, or to the immediate top or left of center for even sizes is automatically selected.

"num, num, num, num, ..." list of floating point numbers defining an 'old style' odd sized square kernel. At least 9 values should be provided for a 3x3 square kernel, 25 for a 5x5 square kernel, 49 for 7x7, etc. Values can be space or comma separated. This is not recommended.

You can define a 'list of kernels' which can be used by some morphology operators A list is defined as a semi-colon separated list kernels.

" kernel ; kernel ; kernel ; "

Any extra ';' characters, at start, end or between kernel defintions are simply ignored.

The special flags will expand a single kernel, into a list of rotated kernels. A '@' flag will expand a 3x3 kernel into a list of 45-degree cyclic rotations, while a '>' will generate a list of 90-degree rotations. The '<' also exands using 90-degree rotates, but giving a 180-degree reflected kernel before the +/- 90-degree rotations, which can be important for Thinning operations.

Note that 'name' kernels will start with an alphabetic character while the new kernel specification has a ':' character in its specification string. If neither is the case, it is assumed an old style of a simple list of numbers generating a odd-sized square kernel has been given.

kernelString: the Morphology/Convolution kernel wanted.

See also AcquireKernelInfo in ImageMagick documentation.
See also:


- 99.9.4 Constructor(KernelInfo as IMKernelInfo7MBS) 15893
- 99.9.6 Constructor(Type as Integer, GeometryInfo as IMGeometryInfo7MBS) 15895


### 99.9.6 Constructor(Type as Integer, GeometryInfo as IMGeometryInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns one of the 'named' built-in types of kernels used for special purposes such as gaussian blurring, skeleton pruning, and edge distance determination.
**Notes:** They take a KernelType, and a set of geometry style arguments, which were typically decoded from a user supplied string, or from a more complex Morphology Method that was requested.

A description of each parameter follows:

type: the pre-defined type of kernel wanted
args: arguments defining or modifying the kernel

Convolution Kernels
Unity The a No-Op or Scaling single element kernel.
Gaussian: { radius } , { sigma } Generate a two-dimensional gaussian kernel, as used by -gaussian. The sigma for the curve is required. The resulting kernel is normalized,
If 'sigma' is zero, you get a single pixel on a field of zeros.
NOTE: that the 'radius' is optional, but if provided can limit (clip) the final size of the resulting kernel to a square 2*radius+1 in size. The radius should be at least 2 times that of the sigma value, or sever clipping and aliasing may result. If not given or set to 0 the radius will be determined so as to produce the best minimal error result, which is usally much larger than is normally needed.
LoG: { radius } , { sigma } "Laplacian of a Gaussian" or "Mexician Hat" Kernel. The supposed ideal edge detection, zero-summing kernel.
An alturnative to this kernel is to use a "DoG" with a sigma ratio of approx 1.6 (according to wikipedia).
DoG: { radius } , { sigma1 } , { sigma2 } "Difference of Gaussians" Kernel. As "Gaussian" but with a gaussian produced by 'sigma2' subtracted from the gaussian produced by 'sigma1'. Typically sigma2 >sigma1. The result is a zero-summing kernel.
Blur: { radius } , { sigma } [ , { angle } ] Generates a 1 dimensional or linear gaussian blur, at the angle given (current restricted to orthogonal angles). If a 'radius' is given the kernel is clipped to a width of 2*radius+1. Kernel can be rotated by a 90 degree angle.
If 'sigma' is zero, you get a single pixel on a field of zeros.
Note that two convolutions with two "Blur" kernels perpendicular to each other, is equivalent to a far larger "Gaussian" kernel with the same sigma value, However it is much faster to apply. This is how the "-blur" operator actually works.
Comet: { width } , { sigma } , { angle } Blur in one direction only, much like how a bright object leaves a

comet like trail. The Kernel is actually half a gaussian curve, Adding two such blurs in opposite directions produces a Blur Kernel. Angle can be rotated in multiples of 90 degrees.
Note that the first argument is the width of the kernel and not the radius of the kernel.
Binomial: [ { radius } ] Generate a discrete kernel using a 2 dimentional Pascel's Triangle of values. Used for special forma of image filters.
See also:


- 99.9.4 Constructor(KernelInfo as IMKernelInfo7MBS) 15893
- 99.9.5 Constructor(kernelString as String) 15893


### 99.9.7 Scale(scaleFactor as double, GeometryFlags as integer)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the given kernel.
**Notes:** Scales the given kernel list by the given amount, with or without normalization of the sum of the kernel values (as per given flags).

By default (no flags given) the values within the kernel is scaled directly using given scaling factor without change.

If either of the two 'normalize_flags' are given the kernel will first be normalized and then further scaled by the scaling factor value given.

Kernel normalization ('normalize_flags' given) is designed to ensure that any use of the kernel scaling factor with 'Convolve' or 'Correlate' morphology methods will fall into -1.0 to +1.0 range. Note that for non-HDRI versions of IM this may cause images to have any negative results clipped, unless some 'bias' is used.

More specifically. Kernels which only contain positive values (such as a 'Gaussian' kernel) will be scaled so that those values sum to +1.0, ensuring a 0.0 to +1.0 output range for non-HDRI images.

For Kernels that contain some negative values, (such as 'Sharpen' kernels) the kernel will be scaled by the absolute of the sum of kernel values, so that it will generally fall within the +/- 1.0 range.

For kernels whose values sum to zero, (such as 'Laplician' kernels) kernel will be scaled by just the sum of the postive values, so that its output range will again fall into the +/- 1.0 range.

For special kernels designed for locating shapes using 'Correlate', (often only containing +1 and -1 values, representing foreground/brackground matching) a special normalization method is provided to scale the positive values separately to those of the negative values, so the kernel will be forced to become a zero-sum kernel better suited to such searches.

WARNING: Correct normalization of the kernel assumes that the '*_range' attributes within the kernel structure have been correctly set during the kernels creation.

NOTE: The values used for 'normalize_flags' have been selected specifically to match the use of geometry options, so that '!' means NormalizeValue, '^' means CorrelateNormalizeValue. All other GeometryFlags values are ignored.

scaleFactor: zero. If the kernel is normalized regardless of any flags.
GeometryFlags: specifically: NormalizeValue, CorrelateNormalizeValue, and/or PercentValue.

See also ScaleKernelInfo in ImageMagick documentation.

### 99.9.8 ScaleGeometry(Geometry as string)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales using a geometry.
**Notes:** Takes a geometry argument string, typically provided as a "-set option:convolve:scale { geometry } " user setting, and modifies the kernel according to the parsed arguments of that setting.

The first argument (and any normalization flags) are passed to ScaleKernelInfo() to scale/normalize the kernel. The second argument is then passed to UnityAddKernelInfo() to add a scled unity kernel into the scaled/normalized kernel.

geometry: "-set option:convolve:scale { geometry } " setting.

See also ScaleGeometryKernelInfo in ImageMagick documentation.

### 99.9.9 UnityAddKernelInfo(scale as double)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a given amount of the 'Unity' Convolution Kernel to the given pre-scaled and normalized Kernel.
**Notes:** This in effect adds that amount of the original image into the resulting convolution kernel. This value is usually provided by the user as a percentage value in the 'convolve:scale' setting.

The resulting effect is to convert the defined kernels into blended soft-blurs, unsharp kernels or into sharpening kernels.

See also UnityAdditionKernelInfo in ImageMagick documentation.

### 99.9.10 Properties

### 99.9.11 Angle as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The angle parameter.
**Notes:** (Read and Write property)

### 99.9.12 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 99.9.13 Height as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height value.
**Notes:** (Read and Write property)

### 99.9.14 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last error code.
**Notes:** (Read and Write property)

### 99.9.15 LastException as IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last exception raised.
**Notes:** (Read and Write property)

### 99.9.16 Maximum as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum parameter.
**Notes:** (Read and Write property)

### 99.9.17 Minimum as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum parameter.
**Notes:** (Read and Write property)

### 99.9.18 NegativeRange as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The negative range parameter.
**Notes:** (Read and Write property)

### 99.9.19 NextKernel as IMKernelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Next kernel in a list of kernels.
**Notes:** (Read only property)

### 99.9.20 PositiveRange as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The postive range parameter.
**Notes:** (Read and Write property)

### 99.9.21 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to release to kernel info structure in destructor.
**Notes:** (Read and Write property)

### 99.9.22 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of kernel.
**Notes:** See Kernel constants.
(Read and Write property)

### 99.9.23 Values as Ptr

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The pointer to the values.
**Notes:** (Read only property)

### 99.9.24 Width as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Width value.
**Notes:** (Read and Write property)

### 99.9.25 X as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X coordinate.
**Notes:** (Read and Write property)

### 99.9.26 Y as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y coordinate.
**Notes:** (Read and Write property)

### 99.9.27 Constants

Kernel

| Constant | Value | Description |
|---|---|---|
| KernelBinomial | 7 | Binomial |
| KernelBlur | 5 | Convolution Kernels, Gaussian Based. |
| KernelChebyshev | 33 | One Distance Measuring Kernel. |
| KernelComet | 6 | Convolution Kernels, Gaussian Based. |
| KernelCompass | 13 | Convolution Kernel. |
| KernelConvexHull | 30 | A Hit And Miss Kernel. |
| KernelCorners | 25 | A Hit And Miss Kernel. |
| KernelCross | 21 | A shape kernel. |
| KernelDiagonals | 26 | A Hit And Miss Kernel. |
| KernelDiamond | 15 | A shape kernel. |
| KernelDisk | 19 | A shape kernel. |
| KernelDoG | 3 | Convolution Kernels, Gaussian Based. |
| KernelEdges | 24 | A Hit And Miss Kernel. |
| KernelEuclidean | 36 | One Distance Measuring Kernel. |
| KernelFreiChen | 10 | Convolution Kernel. |
| KernelGaussian | 2 | Convolution Kernels, Gaussian Based. |
| KernelKirsch | 14 | Convolution Kernel. |
| KernelLaplacian | 8 | Convolution Kernel. |
| KernelLineEnds | 27 | A Hit And Miss Kernel. |
| KernelLineJunctions | 28 | A Hit And Miss Kernel. |
| KernelLoG | 4 | Convolution Kernels, Gaussian Based. |
| KernelManhattan | 34 | One Distance Measuring Kernel. |
| KernelOctagon | 18 | A shape kernel. |
| KernelOctagonal | 35 | One Distance Measuring Kernel. |
| KernelPeaks | 23 | A Hit And Miss Kernel. |
| KernelPlus | 20 | A shape kernel. |
| KernelPrewitt | 12 | Convolution Kernel. |
| KernelRectangle | 17 | A shape kernel. |
| KernelRidges | 29 | A Hit And Miss Kernel. |
| KernelRing | 22 | A shape kernel. |
| KernelRoberts | 11 | Convolution Kernel. |
| KernelSkeleton | 32 | A Hit And Miss Kernel. |
| KernelSobel | 9 | Convolution Kernel. |
| KernelSquare | 16 | A shape kernel. |
| KernelThinSE | 31 | A Hit And Miss Kernel. |
| KernelUndefined | 0 | equivalent to Unity Kernel |
| KernelUnity | 1 | The no-op or 'original image' kernel |
| KernelUserDefinedKernel | 37 | User Specified Kernel Array |

Morphology

| Constant | Value | Description |
|---|---|---|
| MorphologyBottomHat | 17 | |
| MorphologyClose | 9 | |
| MorphologyCloseIntensity | 11 | |
| MorphologyConvolve | 1 | |
| MorphologyCorrelate | 2 | |
| MorphologyDilate | 4 | |
| MorphologyDilateIntensity | 6 | |
| MorphologyDistance | 21 | |
| MorphologyEdge | 15 | |
| MorphologyEdgeIn | 13 | |
| MorphologyEdgeOut | 14 | |
| MorphologyErode | 3 | |
| MorphologyErodeIntensity | 5 | |
| MorphologyHitAndMiss | 18 | |
| MorphologyIterativeDistance | 7 | |
| MorphologyOpen | 8 | |
| MorphologyOpenIntensity | 10 | |
| MorphologySmooth | 12 | |
| MorphologyThicken | 20 | |
| MorphologyThinning | 19 | |
| MorphologyTopHat | 16 | |
| MorphologyUndefined | 0 | |
| MorphologyVoronoi | 22 | |

## 99.10 class IMMagickInfo7MBS

### 99.10.1 class IMMagickInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an encoder/decoder module.

### 99.10.2 Properties

### 99.10.3 Description as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description field.
**Notes:** e.g. "Joint Photographic Experts Group JFIF format" for JPEG format.
(Read only property)

### 99.10.4 flags as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Various flags.
**Notes:** (Read only property)

### 99.10.5 FormatType as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of format defined.
**Notes:** (Read only property)

### 99.10.6 MimeType as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mime type.
**Notes:** e.g. "image/jpeg" for JPEG format.
(Read only property)

### 99.10.7 ModuleName as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module name.
**Notes:** (Read only property)

### 99.10.8 Name as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the encoder/decoder.
**Notes:** (Read only property)

### 99.10.9 Note as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The note for this magick.
**Notes:** (Read only property)

### 99.10.10 Version as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number.
**Notes:** e.g. "libjpeg 90" for JPEG library.
(Read only property)

### 99.10.11 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| FlagAdjoin | &h0001 | Supports adjoin. |
| FlagBlobSupport | &h0002 | Supports blob handling, e.g. reading image from memory. |
| FlagDecoderSeekableStream | &h0200 | Decoder supports seakable streams. |
| FlagDecoderThreadSupport | &h0004 | Supports decoding with threads. |
| FlagEncoderSeekableStream | &h0400 | Encoder supports seekable streams. |
| FlagEncoderThreadSupport | &h0008 | Supports encoding with threads. |
| FlagEndianSupport | &h0010 | Supports endian. |
| FlagNone | &h0000 | No flags set. |
| FlagRawSupport | &h0020 | Whether RAW processing is supported. |
| FlagSeekableStream | &h0040 | Supports seakable streams. |
| FlagStealth | &h0080 | Stealth flag (hidden). |
| FlagUseExtension | &h0100 | Uses extension. |

Format Types

| Constant | Value | Description |
|---|---|---|
| FormatTypeExplicit | 2 | Explicit defined format type. |
| FormatTypeImplicit | 1 | Implicit defined format type. |
| FormatTypeUndefined | 0 | Not defined. |

## 99.11 class IMMagickInfoList7MBS

### 99.11.1 class IMMagickInfoList7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an array of magick info objects.

### 99.11.2 Methods

### 99.11.3 Item(index as integer) as IMMagickInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries an item by the index.
**Notes:** Index is zero based to Count-1.

### 99.11.4 Properties

### 99.11.5 Count as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of entries.
**Notes:** (Read only property)

### 99.11.6 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 99.12 class IMMissingFunctionException7MBS

### 99.12.1 class IMMissingFunctionException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The exception for a missing function.
**Notes:** Subclass of the RuntimeException class.

## 99.13 class IMMontageInfo7MBS

### 99.13.1 class IMMontageInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for montage settings.

### 99.13.2 Methods

### 99.13.3 Clone(ImageInfo as IMImageInfo7MBS) as IMMontageInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the montage settings.

### 99.13.4 Close

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes object.
**Notes:** Same as destructor.

### 99.13.5 Constructor(ImageInfo as IMImageInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 99.13.6 Properties

### 99.13.7 AlphaColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha color.
**Notes:** (Read and Write property)

### 99.13.8 BackgroundColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The background color.
**Notes:** (Read and Write property)

### 99.13.9 BorderColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The border color.
**Notes:** (Read and Write property)

### 99.13.10 BorderWidth as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The border width.
**Notes:** (Read and Write property)

### 99.13.11 Debug as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to output debug messages.
**Notes:** (Read and Write property)

### 99.13.12 Filename as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The filename.
**Notes:** (Read and Write property)

### 99.13.13 Fill as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill color.
**Notes:** (Read and Write property)

### 99.13.14 Font as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font name.
**Notes:** (Read and Write property)

### 99.13.15 Frame as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The frame.
**Notes:** (Read and Write property)

### 99.13.16 Geometry as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry.
**Notes:** (Read and Write property)

### 99.13.17 Gravity as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gravity setting.
**Notes:** (Read and Write property)

### 99.13.18 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 99.13.19 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 99.13.20 LastException as IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception raised.
**Notes:** (Read and Write property)

### 99.13.21 MatteColor as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The matte color.
**Notes:** (Read and Write property)

### 99.13.22 PointSize as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The point size.
**Notes:** (Read and Write property)

### 99.13.23 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to release object in destructor.
**Notes:** (Read and Write property)

### 99.13.24 Shadow as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to use shadow.
**Notes:** (Read and Write property)

### 99.13.25 Stroke as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stroke color.
**Notes:** (Read and Write property)

### 99.13.26 Texture as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The texture string.
**Notes:** (Read and Write property)

### 99.13.27 Tile as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tile string.
**Notes:** (Read and Write property)

### 99.13.28 Title as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title string.
**Notes:** (Read and Write property)

### 99.13.29 Constants

Montage Modes

| Constant | Value | Description |
|---|---|---|
| MontageModeConcatenate | 3 | Concatenate |
| MontageModeFrame | 1 | Frame |
| MontageModeUndefined | 0 | Undefined |
| MontageModeUnframe | 2 | Unframe |

## 99.14 class IMOptionInfo7MBS

### 99.14.1 class IMOptionInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for options.

### 99.14.2 Methods

### 99.14.3 CommandOptionToMnemonic(option as integer, type as integer) as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries command name for a given option number.

### 99.14.4 GetCommandOptionInfo(name as string) as IMOptionInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries option info for given command code.

### 99.14.5 IsCommandOption(name as string) as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the given option is a command option.

### 99.14.6 Properties

### 99.14.7 Flags as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** (Read and Write property)

### 99.14.8 Mnemonic as String

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the option.
**Notes:** (Read and Write property)

### 99.14.9 Stealth as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The stealth property.
**Notes:** This option is hidden.
(Read and Write property)

### 99.14.10 Type as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of option.
**Notes:** (Read and Write property)

### 99.14.11 Constants

Validate Types

| Constant | Value | Description |
|---|---|---|
| AllValidate | &h7fffffff | |
| ColorspaceValidate | &h00001 | |
| CompareValidate | &h00002 | |
| CompositeValidate | &h00004 | |
| ConvertValidate | &h00008 | |
| FormatsDiskValidate | &h00010 | |
| FormatsMapValidate | &h00020 | |
| FormatsMemoryValidate | &h00040 | |
| IdentifyValidate | &h00080 | |
| ImportExportValidate | &h00100 | |
| MagickValidateOptions | 74 | |
| MontageValidate | &h00200 | |
| NoValidate | &h00000 | |
| StreamValidate | &h00400 | |
| UndefinedValidate | 0 | |

Flags

| Constant | Value | Description |
|---|---|---|
| AlwaysInterpretArgsFlag | &h0400 | Always Interpret escapes in Args. CF: ”convert” compatibility mode |
| DeprecateOptionFlag | &h4000 | Deprecate option (no code). |
| DrawInfoOptionFlag | &h0002 | Setting stored in DrawInfo |
| FireOptionFlag | &h2000 | Convert operation seq firing point |
| GenesisOptionFlag | &h0080 | MagickCommandGenesis() Only Option |
| GlobalOptionFlag | &h0008 | Global Setting or Control |
| ImageInfoOptionFlag | &h0001 | Setting stored in ImageInfo |
| ListOperatorFlag | &h0040 | Multi-Image processing operator |
| NeverInterpretArgsFlag | &h0800 | Never Interpret escapes in Args. EG: filename, or delayed escapes. |
| NoImageOperatorFlag | &h0010 | Images not required operator |
| NonMagickOptionFlag | &h1000 | Option not used by Magick Command. |
| QuantizeInfoOptionFlag | &h0004 | Setting stored in QuantizeInfo |
| ReplacedOptionFlag | &h8800 | Replaced Option (but still works). |
| SettingOptionFlags | &h000F | mask any setting option |
| SimpleOperatorFlag | &h0020 | Simple Image processing operator |
| SpecialOptionFlag | &h0100 | Operator with Special Requirements. EG: for specific CLI commands |
| UndefinedOptionFlag | &h0000 | option flag is not in use |

Command Options

| Constant | Value | Description |
|---|---|---|
| MagickAlignOptions | 0 | |
| MagickAlphaChannelOptions | 1 | |
| MagickAutoThresholdOptions | 77 | |
| MagickBooleanOptions | 2 | |
| MagickCacheOptions | 3 | |
| MagickChannelOptions | 4 | |
| MagickClassOptions | 5 | |
| MagickCLIOptions | 79 | |
| MagickClipPathOptions | 6 | |
| MagickCoderOptions | 7 | |
| MagickColorOptions | 8 | |
| MagickColorspaceOptions | 9 | |
| MagickCommandOptions | 10 | |
| MagickComplexOptions | 11 | |
| MagickComplianceOptions | 12 | |
| MagickComposeOptions | 13 | |
| MagickCompressOptions | 14 | |
| MagickConfigureOptions | 15 | |
| MagickDataTypeOptions | 16 | |
| MagickDebugOptions | 17 | |
| MagickDecorateOptions | 18 | |
| MagickDelegateOptions | 19 | |
| MagickDirectionOptions | 20 | |
| MagickDisposeOptions | 21 | |
| MagickDistortOptions | 22 | |
| MagickDitherOptions | 23 | |
| MagickEndianOptions | 24 | |
| MagickEvaluateOptions | 25 | |
| MagickFillRuleOptions | 26 | |
| MagickFilterOptions | 27 | |
| MagickFontOptions | 28 | |
| MagickFontsOptions | 29 | |
| MagickFormatOptions | 30 | |
| MagickFunctionOptions | 31 | |
| MagickGradientOptions | 32 | |
| MagickGravityOptions | 33 | |
| MagickIntensityOptions | 34 | |
| MagickIntentOptions | 35 | |
| MagickInterlaceOptions | 36 | |
| MagickInterpolateOptions | 37 | |
| MagickKernelOptions | 38 | |
| MagickLayerOptions | 39 | |
| MagickLineCapOptions | 40 | |
| MagickLineJoinOptions | 41 | |
| MagickListOptions | 42 | |
| MagickLocaleOptions | 43 | |
| MagickLogEventOptions | 44 | |
| MagickLogOptions | 45 | |
| MagickMagicOptions | 46 | |
| MagickMethodOptions | 47 | |
| MagickMetricOptions | 48 | |
| MagickMimeOptions | 49 | |
| MagickModeOptions | 50 | |
| MagickModuleOptions | 51 | |
| MagickMorphologyOptions | 52 | |
| MagickNoiseOptions | 53 | |
| MagickOrientationOptions | 54 | |
| MagickPixelChannelOptions | 55 | |

## 99.15 class IMPixelInfo7MBS

### 99.15.1 class IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a pixel info.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr6

### 99.15.2 Methods

### 99.15.3 Clone as IMPixelInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the object.

### 99.15.4 Constructor(Image as IMImage7MBS = nil)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 99.15.5 Properties

### 99.15.6 alpha as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha quantum.
**Notes:** Defaults to opaque value, e.g. 65535 for 16 bit.
(Read and Write property)

### 99.15.7 AlphaTrait as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha channel pixel trait.
**Notes:** If zero, no alpha.

(Read and Write property)

### 99.15.8 black as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The black color quantum.
**Notes:** (Read and Write property)

### 99.15.9 blue as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color quantum.
**Notes:** (Read and Write property)

### 99.15.10 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space.
**Notes:** Defaults to ksRGBColorspace.
(Read and Write property)

### 99.15.11 Count as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The count value.
**Notes:** (Read and Write property)

### 99.15.12 Depth as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color depth.
**Notes:** Defaults to quantum depth.
(Read and Write property)

### 99.15.13 fuzz as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fuzz value.
**Notes:** (Read and Write property)

### 99.15.14 green as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color quantum.
**Notes:** (Read and Write property)

### 99.15.15 index as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The index quantum.
**Notes:** (Read and Write property)

### 99.15.16 red as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color quantum.
**Notes:** (Read and Write property)

### 99.15.17 StorageClass as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The storage class.
**Notes:** Defaults to kDirectClass.
(Read and Write property)

## 99.16 class IMPointInfo7MBS

### 99.16.1 class IMPointInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a x/y point.

### 99.16.2 Methods

### 99.16.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with 0/0 values.
See also:

- 99.16.4 Constructor(X as Double, Y as Double) 15921

### 99.16.4 Constructor(X as Double, Y as Double)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with given values.
See also:

- 99.16.3 Constructor 15921

### 99.16.5 Properties

### 99.16.6 X as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x coordinate.
**Notes:** (Read and Write property)

### 99.16.7 Y as Double

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y coordinate.
**Notes:** (Read and Write property)

# 99.17 class IMQuantizeInfo7MBS

## 99.17.1 class IMQuantizeInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for quantize settings.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5

## 99.17.2 Methods

## 99.17.3 Clone as IMQuantizeInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Makes a copy of the given quantize info object.
**Notes:** See CloneQuantizeInfo function in ImageMagick documentation.

## 99.17.4 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty quantize info.
**Notes:** See AcquireQuantizeInfo function in ImageMagick documentation.
See also:

- 99.17.5 Constructor(ImageInfo as IMImageInfo7MBS) 15923
- 99.17.6 Constructor(QuantizeInfo as IMQuantizeInfo7MBS) 15924

## 99.17.5 Constructor(ImageInfo as IMImageInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new quantize info.
**Notes:** If ImageInfo is not empty, copies a few settings from there.
See AcquireQuantizeInfo function in ImageMagick documentation.
See also:

- 99.17.4 Constructor 15923
- 99.17.6 Constructor(QuantizeInfo as IMQuantizeInfo7MBS) 15924

### 99.17.6 Constructor(QuantizeInfo as IMQuantizeInfo7MBS)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Makes a copy of the given quantize info object.
**Notes:** See CloneQuantizeInfo function in ImageMagick documentation.
See also:


- 99.17.4 Constructor 15923
- 99.17.5 Constructor(ImageInfo as IMImageInfo7MBS) 15923


### 99.17.7 Properties

### 99.17.8 ColorSpace as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space.
**Notes:** (Read and Write property)

### 99.17.9 DitherMethod as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dither method.
**Notes:** (Read and Write property)

### 99.17.10 Handle as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 99.17.11 LastError as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 99.17.12 LastException as IMException7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last exception raised.
**Notes:** (Read and Write property)

### 99.17.13 MeasureError as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to measure error.
**Notes:** (Read and Write property)

### 99.17.14 NumberColors as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of colors.
**Notes:** (Read and Write property)

### 99.17.15 Release as Boolean

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to release memory in destructor.
**Notes:** (Read and Write property)

### 99.17.16 TreeDepth as UInt64

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tree depth.
**Notes:** (Read and Write property)

### 99.17.17 Constants

Dither Methods

| Constant | Value | Description |
|---|---|---|
| DitherMethodFloydSteinberg | 3 | FloydSteinberg |
| DitherMethodNo | 1 | No |
| DitherMethodRiemersma | 2 | Riemersma |
| DitherMethodUndefined | 0 | Undefined |

## 99.18 class IMRectangleInfo7MBS

### 99.18.1 class IMRectangleInfo7MBS

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a rectangle.

### 99.18.2 Methods

### 99.18.3 Constructor

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with zero values.
See also:

- 99.18.4 Constructor(X as Integer, Y as Integer, Width as Integer, Heigth as Integer) 15927

### 99.18.4 Constructor(X as Integer, Y as Integer, Width as Integer, Heigth as Integer)

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the point object with given values.
See also:

- 99.18.3 Constructor 15927

### 99.18.5 Properties

### 99.18.6 Height as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the rectangle.
**Notes:** (Read and Write property)

### 99.18.7 Width as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the rectangle.
**Notes:** (Read and Write property)

### 99.18.8 X as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x coordinate of the rectangle.
**Notes:** (Read and Write property)

### 99.18.9 Y as Integer

MBS GraphicsMagick Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y coordinate of the rectangle.
**Notes:** (Read and Write property)

# Chapter 100

# Instant Message

## 100.1 class IMServiceMBS

### 100.1.1 class IMServiceMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** An IMService object represents a service available to a user through iChat, such as AIM, Jabber, and Bonjour.
**Notes:** Each IMService object represents one service available through iChat. Class methods such as allServices and serviceWithName will return these objects. Each object acts as the liaison to its single service, allowing you to access the individual user's global status, the user's list of acquaintances, and other information which can be integrated into your application.

You may want to subclass the InstantMessageMBS class to get events for changes.

All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- Cleanup Xojo Plugins

- MBS Xojo Plugins, version 20.5pr8

### 100.1.2 Methods

### 100.1.3 imageFileForStatus(status as Integer) as folderitem

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the folderitem of the image corresponding to the IMPersonStatus specified by status.
**Notes:** Convenience function which does the same as InstantMessageMBS.imageFileForStatus.

### 100.1.4 imageNameForStatus(status as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image name for the given status.
**Example:**

MsgBox IMServiceMBS.imageNameForStatus(IMServiceMBS.IMPersonStatusIdle)

**Notes:** Mac OS X 10.5 only.
On Mac OS X the NSImage class can be used to access system images by name and there you can use this name.

### 100.1.5 imageURLForStatus(status as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the URL of the image corresponding to the IMPersonStatus specified by status.
**Notes:** Convenience function which does the same as InstantMessageMBS.imageURLForStatus.

### 100.1.6 IMCapabilityAudioConference as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.7 IMCapabilityDirectIM as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.8 IMCapabilityFileSharing as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.9 IMCapabilityFileTransfer as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.10 IMCapabilityText as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.11 IMCapabilityVideoConference as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.

### 100.1.12 IMPersonAVBusyKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's busy status. The value is a number set to 0 if the person's audio/video capabilities are available, or 1 if they are busy.

### 100.1.13 IMPersonCapabilitiesKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's iChat capabilities. The value is an array of capability properties. Check for IMCapability* strings in this array.

### 100.1.14 IMPersonEmailKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's email address. The value is a string containing the person's email address. This is a key used directly by Bonjour; however, if a person has an Address Book entry associated with a relevant AIM account, this key reflects the first email address of that person.

### 100.1.15 IMPersonFirstNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's first name. The value is a string containing the person's first name. This is a key used directly by Bonjour; however, if a person has an Address Book entry associated with a relevant AIM account, this key reflects the first name of that person.

### 100.1.16 IMPersonIdleSinceKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's idle status. The value is a date containing the time, in seconds, since the last user activity. Available if the person's status is idle.

### 100.1.17 IMPersonLastNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's last name. The value is a string containing the person's last name. This is a key used directly by Bonjour; however, if a person has an Address Book entry associated with a relevant AIM account, this key reflects the last name of that person.

### 100.1.18 IMPersonPictureDataKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's image. The value is a string containing the image for the person's icon.

### 100.1.19 IMPersonScreenNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's screen name. The value is a string containing the service-specific identifier for a person. For example, "User123" or "steve@mac.com" for AIM, and "John Doe" for Bonjour.

### 100.1.20 IMPersonServiceNameKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's service name. The value is a string containing the name of the service this person belongs to.

### 100.1.21 IMPersonStatusKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's online status. The value is a number representing the current online status of the person, if known.

### 100.1.22 IMPersonStatusMessageKey as string

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for the info dictionaries.
**Notes:** Used to obtain a person's status message. The value is a string containing the person's current status message.

### 100.1.23 infoForAllScreenNames as dictionary()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns information about all people and all accounts currently logged in to the service.
**Notes:** If a person is logged in on multiple accounts (determined by the user's Address Book), this method will return the information for all of the logged-in accounts.

Returns an Array of the dictionaries. Use IMPerson*Key strings for the keys in that dictionary.

### 100.1.24 infoForPreferredScreenNames as dictionary()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns information about all people and their primary accounts currently logged in to the service.
**Notes:** If a person is logged in on multiple accounts (determined by the user's Address Book), this method will only return the information for the preferred account. The preferred account is determined by iChat, using a combination of capabilities (video chat capability, audio chat capability, and so on), status (available, idle, away), and other user attributes.

Returns an Array of the dictionaries for all people and is guaranteed to provide only one array entry for any logged-in person. Use IMPerson*Key strings for the keys in that dictionary.

### 100.1.25 infoForScreenName(name as string) as dictionary

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns information about the person specified by his/her screenName.
**Notes:** screenName: A string containing the screen name identifier of a person.

Returns a dictionary on success and nil on failure. Use IMPerson*Key strings for the keys in that dictionary.

### 100.1.26 LocalizedName as String

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the user-visible localized name of the service.
**Example:**

```
dim services() as IMServiceMBS = InstantMessageMBS.allServices
```

```
for each service as IMServiceMBS in Services
MsgBox service.LocalizedName
next
```

**Notes:** Returns a String. Will contain the localized service name, such as "AOL Instant Messenger", "Jabber", or "Bonjour", for example. This string will be localized if required.

### 100.1.27 LocalizedShortName as String

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a shorter version, if available, of the user-visible localized name of the service.
**Example:**

```
dim services() as IMServiceMBS = InstantMessageMBS.allServices

for each service as IMServiceMBS in Services
MsgBox service.LocalizedShortName
next
```

**Notes:** Returns a "" on failure. Will return a localized string if required.

### 100.1.28 Name as String

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the fixed canonical name of the service.
**Example:**

```
dim services() as IMServiceMBS = InstantMessageMBS.allServices

for each service as IMServiceMBS in Services
MsgBox service.Name
next
```

**Notes:** Returns a "" on failure. This string is not localized.

### 100.1.29 peopleWithScreenName(screenName as string) as ABPersonMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the Address Book person objects that correspond to the person with the screenName matched by screenName.
**Notes:** screenName: An string containing the screen name identifier of a person or persons.

Returns an array of ABPersonMBS objects that match the screen name matched by screenName. Can return an empty array or an array with one or more items.

Returns empty array on failure.

### 100.1.30 screenNamesForPerson(person as ABPersonMBS) as string()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a list of valid screen names for any given person.
**Example:**

```
// show my screennames on all services

dim AddressBook as new ABAddressBookMBS
dim owner as ABPersonMBS = AddressBook.owner
dim services() as IMServiceMBS = InstantMessageMBS.allServices

for each service as IMServiceMBS in Services
MsgBox service.LocalizedName+":"+EndOfLine+join(service.screenNamesForPerson(owner), EndOfLine)
next
```

**Notes:** person: An Address Book ABPerson object.
Returns an Array of Strings that are valid screen names for the person specified by person. See Address Book documentation for more information on ABPerson and accessing the user's address book. Can return an empty array or an array with one or more items.

Returns an empty array on failure.

### 100.1.31 Status as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the login status of the service.

**Notes:** Returns the appropriate IMServiceStatus number.

### 100.1.32 Properties

### 100.1.33 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Handle to the internal used IMService reference.
**Notes:** (Read and Write property)

### 100.1.34 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| IMPersonStatusAvailable | 4 | A status constant. |
| IMPersonStatusAway | 3 | A status constant. |
| IMPersonStatusIdle | 2 | A status constant. |
| IMPersonStatusNoStatus | 5 | The status constant for persons where the status is unknown. Mac OS X 10.5 only. |
| IMPersonStatusOffline | 1 | A status constant. |
| IMPersonStatusUnknown | 0 | A status constant. |
| IMServiceStatusDisconnected | 1 | A status constant. |
| IMServiceStatusLoggedIn | 4 | A status constant. |
| IMServiceStatusLoggedOut | 0 | A status constant. |
| IMServiceStatusLoggingIn | 3 | A status constant. |
| IMServiceStatusLoggingOut | 2 | A status constant. |

## 100.2 class InstantMessageMBS

### 100.2.1 class InstantMessageMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The class to handle Instant Message support for Mac OS X 10.4 and newer.
**Notes:** This class is based on the Instant Message framework from Apple.
it can be used to get the status of iChat.
**Blog Entries**

- Addressbook classes updated

### 100.2.2 Methods

### 100.2.3 allServices as IMServiceMBS()

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the list of services currently available to the user, regardless of their status.
**Notes:** Returns nil on failure.

Returns a array with IMServiceMBS objects corresponding to the current available services (AIM, Bonjour, Jabber, and so on.)

### 100.2.4 Available as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the InstantMessaging framework is available or not.
**Notes:** Should be true on Mac OS X 10.4.

### 100.2.5 imageFileForStatus(status as Integer) as folderitem

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the folderitem of the image corresponding to the IMPersonStatus specified by status.
**Notes:** This image reflects the status of the user, and is usually reflected by a colored bubble or triangle.

Returns nil on failure.
This is a convenience function which will call imageFileForStatus and return the folderitem matching the

URL in case it points to a disc file.

For Mac OS X 10.4 all images are stored as TIFF files on hard disc. Use the TiffPictureMBS class to load them (OpenAsPicture will not work because of the masks).

values:

| | |
|---|---|
| IMPersonStatusUnknown | = 0 |
| IMPersonStatusOffline | = 1 |
| IMPersonStatusIdle | = 2 |
| IMPersonStatusAway | = 3 |
| IMPersonStatusAvailable | = 4 |

### 100.2.6 imageNameForStatus(status as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the image name for the given status.
**Notes:** Mac OS X 10.5 only.
On Mac OS X the NSImage class can be used to access system images by name and there you can use this name.

### 100.2.7 imageURLForStatus(status as Integer) as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the URL of the image corresponding to the IMPersonStatus specified by status.
**Notes:** This image reflects the status of the user, and is usually reflected by a colored bubble or triangle.

Returns nil on failure.

values:

| | |
|---|---|
| IMPersonStatusUnknown | = 0 |
| IMPersonStatusOffline | = 1 |
| IMPersonStatusIdle | = 2 |
| IMPersonStatusAway | = 3 |
| IMPersonStatusAvailable | = 4 |

### 100.2.8 myIdleTime as Double

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Class method to return the idle time of the active user.
**Notes:** Returns in seconds the time since the currently active user went idle.

### 100.2.9 myStatus as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Class method to return the status of the currently active user.
**Notes:** This status is global across all services.

values:

| | |
|---|---|
| IMPersonStatusUnknown | = 0 |
| IMPersonStatusOffline | = 1 |
| IMPersonStatusIdle | = 2 |
| IMPersonStatusAway | = 3 |
| IMPersonStatusAvailable | = 4 |

### 100.2.10 notificationCenter as NSNotificationCenterMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the custom notification center for the service.
**Notes:** A custom notification center that manages IMService notifications.
Available in Mac OS X v10.4 and later.

### 100.2.11 serviceWithName(name as string) as IMServiceMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns only the service specified by a given name.
**Notes:** name: A String containing a service name as returned by a previous call to name.
Hard-coding the service names internally is not recommended.

Returns an IMService object corresponding to the available service specified by name.
Returns nil on any failure.

### 100.2.12 Events

### 100.2.13 MyStatusChanged

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called when the local user changes online status.
**Notes:** The client should call myStatus function to get the new status.

### 100.2.14 PersonInfoChanged(info as dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Event sent when a screenName changes some aspect of their published information.
**Notes:** The user information dictionary will always contain an ScreenName and may contain any of the following values: StatusMessage, IdleSince, FirstName, LastName, IMPersonEmailKey, PictureData, AVAvailable and AVBusy, Capabilities values.

### 100.2.15 PersonStatusChanged(info as dictionary)

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Event sent when a different user (screenName) logs in, logs off, goes away, and so on.
**Notes:** The info object knows the ScreenName and the Status of the person.

### 100.2.16 ServiceStatusChanged

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** Event sent when the user logs in, logs off, goes away, and so on.
**Notes:** Call MyStatus to get the new state.

### 100.2.17 StatusImagesChangedAppearance

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** Event sent when the user changes their preferred images for displaying status.
**Notes:** Clients that display status information graphically (using the green/yellow/red dots) should call imageURLForStatus to get the new image.

# Chapter 101

# IO Registry

## 101.1 class DarwinDriveStatisticsMBS

### 101.1.1 class DarwinDriveStatisticsMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for an iterator over the IORegistry drives.
**Example:**

```
dim d as DarwinDriveStatisticsMBS
dim l as CFDictionaryMBS

d=new DarwinDriveStatisticsMBS
l=d.NextDrive
while l<>Nil
CFShowMBS l
l=d.NextDrive
wend
```

### 101.1.2 Methods

### 101.1.3 close

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 101.1.4 kIOBlockStorageDriverStatisticsBytesReadKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of bytes read since the block storage driver was instantiated.

This property describes the number of bytes read since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.5 kIOBlockStorageDriverStatisticsBytesWrittenKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of bytes written since the block storage driver was instantiated.

This property describes the number of bytes written since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.6 kIOBlockStorageDriverStatisticsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The key value used to get a statistics dictionary from the drive information dictionary.

### 101.1.7 kIOBlockStorageDriverStatisticsLatentReadTimeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of nanoseconds of latency during reads since the block storage driver was instantiated.

This property describes the number of nanoseconds of latency during reads since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey

property table. It has an CFNumber value.

### 101.1.8 kIOBlockStorageDriverStatisticsLatentWriteTimeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of nanoseconds of latency during writes since the block storage driver was instantiated.

This property describes the number of nanoseconds of latency during writes since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.9 kIOBlockStorageDriverStatisticsReadErrorsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of read errors encountered since the block storage driver was instantiated.
This property describes the number of read errors encountered since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.10 kIOBlockStorageDriverStatisticsReadRetriesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of read retries required since the block storage driver was instantiated.

This property describes the number of read retries required since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.11 kIOBlockStorageDriverStatisticsReadsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.

**Notes:** Describes the number of read operations processed since the block storage driver was instantiated.

This property describes the number of read operations processed since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.12 kIOBlockStorageDriverStatisticsTotalReadTimeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of nanoseconds spent performing reads since the block storage driver was instantiated.

This property describes the number of nanoseconds spent performing reads since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.13 kIOBlockStorageDriverStatisticsTotalWriteTimeKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of nanoseconds spent performing writes since the block storage driver was instantiated.

This property describes the number of nanoseconds spent performing writes since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an OSNumber value.

### 101.1.14 kIOBlockStorageDriverStatisticsWriteErrorsKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of write errors encountered since the block storage driver was instantiated.
This property describes the number of write errors encountered since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.15 kIOBlockStorageDriverStatisticsWriteRetriesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of write retries required since the block storage driver was instantiated.

This property describes the number of write retries required since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an OSNumber value.

### 101.1.16 kIOBlockStorageDriverStatisticsWritesKey as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the statistics dictionary.
**Notes:** Describes the number of write operations processed since the block storage driver was instantiated.

This property describes the number of write operations processed since the block storage driver was instantiated. It is one of the statistic entries listed under the top-level kIOBlockStorageDriverStatisticsKey property table. It has an CFNumber value.

### 101.1.17 NextDrive as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the dictionary describing the next drive in the list.

### 101.1.18 Reset

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves you back to the beginning of the list.

### 101.1.19 Properties

### 101.1.20 Handle as Integer

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 101.2 module IORegistryMBS

### 101.2.1 module IORegistryMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A module for accessing the Mac OS X IO Registry.
**Notes:** The IORegistryMBS stores information about the installed hardware.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr3
- MBS Xojo Plugins, version 19.0pr9
- MBS Xojo / Real Studio Plugins, version 16.3pr4
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- MBS Real Studio Plugins, version 11.2pr7
- Addressbook classes updated

### 101.2.2 Methods

### 101.2.3 AudioRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the Audio tree inside the IO Registry.

### 101.2.4 DeviceRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the Device tree inside the IO Registry.

### 101.2.5 FirewireRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the Firewire tree inside the IO Registry.

### 101.2.6 MatchingServices(servicename as string) as IORegistryNodeMBS()

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the nodes matching the servicename.
**Example:**

```
// search for Serial devices
dim devices() as IORegistryNodeMBS = IORegistryMBS.MatchingServices("IOSerialBSDClient")
dim names(-1) as string

// check devices and query names
for each dev as IORegistryNodeMBS in devices
dim dic as Dictionary = dev.Properties
names.Append dic.Lookup("IOTTYBaseName","")
next

// show all names
MsgBox Join(names,EndOfLine)
```

### 101.2.7 PerformanceStatistics(index as Integer = 0) as Dictionary

MBS MacCF Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries performance statistics for first graphics card on a Mac.
**Example:**

```
dim d as Dictionary = IORegistryMBS.PerformanceStatistics

if d <>nil then

dim gpuCoreUse as Int64 = d.Value("GPU Core Utilization")
dim freeVramCount as Int64 = d.Value("vramFreeBytes")
dim usedVramCount as Int64 = d.Value("vramUsedBytes")

dim sum as int64 = (freeVramCount+usedVramCount)

List.AddRow format(gpuCoreUse/1000000000.0, "0%"), Format(freeVramCount/1024.0/1024.0, "0")+" MB
of "+Format(sum/1024.0/1024.0, "0")+" MB", Format(usedVramCount / sum, "0%")
list.ScrollPosition = list.ListCount
else
Break
end if
```

**Notes:** The dictionary contains details about performance of graphics card.

This includes vramFreeBytes and vramUsedBytes for memory usage as well as "GPU Core Utilization" key with GPU time used.
Returns nil on any error.

Index is zero for first graphics card.
Or 1 for second graphics card.

### 101.2.8 PowerRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the Power tree inside the IO Registry.

### 101.2.9 Present as Boolean

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Is the IORegistryMBS working?
**Notes:** Returns true on Mac OS X and false on other platforms.

### 101.2.10 Root(plane as string) as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the IORegistry tree with the given plane name.
**Example:**

```
// shows names of all USB devices
dim u as IORegistryNodeMBS = IORegistryMBS.Root("IOUSB") // same as USBRoot function

// now loop over all devices with all children (non recursive)
dim names(-1) as string
dim nodes(-1) as IORegistryNodeMBS = array(u)

while UBound(nodes)>=0
dim p as IORegistryNodeMBS = nodes.pop

names.Append p.Name
for each c as IORegistryNodeMBS in p.Children
nodes.Append c
next
wend
```

```
// and display array with names
MsgBox Join(names,EndOfLine)
```

### 101.2.11 ServiceRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the Service tree inside the IO Registry.

### 101.2.12 USBRoot as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the root of the USB tree inside the IO Registry.
**Example:**

```
// shows names of all USB devices
dim u as IORegistryNodeMBS = IORegistryMBS.USBRoot

// now loop over all devices with all children (non recursive)
dim names(-1) as string
dim nodes(-1) as IORegistryNodeMBS = array(u)

while UBound(nodes)>=0
dim p as IORegistryNodeMBS = nodes.pop

names.Append p.Name
for each c as IORegistryNodeMBS in p.Children
nodes.Append c
next
wend

// and display array with names
MsgBox Join(names,EndOfLine)
```

## 101.3 class IORegistryNodeMBS

### 101.3.1 class IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a node inside the IO Registry.

### 101.3.2 Methods

### 101.3.3 CFProperties as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a CFDictionary object with all the properties of this note.

### 101.3.4 Child(index as Integer) as IORegistryNodeMBS

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the IORegistryNodeMBS with the given index.
**Notes:** Index from 0 to ChildCount-1.

### 101.3.5 Children as IORegistryNodeMBS()

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with all child nodes.

### 101.3.6 Parents as IORegistryNodeMBS()

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with all parent nodes.

### 101.3.7 Properties as Dictionary

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a Xojo dictionary with all the properties of this note.

### 101.3.8 Properties

### 101.3.9 Busy as Integer

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the busyState of an IOService.
**Notes:** Many activities in IOService are asynchronous. When registration, matching, or termination is in progress on an IOService, its busyState is increased by one. Change in busyState to or from zero also changes the IOService's provider's busyState by one, which means that an IOService is marked busy when any of the above activities is ocurring on it or any of its clients.
(Read only property)

### 101.3.10 ChildCount as Integer

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Count of sub nodes.
**Notes:** (Read only property)

### 101.3.11 DataCount as Integer

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Count of data items.
**Notes:** (Read only property)

### 101.3.12 IOClass as String

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the IOKit class.
**Notes:** (Read only property)

### 101.3.13 Name as String

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of this node.
**Notes:** (Read only property)

### 101.3.14 ParentCount as Integer

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of parent nodes for this node.
**Notes:** Typically one.
(Read only property)

### 101.3.15 Path as String

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The path of this node.
**Notes:** Useful for finding a node again.
(Read only property)

### 101.3.16 RetainCount as Integer

MBS MacCF Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retain count of this object.
**Notes:** (Read only property)

# Chapter 102

# iTunes

## 102.1 class iTunesLibraryAlbumMBS

### 102.1.1 class iTunesLibraryAlbumMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Represents an album where a given media item (MediaItem) is contained.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 102.1.2 Methods

### 102.1.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.1.4 Properties

### 102.1.5 AlbumArtist as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The artist associated with this album.
**Notes:** (Read only property)

### 102.1.6 Artist as iTunesLibraryArtistMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The artist.
**Notes:** Deprecated. Will be removed in future versions.
(Read only property)

### 102.1.7 Compilation as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this album is a compilation.
**Notes:** (Read only property)

### 102.1.8 DiscCount as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The number of discs in this album.
**Notes:** (Read only property)

### 102.1.9 DiscNumber as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The index (i.e. 1, 2, 3, etc.) of the disc this album refers to within a compilation.0
**Notes:** (Read only property)

### 102.1.10 Gapless as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this track's album is gapless.
**Notes:** (Read only property)

### 102.1.11 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.1.12 Rating as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The rating of this track's album.
**Notes:** (Read only property)

### 102.1.13 RatingComputed as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The rating of this track's album.
**Notes:** (Read only property)

### 102.1.14 SortAlbumArtist as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The artist associated with this album. This field should be used when sorting.
**Notes:** (Read only property)

### 102.1.15 SortTitle as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of this that should be used for sorting purposes.
**Notes:** (Read only property)

### 102.1.16 Title as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of this album.
**Notes:** (Read only property)

### 102.1.17 TrackCount as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Number of tracks in this album.
**Notes:** (Read only property)

## 102.2 class iTunesLibraryArtistMBS

### 102.2.1 class iTunesLibraryArtistMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Represents an artist, such as the performer of a song.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 102.2.2 Methods

### 102.2.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.2.4 Properties

### 102.2.5 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.2.6 name as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of this artist.
**Notes:** (Read only property)

### 102.2.7 sortName as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of this artist that should be used for sorting purposes.
**Notes:** (Read only property)

## 102.3 class iTunesLibraryArtworkMBS

### 102.3.1 class iTunesLibraryArtworkMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Represents a media item artwork.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 102.3.2 Methods

### 102.3.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.3.4 Properties

### 102.3.5 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.3.6 image as NSImageMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The NSImage formed by using image Data.
**Notes:** (Read only property)

### 102.3.7 imageData as Memoryblock

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The data (bytes) of this artwork image.
**Notes:** (Read only property)

### 102.3.8 imageDataFormat as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The fortmat of the data returned by the imageData method.
**Notes:** (Read only property)

### 102.3.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ITLibArtworkFormatBitmap | 1 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data format is a bitmap. |
| ITLibArtworkFormatBMP | 6 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a BMP image. |
| ITLibArtworkFormatGIF | 4 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a GIF image. |
| ITLibArtworkFormatJPEG | 2 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a JPEG image. |
| ITLibArtworkFormatJPEG2000 | 3 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a JPEG2000 image. |
| ITLibArtworkFormatNone | 0 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data format is unknown. |
| ITLibArtworkFormatPICT | 8 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a PICT image. |
| ITLibArtworkFormatPNG | 5 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a PNG image. |
| ITLibArtworkFormatTIFF | 7 | One of the constants to specify the possible formats of the data returned by ITLibArtwork's imageData method.<br>The image data corresponds to a TIFF image. |

## 102.4 class iTunesLibraryMBS

### 102.4.1 class iTunesLibraryMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** A class representing an iTunes library whose metadata is being queried.
**Notes:** Requires iTunes 11 on Mac OS X. And your app must be code signed.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr8
- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 20.0pr7
- MBS Xojo / Real Studio plug-ins in version 13.5

**Xojo Developer Magazine**

- 12.1, page 9: News

### 102.4.2 Methods

### 102.4.3 allMediaItems as iTunesLibraryMediaItemMBS()

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** All media items in the library.

### 102.4.4 allPlaylists as iTunesLibraryPlaylistMBS()

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** All playlists in the library.

### 102.4.5 artworkForMediaFile(mediaFile as folderitem) as iTunesLibraryArtworkMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves the artwork from a media file.
**Notes:** mediaFile: The folderitem of the media file whose artwork should be extracted.

Returns a iTunesLibraryArtworkMBS instance represeting the media file artwork, or nil if the artwork was not found or could not be extracted.
See also:

- 102.4.6 artworkForMediaFile(mediaFileURL as string) as iTunesLibraryArtworkMBS 15966

### 102.4.6 artworkForMediaFile(mediaFileURL as string) as iTunesLibraryArtworkMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Retrieves the artwork from a media file.
**Notes:** mediaFileURL: The URL of the media file whose artwork should be extracted.
Returns a iTunesLibraryArtworkMBS instance represeting the media file artwork, or nil if the artwork was not found or could not be extracted.
See also:

- 102.4.5 artworkForMediaFile(mediaFile as folderitem) as iTunesLibraryArtworkMBS 15965

### 102.4.7 Constructor(requestedAPIVersion as string, byref error as NSErrorMBS, threaded as boolean = false)

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Initializes an instance of ITLibrary which can be used to retrieve media entities.
**Notes:** Upon initialization of the library class, the default iTunes database for the current user will be read and parsed.
At this point all media entities will be cached in memory until the time the object is deallocated.
requestedAPIVersion: The version of the iTunesLibrary API that the application is requesting, provide "1.0" if unknown.
error: A variable that will receive an NSError if this method fails. May be nil if caller does not care about error.

If handle is 0, the initialization failed.
Requires that your app is code signed.

Added threaded parameter in version 20.0 of the MBS Plugins. If true, the work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 102.4.8 libraryWithAPIVersion(requestedAPIVersion as string, byref error as NSErrorMBS) as iTunesLibraryMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Initializes an instance of ITLibrary which can be used to retrieve media entities.
**Notes:** Upon initialization of the library class, the default iTunes database for the current user will be read and parsed.
At this point all media entities will be cached in memory until the time the object is deallocated.
requestedAPIVersion: The version of the iTunesLibrary API that the application is requesting, provide "1.0" if unknown.
error: A variable that will receive an NSError if this method fails. May be nil if caller does not care about error.

Returns a Library instance, or nil if this method fails.
Requires that your app is code signed.

### 102.4.9 Properties

### 102.4.10 apiMajorVersion as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The major version number of this API.
**Notes:** (Read only property)

### 102.4.11 apiMinorVersion as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The minor version number of this API.
**Notes:** (Read only property)

### 102.4.12 applicationVersion as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The version of iTunes being accessed.
**Notes:** (Read only property)

### 102.4.13 features as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** A bitwise OR combination of the features of this library.
**Notes:** (Read only property)

### 102.4.14 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.4.15 musicFolderLocation as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The location of the iTunes music folder.
**Notes:** (Read only property)

### 102.4.16 showContentRating as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to show content rating labels.
**Notes:** (Read only property)

### 102.4.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ITLibExportFeatureNone | 0 | One of the constants describe the features supported by a given iTunes library. No features are supported. |

## 102.5 class iTunesLibraryMediaEntityMBS

### 102.5.1 class iTunesLibraryMediaEntityMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Abstract superclass for MediaItem and Playlist instances.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr2

### 102.5.2 Methods

### 102.5.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.5.4 enumerateValuesExceptForProperties(propertyNames() as string) as dictionary

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries all keys and values for all properties except the given property names.

### 102.5.5 enumerateValuesForAllProperties as dictionary

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries all keys and values.

### 102.5.6 enumerateValuesForProperties(propertyNames() as string) as dictionary

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries all keys and values with the given property names.

### 102.5.7 ITLibMediaEntityPropertyPersistentID as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The property key for the persistent id.

### 102.5.8 valueForProperty(PropertyName as string) as Variant

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Gets the value for a specified media property key.
**Notes:** The media property keys you can use with this property are listed in this document and in Media Item Property Keys and Playlist Property Keys.
property: The media property key that you want the corresponding value of.
Returns the value for the media property key.

### 102.5.9 Properties

### 102.5.10 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.5.11 persistentID as Int64

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The unique identifier of this media entity.
**Notes:** (Read only property)

## 102.6 class iTunesLibraryMediaItemMBS

### 102.6.1 class iTunesLibraryMediaItemMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** A media item represents a single piece of media (such as a song, a video, a podcast, etc) in the iTunes library.
**Notes:** A media item has an overall unique identifier, accessed using the persistentID property. The media item metadata may be accessed through its individual properties or via the iTunesLibraryMediaEntityMBS general property accessor methods.
Subclass of the iTunesLibraryMediaEntityMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 102.6.2 Methods

### 102.6.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.6.4 ITLibMediaItemPropertyAddedDate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.5 ITLibMediaItemPropertyAlbumArtist as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.6 ITLibMediaItemPropertyAlbumDiscCount as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.7 ITLibMediaItemPropertyAlbumDiscNumber as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.8 ITLibMediaItemPropertyAlbumIsCompilation as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.9 ITLibMediaItemPropertyAlbumIsGapless as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.10 ITLibMediaItemPropertyAlbumRating as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.11 ITLibMediaItemPropertyAlbumRatingComputed as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.12 ITLibMediaItemPropertyAlbumTitle as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.13 ITLibMediaItemPropertyAlbumTrackCount as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.14 ITLibMediaItemPropertyArtistName as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.15 ITLibMediaItemPropertyArtwork as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.16 ITLibMediaItemPropertyBeatsPerMinute as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.17 ITLibMediaItemPropertyBitRate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.18 ITLibMediaItemPropertyCategory as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.19 ITLibMediaItemPropertyComments as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.20 ITLibMediaItemPropertyComposer as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.21 ITLibMediaItemPropertyContentRating as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.22 ITLibMediaItemPropertyDescription as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.23 ITLibMediaItemPropertyFileType as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.24 ITLibMediaItemPropertyGenre as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.25 ITLibMediaItemPropertyGrouping as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.26 ITLibMediaItemPropertyHasArtwork as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.27 ITLibMediaItemPropertyIsDRMProtected as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.28 ITLibMediaItemPropertyIsPurchased as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.29 ITLibMediaItemPropertyIsUserDisabled as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.30 ITLibMediaItemPropertyIsVideo as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.31 ITLibMediaItemPropertyKind as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.32 ITLibMediaItemPropertyLastPlayDate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.33 ITLibMediaItemPropertyLocation as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.34 ITLibMediaItemPropertyLocationType as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.35 ITLibMediaItemPropertyLyricsContentRating as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.36 ITLibMediaItemPropertyMediaKind as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.37 ITLibMediaItemPropertyModifiedDate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.38 ITLibMediaItemPropertyPlayCount as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.39 ITLibMediaItemPropertyRating as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.40 ITLibMediaItemPropertyRatingComputed as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.41 ITLibMediaItemPropertyReleaseDate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.42 ITLibMediaItemPropertySampleRate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.43 ITLibMediaItemPropertySize as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.44 ITLibMediaItemPropertySkipDate as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.45 ITLibMediaItemPropertySortAlbumArtist as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.46 ITLibMediaItemPropertySortAlbumTitle as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.47 ITLibMediaItemPropertySortArtistName as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.48 ITLibMediaItemPropertySortComposer as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.49 ITLibMediaItemPropertySortTitle as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.50 ITLibMediaItemPropertyStartTime as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.51 ITLibMediaItemPropertyStopTime as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.52 ITLibMediaItemPropertyTitle as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.53 ITLibMediaItemPropertyTotalTime as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.54 ITLibMediaItemPropertyTrackNumber as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.55 ITLibMediaItemPropertyUserSkipCount as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.56 ITLibMediaItemPropertyVideoEpisode as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.57 ITLibMediaItemPropertyVideoEpisodeOrder as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.58 ITLibMediaItemPropertyVideoHeight as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.59 ITLibMediaItemPropertyVideoIsHD as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.60 ITLibMediaItemPropertyVideoSeason as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.61 ITLibMediaItemPropertyVideoSeries as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.62 ITLibMediaItemPropertyVideoSortSeries as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.63 ITLibMediaItemPropertyVideoWidth as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.64 ITLibMediaItemPropertyVoiceOverLanguage as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.65 ITLibMediaItemPropertyVolumeAdjustment as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.66 ITLibMediaItemPropertyVolumeNormalizationEnergy as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.67 ITLibMediaItemPropertyYear as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for properties.

### 102.6.68 Properties

### 102.6.69 addedDate as Date

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and media item this media item was added to the iTunes database.
**Notes:** (Read only property)

### 102.6.70 addedDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:**

The date and media item this media item was added to the iTunes database.

**Notes:**

(Read only property)

### 102.6.71 album as iTunesLibraryAlbumMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The album where this media item belongs.
**Notes:** (Read only property)

### 102.6.72 artist as iTunesLibraryArtistMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The artist associated with this media item.
**Notes:** (Read only property)

### 102.6.73 artwork as iTunesLibraryArtworkMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item has artwork.
**Notes:** (Read only property)

### 102.6.74 ArtworkAvailable as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item has artwork.
**Notes:** (Read only property)

### 102.6.75 beatsPerMinute as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The BPM (beats per minute) of this media item.
**Notes:** (Read only property)

### 102.6.76 bitrate as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The bitrate of this media item in kbps.
**Notes:** (Read only property)

### 102.6.77 category as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The podcast category of this media item (implies this media item is a podcast).
**Notes:** (Read only property)

### 102.6.78 comments as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Any comments associated with this media item.
**Notes:** (Read only property)

### 102.6.79 composer as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of the composer associated with this media item.
**Notes:** (Read only property)

### 102.6.80 contentRating as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The extended content rating of this media item.
**Notes:** (Read only property)

### 102.6.81 description as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Any podcast description of with this media item (implies this media item is a podcast).
**Notes:** (Read only property)

### 102.6.82 DRMProtected as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item is DRM protected.
**Notes:** (Read only property)

### 102.6.83 fileType as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The type of the file this media item refers to.
**Notes:** (Read only property)

### 102.6.84 genre as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The genre associated with this media item.
**Notes:** (Read only property)

### 102.6.85 grouping as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The grouping of this media item.
**Notes:** (Read only property)

### 102.6.86 kind as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** This media item's file kind (ex. MPEG audio file).
**Notes:** (Read only property)

### 102.6.87 lastPlayedDate as Date

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time this media item was last played in iTunes, or nil if this media item has not been played.
**Notes:** (Read only property)

### 102.6.88 lastPlayedDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time this media item was last played in iTunes, or nil if this media item has not been played.
**Notes:** (Read only property)

### 102.6.89 location as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The location of this media item on disk.
**Notes:** (Read only property)

### 102.6.90 locationFile as FolderItem

MBS MacExtras Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop only.

**Function:** The location of this media item on disk.
**Notes:** For your convenience we provide this folderitem if location points to a valid file.
(Read only property)

### 102.6.91 locationType as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The type of this media item with respect to its location.
**Notes:** (Read only property)

### 102.6.92 lyricsContentRating as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The content rating of this media item's lyrics.
**Notes:** (Read only property)

### 102.6.93 mediaKind as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** This media item's media kind.
**Notes:** (Read only property)

### 102.6.94 modifiedDate as Date

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time this media item was last modified.
**Notes:** (Read only property)

### 102.6.95 modifiedDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time this media item was last modified.
**Notes:** (Read only property)

### 102.6.96 playCount as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The number of times this media item has been played in iTunes.
**Notes:** (Read only property)

### 102.6.97 Purchased as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item was purchased.
**Notes:** (Read only property)

### 102.6.98 rating as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The rating of this media item.
**Notes:** (Read only property)

### 102.6.99 RatingComputed as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item's rating is computed.
**Notes:** (Read only property)

### 102.6.100 releaseDate as Date

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date this media item was released.
**Notes:** (Read only property)

### 102.6.101 releaseDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date this media item was released.
**Notes:** (Read only property)

### 102.6.102 sampleRate as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The sample rate of this media item in samples per second.
**Notes:** (Read only property)

### 102.6.103 size as UInt64

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The size in bytes of this media item on disk.
**Notes:** (Read only property)

### 102.6.104 skipCount as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The number of times this media item has been skiped.
**Notes:** (Read only property)

### 102.6.105 skipDate as Date

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when this media item was last skipped.
**Notes:** (Read only property)

### 102.6.106 skipDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time when this media item was last skipped.
**Notes:** (Read only property)

### 102.6.107 sortComposer as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of the composer associated with this media item that should be used for sorting purposes.
**Notes:** (Read only property)

### 102.6.108 sortTitle as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The title of this media item that should be used for sorting purposes.
**Notes:** (Read only property)

### 102.6.109 startTime as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The start time of this media item given that the media item is a podcast.
**Notes:** (Read only property)

### 102.6.110 stopTime as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The stop time of this media item given that the media item is a podcast.
**Notes:** (Read only property)

### 102.6.111 title as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The title of this media item.
**Notes:** (Read only property)

### 102.6.112 totalTime as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The length of this media item in seconds.
**Notes:** (Read only property)

### 102.6.113 trackNumber as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The position of this media item within its album.
**Notes:** (Read only property)

### 102.6.114 userDisabled as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user has disabled this media item.
**Notes:** (Read only property)

### 102.6.115 video as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this media item is a video media item (video podcast, movie, etc).
**Notes:** (Read only property)

### 102.6.116 videoInfo as iTunesLibraryMediaItemVideoInfoMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The video information of this media item (implies this media item is a video media item).
**Notes:** (Read only property)

### 102.6.117 voiceOverLanguage as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The voice-over language of this media item.
**Notes:** (Read only property)

### 102.6.118 volumeAdjustment as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The volume adjustment used for this media item if any.
**Notes:** (Read only property)

### 102.6.119 volumeNormalizationEnergy as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The volume normalization energy applied to this media item.
**Notes:** (Read only property)

### 102.6.120 year as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The year when this media item was released.
**Notes:** (Read only property)

### 102.6.121 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ITLibMediaItemLocationTypeFile | 1 | One of the constants to specify possible the type of a media item to its location.<br>The media item location refers to a local file. |
| ITLibMediaItemLocationTypeRemote | 3 | One of the constants to specify possible the type of a media item to its location.<br>The media item location refers to a remote file. |
| ITLibMediaItemLocationTypeUnknown | 0 | One of the constants to specify possible the type of a media item to its location.<br>The media item type is not known. |
| ITLibMediaItemLocationTypeURL | 2 | One of the constants to specify possible the type of a media item to its location.<br>The media item location refers to a URL (for example, a podcas |
| ITLibMediaItemLyricsContentRatingClean | 2 | One of the constants to specify the possible ratings of media iter<br>The media item lyrics do not contain explicit language. |
| ITLibMediaItemLyricsContentRatingExplicit | 1 | One of the constants to specify the possible ratings of media iter<br>The media item lyrics contain explicit language. |
| ITLibMediaItemLyricsContentRatingNone | 0 | One of the constants to specify the possible ratings of media iter<br>No rating information for the media item lyrics. |
| ITLibMediaItemMediaKindAlertTone | 21 | One of the constants to specify the possible media kinds of a item.<br>The media item is an audio tone on an iOS device which is no ringtone. |
| ITLibMediaItemMediaKindAudiobook | 5 | One of the constants to specify the possible media kinds of a item.<br>The media item is an audiobook. |
| ITLibMediaItemMediaKindBook | 19 | One of the constants to specify the possible media kinds of a item.<br>The media item is an EPUB or iBooks Author book. |
| ITLibMediaItemMediaKindDigitalBooklet | 15 | One of the constants to specify the possible media kinds of a item.<br>The media item is an iTunes Extra or an iTunes LP. |
| ITLibMediaItemMediaKindHomeVideo | 12 | One of the constants to specify the possible media kinds of a item.<br>The media item is a non-iTunes Store movie. |
| ITLibMediaItemMediaKindInteractiveBooklet | 9 | One of the constants to specify the possible media kinds of a item.<br>The media item is a QuickTime movie with embedded flash (dep |
| ITLibMediaItemMediaKindIOSApplication | 16 | One of the constants to specify the possible media kinds of a item.<br>The media item is an iPhone or iPod touch application. |
| ITLibMediaItemMediaKindiTunesU | 18 | One of the constants to specify the possible media kinds of a item.<br>The media item is an iTunesU audio of video file. |
| ITLibMediaItemMediaKindMovie | 3 | One of the constants to specify the possible media kinds of a item.<br>The media item is a movie. |
| ITLibMediaItemMediaKindMusicVideo | 7 | One of the constants to specify the possible media kinds of a item.<br>The media item is a music video. |
| ITLibMediaItemMediaKindPDFBook | 20 | One of the constants to specify the possible media kinds of a item.<br>The media item is a PDF treated as Books in the UI unless over user. |
| ITLibMediaItemMediaKindPDFBooklet | 6 | One of the constants to specify the possible media kinds of a item.<br>The media item is an unwrapped PDF file that is part of a Musi |
| ITLibMediaItemMediaKindPodcast | 4 | One of the constants to specify the possible media kinds of a item. |

## 102.7 class iTunesLibraryMediaItemVideoInfoMBS

### 102.7.1 class iTunesLibraryMediaItemVideoInfoMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Encapsulates the video information of a video media item.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 102.7.2 Methods

### 102.7.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.7.4 Properties

### 102.7.5 episode as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The TV episode the video is associated with (implies the track is a TV show).
**Notes:** (Read only property)

### 102.7.6 episodeOrder as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The TV episode order the video is associated with (implies the track is a TV show).
**Notes:** (Read only property)

### 102.7.7 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 102.7.8 HD as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the video is high definition.
**Notes:** (Read only property)

### 102.7.9 season as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of TV season the video is associated with (implies the track is a TV show).
**Notes:** (Read only property)

### 102.7.10 series as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of TV series the video is associated with (implies track is a TV show).
**Notes:** (Read only property)

### 102.7.11 sortSeries as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name of the TV series the video is associated with that should be used for when sorting (implies the track is a TV show).
**Notes:** (Read only property)

### 102.7.12 videoHeight as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The height of the video.
**Notes:** (Read only property)

### 102.7.13 videoWidth as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The width of the video.
**Notes:** (Read only property)

## 102.8 class iTunesLibraryPlaylistMBS

### 102.8.1 class iTunesLibraryPlaylistMBS

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** A playlist is a collection of related media items.
**Notes:** (Media items are described in iTunesLibraryMediaItemMBS Class Reference.)
Each playlist has a name, a set of attributes, and a unique identifier that persists across application launches.
Subclass of the iTunesLibraryMediaEntityMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr6

### 102.8.2 Methods

### 102.8.3 Constructor

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The private constructor.

### 102.8.4 items(threaded as boolean = false) as iTunesLibraryMediaItemMBS()

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The media items contained within this playlist.

### 102.8.5 ITLibPlaylistPropertyAllItemsPlaylist as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.6 ITLibPlaylistPropertyDistinguisedKind as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.7 ITLibPlaylistPropertyItems as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.8 ITLibPlaylistPropertyMaster as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.9 ITLibPlaylistPropertyName as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.10 ITLibPlaylistPropertyParentPersistentID as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.11 ITLibPlaylistPropertyVisible as string

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** One of the playlist property.

### 102.8.12 Properties

### 102.8.13 AllItemsPlaylist as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this playlist is an "all items" playlist.
**Notes:** i.e. marked items in playlist exceeds the total tracks in the playlist so the playlist is a discreet object.

(Read only property)

### 102.8.14 DistinguishedKind as Integer

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The distinguished kind of this playlist.
**Notes:** (Read only property)

### 102.8.15 Master as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this playlist is a master playlist.
**Notes:** (Read only property)

### 102.8.16 name as String

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The name or title of this playlist.
**Notes:** (Read only property)

### 102.8.17 ParentID as Int64

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The unique identifier of this playlist' parent.
**Notes:** Changed to Int64 for MBS Plugin 19.5.
(Read only property)

### 102.8.18 Visible as Boolean

MBS MacExtras Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this playlist is visible.
**Notes:** (Read only property)

### 102.8.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ITLibDistinguishedPlaylistKind90sMusic | 42 | One of the constants to specify the possible kinds of playli The playlist is the default 90's music iTunes playlist. |
| ITLibDistinguishedPlaylistKindBooks | 4 | One of the constants to specify the possible kinds of playli The playlist contains all the books in the iTunes Library |
| ITLibDistinguishedPlaylistKindClassicalMusic | 48 | One of the constants to specify the possible kinds of playli The playlist is the default Classical Music smart playlist ge |
| ITLibDistinguishedPlaylistKindHomeVideos | 50 | One of the constants to specify the possible kinds of playli The playlist contains all homes videos in the iTunes Librar |
| ITLibDistinguishedPlaylistKindiTunesU | 26 | One of the constants to specify the possible kinds of playli The playlist contains the user's iTunesU items. |
| ITLibDistinguishedPlaylistKindLibraryMusicVideos | 49 | One of the constants to specify the possible kinds of playli The playlist contains all music videos in the iTunes Librar same as the default Music Videos smart playlist. |
| ITLibDistinguishedPlaylistKindMovies | 1 | One of the constants to specify the possible kinds of playli The playlist contains all the movies in the iTunes Library. |
| ITLibDistinguishedPlaylistKindMusic | 3 | One of the constants to specify the possible kinds of playli The playlist contains all the music items in the iTunes Lib |
| ITLibDistinguishedPlaylistKindMusicVideos | 47 | One of the constants to specify the possible kinds of playli The playlist is the default Music Videos smart playlist gen |
| ITLibDistinguishedPlaylistKindMyTopRated | 43 | One of the constants to specify the possible kinds of playli The playlist is the default Top Rated smart playlist genera |
| ITLibDistinguishedPlaylistKindNone | 0 | One of the constants to specify the possible kinds of playli The playlist is not a distinguished playlist. |
| ITLibDistinguishedPlaylistKindPodcasts | 7 | One of the constants to specify the possible kinds of playli The playlist contains all the podcasts in the iTunes library |
| ITLibDistinguishedPlaylistKindPurchases | 16 | One of the constants to specify the possible kinds of playli The playlist contains all the user's purchases in the iTunes |
| ITLibDistinguishedPlaylistKindRecentlyAdded | 46 | One of the constants to specify the possible kinds of playli The playlist is the default Recently Added smart playlist ge |
| ITLibDistinguishedPlaylistKindRecentlyPlayed | 45 | One of the constants to specify the possible kinds of playli The playlist is the default Recently Played smart playlist g . |
| ITLibDistinguishedPlaylistKindRingtones | 5 | One of the constants to specify the possible kinds of playli The playlist contains all the ringtones in the iTunes Librar |
| ITLibDistinguishedPlaylistKindTop25MostPlayed | 44 | One of the constants to specify the possible kinds of playli The playlist is the default 25 Most Played smart playlist ge |
| ITLibDistinguishedPlaylistKindTVShows | 2 | One of the constants to specify the possible kinds of playli The playlists contains all the TV shows in the iTunes Libr |
| ITLibDistinguishedPlaylistKindVoiceMemos | 14 | One of the constants to specify the possible kinds of playli The playlist contains all voice memos. |

# Chapter 103

# Java

## 103.1 class JavaArrayMBS

### 103.1.1 class JavaArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for a java array object.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Upgrading our Java Support for Xojo
- MBS Xojo Plugins, version 19.2pr5

### 103.1.2 Methods

### 103.1.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.1.4 Properties

### 103.1.5 Length as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of items in the array.
**Notes:** Returns 0 on any error.
(Read only property)

## 103.2 class JavaBooleanArrayMBS

### 103.2.1 class JavaBooleanArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java boolean array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.2.2 Methods

### 103.2.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.2.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.byte(index) to access.

### 103.2.5 Values as Boolean()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.2.6 Properties

### 103.2.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.2.8 Value(index as Integer) as Boolean

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.3 class JavaByteArrayMBS

### 103.3.1 class JavaByteArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java byte array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.3.2 Methods

### 103.3.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.3.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.Byte(index) to access.

### 103.3.5 Values as Int8()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.3.6 Properties

### 103.3.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.3.8 Value(index as Integer) as Int8

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.4 class JavaCharArrayMBS

### 103.4.1 class JavaCharArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java char array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.4.2 Methods

### 103.4.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.4.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.UShortMBS(index*2) to access.

### 103.4.5 Values as UInt16()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.4.6 Properties

### 103.4.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.4.8 Value(index as Integer) as UInt16

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.5 class JavaClassMBS

### 103.5.1 class JavaClassMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for a Java class.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Trying Java 19 in Xojo
- MBS Xojo Plugins, version 19.4pr6
- Upgrading our Java Support for Xojo
- MBS Real Studio Plugins, version 12.5pr1

### 103.5.2 Methods

### 103.5.3 AllocateObject as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allocates a new Java object without invoking any of the constructors for the object. #
**Notes:** Returns a reference to the object or nil on any error.

Does not work for array classes.
Throws InstantiationException if the class is an interface or an abstract class.

### 103.5.4 CallStaticBooleanMethod(MethodID as JavaMethodMBS, args as memoryblock) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a boolean return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.5 CallStaticByteMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a byte return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.6 CallStaticCharMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a char return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.7 CallStaticDoubleMethod(MethodID as JavaMethodMBS, args as memoryblock) as Double

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a double return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.8 CallStaticFloatMethod(MethodID as JavaMethodMBS, args as memoryblock) as single

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a float return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.9 CallStaticIntMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with an integer return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The

methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.10 CallStaticLongMethod(MethodID as JavaMethodMBS, args as memoryblock) as Int64

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a long return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.11 CallStaticMain(args() as string)

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static main method and passes the String array.

### 103.5.12 CallStaticMethod(MethodID as JavaMethodMBS, args() as Variant) as Variant

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method.

**Example:**

```
Dim vm As JavaVMMBS // your initialized VM

// 1. Find class
Dim jclass As JavaClassMBS =vm.FindClass("stringtest")

if jclass=nil then
msgbox "Can't find stringtest class"
Return
end if

// 2. lookup method
Dim jmethod3 As JavaMethodMBS = jclass.GetStaticMethod("setValue","(Ljava/lang/String;)V")
if jmethod3=nil then
MsgBox "Failed to find setValue method."
Return
end if

// 3. Call static method
Dim param3() As Variant
param3.append "Hello World"
Call jclass.CallStaticMethod(jmethod3,param3)

MsgBox "done"
```

**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args variant array that immediately follows the methodID argument.

This is generic version, where our plugin translates between native Xojo data types and Java data types. We support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.

### 103.5.13 CallStaticObjectMethod(MethodID as JavaMethodMBS, args as memoryblock) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with an object return value.
**Example:**

```
dim e as JavaVMMBS // global

// Call "public static String getMessage()" and "public static void setMessage(String theMessage)" from class "test".

dim jclass, sclass as JavaClassMBS
dim jmethod as JavaMethodMBS
dim jstring as JavaStringMBS
dim args as JavaObjectArrayMBS
dim m as MemoryBlock
dim s as String
dim jfield as JavaFieldMBS

jclass=e.FindClass("test")

if jclass=nil then
msgbox "Can't find test class"
else
jmethod = jclass.GetStaticMethod("setMessage", "(Ljava/lang/String;)V")

if jmethod=nil then
msgbox "Can't find HelloWorld.setMessage"
else
jstring = e.NewStringUTF8("Hello from Xojo!")
if jstring=nil then
msgbox "Out of memory"
else
m=NewMemoryBlock(8) // 8 bytes per parameter
m.Int64Value(0)=jstring.Handle

jclass.CallStaticVoidMethod(jmethod, m)

jmethod = jclass.GetStaticMethod("getMessage", "()Ljava/lang/String;")

if jmethod=nil then
msgbox "Can't find HelloWorld.getMessage"
else
m=NewMemoryBlock(8) // 8 bytes per parameter
m.Int64Value(0)=jstring.Handle
```

```
jstring=JavaStringMBS(jclass.CallStaticObjectMethod(jmethod,m))

MsgBox jstring.CopyStringUTF
end if
end if
end if
end if
```

**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.14 CallStaticShortMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with a short return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.15 CallStaticVoidMethod(MethodID as JavaMethodMBS, args as memoryblock)

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a static method with no return value.
**Notes:** This call invokes a static method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling JavaClassMBS.GetMethod().

The method ID must be derived from this class, not from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.5.16 Constructor

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.5.17 GetField(name as string, sig as string) as JavaFieldMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searches for the Field with the given Name and Signature.
**Notes:** Nil on any error.

The signature is a string derived from the field's type or method's arguments and return type, as shown here:

### 103.5.18 GetMethod(name as string, sig as string) as JavaMethodMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searches the method with the given name and signature.
**Example:**

```
dim jclass as JavaClassMBS
dim method as JavaMethodMBS

method=jclass.GetMethod("mymethod", "( [ Ljava/lang/String;)V")
```

| Java Type | Signature |
|---|---|
| boolean | Z |
| byte | B |
| char | C |
| short | S |
| int | I |
| long | L |
| float | F |
| double | D |
| void | V |
| objects | Lfully-qualified-class-name; |
| arrays | [ array-type |
| methods | (argument-types)return-type |

**Notes:** Returns the method ID for an instance (non-static) method of a class or interface. The method may be defined in one of the the class's super classes and inherited by the class. The method is determined by its name and signature.

To obtain the method ID of a constructor, supply <init>as the method name and void (V) as the return type.

Nil on any error.

Throws NoSuchMethodError if the specified method cannot be found.

The signature is a string derived from the field's type or method's arguments and return type, as shown here:

### 103.5.19 GetStaticField(name as string, sig as string) as JavaFieldMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searches the static field with the given name and signature.
**Notes:** Nil on any error.

### 103.5.20 GetStaticMethod(name as string, sig as string) as JavaMethodMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

| Java Type | Signature |
|---|---|
| boolean | Z |
| byte | B |
| char | C |
| short | S |
| int | I |
| long | L |
| float | F |
| double | D |
| void | V |
| objects | Lfully-qualified-class-name; |
| arrays | [ array-type |
| methods | (argument-types)return-type |

**Function:** Returns the method ID for a static method of a class. The method is specified by its name and signature.
**Example:**

```
dim jclass as JavaClassMBS
dim method as JavaMethodMBS

method=jclass.GetStaticMethod("main", "( [ Ljava/lang/String;)V")
```

**Notes:** Nil on any error.
e.g. the signature of the default static main method is "( [ Ljava/lang/String;)V" which means return type void at the end and before an array of string.

### 103.5.21 NewObject(methodID as JavaMethodMBS, args as memoryblock) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constructs a new Java object.
**Notes:** The method ID indicates which constructor method to invoke. This ID must be obtained by calling GetMethod with <init>as the method name and void (V) as the return type.

Returns nil on any error.

Programmers place all arguments to the method in an args memoryblock that immediately follows the

methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

Throws Java InstantiationException if the class is an interface or an abstract class.
See also:

- 103.5.22 NewObject(MethodID as JavaMethodMBS, args() as Variant) as JavaObjectMBS 16019

### 103.5.22 NewObject(MethodID as JavaMethodMBS, args() as Variant) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constructs a new Java object.
**Example:**

```
dim vm as JavaVMMBS // your initialized VM

// 1. Find class
Dim jclass As JavaClassMBS=vm.FindClass("stringtest")

If jclass = Nil Then
MsgBox "Can't find stringtest class"
Return
End If

// 2. Call constructor
Dim jmethod As JavaMethodMBS = jclass.GetMethod("<init>", "(ILjava/lang/String;D)V")

If jmethod = Nil Then
MsgBox "Can't find constructor"
Return
End If

Dim param() As Variant
// 1. Parameter with Integer: I
param.Append 123
// 2. Parameter with string: Ljava/lang/String;
param.Append "Hello World"
// 3. Parameter with double: D
param.Append 3.14
Dim jobject As JavaObjectMBS = jclass.NewObject(jmethod, param)

If jobject = Nil Then
MsgBox "Constructor failed!?"
```

```
Else
MsgBox "OK: "+jobject.ClassName
End If
```

**Notes:** The method ID indicates which constructor method to invoke. This ID must be obtained by calling GetMethod with <init>as the method name and void (V) as the return type.

Returns nil on any error.

Programmers place all arguments to the method in an args variant array that immediately follows the methodID argument.

Throws Java InstantiationException if the class is an interface or an abstract class.

This is generic version, where our plugin translates between native Xojo data types and Java data types. We support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.
See also:

- 103.5.21 NewObject(methodID as JavaMethodMBS, args as memoryblock) as JavaObjectMBS 16018

### 103.5.23 Superclass as JavaClassMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Points to the superclass of this class.
**Notes:** Nil if no superclass exists.

### 103.5.24 Properties

### 103.5.25 StaticBooleanField(TheField as JavaFieldMBS) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static boolean field in this class.
**Notes:** (Read and Write computed property)

### 103.5.26 StaticByteField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static byte field in this class.
**Notes:** (Read and Write computed property)

### 103.5.27 StaticCharField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static char field in this class.
**Notes:** (Read and Write computed property)

### 103.5.28 StaticDoubleField(TheField as JavaFieldMBS) as Double

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static double field in this class.
**Notes:** (Read and Write computed property)

### 103.5.29 StaticField(TheField as JavaFieldMBS) as Variant

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static field in this class.
**Example:**

```
Dim jclass As JavaClassMBS=vm.FindClass("stringtest")

If jclass = Nil Then
MsgBox "Can't find stringtest class"
Return
End If

Dim field As JavaFieldMBS = jclass.GetField("Name", "Ljava/lang/String;")
Dim v As Variant = jclass.StaticField(field)
Dim js As JavaStringMBS = v
MsgBox js
```

**Notes:** This is generic version, where our plugin translates between native Xojo data types and Java data types. We support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.

Do not use for generic fields!
(Read and Write computed property)

### 103.5.30 StaticFloatField(TheField as JavaFieldMBS) as single

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static float field in this class.
**Notes:** (Read and Write computed property)

### 103.5.31 StaticIntField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static integer field in this class.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop.Child("ojdbc14.jar")

dim j as new JavaVMMBS(f)

dim c as JavaClassMBS = j.FindClass("oracle/jdbc/driver/OracleTypes")

dim field as JavaFieldMBS

// this are all static integer fields in this class:

field = c.GetStaticField("CURSOR","I")
MsgBox str(c.StaticIntField(field))

field = c.GetStaticField("BLOB","I")
MsgBox str(c.StaticIntField(field))
```

```
field = c.GetStaticField("DOUBLE","I")
MsgBox str(c.StaticIntField(field))
```

**Notes:** (Read and Write computed property)

### 103.5.32 StaticLongField(TheField as JavaFieldMBS) as Int64

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static long field in this class.
**Notes:** (Read and Write computed property)

### 103.5.33 StaticObjectField(TheField as JavaFieldMBS) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static object field in this class.
**Notes:** (Read and Write computed property)

### 103.5.34 StaticShortField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a static short field in this class.
**Notes:** (Read and Write computed property)

## 103.6 class JavaDoubleArrayMBS

### 103.6.1 class JavaDoubleArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java double array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.6.2 Methods

### 103.6.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.6.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.DoubleValue(index*4) to access.

### 103.6.5 Values as Double()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.6.6 Properties

### 103.6.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.6.8 Value(index as Integer) as Double

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.7 class JavaFieldMBS

### 103.7.1 class JavaFieldMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java field ID.
**Example:**

```
dim f as FolderItem

f=SpecialFolder.Desktop.Child("ojdbc14.jar")

dim j as new JavaVMMBS(f)

dim c as JavaClassMBS = j.FindClass("oracle/jdbc/driver/OracleTypes")

dim field as JavaFieldMBS

// this are all static integer fields in this class:

field = c.GetStaticField("CURSOR","I")
MsgBox str(c.StaticIntField(field))

field = c.GetStaticField("BLOB","I")
MsgBox str(c.StaticIntField(figield))

field = c.GetStaticField("DOUBLE","I")
MsgBox str(c.StaticIntField(field))
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr6
- Upgrading our Java Support for Xojo

### 103.7.2 Methods

### 103.7.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.7.4 Properties

### 103.7.5 Handle as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The fieldID of this field.
**Notes:** (Read only property)

### 103.7.6 Name as String

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of the field.
**Notes:** This is the name you passed in to GetField or GetStaticField functions.
(Read only property)

### 103.7.7 Signature as String

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The signature of the field.
**Notes:** This is the signature you passed in to GetField or GetStaticField functions.
(Read only property)

## 103.8 class JavaFloatArrayMBS

### 103.8.1 class JavaFloatArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java float array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.8.2 Methods

### 103.8.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.8.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.SingleValue(index*4) to access.

### 103.8.5 Values as Single()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.8.6 Properties

### 103.8.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.8.8 Value(index as Integer) as Single

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.9 class JavaHandleNilExceptionMBS

### 103.9.1 class JavaHandleNilExceptionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception which is raised whenever a Java function is operations on an object and there is none.
**Notes:** For example if you call a method on the JavaObjectMBS class which requires the handle value being not zero, the exception raises if the handle value is zero.
Subclass of the RuntimeException class.

## 103.10 class JavaIntArrayMBS

### 103.10.1 class JavaIntArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java int array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.10.2 Methods

### 103.10.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.10.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.Long(index*4) to access.

### 103.10.5 Values as Integer()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.10.6 Properties

### 103.10.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.10.8 Value(index as Integer) as Int32

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.11 class JavaLongArrayMBS

### 103.11.1 class JavaLongArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java long array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.11.2 Methods

### 103.11.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.11.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.Int64DoubleMBS(index*8) to access.

### 103.11.5 Values as Int64()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.11.6 Properties

### 103.11.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.11.8 Value(index as Integer) as Int64

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.12 class JavaMethodMBS

### 103.12.1 class JavaMethodMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java method ID.
**Notes:** In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Trying Java 19 in Xojo
- MBS Xojo Plugins, version 19.4pr6
- Upgrading our Java Support for Xojo

### 103.12.2 Methods

### 103.12.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.12.4 Properties

### 103.12.5 Handle as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The methodID of this method.
**Notes:** (Read only property)

### 103.12.6 Name as String

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of the method.
**Notes:** This is the name you passed in to GetMethod or GetStaticMethod functions.
(Read only property)

### 103.12.7 Signature as String

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The signature of the method.
**Notes:** This is the signature you passed in to GetMethod or GetStaticMethod functions.
(Read only property)

## 103.13 class JavaNotInitializedExceptionMBS

### 103.13.1 class JavaNotInitializedExceptionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception which is raised whenever a Java function is called which requires you to initialize the JVM before calling it.
**Notes:** Subclass of the RuntimeException class.

## 103.14 class JavaObjectArrayMBS

### 103.14.1 class JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java object array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.14.2 Methods

### 103.14.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.14.4 Values as JavaObjectMBS()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.14.5 Properties

### 103.14.6 ArrayElement(index as Integer) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use Value instead. **Function:** The object at the given index in the array.
**Notes:** May return nil if the array is empty on the given index or if the index is out of bounds or any other error occurs.

Index is 0 based.

Throws
ArrayIndexOutOfBoundsException: if index does not specify a valid index in the array.
ArrayStoreException: if the class of value is not a subclass of the element class of the array.
(Read and Write computed property)

### 103.14.7 Value(index as Integer) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

## 103.15 class JavaObjectMBS

### 103.15.1 class JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Trying Java 19 in Xojo
- MBS Xojo Plugins, version 19.4pr6
- Upgrading our Java Support for Xojo
- MBS Xojo / Real Studio Plugins, version 16.5pr1
- MBS Real Studio Plugins, version 12.1pr1

### 103.15.2 Methods

### 103.15.3 CallBooleanMethod(MethodID as JavaMethodMBS, args as memoryblock) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a boolean value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.4 CallByteMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a byte value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.5 CallCharMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a char value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.6 CallDoubleMethod(MethodID as JavaMethodMBS, args as memoryblock) as Double

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a double value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.7 CallFloatMethod(MethodID as JavaMethodMBS, args as memoryblock) as single

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a float value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.8 CallIntMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with an integer value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from

the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.9 CallLongMethod(MethodID as JavaMethodMBS, args as memoryblock) as Int64

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a long value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.10 CallMethod(MethodID as JavaMethodMBS, args() as Variant) as Variant

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method.
**Example:**

```
Dim vm As JavaVMMBS // your initialized VM

// 1. Find class
Dim jclass As JavaClassMBS =vm.FindClass("stringtest")

if jclass=nil then
msgbox "Can't find stringtest class"
Return
end if
```

```
// 2. Call constructor
dim jmethod1 as JavaMethodMBS = jclass.GetMethod("<init>", "()V")

if jmethod1=nil then
msgbox "Can't find constructor"
Return
end if

// 3. Create object
Dim param1() As Variant
dim jobject1 as JavaObjectMBS=jclass.NewObject(jmethod1, param1)

if jobject1=nil then
MsgBox "Constructor failed!?"
Return
end if

// 4. lookup method
Dim jmethod3 As JavaMethodMBS = jclass.GetMethod("setValue","(Ljava/lang/String;)V")
if jmethod3=nil then
MsgBox "Failed to find setValue method."
Return
end if

// 5. Call method
Dim param3() As Variant
param3.append "Hello World"
Call jobject1.CallMethod(jmethod3,param3)

MsgBox "done"
```

**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args variant array that immediately follows the methodID argument.

This is generic version, where our plugin translates between native Xojo data types and Java data types. We

support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.

### 103.15.11 CallNonvirtualBooleanMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a boolean value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.12 CallNonvirtualByteMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a byte value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.

In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.13 CallNonvirtualCharMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a char value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.14 CallNonvirtualDoubleMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Double

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a double value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.15 CallNonvirtualFloatMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as single

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a float value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.16 CallNonvirtualIntMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with an integer value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.17 CallNonvirtualLongMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Int64

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a long value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.18 CallNonvirtualMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMB args() as Variant) as Variant

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args variant array that immediately follows the methodID argument.

This is generic version, where our plugin translates between native Xojo data types and Java data types. We support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.

### 103.15.19 CallNonvirtualObjectMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with an object value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.20 CallNonvirtualShortMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with a short value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.21 CallNonvirtualVoidMethod(TheClass as JavaClassMBS, MethodID as JavaMethodMBS, args as memoryblock)

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a non virtual method with no return value.
**Notes:** This call invokes an instance (non-static) method on a Java object, according to the specified class and method ID. The methodID argument must be obtained by calling GetMethodID on the class TheClass.

The CallNonvirtualMethod family of routines and the CallMethod family of routines are different. CallMethod routines invoke the method based on the class of the object, while CallNonvirtualMethod routines invoke the method based on the class, designated by the TheClass parameter, from which the method ID is obtained. The method ID must be obtained from the real class of the object or from one of its superclasses.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.22 CallObjectMethod(MethodID as JavaMethodMBS, args as memoryblock) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with an object value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.23 CallShortMethod(MethodID as JavaMethodMBS, args as memoryblock) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with a short value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.24 CallVoidMethod(MethodID as JavaMethodMBS, args as memoryblock)

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calls a virtual method with no return value.
**Notes:** This family of operations invokes an instance (non-static) method on a Java object, according to the specified method ID. The methodID argument must be obtained by calling GetMethodID.

When this function is used to call private methods and constructors, the method ID must be derived from the real class of obj, not from one of its super classes.

Programmers place all arguments to the method in an args memoryblock that immediately follows the methodID argument.
In the memoryblock you need to use 8 bytes per argument and align them correctly. (alignment depends on platform)

### 103.15.25 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.15.26 GetDirectBufferAddress(directbuffer as JavaObjectMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the address of the memory from a directbuffer object.
**Notes:** Returns 0 on any error.

### 103.15.27 GetDirectBufferCapacity(directbuffer as JavaObjectMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the size of the memory from a directbuffer object.
**Notes:** Returns 0 on any error.

### 103.15.28 IsInstanceOf(TheClass as JavaClassMBS) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Tests whether an object is an instance of a class.
**Notes:** Returns true if obj can be cast to TheClass; otherwise, returns false. A nil object can be cast to any class.

### 103.15.29 IsSameObject(obj as JavaObjectMBS) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Tests whether two references refer to the same Java object.
**Notes:** Returns true if ref1 and ref2 refer to the same Java object, or are both nil; otherwise, returns false.

False on any error.

### 103.15.30 ObjectClass as JavaClassMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the class of an object.
**Notes:** Returns nil on any error.

### 103.15.31 Properties

### 103.15.32 ClassName as String

MBS Java Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries class name of object.
**Notes:** (Read only property)

### 103.15.33 Database as Variant

MBS Java Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the database object.
**Notes:** The variant is a JavaDatabaseMBS.
Do not assign new values, please.
This is set for all database classes, so the database isn't release from memory before you finished using this object.
(Read and Write property)

### 103.15.34 Handle as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the jobject.
**Notes:** (Read and Write property)

### 103.15.35 Lasterror as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 103.15.36 Tag as Variant

MBS Java Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This is a property you can use for whatever you like.
**Notes:** The property value is stored as long as the RB object lives. The Java object may live longer.
(Read and Write property)

### 103.15.37 VM as JavaVMMBS

MBS Java Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the virtual machine.
**Notes:** Please do not assign new value unless you know what you do.
(Read and Write property)

### 103.15.38 BooleanField(TheField as JavaFieldMBS) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a boolean field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.39 ByteField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a byte field in this class.
**Notes:** Do not use for static fields!

(Read and Write computed property)

### 103.15.40 CharField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a char field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.41 DoubleField(TheField as JavaFieldMBS) as Double

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a double field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.42 Field(TheField as JavaFieldMBS) as Variant

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a field in this class.
**Notes:** This is generic version, where our plugin translates between native Xojo data types and Java data types. We support conversion of boolean, byte (integer), char (integer), short (integer), int (integer), long (int64), double, float (single) and Java objects. Objects can be JavaObjectMBS or subclasses including JavaStringMBS and the JavaArrayMBS subclasses. For your convenience you can pass in string and we convert to JavaStringMBS for you.

Do not use for static fields!
(Read and Write computed property)

### 103.15.43 FloatField(TheField as JavaFieldMBS) as single

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a single field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.44 IntField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for an integer field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.45 LongField(TheField as JavaFieldMBS) as Int64

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a long field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.46 ObjectField(TheField as JavaFieldMBS) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for an object field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

### 103.15.47 ShortField(TheField as JavaFieldMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value for a short field in this class.
**Notes:** Do not use for static fields!
(Read and Write computed property)

## 103.16 class JavaShortArrayMBS

### 103.16.1 class JavaShortArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java short array object.
**Notes:** Subclass of the JavaArrayMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 103.16.2 Methods

### 103.16.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 103.16.4 Elements as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** All the elements in this array as one memoryblock.
**Notes:** Use memoryblock.short(index*2) to access.

### 103.16.5 Values as Int16()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a Xojo array with values.

### 103.16.6 Properties

### 103.16.7 Region(start as Integer, len as Integer) as memoryblock

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set a region of the array.
**Notes:** Start is the starting index (0 based) and len the number of items to copy.
Throws ArrayIndexOutOfBoundsException if (start + len - 1) does not specify a valid index in the array.
(Read and Write computed property)

### 103.16.8 Value(index as Integer) as Int16

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the value with given index.
**Notes:** May raise OutOfBoundsException if index is out of range.
(Read and Write computed property)

# 103.17 class JavaStringMBS

## 103.17.1 class JavaStringMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java string class.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Trying Java 19 in Xojo
- MBS Xojo Plugins, version 19.4pr6
- MBS Xojo Plugins, version 19.2pr5

## 103.17.2 Methods

## 103.17.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 103.17.4 CopyString as string

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use StringValue instead.
**Function:** Copies the content of the string into a Xojo string.
**Notes:** Returns "" on any error. The string returned is marked as being Unicode (16bit).
Deprecated in favor of StringValue property and auto conversion with Operator_Convert.
See also:

- 103.17.5 CopyString(start as Integer, len as Integer) as string 16059

## 103.17.5 CopyString(start as Integer, len as Integer) as string

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies the content of the string into a Xojo string.
**Example:**

```
dim s as string
dim js as JavaStringMBS // your java string

s=js.CopyString(0,1) // copies first character
s=js.CopyString(3,6) // copies six charcters from starting at the forth
```

**Notes:** Returns "" on any error. The string returned is marked as being Unicode (16bit).
For the first character to be the start use start=0.
For the first character to be the end use len=1 and start=0.
May crash on bad values for start and len.
See also:

- 103.17.4 CopyString as string 16059

### 103.17.6 CopyStringUTF as string

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use StringValue instead.
**Function:** Copies the content of the string into a Xojo string.
**Notes:** Returns "" on any error. The string returned is marked as being UTF8.
Deprecated in favor of StringValue property and auto conversion with Operator_Convert.
See also:

- 103.17.7 CopyStringUTF(start as Integer, len as Integer) as string 16060

### 103.17.7 CopyStringUTF(start as Integer, len as Integer) as string

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies the content of the string into a Xojo string.
**Notes:** Returns "" on any error. The string returned is marked as being UTF8.
Start is 0 based.
May crash on bad values for start and len.
See also:

- 103.17.6 CopyStringUTF as string 16060

### 103.17.8 Operator_Convert as string

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts to a string automatically.
**Notes:** Do not call it, just assign JavaStringMBS to a string an Xojo calls this internally.

### 103.17.9 UTFLength as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use StringValue instead.
**Function:** The length of the string in bytes encoded as UTF8.
**Notes:** Returns 0 on any error.

### 103.17.10 Properties

### 103.17.11 Length as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The length of this string in unicode characters.
**Notes:** Returns 0 on any error.
(Read only property)

### 103.17.12 StringValue as String

MBS Java Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The string value as property.
**Notes:** Uses UTF-8 internally.
(Read only property)

## 103.18 class JavaThrowableMBS

### 103.18.1 class JavaThrowableMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The wrapper class for the java throwable object.
**Notes:** Subclass of the JavaObjectMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

# 103.19 class JavaVMMBS

## 103.19.1 class JavaVMMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a java virtual machine.
**Example:**

```
dim vm as JavaVMMBS // global

const JNI_VERSION_1_1 = &h00010001
const JNI_VERSION_1_2 = &h00010002
const JNI_VERSION_1_4 = &h00010004

if TargetLinux then
// change path for your linux PC!
JavaVMMBS.SetLibraryPath("/home/cs/jre1.6.0_05/lib/i386/client/libjvm.so")
end if

dim options(-1) as string
dim f as FolderItem=GetFolderItem("test.jar")

vm=new JavaVMMBS(JNI_VERSION_1_4, options, f, false)

if vm.Handle = 0 then
MsgBox "Can't create Java VM"
else
MsgBox "Java Initialized."
end if
```

**Notes:** Add Linux support plugin version 8.7.

Releasing the java vm (by releasing all java objects), and reinitializing can fail.

Please make sure this Java VM object stays alive until you are done with all your java stuff. So all the java objects go away and this vm object is destroyed on the end. Because if some java code is still running like an background java thread, quitting the VM can lead into crashes.

While the plugin supports to have several instances, it seems like JNI does not support that.

On Windows, we look into Local Machine\SOFTWARE\JavaSoft\Java Runtime Environment in registry to

find the newest entry and the path to the jvm.dll file. Please note that on Windows you can install 32-bit and 64-bit version of Java and you need the matching bit number to FileMaker application.

If you get error 126 on Windows, maybe MSVCR100.DLL is missing. So install Visual Studio 2010 runtime libraries. You can download them from Microsoft website. Do not download them from other websites spreading malware!
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- Trying Java 19 in Xojo
- MBS Xojo Plugins, version 21.3pr7
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- MBS Xojo Plugins, version 20.3pr1
- MBS Xojo Plugins, version 20.0pr8
- MBS Xojo Plugins, version 19.4pr2
- Java with MBS Plugin
- Encrypted Access database in Xojo

### 103.19.2 Methods

### 103.19.3 Constructor(path as folderitem)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the Java virtual machine.
**Notes:** This is a convenience function which initializes the java with version=JNI_VERSION_1_4 and no options except the specified path.
The path can be a folderitem pointing to a jar file or a folder with class files.

This method raises UnsupportedOperationException with error about missing CreateJavaVM function if there is no Java found. Either because it is not installed or the bit number (32 vs. 64) does not match.

Since version 16.5 the plugin will no longer raise exception if an existing JavaVM was found. In that case we use that JavaVM and return normally. Lasterror will be set to -5 which indicates this. In that case your options and paths are not passed to VM.
See also:

- 103.19.4 Constructor(path as string) 16065
- 103.19.5 Constructor(version as Integer, options() as string, ignoreUnrecognizedOptions as boolean) 16065
- 103.19.6 Constructor(version as Integer, options() as string, path as folderitem, ignoreUnrecognizedOptions as boolean) 16067
- 103.19.7 Constructor(version as Integer, options() as string, path as string, ignoreUnrecognizedOptions as boolean) 16068


### 103.19.4 Constructor(path as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the Java virtual machine.
**Notes:** This is a convenience function which initializes the java engine with version=JNI_VERSION_1_4 and no options except the specified path.
The path can be a path pointing to a jar file or a folder with class files. If you use more than one path, you need to separate them with ";". Seems like on Mac OS X and Linux the separator is ":".

This method raises UnsupportedOperationException with error about missing CreateJavaVM function if there is no Java found. Either because it is not installed or the bit number (32 vs. 64) does not match.

Since version 16.5 the plugin will no longer raise exception if an existing JavaVM was found. In that case we use that JavaVM and return normally. Lasterror will be set to -5 which indicates this. In that case your options and paths are not passed to VM.
See also:


- 103.19.3 Constructor(path as folderitem) 16064
- 103.19.5 Constructor(version as Integer, options() as string, ignoreUnrecognizedOptions as boolean) 16065
- 103.19.6 Constructor(version as Integer, options() as string, path as folderitem, ignoreUnrecognizedOptions as boolean) 16067
- 103.19.7 Constructor(version as Integer, options() as string, path as string, ignoreUnrecognizedOptions as boolean) 16068


### 103.19.5 Constructor(version as Integer, options() as string, ignoreUnrecognizedOptions as boolean)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the java virtual machine.
**Notes:** Only one VM can run at a time with this plugin.
You can specify whatever command line options you need in the options array.
Version must be one of the JNI_VERSION_1_x constants.

A note for Mac OS X and Java versions:

To specify the current preferred JDK in a family of JVM's, say the 1.5.x family, applications should set the environment variable JAVA_JVM_VERSION to 1.5, and then pass JNI_VERSION_1_4 into JNI_CreateJavaVM as the vm_args.version. To get a specific Java 1.5 JVM, say Java 1.5.0, set the environment variable JAVA_JVM_VERSION to 1.5.0. For Java 1.6 it will be the same in that applications will need to set the environment variable JAVA_JVM_VERSION to 1.6 to specify the current preferred 1.6 Java VM, and to get a specific Java 1.6 JVM, say Java 1.6.1, set the environment variable JAVA_JVM_VERSION to 1.6.1.

To make this sample bring up the current preferred 1.5 JVM, set the environment variable JAVA_JVM_VERSION to 1.5 before calling JNI_CreateJavaVM as shown below. Applications must currently check for availability of JDK 1.5 before requesting it. If your application requires JDK 1.5 and it is not found, it is your responsibility to report an error to the user. To verify if a JVM is installed, check to see if the symlink, or directory exists for the JVM in /System/Library/Frameworks/JavaVM.framework/Versions/ before setting the environment variable JAVA_JVM_VERSION.

If the environment variable JAVA_JVM_VERSION is not set, and JNI_VERSION_1_4 is passed into JNI_CreateJavaVM as the vm_args.version, JNI_CreateJavaVM will return the current preferred JDK. Java 1.4.2 is the preferred JDK as of the release of this sample and the release of Mac OS X 10.4.

Useful option strings:

| | |
|---|---|
| "-verbose:jni" | show debug output on the console |
| "-Xms256M" | initial memory |
| "-Xmx512M" | maximum memory |

This method raises UnsupportedOperationException with error about missing CreateJavaVM function if there is no Java found. Either because it is not installed or the bit number (32 vs. 64) does not match.

Since version 16.5 the plugin will no longer raise exception if an existing JavaVM was found. In that case we use that JavaVM and return normally. Lasterror will be set to -5 which indicates this. In that case your options and paths are not passed to VM.

If you get error 126 on Windows, maybe MSVCR100.DLL is missing. So install Visual Studio 2010 runtime libraries. You can download them from Microsoft website. Do not download them from other websites spreading malware!
See also:

- 103.19.3 Constructor(path as folderitem) 16064
- 103.19.4 Constructor(path as string) 16065
- 103.19.6 Constructor(version as Integer, options() as string, path as folderitem, ignoreUnrecognizedOptions as boolean) 16067
- 103.19.7 Constructor(version as Integer, options() as string, path as string, ignoreUnrecognizedOptions as boolean) 16068


### 103.19.6 Constructor(version as Integer, options() as string, path as folderitem, ignoreUnrecognizedOptions as boolean)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the Java virtual machine.
**Example:**

```
dim JarPath as folderitem = specialfolder.desktop.child("test.jar")
dim options() as string

options.append "-Xms256M"
options.append "-Xmx512M"

dim v as new JavaVMMBS( JavaVMMBS.JNI_VERSION_1_4, options, JarPath, false)
```

**Notes:** This is a convenience function which initializes the java engine with adding the given path to the options.

Only one VM can run at a time with this plugin.
You can specify whatever command line options you need in the options array.
Version must be one of the JNI_VERSION_1_x constants.
The path can be a folderitem pointing to a jar file or a folder with class files.

Useful option strings:

| | |
|---|---|
| "-verbose:jni" | show debug output on the console |
| "-Xms256M" | initial memory |
| "-Xmx512M" | maximum memory |

This method raises UnsupportedOperationException with error about missing CreateJavaVM function if there is no Java found. Either because it is not installed or the bit number (32 vs. 64) does not match.

Since version 16.5 the plugin will no longer raise exception if an existing JavaVM was found. In that case we use that JavaVM and return normally. Lasterror will be set to -5 which indicates this. In that case your options and paths are not passed to VM.
See also:


- 103.19.3 Constructor(path as folderitem) 16064
- 103.19.4 Constructor(path as string) 16065
- 103.19.5 Constructor(version as Integer, options() as string, ignoreUnrecognizedOptions as boolean) 16065
- 103.19.7 Constructor(version as Integer, options() as string, path as string, ignoreUnrecognizedOptions as boolean) 16068


### 103.19.7 Constructor(version as Integer, options() as string, path as string, ignoreUnrecognizedOptions as boolean)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the java virtual machine.
**Notes:** This is a convenience function which initializes the java engine with adding the given path to the options.

Only one VM can run at a time with this plugin.
You can specify whatever command line options you need in the options array.
Version must be one of the JNI_VERSION_1_x constants.
The path can be a path pointing to a jar file or a folder with class files. If you use more than one path, you need to separate them with ";". Seems like on Mac OS X and Linux the separator is ":".

Useful option strings:

| | |
|---|---|
| "-verbose:jni" | show debug output on the console |
| "-Xms256M" | initial memory |
| "-Xmx512M" | maximum memory |

This method raises UnsupportedOperationException with error about missing CreateJavaVM function if there is no Java found. Either because it is not installed or the bit number (32 vs. 64) does not match.

Since version 16.5 the plugin will no longer raise exception if an existing JavaVM was found. In that case we use that JavaVM and return normally. Lasterror will be set to -5 which indicates this. In that case your options and paths are not passed to VM.
See also:

- 103.19.3 Constructor(path as folderitem) 16064
- 103.19.4 Constructor(path as string) 16065
- 103.19.5 Constructor(version as Integer, options() as string, ignoreUnrecognizedOptions as boolean) 16065
- 103.19.6 Constructor(version as Integer, options() as string, path as folderitem, ignoreUnrecognizedOptions as boolean) 16067


### 103.19.8 DefineClass(name as string, Data as MemoryBlock) as JavaClassMBS

MBS Java Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads a class from a buffer of raw class data.
**Notes:** Returns nil in case of error or valid class object on success.
You may want to load a class file and pass it here as String or MemoryBlock.
To read jar file, you can use our archive classes to expand zip archives.
See also:


- 103.19.9 DefineClass(name as string, Data as String) as JavaClassMBS 16069


### 103.19.9 DefineClass(name as string, Data as String) as JavaClassMBS

MBS Java Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads a class from a buffer of raw class data.
**Notes:** Returns nil in case of error or valid class object on success.
You may want to load a class file and pass it here as String or MemoryBlock.
To read jar file, you can use our archive classes to expand zip archives.
See also:


- 103.19.8 DefineClass(name as string, Data as MemoryBlock) as JavaClassMBS 16069


### 103.19.10 FindClass(name as string) as JavaClassMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searches a class based on the name.
**Example:**

```
dim e as JavaVMMBS // global
dim c as JavaClassMBS
c=e.FindClass("java/lang/String")
```

**Notes:** This function loads a locally defined class. It searches the directories and zip files specified by the CLASSPATH environment variable for the class with the specified name.

name: a fully qualified class name (that is, a package name, delimited by "/", followed by the class name). If the name begins with " [ " (the array signature character), it returns an array class.

Returns nil on any error.

If your class is not found, it may be possible that it can't be loaded as the jar archive has dependencies to other jar archives.

### 103.19.11 FreeCurrentThread

MBS Java Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Releases the thread in Java.
**Example:**

```
dim w as JavaVMMBS // your vm object
w.FreeCurrentThread
```

**Notes:** The plugin is written to detect if you use it in a thread. But when the thread ends you need to deregister it with the Java runtime.

### 103.19.12 FromReflectedField(field as JavaObjectMBS) as JavaFieldMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searchs the field which matches the reflected field object.

### 103.19.13 FromReflectedMethod(method as JavaObjectMBS) as JavaMethodMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Searchs the method which matches the reflected method object.

### 103.19.14 IsAssignableFrom(TheSubClass as JavaClassMBS, TheSuperClass as JavaClassMBS) as boolean

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if the class is assignable from the other class.
**Notes:** That means that the sub class is somewhere down the class tree from the super class.

### 103.19.15 MonitorEnter(obj as JavaObjectMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enters the monitor associated with the underlying Java object referred to by obj.
**Notes:** Returns zero on success; otherwise, returns a negative value on failure.

Each Java objects has a monitor associated with it. If the current thread already owns the monitor associated with ref, it increments a counter in the monitor indicating the number of times this thread has entered the monitor. If the monitor associated with ref is not owned by any thread, the current thread becomes the owner of the monitor, setting the entry count of this monitor to 1. If another thread already owns the monitor associated with ref, the current thread waits until the monitor is released, then tries again to gain ownership.

### 103.19.16 MonitorExit(obj as JavaObjectMBS) as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Releases the monitor.
**Notes:** The current thread must be the owner of the monitor associated with the underlying Java object referred to by ref. The thread decrements the counter indicating the number of times it has entered this monitor. If as a result the value of the counter becomes zero, the current thread releases the montior.

Returns zero on success; otherwise, returns a negative value on failure.

### 103.19.17 NewBooleanArray(ref as JavaObjectMBS) as JavaBooleanArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:

- 103.19.18 NewBooleanArray(size as Integer) as JavaBooleanArrayMBS 16072
- 103.19.19 NewBooleanArray(values() as Boolean) as JavaBooleanArrayMBS 16072

### 103.19.18 NewBooleanArray(size as Integer) as JavaBooleanArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for booleans with the given size.
**Notes:** Returns nil on any error.
See also:

- 103.19.17 NewBooleanArray(ref as JavaObjectMBS) as JavaBooleanArrayMBS 16072
- 103.19.19 NewBooleanArray(values() as Boolean) as JavaBooleanArrayMBS 16072

### 103.19.19 NewBooleanArray(values() as Boolean) as JavaBooleanArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new boolean array with given values.
See also:

- 103.19.17 NewBooleanArray(ref as JavaObjectMBS) as JavaBooleanArrayMBS 16072
- 103.19.18 NewBooleanArray(size as Integer) as JavaBooleanArrayMBS 16072

### 103.19.20 NewByteArray(ref as JavaObjectMBS) as JavaByteArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:

- 103.19.21 NewByteArray(size as Integer) as JavaByteArrayMBS 16073
- 103.19.22 NewByteArray(values() as UInt8) as JavaBooleanArrayMBS 16073


### 103.19.21 NewByteArray(size as Integer) as JavaByteArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for bytes with the given size.
**Notes:** Returns nil on any error.
See also:

- 103.19.20 NewByteArray(ref as JavaObjectMBS) as JavaByteArrayMBS 16072
- 103.19.22 NewByteArray(values() as UInt8) as JavaBooleanArrayMBS 16073

### 103.19.22 NewByteArray(values() as UInt8) as JavaBooleanArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new byte array with given values.
See also:

- 103.19.20 NewByteArray(ref as JavaObjectMBS) as JavaByteArrayMBS 16072
- 103.19.21 NewByteArray(size as Integer) as JavaByteArrayMBS 16073

### 103.19.23 NewCharArray(ref as JavaObjectMBS) as JavaCharArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:

- 103.19.24 NewCharArray(size as Integer) as JavaCharArrayMBS 16073
- 103.19.25 NewCharArray(values() as UInt16) as JavaCharArrayMBS 16074

### 103.19.24 NewCharArray(size as Integer) as JavaCharArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for chars (16bit) with the given size.
**Notes:** Returns nil on any error.
See also:

- 103.19.23 NewCharArray(ref as JavaObjectMBS) as JavaCharArrayMBS 16073
- 103.19.25 NewCharArray(values() as UInt16) as JavaCharArrayMBS 16074

### 103.19.25 NewCharArray(values() as UInt16) as JavaCharArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new char array with given values.
See also:

- 103.19.23 NewCharArray(ref as JavaObjectMBS) as JavaCharArrayMBS 16073
- 103.19.24 NewCharArray(size as Integer) as JavaCharArrayMBS 16073

### 103.19.26 NewDirectByteBuffer(address as Integer, size as Integer) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new DirectBuffer object based on the values in address and size.
See also:

- 103.19.27 NewDirectByteBuffer(mem as memoryblock) as JavaObjectMBS 16074

### 103.19.27 NewDirectByteBuffer(mem as memoryblock) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new DirectBuffer object based on a memoryblock.
**Notes:** Keep the memoryblock until this object is destroyed.
See also:

- 103.19.26 NewDirectByteBuffer(address as Integer, size as Integer) as JavaObjectMBS 16074

### 103.19.28 NewDoubleArray(ref as JavaObjectMBS) as JavaDoubleArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:

- 103.19.29 NewDoubleArray(size as Integer) as JavaDoubleArrayMBS 16075
- 103.19.30 NewDoubleArray(values() as Double) as JavaDoubleArrayMBS 16075

### 103.19.29 NewDoubleArray(size as Integer) as JavaDoubleArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for doubles with the given size.
**Notes:** Returns nil on any error.
See also:

- 103.19.28 NewDoubleArray(ref as JavaObjectMBS) as JavaDoubleArrayMBS 16074
- 103.19.30 NewDoubleArray(values() as Double) as JavaDoubleArrayMBS 16075

### 103.19.30 NewDoubleArray(values() as Double) as JavaDoubleArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new double array with given values.
See also:

- 103.19.28 NewDoubleArray(ref as JavaObjectMBS) as JavaDoubleArrayMBS 16074
- 103.19.29 NewDoubleArray(size as Integer) as JavaDoubleArrayMBS 16075

### 103.19.31 NewFloatArray(ref as JavaObjectMBS) as JavaFloatArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:

- 103.19.32 NewFloatArray(size as Integer) as JavaFloatArrayMBS 16076
- 103.19.33 NewFloatArray(values() as Single) as JavaFloatArrayMBS 16076

### 103.19.32 NewFloatArray(size as Integer) as JavaFloatArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for singles with the given size.
**Notes:** Returns nil on any error.
See also:


- 103.19.31 NewFloatArray(ref as JavaObjectMBS) as JavaFloatArrayMBS 16075
- 103.19.33 NewFloatArray(values() as Single) as JavaFloatArrayMBS 16076


### 103.19.33 NewFloatArray(values() as Single) as JavaFloatArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new float array with given values.
See also:


- 103.19.31 NewFloatArray(ref as JavaObjectMBS) as JavaFloatArrayMBS 16075
- 103.19.32 NewFloatArray(size as Integer) as JavaFloatArrayMBS 16076


### 103.19.34 NewIntArray(ref as JavaObjectMBS) as JavaIntArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:


- 103.19.35 NewIntArray(size as Integer) as JavaIntArrayMBS 16076
- 103.19.36 NewIntArray(values() as Int32) as JavaIntArrayMBS 16077


### 103.19.35 NewIntArray(size as Integer) as JavaIntArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for integers with the given size.
**Notes:** Returns nil on any error.
See also:

- 103.19.34 NewIntArray(ref as JavaObjectMBS) as JavaIntArrayMBS 16076
- 103.19.36 NewIntArray(values() as Int32) as JavaIntArrayMBS 16077


### 103.19.36 NewIntArray(values() as Int32) as JavaIntArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new Int32 array with given values.
See also:


- 103.19.34 NewIntArray(ref as JavaObjectMBS) as JavaIntArrayMBS 16076
- 103.19.35 NewIntArray(size as Integer) as JavaIntArrayMBS 16076


### 103.19.37 NewLongArray(ref as JavaObjectMBS) as JavaLongArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:


- 103.19.38 NewLongArray(size as Integer) as JavaLongArrayMBS 16077
- 103.19.39 NewLongArray(values() as Int64) as JavaLongArrayMBS 16077


### 103.19.38 NewLongArray(size as Integer) as JavaLongArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for 64 bit integers with the given size.
**Notes:** Returns nil on any error.
See also:


- 103.19.37 NewLongArray(ref as JavaObjectMBS) as JavaLongArrayMBS 16077
- 103.19.39 NewLongArray(values() as Int64) as JavaLongArrayMBS 16077


### 103.19.39 NewLongArray(values() as Int64) as JavaLongArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new Int64 array with given values.
See also:


- 103.19.37 NewLongArray(ref as JavaObjectMBS) as JavaLongArrayMBS 16077
- 103.19.38 NewLongArray(size as Integer) as JavaLongArrayMBS 16077


### 103.19.40 NewObjectArray(ref as JavaObjectMBS) as JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:


- 103.19.41 NewObjectArray(size as Integer, TheClass as JavaClassMBS, InitialValue as JavaObjectMBS = nil) as JavaObjectArrayMBS 16078
- 103.19.42 NewObjectArray(values() as JavaObjectMBS) as JavaObjectArrayMBS 16078


### 103.19.41 NewObjectArray(size as Integer, TheClass as JavaClassMBS, InitialValue as JavaObjectMBS = nil) as JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constructs a new array holding objects in class elementClass.
**Notes:** All elements are initially set to initialElement.
Returns nil on any error.
See also:


- 103.19.40 NewObjectArray(ref as JavaObjectMBS) as JavaObjectArrayMBS 16078
- 103.19.42 NewObjectArray(values() as JavaObjectMBS) as JavaObjectArrayMBS 16078


### 103.19.42 NewObjectArray(values() as JavaObjectMBS) as JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new Java object array with given size.
See also:


- 103.19.40 NewObjectArray(ref as JavaObjectMBS) as JavaObjectArrayMBS 16078

- 103.19.41 NewObjectArray(size as Integer, TheClass as JavaClassMBS, InitialValue as JavaObjectMBS = nil) as JavaObjectArrayMBS 16078


### 103.19.43 NewShortArray(ref as JavaObjectMBS) as JavaShortArrayMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array object based on the given java object.
**Notes:** This function is a convenience function to convert a java object array reference to a java array object in Xojo. It can crash if the java object used is not the array of the requested type.
See also:


- 103.19.44 NewShortArray(size as Integer) as JavaShortArrayMBS 16079
- 103.19.45 NewShortArray(values() as Int16) as JavaShortArrayMBS 16079


### 103.19.44 NewShortArray(size as Integer) as JavaShortArrayMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new array for shorts with the given size.
**Notes:** Returns nil on any error.
See also:


- 103.19.43 NewShortArray(ref as JavaObjectMBS) as JavaShortArrayMBS 16079
- 103.19.45 NewShortArray(values() as Int16) as JavaShortArrayMBS 16079


### 103.19.45 NewShortArray(values() as Int16) as JavaShortArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new short array with given values.
See also:


- 103.19.43 NewShortArray(ref as JavaObjectMBS) as JavaShortArrayMBS 16079
- 103.19.44 NewShortArray(size as Integer) as JavaShortArrayMBS 16079


### 103.19.46 NewStringArray(size as integer, InitialValue as JavaStringMBS = nil) as JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new Java string array with given size.
See also:

- 103.19.47 NewStringArray(values() as String) as JavaObjectArrayMBS 16080

### 103.19.47 NewStringArray(values() as String) as JavaObjectArrayMBS

MBS Java Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates new string array with given values.
See also:

- 103.19.46 NewStringArray(size as integer, InitialValue as JavaStringMBS = nil) as JavaObjectArrayMBS 16079

### 103.19.48 NewStringUnicode(s as string) as JavaStringMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new string.
**Notes:** Preferres an Unicode encoded string.

### 103.19.49 NewStringUTF8(s as string) as JavaStringMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new string.
**Example:**

```
// init Java
dim options() as string
dim javaVm as new JavaVMMBS(JavaVMMBS.JNI_VERSION_1_4, options, true)

// Get system class
Dim system As JavaClassMBS = javaVm.FindClass("java/lang/System")

If system <>Nil Then

// query method
dim transfomerGetPropertyId as JavaMethodMBS = system.GetStaticMethod("getProperty", "(Ljava/lang/String;)Ljava/la
If transfomerGetPropertyId <>Nil Then
```

```
// make parameters
Dim keyString As JavaStringMBS = javaVm.NewStringUTF8("os.version")
dim m as New MemoryBlock(8)
m.Int64Value(0)=keyString.Handle

// run it
dim r as JavaObjectMBS = system.CallStaticObjectMethod(transfomerGetPropertyId, m)

if r<>Nil then
// show result
dim s as JavaStringMBS = JavaStringMBS(r)
MsgBox s.CopyStringUTF
end if

End If
End If
```

**Notes:** Preferres an UTF8 encoded string.

### 103.19.50 Runtime as JavaRuntimeMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the runtime object for the current VM so you can query the memory statistics.

### 103.19.51 SetLibraryPath(path as folderitem)

MBS Java Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the path where to find the java library.
**Notes:** Must be called before you use the constructor.
If this is empty on Windows, we will look into registry.
If this is empty on MacOS, we ask the Java.framework for the functions.
See also:

- 103.19.52 SetLibraryPath(path as string) 16081

### 103.19.52 SetLibraryPath(path as string)

MBS Java Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Defines the path where to find the java library.
**Example:**

```
if TargetLinux then
// change path for your linux PC!
JavaVMMBS.SetLibraryPath("/home/cs/jre1.6.0_05/lib/i386/client/libjvm.so")
end if
```

**Notes:** Must be called before you use the constructor.
If this is empty on Windows, we will look into registry.
If this is empty on MacOS, we ask the Java.framework for the functions.
See also:

- 103.19.51 SetLibraryPath(path as folderitem) 16081

### 103.19.53 ToReflectedField(TheClass as JavaClassMBS, fieldID as JavaFieldMBS, isStatic as boolean) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new reflected field object for the given field.

### 103.19.54 ToReflectedMethod(TheClass as JavaClassMBS, methodID as JavaMethodMBS, isStatic as boolean) as JavaObjectMBS

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new reflected method object for the given method.

### 103.19.55 Version as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the version of the java engine.
**Notes:** Currently the plugin always uses version 1.4.

Returns the major version number in the higher 16 bits and the minor version number in the lower 16 bits.

In JDK1.1, GetVersion() returns 0x00010001.

### 103.19.56 Properties

### 103.19.57 Handle as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the JavaVM.
**Notes:** (Read only property)

### 103.19.58 Lasterror as Integer

MBS Java Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 103.19.59 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| JNI_VERSION_1_1 | &h00010001 | One of the constants to specify the JNI version in the constructor. |
| JNI_VERSION_1_2 | &h00010002 | One of the constants to specify the JNI version in the constructor. |
| JNI_VERSION_1_4 | &h00010004 | One of the constants to specify the JNI version in the constructor. |
| JNI_VERSION_1_6 | &h00010006 | One of the constants to specify the JNI version in the constructor. |

# Chapter 104

# Java Database

## 104.1 class JavaBlobMBS

### 104.1.1 class JavaBlobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The java class for a binary large object.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.1.2 Methods

### 104.1.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.1.4 getBytes(Position as Int64, Length as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves all or part of the BLOB value that this Blob object represents, as an array of bytes.
**Notes:** This byte array contains up to length consecutive bytes starting at position pos.

pos: the ordinal position of the first byte in the BLOB value to be extracted; the first byte is at position 1
length: the number of consecutive bytes to be copied

Returns a byte array (as string) containing up to length consecutive bytes from the BLOB value designated by this Blob object, starting with the byte at position pos

### 104.1.5 length as int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of bytes in the BLOB value designated by this Blob object.

### 104.1.6 position(SearchString as JavaBlobMBS, Position as Int64) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the byte position in the BLOB value designated by this Blob object at which pattern begins. The search begins at position start.
**Notes:** pattern: the Blob object designating the BLOB value for which to search
start: the position in the BLOB value at which to begin searching; the first position is 1

Returns the position at which the pattern begins, else -1
See also:

- 104.1.7 position(SearchString as String, Position as Int64) as Int64 16086

### 104.1.7 position(SearchString as String, Position as Int64) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the byte position at which the specified byte array pattern begins within the BLOB value that this Blob object represents.
**Notes:** The search for pattern begins at position start.

pattern: the byte array for which to search
start: the position at which to begin searching; the first position is 1

Returns the position at which the pattern appears, else -1
See also:

- 104.1.6 position(SearchString as JavaBlobMBS, Position as Int64) as Int64 16086

### 104.1.8 setBytes(Position as Int64, Value as String) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes the given array of bytes to the BLOB value that this Blob object represents, starting at position pos, and returns the number of bytes written.
**Notes:** pos: the position in the BLOB object at which to start writing
bytes: the array of bytes to be written to the BLOB value that this Blob object represents

Returns the number of bytes written
See also:

- 104.1.9 setBytes(Position as Int64, Value as String, Offset as Integer, Length as Integer) as Integer 16087

### 104.1.9 setBytes(Position as Int64, Value as String, Offset as Integer, Length as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes all or part of the given byte array to the BLOB value that this Blob object represents and returns the number of bytes written.
**Notes:** Writing starts at position pos in the BLOB value; len bytes from the given byte array are written.

pos: the position in the BLOB object at which to start writing
bytes: the array of bytes to be written to this BLOB object
offset: the offset into the array bytes at which to start reading the bytes to be set
len: the number of bytes to be written to the BLOB value from the array of bytes bytes

Returns the number of bytes written
See also:

- 104.1.8 setBytes(Position as Int64, Value as String) as Integer 16087

### 104.1.10 truncate(len as int64)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Truncates the BLOB value that this Blob object represents to be len bytes in length.
**Notes:** len: the length, in bytes, to which the BLOB value that this Blob object represents should be truncated

## 104.2 class JavaCallableStatementMBS

### 104.2.1 class JavaCallableStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Xojo class to handle a CallableStatement in Java.
**Notes:** The interface used to execute SQL stored procedures. The JDBC API provides a stored procedure SQL escape syntax that allows stored procedures to be called in a standard way for all RDBMSs. This escape syntax has one form that includes a result parameter and one that does not. If used, the result parameter must be registered as an OUT parameter. The other parameters can be used for input, output or both. Parameters are referred to sequentially, by number, with the first parameter being 1.

{ ?= call <procedure-name>[ <arg1>,<arg2>, ... ] }
{ call <procedure-name>[ <arg1>,<arg2>, ... ] }

IN parameter values are set using the set methods inherited from PreparedStatement. The type of all OUT parameters must be registered prior to executing the stored procedure; their values are retrieved after execution via the get methods provided here.

A CallableStatement can return one ResultSet object or multiple ResultSet objects. Multiple ResultSet objects are handled using operations inherited from Statement.

For maximum portability, a call's ResultSet objects and update counts should be processed prior to getting the values of output parameters.
Subclass of the JavaStatementMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.2.2 Methods

### 104.2.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.2.4 getBlob(parameterIndex as Integer) as JavaBlobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC BLOB parameter as a Blob object in the Java programming language.
**Notes:** Parameters:
i - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value as a Blob object in the Java programming language. If the value was SQL NULL, the value null is returned.
See also:

- 104.2.5 getBlob(parameterName as string) as JavaBlobMBS 16090

### 104.2.5 getBlob(parameterName as string) as JavaBlobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC BLOB parameter as a Blob object in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value as a Blob object in the Java programming language. If the value was SQL NULL, the value null is returned.
See also:

- 104.2.4 getBlob(parameterIndex as Integer) as JavaBlobMBS 16090

### 104.2.6 getBoolean(parameterIndex as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC BIT parameter as a boolean in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is false.
See also:

- 104.2.7 getBoolean(parameterName as string) as boolean 16091

### 104.2.7 getBoolean(parameterName as string) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC BIT parameter as a boolean in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is false.
See also:

- 104.2.6 getBoolean(parameterIndex as Integer) as boolean 16090

### 104.2.8 getByte(parameterIndex as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC TINYINT parameter as a byte in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.9 getByte(parameterName as string) as Integer 16091

### 104.2.9 getByte(parameterName as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC TINYINT parameter as a byte in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.8 getByte(parameterIndex as Integer) as Integer 16091

### 104.2.10 getClob(parameterIndex as Integer) as JavaClobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC CLOB parameter as a Clob object in the Java programming language.
**Notes:** Parameters:
i - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value as a Clob object in the Java programming language. If the value was SQL NULL, the value null is returned.
See also:

- 104.2.11 getClob(parameterName as string) as JavaClobMBS 16092

### 104.2.11 getClob(parameterName as string) as JavaClobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC CLOB parameter as a Clob object in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value as a Clob object in the Java programming language. If the value was SQL NULL, the value null is returned.
See also:

- 104.2.10 getClob(parameterIndex as Integer) as JavaClobMBS 16092

### 104.2.12 getDouble(parameterIndex as Integer) as Double

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC DOUBLE parameter as a double in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.13 getDouble(parameterName as string) as Double 16093

### 104.2.13 getDouble(parameterName as string) as Double

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC DOUBLE parameter as a double in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.12 getDouble(parameterIndex as Integer) as Double 16092

### 104.2.14 getFloat(parameterIndex as Integer) as single

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC FLOAT parameter as a float in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.15 getFloat(parameterName as string) as single 16093

### 104.2.15 getFloat(parameterName as string) as single

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC FLOAT parameter as a float in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.14 getFloat(parameterIndex as Integer) as single 16093

### 104.2.16 getInt(parameterIndex as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC INTEGER parameter as an int in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.17 getInt(parameterName as string) as Integer 16094

### 104.2.17 getInt(parameterName as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC INTEGER parameter as an int in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.16 getInt(parameterIndex as Integer) as Integer 16094

### 104.2.18 getLong(parameterIndex as Integer) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC BIGINT parameter as a long in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.19 getLong(parameterName as string) as Int64 16095

### 104.2.19 getLong(parameterName as string) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC BIGINT parameter as a long in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.18 getLong(parameterIndex as Integer) as Int64 16094

### 104.2.20 getShort(parameterIndex as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC SMALLINT parameter as a short in the Java programming language.
**Notes:** Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.21 getShort(parameterName as string) as Integer 16095

### 104.2.21 getShort(parameterName as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC SMALLINT parameter as a short in the Java programming language.
**Notes:** Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is 0.
See also:

- 104.2.20 getShort(parameterIndex as Integer) as Integer 16095

### 104.2.22 getString(parameterIndex as Integer) as String

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated JDBC CHAR, VARCHAR, or LONGVARCHAR parameter as a String in the Java programming language.
**Notes:** For the fixed-length type JDBC CHAR, the String object returned has exactly the same value the JDBC CHAR value had in the database, including any padding added by the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, and so on
Returns:
the parameter value. If the value is SQL NULL, the result is null.
See also:

- 104.2.23 getString(parameterName as string) as String 16096

### 104.2.23 getString(parameterName as string) as String

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of a JDBC CHAR, VARCHAR, or LONGVARCHAR parameter as a String in the Java programming language.
**Notes:** For the fixed-length type JDBC CHAR, the String object returned has exactly the same value the JDBC CHAR value had in the database, including any padding added by the database.

Parameters:
parameterName - the name of the parameter
Returns:
the parameter value. If the value is SQL NULL, the result is null.
See also:

- 104.2.22 getString(parameterIndex as Integer) as String 16096

### 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the OUT parameter in ordinal position parameterIndex to the JDBC type sqlType.
**Notes:** All OUT parameters must be registered before a stored procedure is executed.
The JDBC type specified by sqlType for an OUT parameter determines the Java type that must be used in the get method to read the value of that parameter.

If the JDBC type expected to be returned to this output parameter is specific to this particular database, sqlType should be java.sql.Types.OTHER. The method getObject(int) retrieves the value.

parameterIndex - the first parameter is 1, the second is 2, and so on
sqlType - the JDBC type code defined by java.sql.Types. If the parameter is of JDBC type NUMERIC or DECIMAL, the version of registerOutParameter that accepts a scale value should be used.
See also:


- 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer) 16097
- 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string) 16098
- 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer) 16098
- 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer) 16099
- 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string) 16100


### 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the parameter in ordinal position parameterIndex to be of JDBC type sqlType.
**Notes:** This method must be called before a stored procedure is executed.
The JDBC type specified by sqlType for an OUT parameter determines the Java type that must be used in the get method to read the value of that parameter.

This version of registerOutParameter should be used when the parameter is of JDBC type NUMERIC or DECIMAL.

parameterIndex - the first parameter is 1, the second is 2, and so on
sqlType - the SQL type code defined by java.sql.Types.
scale - the desired number of digits to the right of the decimal point. It must be greater than or equal to zero.
See also:


- 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer) 16096
- 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string) 16098
- 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer) 16098
- 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer) 16099

- 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string) 16100


### 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the designated output parameter.
**Notes:** This version of the method registerOutParameter should be used for a user-defined or REF output parameter. Examples of user-defined types include: STRUCT, DISTINCT, JAVA_OBJECT, and named array types. Before executing a stored procedure call, you must explicitly call registerOutParameter to register the type from java.sql.Types for each OUT parameter. For a user-defined parameter, the fully-qualified SQL type name of the parameter should also be given, while a REF parameter requires that the fully-qualified type name of the referenced type be given. A JDBC driver that does not need the type code and type name information may ignore it. To be portable, however, applications should always provide these values for user-defined and REF parameters. Although it is intended for user-defined and REF parameters, this method may be used to register a parameter of any JDBC type. If the parameter does not have a user-defined or REF type, the typeName parameter is ignored.
Note: When reading the value of an out parameter, you must use the getter method whose Java type corresponds to the parameter's registered SQL type.

Parameters:
paramIndex - the first parameter is 1, the second is 2,...
sqlType - a value from Types
typeName - the fully-qualified name of an SQL structured type
See also:


- 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer) 16096
- 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer) 16097
- 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer) 16098
- 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer) 16099
- 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string) 16100


### 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the OUT parameter named parameterName to the JDBC type sqlType.
**Notes:** Registers the OUT parameter named parameterName to the JDBC type sqlType. All OUT parameters must be registered before a stored procedure is executed.

The JDBC type specified by sqlType for an OUT parameter determines the Java type that must be used in the get method to read the value of that parameter.

If the JDBC type expected to be returned to this output parameter is specific to this particular database, sqlType should be java.sql.Types.OTHER. The method getObject(int) retrieves the value.

Parameters:
parameterName - the name of the parameter
sqlType - the JDBC type code defined by java.sql.Types. If the parameter is of JDBC type NUMERIC or DECIMAL, the version of registerOutParameter that accepts a scale value should be used.
See also:

- 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer) 16096
- 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer) 16097
- 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string) 16098
- 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer) 16099
- 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string) 16100

### 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the parameter named parameterName to be of JDBC type sqlType.
**Notes:** This method must be called before a stored procedure is executed.
The JDBC type specified by sqlType for an OUT parameter determines the Java type that must be used in the get method to read the value of that parameter.

This version of registerOutParameter should be used when the parameter is of JDBC type NUMERIC or DECIMAL.

Parameters:
parameterName - the name of the parameter
sqlType - SQL type code defined by java.sql.Types.
scale - the desired number of digits to the right of the decimal point. It must be greater than or equal to zero.
See also:

- 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer) 16096

- 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer) 16097
- 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string) 16098
- 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer) 16098
- 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string) 16100


### 104.2.29 registerOutParameter(parameterName as string, sqlType as Integer, typeName as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers the designated output parameter.
**Notes:** This version of the method registerOutParameter should be used for a user-named or REF output parameter. Examples of user-named types include: STRUCT, DISTINCT, JAVA_OBJECT, and named array types. Before executing a stored procedure call, you must explicitly call registerOutParameter to register the type from java.sql.Types for each OUT parameter. For a user-named parameter the fully-qualified SQL type name of the parameter should also be given, while a REF parameter requires that the fully-qualified type name of the referenced type be given. A JDBC driver that does not need the type code and type name information may ignore it. To be portable, however, applications should always provide these values for user-named and REF parameters. Although it is intended for user-named and REF parameters, this method may be used to register a parameter of any JDBC type. If the parameter does not have a user-named or REF type, the typeName parameter is ignored.
Note: When reading the value of an out parameter, you must use the getXXX method whose Java type XXX corresponds to the parameter's registered SQL type.

Parameters:
parameterName - the name of the parameter
sqlType - a value from Types
typeName - the fully-qualified name of an SQL structured type
See also:


- 104.2.24 registerOutParameter(parameterIndex as Integer, sqlType as Integer) 16096
- 104.2.25 registerOutParameter(parameterIndex as Integer, sqlType as Integer, scale as Integer) 16097
- 104.2.26 registerOutParameter(parameterIndex as Integer, sqlType as Integer, typeName as string) 16098
- 104.2.27 registerOutParameter(parameterName as string, sqlType as Integer) 16098
- 104.2.28 registerOutParameter(parameterName as string, sqlType as Integer, scale as Integer) 16099

### 104.2.30 setBoolean(parameterName as string, x as boolean)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java boolean value.
**Notes:** The driver converts this to an SQL BIT value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.31 setByte(parameterName as string, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java byte value.
**Notes:** The driver converts this to an SQL TINYINT value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.32 setDouble(parameterName as string, x as Double)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java double value.
**Notes:** The driver converts this to an SQL DOUBLE value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.33 setFloat(parameterName as string, x as single)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java float value.
**Notes:** The driver converts this to an SQL FLOAT value when it sends it to the database.
Parameters:
parameterName - the name of the parameter

x - the parameter value

### 104.2.34 setInt(parameterName as string, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java int value.
**Notes:** The driver converts this to an SQL INTEGER value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.35 setLong(parameterName as string, x as int64)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java long value.
**Notes:** The driver converts this to an SQL BIGINT value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.36 setNull(parameterName as string, sqlType as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to SQL NULL.
**Notes:** Note: You must specify the parameter's SQL type.

Parameters:
parameterName - the name of the parameter
sqlType - the SQL type code defined in java.sql.Types
See also:

- 104.2.37 setNull(parameterName as string, sqlType as Integer, typeName as string)

### 104.2.37 setNull(parameterName as string, sqlType as Integer, typeName as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to SQL NULL.
**Notes:** This version of the method setNull should be used for user-defined types and REF type parameters. Examples of user-defined types include: STRUCT, DISTINCT, JAVA_OBJECT, and named array types. Note: To be portable, applications must give the SQL type code and the fully-qualified SQL type name when specifying a NULL user-defined or REF parameter. In the case of a user-defined type the name is the type name of the parameter itself. For a REF parameter, the name is the type name of the referenced type. If a JDBC driver does not need the type code or type name information, it may ignore it. Although it is intended for user-defined and Ref parameters, this method may be used to set a null parameter of any JDBC type. If the parameter does not have a user-defined or REF type, the given typeName is ignored.

Parameters:
parameterName - the name of the parameter
sqlType - a value from java.sql.Types
typeName - the fully-qualified name of an SQL user-defined type; ignored if the parameter is not a user-defined type or SQL REF value
See also:

- 104.2.36 setNull(parameterName as string, sqlType as Integer) 16102

### 104.2.38 setShort(parameterName as string, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java short value.
**Notes:** The driver converts this to an SQL SMALLINT value when it sends it to the database.
Parameters:
parameterName - the name of the parameter
x - the parameter value

### 104.2.39 setString(parameterName as string, x as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java String value.
**Notes:** The driver converts this to an SQL VARCHAR or LONGVARCHAR value (depending on the argument's size relative to the driver's limits on VARCHAR values) when it sends it to the database.
Parameters:

parameterName - the name of the parameter
x - the parameter value

### 104.2.40 wasNull as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the last OUT parameter read had the value of SQL NULL.
**Notes:** Note that this method should be called only after calling a getter method; otherwise, there is no value to use in determining whether it is null or not.

Returns:
true if the last parameter read was SQL NULL; false otherwise

## 104.3 class JavaClobMBS

### 104.3.1 class JavaClobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The java class for large character objects.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.3.2 Methods

### 104.3.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.3.4 getSubString(Position as int64, Length as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a copy of the specified substring in the CLOB value designated by this Clob object.
**Notes:** The substring begins at position pos and has up to length consecutive characters.

Parameters:
pos: the first character of the substring to be extracted. The first character is at position 1.
length: the number of consecutive characters to be copied

Returns a String that is the specified substring in the CLOB value designated by this Clob object

### 104.3.5 length as int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number of characters in the CLOB value designated by this Clob object.
**Notes:** Returns length of the CLOB in characters.

### 104.3.6 position(SearchString as JavaClobMBS, Start as Int64) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the character position at which the specified Clob object searchstr appears in this Clob object.
**Notes:** The search begins at position start.

SearchString: the Clob object for which to search
start: the position at which to begin searching; the first position is 1

Returns the position at which the Clob object appears or -1 if it is not present; the first position is 1
See also:

- 104.3.7 position(SearchString as String, Start as Int64) as Int64 16106

### 104.3.7 position(SearchString as String, Start as Int64) as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the character position at which the specified substring searchstr appears in the SQL CLOB value represented by this Clob object.
**Notes:** The search begins at position start.

searchstr: the substring for which to search
start: the position at which to begin searching; the first position is 1

Returns the position at which the substring appears or -1 if it is not present; the first position is 1
See also:

- 104.3.6 position(SearchString as JavaClobMBS, Start as Int64) as Int64 16106

### 104.3.8 setString(Position as Int64, Value as String) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes the given Java String to the CLOB value that this Clob object designates at the position pos.

**Notes:** Position: the position at which to start writing to the CLOB value that this Clob object represents
Value: the string to be written to the CLOB value that this Clob designates

Returns the number of characters written
See also:

- 104.3.9 setString(Position as Int64, Value as String, Offset as Integer, Length as Integer) as Integer 16107

### 104.3.9 setString(Position as Int64, Value as String, Offset as Integer, Length as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes Length characters of Value, starting at character offset, to the CLOB value that this Clob represents.
**Notes:** Position: the position at which to start writing to this CLOB object
Value: the string to be written to the CLOB value that this Clob object represents
Offset: the offset into str to start reading the characters to be written
Length: the number of characters to be written

Returns the number of characters written
See also:

- 104.3.8 setString(Position as Int64, Value as String) as Integer 16106

### 104.3.10 truncate(len as int64)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Truncates the CLOB value that this Clob designates to have a length of len characters.
**Notes:** len: the length, in bytes, to which the CLOB value should be truncated

## 104.4 class JavaConnectionMBS

### 104.4.1 class JavaConnectionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a java connection.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Encrypted Access database in Xojo
- MBS Real Studio Plugins, version 11.3pr11

### 104.4.2 Methods

### 104.4.3 clearWarnings

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears all warnings reported for this Connection object.
**Notes:** After a call to this method, the method getWarnings returns null until a new warning is reported for this Connection object.

### 104.4.4 close

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Releases this Connection object's database and JDBC resources immediately instead of waiting for them to be automatically released.

### 104.4.5 CLOSE_CURSORS_AT_COMMIT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that ResultSet objects should be closed when the method Connection.commit is called.

### 104.4.6 commit

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Makes all changes made since the previous commit/rollback permanent and releases any database locks currently held by the Connection.
**Notes:** See the java documentation for details on java.sql.Connection.Commit.

### 104.4.7 CONCUR_READ_ONLY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the concurrency mode for a ResultSet object that may NOT be updated.

### 104.4.8 CONCUR_UPDATABLE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the concurrency mode for a ResultSet object that may be updated.

### 104.4.9 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.4.10 createBlob as JavaBlobMBS

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constructs an object that implements the Blob interface.
**Notes:** The object returned initially contains no data. The setBinaryStream and setBytes methods of the Blob interface may be used to add data to the Blob.

### 104.4.11 createClob as JavaClobMBS

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constructs an object that implements the Clob interface.
**Notes:** The object returned initially contains no data. The setAsciiStream, setCharacterStream and setString methods of the Clob interface may be used to add data to the Clob.

### 104.4.12 createStatement as JavaStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Statement object for sending SQL statements to the database.
**Notes:** SQL statements without parameters are normally executed using Statement objects. If the same SQL statement is executed many times, it may be more efficient to use a PreparedStatement object.
Result sets created using the returned Statement object will by default be type TYPE_FORWARD_ONLY and have a concurrency level of CONCUR_READ_ONLY.

Returns:
a new default Statement object
See also:

- 104.4.13 createStatement(resultSetType as Integer, resultSetConcurrency as Integer) as JavaStatementMBS 16110
- 104.4.14 createStatement(resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaStatementMBS 16111

### 104.4.13 createStatement(resultSetType as Integer, resultSetConcurrency as Integer) as JavaStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Statement object that will generate ResultSet objects with the given type and concurrency.
**Notes:** This method is the same as the createStatement method above, but it allows the default result set type and concurrency to be overridden.
Parameters:
resultSetType - a result set type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - a concurrency type; one of ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE

Returns:
a new Statement object that will generate ResultSet objects with the given type and concurrency
See also:

- 104.4.12 createStatement as JavaStatementMBS 16110
- 104.4.14 createStatement(resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaStatementMBS 16111

### 104.4.14 createStatement(resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Statement object that will generate ResultSet objects with the given type, concurrency, and holdability.
**Notes:** This method is the same as the createStatement method above, but it allows the default result set type, concurrency, and holdability to be overridden.
Parameters:
resultSetType - one of the following ResultSet constants: ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - one of the following ResultSet constants: ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE
resultSetHoldability - one of the following ResultSet constants: ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT
Returns:
a new Statement object that will generate ResultSet objects with the given type, concurrency, and holdability
See also:

- 104.4.12 createStatement as JavaStatementMBS 16110
- 104.4.13 createStatement(resultSetType as Integer, resultSetConcurrency as Integer) as JavaStatementMBS 16110

### 104.4.15 FETCH_FORWARD as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the rows in a result set will be processed in a forward direction; first-to-last.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.4.16 FETCH_REVERSE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the rows in a result set will be processed in a reverse direction; last-to-first.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.4.17 FETCH_UNKNOWN as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the order in which rows in a result set will be processed is unknown.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.4.18 getMetaData as JavaDatabaseMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a DatabaseMetaData object that contains metadata about the database to which this Connection object represents a connection.
**Notes:** The metadata includes information about the database's tables, its supported SQL grammar, its stored procedures, the capabilities of this connection, and so on.
Returns:
a DatabaseMetaData object for this Connection object

### 104.4.19 HOLD_CURSORS_OVER_COMMIT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that ResultSet objects should not be closed when the method Connection.commit is called.

### 104.4.20 isClosed as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this Connection object has been closed.
**Notes:** A connection is closed if the method close has been called on it or if certain fatal errors have occurred. This method is guaranteed to return true only when it is called after the method Connection.close has been called.
This method generally cannot be called to determine whether a connection to a database is valid or invalid. A typical client can determine that a connection is invalid by catching any exceptions that might be thrown when an operation is attempted.

Returns:
true if this Connection object is closed; false if it is still open

### 104.4.21 nativeSQL(sql as string) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Converts the given SQL statement into the system's native SQL grammar.
**Notes:** A driver may convert the JDBC SQL grammar into its system's native SQL grammar prior to sending it. This method returns the native form of the statement that the driver would have sent.
Parameters:
sql - an SQL statement that may contain one or more '?' parameter placeholders
Returns:
the native form of this statement

### 104.4.22 prepareCall(sql as string) as JavaCallableStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a CallableStatement object for calling database stored procedures.
**Notes:** The CallableStatement object provides methods for setting up its IN and OUT parameters, and methods for executing the call to a stored procedure.
Note: This method is optimized for handling stored procedure call statements. Some drivers may send the call statement to the database when the method prepareCall is done; others may wait until the CallableStatement object is executed. This has no direct effect on users; however, it does affect which method throws certain SQLExceptions.

Result sets created using the returned CallableStatement object will by default be type TYPE_FORWARD_ONLY and have a concurrency level of CONCUR_READ_ONLY.

Parameters:
sql - an SQL statement that may contain one or more '?' parameter placeholders. Typically this statement is a JDBC function call escape string.
Returns:
a new default CallableStatement object containing the pre-compiled SQL statement
See also:

- 104.4.23 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaCallableStatementMBS 16114

- 104.4.24 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaCallableStatementMBS 16115

### 104.4.23 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaCallableStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a CallableStatement object that will generate ResultSet objects with the given type and concurrency.
**Notes:** This method is the same as the prepareCall method above, but it allows the default result set type and concurrency to be overridden.
Parameters:
sql - a String object that is the SQL statement to be sent to the database; may contain on or more ? parameters
resultSetType - a result set type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - a concurrency type; one of ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE
Returns:
a new CallableStatement object containing the pre-compiled SQL statement that will produce ResultSet objects with the given type and concurrency
See also:

- 104.4.22 prepareCall(sql as string) as JavaCallableStatementMBS 16113

- 104.4.24 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaCallableStatementMBS 16115

### 104.4.24 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaCallableStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a CallableStatement object that will generate ResultSet objects with the given type and concurrency.
**Notes:** This method is the same as the prepareCall method above, but it allows the default result set type, result set concurrency type and holdability to be overridden.
Parameters:
sql - a String object that is the SQL statement to be sent to the database; may contain on or more ? parameters
resultSetType - one of the following ResultSet constants: ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - one of the following ResultSet constants: ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE
resultSetHoldability - one of the following ResultSet constants: ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT
Returns:
a new CallableStatement object, containing the pre-compiled SQL statement, that will generate ResultSet objects with the given type, concurrency, and holdability
See also:

- 104.4.22 prepareCall(sql as string) as JavaCallableStatementMBS 16113
- 104.4.23 prepareCall(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaCallableStatementMBS 16114

### 104.4.25 prepareStatement(sql as string) as JavaPreparedStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a PreparedStatement object for sending parameterized SQL statements to the database.
**Notes:** A SQL statement with or without IN parameters can be pre-compiled and stored in a PreparedStatement object. This object can then be used to efficiently execute this statement multiple times.

Note: This method is optimized for handling parametric SQL statements that benefit from precompilation. If the driver supports precompilation, the method prepareStatement will send the statement to the database for precompilation. Some drivers may not support precompilation. In this case, the statement may not be sent to the database until the PreparedStatement object is executed. This has no direct effect on users; however, it does affect which methods throw certain SQLException objects.

Result sets created using the returned PreparedStatement object will by default be type TYPE_FORWARD_ONLY and have a concurrency level of CONCUR_READ_ONLY.

Parameters:
sql - an SQL statement that may contain one or more '?' IN parameter placeholders
See also:

- 104.4.26 prepareStatement(sql as string, autoGeneratedKeys as Integer) as JavaPreparedStatementMBS 16116
- 104.4.27 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaPreparedStatementMBS 16117
- 104.4.28 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaPreparedStatementMBS 16117

### 104.4.26 prepareStatement(sql as string, autoGeneratedKeys as Integer) as JavaPreparedStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a default PreparedStatement object that has the capability to retrieve auto-generated keys.
**Notes:** The given constant tells the driver whether it should make auto-generated keys available for retrieval. This parameter is ignored if the SQL statement is not an INSERT statement.
Note: This method is optimized for handling parametric SQL statements that benefit from precompilation. If the driver supports precompilation, the method prepareStatement will send the statement to the database for precompilation. Some drivers may not support precompilation. In this case, the statement may not be sent to the database until the PreparedStatement object is executed. This has no direct effect on users; however, it does affect which methods throw certain SQLExceptions.

Result sets created using the returned PreparedStatement object will by default be type TYPE_FORWARD_ONLY and have a concurrency level of CONCUR_READ_ONLY.

Parameters:
sql - an SQL statement that may contain one or more '?' IN parameter placeholders
autoGeneratedKeys - a flag indicating whether auto-generated keys should be returned; one of Statement.RETURN_GENERATED_KEYS or Statement.NO_GENERATED_KEYS
Returns:
a new PreparedStatement object, containing the pre-compiled SQL statement, that will have the capability of returning auto-generated keys
See also:

- 104.4.25 prepareStatement(sql as string) as JavaPreparedStatementMBS 16115
- 104.4.27 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaPreparedStatementMBS 16117

- 104.4.28 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaPreparedStatementMBS 16117


### 104.4.27 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaPreparedStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a PreparedStatement object that will generate ResultSet objects with the given type and concurrency.
**Notes:** This method is the same as the prepareStatement method above, but it allows the default result set type and concurrency to be overridden.
Parameters:
sql - a String object that is the SQL statement to be sent to the database; may contain one or more ? IN parameters
resultSetType - a result set type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - a concurrency type; one of ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE
Returns:
a new PreparedStatement object containing the pre-compiled SQL statement that will produce ResultSet objects with the given type and concurrency
See also:


- 104.4.25 prepareStatement(sql as string) as JavaPreparedStatementMBS 16115
- 104.4.26 prepareStatement(sql as string, autoGeneratedKeys as Integer) as JavaPreparedStatementMBS 16116
- 104.4.28 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaPreparedStatementMBS 16117


### 104.4.28 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer, resultSetHoldability as Integer) as JavaPreparedStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a PreparedStatement object that will generate ResultSet objects with the given type, concurrency, and holdability.
**Notes:** This method is the same as the prepareStatement method above, but it allows the default result set type, concurrency, and holdability to be overridden.

Parameters:
sql - a String object that is the SQL statement to be sent to the database; may contain one or more ? IN

parameters
resultSetType - one of the following ResultSet constants: ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE
resultSetConcurrency - one of the following ResultSet constants: ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE
resultSetHoldability - one of the following ResultSet constants: ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT
Returns:
a new PreparedStatement object, containing the pre-compiled SQL statement, that will generate ResultSet objects with the given type, concurrency, and holdability
See also:

- 104.4.25 prepareStatement(sql as string) as JavaPreparedStatementMBS 16115
- 104.4.26 prepareStatement(sql as string, autoGeneratedKeys as Integer) as JavaPreparedStatementMBS 16116
- 104.4.27 prepareStatement(sql as string, resultSetType as Integer, resultSetConcurrency as Integer) as JavaPreparedStatementMBS 16117

### 104.4.29 releaseSavepoint(safepoint as JavaSavepointMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes the given Savepoint object from the current transaction.
**Notes:** Any reference to the savepoint after it have been removed will cause an SQLException to be thrown.

savepoint: the Savepoint object to be removed

### 104.4.30 rollback

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Drops all changes made since the previous commit/rollback and releases any database locks currently held by this Connection.
**Notes:** This method should be used only when auto- commit has been disabled.

See the java documentation for details on java.sql.Connection.Rollback.
See also:

- 104.4.31 rollback(safepoint as JavaSavepointMBS) 16119

### 104.4.31 rollback(safepoint as JavaSavepointMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Undoes all changes made after the given Savepoint object was set.
**Notes:** This method should be used only when auto-commit has been disabled.

savepoint: the Savepoint object to roll back to
See also:

- 104.4.30 rollback 16118

### 104.4.32 setSavepoint as JavaSavepointMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates an unnamed savepoint in the current transaction and returns the new Savepoint object that represents it.
See also:

- 104.4.33 setSavepoint(name as string) as JavaSavepointMBS 16119

### 104.4.33 setSavepoint(name as string) as JavaSavepointMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a savepoint with the given name in the current transaction and returns the new Savepoint object that represents it.
**Notes:** name: a String containing the name of the savepoint
returns the new Savepoint object
See also:

- 104.4.32 setSavepoint as JavaSavepointMBS 16119

### 104.4.34 TRANSACTION_NONE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A constant indicating that transactions are not supported.

### 104.4.35 TRANSACTION_READ_COMMITTED as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A constant indicating that dirty reads are prevented; non-repeatable reads and phantom reads can occur.
**Notes:** This level only prohibits a transaction from reading a row with uncommitted changes in it.

### 104.4.36 TRANSACTION_READ_UNCOMMITTED as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A constant indicating that dirty reads, non-repeatable reads and phantom reads can occur.
**Notes:** This level allows a row changed by one transaction to be read by another transaction before any changes in that row have been committed (a "dirty read"). If any of the changes are rolled back, the second transaction will have retrieved an invalid row.

### 104.4.37 TRANSACTION_REPEATABLE_READ as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A constant indicating that dirty reads and non-repeatable reads are prevented; phantom reads can occur.
**Notes:** This level prohibits a transaction from reading a row with uncommitted changes in it, and it also prohibits the situation where one transaction reads a row, a second transaction alters the row, and the first transaction rereads the row, getting different values the second time (a "non-repeatable read").

### 104.4.38 TRANSACTION_SERIALIZABLE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A constant indicating that dirty reads, non-repeatable reads and phantom reads are prevented.
**Notes:** This level includes the prohibitions in TRANSACTION_REPEATABLE_READ and further prohibits the situation where one transaction reads all rows that satisfy a WHERE condition, a second transaction inserts a row that satisfies that WHERE condition, and the first transaction rereads for the same condition, retrieving the additional "phantom" row in the second read.

### 104.4.39 typeARRAY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type ARRAY.

### 104.4.40 typeBIGINT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type BIGINT.
**Example:**

```
dim d as JavaConnectionMBS
MsgBox str(d.typeBIGINT)
```

### 104.4.41 typeBINARY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type BINARY.

### 104.4.42 typeBIT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type BIT.

### 104.4.43 typeBLOB as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type BLOB.

### 104.4.44 typeCHAR as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type CHAR.

### 104.4.45 typeCLOB as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type CLOB.

### 104.4.46 typeDATE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type DATE.

### 104.4.47 typeDECIMAL as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type DECIMAL.

### 104.4.48 typeDISTINCT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type DISTINCT.

### 104.4.49 typeDOUBLE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type DOUBLE.

### 104.4.50 typeFLOAT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type FLOAT.

### 104.4.51 typeINTEGER as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type INTEGER.

### 104.4.52 typeJAVA_OBJECT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type JAVA_OBJECT.

### 104.4.53 typeLONGVARBINARY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type LONGVARBINARY.

### 104.4.54 typeLONGVARCHAR as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type LONGVARCHAR.

### 104.4.55 typeNULL as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type NULL.

### 104.4.56 typeNUMERIC as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type NUMERIC.

### 104.4.57 typeOTHER as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language that indicates that the SQL type is database-specific and gets mapped to a Java object that can be accessed via the methods getObject and setObject.

### 104.4.58 typeREAL as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type REAL.

### 104.4.59 typeREF as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type REF.

### 104.4.60 typeSMALLINT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type SMALLINT.

### 104.4.61 typeSTRUCT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type STRUCT.

### 104.4.62 typeTIME as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type TIME.

### 104.4.63 typeTIMESTAMP as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type TIMESTAMP.

### 104.4.64 typeTINYINT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type TINYINT.

### 104.4.65 typeVARBINARY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type VARBINARY.

### 104.4.66 typeVARCHAR as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant in the Java programming language, sometimes referred to as a type code, that identifies the generic SQL type VARCHAR.

### 104.4.67 TYPE_FORWARD_ONLY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object whose cursor may move only forward.

### 104.4.68 TYPE_SCROLL_INSENSITIVE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object that is scrollable but generally not sensitive to changes made by others.

### 104.4.69 TYPE_SCROLL_SENSITIVE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object that is scrollable and generally sensitive to changes made by others.

### 104.4.70 Properties

### 104.4.71 AutoCommit as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current auto-commit state.
**Notes:** See the java documentation for details on java.sql.Connection.SetAutoCommit.
(Read and Write computed property)

### 104.4.72 Catalog as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets or gets the given catalog name in order to select a subspace of this Connection object's database in which to work.
**Notes:** If the driver does not support catalogs, it will silently ignore this request.
(Read and Write computed property)

### 104.4.73 Holdability as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Changes or retrieves the holdability of ResultSet objects created using this Connection object to the given holdability.
**Notes:** Parameters:
holdability - a ResultSet holdability constant; one of ResultSet.HOLD_CURSORS_OVER_COMMIT or

ResultSet.CLOSE_CURSORS_AT_COMMIT
(Read and Write computed property)

### 104.4.74 ReadOnly as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether this connection in read-only mode as a hint to enable database optimizations.
**Notes:** See the java documentation for details on java.sql.Connection.SetReadOnly.
(Read and Write computed property)

### 104.4.75 TransactionIsolation as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to change the transaction isolation level for this Connection object to the one given.
**Notes:** The constants defined in the interface Connection are the possible transaction isolation levels.
Note: If this method is called during a transaction, the result is implementation-defined.

Parameters:
level - one of the following Connection constants: Connection.TRANSACTION_READ_UNCOMMITTED, Connection.TRANSACTION_READ_COMMITTED, Connection.TRANSACTION_REPEATABLE_READ, or Connection.TRANSACTION_SERIALIZABLE. (Note that Connection.TRANSACTION_NONE cannot be used because it specifies that transactions are not supported.)
(Read and Write computed property)

## 104.5 class JavaDatabaseMBS

### 104.5.1 class JavaDatabaseMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class to handle database access using JDBC drivers.
**Notes:** This class is not a subclass of RB's database class, so you can use it with Xojo Standard Edition.

Nearly all methods on this class can raise java exceptions which you can get using the error property. (and errorstring and errorcode)

Add Linux support plugin version 8.7.

Please make sure this Java VM object stays alive until you are done with all your java stuff. So all the java objects go away and this vm object is destroyed on the end. Because if some java code is still running like an background java thread, quitting the VM can lead into crashes.
Subclass of the JavaObjectMBS class.
**Blog Entries**

- Prefetching records from databases
- Encrypted Access database in Xojo
- MBS Real Studio Plugins, version 12.1pr6
- MonkeyBread Software Releases the MBS Plugins 8.3

### 104.5.2 Methods

### 104.5.3 connect(url as string) as JavaConnectionMBS

MBS Java Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Connects directly to the database calling the Drivers's connect method.
**Notes:** While getConnection calls DriverManager, this calls directly the driver.

Attempts to make a database connection to the given URL. The driver should return "null" if it realizes it is the wrong kind of driver to connect to the given URL. This will be common, as when the JDBC driver manager is asked to connect to a given URL it passes the URL to each loaded driver in turn.
The driver should throw an SQLException if it is the right driver to connect to the given URL but has trouble connecting to the database.

The java.util.Properties argument can be used to pass arbitrary string tag/value pairs as connection arguments. Normally at least "user" and "password" properties should be included in the Properties object. (the plugin passes empty Properties object)

url - the URL of the database to which to connect

Returns a Connection object that represents a connection to the URL
Throws SQLException - if a database access error occurs

### 104.5.4 Constructor(vm as JavaVMMBS, driverclass as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new java database object.
**Example:**

```
dim vm as JavaVMMBS // your VM
dim db as JavaDatabaseMBS

db=new JavaDatabaseMBS(vm,"com.mysql.jdbc.Driver")
```

**Notes:** The driverclass is the name of the main class of the jdbc driver.

### 104.5.5 getConnection(url as string) as JavaConnectionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to establish a connection to the given database URL.
**Example:**

```
dim d as JavaDatabaseMBS
dim c as JavaConnectionMBS

// get database

// connect to Oracle database using service name:
c=d.getConnection("jdbc:oracle:thin:@//192.168.10.20:1521/adbprod","user","pw")

// connect with SID:
c=d.getConnection("jdbc:oracle:thin:@192.168.10.20:1521:adbprod","user","pw")
```

**Notes:** The DriverManager attempts to select an appropriate driver from the set of registered JDBC drivers.

Parameters:
url - a database url of the form jdbc:subprotocol:subname
Returns:
a connection to the URL
See also:

- 104.5.6 getConnection(url as string, username as string, password as string) as JavaConnectionMBS 16131

### 104.5.6 getConnection(url as string, username as string, password as string) as JavaConnectionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to establish a connection to the given database URL.
**Example:**

```
dim d as JavaDatabaseMBS
dim c as JavaConnectionMBS

// get database

// connect to Oracle database using service name:
c=d.getConnection("jdbc:oracle:thin:@//192.168.10.20:1521/adbprod","user","pw")

// connect with SID:
c=d.getConnection("jdbc:oracle:thin:@192.168.10.20:1521:adbprod","user","pw")
```

**Notes:** The DriverManager attempts to select an appropriate driver from the set of registered JDBC drivers.

Parameters:
url - a database url of the form jdbc:subprotocol:subname
user - the database user on whose behalf the connection is being made
password - the user's password

Returns:
a connection to the URL
See also:

- 104.5.5 getConnection(url as string) as JavaConnectionMBS 16130

### 104.5.7 IsDriverLoaded as Boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether a driver has been loaded.

### 104.5.8 println(message as string)

MBS Java Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Prints a message to the current JDBC log stream.

### 104.5.9 Properties

### 104.5.10 LoginTimeout as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum time in seconds that a driver will wait while attempting to connect to a database.
**Notes:** The login time limit in seconds.
(Read and Write computed property)

## 104.6 class JavaDatabaseMetaDataMBS

### 104.6.1 class JavaDatabaseMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Comprehensive information about the database as a whole.
**Notes:** This interface is implemented by driver vendors to let users know the capabilities of a Database Management System (DBMS) in combination with the driver based on JDBCTM technology ("JDBC driver") that is used with it. Different relational DBMSs often support different features, implement features in different ways, and use different data types. In addition, a driver may implement a feature on top of what the DBMS offers. Information returned by methods in this interface applies to the capabilities of a particular driver and a particular DBMS working together. Note that as used in this documentation, the term "database" is used generically to refer to both the driver and DBMS.

A user for this interface is commonly a tool that needs to discover how to deal with the underlying DBMS. This is especially true for applications that are intended to be used with more than one DBMS. For example, a tool might use the method getTypeInfo to find out what data types can be used in a CREATE TABLE statement. Or a user might call the method supportsCorrelatedSubqueries to see if it is possible to use a correlated subquery or supportsBatchUpdates to see if it is possible to use batch updates.

Some DatabaseMetaData methods return lists of information in the form of ResultSet objects. Regular ResultSet methods, such as getString and getInt, can be used to retrieve the data from these ResultSet objects. If a given form of metadata is not available, the ResultSet getter methods throw an SQLException.

Some DatabaseMetaData methods take arguments that are String patterns. These arguments all have names such as fooPattern. Within a pattern String, "%" means match any substring of 0 or more characters, and "_" means match any one character. Only metadata entries matching the search pattern are returned. If a search pattern argument is set to null, that argument's criterion will be dropped from the search.

A method that gets information about a feature that the driver does not support will throw an SQLException. In the case of methods that return a ResultSet object, either a ResultSet object (which may be empty) is returned or an SQLException is thrown.
Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.6.2 Methods

### 104.6.3 allProceduresAreCallable as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the current user can call all the procedures returned by the method getProcedures.
**Notes:** Returns true if so; false otherwise

### 104.6.4 allTablesAreSelectable as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the current user can use all the tables returned by the method getTables in a SELECT statement.
**Notes:** Returns true if so; false otherwise

### 104.6.5 attributeNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that NULL values might not be allowed.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getAttributes.

### 104.6.6 attributeNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that NULL values are definitely allowed.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getAttributes.

### 104.6.7 attributeNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that whether NULL values are allowed is not known.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getAttributes.

### 104.6.8 bestRowNotPseudo as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the best row identifier is NOT a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.9 bestRowPseudo as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the best row identifier is a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.10 bestRowSession as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the scope of the best row identifier is the remainder of the current session.
**Notes:** A possible value for the column SCOPE in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.11 bestRowTemporary as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the scope of the best row identifier is very temporary, lasting only while the row is being used.
**Notes:** A possible value for the column SCOPE in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.12 bestRowTransaction as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the scope of the best row identifier is the remainder of the current transaction.
**Notes:** A possible value for the column SCOPE in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.13 bestRowUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the best row identifier may or may not be a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getBestRowIdentifier.

### 104.6.14 columnNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column might not allow NULL values.
**Notes:** A possible value for the column NULLABLE in the ResultSet returned by the method getColumns.

### 104.6.15 columnNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column definitely allows NULL values.
**Notes:** A possible value for the column NULLABLE in the ResultSet returned by the method getColumns.

### 104.6.16 columnNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the nullability of columns is unknown.
**Notes:** A possible value for the column NULLABLE in the ResultSet returned by the method getColumns.

### 104.6.17 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.6.18 dataDefinitionCausesTransactionCommit as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a data definition statement within a transaction forces the transaction to commit.

### 104.6.19 dataDefinitionIgnoredInTransactions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database ignores a data definition statement within a transaction.

### 104.6.20 deletesAreDetected(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether or not a visible row delete can be detected by calling the method ResultSet.rowDeleted.
**Notes:** If the method deletesAreDetected returns false, it means that deleted rows are removed from the result set.

Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if deletes are detected by the given result set type; false otherwise

### 104.6.21 doesMaxRowSizeIncludeBlobs as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the return value for the method getMaxRowSize includes the SQL data types LONGVARCHAR and LONGVARBINARY.
**Notes:** Returns true if so; false otherwise.

### 104.6.22 getAttributes(catalog as string, schemaPattern as string, typeNamePattern as string, attributeNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the given attribute of the given type for a user-defined type (UDT) that is available in the given schema and catalog.
**Notes:** Descriptions are returned only for attributes of UDTs matching the catalog, schema, type, and attribute name criteria. They are ordered by TYPE_SCHEM, TYPE_NAME and ORDINAL_POSITION. This description does not contain inherited attributes.

The ResultSet object that is returned has the following columns:

TYPE_CAT String =>type catalog (may be null)
TYPE_SCHEM String =>type schema (may be null)
TYPE_NAME String =>type name
ATTR_NAME String =>attribute name
DATA_TYPE int =>attribute type SQL type from java.sql.Types
ATTR_TYPE_NAME String =>Data source dependent type name. For a UDT, the type name is fully qualified. For a REF, the type name is fully qualified and represents the target type of the reference type.
ATTR_SIZE int =>column size. For char or date types this is the maximum number of characters; for numeric or decimal types this is precision.
DECIMAL_DIGITS int =>the number of fractional digits
NUM_PREC_RADIX int =>Radix (typically either 10 or 2)
NULLABLE int =>whether NULL is allowed
attributeNoNulls - might not allow NULL values
attributeNullable - definitely allows NULL values
attributeNullableUnknown - nullability unknown
REMARKS String =>comment describing column (may be null)
ATTR_DEF String =>default value (may be null)
SQL_DATA_TYPE int =>unused
SQL_DATETIME_SUB int =>unused
CHAR_OCTET_LENGTH int =>for char types the maximum number of bytes in the column

IS_NULLABLE String =>”false” means column definitely does not allow NULL values; ”true” means the

ORDINAL_POSITION int =>index of column in table (starting at 1)

column might allow NULL values. An empty string means unknown.
SCOPE_CATALOG String =>catalog of table that is the scope of a reference attribute (null if DATA_TYPE isn't REF)
SCOPE_SCHEMA String =>schema of table that is the scope of a reference attribute (null if DATA_TYPE isn't REF)
SCOPE_TABLE String =>table name that is the scope of a reference attribute (null if the DATA_TYPE isn't REF)
SOURCE_DATA_TYPE short =>source type of a distinct type or user-generated Ref type,SQL type from java.sql.Types (null if DATA_TYPE isn't DISTINCT or user-generated REF)
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
typeNamePattern - a type name pattern; must match the type name as it is stored in the database
attributeNamePattern - an attribute name pattern; must match the attribute name as it is declared in the database

Returns:
a ResultSet object in which each row is an attribute description

Throws:
SQLException - if a database access error occurs

### 104.6.23 getCatalogs as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the catalog names available in this database. The results are ordered by catalog name.
**Notes:** The catalog column is:

TABLE_CAT String =>catalog name

Returns:
a ResultSet object in which each row has a single String column that is a catalog name

Throws:
SQLException - if a database access error occurs

### 104.6.24 getCatalogSeparator as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the String that this database uses as the separator between a catalog and table name.

### 104.6.25 getCatalogTerm as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the database vendor's preferred term for "catalog".

### 104.6.26 getColumnPrivileges(catalog as string, schema as string, table as string, columnNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the access rights for a table's columns.
**Notes:** Only privileges matching the column name criteria are returned. They are ordered by COLUMN_NAME and PRIVILEGE.

Each privilige description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)
TABLE_NAME String =>table name
COLUMN_NAME String =>column name
GRANTOR =>grantor of access (may be null)
GRANTEE String =>grantee of access
PRIVILEGE String =>name of access (SELECT, INSERT, UPDATE, REFRENCES, ...)
IS_GRANTABLE String =>"true" if grantee is permitted to grant to others; "false" if not; null if unknown
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
table - a table name; must match the table name as it is stored in the database
columnNamePattern - a column name pattern; must match the column name as it is stored in the database

Returns:

ResultSet - each row is a column privilege description

Throws:
SQLException - if a database access error occurs

### 104.6.27 getColumns(catalog as string, schemaPattern as string, tableNamePattern as string, columnNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of table columns available in the specified catalog.
**Notes:** Only column descriptions matching the catalog, schema, table and column name criteria are returned. They are ordered by TABLE_SCHEM, TABLE_NAME, and ORDINAL_POSITION.

Each column description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)
TABLE_NAME String =>table name
COLUMN_NAME String =>column name
DATA_TYPE int =>SQL type from java.sql.Types
TYPE_NAME String =>Data source dependent type name, for a UDT the type name is fully qualified
COLUMN_SIZE int =>column size. For char or date types this is the maximum number of characters, for numeric or decimal types this is precision.
BUFFER_LENGTH is not used.
DECIMAL_DIGITS int =>the number of fractional digits
NUM_PREC_RADIX int =>Radix (typically either 10 or 2)
NULLABLE int =>is NULL allowed.
columnNoNulls - might not allow NULL values
columnNullable - definitely allows NULL values
columnNullableUnknown - nullability unknown
REMARKS String =>comment describing column (may be null)
COLUMN_DEF String =>default value (may be null)
SQL_DATA_TYPE int =>unused
SQL_DATETIME_SUB int =>unused
CHAR_OCTET_LENGTH int =>for char types the maximum number of bytes in the column

ORDINAL_POSITION int =>index of column in table (starting at 1)

IS_NULLABLE String =>"false" means column definitely does not allow NULL values; "true" means the column might allow NULL values. An empty string means nobody knows.
SCOPE_CATLOG String =>catalog of table that is the scope of a reference attribute (null if DATA_TYPE

isn't REF)
SCOPE_SCHEMA String =>schema of table that is the scope of a reference attribute (null if the DATA_TYPE isn't REF)
SCOPE_TABLE String =>table name that this the scope of a reference attribure (null if the DATA_TYPE isn't REF)
SOURCE_DATA_TYPE short =>source type of a distinct type or user-generated Ref type, SQL type from java.sql.Types (null if DATA_TYPE isn't DISTINCT or user-generated REF)
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
tableNamePattern - a table name pattern; must match the table name as it is stored in the database
columnNamePattern - a column name pattern; must match the column name as it is stored in the database

Returns:
ResultSet - each row is a column description

Throws:
SQLException - if a database access error occurs

### 104.6.28 getConnection as JavaConnectionMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the connection that produced this metadata object.

### 104.6.29 getCrossReference(primaryCatalog as string, primarySchema as string, primaryTable as string, foreignCatalog as string, foreignSchema as string, foreignTable as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the foreign key columns in the given foreign key table that reference the primary key columns of the given primary key table (describe how one table imports another's key).
**Notes:** This should normally return a single foreign key/primary key pair because most tables import a foreign key from a table only once. They are ordered by FKTABLE_CAT, FKTABLE_SCHEM, FKTABLE_NAME, and KEY_SEQ.
Each foreign key column description has the following columns:

PKTABLE_CAT String =>primary key table catalog (may be null)
PKTABLE_SCHEM String =>primary key table schema (may be null)
PKTABLE_NAME String =>primary key table name
PKCOLUMN_NAME String =>primary key column name
FKTABLE_CAT String =>foreign key table catalog (may be null) being exported (may be null)
FKTABLE_SCHEM String =>foreign key table schema (may be null) being exported (may be null)
FKTABLE_NAME String =>foreign key table name being exported
FKCOLUMN_NAME String =>foreign key column name being exported
KEY_SEQ short =>sequence number within foreign key
UPDATE_RULE short =>What happens to foreign key when primary is updated:
importedNoAction - do not allow update of primary key if it has been imported
importedKeyCascade - change imported key to agree with primary key update
importedKeySetNull - change imported key to NULL if its primary key has been updated
importedKeySetDefault - change imported key to default values if its primary key has been updated
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
DELETE_RULE short =>What happens to the foreign key when primary is deleted.
importedKeyNoAction - do not allow delete of primary key if it has been imported
importedKeyCascade - delete rows that import a deleted key
importedKeySetNull - change imported key to NULL if its primary key has been deleted
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
importedKeySetDefault - change imported key to default if its primary key has been deleted
FK_NAME String =>foreign key name (may be null)
PK_NAME String =>primary key name (may be null)
DEFERRABILITY short =>can the evaluation of foreign key constraints be deferred until commit
importedKeyInitiallyDeferred - see SQL92 for definition
importedKeyInitiallyImmediate - see SQL92 for definition
importedKeyNotDeferrable - see SQL92 for definition
Parameters:
primaryCatalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means drop catalog name from the selection criteria
primarySchema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means drop schema name from the selection criteria
primaryTable - the name of the table that exports the key; must match the table name as it is stored in the database
foreignCatalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means drop catalog name from the selection criteria
foreignSchema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means drop schema name from the selection criteria
foreignTable - the name of the table that imports the key; must match the table name as it is stored in the database
Returns:
ResultSet - each row is a foreign key column description
Throws:
SQLException - if a database access error occurs

### 104.6.30 getDatabaseMajorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the major version number of the underlying database.

### 104.6.31 getDatabaseMinorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the minor version number of the underlying database.

### 104.6.32 getDatabaseProductName as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of this database product.

### 104.6.33 getDatabaseProductVersion as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the version number of this database product.

### 104.6.34 getDefaultTransactionIsolation as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves this database's default transaction isolation level.
**Notes:** The possible values are defined in java.sql.Connection.

### 104.6.35 getDriverMajorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves this JDBC driver's major version number.

### 104.6.36 getDriverMinorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves this JDBC driver's minor version number.

### 104.6.37 getDriverName as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of this JDBC driver.

### 104.6.38 getDriverVersion as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the version number of this JDBC driver as a String.

### 104.6.39 getExportedKeys(catalog as string, schema as string, table as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the foreign key columns that reference the given table's primary key columns (the foreign keys exported by a table).
**Notes:** They are ordered by FKTABLE_CAT, FKTABLE_SCHEM, FKTABLE_NAME, and KEY_SEQ. Each foreign key column description has the following columns:

PKTABLE_CAT String =>primary key table catalog (may be null)
PKTABLE_SCHEM String =>primary key table schema (may be null)
PKTABLE_NAME String =>primary key table name
PKCOLUMN_NAME String =>primary key column name
FKTABLE_CAT String =>foreign key table catalog (may be null) being exported (may be null)
FKTABLE_SCHEM String =>foreign key table schema (may be null) being exported (may be null)
FKTABLE_NAME String =>foreign key table name being exported

FKCOLUMN_NAME String =>foreign key column name being exported
KEY_SEQ short =>sequence number within foreign key
UPDATE_RULE short =>What happens to foreign key when primary is updated:
importedNoAction - do not allow update of primary key if it has been imported
importedKeyCascade - change imported key to agree with primary key update
importedKeySetNull - change imported key to NULL if its primary key has been updated
importedKeySetDefault - change imported key to default values if its primary key has been updated
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
DELETE_RULE short =>What happens to the foreign key when primary is deleted.
importedKeyNoAction - do not allow delete of primary key if it has been imported
importedKeyCascade - delete rows that import a deleted key
importedKeySetNull - change imported key to NULL if its primary key has been deleted
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
importedKeySetDefault - change imported key to default if its primary key has been deleted
FK_NAME String =>foreign key name (may be null)
PK_NAME String =>primary key name (may be null)
DEFERRABILITY short =>can the evaluation of foreign key constraints be deferred until commit
importedKeyInitiallyDeferred - see SQL92 for definition
importedKeyInitiallyImmediate - see SQL92 for definition
importedKeyNotDeferrable - see SQL92 for definition

Parameters:
catalog - a catalog name; must match the catalog name as it is stored in this database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
table - a table name; must match the table name as it is stored in this database

Returns:
a ResultSet object in which each row is a foreign key column description

Throws:
SQLException - if a database access error occurs

### 104.6.40 getExtraNameCharacters as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves all the "extra" characters that can be used in unquoted identifier names (those beyond a-z, A-Z, 0-9 and _).

### 104.6.41 getIdentifierQuoteString as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the string used to quote SQL identifiers. This method returns a space " " if identifier quoting is not supported.

### 104.6.42 getImportedKeys(catalog as string, schema as string, table as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the primary key columns that are referenced by a table's foreign key columns (the primary keys imported by a table).
**Notes:** They are ordered by PKTABLE_CAT, PKTABLE_SCHEM, PKTABLE_NAME, and KEY_SEQ. Each primary key column description has the following columns:

PKTABLE_CAT String =>primary key table catalog being imported (may be null)
PKTABLE_SCHEM String =>primary key table schema being imported (may be null)
PKTABLE_NAME String =>primary key table name being imported
PKCOLUMN_NAME String =>primary key column name being imported
FKTABLE_CAT String =>foreign key table catalog (may be null)
FKTABLE_SCHEM String =>foreign key table schema (may be null)
FKTABLE_NAME String =>foreign key table name
FKCOLUMN_NAME String =>foreign key column name
KEY_SEQ short =>sequence number within a foreign key
UPDATE_RULE short =>What happens to a foreign key when the primary key is updated:
importedNoAction - do not allow update of primary key if it has been imported
importedKeyCascade - change imported key to agree with primary key update
importedKeySetNull - change imported key to NULL if its primary key has been updated
importedKeySetDefault - change imported key to default values if its primary key has been updated
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
DELETE_RULE short =>What happens to the foreign key when primary is deleted.
importedKeyNoAction - do not allow delete of primary key if it has been imported
importedKeyCascade - delete rows that import a deleted key
importedKeySetNull - change imported key to NULL if its primary key has been deleted
importedKeyRestrict - same as importedKeyNoAction (for ODBC 2.x compatibility)
importedKeySetDefault - change imported key to default if its primary key has been deleted
FK_NAME String =>foreign key name (may be null)
PK_NAME String =>primary key name (may be null)
DEFERRABILITY short =>can the evaluation of foreign key constraints be deferred until commit
importedKeyInitiallyDeferred - see SQL92 for definition
importedKeyInitiallyImmediate - see SQL92 for definition
importedKeyNotDeferrable - see SQL92 for definition

Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
table - a table name; must match the table name as it is stored in the database

Returns:
ResultSet - each row is a primary key column description

Throws:
SQLException - if a database access error occurs

### 104.6.43 getJDBCMajorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the major JDBC version number for this driver.

### 104.6.44 getJDBCMinorVersion as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the minor JDBC version number for this driver.

### 104.6.45 getMaxBinaryLiteralLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of hex characters this database allows in an inline binary literal.
**Notes:** Returns the maximum length (in hex characters) for a binary literal; a result of zero means that there is no limit or the limit is not known

### 104.6.46 getMaxCatalogNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters that this database allows in a catalog name.
**Notes:** Returns the maximum number of characters allowed in a catalog name; a result of zero means that there is no limit or the limit is not known

### 104.6.47 getMaxCharLiteralLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters this database allows for a character literal.
**Notes:** Returns the maximum number of characters allowed for a character literal; a result of zero means that there is no limit or the limit is not known

### 104.6.48 getMaxColumnNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters this database allows for a column name.
**Notes:** Returns the maximum number of characters allowed for a column name; a result of zero means that there is no limit or the limit is not known

### 104.6.49 getMaxColumnsInGroupBy as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of columns this database allows in a GROUP BY clause.
**Notes:** Returns the maximum number of columns allowed; a result of zero means that there is no limit or the limit is not known

### 104.6.50 getMaxColumnsInIndex as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of columns this database allows in an index.
**Notes:** Returns the maximum number of columns allowed; a result of zero means that there is no limit or the limit is not known

### 104.6.51 getMaxColumnsInOrderBy as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of columns this database allows in an ORDER BY clause.
**Notes:** Returns the maximum number of columns allowed; a result of zero means that there is no limit or the limit is not known

### 104.6.52 getMaxColumnsInSelect as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of columns this database allows in a SELECT list.
**Notes:** Returns the maximum number of columns allowed; a result of zero means that there is no limit or the limit is not known

### 104.6.53 getMaxColumnsInTable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of columns this database allows in a table.
**Notes:** Returns the maximum number of columns allowed; a result of zero means that there is no limit or the limit is not known

### 104.6.54 getMaxConnections as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of concurrent connections to this database that are possible.
**Notes:** Returns the maximum number of active connections possible at one time; a result of zero means that there is no limit or the limit is not known

### 104.6.55 getMaxCursorNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters that this database allows in a cursor name.
**Notes:** Returns the maximum number of characters allowed in a cursor name; a result of zero means that there is no limit or the limit is not known

### 104.6.56 getMaxIndexLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of bytes this database allows for an index, including all of the parts of the index.
**Notes:** Returns the maximum number of bytes allowed; this limit includes the composite of all the constituent parts of the index; a result of zero means that there is no limit or the limit is not known

### 104.6.57 getMaxProcedureNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters that this database allows in a procedure name.
**Notes:** Returns the maximum number of characters allowed in a procedure name; a result of zero means that there is no limit or the limit is not known

### 104.6.58 getMaxRowSize as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of bytes this database allows in a single row.
**Notes:** Returns the maximum number of bytes allowed for a row; a result of zero means that there is no limit or the limit is not known

### 104.6.59 getMaxSchemaNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters that this database allows in a schema name.
**Notes:** Returns the maximum number of characters allowed in a schema name; a result of zero means that there is no limit or the limit is not known

### 104.6.60 getMaxStatementLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters this database allows in an SQL statement.
**Notes:** Returns the maximum number of characters allowed for an SQL statement; a result of zero means that there is no limit or the limit is not known

### 104.6.61 getMaxStatements as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of active statements to this database that can be open at the same time.
**Notes:** Returns the maximum number of statements that can be open at one time; a result of zero means that there is no limit or the limit is not known

### 104.6.62 getMaxTableNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters this database allows in a table name.
**Notes:** Returns the maximum number of characters allowed for a table name; a result of zero means that there is no limit or the limit is not known

### 104.6.63 getMaxTablesInSelect as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of tables this database allows in a SELECT statement.
**Notes:** Returns the maximum number of tables allowed in a SELECT statement; a result of zero means that there is no limit or the limit is not known

### 104.6.64 getMaxUserNameLength as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the maximum number of characters this database allows in a user name.
**Notes:** Returns the maximum number of characters allowed for a user name; a result of zero means that there is no limit or the limit is not known

### 104.6.65 getNumericFunctions as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a comma-separated list of math functions available with this database.
**Notes:** These are the Open /Open CLI math function names used in the JDBC function escape clause.

### 104.6.66 getPrimaryKeys(catalog as string, schema as string, table as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the given table's primary key columns. They are ordered by COLUMN_NAME.
**Notes:** Each primary key column description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)
TABLE_NAME String =>table name
COLUMN_NAME String =>column name
KEY_SEQ short =>sequence number within primary key
PK_NAME String =>primary key name (may be null)
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
table - a table name; must match the table name as it is stored in the database

Returns:
ResultSet - each row is a primary key column description

### 104.6.67 getProcedureColumns(catalog as string, schemaPattern as string, procedureNamePattern as string, columnNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the given catalog's stored procedure parameter and result columns.
**Notes:** Only descriptions matching the schema, procedure and parameter name criteria are returned. They are ordered by PROCEDURE_SCHEM and PROCEDURE_NAME. Within this, the return value, if any, is first. Next are the parameter descriptions in call order. The column descriptions follow in column number order.

Each row in the ResultSet is a parameter description or column description with the following fields:

PROCEDURE_CAT String =>procedure catalog (may be null)
PROCEDURE_SCHEM String =>procedure schema (may be null)
PROCEDURE_NAME String =>procedure name
COLUMN_NAME String =>column/parameter name
COLUMN_TYPE Short =>kind of column/parameter:
procedureColumnUnknown - nobody knows
procedureColumnIn - IN parameter
procedureColumnInOut - INOUT parameter
procedureColumnOut - OUT parameter
procedureColumnReturn - procedure return value
procedureColumnResult - result column in ResultSet
DATA_TYPE int =>SQL type from java.sql.Types
TYPE_NAME String =>SQL type name, for a UDT type the type name is fully qualified
PRECISION int =>precision
LENGTH int =>length in bytes of data
SCALE short =>scale
RADIX short =>radix
NULLABLE short =>can it contain NULL.
procedureNoNulls - does not allow NULL values
procedureNullable - allows NULL values
procedureNullableUnknown - nullability unknown
REMARKS String =>comment describing parameter/column
Note: Some databases may not return the column descriptions for a procedure. Additional columns beyond REMARKS can be defined by the database.

Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
procedureNamePattern - a procedure name pattern; must match the procedure name as it is stored in the

database
columnNamePattern - a column name pattern; must match the column name as it is stored in the database
Returns:
ResultSet - each row describes a stored procedure parameter or column
Throws:
SQLException - if a database access error occurs

### 104.6.68 getProcedures(catalog as string, schemaPattern as string, procedureNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the stored procedures available in the given catalog.
**Notes:** Only procedure descriptions matching the schema and procedure name criteria are returned. They are ordered by PROCEDURE_SCHEM and PROCEDURE_NAME.

Each procedure description has the the following columns:

PROCEDURE_CAT String =>procedure catalog (may be null)
PROCEDURE_SCHEM String =>procedure schema (may be null)
PROCEDURE_NAME String =>procedure name
reserved for future use
reserved for future use
reserved for future use
REMARKS String =>explanatory comment on the procedure
PROCEDURE_TYPE short =>kind of procedure:
procedureResultUnknown - May return a result
procedureNoResult - Does not return a result
procedureReturnsResult - Returns a result
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
procedureNamePattern - a procedure name pattern; must match the procedure name as it is stored in the database

Returns:
ResultSet - each row is a procedure description

Throws:
SQLException - if a database access error occurs

### 104.6.69 getProcedureTerm as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the database vendor's preferred term for "procedure".

### 104.6.70 getResultSetHoldability as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the default holdability of this ResultSet object.
**Notes:** Returns:
the default holdability; either ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT

### 104.6.71 getSchemas as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the schema names available in this database.
**Notes:** The results are ordered by schema name.

The schema column is:

TABLE_SCHEM String =>schema name
TABLE_CATALOG String =>catalog name (may be null)
Returns:
a ResultSet object in which each row is a schema decription

Throws:
SQLException - if a database access error occurs

### 104.6.72 getSchemaTerm as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the database vendor's preferred term for "schema".

### 104.6.73 getSearchStringEscape as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the string that can be used to escape wildcard characters.
**Notes:** This is the string that can be used to escape '_' or '%' in the catalog search parameters that are a pattern (and therefore use one of the wildcard characters).
The '_' character represents any single character; the '%' character represents any sequence of zero or more characters.

### 104.6.74 getSQLKeywords as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a comma-separated list of all of this database's SQL keywords that are NOT also SQL92 keywords.

### 104.6.75 getSQLStateType as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the SQLSTATE returned by SQLException.getSQLState is X/Open (now known as Open Group) SQL CLI or SQL99.
**Notes:** Returns:
the type of SQLSTATE; one of: sqlStateXOpen or sqlStateSQL99

### 104.6.76 getStringFunctions as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a comma-separated list of string functions available with this database.
**Notes:** These are the Open Group CLI string function names used in the JDBC function escape clause.

### 104.6.77 getSuperTables(catalog as string, schemaPattern as string, tableNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the table hierarchies defined in a particular schema in this database.
**Notes:** Only supertable information for tables matching the catalog, schema and table name are returned. The table name parameter may be a fully- qualified name, in which case, the catalog and schemaPattern parameters are ignored. If a table does not have a super table, it is not listed here. Supertables have to be defined in the same catalog and schema as the sub tables. Therefore, the type description does not need to include this information for the supertable.

Each type description has the following columns:

TABLE_CAT String =>the type's catalog (may be null)
TABLE_SCHEM String =>type's schema (may be null)
TABLE_NAME String =>type name
SUPERTABLE_NAME String =>the direct super type's name
Note: If the driver does not support type hierarchies, an empty result set is returned.

Parameters:
catalog - a catalog name; "" retrieves those without a catalog; null means drop catalog name from the selection criteria
schemaPattern - a schema name pattern; "" retrieves those without a schema
tableNamePattern - a table name pattern; may be a fully-qualified name

Returns:
a ResultSet object in which each row is a type description

Throws:
SQLException - if a database access error occurs

### 104.6.78 getSuperTypes(catalog as string, schemaPattern as string, typeNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the user-defined type (UDT) hierarchies defined in a particular schema in this database.
**Notes:** Only the immediate super type/ sub type relationship is modeled.
Only supertype information for UDTs matching the catalog, schema, and type name is returned. The type

name parameter may be a fully-qualified name. When the UDT name supplied is a fully-qualified name, the catalog and schemaPattern parameters are ignored.

If a UDT does not have a direct super type, it is not listed here. A row of the ResultSet object returned by this method describes the designated UDT and a direct supertype. A row has the following columns:

TYPE_CAT String =>the UDT's catalog (may be null)
TYPE_SCHEM String =>UDT's schema (may be null)
TYPE_NAME String =>type name of the UDT
SUPERTYPE_CAT String =>the direct super type's catalog (may be null)
SUPERTYPE_SCHEM String =>the direct super type's schema (may be null)
SUPERTYPE_NAME String =>the direct super type's name
Note: If the driver does not support type hierarchies, an empty result set is returned.

Parameters:
catalog - a catalog name; "" retrieves those without a catalog; null means drop catalog name from the selection criteria
schemaPattern - a schema name pattern; "" retrieves those without a schema
typeNamePattern - a UDT name pattern; may be a fully-qualified name

Returns:
a ResultSet object in which a row gives information about the designated UDT

Throws:
SQLException - if a database access error occurs

### 104.6.79 getSystemFunctions as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a comma-separated list of system functions available with this database.
**Notes:** These are the Open Group CLI system function names used in the JDBC function escape clause.

### 104.6.80 getTablePrivileges(catalog as string, schemaPattern as string, tableNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the access rights for each table available in a catalog.

**Notes:** Note that a table privilege applies to one or more columns in the table. It would be wrong to assume that this privilege applies to all columns (this may be true for some systems but is not true for all.)
Only privileges matching the schema and table name criteria are returned. They are ordered by TABLE_SCHEM, TABLE_NAME, and PRIVILEGE.

Each privilige description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)
TABLE_NAME String =>table name
GRANTOR =>grantor of access (may be null)
GRANTEE String =>grantee of access
PRIVILEGE String =>name of access (SELECT, INSERT, UPDATE, REFRENCES, ...)
IS_GRANTABLE String =>"true" if grantee is permitted to grant to others; "false" if not; null if unknown
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
tableNamePattern - a table name pattern; must match the table name as it is stored in the database

Returns:
ResultSet - each row is a table privilege description

Throws:
SQLException - if a database access error occurs

### 104.6.81 getTables(catalog as string, schemaPattern as string, tableNamePattern as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the tables available in the given catalog.
**Notes:** Only table descriptions matching the catalog, schema, table name and type criteria are returned. They are ordered by TABLE_TYPE, TABLE_SCHEM and TABLE_NAME.
Each table description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)
TABLE_NAME String =>table name

TABLE_TYPE String =>table type. Typical types are "TABLE", "VIEW", "SYSTEM TABLE", "GLOBAL TEMPORARY", "LOCAL TEMPORARY", "ALIAS", "SYNONYM".

REMARKS String =>explanatory comment on the table
TYPE_CAT String =>the types catalog (may be null)
TYPE_SCHEM String =>the types schema (may be null)
TYPE_NAME String =>type name (may be null)
SELF_REFERENCING_COL_NAME String =>name of the designated "identifier" column of a typed table (may be null)
REF_GENERATION String =>specifies how values in SELF_REFERENCING_COL_NAME are created. Values are "SYSTEM", "USER", "DERIVED". (may be null)
Note: Some databases may not return information for all tables.

Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
tableNamePattern - a table name pattern; must match the table name as it is stored in the database
types - a list of table types to include (optionally)

Returns:
ResultSet - each row is a table description

Throws:
SQLException - if a database access error occurs
See also:

- 104.6.82 getTables(catalog as string, schemaPattern as string, tableNamePattern as string, types() as string) as JavaResultSetMBS 16161

### 104.6.82 getTables(catalog as string, schemaPattern as string, tableNamePattern as string, types() as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of the tables available in the given catalog.
**Notes:** Only table descriptions matching the catalog, schema, table name and type criteria are returned. They are ordered by TABLE_TYPE, TABLE_SCHEM and TABLE_NAME.
Each table description has the following columns:

TABLE_CAT String =>table catalog (may be null)
TABLE_SCHEM String =>table schema (may be null)

TABLE_NAME String =>table name

TABLE_TYPE String =>table type. Typical types are "TABLE", "VIEW", "SYSTEM TABLE", "GLOBAL TEMPORARY", "LOCAL TEMPORARY", "ALIAS", "SYNONYM".

REMARKS String =>explanatory comment on the table
TYPE_CAT String =>the types catalog (may be null)
TYPE_SCHEM String =>the types schema (may be null)
TYPE_NAME String =>type name (may be null)
SELF_REFERENCING_COL_NAME String =>name of the designated "identifier" column of a typed table (may be null)
REF_GENERATION String =>specifies how values in SELF_REFERENCING_COL_NAME are created. Values are "SYSTEM", "USER", "DERIVED". (may be null)
Note: Some databases may not return information for all tables.

Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schemaPattern - a schema name pattern; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
tableNamePattern - a table name pattern; must match the table name as it is stored in the database
types - a list of table types to include (optionally)

Returns:
ResultSet - each row is a table description

Throws:
SQLException - if a database access error occurs
See also:

- 104.6.81 getTables(catalog as string, schemaPattern as string, tableNamePattern as string) as JavaResultSetMBS 16160

### 104.6.83 getTableTypes as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the table types available in this database.
**Notes:** The table type is:

TABLE_TYPE String =>table type. Typical types are "TABLE", "VIEW", "SYSTEM TABLE", "GLOBAL TEMPORARY", "LOCAL TEMPORARY", "ALIAS", "SYNONYM".

Returns:
a ResultSet object in which each row has a single String column that is a table type

Throws:
SQLException - if a database access error occurs

### 104.6.84 getTimeDateFunctions as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a comma-separated list of the time and date functions available with this database.

### 104.6.85 getTypeInfos as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of all the standard SQL types supported by this database.
**Notes:** They are ordered by DATA_TYPE and then by how closely the data type maps to the corresponding JDBC SQL type.

Each type description has the following columns:

TYPE_NAME String =>Type name
DATA_TYPE int =>SQL data type from java.sql.Types
PRECISION int =>maximum precision
LITERAL_PREFIX String =>prefix used to quote a literal (may be null)
LITERAL_SUFFIX String =>suffix used to quote a literal (may be null)
CREATE_PARAMS String =>parameters used in creating the type (may be null)
NULLABLE short =>can you use NULL for this type.
typeNoNulls - does not allow NULL values
typeNullable - allows NULL values
typeNullableUnknown - nullability unknown
CASE_SENSITIVE boolean=>is it case sensitive.
SEARCHABLE short =>can you use "WHERE" based on this type:
typePredNone - No support
typePredChar - Only supported with WHERE .. LIKE
typePredBasic - Supported except for WHERE .. LIKE
typeSearchable - Supported for all WHERE ..
UNSIGNED_ATTRIBUTE boolean =>is it unsigned.
FIXED_PREC_SCALE boolean =>can it be a money value.
AUTO_INCREMENT boolean =>can it be used for an auto-increment value.

LOCAL_TYPE_NAME String =>localized version of type name (may be null)
MINIMUM_SCALE short =>minimum scale supported
MAXIMUM_SCALE short =>maximum scale supported
SQL_DATA_TYPE int =>unused
SQL_DATETIME_SUB int =>unused
NUM_PREC_RADIX int =>usually 2 or 10

Returns:
a ResultSet object in which each row is an SQL type description

Throws:
SQLException - if a database access error occurs

This method is named getTypeInfo in Java and getTypeInfos in this plugin because Xojo has a global method and sees a conflict.

### 104.6.86 getURL as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the URL for this DBMS.
**Notes:** Returns the URL for this DBMS or "" if it cannot be generated.

### 104.6.87 getUserName as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the user name as known to this database.

### 104.6.88 getVersionColumns(catalog as string, schema as string, table as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a description of a table's columns that are automatically updated when any value in a row is updated. They are unordered.
**Notes:** Each column description has the following columns:

SCOPE short =>is not used
COLUMN_NAME String =>column name
DATA_TYPE int =>SQL data type from java.sql.Types
TYPE_NAME String =>Data source-dependent type name
COLUMN_SIZE int =>precision
BUFFER_LENGTH int =>length of column value in bytes

DECIMAL_DIGITS short =>scale

PSEUDO_COLUMN short =>whether this is pseudo column like an Oracle ROWID
versionColumnUnknown - may or may not be pseudo column
versionColumnNotPseudo - is NOT a pseudo column
versionColumnPseudo - is a pseudo column
Parameters:
catalog - a catalog name; must match the catalog name as it is stored in the database; "" retrieves those without a catalog; null means that the catalog name should not be used to narrow the search
schema - a schema name; must match the schema name as it is stored in the database; "" retrieves those without a schema; null means that the schema name should not be used to narrow the search
table - a table name; must match the table name as it is stored in the database

Returns:
a ResultSet object in which each row is a column description

### 104.6.89 importedKeyCascade as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For the column UPDATE_RULE, indicates that when the primary key is updated, the foreign key (imported key) is changed to agree with it.
**Notes:** For the column DELETE_RULE, it indicates that when the primary key is deleted, rows that imported that key are deleted.
A possible value for the columns UPDATE_RULE and DELETE_RULE in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.90 importedKeyInitiallyDeferred as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates deferrability. See SQL-92 for a definition.
**Notes:** A possible value for the column DEFERRABILITY in the ResultSet objects returned by the meth-

ods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.91 importedKeyInitiallyImmediate as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates deferrability. See SQL-92 for a definition.
**Notes:** A possible value for the column DEFERRABILITY in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.92 importedKeyNoAction as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For the columns UPDATE_RULE and DELETE_RULE, indicates that if the primary key has been imported, it cannot be updated or deleted.
**Notes:** A possible value for the columns UPDATE_RULE and DELETE_RULE in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.93 importedKeyNotDeferrable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates deferrability. See SQL-92 for a definition.
**Notes:** A possible value for the column DEFERRABILITY in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.94 importedKeyRestrict as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For the column UPDATE_RULE, indicates that a primary key may not be updated if it has been imported by another table as a foreign key.
**Notes:** For the column DELETE_RULE, indicates that a primary key may not be deleted if it has been imported by another table as a foreign key.
A possible value for the columns UPDATE_RULE and DELETE_RULE in the ResultSet objects returned

by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.95 importedKeySetDefault as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For the columns UPDATE_RULE and DELETE_RULE, indicates that if the primary key is updated or deleted, the foreign key (imported key) is set to the default value.
**Notes:** A possible value for the columns UPDATE_RULE and DELETE_RULE in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.96 importedKeySetNull as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For the columns UPDATE_RULE and DELETE_RULE, indicates that when the primary key is updated or deleted, the foreign key (imported key) is changed to NULL.
**Notes:** A possible value for the columns UPDATE_RULE and DELETE_RULE in the ResultSet objects returned by the methods getImportedKeys, getExportedKeys, and getCrossReference.

### 104.6.97 insertsAreDetected(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether or not a visible row insert can be detected by calling the method ResultSet.rowInserted.
**Notes:** Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if changes are detected by the specified result set type; false otherwise

### 104.6.98 isCatalogAtStart as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog appears at the start of a fully qualified table name. If not, the catalog appears at the end.

### 104.6.99 isReadOnly as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database is in read-only mode.

### 104.6.100 locatorsUpdateCopy as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether updates made to a LOB are made on a copy or directly to the LOB.
**Notes:** Returns:
true if updates are made to a copy of the LOB; false if updates are made directly to the LOB

### 104.6.101 nullPlusNonNullIsNull as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports concatenations between NULL and non-NULL values being NULL.

### 104.6.102 nullsAreSortedAtEnd as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether NULL values are sorted at the end regardless of sort order.

### 104.6.103 nullsAreSortedAtStart as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether NULL values are sorted at the start regardless of sort order.

### 104.6.104 nullsAreSortedHigh as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether NULL values are sorted high.
**Notes:** Sorted high means that NULL values sort higher than any other value in a domain. In an ascending order, if this method returns true, NULL values will appear at the end. By contrast, the method nullsAreSortedAtEnd indicates whether NULL values are sorted at the end regardless of sort order.

### 104.6.105 nullsAreSortedLow as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether NULL values are sorted low.
**Notes:** Sorted low means that NULL values sort lower than any other value in a domain. In an ascending order, if this method returns true, NULL values will appear at the beginning. By contrast, the method nullsAreSortedAtStart indicates whether NULL values are sorted at the beginning regardless of sort order.

### 104.6.106 othersDeletesAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether deletes made by others are visible.
**Notes:** Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if deletes made by others are visible for the given result set type; false otherwise

### 104.6.107 othersInsertsAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether inserts made by others are visible.
**Notes:** Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if inserts made by others are visible for the given result set type; false otherwise

### 104.6.108 othersUpdatesAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether updates made by others are visible.
**Notes:** Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if updates made by others are visible for the given result set type; false otherwise

### 104.6.109 ownDeletesAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a result set's own deletes are visible.
**Notes:** type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns true if deletes are visible for the given result set type; false otherwise

### 104.6.110 ownInsertsAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a result set's own inserts are visible.
**Notes:** type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns true if inserts are visible for the given result set type; false otherwise

### 104.6.111 ownUpdatesAreVisible(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether for the given type of ResultSet object, the result set's own updates are visible.
**Notes:** type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

### 104.6.112 procedureColumnIn as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column stores IN parameters.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method getProcedureColumns.

### 104.6.113 procedureColumnInOut as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column stores INOUT parameters.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method getProcedureColumns.

### 104.6.114 procedureColumnOut as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column stores OUT parameters.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method get-

ProcedureColumns.

### 104.6.115 procedureColumnResult as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column stores results.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method getProcedureColumns.

### 104.6.116 procedureColumnReturn as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the column stores return values.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method getProcedureColumns.

### 104.6.117 procedureColumnUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that type of the column is unknown.
**Notes:** A possible value for the column COLUMN_TYPE in the ResultSet returned by the method getProcedureColumns.

### 104.6.118 procedureNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that NULL values are not allowed.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getProcedureColumns.

### 104.6.119 procedureNoResult as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the procedure does not return a result.
**Notes:** A possible value for column PROCEDURE_TYPE in the ResultSet object returned by the method getProcedures.

### 104.6.120 procedureNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that NULL values are allowed.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getProcedureColumns.

### 104.6.121 procedureNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that whether NULL values are allowed is unknown.
**Notes:** A possible value for the column NULLABLE in the ResultSet object returned by the method getProcedureColumns.

### 104.6.122 procedureResultUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that it is not known whether the procedure returns a result.
**Notes:** A possible value for column PROCEDURE_TYPE in the ResultSet object returned by the method getProcedures.

### 104.6.123 procedureReturnsResult as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the procedure returns a result.
**Notes:** A possible value for column PROCEDURE_TYPE in the ResultSet object returned by the method getProcedures.

### 104.6.124 sqlStateSQL99 as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the value is an SQL99 SQLSTATE value.
**Notes:** A possible return value for the method SQLException.getSQLState.

### 104.6.125 sqlStateXOpen as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the value is an X/Open (now know as Open Group) SQL CLI SQLSTATE value.
**Notes:** A possible return value for the method SQLException.getSQLState.

### 104.6.126 storesLowerCaseIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case unquoted SQL identifiers as case insensitive and stores them in lower case.

### 104.6.127 storesLowerCaseQuotedIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case quoted SQL identifiers as case insensitive and stores them in lower case.

### 104.6.128 storesMixedCaseIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case unquoted SQL identifiers as case insensitive and stores them in mixed case.

### 104.6.129 storesMixedCaseQuotedIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case quoted SQL identifiers as case sensitive and as a result stores them in mixed case.

### 104.6.130 storesUpperCaseIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case unquoted SQL identifiers as case insensitive and stores them in upper case.

### 104.6.131 storesUpperCaseQuotedIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case quoted SQL identifiers as case insensitive and stores them in upper case.

### 104.6.132 supportsAlterTableWithAddColumn as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports ALTER TABLE with add column.

### 104.6.133 supportsAlterTableWithDropColumn as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports ALTER TABLE with drop column.

### 104.6.134 supportsANSI92EntryLevelSQL as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ANSI92 entry level SQL grammar.

### 104.6.135 supportsANSI92FullSQL as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ANSI92 full SQL grammar supported.

### 104.6.136 supportsANSI92IntermediateSQL as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ANSI92 intermediate SQL grammar supported.

### 104.6.137 supportsBatchUpdates as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports batch updates.
**Notes:** Returns:
true if this database supports batch upcates; false otherwise

### 104.6.138 supportsCatalogsInDataManipulation as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in a data manipulation statement.

### 104.6.139 supportsCatalogsInIndexDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in an index definition statement.

### 104.6.140 supportsCatalogsInPrivilegeDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in an index definition statement.

### 104.6.141 supportsCatalogsInProcedureCalls as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in a procedure call statement.

### 104.6.142 supportsCatalogsInTableDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in a table definition statement.

### 104.6.143 supportsColumnAliasing as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports column aliasing.
**Notes:** If so, the SQL AS clause can be used to provide names for computed columns or to provide alias names for columns as required.

### 104.6.144 supportsConvert as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the CONVERT function between SQL types.
See also:

- 104.6.145 supportsConvert(fromType as Integer, toType as Integer) as boolean 16178

### 104.6.145 supportsConvert(fromType as Integer, toType as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the CONVERT for two given SQL types.
**Notes:** Parameters:
fromType - the type to convert from; one of the type codes from the class JavaDatabaseMBS
toType - the type to convert to; one of the type codes from the class JavaDatabaseMBS

Returns:
true if so; false otherwise
See also:

- 104.6.144 supportsConvert as boolean 16178

### 104.6.146 supportsCoreSQLGrammar as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ODBC Core SQL grammar.

### 104.6.147 supportsCorrelatedSubqueries as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports correlated subqueries.

### 104.6.148 supportsDataDefinitionAndDataManipulationTransactions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports both data definition and data manipulation statements within a transaction.

### 104.6.149 supportsDataManipulationTransactionsOnly as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports only data manipulation statements within a transaction.

### 104.6.150 supportsDifferentTableCorrelationNames as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether, when table correlation names are supported, they are restricted to being different from the names of the tables.

### 104.6.151 supportsExpressionsInOrderBy as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports expressions in ORDER BY lists.

### 104.6.152 supportsExtendedSQLGrammar as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ODBC Extended SQL grammar.

### 104.6.153 supportsFullOuterJoins as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports full nested outer joins.

### 104.6.154 supportsGetGeneratedKeys as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether auto-generated keys can be retrieved after a statement has been executed.
**Notes:** Returns:
true if auto-generated keys can be retrieved after a statement has executed; false otherwise

### 104.6.155 supportsGroupBy as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports some form of GROUP BY clause.

### 104.6.156 supportsGroupByBeyondSelect as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports using columns not included in the SELECT statement in a GROUP BY clause provided that all of the columns in the SELECT statement are included in the GROUP BY clause.

### 104.6.157 supportsGroupByUnrelated as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports using a column that is not in the SELECT statement in a GROUP BY clause.

### 104.6.158 supportsIntegrityEnhancementFacility as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the SQL Integrity Enhancement Facility.

### 104.6.159 supportsLikeEscapeClause as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports specifying a LIKE escape clause.

### 104.6.160 supportsLimitedOuterJoins as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database provides limited support for outer joins.
**Notes:** (This will be true if the method supportsFullOuterJoins returns true).

### 104.6.161 supportsMinimumSQLGrammar as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the ODBC Minimum SQL grammar.

### 104.6.162 supportsMixedCaseIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case unquoted SQL identifiers as case sensitive and as a result stores them in mixed case.

### 104.6.163 supportsMixedCaseQuotedIdentifiers as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database treats mixed case quoted SQL identifiers as case sensitive and as a result stores them in mixed case.

### 104.6.164 supportsMultipleOpenResults as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether it is possible to have multiple ResultSet objects returned from a CallableStatement object simultaneously.
**Notes:** Returns:
true if a CallableStatement object can return multiple ResultSet objects simultaneously; false otherwise

### 104.6.165 supportsMultipleResultSets as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports getting multiple ResultSet objects from a single call to the method execute.

### 104.6.166 supportsMultipleTransactions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database allows having multiple transactions open at once (on different connections).

### 104.6.167 supportsNamedParameters as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports named parameters to callable statements.
**Notes:** Returns:

true if named parameters are supported; false otherwise

### 104.6.168 supportsNonNullableColumns as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether columns in this database may be defined as non-nullable.

### 104.6.169 supportsOpenCursorsAcrossCommit as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports keeping cursors open across commits.

### 104.6.170 supportsOpenCursorsAcrossRollback as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports keeping cursors open across rollbacks.

### 104.6.171 supportsOpenStatementsAcrossCommit as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports keeping statements open across commits.

### 104.6.172 supportsOpenStatementsAcrossRollback as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports keeping statements open across rollbacks.

### 104.6.173 supportsOrderByUnrelated as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports using a column that is not in the SELECT statement in an ORDER BY clause.

### 104.6.174 supportsOuterJoins as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports some form of outer join.

### 104.6.175 supportsPositionedDelete as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a catalog name can be used in an index definition statement.

### 104.6.176 supportsPositionedUpdate as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports positioned UPDATE statements.

### 104.6.177 supportsResultSetConcurrency(type as Integer, concurrency as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the given concurrency type in combination with the given result set type.

### 104.6.178 supportsResultSetHoldability(holdability as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the given result set holdability.
**Notes:** Parameters:
holdability - one of the following constants: ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT
Returns:
true if so; false otherwise

### 104.6.179 supportsResultSetType(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the given result set type.

### 104.6.180 supportsSavepoints as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports savepoints.
**Notes:** Returns:
true if savepoints are supported; false otherwise

### 104.6.181 supportsSchemasInDataManipulation as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a schema name can be used in a data manipulation statement.

### 104.6.182 supportsSchemasInIndexDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a schema name can be used in an index definition statement.

### 104.6.183 supportsSchemasInPrivilegeDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a schema name can be used in a privilege definition statement.

### 104.6.184 supportsSchemasInProcedureCalls as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a schema name can be used in a procedure call statement.

### 104.6.185 supportsSchemasInTableDefinitions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a schema name can be used in a table definition statement.

### 104.6.186 supportsSelectForUpdate as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports SELECT FOR UPDATE statements.

### 104.6.187 supportsStatementPooling as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports statement pooling.
**Notes:** Returns:
true if so; false otherwise

### 104.6.188 supportsStoredProcedures as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports stored procedure calls that use the stored procedure escape syntax.

### 104.6.189 supportsSubqueriesInComparisons as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports subqueries in comparison expressions.

### 104.6.190 supportsSubqueriesInExists as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports subqueries in EXISTS expressions.

### 104.6.191 supportsSubqueriesInIns as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports subqueries in IN statements.

### 104.6.192 supportsSubqueriesInQuantifieds as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports subqueries in quantified expressions.

### 104.6.193 supportsTableCorrelationNames as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports table correlation names.

### 104.6.194 supportsTransactionIsolationLevel(level as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports the given transaction isolation level.
**Notes:** Parameters:
level - one of the transaction isolation levels defined in javaConnectionMBS

Returns:
true if so; false otherwise

### 104.6.195 supportsTransactions as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports transactions.
**Notes:** If not, invoking the method commit is a noop, and the isolation level is TRANSACTION_NONE.

### 104.6.196 supportsUnion as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports SQL UNION.

### 104.6.197 supportsUnionAll as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database supports SQL UNION ALL.

### 104.6.198 tableIndexClustered as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this table index is a clustered index.
**Notes:** A possible value for column TYPE in the ResultSet object returned by the method getIndexInfo.

### 104.6.199 tableIndexHashed as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this table index is a hashed index.
**Notes:** A possible value for column TYPE in the ResultSet object returned by the method getIndexInfo.

### 104.6.200 tableIndexOther as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this table index is not a clustered index, a hashed index, or table statistics; it is something other than these.
**Notes:** A possible value for column TYPE in the ResultSet object returned by the method getIndexInfo.

### 104.6.201 tableIndexStatistic as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this column contains table statistics that are returned in conjunction with a table's index descriptions.
**Notes:** A possible value for column TYPE in the ResultSet object returned by the method getIndexInfo.

### 104.6.202 typeNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that a NULL value is NOT allowed for this data type.
**Notes:** A possible value for column NULLABLE in the ResultSet object returned by the method getType-

Info.

### 104.6.203 typeNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that a NULL value is allowed for this data type.
**Notes:** A possible value for column NULLABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.204 typeNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that it is not known whether a NULL value is allowed for this data type.
**Notes:** A possible value for column NULLABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.205 typePredBasic as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that one can base all WHERE search clauses except WHERE . . . LIKE on this data type.
**Notes:** A possible value for column SEARCHABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.206 typePredChar as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the only WHERE search clause that can be based on this type is WHERE . . . LIKE.
**Notes:** A possible value for column SEARCHABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.207 typePredNone as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that WHERE search clauses are not supported for this type.
**Notes:** A possible value for column SEARCHABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.208 typeSearchable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that all WHERE search clauses can be based on this type.
**Notes:** A possible value for column SEARCHABLE in the ResultSet object returned by the method getTypeInfo.

### 104.6.209 updatesAreDetected(type as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether or not a visible row update can be detected by calling the method ResultSet.rowUpdated.
**Notes:** Parameters:
type - the ResultSet type; one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

Returns:
true if changes are detected by the result set type; false otherwise

### 104.6.210 usesLocalFilePerTable as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database uses a file for each table.

### 104.6.211 usesLocalFiles as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether this database stores tables in a local file.

### 104.6.212 versionColumnNotPseudo as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this version column is NOT a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getVersionColumns.

### 104.6.213 versionColumnPseudo as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this version column is a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getVersionColumns.

### 104.6.214 versionColumnUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that this version column may or may not be a pseudo column.
**Notes:** A possible value for the column PSEUDO_COLUMN in the ResultSet object returned by the method getVersionColumns.

## 104.7 class JavaExceptionMBS

### 104.7.1 class JavaExceptionMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception class used to report java exception.
**Notes:** For SQLExceptions the ErrorNumber property will be filled.
For all java exceptions the message property is filled.
Subclass of the RuntimeException class.
**Blog Entries**

- Encrypted Access database in Xojo

### 104.7.2 Methods

### 104.7.3 RaiseJavaException(message as string)

MBS Java Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A method to test exception handling.
**Example:**

JavaExceptionMBS.RaiseJavaException "Just a test!"

**Notes:** This method raises a new JavaExceptionMBS with the given message.

## 104.8 class JavaInputStreamMBS

### 104.8.1 class JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The plugin class for an inputstream.
**Example:**

```
// your result set
dim r as JavaResultSetMBS

// get binary data for BLOB column nameed 'data'
dim myInputStream as JavaInputStreamMBS = r.getBinaryStream( "data" )
if myInputStream <>nil Then

// read byte for byte in a loop
// better use other read() method with buffer
dim data as string

Do
dim c as Integer = myInputStream.read
If c = -1 then exit

data = data + chrb(c)
Loop

Dim myPicture as Picture = Picture.FromData(data)

// work with picture here
End If
```

**Notes:** This abstract class in java is the superclass of all classes representing an input stream of bytes.
Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1

- MBS Real Studio Plugins, version 13.1pr7

### 104.8.2 Methods

### 104.8.3 available as Integer

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an estimate of the number of bytes that can be read (or skipped over) from this input stream without blocking by the next invocation of a method for this input stream.
**Notes:** The next invocation might be the same thread or another thread. A single read or skip of this many bytes will not block, but may read or skip fewer bytes.
Note that while some implementations of InputStream will return the total number of bytes in the stream, many will not. It is never correct to use the return value of this method to allocate a buffer intended to hold all data in this stream.

A subclass' implementation of this method may choose to throw an IOException if this input stream has been closed by invoking the close() method.

The available method for class InputStream always returns 0.

This method should be overridden by subclasses.

Returns an estimate of the number of bytes that can be read (or skipped over) from this input stream without blocking or 0 when it reaches the end of the input stream.

Throws:
IOException - if an I/O error occurs.

### 104.8.4 close

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes this input stream and releases any system resources associated with the stream.

### 104.8.5 Constructor

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.8.6 mark(readlimit as Integer)

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Marks the current position in this input stream.
**Notes:** A subsequent call to the reset method repositions this stream at the last marked position so that subsequent reads re-read the same bytes.
The readlimit arguments tells this input stream to allow that many bytes to be read before the mark position gets invalidated.

The general contract of mark is that, if the method markSupported returns true, the stream somehow remembers all the bytes read after the call to mark and stands ready to supply those same bytes again if and whenever the method reset is called. However, the stream is not required to remember any data at all if more than readlimit bytes are read from the stream before reset is called.

Marking a closed stream should not have any effect on the stream.

The mark method of InputStream does nothing.

Parameters:
readlimit - the maximum limit of bytes that can be read before the mark position becomes invalid.

### 104.8.7 markSupported as boolean

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Tests if this input stream supports the mark and reset methods.
**Notes:** Whether or not mark and reset are supported is an invariant property of a particular input stream instance. The markSupported method of InputStream returns false.

Returns true if this stream instance supports the mark and reset methods; false otherwise.

### 104.8.8 read as Integer

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads the next byte of data from the input stream.
**Notes:** The value byte is returned as an int in the range 0 to 255. If no byte is available because the end of the stream has been reached, the value -1 is returned. This method blocks until input data is available,

the end of the stream is detected, or an exception is thrown.
A subclass must provide an implementation of this method.

Returns the next byte of data, or -1 if the end of the stream is reached.

Throws:
IOException - if an I/O error occurs.
See also:


- 104.8.9 read(bytes as JavaByteArrayMBS) as Integer 16198
- 104.8.10 read(bytes as JavaByteArrayMBS, Offset as Integer, Length as Integer) as Integer 16199


### 104.8.9 read(bytes as JavaByteArrayMBS) as Integer

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads some number of bytes from the input stream and stores them into the buffer array bytes.
**Notes:** The number of bytes actually read is returned as an integer. This method blocks until input data is available, end of file is detected, or an exception is thrown.
If the length of bytes is zero, then no bytes are read and 0 is returned; otherwise, there is an attempt to read at least one byte. If no byte is available because the stream is at the end of the file, the value -1 is returned; otherwise, at least one byte is read and stored into bytes.

The first byte read is stored into element bytes [ 0 ] , the next one into bytes [ 1 ] , and so on. The number of bytes read is, at most, equal to the length of bytes. Let k be the number of bytes actually read; these bytes will be stored in elements bytes [ 0 ] through bytes [ k-1 ] , leaving elements bytes [ k ] through bytes [ bytes.length-1 ] unaffected.

The read(bytes) method for class InputStream has the same effect as:

read(bytes, 0, bytes.length)

Parameters:
bytes: the buffer into which the data is read.

Returns the total number of bytes read into the buffer, or -1 is there is no more data because the end of the stream has been reached.

Throws:
IOException - If the first byte cannot be read for any reason other than the end of the file, if the input stream has been closed, or if some other I/O error occurs.

NullPointerException - if bytes is null.
See also:


- 104.8.8 read as Integer 16197
- 104.8.10 read(bytes as JavaByteArrayMBS, Offset as Integer, Length as Integer) as Integer 16199


### 104.8.10 read(bytes as JavaByteArrayMBS, Offset as Integer, Length as Integer) as Integer

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads up to Length bytes of data from the input stream into an array of bytes.
**Notes:** An attempt is made to read as many as Length bytes, but a smaller number may be read. The number of bytes actually read is returned as an integer.
This method blocks until input data is available, end of file is detected, or an exception is thrown.

If Length is zero, then no bytes are read and 0 is returned; otherwise, there is an attempt to read at least one byte. If no byte is available because the stream is at end of file, the value -1 is returned; otherwise, at least one byte is read and stored into bytes.

The first byte read is stored into element bytes [ Offset ] , the next one into bytes [ Offset+1 ] , and so on. The number of bytes read is, at most, equal to Length. Let k be the number of bytes actually read; these bytes will be stored in elements bytes [ Offset ] through bytes [ Offset+k-1 ] , leaving elements bytes [ Offset+k ] through bytes [ Offset+Length-1 ] unaffected.

In every case, elements bytes [ 0 ] through bytes [ Offset ] and elements bytes [ Offset+Length ] through bytes [ bytes.length-1 ] are unaffected.

The read(bytes, Offset, Length) method for class InputStream simply calls the method read() repeatedly. If the first such call results in an IOException, that exception is returned from the call to the read(bytes, Offset, Length) method. If any subsequent call to read() results in a IOException, the exception is caught and treated as if it were end of file; the bytes read up to that point are stored into bytes and the number of bytes read before the exception occurred is returned. The default implementation of this method blocks until the requested amount of input data len has been read, end of file is detected, or an exception is thrown. Subclasses are encouraged to provide a more efficient implementation of this method.

Parameters:
bytes: the buffer into which the data is read.
Offset: the start offset in array bytes at which the data is written.
Length: the maximum number of bytes to read.

Returns the total number of bytes read into the buffer, or -1 if there is no more data because the end of the

stream has been reached.

Throws:
IOException - If the first byte cannot be read for any reason other than end of file, or if the input stream has been closed, or if some other I/O error occurs.
NullPointerException - If bytes is null.
IndexOutOfBoundsException - If Offset is negative, Length is negative, or Length is greater than bytes.length - Offset
See also:

- 104.8.8 read as Integer 16197
- 104.8.9 read(bytes as JavaByteArrayMBS) as Integer 16198

### 104.8.11 reset

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Repositions this stream to the position at the time the mark method was last called on this input stream.
**Notes:** The general contract of reset is:

- If the method markSupported returns true, then:
- If the method mark has not been called since the stream was created, or the number of bytes read from the stream since mark was last called is larger than the argument to mark at that last call, then an IOException might be thrown.
- If such an IOException is not thrown, then the stream is reset to a state such that all the bytes read since the most recent call to mark (or since the start of the file, if mark has not been called) will be resupplied to subsequent callers of the read method, followed by any bytes that otherwise would have been the next input data as of the time of the call to reset.
- If the method markSupported returns false, then:
- The call to reset may throw an IOException.
- If an IOException is not thrown, then the stream is reset to a fixed state that depends on the particular type of the input stream and how it was created. The bytes that will be supplied to subsequent callers of the read method depend on the particular type of the input stream.

The method reset for class InputStream does nothing except throw an IOException.

Throws:
IOException - if this stream has not been marked or if the mark has been invalidated.

### 104.8.12 skip(count as Int64) as Int64

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Skips over and discards count bytes of data from this input stream.
**Notes:** The skip method may, for a variety of reasons, end up skipping over some smaller number of bytes, possibly 0. This may result from any of a number of conditions; reaching end of file before count bytes have been skipped is only one possibility. The actual number of bytes skipped is returned. If count is negative, no bytes are skipped.
The skip method of this class creates a byte array and then repeatedly reads into it until count bytes have been read or the end of the stream has been reached. Subclasses are encouraged to provide a more efficient implementation of this method. For instance, the implementation may depend on the ability to seek.

Parameters:
count: the number of bytes to be skipped.

Returns the actual number of bytes skipped.

Throws:
IOException - if the stream does not support seek, or if some other I/O error occurs.

## 104.9 class JavaParameterMetaDataMBS

### 104.9.1 class JavaParameterMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An object that can be used to get information about the types and properties of the parameters in a PreparedStatement object.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.9.2 Methods

### 104.9.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.9.4 getParameterClassName(param as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the fully-qualified name of the Java class whose instances should be passed to the method PreparedStatement.setObject.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
the fully-qualified name of the class in the Java programming language that would be used by the method PreparedStatement.setObject to set the value in the specified parameter. This is the class name used for custom mapping.

### 104.9.5 getParameterCount as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number of parameters in the PreparedStatement object for which this ParameterMetaData object contains information.

**Notes:** Returns:
the number of parameters

### 104.9.6 getParameterMode(param as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated parameter's mode.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
mode of the parameter; one of ParameterMetaData.parameterModeIn, ParameterMetaData.parameterModeOut, or ParameterMetaData.parameterModeInOut ParameterMetaData.parameterModeUnknown.

### 104.9.7 getParameterType(param as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated parameter's SQL type.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
SQL type from java.sql.Types

### 104.9.8 getParameterTypeName(param as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated parameter's database-specific type name.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
type the name used by the database. If the parameter type is a user-defined type, then a fully-qualified type name is returned.

### 104.9.9 getPrecision(param as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated parameter's number of decimal digits.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
precision

### 104.9.10 getScale(param as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated parameter's number of digits to right of the decimal point.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
scale

### 104.9.11 isNullable(param as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether null values are allowed in the designated parameter.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:
the nullability status of the given parameter; one of ParameterMetaData.parameterNoNulls, ParameterMetaData.parameterNullable, or ParameterMetaData.parameterNullableUnknown

### 104.9.12 isSigned(param as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether values for the designated parameter can be signed numbers.
**Notes:** Parameters:
param - the first parameter is 1, the second is 2, ...
Returns:

true if so; false otherwise

### 104.9.13 parameterModeIn as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the parameter's mode is IN.

### 104.9.14 parameterModeInOut as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the parameter's mode is INOUT.

### 104.9.15 parameterModeOut as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the parameter's mode is OUT.

### 104.9.16 parameterModeUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the mode of the parameter is unknown.

### 104.9.17 parameterNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that a parameter will not allow NULL values.

### 104.9.18 parameterNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that a parameter will allow NULL values.

### 104.9.19 parameterNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the nullability of a parameter is unknown.

## 104.10 class JavaPreparedStatementMBS

### 104.10.1 class JavaPreparedStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An object that represents a precompiled SQL statement.
**Notes:** A SQL statement is precompiled and stored in a PreparedStatement object. This object can then be used to efficiently execute this statement multiple times.

Note: The setter methods (setShort, setString, and so on) for setting IN parameter values must specify types that are compatible with the defined SQL type of the input parameter. For instance, if the IN parameter has SQL type INTEGER, then the method setInt should be used.

If arbitrary parameter type conversions are required, the method setObject should be used with a target SQL type.

In the following example of setting a parameter, con represents an active connection:

PreparedStatement pstmt = con.prepareStatement("UPDATE EMPLOYEES SET SALARY = ? WHERE ID = ?");
pstmt.setBigDecimal(1, 153833.00)
pstmt.setInt(2, 110592)
Subclass of the JavaStatementMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1

### 104.10.2 Methods

### 104.10.3 addBatch

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a set of parameters to this PreparedStatement object's batch of commands.

### 104.10.4 clearParameters

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears the current parameter values immediately.
**Notes:** In general, parameter values remain in force for repeated use of a statement. Setting a parameter value automatically clears its previous value. However, in some cases it is useful to immediately release the resources used by the current parameter values; this can be done by calling the method clearParameters.

### 104.10.5 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.10.6 execute as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the SQL statement in this PreparedStatement object, which may be any kind of SQL statement.
**Notes:** Some prepared statements return multiple results; the execute method handles these complex statements as well as the simpler form of statements handled by the methods executeQuery and executeUpdate. The execute method returns a boolean to indicate the form of the first result. You must call either the method getResultSet or getUpdateCount to retrieve the result; you must call getMoreResults to move to any subsequent result(s).

Returns:
true if the first result is a ResultSet object; false if the first result is an update count or there is no result

### 104.10.7 executeQuery as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the SQL query in this PreparedStatement object and returns the ResultSet object generated by the query.
**Notes:** Returns:
a ResultSet object that contains the data produced by the query; never null

### 104.10.8 executeUpdate as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the SQL statement in this PreparedStatement object, which must be an SQL INSERT, UPDATE or DELETE statement; or an SQL statement that returns nothing, such as a DDL statement.
**Notes:** Returns:
either (1) the row count for INSERT, UPDATE, or DELETE statements or (2) 0 for SQL statements that return nothing.

### 104.10.9 getMetaData as JavaResultSetMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a ResultSetMetaData object that contains information about the columns of the ResultSet object that will be returned when this PreparedStatement object is executed.
**Notes:** Because a PreparedStatement object is precompiled, it is possible to know about the ResultSet object that it will return without having to execute it. Consequently, it is possible to invoke the method getMetaData on a PreparedStatement object rather than waiting to execute it and then invoking the ResultSet.getMetaData method on the ResultSet object that is returned.

NOTE: Using this method may be expensive for some drivers due to the lack of underlying DBMS support.

Returns:
the description of a ResultSet object's columns or null if the driver cannot return a ResultSetMetaData object

### 104.10.10 getParameterMetaData as JavaParameterMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number, types and properties of this PreparedStatement object's parameters.
**Notes:** Returns:
a ParameterMetaData object that contains information about the number, types and properties of this PreparedStatement object's parameters

### 104.10.11 setBlob(parameterIndex as Integer, x as JavaBlobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Blob object.
**Notes:** The driver converts this to an SQL BLOB value when it sends it to the database.

Parameters:
i - the first parameter is 1, the second is 2, ...
x - a Blob object that maps an SQL BLOB value

### 104.10.12 setBoolean(parameterIndex as Integer, x as boolean)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java boolean value.
**Notes:** The driver converts this to an SQL BIT value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.13 setByte(parameterIndex as Integer, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java byte value.
**Notes:** The driver converts this to an SQL TINYINT value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.14 setBytes(parameterIndex as Integer, Value as String)

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java array of bytes.
**Notes:** The driver converts this to an SQL VARBINARY or LONGVARBINARY (depending on the argument's size relative to the driver's limits on VARBINARY values) when it sends it to the database.

parameterIndex: the first parameter is 1, the second is 2, ...
Value: the parameter value as a string.

### 104.10.15 setClob(parameterIndex as Integer, x as JavaClobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Clob object.
**Notes:** The driver converts this to an SQL CLOB value when it sends it to the database.

Parameters:
i - the first parameter is 1, the second is 2, ...
x - a Clob object that maps an SQL CLOB value

### 104.10.16 setDouble(parameterIndex as Integer, x as Double)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java double value.
**Notes:** The driver converts this to an SQL DOUBLE value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.17 setFloat(parameterIndex as Integer, x as single)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java float value.
**Notes:** The driver converts this to an SQL FLOAT value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.18 setInt(parameterIndex as Integer, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java int value.
**Notes:** The driver converts this to an SQL INTEGER value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.19 setLong(parameterIndex as Integer, x as Int64)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java long value.
**Notes:** The driver converts this to an SQL BIGINT value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.20 setNull(parameterIndex as Integer, sqlType as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to SQL NULL.
**Notes:** You must specify the parameter's SQL type.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
sqlType - the SQL type code defined in java.sql.Types

### 104.10.21 setShort(parameterIndex as Integer, x as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java short value.
**Notes:** The driver converts this to an SQL SMALLINT value when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

### 104.10.22 setString(parameterIndex as Integer, x as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the designated parameter to the given Java String value.
**Notes:** The driver converts this to an SQL VARCHAR or LONGVARCHAR value (depending on the argument's size relative to the driver's limits on VARCHAR values) when it sends it to the database.

Parameters:
parameterIndex - the first parameter is 1, the second is 2, ...
x - the parameter value

## 104.11 class JavaResultSetMBS

### 104.11.1 class JavaResultSetMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a recordset in Java.
**Notes:** Nearly all methods on this class can raise java exceptions which you can get using the error property. (and errorstring and errorcode)
Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Prefetching records from databases
- Encrypted Access database in Xojo
- MBS Real Studio Plugins, version 13.1pr7
- MBS Real Studio Plugins, version 11.3pr1

### 104.11.2 Methods

### 104.11.3 absolute(row as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the given row number in this ResultSet object.
**Example:**

```
dim db as JavaConnectionMBS // your database
dim r as JavaResultSetMBS
dim s as JavaStatementMBS

// check second row
s=db.createStatement
r=s.executeQuery("SELECT * from myTable")

if r<>Nil then
if r.absolute(2) then
MsgBox str(R.getInt("test_id"))+" "+r.getString("test_val")
end if
end if
```

**Notes:** See the java documentation for details on java.sql.ResultSet.absolute.

### 104.11.4 afterLast

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the end of this ResultSet object, just after the last row.
**Notes:** See the java documentation for details on java.sql.ResultSet.afterLast.

### 104.11.5 beforeFirst

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the front of this ResultSet object, just before the first row.
**Notes:** See the java documentation for details on java.sql.ResultSet.beforeFirst.

### 104.11.6 cancelRowUpdates

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Cancels the updates made to the current row in this ResultSet object.
**Notes:** This method may be called after calling an updater method(s) and before calling the method updateRow to roll back the updates made to a row. If no updates have been made or updateRow has already been called, this method has no effect.

See the java documentation for details on java.sql.ResultSet.cancelRowUpdates.

### 104.11.7 clearWarnings

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears all warnings reported on this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.clearWarnings.

### 104.11.8 CLOSE_CURSORS_AT_COMMIT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that ResultSet objects should be closed when the method Connection.commit is called.

### 104.11.9 CONCUR_READ_ONLY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the concurrency mode for a ResultSet object that may NOT be updated.

### 104.11.10 CONCUR_UPDATABLE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the concurrency mode for a ResultSet object that may be updated.

### 104.11.11 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.11.12 deleteRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Deletes the current row from this ResultSet object and from the underlying database.
**Notes:** See the java documentation for details on java.sql.ResultSet.deleteRow.

### 104.11.13 FETCH_FORWARD as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the rows in a result set will be processed in a forward direction; first-to-last.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.11.14 FETCH_REVERSE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the rows in a result set will be processed in a reverse direction; last-to-first.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.11.15 FETCH_UNKNOWN as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the order in which rows in a result set will be processed is unknown.
**Notes:** This constant is used by the method setFetchDirection as a hint to the driver, which the driver may ignore.

### 104.11.16 findColumn(column as string) as Integer

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maps the given ResultSet column name to its ResultSet column index.
**Example:**

```
dim r as JavaResultSetMBS // your result set
MsgBox str(r.findColumn("test_id"))+" "+str(r.findColumn("test_val"))
```

**Notes:** Returns 0 on any error.
See the java documentation for details on java.sql.ResultSet.findColumn.

### 104.11.17 first as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the first row in this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.first.

### 104.11.18 getAsciiStream(column as Integer) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of ASCII characters.
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of ASCII characters. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARCHAR values. The JDBC driver will do any necessary conversion from the database format into ASCII.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method InputStream.available is called whether there is data available or not.

Parameters:
column: the first column is 1, the second is 2, ...

Returns a Java input stream that delivers the database column value as a stream of one-byte ASCII characters; if the value is SQL NULL, the value returned is null

Throws:
SQLException - if the columnIndex is not valid; if a database access error occurs or this method is called on a closed result set.
See also:

- 104.11.19 getAsciiStream(column as string) as JavaInputStreamMBS 16218

### 104.11.19 getAsciiStream(column as string) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as an Array object in the Java programming language.
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of ASCII characters. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARCHAR values. The JDBC driver will do any necessary conversion from the database format into ASCII.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method available is called whether there is data available or not.

Parameters:
column: the label for the column specified with the SQL AS clause. If the SQL AS clause was not specified, then the label is the name of the column

Returns a Java input stream that delivers the database column value as a stream of one-byte ASCII characters. If the value is SQL NULL, the value returned is null.

Throws:
SQLException - if the columnLabel is not valid; if a database access error occurs or this method is called on a closed result set
See also:

- 104.11.18 getAsciiStream(column as Integer) as JavaInputStreamMBS 16218

### 104.11.20 getBinaryStream(column as Integer) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of uninterpreted bytes.
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of uninterpreted bytes. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARBINARY values.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method InputStream.available is called whether there is data available or not.

Parameters:
column: the first column is 1, the second is 2, ...

Returns a Java input stream that delivers the database column value as a stream of uninterpreted bytes; if the value is SQL NULL, the value returned is null

Throws:
SQLException - if the columnIndex is not valid; if a database access error occurs or this method is called on a closed result set
See also:

- 104.11.21 getBinaryStream(column as string) as JavaInputStreamMBS 16220

### 104.11.21 getBinaryStream(column as string) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of uninterpreted bytes.
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of uninterpreted bytes. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARBINARY values.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method available is called whether there is data available or not.

Parameters:
column: the label for the column specified with the SQL AS clause. If the SQL AS clause was not specified, then the label is the name of the column

Returns a Java input stream that delivers the database column value as a stream of uninterpreted bytes; if the value is SQL NULL, the result is null.

Throws SQLException - if the columnLabel is not valid; if a database access error occurs or this method is called on a closed result set
See also:

- 104.11.20 getBinaryStream(column as Integer) as JavaInputStreamMBS 16219

### 104.11.22 getBlob(column as Integer) as JavaBlobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a Blob object in the Java programming language.
**Notes:** Column: the first column is 1, the second is 2, ...

Returns a Blob object representing the SQL BLOB value in the specified column
See also:

- 104.11.23 getBlob(column as string) as JavaBlobMBS 16221

### 104.11.23 getBlob(column as string) as JavaBlobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a Blob object in the Java programming language.
**Notes:** column: the name of the column from which to retrieve the value
Returns a Blob object representing the SQL BLOB value in the specified column
See also:

- 104.11.22 getBlob(column as Integer) as JavaBlobMBS 16220

### 104.11.24 getBoolean(column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a boolean.
**Notes:** See the java documentation for details on java.sql.ResultSet.getBoolean.
See also:

- 104.11.25 getBoolean(column as string) as boolean 16221

### 104.11.25 getBoolean(column as string) as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a boolean.
**Notes:** See the java documentation for details on java.sql.ResultSet.getBoolean.
See also:

- 104.11.24 getBoolean(column as Integer) as boolean 16221

### 104.11.26 getByte(column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a byte in the Java programming language.
**Notes:** Parameters:
columnIndex - the first column is 1, the second is 2, ...
Returns:
the column value; if the value is SQL NULL, the value returned is 0
See also:

- 104.11.27 getByte(column as string) as Integer 16222

### 104.11.27 getByte(column as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a byte in the Java programming language.
**Notes:** Parameters:
columnName - the SQL name of the column
Returns:
the column value; if the value is SQL NULL, the value returned is 0
See also:

- 104.11.26 getByte(column as Integer) as Integer 16221

### 104.11.28 getBytes(column as Integer) as string

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a byte array in the Java programming language.
**Notes:** column: the first column is 1, the second is 2, ...
the plugin gives you the bytes as a string with no encoding.
See also:

- 104.11.29 getBytes(column as string) as string 16222

### 104.11.29 getBytes(column as string) as string

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a byte array in the Java programming language.

**Notes:** the plugin gives you the bytes as a string with no encoding.
See also:

- 104.11.28 getBytes(column as Integer) as string 16222

### 104.11.30 getClob(column as Integer) as JavaClobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a Clob object in the Java programming language.
**Notes:** Column: the first column is 1, the second is 2, ...
Returns a Clob object representing the SQL CLOB value in the specified column
See also:

- 104.11.31 getClob(column as string) as JavaClobMBS 16223

### 104.11.31 getClob(column as string) as JavaClobMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a Clob object in the Java programming language.
**Notes:** column: the name of the column from which to retrieve the value
Returns a Clob object representing the SQL CLOB value in the specified column
See also:

- 104.11.30 getClob(column as Integer) as JavaClobMBS 16223

### 104.11.32 getConcurrency as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the concurrency mode of this ResultSet object.
**Notes:** The concurrency used is determined by the Statement object that created the result set.
Returns:
the concurrency type, either ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE

### 104.11.33 getCursorName as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of the SQL cursor used by this ResultSet object.
**Notes:** In SQL, a result table is retrieved through a cursor that is named. The current row of a result set can be updated or deleted using a positioned update/delete statement that references the cursor name. To insure that the cursor has the proper isolation level to support update, the cursor's SELECT statement should be of the form SELECT FOR UPDATE. If FOR UPDATE is omitted, the positioned updates may fail.

The JDBC API supports this SQL feature by providing the name of the SQL cursor used by a ResultSet object. The current row of a ResultSet object is also the current row of this SQL cursor.

Note: If positioned update is not supported, a SQLException is thrown.

Returns:
the SQL name for this ResultSet object's cursor

### 104.11.34 getDouble(column as Integer) as Double

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a double.
**Notes:** See the java documentation for details on java.sql.ResultSet.getDouble.
See also:

- 104.11.35 getDouble(column as string) as Double 16224

### 104.11.35 getDouble(column as string) as Double

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a double.
**Notes:** See the java documentation for details on java.sql.ResultSet.getDouble.
See also:

- 104.11.34 getDouble(column as Integer) as Double 16224

### 104.11.36 getFloat(column as Integer) as single

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a float in the Java programming language.
**Notes:** Parameters:
columnIndex - the first column is 1, the second is 2, ...
Returns:
the column value; if the value is SQL NULL, the value returned is 0
See also:

- 104.11.37 getFloat(column as string) as single 16225

### 104.11.37 getFloat(column as string) as single

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a float in the Java programming language.
**Notes:** Parameters:
columnName - the SQL name of the column
Returns:
the column value; if the value is SQL NULL, the value returned is 0
See also:

- 104.11.36 getFloat(column as Integer) as single 16225

### 104.11.38 getInt(column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as an int.
**Notes:** Parameters:
columnIndex - the first column is 1, the second is 2, ...
Returns:
the column value; if the value is SQL NULL, the value returned is 0

See the java documentation for details on java.sql.ResultSet.getInt.
See also:

- 104.11.39 getInt(column as string) as Integer 16226

### 104.11.39 getInt(column as string) as Integer

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as an int.
**Example:**

```
dim r as JavaResultSetMBS // your result set
MsgBox str(R.getInt("test_id"))+" "+r.getString("test_val")
```

**Notes:** See the java documentation for details on java.sql.ResultSet.getInt.
See also:

- 104.11.38 getInt(column as Integer) as Integer 16225

### 104.11.40 getLong(column as Integer) as int64

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as an int64.
**Notes:** See the java documentation for details on java.sql.ResultSet.getLong.
See also:

- 104.11.41 getLong(column as string) as int64 16226

### 104.11.41 getLong(column as string) as int64

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as an int64.
**Notes:** See the java documentation for details on java.sql.ResultSet.getLong.
See also:

- 104.11.40 getLong(column as Integer) as int64 16226

### 104.11.42 getMetaData as JavaResultSetMetaDataMBS

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number, types and properties of this ResultSet object's columns.
**Notes:** Returns:

the description of this ResultSet object's columns

### 104.11.43 getRow as Integer

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the current row number.
**Notes:** See the java documentation for details on java.sql.ResultSet.getRow.

### 104.11.44 getShort(column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a short in the Java programming language.
**Notes:** Parameters:
columnIndex - the first column is 1, the second is 2, ...
Returns:
the column value; if the value is SQL NULL, the value returned is 0.
See also:

- 104.11.45 getShort(column as string) as Integer 16227

### 104.11.45 getShort(column as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the value of the designated column in the current row of this ResultSet object as a short in the Java programming language.
**Notes:** Parameters:
columnName - the SQL name of the column
Returns:
the column value; if the value is SQL NULL, the value returned is 0
See also:

- 104.11.44 getShort(column as Integer) as Integer 16227

### 104.11.46 getString(column as Integer) as string

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a String.
**Notes:** See the java documentation for details on java.sql.ResultSet.getString.
See also:

- 104.11.47 getString(column as string) as string 16228

### 104.11.47 getString(column as string) as string

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of the designated column in the current row of this ResultSet object as a String.
**Example:**

```
dim r as JavaResultSetMBS // your result set
MsgBox str(R.getInt("test_id"))+" "+r.getString("test_val")
```

**Notes:** See the java documentation for details on java.sql.ResultSet.getString.
See also:

- 104.11.46 getString(column as Integer) as string 16228

### 104.11.48 getType as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the type of this ResultSet object.
**Notes:** The type is determined by the Statement object that created the result set.
Returns:
ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_SENSITIVE

### 104.11.49 getUnicodeStream(column as Integer) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Deprecated. use getCharacterStream in place of getUnicodeStream
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as as a stream of two-byte 3 characters. The first byte is the high byte; the second byte is the low byte. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARCHARvalues. The JDBC driver will do any necessary conversion from the database format into Unicode.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method InputStream.available is called, whether there is data available or not.

Parameters:
column: the first column is 1, the second is 2, ...

Returns a Java input stream that delivers the database column value as a stream of two-byte Unicode characters; if the value is SQL NULL, the value returned is null

Throws:
SQLException - if the columnIndex is not valid; if a database access error occurs or this method is called on a closed result set
SQLFeatureNotSupportedException - if the JDBC driver does not support this method
See also:

- 104.11.50 getUnicodeStream(column as string) as JavaInputStreamMBS 16229

### 104.11.50 getUnicodeStream(column as string) as JavaInputStreamMBS

MBS Java Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Deprecated. use getCharacterStream instead
**Notes:** Retrieves the value of the designated column in the current row of this ResultSet object as a stream of two-byte Unicode characters. The first byte is the high byte; the second byte is the low byte. The value can then be read in chunks from the stream. This method is particularly suitable for retrieving large LONGVARCHAR values. The JDBC technology-enabled driver will do any necessary conversion from the database format into Unicode.
Note: All the data in the returned stream must be read prior to getting the value of any other column. The next call to a getter method implicitly closes the stream. Also, a stream may return 0 when the method InputStream.available is called, whether there is data available or not.

Parameters:
column: the label for the column specified with the SQL AS clause. If the SQL AS clause was not specified, then the label is the name of the column

Returns a Java input stream that delivers the database column value as a stream of two-byte Unicode char-

acters. If the value is SQL NULL, the value returned is null.

Throws:
SQLException - if the columnLabel is not valid; if a database access error occurs or this method is called on a closed result set
SQLFeatureNotSupportedException - if the JDBC driver does not support this method
See also:

- 104.11.49 getUnicodeStream(column as Integer) as JavaInputStreamMBS 16228

### 104.11.51 HOLD_CURSORS_OVER_COMMIT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that ResultSet objects should not be closed when the method Connection.commit is called.

### 104.11.52 insertRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Inserts the contents of the insert row into this ResultSet objaect and into the database.
**Notes:** See the java documentation for details on java.sql.ResultSet.insertRow.

### 104.11.53 isAfterLast as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the cursor is after the last row in this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.isAfterLast.

### 104.11.54 isBeforeFirst as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the cursor is before the first row in this ResultSet object.
**Notes:** Returns:
true if the cursor is before the first row; false if the cursor is at any other position or the result set contains

no rows

See the java documentation for details on java.sql.ResultSet.isBeforeFirst.

### 104.11.55 isFirst as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the cursor is on the first row of this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.isFirst.

### 104.11.56 isLast as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the cursor is on the last row of this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.isLast.

### 104.11.57 last as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the last row in this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.last.

### 104.11.58 moveToCurrentRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the remembered cursor position, usually the current row.
**Notes:** This method has no effect if the cursor is not on the insert row.

See the java documentation for details on java.sql.ResultSet.moveToCurrentRow.

### 104.11.59 moveToInsertRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the insert row.
**Notes:** The current cursor position is remembered while the cursor is positioned on the insert row. The insert row is a special row associated with an updatable result set. It is essentially a buffer where a new row may be constructed by calling the updater methods prior to inserting the row into the result set. Only the updater, getter, and insertRow methods may be called when the cursor is on the insert row. All of the columns in a result set must be given a value each time this method is called before calling insertRow. An updater method must be called before a getter method can be called on a column value.

See the java documentation for details on java.sql.ResultSet.moveToInsertRow.

### 104.11.60 NextRecord as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor down one row from its current position.
**Notes:** See the java documentation for details on java.sql.ResultSet.next.

### 104.11.61 previousRecord as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor to the previous row in this ResultSet object.
**Notes:** See the java documentation for details on java.sql.ResultSet.previous.

### 104.11.62 refreshRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Refreshes the current row with its most recent value in the database.
**Notes:** This method cannot be called when the cursor is on the insert row.
The refreshRow method provides a way for an application to explicitly tell the JDBC driver to refetch a row(s) from the database. An application may want to call refreshRow when caching or prefetching is being done by the JDBC driver to fetch the latest value of a row from the database. The JDBC driver may actually refresh multiple rows at once if the fetch size is greater than one.

All values are refetched subject to the transaction isolation level and cursor sensitivity. If refreshRow is called after calling an updater method, but before calling the method updateRow, then the updates made to the row are lost. Calling the method refreshRow frequently will likely slow performance.

### 104.11.63 relative(row as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the cursor a relative number of rows, either positive or negative.
**Notes:** See the java documentation for details on java.sql.ResultSet.relative.

### 104.11.64 rowDeleted as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether a row has been deleted.
**Notes:** A deleted row may leave a visible "hole" in a result set. This method can be used to detect holes in a result set. The value returned depends on whether or not this ResultSet object can detect deletions.
Returns:
true if a row was deleted and deletions are detected; false otherwise

### 104.11.65 rowInserted as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the current row has had an insertion.
**Notes:** The value returned depends on whether or not this ResultSet object can detect visible inserts.
Returns:
true if a row has had an insertion and insertions are detected; false otherwise

### 104.11.66 rowUpdated as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves whether the current row has been updated.
**Notes:** The value returned depends on whether or not the result set can detect updates.
Returns:

true if both (1) the row has been visibly updated by the owner or another and (2) updates are detected

### 104.11.67 TYPE_FORWARD_ONLY as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object whose cursor may move only forward.

### 104.11.68 TYPE_SCROLL_INSENSITIVE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object that is scrollable but generally not sensitive to changes made by others.

### 104.11.69 TYPE_SCROLL_SENSITIVE as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating the type for a ResultSet object that is scrollable and generally sensitive to changes made by others.

### 104.11.70 updateBlob(column as Integer, value as JavaBlobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a java.sql.Blob value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

column: the first column is 1, the second is 2, ...
value: the new column value
See also:

- 104.11.71 updateBlob(column as string, value as JavaBlobMBS) 

### 104.11.71 updateBlob(column as string, value as JavaBlobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a java.sql.Blob value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

column: the name of the column
value: the new column value
See also:

- 104.11.70 updateBlob(column as Integer, value as JavaBlobMBS) 16234

### 104.11.72 updateBoolean(column as Integer, value as boolean)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a boolean value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.73 updateBoolean(column as string, value as boolean) 16235

### 104.11.73 updateBoolean(column as string, value as boolean)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a boolean value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.72 updateBoolean(column as Integer, value as boolean) 16235

### 104.11.74 updateByte(column as Integer, value as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a byte value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.75 updateByte(column as string, value as Integer) 16236

### 104.11.75 updateByte(column as string, value as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a byte value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.74 updateByte(column as Integer, value as Integer) 16236

### 104.11.76 updateBytes(column as Integer, Value as String)

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a byte array value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
column: column index starting at 1.

Value: The new byte array as a string.
See also:

- 104.11.77 updateBytes(column as string, Value as String) 16237

### 104.11.77 updateBytes(column as string, Value as String)

MBS Java Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a byte array value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
column: The column name.
Value: The new byte array as a string.
See also:

- 104.11.76 updateBytes(column as Integer, Value as String) 16236

### 104.11.78 updateClob(column as Integer, value as JavaClobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a java.sql.Clob value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

column: the first column is 1, the second is 2, ...
value: the new column value
See also:

- 104.11.79 updateClob(column as string, value as JavaClobMBS) 16237

### 104.11.79 updateClob(column as string, value as JavaClobMBS)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a java.sql.Clob value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are

called to update the database.

column: the name of the column
value: the new column value
See also:

- 104.11.78 updateClob(column as Integer, value as JavaClobMBS) 16237

### 104.11.80 updateDouble(column as Integer, value as Double)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a double value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.81 updateDouble(column as string, value as Double) 16238

### 104.11.81 updateDouble(column as string, value as Double)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a double value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.80 updateDouble(column as Integer, value as Double) 16238

### 104.11.82 updateFloat(column as Integer, value as single)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a float value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.83 updateFloat(column as string, value as single) 16239

### 104.11.83 updateFloat(column as string, value as single)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a float value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.82 updateFloat(column as Integer, value as single) 16238

### 104.11.84 updateInt(column as Integer, value as Integer)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with an int value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.85 updateInt(column as string, value as Integer) 16240

### 104.11.85 updateInt(column as string, value as Integer)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with an int value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.84 updateInt(column as Integer, value as Integer) 16239

### 104.11.86 updateLong(column as Integer, value as int64)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a long value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.87 updateLong(column as string, value as int64) 16240

### 104.11.87 updateLong(column as string, value as int64)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a long value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column

x - the new column value
See also:

- 104.11.86 updateLong(column as Integer, value as int64) 16240

### 104.11.88 updateNull(column as Integer)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gives a nullable column a null value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
See also:

- 104.11.89 updateNull(column as string) 16241

### 104.11.89 updateNull(column as string)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a null value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
See also:

- 104.11.88 updateNull(column as Integer) 16241

### 104.11.90 updateRow

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the underlying database with the new contents of the current row of this ResultSet object.
**Example:**

```
dim r as JavaResultSetMBS
dim db as JavaConnectionMBS // your database
dim s as JavaStatementMBS

s=db.createStatement
r=s.executeQuery("SELECT test_id from myTable")

if r<>Nil then
while r.NextRecord
r.updateInt("test_id",10+r.getInt("test_id"))
r.updateRow
wend
end if
```

**Notes:** This method cannot be called when the cursor is on the insert row.

See the java documentation for details on java.sql.ResultSet.updateRow.

### 104.11.91 updateShort(column as Integer, value as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a short value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.92 updateShort(column as string, value as Integer) 16242

### 104.11.92 updateShort(column as string, value as Integer)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a short value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.91 updateShort(column as Integer, value as Integer) 16242

### 104.11.93 updateString(column as Integer, value as string)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a String value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.

Parameters:
columnIndex - the first column is 1, the second is 2, ...
x - the new column value
See also:

- 104.11.94 updateString(column as string, value as string) 16243

### 104.11.94 updateString(column as string, value as string)

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates the designated column with a String value.
**Notes:** The updater methods are used to update column values in the current row or the insert row. The updater methods do not update the underlying database; instead the updateRow or insertRow methods are called to update the database.
Parameters:
columnName - the name of the column
x - the new column value
See also:

- 104.11.93 updateString(column as Integer, value as string) 16243

### 104.11.95 wasNull as boolean

MBS Java Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reports whether the last column read had a value of SQL NULL.
**Notes:** See the java documentation for details on java.sql.ResultSet.wasNull.

### 104.11.96 Properties

### 104.11.97 FetchDirection as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gives a hint as to the direction in which the rows in this ResultSet object will be processed.
**Notes:** The initial value is determined by the Statement object that produced this ResultSet object. The fetch direction may be changed at any time.

Parameters:
direction - an int specifying the suggested fetch direction; one of ResultSet.FETCH_FORWARD, ResultSet.FETCH_REVERSE, or ResultSet.FETCH_UNKNOWN
(Read and Write computed property)

### 104.11.98 FetchSize as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gives the JDBC driver a hint as to the number of rows that should be fetched from the database when more rows are needed for this ResultSet object.
**Notes:** If the fetch size specified is zero, the JDBC driver ignores the value and is free to make its own best guess as to what the fetch size should be. The default value is set by the Statement object that created the result set. The fetch size may be changed at any time.

Parameters:
rows - the number of rows to fetch
(Read and Write computed property)

## 104.12 class JavaResultSetMetaDataMBS

### 104.12.1 class JavaResultSetMetaDataMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** An object that can be used to get information about the types and properties of the columns in a ResultSet object.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.12.2 Methods

### 104.12.3 columnNoNulls as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that a column does not allow NULL values.

### 104.12.4 columnNullable as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that a column allows NULL values.

### 104.12.5 columnNullableUnknown as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the nullability of a column's values is unknown.

### 104.12.6 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.12.7 getCatalogName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the designated column's table's catalog name.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
the name of the catalog for the table in which the given column appears or "" if not applicable

### 104.12.8 getColumnClassName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the fully-qualified name of the Java class whose instances are manufactured if the method ResultSet.getObject is called to retrieve a value from the column.
**Notes:** ResultSet.getObject may return a subclass of the class returned by this method.

Parameters:
column - the first column is 1, the second is 2, ...
Returns:
the fully-qualified name of the class in the Java programming language that would be used by the method ResultSet.getObject to retrieve the value in the specified column. This is the class name used for custom mapping.

### 104.12.9 getColumnCount as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of columns in this ResultSet object.

### 104.12.10 getColumnDisplaySize(Column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the designated column's normal maximum width in characters.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
the normal maximum number of characters allowed as the width of the designated column

### 104.12.11 getColumnLabel(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the designated column's suggested title for use in printouts and displays.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
the suggested column title

### 104.12.12 getColumnName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the designated column's name.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
column name

### 104.12.13 getColumnType(Column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated column's SQL type.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
SQL type from java.sql.Types

### 104.12.14 getColumnTypeName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the designated column's database-specific type name.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
type name used by the database. If the column type is a user-defined type, then a fully-qualified type name is returned.

### 104.12.15 getPrecision(Column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the designated column's number of decimal digits.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
precision

### 104.12.16 getScale(Column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the designated column's number of digits to right of the decimal point.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
scale

### 104.12.17 getSchemaName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the designated column's table's schema.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:

schema name or "" if not applicable

### 104.12.18 getTableName(Column as Integer) as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the designated column's table name.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
table name or "" if not applicable

### 104.12.19 isAutoIncrement(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the designated column is automatically numbered, thus read-only.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.20 isCaseSensitive(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether a column's case matters.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.21 isCurrency(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the designated column is a cash value

**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.22 isDefinitelyWritable(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether a write on the designated column will definitely succeed.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.23 isNullable(Column as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the nullability of values in the designated column.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
the nullability status of the given column; one of columnNoNulls, columnNullable or columnNullableUnknown

### 104.12.24 isReadOnly(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the designated column is definitely not writable.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.25 isSearchable(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the designated column can be used in a where clause.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.26 isSigned(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether values in the designated column are signed numbers.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

### 104.12.27 isWritable(Column as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether it is possible for a write on the designated column to succeed.
**Notes:** Parameters:
column - the first column is 1, the second is 2, ...
Returns:
true if so; false otherwise

## 104.13 class JavaRuntimeMBS

### 104.13.1 class JavaRuntimeMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The java class for runtime information.
**Notes:** Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.13.2 Methods

### 104.13.3 availableProcessors as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of processors available to the Java virtual machine.
**Notes:** This value may change during a particular invocation of the virtual machine. Applications that are sensitive to the number of available processors should therefore occasionally poll this property and adjust their resource usage appropriately.

### 104.13.4 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.13.5 freeMemory as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the amount of free memory in the Java Virtual Machine.
**Notes:** Calling the gc method may result in increasing the value returned by freeMemory.

### 104.13.6 gc

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Invokes the garbage collection.
**Notes:** Calls "System.gc" in Java.

### 104.13.7 maxMemory as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the maximum amount of memory that the Java virtual machine will attempt to use.
**Notes:** If there is no inherent limit then the value Long.MAX_VALUE will be returned.

### 104.13.8 totalMemory as Int64

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the total amount of memory in the Java virtual machine.
**Notes:** The value returned by this method may vary over time, depending on the host environment.
Note that the amount of memory required to hold an object of any given type may be implementation-dependent.

## 104.14 class JavaSavepointMBS

### 104.14.1 class JavaSavepointMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The representation of a savepoint, which is a point within the current transaction that can be referenced from the Connection.rollback method. When a transaction is rolled back to a savepoint all changes made after that savepoint are undone.
**Notes:** Savepoints can be either named or unnamed. Unnamed savepoints are identified by an ID generated by the underlying data source.
Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 104.14.2 Methods

### 104.14.3 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.14.4 getSavepointId as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the generated ID for the savepoint that this Savepoint object represents.

### 104.14.5 getSavepointName as string

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of the savepoint that this Savepoint object represents.

## 104.15 class JavaStatementMBS

### 104.15.1 class JavaStatementMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The object used for executing a static SQL statement and returning the results it produces.
**Notes:** By default, only one ResultSet object per Statement object can be open at the same time. Therefore, if the reading of one ResultSet object is interleaved with the reading of another, each must have been generated by different Statement objects. All execution methods in the Statement interface implicitly close a statment's current ResultSet object if an open one exists.
Subclass of the JavaObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Prefetching records from databases
- MBS Xojo / Real Studio Plugins, version 15.1pr1

### 104.15.2 Methods

### 104.15.3 addBatch(sql as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds the given SQL command to the current list of commmands for this Statement object.
**Notes:** The commands in this list can be executed as a batch by calling the method executeBatch.

NOTE: This method is optional.

Parameters:
sql - typically this is a static SQL INSERT or UPDATE statement

### 104.15.4 cancel

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Cancels this Statement object if both the DBMS and driver support aborting an SQL statement.
**Notes:** This method can be used by one thread to cancel a statement that is being executed by another thread.

### 104.15.5 clearBatch

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Empties this Statement object's current list of SQL commands.
**Notes:** NOTE: This method is optional.

### 104.15.6 clearWarnings

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears all the warnings reported on this Statement object.
**Notes:** After a call to this method, the method getWarnings will return null until a new warning is reported for this Statement object.

### 104.15.7 close

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Releases this Statement object's database and JDBC resources immediately instead of waiting for this to happen when it is automatically closed.
**Notes:** It is generally good practice to release resources as soon as you are finished with them to avoid tying up database resources.
Calling the method close on a Statement object that is already closed has no effect.

Note: A Statement object is automatically closed when it is garbage collected. When a Statement object is closed, its current ResultSet object, if one exists, is also closed.

### 104.15.8 CLOSE_ALL_RESULTS as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that all ResultSet objects that have previously been kept open should be closed when calling getMoreResults.

### 104.15.9 CLOSE_CURRENT_RESULT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the current ResultSet object should be closed when calling getMoreResults.

### 104.15.10 Constructor

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 104.15.11 execute(sql as string) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the given SQL statement, which may return multiple results.
**Notes:** In some (uncommon) situations, a single SQL statement may return multiple result sets and/or update counts. Normally you can ignore this unless you are (1) executing a stored procedure that you know may return multiple results or (2) you are dynamically executing an unknown SQL string.
The execute method executes an SQL statement and indicates the form of the first result. You must then use the methods getResultSet or getUpdateCount to retrieve the result, and getMoreResults to move to any subsequent result(s).

Parameters:
sql - any SQL statement

Returns:
true if the first result is a ResultSet object; false if it is an update count or there are no results
See also:

- 104.15.12 execute(sql as string, autoGeneratedKeys as Integer) as boolean 16257

### 104.15.12 execute(sql as string, autoGeneratedKeys as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the given SQL statement, which may return multiple results, and signals the driver that any auto-generated keys should be made available for retrieval.
**Notes:** The driver will ignore this signal if the SQL statement is not an INSERT statement.
In some (uncommon) situations, a single SQL statement may return multiple result sets and/or update counts. Normally you can ignore this unless you are (1) executing a stored procedure that you know may return multiple results or (2) you are dynamically executing an unknown SQL string.

The execute method executes an SQL statement and indicates the form of the first result. You must then use the methods getResultSet or getUpdateCount to retrieve the result, and getMoreResults to move to any subsequent result(s).

Parameters:
sql - any SQL statement
autoGeneratedKeys - a constant indicating whether auto-generated keys should be made available for retrieval using the method getGeneratedKeys; one of the following constants: Statement.RETURN_GENERATED_KEYS or Statement.NO_GENERATED_KEYS
Returns:
true if the first result is a ResultSet object; false if it is an update count or there are no results
See also:

- 104.15.11 execute(sql as string) as boolean 16257

### 104.15.13 executeBatch as Integer()

MBS Java Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Submits a batch of commands to the database for execution and if all commands execute successfully, returns an array of update counts.

### 104.15.14 executeQuery(sql as string) as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the given SQL statement, which returns a single ResultSet object.
**Notes:** Parameters:
sql - an SQL statement to be sent to the database, typically a static SQL SELECT statement
Returns:
a ResultSet object that contains the data produced by the given query; never null

### 104.15.15 executeUpdate(Sql as string) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the given SQL statement, which may be an INSERT, UPDATE, or DELETE statement or an SQL statement that returns nothing, such as an SQL DDL statement.
**Notes:** Parameters:
sql - an SQL INSERT, UPDATE or DELETE statement or an SQL statement that returns nothing
Returns:
either the row count for INSERT, UPDATE or DELETE statements, or 0 for SQL statements that return nothing
See also:

- 104.15.16 executeUpdate(Sql as string, autoGeneratedKeys as Integer) as Integer 16259

### 104.15.16 executeUpdate(Sql as string, autoGeneratedKeys as Integer) as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Executes the given SQL statement and signals the driver with the given flag about whether the auto-generated keys produced by this Statement object should be made available for retrieval.
**Notes:** Parameters:
sql - must be an SQL INSERT, UPDATE or DELETE statement or an SQL statement that returns nothing
autoGeneratedKeys - a flag indicating whether auto-generated keys should be made available for retrieval; one of the following constants: Statement.RETURN_GENERATED_KEYS Statement.NO_GENERATED_KEYS
Returns:
either the row count for INSERT, UPDATE or DELETE statements, or 0 for SQL statements that return nothing
See also:

- 104.15.15 executeUpdate(Sql as string) as Integer 16259

### 104.15.17 EXECUTE_FAILED as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that an error occured while executing a batch statement.

### 104.15.18 getGeneratedKeys as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves any auto-generated keys created as a result of executing this Statement object.
**Notes:** If this Statement object did not generate any keys, an empty ResultSet object is returned.

Returns:
a ResultSet object containing the auto-generated key(s) generated by the execution of this Statement object

### 104.15.19 getMoreResults as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves to this Statement object's next result, returns true if it is a ResultSet object, and implicitly closes any current ResultSet object(s) obtained with the method getResultSet.
**Notes:** There are no more results when the following is true:

```
// stmt is a Statement object
((stmt.getMoreResults() == false) && (stmt.getUpdateCount() == -1))
```

Returns:
true if the next result is a ResultSet object; false if it is an update count or there are no more results
See also:

- 104.15.20 getMoreResults(current as Integer) as boolean 16260

### 104.15.20 getMoreResults(current as Integer) as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves to this Statement object's next result, deals with any current ResultSet object(s) according to the instructions specified by the given flag, and returns true if the next result is a ResultSet object.
**Notes:** There are no more results when the following is true:

```
// stmt is a Statement object
((stmt.getMoreResults() == false) && (stmt.getUpdateCount() == -1))
```

Parameters:
current - one of the following Statement constants indicating what should happen to current ResultSet objects

obtained using the method getResultSet: Statement.CLOSE_CURRENT_RESULT, Statement.KEEP_CURRENT_RESULT, or Statement.CLOSE_ALL_RESULTS
Returns:
true if the next result is a ResultSet object; false if it is an update count or there are no more results
See also:

- 104.15.19 getMoreResults as boolean 16260

### 104.15.21 getResultSet as JavaResultSetMBS

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the current result as a ResultSet object.
**Notes:** This method should be called only once per result.

Returns:
the current result as a ResultSet object or null if the result is an update count or there are no more results

### 104.15.22 getResultSetConcurrency as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the result set concurrency for ResultSet objects generated by this Statement object.
**Notes:** Returns:
either ResultSet.CONCUR_READ_ONLY or ResultSet.CONCUR_UPDATABLE

### 104.15.23 getResultSetHoldability as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the result set holdability for ResultSet objects generated by this Statement object.
**Notes:** Returns:
either ResultSet.HOLD_CURSORS_OVER_COMMIT or ResultSet.CLOSE_CURSORS_AT_COMMIT

### 104.15.24 getResultSetType as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the result set type for ResultSet objects generated by this Statement object.
**Notes:** Returns:
one of ResultSet.TYPE_FORWARD_ONLY, ResultSet.TYPE_SCROLL_INSENSITIVE, or ResultSet.TYPE_SCROLL_S
SITIVE

### 104.15.25 getUpdateCount as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the current result as an update count; if the result is a ResultSet object or there are no more results, -1 is returned.
**Notes:** This method should be called only once per result.

Returns:
the current result as an update count; -1 if the current result is a ResultSet object or there are no more results

### 104.15.26 KEEP_CURRENT_RESULT as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that the current ResultSet object should not be closed when calling getMoreResults.

### 104.15.27 NO_GENERATED_KEYS as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that generated keys should not be made available for retrieval.

### 104.15.28 RETURN_GENERATED_KEYS as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that generated keys should be made available for retrieval.

### 104.15.29 setCursorName(name as string)

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the SQL cursor name to the given String, which will be used by subsequent Statement object execute methods.
**Notes:** This name can then be used in SQL positioned update or delete statements to identify the current row in the ResultSet object generated by this statement. If the database does not support positioned update/delete, this method is a noop. To insure that a cursor has the proper isolation level to support updates, the cursor's SELECT statement should have the form SELECT FOR UPDATE. If FOR UPDATE is not present, positioned updates may fail.
Note: By definition, the execution of positioned updates and deletes must be done by a different Statement object than the one that generated the ResultSet object being used for positioning. Also, cursor names must be unique within a connection.

Parameters:
name - the new cursor name, which must be unique within a connection

### 104.15.30 SUCCESS_NO_INFO as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constant indicating that a batch statement executed successfully but that no count of the number of rows it affected is available.

### 104.15.31 Properties

### 104.15.32 EscapeProcessing as boolean

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether escape processing is on or off.
**Notes:** If escape scanning is on (the default), the driver will do escape substitution before sending the SQL statement to the database. Note: Since prepared statements have usually been parsed prior to making this call, disabling escape processing for PreparedStatements objects will have no effect.
Parameters:
enable - true to enable escape processing; false to disable it
(Read and Write computed property)

### 104.15.33 FetchDirection as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The fetch direction.
**Notes:** Gives the driver a hint as to the direction in which rows will be processed in ResultSet objects created using this Statement object. The default value is ResultSet.FETCH_FORWARD.
Note that this method sets the default fetch direction for result sets generated by this Statement object. Each result set has its own methods for getting and setting its own fetch direction.

Parameters:
direction - the initial direction for processing rows
(Read and Write computed property)

### 104.15.34 FetchSize as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gives the JDBC driver a hint as to the number of rows that should be fetched from the database when more rows are needed.
**Notes:** The number of rows specified affects only result sets created using this statement. If the value specified is zero, then the hint is ignored. The default value is zero.
Parameters:
rows - the number of rows to fetch
(Read and Write computed property)

### 104.15.35 MaxFieldSize as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum number of bytes that can be returned for character and binary column values in a ResultSet object produced by this Statement object.
**Notes:** This limit applies only to BINARY, VARBINARY, LONGVARBINARY, CHAR, VARCHAR, and LONGVARCHAR columns. If the limit is exceeded, the excess data is silently discarded.
(Read and Write computed property)

### 104.15.36 MaxRows as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum number of rows that a ResultSet object produced by this Statement object can contain.
**Notes:** If this limit is exceeded, the excess rows are silently dropped.
(Read and Write computed property)

### 104.15.37 QueryTimeout as Integer

MBS Java Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of seconds the driver will wait for a Statement object to execute. If the limit is exceeded, a SQLException is thrown.
**Notes:** Returns:
the current query timeout limit in seconds; zero means there is no limit
(Read and Write computed property)

# Chapter 105

# JavaScript

## 105.1 class JavaScriptDateComponentsMBS

### 105.1.1 class JavaScriptDateComponentsMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for date components in JavaScript.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// get now
Dim t1 As Double = j.Now

// as compoents
Dim d1 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t1)
Dim s1 As String = d1.SQLDateTime
// looks right?

// now convert back
Dim t2 As Double = j.DateComponentsToTime(d1)
Dim d2 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t2)
Dim s2 As String = d2.SQLDateTime
// still looks right?

Dim t3 As Double = j.DateComponentsToTime(d2)
// should be same time as above, but without fractions

Break
```

**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr1

### 105.1.2 Properties

### 105.1.3 DateTimeValue as DateTime

MBS Tools Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The components as Xojo dateTime.
**Notes:** Convenience function to create date with UTC and values from this object.
(Read only property)

### 105.1.4 DateValue as Date

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The components as Xojo date.
**Notes:** Convenience function to create date with UTC and values from this object.
(Read only property)

### 105.1.5 Day as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day value.
**Notes:** Ranges from 1 to 31.
(Read and Write property)

### 105.1.6 Hour as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour.
**Notes:** (Read and Write property)

### 105.1.7 Millisecond as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The milliseconds.
**Notes:** (Read and Write property)

### 105.1.8 Minute as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minutes.
**Notes:** (Read and Write property)

### 105.1.9 Month as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month value.
**Notes:** Range is 1 to 12.
(Read and Write property)

### 105.1.10 Second as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The seconds.
**Notes:** (Read and Write property)

### 105.1.11 SQLDateTime as String

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL date and time.
**Notes:** Convenience property to see value in debugger.
(Read only property)

### 105.1.12 WeekDay as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The week day value.
**Notes:** Range is 0 to 6. Sunday is 0, Monday is 1, Tuesday is 2, Wednesday is 3, Thursday is 4, Friday is 5 and Saturday is 6.
(Read and Write property)

### 105.1.13 Year as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year value.
**Notes:** (Read and Write property)

## 105.2 class JavaScriptEngineExceptionMBS

### 105.2.1 class JavaScriptEngineExceptionMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a fatal exception in our JavaScript engine.
**Notes:** See message property for reason of the exception.
Subclass of the RuntimeException class.
**Blog Entries**

- Our JavaScript engine for Xojo

## 105.3 class JavaScriptEngineMBS

### 105.3.1 class JavaScriptEngineMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for our embedded JavaScript engine.
**Notes:** We use DukTape, an embeddable Javascript engine, with a focus on portability and compact footprint.
https://duktape.org

Your own JavaScript engine is useful for:

- Running some snippet of JavaScript code without HTMLViewer.
- Using various JavaScript libraries
- Providing a scripting language to your own application.
- An lightweight alternative to XojoScript.
- Working with JSON data
- Enjoy using regular expressions, unicode text functions, number parsing and formatting with no platform dependencies

MBS Plugin added Input(), Yield() and Print() functions for your convenience.
Yield will pass CPU control to other threads, so background tasks continue to run.

MBS Plugin can convert JavaScript values to variant.
Boolean ->Boolean
Number ->Double
String ->String
Buffer ->MemoryBlock
Pointer ->Ptr
Array ->Variant array
Object ->JSON string
null ->nil

We convert variant to JavaScript:
nil ->null
Int32, Int64, Single, Double, Currency ->Number
Boolean ->Boolean
String, Text, Date ->String
Ptr ->Pointer
all other ->undefined

This class is like XojoScript, but using JavaScript as language.

Warning: error handling is broken in version 21.1 of the MBS Plugin. Please update to 22.2 for a fix.
**Blog Entries**

- MBS Xojo Plugin, June 2021 News
- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- Multithreaded JavaScript usage
- Our JavaScript engine, a game changer
- Tips for our JavaScript functions
- Comparing JavaScriptEngineMBS to XojoScript
- New in the MBS Xojo Plugins 20.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- Our JavaScript engine for Xojo

**Videos**

- XDC 2020 MBS Plugins Presentation
- MBS Xojo Videos - MBS Xojo Plugin, June 2021 News

**Xojo Developer Magazine**

- 19.5, pages 92 to 93: JavaScript in Xojo, Running JavaScript in your Xojo apps by Stefanie Juchmes
- 19.4, page 9: News
- 18.3, page 47: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 18.3, page 10: News

### 105.3.2 Methods

### 105.3.3 AddFunction(Name as String, JavaScript as String, FileName as String = "")

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a global function defined as a text string.
**Example:**

```
Dim j As New JavaScriptEngineMBS
j.AddFunction "adder", "function (x,y) { return x+y; } "
```

**Notes:** Optional provide a file name to show in stack traces.
Function source code may contain a function name, but we use only the name parameter to register the function as global one.

### 105.3.4 CallFunction(Name as String, ParamArray Params as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a global function given the name.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// call it
Dim r As Variant = j.CallFunction("adder", 2, 3)
Break // check result in debugger
```

**Notes:** Parameters are passed to the function.
If the function needs more parameter, undefined values are used to fill up.
If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.
See also:

- 105.3.5 CallFunction(Name as String, Params() as Variant) as Variant 16274

### 105.3.5 CallFunction(Name as String, Params() as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a global function given the name.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// call it
Dim Params() As Variant
params.Append 3
params.Append 4
params.Append 5 // one too much ->will be ignored
Dim r As Variant = j.CallFunction("adder", params)
Break // check result in debugger
```

**Notes:** Parameters are passed to the function.
If the function needs more parameter, undefined values are used to fill up.
If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.
See also:

- 105.3.4 CallFunction(Name as String, ParamArray Params as Variant) as Variant 16274

### 105.3.6 CallFunctionMT(Name as String, ParamArray Params as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a global function given the name.
**Notes:** Threaded version of CallFunction. If events or delegates are called on main thread, the preemptive thread waits for answer.

Parameters are passed to the function.
If the function needs more parameter, undefined values are used to fill up.
If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 105.3.7 CallFunctionMT(Name as String, Params() as Variant) as Variant 16276

### 105.3.7 CallFunctionMT(Name as String, Params() as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a global function given the name.
**Notes:** Threaded version of CallFunction. If events or delegates are called on main thread, the preemptive thread waits for answer.

Parameters are passed to the function.
If the function needs more parameter, undefined values are used to fill up.
If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 105.3.6 CallFunctionMT(Name as String, ParamArray Params as Variant) as Variant 16275

### 105.3.8 DateComponentsToTime(date as JavaScriptDateComponentsMBS) as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts date components to time.
**Example:**

```
Dim j As New JavaScriptEngineMBS

Dim d As New JavaScriptDateComponentsMBS
d.Year = 1970
d.Month = 1
d.day = 1

// shows zero as that's the start point in time for unix
MsgBox "Start Time: "+Str(j.DateComponentsToTime(d))
```

**Notes:** Convert components (year, month, day, etc), interpreted in UTC, into a time value. The weekday argument is ignored in the conversion. If the component values are invalid, an error is thrown.

There are some differences to the ECMAScript Date.UTC() built-in:

- There's no special handling of two-digit years. For example, Date.UTC(99, 0, 1) gets interpreted as 1999-01-01. If time is 99, it's interpreted as the year 99.
- The milliseconds component is allowed fractions (sub-millisecond resolution) so that the resulting time value may have fractions.

Like the ECMAScript primitives, the components can exceed their natural range and are normalized. For example, specifying minute as 120 is interpreted as adding 2 hours to the time value. The components are expressed as Integers to allow large and negative values to be used.

### 105.3.9 Destructor

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 105.3.10 Evaluate(JavaScript as String) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a JavaScript expression.
**Example:**

```
Dim j As New JavaScriptEngineMBS

Dim v As Variant = j.Evaluate("2+3")
MsgBox v.StringValue
```

**Notes:** This may include definition of functions and objects and using them.
Result is converted to variant and returned.

### 105.3.11 EvaluateMT(JavaScript as String) as Variant

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a JavaScript expression.
**Notes:** Threaded version of Evaluate. If events or delegates are called on main thread, the preemptive thread waits for answer.

This may include definition of functions and objects and using them.
Result is converted to variant and returned.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 105.3.12 EvaluateToString(JavaScript as String) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a JavaScript expression.
**Example:**

```
Dim j As New JavaScriptEngineMBS

Dim s As String = j.EvaluateToString("2+3")
MsgBox s
```

**Notes:** This may include definition of functions and objects and using them.
Result is converted to string in JavaScript and returned as Xojo string.

### 105.3.13 InitModules

MBS Tools Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs Duktape module loading.
**Notes:** Only calls JS.InitModules once on a new instance of the JavaScript engine.
Define your own Duktape.modSearch() to provide environment specific module lookups.
After these steps, require() will be registered to the global object and the module system is ready to use.

### 105.3.14 LoadFunction(Name as String, Data as Memoryblock) as Boolean

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a global function from byte code.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// get byte code
Dim m As MemoryBlock = j.SaveFunction("adder")
```

```
// and load back with new name
dim b as Boolean = j.LoadFunction("adder2", m)

// call it
Dim r As Variant = j.CallFunction("adder2", 2, 3)
break // check result in debugger
```

**Notes:** Load a buffer containing bytecode, recreating the original ECMAScript function (with some limitations). You must ensure that the bytecode has been dumped with a compatible Duktape version and that the bytecode has not been modified since. Loading bytecode from an untrusted source is memory unsafe and may lead to exploitable vulnerabilities.

Returns true in case of success or false on failure.

### 105.3.15 Now as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current time as double value.
**Notes:** This is seconds since 1st January 1970 multiplied by 1000 and may contain fraction with microseconds.

Get current time in POSIX milliseconds, as seen by the ECMAScript environment. The return value matches Date.now() with the reservation that sub-millisecond resolution may be available.

### 105.3.16 RegisterFunction(Name as String, theDelegate as JavaScriptEngineDelegateMBS, ArgCount as Integer = -1, tag as Variant = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registers a global function with given name to call delegate.
**Example:**

```
Dim j As New JavaScriptEngineMBS

j.RegisterFunction "MyFunction", AddressOf testFunction, 1, Nil

// call in JavaScript
Dim x As Variant = j.Evaluate("MyFunction(123);")

// call via plugin
```

```
Dim r As Variant = j.CallFunction("MyFunction", "Hello")

Break

'Public Function testFunction(Name as String, Params() as Variant, tag as Variant) as Variant
' MsgBox params(0).StringValue
' Return "ok"
'End Function
```

**Notes:** ArgCount can be in range from -1 to 15.
If -1 is passed, we allow variable number of arguments.
Tag is passed to delegate and allows you to pass a context object to the delegate.

### 105.3.17 SaveFunction(Name as String) as MemoryBlock

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries byte code for global JavaScript function.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// get byte code
Dim m As MemoryBlock = j.SaveFunction("adder")

// and load back with new name
dim b as Boolean = j.LoadFunction("adder2", m)

// call it
Dim r As Variant = j.CallFunction("adder2", 2, 3)
break // check result in debugger
```

**Notes:** Dump an ECMAScript function at stack top into bytecode, replacing the function with a buffer containing the bytecode data. The bytecode can be loaded back using LoadFunction().

### 105.3.18 TimeToDateComponents(time as Double) as JavaScriptDateComponentsMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts time to date components.
**Example:**

```
Dim j As New JavaScriptEngineMBS

// get now
Dim t1 As Double = j.Now

// as compoents
Dim d1 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t1)
Dim s1 As String = d1.SQLDateTime
// looks right?

Break
```

**Notes:** Convert a time value to components (year, month, day, etc) interpreted in UTC. If the time value is invalid, e.g. beyond the valid ECMAScript time range, an error is thrown.

There are some differences to the ECMAScript Date UTC accessors like Date.prototype.getUTCMinutes():

The time value is allowed to have fractions (sub-millisecond resolution) so that the millisecond component may also have fractions.

### 105.3.19 Properties

### 105.3.20 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 105.3.21 MemoryBlocks as Dictionary

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the dictionary with references memoryblocks.

**Notes:** Just for debugging to inspect.
Memoryblocks need to stay here to avoid them being destructed too early, which can cause crashes.
(Read only property)

### 105.3.22 ObjectCount as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries global object counter.
**Notes:** A fresh JavaScript engine already has about 400 objects for the built-in functionality.
(Read only property)

### 105.3.23 StringCount as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries global string counter.
**Notes:** A fresh JavaScript engine already has about 1000 strings.
(Read only property)

### 105.3.24 GlobalMemoryBlock(PropertyName as String) as MemoryBlock

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query or assign a global property to reference memoryblock.
**Notes:** A normal memoryblock passed as parameter to a function or property would be copied.
This method allows you to define a buffer in JavaScript to reference the bytes in a memoryblock, so all changes are visible in Xojo directly.

You can assign nil as value to clear a memoryblock.
(Read and Write computed property)

### 105.3.25 GlobalProperty(PropertyName as String) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a global property.
**Example:**

```
Dim j As New JavaScriptEngineMBS
```

```
j.GlobalProperty("Hello") = "World"
MsgBox j.GlobalProperty("Hello")
```

**Notes:** Values are converted to/from variant.
(Read and Write computed property)

### 105.3.26 GlobalPropertyJSON(PropertyName as String) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a global property as JSON.
**Example:**

```
Dim j As New JavaScriptEngineMBS

j.GlobalProperty("Hello") = "World"
MsgBox j.GlobalPropertyJSON("Hello")

j.GlobalPropertyJSON("test") = " [ 1,2,3 ] "
MsgBox j.GlobalPropertyJSON("test")
```

**Notes:** Same as GlobalProperty, but needs JSON text.
(Read and Write computed property)

### 105.3.27 Events

### 105.3.28 Input(values() as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The input event.
**Notes:** Called in JavaScript with Input() function call.
Takes variable number of arguments, which are provided as variants here.
Return a value, which we pass through to JavaScript as function result.

### 105.3.29 Print(values() as Variant)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The print event.

**Notes:** Called in JavaScript with Print() function call.
Takes variable number of arguments, which are provided as variants here.

### 105.3.30 Delegates

### 105.3.31 JavaScriptEngineDelegateMBS(Name as String, Params() as Variant, tag as Variant) as Variant

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delegate definition for RegisterFunction function.
**Example:**

```
Public Function testFunction(Name as String, Params() as Variant, tag as Variant) as Variant
MsgBox params(0).StringValue
Return "ok"
End Function
```

**Notes:** We pass name of function, parameters and tag value.
Result is returned to JavaScript.

## 105.4 class JSClassMBS

### 105.4.1 class JSClassMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a class in javascript.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 105.4.2 Methods

### 105.4.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 105.4.4 NewObject as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript object for current class.

### 105.4.5 Properties

### 105.4.6 context as JSContextMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The context for this class.
**Notes:** (Read only property)

### 105.4.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The handle for the class object.
**Notes:** (Read and Write property)

### 105.4.8 Tag as Variant

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The tag value.
**Notes:** You can store anything here and as long as the JSClass object exists, this value is kept referenced. (Read and Write property)

## 105.5 class JSContextMBS

### 105.5.1 class JSContextMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a javascript execution context.
**Example:**

```
dim c as new JSContextMBS
dim e as JSValueMBS
dim v as JSValueMBS = c.EvaluateScript("1+2", "", nil, e)

if e <>nil then
// show error
MsgBox e.StringValue
else
// show result
MsgBox str(v.doubleValue)
end if
```

**Notes:** See also JavaScriptEngineMBS class for cross platform projects.

Updated for version 23.1 to work on Windows and Linux if you have a JavaScriptCore library to load.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr1

### 105.5.2 Methods

### 105.5.3 CheckScriptSyntax(script as string, sourceURL as String, startingLineNumber as Integer = 1, byref JSException as JSValueMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks for syntax errors in a string of JavaScript.
**Example:**

```
dim c as new JSContextMBS
dim e as JSValueMBS
if c.CheckScriptSyntax("1+", "", e) then
MsgBox "OK"
```

```
else
// show error

MsgBox e.StringValue
end if
```

**Notes:** Script: A string containing the script to check for syntax errors.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions. The value is one-based, so the first line is line 1 and invalid values are clamped to 1.
exception: A JSValue in which to store a syntax error exception, if any.

Returns true if the script is syntactically correct, otherwise false.

### 105.5.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Creates a global JavaScript execution context.

### 105.5.5 EvaluateScript(script as string, sourceURL as String, thisObject as JSValueMBS, startingLineNumber as Integer = 1, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Evaluates a string of JavaScript.
**Example:**

```
dim c as new JSContextMBS
dim e as JSValueMBS
dim v as JSValueMBS = c.EvaluateScript("1+", "", nil, e)

if e <>nil then
// show error
MsgBox e.StringValue
else
// show result
MsgBox str(v.doubleValue)
```

end if

**Notes:** script: A string containing the script to evaluate.
thisObject: The object to use as "this," or nil to use the global object as "this."
sourceURL: A string containing a URL for the script's source file. This is used by debuggers and when reporting exceptions. Pass "" if you do not care to include source file information.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions. The value is one-based, so the first line is line 1 and invalid values are clamped to 1.
exception: A JSValueMBS in which to store an exception, if any.

Returns the JSValue that results from evaluating script, or nil if an exception is thrown.

### 105.5.6 GarbageCollect

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Performs a JavaScript garbage collection.
**Notes:** JavaScript values that are on the machine stack, in a register, protected by JSValueProtect, set as the global object of an execution context, or reachable from any such value will not be collected.

During JavaScript execution, you are not required to call this function; the JavaScript engine will garbage collect as needed. JavaScript values created within a context group are automatically destroyed when the last reference to the context group is released.

### 105.5.7 LoadLibrary(File as folderItem) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the library.
**Notes:** Does nothing on macOS or iOS since we use the library provided by Apple with the operation system.

You can load JavaScriptCore.dll on Windows here.
Make sure all dependencies are honored and you may use Dependency Walker application to look for dependencies.

You can load libjavascriptcoregtk.so on Linux here.
e.g. "/usr/lib/aarch64-linux-gnu/libjavascriptcoregtk-4.1.so" for Linux 64-bit on ARM

Returns true on success.

See also:


- 105.5.8 LoadLibrary(Path as String) as boolean 16290


### 105.5.8 LoadLibrary(Path as String) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the library.
**Example:**

```
#If TargetLinux Then

// you may need to check what version you have
If JSContextMBS.LoadLibraryPath("libjavascriptcoregtk-4.1.so") Then
MessageBox "Okay"
Else
MessageBox "Failed to load: "+JSContextMBS.LibraryError
End If

#ElseIf TargetWindows

// you may find somewhere a JavaScriptCore.dll for use here

// we just load the DLLs from iTunes into our folder with exe file:
// ASL.dll
// CoreFoundation.dll
// icudt62.dll
// JavaScriptCore.dll
// libdispatch.dll
// libicuin.dll
// libicuuc.dll
// objc.dll
// WTF.dll


If JSContextMBS.LoadLibraryPath("JavaScriptCore.dll") Then
MessageBox "Okay"
Else
MessageBox "Failed to load: "+JSContextMBS.LibraryError
End If

#endif
```

**Notes:** You can load JavaScriptCore.dll on Windows here.
Make sure all dependencies are honored and you may use Dependency Walker application to look for dependencies.

You can load libjavascriptcoregtk.so on Linux here.
e.g. "/usr/lib/aarch64-linux-gnu/libjavascriptcoregtk-4.1.so" for Linux 64-bit on ARM

Returns true on success.
See also:

- 105.5.7 LoadLibrary(File as folderItem) as boolean 16289

### 105.5.9 NewArray(arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript Array object.
**Example:**

```
dim c as new JSContextMBS

dim e as JSValueMBS
dim v as JSObjectMBS = c.NewArray(nil, e)
v.SetPropertyAtIndex(0, c.valueWithString("Hello"), e)
v.SetPropertyAtIndex(1, c.valueWithString("World"), e)
MsgBox v.JSONString
```

**Notes:** arguments: A JSValue array of data to populate the Array with.
JSException: A JSValueMBS in which to store an exception, if any.
Returns a JSObject that is an Array.
The behavior of this function does not exactly match the behavior of the built-in Array constructor. Specifically, if one argument is supplied, this function returns an array with one element.
Requires Mac OS X 10.6 or newer.

### 105.5.10 NewDate(arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript Date object, as if by invoking the built-in Date constructor.
**Example:**

```
dim c as new JSContextMBS

dim year as JSValueMBS = c.valueWithDouble(2015)
```

```
dim month as JSValueMBS = c.valueWithDouble(5)
dim day as JSValueMBS = c.valueWithDouble(12)

dim e as JSValueMBS // exception
dim d as JSValueMBS = c.NewDate(array(year, month, day), e)

MsgBox d.JSONString
```

**Notes:** arguments: A JSValue array of arguments to pass to the Date Constructor.
JSException: A JSValueMBS in which to store an exception, if any.
Returns a JSObject that is a Date.
Requires Mac OS X 10.6 or newer.

### 105.5.11 NewError(arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript Error object, as if by invoking the built-in Error constructor.
**Example:**

```
dim c as new JSContextMBS

dim parameters() as JSValueMBS
Parameters.Append c.valueWithString("Hello")

dim ex as JSValueMBS
dim e as JSValueMBS = c.NewError(Parameters, ex)
MsgBox e.StringValue
```

**Notes:** arguments: A JSValue array of arguments to pass to the Error Constructor.
JSException: A JSValueMBS in which to store an exception, if any.

Returns a JSObject that is a Error.
Requires Mac OS X 10.6 or newer.

### 105.5.12 NewFunction(name as string) as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience method for creating a JavaScript function which raises FunctionCalled event on

invokation.
**Notes:** name: A string containing the function's name. This will be used when converting the function to string. Pass NULL to create an anonymous function.
Returns a JSObject that is a function. The object's prototype will be the default function prototype.
See also:

- 105.5.13 NewFunction(name as string, parameterNames() as string, Body as String, SourceURL as string = "", startingLineNumber as Integer = 0, byref JSException as JSValueMBS) as JSValueMBS 16293

### 105.5.13 NewFunction(name as string, parameterNames() as string, Body as String, SourceURL as string = "", startingLineNumber as Integer = 0, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a function with a given script as its body.
**Example:**

```
dim c as new JSContextMBS

// create a function
dim parameterNames() as string = array("value")
dim body as string = "return value*value;"
dim name as string = "test"

dim e as JSValueMBS
dim v as JSValueMBS = c.NewFunction(name, parameterNames, body, e )

MsgBox v.StringValue

// put it in global memory
c.globalObject.SetProperty "test", v, e

// and call it
dim r as JSValueMBS = c.EvaluateScript("test(5)", "", nil, e)
MsgBox r.StringValue
```

**Notes:** name: A string containing the function's name. This will be used when converting the function to string. Pass "" to create an anonymous function.
parameterNames: A string array containing the names of the function's parameters.
body: A string containing the script to use as the function's body.
sourceURL: A string containing a URL for the script's source file. This is only used when reporting exceptions. Pass "" if you do not care to include source file information in exceptions.
startingLineNumber: An integer value specifying the script's starting line number in the file located at sourceURL. This is only used when reporting exceptions. The value is one-based, so the first line is line 1

and invalid values are clamped to 1.
exception: A JSValueMBS in which to store a syntax error exception, if any. Pass nil if you do not care to store a syntax error exception.
A JSObject that is a function, or nil if either body or parameterNames contains a syntax error. The object's prototype will be the default function prototype.
Use this method when you want to execute a script repeatedly, to avoid the cost of re-parsing the script before each execution.
See also:

- 105.5.12 NewFunction(name as string) as JSObjectMBS 16292

### 105.5.14 NewObject as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new object.

### 105.5.15 NewRegExp(arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript RegExp object, as if by invoking the built-in RegExp constructor.
**Notes:** arguments: A JSValue array of arguments to pass to the RegExp Constructor.
JSException: A JSValueMBS in which to store an exception, if any.
Returns a JSObject that is a RegExp.
Requires Mac OS X 10.6 or newer.

### 105.5.16 valueWithBool(value as boolean) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value of the boolean type.
**Example:**

```
dim c as new JSContextMBS
dim v as JSValueMBS = c.valueWithBool(true)
MsgBox v.JSONString
```

### 105.5.17 valueWithDouble(value as Double) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value of the number type.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithDouble(5.6)
MsgBox v.StringValue
```

### 105.5.18 valueWithJSON(JSON as string) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value from a JSON formatted string.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithJSON(" [ 1,2,3 ] ")
dim o as JSObjectMBS = JSObjectMBS(v) // arrays are objects

dim e as JSValueMBS
dim p as JSValueMBS = o.GetProperty("length", e)

MsgBox p.StringValue // shows 3
```

**Notes:** Returns a JSValue containing the parsed value, or nil if the input is invalid.
Available on Mac OS X 10.7 and newer

### 105.5.19 valueWithNull as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value of the null type.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithNull

if j.Type = JSValueMBS.kJSTypeNull then
```

```
MsgBox "null"
end if
```

### 105.5.20 valueWithString(value as string) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value of the string type.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithString("Hello")
MsgBox v.StringValue
```

### 105.5.21 valueWithUndefined as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript value of the undefined type.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithUndefined

if j.Type = JSValueMBS.kJSTypeUndefined then
MsgBox "undefined"
end if
```

### 105.5.22 Properties

### 105.5.23 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks whether the JavaScriptCore library is loaded.
**Notes:** Checks whether the JavaScriptCore library is loaded.
Always loaded on macOS since we use the one coming with macOS.

For Windows you can load JavaScriptCore.dll and for Linux you can load the libjavascriptcoregtk.so file with

LoadLibrary function.

Returns always true on macOS and iOS.
(Read only property)

### 105.5.24 globalObject as JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the global object of a JavaScript execution context.
**Example:**

```
dim c as new JSContextMBS

dim v as JSObjectMBS = c.globalObject
dim e as JSValueMBS

v.SetProperty "Hello", c.valueWithString("World"), e
v.SetProperty "Value", c.valueWithDouble(5), e

MsgBox c.globalObject.JSONString
```

**Notes:** (Read only property)

### 105.5.25 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 105.5.26 LibraryError as String

MBS MacFrameworks Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The error message from loading the library.
**Notes:** (Read only property)

### 105.5.27 Name as String

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name.
**Example:**

```
dim c as new JSContextMBS

c.Name = "Hello"
MsgBox c.Name
```

**Notes:** Requires Mac OS X 10.10 and newer.
(Read and Write property)

### 105.5.28 Tag as Variant

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The tag value.
**Notes:** You can store anything here and as long as the JSContext object exists, this value is kept referenced.
(Read and Write property)

### 105.5.29 Events

### 105.5.30 FunctionCalled(functionObject as JSObjectMBS, thisObject as JSObjectMBS, arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** The event called when your custom function is called.
**Notes:** Please return a value and in case of error set exception.

## 105.6 class JSObjectMBS

### 105.6.1 class JSObjectMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a Javascript Object.
**Notes:** Subclass of the JSValueMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 105.6.2 Methods

### 105.6.3 CallAsConstructor(arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calls an object as a constructor.
**Notes:** self: The JSObject to call as a constructor.
arguments: A JSValueMBS array of arguments to pass to the constructor.
JSException A pointer to a JSValueMBS in which to store an exception, if any.
Returns the JSObject that results from calling object as a constructor, or nil if an exception is thrown or object is not a constructor.

### 105.6.4 CallAsFunction(thisObject as JSValueMBS, arguments() as JSValueMBS, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calls an object as a function.
**Notes:** self: The JSObject to call as a function.
thisObject: The object to use as "this," or nil to use the global object as "this."
arguments: A JSValueMBS array of arguments to pass to the function.
JSException: A JSValueMBS in which to store an exception, if any.

Returns the JSValue that results from calling object as a function, or nil if an exception is thrown or object is not a function.

### 105.6.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 105.6.6 DeleteProperty(name as string, byref JSException as JSValueMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Deletes a property from an object.
**Example:**

```
dim c as new JSContextMBS

dim v as JSObjectMBS = c.globalObject
dim e as JSValueMBS

v.SetProperty "Hello", c.valueWithString("World"), e
v.SetProperty "Value", c.valueWithDouble(5), e

MsgBox v.JSONString

call v.DeleteProperty "Hello", e

MsgBox v.JSONString
```

**Notes:** Name: A string containing the property's name.
JSException: A JSValueMBS in which to store an exception, if any.
Returns true if the delete operation succeeds, otherwise false (for example, if the property has the kJSPropertyAttributeDontDelete attribute set).

### 105.6.7 GetProperty(name as string, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets a property from an object.
**Example:**

```
dim c as new JSContextMBS

dim v as JSObjectMBS = c.globalObject
dim e as JSValueMBS

v.SetProperty "Hello", c.valueWithString("World"), e
```

```
MsgBox v.GetProperty("Hello", e).StringValue
```

**Notes:** object: The JSObject whose property you want to get.
Name: A string containing the property's name.
JSException: A JSValueMBS in which to store an exception, if any.
Returns the property's value if object has the property, otherwise the undefined value.

### 105.6.8 GetPropertyAtIndex(propertyIndex as Integer, byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets a property from an object by numeric index.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithJSON(" [ 1,2,3 ] ")
dim o as JSObjectMBS = JSObjectMBS(v) // arrays are objects

dim e as JSValueMBS
dim p as JSValueMBS = o.GetProperty("length", e)

MsgBox "Length: "+p.StringValue

dim n as JSValueMBS = o.GetPropertyAtIndex(2, e)
MsgBox "3rd value in array: "+n.StringValue
```

**Notes:** The JSObject whose property you want to get.
propertyIndex: An integer value that is the property's name.
JSException: A JSValueMBS in which to store an exception, if any.

Returns the property's value if object has the property, otherwise the undefined value.

Calling GetPropertyAtIndex is equivalent to calling GetProperty with a string containing propertyIndex, but GetPropertyAtIndex provides optimized access to numeric properties.

### 105.6.9 HasProperty(name as string) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether an object has a given property.
**Example:**

```
dim c as new JSContextMBS

dim e as JSValueMBS
dim v as JSObjectMBS = c.NewArray(nil, e)
MsgBox str(v.HasProperty("length"))
```

**Notes:** name: A string containing the property's name.
Returns true if the object has a property whose name matches propertyName, otherwise false.

### 105.6.10 PropertyNames as String()

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the names of an object's enumerable properties.
**Example:**

```
dim c as new JSContextMBS

dim v as JSObjectMBS = c.globalObject
dim e as JSValueMBS

v.SetProperty "Hello", c.valueWithString("World"), e
v.SetProperty "Value", c.valueWithDouble(5), e

MsgBox Join(v.PropertyNames, EndOfLine)
```

### 105.6.11 SetProperty(name as string, value as JSValueMBS, byref JSException as JSValueMBS)

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets a property on an object.
**Example:**

```
dim c as new JSContextMBS
```

```
dim v as JSObjectMBS = c.globalObject
dim e as JSValueMBS

v.SetProperty "Hello", c.valueWithString("World"), e
v.SetProperty "Value", c.valueWithDouble(5), e
```

**Notes:** Name: A string containing the property's name.
Value: A JSValue to use as the property's value.
JSException A pointer to a JSValueRef in which to store an exception, if any.

### 105.6.12 SetPropertyAtIndex(propertyIndex as Integer, value as JSValueMBS, byref JSException as JSValueMBS)

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets a property on an object by numeric index.
**Notes:** propertyIndex: The property's name as a number.
value: A JSValue to use as the property's value.
exception: A JSValueMBS in which to store an exception, if any.

Calling SetPropertyAtIndex is equivalent to calling SetProperty with a string containing propertyIndex, but SetPropertyAtIndex provides optimized access to numeric properties.

### 105.6.13 Properties

### 105.6.14 isConstructor as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether an object can be called as a constructor.
**Notes:** Returns true if the object can be called as a constructor, otherwise false.
(Read only property)

### 105.6.15 isFunction as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether an object can be called as a function.
**Example:**

```
dim c as new JSContextMBS
```

```
dim f as JSObjectMBS = c.NewFunction("Hello")

MsgBox str(f.isFunction)
```

**Notes:** Returns true if the object can be called as a function, otherwise false.
(Read only property)

### 105.6.16 Prototype as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An object's prototype.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithJSON(" { ""tag"": 1 } ")

dim o as JSObjectMBS = JSObjectMBS(j)
MsgBox "object prototyp: "+o.Prototype.StringValue
```

**Notes:** (Read and Write property)

## 105.7 class JSValueMBS

### 105.7.1 class JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a Javascript value.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithDouble(1)
MsgBox j.StringValue
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 105.7.2 Methods

### 105.7.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 105.7.4 DoubleValue(byref JSException as JSValueMBS) as Double

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to number and returns the resulting number.
**Notes:** Returns the numeric result of conversion, or NaN if an exception is thrown.
See also:

- 105.7.15 doubleValue as Double 16308

### 105.7.5 IsEqual(OtherValue as JSValueMBS, byref JSException as JSValueMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether two JavaScript values are equal, as compared by the JS == operator.
**Example:**

```
dim c as new JSContextMBS
dim s1 as JSValueMBS = c.valueWithJSON("""Hello""")
dim s2 as JSValueMBS = c.valueWithJSON("""Hello""")
dim e as JSValueMBS
MsgBox str(s1.IsEqual(s2, e))
```

**Notes:** OtherValue The second value to test.
exception: A JSValueMBS in which to store an exception, if any.
Returns true if the two values are equal, false if they are not equal or an exception is thrown.

### 105.7.6 IsInstanceOfConstructor(ConstructorFunction as JSObjectMBS, byref JSException as JSValueMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value is an object constructed by a given constructor, as compared by the JS instanceof operator.
**Notes:** ConstructorFunction: The constructor to test against.
JSException: A JSValueMBS in which to store an exception, if any.
Returns true if value is an object constructed by constructor, as compared by the JS instanceof operator, otherwise false.

### 105.7.7 IsObjectOfClass(ClassObject as JSValueMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value is an object with a given class in its class chain.
**Notes:** ClassObject The JSClass to test against.
Returns true if value is an object and has jsClass in its class chain, otherwise false.

### 105.7.8 IsStrictEqual(OtherValue as JSValueMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether two JavaScript values are strict equal, as compared by the JS === operator.
**Example:**

```
dim c as new JSContextMBS
dim j1 as JSValueMBS = c.valueWithDouble(1)
dim j2 as JSValueMBS = c.valueWithDouble(2)

MsgBox str(j1.IsStrictEqual(j2)) // false
```

```
MsgBox str(j1.IsStrictEqual(j1)) // true
```

**Notes:** OtherValue: The second value to test.
Returns true if the two values are strict equal, otherwise false.

### 105.7.9 JSONString(indent as Integer = 0, byref JSException as JSValueMBS) as string

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript string containing the JSON serialized representation of a JS value.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithJSON(" { ""tag"":""Hello"", ""value"":1 } ")
dim e as JSValueMBS
MsgBox j.JSONString(5, e)
```

**Notes:** Requires Mac OS X 10.7 and newer.

The number of spaces to indent when nesting. If 0, the resulting JSON will not contains newlines. The size of the indent is clamped to 10 spaces.
JSException: A JSValueMBS in which to store an exception, if any.
Returns a JSString with the result of serialization, or nil if an exception is thrown.
See also:

- 105.7.25 JSONString as string 16312

### 105.7.10 ObjectValue(byref JSException as JSValueMBS) as JSValueMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to object and returns the resulting object.
**Notes:** JSException: A JSValueMBS in which to store an exception, if any.
Returns the JSObject result of conversion, or nil if an exception is thrown.

### 105.7.11 StringValue(byref JSException as JSValueMBS) as string

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to string and copies the result into a JavaScript string.
**Notes:** JSException: A JSValueMBS in which to store an exception, if any.
Returns a JSString with the result of conversion, or nil if an exception is thrown.
See also:

- 105.7.26 StringValue as String 16312

### 105.7.12 Properties

### 105.7.13 booleanValue as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to boolean and returns the resulting boolean.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithBool(true)
MsgBox str(j.booleanValue)
```

**Notes:** (Read only property)

### 105.7.14 context as JSContextMBS

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The context for this value.
**Notes:** (Read only property)

### 105.7.15 doubleValue as Double

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to number and returns the resulting number.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithDouble(5.3)
MsgBox str(j.doubleValue)
```

**Notes:** Returns the numeric result of conversion, or NaN if an exception is thrown.

(Read only property)
See also:

- 105.7.4 DoubleValue(byref JSException as JSValueMBS) as Double 16305

### 105.7.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 105.7.17 isArray as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value is an array.
**Example:**

```
dim c as new JSContextMBS

dim e as JSValueMBS
dim v as JSValueMBS = c.NewArray(nil, e)

MsgBox str(v.isArray)
```

**Notes:** Returns true if value is an array, otherwise false.
Requires OS X 10.11 or newer.
(Read only property)

### 105.7.18 isBoolean as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the boolean type.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS = c.valueWithBool(true)
MsgBox str(j.isBoolean)
```

**Notes:** Returns true if value's type is the boolean type, otherwise false.
(Read only property)

### 105.7.19 isDate as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value is a date.
**Example:**

```
dim c as new JSContextMBS

dim year as JSValueMBS = c.valueWithDouble(2015)
dim month as JSValueMBS = c.valueWithDouble(5)
dim day as JSValueMBS = c.valueWithDouble(12)

dim e as JSValueMBS // exception
dim d as JSValueMBS = c.NewDate(array(year, month, day), e)

MsgBox str(d.isDate)
```

**Notes:** Returns true if value is a date, otherwise false.
Requires OS X 10.11 or newer.
(Read only property)

### 105.7.20 isNull as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the null type.
**Example:**

```
dim c as new JSContextMBS
dim n as JSValueMBS = c.valueWithNull

MsgBox str(n.isNull)
```

**Notes:** Returns true if value's type is the null type, otherwise false.
(Read only property)

### 105.7.21 isNumber as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the number type.
**Example:**

```
dim c as new JSContextMBS

dim j as JSValueMBS = c.valueWithDouble(5)
MsgBox str(j.isNumber)
```

**Notes:** Returns true if value's type is the number type, otherwise false.
(Read only property)

### 105.7.22 isObject as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the object type.
**Example:**

```
dim c as new JSContextMBS

dim e as JSValueMBS
dim v as JSValueMBS = c.NewArray(nil, e)

MsgBox str(v.isObject)
```

**Notes:** Returns true if value's type is the object type, otherwise false.
(Read only property)

### 105.7.23 isString as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the string type.
**Example:**

```
dim c as new JSContextMBS
dim s as JSValueMBS = c.valueWithJSON("""Hello""")
MsgBox str(s.isString)
```

**Notes:** Returns true if value's type is the string type, otherwise false.
(Read only property)

### 105.7.24 isUndefined as Boolean

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether a JavaScript value's type is the undefined type.
**Example:**

```
dim c as new JSContextMBS

dim j as JSValueMBS = c.valueWithUndefined
MsgBox str(j.isUndefined)
```

**Notes:** Returns true if value's type is the undefined type, otherwise false.
(Read only property)

### 105.7.25 JSONString as string

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a JavaScript string containing the JSON serialized representation of a JS value.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithString("Hello")
MsgBox v.JSONString
```

**Notes:** Requires Mac OS X 10.7 and newer.
(Read only property)
See also:

- 105.7.9 JSONString(indent as Integer = 0, byref JSException as JSValueMBS) as string 16307

### 105.7.26 StringValue as String

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts a JavaScript value to string and copies the result into a JavaScript string.
**Example:**

```
dim c as new JSContextMBS

dim v as JSValueMBS = c.valueWithString("Hello")
MsgBox v.StringValue
```

**Notes:** Returns a JSString with the result of conversion, or NULL if an exception is thrown.
(Read only property)
See also:

- 105.7.11 StringValue(byref JSException as JSValueMBS) as string 16307

### 105.7.27 Tag as Variant

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The tag value.
**Notes:** You can store anything here and as long as the JSValue object exists, this value is kept referenced.
(Read and Write property)

### 105.7.28 Type as Integer

MBS MacFrameworks Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a JavaScript value's type.
**Example:**

```
dim c as new JSContextMBS
dim j as JSValueMBS

j = c.valueWithDouble(1) // double
'j = c.valueWithNull // null
'j = c.valueWithUndefined // undefined
'j = c.valueWithString("Hello") // string
'j = c.valueWithJSON(" { ""tag"": 1 } ") // object
'j = c.valueWithBool(true)

Select case j.Type
case JSValueMBS.kJSTypeUndefined
MsgBox "undefined"
case JSValueMBS.kJSTypeNull
MsgBox "null"
case JSValueMBS.kJSTypeBoolean
```

```
MsgBox "boolean "+str(j.booleanValue)
case JSValueMBS.kJSTypeNumber
MsgBox "number "+str(j.doubleValue)
case JSValueMBS.kJSTypeString
MsgBox "string "+j.StringValue
case JSValueMBS.kJSTypeObject
MsgBox "object "+j.JSONString
else
Break
end Select
```

**Notes:** (Read only property)

### 105.7.29 Constants

Types

| Constant | Value | Description |
|---|---|---|
| kJSTypeBoolean | 2 | A primitive boolean value, one of true or false. |
| kJSTypeNull | 1 | The unique null value. |
| kJSTypeNumber | 3 | A primitive number value. |
| kJSTypeObject | 5 | An object value (meaning that this JSValueMBS is a JSObjectMBS). |
| kJSTypeString | 4 | A primitive string value. |
| kJSTypeUndefined | 0 | The unique undefined value. |

# Chapter 106

# JavaScript Object Notation

## 106.1 class JSONEntryMBS

### 106.1.1 class JSONEntryMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for an entry in a JSON object or array.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

For Each v As JSONEntryMBS In o.IterateEntries
Break
// watch in debugger
Next
```

**Notes:** For objects, we use the keys as names here and for arrays the index.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- Moving to new JSONMBS class
- New JSON Plugin for Xojo

### 106.1.2 Methods

### 106.1.3 Constructor

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.
See also:

- 106.1.4 Constructor(other as JSONEntryMBS) 16316

### 106.1.4 Constructor(other as JSONEntryMBS)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The copy constructor.
See also:

- 106.1.3 Constructor 16316

### 106.1.5 Properties

### 106.1.6 Item as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The value of the entry as variant.
**Notes:** (Read only property)

### 106.1.7 Name as String

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The key name in the JSON object.
**Notes:** (Read only property)

## 106.2 class JSONIteratorMBS

### 106.2.1 class JSONIteratorMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The iterator object use for for-each loops in Xojo.
**Notes:** Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 23.5
- Embracing for each loops

Interfaces: Iterator, Iterable

### 106.2.2 Methods

### 106.2.3 Constructor

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 106.2.4 Iterator as Iterator

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the iterator object.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

For Each v As JSONMBS In o.Iterate
Break
```

```
// watch in debugger
Next
```

**Notes:** Returns self and is used internally by Xojo for the for each loops.
Part of the Iterable interface and needed for for-each loops.

### 106.2.5 MoveNext as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next object for iterator.
**Notes:** Returns true on success and false in case of an error like end of iterator.
Part of the Iterator interface and needed for for-each loops.

### 106.2.6 Value as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Current value for the iterator.
**Notes:** For an iterator over objects, this is a JSONMBS object.
For an iterator over entries, this is a JSONEntryMBS object.
For an iterator over values, this is a variant with the value.

Part of the Iterator interface and needed for for-each loops.

### 106.2.7 Properties

### 106.2.8 Index as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Current index in array or object.
**Notes:** We iterate over the items in an array or object.
Going by index avoids crashing if you edit the object/array, but going by index may skip an item if you added one before the current one or skip one if you remove one.
(Read only property)

### 106.2.9 Root as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The root object reference.
**Notes:** (Read only property)

## 106.3 class JSONMBS

### 106.3.1 class JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for JSON object parsing and creating.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewObjectNode

o.AddItemToObject "Hello", JSONMBS.NewNumberNode(1)
o.AddItemToObject "World", JSONMBS.NewNumberNode(2)

MsgBox o.toString
```

**Notes:** Our JSON class

- has a high performance.
- is based on a modern C++ library
- supports Xojo features like for-each loops with iterators
- is almost compatible to the old JSONMBS class from before
- is almost compatible to JSONItem class
- automatically converts between variant and JSONMBS as needed.
- reports errors with JSONException class.
- can query, search and replace JSON values with JSON Paths.
- can flatten and unflatten JSON.
- can create patches and merge them back with two ways.
- provides a lot of convenience functions.
- can convert from JSON to/from dictionaries and arrays.
- handles currency better and preserves digits.
- has a lot of duplicate method/property names for API 1 and 2 compatibility and you can choose whether you prefer Append vs Add, Insert vs. AddAt or Key vs. NameAt.
- preserves the order of object entries and allows explicit sorting.
- can convert to HTML for displaying itself.

- prefers case sensitive, but can optionally do case insensitive.

We can convert integer, boolean, string, double, arrays, dictionaries to JSON internally.
And convert back to variant containing integer, boolean, string, double, arrays and dictionaries.

We back ported things like GetChildNode, GetNextNode and GetPreviousNode, but those are not very efficient and you may want to move to using iterators, query values/entries/keys arrays or access items by index.

The old class is still available in a separated OldJSON Plugin for our customers for compatibility with class renamed to OldJSONMBS.

**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- MBS Xojo Plugins, version 24.1pr1
- Playing with JSON Query in Xojo
- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 20.4
- Extends MBS Plugin classes in Xojo
- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins in version 19.2
- New JSONMBS methods for Xojo
- JSON - JavaScript Object Notation

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 22.1, page 9: News
- 21.5, page 10: News
- 21.1, pages 95 to 96: A Database That Connects, A Mongo DB photo database used with FileMaker and Xojo by Stefanie Juchmes
- 19.3, page 10: News
- 18.6, page 10: News
- 17.5, page 9: News

- 17.5, page 35: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.4, page 10: News
- 16.4, page 11: News
- 15.2, page 10: News

### 106.3.2 Methods

### 106.3.3 Add(Value as Variant)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value to an array.
**Example:**

```
Dim o As New JSONMBS

o.Add 1
o.Add "Hello"
o.Add JSONMBS.NewNullNode

MessageBox o.toString
```

**Notes:** Variant is converted to JSONMBS if needed.

If the self is an empty object, we replace it with an empty array and add the value.

Same as Add method.

### 106.3.4 AddAt(index As Integer, value As Variant)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Insert a value to an array at the given index.
**Example:**

```
Dim o As New JSONMBS

o.Append 1
o.AddAt 1,2

MessageBox o.toString
```

```
o.AddAt 1,3

MessageBox o.toString
```

**Notes:** Variant is converted to JSONMBS if needed.

If the self is an empty object, we replace it with an empty array and insert the value.

Same as Insert method.

### 106.3.5 AddItemToArray(item as JSONMBS)

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an item to an array.
**Example:**

```
Var subscriptionId As Integer = 123456
Var Quantity As Integer = 1

// build inner object
Dim ji As JSONMBS = JSONMBS.NewObjectNode

ji.AddItemToObject "subscriptionId", JSONMBS.NewNumberNode(subscriptionId)
ji.AddItemToObject "newQuantity", JSONMBS.NewNumberNode(Quantity)

// array around it
Dim ja As JSONMBS = JSONMBS.NewArrayNode
ja.AddItemToArray ji

// and object around
Dim jo As JSONMBS = JSONMBS.NewObjectNode
jo.AddItemToObject "subscriptionAmendmentParameters", ja


Dim json As String = jo.toString
MessageBox json

' {
' "subscriptionAmendmentParameters": [
' {
' "subscriptionId": 123456,
' "newQuantity": 1
' }
```

```
' ]
' }
```

**Notes:** If you add item from new nodes created with plugin, we add them to the tree.
If you add items from existing node from other JSON tree, we add references.

### 106.3.6 AddItemToObject(label as string, value as JSONMBS)

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an item to an object with given label.
**Example:**

```
Var subscriptionId As Integer = 123456
Var Quantity As Integer = 1

// build inner object
Dim ji As JSONMBS = JSONMBS.NewObjectNode

ji.AddItemToObject "subscriptionId", JSONMBS.NewNumberNode(subscriptionId)
ji.AddItemToObject "newQuantity", JSONMBS.NewNumberNode(Quantity)

// array around it
Dim ja As JSONMBS = JSONMBS.NewArrayNode
ja.AddItemToArray ji

// and object around
Dim jo As JSONMBS = JSONMBS.NewObjectNode
jo.AddItemToObject "subscriptionAmendmentParameters", ja


Dim json As String = jo.toString
MessageBox json

' {
' "subscriptionAmendmentParameters": [
' {
' "subscriptionId": 123456,
' "newQuantity": 1
' }
' ]
' }
```

**Notes:** If you add item from new nodes created with plugin, we add them to the tree.
If you add items from existing node from other JSON tree, we add references.

### 106.3.7 AddOrReplaceItemToObject(label as string, value as JSONMBS)

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds an item to an object with given label.
**Notes:** Same as AddItemToObject, but removes old item for the label if it exists.

### 106.3.8 Append(Value as Variant)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a value to an array.
**Example:**

```
Dim o As New JSONMBS

o.Append 1
o.Append "Hello"
o.Append JSONMBS.NewNullNode

MessageBox o.toString
```

**Notes:** Variant is converted to JSONMBS if needed.

If the self is an empty object, we replace it with an empty array and add the value.

Same as Add method.

### 106.3.9 ApplyMergePatch(target as JSONMBS, patch as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a merge patch to a json document.
**Example:**

```
Dim source As New JSONMBS(" { "+_
" ""title"": ""Goodbye!"","+_
" ""author"" : { "+_
" ""givenName"" : ""John"","+_
" ""familyName"" : ""Doe""}"+_
```

```
" } ,"+_
" ""tags"": [ ""example"", ""sample"" ] ,"+_
" ""content"": ""This will be unchanged""+_
" } ")

Dim patch As New JSONMBS(" { "+_
" ""title"": ""Hello!"","+_
" ""phoneNumber"": ""+01-123-456-7890"","+_
" ""author"": { "+_
" ""familyName"": null"+_
" } ,"+_
" ""tags"": [ ""example"" ] "+_
" } ")

Dim result As JSONMBS = JSONMBS.ApplyMergePatch(source, patch)

Dim sourceText As String = source.toString(True)
Dim resultText As String = result.toString(True)
Dim PatchText As String = Patch.toString(True)

Break
```

**Notes:** The mergepatch function implement the IETF standard JSON Merge Patch

### 106.3.10 ApplyPatch(target as JSONMBS, patch as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a patch to a json document.
**Example:**

```
Dim source As New JSONMBS(" { ""foo"": ""bar"" } ")
Dim patch As New JSONMBS(" [ "+_
" { ""op"": ""add"", ""path"": ""/baz"", ""value"": ""qux"" } ,"+_
" { ""op"": ""add"", ""path"": ""/foo"", ""value"": [ ""bar"", ""baz"" ] } "+_
" ] ")

Dim result As JSONMBS = JSONMBS.ApplyPatch(source, patch)

Dim sourceText As String = source.toString(True)
Dim resultText As String = result.toString(True)
Dim PatchText As String = Patch.toString(True)

Break
```

**Notes:** The jsonpatch functions implement the IETF standard JavaScript Object Notation (JSON) Patch.

The JSON Patch IETF standard requires that the JSON Patch method is atomic, so that if any JSON Patch operation results in an error, the target document is unchanged. The patch function implements this requirement by generating the inverse commands and building an undo stack, which is executed if any part of the patch fails.

### 106.3.11 ArrayItem(index as integer, Clone as Boolean = false) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array item with given index.
**Notes:** Added Clone parameter for version 20.4.
If Clone is true, we duplicate the JSON, so the new JSONMBS object does not point to origin JSONMBS object and exist independent.

### 106.3.12 ArrayItems(Clone as Boolean = false) as JSONMBS()

MBS Util Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array items.
**Notes:** If Clone is true, we duplicate the JSON, so the new JSONMBS objects do not point to origin JSONMBS object and exist independent.

### 106.3.13 Clear

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the JSON object.
**Example:**

```
Dim j As New JSONMBS

j.add 1
j.add 2
j.Clear // remove all
j.add 3

MessageBox j.toString(false)
```

**Notes:** Removes all entries from array or object.

### 106.3.14 Clone as JSONMBS

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the JSON tree.

### 106.3.15 Close

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Frees node.
**Notes:** No need to call this as destructor does the same.
But this call allows you to release circular references.

### 106.3.16 Compare(Other as JSONMBS) as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two objects and returns
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2

Dim j As New JSONMBS

j.add 1
j.add 2

If j.Compare(o) = 0 Then
MessageBox "equal"
Else
MessageBox "not equal"
End If
```

**Notes:** Returns 0 if both are equal, 1 if bigger and -1 if smaller.

### 106.3.17 Constructor

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty object.
**Example:**

```
Dim c As Currency = 1.2345
dim d as Double = c

Dim j As New JSONItem
j.Value("test") = d // can't use c here!

Dim m As New JSONMBS
m.Value("test") = c

MessageBox j.ToString+EndOfLine+m.toString
// shows { "test":1.2344999999999999307 } vs { "test":1.2345 } since we store currency exactly.
```

See also:


- 106.3.18 Constructor(dic As Dictionary) 16329
- 106.3.19 Constructor(JSONString as String) 16330
- 106.3.20 Constructor(other as JSONMBS) 16330


### 106.3.18 Constructor(dic As Dictionary)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with the content of the dictionary.
**Example:**

```
Dim d As New Dictionary
d.Value(1) = 2
d.Value("Hello") = "World"

Dim j As New JSONMBS(d)

MessageBox j.toString(False)
```

**Notes:** Converts all dictionary values to JSON objects internally.
See also:


- 106.3.17 Constructor 16328
- 106.3.19 Constructor(JSONString as String) 16330
- 106.3.20 Constructor(other as JSONMBS) 16330

### 106.3.19 Constructor(JSONString as String)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses the given JSON String into the tree where this node is the root.
**Example:**

```
dim o as new JSONMBS(" { ""text"":""Hello World"" } ")
MsgBox o.toString
```

**Notes:** Text should be UTF-8.
Raises an exception in case of error.
See also:


- 106.3.17 Constructor 16328
- 106.3.18 Constructor(dic As Dictionary) 16329
- 106.3.20 Constructor(other as JSONMBS) 16330


### 106.3.20 Constructor(other as JSONMBS)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy constructor.
**Notes:** Makes a copy of all the nodes.
See also:


- 106.3.17 Constructor 16328
- 106.3.18 Constructor(dic As Dictionary) 16329
- 106.3.19 Constructor(JSONString as String) 16330


### 106.3.21 Convert as Variant

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts JSON object to Xojo variant.
**Example:**

```
// build some JSON:

Dim j As New JSONMBS

j.AddItemToObject "test", JSONMBS.NewNumberNode(123)
j.AddItemToObject "name", JSONMBS.NewStringNode("Joe")
```

```
// convert to Dictionary
Dim v As Variant = j.Convert

// and back
Dim o As JSONMBS = JSONMBS.Convert(v)

// show
MsgBox o.toString
```

**Notes:** Depending on the JSON content, you get variants containing values (string, double, boolean or nil), dictionaries or array of variants.

Dictionary is not case sensitive, so may not work correctly if you have duplicate keys with only different in case.
See also:

- 106.3.22 Convert(value as variant) as JSONMBS 16331

### 106.3.22 Convert(value as variant) as JSONMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts Xojo variant to JSON object.
**Example:**

```
Dim d As New Dictionary
dim n as Double = 1/3

d.Value("number") = n // default double handling

// custom formatted number
Dim j As JSONMBS = JSONMBS.NewNumberNode(Str(n, "-0.0000000000"))

d.value("customNumber") = j
d.Value( "int64") = 1000000000000000000
d.Value("uint64") = 8000000000000000000

Dim a() As String
a.Append "Hello"
a.Append "World"

d.Value("array") = a
d.Value("dictionary") = New Dictionary("a":1, "b":2, "c":3)
```

```
Dim r As JSONMBS = JSONMBS.Convert(d)
MsgBox r.toString
```

**Notes:** Converts values in variant to matching JSON structures.
Currency is converted to double. Color is converted to integer. Dates are converted to string.
We detect arrays of String, Object, Variant, Single, Double, Int32, Int64, Boolean and Currency and convert them to JSON arrays. Dictionaries are converted to JSON objects with texts for keys.
Anything else can raise an exception about an unsupported type.

Please note that Xojo variants don't make a difference between signed and unsigned integers, so we always convert using signed integers.

With version 19.3, the array/dictionary can also contain JSONMBS objects.
See also:

- 106.3.21 Convert as Variant 16330

### 106.3.23 DeleteItem(index as Integer)

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an item from an array/object by index.
**Example:**

```
Dim j As New JSONMBS

j.AddItemToObject "Hello", j.NewStringNode("Testing")
j.AddItemToObject "World", j.NewStringNode("Another node")

MsgBox j.toString

// delete named item
j.DeleteItem "Hello"

MsgBox j.toString

// delete first item
j.DeleteItem 0

MsgBox j.toString
```

**Notes:** Index is zero based.
See also:

• 106.3.24 DeleteItem(label as string) 16333

### 106.3.24 DeleteItem(label as string)

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a named item from an object.
**Example:**

```
Dim j As New JSONMBS

j.AddItemToObject "Hello", j.NewStringNode("Testing")
j.AddItemToObject "World", j.NewStringNode("Another node")

MsgBox j.toString

// delete named item
j.DeleteItem "Hello"

MsgBox j.toString

// delete first item
j.DeleteItem 0

MsgBox j.toString
```

See also:

• 106.3.23 DeleteItem(index as Integer) 16332

### 106.3.25 Entries as JSONEntryMBS()

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all entries.
**Example:**

```
Dim j As New JSONMBS

j.Value("Hello") = "World"
j.Value("Test") = "Value"
j.Value("abc") = "cde"

Dim entries() As JSONEntryMBS = j.Entries
```

Break

**Notes:** Convenience function to get all entries.
Converts values to variants as needed.

Works for both objects and arrays.

### 106.3.26 Equals(Other as JSONMBS) as Boolean

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two JSON are equal.
**Example:**

```
dim j1 as JSONMBS = JSONMBS.NewNumberNode(5)
dim j2 as JSONMBS = JSONMBS.NewNumberNode(5)
dim j3 as JSONMBS = JSONMBS.NewNumberNode(6)

if not j1.Equals(j2) then
break // failed
end if

if j3.Equals(j2) then
break // failed
end if

Break // okay
```

**Notes:** We compare recursively all nodes.
If structure and values are the same, we return true, otherwise false.
Objects do not need to have same order for entries.

### 106.3.27 FilterObjectArray(Name as String, Other as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filters JSON object array to find matching entries.
**Example:**

```
Dim j As JSONMBS = JSONMBS.NewArrayNode
```

```
Dim j1 As JSONMBS = JSONMBS.NewObjectNode
j1.AddItemToObject "id", JSONMBS.NewNumberNode(122)
j1.AddItemToObject "name", JSONMBS.NewStringNode("John")
j.AddItemToArray j1

Dim j2 As JSONMBS = JSONMBS.NewObjectNode
j2.AddItemToObject "id", JSONMBS.NewNumberNode(123)
j2.AddItemToObject "name", JSONMBS.NewStringNode("Matt")
j.AddItemToArray j2

Dim j3 As JSONMBS = JSONMBS.NewObjectNode
j3.AddItemToObject "id", JSONMBS.NewNumberNode(124)
j3.AddItemToObject "name", JSONMBS.NewStringNode("Bob")
j.AddItemToArray j3

Dim resultArray As JSONMBS = j.FilterObjectArray("id", JSONMBS.NewNumberNode(123))
Dim firstEntry As JSONMBS = resultArray.ArrayItem(0)

Break
```

**Notes:** Similar as if you loop and look for index of matching items with FindValueInObjectArray and transfer it yourself to a new array.

### 106.3.28 FindValueInArray(Other as JSONMBS, StartIndex as Integer = 0) as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries index of value in array.
**Example:**

```
dim j1 as JSONMBS = JSONMBS.NewIntegerArray(array(3,4,5,6,7))
dim j2 as JSONMBS = JSONMBS.NewNumberNode(5)
dim j3 as JSONMBS = JSONMBS.NewNumberNode(8)
dim j4 as JSONMBS = JSONMBS.NewStringNode("5")

dim index1 as integer = j1.FindValueInArray(j2) // we can find this
dim index2 as integer = j1.FindValueInArray(j3) // value not found
dim index3 as integer = j1.FindValueInArray(j4) // can't find string in number array

if index1 = 2 and index2 = -1 and index3 = -1 then
Break // okay
else
Break // failed
end if
```

**Notes:** Returns zero based index or -1 if not found.

Version 20.0 or newer allows with ByContent parameter = true to find by content, so number can be found via text.

StartIndex parameter added in version 21.5: Index of first element to check. Zero if not specified.
If you like to continue searching, you can pass last result + 1.

### 106.3.29 FindValueInObjectArray(Name as String, Other as JSONMBS, StartIndex as Integer = 0) as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries index of value in object array.
**Example:**

```
dim j1 as JSONMBS = JSONMBS.NewArrayNode
dim j2 as JSONMBS = JSONMBS.NewObjectNode

j2.AddItemToObject "Hello", JSONMBS.NewStringNode("World")
j2.AddItemToObject "ID", JSONMBS.NewStringNode("123")

j1.AddItemToArray j2

dim index1 as integer = j1.FindValueInObjectArray("ID", JSONMBS.NewStringNode("123")) // we can find this
dim index2 as integer = j1.FindValueInObjectArray("ID", JSONMBS.NewStringNode("456")) // value not found
dim index3 as integer = j1.FindValueInObjectArray("xxx", JSONMBS.NewStringNode("123")) // value not found

if index1 = 0 and index2 = -1 and index3 = -1 then
Break // okay
else
Break // failed
end if
```

**Notes:** Returns zero based index or -1 if not found.
We look into each object in the array, check if it has a value for the given label and compare that to the one to find.

Version 20.0 or newer allows with ByContent parameter = true to find by content, so number can be found via text.

StartIndex parameter added in version 21.5: Index of first element to check. Zero if not specified.
If you like to continue searching, you can pass last result + 1.

### 106.3.30 Flatten(value as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flattens a json object or array to a single depth object of key-value pairs.
**Example:**

```
Dim j As New JSONMBS

j.Value("Hello") = "World"
j.Value("test") = 123

Dim f As JSONMBS = JSONMBS.Flatten(j)
Dim s As String = f.toString

MessageBox s
// shows: { "$ [ 'Hello' ] ":"World","$ [ 'test' ] ":123 }
```

**Notes:** The keys in the flattened object are normalized json paths. The values are primitive (string, number, boolean, or null), empty object ( { } ) or empty array ( [ ] ).

### 106.3.31 HasChild(label as string) as Boolean

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a child node for the node with the given label exists.
**Example:**

```
dim jv as JSONMBS = JSONMBS.NewStringNode("value")
dim jo as JSONMBS = JSONMBS.NewObjectNode

jo.AddItemToObject("key", jv)

// shows { "key": "value" }
MsgBox jo.toString
MsgBox str(jo.hasChild("key"))
```

**Notes:** Returns true if the entry exists or false if not.
Only for objects, not arrays.

Same as HasKey and HasName methods.

### 106.3.32 HasKey(Key as string) as boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a an object has the given key.
**Example:**

```
dim jv as JSONMBS = JSONMBS.NewStringNode("value")
dim jo as JSONMBS = JSONMBS.NewObjectNode

jo.AddItemToObject("key", jv)

// shows { "key": "value" }
MsgBox jo.toString
MsgBox str(jo.HasKey("key"))
```

**Notes:** Returns true if the entry exists or false if not.
Only for objects, not arrays.

Same as HasChild and HasName methods.

### 106.3.33 HasName(Name as string) as boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a an object has the given key.
**Example:**

```
dim jv as JSONMBS = JSONMBS.NewStringNode("value")
dim jo as JSONMBS = JSONMBS.NewObjectNode

jo.AddItemToObject("key", jv)

// shows { "key": "value" }
MsgBox jo.toString
MsgBox str(jo.HasName("key"))
```

**Notes:** Returns true if the entry exists or false if not.

Only for objects, not arrays.

Same as HasKey and HasChild methods.

### 106.3.34 Insert(index as integer, value as variant)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value into the index.
**Example:**

```
Dim o As New JSONMBS

o.Append 1
o.Insert 1,2

MessageBox o.toString

o.Insert 1,3

MessageBox o.toString
```

**Notes:** Variant is converted to JSONMBS if needed.

If the self is an empty object, we replace it with an empty array and insert the value.

Same as AddAt method.

### 106.3.35 Iterate as JSONIteratorMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate about child nodes.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

For Each v As JSONMBS In o.Iterate
Break
```

```
// watch in debugger
Next
```

**Notes:** Provides JSONMBS objects for inspection.

Warning: If you iterate while the JSONMBS is changed you may skip some entries or get duplicates, so please avoid editing it while iterating.

### 106.3.36 IterateEntries as JSONIteratorMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate about child entries.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

For Each v As JSONEntryMBS In o.IterateEntries
Break
// watch in debugger
Next
```

**Notes:** Entries are provided with JSONEntryMBS objects and include key and value.
For arrays, the key name is the index value.

Warning: If you iterate while the JSONMBS is changed you may skip some entries or get duplicates, so please avoid editing it while iterating.

### 106.3.37 IterateValues as JSONIteratorMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate about child values.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
```

```
o.add 3

For Each v As Variant In o.IterateValues
Break
// watch in debugger
// v has values like 1, 2 and 3
Next
```

**Notes:** The values are provided and converted to variant.

Warning: If you iterate while the JSONMBS is changed you may skip some entries or get duplicates, so please avoid editing it while iterating.

### 106.3.38 JSONObjectCount as Integer

MBS Util Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** For debugging, the plugin counts how many JSONMBS objects we have.

### 106.3.39 KeyAt(index As Integer) as String

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries key name at given index.
**Example:**

```
Dim o As New JSONMBS

o.Value("Hello") = "World"

MessageBox o.KeyAt(0)
```

**Notes:** Raises an exception if index is out of range.

Same as Name or NameAt methods.
The order of keys can change if you add/remove values in the JSON object.

### 106.3.40 Keys as String()

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the key names for an object.
**Example:**

```
Dim o As New JSONMBS

o.Value("Hello") = "World"
o.Value("Test") = "Value"

Dim Keys() As String = o.Keys
MessageBox string.FromArray(Keys)
```

**Notes:** The order is as stored in memory currently and that order changes if you edit the JSON object.
We cache the array so multiple calls would return the same array and you should not modify it.

Same as Names method.

### 106.3.41 Load(JSONString as String)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses the given JSON String into the tree where this node is the root.
**Example:**

```
Dim o As New JSONMBS
o.load(" { ""text"":""Hello World"" } ")
MsgBox o.toString
```

**Notes:** Text should be UTF-8.
Raises an exception in case of error.

### 106.3.42 Lookup(Key As String, defaultValue As Variant = nil) as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks up the value for the key.
**Notes:** Variant is converted to JSONMBS if needed.
Returns default value if key is not found.

### 106.3.43 MergePatchFromDiff(source as JSONMBS, target as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a JSON Merge Patch from a diff of two json documents.
**Example:**

```
Dim source As New JSONMBS(" { "+_
" ""title"": ""Goodbye!"","+_
" ""author"" : { "+_
" ""givenName"" : ""John"","+_
" ""familyName"" : ""Doe""""+_
" } ,"+_
" ""tags"": [ ""example"", ""sample"" ] ,"+_
" ""content"": ""This will be unchanged""""+_
" } ")

Dim target As New JSONMBS(" { "+_
" ""title"": ""Hello!"","+_
" ""author"": { "+_
" ""givenName"": ""John""""+_
" } ,"+_
" ""tags"": [ "+_
" ""example""""+_
" ] ,"+_
" ""content"": ""This will be unchanged"","+_
" ""phoneNumber"": ""\u002B01-123-456-7890""""+_
" } ")

Dim patch As JSONMBS = JSONMBS.MergePatchFromDiff(source, target)

Dim sourceText As String = source.toString(True)
Dim targetText As String = target.toString(True)
Dim PatchText As String = Patch.toString(True)

Break
```

**Notes:** The mergepatch function implement the IETF standard JSON Merge Patch
Returns a JSON Merge Patch.

### 106.3.44 Name(index As Integer) as String

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries key name at given index.

**Example:**

```
Dim o As New JSONMBS

o.Value("Hello") = "World"

MessageBox o.Name(0)
```

**Notes:** Raises an exception if index is out of range.

Same as NameAt or KeyAt methods.
See also:

- 106.3.107 Name as String 16371

### 106.3.45 NameAt(index As Integer) as String

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries key name at given index.
**Example:**

```
Dim o As New JSONMBS

o.Value("Hello") = "World"

MessageBox o.NameAt(0)
```

**Notes:** Raises an exception if index is out of range.

Same as Name or KeyAt methods.

### 106.3.46 Names as String()

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the key names for an object.
**Example:**

```
Dim o As New JSONMBS

o.Value("Hello") = "World"
o.Value("Test") = "Value"
```

```
Dim Names() As String = o.Names
MessageBox string.FromArray(Names)
```

**Notes:** The order is as stored in memory currently and that order changes if you edit the JSON object. We cache the array so multiple calls would return the same array and you should not modify it.

Same as Keys method.

### 106.3.47 NewArrayNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node for an array.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewArrayNode
MsgBox str(n.Type)+" = "+str(n.kTypeArray)
```

### 106.3.48 NewBooleanNode(value as Boolean) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Notes:** This is a convenience method to quickly create an array.

### 106.3.49 NewBoolNode(value as boolean) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new boolean node.
**Example:**

```
dim j as JSONMBS = JSONMBS.NewBoolNode(true)
MsgBox j.toString
```

### 106.3.50 NewByteStringNode(Bytes as MemoryBlock) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node for a byte string.
**Example:**

```
Dim m As MemoryBlock = "Hello World"
Dim j As JSONMBS = JSONMBS.NewByteStringNode(m)

MessageBox j.toString
// "SGVsbG8gV29ybGQ"
```

**Notes:** Creates a new JSONMBS object with type = kTypeByteString.
See also:


- 106.3.51 NewByteStringNode(Bytes as ptr, Length as UInt64) as JSONMBS 16346
- 106.3.52 NewByteStringNode(Bytes as String) as JSONMBS 16346


### 106.3.51 NewByteStringNode(Bytes as ptr, Length as UInt64) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node for a byte string.
**Example:**

```
Dim m As MemoryBlock = "Hello World"
Dim p As ptr = m
dim size as integer = m.size
Dim j As JSONMBS = JSONMBS.NewByteStringNode(p,size)

MessageBox j.toString
// "SGVsbG8gV29ybGQ"
```

**Notes:** Creates a new JSONMBS object with type = kTypeByteString.
See also:


- 106.3.50 NewByteStringNode(Bytes as MemoryBlock) as JSONMBS 16345
- 106.3.52 NewByteStringNode(Bytes as String) as JSONMBS 16346


### 106.3.52 NewByteStringNode(Bytes as String) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node for a byte string.
**Example:**

```
Dim j As JSONMBS = JSONMBS.NewByteStringNode("Hello World")
```

```
MessageBox j.toString
// "SGVsbG8gV29ybGQ"
```

**Notes:** Creates a new JSONMBS object with type = kTypeByteString.
See also:

- 106.3.50 NewByteStringNode(Bytes as MemoryBlock) as JSONMBS 16345
- 106.3.51 NewByteStringNode(Bytes as ptr, Length as UInt64) as JSONMBS 16346

### 106.3.53 NewCurrencyNode(value as Currency) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new currency value node.
**Example:**

```
Dim c As Currency = 152.5678

Dim j As JSONMBS = JSONMBS.NewCurrencyNode(c)

MessageBox j.toString
```

**Notes:** Internally we store number as string with a tag marking it as big decimal, so we output it as number. If you ask for double value, we convert it of course.

### 106.3.54 NewDoubleArray(values() as Double) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Example:**

```
dim n() as Double = array(1.0,2,3)
dim j as JSONMBS = JSONMBS.NewDoubleArray(n)
MsgBox j.toString
```

**Notes:** This is a convenience method to quickly create an array.

Version 17.0 and newer return empty JSON array node in case of empty string array.
Older versions returned nil.

### 106.3.55 NewFalseNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new false node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewFalseNode
MsgBox str(n.Type)+" = "+str(n.kTypeFalse)
```

**Notes:** This is a node which represents a boolean false value.

### 106.3.56 NewInt32Array(values() as Int32) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Notes:** This is a convenience method to quickly create an array.

### 106.3.57 NewInt64Array(values() as Int64) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Notes:** This is a convenience method to quickly create an array.

### 106.3.58 NewInt64Node(value as Int64) as JSONMBS

MBS Util Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node based on Int64 value.
**Example:**

```
dim x as int64 = 92233720368547758
dim n as JSONMBS = JSONMBS.NewInt64Node(x)

MsgBox "String: "+n.ValueString+EndOfLine+"ToString: "+n.toString+EndOfLine+"Double: "+str(n.ValueDouble,"-0")+EndOfLine+"Int64: "+str(n.ValueInteger,"-0")
```

### 106.3.59 NewIntegerArray(values() as Integer) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Example:**

```
dim n() as Integer = array(1,2,3)
dim j as JSONMBS = JSONMBS.NewIntegerArray(n)
MsgBox j.toString
```

**Notes:** This is a convenience method to quickly create an array.

Version 17.0 and newer return empty JSON array node in case of empty string array.
Older versions returned nil.

### 106.3.60 NewNullNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new null node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewNullNode
MsgBox str(n.Type)+" = "+str(n.kTypeNull)
```

**Notes:** This is a node which represents a nil value.

### 106.3.61 NewNumberNode(value as Double) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewNumberNode(123)
MsgBox str(n.Type)+" = "+str(n.kTypeNumber)
```

See also:

- 106.3.62 NewNumberNode(value as string) as JSONMBS 

### 106.3.62 NewNumberNode(value as string) as JSONMBS

MBS Util Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number node with given number as text.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewNumberNode("92233720368547758")

MsgBox "String: "+n.ValueString+EndOfLine+"ToString: "+n.toString+EndOfLine+"Double: "+str(n.ValueDouble,"-0")+EndOfLine+"Int64: "+str(n.ValueInteger,"-0")
```

**Notes:** This allows you to control formatting of large integer and floating point values.
See also:

- 106.3.61 NewNumberNode(value as Double) as JSONMBS 16349

### 106.3.63 NewObjectNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewObjectNode
MsgBox str(n.Type)+" = "+str(n.kTypeObject)
```

### 106.3.64 NewStringArray(values() as string) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Example:**

```
dim n() as string = array("Hello", "World")
dim j as JSONMBS = JSONMBS.NewStringArray(n)
MsgBox j.toString
```

**Notes:** This is a convenience method to quickly create an array.

Version 17.0 and newer return empty JSON array node in case of empty string array.
Older versions returned nil.

### 106.3.65 NewStringNode(value as string) as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string node.
**Example:**

```
// some string with single/double quote and EndOfLine
dim s as string = "Hello'World"+EndOfLine+"this is "" a test."

// make string node
dim j as JSONMBS = JSONMBS.NewStringNode(s)

// get as JSON
dim d as string = j.toString
// show
MsgBox d

// parse again
j = new JSONMBS(d)

MsgBox j.ValueString
```

### 106.3.66 NewTrueNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new true node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewTrueNode
MsgBox str(n.Type)+" = "+str(n.kTypeTrue)
```

**Notes:** This is a node which represents a boolean true value.

### 106.3.67 NewUInt32Array(values() as UInt32) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.

**Notes:** This is a convenience method to quickly create an array.

### 106.3.68 NewUInt64Array(values() as UInt64) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a json array object with the given values.
**Notes:** This is a convenience method to quickly create an array.

### 106.3.69 NewUInt64Node(value as UInt64) as JSONMBS

MBS Util Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new node based on UInt64 value.
**Example:**

```
dim x as UInt64 = 92233720368547758
dim n as JSONMBS = JSONMBS.NewUInt64Node(x)

MsgBox "String: "+n.ValueString+EndOfLine+"ToString: "+n.toString+EndOfLine+"Double: "+str(n.ValueDouble,"-0")+EndOfLine+"Int64: "+str(n.ValueInteger,"-0")
```

### 106.3.70 Operator_Compare(Other as JSONMBS) as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two JSONMBS objects.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2

Dim j As New JSONMBS

j.add 1
j.add 2

If j = o Then
MessageBox "equal"
Else
MessageBox "not equal"
```

```
End If
```

**Notes:** Called automatically by Xojo if you use =, >and <operators.
Same as Compare method.

### 106.3.71 Operator_Convert as Variant()

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all values as an array.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2

// auto convert on assignment
Dim values() As Variant = o
Break // see debugger
```

**Notes:** Convenience function to get all values.
Converts values to variants as needed.

Works for both objects and arrays.
Same as Values method.
See also:

- 106.3.72 Operator_Convert(dic As Dictionary) 16353

### 106.3.72 Operator_Convert(dic As Dictionary)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with the content of the dictionary.
**Example:**

```
Dim d As New Dictionary
d.Value(1) = 2
d.Value("Hello") = "World"

dim j as JSONMBS = d

MessageBox j.toString(False)
```

**Notes:** Converts all dictionary values to JSON objects internally.
See also:

- 106.3.71 Operator_Convert as Variant() 16353

### 106.3.73 PatchFromDiff(source as JSONMBS, target as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a JSON Patch from a diff of two json documents.
**Example:**

```
Dim source As New JSONMBS(" { ""/"": 9, ""foo"": ""bar"" } ")
Dim target As New JSONMBS(" { ""baz"":""qux"", ""foo"": [ ""bar"", ""baz"" ] } ")

Dim Patch As JSONMBS = JSONMBS.PatchFromDiff(source, target)

Dim sourceText As String = source.toString(True)
Dim targetText As String = target.toString(True)
Dim PatchText As String = Patch.toString(True)

Break
```

**Notes:** Returns a JSON Patch.

The jsonpatch functions implement the IETF standard JavaScript Object Notation (JSON) Patch.

The JSON Patch IETF standard requires that the JSON Patch method is atomic, so that if any JSON Patch operation results in an error, the target document is unchanged. The patch function implements this requirement by generating the inverse commands and building an undo stack, which is executed if any part of the patch fails.
See also:

- 106.3.74 PatchFromDiff(source as JSONMBS, target as JSONMBS, KeyToCopy as String) as JSONMBS 16354

### 106.3.74 PatchFromDiff(source as JSONMBS, target as JSONMBS, KeyToCopy as String) as JSONMBS

MBS Util Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a JSON Patch from a diff of two json documents.
**Notes:** Same as normal PatchFromDiff, but copies the given primary key field from JSON entries to the

diff.
See also:

- 106.3.73 PatchFromDiff(source as JSONMBS, target as JSONMBS) as JSONMBS 16354

### 106.3.75 Query(Path as string, Options as Integer = 0) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a JSON Path query.
**Example:**

```
Dim book1 As New JSONMBS
book1.Value("title") = "Sayings Of the Century"
book1.Value("price") = 8.95

Dim book2 As New JSONMBS
book2.Value("title") = "Sword Of Honour"
book2.Value("price") = 12.99

Dim bookArray As New JSONMBS
bookArray.Append book1
bookArray.Append book2

Dim j As New JSONMBS
j.Value("book") = bookArray

MessageBox j.toString(True)
// shows
// {
// "book": [
// {
// "title": "Sayings Of the Century",
// "price": 8.95
// } ,
// {
// "title": "Sword Of Honour",
// "price": 12.99
// }
// ]
// }

dim r as JSONMBS = j.Query("$ .book [ ?(@.price <10) ] .title")
Dim s As String = r.toString

MessageBox s
// shows [ "Sayings Of the Century" ]
```

**Notes:** Evaluates the root value against the JSONPath expression and returns an array of values or normalized path expressions.

Returns a JSON with an array containing either values or normalized path expressions matching the JSONPath expression, or an empty array if there is no match.

For options use kPathResultOptions* constants. Use OR to combine multiple flags.

| | |
|---|---|
| kPathResultOptionsValue | Return values. |
| kPathResultOptionsNoDuplicates | Remove duplicates. |
| kPathResultOptionsSort | Sort results. |
| kPathResultOptionsPath | Return paths. |

To learn more about JSONPath, please check this website:
https://goessner.net/articles/JsonPath/

Learn more about the JSONPath implementation here:
https://danielaparker.github.io/JsonCons.Net/articles/JsonPath/JsonConsJsonPath.html

See also Replace() to replace found values with new values.

### 106.3.76 Remove(Index as Integer)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes an entry by index.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

MessageBox o.toString(False)

// remove middle item
o.Remove 1

MessageBox o.toString(false)
```

**Notes:** Works for arrays or objects.

For objects, prefer to delete by key name since removing an entry changes the order.

Same as RemoveAt method.
See also:

- 106.3.77 Remove(Key as string) 16357

### 106.3.77 Remove(Key as string)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the node with the given name.
**Notes:** Only for JSONMBS of type object.
See also:

- 106.3.76 Remove(Index as Integer) 16356

### 106.3.78 RemoveAt(Index as Integer)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes an entry by index.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

MessageBox o.toString(False)

// remove middle item
o.RemoveAt 1

MessageBox o.toString(false)
```

**Notes:** Works for arrays or objects.
For objects, prefer to delete by key name since removing an entry changes the order.

Same as Remove method.

### 106.3.79 Replace(Path as string, NewValue as Variant) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for all values that match the JSONPath expression and replaces them with the specified value.
**Example:**

```
Dim json As String = " { " +_
" ""books"":" +_
" [ " +_
" { " +_
" ""category"": ""fiction"","  +_
" ""title"" : ""A Wild Sheep Chase"","  +_
" ""author"" : ""Haruki Murakami"","  +_
" ""price"" : 22.72" +_
" } ," +_
" { " +_
" ""category"": ""fiction"","  +_
" ""title"" : ""The Night Watch"","  +_
" ""author"" : ""Sergei Lukyanenko"","  +_
" ""price"" : 23.58" +_
" } ," +_
" { " +_
" ""category"": ""fiction"","  +_
" ""title"" : ""The Comedians"","  +_
" ""author"" : ""Graham Greene"","  +_
" ""price"" : 21.99" +_
" } ," +_
" { " +_
" ""category"": ""memoir"","  +_
" ""title"" : ""The Night Watch"","  +_
" ""author"" : ""Phillips, David Atlee""" +_
" } " +_
" ] " +_
" } "

Dim j As New JSONMBS(json)
Dim n As JSONMBS = j.Replace("$ .books [ ?(@.title == 'A Wild Sheep Chase') ] .price", 123.0)

MessageBox n.toString(True)
```

**Notes:** Throws a JSONExceptionMBS if JSONPath evaluation fails.
Returns the modified copy of the JSON.

See also Query() function to just search without replace.

### 106.3.80 Search(Path as string) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a JMESPath query.
**Example:**

```
Dim json As String = " { ""locations"": [ "+EndOfLine+_
" { ""name"": ""Seattle"", ""state"": ""WA"" } ,"+EndOfLine+_
" { ""name"": ""New York"", ""state"": ""NY"" } ,"+EndOfLine+_
" { ""name"": ""Bellevue"", ""state"": ""WA"" } ,"+EndOfLine+_
" { ""name"": ""Olympia"", ""state"": ""WA"" } "+EndOfLine+_
" ] } "
Dim query As String = "locations [ ?state == 'WA' ] .name | sort(@) | { WashingtonCities: join(', ', @) } "

Dim j As New JSONMBS(json)
Dim r As JSONMBS = j.Search(query)

MessageBox r.toString
// { "WashingtonCities": "Bellevue, Olympia, Seattle" }
```

**Notes:** The jmespath extension implements JMESPath. JMESPath is a query language for transforming JSON documents into other JSON documents. It's supported in both the AWS and Azure CLI and has libraries available in a number of languages.

To learn more about JMESPath, please check this website:
https://jmespath.org

See also Query() for queries with JSONPath expressions.

### 106.3.81 Sort(Reverse as boolean = false)

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sorts values in the array by values or objects by key names.
**Example:**

```
Dim o As New JSONMBS

o.add 3
o.add 4
o.Add 1

o.Sort
```

MessageBox o.toString(False) // shows 1,3,4

**Notes:** Reverse can be set to true in order to reverse the order.

### 106.3.82 ToHTML(NoHeader as boolean = false, CSS as string = "") as String

MBS Util Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts JSON to HTML.
**Notes:** We build for you a HTML with tables for each array and object. We include values and tag rows with even/odd CSS classes.
If NoHeader is true, you get just the raw table without header/footer.
Anything in CSS parameter is inserted before the table.
Returns HTML, which can be loaded in htmlviewer.

Example for CSS to do even/odd line backgrounds:

```
/* CSS style to include */
"<style>
td
{
vertical-align:top;
}

.odd
{
background-color: white;
}

.even
{
background-color: #DDD;
}
</style>"
```

### 106.3.83 toString(formatted as boolean) as string

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Produces a JSON markup text document from a document tree.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewObjectNode

o.AddItemToObject "text", JSONMBS.NewStringNode("Hello World")

MsgBox o.toString // shows " { "text":"Hello World" } "
```

**Notes:** Returns "" on any error. Lasterror is set.
See also:

- 106.3.113 toString as String 16373

### 106.3.84 Unflatten(value as JSONMBS) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unflattens that object back to the original json.
**Example:**

```
Dim t As String = " { ""$ [ 'Hello' ] "":""World"","$ [ 'test' ] "":123 } "

Dim f As New JSONMBS(t)
Dim j As JSONMBS = JSONMBS.Unflatten(f)

Dim s As String = j.toString

MessageBox s
// shows: { "Hello":"World","test":123 }
```

**Notes:** The keys in the flattened object are normalized json paths. The values are primitive (string, number, boolean, or null), empty object ( { } ) or empty array ( [ ] ).

### 106.3.85 Values as Variant()

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all values as an array.
**Notes:** Convenience function to get all values.
Converts values to variants as needed.

Works for both objects and arrays.
Same as Operator_Convert method.

### 106.3.86 Properties

### 106.3.87 ArraySize as Integer

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries size of array.
**Notes:** For objects returns number of keys.
Same as Count property.
(Read only property)

### 106.3.88 ByteStringEncoding as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which byte string encoding to use.
**Example:**

```
Dim mem As MemoryBlock = "Hello World"

Dim dic As New Dictionary
dic.Value("test") = mem

Dim j As New JSONMBS(dic)
j.ByteStringEncoding = j.kByteStringEncodingBase64
MessageBox j.toString
// { "test":"SGVsbG8gV29ybGQ=" }
```

**Notes:** Mainly used for encoding MemoryBlocks included in Dictionaries.
Default is Base64.
(Read and Write property)

### 106.3.89 CaseSensitive as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to find keys with wrong case.
**Example:**

```
JSONMBS.CaseSensitive = False

Dim f As New JSONMBS

f.value("Hello") = "World"
```

```
// finds match
Dim b1 As Boolean = f.HasKey("hello")
Dim v1 As Variant = f.Value("hello")

JSONMBS.CaseSensitive = True

Dim b2 As Boolean = f.HasKey("Hello")
Dim v2 As Variant = f.Value("Hello")

// now try with wrong case...
Dim b3 As Boolean = f.HasKey("hello")
Dim v3 As Variant = f.Value("hello") // ->exception

Break
```

**Notes:** By default JSON is case sensitive. You can have a key "a" and another key "A" with different values in an object.
If you set CaseSensitive to true, the plugin will look case insensitive to find a match.
(Read and Write property)

### 106.3.90 ChildNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first child node.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewArrayNode

o.AddItemToArray JSONMBS.NewNumberNode(1)
o.AddItemToArray JSONMBS.NewNumberNode(2)
o.AddItemToArray JSONMBS.NewNumberNode(3)
o.AddItemToArray JSONMBS.NewNumberNode(4)

dim n as JSONMBS = o.ChildNode // first child
MsgBox n.ValueString // shows 1
```

**Notes:** Please move to newer iterator functions instead.
(Read only property)

### 106.3.91 Compact as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to prefer compact output for toString property.
**Example:**

```
Dim j As New JSONMBS
j.Value("Hello") = "World"

Dim s As String = j.toString
j.compact = false
Dim f As String = j.toString

Break // see difference?
```

**Notes:** Default is true.
Set to false to get formatted output.
Or call ToString method with parameter.
(Read and Write property)

### 106.3.92 Count as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries size of array.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

MessageBox o.Count.ToString // shows 3
```

**Notes:** For objects returns number of keys.
Same as ArraySize property.
(Read only property)

### 106.3.93 Handle as Integer

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle to the JSON object.
**Notes:** It is possible to have two Xojo objects with the same handle pointing to the same JSON node.
(Read only property)

### 106.3.94 IsArray as Boolean

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this object represents an array.
**Notes:** Returns true if type is kTypeArray.
(Read only property)

### 106.3.95 IsBoolean as Boolean

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this object represents a boolean value.
**Notes:** Returns true if type is kTypeTrue or kTypeFalse.
(Read only property)

### 106.3.96 IsEmpty as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the value is empty.
**Example:**

```
Dim j As New JSONMBS

Dim empty1 As Boolean = j.IsEmpty // true

j.Value("hello") = "world"

Dim empty2 As Boolean = j.IsEmpty // false

Break
```

**Notes:** Whether a string, array or object is empty and has no content.
Boolean or numerical values are not empty.
(Read only property)

### 106.3.97 IsInt32 as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an 64-bit integer number.
**Example:**

```
Dim j1 As JSONMBS = JSONMBS.NewNumberNode(1234)
Dim j2 As JSONMBS = JSONMBS.NewNumberNode(1234.4)
Dim j3 As JSONMBS = JSONMBS.NewNumberNode(12343456789435234523)
Dim j4 As JSONMBS = JSONMBS.NewNumberNode(-6578904953445453)
dim j5 as JSONMBS = JSONMBS.NewStringNode("Hello")

Dim b1 As Boolean = j1.IsInt32 // okay
Dim b2 As Boolean = j2.IsInt32 // has decimals
Dim b3 As Boolean = j3.IsInt32 // too big
Dim b4 As Boolean = j4.IsInt32 // too small
Dim b5 As Boolean = j5.IsInt32 // is string
```

Break

**Notes:** Returns true if

- it is type number
- it is in the range for int32.
- it is not with decimal digits after the dot.

(Read only property)

### 106.3.98 IsInt64 as Boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an 64-bit integer number.
**Example:**

```
Dim j1 As JSONMBS = JSONMBS.NewNumberNode(1234)
Dim j2 As JSONMBS = JSONMBS.NewNumberNode(1234.4)
Dim j3 As JSONMBS = JSONMBS.NewNumberNode(1234345673389435234523.0)
Dim j4 As JSONMBS = JSONMBS.NewNumberNode(-65789049333353445453.0)
Dim j5 As JSONMBS = JSONMBS.NewStringNode("Hello")

Dim b1 As Boolean = j1.IsInt64 // okay
Dim b2 As Boolean = j2.IsInt64 // has decimals
```

```
Dim b3 As Boolean = j3.IsInt64 // too big
Dim b4 As Boolean = j4.IsInt64 // too small
Dim b5 As Boolean = j5.IsInt64 // is string
```

Break

**Notes:** Returns true if

- it is type number
- it is in the range for int64.
- it is not with decimal digits after the dot.

(Read only property)

### 106.3.99 IsNull as Boolean

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this object represents a NULL value.
**Notes:** Returns true if type is kTypeNull.
(Read only property)

### 106.3.100 IsNumber as Boolean

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this object represents a numberic value.
**Notes:** Returns true if type is int64, uint64, half or double.
If type is string, we check semantic tag and return true for big decimal, big int, big float ot float 128bit, so this is a numeric type.
(Read only property)

### 106.3.101 IsObject as Boolean

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this object represents an object.
**Notes:** Returns true if type is kTypeObject.
(Read only property)

### 106.3.102 IsUInt32 as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an 32-bit unsigned integer number.
**Example:**

```
Dim j1 As JSONMBS = JSONMBS.NewNumberNode(1234)
Dim j2 As JSONMBS = JSONMBS.NewNumberNode(1234.4)
Dim j3 As JSONMBS = JSONMBS.NewNumberNode(12343456789435234523)
Dim j4 As JSONMBS = JSONMBS.NewNumberNode(-6578904953445453)
dim j5 as JSONMBS = JSONMBS.NewStringNode("Hello")

Dim b1 As Boolean = j1.IsUInt32 // okay
Dim b2 As Boolean = j2.IsUInt32 // has decimals
Dim b3 As Boolean = j3.IsUInt32 // too big
Dim b4 As Boolean = j4.IsUInt32 // too small
Dim b5 As Boolean = j5.IsUInt32 // is string
```

Break

**Notes:** Returns true if

- it is type number
- it is in the range for uint32.
- it is not with decimal digits after the dot.

(Read only property)

### 106.3.103 IsUInt64 as Boolean

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an 64-bit unsigned integer number.
**Example:**

```
Dim j1 As JSONMBS = JSONMBS.NewNumberNode(1234)
Dim j2 As JSONMBS = JSONMBS.NewNumberNode(1234.4)
Dim j3 As JSONMBS = JSONMBS.NewNumberNode(1234345673389435234523.0)
Dim j4 As JSONMBS = JSONMBS.NewNumberNode(-65789049333353445453.0)
Dim j5 As JSONMBS = JSONMBS.NewStringNode("Hello")

Dim b1 As Boolean = j1.IsUInt64 // okay
Dim b2 As Boolean = j2.IsUInt64 // has decimals
```

```
Dim b3 As Boolean = j3.IsUInt64 // too big
Dim b4 As Boolean = j4.IsUInt64 // too small
Dim b5 As Boolean = j5.IsUInt64 // is string
```

Break

**Notes:** Returns true if

- it is type number
- it is in the range for uint64.
- it is not with decimal digits after the dot.

(Read only property)

### 106.3.104 LastChildNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last child node.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewArrayNode

o.AddItemToArray JSONMBS.NewNumberNode(1)
o.AddItemToArray JSONMBS.NewNumberNode(2)
o.AddItemToArray JSONMBS.NewNumberNode(3)
o.AddItemToArray JSONMBS.NewNumberNode(4)

dim k as JSONMBS = o.LastChildNode
MsgBox k.ValueString // shows 4
```

**Notes:** (Read only property)

### 106.3.105 LastRowIndex as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries last row index.
**Example:**

```
Dim j As New JSONMBS

j.add 1
j.add 2
j.add 3

MessageBox j.LastRowIndex.ToString // shows 2
```

**Notes:** Same as Count-1.
(Read only property)

### 106.3.106 LineLengthLimit as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The line length limit.
**Example:**

```
Dim jj As New JSONMBS
For i As Integer = 1 To 20
jj.Append i
next

Dim j As New JSONMBS
j.Compact = False
j.Value("Hello") = jj
Dim s1 As String = j.toString
j.LineLengthLimit = 60
Dim s2 As String = j.toString

// second text has a line break after 14
MessageBox s1+EndOfLine+s2
```

**Notes:** By default is 120.
(Read and Write property)

### 106.3.107 Name as String

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of this node.
**Notes:** (Read only property)
See also:

- 106.3.44 Name(index As Integer) as String 16343

### 106.3.108 NewLineCharacters as String

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The new line character to use.
**Example:**

```
Dim j As New JSONMBS
j.Compact = false
j.Value("Hello") = "World"
Dim s1 As String = j.toString
j.NewLineCharacters = EndOfLine.Windows
Dim s2 As String = j.toString

MessageBox s1.len.toString+EndOfLine+s2.len.toString // 24 vs 26
```

**Notes:** Default is EndOfLine.Unix which is Chr(10).

Can be set to others like EndOfLine.Windows if needed.
(Read and Write property)

### 106.3.109 NextNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next node on the same level.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewArrayNode

o.AddItemToArray JSONMBS.NewNumberNode(1)
o.AddItemToArray JSONMBS.NewNumberNode(2)
o.AddItemToArray JSONMBS.NewNumberNode(3)
o.AddItemToArray JSONMBS.NewNumberNode(4)

dim k as JSONMBS = o.ChildNode
while k<>nil
MsgBox k.ValueString // shows 1, 2, 3, 4

k=k.NextNode
wend
```

**Notes:** Please move to newer iterator functions instead.
(Read only property)

### 106.3.110 PreviousNode as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The previous node on the same level.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewArrayNode

o.AddItemToArray JSONMBS.NewNumberNode(1)
o.AddItemToArray JSONMBS.NewNumberNode(2)
o.AddItemToArray JSONMBS.NewNumberNode(3)
o.AddItemToArray JSONMBS.NewNumberNode(4)

dim k as JSONMBS = o.LastChildNode
while k<>nil
MsgBox k.valuestring // shows 4, 3, 2, 1
```

```
k=k.PreviousNode
wend
```

**Notes:** Please move to newer iterator functions instead.
(Read only property)

### 106.3.111 Root as JSONMBS

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The root object.
**Notes:** The root node owns the references to all children.
(Read only property)

### 106.3.112 Tag as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The semantic tag.
**Notes:** This can give a value as more detailed meaning on the usage.
e.g. we often have strings to hold numbers to preserve all digits.
(Read only property)

### 106.3.113 toString as String

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Produces a JSON markup text document from a document tree.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewObjectNode

o.AddItemToObject "text", JSONMBS.NewStringNode("Hello World")

MsgBox o.toString // shows " { "text":"Hello World" } "
```

**Notes:** Returns "" on any error. Lasterror is set.
(Read only property)
See also:

- 106.3.83 toString(formatted as boolean) as string 16360

### 106.3.114 Type as Integer

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the node.
**Example:**

```
dim n as JSONMBS = JSONMBS.NewNullNode

MsgBox str(n.Type)
```

**Notes:** (Read only property)

### 106.3.115 TypeName as String

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows type of this node as string.
**Example:**

```
dim o as JSONMBS = JSONMBS.NewArrayNode
MsgBox o.TypeName
```

**Notes:** This property was added for debugging so you can see type in debugger.
(Read only property)

### 106.3.116 Valid as Boolean

MBS Util Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether node is valid.
**Notes:** The handle is not zero and there are no error nodes in JSON tree.
Returns true if valid, else false.
(Read only property)

### 106.3.117 Value as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the value of this JSON.
**Example:**

```
Dim j1 As JSONMBS = JSONMBS.NewStringNode("Hello World")
Dim v1 As Variant = j1.Value
Dim j2 As JSONMBS = JSONMBS.NewNumberNode(123)
Dim v2 As Variant = j2.Value
Dim j3 As JSONMBS = JSONMBS.NewNumberNode("1234.567")
Dim v3 As Variant = j3.Value
Dim j4 As JSONMBS = JSONMBS.NewCurrencyNode(123.4567)
Dim v4 As Variant = j4.Value

Break
```

**Notes:** Converts value to variant.
(Read only property)
See also:

- 106.3.129 Value(index As Integer) as Variant 16379
- 106.3.130 Value(Key As String) as Variant 16380

### 106.3.118 ValueBoolean as Boolean

MBS Util Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The boolean value of this json node.
**Notes:** Returns true if type is kTypeTrue, false if kTypeFalse or true if ValueInteger <>0.
(Read only property)

### 106.3.119 ValueByteString as MemoryBlock

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries byte string as MemoryBlock
**Example:**

```
Dim mem As MemoryBlock = "Hello World"

// we send a MemoryBlock into our JSON
Dim dic As New Dictionary
dic.Value("test") = mem

Dim j As New JSONMBS(dic)
MessageBox j.toString // auto encodes it as base64
```

```
// let's query value from child()
Dim jm As JSONMBS = j.Child("test")
Dim m1 As MemoryBlock = jm.ValueByteString

// and query via value()
Dim m2 As MemoryBlock = j.Value("test")

Break
```

**Notes:** Returns nil if type is not kTypeByteString.
(Read only property)

### 106.3.120 ValueDouble as Double

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the node.
**Notes:** (Read only property)

### 106.3.121 ValueInt64 as Int64

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Int64 value of the node.
**Notes:** If the node is an Int64, we return it.
Otherwise we try to convert it.
May raise exception if value can't be converted.
(Read only property)

### 106.3.122 ValueInteger as Integer

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Integer value of the node.
**Notes:** If the node is an integer, we return it.
Otherwise we try to convert it.
May raise exception if value can't be converted.
(Read only property)

### 106.3.123 ValueString as String

MBS Util Plugin, Plugin Version: 13.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the node.
**Notes:** (Read only property)

### 106.3.124 ValueUInt64 as UInt64

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The UInt64 value of the node.
**Notes:** If the node is an UInt64, we return it.
Otherwise we try to convert it.
May raise exception if value can't be converted.
(Read only property)

### 106.3.125 Child(index As Integer) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set child node.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

o.Child(1) = JSONMBS.NewNullNode

Dim v As JSONMBS = o.Child(2) // see in debugger

MessageBox o.toString
```

**Notes:** If the self is an empty object, we replace it with an empty array and add the value.

Same as ChildAt method
Raises exception if index is out of range.
(Read and Write computed property)
See also:

- 106.3.126 Child(Key As String) as JSONMBS 16378

### 106.3.126 Child(Key As String) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the child node.
**Notes:** If the self is an empty array, we replace it with an empty object and add the value.
Raises an exception if the value is not found.
(Read and Write computed property)
See also:

- 106.3.125 Child(index As Integer) as JSONMBS 16377

### 106.3.127 ChildAt(index As Integer) as JSONMBS

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set child node.
**Example:**

```
Dim o As New JSONMBS

o.add 1
o.add 2
o.add 3

o.ChildAt(1) = JSONMBS.NewNullNode

Dim v As JSONMBS = o.ChildAt(2) // see in debugger

MessageBox o.toString
```

**Notes:** If the self is an empty object, we replace it with an empty array and add the value.

Same as ChildAt method.
Raises exception if index is out of range.
(Read and Write computed property)

### 106.3.128 Operator_Subscript(index As Integer) as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set value at given index.
**Example:**

```
Dim o As New JSONMBS
```

```
o(0) = "Hello"
o(1) = "World"
o(2) = "test"

MessageBox o.toString
MessageBox o(1)
```

**Notes:** Variant is converted to JSONMBS if needed.
Index must be in range from 0 to Count. If index is equal to count, we append the value on setting.

If the self is an empty object, we replace it with an empty array and add the value.

Same as ValueAt or Operator_Subscript.
(Read and Write computed property)

### 106.3.129 Value(index As Integer) as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set value at given index.
**Example:**

```
Dim o As New JSONMBS

o.value(0) = "Hello"
o.value(1) = "World"
o.value(2) = "test"

MessageBox o.toString
MessageBox o.Value(1)
```

**Notes:** Variant is converted to JSONMBS if needed.
Index must be in range from 0 to Count. If index is equal to count, we append the value on setting.

If the self is an empty object, we replace it with an empty array and add the value.

Same as ValueAt or Operator_Subscript.
Raises exception if index is out of range.
(Read and Write computed property)
See also:

- 106.3.117 Value as Variant 16374
- 106.3.130 Value(Key As String) as Variant 16380

### 106.3.130 Value(Key As String) as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a value in an object by key name.
**Example:**

```
Dim c As Currency = 1.2345
dim d as Double = c

Dim j As New JSONItem
j.Value("test") = d // can't use c here!

Dim m As New JSONMBS
m.Value("test") = c

MessageBox j.ToString+EndOfLine+m.toString
// shows { "test":1.2344999999999999307 } vs { "test":1.2345 } since MBS stores currency exactly.
```

**Notes:** Variant is converted to or from JSONMBS if needed.
Return value as variant.
Raises an exception if the value is not found.
(Read and Write computed property)
See also:

- 106.3.117 Value as Variant 16374
- 106.3.129 Value(index As Integer) as Variant 16379

### 106.3.131 ValueAt(index As Integer) as Variant

MBS Util Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set value at given index.
**Example:**

```
Dim o As New JSONMBS

o.ValueAt(0) = "Hello"
o.ValueAt(1) = "World"
o.ValueAt(2) = "test"

MessageBox o.toString
MessageBox o.ValueAt(1)
```

**Notes:** Variant is converted to JSONMBS if needed.
Index must be in range from 0 to Count. If index is equal to count, we append the value on setting.

If the self is an empty object, we replace it with an empty array and set the value.

Same as Value or Operator_Subscript.
Raises exception if index is out of range.
(Read and Write computed property)

### 106.3.132 Constants

Byte String Encoding

| Constant | Value | Description |
|---|---|---|
| kByteStringEncodingBase64 | 2 | Base64 encoding |
| kByteStringEncodingBase64URL | 3 | Base64 URL encoding |
| kByteStringEncodingHex | 1 | Hex encoding. |
| kByteStringEncodingNone | 0 | Fallback to default behavior. |

Query Result Options

| Constant | Value | Description |
|---|---|---|
| kPathResultOptionsNoDuplicates | 1 | Remove duplicates. |
| kPathResultOptionsPath | 4 | Return paths. |
| kPathResultOptionsSort | 2 | Sort results. |
| kPathResultOptionsValue | 0 | Return value. |

Tags

| Constant | Value | Description |
|---|---|---|
| kTagBase16 | &h1a | Base16 (Hex) |
| kTagBase64 | &h1b | base64 |
| kTagBase64url | &h1c | base64 URL |
| kTagBigDec | 7 | Big decimal |
| kTagBigFloat | 8 | Big Float |
| kTagBigInt | 6 | Big Integer |
| kTagClamped | &h0e | clamped |
| kTagCode | &h14 | code |
| kTagDateTime | 2 | DateTime |
| kTagEpochMilli | 4 | epoch-milli |
| kTagEpochNano | 5 | epoch-nano |
| kTagEpochSecond | 3 | epoch-second |
| kTagExt | &h11 | ext |
| kTagFloat128 | 9 | Float 128 bit |
| kTagId | &h12 | id |
| kTagMultiDimColumnMajor | &h10 | multi-dim-column-major |
| kTagMultiDimRowMajor | &h0f | multi-dim-row-major |
| kTagNone | 0 | n/a |
| kTagRegex | &h13 | regex |
| kTagUndefined | 1 | undefined |
| kTagURI | &h0d | URI |

Types

| Constant | Value | Description |
|---|---|---|
| kTypeArray | 8 | For an array node. |
| kTypeBoolean | 1 | For a boolean node. |
| kTypeByteString | 7 | For a byte string node.<br>Currently only used for MemoryBlocks passed via Variant. |
| kTypeDouble | 5 | For a double node. |
| kTypeInt64 | 2 | For a Int64 node. |
| kTypeNull | 0 | For a null node. |
| kTypeObject | 9 | For a object node. |
| kTypeSingle | 4 | For a single node. |
| kTypeString | 6 | For a string node. Also applies to big numbers. |
| kTypeUInt64 | 3 | For an uint64 node. |

# Chapter 107

# JPEG

## 107.1 class JPEG2000MBS

### 107.1.1 class JPEG2000MBS

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for compress/decompress of JPEG 2000 images.
**Example:**

```
dim file as FolderItem = GetFolderItem("test.jp2")
dim stream as BinaryStream = BinaryStream.Open(file)
dim data as string = stream.Read(stream.Length)

dim jp2 as new JPEG2000MBS
if jp2.InitDecompress(data) then
MsgBox str(jp2.Width)+" x "+str(jp2.Height)
end if
```

**Notes:** Currently only supports RGB, RGBA and Grayscale images.

Please note that Jasper library used here is not very memory efficient and may run out of memory with huge images.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.4pr4

### 107.1.2 Methods

### 107.1.3 Close

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs cleanup.
**Notes:** Called automatically by destructor for you.
You can call it after you are done to free memory now.

### 107.1.4 Compress as Boolean

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compresses image.
**Notes:** Please use first InitCompress, than loop over rows and use SetRow to fill in data.
This method will compress image and set ImageData property.
Returns true on success and false on failure.

### 107.1.5 Decode(Data as MemoryBlock) as Picture

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a JPEG 2000 images.
**Example:**

```
dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)
dim p80 as Picture = JPEG2000MBS.Decode(j80)

window1.Backdrop = p80
```

**Notes:** Returns on success the picture object.
Can raise exception if data is invalid.
See also:

- 107.1.6 Decode(Data as string) as Picture 16384

### 107.1.6 Decode(Data as string) as Picture

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a JPEG 2000 images.
**Notes:** Returns on success the picture object.
Can raise exception if data is invalid.
See also:

- 107.1.5 Decode(Data as MemoryBlock) as Picture 16384

### 107.1.7 Encode(pic as picture, Quality as Integer = 80) as MemoryBlock

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a picture as JPEG 2000 image.
**Example:**

```
dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)
dim p80 as Picture = JPEG2000MBS.Decode(j80)

window1.Backdrop = p80
```

**Notes:** Returns image data on success or nil on failure.

### 107.1.8 GetRow(Index as Integer, Row as MemoryBlock = nil) as MemoryBlock

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries image data for a row.
**Notes:** If you pass in a memoryblock, we use it, else we create a new one.
So you can pass in memoryblock from last call to GetRow.
Returns nil in case of error.

### 107.1.9 InitCompress(Width as Integer, Height as Integer, BytesPerPixel as Integer, BytesPerRow as Integer = 0) as Boolean

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the compression for a new image.
**Example:**

```
dim p as Picture = LogoMBS(200)
dim pp as new PictureMBS(p)
```

```
// compress RGB in PictureMBS
dim je as new JPEG2000MBS
if je.InitCompress(pp.Width, pp.Height, 3, pp.RowSize) then
dim h as Integer = pp.Height-1

for i as Integer = 0 to h
dim rowData as MemoryBlock = pp.RowInFormat(i, pp.ImageFormatRGB)
if not je.SetRow(i, rowData) then
Break
exit
end if
next
if je.Compress then
dim ImageData as MemoryBlock = je.ImageData
if ImageData <>nil then
// and decode to show
dim pic as Picture = JPEG2000MBS.Decode(ImageData)
window1.Backdrop = pic
end if
end if
end if
```

**Notes:** Returns true on success or false on failure.
If BytesPerRow is zero, we calculate it based on BytesPerPixel and Width.
BytesPerPixel can be 1 for gray, 3 for RGB and 4 for RGBA.

### 107.1.10 InitDecompress(ImageData as MemoryBlock) as Boolean

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the decompression for given image data.
**Example:**

```
dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)

// decompress to PictureMBS
dim jd as new JPEG2000MBS

if jd.InitDecompress(j80) then
dim pi as new PictureMBS(jd.Width, jd.Height, PictureMBS.ImageFormatRGB)
dim h as Integer = pi.Height-1
```

```
dim r as MemoryBlock
for i as Integer = 0 to h
// get row. Recycle MemoryBlock, so we don't create new one each row.
r = jd.getRow(i, r)
pi.RowInFormat(i, pi.ImageFormatRGB) = r
next

// get picture
window1.Backdrop = pi.CopyPicture
end if
```

**Notes:** Returns true on success or false on failure.
BytesPerPixel is set to 1 for gray, 3 for RGB and 4 for RGBA.

### 107.1.11 SetRow(Index as Integer, Row as MemoryBlock) as Boolean

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets data for a row.
**Notes:** Returns true on success.

### 107.1.12 Properties

### 107.1.13 BytesPerPixel as Integer

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The number of bytes per pixel.
**Notes:** One for gray, 3 for RGB and 4 for RGBA.
Set by InitCompress or InitDecompress.
(Read only property)

### 107.1.14 BytesPerRow as Integer

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The bytes per row.
**Notes:** Only used to create memoryblock or check memoryblock size.
Set by InitCompress or InitDecompress.
(Read only property)

### 107.1.15 Height as Integer

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The height of the image.
**Notes:** Set by InitCompress or InitDecompress.
(Read only property)

### 107.1.16 ImageData as MemoryBlock

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The image data.
**Notes:** Set by Compress method on success.
(Read only property)

### 107.1.17 Options as String

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Options to pass to Jasper library for compression.
**Notes:** e.g. "rate=80"
(Read and Write property)

### 107.1.18 Width as Integer

MBS Images Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the image.
**Notes:** Set by InitCompress or InitDecompress.
(Read only property)

## 107.2 class JPEGExporterMBS

### 107.2.1 class JPEGExporterMBS

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for JPEG Exporting.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

**Notes:** This class is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

Bases on libjpeg.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr7
- MBS Xojo Plugins, version 20.0pr7
- MBS Xojo Plugins, version 19.6pr4
- MBS Xojo Plugins, version 19.5pr7
- libjpeg-turbo for Xojo
- MBS Xojo Plugins, version 19.5pr6
- MBS Xojo Plugins, version 17.3pr5
- ICC color profiling
- Making use of the WebFileUploader
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

### 107.2.2 Methods

### 107.2.3 Export

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports the picture.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
```

```
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

**Notes:** This methods saves 32bit pictures to a file using JPEG Compression. Using the properties of the class you can specify the quality in range between 0 and 100%

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.

This method uses the YieldTicks property and may yield time to other threads.

### 107.2.4 ExportCMYK(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

MBS Images Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports a picture from CMYK data in a memoryblock.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getOpenFolderItem("image/jpeg")
```

```
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData

// export it
f=SpecialFolder.Desktop.child("test.jpg")
je=new JPEGExporterMBS
je.HorizontalResolution=300
je.VerticalResolution=300
je.ResolutionUnit=1
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
```

**Notes:** This methods saves 32bit CMYK pictures to a file using JPEG Compression. Using the properties of the class you can specify the quality in range between 0 and 100%

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

The picture must be in the format that one byte is used for each channel and the channels are ordered in memory in Cyan, Magenta, Yellow and Black.
If rowbytes is 0, the plugin uses width*4 for rowbytes.

This method uses the YieldTicks property and may yield time to other threads.

### 107.2.5 ExportGray

MBS Images Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports an 8 bit grayscale picture.
**Notes:** Same as Export, but writes grayscale picture. The picture from picture property is converted to grayscale internally for this.
See also:

- 107.2.6 ExportGray(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32) 16393

### 107.2.6 ExportGray(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

MBS Images Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports an 8 bit grayscale picture.
**Notes:** Same as Export, but writes grayscale picture using data in memoryblock.
If rowbytes is 0, the plugin uses width for rowbytes.
This method uses the YieldTicks property and may yield time to other threads.
See also:

- 107.2.5 ExportGray 16392

### 107.2.7 ExportRGB(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports a picture from RGB data in a memoryblock.
**Example:**

```
dim f as FolderItem
dim ji as new JPEGImporterMBS
dim je as new JPEGExporterMBS
dim m as MemoryBlock
dim i,c as Integer

// read jpeg
f=SpecialFolder.Desktop.Child("input.jpg")

ji.Mode=ji.ModeRGB // read RGB to memoryblock
ji.File=f
ji.Import

m=ji.PictureData

// add red
c=m.Size-1
for i=0 to c step 3
m.Byte(i)=255
next

// write jpeg
f=SpecialFolder.Desktop.Child("test.jpg")

je.File=f
je.ExportRGB(m,ji.Width, ji.Height, ji.Width*3)
```

**Notes:** The memoryblock data must be in the format with bytes in the order RGB.

### 107.2.8 ExportRGBwithRowDataEvent(width as UInt32, height as UInt32, rowbytes as UInt32)

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exports a picture from RGB data in memoryblocks from the GetRowData event.
**Notes:** You need to implement the GetRowData event by subclassing this class.
The memoryblock data must be in the format with bytes in the order RGB.

### 107.2.9 GetJPEGVersion as String

MBS Images Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries JPEG library version.
**Notes:** Currently reporting 9.1 for version 9b.

### 107.2.10 SetAPI(API as Ptr = nil)

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets API to use.
**Example:**

```
// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API
```

**Notes:** Set to nil to use built in jpeglib.
Can be set to JPEGTurboMBS.API to use libjpeg-turbo.

Changing API while you have instances of JPEGExporterMBS or methods in use on other thread using the JPEG Library, may result in a crash.

### 107.2.11 Properties

### 107.2.12 API as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of API used.
**Notes:** Either libjpeg or libjpeg-turbo.
(Read only property)

### 107.2.13 data as string

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination string.
**Notes:** If file is nil, the compressed data is saved in this property.

The returned string has the encoding set to MacRoman. If you want to concat the string with another you should change the encoding, so both strings have the same encoding. If you don't handle that RB may convert the JPEG data to UTF8 (Unicode) which will destroy it.
(Read and Write property)

### 107.2.14 DCTMethod as Integer

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which DCT/IDCT algorithm to use.
**Notes:** Possible values:

| | |
|---|---|
| -1 | Plugin does not change setting |
| 0 | slow but accurate integer algorithm (default) |
| 1 | faster, less accurate integer method |
| 2 | floating-point: accurate, fast on fast Hardware |

Default is Integer slow.
(Read and Write property)

### 107.2.15 ErrorCode as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code from the Export method.
**Example:**

```
dim j as new JPEGExporterMBS

// do something

MsgBox str(j.ErrorCode)+" "+j.ErrorMessage
```

**Notes:** The last function was successfull if ErrorCode is 0.
If the parameters are not valid, the value is set to -1.
Other values are Mac OS error codes.
(Read and Write property)

### 107.2.16 ErrorMessage as string

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message reported.
**Example:**

```
dim j as new JPEGExporterMBS

// do something

MsgBox j.ErrorMessage
```

**Notes:** (Read and Write property)

### 107.2.17 EXIFData as String

MBS Images Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The EXIF data for this file.
**Example:**

```
// Read a picture file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim ji as new JPEGImporterMBS
```

```
ji.ReadExifData=true
ji.File=f
ji.Import

// Write a new picture file
dim o as FolderItem = SpecialFolder.Desktop.Child("out.jpg")
dim je as new JPEGExporterMBS

je.File=o
je.EXIFData = ji.ExifData
je.Picture = ji.Picture
je.Export
```

**Notes:** The export methods use this property.
(Read and Write property)

### 107.2.18 file as folderitem

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination file.
**Example:**

```
dim p as Picture = LogoMBS(500)

'Save the scan
dim je as new JPEGExporterMBS
je.file = SpecialFolder.Desktop.Child("just a test.jpg")
je.quality = 75
je.picture = p
je.VerticalResolution = 72
je.HorizontalResolution = 72
je.ResolutionUnit = 1
je.export
```

**Notes:** If file is nil and path is "", the destination is the data property.
(Read and Write property)

### 107.2.19 HorizontalResolution as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution.
**Example:**

```
dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1
```

**Notes:** (Read and Write property)

### 107.2.20 OptimizeCoding as Boolean

MBS Images Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the plugin should ask the compressor to optimize the huffman coding tables.
**Example:**

```
dim j as new JPEGExporterMBS
j.OptimizeCoding = true
```

**Notes:** This usually provides a small percentage decrease in file size.
(Read and Write property)

### 107.2.21 Path as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destination file.
**Example:**

```
Dim p As Picture = LogoMBS(500)

'Save the scan
Dim je As New JPEGExporterMBS

// using file
'je.file = SpecialFolder.Desktop.Child("just a test via file.jpg")
```

```
// using path
Dim f As folderitem = SpecialFolder.Desktop.Child("just a test via path.jpg")
Dim pa As String = f.NativePath
je.path = pa

je.quality = 75
je.picture = p
je.VerticalResolution = 72
je.HorizontalResolution = 72
je.ResolutionUnit = 1
je.export
```

**Notes:** If file is nil and path is "", the destination is the data property.
(Read and Write property)

### 107.2.22 Picture as Picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture to use.
**Example:**

```
dim MyPic as Picture = LogoMBS(500)
dim j as JPEGExporterMBS // your exporter
j.picture=MyPic
```

**Notes:** Should be a bitmap picture without alpha channel or mask.
(Read and Write property)

### 107.2.23 ProfileData as String

MBS Images Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An ICC profile to write to the file.
**Example:**

```
dim f as FolderItem
dim j as JPEGImporterMBS
dim p as LCMS2ProfileMBS
dim e as JPEGExporterMBS
```

```
f=SpecialFolder.Desktop.Child("test2.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all
j.ReadProfileData=true // needed to fill ProfileData property
j.file=f

j.Import

if j.ProfileData="" then
MsgBox "no profile"
Return
end if

p=LCMS2ProfileMBS.CreatesRGBProfile

f=SpecialFolder.Desktop.Child("test3.jpg")
e=new JPEGExporterMBS
e.File=f
e.Picture=j.Picture
e.ProfileData=p.SaveProfileToString
e.Quality=75
e.Export
```

**Notes:** the string must contain the binary data of the profile. For example SaveProfileToString of the CMProfileMBS class returns such a string.
If the string is empty, no profile is written.
(Read and Write property)

### 107.2.24 Progressive as Boolean

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to make a progressive compressed image.
**Example:**

```
dim j as new JPEGExporterMBS
j.Progressive = true
```

**Notes:** Default is true.
(Read and Write property)

### 107.2.25 Quality as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The quality to use.
**Example:**

```
dim je as new JPEGExporterMBS
je.quality = 75
```

**Notes:** Range from 0 to 100. Default is 75.
(Read and Write property)

### 107.2.26 ResolutionUnit as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The unit of the resolution properties.
**Example:**

```
dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1
```

**Notes:** Values:

| | |
|---|---|
| 0 | unknown |
| 1 | dots per inch |
| 2 | dots per cm |

(Read and Write property)

### 107.2.27 VerticalResolution as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution.
**Example:**

```
dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1
```

**Notes:** (Read and Write property)

### 107.2.28 WarningMessage as String

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last warning message reported.
**Example:**

```
dim j as new JPEGExporterMBS

// do something

MsgBox j.WarningMessage
```

**Notes:** (Read and Write property)

### 107.2.29 XMPData as String

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XMP data for this file.
**Notes:** The export methods use this property.
(Read and Write property)

### 107.2.30 YieldTicks as Integer

MBS Images Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim j as JPEGExporterMBS // your exporter

j.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

### 107.2.31 Markers(Index as Integer) as string

MBS Images Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Additional markers.
**Example:**

```
dim j as new JPEGExporterMBS

j.Picture = LogoMBS(500)
j.Markers(5) = "Hello World"
j.File = SpecialFolder.Desktop.Child("test.jpg")
j.Export

// now open jpeg file in text editor and you see hello world near beginning
```

**Notes:** Index from 0 to 15.
Index zero is used for JFIF header.
Index one is normally used for EXIF or XMP.
Index 13 is often used for Photoshop.

see also
http://www.ozhiker.com/electronics/pjmt/jpeg_info/app_segments.html

You can use this markers to embed a given string in the file. You can encrypt data and store it next to the image as you like.
Of course this will not survive if image is loaded and saved again. But can work as a container to hide data and user sees only image.
(Read and Write computed property)

### 107.2.32 Events

### 107.2.33 Error(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all error messages from the jpeg library.

### 107.2.34 GetRowData(index as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called to query for the next data block.
**Notes:** The memoryblock data must be in the format with bytes in the order RGB.
Index is from 0 to height-1.
Returning nil will result in an error on the JPEG compression.

### 107.2.35 Info(message as string, msglevel as Integer, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all information messages from the jpeg library.
**Notes:** msglevel is one of:

| | |
|---|---|
| -1: | recoverable corrupt-data warning, may want to abort. |
| 0: | important advisory messages (always display to user). |
| 1: | first level of tracing detail. |
| 2,3,...: | successively more detailed tracing messages. |

### 107.2.36 Warning(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all warning messages from the jpeg library.

### 107.2.37 Constants

Resolution Unit

| Constant | Value | Description |
|---|---|---|
| ResolutionUnitDotsPerCentimeter | 2 | Dots per centimeter |
| ResolutionUnitDotsPerInch | 1 | Dots per inch |
| ResolutionUnitUnknown | 0 | Undefined |

## 107.3 class JPEGImporterMarkerMBS

### 107.3.1 class JPEGImporterMarkerMBS

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a JPEG marker.

### 107.3.2 Properties

### 107.3.3 Data as String

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The actual data read as a binary string.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

dim data as string = j.MarkerItem(0).Data

// work with data
```

**Notes:** (Read and Write property)

### 107.3.4 DataLength as Integer

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data length in bytes of the data string.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem
```

```
f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).DataLength)

// work with data
```

**Notes:** (Read and Write property)

### 107.3.5 Marker as Integer

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of this datablock.
**Example:**

```
dim j as JPEGImporterMBS
dim f as folderitem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).Marker)

// work with data
```

**Notes:** For example &hE0 for the first user defined block.
(Read and Write property)

### 107.3.6 OriginalLength as Integer

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original data length in the file.

**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).OriginalLength)

// work with data
```

**Notes:** Maybe smaller than datalength because of compression.
(Read and Write property)

## 107.4 class JPEGImporterMBS

### 107.4.1 class JPEGImporterMBS

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for JPEG Importing.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

**Notes:** This class is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

Bases on libjpeg.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr6
- MBS Xojo Plugins, version 20.1pr5
- Reading JPEG Thumbnails from EXIF
- MBS Xojo Plugins, version 19.5pr7
- libjpeg-turbo for Xojo
- ICC color profiling
- JPEG String to Picture
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 18.3, page 10: News
- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 107.4.2 Methods

### 107.4.3 BlueTestPicture as picture

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a 100x100 pixel big picture filles with RGB(0,0,255).
**Notes:** Just for testing how well the plugin picture code works.

### 107.4.4 CleanMarkers

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the marker list.

### 107.4.5 FinishJPEG

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Releases all memory buffers needed for the JPEG decompression.
**Notes:** This must be called if you used InitJPEG!
Else you have a memory leak.

### 107.4.6 GetJPEGVersion as String

MBS Images Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries JPEG library version.
**Notes:** Currently reporting 9.1 for version 9b.

### 107.4.7 GreenTestPicture as picture

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a 100x100 pixel big picture filles with RGB(0,255,0).
**Notes:** Just for testing how well the plugin picture code works.

### 107.4.8 Import

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Imports the picture.
**Example:**

```
dim f as FolderItem
dim ji as new JPEGImporterMBS
dim je as new JPEGExporterMBS
dim m as MemoryBlock
dim i,c as Integer

// read jpeg
f=SpecialFolder.Desktop.Child("input.jpg")

ji.Mode=ji.ModeRGB // read RGB to memoryblock
ji.File=f
ji.Import

m=ji.PictureData
```

```
// add red
c=m.Size-1
for i=0 to c step 3
m.Byte(i)=255
next

// write jpeg
f=SpecialFolder.Desktop.Child("test.jpg")

je.File=f
je.ExportRGB(m,ji.Width, ji.Height, ji.Width*3)
```

**Notes:** This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

This method uses the YieldTicks property and may yield time to other threads.
Depending on the mode this method can read CMYK and RGB. RGB either to memoryblock or to a picture object.
The memoryblock data must be in the format with bytes in the order RGB.

### 107.4.9 ImportCMYK

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Imports a CMYK picture.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getOpenFolderItem("image/jpeg")
ji=new JPEGImporterMBS
```

```
ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData

// export it
f=SpecialFolder.Desktop.child("test.jpg")
je=new JPEGExporterMBS
je.HorizontalResolution=300
je.VerticalResolution=300
je.ResolutionUnit=1
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
```

**Notes:** This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

The read CMYK values are stored in the picturedata property.

This method uses the YieldTicks property and may yield time to other threads.

### 107.4.10 InitJPEG as boolean

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the JPEG decompressor for use with LoopJPEG.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
```

```
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

**Notes:** Call FinishJPEG even if this failes.
Returns true if you can loop using LoopJPEG.

### 107.4.11 LoopJPEG as Integer

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decompresses one line of the picture.
**Example:**

```
dim j as new JPEGImporterMBS
// fill properties...

if j.initJPEG then
do
loop until j.LoopJPEG<>0
end if
j.FinishJPEG

backdrop=j.Picture // nil if failed
```

**Notes:** Return values:

| | |
|---|---|
| 0 | Decompression was okay |
| 1 | Finished decompression |
| 2 | if there was an error. |
| 3 | Not initialized |
| 4 | Header only was requested |

### 107.4.12 MarkerCount as Integer

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of markers found in the JPEG data stream.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all

// do the import

MsgBox str(j.MarkerCount)
```

**Notes:** Only available if ReadMarkers was true on reading the JPEG data.

### 107.4.13 MarkerItem(index as Integer) as JPEGImporterMarkerMBS

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the marker with the given index.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property
```

```
// do the import

dim data as string = j.MarkerItem(0).Data

// work with data
```

**Notes:** Only available if ReadMarkers was true on reading the JPEG data.

### 107.4.14 ReadHeader as boolean

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read the header of the JPEG data in a file or a memoryblock.
**Example:**

```
dim f as FolderItem
dim j as JPEGImporterMBS

f=SpecialFolder.Desktop.Child("Jaguar1600.jpg")
j=new JPEGImporterMBS
j.file=f
if j.ReadHeader then
MsgBox str(j.Width)+" x "+str(j.Height)
else
MsgBox "no JPEG"
end if
```

**Notes:** You can use this function to see if the file is a JPEG image and which dimension it has.
This function calls InitJPEG and FinishJPEG, so we get all the metadata, but no picture.

### 107.4.15 RedTestPicture as picture

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a 100x100 pixel big picture filles with RGB(255,0,0).
**Notes:** Just for testing how well the plugin picture code works.

### 107.4.16 SetAPI(API as Ptr = nil)

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets API to use.
**Example:**

```
// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API
```

**Notes:** Set to nil to use built in jpeglib.
Can be set to JPEGTurboMBS.API to use libjpeg-turbo.

Changing API while you have instances of JPEGImporterMBS or methods in use on other thread using the JPEG Library, may result in a crash.

### 107.4.17 Properties

### 107.4.18 AllowDamaged as boolean

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether you want damaged pictures to be returned.
**Notes:** If AllowDamaged is false, nil will be returned if the picture is damaged.
Default value is false.
(Read and Write property)

### 107.4.19 API as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of API used.
**Notes:** Either libjpeg or libjpeg-turbo.
(Read only property)

### 107.4.20 BlockSmoothing as Boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to do interblock smoothing.
**Notes:** Default value is true.

This setting is relevant only when decoding a progressive JPEG image. During the first DC-only scan,

block smoothing provides a very "fuzzy" look instead of the very "blocky" look seen without it; which is better seems a matter of personal taste. But block smoothing is nearly always a win during later stages, especially when decoding a successive-approximation image: smoothing helps to hide the slight blockiness that otherwise shows up on smooth gradients until the lowest coefficient bits are sent.
(Read and Write property)

### 107.4.21 CMYK as Boolean

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the decompressor has imported the picture as a CMYK image into a memoryblock.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS

g=getFolderItem("a_auf")
ji=new JPEGImporterMBS
ji.File=g
if ji.InitJPEG then

if ji.CMYK then
MsgBox "CMYK"
else
MsgBox "not"
end if
end if
```

**Notes:** This property sets the Mode property to ModeCMYK.
(Read and Write property)

### 107.4.22 ColorComponentCount as Integer

MBS Images Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of color components.
**Notes:**

| | |
|---|---|
| 1 | Grayscale |
| 3 | RGB |
| 4 | CMYK |

(Read and Write property)

### 107.4.23 ColorSpace as Integer

MBS Images Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space of the image.
**Example:**

```
dim j as new JPEGImporterMBS

j.File = SpecialFolder.Desktop.Child("cmyk.jpg")

if j.InitJPEG then

Select case j.ColorSpace
case j.ColorSpaceCMYK, j.ColorSpaceYCCK
MsgBox "CMYK"
case j.ColorSpaceRGB, j.ColorSpaceYCbCr
MsgBox "RGB"
case j.ColorSpaceGrayScale
MsgBox "Gray"
else
MsgBox "unknown? "+str(j.ColorSpace)
end Select

j.FinishJPEG
end if
```

**Notes:** See also the Colorspace constants.
(Read and Write property)

### 107.4.24 CurrentDepth as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The depth of the picture property.
**Notes:** In the current implementation always 32bit.
0 if the loading of the picture failed.
(Read and Write property)

### 107.4.25 data as string

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source string.
**Notes:** If file is nil, the compressed data is taken from this property.
(Read and Write property)

### 107.4.26 ErrorMessage as string

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message reported.
**Notes:** (Read and Write property)

### 107.4.27 ExifData as String

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exif data stored in the file.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadExifData=true // needed to fill ExifData property

// do the import

dim data as string = j.ExifData

// work with data
```

**Notes:** Only used when ReadExifData is set to true before you import the image.
The string contains the binary content of a exif data on disc.
Value is "" if no data was found.
(Read and Write property)

### 107.4.28 ExifOrientation as Integer

MBS Images Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries orientation from EXIF data.
**Notes:** ReadExifData property must be set earlier to have the import process load EXIF data.
Returns -1 in case of error.
Valid values are in range of 1 to 8. See kOrientation* constants.

For new development, please use ExifTagsMBS class instead.
(Read only property)

### 107.4.29 ExifThumbnail as String

MBS Images Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts an embedded thumbnail in EXIF data.
**Example:**

```
Dim g As New JPEGImporterMBS

g.File = SpecialFolder.Desktop.Child("test.jpg")
g.ReadExifData = True

// not load, but just read header & metadata
If g.ReadHeader Then

// get thumbnail
Dim Thumbnail As String = g.ExifThumbnail

// show it
window1.Backdrop = picture.FromData(Thumbnail)

// if nil, use ScaleFactor and read scaled down version
End If
```

**Notes:** ReadExifData property must be set earlier to have the import process load EXIF data.
Returns string containing JPEG compressed image data.

For new development, please use ExifTagsMBS class instead.
(Read only property)

### 107.4.30 FancyUpsampling as Boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to do fancy upsampling.
**Notes:** Default value is true.

If true, use direct DCT scaling with DCT size >8 for downsampling of chroma components. If false, use only DCT size <= 8 and simple separate downsampling. Default is true. For better image stability in multiple generation compression cycles it is preferable that this value matches the corresponding FancyUpsampling value in decompression.
(Read and Write property)

### 107.4.31 file as folderitem

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source file.
**Example:**

```
Dim ji As New JPEGImporterMBS

ji.file = SpecialFolder.Desktop.Child("test.jpg")
ji.Import

Backdrop = ji.Picture
```

**Notes:** If file is nil and path is "", the source is taken from the data property.
(Read and Write property)

### 107.4.32 FileOffset as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The offset inside the file.
**Notes:** (Read and Write property)

### 107.4.33 Height as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture.
**Notes:** 0 if the loading of the picture failed.
(Read and Write property)

### 107.4.34 HorizontalResolution as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution.
**Notes:** (Read and Write property)

### 107.4.35 Mode as Integer

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The operation mode.
**Notes:** Can be either ModePicture (Default), ModeRGB or ModeCMYK.
(Read and Write property)

### 107.4.36 OriginalDepth as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original depth of the picture.
**Notes:** Value maybe 8 for grayscale pictures and 24 or 32 for colored pictures.
0 if the loading of the picture failed.
(Read and Write property)

### 107.4.37 Path as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source file.
**Example:**

```
Dim ji As New JPEGImporterMBS

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
ji.path = f.NativePath
ji.Import
```

Backdrop = ji.Picture

**Notes:** If file is nil and path is "", the source is taken from the data property.
(Read and Write property)

### 107.4.38 Picture as Picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture as the result.
**Notes:** Set to nil on any error.
(Read and Write property)

### 107.4.39 PictureData as MemoryBlock

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cmyk picture data after importing.
**Example:**

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getFolderItem("CMYK Example.jpg")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData
msgBox g.name
// export it
f=SpecialFolder.Desktop.child("CMYK Example2.jpg")
je=new JPEGExporterMBS
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
```

**Notes:** Basicly a memoryblock with one byte for each channel.
For ReadByRow methods this property contains memoryblock for a row of the image.
(Read and Write property)

### 107.4.40 ProfileData as String

MBS Images Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ICC profile stored in the file.
**Example:**

```
dim f as FolderItem
dim j as JPEGImporterMBS
dim p as LCMS2ProfileMBS

f=SpecialFolder.Desktop.Child("test2.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all
j.ReadProfileData=true // needed to fill ProfileData property
j.file=f

j.Import

if j.ProfileData="" then
MsgBox "no profile"
Return
end if

p=LCMS2ProfileMBS.OpenProfileFromString(j.ProfileData)
MsgBox p.Name
```

**Notes:** Only used when ReadProfileData is set to true before you import the image.
The string contains the binary content of a profile file on disc. So you can pass it to the CMOpenProfileFromDataMBS function or write it to a file using the binarystream class.
Value is "" if no profile was found.
(Read and Write property)

### 107.4.41 ProgressiveMode as Boolean

MBS Images Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a progressive jpeg file.

**Notes:** Loading progressive files needs more memory.
(Read and Write property)

### 107.4.42 ReadExifData as Boolean

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the plugin should read in the exif data.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadExifData=true // needed to fill ExifData property

// do the import

dim data as string = j.ExifData

// work with data
```

**Notes:** If there is exif data, it will be stored in the ExifData property.
Setting this value to true will set ReadMarkers to true, too.
The data is stored in one or more markers, so it is needed to read them before extracting the data.
(Read and Write property)

### 107.4.43 ReadMarkers as Boolean

MBS Images Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether importer should read markers.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all
```

```
// do the import

MsgBox str(j.MarkerCount)
```

**Notes:** (Read and Write property)

### 107.4.44 ReadProfileData as Boolean

MBS Images Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the plugin should read in the icc profile.
**Example:**

```
dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadProfileData=true // needed to fill ProfileData property

// do the import

dim Profile as string = j.ProfileData

// work with profile data
```

**Notes:** If there is a profile, it will be stored in the ProfileData property.
Setting this value to true will set ReadMarkers to true, too.
A profile is stored in one or more markers, so it is needed to read them before extracting the profile.
(Read and Write property)

### 107.4.45 ReadXMPData as Boolean

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the plugin should read in the xmp data.
**Notes:** If there is xmp data, it will be stored in the XMPData property.
Setting this value to true will set ReadMarkers to true, too.
The data is stored in one or more markers, so it is needed to read them before extracting the data.
(Read and Write property)

### 107.4.46 ResolutionUnit as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The unit of the resolution properties.
**Notes:** Values:

| | |
|---|---|
| 0 | unknown |
| 1 | dots per inch |
| 2 | dots per cm |

(Read and Write property)

### 107.4.47 ScaleFactor as Integer

MBS Images Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The JPEG Library can scale down the picture on the fly.
**Notes:** Allowed values: 0, 1, 2, 4, 8
0 and 1 disable scaling.
Default valus is 0 for no scaling.
(Read and Write property)

### 107.4.48 VerticalResolution as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution.
**Notes:** (Read and Write property)

### 107.4.49 WarningMessage as String

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last warning message reported.
**Notes:** (Read and Write property)

### 107.4.50 Width as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture.
**Notes:** 0 if the loading of the picture failed.
(Read and Write property)

### 107.4.51 XMPData as String

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XMP Data stored in the file.
**Notes:** Only used when ReadXMPData is set to true before you import the image.
The string contains the binary content of a xmp data on disc.
Value is "" if no data was found.
(Read and Write property)

### 107.4.52 YieldTicks as Integer

MBS Images Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim j as JPEGImporterMBS // your importer
j.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

### 107.4.53 Events

### 107.4.54 Error(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all error messages from the jpeg library.

### 107.4.55 HeadersRead as boolean

MBS Images Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called when headers are read.
**Notes:** This allows you to set Mode, ScaleFactor, FancyUpsampling, BlockSmoothing properties.
Return true to cancel Import/InitJPEG methods early.

### 107.4.56 Info(message as string, msglevel as Integer, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all information messages from the jpeg library.
**Notes:** msglevel is one of:

| | |
|---|---|
| -1: | recoverable corrupt-data warning, may want to abort. |
| 0: | important advisory messages (always display to user). |
| 1: | first level of tracing detail. |
| 2,3,...: | successively more detailed tracing messages. |

### 107.4.57 Warning(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all warning messages from the jpeg library.

### 107.4.58 Constants

Color Spaces

| Constant | Value | Description |
|---|---|---|
| ColorSpaceCMYK | 4 | C/M/Y/K |
| ColorSpaceGrayScale | 1 | Gray |
| ColorSpaceRGB | 2 | red/green/blue |
| ColorSpaceUnknown | 0 | Not set. |
| ColorSpaceYCbCr | 3 | Y/Cb/Cr (also known as YUV) |
| ColorSpaceYCCK | 5 | Y/Cb/Cr/K |

Orientation Constants

| Constant | Value | Description |
|---|---|---|
| kOrientationBottomLeft | 4 | row 0 bottom, col 0 lhs |
| kOrientationBottomRight | 3 | row 0 bottom, col 0 rhs |
| kOrientationLeftBottom | 8 | row 0 lhs, col 0 bottom |
| kOrientationLeftTop | 5 | row 0 lhs, col 0 top |
| kOrientationRightBottom | 7 | row 0 rhs, col 0 bottom |
| kOrientationRightTop | 6 | row 0 rhs, col 0 top |
| kOrientationTopLeft | 1 | row 0 top, col 0 lhs |
| kOrientationTopRight | 2 | row 0 top, col 0 rhs |

Modes

| Constant | Value | Description |
|---|---|---|
| ModeAuto | 30 | Load the image into the picturedata property.<br>Switches on import to RGB, Gray or CMYK depending on color space of JPEG file. |
| ModeAutoByRow | 31 | Load the image into the picturedata property.<br>Switches on import to RGB, Gray or CMYK depending on color space of JPEG file. |
| ModeCMYK | 2 | Load the image into the picturedata property.<br>The PictureData Memoryblock uses 4 bytes per pixel. |
| ModeCMYKbyRow | 12 | Same as ModeCMYK, but PictureData contains only the current row<br>The PictureData Memoryblock uses 4 bytes per pixel. |
| ModeGray | 3 | Load the image into the picturedata property.<br>The PictureData Memoryblock uses one byte per pixel. |
| ModeGraybyRow | 13 | Same as ModeGray, but PictureData contains only the current row<br>The PictureData Memoryblock uses one byte per pixel. |
| ModePicture | 0 | Load the image into the picture property. |
| ModeRaw | 20 | Load the image into the picturedata property.<br>The PictureData Memoryblock uses 1 to 4 bytes per pixel.<br>Check the colorspace property to know which color space is used. |
| ModeRGB | 1 | Load the image into the picturedata property.<br>The PictureData Memoryblock uses 3 bytes per pixel. |
| ModeRGBbyRow | 11 | Same as ModeRGB, but PictureData contains only the current row<br>The PictureData Memoryblock uses 3 bytes per pixel. |

## 107.5 class JPEGMovieMBS

### 107.5.1 class JPEGMovieMBS

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to write a movie with JPEGs.
**Example:**

```
// get a picture
dim p as Picture = LogoMBS(500)

// start movie building
dim m as new JPEGMovieMBS

m.Width = 500
m.Height = 500
m.SecondsPerFrame = 0.5

// add frames where we count up
for i as integer = 1 to 20
dim c as new Picture(500, 500)
dim g as Graphics = c.Graphics
g.ForeColor = &c000000
g.TextSize = 50
g.DrawPicture p, 0, 0
g.DrawString str(i), 20, 50

dim j as string = c.GetData(c.FormatJPEG)
m.AddFrame j

next

// generate movie
dim MovieData as string = m.BuildMovie

// and write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write MovieData
```

**Notes:** This is a self written class to create a QuickTime Movie with one video track using JPEG images. You can use this to quickly write a slideshow video if needed.

Does play in Quicktime player and VLC, but not Windows Media Player.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr3
- MBS Xojo Plugins 17.2
- MBS Xojo Plugins, version 17.2pr1
- JPEGs to Movie

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.4, page 9: News

### 107.5.2 Methods

### 107.5.3 AddFrame(Image as MemoryBlock)

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a frame.
**Notes:** Image must be a JPEG compressed image.
See also:

- 107.5.4 AddFrame(Image as String) 16433

### 107.5.4 AddFrame(Image as String)

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a frame.
**Notes:** Image must be a JPEG compressed image.
See also:

- 107.5.3 AddFrame(Image as MemoryBlock) 16433

### 107.5.5 BuildMovie as String

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds the movie.
**Notes:** Either you get an exception or you get a movie which you can write to a file on disk.

### 107.5.6 Properties

### 107.5.7 Duration as Double

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The duration of the video.
**Notes:** In Seconds.
(Read only property)

### 107.5.8 FrameCount as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of frames.
**Notes:** (Read only property)

### 107.5.9 Height as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the video.
**Notes:** Must match the JPEGs you use.
(Read and Write property)

### 107.5.10 SecondsPerFrame as Double

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The seconds to show a frame.
**Notes:** Default 1 second.
(Read and Write property)

### 107.5.11 TimeScale as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time scale to use.
**Notes:** Defines how fine granular you can define time.
Default is 600 units per second.

(Read and Write property)

### 107.5.12 Width as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The target width of the video.
**Notes:** Must match the JPEGs you use.
(Read and Write property)

## 107.6 class JPEGTransformationMBS

### 107.6.1 class JPEGTransformationMBS

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to wrap the jpegtran utility.
**Notes:** Although rotating and flipping data expressed as DCT coefficients is not hard, there is an asymmetry in the JPEG format specification for images whose dimensions aren't multiples of the iMCU size. The right and bottom image edges are padded out to the next iMCU boundary with junk data; but no padding is possible at the top and left edges. If we were to flip the whole image including the pad data, then pad garbage would become visible at the top and/or left, and real pixels would disappear into the pad margins — perhaps permanently, since encoders & decoders may not bother to preserve DCT blocks that appear to be completely outside the nominal image area. So, we have to exclude any partial iMCUs from the basic transformation.

Transpose is the only transformation that can handle partial iMCUs at the right and bottom edges completely cleanly. Mirror horizontal can flip partial iMCUs at the bottom, but leaves any partial iMCUs at the right edge untouched. Similarly mirror vertical leaves any partial iMCUs at the bottom edge untouched. The other transforms are defined as combinations of these basic transforms and process edge blocks in a way that preserves the equivalence.

The "trim" option causes untransformable partial iMCUs to be dropped; this is not strictly lossless, but it usually gives the best-looking result for odd-size images. Note that when this option is active, the expected mathematical equivalences between the transforms may not hold. (For example, -rot 270 -trim trims only the bottom edge, but -rot 90 -trim followed by -rot 180 -trim trims both edges.)

We also offer a "force to grayscale" option, which simply discards the chrominance channels of a YCbCr image. This is lossless in the sense that the luminance channel is preserved exactly. It's not the same kind of thing as the rotate/flip transformations, but it's convenient to handle it as part of this package, mainly because the transformation routines have to be aware of the option to know how many components to work on.

Bases on libjpeg.
**Blog Entries**

- MBS REALbasic Plugins, version 11.2pr1

### 107.6.2 Methods

### 107.6.3 close

MBS Images Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 107.6.4 Transform as boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the transformation.
**Notes:** Outputfile and Inputfile should never be identical, because this will corrupt the file.

Returns only false if the file specifications are invalid.
So after true is returned you still need to check the errorcode property.

### 107.6.5 Properties

### 107.6.6 CopyOption as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What to copy from the meta information.
**Notes:** Values:

| | | |
|---|---|---|
| JCOPYOPT_NONE | 0 | copy no optional markers |
| JCOPYOPT_COMMENTS | 1 | copy only comment (COM) markers |
| JCOPYOPT_ALL | 2 | copy all optional markers |

(Read and Write property)

### 107.6.7 DebugLevel as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The debug level for the jpeg library.
**Notes:** (Read and Write property)

### 107.6.8 ErrorCode as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 107.6.9 ErrorMessage as String

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message reported.
**Notes:** (Read and Write property)

### 107.6.10 Grayscale as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to reduce to grayscale (omit color data).
**Notes:** If true the a color image is converted to grayscale.
(Read and Write property)

### 107.6.11 InputFile as FolderItem

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input file.
**Notes:** Outputfile and Inputfile should never be identical, because this will corrupt the file.
(Read and Write property)

### 107.6.12 MaxMemoryToUse as Integer

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum memory to use.
**Notes:** Unit is bytes.
(Read and Write property)

### 107.6.13 MirrorHorizonal as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to use the left-right mirror transformation.
**Notes:** Only one transformation can be used.

(Read and Write property)

### 107.6.14 MirrorVertical as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to use the top-bottom mirror transformation.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.15 OptimizeCoding as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Optimize Huffman table (smaller file, but slow compression)
**Notes:** (Read and Write property)

### 107.6.16 OutputFile as FolderItem

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output file.
**Notes:** On Mac OS X, this function uses the short file name (31 characters).
So you may consider to save to a temporary file and rename it after the transformation was successfull.

Outputfile and Inputfile should never be identical, because this will corrupt the file.
(Read and Write property)

### 107.6.17 Progressive as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to create progressive JPEG file.
**Notes:** (Read and Write property)

### 107.6.18 Rotate180 as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to use the 180¬∞ clockwise rotation transformation.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.19 Rotate270 as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to use the 270¬∞ clockwise rotation transformation.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.20 Rotate90 as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to use the 90¬∞ clockwise rotation transformation.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.21 Transpose as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to transpose the image across UR-to-LL axis.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.22 Transverse as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to tanspose the image across UL-to-LR axis.
**Notes:** Only one transformation can be used.
(Read and Write property)

### 107.6.23 Trim as Boolean

MBS Images Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** whether to drop non-transformable edge blocks.
**Notes:** if true, trim partial MCUs as needed.
(Read and Write property)

### 107.6.24 WarningMessage as String

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last warning message reported.
**Notes:** (Read and Write property)

### 107.6.25 Events

### 107.6.26 Error(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all error messages from the jpeg library.

### 107.6.27 Info(message as string, msglevel as Integer, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all information messages from the jpeg library.
**Notes:** msglevel is one of:

| | |
|---|---|
| -1: | recoverable corrupt-data warning, may want to abort. |
| 0: | important advisory messages (always display to user). |
| 1: | first level of tracing detail. |
| 2,3,...: | successively more detailed tracing messages. |

### 107.6.28 Warning(message as string, ErrorCode as Integer)

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This events reports all warning messages from the jpeg library.

## 107.7 module JPEGTurboMBS

### 107.7.1 module JPEGTurboMBS

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module to use libjpeg-turbo in Xojo.
**Example:**

```
// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API
```

**Blog Entries**

- MBS Xojo Plugins, version 19.5pr7
- libjpeg-turbo for Xojo

### 107.7.2 Methods

### 107.7.3 API as Ptr

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns API pointer.
**Notes:** This returns pointer to internal MBS data structure with function pointers to JPEG library functions.

### 107.7.4 GetJPEGVersion as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries JPEG library version.
**Notes:** Currently reporting 8.0 for version 8.0.

### 107.7.5 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| Version | "2.0.3" | The version string for JPEG Turbo library. |

## 107.8 Globals

### 107.8.1 JPEGStringToPictureMBS(buf as string) as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a JPEG file.
**Example:**

```
dim s as string
dim h as new HTTPSocket

s=h.Get("http://www.monkeybreadsoftware.de/xojo/images/rbplugin.jpg",90)

Backdrop=JPEGStringToPictureMBS(s)
```

**Notes:** Short version of the "JPEGStringToPicture(buf as string,allowdamaged as Boolean) as picture" method. allowdamaged is set to false.
See also:

- 107.8.2 JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture 16443

### 107.8.2 JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a picture from a JPEG file.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim s as string = PictureToJPEGStringMBS(p, 80)

s = leftb(s, lenb(s)-1000) // remove last 1000 bytes

dim q as Picture = JPEGStringToPictureMBS(s, true)

Backdrop = q
```

**Notes:** This methods should read all JPEG file data you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally

you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

See the "JPEGToString example", "jpeg load crashtest" and "SaveJPEG without QuickTime" examples.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr1
- Starting with CURL functions
- Tip of the day: Corrupt pictures

See also:

- 107.8.1 JPEGStringToPictureMBS(buf as string) as picture 16443

### 107.8.3 PictureToJPEGStringMBS(pic as picture, quality as Integer = 80) as string

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a picture into a string using JPEG compression.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim s as string = PictureToJPEGStringMBS(p, 80)
dim q as Picture = JPEGStringToPictureMBS(s)

Backdrop = q
```

**Notes:** This methods saves 32bit pictures to a file using JPEG Compression. Using the parameter you can specify the quality in range between 25 and 100%

The picture should be a bitmap picture without alpha channel or mask.
Use the JPEGExporterMBS class for more options.

The returned string has the encoding set to binary (no encoding). If you want to concat the string with another you should change the encoding, so both strings have the same encoding. If you don't handle that RB may convert the JPEG data to UTF8 (Unicode) which will destroy it.

The picture is always encoded with 72 dpi. If you want to set a different dpi value, please use the JPEGExporterMBS class.

**Xojo Developer Magazine**


- 6.1, page 31: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz
- 2.4, page 42: Cross platform streams, We write our own binary stream to save our data by Christian Schmitz
- 19.4, page 83: Archives in Xojo, How to Use Zip Archives by Stefanie Juchmes

# Chapter 108

# Keychain

## 108.1 class KeychainAccessControlMBS

### 108.1.1 class KeychainAccessControlMBS

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Defines access rights for items.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr5

### 108.1.2 Methods

### 108.1.3 Constructor

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 108.1.4 CreateWithFlags(protection as String, Flags as Integer, byref error as Variant) as KeychainAccessControlMBS

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates new access control object based on protection type and additional flags.
**Notes:** Created access control object should be used as a value for kSecAttrAccessControl attribute in AddItem or UpdateItem functions. Accessing keychain items or performing operations on keys which are protected by access control objects can block the execution because of UI which can appear to satisfy the access control conditions, therefore it is recommended to either move those potentially blocking operations out of the main application thread or use combination of kSecUseAuthenticationContext and kSecUseAuthenticationUI attributes to control where the UI interaction can appear.

protection: Protection class to be used for the item. One of kSecAttrAccessible constants.
flags: If no flags are set then all operations are allowed.
error: Additional error information filled in case of failure. a CFErrorMBS object.

Returns newly created access control object.

### 108.1.5 kSecAttrAccessibleAfterFirstUnlock as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can only be accessed once the device has been unlocked after a restart. This is recommended for items that need to be accesible by background applications. Items with this attribute will migrate to a new device when using encrypted backups.

### 108.1.6 kSecAttrAccessibleAfterFirstUnlockThisDeviceOnly as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can only be accessed once the device has been unlocked after a restart. This is recommended for items that need to be accessible by background applications. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device these items will be missing.

### 108.1.7 kSecAttrAccessibleAlways as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can always be accessed regardless of the lock state of the device. This is not recommended for anything except system use. Items with this attribute will migrate to a new device when using encrypted backups.

### 108.1.8 kSecAttrAccessibleAlwaysThisDeviceOnly as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can always be accessed regardless of the lock state of the device. This option is not recommended for anything except system use. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.

### 108.1.9 kSecAttrAccessibleWhenPasscodeSetThisDeviceOnly as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need to be accessible while the application is in the foreground and requires a passcode to be set on the device. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing. This attribute will not be available on devices without a passcode. Disabling the device passcode will cause all previously protected items to be deleted.

### 108.1.10 kSecAttrAccessibleWhenUnlocked as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will migrate to a new device when using encrypted backups.

### 108.1.11 kSecAttrAccessibleWhenUnlockedThisDeviceOnly as String

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the Accessible values.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.

### 108.1.12 Properties

### 108.1.13 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 108.1.14 Constants

Control Flags

| Constant | Value | Description |
|---|---|---|
| kSecAccessControlAnd | &h8000 | Constraint logic operation: when using more than one constrain satisfied. |
| kSecAccessControlApplicationPassword | &h80000000 | Application provided password for data encryption key generatio a constraint but additional item encryption mechanism. |
| kSecAccessControlBiometryAny | 2 | Touch ID (any finger) or Face ID. Touch ID or Face ID must With Touch ID at least one finger must be enrolled. With Face I be enrolled. Item is still accessible by Touch ID even if fingers removed. Item is still accessible by Face ID if user is re-enrolled. |
| kSecAccessControlBiometryCurrentSet | 8 | Touch ID from the set of currently enrolled fingers. Touch ID mus and at least one finger must be enrolled. When fingers are adde the item is invalidated. When Face ID is re-enrolled this item is |
| kSecAccessControlDevicePasscode | 16 | Device passcode |
| kSecAccessControlOr | &h4000 | Constraint logic operation: when using more than one constraint of them must be satisfied. |
| kSecAccessControlPrivateKeyUsage | &h40000000 | Create access control for private key operations (i.e. sign operati |
| kSecAccessControlTouchIDAny | 2 | Touch ID (any finger) or Face ID. Touch ID or Face ID must With Touch ID at least one finger must be enrolled. With Face I be enrolled. Item is still accessible by Touch ID even if fingers removed. Item is still accessible by Face ID if user is re-enrolled. |
| kSecAccessControlTouchIDCurrentSet | 8 | Touch ID from the set of currently enrolled fingers. Touch ID mus and at least one finger must be enrolled. When fingers are adde the item is invalidated. When Face ID is re-enrolled this item is |
| kSecAccessControlUserPresence | 1 | User presence policy using biometry or Passcode. Biometry doe be available or enrolled. Item is still accessible by Touch ID even added or removed. Item is still accessible by Face ID if user is re |

## 108.2 class KeychainItemMBS

### 108.2.1 class KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a keychain item.
**Example:**

```
Const kDomain = "koingosw.com"
Const kUsername = "koingosoftware"
Const kPath = ""
Const kProtocol = "http"

Dim xPassword As MemoryBlock = "testpassword"
Dim xAdded As KeychainItemMBS

Dim dQuery as new Dictionary
dQuery.Value(KeychainManagerMBS.kSecAttrAuthenticationType) = KeychainManagerMBS.kSecAttrAuthen-
ticationTypeHTMLForm
dQuery.Value(KeychainManagerMBS.kSecClass) = KeychainManagerMBS.kSecClassInternetPassword
If Len(kDomain) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrServer) = kDomain
If Len(kUsername) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrAccount) = kUsername
If Len(kProtocol) <>0 Then dQuery.Value(KeychainManagerMBS.kSecAttrProtocol) = kProtocol
dQuery.Value(KeychainManagerMBS.kSecAttrComment) = "default"
dQuery.Value(KeychainManagerMBS.kSecAttrDescription) = "Web form password"
dQuery.Value(KeychainManagerMBS.kSecAttrLabel) = kDomain + " (" + kUsername + ")"
dQuery.Value(KeychainManagerMBS.kSecValueData) = xPassword

If Not KeychainManagerMBS.AddItem(KeychainManagerMBS.Default,dQuery) Then
Break
End If
```

**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr12
- Keychain Plugin rewritten

### 108.2.2 Methods

### 108.2.3 Delete

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes a keychain item from the default keychain's permanent data store.

**Notes:** Lasterror is set.

### 108.2.4 ItemClass as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the item class for this item.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.itemclass // shows genp for generic password
```

**Notes:** Lasterror is set.

### 108.2.5 Keychain as KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the keychain object of a given keychain item.
**Notes:** Lasterror is set.

### 108.2.6 PersistentReference as Memoryblock

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a persistent reference for a keychain item.
**Notes:** Unlike normal references, a persistent reference may be stored on disk or passed between processes. You can convert a persistent reference into an ordinary keychain item reference (KeychainItemMBS) by calling the KeychainManagerMBS.ItemFromPersistentReference function.
Lasterror is set.

### 108.2.7 Properties

### 108.2.8 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 108.2.9 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code returned by one of the methods.
**Notes:** You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read and Write property)

### 108.2.10 Account as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience property to get/set the account attribute as UTF-8 text.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.11 AttributeData(attributeName as string) as memoryblock

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get or set an attribute as raw data (memoryblock).
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim data as MemoryBlock = item.AttributeData(item.kSecCreationDateItemAttr)
dim text as string = DefineEncoding(data, encodings.UTF8)
MsgBox text
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.12 AttributeText(attributeName as string) as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get or set an attribute as an UTF-8 text.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim text as string = item.AttributeText(item.kSecCreationDateItemAttr)
MsgBox text
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.13 Comment as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience property to get/set the comment attribute as UTF-8 text.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.14 Description as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience property to get/set the description attribute as UTF-8 text.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.Description
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.15 Label as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience property to get/set the label attribute as UTF-8 text.
**Example:**

```
dim items() as KeychainItemMBS = KeychainManagerMBS.AllItems(nil, KeychainManagerMBS.kSecGenericPasswordItemClass)
dim labels() as string

for each item as KeychainItemMBS in items
labels.append item.label
next

break // see array of labels
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.16 Password as memoryblock

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the password or sets a new one.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

dim passwordData as MemoryBlock = item.Password
dim password as string = DefineEncoding(passwordData, encodings.UTF8)
MsgBox Password
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.17 Service as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience property to get/set the service attribute as UTF-8 text.

**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)
MsgBox item.Service
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.2.18 Constants

Keychain Attribute Names

| Constant | Value | Description |
|---|---|---|
| kSecAccountItemAttr | "acct" | Identifies the account attribute.<br>You use this tag to set or get a string that represents the user account. It a applies to generic, Internet, and AppleShare password items. Keychain strin should use UTF-8 encoding. |
| kSecAddressItemAttr | "addr" | Identifies the address attribute.<br>You use this tag to set or get a value of type string that represents the AppleT zone name, or the IP or domain name that represents the server address. This unique to AppleShare password attributes. Keychain strings should use UTF encoding. |
| kSecAlias | "alis" | Indicates an alias. |
| kSecAuthenticationTypeItemAttr | "atyp" | Identifies the authentication type attribute.<br>You use this tag to set or get a value of type SecAuthenticationType th represents the Internet authentication scheme. For possible authentication v ues, see "Keychain Authentication Type Constants." This is unique to Intern password attributes. |
| kSecCertificateEncoding | "cenc" | Indicates a CSSM_CERT_ENCODING type. |
| kSecCertificateType | "ctyp" | Indicates a CSSM_CERT_TYPE type. |
| kSecCommentItemAttr | "icmt" | Identifies the comment attribute.<br>You use this tag to set or get a string value that represents a user-edita string containing comments for this item. Keychain strings should use UTF encoding. |
| kSecCreationDateItemAttr | "cdat" | Identifies the creation date attribute.<br>You use this tag to get a string value that represents the date the it was created, expressed in Zulu Time format ("YYYYMMDDhhmmssZ This is the native format for stored time values in the CDSA specifi tion (defined as CSSM_DB_ATTRIBUTE_FORMAT_TIME_DATE in t CSSM_DB_ATTRIBUTE_FORMAT enumeration, Section 17.2.6.). Wh specifying the creation date as input to a function (for example, SecKeycha SearchCreateFromAttributes), you may alternatively provide a numeric va of type UInt32 or SInt64, expressed as seconds since 01 January 1904. |
| kSecCreatorItemAttr | "crtr" | Identifies the creator attribute.<br>You use this tag to set or get a value of type FourCharCode that represe the item's creator. |
| kSecCrlEncoding | "crnc" | Indicates a CSSM_CRL_ENCODING type. |
| kSecCrlType | "crtp" | Indicates a CSSM_CRL_TYPE type. |
| kSecCustomIconItemAttr | "cusi" | Identifies the custom icon attribute.<br>Use of this attribute is deprecated. Custom icons for keychains are not su ported in OS X. |
| kSecDescriptionItemAttr | "desc" | Identifies the description attribute.<br>You use this tag to set or get a string value that represents a user-visible stri describing this particular kind of item, for example "disk image passwor Keychain strings should use UTF-8 encoding. |
| kSecGenericItemAttr | "gena" | Identifies the generic attribute.<br>You use this tag to set or get a value of untyped bytes that represents a us defined attribute. This is unique to generic password attributes. |
| kSecInvisibleItemAttr | "invi" | Identifies the invisible attribute.<br>You use this tag to set or get a value of type Boolean that indicates whet the item is invisible (that is, should not be displayed). |
| kSecLabelItemAttr | "labl" | Identifies the label attribute.<br>You use this tag to set or get a string value that represents a user-edita string containing the label for this item. Keychain strings should use UTF encoding. |
| kSecModDateItemAttr | "mdat" | Identifies the modification date attribute.<br>You use this tag to get a string value that represents the date the it was created, expressed in Zulu Time format ("YYYYMMDDhhmmssZ This is the native format for stored time values in the CDSA specifi tion (defined as CSSM_DB_ATTRIBUTE_FORMAT_TIME_DATE in t CSSM_DB_ATTRIBUTE_FORMAT enumeration, Section 17.2.6.). Wh |

## 108.3 module KeychainManagerMBS

### 108.3.1 module KeychainManagerMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The module for global keychain functions.
**Example:**

```
// build query
dim query as new Dictionary

dim domain as string = "test.test"
dim username as string = "testuser"

query.value( KeychainManagerMBS.kSecAttrServer ) = Domain
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassInternetPassword
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitOne

// Build Dictionary with new values
dim newValues as new Dictionary
newValues.value( KeychainManagerMBS.kSecAttrComment ) = "Just a test"

// and update
if KeychainManagerMBS.UpdateItem(query, newValues) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

**Notes:** For iOS please define a keychain access group in Xojo build settings. Then prefix it with your developer ID as you can see it in the generated entitlement file inside your app. Pass the prefixed string to our functions with kSecAttrAccessGroup key.
**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 18.5pr6
- MBS Real Studio Plugins, version 13.1pr17
- MBS Real Studio Plugins, version 13.1pr12

### 108.3.2 Methods

### 108.3.3 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new generic password to a keychain.
**Example:**

```
// add password with password in MemoryBlock
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

call KeychainManagerMBS.AddGenericPassword(keychain, ServiceName, Username, PasswordData)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

**Notes:** keychain: A reference to the keychain in which to store a generic password. Pass nil to specify the default keychain.
serviceName: The service name.
accountName: The account name.
password: A buffer containing the password data to be stored in the keychain.

Returns the new keychain item.
Lasterror is set.

The result code errSecNoDefaultKeychain indicates that no default keychain could be found. The result code errSecDuplicateItem indicates that you tried to add a password that already exists in the keychain. The result code errSecDataTooLarge indicates that you tried to add more data than is allowed for a structure of this type. Call ErrorMessageString function to get a human-readable string explaining the result.

This function adds a new generic password to the specified keychain. Required parameters to identify the password are serviceName and accountName, which are application-defined strings.

You can use this function to add passwords for accounts other than the Internet. For example, you might add AppleShare passwords, or passwords for your database or scheduling programs.

This function sets the initial access rights for the new keychain item so that the application creating the

item is given trusted access.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.
See also:

- 108.3.4 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as string) as KeychainItemMBS 16461

### 108.3.4 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new generic password to a keychain.
**Example:**

```
// add password with password in string
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim keychain as KeychainMBS = nil // use default

call KeychainManagerMBS.AddGenericPassword(keychain, ServiceName, Username, Password)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

**Notes:** Takes UTF-8 text from password string for the password. Else the same as AddGenericPassword with memoryblock.
See also:

- 108.3.3 AddGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS 16460

### 108.3.5 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new Internet password to a keychain.

**Notes:** keychain: A reference to the keychain in which to store an Internet password. Pass nil to specify the user's default keychain.
serverName: The server name.
securityDomain: The security domain. This parameter is optional. Pass "" if the protocol does not require it.
accountName: The account name.
path: The character string representing the path.
port: The TCP/IP port number. If no specific port number is associated with this password, pass 0.
protocol: The protocol associated with this password. See Protocol Type Constants for a description of possible values.
authenticationType: The authentication scheme used. See Keychain Authentication Type Constants for a description of possible values. Pass the constant kSecAuthenticationTypeDefault, to specify the default authentication scheme.
password: A buffer containing the password data to be stored in the keychain.

Returns the new keychain item.
Lasterror is set.

This function adds a new Internet server password to the specified keychain. Required parameters to identify the password are serverName and accountName (you cannot pass "" for both parameters). In addition, some protocols may require an optional securityDomain when authentication is requested. This function optionally returns a reference to the newly added item.

This function sets the initial access rights for the new keychain item so that the application creating the item is given trusted access.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.
See also:

- 108.3.6 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS 16462

### 108.3.6 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new Internet password to a keychain.
**Example:**

```
// add password with password in string
dim serverName as string = "mytest.com"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)
dim keychain as KeychainMBS = nil // use default
dim securityDomain as string = "ftp://mytest.com"
dim accountName as string = "myusername"
dim path as string = "/test"
dim port as Integer = 22
dim protocol as string = KeychainManagerMBS.kSecAttrProtocolFTP
dim authenticationType as string = KeychainManagerMBS.kSecAttrAuthenticationTypeDefault

call KeychainManagerMBS.AddInternetPassword(keychain, serverName, securityDomain, accountName, path,
port, protocol, authenticationType, PasswordData)

dim e as Integer = KeychainManagerMBS.LastError
MsgBox str(e)+": "+KeychainManagerMBS.ErrorMessageString(e)
```

**Notes:** See KeychainManagerMBS.AddInternetPassword for details.
The password is stored as data with UTF-8 encoding.
See also:

- 108.3.5 AddInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS 16461

### 108.3.7 AddItem(attributesDictionary as dictionary) as boolean

MBS MacClassic Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Adds one or more items to default keychain.
**Notes:** See other method variant for details.
See also:

- 108.3.8 AddItem(attributesDictionary as dictionary, byref result as variant) as boolean 16463
- 108.3.9 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean 16464
- 108.3.10 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean 16465

### 108.3.8 AddItem(attributesDictionary as dictionary, byref result as variant) as boolean

MBS MacClassic Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Adds one or more items to default keychain.
**Notes:** See other method variant for details.
See also:

- 108.3.7 AddItem(attributesDictionary as dictionary) as boolean 16463
- 108.3.9 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean 16464
- 108.3.10 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean 16465

### 108.3.9 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds one or more items to a keychain.
**Example:**

```
dim a as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)

a.value( KeychainManagerMBS.kSecAttrAccount ) = Username
a.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
a.value( KeychainManagerMBS.kSecValueData ) = PasswordData
a.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

if KeychainManagerMBS.AddItem(nil, a) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

**Notes:** See other method variant for details.
See also:

- 108.3.7 AddItem(attributesDictionary as dictionary) as boolean 16463
- 108.3.8 AddItem(attributesDictionary as dictionary, byref result as variant) as boolean 16463
- 108.3.10 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean 16465

### 108.3.10 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary, byref result as Variant) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds one or more items to a keychain.
**Example:**

```
dim a as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim Password as string = "mysecret"
dim PasswordData as MemoryBlock = ConvertEncoding(Password, encodings.UTF8)

a.value( KeychainManagerMBS.kSecAttrAccount ) = Username
a.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
a.value( KeychainManagerMBS.kSecValueData ) = PasswordData
a.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

dim r as Variant
if KeychainManagerMBS.AddItem(nil, a, r) then
dim item as KeychainItemMBS = r
MsgBox "OK"
else
MsgBox "Failed."
end if
```

**Notes:** attributesDictionary: A dictionary containing an item class key-value pair ("Keychain Item Class Keys and Values") and optional attribute key-value pairs ("Attribute Item Keys and Values") specifying the item's attribute values.
result: Optional. On return, a reference to the newly added items. The exact type of the result is based on the values supplied in attributes, as discussed below.

Lasterror is set.

You specify attributes defining an item by adding key-value pairs to the attributes dictionary. To add multiple items to a keychain at once use the kSecUseItemList key (see section "Item List Key") with an array of items as its value. This is currently only supported for non-password items.

If you want the new keychain item to be shared among multiple applications, include the kSecAttrAccessGroup key in the attributes dictionary. The value of this key must be the name of a keychain access group to which all of the programs that will share this item belong.

When you use Xcode to create an application, Xcode adds an application-identifier entitlement to the application bundle. Keychain Services uses this entitlement to grant the application access to its own keychain items. You can also add a keychain-access-groups entitlement to the application and, in the entitlement property list file, specify an array of keychain access groups to which the application belongs. The property list file can have any name you like (for example, keychain-access-groups.plist). The Xcode build variable CODE_SIGN_ENTITLEMENTS should contain the SRCROOT relative path to the entitlement property list file. The property list file itself should be a dictionary with a top-level key called keychain-access-groups whose value is an array of strings. If you add such a property-list file to the application bundle, then the access group corresponding to the application-identifier entitlement is treated as the last element in the access groups array. If you do not include the kSecAttrAccessGroup key in the attributes dictionary when you call the AddItem function to add an item to the keychain, the function uses the first access group in the array by default. If there is no kSecAttrAccessGroup key in the attributes dictionary and there is no keychain-access-groups entitlement in the application bundle, then the access group of a newly created item is the value of the application-identifier entitlement.

For example, a development group in Apple might have the ID:

659823F3DC53.com.apple

and the application identifiers of their two applications might be:

659823F3DC53.com.apple.oneappleapp and

659823F3DC53.com.apple.twoappleapp

If both applications add a keychain-access-groups entitlement with one value in the array of access groups:

659823F3DC53.com.apple.netaccount

then both applications would add new keychain items to the 659823F3DC53.com.apple.netaccount access group by default and both applications would have access to keychain items in that group. In addition, each application would still have access to its own private keychain items: OneAppleApp would have access to items in keychain access group 659823F3DC53.com.apple.oneappleapp and TwoAppleApp would have access to items in 659823F3DC53.com.apple.twoappleapp.

Return types (”Search Results Constants”) are specified as follows:

To obtain the data of the added item as an object of type Memoryblock, specify the return type key kSecReturnData with a value of true.
To obtain all the attributes of the added item as objects of type Dictionary, specify kSecReturnAttributes with a value of true.
To obtain a reference to the added item of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecI-

dentityRef), specify kSecReturnRef with a value of True. This is the default behavior if a return type is not explicitly specified.
To obtain a persistent reference to the added item (an object of type Memoryblock), specify kSecReturnPersistentRef with a value of True. Note that unlike normal references, a persistent reference may be stored on disk or passed between processes.
If more than one of these return types is specified, the result is returned as an object of type Dictionary containing all the requested data.

Available in OS X v10.6 and later.
See also:

- 108.3.7 AddItem(attributesDictionary as dictionary) as boolean 16463
- 108.3.8 AddItem(attributesDictionary as dictionary, byref result as variant) as boolean 16463
- 108.3.9 AddItem(Keychain as KeychainMBS, attributesDictionary as dictionary) as boolean 16464

### 108.3.11 AddItemAsync(attributesDictionary as dictionary, handler as AddItemAsyncCompletedMBS, tag as Variant = nil)

MBS MacClassic Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Asynchronous version of AddItem.
**Notes:** Work performs on a thread and the given delegate handler is called with result.
See also:

- 108.3.12 AddItemAsync(Keychain as KeychainMBS, attributesDictionary as dictionary, handler as AddItemAsyncCompletedMBS, tag as Variant = nil) 16467

### 108.3.12 AddItemAsync(Keychain as KeychainMBS, attributesDictionary as dictionary, handler as AddItemAsyncCompletedMBS, tag as Variant = nil)

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Asynchronous version of AddItem.
**Notes:** Work performs on a thread and the given delegate handler is called with result.
See also:

- 108.3.11 AddItemAsync(attributesDictionary as dictionary, handler as AddItemAsyncCompletedMBS, tag as Variant = nil) 16467

### 108.3.13 AllItems(keychain as KeychainMBS, itemClass as string) as KeychainItemMBS()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries all items.
**Notes:** Keychain: If not nil, searches only this keychain.
ItemClass: The item class to find. For example kSecGenericPasswordItemClass.
Lasterror is set.
Returns array of keychain items.

### 108.3.14 CopyMatching(Query as dictionary, byref result as Variant) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitOne
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName

// search the item and show values from attribute dictionary
dim r as Variant
if KeychainManagerMBS.CopyMatching(query, r) then
if r isa Dictionary then
dim d as Dictionary = r

// show values
MsgBox "Creation Date: "+d.value(KeychainManagerMBS.kSecAttrCreationDate).dateValue.shortdate
MsgBox "Modification Date: "+d.value(KeychainManagerMBS.kSecAttrModificationDate).dateValue.short-
date
end if
end if
```

**Notes:** query: A dictionary containing an item class specification and optional attributes for controlling the search. See
result: On return, a reference to the found items. The exact type of the result is based on the search attributes supplied in the query, as discussed below.

Lasterror is set.

You specify attributes defining a search by adding key-value pairs to the query dictionary.

A typical query consists of:

- The class key ("Item Class Key Constant") and a class value constant ("Item Class Value Constants"), which specifies the class of items for which to search.
- One or more attribute key-value pairs ("Attribute Item Keys and Values"), which specify the attribute data to be matched.
- One or more search key-value pairs ("Search Keys"), which specify values that further refine the search.
- A return-type key-value pair ("Search Results Constants"), specifying the type of results you desire.

Return types ("Search Results Constants") are specified as follows:

- To obtain a reference (of type Memoryblock) to the data of a matching item, specify kSecReturnData with a value of true.
- To obtain a dictionary (of type Dictionary) containing the attributes of a matching item, specify kSecReturnAttributes with a value of true.
- To obtain a reference (of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecIdentityRef) to a matching item, specify kSecReturnRef with a value of true.
- To obtain a persistent reference (of type Memoryblock) to a matching item, specify kSecReturnPersistentRef with a value of true. Note that unlike normal references, a persistent reference may be stored on disk or passed between processes.
- If more than one return type is specified (for example, kSecReturnRef and kSecReturnAttributes), the results are returned as a dictionary (that is, an object of type Dictionary) containing all the requested data.

By default, this function returns only the first match found. To obtain more than one matching item at a time, specify the search key kSecMatchLimit with a value greater than 1. The result will be an object of type Array containing up to that number of matching items.

Note: You cannot combine the kSecReturnData and kSecMatchLimitAll options when copying password items (items of class kSecInternetPasswordItemClass or kSecGenericPasswordItemClass), because copying each password item could require additional authentication. Instead, request a reference or persistent reference to the items, then request the data for only the specific passwords that you actually require.
By default, this function searches for items in the keychain. To instead provide your own set of items to be filtered by this search query, specify the search key kSecMatchItemList and provide as its value a Array

containing items of type SecKeychainItemRef, SecKeyRef, SecCertificateRef, or SecIdentityRef. The objects in the provided array must all be of the same type.

To convert from persistent item references to normal item references, specify the search key kSecMatchItemList with a value that consists of an object of type array referencing an array containing one or more elements of type Memoryblock (the persistent references), and a return-type key of kSecReturnRef whose value is true. The objects in the provided array must all be of the same type.

When you use Xcode to create an application, Xcode adds an application-identifier entitlement to the application bundle. Keychain Services uses this entitlement to grant the application access to its own keychain items. You can also add a keychain-access-groups entitlement to the application and, in the entitlement property list file, specify an array of keychain access groups to which the application belongs. The property list file can have any name you like (for example, keychain-access-groups.plist). The Xcode build variable CODE_SIGN_ENTITLEMENTS should contain the SRCROOT relative path to the entitlement property list file. The property list file itself should be a dictionary with a top-level key called keychain-access-groups whose value is an array of strings. When you call the SecItemAdd function to add an item to the keychain, you can specify the access group to which that item should belong. By default, the SecItemCopyMatching function searches all the access groups to which the application belongs. However, you can add the kSecAttrAccessGroup key to the search dictionary to specify which access group to search for keychain items.

Availability
Available in OS X v10.6 and later.

### 108.3.15 CopyMatchingAsync(Query as dictionary, handler as CopyMatchingAsyncCompletedMBS, tag as Variant = nil)

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Asynchronous version of CopyMatching.
**Notes:** Work performs on a thread and the given delegate handler is called with result.

### 108.3.16 CopyMatchingDictionaries(Query as dictionary) as Dictionary()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
**Example:**

```
// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
```

```
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll

// search all items
dim dics() as Dictionary = KeychainManagerMBS.CopyMatchingDictionaries(query)

// pick first
dim dic as Dictionary = dics(0)

// and display
MsgBox "Service: "+dic.Value(KeychainManagerMBS.kSecAttrService)+EndOfLine+_
"Account: "+dic.Value(KeychainManagerMBS.kSecAttrAccount)
```

**Notes:** This is a variant of CopyMatching which uses kSecReturnAttributes to query array of dictionaries.

### 108.3.17 CopyMatchingItems(Query as dictionary) as KeychainItemMBS()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns one or more keychain items that match a search query, or copies attributes of specific keychain items.
**Example:**

```
// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll
query.Value( KeychainManagerMBS.kSecAttrAccount ) = "myusername"

// search all items
dim items() as KeychainItemMBS = KeychainManagerMBS.CopyMatchingItems(query)

if UBound(items) = -1 then
MsgBox "nothing found."
else

// pick first
dim item as KeychainItemMBS = items(0)

// and display
MsgBox "Service: "+item.Service+EndOfLine+"Account: "+item.Account
end if
```

**Notes:** This is a variant of CopyMatching which uses kSecReturnRef to query array of KeychainItemMBS.

### 108.3.18 Default as KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retrieves the default keychain.
**Example:**

```
MsgBox KeychainManagerMBS.Default.Path
```

**Notes:** Lasterror is set.

### 108.3.19 DeleteItem(Query as Dictionary) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Deletes items that match a search query.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName

// search the item and delete it

if KeychainManagerMBS.DeleteItem(query) then
MsgBox "Deleted"
else
MsgBox "Failed."
end if
```

**Notes:** query: A dictionary containing an item class specification and optional attributes for controlling the search.
Lasterror is set.

See the discussion section of the CopyMatching function for information about how to construct a search dictionary.

By default, this function deletes all items matching the specified query. You can change this behavior by specifying a key, as follows:

- To delete an item identified by a transient reference, specify the kSecMatchItemList search key with a reference returned by using the kSecReturnRef return type key in a previous call to the SecItemCopyMatching or SecItemAdd functions.
- To delete an item identified by a persistent reference, specify the kSecMatchItemList search key with a persistent reference returned by using the kSecReturnPersistentRef return type key to the SecItemCopyMatching or SecItemAdd functions.
- If more than one of these return keys is specified, the behavior is undefined.

Available in OS X v10.6 and later.

### 108.3.20 DomainDefault(domain as Integer) as KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retrieves the default keychain from a specified preference domain.
**Example:**

dim SystemKeychain as KeychainMBS = KeychainManagerMBS.DomainDefault(KeychainManagerMBS.kSecPreferencesDomainSystem)
msgbox SystemKeychain.name

**Notes:** domain: The preference domain from which you wish to retrieve the default keychain. See Preference Domain Constants for possible domain values.

Returns the keychain object of the default keychain in the specified preference domain.
Lasterror is set.

A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to retrieve the default keychain for a specific preference domain. Use the KeychainManagerMBS.Default function if you want the default keychain for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.
Available in OS X v10.3 and later.

### 108.3.21 DomainSearchList(domain as Integer) as KeychainMBS()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retrieves the keychain search list for a specified preference domain.
**Example:**

```
dim SearchList() as KeychainMBS = KeychainManagerMBS.DomainSearchList(KeychainManagerMBS.kSecPreferencesDomainUser)
dim names() as String

for each k as KeychainMBS in SearchList
names.Append k.Name
next

MsgBox Join(names, EndOfLine)
```

**Notes:** domain: The preference domain from which you wish to retrieve the keychain search list. See Preference Domain Constants for possible domain values.

Returns the keychain search list of the specified preference domain.
Lasterror is set.

A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to retrieve the keychain search list for a specific preference domain. Use the SearchList function if you want the keychain search list for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.
Available in OS X v10.3 and later.

### 108.3.22 ErrorMessageString(error as Integer) as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns a string explaining the meaning of a security result code.
**Notes:** status: A result code of type OSStatus or CSSM_RETURN, returned by a security or CSSM function.

Returns a human-readable string describing the result, or empty string if no string is available for the specified result code.
Available in OS X v10.5 and later.

### 108.3.23 FindGenericItem(keychain as KeychainMBS, serviceName as string, accountName as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first generic keychain item based on the attributes passed.
**Example:**

```
dim ServiceName as string = "mytest"
dim Username as string = "myusername"
dim keychain as KeychainMBS = nil // use default

dim item as KeychainItemMBS = KeychainManagerMBS.FindGenericItem(keychain, ServiceName, Username)

MsgBox "Label: "+item.label+EndOfLine+_
"Comment: "+item.comment+EndOfLine+_
"Account: "+item.Account
```

**Notes:** Same as KeychainManagerMBS.FindGenericPassword, but returns item instead of password.

### 108.3.24 FindGenericPassword(keychain as KeychainMBS, serviceName as string, accountName as string, byref password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first generic password based on the attributes passed.
**Notes:** keychain: A reference to a single keychain, or nil to search the user's default keychain search list.
serviceName: The service name.
accountName: The account name.
password: A memoryblock that holds the password data.

Returns the item object of the generic password.
Lasterror is set.

This function finds the first generic password item that matches the attributes you provide. Most attributes are optional; you should pass only as many as you need to narrow the search sufficiently for your application's intended use. This function optionally returns a reference to the found item.

This function decrypts the password before returning it to you. If the calling application is not in the list of trusted applications, the user is prompted before access is allowed. If the access controls for this item do not allow decryption, the function returns the errSecAuthFailed result code.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.

### 108.3.25 FindInternetItem(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first Internet password item based on the attributes passed.
**Notes:** See KeychainManagerMBS.FindInternetPassword for details.

### 108.3.26 FindInternetPassword(keychain as KeychainMBS, serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, byref password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first Internet password based on the attributes passed.
**Notes:** keychain: A single keychain or nil to search the user's default keychain search list.
serverName: The server name.
securityDomain: The security domain. This parameter is optional, as not all protocols require it. Pass "" if it is not required.
accountName: The account name.
path: The string representing the path.
port: The TCP/IP port number. Pass 0 to ignore the port number.
protocol: The protocol associated with this password. See Keychain Protocol Type Constants for a description of possible values.
authenticationType: The authentication scheme used. See Keychain Authentication Type Constants for a description of possible values. Pass the constant kSecAuthenticationTypeDefault, to specify the default authentication scheme.
password: On return, a memoryblock containing the password data.

Returns the item object of the Internet password.
Lasterror is set.

This function finds the first Internet password item that matches the attributes you provide. This function optionally returns a reference to the found item.

This function decrypts the password before returning it to you. If the calling application is not in the list

of trusted applications, the user is prompted before access is allowed. If the access controls for this item do not allow decryption, the function returns the errSecAuthFailed result code.

This function automatically calls the function Unlock to display the Unlock Keychain dialog box if the keychain is currently locked.
Available in OS X v10.2 and later.

### 108.3.27 GetPassword(Query as dictionary, byref result as Memoryblock) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Returns one keychain item that match a search query.
**Example:**

```
// build query
dim query as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"

query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

// query password
dim passwordData as MemoryBlock
if KeychainManagerMBS.GetPassword(query, passwordData) then
// and show it
dim password as string = DefineEncoding(passwordData, Encodings.utf8)
MsgBox "OK: "+password
else
MsgBox "Failed."
end if
```

**Notes:** This is a variant of CopyMatching which uses kSecReturnData to query the data of one keychain item.
Returns password of first item found in result parameter. If you expect text, be sure to use DefineEncoding to define as encodings.UTF8.

### 108.3.28 ItemFromPersistentReference(data as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides a keychain item reference, given a persistent reference.
**Notes:** Returns a keychain item reference for the item for which you provided a persistent reference.
Available in OS X v10.6 and later.

### 108.3.29 kSecAttrAccess as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** A SecAccessRef object describing the access control settings for this item.
Available in OS X v10.7 and later.

### 108.3.30 kSecAttrAccessControl as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value is KeychainAccessControlMBS instance which contains access control conditions for item.
**Notes:** Available on Mac OS X 10.10 and newer.
IMPORTANT: This attribute is mutually exclusive with kSecAttrAccess attribute.

See KeychainAccessControlMBS class.

### 108.3.31 kSecAttrAccessGroup as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value is a CFStringRef indicating which access group a item is in.
**Notes:** Available on Mac OS X 10.9 and newer.
The access groups that a particular application has membership in are determined by two entitlements for that application. The application-identifier entitlement contains the application's single access group, unless there is a keychain-access-groups entitlement present. The latter has as its value a list of access groups; the first item in this list is the default access group. Unless a specific access group is provided as the value of kSecAttrAccessGroup when SecItemAdd is called, new items are created in the application's default access group. Specifying this attribute in SecItemCopyMatching, SecItemUpdate, or SecItemDelete calls limits the search to the specified access group (of which the calling application must be a member to obtain matching results.) To share keychain items between multiple applications, each application must

have a common group listed in its keychain-access-groups entitlement, and each must specify this shared access group name as the value for the kSecAttrAccessGroup key in the dictionary passed to SecItem functions.

For iOS please define a keychain access group in Xojo build settings. Then prefix it with your developer ID as you can see it in the generated entitlement file inside your app. Pass the prefixed string to our functions with kSecAttrAccessGroup key.

### 108.3.32 kSecAttrAccessible as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value indicates when your application needs access to an item's data.
**Notes:** You should choose the most restrictive option that meets your application's needs to allow the system to protect that item in the best way possible. See the kSecAttrAccessible* methods for a list of values which can be specified.

IMPORTANT: This attribute is currently not supported for OS X keychain items, unless the kSecAttrSynchronizable attribute is also present. If both attributes are specified on either OS X or iOS, the value for the kSecAttrAccessible key may only be one whose name does not end with "ThisDeviceOnly", as those cannot sync to another device.

### 108.3.33 kSecAttrAccessibleAfterFirstUnlock as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can only be accessed once the device has been unlocked after a restart. This is recommended for items that need to be accesible by background applications. Items with this attribute will migrate to a new device when using encrypted backups.

### 108.3.34 kSecAttrAccessibleAfterFirstUnlockThisDeviceOnly as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can only be accessed once the device has been unlocked after a restart.
This is recommended for items that need to be accessible by background applications. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device these items will be missing.
Available on Mac OS X 10.9 and newer.

### 108.3.35 kSecAttrAccessibleAlways as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can always be accessed regardless of the lock state of the device. This is not recommended for anything except system use. Items with this attribute will migrate to a new device when using encrypted backups.
Available on Mac OS X 10.9 and newer.

### 108.3.36 kSecAttrAccessibleAlwaysThisDeviceOnly as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can always be accessed regardless of the lock state of the device. This option is not recommended for anything except system use. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.
Available on Mac OS X 10.9 and newer.

### 108.3.37 kSecAttrAccessibleWhenPasscodeSetThisDeviceOnly as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need to be accessible while the application is in the foreground and requires a passcode to be set on the device. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing. This attribute will not be available on devices without a passcode. Disabling the device passcode will cause all previously protected items to be deleted.
Available on Mac OS X 10.9 and newer.

### 108.3.38 kSecAttrAccessibleWhenUnlocked as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will migrate to a new device when using encrypted backups.
Available on Mac OS X 10.9 and newer.

### 108.3.39 kSecAttrAccessibleWhenUnlockedThisDeviceOnly as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** One of the values for kSecAttrAccessible key.
**Notes:** Item data can only be accessed while the device is unlocked. This is recommended for items that only need be accesible while the application is in the foreground. Items with this attribute will never migrate to a new device, so after a backup is restored to a new device, these items will be missing.
Available on Mac OS X 10.9 and newer.

### 108.3.40 kSecAttrAccount as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Account attribute key.
The corresponding value is of type String and contains an account name. Items of class kSecClassGenericPassword and kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.41 kSecAttrApplicationLabel as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Application label attribute key.
The corresponding value is of type String and contains a label for this item. This attribute is different from the kSecAttrLabel attribute, which is intended to be human-readable. This attribute is used to look up a key programmatically; in particular, for keys of class kSecAttrKeyClassPublic and kSecAttrKeyClassPrivate, the value of this attribute is the hash of the public key.
Available in OS X v10.6 and later.

### 108.3.42 kSecAttrApplicationTag as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Private tag attribute key.
The corresponding value is of type Memoryblock and contains private tag data.
Available in OS X v10.6 and later.

### 108.3.43 kSecAttrAuthenticationType as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Authentication type attribute key.
The corresponding value is of type integer and denotes the authentication scheme for this item (see "Authentication Type Values").
Available in OS X v10.6 and later.

### 108.3.44 kSecAttrAuthenticationTypeDefault as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** The default authentication type.
Available in OS X v10.6 and later.

### 108.3.45 kSecAttrAuthenticationTypeDPA as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** Distributed Password authentication.
Available in OS X v10.6 and later.

### 108.3.46 kSecAttrAuthenticationTypeHTMLForm as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** HTML form based authentication.
Available in OS X v10.6 and later.

### 108.3.47 kSecAttrAuthenticationTypeHTTPBasic as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** HTTP Basic authentication.
Available in OS X v10.6 and later.

### 108.3.48 kSecAttrAuthenticationTypeHTTPDigest as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** HTTP Digest Access authentication.
Available in OS X v10.6 and later.

### 108.3.49 kSecAttrAuthenticationTypeMSN as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** Microsoft Network default authentication.
Available in OS X v10.6 and later.

### 108.3.50 kSecAttrAuthenticationTypeNTLM as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** Windows NT LAN Manager authentication.
Available in OS X v10.6 and later.

### 108.3.51 kSecAttrAuthenticationTypeRPA as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrAuthenticationType attribute key.
**Notes:** Remote Password authentication.
Available in OS X v10.6 and later.

### 108.3.52 kSecAttrCanDecrypt as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Decryption attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to decrypt data.
Available in OS X v10.6 and later.

### 108.3.53 kSecAttrCanDerive as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Derivation attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to derive another key.
Available in OS X v10.6 and later.

### 108.3.54 kSecAttrCanEncrypt as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Encryption attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to encrypt data.
Available in OS X v10.6 and later.

### 108.3.55 kSecAttrCanSign as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Signature attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to create a digital signature.
Available in OS X v10.6 and later.

### 108.3.56 kSecAttrCanUnwrap as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Unwrap attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to unwrap another key.
Available in OS X v10.6 and later.

### 108.3.57 kSecAttrCanVerify as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Signature verification attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to verify a digital signature.
Available in OS X v10.6 and later.

### 108.3.58 kSecAttrCanWrap as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Wrap attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key can be used to wrap another key.
Available in OS X v10.6 and later.

### 108.3.59 kSecAttrCertificateEncoding as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Certificate encoding attribute key.
The corresponding value is of type integer and denotes the certificate encoding (see the CSSM_CERT_ENCODING enumeration in cssmtype.h). Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.60 kSecAttrCertificateType as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Certificate type attribute key.
The corresponding value is of type integer and denotes the certificate type (see the CSSM_CERT_TYPE enumeration in cssmtype.h). Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.61 kSecAttrComment as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Comment attribute key.
The corresponding value is of type string and contains the user-editable comment for this item.
Available in OS X v10.6 and later.

### 108.3.62 kSecAttrCreationDate as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Creation date key.
The corresponding value is of type date and represents the date the item was created. Read only.
Available in OS X v10.6 and later.

### 108.3.63 kSecAttrCreator as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Creator attribute key.
The corresponding value is of type integer and represents the item's creator. This number is the unsigned integer representation of a four-character code (for example, 'aCrt').
Available in OS X v10.6 and later.

### 108.3.64 kSecAttrDescription as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Description attribute key.
The corresponding value is of type String and specifies a user-visible string describing this kind of item (for example, "Disk image password").
Available in OS X v10.6 and later.

### 108.3.65 kSecAttrEffectiveKeySize as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Effective number of bits attribute key.
The corresponding value is of type Integer and indicates the effective number of bits in this cryptographic key. For example, a DES key has a kSecAttrKeySizeInBits of 64, but a kSecAttrEffectiveKeySize of 56 bits.
Available in OS X v10.6 and later.

### 108.3.66 kSecAttrGeneric as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Generic attribute key.
The corresponding value is of type Memoryblock and contains a user-defined attribute. Items of class kSecClassGenericPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.67 kSecAttrIsInvisible as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Invisible attribute key.
The corresponding value is of type boolean and is true if the item is invisible (that is, should not be displayed).
Available in OS X v10.6 and later.

### 108.3.68 kSecAttrIsNegative as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Negative attribute key.
The corresponding value is of type Boolean and indicates whether there is a valid password associated with this keychain item. This is useful if your application doesn't want a password for some particular service to be stored in the keychain, but prefers that it always be entered by the user.
Available in OS X v10.6 and later.

### 108.3.69 kSecAttrIsPermanent as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Permanence attribute key.
The corresponding value is of type Boolean and indicates whether this cryptographic key is to be stored permanently.
Available in OS X v10.6 and later.

### 108.3.70 kSecAttrIssuer as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Issuer attribute key.
The corresponding value is of type Date and contains the X.500 issuer name of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.71 kSecAttrKeyClass as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Key class attribute key.
The corresponding value is of type CFTypeRef and specifies a type of cryptographic key. Possible values are listed in "Key Class Values." Read only.
Available in OS X v10.6 and later.

### 108.3.72 kSecAttrKeyClassPrivate as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyClass attribute key.
**Notes:** A private key of a public-private pair.
Available in OS X v10.6 and later.

### 108.3.73 kSecAttrKeyClassPublic as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyClass attribute key.
**Notes:** A public key of a public-private pair.

Available in OS X v10.6 and later.

### 108.3.74 kSecAttrKeyClassSymmetric as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyClass attribute key.
**Notes:** A private key used for symmetric-key encryption and decryption.
Available in OS X v10.6 and later.

### 108.3.75 kSecAttrKeySizeInBits as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Number of bits attribute key.
The corresponding value is of type Integer and indicates the total number of bits in this cryptographic key.
Compare with kSecAttrEffectiveKeySize.
Available in OS X v10.6 and later.

### 108.3.76 kSecAttrKeyType as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Algorithm attribute key.
The corresponding value is of type integer and indicates the algorithm associated with this cryptographic key (see the CSSM_ALGORITHMS enumeration in cssmtype.h and "Key Type Values").
Available in OS X v10.6 and later.

### 108.3.77 kSecAttrKeyType3DES as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.

### 108.3.78 kSecAttrKeyTypeAES as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** AES algorithm.
Available in OS X v10.7 and later.

### 108.3.79 kSecAttrKeyTypeCAST as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** CAST algorithm.
Available in OS X v10.7 and later.

### 108.3.80 kSecAttrKeyTypeDES as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** DES algorithm.
Available in OS X v10.7 and later.

### 108.3.81 kSecAttrKeyTypeDSA as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** DSA algorithm.
Available in OS X v10.7 and later.

### 108.3.82 kSecAttrKeyTypeEC as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** Elliptic curve algorithm.
Available in OS X v10.9 and later.

### 108.3.83 kSecAttrKeyTypeECDSA as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** Elliptic curve DSA algorithm.
Available in OS X v10.7 and later.

### 108.3.84 kSecAttrKeyTypeRC2 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** RC2 algorithm.
Available in OS X v10.7 and later.

### 108.3.85 kSecAttrKeyTypeRC4 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** RC4 algorithm.
Available in OS X v10.7 and later.

### 108.3.86 kSecAttrKeyTypeRSA as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrKeyType attribute key.
**Notes:** RSA algorithm.
Available in OS X v10.6 and later.

### 108.3.87 kSecAttrLabel as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Label attribute key.
The corresponding value is of type String and contains the user-visible label for this item.
Available in OS X v10.6 and later.

### 108.3.88 kSecAttrModificationDate as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Modification date key.
The corresponding value is of type date and represents the last time the item was updated. Read only.
Available in OS X v10.6 and later.

### 108.3.89 kSecAttrPath as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Path attribute key.
The corresponding value is of type String and represents a path, typically the path component of the URL. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.90 kSecAttrPort as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Port attribute key.
The corresponding value is of type integer and represents an Internet port number. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.91 kSecAttrPRF as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Pseudorandom function attribute. Possible values are described in "kSecAttrPRF Value Constants."
Available in OS X v10.7 and later.

### 108.3.92 kSecAttrPRFHmacAlgSHA1 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
**Notes:** Use the SHA1 algorithm.
Available in OS X v10.7 and later.

### 108.3.93 kSecAttrPRFHmacAlgSHA224 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
**Notes:** Use the SHA224 algorithm.
Available in OS X v10.7 and later.

### 108.3.94 kSecAttrPRFHmacAlgSHA256 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
**Notes:** Use the SHA256 algorithm.
Available in OS X v10.7 and later.

### 108.3.95 kSecAttrPRFHmacAlgSHA384 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
**Notes:** Use the SHA384 algorithm.
Available in OS X v10.7 and later.

### 108.3.96 kSecAttrPRFHmacAlgSHA512 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Constants used for the kSecAttrPRF key in the parameters dictionary passed to KeyDeriveFromPassword.
**Notes:** Use the SHA512 algorithm.
Available in OS X v10.7 and later.

### 108.3.97 kSecAttrProtocol as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Protocol attribute key.
The corresponding value is of type integer and denotes the protocol for this item (see "Protocol Values").
Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.98 kSecAttrProtocolAFP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** AFP over TCP.
Available in OS X v10.6 and later.

### 108.3.99 kSecAttrProtocolAppleTalk as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** AFP over AppleTalk.
Available in OS X v10.6 and later.

### 108.3.100 kSecAttrProtocolDAAP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** DAAP protocol.
Available in OS X v10.6 and later.

### 108.3.101 kSecAttrProtocolEPPC as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** Remote Apple Events.
Available in OS X v10.6 and later.

### 108.3.102 kSecAttrProtocolFTP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** FTP protocol.
Available in OS X v10.6 and later.

### 108.3.103 kSecAttrProtocolFTPAccount as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** A client side FTP account.
Available in OS X v10.6 and later.

### 108.3.104 kSecAttrProtocolFTPProxy as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** FTP proxy.
Available in OS X v10.6 and later.

### 108.3.105 kSecAttrProtocolFTPS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** FTP over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.106 kSecAttrProtocolHTTP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** HTTP protocol.
Available in OS X v10.6 and later.

### 108.3.107 kSecAttrProtocolHTTPProxy as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** HTTP proxy.
Available in OS X v10.6 and later.

### 108.3.108 kSecAttrProtocolHTTPS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** HTTP over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.109 kSecAttrProtocolHTTPSProxy as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** HTTPS proxy.
Available in OS X v10.6 and later.

### 108.3.110 kSecAttrProtocolIMAP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** IMAP protocol.
Available in OS X v10.6 and later.

### 108.3.111 kSecAttrProtocolIMAPS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** IMAP over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.112 kSecAttrProtocolIPP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** IPP protocol.
Available in OS X v10.6 and later.

### 108.3.113 kSecAttrProtocolIRC as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** IRC protocol.
Available in OS X v10.6 and later.

### 108.3.114 kSecAttrProtocolIRCS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** IRC over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.115 kSecAttrProtocolLDAP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** LDAP protocol.
Available in OS X v10.6 and later.

### 108.3.116 kSecAttrProtocolLDAPS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** LDAP over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.117 kSecAttrProtocolNNTP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** NNTP protocol.
Available in OS X v10.6 and later.

### 108.3.118 kSecAttrProtocolNNTPS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** NNTP over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.119 kSecAttrProtocolPOP3 as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** POP3 protocol.
Available in OS X v10.6 and later.

### 108.3.120 kSecAttrProtocolPOP3S as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** POP3 over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.121 kSecAttrProtocolRTSP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** RTSP protocol.
Available in OS X v10.6 and later.

### 108.3.122 kSecAttrProtocolRTSPProxy as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** RTSP proxy.
Available in OS X v10.6 and later.

### 108.3.123 kSecAttrProtocolSMB as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** SMB protocol.
Available in OS X v10.6 and later.

### 108.3.124 kSecAttrProtocolSMTP as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** SMTP protocol.
Available in OS X v10.6 and later.

### 108.3.125 kSecAttrProtocolSOCKS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** SOCKS protocol.
Available in OS X v10.6 and later.

### 108.3.126 kSecAttrProtocolSSH as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** SSH protocol.
Available in OS X v10.6 and later.

### 108.3.127 kSecAttrProtocolTelnet as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** Telnet protocol.
Available in OS X v10.6 and later.

### 108.3.128 kSecAttrProtocolTelnetS as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Values that can be used with the kSecAttrProtocol attribute key.
**Notes:** Telnet over TLS/SSL.
Available in OS X v10.6 and later.

### 108.3.129 kSecAttrPublicKeyHash as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Public key hash attribute key.
The corresponding value is of type memoryblock and contains the hash of a certificate's public key. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.130 kSecAttrRounds as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** The number of rounds for the pseudorandom function specified by kSecAttrPRF.
Available in OS X v10.7 and later.

### 108.3.131 kSecAttrSalt as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** A memoryblock object containing the salt to use for this key.
Available in OS X v10.7 and later.

### 108.3.132 kSecAttrSecurityDomain as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Security domain attribute key.
The corresponding value is of type String and represents the Internet security domain. Items of class kSecClassInternetPassword have this attribute.

Available in OS X v10.6 and later.

### 108.3.133 kSecAttrSerialNumber as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Serial number attribute key.
The corresponding value is of type Date and contains the serial number data of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.134 kSecAttrServer as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Server attribute key.
The corresponding value is of type String and contains the server's domain name or IP address. Items of class kSecClassInternetPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.135 kSecAttrService as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Service attribute key.
The corresponding value is a string of type String that represents the service associated with this item. Items of class kSecClassGenericPassword have this attribute.
Available in OS X v10.6 and later.

### 108.3.136 kSecAttrSubject as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Subject attribute key.
The corresponding value is of type CFDataRef and contains the X.500 subject name of a certificate. Items of class kSecClassCertificate have this attribute. Read only.

Available in OS X v10.6 and later.

### 108.3.137 kSecAttrSubjectKeyID as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Subject key ID attribute key.
The corresponding value is of type date and contains the subject key ID of a certificate. Items of class kSecClassCertificate have this attribute. Read only.
Available in OS X v10.6 and later.

### 108.3.138 kSecAttrSynchronizable as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value is a Boolean indicating whether the item in question can be synchronized.
**Notes:** To add a new item which can be synced to other devices, or to obtain synchronizable results from a query, supply this key with a value of true. If the key is not supplied, or has a value of false, then no synchronizable items will be added or returned. A predefined value, kSecAttrSynchronizableAny, may be provided instead of true if both synchronizable and non-synchronizable results are desired.

IMPORTANT: Specifying the kSecAttrSynchronizable key has several caveats:

- Updating or deleting items using the kSecAttrSynchronizable key will affect all copies of the item, not just the one on your local device. Be sure that it makes sense to use the same password on all devices before deciding to make a password synchronizable.
- Only password items can currently be synchronized. Keychain syncing is not supported for certificates or cryptographic keys.
- Items stored or obtained using the kSecAttrSynchronizable key cannot specify SecAccessRef-based access control with kSecAttrAccess. If a password is intended to be shared between multiple applications, the kSecAttrAccessGroup key must be specified, and each application using this password must have a 'keychain-access-groups' entitlement with the specified access group value.
- Items stored or obtained using the kSecAttrSynchronizable key may not also specify a kSecAttrAccessible value which is incompatible with syncing (namely, those whose names end with "ThisDeviceOnly".)
- Items stored or obtained using the kSecAttrSynchronizable key cannot be specified by reference. You must pass kSecReturnAttributes and/or kSecReturnData to retrieve results; kSecReturnRef is currently not supported for synchronizable items.

- Persistent references to synchronizable items should be avoided; while they may work locally, they cannot be moved between devices, and may not resolve if the item is modified on some other device.
- When specifying a query that uses the kSecAttrSynchronizable key, search keys are limited to the item's class and attributes. The only search constant which may be used is kSecMatchLimit; other constants using the kSecMatch prefix are not supported at this time.

Available on Mac OS X 10.9 and newer.

### 108.3.139 kSecAttrSynchronizableAny as string

MBS MacClassic Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** Specifies that both synchronizable and non-synchronizable results should be returned from this query.
**Notes:** This may be used as a value for the kSecAttrSynchronizable dictionary key in a call to SecItemCopyMatching, SecItemUpdate, or SecItemDelete.
Available on Mac OS X 10.9 and newer.

### 108.3.140 kSecAttrType as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the keychain item attribute keys.
**Notes:** Type attribute key.
The corresponding value is of type integer and represents the item's type. This number is the unsigned integer representation of a four-character code (for example, 'aTyp').
Available in OS X v10.6 and later.

### 108.3.141 kSecClass as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Key constant used to set the item class value in a search dictionary.
**Notes:** Dictionary key whose value is the item's class code.
Possible values for this key are listed in Item Class Value Constants.
Available in OS X v10.6 and later.

### 108.3.142 kSecClassCertificate as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the values used with the kSecClass key in a search dictionary.
**Notes:** Certificate item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCertificateType
kSecAttrCertificateEncoding
kSecAttrLabel
kSecAttrSubject
kSecAttrIssuer
kSecAttrSerialNumber
kSecAttrSubjectKeyID
kSecAttrPublicKeyHash

Available in OS X v10.7 and later.

### 108.3.143 kSecClassGenericPassword as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the values used with the kSecClass key in a search dictionary.
**Notes:** Generic password item.

The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCreationDate
kSecAttrModificationDate
kSecAttrDescription
kSecAttrComment
kSecAttrCreator
kSecAttrType
kSecAttrLabel
kSecAttrIsInvisible
kSecAttrIsNegative
kSecAttrAccount
kSecAttrService
kSecAttrGeneric

Available in OS X v10.7 and later.

### 108.3.144 kSecClassIdentity as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the values used with the kSecClass key in a search dictionary.
**Notes:** Identity item.

An identity is a certificate together with its associated private key. Because an identity is the combination of a private key and a certificate, this class shares attributes of both kSecClassKey and kSecClassCertificate.

Available in OS X v10.7 and later.

### 108.3.145 kSecClassInternetPassword as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the values used with the kSecClass key in a search dictionary.
**Notes:** Internet password item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrCreationDate
kSecAttrModificationDate
kSecAttrDescription
kSecAttrComment
kSecAttrCreator
kSecAttrType
kSecAttrLabel
kSecAttrIsInvisible
kSecAttrIsNegative
kSecAttrAccount
kSecAttrSecurityDomain
kSecAttrServer
kSecAttrProtocol
kSecAttrAuthenticationType
kSecAttrPort
kSecAttrPath

Available in OS X v10.6 and later.

### 108.3.146 kSecClassKey as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** One of the values used with the kSecClass key in a search dictionary.
**Notes:** Cryptographic key item.
The following attribute types ("Attribute Item Keys and Values") can be used with an item of this type:

kSecAttrAccessible
kSecAttrAccessGroup
kSecAttrKeyClass
kSecAttrLabel
kSecAttrApplicationLabel
kSecAttrIsPermanent
kSecAttrApplicationTag
kSecAttrKeyType
kSecAttrKeySizeInBits
kSecAttrEffectiveKeySize
kSecAttrCanEncrypt
kSecAttrCanDecrypt
kSecAttrCanDerive
kSecAttrCanSign
kSecAttrCanVerify
kSecAttrCanWrap
kSecAttrCanUnwrap

Available in OS X v10.7 and later.

### 108.3.147 kSecMatchCaseInsensitive as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Case sensitivity attribute key.
The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then case-sensitive string matching is performed.
Available in OS X v10.6 and later.

### 108.3.148 kSecMatchDiacriticInsensitive as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Case sensitivity attribute key.

The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then diacritic-sensitive string matching is performed.
Available in OS X v10.7 and later.

### 108.3.149 kSecMatchEmailAddressIfPresent as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Email address attribute key.
The corresponding value is of type string and contains an RFC822 email address. If provided, returned certificates or identities are limited to those that either contain the address or do not contain any email address.
Available in OS X v10.6 and later.

### 108.3.150 kSecMatchIssuers as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Issuers attribute key.
The corresponding value is of type array, where the array consists of X.500 names of type Memoryblock. If provided, returned certificates or identities are limited to those whose certificate chain contains one of the issuers provided in this list.
Available in OS X v10.6 and later.

### 108.3.151 kSecMatchItemList as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Item list attribute key.
To provide your own set of items to be filtered by a search query rather than searching the keychain, specify this search key in a call to the SecItemCopyMatching function with a value that consists of an object of type array where the array contains either KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or memoryblock items. The objects in the provided array must all be of the same type.
To convert from persistent item references to normal item references, specify this search key in a call to the CopyMatching function with a value of type array where the array contains one or more CFDataRef elements (the persistent references), and a return-type key of kSecReturnRef whose value is True.
To delete an item identified by a transient reference, specify the kSecMatchItemList search key in a call to the SecItemDelete function with a reference returned by using the kSecReturnRef return type key in a previous call to the CopyMatching or SecItemAdd functions.
To delete an item identified by a persistent reference, specify the kSecMatchItemList search key in a call

to the SecItemDelete function with a persistent reference returned by using the kSecReturnPersistentRef return type key to the CopyMatching or SecItemAdd functions.
Available in OS X v10.6 and later.

### 108.3.152 kSecMatchLimit as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Match limit attribute key.
The corresponding value is of type Integer. If provided, this value specifies the maximum number of results to return or otherwise act upon. For a single item, specify kSecMatchLimitOne. To specify all matching items, specify kSecMatchLimitAll. The default behavior is function-dependent.
Available in OS X v10.6 and later.

### 108.3.153 kSecMatchLimitAll as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** An unlimited number of results may be returned; used as a value for the kSecMatchLimit attribute key.
Available in OS X v10.6 and later.

### 108.3.154 kSecMatchLimitOne as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Results are limited to the first item found; used as a value for the kSecMatchLimit attribute key.
Available in OS X v10.6 and later.

### 108.3.155 kSecMatchPolicy as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Match policy attribute key.
The corresponding value is of type SecPolicyRef. If provided, returned certificates or identities must verify with this policy.

Available in OS X v10.6 and later.

### 108.3.156 kSecMatchSearchList as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Example:**

```
// We pass a keychain for searching only in this keychain
dim keychains() as KeychainMBS = KeychainManagerMBS.SearchList
dim keychain as KeychainMBS = keychains(1) // we pick second keychain
dim keychainname as string = keychain.name

// Build query
dim query as new Dictionary

query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword
query.Value( KeychainManagerMBS.kSecReturnAttributes ) = true
query.Value( KeychainManagerMBS.kSecMatchLimit ) = KeychainManagerMBS.kSecMatchLimitAll
query.Value( KeychainManagerMBS.kSecMatchSearchList ) = array(keychain)

// search all items
dim dics() as Dictionary = KeychainManagerMBS.CopyMatchingDictionaries(query)

// pick first
dim dic as Dictionary = dics(0)

// and display
MsgBox "Service: "+dic.Value(KeychainManagerMBS.kSecAttrService)+EndOfLine+_
"Account: "+dic.Value(KeychainManagerMBS.kSecAttrAccount)
```

**Notes:** Available in OS X v10.6 and later.

### 108.3.157 kSecMatchSubjectContains as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Subject attribute key.
The corresponding value is of type string. If provided, returned certificates or identities are limited to those whose subject contains this string.
Available in OS X v10.6 and later.

### 108.3.158 kSecMatchSubjectEndsWith as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject ends with this string.
Available in OS X v10.7 and later.

### 108.3.159 kSecMatchSubjectStartsWith as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject starts with this string.
Available in OS X v10.7 and later.

### 108.3.160 kSecMatchSubjectWholeString as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Subject attribute key.
The corresponding value is of type String. If provided, returned certificates or identities are limited to those whose subject is exactly equal to this string.
Available in OS X v10.7 and later.

### 108.3.161 kSecMatchTrustedOnly as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Trusted anchor attribute key.
The corresponding value is of type Boolean. If this attribute is provided with A value of True, only certificates that can be verified back to a trusted anchor are returned. If this value is False or the attribute is not provided, then both trusted and untrusted certificates may be returned.

Available in OS X v10.6 and later.

### 108.3.162 kSecMatchValidOnDate as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Valid-on-date attribute key.
The corresponding value is of type Date. If provided, returned keys, certificates or identities are limited to those that are valid for the given date. Pass a value of nil to indicate the current date.
Available in OS X v10.6 and later.

### 108.3.163 kSecMatchWidthInsensitive as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to set search attributes in a keychain search dictionary.
**Notes:** Case sensitivity attribute key.
The corresponding value is of type Boolean. If this value is False, or if this attribute is not provided, then width-sensitive string matching is performed (for example, the ASCII character a does not match the UTF-8 full-width letter a (U+FF41).
Available in OS X v10.7 and later.

### 108.3.164 kSecReturnAttributes as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
**Notes:** Return attributes attribute key.
The corresponding value is of type Boolean. A value of True indicates that a dictionary of the (unencrypted) attributes of an item should be returned in the form of a Dictionary.
Available in OS X v10.6 and later.

### 108.3.165 kSecReturnData as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
**Notes:** Return data attribute key.

The corresponding value is of type Boolean. A value of True indicates that the data of an item should be returned in the form of a Memoryblock. For keys and password items, data is secret (encrypted) and may require the user to enter a password for access.
Available in OS X v10.6 and later.

### 108.3.166 kSecReturnPersistentRef as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
**Notes:** Return persistent reference attribute key. A persistent reference to a credential can be stored on disk for later use or passed to other processes.
The corresponding value is of type Boolean. A value of True indicates that a persistent reference to an item (Memoryblock) should be returned.
Available in OS X v10.6 and later.

### 108.3.167 kSecReturnRef as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used to specify the type of results that should be returned by the CopyMatching or AddItem function.
**Notes:** Return reference attribute key.
The corresponding value is of type Boolean. A value of True indicates that a reference should be returned. Depending on the item class requested, the returned references may be of type KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or Memoryblock.
Available in OS X v10.6 and later.

### 108.3.168 kSecUseAuthenticationContext as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value is LAContextMBS to be used for keychain item authentication.
**Notes:** As LAContext is 64-bit only for Mac, this will do nothing in 32-bit.

- If the item requires authentication and this key is omitted, a new context will be created just for the purpose of the single call.
- If the specified context has been previously authenticated, the operation will succeed without asking user for authentication.

- If the specified context has not been previously authenticated, the new authentication will be started on this context, allowing caller to eventually reuse the sucessfully authenticated context in subsequent keychain operations.

### 108.3.169 kSecUseAuthenticationUI as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value to define whether UI is allowed.
**Notes:** Value can be one of kSecUseAuthenticationUIAllow, kSecUseAuthenticationUIFail, kSecUseAuthenticationUISkip.

### 108.3.170 kSecUseAuthenticationUIAllow as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the values for kSecUseAuthenticationUI to allow user interface.

### 108.3.171 kSecUseAuthenticationUIFail as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the values for kSecUseAuthenticationUI to disallow user interface and fail.

### 108.3.172 kSecUseAuthenticationUISkip as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** One of the values for kSecUseAuthenticationUI to disallow user interface and skip.

### 108.3.173 kSecUseItemList as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Key used to specify a list of items to search or add.
**Notes:** Item list key.
The corresponding value is of type CFArrayRef, where the array contains either KeychainItemMBS, SecKeyRef, SecCertificateRef, SecIdentityRef, or (for persistent item references) Memoryblock items. If provided, this array is treated as the set of all possible items to search (or to add if the function being called is AddItem). The items in the array must all be of the same type.

Available in OS X v10.6 and later.

### 108.3.174 kSecUseKeychain as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Key used to specify a list of items to search or add.
**Notes:** Keychain reference key.
Specifies a SecKeychainRef object that references the keychain to which AddItem should add the provided items.
Available in OS X v10.7 and later.

### 108.3.175 kSecUseNoAuthenticationUI as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether to show authentication user interface.
**Notes:** OS X only. Specifies a dictionary key whose value is a boolean. If provided with a value of true, the error errSecInteractionNotAllowed will be returned if the item is attempting to authenticate with UI.
Available in macOS 10.10 or newer and deprecated in 10.11 in favor of kSecUseAuthenticationUI.

### 108.3.176 kSecUseOperationPrompt as string

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Specifies a dictionary key whose value is a string that represents a user-visible string describing the operation for which the application is attempting to authenticate.
**Notes:** The application is responsible for the text localization.

### 108.3.177 kSecValueData as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
**Notes:** Data attribute key. A persistent reference to a credential can be stored on disk for later use or passed to other processes.
The corresponding value is of type memoryblock. For keys and password items, the data is secret (encrypted) and may require the user to enter a password for access.
Available in OS X v10.6 and later.

You can specify zero or more of these types depending on the function you are calling.

### 108.3.178 kSecValuePersistentRef as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
**Notes:** Persistent reference attribute key.
The corresponding value is of type CFDataRef. The bytes in this memoryblock can be stored by the caller and used on a subsequent invocation of the application (or even a different application) to retrieve the item referenced by it.
Available in OS X v10.6 and later.
You can specify zero or more of these types depending on the function you are calling.

### 108.3.179 kSecValueRef as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Keys used in the results dictionary for CopyMatching or Additem, indicating the type of values returned.
**Notes:** Reference attribute key.
The corresponding value, depending on the item class requested, is of type KeychainItemMBS, SecKeyRef, SecCertificateRef, or SecIdentityRef.
Available in OS X v10.6 and later.
You can specify zero or more of these types depending on the function you are calling.

### 108.3.180 LockAll

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Locks all keychains belonging to the current user.
**Notes:** Your application should not call this function unless you are responding to a user's request to lock a keychain. In general, you should leave the keychain unlocked so that the user does not have to unlock it again in another application.
Lasterror is set.

### 108.3.181 Open(file as folderitem) as KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens a keychain.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.keychain")
dim k as KeychainMBS = KeychainManagerMBS.Open(file)

MsgBox k.Name
```

**Notes:** You may use this function to retrieve a pointer to a keychain object given the path of the keychain. You do not need to close the keychain, but you should release the memory that the pointer occupies when you are finished with it.
Lasterror is set.
See also:

- 108.3.182 Open(path as string) as KeychainMBS 16517

### 108.3.182 Open(path as string) as KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Opens a keychain.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.keychain")
dim k as KeychainMBS = KeychainManagerMBS.Open(file.NativePath)

MsgBox k.Name
```

**Notes:** You may use this function to retrieve a pointer to a keychain object given the path of the keychain. You do not need to close the keychain, but you should release the memory that the pointer occupies when you are finished with it.
Lasterror is set.
See also:

- 108.3.181 Open(file as folderitem) as KeychainMBS 16516

### 108.3.183 PreferenceDomain as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets or sets the current keychain preference domain.
**Example:**

```
dim n as Integer = KeychainManagerMBS.PreferenceDomain
Select case n
```

```
case KeychainManagerMBS.kSecPreferencesDomainCommon
MsgBox "common"
case KeychainManagerMBS.kSecPreferencesDomainDynamic
MsgBox "dynamic"
case KeychainManagerMBS.kSecPreferencesDomainSystem
MsgBox "system"
case KeychainManagerMBS.kSecPreferencesDomainUser
MsgBox "user"
else
MsgBox "unknown"
end Select
```

**Notes:** A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. The default preference domain for system daemons (that is, for daemons running in the root session) is the system domain. The default preference domain for all other programs is the user domain. Use the PreferenceDomain function to change the preference domain.

This function changes the preference domain for all subsequent function calls; for example, if you change from the system domain to the user domain and then call Lock specifying nil for the keychain, the function locks the default system keychain rather than the default user keychain. You might want to use this function, for example, when launching a system daemon from a user session so that the daemon uses system preferences rather than user
(Read and Write computed property)

### 108.3.184 SearchCreateFromAttributes(keychain as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a search object matching a list of zero or more attributes.
**Example:**

```
dim AttributeKeys() as string
dim AttributeValues() as string
dim keychain as KeychainMBS = nil // default

dim search as KeychainSearchMBS = KeychainManagerMBS.SearchCreateFromAttributes(keychain, "genp",
AttributeKeys, AttributeValues)
dim items() as KeychainItemMBS

dim item as KeychainItemMBS = search.NextItem
while item<>Nil
items.Append item
```

```
item = search.NextItem
wend

MsgBox str(UBound(items)+1)+" items found."
```

**Notes:** keychains: An array of keychains to search, a single keychain, or nil to search the user's current keychain search list. Use the function SearchList to retrieve the user's default search list.
itemClass: The keychain item class. See "Keychain Item Class Constants" for valid constants.
AttributeKeys: List of zero or more keychain attribute keys to match.
AttributeValues: List of zero or more keychain attribute values to match.

Returns the current search object.
Lasterror is set.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. You look up an item in a keychain by its attributes. If you find a match, you can then retrieve the item's data. Use the search object created by this function as input to the SecKeychainSearchCopyNext function to find a a keychain item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
See also:

- 108.3.185 SearchCreateFromAttributes(keychains() as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS 16519

### 108.3.185 SearchCreateFromAttributes(keychains() as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a search object matching a list of zero or more attributes.
**Example:**

```
dim AttributeKeys() as string
dim AttributeValues() as string

dim keychains() as KeychainMBS

AttributeKeys.Append KeychainManagerMBS.kSecAttrAccount
AttributeValues.Append "myusername"
keychains = KeychainManagerMBS.DomainSearchList(KeychainManagerMBS.kSecPreferencesDomainUser)
```

```
dim search as KeychainSearchMBS = KeychainManagerMBS.SearchCreateFromAttributes(keychains, "genp",
AttributeKeys, AttributeValues)
dim items() as KeychainItemMBS

dim item as KeychainItemMBS = search.NextItem
while item<>Nil
items.Append item
item = search.NextItem
wend

MsgBox str(UBound(items)+1)+" items found."
```

**Notes:** keychains: An array of keychains to search, a single keychain, or nil to search the user's current keychain search list. Use the function SearchList to retrieve the user's default search list.
itemClass: The keychain item class. See "Keychain Item Class Constants" for valid constants.
AttributeKeys: List of zero or more keychain attribute keys to match.
AttributeValues: List of zero or more keychain attribute values to match.

Returns the current search object.
Lasterror is set.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. You look up an item in a keychain by its attributes. If you find a match, you can then retrieve the item's data. Use the search object created by this function as input to the SecKeychainSearchCopyNext function to find a a keychain item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
See also:

- 108.3.184 SearchCreateFromAttributes(keychain as KeychainMBS, itemClass as string, AttributeKeys() as string, AttributeValues() as string) as KeychainSearchMBS 16518

### 108.3.186 SearchList as KeychainMBS()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retrieves a keychain search list.
**Example:**

```
dim SearchList() as KeychainMBS = KeychainManagerMBS.SearchList
dim names() as String

for each k as KeychainMBS in SearchList
```

```
names.Append k.Name
next

MsgBox Join(names, EndOfLine)
```

**Notes:** Returns keychain search list.
Lasterror is set.

### 108.3.187 SetDomainDefault(domain as Integer, keychain as KeychainMBS)

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the default keychain for a specified preference domain.
**Notes:** domain: The preference domain for which you wish to set the default keychain.
keychain: A reference to the keychain you wish to set as default in the specified preference domain.

Lasterror is set.
A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to set the default keychain for a specific preference domain. Use the SetDefault function if you want to set the default keychain for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.

### 108.3.188 SetDomainSearchList(domain as Integer, list() as KeychainMBS)

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the keychain search list for a specified preference domain.
**Notes:** domain: The preference domain for which you wish to set the default keychain search list. See "Keychain Preference Domain Constants"for possible domain values.
searchList: A keychain search list to set in the preference domain.

Lasterror is set.
A preference domain is a set of security-related preferences, such as the default keychain and the current keychain search list. Use this function if you want to set the keychain search list for a specific preference domain. Use the SetSearchList function if you want to set the keychain search list for the current preference domain. See the PreferenceDomain function for a discussion of current and default preference domains.

### 108.3.189 SetSearchList(list() as KeychainMBS)

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies the list of keychains to use in the default keychain search list.
**Notes:** searchList: An array of keychain references specifying the list of keychains to use in the default keychain search list. Passing an empty array clears the search list.

Lasterror is set.
The default keychain search list is used by several functions; see for example SearchCreateFromAttributes, FindInternetPassword, or FindGenericPassword. To obtain the current default keychain search list, use the SearchList function.

The default keychain search list is displayed as the keychain list in the Keychain Access utility. If you use SetSearchList to change the keychain search list, the list displayed in Keychain Access changes accordingly.

### 108.3.190 UpdateItem(Query as Dictionary, attributesToUpdate as dictionary) as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Modifies items that match a search query.
**Example:**

```
// build query
dim query as new Dictionary

dim ServiceName as string = "mytest"
dim Username as string = "myusername"

query.value( KeychainManagerMBS.kSecAttrAccount ) = Username
query.value( KeychainManagerMBS.kSecAttrService ) = ServiceName
query.value( KeychainManagerMBS.kSecClass ) = KeychainManagerMBS.kSecClassGenericPassword

// Build Dictionary with new values
dim newValues as new Dictionary
newValues.value( KeychainManagerMBS.kSecAttrComment ) = "Just a test"

// and update
if KeychainManagerMBS.UpdateItem(query, newValues) then
MsgBox "OK"
else
MsgBox "Failed."
end if
```

**Notes:** query: A dictionary containing an item class specification and optional attributes for controlling the search. Specify the items whose values you wish to change. See "Search Keys" for a description of currently defined search attributes.

attributesToUpdate: A dictionary containing the attributes whose values should be changed, along with the new values. Only real keychain attributes are permitted in this dictionary (no "meta" attributes are allowed.) See "Attribute Item Keys and Values" for a description of currently defined value attributes.

Lasterror is set.
See the discussion section of the CopyMatching function for information about how to construct a search dictionary.

Available in OS X v10.6 and later.

### 108.3.191 UserInteractionAllowed as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether Keychain Services functions that normally display a user interaction are allowed to do so.
**Example:**

```
MsgBox str(KeychainManagerMBS.UserInteractionAllowed)
KeychainManagerMBS.UserInteractionAllowed = false
MsgBox str(KeychainManagerMBS.UserInteractionAllowed)
```

**Notes:** Lasterror is set.
A Boolean value indicating whether user interaction is permitted. If true, user interaction is allowed, and Keychain Services functions that display a user interface can do so as appropriate.
(Read and Write computed property)

### 108.3.192 Version as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines the version of Keychain Services installed on the user's system.
**Example:**

```
MsgBox str(KeychainManagerMBS.Version)
```

**Notes:** Your application can call the Version function to find out which version of Keychain Services is installed on the user's system.
Lasterror is set.

### 108.3.193 Properties

### 108.3.194 LastError as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The last error code returned by one of the methods.
**Notes:** You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read only property)

### 108.3.195 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kSecAppleSharePasswordItemClass | "ashp" | Specifies a keychain item's class code.<br>Indicates that the item is an AppleShare password. |
| kSecGenericPasswordItemClass | "genp" | Specifies a keychain item's class code.<br>Indicates that the item is a generic password. |
| kSecInternetPasswordItemClass | "inet" | Specifies a keychain item's class code.<br>Indicates that the item is an Internet password. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| ErrorAuthorizationFailed | -25293 | The user name or passphrase you entered is not correct. |
| ErrorDuplicatedItem | -25299 | The specified item already exists in the keychain. |
| ErrorFailedToAllocated | -108 | Failed to allocate memory. |
| ErrorFailedToDecode | -26275 | Unable to decode the provided data. |
| ErrorInteractionNotAllowed | -25308 | User interaction is not allowed. |
| ErrorInvalidParameter | -50 | Invalid Parameters. |
| ErrorNone | 0 | No error. |
| ErrorNotAvailable | -25291 | No keychain is available. You may need to restart your computer. |
| ErrorNotFound | -25300 | The specified item could not be found in the keychain. |

Keychain Preference Domain Constants

| Constant | Value | Description |
|---|---|---|
| kSecPreferencesDomainCommon | 2 | Indicates the preferences are common to everyone.<br>Available in OS X v10.3 and later. |
| kSecPreferencesDomainDynamic | 3 | Indicates a dynamic search list (typically provided by removable keychains such as smart cards).<br>Available in OS X v10.4 and later. |
| kSecPreferencesDomainSystem | 1 | Indicates the system or daemon preference domain preferences.<br>Available in OS X v10.3 and later. |
| kSecPreferencesDomainUser | 0 | Indicates the user preference domain preferences.<br>Available in OS X v10.3 and later. |

### 108.3.196 Delegates

### 108.3.197 AddItemAsyncCompletedMBS(Keychain as Variant, attributesDictionary as dictionary, Result as Variant, Lasterror as Integer, Tag as Variant)

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate to be called when AddItemAsync is done.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1

### 108.3.198 CopyMatchingAsyncCompletedMBS(Query as Dictionary, Result as Variant, Lasterror as Integer, Tag as Variant)

MBS MacClassic Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate to be called when CopyMatchingAsync is done.

## 108.4 class KeychainMBS

### 108.4.1 class KeychainMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a keychain.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr12
- Keychain Plugin rewritten

### 108.4.2 Methods

### 108.4.3 AddGenericPassword(serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new generic password to a keychain.
**Notes:** See AddGenericPassword in KeychainManagerMBS for details.
See also:

- 108.4.4 AddGenericPassword(serviceName as string, accountName as string, password as string) as KeychainItemMBS 16526

### 108.4.4 AddGenericPassword(serviceName as string, accountName as string, password as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new generic password to a keychain.
**Notes:** See AddGenericPassword in KeychainManagerMBS for details.
See also:

- 108.4.3 AddGenericPassword(serviceName as string, accountName as string, password as memoryblock) as KeychainItemMBS 16526

### 108.4.5 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new Internet password to a keychain.
**Notes:** See KeychainManagerMBS.AddInternetPassword for details.
See also:

- 108.4.6 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS 16527

### 108.4.6 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new Internet password to a keychain.
**Notes:** See KeychainManagerMBS.AddInternetPassword for details.
See also:

- 108.4.5 AddInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, password as memoryblock) as KeychainItemMBS 16526

### 108.4.7 AllItems(itemClass as string) as KeychainItemMBS()

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries all items.
**Notes:** Keychain: If not nil, searches only this keychain.
ItemClass: The item class to find. For example kSecGenericPasswordItemClass.
Lasterror is set.
Returns array of keychain items.

### 108.4.8 Delete

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes one or more keychains from the default keychain search list, and removes the keychain itself if it is a file.
**Notes:** Lasterror is set.

The keychain may be a file stored locally, a smart card, or retrieved from a network server using non-file-based database protocols. This function deletes the keychain only if it is a local file.

### 108.4.9 FindGenericItem(serviceName as string, accountName as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first generic keychain item based on the attributes passed.
**Notes:** See KeychainManagerMBS.FindGenericItem for details.

### 108.4.10 FindGenericPassword(serviceName as string, accountName as string, byref password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first generic password based on the attributes passed.
**Notes:** See KeychainManagerMBS.FindGenericPassword for details.

### 108.4.11 FindInternetItem(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first Internet password item based on the attributes passed.
**Notes:** See KeychainManagerMBS.FindInternetPassword for details.

### 108.4.12 FindInternetPassword(serverName as string, securityDomain as string, accountName as string, path as string, port as Integer, protocol as string, authenticationType as string, byref password as memoryblock) as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first Internet password based on the attributes passed.
**Notes:** See KeychainManagerMBS.FindInternetPassword for details.

### 108.4.13 IsUnlocked as boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if keychain is unlocked.
**Example:**

MsgBox str(KeychainManagerMBS.Default.IsUnlocked)

**Notes:** Lasterror is set.

### 108.4.14 Lock

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Locks a keychain.
**Notes:** Your application should not call this function unless you are responding to a user's request to lock a keychain. In general, you should leave the keychain unlocked so that the user does not have to unlock it again in another application.
Lasterror is set.

### 108.4.15 Name as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines the file name of a keychain.
**Example:**

MsgBox KeychainManagerMBS.Default.Name

**Notes:** Similar to path, but name without file extension only.
Lasterror is set.

### 108.4.16 Path as string

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Determines the path of a keychain.
**Example:**

MsgBox KeychainManagerMBS.Default.Path

**Notes:** Returns POSIX path of the keychain as a UTF-8 encoded string.
Lasterror is set.

### 108.4.17 SetDefault

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the default keychain.
**Notes:** Lasterror is set.
In most cases, your application should not need to set the default keychain, because this is a choice normally made by the user. You may call this function to change where a password or other keychain items are added, but since this is a user choice, you should set the default keychain back to the user specified keychain when you are done.

### 108.4.18 Status as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retrieves status information of a keychain.
**Example:**

```
dim values() as string
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim status as Integer = DefaultKeychain.status

if BitwiseAnd(status, KeychainMBS.StatusUnlocked) = KeychainMBS.StatusUnlocked then
values.Append "unlocked"
else
values.Append "locked"
end if

if BitwiseAnd(status, KeychainMBS.StatusReadable) = KeychainMBS.StatusReadable then
values.Append "readable"
else
values.Append "not readable"
end if

if BitwiseAnd(status, KeychainMBS.StatusWritable) = KeychainMBS.StatusWritable then
values.Append "writable"
else
values.Append "not writable"
end if

MsgBox Join(values, ", ")
```

**Notes:** Lasterror is set.
This function retrieves the status of a specified keychain. You can use this function to determine if the keychain is unlocked, readable, or writable. Note that the lock status of a keychain can change at any time

due to user or system activity. Because the system automatically prompts the user to unlock a keychain when necessary, you do not usually have to worry about the lock status of a keychain.

### 108.4.19 Unlock

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unlocks a keychain.
**Notes:** In most cases, your application does not need to call this function directly, since most Keychain Services functions that require an unlocked keychain do so for you. If your application needs to verify that a keychain is unlocked, call the function GetStatus.
Lasterror is set.
See also:

- 108.4.20 Unlock(password as string) 16531

### 108.4.20 Unlock(password as string)

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unlocks a keychain.
**Notes:** password: The password to use.
In most cases, your application does not need to call this function directly, since most Keychain Services functions that require an unlocked keychain do so for you. If your application needs to verify that a keychain is unlocked, call the function GetStatus.
Lasterror is set.
See also:

- 108.4.19 Unlock 16531

### 108.4.21 Properties

### 108.4.22 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 108.4.23 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code returned by one of the methods.
**Notes:** You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.
(Read and Write property)

### 108.4.24 Settings as KeychainSettingsMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtains or sets a keychain's settings.
**Example:**

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 108.4.25 Constants

Status Constants

| Constant | Value | Description |
|---|---|---|
| StatusReadable | 2 | Indicates the keychain is readable. |
| StatusUnlocked | 1 | Indicates the keychain is unlocked. |
| StatusWritable | 4 | Indicates the keychain is writable. |

## 108.5 class KeychainSearchMBS

### 108.5.1 class KeychainSearchMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a running keychain search.

### 108.5.2 Methods

### 108.5.3 NextItem as KeychainItemMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the next keychain item matching the given search criteria.
**Notes:** Returns object of the next matching keychain item, if any.

Each item stored in the keychain contains data (such as a certificate), which is indexed by the item's attributes. Use the SearchCreateFromAttributes function to specify attributes to search for. If the NextItem function finds a match, you can use the methods and properties on the item.

To find and obtain data from a password keychain item, use the FindInternetPassword or FindGenericPassword function.
Lasterror is set.

### 108.5.4 Properties

### 108.5.5 Handle as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 108.5.6 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code returned by one of the methods.
**Notes:** You can use KeychainManagerMBS.ErrorMessageString function to get a text message.
The error code -1 is set by plugin if function is missing or parameters are wrong.

(Read and Write property)

## 108.6 class KeychainSettingsMBS

### 108.6.1 class KeychainSettingsMBS

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The class for information about keychain settings.
**Example:**

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

### 108.6.2 Properties

### 108.6.3 lockInterval as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** An unsigned 32-bit integer representing the number of seconds before the keychain locks. If you set useLockInterval to false, set lockInterval to INT_MAX to indicate that the keychain never locks.
**Example:**

```
dim SystemKeychain as KeychainMBS = KeychainManagerMBS.DomainDefault(KeychainManagerMBS.kSecPreferencesDomainSystem)
dim settings as KeychainSettingsMBS = SystemKeychain.Settings
MsgBox str(settings.lockInterval)
```

**Notes:** (Read and Write property)

### 108.6.4 lockOnSleep as Boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the keychain locks when the system sleeps.
**Example:**

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.lockOnSleep)
```

**Notes:** (Read and Write property)

### 108.6.5 useLockInterval as Boolean

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the keychain automatically locks after a certain period of time.
**Example:**

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.useLockInterval)
```

**Notes:** (Read and Write property)

### 108.6.6 version as Integer

MBS MacClassic Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** An unsigned 32-bit integer representing the keychain version.
**Example:**

```
dim DefaultKeychain as KeychainMBS = KeychainManagerMBS.Default
dim settings as KeychainSettingsMBS = DefaultKeychain.Settings
MsgBox str(settings.version)
```

**Notes:** Is always 1.
(Read and Write property)

# Chapter 109

# Large Picture

## 109.1 class PictureFactoryMBS

### 109.1.1 class PictureFactoryMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The factory class for pictures.
**Notes:** This class gives you a global event where you can provide your own pictures.
Whenever the plugin needs a new PictureMBS object for the result of a function or for temporary storage, you can provide one.

This is mainly for the case where you use virtual memory or you want to reuse pictures.

Used for temporary or result pictures for BoxBlur, DitherFilter, EngraveFilter, GainFilter, GammaFilter, NeonFiltrer, OilFilter, PictureMatrix, Rotate, SolarizeFilter and TransferFilter.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr4

### 109.1.2 Methods

### 109.1.3 NewPictureMBS(Width as integer, Height as integer, ImageFormat as integer) as PictureMBS

MBS Images Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new picture.
**Notes:** This may invoke the event.

If no factory is registered, we use our default implementation.
If the event or our implementation raises exception, you may need to catch it, e.g. OutOfMemoryException.
See also:

- 109.1.8 NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS 16538

### 109.1.4 SetFactory(factory as PictureFactoryMBS)

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the global factory object.
**Notes:** You can set to nil to delete the existing factory.

### 109.1.5 Properties

### 109.1.6 currentFactory as PictureFactoryMBS

MBS Images Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current factory.
**Notes:** Use SetFactory method to change it.
(Read only property)

### 109.1.7 Events

### 109.1.8 NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The factory event.
**Example:**

```
function NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS

return new PictureMBS(width, height, ImageFormat)

end function
```

**Notes:** This event is called whenever a picture is requested.
Return an picture you created.

The plugin will check the Valid property for this picture and use it only if Valid is true.
See also:

- 109.1.3 NewPictureMBS(Width as integer, Height as integer, ImageFormat as integer) as PictureMBS 16537

## 109.2 class PictureMBS

### 109.2.1 class PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The MBS picture class for really large pictures.
**Example:**

```
dim fSource as FolderItem = SpecialFolder.Desktop.Child("test.png") // some png with alpha
dim oPNGInput as new PNGReaderMBS

If oPNGInput.OpenFile(fSource) Then
If oPNGInput.ApplyOptions(0) Then

dim imgSource as New PictureMBS(oPNGInput.Width, oPNGInput.Height, PictureMBS.ImageFormatRGBA)

' Read row by row the file and puts it in a PictureMBS instance

dim nMax as Integer = oPNGInput.Height - 1
For nInd as Integer = 0 To nMax
imgSource.RowInFormat(nInd, PictureMBS.ImageFormatRGBA, true) = oPNGInput.ReadRow()
Next

' show only alpha/mask channel
Backdrop=imgSource.AlphaChannel.CopyPicture

' show Picture without mask
Backdrop=imgSource.CopyPicture

' show picture with mask
Backdrop=imgSource.CopyPictureWithMask

End If
End If
```

**Notes:** Using virtual memory you are only limited to hard disc space for swapping.

The Xojo picture class is limited to 2 GB and to width/height being in platform specific ranges. This class works with pictures up to 100 million pixels width and 2 billion pixels height.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Colorspaces in MacOS with Xojo
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0

- CMYK Colors
- MBS Plugins 11.1 Release notes
- A day for bug fixing
- MBS REALbasic plug-ins version 9.5
- MBS REALbasic plug-ins version 9.4
- MBS REALbasic plug-ins version 9.3
- MonkeyBread Software Releases the MBS REALbasic plugins 8.7

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 8.3, page 22: Dropwords, Part 1, Developing a simple game by Marc Zeedar
- 8.2, page 25: Saving Data, A simple method for saving a data structure by Marc Zeedar
- 8.1, page 25: REALbasic Plugins, Getting started with the Plugin SDK
- 7.6, page 21: Think Big by Thinking Small, Build a platform, not an app by Marc Zeedar
- 7.4, page 8: News
- 7.3, page 9: News
- 16.2, page 9: News
- 12.2, page 10: News

### 109.2.2 Methods

### 109.2.3 AlphaChannel as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The alpha channel as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.AlphaChannel
r.fillrect(100) // fill only alpha channel
```

**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.4 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a 5x5 matrix to the picture.
**Example:**

```
dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=value // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

d=s.ApplyMatrix(d, 5, matrix)
```

**Notes:** MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.
- add to the sum the delta value
- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:


- 109.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS 16543
- 109.2.6 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer, ScaleFactor as Double) as PictureMBS 16544


### 109.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a 5x5 matrix to the picture.
**Example:**

```
dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=value // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

d=s.ApplyMatrix(d, 5, matrix, 5)
```

**Notes:** MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.
- add to the sum the delta value
- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.4 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer) as PictureMBS 16542
- 109.2.6 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer, ScaleFactor as Double) as PictureMBS 16544

### 109.2.6 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer, ScaleFactor as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a 5x5 matrix to the picture.
**Example:**

```
dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=1 // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

s = new PictureMBS(LogoMBS(500))
d = new PictureMBS(500, 500, PictureMBS.ImageFormatRGB)

// Blur with 5x5 Matrix
d=s.ApplyMatrix(d, 5, matrix, 1, 1.0/25.0)
```

Backdrop = d.CopyPicture

**Notes:** MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.
- add to the sum the delta value
- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.4 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer) as PictureMBS 16542
- 109.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS 16543

### 109.2.7 AutoLevel as boolean

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies auto levels on the picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
```

```
call p.AutoLevel
window1.Backdrop = p.CopyPicture
```

**Notes:** The histogram is built, white and back points are searched and all pixels adjusted.
Returns true on success and false on any error.

Works only with RGB pictures.
See also:

- 109.2.8 AutoLevel(x as Integer, y as Integer, w as Integer, h as Integer) as boolean 16546

### 109.2.8 AutoLevel(x as Integer, y as Integer, w as Integer, h as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies auto levels on the picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
call p.AutoLevel(0,0,50,50)
window1.Backdrop = p.CopyPicture
```

**Notes:** The histogram is built, white and back points are searched and all pixels adjusted.
Returns true on success and false on any error.

Works only with RGB pictures.
See also:

- 109.2.7 AutoLevel as boolean 16545

### 109.2.9 BlackChannel as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The black channel of a CMYK picture as a new PictureMBS object.
**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.10 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color) as Boolean

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blend picture with mask and background.
**Notes:** Works for gray and RGB pictures, not for CMYK.
Returns true on success and false on failure.
Blends source and dest image into result image.
If mask is nil, we just copy pictures.
If mask is not nil, we blend using either DestImage (if non nil) or background color.
Alpha channels are not used.
See also:

- 109.2.11 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color, X As Integer, Y As Integer, Width As Integer, Height As Integer) as Boolean 16547

### 109.2.11 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color, X As Integer, Y As Integer, Width As Integer, Height As Integer) as Boolean

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Blend picture with mask and background.
**Notes:** Works for gray and RGB pictures, not for CMYK.
Returns true on success and false on failure.
Blends source and dest image into result image.
If mask is nil, we just copy pictures.
If mask is not nil, we blend using either DestImage (if non nil) or background color.
Alpha channels are not used.
See also:

- 109.2.10 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color) as Boolean 16547

### 109.2.12 BlueChannel as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue channel as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.BlueChannel
```

```
r.fillrect(100) // fill only blue channel
```

**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.13 BoxBlurFilter(dest as PictureMBS, Radius as Double, Iterations as Integer, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The box blur filter.
**Example:**

```
Dim boxPic,tempObj As PictureMBS
dim logo as Picture = LogoMBS(500)
dim pictureObj as new PictureMBS(logo)

tempObj = New PictureMBS(pictureObj.Width, pictureObj.Height, pictureObj.ImageFormat)
boxPic = pictureObj.BoxBlurFilter(tempObj, 3.0, 3)

Backdrop=boxpic.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Vertical and Horizontal define whether effect is applied horizontal and/or vertical.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.14 BoxBlurFilter(dest as PictureMBS, Radius as Double, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS

### 109.2.14 BoxBlurFilter(dest as PictureMBS, Radius as Double, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The box blur filter.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Vertical and Horizontal define whether effect is applied horizontal and/or vertical.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.13 BoxBlurFilter(dest as PictureMBS, Radius as Double, Iterations as Integer, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS 16548

### 109.2.15 BoxBlurFractionalFilter(dest as PictureMBS, Radius as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The box blur filter for the radius fraction.
**Notes:** If you call BoxBlurFilter and BoxBlurFractionalFilter with a radius of 3.5 the BoxBlurFilter does the 3.0 and BoxBlurFractionalFilter does the 0.5.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

### 109.2.16 CalculateMemory(width as Integer, height as Integer, theImageFormat as Integer) as Int64

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the memory needed for allocating the image.
**Example:**

```
dim n as int64 = PictureMBS.CalculateMemory(1000, 1000, PictureMBS.ImageFormatRGB)
```

```
MsgBox str(n)
```

**Notes:** Returns number of bytes needed.

### 109.2.17 CanAllocateImage(width as Integer, height as Integer, theImageFormat as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Can the image with this size be allocated?
**Example:**

```
dim n as Boolean = PictureMBS.CanAllocateImage(1000, 1000, PictureMBS.ImageFormatRGB)
MsgBox str(n)
dim x as Boolean = PictureMBS.CanAllocateImage(100000, 100000, PictureMBS.ImageFormatRGB)
MsgBox str(x)
```

**Notes:** Retruns true if possible and false if the size is too big.
To figure out if allocation will work, we simply allocate and release memory and see if that worked.

### 109.2.18 Channel(index as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the channel with the given index as a new picture object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.Channel(0)
r.fillrect(100) // fill only red channel
```

**Notes:** Returns nil on any error. May raise an out of bounds exception on invalid index. Index is zero based.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.
See also:

- 109.2.146 Channel as String 16627

### 109.2.19 ChannelOffset(index as integer) as integer

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries channel offset within pixel.
**Notes:** For RGB the red channel has offset 0, the green channel has offset 1 and the blue channel has offset 2.

### 109.2.20 Channels as String()

MBS Images Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the channels of an image.
**Example:**

```
dim p as new Picture(100,100,32)
dim q as new PictureMBS(p)

dim channels() as string = q.Channels

dim cr as PictureMBS = q.RedChannel
dim cg as PictureMBS = q.GreenChannel
dim cb as PictureMBS = q.BlueChannel
dim c0 as pictureMBS = q.Channel(0)
dim c1 as pictureMBS = q.Channel(1)
dim c2 as pictureMBS = q.Channel(2)

dim crn as string = cg.Channel
dim cgn as string = cg.Channel
dim cbn as string = cg.Channel
dim c0n as string = c0.Channel
dim c1n as string = c1.Channel
dim c2n as string = c2.Channel

Break // check in debugger
```

### 109.2.21 ClearCache

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears picture cache.
**Notes:** If target of this PictureMBS is a Xojo picture, this method clears the Xojo cache for the picture to make sure it recognizes changes.
Does nothing if there is no target picture or there is no cache.

### 109.2.22 ClearRect

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all pixels.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.ClearRect
window1.Backdrop = p.CopyPicture
```

**Notes:** Writes zeros over all pixels and all channels.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.23 ClearRect(x as Integer, y as Integer, width as Integer, height as Integer) 16552

### 109.2.23 ClearRect(x as Integer, y as Integer, width as Integer, height as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all pixels in the given area.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.ClearRect(0,0,100,100)
window1.Backdrop = p.CopyPicture
```

**Notes:** Writes zeros over all pixels and all channels.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.22 ClearRect 16552

### 109.2.24 ClipImage as PictureMBS

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object for the same picture content.
**Notes:** This may be useful if you need a second PictureMBS object. For example if two threads work on

different rows.
See also:

- 109.2.25 ClipImage(x as Integer, y as Integer, width as Integer, height as Integer) as PictureMBS 16553

### 109.2.25 ClipImage(x as Integer, y as Integer, width as Integer, height as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object which draws only into a portion of the existing image.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

// clip it
dim c as PictureMBS = p.ClipImage(100, 100, 300, 300)

// clone it
dim q as PictureMBS = c.Clone

// and see result in debugger
dim pic as Picture = q.CopyPicture

Break
```

**Notes:** This may be useful to apply an effect only on a portion of an existing image.
See also:

- 109.2.24 ClipImage as PictureMBS 16552

### 109.2.26 Clone as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of a picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

// clip it
dim c as PictureMBS = p.ClipImage(100, 100, 300, 300)
```

```
// clone it
dim q as PictureMBS = c.Clone

// and see result in debugger
dim pic as Picture = q.CopyPicture

Break
```

**Notes:** Does not work for pictures using virtual memory.
(Fails if IsMapping=True)
Copies the whole picture even if you clone just one channel.

Returns nil on low memory.

### 109.2.27 Close

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the picture by releasing all memory.
**Notes:** This calls the destructor internally.

### 109.2.28 CMYKChannels as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The CMYK channels as a new PictureMBS object.
**Notes:** Returns nil if the image is not a CMYK picture.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the CMYK pixels directly without modifying an alpha channel
The resulting PictureMBS object is a CMYK picture.

### 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As PictureMBS
```

```
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

// this will only copy the pixels
if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,false) then
window1.Backdrop=DestImage.CopyPicture
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.

ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574

### 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As PictureMBS
dim Image As PictureMBS
```

```
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,true, &cFF0000, &cFF0000)
then
window1.Backdrop=DestImage.CopyPicture
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color

MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574

### 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558

- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As PictureMBS
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

// we create a little mask for a smooth fade
dim m as Picture = New Picture(500,500,32)
```

```
dim g as Graphics = m.Graphics

for y as Integer = 0 to 499
dim n as Integer = y*255/499
g.ForeColor = rgb(n, n, n)
g.DrawLine 0,y,499,y
next

// uncomment to see our mask:
'Backdrop = m
'return

image=new PictureMBS(LogoMBS(500))
Mask=new PictureMBS(m)
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

// this will only copy the pixels
if DestImage.Combine(image,false,Mask,DestX,DestY,SourceX,SourceY,Width,Height,false) then
window1.Backdrop=DestImage.CopyPicture
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position

Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572

- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:


- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557

- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Example:**

```
dim DestImage As PictureMBS
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500
```

```
dim UseColours as Boolean = false
dim ForeColour as color = &cFF0000

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,UseColours,ForeColour) then
window1.Backdrop=DestImage.CopyPicture
end if
```

**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:


- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from one picture into another picture with some options.
**Notes:** Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557

- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558
- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean 16574


### 109.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean

MBS Images Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines picture with mask and background color.
See also:

- 109.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16554
- 109.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16557
- 109.2.31 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16558

- 109.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16561
- 109.2.33 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16562
- 109.2.34 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean 16564
- 109.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean 16567
- 109.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean 16568
- 109.2.37 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean 16570
- 109.2.38 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean 16572


### 109.2.40 CompareImages(other as PictureMBS) as Int64

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two pictures.
**Example:**

```
dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

// fill random
p.FillRectRandom

dim q as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

// copy pixels
call q.CopyPixels(p, 0, 0, 1000, 1000, 0, 0)
q.FillRect(0,0,10,10,0) // fill 100 pixels

// show image
Backdrop = q.CopyPicture

// and compare
```

```
Title = str(p.CompareImages(q)) // shows 100
```

**Notes:** Returns -1 if both pictures are not from the same structure. (e.g. compare gray with RGB)
Else returns the number of different pixels.

### 109.2.41 Constructor(Buf as MemoryBlock, width as Integer, height as Integer, ImageFormat as Integer, RowSize as Integer)

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a PictureMBS object based on a memoryblock.
See also:


- 109.2.42 Constructor(pic as picture, UseAlpha as boolean=false) 16576
- 109.2.43 Constructor(width as Integer, height as Integer, ImageFormat as Integer) 16577
- 109.2.44 Constructor(width as Integer, height as Integer, ImageFormat as Integer, BlockSize as Int64, FilePath as folderitem) 16578


### 109.2.42 Constructor(pic as picture, UseAlpha as boolean=false)

MBS Images Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** Creates a PictureMBS which shares memory with the given picture.
**Example:**

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

canvas1.Backdrop = p

// create PictureMBS
dim pic as new PictureMBS(p, true)
dim mask as new PictureMBS(p.mask)

// draw mask into alpha channel
call pic.AlphaChannel.CopyPixels(mask,0,0,mask.Width,mask.Height,0,0)
```

```
// and copy back to Xojo picture
canvas2.Backdrop = pic.CopyPictureWithMask
```

**Notes:** All drawings in the Picture and in the PictureMBS object will be visible in both objects.
This function works on Mac OS and Windows with both 24 bit and 32 bit pictures.
On Mac this function can fail if the picture is not a GWorld (Bitmap) picture.

The Valid property is set to true on success.

If you set UseAlpha=True, the 4th channel in a 32 bit picture is available for you as an alpha channel. Xojo does not use the 4th channel in the picture data and 24 bit pictures do not have one. So you can use 32 bit pictures, copy the pictures mask in the alpha channel (using PictureMBS.AlphaChannel. inverting may be needed), perform some operations and later make a copy of the of the image to a picture and extract the alpha channel back into the pictue's mask.

Added support for Console/Web targets in 12.2 plugins. Please be aware that alpha channel of pictures with alpha channel has only a range from 0 to 127 for the values.
See also:

- 109.2.41 Constructor(Buf as MemoryBlock, width as Integer, height as Integer, ImageFormat as Integer, RowSize as Integer) 16576
- 109.2.43 Constructor(width as Integer, height as Integer, ImageFormat as Integer) 16577
- 109.2.44 Constructor(width as Integer, height as Integer, ImageFormat as Integer, BlockSize as Int64, FilePath as folderitem) 16578

### 109.2.43 Constructor(width as Integer, height as Integer, ImageFormat as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object with the given size and Imageformat.
**Notes:** ImageFormat must be one of the ImageFormat constants.
The Valid property is set to true on success.

The constructor allocated address space for the image.
Physical memory is allocated based on write access to pixels.
See also:

- 109.2.41 Constructor(Buf as MemoryBlock, width as Integer, height as Integer, ImageFormat as Integer, RowSize as Integer) 16576

- 109.2.42 Constructor(pic as picture, UseAlpha as boolean=false) 16576
- 109.2.44 Constructor(width as Integer, height as Integer, ImageFormat as Integer, BlockSize as Int64, FilePath as folderitem) 16578


### 109.2.44 Constructor(width as Integer, height as Integer, ImageFormat as Integer, BlockSize as Int64, FilePath as folderitem)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a PictureMBS object using virtual memory.
**Example:**

```
dim mm as int64 = Picturembs.CalculateMemory(7000, 150000, PictureMBS.ImageFormatRGB)
// shows that this size needs 3 GB in memory

// create image
dim blocksize as Integer = 100*1024*1024
dim file as FolderItem = GetTemporaryFolderItem
dim pic as new PictureMBS(7000, 150000, PictureMBS.ImageFormatRGB, blocksize, file)

// draw dots on it
for x as Integer = 0 to pic.Width step 500
for y as Integer = 0 to pic.Height step 500
pic.FillRect(x, y, 100, 100, 175)
next
next

// write to tiff
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim t as TiffPictureMBS

if pic <>nil then
t = new TiffPictureMBS

if t.Create(F) then

const PLANARCONFIG_CONTIG = 1
const PHOTOMETRIC_RGB = 2
const FILLORDER_MSB2LSB = 1
const RESUNIT_INCH = 2
const ORIENTATION_TOPLEFT = 1
const COMPRESSION_LZW = 5

t.Height = pic.Height
t.Width = pic.Width

t.RowsPerStrip = 1
```

```
t.PlanarConfig = PLANARCONFIG_CONTIG
t.Photometric = PHOTOMETRIC_RGB
t.BitsPerSample = 8
t.SamplesPerPixel = 3
t.FillOrder = FILLORDER_MSB2LSB
t.Orientation = ORIENTATION_TOPLEFT
t.ResolutionUnit = RESUNIT_INCH
t.VerticalResolution = 72.0
t.HorizontalResolution = 72.0
t.Compression = COMPRESSION_LZW

for i as Integer = 0 to t.Height - 1
dim m as MemoryBlock = pic.RowInFormat(i, PictureMBS.ImageFormatRGB)
t.Scanline(i) = m

next

t.Close
end if
else

end if

// cleanup
pic = nil
file.delete
```

**Notes:** The size of this image is limited to available hard disc space.
The system will cache this data in memory to avoid writing it to disc. Using picture sizes bigger than physical memory can result into slow processing.

FilePath points to the location where the file is created.
On Windows the FilePath can be nil in which space in the system swapfile is used.
On Mac/Linux with nil FilePath, we use automatically a temp file path.

BlockSize specifies how many bytes of memory should be used in application memory space. A typical value may be 100 mega bytes.

The Valid property is set to true on success.
File is deleted in destructor and folderitem is than invalid.
See also:

- 109.2.41 Constructor(Buf as MemoryBlock, width as Integer, height as Integer, ImageFormat as Integer, RowSize as Integer) 16576

- 109.2.42 Constructor(pic as picture, UseAlpha as boolean=false) 16576
- 109.2.43 Constructor(width as Integer, height as Integer, ImageFormat as Integer) 16577


### 109.2.45 CopyMask as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the alpha channel into a mask picture.
**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).
Works for all pictures with alpha channel.
See also:


- 109.2.46 CopyMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture 16580


### 109.2.46 CopyMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the given area of the alpha channel into a mask picture.
**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).
Works for all pictures with alpha channel.
See also:


- 109.2.45 CopyMask as picture 16580


### 109.2.47 CopyPicture as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the RGB channels or the gray channel into a picture.
**Example:**

```
// get some picture
dim logo as Picture = LogoMBS(500)

// create PictureMBS
dim rgb as new PictureMBS(logo)

// Create a gray picture and copy RGB to gray
dim g as new PictureMBS(500, 500, PictureMBS.ImageFormatG)
```

```
call g.CopyPixels(rgb)

// Create CMYK and fill cyan channel with grayscale image
dim cmyk as new PictureMBS(500, 500, PictureMBS.ImageFormatCMYK)
call cmyk.MagentaChannel.CopyPixels(g)

// display it
Backdrop = cmyk.CopyPicture
```

**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

- 109.2.48 CopyPicture(x as Integer, y as Integer, w as Integer, h as Integer) as picture 16581

### 109.2.48 CopyPicture(x as Integer, y as Integer, w as Integer, h as Integer) as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the RGB channels or the gray channel in the given area into a picture.
**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

- 109.2.47 CopyPicture as picture 16580

### 109.2.49 CopyPictureWithAlpha as picture

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies picture with alpha.
**Notes:** Returns a picture with HasAlphaChannel = true.
See also:

- 109.2.50 CopyPictureWithAlpha(x as integer, y as integer, w as integer, h as integer) as picture 16582

### 109.2.50 CopyPictureWithAlpha(x as integer, y as integer, w as integer, h as integer) as picture

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies picture in rectangle with alpha.
**Notes:** Returns a picture with HasAlphaChannel = true.
See also:

- 109.2.49 CopyPictureWithAlpha as picture 16581

### 109.2.51 CopyPictureWithMask as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture with mask.
**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

- 109.2.52 CopyPictureWithMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture 16582

### 109.2.52 CopyPictureWithMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the picture with mask in the given area.
**Notes:** Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

- 109.2.51 CopyPictureWithMask as picture 16582

### 109.2.53 CopyPixels(source as PictureMBS) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies all pixels from the source picture to the current picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
// create new picture:
// can be any image format: ImageFormatRGB, ImageFormatG, ImageFormatBGR, etc.
dim d as new PictureMBS(l.Width, l.Height, PictureMBS.ImageFormatRGB)

if d.CopyPixels(p) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if
```

**Notes:** This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to CMYK
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel

If an alpha channel exists in both images, it is copied.
See also:


- 109.2.54 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) as boolean 16583
- 109.2.55 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) as boolean 16584


### 109.2.54 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from the source picture to the current picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim d as new PictureMBS(700, 700, PictureMBS.ImageFormatRGB)
```

```
if d.CopyPixels(p,100,100,500,500) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if
```

**Notes:** DestWidth and DestHeight specify how many pixels are copied.
DestX/DestY specify the destination position in the current picture.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel
If an alpha channel exists in both images, it is copied.
See also:


- 109.2.53 CopyPixels(source as PictureMBS) as boolean 16583
- 109.2.55 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) as boolean 16584


### 109.2.55 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies pixels from the source picture to the current picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim d as new PictureMBS(700, 700, PictureMBS.ImageFormatRGB)

if d.CopyPixels(p,100,100,500,500,0,0) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if
```

**Notes:** SourceX/SourceY is the position in the source picture.
DestWidth/DestHeight specify how many pixels are copied.
DestX/DestY specify the destination position in the current picture.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel
If an alpha channel exists in both images, it is copied.
See also:

- 109.2.53 CopyPixels(source as PictureMBS) as boolean 16583
- 109.2.54 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) as boolean 16583

### 109.2.56 CreatePictureMBS(width as Integer, height as Integer, ImageFormat as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object.
**Notes:** Returns nil if no factory can create a valid picture.

First the Factory on the current ImageMBS object (self) is asked to create the picture.
Second the global Factory object is asked.
Third the normal PictureMBS constructor is used.
See also:

- 109.2.57 CreatePictureMBS(width as Integer, height as Integer, theImageFormat as Integer) as PictureMBS 16585

### 109.2.57 CreatePictureMBS(width as Integer, height as Integer, theImageFormat as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object.
**Notes:** Returns nil if no factory can create a valid picture.

First the global factory object is asked to create the picture.
Second the normal PictureMBS constructor is used.

See also:

- 109.2.56 CreatePictureMBS(width as Integer, height as Integer, ImageFormat as Integer) as PictureMBS 16585

### 109.2.58 CyanChannel as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cyan channel of a CMYK picture as a new PictureMBS object.
**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.59 DiffuseFilter(dest as PictureMBS, level as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a diffuse filter to the image.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Level must be between 0 and min(width,height).

### 109.2.60 DitherFilter(dest as PictureMBS, matrix as Integer, levels as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the dither filter to the picture.
**Notes:** Use for the matrix parameter one of the Dither* constants.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Levels is a number between 2 and 256 and specifies how many color levels are in the final picture.

Returns nil on any error.

### 109.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16587
- 109.2.63 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16588
- 109.2.64 DrawMaskedPictureApplyMaskRGB(pic as picture, InvertMask as boolean=False) 16588

### 109.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255

Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16587
- 109.2.63 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16588
- 109.2.64 DrawMaskedPictureApplyMaskRGB(pic as picture, InvertMask as boolean=False) 16588

### 109.2.63 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16587
- 109.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16587
- 109.2.64 DrawMaskedPictureApplyMaskRGB(pic as picture, InvertMask as boolean=False) 16588

### 109.2.64 DrawMaskedPictureApplyMaskRGB(pic as picture, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16587
- 109.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16587
- 109.2.63 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16588

### 109.2.65 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.66 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16590

- 109.2.67 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16590
- 109.2.68 DrawMaskedPictureRGB(pic as picture, InvertMask as boolean=False) 16591


### 109.2.66 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:


- 109.2.65 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16589
- 109.2.67 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16590
- 109.2.68 DrawMaskedPictureRGB(pic as picture, InvertMask as boolean=False) 16591


### 109.2.67 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green

Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.65 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16589
- 109.2.66 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16590
- 109.2.68 DrawMaskedPictureRGB(pic as picture, InvertMask as boolean=False) 16591

### 109.2.68 DrawMaskedPictureRGB(pic as picture, InvertMask as boolean=False)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.65 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 16589
- 109.2.66 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 16590
- 109.2.67 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 16590

### 109.2.69 DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the blue channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the blue channel of the picture into the blue channel of the PictureMBS, then first get a PictureMBS object for the blue channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.70 DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16592

### 109.2.70 DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the blue channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the blue channel of the picture into the blue channel of the PictureMBS, then first get a PictureMBS object for the blue channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.69 DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16592

### 109.2.71 DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the green channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the green channel of the picture into the green channel of the PictureMBS, then first get a PictureMBS object for the green channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.72 DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16593

### 109.2.72 DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the green channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the green channel of the picture into the green channel of the PictureMBS, then first get a PictureMBS object for the green channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.71 DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16592

### 109.2.73 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the red channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the red channel of the picture into the red channel of the PictureMBS, then first get a PictureMBS object for the red channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.74 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16593

### 109.2.74 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws the red channel of a picture object into the gray channel of this picture.
**Notes:** If you want to copy the red channel of the picture into the red channel of the PictureMBS, then first get a PictureMBS object for the red channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 109.2.73 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16593

### 109.2.75 DrawPictureRGB(pic as picture)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

- 109.2.76 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer) 16594
- 109.2.77 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16595
- 109.2.78 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16595

### 109.2.76 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer)

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

- 109.2.75 DrawPictureRGB(pic as picture) 16594
- 109.2.77 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16595
- 109.2.78 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16595

### 109.2.77 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

- 109.2.75 DrawPictureRGB(pic as picture) 16594
- 109.2.76 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer) 16594
- 109.2.78 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) 16595

### 109.2.78 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Draws a picture into this PictureMBS object.
**Notes:** Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

- 109.2.75 DrawPictureRGB(pic as picture) 16594
- 109.2.76 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer) 16594

- 109.2.77 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) 16595


### 109.2.79 EngraveFilter(dest as PictureMBS, level as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies an engrave filter to the image.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Level must be between 0 and min(width,height).

Returns nil on any error.

### 109.2.80 FillRect(value as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRect(200)
window1.Backdrop = p.CopyPicture
```

**Notes:** All channels are filled with the given value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:


- 109.2.81 FillRect(Value as integer, Alpha as Integer) 16596
- 109.2.82 FillRect(x as Integer, y as Integer, width as Integer, height as Integer, value as Integer) 16597
- 109.2.83 FillRect(x as integer, y as integer, width as integer, height as integer, Value as integer, Alpha as Integer) 16597


### 109.2.81 FillRect(Value as integer, Alpha as Integer)

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Notes:** All channels are filled with the given value and alpha channel (if exists) with the alpha value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.80 FillRect(value as Integer) 16596
- 109.2.82 FillRect(x as Integer, y as Integer, width as Integer, height as Integer, value as Integer) 16597
- 109.2.83 FillRect(x as integer, y as integer, width as integer, height as integer, Value as integer, Alpha as Integer) 16597

### 109.2.82 FillRect(x as Integer, y as Integer, width as Integer, height as Integer, value as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRect(10, 10, 20, 20, 200)
window1.Backdrop = p.CopyPicture
```

**Notes:** All channels are filled with the given value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.80 FillRect(value as Integer) 16596
- 109.2.81 FillRect(Value as integer, Alpha as Integer) 16596
- 109.2.83 FillRect(x as integer, y as integer, width as integer, height as integer, Value as integer, Alpha as Integer) 16597

### 109.2.83 FillRect(x as integer, y as integer, width as integer, height as integer, Value as integer, Alpha as Integer)

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Notes:** All channels are filled with the given value and alpha channel (if exists) with the alpha value.
The range of value is 0 to 255.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:


- 109.2.80 FillRect(value as Integer) 16596
- 109.2.81 FillRect(Value as integer, Alpha as Integer) 16596
- 109.2.82 FillRect(x as Integer, y as Integer, width as Integer, height as Integer, value as Integer) 16597


### 109.2.84 FillRectApply(FillColor as color, alpha as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color with using alpha.
**Example:**

```
dim p as new PictureMBS(300, 300, PictureMBS.ImageFormatRGB)

p.FillRectRGB &cFF0000

call p.FillRectApply 0, 0, 50, 100, &c00FF00, 0
call p.FillRectApply 50, 0, 50, 100, &c00FF00, 255*1/5
call p.FillRectApply 100, 0, 50, 100, &c00FF00, 255*2/5
call p.FillRectApply 150, 0, 50, 100, &c00FF00, 255*3/5
call p.FillRectApply 200, 0, 50, 100, &c00FF00, 255*4/5
call p.FillRectApply 250, 0, 50, 100, &c00FF00, 255*5/5

Backdrop = p.CopyPicture
```

**Notes:** Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:


- 109.2.85 FillRectApply(red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599
- 109.2.86 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) as boolean 16599
- 109.2.87 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599

### 109.2.85 FillRectApply(red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color with using alpha.
**Notes:** Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

- 109.2.84 FillRectApply(FillColor as color, alpha as Integer) as boolean 16598
- 109.2.86 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) as boolean 16599
- 109.2.87 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599

### 109.2.86 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color with using alpha.
**Notes:** Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

- 109.2.84 FillRectApply(FillColor as color, alpha as Integer) as boolean 16598
- 109.2.85 FillRectApply(red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599
- 109.2.87 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599

### 109.2.87 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color with using alpha.
**Notes:** Works with gray and RGB pictures.

The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

- 109.2.84 FillRectApply(FillColor as color, alpha as Integer) as boolean 16598
- 109.2.85 FillRectApply(red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean 16599
- 109.2.86 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) as boolean 16599

### 109.2.88 FillRectRandom

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the pixels with random values.
**Example:**

```
dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

p.FillRectRandom
```

**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.89 FillRectRandom(x as Integer, y as Integer, width as Integer, height as Integer) 16600

### 109.2.89 FillRectRandom(x as Integer, y as Integer, width as Integer, height as Integer)

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the pixels with random values.
**Example:**

```
dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)
p.FillRectRandom(0,0,100,100)
Backdrop = p.CopyPicture
```

**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.88 FillRectRandom 16600

### 109.2.90 FillRectRGB(FillColor as color)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(&cFF0000)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
See also:


- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606


### 109.2.91 FillRectRGB(FillColor as color, alpha as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(&cFF0000, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.

The range of aloha is 0 to 255.
See also:

- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606

### 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(255, 0, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
The ranges of red, green and blue are 0 to 255.
See also:

- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604

- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606


### 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(255, 0, 0, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
The ranges of alpha, red, green and blue are 0 to 255.
See also:


- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606


### 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20,&cFF0000)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
See also:


- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606


### 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20,&cFF0000, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
The range of aloha is 0 to 255.
See also:


- 109.2.90 FillRectRGB(FillColor as color) 16601

- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606


### 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20, 255, 0, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
The ranges of red, green and blue are 0 to 255.
See also:


- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) 16606

### 109.2.97 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills the given area of the picture with the given color.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10, 10, 20, 20, 255, 0, 0, 0)
window1.Backdrop = p.CopyPicture
```

**Notes:** Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
See also:

- 109.2.90 FillRectRGB(FillColor as color) 16601
- 109.2.91 FillRectRGB(FillColor as color, alpha as Integer) 16601
- 109.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer) 16602
- 109.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer) 16603
- 109.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color) 16603
- 109.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) 16604
- 109.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer) 16605

### 109.2.98 GainFilter(dest as PictureMBS, gain as Double, bias as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the gain filter to the picture.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

### 109.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the gamma value of the picture.
**Notes:** If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
See also:


- 109.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS 16607
- 109.2.101 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double) as PictureMBS 16608
- 109.2.102 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double, alphaGamma as Double) as PictureMBS 16608


### 109.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the gamma value of the picture.
**Notes:** If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:


- 109.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS 16607
- 109.2.101 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double) as PictureMBS 16608
- 109.2.102 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double, alphaGamma as Double) as PictureMBS 16608

### 109.2.101 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the gamma value of the picture.
**Notes:** If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For grayscale pictures the gray color is calculated from red, green and blue value.

Returns nil on any error.
See also:

- 109.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS 16607
- 109.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS 16607
- 109.2.102 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double, alphaGamma as Double) as PictureMBS 16608

### 109.2.102 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double, alphaGamma as Double) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the gamma value of the picture.
**Notes:** If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For grayscale pictures the gray color is calculated from red, green and blue value.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

- 109.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS 16607
- 109.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS 16607

- 109.2.101 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double) as PictureMBS 16608

### 109.2.103 GrayChannel as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The gray channel as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.GrayChannel
r.fillrect(100) // fill only gray channel
```

**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.104 GreenChannel as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green channel as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.GreenChannel
r.fillrect(100) // fill only green channel
```

**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.105 HMirror

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the image content horizontally (flip).
**Example:**

```
// get some picture
dim l as Picture = LogoMBS(500)
// create new image
dim p as new PictureMBS(l)
```

```
// mirror
p.HMirror
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.106 Invert

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the image data.
**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.107 Invert(x as Integer, y as Integer, w as Integer, h as Integer) 16611

### 109.2.107 Invert(x as Integer, y as Integer, w as Integer, h as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the image data in the given area.
**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.106 Invert 16611

### 109.2.108 MagentaChannel as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The magenta channel of a CMYK picture as a new PictureMBS object.
**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.109 MapInRows(FirstRow as Integer, LastRow as Integer) as boolean

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maps in given row range.
**Notes:** This function does nothing if given rows are already mapped in.

Fails if range is invalid, image is invalid or mapping is not possible.
Returns true if not a mapped image.

Will resize memory buffer size to be big enough for those rows.

### 109.2.110 MirroredView as PictureMBS

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new PictureMBS object which draws into the existing on, but has all rows vertically mirrored.
**Notes:** So if the new picture draws into the first row, the change will be in the last row of the original picture.

### 109.2.111 Multiply

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies alpha channel of whole picture.
**Notes:** Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

- 109.2.112 Multiply(x as integer, y as integer, width as integer, height as integer) 16612

### 109.2.112 Multiply(x as integer, y as integer, width as integer, height as integer)

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies alpha channel of a rectangle of the picture.
**Notes:** Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

- 109.2.111 Multiply 16612

### 109.2.113 NeonFilter(dest as PictureMBS) as PictureMBS

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a neon filter to the image.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.NeonFilter(nil)
window1.Backdrop = p.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.114 OilFilter(dest as PictureMBS, levels as Integer, range as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a oil filter to the image.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.OilFilter(nil,5,5)
window1.Backdrop = p.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Levels must be between 0 and 256.
Range must be between 0 and min(width,height).

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.115 RawRow(index as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with the data of this row.
**Example:**

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RawRow(10)
// modify directly
m.FillBytesMBS(10,100,200)
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** This memoryblock is pointing to the original data, so any modification is applied to the picture.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.

For pictures using virtual memory, this memoryblock can become invalid for the next call to any PictureMBS method!

### 109.2.116 RawRowPtr(index as Integer) as Ptr

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a Ptr pointing to the data of this row.
**Notes:** This ptr is pointing to the original data, so any modification is applied to the picture.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.

For pictures using virtual memory, this ptr can become invalid for the next call to any PictureMBS method!

### 109.2.117 RedChannel as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red channel as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.RedChannel
```

```
r.fillrect(100) // fill only red channel
```

**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.118 RGBChannels as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RGB channels as a new PictureMBS object.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGBA)
dim r as PictureMBS = p.RGBChannels
r.fillrect(100) // fill only color channels
```

**Notes:** Returns nil if the image is not a RGB picture.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the RGB pixels directly without modifying an alpha channel
The resulting PictureMBS object is a RGB picture.

### 109.2.119 RGBToGray(mode as Integer = 0) as boolean

MBS Images Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Turns picture into grayscale.
**Notes:** Only for RGB pictures and picture stays RGB, but all channels have same color.
Returns true on success and false on failure.

Modes:

| | | |
|---|---|---|
| 0 | y = 0.33 * R + 0.5 * G + 0.16 * B | Faster version of 3 |
| 1 | y = 0.375 * R + 0.5 * G + 0.125 * B | Faster version of 3 |
| 2 | y = 0.2126 * R + 0.7152 * G + 0.0722 * B | Photometric/digital ITU-R |
| 3 | y = 0.299 * R + 0.587 * G + 0.114 * B | Digital CCIR601 |
| 4 | y = 0.300 * R + 0.588 * G + 0.112 * B | Faster version of 3 |

Mode 2 and 3 uses doubles and mode 0, 4 and 1 use integers so they should be faster.

Still Mode 0 and 1 are just approximation formulas which trade accuracy for perfomance.

e.g. a red pixel (FF0000) will turn to 555555 in Mode 0, 5F5F5F in Mode 1, 363636 in Mode 2 and 4C4C4C in Mode 3 and 4.

### 109.2.120 Rotate(angle as Double, Red as Integer = 0, Green as Integer = 0, Blue as Integer = 0, Alpha as Integer = 0, Gray as Integer = 0, Cyan as Integer = 0, Magenta as Integer = 0, Yellow as Integer = 0, Black as Integer = 0) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by the given degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate(30, 255, 255, 255, 255, 255)
window1.Backdrop = p.CopyPicture
```

**Notes:** With Red, Blue, Green, Alpha and Gray specify the color of the fill color.

If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.121 Rotate180

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 180 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.Rotate180
window1.Backdrop = p.CopyPicture
```

**Notes:** Same as HMirror and VMirror together.

There are two Rotate180 methods. One makes a copy and one not. This one does not make a copy.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.122 Rotate180(dest as PictureMBS=nil) as PictureMBS 16617

### 109.2.122 Rotate180(dest as PictureMBS=nil) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 180 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate180
window1.Backdrop = p.CopyPicture
```

**Notes:** If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture.

Same as HMirror and VMirror together.

There are two Rotate180 methods. One makes a copy and one not. This one does make a copy.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 109.2.121 Rotate180 16616

### 109.2.123 Rotate270(dest as PictureMBS=nil) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 270 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate270
window1.Backdrop = p.CopyPicture
```

**Notes:** If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.124 Rotate270slow(dest as PictureMBS=nil) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 270 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate270slow
window1.Backdrop = p.CopyPicture
```

**Notes:** If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.125 Rotate90(dest as PictureMBS=nil) as PictureMBS

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 90 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate90
window1.Backdrop = p.CopyPicture
```

**Notes:** If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.126 Rotate90slow(dest as PictureMBS=nil) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates the picture by 90 degree.
**Example:**

```
dim l as Picture = LogoMBS(500)
```

```
dim p as new PictureMBS(l)
p = p.Rotate90slow
window1.Backdrop = p.CopyPicture
```

**Notes:** If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

The Rotate90slow function is the older implementation. Please use Rotate90 unless you need the old behavior.

### 109.2.127 Scale(source as PictureMBS, temp as PictureMBS, mode as Integer, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the picture to the given size.
**Notes:** The final image is stored in the PictureMBS object you call this method on.
On low memory this function can fail or the image may look bad. (e.g. all black)

The size of the temporary picture must have the size of the destination width and the source height. Use ImageFormatScaling when you create the temp image to give it the correct size. Temp picture may not be mapped.

For scaling with the same size as the picture already has, the scaling is still performed.

Returns true on success and false on any error. (e.g. width=0)

Use the constants for the mod:

| | |
|---|---|
| ScaleTriangle | triangle |
| ScaleBox | box, nereast neighbor |
| ScaleLanczos3 | lanczos 3 |
| ScaleLanczos8 | lanczos 8 |
| ScaleMitchell | mitchell |
| ScalePoly3 | poly 3 |
| ScaleCubic | cubic |

This function is optimized for several image formats:
- Gray to Gray.

- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
If an alpha channel exists in both images, it is copied.

### 109.2.128 ScaleFast(source as PictureMBS, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scales the picture to the new size fast.
**Notes:** The final image is stored in the PictureMBS object you call this method on.
Returns true on success and false on failure.

This is a low quality alorithm, but it is fast.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
If an alpha channel exists in both images, it is copied.

### 109.2.129 ScaleMT(threads as Integer, source as PictureMBS, temp as PictureMBS, mode as Integer, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The multithreaded variant of Scale function.
**Notes:** Same as Scale, but with additional multithreading.

Threads parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

If one of the pictures used has IsMapping = true, the plugin calls Scale() function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 109.2.130 SolarizeFilter(dest as PictureMBS) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the solarize filter to the picture.
**Example:**

```
// get some picture
dim l as Picture = LogoMBS(500)
// create new image
dim p as new PictureMBS(l)
// add filter
p = p.SolarizeFilter(nil)
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.131 StampFilter(dest as PictureMBS, radius as Double, threshold as Double, softness as Double, Black as Color, White as Color) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the stamp filter to the picture.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray and RGB pictures and supports alpha channel.

### 109.2.132 TransferFilter(dest as PictureMBS, gray() as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers a picture to another picture by looking up each pixel value in the given array.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

dim gray(256) as Integer

for i as Integer = 0 to 255
gray(i)=255-i // invert
next

// inverts the picture
dim d as PictureMBS = p.TransferFilter(nil,gray)

Backdrop = d.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The array for gray must have 256 entries starting with index 0.
For RGB pictures the gray array is used for all three channels.

Returns nil on any error.
See also:

- 109.2.133 TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS 16622
- 109.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS 16623
- 109.2.135 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS 16624

### 109.2.133 TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers a picture to another picture by looking up each pixel value in the given arrays.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The arrays for gray and alpha must have 256 entries starting with index 0.
For RGB pictures the gray array is used for all three channels.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:


- 109.2.132 TransferFilter(dest as PictureMBS, gray() as Integer) as PictureMBS 16622
- 109.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS 16623
- 109.2.135 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS 16624


### 109.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers a picture to another picture by looking up each pixel value in the given arrays.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

dim red(256) as Integer
dim green(256) as Integer
dim blue(256) as Integer

for i as Integer = 0 to 255
red(i)=i
green(i)=i
blue(i)=255-i // invert blue
next

dim d as PictureMBS = p.TransferFilter(nil,red,green,blue)

Backdrop = d.CopyPicture
```

**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The arrays for red, green and blue must have 256 entries starting with index 0.
For grayscale pictures the green array is used for the gray channel.

Returns nil on any error.
See also:

- 109.2.132 TransferFilter(dest as PictureMBS, gray() as Integer) as PictureMBS 16622
- 109.2.133 TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS 16622
- 109.2.135 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS 16624

### 109.2.135 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Transfers a picture to another picture by looking up each pixel value in the given arrays.
**Notes:** if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The arrays for red, green, blue and alpha must have 256 entries starting with index 0.
For grayscale pictures the green array is used for the gray channel.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

- 109.2.132 TransferFilter(dest as PictureMBS, gray() as Integer) as PictureMBS 16622
- 109.2.133 TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS 16622
- 109.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS 16623

### 109.2.136 Unmultiply

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Un-multiplies alpha channel for whole picture.
**Notes:** Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

- 109.2.137 Unmultiply(x as integer, y as integer, width as integer, height as integer) 16625

### 109.2.137 Unmultiply(x as integer, y as integer, width as integer, height as integer)

MBS Images Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Un-multiplies alpha channel for given rectangle in picture.
**Notes:** Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

- 109.2.136 Unmultiply 16624

### 109.2.138 UnsharpFilter(origpixels as PictureMBS, Amount as Double, Threshold as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the unsharp filter.
**Notes:** You may want to run the BoxBlur filter first before using the unsharp filter.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.139 VMirror

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the image content vertically.
**Example:**

```
// get some picture
dim l as Picture = LogoMBS(500)
// create new image
dim p as new PictureMBS(l)
// mirror
p.VMirror
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** Works with Gray, RGB and CMYK pictures and supports alpha channel.

### 109.2.140 YellowChannel as PictureMBS

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The yellow channel of a CMYK picture as a new PictureMBS object.
**Notes:** Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

### 109.2.141 Properties

### 109.2.142 AlphaOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the alpha channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.AlphaOffset)
```

**Notes:** (Read and Write property)

### 109.2.143 BitsPerComponent as Integer

MBS Images Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bits per component.

**Notes:** Value is 8 for most pictures except those with format ImageFormatGray16 which use 16.
(Read only property)

### 109.2.144 BlackOffset as Integer

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the black channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.BlackOffset)
```

**Notes:** (Read only property)

### 109.2.145 BlueOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.BlueOffset)
```

**Notes:** (Read and Write property)

### 109.2.146 Channel as String

MBS Images Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the channel.
**Example:**

```
dim p as new Picture(100,100,32)
dim q as new PictureMBS(p)

dim channels() as string = q.Channels

dim cr as PictureMBS = q.RedChannel
```

```
dim cg as PictureMBS = q.GreenChannel
dim cb as PictureMBS = q.BlueChannel
dim c0 as pictureMBS = q.Channel(0)
dim c1 as pictureMBS = q.Channel(1)
dim c2 as pictureMBS = q.Channel(2)

dim crn as string = cg.Channel
dim cgn as string = cg.Channel
dim cbn as string = cg.Channel
dim c0n as string = c0.Channel
dim c1n as string = c1.Channel
dim c2n as string = c2.Channel

Break // check in debugger
```

**Notes:** For pictures which represent a channel of a bigger picture.
(Read only property)
See also:

- 109.2.18 Channel(index as Integer) as PictureMBS 16550

### 109.2.147 ChannelCount as Integer

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of channels in this picture.
**Notes:** 1 for gray, 2 for gray+alpha, 3 for RGB, 4 for RGB+alpha or CMYK and 5 for CMYK+alpha.
(Read only property)

### 109.2.148 CyanOffset as Integer

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the cyan channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.CyanOffset)
```

**Notes:** (Read only property)

### 109.2.149 DebugPicture as Picture

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture content to view in the debugger.
**Notes:** If DebugPictureEnabled is set to true iny our code you can use the DebugPicture property to watch the picture content in the debugger. For speed reasons the size of the debug picture is limited to 512 by 512 pixels. (that could be increased)
(Read only property)

### 109.2.150 DebugPictureEnabled as Boolean

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want to use the DebugPicture property.
**Notes:** If DebugPictureEnabled is set to true iny our code you can use the DebugPicture property to watch the picture content in the debugger. For speed reasons the size of the debug picture is limited to 512 by 512 pixels. (that could be increased)
(Read and Write property)

### 109.2.151 Factory as PictureFactoryMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The local factory to be used for pictures created in this picture.
**Notes:** If one of the functions in this PictureMBS instance needs a new PictureMBS object, this factory is asked first.
(Read and Write property)

### 109.2.152 FilePath as String

MBS Images Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file path to temporary file.
**Notes:** Only set when we have one, e.g. using mapped memory.
(Read only property)

### 109.2.153 GrayOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the gray channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatAG)
MsgBox str(p.GrayOffset)
```

**Notes:** (Read and Write property)

### 109.2.154 GreenOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the green channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.GreenOffset)
```

**Notes:** (Read and Write property)

### 109.2.155 HasAlpha as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has an alpha channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.HasAlpha)
```

**Notes:** (Read only property)

### 109.2.156 HasBlack as Boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasBlack)
```

**Notes:** (Read only property)

### 109.2.157 HasBlue as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasBlue)
```

**Notes:** (Read only property)

### 109.2.158 HasCyan as Boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasCyan)
```

**Notes:** (Read only property)

### 109.2.159 HasGray as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a gray channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.HasGray)
```

**Notes:** (Read only property)

### 109.2.160 HasGreen as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a green channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasGreen)
```

**Notes:** (Read only property)

### 109.2.161 HasMagenta as Boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasMagenta)
```

**Notes:** (Read only property)

### 109.2.162 HasRed as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
```

```
dim p as new PictureMBS(l)
MsgBox str(p.HasRed)
```

**Notes:** (Read only property)

### 109.2.163 HasYellow as Boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture has a blue channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasYellow)
```

**Notes:** (Read only property)

### 109.2.164 Height as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture in pixels.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Height)
```

**Notes:** (Read only property)

### 109.2.165 ImageFormat as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The image format of this picture object.
**Example:**

```
dim l as Picture = LogoMBS(500)
```

```
dim p as new PictureMBS(l)
MsgBox str(p.ImageFormat)
```

**Notes:** See the ImageFormat* constants.
(Read only property)

### 109.2.166 ImageFormatString as String

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The format of this picture as a string.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox p.ImageFormatString
```

**Notes:** Returns for example "RGB" for ImageFormatRGB.
(Read only property)

### 109.2.167 IsCMYK as Boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture is a CMYK picture.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.IsCMYK)
```

**Notes:** HasCyan, HasMagenta, HasYellow and HasBlack are true if IsRGB is true.
(Read only property)

### 109.2.168 IsGray as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this picture is a grayscale picture.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.IsGray)
```

**Notes:** HasGray is true if IsGray is true.
(Read only property)

### 109.2.169 IsMapping as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this picture uses virtual memory.
**Notes:** If IsMapping is true you should not use the Memory property or the Clone function.
(Read only property)

### 109.2.170 IsRGB as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the picture is a RGB picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.IsRGB)
```

**Notes:** HasRed, HasBlue and HasGreen are true if IsRGB is true.
(Read only property)

### 109.2.171 MagentaOffset as Integer

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the magenta channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.MagentaOffset)
```

**Notes:** (Read only property)

### 109.2.172 MappingBlockSize as Int64

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The block size for a picture using virtual memory.
**Notes:** (Read and Write property)

### 109.2.173 MappingFirstRow as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** First row mapped in memory.
**Notes:** Only for mapped images.
Value is -1 if no data is mapped in.
(Read only property)

### 109.2.174 MappingLastRow as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last row mapped in memory.
**Notes:** Only for mapped images.
Value is -1 if no data is mapped in.
(Read only property)

### 109.2.175 MappingRows as Integer

MBS Images Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of rows for mapping.
**Notes:** For a mapped image how many rows fit in the mapping buffer.
(Read only property)

### 109.2.176 Memory as Memoryblock

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock without size pointing to the current pixel buffer.
**Notes:** Use only if IsMapping is false.

If size is -1, it's a memoryblock referencing the pixel data.
If size is >0, you got the original memoryblock used to allocate the memory.
(Read only property)

### 109.2.177 MemoryTarget as Memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If this picture stores its pixels in a memoryblock, you can access the memory block using this property.
**Notes:** (Read only property)

### 109.2.178 Parent as PictureMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent PictureMBS object.
**Notes:** One PictureMBS can reference the pixels of another PictureMBS. The parent is referenced in this property so it is not released.
(Read only property)

### 109.2.179 PixelSize as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of a pixel in bytes.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.PixelSize)
```

**Notes:** For example:
1 for Gray
2 for Gray with Alpha
3 for RGB
4 for RGB with Alpha
(Read only property)

### 109.2.180 RedOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the red channel.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.RedOffset)
```

**Notes:** (Read and Write property)

### 109.2.181 RowOffset as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal row offset.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim q as PictureMBS = p.ClipImage(10,10,80,80)

MsgBox str(q.width)+" x "+str(q.height)+" with row offset: "+str(q.RowOffset)
```

**Notes:** Only used with clipping images.
(Read only property)

### 109.2.182 RowSize as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of one row in bytes.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.RowSize)
```

**Notes:** Additional bytes may be needed per row for better alignment of the data.

Also using virtual memory functions requires alignment.
(Read only property)

### 109.2.183 Target as Picture

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The target picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

window1.Backdrop = p.Target
```

**Notes:** if this PictureMBS references the pixels of a Xojo picture, this property keeps a reference to this target picture.
(Read only property)

### 109.2.184 TotalSize as Int64

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total size of this picture in bytes.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

MsgBox str(p.TotalSize)
```

**Notes:** The result is Height*RowSize.
(Read only property)

### 109.2.185 UnclippedHeight as Integer

MBS Images Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture in pixels.
**Notes:** Without clipping, the full height of the image.

(Read only property)

### 109.2.186 Valid as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this instance is a valid picture.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Valid)
```

**Notes:** Valid is false if the constructor failed to create a picture.
(Read only property)

### 109.2.187 Width as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture in pixels.
**Example:**

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Width)
```

**Notes:** (Read only property)

### 109.2.188 YellowOffset as Integer

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal offset for pixels in the yellow channel.
**Example:**

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.YellowOffset)
```

**Notes:** (Read only property)

### 109.2.189 YieldTicks as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim p as PictureMBS // your picture

p.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

### 109.2.190 DataStringInFormat(ImageFormat as Integer) as string

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of this picture as a string.
**Notes:** Strings are limit to 2 GB, but the actual limit is certainly smaller.

You can get and set the image data with this method in the native format.
If you set the data, use a string with at least RowSize bytes.
If you query the data, you will get a copy of the data bytes in a string.
Returns "" on any error.
May raise OutOfBoundsException for invalid index.

Version 18.1 or later will raise an out of memory exception for 32-bit applications if the memory needed will exceed 2 GB in memory. Allocating that many memory will be impossible.
(Read and Write computed property)

### 109.2.191 Row(index as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A memoryblock with the data of this row.
**Example:**

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.Row(10)
// modify
m.FillBytesMBS(10,100,200)
// copy back
p.row(10)=m
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** You can get and set a row with this method in the native format.
If you set the row, use a memoryblock with at least RowSize bytes.
If you query the row, you will get a copy of the row bytes in a new memoryblock.
Returns "" on any error.
May raise OutOfBoundsException for invalid index.
(Read and Write computed property)

### 109.2.192 RowInFormat(index as Integer, ImageFormat as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A memoryblock with the data of this row in the format you request.
**Example:**

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RowInFormat(10, p.ImageFormatRofRGB)
// modify
m.FillBytesMBS(10,80,200)
// copy back
p.RowInFormat(10, p.ImageFormatRofRGB)=m
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** You can get and set a row with this method in the given format.
If you set the row, use a memoryblock with at least Width*PixelSize bytes. PixelSize is the format dependend size in bytes for one pixel.
If you query the row, you will get a copy of the row bytes in a new memoryblock.

Returns nil on any error.
May raise OutOfBoundsException for invalid index.
(Read and Write computed property)
See also:

- 109.2.193 RowInFormat(index as Integer, ImageFormat as Integer, InvertAlpha as boolean) as memoryblock 16643

### 109.2.193 RowInFormat(index as Integer, ImageFormat as Integer, InvertAlpha as boolean) as memoryblock

MBS Images Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A memoryblock with the data of this row in the format you request.
**Example:**

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RowInFormat(10, p.ImageFormatRGB, true)
// modify
m.FillBytesMBS(10,80,200)
// copy back
p.RowInFormat(10, p.ImageFormatRGB, true)=m
// show in window
window1.Backdrop = p.CopyPicture
```

**Notes:** You can get and set a row with this method in the given format.
If you set the row, use a memoryblock with at least Width*PixelSize bytes. PixelSize is the format dependend size in bytes for one pixel.
If you query the row, you will get a copy of the row bytes in a new memoryblock.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.
If InvertAlpha is true, the alpha values are inverted by using A=255-A.
(Read and Write computed property)
See also:

- 109.2.192 RowInFormat(index as Integer, ImageFormat as Integer) as memoryblock 16642

### 109.2.194 RowStringInFormat(index as Integer, ImageFormat as Integer) as string

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The row as a string.

**Notes:** You can get and set a row with this method in the native format.
If you set the row, use a memoryblock with at least RowSize bytes.
If you query the row, you will get a copy of the row bytes in a string.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.
(Read and Write computed property)

### 109.2.195 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| Dither90Halftone6x6Matrix | 5 | One of the dither modes for the DitherFilter method. |
| DitherCluster3Matrix | 8 | One of the dither modes for the DitherFilter method. |
| DitherCluster4Matrix | 9 | One of the dither modes for the DitherFilter method. |
| DitherCluster8Matrix | 10 | One of the dither modes for the DitherFilter method. |
| DitherLines4x4Matrix | 4 | One of the dither modes for the DitherFilter method. |
| DitherMagic2x2Matrix | 1 | One of the dither modes for the DitherFilter method. |
| DitherMagic4x4Matrix | 2 | One of the dither modes for the DitherFilter method. |
| DitherOrdered4x4Matrix | 3 | One of the dither modes for the DitherFilter method. |
| DitherOrdered6x6Matrix | 6 | One of the dither modes for the DitherFilter method. |
| DitherOrdered8x8Matrix | 7 | One of the dither modes for the DitherFilter method. |
| ScaleBox | 2 | One of the scale modes for the Scale function. |
| ScaleCubic | 7 | One of the scale modes for the Scale function. |
| ScaleLanczos3 | 3 | One of the scale modes for the Scale function. |
| ScaleLanczos8 | 4 | One of the scale modes for the Scale function. |
| ScaleMitchell | 5 | One of the scale modes for the Scale function. |
| ScalePoly3 | 6 | One of the scale modes for the Scale function. |
| ScaleTriangle | 1 | One of the scale modes for the Scale function. |

Image Formats

| Constant | Value | Description |
|---|---|---|
| ImageFormat1of3 | 15 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the first byte with pixelsize=3. |
| ImageFormat1of4 | 18 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the first byte with pixelsize=4. |
| ImageFormat2of3 | 16 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the second byte with pixelsize=3. |
| ImageFormat2of4 | 19 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the second byte with pixelsize=4. |
| ImageFormat3of3 | 17 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the third byte with pixelsize=3. |
| ImageFormat3of4 | 20 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the third byte with pixelsize=4. |
| ImageFormat4of4 | 21 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory.<br>Targets the forth byte with pixelsize=4. |
| ImageFormatABGR | 9 | |
| ImageFormatACMYK | 25 | |
| ImageFormatAG | 13 | |
| ImageFormatAKYMC | 30 | |
| ImageFormatAofABGR | 18 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatAofARGB | 18 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatAofBGRA | 21 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatAofRGBA | 21 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatARGB | 4 | |
| ImageFormatBGR | 6 | |
| ImageFormatBGRA | 7 | |
| ImageFormatBGRX | 8 | |
| ImageFormatBofABGR | 19 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBofARGB | 21 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBofBGR | 15 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBofBGRA | 18 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBofRGB | 17 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBofRGBA | 20 | This is the imageformat to use if you target only a gray channel in a RGB picture in memory. |
| ImageFormatBuffer | 22 | This format is for PixelSize = 1 and no channels. |
| ImageFormatCMYK | 23 | |
| ImageFormatCMYKA | 24 | |
| ImageFormatCMYKX | 26 | |
| ImageFormatG | 11 | |
| ImageFormatG1 | 11 | One gray channel. |
| ImageFormatG2 | 42 | Two gray channels. |
| ImageFormatG3 | 43 | Three gray channels. |
| ImageFormatG4 | 44 | Four gray channels. |

# Chapter 110

# Launch Services

## 110.1 class LaunchServicesApplicationListMBS

### 110.1.1 class LaunchServicesApplicationListMBS

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** A class for a list of folderitems.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.4pr2

### 110.1.2 Methods

### 110.1.3 Constructor

MBS MacOSX Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 110.1.4 Item(index as Integer) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Returns an item of this list.
**Notes:** Index goes from 0 to count-1.

### 110.1.5 Properties

### 110.1.6 Count as Integer

MBS MacOSX Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The number of items inside this list.
**Notes:** (Read and Write property)

## 110.2 class LaunchServicesItemInfoMBS

### 110.2.1 class LaunchServicesItemInfoMBS

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class to represent several details about an application folderitem.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 110.2.2 Methods

### 110.2.3 close

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 110.2.4 Properties

### 110.2.5 AppIsScriptable as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Whether the application can be scripted.
**Notes:** (Read only property)

### 110.2.6 AppPrefersClassic as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Item is an application that can run either natively or in the Classic emulation environment, but prefers to be launched in the Classic environment.
**Notes:** This flag is valid only when kLSItemInfoIsNativeApp is set.
(Read only property)

### 110.2.7 AppPrefersNative as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Item is an application that can run either natively or in the Classic emulation environment, but prefers to be launched natively.
**Notes:** This flag is valid only when kLSItemInfoIsNativeApp is set.
(Read only property)

### 110.2.8 Extension as String

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The extension for the folderitem.
**Notes:** You need to specify the kLSRequestExtension flag to get this information.
(Read only property)

### 110.2.9 ExtensionIsHidden as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** whether the folderitem has a hidden extension.
**Notes:** (Read only property)

### 110.2.10 IconFilename as String

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The optional filename string for the icon of this application.
**Notes:** This property is not be used on 64bit Mac targets.
(Read only property)

### 110.2.11 IsAliasFile as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Whether the folderitem is an alias file (includes sym links)
**Notes:** (Read only property)

### 110.2.12 IsApplication as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The folderitem is a Single-file or packaged application.
**Example:**

```
dim l as LaunchServicesItemInfoMBS
dim f as FolderItem

f=ApplicationsFolderMBS(0).Child("Mail.app")
l=f.LaunchServicesItemInfoMBS(-1)

if l.IsApplication then
MsgBox "Is an application!"
end if
```

**Notes:** This property is filled when kLSRequestBasicFlagsOnly is requested.
(Read only property)

### 110.2.13 IsClassicApp as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The folderitem is a CFM Classic application.
**Notes:** (Read only property)

### 110.2.14 IsContainer as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The fodleritem is a directory (includes packages) or a volume.
**Notes:** (Read only property)

### 110.2.15 IsInvisible as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The folderitem is invisible.
**Notes:** Does not include '.' files or '.hidden' entries.
This property is filled when kLSRequestBasicFlagsOnly is requested.

(Read only property)

### 110.2.16 IsNativeApp as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The application is a Carbon or Cocoa native application.
**Notes:** (Read only property)

### 110.2.17 IsPackage as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** whether the folderitem is an Application, document, or bundle package.
**Example:**

```
dim l as LaunchServicesItemInfoMBS
dim f as FolderItem

f=SpecialFolder.Applications.Child("Mail.app")
l=f.LaunchServicesItemInfoMBS(-1)

if l.IsPackage then
MsgBox "Is a package!"
end if
```

**Notes:** The item is a packaged directory.
This property is filled when kLSRequestBasicFlagsOnly is requested.
(Read only property)

### 110.2.18 IsPlainFile as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** None of the other attributes is true.
**Notes:** The item is not a directory, volume, or symlink.
This property is filled when kLSRequestBasicFlagsOnly is requested.
(Read only property)

### 110.2.19 IsSymlink as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The folderitem is only an UNIX symbolic link.
**Notes:** (Read only property)

### 110.2.20 IsVolume as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The folderitem is a volume.
**Notes:** (Read only property)

### 110.2.21 KindID as Integer

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The kind ID of this folderitem.
**Notes:** This property is not be used on 64bit Mac targets.
(Read only property)

### 110.2.22 MacCreator as String

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The Mac OS creator code.
**Example:**

```
dim f as FolderItem = SpecialFolder.Applications.Child("Firefox.app")

dim l As LaunchServicesItemInfoMBS = f.LaunchServicesItemInfoMBS(&h02)

if l <>nil Then
MsgBox l.MacCreator // shows "MOZB"
end
```

**Notes:** You need to specify the kLSRequestTypeCreator flag to get this information.
(Read only property)

### 110.2.23 MacType as String

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The Mac OS type code.
**Notes:** You need to specify the kLSRequestTypeCreator flag to get this information.
(Read only property)

## 110.3 class LaunchServicesLaunchParameterMBS

### 110.3.1 class LaunchServicesLaunchParameterMBS

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class for parameters which can be used to launch an application.
**Example:**

```
dim f(0) as FolderItem
dim a as FolderItem
dim p as LaunchServicesLaunchParameterMBS

p=new LaunchServicesLaunchParameterMBS

p.Defaults=true
p.Hide=true
f.Append SpecialFolder.Desktop.Child("picture.tiff")

a=LaunchServicesOpenXMBS(f,p)

MsgBox a.Name
```

### 110.3.2 Methods

### 110.3.3 close

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 110.3.4 Properties

### 110.3.5 Application as FolderItem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The application to use to open documents.
**Notes:** (Read and Write property)

### 110.3.6 Defaults as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Default settings should be used.
**Notes:** default means: open, async, use Info.plist, start Classic.
(Read and Write property)

### 110.3.7 DontAddToRecents as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Do not add application or documents to recents menus.
**Notes:** (Read and Write property)

### 110.3.8 DontSwitch as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Don't bring new app to the foreground.
**Example:**

```
dim l as new LaunchServicesLaunchParameterMBS

l.DontSwitch=true

dim files(0) as FolderItem

files(0)=GetFolderItem("/Applications/iTunes.app", FolderItem.PathTypeShell)

call LaunchServicesOpenXMBS(files,l)
```

**Notes:** (Read and Write property)

### 110.3.9 Hide as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Send child a "hide" request as soon as it checks in.
**Notes:** (Read and Write property)

### 110.3.10 HideOthers as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Hide all other apps when child checks in.
**Notes:** (Read and Write property)

### 110.3.11 InClassic as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Force app to launch in Classic environment.
**Notes:** (Read and Write property)

### 110.3.12 InhibitBGOnly as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Causes launch to fail if target is background-only.
**Notes:** (Read and Write property)

### 110.3.13 LastError as Integer

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The last error value from the LaunchServicesOpenXMBS function.
**Notes:** Values for errors:

| | | |
|---|---|---|
| kLSUnknownErr | = -10810 | |
| kLSNotAnApplicationErr | = -10811 | |
| kLSNotInitializedErr | = -10812 | |
| kLSDataUnavailableErr | = -10813 | e.g. no kind string |
| kLSApplicationNotFoundErr | = -10814 | e.g. no application claims the file |
| kLSUnknownTypeErr | = -10815 | |
| kLSDataTooOldErr | = -10816 | |
| kLSDataErr | = -10817 | |
| kLSLaunchInProgressErr | = -10818 | e.g. opening an alreay opening application |
| kLSNotRegisteredErr | = -10819 | |
| kLSAppDoesNotClaimTypeErr | = -10820 | |
| kLSAppDoesNotSupportSchemeWarning | = -10821 | not an error, just a warning |
| kLSServerCommunicationErr | = -10822 | cannot set recent items |
| kLSCannotSetInfoErr | = -10823 | you may not set item info for this item |

(Read and Write property)

### 110.3.14 NewInstance as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Instantiate app even if it is already running.
**Notes:** (Read and Write property)

### 110.3.15 NoParams as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Use Info.plist to determine launch parameters.
**Notes:** (Read and Write property)

### 110.3.16 Print as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Print items instead of opening them.
**Notes:** (Read and Write property)

### 110.3.17 StartClassic as Boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Start up Classic environment if required for this application.
**Notes:** (Read and Write property)

## 110.4 class LaunchServicesStringListMBS

### 110.4.1 class LaunchServicesStringListMBS

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** A class for a list of strings.

### 110.4.2 Methods

### 110.4.3 Item(index as Integer) as string

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** Returns an item of this list.
**Notes:** Index goes from 0 to count-1.

### 110.4.4 Properties

### 110.4.5 Count as Integer

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** The number of items inside this list.
**Notes:** (Read and Write property)

## 110.5 Globals

### 110.5.1 LaunchServicesAllHandlersForURLSchemeMBS(URLScheme as string) as LaunchServicesStringListMBS

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** Returns an array of application bundle identifiers for applications capable of handling the specified URL scheme.
**Example:**

```
dim l as LaunchServicesStringListMBS
dim s(-1) as string
dim i,c as Integer

l=LaunchServicesAllHandlersForURLSchemeMBS("http")
if l<>nil then
c=l.Count-1
for i=0 to c
s.Append l.Item(i)
next

MsgBox Join(s,", ")
end if
```

**Notes:** URL handling capability is determined according to the kCFBundleURLTypes listed in an application's Info.plist).
Returns nil if no handlers are available.

Example output from the code above:
org.videolan.vlc, com.RealNetworks.RealPlayer, org.mozilla.firefox, com.apple.safari, de.icab.iCab, com.microsoft.explorer

Requires Mac OS X 10.4 to work correct. Returns always nil on older systems.

### 110.5.2 LaunchServicesAllRoleHandlersForContentTypeMBS(ContentType as string, role as Integer) as LaunchServicesStringListMBS

MBS MacOSX Plugin, Plugin Version: 6.0, Platform: macOS, Targets: All.

**Function:** Returns an array of application bundle identifiers for applications capable of handling the specified content type (UTI) with the specified role(s).
**Example:**

```
dim l as LaunchServicesStringListMBS
dim s(-1) as string
dim i,c as Integer

const kLSRolesAll=-1

l=LaunchServicesAllRoleHandlersForContentTypeMBS("com.adobe.pdf",kLSRolesAll)
if l<>nil then
c=l.Count-1
for i=0 to c
s.Append l.Item(i)
next

MsgBox Join(s,", ")
end if
```

**Notes:** Application content handling capabilities are determined according to the kCFBundleDocumentTypes listed in an application's Info.plist). For any role, specify kLSRolesAll.
Returns nil if no handlers are available.
Requires Mac OS X 10.4.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

Example output for code above is:
com.adobe.Reader, com.apple.preview, com.adobe.acrobat.reader, com.apple.MDIimporter.PDF

### 110.5.3 LaunchServicesApplicationForInfoMBS(type as string, creator as string, extension as string, role as Integer) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the application used to open items with particular data.
**Example:**

```
MsgBox LaunchServicesApplicationForInfoMBS("","R*ch","txt",-1).name
MsgBox LaunchServicesApplicationForInfoMBS("TEXT","","",-1).name
MsgBox LaunchServicesApplicationForInfoMBS("","","txt",-1).name
```

**Notes:** Consults the binding tables to return the application that would be used to open items with type, creator, and/or extension as provided if they were double-clicked in the Finder. This application will be the default for items like this if one has been set. If no application is known to LaunchServices suitable for opening such items, nil (kLSApplicationNotFoundErr) will be returned. Not all three input parameters can be "" at the same time nor can both output parameters be "" at the same time.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

### 110.5.4 LaunchServicesApplicationForItemMBS(file as folderitem, role as Integer) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return the application used to open an item.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")

Const kLSRolesNone = 1 // no claim Is made about support For this type/scheme
Const kLSRolesViewer = 2 // claim To be able To view this type/scheme
Const kLSRolesEditor = 4 // claim To be able To edit this type/scheme
Const kLSRolesAll = -1 // claim To Do it all

Dim appfile As FolderItem = LaunchServicesApplicationForItemMBS(file, kLSRolesEditor)

// shows Xojo
MsgBox appfile.NativePath
```

**Notes:** Consults the binding tables to return the application that would be used to open the folderitem if it were double-clicked in the Finder. This application will be the user-specified override if appropriate or the default otherwise. If no application is known to LaunchServices suitable for opening this item, nil

(kLSApplicationNotFoundErr) will be returned.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 110.5.5 LaunchServicesCanApplicationAcceptItemMBS(item as folderitem, targetapp as folderitem, role as Integer, flags as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Determine whether an item can accept another item.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")
Dim a As FolderItem = LaunchServicesOpenMBS(file)

Const kLSRolesNone = 1 // no claim Is made about support For this type/scheme
Const kLSRolesViewer = 2 // claim To be able To view this type/scheme
Const kLSRolesEditor = 4 // claim To be able To edit this type/scheme
Const kLSRolesAll = -1 // claim To Do it all

Dim accept As Boolean = LaunchServicesCanApplicationAcceptItemMBS(file, a, kLSRolesEditor, 0)

MsgBox "accept by Xojo: "+Str(accept)
```

**Notes:** Returns whether TargetApp can accept this folderitem as in a drag and drop operation. If role is other than kLSRolesAll then make sure TargetApp claims to fulfill the requested role.

Constants you can use for the role parameter:

Values for the flags:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

| | | |
|---|---|---|
| kLSAcceptDefault | = 1 | |
| kLSAcceptAllowLoginUI | = 2 | show UI to log in if necessary |

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 110.5.6 LaunchServicesDefaultHandlerForURLSchemeMBS(URLScheme as string) as string

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** Returns the bundle identifier of the default handler for the specified URL scheme.
**Example:**

```
MsgBox LaunchServicesDefaultHandlerForURLSchemeMBS("http") // shows here: com.apple.safari
```

**Notes:** Returns "" if no handler is available.
Requires Mac OS X 10.4 to work correct. Returns always "" on older systems.

### 110.5.7 LaunchServicesDefaultRoleHandlerForContentTypeMBS(ContentType as string, role as Integer) as string

MBS MacOSX Plugin, Plugin Version: 6.0, Platform: macOS, Targets: All.

**Function:** Returns the application bundle identifier of the default handler for the specified content type (UTI), in the specified role(s).
**Example:**

```
const type="com.adobe.pdf"
msgbox LaunchServicesDefaultRoleHandlerForContentTypeMBS(type,-1)
```

**Notes:** For any role, specify kLSRolesAll. Returns "" if no handler is available.
Requires Mac OS X 10.4.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

### 110.5.8 LaunchServicesDisplayNameForCFURLMBS(cfurlhandle as Integer) as string

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Get the display name for an url handle.
**Notes:** Return a copy of the display name for an url handle. Takes into consideration whether this item has a hidden extension or not.

Cfurlhandle should be the non 0 value from a CFURL object handle property.

### 110.5.9 LaunchServicesFindApplicationForInfoMBS(creator as string, bundleID as string, name as string) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Locate a specific application.
**Example:**

```
MsgBox LaunchServicesFindApplicationForInfoMBS("prvw","","").Name
MsgBox LaunchServicesFindApplicationForInfoMBS("","com.apple.iTunes","").Name
MsgBox LaunchServicesFindApplicationForInfoMBS("","","Safari.app").Name
```

**Notes:** Returns the application with the corresponding input information. The registry of applications is consulted first in order of bundleID, then creator, then name. All comparisons are case insensitive and 'ties' are decided first by version, then by native vs. Classic.

Parameters can be "". The name of the application must be the name with the extension.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 19.4pr1
- Tip of the day: How to launch Disc Utility?

### 110.5.10 LaunchServicesItemInfoForCFURLMBS(cfurlhandle as Integer, WhichInfo as Integer) as LaunchServicesItemInfoMBS

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Return information about an item.
**Notes:** Returns as much or as little information as requested about the url. Some information is available in a thread-safe manner, some is not.

Cfurlhandle should be the non 0 value from a CFURL object handle property.

Possible values you can combine for the WhichInfo parameter:

| | | |
|---|---|---|
| kLSRequestExtension | = &h01 | Requests the item's filename extension. |
| kLSRequestTypeCreator | = &h02 | Requests the item's file type and creator signature. |
| kLSRequestBasicFlagsOnly | = &h04 | Requests all item-information flags that are not application-specific: that is, all except IsNativeApp, IsClassicApp, AppPrefersNative, AppPrefersClassic and AppIsScriptable. |
| kLSRequestAppTypeFlags | = &h08 | Requests all application-specific item-information flags: that is, IsNativeApp, IsClassicApp, AppPrefersNative, AppPrefersClassic and AppIsScriptable. |
| kLSRequestAllFlags | = &h10 | Requests all item-information flags. |
| kLSRequestIconAndKind | = &h20 | Not used. |
| kLSRequestExtensionFlagsOnly | = &h40 | Requests only the kLSItemInfoExtensionIsHidden item-information flag. |
| kLSRequestAllInfo | = -1 | |

### 110.5.11 LaunchServicesKindStringForCFURLMBS(cfurlhandle as Integer) as string

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Get the kind string for an item.
**Notes:** Returns the kind string as used in the Finder and elsewhere for the given folderitem.

Cfurlhandle should be the non 0 value from a CFURL object handle property.

### 110.5.12 LaunchServicesOpenMBS(item as folderitem) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Open an application, document, or folder.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Test.xojo_binary_project")
Dim a As FolderItem = LaunchServicesOpenMBS(file)
```

MsgBox a.NativePath

**Notes:** Opens applications, documents, and folders. Applications are opened via an 'oapp' or 'rapp' event. Documents are opened in their user-overridden or default applications as appropriate. Folders are opened in the Finder. Use the more specific LaunchServicesOpenXMBS for more control over launching.

Returns a folderitem to the application which was launched.

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 110.5.13 LaunchServicesOpenXMBS(documents() as folderitem, parameter as LaunchServicesLaunchParameterMBS) as folderitem

MBS MacOSX Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Opens an application or one or more documents or folders.
**Example:**

```
// Open a file in Preview (Mac OS X).
Sub OpenWithPreview(f as folderitem)
dim p as FolderItem
dim d(0) as FolderItem
dim r as FolderItem
dim param as LaunchServicesLaunchParameterMBS

// Find preview
p=LaunchServicesFindApplicationForInfoMBS("prvw","com.apple.Preview","Preview.app")

if p<>Nil then
d(0)=f

param=new LaunchServicesLaunchParameterMBS
param.Application=p
param.Defaults=true // just default settings

r=LaunchServicesOpenXMBS(d, param)
if r<>nil then
Return //Success
end if
end if
```

```
// On failure, just launch normally:
f.Launch true
End Sub
```

**Notes:** Opens applications, documents, and folders. Applications are opened via an 'oapp' or 'rapp' event. Documents are opened in their user-overridden or default applications as appropriate. Folders are opened in the Finder.

Returns a folderitem to the application which was launched.
Currently this function is not available to RB versions before 3.5.
Note that the documents parameter is an array of folderitem and not just one.

Upgraded in version 19.5 to use CFURL instead of FSRef APIs.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1

### 110.5.14 LaunchServicesSetDefaultHandlerForURLSchemeMBS(URLScheme as string, BundleID as string) as Integer

MBS MacOSX Plugin, Plugin Version: 6.1, Platform: macOS, Targets: All.

**Function:** Sets the user's preferred handler for the specified URL scheme.
**Example:**

```
dim e as Integer
dim old as string

old=LaunchServicesDefaultHandlerForURLSchemeMBS("http")

MsgBox "Before: "+old

e=LaunchServicesSetDefaultHandlerForURLSchemeMBS("http","com.microsoft.explorer")

MsgBox "LaunchServicesSetDefaultHandlerForURLSchemeMBS: "+str(e)

MsgBox "Between: "+LaunchServicesDefaultHandlerForURLSchemeMBS("http")

e=LaunchServicesSetDefaultHandlerForURLSchemeMBS("http",old)

MsgBox "LaunchServicesSetDefaultHandlerForURLSchemeMBS: "+str(e)

MsgBox "After: "+LaunchServicesDefaultHandlerForURLSchemeMBS("http")
```

**Notes:** Returns Mac OS error code with 0 for success.
The handler is specified as an application bundle identifier.
Requires Mac OS X 10.4 to work correct. Returns always -1 on older systems.

### 110.5.15 LaunchServicesSetDefaultRoleHandlerForContentTypeMBS(ContentType as string, role as Integer, BundleID as string) as Integer

MBS MacOSX Plugin, Plugin Version: 6.0, Platform: macOS, Targets: All.

**Function:** Sets the user's preferred handler for the specified content type (UTI) in the specified role(s).
**Example:**

```
dim e as Integer

// makes Acrobat the default pdf reader
'e=LaunchServicesSetDefaultRoleHandlerForContentTypeMBS("com.adobe.pdf",-1,"com.adobe.Reader")

// makes preview the default pdf reader
e=LaunchServicesSetDefaultRoleHandlerForContentTypeMBS("com.adobe.pdf",-1,"com.apple.preview")

msgbox str(e)
```

**Notes:** For all roles, specify kLSRolesAll. The handler is specified as an application bundle identifier.
Returns a Mac OS error code or -1 if the function is not available.
Requires Mac OS X 10.4.

Constants you can use for the role parameter:

| | | |
|---|---|---|
| kLSRolesNone | = 1 | no claim is made about support for this type/scheme |
| kLSRolesViewer | = 2 | claim to be able to view this type/scheme |
| kLSRolesEditor | = 4 | claim to be able to edit this type/scheme |
| kLSRolesAll | = -1 | claim to do it all |

## 110.6 module UTTypeMBS

### 110.6.1 module UTTypeMBS

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** The module to wrap all the Apple UTI functions.

**Notes:** See this webpage for a list of all the predefined types:

http://developer.apple.com/documentation/Carbon/Conceptual/understanding_utis/utilist/chapter_4_section_1.html
**Blog Entries**

- MacOSX plugin for iOS
- MBS Xojo Plugins, version 19.0pr6

### 110.6.2 Methods

### 110.6.3 ConformsTo(UTI as string, ConformsToUTI as string) as boolean

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Checks whether a type is a subtype of the second type.
**Example:**

```
if UTTypeMBS.ConformsTo("public.jpeg","public.image") then
MsgBox "ConformsTo"
else
MsgBox "not ConformsTo"
end if
```

### 110.6.4 CreateAllIdentifiersForTag(inTagClass as string, inTag as string, inConformingToUTI as string) as string()

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Creates an array of all uniform type identifiers indicated by the specified tag.
**Example:**

```
MsgBox join(UTTypeMBS.CreateAllIdentifiersForTag(UTTypeMBS.kUTTagClassFilenameExtension, "txt",
""))
// shows "public.plain-text"

MsgBox join(UTTypeMBS.CreateAllIdentifiersForTag(UTTypeMBS.kUTTagClassFilenameExtension, "xml",
""))
// shows "public.xml com.apple.dashcode.xml"
```

**Notes:** An overloaded tag (e.g., an extension used by several applications for different file formats) may

indicate multiple types. If no declared type identifiers have the specified tag, then a single dynamic type identifier will be created for the tag. Optionally, the returned type identifiers must conform to the identified "conforming-to" type argument. This is a hint to the implementation to constrain the search to a particular tree of types. For example, the client may want to know the type indicated by a particular extension tag. If the client knows that the extension is associated with a directory (rather than a file), the client may specify "public.directory" for the conforming-to argument. This will allow the implementation to ignore all types associated with byte data formats (public.data base type).

### 110.6.5 CreatePreferredIdentifierForTag(inTagClass as string, inTag as string, inConformingToUTI as string) as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Creates a uniform type identifier for the type indicated by the specified tag.
**Example:**

```
MsgBox UTTypeMBS.CreatePreferredIdentifierForTag(UTTypeMBS.kUTTagClassFilenameExtension, "jpg", "")
// shows "public.jpeg"
MsgBox UTTypeMBS.CreatePreferredIdentifierForTag(UTTypeMBS.kUTTagClassOSType, "TIFF", "public.image")
// shows "public.tiff"
```

**Notes:** This is the primary function to use for going from tag (extension/MIMEType/OSType) to uniform type identifier. Optionally, the returned type identifiers must conform to the identified "conforming-to" type argument. This is a hint to the implementation to constrain the search to a particular tree of types. For example, the client may want to know the type indicated by a particular extension tag. If the client knows that the extension is associated with a directory (rather than a file), the client may specify "public.directory" for the conforming-to argument. This will allow the implementation to ignore all types associated with byte data formats (public.data base type). If more than one type is indicated, preference is given to a public type over a non-public type on the theory that instances of public types are more common, and therefore more likely to be correct. When there a choice must be made between multiple public types or multiple non-public types, the selection rules are undefined. Clients needing finer control should use CreateAllIdentifiersWithTag. If no declared type is indicated, a dynamic type identifier is generated which satisfies the parameters.

### 110.6.6 DeclaringBundleURL(UTI as string) as folderitem

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Returns the folderitem of the bundle containing the type declaration of the identified type.
**Example:**

```
MsgBox UTTypeMBS.DeclaringBundleURL("public.jpeg").NativePath
```

### 110.6.7 Description(UTI as string) as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Returns the localized, user-readable type description string.
**Example:**

```
MsgBox UTTypeMBS.Description("public.jpeg") // "JPEG-Bild" in German
```

### 110.6.8 Equal(UTI as string, SecondUTI as string) as boolean

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Checks whether two types are equal.
**Example:**

```
if UTTypeMBS.Equal("public.jpeg","public.jpeg") then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

**Notes:** Returns true if both UTIs are equal.

### 110.6.9 kUTExportedTypeDeclarationsKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTExportedTypeDeclarationsKey // "UTExportedTypeDeclarations"
```

### 110.6.10 kUTImportedTypeDeclarationsKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

MsgBox UTTypeMBS.kUTImportedTypeDeclarationsKey // "UTImportedTypeDeclarations"

### 110.6.11 kUTTagClassFilenameExtension as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constant strings identify tag classes for use when converting uniform type identifiers to and from equivalent tags.
**Example:**

MsgBox UTTypeMBS.kUTTagClassFilenameExtension // "public.filename-extension"

### 110.6.12 kUTTagClassMIMEType as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constant strings identify tag classes for use when converting uniform type identifiers to and from equivalent tags.
**Example:**

MsgBox UTTypeMBS.kUTTagClassMIMEType // "public.mime-type"

### 110.6.13 kUTTagClassNSPboardType as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constant strings identify tag classes for use when converting uniform type identifiers to and from equivalent tags.
**Example:**

MsgBox UTTypeMBS.kUTTagClassNSPboardType // "com.apple.nspboard-type"

### 110.6.14 kUTTagClassOSType as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constant strings identify tag classes for use when converting uniform type identifiers to and from equivalent tags.
**Example:**

```
MsgBox UTTypeMBS.kUTTagClassOSType // "com.apple.ostype"
```

### 110.6.15 kUTTypeAliasFile as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.16 kUTTypeAliasRecord as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.17 kUTTypeAppleICNS as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.18 kUTTypeAppleProtectedMPEG4Audio as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.19 kUTTypeApplication as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.20 kUTTypeApplicationBundle as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.21 kUTTypeApplicationFile as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.22 kUTTypeArchive as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.23 kUTTypeAudio as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.24 kUTTypeAudiovisualContent as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.25 kUTTypeBMP as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.26 kUTTypeBundle as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.27 kUTTypeCHeader as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.28 kUTTypeCompositeContent as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.29 kUTTypeConformsToKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeConformsToKey // "UTTypeConformsTo"
```

### 110.6.30 kUTTypeContact as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.31 kUTTypeContent as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.32 kUTTypeCPlusPlusHeader as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.33 kUTTypeCPlusPlusSource as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.34 kUTTypeCSource as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.35 kUTTypeData as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.36 kUTTypeDescriptionKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeDescriptionKey // "UTTypeDescription"
```

### 110.6.37 kUTTypeDirectory as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.38 kUTTypeDiskImage as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.39 kUTTypeFileURL as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.40 kUTTypeFlatRTFD as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.41 kUTTypeFolder as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.42 kUTTypeFramework as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.43 kUTTypeGIF as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.44 kUTTypeHTML as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.45 kUTTypeICO as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.46 kUTTypeIconFileKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeIconFileKey // "UTTypeIconFile"
```

### 110.6.47 kUTTypeIdentifierKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeIdentifierKey // "UTTypeIdentifier"
```

### 110.6.48 kUTTypeImage as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.49 kUTTypeInkText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.50 kUTTypeItem as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.51 kUTTypeJavaSource as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.52 kUTTypeJPEG as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.53 kUTTypeJPEG2000 as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.54 kUTTypeMessage as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.55 kUTTypeMountPoint as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.56 kUTTypeMovie as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.avi")
dim u as string = UTTypeMBS.UTI(f)

if UTTypeMBS.ConformsTo(u, UTTypeMBS.kUTTypeMovie) then
MsgBox u+" is movie"
else
MsgBox u+" is not movie."
end if
```

### 110.6.57 kUTTypeMP3 as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.58 kUTTypeMPEG as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.59 kUTTypeMPEG4 as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.60 kUTTypeMPEG4Audio as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.61 kUTTypeObjectiveCPlusPlusSource as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.62 kUTTypeObjectiveCSource as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.63 kUTTypePackage as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.64 kUTTypePDF as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.65 kUTTypePICT as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.66 kUTTypePlainText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.67 kUTTypePNG as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.68 kUTTypeQuickTimeImage as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.69 kUTTypeQuickTimeMovie as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.70 kUTTypeReferenceURLKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeReferenceURLKey // "UTTypeReferenceURL"
```

### 110.6.71 kUTTypeResolvable as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.72 kUTTypeRTF as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.73 kUTTypeRTFD as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.74 kUTTypeSourceCode as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.75 kUTTypeSymLink as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.76 kUTTypeTagSpecificationKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

```
MsgBox UTTypeMBS.kUTTypeTagSpecificationKey // "UTTypeTagSpecification"
```

### 110.6.77 kUTTypeText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.78 kUTTypeTIFF as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.79 kUTTypeTXNTextAndMultimediaData as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.80 kUTTypeURL as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.81 kUTTypeUTF16ExternalPlainText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.82 kUTTypeUTF16PlainText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.83 kUTTypeUTF8PlainText as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.84 kUTTypeVCard as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.85 kUTTypeVersionKey as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the constants for the keys used in type declarations.
**Example:**

MsgBox UTTypeMBS.kUTTypeVersionKey // "UTTypeVersion"

### 110.6.86 kUTTypeVideo as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.87 kUTTypeVolume as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.88 kUTTypeWebArchive as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.89 kUTTypeXML as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** One of the predefined type constants.

### 110.6.90 PreferredTagWithClass(inUTI as string, inTagClass as string) as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Returns the identified type's preferred tag with the specified tag class as a String.
**Example:**

```
MsgBox UTTypeMBS.PreferredTagWithClass("public.jpeg",UTTypeMBS.kUTTagClassMIMEType)
// shows "image/jpeg"
MsgBox UTTypeMBS.PreferredTagWithClass("public.jpeg",UTTypeMBS.kUTTagClassFilenameExtension)
// shows "jpeg"
```

**Notes:** This is the primary function to use for going from uniform type identifier to tag. If the type declaration included more than one tag with the specified class, the first tag in the declared tag array is the preferred tag.

### 110.6.91 UTI(file as folderitem) as string

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Queries the UTI for a given file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
MsgBox UTTypeMBS.UTI(f) // shows com.xojo.project.binary
```

**Notes:** Returns "" if no UTI is available.

# Chapter 111

# LCMS2

## 111.1 class LCMS2BitmapMBS

### 111.1.1 class LCMS2BitmapMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a bitmap.
**Notes:** You can pass bitmap data as raw memoryblock or fill it using a Xojo picture.
In our LCMS 1.x plugin, the bitmap was always 16 bit. This plugin also can also use 8 bit or 32 bit.
**Blog Entries**

- ICC color profiling
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- MBS Xojo / Real Studio Plugins, version 13.2pr3

### 111.1.2 Methods

### 111.1.3 Constructor

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty bitmap object.
See also:

- 111.1.4 Constructor(p as picture, bits as Integer = 8) 16690
- 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 16690

- 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer) 16691
- 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer) 16691
- 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) 16692


### 111.1.4 Constructor(p as picture, bits as Integer = 8)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new bitmap based on the pictures.
**Example:**

```
// convert picture to bitmap
dim b as new LCMS2BitmapMBS(pic)
// convert to picture
Backdrop = b.Picture
```

**Notes:** Bits can be 8, 16 or 32 bit integers.
See also:


- 111.1.3 Constructor 16689
- 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 16690
- 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer) 16691
- 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer) 16691
- 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) 16692


### 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8)

MBS Images Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new bitmap based on the pictures.
**Example:**

```
// convert small part of picture to bitmap
dim b as new LCMS2BitmapMBS(pic, 50, 50, 100, 100)
// convert to picture
Backdrop = b.Picture
```

**Notes:** Picks only the provided area from the source picture.
Bits can be 8, 16 or 32 bit integers.
See also:

- 111.1.3 Constructor 16689
- 111.1.4 Constructor(p as picture, bits as Integer = 8) 16690
- 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer) 16691
- 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer) 16691
- 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) 16692

### 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
**Notes:** Colorspace Type should be one of the color space signatures like kcmsSigRgbData.
Raises exception if colorspace is invalid.
See also:

- 111.1.3 Constructor 16689
- 111.1.4 Constructor(p as picture, bits as Integer = 8) 16690
- 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 16690
- 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer) 16691
- 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) 16692

### 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
**Notes:** Colorspace Type should be one of the colorspace signatures like kcmsSigRgbData.
Raises exception if colorspace is invalid.
See also:

- 111.1.3 Constructor 16689
- 111.1.4 Constructor(p as picture, bits as Integer = 8) 16690
- 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 16690
- 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer) 16691
- 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) 16692


### 111.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
**Notes:** In this variant, you pass the memoryblock with right size.
Passing memoryblock of wrong size can lead into crashs.
Raises exception if colorspace is invalid.
See also:


- 111.1.3 Constructor 16689
- 111.1.4 Constructor(p as picture, bits as Integer = 8) 16690
- 111.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 16690
- 111.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer) 16691
- 111.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer) 16691


### 111.1.9 CopyToPicture(pic as picture, x as Integer = 0, y as Integer = 0) as boolean

MBS Images Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies image data into an existing picture.
**Example:**

```
// convert small part of picture to bitmap
dim b as new LCMS2BitmapMBS(pic)

// create destination picture
dim pic as new Picture(500, 500, 32)
```

```
// copy pixels and show
if b.CopyToPicture(pic, 50, 50) then

Backdrop = pic
end if
```

**Notes:** This may be more efficient for you if you process a lot of image data as you can avoid creating new picture objects with using Picture method in this class.
May not work for all pictures, especially may fail on Linux.
Returns true on success.

### 111.1.10 Invert

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the bitmap data.
**Notes:** Requires correct settings for rowbytes, height and data properties.

### 111.1.11 Picture(HasAlpha as Boolean = false) as picture

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the picture.
**Example:**

```
// get some picture
dim logo as Picture = LogoMBS(500)

// let us convert it to a 16 bit memory block
dim l as new LCMS2BitmapMBS(logo, 16)

// check bit depth
Title = str(l.Bits)

// convert back
dim p as Picture = l.Picture

// and display
Backdrop = p
```

**Notes:** This method works with 8, 16 and 32 bit integer pictures. Make sure bits property is set.

### 111.1.12 Properties

### 111.1.13 Bits as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bits.
**Notes:** Can be 8, 16 or 32 and is used for conversion to and from Xojo picture objects.
(Read and Write property)

### 111.1.14 ColorSpaceType as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color space type.
**Notes:** Only used to let Picture function know what format the data is.
Typically kcmsSigRgbData.
(Read and Write property)

### 111.1.15 Data as MemoryBlock

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the actual image data.
**Notes:** Data can be stored in 8, 16 or 32 bit Integers or 32bit Floats.
(Read and Write property)

### 111.1.16 Height as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the Bitmap in Pixels.
**Notes:** (Read and Write property)

### 111.1.17 RowBytes as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes per row.
**Notes:** Normally: rowbytes=pixelsize*width+padding
Where padding is some extra bytes.

(Read and Write property)

### 111.1.18 Width as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the Bitmap in Pixels.
**Notes:** (Read and Write property)

## 111.2 class LCMS2CIECAM02MBS

### 111.2.1 class LCMS2CIECAM02MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Class to evaluated viewing conditions.
**Notes:** Viewing conditions. Please note those are CAM model viewing conditions, and not the ICC tag viewing conditions, which I'm naming LCMS2ICCViewingConditionsMBS to make differences evident. Unfortunately, the tag cannot deal with surround La, Yb and D value so is basically useless to store CAM02 viewing conditions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr5

### 111.2.2 Methods

### 111.2.3 Constructor(context as LCMS2ContextMBS, VC as LCMS2ViewingConditionsMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a CAM02 object based on given viewing conditions.
**Notes:** Such object may be used as a color appearance model and evaluated in forward and reverse directions. Viewing conditions is defined by LCMS2ViewingConditionsMBS class. The surround member has to be one of this values: kAVG_SURROUND, kDIM_SURROUND, kDARK_SURROUND or kCUTSHEET_SURROUND. Degree of chromatic adaptation (d), can be specified in 0...1.0 range, or the model can be instructed to calculate it by using D_CALCULATE constant (-1).

Context: user-defined context cargo.
VC: A structure holding viewing conditions.

### 111.2.4 Forward(value as LCMS2CIEXYZMBS) as LCMS2JChMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates the CAM02 model in the forward direction: XYZ to JCh
**Notes:** value: the input XYZ value.
Returns the output JCh value.

### 111.2.5 Reverse(value as LCMS2JChMBS) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates the CAM02 model in the reverse direction: JCh to XYZ
**Notes:** Values: The input JCh value.
Returns the output XYZ value

### 111.2.6 Properties

### 111.2.7 Handle as Integer

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle to the conversion engine.
**Notes:** (Read and Write property)

## 111.3 class LCMS2CIELabMBS

### 111.3.1 class LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a Lab color.

### 111.3.2 Methods

### 111.3.3 BFDdeltaE(Other as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates BFD delta E metric.

### 111.3.4 CIE2000DeltaE(Other as LCMS2CIELabMBS, Kl as Double = 1.0, Kc as Double = 1.0, Kh as Double = 1.0) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Delta-E 2000.
**Notes:** Delta-E 2000 is the first major revision of the dE94 equation. Unlike dE94, which assumes that L* correctly reflects the perceived differences in lightness, dE2000 varies the weighting of L* depending on where in the lightness range the color falls. dE2000 is still under consideration and does not seem to be widely supported in graphics arts applications.

The weightings KL, KC and KH can be modified to reflect the relative importance of lightness, chroma and hue in different industrial applications

### 111.3.5 CIE94DeltaE(Other as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the CIE 94 delta e value.
**Notes:** A technical committee of the CIE (TC1-29) published an equation in 1995 called CIE94. The equation is similar to CMC but the weighting functions are largely based on RIT/DuPont tolerance data derived from automotive paint experiments where sample surfaces are smooth.
It also has ratios, labeled kL (lightness) and Kc (chroma) and the commercial factor (cf) but these tend to be preset in software and are not often exposed for the user (as it is the case in Little CMS).

### 111.3.6 Clone as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the color object.
**Example:**

```
dim l as new LCMS2CIELabMBS(0.1, 0.2, 0.3)
dim k as LCMS2CIELabMBS = l.Clone
MsgBox str(k.L)+" "+str(k.a)+" "+str(k.b)
```

### 111.3.7 CMCdeltaE(Other as LCMS2CIELabMBS, l as Double, c as Double) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the CMC delta E.
**Notes:** In 1984 the CMC (Colour Measurement Committee of the Society of Dyes and Colourists of Great Britain) developed and adopted an equation based on LCH numbers. Intended for the textiles industry, CMC l:c allows the setting of lightness (l) and chroma (c) factors. As the eye is more sensitive to chroma, the default ratio for l:c is 2:1 allowing for 2x the difference in lightness than chroma (numbers). There is also a 'commercial factor' (cf) which allows an overall varying of the size of the tolerance region according to accuracy requirements. A cf=1.0 means that a delta-E CMC value <1.0 is acceptable.
CMC l:c is designed to be used with D65 and the CIE Supplementary Observer. Commonly-used values for l:c are 2:1 for acceptability and 1:1 for the threshold of imperceptibility.

### 111.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Lab color with the given values.
See also:

- 111.3.9 Constructor(other as LCMS2CIELabMBS) 16699

### 111.3.9 Constructor(other as LCMS2CIELabMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the color value.
See also:

- 111.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0) 16699

### 111.3.10 DeltaE(Other as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates delta E.
**Notes:** You don't have to spend too long in the color management world before you come across the term Delta-E. As with many things color, it seems simple to understand at first, yet the closer you look, the more elusive it gets. Delta-E (dE) is a single number that represents the 'distance' between two colors. The idea is that a dE of 1.0 is the smallest color difference the human eye can see. So any dE less than 1.0 is imperceptible and it stands to reason that any dE greater than 1.0 is noticeable. Unfortunately it's not that simple. Some color differences greater than 1 are perfectly acceptable, maybe even unnoticeable. Also, the same dE color difference between two yellows and two blues may not look like the same difference to the eye and there are other places where it can fall down. It's perfectly understandable that we would want to have a system to show errors. After all, we've spent the money on the instruments; shouldn't we get numbers from them? Delta-E numbers can be used for:

- how far off is a print or proof from the original
- how much has a device drifted
- how effective is a particular profile for printing or proofing
- removes subjectivity (as much as possible)

These functions does compute the difference between two Lab colors, using several difference spaces.

The L*a*b* color space was devised in 1976 and, at the same time delta-E 1976 (dE76) came into being. If you can imagine attaching a string to a color point in 3D Lab space, dE76 describes the sphere that is described by all the possible directions you could pull the string. If you hear people speak of just plain 'delta-E' they are probably referring to dE76. It is also known as dE-Lab and dE- ab. One problem with dE76 is that Lab itself is not 'perceptually uniform' as its creators had intended. So different amounts of visual color shift in different color areas of Lab might have the same dE76 number. Conversely, the same amount of color shift might result in different dE76 values. Another issue is that the eye is most sensitive to hue differences, then chroma and finally lightness and dE76 does not take this into account.

### 111.3.11 DesaturateLab(amax as Double, amin as Double, bmax as Double, bmin as Double) as Boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does poor man's gamut mapping.
**Notes:** See also cmsDesaturateLab in LCMS manual.

### 111.3.12 XYZ(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color to XYZ value.
**Notes:** Setting WhitePoint to NULL forces D50 as white point.

### 111.3.13 Properties

### 111.3.14 A as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The a value.
**Notes:** (Read and Write property)

### 111.3.15 B as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The b value.
**Notes:** (Read and Write property)

### 111.3.16 L as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The L value.
**Notes:** (Read and Write property)

### 111.3.17 LCh as LCMS2CIELChMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color to LCh value.
**Notes:** (Read only property)

## 111.4 class LCMS2CIELChMBS

### 111.4.1 class LCMS2CIELChMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The plugin class for CIE LCh values.
**Example:**

```
dim c as new LCMS2CIELChMBS(1,2,3)
MsgBox str(c.L)+" "+str(c.C)+" "+str(c.h)
```

### 111.4.2 Methods

### 111.4.3 Clone as LCMS2CIELChMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the color object.

### 111.4.4 Constructor(L as Double=0.0, C as Double=0.0, h as Double=0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with the given values.
See also:

- 111.4.5 Constructor(other as LCMS2CIELChMBS) 16702

### 111.4.5 Constructor(other as LCMS2CIELChMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes object with values from other object.
See also:

- 111.4.4 Constructor(L as Double=0.0, C as Double=0.0, h as Double=0.0) 16702

### 111.4.6 Properties

### 111.4.7 C as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The C value.
**Notes:** (Read and Write property)

### 111.4.8 h as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The h value.
**Notes:** (Read and Write property)

### 111.4.9 L as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The L value.
**Notes:** (Read and Write property)

### 111.4.10 Lab as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the LCh value to a Lab value.
**Example:**

```
dim c as new LCMS2CIELChMBS(0.1, 0.2, 0.3)
dim lab as LCMS2CIELabMBS = c.Lab
MsgBox str(lab.L)+" "+str(lab.a)+" "+str(lab.b)
```

**Notes:** (Read only property)

## 111.5 class LCMS2CIExyYMBS

### 111.5.1 class LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a CIE xyY value.
**Example:**

```
dim c as new LCMS2CIExyYMBS(1,2,3)
MsgBox str(c.x)+" "+str(c.y)+" "+str(c.yy)
```

**Notes:** As Xojo is case insensitive, we have to name the big Y as YY.

### 111.5.2 Methods

### 111.5.3 Clone as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the color.

### 111.5.4 Constructor(other as LCMS2CIExyYMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the object with values from other object.
See also:

- 111.5.5 Constructor(X as Double=0.0, Y as Double=0.0, YY as Double=0.0) 16704

### 111.5.5 Constructor(X as Double=0.0, Y as Double=0.0, YY as Double=0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new xyY object with the given values.
See also:

- 111.5.4 Constructor(other as LCMS2CIExyYMBS) 16704

### 111.5.6 TempFromWhitePoint as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the temperature from using this xyY point as the white point.
**Example:**

```
dim c as new LCMS2CIExyYMBS(1,2,3)
MsgBox str(c.TempFromWhitePoint)
```

### 111.5.7 Properties

### 111.5.8 x as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Notes:** (Read and Write property)

### 111.5.9 XYZ as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the xyY value to XYZ.
**Example:**

```
dim c as new LCMS2CIExyYMBS(1,2,3)
dim n as LCMS2CIEXYZMBS = c.XYZ
MsgBox str(n.x)+" "+str(n.y)+" "+str(n.z)
dim x as LCMS2CIExyYMBS = n.xyY
MsgBox str(x.x)+" "+str(x.y)+" "+str(x.yy)
```

**Notes:** (Read only property)

### 111.5.10 y as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Notes:** (Read and Write property)

### 111.5.11 YY as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Y value.
**Notes:** As Xojo is case insensitive, we have to name the big Y as YY.
(Read and Write property)

## 111.6 class LCMS2CIExyYTripleMBS

### 111.6.1 class LCMS2CIExyYTripleMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a xyY color triple.

### 111.6.2 Methods

### 111.6.3 Clone as LCMS2CIExyYTripleMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the xyY triple.

### 111.6.4 Constructor

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a xyY triple with zero values.
See also:

- 111.6.5 Constructor(other as LCMS2CIExyYTripleMBS) 16707
- 111.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS) 16708

### 111.6.5 Constructor(other as LCMS2CIExyYTripleMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a xyY triple with values from other object.
See also:

- 111.6.4 Constructor 16707
- 111.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS) 16708

### 111.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a xyY triple with given values.
See also:

- 111.6.4 Constructor 16707
- 111.6.5 Constructor(other as LCMS2CIExyYTripleMBS) 16707

### 111.6.7 Properties

### 111.6.8 Blue as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color.
**Notes:** (Read and Write property)

### 111.6.9 Green as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color.
**Notes:** (Read and Write property)

### 111.6.10 Red as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color.
**Notes:** (Read and Write property)

## 111.7 class LCMS2CIEXYZMBS

### 111.7.1 class LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a CIE XYZ values.
**Example:**

```
dim n as new LCMS2CIEXYZMBS(0.1, 0.2, 0.3)
MsgBox str(n.x)+" "+str(n.y)+" "+str(n.z)
```

### 111.7.2 Methods

### 111.7.3 Constructor(x as Double=0.0, y as Double=0.0, z as Double=0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with the given values.

### 111.7.4 Lab(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the XYZ value to a lab value using the given whitepoint.
**Notes:** Setting WhitePoint to nil forces D50 as white point.

### 111.7.5 Properties

### 111.7.6 x as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value.
**Notes:** (Read and Write property)

### 111.7.7 xyY as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the XYZ value to a xyY value.
**Example:**

```
dim n as new LCMS2CIEXYZMBS(0.1, 0.2, 0.3)
dim l as LCMS2CIExyYMBS = n.xyY
MsgBox str(l.x)+" "+str(l.y)+" "+str(l.yy)
```

**Notes:** (Read only property)

### 111.7.8 y as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value.
**Notes:** (Read and Write property)

### 111.7.9 z as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The z value.
**Notes:** (Read and Write property)

## 111.8 class LCMS2CIEXYZTripleMBS

### 111.8.1 class LCMS2CIEXYZTripleMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a XYZ color triple.

### 111.8.2 Methods

### 111.8.3 Clone as LCMS2CIEXYZTripleMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the XYZ triple.

### 111.8.4 Constructor

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a XYZ triple with zero values.
See also:

- 111.8.5 Constructor(other as LCMS2CIEXYZTripleMBS) 16711
- 111.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS) 16712

### 111.8.5 Constructor(other as LCMS2CIEXYZTripleMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a XYZ triple with values from other object.
See also:

- 111.8.4 Constructor 16711
- 111.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS) 16712

### 111.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a XYZ triple with given values.
See also:


- 111.8.4 Constructor 16711
- 111.8.5 Constructor(other as LCMS2CIEXYZTripleMBS) 16711


### 111.8.7 Properties

### 111.8.8 Blue as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blue color.
**Notes:** (Read and Write property)

### 111.8.9 Green as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green color.
**Notes:** (Read and Write property)

### 111.8.10 Red as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The red color.
**Notes:** (Read and Write property)

## 111.9 class LCMS2ContextMBS

### 111.9.1 class LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a LCMS2 context.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.1pr1

### 111.9.2 Methods

### 111.9.3 Clone as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the context object.
**Notes:** You can assign a new tag to the copy.

### 111.9.4 Constructor(other as LCMS2ContextMBS)

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new context object with a copy of the existing one.
See also:

- 111.9.5 Constructor(tag as Variant = nil) 16713

### 111.9.5 Constructor(tag as Variant = nil)

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new context object with given tag.
See also:

- 111.9.4 Constructor(other as LCMS2ContextMBS) 16713

### 111.9.6 Properties

### 111.9.7 Handle as Integer

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal handle value.
**Notes:** (Read and Write property)

### 111.9.8 Tag as Variant

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** (Read and Write property)

## 111.10 class LCMS2CurveSegmentMBS

### 111.10.1 class LCMS2CurveSegmentMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a curve segment.
**Notes:** Segmented curves are formed by several segments.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr4

### 111.10.2 Methods

### 111.10.3 Constructor(nGridPoints as Integer = 0)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object and allocates sample points.
**Notes:** Pass number of sample points you want to fill.

### 111.10.4 Properties

### 111.10.5 nGridPoints as UInt32

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of grid points if Type = 0.
**Notes:** (Read only property)

### 111.10.6 Type as Integer

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of curve segment.
**Notes:** Parametric type, Type = 0 means sampled segment.
Negative values are reserved.
(Read and Write property)

### 111.10.7 x0 as Single

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x0 value of the domain.
**Notes:** Domain; for x0 <x <= x1
(Read and Write property)

### 111.10.8 x1 as Single

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x1 value of the domain.
**Notes:** Domain; for x0 <x <= x1
(Read and Write property)

### 111.10.9 Params(index as Integer) as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameters if Type != 0.
**Notes:** Index from 0 to 9.
(Read and Write computed property)

### 111.10.10 SampledPoints(index as Integer) as Single

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Array of floats if Type = 0.
**Notes:** Index from 0 to nGridPoints-1.
(Read and Write computed property)

## 111.11 class LCMS2DateMBS

### 111.11.1 class LCMS2DateMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a date.

### 111.11.2 Properties

### 111.11.3 Date as Date

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The date as a Xojo date object.
**Notes:** (Read only property)

### 111.11.4 DateTime as DateTime

MBS Images Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The date as a Xojo dateTime object.
**Notes:** (Read only property)

### 111.11.5 Day as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day value.
**Notes:** (Read only property)

### 111.11.6 Daylight as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether it is daylight saving time.
**Notes:** (Read only property)

### 111.11.7 DayOfWeek as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the week.
**Notes:** (Read only property)

### 111.11.8 DayOfYear as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the year.
**Notes:** (Read only property)

### 111.11.9 Hour as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour value.
**Notes:** (Read only property)

### 111.11.10 Minute as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minute value.
**Notes:** (Read only property)

### 111.11.11 Month as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month value.
**Notes:** (Read only property)

### 111.11.12 Second as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second value.
**Notes:** (Read only property)

### 111.11.13 Year as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year value.
**Notes:** (Read only property)

## 111.12 class LCMS2DictionaryEntryMBS

### 111.12.1 class LCMS2DictionaryEntryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an entry of the dictionary.
**Example:**

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr8
- LCMS 2.4

### 111.12.2 Methods

### 111.12.3 Constructor

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 111.12.4 NextEntry as LCMS2DictionaryEntryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the next element in linked list.

### 111.12.5 Properties

### 111.12.6 DisplayName as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The display name multi language unicode string.
**Notes:** (Read only property)

### 111.12.7 DisplayValue as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The display value multi language unicode string.
**Notes:** (Read only property)

### 111.12.8 Handle as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 111.12.9 Name as String

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name string.
**Example:**

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

**Notes:** (Read only property)

### 111.12.10 Parent as LCMS2DictionaryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the parent dictionary.
**Notes:** (Read only property)

### 111.12.11 Value as String

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value string.
**Example:**

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

**Notes:** (Read only property)

# 111.13 class LCMS2DictionaryMBS

## 111.13.1 class LCMS2DictionaryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The LCMS 2 class for a dictionary of values.
**Example:**

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

**Notes:** This is a simple linked list used to store pairs Name,ÄêValue for the dictionary metatag, as described in http://www.color.org/ICCSpecRevision_25,Äê02,Äê10_dictType.pdf
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr8

## 111.13.2 Methods

## 111.13.3 AddEntry(Name as String, Value as String, DisplayName as LCMS2MLUMBS, DisplayValue as LCMS2MLUMBS) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data to a dictionary linked list object.
**Notes:** No check for duplicity is made. Dictionary and Name parameters a required, rest is optional and nil may be used.

Name, Value: Strings. Value may be empty.
DisplayName, Display Value: Multilocalized Unicode objects. May be nil.
Returns true on success.

### 111.13.4 Constructor(context as LCMS2ContextMBS = nil)

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates an empty dictionary linked list object.

### 111.13.5 EntryList as LCMS2DictionaryEntryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns first element in linked list.
**Example:**

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

### 111.13.6 Properties

### 111.13.7 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context for this profile.
**Notes:** Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

### 111.13.8 Handle as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 111.14 class LCMS2GamutBoundaryDescriptionMBS

### 111.14.1 class LCMS2GamutBoundaryDescriptionMBS

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class allows you to create gamut boundary, add points, compute and check points.
**Example:**

```
dim n1,n2 as Integer
dim h as new LCMS2GamutBoundaryDescriptionMBS

// Fill all Lab gamut as valid

for L as Integer = 0 to 100 step 10
for a as Integer = -128 to 128 step 5
for b as Integer = -128 to 128 step 5

dim lab as new LCMS2CIELabMBS(l, a, b)

if h.AddPoint(lab) then
n1 = n1 + 1
else
break
MsgBox "Point not in boundary!"
end if
next
next
next

// Complete boundaries
call h.Compute

// All points should be inside gamut

for L as Integer = 10 to 90 step 25
for a as Integer = -120 to 120 step 25
for b as Integer = -120 to 120 step 25

dim lab as new LCMS2CIELabMBS(l, a, b)

if h.CheckPoint(lab) then
n2 = n2 + 1
else
break
MsgBox "Point not in boundary!"
end if
next
```

next
next

MsgBox str(n1)+" points added and "+str(n2)+" other points found."

**Notes:** Please check LittleCMS API and tutorial documentation for more details.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6

### 111.14.2 Methods

### 111.14.3 AddPoint(Lab as LCMS2CIELabMBS) as Boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new sample point for computing the gamut boundary descriptor.
**Notes:** This function can be called as many times as known points. No memory or other resurces are wasted by adding new points. The gamut boundary descriptor cannot be checked until Compute() is called.

Lab: Lab value.
Returns true on success, false on error.

### 111.14.4 CheckPoint(Lab as LCMS2CIELabMBS) as Boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whatever a Lab value is inside a given gamut boundary descriptor.
**Notes:** Lab: Lab value.
Returns: True if point is inside gamut, false otherwise.

### 111.14.5 Compute(options as UInt32 = 0) as Boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Computes the gamut boundary descriptor using all know points and interpolating any missing sector(s).
**Notes:** Call this function after adding all know points with AddPoint() and before using CheckPoint().
Flags: reserved (unused). Set it to 0.
Returns true on success, false on error

### 111.14.6 Constructor(context as LCMS2ContextMBS = nil)

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object.

### 111.14.7 Properties

### 111.14.8 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context for this profile.
**Notes:** Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

### 111.14.9 Handle as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 111.15 class LCMS2ICCDataMBS

### 111.15.1 class LCMS2ICCDataMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for ICC data.
**Notes:** This is used for some tags where no dedicated class is available. This way you can modify the data directly in the memoryblock.

### 111.15.2 Properties

### 111.15.3 Data as Memoryblock

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock with the data.
**Notes:** (Read only property)

### 111.15.4 Flags as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** (Read and Write property)

### 111.15.5 Size as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the data.
**Notes:** (Read and Write property)

# 111.16 class LCMS2ICCMeasurementConditionsMBS

## 111.16.1 class LCMS2ICCMeasurementConditionsMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for ICC measurement conditions.

## 111.16.2 Methods

## 111.16.3 Constructor(Observer as UInt32 = 0, Backing as LCMS2CIEXYZMBS = nil, Geometry as UInt32 = 0, Flare as Double = 0.0, IlluminantType as UInt32 = 0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with given values.

## 111.16.4 Properties

## 111.16.5 Backing as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Backing value.
**Notes:** (Read and Write property)

## 111.16.6 Flare as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flare value.
**Notes:** Range 0..1.0.
(Read and Write property)

## 111.16.7 Geometry as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The geometry value.
**Notes:** 0=unknown, 1=45/0, 0/45 2=0d, d/0.
(Read and Write property)

### 111.16.8 IlluminantType as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The illuminant type.
**Notes:** (Read and Write property)

### 111.16.9 Observer as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The observer value.
**Notes:** 0 = unknown, 1=CIE 1931, 2=CIE 1964
(Read and Write property)

# 111.17 class LCMS2ICCViewingConditionsMBS

## 111.17.1 class LCMS2ICCViewingConditionsMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a ICC viewing conditions tag stored in the profile.

## 111.17.2 Methods

## 111.17.3 Constructor(IlluminantXYZ as LCMS2CIEXYZMBS = nil, Backing as LCMS2CIEXYZMBS = nil, IlluminantType as UInt32 = 0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new ICC viewing conditions object.

## 111.17.4 Properties

## 111.17.5 IlluminantType as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The illuminant.
**Notes:** (Read and Write property)

## 111.17.6 IlluminantXYZ as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The illuminant.
**Notes:** (Read and Write property)

## 111.17.7 SurroundXYZ as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The surround.
**Notes:** (Read and Write property)

## 111.18 class LCMS2IT8MBS

### 111.18.1 class LCMS2IT8MBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for IT8 handling.
**Notes:** ANSI CGATS.17 is THE standard text file format for exchanging color measurement data. This standard text format (the ASCII version is by far the most common) is the format accepted by most color measurement and profiling applications.
It consists of a Preamble section containing originator information, keyword definitions, etc and then one or more data sections, each consisting of header and data subsections. The header subsection is where the BEGIN_DATA_FORMAT and END_DATA_FORMAT delimiters define the actual data types / units contained in the following tables. The data subsection contains the BEGIN_DATA and END_DATA delimiters which contain the actual color information in tabular form.
CGATS.17 text files can contain device (RGB, CMYK, etc), colorimetric (Lab, XYZ, etc), densitometric, spectral, naming and other information so it is a fairly comprehensive storage and exchange format.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr8
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4
- MBS Real Studio Plugins, version 12.4pr8
- LCMS 2.4

### 111.18.2 Methods

### 111.18.3 Constructor(context as LCMS2ContextMBS = nil)

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates an empty CGATS.17 object.

### 111.18.4 DefineDblFormat(Formatter as string)

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the format string for float numbers.
**Notes:** It uses the "C" sprintf convention. The default format string is "%.10g".

### 111.18.5 EnumDataFormat as string()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with pointers to the column names in current table.
**Notes:** Return the column names in table.

### 111.18.6 EnumProperties as string()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enumerates all properties in current table.
**Notes:** Returns array of property name string.

### 111.18.7 EnumPropertyMulti(Prop as string) as string()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enumerates all the identifiers found in a multi,Äêvalue property in current table.
**Notes:** Prop: A string holding property name
Returns an array with property names.

### 111.18.8 FindDataFormat(Sample as string) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the position (column) of a given data sample name in current table.
**Notes:** First column is 0 (SAMPLE_ID).
Returns column number if found, ,Äê1 if not found

### 111.18.9 GetData(Patch as string, Sample as string) as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a cell [ Patch, Sample ] as a literal string (uncooked string) in current table.
**Notes:** Patch: The intended patch name (row)
Sample: The intended sample name (column)

Returns the data for the intended cell on success, "" on error.

### 111.18.10 GetDataAsDouble(Patch as string, Sample as string) as Double

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a cell [ Patch, Sample ] as a double in current table.
**Notes:** Patch: The intended patch name (row)
Sample: The intended sample name (column)

Returns the data for the intended cell interpreted as Double on success, 0 on error.

### 111.18.11 GetDataRowCol(Row as Integer, Col as Integer) as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a cell [ row, col ] as a literal string in current table.
**Notes:** This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.

Returns the data for the intended cell on success, "" on error.

### 111.18.12 GetDataRowColAsDouble(Row as Integer, Col as Integer) as Double

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a cell [ row, col ] as a double in current table.
**Notes:** This function is fast since it has not to search columns or rows by name.
row, col: The position of the cell.

Returns the data for the intended cell interpreted as Double on success, 0 on error.

### 111.18.13 GetPatchByName(Patch as string) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lookups patch index by name.

### 111.18.14 GetPatchName(nPatch as Integer) as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills buffer with the contents of SAMPLE_ID column for the set given in nPatch.
**Notes:** That usually corresponds to patch name. Buffer may be NULL to get the internal memory block

used by the CGATS.17 object. If specified, buffer gets a copy of such block. In this case it should have space for at least 1024 characters.

nPatch: set number to retrieve name

Returns the patch name. "" if error.

### 111.18.15 GetProperty(Prop as string) as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a property as a literal string in current table.
**Notes:** Prop: A string holding property name.

Returns the data for the intended property on success, "" on error.

### 111.18.16 GetPropertyAsDouble(Prop as string) as Double

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a property as a double in current table.
**Notes:** Prop: A string holding property name.

Returns the data for the intended property interpreted as Double on success, 0 on error.

### 111.18.17 GetPropertyMulti(Key as string, SubKey as string) as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries property.

### 111.18.18 GetSheetType as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the type of the IT8 object.

### 111.18.19 HeaderIsDictionary(HeaderName as string) as boolean

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a header entry has subkeys, so it has a dictionary with keys and values.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

### 111.18.20 HeaderList as string()

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns list of header properties.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

### 111.18.21 HeadersAsDictionary as dictionary

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the header keys and values as dictionary.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.
Returns nil on any error.

### 111.18.22 HeaderSubDictionary(HeaderName as string) as dictionary

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the dictionary with subkeys for a given header entry.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.
Returns nil on any error.

### 111.18.23 HeaderValue(HeaderName as string) as string

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the header value for the given header.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

### 111.18.24 LoadFromFile(context as LCMS2ContextMBS, file as folderitem) as LCMS2IT8MBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function allocates a CGATS.17 object and fills it with the contents of file.
**Notes:** Used for reading existing CGATS files.

Context: The context value.
File: The CGATS.17 file name to read/parse

Returns a CGATS.17 object on success, nil on error.

### 111.18.25 LoadFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2IT8MBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a memory block.
**Notes:** Returns nil on failure.

### 111.18.26 LoadFromString(context as LCMS2ContextMBS, data as string) as LCMS2IT8MBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a string.
**Notes:** Returns nil on failure.

### 111.18.27 SaveToFile(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function saves a CGATS.17 object to a file.
**Notes:** File: Destination file. Existing file will be overwritten if possible.

Returns true on success, false on error

### 111.18.28 SaveToMemory as Memoryblock

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function saves a CGATS.17 object to a contiguous memory block.

### 111.18.29 SaveToString as string

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function saves a CGATS.17 object to a contiguous memory block.

### 111.18.30 SetComment(comment as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function is intended to provide a way automated IT8 creators can embed comments into the file.
**Notes:** Comments have no effect, and its only purpose is to document any of the file meaning. On this function the calling order is important; as successive calls to SetComment do embed comments in the same order the function is being called.

Comment: The comment to inserted

Returns true on success, false on error.

### 111.18.31 SetData(Patch as string, Sample as string, Val as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a cell [ Patch, Sample ] as a literal string (uncooked string) in current table.
**Notes:** Patch: The intended patch name (row)
Sample: The intended sample name (column)
Val: The value to be set, as a literal

Returns true on success, false on error.

### 111.18.32 SetDataAsDouble(Patch as string, Sample as string, Val as Double) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a cell [ Patch, Sample ] as a double in current table.
**Notes:** Patch: The intended patch name (row)
Sample: The intended sample name (column)
Val: The value to be set, as a cmsFloat64Number

Returns true on success, false on error

### 111.18.33 SetDataFormat(n as Integer, Sample as String) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets column names in current table.
**Notes:** First column is 0 (SAMPLE_ID). Special property NUMBER_OF_FIELDS must be set before calling this function.

n: Column to set name
Sample: Name of data

Returns true on success, false on error.

### 111.18.34 SetDataRowCol(Row as Integer, Col as Integer, Val as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a cell [ row, col ] as a literal string in current table.
**Notes:** This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.
Val: The value to be set, as a literal string.

Returns true on success, false on error.

### 111.18.35 SetDataRowColAsDouble(Row as Integer, Col as Integer, Val as Double) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a cell [ Patch, Sample ] as a double in current table.
**Notes:** This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.
Val: The value to be set, as a cmsFloat64Number

Returns true on success, false on error

### 111.18.36 SetIndexColumn(Sample as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the index column.

### 111.18.37 SetPropertyDouble(Prop as string, Value as Double) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a property as a double in current table.
**Notes:** Prop: A string holding property name.
Value: The data for the intended property as Double.

Returns true on success, false on error.

### 111.18.38 SetPropertyHex(Prop as string, Value as UInt32) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a property as an hexadecimal constant (appends 0x) in current table.
**Notes:** Prop: A string holding property name.
Value: The value to be set (32 bits max)

Returns true on success, false on error.

### 111.18.39 SetPropertyMulti(Key as string, SubKey as string, Value as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new sub,Äêproperty to the property Key.
**Notes:** Value of buffer is interpreted literally.

Key: A string holding property name.
SubKey: A string holding the sub,Äêproperty name.
Buffer: A string holding the uncooked value of sub,Äêproperty.

Returns true on success, false on error.

### 111.18.40 SetPropertyString(Prop as string, Value as String) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a property as a literal string in current table.
**Notes:** The string is enclosed in quotes "".
Returns true on success, false on error.

### 111.18.41 SetPropertyUncooked(Prop as string, Value as Memoryblock) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a property with no interpretation in current table.
**Notes:** No quotes "" are added. No checking is performed, and it is up to the programmer to make sure the string is valid.
Special prefixes:
0b: Binary
0x : Hexadecimal

Parameters:
cProp: A string holding property name.
Buffer: A string holding the uncooked value to place in the CGATS file.

Returns true on success, false on error.

### 111.18.42 SetSheetType(type as string) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function sets the type of a CGATS.17 object to the new type.
**Notes:** Returns true on success, false on error.

### 111.18.43 SetTable(nTable as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function positions the IT8 object in a given table, identified by its position.
**Notes:** Setting nTable to Table Count + 1 does allocate a new empty table.
Returns the current table number on success, ,Äê1 on error.

### 111.18.44 SetTableByLabel(Set as string, Field as string, ExpectedType as string) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets table by label.

### 111.18.45 TableCount as UInt32

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the number of tables found in the current CGATS object.
**Notes:** Returns the number of tables on success, 0 on error.

### 111.18.46 ValidKeywords as string()

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns list of valid keywords.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

### 111.18.47 ValidSampleIDs as string()

MBS Images Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns list of valid sample IDs.
**Notes:** This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

### 111.18.48 Properties

### 111.18.49 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context for this profile.
**Notes:** Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

### 111.18.50 Handle as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 111.19 class LCMS2JChMBS

## 111.19.1 class LCMS2JChMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a JCh value.

## 111.19.2 Methods

## 111.19.3 Clone as LCMS2JChMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of this object.

## 111.19.4 Constructor(J as Double=0.0, C as Double=0.0, h as Double=0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new JCh value.
See also:

- 111.19.5 Constructor(other as LCMS2JChMBS) 16744

## 111.19.5 Constructor(other as LCMS2JChMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes new JCh color object with values from existing object.
See also:

- 111.19.4 Constructor(J as Double=0.0, C as Double=0.0, h as Double=0.0) 16744

## 111.19.6 Properties

## 111.19.7 C as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The C value.
**Notes:** (Read and Write property)

### 111.19.8 h as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The h value.
**Notes:** (Read and Write property)

### 111.19.9 J as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The J value.
**Notes:** (Read and Write property)

# 111.20 class LCMS2Mat3MBS

## 111.20.1 class LCMS2Mat3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a 3 by 3 matrix.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr4

## 111.20.2 Methods

## 111.20.3 Clone as LCMS2Mat3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the matrix.

## 111.20.4 Constructor

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new matrix.
See also:

- 111.20.5 Constructor(other as LCMS2Mat3MBS) 16746
- 111.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS) 16747

## 111.20.5 Constructor(other as LCMS2Mat3MBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the given matrix.
See also:

- 111.20.4 Constructor 16746
- 111.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS) 16747

### 111.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new matrix with the given three vectors.
See also:


- 111.20.4 Constructor 16746
- 111.20.5 Constructor(other as LCMS2Mat3MBS) 16746


### 111.20.7 Properties

### 111.20.8 V0 as LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Property for first vector.
**Notes:** (Read and Write property)

### 111.20.9 V1 as LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Property for second vector.
**Notes:** (Read and Write property)

### 111.20.10 V2 as LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Property for third vector.
**Notes:** (Read and Write property)

### 111.20.11 value(index as UInt32) as LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the vector by index.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

## 111.21 module LCMS2MBS

### 111.21.1 module LCMS2MBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The central LCMS module with all the global methods and constants.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 20.3pr2
- MBS Xojo Plugins, version 20.3pr1
- ICC color profiling

### 111.21.2 Methods

### 111.21.3 AdaptationMatrix(ConeMatrix as LCMS2Mat3MBS, FromIll as LCMS2CIEXYZM ToIll as LCMS2CIEXYZMBS) as LCMS2Mat3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates adaptation matrix.
**Notes:** Returns the final chromatic adaptation from illuminant FromIll to Illuminant ToIll.
The cone matrix can be specified in ConeMatrix. If nil, Bradford is assumed.

ConeMatrix: the cone matrix.
FromIll: Source illuminant.
ToIll: Destination illuminant.

Returns matrix on success or nil on failure.

### 111.21.4 AdaptToIlluminant(SourceWhitePt as LCMS2CIEXYZMBS, Illuminant as LCMS2CIEXYZMBS, Value as LCMS2CIEXYZMBS) as LCMS2CIEXYZM

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Chromatic adaptation.
**Notes:** Adapts a color to a given illuminant. Original color is expected to have a SourceWhitePt white point.

### 111.21.5 BFDdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Computes the dE between two Lab values.

### 111.21.6 BIT15_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Bit15 flag

### 111.21.7 BuildRGB2XYZtransferMatrix(WhitePoint as LCMS2CIExyYMBS, Primaries as LCMS2CIExyYTripleMBS) as LCMS2Mat3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds RGB to XYZ transfer matrix.
**Notes:** Build a White point, primary chromas transfer matrix from RGB to CIE XYZ.
This is just an approximation, I am not handling all the non-linear aspects of the RGB to XYZ process, and assumming that the gamma correction has transitive property in the tranformation chain.

The alghoritm:

- First I build the absolute conversion matrix using primaries in XYZ. This matrix is next inverted
- Then I eval the source white point across this matrix obtaining the coeficients of the transformation
- Then, I apply these coeficients to the original matrix

WhitePoint: The white point.
Primaries: The primaries.
Returns matrix on success or nil on failure.

### 111.21.8 BYTES_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** bytes per sample

### 111.21.9 ChannelsOf(ColorSpaceSignature as Integer) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of channels in a color space signature.
**Example:**

MsgBox "RGB has "+str(LCMS2MBS.ChannelsOf(LCMS2MBS.kcmsSigRgbData))+" channels"

### 111.21.10 CHANNELS_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Channels (Samples per pixel)

### 111.21.11 CIE2000DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS, Kl as Double = 1.0, Kc as Double = 1.0, Kh as Double = 1.0) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Delta-E 2000.
**Notes:** Delta-E 2000 is the first major revision of the dE94 equation. Unlike dE94, which assumes that L* correctly reflects the perceived differences in lightness, dE2000 varies the weighting of L* depending on where in the lightness range the color falls. dE2000 is still under consideration and does not seem to be widely supported in graphics arts applications.

The weightings KL, KC and KH can be modified to reflect the relative importance of lightness, chroma and hue in different industrial applications

### 111.21.12 CIE94DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the CIE 94 delta e value.
**Notes:** A technical committee of the CIE (TC1-29) published an equation in 1995 called CIE94. The equation is similar to CMC but the weighting functions are largely based on RIT/DuPont tolerance data derived from automotive paint experiments where sample surfaces are smooth.
It also has ratios, labeled kL (lightness) and Kc (chroma) and the commercial factor (cf) but these tend to be preset in software and are not often exposed for the user (as it is the case in Little CMS).

### 111.21.13 CMCdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS, l as Double, c as Double) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the CMC delta E.
**Notes:** In 1984 the CMC (Colour Measurement Committee of the Society of Dyes and Colourists of Great Britain) developed and adopted an equation based on LCH numbers. Intended for the textiles industry, CMC l:c allows the setting of lightness (l) and chroma (c) factors. As the eye is more sensitive to chroma, the default ratio for l:c is 2:1 allowing for 2x the difference in lightness than chroma (numbers). There is also a 'commercial factor' (cf) which allows an overall varying of the size of the tolerance region according to accuracy requirements. A cf=1.0 means that a delta-E CMC value <1.0 is acceptable.
CMC l:c is designed to be used with D65 and the CIE Supplementary Observer. Commonly-used values for l:c are 2:1 for acceptability and 1:1 for the threshold of imperceptibility.

### 111.21.14 ColorSpaceICCtoLCMS(ICCColorSpace as Integer) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts from ICC color space notation to Little CMS color space notation.

### 111.21.15 ColorSpaceLCMStoICC(LCMSColorSpace as Integer) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts from Little CMS color space notation to ICC color space notation.

### 111.21.16 COLORSPACE_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Pixeltype.

### 111.21.17 CreateBitmapFromPicture(p as picture, bits as Integer = 8) as LCMS2BitmapMB

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new bitmap based on the pictures.
**Notes:** Bits can be 8, 16 or 32 bit integers.

### 111.21.18 D50_xyY as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns D50 white point as xyY color.

### 111.21.19 D50_XYZ as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns D50 white point as XYZ color.

### 111.21.20 DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates delta E.
**Notes:** You don't have to spend too long in the color management world before you come across the term Delta-E. As with many things color, it seems simple to understand at first, yet the closer you look, the more elusive it gets. Delta-E (dE) is a single number that represents the 'distance' between two colors. The idea is that a dE of 1.0 is the smallest color difference the human eye can see. So any dE less than 1.0 is imperceptible and it stands to reason that any dE greater than 1.0 is noticeable. Unfortunately it's not that simple. Some color differences greater than 1 are perfectly acceptable, maybe even unnoticeable. Also, the same dE color difference between two yellows and two blues may not look like the same difference to the eye and there are other places where it can fall down. It's perfectly understandable that we would want to have a system to show errors. After all, we've spent the money on the instruments; shouldn't we get numbers from them? Delta-E numbers can be used for:

- how far off is a print or proof from the original
- how much has a device drifted
- how effective is a particular profile for printing or proofing
- removes subjectivity (as much as possible)

These functions does compute the difference between two Lab colors, using several difference spaces.

The L*a*b* color space was devised in 1976 and, at the same time delta-E 1976 (dE76) came into being. If you can imagine attaching a string to a color point in 3D Lab space, dE76 describes the sphere that is described by all the possible directions you could pull the string. If you hear people speak of just plain 'delta-E' they are probably referring to dE76. It is also known as dE-Lab and dE- ab. One problem with dE76 is that Lab itself is not 'perceptually uniform' as its creators had intended. So different amounts of visual color shift in different color areas of Lab might have the same dE76 number. Conversely, the same amount of color shift might result in different dE76 values. Another issue is that the eye is most sensitive to hue differences, then chroma and finally lightness and dE76 does not take this into account.

### 111.21.21 DITHER_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** dither flag

### 111.21.22 DOSWAP_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Do swap? ie, BGR, KYMC

### 111.21.23 EnableFastFloatExtensions

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables fast float extension for Little CMS 2.10.
**Notes:** Originally this is GPLv3 licensed, but MBS bought a commercial license for all our plugins, so you don't need to worry about the license.

### 111.21.24 EncodedCMMversion as Integer

MBS Images Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of LCMS library.
**Example:**

```
dim e as Integer = LCMS2MBS.EncodedCMMversion
MsgBox str(e \1000)+"."+str((e\10) mod 100)+"."+str(e mod 10)
```

**Notes:** Returns 2070 for version 2.7.

### 111.21.25 ENDIAN16_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** swap 16 bps endianess?

### 111.21.26 EXTRA_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Extra samples

### 111.21.27 FLAVOR_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla).

### 111.21.28 Float2LabEncoded(c as LCMS2CIELabMBS) as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a Lab value.
**Notes:** Returns array of 3 encoded UInt16 values.

### 111.21.29 Float2LabEncodedV2(c as LCMS2CIELabMBS) as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a Lab value to ICC v2 convention.
**Notes:** Returns array of 3 encoded UInt16 values.

### 111.21.30 Float2XYZEncoded(c as LCMS2CIEXYZMBS) as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a XYZ value to ICC convention.
**Notes:** Returns three UInt16 values as Integer array.

### 111.21.31 FLOAT_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Floating point – With this flag we can differentiate 16 bits as float and as int.

### 111.21.32 GetAlarmCodes as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the current global codes used to mark out-out-gamut on Proofing transforms.
**Notes:** Values are meant to be encoded in 16 bits.
Returns array with 16 integer values.
See also:

- 111.21.33 GetAlarmCodes(context as LCMS2ContextMBS) as Integer() 16755

### 111.21.33 GetAlarmCodes(context as LCMS2ContextMBS) as Integer()

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the current global codes used to mark out-out-gamut on Proofing transforms.
**Notes:** Values are meant to be encoded in 16 bits.
Returns array with 16 integer values.
See also:

- 111.21.32 GetAlarmCodes as Integer() 16755

### 111.21.34 GetSupportedIntentCodes as UInt32()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills an array with id,Äênumbers for all supported intents.
**Example:**

```
dim names() as string = LCMS2MBS.GetSupportedIntentDescriptions
dim codes() as UInt32 = LCMS2MBS.GetSupportedIntentCodes

dim u as Integer = UBound(names)
for i as Integer = 0 to u
MsgBox str(codes(i))+": "+names(i)
next
```

**Notes:** Little CMS plug,Äêin architecture allows to implement user,Äêdefined intents; use this function to get info about such extended functionality.
See also:

- 111.21.35 GetSupportedIntentCodes(context as LCMS2ContextMBS) as UInt32() 16756

### 111.21.35 GetSupportedIntentCodes(context as LCMS2ContextMBS) as UInt32()

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills an array with id,Äênumbers for all supported intents.
**Example:**

```
dim names() as string = LCMS2MBS.GetSupportedIntentDescriptions
dim codes() as UInt32 = LCMS2MBS.GetSupportedIntentCodes

dim u as Integer = UBound(names)
for i as Integer = 0 to u
MsgBox str(codes(i))+": "+names(i)
next
```

**Notes:** Little CMS plug,Äêin architecture allows to implement user,Äêdefined intents; use this function to get info about such extended functionality.
See also:

- 111.21.34 GetSupportedIntentCodes as UInt32() 16755

### 111.21.36 GetSupportedIntentDescriptions as string()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills an array with descriptions for all supported intents.
**Example:**

MsgBox Join(LCMS2MBS.GetSupportedIntentDescriptions, EndOfLine)

**Notes:** Little CMS plug,Äêin architecture allows to implement user,Äêdefined intents; use this function to get info about such extended functionality.

### 111.21.37 GridPoints(n as Integer) as Integer

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates grid points.
**Example:**

MsgBox str(LCMS2MBS.GridPoints(2))

### 111.21.38 kcmsD50X as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X value of D50 XYZ normalized to Y=1.0.

### 111.21.39 kcmsD50Y as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y value of D50 XYZ normalized to Y=1.0.

### 111.21.40 kcmsD50Z as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Z value of D50 XYZ normalized to Y=1.0.

### 111.21.41 kcmsPERCEPTUAL_BLACK_X as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** X of V4 perceptual black.

### 111.21.42 kcmsPERCEPTUAL_BLACK_Y as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Y of V4 perceptual black.

### 111.21.43 kcmsPERCEPTUAL_BLACK_Z as Double

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Z of V4 perceptual black.

### 111.21.44 Lab2LCh(p as LCMS2CIELabMBS) as LCMS2CIELChMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts lab color to LCh value.

### 111.21.45 Lab2XYZ(p as LCMS2CIELabMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts color to XYZ value.
**Notes:** Setting WhitePoint to NULL forces D50 as white point.

### 111.21.46 LabEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a Lab value, encoded on ICC v4 convention to a lab value.
**Notes:** w0, w1 and w2: Array of 3 UInt16 holding the encoded values.
Returns lab color.

### 111.21.47 LabEncoded2FloatV2(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a Lab value, encoded on ICC v2 convention to a Lab value.
**Notes:** w0, w1 and w2: 3 UInt16 numbers holding the encoded values.

### 111.21.48 LCh2Lab(p as LCMS2CIELChMBS) as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorimetric space conversion from LCh to Lab.

### 111.21.49 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
See also:

- 111.21.50 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS 16759
- 111.21.51 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS 16759

### 111.21.50 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
See also:

- 111.21.49 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS 16759
- 111.21.51 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS 16759

### 111.21.51 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a bitmap object with given size and color space.
**Notes:** In this variant, you pass the memoryblock with right size.

Passing memoryblock of wrong size can lead into crashs.
See also:

- 111.21.49 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS 16759
- 111.21.50 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS 16759

### 111.21.52 OPTIMIZED_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Optimized – previous optimization already returns the final 8-bit value.

### 111.21.53 PixelFormat(FloatingPoint as boolean, Optimized as boolean, ColorSpace as UInt32, MinIsWhite as boolean, Planar as boolean, EndianSwap as boolean, DoSwap as boolean, ExtraSamples as UInt32, Channels as UInt32, BytesPerSample as UInt32, SwapFirst as boolean) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Utility function to create a pixel format.
**Notes:** Format of pixel is defined by one UInt32, using bit fields as follows

A O TTTTT U Y F P X S EEE CCCC BBB

FloatingPoint: With this flag we can differentiate 16 bits as float and as int
Optimized: Previous optimization already returns the final 8-bit value
ColorSpace: Pixeltype
MinIsWhite: Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla)
Planar: Planar? 0=Chunky, 1=Planar
EndianSwap: swap 16 bps endianess?
DoSwap: Do swap? ie, BGR, KYMC
ExtraSamples: Extra samples
Channels: Channels (Samples per pixel)
BytesPerSample: bytes per sample
SwapFirst: Swap first - changes ABGR to BGRA and KCMY to CMYK

### 111.21.54 PLANAR_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Planar? 0=Chunky, 1=Planar

### 111.21.55 PREMUL_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Premultiplied? 0=No, 1=Yes

### 111.21.56 SetAdaptationState(context as LCMS2ContextMBS, d as Double) as Double

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets adaptation state for absolute colorimetric intent, on all but CreateExtendedTransform.
**Notes:** Little CMS can handle incomplete adaptation states.

d: Degree on adaptation 0=Not adapted, 1=Complete adaptation, in-between=Partial adaptation. Use negative values to return the global state without changing it.

Returns previous global adaptation state.
See also:

- 111.21.57 SetAdaptationState(d as Double) as Double 16761

### 111.21.57 SetAdaptationState(d as Double) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets adaptation state for absolute colorimetric intent, on all but CreateExtendedTransform.
**Notes:** Little CMS can handle incomplete adaptation states.

d: Degree on adaptation 0=Not adapted, 1=Complete adaptation, in-between=Partial adaptation. Use negative values to return the global state without changing it.

Returns previous global adaptation state.
See also:

- 111.21.56 SetAdaptationState(context as LCMS2ContextMBS, d as Double) as Double 16761

### 111.21.58 SetAlarmCodes(context as LCMS2ContextMBS, values() as Integer)

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the global codes used to mark out-out-gamut on Proofing transforms.
**Notes:** Values are meant to be encoded in 16 bits.
AlarmCodes: Array of 16 codes. All 16 values must be specified, set to zero for unused channels.
See also:

- 111.21.59 SetAlarmCodes(values() as Integer) 16762

### 111.21.59 SetAlarmCodes(values() as Integer)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the global codes used to mark out-out-gamut on Proofing transforms.
**Notes:** Values are meant to be encoded in 16 bits.
AlarmCodes: Array of 16 codes. All 16 values must be specified, set to zero for unused channels.
See also:

- 111.21.58 SetAlarmCodes(context as LCMS2ContextMBS, values() as Integer) 16762

### 111.21.60 SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS)

MBS Images Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows user to set any specific logger.
**Notes:** Each time this function is called, the previous logger is replaced. Calling this functin with NULL as parameter, does reset the logger to the default Little CMS logger. The default Little CMS logger does nothing.

LCMS2ErrorHandlerMBS is an Interface. You add it to the interface of your window/thread/class. Than you get a method "Error(context as LCMS2ContextMBS, ErrorCode as UInt32, Text as string)" which is called to log error messages. The context parameter is the object you pass for reference in the various context parameters to LCMS2 functions.
See also:

- 111.21.61 SetLogErrorHandler(handler as LCMS2ErrorHandlerMBS) 16763

### 111.21.61 SetLogErrorHandler(handler as LCMS2ErrorHandlerMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows user to set any specific logger.
**Notes:** Each time this function is called, the previous logger is replaced. Calling this functin with NULL as parameter, does reset the logger to the default Little CMS logger. The default Little CMS logger does nothing.

LCMS2ErrorHandlerMBS is an Interface. You add it to the interface of your window/thread/class. Than you get a method "Error(context as LCMS2ContextMBS, ErrorCode as UInt32, Text as string)" which is called to log error messages. The context parameter is the object you pass for reference in the various context parameters to LCMS2 functions.
See also:

- 111.21.60 SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS) 16762

### 111.21.62 SWAPFIRST_SH(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
**Notes:** Swap first - changes ABGR to BGRA and KCMY to CMYK

### 111.21.63 TagInteger(tag as string) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts tag integer to string.
**Example:**

```
MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(&h64657673)
```

### 111.21.64 TagString(tag as UInt32) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts tag string to integer.
**Example:**

```
MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(&h64657673)
```

### 111.21.65 TempFromWhitePoint(TempK as LCMS2CIExyYMBS) as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Correlates a black body temperature in K from given chromaticity.
**Example:**

```
dim c as new LCMS2CIExyYMBS

c.x = 0.32
c.y = 0.32
c.YY = 1.0

MsgBox str(LCMS2MBS.TempFromWhitePoint(c))
```

**Notes:** Returns temperature. Or zero on any error.

### 111.21.66 T_BIT15(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Bit15 flag

### 111.21.67 T_BYTES(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** bytes per sample

### 111.21.68 T_CHANNELS(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Channels (Samples per pixel)

### 111.21.69 T_COLORSPACE(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Pixeltype

### 111.21.70 T_DITHER(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** dither flag

### 111.21.71 T_DOSWAP(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Do swap? ie, BGR, KYMC

### 111.21.72 T_ENDIAN16(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** swap 16 bps endianess?

### 111.21.73 T_EXTRA(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Extra samples

### 111.21.74 T_FLAVOR(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla)

### 111.21.75 T_FLOAT(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Floating point – With this flag we can differentiate 16 bits as float and as int

### 111.21.76 T_OPTIMIZED(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Optimized – previous optimization already returns the final 8-bit value

### 111.21.77 T_PLANAR(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Planar? 0=Chunky, 1=Planar

### 111.21.78 T_PREMUL(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Premultiplied? 0=Yes, 1=No

### 111.21.79 T_SWAPFIRST(n as UInt32) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks a value from a bitwise pixel format.
**Notes:** Swap first - changes ABGR to BGRA and KCMY to CMYK.

### 111.21.80 Version as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version number of LCMS2.
**Example:**

```
MsgBox LCMS2MBS.Version
```

### 111.21.81 WhitePointFromTemp(TempK as Double) as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Correlates a black body chromaticity from given temperature in K.
**Example:**

```
dim c as LCMS2CIExyYMBS = LCMS2MBS.WhitePointFromTemp(6500)

MsgBox str(c.x)+" "+str(c.y)+" "+str(c.yy)
```

**Notes:** Valid range is 4000K-25000K.
TempK: Temperature in oK
Returns white point or nil in case of error.

### 111.21.82 xyY2XYZ(p as LCMS2CIExyYMBS) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorimetric space conversion from xyY to XYZ.

### 111.21.83 XYZ2Lab(p as LCMS2CIEXYZMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIELabMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts XYZ color to Lab.
**Notes:** Setting WhitePoint to nil forces D50 as white point.

### 111.21.84 XYZ2xyY(p as LCMS2CIEXYZMBS) as LCMS2CIExyYMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colorimetric space conversion from XYZ to xyY.

### 111.21.85 XYZEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a XYZ value, encoded on ICC convention to a LCMS2CIEXYZMBS value.
**Notes:** w0,w1 and w2: Array of 3 UInt16 values holding the encoded valkues.
Returns XYZ color on success or nil on failure.

### 111.21.86 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kcmsMagicNumber | &h61637370 | Magic number to identify an ICC profile. |
| kcmsMAXCHANNELS | 16 | Maximum number of channels in ICC profiles. |
| kD_CALCULATE | -1 | Special value for D Value of ViewingConditions. |
| klcmsSignature | &h6C636D73 | Little CMS signature. |

Surround Constants

| Constant | Value | Description |
|---|---|---|
| kAVG_SURROUND | 1 | |
| kCUTSHEET_SURROUND | 4 | |
| kDARK_SURROUND | 3 | |
| kDIM_SURROUND | 2 | |

Header Flag Constants

| Constant | Value | Description |
|---|---|---|
| kcmsEmbeddedProfileFalse | 0 | |
| kcmsEmbeddedProfileTrue | 1 | |
| kcmsUseAnywhere | 0 | |
| kcmsUseWithEmbeddedDataOnly | 2 | |

Error Constants

| Constant | Value | Description |
|---|---|---|
| kcmsERROR_ALREADY_DEFINED | 10 | Already defined |
| kcmsERROR_BAD_SIGNATURE | 11 | Bad signature |
| kcmsERROR_COLORSPACE_CHECK | 9 | Colorspace Check |
| kcmsERROR_CORRUPTION_DETECTED | 12 | Corruption detected |
| kcmsERROR_FILE | 1 | File error |
| kcmsERROR_INTERNAL | 3 | Internal error |
| kcmsERROR_NOT_SUITABLE | 13 | Not suitable |
| kcmsERROR_NULL | 4 | NULL passed |
| kcmsERROR_RANGE | 2 | Range error |
| kcmsERROR_READ | 5 | Read error |
| kcmsERROR_SEEK | 6 | Seek error |
| kcmsERROR_UNDEFINED | 0 | Undefined error |
| kcmsERROR_UNKNOWN_EXTENSION | 8 | Unknown extension |
| kcmsERROR_WRITE | 7 | Write error |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| kcmsFLAGS_8BITS_DEVICELINK | 8 | Create 8 bits devicelinks |
| kcmsFLAGS_BLACKPOINTCOMPENSATION | &h00002000 | Black point compensation. |
| kcmsFLAGS_CLUT_POST_LINEARIZATION | 1 | Create postlinearization tables if possible |
| kcmsFLAGS_CLUT_PRE_LINEARIZATION | 16 | Create prelinearization tables if possible |
| kcmsFLAGS_COPY_ALPHA | &h04000000 | Whether to copy alpha. |
| kcmsFLAGS_FORCE_CLUT | 2 | Force CLUT optimization |
| kcmsFLAGS_GAMUTCHECK | &h00001000 | Out of Gamut alarm |
| kcmsFLAGS_GUESSDEVICECLASS | 32 | Guess device class (for transform2devicelink) |
| kcmsFLAGS_HIGHRESPRECALC | &h00000400 | Use more memory to give better accurancy |
| kcmsFLAGS_KEEP_SEQUENCE | &h00000080 | Keep profile sequence for devicelink creation |
| kcmsFLAGS_LOWRESPRECALC | &h00000800 | Use less memory to minimize resouces |
| kcmsFLAGS_NOCACHE | 64 | Inhibit 1-pixel cache |
| kcmsFLAGS_NODEFAULTRESOURCEDEF | &h01000000 | |
| kcmsFLAGS_NONEGATIVES | &h00008000 | Prevent negative numbers in floating point transforms |
| kcmsFLAGS_NOOPTIMIZE | &h00000100 | Inhibit optimizations |
| kcmsFLAGS_NOWHITEONWHITEFIXUP | 4 | Don't fix scum dot |
| kcmsFLAGS_NULLTRANSFORM | &h00000200 | Don't transform anyway |
| kcmsFLAGS_SOFTPROOFING | &h00004000 | Do softproofing |

Screening Flag Constants

| Constant | Value | Description |
|---|---|---|
| kcmsFREQUENCE_UNITS_LINES_CM | 0 | |
| kcmsFREQUENCE_UNITS_LINES_INCH | 2 | |
| kcmsPRINTER_DEFAULT_SCREENS | 1 | |

Device Attribute Constants

| Constant | Value | Description |
|---|---|---|
| kcmsGlossy | 0 | |
| kcmsMatte | 2 | |
| kcmsReflective | 0 | |
| kcmsTransparency | 1 | |

Illuminant Constants

| Constant | Value | Description |
|---|---|---|
| kcmsILLUMINANT_TYPE_A | 6 | A |
| kcmsILLUMINANT_TYPE_D50 | 1 | D50 |
| kcmsILLUMINANT_TYPE_D55 | 5 | D55 |
| kcmsILLUMINANT_TYPE_D65 | 2 | D65 |
| kcmsILLUMINANT_TYPE_D93 | 3 | D93 |
| kcmsILLUMINANT_TYPE_E | 7 | E |
| kcmsILLUMINANT_TYPE_F2 | 4 | F2 |
| kcmsILLUMINANT_TYPE_F8 | 8 | F8 |
| kcmsILLUMINANT_TYPE_UNKNOWN | 0 | Unknown |

Colorspace Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSig10colorData | &h41434C52 | |
| kcmsSig11colorData | &h42434C52 | |
| kcmsSig12colorData | &h43434C52 | |
| kcmsSig13colorData | &h44434C52 | |
| kcmsSig14colorData | &h45434C52 | |
| kcmsSig15colorData | &h46434C52 | |
| kcmsSig1colorData | &h31434C52 | |
| kcmsSig2colorData | &h32434C52 | |
| kcmsSig3colorData | &h33434C52 | |
| kcmsSig4colorData | &h34434C52 | |
| kcmsSig5colorData | &h35434C52 | |
| kcmsSig6colorData | &h36434C52 | |
| kcmsSig7colorData | &h37434C52 | |
| kcmsSig8colorData | &h38434C52 | |
| kcmsSig9colorData | &h39434C52 | |
| kcmsSigCmyData | &h434D5920 | |
| kcmsSigCmykData | &h434D594B | |
| kcmsSigGrayData | &h47524159 | |
| kcmsSigHlsData | &h484C5320 | |
| kcmsSigHsvData | &h48535620 | |
| kcmsSigLabData | &h4C616220 | |
| kcmsSigLabV2toV4 | &h32203420 | |
| kcmsSigLabV4toV2 | &h34203220 | |
| kcmsSigLuvData | &h4C757620 | |
| kcmsSigLuvKData | &h4C75764B | |
| kcmsSigMCH1Data | &h4D434831 | |
| kcmsSigMCH2Data | &h4D434832 | |
| kcmsSigMCH3Data | &h4D434833 | |
| kcmsSigMCH4Data | &h4D434834 | |
| kcmsSigMCH5Data | &h4D434835 | |
| kcmsSigMCH6Data | &h4D434836 | |
| kcmsSigMCH7Data | &h4D434837 | |
| kcmsSigMCH8Data | &h4D434838 | |
| kcmsSigMCH9Data | &h4D434839 | |
| kcmsSigMCHAData | &h4D434841 | |
| kcmsSigMCHBData | &h4D434842 | |
| kcmsSigMCHCData | &h4D434843 | |
| kcmsSigMCHDData | &h4D434844 | |
| kcmsSigMCHEData | &h4D434845 | |
| kcmsSigMCHFData | &h4D434846 | |
| kcmsSigNamedData | &h6E6D636C | |
| kcmsSigRgbData | &h52474220 | |
| kcmsSigXYZData | &h58595A20 | |
| kcmsSigYCbCrData | &h59436272 | |
| kcmsSigYxyData | &h59787920 | |

Profile Class Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigAbstractClass | &h61627374 | Abstract |
| kcmsSigColorSpaceClass | &h73706163 | Colorspace |
| kcmsSigDisplayClass | &h6D6E7472 | Display |
| kcmsSigInputClass | &h73636E72 | Input |
| kcmsSigLinkClass | &h6C696E6B | Link |
| kcmsSigNamedColorClass | &h6E6D636C | Named Colors |
| kcmsSigOutputClass | &h70727472 | Output |

Technology Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigAMDisplay | &h414D4420 | |
| kcmsSigCRTDisplay | &h43525420 | |
| kcmsSigDigitalCamera | &h6463616D | |
| kcmsSigDigitalCinemaProjector | &h64636A70 | |
| kcmsSigDigitalMotionPictureCamera | &h646D7063 | |
| kcmsSigDyeSublimationPrinter | &h64737562 | |
| kcmsSigElectrophotographicPrinter | &h6570686F | |
| kcmsSigElectrostaticPrinter | &h65737461 | |
| kcmsSigFilmScanner | &h6673636E | |
| kcmsSigFilmWriter | &h6670726E | |
| kcmsSigFlexography | &h666C6578 | |
| kcmsSigGravure | &h67726176 | |
| kcmsSigInkJetPrinter | &h696A6574 | |
| kcmsSigMotionPictureFilmRecorder | &h6D706672 | |
| kcmsSigMotionPictureFilmScanner | &h6D706673 | |
| kcmsSigOffsetLithography | &h6F666673 | |
| kcmsSigPhotoCD | &h4B504344 | |
| kcmsSigPhotographicPaperPrinter | &h7270686F | |
| kcmsSigPhotoImageSetter | &h696D6773 | |
| kcmsSigPMDisplay | &h504D4420 | |
| kcmsSigProjectionTelevision | &h706A7476 | |
| kcmsSigReflectiveScanner | &h7273636E | |
| kcmsSigSilkscreen | &h73696C6B | |
| kcmsSigThermalWaxPrinter | &h74776178 | |
| kcmsSigVideoCamera | &h76696463 | |
| kcmsSigVideoMonitor | &h7669646D | |

Tag Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigArgyllArtsTag | &h61727473 | |
| kcmsSigAToB0Tag | &h41324230 | |
| kcmsSigAToB1Tag | &h41324231 | |
| kcmsSigAToB2Tag | &h41324232 | |
| kcmsSigBlueColorantTag | &h6258595A | |
| kcmsSigBlueMatrixColumnTag | &h6258595A | |
| kcmsSigBlueTRCTag | &h62545243 | |
| kcmsSigBToA0Tag | &h42324130 | |
| kcmsSigBToA1Tag | &h42324131 | |
| kcmsSigBToA2Tag | &h42324132 | |
| kcmsSigBToD0Tag | &h42324430 | |
| kcmsSigBToD1Tag | &h42324431 | |
| kcmsSigBToD2Tag | &h42324432 | |
| kcmsSigBToD3Tag | &h42324433 | |
| kcmsSigCalibrationDateTimeTag | &h63616C74 | |
| kcmsSigCharTargetTag | &h74617267 | |
| kcmsSigChromaticAdaptationTag | &h63686164 | |
| kcmsSigChromaticityTag | &h6368726D | |
| kcmsSigColorantOrderTag | &h636C726F | |
| kcmsSigColorantTableOutTag | &h636C6F74 | |
| kcmsSigColorantTableTag | &h636C7274 | |
| kcmsSigColorimetricIntentImageStateTag | &h63696973 | |
| kcmsSigCopyrightTag | &h63707274 | |
| kcmsSigCrdInfoTag | &h63726469 | |
| kcmsSigDataTag | &h64617461 | |
| kcmsSigDateTimeTag | &h6474696D | |
| kcmsSigDeviceMfgDescTag | &h646D6E64 | |
| kcmsSigDeviceModelDescTag | &h646D6464 | |
| kcmsSigDeviceSettingsTag | &h64657673 | |
| kcmsSigDToB0Tag | &h44324230 | |
| kcmsSigDToB1Tag | &h44324231 | |
| kcmsSigDToB2Tag | &h44324232 | |
| kcmsSigDToB3Tag | &h44324233 | |
| kcmsSigGamutTag | &h67616D74 | |
| kcmsSigGrayTRCTag | &h6B545243 | |
| kcmsSigGreenColorantTag | &h6758595A | |
| kcmsSigGreenMatrixColumnTag | &h6758595A | |
| kcmsSigGreenTRCTag | &h67545243 | |
| kcmsSigLuminanceTag | &h6C756D69 | |
| kcmsSigMeasurementTag | &h6D656173 | |
| kcmsSigMediaBlackPointTag | &h626B7074 | |
| kcmsSigMediaWhitePointTag | &h77747074 | |
| kcmsSigMetaTag | &h6D657461 | |
| kcmsSigNamedColor2Tag | &h6E636C32 | |
| kcmsSigNamedColorTag | &h6E636F6C | |
| kcmsSigOutputResponseTag | &h72657370 | |
| kcmsSigPerceptualRenderingIntentGamutTag | &h72696730 | |
| kcmsSigPreview0Tag | &h70726530 | |
| kcmsSigPreview1Tag | &h70726531 | |
| kcmsSigPreview2Tag | &h70726532 | |
| kcmsSigProfileDescriptionMLTag | &h6473636D | |
| kcmsSigProfileDescriptionTag | &h64657363 | |
| kcmsSigProfileSequenceDescTag | &h70736571 | |
| kcmsSigProfileSequenceIdTag | &h70736964 | |
| kcmsSigPs2CRD0Tag | &h70736430 | |
| kcmsSigPs2CRD1Tag | &h70736431 | |
| kcmsSigPs2CRD2Tag | &h70736432 | |
| kcmsSigPs2CRD3Tag | &h70736433 | |

Data Type Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigBAcsElemType | &h62414353 | |
| kcmsSigChromaticityType | &h6368726D | |
| kcmsSigClipNegativesElemType | &h636C7020 | |
| kcmsSigCLutElemType | &h636C7574 | |
| kcmsSigColorantOrderType | &h636C726F | |
| kcmsSigColorantTableType | &h636C7274 | |
| kcmsSigCrdInfoType | &h63726469 | |
| kcmsSigCurveSetElemType | &h63767374 | |
| kcmsSigCurveType | &h63757276 | |
| kcmsSigDataType | &h64617461 | |
| kcmsSigDateTimeType | &h6474696D | |
| kcmsSigDeviceSettingsType | &h64657673 | |
| kcmsSigDictType | &h64696374 | |
| kcmsSigEAcsElemType | &h65414353 | |
| kcmsSigFloatPCS2Lab | &h6C326420 | |
| kcmsSigFloatPCS2XYZ | &h78326420 | |
| kcmsSigIdentityElemType | &h69646E20 | |
| kcmsSigLab2FloatPCS | &h64326C20 | |
| kcmsSigLab2XYZElemType | &h78326C20 | |
| kcmsSigLut16Type | &h6D667432 | |
| kcmsSigLut8Type | &h6D667431 | |
| kcmsSigLutAtoBType | &h6D414220 | |
| kcmsSigLutBtoAType | &h6D424120 | |
| kcmsSigMatrixElemType | &h6D617466 | |
| kcmsSigMeasurementType | &h6D656173 | |
| kcmsSigMultiLocalizedUnicodeType | &h6D6C7563 | |
| kcmsSigMultiProcessElementType | &h6D706574 | |
| kcmsSigNamedColor2Type | &h6E636C32 | |
| kcmsSigNamedColorElemType | &h6E636C20 | |
| kcmsSigNamedColorType | &h6E636F6C | |
| kcmsSigParametricCurveType | &h70617261 | |
| kcmsSigProfileSequenceDescType | &h70736571 | |
| kcmsSigProfileSequenceIdType | &h70736964 | |
| kcmsSigResponseCurveSet16Type | &h72637332 | |
| kcmsSigS15Fixed16ArrayType | &h73663332 | |
| kcmsSigScreeningType | &h7363726E | |
| kcmsSigSignatureType | &h73696720 | |
| kcmsSigTextDescriptionType | &h64657363 | |
| kcmsSigTextType | &h74657874 | |
| kcmsSigU16Fixed16ArrayType | &h75663332 | |
| kcmsSigUcrBgType | &h62666420 | |
| kcmsSigUInt16ArrayType | &h75693136 | |
| kcmsSigUInt32ArrayType | &h75693332 | |
| kcmsSigUInt64ArrayType | &h75693634 | |
| kcmsSigUInt8ArrayType | &h75693038 | |
| kcmsSigVcgtType | &h76636774 | |
| kcmsSigViewingConditionsType | &h76696577 | |
| kcmsSigXYZ2FloatPCS | &h64327820 | |
| kcmsSigXYZ2LabElemType | &h6C327820 | |
| kcmsSigXYZType | &h58595A20 | |

Response Curve Type Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigDN | &h444E2020 | DIN E: DIN 16536-2 densitometer response, with no polarising filter. |
| kcmsSigDNN | &h444E4E20 | DIN I: DIN 16536-2 narrow band densitometer response, with no polarising filter. |
| kcmsSigDNNP | &h444E4E50 | DIN I: DIN 16536-2 narrow band densitometer response, with polarising filter. |
| kcmsSigDNP | &h444E2050 | DIN E: DIN 16536-2 densitometer response, with polarising filter. |
| kcmsSigStatusA | &h53746141 | Status A: ISO 5-3 densitometer response. This is the accepted standard for reflection densitometers for measuring photographic colour prints. |
| kcmsSigStatusE | &h53746145 | Status E: ISO 5-3 densitometer response which is the accepted standard in Europe for colour reflection densitometers. |
| kcmsSigStatusI | &h53746149 | Status I: ISO 5-3 densitometer response commonly referred to as narrow band or interference-type response. |
| kcmsSigStatusM | &h5374614D | Status M: ISO 5-3 densitometer response for measuring colour negatives. |
| kcmsSigStatusT | &h53746154 | Status T: ISO 5-3 wide band colour reflection densitometer response which is the accepted standard in the United States for colour reflection densitometers. |

Colorimetric Intent Image State Tag Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigFocalPlaneColorimetryEstimates | &h66706365 | |
| kcmsSigReflectionHardcopyOriginalColorimetry | &h72686F63 | |
| kcmsSigReflectionPrintOutputColorimetry | &h72706F63 | |
| kcmsSigSceneAppearanceEstimates | &h73617065 | |
| kcmsSigSceneColorimetryEstimates | &h73636F65 | |

Curve Element Type Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigFormulaCurveSeg | &h70617266 | |
| kcmsSigSampledCurveSeg | &h73616D66 | |
| kcmsSigSegmentedCurve | &h63757266 | |

Platform Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigMacintosh | &h4150504C | Mac |
| kcmsSigMicrosoft | &h4D534654 | Windows |
| kcmsSigSGI | &h53474920 | SGI |
| kcmsSigSolaris | &h53554E57 | Solaris |
| kcmsSigTaligent | &h54474E54 | Taligent |
| kcmsSigUnices | &h2A6E6978 | Unix systems |

Reference Gammut Signature Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSigPerceptualReferenceMediumGamut | &h70726D67 | |

Spot Shape Constants

| Constant | Value | Description |
|---|---|---|
| kcmsSPOT_CROSS | 7 | |
| kcmsSPOT_DIAMOND | 3 | |
| kcmsSPOT_ELLIPSE | 4 | |
| kcmsSPOT_LINE | 5 | |
| kcmsSPOT_PRINTER_DEFAULT | 1 | |
| kcmsSPOT_ROUND | 2 | |
| kcmsSPOT_SQUARE | 6 | |
| kcmsSPOT_UNKNOWN | 0 | |

Intent Constants

| Constant | Value | Description |
|---|---|---|
| kINTENT_ABSOLUTE_COLORIMETRIC | 3 | Absolute Colorimetric ICC Intent. |
| kINTENT_PERCEPTUAL | 0 | Perceptual Colorimetric ICC Intent. |
| kINTENT_PRESERVE_K_ONLY_PERCEPTUAL | 10 | Special LCMS intent: Perceptual prese |
| kINTENT_PRESERVE_K_ONLY_RELATIVE_COLORIMETRIC | 11 | Special LCMS intent: Relative colorime |
| kINTENT_PRESERVE_K_ONLY_SATURATION | 12 | Special LCMS intent: Saturation prese |
| kINTENT_PRESERVE_K_PLANE_PERCEPTUAL | 13 | Special LCMS intent: Perceptual prese |
| kINTENT_PRESERVE_K_PLANE_RELATIVE_COLORIMETRIC | 14 | Special LCMS intent: Relative colorime |
| kINTENT_PRESERVE_K_PLANE_SATURATION | 15 | Special LCMS intent: Saturation prese |
| kINTENT_RELATIVE_COLORIMETRIC | 1 | Relative Colorimetric ICC Intent. |
| kINTENT_SATURATION | 2 | Saturation ICC Intent. |

Used Direction Constants

| Constant | Value | Description |
|---|---|---|
| kLCMS_USED_AS_INPUT | 0 | |
| kLCMS_USED_AS_OUTPUT | 1 | |
| kLCMS_USED_AS_PROOF | 2 | |

Pixel Type Constants

| Constant | Value | Description |
|---|---|---|
| kPT_ANY | 0 | Don't check colorspace |
| kPT_CMY | 5 | CMY |
| kPT_CMYK | 6 | CMYK |
| kPT_GRAY | 3 | Gray |
| kPT_HLS | 13 | HLS |
| kPT_HSV | 12 | HSV |
| kPT_Lab | 10 | Lab |
| kPT_LabV2 | 30 | Identical to kPT_Lab, but using the V2 old encoding |
| kPT_MCH1 | 15 | Multichannel with 1 channels. |
| kPT_MCH10 | 24 | Multichannel with 10 channels. |
| kPT_MCH11 | 25 | Multichannel with 11 channels. |
| kPT_MCH12 | 26 | Multichannel with 12 channels. |
| kPT_MCH13 | 27 | Multichannel with 13 channels. |
| kPT_MCH14 | 28 | Multichannel with 14 channels. |
| kPT_MCH15 | 29 | Multichannel with 15 channels. |
| kPT_MCH2 | 16 | Multichannel with 2 channels. |
| kPT_MCH3 | 17 | Multichannel with 3 channels. |
| kPT_MCH4 | 18 | Multichannel with 4 channels. |
| kPT_MCH5 | 19 | Multichannel with 5 channels. |
| kPT_MCH6 | 20 | Multichannel with 6 channels. |
| kPT_MCH7 | 21 | Multichannel with 7 channels. |
| kPT_MCH8 | 22 | Multichannel with 8 channels. |
| kPT_MCH9 | 23 | noMultichannel with 9 channels.ne |
| kPT_RGB | 4 | RGB |
| kPT_XYZ | 9 | XYZ |
| kPT_YCbCr | 7 | YCbCr |
| kPT_YUV | 8 | Lu'v' |
| kPT_YUVK | 11 | Lu'v'K |
| kPT_Yxy | 14 | Yxy |

Color Space Type Constants

| Constant | Value | Description |
|---|---|---|
| kTYPE_ABGR_15 | &h0404049A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap 15, 8 bytes in total. |
| kTYPE_ABGR_15_PLANAR | &h0404149A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, planar, swap 15, 8 bytes in total. |
| kTYPE_ABGR_15_SE | &h04040C9A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap endian, bit 15, 8 bytes in total. |
| kTYPE_ABGR_16 | &h0004049A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_ABGR_16_PLANAR | &h0004149A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, planar, sw bytes in total. |
| kTYPE_ABGR_16_PREMUL | &h0084049A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, premultiplied, output, 8 bytes in total. |
| kTYPE_ABGR_16_SE | &h00040C9A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap endian, 8 bytes in total. |
| kTYPE_ABGR_8 | &h00040499 | RGB, 3 channels, 1 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_ABGR_8_DITHER | &h08040499 | RGB, 3 channels, 1 bytes, 1 extra samples, integer, dither, chunky, 4 bytes in total. |
| kTYPE_ABGR_8_PLANAR | &h00041499 | RGB, 3 channels, 1 bytes, 1 extra samples, integer, planar, sw bytes in total. |
| kTYPE_ABGR_8_PREMUL | &h00840499 | RGB, 3 channels, 1 bytes, 1 extra samples, integer, premultiplied, output, 4 bytes in total. |
| kTYPE_ABGR_FLT | &h0044049C | RGB, 3 channels, 4 bytes, 1 extra samples, single, chunky, swa bytes in total. |
| kTYPE_ABGR_FLT_PREMUL | &h00C4049C | RGB, 3 channels, 4 bytes, 1 extra samples, single, premultiplied, output, 16 bytes in total. |
| kTYPE_ABGR_HALF_FLT | &h0044041A | RGB, 3 channels, 2 bytes, single, chunky, swap output, 6 bytes in |
| kTYPE_ACMYK_16 | &h000640A2 | CMYK, 4 channels, 2 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_ACMYK_8 | &h000640A1 | CMYK, 4 channels, 1 bytes, 1 extra samples, integer, chunky, s bytes in total. |
| kTYPE_AGRAY_16 | &h0003048A | GRAY, 1 channels, 2 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_AGRAY_16_PLANAR | &h0003508A | GRAY, 1 channels, 2 bytes, 1 extra samples, integer, planar, s bytes in total. |
| kTYPE_AGRAY_8 | &h00030489 | GRAY, 1 channels, 1 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_AGRAY_8_PLANAR | &h00035089 | GRAY, 1 channels, 1 bytes, 1 extra samples, integer, planar, s bytes in total. |
| kTYPE_AGRAY_DBL | &h00430488 | GRAY, 1 channels, 8 bytes, 1 extra samples, double, chunky, swa bytes in total. |
| kTYPE_AGRAY_DBL_PLANAR | &h00435088 | GRAY, 1 channels, 8 bytes, 1 extra samples, double, planar, sw bytes in total. |
| kTYPE_AGRAY_FLT | &h0043048C | GRAY, 1 channels, 4 bytes, 1 extra samples, single, chunky, sw bytes in total. |
| kTYPE_AGRAY_FLT_PLANAR | &h0043508C | GRAY, 1 channels, 4 bytes, 1 extra samples, single, planar, swap i in total. |
| kTYPE_AKYMC_16 | &h000604A2 | CMYK, 4 channels, 2 bytes, 1 extra samples, integer, chunky, swa bytes in total. |
| kTYPE_AKYMC_8 | &h000604A1 | CMYK, 4 channels, 1 bytes, 1 extra samples, integer, chunky, sw bytes in total. |
| kTYPE_ALabV2_8 | &h001E4099 | LabV2, 3 channels, 1 bytes, 1 extra samples, integer, chunky, s bytes in total. |
| kTYPE_ALab_8 | &h000A4099 | Lab, 3 channels, 1 bytes, 1 extra samples, integer, chunky, swap i in total. |
| kTYPE_ARGB_15 | &h0404409A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap i 8 bytes in total. |
| kTYPE_ARGB_16 | &h0004409A | RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap i |

## 111.22 class LCMS2MLUMBS

### 111.22.1 class LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a multi localized unicode string.
**Notes:** MLU funtions are the low-level interface to access the localization features of V4 ICC profiles. Little CMS does offer a high-level interface for easy operation. You may want, however, handle those objects by yourself.

Obtaining localized info from profiles
In versions prior to 4.0, the ICC format defined a required tag 'desc' which stored ASCII, Unicode, and Script Code versions of the profile description for display purposes. However, this structure allowed the profile to be localized for one language only through Unicode or Script Code. Profile vendors had to ship many localized versions to different countries. It also created problems when a document with localized profiles embedded in it was shipped to a system using a different language. With the adoption of V4 spec as basis, Little CMS solves all those issues honoring a new tag type: ‚Äòmluc' and multi localized Unicode. There is a full part of the API to deal with this stuff, but if you don't care about the details and all you want is to display the right string, Little CMS provides a simplified interface for that purpose.
Note that ASCII is strictly 7 bits, so you need to use wide chars if you want to preserve the information in the profile. The localization trick is done by using the lenguage and country codes, which you are supposed to supply. Those are two or three ASCII letters. A list of codes may be found here:

Language Code:
http://lcweb.loc.gov/standards/iso639-2/iso639jac.html

Country Codes:
http://www.iso.ch/iso/en/prods-services/iso3166ma/index.html

In practice, "en" for "english" and "US" for "united states" are implemented in most profiles. It is Ok to set a language and a country even if the profile does not implement such specific language and country. Little CMS will search for a proper match.
If you don't care and want just to take the first string in the profile, you can use:

For the language:
kcmsNoLanguage

For the country:
kcmsNoCountry

This will force to get the very first string, without any searching. A note of warning on that: you will get an string, but the language would be any, and probably that is not what you want. It is better to specify

a default for language, and let LittleCMS to choose any other country (or language!) if what you ask for is not available.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr7

### 111.22.2 Methods

### 111.22.3 Constructor(context as LCMS2ContextMBS, items as UInt32)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates an empty multilocalized unicode object.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello" )
call c.setASCII("de", "DE", "Hallo" )
```

### 111.22.4 getASCII(LanguageCode as string, CountryCode as string) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an ASCII (7 bit) entry for the given Language and country.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello" )
call c.setASCII("de", "DE", "Hallo" )

MsgBox "en: "+c.getASCII("en", "US") + EndOfLine + "de: "+c.getASCII("de", "DE") + EndOfLine
+ "any: "+c.getASCII("", "")
```

**Notes:** Language Code: 3 chars describing the language.
CountryCode: 3 chars describing the country.

Returns the string.

### 111.22.5 getTranslation(LanguageCode as string, CountryCode as string, byref ObtainedLanguageCode as string, byref ObtainedCountryCode as string) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtains the translation rule for given multilocalized unicode object.
**Notes:** Language Code: 3 chars describing the language.
CountryCode: 3 chars describing the country
ObtainedLanguage: 3 chars to get the language translation.
ObtainedCode: 3 chars to get the country translation.

Returns true on success, false on error

### 111.22.6 getUnicode(LanguageCode as string, CountryCode as string) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an unicode (16 bit) entry for the given Language and country.
**Notes:** Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country

Returns the string value.

### 111.22.7 setASCII(LanguageCode as string, CountryCode as string, ASCIIString as string) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills an ASCII (7 bit) entry for the given Language and country.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello" )
call c.setASCII("de", "DE", "Hallo" )

MsgBox "en: "+c.getASCII("en", "US") + EndOfLine + "de: "+c.getASCII("de", "DE") + EndOfLine
+ "any: "+c.getASCII("", "")
```

**Notes:** Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country

ASCIIString: String to add.

Returns true on success, false on error.

### 111.22.8 setUnicode(LanguageCode as string, CountryCode as string, UnicodeString as string) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills a UNICODE wide char (16 bit) entry for the given Language and country.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)
call c.setUnicode("de", "DE", "K√§tzchen" )
dim u as string = c.getUnicode("de", "DE")
MsgBox u
```

**Notes:** Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country
WideString: String to add.

Returns true on success, false on error.

### 111.22.9 translationsCodes(index as Integer, byref LanguageCode as string, byref CountryCode as string) as boolean

MBS Images Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries language and country code for the given index.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello" )
call c.setASCII("de", "DE", "Hallo" )

dim u as Integer = c.TranslationsCount-1
for i as Integer = 0 to u
dim LanguageCode as string
dim CountryCode as string

if c.translationsCodes(i, LanguageCode, CountryCode) then
```

```
MsgBox LanguageCode+" "+CountryCode
end if
next
```

**Notes:** Index is from 0 to TranslationsCount-1.

### 111.22.10 UnicodeStrings as String()

MBS Images Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all available strings.

### 111.22.11 Properties

### 111.22.12 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 111.22.13 TranslationsCount as Integer

MBS Images Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of stored translations.
**Example:**

```
dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello" )
call c.setASCII("de", "DE", "Hallo" )

MsgBox str(c.TranslationsCount)+" translations"
```

**Notes:** (Read only property)

### 111.22.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kNoCountry | "" | One of the possible country constants.<br>Any country. |
| kNoLanguage | "" | One of the possible language constants.<br>Any language. |

# 111.23 class LCMS2NamedColorListMBS

## 111.23.1 class LCMS2NamedColorListMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specialized dictionaries for dealing with named color profiles.

## 111.23.2 Methods

## 111.23.3 Append(name as string) as Boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new spot color to the list.
**Notes:** If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:


- 111.23.4 Append(name as string, PCS() as Integer) as Boolean 16786
- 111.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean 16787


## 111.23.4 Append(name as string, PCS() as Integer) as Boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new spot color to the list.
**Notes:** If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:

- 111.23.3 Append(name as string) as Boolean 16786
- 111.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean 16787


### 111.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new spot color to the list.
**Notes:** If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:


- 111.23.3 Append(name as string) as Boolean 16786
- 111.23.4 Append(name as string, PCS() as Integer) as Boolean 16786


### 111.23.6 Colorant(nColor as UInt32) as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns encoded colorants of nth color.
**Notes:** Array has 16 entries, but not all may be in use.

### 111.23.7 ColorIndex(name as string) as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a look-up in the dictionary and returns an index on the given color name.
**Notes:** Returns index on name, or -1 if the spot color is not found.

### 111.23.8 Constructor(context as LCMS2ContextMBS, n as UInt32, ColorantCount as UInt32, Prefix as string = "", Suffix as string = "")

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new named color list.
**Notes:** Allocates an empty named color dictionary.

Context: The user-defined context cargo.
N: Initial number of spot colors in the list
Colorant count: Number of channels of device space (i.e, 3 for RGB, 4 for CMYK, etc,)
Prefix, Suffix: fixed strings for all spot color names, e.g., "coated", "system", ...

On success handle is not zero.

### 111.23.9 Name(nColor as UInt32) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns name of nth color.

### 111.23.10 PCS(nColor as UInt32) as Integer()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns encoded PCS of nth color.
**Notes:** Array has 3 entries.

### 111.23.11 Prefix(nColor as UInt32) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns prefix of nth color.

### 111.23.12 Suffix(nColor as UInt32) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns suffix of nth color.

### 111.23.13 Properties

### 111.23.14 Count as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of spot colors in a named color list.
**Notes:** Returns the number of spot colors on success, 0 on error.
(Read only property)

### 111.23.15 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 111.24 class LCMS2PipelineMBS

### 111.24.1 class LCMS2PipelineMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a pipeline.
**Notes:** Pipelines are a convenient way to model complex operations on image data. Each pipeline may contain an arbitrary number of stages. Each stage performs a single operation. Pipelines may be optimized to be executed on a certain format (8 bits, for example) and can be saved as LUTs in ICC profiles.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr8
- MBS Releases the MBS Real Studio plug-ins in version 12.0

### 111.24.2 Methods

### 111.24.3 Append(p as LCMS2PipelineMBS) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends pipeline l2 at the end of pipeline l1.
**Notes:** Channel count must match.
Returns true on success and false on failure.

### 111.24.4 CheckAndRetreiveStages(type1 as Integer, byref stage1 as LCMS2StageMBS) as Boolean

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks for some specific stages and returns them via byref parameters.
**Notes:** This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then a list of expected types followed with a list of double pointers to Stage elements. If the function founds a match with current pipeline, it fills the parameters and returns true if not, returns false without touching anything.
See also:

- 111.24.5 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS) as Boolean 16791
- 111.24.6 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, type3 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS, byref stage3 as LCMS2StageMBS) as Boolean 16791

### 111.24.5 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS) as Boolean

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks for some specific stages and returns them via byref parameters.
**Notes:** This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then a list of expected types followed with a list of double pointers to Stage elements. If the function founds a match with current pipeline, it fills the parameters and returns true if not, returns false without touching anything.
See also:

- 111.24.4 CheckAndRetreiveStages(type1 as Integer, byref stage1 as LCMS2StageMBS) as Boolean 16790
- 111.24.6 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, type3 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS, byref stage3 as LCMS2StageMBS) as Boolean 16791

### 111.24.6 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, type3 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS, byref stage3 as LCMS2StageMBS) as Boolean

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks for some specific stages and returns them via byref parameters.
**Example:**

```
// load a profile
Dim file As FolderItem = SpecialFolder.Desktop.child("test.icc")
Dim profile As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile( file, False )

// get the pipeline
Dim pipeline As LCMS2PipelineMBS = profile.ReadPipeline( LCMS2MBS.kcmsSigBToA1Tag )

// get curves
Dim CurveIn As LCMS2StageMBS
Dim CLUT As LCMS2StageMBS
Dim CurveOut As LCMS2StageMBS

Dim ok As Boolean = pipeline.CheckAndRetreiveStages(_
LCMS2MBS.kcmsSigCurveSetElemType, _
LCMS2MBS.kcmsSigCLutElemType, _
LCMS2MBS.kcmsSigCurveSetElemType, _
CurveIn, CLUT, CurveOut)
```

```
Break // check the three entries
```

**Notes:** This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then a list of expected types followed with a list of double pointers to Stage elements. If the function founds a match with current pipeline, it fills the parameters and returns true if not, returns false without touching anything.
See also:

- 111.24.4 CheckAndRetreiveStages(type1 as Integer, byref stage1 as LCMS2StageMBS) as Boolean 16790
- 111.24.5 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS) as Boolean 16791

### 111.24.7 Constructor(context as LCMS2ContextMBS, InputChannels as UInt32, OutputChannels as UInt32)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocates an empty pipeline.
**Notes:** Final Input and output channels must be specified at creation time.

context: A user-defined context cargo.
InputChannels, OutputChannels: Number of channels on input and output.

### 111.24.8 Eval16(In as Ptr, Out as Ptr)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a pipeline usin 16-bit numbers, optionally using the optimized path.
**Notes:** In: Input values.
Out: Output values.

For in and out you can use memoryblocks with UInt16 values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. An UInt16 value has 2 bytes.

### 111.24.9 EvalFloat(In as Ptr, Out as Ptr)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a pipeline using floating point numbers.
**Notes:** In: Input values.
Out: Output values.

For in and out you can use memoryblocks with single values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. A single value has 4 bytes.

### 111.24.10 EvalReverseFloat(Target as Ptr, Result as Ptr, Hint as Ptr)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates a pipeline in the reverse direction, using Newton's method.
**Notes:** Target: Input values.
Result: Output values.
Hint: Where begin the search.

For target, result and hint you can use memoryblocks with single values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. A single value has 4 bytes.

Returns true on success, false on error.

### 111.24.11 InsertStage(where as Integer, stage as LCMS2StageMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a stage on either the head or the tail of a given pipeline.
**Notes:** where: enumerated constant, either kAtBegin or kAtEnd.
stage: Pointer to a stage object

### 111.24.12 SetSaveAs8bitsFlag(save8bit as boolean) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an internal flag that marks the pipeline to be saved in 8 bit precision.
**Notes:** By default all pipelines are saved on 16 bits precision on AtoB/BToA tags and in floating point precision on DToB/BToD tags.

save8bit: State of the flag, true=Save as 8 bits, false=Save as 16 bits

Returns true on success, false on error

### 111.24.13 Stages as LCMS2StageMBS()

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with all stage objects.

### 111.24.14 UnlinkStage(where as Integer) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the stage from the pipeline.
**Notes:** Returns the removed stage object.
where can be kAtBegin or kAtEnd values.

### 111.24.15 Properties

### 111.24.16 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context object.
**Notes:** (Read and Write property)

### 111.24.17 FirstStage as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get a the first stage in the pipeline, or nil if pipeline is empty.
**Notes:** Intended for iterators.
(Read only property)

### 111.24.18 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 111.24.19 InputChannels as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of input channels of a given pipeline.
**Notes:** Number of channels on success, 0 on error.
(Read only property)

### 111.24.20 LastStage as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get a the last stage in the pipeline, or nil if pipeline is empty.
**Notes:** Intended for iterators.
(Read only property)

### 111.24.21 OutputChannels as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of output channels of a given pipeline.
**Notes:** Number of channels on success, 0 on error.
(Read only property)

### 111.24.22 StageCount as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of stages of a given pipeline.
**Notes:** (Read only property)

### 111.24.23 Constants

Location Constants for UnlinkStage

| Constant | Value | Description |
|---|---|---|
| kAtBegin | 0 | At the beginning. |
| kAtEnd | 1 | At the end. |

## 111.25 class LCMS2ProfileMBS

### 111.25.1 class LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a LCMS2 profile.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 23.5pr6
- MBS Xojo Plugins, version 22.0pr7
- MBS Xojo Plugins, version 21.1pr1
- Colorspaces in MacOS with Xojo
- Tip of day: Load ICC profile on OS X for any image format with CGImageSource
- ICC color profiling
- MBS Xojo / Real Studio Plugins, version 13.4pr3
- MBS Real Studio Plugins, version 12.3pr11
- MBS Real Studio Plugins, version 12.0pr4

### 111.25.2 Methods

### 111.25.3 cmsV2Unicode as String

MBS Images Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns special constant to access unicode string for V2 profiles.
**Example:**

```
// special v2 unicode string
Dim ProfileVersion As Integer = MyProfile.ProfileVersion

If ProfileVersion = 2 Then
Dim cmsV2Unicode As String = LCMS2ProfileMBS.cmsV2Unicode
Dim s2 As String = MyMLU.getUnicode(cmsV2Unicode, cmsV2Unicode)

If s2<>"" Then
List.AddRow "V2 Unicode Text", s2
End If
End If
```

### 111.25.4 Constructor(context as LCMS2ContextMBS = nil)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty profile.
**Notes:** On success the handle property is not zero.
See also:

- 111.25.5 Constructor(file as folderitem, write as boolean = false) 16797

### 111.25.5 Constructor(file as folderitem, write as boolean = false)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates profile by reading in an existing profile or creating a new profile at the given location.
**Notes:** file: file location.
write: Whether to create new profile.

On success the handle property is not zero.
See also:

- 111.25.4 Constructor(context as LCMS2ContextMBS = nil) 16797

### 111.25.6 CreateBCHSWabstractProfile(context as LCMS2ContextMBS, nLUTPoints as UInt32, Bright as double, Contrast as double, Hue as double, Saturation as double, TempSrc as UInt32, TempDest as UInt32) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an abstract devicelink operating in Lab for Bright/Contrast/Hue/Saturation and white point translation.
**Notes:** White points are specified as temperatures degree of Kelvin.

context: optional context object.
nLUTPoints: Resulting colormap resolution
Bright: Bright increment. May be negative
Contrast: Contrast increment. May be negative.
Hue: Hue displacement in degree.
Saturation: Saturation increment. May be negative
TempSrc: Source white point temperature
TempDest: Destination white point temperature.

Returns an ICC profile object on success, nil on error.

### 111.25.7 CreateGrayProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyY TransferFunction as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a gray profile based on White point and transfer function.
**Notes:** It populates followingtags; this conform a standard gray display profile:

1 cmsSigProfileDescriptionTag
2 cmsSigMediaWhitePointTag
3 cmsSigGrayTRCTag

Context: Optional context object.
WhitePoint: The white point of the gray device or space.
TransferFunction: tone curve describing the device or space gamma.

Returns an ICC profile object on success, NULL on error.

### 111.25.8 CreateInkLimitingDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, Limit as Double) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a devicelink operating in CMYK for ink-limiting.
**Notes:** Space: any color space signature. Currently only kcmsSigCmykData is supported.
Limit: Amount of ink limiting in % (0..400%)

Returns new profile or nil on error.

### 111.25.9 CreateLab2Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYM = nil) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a Lab to Lab identity, marking it as v2 ICC profile.
**Notes:** Adjustments for accomodating PCS endoing shall be done by Little CMS when using this profile.

Context: The optional context object.
WhitePoint: Lab reference white. nil for D50.

Returns a handle to an ICC profile object on success, nil on error.

### 111.25.10 CreateLab4Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYMBS = nil) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a Lab to Lab identity, marking it as v4 ICC profile.
**Notes:** Context: The optional context object.
WhitePoint: Lab reference white. nil for D50.

Returns a handle to an ICC profile object on success, nil on error.

### 111.25.11 CreateLinearizationDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, TransferFunction() as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is a devicelink operating in the target colorspace with as many transfer functions asÔøº-components.
**Notes:** Space: The desired color space signature. Like &h52474220 for RGB.
TransferFunction: tone curves describing the device or space linearization.

Please make sure you pass right number of transfer functions matching number of channels of color space.

A handle to an ICC profile object on success, NULL on error.

### 111.25.12 CreateNULLProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a fake NULL profile.
**Notes:** This profile return 1 channel as always 0. Is useful only for gamut checking tricks.
Returns an ICC profile object on success, nil on error.

### 111.25.13 CreateProfilePlaceholder(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty profile object, to be populated by the programmer.
**Notes:** WARNING: The profile without adding any information is not directly useable.

Context: The context object.
Returns an ICC profile object on success, nil on error.

### 111.25.14 CreateRGBProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyYMBS, Primaries as LCMS2CIExyYTripleMBS, TransferFunction() as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function creates a RGB profile based on White point, primaries and transfer functions.
**Notes:** It populates following tags; this conform a standard RGB Display Profile, and then I add (As per addendum II) chromaticity tag.

1 cmsSigProfileDescriptionTag
2 cmsSigMediaWhitePointTag
3 cmsSigRedColorantTag
4 cmsSigGreenColorantTag
5 cmsSigBlueColorantTag
6 cmsSigRedTRCTag
7 cmsSigGreenTRCTag
8 cmsSigBlueTRCTag
9 Chromatic adaptation Tag
10 cmsSigChromaticityTag

Context: Optional context object.
WhitePoint: The white point of the RGB device or space.
Primaries: The primaries in xyY of the device or space.
TransferFunction: 3 tone curves describing the device or space gamma. (if you pass just one, the plugin uses it for all three channels)

Returns the new ICC profile object or nil on any error.

### 111.25.15 CreateSRGBProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create an ICC virtual profile for sRGB space.
**Notes:** sRGB is a standard RGB color space created cooperatively by HP and Microsoft in 1996 for use on monitors, printers, and the Internet.

sRGB white point is D65.
xyY 0.3127, 0.3291, 1.0
ÔøºÔøºÔøº

Returns the new profile on success or nil on failure.

### 111.25.17 DetectBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Estimate the black point.

### 111.25.18 DetectDestinationBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the black point of a destination profile.
**Notes:** This algorithm comes from the Adobe paper disclosing its black point compensation method.

### 111.25.19 DetectRGBProfileGamma(threshold as double) as double

MBS Images Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Estimate gamma space, always positive.
**Notes:** Returns -1 on error.
threshold e.g. 0.01.

### 111.25.20 DetectTAC as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Detects total area coverage.
**Notes:** When several colors are printed on top of each other, there is a limit to the amount of ink that can be put on paper. This maximum total dot percentage is referred to as either TIC (Total Ink Coverage) or TAC (Total Area Coverage). This function does estimate total area coverage for a given profile in %. Only works on output profiles. On RGB profiles, 400% is returned. TAC is detected by subsampling Lab color space on 6x74x74 points.

Returns estimated area coverage in % on success, 0 on error.

### 111.25.21 FormatterForBitmap(BitCount as Integer = 8) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Build a suitable formatter for the colorspace of this profile.
**Notes:** This is a convenience function which prepares you a pixel format for use with LCMS2BitmapMBS class.
Formatters are used to describe how bitmap buffers are organized.

### 111.25.22 FormatterForColorspace(nBytes as UInt32, IsFloat as boolean = false) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Build a suitable formatter for the colorspace of this profile.
**Notes:** nBytes is number of bytes per color value. For 3 byte RGB, you pass 1 here.
Formatters are used to describe how bitmap buffers are organized.

e.g.
nBytes = 1 and isfloat = false gives UInt8.
nBytes = 2 and isfloat = false gives UInt16.
nBytes = 4 and isfloat = true gives 32-bit float, which is Single in Xojo.
nBytes = 8 and isfloat = true gives 64-bit float, which is Double in Xojo.

### 111.25.23 FormatterForPCS(nBytes as UInt32, IsFloat as boolean = false) as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Build a suitable formatter for the colorspace of this profile.
**Notes:** Formatters are used to describe how bitmap buffers are organized.

### 111.25.24 GetProfileInfo(Info as Integer, LanguageCode as string, CountryCode as string) as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets several information strings from the profile, dealing with localization.
**Notes:** Info: A selector of which info to return. (kInfoCopyright, kInfoDescription, kInfoManufacturer or kInfoModel)
Language Code: first name language code from ISO-639/2.

Country Code: first name region code from ISO-3166.

Returns the string. (empty string on error)

### 111.25.25 IsCLUT(Intent as UInt32, UsedDirection as UInt32) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns whatever a CLUT is present in the profile for the given intent and direction.
**Notes:** Intent: The intent code.
UsedDirection: UsedAsInput = 0, UsedAsOutput = 1, UsedAsProof = 2.
Returns true CLUT is present for given intent and direction, false otherwise.

### 111.25.26 IsIntentSupported(Intent as UInt32, UsedDirection as UInt32) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the requested intent is implemented in the given direction.
**Notes:** Little CMS has a fallback strategy that allows to specify any rendering intent when creating the transform, but the intent really being used may be another if the requested intent is not implemented.

UsedDirection: UsedAsInput = 0, UsedAsOutput = 1, UsedAsProof = 2.
Returns true if the intent is implemented, false otherwise.

### 111.25.27 IsTag(TagSignature as Integer) as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if a tag with signature sig is found on the profile.
**Notes:** Useful to check if a profile contains a given tag.
Returns true if the tag is found or false otherwise.

### 111.25.28 LinkTag(sig as Integer, dest as Integer) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a directory entry on tag sig that points to same location as tag dest.
**Notes:** Using this function you can collapse several tag entries to the same block in the profile.

sig: Signature of linking tag.
dest: Signature of linked tag.

Returns ture on success, false on error

### 111.25.29 MD5computeID as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Computes a MD5 checksum and stores it as Profile ID in the profile header.
**Notes:** Returns true on success or false on failure.

### 111.25.30 OpenProfileFromFile(context as LCMS2ContextMBS, file as folderitem, write as boolean = false) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a profile from a file or creates a new profile file there.
**Notes:** context: Optional context object.
file: The folderitem for the file location.
write: If true, a new profile is created. If false an existing profile is opened.

Returns a new ICC Profile object on success or nil on failure.
See also:

- 111.25.31 OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS 16805

### 111.25.31 OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a profile from a file or creates a new profile file there.
**Example:**

```
Dim path As String = "/Library/ColorSync/Profiles/Blue Tone.icc"
dim file as new FolderItem(path, FolderItem.PathModes.Native)
Dim p As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(file)

MessageBox p.TagCount.ToString+" tags"
```

**Notes:** context: Optional context object.

file: The folderitem for the file location.
write: If true, a new profile is created. If false an existing profile is opened.

Returns a new ICC Profile object on success or nil on failure.
See also:

- 111.25.30 OpenProfileFromFile(context as LCMS2ContextMBS, file as folderitem, write as boolean = false) as LCMS2ProfileMBS 16805

### 111.25.32 OpenProfileFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an ICC profile which is entirely contained in a memory block.
**Notes:** Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

- 111.25.33 OpenProfileFromMemory(data as Memoryblock) as LCMS2ProfileMBS 16806

### 111.25.33 OpenProfileFromMemory(data as Memoryblock) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an ICC profile which is entirely contained in a memory block.
**Notes:** Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

- 111.25.32 OpenProfileFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2ProfileMBS 16806

### 111.25.34 OpenProfileFromString(context as LCMS2ContextMBS, data as string) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an ICC profile which is entirely contained in a string.
**Notes:** Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

- 111.25.35 OpenProfileFromString(data as string) as LCMS2ProfileMBS 16807

### 111.25.35 OpenProfileFromString(data as string) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an ICC profile which is entirely contained in a string.
**Notes:** Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

- 111.25.34 OpenProfileFromString(context as LCMS2ContextMBS, data as string) as LCMS2ProfileMBS 16807

### 111.25.36 PostScriptCRD(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A wrapper on cmsGetPostScriptColorResource to simplify CRD generation.
**Notes:** context: Optional a user-defined context cargo.
Intent: The intent code, as described in Intents constants.
Flags: A combination of bit-field kcmsFLAGS* constants.

Returns: The resource as string or an empty string on error.

### 111.25.37 PostScriptCSA(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A wrapper on cmsGetPostScriptColorResource to simplify CSA generation.
**Notes:** context: Optional a user-defined context cargo.
Intent: The intent code, as described in Intents constants.
Flags: A combination of bit-field kcmsFLAGS* constants.

Returns: The resource as string or an empty string on error.

### 111.25.38 ReadChromaticAdaptation as LCMS2CIEXYZMBS()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a chromatic adaptation.
**Notes:** On success returns an array of 3 XYZ values.

### 111.25.39 ReadChromaticity as LCMS2CIExyYTripleMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads chromaticity tag.
**Notes:** For kcmsSigChromaticityTag.
Returns nil on error.

### 111.25.40 ReadCIEXYZ(tag as Integer) as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as CIE XYZ value.
**Notes:** Works with kcmsSigBlueColorantTag, kcmsSigBlueMatrixColumnTag, kcmsSigGreenColorantTag, kcmsSigGreenMatrixColumnTag, kcmsSigLuminanceTag, kcmsSigMediaBlackPointTag, kcmsSigMediaWhite-PointTag, kcmsSigRedColorantTag and kcmsSigRedMatrixColumnTag.
Returns nil on any error.

### 111.25.41 ReadColorantOrder as Memoryblock

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads colorant order.
**Notes:** For kcmsSigColorantOrderTag.
Returns nil on any error.

### 111.25.42 ReadDate(tag as Integer) as LCMS2DateMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as date.
**Notes:** Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.
Returns nil on any error.

### 111.25.43 ReadDict(tag as Integer) as LCMS2DictionaryMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as Dictionary value.
**Notes:** Works with kcmsSigMetaTag.
Returns nil on any error.

### 111.25.44 ReadICCData(tag as Integer) as LCMS2ICCDataMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as ICC Data.
**Notes:** Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.
Returns nil on any error.

### 111.25.45 ReadICCMeasurementConditions as LCMS2ICCMeasurementConditionsMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads IIC measurement conditions.
**Notes:** for kcmsSigMeasurementTag.
Returns nil on any error.

### 111.25.46 ReadICCViewingConditions as LCMS2ICCViewingConditionsMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as ICCViewingConditions value.
**Notes:** Works with kcmsSigViewingConditionsTag.

### 111.25.47 ReadMLU(tag as Integer) as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as MLU.
**Notes:** Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.
Returns nil on any error.

### 111.25.48 ReadNamedColorList(tag as Integer) as LCMS2NamedColorListMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as named color list.
**Notes:** Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.
Returns nil on any error.

### 111.25.49 ReadPipeline(tag as Integer) as LCMS2PipelineMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as pipeline.
**Notes:** Works with kcmsSigAToB0Tag, kcmsSigAToB1Tag, kcmsSigAToB2Tag, kcmsSigBToA0Tag, kcmsSigBToA1Tag, kcmsSigBToA2Tag, kcmsSigDToB0Tag, kcmsSigDToB1Tag, kcmsSigDToB2Tag, kcmsSigDToB3Tag, kcmsSigBToD0Tag, kcmsSigBToD1Tag, kcmsSigBToD2Tag, kcmsSigBToD3Tag, kcmsSigGamutTag, kcmsSigPreview0Tag, kcmsSigPreview1Tag and kcmsSigPreview2Tag.
Returns nil on any error.

### 111.25.50 ReadRawTag(sig as Integer) as Memoryblock

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads raw tag.
**Notes:** Similar to ReadTag*, but different in two important aspects. The important point is, this is raw data. No processing is performed, so you can effectively read wrong or broken profiles with this function. Obviously, then you have to interpret all those bytes!

sig: Signature of tag to be read

Returns memoryblock with data or nil on any error.

Those functions allows to read/write directly to the ICC profile any data, without checking anything. As a rule, mixing Raw with cooked doesn't work, so writting a tag as raw and then reading it as cooked without serializing does result into an error. If that is wha you want, you will need to dump the profile to memory or disk and then reopen it.

Returns nil on any error.

### 111.25.51 ReadScreening as LCMS2ScreeningMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as screening.
**Notes:** Works with kcmsSigScreeningTag.
Returns nil on any error.

### 111.25.52 ReadSequence(tag as Integer) as LCMS2SequenceMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as sequence.
**Notes:** Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.
Returns nil on any error.

### 111.25.53 ReadSignature(tag as Integer) as UInt32

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a signature tag.
**Notes:** Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

### 111.25.54 ReadTag(tag as Integer) as Variant

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a tag.
**Notes:** This is a convenience function which gives you the tag in whatever class the plugin thing is suitable. Check with isa what class you get.
Returns nil on any error.

### 111.25.55 ReadToneCurve(tag as Integer) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads tag as ToneCurve.
**Notes:** Works with kcmsSigBlueTRCTag, kcmsSigGrayTRCTag, kcmsSigGreenTRCTag and kcmsSigRedTRC-Tag.

### 111.25.56 ReadUcrBg as LCMS2UcrBgMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads UcrBg tag.

### 111.25.57 SaveProfileToFile(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves the contents of a profile to a given file.
**Notes:** Returns true on success and false on failure.

### 111.25.58 SaveProfileToMemory as Memoryblock

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves the contents of a profile to a memoryblock.
**Notes:** Returns memoryblock on success and nil on failure.

### 111.25.59 SaveProfileToString as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves the contents of a profile to a string.
**Notes:** Returns string with profile data on success and "" on failure.

### 111.25.60 TagLinkedTo(sig as Integer) as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the tag linked to sig, in the case two tags are sharing same resource, or nil if the tag is not linked to any other tag.
**Notes:** sig: Signature of linking tag.

Returns signature of linked tag, or 0 if no tag is linked.

### 111.25.61 TagSignature(index as Integer) as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the signature of a tag located in n position being n a 0-based index: i.e., first tag is indexed with n=0.
**Notes:** index: index to a tag position (0-based)

Returns the tag signature on success, 0 on error.
Changed in v23.5 to raise exception for invalid index.

### 111.25.62 TagSignatures as Integer()

MBS Images Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the array of tag signatures.
**Example:**

```
Dim path As String = "/Library/ColorSync/Profiles/Blue Tone.icc"
dim file as new FolderItem(path, FolderItem.PathModes.Native)
Dim p As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(file)

Dim tags() As Integer = p.TagSignatures
Break // inspect array in debugger
```

**Notes:** The array contains all tags and you can loop over the array and use ReadTag()

### 111.25.63 WriteChromaticAdaptation(value as LCMS2Mat3MBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes chromatic adaptation.
**Notes:** Variant of the function which takes matrix of values.
See also:

- 111.25.64 WriteChromaticAdaptation(values() as LCMS2CIEXYZMBS) as boolean 16814

### 111.25.64 WriteChromaticAdaptation(values() as LCMS2CIEXYZMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes chromatic adaptation.
**Notes:** Pass array with 3 XYZ colors.
Returns true on success.
See also:

- 111.25.63 WriteChromaticAdaptation(value as LCMS2Mat3MBS) as boolean 16814

### 111.25.65 WriteChromaticity(o as LCMS2CIExyYTripleMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes chromaticity tag.
**Notes:** For kcmsSigChromaticityTag.
Returns true on success and false on error.

### 111.25.66 WriteCIEXYZ(tag as Integer, o as LCMS2CIEXYZMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes CIE XYZ tag.
**Notes:** Works with kcmsSigBlueColorantTag, kcmsSigBlueMatrixColumnTag, kcmsSigGreenColorantTag, kcmsSigGreenMatrixColumnTag, kcmsSigLuminanceTag, kcmsSigMediaBlackPointTag, kcmsSigMediaWhite-PointTag, kcmsSigRedColorantTag and kcmsSigRedMatrixColumnTag.

### 111.25.67 WriteColorantOrder(data as Memoryblock) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes colorant order.
**Notes:** For kcmsSigColorantOrderTag.

Data should be 16 byte long.
Returns true on success or false on failure.

### 111.25.68 WriteDate(tag as Integer, o as LCMS2DateMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes date tag.
**Notes:** Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.

### 111.25.69 WriteDict(tag as Integer, o as LCMS2DictionaryMBS) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes Dictionary tag.
**Notes:** Works with kcmsSigMetaTag.

### 111.25.70 WriteICCData(tag as Integer, o as LCMS2ICCDataMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes ICC Data tag.
**Notes:** Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.

### 111.25.71 WriteICCMeasurementConditions(value as LCMS2ICCMeasurement-ConditionsMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes IIC measurement conditions.
**Notes:** for kcmsSigMeasurementTag.
Writes data and returns true on success or false on failure.

### 111.25.72 WriteICCViewingConditions(o as LCMS2ICCViewingConditionsMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes ICC Viewing conditions tag.
**Notes:** Works with kcmsSigViewingConditionsTag.

### 111.25.73 WriteMLU(tag as Integer, o as LCMS2MLUMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes MLU tag.
**Notes:** Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.

### 111.25.74 WriteNamedColorList(tag as Integer, o as LCMS2NamedColorListMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes named color list tag.
**Notes:** Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.

### 111.25.75 WritePipeline(tag as Integer, o as LCMS2PipelineMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes pipeline tag.
**Notes:** Works with kcmsSigAToB0Tag, kcmsSigAToB1Tag, kcmsSigAToB2Tag, kcmsSigBToA0Tag, kcmsSigBToA1Tag, kcmsSigBToA2Tag, kcmsSigDToB0Tag, kcmsSigDToB1Tag, kcmsSigDToB2Tag, kcmsSigDToB3Tag, kcmsSigBToD0Tag, kcmsSigBToD1Tag, kcmsSigBToD2Tag, kcmsSigBToD3Tag, kcmsSigGamutTag, kcmsSigPreview0Tag, kcmsSigPreview1Tag and kcmsSigPreview2Tag.

### 111.25.76 WriteRawTag(sig as Integer, data as Memoryblock) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes raw tag.
**Notes:** The RAW version does the same as WriteTag* but without any interpretation of the data. Please note it is fair easy to deal with "cooked" structures, since there are primitives for allocating, deleting and modifying data. For RAW data you are responsible of everything. If you want to deal with a private tag, you may want to write a plug-in instead of messing up with raw data.

sig: Signature of tag to be written
data: memory block holding the data.

Returns true on success, false on error

Those functions allows to read/write directly to the ICC profile any data, without checking anything. As a rule, mixing Raw with cooked doesn't work, so writting a tag as raw and then reading it as cooked without serializing does result into an error. If that is wha you want, you will need to dump the profile to memory or disk and then reopen it.

### 111.25.77 WriteScreening(o as LCMS2ScreeningMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes screening tag.
**Notes:** Works with kcmsSigScreeningTag.

### 111.25.78 WriteSequence(tag as Integer, o as LCMS2SequenceMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes sequence tag.
**Notes:** Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.

### 111.25.79 WriteSignature(tag as Integer, o as UInt32) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a signature tag with the given values.
**Notes:** Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

### 111.25.80 WriteToneCurve(tag as Integer, o as LCMS2ToneCurveMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes tone curve tag.
**Example:**

```
// read a profile
dim f as FolderItem = SpecialFolder.Desktop.Child("myprofile.icc")
```

```
dim p as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(f)

// find gray level tone curve
dim t as LCMS2ToneCurveMBS = p.ReadToneCurve(LCMS2MBS.kcmsSigGrayTRCTag)
if t<>nil then

// let's make a new one with half of old values
dim values(1000) as single

for i as Integer = 0 to 1000
values(i) = t.EvalToneCurveFloat(i/1000.0) * 0.5
next

// build new curve with that values
dim n as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildTabulatedToneCurve(nil, values)

// write back
if not p.WriteToneCurve(LCMS2MBS.kcmsSigGrayTRCTag, n) then
MsgBox "failed to write tone curve"
end if
end if

// write profile
f = SpecialFolder.Desktop.Child("test.icc")
call p.SaveProfileToFile(f)
```

**Notes:** Works with kcmsSigBlueTRCTag, kcmsSigGrayTRCTag, kcmsSigGreenTRCTag and kcmsSigRedTRCTag.

### 111.25.81 WriteUcrBg(o as LCMS2UcrBgMBS) as boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes UcrBg tag.

### 111.25.82 Properties

### 111.25.83 ChannelCount as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of channels used for the colorspace of this profile.
**Example:**

```
dim p as LCMS2ProfileMBS = LCMS2ProfileMBS.CreateSRGBProfile
MsgBox str(p.ChannelCount)
```

**Notes:** (Read only property)

### 111.25.84 ColorSpaceType as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets/Sets the color space used by the given profile, using the ICC convention.
**Notes:** (Read and Write property)

### 111.25.85 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context for this profile.
**Notes:** Error handling uses it, so you can see which part of your application failed.
(Read only property)

### 111.25.86 DeviceClass as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets/sets the device class signature from profile header.
**Notes:** Device Classes:
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| | | |
|---|---|---|
| kcmsSigInputClass | &h73636E72 | scnr |
| kcmsSigDisplayClass | &h6D6E7472 | mntr |
| kcmsSigOutputClass | &h70727472 | prtr |
| kcmsSigLinkClass | &h6C696E6B | link |
| kcmsSigAbstractClass | &h61627374 | abst |
| kcmsSigColorSpaceClass | &h73706163 | spac |
| kcmsSigNamedColorClass | &h6e6d636c | nmcl |

(Read and Write property)

### 111.25.87 File as FolderItem

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file reference.
**Notes:** Only set for file based profiles, so you can later know what file you used to create the profile object.
(Read and Write property)

### 111.25.88 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 111.25.89 HeaderAttributes as UInt64

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set header attribute flags.
**Notes:** Flags can be a combination of kcmsReflective,ÔøºkcmsTransparency,ÔøºkcmsGlossy or kcmsMatte.
(Read and Write property)

### 111.25.90 HeaderCreationDateTime as LCMS2DateMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the date and time when profile was created.
**Notes:** This is a field stored in profile header.
Returns nil on any error.
(Read only property)

### 111.25.91 HeaderCreator as UInt32

MBS Images Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set the creator signature as described in the header.
**Notes:** (Read only property)

### 111.25.92 HeaderFlags as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set header flags of given ICC profile object.
**Notes:** The profile flags field does contain flags to indicate various hints for the CMM such as distributed processing and caching options. The least-significant 16 bits are reserved for the ICC. Flags in bit positions 0 and 1 shall be used as indicated below.

| Position | Field Length (bits) | Field Contents |
|---|---|---|
| 0 | 1 | Embedded Profile (kcmsEmbeddedProfileFalse if not embedded, kcmsEmbeddedProfileTrue if embedded in file) |
| 1 | 1 | Profile cannot be used independently from the embedded color data (set to kcmsUseWithEmbeddedDataOnly if true, kcmsUseAnywhere if false) |

(Read and Write property)

### 111.25.93 HeaderManufacturer as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set the manufacturer signature as described in the header.
**Notes:** This funcionality is widely superseded by the manufaturer tag. Of use only in elder profiles.
(Read and Write property)

### 111.25.94 HeaderModel as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set the model signature as described in the header.
**Notes:** This funcionality is widely superseded by
the model tag. Of use only in elder profiles.
(Read and Write property)

### 111.25.95 HeaderProfileID as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set header profile ID.
**Notes:** Profile ID must be a 16 byte long string.
(Read and Write property)

### 111.25.96 IsMatrixShaper as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns whatever a matrix-shaper is present in the profile.
**Notes:** Note that a profile may hold matrix-shaper and CLUT as well.
Returns true if the profile holds a matrix-shaper, false otherwise.
(Read only property)

### 111.25.97 Name as string

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the profile name.
**Notes:** This is a convenience function. The plugin builds this name from manufacturer, model and description strings.
(Read only property)

### 111.25.98 PCS as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets/Sets the profile connection space used by the given profile, using the ICC convention.
**Notes:** (Read and Write property)

### 111.25.99 ProfileICCversion as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/set the profile ICC version in the same format as it is stored in the header.
**Notes:** (Read and Write property)

### 111.25.100 ProfileVersion as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets/Sets the ICC version in profile header.
**Notes:** The version given as to this function as a float n.m is properly encoded.
(Read and Write property)

### 111.25.101 RenderingIntent as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets/Sets the profile header rendering intent.
**Notes:** From the ICC spec: "The rendering intent field shall specify the rendering intent which should be used (or, in the case of a Devicelink profile, was used) when this profile is (was) combined with another profile. In a sequence of more than two profiles, it applies to the combination of this profile and the next profile in the sequence and not to the entire sequence. Typically, the user or application will set the rendering intent dynamically at runtime or embedding time. Therefore, this flag may not have any meaning until the profile is used in some context, e.g. in a Devicelink or an embedded source profile."
(Read and Write property)

### 111.25.102 TagCount as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of tags of a given profile.
**Notes:** Returns number of tags on success, -1 on error.
(Read only property)

### 111.25.103 Constants

Info selector.

| Constant | Value | Description |
|---|---|---|
| kInfoCopyright | 3 | The copyright string. |
| kInfoDescription | 0 | The description string. |
| kInfoManufacturer | 1 | The manufacturer string. |
| kInfoModel | 2 | The model string. |

## 111.26 class LCMS2ScreeningChannelMBS

### 111.26.1 class LCMS2ScreeningChannelMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The screening information for one channel.

### 111.26.2 Methods

### 111.26.3 Clone as LCMS2ScreeningChannelMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the screening channel object.

### 111.26.4 Constructor(Frequency as Double = 0.0, ScreenAngle as Double = 0.0, SpotShape as UInt32 = 0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
See also:

- 111.26.5 Constructor(other as LCMS2ScreeningChannelMBS) 16824

### 111.26.5 Constructor(other as LCMS2ScreeningChannelMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes object with values from other object.
See also:

- 111.26.4 Constructor(Frequency as Double = 0.0, ScreenAngle as Double = 0.0, SpotShape as UInt32 = 0) 16824

### 111.26.6 Properties

### 111.26.7 Frequency as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The frequency.
**Notes:** (Read and Write property)

### 111.26.8 ScreenAngle as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The screen angle.
**Notes:** (Read and Write property)

### 111.26.9 SpotShape as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The spot shape.
**Notes:** See kcmsSpot* constants.
(Read and Write property)

## 111.27 class LCMS2ScreeningMBS

### 111.27.1 class LCMS2ScreeningMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for screening parameters.

### 111.27.2 Properties

### 111.27.3 Channels as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of channels.
**Notes:** (Read and Write property)

### 111.27.4 Flag as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags for screening.
**Notes:** See flags kcmsPRINTER_DEFAULT_SCREENS, kcmsFREQUENCE_UNITS_LINES_CM and kcmsFREQUENCE_UNITS_LINES_INCH.
(Read and Write property)

### 111.27.5 Channel(index as Integer) as LCMS2ScreeningChannelMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The screening information for each channel.
**Notes:** Index from 0 to 15.
(Read and Write computed property)

# 111.28 class LCMS2SequenceDescriptionMBS

## 111.28.1 class LCMS2SequenceDescriptionMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a sequence description.

## 111.28.2 Properties

## 111.28.3 AttributeFlags as UInt64

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attribute flags.
**Notes:** (Read and Write property)

## 111.28.4 Description as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description.
**Notes:** (Read only property)

## 111.28.5 DeviceMfg as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device Mfg.
**Notes:** (Read and Write property)

## 111.28.6 DeviceModel as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device model.
**Notes:** (Read and Write property)

### 111.28.7 Manufacturer as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The manufacturer name.
**Notes:** (Read only property)

### 111.28.8 Model as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The model string.
**Notes:** (Read only property)

### 111.28.9 ProfileID as Memoryblock

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The profile ID.
**Notes:** 16 bytes and typically the result of a MD5.
(Read only property)

### 111.28.10 Technology as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The technology value.
**Notes:** Use one of the following constants: kcmsSigDigitalCamera, kcmsSigFilmScanner, kcmsSigReflectiveScanner, kcmsSigInkJetPrinter, kcmsSigThermalWaxPrinter, kcmsSigElectrophotographicPrinter, kcmsSigElectrostaticPrinter, kcmsSigDyeSublimationPrinter, kcmsSigPhotographicPaperPrinter, kcmsSigFilmWriter, kcmsSigVideoMonitor, kcmsSigVideoCamera, kcmsSigProjectionTelevision, kcmsSigCRTDisplay, kcmsSigPMDisplay, kcmsSigAMDisplay, kcmsSigPhotoCD, kcmsSigPhotoImageSetter, kcmsSigGravure, kcmsSigOffsetLithography, kcmsSigSilkscreen, kcmsSigFlexography, kcmsSigMotionPictureFilmScanner, kcmsSigMotionPictureFilmRecorder, kcmsSigDigitalMotionPictureCamera or kcmsSigDigitalCinemaProjector.
(Read and Write property)

# 111.29 class LCMS2SequenceMBS

## 111.29.1 class LCMS2SequenceMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Profile sequence descriptors.
**Notes:** Profile sequence can be read/written by using cmsReadTag and cmsWriteTag functions.

## 111.29.2 Methods

## 111.29.3 Constructor(context as LCMS2ContextMBS, Count as UInt32)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new sequence with the given number of entries.
**Example:**

```
dim d as new LCMS2SequenceMBS(nil, 5)
MsgBox str(d.Count)
```

**Notes:** On success the handle property is not zero.

## 111.29.4 Properties

## 111.29.5 Count as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of sequence descriptions used in this class.
**Notes:** (Read only property)

## 111.29.6 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 111.29.7 Description(index as Integer) as LCMS2SequenceDescriptionMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sequence descriptions.
**Notes:** Index from 0 to count-1.
(Read and Write computed property)

# 111.30 class LCMS2StageMBS

## 111.30.1 class LCMS2StageMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A pipeline stage.
**Notes:** Stages are single-step operations that can be chained to create pipelines. Actual stage types does include matrices, tone curves, Look-up interpolation and user-defined. There are functions to create new stage types and a plug-in type to allow stages to be saved in multi profile elements tag types. See the plug-in API for further details.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.3pr5
- MBS Real Studio Plugins, version 12.1pr1
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 12.0pr5

## 111.30.2 Methods

## 111.30.3 CLutFloatValues as Double()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns CLut floating point values.
**Notes:** Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = true.

## 111.30.4 CLutParamsSamples as UInt32()

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sample counts in the CLut parameters.
**Notes:** Valid on all kinds of tables.

## 111.30.5 CLutUInt16Values as UInt16()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns CLut integer values.
**Notes:** Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = false.

### 111.30.6 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
**Notes:** Each dimension has same resolution.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.7 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 16832
- 111.30.8 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as UInt16) as LCMS2StageMBS 16833

### 111.30.7 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
**Notes:** Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter. The recommended way is to set Table to nil and use StageSampleCLut16bit with a event, because this way the implementation is independent of the selected number of grid points.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with a table of UInt16, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

- 111.30.6 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan

as UInt32, outputChan as UInt32) as LCMS2StageMBS 16832

- 111.30.8 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as UInt16) as LCMS2StageMBS 16833

### 111.30.8 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as UInt16) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
**Example:**

```
// creates CLUT with 17 grid points, 3 input channels RGB and 4 output channels CMYK

dim data() as UInt16

// fill all the data into the table upfront, RGB to CMYK

dim c,m,y,k as Double

for Grid0 as Integer = 0 to 16 // 17 grid, 1st input
dim r as Double = Grid0 / 16
for Grid1 as Integer = 0 to 16 // 17 grid, 2nd input
dim g as Double = Grid0 / 16
for Grid2 as Integer = 0 to 16 // 17 grid, 3rd input
dim b as Double = Grid0 / 16

// some bad conversion

c = r
m = g
y = b
k = 0

// fill array with values
data.Append 65535 * c
data.Append 65535 * m
data.Append 65535 * y
data.Append 65535 * k

next
next
next

dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLut16bit(nil, 17, 3, 4, data)
break
```

**Notes:** Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: array of UInt16, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

- 111.30.6 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16832
- 111.30.7 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 16832

### 111.30.9 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
**Notes:** Context: user-defined context cargo.
clutPoints: Memoryblock with array [ inputChan ] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.10 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 16835
- 111.30.11 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS 16835

### 111.30.10 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
**Notes:** Context: user-defined context cargo.
clutPoints: Memoryblock with array [ inputChan ] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with table of UInt16, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

- 111.30.9 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16834
- 111.30.11 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS 16835

### 111.30.11 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
**Example:**

```
// create CLUT with 15 grid points for 1st channel, 16 for 2nd channel and 17 for 3rd channel
dim ChannelGridPoints(2) as UInt32
ChannelGridPoints(0) = 15
ChannelGridPoints(1) = 16
ChannelGridPoints(2) = 17

dim noData() as UInt16 = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLut16bitGranular(nil, ChannelGridPoints, 3, 4, noData)

break
```

**Notes:** Context: user-defined context cargo.
clutPoints: Array [ inputChan ] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Table of UInt16, holding initial values for nodes. If nil/empty the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

- 111.30.9 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16834
- 111.30.10 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 16835

### 111.30.12 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a float multidimensional lookup table (CLUT).
**Notes:** Each dimension has same resolution.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 16837
- 111.30.14 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS 16837
- 111.30.15 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS 16838

### 111.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a float multidimensional lookup table (CLUT).
**Notes:** Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter. The recommended way is to set Table to nil and use StageSampleCLutFloat with an event, because this way the implementation is independent of the selected number of grid points.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with a table of Single (Float32) values, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:


- 111.30.12 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16836
- 111.30.14 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS 16837
- 111.30.15 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS 16838


### 111.30.14 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a float multidimensional lookup table (CLUT).
**Example:**

```
// creates CLUT with 17 grid points, 3 input channels and 4 output channels
dim noData() as Double = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloat(nil, 17, 3, 4, noData)
```

break

**Notes:** Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: Array of double values, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

- 111.30.12 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16836
- 111.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 16837
- 111.30.15 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS 16838

### 111.30.15 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a float multidimensional lookup table (CLUT).
**Example:**

```
// creates CLUT with 17 grid points, 3 input channels RGB and 4 output channels CMYK

dim data() as Single

// fill all the data into the table upfront, RGB to CMYK

dim c,m,y,k as Double

for Grid0 as Integer = 0 to 16 // 17 grid, 1st input
dim r as Double = Grid0 / 16
for Grid1 as Integer = 0 to 16 // 17 grid, 2nd input
dim g as Double = Grid0 / 16
for Grid2 as Integer = 0 to 16 // 17 grid, 3rd input
dim b as Double = Grid0 / 16

// some bad conversion
```

```
c = r
m = g
y = b
k = 0

// fill array with values
data.Append c
data.Append m
data.Append y
data.Append k

next
next
next

dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloat(nil, 17, 3, 4, data)

break
```

**Notes:** Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: Array of single (Float32) values, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:


- 111.30.12 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16836
- 111.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 16837
- 111.30.14 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS 16837

### 111.30.16 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
**Notes:** Context: user-defined context cargo.
clutPoints: Memoryblock with Array of UInt32 [ inputChan ] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.17 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 16840
- 111.30.18 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle() as Single) as LCMS2StageMBS 16841

### 111.30.17 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
**Notes:** Context: user-defined context cargo.
clutPoints: Memoryblock with Array of UInt32 [ inputChan ] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: a pointer to a table of Singles (Float32), holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

- 111.30.16 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16840
- 111.30.18 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle() as Single) as LCMS2StageMBS 16841

### 111.30.18 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle() as Single) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
**Example:**

```
// create CLUT with 15 grid points for 1st channel, 16 for 2nd channel and 17 for 3rd channel
dim ChannelGridPoints(2) as UInt32
ChannelGridPoints(0) = 15
ChannelGridPoints(1) = 16
ChannelGridPoints(2) = 17

dim noData() as Single = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloatGranular(nil, ChannelGridPoints, 3, 4, noData)
Break
```

**Notes:** Context: user-defined context cargo.
clutPoints: Array of UInt32 [ inputChan ] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: a table of Singles (Float32), holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

- 111.30.16 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 16840
- 111.30.17 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 16840

### 111.30.19 CreateStageWithIdentity(context as LCMS2ContextMBS, Channels as UInt32) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty (identity) stage that does no operation.
**Notes:** May be needed in order to save the pipeline as AToB/BToA tags in ICC profiles.

Context: user-defined context cargo.
Channels: Number of channels

Returns a pipeline stage on success, nil on error.

### 111.30.20 CreateStageWithMatrix(context as LCMS2ContextMBS, Rows as UInt32, Cols as UInt32, Matrix as Memoryblock, Offset as Memoryblock = nil) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains a matrix plus an optional offset.
**Notes:** Note that Matrix is specified in double precision, whilst CLUT has only float precision. That is because an ICC profile can encode matrices with far more precision that CLUTS.

Context: user-defined context cargo.
Rows, Cols: Dimensions of matrix
Matrix: Memoryblock with a matrix of [ Rows, Cols ] (double values, 8 byte per value)
Offset: Memoryblock with a vector of [ Cols ] , nil if no offset is to be applied.

Returns a pipeline stage on success, nil on error.

### 111.30.21 CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains n channels tone curves, one per channel.
**Notes:** Setting Curves to nil forces identity (1:1) curves to be used. The stage keeps and owns a private copy of the tone curve objects.

Context: user-defined context cargo.
Curvess: Optionally, an array of tone curves objects, one per channel.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.22 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS

### 111.30.22 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a stage that contains n channels tone curves, one per channel.
**Notes:** Setting Curves to nil forces identity (1:1) curves to be used. The stage keeps and owns a private copy of the tone curve objects.

Context: user-defined context cargo.
Curvess: Optionally, an array of tone curves objects, one per channel.

Returns a pipeline stage on success, nil on error.
See also:

- 111.30.21 CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS 16842

### 111.30.23 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the number of values needed for a CLUT with given dimensions.
**Notes:** This is a helper function, so you can know how big the table for CreateStageWithCLut16bitGranular or CreateStageWithCLutFloatGranular must be.
See also:

- 111.30.24 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 16843

### 111.30.24 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

MBS Images Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the number of values needed for a CLUT with given dimensions.
**Notes:** This is a helper function, so you can know how big the table for CreateStageWithCLut16bit or CreateStageWithCLutFloat must be.
See also:

- 111.30.23 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 16843

### 111.30.25 MatrixOffsets as Double()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with matrix offsets.
**Notes:** Only if stage is from type kcmsSigMatrixElemType and.

### 111.30.26 MatrixValues as Double()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with matrix values.
**Notes:** Only if stage is from type kcmsSigMatrixElemType and.

### 111.30.27 SampleCLut16bit(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate on all nodes of a given CLUT stage, calling a 16-bit sampler on each node.
**Notes:** Those functions (SampleCLut16bit and SampleCLutFloat) are provided to populate CLUT stages in a way that is independent of the number of nodes. The programmer has to provide an object with event that will be invoked on each CLUT node. LittleCMS does fill the In parameter with the coordinates that addresses the node. It also fills the Out parameter with CLUT contents on the node, so this can be used also to get CLUT contents after reading it from an ICC profile. In this case, a special flag can be specified to make sure the CLUT is being accessed as read-only and not modified (kSamplerInspect).

Works only with CLut stage objects and returns false if the object is not a Clut.

Sampler: The object to receive events.
Flags: Bit-field flags for different options. Only kSamplerInspect is currently supported.

Returns true on success, false on error.

### 111.30.28 SampleCLutFloat(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate on all nodes of a given CLUT stage, calling a float sampler on each node.
**Notes:** Those functions (SampleCLut16bit and SampleCLutFloat) are provided to populate CLUT stages

in a way that is independent of the number of nodes. The programmer has to provide an object with event that will be invoked on each CLUT node. LittleCMS does fill the In parameter with the coordinates that addresses the node. It also fills the Out parameter with CLUT contents on the node, so this can be used also to get CLUT contents after reading it from an ICC profile. In this case, a special flag can be specified to make sure the CLUT is being accessed as read-only and not modified (kSamplerInspect).

Works only with CLut stage objects and returns false if the object is not a Clut.

Sampler: The object to receive events.
Flags: Bit-field flags for different options. Only kSamplerInspect is currently supported.

Returns true on success, false on error.

### 111.30.29 ToneCurves as LCMS2ToneCurveMBS()

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with tone curves.
**Notes:** Only if stage is from type kcmsSigCurveSetElemType and.

### 111.30.30 Properties

### 111.30.31 CLutEntries as Integer

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of entries in the CLut.
**Notes:** Only if stage is from type kcmsSigCLutElemType.
(Read only property)

### 111.30.32 CLutHasFloatValues as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this CLut has floating point values.
**Notes:** Only if stage is from type kcmsSigCLutElemType.
(Read only property)

### 111.30.33 CLutParamsInputs as Integer

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of input parameters for in the CLut parameters.
**Notes:** Value is <>1 only in 3D interpolation.
(Read only property)

### 111.30.34 CLutParamsOutputs as Integer

MBS Images Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of output parameters for in the CLut parameters.
**Notes:** Value is <>1 only in 3D interpolation.
(Read only property)

### 111.30.35 Data as Ptr

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw stage data.
**Notes:** (Read only property)

### 111.30.36 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 111.30.37 InputChannels as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of input channels of a given stage object.
**Notes:** (Read only property)

### 111.30.38 NextItem as LCMS2StageMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns next stage in pipeline list, or nil if end of list.
**Notes:** Intended for iterators.
(Read only property)

### 111.30.39 OutputChannels as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of output channels of a this stage object.
**Notes:** (Read only property)

### 111.30.40 Type as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the type of a given stage object.
**Notes:** Use this type constants: kcmsSigCurveSetElemType, kcmsSigMatrixElemType, kcmsSigCLutElemType, kcmsSigBAcsElemType, kcmsSigEAcsElemType, kcmsSigXYZ2LabElemType, kcmsSigLab2XYZElemType, kcmsSigNamedColorElemType, kcmsSigLabV2toV4, kcmsSigLabV4toV2, kcmsSigIdentityElemType.
(Read only property)

### 111.30.41 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kSamplerInspect | &h01000000 | One of the flags for Sampling.<br>Use this flag to prevent changes being written to destination when using SampleCLutFloat or SampleCLut16bit. |

## 111.31 class LCMS2StageSamplerMBS

### 111.31.1 class LCMS2StageSamplerMBS

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for getting sampler callback.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 111.31.2 Methods

### 111.31.3 SliceSpaceFloat(Inputs as UInt32, values() as UInt32) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Slices target space executing a floating point callback of type cmsSAMPLERFLOAT.
**Notes:** Parameters:
Inputs: Number of components in target space.
clutPoints: Array [ nInputs ] holding the division slices for each component.
Calls Floating point sample event to execute on each slice.

Returns true on success, false on error.

### 111.31.4 SliceSpaceInteger(Inputs as UInt32, values() as UInt32) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Slices target space executing a 16 bits callback of type cmsSAMPLER16.
**Notes:** Parameters:
Inputs: Number of components in target space.
values: Array [ nInputs ] holding the division slices for each component.

Calls 16 bit Sample event to execute on each slice.

Returns true on success, false on error.

### 111.31.5 Events

### 111.31.6 SamplerFloat(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sampler event called by SampleCLutFloat.
**Notes:** In and Out point to 32 bit float values, so please use Single property to access.
InputChannels and OutputChannels are the number of channels.

### 111.31.7 SamplerInteger(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sampler event called by SampleCLut16bit.
**Notes:** In and Out point to 16 bit unsigned integer values, so please use UInt16 property to access.
InputChannels and OutputChannels are the number of channels.

## 111.32 class LCMS2ToneCurveMBS

### 111.32.1 class LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a tone curve or gamma.
**Blog Entries**

- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 12.0pr4

### 111.32.2 Methods

### 111.32.3 BuildGamma(context as LCMS2ContextMBS, gamma as Double) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simplified wrapper to BuildParametricToneCurve.
**Example:**

```
dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox str(t.EstimateGamma)
```

**Notes:** Builds a parametric curve of type 1.

Context: user-defined context object.
Gamma: Value of gamma exponent

Returns a newly created tone curve object on success, nil on error.

### 111.32.4 BuildParametricToneCurve(context as LCMS2ContextMBS, Type as Integer, params() as Double) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a parametric tone curve.
**Notes:** Parameters:
context: user-defined context object.
Type: Number of parametric tone curve. (see LCMS2 manual)

Params: Array of tone curve parameters.

Returns a newly created tone curve object on success, nil on error.

### 111.32.5 BuildSegmentedToneCurve(context as LCMS2ContextMBS, Segments() as LCMS2CurveSegmentMBS) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a tone curve from given segment information.
**Notes:** context: Puser-defined context object
Segments: Array of segments

Returns a newly created tone curve object on success, nil on error.

### 111.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a tone curve based on a table of floating point values.
**Example:**

```
dim values(-1) as Single

for i as Integer = 0 to 9
values.Append 0.5 + i*0.02
next

dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildTabulatedToneCurve(nil, values)

dim items(-1) as string
for i as Integer = 0 to 10
dim v as Single = t.EvalToneCurveFloat(i/10.0)
items.Append str(i/10.0)+" ->"+str(v)
next

MsgBox Join(items,EndOfLine)
```

**Notes:** Tone curves built with this function are not restricted to 0...1.0 domain.

context: user-defined context object.
values: Array of samples. Domain of samples is 0...1.0

Returns a newly created tone curve object on success, nil on error.
See also:

- 111.32.7 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS 16852

### 111.32.7 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a tone curve based on a table of 16-bit values. Tone curves built with this function are restricted to 0...1.0 domain.
**Notes:** context: user-defined context object.
values: Array of samples. Domain is 0...65535 (UInt32).

Returns a newly created tone curve object on success, nil on error.
See also:

- 111.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS 16851

### 111.32.8 EstimatedTable as UInt16()

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tone curves do maintain a shadow low,Äêresolution tabulated representation of the curve. This function returns an array with this table.

### 111.32.9 EstimatedTableEntries as UInt32

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tone curves do maintain a shadow low,Äêresolution tabulated representation of the curve. This function returns the number of entries such table has.

### 111.32.10 EstimateGamma(Precision as Double = 0.01) as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Estimates the apparent gamma of the tone curve by using least squares fitting to a pure exponential expression in the f(ùë • ) = ùë • .
**Example:**

```
dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox str(t.EstimateGamma)
```

**Notes:** Precision: The maximum standard deviation allowed on the residuals, 0.01 is a fair value, set it to a big number to fit any curve, mo matter how good is the fit.

Returns the estimated gamma at given precision, or -1.0 if the fitting has less precision.

### 111.32.11 EvalToneCurve16(value as UInt16) as UInt16

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates the given 16-bit number across the given tone curve.
**Notes:** This function is significantly faster than EvalToneCurveFloat, since it uses a pre-computed 16-bit lookup table.
Value: 16 bit Number to evaluate
Returns operation result

### 111.32.12 EvalToneCurveFloat(value as Single) as Single

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Evaluates the given floating-point number across the given tone curve.
**Example:**

```
dim t1 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 1.0)
dim t2 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.0)
dim t3 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 3.0)

dim v1 as Double = t1.EvalToneCurveFloat(0.5)
dim v2 as Double = t2.EvalToneCurveFloat(0.5)
dim v3 as Double = t3.EvalToneCurveFloat(0.5)

MsgBox str(v1)+" "+str(v2)+" "+str(v3)
```

**Notes:** Value: floating point number to evaluate
Returns the result.

### 111.32.13 IsDescending as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if f(0) >f(1) , false otherwise.
**Notes:** Does not take unbounded parts into account.

### 111.32.14 IsLinear as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an estimation of cube being an identity (1:1) in the [ 0..1 ] domain.
**Notes:** Does not take unbounded parts into account. This is just a coarse approximation, with no mathematical validity.

### 111.32.15 IsMonotonic as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an estimation of monotonicity of curve in the [ 0..1 ] domain.
**Example:**

```
dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox "IsMonotonic: "+str(t.IsMonotonic)
```

**Notes:** Does not take unbounded parts into account. This is just a coarse approximation, with no mathematical validity.

### 111.32.16 IsMultisegment as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the tone curve contains more than one segment, false if it has only one segment.

### 111.32.17 JoinToneCurve(context as LCMS2ContextMBS, X as LCMS2ToneCurveMBS, Y as LCMS2ToneCurveMBS, nPoints as UInt32) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Composites two tone curves in the form ùëå,àí1(ùëã(ùë°)).

**Notes:** context: user-defined context object.
X, Y : Tone curve objects.
nPoints: Sample rate for resulting tone curve.

Returns a newly created tone curve object on success, nil on error.

### 111.32.18 ParametricType as Integer

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the parametric type.

### 111.32.19 Reverse as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a tone curve that is the inverse f-1 of given tone curve.
**Notes:** Returns a newly created tone curve object on success, nil on error.
See also:

- 111.32.20 Reverse(nResultSamples as Integer) as LCMS2ToneCurveMBS 16855

### 111.32.20 Reverse(nResultSamples as Integer) as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a tone curve that is the inverse f-1 of given tone curve.
**Notes:** In the case it couldn't be analytically reversed, a tablulated curve of nResultSamples is created.
nResultSamples: Number of samples to use in the case origin tone curve couldn't be analytically reversed
Returns a newly created tone curve object on success, nil on error.
See also:

- 111.32.19 Reverse as LCMS2ToneCurveMBS 16855

### 111.32.21 Smooth(lambda as Double) as Boolean

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Smoothes tone curve according to the lambda parameter.
**Notes:** Lambda: degree of smoothing.
Returns true on success, false on error.

### 111.32.22 Properties

### 111.32.23 Handle as Integer

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 111.33 class LCMS2TransformMBS

## 111.33.1 class LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a LCMS 2.x transformation.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr1
- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 20.0pr5
- MBS Xojo Plugins, version 19.6pr1
- MBS Xojo Plugins, version 19.5pr8
- MBS Xojo / Real Studio Plugins, version 15.0pr6
- ICC color profiling
- MBS Real Studio Plugins, version 12.4pr1

## 111.33.2 Methods

## 111.33.3 ChangeBuffersFormat(InputFormat as UInt32, OutputFormat as UInt32) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function does change the encoding of buffers in a yet-existing transform.
**Notes:** Not all transforms can be changed, cmsChangeBuffersFormat only works on transforms created originally with at least 16 bits of precision. This function is provided for backwards compatibility and should be avoided whenever possible, as it prevents transform optimization.

InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.

Returns true on success and false on failure.

### 111.33.4 CreateExtendedTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, BPC() as boolean, Intents() as UInt32, AdaptationStates() as Double, GamutProfile as LCMS2ProfileMBS, GamutPCSposition as UInt32, InputFormat as UInt32, OutputFormat as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extended form of multiprofile color transform creation, exposing all parameters for each profile in the chain.
**Notes:** All other transform cration functions are wrappers to this call.

Parameters:
context: Pointer to a user-defined context cargo.
Profiles: Array of handles to open profile objects.
BPC: Array of black point compensation states
GamutProfile: A profile holding gamut information for gamut check. Only used if cmsFLAGS_GAMUTCHECK specified. Set to nil for no gamut check.
GamutPCSPosition: Position in the chain of Lab/XYZ PCS to check against gamut profile Only used if cmsFLAGS_GAMUTCHECK specified.
InputFormat: Input format.
OutputFormat: Output format.
Intents: An array holding the intent codes.
Flags: Some flags to control it.

Returns a transform object on success, NULL on error.
See also cmsCreateExtendedTransform in the LCMS2 manual.

### 111.33.5 CreateMultiprofileTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi profile transformation.
**Notes:** User passes in an array of handles to open profiles. The returned color transform do "smelt" all profiles in a single devicelink. Color spaces must be paired with the exception of Lab/XYZ, which can be interchanged.

context: Optional context object.
Profiles: Array of open profile objects.
InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.

Flags: A combination of bit-field of kcmsFLAGS_* constants.

Returns a transform object on success, nil on error.
See also:

- 111.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16859

### 111.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a multi profile transformation.
**Notes:** User passes in an array of handles to open profiles. The returned color transform do "smelt" all profiles in a single devicelink. Color spaces must be paired with the exception of Lab/XYZ, which can be interchanged.

context: Optional context object.
Profiles: Array of open profile objects.
InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field of kcmsFLAGS_* constants.

Returns a transform object on success, nil on error.
See also:

- 111.33.5 CreateMultiprofileTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16858

### 111.33.7 CreateProofingTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as CreateTransform(), but including soft-proofing.
**Notes:** A proofing transform does emulate the colors that would appear as the image were rendered on a specific device. That is, for example, with a proofing transform I can see how will look a photo of my

little daughter if rendered on my HP printer. Since most printer profiles does include some sort of gamut-remapping, it is likely colors will not look as the original. Using a proofing transform, it can be done by using the appropriate function. Note that this is an important feature for final users, it is worth of all color-management stuff if the final media is not cheap.

The obtained transform emulates the device described by the "Proofing" profile. Useful to preview final result without rendering to the physical medium. To enable proofing and gamut check you need to include following flags:

cmsFLAGS_GAMUTCHECK: Color out of gamut are flagged to a fixed color defined by the function kcmsSetAlarmCodes
cmsFLAGS_SOFTPROOFING: does emulate the Proofing device.

context: Optional context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code.
ProofingIntent: The intent code.
Flags: A combination of bit-field constants described in Table 42.

Returns transform object on success, nil on error.
See also:

- 111.33.8 CreateProofingTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16860

### 111.33.8 CreateProofingTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Same as CreateTransform(), but including soft-proofing.
**Notes:** A proofing transform does emulate the colors that would appear as the image were rendered on a specific device. That is, for example, with a proofing transform I can see how will look a photo of my little daughter if rendered on my HP printer. Since most printer profiles does include some sort of gamut-remapping, it is likely colors will not look as the original. Using a proofing transform, it can be done by using the appropriate function. Note that this is an important feature for final users, it is worth of all color-management stuff if the final media is not cheap.

The obtained transform emulates the device described by the "Proofing" profile. Useful to preview final result without rendering to the physical medium. To enable proofing and gamut check you need to include following flags:

cmsFLAGS_GAMUTCHECK: Color out of gamut are flagged to a fixed color defined by the function kcmsSetAlarmCodes
cmsFLAGS_SOFTPROOFING: does emulate the Proofing device.

context: Optional context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code.
ProofingIntent: The intent code.
Flags: A combination of bit-field constants described in Table 42.

Returns transform object on success, nil on error.
See also:

- 111.33.7 CreateProofingTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16859

### 111.33.9 CreateTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color transform for translating bitmaps.
**Notes:** context: Optional, the context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field kcmsFLAGS_* constants.

Returns a transform object on success, NULL on error.
See also:

- 111.33.10 CreateTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16862

### 111.33.10 CreateTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a color transform for translating bitmaps.
**Notes:** context: Optional, the context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field kcmsFLAGS_* constants.

Returns a transform object on success, NULL on error.
See also:

- 111.33.9 CreateTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 16861

### 111.33.11 ToDeviceLink(Version as Double, Flags as UInt32) as LCMS2ProfileMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates a device-link profile from a given color transform.
**Notes:** This profile can then be used by any other function accepting profile handle. Depending on the specified version number, the implementation of the devicelink may vary. Accepted versions are in range 1.0...4.3

Version: The target devicelink version number.
Flags: A combination of bit-field constants kcmsFLAGS_*.

Returns an ICC profile object on success, nil on error.

### 111.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps according of parameters setup when creating the color transform.
**Notes:** bitmap: the input and output bitmap.

Returns true on success.
Size of input and output bitmaps must match.
Please make sure RowBytes is either zero for both (block mode) or is correct (row by row mode).
Please make sure input and output color space types of transform match the one in the bitmap.
See also:

- 111.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean 16863
- 111.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 16863

### 111.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function translates bitmaps according of parameters setup when creating the color transform.
**Notes:** inBitmap: the input bitmap.
outBitmap: the output bitmap.

Returns true on success.
Size of input and output bitmaps must match.
Please make sure RowBytes is either zero for both (block mode) or is correct (row by row mode).
Please make sure input and output color space types of transform match the those in the bitmaps.
See also:

- 111.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean 16863
- 111.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 16863

### 111.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function translates bitmaps according of parameters setup when creating the color transform.
**Notes:** InputBuffer: A pointer to the input bitmap.

OutputBuffer: A pointer to the output bitmap.
Size: the number of PIXELS to be transformed.

Returns true on success.
See also:

- 111.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean 16863
- 111.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean 16863

### 111.33.15 TransformLineStride(inBitmap as Ptr, outBitmap as Ptr, PixelsPerLine as UInt32, LineCount as UInt32, BytesPerLineIn as UInt32, BytesPerLineOut as UInt32, BytesPerPlaneIn as UInt32, BytesPerPlaneOut as UInt32) as boolean

MBS Images Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps with complex organization.
**Notes:** Each bitmap may contain several lines, and every may have padding. The distance from one line to the next one is BytesPerLine { In/Out } . In planar formats, each line may hold several planes, each plane may have padding. Padding of lines and planes should be same across all bitmap. I.e. all lines in same bitmap have to be padded in same way. This function may be more efficient that repeated calls to Transform(), especially when customized plug-ins are being used.

Parameters:
InputBuffer: A pointer to the input bitmap
OutputBuffer: A pointer to the output bitmap.
PixelsPerLine: The number of pixels for line, which is same on input and in output.
LineCount: The number of lines, which is same on input and output
BytesPerLine { In,Out } : The distance in bytes from one line to the next one.
BytesPerPlaneIn { In,Out } : The distance in bytes from one plane to the next one inside a line. Only applies in planar formats.

Returns true on success.

### 111.33.16 TransformLineStrideMT(inBitmap as Ptr, outBitmap as Ptr, PixelsPerLine as UInt32, LineCount as UInt32, BytesPerLineIn as UInt32, BytesPerLineOut as UInt32, BytesPerPlaneIn as UInt32, BytesPerPlaneOut as UInt32, ThreadCount as Integer = 1) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps with complex organization.
**Notes:** Same as TransformLineStride, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 111.33.17 TransformMT(bitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps according of parameters setup when creating the color transform.
**Notes:** Same as Transform, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:


- 111.33.18 TransformMT(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean 16865
- 111.33.19 TransformMT(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 16866


### 111.33.18 TransformMT(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMB ThreadCount as Integer = 1) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps according of parameters setup when creating the color transform.

**Notes:** Same as Transform, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 111.33.17 TransformMT(bitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean 16865
- 111.33.19 TransformMT(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 16866

### 111.33.19 TransformMT(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps according of parameters setup when creating the color transform.
**Notes:** Same as Transform, but with thread support.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

- 111.33.17 TransformMT(bitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean 16865
- 111.33.18 TransformMT(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean 16865

### 111.33.20 TransformRGB(c as color) as color

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to convert one RGB color.
**Notes:** Works for input/output data with Float (4 or 8 byte) or Integer (1, 2 or 4 bytes).

### 111.33.21 TransformStride(inBitmap as Ptr, outBitmap as Ptr, size as UInt32, Stride as UInt32) as boolean

MBS Images Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function translates bitmaps according of parameters setup when creating the color transform.
**Notes:** On planar-organized buffers, the parameter stride specifies the separation between planes, which may be different of the number of pixels to transform. The main application of this function is when several threads are transforming pixels from different zones of same planar buffer. Otherwise it is identical to other Transform functions.

InputBuffer: A pointer to the input bitmap.
OutputBuffer: A pointer to the output bitmap.
Size: the number of PIXELS to be transformed.
Stride: Plane separation on planar formats

Returns true on success.

### 111.33.22 TransformStrideMT(inBitmap as Ptr, outBitmap as Ptr, size as UInt32, Stride as UInt32) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translates bitmaps with complex organization.
**Notes:** Same as TransformLineStride, but with thread support.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 111.33.23 Properties

### 111.33.24 AdaptationState as Double

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The adaptation state.
**Notes:** (Read only property)

### 111.33.25 context as LCMS2ContextMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The context object.
**Notes:** (Read and Write property)

### 111.33.26 EntryColorSpace as Integer

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The entry colorspace.
**Notes:** (Read only property)

### 111.33.27 EntryWhitePoint as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The entry white points.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.28 ExitColorSpace as Integer

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exit colorspace.
**Notes:** (Read only property)

### 111.33.29 ExitWhitePoint as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exit white points.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.30 GamutCheck as LCMS2PipelineMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A Pipeline holding the gamut check. It goes from the input space to bilevel.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.31 Handle as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 111.33.32 InputColorant as LCMS2NamedColorListMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Input Colorant table.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.33 InputFormat as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the input format associated with a given transform.
**Notes:** (Read only property)

### 111.33.34 Lut as LCMS2PipelineMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A Pipeline holding the full (optimized) transform.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.35 NamedColorList as LCMS2NamedColorListMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a named color list from a given color transform.
**Notes:** Returns named color list dictionary on success, nil on error.

Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.36 OriginalFlags as UInt32

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original flags used to create transform.
**Notes:** (Read only property)

### 111.33.37 OutputColorant as LCMS2NamedColorListMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Output Colorant table (for n chans >CMYK)
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.38 OutputFormat as UInt32

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the output format associated with a given transform.
**Notes:** (Read only property)

### 111.33.39 RenderingIntent as UInt32

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The intent of this transform. That is usually the last intent in the profilechain, but may differ.
**Notes:** (Read only property)

### 111.33.40 Sequence as LCMS2SequenceMBS

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The profiles used to create the transform.
**Notes:** Only for information, so plugin may return a copy of the data.
(Read only property)

### 111.33.41 YieldToRB as Boolean

MBS Images Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the MT methods should yield.
**Notes:** If true (default), we yield to keep other threads running.
Can be set to false to disable yielding.
(Read and Write property)

## 111.34 class LCMS2UcrBgMBS

### 111.34.1 class LCMS2UcrBgMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the cmsSigUcrBgType tag.
**Notes:** This is for Undercolorremoval and black generation.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr4

### 111.34.2 Methods

### 111.34.3 Constructor(Ucr as LCMS2ToneCurveMBS = nil, Bg as LCMS2ToneCurveMBS = nil, Desc as LCMS2MLUMBS = nil)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new object with given values.

### 111.34.4 Properties

### 111.34.5 Bg as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The black generation value.
**Notes:** (Read and Write property)

### 111.34.6 Desc as LCMS2MLUMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The description.
**Notes:** (Read and Write property)

### 111.34.7 Ucr as LCMS2ToneCurveMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The undercolor removal setting.
**Notes:** (Read and Write property)

# 111.35 class LCMS2Vec3MBS

## 111.35.1 class LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a three dimension vector.
**Example:**

```
dim v as new LCMS2Vec3MBS(1,2,3)
MsgBox str(v.X)+" "+str(v.y)+" "+str(v.z)
```

**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr4

## 111.35.2 Methods

## 111.35.3 Clone as LCMS2Vec3MBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the vector.

## 111.35.4 Constructor(other as LCMS2Vec3MBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copy constructor.
**Example:**

```
// make a vector
dim v as new LCMS2Vec3MBS(1,2,3)

// create a copy
dim w as new LCMS2Vec3MBS(v)

// show values
MsgBox str(w.X)+" "+str(w.y)+" "+str(w.z)
```

See also:

- 111.35.5 Constructor(v1 as Double = 0.0, v2 as Double = 0.0, v3 as Double = 0.0)

### 111.35.5 Constructor(v1 as Double = 0.0, v2 as Double = 0.0, v3 as Double = 0.0)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to initialize the object with the given values.
**Example:**

```
dim v as new LCMS2Vec3MBS(1,2,3)
MsgBox str(v.X)+" "+str(v.y)+" "+str(v.z)
```

See also:

- 111.35.4 Constructor(other as LCMS2Vec3MBS) 16874

### 111.35.6 Properties

### 111.35.7 X as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first value.
**Notes:** (Read and Write property)

### 111.35.8 Y as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second value.
**Notes:** (Read and Write property)

### 111.35.9 Z as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The third value.
**Notes:** (Read and Write property)

### 111.35.10 value(index as UInt32) as Double

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The values by index.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

# 111.36 class LCMS2ViewingConditionsMBS

## 111.36.1 class LCMS2ViewingConditionsMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Viewing conditions.
**Notes:** From LCMS documenation: Please note those are CAM model viewing conditions, and not the ICC tag viewing conditions, which I'm naming cmsICCViewingConditions to make differences evident. Unfortunately, the tag cannot deal with surround La, Yb and D value so is basically useless to store CAM02 viewing conditions.

## 111.36.2 Methods

## 111.36.3 Clone as LCMS2ViewingConditionsMBS

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the object.

## 111.36.4 Constructor(other as LCMS2ViewingConditionsMBS)

MBS Images Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes object with values from other object.
See also:

- 111.36.5 Constructor(whitePoint as LCMS2CIEXYZMBS = nil, Yb as Double = 0.0, La as Double = 0.0, surround as Integer = 0, D_value as Double = 0.0) 16877

## 111.36.5 Constructor(whitePoint as LCMS2CIEXYZMBS = nil, Yb as Double = 0.0, La as Double = 0.0, surround as Integer = 0, D_value as Double = 0.0)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new viewing conditions object.
See also:

- 111.36.4 Constructor(other as LCMS2ViewingConditionsMBS) 16877

### 111.36.6 Properties

### 111.36.7 D_value as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The D value value.
**Notes:** (Read and Write property)

### 111.36.8 La as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The La value.
**Notes:** (Read and Write property)

### 111.36.9 Surround as Integer

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The surround value.
**Notes:** Use this constants:
kAVG_SURROUND = 1
kDIM_SURROUND = 2
kDARK_SURROUND = Ôøº3
kCUTSHEET_SURROUND = 4
(Read and Write property)

### 111.36.10 whitePoint as LCMS2CIEXYZMBS

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The white point.
**Notes:** (Read and Write property)

### 111.36.11 Yb as Double

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Yb value.
**Notes:** (Read and Write property)

# Chapter 112

# LDAP

## 112.1 class LDAPMBS

### 112.1.1 class LDAPMBS

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for LDAP connection.
**Example:**

```
// Get a handle to an LDAP connection and set any session preferences.
dim l as new LDAPMBS("localhost", 389)

// Use the ProtocolVersion session preference to specify that the client is an LDAPv3 client.
l.ProtocolVersion = 3
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
Break
end if

// Bind to the server.
// In this example, the client binds anonymously to the server
// (no DN or credentials are specified).

l.SimpleBind("", "")
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
Break
end if

const BASEDN = "dc=example,dc=com"
const SCOPE = l.kScopeSubtree
```

```
const FILTER = "(sn=Jensen)"

dim results() as Dictionary = l.Search(BASEDN, SCOPE, FILTER)

for each dic as Dictionary in results
Break // look in debugger
next
```

**Notes:** On Windows we use Microsoft's WinLDAP Library.
For Mac OS X and Linux we link to OpenLDAP, so be sure to have the right package installed on Linux.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 20.1pr3
- MBS Xojo Plugins, version 19.4pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- OpenDirectory Framework for Xojo
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo Plugins, version 18.5pr7
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 16.3pr3
- MBS Xojo / Real Studio Plugins, version 15.5pr3

**Xojo Developer Magazine**

- 18.3, page 50: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 9: News

### 112.1.2 Methods

### 112.1.3 Add(distinguishedName as string, attrs() as LDAPModMBS)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds attributes.
**Example:**

```
// add like this

dim m1 as new LDAPModMBS
dim m2 as new LDAPModMBS

m1.Operation = m1.kOperationAdd
m1.Type = "sn"
m1.addValue "yyy"

m2.Operation = m1.kOperationAdd
m2.Type = "cn"
m2.addValue "xxx"

dim attr() as LDAPModMBS
attr.Append m1
attr.Append m2

l.Add("test", attr)
```

**Notes:** The Add function initiates a synchronous add operation that adds an entry to a tree. The parent of the entry being added must already exist or the parent must be empty (equal to the root distinguished name) for an add operation to succeed.

Before calling Add, you must create an entry by specifying its attributes in LDAPModMBS objects. Set the Operator member of each structure to kOperationAdd, and set the Type and Value members as appropriate for your entry.

### 112.1.4 Bind(Who as String, Cred as String, AuthMethod as Integer, Domain as String = "")

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Binds to a server with given credentials and authorization method.
**Notes:** Synchronously authenticates a client to the LDAP server.

Added domain parameter in plugin version 17.1, Windows only.

### 112.1.5 Connect(TimeOutSeconds as Double = 1.0)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to server.

**Notes:** On Mac does nothing.

### 112.1.6 Constructor

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Targets: All.

**Function:** Default constructor.
**Notes:** Creates a new connection without connecting.
See also:

- 112.1.7 Constructor(IP as string, Port as Integer, Open as Boolean = false, Secure as Boolean = false) 16884
- 112.1.8 Constructor(URL as string) 16885

### 112.1.7 Constructor(IP as string, Port as Integer, Open as Boolean = false, Secure as Boolean = false)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a connection to a LDAP server.
**Example:**

```
// connect with SSL
dim ldap as LDAPMBS

#if TargetWin32 then
ldap = new LDAPMBS("192.168.1.123", 636, false, true)
#else
ldap = new LDAPMBS("ldaps://192.168.1.123")
#endif
```

**Notes:** If open is true, we connect directly to server.
Secure: For Windows Vista and newer. Set to true for a secure connection with SSL. (only for open=false)

For connecting via SSL, please use on Mac OS X the Constructor taking the URL and specify ldaps protocol.
For Windows use this constructor with secure parameter set to true.

Changed with 16.0 to work on Mac with secure = true. For Windows we switch to Open = false if secure is true.
See also:

- 112.1.6 Constructor 16884

• 112.1.8 Constructor(URL as string) 16885

### 112.1.8 Constructor(URL as string)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a connection to a LDAP server.
**Example:**

```
// connect with SSL
dim ldap as LDAPMBS

#if TargetWin32 then
ldap = new LDAPMBS("192.168.1.123", 636, false, true)
#else
ldap = new LDAPMBS("ldaps://192.168.1.123")
#endif
```

**Notes:** Added Windows support in 16.0 plugins.
See also:

• 112.1.6 Constructor 16884

• 112.1.7 Constructor(IP as string, Port as Integer, Open as Boolean = false, Secure as Boolean = false) 16884

### 112.1.9 Delete(distinguishedName as string)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes an entry.

### 112.1.10 ErrorString(error as Integer) as string

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries an error message for an error code.

### 112.1.11 Modify(distinguishedName as string, attrs() as LDAPModMBS)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modifies an entry.
**Notes:** Please pass one LDAPModMBS for each attribute to change.

The Modify function initiates a synchronous operation to modify an existing entry. If values are being added to or replaced in the entry, the function creates the attribute, if necessary. If values are being deleted, the function removes the attribute if no values remain. All modifications are performed in the order in which they are listed.

When connecting to an LDAP 2 server, the application must perform a bind operation (by calling one of the Bind or SimpleBind routines) before attempting any other operations.

### 112.1.12 Rename(distinguishedName as string, NewDistinguishedName as String, DeleteOldRdn as Boolean)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renames an item.
See also:

- 112.1.13 Rename(distinguishedName as string, NewRDN as String, NewParent as String, DeleteOldRdn as Boolean) 16886

### 112.1.13 Rename(distinguishedName as string, NewRDN as String, NewParent as String, DeleteOldRdn as Boolean)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Renames an item and can move it to other parent.
See also:

- 112.1.12 Rename(distinguishedName as string, NewDistinguishedName as String, DeleteOldRdn as Boolean) 16886

### 112.1.14 Search(distinguishedName as string, Scope as Integer, Filter as String, Attrs() as String = nil, AttributesOnly as boolean = false, timeout as Double = 1.0, SizeLimit as Integer = 0) as Dictionary()

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Search for something.
**Example:**

```
// Get a handle to an LDAP connection and set any session preferences.
dim l as new LDAPMBS("localhost", 389)
```

```
// Use the ProtocolVersion session preference to specify that the client is an LDAPv3 client.
l.ProtocolVersion = 3
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
Break
end if

// Bind to the server.
// In this example, the client binds anonymously to the server
// (no DN or credentials are specified).

l.SimpleBind("", "")
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
Break
end if

const BASEDN = "dc=example,dc=com"
const SCOPE = l.kScopeSubtree
const FILTER = "(sn=Jensen)"

dim results() as Dictionary = l.Search(BASEDN, SCOPE, FILTER)

for each dic as Dictionary in results
Break // look in debugger
next
```

**Notes:** The plugin will return result as array of Dictionaries, one for each item. Dictionary contains attributes with their values. A special entry has key = nil and as value the distinguish name of the item.

### 112.1.15 SimpleBind(Who as String, Cred as String)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Simple bind call.
**Example:**

```
// Get a handle to an LDAP connection and set any session preferences.
dim l as new LDAPMBS("localhost", 389)

// Use the ProtocolVersion session preference to specify that the client is an LDAPv3 client.
l.ProtocolVersion = 3
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
```

```
Break
end if

// Bind to the server.
// In this example, the client binds anonymously to the server
// (no DN or credentials are specified).

l.SimpleBind("", "")
if l.Lasterror <>0 then
dim error as string = l.ErrorString(l.Lasterror)
Break
end if

const BASEDN = "dc=example,dc=com"
const SCOPE = l.kScopeSubtree
const FILTER = "(sn=Jensen)"

dim results() as Dictionary = l.Search(BASEDN, SCOPE, FILTER)

for each dic as Dictionary in results
Break // look in debugger
next
```

### 112.1.16 StartTLS

MBS Network Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a StartTLS request to a server, waits for the reply, and then installs TLS handlers on the session if the request succeeded.
**Notes:** Lasterror is set.

### 112.1.17 Properties

### 112.1.18 CACertFile as FolderItem

MBS Network Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Targets: All.

**Function:** The path for CACert file.
**Notes:** Should be PEM format.
Lasterror is set.
(Read and Write property)

### 112.1.19 Handle as Integer

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 112.1.20 Lasterror as Integer

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 112.1.21 NetworkTimeOut as Double

MBS Network Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Targets: All.

**Function:** The network timeout.
**Example:**

```
dim l as LDAPMBS
l.NetworkTimeOut = 2.5 // 2.5 seconds
```

**Notes:** This is the timeout for the underlaying sockets.
Value is in seconds with resolution to microseconds.
(Read and Write property)

### 112.1.22 ProtocolVersion as Integer

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the protocol version to use.
**Notes:** (Read and Write property)

### 112.1.23 Referrals as Integer

MBS Network Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies whether to automatically follow referrals returned by the LDAP server.

**Notes:** (Read and Write property)

### 112.1.24 TimeOut as Double

MBS Network Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Targets: All.

**Function:** The default timeout.
**Example:**

```
dim l as LDAPMBS
l.TimeOut = 2.5 // 2.5 seconds
```

**Notes:** Value is in seconds with resolution to microseconds.
(Read and Write property)

### 112.1.25 Events

### 112.1.26 Error(ErrorCode as Integer, ErrorMessage as String, FunctionName as String)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The error event.
**Notes:** Called for any function which got an error. Provides for your convenience the error code, message and function name.

### 112.1.27 Constants

Auth Modes

| Constant | Value | Description |
|---|---|---|
| kAuthDigest | &h4086 | Only for Windows. |
| kAuthDPA | &h2086 | Only for Windows. |
| kAuthExternal | &hA6 | |
| kAuthKRBV4 | &hFF | Only for Mac OS X and Linux. |
| kAuthKRBV41 | &h81 | Only for Mac OS X and Linux. |
| kAuthKRBV42 | &h82 | Only for Mac OS X and Linux. |
| kAuthMSN | &h0886 | Only for Windows. |
| kAuthNegotiate | &h4FF | Only for Windows. |
| kAuthNegotiateWin | &h0486 | Only for Windows. |
| kAuthNone | 0 | No auth. |
| kAuthNTLM | &h1086 | Only for Windows. |
| kAuthSASL | &hA3 | Only for Mac OS X and Linux. |
| kAuthSASLWin | &h83 | Only for Windows. |
| kAuthSicily | &h0286 | Only for Windows. |
| kAuthSimple | &h80 | Simple authentication. |
| kAuthSSPI | &h4FF | Only for Windows. |

Scopes

| Constant | Value | Description |
|---|---|---|
| kScopeBase | 0 | |
| kScopeDefault | -1 | |
| kScopeOneLevel | 1 | |
| kScopeSubordinate | 3 | |
| kScopeSubtree | 2 | |

Versions

| Constant | Value | Description |
|---|---|---|
| kVersion1 | 1 | |
| kVersion2 | 2 | |
| kVersion3 | 3 | |

## 112.2 class LDAPModMBS

### 112.2.1 class LDAPModMBS

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to hold values being added/modified.
**Example:**

```
dim m1 as new LDAPModMBS

m1.Operation = m1.kOperationAdd
m1.Type = "sn"
m1.addValue "yyy"
```

### 112.2.2 Methods

### 112.2.3 addValue(value as String)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value.
**Notes:** An item may have one value or several, so the plugin manages an array for you.

### 112.2.4 clearValues

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all values.

### 112.2.5 Constructor

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 112.2.6 setValues(values() as String)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the values array to be the one passed.
**Notes:** Does not make a copy of the array, but references it.

### 112.2.7 Values as String()

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the array with values.
**Notes:** Returns not a copy, but the array used to store values.

### 112.2.8 Properties

### 112.2.9 Operation as Integer

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The operation to perform.
**Notes:** Can be kOperationAdd, kOperationDelete or kOperationReplace.
(Read and Write property)

### 112.2.10 Type as String

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** String that specifies the name of the attribute to modify.
**Notes:** (Read and Write property)

### 112.2.11 Value as String

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns first value.
**Notes:** Some items only have one value, so this is the value.
(Read only property)

### 112.2.12 Constants

Operations

| Constant | Value | Description |
|---|---|---|
| kOperationAdd | 0 | Adds a value to the entry. The supplied values are appended to the existing values in the attribute. |
| kOperationDelete | 1 | Deletes a value in the entry. The supplied values are deleted from the current attribute values. |
| kOperationReplace | 2 | Replaces a value in the entry. The supplied values replace the existing attribute values. |

# Chapter 113

# Licenses

## 113.1 Licenses

### 113.1.1 bzip2

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The bzip2 1.0.5 license
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Julian Seward, jseward@bzip.org bzip2/libbzip2 version 1.0.5 of 10 December 2007

### 113.1.2 ChartDirector

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The ChartDirector 5.0 license
**Notes:** Please note: The license for the ChartDirector is included when you purchase the plugin as we pay royalties. So you do not need to buy an additional license from Advanced Software Engineering Limited.

The original license for the C library:

ChartDirector Version 5.0
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Platforms: macOS, Linux, Windows, Targets: .

**Function:** The CUPS 1.4.4 license
**Notes:** CUPS License Agreement

Copyright 2007-2009 by Apple Inc.
1 Infinite Loop
Cupertino, CA 95014 USA

WWW: http://www.cups.org/

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b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium

customarily used for software interchange; or,

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END OF TERMS AND CONDITIONS

Appendix: How to Apply These Terms to Your New Programs

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possible use to the public, the best way to achieve this is to make it
free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest
to attach them to the start of each source file to most effectively
convey the exclusion of warranty; and each file should have at least
the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.>
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<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

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[ This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL. ]

Preamble

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For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link a program with the library, you must provide complete object files to the recipients so that they can relink them with the library, after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

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Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that companies distributing free software will individually obtain patent licenses, thus in effect transforming the program into proprietary software. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain

designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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A ”library” means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The ”Library”, below, refers to any such software library or work which has been distributed under these terms. A ”work based on the Library” means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term ”modification”.)

”Source code” for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

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For an executable, the required form of the "work that uses the
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**Notes:** CURL links to libssl, libcrypto, libssh2 and other libraries.

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That's all there is to it!

### 113.1.18 libunzip

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The libunzip 1.01e license
**Notes:** unzip.h – IO for uncompress .zip files using zlib
Version 1.01e, February 12th, 2005

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This unzip package allow extract file from .ZIP file, compatible with PKZip 2.04g
WinZip, InfoZip tools and compatible.

Multi volume ZipFile (span) are not supported.
Encryption compatible with pkzip 2.04g only supported
Old compressions used by old PKZip 1.x are not supported

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### 113.1.19 libxml

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The libxml license
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### 113.1.20 libzip

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The libzip 1.01e license
**Notes:** zip.h – IO for compress .zip files using zlib
Version 1.01e, February 12th, 2005

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This unzip package allow creates .ZIP file, compatible with PKZip 2.04g
WinZip, InfoZip tools and compatible.
Multi volume ZipFile (span) are not supported.
Encryption compatible with pkzip 2.04g only supported
Old compressions used by old PKZip 1.x are not supported

For uncompress .zip file, look at unzip.h

I WAIT FEEDBACK at mail info@winimage.com
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### 113.1.21 LZW

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The LZW license
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### 113.1.22 OpenSSL

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The OpenSSL license
**Notes:** LICENSE ISSUES
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### 113.1.24 PCRE

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PCRE 8.0.1 license (RegEx)
**Notes:** PCRE LICENCE

---

PCRE is a library of functions to support regular expressions whose syntax
and semantics are as close as possible to those of the Perl 5 language.

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The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions.

THE BASIC LIBRARY FUNCTIONS

---

Written by: Philip Hazel
Email local part: ph10
Email domain: cam.ac.uk

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Cambridge, England.

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THE C++ WRAPPER FUNCTIONS

---

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### 113.1.26 PortAudio

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PortAudio v19 license
**Notes:** Portable header file to contain:
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* PortAudio Portable Real-Time Audio Library
* PortAudio API Header File
* Latest version available at: http://www.portaudio.com
*
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Implementation files to contain:
»»>
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* Latest version at: http://www.portaudio.com
* <platform>Implementation
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### 113.1.27 PortMidi

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PortMidi v17 license
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*
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*
* Latest version available at: http://www.cs.cmu.edu/
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*
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### 113.1.30 TCMPortMapper

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The TCMPortMapper 1.3.1 license
**Notes:** TCMPortMapper
Establishes port mapping via upnp or natpmp

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### 113.1.31 Tidy

Platforms: macOS, Linux, Windows, Targets: .

**Function:** The Tidy license
**Notes:** HTML Tidy

HTML parser and pretty printer

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### 113.1.34 zlib

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# Chapter 114

# Linguistic

## 114.1 class NSLinguisticTaggerMBS

### 114.1.1 class NSLinguisticTaggerMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Analyze natural language to tag part of speech and lexical class, identify proper names, perform lemmatization, and determine the language and script (orthography) of text.
**Example:**

```
dim TagScheme as string = NSLinguisticTaggerMBS.NSLinguisticTagSchemeLanguage
dim TagSchemes() as string = array(TagScheme)
dim t as new NSLinguisticTaggerMBS(TagSchemes)

t.Text = "Hallo Leute"

dim tokenRange as NSRangeMBS
dim sentenceRange as NSRangeMBS
dim tag as string = t.tagAtIndex(0, TagScheme, tokenRange, sentenceRange)

MsgBox "Language: "+tag // should be "de" for German
```

**Notes:** The NSLinguisticTaggerMBS class provides a uniform interface to a variety of natural language processing functionality with support for many different languages and scripts. You can use NSLinguisticTaggerMBS to segment natural language text into paragraphs, sentences, or words, and tag information about those tokens, such as part of speech, lexical class, lemma, script, and language.
When you create a linguistic tagger, you specify what kind of information you're interested in by passing one or more
NSLinguisticTagScheme values. Set the string property to the natural language text you want to analyze,

and the linguistic tagger processes it according to the specified tag schemes. You can then enumerate over the tags in a specified range, using the methods described in Enumerating Linguistic Tags, to get the information requested for a given scheme and unit.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr6
- MBS Xojo Plugins, version 17.3pr3

### 114.1.2 Methods

### 114.1.3 availableTagSchemesForLanguage(Language as String) as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the tag schemes available for a particular language on the current device.
**Notes:** language: A BCP-47 tag identifying the language. For example, "en" for English or "zh-Hans" for Chinese written using the Simplified Chinese script.

Returns the available tag schemes. For possible values, see NSLinguisticTagScheme.

This is a convenience method for calling the availableTagSchemesForUnit, passing NSLinguisticTaggerUnitWord as the linguistic unit.

### 114.1.4 availableTagSchemesForUnit(unit as Integer, Language as String) as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the tag schemes available for a particular unit and language on the current device.
**Notes:** unit: The linguistic unit. For possible values, see NSLinguisticTaggerUnit.
language: A BCP-47 tag identifying the language. For example, "en" for English or "zh-Hans" for Chinese written using the Simplified Chinese script.

Returns the supported tag schemes. For possible values, see NSLinguisticTagScheme.

Available in macOS 10.13 and newer.

### 114.1.5 Constructor(tagSchemes() as String, options as integer = 0)

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Creates a linguistic tagger instance using the specified tag schemes and options.
**Notes:** tagSchemes: An array of tag schemes. See NSLinguisticTagScheme for the possible values.
options: Reserved for future use. Specify 0 for this parameter.

### 114.1.6 dominantLanguageForString(text as String) as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the dominant language for the specified string.
**Notes:** string: The string for which the dominant language is determined.

Returns the BCP-47 tag identifying the dominant language of the string, or the tag "und" if a specific language cannot be determined.

This is a convenience method for creating a new linguistic tagger, setting the string property, and getting the dominantLanguage property. If you analyze the same string more than once, you should create a linguistic tagger object instead of calling this method.

Available in macOS 10.13 and newer.

### 114.1.7 NSLinguisticTagAdjective as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an adjective.

### 114.1.8 NSLinguisticTagAdverb as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an adverb.

### 114.1.9 NSLinguisticTagClassifier as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.

**Notes:** This token is a classifier.

### 114.1.10 NSLinguisticTagCloseParenthesis as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a close parenthesis.

### 114.1.11 NSLinguisticTagCloseQuote as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a close quote.

### 114.1.12 NSLinguisticTagConjunction as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a conjunction.

### 114.1.13 NSLinguisticTagDash as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a dash.

### 114.1.14 NSLinguisticTagDeterminer as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a determiner.

### 114.1.15 NSLinguisticTagIdiom as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an idiom.

### 114.1.16 NSLinguisticTagInterjection as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an interjection.

### 114.1.17 NSLinguisticTagNoun as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** The token is a noun.

### 114.1.18 NSLinguisticTagNumber as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a number.

### 114.1.19 NSLinguisticTagOpenParenthesis as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an open parenthesis.

### 114.1.20 NSLinguisticTagOpenQuote as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is an open quote.

### 114.1.21 NSLinguisticTagOrganizationName as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the Name Types.
**Notes:** This token is an organization name.

### 114.1.22 NSLinguisticTagOther as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the token types.
**Notes:** The token indicates a non-linguistic item, such as a symbol.

### 114.1.23 NSLinguisticTagOtherPunctuation as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is punctuation other than a kind described by other lexical classes (sentence terminator, open or close quote, open or close parenthesis, word joiner, and dash).

### 114.1.24 NSLinguisticTagOtherWhitespace as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is whitespace other than a kind described by other lexical classes (paragraph break).

### 114.1.25 NSLinguisticTagOtherWord as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a word other than a kind described by other lexical classes (noun, verb, adjective, adverb, pronoun, determiner, particle, preposition, number, conjunction, interjection, classifier, and idiom).

### 114.1.26 NSLinguisticTagParagraphBreak as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a paragraph break.

### 114.1.27 NSLinguisticTagParticle as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a particle.

### 114.1.28 NSLinguisticTagPersonalName as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the Name Types.
**Notes:** This token is a personal name.

### 114.1.29 NSLinguisticTagPlaceName as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the Name Types.
**Notes:** This token is a place name.

### 114.1.30 NSLinguisticTagPreposition as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a preposition.

### 114.1.31 NSLinguisticTagPronoun as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a pronoun.

### 114.1.32 NSLinguisticTagPunctuation as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the token types.
**Notes:** The token indicates punctuation.

### 114.1.33 NSLinguisticTagSchemeLanguage as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Supplies a BCP-47 language identifier for a token.
**Notes:** For example, the language identifier for English is "en" and the identifier for Chinese written using the Simplified Chinese script is "zh-Hans". The identifier "und" is used if a specific language cannot be determined.
The tagger generally attempts to determine the language of text at the level of an entire sentence, paragraph, or document, rather than word by word.

### 114.1.34 NSLinguisticTagSchemeLemma as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Supplies a stem form of a word token, if known.

### 114.1.35 NSLinguisticTagSchemeLexicalClass as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Classifies tokens according to class: part of speech for words, type of punctuation, or whitespace.

### 114.1.36 NSLinguisticTagSchemeNameType as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Classifies tokens according to whether they are part of a named entity.

### 114.1.37 NSLinguisticTagSchemeNameTypeOrLexicalClass as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Classifies tokens corresponding to names according to NSLinguisticTagSchemeNameType and tokens all other tokens according to NSLinguisticTagSchemeLexicalClass.

### 114.1.38 NSLinguisticTagSchemeScript as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Supplies an ISO 15924 script identifier for a token.
**Notes:** For example, the identifier for Latin script is "Latn" and the identifier for Simplified Chinese script is "Hans". The identifier "Zyyy" is used if a specific script cannot be determined.

### 114.1.39 NSLinguisticTagSchemeTokenType as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Classifies tokens according to their broad type: word, punctuation, or whitespace.
**Notes:** To classify tokens by a more specific type, for example, distinguishing words between nouns and verbs, use the
NSLinguisticTagSchemeLexicalClass scheme.

### 114.1.40 NSLinguisticTagSentenceTerminator as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a sentence terminator.

### 114.1.41 NSLinguisticTagVerb as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a verb.

### 114.1.42 NSLinguisticTagWhitespace as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the token types.
**Notes:** The token indicates white space of any sort.

### 114.1.43 NSLinguisticTagWord as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the token types.
**Notes:** The token indicates a word.

### 114.1.44 NSLinguisticTagWordJoiner as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** One of the lexical classes.
**Notes:** This token is a word joiner.

### 114.1.45 orthographyAtIndex(charIndex as integer, byref effectiveRange as NSRangeMBS) as NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the orthography at the index and also returns the effective range.
**Example:**

```
dim TagScheme as string = NSLinguisticTaggerMBS.NSLinguisticTagSchemeLanguage
dim TagSchemes() as string = array(TagScheme)
dim t as new NSLinguisticTaggerMBS(TagSchemes)

t.Text = "Hallo Leute"

dim tokenRange as NSRangeMBS
dim sentenceRange as NSRangeMBS
dim tag as string = t.tagAtIndex(0, TagScheme, tokenRange, sentenceRange)

dim effectiveRange as NSRangeMBS
dim o as NSOrthographyMBS = t.orthographyAtIndex(0, effectiveRange)

MsgBox o.dominantLanguage+" "+o.dominantScript
```

**Notes:** charIndex: The character index to begin examination.
effectiveRange: An NSRangeMBS that, upon completion, contains the range of the orthography containing charIndex.

Returns the orthography for the location.

### 114.1.46 sentenceRangeForRange(range as NSRangeMBS) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the range of a sentence containing the specified range.
**Notes:** charRange: The character range.

Returns the range of the sentence.

This is a convenience method for calling tokenRangeAtIndex, passing the NSLinguisticTaggerUnitSentence unit and the first position of the provided range.

### 114.1.47 setOrthography(orthography as NSOrthographyMBS, range as NSRangeMBS)

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Sets the orthography for the specified range.
**Notes:** orthography: The orthography.
charRange: The range.

If the orthography of the linguistic tagger is not set, it will determine it automatically from the contents of the text. You should call this method only if you know the orthography of the text by some other means.

### 114.1.48 tagAtIndex(charIndex as Integer, Scheme as String, byref tokenRange as NSRangeMBS, byref sentenceRange as NSRangeMBS) as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns a tag for a single scheme at the specified character position.
**Notes:** charIndex: The position of the initial character.
tagScheme: The tag scheme. See NSLinguisticTagScheme for the possible values.
tokenRange: The token range for output.

sentenceRange: The range of the sentence for output.

Returns the tag for the requested tag scheme, or nil. If a tag is returned, this function returns by reference the range of the token to tokenRange, and the range of the enclosing sentence to sentenceRange, if applicable.

This is a convenience method for calling tagAtIndex and passing NSLinguisticTaggerUnitWord as the linguistic unit.

Available in macOS 10.7 and newer.
See also:

- 114.1.49 tagAtIndex(charIndex as Integer, unit as Integer, Scheme as String, byref tokenRange as NSRangeMBS) as String 16996

### 114.1.49 tagAtIndex(charIndex as Integer, unit as Integer, Scheme as String, byref tokenRange as NSRangeMBS) as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns a tag for a single scheme for a given linguistic unit at the specified character position.
**Notes:** charIndex: The position of the initial character.
unit: The linguistic unit. See NSLinguisticTaggerUnit for possible values.
tagScheme: The tag scheme. See NSLinguisticTagScheme for possible values.
tokenRange: The token range for output.

Returns the tag for the requested tag scheme and linguistic unit, or nil. If a tag is returned, this function returns by reference the range of the token to tokenRange.

Available in macOS 10.13 and newer.
See also:

- 114.1.48 tagAtIndex(charIndex as Integer, Scheme as String, byref tokenRange as NSRangeMBS, byref sentenceRange as NSRangeMBS) as String 16995

### 114.1.50 tagForString(text as string, charIndex as Integer, unit as Integer, Scheme as String, orthography as NSOrthographyMBS, byref tokenRange as NSRangeMBS) as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns a tag for a single scheme for a given linguistic unit at the specified character position in a string.
**Notes:** charIndex: The position of the initial character.

unit: The linguistic unit. See NSLinguisticTaggerUnit for possible values.
tagScheme: The tag scheme. See NSLinguisticTagScheme for possible values.
tokenRange: The token range for output.

Returns the tag for the requested tag scheme and linguistic unit, or nil. If a tag is returned, this function returns by reference the range of the token to tokenRange.

This is a convenience method for initializing a linguistic tagger, setting the string property, and calling the tagForString method. If you analyze the same string more than once, you should create a linguistic tagger object instead of calling this method.

### 114.1.51 tagSchemes as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the tag schemes configured for this linguistic tagger.
**Notes:** For possible values, see NSLinguisticTagScheme.

### 114.1.52 TagsForString(text as string, range as NSRangeMBS, unit as Integer, Scheme as String, options as Integer, orthography as NSOrthographyMBS) as NSLinguisticValueMBS()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns an array of linguistic tags and token ranges.
**Notes:** range: The range from which to return tags.
unit: The linguistic unit. See NSLinguisticTaggerUnit for possible values.
tagScheme: The tag scheme. See NSLinguisticTagScheme for possible values.
options: The linguistic tagger options to use. See NSLinguisticTaggerOptions for possible values.

An array of the values in the requested range (tag and tokenRange set).

When the returned array contains an entry that doesn't have a corresponding tag scheme, that entry is an empty string ("").
This is a convenience method for initializing a linguistic tagger, setting the
string property, and calling the tagsInRange method. If you analyze the same string more than once, you should create a linguistic tagger object instead of calling this method.

Available in macOS 10.13 and newer.

### 114.1.53 tagsInRange(range as NSRangeMBS, Scheme as String, options as Integer) as NSLinguisticValueMBS()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns an array of linguistic tags and token ranges.
**Notes:** range: The range to analyze.
tagScheme: The tag scheme. For possible values, see NSLinguisticTagScheme.
options: The linguistic tagger options to use. See NSLinguisticTaggerOptions for possible values.

Available in macOS 10.7 and newer.
See also:

- 114.1.54 tagsInRange(range as NSRangeMBS, unit as Integer, Scheme as String, options as Integer) as NSLinguisticValueMBS() 16998

### 114.1.54 tagsInRange(range as NSRangeMBS, unit as Integer, Scheme as String, options as Integer) as NSLinguisticValueMBS()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns an array of linguistic tags and token ranges.
**Notes:** range: The range to analyze.
unit: The linguistic unit. For possible values, see NSLinguisticTaggerUnit.
tagScheme: The tag scheme. For possible values, see NSLinguisticTagScheme.
options: The linguistic tagger options to use. See NSLinguisticTaggerOptions for possible values.

Available in macOS 10.13 and newer.

Returns all tokens intersecting a given range, supplying tags and ranges. The tagger segments the string into sentences and tokens as necessary, and return those ranges along with a tag for any scheme in its array of tag schemes. For example, if the tag scheme is NSLinguisticTagSchemeLexicalClass, the tags specify the part of speech (for word tokens) or the type of whitespace or punctuation (for whitespace or punctuation tokens). If the tag scheme is NSLinguisticTagSchemeLemma, the tags specify the stem form of the word (if known) for each word token.
See also:

- 114.1.53 tagsInRange(range as NSRangeMBS, Scheme as String, options as Integer) as NSLinguistic-ValueMBS() 16998

### 114.1.55 tokenRangeAtIndex(charIndex as Integer, Unit as Integer) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the range of the linguistic unit containing the specified character index.
**Notes:** charIndex: The character index to begin examination.
unit: The linguistic unit. For possible values, see NSLinguisticTaggerUnit.

Returns the range of the substring for the linguistic unit.
Available in macOS 10.13 and newer.

### 114.1.56 Properties

### 114.1.57 dominantLanguage as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the dominant language of the string set for the linguistic tagger.
**Notes:** The BCP-47 tag identifying the dominant language of the string, or the tag "und" if a specific language cannot be determined.
Available in macOS 10.13 and newer.
(Read only property)

### 114.1.58 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 114.1.59 Text as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The string being analyzed by the linguistic tagger.
**Notes:** (Read and Write property)

### 114.1.60 Constants

Options

| Constant | Value | Description |
|---|---|---|
| NSLinguisticTaggerJoinNames | 16 | Typically, multiple-word names will be returned as multiple tokens, follo the standard tokenization practice of the tagger. If this option is set, multiple-word names will be joined together and returned as a single toke |
| NSLinguisticTaggerOmitOther | 8 | Omit tokens of type NSLinguisticTagOther (non-linguistic items, such as s bols). |
| NSLinguisticTaggerOmitPunctuation | 2 | Omit tokens of type NSLinguisticTagPunctuation (all punctuation). |
| NSLinguisticTaggerOmitWhitespace | 4 | Omit tokens of type NSLinguisticTagWhitespace (whitespace of all sorts) |
| NSLinguisticTaggerOmitWords | 1 | Omit tokens of type NSLinguisticTagWord (items considered to be words |

Units

| Constant | Value | Description |
|---|---|---|
| NSLinguisticTaggerUnitDocument | 3 | The document in its entirety. |
| NSLinguisticTaggerUnitParagraph | 2 | An individual paragraph. |
| NSLinguisticTaggerUnitSentence | 1 | An individual sentence. |
| NSLinguisticTaggerUnitWord | 0 | An individual word. |

## 114.2 class NSLinguisticValueMBS

### 114.2.1 class NSLinguisticValueMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The class for linguistic tokens.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr6
- MBS Xojo Plugins, version 17.3pr3

### 114.2.2 Methods

### 114.2.3 Constructor

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 114.2.4 Properties

### 114.2.5 sentenceRange as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The sentence range.
**Notes:** Only filled by tagAtIndex when used without unit.
(Read and Write property)

### 114.2.6 Tag as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The linguistic tag.
**Notes:** (Read and Write property)

### 114.2.7 Text as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The text for the token.
**Notes:** (Read and Write property)

### 114.2.8 tokenRange as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The token range.
**Notes:** (Read and Write property)

## 114.3 class NSOrthographyMBS

### 114.3.1 class NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** A description of the linguistic content of a piece of text typically used for spelling and grammar checking.
**Notes:** An NSOrthography instance describes:

- Which scripts the text contains.
- A dominant language and possibly other languages for each of these scripts.
- A dominant script and language for the text as a whole.

Scripts are uniformly described by standard four-letter tags (Latn, Grek, Cyrl, etc.) with the supertags Jpan and Kore typically used for Japanese and Korean text, Hans and Hant for Chinese text; the tag Zyyy is used if a specific script cannot be identified. See Internationalization and Localization Guide for more information on internationalization.

Languages are uniformly described by BCP-47 tags , preferably in canonical form; the tag und is used if a specific language cannot be determined.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr6
- MBS Xojo Plugins, version 17.3pr3

### 114.3.2 Methods

### 114.3.3 allLanguages as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing all the languages appearing in the values of the language map.
**Notes:** Available in macOS 10.6 and newer.

### 114.3.4 allScripts as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns an array containing all the scripts appearing as keys in the language map.
**Notes:** Available in macOS 10.6 and newer.

### 114.3.5 Constructor(script as string, map as dictionary)

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Creates and returns an orthography instance with the specified dominant script and language map.
**Notes:** script: The dominant script.
map: A dictionary containing the language map.

Returns an initialized orthography object for the specified script and language map.

### 114.3.6 copy as NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Create a copy of the object.

### 114.3.7 defaultOrthographyForLanguage(language as string) as NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Queries default orthography for a language.
**Notes:** Available in macOS 10.13 and newer.

### 114.3.8 dominantLanguageForScript(script as string) as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the dominant language for the specified script.
**Notes:** Available in macOS 10.6 and newer.

### 114.3.9 languagesForScript(script as string) as String()

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the list of languages for the specified script.
**Notes:** Available in macOS 10.6 and newer.

### 114.3.10 orthographyWithDominantScript(script as string, map as dictionary) as NSOrthographyMBS

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Creates and returns an orthography instance with the specified dominant script and language map.
**Notes:** script: The dominant script.
map: A dictionary containing the language map.

Returns an initialized orthography object for the specified script and language map.

### 114.3.11 Properties

### 114.3.12 dominantLanguage as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** Returns the first language in the list of languages for the dominant script.
**Notes:** Available in macOS 10.6 and newer.
(Read only property)

### 114.3.13 dominantScript as String

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The dominant script for the text.
**Notes:** The dominant script should be a script tag, such as Latn, Cyrl, etc.
Available in macOS 10.6 and newer.
(Read only property)

### 114.3.14 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 114.3.15 languageMap as Dictionary

MBS MacCocoa Plugin, Plugin Version: 17.3, Platform: macOS, Targets: All.

**Function:** A dictionary that map script tags to arrays of language tags.
**Notes:** The dictionary,Äôs keys are script tags (such as Latn, Cyrl, and so forth) and whose values are arrays of language tags (such as en, fr, de, etc.)
(Read only property)

# Chapter 115

# Linux

## 115.1 module LinuxIconMBS

### 115.1.1 module LinuxIconMBS

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The module for linux icons.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr1
- Linux Icon Functions for Xojo

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 43: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.3, page 11: News

### 115.1.2 Methods

### 115.1.3 FileIcon(file as FolderItem, size as integer = 48) as Picture

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries file icon for file.
**Example:**

```
dim f2 as FolderItem = SpecialFolder.Desktop
Canvas2.Backdrop = LinuxIconMBS.FileIcon(f2, Canvas2.Width)
```

**Notes:** Returns nil in case of error.

### 115.1.4 FilePreview(file as FolderItem, size as integer = 48) as Picture

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries preview icon for file.
**Notes:** Returns nil in case of error.

### 115.1.5 FileThumbnail(file as FolderItem) as FolderItem

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries thumbnail path for a given file.
**Example:**

```
// make an image file
dim p as picture = logoMBS(500) // from Main plugin
dim f as FolderItem = SpecialFolder.Desktop.Child("MBS.jpg")
p.Save(f, p.SaveAsJPEG, 90)

// show thumbnail
dim ThumbnailFile as FolderItem = LinuxIconMBS.FileThumbnail(f)
if ThumbnailFile <>nil then
Canvas6.Backdrop = Picture.Open(ThumbnailFile)
end if
```

**Notes:** Returns nil in case of error.
Otherwise this may be URL for png file with thumbnail.

### 115.1.6 GenericIconName(MimeType as String) as String

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries generic icon name for mime type.

### 115.1.7 Icon(MimeType as String, size as integer = 48) as Picture

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries icon for mime type.
**Example:**

Canvas1.Backdrop = LinuxIconMBS.Icon("image/jpeg", Canvas1.Width)

**Notes:** Returns nil in case of error.

### 115.1.8 SymbolicIcon(MimeType as String, size as integer = 48) as Picture

MBS Linux Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries symbolic icon for given mime type.
**Example:**

Canvas3.Backdrop = LinuxIconMBS.SymbolicIcon("image/jpeg", Canvas3.Width)

**Notes:** Returns nil in case of error.

## 115.2 class LinuxProcessMBS

### 115.2.1 class LinuxProcessMBS

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for querying linux process details.
**Example:**

```
// show the path of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)

MsgBox myProcess.path
```

**Notes:** If your app has not enough permission to read info about other app, values may be missing.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Thoughts on the 14.1 plugin release
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- MBS Xojo / Real Studio Plugins, version 14.1pr3

**Xojo Developer Magazine**

- 12.3, page 10: News

### 115.2.2 Methods

### 115.2.3 Constructor

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 115.2.4 PID as Integer

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The Process ID of the current process (your app).
**Example:**

```
dim myPID as Integer = LinuxProcessMBS.PID
MsgBox "my process ID is: "+str(myPID)
```

### 115.2.5 ProcessByPID(ProcessID as Integer) as LinuxProcessMBS

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries the information for a process with given ID.
**Example:**

```
// show the name of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)

MsgBox myProcess.name
```

**Notes:** Returns nil on error.

### 115.2.6 Processes as LinuxProcessMBS()

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns array with all processes.
**Example:**

```
// shows all process names in listbox
dim Processes() as LinuxProcessMBS = LinuxProcessMBS.Processes

for each p as LinuxProcessMBS in Processes
listbox1.addrow p.name
next
```

### 115.2.7 Properties

### 115.2.8 CommandLine as String

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The command line used to create this process.
**Example:**

```
// show the command line of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
MsgBox myProcess.CommandLine
```

**Notes:** (Read only property)

### 115.2.9 CurrentWorkingDirectory as String

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The current working directory.
**Example:**

```
// show the current working directory of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)

MsgBox myProcess.CurrentWorkingDirectory
```

**Notes:** (Read only property)

### 115.2.10 Environment as Dictionary

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The environment variables.
**Notes:** (Read only property)

### 115.2.11 Name as String

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The name of the process.
**Example:**

```
// shows all process names in listbox
dim Processes() as LinuxProcessMBS = LinuxProcessMBS.Processes

for each p as LinuxProcessMBS in Processes
listbox1.addrow p.name
```

next

**Notes:** (Read only property)

### 115.2.12 NumberOfThreads as Integer

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The number of threads used by this process.
**Notes:** (Read only property)

### 115.2.13 OpenFiles as Dictionary

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries details about open files.
**Example:**

```
// show the paths of open files of current process in listbox
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
dim OpenFiles as Dictionary = myProcess.OpenFiles

for each key as Variant in OpenFiles.keys
listbox1.addrow OpenFiles.Value(key).StringValue
next
```

**Notes:** This dictionary contains the file descriptor number as key and the path to the file as text.
(Read only property)

### 115.2.14 ParentProcessID as Integer

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The parent process ID.
**Notes:** (Read only property)

### 115.2.15 Path as String

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The path for this process.
**Example:**

```
// show the path of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
MsgBox myProcess.Path
```

**Notes:** (Read only property)

### 115.2.16 ProcessID as Integer

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The process ID.
**Notes:** (Read only property)

### 115.2.17 StartTime as Date

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The start time of the process.
**Example:**

```
// show the start time of current process
dim myPID as Integer = LinuxProcessMBS.PID
dim myProcess as LinuxProcessMBS = LinuxProcessMBS.ProcessByPID(myPID)
dim d as date = myProcess.StartTime
MsgBox d.LongDate+" "+d.LongTime
```

**Notes:** (Read only property)

### 115.2.18 State as String

MBS Linux Plugin, Plugin Version: 14.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The state of the process.

**Notes:** Can be Running, Sleeping, Disk Sleep, Zombie, Trace or Writing pages.
(Read only property)

## 115.3 class LinuxSuMBS

### 115.3.1 class LinuxSuMBS

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to run stuff with sudo.
**Example:**

```
dim s as new LinuxSuMBS

s.Command = "/usr/bin/whoami"
s.User = "root"
s.Alert = "Please Root?"
s.Message "Can I install something for you?"

if s.ExecuteSudo then
MsgBox "OK"
else
MsgBox s.LastErrorMessage
end if
```

**Notes:** Uses the gksu library.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- MBS Xojo / Real Studio Plugins, version 16.1pr1
- Sudo on Linux

### 115.3.2 Methods

### 115.3.3 AskPassword(prompt as String) as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Asks for the password.
**Notes:** Returns password.
Stores error in LastError and LastErrorMessage properties.
See also:

- 115.3.24 AskPassword(prompt as String, byref ErrorCode as Integer, byref ErrorMessage as String) as string

### 115.3.4 Available as boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the gksu library was found and loaded.
**Notes:** Should return true on linux.
If missing, install the libgksu2-0 library.

### 115.3.5 ExecuteRun as boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Runs the command.
**Notes:** Returns true on success.
Stores error in LastError and LastErrorMessage properties.

### 115.3.6 ExecuteSu as boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Runs the command with su.
**Notes:** Returns true on success.
Stores error in LastError and LastErrorMessage properties.

### 115.3.7 ExecuteSudo as boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Runs the command with sudo.
**Example:**

```
dim s as new LinuxSuMBS

s.Command = "/usr/bin/whoami"
s.User = "root"
s.Alert = "Please Root?"
s.Message "Can I install something for you?"

if s.ExecuteSudo then
MsgBox "OK"
else
MsgBox s.LastErrorMessage
end if
```

**Notes:** Returns true on success.
Stores error in LastError and LastErrorMessage properties.

### 115.3.8 Properties

### 115.3.9 Alert as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The alert message.
**Notes:** (Read and Write property)

### 115.3.10 AlwaysAskPassword as Boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether to always ask for a password.
**Notes:** (Read and Write property)

### 115.3.11 Command as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The command will run with the target user.
**Notes:** (Read and Write property)

### 115.3.12 Debug as Boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether debuging information should be printed.
**Notes:** (Read and Write property)

### 115.3.13 Description as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The description text.
**Notes:** (Read and Write property)

### 115.3.14 ExitCode as Integer

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The exit code of the last command run.
**Notes:** (Read and Write property)

### 115.3.15 Grab as Boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Grab?
**Notes:** (Read and Write property)

### 115.3.16 Handle as Integer

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 115.3.17 KeepEnvironment as Boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Should the environment be kept as it is?
**Notes:** Defaults to true. Notice that setting this to false may cause the X authorization stuff to fail.
(Read and Write property)

### 115.3.18 LastError as Integer

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 115.3.19 LastErrorMessage as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last error message.
**Notes:** (Read and Write property)

### 115.3.20 LoginShell as Boolean

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The shell in which the command will be run be a login shell?
**Notes:** Finds out if the shell created by the underlying su process will be a login shell.
(Read and Write property)

### 115.3.21 Message as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The message text.
**Notes:** (Read and Write property)

### 115.3.22 User as String

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** What user the command will be run as.
**Notes:** The default is root, but you can run the command as any user.
(Read and Write property)

### 115.3.23 Events

### 115.3.24 AskPassword(prompt as String, byref ErrorCode as Integer, byref ErrorMessage as String) as string

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: .

**Function:** The event to ask for password.
**Notes:** If you prefer your own dialog.
Return password or set error parameters.
See also:

• 115.3.3 AskPassword(prompt as String) as String 17016

### 115.3.25 PasswordNoNeeded

MBS Linux Plugin, Plugin Version: 16.1, Platform: Linux, Targets: .

**Function:** No password is needed.

### 115.3.26 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| ErrorCanceled | 11 | The user cancelled. |
| ErrorChildFailed | 9 | Child failed. |
| ErrorExec | 5 | Execution failed. |
| ErrorFork | 4 | Forking failed. |
| ErrorHelper | 1 | The helper tool failed. |
| ErrorNoCommand | 2 | Missing command. |
| ErrorNoPassword | 3 | Missing password. |
| ErrorNotAllowed | 10 | Not allowed. |
| ErrorPipe | 6 | Pipe failed. |
| ErrorPiperead | 7 | Pipe read error. |
| ErrorWrongAutoPass | 12 | Wrong auto Password. |
| ErrorWrongPass | 8 | Wrong Password |
| ErrorXauth | 0 | XAuth failed. |

# Chapter 116

# LMFit

## 116.1 class LMFitControlMBS

### 116.1.1 class LMFitControlMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Collection of input parameters for fit control.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1

### 116.1.2 Methods

### 116.1.3 MsgFileStderr

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set msgfile to stderr.

### 116.1.4 MsgFileStdout

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set msgfile to stdout.

### 116.1.5 Properties

### 116.1.6 epsilon as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Step used to calculate the Jacobian, should be slightly larger than the relative error in the user-supplied functions.
**Notes:** (Read and Write property)

### 116.1.7 ftol as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Relative error desired in the sum of squares.
**Notes:** Termination occurs when both the actual and predicted relative reductions in the sum of squares are at most ftol.
(Read and Write property)

### 116.1.8 gtol as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Orthogonality desired between fvec and its derivs.
**Notes:** Termination occurs when the cosine of the angle between fvec and any column of the Jacobian is at most gtol in absolute value.
(Read and Write property)

### 116.1.9 msgfile as FolderItem

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Progress messages will be written to this file.
**Notes:** (Read and Write property)

### 116.1.10 m_maxpri as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** -1, or max number of residuals to print.
**Notes:** (Read and Write property)

### 116.1.11 n_maxpri as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** -1, or max number of parameters to print.
**Notes:** (Read and Write property)

### 116.1.12 patience as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used to set the maximum number of function evaluations to patience*(number_of_parameters+1).
**Notes:** (Read and Write property)

### 116.1.13 scale_diag as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If 1, the variables will be rescaled internally.
**Notes:** Recommended value is 1.
(Read and Write property)

### 116.1.14 stepbound as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used in determining the initial step bound.
**Notes:** This bound is set to the product of stepbound and the Euclidean norm of diag*x if nonzero, or else to stepbound itself. In most cases stepbound should lie in the interval (0.1,100.0). Generally, the value 100.0 is recommended.
(Read and Write property)

### 116.1.15 verbosity as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The verbosity flags.
**Notes:** OR'ed: 1: print some messages; 2: print Jacobian.

(Read and Write property)

### 116.1.16 xtol as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Relative error between last two approximations.
**Notes:** Termination occurs when the relative error between two consecutive iterates is at most xtol.
(Read and Write property)

## 116.2 class LMFitMBS

### 116.2.1 class LMFitMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to run Levenberg-Marquardt least squares fitting algorithm.
**Notes:** Based on lmfit library from Joachim Wuttke, Forschungszentrum Juelich GmbH (2004-2013).
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 19.6pr1

**Videos**

- XDC 2020 MBS Plugins Presentation

### 116.2.2 Methods

### 116.2.3 LMCurve(NPar as Integer, Par as Ptr, mDat as Integer, t as Ptr, y as Ptr, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs curve algorithm.
**Notes:** NPar is the number of variables (INPUT, positive integer).
Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.
mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill m>=n.

Calls evaluateCurve event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h
status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h
See also:

- 116.2.4 LMCurve(NPar as Integer, Par() as double, mDat as Integer, t() as double, y() as double, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 17028

### 116.2.4 LMCurve(NPar as Integer, Par() as double, mDat as Integer, t() as double, y() as double, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs curve algorithm.
**Notes:** NPar is the number of variables (INPUT, positive integer).
Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.
mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill m>=n.

Calls evaluateCurve event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h
status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h
See also:

- 116.2.3 LMCurve(NPar as Integer, Par as Ptr, mDat as Integer, t as Ptr, y as Ptr, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 17027

### 116.2.5 LMMin(NPar as Integer, Par as Ptr, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs Levenberg-Marquardt minimization.
**Notes:** This routine contains the core algorithm of our library.

It minimizes the sum of the squares of m nonlinear functions in n variables by a modified Levenberg-Marquardt algorithm. The function evaluation is done by the user-provided routine 'evaluate'. The Jacobian is then calculated by a forward-difference approximation.

Parameters:

NPar is the number of variables (INPUT, positive integer).
Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution. This should be memoryblock with double values.
mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill m>=n.

Calls evaluateMin event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h
status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h
See also:

- 116.2.6 LMMin(NPar as Integer, Par() as double, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 17029

### 116.2.6 LMMin(NPar as Integer, Par() as double, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs Levenberg-Marquardt minimization.
**Notes:** This routine contains the core algorithm of our library.

It minimizes the sum of the squares of m nonlinear functions in n variables by a modified Levenberg-Marquardt algorithm. The function evaluation is done by the user-provided routine 'evaluate'. The Jacobian is then calculated by a forward-difference approximation.

Parameters:

NPar is the number of variables (INPUT, positive integer).
Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.
mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill m>=n.

Calls evaluateMin event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h
status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h
See also:

- 116.2.5 LMMin(NPar as Integer, Par as Ptr, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 17028

### 116.2.7 Properties

### 116.2.8 provideArrays as Boolean

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to fill parameter array for evaluateMin event.
**Notes:** If provideArrays property is true, we provide values via parameters array, which may be slower than

using par pointer.
(Read and Write property)

### 116.2.9 Events

### 116.2.10 evaluateCurve(t as double, par as Ptr, nPar as Integer, parameters() as double, tag as variant) as double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Evaluate is a event that calculates the m functions.
**Notes:** The parameter par, nPar, parameters and mDat are passed through from the call to LMCurve.

fvec is an array of length m; on OUTPUT, it must contain the m function values for the parameter vector x.

If you return a nonzero value, lmmin will terminate.
Return zero to continue.

If provideArrays property is true, we provide values via parameters array, which may be slower than using par pointer.

### 116.2.11 evaluateMin(par as Ptr, nPar as Integer, parameters() as double, mDat as Integer, fvec as Ptr, tag as variant) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Evaluate is a event that calculates the m functions.
**Notes:** The parameter par, nPar, parameters and mDat are passed through from the call to LMMin.

fvec is an array of length m; on OUTPUT, it must contain the m function values for the parameter vector x.

If you return a nonzero value, lmmin will terminate.
Return zero to continue.

If provideArrays property is true, we provide values via parameters array, which may be slower than using par pointer.

## 116.3 class LMFitStatusMBS

### 116.3.1 class LMFitStatusMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Collection of output parameters for status info.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1

### 116.3.2 Properties

### 116.3.3 fnorm as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Norm of the residue vector fvec.
**Notes:** (Read and Write property)

### 116.3.4 nfev as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Actual number of iterations.
**Notes:** (Read and Write property)

### 116.3.5 outcome as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Status indicator.
**Notes:** Nonnegative values are used as index for the message text.
(Read and Write property)

### 116.3.6 outcomeInfoMessage as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The info message text.
**Notes:** The plugin looks up text based on outcome value.

(Read only property)

### 116.3.7 outcomeShortMessage as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The short message text.
**Notes:** The plugin looks up text based on outcome value.
(Read only property)

### 116.3.8 userbreak as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set when function evaluation requests termination.
**Notes:** (Read and Write property)

# Chapter 117

# Login Items

## 117.1 class LoginItemsMBS

### 117.1.1 class LoginItemsMBS

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use LSSharedFileListMBS instead. **Function:** A class to handle login items on Mac OS X.
**Notes:** After creating a new object, the constructor may fail sometimes while updateing the list. lasterror is -609 in that case. His happens most likely just after login when the system events process is not yet ready. In that case, let your app wait a few seconds and try again.

For newer Mac OS X versions, please use LSSharedFileListMBS class instead.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- Adding Login Items on Mac OS X

### 117.1.2 Methods

### 117.1.3 AddFile(file as FolderItem, hidden as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds a file to the login items.
**Notes:** Returns true on success.

For newer Mac OS X versions, please use LSSharedFileListMBS class instead.

### 117.1.4 AddURL(url as string, hidden as boolean=false) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Adds an url to the item list.
**Notes:** Returns true on success.

For newer Mac OS X versions, please use LSSharedFileListMBS class instead.

### 117.1.5 DisplayName(index as Integer) as String

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The display name of the item with the given index.
**Example:**

```
dim l as LoginItemsMBS

l=new LoginItemsMBS
MsgBox l.displayName(0) // shows name of first item
```

**Notes:** The display name may be localized.

### 117.1.6 File(index as Integer) as FolderItem

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The file reference of the item with the given index.
**Notes:** Index is from 0 to count-1.

### 117.1.7 IsHidden(index as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the item with the given index should be hidden after launch.
**Notes:** Index is from 0 to count-1.

This value does not work in Mac OS X 10.4, but works in 10.5.

### 117.1.8 Name(index as Integer) as String

MBS MacOSX Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** The name of the item with the given index.
**Example:**

```
dim l as LoginItemsMBS

l=new LoginItemsMBS
MsgBox l.Name(0) // shows name of first item
```

**Notes:** This is the file name. To get the name for display, use displayname.

### 117.1.9 OldAddLoginItem(file as folderitem,hide as boolean,allusers as boolean) as boolean

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Adds a file to the loginitems list.
**Example:**

```
dim f as folderItem
dim r as new LoginItemsMBS

f=app.applicationFileMBS
if r.OldAddLoginItem(f,false,false) then
msgBox f.displayName+" has been added to the login items!"
else
msgBox "Something went wrong."
end if
```

**Notes:** This is the old method which edits the preferences file directly.
Do not use it unless you really need to. The new functions in this class handle login items using a system service and will be safer for future releases of Mac OS X.

hide matches the checkbox in the loginitems list.
allusers decides whether to set it for all user or the current one.

This function will add a LoginItem to the list of LoginItems when called. The properties given to the new LoginItem are passed when calling the function. Note that *no* check is made when adding the LoginItem to ensure that the path points to a valid application. Note that the LoginItem Is always added to the *end* of the list of LoginItems.

First Parameter (appfile):
The absolute path of the application to be launched expressed as a Xojo folderitem.

Second Parameter (hide):
A value representing if you want your application to be hidden at login time. True if you want the application to be hidden after it is launched. If you want the application to show up normally use be hidden use false.

Third Parameter (allusers):
A constant which represents which users preferences we want to change. In this case there are two alternatives: False which changes the preferences of the current user. The second alternative is True.
The kAllUsers LoginItems are launched for all users on the system. You must be root or admin to use the kAllUsers option.

Function Returns:
This function returns a boolean value representing if the function was successful.
The function returns true if the LoginItem was successfully added. False if otherwise. No additional error codes are returned.

Other Notes:
This code doesn't work properly if more than one application is attempting to write to the LoginItems preference at once.
Also no check is made to ensure that what you are adding to the LoginItem list isn't a duplicate. If there is a duplicate however only one instance of the application is launched.

### 117.1.10 OldCountOfLoginItems(allusers as boolean) as Integer

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** This function will return the number of LoginItems for the user requested.
**Example:**

```
// Add this code for syncronization:

dim cf as CFPreferencesMBS
dim b as Boolean

cf=new CFPreferencesMBS
b=cf.AppSynchronize(cf.kCFPreferencesCurrentApplication)
```

```
// Count items

dim r as new LoginItemsMBS
msgbox str(r.OldCountOfLoginItems(false))
```

**Notes:** This is the old method which edits the preferences file directly.
Do not use it unless you really need to. The new functions in this class handle login items using a system service and will be safer for future releases of Mac OS X.

This function returns the number of LoginItems for the user requested as a signed integer.

### 117.1.11 OldLoginItemPropertyAtIndex(what as Integer, index as Integer, allusers as boolean) as string

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a property from the loginitems list.
**Example:**

```
dim i as Integer
dim c as Integer
dim l as Integer
dim path,name,hide as string
dim r as new LoginItemsMBS

c=r.OldCountOfLoginItems(false)

MsgBox str(c)+" Login items found for this user."

c=c-1
for i=0 to c
name=r.OldLoginItemPropertyAtIndex(2,i,false)
hide=r.OldLoginItemPropertyAtIndex(3,i,false)
path=r.OldLoginItemPropertyAtIndex(1,i,false)

list.addrow name
l=list.lastIndex
list.cell(l,1)=hide
list.cell(l,2)=path
list.cell(l,3)=str(i)
next
```

**Notes:** This is the old method which edits the preferences file directly.

Do not use it unless you really need to. The new functions in this class handle login items using a system service and will be safer for future releases of Mac OS X.

Index is from 0 to count-1.
What can be 1 for the absolute path of the LoginItem, 2 for the LoginItem name or 3 for a string with "false" or "true" for the hiding option.

Returns "" on any error.

### 117.1.12 OldRemoveLoginItem(file as folderitem,allusers as boolean) as boolean

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes a file to the loginitems list.
**Example:**

```
dim f as folderItem
dim r as new LoginItemsMBS

f=app.applicationFileMBS
if r.OldRemoveLoginItem(f,false) then
msgBox f.displayName+" has been added to the login items!"
else
msgBox "Something went wrong."
end if
```

**Notes:** This is the old method which edits the preferences file directly.
Do not use it unless you really need to. The new functions in this class handle login items using a system service and will be safer for future releases of Mac OS X.

The items are compared by path.
Returns true if item was found and the new list is written correctly to disk.
allusers decides whether to set it for all user or the current one.

### 117.1.13 OldRemoveLoginItemAtIndex(index as Integer, allusers as boolean) as boolean

MBS MacOSX Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes an entry from the loginitem list.
**Notes:** This is the old method which edits the preferences file directly.

Do not use it unless you really need to. The new functions in this class handle login items using a system service and will be safer for future releases of Mac OS X.

Index is from 0 to count-1.

### 117.1.14 Remove(index as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item from the login items list.
**Notes:** Index is from 0 to count-1.
The count property is updated.

### 117.1.15 RemoveFile(file as FolderItem) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the items matching this file reference from the list.
**Notes:** Returns true on success.
Count is updated.

### 117.1.16 RemoveURL(url as string) as boolean

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the item matching the given URL.
**Notes:** Returns true on success.

### 117.1.17 Update

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the list of items.
**Notes:** Update is done after each modification method and in the constructor.
You should never need to call this method.

### 117.1.18 URL(index as Integer) as String

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The URL of the item with the given index.
**Notes:** Index is from 0 to count-1.

### 117.1.19 Properties

### 117.1.20 Count as Integer

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Number of items in the list currently.
**Notes:** (Read and Write property)

### 117.1.21 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The handle to the NSArray Reference used internally for the item list.
**Notes:** (Read and Write property)

### 117.1.22 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The last error code.
**Notes:** Value can be 0 for success or -1 for a parameter error in the plugins or some other Mac OS X error code.
(Read and Write property)

## 117.2 class LSSharedFileListItemMBS

### 117.2.1 class LSSharedFileListItemMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a list item.
**Notes:** Requires Mac OS X 10.5.

### 117.2.2 Methods

### 117.2.3 DisplayName as string

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtain item's display name.
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kRecentDocumentItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.DisplayName
next

MsgBox Join(lines, EndOfLine)
end if
```

### 117.2.4 Icon as Variant

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtain item's icon.
**Notes:** Returns an IconMBS object.

### 117.2.5 ID as UInt32

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Obtain unique item id.
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kSessionLoginItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.DisplayName+": "+str(x.ID)
next

MsgBox Join(lines, EndOfLine)
end if
```

### 117.2.6 Resolve(flags as UInt32) as folderitem

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resolve item and return its folderitem.
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kRecentDocumentItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.Resolve(0).NativePath
next

MsgBox Join(lines, EndOfLine)
end if
```

**Notes:** Pass values like 0, kNoUserInteraction, kDoNotMountVolumes or kDoNotMountVolumes+kNoUser-

Interaction.

### 117.2.7 ResolveURL(flags as UInt32) as string

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resolve item and return its URL.
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kRecentDocumentItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.ResolveURL(x.kNoUserInteraction)
next

MsgBox Join(lines, EndOfLine)
end if
```

**Notes:** Pass values like 0, kNoUserInteraction, kDoNotMountVolumes or kDoNotMountVolumes+kNoUser-Interaction.

### 117.2.8 Properties

### 117.2.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the item.
**Notes:** (Read and Write property)

### 117.2.10 Lasterror as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.

**Notes:** (Read and Write property)

### 117.2.11 ItemHidden as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Is item hidden in UI?
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kSessionLoginItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.DisplayName+": "+str(x.ItemHidden)
next

MsgBox Join(lines, EndOfLine)
end if
```

**Notes:** (Read and Write computed property)

### 117.2.12 LoginItemHidden as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Should UI hide login item's window?
**Example:**

```
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kSessionLoginItems)

if l.Handle=0 then
MsgBox "Failed to get list."
else
dim a(-1) as LSSharedFileListItemMBS = l.Snapshot
dim lines(-1) as string

for each x as LSSharedFileListItemMBS in a
lines.append x.DisplayName+": "+str(x.LoginItemHidden)
next
```

```
MsgBox Join(lines, EndOfLine)
end if
```

**Notes:** Requires Mac OS X 10.6.
(Read and Write computed property)

### 117.2.13 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDoNotMountVolumes | 2 | One of the flags for resolve.<br>do not mount volumes during resolution |
| kNoUserInteraction | 1 | One of the flags for resolve.<br>no user interaction during resolution |

## 117.3 class LSSharedFileListMBS

### 117.3.1 class LSSharedFileListMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The shared list class.
**Notes:** The shared file list API is for sharing and storing list of references to file system objects. The shared file list is a persistent list of objects, where each item has assigned display name, icon, and url as well as other optional properties.
Each list can also have various properties attached.

Requires Mac OS X 10.5.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Real Studio Plugins, version 12.4pr8
- Adding Login Items on Mac OS X

### 117.3.2 Methods

### 117.3.3 Constructor(type as Integer)

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates shared file list reference to be used for changing list and reading its various properties.
**Notes:** type: A constant indicating list type to create. See the constants in this class.

### 117.3.4 GetSeedValue as UInt32

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns seed value of the shared list.

### 117.3.5 InsertFile(AfterItem as LSSharedFileListItemMBS, DisplayName as string, Icon as object, file as folderitem) as LSSharedFileListItemMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Insert item into shared list.
**Example:**

```
// Add iPhoto to launch items

// pick app
dim app as FolderItem = SpecialFolder.Applications.Child("iPhoto.app")

// get list object
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kSessionLoginItems)

// insert file
dim item as LSSharedFileListItemMBS = l.InsertFile(l.kLSSharedFileListItemBeforeFirst, "Launch iPhoto",
nil, app)

// check error
if l.Lasterror = 0 then
MsgBox "OK"
else
MsgBox "Failed: "+str(l.Lasterror)
end if
```

**Notes:** Inserts item into shared list at specified location. If the item already exists in the list it will be moved and its icon, display name and properties will be updated.

AfterItem: Item after which new item has to be inserted. To insert at the beginning of the list use kLSSharedFileListItemBeforeFirst or to insert at the end of the list use kLSSharedFileListItemLast.

DisplayName: Display name of the new item. Can be NULL.
Icon: IconMBS of the new item. Can be nil.
File: FolderItem of the new item.

### 117.3.6 InsertURL(AfterItem as LSSharedFileListItemMBS, DisplayName as string, Icon as object, URL as string) as LSSharedFileListItemMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Insert item into shared list.
**Notes:** Inserts item into shared list at specified location. If the item already exists in the list it will be moved and its icon, display name and properties will be updated.

AfterItem: Item after which new item has to be inserted. To insert at the beginning of the list use kLSSharedFileListItemBeforeFirst or to insert at the end of the list use kLSSharedFileListItemLast.

DisplayName: Display name of the new item. Can be "".

Icon: IconMBS object for the icon. Can be nil.
URL: URL of the new item.

### 117.3.7 kLSSharedFileListItemBeforeFirst as LSSharedFileListItemMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A virtual item reference for inserting new item at beginning of the list.
**Example:**

```
dim n as LSSharedFileListItemMBS = LSSharedFileListMBS.kLSSharedFileListItemBeforeFirst
MsgBox str(n.Handle) // a special handle value for this virtual item: 1
```

### 117.3.8 kLSSharedFileListItemLast as LSSharedFileListItemMBS

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A virtual item reference for inserting new item at end of the list.
**Example:**

```
dim n as LSSharedFileListItemMBS = LSSharedFileListMBS.kLSSharedFileListItemLast
MsgBox str(n.Handle) // a special handle value for this virtual item: 2
```

### 117.3.9 Move(item as LSSharedFileListItemMBS, MoveAfterItem as LSSharedFileListItemMBS)

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves item at specified location.
**Notes:** item: Item to move.
MoveAfterItem: New icon of the new item. Use kLSSharedFileListItemBeforeFirst and kLSSharedFileListItemLast to move at the beginning or the end of the shared list.

### 117.3.10 Remove(item as LSSharedFileListItemMBS)

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Remove item from shared list.
**Example:**

```
// Remove iPhoto from launch items

// get list object
dim l as new LSSharedFileListMBS(LSSharedFileListMBS.kSessionLoginItems)

// get items
dim items(-1) as LSSharedFileListItemMBS = l.Snapshot

// check all items
for each item as LSSharedFileListItemMBS in items
dim file as FolderItem = item.Resolve(LSSharedFileListItemMBS.kNoUserInteraction)

if file<>nil then
if file.Name = "iPhoto.app" then
l.Remove item

if l.Lasterror = 0 then
MsgBox "OK"
else
MsgBox "Error: "+str(l.Lasterror)
end if
Return
end if
end if

next
```

### 117.3.11 RemoveAllItems

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Remove all items from shared list.

### 117.3.12 SetAuthorization(handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Set authorization reference for the shared list.
**Notes:** Before attempting to perform a privileged operation on the shared list caller must authorize appropriate rights. For example, modifying kGlobalLoginItems list requires "system.global-login-items." right authorized.

### 117.3.13 Snapshot as LSSharedFileListItemMBS()

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates snapshot array, which is list of all items at the moment this method was called.
See also:

- 117.3.14 Snapshot(byref seed as UInt32) as LSSharedFileListItemMBS() 17050

### 117.3.14 Snapshot(byref seed as UInt32) as LSSharedFileListItemMBS()

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates snapshot array, which is list of all items at the moment this method was called.
**Notes:** seed: Returned seed value at which snapshot was taken.
See also:

- 117.3.13 Snapshot as LSSharedFileListItemMBS() 17050

### 117.3.15 Properties

### 117.3.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the list.
**Notes:** (Read and Write property)

### 117.3.17 Lasterror as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 117.3.18 RecentItemsMaxAmount as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Maximum amount of items in the list.
**Notes:** (Read and Write computed property)

### 117.3.19 VolumesComputerVisible as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Is Computer item visible in favorite volumes list?
**Notes:** (Read and Write computed property)

### 117.3.20 VolumesIDiskVisible as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Is iDisk item visible in favorite volumes list.
**Notes:** (Read and Write computed property)

### 117.3.21 VolumesNetworkVisible as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Is Network item visible in favorite volumes list?
**Notes:** (Read and Write computed property)

### 117.3.22 Events

### 117.3.23 Changed

MBS MacFrameworks Plugin, Plugin Version: 9.8, Platform: macOS, Targets: .

**Function:** The event called whenever the list is changed by an application.

### 117.3.24 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFavoriteItems | 2 | One of the list type constants. |
| kFavoriteVolumes | 1 | One of the list type constants. |
| kGlobalLoginItems | 7 | One of the list type constants. |
| kRecentApplicationItems | 3 | One of the list type constants. |
| kRecentDocumentItems | 4 | One of the list type constants. |
| kRecentServerItems | 5 | One of the list type constants. |
| kSessionLoginItems | 6 | One of the list type constants. |

## 117.4 module ServiceManagementModuleMBS

### 117.4.1 module ServiceManagementModuleMBS

MBS MacCF Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The module with function to add helper to login items.
**Notes:** This API seems to be sandbox safe and working with Mac App Store.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr6
- MBS Real Studio Plugins, version 12.3pr9
- Adding Login Items on Mac OS X

### 117.4.2 Methods

### 117.4.3 AllJobDictionaries(domain as string) as Dictionary()

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the job description dictionaries for all jobs in the given domain.
**Notes:** domain: The desired domain (e.g. kSMDomainSystemLaunchd).

Returns a new array containing all job dictionaries, or empty array if an error occurred. Must be released by the caller.
Available in OS X v10.6 and later.

### 117.4.4 CreateAuthorization as AuthorizationMBS

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates an authorization for Job operations.
**Notes:** Creates an authorization with kSMRightBlessPrivilegedHelper and flags InteractionAllowed, PreAuthorize and ExtendRights.

### 117.4.5 JobBless(domain as string, executableLabel as string, auth as AuthorizationMBS, byref error as Variant) as boolean

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Submits the executable for the given label as a launchd job.
**Notes:** domain: The job's domain. Only kSMDomainSystemLaunchd is supported.
executableLabel: The label of the privileged executable to install. This label must be one of the keys found in the SMPrivilegedExecutables dictionary in the application's Info.plist.
auth: An authorization reference containing the kSMRightBlessPrivilegedHelper right.
Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the executable tool, or nil if successful. It is the responsibility of the application to release the error reference.

Returns true if the job was successfully submitted, otherwise false.

JobBless submits the executable for the given label as a launchd job. This function obviates the need for a setuid helper invoked via AuthorizationExecuteWithPrivileges in order to install a launchd plist.

If the job is already installed, success is returned.

In order to use this function the following requirements must be met:

- The calling application and target executable tool must both be signed.
- The calling application's Info.plist must include a "SMPrivilegedExecutables" dictionary of strings. Each string is a textual representation of a code signing requirement used to determine whether the application owns the privileged tool once installed (i.e. in order for subsequent versions to update the installed version).

Each key of SMPrivilegedExecutables is a reverse-DNS label for the helper tool (must be globally unique).

- The helper tool must have an embedded Info.plist containing an "SMAuthorizedClients" array of strings. Each string is a textual representation of a code signing requirement describing a client which is allowed to add and remove the tool.
- The helper tool must have an embedded launchd plist. The only required key in this plist is the Label key. When the launchd plist is extracted and written to disk, the key for ProgramArguments will be set to an array of 1 element pointing to a standard location. You cannot specify your own program arguments, so do not rely on custom command line arguments being passed to your tool. Pass any parameters via IPC.
- The helper tool must reside in the Contents/Library/LaunchServices directory inside the application bundle, and its name must be its launchd job label. So if your launchd job label is "com.apple.Mail.helper", this must be the name of the tool in your application bundle.

Available in OS X v10.6 and later.

### 117.4.6 JobDictionary(domain as string, jobLabel as string) as Dictionary

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the job description dictionary for the given job label.
**Notes:** domain: The job's domain (e.g. kSMDomainSystemLaunchd).
jobLabel: The label identifier for the job to copy.

Return a new dictionary describing the job, or nil if the job could not be found.
Available in OS X v10.6 and later.

### 117.4.7 JobRemove(domain as string, jobLabel as string, auth as AuthorizationMBS, wait as boolean, byref error as CFErrorMBS) as boolean

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the job with the given label from the specified domain.
**Notes:** domain: The job's domain (e.g. kSMDomainSystemLaunchd).
jobLabel: The label for the job to remove.
auth: An AuthorizationRef containing the kSMRightModifySystemDaemons right if the given domain is kSMDomainSystemLaunchd.
wait: Pass true to block until the process for the given job has exited.
Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the job dictionary, or nil if no error occurred. It is the responsibility of the application to release the error reference.

Returns true if the job was removed successfully, otherwise false.

JobSubmit removes the job specified by label from the domain. If the job is currently running, it will conditionally block until the running process has exited.
Available in OS X v10.6 and later.

### 117.4.8 JobSubmit(domain as string, job as Dictionary, auth as AuthorizationMBS, byref error as CFErrorMBS) as boolean

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Submits the given job to the specified domain.
**Notes:** domain: The job's domain (e.g. kSMDomainSystemLaunchd).
job: A dictionary describing a job.
auth: An AuthorizationRef containing the kSMRightModifySystemDaemons right if the given domain is kSMDomainSystemLaunchd.
Error: An output reference to a CFErrorMBS describing the specific error encountered while submitting the

job dictionary, or NULL if no error occurred. It is the responsibility of the application to release the error reference.

Returns true if the job was submitted successfully, otherwise false.

JobSubmit submits the given job to the specified domain.
Available in OS X v10.6 and later.

### 117.4.9 kSMDomainSystemLaunchd as string

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** System-level launchd domain.

### 117.4.10 kSMDomainUserLaunchd as string

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** User-level launchd domain.

### 117.4.11 kSMInfoKeyAuthorizedClients as string

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Authorized clients property list key.

### 117.4.12 kSMInfoKeyPrivilegedExecutables as string

MBS MacCF Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Privileged executables property list key.

### 117.4.13 LoginItemRunning(identifier as string) as boolean

MBS MacCF Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Checks whether a login item is running.
**Notes:** Actually checks if there is a record for your helper, so if it crashed, this returns still true.

### 117.4.14 LoginItemSetEnabled(identifier as string, enabled as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Enable a helper application located in the main application bundle's Contents/Library/LoginItems directory.
**Notes:** identifier: The bundle identifier of the helper application bundle.
enabled: The Boolean enabled state of the helper application. This value is effective only for the currently logged in user. If true, the helper application will be started immediately (and upon subsequent logins) and kept running. If false, the helper application will no longer be kept running.

Returns true if the requested change has taken effect.

### 117.4.15 RegisterHelperApp(name as string, Update as boolean = false) as boolean

MBS MacCF Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Registers a helper application in the Launch Services database.
**Notes:** The app must exist with given name inside the bundle in Library/LoginItems folder.

Update: A Boolean value specifying whether Launch Services should update existing information registered for the application, if any. If this parameter is false, the application will not be registered if it has already been registered previously and its current modification date has not changed from when it was last registered; if the parameter is true, the application's registered information will be updated even if its modification date has not changed.

Returns true on success and false on failure.

## 117.5 class SMAppServiceMBS

### 117.5.1 class SMAppServiceMBS

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** An object the framework uses to control helper executables that live inside an app,Äôs main bundle.
**Notes:** In macOS 13 and later, use SMAppService to register and control LoginItems, LaunchAgents, and LaunchDaemons as helper executables for your app. When converting code from earlier versions of macOS, use an SMAppService object and select one of the following methods depending on the type of service your helper executable provides:

- For SMAppServices initialized as LoginItems, the register and unregister APIs provide a replacement for SMLoginItemSetEnabled.
- For SMAppServices initialized as LaunchAgents, the register and unregister methods provide a replacement for installing property lists in
textasciitilde /Library/LaunchAgents or /Library/LaunchAgents.
- For SMAppServices initialized as LaunchDaemons, the register and unregister methods provide a replacement for installing property lists in /Library/LaunchDaemons.

Requires macOS 13.0.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0

### 117.5.2 Methods

### 117.5.3 agentService(plistName as String) as SMAppServiceMBS

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Initializes an app service object with a launch agent with the property list name you provide.
**Notes:** plistName: The name of the property list corresponding to the SMAppService.

The property list name must correspond to a property list in the calling app,Äôs Contents/Library/LaunchAgents directory.

### 117.5.4 Constructor

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** An app service object that corresponds to the main application as a login item.
Use this SMAppServiceMBS to configure the main app to launch at login.

### 117.5.5 daemonService(plistName as String) as SMAppServiceMBS

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Initializes an app service object with a launch daemon with the property list name you provide.
**Notes:** plistName: The name of the property list corresponding to the SMAppService.

Returns an SMService object

The property list name must correspond to a property list in the calling app,Äôs Contents/Library/LaunchDaemons directory

### 117.5.6 loginItemService(identifier as String) as SMAppServiceMBS

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Initializes an app service object for a login item corresponding to the bundle with the identifier you provide.
**Notes:** identifier: The bundle identifier of the helper application.

Returns an SMService object.

The property list name must correspond to a property list in the calling app,Äôs Contents/Library/LoginItems directory.

### 117.5.7 mainAppService as SMAppServiceMBS

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** An app service object that corresponds to the main application as a login item.
**Notes:** Use this SMAppServiceMBS to configure the main app to launch at login.

### 117.5.8 openSystemSettingsLoginItems

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Opens System Settings to the Login Items control panel.

### 117.5.9 register(byref error as NSErrorMBS) as Boolean

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Registers the service so it can begin launching subject to user approval.
**Notes:** The registration process applies to the following rules, depending upon the type of service:

- If the service corresponds to a LoginItem bundle, the helper starts immediately and on subsequent logins. If the helper crashes or exits with a non-zero status, the system relaunches it.
- If the service corresponds to the main application, the application launches on subsequent logins.
- If the service corresponds to a LaunchAgent, the LaunchAgent is immediately bootstrapped and may begin running. In addition LaunchAgents registered with this method bootstrap on each subsequent login.
- If an app needs to register a LaunchAgent for multiple users, you must call the API once per user while that user is running the app.
- If the service corresponds to a LaunchDaemon, the system won,Äôt bootstrap the LaunchDaemon until an admin approves the LaunchDaemon in System Preferences. The system bootstraps LaunchDaemons registered with this method and approved by an admin on each subsequent boot.

If the service is already registered, this method returns kSMErrorAlreadyRegistered.
If the service isn,Äôt approved by the user, this method returns kSMErrorLaunchDeniedByUser.

### 117.5.10 statusForLegacyFile(File as FolderItem) as Integer

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Check the authorization status of an earlier OS version login item.
**Notes:** File: The folderitem of the helper executable,Äôs property list.

Returns one of the SMAppServiceStatus constants that indicate the current authorization status.

### 117.5.11 statusForLegacyURL(URL as String) as Integer

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Check the authorization status of an earlier OS version login item.
**Notes:** url: The URL of the helper executable,Äôs property list.

Returns one of the SMAppServiceStatus constants that indicate the current authorization status.

### 117.5.12 unregister(byref error as NSErrorMBS) as Boolean

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Unregisters the service so the system no longer launches it.
**Notes:** error: Upon an unsuccessful return, a new NSError object describing the error. Upon successful return, this argument is nil. This argument may be NULL.

Returns true if the service was successfully unregistered; otherwise, false.

This is the opposite operation of register().
If the service corresponds to a LoginItem, LaunchAgent, or LaunchDaemon and the service is currently running it, the system terminates it. If the service corresponds to the main application, it continues running, but becomes unregistered to prevent future launches at login.
If the service is already unregistered, this method returns kSMErrorJobNotFound.
See also:

- 117.5.13 unregister(CompleteHandler as SMAppServiceUnregisterCompletedMBS, tag as variant = nil) 17060

### 117.5.13 unregister(CompleteHandler as SMAppServiceUnregisterCompletedMBS, tag as variant = nil)

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** Unregisters the service so the system no longer launches it and calls a completion handler you provide with the resulting error value.
**Notes:** CompleteHandler: A completion handler to call with the result of the unregistration operation. Upon an unsuccessful return, the handler contains a new NSErrorMBS object describing the error. Upon successful return, this argument is nil.
See also:

- 117.5.12 unregister(byref error as NSErrorMBS) as Boolean 17060

### 117.5.14 Properties

### 117.5.15 Handle as Integer

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 117.5.16 Status as Integer

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** A property that describes registration or authorization state of the service.
**Notes:** (Read only property)

### 117.5.17 Constants

Service Status

| Constant | Value | Description |
|---|---|---|
| SMAppServiceStatusEnabled | 1 | The service has been successfully registered and is eligible to run. |
| SMAppServiceStatusNotFound | 3 | An error occurred and the framework couldn,Äôt find this service. |
| SMAppServiceStatusNotRegistered | 0 | The service hasn,Äôt registered with the Service Management framewo the service attempted to reregister after it was already registered. |
| SMAppServiceStatusRequiresApproval | 2 | The service has been successfully registered, but the user needs to take in System Preferences.<br>The Service Management framework successfully registered this servic the user needs to take action in System Settings before the service is e to run. The framework also returns this status if the user revokes conse the service to run in System Settings. |

### 117.5.18 Delegates

### 117.5.19 SMAppServiceUnregisterCompletedMBS(Error as NSErrorMBS, Tag as Variant)

MBS MacCF Plugin, Plugin Version: 23.0, Platform: macOS, Targets: All.

**Function:** The delegate used with unregister method.
**Notes:** A handler to call with the result of the unregistration operation. Upon an unsuccessful return, the handler contains a new NSErrorMBS object describing the error. Upon successful return, this argument is nil.

# Chapter 118

# Mac

## 118.1 Globals

### 118.1.1 CurrentAppearanceThemeMBS as string

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns which theme is used on your computer.
**Example:**

msgbox "You are using this theme: "+CurrentAppearanceThemeMBS

**Notes:** Possible values:
com.apple.theme.appearance.platinum
com.apple.theme.appearance.aqua
com.apple.theme.appearance.aqua.blue
com.apple.theme.appearance.aqua.graphite
Returns "" on any error.
Available in CarbonLib 1.4 and later. Available in Mac OS X 10.1 and later.

On Windows or Linux an empty string is returned.

### 118.1.2 SetDesktopPictureMBS(file as folderitem) as Integer

MBS Picture Plugin, Plugin Version: 3.3, Platforms: macOS, Windows, Targets: All.

**Function:** Asks the Finder/Explorer to change the desktop picture.
**Notes:** File must be a valid folderitem for an existing file to define a new desktop picture.

Returns a Mac OS or Windows error code or -1 if the function is not available.

You can use file=nil to remove the desktop wallpaper on Windows.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2

## 118.2 class SummaryMBS

### 118.2.1 class SummaryMBS

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** A class using SearchKit on Mac OS X 10.4 and newer to summarize texts.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")

MsgBox s.SentenceSummaryString(1)
```

**Blog Entries**

- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 118.2.2 Methods

### 118.2.3 Constructor(text as string)

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Creates a summary object based on a text string.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")

MsgBox s.SentenceSummaryString(1)
```

**Notes:** text: The text string that you want to summarize.
On success the handle property is not zero.

The constructor creates a summarization object that pre-analyzes a text string to support fast summarization.
Available in Mac OS X v10.4 and later.

### 118.2.4 ParagraphAtIndex(index as Integer) as string

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets a specified paragraph from the text in a summarization object.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")
MsgBox s.ParagraphAtIndex(0)
```

**Notes:** index: The ordinal number of the paragraph in the original text, with the first paragraph designated by zero (this function uses zero-based indexing).

Return a string containing the specified paragraph, or "" on failure.

Available in Mac OS X v10.4 and later.

### 118.2.5 ParagraphIndexOfParagraphs as Integer()

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the array containing the ordinal number for each paragraph in the original text.

### 118.2.6 ParagraphIndexOfSentences as Integer()

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array of indexes to map a sentence index to it's paragraph index.

### 118.2.7 ParagraphSummaryString(numParagraphs as Integer) as string

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets a text string consisting of a summary with, at most, the requested number of paragraphs.
**Notes:** numParagraphs: The maximum number of paragraphs you want in the summary.

Returns a string containing the requested summary.
Available in Mac OS X v10.4 and later.

### 118.2.8 RankOrderOfParagraphs as Integer()

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array with the summarization relevance rank of each paragraph in the original text.

### 118.2.9 RankOrderOfSentences as Integer()

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array with the summarization relevance rank of each sentence in the original text.

### 118.2.10 SentenceAtIndex(index as Integer) as string

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets a specified sentence from the text in a summarization object.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")
MsgBox s.SentenceAtIndex(0)
```

**Notes:** index: The ordinal number of the sentence in the original text, with the first sentence designated by zero (this function uses zero-based indexing).
Returns a string containing the specified sentence, or NULL on failure.
Available in Mac OS X v10.4 and later.

### 118.2.11 SentenceIndexOfSentences as Integer()

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns an array of the ordinal number for each sentence in the original text.

### 118.2.12 SentenceSummaryString(numSentences as Integer) as string

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets a text string consisting of a summary with, at most, the requested number of sentences.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")

MsgBox s.SentenceSummaryString(1)
```

**Notes:** numSentences: The maximum number of sentences you want in the summary.
Returns a string containing the requested summary.
Available in Mac OS X v10.4 and later.

### 118.2.13 Properties

### 118.2.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The internal reference to the SKSummary object.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")
MsgBox str(s.handle)
```

**Notes:** (Read and Write property)

### 118.2.15 ParagraphCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets the number of paragraphs in a summarization object.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")
MsgBox str(s.ParagraphCount)
```

**Notes:** (Read only property)

### 118.2.16 SentenceCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Gets the number of sentences in a summarization object.
**Example:**

```
dim s as new SummaryMBS("Hello World. This is just a test.")
MsgBox str(s.SentenceCount)
```

**Notes:** (Read only property)

## 118.3 class TextInputSourceMBS

### 118.3.1 class TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The class for text input source on Mac OS X.
**Notes:** Text input sources fall into three general categories:

- Keyboard input sources, including keyboard layouts, keyboard input methods and input modes
- Palette input sources, including the character palette, keyboard viewer, and private dictionary panels
- Ink input sources

Palette input sources and ink input source are categorized as non-keyboard input sources. However, palette input sources might still involve some keyboard interaction. Keyboard input methods can be mode-enabled (for instance, Kotoeri). Hence, they are potentially the parent of several input modes directly selectable in the user interface (for instance, hiragana, katakana, and romaji). With mode-enabled input methods, the parent input method is not directly selectable. Non-mode-enabled input methods are directly selectable.

Some input sources are provided and installed with OS X. Other input sources can be installed as third party products themselves or as part of the installation of certain applications. International Preferences displays a list of all visible installed input sources. You can use International Preferences to enable or disable most input sources that are intended to be visible in the user interface. Setup Assistant also enables some input sources. A separate user interface provides a way to enable ink input sources.

You can use some of the functions in Text Input Source Services to enable or disable input sources programmatically in your application. One keyboard input source must be enabled. Only one ink input source may be enabled. Multiple instances of other input source types may be enabled.

Some enabled input sources are invisible but programmatically selectable, such as ink. Some are visible but not programmatically selectable, such as mode-savvy parent input methods (these must be visible so that International Preferences can display the parent input method for a group of input modes).

Input modes can only be changed from disabled to enabled if their parent input method is enabled. Input modes can only be selected if they and their parent input method are enabled.

Exactly one keyboard input source is selected at any time: the current keyboard input source. Selecting a new keyboard input source deselects the previous keyboard input source. Multiple palette input sources may be selected. For instance, there may be one or more character palettes and one or more keyboard viewers selected in addition to the selected keyboard input source. Selecting or deselecting a palette (or ink) input source does not affect any other input source. Input methods that provide associated input palettes may

programmatically deselect the palette when the input method is deselected, for example.

Text Input Source Source Services specifies modern, non-Script-Manager-based programming interfaces for operating on text input sources and performs the following functions:

- Finds information about text input sources
- Selects, enables, and disables text input sources
- Receives notifications about relevant changes in text input sources.

Available in OS X v10.5 and later.

see also
https://developer.apple.com/library/mac/#documentation/TextFonts/Reference/TextInputSourcesReference/Reference/reference.html
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

### 118.3.2 Methods

### 118.3.3 BundleID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The reverse DNS BundleID associated with the input source.
**Example:**

MsgBox TextInputSourceMBS.CurrentKeyboardInputSource.BundleID

### 118.3.4 Category as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The category of this input source.
**Example:**

MsgBox TextInputSourceMBS.CurrentKeyboardInputSource.Category

**Notes:** Can be kTISCategoryKeyboardInputSource, kTISCategoryPaletteInputSource, and kTISCategoryInkInputSource.

### 118.3.5 CreateASCIICapableInputSourceList as TextInputSourceMBS()

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates a list of ASCII-capable keyboard input sources.
**Notes:** This list represents a snapshot of ASCII-capable keyboard input sources enabled when the call was made. Successive calls to CreateASCIICapableInputSourceList may return different results because, for example, in between the calls the user may enable or disable an input source in the International Preferences pane. When a keyboard input source is enabled or disabled, by the user or programmatically, the distributed CF notification kTISNotifyEnabledKeyboardInputSourcesChanged is posted.

### 118.3.6 CreateInputSourceList(properties as dictionary, includeAllInstalled as boolean) as TextInputSourceMBS()

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Creates a list of input sources that match specified properties.
**Example:**

```
// show keyboard viewer
Dim d As New Dictionary
d.Value(TextInputSourceMBS.kTISPropertyInputSourceID) = "com.apple.KeyboardViewer"

Dim sources() As TextInputSourceMBS = TextInputSourceMBS.CreateInputSourceList(d, False)
If UBound(Sources) >= 0 Then
sources(0).SelectIt
End If
```

**Notes:** properties: A dictionary of property keys and corresponding values to filter the input source list. May be nil, in which case no filtering is performed.
includeAllInstalled: Typically, set to false so that only enabled input sources are included; set to true to include all installed input sources that match the filter .

Returns an array for a list of text input source references that match the specified properties.

This list represents a snapshot of input sources that matched the properties specified when you made the call. If you want to include input sources that are installed but not currently enabled, set the includeAllInstalled parameter to true. Typically, you do this to obtain a text input source reference for a newly installed input source. In this case, the properties parameter would include very specific criteria limiting the matching input

sources.

Important: Calling this function with the includeAllInstalled parameter set to true can have significant memory impact on the calling application if the properties parameter is nil (match all) or if it specifies criteria that might match many installed input sources. This setting might force caching of data for all matching input sources and result in an allocation of up to 120K.
If you are calling CreateInputSourceList to find a specific input source or sources from among the sources included in the list, first call CreateInputSourceList with includeAllInstalled set to false and check whether the returned array includes the desired input source(s). If this is not the case, call CreateInputSourceList again with the includeAllInstalled parameter set to true.
none

### 118.3.7 CurrentASCIICapableKeyboardInputSource as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the most recently used ASCII-capable keyboard input source.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentASCIICapableKeyboardInputSource

MsgBox t.LocalizedName
```

**Notes:** Returns text input source reference for the most recently used ASCII-capable keyboard input source.

If no ASCII-capable keyboard input source has been used yet, the function returns the default ASCII-capable keyboard layout chosen by Setup Assistant.

### 118.3.8 CurrentASCIICapableKeyboardLayoutInputSource as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the most recently used ASCII-capable keyboard layout.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentASCIICapableKeyboardLayoutInputSource

MsgBox t.LocalizedName
```

**Notes:** Returns A text input source reference for the most recently used ASCII-capable keyboard layout.

If no ASCII-capable keyboard input source has been used, the function returns the default ASCII-capable keyboard layout chosen by Setup Assistant.

This function is used by input methods to get the keyboard layout used for key translation if no specific keyboard layout override exists. The CurrentASCIICapableKeyboardInputSource can return input sources that are not keyboard layouts.

### 118.3.9 CurrentKeyboardInputSource as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the currently selected keyboard input source.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentKeyboardInputSource
MsgBox t.LocalizedName
```

### 118.3.10 CurrentKeyboardLayoutInputSource as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the keyboard layout currently in use.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentKeyboardLayoutInputSource
MsgBox t.LocalizedName
```

**Notes:** If the currently selected keyboard input source is a keyboard layout, the text input source reference refers to that layout. If the currently selected keyboard input source is an input method or mode, the text input source reference refers to the keyboard layout used by that input method or mode.

### 118.3.11 Deselect

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Deselects the specified input source.

**Notes:** inputSource: The input source you want to deselect.

Lasterror is set.

Deselect is for use with palette or ink input sources only. It has no effect on other input sources. When palette input sources are disabled, the palette disappears. Ink input sources are usually deselected and disabled at the same time.

### 118.3.12 Disable

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Disables the specified input source.
**Notes:** Sets lasterror. Lasterror is paramErr (-50) if the input source cannot be disabled. Otherwise, lasterror is noErr (0).

Disable is primarily intended for input methods, or for applications that supply their own input sources (for example, applications that provide keyboard layouts or palette input methods, and keyboard input methods that provide their own keyboard layouts and input modes). It makes the specified input source unavailable for selection and removes it from the user interface.

### 118.3.13 Enable

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Enables the specified input source.
**Notes:** Lasterror is set. Lasterror is paramErr (-50) if the input source cannot be enabled. Otherwise, it is noErr (0).

Enable is primarily for input methods or for applications that supply their own input sources (for example, applications that provide keyboard layouts or palette input methods, and keyboard input methods that provide their own keyboard layouts and input modes). It makes the specified input source available in the user interface for selection.

For Enable to succeed, the input source must be capable of being enabled (that is, kTISPropertyInputSourceIsEnableCapable is set to true). Furthermore, if the input source is an input mode, its parent must already be enabled for the mode to become enabled.

### 118.3.14 Icon as Variant

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Queries IconMBS object for this input source.
**Notes:** Icon references are the typical icon format for keyboard layouts and input methods. If an icon reference is not available for the specified input source, the value is nil.

### 118.3.15 IconImageFile as folderitem

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The file containing the image (typically TIFF) to be used as the input source icon.
**Notes:** If an image file URL is not available for the specified input source, the value is nil. Note that other image formats (for example, JPEG, PNG) may also be used in the future.

### 118.3.16 IconImageURL as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The URL to the file containing the image (typically TIFF) to be used as the input source icon.
**Notes:** If an image file URL is not available for the specified input source, the value is nil. Note that other image formats (for example, JPEG, PNG) may also be used in the future.

### 118.3.17 InputMethodKeyboardLayoutOverride as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the currently selected input method's keyboard layout override.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.InputMethodKeyboardLayoutOverride
if t = nil then
MsgBox "Nil"
else
MsgBox t.LocalizedName
end if
```

**Notes:** If the current keyboard input source is an input method or mode that has a keyboard layout override, a text input source reference for that keyboard layout is returned. Otherwise, the function returns nil.

### 118.3.18 InputModeID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** A reverse DNS string that identifies a particular usage class for input modes.
**Example:**

MsgBox TextInputSourceMBS.CurrentKeyboardInputSource.InputModeID

**Notes:** For example, com.apple.inputmethod.Japanese.Katakana identifies a standard Katakana-input usage class that may be associated with input modes from several different input methods.
You can attach this input mode to a TSMDocument using the TSMSetDocumentProperty function with the tag kTSMDocumentInputModePropertyTag, to control the input mode usage class that should be used with that TSM document.

### 118.3.19 InputSourceForLanguage(language as string) as TextInputSourceMBS

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns a text input source reference for the input source that should be used to input the specified language.
**Notes:** language: A BCP 47 language code (in the same form returned by the Core Foundation function CFLocaleCreateCanonicalLanguageIdentifierFromString function) that represents the language an input source should be returned for.

Returns an enabled input source that can input the specified language. If more than one such input source exists and at least one has been used, the most recently used input source is chosen. If none has been used, one is chosen based on the intended languages of the input sources. If no enabled input source exists that can input the specified language, the function returns nil.

If a text field is expected to have input in a particular language, an application can call InputSourceForLanguage and then SelectIt to select an input source appropriate for that language. This function is a replacement for the deprecated KeyScript programming interface's capability to select the default input source associated with a particular script code.

### 118.3.20 IsASCIICapable as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Whether the input source is intended to be capable of ASCII input.

### 118.3.21 IsEnableCapable as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Whether the input source can ever be programmatically enabled using Enable.
**Notes:** You can enable most input sources programmatically at any time. IsEnableCapable is set to true for these input sources.
Some input sources can never be programmatically enabled. These are mainly input method private keyboard layouts used by the input method via the function SetInputMethodKeyboardLayoutOverride. You cannot directly enable these layouts, nor use them as keyboard layout input sources. IsEnableCapable is set to false for these.
Some input sources can be programmatically enabled only under the correct conditions. These are mainly input modes, which can be changed from disabled to enabled only if their parent input method is enabled. However, they can already be in the enabled state, but not currently selectable if their parent input method is disabled. IsEnableCapable is true for these.

### 118.3.22 IsEnabled as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Whether the input source is currently enabled.
**Example:**

MsgBox str(TextInputSourceMBS.CurrentKeyboardInputSource.IsEnabled)

### 118.3.23 IsSelectCapable as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Whether the input source can ever be programmatically selected using Select.
**Notes:** This static property of an input source does not depend on any current state. For input sources that can be programmatically selected if they are enabled, IsSelectCapable is set to true.
For input sources that can never be programmatically selected even if they are enabled, IsSelectCapable is set to false. Such sources are mainly input methods that have modes (parent input methods); only their modes can be selected.
For input sources that are enabled and can only be programmatically selected under the correct conditions, IsSelectCapable is set to true. Such input sources are mainly input modes, which can only be selected if both they and their parent input method are enabled.
For input sources that can never be enabled or selected, IsSelectCapable is set to false.

### 118.3.24 IsSelected as boolean

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Whether the input source is currently selected.
**Example:**

MsgBox str(TextInputSourceMBS.CurrentKeyboardInputSource.IsSelected)

### 118.3.25 kTISCategoryInkInputSource as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the category identifiers.
**Notes:** You can install or select 0 or 1 ink input source.

### 118.3.26 kTISCategoryKeyboardInputSource as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the category identifiers.
**Notes:** This category includes keyboard layouts, keyboard input methods (both with modes and without), and keyboard input modes. At least one input source in this category is installed. Of all input sources in this category, exactly one is selected; selecting a new one deselects the previous one.

### 118.3.27 kTISCategoryPaletteInputSource as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the category identifiers.
**Notes:** This category includes character palettes and keyboard viewers. You can select 0 or more categories.

### 118.3.28 kTISNotifyEnabledKeyboardInputSourcesChanged as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The name of the CF distributed notification for a change to the set of enabled keyboard input sources.
**Notes:** Available in OS X v10.5 and later.

### 118.3.29 kTISNotifySelectedKeyboardInputSourceChanged as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The name of the CF distributed notification for a change to the selected keyboard input source.
**Notes:** Available in OS X v10.5 and later.

### 118.3.30 kTISPropertyBundleID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a string for the reverse DNS BundleID associated with the input source.

### 118.3.31 kTISPropertyIconImageURL as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a CFURLRef indicating the file containing the image (typically TIFF) to be used as the input source icon.
If an image file URL is not available for the specified input source, the value is nil. Note that other image formats (for example, JPEG, PNG) may also be used in the future.
Note: You may not use this key (and its corresponding value) used in the filter dictionary passed to the CreateInputSourceList function.

### 118.3.32 kTISPropertyIconRef as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is an IconRef value for the input source icon. Icon references are the typical icon format for keyboard layouts and input methods. If an icon reference is not available for the specified input source, the value is nil.
Note: You may not use this key (and its corresponding value) used in the filter dictionary passed to the CreateInputSourceList function.

### 118.3.33 kTISPropertyInputModeID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a CFStringRef for a reverse DNS string that identifies a particular usage class for input modes.
For example, com.apple.inputmethod.Japanese.Katakana identifies a standard Katakana-input usage class that may be associated with input modes from several different input methods.
You can attach this input mode to a TSMDocument using the TSMSetDocumentProperty function with the tag kTSMDocumentInputModePropertyTag, to control the input mode usage class that should be used with that TSM document.

### 118.3.34 kTISPropertyInputSourceCategory as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a string indicating the category of an input source.
Possible values are specified by the following property value constants: kTISCategoryKeyboardInputSource, kTISCategoryPaletteInputSource, and kTISCategoryInkInputSource.

### 118.3.35 kTISPropertyInputSourceID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Example:**

```
// show keyboard viewer
Dim d As New Dictionary
d.Value(TextInputSourceMBS.kTISPropertyInputSourceID) = "com.apple.KeyboardViewer"

Dim sources() As TextInputSourceMBS = TextInputSourceMBS.CreateInputSourceList(d, False)
If UBound(Sources) >= 0 Then
sources(0).SelectIt
End If
```

**Notes:** This property key designates a property value, which is a CFStringRef for the unique reverse DNS name associated with the input source.

- For keyboard input methods and for palette or ink input sources, typically, the bundle ID, for instance, com.apple.Kotoeri.
- For keyboard input modes, typically, the bundle ID of the parent input method plus a suffix that uniquely identifies the input mode, for instance, com.apple.Kotoeri.Katakana. It is not the generic

input mode name used across input methods, for instance, com.apple.inputmethod.Japanese.Katakana.

- For keyboard layouts, a new identification mechanism typically structured as com.company.keyboardlayout.name,for instance, com.apple.keyboardlayout.US.

### 118.3.36 kTISPropertyInputSourceIsASCIICapable as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a boolean indicating whether the input source is intended to be capable of ASCII input.

### 118.3.37 kTISPropertyInputSourceIsEnableCapable as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value which is a boolean indicating whether the input source can ever be programmatically enabled using TISEnableInputSource.
You can enable most input sources programmatically at any time. kTISPropertyInputSourceIsEnableCapable is set to true for these input sources.
Some input sources can never be programmatically enabled. These are mainly input method private keyboard layouts used by the input method via the functionTISSetInputMethodKeyboardLayoutOverride. You cannot directly enable these layouts, nor use them as keyboard layout input sources. kTISPropertyInputSourceIsEnableCapable is set to false for these.
Some input sources can be programmatically enabled only under the correct conditions. These are mainly input modes, which can be changed from disabled to enabled only if their parent input method is enabled. However, they can already be in the enabled state, but not currently selectable if their parent input method is disabled. kTISPropertyInputSourceIsEnableCapable is true for these.

### 118.3.38 kTISPropertyInputSourceIsEnabled as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a boolean indicating whether the input source is currently enabled.

### 118.3.39 kTISPropertyInputSourceIsSelectCapable as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a boolean indicating whether the input source can ever be programmatically selected using TISSelectInputSource.
This static property of an input source does not depend on any current state. For input sources that can be programmatically selected if they are enabled, kTISPropertyInputSourceIsSelectCapable is set to true.
For input sources that can never be programmatically selected even if they are enabled, kTISPropertyInputSourceIsSelectCapable is set to false. Such sources are mainly input methods that have modes (parent input methods); only their modes can be selected.
For input sources that are enabled and can only be programmatically selected under the correct conditions, kTISPropertyInputSourceIsSelectCapable is set to true. Such input sources are mainly input modes, which can only be selected if both they and their parent input method are enabled.
For input sources that can never be enabled or selected, kTISPropertyInputSourceIsSelectCapable is set to false.

### 118.3.40 kTISPropertyInputSourceIsSelected as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a Boolean indicating whether the input source is currently selected.

### 118.3.41 kTISPropertyInputSourceLanguages as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a CFArrayRef for an array of CFStringRefs, where each string is the language code for a language that can be input using the input source. You can use this constant with the PropertyValue function, but you may not use it in the filter dictionary passed to the CreateInputSourceList function.
Languages codes are in the same BCP 47 form returned by the CFLocaleCreateCanonicalLanguageIdentifierFromString function. The first language code in the array is the language the input source is intended for. If no such language exists (for example, for the Unicode Hex Input keyboard layout), the first language code is an empty string.

### 118.3.42 kTISPropertyInputSourceType as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a string indicating the specific type of an input source.

Possible values are specified by the following property value constants: kTISTypeKeyboardLayout, kTISTypeKeyboardInputMethodWithoutModes, kTISTypeKeyboardInputMethodModeEnabled, kTISTypeKeyboardInputMode, kTISTypeCharacterPalette, kTISTypeKeyboardViewer, and kTISTypeInk.

### 118.3.43 kTISPropertyLocalizedName as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentKeyboardInputSource
MsgBox t.PropertyValue(t.kTISPropertyLocalizedName)
```

**Notes:** This property key designates a property value, which is a string for the input source's localized name as intended for user interface use.
Uses the best match (determined by CFBundle) between the localization used by the caller and the available localizations of the input source name. In some cases, this might be an unlocalized name.

### 118.3.44 kTISPropertyUnicodeKeyLayoutData as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the property keys.
**Notes:** This property key designates a property value, which is a Memoryblock that refers to the 'uchr' keyboard layout data for a keyboard layout input source.
The 'uchr' data is in native-endian order. If the input source is not a keyboard layout, or is a keyboard layout for which only 'KCHR data' is available, the value is nil.
Note: You may not use this key (and its corresponding value) used in the filter dictionary passed to the CreateInputSourceList function.

### 118.3.45 kTISTypeCharacterPalette as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryPaletteInputSource.

### 118.3.46 kTISTypeInk as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryInkInputSource. Even though it is the only type in that category, a type is provided so that clients who don't need category information can just check input source type.

### 118.3.47 kTISTypeKeyboardInputMethodModeEnabled as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryKeyboardInputSource.

### 118.3.48 kTISTypeKeyboardInputMethodWithoutModes as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryKeyboardInputSource.

### 118.3.49 kTISTypeKeyboardInputMode as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryKeyboardInputSource.

### 118.3.50 kTISTypeKeyboardLayout as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryKeyboardInputSource.

### 118.3.51 kTISTypeKeyboardViewer as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** One of the possible type values.
**Notes:** This type belongs to the category kTISCategoryPaletteInputSource.

### 118.3.52 LocalizedName as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The input source's localized name as intended for user interface use.
**Example:**

```
MsgBox TextInputSourceMBS.CurrentKeyboardInputSource.LocalizedName
```

**Notes:** Uses the best match (determined by CFBundle) between the localization used by the caller and the available localizations of the input source name. In some cases, this might be an unlocalized name.

### 118.3.53 PropertyValue(key as string) as Variant

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Gets the value of a specified property for a specified input source.
**Example:**

```
dim t as TextInputSourceMBS
t = TextInputSourceMBS.CurrentKeyboardInputSource
MsgBox t.PropertyValue(t.kTISPropertyLocalizedName)
```

**Notes:** Key: The property key constant specifying the desired property value.

Returns a variant associated with the property key. The value type is specified for each key. Can be a string a boolean, a number, an array or an IconMBS. The function might return nil if the specified property is missing or invalid for the specified input source.

### 118.3.54 RegisterInputSource(file as folderitem) as Integer

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Registers any new input sources in a file or bundle so a text input source reference can be obtained immediately for each new input source.
**Notes:** location: The location of the input sources in a file or bundle.

Returns a result code. The function returns paramErr (-50) if location is invalid or the input sources in the specified location cannot be registered. Otherwise, it returns noErr (0).

This function enables an installer for an input method bundle or a keyboard layout file or bundle to notify the system to register these new input sources. The system can then locate the specified file or bundle and perform any necessary cache rebuilds so that the installer can immediately call TISCreateInputSourceList with appropriate properties (for example, a bundle ID or input source ID) to get text input source references for one or more of the newly registered input sources.

You can only use this function to register the following:

Keyboard layout files or bundles in the /Library/Keyboard Layouts/ or
textasciitilde /Library/Keyboard Layouts/ directory (available to all users or to the current user, respectively). Such keyboard layouts, once enabled, are selectable.
Input method bundles in the new Library/Input Methods/ or
textasciitilde /Library/Input Methods/ directories (available to all users or to the current user, respectively).
Note: Input method bundles can include private non-selectable keyboard layouts for use with SetInputMethodKeyboardLayoutOverride. These are registered automatically when the input method is registered, and do not need to be separately registered. They are not registered using TISRegisterInputSource.
Security: Any code that calls RegisterInputSource is part of an application or service that has already been validated in some way (for instance, by the user).
See also:

- 118.3.55 RegisterInputSource(URL as string) as Integer 17086

### 118.3.55 RegisterInputSource(URL as string) as Integer

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Registers any new input sources in a file or bundle so a text input source reference can be obtained immediately for each new input source.
**Notes:** location: The location of the input sources in a file or bundle.

Returns a result code. The function returns paramErr (-50) if location is invalid or the input sources in the specified location cannot be registered. Otherwise, it returns noErr (0).

This function enables an installer for an input method bundle or a keyboard layout file or bundle to notify the system to register these new input sources. The system can then locate the specified file or bundle and perform any necessary cache rebuilds so that the installer can immediately call TISCreateInputSourceList with appropriate properties (for example, a bundle ID or input source ID) to get text input source references for one or more of the newly registered input sources.

You can only use this function to register the following:

Keyboard layout files or bundles in the /Library/Keyboard Layouts/ or
textasciitilde /Library/Keyboard Layouts/ directory (available to all users or to the current user, respectively). Such keyboard layouts, once enabled, are selectable.
Input method bundles in the new Library/Input Methods/ or
textasciitilde /Library/Input Methods/ directories (available to all users or to the current user, respectively).
Note: Input method bundles can include private non-selectable keyboard layouts for use with SetInputMethodKeyboardLayoutOverride. These are registered automatically when the input method is registered, and do not need to be separately registered. They are not registered using TISRegisterInputSource.
Security: Any code that calls RegisterInputSource is part of an application or service that has already been validated in some way (for instance, by the user).
See also:

- 118.3.54 RegisterInputSource(file as folderitem) as Integer 17085

### 118.3.56 SelectIt

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Selects the specified input source.
**Example:**

```
// show keyboard viewer
Dim d As New Dictionary
d.Value(TextInputSourceMBS.kTISPropertyInputSourceID) = "com.apple.KeyboardViewer"

Dim sources() As TextInputSourceMBS = TextInputSourceMBS.CreateInputSourceList(d, False)
If UBound(Sources) >= 0 Then
sources(0).SelectIt
End If
```

**Notes:** Lasterror is set. Lasterror is paramErr (-50) if the input source is not selectable. Otherwise, it is noErr (0).

When the input source is a selectable keyboard, the specified input source becomes the new current keyboard input source, and the previous input source is deselected. When the input source is a palette, that palette is displayed and made available for input. Ink input sources are typically enabled and selected at the same time. When you call SelectInputSource for a palette or ink input source, there is no effect on other input sources. When you call SelectInputSource for an already selected input source, there is, similarly, no effect.

For SelectInputSource to succeed, the input source must be selectable (that is, kTISPropertyInputSourceIsSelectCapable is set to true) and the input source must be enabled (that is, kTISPropertyInputSourceIsEnabled is set to true). Furthermore, if the input source is an input mode, its parent must be enabled for it to be

selected.

We named the function SelectIt as Select is a reserved word in Xojo.

### 118.3.57 SetInputMethodKeyboardLayoutOverride

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Sets the keyboard layout override for an input method or mode.
**Notes:** self: The input source for the keyboard layout that should be used until the current input method is deactivated (if it should be something other than the most recently used ASCII-capable keyboard layout).

Lasterorr is set. Value is paramErr (-50) if the current keyboard input source is not an input method or mode or if keyboardLayout does not designate a keyboard layout. Otherwise, it is noErr (0).

When an input method or mode is the selected input source, the most recently used ASCII-capable keyboard layout to translate key events is used. This keyboard layout is also the one that appears in Keyboard Viewer. An input source for this keyboard layout is returned by the function CurrentASCIICapableKeyboardLayoutInputSource. If a different keyboard layout should be used for a particular input method or mode, the activated input method or mode should call SetInputMethodKeyboardLayoutOverride to specify the desired keyboard layout.

For example, when a Kotoeri user selects kana layout for kana input, Kotoeri should call SetInputMethodKeyboardLayoutOverride to set the kana keyboard as the override for the appropriate input modes.

The keyboard layout set in this way is used for the final stage of key translation in the Window Server, the connection, or application-specific key translation.

The override setting is lost when the input method that set it is deactivated.

The keyboard layout used for overriding need not be enabled or explicitly selectable. It can be a non-selectable layout included in an input method bundle and automatically registered.

The default behavior is new with OS X v10.5, and eliminates the necessity that input methods have a user interface for setting the ASCII- capable keyboard for phonetic input based on Latin characters.

### 118.3.58 SourceID as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The unique reverse DNS name associated with the input source.
**Notes:**

- For keyboard input methods and for palette or ink input sources, typically, the bundle ID, for instance, com.apple.Kotoeri.
- For keyboard input modes, typically, the bundle ID of the parent input method plus a suffix that uniquely identifies the input mode, for instance, com.apple.Kotoeri.Katakana. It is not the generic input mode name used across input methods, for instance, com.apple.inputmethod.Japanese.Katakana.
- For keyboard layouts, a new identification mechanism typically structured as com.company.keyboardlayout.name,for instance, com.apple.keyboardlayout.US.

### 118.3.59 SourceLanguages as string()

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The array of string, where each string is the language code for a language that can be input using the input source.
**Notes:** Languages codes are in the same BCP 47 form returned by the CFLocaleCreateCanonicalLanguageIdentifierFromString function. The first language code in the array is the language the input source is intended for. If no such language exists (for example, for the Unicode Hex Input keyboard layout), the first language code is an empty string.

### 118.3.60 Type as string

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Returns the type of an input source.
**Example:**

MsgBox TextInputSourceMBS.CurrentKeyboardInputSource.Type

**Notes:** Value can be kTISTypeKeyboardLayout, kTISTypeKeyboardInputMethodWithoutModes, kTISTypeKeyboardInputMethodModeEnabled, kTISTypeKeyboardInputMode, kTISTypeCharacterPalette, kTISTypeKeyboardViewer, and kTISTypeInk.

### 118.3.61 Properties

### 118.3.62 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 118.3.63 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 118.4 module ValidationMBS

### 118.4.1 module ValidationMBS

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** This module has helper functions for App Store Validation.
**Notes:** Please use AppReceiptMBS and AppReceiptVerificatorMBS classes instead.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1

### 118.4.2 Methods

### 118.4.3 AppStoreReceipt(file as folderitem) as dictionary

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Reads the app store receipt.
**Example:**

```
// read a receipt file
dim file as FolderItem = SpecialFolder.Desktop.Child("receipt")

// query values
dim dic as Dictionary = ValidationMBS.AppStoreReceipt(file)

// show identifier
MsgBox dic.Value(ValidationMBS.kReceiptBundleIdentifer)
```

**Notes:** You can use this to get details from your receipt.
Returns nil on any error.
Please pass folderitem to receipt file.

### 118.4.4 ExitApp(code as Integer = 173)

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Quits the application directly.
**Example:**

```
ValidationMBS.ExitApp 173
```

**Notes:** This does not call the destructors and CancelClose events. The app is quit right away.
If you use code 173 the Finder will show error message that app needs to be downloaded again from Mac App Store.

### 118.4.5 GUID as string

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Reads the GUID of the Mac.
**Example:**

```
dim g as String = ValidationMBS.GUID
MsgBox EncodeHex(g)
```

**Notes:** This is normally build from the MAC ID of the ethernet card.

### 118.4.6 locateAppStoreReceipt as folderitem

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Locates the App Store Receipt in the application bundle.
**Example:**

```
dim f as FolderItem = ValidationMBS.locateAppStoreReceipt
MsgBox f.NativePath
```

**Notes:** Please check result if folderitem is not nil and exists before processing.

### 118.4.7 Validate(file as folderitem) as boolean

MBS Encryption Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Validates the receipt.
**Example:**

```
dim file as FolderItem = ValidationMBS.locateAppStoreReceipt

if ValidationMBS.Validate(file) = false then
ValidationMBS.ExitApp 173
else
// ok
```

```
end if
```

**Notes:** Returns true if valid and false if not.

### 118.4.8 Constants

Dictionary Keys

| Constant | Value | Description |
|---|---|---|
| kReceiptBundleIdentifer | "BundleIdentifier" | The bundle identifier. |
| kReceiptBundleIdentiferData | "BundleIdentifierData" | The bundle identifier data. |
| kReceiptHash | "Hash" | The hash for the receipt. |
| kReceiptOpaqueValue | "OpaqueValue" | The opaque value used for hashing. |
| kReceiptVersion | "Version" | The version string. |

# Chapter 119

# MapKit

## 119.1 control DesktopMapKitViewControlMBS

### 119.1.1 control DesktopMapKitViewControlMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control for showing a map in Xojo.
**Notes:** This control is designed for Xojo (it may or may not work in REAL Studio if the Cocoa target is chosen)

As Xojo provides some events for us automatically like for context menu or mouse wheel, it does not mean that those events do work. The webview used in the map view seems to consume them before the plugin gets them.
**Blog Entries**

- Apple MapView In Xojo
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.3pr1
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3
- MBS Xojo Plugins, version 19.5pr1
- MapKit Framework for Xojo
- MBS Xojo / Real Studio Plugins, version 14.2pr6

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.
- Apple MapView In Xojo
- Apple MapView In Xojo

**Xojo Developer Magazine**

- 18.6, page 69: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.1.2 Properties

### 119.1.3 View as MKMapViewMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The map view used for this control.
**Notes:** The plugin creates it automatically when the constructor runs.
(Read only property)

### 119.1.4 Events

### 119.1.5 annotationViewDidChangeDragState(mapView as MKMapViewMBS, annotationView as MKAnnotationViewMBS, newState as Integer, oldState as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the drag state of one of its annotation views changed.
**Notes:** mapView: The map view containing the annotation view.
annotationView: The annotation view whose drag state changed.
newState: The new drag state of the annotation view.
oldState: The previous drag state of the annotation view.

The drag state typically changes in response to user interactions with the annotation view. However, the annotation view itself is responsible for changing that state as well.

### 119.1.6 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.1.7 BoundsChanged

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 119.1.8 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 119.1.9 ClusterAnnotationForMemberAnnotations(mapView as MKMapViewMBS, memberAnnotations() as MKAnnotationMBS) as MKClusterAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks you to provide a cluster annotation object for the specified annotations.
**Notes:** mapView: The map view containing the specified annotations.
memberAnnotations: The annotations to be clustered together. The returned MKClusterAnnotation object must include the specific annotations in this parameter.

Return the cluster annotation object.

Use this method to customize the cluster annotations displayed on your map. Normally, MapKit creates cluster annotation objects automatically when one or more annotations with the same cluster identifier are too close together. However, you can implement this method and return a custom cluster annotation object for the specified set of annotations.

### 119.1.10 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 119.1.11 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 119.1.12 didAddAnnotationViews(mapView as MKMapViewMBS, AnnotationViews() as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that one or more annotation views were added to the map.
**Notes:** mapView: The map view that added the annotation views.
views: An array of MKAnnotationView objects representing the views that were added.

By the time this method is called, the specified views are already added to the map.

### 119.1.13 DidAddOverlayRenderers(mapView as MKMapViewMBS, renderers() as MKOverlayRendererMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells you that one or more renderer objects were added to the map.
**Notes:** mapView: The map view that added the renderer objects.
renderers: The renderer objects that were added.

The map view adds renderer objects when it needs them to draw their contents, which might be prior to those contents appearing onscreen. It calls this method to let you know that the renderer is active and in use. By the time this method is called, the specified renderers have already been added to the map.

### 119.1.14 didAddOverlayViews(mapView as MKMapViewMBS, overlayViews() as NSViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event to inform you about added overlay views.

### 119.1.15 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 119.1.16 didDeselectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that one of its annotation views was deselected.
**Notes:** mapView: The map view containing the annotation view.
view: The annotation view that was deselected.

You can use this method to track changes in the selection state of annotation views.

### 119.1.17 didFailLoadingMap(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the specified view was unable to load the map data.
**Notes:** mapView: The map view that started the load operation.
error: The reason that the map data could not be loaded.

This method might be called in situations where the device does not have access to the network or is unable to load the map data for some reason. It may also be called if a request for additional map tiles comes in while a previous request for tiles is still pending. You can use this message to notify the user that the map data is unavailable.

### 119.1.18 didFailToLocateUserWithError(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that an attempt to locate the user's position failed.
**Notes:** mapView: The map view that is tracking the user's location.
error: An error object containing the reason why location tracking failed.

### 119.1.19 didFinishLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the specified map view successfully loaded the needed map data.
**Notes:** mapView: The map view that started the load operation.

This method is called when the map tiles associated with the current request have been loaded. Map tiles are requested when a new visible area is scrolled into view and tiles are not already available. Map tiles may also be requested for portions of the map that are not currently visible. For example, the map view may load tiles immediately surrounding the currently visible area as needed to handle small pans by the user.

### 119.1.20 DidFinishRenderingMap(mapView as MKMapViewMBS, fullyRendered as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells you that the map view has finished rendering all visible tiles.
**Notes:** fullyRendered: This parameter is set to true if the map view was able to render all tiles completely or false if errors prevented all tiles from being rendered.

This method lets you know when the map view finishes rendering all of the currently visible tiles to the best of its ability. This method is called regardless of whether all tiles were rendered successfully. If there were errors loading one or more tiles that prevented map view from rendering them, the fullyRendered parameter is set to false.

### 119.1.21 didSelectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that one of its annotation views was selected.
**Notes:** mapView: The map view containing the annotation view.

view: The annotation view that was selected.

You can use this method to track changes in the selection state of annotation views.

### 119.1.22 didStopLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the map view stopped tracking the user's location.
**Notes:** mapView: The map view that stopped tracking the user's location.

This method is called when the value of the showsUserLocation property changes to false.

### 119.1.23 didUpdateUserLocation(mapView as MKMapViewMBS, userLocation as MKUserLocationMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the location of the user was updated.
**Notes:** mapView: The map view that is tracking the user's location.
userLocation: The location object representing the user's latest location. This property may be nil.

While the showsUserLocation property is set to true, this method is called whenever a new location update is received by the map view. This method is also called if the map view's user tracking mode is set to MKUserTrackingModeFollowWithHeading and the heading changes.

This method is not called if the application is currently running in the background. If you want to receive location updates while running in the background, you must use the Core Location framework.

### 119.1.24 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.1.25 FocusLost

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 119.1.26 FocusReceived

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 119.1.27 FrameChanged

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 119.1.28 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.1.29 MenuBarSelected

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 119.1.30 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 119.1.31 MouseDrag(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 119.1.32 MouseUp(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 119.1.33 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 119.1.34 pressureChange(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 119.1.35 regionDidChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the region displayed by the map view just changed.
**Notes:** mapView: The map view whose visible region changed.
animated: If true, the change to the new region was animated.

This method is called whenever the currently displayed map region changes. During scrolling, this method may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.1.36 regionWillChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the region displayed by the map view is about to change.
**Notes:** mapView: The map view whose visible region is about to change.
animated: If true, the change to the new region will be animated. If NO, the change will be made immediately.

This method is called whenever the currently displayed map region changes. During scrolling, this method

may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.1.37 rendererForOverlay(mapView as MKMapViewMBS, overlay as MKOverlayMBS) as MKOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Asks the control for a renderer object to use when drawing the specified overlay.
**Notes:** mapView: The map view that requested the renderer object.
overlay: The overlay object that is about to be displayed.

Return the renderer to use when presenting the specified overlay on the map.

You must implement this method and use it to provide an appropriate renderer object for your overlays. The renderer object is responsible for drawing the contents of your overlay when asked to do so by the map view. Map Kit supports many different types of standard renderer objects and you may also define your own custom renderers.

If you don't implement this event, the MBS Plugin returns a default renderer.

### 119.1.38 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.1.39 ScaleFactorChanged(NewFactor as Double)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 119.1.40 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.1.41 viewForAnnotation(mapView as MKMapViewMBS, annotation as MKAnnotationMBS) as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event to query an annotation view for the given annotation.

### 119.1.42 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 119.1.43 willStartLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the specified map view is about to retrieve some map data.
**Notes:** mapView: The map view that began loading the data.

This method is called whenever a new group of map tiles need to be downloaded from the server. This typically occurs whenever you expose portions of the map by panning or zooming the content. You can use this method to mark the time that it takes for the map view to load the data.

### 119.1.44 willStartLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the map view will start tracking the user's position.
**Notes:** mapView: The map view that is tracking the user's location.

This method is called when the value of the showsUserLocation property changes to true.

### 119.1.45 WillStartRenderingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells you that the map view is about to start rendering some of its tiles.
**Notes:** The map view calls this method when one or more tiles are revealed and require rendering.

## 119.2 control MapKitIOSControlMBS

### 119.2.1 control MapKitIOSControlMBS

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The control for showing a map in Xojo.
**Notes:** This control is designed for Xojo 2020r2 or newer.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr7
- Apple MapView In Xojo
- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 22.1, page 9: News
- 19.2, page 9: News

### 119.2.2 Properties

### 119.2.3 View as MKMapViewMBS

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The map view used for this control.
**Notes:** The plugin creates it automatically when the constructor runs.
(Read only property)

### 119.2.4 Events

### 119.2.5 annotationViewDidChangeDragState(mapView as MKMapViewMBS, annotationView as MKAnnotationViewMBS, newState as integer, oldState as integer)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the drag state of one of its annotation views changed.
**Notes:** mapView: The map view containing the annotation view.
annotationView: The annotation view whose drag state changed.
newState: The new drag state of the annotation view.
oldState: The previous drag state of the annotation view.

The drag state typically changes in response to user interactions with the annotation view. However, the annotation view itself is responsible for changing that state as well.

### 119.2.6 Close

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to close.

### 119.2.7 ClusterAnnotationForMemberAnnotations(mapView as MKMapViewMBS, memberAnnotations() as MKAnnotationMBS) as MKClusterAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Asks you to provide a cluster annotation object for the specified annotations.
**Notes:** mapView: The map view containing the specified annotations.
memberAnnotations: The annotations to be clustered together. The returned MKClusterAnnotation object must include the specific annotations in this parameter.

Return the cluster annotation object.

Use this method to customize the cluster annotations displayed on your map. Normally, MapKit creates cluster annotation objects automatically when one or more annotations with the same cluster identifier are too close together. However, you can implement this method and return a custom cluster annotation object for the specified set of annotations.

### 119.2.8 didAddAnnotationViews(mapView as MKMapViewMBS, AnnotationViews() as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that one or more annotation views were added to the map.
**Notes:** mapView: The map view that added the annotation views.
views: An array of MKAnnotationView objects representing the views that were added.

By the time this method is called, the specified views are already added to the map.

### 119.2.9 DidAddOverlayRenderers(mapView as MKMapViewMBS, renderers() as MKOverlayRendererMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells you that one or more renderer objects were added to the map.
**Notes:** mapView: The map view that added the renderer objects.
renderers: The renderer objects that were added.

The map view adds renderer objects when it needs them to draw their contents, which might be prior to those contents appearing onscreen. It calls this method to let you know that the renderer is active and in use. By the time this method is called, the specified renderers have already been added to the map.

### 119.2.10 didAddOverlayViews(mapView as MKMapViewMBS, overlayViews() as NSViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The event to inform you about added overlay views.

### 119.2.11 didDeselectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that one of its annotation views was deselected.
**Notes:** mapView: The map view containing the annotation view.
view: The annotation view that was deselected.

You can use this method to track changes in the selection state of annotation views.

### 119.2.12 didFailLoadingMap(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the specified view was unable to load the map data.
**Notes:** mapView: The map view that started the load operation.
error: The reason that the map data could not be loaded.

This method might be called in situations where the device does not have access to the network or is unable to load the map data for some reason. It may also be called if a request for additional map tiles comes in while a previous request for tiles is still pending. You can use this message to notify the user that the map data is unavailable.

### 119.2.13 didFailToLocateUserWithError(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that an attempt to locate the user's position failed.
**Notes:** mapView: The map view that is tracking the user's location.
error: An error object containing the reason why location tracking failed.

### 119.2.14 didFinishLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the specified map view successfully loaded the needed map data.
**Notes:** mapView: The map view that started the load operation.

This method is called when the map tiles associated with the current request have been loaded. Map tiles are requested when a new visible area is scrolled into view and tiles are not already available. Map tiles may also be requested for portions of the map that are not currently visible. For example, the map view may load tiles immediately surrounding the currently visible area as needed to handle small pans by the user.

### 119.2.15 DidFinishRenderingMap(mapView as MKMapViewMBS, fullyRendered as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells you that the map view has finished rendering all visible tiles.
**Notes:** fullyRendered: This parameter is set to true if the map view was able to render all tiles completely or false if errors prevented all tiles from being rendered.

This method lets you know when the map view finishes rendering all of the currently visible tiles to the best of its ability. This method is called regardless of whether all tiles were rendered successfully. If there were errors loading one or more tiles that prevented map view from rendering them, the fullyRendered parameter is set to false.

### 119.2.16 didSelectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that one of its annotation views was selected.
**Notes:** mapView: The map view containing the annotation view.
view: The annotation view that was selected.

You can use this method to track changes in the selection state of annotation views.

### 119.2.17 didStopLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the map view stopped tracking the user's location.
**Notes:** mapView: The map view that stopped tracking the user's location.

This method is called when the value of the showsUserLocation property changes to false.

### 119.2.18 didUpdateUserLocation(mapView as MKMapViewMBS, userLocation as MKUserLocationMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the location of the user was updated.
**Notes:** mapView: The map view that is tracking the user's location.

userLocation: The location object representing the user's latest location. This property may be nil.

While the showsUserLocation property is set to true, this method is called whenever a new location update is received by the map view. This method is also called if the map view's user tracking mode is set to MKUserTrackingModeFollowWithHeading and the heading changes.

This method is not called if the application is currently running in the background. If you want to receive location updates while running in the background, you must use the Core Location framework.

### 119.2.19 GotFocus

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 119.2.20 LostFocus

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 119.2.21 Open

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 119.2.22 regionDidChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the region displayed by the map view just changed.
**Notes:** mapView: The map view whose visible region changed.
animated: If true, the change to the new region was animated.

This method is called whenever the currently displayed map region changes. During scrolling, this method

may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.2.23 regionWillChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the region displayed by the map view is about to change.
**Notes:** mapView: The map view whose visible region is about to change.
animated: If true, the change to the new region will be animated. If NO, the change will be made immediately.

This method is called whenever the currently displayed map region changes. During scrolling, this method may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.2.24 rendererForOverlay(mapView as MKMapViewMBS, overlay as MKOverlayMBS) as MKOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Asks the control for a renderer object to use when drawing the specified overlay.
**Notes:** mapView: The map view that requested the renderer object.
overlay: The overlay object that is about to be displayed.

Return the renderer to use when presenting the specified overlay on the map.

You must implement this method and use it to provide an appropriate renderer object for your overlays. The renderer object is responsible for drawing the contents of your overlay when asked to do so by the map view. Map Kit supports many different types of standard renderer objects and you may also define your own custom renderers.

If you don't implement this event, the MBS Plugin returns a default renderer.

### 119.2.25 touchesBegan(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells this object that one or more new touches occurred in a view or window.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when a new touch is detected in a view or window. Many UIKit classes override this method and use it to handle the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

### 119.2.26 touchesCancelled(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when a system event (such as a system alert) cancels a touch sequence.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when it receives a system interruption requiring cancellation of the touch sequence. An interruption is anything that causes the application to become inactive or causes the view handling the touch events to be removed from its window. Your implementation of this method should clean up any state associated with handling the touch sequence.

Return true if you handled it as otherwise we pass it on.

### 119.2.27 touchesEnded(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when one or more fingers are raised from a view or window.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when a finger or Apple Pencil is no longer touching the screen. Many UIKit classes override this method and use it to clean up state involved in the handling of the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

### 119.2.28 touchesMoved(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when one or more touches associated with an event changed.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when the location or force of a touch changes. Many UIKit classes override this method and use it to handle the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

### 119.2.29 viewForAnnotation(mapView as MKMapViewMBS, annotation as MKAnnotationMBS) as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The event to query an annotation view for the given annotation.

### 119.2.30 willStartLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the specified map view is about to retrieve some map data.
**Notes:** mapView: The map view that began loading the data.

This method is called whenever a new group of map tiles need to be downloaded from the server. This typically occurs whenever you expose portions of the map by panning or zooming the content. You can use this method to mark the time that it takes for the map view to load the data.

### 119.2.31 willStartLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the map view will start tracking the user's position.
**Notes:** mapView: The map view that is tracking the user's location.

This method is called when the value of the showsUserLocation property changes to true.

### 119.2.32 WillStartRenderingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells you that the map view is about to start rendering some of its tiles.
**Notes:** The map view calls this method when one or more tiles are revealed and require rendering.

## 119.3 control MapKitViewControlMBS

### 119.3.1 control MapKitViewControlMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop only.

**Function:** The control for showing a map in Xojo.
**Notes:** This control is designed for Xojo (it may or may not work in REAL Studio if the Cocoa target is chosen)

As Xojo provides some events for us automatically like for context menu or mouse wheel, it does not mean that those events do work. The webview used in the map view seems to consume them before the plugin gets them.
**Blog Entries**

- Apple MapView In Xojo
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.3pr1
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3
- MBS Xojo Plugins, version 19.5pr1
- MapKit Framework for Xojo
- MBS Xojo / Real Studio Plugins, version 14.2pr6

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.
- Apple MapView In Xojo
- Apple MapView In Xojo

**Xojo Developer Magazine**

- 18.6, page 69: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.3.2 Properties

### 119.3.3 View as MKMapViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop only.

**Function:** The map view used for this control.
**Notes:** The plugin creates it automatically when the constructor runs.
(Read only property)

### 119.3.4 Events

### 119.3.5 annotationViewDidChangeDragState(mapView as MKMapViewMBS, annotationView as MKAnnotationViewMBS, newState as Integer, oldState as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the drag state of one of its annotation views changed.
**Notes:** mapView: The map view containing the annotation view.
annotationView: The annotation view whose drag state changed.
newState: The new drag state of the annotation view.
oldState: The previous drag state of the annotation view.

The drag state typically changes in response to user interactions with the annotation view. However, the annotation view itself is responsible for changing that state as well.

### 119.3.6 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.3.7 BoundsChanged

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 119.3.8 Close

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 119.3.9 Closing

Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 119.3.10 ClusterAnnotationForMemberAnnotations(mapView as MKMapViewMBS, memberAnnotations() as MKAnnotationMBS) as MKClusterAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Asks you to provide a cluster annotation object for the specified annotations.
**Notes:** mapView: The map view containing the specified annotations.
memberAnnotations: The annotations to be clustered together. The returned MKClusterAnnotation object must include the specific annotations in this parameter.

Return the cluster annotation object.

Use this method to customize the cluster annotations displayed on your map. Normally, MapKit creates cluster annotation objects automatically when one or more annotations with the same cluster identifier are too close together. However, you can implement this method and return a custom cluster annotation object for the specified set of annotations.

### 119.3.11 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 119.3.12 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 119.3.13 didAddAnnotationViews(mapView as MKMapViewMBS, AnnotationViews() as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that one or more annotation views were added to the map.
**Notes:** mapView: The map view that added the annotation views.
views: An array of MKAnnotationView objects representing the views that were added.

By the time this method is called, the specified views are already added to the map.

### 119.3.14 DidAddOverlayRenderers(mapView as MKMapViewMBS, renderers() as MKOverlayRendererMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Tells you that one or more renderer objects were added to the map.
**Notes:** mapView: The map view that added the renderer objects.
renderers: The renderer objects that were added.

The map view adds renderer objects when it needs them to draw their contents, which might be prior to those contents appearing onscreen. It calls this method to let you know that the renderer is active and in use. By the time this method is called, the specified renderers have already been added to the map.

### 119.3.15 didAddOverlayViews(mapView as MKMapViewMBS, overlayViews() as NSViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The event to inform you about added overlay views.

### 119.3.16 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 119.3.17 didDeselectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that one of its annotation views was deselected.
**Notes:** mapView: The map view containing the annotation view.
view: The annotation view that was deselected.

You can use this method to track changes in the selection state of annotation views.

### 119.3.18 didFailLoadingMap(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the specified view was unable to load the map data.
**Notes:** mapView: The map view that started the load operation.
error: The reason that the map data could not be loaded.

This method might be called in situations where the device does not have access to the network or is unable to load the map data for some reason. It may also be called if a request for additional map tiles comes in while a previous request for tiles is still pending. You can use this message to notify the user that the map data is unavailable.

### 119.3.19 didFailToLocateUserWithError(mapView as MKMapViewMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that an attempt to locate the user's position failed.
**Notes:** mapView: The map view that is tracking the user's location.
error: An error object containing the reason why location tracking failed.

### 119.3.20 didFinishLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the specified map view successfully loaded the needed map data.
**Notes:** mapView: The map view that started the load operation.

This method is called when the map tiles associated with the current request have been loaded. Map tiles are requested when a new visible area is scrolled into view and tiles are not already available. Map tiles may also be requested for portions of the map that are not currently visible. For example, the map view may load tiles immediately surrounding the currently visible area as needed to handle small pans by the user.

### 119.3.21 DidFinishRenderingMap(mapView as MKMapViewMBS, fullyRendered as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Tells you that the map view has finished rendering all visible tiles.
**Notes:** fullyRendered: This parameter is set to true if the map view was able to render all tiles completely or false if errors prevented all tiles from being rendered.

This method lets you know when the map view finishes rendering all of the currently visible tiles to the best of its ability. This method is called regardless of whether all tiles were rendered successfully. If there were errors loading one or more tiles that prevented map view from rendering them, the fullyRendered parameter is set to false.

### 119.3.22 didSelectAnnotationView(mapView as MKMapViewMBS, view as MKAnnotationViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that one of its annotation views was selected.
**Notes:** mapView: The map view containing the annotation view.

view: The annotation view that was selected.

You can use this method to track changes in the selection state of annotation views.

### 119.3.23 didStopLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the map view stopped tracking the user's location.
**Notes:** mapView: The map view that stopped tracking the user's location.

This method is called when the value of the showsUserLocation property changes to false.

### 119.3.24 didUpdateUserLocation(mapView as MKMapViewMBS, userLocation as MKUserLocationMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the location of the user was updated.
**Notes:** mapView: The map view that is tracking the user's location.
userLocation: The location object representing the user's latest location. This property may be nil.

While the showsUserLocation property is set to true, this method is called whenever a new location update is received by the map view. This method is also called if the map view's user tracking mode is set to MKUserTrackingModeFollowWithHeading and the heading changes.

This method is not called if the application is currently running in the background. If you want to receive location updates while running in the background, you must use the Core Location framework.

### 119.3.25 EnableMenuItems

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 119.3.26 endGestureWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.3.27 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 119.3.28 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 119.3.29 FrameChanged

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 119.3.30 GotFocus

MBS MacFrameworks Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 119.3.31 LostFocus

MBS MacFrameworks Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 119.3.32 magnifyWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.3.33 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 119.3.34 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 119.3.35 MouseDrag(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 119.3.36 MouseUp(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 119.3.37 Open

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 119.3.38 Opening

Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 119.3.39 pressureChange(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 119.3.40 regionDidChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the region displayed by the map view just changed.
**Notes:** mapView: The map view whose visible region changed.
animated: If true, the change to the new region was animated.

This method is called whenever the currently displayed map region changes. During scrolling, this method may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.3.41 regionWillChangeAnimated(mapView as MKMapViewMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the region displayed by the map view is about to change.
**Notes:** mapView: The map view whose visible region is about to change.
animated: If true, the change to the new region will be animated. If NO, the change will be made immediately.

This method is called whenever the currently displayed map region changes. During scrolling, this method may be called many times to report updates to the map position. Therefore, your implementation of this method should be as lightweight as possible to avoid affecting scrolling performance.

### 119.3.42 rendererForOverlay(mapView as MKMapViewMBS, overlay as MKOverlayMBS) as MKOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Asks the control for a renderer object to use when drawing the specified overlay.
**Notes:** mapView: The map view that requested the renderer object.
overlay: The overlay object that is about to be displayed.

Return the renderer to use when presenting the specified overlay on the map.

You must implement this method and use it to provide an appropriate renderer object for your overlays. The renderer object is responsible for drawing the contents of your overlay when asked to do so by the map view. Map Kit supports many different types of standard renderer objects and you may also define your own custom renderers.

If you don't implement this event, the MBS Plugin returns a default renderer.

### 119.3.43 rotateWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.3.44 ScaleFactorChanged(NewFactor as Double)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 119.3.45 swipeWithEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.

The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 119.3.46 viewForAnnotation(mapView as MKMapViewMBS, annotation as MKAnnotationMBS) as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The event to query an annotation view for the given annotation.

### 119.3.47 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 119.3.48 willStartLoadingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the specified map view is about to retrieve some map data.
**Notes:** mapView: The map view that began loading the data.

This method is called whenever a new group of map tiles need to be downloaded from the server. This typically occurs whenever you expose portions of the map by panning or zooming the content. You can use this method to mark the time that it takes for the map view to load the data.

### 119.3.49 willStartLocatingUser(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: .

**Function:** Tells the control that the map view will start tracking the user's position.
**Notes:** mapView: The map view that is tracking the user's location.

This method is called when the value of the showsUserLocation property changes to true.

### 119.3.50 WillStartRenderingMap(mapView as MKMapViewMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Tells you that the map view is about to start rendering some of its tiles.
**Notes:** The map view calls this method when one or more tiles are revealed and require rendering.

## 119.4 class MKAnnotationViewMBS

### 119.4.1 class MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual representation of one of your annotation objects.
**Notes:** See
https://developer.apple.com/documentation/mapkit/mkannotationview
Subclass of the NSViewMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr8
- Mapview with icons in Xojo
- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.1, pages 80 to 82: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 19.1, page 78: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, pages 78 to 79: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 74: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, pages 64 to 65: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.5, pages 80 to 81: Maps (Part 6), A deep dive into Annotations by Markus Winter

### 119.4.2 Methods

### 119.4.3 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a new annotation view.
**Notes:** annotation: The annotation object to associate with the new view.
reuseIdentifier: If you plan to reuse the annotation view for similar types of annotations, pass a string to

identify it. Although you can pass nil if you do not intend to reuse the view, reusing annotation views is generally recommended.

Returns the initialized annotation view or nil if there was a problem initializing the object.

The reuse identifier provides a way for you to improve performance by recycling annotation views as they are scrolled on and off of the map. As views are no longer needed, they are moved to a reuse queue by the map view. When a new annotation becomes visible, your application can request a view for that annotation by passing the appropriate reuse identifier string to the dequeueReusableAnnotationViewWithIdentifier: method of MKMapView.

Added EnableEvents parameter to enable new prepareForDisplay and prepareForReuse events. But please keep reference in some global array to those objects to keep the events working.
See also:

- 119.4.4 Constructor(Handle as Integer) 17133

### 119.4.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKAnnotationView reference from a declare.
The object is retained.
See also:

- 119.4.3 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false) 17132

### 119.4.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.4.6 MKAnnotationCalloutInfoDidChangeNotification as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The notification name for the case callout info changed.

### 119.4.7 setDragState(State as Integer, animated as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the current drag state for the annotation view.
**Notes:** newDragState: The new drag state for the annotation view.
animated: If true, the change to the new drag state should be animated; otherwise, it should be made without animations.

Applications targeting iOS 4.2 and later can override this method and use it to implement drag support for custom annotation views. As the system detects user actions that would indicate a drag, it calls this method to update the drag state. In response to these changes, your custom implementation of this method should do the following:
When the drag state changes to MKAnnotationViewDragStateStarting, set the state to MKAnnotationViewDragStateDragging. If you perform an animation to indicate the beginning of a drag, and the animated parameter is true, perform that animation before changing the state.

When the state changes to either MKAnnotationViewDragStateCanceling or MKAnnotationViewDragStateEnding, set the state to MKAnnotationViewDragStateNone. If you perform an animation at the end of a drag, and the animated parameter is true, you should perform that animation before changing the state.

The default implementation of this method sets the value of the dragState property to the value in the newDragState parameter only. Therefore, direct subclasses can simply call the inherited version of this method to change the drag state; otherwise, just change the value in the draggable property directly.

Changing the state to MKAnnotationViewDragStateDragging or MKAnnotationViewDragStateNone is the way to signal to the map view that you are done with any animations you wanted to perform. For example, when a drag operation begins for a pin annotation, the MKPinAnnotationView class executes an animation to lift the pin off the map. Similarly, when the pin is dropped, the class performs a drop animation. Even if you do not perform any animations, you should call the inherited version of this method to update the dragState property.

You must not try to abort a new drag operation by changing the state from MKAnnotationViewDragStateStarting to MKAnnotationViewDragStateNone. If you do not want your annotation view to be draggable, set the draggable property to NO.

### 119.4.8 setSelected(selected as boolean, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the selection state of the annotation view.
**Notes:** selected: Contains the value true if the view should display itself as selected.
animated: Set to true if the change in selection state is animated.

You should not call this method directly. An MKMapView object calls this method in response to user interactions with the annotation.

### 119.4.9 Properties

### 119.4.10 annotation as MKAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The annotation object currently associated with the view.
**Notes:** You should not change the value of this property directly. This property contains a non-nil value only while the annotation view is visible on the map. If the view is queued and waiting to be reused, the value is nil
(Read and Write property)

### 119.4.11 CalloutOffset as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset (in points) at which to place the callout bubble.
**Notes:** This property determines the additional distance by which to move the callout bubble. When this property is set to (0, 0), the anchor point of the callout bubble is placed on the top-center point of the annotation view,Äôs frame. Specifying positive offset values moves the callout bubble down and to the right, while specifying negative values moves it up and to the left.
The calloutOffset property is not used in macOS apps. Instead, macOS apps use leftCalloutOffset and rightCalloutOffset.
(Read and Write property)

### 119.4.12 canShowCallout as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the annotation view is able to display extra information in a callout bubble.
**Notes:** If the value of this property is YES, a standard callout bubble is shown when the user taps a selected annotation view. The callout uses the title and subtitle text from the associated annotation object. If there is no title text, though, the annotation view is treated as if its enabled property is set to NO. The callout also displays any custom callout views stored in the leftCalloutAccessoryView and rightCalloutAccessoryView properties.
If the value of this property is NO, the value of the title and subtitle strings are ignored and the annotation view remains enabled by default. You can still disable the view explicitly using the enabled property.

(Read and Write property)

### 119.4.13 CenterOffset as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset (in points) at which to display the view.
**Notes:** By default, the center point of an annotation view is placed at the coordinate point of the associated annotation. You can use this property to reposition the annotation view as needed. This x and y offset values are measured in points. Positive offset values move the annotation view down and to the right, while negative values move it up and to the left.
(Read and Write property)

### 119.4.14 clusterAnnotationView as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The clustering annotation view currently standing in for this annotation view.
**Notes:** When the annotation view is being displayed on the map, the value of this property is nil.
(Read only property)

### 119.4.15 clusteringIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An identifier that determines whether the annotation view participates in clustering.
**Notes:** The default value of this property is empty, which prevents the annotation view from being clustered with other annotation views. Setting the property to a non empty value it to participate in clustering.
Clustering occurs when there is a collision between multiple annotation views with the same identifier on the map surface. The annotation views involved in the collision are removed from the map view and replaced by a clustering annotation view, which displays the title from one of the annotations and provides access to the other annotations.
(Read and Write property)

### 119.4.16 collisionMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The collision mode to use when interpreting the collision frame rectangle.
**Notes:** (Read and Write property)

### 119.4.17 detailCalloutAccessoryView as NSViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The detail accessory view to be used in the standard callout.
**Notes:** (Read and Write property)

### 119.4.18 displayPriority as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The display priority of this annotation view.
**Notes:** An annotation view whose priority is set to DisplayPriorityRequired is always visible on the map, whereas other priorities may result in the annotation view being hidden.
The default value of this property is DisplayPriorityRequired.
(Read and Write property)

### 119.4.19 draggable as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the annotation view is draggable.
**Notes:** Setting this property to true makes an annotation draggable by the user. If true, the associated annotation object must also implement the setCoordinate: method. The default value of this property is false.
Setting this property to true, lets the map view know that the annotation is always draggable. In other words, you cannot conditionalize drag operations by attempting to stop an operation that has already been initiated; doing so can lead to undefined behavior. Once begun, the drag operation should always continue to completion.
(Read and Write property)

### 119.4.20 dragState as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current drag state of the annotation view.
**Notes:** To support drag operations, you must override the implementation of this property and update the drag state at the following times:
When the drag state changes to MKAnnotationViewDragStateStarting, you should set the state to MKAnnotationViewDragStateDragging. If you perform an animation to indicate the beginning of a drag, you should perform that animation before changing the state. Changing the state to the new value lets the map know that your animations are done.
When the state changes to either MKAnnotationViewDragStateCanceling or MKAnnotationViewDragSta-

teEnding, set the state to MKAnnotationViewDragStateNone. If you perform an animation at the end of a drag, you should perform that animation before changing the state.

Changing the state to the MKAnnotationViewDragStateDragging or MKAnnotationViewDragStateNone value is the way to signal to the map view that you are done with any animations you wanted to perform. For example, when a drag operation begins for a pin annotation, the MKPinAnnotationView class executes an animation to lift the pin off the map. Similarly, when the pin is dropped, the class performs a drop animation. Even if you do not perform any animations, you should still change the value of this property to reflect the correct state.

You must not try to abort a new drag operation by changing the state from MKAnnotationViewDragStateStarting to MKAnnotationViewDragStateNone. If you do not want your annotation view to be draggable, set the draggable property to NO.
(Read and Write property)

### 119.4.21 enabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the annotation is enabled.
**Notes:** The default value of this property is YES. If the value of this property is NO, the annotation view ignores touch events and cannot be selected. Subclasses may also display the annotation contents differently depending on the value of this property.
(Read and Write property)

### 119.4.22 highlighted as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the annotation view is highlighted.
**Notes:** You should not set the value of this property directly. The map view sets it in response to touch events entering or exiting the annotation view,Äôs bounds.
(Read and Write property)

### 119.4.23 image as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The image to be displayed by the annotation view.
**Notes:** Looks like MKPinAnnotationViewMBS likes to ignore it, so you may prefer to use MKAnnotationViewMBS directly.

(Read and Write property)

### 119.4.24 leftCalloutAccessoryView as NSViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The view to display on the left side of the standard callout bubble.
**Notes:** The default value of this property is nil. The left callout view is typically used to display information about the annotation or to link to custom information provided by your application.
In an iOS app, if the view you specify is also a descendant of the UIControl class, you can use the map view,Äôs delegate to receive notifications when your control is tapped. If it does not descend from UIControl, your view is responsible for handling any touch events within its bounds.
In a macOS app, the callout view,Äôs view controller can implement an action method that responds when a user clicks the control in a callout view.
(Read and Write property)

### 119.4.25 leftCalloutOffset as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The offset in points from the middle-left of the annotation view.
**Notes:** This property specifies where the anchor of the callout should be shown when it,Äôs oriented off the left side of the annotation view.
(Read and Write property)

### 119.4.26 reuseIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The string that identifies that this annotation view is reusable.
**Notes:** You specify the reuse identifier when you create the view. You use this type later to retrieve an annotation view that was created previously but which is currently unused because its annotation is not on screen.
If you define distinctly different types of annotations (with distinctly different annotation views to go with them), you can differentiate between the annotation types by specifying different reuse identifiers for each one.
(Read only property)

### 119.4.27 rightCalloutAccessoryView as NSViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The view to display on the right side of the standard callout bubble.
**Notes:** This property is set to nil by default. The right callout view is typically used to link to more detailed information about the annotation. In an iOS app, a common view to specify for this property is a button object whose type is set to UIButtonTypeDetailDisclosure.
In an iOS app, if the view you specify is also a descendant of the UIControl class, you can use the map view,Äôs delegate to receive notifications when your control is tapped. If it does not descend from UIControl, your view is responsible for handling any touch events within its bounds.
In a macOS app, the callout view,Äôs view controller can implement an action method that responds when a user clicks the control in a callout view.
(Read and Write property)

### 119.4.28 rightCalloutOffset as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The offset in points from the middle-right of the annotation view.
**Notes:** This property specifies where the anchor of the callout should be shown when it,Äôs oriented off the right side of the annotation view.
(Read and Write property)

### 119.4.29 selected as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the annotation view is currently selected.
**Notes:** You should not set the value of this property directly. If the property contains true, the annotation view is displaying a callout bubble.
(Read and Write property)

### 119.4.30 Events

### 119.4.31 prepareForDisplay

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Notifies the annotation view that it is about to be displayed on the map.
**Notes:** Use this event to prepare the content of your annotation view.

### 119.4.32 prepareForReuse

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: .

**Function:** Called when the view is removed from the reuse queue.
**Notes:** You can implement this event in your custom annotation views and use it to put the view in a known state before it is returned to your map view delegate.

### 119.4.33 Constants

Collision Modes

| Constant | Value | Description |
|---|---|---|
| CollisionModeCircle | 1 | |
| CollisionModeRectangle | 0 | |

Display Priorities

| Constant | Value | Description |
|---|---|---|
| DisplayPriorityDefaultHigh | 750 | A constant indicating that the item's display priority is high. |
| DisplayPriorityDefaultLow | 250 | A constant indicating that the item's display priority is low. |
| DisplayPriorityRequired | 1000 | A constant indicating that the item is required. |

Drag States

| Constant | Value | Description |
|---|---|---|
| DragStateCanceling | 3 | Drag was cancelled. |
| DragStateDragging | 2 | Drag is happening. |
| DragStateEnding | 4 | Drag is ending. |
| DragStateNone | 0 | No dragging. |
| DragStateStarting | 1 | Drag is starting. |

## 119.5 class MKCircleMBS

### 119.5.1 class MKCircleMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKCircle class is a concrete overlay object representing a circular area on a map.
**Notes:** This class manages the data that defines the area and is typically used in conjunction with an MKCircleView object, which handles the drawing of the circular area on a map.
Subclass of the MKShapeMBS class.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

Interfaces: MKOverlayMBS

### 119.5.2 Methods

### 119.5.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.
See also:

- 119.5.15 boundingMapRect as MKMapRectMBS 17145

### 119.5.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.

### 119.5.5 circleWithCenterCoordinate(coord as CLLocationCoordinate2DMBS, radius as Double) as MKCircleMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKCircle object using the specified coordinate and radius.
**Example:**

```
dim mapview as MKMapViewMBS // your map view
dim centerCoordinate as CLLocationCoordinate2DMBS = mapview.centerCoordinate
dim radius as Integer = 300 // 300 meter

dim circle as MKCircleMBS = MKCircleMBS.circleWithCenterCoordinate(centerCoordinate, radius)
mapview.addOverlay circle
```

**Notes:** coord: The center point of the circle, specified as a latitude and longitude value.
radius: The radius of the circle, measured in meters from the center point.
See also:

- 119.5.6 circleWithCenterCoordinate(Latitude as Double, Longitude as Double, radius as Double) as MKCircleMBS 17143

### 119.5.6 circleWithCenterCoordinate(Latitude as Double, Longitude as Double, radius as Double) as MKCircleMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKCircle object using the specified coordinate and radius.
**Notes:** Latitude and Longitude: The center point of the circle, specified as a latitude and longitude value.
radius: The radius of the circle, measured in meters from the center point.
See also:

- 119.5.5 circleWithCenterCoordinate(coord as CLLocationCoordinate2DMBS, radius as Double) as MKCircleMBS 17143

### 119.5.7 circleWithMapRect(mapRect as MKMapRectMBS) as MKCircleMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates new circle object with given rectangle.

### 119.5.8 Constructor(coord as CLLocationCoordinate2DMBS, radius as Double)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKCircle object using the specified coordinate and radius.
**Notes:** coord: The center point of the circle, specified as a latitude and longitude value.
radius: The radius of the circle, measured in meters from the center point.
See also:


- 119.5.9 Constructor(Handle as Integer) 17144
- 119.5.10 Constructor(Latitude as Double, Longitude as Double, radius as Double) 17144
- 119.5.11 Constructor(mapRect as MKMapRectMBS) 17145


### 119.5.9 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKCircle reference from a declare.
The object is retained.
See also:


- 119.5.8 Constructor(coord as CLLocationCoordinate2DMBS, radius as Double) 17144
- 119.5.10 Constructor(Latitude as Double, Longitude as Double, radius as Double) 17144
- 119.5.11 Constructor(mapRect as MKMapRectMBS) 17145


### 119.5.10 Constructor(Latitude as Double, Longitude as Double, radius as Double)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKCircle object using the specified coordinate and radius.
**Notes:** Latitude and Longitude: The center point of the circle, specified as a latitude and longitude value.
radius: The radius of the circle, measured in meters from the center point.
See also:

- 119.5.8 Constructor(coord as CLLocationCoordinate2DMBS, radius as Double) 17144
- 119.5.9 Constructor(Handle as Integer) 17144
- 119.5.11 Constructor(mapRect as MKMapRectMBS) 17145


### 119.5.11 Constructor(mapRect as MKMapRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates new circle object with given rectangle.
See also:


- 119.5.8 Constructor(coord as CLLocationCoordinate2DMBS, radius as Double) 17144
- 119.5.9 Constructor(Handle as Integer) 17144
- 119.5.10 Constructor(Latitude as Double, Longitude as Double, radius as Double) 17144


### 119.5.12 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:


- 119.5.16 coordinate as CLLocationCoordinate2DMBS 17146


### 119.5.13 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.5.14 Properties

### 119.5.15 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you

must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.
(Read only property)
See also:

- 119.5.3 boundingMapRect as MKMapRectMBS 17142

### 119.5.16 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The center point of the circular area, specified as a latitude and longitude.
**Notes:** (Read only property)
See also:

- 119.5.12 coordinate as CLLocationCoordinate2DMBS 17145

### 119.5.17 radius as Double

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius of the circular area, measured in meters.
**Notes:** (Read only property)

## 119.6 class MKCircleRendererMBS

### 119.6.1 class MKCircleRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual representation for a circular overlay.
**Notes:** This renderer fills and strokes the circular region represented by the overlay object. You can change the color and other drawing attributes of the circle by modifying the properties inherited from the parent class. You typically use this class as is and do not subclass it.

You create an instance of this class in your map view rendererForOverlay event.
Subclass of the MKOverlayPathRendererMBS class.
**Blog Entries**

- MapKit Framework for Xojo

### 119.6.2 Methods

### 119.6.3 Constructor(Circle as MKCircleMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a new overlay view using the specified circle overlay object.
**Notes:** circle: The circle overlay containing the information about the circular area to be drawn. The renderer maintains a strong reference to the object you provide. This parameter must not be nil.
See also:

- 119.6.4 Constructor(Handle as Integer) 17147

### 119.6.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKCircleRenderer reference from a declare.
The object is retained.
See also:

- 119.6.3 Constructor(Circle as MKCircleMBS) 17147

### 119.6.5 Properties

### 119.6.6 circle as MKCircleMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The circle overlay object that contains the information used to draw the overlay.
**Notes:** (Read only property)

# 119.7 class MKClusterAnnotationMBS

## 119.7.1 class MKClusterAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An annotation that groups two or more distinct annotations into a single entity.
**Notes:** A cluster annotation object stands in for the group of annotations. Cluster views promote legibility of the underlying annotations by displaying a single annotation whose title is taken from one annotation and whose subtitle indicates how many additional annotations belong to the group.

MapKit automatically creates cluster annotations when two or more annotation views become grouped too closely together on the map surface. To customize the cluster annotations displayed on your map, implement the clusterAnnotationForMemberAnnotations event in your map's control.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.1, pages 87 to 89: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 19.1, pages 82 to 83: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 80: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, pages 74 to 77: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.5, pages 85 to 87: Maps (Part 6), A deep dive into Annotations by Markus Winter

Interfaces: MKAnnotationMBS

## 119.7.2 Methods

## 119.7.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:


- 119.7.4 Constructor(Handle as Integer) 17150
- 119.7.5 Constructor(memberAnnotations() as MKAnnotationMBS) 17150

### 119.7.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKClusterAnnotation reference from a declare.
The object is retained.
See also:

- 119.7.3 Constructor 17149
- 119.7.5 Constructor(memberAnnotations() as MKAnnotationMBS) 17150

### 119.7.5 Constructor(memberAnnotations() as MKAnnotationMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes the cluster annotations with the specified individual annotations.
**Notes:** memberAnnotations: The annotations to group together as a single entity.

Returns an initialized MKClusterAnnotationMBS object or nil if the object could not be created.
See also:

- 119.7.3 Constructor 17149
- 119.7.4 Constructor(Handle as Integer) 17150

### 119.7.6 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.7.7 memberAnnotations as MKAnnotationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The annotations that are grouped together by the cluster.

### 119.7.8 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.7.9 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
See also:

- 119.7.13 SubTitle as String 17151

### 119.7.10 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.7.14 Title as String 17152

### 119.7.11 Properties

### 119.7.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 119.7.13 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
(Read and Write property)
See also:

- 119.7.9 SubTitle as String 17151

### 119.7.14 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read and Write property)
See also:

- 119.7.10 Title as String 17151

## 119.8 class MKCoordinateRegionMBS

### 119.8.1 class MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A structure that defines which portion of the map to display.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.6, page 74: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.3, page 79: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 119.8.2 Methods

### 119.8.3 Constructor(center as CLLocationCoordinate2DMBS, span as MKCoordinateSpanMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor to initialize an object of this class.

### 119.8.4 MakeWithDistance(center as CLLocationCoordinate2DMBS, latitudinalMeters as double, longitudinalMeters as double) as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a region with given center and size.

### 119.8.5 Properties

### 119.8.6 center as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The center point of the region.
**Notes:** (Read and Write property)

### 119.8.7 span as MKCoordinateSpanMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The horizontal and vertical span representing the amount of map to display.
**Notes:** The span also defines the current zoom level used by the map view object.
(Read and Write property)

## 119.9 class MKCoordinateSpanMBS

### 119.9.1 class MKCoordinateSpanMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A structure that defines the area spanned by a map region.
**Notes:** You use the delta values in this structure to indicate the desired zoom level of the map, with smaller delta values corresponding to a higher zoom level.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.6, page 74: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.9.2 Methods

### 119.9.3 Constructor(latitudeDelta as Double, longitudeDelta as Double)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor to initialize this class.

### 119.9.4 Properties

### 119.9.5 latitudeDelta as Double

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of north-to-south distance (measured in degrees) to display on the map.
**Notes:** Unlike longitudinal distances, which vary based on the latitude, one degree of latitude is always approximately 111 kilometers (69 miles).
(Read and Write property)

### 119.9.6 longitudeDelta as Double

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of east-to-west distance (measured in degrees) to display for the map region.
**Notes:** The number of kilometers spanned by a longitude range varies based on the current latitude. For

example, one degree of longitude spans a distance of approximately 111 kilometers (69 miles) at the equator but shrinks to 0 kilometers at the poles.
(Read and Write property)

# 119.10 class MKCustomAnnotationMBS

## 119.10.1 class MKCustomAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a custom MKAnnotationMBS.
**Notes:** As MKAnnotationMBS is an interface, you need a Cocoa class to implement coordinate, title and subtitle properties.
So you can subclass this class if you like.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1

Interfaces: MKAnnotationMBS

## 119.10.2 Methods

## 119.10.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.10.4 Constructor(Handle as Integer) 17157

## 119.10.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKCustomAnnotation reference from a declare.
The object is retained.
See also:

- 119.10.3 Constructor 17157

## 119.10.5 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.10.6 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.10.7 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.10.11 subtitle as String 17158

### 119.10.8 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.10.12 title as String 17159

### 119.10.9 Properties

### 119.10.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.10.11 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKAnnotationMBS interface.

(Read and Write property)
See also:

- 119.10.7 SubTitle as String 17158

### 119.10.12 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read and Write property)
See also:

- 119.10.8 Title as String 17158

## 119.11 class MKCustomOverlayMBS

### 119.11.1 class MKCustomOverlayMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a custom overlay.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1

**Xojo Developer Magazine**

- 17.5, page 54: Maps (Part 1), Implementing Maps in Xojo desktop apps with the MapKitMBS plug-in by Markus Winter

Interfaces: MKOverlayMBS, MKAnnotationMBS

### 119.11.2 Methods

### 119.11.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

### 119.11.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need

for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.
See also:

- 119.11.14 canReplaceMapContent as Boolean 17162

### 119.11.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.11.6 Constructor(Handle as Integer) 17161

### 119.11.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKCustomOverlay reference from a declare.
The object is retained.
See also:

- 119.11.5 Constructor 17161

### 119.11.7 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The center point of the circular area, specified as a latitude and longitude.

### 119.11.8 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.11.9 setBoundingMapRect(m as MKMapRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets boundingMapRect property.

### 119.11.10 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.11.11 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
See also:

- 119.11.16 subtitle as String 17163

### 119.11.12 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.11.17 title as String 17163

### 119.11.13 Properties

### 119.11.14 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.
(Read and Write property)
See also:

- 119.11.4 canReplaceMapContent as Boolean 17160

### 119.11.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 119.11.16 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
(Read and Write property)
See also:

- 119.11.11 SubTitle as String 17162

### 119.11.17 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read and Write property)
See also:

- 119.11.12 Title as String 17162

## 119.12 class MKCustomOverlayRendererMBS

### 119.12.1 class MKCustomOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The renderer for custom overlays.
**Notes:** A special renderer with events for Xojo.
Subclass of the MKOverlayRendererMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1

**Xojo Developer Magazine**

- 17.5, page 54: Maps (Part 1), Implementing Maps in Xojo desktop apps with the MapKitMBS plug-in by Markus Winter

### 119.12.2 Methods

### 119.12.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKCustomOverlayRenderer reference from a declare.
The object is retained.
See also:

- 119.12.4 Constructor(overlay as MKOverlayMBS) 17164

### 119.12.4 Constructor(overlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:** The overlay can be any overlay, not just a MKCustomOverlayMBS one.
See also:

- 119.12.3 Constructor(Handle as Integer) 17164

### 119.12.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.12.6 Events

### 119.12.7 canDrawMapRect(mapRect as MKMapRectMBS, zoomScale as Double) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: .

**Function:** Event to return a Boolean value indicating whether the overlay view is ready to draw its content.
**Example:**

```
Function canDrawMapRect(mapRect as MKMapRectMBS, zoomScale as Double) Handles canDrawMapRect as Boolean
Return True
End Function
```

**Notes:** mapRect: The map rectangle that needs to be updated.
zoomScale: The current scale factor applied to the map.

Return yes if this overlay renderer is ready to draw its contents on the map or false if it is not.

Overlay renderers can override this method in situations where they may depend on the availability of other information to draw their contents. For example, a renderer showing traffic information might want to delay drawing until it has all of the traffic data it needs. In such a case, it can return NO from this method to indicate that it is not ready. An overlay renderer might also return false if it does not draw content in the specified rectangle.

If you return false from this method, your application is responsible for calling the setNeedsDisplayInMapRect method when the overlay renderer subsequently becomes ready to draw its contents.

The default implementation of this method returns YES.

As callback may come on a thread, MBS Xojo Plugin invokes event on the main thread. For best performance, please make sure your code does not take long time to execute.

### 119.12.8 DrawMapRect(mapRect as MKMapRectMBS, zoomScale as Double, context as CGContextMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: .

**Function:** The event to draw the overlay,Äôs contents at the specified location on the map.
**Example:**

```
Sub DrawMapRect(mapRect as MKMapRectMBS, zoomScale as Double, context as CGContextMBS) Handles DrawMapRect
// change coordinate system to show just our area
Dim rect As CGRectMBS = Self.RectForMapRect(overlay.boundingMapRect)
context.ScaleCTM(1.0, -1.0)
context.TranslateCTM(0.0, -rect.size.height)

// and fill it all in red
context.SetRGBFillColor 1,0,0,0.3
context.FillRect rect

context.Flush
End Sub
```

**Notes:** mapRect: The map rectangle that needs to be updated. Your drawing code should avoid drawing outside of this rectangle.
zoomScale: The current zoom factor applied to the map content. You can use this value for configuring the stroke width of lines or other attributes that might be affected by the scale of the map,Äôs contents.
context: The graphics context to use for drawing the overlay,Äôs contents.

The default implementation of this method does nothing. Subclasses are expected to implement this event and use it to draw the overlay,Äôs contents.

When determining where to draw content, make your initial calculations relative to the map itself. In other words, compute the position and size of any overlay content using map points and map rectangles, convert those values to regular CGPoint and CGRect types using the methods of this class, and then pass the converted points to any drawing primitives.
It is recommended that you use Core Graphics to draw any content for your overlays.

To improve drawing performance, the map view may divide your overlay into multiple tiles and render each one on a separate thread.

As callback may come on a thread, MBS Xojo Plugin invokes event on the main thread. For best performance, please make sure your code does not take long time to execute.

## 119.13 class MKDirectionsMBS

### 119.13.1 class MKDirectionsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A utility object that computes directions and travel-time information based on the route information you provide.
**Notes:** You use an MKDirections object to ask the Apple servers to provide walking or driving directions for a route, which you specify using an MKDirectionsRequestMBS object. After making a request, MapKit delivers the results asynchronously to the completion handler that you provide. You can also get the estimated travel time for the route.

Each MKDirectionsMBS object handles a single request for directions, although you can cancel and restart that request as needed. You can create multiple instances of this class and process different route requests at the same time, but you should make requests only when you plan to present the corresponding route information to the user. Apps may receive a MKErrorLoadingThrottled error if too many requests have been made from the current device in too short a time period.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

### 119.13.2 Methods

### 119.13.3 calculateDirections(tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Begins calculating the requested route information asynchronously.
**Notes:** Calls calculateDirectionsCompleted event later.

This method initiates the request for directions and calls your calculateDirectionsCompleted event with the results. The implementation of your event handler should check for errors and then incorporate the response data as appropriate.

If you call this method while a previous request is in process, this method calls your event with an error. You can determine if a request is in process by checking the value of the calculating property. You can also cancel a request as needed.

### 119.13.4 calculateETA(tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Begins calculating the requested travel-time information asynchronously.
**Notes:** This method initiates a request for a travel-time estimate and calls your calculateETAWithCompleted event handler block with the results. Travel-time estimates take much less time to generate than directions, so use this method in situations where you want a time estimate only. The implementation of your handler should check for errors and then incorporate the response data as appropriate.

If you call this method while a previous request is in process, this method calls your event handler with an error. You can determine if a request is in process by checking the value of the calculating property. You can also cancel a request as needed.

### 119.13.5 cancel

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels a pending request.
**Notes:** After canceling a request, you can call the calculateDirections method again (if you want) to restart the request process.

### 119.13.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKDirections reference from a declare.
The object is retained.
See also:

- 119.13.7 Constructor(request as MKDirectionsRequestMBS) 17168

### 119.13.7 Constructor(request as MKDirectionsRequestMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a directions object using the specified request.
**Notes:** request: The request object containing the start and end points of the route. This parameter must not be nil.

After initializing your directions object, you must call the calculateDirections or calculateETA method to perform the request.

See also:

- 119.13.6 Constructor(Handle as Integer) 17168

### 119.13.8 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.13.9 Properties

### 119.13.10 Calculating as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether a request is currently in process.
**Notes:** (Read only property)

### 119.13.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.13.12 Request as MKDirectionsRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The request used to create this object.
**Notes:** (Read only property)

### 119.13.13 Events

### 119.13.14 calculateDirectionsCompleted(response as MKDirectionsResponseMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The event called when calculateDirections method finished.
**Notes:** This event takes three parameters:

- The response parameter contains the route information for the request. If an error occurred or no route could be determined, this parameter is nil.
- The error parameter contains information about any errors that occurred. If no errors occurred, this parameter is nil.
- The tag passed to the method.

The implementation of your block should check for a value in the error parameter and, if that parameter is nil, incorporate the route information provided in the response parameter.

### 119.13.15 calculateETAWithCompleted(response as MKETAResponseMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Event called by calculateETA when method is done.

## 119.14 class MKDirectionsRequestMBS

### 119.14.1 class MKDirectionsRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The start and end points of a route, along with the planned mode of transportation.
**Notes:** You use an MKDirectionsRequestMBS object when requesting or providing directions. If your app provides directions, use this class to decode the URL sent to you by Maps. If you need to request directions from Apple, pass an instance of this class to an MKDirections object. For example, an app that provides subway directions might request walking directions to and from relevant subway stations.

For apps that provide directions, you receive direction-related URLs in your app delegate,Äôs application:openURL:sourceApplication:annotation: method. Upon receiving a URL, call the isDirectionsRequestURL method of this class to determine if the URL is related to routing directions. If it is, create an instance of this class using the provided URL and extract the map items associated with the start and end points.

To provide routing directions, your app must include special keys in its Info.plist file and be able to handle URLs sent to it by the Maps app. These keys indicate a special URL type that your app must be prepared to handle. For information about how to implement this support, see Location and Maps Programming Guide.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

### 119.14.2 Methods

### 119.14.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The construtor.
See also:


- 119.14.4 Constructor(Handle as Integer) 17171
- 119.14.5 Constructor(URL as string) 17172


### 119.14.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKDirectionsRequest reference from a declare.
The object is retained.
See also:

- 119.14.3 Constructor 17171
- 119.14.5 Constructor(URL as string) 17172

### 119.14.5 Constructor(URL as string)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a directions request object using the specified URL.
**Notes:** You should use the isDirectionsRequestURL method to verify that the specified URL is of the correct format before calling this method to initialize the object.
See also:

- 119.14.3 Constructor 17171
- 119.14.4 Constructor(Handle as Integer) 17171

### 119.14.6 isDirectionsRequestURL(URL as string) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the specified URL contains a directions request.
**Notes:** True if the URL contains a directions request that your app should display to the user or false if it does not.

### 119.14.7 Properties

### 119.14.8 arrivalDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The arrival date for the trip.
**Notes:** Specifying an arrival date provides the server with extra information that it can use to optimize the returned routes. For example, for a trip that takes place during commute hours, the server might consider alternatives to routes that are typically congested at that time.
The use of this property is optional.
(Read and Write property)

### 119.14.9 arrivalDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The arrival date for the trip.
**Notes:** Specifying an arrival date provides the server with extra information that it can use to optimize the returned routes. For example, for a trip that takes place during commute hours, the server might consider alternatives to routes that are typically congested at that time.
The use of this property is optional.
(Read and Write property)

### 119.14.10 departureDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The departure date for the trip.
**Notes:** Specifying a departure date provides the server with extra information that it can use to optimize the returned routes. For example, for a trip that takes place during commute hours, the server might consider alternatives to routes that are typically congested at that time.
The use of this property is optional.
(Read and Write property)

### 119.14.11 departureDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The departure date for the trip.
**Notes:** Specifying a departure date provides the server with extra information that it can use to optimize the returned routes. For example, for a trip that takes place during commute hours, the server might consider alternatives to routes that are typically congested at that time.
The use of this property is optional.
(Read and Write property)

### 119.14.12 destination as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The end point for routing directions.
**Notes:** (Read and Write property)

### 119.14.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.14.14 requestsAlternateRoutes as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether your app wants multiple routes when they are available.
**Notes:** When this property is set to false, the server returns a single route between the start and end points. When this property is YES, the server may return additional routes for the user to follow. The server returns additional routes only if they are available and represent a reasonable path that the user might take.
The default value of this property is false.
(Read and Write property)

### 119.14.15 source as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The starting point for routing directions.
**Notes:** (Read and Write property)

### 119.14.16 transportType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of conveyance to which the directions should apply.
**Notes:** You can use this property to specify whether you want directions suited to a particular type of transportation. For example, you can use this to specify that you want walking directions or driving directions.
The default value of this property is TransportTypeAny.
(Read and Write property)

### 119.14.17 Constants

Transport Types

| Constant | Value | Description |
|---|---|---|
| TransportTypeAny | &h0FFFFFFF | Directions suitable for any transportation option. |
| TransportTypeAutomobile | 1 | Directions suitable for use while driving. |
| TransportTypeTransit | 3 | Directions suitable for public transportation. |
| TransportTypeWalking | 2 | Directions suitable for a pedestrian. |

## 119.15 class MKDirectionsResponseMBS

### 119.15.1 class MKDirectionsResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The route information returned by Apple servers in response to one of your requests for directions.
**Notes:** You do not create instances of this class directly. Instead, you initiate a request for directions by calling the calculateDirection method of an MKDirectionsMBS object. The calculateDirectionCompleted event handler receives an MKDirectionsResponseMBS object with the results.
**Blog Entries**

- MapKit Framework for Xojo

### 119.15.2 Methods

### 119.15.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.15.4 Constructor(Handle as Integer) 17176

### 119.15.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKDirectionsResponse reference from a declare.
The object is retained.
See also:

- 119.15.3 Constructor 17176

### 119.15.5 routes as MKRouteMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of route objects representing the directions between the start and end points.
**Notes:** The array contains one or more MKRouteMBS objects, each of which represents a possible set of directions for the user to follow. If you did not request alternate routes in the original directions request, this array contains at most one object.
Each route object contains geometry information that you can use to display that route on your app,Äôs

map view. Routes may also contain additional information that is relevant to that particular route, such as the expected travel time and any trip advisory notices.

### 119.15.6 Properties

### 119.15.7 destination as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The end point of the route.
**Notes:** The item in this property may contain additional details that were not included in the original item used to create the MKDirectionsRequestMBS object.
(Read only property)

### 119.15.8 firstRoute as MKRouteMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first route.
**Notes:** Mainly for debugging, so you can see the routes in debugger.
(Read only property)

### 119.15.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.15.10 routeCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Number of routes.
**Notes:** (Read only property)

### 119.15.11 source as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The start point of the route.
**Notes:** The item in this property may contain additional details that were not included in the original item used to create the MKDirectionsRequestMBS object.
(Read only property)

### 119.15.12 Constants

Transport Types

| Constant | Value | Description |
|---|---|---|
| TransportTypeAny | &h0FFFFFFF | Directions suitable for any transportation option. |
| TransportTypeAutomobile | 1 | Directions suitable for use while driving. |
| TransportTypeTransit | 3 | Directions suitable for public transportation. |
| TransportTypeWalking | 2 | Directions suitable for a pedestrian. |

# 119.16 class MKDistanceFormatterMBS

## 119.16.1 class MKDistanceFormatterMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A utility object that converts between a geographic distance and a string-based expression of that distance.
**Example:**

```
dim f as new MKDistanceFormatterMBS

f.Units = f.UnitsMetric
f.UnitStyle = f.UnitStyleFull

MsgBox f.stringFromDistance(1234.56)
```

**Notes:** You use a distance formatter when you need to display distances to the user or when you want to parse user-specified text to obtain a numerical value for a distance. When formatting strings containing distances, a distance formatter object takes into account the user,Äôs locale and language settings. You can also specify a custom locale or custom units for any distances that you format.
**Blog Entries**

- MapKit Framework for Xojo

## 119.16.2 Methods

## 119.16.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.16.4 Constructor(Handle as Integer) 17179

## 119.16.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKDistanceFormatter reference from a declare.
The object is retained.
See also:

• 119.16.3 Constructor 17179

### 119.16.5 distanceFromString(distance as String) as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the distance value parsed from the specified string.
**Notes:** distance: A formatted string that specifies a distance.

Returns the distance value represented by the string or -1.0 if the string does not contain a recognized distance value.

This method searches the provided string for a number that could represent a distance. Distances must be specified as purely numerical values. Do not specify distances as fractions such as "1/4 mile".

### 119.16.6 formatter as MKDistanceFormatterMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The singelton instance for easy use.
**Example:**

```
// shows e.g. 1,2km
// depending on the locale
MsgBox MKDistanceFormatterMBS.formatter.stringFromDistance(1234)
```

**Notes:** The plugin keeps an object, so you get the same one everytime and you can reuse it often.

### 119.16.7 stringFromDistance(distance as Double) as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a string representation of the specified distance.
**Notes:** distance: The distance value that you want to convert to a string.

Returns a user-readable string that describes the distance based on the formatter settings.

### 119.16.8 Properties

### 119.16.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.16.10 Locale as NSLocaleMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The locale to use when formatting strings.
**Notes:** If you do not specify an explicit locale, the formatter uses the user,Äôs current locale information.
(Read and Write property)

### 119.16.11 Units as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The measuring system (imperial or metric) to use for units.
**Notes:** You can use this property to explicitly set the measuring system for units. The default value of this property is UnitsDefault, which bases the measuring system on the user,Äôs locale.
(Read and Write property)

### 119.16.12 UnitStyle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The preferred style for units.
**Notes:** Units can be abbreviated or fully spelled out. The default value of this property is UnitStyleDefault, which bases the style on the user,Äôs locale and language settings.
(Read and Write property)

### 119.16.13 Constants

Units

| Constant | Value | Description |
|---|---|---|
| UnitsDefault | 0 | The format uses the locale information to determine which units to use. Some locales mix metric and imperial units so do not assume this means one or the other. |
| UnitsImperial | 2 | The format uses imperial units. |
| UnitsImperialWithYards | 3 | The format uses imperial units that include measurements in yards. |
| UnitsMetric | 1 | The format uses metric units. |

Util Styles

| Constant | Value | Description |
|---|---|---|
| UnitStyleAbbreviated | 1 | Use abbreviated units. For example, use the abbreviation km instead of kilometer. |
| UnitStyleDefault | 0 | The decision to abbreviate is based on the current locale and user language settings. |
| UnitStyleFull | 2 | Spell out units in full. For example, use kilometer instead of the abbreviation km. |

# 119.17 class MKETAResponseMBS

## 119.17.1 class MKETAResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The travel-time information returned by Apple servers.
**Notes:** You do not create instances of this class directly. Instead, you initiate a request for the travel time by calling the calculateETA method of an MKDirectionsMBS object. The completion event handler receives an MKETAResponseMBS object with the results.
**Blog Entries**

- MapKit Framework for Xojo

## 119.17.2 Methods

## 119.17.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.17.4 Constructor(Handle as Integer) 17183

## 119.17.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKETAResponse reference from a declare.
The object is retained.
See also:

- 119.17.3 Constructor 17183

## 119.17.5 Properties

## 119.17.6 destination as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The end point of the route.
**Notes:** The item in this property may contain additional details that were not included in the original item

used to create the MKDirectionsRequestMBS object.
(Read only property)

### 119.17.7 distance as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The expected travel distance, in meters.
**Notes:** This property contains the overall distance traversed by the route.
(Read only property)

### 119.17.8 expectedArrivalDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The expected arrival time.
**Notes:** The value of this property is dependent on whether you specified a departure date or arrival date in your MKDirectionsRequestMBS object. If you specified a departure date, the date in this property is computed by starting at your departure date and adding the expected travel time. If you specified an arrival time but not a departure date, this property is set to your arrival time. If you did not specify an arrival date or departure date, this property is set to the date computed by adding the travel time to the current time.
(Read only property)

### 119.17.9 expectedArrivalDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The expected arrival time.
**Notes:** The value of this property is dependent on whether you specified a departure date or arrival date in your MKDirectionsRequestMBS object. If you specified a departure date, the date in this property is computed by starting at your departure date and adding the expected travel time. If you specified an arrival time but not a departure date, this property is set to your arrival time. If you did not specify an arrival date or departure date, this property is set to the date computed by adding the travel time to the current time.
(Read only property)

### 119.17.10 expectedDepartureDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The expected departure time.
**Notes:** The value of this property is dependent on whether you specified a departure date or arrival date in

your MKDirectionsRequestMBS object. If you specified a departure date, that date is copied to this property. If you specified an arrival date but not a departure date, the departure date is computed by subtracting the expected travel time from your arrival date. If you did not specify an arrival date or departure date, this property is set to the current time.
(Read only property)

### 119.17.11 expectedDepartureDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The expected departure time.
**Notes:** The value of this property is dependent on whether you specified a departure date or arrival date in your MKDirectionsRequestMBS object. If you specified a departure date, that date is copied to this property. If you specified an arrival date but not a departure date, the departure date is computed by subtracting the expected travel time from your arrival date. If you did not specify an arrival date or departure date, this property is set to the current time.
(Read only property)

### 119.17.12 expectedTravelTime as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The expected travel time in seconds.
**Notes:** The expected travel time reflects the time it takes to traverse the route, taking expected traffic into account. The actual amount of time may vary based on changes in traffic and other travel conditions.
(Read only property)

### 119.17.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.17.14 source as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The start point of the route.
**Notes:** This item in this property may contain additional details that were not included in the original item used to create the MKDirectionsRequestMBS object.

(Read only property)

### 119.17.15 transportType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of conveyance used to determine the travel time.
**Notes:** You specify the desired transportation type in your MKDirectionsRequestMBS object. If you specified TransportTypeAny, this property contains the transportation type used to generate the estimated information.
(Read only property)

### 119.17.16 Constants

Transport Types

| Constant | Value | Description |
|---|---|---|
| TransportTypeAny | &h0FFFFFFF | Directions suitable for any transportation option. |
| TransportTypeAutomobile | 1 | Directions suitable for use while driving. |
| TransportTypeTransit | 3 | Directions suitable for public transportation. |
| TransportTypeWalking | 2 | Directions suitable for a pedestrian. |

# 119.18 class MKGeodesicPolylineMBS

## 119.18.1 class MKGeodesicPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A line-based shape that follows the contours of the Earth to create the shortest path between the specified points.
**Notes:** A geodesic polyline contains a set of points that are connected end-to-end in the order that you provide them. The first and last points are not automatically connected to each other. When displayed on a two-dimensional map view, the line segment between any two points may appear curved.
Subclass of the MKPolylineMBS class.
**Blog Entries**

- MapKit Framework for Xojo

## 119.18.2 Methods

## 119.18.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:


- 119.18.4 Constructor(coords() as CLLocationCoordinate2DMBS) 17187
- 119.18.5 Constructor(Handle as Integer) 17188
- 119.18.6 Constructor(points() as MKMapPointMBS) 17188


## 119.18.4 Constructor(coords() as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a geodesic polyline using the specified coordinates.
**Notes:** coords: The array of coordinates that define the path.

Returns a new geodesic polyline object.
See also:


- 119.18.3 Constructor 17187
- 119.18.5 Constructor(Handle as Integer) 17188
- 119.18.6 Constructor(points() as MKMapPointMBS) 17188

### 119.18.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKGeodesicPolyline reference from a declare.
The object is retained.
See also:


- 119.18.3 Constructor 17187
- 119.18.4 Constructor(coords() as CLLocationCoordinate2DMBS) 17187
- 119.18.6 Constructor(points() as MKMapPointMBS) 17188


### 119.18.6 Constructor(points() as MKMapPointMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a geodesic polyline using the specified map points.
**Notes:** points: The array of map points that define the path.

Returns a new geodesic polyline object.
See also:


- 119.18.3 Constructor 17187
- 119.18.4 Constructor(coords() as CLLocationCoordinate2DMBS) 17187
- 119.18.5 Constructor(Handle as Integer) 17188


### 119.18.7 polylineWithCoordinates(coords() as CLLocationCoordinate2DMBS) as MKGeodesicPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a geodesic polyline using the specified coordinates.
**Notes:** coords: The array of coordinates that define the path.

Returns a new geodesic polyline object.

### 119.18.8 polylineWithPoints(points() as MKMapPointMBS) as MKGeodesicPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a geodesic polyline using the specified map points.
**Notes:** points: The array of map points that define the path.

Returns a new geodesic polyline object.

## 119.19 class MKLocalSearchCompleterMBS

### 119.19.1 class MKLocalSearchCompleterMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A utility object for generating a list of completion strings based on a partial search string that you provide.
**Notes:** You use an MKLocalSearchCompleter object to retrieve auto-complete suggestions for your own map-based search controls. As the user types text, you feed the current text string into the search completer object, which delivers possible string completions that match locations or points of interest.

You create and configure MKLocalSearchCompleterMBS objects yourself. You should subclass this class to fill the event handler. You should also specify a search region to restrict results to a designated area.

Update the value of the completer,Äôs queryFragment property to begin a search query. You can update this property in real time as the user types new characters into a text field because the completer object waits a short amount of time for the query string to stabilize. When modifications to the query strong stop, the completer initiates a new search and returns the results to your delegate as an array of MKLocalSearch-CompletionMBS objects.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 17.6, page 36: Maps Part 2, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.19.2 Methods

### 119.19.3 cancel

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels an in-progress search operation.
**Notes:** If a search operation is currently in progress, this method attempts to cancels it. If cancellation is successful, the search completer does not notify its delegate. If no search operation is in progress, this method does nothing.

### 119.19.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 119.19.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.19.6 results as MKLocalSearchCompletionMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The most recently received search completions.
**Notes:** This property is nil initially. After a successful query, the property is set to the array of MKLocalSearchCompletionMBS objects returned by that query. Each new successful query replaces the previous value of this property.

### 119.19.7 Properties

### 119.19.8 filterType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The filter options for the search results.
**Notes:** Use this property to determine whether you want completions that represent points-of-interest or whether completions might yield additional relevant query strings.
(Read and Write property)

### 119.19.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.19.10 QueryFragment as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The search string for which you want completions.
**Notes:** Assigning a string to this property initiates a search based on that string. The completer object waits a short amount of time before initiating new searches. This delay gives you enough time to update the search string based on typed input from the user. For example, if you are using a text field to manage the input from the user, you could use the TextChange event to update the value of this property.
(Read and Write property)

### 119.19.11 region as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The region that defines the geographic scope of the search.
**Notes:** Use this property to limit search results to the specified geographic area. The default value of this property is a region that spans the entire world.
(Read and Write property)

### 119.19.12 Searching as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether a search operation is in progress.
**Notes:** (Read only property)

### 119.19.13 Events

### 119.19.14 DidFailWithError(error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Called when the specified search completer is unable to generate a list of search results.
**Notes:** completer: The search completer object reporting the error.
error: The error object containing the reason for the failure.

Use this object to process any errors that occurred while generating search results. Even when an error occurs, the search completer starts a new search if it already has a new search string. Depending on the error, you might do nothing or let the user know that you were unable to obtain a list of search completions.

### 119.19.15 DidUpdateResults

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Called when the specified search completer updates its array of search completions.
**Notes:** After receiving results from a query, the search completer updates its results property with the new MKLocalSearchCompletionMBS objects and calls this method. Use this method to update your app,Äôs interface based on the new search results. For example, you might update a table that you use to display search results to the user.

### 119.19.16 Constants

Filter Types

| Constant | Value | Description |
|---|---|---|
| FilterTypeLocationsAndQueries | 0 | Points of interest and query suggestions. Specify this value when you want both map-based points of interest and common query terms used to find locations. For example, the search string ,Äúcof,Äù yields a completion for ,Äúcoffee,Äù. |
| FilterTypeLocationsOnly | 1 | Points of interest only. Specify this value when you want the search string to yield completions that correspond to a specific point-of-interest on the map. |

## 119.20 class MKLocalSearchCompletionMBS

### 119.20.1 class MKLocalSearchCompletionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A fully formed string that completes a partial string.
**Notes:** You do not create instances of this class directly. Instead, you use an MKLocalSearchCompleterMBS to initiate a search based on a set of partial search strings. That object stores any matches in its results property. Retrieve any MKLocalSearchCompletionMBS objects from that property and display the search terms in your interface or use one to initiate a search for content based on that search term.

When displaying text completions for a partial search term in your user interface, you might want to use a bold version of a font or add some other highlighting to the portion of the completion string that caused it to match the partial search term. To help you add this styling, the completion object includes highlight ranges for the title and subtitle strings.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.3, page 77: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 18.3, page 74: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 17.6, page 36: Maps Part 2, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.20.2 Methods

### 119.20.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructors.

### 119.20.4 subtitleHighlightRanges as NSRangeMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The ranges of characters to highlight in the subtitle string.
**Notes:** This property contains an array of NSRangeMBS objects, each defining a range of characters in the subtitle string. Use this property to identify the ranges of characters in the subtitle string that you should highlight. Highlighting the matching text of a search completion is optional, but does provide helpful information to the user and is recommended.

Zerobased ranges.

### 119.20.5 titleHighlightRanges as NSRangeMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The ranges of characters to highlight in the title string.
**Notes:** This property contains an array of NSRangeNBS objects, each defining a range of characters in the title string. Use this property to identify the ranges of characters in the title string that you should highlight. Highlighting the matching text of a search completion is optional, but does provide helpful information to the user and is recommended.

Range is zero based.

### 119.20.6 Properties

### 119.20.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.20.8 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle (if any) associated with the point-of-interest.
**Notes:** The string in this property may be empty.
(Read only property)

### 119.20.9 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title string associated with the point-of-interest.
**Notes:** This string is guaranteed not to be empty.
(Read only property)

# 119.21 class MKLocalSearchMBS

## 119.21.1 class MKLocalSearchMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A utility object for initiating map-based searches and processing the results.
**Notes:** Use an MKLocalSearchMBS object to execute a single search request. You might use this class to search for addresses or points of interest on the map. Upon completion of the request, the object delivers the results to the SearchFinished event handler that you provide.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 17.6, page 34: Maps Part 2, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

## 119.21.2 Methods

## 119.21.3 cancel

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels an in-progress search operation.
**Notes:** If no search operation is in progress, this method does nothing.

## 119.21.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKLocalSearch reference from a declare.
The object is retained.
See also:

- 119.21.5 Constructor(request as MKLocalSearchRequestMBS) 17197

## 119.21.5 Constructor(request as MKLocalSearchRequestMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a search object configured with the specified parameters.
**Notes:** request: The search request information. This parameter must not be nil.

This method stores a copy of the object in the request parameter. So any changes you make to your request object after calling this method are ignored.
See also:

- 119.21.4 Constructor(Handle as Integer) 17197

### 119.21.6 Start(tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Starts the search and delivers the results to the specified completion handler.
**Notes:** Triggers SearchFinished event later.

You use this method to initiate a map-based search operation. The search runs until the results are delivered, at which point the specified completion handler is called.
You should call this method only once to start the search operation. Calling this method while the search is running does not stop the original search operation from finishing. However, for each subsequent call, the search object executes your completion handler and passes an error object to it.
The provided completion handler is always executed on your app,Äôs main thread. The local search object keeps a reference to the completion handler block until the results (or an error) are delivered, at which point it relinquishes that reference.

### 119.21.7 Properties

### 119.21.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.21.9 Searching as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the search is currently in progress.
**Notes:** The value of this property is set to true when a search is initiated and remains in that state until the search results (or an appropriate error) are delivered, at which time the property is set to false.
(Read only property)

### 119.21.10 Events

### 119.21.11 SearchFinished(response as MKLocalSearchResponseMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The event handler that processes the results. This parameter must not be nil.
**Notes:** Called by Start asynchronously.

## 119.22 class MKLocalSearchRequestMBS

### 119.22.1 class MKLocalSearchRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The parameters to use when searching for points of interest on the map.
**Notes:** You create an MKLocalSearchRequest object when you want to search for map locations based on a natural language string. For example, if your interface allows the user to type in addresses, you would place the typed text in this object and pass it to an MKLocalSearch object to begin the search process. When specifying your search strings, include a map region to narrow the search results to the specified geographical area.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.3, page 77: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 119.22.2 Methods

### 119.22.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:


- 119.22.4 Constructor(completion as MKLocalSearchCompletionMBS) 17200
- 119.22.5 Constructor(Handle as Integer) 17201


### 119.22.4 Constructor(completion as MKLocalSearchCompletionMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a search request based on the specified search completion data.
**Notes:** completion: A search completion object obtained from an MKLocalSearchCompleterMBS object. The search request uses the provided object to set the value of the naturalLanguageQuery property.

Use this method when initializing your object from MKLocalSearchCompleterMBS objects. You do not need to use this method if you intend to provide the search string and region information yourself.
See also:

- 119.22.3 Constructor 17200
- 119.22.5 Constructor(Handle as Integer) 17201


### 119.22.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKLocalSearchRequest reference from a declare.
The object is retained.
See also:


- 119.22.3 Constructor 17200
- 119.22.4 Constructor(completion as MKLocalSearchCompletionMBS) 17200


### 119.22.6 Copy as MKLocalSearchRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the request.

### 119.22.7 Properties

### 119.22.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.22.9 naturalLanguageQuery as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string containing the desired search item.
**Notes:** You specify this parameter as a string describing the map-based item you want to look for. The text is equivalent to what the user would type in a search field in the Maps app. For example, the text might contain all or part of an address or it might contain the name of a point of interest.
(Read and Write property)

### 119.22.10 region as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A map region that provides a hint as to where to search.
**Notes:** You can use this parameter to narrow the list of search results to those inside or close to the specified region. Specifying a region does not guarantee that the results will all be inside the region. It is merely a hint to the search engine.
(Read and Write property)

# 119.23 class MKLocalSearchResponseMBS

## 119.23.1 class MKLocalSearchResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The results from a map-based search.
**Notes:** You do not create instances of this class directly. After initiating a map search using an MKLocalSearchMBS object, MapKit passes an instance of this class to your event handler.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.3, page 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 18.3, page 72: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 17.6, page 35: Maps Part 2, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

## 119.23.2 Methods

## 119.23.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.23.4 Constructor(Handle as Integer) 17203

## 119.23.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKLocalSearchResponse reference from a declare.
The object is retained.
See also:

- 119.23.3 Constructor 17203

### 119.23.5 mapItems as MKMapItemMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of map items representing the search results.
**Notes:** This property contains an array of MKMapItemMBS objects, each of which represents a returned search result. You can use these objects to retrieve information about the search result, such as the name of the point of interest, the address, the geographic location, and so on.

### 119.23.6 Properties

### 119.23.7 boundingRegion as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The map region that encloses the returned search results.
**Notes:** The returned region is the smallest bounding box that encloses all of the map items. If there is only one search result, the size of the region may be (0, 0).
(Read only property)

### 119.23.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

# 119.24 class MKMapCameraMBS

## 119.24.1 class MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A virtual camera for defining the appearance of the map.
**Notes:** A camera object defines a virtual viewpoint above the map surface and affects how the map is presented to the user. You use a camera object to specify the location of the camera on the map, the compass heading indicating the camera,Äôs viewing direction, the pitch of the camera relative to the map perpendicular, and the camera,Äôs altitude above the map. These factors create a map view with a three dimensional perspective.
After creating an instance of this class, configure it with the desired attributes and assign it to your map view. When you assign a camera to your map view, the map centers the map using the value in your camera object,Äôs centerCoordinate property, updating the map,Äôs own region information in the process. The map also takes the camera,Äôs the pitch and altitude into account when calculating the visible region, ensuring that the region always encompasses the visible content on the map.
**Blog Entries**

- MapKit Framework for Xojo

## 119.24.2 Methods

## 119.24.3 camera as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object for you to configure.
**Notes:** You must change the values of the returned camera object before using it.

## 119.24.4 cameraLookingAtCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double) as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object using the specified distance, pitch, and heading information.
**Notes:** centerCoordinate: The coordinate point on which the map should be centered.
distance: The line-of-sight distance from the camera to the center coordinate of the map.
pitch: The viewing angle of the camera, measured in degrees. A value of 0 results in a camera pointed straight down at the map. Angles greater than 0 result in a camera that is pitched toward the horizon by the specified number of degrees.
heading: The heading of the camera (measured in degrees) relative to true north. The value 0 means that the top edge of the map view corresponds to true north. The value 90 means the top of the map is pointing

due east. The value 180 means the top of the map points due south, and so on.

Returns a new camera object initialized with the specified information.
The altitude of the camera is obtained by multiplying distance by the cosine of the pitch value.
See also:

- 119.24.5 cameraLookingAtCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double) as MKMapCameraMBS 17206

### 119.24.5 cameraLookingAtCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double) as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object using the specified viewing angle information.
**Notes:** centerCoordinate: The coordinate point on which the map should be centered.
eyeCoordinate: The coordinate point at which to place the camera. If the value for this parameter is equal to the value in the centerCoordinate parameter, the map is displayed as if the camera is looking straight down. If this point is offset from the centerCoordinate value, the map is displayed with an appropriate heading and pitch angle.
eyeAltitude: The altitude (in meters) above the ground at which to place the camera.

Returns a new camera object initialized with the specified information.

This method calculates the required pitch and heading angles to accommodate the specified eye position and altitude.
See also:

- 119.24.4 cameraLookingAtCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double) as MKMapCameraMBS 17205

### 119.24.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object for you to configure.
**Notes:** You must change the values of the returned camera object before using it.
See also:

- 119.24.7 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double) 17207
- 119.24.8 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double) 17207

- 119.24.9 Constructor(Handle as Integer) 17208


### 119.24.7 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object using the specified distance, pitch, and heading information.
**Notes:** centerCoordinate: The coordinate point on which the map should be centered.
distance: The line-of-sight distance from the camera to the center coordinate of the map.
pitch: The viewing angle of the camera, measured in degrees. A value of 0 results in a camera pointed straight down at the map. Angles greater than 0 result in a camera that is pitched toward the horizon by the specified number of degrees.
heading: The heading of the camera (measured in degrees) relative to true north. The value 0 means that the top edge of the map view corresponds to true north. The value 90 means the top of the map is pointing due east. The value 180 means the top of the map points due south, and so on.

Returns a new camera object initialized with the specified information.
The altitude of the camera is obtained by multiplying distance by the cosine of the pitch value.
See also:


- 119.24.6 Constructor 17206
- 119.24.8 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double) 17207
- 119.24.9 Constructor(Handle as Integer) 17208


### 119.24.8 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new camera object using the specified viewing angle information.
**Notes:** centerCoordinate: The coordinate point on which the map should be centered.
eyeCoordinate: The coordinate point at which to place the camera. If the value for this parameter is equal to the value in the centerCoordinate parameter, the map is displayed as if the camera is looking straight down. If this point is offset from the centerCoordinate value, the map is displayed with an appropriate heading and pitch angle.
eyeAltitude: The altitude (in meters) above the ground at which to place the camera.

Returns a new camera object initialized with the specified information.

This method calculates the required pitch and heading angles to accommodate the specified eye position and altitude.
See also:

- 119.24.6 Constructor 17206
- 119.24.7 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double) 17207
- 119.24.9 Constructor(Handle as Integer) 17208


### 119.24.9 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMapCamera reference from a declare.
The object is retained.
See also:


- 119.24.6 Constructor 17206
- 119.24.7 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, distance as double, pitch as double, heading as double) 17207
- 119.24.8 Constructor(centerCoordinate as CLLocationCoordinate2DMBS, eyeCoordinate as CLLocationCoordinate2DMBS, eyeAltitude as double) 17207


### 119.24.10 copy as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the camera object.

### 119.24.11 Properties

### 119.24.12 altitude as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The altitude above the ground, measured in meters.
**Notes:** The value you specify for this property must not be less than 0.
Changing this property may also change the maximum pitch that is allowed for the map. If the current pitch value exceeds the new maximum, the pitch property is clamped to the new maximum.
(Read and Write property)

### 119.24.13 centerCoordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The map coordinate at the center of the map view.
**Notes:** This point represents the coordinate on which the map should be centered. When the camera pitch is 0, this property also corresponds to the geographic position of the camera. Changing the pitch to a nonzero value moves the camera but does not affect this property.
(Read and Write property)

### 119.24.14 heading as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The heading of the camera (measured in degrees) relative to true north.
**Notes:** The value 0 means that the top edge of the map view corresponds to true north. The value 90 means the top of the map is pointing due east. The value 180 means the top of the map points due south, and so on.
(Read and Write property)

### 119.24.15 pitch as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The viewing angle of the camera, measured in degrees.
**Notes:** A value of 0 results in a camera pointed straight down at the map. Angles greater than 0 result in a camera that is pitched toward the horizon by the specified number of degrees. If the map type is MapTypeSatellite or MapTypeHybrid, the pitch value is clamped to 0.
The value in this property may be clamped to a maximum value to maintain map readability. There is no fixed maximum value, though, because the actual maximum value is dependent on the current altitude of the camera.
(Read and Write property)

## 119.25 class MKMapItemMBS

### 119.25.1 class MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A point of interest on the map.
**Notes:** A map item includes a geographic location and any interesting data that might apply to that location, such as the address at that location and the name of a business at that address. You can also create a special MKMapItem object representing the user's current location.

Use this class to do the following:

- Share map-related data with the Maps app.
- Handle requests for directions that originate from the Maps app.

To display information in Maps, create an MKMapItem object with the information you want to display and call the openMapsWithItems method. Maps displays that location on the map and shows the information you provide.
If you implement a routing app, Maps provides you with two MKMapItem objects representing the start and end points. Use the information in those two objects to plot the route and generate directions.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 18.4, page 73: Maps Part 5 (Finding and Displaying Addresses), Implementing Maps in Xojo desktop apps with the MapKitMBS plug-in by Markus Winter
- 18.3, pages 79 to 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter
- 17.6, page 35: Maps Part 2, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

### 119.25.2 Methods

### 119.25.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMapItem reference from a declare.
The object is retained.
See also:

- 119.25.4 Constructor(PlaceMark as MKPlacemarkMBS) 17211

### 119.25.4 Constructor(PlaceMark as MKPlacemarkMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a map item object using the specified placemark object.
**Notes:** placemark: The placemark object corresponding to the desired map location. This parameter must not be nil.

Use this method to create a map item for an existing placemark. Do not use it to create a map item representing the user,Äôs current location. To do that, use the mapItemForCurrentLocation method instead.
See also:

- 119.25.3 Constructor(Handle as Integer) 17210

### 119.25.5 mapItemForCurrentLocation as MKMapItemMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a singleton map item object representing the device,Äôs current location.
**Notes:** For privacy reasons, and because the user,Äôs location can change, the map item returned by this method does not contain any coordinate data. When you need the actual location of the user, you must use the Core Location framework to retrieve it.

### 119.25.6 MKLaunchOptionsCameraKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The virtual camera to use for viewing the map.
**Notes:** The value of this key is an MKMapCameraMBS object that describes a virtual camera that can specify a 3D perspective for the map. If you do not specify this key, Maps uses its current settings to define the appearance of the map.

### 119.25.7 MKLaunchOptionsDirectionsModeDefault as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Directions that match the user,Äôs preferred transportation type.

### 119.25.8 MKLaunchOptionsDirectionsModeDriving as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Driving directions between the specified start and end points.

### 119.25.9 MKLaunchOptionsDirectionsModeKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mode of transportation.
**Notes:** The value of this key is an NSString corresponding to one of the values described in Directions Mode Values. You specify this key to tell the Maps app which mode of transport to use when generating directions.

### 119.25.10 MKLaunchOptionsDirectionsModeTransit as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Public transit directions between the specified start and end points.

### 119.25.11 MKLaunchOptionsDirectionsModeWalking as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Walking directions between the specified start and end points.

### 119.25.12 MKLaunchOptionsMapCenterKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate value on which to center the map.
**Notes:** The value of this key is an NSValue object that contains an encoded CLLocationCoordinate2D structure.

### 119.25.13 MKLaunchOptionsMapSpanKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of the map to display.
**Notes:** The value of this key is an NSValue object that contains an encoded MKCoordinateSpan structure.

### 119.25.14 MKLaunchOptionsMapTypeKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of map (standard, satellite, or hybrid) to display.
**Notes:** The value of this key is an NSNumber object whose value is an integer corresponding to an MKMapType value.

### 119.25.15 MKLaunchOptionsShowsTrafficKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether to display traffic information.
**Notes:** The value of this key is a Boolean value. If you do not specify this key, Maps uses its current settings to determine whether or not to display traffic.

### 119.25.16 openInMaps(LaunchOptions as Dictionary) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Open the Maps app and display this map item.
**Notes:** launchOptions: Additional information that the Maps app can use to configure the map display. For example, you can use the launch options to specify the visible map region and the map type. For a list of keys you can put into this dictionary, see Launch Options Dictionary Keys.

This parameter may be nil.

Returns true if this map item was successfully opened by the Maps app, or false if there was an error.

You use this method to pass the current map item to the Maps app. If your map item contains descriptive information about the location (such as a name or URL), the Maps app displays that information at the specified coordinate.
If you specify the MKLaunchOptionsDirectionsModeKey option in the launchOptions dictionary, the Maps app interprets that as an attempt to map from the user,Äôs current location to the location specified by this

map item.
If you do not include the MKLaunchOptionsMapCenterKey and MKLaunchOptionsMapSpanKey keys in your launchOptions dictionary, Maps constructs a region around the current item. It uses that region to set the visible portion of the map.

### 119.25.17 openMapsWithItems(items() as MKMapItemMBS, launchOptions as Dictionary) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Open the Maps app and display the specified map items.
**Notes:** mapItems: An array containing one or more MKMapItemMBS objects representing the items you want to display on the map.
launchOptions: Additional information that the Maps app can use to configure the map display. For example, you can use the launch options to specify the visible map region, a 3D perspective, and the map type. For a list of keys you can put into this dictionary, see Launch Options Dictionary Keys.

You may specify nil for this parameter.

Returns true if the map items were successfully opened by the Maps app, or false if there was an error.

You use this method to pass one or more map items to the Maps app. For example, you might use this method to ask the Maps app to display location-based search results generated by your app. Maps displays pins at each location you specify and uses the contents of each map item object to display additional information.
If you specify the MKLaunchOptionsDirectionsModeKey option in the launchOptions dictionary, the mapItems array must have no more than two items in it. If the array contains one item, the Maps app generates directions from the user,Äôs current location to the location specified by the map item. If the array contains two items, the Maps app generates directions from the location of the first item to the location of the second item in the array.
If you do not include the MKLaunchOptionsMapCenterKey and MKLaunchOptionsMapSpanKey keys in your launchOptions dictionary, Maps constructs a region that encompasses the provided items. It uses this region to set the visible portion of the map.

### 119.25.18 Properties

### 119.25.19 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.25.20 isCurrentLocation as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the map item represents the user,Äôs current location.
**Notes:** If the value of this property is true, the map item represents the user,Äôs current location. If true, the value in the placemark property is set to nil.
(Read only property)

### 119.25.21 Name as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The descriptive name associated with the map item.
**Notes:** Use this property to specify the name associated with the location. For example, if there is a business at the specified location, you would use this property to specify the name of the business.
If this map item represents the user,Äôs current location, the value in property is set to a localized version of ,ÄúCurrent Location,Äù.
(Read and Write property)

### 119.25.22 phoneNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The phone number associated with a business at the specified location.
**Notes:** If there is a relevant phone number associated with the location, such as a phone number for a business at the location, use this property to specify that value.
(Read and Write property)

### 119.25.23 placemark as MKPlacemarkMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The placemark object containing the location information.
**Notes:** If you created the map item using the mapItemForCurrentLocation method, the value of this property is nil and the isCurrentLocation property is set to true.
(Read only property)

### 119.25.24 timeZone as NSTimeZoneMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The time zone of the specified location.
**Notes:** When you search for map items, MapKit populates this field with the time zone information as a convenience. You may also set the time zone for any map items you create.
(Read and Write property)

### 119.25.25 URL as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL associated with the specified location.
**Notes:** If there is a relevant URL associated with the location, such as a URL for a business at the location, use this property to specify that value.
(Read and Write property)

# 119.26 class MKMapPointMBS

## 119.26.1 class MKMapPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a point on the map.
**Example:**

```
// take some coordinates
dim c1 as new CLLocationCoordinate2DMBS(52.518611, 13.408333) // Berlin
dim c2 as new CLLocationCoordinate2DMBS(48.137222, 11.575556) // Munich

// convert to points on map
dim p1 as MKMapPointMBS = MKMapPointMBS.Point(c1)
dim p2 as MKMapPointMBS = MKMapPointMBS.Point(c2)

// show
MsgBox p1.StringValue+EndOfLine+p2.StringValue

// create locations
dim l1 as new CLLocationMBS(c1.latitude, c1.longitude)
dim l2 as new CLLocationMBS(c2.latitude, c2.longitude)

// show
MsgBox l1.Description+EndOfLine+l2.Description

// now get distance on two ways
dim d1 as Double = MKMapPointMBS.MetersBetweenMapPoints(p1,p2)
dim d2 as Double = l1.distanceFromLocation(l2)

// and format to show
dim s1 as string = MKDistanceFormatterMBS.formatter.stringFromDistance(d1)
dim s2 as string = MKDistanceFormatterMBS.formatter.stringFromDistance(d2)

MsgBox "Distance: "+s1+" vs. "+s2
// not the same due to rounding!
```

**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.4, page 49: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter

### 119.26.2 Methods

### 119.26.3 Constructor(other as MKMapPointMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The copy constructor.
See also:

- 119.26.4 Constructor(x as double = 0, y as double = 0) 17218

### 119.26.4 Constructor(x as double = 0, y as double = 0)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The map constructor.
See also:

- 119.26.3 Constructor(other as MKMapPointMBS) 17218

### 119.26.5 Coordinate(point as MKMapPointMBS) as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts point in map to coordinate.

### 119.26.6 Equal(other as MKMapPointMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Compares two point objects.
**Notes:** Returns true if both are equal.

### 119.26.7 MapPointsPerMeterAtLatitude(Latitude as Double) as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the number of map points that represent one meter at the given latitude.
**Notes:** The number of map points per meter increases as the latitude approaches the poles.

### 119.26.8 MetersBetweenMapPoints(point1 as MKMapPointMBS, point2 as MKMapPointMBS) as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the number of meters between two map points.
**Notes:** This distance reflects the actual distance between the two points on the surface of the globe, taking into account the curvature of the Earth.

### 119.26.9 MetersPerMapPointAtLatitude(Latitude as Double) as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the distance spanned by one map point at the specified latitude.
**Example:**

```
MsgBox str(MKMapPointMBS.MetersPerMapPointAtLatitude(50.0))
```

**Notes:** latitude: The latitude for which to return the value.

Returns the distance (in meters) spanned by a single map point.

The distance between map points decreases as the latitude approaches the poles. This relationship parallels the relationship between longitudinal coordinates at different latitudes.

### 119.26.10 Point(coordinate as CLLocationCoordinate2DMBS) as MKMapPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts coordinate in point in map.
See also:

- 119.26.11 Point(x as double = 0, y as double = 0) as MKMapPointMBS 17219

### 119.26.11 Point(x as double = 0, y as double = 0) as MKMapPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new point with given values.
See also:

- 119.26.10 Point(coordinate as CLLocationCoordinate2DMBS) as MKMapPointMBS 17219

### 119.26.12 Properties

### 119.26.13 StringValue as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats point as text for display in debugger.
**Example:**

```
dim p as new MKMapPointMBS(12, 34)

MsgBox p.StringValue
```

**Notes:** (Read only property)

### 119.26.14 X as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The X coordinate.
**Notes:** (Read and Write property)

### 119.26.15 Y as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Y coordinate.
**Notes:** (Read and Write property)

# 119.27 class MKMapRectMBS

## 119.27.1 class MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a map rectangle.
**Blog Entries**

- MapKit Framework for Xojo

## 119.27.2 Methods

## 119.27.3 Constructor(origin as MKMapPointMBS, size as MKMapSizeMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:** Copies values from point and size to build new rectangle.
See also:

- 119.27.4 Constructor(other as MKMapRectMBS) 17221
- 119.27.5 Constructor(x as double = 0, y as double = 0, w as double = 0, h as double = 0) 17221

## 119.27.4 Constructor(other as MKMapRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The copy constructor.
See also:

- 119.27.3 Constructor(origin as MKMapPointMBS, size as MKMapSizeMBS) 17221
- 119.27.5 Constructor(x as double = 0, y as double = 0, w as double = 0, h as double = 0) 17221

## 119.27.5 Constructor(x as double = 0, y as double = 0, w as double = 0, h as double = 0)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.27.3 Constructor(origin as MKMapPointMBS, size as MKMapSizeMBS) 17221
- 119.27.4 Constructor(other as MKMapRectMBS) 17221

### 119.27.6 Contains(other as MKMapPointMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if point is included in rectangle area.
See also:

- 119.27.7 Contains(other as MKMapRectMBS) as Boolean 17222

### 119.27.7 Contains(other as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if given rectangle is included in rectangle area.
See also:

- 119.27.6 Contains(other as MKMapPointMBS) as Boolean 17222

### 119.27.8 Divide(byref slice as MKMapRectMBS, byref remainder as MKMapRectMBS, amount as double, edge as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Divides rectangle in slice and remainder.

### 119.27.9 Equal(other as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Compares two rectangle objects.
**Notes:** Returns true if both are equal.

### 119.27.10 Inset(dx as Double, dy as Double) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Insets rectangle by given delta and returns new rectangle.

### 119.27.11 Intersection(other as MKMapRectMBS) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns intersection of two map rectangles.

### 119.27.12 Intersects(other as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether the given rectangle intersects with the current one.

### 119.27.13 Null as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries a null rectangle.

### 119.27.14 Offset(dx as Double, dy as Double) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Offsets map rectangle by given offset.

### 119.27.15 Rect(x as double = 0, y as double = 0, width as double = 0, heigth as double = 0) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates new rectangle with given values.

### 119.27.16 Region as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creation region covering the map rectangle.

### 119.27.17 Remainder as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** For map rects that span the 180th meridian, this returns the portion of the rect that lies outside of the world rect wrapped around to the other side of the world.
**Notes:** The portion of the rect that lies inside the world rect can be determined with rect.Intersection(MKMapRectMBS.World).

### 119.27.18 Union(other as MKMapRectMBS) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns union of both rectangles.

### 119.27.19 World as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The world rectangle.
**Notes:** The rect that contains every map point in the world.

### 119.27.20 Properties

### 119.27.21 Height as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the rectangle.
**Notes:** (Read and Write property)

### 119.27.22 isEmpty as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if rectangle is empty.
**Notes:** (Read only property)

### 119.27.23 isNull as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if rectangle is null rectangle.
**Notes:** (Read only property)

### 119.27.24 MaxX as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Maximum X value of rectangle.
**Notes:** (Read only property)

### 119.27.25 MaxY as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum X value of the rectangle.
**Notes:** (Read only property)

### 119.27.26 MidX as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The middle x value of this rectangle.
**Notes:** (Read only property)

### 119.27.27 MidY as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Middle Y value of rectangle.
**Notes:** (Read only property)

### 119.27.28 MinX as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum X value of rectangle.
**Notes:** (Read only property)

### 119.27.29 MinY as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum Y value of rectangle.
**Notes:** (Read only property)

### 119.27.30 Origin as MKMapPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The origin point of the rectangle.
**Notes:** Returns new point object with given values.
(Read and Write property)

### 119.27.31 Size as MKMapSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size of the rectangle.
**Notes:** Returns new size object with given values.
(Read and Write property)

### 119.27.32 Spans180thMeridian as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this map rectangle spans the 180th meridian.
**Notes:** (Read only property)

### 119.27.33 StringValue as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats rect as text for display in debugger.
**Example:**

```
dim r as new MKMapRectMBS(1,2,3,4)

MsgBox r.StringValue
```

**Notes:** (Read only property)

### 119.27.34 Width as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the rectangle.
**Notes:** (Read and Write property)

### 119.27.35 X as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The X origin coordinate.
**Notes:** (Read and Write property)

### 119.27.36 Y as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Y origin coordinate.
**Notes:** (Read and Write property)

## 119.28 class MKMapSizeMBS

### 119.28.1 class MKMapSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a size in maps.
**Blog Entries**

- MapKit Framework for Xojo

### 119.28.2 Methods

### 119.28.3 Constructor(other as MKMapSizeMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The copy constructor.
See also:

- 119.28.4 Constructor(width as double = 0, height as double = 0) 17228

### 119.28.4 Constructor(width as double = 0, height as double = 0)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.28.3 Constructor(other as MKMapSizeMBS) 17228

### 119.28.5 Equal(other as MKMapSizeMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Compares two size objects.
**Notes:** Returns true if both are equal.

### 119.28.6 Size(Width as double = 0, Height as double = 0) as MKMapSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates new size object with given values.

### 119.28.7 World as MKMapSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size that contains every map point in the world.

### 119.28.8 Properties

### 119.28.9 Height as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the size.
**Notes:** (Read and Write property)

### 119.28.10 StringValue as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Formats size as text for display in debugger.
**Notes:** (Read only property)

### 119.28.11 Width as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the size.
**Notes:** (Read and Write property)

# 119.29 class MKMapSnapshotMBS

## 119.29.1 class MKMapSnapshotMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class to take map snapshots.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

## 119.29.2 Methods

## 119.29.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.29.4 Constructor(Handle as Integer) 17230

## 119.29.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMapSnapshot reference from a declare.
The object is retained.
See also:

- 119.29.3 Constructor 17230

## 119.29.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.29.6 pointForCoordinate(coordinate as CLLocationCoordinate2DMBS) as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Translates a point in the coordinate to the point in the image.

### 119.29.7 Properties

### 119.29.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.29.9 Image as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The image created.
**Notes:** Please use methods in NSImageMBS class to get PNG or JPEG data.
Or use methods to copy a xojo picture.
(Read only property)

### 119.29.10 Options as MKMapSnapshotOptionsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The options used to create object.
**Notes:** (Read and Write property)

### 119.29.11 Tag as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The tag passed to creating the snapshot.
**Notes:** e.g. a ID for a database record.
(Read and Write property)

## 119.30 class MKMapSnapshotOptionsMBS

### 119.30.1 class MKMapSnapshotOptionsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for snapshot options.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

### 119.30.2 Methods

### 119.30.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.30.4 Constructor(Handle as Integer) 17232

### 119.30.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMapSnapshotOptions reference from a declare.
The object is retained.
See also:

- 119.30.3 Constructor 17232

### 119.30.5 Copy as MKMapSnapshotOptionsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the options.

### 119.30.6 Properties

### 119.30.7 appearance as NSAppearanceMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** The appearance to use for rendering.
**Notes:** For MacOS 10.14 or newer.
(Read and Write property)

### 119.30.8 camera as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera to use.
**Notes:** (Read and Write property)

### 119.30.9 mapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The rectangle in the map to query.
**Notes:** (Read and Write property)

### 119.30.10 mapType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The map type to use.
**Notes:** (Read and Write property)

### 119.30.11 region as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The region to use.
**Notes:** (Read and Write property)

### 119.30.12 showsBuildings as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to show buildings.
**Notes:** Affects MKMapTypeStandard.
(Read and Write property)

### 119.30.13 showsPointsOfInterest as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to show points of interest.
**Notes:** Affects MKMapTypeStandard and MKMapTypeHybrid.
(Read and Write property)

### 119.30.14 size as NSSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size of the image to create.
**Notes:** Defaults to 256x256 if nil.
(Read and Write property)

# 119.31 class MKMapSnapshotterMBS

## 119.31.1 class MKMapSnapshotterMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class to take snapshots for maps.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr6
- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

## 119.31.2 Methods

## 119.31.3 Cancel

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels the snapshot.

## 119.31.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMapSnapshotter reference from a declare.
The object is retained.
See also:

- 119.31.5 Constructor(options as MKMapSnapshotOptionsMBS) 17235

## 119.31.5 Constructor(options as MKMapSnapshotOptionsMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:** We keep reference to options in options property.
See also:

- 119.31.4 Constructor(Handle as Integer) 17235

### 119.31.6 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.31.7 Start(tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Starts the asynchronous snapshot process.
**Notes:** The tag value is passed to the snapshot for later reference.
Triggers SnapshotCompleted event later.
Sets Error and Snapshot properties on this object.

### 119.31.8 Properties

### 119.31.9 Error as NSErrorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The last error.
**Notes:** (Read and Write property)

### 119.31.10 Loading as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this is still loading.
**Notes:** (Read only property)

### 119.31.11 Options as MKMapSnapshotOptionsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The options used to create object.
**Notes:** (Read and Write property)

### 119.31.12 Snapshot as MKMapSnapshotMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The last snapshot.
**Notes:** (Read and Write property)

### 119.31.13 Events

### 119.31.14 SnapshotCompleted(snapshot as MKMapSnapshotMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The event to be called when snapshot is done.

## 119.32 class MKMapViewMBS

### 119.32.1 class MKMapViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An MKMapView object provides an embeddable map interface, similar to the one provided by the Maps application.
**Notes:** You use this class as-is to display map information and to manipulate the map contents from your application. You can center the map on a given coordinate, specify the size of the area you want to display, and annotate the map with custom information.

In the IDE we show a generic map image as preview as the control itself doesn't perform well inside the Xojo IDE.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.4pr5
- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- MBS Xojo Plugins, version 21.6pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr6
- MBS Xojo Plugins, version 20.1pr3
- MBS Xojo Plugins, version 19.5pr8
- MBS Xojo Plugins, version 19.5pr1
- MapKit Framework for Xojo

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.
- Apple MapView In Xojo

**Xojo Developer Magazine**

- 20.2, page 10: News
- 19.1, pages 87 to 88: Maps Part 8, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

- 18.6, page 79: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 76: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 74: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 65: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, page 10: News
- 18.5, pages 86 to 87: Maps (Part 6), A deep dive into Annotations by Markus Winter
- 18.5, page 80: Maps (Part 6), A deep dive into Annotations by Markus Winter

### 119.32.2 Methods

### 119.32.3 addAnnotation(annotation as MKAnnotationMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds the specified annotation to the map view.
**Example:**

```
dim mapview as MKMapViewMBS // your map view

// new pin
dim pin as new MKPointAnnotationMBS

pin.coordinate = mapView.centerCoordinate
pin.title = "Hello"

// show on map
mapView.addAnnotation pin
```

### 119.32.4 addAnnotations(annotations() as MKAnnotationMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an array of annotation objects to the map view.

### 119.32.5 addOverlay(overlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a single overlay object to the map.
**Example:**

```
dim mapview as MKMapViewMBS // your map view
dim centerCoordinate as CLLocationCoordinate2DMBS = mapview.centerCoordinate
dim radius as Integer = 300 // 300 meter

dim circle as MKCircleMBS = MKCircleMBS.circleWithCenterCoordinate(centerCoordinate, radius)
mapview.addOverlay circle
```

**Notes:** overlay: The overlay object to add. This object must conform to the MKOverlayMBS interface.

The specified object is added to the group of overlay objects in the MKOverlayLevelAboveLabels level. Adding an overlay causes the map view to begin monitoring the area represented by that overlay. As soon as the bounding rectangle of an overlay intersects the visible portion of the map, the map view adds a corresponding overlay view to the map. The overlay view is provided by the mapViewViewForOverlay event.

To remove an overlay from a map, use the removeOverlay method.
See also:

- 119.32.6 addOverlay(overlay as MKOverlayMBS, level as integer) 17240

### 119.32.6 addOverlay(overlay as MKOverlayMBS, level as integer)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds the overlay object to the map at the specified level.
**Notes:** overlay: The overlay object to add. This object must conform to the MKOverlayMBS interface.
level: The map level at which to place the overlay. For a list of possible values for this parameter, see level constants.

Positioning an overlay at a specific level places that overlay,Äôs visual representation in front of or behind other map content such as map labels and point-of-interest icons.
This method adds the specified overlay to the end of the list of overlay objects at the given level. Adding an overlay also causes the map view to begin monitoring the area they represent. As soon as the bounding rectangle of the overlay intersects the visible portion of the map, the map view calls your rendererForOverlay event to get the renderer object to use when drawing the overlay.
To remove an overlay from a map, use the removeOverlay: method.
See also:

- 119.32.5 addOverlay(overlay as MKOverlayMBS) 17240

### 119.32.7 addOverlays(overlays() as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an array of overlay objects to the map.
**Notes:** overlays: An array of objects, each of which must conform to the MKOverlayMBS interface.

The specified objects are added to the group of overlay objects in the MKOverlayLevelAboveLabels level. Adding an overlay causes the map view to begin monitoring the area represented by that overlay. As soon as the bounding rectangle of the overlay intersects the visible portion of the map, the map view tries to draw the overlay. As soon as the bounding rectangle of an overlay intersects the visible portion of the map, the map view adds a corresponding overlay view to the map. The overlay view is provided by the mapViewViewForOverlay method of the map view's delegate object.

To remove multiple overlays from a map, use the removeOverlays method.
See also:

- 119.32.8 addOverlays(overlays() as MKOverlayMBS, level as integer) 17241

### 119.32.8 addOverlays(overlays() as MKOverlayMBS, level as integer)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an array of overlay objects to the map at the specified level.
**Notes:** overlays: The array of overlay objects to add. Each object in the array must conform to the MKOverlayMBS interface.
level: The map level at which to place the overlays. For a list of possible values for this parameter, see MKOverlayLevel.

Positioning an overlay at a specific level places that overlay,Äôs visual representation in front of or behind other map content such as map labels and point-of-interest icons.

This method adds the specified overlays to the end of the list of overlay objects at the given level. Adding the overlays also causes the map view to begin monitoring the area they represent. As soon as the bounding rectangle of an overlay intersects the visible portion of the map, the map view calls your rendererForOverlay event to get the renderer object to use when drawing that overlay.

To remove multiple overlays from a map, use the removeOverlays method.
See also:

- 119.32.7 addOverlays(overlays() as MKOverlayMBS) 17241

### 119.32.9 annotations as MKAnnotationMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The complete list of annotations associated with the receiver.
**Notes:** If no annotations are associated with the map view, the value of this property is empty.

### 119.32.10 annotationsInMapRect(mapRect as MKMapRectMBS) as MKAnnotationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the annotation objects located in the specified map rectangle.
**Notes:** mapRect: The portion of the map that you want to search for annotations.

Returns the array of annotation objects located in mapRect.

This method offers a fast way to retrieve the annotation objects in a particular portion of the map. This method is much faster than doing a linear search of the objects in the annotations property yourself.

### 119.32.11 annotationViews as MKAnnotationViewMBS()

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries internal list of MapView to get list of all annotation views.

### 119.32.12 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Returns true for Mac 64-bit targets.

### 119.32.13 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new MKMapViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 119.32.14 Constructor(Handle as Integer) 17243
- 119.32.15 Constructor(left as Double, top as Double, width as Double, height as Double) 17243

### 119.32.14 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new MKMapViewMBS(0, 0, 100, 100)
dim v as new MKMapViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a MKMapView and the plugin retains this handle.
See also:

- 119.32.13 Constructor 17242
- 119.32.15 Constructor(left as Double, top as Double, width as Double, height as Double) 17243

### 119.32.15 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new MKMapViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.
See also:

- 119.32.13 Constructor 17242
- 119.32.14 Constructor(Handle as Integer) 17243


### 119.32.16 convertCoordinateToPointToView(coordinate as CLLocationCoordinate2DMBS, view as NSViewMBS) as NSPointMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a map coordinate to a point in the specified view.
**Notes:** coordinate: The map coordinate for which you want to find the corresponding point.
view: The view in whose coordinate system you want to locate the specified map coordinate. If this parameter is nil, the returned point is specified in the window's coordinate system. If view is not nil, it must belong to the same window as the map view.

Returns the point (in the appropriate view or window coordinate system) corresponding to the specified latitude and longitude value.

### 119.32.17 convertPointToCoordinateFromView(point as NSPointMBS, view as NSViewMBS) as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a point in the specified view's coordinate system to a map coordinate.
**Notes:** point: The point you want to convert.
view: The view that serves as the reference coordinate system for the point parameter.

Returns the map coordinate at the specified point.

### 119.32.18 convertRectToRegionFromView(rect as NSRectMBS, view as NSViewMBS) as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a rectangle in the specified view's coordinate system to a map region.
**Example:**

```
// convert mouse position in x/y to select annotation on the given mouse point
Dim xView As MKMapViewMBS = MapViewControl.View
Dim rect As New NSRectMBS(x,y,1,1)
Dim region As MKCoordinateRegionMBS = xView.convertRectToRegionFromView(rect,xView)
Dim center As CLLocationCoordinate2DMBS = region.center
Dim circle As New MKCircleMBS(center,32)
```

```
Dim mapRect As MKMapRectMBS = circle.boundingMapRect()
Dim xAnnos() As MKAnnotationMBS = xView.annotationsInMapRect(mapRect)

If xAnnos.LastRowIndex <>-1 Then
Dim xThisAnno As MKAnnotationMBS = xAnnos(0)
If xThisAnno IsA MKPointAnnotationMBS Then
me.View.selectAnnotation(xThisAnno,False)
Return True
End If
End If
```

**Notes:** rect: The rectangle you want to convert.
view: The view that serves as the reference coordinate system for the rect parameter.

Returns the map region corresponding to the specified view rectangle.

### 119.32.19 convertRegionToRectToView(region as MKCoordinateRegionMBS, view as NSViewMBS) as NSRectMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a map region to a rectangle in the specified view.
**Notes:** region: The map region for which you want to find the corresponding view rectangle.
view: The view in whose coordinate system you want to locate the specified map region. If this parameter is nil, the returned rectangle is specified in the window's coordinate system. If view is not nil, it must belong to the same window as the map view.

Returns the rectangle corresponding to the specified map region.

### 119.32.20 dequeueReusableAnnotationViewWithIdentifier(identifier as string) as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a reusable annotation view located by its identifier.
**Notes:** identifier: A string identifying the annotation view to be reused. This string is the same one you specify when initializing the annotation view using the Constructor method.

Returns an annotation view with the specified identifier, or nil if no such object exists in the reuse queue.

For performance reasons, you should generally reuse MKAnnotationView objects in your map views. As annotation views move offscreen, the map view moves them to an internally managed reuse queue. As new annotations move onscreen, and your code is prompted to provide a corresponding annotation view, you should always attempt to dequeue an existing view before creating a new one. Dequeueing saves time and memory during performance-critical operations such as scrolling.

### 119.32.21 deselectAnnotation(annotation as MKAnnotationMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Deselects the specified annotation and hides its callout view.
**Notes:** annotation: The annotation object to deselect.
animated: If true, the callout view is animated offscreen.

### 119.32.22 Destructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 119.32.23 exchangeOverlay(index1 as Integer, index2 as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Exchanges the positions of the two overlay objects.
**Notes:** index1: The index of an overlay in the MKOverlayLevelAboveLabels map level.
index2: The index of another overlay in the MKOverlayLevelAboveLabels map level.

If you need to exchange overlays in other map levels, use the exchangeOverlay method.
See also:

- 119.32.24 exchangeOverlay(Overlay1 as MKOverlayMBS, Overlay2 as MKOverlayMBS) 17246

### 119.32.24 exchangeOverlay(Overlay1 as MKOverlayMBS, Overlay2 as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Exchanges the positions of the two overlay objects.
**Notes:** If the overlays are in the same map level, they exchange positions within that level,Äôs array of

overlay objects. If they are in different map levels, the two objects also swap levels. Swapping the position of the overlays affects their visibility in the map view.
See also:

- 119.32.23 exchangeOverlay(index1 as Integer, index2 as Integer) 17246

### 119.32.25 insertOverlayAboveOverlay(overlay as MKOverlayMBS, aboveOverlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts one overlay object on top of another.
**Notes:** overlay: The overlay object to insert.
sibling: An existing object in the overlays array. This object must exist in the array and must not be nil.

This method inserts the overlay into the MKOverlayLevelAboveLabels level and positions it relative to the specified sibling. When displayed, this leads to the overlay's contents being displayed above that of its sibling. If sibling is not in the same map level, this method appends the overlay to the end of the list of overlays at the indicated level.

### 119.32.26 insertOverlayAtIndex(overlay as MKOverlayMBS, index as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts an overlay object into the list associated with the map.
**Notes:** overlay: The overlay object to insert.
index: The index at which to insert the overlay object. If this value is greater than the number of objects in the overlays property, this method appends the object to the end of the array.

This method inserts the overlay into the MKOverlayLevelAboveLabels level.
See also:

- 119.32.27 insertOverlayAtIndex(overlay as MKOverlayMBS, index as integer, level as integer) 17247

### 119.32.27 insertOverlayAtIndex(overlay as MKOverlayMBS, index as integer, level as integer)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts an overlay object into the level at the specified index.
**Notes:** overlay: The overlay object to insert.
index: The index at which to insert the overlay object. If this value is greater than the number of objects in the overlays property, this method appends the object to the end of the array.

level: The map level at which to place the overlay. For a list of possible values for this parameter, see level constants.

Inserting an overlay at a specific level places that overlay,Äôs visual representation in front of or behind other map content such as map labels and point-of-interest icons.
See also:

- 119.32.26 insertOverlayAtIndex(overlay as MKOverlayMBS, index as Integer) 17247

### 119.32.28 insertOverlayBelowOverlay(overlay as MKOverlayMBS, belowOverlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts one overlay object below another.
**Notes:** overlay: The overlay object to insert.
sibling: An existing object in the overlays array. This object must exist in the array and must not be nil.

This method inserts the overlay into the MKOverlayLevelAboveLabels level and positions it relative to the specified sibling. When displayed, this leads to the overlay's contents being displayed beneath that of its sibling. If sibling is not in the same map level, this method appends the overlay to the end of the list of overlays at the indicated level.

### 119.32.29 mapRectThatFits(mapRect as MKMapRectMBS) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adjusts the aspect ratio of the specified map rectangle to ensure that it fits in the map view,Äôs frame.
**Notes:** mapRect: The initial map rectangle whose width and height you want to adjust.

Returns a map rectangle that is still centered on the same point of the map but whose width and height are adjusted to fit in the map view,Äôs frame.

You can use this method to normalize map rectangle values before displaying the corresponding area. This method returns a new map rectangle that both contains the specified rectangle and fits neatly inside the map view,Äôs frame.
See also:

- 119.32.30 mapRectThatFits(mapRect as MKMapRectMBS, edgePaddingLeft as Double, edgePaddingTop as Double, edgePaddingRight as Double, edgePaddingBottom as Double) as MKMapRectMBS 17249

### 119.32.30 mapRectThatFits(mapRect as MKMapRectMBS, edgePaddingLeft as Double, edgePaddingTop as Double, edgePaddingRight as Double, edgePaddingBottom as Double) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adjusts the aspect ratio of the specified map rectangle, incorporating the specified inset values.
**Notes:** A map rectangle that is still centered on the same point of the map but whose width and height are adjusted to fit in the map view,Äôs frame minus the inset values.
See also:

- 119.32.29 mapRectThatFits(mapRect as MKMapRectMBS) as MKMapRectMBS 17248

### 119.32.31 MKErrorDomain as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The error domain for Map Kit.

### 119.32.32 MKMapViewDefaultAnnotationViewReuseIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The default reuse identifier for your map's annotation views.
**Notes:** Use this constant to register a default annotation view. This default annotation view is used when your map view's delegate does not implement the viewForAnnotation event or when that method returns nil.

### 119.32.33 MKMapViewDefaultClusterAnnotationViewReuseIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The default reuse identifier for the annotation view representing a cluster of annotations.
**Notes:** Use this constant to register a default annotation view to use for clusters of annotations. This cluster annotation view is used when your map view's delegate does not implement the viewForAnnotation event or when that method returns nil.

### 119.32.34 overlays as MKOverlayMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The overlay objects currently associated with the map view.
**Notes:** This property contains the union of all overlays at the different levels of the map. The objects in

this array must adopt the MKOverlayMBS interface. If no overlays are associated with the map view, the value of this property is an empty array.

The order of the objects in this array does not necessary reflect their visual order on the map.

### 119.32.35 overlaysInLevel(level as Integer) as MKOverlayMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The overlay objects in the specified level of the map.
**Notes:** level: The map level whose overlays you want. For a list of possible values for this parameter.

Returns an array of objects conforming to the MKOverlayMBS interfaces that display in the specified map level. If there are no overlays at the specified level, this method returns an empty array.

You can use this method to get all of the overlays assigned to a specific map level, which might be a subset of the complete set of overlay objects. For overlapping overlay objects, the order of objects in the array represents their visual order when displayed on the map, with objects in the beginning of the array located behind those at later indexes.

### 119.32.36 regionThatFits(region as MKCoordinateRegionMBS) as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adjusts the aspect ratio of the specified region to ensure that it fits in the map view,Äôs frame.
**Notes:** region: The initial region whose span you want to adjust.

Returns a region that is still centered on the same point of the map but whose span values are adjusted to fit in the map view,Äôs frame.

You can use this method to normalize the region values before displaying them in the map. This method returns a new region that both contains the specified region and fits neatly inside the map view,Äôs frame.

### 119.32.37 removeAnnotation(annotation as MKAnnotationMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the specified annotation object from the map view.
**Notes:** annotation: The annotation object to remove. This object must conform to the MKAnnotationMBS

interface.

If the annotation is currently associated with an annotation view, and that view has a reuse identifier, this method removes the annotation view and queues it internally for later reuse. You can retrieve queued annotation views (and associate them with new annotations) using the dequeueReusableAnnotationViewWithIdentifier method.

Removing an annotation object disassociates it from the map view entirely, preventing it from being displayed on the map. Thus, you would typically call this method only when you want to hide or delete a given annotation.

### 119.32.38 removeAnnotations(annotations() as MKAnnotationMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes an array of annotation objects from the map view.
**Notes:** annotations: The array of annotations to remove. Objects in the array must conform to the MKAnnotationMBS interface.

If any annotation object in the array has an associated annotation view, and if that view has a reuse identifier, this method removes the annotation view and queues it internally for later reuse. You can retrieve queued annotation views (and associate them with new annotations) using the dequeueReusableAnnotationViewWithIdentifier method.

Removing annotation objects disassociates them from the map view entirely, preventing them from being displayed on the map. Thus, you would typically call this method only when you want to hide or delete the specified annotations.

### 119.32.39 removeOverlay(overlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a single overlay object from the map.
**Notes:** overlay: The overlay object to remove.

This method removes the overlay regardless of the level that it is in. Removing an overlay also removes its corresponding renderer, if one is in use. If the specified overlay is not currently associated with the map view, this method does nothing.

### 119.32.40 removeOverlays(overlays() as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes one or more overlay objects from the map.
**Notes:** overlays: An array of objects, each of which conforms to the MKOverlayMBS interface.

This method removes the specified overlays regardless of which level each one is in. Removing an overlay also removes its corresponding renderer, if one is in use. If a given overlay object is not associated with the map view, it is ignored.

### 119.32.41 rendererForOverlay(overlay as MKOverlayMBS) as MKOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the renderer object used to draw the contents of the specified overlay object.
**Notes:** overlay: The overlay object whose renderer you want.

Returns the renderer object in use for the specified overlay or nil if the overlay is not onscreen.

This method returns the renderer object that your control provided in its xrendererForOverlay event.

### 119.32.42 selectAnnotation(annotation as MKAnnotationMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Selects the specified annotation and displays a callout view for it.
**Notes:** annotation: The annotation object to select.
animated: If true, the callout view is animated into position.

If the specified annotation is not onscreen, and therefore does not have an associated annotation view, this method has no effect.

### 119.32.43 selectedAnnotations as MKAnnotationMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The annotations that are currently selected.
**Notes:** Assigning a new array to this property selects only the first annotation in the array.

### 119.32.44 setCamera(camera as MKMapCameraMBS, Animated as boolean = true)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the camera used for determining the map,Äôs viewing parameters and optionally animates the change.
**Notes:** camera: The camera object containing the viewing angle information. This parameter must not be nil.
animated: Specify true if you want the change in viewing angle to be animated or false if you want the map to reflect the changes without animations.

### 119.32.45 setCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, zoomLevel as double, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** hanges the center coordinate of the map with zoom and optionally animates the change.
**Notes:** Zoomlevel is in range 1 to 20.

Latitude and Longitude in coordinate: The new center coordinate for the map.
animated: Specify true if you want the map view to scroll to the new location or false if you want the map to display the new location immediately.

Changing the center coordinate centers the map on the new coordinate without changing the current zoom level. It also updates the value in the region property to reflect the new center coordinate and the new span values needed to maintain the current zoom level.
See also:

- 119.32.46 setCenterCoordinate(coordinate as CLLocationCoordinate2DMBS, Animated as boolean = true) 17253

### 119.32.46 setCenterCoordinate(coordinate as CLLocationCoordinate2DMBS, Animated as boolean = true)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the center coordinate of the map and optionally animates the change.
**Notes:** Latitude and Longitude in coordinate: The new center coordinate for the map.
animated: Specify true if you want the map view to scroll to the new location or false if you want the map to display the new location immediately.

Changing the center coordinate centers the map on the new coordinate without changing the current zoom level. It also updates the value in the region property to reflect the new center coordinate and the new span

values needed to maintain the current zoom level.
See also:

- 119.32.45 setCenterCoordinate(centerCoordinate as CLLocationCoordinate2DMBS, zoomLevel as double, animated as boolean) 17253

### 119.32.47 setRegion(c as CLLocationCoordinate2DMBS, animated as boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the currently visible region and optionally animates the change.
**Notes:** Same as SetRegion with MKCoordinateRegionMBS but reuses current coordinate span.
See also:

- 119.32.48 setRegion(region as MKCoordinateRegionMBS, animated as boolean = false) 17254

### 119.32.48 setRegion(region as MKCoordinateRegionMBS, animated as boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the currently visible region and optionally animates the change.
**Example:**

```
dim mapview as MKMapViewMBS // your mapview

// get current region
dim r as MKCoordinateRegionMBS = mapview.region

// make new span with double deltas
dim s as new MKCoordinateSpanMBS(r.span.latitudeDelta*2, r.span.longitudeDelta*2)

// make new region
dim n as new MKCoordinateRegionMBS(r.center, s)

// and zoom there
mapview.setRegion n, true
```

**Notes:** region: The new region to display in the map view.
animated: Specify true if you want the map view to animate the transition to the new region or false if you want the map to center on the specified region immediately.

Changing just the center coordinate of the region can still cause the span values to change implicitly. The span values might change because that the distances represented by a span change at different latitudes and

longitudes and the map view may need to adjust the span to account for the new location. If you want to change the center coordinate without changing the zoom level, use the setCenterCoordinate instead.

When setting a new region, the map may adjust the value in the region parameter so that it fits the visible area of the map precisely. This adjustment is normal and is done to ensure that the value in the region property always reflects the visible portion of the map. However, it does mean that if you get the value of that property right after calling this method, the returned value may not match the value you set. (You can use the regionThatFits method to determine the region that will actually be set by the map.)
See also:

- 119.32.47 setRegion(c as CLLocationCoordinate2DMBS, animated as boolean = false) 17254

### 119.32.49 setVisibleMapRect(coordinate as MKMapRectMBS, Animated as boolean = true)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the currently visible portion of the map and optionally animates the change.
**Notes:** mapRect: The map rectangle to make visible in the map view.
animate: Specify true if you want the map view to animate the transition to the new map rectangle or false if you want the map to center on the specified rectangle immediately.
See also:

- 119.32.50 setVisibleMapRect(mapRect as MKMapRectMBS, edgePaddingLeft as Double, edgePadding-Top as Double, edgePaddingRight as Double, edgePaddingBottom as Double, animated as boolean) 17255

### 119.32.50 setVisibleMapRect(mapRect as MKMapRectMBS, edgePaddingLeft as Double, edgePaddingTop as Double, edgePaddingRight as Double, edgePaddingBottom as Double, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the currently visible portion of the map, allowing you to specify additional space around the edges.
**Notes:** MapRect: The map rectangle to make visible in the map view.
edgePaddingLeft, edgePaddingTop, edgePaddingRight and edgePaddingBottom: The amount of additional space (measured in screen points) to make visible around the specified rectangle.
animate: Specify true if you want the map view to animate the transition to the new map rectangle or false if you want the map to center on the specified rectangle immediately.
See also:

- 119.32.49 setVisibleMapRect(coordinate as MKMapRectMBS, Animated as boolean = true) 17255

### 119.32.51 setZoomLevel(zoomLevel as double, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets zoom level.
**Notes:** Zoomlevel is in range 1 to 20.

### 119.32.52 showAddress(address as string)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Convenience method to run an address geocoding and shows position on map.
**Example:**

```
dim mapview as MKMapViewMBS // your map view
mapView.showAddress "Markt 15, Andernach, Deutschland"
```

**Notes:** Uses CLGeocoderMBS geocodeAddressString method to asynchronously find the place and show it on the map.

### 119.32.53 ShowAllAnnotations(withOverlays as boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Zooms map to show all annotations.
**Notes:** The plugin loops over the annotations to calculate a bounding rectangle for all annotations and zoom the map to make them all visible with some border space around.

Added withOverlays parameter in v22.4 to include overlays in the calculation of the rectangle.

### 119.32.54 showAnnotations(annotations() as MKAnnotationMBS, animated as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the visible region so that the map displays the specified annotations.
**Notes:** annotations: The annotations that you want to be visible in the map.
animated: true if you want the map region change to be animated, or NO if you want the map to display the new region immediately without animations.

Calling this method updates the value in the region property and potentially other properties to reflect the

new map region.

### 119.32.55 viewForAnnotation(annotation as MKAnnotationMBS) as MKAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the annotation view associated with the specified annotation object, if any.
**Example:**

```
Function viewForAnnotation(mapView as MKMapViewMBS, annotation as MKAnnotationMBS) Handles viewForAnnotation as MKAnnotationViewMBS
// return nil for default annotation view

// new annotation view
Dim v As New MKAnnotationViewMBS(annotation)

// get a picture and use it as decoration
Dim pic As Picture = LogoMBS(100)
Dim img As New NSImageMBS(pic)
img.setSize(pic.Width/2, pic.Height/2) // half size gives 2x resolution, if the picture isn't retina aware

// set image and return
v.image = img

Return v
End Function
```

**Notes:** annotation: The annotation object whose view you want.

Returns the annotation view or nil if the view has not yet been created. This method may also return nil if the annotation is not in the visible map region and therefore does not have an associated annotation view.

### 119.32.56 Properties

### 119.32.57 annotationVisibleRect as NSRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visible rectangle where annotation views are currently being displayed.
**Notes:** (Read only property)

### 119.32.58 camera as MKMapCameraMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera used for determining the appearance of the map.
**Notes:** A camera object defines a point above the map,Äôs surface from which to view the map. Applying a camera to a map can have the effect of giving the map a 3D-like appearance. You can use a camera to rotate the map so that it is oriented to match the user,Äôs heading or to apply a pitch angle to tilt the plane of the map. (You can check the map,Äôs pitchEnabled property to determine whether the map can be pitched.)

Assigning a new camera to this property updates the map immediately and without animating the change. If you want to animate changes in camera position, use the setCamera method instead.

You must not set this property to nil. To restore the map to a flat appearance, apply a camera with a pitch angle of 0, which yields a camera looking straight down onto the map surface.
(Read and Write property)

### 119.32.59 centerCoordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The map coordinate at the center of the map view.
**Example:**

```
dim mapview as MKMapViewMBS // your map view
dim centerCoordinate as CLLocationCoordinate2DMBS = mapview.centerCoordinate

// show center
MsgBox str(centerCoordinate.latitude)+" "+str(centerCoordinate.longitude)
```

**Notes:** Changing the value in this property centers the map on the new coordinate without changing the current zoom level. It also updates the values in the region property to reflect the new center coordinate and the new span values needed to maintain the current zoom level.

Changing the value of this property updates the map view immediately. If you want to animate the change, use the setCenterCoordinate method instead.
(Read and Write property)

### 119.32.60 mapType as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of data displayed by the map view.
**Example:**

```
dim mapview as MKMapViewMBS // your map view
mapView.mapType = mapView.MKMapTypeHybrid
```

**Notes:** Changing the value in this property may cause the receiver to begin loading new map content. For example, changing from MKMapTypeStandard to MKMapTypeSatellite might cause it to begin loading the satellite imagery needed for the map. If new data is needed, however, it is loaded asynchronously and appropriate messages are sent to the receiver's delegate indicating the status of the operation.
(Read and Write property)

### 119.32.61 PitchEnabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the map camera,Äôs pitch information is used.
**Notes:** When this property is set to true and a valid camera is associated with the map, the camera,Äôs pitch angle is used to tilt the plane of the map. When this property is set to NO, the camera,Äôs pitch angle is ignored and the map is always displayed as if the user is looking straight down onto it.
In an app, always check the value of this property to determine whether a map can support 3D.
(Read and Write property)

### 119.32.62 region as MKCoordinateRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The area currently displayed by the map view.
**Notes:** The region encompasses both the latitude and longitude point on which the map is centered and the span of coordinates to display. The span values provide an implicit zoom value for the map. The larger the displayed area, the lower the amount of zoom. Similarly, the smaller the displayed area, the greater the amount of zoom.

Changing only the center coordinate of the region can still cause the span to change implicitly. The span might change because the distances represented by a span change at different latitudes and longitudes and the map view may need to adjust the span to account for the new location. If you want to change the center coordinate without changing the zoom level, use the centerCoordinate instead.

Changing the value of this property updates the map view immediately. When setting this property, the map may adjust the new region value so that it fits the visible area of the map precisely. This is normal and is done to ensure that the value in this property always reflects the visible portion of the map. However, it does mean that if you get the value of this property right after setting it, the returned value may not match

the value you set. (You can use the regionThatFits method to determine the region that will actually be set by the map.)

If you want to animate the change in region, use the setRegion method instead.
(Read and Write property)

### 119.32.63 RotateEnabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the map camera,Äôs heading information is used.
**Notes:** When this property is set to true and a valid camera is associated with the map, the camera,Äôs heading angle is used to rotate the plane of the map around its center point. When this property is set to false, the camera,Äôs heading angle is ignored and the map is always oriented so that true north is situated at the top of the map view.
(Read and Write property)

### 119.32.64 scrollEnabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the user may scroll around the map.
**Notes:** This property controls only user interactions with the map. If you set the value of this property to NO, you may still change the map location programmatically by changing the value in the region property.

The default value of this property is true.
(Read and Write property)

### 119.32.65 showsBuildings as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the map displays extruded building information.
**Notes:** When this property is set to YES and the camera has a pitch angle greater than zero, the map extrudes buildings so that they extend above the map plane, creating a 3D effect. The mapType property must be set to MapTypeStandard for extruded buildings to be displayed. The default value of this property is true.
(Read and Write property)

### 119.32.66 ShowsCompass as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the map displays a compass control.
**Notes:** Use this property to show or hide a control that lets users change the heading orientation of the map.
(Read and Write property)

### 119.32.67 showsPointsOfInterest as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the map displays point-of-interest information.
**Notes:** When this property is set to true, the map displays icons and labels for restaurants, schools, and other relevant points of interest. The mapType property must be set to MapTypeStandard or MapTypeHybrid for points of interest to be displayed. The default value of this property is true.
(Read and Write property)

### 119.32.68 showsScale as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean indicating whether the map shows scale information.
**Notes:** The default value of this property is false.
(Read and Write property)

### 119.32.69 showsTraffic as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the map displays traffic information.
**Notes:** The mapType property must be set to MapTypeStandard or MapTypeHybrid for traffic information to be shown. The default value of this property is false.
(Read and Write property)

### 119.32.70 showsUserLocation as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the map should try to display the user's location.
**Notes:** This property does not indicate whether the user's position is actually visible on the map, only

whether the map view should try to display it. Setting this property to true causes the map view to use the Core Location framework to find the current location and try to display it on the map. As long as this property is true, the map view continues to track the user's location and update it periodically. The default value of this property is false.

Showing the user's location does not guarantee that the location is visible on the map. The user might have scrolled the map to a different point, causing the current location to be offscreen. To determine whether the user's current location is currently displayed on the map, use the userLocationVisible property.
(Read and Write property)

### 119.32.71 showsZoomControls as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean indicating whether the map displays zoom controls.
**Notes:** In macOS, use this property to show or hide the controls that let users change the zoom level of the map.
(Read and Write property)

### 119.32.72 userLocation as MKUserLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The annotation object representing the user's current location.
**Notes:** (Read only property)

### 119.32.73 userLocationVisible as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the device's current location is visible in the map view.
**Notes:** This property tells you whether the icon used to represent the user's current location is visible in the map view. When determining whether the current location is visible, this property factors in the horizontal accuracy of the location data. Specifically, if the rectangle represented by the user's current location plus or minus minus the horizontal accuracy of that location intersects the map's visible rectangle, this property contains the value true. If that location rectangle does not intersect the map's visible rectangle, this property contains the value false.

If the user's location cannot be determined, this property contains the value false.
(Read only property)

### 119.32.74 visibleMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The area currently displayed by the map view.
**Notes:** This property represents the same basic information as the region property but specified as a map rectangle instead of a region.
Changing the value of this property updates the map view immediately. If you want to animate the change, use the setVisibleMapRect method instead.
(Read and Write property)

### 119.32.75 zoomEnabled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the user may use pinch gestures to zoom in and out of the map.
**Notes:** This property controls only user interactions with the map. If you set the value of this property to NO, you may still change the zoom level programmatically by changing the value in the region property.

The default value of this property is true.
(Read and Write property)

### 119.32.76 zoomLevel as Double

MBS MacFrameworks Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries current zoom level.
**Example:**

```
dim m as MKMapViewMBS // your map view

// zoom in one level
m.zoomLevel = m.zoomLevel + 1
```

**Notes:** A value between 1 and 20.
(Read and Write property)

### 119.32.77 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| ErrorDirectionsNotFound | 4 | The specified directions could not be found. |
| ErrorLoadingThrottled | 2 | The data was not loaded because data throttling is in effect. This error can occur if an app makes frequent requests for data over a short period of time. |
| ErrorPlacemarkNotFound | 3 | The specified placemark could not be found. |
| ErrorServerFailure | 1 | The map server was unable to return the desired information. |
| ErrorUnknown | 0 | An unknown error occurred. |

Feature visibility

| Constant | Value | Description |
|---|---|---|
| FeatureVisibilityAdaptive | 0 | For features in the normal state, title text is displayed and subtitle text is hidden. When a feature is selected, the title and subtitle text are hidden when the feature requires a callout. |
| FeatureVisibilityHidden | 1 | Always hidden. |
| FeatureVisibilityVisible | 2 | Always visible. |

Map Types

| Constant | Value | Description |
|---|---|---|
| MapTypeHybrid | 2 | Displays a satellite image of the area with road and road name information layered on top. |
| MapTypeHybridFlyover | 4 | A hybrid satellite image with flyover data where available. |
| MapTypeMutedStandard | 5 | A street map where your data is emphasized over the underlying map details. |
| MapTypeSatellite | 1 | Displays satellite imagery of the area. |
| MapTypeSatelliteFlyover | 3 | A satellite image of the area with flyover data where available. |
| MapTypeStandard | 0 | Displays a street map that shows the position of all roads and some road names. |

Overlay Levels

| Constant | Value | Description |
|---|---|---|
| OverlayLevelAboveLabels | 1 | Above labels |
| OverlayLevelAboveRoads | 0 | Above roads |

# 119.33 class MKMarkerAnnotationViewMBS

## 119.33.1 class MKMarkerAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** An annotation view that displays a balloon-shaped marker at the designated location.
**Notes:** Return an instance of this class from the viewForAnnotation event of your map view delegate when you want to display the same types of markers used in the Maps app.
The default displayPriority for an instance of this class is FeatureDisplayPriorityDefaultLow.

Available on macOS 11.0
Subclass of the MKAnnotationViewMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr8

**Xojo Developer Magazine**

- 18.6, page 10: News

## 119.33.2 Methods

## 119.33.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 11.0 and newer.

## 119.33.4 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.33.5 Constructor(Handle as Integer) 17266

### 119.33.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMarkerAnnotationView reference from a declare.
The object is retained.
See also:

- 119.33.4 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false) 17265

### 119.33.6 Properties

### 119.33.7 animatesWhenAdded as Boolean

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean that indicates whether the marker animates into position onscreen.
**Notes:** The default value of this property is false.
(Read and Write property)

### 119.33.8 glyphImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** An image to display in the marker balloon.
**Notes:** Use this property or the glyphText property to specify the marker balloon content. If you specify both an image and text, MapKit displays the text.
MapKit displays the glyph image when the marker is in the normal state. Create glyph images as template images so that MapKit can apply the glyph tint color to the image. Normally, you set the size of this image to 20 by 20 points on iOS and 40 by 40 points on tvOS. However, if you don,Äôt provide a separate selected image in the selectedGlyphImage property, make the size of this image 40 by 40 points on iOS and 60 by 40 points on tvOS instead. MapKit scales images that are larger or smaller than those sizes.
(Read and Write property)

### 119.33.9 glyphText as String

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The text to display in the marker balloon.
**Notes:** Use this property or the glyphText property to specify the marker balloon content. If you specify both an image and text, MapKit displays the text.
MapKit limits the amount of space available for displaying your glyph text. Specify no more than two or

three characters for any strings you assign to this property.
(Read and Write property)

### 119.33.10 glyphTintColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color to apply to the glyph text or image.
**Notes:** The default value of this property is nil, which applies the standard tint color for the current map style.
(Read and Write property)

### 119.33.11 markerTintColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The background color of the marker balloon.
**Notes:** The default value of this property is nil, which applies the standard color that,Äôs appropriate for the current map style.
(Read and Write property)

### 119.33.12 selectedGlyphImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** An image to display when the user selects the marker.
**Notes:** MapKit displays the glyph image when the marker is in the selected state. If you specify an image for this property, you should also specify an image in the glyphImage property.
Create glyph images as template images so that MapKit can apply the glyph tint color to the image. Set the size of this image to 40 by 40 points on iOS and 60 by 40 points on tvOS. MapKit scales images that are larger or smaller than those sizes.
(Read and Write property)

### 119.33.13 subtitleVisibility as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visibility of the subtitle text rendered beneath the marker balloon.
**Notes:** MapKit shows the text when the user selects a marker.
(Read and Write property)

### 119.33.14 titleVisibility as Integer

MBS MacFrameworks Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visibility of the title text rendered beneath the marker balloon.
**Notes:** (Read and Write property)

### 119.33.15 Constants

Feature Visibility

| Constant | Value | Description |
|---|---|---|
| FeatureVisibilityAdaptive | 0 | A constant indicating that the feature adapts to the current map state. |
| FeatureVisibilityHidden | 1 | A constant indicating that the feature is always hidden. |
| FeatureVisibilityVisible | 2 | A constant indicating that the feature is always visible. |

# 119.34 class MKMultiPointMBS

## 119.34.1 class MKMultiPointMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKMultiPoint class is an abstract superclass used to define shapes composed of multiple points.
**Notes:** You should not create instances of this class directly. Instead, you should create instances of the MKPolyline or MKPolygon classes. However, you can use the method and properties of this class to access information about the specific points associated with the line or polygon.
Subclass of the MKShapeMBS class.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.2, page 49: Maps Part 9,ÄîPutting GPS Data on the Map, Helping out a fellow coder with the MapKitMBS plugin by Markus Winter

## 119.34.2 Methods

## 119.34.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.34.4 Constructor(Handle as Integer) 17269

## 119.34.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMultiPoint reference from a declare.
The object is retained.
See also:

- 119.34.3 Constructor 17269

### 119.34.5 Coordinates as MKMapPointMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries list of coordinates for all the points.

### 119.34.6 points as MKMapPointMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries array with points.

### 119.34.7 Properties

### 119.34.8 pointCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries number of points for this multi point object.
**Notes:** (Read only property)

# 119.35 class MKMultiPolygonMBS

## 119.35.1 class MKMultiPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A collection of multiple closed polygon shapes.
**Notes:** Use a MKMultiPolygon when you have multiple distinct polygon shapes that you intend to render using the same style.
Available on macOS 10.15 and iOS 13 or newer.
Subclass of the MKShapeMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr3

Interfaces: MKOverlayMBS

## 119.35.2 Methods

## 119.35.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

## 119.35.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces

the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.

### 119.35.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.35.6 Constructor(Handle as Integer) 17272
- 119.35.7 Constructor(polygons() as MKPolygonMBS) 17272

### 119.35.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMultiPolygon reference from a declare.
The object is retained.
See also:

- 119.35.5 Constructor 17272
- 119.35.7 Constructor(polygons() as MKPolygonMBS) 17272

### 119.35.7 Constructor(polygons() as MKPolygonMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Create a multipolygon object using the provided polygons.
See also:

- 119.35.5 Constructor 17272
- 119.35.6 Constructor(Handle as Integer) 17272

### 119.35.8 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The center point of the circular area, specified as a latitude and longitude.

### 119.35.9 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.35.10 multiPolygon(polygons() as MKPolygonMBS) as MKMultiPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Create a multipolygon object using the provided polygons.

### 119.35.11 polygons as MKPolygonMBS()

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** An array containing the polygons that make up the multipolygon object.

## 119.36 class MKMultiPolygonRendererMBS

### 119.36.1 class MKMultiPolygonRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The visual representation for a multipolygon overlay.
**Notes:** Use this renderer to provide the style for multiple polygons created using MKMultiPolygonMBS.
Available on macOS 10.15 and iOS 13 or newer.
Subclass of the MKOverlayPathRendererMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr3

### 119.36.2 Methods

### 119.36.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMultiPolygonRenderer reference from a declare.
The object is retained.
See also:

- 119.36.4 Constructor(multiPolygon as MKMultiPolygonMBS) 17274

### 119.36.4 Constructor(multiPolygon as MKMultiPolygonMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a renderer that handles drawing for the specified multipolygon overlay object.
See also:

- 119.36.3 Constructor(Handle as Integer) 17274

### 119.36.5 Properties

### 119.36.6 multiPolygon as MKMultiPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The multipolygon object that the renderer uses to draw the overlay,Äôs contents.
**Notes:** (Read only property)

## 119.37 class MKMultiPolylineMBS

### 119.37.1 class MKMultiPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A collection of multipolyline shapes, each consisting of one or more connected line segments.
**Notes:** Use a MKMultiPolyline object when you have multiple distinct polyline shapes that you intend to render using the same style.
Available on macOS 10.15 and iOS 13 or newer.
Subclass of the MKShapeMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr3

Interfaces: MKOverlayMBS

### 119.37.2 Methods

### 119.37.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

### 119.37.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces

the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.

### 119.37.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.37.6 Constructor(Handle as Integer) 17277
- 119.37.7 Constructor(polylines() as MKPolylineMBS) 17277

### 119.37.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMultiPolyline reference from a declare.
The object is retained.
See also:

- 119.37.5 Constructor 17277
- 119.37.7 Constructor(polylines() as MKPolylineMBS) 17277

### 119.37.7 Constructor(polylines() as MKPolylineMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Create a multipolyline object using the provided polylines.
See also:

- 119.37.5 Constructor 17277
- 119.37.6 Constructor(Handle as Integer) 17277

### 119.37.8 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The center point of the circular area, specified as a latitude and longitude.

### 119.37.9 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.37.10 multiPolyline(polylines() as MKPolylineMBS) as MKMultiPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Create a multipolyline object using the provided polylines.

### 119.37.11 polylines as MKPolylineMBS()

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** An array containing the polyline objects that make up the multipolyline object.

# 119.38 class MKMultiPolylineRendererMBS

## 119.38.1 class MKMultiPolylineRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The visual representation for a multipolygon overlay.
**Notes:** Use this renderer to provide the style for multiple polygons created using MKMultiPolygonMBS.
Available on macOS 10.15 and iOS 13 or newer.
Subclass of the MKOverlayPathRendererMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MBS Xojo Plugins, version 21.3pr3

**Videos**

- Apple MapView In Xojo

## 119.38.2 Methods

## 119.38.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKMultiPolylineRenderer reference from a declare.
The object is retained.
See also:

- 119.38.4 Constructor(multiPolyline as MKMultiPolylineMBS) 17279

## 119.38.4 Constructor(multiPolyline as MKMultiPolylineMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a renderer that handles drawing for the specified multipolygon overlay object.
See also:

- 119.38.3 Constructor(Handle as Integer) 17279

### 119.38.5 Properties

### 119.38.6 multiPolyline as MKMultiPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The multipolygon object that the renderer uses to draw the overlay,Äôs contents.
**Notes:** (Read only property)

# 119.39 class MKOverlayPathRendererMBS

## 119.39.1 class MKOverlayPathRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual representation for a path-based overlay.
**Notes:** Use this renderer when your overlay's shape is defined by a CGPath object. By default, this renderer fills and strokes the path using its current attributes.
You can use this class as-is or subclass to define additional drawing behaviors. If you subclass, you should override the createPath method and use that method to build the appropriate path object. To change the path, invalidate it and recreate the path using whatever new data your subclass has obtained.
Subclass of the MKOverlayRendererMBS class.
**Blog Entries**

- MapKit Framework for Xojo

## 119.39.2 Methods

## 119.39.3 applyFillProperties(context as CGContextMBS, zoomScale as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies the receiver,Äôs current fill-related drawing properties to the specified graphics context.
**Notes:** context: The graphics context used to draw the view,Äôs contents.
zoomScale: The current zoom scale used for drawing.

This is a convenience method for applying all of the drawing properties used when filling a path. This method applies the current fill color to the specified graphics context.

## 119.39.4 applyStrokeProperties(context as CGContextMBS, zoomScale as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies the receiver,Äôs current stroke-related drawing properties to the specified graphics context.
**Notes:** context: The graphics context used to draw the view,Äôs contents.
zoomScale: The current zoom scale used for drawing.

This is a convenience method for applying all of the drawing properties used when stroking a path. This method applies the stroke color, line width, line join, line cap, miter limit, line dash phase, and line dash attributes to the specified graphics context. This method applies the scale factor in the zoomScale parameter

to the line width and line dash pattern automatically so that lines scale appropriately.
This method does not save the current graphics state before applying the new attributes. If you want to preserve the existing state, you must save it yourself and restore it later when you finish drawing.

### 119.39.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.39.6 Constructor(Handle as Integer) 17282

### 119.39.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKOverlayPathRenderer reference from a declare.
The object is retained.
See also:

- 119.39.5 Constructor 17282

### 119.39.7 createPath

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates the path for the overlay.
**Notes:** The default implementation of this method does nothing. Subclasses should override it and use it to create the CGPathRef data type to be used for drawing. After creating the path, your implementation should assign it to the path property.

### 119.39.8 fillPath(path as CGPathMBS, context as CGContextMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Fills the area enclosed by the specified path.
**Notes:** path: The path to fill.
context: The graphics context in which to draw the path.

You must set the current fill color before calling this method. Typically you do this by calling the applyFillProperties method prior to drawing. If the fillColor property is currently nil, this method does nothing.

### 119.39.9 GetLineDashPattern as Integer()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of numbers specifying the dash pattern to use for the path.
**Notes:** The array contains one or more numbers that indicate the lengths (measured in points) of the line segments and gaps in the pattern. The values in the array alternate, starting with the first line segment length, followed by the first gap length, followed by the second line segment length, and so on.
This property is set to nil by default, which indicates no line dash pattern.

### 119.39.10 invalidatePath

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates the path associated with the overlay renderer.
**Notes:** Call this method when a change in the path information would require you to recreate the overlay,Äôs path. This method sets the path property to nil and tells the overlay renderer to redisplay its contents.

### 119.39.11 SetLineDashPattern(values() as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets an array of numbers specifying the dash pattern to use for the path.
**Notes:** The array contains one or more numbers that indicate the lengths (measured in points) of the line segments and gaps in the pattern. The values in the array alternate, starting with the first line segment length, followed by the first gap length, followed by the second line segment length, and so on.
This property is set to nil by default, which indicates no line dash pattern.

### 119.39.12 strokePath(path as CGPathMBS, context as CGContextMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Draws a line along the specified path.
**Notes:** path: The path to draw.
context: The graphics context in which to draw the path.

You must set the current stroke color before calling this method. Typically you do this by calling the applyStrokePropertiesToContext method prior to drawing. If the strokeColor property is currently nil, this

method does nothing.

### 119.39.13 Properties

### 119.39.14 fillColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The fill color to use for the path.
**Notes:** (Read and Write property)

### 119.39.15 lineCap as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The line cap style to apply to the open ends of the path.
**Notes:** The line cap style is applied to the start and end points of any open subpaths. This property does not affect closed subpaths. The default line cap style is kCGLineCapRound.
(Read and Write property)

### 119.39.16 lineDashPhase as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset (in points) at which to start drawing the dash pattern.
**Notes:** Use this property to start drawing a dashed line partway through a segment or gap. For example, a phase value of 6 for the patter 5-2-3-2 would cause drawing to begin in the middle of the first gap.
The default value of this property is 0.
(Read and Write property)

### 119.39.17 lineJoin as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The line join style to apply to corners of the path.
**Notes:** The default line join style is kCGLineJoinRound.
(Read and Write property)

### 119.39.18 lineWidth as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The stroke width to use for the path.
**Notes:** The default value of this property is 0.
(Read and Write property)

### 119.39.19 miterLimit as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The limiting value that helps avoid spikes at junctions between connected line segments.
**Notes:** The miter limit helps you avoid spikes in paths that use the kCGLineJoinMiter join style. If the ratio of the miter length—that is, the diagonal length of the miter join—to the line thickness exceeds the miter limit, the joint is converted to a bevel join. The default miter limit is 10, which results in the conversion of miters whose angle at the joint is less than 11 degrees.
(Read and Write property)

### 119.39.20 Path as CGPathMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The path representing the overlay,Äôs shape.
**Notes:** Getting the value of this property causes the path to be created (using the createPath method) if it does not already exist. You can assign a path object to this property explicitly. When assigning a new path object to this property, the overlay renderer stores a strong reference to the path you provide.
(Read and Write property)

### 119.39.21 strokeColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The stroke color to use for the path.
**Notes:** (Read and Write property)

## 119.40 class MKOverlayRendererMBS

### 119.40.1 class MKOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The shared infrastructure used to draw overlays on the map surface.
**Notes:** An overlay renderer draws the visual representation of an overlay object—that is, an object that conforms to the MKOverlayMBS interface. This class defines the drawing infrastructure used by the map view. Subclasses are expected to override the drawMapRect method to draw the contents of the overlay.
The Map Kit framework provides several concrete instances of overlay renderers. Specifically, it provides renderers for each of the concrete overlay objects. You can use one of these existing renderers or define your own subclasses if you want to draw the overlay contents differently.
**Blog Entries**

- MapKit Framework for Xojo

### 119.40.2 Methods

### 119.40.3 canDrawMapRect(Rect as MKMapRectMBS, zoomScale as Double) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the overlay view is ready to draw its content.
**Notes:** mapRect: The map rectangle that needs to be updated.
zoomScale: The current scale factor applied to the map.

Returns true if this overlay renderer is ready to draw its contents on the map or false if it is not.

Overlay renderers can override this method in situations where they may depend on the availability of other information to draw their contents. For example, a renderer showing traffic information might want to delay drawing until it has all of the traffic data it needs. In such a case, it can return NO from this method to indicate that it is not ready. An overlay renderer might also return NO if it does not draw content in the specified rectangle.

If you return NO from this method, your application is responsible for calling the setNeedsDisplayInMapRect method when the overlay renderer subsequently becomes ready to draw its contents.
The default implementation of this method returns true.

### 119.40.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKOverlayRenderer reference from a declare.
The object is retained.
See also:

- 119.40.5 Constructor(overlay as MKOverlayMBS) 17287

### 119.40.5 Constructor(overlay as MKOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns the overlay renderer and associates it with the specified overlay object.
**Notes:** overlay: The overlay object to use when drawing the overlay content on the map. This object provides the data needed to draw the overlay,Äôs shape. The overlay renderer stores a strong reference to this object.
Return Value

Initially, the overlay renderer assumes that the overlay is fully opaque and that it has a content scale factor of 1.0. You can change these values as needed using the alpha and contentScaleFactor properties.
See also:

- 119.40.4 Constructor(Handle as Integer) 17286

### 119.40.6 drawMapRect(Rect as MKMapRectMBS, zoomScale as Double, context as CGContextMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Draws the overlay,Äôs contents at the specified location on the map.
**Notes:** mapRect: The map rectangle that needs to be updated. Your drawing code should avoid drawing outside of this rectangle.
zoomScale: The current zoom factor applied to the map content. You can use this value for configuring the stroke width of lines or other attributes that might be affected by the scale of the map,Äôs contents.
context: The graphics context to use for drawing the overlay,Äôs contents.

The default implementation of this method does nothing. Subclasses are expected to override this method and use it to draw the overlay,Äôs contents.

When determining where to draw content, make your initial calculations relative to the map itself. In other words, compute the position and size of any overlay content using map points and map rectangles, convert those values to regular CGPoint and CGRect types using the methods of this class, and then pass the converted points to any drawing primitives.
It is recommended that you use Core Graphics to draw any content for your overlays.

To improve drawing performance, the map view may divide your overlay into multiple tiles and render each one on a separate thread. Your implementation of this method must therefore be capable of safely running from multiple threads simultaneously. In addition, you should avoid drawing the entire contents of the overlay each time this method is called. Instead, always take the mapRect parameter into consideration and avoid drawing content outside that rectangle.

### 119.40.7 mapPointForPoint(point as CGPointMBS) as MKMapPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the point on the map that corresponds to the specified point in the overlay renderer,Äôs drawing area.
**Notes:** point: The point in the overlay,Äôs drawing area that you want to convert.
Returns the point on the two-dimensional map projection corresponding to the specified point.

### 119.40.8 mapRectForRect(Rect as CGRectMBS) as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the rectangle on the map that corresponds to the specified rectangle in the overlay renderer,Äôs drawing area.
**Notes:** rect: The rectangle in the overlay,Äôs drawing area that you want to convert.

Returns the rectangle on the two-dimensional map projection corresponding to the specified rectangle.

### 119.40.9 pointForMapPoint(mapRect as MKMapPointMBS) as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the point in the overlay renderer,Äôs drawing area corresponding to the specified point on the map.
**Notes:** mapPoint: A point on the two-dimensional map projection. If you have a coordinate value (latitude and longitude), you can use the MKMapPointForCoordinate function to convert that coordinate to a map point.

Returns the point in the overlay,Äôs drawing area that corresponds to the map point.

### 119.40.10 RectForMapRect(mapRect as MKMapRectMBS) as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the rectangle in the overlay renderer,Äôs drawing area corresponding to the specified rectangle on the map.
**Notes:** mapRect: A rectangle on the two-dimensional map projection.

Returns the rectangle in the overlay,Äôs drawing area that corresponds to the map rectangle.

### 119.40.11 RoadWidthAtZoomScale(zoomScale as double) as double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the width (in screen points) of roads on a map at the specified zoom level.
**Notes:** zoomScale: The scale factor currently applied to the map view.

Returns the width of roads, measured in screen points. You can use the returned value to set the width of lines in drawing code that traces the path of a road.

### 119.40.12 setNeedsDisplay

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invalidates the entire contents of the overlay for all zoom scales.
**Notes:** This method causes the entire contents of the overlay to be redrawn during the next update cycle. This method invalidates the overlay regardless of the current zoom scale associated with the map.

### 119.40.13 setNeedsDisplayInMapRect(mapRect as MKMapRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invalidates the specified portion of the overlay at all zoom scales.
**Notes:** mapRect: The portion of the overlay to update. Specify this value using a map coordinates.

Marking a rectangle as invalid causes that portion of the overlay to be redrawn during the next update cycle. This method invalidates the overlay regardless of the current zoom scale associated with the map.
See also:

- 119.40.14 setNeedsDisplayInMapRect(mapRect as MKMapRectMBS, zoomScale as double) 17290

### 119.40.14 setNeedsDisplayInMapRect(mapRect as MKMapRectMBS, zoomScale as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Invalidates the specified portion of the overlay but only at the specified zoom scale.
**Notes:** mapRect: The portion of the overlay to update. Specify this value using a map coordinates.
zoomScale: The zoom scale for which you want to invalidate the overlay.

Marking a rectangle as invalid causes that portion of the overlay to be redrawn during the next update cycle.
This method invalidates the overlay only at the specified zoom scale.
See also:

- 119.40.13 setNeedsDisplayInMapRect(mapRect as MKMapRectMBS) 17289

### 119.40.15 Properties

### 119.40.16 alpha as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of transparency to apply to the overlay.
**Notes:** The value in this property can be in the range 0.0 to 1.0, where 0.0 represents total transparency and 1.0 represents total opacity. The default value of this property is 1.0.
(Read and Write property)

### 119.40.17 contentScaleFactor as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The scale factor used to draw the overlay,Äôs content.
**Notes:** The scale factor determines how content is mapped from the logical coordinate space (measured in points) to the device coordinate space (measured in pixels). This value is typically either 1.0 or 2.0. Higher scale factors indicate that each point is represented by more than one pixel on the screen. For example, if the scale factor is 2.0 and the drawing rectangle size is 50 x 50 points, the size of the underlying area is 100 x 100 pixels.
When drawing the content for your overlays, you can use this value to determine how best to render your content.
(Read only property)

### 119.40.18 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.40.19 overlay as MKOverlayMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The overlay object containing the data for drawing.
**Notes:** The overlay object contains the coordinate at which to draw the overlay and other information that your app provides.
(Read only property)

# 119.41 class MKPinAnnotationViewMBS

## 119.41.1 class MKPinAnnotationViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKPinAnnotationView class provides a concrete annotation view that displays a pin icon like the ones found in the Maps application.
**Notes:** Using this class, you can configure the type of pin to drop and whether you want the pin to be animated into place.
Subclass of the MKAnnotationViewMBS class.
**Blog Entries**

- Mapview with icons in Xojo
- MBS Xojo Plugins, version 19.3pr1
- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.6, page 78: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.6, pages 65 to 67: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter

## 119.41.2 Methods

## 119.41.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:


- 119.41.4 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false) 17292
- 119.41.5 Constructor(Handle as Integer) 17293


## 119.41.4 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.41.3 Constructor 17292
- 119.41.5 Constructor(Handle as Integer) 17293


### 119.41.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPinAnnotationView reference from a declare.
The object is retained.
See also:

- 119.41.3 Constructor 17292
- 119.41.4 Constructor(annotation as MKAnnotationMBS, reuseIdentifier as string = """, EnableEvents as Boolean = false) 17292

### 119.41.6 greenPinColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the standard color for green pins.
**Notes:** The system uses green pins to indicate starting points on the map.

### 119.41.7 purplePinColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the standard color for purple pins.
**Notes:** The system uses purple pins to indicate user-specified points on the map.

### 119.41.8 redPinColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the standard color for red pins.
**Notes:** The system uses red pins to indicate destination points on the map.

### 119.41.9 Properties

### 119.41.10 animatesDrop as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to animate the dropping of the pin.
**Notes:** (Read and Write property)

### 119.41.11 pinColor as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color of the pin head.
**Notes:** The Maps application uses different pin colors for different types of map annotations. Your own map annotation should use the available pin colors in the same way.
Deprecated in favor of pinTintColor.
(Read and Write property)

### 119.41.12 pinTintColor as NSColorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color of the pin head.
**Notes:** Use this property to specify custom a custom color for your pin. You can also specify one of the standard pin colors.
(Read and Write property)

### 119.41.13 Constants

Color constants

| Constant | Value | Description |
|---|---|---|
| ColorBlue | 2 | The head of the pin is blue. Purple pins indicate user-specified points on the map. |
| ColorGreen | 1 | The head of the pin is green. Green pins indicate starting points on the map. |
| ColorRed | 0 | The head of the pin is red. Red pins indicate destination points on the map. |

# 119.42 class MKPlacemarkMBS

## 119.42.1 class MKPlacemarkMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A MKPlacemark object stores placemark data for a given latitude and longitude.
**Notes:** Placemark data includes information such as the country, state, city, and street address associated with the specified coordinate. Placemark objects are typically generated by a MKReverseGeocoderMBS object, although you can also create them explicitly yourself.

A placemark is also an annotation and conforms to the MKAnnotationMBS interface, whose properties and methods include the placemark coordinate and other information. Because they are annotations, you can add them directly to the map view.
Subclass of the CLPlacemarkMBS class.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 18.5, pages 81 to 83: Maps (Part 6), A deep dive into Annotations by Markus Winter
- 18.4, page 73: Maps Part 5 (Finding and Displaying Addresses), Implementing Maps in Xojo desktop apps with the MapKitMBS plug-in by Markus Winter
- 18.3, page 80: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

Interfaces: MKAnnotationMBS

## 119.42.2 Methods

## 119.42.3 Constructor(coordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a placemark object using the specified coordinate only.
See also:

- 119.42.4 Constructor(coordinate as CLLocationCoordinate2DMBS, addressDictionary as dictionary) 17296

- 119.42.5 Constructor(coordinate as CLLocationCoordinate2DMBS, postalAddress as Variant) 17296
- 119.42.6 Constructor(Handle as Integer) 17296


### 119.42.4 Constructor(coordinate as CLLocationCoordinate2DMBS, addressDictionary as dictionary)

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a placemark object using the specified coordinate and Address Book dictionary.
**Notes:** You can create placemark objects manually for entities for which you already have address information, such as contacts in the Address Book. Creating a placemark object explicitly avoids the need to query the reverse geocoder object for the same information.
See also:


- 119.42.3 Constructor(coordinate as CLLocationCoordinate2DMBS) 17295
- 119.42.5 Constructor(coordinate as CLLocationCoordinate2DMBS, postalAddress as Variant) 17296
- 119.42.6 Constructor(Handle as Integer) 17296


### 119.42.5 Constructor(coordinate as CLLocationCoordinate2DMBS, postalAddress as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a placemark object using the specified coordinate and CNPostalAddressMBS object.
**Notes:** You can create placemark objects manually for entities for which you already have address information, such as contacts in the Address Book. Creating a placemark object explicitly avoids the need to query the reverse geocoder object for the same information.
See also:


- 119.42.3 Constructor(coordinate as CLLocationCoordinate2DMBS) 17295
- 119.42.4 Constructor(coordinate as CLLocationCoordinate2DMBS, addressDictionary as dictionary) 17296
- 119.42.6 Constructor(Handle as Integer) 17296


### 119.42.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPlacemark reference from a declare.

The object is retained.
See also:


- 119.42.3 Constructor(coordinate as CLLocationCoordinate2DMBS) 17295
- 119.42.4 Constructor(coordinate as CLLocationCoordinate2DMBS, addressDictionary as dictionary) 17296
- 119.42.5 Constructor(coordinate as CLLocationCoordinate2DMBS, postalAddress as Variant) 17296


### 119.42.7 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.42.8 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.42.9 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.

### 119.42.10 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.42.11 Properties

### 119.42.12 countryCode as String

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The abbreviated country name.
**Notes:** This string is the standard abbreviation used to refer to the country. For example, if the placemark location was Apple's headquarters, the value for this property would be the string "US".
(Read only property)

# 119.43 class MKPointAnnotationMBS

## 119.43.1 class MKPointAnnotationMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKPointAnnotation class defines a concrete annotation object located at a specified point.
**Example:**

```
dim mapview as MKMapViewMBS // your map view

// new pin
dim pin as new MKPointAnnotationMBS

pin.coordinate = mapView.centerCoordinate
pin.title = "Hello"

// show on map
mapView.addAnnotation pin
```

**Notes:** You can use this class, rather than define your own, in situations where all you want to do is associate a point on the map with a title.
Subclass of the MKShapeMBS class.
**Blog Entries**

- Mapview with icons in Xojo
- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

**Xojo Developer Magazine**

- 18.5, pages 84 to 85: Maps (Part 6), A deep dive into Annotations by Markus Winter
- 18.4, page 73: Maps Part 5 (Finding and Displaying Addresses), Implementing Maps in Xojo desktop apps with the MapKitMBS plug-in by Markus Winter
- 18.3, page 79: Xojo Maps, Part 4, Finding and Displaying Addresses with the MapKitMBS plugin by Markus Winter

### 119.43.2 Methods

### 119.43.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Example:**

```
dim mapview as MKMapViewMBS // your map view

// new pin
dim pin as new MKPointAnnotationMBS

pin.coordinate = mapView.centerCoordinate
pin.title = "Hello"

// show on map
mapView.addAnnotation pin
```

See also:

- 119.43.4 Constructor(Handle as Integer) 17300

### 119.43.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPointAnnotation reference from a declare.
The object is retained.
See also:

- 119.43.3 Constructor 17300

### 119.43.5 Properties

### 119.43.6 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate point of the annotation, specified as a latitude and longitude.
**Notes:** (Read and Write property)

# 119.44 class MKPolygonMBS

## 119.44.1 class MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKPolygon class represents a shape consisting of one or more points that define a closed polygon.
**Notes:** The points are connected end-to-end in the order they are provided. The first and last points are connected to each other to create the closed shape.

When creating a polygon, you can mask out portions of the polygon by specifying one or more interior polygons. For the polygons you specify, this class uses the even-odd fill rule to determine the final occupied area. When applied to overlapping polygons, this rule can cause specific regions to be masked out (and thereby removed) from the total occupied area. For more information about how fill rules are applied to paths, see "Paths" in Quartz 2D Programming Guide.
Subclass of the MKMultiPointMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.2, page 49: Maps Part 9,ÄîPutting GPS Data on the Map, Helping out a fellow coder with the MapKitMBS plugin by Markus Winter

Interfaces: MKOverlayMBS

## 119.44.2 Methods

## 119.44.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

### 119.44.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.

### 119.44.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:


- 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17302
- 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) 17303
- 119.44.8 Constructor(Handle as Integer) 17303
- 119.44.9 Constructor(points() as MKMapPointMBS) 17304
- 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) 17304


### 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of coordinates.
**Notes:** coords: The array of coordinates defining the shape.
Returns a new polygon object.
See also:


- 119.44.5 Constructor 17302

- 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) 17303
- 119.44.8 Constructor(Handle as Integer) 17303
- 119.44.9 Constructor(points() as MKMapPointMBS) 17304
- 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) 17304


### 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of map points and interior polygons.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
interiorPolygons: An array of MKPolygon objects that define one or more cutout regions for the receiver,Äôs polygon.
See also:


- 119.44.5 Constructor 17302
- 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17302
- 119.44.8 Constructor(Handle as Integer) 17303
- 119.44.9 Constructor(points() as MKMapPointMBS) 17304
- 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) 17304


### 119.44.8 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPolygon reference from a declare.
The object is retained.
See also:


- 119.44.5 Constructor 17302
- 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17302
- 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) 17303
- 119.44.9 Constructor(points() as MKMapPointMBS) 17304
- 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) 17304

### 119.44.9 Constructor(points() as MKMapPointMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of map points.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
See also:


- 119.44.5 Constructor 17302
- 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17302
- 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) 17303
- 119.44.8 Constructor(Handle as Integer) 17303
- 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) 17304


### 119.44.10 Constructor(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of map points and interior polygons.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
interiorPolygons: An array of MKPolygon objects that define one or more cutout regions for the receiver,Äôs polygon.
See also:


- 119.44.5 Constructor 17302
- 119.44.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17302
- 119.44.7 Constructor(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) 17303
- 119.44.8 Constructor(Handle as Integer) 17303
- 119.44.9 Constructor(points() as MKMapPointMBS) 17304


### 119.44.11 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.44.12 interiorPolygons as MKPolygonMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The array of polygons nested inside the receiver.
**Notes:** When a polygon is rendered on screen, the area occupied by any interior polygons is masked out and not considered part of the polygon.

### 119.44.13 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.44.14 polygonWithCoordinates(coords() as CLLocationCoordinate2DMBS) as MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of coordinates.
**Notes:** coords: The array of coordinates defining the shape.
Returns a new polygon object.
See also:

- 119.44.15 polygonWithCoordinates(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) as MKPolygonMBS 17305

### 119.44.15 polygonWithCoordinates(coords() as CLLocationCoordinate2DMBS, InteriorPolygons() as MKPolygonMBS) as MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of coordinates and interior polygons.
**Notes:** coords: The array of coordinates defining the shape.
interiorPolygons: An array of MKPolygon objects that define one or more cutout regions for the receiver's polygon.

Returns a new polygon object.
See also:

- 119.44.14 polygonWithCoordinates(coords() as CLLocationCoordinate2DMBS) as MKPolygonMBS

17305

### 119.44.16 polygonWithPoints(points() as MKMapPointMBS) as MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of map points.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
See also:

- 119.44.17 polygonWithPoints(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) as MKPolygonMBS 17306

### 119.44.17 polygonWithPoints(points() as MKMapPointMBS, InteriorPolygons() as MKPolygonMBS) as MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolygon object from the specified set of map points and interior polygons.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
interiorPolygons: An array of MKPolygon objects that define one or more cutout regions for the receiver,Äôs polygon.
See also:

- 119.44.16 polygonWithPoints(points() as MKMapPointMBS) as MKPolygonMBS 17306

# 119.45 class MKPolygonRendererMBS

## 119.45.1 class MKPolygonRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual representation for a polygon overlay.
**Notes:** This renderer fills and strokes the polygon represented by first filling the shape and then stroking its outline. You can change the color and other drawing attributes of the polygon by modifying the properties inherited from the parent class. You typically use this class as is and do not subclass it.
Subclass of the MKOverlayPathRendererMBS class.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.2, page 49: Maps Part 9,ÄîPutting GPS Data on the Map, Helping out a fellow coder with the MapKitMBS plugin by Markus Winter

## 119.45.2 Methods

## 119.45.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPolygonRenderer reference from a declare.
The object is retained.
See also:

- 119.45.4 Constructor(polygon as MKPolygonMBS) 17307

## 119.45.4 Constructor(polygon as MKPolygonMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a new renderer that handles drawing for the specified polygon overlay object.
**Notes:** polygon: The polygon overlay containing information about the area to be drawn. This object must have at least three points defining the polygon to draw. This parameter must not be nil.
See also:

- 119.45.3 Constructor(Handle as Integer) 17307

### 119.45.5 Properties

### 119.45.6 polygon as MKPolygonMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The polygon object that contains the information used to draw the overlay,Äôs contents.
**Notes:** (Read only property)

# 119.46 class MKPolylineMBS

## 119.46.1 class MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKPolyline class represents a shape consisting of one or more points that define connecting line segments.
**Notes:** The points are connected end-to-end in the order they are provided. The first and last points are not connected to each other.
Subclass of the MKMultiPointMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 19.4, page 55: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter
- 19.4, pages 47 to 49: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter
- 19.2, page 49: Maps Part 9,ÄîPutting GPS Data on the Map, Helping out a fellow coder with the MapKitMBS plugin by Markus Winter

Interfaces: MKOverlayMBS

## 119.46.2 Methods

## 119.46.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

### 119.46.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.

### 119.46.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:


- 119.46.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17310
- 119.46.7 Constructor(Handle as Integer) 17311
- 119.46.8 Constructor(points() as MKMapPointMBS) 17311


### 119.46.6 Constructor(coords() as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolyline object from the specified set of coordinates.
**Notes:** coords: The array of coordinates defining the shape. The data in this array is copied to the new object.
Returns a new polyline object.
See also:


- 119.46.5 Constructor 17310
- 119.46.7 Constructor(Handle as Integer) 17311
- 119.46.8 Constructor(points() as MKMapPointMBS) 17311

### 119.46.7 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPolyline reference from a declare.
The object is retained.
See also:


- 119.46.5 Constructor 17310
- 119.46.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17310
- 119.46.8 Constructor(points() as MKMapPointMBS) 17311


### 119.46.8 Constructor(points() as MKMapPointMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolyline object from the specified set of map points.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.
See also:


- 119.46.5 Constructor 17310
- 119.46.6 Constructor(coords() as CLLocationCoordinate2DMBS) 17310
- 119.46.7 Constructor(Handle as Integer) 17311


### 119.46.9 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.46.10 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.46.11 polylineWithCoordinates(coords() as CLLocationCoordinate2DMBS) as MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolyline object from the specified set of coordinates.
**Notes:** coords: The array of coordinates defining the shape. The data in this array is copied to the new object.
Returns a new polyline object.

### 119.46.12 polylineWithPoints(points() as MKMapPointMBS) as MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an MKPolyline object from the specified set of map points.
**Notes:** points: The array of map points defining the shape. The data in this array is copied to the new object.

# 119.47 class MKPolylineRendererMBS

## 119.47.1 class MKPolylineRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual representation for any polyline overlay object.
**Notes:** This renderer strokes the line only; it does not fill it. You can change the color and other drawing attributes of the polyline by modifying the properties inherited from the parent class. You typically use this class as is and do not subclass it.
Subclass of the MKOverlayPathRendererMBS class.
**Blog Entries**

- MapKit Framework for Xojo

## 119.47.2 Methods

## 119.47.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKPolylineRenderer reference from a declare.
The object is retained.
See also:

- 119.47.4 Constructor(polyline as MKPolylineMBS) 17313

## 119.47.4 Constructor(polyline as MKPolylineMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a new overlay view using the specified polyline overlay object
**Notes:** polyline: The polyline overlay containing information about the area to be drawn. This object must have at least two points defining the line segment to draw. This parameter must not be nil.
See also:

- 119.47.3 Constructor(Handle as Integer) 17313

## 119.47.5 Properties

## 119.47.6 polyline as MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The polyline overlay object that contains the information used to draw the overlay.
**Notes:** (Read only property)

# 119.48 class MKRouteMBS

## 119.48.1 class MKRouteMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A single route between a requested start and end point.
**Notes:** An MKRouteMBS object defines the geometry for the route—that is, it contains line segments associated with specific map coordinates. A route object may also include other information, such as the name of the route, its distance, and the expected travel time.

You do not create instances of this class directly. When you use an MKDirectionsMBS object to request directions from Apple, the returned MKDirectionsResponseMBS object contains the possible routes.
**Blog Entries**

- MapKit Framework for Xojo

**Videos**

- Apple MapView In Xojo

## 119.48.2 Methods

## 119.48.3 advisoryNotices as String()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of advisory notice strings for the route.
**Notes:** This property contains an array of strings. Each string is localized according to the user,Äôs language preferences. The strings contain additional information that is important for the user to know about the route. For example, a string might note that a portion of the route is closed during the winter or after big storms.

## 119.48.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.48.5 Constructor(Handle as Integer) 17316

### 119.48.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKRoute reference from a declare.
The object is retained.
See also:

- 119.48.4 Constructor 17315

### 119.48.6 steps as MKRouteStepMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The array of steps that comprise the overall route.
**Notes:** The array contains one or more MKRouteStep objects representing distinct portions of the route. Each step corresponds to a single direction that must be followed along the route.

### 119.48.7 Properties

### 119.48.8 distance as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The route distance in meters.
**Notes:** This property reflects the distance that the user covers while traversing the path of the route. It is not a direct distance between the start and end points of the route.
(Read only property)

### 119.48.9 expectedTravelTime as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The expected travel time in seconds.
**Notes:** This expected travel time reflects the time it takes to traverse the route under ideal conditions. The actual amount of time may vary based on conditions.
(Read only property)

### 119.48.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.48.11 name as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name assigned to the route.
**Notes:** The string in this property is localized according to the user,Äôs language preferences. You can display this string to the user from your app,Äôs user interface so that the user can distinguish one route from another.
The string itself describes the route using one of the route,Äôs significant features. For example, a route that uses a major highway for a significant portion of the route might use that highway for its name.
(Read only property)

### 119.48.12 polyline as MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The detailed route geometry.
**Notes:** The polyline object in this property reflects the complete path of the route, including all of its steps. You can use the polyline object as an overlay in a map view.
(Read only property)

### 119.48.13 transportType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The overall route transport type.
**Notes:** This property reflects the primary transport type used for the route. Individual steps of the route might use different transport types.
(Read only property)

### 119.48.14 Constants

Transport Types

| Constant | Value | Description |
|---|---|---|
| TransportTypeAny | &h0FFFFFFF | Directions suitable for any transportation option. |
| TransportTypeAutomobile | 1 | Directions suitable for use while driving. |
| TransportTypeTransit | 3 | Directions suitable for public transportation. |
| TransportTypeWalking | 2 | Directions suitable for a pedestrian. |

# 119.49 class MKRouteStepMBS

## 119.49.1 class MKRouteStepMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** One portion of an overall route.
**Notes:** Each MKRouteStepMBS object corresponds to a single instruction that would need to be followed by the user when navigating between two points. For example, a step might involve following a single road until a turn is required.

You do not create instances of this class directly. An MKRouteMBS object contains the MKRouteStepMBS objects associated with a route. For more information about requesting directions, see MKDirectionsMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MapKit Framework for Xojo

## 119.49.2 Methods

## 119.49.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 119.49.4 Properties

## 119.49.5 distance as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The step distance in meters.
**Notes:** This property reflects the distance that the user covers while traversing the path of the step. It is not a direct distance between the start and end points of the step.
(Read only property)

## 119.49.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.

**Notes:** (Read and Write property)

### 119.49.7 instructions as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The written instructions for following the path represented by this step.
**Notes:** The string in this property is localized according to the user,Äôs language preferences. You can present this string to the user from your app,Äôs interface.
(Read only property)

### 119.49.8 notice as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Additional notices that apply to the step.
**Notes:** Notices may include legal information or warning notices that apply to the step. For example, if the step crosses railroad tracks, it might contain a notice that warns the user not to cross the tracks when the lights are flashing.
(Read only property)

### 119.49.9 polyline as MKPolylineMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The detailed step geometry.
**Notes:** The polyline object in this property contains the geometry for this step. You can use the polyline object as an overlay in a map view.
(Read only property)

### 119.49.10 transportType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transport type of the step.
**Notes:** This property reflects the transport type employed by the step and may differ from the transport type of the overall route.
(Read only property)

### 119.49.11 Constants

Transport Types

| Constant | Value | Description |
|---|---|---|
| TransportTypeAny | &h0FFFFFFF | Directions suitable for any transportation option. |
| TransportTypeAutomobile | 1 | Directions suitable for use while driving. |
| TransportTypeTransit | 3 | Directions suitable for public transportation. |
| TransportTypeWalking | 2 | Directions suitable for a pedestrian. |

## 119.50 class MKShapeMBS

### 119.50.1 class MKShapeMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKShape class is an abstract class that defines the basic properties for all shape-based annotation objects.
**Notes:** This class must be subclassed and cannot be used as is. Subclasses are responsible for defining the geometry of the shape and providing an appropriate value for the coordinate property inherited from the MKAnnotationMBS interface.
**Blog Entries**

- MapKit Framework for Xojo

Interfaces: MKAnnotationMBS

### 119.50.2 Methods

### 119.50.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.50.4 Constructor(Handle as Integer) 17322

### 119.50.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKShape reference from a declare.
The object is retained.
See also:

- 119.50.3 Constructor 17322

### 119.50.5 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.50.6 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.50.7 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.50.11 subtitle as String 17323

### 119.50.8 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.50.12 title as String 17324

### 119.50.9 Properties

### 119.50.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 119.50.11 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKAnnotationMBS interface.

(Read and Write property)
See also:

- 119.50.7 SubTitle as String 17323

### 119.50.12 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read and Write property)
See also:

- 119.50.8 Title as String 17323

# 119.51 class MKTileOverlayMBS

## 119.51.1 class MKTileOverlayMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** MKTileOverlay represents a data source for raster image tiles in the spherical mercator projection (EPSG:3857).
**Blog Entries**

- MapKit Framework for Xojo

Interfaces: MKOverlayMBS, MKAnnotationMBS

## 119.51.2 Methods

## 119.51.3 boundingMapRect as MKMapRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The projected rectangle that encompasses the overlay.
**Notes:** This property contains the smallest rectangle that completely encompasses the overlay. Implementers of this interface must set this area when implementing their overlay class, and after setting it, you must not change it. The rectangle should be specified using projected coordinates—that is, coordinates obtained by projecting the globe onto a two-dimensional surface.

Part of the MKOverlayMBS interface.

## 119.51.4 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean indicating whether the overlay content replaces the underlying map content.
**Notes:** true if the map view can skip the loading and drawing of the underlying map tiles or false if the map tiles should still be drawn.

The map view uses the return value of this method as a hint to determine whether it should load and render its tiles. If your overlay covers its designated region entirely with opaque content, and effectively replaces the content of underlying map tiles, implement this method and return true. Doing so alleviates the need for the map to render its tiles.
If you do not implement this method, or if you return false from it, the map view continues to load and render its tiles.

Part of MKOverlayMBS interface.
See also:

- 119.51.15 canReplaceMapContent as Boolean 17328

### 119.51.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKTileOverlay reference from a declare.
The object is retained.
See also:

- 119.51.6 Constructor(URL as string) 17326

### 119.51.6 Constructor(URL as string)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a tile overlay object using the specified tile-access template.
**Notes:** URLTemplate: A string that can be used to build a URL to access your tile images. The string you specify can point to a local file or to an image on a remote server. To facilitate retrieving multiple tiles using the string, use the placeholder values { x } , { y } , { z } , and { scale } as stand-ins for the x and y tile indexes, the zoom level, and the resolution of the tile image. If this parameter is nil, you must provide custom implementations for the tile-loading methods of this class.

Returns an initialized tile overlay object.

The default tile overlay object uses the template string you specify to request tiles. This template string should incorporate the { x } , { y } , { z } , and { scale } placeholder strings to facilitate the creation of a URL for requesting the appropriate tile. For example, if you have a server that vends tiles when you provide a URL of the form http://myserver/tile?x=0&y=0&z=0&scale=1.0, you would specify a template string of http://myserver/tile?x= { x } &y= { y } &z= { z } &scale= { scale } . The tile overlay object substitutes actual index values in for your template,Äôs placeholders before requesting the actual tile.
See also:

- 119.51.5 Constructor(Handle as Integer) 17326

### 119.51.7 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.51.16 coordinate as CLLocationCoordinate2DMBS 17329

### 119.51.8 intersectsMapRect(mapRect as MKMapRectMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether this overlay intersects with the given map rectangle.
**Notes:** Part of the MKOverlayMBS interface.

### 119.51.9 loadTileAtPath(Path as MKTileOverlayPathMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Loads the specified tile asynchronously.
**Notes:** Path: The path structure that identifies the specific tile you want. This structure incorporates the tile,Äôs X-Y coordinate at a given zoom level and scale factor.

The default implementation of this method uses the URLForTilePath method to retrieve the URL for the specified tile and then loads that tile into memory asynchronously using an NSURLConnectionMBS object. The specified tile may be located either on the local file system or on a remote server. Subclasses may override this method and implement their own custom tile-loading behavior.

When a tile overlay renderer (that is, an instance of MKTileOverlayRendererMBS) needs to display tiles, it uses this method to request the data for each tile.

### 119.51.10 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.51.11 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
See also:

- 119.51.22 subtitle as String 17330

### 119.51.12 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
See also:

- 119.51.24 title as String 17331

### 119.51.13 URLForTilePath(Path as MKTileOverlayPathMBS) as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the URL to use to access the specified tile.
**Notes:** path: The path structure that identifies the specific tile you want. This structure incorporates the tile,Äôs X-Y coordinate at a given zoom level and scale factor.

Returns the URL to use to retrieve the tile.

The default implementation of this method uses the template string you provided at initialization time to build a URL to the specified tile image. Subclasses can override this method and use a different scheme to provide URLs for tiles. Tiles can be located either on a local file system or on a remote server.

### 119.51.14 Properties

### 119.51.15 canReplaceMapContent as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the tile content is fully opaque.
**Notes:** If the tile content you provide can cover the entire drawing area with opaque content, set this property to true. Doing so serves as a hint to the map view that it does not need to draw any additional content underneath your tiles. Set this property to false if your tiles contain any transparency.
The default value for this property is false.
(Read and Write property)
See also:

• 119.51.4 canReplaceMapContent as Boolean 17325

### 119.51.16 coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read only property)
See also:

• 119.51.7 Coordinate as CLLocationCoordinate2DMBS 17326

### 119.51.17 geometryFlipped as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates the orientation of tile indexes along the y axis.
**Notes:** When set to NO, tile indexes start in the upper-left corner of the map and proceed down and to the right. Thus, the tile at (0, 0) is in the upper-left corner of the map, the tile at (1, 0) is to its immediate right and the tile at (0, 1) is immediately below it. Setting this property to true causes the map to start indexes at the lower-left corner of the map and proceed up and to the right.
The default value of this property is false.
(Read and Write property)

### 119.51.18 latitude as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The latitude of the coordinates.
**Notes:** (Read only property)

### 119.51.19 longitude as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The longitude of the coordinates.
**Notes:** (Read only property)

### 119.51.20 maximumZ as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum zoom level supported by the tiles of this overlay object.
**Notes:** If you use different overlay objects to represent different tiles at different zoom levels, use this property to specify the maximum zoom level supported by this overlay,Äôs tiles. At zoom level 0, tiles cover the entire world map; at zoom level 1, tiles cover 1/4 of the world; at zoom level 2, tiles cover 1/16 of the world, and so on. The map never tries to load tiles for a zoom level greater than the value specified by this property.
The default value of this property is 21. Setting the value of this property to a number greater than the default does not guarantee the use of those extra zoom levels.
(Read and Write property)

### 119.51.21 minimumZ as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum zoom level supported by the tiles of this overlay object.
**Notes:** If you use different overlay objects to represent different tiles at different zoom levels, use this property to specify the minimum zoom level supported by this overlay,Äôs tiles. At zoom level 0, tiles cover the entire world map; at zoom level 1, tiles cover 1/4 of the world; at zoom level 2, tiles cover 1/16 of the world, and so on. The map never tries to load tiles for a zoom level less than the value specified by this property.

The default value of this property is 0.
(Read and Write property)

### 119.51.22 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.
(Read only property)
See also:

- 119.51.11 SubTitle as String 17327

### 119.51.23 TileSize as CGSizeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size (in pixels) of your tile images.
**Notes:** On Retina displays, the images are rendered pixel for pixel and are not scaled. This means that if

the tile size is 256 x 256 pixels and the scale factor is 2.0, the image would be rendered as if it were 128 x 128 points in size. This behavior causes the tile to appear smaller but preserves the original image data. The default tile size is set to 256 x 256 pixels.
(Read and Write property)

### 119.51.24 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
(Read only property)
See also:

- 119.51.12 Title as String 17328

### 119.51.25 URLTemplate as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The template for generating tile image URLs.
**Notes:** You specify this string at initialization time.
(Read only property)

### 119.51.26 Events

### 119.51.27 TileLoaded(path as MKTileOverlayPathMBS, tileData as MemoryBlock, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** Called by loadTileAtPath when loading finished.
**Notes:** The tileData parameter contains the raw data loaded from the corresponding image file. You can use this data to initialize an image object. If an error occurred, this parameter is nil.

The error parameter contains an error object if there was a problem loading the tile image. If no errors occurred, this parameter is nil.

## 119.52 class MKTileOverlayPathMBS

### 119.52.1 class MKTileOverlayPathMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Use this class to specify the index values for a single tile.
**Blog Entries**

- MapKit Framework for Xojo

### 119.52.2 Methods

### 119.52.3 Constructor(other as MKTileOverlayPathMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The copy constructor.
See also:

- 119.52.4 Constructor(x as Integer, y as Integer, z as Integer, ContentScaleFactor as double) 17332

### 119.52.4 Constructor(x as Integer, y as Integer, z as Integer, ContentScaleFactor as double)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 119.52.3 Constructor(other as MKTileOverlayPathMBS) 17332

### 119.52.5 Properties

### 119.52.6 ContentScaleFactor as Double

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The screen scale factor for which the tile is intended.
**Notes:** (Read and Write property)

### 119.52.7 X as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The index of the tile along the x axis of the map.
**Notes:** (Read and Write property)

### 119.52.8 Y as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The index of the tile along the y axis of the map.
**Notes:** (Read and Write property)

### 119.52.9 Z as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The zoom level number for the tile.
**Notes:** (Read and Write property)

## 119.53 class MKTileOverlayRendererMBS

### 119.53.1 class MKTileOverlayRendererMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The renderer for a tile overlay that handles the drawing of bitmap images on the map surface.
**Notes:** You create instances of this class when tile overlays become visible on the map view. A renderer works closely with its associated tile overlay object to coordinate the loading and drawing of tiles at appropriate times.
For information about how to specify the tiles to display on the map, see MKTileOverlayMBS.
Subclass of the MKOverlayRendererMBS class.
**Blog Entries**

- MapKit Framework for Xojo

### 119.53.2 Methods

### 119.53.3 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKTileOverlayRenderer reference from a declare.
The object is retained.
See also:

- 119.53.4 Constructor(TileOverlay as MKTileOverlayMBS) 17334

### 119.53.4 Constructor(TileOverlay as MKTileOverlayMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a tile renderer with the specified overlay object.
**Notes:** overlay: The tile overlay object whose contents you want to draw.
See also:

- 119.53.3 Constructor(Handle as Integer) 17334

### 119.53.5 reloadData

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Forces tiles to be reloaded and displayed.
**Notes:** Use this method to remove the overlay,Äôs existing tile images and reload them from the original

source. This method automatically causes the renderer to redraw the new tiles as soon as they are loaded into memory.

## 119.54 class MKUserLocationMBS

### 119.54.1 class MKUserLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The MKUserLocation class defines a specific type of annotation that identifies the user's current location.
**Notes:** You do not create instances of this class directly. Instead, you retrieve an existing MKUserLocation object from the userLocation property of the map view displayed in your application.
**Blog Entries**

- MapKit Framework for Xojo

**Xojo Developer Magazine**

- 18.6, page 79: MapKit Part 7, Implementing Maps in Xojo desktop apps with the MapKitMBS plugin by Markus Winter
- 18.5, page 88: Maps (Part 6), A deep dive into Annotations by Markus Winter

Interfaces: MKAnnotationMBS

### 119.54.2 Methods

### 119.54.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.
See also:

- 119.54.4 Constructor(Handle as Integer) 17336

### 119.54.4 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a MKUserLocation reference from a declare.
The object is retained.
See also:

- 119.54.3 Constructor 17336

### 119.54.5 Coordinate as CLLocationCoordinate2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.54.6 SetCoordinate(newCoordinate as CLLocationCoordinate2DMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the coordinate of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.
Do not use.

### 119.54.7 SubTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtitle of the item.
**Notes:** Part of the MKOverlayMBS interface.

### 119.54.8 Title as String

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the annotation.
**Notes:** Part of the MKAnnotationMBS interface.

### 119.54.9 Properties

### 119.54.10 heading as CLHeadingMBS

MBS MacFrameworks Plugin, Plugin Version: 19.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The heading for the user location.
**Notes:** Returns nil if not in MKUserTrackingModeFollowWithHeading is used.
(Read only property)

### 119.54.11 location as CLLocationMBS

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current location of the device.
**Notes:** This property contains nil if the map view is not currently showing the user location or if the user's location has not yet been determined.
(Read only property)

### 119.54.12 updating as Boolean

MBS MacFrameworks Plugin, Plugin Version: 14.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the user's location is currently being updated.
**Notes:** (Read only property)

# Chapter 120

# MarkDown

## 120.1 class MarkdownDocumentMBS

### 120.1.1 class MarkdownDocumentMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class ot process markdown text.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1

### 120.1.2 Methods

### 120.1.3 Compile(flags as Integer = 35799040) as boolean

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compiles the markdown code.

### 120.1.4 Constructor(data as string, flags as Integer = 35799040)

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new document with the content of the file.
**Notes:** Text should have EndOfLine.Unix as newline character.
Text must be in UTF-8 encoding to work best.
See also:

• 120.1.5 Constructor(file as folderitem, flags as Integer = 35799040) 17340

### 120.1.5 Constructor(file as folderitem, flags as Integer = 35799040)

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new document with the content of the file.
**Notes:** Text should have EndOfLine.Unix as newline character.
Text must be in UTF-8 encoding to work best.
See also:

• 120.1.4 Constructor(data as string, flags as Integer = 35799040) 17339

### 120.1.6 CSS as string

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates CSS for the html code.

### 120.1.7 Document as string

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates HTML document.
**Notes:** Creates HTML if needed.

### 120.1.8 Footnotes as MarkdownFootnoteMBS()

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of foot notes.

### 120.1.9 GenerateCSS(File as folderitem) as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates a css file.
**Notes:** Returns number of bytes written. Or -1 on any error.

### 120.1.10 GenerateHTML(File as folderitem) as boolean

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generates a html file.
**Notes:** Returns true on success and false on failure.

### 120.1.11 Properties

### 120.1.12 Author as MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The author line.
**Notes:** Can be nil if not used.
(Read only property)

### 120.1.13 Code as MarkdownParagraphMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Intermediate code generated by compile.
**Notes:** (Read only property)

### 120.1.14 Compiled as Boolean

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether document is compiled already.
**Notes:** (Read only property)

### 120.1.15 Date as MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The date line.
**Notes:** Can be nil if not used.
(Read only property)

### 120.1.16 ExtraFootnotePrefix as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The extra footnote prefix.
**Notes:** (Read and Write property)

### 120.1.17 Handle as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read only property)

### 120.1.18 HasHTML as Boolean

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether html is available.
**Notes:** Set to true when html is generated.
(Read only property)

### 120.1.19 Title as MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title line.
**Notes:** Can be nil if not used.
(Read only property)

### 120.1.20 URLBase as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The URL base.
**Notes:** (Read and Write property)

### 120.1.21 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kAutoLink | &h4000 | make http://foo.com link even without <>s |
| kCDATA | &h80 | generate code for xml ! [ CDATA [ ... ] ] |
| kExtraFootnote | &h200000 | Enable markdown extra-style footnotes. |
| kInputMask | &h00030000 | |
| kIsLabel | &h08000000 | |
| kNoAlphaList | &h80000 | Forbid alphabetic lists. |
| kNoDivQuote | &h40000 | Forbid >%class% blocks. |
| kNoDList | &h100000 | Forbid definition lists. |
| kNoExt | &h40 | Don't allow pseudo-protocols. |
| kNoHeader | &h10000 | Don't process header blocks. |
| kNoHTML | 8 | Don't allow raw html through AT ALL |
| kNoImage | 2 | Don't do image processing, block <img>. |
| kNoLinks | 1 | Don't do link processing, block <a>tags. |
| kNoPants | 4 | don't run smartypants. |
| kNoRelaxed | &h200 | emphasis happens /everywhere/ |
| kNoStrikethrough | &h800 | Forbid strikethrough. |
| kNoSuperscript | &h100 | no A^B |
| kNoTables | &h400 | Disallow tables. |
| kSafeLink | &h8000 | Paranoid check for link protocol. |
| kStrict | &h10 | Disable SUPERSCRIPT, RELAXED_EMPHASIS. |
| kTabStop | &h20000 | Expand tabs to 4 spaces. |
| kTagText | &h20 | process text inside an html tag; no * , no <bold>, no html or [ ] expansion |
| kTOC | &h1000 | Do table-of-contents processing. |
| kUserFlags | &h0FFFFFFF | |

## 120.2 class MarkdownFootnoteMBS

### 120.2.1 class MarkdownFootnoteMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a foot note.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 120.2.2 Methods

### 120.2.3 Constructor

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 120.2.4 Properties

### 120.2.5 Document as MarkdownDocumentMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The back reference to the markdown document.
**Notes:** (Read only property)

### 120.2.6 Flags as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Can be zero or a combination of kFlagExtraBookmark and kFlagReferenced.
(Read only property)

### 120.2.7 Height as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dimensions for image link.
**Notes:** (Read only property)

### 120.2.8 Link as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What this footnote points to.
**Notes:** (Read only property)

### 120.2.9 RefNumber as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference number.
**Notes:** (Read only property)

### 120.2.10 Tag as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag for the reference link.
**Notes:** (Read only property)

### 120.2.11 Title as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The title of the footnode.
**Notes:** (Read only property)

### 120.2.12 Width as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The dimensions for image link.
**Notes:** (Read only property)

### 120.2.13 Constants

Footnote Flags

| Constant | Value | Description |
|---|---|---|
| kFlagExtraBookmark | 1 | |
| kFlagReferenced | 2 | Set if this footnote is referenced. |

## 120.3 class MarkdownLineMBS

### 120.3.1 class MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a line in the markdown text.
**Notes:** Each input line is read into a Line, which contains the line, the offset of the first non-space character [ this assumes that all tabs will be expanded to spaces! ] , and a pointer to the next line.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 120.3.2 Methods

### 120.3.3 Constructor

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 120.3.4 Properties

### 120.3.5 Count as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The kind of this line.
**Notes:** See kKind* constants.
(Read only property)

### 120.3.6 DLE as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The leading indent on the line.
**Notes:** (Read only property)

### 120.3.7 Document as MarkdownDocumentMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The back reference to the markdown document.
**Notes:** (Read only property)

### 120.3.8 Flags as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Special attributes for this line.
**Notes:** Can be combination of kFlag* constants.
(Read only property)

### 120.3.9 Kind as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The line type.
**Notes:** See kKind* constants.
(Read only property)

### 120.3.10 NextLine as MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next line.
**Notes:** (Read only property)

### 120.3.11 Text as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text of the line.
**Notes:** (Read only property)

### 120.3.12 Constants

Flag Values

| Constant | Value | Description |
|---|---|---|
| kFlagChecked | 2 | The line was already processed. |
| kFlagPipeChar | 1 | line contains a \| |

Kind Values

| Constant | Value | Description |
|---|---|---|
| kKindCode | 1 | Code |
| kKindDash | 3 | Dash line |
| kKindEqual | 5 | Equal line |
| kKindHR | 2 | HR line |
| kKindText | 0 | Text line |
| kKindTilde | 4 | Tilde line |

## 120.4 class MarkdownParagraphMBS

### 120.4.1 class MarkdownParagraphMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class ofr a paragraph.
**Notes:** A paragraph is a collection of Lines, with links to the next paragraph and (if it's a QUOTE, UL, or OL) to the reparsed contents of this paragraph.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 120.4.2 Methods

### 120.4.3 Constructor

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 120.4.4 Properties

### 120.4.5 Align as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The paragraph alignment.
**Notes:** Can be kAlignPara, kAlignImplicit or kAlignCenter.
(Read only property)

### 120.4.6 Document as MarkdownDocumentMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The back reference to the markdown document.
**Notes:** (Read only property)

### 120.4.7 Down as MarkdownParagraphMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Recompiled contents of this paragraph.
**Notes:** (Read only property)

### 120.4.8 hNumber as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header level for HDR.
**Notes:** (Read only property)

### 120.4.9 Ident as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ID tag for quote.
**Notes:** (Read only property)

### 120.4.10 Lang as String

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** lang attribute for CODE
**Notes:** (Read only property)

### 120.4.11 NextParagraph as MarkdownParagraphMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next paragraph.
**Notes:** (Read only property)

### 120.4.12 Text as MarkdownLineMBS

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** All the text in this paragraph.
**Notes:** (Read only property)

### 120.4.13 Typ as Integer

MBS Tools Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of paragraph.
**Notes:** See kType* constants.
(Read only property)

### 120.4.14 Constants

Alignment Values

| Constant | Value | Description |
|---|---|---|
| kAlignCenter | 2 | Center |
| kAlignImplicit | 0 | Implicit alignment |
| kAlignPara | 1 | Paragraph |

Typ Codes

| Constant | Value | Description |
|---|---|---|
| kTypeAL | 9 | AL |
| kTypeCode | 1 | Code |
| kTypeDL | 6 | DL |
| kTypeHDR | 11 | HDR |
| kTypeHR | 12 | HR |
| kTypeHTML | 4 | HTML |
| kTypeListItem | 10 | ListItem |
| kTypeMarkup | 3 | Markup |
| kTypeOL | 8 | OL |
| kTypeQuote | 2 | Quote |
| kTypeSource | 14 | Source |
| kTypeStyle | 5 | Style |
| kTypeTable | 13 | Table |
| kTypeUL | 7 | UL |
| kTypeWhitespace | 0 | Whitespace |

# Chapter 121

# Math

## 121.1 class BiggerNumberMBS

### 121.1.1 class BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a big number.
**Example:**

```
// speed of light in m/s
Dim SpeedOfLight As New BiggerNumberMBS("299792458")

// seconds per day
Dim SecondsPerDay As New BiggerNumberMBS(24 * 3600)

Dim DaysPerYear As New BiggerNumberMBS(365.25)

Dim LightYear As BiggerNumberMBS = SpeedOfLight * DaysPerYear * SecondsPerDay
MsgBox LightYear.StringValue+" meter per light year"

// 9.460.730.472.580.800 matches number from Wikipedia


Dim AgeOfUniversum As New BiggerNumberMBS(13810000000)

Dim MaxDistance As BiggerNumberMBS = LightYear * AgeOfUniversum

MsgBox MaxDistance.GetStringValue(10, False, 100, 3, True)+" meter maximum"
```

**Notes:** This is floating point number with 320 bits in BigNumber and 2560 bits in BiggerNumber class.
Precision is about 77 digits dot for the smaller one and 617 for the bigger one.
So use first for speed and second for precision.

So if you want to store currency or other values where rounding should not happen, better store values multiplied, e.g. in cents.

Compared to normal double values, you have 5 times the bits.
And we check for math errors and raise exceptions if something goes wrong.

See LargeNumberMBS for a 4128 bit integer number, about 1200 digits in length.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MBS Xojo Plugin, June 2021 News
- News from the MBS Xojo Plugins Version 21.1
- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr9

**Videos**

- MBS Xojo Plugins 21.1
- MBS Xojo Videos - MBS Xojo Plugin, June 2021 News

**Xojo Developer Magazine**

- 21.3, page 68: Large, Big, and Bigger Numbers, Working with giant numbers by Stefanie Juchmes
- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 19.3, page 44: Xojo Time and Space,ÄîInto a Programming Black Hole, How converting durations and distances into human-readable form reveals a 32-bit problem at the heart of Xojo's 64-bit math module by Markus Winter
- 19.3, page 10: News

### 121.1.2 Methods

### 121.1.3 Abs as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries absolute value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(-123)
dim z as BiggerNumberMBS = o.Abs

MsgBox z.StringValue
```

**Notes:** Removes sign.
See also:

- 121.1.4 Abs(value as BiggerNumberMBS) as BiggerNumberMBS 17355

### 121.1.4 Abs(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Absolute value of x.
**Example:**

```
Dim c As New BiggerNumberMBS(-3)
Dim d As BiggerNumberMBS = BiggerNumberMBS.Abs(c)
Dim e As BiggerNumberMBS = c.Abs

MsgBox d.StringValue+EndOfLine+e.StringValue // shows 3
```

See also:

- 121.1.3 Abs as BiggerNumberMBS 17355

### 121.1.5 ACos(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Cosine.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ACos(c)
```

```
Dim x As Double = ACos(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** we're using the formula: acos(x) = pi/2 - asin(x)

### 121.1.6 ACosh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverse hyperbolic cosine.
**Example:**

```
Dim c As New BiggerNumberMBS(2.0)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ACosh(c)

// ACosHMBS is in MBS Xojo Util Plugin
Dim x As Double = ACosHMBS(2.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** acosh(x) = ln( x + sqrt(x^2 - 1) ) x in <1, infinity)

### 121.1.7 ACot(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Cotangent.
**Notes:** we're using the formula: actan(x) = pi/2 - atan(x)

### 121.1.8 ACoth(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates inverse hyperbolic cotangent.
**Notes:** acoth(x) = 0.5 * ln( (x+1) / (x-1) ) x in (-infinity, -1) or (1, infinity)

### 121.1.9 Add(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim d as new BiggerNumberMBS(3)
dim p as BiggerNumberMBS = x.Add(d)

MsgBox p.StringValue // shows 5
```

### 121.1.10 ASin(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Sine.
**Example:**

```
Dim c As New BiggerNumberMBS(1.0)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ASin(c)

Dim x As Double = ASin(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** Range is from -1 to 1.

### 121.1.11 ASinh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverse hyperbolic sine.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ASinH(c)

// ASinHMBS is in MBS Xojo Util Plugin
Dim x As Double = ASinHMBS(0.5)
```

MsgBox d.StringValue+EndOfLine+Str(x)

**Notes:** asinh(x) = ln( x + sqrt(x^2 + 1) )

### 121.1.12 ATan(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Tangent.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ATan(c)

Dim x As Double = ATan(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

### 121.1.13 ATanh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates inverse hyperbolic tangent.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.ATanh(c)

// ATanhMBS is in MBS Xojo Util Plugin
Dim x As Double = ATanhMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** atanh(x) = 0.5 * ln( (1+x) / (1-x) ) x in (-1, 1)

### 121.1.14 BitAnd(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise AND operation.
**Example:**

```
dim x as new BiggerNumberMBS(17)
dim y as new BiggerNumberMBS(16)
dim r as BiggerNumberMBS = x.BitAnd(y)

MsgBox r.StringValue
```

### 121.1.15 BitOr(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise or operation.
**Example:**

```
dim x as new BiggerNumberMBS(17)
dim y as new BiggerNumberMBS(16)
dim r as BiggerNumberMBS = x.BitOr(y)

MsgBox r.StringValue
```

### 121.1.16 BitXOr(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise xor operation.
**Example:**

```
dim x as new BiggerNumberMBS(17)
dim y as new BiggerNumberMBS(16)
dim r as BiggerNumberMBS = x.BitXOr(y)

MsgBox r.StringValue
```

### 121.1.17 Ceil as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns a value representing the smallest integer that is greater than or equal to x.
**Example:**

```
Dim c As New BiggerNumberMBS(-3.7)
Dim d As BiggerNumberMBS = c.Ceil

MsgBox d // shows -3
```

**Notes:** e.g.
Ceil(-3.7) = -3
Ceil(-3.1) = -3
Ceil(-3.0) = -3
Ceil(4.0) = 4
Ceil(4.2) = 5
Ceil(4.8) = 5

### 121.1.18 Constructor

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with zero value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS
MsgBox o.StringValue
```

See also:


- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366

### 121.1.19 Constructor(other as BiggerNumberMBS)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with other value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.5)
dim c as BiggerNumberMBS = new BiggerNumberMBS(o)

MsgBox c.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.20 Constructor(value as Currency)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number object with a currency object.
**Example:**

```
dim v as Currency = 123.456
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361

- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.21 Constructor(value as Double)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with double value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.5)
MsgBox str(o.DoubleValue)+" = "+str(o.StringValue)#
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.22 Constructor(value as Int32)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 32-bit integer.
**Example:**

```
dim v as Int32 = 123
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.23 Constructor(value as Int64)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 64-bit integer.
**Example:**

```
dim v as Int64 = 123
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.24 Constructor(value as Single) 17364

- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.24 Constructor(value as Single)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 32-bit floating point number.
**Example:**

```
dim v as Single = 123
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.25 Constructor(value as String)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with string value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS("123.456")
MsgBox o.StringValue
```

See also:

- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.26 Constructor(value as UInt32) 17365
- 121.1.27 Constructor(value as UInt64) 17366


### 121.1.26 Constructor(value as UInt32)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with an unsigned 32-bit integer.
**Example:**

```
dim v as UInt32 = 123
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.27 Constructor(value as UInt64) 17366

### 121.1.27 Constructor(value as UInt64)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with an unsigned 32-bit integer.
**Example:**

```
dim v as UInt64 = 123
dim b as new BiggerNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.1.18 Constructor 17360
- 121.1.19 Constructor(other as BiggerNumberMBS) 17361
- 121.1.20 Constructor(value as Currency) 17361
- 121.1.21 Constructor(value as Double) 17362
- 121.1.22 Constructor(value as Int32) 17362
- 121.1.23 Constructor(value as Int64) 17363
- 121.1.24 Constructor(value as Single) 17364
- 121.1.25 Constructor(value as String) 17364
- 121.1.26 Constructor(value as UInt32) 17365


### 121.1.28 Cos(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the cosine value.
**Example:**

```
Dim c As New BiggerNumberMBS(1.0)
Dim d As BiggerNumberMBS = BiggerNumberMBS.Cos(c)

Dim x As Double = Cos(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula cos(x) = sin(x + PI/2).

### 121.1.29 Cosh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Cosine.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.CosH(c)

// CosHMBS is in MBS Xojo Util Plugin
Dim x As Double = CosHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula cosh(x)= ( e^x + e^(-x) ) / 2.

### 121.1.30 Cot(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Cotangent.
**Notes:** We're using the formula tan(x) = cos(x) / sin(x).

### 121.1.31 Coth(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Cotangent.
**Notes:** We're using the formula coth(x)= ( e^x + e^(-x) ) / ( e^x - e^(-x) )

### 121.1.32 DegToDeg(d as BiggerNumberMBS, m as BiggerNumberMBS, s as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format into one value.
**Notes:** long format: (degrees, minutes, seconds)
minutes and seconds must be greater than or equal zero

result:

if d>=0 : result= d + ((s/60)+m)/60
if d<0 : result= d - ((s/60)+m)/60

((s/60)+m)/60 = (s+60*m)/3600 (second version is faster because there's only one division)

for example:
DegToDeg(10, 30, 0) = 10.5
DegToDeg(10, 24, 35.6)=10.4098(8)

### 121.1.33 DegToGrad(d as BiggerNumberMBS, m as BiggerNumberMBS, s as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format to gradians.
See also:

- 121.1.34 DegToGrad(value as BiggerNumberMBS) as BiggerNumberMBS 17368

### 121.1.34 DegToGrad(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to gradians.
**Notes:** it returns: x * 200 / 180
See also:

- 121.1.33 DegToGrad(d as BiggerNumberMBS, m as BiggerNumberMBS, s as BiggerNumberMBS) as BiggerNumberMBS 17368

### 121.1.35 DegToRad(d as BiggerNumberMBS, m as BiggerNumberMBS, s as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format to radians.
See also:

- 121.1.36 DegToRad(value as BiggerNumberMBS) as BiggerNumberMBS 17368

### 121.1.36 DegToRad(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to radians.
**Notes:** It returns: x * pi / 180
See also:

- 121.1.35 DegToRad(d as BiggerNumberMBS, m as BiggerNumberMBS, s as BiggerNumberMBS) as BiggerNumberMBS 17368

### 121.1.37 Divide(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides the number.
**Example:**

```
dim x as new BiggerNumberMBS(8)
dim d as new BiggerNumberMBS(2)
dim p as BiggerNumberMBS = x.Divide(d)

MsgBox p.StringValue // shows 4
```

### 121.1.38 E as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value zero.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.e
MsgBox b.StringValue
```

### 121.1.39 Equals(other as BiggerNumberMBS) as Boolean

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two numbers are the same.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(123)
dim z as BiggerNumberMBS = new BiggerNumberMBS(123)

if o.Equals(z) then
MsgBox "equal"
```

```
else
Break // error
end if
```

**Notes:** Returns true if equal.

### 121.1.40 Exp(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates e^value.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim p as BiggerNumberMBS = BiggerNumberMBS.Exp(x)

MsgBox p.StringValue // shows e^2 = 7.38
```

### 121.1.41 Floor as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any fraction part.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.3)
dim s as BiggerNumberMBS = o.Floor

MsgBox s.StringValue

dim a as BiggerNumberMBS = new BiggerNumberMBS(-2.3)
dim b as BiggerNumberMBS = a.Floor

MsgBox b.StringValue
```

### 121.1.42 Frac as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the fraction part.

**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.5)
dim s as BiggerNumberMBS = o.Frac

MsgBox s.StringValue

dim a as BiggerNumberMBS = new BiggerNumberMBS(-2.5)
dim b as BiggerNumberMBS = a.Frac

MsgBox b.StringValue
```

### 121.1.43 GetStringValue(Base as Integer = 10, scientific as boolean = false, scientificFrom as Integer = 15, round as Integer = -1, TrimZeros as Boolean = true, comma as String = ".") as String

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string value.
**Example:**

```
dim o as new BiggerNumberMBS(1234)

// show as hex
MsgBox o.GetStringValue(16)

// show as number with comma and 3 digits
dim z as new BiggerNumberMBS(12.345)
MsgBox z.GetStringValue(10, false, 15, 3, true, ",")
```

**Notes:** Base: The base of the number system. Normally 10, but also 16 for hex is common.
scientific: Whether to use scientific notation.
scientificFrom: How many digits we show.
Round: Whether to round to n digits.
TrimZeros: Whether to trim unneeded zeros.
comma: The character to use as decimal dot.
See also:

- 121.1.44 GetStringValue(Conversion as BigNumberConversionMBS) as String 17371

### 121.1.44 GetStringValue(Conversion as BigNumberConversionMBS) as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string value.
**Example:**

```
Dim o As New BiggerNumberMBS(1234567.890)

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

Dim s1 As String = o.GetStringValue(conv)
// 1'234'567,89

conv.Comma = "."
conv.Group = ","

Dim s2 As String = o.GetStringValue(conv)
// 1,234,567,89

conv.Comma = ","
conv.Group = "'"
conv.Scientific = True

Dim s3 As String = o.GetStringValue(conv)
// 1,235e+6
```

Break

See also:

- 121.1.43 GetStringValue(Base as Integer = 10, scientific as boolean = false, scientificFrom as Integer = 15, round as Integer = -1, TrimZeros as Boolean = true, comma as String = ".") as String 17371

### 121.1.45 GradToDeg(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to gradians.
**Notes:** it returns: x * 180 / 200

### 121.1.46 GradToRad(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts gradians to radians.
**Notes:** It returns: x * pi / 200.

### 121.1.47 HalfPi as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value pi/2.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.HalfPi
MsgBox b.StringValue
```

### 121.1.48 LibTypeStr as String

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries what implementation is used for this platform.
**Notes:** Shows asm in the text if assembler code is used.
Assembler code is not available for all platforms.

### 121.1.49 Ln(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates natural logarithm.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim p as BiggerNumberMBS = BiggerNumberMBS.Ln(x)

MsgBox p.StringValue // shows ln(2) = 0.69
```

### 121.1.50 Ln10 as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value ln(10).
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Ln10
MsgBox b.StringValue
```

### 121.1.51 Ln2 as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value ln(2).
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Ln2
MsgBox b.StringValue
```

### 121.1.52 Log(value as BiggerNumberMBS, base as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates logarithm in a given base.
**Example:**

```
dim x as new BiggerNumberMBS(100)
dim d as new BiggerNumberMBS(10)
dim p as BiggerNumberMBS = BiggerNumberMBS.Log(x, d)

MsgBox p.StringValue // shows ln(100)/ln(10) = 2
```

### 121.1.53 Max as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with maximum value.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Min
MsgBox b.StringValue
```

### 121.1.54 Min as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with minimum value.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Min
MsgBox b.StringValue
```

### 121.1.55 Modulate(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulates a number.
**Example:**

```
dim x as new BiggerNumberMBS(17)
dim y as new BiggerNumberMBS(3)
dim r as BiggerNumberMBS = x.Modulate(y)

MsgBox r.StringValue
```

**Notes:** Similar to mod keyword in Xojo.

### 121.1.56 Modulate2 as Integer

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulates by 2.
**Example:**

```
dim x as new BiggerNumberMBS(8)
dim y as new BiggerNumberMBS(9)

MsgBox str(x.Modulate2)+" "+str(y.Modulate2)
```

**Notes:** Returns 0 or 1.

### 121.1.57 Multiply(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies two numbers.
**Example:**

```
dim x as new BiggerNumberMBS(8)
dim d as new BiggerNumberMBS(2)
dim p as BiggerNumberMBS = x.Multiply(d)

MsgBox p.StringValue // shows 16
```

See also:


- 121.1.58 Multiply(value as Integer) as BiggerNumberMBS 17376
- 121.1.59 Multiply(value as UInt32) as BiggerNumberMBS 17376


### 121.1.58 Multiply(value as Integer) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply by an integer.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim p as BiggerNumberMBS = x.Multiply(3)

MsgBox p.StringValue // shows 6
```

See also:


- 121.1.57 Multiply(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS 17376
- 121.1.59 Multiply(value as UInt32) as BiggerNumberMBS 17376


### 121.1.59 Multiply(value as UInt32) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply by an unsigned integer.
**Example:**

```
dim x as new BiggerNumberMBS(17)
dim r as BiggerNumberMBS = x.Multiply(3)

MsgBox r.StringValue
```

See also:

- 121.1.57 Multiply(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS 17376
- 121.1.58 Multiply(value as Integer) as BiggerNumberMBS 17376

### 121.1.60 Nan as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value NaN.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Nan
MsgBox b.StringValue
```

### 121.1.61 Negate as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the number.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(123)
dim z as BiggerNumberMBS = o.Negate

MsgBox z.StringValue
```

### 121.1.62 NumberWithCurrency(value as Currency) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a currency value.
**Example:**

```
dim v as Currency = 123.456
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithCurrency(v)
```

MsgBox b.StringValue

### 121.1.63 NumberWithDouble(value as Double) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a 64-bit floating number.
**Example:**

```
dim v as Double = 123.456
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithDouble(v)

MsgBox b.StringValue
```

### 121.1.64 NumberWithInt32(value as Int32) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a signed 32-bit integer.
**Example:**

```
dim v as Int32 = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithInt32(v)

MsgBox b.StringValue
```

### 121.1.65 NumberWithInt64(value as Int64) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a signed 64-bit integer.
**Example:**

```
dim v as Int64 = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithInt64(v)

MsgBox b.StringValue
```

### 121.1.66 NumberWithInteger(value as Integer) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an integer.
**Example:**

```
dim v as Integer = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithInteger(v)

MsgBox b.StringValue
```

### 121.1.67 NumberWithSingle(value as single) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an 32-bit floating point number.
**Example:**

```
dim v as Single = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithSingle(v)

MsgBox b.StringValue
```

### 121.1.68 NumberWithString(value as String) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with value from string.
**Example:**

```
dim v as String = "123"
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithString(v)

MsgBox b.StringValue
```

### 121.1.69 NumberWithUInt32(value as UInt32) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned 32-bit integer.

**Example:**

```
dim v as UInt32 = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithUInt32(v)

MsgBox b.StringValue
```

### 121.1.70 NumberWithUInt64(value as UInt64) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned 64-bit integer.
**Example:**

```
dim v as UInt64 = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithUInt64(v)

MsgBox b.StringValue
```

### 121.1.71 NumberWithUInteger(value as UInteger) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned integer.
**Example:**

```
dim v as UInteger = 123
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithUInteger(v)

MsgBox b.StringValue
```

### 121.1.72 NumberWithVariant(value as Variant) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number based on a variant.
**Example:**

```
dim v as Variant = 123.456
dim b as BiggerNumberMBS = BiggerNumberMBS.NumberWithVariant(v)

MsgBox b.StringValue
```

**Notes:** Internally redirects to other NumberWith functions based on the value type.

### 121.1.73 One as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value one.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.One
MsgBox b.StringValue
```

### 121.1.74 Operator_Add(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim a as new BiggerNumberMBS(3)
dim b as new BiggerNumberMBS(4)

// add
dim c as BiggerNumberMBS = a + b

MsgBox c.StringValue
```

### 121.1.75 Operator_AddRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim a as new BiggerNumberMBS(3)
dim b as new BiggerNumberMBS(4)

// add
dim c as BiggerNumberMBS = a + b
```

MsgBox c.StringValue

### 121.1.76 Operator_Compare(other as BiggerNumberMBS) as Integer

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two numbers.
**Example:**

```
dim a as new BiggerNumberMBS(1.2)
dim b as new BiggerNumberMBS(1.2)
dim c as new BiggerNumberMBS(1.3)

if a = b then
// ok
else
break
end if

if a <c then
// ok
else
Break
end if

if c >b then
// ok
else
break
end if
```

### 121.1.77 Operator_Convert as String

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts big number to string automatically.
**Example:**

```
dim b as new BiggerNumberMBS
dim n as Double = 5

// convert from double to big number automatically
b = n
```

```
// convert to string automatically
MsgBox b
```

See also:

- 121.1.78 Operator_Convert(value as String) 17383

### 121.1.78 Operator_Convert(value as String)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a string to a big number.
**Example:**

```
dim b as new BiggerNumberMBS
dim n as string = "5"

// convert from string to big number automatically
b = n

// convert to double automatically
dim d as Double = b
MsgBox str(d)
```

See also:

- 121.1.77 Operator_Convert as String 17382

### 121.1.79 Operator_Divide(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides two numbers.
**Example:**

```
dim a as new BiggerNumberMBS(9.3)
dim b as new BiggerNumberMBS(3.0)

dim r as BiggerNumberMBS = a / b

MsgBox r.StringValue
```

### 121.1.80 Operator_DivideRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides two numbers.

### 121.1.81 Operator_IntegerDivide(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates an integer divide.
**Example:**

```
dim a as new BiggerNumberMBS(9.3)
dim b as new BiggerNumberMBS(3.0)

dim r as BiggerNumberMBS = a \b

MsgBox r.StringValue
```

**Notes:** Same as normal divide, but removes fraction part.

### 121.1.82 Operator_IntegerDivideRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates an integer divide.
**Notes:** Same as normal divide, but removes fraction part.

### 121.1.83 Operator_Modulo(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the modulo of two numbers.
**Example:**

```
dim a as new BiggerNumberMBS(9.3)
dim b as new BiggerNumberMBS(3.0)
```

```
dim r as BiggerNumberMBS = a mod b

MsgBox r.StringValue
```

### 121.1.84 Operator_ModuloRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the modulo of two numbers.

### 121.1.85 Operator_Multiply(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply two numbers.
**Example:**

```
// speed of light in m/s
Dim SpeedOfLight As New BiggerNumberMBS("299792458")

// seconds per day
Dim SecondsPerDay As New BiggerNumberMBS(24 * 3600)

Dim DaysPerYear As New BiggerNumberMBS(365.25)

Dim LightYear As BiggerNumberMBS = SpeedOfLight * DaysPerYear * SecondsPerDay
MsgBox LightYear.StringValue+" meter per light year"

// 9.460.730.472.580.800 matches number from Wikipedia


Dim AgeOfUniversum As New BiggerNumberMBS(13810000000)

Dim MaxDistance As BiggerNumberMBS = LightYear * AgeOfUniversum

MsgBox MaxDistance.GetStringValue(10, False, 100, 3, True)+" meter maximum"
```

### 121.1.86 Operator_MultiplyRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply two numbers.

### 121.1.87 Operator_Negate as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates a number.
**Example:**

```
dim a as new BiggerNumberMBS(3)

// negate
dim c as BiggerNumberMBS = -a

MsgBox c.StringValue
```

### 121.1.88 Operator_Power(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates power of two numbers.
**Example:**

```
dim a as new BiggerNumberMBS(3)
dim b as new BiggerNumberMBS(4)

// pow
dim c as BiggerNumberMBS = a ^b

MsgBox c.StringValue
```

### 121.1.89 Operator_PowerRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates power of two numbers.

### 121.1.90 Operator_Subtract(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts one number from other.
**Example:**

```
dim a as new BiggerNumberMBS(3)
dim b as new BiggerNumberMBS(4)

// subtract
dim c as BiggerNumberMBS = a - b

MsgBox c.StringValue
```

### 121.1.91 Operator_SubtractRight(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts one number from other.

### 121.1.92 Pi as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value pi.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Pi
MsgBox b.StringValue
```

### 121.1.93 Pow(other as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the power of the number.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim o as new BiggerNumberMBS(5)
dim p as BiggerNumberMBS = x.Pow(o)

MsgBox p.StringValue // shows 32
```

### 121.1.94 RadToDeg(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts radians to degrees.
**Notes:** It returns: x * 180 / pi.

### 121.1.95 RadToGrad(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts radians to gradians.
**Notes:** it returns: x * 200 / pi

### 121.1.96 Rand as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates random number.
**Notes:** Mantissa and exponent are filled with random bytes to generate a random names.

### 121.1.97 Root(value as BiggerNumberMBS, index as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Indexth Root of x
**Example:**

```
Dim c As New BiggerNumberMBS(5*5*5*5)
Dim e As New BiggerNumberMBS(4)
Dim d As BiggerNumberMBS = BiggerNumberMBS.Root(c, e)

MsgBox d.StringValue
```

**Notes:** index must be integer and not negative <0;1;2;3....)

if index==0 the result is one
if x==0 the result is zero and we assume root(0;0) is not defined

if index is even (2;4;6...) the result is x^(1/index) and x>0
if index is odd (1;2;3;...) the result is either

-(abs(x)^(1/index)) if x<0
or
x^(1/index)) if x>0

(for index==1 the result is equal x)

### 121.1.98 Round as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rounds the number.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.3)
dim s as BiggerNumberMBS = o.Round

MsgBox s.StringValue

dim a as BiggerNumberMBS = new BiggerNumberMBS(-2.3)
dim b as BiggerNumberMBS = a.Round

MsgBox b.StringValue
```

### 121.1.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean)

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
// set to 1.2 and show
dim o as new BiggerNumberMBS

dim after as string
dim ValueRead as Boolean

o.SetStringValue "1.2 hello", 10, after, ValueRead

MsgBox "value: "+o.StringValue+EndOfLine+"after: "+after
Break
```

**Notes:** Returns also the text after the given text following the number.
Also sets ValueRead if a value was read.
See also:

- 121.1.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS) 17390
- 121.1.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean) 17391

### 121.1.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS)

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
Dim o As New BiggerNumberMBS

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

o.SetStringValue("1'234'567,89", conv)

MessageBox o.StringValue
```

See also:

- 121.1.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean) 17389
- 121.1.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean) 17391

### 121.1.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean)

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
Dim o As New BiggerNumberMBS

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

Dim after As String
Dim read As Boolean

o.SetStringValue("1'234'567,89abc", conv, after, read)
// read will be true and after contains "abc".

Dim value As String = o.StringValue

Dim after2 As String
Dim read2 As Boolean

o.SetStringValue("abc", conv, after2, read2)
// read2 will be false and after2 contains "abc".

Break
```

**Notes:** Returns the text after the given text following the number in AfterText parameter.
Sets ValueRead if a value was read.
See also:

- 121.1.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean) 17389
- 121.1.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS) 17390

### 121.1.102 Sgn(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries sign of number.
**Example:**

```
Dim negative As New BiggerNumberMBS(-5.6)
Dim sign1 As BiggerNumberMBS = BiggerNumberMBS.Sgn(negative)

Dim positive As New BiggerNumberMBS(5.6)
Dim sign2 As BiggerNumberMBS = BiggerNumberMBS.Sgn(positive)

Break
```

### 121.1.103 Sin(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the sinus value.
**Example:**

```
Dim c As New BiggerNumberMBS(1.0)
Dim d As BiggerNumberMBS = BiggerNumberMBS.Sin(c)

Dim x As Double = Sin(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

### 121.1.104 Sinh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Sine.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.SinH(c)

// SinHMBS is in MBS Xojo Util Plugin
Dim x As Double = SinHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** we're using the formula sinh(x) = ( e^x - e^(-x) ) / 2

### 121.1.105 SkipFraction as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function skips the fraction.
**Example:**

```
Dim c As New BiggerNumberMBS(-3.7)
Dim d As BiggerNumberMBS = c.SkipFraction

MsgBox d // shows -3
```

**Notes:** Similar to floor, but different for negative ones.

e.g
2.2 =>2
2.7 =>2
-2.2 =>2
-2.7 =>2

### 121.1.106 Sqrt as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the square root.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(256)
dim s as BiggerNumberMBS = o.Sqrt

MsgBox s.StringValue
```

### 121.1.107 Subtract(other as BiggerNumberMBS, round as boolean = true) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts a number.
**Example:**

```
dim x as new BiggerNumberMBS(2)
dim d as new BiggerNumberMBS(3)
dim p as BiggerNumberMBS = x.Subtract(d)

MsgBox p.StringValue // shows -1
```

### 121.1.108 Tan(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Tangent.

**Example:**

```
Dim c As New BiggerNumberMBS(1.0)
Dim d As BiggerNumberMBS = BiggerNumberMBS.Tan(c)

Dim x As Double = Tan(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula tan(x) = sin(x) / cos(x).

### 121.1.109 Tanh(value as BiggerNumberMBS) as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Tangent.
**Example:**

```
Dim c As New BiggerNumberMBS(0.5)
Dim d As BiggerNumberMBS = BiggerNumberMBS.TanH(c)

// TanHMBS is in MBS Xojo Util Plugin
Dim x As Double = TanHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula tanh(x)= ( e^x - e^(-x) ) / ( e^x + e^(-x) )

### 121.1.110 TwoPi as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value 2 * PI.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.TwoPi
MsgBox b.StringValue
```

### 121.1.111 Zero as BiggerNumberMBS

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value zero.
**Example:**

```
dim b as BiggerNumberMBS = BiggerNumberMBS.Zero
MsgBox b.StringValue
```

### 121.1.112 Properties

### 121.1.113 CurrencyValue as Currency

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets/Queries currency value.
**Example:**

```
dim u as Currency = 1234.5678
dim b as new BiggerNumberMBS(u)
MsgBox str(b.CurrencyValue)
```

**Notes:** (Read and Write property)

### 121.1.114 DataExponent as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exponent for this number.
**Notes:** Setting this may need to update flags, too.
(Read and Write property)

### 121.1.115 DataFlags as Integer

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Bits are 128 for Sign, 64 for NAN and 32 for zero.
(Read and Write property)

### 121.1.116 DataMantissa as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mantissa for this number.
**Notes:** Setting this may need to update flags, too.
(Read and Write property)

### 121.1.117 DoubleValue as Double

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or Set the double value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.5)

MsgBox str(o.DoubleValue)+" = "+str(o.StringValue)
```

**Notes:** (Read and Write property)

### 121.1.118 Int64Value as Int64

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set value as Int64.
**Example:**

```
dim u as Int64 = &h7FFFFFFFFFFFFFFF // maximum Int64
dim b as new BiggerNumberMBS(u)
MsgBox str(b.Int64Value)

dim one as new BiggerNumberMBS(1)
b = b + one

// raises exception due to overflow
MsgBox str(b.Int64Value)
```

**Notes:** (Read and Write property)

### 121.1.119 IntegerValue as Integer

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or Set the integer value.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(2.5)

MsgBox str(o.IntegerValue)+" = "+str(o.StringValue)
```

**Notes:** (Read and Write property)

### 121.1.120 IsInteger as Boolean

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this number is an integer.
**Example:**

```
dim o as BiggerNumberMBS = new BiggerNumberMBS(1)
dim z as BiggerNumberMBS = new BiggerNumberMBS(1.5)

if o.IsInteger then
MsgBox o.StringValue+" is integer"
else
break // error
end if

if z.IsInteger then
break // error
else
MsgBox z.StringValue+" is not integer"
end if
```

**Notes:** If true, there are no digits after the dot.
(Read only property)

### 121.1.121 IsNan as Boolean

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an invalid number.
**Example:**

```
dim o as BiggerNumberMBS = BiggerNumberMBS.zero
dim z as BiggerNumberMBS = BiggerNumberMBS.Nan

if z.IsNan then
MsgBox z.StringValue+" is NaN"
else
break // error
end if

if o.IsNan then
break // error
else
MsgBox o.StringValue+" is not NaN"
end if
```

**Notes:** (Read only property)

### 121.1.122 IsNegative as Boolean

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value is negative.
**Example:**

```
dim o as BiggerNumberMBS = BiggerNumberMBS.one
dim z as BiggerNumberMBS = BiggerNumberMBS.one.Negate

if z.IsNegative then
MsgBox z.StringValue+" is negative"
else
break // error
end if

if o.IsNegative then
break // error
else
MsgBox o.StringValue+" is not negative"
end if
```

**Notes:** (Read only property)

### 121.1.123 IsZero as Boolean

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if value is zero.
**Example:**

```
dim o as BiggerNumberMBS = BiggerNumberMBS.one
dim z as BiggerNumberMBS = BiggerNumberMBS.zero

if z.IsZero then
MsgBox z.StringValue+" is zero"
else
break // error
end if

if o.IsZero then
break // error
else
MsgBox o.StringValue+" is not zero"
end if
```

**Notes:** (Read only property)

### 121.1.124 StringValue as String

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set string value of text.
**Example:**

```
// set to 1.2 and show
dim o as new BiggerNumberMBS("1.2")
MsgBox o.StringValue

// set to 2.3
o.StringValue = "2.3"
MsgBox o.StringValue
```

**Notes:** (Read and Write property)
See also:

- 121.1.127 StringValue(Base as Integer) as String

### 121.1.125 UInt64Value as UInt64

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set value as UInt64.
**Example:**

```
dim u as UInt64 = 12345678901234567890
dim b as new BiggerNumberMBS(u)
MsgBox str(b.UInt64Value)
```

**Notes:** (Read and Write property)

### 121.1.126 VariantValue as Variant

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries/Sets value with variant.
**Notes:** Floating point values are given as Double.
Integer types as Int32, Int64 or UInt64.
If value exceeds the ranges of those data types, we fall back to string.

When setting, the value is converted to a big number similiar to NumberWithVariant.
(Read and Write property)

### 121.1.127 StringValue(Base as Integer) as String

MBS DataTypes Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set string value with a given base.
**Example:**

```
dim o as new BiggerNumberMBS(1234)

// show as hex
MsgBox o.StringValue(16)
```

**Notes:** (Read and Write computed property)
See also:

- 121.1.124 StringValue as String 17400

## 121.2 class BigNumberConversionMBS

### 121.2.1 class BigNumberConversionMBS

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This class holds information to convert numbers to/from text.
**Example:**

```
Dim o As New BigNumberMBS(1234567.890)

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

Dim s1 As String = o.GetStringValue(conv)
// 1'234'567,89

conv.Comma = "."
conv.Group = ","

Dim s2 As String = o.GetStringValue(conv)
// 1,234,567,89

conv.Comma = ","
conv.Group = "'"
conv.Scientific = True

Dim s3 As String = o.GetStringValue(conv)
// 1,235e+6

Break
```

#### Blog Entries

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr2
- MBS Xojo Plugins, version 23.6pr1

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### 121.2.2 Methods

### 121.2.3 Constructor

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 121.2.4 Properties

### 121.2.5 Base as Integer

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** base (radix) on which the value will be shown (or read)
**Notes:** default: 10
(Read and Write property)

### 121.2.6 BaseRound as Boolean

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to round last digit.
**Notes:** if 'base_round' is true and 'base' is different from 2, 4, 8, or 16 and the result value is not an integer then we make an additional rounding (after converting the last digit from the result is skipped)
default: true
(Read and Write property)

### 121.2.7 Comma as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The main comma operator (used when reading and writing)
**Notes:** default is a dot "."
(Read and Write property)

### 121.2.8 Comma2 as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Additional comma operator (used only when reading)
**Example:**

```
Dim o1 As New BigNumberMBS
Dim o2 As New BigNumberMBS
Dim o3 As New BigNumberMBS

Dim conv As New BigNumberConversionMBS
Dim after1, after2, after3 As String
Dim read1, read2, read3 As Boolean

conv.Comma = "."
conv.Comma2 = ","

// by default comma accepts dot and comma
o1.SetStringValue("1,2", conv, after1, read1)
o2.SetStringValue("1.2", conv, after2, read2)

// now set us conversion
conv.Comma = "."
conv.Comma2 = ""
conv.Group = ","

o3.SetStringValue("1,234.5", conv, after3, read3)

Dim value1 As String = o1.StringValue
Dim value2 As String = o2.StringValue
Dim value3 As String = o3.StringValue

Break
```

**Notes:** If you don't want it just set it to zero.
default is a comma ','

This allowes you to convert from a value:
123.45 as well as from 123,45
(Read and Write property)

### 121.2.9 Group1 as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** It sets the character which is used for grouping after comma.
**Notes:** If group1 and group2 are both a space then: 1234,56789 will be printed as: 1 234,567 89
If you don't want grouping just set it to "" (which is default)

(Read and Write property)

### 121.2.10 Group2 as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** It sets the character which is used for grouping before comma.
**Notes:** If group1 and group2 are both a space then: 1234,56789 will be printed as: 1 234,567 89
If you don't want grouping just set it to "" (which is default)
(Read and Write property)

### 121.2.11 GroupDigits as Integer

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** How many digits should be grouped (it is used if 'group' is non "")
**Notes:** default: 3
(Read and Write property)

### 121.2.12 Round as Integer

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tells how many digits after comma are possible.
**Notes:** default: -1 which means all digits are printed

set it to zero if you want integer value only.

for example when the value is: 12.345678 and 'round' is 4 then the result will be 12.3457 (the last digit was rounded)
(Read and Write property)

### 121.2.13 Scientific as Boolean

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to use scientific mode.
**Notes:** If true the value will be always shown in the scientific mode, e.g: 123e+30

default: false
(Read and Write property)

### 121.2.14 ScientificFrom as Integer

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Scientific from this exponent value.
**Notes:** If scient is false then the value will be printed in the scientific mode only if the exponent is greater than ScientificFrom.

default: 15
(Read and Write property)

### 121.2.15 TrimZeroes as Boolean

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to trim zeros.
**Notes:** If true that not mattered digits in the mantissa will be cut off
(zero characters at the end – after the comma operator)
e.g. 1234,78000 will be: 1234,78
default: true
(Read and Write property)

## 121.3 class BigNumberErrorExceptionMBS

### 121.3.1 class BigNumberErrorExceptionMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception class for big number math.
**Example:**

```
dim b as new BigNumberMBS(5)
dim c as BigNumberMBS = BigNumberMBS.Zero

// raises exception due to division by zero
dim x as BigNumberMBS = b/c
```

**Notes:** Raised when operations fail due to division by zero, invalid numbers or overflow/underflow.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr8
- Big numbers for Xojo

**Xojo Developer Magazine**

- 17.6, page 65: Big Numbers and Large Numbers, How you can use the BigNumberMBS and LargeNumberMBS class in Xojo by Stefanie Juchmes

## 121.4 class BigNumberMBS

### 121.4.1 class BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a big number.
**Example:**

```
// speed of light in m/s
Dim SpeedOfLight As New BigNumberMBS("299792458")

// seconds per day
Dim SecondsPerDay As New BigNumberMBS(24 * 3600)

Dim DaysPerYear As New BigNumberMBS(365.25)

Dim LightYear As BigNumberMBS = SpeedOfLight * DaysPerYear * SecondsPerDay
MsgBox LightYear.StringValue+" meter per light year"

// 9.460.730.472.580.800 matches number from Wikipedia


Dim AgeOfUniversum As New BigNumberMBS(13810000000)

Dim MaxDistance As BigNumberMBS = LightYear * AgeOfUniversum

MsgBox MaxDistance.GetStringValue(10, False, 100, 3, True)+" meter maximum"
```

**Notes:** This is floating point number with 320 bits in BigNumber and 2560 bits in BiggerNumber class.
Precision is about 77 digits dot for the smaller one and 617 for the bigger one.
So use first for speed and second for precision.

So if you want to store currency or other values where rounding should not happen, better store values multiplied, e.g. in cents.

Compared to normal double values, you have 5 times the bits.
And we check for math errors and raise exceptions if something goes wrong.

See LargeNumberMBS for a 4128 bit integer number, about 1200 digits in length.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0

- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 21.1
- Video about MBS Xojo Plugins 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- Large integer numbers in Xojo
- MBS Xojo / Real Studio plug-ins in version 16.5
- Big numbers for Xojo

**Videos**

- MBS Xojo Plugins 21.1
- Presentation from London conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 22.2, page 9: News
- 21.3, pages 68 to 69: Large, Big, and Bigger Numbers, Working with giant numbers by Stefanie Juchmes
- 19.3, page 44: Xojo Time and Space,ÄîInto a Programming Black Hole, How converting durations and distances into human-readable form reveals a 32-bit problem at the heart of Xojo's 64-bit math module by Markus Winter
- 19.3, page 10: News
- 17.6, page 65: Big Numbers and Large Numbers, How you can use the BigNumberMBS and LargeNumberMBS class in Xojo by Stefanie Juchmes
- 17.6, pages 61 to 63: Big Numbers and Large Numbers, How you can use the BigNumberMBS and LargeNumberMBS class in Xojo by Stefanie Juchmes
- 17.5, page 33: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 16.1, page 28: MBS London Conference 2017, Marc visits England by Richard Duke, Mediatec
- 15.1, page 8: News

### 121.4.2 Methods

### 121.4.3 Abs as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries absolute value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(-123)
dim z as BigNumberMBS = o.Abs

MsgBox z.StringValue
```

**Notes:** Removes sign.
See also:

- 121.4.4 Abs(value as BigNumberMBS) as BigNumberMBS 17410

### 121.4.4 Abs(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Absolute value of x.
**Example:**

```
Dim c As New BigNumberMBS(-3)
Dim d As BigNumberMBS = BigNumberMBS.Abs(c)
Dim e As BigNumberMBS = c.Abs

MsgBox d.StringValue+EndOfLine+e.StringValue // shows 3
```

See also:

- 121.4.3 Abs as BigNumberMBS 17410

### 121.4.5 ACos(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Cosine.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.ACos(c)
```

```
Dim x As Double = ACos(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** we're using the formula: acos(x) = pi/2 - asin(x)

### 121.4.6 ACosh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverse hyperbolic cosine.
**Example:**

```
Dim c As New BigNumberMBS(2.0)
Dim d As BigNumberMBS = BigNumberMBS.ACosh(c)

// ACosHMBS is in MBS Xojo Util Plugin
Dim x As Double = ACosHMBS(2.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** acosh(x) = ln( x + sqrt(x^2 - 1) ) x in <1, infinity)

### 121.4.7 ACot(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Cotangent.
**Notes:** we're using the formula: actan(x) = pi/2 - atan(x)

### 121.4.8 ACoth(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates inverse hyperbolic cotangent.
**Notes:** acoth(x) = 0.5 * ln( (x+1) / (x-1) ) x in (-infinity, -1) or (1, infinity)

### 121.4.9 Add(other as BigNumberMBS, round as boolean = true) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim x as new BigNumberMBS(2)
dim d as new BigNumberMBS(3)
dim p as BigNumberMBS = x.Add(d)

MsgBox p.StringValue // shows 5
```

### 121.4.10 ASin(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Sine.
**Example:**

```
Dim c As New BigNumberMBS(1.0)
Dim d As BigNumberMBS = BigNumberMBS.ASin(c)

Dim x As Double = ASin(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** Range is from -1 to 1.

### 121.4.11 ASinh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverse hyperbolic sine.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.ASinH(c)

// ASinHMBS is in MBS Xojo Util Plugin
Dim x As Double = ASinHMBS(0.5)
```

```
MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** asinh(x) = ln( x + sqrt(x^2 + 1) )

### 121.4.12 ATan(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Arc Tangent.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.ATan(c)

Dim x As Double = ATan(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

### 121.4.13 ATanh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates inverse hyperbolic tangent.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.ATanh(c)

// ATanhMBS is in MBS Xojo Util Plugin
Dim x As Double = ATanhMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** atanh(x) = 0.5 * ln( (1+x) / (1-x) ) x in (-1, 1)

### 121.4.14 BitAnd(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise AND operation.
**Example:**

```
dim x as new BigNumberMBS(17)
dim y as new BigNumberMBS(16)
dim r as BigNumberMBS = x.BitAnd(y)

MsgBox r.StringValue
```

### 121.4.15 BitOr(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise or operation.
**Example:**

```
dim x as new BigNumberMBS(17)
dim y as new BigNumberMBS(16)
dim r as BigNumberMBS = x.BitOr(y)

MsgBox r.StringValue
```

### 121.4.16 BitXOr(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates bitwise xor operation.
**Example:**

```
dim x as new BigNumberMBS(17)
dim y as new BigNumberMBS(16)
dim r as BigNumberMBS = x.BitXOr(y)

MsgBox r.StringValue
```

### 121.4.17 Ceil as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns a value representing the smallest integer that is greater than or equal to x.
**Example:**

```
Dim c As New BigNumberMBS(-3.7)
Dim d As BigNumberMBS = c.Ceil

MsgBox d // shows -3
```

**Notes:** e.g.
Ceil(-3.7) = -3
Ceil(-3.1) = -3
Ceil(-3.0) = -3
Ceil(4.0) = 4
Ceil(4.2) = 5
Ceil(4.8) = 5

### 121.4.18 Constructor

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with zero value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS
MsgBox o.StringValue
```

See also:


- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421

### 121.4.19 Constructor(other as BigNumberMBS)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with other value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.5)
dim c as BigNumberMBS = new BigNumberMBS(o)

MsgBox c.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.20 Constructor(value as Currency)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number object with a currency object.
**Example:**

```
dim v as Currency = 123.456
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416

- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.21 Constructor(value as Double)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with double value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.5)
MsgBox str(o.DoubleValue)+" = "+str(o.StringValue)#
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.22 Constructor(value as Int32)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 32-bit integer.
**Example:**

```
dim v as Int32 = 123
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.23 Constructor(value as Int64)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 64-bit integer.
**Example:**

```
dim v as Int64 = 123
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.24 Constructor(value as Single) 17419

- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.24 Constructor(value as Single)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with a 32-bit floating point number.
**Example:**

```
dim v as Single = 123
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.25 Constructor(value as String)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialize the number with string value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS("123.456")
MsgBox o.StringValue
```

See also:

- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.26 Constructor(value as UInt32) 17420
- 121.4.27 Constructor(value as UInt64) 17421


### 121.4.26 Constructor(value as UInt32)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with an unsigned 32-bit integer.
**Example:**

```
dim v as UInt32 = 123
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.27 Constructor(value as UInt64) 17421

### 121.4.27 Constructor(value as UInt64)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with an unsigned 32-bit integer.
**Example:**

```
dim v as UInt64 = 123
dim b as new BigNumberMBS(v)
MsgBox b.StringValue
```

See also:


- 121.4.18 Constructor 17415
- 121.4.19 Constructor(other as BigNumberMBS) 17416
- 121.4.20 Constructor(value as Currency) 17416
- 121.4.21 Constructor(value as Double) 17417
- 121.4.22 Constructor(value as Int32) 17417
- 121.4.23 Constructor(value as Int64) 17418
- 121.4.24 Constructor(value as Single) 17419
- 121.4.25 Constructor(value as String) 17419
- 121.4.26 Constructor(value as UInt32) 17420


### 121.4.28 Cos(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the cosine value.
**Example:**

```
Dim c As New BigNumberMBS(1.0)
Dim d As BigNumberMBS = BigNumberMBS.Cos(c)

Dim x As Double = Cos(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula cos(x) = sin(x + PI/2).

### 121.4.29 Cosh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Cosine.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.CosH(c)

// CosHMBS is in MBS Xojo Util Plugin
Dim x As Double = CosHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula cosh(x)= ( e^x + e^(-x) ) / 2.

### 121.4.30 Cot(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Cotangent.
**Notes:** We're using the formula tan(x) = cos(x) / sin(x).

### 121.4.31 Coth(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Cotangent.
**Notes:** We're using the formula coth(x)= ( e^x + e^(-x) ) / ( e^x - e^(-x) )

### 121.4.32 DegToDeg(d as BigNumberMBS, m as BigNumberMBS, s as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format into one value.
**Notes:** long format: (degrees, minutes, seconds)
minutes and seconds must be greater than or equal zero

result:

if d>=0 : result= d + ((s/60)+m)/60
if d<0 : result= d - ((s/60)+m)/60

((s/60)+m)/60 = (s+60*m)/3600 (second version is faster because there's only one division)

for example:
DegToDeg(10, 30, 0) = 10.5
DegToDeg(10, 24, 35.6)=10.4098(8)

### 121.4.33 DegToGrad(d as BigNumberMBS, m as BigNumberMBS, s as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format to gradians.
See also:

- 121.4.34 DegToGrad(value as BigNumberMBS) as BigNumberMBS 17423

### 121.4.34 DegToGrad(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to gradians.
**Notes:** it returns: x * 200 / 180
See also:

- 121.4.33 DegToGrad(d as BigNumberMBS, m as BigNumberMBS, s as BigNumberMBS) as BigNumberMBS 17423

### 121.4.35 DegToRad(d as BigNumberMBS, m as BigNumberMBS, s as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees in the long format to radians.
See also:

- 121.4.36 DegToRad(value as BigNumberMBS) as BigNumberMBS 17423

### 121.4.36 DegToRad(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to radians.
**Notes:** It returns: x * pi / 180
See also:

- 121.4.35 DegToRad(d as BigNumberMBS, m as BigNumberMBS, s as BigNumberMBS) as BigNumberMBS 17423

### 121.4.37 Divide(other as BigNumberMBS, round as boolean = true) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides the number.
**Example:**

```
dim x as new BigNumberMBS(8)
dim d as new BigNumberMBS(2)
dim p as BigNumberMBS = x.Divide(d)

MsgBox p.StringValue // shows 4
```

### 121.4.38 E as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value zero.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.e
MsgBox b.StringValue
```

### 121.4.39 Equals(other as BigNumberMBS) as Boolean

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if two numbers are the same.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(123)
dim z as BigNumberMBS = new BigNumberMBS(123)

if o.Equals(z) then
MsgBox "equal"
```

```
else
Break // error
end if
```

**Notes:** Returns true if equal.

### 121.4.40 Exp(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates e^value.
**Example:**

```
dim x as new BigNumberMBS(2)
dim p as BigNumberMBS = BigNumberMBS.Exp(x)

MsgBox p.StringValue // shows e^2 = 7.38
```

### 121.4.41 Floor as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes any fraction part.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.3)
dim s as BigNumberMBS = o.Floor

MsgBox s.StringValue

dim a as BigNumberMBS = new BigNumberMBS(-2.3)
dim b as BigNumberMBS = a.Floor

MsgBox b.StringValue
```

### 121.4.42 Frac as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the fraction part.

**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.5)
dim s as BigNumberMBS = o.Frac

MsgBox s.StringValue

dim a as BigNumberMBS = new BigNumberMBS(-2.5)
dim b as BigNumberMBS = a.Frac

MsgBox b.StringValue
```

### 121.4.43 GetStringValue(Base as Integer = 10, scientific as boolean = false, scientificFrom as Integer = 15, round as Integer = -1, TrimZeros as Boolean = true, comma as String = ".") as String

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string value.
**Example:**

```
dim o as new BigNumberMBS(1234)

// show as hex
MsgBox o.GetStringValue(16)

// show as number with comma and 3 digits
dim z as new BigNumberMBS(12.345)
MsgBox z.GetStringValue(10, false, 15, 3, true, ",")
```

**Notes:** Base: The base of the number system. Normally 10, but also 16 for hex is common.
scientific: Whether to use scientific notation.
scientificFrom: How many digits we show.
Round: Whether to round to n digits.
TrimZeros: Whether to trim unneeded zeros.
comma: The character to use as decimal dot.
See also:

- 121.4.44 GetStringValue(Conversion as BigNumberConversionMBS) as String 17426

### 121.4.44 GetStringValue(Conversion as BigNumberConversionMBS) as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string value.
**Example:**

```
Dim o As New BigNumberMBS(1234567.890)

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

Dim s1 As String = o.GetStringValue(conv)
// 1'234'567,89

conv.Comma = "."
conv.Group = ","

Dim s2 As String = o.GetStringValue(conv)
// 1,234,567,89

conv.Comma = ","
conv.Group = "'"
conv.Scientific = True

Dim s3 As String = o.GetStringValue(conv)
// 1,235e+6
```

Break

See also:

- 121.4.43 GetStringValue(Base as Integer = 10, scientific as boolean = false, scientificFrom as Integer = 15, round as Integer = -1, TrimZeros as Boolean = true, comma as String = ".") as String 17426

### 121.4.45 GradToDeg(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts degrees to gradians.
**Notes:** it returns: x * 180 / 200

### 121.4.46 GradToRad(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts gradians to radians.
**Notes:** It returns: x * pi / 200.

### 121.4.47 HalfPi as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value pi/2.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.HalfPi
MsgBox b.StringValue
```

### 121.4.48 LibTypeStr as String

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries what implementation is used for this platform.
**Notes:** Shows asm in the text if assembler code is used.
Assembler code is not available for all platforms.

### 121.4.49 Ln(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates natural logarithm.
**Example:**

```
dim x as new BigNumberMBS(2)
dim p as BigNumberMBS = BigNumberMBS.Ln(x)

MsgBox p.StringValue // shows ln(2) = 0.69
```

### 121.4.50 Ln10 as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value ln(10).
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Ln10
MsgBox b.StringValue
```

### 121.4.51 Ln2 as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value ln(2).
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Ln2
MsgBox b.StringValue
```

### 121.4.52 Log(value as BigNumberMBS, base as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates logarithm in a given base.
**Example:**

```
dim x as new BigNumberMBS(100)
dim d as new BigNumberMBS(10)
dim p as BigNumberMBS = BigNumberMBS.Log(x, d)

MsgBox p.StringValue // shows ln(100)/ln(10) = 2
```

### 121.4.53 Max as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with maximum value.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Min
MsgBox b.StringValue
```

### 121.4.54 Min as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with minimum value.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Min
MsgBox b.StringValue
```

### 121.4.55 Modulate(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulates a number.
**Example:**

```
dim x as new BigNumberMBS(17)
dim y as new BigNumberMBS(3)
dim r as BigNumberMBS = x.Modulate(y)

MsgBox r.StringValue
```

**Notes:** Similar to mod keyword in Xojo.

### 121.4.56 Modulate2 as Integer

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulates by 2.
**Example:**

```
dim x as new BigNumberMBS(8)
dim y as new BigNumberMBS(9)

MsgBox str(x.Modulate2)+" "+str(y.Modulate2)
```

**Notes:** Returns 0 or 1.

### 121.4.57 Multiply(other as BigNumberMBS, round as boolean = true) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies two numbers.
**Example:**

```
dim x as new BigNumberMBS(8)
dim d as new BigNumberMBS(2)
dim p as BigNumberMBS = x.Multiply(d)

MsgBox p.StringValue // shows 16
```

See also:


- 121.4.58 Multiply(value as Integer) as BigNumberMBS 17431
- 121.4.59 Multiply(value as UInt32) as BigNumberMBS 17431


### 121.4.58 Multiply(value as Integer) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply by an integer.
**Example:**

```
dim x as new BigNumberMBS(2)
dim p as BigNumberMBS = x.Multiply(3)

MsgBox p.StringValue // shows 6
```

See also:


- 121.4.57 Multiply(other as BigNumberMBS, round as boolean = true) as BigNumberMBS 17431
- 121.4.59 Multiply(value as UInt32) as BigNumberMBS 17431


### 121.4.59 Multiply(value as UInt32) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply by an unsigned integer.
**Example:**

```
dim x as new BigNumberMBS(17)
dim r as BigNumberMBS = x.Multiply(3)

MsgBox r.StringValue
```

See also:

- 121.4.57 Multiply(other as BigNumberMBS, round as boolean = true) as BigNumberMBS 17431
- 121.4.58 Multiply(value as Integer) as BigNumberMBS 17431

### 121.4.60 Nan as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value NaN.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Nan
MsgBox b.StringValue
```

### 121.4.61 Negate as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the number.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(123)
dim z as BigNumberMBS = o.Negate

MsgBox z.StringValue
```

### 121.4.62 NumberWithCurrency(value as Currency) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a currency value.
**Example:**

```
dim v as Currency = 123.456
dim b as BigNumberMBS = BigNumberMBS.NumberWithCurrency(v)
```

MsgBox b.StringValue

### 121.4.63 NumberWithDouble(value as Double) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a 64-bit floating number.
**Example:**

```
dim v as Double = 123.456
dim b as BigNumberMBS = BigNumberMBS.NumberWithDouble(v)

MsgBox b.StringValue
```

### 121.4.64 NumberWithInt32(value as Int32) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a signed 32-bit integer.
**Example:**

```
dim v as Int32 = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithInt32(v)

MsgBox b.StringValue
```

### 121.4.65 NumberWithInt64(value as Int64) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with a signed 64-bit integer.
**Example:**

```
dim v as Int64 = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithInt64(v)

MsgBox b.StringValue
```

### 121.4.66 NumberWithInteger(value as Integer) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an integer.
**Example:**

```
dim v as Integer = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithInteger(v)

MsgBox b.StringValue
```

### 121.4.67 NumberWithSingle(value as single) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an 32-bit floating point number.
**Example:**

```
dim v as Single = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithSingle(v)

MsgBox b.StringValue
```

### 121.4.68 NumberWithString(value as String) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with value from string.
**Example:**

```
dim v as String = "123"
dim b as BigNumberMBS = BigNumberMBS.NumberWithString(v)

MsgBox b.StringValue
```

### 121.4.69 NumberWithUInt32(value as UInt32) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned 32-bit integer.

**Example:**

```
dim v as UInt32 = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithUInt32(v)

MsgBox b.StringValue
```

### 121.4.70 NumberWithUInt64(value as UInt64) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned 64-bit integer.
**Example:**

```
dim v as UInt64 = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithUInt64(v)

MsgBox b.StringValue
```

### 121.4.71 NumberWithUInteger(value as UInteger) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with an unsigned integer.
**Example:**

```
dim v as UInteger = 123
dim b as BigNumberMBS = BigNumberMBS.NumberWithUInteger(v)

MsgBox b.StringValue
```

### 121.4.72 NumberWithVariant(value as Variant) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number based on a variant.
**Example:**

```
dim v as Variant = 123.456
dim b as BigNumberMBS = BigNumberMBS.NumberWithVariant(v)

MsgBox b.StringValue
```

**Notes:** Internally redirects to other NumberWith functions based on the value type.

### 121.4.73 One as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value one.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.One
MsgBox b.StringValue
```

### 121.4.74 Operator_Add(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim a as new BigNumberMBS(3)
dim b as new BigNumberMBS(4)

// add
dim c as BigNumberMBS = a + b

MsgBox c.StringValue
```

### 121.4.75 Operator_AddRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a number.
**Example:**

```
dim a as new BigNumberMBS(3)
dim b as new BigNumberMBS(4)

// add
dim c as BigNumberMBS = a + b
```

MsgBox c.StringValue

### 121.4.76 Operator_Compare(other as BigNumberMBS) as Integer

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two numbers.
**Example:**

```
dim a as new BigNumberMBS(1.2)
dim b as new BigNumberMBS(1.2)
dim c as new BigNumberMBS(1.3)

if a = b then
// ok
else
break
end if

if a <c then
// ok
else
Break
end if

if c >b then
// ok
else
break
end if
```

### 121.4.77 Operator_Convert as String

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts big number to string automatically.
**Example:**

```
dim b as new BigNumberMBS
dim n as Double = 5

// convert from double to big number automatically
b = n
```

```
// convert to string automatically
MsgBox b
```

See also:

- 121.4.78 Operator_Convert(value as String) 17438

### 121.4.78 Operator_Convert(value as String)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a string to a big number.
**Example:**

```
dim b as new BigNumberMBS
dim n as string = "5"

// convert from string to big number automatically
b = n

// convert to double automatically
dim d as Double = b
MsgBox str(d)
```

See also:

- 121.4.77 Operator_Convert as String 17437

### 121.4.79 Operator_Divide(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides two numbers.
**Example:**

```
dim a as new BigNumberMBS(9.3)
dim b as new BigNumberMBS(3.0)

dim r as BigNumberMBS = a / b

MsgBox r.StringValue
```

### 121.4.80 Operator_DivideRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides two numbers.

### 121.4.81 Operator_IntegerDivide(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates an integer divide.
**Example:**

```
dim a as new BigNumberMBS(9.3)
dim b as new BigNumberMBS(3.0)

dim r as BigNumberMBS = a \b

MsgBox r.StringValue
```

**Notes:** Same as normal divide, but removes fraction part.

### 121.4.82 Operator_IntegerDivideRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates an integer divide.
**Notes:** Same as normal divide, but removes fraction part.

### 121.4.83 Operator_Modulo(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the modulo of two numbers.
**Example:**

```
dim a as new BigNumberMBS(9.3)
dim b as new BigNumberMBS(3.0)

dim r as BigNumberMBS = a mod b
```

MsgBox r.StringValue

### 121.4.84 Operator_ModuloRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the modulo of two numbers.

### 121.4.85 Operator_Multiply(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply two numbers.
**Example:**

```
// speed of light in m/s
Dim SpeedOfLight As New BigNumberMBS("299792458")

// seconds per day
Dim SecondsPerDay As New BigNumberMBS(24 * 3600)

Dim DaysPerYear As New BigNumberMBS(365.25)

Dim LightYear As BigNumberMBS = SpeedOfLight * DaysPerYear * SecondsPerDay
MsgBox LightYear.StringValue+" meter per light year"

// 9.460.730.472.580.800 matches number from Wikipedia


Dim AgeOfUniversum As New BigNumberMBS(13810000000)

Dim MaxDistance As BigNumberMBS = LightYear * AgeOfUniversum

MsgBox MaxDistance.GetStringValue(10, False, 100, 3, True)+" meter maximum"
```

### 121.4.86 Operator_MultiplyRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply two numbers.

### 121.4.87 Operator_Negate as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates a number.
**Example:**

```
dim a as new BigNumberMBS(3)

// negate
dim c as BigNumberMBS = -a

MsgBox c.StringValue
```

### 121.4.88 Operator_Power(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates power of two numbers.
**Example:**

```
dim a as new BigNumberMBS(3)
dim b as new BigNumberMBS(4)

// pow
dim c as BigNumberMBS = a ^b

MsgBox c.StringValue
```

### 121.4.89 Operator_PowerRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates power of two numbers.

### 121.4.90 Operator_Subtract(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts one number from other.
**Example:**

```
dim a as new BigNumberMBS(3)
dim b as new BigNumberMBS(4)

// subtract
dim c as BigNumberMBS = a - b

MsgBox c.StringValue
```

### 121.4.91 Operator_SubtractRight(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts one number from other.

### 121.4.92 Pi as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value pi.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Pi
MsgBox b.StringValue
```

### 121.4.93 Pow(other as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the power of the number.
**Example:**

```
dim x as new BigNumberMBS(2)
dim o as new BigNumberMBS(5)
dim p as BigNumberMBS = x.Pow(o)

MsgBox p.StringValue // shows 32
```

### 121.4.94 RadToDeg(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts radians to degrees.
**Notes:** It returns: x * 180 / pi.

### 121.4.95 RadToGrad(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts radians to gradians.
**Notes:** it returns: x * 200 / pi

### 121.4.96 Rand as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates random number.
**Notes:** Mantissa and exponent are filled with random bytes to generate a random names.

### 121.4.97 Root(value as BigNumberMBS, index as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Indexth Root of x
**Example:**

```
Dim c As New BigNumberMBS(5*5*5*5)
Dim e As New BigNumberMBS(4)
Dim d As BigNumberMBS = BigNumberMBS.Root(c, e)

MsgBox d.StringValue
```

**Notes:** index must be integer and not negative <0;1;2;3....)

if index==0 the result is one
if x==0 the result is zero and we assume root(0;0) is not defined

if index is even (2;4;6...) the result is x^(1/index) and x>0

if index is odd (1;2;3;...) the result is either

-(abs(x)^(1/index)) if x<0
or
x^(1/index)) if x>0

(for index==1 the result is equal x)

### 121.4.98 Round as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rounds the number.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.3)
dim s as BigNumberMBS = o.Round

MsgBox s.StringValue

dim a as BigNumberMBS = new BigNumberMBS(-2.3)
dim b as BigNumberMBS = a.Round

MsgBox b.StringValue
```

### 121.4.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean)

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
// set to 1.2 and show
dim o as new BigNumberMBS

dim after as string
dim ValueRead as Boolean

o.SetStringValue "1.2 hello", 10, after, ValueRead

MsgBox "value: "+o.StringValue+EndOfLine+"after: "+after
Break
```

**Notes:** Returns also the text after the given text following the number.
Also sets ValueRead if a value was read.
See also:

- 121.4.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS) 17445
- 121.4.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean) 17445

### 121.4.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS)

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
Dim o As New BigNumberMBS

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

o.SetStringValue("1'234'567,89", conv)

MessageBox o.StringValue
```

See also:

- 121.4.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean) 17444
- 121.4.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean) 17445

### 121.4.101 SetStringValue(Text As String, Conversion as BigNumberConversionMBS, byref AfterText as String, Byref ValueRead as boolean)

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses number from string.
**Example:**

```
Dim o As New BigNumberMBS

Dim conv As New BigNumberConversionMBS
conv.Comma = ","
conv.Group = "'"
conv.Scientific = False
conv.Round = 3

Dim after As String
Dim read As Boolean

o.SetStringValue("1'234'567,89abc", conv, after, read)
// read will be true and after contains "abc".

Dim value As String = o.StringValue

Dim after2 As String
Dim read2 As Boolean

o.SetStringValue("abc", conv, after2, read2)
// read2 will be false and after2 contains "abc".

Break
```

**Notes:** Returns the text after the given text following the number in AfterText parameter.
Sets ValueRead if a value was read.
See also:

- 121.4.99 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean) 17444
- 121.4.100 SetStringValue(Text As String, Conversion as BigNumberConversionMBS) 17445

### 121.4.102 Sgn(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries sign of number.
**Example:**

```
Dim negative As New BigNumberMBS(-5.6)
Dim sign1 As BigNumberMBS = BigNumberMBS.Sgn(negative)

Dim positive As New BigNumberMBS(5.6)
Dim sign2 As BigNumberMBS = BigNumberMBS.Sgn(positive)

Break
```

### 121.4.103 Sin(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the sinus value.
**Example:**

```
Dim c As New BigNumberMBS(1.0)
Dim d As BigNumberMBS = BigNumberMBS.Sin(c)

Dim x As Double = Sin(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

### 121.4.104 Sinh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Sine.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.SinH(c)

// SinHMBS is in MBS Xojo Util Plugin
Dim x As Double = SinHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** we're using the formula sinh(x) = ( e^x - e^(-x) ) / 2

### 121.4.105 SkipFraction as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function skips the fraction.
**Example:**

```
Dim c As New BigNumberMBS(-3.7)
Dim d As BigNumberMBS = c.SkipFraction

MsgBox d // shows -3
```

**Notes:** Similar to floor, but different for negative ones.

e.g
2.2 =>2
2.7 =>2
-2.2 =>2
-2.7 =>2

### 121.4.106 Sqrt as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the square root.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(256)
dim s as BigNumberMBS = o.Sqrt

MsgBox s.StringValue
```

### 121.4.107 Subtract(other as BigNumberMBS, round as boolean = true) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts a number.
**Example:**

```
dim x as new BigNumberMBS(2)
dim d as new BigNumberMBS(3)
dim p as BigNumberMBS = x.Subtract(d)

MsgBox p.StringValue // shows -1
```

### 121.4.108 Tan(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Tangent.

**Example:**

```
Dim c As New BigNumberMBS(1.0)
Dim d As BigNumberMBS = BigNumberMBS.Tan(c)

Dim x As Double = Tan(1.0)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula tan(x) = sin(x) / cos(x).

### 121.4.109 Tanh(value as BigNumberMBS) as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Hyperbolic Tangent.
**Example:**

```
Dim c As New BigNumberMBS(0.5)
Dim d As BigNumberMBS = BigNumberMBS.TanH(c)

// TanHMBS is in MBS Xojo Util Plugin
Dim x As Double = TanHMBS(0.5)

MsgBox d.StringValue+EndOfLine+Str(x)
```

**Notes:** We're using the formula tanh(x)= ( e^x - e^(-x) ) / ( e^x + e^(-x) )

### 121.4.110 TwoPi as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value 2 * PI.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.TwoPi
MsgBox b.StringValue
```

### 121.4.111 Zero as BigNumberMBS

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number with value zero.
**Example:**

```
dim b as BigNumberMBS = BigNumberMBS.Zero
MsgBox b.StringValue
```

### 121.4.112 Properties

### 121.4.113 CurrencyValue as Currency

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets/Queries currency value.
**Example:**

```
dim u as Currency = 1234.5678
dim b as new BigNumberMBS(u)
MsgBox str(b.CurrencyValue)
```

**Notes:** (Read and Write property)

### 121.4.114 DataExponent as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exponent for this number.
**Notes:** Setting this may need to update flags, too.
(Read and Write property)

### 121.4.115 DataFlags as Integer

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags.
**Notes:** Bits are 128 for Sign, 64 for NAN and 32 for zero.
(Read and Write property)

### 121.4.116 DataMantissa as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mantissa for this number.
**Notes:** Setting this may need to update flags, too.
(Read and Write property)

### 121.4.117 DoubleValue as Double

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or Set the double value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.5)

MsgBox str(o.DoubleValue)+" = "+str(o.StringValue)
```

**Notes:** (Read and Write property)

### 121.4.118 Int64Value as Int64

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set value as Int64.
**Example:**

```
dim u as Int64 = &h7FFFFFFFFFFFFFFF // maximum Int64
dim b as new BigNumberMBS(u)
MsgBox str(b.Int64Value)

dim one as new BigNumberMBS(1)
b = b + one

// raises exception due to overflow
MsgBox str(b.Int64Value)
```

**Notes:** (Read and Write property)

### 121.4.119 IntegerValue as Integer

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or Set the integer value.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(2.5)

MsgBox str(o.IntegerValue)+" = "+str(o.StringValue)
```

**Notes:** (Read and Write property)

### 121.4.120 IsInteger as Boolean

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this number is an integer.
**Example:**

```
dim o as BigNumberMBS = new BigNumberMBS(1)
dim z as BigNumberMBS = new BigNumberMBS(1.5)

if o.IsInteger then
MsgBox o.StringValue+" is integer"
else
break // error
end if

if z.IsInteger then
break // error
else
MsgBox z.StringValue+" is not integer"
end if
```

**Notes:** If true, there are no digits after the dot.
(Read only property)

### 121.4.121 IsNan as Boolean

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an invalid number.
**Example:**

```
dim o as BigNumberMBS = BigNumberMBS.zero
dim z as BigNumberMBS = BigNumberMBS.Nan

if z.IsNan then
MsgBox z.StringValue+" is NaN"
else
break // error
end if

if o.IsNan then
break // error
else
MsgBox o.StringValue+" is not NaN"
end if
```

**Notes:** (Read only property)

### 121.4.122 IsNegative as Boolean

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value is negative.
**Example:**

```
dim o as BigNumberMBS = BigNumberMBS.one
dim z as BigNumberMBS = BigNumberMBS.one.Negate

if z.IsNegative then
MsgBox z.StringValue+" is negative"
else
break // error
end if

if o.IsNegative then
break // error
else
MsgBox o.StringValue+" is not negative"
end if
```

**Notes:** (Read only property)

### 121.4.123 IsZero as Boolean

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if value is zero.
**Example:**

```
dim o as BigNumberMBS = BigNumberMBS.one
dim z as BigNumberMBS = BigNumberMBS.zero

if z.IsZero then
MsgBox z.StringValue+" is zero"
else
break // error
end if

if o.IsZero then
break // error
else
MsgBox o.StringValue+" is not zero"
end if
```

**Notes:** (Read only property)

### 121.4.124 StringValue as String

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set string value of text.
**Example:**

```
// set to 1.2 and show
dim o as new BigNumberMBS("1.2")
MsgBox o.StringValue

// set to 2.3
o.StringValue = "2.3"
MsgBox o.StringValue
```

**Notes:** (Read and Write property)
See also:

- 121.4.127 StringValue(Base as Integer) as String 17456

### 121.4.125 UInt64Value as UInt64

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set value as UInt64.
**Example:**

```
dim u as UInt64 = 12345678901234567890
dim b as new BigNumberMBS(u)
MsgBox str(b.UInt64Value)
```

**Notes:** (Read and Write property)

### 121.4.126 VariantValue as Variant

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries/Sets value with variant.
**Notes:** Floating point values are given as Double.
Integer types as Int32, Int64 or UInt64.
If value exceeds the ranges of those data types, we fall back to string.

When setting, the value is converted to a big number similiar to NumberWithVariant.
(Read and Write property)

### 121.4.127 StringValue(Base as Integer) as String

MBS DataTypes Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set string value with a given base.
**Example:**

```
dim o as new BigNumberMBS(1234)

// show as hex
MsgBox o.StringValue(16)
```

**Notes:** (Read and Write computed property)
See also:

- 121.4.124 StringValue as String 17455

## 121.5 Globals

### 121.5.1 IsValidCreditCardNumberMBS(Number as String) as boolean

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies a credit card number.
**Example:**

```
MsgBox "test 49927398716 gives "+str(IsValidCreditCardNumberMBS("49927398716"))+EndOfLine+_
"test 49927398717 gives "+str(IsValidCreditCardNumberMBS("49927398717"))
```

**Notes:** This function implements the Luhn algorithm. This is a simple checksum formula used to validate a variety of identification numbers, such as credit card numbers, IMEI numbers, National Provider Identifier numbers in US and Canadian Social Insurance Numbers.
Returns true on success or false on failure.

If this function returns false, you can be sure the number is not valid. But if the function returns true, you may want to check the number online with some database.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 121.5.2 CompareNumbersMBS(v1 as Variant, v2 as Variant) as Integer

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares numbers.
**Example:**

```
Dim u As UInt64 = 12345678901234567890
Dim i As Int64 = -1

If u >i Then
Break // 12345678901234567890 >-1
Else
Break // xojo says it's smaller!
End If

If CompareNumbersMBS(u,i) >0 Then
Break // Plugin does it right
Else
Break
End If
```

**Notes:** The goal: compare numbers better than Xojo.
Especially UInt64/Int64 edge cases.

We treat nil as 0 value and ptr as UInt64.
If first argument is string, we just compare both as string. If first argument is numeric and second argument is string, we convert second one to number.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

### 121.5.3 ACosHMBS(x as Double) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the inverse hyperbolic cosine of the real argument x.
**Example:**

MsgBox str(ACosHMBS(5))

**Notes:** acosh(1) returns +0.
acosh(x) returns a NAN for x <1.
acosh(+infinity) returns +infinity.

### 121.5.4 ACosMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the principal value of the arc cosine of x in the range [ 0, pi ] .
**Example:**

MsgBox str(ACosMBS(5))

**Notes:** acos(1) returns +0.
acos(x) returns a NAN for | x | >1.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.5 ArithmeticShiftMBS(value as UInt64, count as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does an arithmetic Shift of value and cares for the sign (+ or -).
**Example:**

msgbox str(ArithmeticShiftMBS(5,3))

// displays 40 which is 5*(2^3) = 5 * 8

**Notes:** Always using 32bit.

### 121.5.6 ASinHMBS(x as Double) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the principal value of the arc sine of x in the range [ -pi/2, +pi/2 ] .
**Example:**

MsgBox str(ASinHMBS(5))

**Notes:** asin(+-0) returns +-0.
asin(x) returns a NAN for | x | >1.

### 121.5.7 ASinMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the principal value of the arc sine of x in the range [ -pi/2, +pi/2 ] .
**Example:**

MsgBox str(ASinMBS(5))

**Notes:** asin(+-0) returns +-0.
asin(x) returns a NAN for | x | >1.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.8 ATan2MBS(x as Double, y as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the principal value of the arc tangent of y/x, using the signs of both arguments to determine the quadrant of the return value.
**Example:**

MsgBox str(ATan2MBS(3,4))

**Notes:** atan2(+-0, -0) returns +-pi.
atan2(+-0, +0) returns +-0.
atan2(+-0, x) returns +-pi for x <0.
atan2(+-0, x) returns +-0 for x >0.
atan2(y, +-0) returns -pi/2 for y >0.
atan2(+-y, -infinity) returns +-pi for finite y >0.
atan2(+-y, +infinity) returns +-0 for finite y >0.
atan2(+-infinity, +x) returns +-pi/2 for finite x.
atan2(+-infinity, -infinity) returns +-3*pi/4.
atan2(+-infinity, +infinity) returns +-pi/4.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.9 ATanHMBS(x as Double) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the inverse hyperbolic tangent of the real argument x.
**Example:**

MsgBox str(ATanHMBS(5))

**Notes:** atanh(+-0) returns +-0.
atanh(+-1) returns +-infinity.
atanh(x) returns a NaN for | x | >1.

### 121.5.10 ATanMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The atan() function computes the principal value of the arc tangent of x in the range [ -pi/2, +pi/2 ] .
**Example:**

```
MsgBox str(ATanMBS(5))
```

**Notes:** atan(+-0) returns +-0.
atan(+-infinity) returns +-pi/2.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.11 BitClearMBS(value as UInt64, mask as UInt64) as UInt64

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the bits in the mask from the value.
**Example:**

```
MsgBox bin(BitClearMBS(&b1111,&b0110)) // 1001
```

**Notes:** Does not work for 64 bit integers.

### 121.5.12 BitCountMBS(value as UInt64) as Integer

MBS Util Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts the number of bits set.
**Example:**

```
MsgBox str(BitCountMBS(&b101)) // 2
MsgBox str(BitCountMBS(&b10101)) // 5
MsgBox str(BitCountMBS(&b11111111111100001111)) // 16
MsgBox str(BitCountMBS(&hFFFFFFFF)) // 32
```

**Notes:** Does not work for 64 bit integers.

### 121.5.13 BitExclMBS(value as UInt64, bitNumber as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

Does an bitwiseAnd using the value and bitwisenot of 2^bitNumber.
Or: Switches off the bit bitNumber inside value.
**Example:**

```
msgBox str(BitExclMBS(80,4))
' displays 64 which is 80 without 16 = 2^4+2^5 without 2^4
```

**Notes:**

Always using 64-bit.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6

### 121.5.14 BitInclMBS(value as UInt64, bitNumber as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

Does an bitwiseOr using the value and 2^bitNumber
Or: Switches on the bit bitNumber inside value.
**Example:**

```
msgBox str(BitInclMBS(64,4))
' displays 80 which is 64 + 16 = 64 + 2^4
```

**Notes:**

Always using 64-bit.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6

### 121.5.15 BitIsSetMBS(value as UInt64, bitNumber as Integer) as Boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tests whether a certain bit is set inside the value
**Example:**

```
dim bool as boolean

bool=BitIsSetMBS(80,4)
' true, because 2^4=16 is included in 80=2^4+2^6
```

**Notes:** Always using 64-bit.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6

### 121.5.16 BitValMBS(bitNumber as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns 2^bitNumber
**Example:**

```
msgBox str(BitValMBS(5))
' displays 32
```

**Notes:** Always using 64-bit.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6

### 121.5.17 BitwiseDiffMBS(x as UInt64, y as UInt64) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns all bits of val1 which are not in val2.
**Example:**

```
msgBox str(BitwiseDiffMBS(65,80))
' displays 1, because 65=2^0+2^5 includes 1=2^0, which is not part of 80=2^4+2^5.
```

**Notes:** Always using 32bit.

### 121.5.18 BitwiseNAndMBS(x as UInt64, y as UInt64) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** negates both values and does bitwiseAnd on them.
**Example:**

```
msgBox str(bitwiseNandMBS(65,80))
' displays -82
```

**Notes:** Always using 32bit.

### 121.5.19 BitwiseNOrMBS(x as UInt64, y as UInt64) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** negates both values and does bitwiseor on them.
**Example:**

```
msgBox str(bitwisenorMBS(65,80))
' displays -65
```

**Notes:** Always using 32bit.

### 121.5.20 BitwiseNotMBS(value as UInt64) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does an bitwise negation of value.
**Example:**

```
msgBox str(BitwiseNotMBS(5))
' displays -6
```

**Notes:** Always using 32bit.

### 121.5.21 BitwiseRotateMBS(value as UInt64, count as Integer, offset as Integer, width as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does an bitwise rotation of value.
**Example:**

```
msgBox str(BitwiseRotateMBS(5,2,0,32))
' displays 20
```

**Notes:** Always using 32bit.

### 121.5.22 ConvertFromFloat16MBS(Number as UInt16) as Single

MBS Util Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a 16bit floating point number to a 32bit floating point number.
**Example:**

```
dim h1 as UInt16 = ConvertToFloat16MBS(1.0)
dim f1 as single = ConvertFromFloat16MBS(h1) // should be 1.0


dim h2 as UInt16 = ConvertToFloat16MBS(-1.0)
dim f2 as single = ConvertFromFloat16MBS(h2) // should be -1.0


dim h3 as UInt16 = ConvertToFloat16MBS(1000.0)
dim f3 as single = ConvertFromFloat16MBS(h3) // should be 1000.0


dim h4 as UInt16 = ConvertToFloat16MBS(-1000.0)
dim f4 as single = ConvertFromFloat16MBS(h4) // should be -1000.0


dim inf as single = 65504.0
dim h5 as UInt16 = ConvertToFloat16MBS(inf)
dim f5 as single = ConvertFromFloat16MBS(h5) // should be 65504


dim nan as single = sqrt(-1)
dim h6 as UInt16 = ConvertToFloat16MBS(nan)
dim f6 as single = ConvertFromFloat16MBS(h6) // should be NAN


Break // check in debugger
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 121.5.23 ConvertToFloat16MBS(Number as Single) as UInt16

MBS Util Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a 32bit floating point number to a 16bit floating point number.
**Example:**

```
dim h1 as UInt16 = ConvertToFloat16MBS(1.0)
dim f1 as single = ConvertFromFloat16MBS(h1) // should be 1.0


dim h2 as UInt16 = ConvertToFloat16MBS(-1.0)
dim f2 as single = ConvertFromFloat16MBS(h2) // should be -1.0


dim h3 as UInt16 = ConvertToFloat16MBS(1000.0)
dim f3 as single = ConvertFromFloat16MBS(h3) // should be 1000.0


dim h4 as UInt16 = ConvertToFloat16MBS(-1000.0)
dim f4 as single = ConvertFromFloat16MBS(h4) // should be -1000.0


dim inf as single = 65504.0
dim h5 as UInt16 = ConvertToFloat16MBS(inf)
dim f5 as single = ConvertFromFloat16MBS(h5) // should be 65504


dim nan as single = sqrt(-1)
dim h6 as UInt16 = ConvertToFloat16MBS(nan)
dim f6 as single = ConvertFromFloat16MBS(h6) // should be NAN


Break // check in debugger
```

**Notes:** This looses precision as 16bit fit less bits than 32 bit.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.5pr4

### 121.5.24 CosHMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the hyperbolic cosine of x.
**Example:**

MsgBox str(CosHMBS(5))

**Notes:** cosh(+-0) returns 1.
cosh(+-infinity) returns +infinity.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.25 CosMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the cosine of x (measured in radians).
**Example:**

MsgBox str(CosMBS(5))

**Notes:** cos(+-0) returns 1.
cos(+-infinity) returns a NaN.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.26 CurrencyAddMBS(value1 as Currency, value2 as Currency) as Currency

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds two currency values.
**Notes:** This function uses 64bit integer math to avoid rounding issues.

### 121.5.27 CurrencyDivMBS(value1 as Currency, value2 as Integer) as Currency

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides currency value by integer.
**Notes:** Rest is ignored.
This function uses 64bit integer math to avoid rounding issues.

### 121.5.28 CurrencyMulMBS(value1 as Currency, value2 as Integer) as Currency

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies currency value with integer.
**Example:**

```
dim c1 as Currency = 1234567890.1234

// in xojo
dim c3 as Currency = c1 * 12345

// with plugin
dim c4 as Currency = CurrencyMulMBS(c1, 12345)

// verify by 64bit math
dim c5 as Int64 = 12345678901234
dim c6 as int64 = c5 * 12345

// and plugin is correct
MsgBox str(c3)+" "+str(c4)+" "+str(c6)
```

**Notes:** This function uses 64bit integer math to avoid rounding issues.

### 121.5.29 CurrencySubMBS(value1 as Currency, value2 as Currency) as Currency

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts value2 from value1.
**Notes:** This function uses 64bit integer math to avoid rounding issues.

### 121.5.30 CurrencyValueMBS(value as string) as Currency

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses string into currency value.
**Notes:** Replacement for val() which works better with large numbers and raises exceptions on errors.
**Blog Entries**

- Currency Data Type
- MBS Xojo / Real Studio Plugins, version 14.3pr9
- Currency Data Type

### 121.5.31 DoubleToExtendedStrMBS(x as Double) as string

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Returns the double as an 80bit Float stored inside a ten byte string.
**Example:**

```
dim s as string
dim d as Double

d=5
s=DoubleToExtendedStrMBS(d)
msgBox s
d=extendedStrToDoubleMBS(s)
msgBox str(d)
```

**Notes:** Returns "" if there is not enough memory to create the string.

### 121.5.32 Exp2MBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes 2^x, the base-2 exponential of x.
**Example:**

```
MsgBox str(Exp2MBS(5))
```

**Notes:** exp2(+-0) return 1.
exp2(-infinity) return +0.
exp2(+infinity) return +infinity.

### 121.5.33 ExpMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes e^x, the base-e exponential of x.
**Example:**

```
MsgBox str(ExpMBS(5))
```

**Notes:** exp(+-0) return 1.

exp(-infinity) return +0.
exp(+infinity) return +infinity.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.34 ExtendedStrToDoubleMBS(v as string) as Double

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Returns the 80bit Float as a double.
**Example:**

```
dim s as string
dim d as Double

d=5
s=DoubleToExtendedStrMBS(d)
msgBox s
d=extendedStrToDoubleMBS(s)
msgBox str(d)
```

**Notes:** Returns NAN (255) if the string is not valid. e.g. "".
Returns always NAN on Windows.

### 121.5.35 FacMBS(x as Integer) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates (value!).
**Example:**

```
Sub Open()
// Fill a listbox with Fac values:
dim x as Integer
dim y as Double

for x=1 to 100
listBox1.addrow format(x,"0")
y=FacMBS(x)
if y=0 then
exit
else
listBox1.cell(listBox1.lastIndex,1)=format(y,"0")
end if
```

```
next
End Sub
```

**Notes:** msgBox str(facMBS(5))
' displays 120 which is 1*2*3*4*5

### 121.5.36 FloorMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the largest integral value less than or equal to x.
**Example:**

```
MsgBox str(FloorMBS(5.45))
```

**Notes:** floor(+-0) returns +-0.
floor(+-infinity) returns +-infinity.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.37 FRExpMBS(inputx as Double, byref expValue as Integer) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Breaks floating-point number into normalized fraction and power of 2.
**Example:**

```
dim x as Double = 123.456

dim y as Integer
dim r as Double = FRExpMBS(x, y)

MsgBox str(X)+": "+str(y)+" "+str(r)
```

**Notes:** This functions break the floating-point number value into a normalized fraction and an integral power of 2. They store the integer in the int object pointed to by exp.

The functions return a number x such that x has a magnitude in the interval [ 1/2, 1) or 0, and value = x*(2^exp).

frexp(+-0, exp) returns +-0, and stores 0 in the object pointed to by exp.

frexp(+-infinity, exp) returns +-infinity, and stores an unspecified value in the object pointed to by exp.

frexp(Nan, exp) returns a Nan, and stores an unspecified value in the object pointed to by exp.

### 121.5.38 HiWordMBS(i as Integer) as Integer

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the high word part of the integer.
**Example:**

```
MsgBox hex(HiWordMBS(&H12345678)) // shows 1234
```

**Notes:** equal to bitwiseshiftright(i,16)

### 121.5.39 HypotMBS(x as Double, y as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the sqrt(x*x+y*y) without undue overflow or underflow.
**Example:**

```
MsgBox str(HypotMBS(3,4)) // shows 5
```

**Notes:** hypot(x, y) , hypot(y, x) , and hypot(x, -y) are equivalent.
hypot(x, +-0) is equivalent to fabs(x).
hypot(+-infinity, y) returns +infinity even if y is a NaN.

### 121.5.40 IsFiniteMBS(x as Double) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the parameter is finite.
**Example:**

```
dim x as Double

x=1/0
```

```
if not isfiniteMBS(x) then
msgbox "the result is Infinite."
end if
```

### 121.5.41 IsInfMBS(x as Double) as boolean

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the double passed in is an infinity value.
**Example:**

```
dim e as Double = 0.0000000000000000000000000000000000000000000000001
dim d as Double = 1.0/e/e/e/e/e/e/e

MsgBox str(d)+" is inf: "+str(IsInfMBS(d))
```

### 121.5.42 IsNANMBS(x as Double) as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the parameter is not a number.
**Example:**

```
dim x as Double
x=sqrt(-1)
if isnanMBS(x) then
msgbox "the square root of -1 is not correct."
end if
```

### 121.5.43 Log10MBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the value of the logarithm of argument x to base 10.
**Example:**

```
MsgBox str(Log10MBS(5))
```

**Notes:** log10(1) return +0.
log10(x) return a NaN for x <0.

log10(+infinity) return +infinity.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.44 Log2MBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the value of the logarithm of argument x to base 2.
**Example:**

MsgBox str(Log2MBS(5))

**Notes:** log2(1) return +0.
log2(x) return a NaN for x <0.
log2(+infinity) return +infinity.

### 121.5.45 LogicalShiftMBS(value as UInt64, count as Integer) as UInt64

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Does an logical Shift of value and doesn't take care for the sign (+ or -).
**Example:**

msgbox str(LogicalShiftMBS(5,3))

**Notes:** Always using 32bit.

### 121.5.46 LogMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the value of the logarithm of argument x to base e.
**Example:**

MsgBox str(LogMBS(5))

**Notes:** log(1) return +0.
log(x) return a NaN for x <0.

log(+infinity) return +infinity.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.47 LoWordMBS(i as Integer) as Integer

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the low word part of the integer.
**Example:**

```
MsgBox hex(LoWordMBS(&H12345678)) // shows 5678
```

**Notes:** equal to bitwiseand(i,&HFFFF)

### 121.5.48 NormInvMBS(p as Double, mu as double = 0.0, sigma as double = 1.0) as double

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calculates NormInv function like in Excel.
**Example:**

```
MsgBox Str(NormInvMBS(0.56, 5, 2)) // should show 5.3019
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr1

### 121.5.49 PowMBS(x as Double, y as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes x raised to the power y.
**Example:**

```
MsgBox str(PowMBS(5,5))
```

**Notes:** pow(+-0, y) returns +-infinity for y an odd integer <0.
pow(+-0, y) returns +infinity for y <0 and not an odd integer.
pow(+-0, y) returns +-0 for y an odd integer >0.
pow(+-0, y) returns +0 for y >0 and not an odd integer.
pow(-1, +-infinity) returns 1.
pow(1, y) returns 1 for any y, even a NaN.
pow(x, +-0) returns 1 for any x, even a NaN.
pow(x, y) returns a NaN for finite x <0 and finite non-integer y.
pow(x, -infinity) returns +infinity for | x | <1.
pow(x, -infinity) returns +0 for | x | >1.
pow(x, +infinity) returns +0 for | x | <1.
pow(x, +infinity) returns +infinity for | x | >1.
pow(-infinity, y) returns -0 for y an odd integer <0.
pow(-infinity, y) returns +0 for y <0 and not an odd integer.
pow(-infinity, y) returns -infinity for y an odd integer >0.
pow(-infinity, y) returns +infinity for y >0 and not an odd integer.
pow(+infinity, y) returns +0 for y <0.
pow(+infinity, y) returns +infinity for y >0.

Range errors may occur.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.50 RandomExponentialDistributionMBS(lambda as Double) as double

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Generates a random number using exponential distribution.
**Notes:** Produces random non-negative floating-point values, distributed according to probability density function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr2

### 121.5.51 RandomNormalDistributionMBS(Mean as Double, StdDev as Double) as double

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Generates a random number using normal distribution.
**Notes:** Generates random numbers according to the Normal (or Gaussian) random number distribution.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr2

**Xojo Developer Magazine**

- 22.2, page 9: News

### 121.5.52 RandomPoissonDistributionMBS(Mean as Integer) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Generates a random number using poisson distribution.
**Notes:** Produces random non-negative integer values i, distributed according to discrete probability function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr2

**Xojo Developer Magazine**

- 22.2, page 9: News

### 121.5.53 RoundMBS(x as Double, decimals as Integer = 0) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function returns the integral value nearest to x rounding half-way cases away from zero, regardless of the current rounding direction.
**Example:**

```
MsgBox str(RoundMBS(5.5))

dim lines(-1) as string

for i as Integer = -5 to 5
lines.Append str(i)+": "+Format(RoundMBS(123456789.123456789, i), "0.0000000")
next

MsgBox join(lines,EndOfLine)
```

**Notes:** round(+-0) returns +-0.
round(+-infinity) returns +-infinity.
**Blog Entries**

- MBS REALbasic Plugins, version 11.0pr14
- REAL Server Plugin 0.4

### 121.5.54 SinHMBS(x as Double) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the hyperbolic sine of x.
**Example:**

MsgBox str(SinHMBS(5.5))

**Notes:** sinh(+-0) returns +-0.
sinh(+-infinity) returns +-infinity.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.55 SinMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the sine of x (measured in radians).
**Example:**

MsgBox str(SinMBS(5.5))

**Notes:** sin(+-0) returns +-0.
sin(+-infinity) returns a NaN.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.56 SqrtMBS(x as Double, y as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function compute the yth root of x.
**Example:**

```
dim r,x,y as Double

r=SqrtMBS(x,y)
// r^y=x
```

**Notes:** sqrt(-0) returns -0.
sqrt(x,y) returns a NaN if the root can't be calculated.
**Blog Entries**

- REAL Server Plugin 0.4

### 121.5.57 TanHMBS(x as Double) as Double

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the hyperbolic tangent of x.
**Example:**

```
MsgBox str(TanHMBS(5.5))
```

**Notes:** tanh(+-0) returns +-0.
tanh(+-infinity) returns +-1.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.58 TanMBS(x as Double) as Double

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function computes the tangent of x (measured in radians).
**Example:**

```
MsgBox str(TanMBS(5.5))
```

**Notes:** tan(+-0) returns +-0.
tan(+-infinity) returns a NaN.
**Blog Entries**

- MBS SQLite Extension in version 1.1
- MBS SQLite Extension, version 1.1pr1

### 121.5.59 DoubleToInt64MBS(value as Double) as Int64

MBS Util Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a double value to Int64.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr7

### 121.5.60 DoubleToUInt64MBS(value as Double) as UInt64

MBS Util Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a double value to UInt64 correctly.
**Example:**

```
// set d to a very high UInt64 value
dim d as Double = pow(256.0,8.0) - 10000

// RB will convert to Int64 here! so number is cut to 9... instead of 18...
dim u1 as UInt64 = d

// plugin does it right
dim u2 as UInt64 = DoubleToUInt64MBS(d)

MsgBox str(u1)+" "+str(u2)
```

**Notes:** Xojo converts UInt64 to Double with an intermediate Int64 which breaks big numbers. This function does it correctly.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr11

### 121.5.61 Int64ToDoubleMBS(value as Int64) as Double

MBS Util Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts an Int64 to Double.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr7

### 121.5.62 UInt64ToDoubleMBS(value as UInt64) as Double

MBS Util Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts an UInt64 to Double.
**Example:**

```
dim d as Double = 18446744073709541376
MsgBox str(d) // fails

dim e as Double = UInt64ToDoubleMBS(18446744073709541376)
MsgBox str(e) // works
```

**Notes:** Xojo likes to use Int64 internally when doing math with UInt64, so we added this method to fix it.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr11

## 121.6 class LargeNumberErrorExceptionMBS

### 121.6.1 class LargeNumberErrorExceptionMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception class used to report with problems in LargeNumberMBS class.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr5

## 121.7 class LargeNumberMBS

### 121.7.1 class LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An 4128 bit integer number.
**Example:**

```
Dim n1 As Int64 = 10000000000
Dim n2 As Int64 = 10000000000
Dim n3 As Int64 = n1 * n2 // overflow, so wrong result

Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithInt64(n1)
Dim l2 As LargeNumberMBS = LargeNumberMBS.NumberWithInt64(n2)
Dim l3 As LargeNumberMBS = l1 * l2

Dim s4 As String = l3.StringValue // this is correct

Break
```

**Notes:** Can be useful to calculate with more than Int64.
This class works with up to 1224 digits.

See BigNumberMBS for a 320 bit floating point number.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr3
- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 19.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr6
- MBS Xojo Plugins, version 19.1pr5
- Large integer numbers in Xojo

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

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- 22.2, page 9: News
- 21.3, page 69: Large, Big, and Bigger Numbers, Working with giant numbers by Stefanie Juchmes
- 21.3, page 67: Large, Big, and Bigger Numbers, Working with giant numbers by Stefanie Juchmes
- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 19.3, page 44: Xojo Time and Space,ÄîInto a Programming Black Hole, How converting durations and distances into human-readable form reveals a 32-bit problem at the heart of Xojo's 64-bit math module by Markus Winter
- 17.6, pages 63 to 64: Big Numbers and Large Numbers, How you can use the BigNumberMBS and LargeNumberMBS class in Xojo by Stefanie Juchmes
- 17.6, page 61: Big Numbers and Large Numbers, How you can use the BigNumberMBS and LargeNumberMBS class in Xojo by Stefanie Juchmes
- 17.5, page 33: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.3, page 10: News

### 121.7.2 Methods

### 121.7.3 Add(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds other number.
See also:

- 121.7.4 Add(other as LargeNumberMBS) as LargeNumberMBS 17483

### 121.7.4 Add(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds other number and returns result.
See also:

- 121.7.3 Add(other as LargeNumberMBS) 17483

### 121.7.5 AddMod(v as LargeNumberMBS, Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Addition with modulo.
**Example:**

```
Dim v As New LargeNumberMBS(100)
Dim o As New LargeNumberMBS(200)
Dim n As New LargeNumberMBS(&hFF)

Dim r As LargeNumberMBS = v.AddMod(o, n)

MsgBox r.StringValue // shows 45 = (100+200) mod 255
```

### 121.7.6 CheckBit(bit as integer) as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether a bit is set.
**Notes:** Returns true if bit is set.

### 121.7.7 Clone as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the number.

### 121.7.8 Constructor

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with value zero.
**Example:**

```
Dim l1 As New LargeNumberMBS
MsgBox l1.StringValue
```

See also:

- 121.7.9 Constructor(other as LargeNumberMBS) 17485
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.11 Constructor(value as Int64) 17486
- 121.7.12 Constructor(value as String) 17486
- 121.7.13 Constructor(value as UInt32) 17487
- 121.7.14 Constructor(value as UInt64) 17487


### 121.7.9 Constructor(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the number.
**Example:**

```
Dim l1 As New LargeNumberMBS(123456789)
Dim l2 As New LargeNumberMBS(l1)

MsgBox l2.StringValue
```

See also:


- 121.7.8 Constructor 17484
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.11 Constructor(value as Int64) 17486
- 121.7.12 Constructor(value as String) 17486
- 121.7.13 Constructor(value as UInt32) 17487
- 121.7.14 Constructor(value as UInt64) 17487


### 121.7.10 Constructor(value as Int32)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with an 32-bit integer.
See also:


- 121.7.8 Constructor 17484
- 121.7.9 Constructor(other as LargeNumberMBS) 17485

- 121.7.11 Constructor(value as Int64) 17486
- 121.7.12 Constructor(value as String) 17486
- 121.7.13 Constructor(value as UInt32) 17487
- 121.7.14 Constructor(value as UInt64) 17487


### 121.7.11 Constructor(value as Int64)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with an 64-bit integer.
See also:


- 121.7.8 Constructor 17484
- 121.7.9 Constructor(other as LargeNumberMBS) 17485
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.12 Constructor(value as String) 17486
- 121.7.13 Constructor(value as UInt32) 17487
- 121.7.14 Constructor(value as UInt64) 17487


### 121.7.12 Constructor(value as String)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number based on a string.
**Notes:** Raises OutOfBoundsExceptionMBS if your string is too long.
See also:


- 121.7.8 Constructor 17484
- 121.7.9 Constructor(other as LargeNumberMBS) 17485
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.11 Constructor(value as Int64) 17486
- 121.7.13 Constructor(value as UInt32) 17487
- 121.7.14 Constructor(value as UInt64) 17487

### 121.7.13 Constructor(value as UInt32)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with an unsigned 32-bit integer.
See also:


- 121.7.8 Constructor 17484
- 121.7.9 Constructor(other as LargeNumberMBS) 17485
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.11 Constructor(value as Int64) 17486
- 121.7.12 Constructor(value as String) 17486
- 121.7.14 Constructor(value as UInt64) 17487


### 121.7.14 Constructor(value as UInt64)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new instance with an unsigned 64-bit integer.
See also:


- 121.7.8 Constructor 17484
- 121.7.9 Constructor(other as LargeNumberMBS) 17485
- 121.7.10 Constructor(value as Int32) 17485
- 121.7.11 Constructor(value as Int64) 17486
- 121.7.12 Constructor(value as String) 17486
- 121.7.13 Constructor(value as UInt32) 17487


### 121.7.15 Decrement(value as UInt32 = 1)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrement number with an integer.
**Example:**

```
Dim o As New LargeNumberMBS(5)
MsgBox o.StringValue
o.Increment
MsgBox o.StringValue
o.Decrement
```

```
MsgBox o.StringValue
```

**Notes:** This is faster than building a new LargeNumberMBS, just to subtract some small number.

### 121.7.16 Divide(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides value with by value.
See also:


- 121.7.17 Divide(other as LargeNumberMBS) as LargeNumberMBS 17488
- 121.7.18 Divide(value as UInt32) as LargeNumberMBS 17488


### 121.7.17 Divide(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides value with by value.
See also:


- 121.7.16 Divide(other as LargeNumberMBS) 17488
- 121.7.18 Divide(value as UInt32) as LargeNumberMBS 17488


### 121.7.18 Divide(value as UInt32) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divide by given integer and return result.
**Example:**

```
Dim o As New LargeNumberMBS(63)
Dim r1 As LargeNumberMBS = o.Divide(8)
Dim r2 As UInt32 = o.Modulo(8)

MsgBox r1.StringValue+" "+str(r2) // shows 7 and 7
```

**Notes:** For small numbers this is more efficient than creating new LargeNumberMBS to store value.
See also:


- 121.7.16 Divide(other as LargeNumberMBS) 17488

• 121.7.17 Divide(other as LargeNumberMBS) as LargeNumberMBS 17488

### 121.7.19 DivMod(other as LargeNumberMBS, byref DivResult as LargeNumberMBS, byref ModResult as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs divide and modulo together.
**Example:**

```
Dim d As New LargeNumberMBS(100)
Dim n As New LargeNumberMBS(13)

Dim x As LargeNumberMBS
Dim y As LargeNumberMBS

d.DivMod n, x, y

MsgBox d.StringValue + " = " + x.StringValue + " * " + n.StringValue + " + " + y.StringValue
```

**Notes:** Puts result into both byref parameters.

### 121.7.20 Equals(other as LargeNumberMBS) as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares if two numbers are equal.
**Notes:** Returns true if equal.

### 121.7.21 ExpMod(e as LargeNumberMBS, Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates an exponent.
**Example:**

```
Dim o As New LargeNumberMBS(2)
Dim e As New LargeNumberMBS(11)
Dim m As New LargeNumberMBS(255)
Dim r As LargeNumberMBS = o.ExpMod(e,m)

MsgBox r.StringValue // shows 8 = 2^11 mod 255
```

**Notes:** Returns x^e mod n where x is the current number, e a parameter and n the modulo parameter.

### 121.7.22 FindGCD(v as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds greatest common divisor for two positive numbers.

### 121.7.23 GetStringValue(Base as Integer = 10, ThousandsDelimiter as String = "") as String

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number with a given base and delimiter.
**Example:**

```
Dim l As New LargeNumberMBS(1234567890)

Dim s0 As String = l.StringValue
Dim s1 As String = l.GetStringValue
// 1234567890
Dim s2 As String = l.GetStringValue(10, ",")
// 1,234,567,890
Dim s4 As String = l.GetStringValue(8, "")
// 499602d2
Dim s3 As String = l.GetStringValue(16, "")
// 11145401322

Break // check in debugger
```

**Notes:** With all default parameter, this is same as StringValue property.

### 121.7.24 Increment(value as UInt32 = 1)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Increment number with an integer.
**Example:**

```
Dim o As New LargeNumberMBS(5)
```

```
MsgBox o.StringValue
o.Increment
MsgBox o.StringValue
o.Decrement
MsgBox o.StringValue
```

**Notes:** This is faster than building a new LargeNumberMBS, just to add some small number.

### 121.7.25 IsPrime(iter as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if number is a prime number.
**Example:**

```
Dim lines() As String

For i As Integer = 61 To 69 Step 2
Dim a As New LargeNumberMBS(i)
lines.Append a.StringValue+": "+Str(a.IsPrime(5))
Next

MsgBox Join(lines, EndOfLine)
```

**Notes:** Returns 1 if prime and 0 if not.
Returns -1 in case of error.

Iter is the factor between 1 and 680 about how deep to iterate. The bigger the this factor, the more exact the check is.

Miller-Rabin Algorithm (ret=1 .. n is composit)

### 121.7.26 LeftShift(bits as integer) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts value to left by given number of bits.
**Notes:** Bits must be <= 32.

### 121.7.27 MaxInt32 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value which can be represented as Int32.

### 121.7.28 MaxInt64 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value which can be represented as Int64.

### 121.7.29 MaxUInt32 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value which can be represented as UInt32.

### 121.7.30 MaxUInt64 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum value which can be represented as UInt64.

### 121.7.31 MinInt32 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value which can be represented as Int32.

### 121.7.32 MinInt64 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value which can be represented as Int64.

### 121.7.33 MinUInt32 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value which can be represented as UInt32.

### 121.7.34 MinUInt64 as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Minimum value which can be represented as UInt64.

### 121.7.35 ModInverse(Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This function calculates modular multiplicative inverse of an given integer a modulo m.
**Example:**

```
Dim l As New LargeNumberMBS(3)
Dim n As New LargeNumberMBS(26)

Dim r As LargeNumberMBS = l.ModInverse(n)

MsgBox r.StringValue
```

### 121.7.36 Modulo(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulo value.
**Notes:** Divides value and returns the rest.
See also:


- 121.7.37 Modulo(other as LargeNumberMBS) as LargeNumberMBS 17493
- 121.7.38 Modulo(value as UInt32) as UInt32 17494


### 121.7.37 Modulo(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulo value.
**Notes:** Divides value and returns the rest.
See also:

- 121.7.36 Modulo(other as LargeNumberMBS) 17493
- 121.7.38 Modulo(value as UInt32) as UInt32 17494

### 121.7.38 Modulo(value as UInt32) as UInt32

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divide by given integer and return remainder.
**Example:**

```
Dim o As New LargeNumberMBS(63)
Dim r1 As LargeNumberMBS = o.Divide(8)
Dim r2 As UInt32 = o.Modulo(8)

MsgBox r1.StringValue+" "+str(r2) // shows 7 and 7
```

**Notes:** For small numbers this is more efficient than creating new LargeNumberMBS to store value.
See also:

- 121.7.36 Modulo(other as LargeNumberMBS) 17493
- 121.7.37 Modulo(other as LargeNumberMBS) as LargeNumberMBS 17493

### 121.7.39 MulMod(v as LargeNumberMBS, Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply with modulo.
**Example:**

```
Dim o As New LargeNumberMBS(50)
Dim f As New LargeNumberMBS(80)
Dim m As New LargeNumberMBS(255)
Dim r As LargeNumberMBS = o.MulMod(f, m)

MsgBox r.StringValue // shows 175 = (50 * 80) mod 255
```

### 121.7.40 Multiply(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies value with other value.
See also:

- 121.7.41 Multiply(value as UInt32) as LargeNumberMBS 17495

### 121.7.41 Multiply(value as UInt32) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply by given integer and return result.
**Example:**

```
Dim o As New LargeNumberMBS(5)
Dim r As LargeNumberMBS = o.Multiply(8)

MsgBox r.StringValue // shows 40
```

**Notes:** For small numbers this is more efficient than creating new LargeNumberMBS to store value.
See also:

- 121.7.40 Multiply(other as LargeNumberMBS) 17495

### 121.7.42 Negate as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the value.
**Notes:** Returns new value with different sign.

### 121.7.43 NumberWithInt32(value as Int32) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given Int32 value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithInt32(123456789)
MsgBox l1.StringValue
```

### 121.7.44 NumberWithInt64(value as Int64) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given Int64 value.
**Example:**

```
Dim d1 As LargeNumberMBS = LargeNumberMBS.NumberWithInt64(0)
Dim d2 As LargeNumberMBS = LargeNumberMBS.NumberWithInt64(123)
Dim d3 As LargeNumberMBS = LargeNumberMBS.NumberWithInt64(123456789012345)

MsgBox d1.StringValue+EndOfLine+d1.HexString+EndOfLine+_
d2.StringValue+EndOfLine+d2.HexString+EndOfLine+_
d3.StringValue+EndOfLine+d3.HexString
```

### 121.7.45 NumberWithInteger(value as Integer) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given integer value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(123456789)
MsgBox l1.StringValue
```

### 121.7.46 NumberWithString(value as String) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given string.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithString("123456789")
MsgBox l1.StringValue
```

### 121.7.47 NumberWithUInt32(value as UInt32) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given UInt32 value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithUInt32(123456789)
MsgBox l1.StringValue
```

### 121.7.48 NumberWithUInt64(value as UInt64) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given UInt64 value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithUInt64(123456789)
MsgBox l1.StringValue
```

### 121.7.49 NumberWithUInteger(value as UInteger) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given unsigned integer value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithUInteger(123456789)
MsgBox l1.StringValue
```

### 121.7.50 NumberWithVariant(value as variant) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a number with the given variant value.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithVariant(123456789)
MsgBox l1.StringValue
```

**Notes:** Variant can be integer or string.

### 121.7.51 Operator_Add(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds other number and returns result.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(20)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(10)

Dim r As LargeNumberMBS = l+o
Dim s As LargeNumberMBS = o+l

MsgBox r.StringValue+" "+s.StringValue
```

### 121.7.52 Operator_AddRight(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds other number and returns result.

### 121.7.53 Operator_And(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs bitwise AND operator on the values.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(16+4)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(4+2)

Dim ra As LargeNumberMBS = l And o
Dim ro As LargeNumberMBS = l Or o

MsgBox ra.StringValue +" "+ro.StringValue
```

**Notes:** Returns new value.

### 121.7.54 Operator_Compare(other as LargeNumberMBS) as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two values.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(20)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(10)

If l >o Then
MsgBox "l is bigger"
Else
MsgBox "o is bigger"
end if
```

**Notes:** Returns -1, 1 or 0.

### 121.7.55 Operator_Convert as String

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts the number to string.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(23)
MsgBox l
```

See also:

- 121.7.56 Operator_Convert(value as String) 17499

### 121.7.56 Operator_Convert(value as String)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts string to large number.
**Example:**

```
Dim l As LargeNumberMBS = "123"
MsgBox l
```

See also:

- 121.7.55 Operator_Convert as String 17499

### 121.7.57 Operator_Divide(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides value by other value.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(21)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(3)
Dim r As LargeNumberMBS = l / o

MsgBox r.stringValue
```

### 121.7.58 Operator_DivideRight(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Divides value by other value.
**Example:**

```
Dim o As New LargeNumberMBS(5)

// "10" is auto converted to LargeNumberMBS and Operator_DivideRight is called
Dim r As LargeNumberMBS = "10" / o

MsgBox r.StringValue
```

### 121.7.59 Operator_Modulo(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulo value.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(23)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(3)
Dim r As LargeNumberMBS = l Mod o

MsgBox r.stringValue
```

**Notes:** Divides value and returns the rest.

### 121.7.60 Operator_ModuloRight(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Modulo value.
**Notes:** Divides value and returns the rest.

### 121.7.61 Operator_Multiply(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies value with other value.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(4)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(5)
Dim r As LargeNumberMBS = o*l

MsgBox r.stringValue
```

### 121.7.62 Operator_MultiplyRight(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies value with other value.
**Example:**

```
Dim o As New LargeNumberMBS(5)

// "10" is auto converted to LargeNumberMBS and Operator_MultiplyRight is called
Dim r As LargeNumberMBS = "10" * o

MsgBox r.StringValue
```

### 121.7.63 Operator_Negate as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Negates the value.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(20)
Dim r As LargeNumberMBS = -l

MsgBox r.StringValue
```

### 121.7.64 Operator_Or(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs bitwise OR operator on the values.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(16+4)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(4+2)

Dim ra As LargeNumberMBS = l And o
Dim ro As LargeNumberMBS = l Or o

MsgBox ra.StringValue +" "+ro.StringValue
```

**Notes:** Returns new value.

### 121.7.65 Operator_Subtract(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts other number and returns result.
**Example:**

```
Dim l As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(20)
Dim o As LargeNumberMBS = LargeNumberMBS.NumberWithInteger(10)

Dim r As LargeNumberMBS = l-o
Dim s As LargeNumberMBS = o-l

MsgBox r.StringValue+" "+s.StringValue
```

### 121.7.66 Operator_SubtractRight(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts other number and returns result.
**Example:**

```
Dim o As New LargeNumberMBS(5)

// "10" is auto converted to LargeNumberMBS and Operator_SubtractRight is called
Dim r As LargeNumberMBS = "10" - o

MsgBox r.StringValue
```

### 121.7.67 Prime(byte as Integer) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new big prime number.
**Example:**

```
Dim lines() As String
For i As Integer = 1 To 10

Dim r As LargeNumberMBS = LargeNumberMBS.Prime(i)
lines.Append r.StringValue

Next
MsgBox Join(lines,EndOfLine)
```

**Notes:** Byte defines how big the prime number becomes. Range 1 to 680.

### 121.7.68 RightShift(bits as integer) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shifts value to right by given number of bits.
**Notes:** Bits must be <= 32.

### 121.7.69 SetStringValue(Text As String, Base as Integer, byref AfterText as String, Byref ValueRead as boolean)

MBS DataTypes Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets number from text.
**Notes:** Returns the text after the given text following the number in AfterText parameter.
Sets ValueRead if a value was read.

### 121.7.70 SetZero

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets number to zero.
**Example:**

```
Dim l1 As LargeNumberMBS = LargeNumberMBS.NumberWithInt32(12345)
MsgBox l1.StringValue

// set to zero
l1.SetZero
MsgBox l1.StringValue
```

### 121.7.71 SqrMod(Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiply with itself and modulo.
**Example:**

```
Dim o As New LargeNumberMBS(90)
Dim m As New LargeNumberMBS(255)
Dim r As LargeNumberMBS = o.SqrMod(m)

MsgBox r.StringValue // shows 195 = (90 * 90) mod 255
```

### 121.7.72 sqrt as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates square root of value.
**Example:**

```
Dim l As New LargeNumberMBS(1234567890123456)

// let's multiple first and then
Dim q As LargeNumberMBS = l * l
Dim root As LargeNumberMBS = q.Sqrt

If l = root Then
Break // okay
Else
Break // failed
End If
```

**Notes:** Get nearly square root of a. The answer will be a >= ret^2.

### 121.7.73 Square as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates square of current value.
**Notes:** Return x^2.

### 121.7.74 SubMod(v as LargeNumberMBS, Modulo as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtraction with modulo.
**Example:**

```
Dim v As New LargeNumberMBS(100)
Dim o As New LargeNumberMBS(200)
Dim n As New LargeNumberMBS(&hFF)

Dim r As LargeNumberMBS = v.SubMod(o, n)

MsgBox r.StringValue // shows 155 = (100-200) mod 255

// -100 is too small, so 255 is added to bring to range.
```

### 121.7.75 Subtract(other as LargeNumberMBS)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts other number.
See also:

- 121.7.76 Subtract(other as LargeNumberMBS) as LargeNumberMBS 17506

### 121.7.76 Subtract(other as LargeNumberMBS) as LargeNumberMBS

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Subtracts other number and returns result.
See also:

- 121.7.75 Subtract(other as LargeNumberMBS) 17506

### 121.7.77 Properties

### 121.7.78 BitSize as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries bit size of the number.
**Notes:** Up to 4128 bits.
(Read only property)

### 121.7.79 Bytes as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provides raw bytes of number in memory.
**Example:**

```
Dim o As New LargeNumberMBS(&h12345678)
Dim m As MemoryBlock = o.Bytes

Break
```

**Notes:** Without sign as number is always positive.
(Read only property)

### 121.7.80 ByteSize as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries byte size of the number.
**Notes:** Up to 516 bytes.
(Read only property)

### 121.7.81 DoubleValue as Double

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as double.
**Notes:** Result is not correct if value is not in range of a double.
(Read only property)

### 121.7.82 HexString as String

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as hex string.
**Notes:** (Read only property)

### 121.7.83 Int64Value as Int64

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as Int64.
**Notes:** Result is not correct if value is not in range of a double.
(Read and Write property)

### 121.7.84 IntegerValue as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as integer.
**Example:**

```
Dim l As New LargeNumberMBS(123)

Dim u As UInteger = l.UIntegerValue
Dim i As Integer = l.IntegerValue
```

Break

**Notes:** Result is not correct if value is not in range of a double.
(Read and Write property)

### 121.7.85 IsDouble as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value fits in double range.
**Notes:** (Read only property)

### 121.7.86 IsInt32 as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value fits in Int32 range.
**Notes:** (Read only property)

### 121.7.87 IsInt64 as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value fits in Int64 range.
**Notes:** (Read only property)

### 121.7.88 IsNegate as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether value is negative.
**Notes:** (Read and Write property)

### 121.7.89 IsUInt32 as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value fits in UInt32 range.
**Notes:** (Read only property)

### 121.7.90 IsUInt64 as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this value fits in UInt64 range.
**Notes:** (Read only property)

### 121.7.91 IsZero as Boolean

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether value is zero.
**Notes:** (Read only property)

### 121.7.92 StringValue as String

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as string.
**Notes:** Result is not correct if value is not in range of a double.
(Read and Write property)

### 121.7.93 UInt64Value as UInt64

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as UInt64.
**Notes:** Result is not correct if value is not in range of a double.
(Read and Write property)

### 121.7.94 UIntegerValue as UInteger

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as unsigned integer.
**Example:**

```
Dim l As New LargeNumberMBS(123)

Dim u As UInteger = l.UIntegerValue
Dim i As Integer = l.IntegerValue

Break
```

**Notes:** Result is not correct if value is not in range of a double.
(Read and Write property)

### 121.7.95 VariantValue as Variant

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value as variant.
**Notes:** Result is can be string, integer or double.
(Read and Write property)

## 121.8 class SplineMBS

### 121.8.1 class SplineMBS

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class calculates a 2D cubic spline.
**Notes:** The curve goes smooth through all points.
**Blog Entries**

- MBS Xojo / Real Studio plug-ins in version 15.4
- MBS Xojo / Real Studio Plugins, version 15.4pr4
- MBS Xojo / Real Studio Plugins, version 15.3pr3

### 121.8.2 Methods

### 121.8.3 a(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constant part of the coefficient.

### 121.8.4 b(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The 1st order coefficient.

### 121.8.5 c(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The 2nd order coefficient.

### 121.8.6 calc(x as Double) as Double

MBS Util Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the Y value on the spline for a given X value.

### 121.8.7 Constructor(X() as Double, Y() as Double)

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Raises an exception for invalid arrays passed, e.g. different size.
Calculates the spline curve coefficients and sets count property.

### 121.8.8 d(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The 3rd order coefficient.

### 121.8.9 x(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x value for this coefficent.

### 121.8.10 y(index as Integer) as Double

MBS Util Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y value for this coefficent.

### 121.8.11 Properties

### 121.8.12 count as Integer

MBS Util Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of coefficients.
**Notes:** (Read and Write property)

## 121.9 module SunTimesMBS

### 121.9.1 module SunTimesMBS

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A helper module to calculate sunset/sunrise times.
**Example:**

```
// may be an hour off due to daylight saving time

dim d as new date

dim jd as Double = SunTimesMBS.CalcJulianDate(d.day, d.Month, d.Year)

// Koblenz, Germany
const latitude = 50.356667
const longitude = 7.593889

// Miami, FL
'const latitude = 25.787778
'const longitude = -80.224167

dim sr as Double = SunTimesMBS.CalcSunriseUTC(jd, latitude, longitude)
dim ss as Double = SunTimesMBS.CalcSunsetUTC (jd, latitude, longitude)

d.gmtoffset = 0
d.hour = 0
d.minute = 0
d.second = 0

dim base as Double = d.totalseconds
d.totalseconds = sr*60 + base

MsgBox "Sunrise: "+d.longdate+" "+d.longtime

d.totalseconds = ss*60 + base

MsgBox "Sunset: "+d.longdate+" "+d.longtime
```

**Notes:** The example code above works well, but seems not to take into account the daylight saving time.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr3

### 121.9.2 Methods

### 121.9.3 CalcJulianDate(day as Integer, month as Integer, year as Integer) as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a julian date from given date values.

### 121.9.4 CalcSunriseUTC(JD as Double, latitude as Double, longitude as Double) as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates sunrise time.
**Notes:** Returns time on date in minutes.
Use CalcJulianDate to calculate the JD parameter.

### 121.9.5 CalcSunsetUTC(JD as Double, latitude as Double, longitude as Double) as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates sunset time.
**Notes:** Returns time on date in minutes.
Use CalcJulianDate to calculate the JD parameter.

# Chapter 122

# Media Keys

## 122.1 class MediaKeysMBS

### 122.1.1 class MediaKeysMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Catch some special keys with this class.
**Example:**

```
dim m as MediaKeysMBS // global property!

// app initialization
m = new MediaKeysMBS

// set which keys to watch for
m.Keys(MediaKeysMBS.kMediaKeyEject) = MediaKeysMBS.kModeEventAndBlock

// and start
m.startWatchingMediaKeys
```

**Notes:** First written to catch play, fast and rewind keys from Apple keyboards.
Later extended to also catch other keys.
Still not all keys are available on all keyboards.

Please have only instance of this class running your application.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr12

- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9
- MBS Real Studio Plugins, version 11.2pr9

### 122.1.2 Methods

### 122.1.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the key watcher.

### 122.1.4 startWatchingMediaKeys

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Starts watching for keys.
**Example:**

```
dim m as MediaKeysMBS // global property!

// app initialization
m = new MediaKeysMBS

m.Keys(MediaKeysMBS.kMediaKeyEject) = MediaKeysMBS.kModeEventAndBlock
m.startWatchingMediaKeys
```

### 122.1.5 stopWatchingMediaKeys

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Stops watching for keys.
**Example:**

```
dim m as MediaKeysMBS // global property

// when closing media window
m.stopWatchingMediaKeys
```

**Notes:** The destructor calls this for cleanup.

### 122.1.6 Properties

### 122.1.7 Keys(keyCode as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Which keys should be intercepted and handled by your application.
**Example:**

```
dim m as new MediaKeysMBS // your MediaKeys object

// watch for this key
m.Keys(MediaKeysMBS.kMediaKeyEject) = MediaKeysMBS.kModeEventAndBlock
```

**Notes:** (Read and Write computed property)

### 122.1.8 Events

### 122.1.9 receivedMediaKeyEvent(e as NSEventMBS, keyCode as Integer, keyFlags as Integer, keyState as Integer, keyRepeat as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** The event called when the user uses one of the special keys we listen for.
**Notes:** If you don't get the event, did you make sure all conditions are right?

- Requires Mac OS X 10.5
- Keys(x) set to kModeEventAndBlock or kModeEventAndPass for the keys you need?
- startWatchingMediaKeys called?
- your object is still alive in your application?

### 122.1.10 Constants

Key Constants

| Constant | Value | Description |
|---|---|---|
| kMediaKeyBrightnessDown | 3 | |
| kMediaKeyBrightnessUp | 2 | |
| kMediaKeyCapsLock | 4 | Caps Lock |
| kMediaKeyContrastDown | 12 | |
| kMediaKeyContrastUp | 11 | |
| kMediaKeyDownArrow | 9 | |
| kMediaKeyEject | 14 | Eject key |
| kMediaKeyFast | 19 | Fast key. On by default. |
| kMediaKeyHelp | 5 | |
| kMediaKeyIlluminationDown | 22 | |
| kMediaKeyIlluminationToggle | 23 | |
| kMediaKeyIlluminationUp | 21 | |
| kMediaKeyLaunchPanel | 13 | |
| kMediaKeyMute | 7 | Sound Mute |
| kMediaKeyNext | 17 | |
| kMediaKeyNumLock | 10 | Num Lock key |
| kMediaKeyPlay | 16 | Play key. On by default. |
| kMediaKeyPower | 6 | Power Key |
| kMediaKeyPrevious | 18 | Previous key |
| kMediaKeyRewind | 20 | Rewind Key. On by default. |
| kMediaKeySoundDown | 1 | Sound down |
| kMediaKeySoundUp | 0 | Sound up |
| kMediaKeyUpArrow | 8 | |
| kMediaKeyVideoMirror | 15 | |

Mode Constants

| Constant | Value | Description |
|---|---|---|
| kModeBlock | 1 | Block the event. |
| kModeEventAndBlock | 2 | Call the receivedMediaKeyEvent event and block the event. |
| kModeEventAndPass | 3 | Call the receivedMediaKeyEvent event and pass the event to other applications. |
| kModePass | 0 | Pass event to other applications. |

# Chapter 123

# MediaLibrary

## 123.1 class MLMediaGroupMBS

### 123.1.1 class MLMediaGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The MLMediaGroup class provides groupings for media objects from a single source of media, such as iTunes or Aperture.
**Notes:** The media objects—individual files containing a piece of media such as a photo, song, or movie—are referenced by one or more groups within each media source. These groupings serve as filters, providing hierarchical structure to the collection of objects in each source.

The structure of the group hierarchy is specific to each media source, but all sources have certain commonalities. For example, every source has a single root media group, which contains all groups and objects within that source. It is the highest-level parent group in the hierarchy and each of its descendant groups contains its own subgroups and their objects. All groups have a reference to their parent within the hierarchy. A group with no descendants contains only its own objects. If a media group does not contain any objects, it is not visible in the hierarchy.

A media group has an array of attributes which can change at any point. For example, a media group may have certain attributes that describe its objects, but these attributes appear only after the objects for that group have been loaded. When any media group attribute changes, observers are notified via KVO notification. For information about handling attributes that change, see Cocoa Bindings Programming Topics.

Every media group has a unique identifier as well as a type identifier. In certain cases, multiple groups within a source can have the same type identifier. For descriptions of group type identifiers, see MediaLibrary Constants.
All MLMediaGroup properties are read-only, so this information can be accessed but not altered.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

**Blog Entries**

- MBS Xojo Plugins, version 18.2pr1

### 123.1.2 Methods

### 123.1.3 childGroups as MLMediaGroupMBS()

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A list of child groups contained in the media group.

### 123.1.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 123.1.5 mediaObjects as MLMediaObjectMBS()

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A list of media objects in the media group.
**Notes:** This accessor property is nonblocking. If there is no data yet, it returns nil and automatically triggers an internal asynchronous request. A KVO notification will be sent via the main thread when data arrives.

### 123.1.6 MLApertureAllPhotosTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents all photos in Aperture.

### 123.1.7 MLApertureAllProjectsTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents all projects in Aperture.

### 123.1.8 MLApertureFacebookAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Facebook album that is visible in Aperture.

### 123.1.9 MLApertureFacebookGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Facebook user account in Aperture. A Facebook user account contains one or more Facebook albums.

### 123.1.10 MLApertureFacesAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Faces album in Aperture. Individual Faces albums are nested in the main Faces album.

### 123.1.11 MLApertureFlaggedTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents the album of flagged media in Aperture.

### 123.1.12 MLApertureFlickrAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Flickr album that is visible in Aperture.

### 123.1.13 MLApertureFlickrGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Flickr user account in Aperture. A Flickr user account contains one or more Flickr albums.

### 123.1.14 MLApertureFolderAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a folder in Aperture.

### 123.1.15 MLApertureLastImportAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents the last import album in Aperture.

### 123.1.16 MLApertureLastNMonthsAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents the recent content album in Aperture, known as the Last N Months album. The value for N is usually 12 (settable in Aperture >Preferences >General).

### 123.1.17 MLApertureLastViewedEventAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents the last viewed event in Aperture.

### 123.1.18 MLApertureLightTableTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a light table in Aperture.

### 123.1.19 MLApertureStreamAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a photo stream in Aperture.

### 123.1.20 MLAperturePlacesAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents the Places album in Aperture.

### 123.1.21 MLAperturePlacesCityAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Places album for a city in Aperture. A city album is nested in a province or state album.

### 123.1.22 MLAperturePlacesCountryAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Places album for a country in Aperture. A country album is nested in the main Places album.

### 123.1.23 MLAperturePlacesPointOfInterestAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Places album for a point-of-interest in Aperture. A point of interest album is nested in a city album.

### 123.1.24 MLApertureProvinceAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a Places album for a province or state in Aperture. A province or state album is nested in a country album.

### 123.1.25 MLApertureProjectAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a project in Aperture.

### 123.1.26 MLApertureProjectFolderAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a folder within a project in Aperture.

### 123.1.27 MLApertureRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The root media group for Aperture.

### 123.1.28 MLApertureSlideShowTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** The media group that represents a slideshow in Aperture.

### 123.1.29 MLApertureSmugMugAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a SmugMug album that is visible in Aperture.

### 123.1.30 MLApertureSmugMugGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a SmugMug user account in Aperture. A SmugMug user account contains one or more SmugMug albums.

### 123.1.31 MLApertureUserAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a user-created album in Aperture.

### 123.1.32 MLApertureUserSmartAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Aperture media source.
**Notes:** A media group that represents a user-created smart album in Aperture.

### 123.1.33 MLFinalCutEventCalendarGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** A media group that represents a collection of events from a specific time period in Final Cut Pro.

### 123.1.34 MLFinalCutEventGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** A media group that represents an event in Final Cut Pro.

### 123.1.35 MLFinalCutEventLibraryGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** The media group that represents the event library in Final Cut Pro. The event library contains all event calendar groups.

### 123.1.36 MLFinalCutFolderGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** A media group that represents a folder in Final Cut Pro.

### 123.1.37 MLFinalCutProjectGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** A media group that represents a project in Final Cut Pro.

### 123.1.38 MLFinalCutRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Final Cut Pro media source.
**Notes:** The root media group for Final Cut Pro.

### 123.1.39 MLFolderGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in folder-based media sources.
**Notes:** A media group that represents a folder in folder-based media.

### 123.1.40 MLFolderRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in folder-based media sources.
**Notes:** The root media group for folder-based media.

### 123.1.41 MLGarageBandFolderGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the GarageBand media source.
**Notes:** A media group that represents a folder in GarageBand.

### 123.1.42 MLGarageBandRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the GarageBand media source.
**Notes:** The root media group for GarageBand.

### 123.1.43 MLiMovieEventCalendarGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** A media group that represents a collection of events from a specific time period in iMovie.

### 123.1.44 MLiMovieEventGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** A media group that represents an event in iMovie.

### 123.1.45 MLiMovieEventLibraryGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** The media group that represents the event library in iMovie. The event library contains all event calendar groups.

### 123.1.46 MLiMovieFolderGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** A media group that represents a folder in iMovie.

### 123.1.47 MLiMovieProjectGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** A media group that represents a project in iMovie.

### 123.1.48 MLiMovieRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iMovie media source.
**Notes:** The root media group for iMovie.

### 123.1.49 MLiPhotoAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents an album in iPhoto.

### 123.1.50 MLiPhotoEventAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents an event in iPhoto.

### 123.1.51 MLiPhotoEventsFolderTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the Events album in iPhoto.

### 123.1.52 MLiPhotoFacebookAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Facebook album that is visible in iPhoto.

### 123.1.53 MLiPhotoFacebookGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Facebook user account in iPhoto. A Facebook user account contains one or more Facebook albums.

### 123.1.54 MLiPhotoFacesAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Faces album in iPhoto. Individual Faces albums are nested in the main Faces album.

### 123.1.55 MLiPhotoFlaggedAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the album of flagged media in iPhoto.

### 123.1.56 MLiPhotoFlickrAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Flickr album that is visible in iPhoto.

### 123.1.57 MLiPhotoFlickrGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Flickr user account in iPhoto. A Flickr user account contains one or more Flickr albums.

### 123.1.58 MLiPhotoFolderAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a folder in iPhoto.

### 123.1.59 MLiPhotoLastImportAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the Last Import album in iPhoto.

### 123.1.60 MLiPhotoLastNMonthsAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the recent content album in iPhoto, known as the Last N Months album. The value for N is usually 12 (settable in iPhoto >Preferences >General).

### 123.1.61 MLiPhotoLastViewedEventAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the last viewed event in iPhoto.

### 123.1.62 MLiPhotoLibraryAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the Photos album in iPhoto.

### 123.1.63 MLiPhotoPhotoStreamAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a photo stream in iPhoto.

### 123.1.64 MLiPhotoPlacesAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The media group that represents the Places album in iPhoto.

### 123.1.65 MLiPhotoPlacesCityAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Places album for a city in iPhoto. A city album is nested in a province or state album.

### 123.1.66 MLiPhotoPlacesCountryAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Places album for a country in iPhoto. A country album is nested in the main Places album.

### 123.1.67 MLiPhotoPlacesPointOfInterestAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Places album for a point-of-interest in iPhoto. A point of interest

album is nested in a city album.

### 123.1.68 MLiPhotoPlacesProvinceAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a Places album for a province or state in iPhoto. A province or state album is nested in a country album.

### 123.1.69 MLiPhotoRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** The root media group for iPhoto.

### 123.1.70 MLiPhotoSlideShowAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a slideshow album in iPhoto.

### 123.1.71 MLiPhotoSmartAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a smart album in iPhoto.

### 123.1.72 MLiPhotoSubscribedAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iPhoto media source.
**Notes:** A media group that represents a subscribed album in iPhoto.

### 123.1.73 MLiTunesAudioBooksPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the Audio Books playlist in iTunes.

### 123.1.74 MLiTunesFolderPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** A media group that represents a folder in iTunes.

### 123.1.75 MLiTunesGeniusPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** A media group that represents a genius playlist in iTunes.

### 123.1.76 MLiTunesiTunesUPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the iTunes U playlist in iTunes.

### 123.1.77 MLiTunesMoviesPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the Movies playlist in iTunes.

### 123.1.78 MLiTunesMusicPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the Music playlist in iTunes.

### 123.1.79 MLiTunesMusicVideosPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** Musicvideos playlist

### 123.1.80 MLiTunesPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** A media group that represents a user-created playlist in iTunes.

### 123.1.81 MLiTunesPodcastPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the Podcast playlist in iTunes.

### 123.1.82 MLiTunesPurchasedPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the Purchased playlist in iTunes.

### 123.1.83 MLiTunesRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The root media group for iTunes.

### 123.1.84 MLiTunesSavedGeniusPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** A media group that represents a saved genius playlist in iTunes.

### 123.1.85 MLiTunesSmartPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** A media group that represents a smart playlist in iTunes.

### 123.1.86 MLiTunesTVShowsPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the iTunes media source.
**Notes:** The media group that represents the TV Shows playlist in iTunes.

### 123.1.87 MLiTunesVideoPlaylistTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** Video Playlist

### 123.1.88 MLLogicBouncesGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** The media group that represents all bounces in Logic.

### 123.1.89 MLLogicProjectsGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** The media group that represents all projects in Logic.

### 123.1.90 MLLogicProjectTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** A media group that represents a project in Logic. Projects may be nested.

### 123.1.91 MLLogicRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Logic media source.
**Notes:** The root media group for Logic.

### 123.1.92 MLPhotosAlbumsGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.93 MLPhotosAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.
**Notes:** A media group that represents an album in Photos.

### 123.1.94 MLPhotosAllCollectionsGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.95 MLPhotosAllMomentsGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.96 MLPhotosAllPhotosAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.97 MLPhotosAllYearsGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.98 MLPhotosAnimatedGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.99 MLPhotosBurstGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.100 MLPhotosCollectionGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.101 MLPhotosDepthEffectGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.102 MLPhotosFacesAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.103 MLPhotosFavoritesGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.104 MLPhotosFolderTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.105 MLPhotosFrontCameraGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.106 MLPhotosLastImportGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.107 MLPhotosLivePhotosGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.108 MLPhotosLongExposureGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.109 MLPhotosMomentGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.110 MLPhotosMyPhotoStreamTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.111 MLPhotosPanoramasGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.112 MLPhotosPublishedAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.113 MLPhotosRootGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.
**Notes:** The root media group for Photos.

### 123.1.114 MLPhotosScreenshotGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.115 MLPhotosSharedGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.116 MLPhotosSharedPhotoStreamTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.117 MLPhotosSloMoGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.118 MLPhotosSmartAlbumTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.
**Notes:** A media group that represents a smart album in Photos.

### 123.1.119 MLPhotosTimelapseGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.120 MLPhotosVideosGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.121 MLPhotosYearGroupTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for media group types in the Photos media source.

### 123.1.122 Properties

### 123.1.123 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internet object reference.
**Notes:** (Read and Write property)

### 123.1.124 IconImage as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The media group,Äôs icon.
**Notes:** (Read only property)

### 123.1.125 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An identifier for the media group.
**Notes:** Each group,Äôs identifier is unique within a media source.
(Read only property)

### 123.1.126 MediaLibrary as MLMediaLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A pointer to the media library instance that loaded the media group,Äôs source.
**Notes:** (Read only property)

### 123.1.127 MediaSourceIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An identifier for the source that loaded the media group.
**Notes:** (Read only property)

### 123.1.128 ModificationDate as Date

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when the media group was last altered.
**Notes:** (Read only property)

### 123.1.129 ModificationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when the media group was last altered.
**Notes:** (Read only property)

### 123.1.130 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the media group.
**Notes:** This string is human-readable. It is either user created (such as the name of an iTunes playlist) or already localized.
(Read only property)

### 123.1.131 Parent as MLMediaGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The media group,Äôs parent group.
**Notes:** (Read only property)

### 123.1.132 Properties as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A dictionary of attributes describing the media group.
**Notes:** These attributes are usually defined by the source app, such as iTunes. For example, an iTunes playlist is represented as a group. iTunes attaches attributes such as "Playlist Persistent ID" to the group in its attributes. The attribute names vary based on the media source. Attributes common to all sources are called out as separate properties.
(Read only property)

### 123.1.133 TypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An identifier for the media group,Äôs type.
**Notes:** Multiple groups within a media source can have the same type identifier. For descriptions of group type identifiers, see MediaLibrary Constants.
(Read only property)

### 123.1.134 URL as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the media group.
**Notes:** Some groups do not have a URL, in which case this returns nil. For example, a group that represents a filesystem folder on disk has a URL, but a group that represents a named face in iPhoto does not.
(Read only property)

## 123.2 class MLMediaLibraryMBS

### 123.2.1 class MLMediaLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The MLMediaLibrary class provides an interface for accessing a collection of media objects from various sources.
**Notes:** It serves as the initial access point of the Media Library framework.

The media library structure is defined by MLMediaSource, MLMediaGroup, and MLMediaObject classes. At the highest level, all content within a media library instance is categorized by media source. Conceptually, a media source represents a single app, such as iTunes or Aperture. Each source contains a hierarchy of media groups that originates from a root group. These groups consist of media objects—individual files containing a piece of media such as a photo, song, or movie. Only one copy of each object exists within a media library instance, but an object can be referenced by multiple groups from a single source. The structure of the group hierarchy is specific to each media source.

A media library is initialized using the Constructor. The options argument to this method serves as a filter. By specifying which folders or sources to include or exclude during load, you can view a particular subset of groups and objects from your collection. All objects provided are thread-safe. For descriptions of possible load options, see Load Options Keys.
The typical and most efficient use case is to create and use one instance of MLMediaLibrary for the lifetime of an app. When the underlying media files and metadata on the user,Äôs system change, the corresponding data model objects (media groups and media objects) are automatically updated and KVO notifications are sent to notify the calling code of any changes. Multiple instances of MLMediaLibrary can be created and used, but their sources, groups, and objects will be independent of those provided by other instances of MLMediaLibrary.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr2
- MBS Xojo Plugins, version 18.2pr1

### 123.2.2 Methods

### 123.2.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this class available.
**Notes:** Returns true on Mac OS 10.7 or newer in 64-bit app.

### 123.2.4 Constructor(options as Dictionary)

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the media library based on the specified load options.
**Notes:** options: A dictionary of load options.

Returns a new media library.

For descriptions of possible load options, see Load Options Keys.

### 123.2.5 MLMediaLoadAppFoldersKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** Specifies one or more relative paths inside the caller,Äôs app bundle in which to search for media files. The value for this key is an array of strings (relative paths inside the caller,Äôs app bundle).

### 123.2.6 MLMediaLoadAppleLoops as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for well-known media folders used to specify the value for MLMediaLoadFoldersKey.
**Notes:** Identifies the folder containing audio loops from Apple.

### 123.2.7 MLMediaLoadExcludeSourcesKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** Defines which media sources to exclude when loading. This option is processed after MLMediaLoadIncludeSourcesKey. The value for this key is an array of strings (media source identifiers). For a list of valid media source identifiers, see Media Source Identifiers.

### 123.2.8 MLMediaLoadFoldersKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** Specifies the well-known folders that should be searched for media files. If this key is not present, none of the well-known folders will be provided. The value for this key is an array of strings (identifiers that correspond to well-known folder locations). For a list of well-known folder identifiers, see MLMediaLoadMoviesFolder and MLMediaLoadAppleLoops.

### 123.2.9 MLMediaLoadIncludeSourcesKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** Defines which media sources to include when loading. If not present, load all available media sources. This option is processed after MLMediaLoadSourceTypesKey. If MLMediaLoadIncludeSourcesKey is present but MLMediaLoadSourceTypesKey is not, then only those sources specified here will be loaded. This is useful for loading a single media source. When both keys are present, this is useful for adding one or more media sources that normally would not appear for the requested library type. The value for this key is an array of strings (media source identifiers). For a list of valid media source identifiers, see Media Source Identifiers.

### 123.2.10 MLMediaLoadMoviesFolder as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the identifiers for well-known media folders used to specify the value for MLMediaLoadFoldersKey.
**Notes:** Identifies the user,Äôs Movies folder.

### 123.2.11 MLMediaLoadSourceTypesKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the option keys.
**Notes:** Defines which sources to load based on library type. If not present, this will load all sources. The value for this key is a media source type.

### 123.2.12 Properties

### 123.2.13 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internet object reference.
**Notes:** (Read and Write property)

### 123.2.14 mediaSources as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary of media sources by identifier.
**Notes:** Returns nil the first time, beginning an asynchronous load of the media sources. A KVO notification is sent when all media sources have been loaded. If there are no objects in a media source, the source does not appear in this dictionary.
(Read only property)

## 123.3 class MLMediaObjectMBS

### 123.3.1 class MLMediaObjectMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The MLMediaObject class describes a single media file, such as a photo, song, or movie.
**Notes:** Each media object contains basic metadata including a name, media type, URL, and so on. Additional information about each object is stored in its list of attributes. For a list of possible object attribute keys, see Media Object Attribute Keys.

A media object belongs to a single media source but can be referenced by several groups within that source. In other words, an object can appear in multiple places in the group hierarchy under a single media source. In iTunes, a movie that was purchased through the iTunes Store is referenced by both the Purchased playlist and the Movies playlist. If a user adds the movie to his own playlist, the group respresenting that playlist will also reference the movie. All three groups reference the same media object.

All MLMediaObject properties are read-only, so this information can be accessed but not altered.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr1

### 123.3.2 Methods

### 123.3.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 123.3.4 MLMediaObjectAlbumKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs album. The value for this key is a string.

### 123.3.5 MLMediaObjectArtistKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs artist. The value for this key is a string.

### 123.3.6 MLMediaObjectBitRateKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs bit rate, in kilobits per second. The value for this key is a number.

### 123.3.7 MLMediaObjectChannelCountKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs channel count. The value for this key is a number.

### 123.3.8 MLMediaObjectCommentsKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the contents of the comments field associated with the media object. The value for this key is a string.

### 123.3.9 MLMediaObjectDurationKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs duration, in seconds. The value for this key is a number.

### 123.3.10 MLMediaObjectGenreKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs genre. The value for this key is a string.

### 123.3.11 MLMediaObjectKeywordsKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the keywords associated with the media object. The value for this key is an array of strings.

### 123.3.12 MLMediaObjectKindKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Used by iTunes only. Specifies the media object,Äôs file format (shown in the ,ÄúKind,Äù column in iTunes). The value for this key is a string.

### 123.3.13 MLMediaObjectProtectedKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies whether the media object is protected by DRM (Digital Rights Management). The value for this key is a boolean value.

### 123.3.14 MLMediaObjectResolutionStringKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs resolution. The value for this key is a string with size.

### 123.3.15 MLMediaObjectSampleRateKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs sample rate, in samples per second (Hz). The value for this key is a number.

### 123.3.16 MLMediaObjectTrackNumberKey as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the property keys for a media object.
**Notes:** Specifies the media object,Äôs track number. The value for this key is a number.

### 123.3.17 Properties

### 123.3.18 ArtworkImage as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Album artwork associated with the media object.
**Notes:** Applies to iTunes media only. Returns nil if not applicable or not available.
(Read only property)

### 123.3.19 ContentType as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The UTI associated with the media object.
**Notes:** (Read only property)

### 123.3.20 File as FolderItem

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the media object.
**Notes:** For your convenience, the plugin provides here a folderitem for the URL.
(Read only property)

### 123.3.21 FileSize as UInt64

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The size, in bytes, of the media object.
**Notes:** (Read only property)

### 123.3.22 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internet object reference.
**Notes:** (Read and Write property)

### 123.3.23 Identifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An identifier for the media object.
**Notes:** Each object,Äôs identifier is unique within a media source.
(Read only property)

### 123.3.24 MediaLibrary as MLMediaLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A pointer to the media library instance that loaded the media object,Äôs source.
**Notes:** (Read only property)

### 123.3.25 MediaSourceIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An identifier for the source that loaded the media object.
**Notes:** For a list of possible media source identifiers, see MLMediaLibraryMBS.
(Read only property)

### 123.3.26 MediaType as Integer

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The media object,Äôs type of media (image, audio, or movie).
**Notes:** For a list of possible media types, see kType* constants.
(Read only property)

### 123.3.27 ModificationDate as Date

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when the media object was last altered.
**Notes:** (Read only property)

### 123.3.28 ModificationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time when the media object was last altered.
**Notes:** (Read only property)

### 123.3.29 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the media object.
**Notes:** (Read only property)

### 123.3.30 OriginalFile as FolderItem

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the original media object, if URL is not the original (master).
**Notes:** For your convenience, the plugin provides here a folderitem for the URL.
(Read only property)

### 123.3.31 OriginalURL as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the original media object, if URL is not the original (master).
**Notes:** This property is provided as a security-scoped URL. In order to gain access to the file that this URL refers to, the caller must call startAccessingSecurityScopedResource before and stopAccessingSecurityScopedResource after using the URL to access the file. For more information about security-scoped URLs, see NSURL.
(Read only property)

### 123.3.32 Properties as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A dictionary of attributes describing the media object.
**Notes:** For a list of possible object attribute keys, see Media Object Attribute Keys.
(Read only property)

### 123.3.33 ThumbnailFile as FolderItem

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the media object,Äôs thumbnail image.
**Notes:** For your convenience, the plugin provides here a folderitem for the URL.
(Read only property)

### 123.3.34 ThumbnailURL as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the media object,Äôs thumbnail image.
**Notes:** This property is provided as a security-scoped URL. In order to gain access to the file that this URL refers to, the caller must call startAccessingSecurityScopedResource before and stopAccessingSecurityScopedResource after using the URL to access the file. For more information about security-scoped URLs, see NSURL.
(Read only property)

### 123.3.35 URL as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The location of the media object.
**Notes:** This property is provided as a security-scoped URL. In order to gain access to the file that this URL refers to, the caller must call startAccessingSecurityScopedResource before and stopAccessingSecurityScopedResource after using the URL to access the file. For more information about security-scoped URLs, see NSURL.
(Read only property)

### 123.3.36 Constants

Types

| Constant | Value | Description |
|---|---|---|
| kTypeAudio | 1 | Audio |
| kTypeImage | 2 | Image |
| kTypeMovie | 4 | Movie |

## 123.4 class MLMediaSourceMBS

### 123.4.1 class MLMediaSourceMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The MLMediaSource class identifies a specific provider of media.
**Notes:** Conceptually, a media source respresents a single app, such as iTunes or Aperture. Each media source contains multiple groups of media objects—individual files containing a piece of media such as a photo, song, or movie.

The structure of the group hierarchy is specific to each media source, but all sources have certain commonalities. For example, every source has a single root media group, which contains all groups and objects within that source. It is the highest-level parent group in the hierarchy and each of its descendant groups contains its own subgroups and their objects. All groups have a reference to their parent within the hierarchy. A group with no descendants contains only its own objects. If a media group does not contain any objects, it is not visible in the hierarchy.
Every media source has a unique media source identifier within a single media library instance. For a list of possible media source identifiers, see Media Source Identifiers.
All MLMediaSourceMBS properties are read-only, so this information can be accessed but not altered.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.2pr1

### 123.4.2 Methods

### 123.4.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 123.4.4 mediaGroupForIdentifier(mediaGroupIdentifier as string) as MLMediaGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the media group with the specified identifier.
**Notes:** mediaGroupIdentifier: The media group identifier to search for in the source.

The media source must have finished loading before this method returns valid data. Specifically, the root media group must be available before the lookup methods will succeed. Otherwise, the return value is undefined.

### 123.4.5 mediaGroupsForIdentifiers(mediaGroupIdentifiers() as string) as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the media groups with the specified identifiers.
**Notes:** mediaGroupIdentifiers: An array of media group identifiers to search for in the source.

Returns a dictionary of media groups matching the specified identifiers.

The media source must have finished loading before this method returns valid data. Specifically, the root media group must be available before the lookup methods will succeed. Otherwise, the return value is undefined.

### 123.4.6 mediaObjectForIdentifier(mediaObjectIdentifier as string) as MLMediaObjectMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the media object with the specified identifier.
**Notes:** mediaObjectIdentifier: The media object identifier to search for in the media source.

The media source must have finished loading before this method returns valid data. Specifically, the root media group must be available before the lookup methods will succeed. Otherwise, the return value is undefined.

### 123.4.7 mediaObjectsForIdentifiers(mediaObjectIdentifiers() as string) as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the media objects with the specified identifiers.
**Notes:** mediaObjectIdentifiers: An array of media object identifiers to search for in the source.

Returns a dictionary of media objects matching the specified identifiers.

The media source must have finished loading before this method returns valid data. Specifically, the root media group must be available before the lookup methods will succeed. Otherwise, the return value is undefined.

### 123.4.8 MLMediaSourceApertureIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from Aperture.

### 123.4.9 MLMediaSourceAppDefinedFoldersIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from app defined folder.

### 123.4.10 MLMediaSourceCustomFoldersIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from a custom folder.

### 123.4.11 MLMediaSourceFinalCutIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from Final Cut Pro.

### 123.4.12 MLMediaSourceGarageBandIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from GarageBand.

### 123.4.13 MLMediaSourceiMovieIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from iMovie.

### 123.4.14 MLMediaSourceiPhotoIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from iPhoto.

### 123.4.15 MLMediaSourceiTunesIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from iTunes.

### 123.4.16 MLMediaSourceLogicIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from Logic.

### 123.4.17 MLMediaSourceMoviesFolderIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from movies folder.

### 123.4.18 MLMediaSourcePhotoBoothIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from Photo Booth.

### 123.4.19 MLMediaSourcePhotosIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the media source providing content from photos folder.

### 123.4.20 Properties

### 123.4.21 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internet object reference.
**Notes:** (Read and Write property)

### 123.4.22 MediaLibrary as MLMediaLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A pointer to the media library instance that loaded this media source.
**Notes:** (Read only property)

### 123.4.23 mediaSourceIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A unique identifier for the media source.
**Notes:** For a list of possible media source identifiers, see shared methods.
(Read only property)

### 123.4.24 Properties as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A list of attributes describing the media source.
**Notes:** (Read only property)

### 123.4.25 rootMediaGroup as MLMediaGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The base media group in the media source that contains all other groups within the source as descendant elements.
**Notes:** This accessor property is nonblocking. If there is no data yet, it returns nil and automatically triggers an internal asynchronous request. When data arrives, a KVO notification is sent via the main thread.
(Read only property)

### 123.4.26 Constants

Source Types

| Constant | Value | Description |
|---|---|---|
| kSourceTypeAudio | 1 | Audio |
| kSourceTypeImage | 2 | Images |
| kSourceTypeMovie | 4 | Movies |

## 123.5 class NSMediaLibraryBrowserControllerMBS

### 123.5.1 class NSMediaLibraryBrowserControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** An instance of an NSMediaLibraryBrowserController configures and displays a Media Library Browser Panel.
**Notes:** A User can drag and drop media files from the Media Library Browser into views in their application. Requires Mac OS X 10.9.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 13.5pr1

### 123.5.2 Methods

### 123.5.3 available as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.9 and false on other platforms.

### 123.5.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new object for the shared library browser.

### 123.5.5 orderFront

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Orders window to front.

### 123.5.6 orderOut

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: Desktop only.

**Function:** Orders window out.
**Notes:** Hides window.

### 123.5.7 sharedMediaLibraryBrowserController as NSMediaLibraryBrowserControllerMBS

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a new object for the shared library browser.

### 123.5.8 togglePanel

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Toggles the panel to hide/show.

### 123.5.9 Properties

### 123.5.10 Frame as NSRectMBS

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The bounds of the panel.
**Notes:** (Read and Write property)

### 123.5.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 123.5.12 mediaLibraries as Integer

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Which media library to show: audio, video or image.
**Notes:** (Read and Write property)

### 123.5.13 Visible as Boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The visible state of the browser panel.
**Notes:** (Read and Write property)

### 123.5.14 Constants

Library Types

| Constant | Value | Description |
|---|---|---|
| NSMediaLibraryAudio | 1 | Audio |
| NSMediaLibraryImage | 2 | Image |
| NSMediaLibraryMovie | 4 | Movie |

# Chapter 124

# MemoryBlock

## 124.1 Globals

### 124.1.1 NewMemoryBlockWithBytesMBS(Data as Ptr, size as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new memoryblock with a copy of the given data.

### 124.1.2 NewMemoryBlockFromPtrMBS(ptr as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock for a given address in memory.
**Notes:** The memory for the ptr is not freed as you have to do this yourself (or via the library that allocated it).

### 124.1.3 Memoryblock2ptrMBS(mem as memoryblock) as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the memory adress of the memoryblock

### 124.1.4 ptr2MemoryblockMBS(Value as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a memoryblock with the bytes at position mem in memory.

## 124.2 class Memoryblock

### 124.2.1 class Memoryblock

Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extends Xojo's Memoryblock class.

### 124.2.2 Methods

### 124.2.3 AddressMBS(offset as Int64 = 0) as UInt64

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the adress of the byte at offset inside the memoryblock.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

**Xojo Developer Magazine**

- 11.3, page 8: News

### 124.2.4 AddressPtrMBS(offset as Int64 = 0) as Ptr

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the adress of the byte at offset inside the memoryblock.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr5

### 124.2.5 AndBitsMBS(Second as memoryblock, Dest as memoryblock=nil) as memoryblock

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a And on the bits in the memoryblock.
**Example:**

```
dim m1 as MemoryBlock = NewMemoryBlock(20)
dim m2 as MemoryBlock = NewMemoryBlock(20)
dim m3 as MemoryBlock = NewMemoryBlock(20)

m1.Int32Value(0)=&b10000001
m2.Int32Value(0)=&b10000000

MsgBox bin(m1.Int32Value(0))+EndOfLine+bin(m2.Int32Value(0))+EndOfLine+bin(m3.Int32Value(0))

call m1.AndBitsMBS(m2,m3)

MsgBox bin(m1.Int32Value(0))+EndOfLine+bin(m2.Int32Value(0))+EndOfLine+bin(m3.Int32Value(0))
```

**Notes:** Dest is first and second memoryblock combine with a bitwiseand.
And first and second memoryblock are filled with the difference between them.

If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memoryblock in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.
See also:

- 124.2.6 AndBitsMBS(Second as memoryblock, Mask as Integer, Dest as memoryblock=nil) as memoryblock 17569

### 124.2.6 AndBitsMBS(Second as memoryblock, Mask as Integer, Dest as memoryblock=nil) as memoryblock

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a And on the bits in the memoryblock.
**Example:**

```
dim m1 as MemoryBlock = NewMemoryBlock(20)
dim m2 as MemoryBlock = NewMemoryBlock(20)
dim m3 as MemoryBlock = NewMemoryBlock(20)

m1.Int32Value(0)=&b11110001
m2.Int32Value(0)=&b11110000

const mask = &b11001111
```

```
MsgBox bin(m1.Int32Value(0))+EndOfLine+bin(m2.Int32Value(0))+EndOfLine+bin(m3.Int32Value(0))

call m1.AndBitsMBS(m2,mask,m3)

MsgBox bin(m1.Int32Value(0))+EndOfLine+bin(m2.Int32Value(0))+EndOfLine+bin(m3.Int32Value(0))
```

**Notes:** The mask is always 8 bit. Use the &b notation to specify it.
Dest is first and second memoryblock combine with a bitwiseand.
And first and second memoryblock are filled with the difference between them. Only bits set int he given mask are used.

If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memoryblock in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.
See also:

- 124.2.5 AndBitsMBS(Second as memoryblock, Dest as memoryblock=nil) as memoryblock 17568

### 124.2.7 AppendMBS(other as memoryblock) as memoryblock

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new memoryblock with the bytes of the two given memoryblocks.
**Example:**

```
Dim m1 As MemoryBlock = "Hello "
Dim m2 As MemoryBlock = "World!"

Dim m3 As MemoryBlock = m1.AppendMBS(m2)
Dim s As String = m3

MessageBox s
```

**Notes:** This function will not work if the memoryblock has an unknown size.
If one memoryblock is nil than you get a copy of the other memoryblock.

### 124.2.8 BitwiseAndMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitwise AND for a Memoryblock.
**Example:**

```
Dim m1 As New MemoryBlock(555)
Dim m2 As New MemoryBlock(555)
Dim r As New Random

For i As Integer = 0 To 555-1
m1.Byte(i) = r.InRange(0,255)
m2.Byte(i) = r.InRange(0,255)
Next

Dim mAND As MemoryBlock = m1.BitwiseAndMBS(m2)
Dim mOR As MemoryBlock = m1.BitwiseOrMBS(m2)
Dim mXOR As MemoryBlock = m1.BitwiseXOrMBS(m2)


// check value
For i As Integer = 0 To 555-1
If BitwiseAnd(m1.Byte(i), m2.Byte(i)) <>mAND.Byte(i) Then
Break
End If
If BitwiseOr(m1.Byte(i), m2.Byte(i)) <>mOR.Byte(i) Then
Break
End If
If BitwiseXor(m1.Byte(i), m2.Byte(i)) <>mXOR.Byte(i) Then
Break
End If

Next

Break
```

**Notes:** We walk over all values in current and second MemoryBlock and apply a bitwise AND to each byte and store that in the destination block.

If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memoryblock in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.5

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 124.2.9 BitwiseOrMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitwise OR for a Memoryblock.
**Example:**

```
Dim m1 As New MemoryBlock(555)
Dim m2 As New MemoryBlock(555)
Dim r As New Random

For i As Integer = 0 To 555-1
m1.Byte(i) = r.InRange(0,255)
m2.Byte(i) = r.InRange(0,255)
Next

Dim mAND As MemoryBlock = m1.BitwiseAndMBS(m2)
Dim mOR As MemoryBlock = m1.BitwiseOrMBS(m2)
Dim mXOR As MemoryBlock = m1.BitwiseXOrMBS(m2)


// check value
For i As Integer = 0 To 555-1
If BitwiseAnd(m1.Byte(i), m2.Byte(i)) <>mAND.Byte(i) Then
Break
End If
If BitwiseOr(m1.Byte(i), m2.Byte(i)) <>mOR.Byte(i) Then
Break
End If
If BitwiseXor(m1.Byte(i), m2.Byte(i)) <>mXOR.Byte(i) Then
Break
End If

Next

Break
```

**Notes:** We walk over all values in current and second MemoryBlock and apply a bitwise OR to each byte and store that in the destination block.

If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memoryblock in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.5

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 124.2.10 BitwiseXOrMBS(Second as MemoryBlock, Dest as MemoryBlock = nil) as MemoryBlock

MBS Util Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Bitwise XOR for a Memoryblock.
**Example:**

```
Dim m1 As New MemoryBlock(555)
Dim m2 As New MemoryBlock(555)
Dim r As New Random

For i As Integer = 0 To 555-1
m1.Byte(i) = r.InRange(0,255)
m2.Byte(i) = r.InRange(0,255)
Next

Dim mAND As MemoryBlock = m1.BitwiseAndMBS(m2)
Dim mOR As MemoryBlock = m1.BitwiseOrMBS(m2)
Dim mXOR As MemoryBlock = m1.BitwiseXOrMBS(m2)


// check value
For i As Integer = 0 To 555-1
If BitwiseAnd(m1.Byte(i), m2.Byte(i)) <>mAND.Byte(i) Then
Break
End If
If BitwiseOr(m1.Byte(i), m2.Byte(i)) <>mOR.Byte(i) Then
Break
```

```
End If
If BitwiseXor(m1.Byte(i), m2.Byte(i)) <>mXOR.Byte(i) Then
Break
End If

Next

Break
```

**Notes:** We walk over all values in current and second MemoryBlock and apply a bitwise XOR to each byte and store that in the destination block.

If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memoryblock in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.5

### 124.2.11 BytesEqualMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer) as Boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if equal byte data.
**Example:**

```
dim m1 as MemoryBlock = NewMemoryBlock(100)
dim m2 as MemoryBlock = NewMemoryBlock(100)

// try with 2 different strings
m1.CString(0)="Hello"
m2.CString(0)="Hallo"

if m1.BytesEqualMBS(0, 100, m2, 0) then
MsgBox "equal"
else
MsgBox "not equal"
end if

// try with 2 equal strings
```

```
m1.CString(0)="Hello"
m2.CString(0)="Hello"

if m1.BytesEqualMBS(0, 100, m2, 0) then
MsgBox "equal"
else
MsgBox "not equal"
end if
```

**Notes:** Fixed in 10.1 to return true on equal bytes and false on non equal bytes. Older plugin versions returned the wrong value.

Does not check the bounds of the memoryblock, so it can crash with wrong parameters.
Returns false if one of the memoryblocks is nil.

### 124.2.12 BytesZeroMBS(srcOfs as Integer, numBytes as Integer) as Boolean

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if all bytes in the memoryblock in the given range are zero.
**Example:**

```
dim m as MemoryBlock = NewMemoryBlock(100)

if m.BytesZeroMBS(0,100) then
MsgBox "all zero"
else
MsgBox "error"
end if

m.Byte(50)=1

if m.BytesZeroMBS(0,100) then
MsgBox "error"
else
MsgBox "okay"
end if
```

**Notes:** Returns false on any error.
Bounds are not checked with the memoryblock, so be careful.
**Blog Entries**

- MBS Xojo Plugins, version 22.4pr2

### 124.2.13 ClearBitMBS(Bit as UInt64)

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123)
Dim v1 As Boolean = m.IsBitSetMBS(123)
m.ClearBitMBS(123)
Dim v2 As Boolean = m.IsBitSetMBS(123)
Break // see debugger
```

**Notes:** Sets value of the bit to zero.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 20.6pr5

### 124.2.14 ConvertRGB12BitTo8BitMBS(Width as Integer)

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a memoryblock with 12 bit RGB data into 8 bit RGB data.
**Notes:** Width is number of pixels.

Please make sure the memoryblock is 9 bytes bigger than input to avoid errors.
Plugin converts each 9 bytes (72 bits) with 2 RGB triple. So first 12 bits are red, next 12 bits green and last 12 bits blue.
Plugin removes last 4 bits.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr7

### 124.2.15 CopyBytesFromMacHandleMBS(srcHandle as Integer, numBytes as Integer, destOfs as Integer)

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Copies bytes from Mac Handle into your memoryblock.
**Notes:** Same as CopyBytesFromMacPtr, only that the memory address is a so-called Handle (see documentation about the MacOS memory Manager), which is double-referenced.

### 124.2.16 CopyBytesFromMacPtrMBS(srcPtr as Ptr, numBytes as Integer, destOfs as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the given amount of bytes from the given address in the Mac's memory address space into the memoryBlock.
**Notes:** Make sure that the destination block is large enough to hold the copied bytes (if not, your application or even the whole system can crash).

### 124.2.17 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the specified amount of bytes into a second memoryBlock.
**Example:**

```
dim m as MemoryBlock
dim n as MemoryBlock

m=NewMemoryBlock(100)
n=NewMemoryBlock(100)

m.Long(0)=12345

m.CopyBytesMBS(0,4,n,0)

MsgBox str(n.long(0))
```

**Notes:** You must make sure that the destination block is large enough to hold the copied bytes (if not, your application or even the whole system can crash).
See also:

- 124.2.18 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destOfs as Integer) 17578

### 124.2.18 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destOfs as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the specified amount of bytes inside the memoryBlock.
**Notes:** You must make sure that the copied bytes fit inside the block (if they don't, your application or even the whole system can crash).
See also:

- 124.2.17 CopyBytesMBS(srcOfs as Integer, numBytes as Integer, destBlk as memoryBlock, destOfs as Integer) 17577

### 124.2.19 CopyBytesToMacHandleMBS(srcOfs as Integer, numBytes as Integer, destHandle as Integer)

MBS Util Plugin, Platform: macOS, Targets: All.

**Function:** Copies byte data from the memoryblock into the memory the handle is pointing to.
**Notes:** Same as CopyBytesToMacPtr, only that the memory address is a so-called Handle (see documentation about the MacOS memory Manager), which is double-referenced.

### 124.2.20 CopyBytesToMacPtrMBS(srcOfs as Integer, numBytes as Integer, destPtr as Ptr)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the given amount of bytes from the memoryBlock to the given address in the Mac's memory address space.
**Notes:** Be careful where you copy the data to - you can easily crash your computer if you write to the wrong address space.

### 124.2.21 CopyByteToUShortMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer)

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies bytes in a memoryblock to another memoryblock converting the 8bit values to 16bit values.
**Notes:** Common values for divisor are 256 and 257.
No bound checking. Crashes with invalid values. Optimized for special divisor values.

### 124.2.22 CopyNthBitsMBS(source as memoryblock, SourceOffsetBits as Integer, DestinationOffsetBits as Integer, BitCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies every nth bits in the source memoryblock to the current memoryblock.
**Notes:** BitCount = the number of bits to copy from each step.
StepCount = the number of bits to not copy.
NumberOfSteps = the number of rounds to do.
There is no bound checking. The function will crash with invalid parameters!

### 124.2.23 CopyNthBytesMBS(source as memoryblock, SourceOffsetBytes as Integer, DestinationOffsetBytes as Integer, ByteCount as Integer, StepCount as Integer, NumberOfSteps as Integer) as boolean

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies every nth bytes in the source memoryblock to the current memoryblock.
**Example:**

```
dim s,d as memoryBlock

s=NewmemoryBlock(100)
d=NewmemoryBlock(100)

s.CString(0)="Hello World!"

call d.CopyNthBytesMBS(s,0,0,2,4,3)

MsgBox d.CString(0) // "Heo rl"
```

**Notes:** ByteCount = the number of bytes to copy from each step.
StepCount = the number of bytes to move for each step forward in source.
NumberOfSteps = the number of steps to do.
There is no bound checking. The function will crash with invalid parameters!

### 124.2.24 CopyUShortToByteMBS(dest as memoryblock, SourceOffset as Integer, DestinationOffset as Integer, ByteCount as Integer, divisor as Integer)

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies shorts in a memoryblock to another memoryblock converting the 16bit values to 8bit values.
**Notes:** Common values for divisor are 256 and 257.
No bound checking. Crashes with invalid values. Optimized for special divisor values.

### 124.2.25 CRC_32ContMBS(offset as Integer, numBytes as Integer, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided block of data.

### 124.2.26 CRC_32MBS(offset as Integer, numBytes as Integer) as UInt32

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 32bit Checksum about the provided block of data.

### 124.2.27 CRC_CCITTContMBS(offset as Integer, numBytes as Integer, prevCRC as UInt32) as UInt32

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided string.

### 124.2.28 CRC_CCITTMBS(offset as Integer, numBytes as Integer) as UInt32

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16bit Checksum about the provided block of data.
**Notes:** See the text "About-CRC" for details about this Checksum things.
This function is also available for strings.

See the CRC_32 for more details on Checksums.

### 124.2.29 CRC_DillonMBS(bitWidth as Integer, offset as Integer, numBytes as Integer) as String

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a 16 to 64bit Checksum about the provided block of data.
**Notes:** This function is also available for strings.

See the CRC_32 for more details on Checksums.

### 124.2.30 EndianS16_BtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_BtoLMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.31 EndianS16_BtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_BtoNMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.32 EndianS16_LtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_LtoBMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.33 EndianS16_LtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_LtoNMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.34 EndianS16_NtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_NtoBMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.35 EndianS16_NtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS16_NtoLMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.36 EndianS32_BtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_BtoLMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.37 EndianS32_BtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_BtoNMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.38 EndianS32_LtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_LtoBMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.39 EndianS32_LtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_LtoNMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.40 EndianS32_NtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_NtoBMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.41 EndianS32_NtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianS32_NtoLMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.42 EndianSwap16MBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Swaps several 16 bit integers inside a memoryblock.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianSwap16MBS(0,mem.size/2)
```

### 124.2.43 EndianSwap32MBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Swaps several 32 bit integers inside a memoryblock.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianSwap32MBS(0,mem.size/4)
```

### 124.2.44 EndianU16_BtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_BtoLMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.45 EndianU16_BtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_BtoNMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.46 EndianU16_LtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_LtoBMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.47 EndianU16_LtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_LtoNMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.48 EndianU16_NtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_NtoBMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.49 EndianU16_NtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU16_NtoLMBS(0,mem.size/2)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.50 EndianU32_BtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_BtoLMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.51 EndianU32_BtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_BtoNMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.52 EndianU32_LtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_LtoBMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.53 EndianU32_LtoNMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_LtoNMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.54 EndianU32_NtoBMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_NtoBMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.55 EndianU32_NtoLMBS(offset as Integer,count as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Function:** Converts between BigEndian, LowEndian and Native byte encoding.
**Example:**

```
dim mem as memoryblock // your memoryblock
mem.EndianU32_NtoLMBS(0,mem.size/4)
```

**Notes:** e.g.:
EndianS32_BtoNMBS(offset as Integer,count as Integer)
EndianU16_LtoBMBS(offset as Integer,count as Integer)

Details:
S for signed or U for unsigned.
16 for short and 32 for integer.
B for BigEndian (Mac), L for LowEndian (x86) and N for the native form of the current platform.

Note that count is not the size of the block, but the count of the integers to change.

### 124.2.56 ExpandBitsMBS(dest as memoryblock, SourceByteCount as Integer, LowValue as Integer = 0, HighValue as Integer = 255) as boolean

MBS Util Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Expands bits into bytes.
**Example:**

```
dim m1 as new MemoryBlock(200)
dim m2 as new MemoryBlock(1600)

for i as Integer = 0 to 127
m1.Int8Value(i) = i
next

dim n as Integer = 128
dim b as Boolean = m1.ExpandBitsMBS(m2, n)

break // see result in debugger
```

**Notes:** Takes a bit from the source memoryblock and writes a byte for it to destination. Uses LowValue (default 0) if the bit is not set and HighValue (Default 255) if the bit is set.
Works only on x86 CPUs (no PPC).
Reads source memoryblock in 32 bit blocks and writes the destination in 32 byte blocks.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr9

### 124.2.57 ExtractBitsMBS(Mask as Integer, Dest as memoryblock=nil) as memoryblock

MBS Util Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies bits from a memoryblock to another.
**Example:**

```
dim mask as Integer = &b01010101
dim m as MemoryBlock = "Hello World"

dim r as MemoryBlock = m.ExtractBitsMBS(mask)

MsgBox r.StringValue(0,r.size) // shows "@EDDE UEPDD"
```

**Notes:** The mask is always 8 bit. Use the &b notation to specify it.
If dest is nil, a new memoryblock is created. You can speed up processing with reusing the same memory-

block in iterations. If you pass a memoryblock, the plugin does not check the size of the memoryblock.

Returns nil on any error. For example if source is a memoryblock without a known size.

### 124.2.58 FillBytesMBS(offset as Integer, count as Integer, value as Integer)

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fills memory with a specific byte value.
**Notes:** Caution: No bounds checking.

### 124.2.59 FindByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the position of the first byte which has the given value.
**Example:**

```
dim m as MemoryBlock = NewMemoryBlock(100)
dim n as Integer

n = m.FindByteMBS(0, 100, 0)

MsgBox str(n) // shows 0 as the byte at offset 0 is zero

m.Byte(0)=1

n = m.FindByteMBS(0, 100, 0)

MsgBox str(n) // shows 1 as the byte at offset 1 is zero

m.FillBytesMBS(0,100,5)

n = m.FindByteMBS(0, 100, 6)

MsgBox str(n) // shows -1 as there is no byte with value 6
```

**Notes:** Returns -1 if the byte is not found.
See also:

- 124.2.60 FindByteMBS(values() as UInt8, StartByteOffset as Integer = 0) as Integer 17596

### 124.2.60 FindByteMBS(values() as UInt8, StartByteOffset as Integer = 0) as Integer

MBS Util Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds position of a given value.
**Example:**

```
Dim m As MemoryBlock = "Hello World"

Dim u() As UInt8
u.Append Asc("e")
u.Append Asc("o")

Dim pos1 As Integer = m.FindByteMBS(u)
Dim pos2 As Integer = m.FindByteMBS(u, pos1+1)

// shows 1 and 4
MsgBox "Found position: "+Str(pos1)+" and "+Str(pos2)
```

**Notes:** Values is an array of possible values to find.
For best performance avoid duplicates in that array.

Returns zero based byte offset.
Result is -1 if not found.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins, version 21.4pr1

**Xojo Developer Magazine**

- 19.6, page 10: News

See also:

- 124.2.59 FindByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer 17595

### 124.2.61 FindBytesMBS(srcOfs as Integer, maxBytes as Integer, target as memoryBlock, targOfs as Integer, targLen as Integer) as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds some bytes from the target memoryblock inside the current memoryblock.

### 124.2.62 FindNotByteMBS(srcOfs as Integer, numBytes as Integer, byteValue as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the position of the first byte which has no the given value.
**Example:**

```
dim m as MemoryBlock = NewMemoryBlock(100)
dim n as Integer

n = m.FindNotByteMBS(0, 100, 0)

MsgBox str(n) // -1 as no value is not zero

m.Byte(30)=1

n = m.FindNotByteMBS(0, 100, 0)

MsgBox str(n) // shows 30 as the byte at offset 30 is not zero

m.Byte(0)=255

n = m.FindNotByteMBS(0, 100, 255)

MsgBox str(n) // shows 1 as the byte at offset 1 is not 255
```

**Notes:** Returns -1 if the no byte was found which has not the given value.

### 124.2.63 FindStringMBS(srcOfs as Integer, maxBytes as Integer, target as String) as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds a string inside a memoryblock.

### 124.2.64 GetBitMBS(Bit as UInt64) as Integer

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value of the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123)
Dim v1 As Integer = m.GetBitMBS(123)
Break // see debugger
```

**Notes:** Returns 1 if bit is set or 0 if not.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 20.6pr5

### 124.2.65 GetStringMBS(offset as Integer, numBytes as Integer) as String

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string from the memoryblock.
**Notes:** With newer RB versions you may better use StringValue.

### 124.2.66 InvertBytesMBS(offset as Integer, count as Integer)

MBS Util Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inverts the given number of bytes in a memoryblock.
**Example:**

```
dim m as memoryblock
m=newmemoryblock(100)
' do something
m.InvertBytesMBS(0,100) // invert all bytes
```

**Notes:** Does work faster if count is a multiply of 4.

### 124.2.67 IsBitSetMBS(Bit as UInt64) as Boolean

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value of the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123)

Dim v1 As Boolean = m.IsBitSetMBS(123)
Break // see debugger
```

**Notes:** Returns true if bit is set or false if not.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 20.6pr5

### 124.2.68 LeftMBS(length as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with the first given number of bytes.
**Notes:** If length is greater than the size of the memoryblock then then length is set to size.
Returns nil if length<=0 or on low memory.
This function will not work if the memoryblock has an unknown size.

### 124.2.69 MaxMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean

MBS Util Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates max values of values in memory.
**Example:**

```
dim m1 as new MemoryBlock(12)
dim m2 as new MemoryBlock(12)
```

```
dim mr1 as new MemoryBlock(12)
dim mr2 as new MemoryBlock(12)

for i as Integer = 0 to 11
m1.UInt8Value(i) = i
m2.UInt8Value(11-i) = i
next

if mr1.minMBS(m1, m2) then
if mr2.maxMBS(m1, m2) then

MsgBox EncodeHex(m1)+" first"+EndOfLine+_
EncodeHex(m2)+" second"+EndOfLine+_
EncodeHex(mr1)+" min"+EndOfLine+_
EncodeHex(mr2)+" max"

end if
end if
```

**Notes:** firstMem and secondMem can be ptr or memoryblock with some values. Can be same as destination (the memoryblock the method is called at)
BitSize defines integer bit depth 8, 16, 32 or 64. Signed defines if to expect signed or unsigned integers.
offsetByte defines offset in destination memoryblock. lengthBytes is length of memory. If zero, we use size of destination memoryblock.
Passing bad parameters can easily lead to crash. Return true on success and false on failure and raises exceptions for invalid parameters.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4

### 124.2.70 MidMBS(offset as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with the bytes of the given memoryblock from the given offset on.
**Notes:** Offset is 0 based.
Returns nil if offset<0 or on low memory.
This function will not work if the memoryblock has an unknown size.
See also:

- 124.2.71 MidMBS(offset as Integer, length as Integer) as memoryblock 17600

### 124.2.71 MidMBS(offset as Integer, length as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with the given bytes from the middle of the memoryblock.
**Notes:** Offset is 0 based.
Returns nil if offset<0 or on low memory.
If length is too long then length is set to a lower value.
This function will not work if the memoryblock has an unknown size.
See also:

- 124.2.70 MidMBS(offset as Integer) as memoryblock 17600

### 124.2.72 MinMBS(firstMem as Ptr, secondMem as Ptr, BitSize as Integer = 8, Signed as Boolean = false, offsetByte as Integer = 0, lengthBytes as Integer = 0) as boolean

MBS Util Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates min values of values in memory.
**Example:**

```
dim m1 as new MemoryBlock(24)
dim m2 as new MemoryBlock(24)
dim mr1 as new MemoryBlock(24)
dim mr2 as new MemoryBlock(24)

for i as Integer = 0 to 11
m1.UInt16Value(2*i) = i
m2.UInt16Value(2*(11-i)) = i
next

if mr1.minMBS(m1, m2, 16, false, 0, 24) then
if mr2.maxMBS(m1, m2, 16, false, 0, 24) then

MsgBox EncodeHex(m1)+" first"+EndOfLine+_
EncodeHex(m2)+" second"+EndOfLine+_
EncodeHex(mr1)+" min"+EndOfLine+_
EncodeHex(mr2)+" max"

end if
end if
```

**Notes:** firstMem and secondMem can be ptr or memoryblock with some values. Can be same as destination (the memoryblock the method is called at)
BitSize defines integer bit depth 8, 16, 32 or 64. Signed defines if to expect signed or unsigned integers.
offsetByte defines offset in destination memoryblock. lengthBytes is length of memory. If zero, we use size of destination memoryblock.
Passing bad parameters can easily lead to crash. Return true on success and false on failure and raises exceptions for invalid parameters.

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4

**Xojo Developer Magazine**

- 18.6, page 9: News

### 124.2.73 MirrorBitsInBytesMBS(offsetByte as Integer, lengthByte as Integer)

MBS Util Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors bits in each byte.
**Example:**

```
dim m as new MemoryBlock(12)

m.CString(0)="HelloHello"

m.MirrorBitsInBytesMBS(0,5)

MsgBox EncodingToHexMBS(m.StringValue(5,5))+" ->"+EncodingToHexMBS(m.StringValue(0,5))
```

**Notes:** offsetByte: where to start in the memoryblock
lengthByte: number of bytes to swap

Mirror means in this case, that if you a byte with bits 11001100, after the mirror, you have 00110011. So bit 0 and 7 exchange values. Same for 1 and 6, 2 and 5, 3 and 4.

### 124.2.74 MirrorBitsMBS(offsetBit as Integer, lengthBit as Integer)

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the bits in a memoryblock.
**Notes:** e.g. "111100001" in the memoryblock would give "100001111"
This function is certainly not the fastest one, but faster than anything you can get written in Xojo.
And make sure the bounds are matched, because on memory access outside the valid ranges, the function will crash.
0 ,â§ offsetBit <mem.size*8 and 0 ,â§ lengthBit ,â§ mem.size*8 - offsetBit

### 124.2.75 MirrorBytesMBS(offsetByte as Integer = 0, lengthByte as Integer = -1)

MBS Util Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the bytes in the given range.
**Notes:** e.g. "abcdefgh" in the memoryblock would give "hgfedcba"
This function is certainly not the fastest one, but faster than anything you can get written in Xojo.
And make sure the bounds are matched, because on memory access outside the valid ranges, the function will crash.
0 ,â§ offsetByte <mem.size and 0 ,â§ lengthByte ,â§ mem.size - offsetByte

If lengthByte is -1, we query memoryblock for size. If size is unknown or negative, the function does nothing.

### 124.2.76 MultiplyUInt16MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1)

MBS Util Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplied UInt16 values in the memoryblock.
**Example:**

```
dim myMemOut3 as new MemoryBlock(500)
myMemOut3.MultiplyUInt16MBS(0.9)
```

**Notes:** Values bigger than 65535 are set to 65535.
lengthBytes is in bytes, so 2 times the number of values.
Factor must be >= 0.0.
Offset is the offset in bytes from the beginning of the memoryblock to start. Wrong offsets (e.g. negative) can lead to crashes. lengthBytes is optional, if not specified or zero uses the length of memoryblock.

Added MultiplyOnlyOver parameter in version 18.4. If negative, we multiply all values. If positive, we multiply only values >the given value.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr7

### 124.2.77 MultiplyUInt8MBS(Factor as Double, offsetByte as Integer = 0, lengthBytes as Integer = 0, MultiplyOnlyOver as Integer = -1)

MBS Util Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Multiplies UInt8 values in the memoryblock.

**Example:**

```
dim myMemOut3 as new MemoryBlock(500)
myMemOut3.MultiplyUInt8MBS(0.9)
```

**Notes:** Values bigger than 255 are set to 255.
lengthBytes is in bytes, so 2 times the number of values.
Factor must be >= 0.0.
Offset is the offset in bytes from the beginning of the memoryblock to start. Wrong offsets (e.g. negative) can lead to crashes. lengthBytes is optional, if not specified or zero uses the length of memoryblock.

Added MultiplyOnlyOver parameter in version 18.4. If negative, we multiply all values. If positive, we multiply only values >the given value.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr7

### 124.2.78 RightMBS(length as Integer) as memoryblock

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a memoryblock with the given number of bytes from the right side of the memoryblock.
**Example:**

```
dim mem,m as MemoryBlock
mem=m.RightMBS(5)
```

**Notes:** If length is more than the memoryblock's size, than length is set to size.
Returns nil if length<=0 or on low memory.
This function will not work if the memoryblock has an unknown size.

### 124.2.79 SetBitMBS(Bit as UInt64)

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets value of the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123)

Dim v1 As Boolean = m.IsBitSetMBS(123)
```

```
Break // see debugger
```

**Notes:** Sets bit to 1.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
See also:


- 124.2.80 SetBitMBS(Bit as UInt64, Value as Boolean) 17605
- 124.2.81 SetBitMBS(Bit as UInt64, Value as Integer) 17605


### 124.2.80 SetBitMBS(Bit as UInt64, Value as Boolean)

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets value of the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123, true)

Dim v1 As Boolean = m.IsBitSetMBS(123)
Break // see debugger
```

**Notes:** Pass true to set bit or false to clear bit.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
See also:


- 124.2.79 SetBitMBS(Bit as UInt64) 17604
- 124.2.81 SetBitMBS(Bit as UInt64, Value as Integer) 17605


### 124.2.81 SetBitMBS(Bit as UInt64, Value as Integer)

MBS Util Plugin, Plugin Version: 21.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets value of the given bit in the MemoryBlock.
**Example:**

```
Dim m As New MemoryBlock(100)

m.SetBitMBS(123, 1)

Dim v1 As Boolean = m.IsBitSetMBS(123)
Break // see debugger
```

**Notes:** Pass 1 to set bit or 0 to clear bit.

Raises exception is MemoryBlock is nil.
If MemoryBlock has a known size and Bit is out of range, we raise an OutOfBoundsException.
**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 20.6pr5

See also:

- 124.2.79 SetBitMBS(Bit as UInt64) 17604
- 124.2.80 SetBitMBS(Bit as UInt64, Value as Boolean) 17605

### 124.2.82 SetStringMBS(str as String, offset as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a string inside the memoryblock.
**Notes:** With newer RB versions you may better use StringValue.

### 124.2.83 SwapBytes16MBS(offset as Integer, numBytes as Integer)

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swaps words inside the given bounds inside the memoryblock.
**Example:**

```
dim numbytes as Integer // number of bytes in MemoryBlock
dim m as MemoryBlock // your memoryblock
dim i as Integer

for i=0 to numbytes step 2
m.UShort(i)=EndianSwap16MBS(m.UShort(i))
next
```

### 124.2.84 SwapBytes32MBS(offset as Integer, numBytes as Integer)

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swaps longs inside the given bounds inside the memoryblock.
**Example:**

```
// Test SwapBytes32MBS and SwapBytes16MBS:

const h11223344=&h11223344
const h22114411=&h22114433 // 16bit swap
const h44332211=&h44332211 // 32bit swap

dim m as memoryBlock
dim ok as Integer

m=NewmemoryBlock(20)
m.Long(00)=h11223344
m.Long(04)=h11223344
m.Long(08)=h11223344
m.Long(12)=h11223344
m.Long(16)=h11223344

m.SwapBytes16MBS(4,4)
m.SwapBytes32MBS(12,4)

if m.Long(00)=h11223344 then
ok=ok+1
else
MsgBox "00: "+hex(m.Long(00))
end if

if m.Long(04)=h22114411 then
ok=ok+1
else
MsgBox "04: "+hex(m.Long(04))
end if

if m.Long(08)=h11223344 then
ok=ok+1
else
MsgBox "08: "+hex(m.Long(08))
end if

if m.Long(12)=h44332211 then
```

```
ok=ok+1
else
MsgBox "12: "+hex(m.Long(12))
end if

if m.Long(16)=h11223344 then
ok=ok+1
else
MsgBox "16: "+hex(m.Long(16))
end if

if ok=5 then
MsgBox "OK"
else
MsgBox "Fail"
end if
```

**Notes:** It should do something like this:

```
dim m as memoryBlock

for i=0 to numbytes step 2
m.long(i)=EndianSwap32MBS(m.long(i))
next
```

### 124.2.85 SwapBytesMBS(offset as Integer, numBytes as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Swaps bytes inside the given bounds inside the memoryblock.
**Notes:** Reverses the order of the bytes at the given offset and length in the memoryBlock. This is helpful to change representation of values from Little Endian (used in Windows) to Big Endian (used in Mac OS) and vice versa. Thanks to Franco Vaccari for the code of this routine.

### 124.2.86 Properties

### 124.2.87 OSTypeMBS(offset as Integer) as String

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read/Write an OSType.
**Notes:** Interprets 4 bytes starting at the given offset as a OSType value.

(Read and Write computed property)

## 124.3 class MemoryBlockMBS

### 124.3.1 class MemoryBlockMBS

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class to hold a memoryblock.
**Example:**

```
dim m as new MemoryBlockMBS

if m.Create(2000) then

// copy struing into memory
m.Memory.StringValue(0,5)="Hello"

// and read again
MsgBox m.Memory.StringValue(0,5)

end if
```

**Notes:** Xojo's memoryblocks have two bad things:
- they are limited to 1 GB on Mac OS X and Mac OS Classic
- they take a lot of time to create them
- they take a lot of real memory

Xojo allocates the memory and fills it with zeros.

The plugin in contrast uses zero filled pages to create the memoryblock which nearly take no time to create them and it does only need virtual memory until the memory is really used which saved swapping space.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr2
- MemoryblockMBS benchmark
- MBS REALbasic plug-ins version 9.4

### 124.3.2 Methods

### 124.3.3 Close

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 124.3.4 Constructor

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** This constructor does nothing, so you can call Create yourself.
See also:


- 124.3.5 Constructor(Mem as MemoryBlock) 17611
- 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0) 17612
- 124.3.7 Constructor(Size as Int64) 17612
- 124.3.8 Constructor(Str as String) 17613
- 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0) 17613


### 124.3.5 Constructor(Mem as MemoryBlock)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MemoryBlockMBS with content of memoryblock.
**Example:**

```
dim s as string = "Hello World"
dim m as MemoryBlock = s

dim x as new MemoryBlockMBS(m)

MsgBox str(x.Size)
```

**Notes:** Raises exception is size is invalid or no memory is available.
See also:


- 124.3.4 Constructor 17611
- 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0) 17612
- 124.3.7 Constructor(Size as Int64) 17612
- 124.3.8 Constructor(Str as String) 17613
- 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0) 17613

### 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MemoryBlockMBS with given size and copies content of memoryblock.
**Example:**

```
dim s as string = "Hello World"
dim m as MemoryBlock = s

dim x as new MemoryBlockMBS(m, 9)

MsgBox str(x.Size)
```

**Notes:** Raises exception is size is invalid or no memory is available.
See also:


- 124.3.4 Constructor 17611
- 124.3.5 Constructor(Mem as MemoryBlock) 17611
- 124.3.7 Constructor(Size as Int64) 17612
- 124.3.8 Constructor(Str as String) 17613
- 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0) 17613


### 124.3.7 Constructor(Size as Int64)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MemoryBlockMBS with given size.
**Notes:** Raises exception is size is invalid or no memory is available.
See also:


- 124.3.4 Constructor 17611
- 124.3.5 Constructor(Mem as MemoryBlock) 17611
- 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0) 17612
- 124.3.8 Constructor(Str as String) 17613
- 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0) 17613

### 124.3.8 Constructor(Str as String)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MemoryBlockMBS with content of string.
**Example:**

```
dim s as string = "Hello World"
dim x as new MemoryBlockMBS(s)

MsgBox str(x.Size)
```

**Notes:** Text encoding is ignored and bytes copied as they are.
Raises exception is size is invalid or no memory is available.
See also:


- 124.3.4 Constructor 17611
- 124.3.5 Constructor(Mem as MemoryBlock) 17611
- 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0) 17612
- 124.3.7 Constructor(Size as Int64) 17612
- 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0) 17613


### 124.3.9 Constructor(Str as String, Size as Int64, Offset as Int64 = 0)

MBS Util Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new MemoryBlockMBS with given size and copies content of string.
**Example:**

```
dim s as string = "Hello World"
dim x as new MemoryBlockMBS(s, 9)

MsgBox str(x.Size)
```

**Notes:** Text encoding is ignored and bytes copied as they are.
Raises exception is size is invalid or no memory is available.
See also:


- 124.3.4 Constructor 17611
- 124.3.5 Constructor(Mem as MemoryBlock) 17611
- 124.3.6 Constructor(Mem as MemoryBlock, Size as Int64, Offset as Int64 = 0) 17612

- 124.3.7 Constructor(Size as Int64) 17612
- 124.3.8 Constructor(Str as String) 17613


### 124.3.10 Create(size as Int64) as boolean

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new memoryblock.
**Example:**

```
dim m as MemoryBlockMBS
dim n as MemoryBlock
dim t as Integer

const size=2200000000

// RB: up to 1 GigaByte
// Plugin: up to 2 GigaByte - 1 Byte

m=New MemoryBlockMBS

t=ticks
if m.Create(size) then
n=m.Memory

MsgBox str(ticks-t)

end if

t=ticks
n=NewMemoryBlock(size)
if n<>nil then
MsgBox str(ticks-t)
end if
```

**Notes:** Returns true on success and false on failure.
Size can be any positive value up to &h7FFFFFFF (=2^31-1).

Size became 64bit to avoid integer overflows.

### 124.3.11 Resize(Size as Int64) as boolean

MBS Util Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tries to resize the memorybock to the new size.
**Example:**

```
dim m as new MemoryBlockMBS

if m.Create(1000) then
MsgBox str(m.Size)

if m.Resize(2000) then
MsgBox str(m.Size)
end if
end if
```

**Notes:** Returns true on success.
If false is returned, the memoryblockMBS is not touched.

If the new size is smaller, data is lost as the memoryblock is cut.
If the new size is bigger, the memoryblock is resized. Or if that does not work, a new memoryblock is created and data is copied. New bytes will be zero.

### 124.3.12 Properties

### 124.3.13 Address as Int64

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address of the memory.
**Notes:** This value became 64bit to avoid integer overflows.
(Read only property)

### 124.3.14 Memory as Memoryblock

MBS Util Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The memoryblock to access this memory.
**Notes:** Keep a reference to the MemoryBlockMBS object as long as you use this memoryblock object.
(Read only property)

### 124.3.15 Size as Int64

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of this memoryblock.
**Notes:** This value became 64bit to avoid integer overflows.
(Read only property)

## 124.4 class MemoryStorageMBS

### 124.4.1 class MemoryStorageMBS

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to store stuff in memory outside of the app memory.
**Notes:** The memory is stored using mapped memory in the system address space outside of the 32bit app memory of your app.

Normally a 32-bit app can only use 2 to 4 GB of memory. Using blocks of memory outside this address space, you can easily keep 10 GB of data in memory.

Be aware that a some point creating more storages may fail due to out of memory.
The system may decide to swap memory to disk if you run out of physical memory.

Please have your app check free space on boot disk regularly and avoid running out of disk space for swap!
**Blog Entries**

- MBS Xojo Plugins, version 18.1pr3
- MBS Xojo Plugins, version 18.1pr2
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

### 124.4.2 Methods

### 124.4.3 Constructor(Size as Int64 = 0)

MBS Util Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** If size >0, we allocate the memory for this size right away.

### 124.4.4 Destructor

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 124.4.5 MemoryValue(Offset as Int64, Assigns s as MemoryBlock)

MBS Util Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets part of memory storage as string.
**Notes:** Offset and Size are checked for range and an OutOfBoundsException can be raised.
Please use constructor before to create memory storage with given size.
See also:

- 124.4.10 MemoryValue as MemoryBlock 17619
- 124.4.6 MemoryValue(Offset as Int64, Size as Int64) as MemoryBlock 17618

### 124.4.6 MemoryValue(Offset as Int64, Size as Int64) as MemoryBlock

MBS Util Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries part of memory storage as memory block.
**Notes:** Offset and Size are checked for range and an OutOfBoundsException can be raised.
See also:

- 124.4.10 MemoryValue as MemoryBlock 17619
- 124.4.5 MemoryValue(Offset as Int64, Assigns s as MemoryBlock) 17618

### 124.4.7 StringValue(Offset as Int64, Assigns s as String)

MBS Util Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries part of memory storage as string.
**Notes:** Offset and Size are checked for range and an OutOfBoundsException can be raised.
Please use constructor before to create memory storage with given size.
See also:

- 124.4.13 StringValue as String 17619
- 124.4.8 StringValue(Offset as Int64, Size as Int64) as String 17618

### 124.4.8 StringValue(Offset as Int64, Size as Int64) as String

MBS Util Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries part of memory storage as string.
**Notes:** Offset and Size are checked for range and an OutOfBoundsException can be raised.
See also:

- 124.4.13 StringValue as String 17619
- 124.4.7 StringValue(Offset as Int64, Assigns s as String) 17618

### 124.4.9 Properties

### 124.4.10 MemoryValue as MemoryBlock

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of this memory storage as a memoryblock.
**Notes:** (Read and Write property)
See also:

- 124.4.5 MemoryValue(Offset as Int64, Assigns s as MemoryBlock) 17618
- 124.4.6 MemoryValue(Offset as Int64, Size as Int64) as MemoryBlock 17618

### 124.4.11 Size as Integer

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the data in bytes.
**Notes:** (Read and Write property)

### 124.4.12 SizeAllocated as Integer

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of memory allocated.
**Notes:** (Read and Write property)

### 124.4.13 StringValue as String

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The content of this memory storage as a string.
**Notes:** (Read and Write property)
See also:

- 124.4.7 StringValue(Offset as Int64, Assigns s as String) 17618
- 124.4.8 StringValue(Offset as Int64, Size as Int64) as String 17618

# Chapter 125

# Midi

## 125.1 class AVMIDIPlayerMBS

### 125.1.1 class AVMIDIPlayerMBS

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The AVMIDIPlayer class is a player for music file formats such as MIDI and iMelody.
**Notes:** Requires Mac OS X 10.10.

See also MidiPlaybackMBS class for playing notes.
**Blog Entries**

- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio Plugins, version 16.2pr1

### 125.1.2 Methods

### 125.1.3 Constructor(Data as MemoryBlock, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated MIDI player with the contents of the String, using the specified sound bank.
**Notes:** Data: The data to play.
SoundBankFile: The folderitem of the sound bank. The sound bank must be a SoundFont2 or DLS bank.
Error: Returns, by-reference, a description of the error, if an error occurs.

For OS X the bank folderitem can be set to nil to use the default sound bank. However, iOS must always refer to a valid bank file.
See also:

- 125.1.4 Constructor(Data as String, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17622
- 125.1.5 Constructor(File as FolderItem, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17622

### 125.1.4 Constructor(Data as String, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated MIDI player with the contents of the String, using the specified sound bank.
**Notes:** Data: The data to play.
SoundBankFile: The folderitem of the sound bank. The sound bank must be a SoundFont2 or DLS bank.
Error: Returns, by-reference, a description of the error, if an error occurs.

For OS X the bank folderitem can be set to nil to use the default sound bank. However, iOS must always refer to a valid bank file.
See also:

- 125.1.3 Constructor(Data as MemoryBlock, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17621
- 125.1.5 Constructor(File as FolderItem, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17622

### 125.1.5 Constructor(File as FolderItem, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS)

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Initializes a newly allocated MIDI player with the contents of the file, using the specified sound bank.
**Notes:** File: The file to play.
SoundBankFile: The folderitem of the sound bank. The sound bank must be a SoundFont2 or DLS bank.
Error: Returns, by-reference, a description of the error, if an error occurs.

For OS X the bank folderitem can be set to nil to use the default sound bank. However, iOS must always refer to a valid bank file.
See also:

- 125.1.3 Constructor(Data as MemoryBlock, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17621
- 125.1.4 Constructor(Data as String, SoundBankFile as FolderItem = nil, byref error as NSErrorMBS) 17622


### 125.1.6 Destructor

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 125.1.7 play

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Plays the sequence.
**Notes:** If prepareToPlay has not been invoked, play may be delayed while the events are prerolled.

### 125.1.8 prepareToPlay

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Prepares to play the sequence by prerolling all events.
**Notes:** This happens automatically on play if it has not already been called, but may produce a delay in startup.

### 125.1.9 stop

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Stops playing the sequence.

### 125.1.10 Properties

### 125.1.11 CurrentPosition as Double

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The current playback position, in seconds.
**Notes:** You can set the currentPosition of the player while the player is playing, in which case playback will

resume at the new time.

Note: No range checking on the currentPosition value is done when you set it to a new value. It is your responsibility to ensure the position is valid relative to the duration.
(Read and Write property)

### 125.1.12 Duration as Double

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The length of the currently loaded file, in seconds.
**Notes:** (Read only property)

### 125.1.13 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 125.1.14 Playing as Boolean

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** Whether the sequence is playing.
**Notes:** The player may have reached the end of all the events in any of its tracks, but it will return true until it is stopped.
(Read only property)

### 125.1.15 Rate as Double

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: All.

**Function:** The playback rate of the player.
**Notes:** The default value is 1.0, normal playback rate.
(Read and Write property)

### 125.1.16 Events

### 125.1.17 Completed

MBS AVFoundation Plugin, Plugin Version: 16.2, Platform: macOS, Targets: .

**Function:** Called when a MIDI playback request is completed.

## 125.2 class MidiClientMBS

### 125.2.1 class MidiClientMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class for the global MIDI stuff on Mac OS X.
**Notes:** Only make one instance of this class in your application.

From Apple's documentation:

History:

Apple's MIDI Manager (ca. 1990) had a simple model of the world. There were application and driver clients, which had MIDI in/out ports, which could be interconnected in arbitrary ways. This model failed to provide a way for applications to make reasonable assumptions about how to make bi-directional connections to a MIDI device. MIDI Manager also had limitations on the number of ports per client, and became very unwieldy with the advent of large studios and multi-port MIDI interfaces such as the MIDI Time Piece and Studio 5.

Opcode's OMS (1991) addressed some of the shortcomings of MIDI Manager. There was the concept of a studio setup document, where drivers detected their devices, and the user could define the characteristics of additional devices connected to the MIDI ports. Applications could view the studio both as a collection of MIDI source and destination "nodes", but also as a collection of devices. OMS collected information about, and made available to its clients, useful characteristics of the devices in the studio, such as their system-exclusive IDs, MIDI channels on which they were listening, which were controllers (as opposed to simple tone generators), etc.

API Overview:
This design expands slightly on OMS's device/node hierarchy, inspired by the USB MIDI spec.

Drivers own and control devices, e.g. USB interfaces, PCI cards, etc. A device is defined as a physical object that would be represented by a single icon if there were a graphical view of the studio.

Devices may have multiple logically distinct sub-components, e.g. a MIDI synthesizer and a pair of MIDI ports, both addressable via a USB port. These are called Entities.

Entities have any number of Endpoints, sources and destinations of 16-channel MIDI streams. By grouping a device's endpoints into entities, the system has enough information for an application to make reasonable assumptions about how to communicate in a bi-directional manner with each entity, as is necessary in MIDI librarian applications.

Third-party services like FreeMIDI or OMS can collect and report interesting properties of a device by attaching those properties to the devices' entities – CoreMIDI provides a central database, but no user interfaces.. It's worth noting that some device characteristics are dynamic (e.g. MIDI receive channel and system-exclusive ID's), or a matter of user preference (choice of icon, whether the device should appear in lists of possible controllers), while other properties are static and could be looked up in a database, using the device's manufacturer and model names as a key.

Persistent configurations / Device Information:
There are a number of reasons why CoreMIDI has a persistent state.

Endpoints must have persistent ID's. When a user assigns events in a sequencing application to an endpoint, the application needs a way to retain a permanent reference to the selected endpoint. A brute-force method of generating a persistent ID would be to combine the driver name, device name, entity name, and endpoint type and index into a string, but this is not very friendly to clients even if the system provides services to generate and decode these strings.

Consider a USB MIDI interface driver, in the case where there are two instances of one model of interface present. The driver needs a way to permanently distinguish, to the system and its clients, between the two interfaces. Which is #1 and which is #2? If #1 gets unplugged, #2 should not automatically become #1; the user's documents may be referring to devices which were attached to #2.

The system needs a persistent concept of which driver's device is attached to a serial port.

Some drivers will need to store configuration information about the devices they control. For example, the driver for a standard MIDI interface on a serial port needs to remember which external clocking speed to use (this is a simple, slightly obscure, but hardly unique example). The Alesis QS7 is capable of communicating at a variety of speeds, so its driver needs to remember the correct speed.

These needs for persistent configuration information provide a rationale for having something akin to OMS's studio setup document, a saved configuration for the system. Mobile users who work in multiple environments could select between multiple saved configurations in a Location Manager-compatible manner.

Given services with which to store driver configuration information, we then have built the groundwork for a client studio setup editor application.
Such an application can define external MIDI devices (not to be confused with the driver-owned cards/ interfaces/etc whose presence in the configuration is determined by the driver).

Moreover, since a driver knows exactly what device it is communicating with, it is capable of supplying information to the system about the characteristics of the device, such as its system-exclusive ID, whether it is General MIDI or DLS-compatible, etc.

Implementation overview:
The client API is implemented as the CoreMIDI framework, which uses IPC to communicate with a server process, MIDIServer.

The server process loads, and manages all communication with, MIDI drivers. Most of its implementation is in the CoreMIDIServer framework, which drivers may import in order to access the API.

"Drivers" are not I/O Kit drivers. They are dynamic libraries, using CFPlugin.

Many MIDI drivers can simply be user-side I/O Kit clients (probably for serial, USB, Firewire).

But unlike OMS, the system is able to begin functioning immediately, using only the MIDI devices/endpoints detected by the drivers, without forcing the user to go through a somewhat lengthy and confusing intial configuration process. Definition of external MIDI devices can be a completely optional step, only made possible when a client application requests that they be added to the configuration.

PCI card drivers will need their MIDI drivers to communicate with a separate kernel extension.

If you have an old file named EmagicUSBMIDIDriver.plugin in your /Library/Audio/MIDI Drivers folder, please remove it. It makes trouble with our Midi classes.

See also macOS specific classes AVMIDIPlayerMBS and MidiPlaybackMBS for playback. For Windows see also WindowsMidiMBS class.
See also PortMidiMBS class for cross platform Midi handling.
Subclass of the MidiObjectMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr2
- MBS Real Studio Plugins, version 11.3fc

**Xojo Developer Magazine**

- 21.6, page 8: News

### 125.2.2 Methods

### 125.2.3 Available as boolean

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** True if the MIDI stuff was successfull loaded.

### 125.2.4 close

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.2.5 CreateDestination(name as CFStringMBS, TargetEndpointObject as MidiEndpointMBS)

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Create a virtual destination in a client.
**Notes:** Clients may use this to create virtual destinations.
Lasterror is set.
You must pass a valid new MidiEndpointMBS for TargetEndpointObject. Best is if you make a subclass from MidiEndpointMBS and fill the event. You can add there additional methods and properties. CreateDestination will than fill the handle property on success.

### 125.2.6 CreateInputPort(name as CFStringMBS, targetportobject as MidiPortMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Create an input port through which the client may receive incoming MIDI messages from any MIDI source.
**Example:**

```
dim mc as MidiClientMBS
dim mp as MidiPortMBS

mc=new MidiClientMBS
mc.Init NewCFStringMBS("Testapp")

mp=new MidiPortMBS
mc.CreateInputPort NewCFStringMBS("Testport"), mp

if mp.Handle=0 then
MsgBox "There was an error: "+str(mc.Lasterror)
else
MsgBox "ok"
end if
```

**Notes:** After creating a port, use MIDIPortConnectSource to establish an input connection from any number of sources to your port.

Lasterror is set.

As you can subclass the MidiPortMBS class you must pass to this function a valid MidiPortMBS object so it can be filled.

### 125.2.7 CreateOutputPort(name as CFStringMBS, targetportobject as MidiPortMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Create an output port through which the client may send outgoing MIDI messages to any MIDI destination.
**Example:**

```
dim mc as MidiClientMBS
dim mp as MidiPortMBS

mc=new MidiClientMBS
mc.Init NewCFStringMBS("Testapp")

mp=new MidiPortMBS
mc.CreateOutputPort NewCFStringMBS("Testport"), mp

if mp.Handle=0 then
MsgBox "There was an error: "+str(mc.Lasterror)
else
MsgBox "ok"
end if
```

**Notes:** Output ports provide a mechanism for MIDI merging. The system assumes that each output port will be responsible for sending only a single MIDI stream to each destination, although a single port may address all of the destinations in the system.

Lasterror is set.

As you can subclass the MidiPortMBS class you must pass to this function a valid MidiPortMBS object so it can be filled.

### 125.2.8 CreateSource(name as CFStringMBS) as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new virtual Midi source.
**Example:**

```
dim m as MidiClientMBS
dim e as MidiEndpointMBS

m=new MidiClientMBS
```

```
// Initialize
m.Init NewCFStringMBS("Hallo")

// Create device:
e=m.CreateSource(NewCFStringMBS("Hallo"))

// if error is 0 and handle is not 0, it's okay
MsgBox "error: "+str(m.Lasterror)+", handle: "+str(e.Handle)
```

**Notes:** Lasterror is set.
Returns nil on any error.

Clients may use this to create virtual sources.

After creating a virtual source, use Received to transmit MIDI messages from your virtual source to any clients connected to the virtual source.

### 125.2.9 FindObjectByUniqueID(id as Integer) as MidiObjectMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Locate a device, typedefal device, entity, or endpoint by its uniqueID.
**Notes:** New for CoreMIDI 1.3.
You may cast the returned object to MidiEndpointMBS, MidiEntityMBS or MidiDeviceMBS. RB's "isa" command may help you.
Returns nil on any error. Lasterror is set.

### 125.2.10 GetDestination(index as Integer) as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of the destinations in the system.
**Notes:** The index goes from 0 to NumberOfDestinations-1.
Lasterror is set.
Returns nil on any error.

### 125.2.11 GetDevice(index as Integer) as MidiDeviceMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of the devices in the system.
**Notes:** To enumerate the entities in the system, you can walk through the devices, then walk through the devices' entities.

Note: If a client iterates through the devices and entities in the system, it will not ever visit any virtual sources and destinations created by other clients. Also, a device iteration will return devices which are "offline" (were present in the past but are not currently present), while iterations through the system's sources and destinations will not include the endpoints of offline devices.

Thus clients should usually prefer NumberOfSources, GetSource, NumberOfDestinations and GetDestination to iterating through devices and entities to locate endpoints.

Lasterror is set.
Returns nil on any error.

### 125.2.12 GetExternalDevice(index as Integer) as MidiDeviceMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of the external devices in the system.
**Notes:** The index goes from 0 to NumberOfDevices-1.
Lasterror is set.
Returns nil on any error.

### 125.2.13 GetSource(index as Integer) as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of the sources in the system.
**Notes:** The index goes from 0 to NumberOfSources-1.
Lasterror is set.
Returns nil on any error.

### 125.2.14 Init(name as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Creates a new Client object with the given client name.
**Notes:** Lasterror is set.

### 125.2.15 NumberOfDestinations as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the number of destinations in the system.
**Example:**

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfDestinations

MsgBox "NumberOfDestinations: "+str(n)
```

**Notes:** Returns 0 on any error.
Lasterror is set.

### 125.2.16 NumberOfDevices as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the number of devices in the system.
**Example:**

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfDevices

MsgBox "NumberOfDevices: "+str(n)
```

**Notes:** Returns 0 on any error.
Lasterror is set.

### 125.2.17 NumberOfExternalDevices as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the number of typedefal MIDI devices in the system.
**Example:**

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfExternalDevices

MsgBox "NumberOfExternalDevices: "+str(n)
```

**Notes:** External MIDI devices are MIDI devices connected to endpoints via a standard MIDI cable. Their presence is completely optional, only when a UI somewhere adds them.

New for CoreMIDI 1.1.

Returns 0 on any error.
Lasterror is set.

### 125.2.18 NumberOfSources as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the number of sources in the system.
**Example:**

```
dim m as new MidiClientMBS
dim n as Integer = m.NumberOfSources

MsgBox "NumberOfSources: "+str(n)
```

**Notes:** Returns 0 on any error.
Lasterror is set.

### 125.2.19 Restart as Integer

MBS MacCF Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Stops and restarts MIDI I/O.
**Notes:** This is useful for forcing CoreMIDI to ask its drivers to rescan for hardware.
Returns the Mac OS X error code.

### 125.2.20 Send(port as MidiPortMBS, endpoint as MidiEndpointMBS, packets as MidiPacketListMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Sends midi data using the port to the given endpoint.
**Example:**

```
// Not 100% if this example works:
dim client as MIDIClientMBS
```

```
dim outport as MIDIPortMBS
dim dest as MIDIEndpointMBS
dim pack as MIDIPacketMBS
dim list as MIDIPacketListMBS
dim packs(-1) as MIDIPacketMBS

client = new MidiClientMBS

if client <>nil then
client.Init newcfstringmbs("CoreMIDI")
outport = new MIDIPortMBS
client.CreateOutputPort(NewCFStringMBS("outport"), outport)
dest = client.getDestination(0)
outport.connectSource dest

pack = new MIDIPacketMBS
list = new MIDIPacketListMBS
pack.timeStamp = nil
pack.datastring = chrb(&h90)+chrb(&h5A)+chrb(&h7C)
packs.append pack
if not list.FillList(packs) then
msgBox "bad"
end

client.Send(outport, dest, list)
end
```

**Notes:** Events with future timestamps are scheduled for future delivery. The system performs any needed MIDI merging.

Lasterror is set.

### 125.2.21 Events

### 125.2.22 ObjectAdded(parent as MidiObjectMBS, child as MidiObjectMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** Called when an object is added to a MidiObject.

### 125.2.23 ObjectRemoved(parent as MidiObjectMBS, child as MidiObjectMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** Called when an object is removed from a MidiObject.

### 125.2.24 PropertyChanged(target as MidiObjectMBS, theProperty as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** Called when a property was changed.

### 125.2.25 SerialPortOwnerChanged

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** A persistent MIDI Thru connection was created or destroyed.
**Notes:** New for CoreMIDI 1.3.

### 125.2.26 SetupChanged

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** Some aspect of the current MIDISetup has changed.
**Notes:** You should ignore this message if you handle the other messages.

### 125.2.27 ThruConnectionsChanged

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: .

**Function:** A persistent MIDI Thru connection was created or destroyed.
**Notes:** New for CoreMIDI 1.3.

### 125.2.28 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMIDIIDNotUnique | -10843 | One of the type constants for a MIDI error.<br>Attempt to set a non-unique kMIDIPropertyUniqueID on an object. |
| kMIDIInvalidClient | -10830 | One of the type constants for a MIDI error.<br>An invalid MIDIClientRef was passed. |
| kMIDIInvalidPort | -10831 | One of the type constants for a MIDI error.<br>An invalid MIDIPortRef was passed. |
| kMIDIInvalidUniqueID | 0 | A constant for an invalid unique ID. |
| kMIDIMessageSendErr | -10838 | One of the type constants for a MIDI error.<br>Communication with MIDIServer failed. |
| kMIDIMsgIOError | 7 | One of the type constants for a MIDI Notification.<br>A driver I/O error occurred. |
| kMIDIMsgObjectAdded | 2 | One of the type constants for a MIDI Notification.<br>A device, entity or endpoint was added. |
| kMIDIMsgObjectRemoved | 3 | One of the type constants for a MIDI Notification.<br>A device, entity or endpoint was removed. |
| kMIDIMsgPropertyChanged | 4 | One of the type constants for a MIDI Notification.<br>An object's property was changed. |
| kMIDIMsgSerialPortOwnerChanged | 6 | One of the type constants for a MIDI Notification.<br>A persistent MIDI Thru connection was created or destroyed. No data.<br>for CoreMIDI 1.3. |
| kMIDIMsgSetupChanged | 1 | One of the type constants for a MIDI Notification.<br>Some aspect of the current MIDISetup has changed. No data. Should ig<br>this message if messages 2-6 are handled. |
| kMIDIMsgThruConnectionsChanged | 5 | One of the type constants for a MIDI Notification.<br>A persistent MIDI Thru connection was created or destroyed. No data.<br>for CoreMIDI 1.3. |
| kMIDINoConnection | -10833 | One of the type constants for a MIDI error.<br>Attempt to close a non-existant connection. |
| kMIDINoCurrentSetup | -10837 | One of the type constants for a MIDI error.<br>Internal error; there is no current MIDI setup object. |
| kMIDIObjectNotFound | -10842 | One of the type constants for a MIDI error.<br>The requested object does not exist. |
| kMIDIServerStartErr | -10839 | One of the type constants for a MIDI error.<br>Unable to start MIDIServer. |
| kMIDISetupFormatErr | -10840 | One of the type constants for a MIDI error.<br>Unable to read the saved state. |
| kMIDIUnknownEndpoint | -10834 | One of the type constants for a MIDI error.<br>An invalid MIDIEndpointRef was passed. |
| kMIDIUnknownProperty | -10835 | One of the type constants for a MIDI error.<br>Attempt to query a property not set on the object. |
| kMIDIWrongEndpointType | -10832 | One of the type constants for a MIDI error.<br>A source endpoint was passed to a function expecting a destination, or<br>versa. |
| kMIDIWrongPropertyType | -10836 | One of the type constants for a MIDI error.<br>Attempt to set a property with a value not of the correct type. |
| kMIDIWrongThread | -10841 | One of the type constants for a MIDI error.<br>A driver is calling a non-I/O function in the server from a thread other<br>the server's main thread. |

## 125.3 class MidiDeviceMBS

### 125.3.1 class MidiDeviceMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class for a MIDI device.
**Notes:** A MIDI device, which either attaches directly to the computer and is controlled by a MIDI driver, or which is "external," meaning that it is connected to a driver-controlled device via a standard MIDI cable.
Subclass of the MidiObjectMBS class.

### 125.3.2 Methods

### 125.3.3 GetEntity(index as Integer) as MidiEntityMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of a given device's entities.
**Notes:** The index goes from 0 to NumberOfEntities-1.
Lasterror is set.
Returns nil on any error.

### 125.3.4 NumberOfEntities as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the number of entilities for this device.
**Notes:** Returns nil on any error.
Lasterror is set.

## 125.4 class MidiEndpointMBS

### 125.4.1 class MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the CoreMidi classes.
**Notes:** Entities have any number of MIDIEndpointRef's, sources and destinations of 16-channel MIDI streams.
Subclass of the MidiObjectMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr1

### 125.4.2 Methods

### 125.4.3 close

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** Frees the endpoint handle.
There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.4.4 Entity as MidiEntityMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns an endpoint's entity.
**Notes:** Returns nil on any error.
Lasterror is set.
New for CoreMIDI 1.3.

### 125.4.5 FlushOutput

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Unschedule previously-sent packets.
**Notes:** Clients may use MIDIFlushOutput to cancel the sending of
packets that were previously scheduled for future delivery.
New for CoreMIDI 1.1.

Lasterror is set.

### 125.4.6 Received(packets as MidiPacketListMBS)

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Distribute MIDI from a source to the client input ports which are connected to that source.
**Notes:** Drivers should call this function when receiving MIDI from a source.
Clients which have created virtual sources, using MIDICreateSource, should call this function when the source is generating MIDI.
Lasterror is set.

### 125.4.7 Events

### 125.4.8 Read(endpoint as MidiEndpointMBS, list as MidiPacketListMBS)

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: .

**Function:** Called when data arrives at an endpoint.
**Notes:** If more than 256 bytes of data is received, it may be splitted and send in several events.

For some devices a Note Off is just a Note On with a zero velocity.

## 125.5 class MidiEntityMBS

### 125.5.1 class MidiEntityMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the CoreMidi classes.
**Notes:** Devices may have multiple logically distinct sub-components, e.g. a MIDI synthesizer and a pair of MIDI ports, both addressable via a USB port.

By grouping a device's endpoints into entities, the system has enough information for an application to make reasonable assumptions about how to communicate in a bi-directional manner with each entity, as is desirable in MIDI librarian applications.

These sub-components are MIDIEntityRef's.
Subclass of the MidiObjectMBS class.

### 125.5.2 Methods

### 125.5.3 Device as MidiDeviceMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns an entity's device.
**Notes:** Returns nil on any error.
Lasterror is set.
New for CoreMIDI 1.3.

### 125.5.4 GetDestination(index as Integer) as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of a given entity's destinations.
**Notes:** Lasterror is set.
Returns nil on any error.

### 125.5.5 GetSource(index as Integer) as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return one of a given entity's sources.

**Notes:** Lasterror is set.
Returns nil on any error.

### 125.5.6 NumberOfDestinations as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return the number of destinations in a given entity.
**Notes:** Lasterror is set.
Returns 0 on any error.

### 125.5.7 NumberOfSources as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Return the number of sources in a given entity.
**Notes:** Lasterror is set.
Returns 0 on any error.

## 125.6 class MidiObjectMBS

### 125.6.1 class MidiObjectMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class for a Mac OS X CoreMidi object.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MBS Xojo Plugins, version 17.4pr2
- MBS Real Studio Plugins, version 12.5pr2

### 125.6.2 Methods

### 125.6.3 kMIDIPropertyAdvanceScheduleTimeMuSec as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, integer
Set by the owning driver; should not be touched by other clients.
If it is >0, then it is a recommendation of how many microseconds in advance clients should schedule output. Clients should treat this value as a minimum. For devices with a >0 advance schedule time, drivers will receive outgoing messages to the device at the time they are sent by the client, via MIDISend, and the driver is responsible for scheduling events to be played at the right times according to their timestamps.
As of CoreMIDI 1.3, this property may also be set on virtual destinations (but only the creator of the destination should do so).
When a client sends to a virtual destination with an advance schedule time of 0, the virtual destination receives its messages at their scheduled delivery time. If a virtual destination has a non-zero advance schedule time, it receives timestamped messages as soon as they are sent, and must do its own scheduling of the events.

### 125.6.4 kMIDIPropertyCanRoute as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.5 kMIDIPropertyConnectionUniqueID as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, integer or CFDataRef

UniqueID of an external device/entity/endpoint attached to this one (strongly recommended that it be an endpoint). This is for the use of a setup editor UI; not currently used internally. A driver-owned entity or endpoint has this property to refer to an external MIDI device that is connected to it.

The property is non-existant or 0 if there is no connection.

New for CoreMIDI 1.1.

Beginning with CoreMIDI 1.3, this property may be a CFDataRef containing an array of big-endian SInt32's, to allow specifying that a driver object connects to multiple external objects (via MIDI thru-ing or splitting).

This property may also exist for external devices/entities/endpoints, in which case it signifies a MIDI Thru connection to another external device/entity/endpoint (again, strongly recommended that it be an edpoint).

### 125.6.6 kMIDIPropertyDeviceID as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.
device/entity property, integer
The entity's system-exclusive ID, in user-visible form
Drivers may set this property on their devices or entities.
Setup editors may allow the user to set this property on external devices.

### 125.6.7 kMIDIPropertyDisplayName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** device/entity/endpoint property, string.

Provides the Apple-recommended user-visible name for an endpoint, by combining the device and endpoint names.

For objects other than endpoints, the display name is the same as the name.

New for CoreMIDI 1.5.

### 125.6.8 kMIDIPropertyDriverDeviceEditorApp as CFStringMBS

MBS MacCF Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** device property, string, contains the full path to an application which knows how to configure this driver-owned devices. Drivers may set this property on their owned devices. Applications must not write to it.

New for CoreMIDI 1.4.

### 125.6.9 kMIDIPropertyDriverOwner as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, string

Name of the driver that owns a device.
Set by the owning driver, on the device; should not be touched by other clients. Property is inherited from the device by its entities and endpoints.

New for CoreMIDI 1.1.

### 125.6.10 kMIDIPropertyDriverVersion as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, integer, returns the driver version API of the owning driver (only for driver-owned devices). Drivers need not set this property; applications should not write to it.

New for CoreMIDI 1.3.

### 125.6.11 kMIDIPropertyFactoryPatchNameFile as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, CFData containing AliasHandle

An alias to the device's current factory patch name file.

Added in CoreMIDI 1.1. DEPRECATED as of CoreMIDI 1.3.
Use kMIDIPropertyNameConfiguration instead.

### 125.6.12 kMIDIPropertyImage as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device property, CFStringRef which is a full POSIX path to a device or external device's icon, stored in any standard graphic file format such as JPEG, GIF, PNG and TIFF are all acceptable. (See CFURL for functions to convert between POSIX paths and other ways of specifying files.) The image's maximum size should be 128x128.

Drivers should set the icon on the devices they add.
A studio setup editor should allow the user to choose icons for external devices.

New for CoreMIDI 1.3.

### 125.6.13 kMIDIPropertyIsBroadcast as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.
entity/endpoint property, integer
1 if the endpoint broadcasts messages to all of the other endpoints in the device, 0 if not. Set by the owning driver; should not be touched by other clients.
New for CoreMIDI 1.3.

### 125.6.14 kMIDIPropertyIsDrumMachine as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.15 kMIDIPropertyIsEffectUnit as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.16 kMIDIPropertyIsEmbeddedEntity as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

entity/endpoint property, integer
0 if there are external MIDI connectors, 1 if not.
New for CoreMIDI 1.1.

### 125.6.17 kMIDIPropertyIsMixer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.18 kMIDIPropertyIsSampler as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.19 kMIDIPropertyManufacturer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Example:**

```
dim m as MidiClientMBS
dim i, n as Integer
dim e as MIDIEndpointMBS
dim d as MIDIDeviceMBS
dim s as CFStringMBS

m = new MidiClientMBS
m.Init NewCFStringMBS("Test")
d = m.GetDevice(0)

s = d.StringProperty(d.kMIDIPropertyManufacturer)

MsgBox s.str
```

**Notes:** Only available after you called the Init Method.

device/endpoint property, string

Drivers should set this property on their devices.
Setup editors may allow the user to set this property on external devices.
Creators of virtual endpoints may set this property on their endpoints.

### 125.6.20 kMIDIPropertyMaxReceiveChannels as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0-16

### 125.6.21 kMIDIPropertyMaxSysExSpeed as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.
device/entity/endpoint property, integer
Set by the owning driver; should not be touched by other clients.
maximum bytes/second of sysex messages sent to it
(default is 3125, as with MIDI 1.0)

### 125.6.22 kMIDIPropertyMaxTransmitChannels as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0-16

### 125.6.23 kMIDIPropertyModel as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/endpoint property, string
Drivers should set this property on their devices.
Setup editors may allow the user to set this property on external devices.
Creators of virtual endpoints may set this property on their endpoints.

### 125.6.24 kMIDIPropertyName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Example:**

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as CFStringMBS = source.StringProperty(source.kMIDIPropertyName)
MsgBox "Name: "+s.str
```

**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, string
Devices, entities, and endpoints may all have names. The recommended way to display an endpoint's name is to ask for the endpoint name, and display only that name if it is unique. If it is non-unique, prepend the device name.
A setup editor may allow the user to set the names of both driver-owned and external devices.

### 125.6.25 kMIDIPropertyNameConfiguration as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, CFDictionary

This specifies the device's current patch, note and control name values using the MIDINameDocument XML

format. This specification requires the use of higher-level, OS-specific constructs outside of the specification, to fully define the current names for a device.

The MIDINameConfiguration property is implementated as a CFDictionary:

key "master" maps to a CFDataRef containing an AliasHandle referring to the device's master name document.

key "banks" maps to a CFDictionaryRef. This dictionary's keys are CFStringRef names of patchBank elements in the master document, and its values are each a CFDictionaryRef: key "file" maps to a CFDataRef containing an AliasHandle to a document containing patches that override those in the master document, and key "patchNameList" maps to a CFStringRef which is the name of the patchNameList element in the overriding document.

key "currentModes" maps to a 16-element CFArrayRef, each element of which is a CFStringRef of the name of the current mode for each of the 16 MIDI channels.

Clients setting this property must take particular care to preserve dictionary values other than the ones they are interested in changing, and to properly structure the dictionary.

New for CoreMIDI 1.3.

### 125.6.26 kMIDIPropertyOffline as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, integer

1 = device is offline (is temporarily absent), 0 = present
Set by the owning driver, on the device; should not be touched by other clients. Property is inherited from the device by its entities and endpoints.

New for CoreMIDI 1.1.

### 125.6.27 kMIDIPropertyPanDisruptsStereo as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.28 kMIDIPropertyPrivate as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, integer

1 = endpoint is private, hidden from other clients.
May be set on a device or entity, but they will still appear in the API; only affects whether the owned endpoints are hidden.

New for CoreMIDI 1.3.

### 125.6.29 kMIDIPropertyReceiveChannels as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.
endpoint property, integer
The value is a bitmap of channels on which the object receives, (1«0)=ch 1...(1«15)=ch 16.
Drivers may set this property on their entities or endpoints.
Setup editors may allow the user to set this property on external endpoints.
Virtual destination may set this property on their endpoints.

### 125.6.30 kMIDIPropertyReceivesBankSelectLSB as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.

**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.31 kMIDIPropertyReceivesBankSelectMSB as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.32 kMIDIPropertyReceivesClock as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.33 kMIDIPropertyReceivesMTC as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.34 kMIDIPropertyReceivesNotes as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.35 kMIDIPropertyReceivesProgramChanges as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.36 kMIDIPropertySingleRealtimeEntity as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device property, integer

Some MIDI interfaces cannot route MIDI realtime messages to individual outputs; they are broadcast. On such devices the inverse is usually also true – incoming realtime messages cannot be identified as originating from any particular source.

When this property is set on a driver device, it signifies the 0-based index of the entity on which incoming realtime messages from the device will appear to have originated from.

New for CoreMIDI 1.3.

### 125.6.37 kMIDIPropertySupportsGeneralMIDI as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.38 kMIDIPropertySupportsMMC as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.39 kMIDIPropertySupportsShowControl as CFStringMBS

MBS MacCF Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** device/entity property, integer (0/1). Indicates whether the device implements the MIDI.
New for CoreMIDI 1.5.

### 125.6.40 kMIDIPropertyTransmitChannels as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.
endpoint property, integer
The value is a bitmap of channels on which the object transmits, (1«0)=ch 1...(1«15)=ch 16
New for CoreMIDI 1.3.

### 125.6.41 kMIDIPropertyTransmitsBankSelectLSB as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.42 kMIDIPropertyTransmitsBankSelectMSB as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.43 kMIDIPropertyTransmitsClock as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.44 kMIDIPropertyTransmitsMTC as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.45 kMIDIPropertyTransmitsNotes as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.46 kMIDIPropertyTransmitsProgramChanges as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

New for CoreMIDI 1.3. This is set on devices/entities, and is ab integer properties, 0/1

### 125.6.47 kMIDIPropertyUniqueID as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Example:**

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
MsgBox "UniqueID: "+str(s)
```

**Notes:** Only available after you called the Init Method.
devices, entities, endpoints all have unique ID's, integer
The system assigns unique ID's to all objects. Creators of virtual endpoints may set this property on their endpoints, though doing so may fail if the chosen ID is not unique.

### 125.6.48 kMIDIPropertyUserPatchNameFile as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** One of the properties for MIDI on Mac OS X.
**Notes:** Only available after you called the Init Method.

device/entity/endpoint property, CFData containing AliasHandle

An alias to the device's current user patch name file.

Added in CoreMIDI 1.1. DEPRECATED as of CoreMIDI 1.3.
Use kMIDIPropertyNameConfiguration instead.

### 125.6.49 Properties(deep as boolean) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Get all of an object's properties.
**Notes:** Deep parameter: true if the object's child objects are to be included (e.g. a device's entities, or an entity's endpoints).
Properties which an object inherits from its owning object (if any) are not included.

New for CoreMIDI 1.1.

Returns nil on any error.
Lasterror is set.

### 125.6.50 RemoveProperty(name as CFStringMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Remove an object's property.
**Notes:** Lasterror is set.

### 125.6.51 Properties

### 125.6.52 DisplayName as String

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Provides the Apple-recommended user-visible name for an endpoint, by combining the device and endpoint names.
**Notes:** For objects other than endpoints, the display name is the same as the name.
(Read only property)

### 125.6.53 Handle as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The handle of this object.
**Notes:** (Read and Write property)

### 125.6.54 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The last error code reported.
**Notes:** 0 if the function was successfull.
-1 if the function is not available or the RB parameters were bad. (e.g. nil)
else a Mac OS error code.

Some Midi specific error codes:

| | | |
|---|---|---|
| kMIDIInvalidClient | -10830 | |
| kMIDIInvalidPort | -10831 | |
| kMIDIWrongEndpointType | -10832 | want source, got destination, or vice versa |
| kMIDINoConnection | -10833 | attempt to close a non-existant connection |
| kMIDIUnknownEndpoint | -10834 | |
| kMIDIUnknownProperty | -10835 | |
| kMIDIWrongPropertyType | -10836 | |
| kMIDINoCurrentSetup | -10837 | there is no current setup, or it contains no devices |
| kMIDIMessageSendErr | -10838 | communication with server failed |
| kMIDIServerStartErr | -10839 | couldn't start the server |
| kMIDISetupFormatErr | -10840 | unparseable saved state |
| kMIDIWrongThread | -10841 | driver is calling non I/O function in server from a thread other than server's main one: |
| kMIDIObjectNotFound | -10842 | |
| kMIDIIDNotUnique | -10843 | |

(Read and Write property)

### 125.6.55 Manufacturer as String

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** Drivers should set this property on their devices.
**Notes:** Setup editors may allow the user to set this property on external devices.
(Read only property)

### 125.6.56 Model as String

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The model name.
**Notes:** (Read only property)

### 125.6.57 Name as String

MBS MacCF Plugin, Plugin Version: 17.4, Platform: macOS, Targets: All.

**Function:** The item's name.
**Notes:** Devices, entities, and endpoints may all have names. The recommended way to display an endpoint's name is to ask for the endpoint name, and display only that name if it is unique. If it is non-unique, prepend the device name.

A setup editor may allow the user to set the names of both driver-owned and external devices.
(Read only property)

### 125.6.58 BinaryProperty(name as CFStringMBS) as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Set or Get an object's data-type property.
**Notes:** Lasterror is set.
Returns nil on any error.
(Read and Write computed property)

### 125.6.59 IntegerProperty(name as CFStringMBS) as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Set or Get an object's integer-type property.
**Example:**

```
// init midi
dim m as new MidiClientMBS
m.Init NewCFStringMBS("TestApp")

// create a source
dim name as CFStringMBS = NewCFStringMBS("TestSource")
dim source as MidiEndpointMBS = m.CreateSource(name)

// query name property
dim s as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
MsgBox "UniqueID: "+str(s)

// set it
source.IntegerProperty(source.kMIDIPropertyUniqueID) = 1234

// query again
dim t as Integer = source.IntegerProperty(source.kMIDIPropertyUniqueID)
```

```
MsgBox "UniqueID: "+str(t)
```

**Notes:** Returns 0 on any error.
Lasterror is set.
(Read and Write computed property)

### 125.6.60 ObjectProperty(name as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Get or Set an object's dictionary-type property.
**Notes:** Lasterror is set.
New for CoreMIDI 1.3.
Renamed from Property to ObjectProperty in v4.3 for Xojo 6 compatibility.
(Read and Write computed property)

### 125.6.61 StringProperty(name as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Get or Set an object's string-type property.
**Example:**

```
dim m as MidiClientMBS
dim i, n as Integer
dim e as MIDIEndpointMBS
dim d as MIDIDeviceMBS
dim s as CFStringMBS

m = new MidiClientMBS
m.Init NewCFStringMBS("Test")
d = m.GetDevice(0)

s = d.StringProperty(d.kMIDIPropertyManufacturer)

MsgBox s.str
```

**Notes:** Lasterror is set.
(Read and Write computed property)

## 125.7 class MidiPacketListMBS

### 125.7.1 class MidiPacketListMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class to hold a list of MidiPackets.

### 125.7.2 Methods

### 125.7.3 FillList(packets() as MidiPacketMBS) as boolean

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Fills the list with the given Xojo array of MidiPackets.
**Example:**

```
Dim packs(-1) As MIDIPacketMBS

Dim pack As New MIDIPacketMBS
Dim list As New MIDIPacketListMBS
Dim data As New MemoryBlock(9)

data.Byte(0) = &hF0
data.Byte(1) = &h00
data.Byte(2) = &h20
data.Byte(3) = &h1C
data.Byte(4) = &h7F
data.Byte(5) = &h04
data.Byte(6) = &h02
data.Byte(7) = &h01
data.Byte(8) = &hF7

pack.datamemory = data
pack.timeStamp = Nil 'now

packs.append pack
If Not list.FillList(packs) Then
Break // problem
Else
// send to current port and destination
client.Send(outport, currentDest, list)
End If
```

### 125.7.4 Item(index as Integer) as MidiPacketMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Returns the item with the given index.

### 125.7.5 Properties

### 125.7.6 Count as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The number of items in the list.
**Notes:** (Read and Write property)

## 125.8 class MidiPacketMBS

### 125.8.1 class MidiPacketMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a midi packet.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Plugins 10.3 Release Notes

### 125.8.2 Methods

### 125.8.3 AbsoluteToNanoseconds(value as UInt64) as UInt64

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Converts an absolute time value to a nanoseconds time value.
**Example:**

```
dim x as UInt64 = MidiPacketMBS.CurrentTime

dim y as UInt64 = x + MidiPacketMBS.NanosecondsToAbsolute(5)

MsgBox str(x)+" + 5 ns = "+str(Y)
```

### 125.8.4 CurrentTime as UInt64

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** Returns the current time of the computer as an absolute time value.
**Example:**

```
dim u as uint64 = MidiPacketMBS.CurrentTime
dim n as uint64 = MidiPacketMBS.AbsoluteToNanoseconds(u)
dim x as Double = n / 1000000000.0

MsgBox str(u)+" "+str(n)+" "+str(x)

dim d as new date
d.Minute = 0
d.Hour = 0
d.Second = 0
```

```
d.TotalSeconds = d.TotalSeconds + x

MsgBox d.ShortTime // how long the mac is running.
```

**Notes:** While some Macs do have host clock time being in nanoseconds, this is not guaranteed. So use the function AbsoluteToNanoseconds to convert to nanoseconds.

### 125.8.5 NanosecondsToAbsolute(value as UInt64) as UInt64

MBS MacCF Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Converts a nanoseconds value to an absolute time.
**Example:**

```
dim x as UInt64 = MidiPacketMBS.CurrentTime

dim y as UInt64 = MidiPacketMBS.NanosecondsToAbsolute(x)

dim seconds as uint64 = y / 1000000000
dim hours as uint64 = seconds / 3600
seconds = seconds - hours*3600
dim minutes as uint64 = seconds / 60
seconds = seconds - minutes*60

// shows how long the Mac is running:
MsgBox str(hours)+" hours, "+str(minutes)+" minutes, "+str(seconds)+" seconds"
```

### 125.8.6 Properties

### 125.8.7 DataMemory as MemoryBlock

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The data of the packet as a memoryblock.
**Notes:** Setting this value will automatically fill the DataString property, so both are in sync.
(Read and Write property)

### 125.8.8 DataString as String

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The data of the packet as a string.
**Notes:** Setting this value will automatically fill the DataMemory property, so both are in sync.

This will not work:
DataString="90 5A 7C"

But this is better:
DataString=chrb(&h90)+chrb(&h5A)+chrb(&h7C)

or with the DataMemory property:
m=newmemoryblock(3)
m.byte(0)=&h90
m.byte(1)=&h5A
m.byte(2)=&h7C
DataMemory=m
(Read and Write property)

### 125.8.9 TimeStamp as MemoryBlock

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use TimeStampValue instead.
**Function:** The timestamp of the packet.
**Example:**

```
dim pack as MIDIPacketMBS
dim m as memoryblock

m=newmemoryblock(8)
m.Long(0) = 2345678 // some time value
m.Long(4) = 3456789
pack = new MIDIPacketMBS
pack.TimeStamp = m
```

**Notes:** A host clock time (64 bit value) representing the time of an event, as returned by MidiPacketMBS.CurrentTime.

As a convenience, you can use zero to use the current time.
And using nil for the memoryblock represents a value of zero (=now).
(Read and Write property)

### 125.8.10 TimeStampValue as UInt64

MBS MacCF Plugin, Plugin Version: 7.0, Platform: macOS, Targets: All.

**Function:** The timestamp of the packet.
**Notes:** A host clock time (64 bit value) representing the time of an event, as returned by MidiPacketMBS.CurrentTime.

As a convenience, you can use zero to use the current time.
(Read and Write property)

## 125.9 class MidiPlaybackMBS

### 125.9.1 class MidiPlaybackMBS

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** A class to do Midi playback on Mac OS X.
**Notes:** With sandbox, you need the com.apple.security.temporary-exception.audio-unit-host entitlement as of September 2013.
see
https://developer.apple.com/library/mac/qa/qa1483/_index.html

See also AVMIDIPlayerMBS class for playing midi files.
**Blog Entries**

- MacOSX plugin for iOS
- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 13.4pr4
- Sandbox and playing Midi
- MBS Real Studio Plugins, version 11.2pr2
- MBS REALbasic plug-ins version 9.4

### 125.9.2 Methods

### 125.9.3 Callback as Integer

MBS MacOSX Plugin, Plugin Version: 6.0, Platform: macOS, Targets: All.

**Function:** Needed for the MidiPortMBS class to know which function to call
**Example:**

```
dim p as MidiPlaybackMBS
dim m as MidiPortMBS
// do something useful
m.SetCallback p.Callback, p
```

**Notes:** Return the address of the callback method used to process Midi data.
The method is to be used together with the SetCallback method in the MidiPortMBS class.

### 125.9.4 Constructor(UsesInternalReverb as boolean=false, AutoStart as boolean=true)

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** Initializes the midi playback.
**Notes:** After calling the constructor the Inited flag is true on success.
If AutoStart is false the midi playback is not started.

### 125.9.5 CPULoad as single

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** The CPU load of the graph.
**Notes:**

Returns a short-term running average of the current CPU load of the graph.

### 125.9.6 InstrumentCount as Integer

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** The number of instruments.

### 125.9.7 InstrumentID(index as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** The ID of the instrument with the given index.

### 125.9.8 InstrumentName(index as Integer) as string

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** The name of the instrument with the given index.
**Example:**

```
// show list of all names
dim m as new MidiPlaybackMBS

dim u as Integer = m.InstrumentCount-1
for i as Integer = 0 to u
Listbox1.AddRow m.InstrumentName(i)
```

next

**Notes:** Index from 0 to InstrumentCount-1.

### 125.9.9 IsRunning as boolean

MBS MacOSX Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Whether the midi playback is running.
**Notes:** Lasterror is set.

### 125.9.10 LoadSoundBankFile(file as folderitem)

MBS MacOSX Plugin, Plugin Version: 8.5, Platform: macOS, Targets: All.

**Function:** Loads a sound bank file.
**Example:**

```
Sub LoadSoundFont (SoundFontName as string)

dim j as Integer
dim f as folderitem
dim e as string

//GET SOUNDFONT
f = Volume(0).Child("Library").Child("Audio").Child("Sounds").Child("Banks").Child(SoundFontName)

if f <>Nil then
//INSTALL SOUNDFONT
me.LoadSoundBankFile(f)
Window1.PopupMenu1.DeleteAllRows
for j = 0 to 127
if me.InstrumentName(j) <>"" then
Window1.PopupMenu1.addrow me.InstrumentName(j)
end if
next
Window1.PopupMenu1.ListIndex = 0
else
e = "Could not locate the SoundFont: "+ SoundFontName
e = e + " Please make sure the file is a valid soundfont file"
e = e + " and is located in the folder YourHardDrive/Library/Audio/Sounds/Banks"
e = e + " and has the extension .sf2"
MsgBox e
```

```
end if

End Sub
```

**Notes:** This function can load files with .sf2 extension placed in the location: Library/Audio/Sounds/Banks.

Lasterror is set.

To avoid crashes on Mac OS X 10.5, the midi playback is stopped before loading is done and restarted if necessary after loading completed.

As a side effect stopping the midi playback may reset volume, reverb and tuning.

### 125.9.11 MaxCPULoad as single

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** The Maximum CPU load of the graph
**Notes:** Returns the max CPU load of the graph since this call was last made or the graph was last started.

### 125.9.12 SendMidiEvent(Status as Integer, Data1 as Integer, Data2 as Integer, OffsetSampleFrame as Integer)

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** Sends midi data for playback.

### 125.9.13 Start

MBS MacOSX Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Starts the midi playback.
**Notes:** Lasterror is set.

### 125.9.14 Stop

MBS MacOSX Plugin, Plugin Version: 9.4, Platform: macOS, Targets: All.

**Function:** Stops the midi playback.
**Notes:** Lasterror is set.

As a side effect stopping the midi playback may reset volume, reverb and tuning.

### 125.9.15 Properties

### 125.9.16 FilterNodeHandle as Integer

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for the filter graph node.
**Notes:** (Read only property)

### 125.9.17 GraphHandle as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** The handle for the AUGraph.
**Notes:** (Read only property)

### 125.9.18 Inited as boolean

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** Whether the constructor was successful.
**Notes:** This property is false if the constructor failed to initialize.
(Read only property)

### 125.9.19 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read only property)

### 125.9.20 OutputNodeHandle as Integer

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for the output graph node.
**Notes:** (Read only property)

### 125.9.21 SynthNodeHandle as Integer

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for the synth graph node.
**Notes:** (Read only property)

### 125.9.22 SynthUnitHandle as Integer

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The internal reference for the synth audio unit.
**Notes:** (Read only property)

### 125.9.23 InstrumentIDOnChannel(Channel as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 5.4, Platform: macOS, Targets: All.

**Function:** Which instrument is playing on which channel.
**Notes:** (Read and Write computed property)

### 125.9.24 ReverbVolume as single

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** The reverb volume.
**Notes:** The value range is -120 to 40 dB.
(Read and Write computed property)

### 125.9.25 StreamFromDisk as boolean

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** Whether we are streaming from disk.
**Notes:** Currently setting this value can crash the application.
(Read and Write computed property)

### 125.9.26 Tuning as single

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** The tuning setting.
**Notes:** Value is in cents from -1200 to 1200.
(Read and Write computed property)

### 125.9.27 UsesInternalReverb as boolean

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** One of the audio unit properties.
**Example:**

```
dim m as new MidiPlaybackMBS

MsgBox "UsesInternalRever: "+str(m.UsesInternalReverb)
m.UsesInternalReverb=true
MsgBox "UsesInternalRever: "+str(m.UsesInternalReverb)
```

**Notes:** Lasterror is set.
(Read and Write computed property)

### 125.9.28 Volume as single

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: All.

**Function:** The volume.
**Notes:** The value is in dB from -120 to 40.
(Read and Write computed property)

## 125.10 class MidiPortMBS

### 125.10.1 class MidiPortMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class for a MIDI port.
**Notes:** A MIDIPortMBS, which may be an input port or output port, is an object through which a client may communicate with any number of MIDI sources or destinations.
Subclass of the MidiObjectMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr1

### 125.10.2 Methods

### 125.10.3 close

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.10.4 ConnectSource(source as MidiEndpointMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Establish a connection from a source to a client's input port.
**Notes:** Lasterror is set.

### 125.10.5 DisconnectSource(source as MidiEndpointMBS)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Close a previously-established source-to-input port connection.
**Notes:** Lasterror is set.

### 125.10.6 SetCallback(callback as Integer, reference as object)

MBS MacCF Plugin, Plugin Version: 6.0, Platform: macOS, Targets: All.

**Function:** Connects the MidiPort to send data to given MidiPlayback reference.
**Example:**

```
dim p as MidiPlaybackMBS
dim m as MidiPortMBS
// do something useful
m.SetCallback p.Callback, p
```

**Notes:** The method is to be used together with the Callback function in the MidiPlaybackMBS class.
Read event is still being called if needed.

You can call again with 0 as callback to clear it.

### 125.10.7 Events

### 125.10.8 Read(endpoint as MidiEndpointMBS, list as MidiPacketListMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: .

**Function:** Called when data arrives at this port.
**Notes:** If more than 256 bytes of data is received, it may be splitted and send in several events.

For some devices a Note Off is just a Note On with a zero velocity.

## 125.11 class MIDISysexSendRequestMBS

### 125.11.1 class MIDISysexSendRequestMBS

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** An asynchronous request to send a single system-exclusive MIDI event to a MIDI destination.
**Example:**

```
// build a data package
Dim data As New MemoryBlock(9)

data.Byte(0) = &hF0
data.Byte(1) = &h00
data.Byte(2) = &h20
data.Byte(3) = &h1C
data.Byte(4) = &h7F
data.Byte(5) = &h04
data.Byte(6) = &h02
data.Byte(7) = &h01
data.Byte(8) = &hF7

// make new secon request
Dim sendRequest As New MIDISysexSendRequestMBS
sendRequest.Data = data
sendRequest.Destination = currentDest
sendRequest.Send

// store reference for later as send is asynchron
Window1.sendRequest = sendRequest
```

### 125.11.2 Methods

### 125.11.3 close

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.11.4 Send

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Send a single system-exclusive event, asynchronously.
**Notes:** Keep a reference to this object until the call Completes.

### 125.11.5 Properties

### 125.11.6 BytesToSend as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** Initially set when sending starts to the number of bytes to be sent.
**Notes:** MIDISendSysex will decrement this counter as bytes are sent.
(Read and Write property)

### 125.11.7 Data as Memoryblock

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The memoryblock with the data you want to send.
**Notes:** (Read and Write property)

### 125.11.8 Destination as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The endpoint to which the event is to be sent.
**Notes:** (Read and Write property)

### 125.11.9 IsComplete as boolean

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The client may set this to true at any time to abort transmission.
**Notes:** The implementation sets this to true when all bytes have been sent.
Renamed from Complete to IsComplete in v4.3 for Xojo 6 compatibility.
(Read and Write property)

### 125.11.10 Lasterror as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** 0 for success.
(Read and Write property)

### 125.11.11 Length as Integer

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Function:** The length of the memoryblock.
**Notes:** If 0, the memoryblock.size property is taken, but not all memoryblocks know their size.
(Read and Write property)

### 125.11.12 Events

### 125.11.13 Complete

MBS MacCF Plugin, Plugin Version: 3.4, Platform: macOS, Targets: .

**Function:** An event to notify the client of the completion of a call to MIDISendSysex.

## 125.12 class MidiThruConnectionControlTransformMBS

### 125.12.1 class MidiThruConnectionControlTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a control transformation midi connection.
**Notes:** Note: must order control transforms appropriately – first, filter out and remap. Further transforms can follow, and will apply to the remapped control number (if any).
N.B. All transformations are done using 14-bit control values, so, when doing an add/min/max transform on a 7-bit value, the parameter must be a 14-bit value, e.g. to add n, param must be n «7.

### 125.12.2 Properties

### 125.12.3 ControlNumber as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The control number.
**Notes:** (Read and Write property)

### 125.12.4 ControlType as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The control type.
**Notes:** implementation note: some code tests bits of these values

constants:

| | | |
|---|---|---|
| kMIDIControlType_7Bit | 0 | control numbers may be 0-127 |
| kMIDIControlType_14Bit | 1 | control numbers may be 0-31 |
| kMIDIControlType_7BitRPN | 2 | control numbers may be 0-16383 |
| kMIDIControlType_14BitRPN | 3 | |
| kMIDIControlType_7BitNRPN | 4 | |
| kMIDIControlType_14BitNRPN | 5 | |

(Read and Write property)

### 125.12.5 Parameter as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The parameter for the transformation.
**Notes:** (Read and Write property)

### 125.12.6 RemappedControlType as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The Remapped Control Type.
**Notes:** Only used when transform is kMIDITransform_MapControl
(Read and Write property)

### 125.12.7 Transform as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The transformation code to apply.
**Notes:** Some constants:

| | | |
|---|---|---|
| kMIDITransform_None | 0 | no param |
| kMIDITransform_FilterOut | 1 | filter out event type, no param |
| kMIDITransform_MapControl | 2 | param is remapped control number |
| kMIDITransform_Add | 8 | param is value to add |
| kMIDITransform_Scale | 9 | param is amount to scale by: fixed point bbbb.bbbb bbbb bbbb |
| kMIDITransform_MinValue | 10 | |
| kMIDITransform_MaxValue | 11 | |
| kMIDITransform_MapValue | 12 | param is index of map in connection's map array |

(Read and Write property)

## 125.13 class MidiThruConnectionEndpointMBS

### 125.13.1 class MidiThruConnectionEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for an endpoint specifications.
**Notes:** When filling one of these out, clients can leave uniqueID 0 if the endpoint exists.
When when one is provided back to the client, the endpoint may be null if it doesn't exist, but the uniqueID will always be non-zero.

### 125.13.2 Methods

### 125.13.3 close

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.13.4 Properties

### 125.13.5 Endpoint as MidiEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The endpoint to use for a connection.
**Notes:** (Read and Write property)

### 125.13.6 UniqueID as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** An unique ID for an endpoint.
**Notes:** (Read and Write property)

## 125.14 class MidiThruConnectionMBS

### 125.14.1 class MidiThruConnectionMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A class for a midi connection.
**Notes:** This class defines functions to create MIDI play-through connections between the MIDI sources and destinations. These connections may be persistent or transitory, owned by a client.

By using connections instead of doing MIDI Thru operations themselves, the overhead of moving MIDI messages between the server and the client for thru-ing is reduced.

The aim of these functions is to permit as flexible a set of transformations as possible while keeping the API and data structures relatively simple.

Subclass of the MidiObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MBS Xojo Plugins, version 20.1pr4
- MBS Xojo Plugins, version 19.3pr5

### 125.14.2 Methods

### 125.14.3 close

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.14.4 Create(PersistentOwnerID as CFStringMBS, params as MidiThruConnectionParamsMBS)

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Creates a new connection.
**Notes:** If inPersistentOwnerID is nil, then the connection is marked as owned by the client and will be automatically disposed with the client.
If it is non-nil, then it should be a unique identifier, e.g. "com.mycompany.MyCoolProgram".

### 125.14.5 Find(PersistentOwnerID as String) as MidiThruConnectionMBS()

MBS MacCF Plugin, Plugin Version: 24.1, Platform: macOS, Targets: All.

**Function:** Returns all of the persistent thru connections created by a client.
**Notes:** PersistentOwnerID: The ID of the owner whose connections are to be returned.

### 125.14.6 Properties

### 125.14.7 Parameter as MidiThruConnectionParamsMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The parameters for the connection.
**Notes:** Lasterror is set.
(Read and Write computed property)

# 125.15 class MidiThruConnectionParamsMBS

## 125.15.1 class MidiThruConnectionParamsMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The class for the parameters of a midi connection.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr4

## 125.15.2 Methods

## 125.15.3 close

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

## 125.15.4 Properties

## 125.15.5 ChannelPressure as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

## 125.15.6 ControlTransformsCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The number of control transformations used.
**Notes:** If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the ControlTransform array.
(Read and Write property)

### 125.15.7 DestinationsCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The number of destinations.
**Notes:** If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the destination array.
(Read and Write property)

### 125.15.8 FilterOutAllControls as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Unknown.
**Notes:** (Read and Write property)

### 125.15.9 FilterOutBeatClock as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Unknown.
**Notes:** (Read and Write property)

### 125.15.10 FilterOutMTC as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Unknown.
**Notes:** (Read and Write property)

### 125.15.11 FilterOutSysEx as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Unknown.
**Notes:** (Read and Write property)

### 125.15.12 FilterOutTuneRequest as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** Unknown.
**Notes:** (Read and Write property)

### 125.15.13 HighNote as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The high note value.
**Notes:** Ignored if mapping.
If highNote <lowNote, then 0..highNote and lowNote..127 are passed.
(Read and Write property)

### 125.15.14 HighVelocity as Integer

MBS MacCF Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** Higher velocity limit.
**Notes:** Note events with a velocity greater than this, if it is not 0, are filtered out.
(Read and Write property)

### 125.15.15 KeyPressure as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

### 125.15.16 LowNote as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The low note value.
**Notes:** Ignored if mapping.
If highNote <lowNote, then 0..highNote and lowNote..127 are passed.
(Read and Write property)

### 125.15.17 LowVelocity as Integer

MBS MacCF Plugin, Plugin Version: 20.1, Platform: macOS, Targets: All.

**Function:** Lower velocity limit.
**Notes:** Note events with a velocity less than this value are filtered out.
(Read and Write property)

### 125.15.18 MapsCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The number of mappings used.
**Notes:** If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries in the Map array.
(Read and Write property)

### 125.15.19 NoteNumber as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

### 125.15.20 PitchBend as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

### 125.15.21 ProgramChange as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

### 125.15.22 SourcesCount as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The number of sources used.
**Notes:** If you create a MidiThruConnectionParamsMBS object than this number is counted from the entries

in the Source array.
(Read and Write property)

### 125.15.23 Velocity as MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** One of the transformations.
**Notes:** (Read and Write property)

### 125.15.24 ChannelMap(index as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The array with the value mappings.
**Notes:** Map each of the source 16 MIDI channels to channel 0-15 (1-16) or 0xFF to filter out.
(Read and Write computed property)

### 125.15.25 ControlTransform(index as Integer) as MidiThruConnectionControlTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The array of control transformations.
**Notes:** (Read and Write computed property)

### 125.15.26 Destination(index as Integer) as MidiThruConnectionEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The array of destination endpoints.
**Notes:** (Read and Write computed property)

### 125.15.27 Map(index as Integer) as MidiThruConnectionValueMapMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The list of mappings for this midi connection.
**Notes:** Index is from 0 to 15.

(if you need more, send me an email and I upper the limit.)
(Read and Write computed property)

### 125.15.28 Source(index as Integer) as MidiThruConnectionEndpointMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The array of source endpoints.
**Notes:** (Read and Write computed property)

# 125.16 class MidiThruConnectionTransformMBS

## 125.16.1 class MidiThruConnectionTransformMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The class for a Midi connection transformation.

## 125.16.2 Properties

## 125.16.3 Parameter as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The parameter of the transformation.
**Notes:** (Read and Write property)

## 125.16.4 Transform as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The transformation code.
**Notes:** Some constants:

| | | |
|---|---|---|
| kMIDITransform_None | 0 | no param |
| kMIDITransform_FilterOut | 1 | filter out event type, no param |
| kMIDITransform_MapControl | 2 | param is remapped control number |
| kMIDITransform_Add | 8 | param is value to add |
| kMIDITransform_Scale | 9 | param is amount to scale by: fixed point bbbb.bbbb bbbb bbbb |
| kMIDITransform_MinValue | 10 | |
| kMIDITransform_MaxValue | 11 | |
| kMIDITransform_MapValue | 12 | param is index of map in connection's map array |

(Read and Write property)

## 125.17 class MidiThruConnectionValueMapMBS

### 125.17.1 class MidiThruConnectionValueMapMBS

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** A value map for a Midi connection.
**Notes:** This is an array to map Midi values from 0 to 127 to new values from 0 to 127.

### 125.17.2 Properties

### 125.17.3 Value(index as Integer) as Integer

MBS MacCF Plugin, Plugin Version: 3.3, Platform: macOS, Targets: All.

**Function:** The value Map.
**Notes:** Index is from 0 to 127.
Use only values from 0 to 127.
(Read and Write computed property)

# 125.18 class PortMidiDeviceInfoMBS

## 125.18.1 class PortMidiDeviceInfoMBS

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for device information.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.3pr5

## 125.18.2 Properties

## 125.18.3 HasInput as Boolean

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if input is available.
**Notes:** (Read only property)

## 125.18.4 HasOutput as Boolean

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if output is available.
**Notes:** (Read only property)

## 125.18.5 InterfaceName as String

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Underlying MIDI API.
**Notes:** e.g. MMSystem, DirectX or CoreMidi.
(Read only property)

## 125.18.6 Name as String

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The device name.
**Notes:** e.g. USB MidiSport 1x1

(Read only property)

## 125.19 class PortMidiEventMBS

### 125.19.1 class PortMidiEventMBS

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a piece of midi data.
**Notes:** See this website for a list of Midi status codes:
https://www.midi.org/specifications-old/item/table-2-expanded-messages-list-status-bytes
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr3
- MBS REALbasic Plugins, version 11.0pr14

### 125.19.2 Methods

### 125.19.3 Set(status as Integer, data1 as Integer, data2 as Integer)

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value to the given data.

### 125.19.4 SetRaw(data0 as Integer, data1 as Integer, data2 as Integer, data3 as Integer)

MBS Audio Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the raw data by setting all 4 bytes together.

### 125.19.5 Properties

### 125.19.6 CurrentEvent as PortMidiEventMBS

MBS Audio Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current event played.
**Notes:** You can use this to show current note playing.
(Read only property)

### 125.19.7 Data1 as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first data value in the midi event.
**Notes:** (Read and Write property)

### 125.19.8 Data2 as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second data value in the midi event.
**Notes:** (Read and Write property)

### 125.19.9 RawData0 as Integer

MBS Audio Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first byte of the raw data in this event.
**Notes:** Same as Status property.
(Read and Write property)

### 125.19.10 RawData1 as Integer

MBS Audio Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second byte of the raw data in this event.
**Notes:** Same as Data1 property.
(Read and Write property)

### 125.19.11 RawData2 as Integer

MBS Audio Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The third byte of the raw data in this event.
**Notes:** Same as Data2 property.
(Read and Write property)

### 125.19.12 RawData3 as Integer

MBS Audio Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The forth byte of the raw data in this event.
**Notes:** (Read and Write property)

### 125.19.13 RawMessage as Integer

MBS Audio Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw content of the event as a integer.
**Notes:** Take care about platform differences like the byte order.
(Read and Write property)

### 125.19.14 Status as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The status value.
**Notes:** (Read and Write property)

### 125.19.15 When as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time value of this midi data.
**Notes:** Should be milliseconds.
(Read and Write property)

## 125.20 class PortMidiMBS

### 125.20.1 class PortMidiMBS

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The PortMidi library wrapped for use in Xojo.
**Notes:** Error codes:

```
const pmNoError              = 0
const pmHostError            = -10000
const pmInvalidDeviceId      = -9999
const pmInsufficientMemory   = -9998
const pmBufferTooSmall       = -9997
const pmBufferOverflow       = -9996
const pmBadPtr               = -9995
const pmBadData              = -9994
const pmInternalError        = -9993
const pmBufferMaxSize        = -9992
```

Requires libasound.so.2 on Linux to be installed.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr5
- MBS Xojo / Real Studio Plugins, version 16.3pr4

### 125.20.2 Methods

### 125.20.3 CountDevices as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts the devices.
**Example:**

```
dim pa as new PortMidiMBS

Dim u as Integer = pa.CountDevices-1
for i as Integer = 0 to u
dim d as PortMidiDeviceInfoMBS = pa.DeviceInfo(i)
MsgBox d.Name+", "+D.InterfaceName
next
```

**Notes:** Returns 0 on any error.

### 125.20.4 DefaultInputDeviceID as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the default device ID or pmNoDevice (-1) if there are no devices.
**Notes:** On the PC, the user can specify a default device by setting an environment variable. For example, to use device #1.

set PM_RECOMMENDED_OUTPUT_DEVICE=1

The user should first determine the available device ID by using the supplied application "testin" or "testout".

In general, the registry is a better place for this kind of info, and with USB devices that can come and go, using integers is not very reliable for device identification. Under Windows, if PM_RECOMMENDED_OUTPUT_DEVICE (or PM_RECOMMENDED_INPUT_DEVICE) is *NOT* found in the environment, then the default device is obtained by looking for a string in the registry under: HKEY_LOCAL_MACHINE/SOFTWARE/PortMidi/Recommended_Input_Device and HKEY_LOCAL_MACHINE/SOFTWARE/PortMidi/Recommended_Output_Device for a string. The number of the first device with a substring that matches the string exactly is returned. For example, if the string in the registry is "USB", and device 1 is named "In USB MidiSport 1x1", then that will be the default input because it contains the string "USB".

In addition to the name, PmDeviceInfo has the member "interf", which is the interface name. (The "interface" is the underlying software system or API used by PortMidi to access devices. Examples are MMSystem, DirectX (not implemented), ALSA, OSS (not implemented), etc.) At present, the only Win32 interface is "MMSystem", the only Linux interface is "ALSA", and the only Max OS X interface is "CoreMIDI".

To specify both the interface and the device name in the registry, separate the two with a comma and a space, e.g.:
MMSystem, In USB MidiSport 1x1
In this case, the string before the comma must be a substring of the "interf" string, and the string after the space must be a substring of the "name" name string in order to match the device.

Note: in the current release, the default is simply the first device (the input or output device with the lowest PmDeviceID).

### 125.20.5 DefaultOutputDeviceID as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the default device ID or pmNoDevice (-1) if there are no devices.
**Notes:** On the PC, the user can specify a default device by setting an environment variable. For example,

to use device #1.

set PM_RECOMMENDED_OUTPUT_DEVICE=1

The user should first determine the available device ID by using the supplied application "testin" or "testout".

In general, the registry is a better place for this kind of info, and with USB devices that can come and go, using integers is not very reliable for device identification. Under Windows, if PM_RECOMMENDED_OUTPUT_DEVICE (or PM_RECOMMENDED_INPUT_DEVICE) is *NOT* found in the environment, then the default device is obtained by looking for a string in the registry under: HKEY_LOCAL_MACHINE/SOFTWARE/PortMidi/Recommended_Input_Device and HKEY_LOCAL_MACHINE/SOFTWARE/PortMidi/Recommended_Output_Device for a string. The number of the first device with a substring that matches the string exactly is returned. For example, if the string in the registry is "USB", and device 1 is named "In USB MidiSport 1x1", then that will be the default input because it contains the string "USB".

In addition to the name, PmDeviceInfo has the member "interf", which is the interface name. (The "interface" is the underlying software system or API used by PortMidi to access devices. Examples are MMSystem, DirectX (not implemented), ALSA, OSS (not implemented), etc.) At present, the only Win32 interface is "MMSystem", the only Linux interface is "ALSA", and the only Max OS X interface is "CoreMIDI".

To specify both the interface and the device name in the registry, separate the two with a comma and a space, e.g.:
MMSystem, In USB MidiSport 1x1
In this case, the string before the comma must be a substring of the "interf" string, and the string after the space must be a substring of the "name" name string in order to match the device.

Note: in the current release, the default is simply the first device (the input or output device with the lowest PmDeviceID).

### 125.20.6 DeviceInfo(DeviceID as Integer) as PortMidiDeviceInfoMBS

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns information about a certain device.
**Example:**

```
dim pa as new PortMidiMBS

Dim u as Integer = pa.CountDevices-1
for i as Integer = 0 to u
dim d as PortMidiDeviceInfoMBS = pa.DeviceInfo(i)
MsgBox d.Name+", "+D.InterfaceName
next
```

**Notes:** Returns nil on any error.

### 125.20.7 ErrorText(ErrorNumber as Integer) as string

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error text for the given error code.
**Notes:** Returns "" on any error.

### 125.20.8 Initialize as Integer

MBS Audio Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the PortMidi functions.
**Notes:** You call this manually to trigger initialization now.
Or you just let the plugin do it automatically when you call one of the portmidi functions.
Returns the error code. (0 = okay)

### 125.20.9 ReInitialize as Integer

MBS Audio Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shuts down PortMidi and initializes it again.
**Notes:** As PortMidi does not recognize the attachment of new MIdi devices, you can only reinitialize.

Returns a PortMidi error code.

### 125.20.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| pmBadData | -9994 | One of the PortMidi errors.<br>illegal midi data, e.g. missing EOX |
| pmBadPtr | -9995 | One of the PortMidi errors. |
| pmBufferMaxSize | -9992 | One of the PortMidi errors.<br>buffer is already as large as it can be. |
| pmBufferOverflow | -9996 | One of the PortMidi errors. |
| pmBufferTooSmall | -9997 | One of the PortMidi errors. |
| pmHostError | -10000 | One of the PortMidi errors. |
| pmInsufficientMemory | -9998 | One of the PortMidi errors. |
| pmInternalError | -9993 | One of the PortMidi errors. |
| pmInvalidDeviceId | -9999 | One of the PortMidi errors.<br>out of range or output device when input is requested or input device when output is requested or device is already opened. |
| pmNoDevice | -1 | One of the PortMidi errors. |
| pmNoError | 0 | One of the PortMidi errors. |

# 125.21 class PortMidiStreamMBS

## 125.21.1 class PortMidiStreamMBS

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Xojo class to represent a PortMidi stream.
**Notes:** A single PortMidiStream is a descriptor for an open MIDI device.

See also macOS specific classes AVMIDIPlayerMBS, MidiPlaybackMBS and MidiClientMBS.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr4
- MBS Xojo / Real Studio Plugins, version 17.0pr1

**Xojo Developer Magazine**

- 15.2, page 10: News

## 125.21.2 Methods

## 125.21.3 Abort as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminates outgoing messages immediately.
**Notes:** The caller should immediately close the output port; this call may result in transmission of a partial midi message. There is no abort for Midi input because the user can simply ignore messages in the buffer and close an input device at any time.
Returns an error code.

## 125.21.4 Close

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 125.21.5 currentTimeStamp as Integer

MBS Audio Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current time stamp.

### 125.21.6 ErrorText(ErrorNumber as Integer) as string

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error message for this error number.

### 125.21.7 HostError as string

MBS Audio Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries host error string.
**Example:**

```
dim s as new PortMidiStreamMBS
// do something that causes an error
MsgBox "HostError: "+s.HostError
```

**Notes:** Clears error.

### 125.21.8 OpenInput(DeviceID as Integer, Buffersize as Integer) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a device for reading.
**Notes:** DeviceID is the id of the device used for input.

For input, the buffersize specifies the number of input events to be buffered waiting to be read using Pm_Read().
(In some cases – see below – PortMidi does not buffer output at all and merely passes data to a lower-level API, in which case buffersize is ignored.)

return value:
Upon success OpenInput returns PmNoError.
If a call to OpenInput fails a nonzero error code is returned (see PMError above) and the value of port is

invalid.

### 125.21.9 OpenOutput(DeviceID as Integer, Buffersize as Integer, Latency as Integer) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a device for writing.
**Notes:** DeviceID is the id of the device used for input.

For output, buffersize specifies the number of output events to be buffered waiting for output.
(In some cases – see below – PortMidi does not buffer output at all and merely passes data to a lower-level API, in which case buffersize is ignored.)

Latency is the delay in milliseconds applied to timestamps to determine when the output should actually occur. (If latency is <0, 0 is assumed.)
If latency is zero, timestamps are ignored and all output is delivered immediately. If latency is greater than zero, output is delayed until the message timestamp plus the latency. (NOTE: time is measured relative to the time source indicated by time_proc. Timestamps are absolute, not relative delays or offsets.) In some cases, PortMidi can obtain better timing than your application by passing timestamps along to the device driver or hardware. Latency may also help you to synchronize midi data to audio data by matching midi latency to the audio buffer latency.
Due to the may timers work on Windows, the latency is limited there.

return value:
Upon success OpenInput returns PmNoError.
If a call to OpenInput fails a nonzero error code is returned (see PMError above) and the value of port is invalid.

### 125.21.10 Poll as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tests whether input is available,
**Notes:** Returns 1 on success and 0 on failure.

### 125.21.11 Read(byref data as PortMidiEventMBS) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads midi data.

**Notes:** Returns the number of read items.
(0 for error and 1 for success)

Read retrieves midi data into a buffer, and returns the number of events read. Result is a non-negative number unless an error occurs, in which case a PmError value will be returned.

Buffer Overflow

The problem: if an input overflow occurs, data will be lost, ultimately because there is no flow control all the way back to the data source. When data is lost, the receiver should be notified and some sort of graceful recovery should take place, e.g. you shouldn't resume receiving in the middle of a long sysex message.

With a lock-free fifo, which is pretty much what we're stuck with to enable portability to the Mac, it's tricky for the producer and consumer to synchronously reset the buffer and resume normal operation.

Solution: the buffer managed by PortMidi will be flushed when an overflow occurs. The consumer (Read()) gets an error message (pmBufferOverflow) and ordinary processing resumes as soon as a new message arrives. The remainder of a partial sysex message is not considered to be a "new message" and will be flushed as well.

### 125.21.12 SetChannelMask(mask as Integer) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Filters incoming messages based on channel.
**Example:**

```
dim s as PortMidiStreamMBS // your midi stream

call s.SetChannelMask(1+4) // Channel 1 and 3.
```

**Notes:** The mask is a 16-bit bitfield corresponding to appropriate channels
All channels are allowed by default.
Returns an error code.

### 125.21.13 SetFilter(filters as Integer) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetFilter() sets filters on an open input stream to drop selected input types.
**Notes:** By default, only active sensing messages are filtered.

To prohibit, say, active sensing and sysex messages, call SetFilter(FilterActive + FilterSysEx);

Filtering is useful when midi routing or midi thru functionality is being provided by the user application.
For example, you may want to exclude timing messages (clock, MTC, start/stop/continue), while allowing note-related messages to pass.
Or you may be using a sequencer or drum-machine for MIDI clock information but want to exclude any notes it may play.

Returns an error code.

### 125.21.14 Write(data as PortMidiEventMBS) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes midi data from a buffer.
**Notes:** This may contain:
- short messages or
- sysex messages that are converted into a sequence of PortMidiStreamMBS objects, e.g. sending data from a file or forwarding them from midi input.

Use WriteSysEx() to write a sysex message stored as a contiguous array of bytes.

Sysex data may contain embedded real-time messages.
Returns an error code.

### 125.21.15 WriteShort(When as Integer, message as Integer) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a timestamped non-system-exclusive midi message.
**Notes:** Messages are delivered in order as received, and timestamps must be non-decreasing. (But timestamps are ignored if the stream was opened with latency = 0.)

### 125.21.16 WriteSysEx(When as Integer, message as memoryblock, offset as Integer) as Integer

MBS Audio Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a timestamped system-exclusive midi message.
**Notes:** The data is taken from the memoryblock at the given offset.

The message must be 0 terminated.

This message must be valid and contain the special start value and a EOX value on the end.
See also:

- 125.21.17 WriteSysEx(When as Integer, message as string) as Integer 17708

### 125.21.17 WriteSysEx(When as Integer, message as string) as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a timestamped system-exclusive midi message.
**Notes:** This message must be valid and contain the special start value and a EOX value on the end.
See also:

- 125.21.16 WriteSysEx(When as Integer, message as memoryblock, offset as Integer) as Integer 17707

### 125.21.18 Properties

### 125.21.19 ChannelMask as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The channel mask used.
**Notes:** Use SetChannelMask to change it.
(Read only property)

### 125.21.20 DeviceID as Integer

MBS Audio Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The device ID.
**Notes:** The ID of the device the stream is connected to.
(Read only property)

### 125.21.21 DeviceName as String

MBS Audio Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The device name.
**Notes:** The name of the device the stream is connected to.
(Read only property)

### 125.21.22 Filters as Integer

MBS Audio Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The filters setting.
**Notes:** Use SetFilters to change it.
(Read only property)

### 125.21.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| FilterActive | &h4000 | One of the PortMidi filter constants.<br>filter active sensing messages (&hFE) |
| FilterAftertouch | &h6000000 | One of the PortMidi filter constants.<br>filter both channel and poly aftertouch |
| FilterChannelAftertouch | &h20000000 | One of the PortMidi filter constants.<br>filter channel aftertouch (most midi controllers use this) (&hD0-&hDF) |
| FilterClock | &h1D00 | One of the PortMidi filter constants.<br>filter clock messages (CLOCK &hF8, START &hFA, STOP &hFC, and CONTINUE &hFB) |
| FilterControl | &h8000000 | One of the PortMidi filter constants.<br>Control Changes (CC's) (&hB0-&hBF) |
| FilterFD | &h2000 | One of the PortMidi filter constants.<br>filter undefined FD messages |
| FilterMTC | 2 | One of the PortMidi filter constants.<br>MIDI Time Code (&hF1) |
| FilterNote | &h3000000 | One of the PortMidi filter constants.<br>filter note-on and note-off (&h90-&h9F and &h80-&h8F |
| FilterPitchBend | &h40000000 | One of the PortMidi filter constants.<br>Pitch Bender (&hE0-&hEF) |
| FilterPlay | &h400 | One of the PortMidi filter constants.<br>filter play messages (start &hFA, stop &hFC, continue &hFB) |
| FilterPolyAftertouch | &h4000000 | One of the PortMidi filter constants.<br>per-note aftertouch (&hA0-&hAF) |
| FilterProgram | &h10000000 | One of the PortMidi filter constants.<br>Program changes (&hC0-&hCF) |
| FilterRealTime | &hFF01 | One of the PortMidi filter constants.<br>filter all real-time messages |
| FilterReset | &h8000 | One of the PortMidi filter constants.<br>filter reset messages (&hFF) |
| FilterSongPosition | 4 | One of the PortMidi filter constants.<br>Song Position (&hF2) |
| FilterSongSelect | 8 | One of the PortMidi filter constants.<br>Song Select (&hF3) |
| FilterSysEx | 1 | One of the PortMidi filter constants.<br>filter system exclusive messages (&hF0) |
| FilterSystemCommon | &h4E | One of the PortMidi filter constants.<br>All System Common messages (mtc, song position, song select, tune request) |
| FilterTick | &h200 | One of the PortMidi filter constants.<br>filter tick messages (&hF9) |
| FilterTune | &h40 | One of the PortMidi filter constants.<br>Tuning request (&hF6) |
| FilterUndefined | &h2000 | One of the PortMidi filter constants.<br>filter undefined real-time messages |

## 125.22 class WindowsMidiInputInfoMBS

### 125.22.1 class WindowsMidiInputInfoMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** A class for information about a certain Midi Device.

### 125.22.2 Properties

### 125.22.3 DriverVersion as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Version number of the device driver for the MIDI input device.
**Notes:** The high-order byte is the major version number, and the low-order byte is the minor version number.
(Read only property)

### 125.22.4 Flags as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Some flags.
**Notes:** Currently unused in Windows XP.
(Read only property)

### 125.22.5 ManufacturerID as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Manufacturer identifier of the device driver for the MIDI input device.
**Notes:** (Read only property)

### 125.22.6 Name as String

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Product name.
**Notes:** Currently an ANSI string.

(Read only property)

### 125.22.7 ProductID as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Product identifier of the MIDI input device.
**Notes:** (Read only property)

# 125.23 class WindowsMidiInputMBS

## 125.23.1 class WindowsMidiInputMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** A class to represent an open Midi Input device in Xojo.
**Notes:** Subclass of the WindowsMidiMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr2
- MBS Real Studio Plugins, version 13.1pr9

## 125.23.2 Methods

## 125.23.3 Close

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Closes the device.
**Notes:** First stops recording, second resets midi output device and third Closes the device with waiting till device is done.
Handle is set to 0 and lasterror is set.

## 125.23.4 Idle

MBS Audio Plugin, Plugin Version: 9.7, Platform: Windows, Targets: All.

**Function:** Processes events.
**Notes:** Midi events are buffered in data structures. This method dispatches them to the Xojo event handlers.
Call this method as often as you need events to fire. For example every 100ms in a timer.

same as WindowsMidiMBS.Idle

## 125.23.5 InputErrorText(errorcode as Integer) as string

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Translates an error number into a human readable text.
**Notes:** Returns "" on unknown errros.

String returned has Windows ANSI text encoding.

### 125.23.6 Open(DeviceID as Integer, BufferSize as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Opens a Midi device.
**Notes:** DeviceID is from 0 to NumberOfMidiInputDevices-1.
Buffersize is the maximum size to allocate for each SysEx receive buffer.
Minimum is 256 bytes. Windows does not handle SysEx messages bigger than 64K.
Lasterror is set.
On success the handle property is non zero.

### 125.23.7 Reset

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Resets the device.
**Notes:** Lasterror is set.

### 125.23.8 Start

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Starts listening for events.
**Notes:** Lasterror is set.
Please do not call from Open event as that's too early.

### 125.23.9 Stop

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Stops recording.
**Notes:** Lasterror is set.
You should not need this and just call close or let the object die.

### 125.23.10 Events

### 125.23.11 DeviceClose

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** An event called whenever the output device is closed.
**Notes:** Called when you call close.

### 125.23.12 DeviceData(timestamp as Integer, status as Integer, data1 as Integer, data2 as Integer, RawData as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** A simple Midi message has been received.
**Notes:** Process this event fast to avoid loosing events.
Status, Data1 and Data2 are all 8 bit values.
The time stamp is specified in milliseconds, beginning at zero when the Start function was called.

### 125.23.13 DeviceError(timestamp as Integer, status as Integer, data1 as Integer, data2 as Integer, RawData as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** A bad Midi message has been received.
**Notes:** Process this event fast to avoid loosing events.
Status, Data1 and Data2 are all 8 bit values.
The time stamp is specified in milliseconds, beginning at zero when the Start function was called.

### 125.23.14 DeviceLongData(timestamp as Integer, data as string, dataMemory as memoryblock)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** SysEx data was received.
**Notes:** If data is "" no free buffer was available to store the data.
The time stamp is specified in milliseconds, beginning at zero when the Start function was called.

### 125.23.15 DeviceLongError(timestamp as Integer, data as string, dataMemory as memoryblock)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** Bad SysEx data was received.
**Notes:** If data is "" no free buffer was available to store the data.
The time stamp is specified in milliseconds, beginning at zero when the Start function was called.

### 125.23.16 DeviceOpen

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** An event called whenever the output device is opened.
**Notes:** Called when you call open.
Please do not call Start from Open event as that's too early.

# 125.24 class WindowsMidiMBS

## 125.24.1 class WindowsMidiMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Windows Midi base class.
**Example:**

```
dim midi as WindowsMidiMBS // your midi object

Sub Open()
dim i as WindowsMidiInputInfoMBS
dim o as WindowsMidiOutputInfoMBS
dim c,n as Integer

midi=new WindowsMidiMBS

c=midi.NumberOfMidiInputDevices-1

for n=0 to c
i=midi.InputDevice(n)

listbox1.AddRow str(n+1)
listbox1.Cell(listbox1.LastIndex,1)=i.Name
listbox1.Cell(listbox1.LastIndex,2)=hex(i.DriverVersion)

next

c=midi.NumberOfMidiOutputDevices-1

for n=0 to c
o=midi.OutputDevice(n)

listbox2.AddRow str(n+1)
listbox2.Cell(listbox2.LastIndex,1)=o.Name
listbox2.Cell(listbox2.LastIndex,2)=hex(o.DriverVersion)

next

End Sub
```

**Notes:** See also PortMidiMBS class for cross platform Midi handling.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr9

### 125.24.2 Methods

### 125.24.3 Connect(output as WindowsMidiOutputMBS)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The Connect function connects a MIDI input device to a MIDI thru or output device, or connects a MIDI thru device to a MIDI output device.
**Notes:** self must be a MIDI input device or a MIDI thru device.
output must be the MIDI output or thru device.

After calling this function, the MIDI input device receives event data in an DeviceData event whenever a message with the same event data is sent to the output device driver.

A thru driver is a special form of MIDI output driver. The system will allow only one MIDI output device to be connected to a MIDI input device, but multiple MIDI output devices can be connected to a MIDI thru device. Whenever the given MIDI input device receives event data in an DeviceData event, a message with the same event data is sent to the given output device driver (or through the thru driver to the output drivers).

Lasterror is set.

### 125.24.4 DataLost as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Number of data blocks lost.
**Notes:** The buffers in the plugins have a certain size.
In case midi events are coming fast in and the Idle method is not called often enough events are lost.
In that case increase the frequency of calling Idle or request the buffer size to be increased in the next plugin version.

### 125.24.5 Disconnect(output as WindowsMidiOutputMBS)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The Disconnect function disconnects a MIDI input device from a MIDI thru or output device, or disconnects a MIDI thru device from a MIDI output device.
**Notes:** self must be a MIDI input device or a MIDI thru device.
output must be the MIDI output device to be disconnected.

MIDI input, output, and thru devices can be connected by using the Connect function. Thereafter, whenever the MIDI input device receives event data in an DeviceData event, a message with the same event data is

sent to the output device driver (or through the thru driver to the output drivers).

Lasterror is set.

### 125.24.6 EventsLost as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Number of events lost.
**Notes:** The buffers in the plugins have a certain size.
In case midi events are coming fast in and the Idle method is not called often enough events are lost.
In that case increase the frequency of calling Idle or request the buffer size to be increased in the next plugin version.

### 125.24.7 Idle

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Processes events.
**Notes:** Midi events are buffered in data structures. This method dispatches them to the Xojo event handlers.
Call this method as often as you need events to fire. For example every 100ms in a timer.

### 125.24.8 InputDevice(index as Integer) as WindowsMidiInputInfoMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The InputDevice function queries a specified MIDI input device to determine its capabilities.
**Example:**

```
dim midi as WindowsMidiMBS // your midi object
dim n,c as Integer
dim i as WindowsMidiInputInfoMBS

c=midi.NumberOfMidiInputDevices-1

for n=0 to c
i=midi.InputDevice(n)

listbox1.AddRow str(n+1)
listbox1.Cell(listbox1.LastIndex,1)=i.Name
listbox1.Cell(listbox1.LastIndex,2)=hex(i.DriverVersion)
```

next

**Notes:** Index is from 0 to NumberOfMidiInputDevices-1.

### 125.24.9 NumberOfMidiInputDevices as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Returns the number of MIDI input devices present in the system.
**Example:**

```
dim midi as new WindowsMidiMBS
MsgBox str(midi.NumberOfMidiInputDevices)
```

**Notes:** A return value of zero means that there are no devices.

### 125.24.10 NumberOfMidiOutputDevices as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Returns the number of MIDI output devices present in the system.
**Example:**

```
dim midi as new WindowsMidiMBS
MsgBox str(midi.NumberOfMidiOutputDevices)
```

**Notes:** A return value of zero means that there are no devices.

### 125.24.11 OutputDevice(index as Integer) as WindowsMidiOutputInfoMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The OutputDevice function queries a specified MIDI output device to determine its capabilities.
**Example:**

```
dim midi as WindowsMidiMBS // your midi object
dim c,n as Integer
dim o as WindowsMidiOutputInfoMBS
```

```
c=midi.NumberOfMidiOutputDevices-1

for n=0 to c
o=midi.OutputDevice(n)

listbox2.AddRow str(n+1)
listbox2.Cell(listbox2.LastIndex,1)=o.Name
listbox2.Cell(listbox2.LastIndex,2)=hex(o.DriverVersion)

next
```

**Notes:** Index is from 0 to NumberOfMidiOutputDevices-1.

### 125.24.12 Properties

### 125.24.13 Handle as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The handle for this Midi input or output port.
**Notes:** Depending on which Xojo class this is, value is a HMIDI, HMIDIIN or HMIDIOUT handle.
(Read only property)

### 125.24.14 Lasterror as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** 0 is no error and -1 is parameter error from the plugin.
(Read only property)

## 125.25 class WindowsMidiOutputInfoMBS

### 125.25.1 class WindowsMidiOutputInfoMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** A class for information about a certain Midi Device.

### 125.25.2 Properties

### 125.25.3 ChannelMask as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Channels that an internal synthesizer device responds to, where the least significant bit refers to channel 0 and the most significant bit to channel 15.
**Notes:** Port devices that transmit on all channels set this member to &hFFFF.
(Read only property)

### 125.25.4 DriverVersion as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Version number of the device driver for the MIDI input device.
**Notes:** The high-order byte is the major version number, and the low-order byte is the minor version number.
(Read only property)

### 125.25.5 Flags as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Optional functionality supported by the device.
**Notes:** It can be one or more of the following:

| | | |
|---|---|---|
| MIDICAPS_CACHE | = 4 | Supports patch caching. |
| MIDICAPS_LRVOLUME | = 2 | Supports separate left and right volume control. |
| MIDICAPS_STREAM | = 8 | Provides direct support for the midiStreamOut function. |
| MIDICAPS_VOLUME | = 1 | Supports volume control. |

If a device supports volume changes, the MIDICAPS_VOLUME flag will be set for the dwSupport member.

If a device supports separate volume changes on the left and right channels, both the MIDICAPS_VOLUME and the MIDICAPS_LRVOLUME flags will be set for this member.
(Read only property)

### 125.25.6 ManufacturerID as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Manufacturer identifier of the device driver for the MIDI input device.
**Notes:** (Read only property)

### 125.25.7 Name as String

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Product name.
**Notes:** Currently an ANSI string.
(Read only property)

### 125.25.8 Notes as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Maximum number of simultaneous notes that can be played by an internal synthesizer device.
**Notes:** If the device is a port, this member is not meaningful and is set to 0.
(Read only property)

### 125.25.9 ProductID as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Product identifier of the MIDI input device.
**Notes:** (Read only property)

### 125.25.10 Technology as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Type of the MIDI output device.
**Notes:** This value can be one of the following:

```
MOD_MIDIPORT     = 1   // output port
MOD_SYNTH        = 2   // generic internal synth
MOD_SQSYNTH      = 3   // square wave internal synth
MOD_FMSYNTH      = 4   // FM internal synth
MOD_MAPPER       = 5   // MIDI mapper
MOD_WAVETABLE    = 6   // hardware wavetable synth
MOD_SWSYNTH      = 7   // software synth
```

(Read only property)

### 125.25.11 Voices as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Number of voices supported by an internal synthesizer device.
**Notes:** If the device is a port, this member is not meaningful and is set to 0.
(Read only property)

### 125.25.12 Volume as Boolean

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Whether volume control is available.
**Notes:** True if yes and False if no.
(Read only property)

### 125.25.13 VolumeStereo as Boolean

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Whether the device can control volume on two independend channels.
**Notes:** True if stereo, False if mono.
(Read only property)

# 125.26 class WindowsMidiOutputMBS

## 125.26.1 class WindowsMidiOutputMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** A class to represent a Midi Output device.
**Notes:** Subclass of the WindowsMidiMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr2

## 125.26.2 Methods

## 125.26.3 Close

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Closes the output device.
**Notes:** Closes the device with waiting till device is done.
Handle is set to 0 and lasterror is set.

## 125.26.4 Open(DeviceID as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Opens the midi device with the given index.
**Notes:** DeviceID is from 0 to NumberOfMidiOutputDevices-1.
Lasterror is set.

## 125.26.5 OpenDefault

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Opens the Midi mapper which opens the device the user selected as the default midi device.
**Notes:** If only one midi output device is available this one is opened.
On success the handle property is not zero.
Lasterror is set.

### 125.26.6 OutputErrorText(errorcode as Integer) as string

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Translates an error number into a human readable text.
**Notes:** Returns "" on unknown errros.
String returned has Windows ANSI text encoding.

### 125.26.7 Reset

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Resets the output device.
**Notes:** Lasterror is set.

### 125.26.8 SendData(data as memoryblock)

MBS Audio Plugin, Plugin Version: 12.5, Platform: Windows, Targets: All.

**Function:** Sends sysex data.
**Notes:** Lasterror is set.

See also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd798474(v=vs.85).aspx
See also:


- 125.26.9 SendData(data as memoryblock, size as Integer) 17726
- 125.26.10 SendData(data as string) 17727


### 125.26.9 SendData(data as memoryblock, size as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends sysex data.
**Example:**

```
dim m as MemoryBlock
dim o as WindowsMidiOutputMBS // your midi output

m=NewMemoryBlock(8)

m.Byte(0)=&hF0
m.Byte(1)=&h7F
```

```
m.Byte(2)=&h7F
m.Byte(3)=&h04
m.Byte(4)=&h01
m.Byte(5)=&h7F
m.Byte(6)=&h7F
m.Byte(7)=&hF7

o.SendData m
```

**Notes:** Lasterror is set.
size is the size of the memoryblock to use. A wrong value will crash the application.

See also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd798474(v=vs.85).aspx
See also:

- 125.26.8 SendData(data as memoryblock) 17726
- 125.26.10 SendData(data as string) 17727

### 125.26.10 SendData(data as string)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends sysex data.
**Notes:** Lasterror is set.

See also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd798474(v=vs.85).aspx
The plugin prepares MIDIHDR structure and uses your data there.
See also:

- 125.26.8 SendData(data as memoryblock) 17726
- 125.26.9 SendData(data as memoryblock, size as Integer) 17726

### 125.26.11 SendMessage(message as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends a short midi message immediately.
**Example:**

```
dim o as WindowsMidiOutputMBS // your windows midi output
// &h90 = Note down
```

```
// &h43 = the note number
// &h40 = the velocity
o.SendMessage &h404390
```

**Notes:** The message is stored in one 32bit integer.
lowest 8 bit is status, second 8 bit is data1, third 8 bit is data2 and highest 8 bit is left 0.

Between sending note on and off messages, you need to leave time for actual playback.
Lasterror is set.

See also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd798481(v=vs.85).aspx
See also:

- 125.26.12 SendMessage(status as Integer, data1 as Integer, data2 as Integer) 17728

### 125.26.12 SendMessage(status as Integer, data1 as Integer, data2 as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends a short midi message immediately.
**Example:**

```
dim o as WindowsMidiOutputMBS // your windows midi output
// &h90 = Note down
// &h3C = the note number
// &h40 = the velocity
o.SendMessage &h90, &h3C, &h40
```

**Notes:** Lasterror is set.
Between sending note on and off messages, you need to leave time for actual playback.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd798481(v=vs.85).aspx
See also:

- 125.26.11 SendMessage(message as Integer) 17727

### 125.26.13 Properties

### 125.26.14 Volume as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The volume to be used for this device.
**Example:**

```
dim m as WindowsMidiOutputMBS // your midi output

m.Volume=0 // all silent
m.Volume=&hFFFF0000 // right only
m.Volume=&h0000FFFF // left only or max volume for mono device
m.Volume=&h7FFF7FFF // half volume for both channels
```

**Notes:** Not all devices can set the volume.
Lasterror is set.

The low-order word contains the left-channel volume setting, and the high-order word contains the right-channel setting. A value of &hFFFF represents full volume, and a value of &h0000 is silence.

If a device does not support both left and right volume control, the low-order word of dwVolume specifies the mono volume level, and the high-order word is ignored.
(Read and Write computed property)

### 125.26.15 Events

### 125.26.16 DeviceClose

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** An event called when the device is closed.
**Notes:** Should be called when you call close or the object dies.

### 125.26.17 DeviceDataSent

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** An event called whenever SysEx data was sent.

### 125.26.18 DeviceOpen

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** An event called whenever the device was opened successfully.

### 125.26.19 DevicePositionCallback

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** Called when a MEVT_F_CALLBACK Midi event is about to be executed.
**Notes:** A way to track progress in playback.

# 125.27 class WindowsMidiStreamMBS

## 125.27.1 class WindowsMidiStreamMBS

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** A class for a Windows Midi Stream.

## 125.27.2 Methods

## 125.27.3 Close

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Closes the Midi stream.

## 125.27.4 Open(DeviceID as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Opens a MIDI stream for output.
**Notes:** By default, the device is opened in paused mode.
Lasterror is set.
DeviceID: The device is opened on behalf of the stream and closed again when the stream is closed.

## 125.27.5 Pause

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Pauses playback of a specified MIDI stream.
**Notes:** Lasterror is set.

## 125.27.6 PositionBytes as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Position of the stream in bytes.
**Notes:** Lasterror is set.

### 125.27.7 PositionMS as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:**

Position of the stream in milliseconds.

**Notes:**

Lasterror is set.

### 125.27.8 PositionSamples as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Position of the stream in samples.
**Notes:** Lasterror is set.

### 125.27.9 PositionTicks as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Position of the stream in ticks.
**Notes:** Lasterror is set.

### 125.27.10 Restart

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The Restart function restarts a paused MIDI stream.
**Notes:** Lasterror is set.

### 125.27.11 SendMessage(message as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends a short midi message immediately.
**Example:**

```
dim o as WindowsMidiStreamMBS // your midi stream
```

```
// &h90 = Note down
// &h43 = the note number
// &h40 = the velocity
o.SendMessage &h404390
```

**Notes:** The message is stored in one 32bit integer.
lowest 8 bit is status, second 8 bit is data1, third 8 bit is data2 and highest 8 bit is left 0.

Between sending note on and off messages, you need to leave time for actual playback.
Lasterror is set.
See also:

- 125.27.12 SendMessage(status as Integer, data1 as Integer, data2 as Integer) 17733

### 125.27.12 SendMessage(status as Integer, data1 as Integer, data2 as Integer)

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Sends a short midi message immediately.
**Example:**

```
dim o as WindowsMidiStreamMBS // your midi stream

// &h90 = Note down
// &h3C = the note number
// &h40 = the velocity
o.SendMessage &h90, &h3C, &h40
```

**Notes:** Lasterror is set.
Between sending note on and off messages, you need to leave time for actual playback.
See also:

- 125.27.11 SendMessage(message as Integer) 17732

### 125.27.13 Stop

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The Stop function turns off all notes on all MIDI channels for the specified MIDI output device.
**Notes:** Lasterror is set.

### 125.27.14 Properties

### 125.27.15 Handle as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The handle for the midi stream.
**Notes:** Type is HMIDISTRM.
(Read only property)

### 125.27.16 Lasterror as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The last error code reported by one of the class functions.
**Notes:** (Read only property)

### 125.27.17 Tempo as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Tempo of the stream, in microseconds per quarter note.
**Notes:** The tempo is honored only if the time division for the stream is specified in quarter note format.
Lasterror is set.
(Read and Write computed property)

### 125.27.18 TimeDiv as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** Time division for this stream, in the format specified in the Standard MIDI Files 1.0 specification.
**Notes:** The low 16 bits of this integer value contain the time division.
Lasterror is set.
(Read and Write computed property)

### 125.27.19 Volume as Integer

MBS Audio Plugin, Plugin Version: 6.1, Platform: Windows, Targets: All.

**Function:** The volume to be used for this stream.
**Example:**

```
dim m as WindowsMidiStreamMBS // your midi stream

m.Volume=0 // all silent
m.Volume=&hFFFF0000 // right only
m.Volume=&h0000FFFF // left only or max volume for mono device
m.Volume=&h7FFF7FFF // half volume for both channels
```

**Notes:** Not all devices can set the volume.
Lasterror is set.

The low-order word contains the left-channel volume setting, and the high-order word contains the right-channel setting. A value of &hFFFF represents full volume, and a value of &h0000 is silence.

If a device does not support both left and right volume control, the low-order word of dwVolume specifies the mono volume level, and the high-order word is ignored.
Lasterror is set.
(Read and Write computed property)

# Chapter 126

# Mobile Ads

## 126.1 class GADAdNetworkResponseInfoMBS

### 126.1.1 class GADAdNetworkResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Response metadata for an individual ad network in an ad response.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.1.2 Methods

### 126.1.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.1.4 Properties

### 126.1.5 adNetworkClassName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A class name that identifies the ad network.
**Notes:** (Read only property)

### 126.1.6 adSourceID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source ID associated with this ad network response.
**Notes:** Empty if the ad server does not populate this field.
(Read only property)

### 126.1.7 adSourceInstanceID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source instance ID associated with this ad network response. not populate this field.
**Notes:** Empty if the ad server does
(Read only property)

### 126.1.8 adSourceInstanceName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source instance name associated with this ad network response.
**Notes:** Empty if the ad server does not populate this field.
(Read only property)

### 126.1.9 adSourceName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source name associated with this ad network response.
**Notes:** Empty if the ad server does not populate this field.
(Read only property)

### 126.1.10 adUnitMapping as Dictionary

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Network configuration set on the AdMob UI.
**Notes:** (Read only property)

### 126.1.11 dictionaryRepresentation as Dictionary

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** JSON-safe dictionary representation of the ad network response info.
**Notes:** (Read only property)

### 126.1.12 error as NSErrorMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Error associated with the request to the network.
**Notes:** Nil if the network successfully loaded an ad or if the network was not attempted.
(Read only property)

### 126.1.13 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.1.14 latency as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount of time the ad network spent loading an ad. 0 if the network was not attempted.
**Notes:** (Read only property)

## 126.2 class GADAdRewardMBS

### 126.2.1 class GADAdRewardMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad reward information.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.2.2 Methods

### 126.2.3 Constructor(rewardType as string, rewardAmount as String)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns an initialized GADAdReward with the provided reward type and reward amount.

### 126.2.4 Properties

### 126.2.5 amount as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount rewarded to the user as string.
**Notes:** (Read only property)

### 126.2.6 amountValue as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount rewarded to the user as double.
**Notes:** (Read only property)

### 126.2.7 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.2.8 type as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Type of the reward.
**Notes:** (Read only property)

## 126.3 class GADAdSizeMBS

### 126.3.1 class GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The class for an ad size.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5

**Xojo Developer Magazine**

- 21.1, page 33: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 126.3.2 Methods

### 126.3.3 Banner as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** iPhone and iPod Touch ad size.
**Notes:** Typically 320x50.

### 126.3.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.3.5 Fluid as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An ad size that spans the full width of its container, with a height dynamically determined by the ad.

### 126.3.6 FullBanner as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Full Banner size for the iPad (especially in a PopOver or in sheet).
**Notes:** Typically 468x60.

### 126.3.7 Invalid as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Invalid ad size marker.

### 126.3.8 LargeBanner as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Taller version of GADAdSizeBanner.
**Notes:** Typically 320x100.

### 126.3.9 Leaderboard as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Leaderboard size for the iPad.
**Notes:** Typically 728x90.

### 126.3.10 MediumRectangle as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Medium Rectangle size for the iPad (especially in a UISplitView's left pane).
**Notes:** Typically 300x250.

### 126.3.11 Skyscraper as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Skyscraper size for the iPad.
**Notes:** Mediation only. AdMob/Google does not offer this size. Typically 120x600.

### 126.3.12 Properties

### 126.3.13 Flags as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The flags field.
**Notes:** (Read only property)

### 126.3.14 Height as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The height value.
**Notes:** (Read only property)

### 126.3.15 IsFluid as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns true if this is a fluid ad size.
**Notes:** (Read only property)

### 126.3.16 IsValid as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns true if this is a valid size.
**Notes:** (Read only property)

### 126.3.17 StringValue as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns a string describing the provided AdSize.
**Notes:** (Read only property)

### 126.3.18 Width as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The width.
**Notes:** (Read only property)

## 126.4 class GADAdValueMBS

### 126.4.1 class GADAdValueMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The monetary value earned from an ad.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.4.2 Methods

### 126.4.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.4.4 Properties

### 126.4.5 amount as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad's value as string.
**Notes:** (Read only property)

### 126.4.6 amountValue as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad's value as double.
**Notes:** (Read only property)

### 126.4.7 currencyCode as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The value's currency code.
**Notes:** (Read only property)

### 126.4.8 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.4.9 precision as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The precision of the reported ad value.
**Notes:** (Read only property)

### 126.4.10 Constants

Precisions

| Constant | Value | Description |
|---|---|---|
| PrecisionEstimated | 1 | An ad value estimated from aggregated data. |
| PrecisionPrecise | 3 | The precise value paid for this ad. |
| PrecisionPublisherProvided | 2 | A publisher-provided ad value, such as manual CPMs in a mediation group. |
| PrecisionUnknown | 0 | An ad value with unknown precision. |

## 126.5 class GADAppOpenAdMBS

### 126.5.1 class GADAppOpenAdMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An app open ad.
**Notes:** Used to monetize app load screens.

See https://developers.google.com/admob/ios/app-open to get started.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr5
- Google Admob for Xojo

### 126.5.2 Methods

### 126.5.3 canPresent(byref error as NSErrorMBS) as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.
**Notes:** Sets the error out parameter if the ad can't be presented.
Must be called on the main thread.

### 126.5.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Notes:** Please call Load method first to load the ad in background.
Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 126.5.5 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.5.6 loadWithAdUnitID(adUnitID as String, orientation as Integer, request as GADRequestMBS = nil)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.
**Notes:** Deprecated in favor of the other variant without orientation.

adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.
See also:

- 126.5.7 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil) 17749

### 126.5.7 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.
**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.
See also:

- 126.5.6 loadWithAdUnitID(adUnitID as String, orientation as Integer, request as GADRequestMBS = nil) 17749

### 126.5.8 Present

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.
**Notes:** Must be called on the main thread.

### 126.5.9 Properties

### 126.5.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.5.11 responseInfo as GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.
**Notes:** Nil until the first ad request succeeds or fails.
(Read only property)

### 126.5.12 Events

### 126.5.13 DidDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

### 126.5.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

### 126.5.15 DidRecordClick

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 126.5.16 DidRecordImpression

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

### 126.5.17 loadCompleted(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.
**Notes:** Next you can call Present when needed.

### 126.5.18 paid(value as GADAdValueMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 126.5.19 WillDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 126.5.20 WillPresentFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

### 126.5.21 Constants

Device Orientation Constants

| Constant | Value | Description |
|---|---|---|
| DeviceOrientationFaceDown | 6 | The device is held parallel to the ground with the screen facing downwa |
| DeviceOrientationFaceUp | 5 | The device is held parallel to the ground with the screen facing upwards |
| DeviceOrientationLandscapeLeft | 3 | The device is in landscape mode, with the device held upright and the button on the right side. |
| DeviceOrientationLandscapeRight | 4 | The device is in landscape mode, with the device held upright and the button on the left side. |
| DeviceOrientationPortrait | 1 | The device is in portrait mode, with the device held upright and the button at the bottom. |
| DeviceOrientationPortraitUpsideDown | 2 | The device is in portrait mode but upside down, with the device held u and the home button at the top. |
| DeviceOrientationUnknown | 0 | The orientation is currently not known. |

## 126.6 class GADBannerViewMBS

### 126.6.1 class GADBannerViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A view that displays banner ads.
**Notes:** See https://developers.google.com/admob/ios/banner to get started.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5
- Google Admob for Xojo

**Xojo Developer Magazine**

- 21.1, page 33: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 126.6.2 Methods

### 126.6.3 AddToControl(Control as MobileControl)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Adds the control to the existing mobile control as children.

### 126.6.4 Constructor(AdSize as GADAdSizeMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Initializes and returns a banner view with the specified ad size placed at its superview's origin.

### 126.6.5 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.6.6 loadRequest(request as GADRequestMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Requests an ad. The request object supplies targeting information.

### 126.6.7 setValidAdSizes(sizes() as GADAdSizeMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Sets array of GADAdSizeMBS objects, specifying all valid sizes that are appropriate for this slot.

### 126.6.8 validAdSizes as GADAdSizeMBS()

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Optional array of GADAdSizeMBS objects, specifying all valid sizes that are appropriate for this slot.

### 126.6.9 Properties

### 126.6.10 adSize as GADAdSizeMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Required to set this banner view to a proper size.
**Notes:** If not using mediation, then changing the adSize after an ad has been shown will cause a new request (for an ad of the new size) to be sent. If using mediation, then a new request may not be sent.
(Read and Write property)

### 126.6.11 adUnitID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.
**Notes:** Required value created on the Ad Manager website. Create a new ad unit for every unique placement of an ad in your application. Set this to the ID assigned for this placement. Ad units are important for targeting and statistics.

Example Ad Manager ad unit ID: "/6499/example/banner"
(Read and Write property)

### 126.6.12 autoloadEnabled as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether autoloading of ads in the receiver is enabled.
**Notes:** If enabled, you do not need to call the loadRequest method to load ads.
(Read and Write property)

### 126.6.13 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.6.14 responseInfo as GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.
**Notes:** Nil until the first ad request succeeds or fails.
(Read only property)

### 126.6.15 Events

### 126.6.16 DidDismissScreen

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the full screen view has been dismissed.
**Notes:** You should restart anything paused while handling WillPresentScreen.

### 126.6.17 DidFailToReceiveAdWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called whenan ad request failed.
**Notes:** The failure is normally due to network connectivity or ad availablility (for example, no fill).

### 126.6.18 DidReceiveAd

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when an ad request successfully received an ad.
**Notes:** You may want to add the banner view to the view hierarchy if it hasn't been added yet.

### 126.6.19 DidRecordClick

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 126.6.20 DidRecordImpression

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when an impression has been recorded for an ad.

### 126.6.21 paid(value as GADAdValueMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 126.6.22 WillDismissScreen

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the full screen view will be dismissed.

### 126.6.23 WillPresentScreen

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a full screen view will be presented in response to the user clicking on an ad.
**Notes:** You may want to pause animations and time sensitive interactions.

## 126.7 class GADInterstitialAdMBS

### 126.7.1 class GADInterstitialAdMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An interstitial ad.
**Notes:** This is a full-screen advertisement shown at natural transition points in your application such as between game levels or news stories.

See https://developers.google.com/admob/ios/interstitial to get started.
**Blog Entries**

- Add Google Ads to your Xojo app
- Google Admob for Xojo

### 126.7.2 Methods

### 126.7.3 canPresent(byref error as NSErrorMBS) as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.
**Notes:** Sets the error out parameter if the ad can't be presented.
Must be called on the main thread.

### 126.7.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Notes:** Please call Load method first to load the ad in background.
Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 126.7.5 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.7.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.
**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 126.7.7 Present

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.
**Notes:** Must be called on the main thread.

### 126.7.8 Properties

### 126.7.9 adUnitID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.
**Notes:** (Read only property)

### 126.7.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.7.11 responseInfo as GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.
**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 126.7.12 Events

### 126.7.13 DidDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

### 126.7.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

### 126.7.15 DidRecordClick

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 126.7.16 DidRecordImpression

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

### 126.7.17 loadCompleted(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.
**Notes:** Next you can call Present when needed.

### 126.7.18 paid(value as GADAdValueMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 126.7.19 WillDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 126.7.20 WillPresentFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 126.8 class GADMobileAdsMBS

### 126.8.1 class GADMobileAdsMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Google Mobile Ads SDK settings.
**Notes:** You need to load framework first, before using this class.
**Blog Entries**

- Add Google Ads to your Xojo app
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5

### 126.8.2 Methods

### 126.8.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 126.8.4 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.8.5 disableMediationInitialization

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Disables mediation adapter initialization during initialization of the GMA SDK.
**Notes:** Calling this method may negatively impact your ad performance and should only be called if you will not use GMA SDK controlled mediation during this app session. This method must be called before initializing the GMA SDK or loading ads and has no effect once the SDK has been initialized.

### 126.8.6 disableSDKCrashReporting

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Disables automated SDK crash reporting.
**Notes:** If not called, the SDK records the original exception handler if available and registers a new exception handler. The new exception handler only reports SDK related exceptions and calls the recorded original exception handler.

### 126.8.7 registerWebView(WKWebViewPtr as Ptr)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Registers a web view with the Google Mobile Ads SDK to improve in-app ad monetization of ads within this web view.
**Notes:** Please pass handle of HTMLViewer controls or WKWebViewMBS.
If needed, cast from Integer to Ptr.

### 126.8.8 requestTrackingAuthorization

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The request for user authorization to access app-related data.
**Notes:** The requestTrackingAuthorization: is a one-time request to authorize or deny access to app-related data that can be used for tracking the user or the device. The system remembers the user,Äôs choice and doesn,Äôt prompt again unless a user uninstalls and then reinstalls the app on the device.

Calls to the API only prompt when the application state is UIApplicationStateActive. The authorization prompt doesn,Äôt display if another permission request is pending user confirmation. Concurrent requests aren,Äôt preserved by iOS, and calls to the API through an app extension don,Äôt prompt. Check the trackingAuthorizationStatus for a status of TrackingManagerAuthorizationStatusNotDetermined to determine if you need to make an additional call.

### 126.8.9 sharedInstance as GADMobileAdsMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns the shared GADMobileAds instance.

### 126.8.10 start

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Starts the Google Mobile Ads SDK.
**Notes:** Call this method as early as possible to reduce latency on the session's first ad request. Calls start-

Completed event when the GMA SDK and all mediation networks are fully set up or if set-up times out. The Google Mobile Ads SDK starts on the first ad request if this method is not called.

### 126.8.11 Properties

### 126.8.12 applicationMuted as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the application's audio is muted.
**Notes:** Affects initial mute state for all ads. Use this method only if your application has its own volume controls (e.g., custom music or sound effect muting). Defaults to false.
(Read and Write property)

### 126.8.13 applicationVolume as Single

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The application's audio volume.
**Notes:** Affects audio volumes of all ads relative to other audio output.
Valid ad volume values range from 0.0 (silent) to 1.0 (current device volume). Use this method only if your application has its own volume controls (e.g., custom music or sound effect volumes). Defaults to 1.0.
(Read and Write property)

### 126.8.14 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.8.15 requestConfiguration as GADRequestConfigurationMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Request configuration that is common to all requests.
**Notes:** (Read only property)

### 126.8.16 sdkVersion as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns the version of the SDK.
**Notes:** (Read only property)

### 126.8.17 trackingAuthorizationStatus as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The authorization status that is current for the calling application.
**Notes:** Use the trackingAuthorizationStatus property to check authorization status.
(Read only property)

### 126.8.18 Events

### 126.8.19 requestTrackingAuthorizationCompleted(status as integer)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when requestTrackingAuthorization is done.

### 126.8.20 startCompleted

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called, when start method finishes.

### 126.8.21 Constants

Tracking Authorization Status

| Constant | Value | Description |
|---|---|---|
| TrackingManagerAuthorizationStatusAuthorized | 3 | The value that returns if the user authorizes access to a tracking the user or the device. |
| TrackingManagerAuthorizationStatusDenied | 2 | The value that returns if the user denies authorization t data for tracking the user or the device. |
| TrackingManagerAuthorizationStatusNotDetermined | 0 | The value that returns when the app can,Äôt determine rization status for access to app-related data for tracking th |
| TrackingManagerAuthorizationStatusRestricted | 1 | The value that returns if authorization to access app-relat the user or the device has a restricted status. |

## 126.9 class GADRequestConfigurationMBS

### 126.9.1 class GADRequestConfigurationMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Request configuration.
**Notes:** The settings in this class will apply to all ad requests.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MBS Xojo Plugins, version 23.6pr5

### 126.9.2 Methods

### 126.9.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.9.4 GADMaxAdContentRatingGeneral as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for general audiences, including families.

### 126.9.5 GADMaxAdContentRatingMatureAudience as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable only for mature audiences.

### 126.9.6 GADMaxAdContentRatingParentalGuidance as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for most audiences with parental guidance.

### 126.9.7 GADMaxAdContentRatingTeen as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for teen and older audiences.

### 126.9.8 GADSimulatorID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Add this constant to the testDevices property's array to receive test ads on the simulator.

### 126.9.9 setSameAppKeyEnabled(enabled as boolean)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Controls whether the Google Mobile Ads SDK Same App Key is enabled.
**Notes:** The value set persists across app sessions. The key is enabled by default.

### 126.9.10 setTestDeviceIdentifiers(testDeviceIdentifiers() as string)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Sets the identifiers corresponding to test devices which will always request test ads.
**Notes:** The test device identifier for the current device is logged to the console when the first ad request is made.

### 126.9.11 testDeviceIdentifiers as string()

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Identifiers corresponding to test devices which will always request test ads.
**Notes:** The test device identifier for the current device is logged to the console when the first ad request is made.

### 126.9.12 Properties

### 126.9.13 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.9.14 maxAdContentRating as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The maximum ad content rating. All Google ads will have this content rating or lower.
**Notes:** (Read and Write property)

### 126.9.15 publisherPrivacyPersonalizationState as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:**

This property lets you specify the personalization treatment that applies to subsequent ad requests.
**Notes:**

(Read and Write property)

### 126.9.16 tagForChildDirectedTreatment as Variant

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The child directed treatment tag.
**Notes:** This property indicates whether you would like your app to be treated as child-directed for purposes of the Children,Äôs Online Privacy Protection Act (COPPA),
https://www.ftc.gov/business-guidance/privacy-security/childrens-privacy.

If you set this property with true, you are indicating that your app should be treated as child-directed for purposes of the Children,Äôs Online Privacy Protection Act (COPPA).

If you set this property with false, you are indicating that your app should not be treated as child-directed for purposes of the Children,Äôs Online Privacy Protection Act (COPPA).

If you leave or reset this property as nil, ad requests will include no indication of how you would like your app treated with respect to COPPA.

By setting this property, you certify that this notification is accurate and you are authorized to act on behalf of the owner of the app. You understand that abuse of this setting may result in termination of your Google account.
(Read and Write property)

### 126.9.17 tagForUnderAgeOfConsent as Variant

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The tag for under age consent
**Notes:** This property indicates whether the user is under the age of consent.
https://developers.google.com/admob/ios/targeting#users_under_the_age_of_consent.

If you set this property with true, a TFUA parameter will be included in all ad requests, and you are indicating that you want ad requests to be handled in a manner suitable for users under the age of consent. This parameter disables personalized advertising, including remarketing, for all ad requests. It also disables requests to third-party ad vendors, such as ad measurement pixels and third-party ad servers.

If you set this property with false, you are indicating that you don't want ad requests to be handled in a manner suitable for users under the age of consent.

If you leave or reset this property as nil, ad requests will include no indication of how you would like your ad requests to be handled in a manner suitable for users under the age of consent.
(Read and Write property)

### 126.9.18 Constants

Privacy treatment personalization states

| Constant | Value | Description |
|---|---|---|
| PublisherPrivacyPersonalizationStateDefault | 0 | Indicates that ad requests should receive the default publisher p ment. |
| PublisherPrivacyPersonalizationStateDisabled | 2 | Indicates that ad requests should receive non-personalized publ treatment. |
| PublisherPrivacyPersonalizationStateEnabled | 1 | Indicates that ad requests should receive personalized publisher p ment. |

## 126.10 class GADRequestMBS

### 126.10.1 class GADRequestMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Specifies optional parameters for ad requests.
**Blog Entries**

- Add Google Ads to your Xojo app

### 126.10.2 Methods

### 126.10.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 126.10.4 request as GADRequestMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns a default request.

### 126.10.5 Properties

### 126.10.6 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.10.7 publisherProvidedID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Publisher provided user ID.
**Notes:** (Read and Write property)

### 126.10.8 requestAgent as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** String that identifies the ad request's origin.
**Notes:** Third party libraries that reference the Mobile Ads SDK should set this property to denote the platform from which the ad request originated.
For example, a third party ad network called "CoolAds network" that is mediating requests to the Mobile Ads SDK should set this property as "CoolAds".
(Read and Write property)

## 126.11 class GADResponseInfoMBS

### 126.11.1 class GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about a response to an ad request.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.11.2 Methods

### 126.11.3 adNetworkInfoArray as GADAdNetworkResponseInfoMBS()

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Array of metadata for each ad network included in the response.

### 126.11.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.11.5 GADCustomEventAdNetworkClassName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad network class name for custom event ads.

### 126.11.6 GADErrorUserInfoKeyResponseInfo as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Key into NSError.userInfo mapping to a GADResponseInfo object.
**Notes:** When ads fail to load, errors returned contain an instance of GADResponseInfoMBS.

### 126.11.7 GADGoogleAdNetworkClassName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad network class name for ads returned from Google's ad network.

### 126.11.8 Properties

### 126.11.9 adNetworkClassName as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A class name that identifies the ad network that returned the ad. Nil if no ad was returned.
**Notes:** (Read only property)

### 126.11.10 dictionaryRepresentation as Dictionary

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** JSON-safe dictionary representation of the response info.
**Notes:** (Read only property)

### 126.11.11 extrasDictionary as Dictionary

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Dictionary of extra parameters that may be returned in an ad response.
**Notes:** (Read only property)

### 126.11.12 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.11.13 loadedAdNetworkResponseInfo as GADAdNetworkResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The GADAdNetworkResponseInfo corresponding to the adapter that was used to load the ad.
**Notes:** Nil if the ad failed to load.
(Read only property)

### 126.11.14 responseIdentifier as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Unique identifier of the ad response.
**Notes:** (Read only property)

## 126.12 class GADRewardedAdMBS

### 126.12.1 class GADRewardedAdMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A rewarded ad.
**Notes:** Rewarded ads are ads that users have the option of interacting with in exchange for in-app rewards.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.12.2 Methods

### 126.12.3 canPresent(byref error as NSErrorMBS) as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the ad can be presented from the provided root view controller.
**Notes:** Sets the error out parameter if the ad can't be presented.
Must be called on the main thread.

### 126.12.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Notes:** Please call Load method first to load the ad in background.
Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 126.12.5 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.12.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads a reward ad.
**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 126.12.7 Present

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.
**Notes:** Must be called on the main thread.

### 126.12.8 Properties

### 126.12.9 adReward as GADAdRewardMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The reward earned by the user for interacting with the ad.
**Notes:** (Read only property)

### 126.12.10 adUnitID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.
**Notes:** (Read only property)

### 126.12.11 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.12.12 responseInfo as GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.
**Notes:** Nil until the first ad request succeeds or fails.
(Read only property)

### 126.12.13 Events

### 126.12.14 DidDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

### 126.12.15 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

### 126.12.16 DidRecordClick

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 126.12.17 DidRecordImpression

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

### 126.12.18 loadCompleted(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.
**Notes:** Next you can call Present when needed.

### 126.12.19 paid(value as GADAdValueMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 126.12.20 userDidEarnReward

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be executed when the user earns a reward.

### 126.12.21 WillDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 126.12.22 WillPresentFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 126.13 class GADRewardedInterstitialAdMBS

### 126.13.1 class GADRewardedInterstitialAdMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A rewarded interstitial ad.
**Notes:** Rewarded Interstitial ads are full screen ads that can be presented without user-opt in and allow you to reward the user with in-app items.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr3

### 126.13.2 Methods

### 126.13.3 canPresent(byref error as NSErrorMBS) as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.
**Notes:** Sets the error out parameter if the ad can't be presented.
Must be called on the main thread.

### 126.13.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Notes:** Please call Load method first to load the ad in background.
Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 126.13.5 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.13.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads a rewarded interstitial ad.
**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 126.13.7 Present

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.
**Notes:** Must be called on the main thread.

### 126.13.8 Properties

### 126.13.9 adReward as GADAdRewardMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The reward earned by the user for interacting with the ad.
**Notes:** (Read only property)

### 126.13.10 adUnitID as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.
**Notes:** (Read only property)

### 126.13.11 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.13.12 responseInfo as GADResponseInfoMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.
**Notes:** Nil until the first ad request succeeds or fails.
(Read only property)

### 126.13.13 Events

### 126.13.14 DidDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

### 126.13.15 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

### 126.13.16 DidRecordClick

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 126.13.17 DidRecordImpression

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

### 126.13.18 loadCompleted(error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.
**Notes:** Next you can call Present when needed.

### 126.13.19 paid(value as GADAdValueMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 126.13.20 userDidEarnReward

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be executed when the user earns a reward.

### 126.13.21 WillDismissFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 126.13.22 WillPresentFullScreenContent

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 126.14 class UIViewControllerMBS

### 126.14.1 class UIViewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** An object that manages a view hierarchy for your UIKit app.
**Notes:** The UIViewController class defines the shared behavior that,Äôs common to all view controllers. You rarely create instances of the UIViewController class directly. Instead, you subclass UIViewController and add the methods and properties needed to manage the view controller,Äôs view hierarchy.

A view controller,Äôs main responsibilities include the following:

- Updating the contents of the views, usually in response to changes to the underlying data
- Responding to user interactions with views
- Resizing views and managing the layout of the overall interface
- Coordinating with other objects —including other view controllers —in your app

A view controller is tightly bound to the views it manages and takes part in handling events in its view hierarchy. Specifically, view controllers are UIResponder objects and are inserted into the responder chain between the view controller,Äôs root view and that view,Äôs superview, which typically belongs to a different view controller. If none of the view controller,Äôs views handle an event, the view controller has the option of handling the event or passing it along to the superview.

View controllers are rarely used in isolation. Instead, you often use multiple view controllers, each of which owns a portion of your app,Äôs user interface. For example, one view controller might display a table of items while a different view controller displays the selected item from that table. Usually, only the views from one view controller are visible at a time. A view controller may present a different view controller to display a new set of views, or it may act as a container for other view controllers,Äô content and animate views however it wants.
Subclass of the NSResponderMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr5

### 126.14.2 Methods

### 126.14.3 Constructor

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The constructor to create a new empty UIViewController.

### 126.14.4 dismissViewController(animated as boolean)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the view controller that was presented modally by the view controller.
**Notes:** animated: Pass true to animate the transition.

The presenting view controller is responsible for dismissing the view controller it presented. If you call this method on the presented view controller itself, UIKit asks the presenting view controller to handle the dismissal.

If you present several view controllers in succession, thus building a stack of presented view controllers, calling this method on a view controller lower in the stack dismisses its immediate child view controller and all view controllers above that child on the stack. When this happens, only the top-most view is dismissed in an animated fashion; any intermediate view controllers are simply removed from the stack. The top-most view is dismissed using its modal transition style, which may differ from the styles used by other view controllers lower in the stack.

If you want to retain a reference to the view controller's presented view controller, get the value in the presentedViewController property before calling this method.

Xojo may not be happy, if you mess up their controllers!

### 126.14.5 loadView

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Creates the view that the controller manages.
**Notes:** You should never call this method directly. The view controller calls this method when its view property is requested but is currently nil. This method loads or creates a view and assigns it to the view property.

### 126.14.6 presentViewController(ViewController as UIViewControllerMBS, animated as Boolean)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Presents a view controller modally.
**Notes:** ViewController: The view controller to display over the current view controller,Äôs content.

animated: Pass true to animate the presentation; otherwise, pass false.

In a horizontally regular environment, the view controller is presented in the style specified by the modalPresentationStyle property. In a horizontally compact environment, the view controller is presented full screen by default. If you associate an adaptive delegate with the presentation controller associated with the object in viewControllerToPresent, you can modify the presentation style dynamically.
The object on which you call this method may not always be the one that handles the presentation. Each presentation style has different rules governing its behavior. For example, a full-screen presentation must be made by a view controller that itself covers the entire screen. If the current view controller is unable to fulfill a request, it forwards the request up the view controller hierarchy to its nearest parent, which can then handle or forward the request.
Before displaying the view controller, this method resizes the presented view controller's view based on the presentation style. For most presentation styles, the resulting view is then animated onscreen using the transition style in the modalTransitionStyle property of the presented view controller. For custom presentations, the view is animated onscreen using the presented view controller,Äôs transitioning delegate. For current context presentations, the view may be animated onscreen using the current view controller,Äôs transition style.

Xojo may not be happy, if you mess up their controllers!

### 126.14.7 Properties

### 126.14.8 className as String

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The name of this NSViewController class.
**Notes:** e.g. XOJViewController
(Read only property)

### 126.14.9 classPath as String

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The path of this NSViewController class.
**Notes:** Useful for debugging to know what super classes the view controller has.

e.g. XOJViewController:UIViewController:UIResponder:NSObject
(Read only property)

### 126.14.10 currentViewController as UIViewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Queries the current view controller on the screen.
**Example:**

```
Dim c As UIViewControllerMBS = UIViewControllerMBS.currentViewController

Break
```

**Notes:** (Read only property)

### 126.14.11 isBeingDismissed as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view controller is dismissing.
**Notes:** (Read only property)

### 126.14.12 isBeingPresented as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view controller is presenting.
**Notes:** (Read only property)

### 126.14.13 isViewLoaded as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view is currently loaded into memory.
**Notes:** (Read only property)

### 126.14.14 parentViewController as UIViewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The parent view controller of the recipient.
**Notes:** If the recipient is a child of a container view controller, this property holds the view controller it is contained in. If the recipient has no parent, the value in this property is nil.

(Read only property)

### 126.14.15 prefersStatusBarHidden as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Specifies whether the view controller prefers the status bar to be hidden or shown.
**Notes:** True if the status bar should be hidden or false if it should be shown.
(Read only property)

### 126.14.16 presentedViewController as UIViewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view controller that is presented by this view controller, or one of its ancestors in the view controller hierarchy.
**Notes:** When you present a view controller modally (either explicitly or implicitly) using the presentViewController method, the view controller that called the method has this property set to the view controller that it presented. If the current view controller did not present another view controller modally, the value in this property is nil.
(Read only property)

### 126.14.17 presentingViewController as UIViewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view controller that presented this view controller.
**Notes:** When you present a view controller modally (either explicitly or implicitly) using the presentViewController() method, the view controller that was presented has this property set to the view controller that presented it. If the view controller was not presented modally, but one of its ancestors was, this property contains the view controller that presented the ancestor. If neither the current view controller or any of its ancestors were presented modally, the value in this property is nil.
(Read only property)

### 126.14.18 Title as String

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A localized string that represents the view this controller manages.
**Notes:** Set the title to a human-readable string that describes the view. If the view controller has a valid navigation item or tab-bar item, assigning a value to this property updates the title text of those objects.

(Read and Write property)

### 126.14.19 View as NSViewMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view that the controller manages.
**Notes:** This property represents the root view of the view controller's view hierarchy. The default value of this property is nil.

If you access this property when its value is nil, the view controller automatically calls the loadView method and returns the resulting view.

Each view controller is the sole owner of its view object. Don,Äôt associate the same view object with multiple view controllers. The only exception is that a container view controller implementation may add another view controller,Äôs view object to its own view hierarchy. Before adding the subview, the container must first call its addChildViewController method to create a parent-child relationship between the two view controller objects.

Because accessing this property can cause the view to be loaded automatically, you can use viewLoaded to determine if the view is currently in memory. Unlike this property, viewLoaded doesn,Äôt force the loading of the view if it,Äôs not currently in memory.
(Read and Write property)

## 126.15 class UMPConsentFormMBS

### 126.15.1 class UMPConsentFormMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** A single use consent form object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- Google Admob Update
- MBS Xojo Plugins, version 23.6pr5

### 126.15.2 Methods

### 126.15.3 Constructor

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 126.15.4 load(handler as ConsentFormLoadCompletedMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads a consent form and calls completionHandler on completion.
**Notes:** Must be called on the main queue.

### 126.15.5 loadAndPresentIfRequiredFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads a consent form and immediately presents it.
**Notes:** Loads a consent form and immediately presents it from the provided viewController if ConsentInformation.sharedInstance.consentStatus is UMPConsentStatusRequired. Calls handler after the user selects an option and the form is dismissed, or on the next run loop if no form is presented.
Must be called on the main queue.

### 126.15.6 presentFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Presents the full screen consent form over viewController.
**Notes:** The form is dismissed and handler is called after the user selects an option.
ConsentInformation.sharedInstance.consentStatus is updated prior to handler being called.

### 126.15.7 presentPrivacyOptionsFormFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Presents a privacy options form.
**Notes:** Presents a privacy options form from the provided viewController if ConsentInformation.sharedInstance.privacyOptionsRequirementStatus is
PrivacyOptionsRequirementStatusRequired.

Calls handler with nil error after the user selects an option and the form is dismissed, or on the next run loop with a non-nil error if no form is presented. Must be called on the main queue.

This method should only be called in response to a user input to request a privacy options form to be shown. The privacy options form is preloaded by the SDK automatically when a form becomes available. If no form is preloaded, the SDK will invoke the handler on the next run loop, but will asynchronously retry to load one.

### 126.15.8 UMPErrorDomain as String

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Error domain for all SDK errors.

### 126.15.9 Properties

### 126.15.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.15.11 VersionString as String

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The SDK version string.
**Notes:** In the form "major.minor.patch".
(Read only property)

### 126.15.12 Constants

Error codes

| Constant | Value | Description |
|---|---|---|
| FormErrorCodeAlreadyUsed | 6 | Form was already used. |
| FormErrorCodeInternal | 5 | Internal error. |
| FormErrorCodeInvalidViewController | 9 | Form cannot be presented from the provided view controller. |
| FormErrorCodeTimeout | 8 | Loading a form timed out. |
| FormErrorCodeUnavailable | 7 | Form is unavailable. |
| RequestErrorCodeInternal | 1 | Internal error. |
| RequestErrorCodeInvalidAppID | 2 | The application's app ID is invalid. |
| RequestErrorCodeMisconfiguration | 4 | A misconfiguration exists in the Funding Choices UI. |
| RequestErrorCodeNetwork | 3 | Network error communicating with Funding Choices. |

### 126.15.13 Delegates

### 126.15.14 ConsentFormLoadCompletedMBS(consentForm as UMPConsentFormMBS, Error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Provides a nonnull consentForm and a nil error if the load succeeded.
**Notes:** Provides a nil consentForm and a nonnull error if the load failed.

### 126.15.15 ConsentFormPresentCompletedMBS(Error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Called after presentation of a ConsentForm finishes.

## 126.16 class UMPConsentInformationMBS

### 126.16.1 class UMPConsentInformationMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Consent information.
**Notes:** All methods must be called on the main thread.
**Blog Entries**

- Google Admob Update
- MBS Xojo Plugins, version 23.6pr5

### 126.16.2 Methods

### 126.16.3 Constructor

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Notes:** Gets you the shared instance.

### 126.16.4 Destructor

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 126.16.5 requestConsentInfoUpdateWithParameters(parameters as UMPRequestParametersMBS = nil)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Requests consent information update.
**Notes:** Must be called in every app session before checking the user's consentStatus or loading a consent form. After calling this method, consentStatus will be updated synchronously to hold the consent state from the previous app session, if one exists.
consentStatus may be updated again immediately before the handler is called.

### 126.16.6 Reset

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Clears all consent state from persistent storage.

### 126.16.7 Properties

### 126.16.8 canRequestAds as Boolean

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the app has completed the necessary steps for gathering updated user consent.
**Notes:** Returns false until requestConsentInfoUpdateWithParameters is called. Returns true once requestConsentInfoUpdateWithParameters is called and when consentStatus is ConsentStatusNotRequired or ConsentStatusObtained.
(Read only property)

### 126.16.9 consentStatus as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The user's consent status.
**Notes:** This value defaults to ConsentStatusUnknown until requestConsentInfoUpdateWithParameters is called, and defaults to the previous session's value until your handler from requestConsentInfoUpdateWithParameters is called.
(Read only property)

### 126.16.10 formStatus as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Consent form status.
**Notes:** This value defaults to FormStatusUnknown and requires a call to requestConsentInfoUpdateWithParameters to update.
(Read only property)

### 126.16.11 Handle as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.16.12 privacyOptionsRequirementStatus as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Privacy options requirement status.
**Notes:** This value defaults to PrivacyOptionsRequirementStatusUnknown until requestConsentInfoUpdateWithParameters is called, and defaults to the previous session's value until your handler from requestConsentInfoUpdateWithParameters is called.
(Read only property)

### 126.16.13 sharedInstance as UMPConsentInformationMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The shared consent information instance.
**Notes:** (Read only property)

### 126.16.14 Events

### 126.16.15 ConsentInformationUpdateCompleted(Error as NSErrorMBS)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: .

**Function:** Called when the consent info request completes.
**Notes:** Error is nil on success, and non-nil if the update failed.

### 126.16.16 Constants

Consent Status

| Constant | Value | Description |
|---|---|---|
| ConsentStatusNotRequired | 2 | Consent not required. |
| ConsentStatusObtained | 3 | User consent obtained, personalized vs non-personalized undefined. |
| ConsentStatusRequired | 1 | User consent required but not yet obtained. |
| ConsentStatusUnknown | 0 | Unknown consent status. |

Form Status

| Constant | Value | Description |
|---|---|---|
| FormStatusAvailable | 1 | Consent forms are available and can be loaded using loadWithCompletionHandler. |
| FormStatusUnavailable | 2 | Consent forms are unavailable. Showing a consent form is not required. |
| FormStatusUnknown | 0 | Whether a consent form is available is unknown. An update should be requested using requestConsentInfoUpdateWithParameters(). |

Privacy options requirement status

| Constant | Value | Description |
|---|---|---|
| PrivacyOptionsRequirementStatusNotRequired | 2 | User does not need to modify their privacy options. Either required, or the consent type does not require modification. |
| PrivacyOptionsRequirementStatusRequired | 1 | A way must be provided for the user to modify their privacy op |
| PrivacyOptionsRequirementStatusUnknown | 0 | Requirement unknown. |

## 126.17 class UMPDebugSettingsMBS

### 126.17.1 class UMPDebugSettingsMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Overrides settings for debugging or testing.
**Example:**

```
// test for Europe Economic Area
Dim debug As New UMPDebugSettingsMBS
debug.geography = debug.DebugGeographyEEA

Dim param As New UMPRequestParametersMBS
param.debugSettings = debug
param.tagForUnderAgeOfConsent = True

UMPConsentInformationMBS.sharedInstance.requestConsentInfoUpdateWithParameters param
```

**Blog Entries**

- Google Admob Update
- MBS Xojo Plugins, version 23.6pr5

### 126.17.2 Methods

### 126.17.3 Constructor

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.
**Example:**

```
// test for Europe Economic Area
Dim debug As New UMPDebugSettingsMBS
debug.geography = debug.DebugGeographyEEA

Dim param As New UMPRequestParametersMBS
param.debugSettings = debug
param.tagForUnderAgeOfConsent = True

UMPConsentInformationMBS.sharedInstance.requestConsentInfoUpdateWithParameters param
```

### 126.17.4 copy as UMPDebugSettingsMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: All.

**Function:** Creates a copy o this class.

### 126.17.5 setTestDeviceIdentifiers(testDeviceIdentifiers() as String)

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Sets the array of device identifier strings.
**Notes:** Debug features are enabled for devices with these identifiers. Debug features are always enabled for simulators.

### 126.17.6 testDeviceIdentifiers as String()

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Array of device identifier strings.
**Notes:** Debug features are enabled for devices with these identifiers. Debug features are always enabled for simulators.

### 126.17.7 Properties

### 126.17.8 geography as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Debug geography.
**Notes:** (Read and Write property)

### 126.17.9 Handle as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.17.10 Constants

Debug Geography

| Constant | Value | Description |
|---|---|---|
| DebugGeographyDisabled | 0 | Disable geography debugging. |
| DebugGeographyEEA | 1 | Geography appears as in EEA for debug devices. |
| DebugGeographyNotEEA | 2 | Geography appears as not in EEA for debug devices. |

## 126.18 class UMPRequestParametersMBS

### 126.18.1 class UMPRequestParametersMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Parameters sent on updates to user consent info.
**Blog Entries**

- Google Admob Update
- MBS Xojo Plugins, version 23.6pr5

### 126.18.2 Methods

### 126.18.3 Constructor

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 126.18.4 copy as UMPRequestParametersMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: All.

**Function:** Creates a copy of the object.

### 126.18.5 Properties

### 126.18.6 debugSettings as UMPDebugSettingsMBS

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Debug settings for the request.
**Notes:** (Read and Write property)

### 126.18.7 Handle as Integer

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 126.18.8 tagForUnderAgeOfConsent as Boolean

MBS iOS Plugin, Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the user is tagged for under age of consent.
**Notes:** (Read and Write property)

# Chapter 127

# MongoDB

## 127.1 class MongoChangeStreamMBS

### 127.1.1 class MongoChangeStreamMBS

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** A MongoDB change stream.
**Example:**

```
Dim pipeline As String = " { } "
Dim stream As MongoChangeStreamMBS = Collection.Watch(pipeline)

// now do inserts

// and now query changes
Dim changeJSON As String

While stream.NextChange(changeJSON)

MessageBox changeJSON

Wend
```

**Notes:** Use this class to audit a collection, database or client for changes.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- Watch MongoDB Database changes in Xojo

- MBS Xojo Plugins, version 23.5pr4
- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- Watch changes in MongoDB with Xojo application
- MBS Xojo Plugins, version 22.6pr1

**Xojo Developer Magazine**

- 22.1, page 9: News

### 127.1.2 Methods

### 127.1.3 Constructor

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.1.4 ErrorDocument(byref ReplyJSON as String) as Boolean

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks if an error has occurred when creating or iterating over a change stream.
**Notes:** Similar to ErrorDocument in MongoCursorMBS if the error has occurred client-side then the reply will be set to an empty BSON document. If the error occurred server-side, reply is set to the server,Äôs reply document.

Provides the reply from server about the error.

Returns a boolean indicating if there was an error.

### 127.1.5 NextChange(byref RecordJSON as String) as Boolean

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates the underlying change stream, setting RecordJSON to the next document.
**Example:**

```
Dim pipeline As String = " { } "
Dim stream As MongoChangeStreamMBS = Collection.Watch(pipeline)
```

```
// now do inserts

// and now query changes
Dim changeJSON As String

While stream.NextChange(changeJSON)

MessageBox changeJSON

Wend
```

**Notes:** This will block for a maximum of maxAwaitTimeMS milliseconds as specified in the options when created, or the default timeout if omitted. Data may be returned before the timeout. If no data is returned this function returns false.

RecordJSON: The location for the resulting document.

This function returns true if a valid bson document was read from the stream. Otherwise, false if there was an error or no document was available.

Raises exception in case of error.

### 127.1.6 StreamResumeToken as String

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the cached resume token, which may be passed as either the resumeAfter or startAfter option of a watch function to start a new change stream from the same point.
**Notes:** Returns "" if no resume token is available. This is possible if the change stream has not been iterated and neither resumeAfter nor startAfter options were specified in the watch function.

### 127.1.7 Properties

### 127.1.8 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.1.9 Parent as Variant

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

## 127.2 class MongoClientMBS

### 127.2.1 class MongoClientMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** A MongoDB connection.
**Notes:** This is a class that provides access to a MongoDB server, replica set, or sharded cluster. It maintains management of underlying sockets and routing to individual nodes

The connection is NOT thread-safe and should only be used from one thread at a time.
**Blog Entries**

- Watch MongoDB Database changes in Xojo
- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr2
- MBS Xojo Plugins, version 23.4pr1
- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 22.4
- Insert record to MongoDB in Xojo

**Xojo Developer Magazine**

- 21.6, page 8: News
- 21.4, page 10: News
- 21.1, pages 94 to 95: A Database That Connects, A Mongo DB photo database used with FileMaker and Xojo by Stefanie Juchmes

### 127.2.2 Methods

### 127.2.3 Collection(DatabaseName as String, CollectionName as String) as MongoCollectionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get a newly allocated MongoCollectionMBS for the collection named collection in the named database.
**Notes:** Collections are automatically created on the MongoDB server upon insertion of the first document. There is no need to create a collection manually.

### 127.2.4 Constructor(URI as MongoURIMBS)

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new client using the URI provided.
**Notes:** In case of an error, raises MongoExceptionMBS.

Connection is made when you run the first command, so you may want to soon query something or run a ping command.

### 127.2.5 Database(Name as String) as MongoDatabaseMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Opens the given database.
**Notes:** Databases are automatically created on the MongoDB server upon insertion of the first document into a collection. There is no need to create a database manually.

### 127.2.6 DatabasesNames(OptionsJSON as String = "") as String()

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the MongoDB server for a list of known databases.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim databases() as string = client.DatabasesNames

Break // shows e.g. admin, config and local.
```

**Notes:** Returns a list of database names.
In case of an error, raises MongoExceptionMBS.

### 127.2.7 DataToBinary(Data as MemoryBlock) as String

MBS MongoDB Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts the data to a binary object.
**Notes:** Converts a string or MemoryBlock to JSON for MongoDB.
Reads the bytes, converts to base64 and embeds it in a $ binary JSON for use in MongoDB.
See also:

- 127.2.8 DataToBinary(Data as String) as String 17807

### 127.2.8 DataToBinary(Data as String) as String

MBS MongoDB Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Converts the data to a binary object.
**Example:**

```
Dim json As String = MongoClientMBS.DataToBinary("Hello World")

MessageBox json

// shows: { "$ binary" : { "base64" : "SGVsbG8gV29ybGQ=", "subType" : "00" }
```

**Notes:** Converts a string or MemoryBlock to JSON for MongoDB.
Reads the bytes, converts to base64 and embeds it in a $ binary JSON for use in MongoDB.
See also:

- 127.2.7 DataToBinary(Data as MemoryBlock) as String 17807

### 127.2.9 DefaultDatabase as MongoDatabaseMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Opens default database.
**Notes:** Get the database named in the MongoDB connection URI, or "" if the URI specifies none.
Useful when you want to choose which database to use based only on the URI in a configuration file.

### 127.2.10 FindDatabases(OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches list of database records.
**Notes:** Fetches a cursor containing documents, each corresponding to a database on this MongoDB server.

Sets current cursor.

### 127.2.11 LogMessage(Message as String)

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sends message through MongoDB logging system.
See also:

- 127.2.31 LogMessage(Level as Integer, Domain as String, Message as String) 17813

### 127.2.12 NewCursorFromCommandReply(commandReplyJSON as String, OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a cursor object from the reply of a command.
**Notes:** Some MongoDB commands return a ‚Äúcursor‚Äù document.

commandReplyJSON: The reply to a command, such as ‚Äúaggregate‚Äù, ‚Äúfind‚Äù, or ‚Äúlist Collections‚Äù, that returns a cursor document.

### 127.2.13 NowUTC as String

MBS MongoDB Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a new JSON value with current date and time.
**Notes:** Value is in GMT/UTC.
e.g. { "$ date" : "2023-03-09T11:39:34Z" }

### 127.2.14 Ping

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sends ping command.
**Notes:** Great to check if connection is there and/or trigger reconnection.

### 127.2.15 ServerDescription(ServerID as UInt32) as MongoServerDescriptionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get information about the server specified by ServerID.
**Example:**

```
Const URL = "mongodb://localhost/"

Dim uri As New MongoURIMBS(URL)
Dim client As New MongoClientMBS(uri)

// do something to trigger connection
Dim names() As String = client.DatabasesNames

// now check first server
Dim des As MongoServerDescriptionMBS = client.ServerDescription(1)
Break // check in debugger
```

### 127.2.16 ServerDescriptions as MongoServerDescriptionMBS()

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches an server descroptions for all known servers in the topology.
**Example:**

```
Const URL = "mongodb://localhost/"

Dim uri As New MongoURIMBS(URL)
Dim client As New MongoClientMBS(uri)

// do something to trigger connection
Dim names() As String = client.DatabasesNames

// now check first server
Dim ServerDescriptions() As MongoServerDescriptionMBS = client.ServerDescriptions
Break // check in debugger
```

**Notes:** Returns no servers until the client connects. Returns a single server if the client is directly connected, or all members of a replica set if the client,Äôs MongoDB URI includes a ,ÄúreplicaSet,Äù option, or all known mongos servers if the MongoDB URI includes a list of them.

### 127.2.17 Time(SecondsSince1970 as Double) as String

MBS MongoDB Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a new JSON value with given timestamp.
**Notes:** Please pass time as seconds since 1970 and in UTC time zone.

e.g. { "$ date" : "2023-03-09T11:39:34Z" }

### 127.2.18 Watch(pipelineJSON as String, OptionsJSON as String = "") as MongoChangeStreamMBS

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a change stream for a client.
**Notes:** It is preferred to call this function over using a raw aggregation to create a change stream.

This function uses the read preference and read concern of the client. If the change stream needs to reestablish connection, the same read preference will be used. This may happen if the change stream encounters a resumable error.

Warning A change stream is only supported with majority read concern.
This function is considered a retryable read operation. Upon a transient error (a network error, errors due to replica set failover, etc.) the operation is safely retried once. If retryreads is false in the URI the retry behavior does not apply.

Call this method on the client which the change stream listens to.

pipelineJSON: A JSON representing an aggregation pipeline appended to the change stream. This may be an empty document.

OptionsJSON: A JSON containing change stream options. options may be "" or a JSON document with additional command options:

batchSize: An integer representing number of documents requested to be returned on each call to NextChange()

resumeAfter: A Document representing the logical starting point of the change stream. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with startAfter and startAtOperationTime.

startAfter: A Document representing the logical starting point of the change stream. Unlike resumeAfter,

this can resume notifications after an ,Äúinvalidate,Äù event. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with resumeAfter and startAtOperationTime.

startAtOperationTime: A Timestamp. The change stream only provides changes that occurred at or after the specified timestamp. Any command run against the server will return an operation time that can be used here. This option is mutually exclusive with resumeAfter and startAfter.

maxAwaitTimeMS: An int64 representing the maximum amount of time a call to StreamResumeToken() will block waiting for data

fullDocument: An optional UTF-8 string. Set this option to ,Äúdefault,Äù, ,ÄúupdateLookup,Äù, ,ÄúwhenAvailable,Äù, or ,Äúrequired,Äù, If unset, The string ,Äúdefault,Äù is assumed. Set this option to ,ÄúupdateLookup,Äù to direct the change stream cursor to lookup the most current majority-committed version of the document associated to an update change stream event.

fullDocumentBeforeChange: An optional UTF-8 string. Set this option to ,ÄúwhenAvailable,Äù, ,Äúrequired,Äù, or ,Äúoff,Äù. When unset, the default value is ,Äúoff,Äù. Similar to ,ÄúfullDocument,Äù, but returns the value of the document before the associated change.

comment: A JSON specifying the comment to attach to this command. The comment will appear in log messages, profiler output, and currentOp output. Only string values are supported prior to MongoDB 4.4.

### 127.2.19 Properties

### 127.2.20 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.2.21 LibraryVersion as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries library version.
**Notes:** This is the version of the mongo client library we use to build the plugin.
(Read only property)

### 127.2.22 MaxBSONSize as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the maximum bson document size allowed by the cluster.
**Notes:** Until a connection has been made, this will be the default of 16Mb.
(Read only property)

### 127.2.23 MaxMessageSize as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the maximum message size allowed by the cluster.
**Notes:** Until a connection has been made, this will be the default of 40Mb.
(Read only property)

### 127.2.24 Parent as Variant

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parent object reference.
**Notes:** (Read only property)

### 127.2.25 Session as MongoSessionMBS

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current session.
**Notes:** Weak reference, which is cleared when the session object is destroyed.
(Read only property)

### 127.2.26 SSLLibrary as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries SSL library used.
**Notes:** Returns SecureTransport, SecureChannel or OpenSSL.
SecureChannel is used on Windows while SecureTransport is Apple's framework on iOS and macOS. And OpenSSL is available for all platforms.
(Read only property)

### 127.2.27 SSLOptions as MongoSSLOptionsMBS

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the TLS (SSL) options to use when connecting to TLS enabled MongoDB servers.
**Notes:** Setting SSLOptions overrides all TLS options set through the connection string with which the client was constructed.
(Read and Write property)

### 127.2.28 Trace as Boolean

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enables trace messages to be written.
**Notes:** Default error logging will print errors to stderr/stdout already.
(Read and Write property)

### 127.2.29 URI as MongoURIMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the URI object used to construct this.
**Notes:** (Read only property)

### 127.2.30 Events

### 127.2.31 LogMessage(Level as Integer, Domain as String, Message as String)

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** The event called for log messages in MongoDB client.
**Notes:** Trace level is not used by our plugin.
See also:

- 127.2.11 LogMessage(Message as String) 17808

### 127.2.32 Constants

Log Levels

| Constant | Value | Description |
|---|---|---|
| LogLevelCritical | 1 | Critical |
| LogLevelDebug | 5 | Debug |
| LogLevelError | 0 | Error |
| LogLevelInfo | 4 | Info |
| LogLevelMessage | 3 | Message |
| LogLevelTrace | 6 | Trace |
| LogLevelWarning | 2 | Warning |

## 127.3 class MongoCollectionMBS

### 127.3.1 class MongoCollectionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This class provides access to a MongoDB collection.
**Notes:** This handle is useful for actions for most CRUD operations, I.e. insert, update, delete, find, etc.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Watch MongoDB Database changes in Xojo
- MBS Xojo Plugins, version 23.1pr2
- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 22.4
- Distinct in MongoDB to find all tags from documents
- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr1
- Insert record to MongoDB in Xojo

**Xojo Developer Magazine**

- 20.6, page 9: News

### 127.3.2 Methods

### 127.3.3 Aggregate(flags as Integer, pipelineJSON as String, OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an aggregate collection.
**Example:**

```
dim collection as MongoCollectionMBS // your collection
Dim json As String = " [ "+_
" { ""$ match"" : { ""index"" : 123 } } ,"+_
" { ""$ sort"" : { ""index"" : -1 } } ,"+_
" { ""$ limit"" : 2 } "+_
" ] "

cursor = Collection.Aggregate(Collection.kFlagNone, json)
```

```
// loop over cursor
```

**Notes:** This function creates a cursor which sends the aggregate command on the underlying collection upon the first call to CursorNext. For more information on building aggregation pipelines, see the MongoDB Manual entry on the aggregate command.
Returns a new cursor on success.

Please review the documentation for MongoDB on how to build the JSON for pipeline or options.

| Flag | Value | Description |
|---|---|---|
| None | 0 | Specify no query flags. |
| TailableCursor | 2 | Cursor will not be closed when the last data is retrieved. You can resume this cursor later. |
| SecondaryOk | 4 | Allow query of replica set secondaries. |
| NoCursorTimeout | 16 | The server normally times out an idle cursor after an inactivity period (10 minutes). This prevents that. |
| AwaitData | 32 | Use with TailableCursor. Block rather than returning no data. After a period, time out. |
| Exhaust | 64 | Stream the data down full blast in multiple ,Äúreply,Äù packets. Faster when you are pulling down a lot of data and you know you want to retrieve it all. Only applies to cursors created from a find operation (i.e. find) |
| Partial | 128 | Get partial results from mongos if some shards are down (instead of throwing an error). |

In case of an error, raises MongoExceptionMBS.

### 127.3.4 Command(commandJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Execute a command on the server.
**Example:**

```
dim collection as MongoCollectionMBS // your collection

dim Reply as String = collection.Command(" { ""hello"": 1 } ")
```

**Notes:** Consult the MongoDB Manual entry on Database Commands for each command,Äôs arguments.

In case of an error, raises MongoExceptionMBS.

### 127.3.5 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.3.6 Copy as MongoCollectionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Performs a deep copy of the collection struct and its configuration.
**Notes:** This function does not copy the contents of the collection on the MongoDB server.

### 127.3.7 DeleteMany(selectorJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Deletes many records.
**Notes:** This function removes all documents in the given collection that match selector.

To delete at most one matching document, use DeleteOne().
Returns string with JSON about errors on server.

### 127.3.8 DeleteOne(selectorJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Deletes one record.
**Example:**

```
// delete record by object ID

Dim oid As New JSONItem
oid.Value("$ oid") = "632752c4031bafedd50fbf21"

Dim Record As New JSONItem
Record.Value("_id") = oid

Dim Result As String = Collection.DeleteOne(Record.toString)
// e.g. { "deletedCount" : 1 }
```

**Notes:** This function removes at most one document in the given collection that matches selector.

To delete all matching documents, use DeleteMany().

Returns string with JSON about errors on server.

### 127.3.9 EstimatedDocumentCount(OptionsJSON as String = "") as Int64

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Executes a count query on collection.
**Notes:** The count returned is not guaranteed to be accurate.

see also
http://mongoc.org/libmongoc/current/mongoc_collection_estimated_document_count.html
See also:

- 127.3.10 EstimatedDocumentCount(OptionsJSON as String, byref ReplyJSON as String) as Int64 17818

### 127.3.10 EstimatedDocumentCount(OptionsJSON as String, byref ReplyJSON as String) as Int64

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Executes a count query on collection.
**Notes:** The count returned is not guaranteed to be accurate.

see also
http://mongoc.org/libmongoc/current/mongoc_collection_estimated_document_count.html
See also:

- 127.3.9 EstimatedDocumentCount(OptionsJSON as String = "") as Int64 17818

### 127.3.11 Find(FilterJSON as String, OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Query on collection, passing arbitrary query options to the server in opts.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.Collection("test")

dim Filter as new JSONItem
'filter.Value("Hello") = "World"

dim sortOrder as new JSONItem
sortOrder.Value("hello") = -1 // descending

dim options as new JSONItem
options.Value("limit") = 10
options.Value("sort") = sortOrder

dim cursor as MongoCursorMBS = Collection.Find(filter.toString, options.toString)
dim Record as string

while cursor.NextRecord(record)

MessageBox record

wend
```

**Notes:** See also find command documented here:
https://www.mongodb.com/docs/manual/reference/command/find/

### 127.3.12 FindIndexes(OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches a cursor containing documents, each corresponding to an index on this collection.

### 127.3.13 InsertMany(documentArrayJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Insert documents into collection.
**Notes:** Please pass a JSON array as string for all documents. Each entry in the array should be a JSON object with the document data.

For any document that does not have an "_id" field, a bson_oid_t will be generated locally and added to the document. If you must know the inserted document's _id, generate it in your code and include it in the document. The _id you generate can be a bson_oid_t or any other non-array BSON type.

The reply is filled out with an "insertedCount" field. If there is a server error then reply may contain a "writeErrors" array and/or a "writeConcernErrors" array.
See also:

- 127.3.14 InsertMany(documentJSON() as String, OptionsJSON as String = "") as String 17820

### 127.3.14 InsertMany(documentJSON() as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Insert documents into collection.
**Notes:** Please pass an array with a JSON object in each entry as string.

For any document that does not have an "_id" field, a bson_oid_t will be generated locally and added to the document. If you must know the inserted document's _id, generate it in your code and include it in the document. The _id you generate can be a bson_oid_t or any other non-array BSON type.

The reply is filled out with an "insertedCount" field. If there is a server error then reply may contain a "writeErrors" array and/or a "writeConcernErrors" array.
See also:

- 127.3.13 InsertMany(documentArrayJSON as String, OptionsJSON as String = "") as String 17819

### 127.3.15 InsertOne(documentJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Inserts a document into collection.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.Collection("test")
```

```
dim j as new JSONItem
j.Value("Hello") = "World"

dim reply as string = Collection.InsertOne(j.ToString)

// reply is { "insertedCount" : 1 }
```

Break

**Notes:** To insert an array of documents, see MongoDB.InsertMany.

If no _id element is found in document, then an oid will be generated locally and added to the document. If you must know the inserted document,Äôs _id, generate it in your code and include it in the document. The _id you generate can be an old or any other non-array BSON type.

The reply is filled out with an ,ÄúinsertedCount,Äù field. If there is a server error then reply contains either a ,ÄúwriteErrors,Äù array with one subdocument or a ,ÄúwriteConcernErrors,Äù array.

In case of an error, raises MongoExceptionMBS.

OptionsJSON may be empty or a JSON document with additional command options:

writeConcern: the write concern.
sessionId: The session ID.
validate: The validation flags.
bypassDocumentValidation: Set to true to skip server-side schema validation of the provided BSON documents.

### 127.3.16 Keys as String()

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries current collection to find all the key names.
**Notes:** You may store different JSON documents in the collection with different keys.
This function scans all documents to get the root keys and returns the list.

### 127.3.17 Rename(NewDatabaseName as String, NewCollectionName as String, DropTargetBeforeRename as Boolean = false, OptionsJSON as String = "") as boolean

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This function is a helper to rename an existing collection on a MongoDB server.
**Notes:** The name of the collection will also be updated internally so it is safe to continue using this collection after the rename. Additional operations will occur on renamed collection.

NewDatabaseName: The name of the new database.
NewCollectionName: The new name for the collection.
DropTargetBeforeRename: If an existing collection matches the new name, drop it before the rename.

Returns true if successful. Returns false and raises exception in case of an error.

### 127.3.18 ReplaceOne(selectorJSON as String, replacementJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This replaces documents in collection that match selector with replacement.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.Collection("test")

// the conditions to match records
dim j as new JSONItem
j.Value("Hello") = "World"

// the new values
dim u as new JSONItem
u.Value("OtherField") = 456
u.Value("Hello") = "World"

dim reply as string = Collection.ReplaceOne(j.ToString, u.ToString)

Break
```

**Notes:** selectorJSON: A JSON containing the query to match the document for updating.
updateJSON: A JSON containing the replacement document.

The reply JSON is populated with the fields matchedCount, modifiedCount, upsertedCount, and optionally upsertedId if applicable. If there is a server error then reply contains either a writeErrors array with one subdocument or a writeConcernErrors array.

In case of an error, raises MongoExceptionMBS.

### 127.3.19 UpdateMany(selectorJSON as String, updateJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Updates all documents in collection that match selector.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.Collection("test")

// the conditions to match records
dim j as new JSONItem
j.Value("Hello") = "World"

// the new values
dim u as new JSONItem
u.Value("OtherField") = 123

// and the update, where we define to set those values
dim s as new JSONItem
s.Value("$ set") = u

dim reply as string = Collection.UpdateMany(j.ToString, s.ToString)

// reply: { "modifiedCount" : 1, "matchedCount" : 1, "upsertedCount" : 0 }
Break
```

**Notes:** In case of an error, raises MongoExceptionMBS.

To update at most one document see UpdateOne().

The result JSON is filled out with fields matchedCount, modifiedCount, and optionally upsertedId if applicable. If there is a server error then reply contains either a ,ÄúwriteErrors,Äù array with one subdocument or a ,ÄúwriteConcernErrors,Äù array.

### 127.3.20 UpdateOne(selectorJSON as String, updateJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Updates at most one document in collection that matches selector.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.Collection("test")

// the conditions to match records
dim j as new JSONItem
j.Value("Hello") = "World"

// the new values
dim u as new JSONItem
u.Value("OtherField") = 123

// and the update, where we define to set those values
dim s as new JSONItem
s.Value("$ set") = u

dim reply as string = Collection.UpdateOne(j.ToString, s.ToString)

// reply: { "modifiedCount" : 1, "matchedCount" : 1, "upsertedCount" : 0 }
break
```

**Notes:** In case of an error, raises MongoExceptionMBS.

To update multiple documents see UpdateMany().

Return is a JSON filled out with fields matchedCount, modifiedCount, and optionally upsertedId if applica-

ble. If there is a server error then reply contains either a ,ÄúwriteErrors,Äù array with one subdocument or a ,ÄúwriteConcernErrors,Äù array.

for Options you may e.g. pass { "upsert":true } to create a new record if the old one doesn't exist.

### 127.3.21 Watch(pipelineJSON as String, OptionsJSON as String = "") as MongoChangeStreamMBS

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a change stream for a collection.
**Notes:** It is preferred to call this function over using a raw aggregation to create a change stream.

This function uses the read preference and read concern of the collection. If the change stream needs to re-establish connection, the same read preference will be used. This may happen if the change stream encounters a resumable error.

Warning A change stream is only supported with majority read concern.
This function is considered a retryable read operation. Upon a transient error (a network error, errors due to replica set failover, etc.) the operation is safely retried once. If retryreads is false in the URI the retry behavior does not apply.

Call this method on the collection which the change stream listens to.

pipelineJSON: A JSON representing an aggregation pipeline appended to the change stream. This may be an empty document.

OptionsJSON: A JSON containing change stream options. options may be "" or a JSON document with additional command options:

batchSize: An integer representing number of documents requested to be returned on each call to NextChange()

resumeAfter: A Document representing the logical starting point of the change stream. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with startAfter and startAtOperationTime.

startAfter: A Document representing the logical starting point of the change stream. Unlike resumeAfter, this can resume notifications after an ,Äúinvalidate,Äù event. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with resumeAfter and startAtOperationTime.

startAtOperationTime: A Timestamp. The change stream only provides changes that occurred at or after the specified timestamp. Any command run against the server will return an operation time that can be used here. This option is mutually exclusive with resumeAfter and startAfter.

maxAwaitTimeMS: An int64 representing the maximum amount of time a call to StreamResumeToken() will block waiting for data

fullDocument: An optional UTF-8 string. Set this option to ,Äúdefault,Äù, ,ÄúupdateLookup,Äù, ,ÄúwhenAvailable,Äù, or ,Äúrequired,Äù, If unset, The string ,Äúdefault,Äù is assumed. Set this option to ,ÄúupdateLookup,Äù to direct the change stream cursor to lookup the most current majority-committed version of the document associated to an update change stream event.

fullDocumentBeforeChange: An optional UTF-8 string. Set this option to ,ÄúwhenAvailable,Äù, ,Äúrequired,Äù, or ,Äúoff,Äù. When unset, the default value is ,Äúoff,Äù. Similar to ,ÄúfullDocument,Äù, but returns the value of the document before the associated change.

comment: A JSON specifying the comment to attach to this command. The comment will appear in log messages, profiler output, and currentOp output. Only string values are supported prior to MongoDB 4.4.

### 127.3.22 Properties

### 127.3.23 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.3.24 Name as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries name of the collection.
**Notes:** (Read only property)

### 127.3.25 Parent as Variant

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parent object reference.

**Notes:** Points to the related database or client and avoids you free those before this object gets destructed. (Read only property)

### 127.3.26 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagAwaitData | 32 | Use with kFlagTailableCursor. Block rather than returning no data. After a period, time out. |
| kFlagExhaust | 64 | Stream the data down full blast in multiple ,Äúreply,Äù packets. Faster when you are pulling down a lot of data and you know you want to retrieve it all. Only applies to cursors created from a find operation (i.e. find). |
| kFlagNoCursorTimeout | 16 | The server normally times out an idle cursor after an inactivity period (10 minutes). This prevents that. |
| kFlagNone | 0 | Specify no query flags. |
| kFlagPartial | 128 | Get partial results from mongos if some shards are down (instead of throwing an error). |
| kFlagSecondaryOk | 4 | Allow query of replica set secondaries. |
| kFlagTailableCursor | 2 | Cursor will not be closed when the last data is retrieved. You can resume this cursor later. |

## 127.4 class MongoCursorMBS

### 127.4.1 class MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This class provides access to a MongoDB query cursor.
**Notes:** It wraps up the wire protocol negotiation required to initiate a query and retrieve an unknown number of documents.

Cursors are lazy, meaning that no connection is established and no network traffic occurs until the first call to NextRecord().
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.4
- MBS Xojo Plugins, version 22.4pr1

**Xojo Developer Magazine**

- 21.1, page 95: A Database That Connects, A Mongo DB photo database used with FileMaker and Xojo by Stefanie Juchmes

### 127.4.2 Methods

### 127.4.3 Clone as MongoURIMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a copy of a cursor.
**Notes:** The cloned cursor will be reset to the beginning of the query, and therefore the query will be re-executed on the MongoDB server when Next is called.

### 127.4.4 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.4.5 ErrorDocument(byref ReplyJSON as String) as Boolean

MBS MongoDB Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks to see if an error has occurred while iterating the cursor.
**Notes:** If an error occurred server-side, the ReplyJSON is set to the server,Äôs reply document with information about the error.

### 127.4.6 NextRecord(byref RecordJSON as String) as Boolean

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the next record as JSON.
**Notes:** This function shall iterate the underlying cursor, setting bson to the next document.
Returns false if there is no other record.

In case of an error, raises MongoExceptionMBS.

### 127.4.7 Properties

### 127.4.8 BatchSize as UInt32

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cursor,Äôs batch size.
**Notes:** (Read and Write property)

### 127.4.9 Current as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries current record as JSON.
**Notes:** Fetches the cursors current document or "" if there has been an error.
(Read only property)

### 127.4.10 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.4.11 Host as MongoHostListMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the MongoDB host that the cursor is communicating with in the host out parameter.
**Notes:** (Read only property)

### 127.4.12 ID as Int64

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves the cursor id used by the server to track the cursor.
**Notes:** This number is zero until the driver actually uses a server when executing the query, and after it has fetched all results from the server.
(Read only property)

### 127.4.13 Limit as Int64

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Limits the number of documents in the result set.
**Notes:** This function is useful for setting the limit on a cursor after the cursor is created, but before any calls to NextRecord().

Calling this function after NextRecord() has no effect.
(Read and Write property)

### 127.4.14 MaxAwaitTimeMS as UInt32

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The maximum amount of time for the server to wait on new documents to satisfy a tailable cursor query.
**Notes:** Only applies if the cursor is created from Find() with ‚Äútailable‚Äù and ‚ÄúawaitData‚Äù options, and the server is MongoDB 3.2 or later.

The max await time ms cannot be changed after the first call to NextRecord().

This is not applicable to all cursors. Setting batch size on a cursor returned by FindDatabases(), FindCollections(), or FindIndexes() will not change the results.
(Read and Write property)

### 127.4.15 More as Boolean

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether there may be more data.
**Notes:** This function shall indicate if there is potentially more data to be read from the cursor.
This is only useful with tailable cursors. Use NextRecord() for regular cursors.

Details: mongoc_cursor_more is unreliable because it does not contact the server to see if there are actually more documents in the result set. It simply returns true if the cursor has not begun, or if it has begun and there are buffered documents in the client-side cursor, or if it has begun and the server has not yet told the cursor it is completely iterated.

This is unreliable with regular queries because it returns true for a new cursor before iteration, even if the cursor will match no documents. It is also true if the collection has been dropped on the server since the previous fetch, or if the cursor has finished its final batch and the next batch will be empty.

Returns true if the cursor has locally-buffered documents, or if a round-trip to the server might fetch additional documents.
(Read only property)

### 127.4.16 Parent as Variant

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parent object reference.
**Notes:** Points to the related database or collection and avoids you free those before this object gets destructed.
(Read only property)

## 127.5 class MongoDatabaseMBS

### 127.5.1 class MongoDatabaseMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** MongoDB Database Abstraction.
**Notes:** This class provides access to a MongoDB database. This handle is useful for actions a particular database object. It is not a container for collection objects.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Watch MongoDB Database changes in Xojo
- MBS Xojo Plugins, version 23.1pr2
- News from the MBS Xojo Plugins in Version 23.0
- Insert record to MongoDB in Xojo

### 127.5.2 Methods

### 127.5.3 Aggregate(pipelineJSON as String, OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an aggregate database.
**Example:**

```
dim database as MongoDatabaseMBS // your database

dim Cursor as MongoCursorMBS = database.Aggregate(" [ { ""$ listLocalSessions"": { } } ] ")
// loop over cursor
```

**Notes:** This function creates a cursor which sends the aggregate command on the underlying database upon the first call to MongoDB.CursorNext. For more information on building aggregation pipelines, see the MongoDB Manual entry on the aggregate command. Note that the pipeline must start with a compatible stage that does not require an underlying collection (e.g. ,Äú$ currentOp,Äù, ,Äú$ listLocalSessions,Äù).
Returns a new cursor on success.

Please review the documentation for MongoDB on how to build the JSON for pipeline or options.

In case of an error, raises MongoExceptionMBS.

### 127.5.4 Collection(Name as String) as MongoCollectionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the collection with given name.

### 127.5.5 CollectionNames(OptionsJSON as String = "") as String()

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the list of the names of all of the collections in database.
**Example:**

```
const URL = "mongodb://192.168.2.102/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collections() as string = database.CollectionNames

Break // see in debugger
```

**Notes:** see MongoDB documentation for list of options:
https://www.mongodb.com/docs/manual/reference/command/listCollections/

In case of an error, raises MongoExceptionMBS.

### 127.5.6 Command(commandJSON as String, OptionsJSON as String = "") as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Execute a command on the server, interpreting opts according to the MongoDB server version.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)
dim database as MongoDatabaseMBS = client.Database("local")

dim ping as new JSONItem
ping.Value("ping") = 1
```

```
dim reply as string = database.Command(ping.ToString)

Break // { "ok" : 1.0 }
```

**Notes:** Returns the reply from the server.

In case of an error, raises MongoExceptionMBS.

### 127.5.7 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.5.8 Copy as MongoDatabaseMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Performs a deep copy of the database struct and its configuration.

### 127.5.9 CreateCollection(Name as String, OptionsJSON as String = "") as MongoCollectionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a collection in the database.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")
dim Collection as MongoCollectionMBS = database.CreateCollection("testing2")

MessageBox Collection.Name

Break
```

**Notes:** If no write concern is provided in opts, the database,Äôs write concern is used.

For a list of all options, see the MongoDB Manual entry on the create command.
In case of an error, raises MongoExceptionMBS.

### 127.5.10 FindCollections(OptionsJSON as String = "") as MongoCursorMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches a cursor containing documents, each corresponding to a collection on this database.
**Example:**

```
const URL = "mongodb://localhost/"

dim uri as new MongoURIMBS(URL)
dim client as new MongoClientMBS(uri)

dim database as MongoDatabaseMBS = client.Database("local")

dim cursor as MongoCursorMBS = database.FindCollections
dim Record as string

while cursor.NextRecord(record)

MessageBox record

wend

Break
```

**Notes:** In case of an error, raises MongoExceptionMBS.

### 127.5.11 HasCollection(Name as String) as Boolean

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks to see if a collection exists on the MongoDB server within database.
**Notes:** If the function succeeds, it returns true if the collection exists and false if not.
Raises exception in case of an invalid arguments or a server or network error.

In case of an error, raises MongoExceptionMBS.

### 127.5.12 Watch(pipelineJSON as String, OptionsJSON as String = "") as MongoChangeStreamMBS

MBS MongoDB Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a change stream for a database.
**Notes:** It is preferred to call this function over using a raw aggregation to create a change stream.

This function uses the read preference and read concern of the database. If the change stream needs to re-establish connection, the same read preference will be used. This may happen if the change stream encounters a resumable error.

Warning A change stream is only supported with majority read concern.
This function is considered a retryable read operation. Upon a transient error (a network error, errors due to replica set failover, etc.) the operation is safely retried once. If retryreads is false in the URI the retry behavior does not apply.

Call this method on the database which the change stream listens to.

pipelineJSON: A JSON representing an aggregation pipeline appended to the change stream. This may be an empty document.

OptionsJSON: A JSON containing change stream options. options may be "" or a JSON document with additional command options:

batchSize: An integer representing number of documents requested to be returned on each call to NextChange()

resumeAfter: A Document representing the logical starting point of the change stream. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with startAfter and startAtOperationTime.

startAfter: A Document representing the logical starting point of the change stream. Unlike resumeAfter, this can resume notifications after an ,Äúinvalidate,Äù event. The result of StreamResumeToken() or the _id field of any change received from a change stream can be used here. This option is mutually exclusive with resumeAfter and startAtOperationTime.

startAtOperationTime: A Timestamp. The change stream only provides changes that occurred at or after the specified timestamp. Any command run against the server will return an operation time that can be used here. This option is mutually exclusive with resumeAfter and startAfter.

maxAwaitTimeMS: An int64 representing the maximum amount of time a call to StreamResumeToken() will block waiting for data

fullDocument: An optional UTF-8 string. Set this option to ‚Äúdefault‚Äù, ‚Äúupdate Lookup‚Äù, ‚Äúwhen Available‚Äù, or ‚Äúrequired‚Äù, If unset, The string ‚Äúdefault‚Äù is assumed. Set this option to ‚ÄúupdateLookup‚Äù to direct the change stream cursor to lookup the most current majority-committed version of the document associated to an update change stream event.

fullDocumentBeforeChange: An optional UTF-8 string. Set this option to ‚ÄúwhenAvailable‚Äù, ‚Äúrequired‚Äù, or ‚Äúoff‚Äù. When unset, the default value is ‚Äúoff‚Äù. Similar to ‚Äúfull Document‚Äù, but returns the value of the document before the associated change.

comment: A JSON specifying the comment to attach to this command. The comment will appear in log messages, profiler output, and currentOp output. Only string values are supported prior to MongoDB 4.4.

### 127.5.13 Properties

### 127.5.14 Client as MongoClientMBS

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current client for this database.
**Notes:** (Read only property)

### 127.5.15 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.5.16 Name as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries name of the database.
**Notes:** (Read only property)

## 127.6 class MongoExceptionMBS

### 127.6.1 class MongoExceptionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class to report errors in MongoDB.
**Notes:** Subclass of the RuntimeException class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Insert record to MongoDB in Xojo

### 127.6.2 Methods

### 127.6.3 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 127.7 class MongoHostListMBS

### 127.7.1 class MongoHostListMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The host entry for a MongoDB server.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 127.7.2 Methods

### 127.7.3 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.7.4 Properties

### 127.7.5 Family as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The protocol family.
**Notes:** (Read only property)

### 127.7.6 Host as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The host.
**Notes:** (Read only property)

### 127.7.7 HostAndPort as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The host and port together.
**Notes:** (Read only property)

### 127.7.8 NextHost as MongoHostListMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The next entry in the list.
**Notes:** (Read only property)

### 127.7.9 Port as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The port number.
**Notes:** (Read only property)

## 127.8 class MongoServerDescriptionMBS

### 127.8.1 class MongoServerDescriptionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The server description class.
**Example:**

```
Const URL = "mongodb://localhost/"

Dim uri As New MongoURIMBS(URL)
Dim client As New MongoClientMBS(uri)

// do something to trigger connection
Dim names() As String = client.DatabasesNames

// now check first server
Dim ServerDescriptions() As MongoServerDescriptionMBS = client.ServerDescriptions
Break // check in debugger
```

**Notes:** Holds information about a mongod or mongos the driver is connected to.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 127.8.2 Methods

### 127.8.3 Constructor

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 127.8.4 Properties

### 127.8.5 CompressorID as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the compressor ID used here.
**Notes:** (Read only property)

### 127.8.6 helloResponse as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The hello response from the server.
**Notes:** (Read only property)

### 127.8.7 HostList as MongoHostListMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The server's host and port.
**Notes:** (Read only property)

### 127.8.8 ID as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the server's id, an opaque identifier generated by the client or client pool.
**Notes:** (Read only property)

### 127.8.9 LastUpdateTime as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last timestamp when the server description was updated.
**Notes:** (Read only property)

### 127.8.10 NextDescription as MongoServerDescriptionMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The next server in the list.
**Notes:** (Read only property)

### 127.8.11 RTT as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the server's round trip time in milliseconds.
**Notes:** This is the client's measurement of the duration of an "ismaster" command.
(Read only property)

### 127.8.12 Type as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a string, one of the server types defined in the Server Discovery And Monitoring Spec
**Notes:** Possible types:

- Standalone
- Mongos
- PossiblePrimary
- RSPrimary
- RSSecondary
- RSArbiter
- RSOther
- RSGhost
- Unknown

(Read only property)

## 127.9 class MongoSessionMBS

### 127.9.1 class MongoSessionMBS

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for organizing a transaction session.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr1

### 127.9.2 Methods

### 127.9.3 AbortTransaction

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Abort a multi-document transaction.
**Example:**

```
Dim Client as MongoClientMBS // your connection
Dim Collection as MongoClientMBS // your collection

// count before
Dim count1 As Integer = Collection.EstimatedDocumentCount

Dim session As New MongoSessionMBS(Client)
session.StartTransaction

Dim NewRecord As New JSONItem

NewRecord.Value("firstName") = "Bob"
NewRecord.Value("lastName") = "Jones"
NewRecord.Value("phone") = "555-1234-567"

Dim Result As String = Collection.InsertOne(NewRecord.toString)

// should be count1 + 1
Dim count2 As Integer = Collection.EstimatedDocumentCount

details.Text = result

session.AbortTransaction
Dim count3 As Integer = Collection.EstimatedDocumentCount
```

```
// should be back to count1

Break // see in debugger
```

**Notes:** Raises exception if there are invalid arguments, such as a session with no transaction in progress. Network or server errors are ignored.

### 127.9.4 CommitTransaction as String

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Commit a multi-document transaction.
**Example:**

```
Dim Client as MongoClientMBS // your connection
Dim Collection as MongoClientMBS // your collection

Dim session As New MongoSessionMBS(Client)

session.StartTransaction

Dim NewRecord As New JSONItem

NewRecord.Value("firstName") = "Bob"
NewRecord.Value("lastName") = "Jones"
NewRecord.Value("phone") = "555-1234-567"

Dim Result As String = Collection.InsertOne(NewRecord.toString)
Break // see in debugger
```

**Notes:** Returns JSON if the transaction was committed. Raises exception if there are invalid arguments, such as a session with no transaction in progress, or if there is a server or network error.

### 127.9.5 Constructor(client as MongoClientMBS)

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a session for a sequence of operations.

### 127.9.6 StartTransaction

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Start a multi-document transaction for all following operations in this session.
**Notes:** The transaction must be completed with CommitTransaction or AbortTransaction. An in-progress transaction is automatically aborted by destructor.

Raises exception if there are invalid arguments, such as a session with a transaction already in progress.

If you run MongoDB server locally, you may need to configure a replication. Otherwise you get an error like this: "Error 17:20: Transaction numbers are only allowed on a replica set member or mongos".

### 127.9.7 Properties

### 127.9.8 Client as Variant

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The reference to the client object.
**Notes:** (Read only property)

### 127.9.9 ClusterTime as String

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the session's clusterTime, as a JSON document.
**Notes:** If the session has not been used for any operation and you have not called AdvanceClusterTime, then the returned value is NULL.
(Read only property)

### 127.9.10 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.9.11 InTransaction as Boolean

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Check whether a multi-document transaction is in progress for this session.
**Notes:** Returns true if a transaction was started and has not been committed or aborted, otherwise false.

(Read only property)

### 127.9.12 ServerID as UInt32

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the "server ID" of the mongos this session is pinned to.
**Notes:** A server ID or 0 if this session is not pinned.
(Read only property)

### 127.9.13 SessionID as String

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the server-side "logical session ID" associated with this session as a JSON document.
**Notes:** (Read only property)

### 127.9.14 TransactionState as Integer

MBS MongoDB Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the current transaction state for this session.
**Notes:** See transaction* constants.
(Read only property)

### 127.9.15 Constants

Transaction States

| Constant | Value | Description |
|---|---|---|
| TransactionAborted | 4 | Aborted |
| TransactionCommitted | 3 | Committed |
| TransactionInProgress | 2 | In Progress |
| TransactionNone | 0 | Not yet initialized. |
| TransactionStarting | 1 | Starting transaction |

## 127.10 class MongoSSLOptionsMBS

### 127.10.1 class MongoSSLOptionsMBS

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for MongoDB SSL Options.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr1

### 127.10.2 Methods

### 127.10.3 Constructor

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Initializes the object with default values.
**Notes:** Default is false for all boolean.

### 127.10.4 Properties

### 127.10.5 AllowInvalidCertificates as Boolean

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to do weaker certificate validation.
**Notes:** Default is false to disallow.
(Read only property)

### 127.10.6 AllowInvalidHostnames as Boolean

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to allow invalid host names.
**Notes:** This allows you to disable hostname validation to allow to continue if the hostname doesn't match the certificate.

Default is false to disallow.
(Read only property)

### 127.10.7 CertificateAuthorityDirectory as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The native file path to the CA directory.
**Notes:** (Read only property)

### 127.10.8 CertificateAuthorityFile as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The native file path for a CA file.
**Notes:** e.g. get such a file from CURL website:
https://curl.se/docs/caextract.html
(Read only property)

### 127.10.9 CertificateRevocationListFile as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The native file path to the Certificate revocation list file.
**Notes:** (Read only property)

### 127.10.10 ClientCertificateKeyFile as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The native path to the PEM file with the private key to use.
**Notes:** (Read only property)

### 127.10.11 ClientCertificateKeyPassword as String

MBS MongoDB Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The password for the PEM file with private key.
**Notes:** (Read only property)

## 127.11 class MongoURIMBS

### 127.11.1 class MongoURIMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** MongoURIMBS provides an abstraction on top of the MongoDB connection URI format.
**Example:**

```
Dim URL As String = "mongodb://myuser:mypass@localhost/"
Dim URI As New MongoURIMBS(URL)

MessageBox URI.URI
```

**Notes:** It provides standardized parsing as well as convenience methods for extracting useful information such as replica hosts or authorization information.
**Blog Entries**

- Watch MongoDB Database changes in Xojo
- New in MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr1
- Insert record to MongoDB in Xojo
- MBS Xojo Plugins, version 22.3pr2

**Xojo Developer Magazine**

- 21.1, pages 94 to 95: A Database That Connects, A Mongo DB photo database used with FileMaker and Xojo by Stefanie Juchmes

### 127.11.2 Methods

### 127.11.3 Constructor(URI as String)

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parses a string containing a MongoDB style URI connection string.
**Example:**

```
dim URL as string = "mongodb://localhost/"
dim URI as new MongoURIMBS(URI)

MessageBox URI.URI
```

**Notes:** Raises a MongoExceptionMBS in case of a parsing error.
Examples of some valid MongoDB connection strings can be seen below.

- ”mongodb://localhost/”
- ”mongodb://localhost/?replicaSet=myreplset”
- ”mongodb://myuser:mypass@localhost/”
- ”mongodb://kerberosuser%40EXAMPLE.COM@example.com/?authMechanism=GSSAPI”
- ”mongodb:// [ ::1 ] :27017/”
- ”mongodb://10.0.0.1:27017,10.0.0.1:27018, [ ::1 ] :27019/?tls=true”
- ”mongodb://%2Ftmp%2Fmongodb-27017.sock”
- ”mongodb://user:pass@%2Ftmp%2Fmongodb-27017.sock”
- ”mongodb://localhost, [ ::1 ] /mydb?authSource=mydb”

### 127.11.4 Copy as MongoURIMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the entire contents of a URI.

### 127.11.5 Properties

### 127.11.6 AuthMechanism as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Authentication mechanism.
**Notes:** Sets the ,ÄúauthMechanism,Äù URI option, such as ,ÄúSCRAM-SHA-1,Äù or ,ÄúGSSAPI,Äù, after the URI has been parsed from a string.
Updates the option in-place if already set, otherwise appends it to the URI,Äôs of options.
(Read and Write property)

### 127.11.7 AuthSource as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Authentication source.
**Notes:** Sets the ,ÄúauthSource,Äù URI option, after the URI has been parsed from a string.

Updates the option in-place if already set, otherwise appends it to the URI,Äôs options.
(Read and Write property)

### 127.11.8 Compressors as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets or sets compressors to use.
**Notes:** Sets the URI,Äôs compressors, after the URI has been parsed from a string. Will overwrite any previously set value.

Value is a text consisting of one or more comma (,) separated compressors (e.g. ,Äúsnappy,zlib,Äù) or "". Passing "" clears any existing compressors set on uri.
(Read and Write property)

### 127.11.9 DatabaseName as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the database portion of an URI if provided.
**Notes:** This is the portion after the / but before the ?.

Sets the URI's database, after the URI has been parsed from a string.

The driver authenticates to this database if the connection string includes authentication credentials. This database is used when you open the default database with DefaultDatabase function.
(Read and Write property)

### 127.11.10 Handle as Integer

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 127.11.11 Hosts as MongoHostListMBS

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches a linked list of hosts that were defined in the URI (the comma-separated host section).
**Notes:** (Read only property)

### 127.11.12 Options as String

MBS MongoDB Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the options from the URL.
**Notes:** Fetches a JSON document containing all of the options provided after the ? of a URI.
Can be empty if not set.
(Read only property)

### 127.11.13 Password as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the password portion of an URI.
**Example:**

```
Dim URL As String = "mongodb://myuser:mypass@localhost/"
Dim URI As New MongoURIMBS(URL)

MessageBox URI.Password
```

**Notes:** (Read and Write property)

### 127.11.14 ServiceHostName as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the hostname for the service.
**Notes:** (Read only property)

### 127.11.15 ServiceName as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the service name.
**Notes:** (Read only property)

### 127.11.16 TLS as Boolean

MBS MongoDB Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether this connection is set to be encrypted.
**Notes:** Fetches a boolean indicating if TLS was specified for use in the URI.

Returns a boolean, true indicating that TLS should be used. This returns true if any TLS option is specified. (Read only property)

### 127.11.17 URI as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the URI as a string.
**Example:**

```
dim URL as string = "mongodb://localhost/"
dim URI as new MongoURIMBS(URL)

MessageBox URI.URI
```

**Notes:** (Read only property)

### 127.11.18 UserName as String

MBS MongoDB Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Fetches the username portion of a URI.
**Example:**

```
dim URL as string = "mongodb://myuser:mypass@localhost/"
dim URI as new MongoURIMBS(URL)

MessageBox URI.UserName+EndOfLine+uri.Password
```

**Notes:** (Read and Write property)

### 127.11.19 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DefaultPort | 27017 | The default port number. |

# Chapter 128

# Navigation

## 128.1 class NSOpenPanelMBS

### 128.1.1 class NSOpenPanelMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The class for the Cocoa Open Panel.
**Notes:** Subclass of the NSSavePanelMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MBS Xojo Plugins, version 22.6pr3
- Customized File Open and Save Dialogs for Windows
- MBS Xojo Plugins, version 18.1pr4
- New for Mac OS X 10.10 in MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 14.3pr2

### 128.1.2 Methods

### 128.1.3 beginForDirectory(path as folderitem, name as string, filetypes() as string)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Presents a modeless Open panel.
**Notes:** path:

Directory whose files the panel displays. When nil, the directory is the same directory used in the previous invocation of the panel; this is probably the best choice for most situations.

name:
Specifies a particular file in absoluteDirectoryPath that is selected when the Open panel is presented to the user. When nil, no file is initially selected.

fileTypes:
Array of file extensions and/or HFS file types. Specifies the files the panel allows the user to select. An empty array makes all files in path selectable by the user.

This method will later called the savePanelDidEnd event.

### 128.1.4 beginSheetForDirectory(path as folderitem, name as string, filetypes() as string, targetWindow as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Presents a sheet Open panel on a given window.
**Notes:** path:
Directory whose files the panel displays. When nil, the directory is the same directory used in the previous invocation of the panel; this is probably the best choice for most situations.

name:
Specifies a particular file in path that is selected when the Open panel is presented to the user. When "", no file is initially selected.

filetypes:
Array of file extensions and/or HFS file types. Specifies the files the panel allows the user to select. An empty array makes all files in absoluteDirectoryPath selectable by the user.

targetWindow:
Window to open the sheet on.

This method will later called the savePanelDidEnd event.

Seems like on Mac OS X 10.4 the usage of sheets will raise NSExceptions for missing methods in the NSCarbonWindowFrame class.
See also:

- 128.1.5 beginSheetForDirectory(path as folderitem, name as string, filetypes() as string, targetWindow

as window) 17859

### 128.1.5 beginSheetForDirectory(path as folderitem, name as string, filetypes() as string, targetWindow as window)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Presents a sheet Open panel on a given window.
**Notes:** path:
Directory whose files the panel displays. When nil, the directory is the same directory used in the previous invocation of the panel; this is probably the best choice for most situations.

name:
Specifies a particular file in path that is selected when the Open panel is presented to the user. When "", no file is initially selected.

filetypes:
Array of file extensions and/or HFS file types. Specifies the files the panel allows the user to select. An empty array makes all files in absoluteDirectoryPath selectable by the user.

targetWindow:
Window to open the sheet on.

This method will later called the savePanelDidEnd event.

Seems like on Mac OS X 10.4 the usage of sheets will raise NSExceptions for missing methods in the NSCarbonWindowFrame class.
See also:

- 128.1.4 beginSheetForDirectory(path as folderitem, name as string, filetypes() as string, targetWindow as DesktopWindow) 17858

### 128.1.6 Constructor

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The constructor which initializes the panel with default values.

### 128.1.7 Files as FolderItem()

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries all folderitems.
See also:

- 128.1.8 Files(index as UInt32) as folderitem 17860

### 128.1.8 Files(index as UInt32) as folderitem

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The array of files.
**Notes:** Index is zero based.
See also:

- 128.1.7 Files as FolderItem() 17859

### 128.1.9 runModalForDirectory(path as folderitem, name as string, filetypes as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A convenience version of the runModalForDirectory function which passes one filetype instead of an array of file types.
**Notes:** See NSCancelButton and NSOkButton constants for return values.
See also:

- 128.1.10 runModalForDirectory(path as folderitem, name as string, filetypes() as string) as Integer 17860

### 128.1.10 runModalForDirectory(path as folderitem, name as string, filetypes() as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Runs the panel as a modal dialog with the given filetypes.
**Notes:** path is the directory to use as a start point. Pass nil to use the last directory which has been used.

filetypes:
The filetypes you want to allow.

See NSCancelButton and NSOkButton constants for return values.
See also:

- 128.1.9 runModalForDirectory(path as folderitem, name as string, filetypes as string) as Integer 17860

### 128.1.11 runModalForTypes(filetypes as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A convenience version of the runModalForTypes function which passes one filetype instead of an array of file types.
**Example:**

```
Dim dlg As New NSOpenPanelMBS
Dim iResult as Integer = dlg.runModalForTypes("jpg")
```

**Notes:** See NSCancelButton and NSOkButton constants for return values.
See also:

- 128.1.12 runModalForTypes(filetypes() as string) as Integer 17861

### 128.1.12 runModalForTypes(filetypes() as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Runs the panel as a modal dialog with the given filetypes.
**Example:**

```
Dim dlg As New NSOpenPanelMBS
dim types() as string = array("jpg", "tif")
Dim iResult as Integer = dlg.runModalForTypes(types)
```

**Notes:** See NSCancelButton and NSOkButton constants for return values.
See also:

- 128.1.11 runModalForTypes(filetypes as string) as Integer 17861

### 128.1.13 URL(index as UInt32) as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The array of file URLs.
**Notes:** Index is zero based.

### 128.1.14 URLs as String()

MBS MacCocoa Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries all URLs.

### 128.1.15 Properties

### 128.1.16 AccessoryViewDisclosed as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the panel's accessory view is visible.
**Notes:** The value of this property is true when the accessory view is visible, and false when it isn't. Setting the value of this property programmatically changes the visibility of the accessory panel. If no accessory panel is present, setting this property does nothing.
(Read and Write property)

### 128.1.17 allowsMultipleSelection as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the panel's browser allows the user to open multiple files (and directories) at a time.
**Notes:** (Read and Write property)

### 128.1.18 canChooseDirectories as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the user can select directories in the pane's browser.
**Notes:** When a directory is selected, the OK button is enabled only if flag is true.
(Read and Write property)

### 128.1.19 canChooseFiles as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the panel allows the user to choose files to open.
**Notes:** (Read and Write property)

### 128.1.20 canDownloadUbiquitousContents as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls how the receiver responds to ubiquitous documents that aren't yet fully downloaded locally.
**Notes:** If true, then the receiver will disallow opening non-local ubiquitous files. Also, if the user attempts to select a non-local file, the receiver will trigger or reprioritize downloading for that file so that it can be opened as soon as possible. If false, then the receiver will allow the user to select and open non-local files, giving your application responsibility for downloading and reporting progress. The default value is true, except for applications linked against the 10.9 SDK or earlier that have adopted iCloud by specifying a ubiquitous container identifier entitlement.

To provide the ideal user experience, you should set this property to NO and download the file's contents (with NSFileCoordinator) and show downloading progress (with NSProgress or NSMetadataQuery) in the context of your application, instead of relying on the open panel to do it.

Available in Mac OS X 10.10 and newer.
(Read and Write property)

### 128.1.21 canResolveUbiquitousConflicts as Boolean

MBS MacCocoa Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Controls how the receiver responds to ubiquitous documents with conflicting versions.
**Notes:** If true, then when the user attempts to open one or more documents with conflicts, the receiver will first display conflict resolution UI, requiring the user to resolve those conflicts before the documents can be opened. If false, then the receiver does nothing in response to conflicts, allowing your application to handle them. The default value is true, except for applications linked against the 10.9 SDK or earlier that have adopted iCloud by specifying a ubiquitous container identifier entitlement.

To provide the ideal user experience, you should set this property to NO and do conflict detection and resolution (using NSURLUbiquitousItemHasUnresolvedConflictsKey and NSFileVersion) in the context of your application, instead of relying on the open panel to do it.

Available in Mac OS X 10.10 and newer.
(Read and Write property)

### 128.1.22 FilesCount as UInt32

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The number of selected files.
**Notes:** (Read only property)

### 128.1.23 resolvesAliases as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver resolves aliases.
**Notes:** If true, the effect is that dropping an alias on the panel or asking for filenames returns the resolved aliases. The default is true.
(Read and Write property)

## 128.2 class NSSavePanelMBS

### 128.2.1 class NSSavePanelMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The class for a Cocoa Save Panel.
**Example:**

```
dim n as new NSSavePanelMBS

dim e as integer = n.runModal

if e = n.NSCancelButton then
// cancelled
Break
elseif e = n.NSOKButton then
// got file
dim file as FolderItem = n.file
Break
end if
```

**Notes:** Subclass of the NSPanelMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MBS Xojo Plugins, version 22.6pr3
- MBS Xojo Plugins, version 20.1pr5
- Customized File Open and Save Dialogs for Windows
- MBS Xojo Plugins, version 19.4pr1
- MBS Xojo / Real Studio Plugins, version 14.3pr2
- MBS Real Studio Plugins, version 12.5pr8
- Sandboxing
- MBS Plugins 11.1 Release notes
- MonkeyBread Software Releases the MBS Plugins 8.2

**Xojo Developer Magazine**

- 18.3, page 52: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 128.2.2 Methods

### 128.2.3 allowedFileTypes as string()

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array of the allowed file types.
**Notes:** If the user specifies a file whose type is in the array of allowed types, the user is not presented with another dialog (see allowsOtherFileTypes for details about this dialog) when trying to save. Examples of common file types are "rtf", "tiff", and "ps". File type strings encoding HFS file types are not valid values for this attribute. A nil return value, which is the default, indicates that the user can save to any ASCII file.

Available in Mac OS X v10.3 and later.

### 128.2.4 beginSheetForDirectory(path as folderitem, name as string, targetWindow as DesktopWindow)

MBS MacCocoa Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Presents a Save panel as a sheet with the directory specified by path and optionally, the file specified by name selected.
**Notes:** If targetWindow is nil, the panel will be a modal dialog.

This method will later called the savePanelDidEnd event.

Seems like on Mac OS X 10.4 the usage of sheets will raise NSExceptions for missing methods in the NSCarbonWindowFrame class.
See also:

- 128.2.5 beginSheetForDirectory(path as folderitem, name as string, targetWindow as window) 17866

### 128.2.5 beginSheetForDirectory(path as folderitem, name as string, targetWindow as window)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Presents a Save panel as a sheet with the directory specified by path and optionally, the file specified by name selected.
**Notes:** If targetWindow is nil, the panel will be a modal dialog.

This method will later called the savePanelDidEnd event.

Seems like on Mac OS X 10.4 the usage of sheets will raise NSExceptions for missing methods in the NSCarbonWindowFrame class.
See also:

- 128.2.4 beginSheetForDirectory(path as folderitem, name as string, targetWindow as DesktopWindow) 17866

### 128.2.6 Cancel

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** You can cancel the dialog using this method.

### 128.2.7 Constructor

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The constructor which initializes the panel with default values.

### 128.2.8 File as folderitem

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The file currently shown in the panel.
**Notes:** May be nil.

### 128.2.9 FileTypeForHFSType(hfstype as string) as string

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a string encoding a file type code.
**Example:**

```
dim n as new NSSavePanelMBS

MsgBox n.FileTypeForHFSType("TEXT") // shows 'TEXT'
```

**Notes:** When using Mac Type codes, you need to use this function to convert them in a string the file manager understands.

### 128.2.10 HideNSNavNodePopUpButton

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Hides the nagivation popup menu.
**Notes:** This is a function using undocumented features from the Apple NSSavePanel class, so there is not guarantee that it will work in future versions.

### 128.2.11 Ok

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** You can click ok in the dialog using this method.

### 128.2.12 runModal as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Displays the panel and begins its event loop with the current working (or last selected) directory as the default starting point.
**Example:**

```
dim n as new NSSavePanelMBS

dim e as integer = n.runModal

if e = n.NSCancelButton then
// cancelled
Break
elseif e = n.NSOKButton then
// got file
dim file as FolderItem = n.file
Break
end if
```

**Notes:** Returns NSOKButton or NSCancelButton or -1 on any error.

### 128.2.13 runModalForDirectory(path as folderitem, name as string) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Initializes the panel to the directory specified by path and, optionally, the file specified by filename, then displays it and begins its modal event loop; path and filename can be empty strings.

**Notes:** If path is nil, the previous directory the Save panel was in is used.
See NSCancelButton and NSOkButton constants for return values.

### 128.2.14 setAllowedFileTypes(filetype as string)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A convenience method for setAllowedFileTypes with only one file type.
See also:

- 128.2.15 setAllowedFileTypes(filetypes() as string) 17869

### 128.2.15 setAllowedFileTypes(filetypes() as string)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the allowed file types.
**Notes:** A file type is an extension to be appended to any selected files that don't already have that extension; "nib" and "rtf" are examples. The items in types should not include the period that begins the extension. File type strings encoding HFS file types are not valid values. Pass an empty array, to allow any file type, which is the default.
See also:

- 128.2.14 setAllowedFileTypes(filetype as string) 17869

### 128.2.16 setTagNames(tagNames() as string)

MBS MacCocoa Plugin, Plugin Version: 23.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the tag names that you want to include on a saved file.
**Example:**

```
dim n as new NSSavePanelMBS
n.showsTagField = true
n.setTagNames array("test")
```

**Notes:** When the value of showsTagField is true, use this property to provide an array of strings that represent the initial tag names to display in the panel. If you set the property to nil or an empty array, the panel displays no initial tag names.

### 128.2.17 tagNames as string()

MBS MacCocoa Plugin, Plugin Version: 23.0, Platform: macOS, Targets: Desktop only.

**Function:** The tag names that you want to include on a saved file.
**Notes:** When the value of showsTagField is true, use this property to provide an array of strings that represent the initial tag names to display in the panel. If you set the property to nil or an empty array, the panel displays no initial tag names.

### 128.2.18 validateVisibleColumns

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Validates and possibly reloads the browser columns visible in the receiver by invoking the delegate method shouldShowFilename.
**Notes:** You might use this method if you want the browser to only allow selection of files with certain extensions based on the selection made in an accessory-view pop-up list. When the user changes the selection, you would invoke this method to revalidate the visible columns.

### 128.2.19 Properties

### 128.2.20 accessoryView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The custom accessory view for the current application.
**Notes:** You can place any Cocoa control on that panel.
(Read and Write property)

### 128.2.21 allowsOtherFileTypes as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver allows the user to save files with an extension that's not in the list of allowed types.
**Notes:** If the user tries to save a filename with a recognized extension that's not in the list of allowed types they are presented with a dialog. If this property is true, then the dialog presents the option of using the extension the user specified.

The default setting is false.
(Read and Write property)

### 128.2.22 canCreateDirectories as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver allows the user to create directories.
**Notes:** (Read and Write property)

### 128.2.23 canSelectHiddenExtension as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the receiver allows the user to hide or show extensions.
**Notes:** (Read and Write property)

### 128.2.24 Directory as folderitem

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The path of the directory currently shown in the panel.
**Notes:** May be nil on any error.
(Read and Write property)

### 128.2.25 directoryURL as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The directory shown in the panel as a URL.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 128.2.26 isExpanded as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the panel is expanded.
**Notes:** (Read only property)

### 128.2.27 isExtensionHidden as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** Whether the extension-hiding checkbox is visible and checked.
**Notes:** True to show the checkbox and false to hide.
(Read and Write property)

### 128.2.28 Message as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The message displayed in the panel.
**Notes:** The default message text is an empty string.
(Read and Write property)

### 128.2.29 NameFieldLabel as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The string displayed in front of the filename text field.
**Notes:** By default the label is "Save As:".
(Read and Write property)

### 128.2.30 nameFieldStringValue as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The user-editable filename currently shown in the name field.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 128.2.31 Prompt as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The prompt of the default button.
**Notes:** This prompt appears on all SavePanel objects (or all OpenPanel objects if the panel of this message is an NSOpenPanel instance) in your application. By default the text in the default button is "Open" for an Open panel and "Save" for a Save panel.

It is intended that short words or phrases, such as "Open", "Save", "Set", or "Choose", be used on the button. The button is not resized to accommodate long prompts.

Since this method previously affected a title field, any colon at the end of prompt is removed.
(Read and Write property)

### 128.2.32 requiredFileType as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The required file type (if any).
**Notes:** A file specified in the Save panel is saved with the designated filename and this file type as an extension. Examples of common file types are "rtf", "tiff", and "ps". File type strings encoding HFS file types are not valid values for this attribute. An "" return value indicates that the user can save to any ASCII file.

This method is equivalent to calling allowedFileTypes and returning the first element of the list of allowed types, or "" if there are none.
(Read and Write property)

### 128.2.33 showsHiddenFiles as boolean

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to show or hide the invisible files.
**Notes:** This is a function using undocumented features from the Apple NSSavePanel class, so there is not guarantee that it will work in future versions.
(Read and Write property)

### 128.2.34 showsTagField as Boolean

MBS MacCocoa Plugin, Plugin Version: 23.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the panel displays the Tags field.
**Example:**

```
dim n as new NSSavePanelMBS
n.showsTagField = true
n.setTagNames array("test")
```

**Notes:** When the value of this property is true, the panel displays the Tags field; if NO, the panel doesn,Äôt display the Tags field. The default value is true. (Note that the Tags field is appropriate only in a Save panel.)
If you set this property to true, you are responsible for setting tag names on the resulting file after saving is complete. If you don,Äôt set this property, macOS will automatically show the tag field and attempt to

apply the tags to the file. To set tags on files, use the NSURLTagNamesKey.
(Read and Write property)

### 128.2.35 Title as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** The title of the panel.
**Notes:** (Read and Write property)

### 128.2.36 treatsFilePackagesAsDirectories as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the panel displays file packages to the user as directories.
**Notes:** (Read and Write property)

### 128.2.37 Events

### 128.2.38 compareFilename(name1 as string, name2 as string, caseSensitive as boolean) as Integer

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Controls the ordering of files presented by the NSSavePanel.
**Notes:** If this event has no code, the default behavior is used.

The caseSensitive argument, if true, indicates that the ordering is to be case-sensitive.

Don't reorder filenames in the Save panel without good reason, because it may confuse the user to have files in one Save panel or Open panel ordered differently than those in other such panels or in the Finder. The default behavior of Save and Open panels is to order files as they appear in the Finder. Note also that by implementing this method you will reduce the operating performance of the panel.

Constants:
const NSOrderedAscending=-1 // The left operand is smaller than the right operand.
const NSOrderedSame=0 // The two operands are equal.
const NSOrderedDescending=1 // The left operand is greater than the right operand.

### 128.2.39 directoryDidChange(path as string, folder as folderitem)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Sent when the user has changed the selected directory in the panel.
**Notes:** If this event has no code, the default behavior is used.

### 128.2.40 isValidFilename(path as string, item as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Gives the delegate the opportunity to validate selected items.
**Notes:** If this event has no code, the default behavior is used.

The NSSavePanel object sender sends this event just before the end of a modal session for each filename displayed or selected (including filenames in multiple selections). The event determines whether it wants the file identified by filename; it returns true if the filename is valid, or false if the save panel should stay in its modal loop and wait for the user to type in or select a different filename or names. If the event refuses a filename in a multiple selection, none of the filenames in the selection is accepted.

### 128.2.41 panelSelectionDidChange

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** The event called whenever the selection changed in the dialog.
**Notes:** If this event has no code, the default behavior is used.

### 128.2.42 savePanelDidEnd(ReturnCode as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** The save panel finished in sheet mode.
**Notes:** Returncode is NSOKButton or NSCancelButton.

### 128.2.43 shouldShowFilename(path as string, item as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Gives the delegate the opportunity to filter items that it doesn't want the user to choose.
**Notes:** If this event has no code, the default behavior is used.

The NSSavePanel sends this event for each file or directory (filename) it is about to load in the browser. The delegate returns true if filename should be selectable, and false if the save panel should disable the file or directory.

### 128.2.44 userEnteredFilename(filename as string, confirmed as boolean) as string

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Sent when the user confirms a filename choice by hitting OK or Return in the NSSavePanel.
**Notes:** You can either leave the filename alone, return a new filename, or return "" to cancel the save (and leave the Save panel as is). This method is sent before any required extension is appended to the filename and before the Save panel asks the user whether to replace an existing file.

Note that in the future, this method may be called multiple times in the sessions as the user types. In those cases, okFlag will be false until the user confirms the choice, in which case okFlag will become true. If the delegate does extensive validation or puts up alerts, it should do so only when okFlag is true.

If this event has no code, the default behavior is used.

### 128.2.45 willExpand(expanding as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.8, Platform: macOS, Targets: .

**Function:** Sent when the NSSavePanel is about to expand or collapse because the user clicked the disclosure triangle that displays or hides the file browser.
**Notes:** If this event has no code, the default behavior is used.

### 128.2.46 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSCancelButton | 0 | One of the result codes you may need with this class. |
| NSOKButton | 1 | One of the result codes you may need with this class. |

## 128.3 class OpenDialogFileTypeMBS

### 128.3.1 class OpenDialogFileTypeMBS

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A class for a file type for the OpenDialog class.
**Notes:** For Cocoa, only the type field is used and can be an UTI or file extension.

### 128.3.2 Methods

### 128.3.3 Close

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 128.3.4 Properties

### 128.3.5 Extension as String

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The extension for this filetype.
**Notes:** Currently this value is only used on Windows.
Value e.g. "*.TXT" or "*.TXT;*.BMP".

Use a value like "*.TXT" or to match multiple types, list multiple extensions separated by semicolons like this: "*.TXT;*.BMP".

With version 8.2, we use extensions also for MacOS.
(Read and Write property)

### 128.3.6 Name as String

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The name of this file type.
**Notes:** Currently this value is only used on Windows.

(Read and Write property)

### 128.3.7 Type as String

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Mac OS type code for this file type.
**Notes:** Currently this value is only used on Mac OS.
And check the documenation on the Navigation Manager if you use it as you will need a KIND Resource for this.

For Cocoa, only the type field is used and can be an UTI or file extension.
(Read and Write property)

## 128.4 class OpenDialogItemMBS

### 128.4.1 class OpenDialogItemMBS

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for an item selected via open dialog.
**Notes:** Currently only used for Windows.
**Blog Entries**

- New in the MBS Xojo Plugins 20.0
- MBS Xojo Plugins, version 20.0pr7

### 128.4.2 Methods

### 128.4.3 ReadData as String

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reads the data.
**Notes:** We try to get a stream for the data from Windows and then read all available data.

### 128.4.4 Properties

### 128.4.5 Handle as Integer

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The internal object handle.
**Notes:** Points to an IShellItem object.
(Read and Write property)

### 128.4.6 Name as String

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The display name of the file.
**Notes:** (Read and Write property)

### 128.4.7 Path as String

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The file path of the file.
**Notes:** Not available for virtual files.
(Read and Write property)

### 128.4.8 URL as String

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The URL of the file.
**Notes:** Not available for virtual files.
(Read and Write property)

## 128.5 class OpenDialogMBS

### 128.5.1 class OpenDialogMBS

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A class for a multiple selection open dialog.
**Example:**

```
dim o as OpenDialogMBS
dim i,c as Integer
dim f as FolderItem

o=new OpenDialogMBS
o.ShowHiddenFiles=true
o.PromptText="Select one or more files:"
o.MultipleSelection=true
o.ActionButtonLabel="Open files"
o.CancelButtonLabel="no, thanks."
o.WindowTitle="This is a window title."
o.ClientName="Client Name?"
o.ShowDialog

c=o.FileCount
if c>0 then
for i=0 to c-1
f=o.Files(i)

Listbox1.AddRow f.NativePath
next

else
// MsgBox "no file was selected."
quit
end if
```

**Notes:** OpenDialogMBS does not yet use NSOpenPanel yet. So for Cocoa applications you can use NSOpenPanelMBS class directly. For the Mac App Store, you must use NSOpenPanelMBS and avoid OpenDialogMBS.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 21.1pr8
- MBS Xojo Plugins, version 20.2pr2
- Customized File Open and Save Dialogs for Windows

- MBS Xojo Plugins, version 20.0pr7
- Open Dialog upgraded
- Xojo 2017 Release 2
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS REALbasic Plugins, version 11.0fc1
- MonkeyBread Software Releases the MBS Plugins 8.1

**Xojo Developer Magazine**

- 3.2, page 42: Notes, Questions, and Answers, Christian tackles a variety of issues by Christian Schmitz
- 12.2, page 10: News

### 128.5.2 Methods

### 128.5.3 AddType(t as OpenDialogFileTypeMBS)

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds a file type to the list.

### 128.5.4 ClearTypes

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears the file type list.

### 128.5.5 CountTypes as Integer

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the number of file types in the file type list.

### 128.5.6 Files as FolderItem()

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries an array with all files picked.
See also:

• 128.5.7 Files(index as Integer) as folderitem 17883

### 128.5.7 Files(index as Integer) as folderitem

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The array with the selected files.
**Notes:** Index goes from 0 to filecount-1.
See also:

• 128.5.6 Files as FolderItem() 17882

### 128.5.8 GetCustomImageHeight as Integer

MBS Util Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop only.

**Function:** Returns the heigh of the custom picture in pixels.
**Example:**

```
dim o as new OpenDialogMBS
msgbox "GetCustomImageHeight: "+str(o.GetCustomImageHeight) // could show 72 as value.
```

**Notes:** The height depends on the size of the Windows system font, so it's variable and this function calculates the size for you.

Returns 0 on any error.

### 128.5.9 GetType(index as Integer) as OpenDialogFileTypeMBS

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the file type with the given index.
**Notes:** Returns nil on any error.

### 128.5.10 Items as OpenDialogItemMBS()

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries items picked.
**Notes:** Currently only provided for Windows to get name, path, URL or data for items, which may not always have a file path.

### 128.5.11 RefreshCustomImage

MBS Util Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop only.

**Function:** Call this method after you set the custompicture property to update the window.
**Notes:** The control is asked to redraw and will use the CustomPicture property for the picture content. Space around is colored with window background color.

### 128.5.12 ShowDialog

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Shows the dialog.
**Example:**

```
dim o as new OpenDialogMBS
o.ShowDialog
```

**Notes:** Check the FileCount property to see whether something was selected.

### 128.5.13 Properties

### 128.5.14 accessoryView as Variant

MBS Util Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Customizes the panel for the application by adding a custom view to the panel.
**Notes:** Only for Cocoa target. Must be a NSViewMBS or subclass.

The custom object that is added appears just above the OK and Cancel buttons at the bottom of the panel. The open panel automatically resizes itself to accommodate the view. You can invoke this method repeatedly to change the accessory view as needed. If view is nil, the panel removes the current accessory view.
(Read and Write property)

### 128.5.15 ActionButtonLabel as String

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Function:** The label of the action button.
**Example:**

```
dim o as new OpenDialogMBS

o.ActionButtonLabel = "Hello"
o.ShowDialog
```

**Notes:** Used only on Mac OS.
For RB 4.5 and earlier you need to make sure the encoding is set correctly.
Can be set to "" to use the default value.
(Read and Write property)

### 128.5.16 AllowFolderSelection as Boolean

MBS Util Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether folders can be selected.
**Example:**

```
dim o as OpenDialogMBS
dim i,c as Integer
dim f as FolderItem

o=new OpenDialogMBS
o.ShowHiddenFiles=true
o.PromptText="Select one or more files/folders:"
o.MultipleSelection=true
o.ActionButtonLabel="Open files/folders"
o.CancelButtonLabel="no, thanks."
o.WindowTitle="This is a window title."
o.ClientName="Client Name?"
o.AllowFolderSelection=true
o.ShowDialog

c=o.FileCount
if c>0 then
for i=0 to c-1
f=o.Files(i)

Listbox1.AddRow f.NativePath
next
end if
```

**Notes:** Default is false.
Setting this to true on Windows or Linux has no effect there.

(Read and Write property)

### 128.5.17 CancelButtonLabel as String

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The text for the cancel button.
**Example:**

```
dim o as new OpenDialogMBS

o.CancelButtonLabel = "Hello"
o.ShowDialog
```

**Notes:** Used only on Mac OS Carbon.
Can be set to "" to use the default value.

Deprecated as no longer needed for Windows, Linux or MacOS Cocoa.
(Read and Write property)

### 128.5.18 ClientName as String

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The name of the client.
**Example:**

```
dim o as new OpenDialogMBS
o.ClientName = "Hello"
o.ShowDialog
```

**Notes:** Used only on Mac OS Carbon.
Can be set to "" to use the default value.

Deprecated as no longer needed for Windows, Linux or MacOS Cocoa.
(Read and Write property)

### 128.5.19 Creator as String

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Function:** The creator code of your application.
**Notes:** This property is only used Mac OS if you specify one or more file types.
(Read and Write property)

### 128.5.20 CustomPicture as Picture

MBS Util Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop only.

**Function:** The custom picture content.
**Notes:** You need to call RefreshCustomImage to refresh the picture visible to the user.
(Read and Write property)

### 128.5.21 File as FolderItem

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The first file selected.
**Example:**

```
dim o as new OpenDialogMBS
o.MultipleSelection = true
o.ShowDialog

MsgBox o.File.displaypathmbs
```

**Notes:** file = files(0)
Just for the cases where you only need the first file.
(Read only property)

### 128.5.22 FileCount as Integer

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The number of files selected.
**Example:**

```
dim o as new OpenDialogMBS
o.MultipleSelection = true
```

```
o.ShowDialog

MsgBox str(o.FileCount)
```

**Notes:** (Read only property)

### 128.5.23 InitialDirectory as FolderItem

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The initial directory.
**Example:**

```
dim o as new OpenDialogMBS
o.InitialDirectory = SpecialFolder.Desktop
o.ShowDialog
```

**Notes:** Set to nil to get the last directory used.
(Read and Write property)

### 128.5.24 Lasterror as Integer

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 128.5.25 Left as Integer

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Function:** The horizontal position of the dialog.
**Notes:** -1 is for the default position.
Used only on the Mac side.
(Read and Write property)

### 128.5.26 MultipleSelection as Boolean

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether you want to allow multiple file selection.
**Example:**

```
dim o as new OpenDialogMBS
o.MultipleSelection = true
o.ShowDialog
```

**Notes:** (Read and Write property)

### 128.5.27 ParentWindow as Variant

MBS Util Plugin, Plugin Version: 6.3, Platforms: Linux, Windows, Targets: Desktop only.

**Function:** The parent window of the dialog.
**Example:**

```
dim o as new OpenDialogMBS
o.ParentWindow = window1
o.ShowDialog
```

**Notes:** Only implemented for Windows and Linux.
Can reference a Window or DesktopWindow object.
(Read and Write property)

### 128.5.28 PromptText as String

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Function:** The prompt text.
**Example:**

```
dim o as new OpenDialogMBS

o.PromptText = "Hello"
o.ShowDialog
```

**Notes:** For RB 4.5 and earlier you need to make sure the encoding is set correctly.

Can be set to "" to use the default value.
(Read and Write property)

### 128.5.29 ResolveAliases as Boolean

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether aliases should be resolved.
**Example:**

```
dim o as new OpenDialogMBS
o.ResolveAliases = false
o.ShowDialog
```

**Notes:** This property is only used on Mac OS X.
Default is true.

Flag seems to be broken on Mac OS X 10.7.
(Read and Write property)

### 128.5.30 ShowHiddenFiles as Boolean

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether hidden files should be shown.
**Example:**

```
dim o as new OpenDialogMBS
o.ShowHiddenFiles = true
o.ShowDialog
```

**Notes:** Default is false.
(Read and Write property)

### 128.5.31 Top as Integer

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop only.

**Function:** The vertical position of the dialog.
**Notes:** -1 is for the default position.

Used only on the Mac side.
(Read and Write property)

### 128.5.32 TreatFilePackagesAsDirectories as Boolean

MBS Util Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Sets the panel's behavior for displaying file packages (for example, MyApp.app) to the user.
**Notes:** If true, the panel will display file packages as directories; if false, it will not.
(Read and Write property)

### 128.5.33 UseCustomPicture as Integer

MBS Util Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop only.

**Function:** Whether to add a custom picture control.
**Notes:** Specify the size of the area you want. As the size is relative to the font size of the system font on windows, the results can be interesting. For example a value of 50 gives here a 72 pixel height area. Value can be from 1 to 100. Or zero to disable.

This method was added for a client who needed to show a small preview of a project file in the open dialog on Windows.
For Mac OS X you can use the NSSavePanelMBS/NSOpenPanelMBS with an accessory view.
(Read and Write property)

### 128.5.34 WindowTitle as String

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The window title to use.
**Example:**

```
dim o as new OpenDialogMBS

o.WindowTitle = "Hello World"
o.ShowDialog
```

**Notes:** Can be set to "" to use the default value.
Not shown on MacOS.
(Read and Write property)

### 128.5.35 Events

### 128.5.36 FilterItem(file as folderitem, filterMode as Integer) as boolean

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Windows, Targets: .

**Function:** An event where you can filter the file list.
**Notes:** Return true to disable the file.
The result of the event is ignored by Windows. But on Mac OS it works.
So use the event on Mac and the filetype objects on Windows.

### 128.5.37 SelectionChanged(file as folderitem)

MBS Util Plugin, Plugin Version: 11.0, Platform: Windows, Targets: .

**Function:** Called when the selection changes in the window.
**Notes:** This is currently only implemented for Windows and gives you only one file name.

## 128.6 class UIDocumentPickerMBS

### 128.6.1 class UIDocumentPickerMBS

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A view controller that provides access to documents or destinations outside your app,Äôs sandbox.
**Notes:** Use a document picker view controller to select a document to open or export, and optionally copy. Don,Äôt copy the document if you can avoid it. The document picker operates in two modes:

Open a document. The user selects a document. The document picker provides access to the document, and the user can edit the document in place. Optionally, you can specify that the document picker makes a copy of the document, leaving the original unchanged.

Export a local document. The user selects a destination. The document picker moves the document, and the user can access it and edit it in place. Optionally, you can specify that the document picker makes a copy of the document, leaving the original unchanged.

Working with External Documents
Both the open and export operations grant access to documents outside your app,Äôs sandbox. This access gives users an unprecedented amount of flexibility when working with their documents. However, it also adds a layer of complexity to your file handling. External documents have the following additional requirements: The open and move operations provide security-scoped URLs for all external documents. Call the startAccessingSecurityScopedResource method to access or bookmark these documents, and the stopAccessingSecurityScopedResource method to release them (see NSURLMBS class). If you,Äôre using a UIDocument subclass to manage your document, it automatically manages the security-scoped URL for you.

Always use file coordinators (see NSFileCoordinatorMBS) to read and write to external documents.
Always use a file presenter (see NSFilePresenterMBS) when displaying the contents of an external document.

Don,Äôt save URLs that the open and move operations provide. You can, however, save a bookmark to these URLs after calling startAccessingSecurityScopedResource to ensure you have access. Call the bookmarkDataWithOptions method and pass in the NSURLBookmarkCreationWithSecurityScope option, creating a bookmark that contains a security-scoped URL.

For more information about working with external documents, see Providing Access to Directories and Adding a Document Browser to Your App.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr6

- MBS Xojo Plugins, version 22.3pr5

### 128.6.2 Methods

### 128.6.3 Constructor(Mode as Integer, contentTypesOrURLs() as String, asCopy as Boolean = true)

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Initializes and a document picker/exporter.
**Notes:** For Mode = ModeImport or ModeOpen, please pass array of content types. That may be mime types (e.g. "image/jpeg"), file extensions with dot prefix (e.g. ".jpg") or UTIs (e.g. "public.archive"). For iOS 13 and older, please pass only UTIs.

For Mode = ModeExportToService or ModeMoveToService takes in contentTypesOrURLs an array of file URLs to export.

AsCopy defines whether you like to get a copy on import (copied to temp folder) and copies your file for export. This way you can use temporary folders and later delete them when you are done.

### 128.6.4 Destructor

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 128.6.5 Dismiss

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 128.6.6 Present

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 128.6.7 Properties

### 128.6.8 allowsMultipleSelection as Boolean

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether the user can select more than one document at a time.
**Notes:** By default, this property is false.
(Read and Write property)

### 128.6.9 directoryURL as String

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The initial directory that the document picker displays.
**Notes:** Set this property to specify the starting directory for the document picker. This property defaults to "". If you specify a value, the document picker tries to start at the specified directory. Otherwise, it starts with the last directory chosen by the user.
The directoryURL property only returns a value when you explicitly set it. For example, it doesn,Äôt calculate the default URL presented to the user when the property isn,Äôt set.

For a folderItem, please pass URLPath property.
(Read and Write property)

### 128.6.10 documentPickerMode as Integer

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The type of file transfer operation that the document picker uses.
**Notes:** (Read only property)

### 128.6.11 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 128.6.12 isBeingPresented as Boolean

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Whether the controller is presented.
**Notes:** Returns true if the dialog is visible.
(Read only property)

### 128.6.13 shouldShowFileExtensions as Boolean

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether the browser always shows file extensions.
**Notes:** The default value is false.
(Read and Write property)

### 128.6.14 Events

### 128.6.15 documentPickerDidPickDocuments(URLs() as String)

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Event called when documents were picked.
**Notes:** The array may have one or more URLs.

The meaning of the provided URLs varies depending on the document picker,Äôs mode:

Import:
The URLs refer to a copy of the selected documents. These documents are temporary files. They remain available only until your application terminates. To keep a permanent copy, move these files to a permanent location inside your sandbox.

Open:
The URLs refer to the selected documents.

ExportToService:
The URLs refer to new copies of the exported documents at the selected destination.

MoveToService:
The URLs refer to the documents' new locations.
The provided URLs are security-scoped, referring to files outside your app,Äôs sandbox. For more about

working with external, security-scoped URLs, see Requirements in the Document Picker Programming Guide.

### 128.6.16 documentPickerWasCancelled

MBS iOS Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** The user canceled the document picker.

### 128.6.17 Constants

Modes

| Constant | Value | Description |
|---|---|---|
| ModeExportToService | 2 | The document picker exports a local file to a destination outside the app,Äôs sandbox. |
| ModeImport | 0 | The document picker imports a file from outside the app,Äôs sandbox. |
| ModeMoveToService | 3 | The document picker moves a local file outside the app,Äôs sandbox and provides access to it as an external file. |
| ModeOpen | 1 | The document picker opens an external file outside the app,Äôs sandbox. |

## 128.7 class WinFileDialogExceptionMBS

### 128.7.1 class WinFileDialogExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for an error exception in our WinFileDialog classes.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

## 128.8 class WinFileDialogMBS

### 128.8.1 class WinFileDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for a file dialog.
**Notes:** All methods may raise WinFileDialogExceptionMBS in case of errors.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

**Xojo Developer Magazine**

- 18.3, page 10: News

### 128.8.2 Methods

### 128.8.3 AddCheckButton(ControlID as Integer, label as String, Checked as boolean = false)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a check button (check box) to the dialog.
**Notes:** ControlID: The ID of the check button to add.
Label: the button text.
Checked: A boolean indicating the current state of the check button. True if checked; false otherwise.

The default state for this control is enabled and visible.

### 128.8.4 AddComboBox(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a combo box to the dialog.
**Notes:** ControlID: The ID of the combo box to add.

The default state for this control is enabled and visible.

### 128.8.5 AddControlItem(ControlID as Integer, ItemID as Integer, Label as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds an item to a container control in the dialog.
**Notes:** ControlID: The ID of the container control to which the item is to be added.
ItemID: The ID of the item.
Label: The item's text, which can be either a label or, in the case of a drop-down list, the item itself.

The default state for this item is enabled and visible. Items in control groups cannot be changed after they have been created, with the exception of their enabled and visible states.
Container controls include option button groups, combo boxes, drop-down lists on the Open or Save button, and menus.

### 128.8.6 AddEditBox(ControlID as Integer, Text as String = "")

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds an edit box control to the dialog.
**Notes:** ControlID: The ID of the edit box to add.
Text: The default text displayed in the edit box.

The default state for this control is enabled and visible.
To add a label next to the edit box, place it in a visual group with StartVisualGroup.

### 128.8.7 AddMenu(ControlID as Integer, Label as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a menu to the dialog.
**Notes:** ControlID: The ID of the menu to add.
Label: The menu name.

The default state for this control is enabled and visible.
To add items to this control, use AddControlItem.

### 128.8.8 AddPlace(Item as WinShellItemMBS, top as boolean = false)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a folder to the list of places available for the user to open or save items.
**Notes:** Item: the folder to be made available to the user. This can only be a folder.
Top: Specifies where the folder is placed within the list. Pass true for top or false for bottom.

### 128.8.9 AddPushButton(ControlID as Integer, Label as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a button to the dialog.
**Notes:** ControlID: The ID of the button to add.
Label: the button text

The default state for this control is enabled and visible..

### 128.8.10 AddRadioButtonList(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds an option button (also known as radio button) group to the dialog.
**Notes:** ControlID: The ID of the option button group to add.
The default state for this control is enabled and visible.

### 128.8.11 AddSeparator(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds a separator to the dialog, allowing a visual separation of controls.
**Notes:** ControlID: The control ID of the separator.

The default state for this control is enabled and visible.

### 128.8.12 AddText(ControlID as Integer, Text as String = "")

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds text content to the dialog.

**Notes:** ControlID: The ID of the text to add.
Text: The text to show.

The default state for this control is enabled and visible.

### 128.8.13 ClearClientData

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Instructs the dialog to clear all persisted state information.
**Notes:** Persisted information can be associated with an application or a GUID. If a GUID was set by using SetClientGuid, that GUID is used to clear persisted information.

### 128.8.14 Close(cancel as boolean = false)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Closes the dialog.
**Notes:** Pass or false/true for cancel parameter to have that being returned by Show method.

An application can call this method from an event while the dialog is open. The dialog will close and the Show method will return with the result given by cancel parameter.

If this method is called, there is no result available for the Result or Results methods, and they will fail if called.

### 128.8.15 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 128.8.16 EnableOpenDropDown(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Enables a drop-down list on the Open or Save button in the dialog.
**Notes:** ControlID: The ID of the drop-down list.

The Open or Save button label takes on the text of the first item in the drop-down. This overrides any label set by OkButtonLabel.
Use AddControlItem to add items to the drop-down.

### 128.8.17 EndVisualGroup

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Stops the addition of elements to a visual group in the dialog.

### 128.8.18 RemoveAllControlItems(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Removes all items from a container control in the dialog.
**Notes:** ControlID: The ID of the container control from which to remove the items.

Container controls include option button groups, combo boxes, drop-down lists on the Open or Save button, and menus.

### 128.8.19 RemoveControlItem(ControlID as Integer, ItemID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Removes an item from a container control in the dialog.
**Notes:** ControlID: The ID of the container control from which the item is to be removed.
ItemId: The ID of the item.

Container controls include option button groups, combo boxes, drop-down lists on the Open or Save button, and menus.

### 128.8.20 SetFileTypes(FileTypes() as WinFileTypeMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The file types that the dialog can open or save.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
Dim FileTypes() As WinFileTypeMBS
```

```
FileTypes.Append New WinFileTypeMBS("JPEG image", "*.jpg")
FileTypes.Append New WinFileTypeMBS("PNG image", "*.png")
FileTypes.Append New WinFileTypeMBS("Tiff image", "*.tif;*.tiff")

d.SetFileTypes FileTypes
```

**Notes:** When using the Open dialog, the file types declared there are used to filter the view. When using the Save dialog, these values determine which file name extension is appended to the file name.
This method must be called before the dialog is shown and can only be called once for each dialog instance.
File types cannot be modified once the Common Item dialog box is displayed.

### 128.8.21 Show as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Launches the modal window.
**Notes:** Returns true on success or false on failure.
See also:

- 128.8.22 Show(parent as DesktopWindow) as Boolean 17904
- 128.8.23 Show(parent as window) as Boolean 17904

### 128.8.22 Show(parent as DesktopWindow) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Launches the modal window.
**Notes:** parent: The handle of the owner window. This value can be nil.
Returns true on success or false on failure.
See also:

- 128.8.21 Show as Boolean 17904
- 128.8.23 Show(parent as window) as Boolean 17904

### 128.8.23 Show(parent as window) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Launches the modal window.
**Notes:** parent: The handle of the owner window. This value can be nil.

Returns true on success or false on failure.
See also:

- 128.8.21 Show as Boolean 17904
- 128.8.22 Show(parent as DesktopWindow) as Boolean 17904

### 128.8.24 StartVisualGroup(ControlID as Integer, label as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Declares a visual group in the dialog. Subsequent calls to any "add" method add those elements to this group.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog

d.StartVisualGroup 1, "Metadata"
d.AddText 2, "Author:"
d.AddEditBox 3, CustomValue.Text
d.AddText 4, "Subject:"
d.AddEditBox 5, "Hello World"
d.EndVisualGroup
```

**Notes:** ControlID: The ID of the visual group.
Label: text that appears next to the visual group.

Controls will continue to be added to this visual group until you call EndVisualGroup.
A visual group can be hidden and disabled like any other control, except that doing so affects all of the controls within it. Individual members of the visual group can also be hidden and disabled singly.

### 128.8.25 Properties

### 128.8.26 ClientGuid as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The client GUID.
**Notes:** A dialog's state can include factors such as the last visited folder and the position and size of the dialog.
Typically, this state is persisted based on the name of the executable file. By specifying a GUID, an application can have different persisted states for different versions of the dialog within the same application (for example, an import dialog and an open dialog).

SetClientGuid should be called immediately after creation of the dialog object.

Enables a calling application to associate a GUID with a dialog's persisted state.
(Read and Write property)

### 128.8.27 CurrentSelection as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The user's current selection in the dialog.
**Notes:** The item currently selected in the dialog. This item can be a file or folder selected in the view window, or something that the user has entered into the dialog's edit box. The latter case may require a parsing operation (cancelable by the user) that blocks the current thread.

If not result exists, the plugin returns nil and raises no failed exceptions.
(Read only property)

### 128.8.28 DefaultExtension as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The default extension to be added to file names.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.DefaultExtension = "jpg"
```

**Notes:** The extension text. This string should not include a leading period. For example, "jpg" is correct, while ".jpg" is not.

If this method is called before showing the dialog, the dialog will update the default extension automatically when the user chooses a new file type (see SetFileTypes).
(Read and Write property)

### 128.8.29 DefaultFolder as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The folder used as a default if there is not a recently used folder value available.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.DefaultFolder = New WinShellItemMBS(SpecialFolder.Desktop)
```

**Notes:** (Read and Write property)

### 128.8.30 FileName as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The text currently entered in the dialog's File name edit box.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.FileName = "New Document"
```

**Notes:** The text in the File name edit box does not necessarily reflect the item the user chose. To get the item the user chose, use Result property.

If not result exists, the plugin returns "" and raises no failed exceptions.
(Read and Write property)

### 128.8.31 FileNameLabel as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The text of the label next to the file name edit box.
**Notes:** (Read and Write property)

### 128.8.32 FileTypeIndex as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The currently selected file type.
**Notes:** The index of the selected file type in the file type array passed to SetFileTypes.

This is a one-based index rather than zero-based.
FileTypeIndex can be called either while the dialog is open or after it has closed.
(Read and Write property)

### 128.8.33 Folder as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** A folder that is always selected when the dialog is opened, regardless of previous user action.
**Notes:** Gets either the folder currently selected in the dialog, or, if the dialog is not currently displayed, the folder that is to be selected when the dialog is opened.

This folder overrides any "most recently used" folder. If this method is called while the dialog is displayed, it causes the dialog to navigate to the specified folder.
In general, we do not recommended the use of this method. If you call SetFolder before you display the dialog box, the most recent location that the user saved to or opened from is not shown. Unless there is a very specific reason for this behavior, it is not a good or expected user experience and should therefore be avoided. In almost all instances, SetDefaultFolder is the better method.

As of Windows 7, if the path of the folder specified through psi is the default path of a known folder, the known folder's current path is used in the dialog. That path might not be the same as the path specified in psi; for instance, if the known folder has been redirected. If the known folder is a library (virtual folders Documents, Music, Pictures, and Videos), the library's path is used in the dialog. If the specified library is hidden (as they are by default as of Windows 8.1), the library's default save location is used in the dialog, such as the Microsoft OneDrive Documents folder for the Documents library. Because of these mappings, the folder location used in the dialog might not be exactly as you specified when you called this method.
(Read and Write property)

### 128.8.34 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 128.8.35 OkButtonLabel as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The text of the Open or Save button.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OkButtonLabel = "Export"
```

**Notes:** (Read and Write property)

### 128.8.36 OptionAllNonStorageItems as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Enables the user to choose any item in the Shell namespace, not just those with SFGAO_STREAM or SFAGO_FILESYSTEM attributes. #
**Notes:** This flag cannot be combined with OptionForceFileSystem.
(Read and Write property)

### 128.8.37 OptionAllowMultiSelect as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Enables the user to select multiple items in the open dialog.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionAllowMultiSelect = true
```

**Notes:** Note that when this flag is set, the WinFileOpenDialogMBS class must be used to retrieve those items.
(Read and Write property)

### 128.8.38 OptionCreatePrompt as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Prompt for creation if the item returned in the save dialog does not exist.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionCreatePrompt = true
```

**Notes:** Note that this does not actually create the item.
(Read and Write property)

### 128.8.39 OptionDefaultNoMiniMode as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Indicates to the Save As dialog box that it should open in expanded mode.
**Notes:** Expanded mode is the mode that is set and unset by clicking the button in the lower-left corner of the Save As dialog box that switches between Browse Folders and Hide Folders when clicked. This value is not supported as of Windows 7.
(Read and Write property)

### 128.8.40 OptionDontAaddToRecent as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Do not add the item being opened or saved to the recent documents list.
**Notes:** (Read and Write property)

### 128.8.41 OptionFileMustExist as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The item returned must exist.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionFileMustExist = true
```

**Notes:** This is a default value for the Open dialog.
(Read and Write property)

### 128.8.42 OptionForceFileSystem as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Ensures that returned items are file system items.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionForceFileSystem = true
```

**Notes:** Note that this does not apply to items returned by CurrentSelection.

(Read and Write property)

### 128.8.43 OptionForcePreviewPaneOn as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Indicates to the Open dialog box that the preview pane should always be displayed.
**Notes:** (Read and Write property)

### 128.8.44 OptionForceShowHidden as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Include hidden and system items.
**Notes:** (Read and Write property)

### 128.8.45 OptionHideMRUPlaces as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Hide the list of places from which the user has recently opened or saved items. This value is not supported as of Windows 7.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionHideMRUPlaces = true
```

**Notes:** (Read and Write property)

### 128.8.46 OptionHidePinnedPlaces as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Hide items shown by default in the view's navigation pane.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionHidePinnedPlaces = true
```

**Notes:** This flag is often used in conjunction with the AddPlace method, to hide standard locations and replace them with custom locations.

Windows 7 and later. Hide all of the standard namespace locations (such as Favorites, Libraries, Computer, and Network) shown in the navigation pane.

Windows Vista. Hide the contents of the Favorite Links tree in the navigation pane. Note that the category itself is still displayed, but shown as empty.
(Read and Write property)

### 128.8.47 OptionNoChangeDir as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Don't change the current working directory.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionNoChangeDir = true
```

**Notes:** (Read and Write property)

### 128.8.48 OptionNoDereferenceLinks as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Shortcuts should not be treated as their target items.
**Notes:** This allows an application to open a .lnk file rather than what that file is a shortcut to.
(Read and Write property)

### 128.8.49 OptionNoReadOnlyReturn as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Do not return read-only items.
**Notes:** This is a default value for the Save dialog.
(Read and Write property)

### 128.8.50 OptionNoTestFileCreate as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Do not test whether creation of the item as specified in the Save dialog will be successful.
**Notes:** If this flag is not set, the calling application must handle errors, such as denial of access, discovered when the item is created.
(Read and Write property)

### 128.8.51 OptionNoValidate as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Do not check for situations that would prevent an application from opening the selected file, such as sharing violations or access denied errors.
**Notes:** (Read and Write property)

### 128.8.52 OptionOKButtonNeedsInteraction as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** OKButton needs interaction?
**Notes:** (Read and Write property)

### 128.8.53 OptionOverwritePrompt as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** When saving a file, prompt before overwriting an existing file of the same name.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionOverwritePrompt = true
```

**Notes:** This is a default value for the Save dialog.
(Read and Write property)

### 128.8.54 OptionPathMustExist as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The item returned must be in an existing folder.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.OptionPathMustExist = true
```

**Notes:** This is a default value.
(Read and Write property)

### 128.8.55 OptionPickFolders as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Present an Open dialog that offers a choice of folders rather than files.
**Notes:** (Read and Write property)

### 128.8.56 Options as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The current flags that are set to control dialog behavior.
**Notes:** See kOptions* constants.

Generally, you should read the property, modify it to include or exclude options by setting the appropriate flags and assign it again.
(Read and Write property)

### 128.8.57 OptionShareaware as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** In the case of a sharing violation when an application is opening a file, call the application back through ShareViolation event for guidance.
**Notes:** This flag is overridden by kOptionsNoValidate.
(Read and Write property)

### 128.8.58 OptionStrictFileTypes as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** In the Save dialog, only allow the user to choose a file that has one of the file name extensions specified through SetFileTypes.
**Notes:** (Read and Write property)

### 128.8.59 OptionSupportsStreamableItems as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Indicates that the caller is opening a file as a stream (BHID_Stream), so there is no need to download that file.
**Notes:** (Read and Write property)

### 128.8.60 ProminentControlID as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Places a control in the dialog so that it stands out compared to other added controls.
**Notes:** Setting this property causes the control to be placed near the Open or Save button instead of being grouped with the rest of the custom controls.
Only check buttons (check boxes), push buttons, combo boxes, and menus—or a visual group that contains only a single item of one of those types—can be made prominent.
Only one control can be marked in this way. If a dialog has only one added control, that control is marked as prominent by default.
(Read and Write property)

### 128.8.61 Result as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The choice that the user made in the dialog.
**Notes:** Result can be called after the dialog has closed or during the handling of an OnFileOk event. Calling this method at any other time will fail. If multiple items were chosen, this method will fail. In the case of multiple items, call Results method.
Show must return a success code for a result to be available to Result.

If not result exists, the plugin returns nil and raises no failed exceptions.
(Read only property)

### 128.8.62 Title as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The title of the dialog.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
d.title = "Export database"
```

**Notes:** (Read and Write property)

### 128.8.63 WindowHandle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries window handle.
**Notes:** Value is a HWND and may be used in declares.
(Read only property)

### 128.8.64 CheckButtonState(ControlID as Integer) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The current state of a check button (check box) in the dialog.
**Notes:** ControlID: The ID of the check box.

True means checked; false, unchecked.
(Read and Write computed property)

### 128.8.65 ControlItemState(ControlID as Integer, ItemID as Integer) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The current state of an item in a container control found in the dialog.
**Notes:** ControlID: The ID of the container control.
ItemID: The ID of the item.

See kControlState* flags.
(Read and Write computed property)

### 128.8.66 ControlItemText(ControlID as Integer, ItemID as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The text of a control item.
**Notes:** For example, the text that accompanies a radio button or an item in a menu.

ControlID: The ID of the container control.
ItemID: The ID of the item.

The default state of a control item is enabled and visible. Items in control groups cannot be changed after they have been created, with the exception of their enabled and visible states.
Container controls include option button groups, combo boxes, drop-down lists on the Open or Save button, and menus.
(Read and Write computed property)

### 128.8.67 ControlLabel(ControlID as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The text associated with a control, such as button text or an edit box label.
**Notes:** ControlID: The ID of the control whose text is to be changed.

Control labels can be changed at any time, including when the dialog is visible.
(Read and Write computed property)

### 128.8.68 ControlState(ControlID as Integer) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the current visibility and enabled states of a given control.
**Notes:** ControlID: The ID of the control in question.

See kControlState* flags.
(Read and Write computed property)

### 128.8.69 EditBoxText(ControlID as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The current text in an edit box control.

**Notes:** ControlID: The ID of the edit box.
(Read and Write computed property)

### 128.8.70 SelectedControlItem(ControlID as Integer) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Item index from specified container controls in the dialog.
**Notes:** ControlID: The ID of the container control.

Value is the ID of the item that the user selected in the control.

To determine the user's final choice, this method can be called on option button groups, combo boxes, and drop-down lists on the Open or Save button after the dialog has closed. This method cannot be called on menus.
For option button groups and combo boxes, this method can also be called while the dialog is showing, to determine the current choice.

When you query, the plugin does not raise error for failure, but returns 0.
(Read and Write computed property)

### 128.8.71 Events

### 128.8.72 ButtonClicked(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when the user clicks a command button.
**Notes:** ControlID: The ID of the button that the user clicked.

### 128.8.73 CheckButtonToggled(ControlID as Integer, Checked as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when the user changes the state of a check button (check box).
**Notes:** ControlID: The ID of the button that the user clicked.
Checked: A boolean indicating the current state of the check button. true if checked; false otherwise.

### 128.8.74 ControlActivating(ControlID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when an Open button drop-down list customized through EnableOpenDropDown or a Tools menu is about to display its contents.
**Notes:** ControlID: The ID of the list or menu about to display.

In response to this notification, an application can update the contents of the menu or list about to be displayed, based on the current state of the dialog.

### 128.8.75 FileOk as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called just before the dialog is about to return with a result.
**Notes:** Implementations should return true to accept the current result in the dialog or false to refuse it. In the case of false, the dialog should remain open.

When this method is called, the Result and Results methods can be called.
The application can use this callback method to perform additional validation before the dialog closes, or to prevent the dialog from closing. If the application prevents the dialog from closing, it should display a UI to indicate a cause.

An application can also use this method to perform all of its work surrounding the opening or saving of files.

### 128.8.76 FileTypeChanged

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when the dialog is opened to notify the application of the initial chosen filetype.
**Notes:** This method is called when the dialog is opened to notify the application of the initially chosen filetype. If the application has code in this event that responds to type changes, it can respond to the type. For example, it could hide certain controls. The application controls the initial file type and could do its own checks, so this method is provided as a convenience.

### 128.8.77 FolderChanged

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when the user navigates to a new folder.

### 128.8.78 FolderChanging(Folder as WinShellItemMBS) as boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called before FolderChanged.
**Notes:** This allows the implementer to stop navigation to a particular location.

Folder: the folder to which the dialog is about to navigate.

Return true to accept or false to decline.

The calling application can set Folder during this callback to redirect navigation to an alternate folder. The actual navigation does not occur until FolderChanging has returned.

If the calling application simply prevents navigation to a particular folder, UI should be displayed with an explanation of the restriction. To obtain a parent HWND for the UI, use WindowHandle property.

Warning: If you implement this, add "return true" to allow folders to change.

### 128.8.79 ItemSelected(ControlID as Integer, ItemID as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when an item is selected in a combo box, when a user clicks an option button (also known as a radio button), or an item is chosen from the Tools menu.
**Notes:** ControlID: The ID of the control in which the user made a selection.
ItemID: The ID of the selection.

This notification is not sent when the user chooses an item from the drop-down menu attached to the Open button, because the action taken in that case is always the same: close the dialog as if the user had simply clicked the Open button. For that situation, the application can call SelectedControlItem to obtain the item the user chose from that menu.

### 128.8.80 Overwrite(item as WinShellItemMBS) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called from the save dialog when the user chooses to overwrite a file.

**Notes:** item: the item that will be overwritten.

Return one of the kResponse* constants.

### 128.8.81 SelectionChange

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Called when the user changes the selection in the dialog's view.

### 128.8.82 ShareViolation(item as WinShellItemMBS) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: .

**Function:** Enables an application to respond to sharing violations that arise from Open or Save operations.
**Notes:** item: the item that has the sharing violation.
Return one of the kShareViolation* constants.

The kOptionsShareaware flag must be set through Options before this method is called.
A sharing violation could possibly arise when the application attempts to open a file, because the file could have been locked between the time that the dialog tested it and the application opened it.

### 128.8.83 Constants

Control States

| Constant | Value | Description |
|---|---|---|
| kControlStateEnabled | 1 | The control is active. |
| kControlStateEnableVisible | 3 | The control is visible and enabled. |
| kControlStateInactive | 0 | The control is inactive and cannot be accessed by the user. |
| kControlStateVisible | 2 | The control is visible. The absence of this value indicates that the control is hidden. |

Option Flags

| Constant | Value | Description |
|---|---|---|
| kOptionsAllNonStorageItems | &h80 | Enables the user to choose any item in the Shell namespace, not just SFGAO_STREAM or SFAGO_FILESYSTEM attributes. This flag combined with kOptionsForceFileSystem. |
| kOptionsAllowMultiSelect | &h200 | Enables the user to select multiple items in the open dialog. Note this flag is set, the WinFileOpenDialogMBS class must be used to ret items. |
| kOptionsCreatePrompt | &h2000 | Prompt for creation if the item returned in the save dialog does not e that this does not actually create the item. |
| kOptionsDefaultNoMiniMode | &h20000000 | Indicates to the Save As dialog box that it should open in expan Expanded mode is the mode that is set and unset by clicking the the lower-left corner of the Save As dialog box that switches betwe Folders and Hide Folders when clicked. This value is not suppo Windows 7. |
| kOptionsDontAaddToRecent | &h2000000 | Do not add the item being opened or saved to the recent document |
| kOptionsFileMustExist | &h1000 | The item returned must exist. This is a default value for the Open |
| kOptionsForceFileSystem | &h40 | Ensures that returned items are file system items. Note that thi apply to items returned by CurrentSelection. |
| kOptionsForcePreviewPaneOn | &h40000000 | Indicates to the Open dialog box that the preview pane should alw played. |
| kOptionsForceShowHidden | &h10000000 | Include hidden and system items. |
| kOptionsHideMRUPlaces | &h20000 | Hide the list of places from which the user has recently opened or sa This value is not supported as of Windows 7. |
| kOptionsHidePinnedPlaces | &h40000 | Hide items shown by default in the view's navigation pane. This fl used in conjunction with the AddPlace method, to hide standard loc replace them with custom locations.<br>Windows 7 and later. Hide all of the standard namespace location Favorites, Libraries, Computer, and Network) shown in the navigat Windows Vista. Hide the contents of the Favorite Links tree in the pane. Note that the category itself is still displayed, but shown as e |
| kOptionsNoChangeDir | 8 | Don't change the current working directory. |
| kOptionsNoDereferenceLinks | &h100000 | Shortcuts should not be treated as their target items. This allows an a to open a .lnk file rather than what that file is a shortcut to. |
| kOptionsNoReadOnlyReturn | &h8000 | Do not return read-only items. This is a default value for the Save |
| kOptionsNoTestFileCreate | &h10000 | Do not test whether creation of the item as specified in the Save be successful. If this flag is not set, the calling application must har such as denial of access, discovered when the item is created. |
| kOptionsNoValidate | &h100 | Do not check for situations that would prevent an application fro the selected file, such as sharing violations or access denied errors. |
| kOptionsOKButtonNeedsInteraction | &h200000 | OKButton needs interaction? |
| kOptionsOverwritePrompt | 2 | When saving a file, prompt before overwriting an existing file of the s This is a default value for the Save dialog. |
| kOptionsPathMustExist | &h800 | The item returned must be in an existing folder. This is a default v |
| kOptionsPickFolders | &h20 | Present an Open dialog that offers a choice of folders rather than fi |
| kOptionsShareaware | &h4000 | In the case of a sharing violation when an application is opening the application back through ShareViolation event for guidance. T overridden by kOptionsNoValidate. |
| kOptionsStrictFileTypes | 4 | In the Save dialog, only allow the user to choose a file that has one name extensions specified through SetFileTypes. |
| kOptionsSupportsStreamableItems | &h80000000 | Indicates that the caller is opening a file as a stream (BHID_Stream is no need to download that file. |

Overwrite Responses

| Constant | Value | Description |
|---|---|---|
| kOverwriteAccept | 1 | The application has determined that the file should be returned from the dialog. |
| kOverwriteDefault | 0 | The application has not handled the event. The dialog displays a UI asking the user whether the file should be overwritten and returned from the dialog. |
| kOverwriteRefuse | 2 | The application has determined that the file should not be returned from the dialog. |

Share Violation Responds

| Constant | Value | Description |
|---|---|---|
| kShareViolationAccept | 1 | The application has determined that the file should be returned from the dialog. |
| kShareViolationDefault | 0 | The application has not handled the event. The dialog displays a UI that indicates that the file is in use and a different file must be chosen. |
| kShareViolationRefuse | 2 | The application has determined that the file should not be returned from the dialog. |

## 128.9 class WinFileDialogObserverMBS

### 128.9.1 class WinFileDialogObserverMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Intercepts save and open dialogs on Windows to provide events to customize.
**Notes:** You can only have one instance of this class at a time.
First time you create an object, we initialize the necessary feature.

See also NSSavePanelObserverMBS class for Windows.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr8

**Xojo Developer Magazine**

- 18.6, page 10: News

### 128.9.2 Properties

### 128.9.3 Enabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether the feature is enabled.
**Notes:** If value is false, no events will be called.
(Read and Write property)

### 128.9.4 Events

### 128.9.5 DidShowDialog(dialog as WinFileDialogMBS, Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: .

**Function:** Event called after dialog showed.
**Notes:** You can read results from whatever modification you made.

### 128.9.6 WillShowDialog(dialog as WinFileDialogMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: .

**Function:** Event called before dialog shows.
**Notes:** You can do customization just before the dialog shows.

## 128.10 class WinFileOpenDialogMBS

### 128.10.1 class WinFileOpenDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Extends the WinFileDialogMBS interface by adding methods specific to the open dialog.
**Notes:** Requires Windows Vista or newer.
All methods may raise WinFileDialogExceptionMBS in case of errors.
Subclass of the WinFileDialogMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

**Videos**

- XDC 2020 MBS Plugins Presentation

### 128.10.2 Methods

### 128.10.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 128.10.4 Results as WinShellItemArrayMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the user's choices in a dialog that allows multiple selection.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
Dim items As WinShellItemArrayMBS = d.Results

Dim c As Integer = items.Count
For i As Integer = 0 To c-1
Dim item As WinShellItemMBS = items.Item(i)

Listbox1.AddRow item.NativePath
Next
```

**Notes:** This method can be used whether the selection consists of a single item or multiple items.

Result property can be called after the dialog has closed or during the handling of an OnFileOk event. Calling this method at any other time will fail.
Show must return a success code for a result to be available to Result/Results.

### 128.10.5 SelectedItems as WinShellItemArrayMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the currently selected items in the dialog. These items may be items selected in the view, or text selected in the file name edit box.
**Notes:** This method can be used for single item or multiple item selections. If the user has entered new text in the file name field, this can be a time-consuming operation. When the application calls this method, the application parses the text in the filename field. For example, if this is a network share, the operation could take some time. However, this operation will not block the UI, since the user should able to stop the operation, which will result in SelectedItems raising an exception).

## 128.11 class WinFileSaveDialogMBS

### 128.11.1 class WinFileSaveDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Extends the WinFileDialogMBS class by adding methods specific to the save dialog, which include those that provide support for the collection of metadata to be persisted with the file.
**Notes:** All methods may raise WinFileDialogExceptionMBS in case of errors.
Subclass of the WinFileDialogMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

**Videos**

- XDC 2020 MBS Plugins Presentation

### 128.11.2 Methods

### 128.11.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 128.11.4 Properties

### 128.11.5 SaveAsItem as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The item to be used as the initial entry in a Save As dialog.
**Notes:** he name of the item is displayed in the file name edit box, and the containing folder is opened in the view. This would generally be used when the application is saving an item that already exists. For new items, use FileName property.
(Read and Write property)

## 128.12 class WinFileTypeMBS

### 128.12.1 class WinFileTypeMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for a file type.
**Example:**

```
Dim d As WinFileOpenDialogMBS // your dialog
Dim FileTypes() As WinFileTypeMBS

FileTypes.Append New WinFileTypeMBS("JPEG image", "*.jpg")
FileTypes.Append New WinFileTypeMBS("PNG image", "*.png")
FileTypes.Append New WinFileTypeMBS("Tiff image", "*.tif;*.tiff")

d.SetFileTypes FileTypes
```

**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

### 128.12.2 Methods

### 128.12.3 Constructor(Name as string, Spec as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 128.12.4 Properties

### 128.12.5 Name as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The name of the entry.
**Notes:** (Read and Write property)

### 128.12.6 Spec as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The file type specification.
**Notes:** e.g. "*.jpg;*.jpeg", "*.bmp" or "*.*".
(Read and Write property)

## 128.13 class WinShellItemArrayMBS

### 128.13.1 class WinShellItemArrayMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for an array of shell items.
**Notes:** All methods may raise WinFileDialogExceptionMBS in case of errors.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

### 128.13.2 Methods

### 128.13.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 128.13.4 Item(index as Integer) as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the item at the given index in the IShellItemArray.

### 128.13.5 Properties

### 128.13.6 Count as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the number of items in the given IShellItem array.
**Notes:** (Read only property)

### 128.13.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 128.14 class WinShellItemMBS

### 128.14.1 class WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for a Shell item.
**Notes:** All methods may raise WinFileDialogExceptionMBS in case of errors.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr3
- Customized File Open and Save Dialogs for Windows

### 128.14.2 Methods

### 128.14.3 Compare(other as WinShellItemMBS, Mode as Integer = 0) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Compares two shell items.
**Notes:** Default mode is to compare display names.
Returns 0 if equal or non-null value if not.

### 128.14.4 Constructor(item as folderItem)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Creates new shell item based on a folderitem.
See also:

- 128.14.5 Constructor(path as String) 17933

### 128.14.5 Constructor(path as String)

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Creates new shell item based on a path.
See also:

- 128.14.4 Constructor(item as folderItem) 17933

### 128.14.6 Operator_Compare(other as WinShellItemMBS) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Compares two shell items.
**Notes:** Returns 0 if equal or non-null value if not.
Compares display name.
This method is called by Xojo when you use = operator on items to compare.

### 128.14.7 ReadData as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Utility function to read data from item.
**Notes:** A shell item may not point necessarily to a real file.
This method can read it even if it is not a real file, but still can be opened as IStream.

### 128.14.8 Thumbnail(preferredSize as Integer) as Picture

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries thumbnail for item.
**Notes:** preferredSize is the size you'd like to have. Resulting image can be smaller or bigger.
Returns nil on any error.
If user disabled thumbnails for explorer, the shell also provides none for us, just icons.
Requires Windows Vista or newer.

### 128.14.9 Properties

### 128.14.10 DisplayName as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the display name of the shell item.
**Notes:** Returns the display name relative to the parent folder. In UI this name is generally ideal for display to the user.

If no path is available, the plugin does not raise exception, but returns "".
(Read only property)

### 128.14.11 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 128.14.12 Item as FolderItem

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries folderitem for the item.
**Notes:** Queries internally native path and builds folderitem for it.

If no path is available, the plugin does not raise exception, but returns nil.
(Read only property)

### 128.14.13 NativePath as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the native path of the shell item.
**Notes:** Returns the item's file system path, if it has one.

If no path is available, the plugin does not raise exception, but returns "".
(Read only property)

### 128.14.14 Parent as WinShellItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the parent of an IShellItem object.
**Notes:** (Read only property)

### 128.14.15 URLPath as String

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URL of the shell item.
**Notes:** Returns the item's URL, if it has one.

Some items do not have a URL, and in those cases a call to DisplayName will fail. This name is suitable for display to the user in some cases, but note that it might not be specified for all items.

If no path is available, the plugin does not raise exception, but returns "".
(Read only property)

### 128.14.16 Constants

Comparison Modes

| Constant | Value | Description |
|---|---|---|
| kCompareAllFields | &h80000000 | Exact comparison of two instances of a Shell item. |
| kCompareCanonical | &h10000000 | Comparison is based on a canonical name. |
| kCompareDisplayName | 0 | Comparison based on the display name in a folder view. |
| kCompareTestFileSystemPathIfNotEqual | &h20000000 | Windows 7 and later. If the Shell items are not the same, test paths. |

# Chapter 129

# Network

## 129.1 class AvahiBrowserMBS

### 129.1.1 class AvahiBrowserMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to browse for services.
**Blog Entries**

- Bonjour on Linux

### 129.1.2 Methods

### 129.1.3 Browse(InterfaceIndex as Integer, Protocol as Integer, servicetype as string, domain as string = """, flags as Integer = 0) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Browse for services of a type on the network.
**Notes:** In most cases you probably want to pass kInterfaceAny and kProtocolAny in InterfaceIndex, resp. protocol to browse on all local networks. The specified events will be called whenever a new service appears or is removed from the network. Please note that events may be collapsed to minimize traffic (i.e. a REMOVED followed by a NEW for the same service data is dropped because redundant). If you want to subscribe to service data changes, you should use AvahiResolverMBS class and keep it open, in which case you will be notified via Found event everytime the service data changes.

Only one browse call per AvahiBrowserMBS object please.
Returns true on success and false on failure.

### 129.1.4 Constructor(client as AvahiClientMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 129.1.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.1.6 Properties

### 129.1.7 Client as AvahiClientMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The reference to the parent client object.
**Notes:** (Read only property)

### 129.1.8 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 129.1.9 Events

### 129.1.10 AllForNow(type as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

### 129.1.11 CacheExhausted(type as string)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that all entries from the caches have been sent.

### 129.1.12 Failure(error as string, errorcode as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Some error occurred.

### 129.1.13 ServiceFound(InterfaceIndex as Integer, protocol as Integer, name as string, type as string, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Found a new object on the network.

### 129.1.14 ServiceRemoved(InterfaceIndex as Integer, protocol as Integer, name as string, type as string, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** The service has been removed from the network.

### 129.1.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kInterfaceAny | -1 | Special constant to use any interface available.<br>Otherwise you would pass the index of the network interface you want to use. |

IP Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | -1 | Any protocol. |
| kProtocolIPv4 | 0 | Only IPv4. |
| kProtocolIPv6 | 1 | Only IPv6. |

## 129.2 class AvahiClientMBS

### 129.2.1 class AvahiClientMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The base class for avahi.
**Notes:** Typically you create an object of your subclass of AvahiClientMBS at application launch and keep it running.
If events are too slow in GUI events, please use a timer with 50ms and call the AvahiClientMBS.Poll method there.

### 129.2.2 Methods

### 129.2.3 Available as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the avahi library has been found and loaded.

### 129.2.4 Constructor(flags as Integer = 0)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes the client.

### 129.2.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.2.6 DomainName as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Get domain name.

### 129.2.7 HostName as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Get host name.

### 129.2.8 Poll

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Polls for events.
**Example:**

```
// in a timer with 50ms
AvahiClientMBS.Poll
```

**Notes:** This is automatically called by the plugin for GUI applications. If you call it in a timer, you can speedup avahi.
Console applications with their own event loop need to call Poll method regularly.

### 129.2.9 Version as string

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Get the version of the server.

### 129.2.10 Properties

### 129.2.11 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 129.2.12 Events

### 129.2.13 Collision

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** We're still connecting.
**Notes:** This state is only entered when kClientNoFail has been passed to Constructor() and the daemon is not yet available.

### 129.2.14 Connecting

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Client is connecting.

### 129.2.15 Failure(error as string, errorcode as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Some kind of error happened on the client side.

### 129.2.16 Registering

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Client is registering.

### 129.2.17 Running

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Client is running.

### 129.2.18 Constants

Client Flags

| Constant | Value | Description |
|---|---|---|
| kClientIgnoreUserConfig | 1 | Don't read user configuration |
| kClientNoFail | 2 | Don't fail if the daemon is not available when avahi_client_new() is called, instead enter AVAHI_CLIENT_CONNECTING state and wait for the daemon to appear. |

## 129.3 class AvahiDomainBrowserMBS

### 129.3.1 class AvahiDomainBrowserMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to browse for domains.

### 129.3.2 Methods

### 129.3.3 BrowseDomains(InterfaceIndex as Integer, Protocol as Integer, domain as string = """, BrowserType as Integer = 0, flags as Integer = 0) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Browse for domains on the local network.
**Notes:** Only one BrowseDomains call per AvahiDomainBrowserMBS object please.
Returns true on success and false on failure.

### 129.3.4 Constructor(client as AvahiClientMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 129.3.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.3.6 Properties

### 129.3.7 Client as AvahiClientMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The reference to the parent client object.
**Notes:** (Read only property)

### 129.3.8 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 129.3.9 Events

### 129.3.10 AllForNow

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

### 129.3.11 CacheExhausted

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that all entries from the caches have been sent.

### 129.3.12 DomainFound(InterfaceIndex as Integer, protocol as Integer, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Found a new domain on the network.

### 129.3.13 DomainRemoved(InterfaceIndex as Integer, protocol as Integer, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** The domain has been removed from the network.

### 129.3.14 Failure(error as string, errorcode as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Some error occurred.

### 129.3.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kInterfaceAny | -1 | Special constant to use any interface available.<br>Otherwise you would pass the index of the network interface you want to use. |

Browse modes for domain browsing

| Constant | Value | Description |
|---|---|---|
| kBrowseTypeBrowse | 0 | Browse for a list of available browsing domains. |
| kBrowseTypeBrowseDefault | 1 | Browse for the default browsing domain. |
| kBrowseTypeBrowseLegacy | 4 | Legacy browse domain - see DNS-SD spec for more information. |
| kBrowseTypeRegister | 2 | Browse for a list of available registering domains. |
| kBrowseTypeRegisterDefault | 3 | Browse for the default registering domain. |

IP Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | -1 | Any protocol. |
| kProtocolIPv4 | 0 | Only IPv4. |
| kProtocolIPv6 | 1 | Only IPv6. |

## 129.4 class AvahiResolverMBS

### 129.4.1 class AvahiResolverMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to resolve service name to IP address.

### 129.4.2 Methods

### 129.4.3 Constructor(client as AvahiClientMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 129.4.4 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.4.5 Resolve(InterfaceIndex as Integer, Protocol as Integer, name as string, servicetype as string, domain as string, flags as Integer = 0) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Create a new service resolver object.
**Notes:** Please make sure to pass all the service data you received via Found event, especially interface and protocol. The protocol argument specifies the protocol (IPv4 or IPv6) to use as transport for the queries which are sent out by this resolver. The protocol argument specifies the adress family (IPv4 or IPv6) of the address of the service we are looking for. Generally, on "protocol" you should only pass what was supplied to you as parameter to your Browse function. In protocol you should pass what your application code can deal with when connecting to the service. Or, more technically speaking: protocol specifies if the mDNS queries should be sent as UDP/IPv4 resp. UDP/IPv6 packets. protocol specifies whether the query is for a A resp. AAAA resource record.

Only one resolve call per AvahiResolverMBS object please.
Returns true on success and false on failure.

### 129.4.6 Properties

### 129.4.7 Client as AvahiClientMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The reference to the parent client object.
**Notes:** (Read only property)

### 129.4.8 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 129.4.9 Events

### 129.4.10 Failure(error as string, errorcode as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Some error occurred.

### 129.4.11 Found(interfaceIndex as Integer, Protocol as Integer, name as string, type as string, domain as string, hostname as string, port as Integer, address as string, txt as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** An address was found.

### 129.4.12 Constants

Result Flags

| Constant | Value | Description |
|---|---|---|
| kResultCached | 1 | This response originates from the cache. |
| kResultLocal | 8 | This record/service resides on and was announced by the local host. Only available in service and record browsers and only on Found event. |
| kResultMultiCast | 4 | This response originates from multicast DNS. |
| kResultOurOwn | 16 | This service belongs to the same local client as the browser object. Only available in avahi-client, and only for service browsers and only on Found event. |
| kResultStatic | 32 | The returned data has been defined statically by some configuration option. |
| kResultWideArea | 2 | This response originates from wide area DNS. |

## 129.5 class AvahiTypeBrowserMBS

### 129.5.1 class AvahiTypeBrowserMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to browse for types.

### 129.5.2 Methods

### 129.5.3 BrowseTypes(InterfaceIndex as Integer, Protocol as Integer, domain as string = """, flags as Integer = 0) as boolean

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Browse for service types on the local network.
**Notes:** Only one BrowseTypes call per AvahiTypeBrowserMBS object please.
Returns true on success and false on failure.

### 129.5.4 Constructor(client as AvahiClientMBS)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 129.5.5 Destructor

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.5.6 Properties

### 129.5.7 Client as AvahiClientMBS

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The reference to the parent client object.
**Notes:** (Read only property)

### 129.5.8 Handle as Integer

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 129.5.9 Events

### 129.5.10 AllForNow

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that more records will probably not show up in the near future, i.e. all cache entries have been read and all static servers been queried.

### 129.5.11 CacheExhausted

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** One-time event, to notify the user that all entries from the caches have been sent.

### 129.5.12 Failure(error as string, errorcode as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Some error occurred.

### 129.5.13 TypeFound(InterfaceIndex as Integer, protocol as Integer, type as string, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** Found a new type on the network.

### 129.5.14 TypeRemoved(InterfaceIndex as Integer, protocol as Integer, type as string, domain as string, flags as Integer)

MBS Linux Plugin, Plugin Version: 12.4, Platform: Linux, Targets: .

**Function:** The type has been removed from the network.

### 129.5.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kInterfaceAny | -1 | Special constant to use any interface available.<br>Otherwise you would pass the index of the network interface you want to use. |

IP Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | -1 | Any protocol. |
| kProtocolIPv4 | 0 | Only IPv4. |
| kProtocolIPv6 | 1 | Only IPv6. |

## 129.6 class CWChannelMBS

### 129.6.1 class CWChannelMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The CoreWLAN class for a channel.
**Notes:** Encapsulates an IEEE 802.11 channel.

Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the CWChannel class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.6.2 Methods

### 129.6.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 129.6.4 copy as CWChannelMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the object.

### 129.6.5 isEqualToChannel(channel as CWChannelMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares two channels.
**Notes:** Returns true if both are equal.

### 129.6.6 Operator_Compare(channel as CWChannelMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares two channels.

### 129.6.7 Properties

### 129.6.8 channelBand as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The channel band.
**Notes:** (Read only property)

### 129.6.9 channelNumber as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The channel number.
**Notes:** (Read only property)

### 129.6.10 channelWidth as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The channel width.
**Notes:** (Read only property)

### 129.6.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference for this object.
**Notes:** (Read and Write property)

## 129.7 class CWConfigurationMBS

### 129.7.1 class CWConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN configuration.
**Notes:** Encapsulates a static configuration for a given IEEE 802.11 wireless interface.

Requires Mac OS X 10.6 or newer.

### 129.7.2 Methods

### 129.7.3 configuration as CWConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting an CWConfiguration object.
**Notes:** dim c as CWConfigurationMBS = CWConfigurationMBS.configuration
MsgBox hex(c.Handle)
See also:

- 129.7.4 configuration(config as CWConfigurationMBS) as CWConfigurationMBS 17955

### 129.7.4 configuration(config as CWConfigurationMBS) as CWConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting a CWConfiguration object initialized with the given CWConfiguration object.
**Notes:** Available on Mac OS X 10.7 or later.
See also:

- 129.7.3 configuration as CWConfigurationMBS 17955

### 129.7.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an CWConfiguration.
See also:

- 129.7.6 Constructor(configuration as CWConfigurationMBS) 17956

### 129.7.6 Constructor(configuration as CWConfigurationMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a CWConfigurationMBS object initialized with the given CWConfigurationMBS object.
**Notes:** Available on Mac OS X 10.7 or later.
See also:

- 129.7.5 Constructor 17955

### 129.7.7 copy as CWConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of this object.

### 129.7.8 isEqualToConfiguration(configuration as CWConfigurationMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Test whether two configurations are equal.
**Notes:** Two CWConfiguration objects are considered equal if all their corresponding properties are equal.

### 129.7.9 mutableCopy as CWMutableConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a mutable copy of this object.
**Notes:** Available on Mac OS X 10.7 or later.

### 129.7.10 networkProfiles as CWNetworkProfileMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of remembered CWNetworkProfileMBS objects.
**Notes:** The order of this array corresponds to the order in which the the CWNetworkProfile objects participate in the auto-join process.

Available on Mac OS X 10.7 or later.

### 129.7.11 Operator_Compare(configuration as CWConfigurationMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares two profiles.

### 129.7.12 Properties

### 129.7.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.7.14 rememberJoinedNetworks as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** AirPort client will remember all joined networks.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.7.15 requireAdministratorForAssociation as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to change networks.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.7.16 requireAdministratorForIBSSMode as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to create a computer-to-computer network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.7.17 requireAdministratorForPower as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to change the interface power state.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

## 129.8 module CWGlobalsMBS

### 129.8.1 module CWGlobalsMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The module for the global constants.
**Notes:** Please note that MBS Plugin implements all methods from 10.6 to 10.9 in CoreWLAN. But Apple changes things often, so some methods are only for older system, some only for newer. e.g. kCWErrorDomain is for 10.6 and CWErrorDomain for 10.7 and newer.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.4pr2

### 129.8.2 Methods

### 129.8.3 CWBSSIDDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the BSSID of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.4 CWCountryCodeDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the country code of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.5 CWErrorDomain as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN Error Domain.

### 129.8.6 CWLinkDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the link state of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.7 CWLinkQualityDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the link quality for any WLAN interface changes. The object for this notification is the corresponding BSD interface name. The userInfo dictionary for this notification contains the current RSSI and current transmit rate for the given CoreWLAN interface.

### 129.8.8 CWLinkQualityNotificationRSSIKey as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Dictionary key for link quality change details.
**Notes:** Number containing the current RSSI value for the WLAN interface. Found in the userInfo dictionary for the CWLinkQualityChangedNotification.

### 129.8.9 CWLinkQualityNotificationTransmitRateKey as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Dictionary key for link quality change details.
**Notes:** Number containing the current transmit rate value for the WLAN interface. Found in the userInfo dictionary for the CWLinkQualityChangedNotification.

### 129.8.10 CWModeDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.

Posted when the mode of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.11 CWPowerDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the power state of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.12 CWScanCacheDidUpdateNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when new entries are added to the scan cache, or existing entries are updated with more current information. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.13 CWSSIDDidChangeNotification as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names for CoreWLAN.
**Notes:** Please use with NSNotificationObserverMBS class.
Posted when the SSID of any WLAN interface changes. The object for this notification is the corresponding BSD interface name. This notification does not contain a userInfo dictionary.

### 129.8.14 KeychainDeleteEAPUsernameAndPassword(ssidData as memoryblock) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes the 802.1X username and password for the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainDeleteWiFiEAPUsernameAndPassword instead.

### 129.8.15 KeychainDeletePassword(ssidData as memoryblock) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes the password for the specified SSID and keychain domain.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainDeleteWiFiPassword instead.

### 129.8.16 KeychainDeleteWiFiEAPUsernameAndPassword(KeychainDomain as Integer, ssidData as memoryblock) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes the 802.1X username and password for the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.17 KeychainDeleteWiFiPassword(KeychainDomain as Integer, ssidData as memoryblock) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes the password for the specified SSID and keychain domain.

**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.18 KeychainFindWiFiEAPUsernameAndPassword(KeychainDomain as Integer, ssidData as memoryblock, byref username as string, byref password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns the 802.1X username and password stored for the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
username: a string passed by reference, which upon return will contain the 802.1X username for the specified SSID.
password: a string passed by reference, which upon return will contain the 802.1X password for the specified SSID.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.19 KeychainFindWiFiPassword(KeychainDomain as Integer, ssidData as memoryblock, byref password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns (by reference) the password for the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
password: An string passed by reference, which upon return will contain the Wi-Fi keychain password for the specified SSID. This parameter is optional.

Returns an error code indicating whether or not a failure occurred. errSecSuccess indicates no error occurred.
Available on Mac OS X 10.9 or newer.

### 129.8.20 KeychainGetEAPIdentity(ssidData as memoryblock, byref SecIdentityRef as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns the identity stored for the specified SSID and keychain domain.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
identity: An Integer passed by reference, which upon return will contain the SecIdentityRef associated with the specified SSID.
The returned value must be released by the caller.

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainGetWiFiEAPIdentity instead.

### 129.8.21 KeychainGetEAPIdentityList(byref ListSecIdentityRef() as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns all available identities.
**Notes:** ListSecIdentityRef: An array passed by reference, which upon return will be populated with a list of integers (SecIdentityRef).

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.22 KeychainGetEAPUsernameAndPassword(ssidData as memoryblock, byref username as string, byref password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns the 802.1X username and password stored for the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
username: A string passed by reference, which upon return will contain the 802.1X username for the specified SSID.

password: A string passed by reference, which upon return will contain the 802.1X password for the specified SSID.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain.

Available in Mac OS X 10.7, deprecated in 10.9. Please use FindWiFiEAPUsernameAndPassword instead.

### 129.8.23 KeychainGetPassword(ssidData as memoryblock, byref password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns (by reference) the password for the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
password: A string passed by reference, which upon return will contain the Wi-Fi keychain password for the specified SSID.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainFindWiFiPassword instead.

### 129.8.24 KeychainGetWiFiEAPIdentity(KeychainDomain as Integer, ssidData as memoryblock, byref SecIdentityRef as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds and returns the identity stored for the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
identity: An Integer passed by reference, which upon return will contain the SecIdentityRef associated with the specified SSID.
The returned value must be released by the caller.

Returns an OSStatus error code indicating whether or not a failure occurred.

errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.25 KeychainSetEAPIdentity(ssidData as memoryblock, SecIdentityRef as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Associates an identity to the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
identity: The identity containing the certificate to use for 802.1X authentication.
Passing 0 clears any identity association for the specified SSID.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainSetWiFiEAPIdentity instead.

### 129.8.26 KeychainSetEAPUsernameAndPassword(ssidData as memoryblock, username as string, password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the 802.1X username and password for the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
username: The 802.1X username.
password: The 802.1X password. This parameter is optional.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use SetWiFiEAPUsernameAndPassword instead.

### 129.8.27 KeychainSetPassword(ssidData as memoryblock, password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the Wi-Fi network keychain password for the specified SSID.
**Notes:** ssidData: The service set identifier (SSID) which is used to uniquely identify the keychain item.
password: The Wi-Fi network password.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

The keychain used is determined by the SecPreferencesDomain of the caller as returned by KeychainManagerMBS.PreferenceDomain().
Available in Mac OS X 10.7, deprecated in 10.9. Please use KeychainSetWiFiPassword instead.

### 129.8.28 KeychainSetWiFiEAPIdentity(KeychainDomain as Integer, ssidData as memoryblock, SecIdentityRef as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Associates an identity to the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
identity: The identity containing the certificate to use for 802.1X authentication. a SecIdentityRef passed as Integer.

Passing 0 clears any identity association for the specified SSID.

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.29 KeychainSetWiFiEAPUsernameAndPassword(KeychainDomain as Integer, ssidData as memoryblock, Username as string, Password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the 802.1X username and password for the specified SSID and keychain domain.

**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
username: The 802.1X username.
password: The 802.1X password. This parameter is optional.

Returns an OSStatus error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.

Available on Mac OS X 10.9 or newer.

### 129.8.30 KeychainSetWiFiPassword(KeychainDomain as Integer, ssidData as memoryblock, password as string) as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the Wi-Fi network keychain password for the specified SSID and keychain domain.
**Notes:** domain: The keychain domain, which determines which keychain will be used.
ssid: The service set identifier (SSID) which is used to uniquely identify the keychain item.
password: The Wi-Fi network password.

Returns an error code indicating whether or not a failure occurred.
errSecSuccess indicates no error occurred.
Available on Mac OS X 10.9 or newer.

### 129.8.31 MergeNetworks(networks() as CWNetworkMBS) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Merges the specified set of CWNetwork objects.
**Notes:** networks: The set of networks to merge.

Duplicate networks are defined as networks with the same SSID, security type, and BSS type (IBSS or Infrastructure).
When duplicate networks exist, the network with the best RSSI value will be chosen.

### 129.8.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCWError | -3931 | One of the error constants in CoreWLAN.<br>Generic error. |
| kCWHTFeaturesNotSupported | -3926 | One of the error constants in CoreWLAN.<br>Association was denied because the requesting station does not supp features. |
| kCWInterfaceStateAssociating | 3 | One of the interface state constants in CoreWLAN.<br>CoreWLAN interface is associating. |
| kCWInterfaceStateAuthenticating | 2 | One of the interface state constants in CoreWLAN.<br>CoreWLAN interface is authenticating. |
| kCWInterfaceStateInactive | 0 | One of the interface state constants in CoreWLAN.<br>CoreWLAN interface is in the initial, inactive state. |
| kCWInterfaceStateRunning | 4 | One of the interface state constants in CoreWLAN.<br>CoreWLAN interface is running. |
| kCWInterfaceStateScanning | 1 | One of the interface state constants in CoreWLAN.<br>CoreWLAN interface is scanning. |
| kCWIPCError | -3929 | One of the error constants in CoreWLAN.<br>Error communicating with a separate process. |
| kCWOpModeHostAP | 3 | One of the interface operation mode constants in CoreWLAN.<br>Interface is participating in an infrastructure network as an access poi |
| kCWOpModeIBSS | 1 | One of the interface operation mode constants in CoreWLAN.<br>Interface is participating in an IBSS network. |
| kCWOpModeMonitorMode | 2 | One of the interface operation mode constants in CoreWLAN.<br>Interface is in 802.11 monitor mode. |
| kCWOpModeStation | 0 | One of the interface operation mode constants in CoreWLAN.<br>Interface is participating in an infrastructure network as a non-AP stat |
| kCWOpNotPermitted | -3930 | One of the error constants in CoreWLAN.<br>Calling process does not have permission to perform this operation. |
| kCWPCOTransitionTimeNotSupported | -3927 | One of the error constants in CoreWLAN.<br>Association was denied because the requesting station does not supp PCO transition time required by the AP. |
| kCWScanTypeActive | 0 | One of the scan type constants in CoreWLAN.<br>In accordance with the supported channels for the active country co interface will transmit probe request frames and listen for probe respo |
| kCWScanTypeFast | 2 | One of the scan type constants in CoreWLAN.<br>The scan will return cached scan results. |
| kCWScanTypePassive | 1 | One of the scan type constants in CoreWLAN.<br>The interface will listen for beacon frames on each channel irrespective c try code. |
| kCWSecurityModeDynamicWEP | 7 | One of the security mode constants in CoreWLAN.<br>Dynamic WEP 802.1X authentication. |
| kCWSecurityModeOpen | 0 | One of the security mode constants in CoreWLAN.<br>Open System authentication. |
| kCWSecurityModeWEP | 1 | One of the security mode constants in CoreWLAN.<br>WEP authentication. |
| kCWSecurityModeWPA2_Enterprise | 5 | One of the security mode constants in CoreWLAN.<br>WPA2 Enterprise authentication. |
| kCWSecurityModeWPA2_PSK | 3 | One of the security mode constants in CoreWLAN.<br>WPA2 Personal authentication. |
| kCWSecurityModeWPA_Enterprise | 4 | One of the security mode constants in CoreWLAN.<br>WPA Enterprise authentication. |
| kCWSecurityModeWPA_PSK | 2 | One of the security mode constants in CoreWLAN.<br>WPA Personal authentication. |
| kCWSecurityModeWPS | 6 | One of the security mode constants in CoreWLAN.<br>WiFi Protected Setup authentication. |
| kOldCWPHYMode11A | 0 | One of the physical layer mode constants in CoreWLAN.<br>IEEE 802.11a |
| kOldCWPHYMode11B | 1 | One of the physical layer mode constants in CoreWLAN.<br>IEEE 802.11b |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kCWAPFullErr | -3913 | Access point is unable to handle another associated station. |
| kCWAssociationDeniedErr | -3909 | Association was denied for an unspecified reason. |
| kCWAuthAlgUnsupportedErr | -3910 | Specified authentication algorithm is not supported. |
| kCWAuthenticationAlgorithmUnsupportedErr | -3910 | Specified authentication algorithm is not supported. |
| kCWChallengeFailureErr | -3912 | Authentication was rejected because of a challenge failure. |
| kCWCipherSuiteRejectedErr | -3923 | Cipher suite rejected due to network security policy. |
| kCWDSSSOFDMUnsupportedErr | -3916 | Association denied because DSSS-OFDM is not supported by tion. |
| kCWEAPOLErr | 1 | EAPOL-related error. |
| kCWErr | -3931 | Generic error, no specific error code exists to describe the error |
| kCWFormatErr | -3904 | Invalid protocol element field detected. |
| kCWHTFeaturesNotSupportedErr | -3926 | Association was denied because the requesting station does n features. |
| kCWInvalidAKMPErr | -3920 | Invalid authentication selector requested. |
| kCWInvalidAuthenticationSequenceNumberErr | -3911 | Authentication frame received with an authentication sequence expected sequence. |
| kCWInvalidAuthSeqNumErr | -3911 | Authentication frame received with an authentication sequence expected sequence. |
| kCWInvalidFormatErr | -3904 | Invalid protocol element field detected. |
| kCWInvalidGroupCipherErr | -3918 | Invalid group cipher requested. |
| kCWInvalidInfoElementErr | -3917 | Invalid information element included in association request. |
| kCWInvalidInformationElementErr | -3917 | Invalid information element included in association request. |
| kCWInvalidPairwiseCipherErr | -3919 | Invalid pairwise cipher requested. |
| kCWInvalidParameterErr | -3900 | Parameter error. |
| kCWInvalidPMKErr | -3924 | PMK rejected by the access point. |
| kCWInvalidRSNCapabilitiesErr | -3922 | Invalid RSN capabilities specified in association request. |
| kCWIPCFailureErr | -3929 | Error communicating with a separate process. |
| kCWNoErr | 0 | Success. |
| kCWNoMemErr | -3901 | Memory allocation failed. |
| kCWNoMemoryErr | -3901 | Memory allocation failed. |
| kCWNotSupportedErr | -3903 | Operation not supported. |
| kCWOperationNotPermittedErr | -3930 | Calling process does not have permission to perform this opera |
| kCWParamErr | -3900 | Parameter error. |
| kCWPCOTransitionTimeNotSupportedErr | -3927 | Association was denied because the requesting station does n PCO transition time required by the AP. |
| kCWReassociationDeniedErr | -3908 | Reassociation was denied because the access point was unabl that an association exists. |
| kCWReferenceNotBoundErr | -3928 | No interface is bound to the CWInterface. |
| kCWRefNotBoundErr | -3928 | No interface is bound to the CWInterface. |
| kCWShortSlotUnsupportedErr | -3915 | Association denied because short slot time option is not suppor ing station. |
| kCWSupplicantTimeoutErr | -3925 | WPA/WPA2 handshake timed out. |
| kCWTimeoutErr | -3905 | Authentication/Association timed out. |
| kCWUknownErr | -3902 | Unexpected error condition encountered for which no error cod |
| kCWUnknownErr | -3902 | Unexpected error condition encountered for which no error cod |
| kCWUnspecifiedFailureErr | -3906 | Access point did not specify a reason for authentication/associa |
| kCWUnsupportedCapabilitiesErr | -3907 | Access point cannot support all requested capabilities. |
| kCWUnsupportedRateSetErr | -3914 | Interface does not support all of the rates in the access point's |
| kCWUnsupportedRSNVersionErr | -3921 | Invalid WPA/WPA2 version specified. |

Channel bands

| Constant | Value | Description |
|---|---|---|
| kCWChannelBand2GHz | 1 | 2 GHz channel band. |
| kCWChannelBand5GHz | 2 | 5 GHz channel band. |
| kCWChannelBandUnknown | 0 | Unknown channel band. |

Channel Widths

| Constant | Value | Description |
|---|---|---|
| kCWChannelWidth160MHz | 4 | 160MHz channel width. |
| kCWChannelWidth20MHz | 1 | 20MHz channel width. |
| kCWChannelWidth40MHz | 2 | 40MHz channel width. |
| kCWChannelWidth80MHz | 3 | 80MHz channel width. |
| kCWChannelWidthUnknown | 0 | Unknown channel width. |

Chipher Key Flahs

| Constant | Value | Description |
|---|---|---|
| kCWCipherKeyFlagsMulticast | 4 | Cipher key will be used for multicast packets. |
| kCWCipherKeyFlagsNone | 0 | Open System authentication. |
| kCWCipherKeyFlagsRx | 16 | Cipher key will be used for packets received by the interface. |
| kCWCipherKeyFlagsTx | 8 | Cipher key will be used for packets sent from the interface. |
| kCWCipherKeyFlagsUnicast | 2 | Cipher key will be used for unicast packets. |

IBSS mode security types

| Constant | Value | Description |
|---|---|---|
| kCWIBSSModeSecurityNone | 0 | Open System authentication. |
| kCWIBSSModeSecurityWEP104 | 2 | WPA Personal authentication. |
| kCWIBSSModeSecurityWEP40 | 1 | WEP security. |

Interface operation modes

| Constant | Value | Description |
|---|---|---|
| kCWInterfaceModeHostAP | 3 | Interface is participating in an infrastructure network as an access point. |
| kCWInterfaceModeIBSS | 2 | Interface is participating in an IBSS network. |
| kCWInterfaceModeNone | 0 | Interface is not in any mode. |
| kCWInterfaceModeStation | 1 | Interface is participating in an infrastructure network as a non-AP station. |

Keychain Domains

| Constant | Value | Description |
|---|---|---|
| kCWKeychainDomainNone | 0 | No keychain domain specified. |
| kCWKeychainDomainSystem | 2 | The system keychain domain. |
| kCWKeychainDomainUser | 1 | The login (user) keychain domain. |

Physical Layer Modes

| Constant | Value | Description |
|---|---|---|
| kCWPHYMode11a | 1 | IEEE 802.11a PHY. |
| kCWPHYMode11ac | 5 | IEEE 802.11ac PHY. |
| kCWPHYMode11b | 2 | IEEE 802.11b PHY. |
| kCWPHYMode11g | 3 | IEEE 802.11g PHY. |
| kCWPHYMode11n | 4 | IEEE 802.11n PHY. |
| kCWPHYModeNone | 0 | No PHY mode. |

Security types

| Constant | Value | Description |
|---|---|---|
| kCWSecurityDynamicWEP | 6 | Dynamic WEP security. |
| kCWSecurityEnterprise | 10 | Enterprise authentication. |
| kCWSecurityNone | 0 | Open System authentication. |
| kCWSecurityPersonal | 5 | Personal authentication. |
| kCWSecurityUnknown | &h7FFFFFFF | Unknown security type. |
| kCWSecurityWEP | 1 | WEP security. |
| kCWSecurityWPA2Enterprise | 9 | WPA2 Enterprise authentication. |
| kCWSecurityWPA2Personal | 4 | WPA2 Personal authentication. |
| kCWSecurityWPAEnterprise | 7 | WPA Enterprise authentication. |
| kCWSecurityWPAEnterpriseMixed | 8 | WPA/WPA2 Enterprise authentication. |
| kCWSecurityWPAPersonal | 2 | WPA Personal authentication. |
| kCWSecurityWPAPersonalMixed | 3 | WPA/WPA2 Personal authentication. |

## 129.9 class CWInterfaceMBS

### 129.9.1 class CWInterfaceMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface.
**Notes:** Encapsulates an CoreWLAN interface providing controlled access to various interface operations such as scanning, assocation, and IBSS creation, and providing a means to query and manipulate interface parameters.

Requires Mac OS X 10.6 or newer.

Please note that MBS Plugin implements all methods from 10.6 to 10.9 in CoreWLAN. But Apple changes things often, so some methods are only for older system, some only for newer. e.g. kCWErrorDomain is for 10.6 and CWErrorDomain for 10.7 and newer.

### 129.9.2 Methods

### 129.9.3 associateToEnterpriseNetwork(network as CWNetworkMBS, SecIdentityRef as Integer, username as string, password as string, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Connects to the given enterprise network.
**Notes:** network: The network to which the interface will associate.
username: The username to use for IEEE 802.1X authentication.
password: The password to use for IEEE 802.1X authentication.
identity: The identity to use for IEEE 802.1X authentication. Holds the corresponding client certificate.
error: An NSError object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method.

Returns a Boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

This method will block for the duration of the association. This operation may require an administrator password.

### 129.9.4 associateToNetwork(network as CWNetworkMBS, parameters as dictionary, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to associate to the given CWNetworkMBS, with the given association parameters.
**Notes:** parameters: A dicitonary object containing association parameters.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

See the association parameters defined in CWGlobalsMBS for more information. Certain networks will require specific authentication credentials for association (i.e. a network using WPA2 Personal authentication will require a passphrase). This method will block for the duration of the association. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:

- 129.9.5 associateToNetwork(network as CWNetworkMBS, password as string, byref error as NSErrorMBS) as boolean 17975

### 129.9.5 associateToNetwork(network as CWNetworkMBS, password as string, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Associates to a given network using the given network passphrase.
**Notes:** network: The network to which the interface will associate.
password: The network passphrase or key. Required for association to WEP, WPA Personal, and WPA2 Personal networks.
error: An NSErrorMBS object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method. This parameter is optional and can be passed as nil.

Returns a boolean value which will indicate whether or not a failure occurred during execution. true indicates no error occurred.

This method will block for the duration of the association. This operation may require an administrator password.

Available on Mac OS X 10.7 or later.
See also:

- 129.9.4 associateToNetwork(network as CWNetworkMBS, parameters as dictionary, byref error as

NSErrorMBS) as boolean 17975

### 129.9.6 cachedScanResults as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The networks currently in the scan cache for the WLAN interface.
**Notes:** Returns empty array in the case of an error.
Available on Mac OS X 10.7 or later.

### 129.9.7 commitConfiguration(config as CWConfigurationMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changing the interface configuration.
**Notes:** config: An CWConfiguration object containing the desired changes to the current CW configuration preferences.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

This method uses the SFAuthorization property of the given CWInterface object to commit the given configuration. The SFAuthorization property must be authorized with administrative privileges.
See also:

- 129.9.8 commitConfiguration(config as CWConfigurationMBS, SFAuthorizationRef as Integer, byref error as NSErrorMBS) as boolean 17976

### 129.9.8 commitConfiguration(config as CWConfigurationMBS, SFAuthorizationRef as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Commit a configuration for the given WLAN interface.
**Notes:** configuration: The configuration to commit.
authorization: An SFAuthorization object to use for authorizing the commit. This parameter is optional and can be passed as 0.
error: An NSError object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method.

Returns a Boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

This method requires the caller have root privileges or obtain administrator privileges with the authorization parameter.
See also:

- 129.9.7 commitConfiguration(config as CWConfigurationMBS, byref error as NSErrorMBS) as boolean 17976

### 129.9.9 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an CWInterface for the primary interface.
**Example:**

```
dim c as new CWInterfaceMBS

MsgBox c.description
```

See also:

- 129.9.10 Constructor(name as string) 17977

### 129.9.10 Constructor(name as string)

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an interface object linked to the interface of the given name.
**Example:**

```
dim c as new CWInterfaceMBS("en0")

MsgBox c.description
```

See also:

- 129.9.9 Constructor 17977

### 129.9.11 disassociate

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Disassociates the CoreWLAN interface from the currently associated network.
**Notes:** This method is a no-op if the given CoreWLAN interface is not associated to a network. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.

### 129.9.12 enableIBSSWithParameters as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to create a computer-to-computer network with the given parameters.
**Notes:** parameters: A dictionary object containing optional parameters for creating an IBSS network. This parameter is optional and may be passed as nil.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional and can be passed as nil.

Return a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

See the IBSS creation parameters defined in CWGlobals.h for more information. If no IBSS creation parameters are present, the default behavior is to create an open authentication computer-to-computer network using the machine name as the network name. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:


- 129.9.13 enableIBSSWithParameters(byref error as NSErrorMBS) as boolean 17978
- 129.9.14 enableIBSSWithParameters(parameters as dictionary) as boolean 17979
- 129.9.15 enableIBSSWithParameters(parameters as dictionary, byref error as NSErrorMBS) as boolean 17979


### 129.9.13 enableIBSSWithParameters(byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to create a computer-to-computer network with the given parameters.
**Notes:** parameters: A dictionary object containing optional parameters for creating an IBSS network. This parameter is optional and may be passed as nil.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional and can be passed as nil.

Return a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

See the IBSS creation parameters defined in CWGlobals.h for more information. If no IBSS creation parameters are present, the default behavior is to create an open authentication computer-to-computer network

using the machine name as the network name. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:

- 129.9.12 enableIBSSWithParameters as boolean 17978
- 129.9.14 enableIBSSWithParameters(parameters as dictionary) as boolean 17979
- 129.9.15 enableIBSSWithParameters(parameters as dictionary, byref error as NSErrorMBS) as boolean 17979

### 129.9.14 enableIBSSWithParameters(parameters as dictionary) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to create a computer-to-computer network with the given parameters.
**Notes:** parameters: A dictionary object containing optional parameters for creating an IBSS network. This parameter is optional and may be passed as nil.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional and can be passed as nil.

Return a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

See the IBSS creation parameters defined in CWGlobals.h for more information. If no IBSS creation parameters are present, the default behavior is to create an open authentication computer-to-computer network using the machine name as the network name. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:

- 129.9.12 enableIBSSWithParameters as boolean 17978
- 129.9.13 enableIBSSWithParameters(byref error as NSErrorMBS) as boolean 17978
- 129.9.15 enableIBSSWithParameters(parameters as dictionary, byref error as NSErrorMBS) as boolean 17979

### 129.9.15 enableIBSSWithParameters(parameters as dictionary, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to create a computer-to-computer network with the given parameters.
**Notes:** parameters: A dictionary object containing optional parameters for creating an IBSS network. This parameter is optional and may be passed as nil.
error: An error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional and can be passed as nil.

Return a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

See the IBSS creation parameters defined in CWGlobals.h for more information. If no IBSS creation parameters are present, the default behavior is to create an open authentication computer-to-computer network using the machine name as the network name. This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:


- 129.9.12 enableIBSSWithParameters as boolean 17978
- 129.9.13 enableIBSSWithParameters(byref error as NSErrorMBS) as boolean 17978
- 129.9.14 enableIBSSWithParameters(parameters as dictionary) as boolean 17979


### 129.9.16 interfaceNames as String()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of BSD names for WLAN interfaces available on the current system.
**Example:**

```
dim names() as string = CWInterfaceMBS.interfaceNames
MsgBox Join(names,EndOfLine)
```

**Notes:** Returns an array of strings representing the supported WLAN BSD interface names avaliable on the current system (i.e. "en1", "en2"). If there are no supported interfaces for the current system, then this method will return an empty NSArray object.
Returns empty array in the case of an error.

Available on Mac OS X 10.7 or later.

### 129.9.17 interfaceWithName(name as string) as CWInterfaceMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the interface with the given name.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")

MsgBox c.description
```

**Notes:** name: A string representing the name of an Airport interface.

### 129.9.18 isEqualToInterface(otherInterface as CWInterfaceMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Comparing interfaces.
**Notes:** Two CWInterface objects are considered equal if their corresponding nameand capabilities properties are equal.

Returns true if both interfaces are equal.

### 129.9.19 primaryInterface as CWInterfaceMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting an CWInterface object for the primary interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.primaryInterface

MsgBox c.name
```

### 129.9.20 scanForNetworksWithName(networkName as string, byref error as NSErrorMBS) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Scans for networks.
**Notes:** networkName: The name (SSID) of the network for which to scan.
error: An NSErrorMBS object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method. This parameter is optional and can be passed as nil.

Returns an array of CWNetworkMBS objects.

If ssid parameter is present, a directed scan will be performed by the interface, otherwise a broadcast scan will be performed. This method will block for the duration of the scan.

Available on Mac OS X 10.7 or later.

### 129.9.21 scanForNetworksWithParameters as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a scan with the given CoreWLAN interface, returning any found networks.
**Notes:** parameters: A dicitonary object containing optional scan parameters which can be used to control the behavior of the scan. This parameter is optional.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns an array containing CWNetworkMBS objects representing the networks found in the scan.

See the scan parameters defined in CWGlobalsMBS for controlling scan behavior. If no scan parameters are present, the default behavior is to perform a broadcast scan on active channels, for all supported PHY modes. This method will block for the duration of the scan.
See also:


- 129.9.22 scanForNetworksWithParameters(byref error as NSErrorMBS) as CWNetworkMBS() 17982
- 129.9.23 scanForNetworksWithParameters(parameters as dictionary) as CWNetworkMBS() 17983
- 129.9.24 scanForNetworksWithParameters(parameters as dictionary, byref error as NSErrorMBS) as CWNetworkMBS() 17983


### 129.9.22 scanForNetworksWithParameters(byref error as NSErrorMBS) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a scan with the given CoreWLAN interface, returning any found networks.
**Notes:** parameters: A dicitonary object containing optional scan parameters which can be used to control the behavior of the scan. This parameter is optional.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns an array containing CWNetworkMBS objects representing the networks found in the scan.

See the scan parameters defined in CWGlobalsMBS for controlling scan behavior. If no scan parameters are present, the default behavior is to perform a broadcast scan on active channels, for all supported PHY

modes. This method will block for the duration of the scan.
See also:

- 129.9.21 scanForNetworksWithParameters as CWNetworkMBS() 17982
- 129.9.23 scanForNetworksWithParameters(parameters as dictionary) as CWNetworkMBS() 17983
- 129.9.24 scanForNetworksWithParameters(parameters as dictionary, byref error as NSErrorMBS) as CWNetworkMBS() 17983

### 129.9.23 scanForNetworksWithParameters(parameters as dictionary) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a scan with the given CoreWLAN interface, returning any found networks.
**Notes:** parameters: A dicitonary object containing optional scan parameters which can be used to control the behavior of the scan. This parameter is optional.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns an array containing CWNetworkMBS objects representing the networks found in the scan.

See the scan parameters defined in CWGlobalsMBS for controlling scan behavior. If no scan parameters are present, the default behavior is to perform a broadcast scan on active channels, for all supported PHY modes. This method will block for the duration of the scan.
See also:

- 129.9.21 scanForNetworksWithParameters as CWNetworkMBS() 17982
- 129.9.22 scanForNetworksWithParameters(byref error as NSErrorMBS) as CWNetworkMBS() 17982
- 129.9.24 scanForNetworksWithParameters(parameters as dictionary, byref error as NSErrorMBS) as CWNetworkMBS() 17983

### 129.9.24 scanForNetworksWithParameters(parameters as dictionary, byref error as NSErrorMBS) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a scan with the given CoreWLAN interface, returning any found networks.
**Notes:** parameters: A dicitonary object containing optional scan parameters which can be used to control the behavior of the scan. This parameter is optional.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns an array containing CWNetworkMBS objects representing the networks found in the scan.

See the scan parameters defined in CWGlobalsMBS for controlling scan behavior. If no scan parameters are present, the default behavior is to perform a broadcast scan on active channels, for all supported PHY modes. This method will block for the duration of the scan.
See also:


- 129.9.21 scanForNetworksWithParameters as CWNetworkMBS() 17982
- 129.9.22 scanForNetworksWithParameters(byref error as NSErrorMBS) as CWNetworkMBS() 17982
- 129.9.23 scanForNetworksWithParameters(parameters as dictionary) as CWNetworkMBS() 17983


### 129.9.25 scanForNetworksWithSSID(ssid as memoryblock, byref error as NSErrorMBS) as CWNetworkMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Scans for networks.
**Notes:** ssid The SSID for which to scan.
error: An NSErrorMBS object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method. This parameter is optional and can be passed as nil.

Returns an array of CWNetworkMBS objects.

If ssid parameter is present, a directed scan will be performed by the interface, otherwise a broadcast scan will be performed. This method will block for the duration of the scan.

Available on Mac OS X 10.7 or later.

### 129.9.26 setChannel(channel as UInt32) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the channel for the given CoreWLAN interface.
**Notes:** channel: An integer representing the channel to which the CoreWLAN interface should be tuned.
error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

The current channel cannot be changed if the CoreWLAN interface is associated to a network. channel must be supported by the given interface.
See also:

- 129.9.27 setChannel(channel as UInt32, byref error as NSErrorMBS) as boolean 17985

### 129.9.27 setChannel(channel as UInt32, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the channel for the given CoreWLAN interface.
**Notes:** channel: An integer representing the channel to which the CoreWLAN interface should be tuned.
error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

The current channel cannot be changed if the CoreWLAN interface is associated to a network. channel must be supported by the given interface.
See also:

- 129.9.26 setChannel(channel as UInt32) as boolean 17984

### 129.9.28 setPairwiseMasterKey(key as Memoryblock, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the interface pairwise master key (PMK).
**Notes:** key: A memoryblock containing the pairwise master key (PMK).
error: An NSError object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method.
Returns a Boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

Key must be 32 octets. If key is nil, this method clears the PMK for the interface.

### 129.9.29 setPower(p as boolean) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the power state for the given CoreWLAN interface.
**Notes:** power: A boolean value indicating the power state to which the CoreWLAN interface should be set. False indicates the "OFF" state.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:

- 129.9.30 setPower(p as boolean, byref error as NSErrorMBS) as boolean 17986

### 129.9.30 setPower(p as boolean, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the power state for the given CoreWLAN interface.
**Notes:** power: A boolean value indicating the power state to which the CoreWLAN interface should be set. False indicates the "OFF" state.

error: A error object passed by reference, which will be populated with error code and error description if an error occurs during the execution of the method. This parameter is optional.

Returns a boolean value which will indicate whether or not a failure occured. True indicates no error occured.

This method may prompt for an administrator password if the corresponding preference is enabled in the current configuration.
See also:

- 129.9.29 setPower(p as boolean) as boolean 17985

### 129.9.31 setWEPKey(key as Memoryblock, flags as Integer, index as Integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the interface WEP key.
**Notes:** key: A memoryblock containing the WEP key.
flags: The cipher key flags to use for the specified key. Combination of kCWCipherKeyFlagsNone, kCWCipherKeyFlagsUnicast, kCWCipherKeyFlagsMulticast, kCWCipherKeyFlagsTx or kCWCipherKeyFlagsRx.

index: Integer which default key index to use for the specified key.
error An NSError object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method.

Returns a boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

Key must be 5 octets for WEP-40 or 13 octets for WEP-104. if key is nil, this method clears the WEP key for the interface. index must correspond to default key index 1-4.

### 129.9.32 setWLANChannel(channel as CWChannelMBS, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the interface channel.
**Notes:** channel: A CWChannel object corresponding to the channel.
error: An NSErrorMBS object passed by reference, which will be populated with the error code and the error description if an error occurs during the execution of this method. This parameter is optional and can be passed as nil.

A Boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

The channel cannot be changed if the interface is associated to a network.

Available on Mac OS X 10.7 or later.

### 129.9.33 startIBSSModeWithSSID(ssidData as MemoryBlock, security as Integer, channel as Integer, password as string, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a computer-to-computer (ad-hoc) network with the given network name, security type, and password on the specified channel.
**Notes:** security: The security type to be used. kCWIBSSModeSecurityNone, kCWIBSSModeSecurityWEP40 or kCWIBSSModeSecurityWEP104.
channel: The channel on which the network will be created.
password: The password to be used. This paramter is not applicable to open system authentication.

Returns a Boolean value which will indicate whether or not a failure occurred during execution. True indicates no error occurred.

This operation may require an administrator password.

### 129.9.34 supportedChannels as Integer()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Array of channels supported by the CoreWLAN interface for the active country code.
**Notes:** Dynamically queries the interface for the supported channels.

### 129.9.35 supportedInterfaces as String()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Getting all supported interfaces
**Notes:** Returns an array containing strings representing the supported CoreWLAN interface names available on the current system (i.e. "en1", "en2"). If there are no supported interfaces for the current system, then this method will return an empty array.

### 129.9.36 supportedPHYModes as Integer()

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Array of PHY modes supported by the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the supported PHY modes.

### 129.9.37 supportedWLANChannels as CWChannelMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of channels supported by the interface for the active country code.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
dim channels() as CWChannelMBS = c.supportedWLANChannels
dim lines() as string
for each ch as CWChannelMBS in channels
lines.append str(ch.channelNumber) + ": "+ str(ch.channelBand)
next
```

```
MsgBox join(lines,", ")
```

**Notes:** Dynamically queries the interface for the supported channels. Returns an array of CWChannel objects, or nil in the case of an error.

Available on Mac OS X 10.7 or later.

### 129.9.38 Properties

### 129.9.39 activePHYMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current active PHY modes for the interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.activePHYMode)
```

**Notes:** Dynamically queries the interface for the current active PHY mode.
Returns kCWPHYModeNone in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.40 bssid as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current BSSID of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current BSSID.
(Read only property)

### 129.9.41 bssidData as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current BSSID of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current BSSID.

(Read only property)

### 129.9.42 channel as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current channel of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current channel.
(Read only property)

### 129.9.43 configuration as CWConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current stored configuration for the CoreWLAN interface.
**Notes:** (Read only property)

### 129.9.44 countryCode as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Country code (ISO/IEC 3166-1:1997) of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current country code.
(Read only property)

### 129.9.45 description as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The object description.
**Notes:** (Read only property)

### 129.9.46 deviceAttached as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The interface has its corresponding hardware attached.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.deviceAttached)
```

**Notes:** Returns false in the case of an error.
Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.47 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.9.48 hardwareAddress as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The hardware media access control (MAC) address for the interface, returned as a UTF-8 string.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox c.hardwareAddress
```

**Notes:** The standard format for printing a MAC-48 address <00:00:00:00:00:00>is used to represent the MAC address as a string. Returns "" in the case of an error.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.49 interfaceMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current mode for the interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.interfaceMode)
```

**Notes:** Dynamically queries the interface for the current mode. Returns kCWInterfaceModeNone in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.50 interfaceName as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The BSD name of the interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox c.interfaceName
MsgBox str(c.noiseMeasurement)
```

**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.51 interfaceState as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current state of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current interface state.
(Read only property)

### 129.9.52 name as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** BSD name for the CoreWLAN interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.primaryInterface

MsgBox c.name
```

**Notes:** (Read only property)

### 129.9.53 noise as Double

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current aggregate noise measurement (dBm) of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current aggregate noise measurement.
(Read only property)

### 129.9.54 noiseMeasurement as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current aggregate noise measurement (dBm) for the interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.noiseMeasurement)
```

**Notes:** Dynamically queries the interface for the current aggregate noise measurement.
Returns 0 in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.55 opMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current operation mode of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current operation mode.
(Read only property)

### 129.9.56 phyMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current active PHY mode of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current active PHY mode.
(Read only property)

### 129.9.57 power as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current power state for the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current power state.
(Read only property)

### 129.9.58 powerOn as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The interface power state is set to "ON".
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.rssiValue)
```

**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.59 powerSave as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current power save state for the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current power save state.
Introduced in 10.6, deprecated in 10.7 and gone in 10.9.
(Read only property)

### 129.9.60 rssi as Double

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current aggregate RSSI measurement (dBm) of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current aggregate RSSI measurement.

(Read only property)

### 129.9.61 rssiValue as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current aggregate received signal strength indication (RSSI) measurement (dBm) for the interface.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.rssiValue)
```

**Notes:** Dynamically queries the interface for the current aggregate RSSI measurement.
Returns 0 in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.62 security as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current security mode for the interface.
**Notes:** Dynamically queries the interface for the security mode. Returns kCWSecurityUnknown in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.63 securityMode as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current security mode of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current security mode.
(Read only property)

### 129.9.64 serviceActive as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The interface has its corresponding network service enabled.
**Example:**

```
dim c as CWInterfaceMBS = CWInterfaceMBS.interfaceWithName("en0")
MsgBox str(c.serviceActive)
```

**Notes:** Returns false in the case of an error.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.65 ssid as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current SSID of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current SSID.
(Read only property)

### 129.9.66 ssidData as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current service set identifier (SSID) for the interface, returned as data.
**Notes:** Dynamically queries the interface for the current SSID. The SSID is 1-32 octets.
Returns nil in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.67 supportsAES_CCM as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports AES-CCM (IEEE 802.11i Advanced Encryption Standard - Counter Mode with Cipher-Block Chaining Message Authentication Code).

**Notes:** (Read only property)

### 129.9.68 supportsHostAP as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports host access point mode.
**Notes:** (Read only property)

### 129.9.69 supportsIBSS as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports IBSS networks (IEEE 802.11 Independent Basic Service Set).
**Notes:** (Read only property)

### 129.9.70 supportsMonitorMode as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports monitor mode.
**Notes:** (Read only property)

### 129.9.71 supportsPMGT as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports power save modes.
**Notes:** (Read only property)

### 129.9.72 supportsShortGI20MHz as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports short guard interval in 20MHz channels.
**Notes:** (Read only property)

### 129.9.73 supportsShortGI40MHz as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports short guard interval in 40MHz channels.
**Notes:** (Read only property)

### 129.9.74 supportsTKIP as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports TKIP (IEEE 802.11i Temporal Key Integrity Protocol).
**Notes:** (Read only property)

### 129.9.75 supportsTSN as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports TSN authentication (Transitional Security Network).
**Notes:** (Read only property)

### 129.9.76 supportsWEP as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports WEP authentication (IEEE 802.11 Wired Equivalent Privacy).
**Notes:** (Read only property)

### 129.9.77 supportsWME as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports WME (IEEE 802.11e Wireless Multimedia Extensions).
**Notes:** (Read only property)

### 129.9.78 supportsWoW as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports wake on wireless capability.
**Notes:** (Read only property)

### 129.9.79 supportsWPA as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports WPA (Wi-Fi Alliance Wi-Fi Protected Access).
**Notes:** (Read only property)

### 129.9.80 supportsWPA2 as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN interface supports WPA2 (Wi-Fi Alliance Wi-Fi Protected Access 2).
**Notes:** (Read only property)

### 129.9.81 transmitPower as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current transmit power (mW) for the interface.
**Notes:** Dynamically queries the interface for the current transmit power.
Returns 0 in the case of an error.

Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.82 transmitRate as Double

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current transmit rate (Mbps) for the interface.
**Notes:** Dynamically queries the interface for the current transmit rate.
Returns 0 in the case of an error, or if the interface is not participating in a network.
Available on Mac OS X 10.7 or later.
(Read only property)

### 129.9.83 txPower as Double

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current target transmit power (mW) of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current transmit power.
(Read only property)

### 129.9.84 txRate as Double

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Current transmit rate (Mbps) of the CoreWLAN interface.
**Notes:** Dynamically queries the interface for the current transmit rate.
(Read only property)

### 129.9.85 wlanChannel as CWChannelMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current channel for the interface.
**Notes:** Dynamically queries the interface for the current channel. Returns nil in the case of an error, or if the interface is not participating in a network.

Available on Mac OS X 10.7 or later.
(Read only property)

## 129.10 class CWMutableConfigurationMBS

### 129.10.1 class CWMutableConfigurationMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Encapsulates a mutable configuration for an AirPort WLAN interface.
**Notes:** Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the CWMutableConfiguration class.
Subclass of the CWConfigurationMBS class.

### 129.10.2 Methods

### 129.10.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new mutable configuration.

### 129.10.4 setNetworkProfiles(values() as CWNetworkProfileMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An array of remembered CWNetworkProfileMBS objects.
**Notes:** The order of this array corresponds to the order in which the the CWNetworkProfileMBS objects participate in the auto-join process.

### 129.10.5 setRememberJoinedNetworks(value as boolean)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** AirPort client will remember all joined networks.

### 129.10.6 setRequireAdministratorForAssociation(value as boolean)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to change networks.

### 129.10.7 setRequireAdministratorForIBSSMode(value as boolean)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to create a computer-to-computer network.

### 129.10.8 setRequireAdministratorForPower(value as boolean)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Require an administrator password to change the interface power state.

## 129.11 class CWMutableNetworkProfileMBS

### 129.11.1 class CWMutableNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Encapsulates a mutable network profile entry.
**Notes:** Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the CWMutableNetworkProfile class.
Subclass of the CWNetworkProfileMBS class.

### 129.11.2 Methods

### 129.11.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 129.11.4 setSecurity(value as Integer)

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the security mode for the network profile.
**Notes:** See kCWSecurity* constants.

### 129.11.5 setSsidData(data as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the service set identifier (SSID) for the network profile, returned as data.
**Notes:** The SSID is 1-32 octets.

## 129.12 class CWNetworkMBS

### 129.12.1 class CWNetworkMBS

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** CoreWLAN wireless (IEEE 802.11) network.
**Notes:** Encapsulates a wireless network providing read-only accessors to various properties of the network.

Requires Mac OS X 10.6 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.12.2 Methods

### 129.12.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 129.12.4 copy as CWNetworkMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of this object.

### 129.12.5 isEqualToNetwork(network as CWNetworkMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Comparing wireless networks.
**Notes:** Returns true if the network objects are equal.

Two CWNetworkMBS objects are considered equal if their corresponding ssid, securityMode, and isIBSS properties are equal.

### 129.12.6 Operator_Compare(profile as CWNetworkMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares two networks.

### 129.12.7 supportsPHYMode(phyMode as Integer) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Method for determining which PHY modes a network supports.
**Notes:** True if the network supports the specified PHY mode.

Available on Mac OS X 10.7 or later.

### 129.12.8 supportsSecurity(security as Integer) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Getting supported security types
**Notes:** True if the network supports the specified security type.

Method for determining which security types a network supports.

Available on Mac OS X 10.7 or later.

### 129.12.9 Properties

### 129.12.10 beaconInterval as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The beacon interval (ms) for the network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.11 bssid as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Basic service set identifier for the given CWNetworkMBS.
**Notes:** (Read only property)

### 129.12.12 countryCode as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The country code (ISO/IEC 3166-1:1997) for the network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.13 description as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The object description.
**Notes:** (Read only property)

### 129.12.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.12.15 ibss as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The network is an IBSS network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.16 informationElementData as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Information element data included in beacon or probe response frames.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.17 noiseMeasurement as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The aggregate noise measurement (dBm) for the network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.18 rssiValue as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The aggregate received signal strength indication (RSSI) measurement (dBm) for the network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

### 129.12.19 ssid as string

MBS MacFrameworks Plugin, Plugin Version: 11.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Service set identifier for the given CWNetworkMBS.
**Notes:** (Read only property)

### 129.12.20 ssidData as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The service set identifier (SSID) for the network, returned as data.
**Notes:** The SSID is defined as 1-32 octets.
(Read only property)

### 129.12.21 wlanChannel as CWChannelMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The channel for the network.
**Notes:** Available on Mac OS X 10.7 or later.
(Read only property)

## 129.13 class CWNetworkProfileMBS

### 129.13.1 class CWNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a network profile.
**Notes:** Encapsulates an immutable network profile entry.

Available on Mac OS X 10.7 or later.
Please also check the documentation from Apple for the CWNetworkProfile class.

### 129.13.2 Methods

### 129.13.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting a CWNetworkProfile object.
See also:

- 129.13.4 Constructor(networkProfile as CWNetworkProfileMBS) 18008

### 129.13.4 Constructor(networkProfile as CWNetworkProfileMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting a CWNetworkProfile object initialized with the given CWNetworkProfile object.
See also:

- 129.13.3 Constructor 18008

### 129.13.5 copy as CWNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the object.

### 129.13.6 isEqualToNetworkProfile(networkProfile as CWNetworkProfileMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Comparing network profiles.
**Notes:** networkProfile: The CWNetworkProfile object with which to compare the receiver.

CWNetworkMBS objects are considered equal if their corresponding ssidData and securityType properties are equal.

### 129.13.7 mutableCopy as CWMutableNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a mutable copy of the object.

### 129.13.8 networkProfile as CWNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting a CWNetworkProfile object.

### 129.13.9 networkProfileWithNetworkProfile(networkProfile as CWNetworkProfileMBS) as CWNetworkProfileMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Convenience method for getting a CWNetworkProfile object initialized with the given CWNetworkProfile object.
**Notes:** networkProfile: The CWNetworkProfile object to use to initialize a new CWNetworkProfile object.

### 129.13.10 Operator_Compare(networkProfile as CWNetworkProfileMBS) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Compares two network profiles.

### 129.13.11 Properties

### 129.13.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.13.13 security as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The security mode for the network profile.
**Notes:** See kCWSecurity* constants.
(Read only property)

### 129.13.14 ssid as string

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The service set identifier (SSID) for the network profile, encoded as a string.
**Notes:** If the SSID can not be encoded as a valid UTF-8 or WinLatin1 string, this method returns "".
(Read only property)

### 129.13.15 ssidData as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The service set identifier (SSID) for the network profile, returned as data.
**Notes:** The SSID is 1-32 octets.
(Read only property)

## 129.14 class CWWiFiClientMBS

### 129.14.1 class CWWiFiClientMBS

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The interface to the Wi-Fi subsystem on OS X.
**Notes:** Provides access to all Wi-Fi interfaces and allows Wi-Fi clients to setup event notifications.

CWWiFiClientMBS objects are heavy objects, therefore, clients of the CoreWLAN framework should use a single, long-running instance rather than creating several short-lived instances.

The CWWiFiClientMBS object should be used to instantiate CWInterfaceMBS objects rather than using a CWInterfaceMBS initializer directly.

MBS Plugin make sure that all events are routed to main thread.

Available on MacOS 10.10 or newer.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- MBS Xojo Plugins, version 18.2pr6

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 129.14.2 Methods

### 129.14.3 available as boolean

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this class is available.
**Notes:** Returnes true on MacOS 10.10 or newer.

### 129.14.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a CWWiFiClient object.
**Notes:** Available on MacOS 10.10 or newer.

### 129.14.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 129.14.6 interfaceNames as String()

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of available Wi-Fi interface names (e.g. "en0").
**Notes:** An Array of string corresponding to Wi-Fi interface names.
If no Wi-Fi interfaces are available, this method will return an empty array.
Returns nil if an error occurs.

### 129.14.7 interfaces as CWInterfaceMBS()

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns all available Wi-Fi interfaces.
**Notes:** If no Wi-Fi interfaces are available, this method will return an empty array.
Returns nil if an error occurs.

### 129.14.8 interfaceWithName(name as string) as CWInterfaceMBS

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the CWInterface object bound to the Wi-Fi interface with a specific interface name.
**Notes:** interfaceName: The name of an available Wi-Fi interface.

Use interfaceNames function to get a list of available Wi-Fi interface names.
Returns a CWInterface object for the default Wi-Fi interface if no interface name is specified.

### 129.14.9 startMonitoring(EventType as integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Register for specific Wi-Fi event notifications.
**Notes:** type: A CWEventType value.
error: An NSError object passed by reference, which upon return will contain the error if an error occurs.

Return a boolean value indicating whether or not an error occurred. True indicates no error occurred.

### 129.14.10 stopMonitoring(EventType as integer, byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unregister for specific Wi-Fi event notifications.
**Notes:** type: A CWEventType value.

error: An NSError object passed by reference, which upon return will contain the error if an error occurs.

Returns a boolean value indicating whether or not an error occurred. true indicates no error occurred.

### 129.14.11 stopMonitoringAllEvents(byref error as NSErrorMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Unregister for all Wi-Fi event notifications.
**Notes:** error: An NSError object passed by reference, which upon return will contain the error if an error occurs.

Returns a boolean value indicating whether or not an error occurred. true indicates no error occurred.

### 129.14.12 Properties

### 129.14.13 CWInterface as CWInterfaceMBS

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the CWInterface object for the default Wi-Fi interface.

**Notes:** This method is named CWInterface as the name interface would cause an error in Xojo.
(Read only property)

### 129.14.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.14.15 Events

### 129.14.16 bssidDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the current BSSID changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeBSSIDDidChange event type to register for BSSID event notifications.
Use CWInterfaceMBS.bssid to query the current BSSID.

### 129.14.17 clientConnectionInterrupted

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked if the connection to the Wi-Fi subsystem is temporarily interrupted.
**Notes:** All event notifications for which the Wi-Fi client has registered will be automatically re-registered if the connection is interrupted.
The Wi-Fi client should re-sync any local state which is updated as a result of Wi-Fi event notifications.

### 129.14.18 clientConnectionInvalidated

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked if the connection to the Wi-Fi subsystem is permanently invalidated.

### 129.14.19 countryCodeDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the currently adopted country code changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeCountryCodeDidChange event type to register for country code event notifications.
Use CWInterfaceMBS.countryCode to query the currently adopted country code.

### 129.14.20 linkDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the Wi-Fi link state changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeLinkDidChange event type to register for link event notifications.

### 129.14.21 linkQualityDidChangeForWiFiInterfaceWithName(interfaceName as String, rssi as Integer, transmitRate as double)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the Wi-Fi link quality changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.
rssi: The RSSI value for the currently associated network on the Wi-Fi interface.
transmitRate: The transmit rate for the currently associated network on the Wi-Fi interface.

Use startMonitoring with the CWEventTypeLinkQualityDidChange event type to register for link quality event notifications.
Use CWInterfaceMBS.rssiValue and CWInterfaceMBS.transmitRate to query the current RSSI and transmit rate, respectively.

### 129.14.22 modeDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the Wi-Fi operating mode changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeModeDidChange event type to register for interface mode event notifications.
Use CWInterfaceMBS.interfaceMode to query the current operating mode.

### 129.14.23 powerStateDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the Wi-Fi power state changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypePowerDidChange event type to register for power event notifications.
Use CWInterfaceMBS.powerOn to query the current Wi-Fi power state.

### 129.14.24 rangingReportEventForWiFiInterfaceWithName(interfaceName as String, rangingData() as Dictionary, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when WiFi ranging measurement completed.
**Notes:** interfaceName: The name of the Wi-Fi interface.
rangingData: Dictionary containing distance measurement data.

Use startMonitoring with the CWEventTypeRangingReportEvent event type to register for ranging event notifications.

### 129.14.25 scanCacheUpdatedForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the Wi-Fi interface scan cache is updated with new scan results.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeScanCacheUpdated event type to register for scan cache event notifications.

Use CWInterfaceMBS.cachedScanResults to query scan cache results from the last scan.

### 129.14.26 ssidDidChangeForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when the current SSID changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeSSIDDidChange event type to register for SSID event notifications.
Use CWInterfaceMBS.ssidData or CWInterfaceMBS.ssid to query the current SSID.

### 129.14.27 virtualInterfaceStateChangedForWiFiInterfaceWithName(interfaceName as String)

MBS MacFrameworks Plugin, Plugin Version: 18.2, Platform: macOS, Targets: .

**Function:** Invoked when any state of WiFi virtual interface changes.
**Notes:** interfaceName: The name of the Wi-Fi interface.

Use startMonitoring with the CWEventTypeVirtualInterfaceStateChanged event type to register for virtual interface state changed notifications.

### 129.14.28 Constants

Event Types

| Constant | Value | Description |
|---|---|---|
| CWEventTypeBSSIDDidChange | 3 | Posted when the current BSSID of any Wi-Fi interface changes. |
| CWEventTypeCountryCodeDidChange | 4 | Posted when the adopted country code of any Wi-Fi interface cha |
| CWEventTypeLinkDidChange | 5 | Posted when the link state for any Wi-Fi interface changes. |
| CWEventTypeLinkQualityDidChange | 6 | Posted when the RSSI or transmit rate for any Wi-Fi interface ch |
| CWEventTypeModeDidChange | 7 | Posted when the operating mode of any Wi-Fi interface changes. |
| CWEventTypeNone | 0 | No event type specified. |
| CWEventTypePowerDidChange | 1 | Posted when the power state of any Wi-Fi interface changes. |
| CWEventTypeRangingReportEvent | 10 | Posted when WiFi ranging measurement completed. |
| CWEventTypeScanCacheUpdated | 8 | Posted when the scan cache of any Wi-Fi interface is updated wi results. |
| CWEventTypeSSIDDidChange | 2 | Posted when the current SSID of any Wi-Fi interface changes. |
| CWEventTypeVirtualInterfaceStateChanged | 9 | Posted when any state of any Wi-Fi virtual interface changes. |

## 129.15 class DatagramMBS

### 129.15.1 class DatagramMBS

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a datagram.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 129.15.2 Properties

### 129.15.3 Address as String

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address of the datagram.
**Notes:** This is an IPv4.
(Read and Write property)

### 129.15.4 Data as String

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data of the datagram.
**Notes:** (Read and Write property)

### 129.15.5 Length as Integer

MBS Network Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Length of Data in bytes.
**Notes:** (Read and Write property)

### 129.15.6 Port as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The port of the datagram.
**Notes:** (Read and Write property)

### 129.15.7 rawAddress as MemoryBlock

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw address.
**Notes:** This is socket address structure as used in C.
(Read and Write property)

## 129.16 class DNSLookupMBS

### 129.16.1 class DNSLookupMBS

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the result of a Lookup query.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox DNSLookupMBS.FormatIP(d.Address)
end if
```

**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.
- MBS Real Studio Plugins, version 13.1pr12
- Multithreaded plugin functions can increase speed of Real Studio application
- MBS Real Studio Plugins, version 12.2pr5
- MBS Real Studio Plugins, version 11.3pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3

### 129.16.2 Methods

### 129.16.3 Addresses(index as Integer) as string

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the address with the given index for this host.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
```

```
else
dim c as Integer = d.AddressesCount-1
for i as Integer = 0 to c
MsgBox d.FormatIP(d.Addresses(i))
next
end if
```

**Notes:** Index from 0 to count-1.

### 129.16.4 Aliases(index as Integer) as string

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the aliasname for the given index.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
dim c as Integer = d.AliasCount-1
for i as Integer = 0 to c
MsgBox d.Aliases(i)
next

end if
```

**Notes:** Index is from 0 to count-1.

### 129.16.5 FormatIP(ip as string) as string

MBS Network Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Formats an IP from binary representation into string representation.
**Example:**

```
dim s as string = DNSLookupMBS.ParseIPv4("65.66.67.68")

MsgBox s // in binary representation of that IP

dim t as string = DNSLookupMBS.FormatIP(s)
```

```
MsgBox t
```

**Notes:** Formats both IPv4 and IPv6 IP addresses in binary representation into human readable text.
On Windows IPv6 is only supported on Windows Vista and newer.
Returns empty string on failure.

### 129.16.6 LookupHostbyAddress(HostAddressBinary as string) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host IP address.
**Example:**

```
dim l as DNSLookupMBS
dim a as string

a = DNSLookupMBS.ParseIPv4("17.254.0.91")

// try it...
l = DNSLookupMBS.LookupHostbyAddress(a)

// success...
MsgBox l.Name
```

**Notes:** The address must be a 4 byte IP address like the ones returned by DNSLookupMBS.Address.
Returns nil on any error.

### 129.16.7 LookupHostbyAddressMT(HostAddressBinary as string) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host IP address.
**Example:**

```
dim l as DNSLookupMBS
dim a as string

a = DNSLookupMBS.ParseIPv4("17.254.0.91")

// try it...
l = DNSLookupMBS.LookupHostbyAddressMT(a)
```

```
// success...
MsgBox l.Name
```

**Notes:** Same as LookupHostbyAddress, but with additional multithreading.

The address must be a 4 byte IP address like the ones returned by DNSLookupMBS.Address.
Returns nil on any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 129.16.8 LookupHostbyName(HostName as string) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host name.
**Example:**

```
dim s as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.monkeybreadsoftware.de")

dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
```

**Notes:** Will fail if you pass an IP as an host. (e.g. 10.20.30.40)
Returns nil on any error.
See also:

- 129.16.9 LookupHostbyName(HostName as string, AddressType as Integer) as DNSLookupMBS 18023

### 129.16.9 LookupHostbyName(HostName as string, AddressType as Integer) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host name.
**Example:**

```
dim s as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("ipv6.google.com", DNSLookupMBS.AddressTypeIPv6)

if s<>nil then
dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
end if

s = DNSLookupMBS.LookupHostbyName("www.six.heise.de", DNSLookupMBS.AddressTypeIPv6)

if s<>nil then
dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
end if
```

**Notes:** Will fail if you pass an IP as an host. (e.g. 10.20.30.40)
Returns nil on any error.

IPv6 on Windows does not work with this method.
See also:

- 129.16.8 LookupHostbyName(HostName as string) as DNSLookupMBS 18023

### 129.16.10 LookupHostbyNameMT(HostName as string) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host name.
**Example:**

```
dim s as DNSLookupMBS = DNSLookupMBS.LookupHostbyNameMT("www.monkeybreadsoftware.de")

dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
```

**Notes:** Same as LookupHostbyName, but with additional multithreading.

Will fail if you pass an IP as an host. (e.g. 10.20.30.40)
Returns nil on any error.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 129.16.11 LookupHostbyNameMT(HostName as string, AddressType as Integer) as DNSLookupMBS 18025

### 129.16.11 LookupHostbyNameMT(HostName as string, AddressType as Integer) as DNSLookupMBS

MBS Network Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the DNS server for information about a host name.
**Example:**

```
dim s as DNSLookupMBS = DNSLookupMBS.LookupHostbyNameMT("ipv6.google.com", DNSLookupMBS.AddressTypeIPv6)

if s<>nil then
dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
end if

s = DNSLookupMBS.LookupHostbyNameMT("www.six.heise.de", DNSLookupMBS.AddressTypeIPv6)

if s<>nil then
dim c as Integer = s.AddressesCount-1
for i as Integer = 0 to c
dim ss as string = s.Addresses(i)
print str(s.FormatIP(ss))
next
end if
```

**Notes:** Same as LookupHostbyName, but with additional multithreading.

Will fail if you pass an IP as an host. (e.g. 10.20.30.40)
Returns nil on any error.

IPv6 on Windows does not work with this method.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 129.16.10 LookupHostbyNameMT(HostName as string) as DNSLookupMBS 18024

### 129.16.12 ParseIPv4(ip as string) as string

MBS Network Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an IP address in IPv4 format.
**Example:**

```
dim s as string = DNSLookupMBS.ParseIPv4("65.66.67.68")

MsgBox s // in binary representation of that IP

dim t as string = DNSLookupMBS.FormatIP(s)

MsgBox t
```

**Notes:** Returns empty string on failure.
Works only for IPv4 strings.

### 129.16.13 ParseIPv6(ip as string) as string

MBS Network Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses an IP address in IPv6 format.
**Example:**

```
dim s as string = DNSLookupMBS.ParseIPv6("2001:0db8:85a3:08d3:1319:8a2e:0370:7344")

MsgBox s // in binary representation of that IP

dim t as string = DNSLookupMBS.FormatIP(s)

MsgBox t
```

**Notes:** Returns empty string on failure.
Works only for IPv6 strings.

### 129.16.14 Properties

### 129.16.15 Address as String

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The primary address of the host.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox DNSLookupMBS.FormatIP(d.Address)
end if
```

**Notes:** On TCP/IP based system the address is 4 bytes long binary string.
(Read and Write property)

### 129.16.16 AddressesCount as Integer

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of addresses for this host.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox str(d.AddressesCount)
end if
```

**Notes:** (Read and Write property)

### 129.16.17 AddressType as Integer

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of the address format.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox str(d.AddressType) // shows 2 for IPv4
end if
```

**Notes:** 2 for IPv2
10 for IPv10
(Read and Write property)

### 129.16.18 AliasCount as Integer

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of aliases for this host.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox str(d.AliasCount)
end if
```

**Notes:** (Read and Write property)

### 129.16.19 Name as String

MBS Network Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the host.
**Example:**

```
dim d as DNSLookupMBS = DNSLookupMBS.LookupHostbyName("www.apple.com")

if d=nil then
MsgBox "No DNS Server available?"
else
MsgBox d.Name
end if
```

**Notes:** (Read and Write property)

### 129.16.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| AddressTypeIPv4 | 2 | One of the address types. An IPv4 address. |
| AddressTypeIPv6 | 10 | One of the address types. An IPv6 address. |

## 129.17 class DNSServiceAddrInfoMBS

### 129.17.1 class DNSServiceAddrInfoMBS

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: All.

**Function:** The class to query IP Address for hostname asynchronously.
**Notes:** Queries for the IP address of a hostname by using either Multicast or Unicast DNS.
Subclass of the DNSServiceBaseMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 18.1pr3
- MBS Xojo / Real Studio Plugins, version 16.5pr3
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 129.17.2 Methods

### 129.17.3 AddrInfo(InterfaceIndex as Integer, protocol as Integer, HostName as string) as boolean

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: All.

**Function:** Queries for the IP address of a hostname by using either Multicast or Unicast DNS.
**Notes:** interfaceIndex: The interface on which to issue the query. Passing 0 causes the query to be sent on all active interfaces via Multicast or the primary interface via Unicast.
protocol: Pass in kDNSServiceProtocol_IPv4 to look up IPv4 addresses, or kDNSServiceProtocol_IPv6 to look up IPv6 addresses, or both to look up both kinds. If neither flag is set, the system will apply an intelligent heuristic, which is (currently) that it will attempt to look up both, except:
If "hostname" is a wide-area unicast DNS hostname (i.e. not a ".local." name) but this host has no routable IPv6 address, then the call will not try to look up IPv6 addresses for "hostname", since any addresses it found would be unlikely to be of any use anyway. Similarly, if this host has no routable IPv4 address, the call will not try to look up IPv4 addresses for "hostname".

hostname: The fully qualified domain name of the host to be queried for.

Lasterror is set to kDNSServiceErr_NoError (0) on success (any subsequent, asynchronous errors are delivered to the callback), otherwise returns an error code indicating the error that occurred.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.17.4 Available as boolean

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: All.

**Function:** Whether this class is available for use.
**Notes:** Older versions of Bonjour did not have such functions, so there it may not be available.

### 129.17.5 Events

### 129.17.6 ServiceAddrInfo(Flags as Integer, InterfaceIndex as Integer, ErrorCode as Integer, AddressFamily as Integer, IP as string, SockAddr as MemoryBlock, HostName as string, ttl as Integer)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: .

**Function:** The event called when something is found.
**Notes:** Flags: Possible values are kDNSServiceFlagsMoreComing and kDNSServiceFlagsAdd.
interfaceIndex: The interface to which the answers pertain.
errorCode: Will be kDNSServiceErr_NoError (0) on success, otherwise will indicate the failure that occurred. Other parameters are undefined if errorCode is nonzero.
hostname: The fully qualified domain name of the host to be queried for.
address: IPv4 or IPv6 address.
ttl: If the client wishes to cache the result for performance reasons, the TTL indicates how long the client may legitimately hold onto this result, in seconds. After the TTL expires, the client should consider the result no longer valid, and if it requires this data again, it should be re-fetched with a new query. Of course, this only applies to clients that cancel the asynchronous operation when they get a result. Clients that leave the asynchronous operation running can safely assume that the data remains valid until they get another callback telling them otherwise.

### 129.17.7 Constants

Address families

| Constant | Value | Description |
|---|---|---|
| kAddressFamilyIPv4 | 2 | IPv4 protocol |
| kAddressFamilyIPv6 | 30 | IPv6 protocol |

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAuto | 0 | Automatic decide. |
| kProtocolIPv4 | 1 | IPv4 protocol |
| kProtocolIPv6 | 2 | IPv6 protocol |

## 129.18 class DNSServiceBaseMBS

### 129.18.1 class DNSServiceBaseMBS

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** The base DNS Service class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr1
- MBS Xojo / Real Studio Plugins, version 14.2pr4

### 129.18.2 Methods

### 129.18.3 Available as boolean

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Whether Bonjour (zeroconfig) is installed and useable.
**Notes:** If this function returns true, all the needed stuff is installed and the function have been loaded.

### 129.18.4 Close

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Stops the current request and releases all used memory.
**Notes:** This is done automatically for you by the destructor.

### 129.18.5 ConstructFullName(Service as string, regtype as string, domain as string) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Concatenate a three-part domain name (as returned by the above callbacks) into a properly-escaped full domain name.
**Notes:** Note that events in the above functions ALREADY ESCAPE strings where necessary.

service: The service name - any dots or backslashes must NOT be escaped. May be "" (to construct a PTR record name, e.g. "_ftp._tcp.apple.com.").
regtype: The service type followed by the protocol, separated by a dot (e.g. "_ftp._tcp").
domain: The domain name, e.g. "apple.com.". Literal dots or backslashes, if any, must be escaped, e.g.

"1st\. Floor.apple.com."

Returns 0 on success, -1 on error.

### 129.18.6 GetDaemonVersion as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Queries the version of the daemon.
**Notes:** Value is zero on any error.

### 129.18.7 Initialize

MBS Network Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Initializes API.
**Notes:** On Windows the plugin calls this internally at startup of application.
Now if your app installs Bonjour while running, you can call this method to let the plugin load the bonjour dll.
After successful call, the available functions return true.

Does nothing on Mac OS X or Linux.

### 129.18.8 Running as boolean

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** True if there is a running request.

### 129.18.9 Properties

### 129.18.10 Handle as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** The handle for this request.
**Notes:** (Read and Write property)

### 129.18.11 Lasterror as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** 0 if the function succeeded.
-1 if the function used was not available.
See the kError constants for possible errors.
(Read and Write property)

### 129.18.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kClassIN | 1 | The DNS class for Internet services. |
| kErrorAlreadyRegistered | -65547 | One of the error constants. |
| kErrorBadFlags | -65543 | One of the error constants. |
| kErrorBadInterfaceIndex | -65552 | One of the error constants. |
| kErrorBadParam | -65540 | One of the error constants. |
| kErrorBadReference | -65541 | One of the error constants. |
| kErrorBadState | -65542 | One of the error constants. |
| kErrorBadTime | -65559 | One of the error constants. |
| kErrorDoubleNAT | -65558 | One of the error constants. |
| kErrorFirewall | -65550 | One of the error constants. |
| kErrorIncompatible | -65551 | One of the error constants. |
| kErrorInvalid | -65549 | One of the error constants. |
| kErrorNameConflict | -65548 | One of the error constants. |
| kErrorNATTraversal | -65557 | One of the error constants. |
| kErrorNoAuth | -65555 | One of the error constants. |
| kErrorNoError | 0 | One of the error constants. |
| kErrorNoMemory | -65539 | One of the error constants. |
| kErrorNoSuchKey | -65556 | One of the error constants. |
| kErrorNoSuchName | -65538 | One of the error constants. |
| kErrorNoSuchRecord | -65554 | One of the error constants. |
| kErrorNotInitialized | -65545 | One of the error constants. |
| kErrorRefused | -65553 | One of the error constants. |
| kErrorUnknown | -65537 | One of the error constants. |
| kErrorUnsupported | -65544 | One of the error constants. |
| kFlagsAdd | 2 | A flag for domain enumeration and browse/query events.<br>"Default" applies only to enumeration and is only valid in conjuction with "Add". An enumeration callback with the "Add" flag NOT set indicates a "Remove", i.e. the domain is no longer valid. |
| kFlagsAllowRemoteQuery | &h200 | Flag for creating a record for which we will answer remote queries (queries from hosts more than one hop away; hosts not directly connected to the local link). |
| kFlagsBrowseDomains | &h40 | Flags for specifying domain enumeration type in DNSServiceEnumerateDomains.<br>BrowseDomains enumerates domains recommended for browsing, RegistrationDomains enumerates domains recommended for registration. |
| kFlagsDefault | 4 | A flag for domain enumeration and browse/query events.<br>"Default" applies only to enumeration and is only valid in conjuction with "Add". An enumeration callback with the "Add" flag NOT set indicates a "Remove", i.e. the domain is no longer valid. |
| kFlagsForceMulticast | &h400 | One of the flags.<br>Flag for signifying that a query or registration should be performed exclusively via multicast DNS, even for a name in a domain (e.g. foo.apple.com.) that would normally imply unicast DNS. |
| kFlagsLongLivedQuery | &h100 | Flag for creating a long-lived unicast query for the QueryRecord call. |
| kFlagsMoreComing | 1 | One of the flags used for the events.<br>MoreComing indicates to a callback that at least one more result is queued and will be delivered following immediately after this one. Applications should not update their UI to display browse results when the MoreComing flag is set, because this would result in a great deal of ugly flickering on the screen. Applications should instead wait until until MoreComing is not set, and then update their UI. When MoreComing is not set, that doesn't mean there will be no more answers EVER, just that there are no more answers immediately available right now at this instant. If more answers become available in the future they will be delivered as usual. |
| kFlagsNoAutoRename | 8 | The flag for specifying renaming behavior on name conflict when registering non-shared records.<br>By default, name conflicts are automatically handled by renaming the service. NoAutoRename overrides this behavior - with this flag set, name conflicts will result in a callback. The NoAutorename flag is only valid if a name is explicitly |

## 129.19 class DNSServiceBrowseMBS

### 129.19.1 class DNSServiceBrowseMBS

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to browse for services on the local network using Rendezvous.

This class requires Mac OS X 10.3 or Windows (with installed Bonjour support and the dnssd.dll) to work. Use DNSServiceDiscoveryBrowseMBS if you want to support Mac OS X 10.2.

common error codes:

| | |
|---|---|
| kDNSServiceErr_NoError | = 0 |
| kDNSServiceErr_Unknown | = -65537 (=&hFFFE FFFF) |
| kDNSServiceErr_NoSuchName | = -65538 |
| kDNSServiceErr_NoMemory | = -65539 |
| kDNSServiceErr_BadParam | = -65540 |
| kDNSServiceErr_BadReference | = -65541 |
| kDNSServiceErr_BadState | = -65542 |
| kDNSServiceErr_BadFlags | = -65543 |
| kDNSServiceErr_Unsupported | = -65544 |
| kDNSServiceErr_NotInitialized | = -65545 |
| kDNSServiceErr_AlreadyRegistered | = -65547 |
| kDNSServiceErr_NameConflict | = -65548 |
| kDNSServiceErr_Invalid | = -65549 |
| kDNSServiceErr_Incompatible | = -65551 (client library incompatible with daemon) |
| kDNSServiceErr_BadinterfaceIndex | = -65552 |

Subclass of the DNSServiceBaseMBS class.

### 129.19.2 Methods

### 129.19.3 Browse(InterfaceIndex as Integer, servicetype as string, domain as string) as boolean

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** Asynchronously create a DNS Service browser to search for matching services in the local network.
**Notes:** servicetype:
The type of service.

domain:
The domain in which to find the service.

Returns true if successfull.
The ServiceBrowse event may be called till this browse request is closed.

You need to keep this object alive (keep a reference in a window, a module or your app class) so you can receive events.

In a perfect application you use DNSServiceDomainEnumerationMBS class to enumerate which domains you should use.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.19.4 Events

### 129.19.5 ServiceBrowse(Flags as Integer, InterfaceIndex as Integer, ErrorCode as Integer, ServiceName as string, RegType as string, Domain as string)

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: .

**Function:** New service found or lost one.
**Example:**

```
sub ServiceBrowse(Flags as Integer, InterfaceIndex as Integer, ErrorCode as Integer, ServiceName as string,
RegType as string, Domain as string)
// example for event implementation

const kDNSServiceFlagsAdd = 2
const kDNSServiceFlagsRemove = 0
const kDNSServiceFlagsMoreComing = 1
const kDNSServiceFlagsFinished = 0

dim Added as boolean = bitwiseAnd(flags, kDNSServiceFlagsAdd) = kDNSServiceFlagsAdd
dim Removed as boolean = bitwiseAnd(flags, kDNSServiceFlagsAdd) = kDNSServiceFlagsRemove

dim MoreComing as boolean = bitwiseAnd(flags, kDNSServiceFlagsMoreComing) = kDNSServiceFlagsMore-
Coming
dim Finished as boolean = bitwiseAnd(flags, kDNSServiceFlagsMoreComing) = kDNSServiceFlagsFinished

// work with the booleans to decide what to do.

end sub
```

**Notes:** Values for flags:

| | |
|---|---|
| kDNSServiceFlagsAdd | = 2 |
| kDNSServiceFlagsRemove | = 0 (i.e. bit not set) |
| kDNSServiceFlagsMoreComing | = 1 |
| kDNSServiceFlagsFinished | = 0 (i.e. bit not set) |

MoreComing indicates to a Browse callback that another result is queued. Applications should not update their UI to display browse results when the MoreComing flag is set, instead deferring the update until the callback's flag is Finished.

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

InterfaceIndex can be kInterfaceIndexLocalOnly, kInterfaceIndexAny or a positive index for the interface index (1 = first device).
For interface indexes, please also check NetworkInterfaceMBS class.

# 129.20 class DNSServiceDiscoveryBrowseMBS

## 129.20.1 class DNSServiceDiscoveryBrowseMBS

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DNSServiceBrowseMBS instead. **Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to browse for services on the local network using Bonjour.

Common error codes for Rendevouz:

| | |
|---|---|
| kDNSServiceDiscoveryUnknownErr | -65537 |
| kDNSServiceDiscoveryNoSuchNameErr | -65538 |
| kDNSServiceDiscoveryNoMemoryErr | -65539 |
| kDNSServiceDiscoveryBadParamErr | -65540 |
| kDNSServiceDiscoveryBadReferenceErr | -65541 |
| kDNSServiceDiscoveryBadStateErr | -65542 |
| kDNSServiceDiscoveryBadFlagsErr | -65543 |
| kDNSServiceDiscoveryUnsupportedErr | -65544 |
| kDNSServiceDiscoveryNotInitializedErr | -65545 |
| kDNSServiceDiscoveryNoCache | -65546 |
| kDNSServiceDiscoveryAlreadyRegistered | -65547 |
| kDNSServiceDiscoveryNameConflict | -65548 |
| kDNSServiceDiscoveryInvalid | -65549 |
| kDNSServiceDiscoveryMemFree | -65792 |

But several other Mac OS error codes may also be there.
This class requires Mac OS X 10.2 to work. Use DNSServiceBrowseMBS if you want to support Mac OS X 10.3 and Windows.

Not available on Mac OS X 10.9.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr7

## 129.20.2 Methods

## 129.20.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether Bonjour (zeroconfig) is installed.
**Notes:** If this function returns true, all the needed stuff is installed and the function have been loaded.

### 129.20.4 Browse(servicetype as string, domain as string) as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Asynchronously create a DNS Service browser to search for matching services in the local network.
**Notes:** servicetype:
The type of service.

domain:
The domain in which to find the service.

Returns true if successfull.
The ServiceBrowse event may be called till this browse request is closed.

### 129.20.5 Close

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops the current request and releases all used memory.

### 129.20.6 Running as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if there is a running request.

### 129.20.7 Properties

### 129.20.8 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle for this request.
**Notes:** (Read only property)

### 129.20.9 Events

### 129.20.10 ServiceBrowse(message as Integer, name as string, type as string, domain as string, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: .

**Function:** New service found or lost one.
**Notes:** If message=0 a new service was found. Message=1 means that a service was removed.
Flags=1 means that more data is coming. Flags=0 means the end of the current list of services. But several minutes later when a new Mac connects to the network another ServiceBrowse Event may inform you, even if flags was 0.

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

## 129.21 class DNSServiceDiscoveryDomainEnumerationMBS

### 129.21.1 class DNSServiceDiscoveryDomainEnumerationMBS

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DNSServiceDomainEnumerationMBS instead. **Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to enumerate domains.

Common error codes for Rendevouz:

| | |
|---|---|
| kDNSServiceDiscoveryUnknownErr | -65537 |
| kDNSServiceDiscoveryNoSuchNameErr | -65538 |
| kDNSServiceDiscoveryNoMemoryErr | -65539 |
| kDNSServiceDiscoveryBadParamErr | -65540 |
| kDNSServiceDiscoveryBadReferenceErr | -65541 |
| kDNSServiceDiscoveryBadStateErr | -65542 |
| kDNSServiceDiscoveryBadFlagsErr | -65543 |
| kDNSServiceDiscoveryUnsupportedErr | -65544 |
| kDNSServiceDiscoveryNotInitializedErr | -65545 |
| kDNSServiceDiscoveryNoCache | -65546 |
| kDNSServiceDiscoveryAlreadyRegistered | -65547 |
| kDNSServiceDiscoveryNameConflict | -65548 |
| kDNSServiceDiscoveryInvalid | -65549 |
| kDNSServiceDiscoveryMemFree | -65792 |

But several other Mac OS error codes may also be there.
This class requires Mac OS X 10.2 to work. Use DNSServiceDomainEnumerationMBS if you want to support Mac OS X 10.3 and Windows.

Not available on Mac OS X 10.9.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 129.21.2 Methods

### 129.21.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether Bonjour (zeroconfig) is installed.
**Notes:** If this function returns true, all the needed stuff is installed and the function have been loaded.

### 129.21.4 Close

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops the current request and releases all used memory.

### 129.21.5 EnumerateDomains(domaintype as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Asynchronously create a DNS Domain Enumerator to search for domains in the local network.
**Notes:** domaintype:
A flag indicating whether you are looking for recommended registration domains (value=1, e.g. equivalent to the AppleTalk zone list in the AppleTalk Control Panel) or recommended browsing domains (value=0, e.g. equivalent to the AppleTalk zone list in the Chooser).

Returns true if successfull.
The ServiceDomainEnumeration event may be called till this enumerate request is closed.

### 129.21.6 Running as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if there is a running request.

### 129.21.7 Properties

### 129.21.8 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle for this request.
**Notes:** (Read only property)

### 129.21.9 Events

### 129.21.10 ServiceDomainEnumeration(message as Integer, domain as string, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: .

**Function:** Domains changed.
**Notes:** Meaning of message:

0: Domain found.
1: Domain found (and should be selected by default).
2: Domain has been removed from network.

Flags=1 means that more data is coming. Flags=0 means the end of the current list of services. But several minutes later when a new Mac connects to the network another ServiceLookup Event may inform you, even if flags was 0.

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

## 129.22 class DNSServiceDiscoveryRegisterMBS

### 129.22.1 class DNSServiceDiscoveryRegisterMBS

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DNSServiceRegisterMBS instead. **Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to register names on the local network using Bonjour.

Common error codes for Rendevouz:

| | |
|---|---|
| kDNSServiceDiscoveryUnknownErr | -65537 |
| kDNSServiceDiscoveryNoSuchNameErr | -65538 |
| kDNSServiceDiscoveryNoMemoryErr | -65539 |
| kDNSServiceDiscoveryBadParamErr | -65540 |
| kDNSServiceDiscoveryBadReferenceErr | -65541 |
| kDNSServiceDiscoveryBadStateErr | -65542 |
| kDNSServiceDiscoveryBadFlagsErr | -65543 |
| kDNSServiceDiscoveryUnsupportedErr | -65544 |
| kDNSServiceDiscoveryNotInitializedErr | -65545 |
| kDNSServiceDiscoveryNoCache | -65546 |
| kDNSServiceDiscoveryAlreadyRegistered | -65547 |
| kDNSServiceDiscoveryNameConflict | -65548 |
| kDNSServiceDiscoveryInvalid | -65549 |
| kDNSServiceDiscoveryMemFree | -65792 |

But several other Mac OS error codes may also be there.
This class requires Mac OS X 10.2 to work. Use DNSServiceRegisterMBS if you want to support Mac OS X 10.3 and Windows.

Not available on Mac OS X 10.9.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 129.22.2 Methods

### 129.22.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether Bonjour (zeroconfig) is installed.
**Notes:** If this function returns true, all the needed stuff is installed and the function have been loaded.

### 129.22.4 Close

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops the current request and releases all used memory.

### 129.22.5 Register(servicename as string, servicetype as string, domain as string, port as Integer, text as string) as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Register a named service with DNS Service Discovery.
**Notes:** servicename:
The name of this service instance (e.g. "Steve's Printer")

servicetype:
The service type (e.g. "_printer._tcp."
See RFC 2782 (DNS SRV) and this website:
http://www.iana.org/assignments/port-numbers

domain:
The domain in which to register the service (e.g. "apple.com.")

port:
The local port on which this service is being offered (in network byte order)

text:
Optional protocol-specific additional information

Returns true if successfull.
The ServiceRegistration event may be called till this registration request is closed.

### 129.22.6 Running as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if there is a running request.

### 129.22.7 UpdateText(data as string, ttl as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changes the TXT Record.
**Notes:** data is the TXT Record composed of Pascal Strings.
ttl = time to live.
Returns an error code. (0=success)

### 129.22.8 Properties

### 129.22.9 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle for this request.
**Notes:** (Read only property)

### 129.22.10 Text as String

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last TXT Record text used.
**Notes:** (Read only property)

### 129.22.11 Events

### 129.22.12 ServiceRegistration(errorcode as Integer)

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: .

**Function:** Registration was done.
**Notes:** errorcode is 0 if successfull.

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

## 129.23 class DNSServiceDiscoveryResolveMBS

### 129.23.1 class DNSServiceDiscoveryResolveMBS

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use DNSServiceResolveMBS instead. **Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to lookup names on the local network using Bonjour.

Common error codes for Rendevouz:

| | |
|---|---|
| kDNSServiceDiscoveryUnknownErr | -65537 |
| kDNSServiceDiscoveryNoSuchNameErr | -65538 |
| kDNSServiceDiscoveryNoMemoryErr | -65539 |
| kDNSServiceDiscoveryBadParamErr | -65540 |
| kDNSServiceDiscoveryBadReferenceErr | -65541 |
| kDNSServiceDiscoveryBadStateErr | -65542 |
| kDNSServiceDiscoveryBadFlagsErr | -65543 |
| kDNSServiceDiscoveryUnsupportedErr | -65544 |
| kDNSServiceDiscoveryNotInitializedErr | -65545 |
| kDNSServiceDiscoveryNoCache | -65546 |
| kDNSServiceDiscoveryAlreadyRegistered | -65547 |
| kDNSServiceDiscoveryNameConflict | -65548 |
| kDNSServiceDiscoveryInvalid | -65549 |
| kDNSServiceDiscoveryMemFree | -65792 |

But several other Mac OS error codes may also be there.
This class requires Mac OS X 10.2 to work. Use DNSServiceResolveMBS if you want to support Mac OS X 10.3 and Windows.

Not available on Mac OS X 10.9.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr4
- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 129.23.2 Methods

### 129.23.3 Available as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether Bonjour (zeroconfig) is installed.
**Notes:** If this function returns true, all the needed stuff is installed and the function have been loaded.

### 129.23.4 Close

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops the current request and releases all used memory.

### 129.23.5 Lookup(servicename as string, servicetype as string, domain as string) as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Resolved a named instance of a service to its address, port, and (optionally) a text description.
**Notes:** servicename:
The name of the service instance.

servicetype:
The type of service.

domain:
The domain in which to find the service.

Returns true if successfull.
The ServiceLookup event may be called till this lookup request is closed.

### 129.23.6 Running as boolean

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** True if there is a running request.

### 129.23.7 Properties

### 129.23.8 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle for this request.
**Notes:** (Read only property)

### 129.23.9 Events

### 129.23.10 ServiceLookup(ip as string, port as Integer, text as string, flags as Integer)

MBS MacOSX Plugin, Plugin Version: 5.0, Platform: macOS, Targets: .

**Function:** Lookup got something.
**Notes:** IP is a string like "192.168.1.14".
Flags=1 means that more data is coming. Flags=0 means the end of the current list of services. But several minutes later when a new Mac connects to the network another ServiceLookup Event may inform you, even if flags was 0.

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

# 129.24 class DNSServiceDomainEnumerationMBS

## 129.24.1 class DNSServiceDomainEnumerationMBS

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to enumerate domains.

This class requires Mac OS X 10.3 or Windows (with installed Bonjour support and the dnssd.dll) to work. Use DNSServiceDiscoveryBrowseMBS if you want to support Mac OS X 10.2.

common error codes:

| | |
|---|---|
| kDNSServiceErr_NoError | = 0 |
| kDNSServiceErr_Unknown | = -65537 (=&hFFFE FFFF) |
| kDNSServiceErr_NoSuchName | = -65538 |
| kDNSServiceErr_NoMemory | = -65539 |
| kDNSServiceErr_BadParam | = -65540 |
| kDNSServiceErr_BadReference | = -65541 |
| kDNSServiceErr_BadState | = -65542 |
| kDNSServiceErr_BadFlags | = -65543 |
| kDNSServiceErr_Unsupported | = -65544 |
| kDNSServiceErr_NotInitialized | = -65545 |
| kDNSServiceErr_AlreadyRegistered | = -65547 |
| kDNSServiceErr_NameConflict | = -65548 |
| kDNSServiceErr_Invalid | = -65549 |
| kDNSServiceErr_Incompatible | = -65551 (client library incompatible with daemon) |
| kDNSServiceErr_BadinterfaceIndex | = -65552 |

Subclass of the DNSServiceBaseMBS class.

## 129.24.2 Methods

## 129.24.3 EnumerateDomains(Flags as Integer, InterfaceIndex as Integer) as boolean

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** Asynchronously enumerate domains available for browsing and registration.
**Notes:** Note that the names returned are (like all of DNS-SD) UTF-8 strings, and are escaped using standard DNS escaping rules.
A graphical browser displaying a hierarchical tree-structured view should cut the names at the bare dots to yield individual labels, then de-escape each label according to the escaping rules, and then display the

resulting UTF-8 text.

Flags for specifying domain enumeration type in DNSServiceEnumerateDomains.
BrowseDomains enumerates domains recommended for browsing, RegistrationDomains enumerates domains recommended for registration:

```
kDNSServiceFlagsBrowseDomains          = 64
kDNSServiceFlagsRegistrationDomains    = 128
```

You need to keep this object alive (keep a reference in a window, a module or your app class) so you can receive events.
For interface indexes, please also check NetworkInterfaceMBS class.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.24.4 Events

### 129.24.5 ServiceDomainEnumeration(flags as Integer, interfaceIndex as Integer, errorcode as Integer, Domain as string)

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: .

**Function:** Domains changed.
**Notes:** Flags uses this flags: kFlagsAdd, kFlagsDefault.

"Default" applies only to enumeration and is only valid in conjuction with "Add"

Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.
For interface indexes, please also check NetworkInterfaceMBS class.

# 129.25 class DNSServiceMetaQueryMBS

## 129.25.1 class DNSServiceMetaQueryMBS

MBS MacOSX Plugin, Plugin Version: 12.0, Platforms: macOS, iOS, Targets: All.

**Function:** Queries all Bonjour services.
**Notes:** Useful to learn what services are available. This queries the bonjour cache.
**Blog Entries**

- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr1
- MacOSX plugin for iOS

**Xojo Developer Magazine**

- 20.6, page 9: News

## 129.25.2 Properties

## 129.25.3 Lasterror as Integer

MBS MacOSX Plugin, Plugin Version: 12.0, Platforms: macOS, iOS, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 129.25.4 Events

## 129.25.5 AddService(type as string, domain as string, interfaceName as string, rrtype as Integer, rrclass as Integer)

MBS MacOSX Plugin, Plugin Version: 12.0, Platforms: macOS, iOS, Targets: .

**Function:** A service was found.

## 129.25.6 RemoveService(type as string, domain as string, interfaceName as string, rrtype as Integer, rrclass as Integer)

MBS MacOSX Plugin, Plugin Version: 12.0, Platforms: macOS, iOS, Targets: .

**Function:** A service was removed.
**Notes:** Remove is only called when a network interface is disabled or if the record expires from the cache. For network efficiency reasons, clients do not send goodbye packets for meta-query PTR records when deregistering a service.

# 129.26 class DNSServiceRegisterMBS

## 129.26.1 class DNSServiceRegisterMBS

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to register names on the local network using Bonjour.

This class requires Mac OS X 10.3 or Windows (with installed Bonjour support and the dnssd.dll) to work.
Use DNSServiceDiscoveryBrowseMBS if you want to support Mac OS X 10.2.

common error codes:

| | |
|---|---|
| kDNSServiceErr_NoError | = 0 |
| kDNSServiceErr_Unknown | = -65537 (=&hFFFE FFFF) |
| kDNSServiceErr_NoSuchName | = -65538 |
| kDNSServiceErr_NoMemory | = -65539 |
| kDNSServiceErr_BadParam | = -65540 |
| kDNSServiceErr_BadReference | = -65541 |
| kDNSServiceErr_BadState | = -65542 |
| kDNSServiceErr_BadFlags | = -65543 |
| kDNSServiceErr_Unsupported | = -65544 |
| kDNSServiceErr_NotInitialized | = -65545 |
| kDNSServiceErr_AlreadyRegistered | = -65547 |
| kDNSServiceErr_NameConflict | = -65548 |
| kDNSServiceErr_Invalid | = -65549 |
| kDNSServiceErr_Incompatible | = -65551 (client library incompatible with daemon) |
| kDNSServiceErr_BadinterfaceIndex | = -65552 |

Subclass of the DNSServiceBaseMBS class.
**Blog Entries**

- Using ServerSocket with a system chosen port

## 129.26.2 Methods

## 129.26.3 AddRecord(rrType as Integer, TXTRecord as string, ttl as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: All.

**Function:** Add a record to a registered service.
**Notes:** Lasterror is set.

The name of the record will be the same as the registered service's name. The record can later be updated or deregistered by UpdateRecord() or RemoveRecord().

rrtype: The type of the record (e.g. kTypeTXT, kTypeSRV, etc)
data: The raw rdata to be contained in the added resource record.
ttl: The time to live of the resource record, in seconds. Pass 0 to use a default value.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.26.4 Register(Flags as Integer, interfaceIndex as Integer, servicename as string, servicetype as string, domain as string, host as string, port as Integer, txtRecord as string) as boolean

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** Register a service that is discovered via Browse() and Resolve() calls.
**Notes:** Flag for specifying renaming behavior on name conflict when registering non-shared records. NoAutorename is only valid if a name is explicitly specified when registering a service (ie the default name is not used.)

```
kDNSServiceFlagsNoAutoRename    = 8,
 kDNSServiceFlagsAutoRename     = 0 (i.e. bit not set)
```

You need to keep this object alive (keep a reference in a window, a module or your app class) so you can receive events.

In a perfect application you use DNSServiceDomainEnumerationMBS class to enumerate which domains you should use.
For interface indexes, please also check NetworkInterfaceMBS class.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.26.5 RemoveRecord

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: All.

**Function:** Remove a record previously added to a service record set via AddTextRecord.
**Notes:** Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.26.6 UpdateRecord(TXTRecord as string, ttl as Integer)

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Changes the TXT Record.
**Notes:** data is the TXT Record composed of Pascal Strings.
ttl = time to live.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.26.7 Events

### 129.26.8 ServiceRegistration(flags as Integer, errorcode as Integer, Name as string, RegType as string, Domain as string)

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: .

**Function:** Registration was done.
**Notes:** Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

## 129.27 class DNSServiceRegisterRecordMBS

### 129.27.1 class DNSServiceRegisterRecordMBS

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: All.

**Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class is to register a name record with the dns service.
Subclass of the DNSServiceBaseMBS class.

### 129.27.2 Methods

### 129.27.3 RegisterRecord(Flags as Integer, interfaceIndex as Integer, fullname as string, rrtype as Integer, rrClass as Integer, data as string, ttl as Integer) as boolean

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: All.

**Function:** Registers a record on the DNS system.
**Example:**

```
const kDNSServiceClass_IN = 1
const kDNSServiceType_SRV = 33
const kDNSServiceFlagsShared = &h10
const kDNSServiceFlagsUnique = &h20
```

**Notes:** flags: Possible values are kDNSServiceFlagsShared or kDNSServiceFlagsUnique (see flag type definitions for details).
interfaceIndex: If non-zero, specifies the interface on which to register the record (the index for a given interface is determined via the if_nametoindex() family of calls.) Passing 0 causes the record to be registered on all interfaces. See "Constants for specifying an interface index" for more details.
fullname: The full domain name of the resource record.
rrtype: The numerical type of the resource record (e.g. kDNSServiceType_PTR, kDNSServiceType_SRV, etc)
rrclass: The class of the resource record (usually kDNSServiceClass_IN)
data: the raw rdata, as it is to appear in the DNS record.
ttl: The time to live of the resource record, in seconds. Pass 0 to use a default value.

Lasterror is set. kDNSServiceErr_NoError on success (any subsequent, asynchronous errors are delivered to the event), otherwise returns an error code indicating the error that occurred (the event is never invoked)

You need to keep this object alive (keep a reference in a window, a module or your app class) so you can receive events.

For interface indexes, please also check NetworkInterfaceMBS class.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.27.4 UpdateRecord(TXTRecord as string, ttl as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: All.

**Function:** Changes the TXT Record.
**Notes:** data is the TXT Record composed of Pascal Strings.
ttl = time to live.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.27.5 Events

### 129.27.6 ServiceRegistration(flags as Integer, errorcode as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: .

**Function:** Registration was done.
**Notes:** Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.

## 129.28 class DNSServiceResolveMBS

### 129.28.1 class DNSServiceResolveMBS

MBS Network Plugin, Plugin Version: 5.0, Platforms: macOS, Windows, Targets: All.

**Function:** A class for Apple's implementation of ZeroConfig named Bonjour.
**Notes:** This class allows you to lookup names on the local network using Bonjour.

This class requires Mac OS X 10.3 or Windows (with installed Bonjour support and the dnssd.dll) to work. Use DNSServiceDiscoveryBrowseMBS if you want to support Mac OS X 10.2.

common error codes:

```
kDNSServiceErr_NoError              = 0
kDNSServiceErr_Unknown              = -65537 (=&hFFFE FFFF)
kDNSServiceErr_NoSuchName           = -65538
kDNSServiceErr_NoMemory             = -65539
kDNSServiceErr_BadParam             = -65540
kDNSServiceErr_BadReference         = -65541
kDNSServiceErr_BadState             = -65542
kDNSServiceErr_BadFlags             = -65543
kDNSServiceErr_Unsupported          = -65544
kDNSServiceErr_NotInitialized       = -65545
kDNSServiceErr_AlreadyRegistered    = -65547
kDNSServiceErr_NameConflict         = -65548
kDNSServiceErr_Invalid              = -65549
kDNSServiceErr_Incompatible         = -65551 (client library incompatible with daemon)
kDNSServiceErr_BadinterfaceIndex    = -65552
```

Subclass of the DNSServiceBaseMBS class.

### 129.28.2 Methods

### 129.28.3 Resolve(InterfaceIndex as Integer, servicename as string, servicetype as string, domain as string) as boolean

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Resolves a named instance of a service to its address, port, and (optionally) a text description.
**Notes:** You need to keep this object alive (keep a reference in a window, a module or your app class) so you can receive events.

If you call this method in response to a browse call, please pass the domain string you got in the Service-

Browse event and do not replace it with something else.
For interface indexes, please also check NetworkInterfaceMBS class.

Returns false on any error and true on success. Please check lasterror property when false is returned.

### 129.28.4 Events

### 129.28.5 ServiceResolve(flags as Integer, InterfaceIndex as Integer, ErrorCode as Integer, Fullname as string, Hosttarget as string, Port as Integer, TxtRecord as string)

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: .

**Function:** Resolve got something.
**Notes:** Starting a new query from within this event on the same object can cause problems. Better you create a new instance for another query if you need one.
For interface indexes, please also check NetworkInterfaceMBS class.

## 129.29 class NetSNMPMBS

### 129.29.1 class NetSNMPMBS

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The class to do SNMP queries.
**Example:**

```
dim s as new NetSNMPMBS

s.Community = "demopublic"
s.IP = "test.net-snmp.org"

dim r as string = s.Query("system.sysUpTime.0")

MsgBox r
```

**Notes:** Performs a SNMP GET query.
Using version 1, no authentication and no security options.
**Blog Entries**

- Multithreaded plugin functions can increase speed of Xojo application
- MBS Xojo Plugins, version 18.2pr1
- Problems with killing Xojo threads with plugin calls.
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.3
- MBS Xojo Plugins, version 17.3pr2
- MBS Xojo Plugins, version 17.3pr1

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.5, page 9: News

### 129.29.2 Methods

### 129.29.3 Constructor

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The constructor.

### 129.29.4 Destructor

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The destructor.

### 129.29.5 Query(ObjectID as String) as String

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** Peforms a SNMP Get Query
**Example:**

```
dim s as new NetSNMPMBS

s.Community = "demopublic"
s.IP = "test.net-snmp.org"

dim r as string = s.Query("system.sysUpTime.0")

MsgBox r
```

**Notes:** Please set community and IP properties before.
Lasterror and ErrorMessage properties are set.

### 129.29.6 QueryMT(ObjectID as String) as String

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** Peforms a SNMP Get Query
**Example:**

```
dim s as new NetSNMPMBS
```

```
s.Community = "demopublic"
s.IP = "test.net-snmp.org"

dim r as string = s.Query("system.sysUpTime.0")

MsgBox r
```

**Notes:** Please set community and IP properties before.
Lasterror and ErrorMessage properties are set.

Same as Query, but thread friendly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 129.29.7 Properties

### 129.29.8 Community as String

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The community name to use.
**Notes:** e.g. "public"
(Read and Write property)

### 129.29.9 ErrorMessage as String

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The last error message as text.
**Notes:** (Read and Write property)

### 129.29.10 IP as String

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The IP and port to connect to.
**Notes:** e.g. "192.168.2.5:1234"

(Read and Write property)

### 129.29.11 LastError as Integer

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 129.29.12 MaximumReceiveBufferSize as Integer

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** The maximum bytes to allocate for receiving buffer.
**Notes:** By default 100000 bytes.
(Read and Write property)

### 129.29.13 Retries as Integer

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** Number of retries.
**Notes:** Default is -1 to use system default.
(Read and Write property)

### 129.29.14 TimeOut as Integer

MBS Network Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Targets: All.

**Function:** Timeout in seconds.
**Notes:** Default is -1 to use system default.
(Read and Write property)

## 129.30 Globals

### 129.30.1 DNSAddressToNameIPv6MBS(HostAddress as string) as string

MBS Network Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolves an IP to it's name.
**Notes:** Only for IPv6.
Returns "" on any error (like no name known).
Improved in 13.1 plugins to work on all platforms.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr13

### 129.30.2 DNSAddressToNameMBS(HostAddress as string) as string

MBS Network Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolves an IP to it's name.
**Notes:** Only for IPv4.
Returns "" on any error (like no name known).
Improved in 13.1 plugins to work on all platforms.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr13

### 129.30.3 DNSNameToAddressIPv6MBS(HostName as string) as string

MBS Network Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolves the IP address for this name.
**Example:**

```
msgBox dnsnameToAddressIPv6MBS("localhost") + endofLine + dnsnameToAddressMBS("localhost")
```

**Notes:** Only for IPv6.
Returns "" on any error (like no name known).
Improved in 13.1 plugins to work on all platforms.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.3pr1
- MBS Real Studio Plugins, version 13.1pr13

### 129.30.4 DNSNameToAddressMBS(HostName as string) as string

MBS Network Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resolves the IP address for this name.
**Example:**

msgBox dnsnameToAddressIPv6MBS("localhost") + endofLine + dnsnameToAddressMBS("localhost")

**Notes:** Only for IPv4.
Returns "" on any error (like no name known).
Improved in 13.1 plugins to work on all platforms.

This may not work on Windows or Linux with Bonjour host names!
**Blog Entries**

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.1pr13
- NetworkAvailableMBS

### 129.30.5 OptionReuseAddressMBS(extends s as SocketCore) as Boolean

MBS Network Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries whether to allow reuse of same port.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEADDR option.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.6 OptionReuseAddressMBS(extends s as SocketCore, assigns value as Boolean) 18067

### 129.30.6 OptionReuseAddressMBS(extends s as SocketCore, assigns value as Boolean)

MBS Network Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to allow reuse of same port.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEADDR option.

see also
http://stackoverflow.com/questions/14388706/socket-options-so-reuseaddr-and-so-reuseport-how-do-they-differ-do-they-mean-t

Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.0pr1

See also:

- 129.30.5 OptionReuseAddressMBS(extends s as SocketCore) as Boolean 18067

### 129.30.7 OptionReusePortMBS(extends s as SocketCore) as Boolean

MBS Network Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query whether reuse of same port and IP is allowed.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEPORT option.
On Windows, this is not supported, so this property sets ReuseAddress.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.8 OptionReusePortMBS(extends s as SocketCore, assigns value as Boolean) 18068

### 129.30.8 OptionReusePortMBS(extends s as SocketCore, assigns value as Boolean)

MBS Network Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets whether to allow reuse of same port and IP.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEPORT option.
On Windows, this is not supported, so this property sets ReuseAddress.
Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.0pr1

See also:

- 129.30.7 OptionReusePortMBS(extends s as SocketCore) as Boolean 18068

### 129.30.9 VerifyEmailMBS(email as string, NetworkCheck as boolean) as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Targets: All.

**Function:** Checks if an email can be valid.
**Example:**

```
// should be okay
dim r1 as Integer = VerifyEmailMBS("testing@monkeybreadsoftware.de", true)

// should fail
dim r2 as Integer = VerifyEmailMBS("testing@monkeybreadsoftware.test", true)

MsgBox str(r1)+EndOfLine+str(r2)
```

**Notes:** If NetworkCheck is true, the DNS server is queries for whether an email service is available (MX Record).
Else we only do a syntax check.

Result is zero for scuccess or one of this error codes:

| | |
|---|---|
| 1 | Invalid character in local part of email address. |
| 2 | Missing dot in local part of email address. |
| 3 | Invalid character in local part of email address. |
| 4 | Unescaped special character in local part of email address. |
| 5 | No local part in email address. |
| 6 | Dot found before @ character. |
| 7 | No domain in email address. |
| 8 | Domain starting with dot. |
| 9 | Domain is not allowed to have two dots. |
| 10 | Invalid character in domain of email address. |
| 11 | Special character in domain of email address. |
| 12 | No dot in domain in email address. |
| 13 | Domain longer than allowed in email address. |
| 14 | DNS failed to find mail server for the domain in email address. (Windows) |
| 15 | DNS failed to find mail server for the domain in email address. (Mac/Linux) |
| 16 | DNS did not find a mail server for the domain in email address. |
| 17 | DNS failed to find mail server for the domain in email address |
| 18 | DNS server answers try again too often. |

IDN support is not included. You may need to preprocess email if you need that.

If you have a DNS server, which will redirect all mistyped domain names to a search website, this won,Äôt really work well and detect too many valid domain names.
**Blog Entries**

- MBS Xojo Plugins, version 18.0pr7
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr5
- MBS Xojo / Real Studio Plugins, version 14.0pr4

**Xojo Developer Magazine**

- 12.2, page 10: News

### 129.30.10 ClearOptionsMBS(extends s as SocketCore)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all options.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Raises UnsupportedOperationException in case of failure.

### 129.30.11 OptionKeepAliveMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the keep alive.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Returns -1 on any error.

Enables the periodic transmission of messages on a connected socket. Should the connected party fail to respond to these messages, the connection is considered broken and processes using the socket are notified via a SIGPIPE signal when attempting to send data.
See also:

- 129.30.12 OptionKeepAliveMBS(extends s as SocketCore, assigns value as Integer) 18070

### 129.30.12 OptionKeepAliveMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the keep alive.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.

Enables the periodic transmission of messages on a connected socket. Should the connected party fail to respond to these messages, the connection is considered broken and processes using the socket are notified

via a SIGPIPE signal when attempting to send data.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr6

See also:

- 129.30.11 OptionKeepAliveMBS(extends s as SocketCore) as Integer 18070

### 129.30.13 OptionMaximumSegmentSizeMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the maximum segment size.
**Example:**

```
dim s as new TCPSocket

s.Port = 0
s.listen

MsgBox str(s.OptionMaximumSegmentSizeMBS)
```

**Notes:** Only for TCP sockets.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.14 OptionMaximumSegmentSizeMBS(extends s as SocketCore, assigns value as Integer) 18071

### 129.30.14 OptionMaximumSegmentSizeMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the maximum segment size.
**Notes:** Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr7
- MBS Real Studio Plugins, version 13.0pr6

See also:

- 129.30.13 OptionMaximumSegmentSizeMBS(extends s as SocketCore) as Integer 18071

### 129.30.15 OptionMutliCastTTLMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the multicast time to live value.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.16 OptionMutliCastTTLMBS(extends s as SocketCore, assigns value as Integer) 18072

### 129.30.16 OptionMutliCastTTLMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the multicast time to live value.
**Example:**

```
dim t as new UDPSocket

// create a socket
t.Port=80
t.Connect

// wait a second to connect
app.DoEvents 1000

// shows handle
MsgBox str(t.Handle)

// shows current value
MsgBox str(t.OptionMutliCastTTLMBS)
t.OptionMutliCastTTLMBS=10

// shows new value
MsgBox str(t.OptionMutliCastTTLMBS)
```

**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.15 OptionMutliCastTTLMBS(extends s as SocketCore) as Integer 18072

### 129.30.17 OptionReceiveBufferSizeMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the receiving buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.18 OptionReceiveBufferSizeMBS(extends s as SocketCore, assigns value as Integer) 18073

### 129.30.18 OptionReceiveBufferSizeMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the receiving buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

See also:

- 129.30.17 OptionReceiveBufferSizeMBS(extends s as SocketCore) as Integer 18073

### 129.30.19 OptionSendBufferSizeMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the sending buffer size.
**Example:**

```
dim s as new UDPSocket

s.Port = 0
s.Connect

MsgBox str(s.OptionSendBufferSizeMBS)
```

**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.

Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.20 OptionSendBufferSizeMBS(extends s as SocketCore, assigns value as Integer) 18074

### 129.30.20 OptionSendBufferSizeMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adjusts the sending buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

See also:

- 129.30.19 OptionSendBufferSizeMBS(extends s as SocketCore) as Integer 18073

### 129.30.21 OptionTOSMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the type of service value.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.22 OptionTOSMBS(extends s as SocketCore, assigns value as Integer) 18074

### 129.30.22 OptionTOSMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the type of service value.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Possible values:
IPTOS_MINCOST = 2
IPTOS_RELIABILITY = 4
IPTOS_THROUGHPUT = 8
IPTOS_LOWDELAY = 16

You may want to set it after connecting.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.21 OptionTOSMBS(extends s as SocketCore) as Integer 18074

### 129.30.23 OptionTTLMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the time to live value.
**Notes:** Works only on BSD Sockets and if the socket handle value is valid.
Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.24 OptionTTLMBS(extends s as SocketCore, assigns value as Integer) 18075

### 129.30.24 OptionTTLMBS(extends s as SocketCore, assigns value as Integer)

MBS Network Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the time to live value.
**Example:**

```
dim t as new TCPSocket

// create a socket
t.Port=80
t.Address="www.apple.com"
t.Connect

// wait a second to connect
app.DoEvents 1000

// shows handle
MsgBox str(t.Handle)

// shows current value
MsgBox str(t.OptionTTLMBS)
t.OptionTTLMBS=10

// shows new value
MsgBox str(t.OptionTTLMBS)
```

**Notes:** Works only on BSD Sockets and if the socket handle value is valid.

Raises UnsupportedOperationException in case of failure.
See also:

- 129.30.23 OptionTTLMBS(extends s as SocketCore) as Integer 18075

### 129.30.25 OptionTypeMBS(extends s as SocketCore) as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the type of socket.
**Example:**

```
dim u as new UDPSocket

u.Port = 9000
u.Connect

// shows 2 for UDP
MsgBox str(u.OptionTypeMBS)
```

**Notes:** Type is 1 for stream socket, 2 for datagram socket, 3 for raw socket, 4 for reliably-delivered message socket and 5 for a sequenced packet stream.
Raises UnsupportedOperationException in case of failure.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr6

## 129.31 class NetworkInterfaceMBS

### 129.31.1 class NetworkInterfaceMBS

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The class for unix network interfaces.
**Example:**

```
// show IPv4 addresses
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces

for each n as NetworkInterfaceMBS in interfaces
MsgBox n.name+": "+n.IPv4
next
```

**Notes:** For Windows, please use WindowsEthernetMBS class.
The values are not updated for this class. Just when you create the interface objects, you get a snapshot of the current state.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr3
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 14.2pr8
- Tip of the day: Find network interfaces by name
- MBS Real Studio Plugins, version 13.0pr2

### 129.31.2 Methods

### 129.31.3 AllInterfaces(Merge as boolean = true) as NetworkInterfaceMBS()

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Returns array with all interfaces.
**Example:**

```
// show IPv4 addresses
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces

for each n as NetworkInterfaceMBS in interfaces
MsgBox n.name+": "+n.IPv4
next
```

**Notes:** By default we merge several records for the same interface.
You may see one record for each protocol (IPv4, IPv6, LINK layer).

### 129.31.4 IndexMap as Dictionary

MBS Network Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** Builds a dictionary to map indexes to names.
**Example:**

```
dim d as Dictionary = NetworkInterfaceMBS.IndexMap
dim lines() as string

for each key as Variant in d.keys
lines.Append key+": "+d.Value(key)
```

next

MsgBox Join(lines,EndOfLine)

**Notes:** This is convenient method for the case you need to show list to user.
On Windows requires Windows Vista or newer.

### 129.31.5 IndexToName(Index as Integer) as string

MBS Network Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** Queries name for network interface with index.
**Example:**

```
dim Name as string
Name = NetworkInterfaceMBS.IndexToName(1)
msgbox Name
```

**Notes:** On Windows requires Windows Vista or newer.

### 129.31.6 IPv4s as string()

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** All IPv4 addresses for this interface.

### 129.31.7 IPv6s as string()

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** All IPv6 addresses for this interface.

### 129.31.8 NameToIndex(Name as String) as Integer

MBS Network Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** Queries index for network interface with given name..
**Example:**

```
dim index as Integer
index = NetworkInterfaceMBS.NameToIndex("en0")
```

**Notes:** On Windows requires Windows Vista or newer.

### 129.31.9 Properties

### 129.31.10 Broadcast as Boolean

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Whether a broadcast address exists for this interface.
**Notes:** (Read and Write property)

### 129.31.11 BroadcastAddress as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The broadcast address.
**Notes:** (Read and Write property)

### 129.31.12 Flags as Integer

MBS Network Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Targets: All.

**Function:** The interface flags.
**Notes:** See if.h file in C system headers.
(Read and Write property)

### 129.31.13 Index as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The index of this interface.
**Notes:** (Read and Write property)

### 129.31.14 InterfaceIndex as Integer

MBS Network Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** The index of this interface.
**Notes:** Index counts by plugin from 0 on the interfaces.
But this is real index from operation system.
On Windows requires Windows Vista or newer.
(Read and Write property)

### 129.31.15 IPv4 as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The IPv4 address for this interface.
**Example:**

```
// show IPv4 addresses
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces

for each n as NetworkInterfaceMBS in interfaces
MsgBox n.name+": "+n.IPv4
next
```

**Notes:** (Read and Write property)

### 129.31.16 IPv4count as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Returns the number of IPv4 addresses for this interface.
**Notes:** (Read and Write property)

### 129.31.17 IPv6 as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The IPv6 address for this interface.
**Notes:** (Read and Write property)

### 129.31.18 IPv6count as Integer

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Returns the number of IPv6 addresses for this interface.
**Notes:** (Read and Write property)

### 129.31.19 Loopback as Boolean

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Whether this interface is the loopback interface.
**Notes:** (Read and Write property)

### 129.31.20 MAC as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The ethernet hardware address (MAC).
**Notes:** (Read and Write property)

### 129.31.21 Multicast as Boolean

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Whether this interface supports multicast.
**Notes:** (Read and Write property)

### 129.31.22 Name as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The name of the network interface.
**Notes:** (Read and Write property)

### 129.31.23 Netmask as String

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** The network mask.
**Notes:** Returns the IPv4 netmask.
if that one is undefined, returns the IPv6 netmask.
This property is just kept for compatibility.
(Read only property)

### 129.31.24 NetmaskIPv4 as String

MBS Network Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Targets: All.

**Function:** The network mask for IPv4.
**Notes:** (Read and Write property)

### 129.31.25 NetmaskIPv6 as String

MBS Network Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Targets: All.

**Function:** The network mask for IPv6.
**Notes:** (Read and Write property)

### 129.31.26 Running as Boolean

MBS Network Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Targets: All.

**Function:** Whether the interface is running (resources allocated).
**Notes:** (Read and Write property)

### 129.31.27 Up as Boolean

MBS Network Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Whether the interface is up.
**Notes:** (Read and Write property)

# 129.32 class NWEndPointMBS

## 129.32.1 class NWEndPointMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The class for a network endpoint.
**Notes:**

A Network Endpoint is an abstract static representation of a local or remote network entity. Endpoints indicate specific instances that connections may be created between, such as Hostname + Port pairs, IP Address + Port pairs, and named Bonjour Services.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1

## 129.32.2 Methods

## 129.32.3 Constructor

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

## 129.32.4 Properties

## 129.32.5 AddressString as String

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an allocated IP address string for a network endpoint with the type address.
**Notes:** Returns the IP address string for the endpoint, or "" if the endpoint is not of type address.
(Read only property)

## 129.32.6 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.32.7 HostName as String

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the hostname string for a network endpoint with the type host or URL.
**Notes:** (Read only property)

### 129.32.8 Port as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:**

Retrieves the port for a network endpoint with the type URL, Host, or address.

**Notes:**

The port will be returned in Host Byte Order.

Returns the port for the endpoint, or 0 if the endpoint is not of type host or address.
(Read only property)

### 129.32.9 PortString as String

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns an allocated port string for a network endpoint with the type host or address.
**Notes:** (Read only property)

### 129.32.10 Type as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the type of a network endpoint.
**Notes:** (Read only property)

### 129.32.11 URL as String

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the URL string from a network endpoint of type URL.

**Notes:** (Read only property)

### 129.32.12 Constants

EndPoint Types

| Constant | Value | Description |
|---|---|---|
| kTypeAddress | 1 | An IP Address + Port |
| kTypeBonjourService | 3 | A Bonjour Service Name + Type + Domain |
| kTypeHost | 2 | A Hostname + Port |
| kTypeInvalid | 0 | An invalid endpoint |
| kTypeURL | 4 | A URL endpoint. |

## 129.33 class NWInterfaceMBS

### 129.33.1 class NWInterfaceMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A network interface.
**Notes:** A Network Interface is an object that represents a static snapshot of an interface that provides network connectivity, such as a Wi-Fi link, an Ethernet connection, a Cellular service, a VPN, or the loopback interface.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1

### 129.33.2 Methods

### 129.33.3 Constructor

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 129.33.4 Properties

### 129.33.5 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.33.6 Index as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the index of an interface, to be used for reference or logging purposes.
**Notes:** This is the same value as provided by if_nametoindex.
(Read only property)

### 129.33.7 Name as String

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the name of an interface, to be used for reference or logging purposes.
**Notes:** (Read only property)

### 129.33.8 Type as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the type of an interface.
**Notes:** This only accesses the type of the specific interface being queried, and will not take into account types used by interfaces that traffic will eventually be routed through. That is, if the interface is a virtual interface (such as a VPN) that eventually forwards traffic through Wi-Fi, the type will be of type other, not wifi.
(Read only property)

### 129.33.9 Constants

Interface Types

| Constant | Value | Description |
|---|---|---|
| kInterfaceTypeCellular | 2 | The network interface type used for communication over cellular networks. |
| kInterfaceTypeLoopback | 4 | The network interface type used for communication over local loopback networks. |
| kInterfaceTypeOther | 0 | The network interface type used for communication over virtual networks or networks of unknown types. |
| kInterfaceTypeWifi | 1 | The network interface type used for communication over Wi-Fi networks. |
| kInterfaceTypeWired | 3 | The network interface type used for communication over wired Ethernet networks. |

## 129.34 class NWPathMBS

### 129.34.1 class NWPathMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A Network Path object represents a snapshot of network path state.
**Notes:**

This state represents the known information about the local interface and routes that may be used to send and receive data. If the network path for a connection changes due to interface characteristics, addresses, or other attributes, a new path object will be generated. Note that the differences in the path attributes may not be visible through public accessors, and these changes should be treated merely as an indication that something about the network has changed.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1

### 129.34.2 Methods

### 129.34.3 Constructor

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 129.34.4 Gateways as NWEndPointMBS()

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** List the IP addresses of the routers acting as the gateways for the path.

### 129.34.5 Interfaces as NWInterfaceMBS()

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** List all interfaces associated with the path.

### 129.34.6 IsEqual(other as NWPathMBS) as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Compares two network path objects and checks if their content is equal.
**Notes:** If they are not equal, they represent two different network states.

Returns true if the paths are equivalent, or false if there is any difference between the paths.

### 129.34.7 UsesInterfaceType(InterfaceType as Integer) as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path uses a network interface with the specified type.
**Notes:** Returns true if the path uses any network interface with the specified type, false otherwise.

### 129.34.8 Properties

### 129.34.9 EffectiveLocalEndPoint as NWEndPointMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieve the local endpoint that is being used, if present.
**Notes:**

If this path is the path from an connection, it represents the address that data is sent from.

(Read only property)

### 129.34.10 EffectiveRemoteEndPoint as NWEndPointMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieve the remote endpoint that is being used, if present.
**Notes:** If this path is the path from a connection, it represents the address that data is sent to.
(Read only property)

### 129.34.11 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.34.12 HasDNS as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path has a DNS server configuration set.
**Notes:** Returns true if the path has a DNS server configuration set, false otherwise.
(Read only property)

### 129.34.13 HasIPv4 as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path uses a network interface that supports IPv4 connectivity.
**Notes:** Returns true if the path uses a network interface that supports IPv4, false otherwise.
(Read only property)

### 129.34.14 HasIPv6 as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path uses a network interface that supports IPv6 connectivity.
**Notes:** Returns true if the path uses a network interface that supports IPv6, false otherwise.
(Read only property)

### 129.34.15 IsConstrained as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path uses any network interfaces that are considered constrained to the user.
**Notes:** Returns true if the path uses any network interface that is considered constrained, false otherwise.
(Read only property)

### 129.34.16 IsExpensive as Boolean

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Checks if the path uses any network interfaces that are considered expensive to the user, such as, but not limited to, a cellular network.
**Notes:** Returns true if the path uses any network interface that is considered expensive, false otherwise.
(Read only property)

### 129.34.17 Status as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves the status of a path.
**Notes:** The status of a specific path object will never change, as the path object itself is static. If there is a network change, the object that generated the path object will generate a new path object.
(Read only property)

### 129.34.18 UnsatisfiedReason as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves a reason the path is not satisfied.
**Notes:**

In some cases, the reason helps to determine why the path is not satisfied. While the path may be unsatisfied for more than one reason, only the first reason will be given. In many cases, the path may be unsatisfied with no reason available.

Returns a reason the path is unsatisfied or kUnsatisfiedReasonNotAvailable if a reason is not available.
(Read only property)

### 129.34.19 Constants

Status

| Constant | Value | Description |
|---|---|---|
| kStatusInvalid | 0 | The path is not valid |
| kStatusSatisfiable | 3 | The path does not currently have a usable route, but a connection attempt will trigger network attachment. |
| kStatusSatisfied | 1 | The path has a usable route upon which to send and receive data. |
| kStatusUnsatisfied | 2 | The path does not have a usable route. This may be due to a network interface being down, or due to system policy. |

Unsatisfied Reason

| Constant | Value | Description |
|---|---|---|
| kUnsatisfiedReasonCellularDenied | 1 | The user has disabled cellular |
| kUnsatisfiedReasonLocalNetworkDenied | 3 | The user has disabled local network access |
| kUnsatisfiedReasonNotAvailable | 0 | No reason is given |
| kUnsatisfiedReasonVPNInactive | 4 | A required VPN is not active |
| kUnsatisfiedReasonWifiDenied | 2 | The user has disabled Wi-Fi |

## 129.35 class NWPathMonitorMBS

### 129.35.1 class NWPathMonitorMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** An observer that you use to monitor and react to network changes.
**Notes:** The Network Path Monitor allows the caller to fetch the current global path (or a path restricted to a specific network interface type). The path is delivered in an event that is called every time the network path changes.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1

### 129.35.2 Methods

### 129.35.3 Cancel

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Stops receiving network path updates.
**Notes:** Cancel the path monitor.
Calls Cancel event when done.
See also:

- 129.35.12 Cancel 18093

### 129.35.4 Constructor

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes a path monitor to observe all available interface types.
**Notes:** Create a default path monitor, that will allow the enumeration of all available interfaces on the system.
See also:

- 129.35.5 Constructor(requiredInterfaceType as Integer) 18092

### 129.35.5 Constructor(requiredInterfaceType as Integer)

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Initializes a path monitor to observe a specific interface type.
**Notes:** Create a path monitor specific to an interface type, that will allow the enumeration of any interface

that matches the type on the system.
See also:

- 129.35.4 Constructor 18092

### 129.35.6 CreateForEthernetChannel as NWPathMonitorMBS

MBS MacOSX Plugin, Plugin Version: 24.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a path monitor for the ethernet interface.
**Notes:** Create a path monitor that enumerates all interfaces that support Ethernet channel.

### 129.35.7 ProhibitInterfaceType(InterfaceType as Integer)

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Prohibit this path monitor from using the provided network interface type.
**Notes:** Call before calling Start.

### 129.35.8 Start

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Starts monitoring path changes.
**Notes:** Starts the path monitor.

### 129.35.9 Properties

### 129.35.10 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.35.11 Events

### 129.35.12 Cancel

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** The event to be called on the queue provided once cancellation has completed.
**Notes:** Once the cancel handler has been called, the update event will not fire again.
See also:

- 129.35.3 Cancel 18092

### 129.35.13 Update(path as NWPathMBS)

MBS MacOSX Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** An event to be called whenever a path monitor has a new snapshot.
**Notes:** This will be called one or more times after calling Start.

# 129.36 class PacketSocketMBS

## 129.36.1 class PacketSocketMBS

MBS Network Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An extension to the socket class for easy sending packets through the net.
**Notes:** A packet is made like this:
+0: Size of data block
+4: 4 byte code string
+8: 4 byte for ID
+12: variable data.

The numbers are send in low endian format so this is crossplatform.

This socket subclass can be easily made in Xojo code itself. I did it for several of my applications, so if you like it decide between making it yourself or using this one which may even be faster, because it is written in C?

This class is only available in RB 4.0 or newer, because it crashes on RB 3.5.

As the strings are transferred as binary data you need to take care that you send text e.g. as UTF8 and restore this encoding setting on receiving.
Subclass of the TCPSocket class.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr4
- MBS Xojo Plugins, version 21.5pr1
- MonkeyBread Software Releases the MBS Plugins 8.1

## 129.36.2 Methods

## 129.36.3 SendPacket(data as string)

MBS Network Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a packet.
**Notes:** Uses ID=0 and code="" as a shortcut for the long SendPacket call.
See also:


- 129.36.4 SendPacket(data as string,code as string) 18096
- 129.36.5 SendPacket(data as string,code as string,ID as Integer) 18096

### 129.36.4 SendPacket(data as string,code as string)

MBS Network Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a packet.
**Notes:** Uses ID=0 as a shortcut for the long SendPacket call.
See also:

- 129.36.3 SendPacket(data as string) 18095
- 129.36.5 SendPacket(data as string,code as string,ID as Integer) 18096

### 129.36.5 SendPacket(data as string,code as string,ID as Integer)

MBS Network Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a packet.
**Notes:** code and ID are optional.
Code is a 4 byte string to identify the content.
(e.g. "mess" for a message or "link" for a link.)
See also:

- 129.36.3 SendPacket(data as string) 18095
- 129.36.4 SendPacket(data as string,code as string) 18096

### 129.36.6 Events

### 129.36.7 ReceivedPacket(data as string,code as string,ID as Integer)

MBS Network Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A packet was received.

# 129.37 class RAWSocketMBS

## 129.37.1 class RAWSocketMBS

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for low level and raw sockets.
**Example:**

```
dim sock as RAWSocketMBS

// create UDP socket
sock = new RAWSocketMBS(RAWSocketMBS.AddressFamilyINet, RAWSocketMBS.SocketTypeDatagram,
RAWSocketMBS.ProtocolUDP)
```

**Notes:** Similar to Xojo's built in Socket class, but more low level and with more options.
Raw sockets for things like PING may need root permissions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr10
- MBS Xojo Plugins, version 18.4pr9
- MBS Xojo Plugins, version 18.3pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr8
- MBS Xojo Plugins, version 17.4pr5
- Raw Sockets for Xojo

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News
- 15.6, page 9: News

### 129.37.2 Methods

### 129.37.3 Accept(byref RemoteAddress as String, byref RemotePort as Integer, NewSocket as RAWSocketMBS) as RAWSocketMBS

MBS Network Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Listens for connections on this socket.
**Notes:** Lasterror is set.

### 129.37.4 AddressFamilyINet6 as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the address family constants.
**Notes:** IPv6
This is a method as value is different.
Mac 30, Windows 23 and Linux 10.

### 129.37.5 Bind(DestAddr as Ptr, DestAddrByteSize as Integer) as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Binds the socket to the given destination address.
**Notes:** Set ReuseAddress to bind to an address which already a socket is bound to.
Lasterror is set.
Returns true on success and false on failure.
Please specify with port and IP in destAddress where to bind against.
Structure of DestAddress is OS and address family dependent.
See also:

- 129.37.6 Bind(Port as Integer, IP as string = "") 18098

### 129.37.6 Bind(Port as Integer, IP as string = "")

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Binds the socket to the given port.
**Notes:** If IP is not empty, you can bind the socket to only the given network interface with that IPv4.
Set ReuseAddress to bind to an address which already a socket is bound to.
Lasterror is set.
See also:

- 129.37.5 Bind(DestAddr as Ptr, DestAddrByteSize as Integer) as Boolean 18098

### 129.37.7 CalcChecksum(data as ptr, ByteCount as Integer) as UInt16

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates checksum for IP header.

### 129.37.8 Close

MBS Network Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes socket.
**Notes:** Same as destructor.

### 129.37.9 Connect(Address as String, Port as Integer, byref ErrorMessage as String) as Boolean

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience method to connect.
**Notes:** Will parse IPv4/IPv6 or query DNS server for IP and connect.
Returns true on success.
See also:

- 129.37.10 Connect(DestAddr as Ptr, DestAddrByteSize as Integer) as Boolean 18099

### 129.37.10 Connect(DestAddr as Ptr, DestAddrByteSize as Integer) as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to destination address.
**Notes:** lasterror is set.
Returns true on success and false on failure.
Please specify with port and IP in destAddress where package is sent to.
Structure of DestAddress is OS and address family dependent.
See also:

- 129.37.9 Connect(Address as String, Port as Integer, byref ErrorMessage as String) as Boolean 18099

### 129.37.11 Constructor(AddressFamily as Integer, SocketType as Integer, Protocol as Integer)

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Example:**

```
dim sock as RAWSocketMBS

// create UDP socket
sock = new RAWSocketMBS(RAWSocketMBS.AddressFamilyINet, RAWSocketMBS.SocketTypeDatagram,
RAWSocketMBS.ProtocolUDP)
```

**Notes:** Please pass valid combination of OS supported sockets.
Raises exception if creation is not possible.
Raw socket requires root access.

### 129.37.12 Destructor

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** Closes the socket.

### 129.37.13 htonl(value as UInt32) as UInt32

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert 32bit Integer from network to host byte order.

### 129.37.14 htons(value as UInt16) as UInt16

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert 16bit Integer from network to host byte order.

### 129.37.15 inet_addr(IPv4 as String) as UInt32

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts IPv4 to numerical representation.

### 129.37.16 inet_ntoa(IPv4 as UInt32) as String

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts IPv4 to string representation.

### 129.37.17 Listen(BackLog as Integer = 2)

MBS Network Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Accepts a new incoming connection.
**Notes:** Sockets uses the accept function to enable incoming connection attempts on a socket.
RemoteAddress and RemotePort are set to address of remote peer.

If you like to pass in your own subclass object for NewSocket, we can use that socket object. Otherwise, we make a new RAWSocketMBS object.

Lasterror is set.

### 129.37.18 ntohl(value as UInt32) as UInt32

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert 32bit Integer from host to network byte order.

### 129.37.19 ntohs(value as UInt16) as UInt16

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert 16bit Integer from host to network byte order.

### 129.37.20 Poll

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Polls for activity.
**Notes:** Calls events if needed.
This is called automatically via timer by the plugin.

### 129.37.21 Read(ByteSize as Integer, peek as boolean = false) as MemoryBlock

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read at maximum the given number of bytes in buffer.
**Notes:** Pass true for peek if data should not be removed from receiving buffer.
Lasterror is set.

Be aware that you may not get whole packages here, so data may come in several chunks.
For that, please collect the data and look for whether your package is complete or a required end mark arrived.

### 129.37.22 ReadAll(peek as boolean = false) as MemoryBlock

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read all bytes in buffer.
**Example:**

```
dim sock as RAWSocketMBS
dim data as MemoryBlock = sock.ReadAll
if data = nil then
// nothing read
else

end if
```

**Notes:** Pass true for peek if data should not be removed from receiving buffer.
Lasterror is set.

Be aware that you may not get whole packages here, so data may come in several chunks.
For that, please collect the data and look for whether your package is complete or a required end mark arrived.

### 129.37.23 ReadDatagram(peek as boolean = false) as DatagramMBS

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a datagram.
**Notes:** If peek is true, the data is not removed from read buffer.
On error returns nil.

### 129.37.24 Send(Data as Ptr, DataByteSize as Integer, Flags as Integer = 0) as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data.
**Notes:** Data is sent to address passed with Connect method.
Returns number of bytes sent.
Lasterror is set.

For TCP sockets and similar, which have a stream of data.

### 129.37.25 SendMessage(Data as DatagramMBS) as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a datagram.
**Notes:** Please specify with port and address of datagram where package is sent to.
Returns number of bytes sent.
Lasterror is set.

For UDP sockets and similar.
See also:


- 129.37.26 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer 18103
- 129.37.27 SendMessage(Data as string, IP as String, Port as Integer) as Integer 18104


### 129.37.26 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a datagram.
**Notes:** Please specify with port and IP where package is sent to.
Returns number of bytes sent.
Lasterror is set.

For UDP sockets and similar.
See also:


- 129.37.25 SendMessage(Data as DatagramMBS) as Integer 18103
- 129.37.27 SendMessage(Data as string, IP as String, Port as Integer) as Integer 18104

### 129.37.27 SendMessage(Data as string, IP as String, Port as Integer) as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data to target.
**Notes:** Please specify with port and IP where package is sent to.
Returns number of bytes sent.
Lasterror is set.

For UDP sockets and similar.
See also:

- 129.37.25 SendMessage(Data as DatagramMBS) as Integer 18103
- 129.37.26 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer 18103

### 129.37.28 SendTo(Data as Ptr, DataByteSize as Integer, Flags as Integer, DestAddr as Ptr, DestAddrByteSize as Integer) as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data to dest address.
**Example:**

```
dim sock as RawSocketMBS
dim Flags as integer
dim r as Integer

// port
dim port as integer = val(iPort.Text)
if port <= 0 or port >= 65535 then
break
MsgBox "Wrong port: "+iPort.Text
Return
end if

// dest address

'/*
'* Socket address, internet style. C declaration for Mac
'*/
'struct sockaddr_in {
'__uint8_t sin_len; // 1 byte, Mac only
'sa_family_t sin_family; // 1 byte
'in_port_t sin_port; // 2 byte in Network byte order
'struct in_addr sin_addr; // 4 byte
'char sin_zero [ 8 ] ; // 8 bytes filler
```

```
' } ;

// convert IPv4 from text to numeric value
dim IP as Uint32 = RAWSocketMBS.inet_addr(iIP.Text)

// create destination address. This is for Mac! Windows and Linux have different structures
dim dest as new MemoryBlock(16)
dest.UInt8Value(0) = dest.size
dest.UInt8Value(1) = RAWSocketMBS.AddressFamilyINet
dest.UInt16Value(2) = RAWSocketMBS.htons(port)
dest.UInt32Value(4) = IP

// message
dim m as string = ConvertEncoding(iMessage.Text, encodings.UTF8)
dim data as MemoryBlock = m

// send
r = sock.SendTo(data, data.size, Flags, dest, dest.size)
```

**Notes:** Please specify with port and IP in destAddress where package is sent to.
Returns number of bytes sent. Structure of DestAddress is OS and address family dependent.
Lasterror is set.

For UDP sockets and similar.

### 129.37.29 Properties

### 129.37.30 AddressFamily as Integer

MBS Network Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address family of the socket.
**Notes:** This is either RAWSocketMBS.AddressFamilyINet (2) for IPv4 or RAWSocketMBS.AddressFamilyINet6 (Mac 30, Windows 23 and Linux 10) for IPv6.
(Read and Write property)

### 129.37.31 AvailableBytes as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of bytes available for reading.

**Notes:** Lasterror is set.
(Read only property)

### 129.37.32 Broadcast as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether broadcasts are allowed.
**Notes:** Set to true before sending a broadcast message.
Internally this uses SOL_SOCKET/SO_BROADCAST option.
Lasterror is set.
(Read and Write property)

### 129.37.33 Handle as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal socket handle.
**Notes:** (Read and Write property)

### 129.37.34 IPHeaderIncluded as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the OS provides IP header or you.
**Notes:** Default is false.
Set to true when you include IP header in data.
(Read and Write property)

### 129.37.35 Lasterror as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** Platform dependent.
(Read and Write property)

### 129.37.36 LocalIP as String

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries local IP.
**Notes:** Can be 0.0.0.0 if unknown.
May only be set if connected or binded.
Lasterror is set.
(Read only property)

### 129.37.37 LocalPort as Integer

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries local port.
**Notes:** Lasterror is set.
Can be -1 if unknown.
(Read only property)

### 129.37.38 Protocol as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The socket protocol.
**Notes:** The value from constructor.
(Read and Write property)

### 129.37.39 ReceiveBufferSize as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the receiving buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Internally this uses SOL_SOCKET/SO_RCVBUF option.
Lasterror is set.
(Read and Write property)

### 129.37.40 ReuseAddress as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows reuse of same port.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEADDR option.

see also
http://stackoverflow.com/questions/14388706/socket-options-so-reuseaddr-and-so-reuseport-how-do-they-differ-do-they-mean-t

Lasterror is set.
(Read and Write property)

### 129.37.41 ReusePort as Boolean

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allow reuse of same port and IP.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEPORT option.
On Windows, this is not supported, so this property sets ReuseAddress.
Lasterror is set.
(Read and Write property)

### 129.37.42 SendBufferSize as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sending buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Internally this uses SOL_SOCKET/SO_SNDBUF option.
Lasterror is set.
(Read and Write property)

### 129.37.43 SocketError as Integer

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native socket error.
**Notes:** Internally this uses SOL_SOCKET/SO_ERROR option.
Lasterror is set.
(Read only property)

### 129.37.44 SocketType as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The socket type.
**Notes:** The value from constructor.
(Read and Write property)

### 129.37.45 Events

### 129.37.46 DataAvailable

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when new data is available.
**Notes:** Requires the socket to be bound.

### 129.37.47 Error

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called if socket is in error state.

### 129.37.48 SendComplete

MBS Network Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The last write operation is done.

### 129.37.49 Constants

Address Families

| Constant | Value | Description |
|---|---|---|
| AddressFamilyINet | 2 | IPv4 |

Protocols

| Constant | Value | Description |
|---|---|---|
| ProtocolICMP | 1 | ICMP |
| ProtocolIP | 0 | IPv4 |
| ProtocolIPv6 | 41 | IPv6 |
| ProtocolRaw | 255 | Raw protocol |
| ProtocolTCP | 6 | TCP |
| ProtocolUDP | 17 | UDP |

Socket Types

| Constant | Value | Description |
|---|---|---|
| SocketTypeDatagram | 2 | Datagram, e.g. UDP. |
| SocketTypeRaw | 3 | Raw socket, requires root permissions. |
| SocketTypeStream | 1 | Stream socket, e.g. TCP/IP. |

# 129.38 class SSH2ChannelMBS

## 129.38.1 class SSH2ChannelMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a SSH2 channel.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3
- SSH Terminal example for Xojo
- SSH tunnel in Xojo

## 129.38.2 Methods

## 129.38.3 Close(Wait as Boolean = true)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Close a channel.
**Notes:** Lasterror is set.
Close an active data channel. In practice this means sending an SSH_MSG_CLOSE packet to the remote host which serves as instruction that no further data will be sent to it. The remote host may still send data back until it sends its own close message in response. To wait for the remote end to close its connection as well, follow this command with WaitClosed.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

If wait parameter is true, the plugin does a loop to try close until it receives an okay (and not EAGAIN).

## 129.38.4 Constructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:

- 129.38.5 Constructor(session as SSH2SessionMBS) 18112

### 129.38.5 Constructor(session as SSH2SessionMBS)

MBS Network Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create new channel.
**Notes:** May raise UnsupportedOperationException if channel creation fails.
See also:

- 129.38.4 Constructor 18111

### 129.38.6 Destructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 129.38.7 EOF as boolean

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Check a channel's EOF status.
**Example:**

```
dim s as string
dim channel as SSH2ChannelMBS // your channel

// read all till end of channel
s = ""
do
app.YieldToNextThread
dim r as string = channel.Read(50000)
s = s + r

if channel.LastError = SSH2SessionMBS.kErrorEagain then
// no answer yet
Continue
elseif channel.LastError = SSH2SessionMBS.kErrorNone then
// we got something
if channel.EOF then
// done?
MsgBox "Result: " + s
exit
end if
else
exit
end if
```

loop

**Notes:** Check if the remote host has sent an EOF status for the selected stream.
Returns true if the remote host has sent EOF, otherwise false.
Lasterror is set. On error, this function returns true.

### 129.38.8 Execute(command as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes something on the server.
**Notes:** Lasterror is set.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.9 Flush

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush stream for this channel.
**Notes:** Lasterror is set.

### 129.38.10 FlushAll

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush all streams for this channel.
**Notes:** Lasterror is set.

### 129.38.11 FlushExtendedData

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush extended data stream for this channel.
**Notes:** Lasterror is set.

### 129.38.12 FlushStdErr

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush stderr stream for this channel.
**Notes:** Lasterror is set.

### 129.38.13 Read(length as Integer = 65536) as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read data from a channel stream.
**Example:**

```
dim s as string
dim channel as SSH2ChannelMBS // your channel

// read all till end of channel
s = ""
do
app.YieldToNextThread
dim r as string = channel.Read(50000)
s = s + r

if channel.LastError = SSH2SessionMBS.kErrorEagain then
// no answer yet
Continue
elseif channel.LastError = SSH2SessionMBS.kErrorNone then
// we got something
if channel.EOF then
// done?
MsgBox "Result: " + s
exit
end if
else
exit
end if
loop
```

**Notes:** Lasterror is set.
Attempt to read data from a stdout channel stream.
Returns data read.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.
Version up to 18.2 return text marked as UTF-8, but in 18.3 we change to return text without encoding

marking. So if you expect UTF-8, you can apply UTF-8 encoding with DefineEncoding.

### 129.38.14 ReadStdErr(length as Integer = 65536) as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read data from a channel stream.
**Notes:** Lasterror is set.
Attempt to read data from a stderr channel stream.
Returns data read.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.15 RequestPTY(term as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request a PTY on an established channel.
**Notes:** Lasterror is set.
Note that this does not make sense for all channel types and may be ignored by the server despite returning success.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.16 SendEOF

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Send EOF to remote server.
**Notes:** Lasterror is set.
Tell the remote host that no further data will be sent on the specified channel. Processes typically interpret this as a closed stdin descriptor.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.17 SetBlocking(blocking as boolean)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set or clear blocking mode on channel.

### 129.38.18 SetEnv(name as string, value as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set an environment variable on the channel.
**Notes:** Lasterror is set.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.19 Shell

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Request a shell on a channel.
**Notes:** Lasterror is set.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.20 WaitClosed

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wait for the remote to close the channel.
**Notes:** Lasterror is set.

Enter a temporary blocking state until the remote host closes the named channel. Typically sent after Close in order to examine the exit status.
Lasterror is set to kErrorEAgain when it would otherwise block. While kErrorEAgain is an error, it isn't really a failure per se.

### 129.38.21 WaitEOF

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Wait for the remote end to acknowledge an EOF request.
**Notes:** Lasterror is set.
May give kErrorEAgain error which means you should try again later.

### 129.38.22 Write(data as MemoryBlock) as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write data to a channel stdout stream.
**Notes:** Lasterror is set.

Write functions will use as much as possible of the buffer and put it into a single SSH protocol packet. This means that to get maximum performance when sending larger files, you should try to always pass in at least 32K of data to this function.

Returns actual number of bytes written. Lasterror being kErrorEagain when it would otherwise block. While kErrorEagain is an error, it isn't really a failure per se.
See also:

- 129.38.23 Write(text as string) as Integer 18117

### 129.38.23 Write(text as string) as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write data to a channel stdout stream.
**Notes:** Lasterror is set.

Write functions will use as much as possible of the buffer and put it into a single SSH protocol packet. This means that to get maximum performance when sending larger files, you should try to always pass in at least 32K of data to this function.

Returns actual number of bytes written. Lasterror being kErrorEagain when it would otherwise block. While kErrorEagain is an error, it isn't really a failure per se.

Until version 18.2 we send text as UTF-8. Version 18.3 or newer send bytes as they are in whatever encoding your string has.
See also:

- 129.38.22 Write(data as MemoryBlock) as Integer 18116

### 129.38.24 WriteStdErr(data as MemoryBlock) as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write data to a channel stderr stream.
**Notes:** Lasterror is set.

Write functions will use as much as possible of the buffer and put it into a single SSH protocol packet. This means that to get maximum performance when sending larger files, you should try to always pass in at least

32K of data to this function.

Returns actual number of bytes written. Lasterror being kErrorEagain when it would otherwise block. While kErrorEagain is an error, it isn't really a failure per se.
See also:

- 129.38.25 WriteStdErr(text as string) as Integer 18118

### 129.38.25 WriteStdErr(text as string) as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write data to a channel stderr stream.
**Notes:** Lasterror is set.

Write functions will use as much as possible of the buffer and put it into a single SSH protocol packet. This means that to get maximum performance when sending larger files, you should try to always pass in at least 32K of data to this function.

Returns actual number of bytes written. Lasterror being kErrorEagain when it would otherwise block. While kErrorEagain is an error, it isn't really a failure per se.

Until version 18.2 we send text as UTF-8. Version 18.3 or newer send bytes as they are in whatever encoding your string has.
See also:

- 129.38.24 WriteStdErr(data as MemoryBlock) as Integer 18117

### 129.38.26 Properties

### 129.38.27 ExitStatus as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the remote exit code.
**Notes:** Returns the exit code raised by the process running on the remote host at the other end of the named channel. Note that the exit status may not be available if the remote end has not yet set its status to closed.
Returns 0 on failure, otherwise the Exit Status reported by remote host.
(Read only property)

### 129.38.28 Handle as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 129.38.29 LastError as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** See SSH2SessionMBS.kError* constants.
(Read and Write property)

### 129.38.30 Session as SSH2SessionMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The session this channel belongs to.
**Notes:** (Read and Write property)

### 129.38.31 Tag as Variant

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** A property where you can store any value you like.
(Read and Write property)

### 129.38.32 Events

### 129.38.33 DataAvailable(Data as string, ErrorChannel as boolean)

MBS Network Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for new data coming in.
**Notes:** For console app with DoEvents loop or for GUI apps.
Works starting with running Execute as that initializes the DataAvailable event.

ErrorChannel is true, if we got data from the stderr channel instead of stdout channel.

# 129.39 class SSH2ConnectFailedExceptionMBS

## 129.39.1 class SSH2ConnectFailedExceptionMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception for an error in the SSH2SessionMBS.Constructor.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.0pr5

## 129.40 class SSH2SessionMBS

### 129.40.1 class SSH2SessionMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a SSH2 session.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo Plugins, version 22.3pr3
- News from the MBS Xojo Plugins Version 20.5
- SSH Terminal example for Xojo
- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 18.5pr1
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr3
- SSH tunnel in Xojo
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

### 129.40.2 Methods

### 129.40.3 Banner as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the remote banner.
**Notes:** Once the session has been setup and Handshake has completed successfully, this function can be used to get the server id from the banner each server presents.

### 129.40.4 CipherNames as String()

MBS Network Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all ciphers.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = SSH2SessionMBS.CipherNames
dim DigestNames() as string = SSH2SessionMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

### 129.40.5 ConfigureKeepAlive(WantReply as Boolean = true, Interval as Integer = 2)

MBS Network Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configures keep alive probes.
**Notes:** Set how often keepalive messages should be sent.
WantReply indicates whether the keepalive messages should request a response from the server.
Interval is number of seconds that can pass without any I/O, use 0 to disable keepalives. To avoid some busy-loop corner-cases, if you specify an interval of 1 it will be treated as 2.

### 129.40.6 Constructor(IP as string, Port as Integer = 22, TimeOut as Integer = 30)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for using a new socket.
**Notes:** The plugin creates a new socket, connects to the given IP&Port and than creates a new session for it.
Lasterror is set.
Please check if Handle property is non zero after constructor finishes.

Timeout defines timeout for connection in seconds. While waiting, the plugin yields time to other threads.
If timeout is zero, the connection will not yield and take up to the default TCP/IP timeout.

IPv4, IPv6 address or domain name with version 18.3 or newer.
See also:

- 129.40.7 Constructor(socket as TCPSocket) 18124
- 129.40.8 Constructor(socketHandle as Integer, CloseSocketLater as boolean = false) 18124

### 129.40.7 Constructor(socket as TCPSocket)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for using an existing socket.
**Notes:** Initializes a new session.
socket: The socket to use. The plugin keeps reference to this socket in socket property.

You can use a Xojo socket and connect it. Once connected, pass it here, so the session can use this socket for communication.
If you connect the xojo socket in a loop on a thread, be sure to call poll method of socket, so it processes events like connecting. In main thread with timer, you would get this automatically.
See also:

- 129.40.6 Constructor(IP as string, Port as Integer = 22, TimeOut as Integer = 30) 18123
- 129.40.8 Constructor(socketHandle as Integer, CloseSocketLater as boolean = false) 18124

### 129.40.8 Constructor(socketHandle as Integer, CloseSocketLater as boolean = false)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for using an existing socket.
**Notes:** Initializes a new session.
socketHandle: The socket to use. Can be TCPSocket's handle property for a Xojo socket. Or a socket connected via declares.
You can put the socket in the socket property to keep it alive as long as session is in memory.

Set CloseSocketLater = true if you pass a socket which can be closed in destructor. For Xojo socket, pass false as Xojo closes socket later.
You can use a Xojo socket and connect it. Once connected, pass it here, so the session can use this socket for communication.
See also:

- 129.40.6 Constructor(IP as string, Port as Integer = 22, TimeOut as Integer = 30) 18123
- 129.40.7 Constructor(socket as TCPSocket) 18124

### 129.40.9 Destructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 129.40.10 DigestNames as String()

MBS Network Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all digest algorithms.
**Example:**

```
// see hash and encryption algorithms available
dim CipherNames() as string = SSH2SessionMBS.CipherNames
dim DigestNames() as string = SSH2SessionMBS.DigestNames
Break
```

**Notes:** The list may not be the same for Mac, Windows and Linux.

### 129.40.11 Disconnect(description as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminate transport layer.
**Notes:** Lasterror is set.
description: Human readable reason for disconnection.
See also:

- 129.40.12 Disconnect(reason as Integer, description as string, lang as string = "") 18125

### 129.40.12 Disconnect(reason as Integer, description as string, lang as string = "")

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Terminate transport layer.
**Notes:** Lasterror is set.

reason: One of the Disconnect Reason constants.
description: Human readable reason for disconnection.
lang: Localization string describing the langauge/encoding of the description provided.
See also:

- 129.40.11 Disconnect(description as string) 18125

### 129.40.13 HostKey(byref Type as Integer) as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the remote key.

### 129.40.14 HostKeyHash(HashType as Integer) as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return a hash of the remote host's key.
**Notes:** HashType: kHostKeyHashSHA1 or kHostKeyHashMD5.
Returns the computed digest of the remote system's hostkey. The length of the returned string is hash_type specific (e.g. 16 bytes for MD5, 20 bytes for SHA1).
Computed hostkey hash value, or empty string if the information is not available (either the session has not yet been started up, or the requested hash algorithm was not available). The hash consists of raw binary bytes, not hex digits, so it is not directly printable.

### 129.40.15 OpenDirectTCPIPChannel(host as string, port as integer, sourceHost as string = "127.0.0.1", sourcePort as Integer = 22) as SSH2ChannelMBS

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tunnel a TCP connection through an SSH session.
**Notes:** host: Third party host to connect to using the SSH host as a proxy.
port: Port on third party host to connect to.
SourceHost: Host to tell the SSH server the connection originated on.
SourcePort: Port to tell the SSH server the connection originated from.

Tunnel a TCP/IP connection through the SSH transport via the remote host to a third party. Communication from the client to the SSH server remains encrypted, communication from the server to the 3rd party host travels in cleartext.

This is not a replacement for ssh in command line with -L option.

Returns a newly allocated channel object, or nil on errors.

### 129.40.16 OpenSession as SSH2ChannelMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Establish a generic session channel.
**Notes:** Lasterror is set.

Returns nil if the session start fails.

### 129.40.17 SessionFlag(Flag as Integer, Value as boolean)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get/Set a session flag.
**Notes:** See kFlag* constants.
Lasterror is set.

### 129.40.18 SessionHandshake

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform the SSH handshake.
**Notes:** Lasterror is set.

### 129.40.19 SetBanner(Banner as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the SSH prococol banner for the local client.
**Notes:** Set the banner that will be sent to the remote host when the SSH session is started with Handshake. This is optional; a banner corresponding to the protocol and libssh2 version will be sent by default.
Lasterror is set.

### 129.40.20 SetMethodPreference(methodType as Integer, Pref as string) as Boolean

MBS Network Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set preferred key exchange method.
**Example:**

```
// set preferences for key exchange method:
dim r as Boolean = s.SetMethodPreference(SSH2SessionMBS.kMethodKEX, "diffie-hellman-group-exchange-sha256")
```

**Notes:** methodType: One of the Method Type constants.
Pref: Coma delimited list of preferred methods to use with the most preferred listed first and the least preferred listed last. If a method is listed which is not supported by libssh2 it will be ignored and not sent

to the remote host during protocol negotiation.

Set preferred methods to be negotiated. These preferences must be set prior to calling SessionHandshake, as they are used during the protocol initiation phase.

Return true on success or false on failure. Lasterror is set. Lasterror is set to LIBSSH2_ERROR_EAGAIN (-37) when it would otherwise block. While LIBSSH2_ERROR_EAGAIN is a negative number, it isn't really a failure per se.

### 129.40.21 SupportedAlgorithms(methodType as Integer) as String()

MBS Network Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get list of supported algorithms.
**Example:**

```
dim s as new SSH2SessionMBS("localhost")

dim KeyExchange() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodKEX)
dim HostKey() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodHostKey)
dim CryptCS() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodCryptCS)
dim CryptSC() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodCryptSC)
dim MacCS() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodMacCS)
dim MacSC() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodMacSC)
dim CompCS() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodCompCS)
dim CompSC() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodCompSC)
dim LangCS() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodLangCS)
dim LangSC() as string = s.SupportedAlgorithms(SSH2SessionMBS.kMethodLangSC)

Break
```

**Notes:** Method type: see kMethod* constants.

Get a list of supported algorithms for the given methodType. The methodType parameter is equivalent to methodType in SetMethodPreference.

In order to get a list of all supported compression algorithms, SessionFlag(SSH2SessionMBS.kFlagCompress, true) must be called before calling this function, otherwise only "none" will be returned.

On success, returns array with algorithms
Lasterror is set with error code.

### 129.40.22 UserAuthKeyboardInteractive(UserName as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Authenticate a session using keyboard-interactive authentication.
**Notes:** username: Name of user to attempt keyboard-interactive authentication for.
Lasterror is set.
Calls KeyboardCallback callback to query input from user.

### 129.40.23 UserAuthList(username as string) as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** List supported authentication methods.
**Notes:** username: Username which will be used while authenticating. Note that most server implementations do not permit attempting authentication with different usernames between requests. Therefore this must be the same username you will use on later userauth calls.

Send a SSH_USERAUTH_NONE request to the remote host. Unless the remote host is configured to accept none as a viable authentication scheme (unlikely), it will return SSH_USERAUTH_FAILURE along with a listing of what authentication schemes it does support. In the unlikely event that none authentication succeeds, this method with return NULL. This case may be distinguished from a failing case by examining Authenticated.

### 129.40.24 UserAuthPassword(UserName as string, Password as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Authenticate a session with username and password.
**Notes:** username: Name of user to attempt plain password authentication for.
password: Password to use for authenticating username.

Attempt basic password authentication. Note that many SSH servers which appear to support ordinary password authentication actually have it disabled and use Keyboard Interactive authentication (routed via PAM or another authentication backed) instead.
Lasterror is set.

### 129.40.25 UserAuthPublicKeyFromFile(UserName as string, publickey as folderitem, privatekey as folderitem, Passphrase as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Authenticate a session with a public key, read from a file.
**Notes:** Lasterror is set.
username: user name to authenticate as.
publickey: Path of the public key file. (e.g. /etc/ssh/hostkey.pub). If libssh2 is built against OpenSSL, this option can be set to ""/nil.
privatekey: Path of the private key file. (e.g. /etc/ssh/hostkey)
passphrase: Passphrase to use when decoding privatekey.

Attempt public key authentication using a PEM encoded private key file stored on disk
See also:

- 129.40.26 UserAuthPublicKeyFromFile(UserName as string, publickey as string, privatekey as string, Passphrase as string) 18130

### 129.40.26 UserAuthPublicKeyFromFile(UserName as string, publickey as string, privatekey as string, Passphrase as string)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Authenticate a session with a public key, read from a file.
**Notes:** Lasterror is set.
username: user name to authenticate as.
publickey: Path of the public key file. (e.g. /etc/ssh/hostkey.pub). If libssh2 is built against OpenSSL, this option can be set to ""/nil.
privatekey: Path of the private key file. (e.g. /etc/ssh/hostkey)
passphrase: Passphrase to use when decoding privatekey.

Attempt public key authentication using a PEM encoded private key file stored on disk
See also:

- 129.40.25 UserAuthPublicKeyFromFile(UserName as string, publickey as folderitem, privatekey as folderitem, Passphrase as string) 18129

### 129.40.27 UserAuthPublicKeyFromMemory(UserName as string, publickey as string, privatekey as string, Passphrase as string)

MBS Network Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Authenticate a session with a public key, read from memory
**Notes:** This function allows to authenticate a session with a public key read from memory.
Lasterror is set.

username - Remote user name to authenticate as.
publickeydata - Buffer containing the contents of a public key file. Optional.

privatekeydata - Buffer containing the contents of a private key file.
passphrase - Passphrase to use when decoding private key file.

Keys must have LF as line ending, not CR.

Attempt public key authentication using a PEM encoded private key file stored in memory.

### 129.40.28 Version as string

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version for the SSH library.
**Example:**

MsgBox SSH2SessionMBS.Version

### 129.40.29 WaitSocket(TimeOut as Double = 0.1)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Waits on the socket for sending or receiving.
**Notes:** Default used to be 10 seconds, but that may be to much, so since v22.3 the value can be customized and is now 1/10th of a second.

### 129.40.30 Properties

### 129.40.31 Authenticated as Boolean

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return authentication status.
**Notes:** Indicates whether or not the named session has been successfully authenticated.
Returns true if authenticated and false if not.
(Read only property)

### 129.40.32 Blocking as Boolean

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The blocking mode on session.
**Notes:** blocking: Set to a non-zero value to make the channel block, or zero to make it non-blocking.

Set or clear blocking mode on the selected on the session. This will instantly affect any channels associated with this session. If a read is performed on a session with no data currently available, a blocking session will wait for data to arrive and return what it receives. A non-blocking session will return immediately with an empty buffer. If a write is performed on a session with no room for more data, a blocking session will wait for room. A non-blocking session will return immediately without writing anything.
(Read and Write property)

### 129.40.33 Handle as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 129.40.34 LastErrNo as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the most recent error number.
**Notes:** Returns a numeric error code corresponding to the the Error Code constants.
(Read only property)

### 129.40.35 LastError as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 129.40.36 Socket as TCPSocket

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The socket value.
**Notes:** This is set by constructor if you base the session on an existing session.
But you can assign a socket here if you like.
(Read and Write property)

### 129.40.37 Tag as Variant

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** A property where you can store any value you like.
(Read and Write property)

### 129.40.38 TimeOut as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The timeout for blocking functions.
**Notes:** In milliseconds.
(Read and Write property)

### 129.40.39 Events

### 129.40.40 KeyboardCallback(Name as string, Instruction as string, PromptCount as Integer, Prompts() as SSH2UserAuthKeyboardInteractivePromptMBS, responses() as SSH2UserAuthKeyboardInteractiveResponseMBS)

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event to ask for user input on a UserAuthKeyboardInteractive run.
**Notes:** You can ask user for password, e.g. with a modal dialog.
You find prompt text in SSH2UserAuthKeyboardInteractivePromptMBS object and place answer in SSH2UserAuthKeyboardInteractiveResponseMBS objects.

### 129.40.41 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAgentProtocol | -42 | Invalid agent protocol. |
| kErrorAlloc | -6 | Out of memory. |
| kErrorAuthenticationFailed | -18 | Authentication failed. |
| kErrorBadSocket | -45 | Bad socket handle. |
| kErrorBadUse | -39 | Bad use. |
| kErrorBannerRecv | -2 | Failed to receive banner. |
| kErrorBannerSend | -3 | Failed to send banner. |
| kErrorBufferTooSmall | -38 | Memory buffer is too small. |
| kErrorChannelClosed | -26 | Channel is already closed. |
| kErrorChannelEofSent | -27 | Chanel sent EOF. |
| kErrorChannelFailure | -21 | Generic error on a channel. |
| kErrorChannelOutoforder | -20 | Channel commands out of order. |
| kErrorChannelPacketExceeded | -25 | Channel packet exceeded. |
| kErrorChannelRequestDenied | -22 | Channel request denied. |
| kErrorChannelUnknown | -23 | Unknown channel. |
| kErrorChannelWindowExceeded | -24 | Channel window exceeded. |
| kErrorChannelWindowFull | -47 | Channel window is full. |
| kErrorCompress | -40 | Compression error. |
| kErrorDecrypt | -12 | Error with decryption. |
| kErrorEagain | -37 | Please try again later. |
| kErrorEncrypt | -44 | Error on encrypting. |
| kErrorFile | -16 | File IO error. |
| kErrorHostkeyInit | -10 | Failed to init host key. |
| kErrorHostkeySign | -11 | Failed to sign host key. |
| kErrorInval | -34 | Input value error. |
| kErrorInvalidMac | -4 | Invalid MAC address. |
| kErrorInvalidPollType | -35 | Invalid poll type. |
| kErrorKexFailure | -5 | Key exchange failed. |
| kErrorKeyExchangeFailure | -8 | Key exchange failed. |
| kErrorKeyfileAuthFailed | -48 | Authorization with key file failed. |
| kErrorKnownHosts | -46 | Unknown host. |
| kErrorMethodNone | -17 | No method. |
| kErrorMethodNotSupported | -33 | Method not supported. |
| kErrorNone | 0 | No error. |
| kErrorOutOfBoundary | -41 | Out of Boundary. |
| kErrorPasswordExpired | -15 | Password expired. |
| kErrorProto | -14 | Protocol error. |
| kErrorPublickeyProtocol | -36 | Publickey protocol failed. |
| kErrorPublickeyUnverified | -19 | Publickey is not verified. |
| kErrorRequestDenied | -32 | Request denied. |
| kErrorScpProtocol | -28 | Error with SCP protocol. |
| kErrorSftpProtocol | -31 | Error with SFTP protocol. |
| kErrorSocketDisconnect | -13 | Socket got disconnected. |
| kErrorSocketNone | -1 | No socket error. |
| kErrorSocketRecv | -43 | Socket receive failed. |
| kErrorSocketSend | -7 | Socket send failed. |
| kErrorSocketTimeout | -30 | Socket timeout. |
| kErrorTimeout | -9 | Timeout. |
| kErrorZlib | -29 | Error with zlib (Compression). |

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagCompress | 2 | Set options for the created session. flag is the option to set, while value is typically set to 1 or 0 to enable or disable the option.<br>If set - before the connection negotiation is performed - libssh2 will try to negotiate compression enabling for this connection. By default libssh2 will not attempt to use compression. |
| kFlagSigPipe | 1 | Set options for the created session. flag is the option to set, while value is typically set to 1 or 0 to enable or disable the option.<br>If set, libssh2 will not attempt to block SIGPIPEs but will let them trigger from the underlying socket layer. |

Hash Type

| Constant | Value | Description |
|---|---|---|
| kHostKeyHashMD5 | 1 | MD5 |
| kHostKeyHashSHA1 | 2 | SHA1 |
| kHostKeyHashSHA256 | 3 | SHA256 |

Method Preferences

| Constant | Value | Description |
|---|---|---|
| kMethodCompCS | 6 | Compression method.<br>e.g. zlib, zlib@openssh.com, none |
| kMethodCompSC | 7 | Compression method.<br>e.g. zlib, zlib@openssh.com, none |
| kMethodCryptCS | 2 | Crypt Method.<br>e.g. aes128-ctr, aes192-ctr, aes256-ctr, aes256-cbc, rijndael-cbc@lysator.liu.se, aes192-cbc, aes128-cbc, blowfish-cbc, arcfour128, arcfour, cast128-cbc, 3des-cbc. |
| kMethodCryptSC | 3 | Crypt Method.<br>e.g. aes128-ctr, aes192-ctr, aes256-ctr, aes256-cbc, rijndael-cbc@lysator.liu.se, aes192-cbc, aes128-cbc, blowfish-cbc, arcfour128, arcfour, cast128-cbc, 3des-cbc |
| kMethodHostKey | 1 | Host key method.<br>e.g. ssh-rsa, ssh-dss |
| kMethodKEX | 0 | Key Exchange Method.<br>e.g. diffie-hellman-group-exchange-sha256, diffie-hellman-group-exchange-sha1, diffie-hellman-group14-sha1 or diffie-hellman-group1-sha1. |
| kMethodLangCS | 8 | Language. |
| kMethodLangSC | 9 | Language. |
| kMethodMacCS | 4 | MAC method (hash)<br>e.g. hmac-sha2-256, hmac-sha2-512, hmac-sha1, hmac-sha1-96, hmac-md5, hmac-md5-96, hmac-ripemd160, hmac-ripemd160@openssh.com |
| kMethodMacSC | 5 | MAC method (hash)<br>e.g. hmac-sha2-256, hmac-sha2-512, hmac-sha1, hmac-sha1-96, hmac-md5, hmac-md5-96, hmac-ripemd160, hmac-ripemd160@openssh.com |

## 129.41 class SSH2TunnelMBS

### 129.41.1 class SSH2TunnelMBS

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a SSH tunnel.
**Notes:** The MBS Plugin can spin of a new preemptive thread to run a tunnel to forward a SSH connection from local socket to remote server via SSH tunnel.
This works well for database access with MySQL.
By using our own thread, we are not blocking or blocked by your Xojo code.

The tunnel allows currently one connection through it, e.g. run one tunnel per MySQL connection to go through the tunnel. If you need multiple tunnels, please create multiple SSH tunnels.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr6
- MBS Xojo Plugins, version 20.3pr1

- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 18.5pr3
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr3
- SSH tunnel in Xojo

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 129.41.2 Methods

### 129.41.3 Constructor(session as SSH2SessionMBS)

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Please pass connected SSH session.

### 129.41.4 Destructor

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 129.41.5 Run

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the thread with the tunnel.

### 129.41.6 Properties

### 129.41.7 BytesReceived as Int64

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes received.
**Notes:** (Read only property)

### 129.41.8 BytesSent as Int64

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes sent.
**Notes:** (Read only property)

### 129.41.9 Cancel as Boolean

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to cancel tunnel.
**Notes:** This property can be set to request end of the thread.
(Read and Write property)

### 129.41.10 Connected as Boolean

MBS Network Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries whether tunnel is connected and transfers data.
**Notes:** Returns true if connected or false if not.
(Read only property)

### 129.41.11 KeepAlive as Boolean

MBS Network Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to sent keep-alive packets.
**Example:**

```
dim tunnel as SSH2TunnelMBS // your tunnel

// avoid timeing out in Socket and SSH layers
tunnel.KeepAlive = True
session.ConfigureKeepAlive
```

**Notes:** If set to true, TCP keep alive probes will be sent to avoid TCP/IP timeouts.

Set to false (default behavior) to disable keep alive probes.

You may also need to use ConfigureKeepAlive on the SSH2SessionMBS class.
(Read and Write property)

### 129.41.12 LocalAddress as String

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The local address to use.
**Notes:** Defines where we wait for a connection to forward.
IPv4 or IPv6 address.
(Read and Write property)

### 129.41.13 LocalPort as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The local port to use.
**Notes:** (Read and Write property)

### 129.41.14 Messages as String

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Log messages.
**Notes:** Filled by thread to tell you about errors.
(Read only property)

### 129.41.15 RemoteAddress as String

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The remote address to use.
**Notes:** When connecting through tunnel this address is used from server to connect to.
IPv4 or IPv6 address.
(Read and Write property)

### 129.41.16 RemotePort as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The remote port to use.
**Notes:** When connecting through tunnel this port is used from server to connect to.
(Read and Write property)

### 129.41.17 Running as Boolean

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether tunnel is running.
**Notes:** True if running, false if not.
(Read only property)

### 129.41.18 Session as SSH2SessionMBS

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The session used for the tunnel.
**Notes:** (Read only property)

# 129.42 class SSH2UserAuthKeyboardInteractivePromptMBS

## 129.42.1 class SSH2UserAuthKeyboardInteractivePromptMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an interactive keyboard authentication prompt.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.42.2 Methods

## 129.42.3 Constructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 129.42.4 Destructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

## 129.42.5 Properties

## 129.42.6 Echo as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The echo flag.
**Notes:** (not sure what this is)
(Read and Write property)

## 129.42.7 Length as Integer

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the text.
**Notes:** (Read and Write property)

### 129.42.8 Text as String

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text message.
**Notes:** (Read and Write property)

# 129.43 class SSH2UserAuthKeyboardInteractiveResponseMBS

## 129.43.1 class SSH2UserAuthKeyboardInteractiveResponseMBS

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a response with interactive keyboard login.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.43.2 Methods

## 129.43.3 Constructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 129.43.4 Destructor

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destrutor.

## 129.43.5 Properties

## 129.43.6 Text as String

MBS Network Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The response text.
**Notes:** Usually a password.
(Read and Write property)

## 129.44 class TCPSocket

### 129.44.1 class TCPSocket

Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The Socket class in Xojo which is the superclass of the PacketSocketMBS class.

# 129.45 class TXTRecordMBS

## 129.45.1 class TXTRecordMBS

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** The class to represent a DNS-SD TXT record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

MsgBox t.Bytes // show complete record
MsgBox t.Value("Hello") // lookup value
```

**Notes:** The constructor creates an empty TXTRecord where you can add values using TXTRecordSetValue.

## 129.45.2 Methods

## 129.45.3 Bytes as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to retrieve a copy of to the raw bytes within a TXTRecord.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"
```

**Notes:** Returns a string with the raw bytes inside the TXTRecord which you can pass directly to DNSServiceRegisterMBS.Register() or to DNSServiceRegisterMBS.UpdateRecord().

## 129.45.4 ContainsKey(key as string) as boolean

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to determine if a given TXT Record contains a specified key.
**Example:**

```
dim t as new TXTRecordMBS
```

```
call t.SetValue "Hello", "World"

if t.ContainsKey("Hello") then
MsgBox "Hello found."
else
MsgBox "Hello not found ->bug."
end if

if t.ContainsKey("hallo") then
MsgBox "hallo found ->bug."
else
MsgBox "hallo not found."
end if
```

**Notes:** key: An ASCII string containing the key name.

Returns true if the TXT Record contains the specified key. Otherwise, it returns false.
See also:

- 129.45.5 ContainsKey(txtRecord as string, key as string) as boolean 18146

### 129.45.5 ContainsKey(txtRecord as string, key as string) as boolean

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to determine if a given TXT Record contains a specified key.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

dim s as string = t.Bytes // copy record to string

// now search in that string:
if TXTRecordMBS.ContainsKey(s, "Hello") then
MsgBox "Hello found."
else
MsgBox "Hello not found ->bug."
end if

if TXTRecordMBS.ContainsKey(s, "hallo") then
MsgBox "hallo found ->bug."
else
```

```
MsgBox "hallo not found."
end if
```

**Notes:** txtRecord: The txt record to search in as a string.
key: An ASCII string containing the key name.

Returns true if the TXT Record contains the specified key. Otherwise, it returns false.
See also:

- 129.45.4 ContainsKey(key as string) as boolean 18145

### 129.45.6 Count as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the number of keys stored in the TXT Record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello1", "World1"
call t.SetValue "Hello2", "World2"
call t.SetValue "Hello3", "World3"

MsgBox str(t.Count)
```

See also:

- 129.45.7 Count(txtRecord as string) as Integer 18147

### 129.45.7 Count(txtRecord as string) as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the number of keys stored in the TXT Record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello1", "World1"
call t.SetValue "Hello2", "World2"
call t.SetValue "Hello3", "World3"
```

```
dim s as string = t.Bytes // copy record

// now count in that record
MsgBox str(TXTRecordMBS.Count(s))
```

See also:

- 129.45.6 Count as Integer 18147

### 129.45.8 KeyAtIndex(index as Integer) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the key with the given index from the txt record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

MsgBox t.KeyAtIndex(0) +EndOfLine + t.ValueAtIndex(0)
```

**Notes:** index: the index you want in the range from zero to GetCount()-1.

It's also possible to iterate through keys in a TXT record by simply calling KeyAtIndex() repeatedly, beginning with index zero and increasing until lasterror is set to kErrorInvalid.
See also:

- 129.45.9 KeyAtIndex(txtRecord as string, index as Integer) as string 18148

### 129.45.9 KeyAtIndex(txtRecord as string, index as Integer) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the key with the given index from the txt record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

dim s as string = t.Bytes // copy record to string
```

```
// now search in that string:
MsgBox TXTRecordMBS.KeyAtIndex(s,0) +EndOfLine + TXTRecordMBS.ValueAtIndex(s,0)
```

**Notes:** txtRecord: The txt record to search in as a string.
index: the index you want in the range from zero to GetCount()-1.

It's also possible to iterate through keys in a TXT record by simply calling KeyAtIndex() repeatedly, beginning with index zero and increasing until lasterror is set to kErrorInvalid.
See also:

- 129.45.8 KeyAtIndex(index as Integer) as string 18148

### 129.45.10 Length as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to determine the length of the raw bytes within a TXTRecord.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello1", "World1"
call t.SetValue "Hello2", "World2"
call t.SetValue "Hello3", "World3"

MsgBox str(t.Length) // shows 42
```

### 129.45.11 RemoveValue(key as string)

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Removes a key from a TXTRecordRef. The "key" must be an ASCII string which exists in the TXTRecord.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello1", "World1"
call t.SetValue "Hello2", "World2"
call t.SetValue "Hello3", "World3"

t.RemoveValue "Hello2"
```

MsgBox t.Bytes

**Notes:** key: A key name which exists in the TXTRecord.

Lasterror is kErrorNoError on success or kErrorNoSuchKey if the "key" does not exist in the TXTRecord.

### 129.45.12 SetValue(key as string, value as string) as Integer

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Adds a key (optionally with value) to a TXTRecordRef.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello1", "World1"
call t.SetValue "Hello2", "World2"
call t.SetValue "Hello3", "World3"
```

**Notes:** If the "key" already exists in the TXTRecord, then the current value will be replaced with the new value.

Keys may exist in four states with respect to a given TXT record:

- Absent (key does not appear at all)
- Present with no value ("key" appears alone)
- Present with empty value ("key=" appears in TXT record)
- Present with non-empty value ("key=value" appears in TXT record)

For more details refer to "Data Syntax for DNS-SD TXT Records" in

http://files.dns-sd.org/draft-cheshire-dnsext-dns-sd.txt

key: A string which only contains printable ASCII values (&h20-&h7E), excluding '=' (&h3D). Keys should be 8 characters or less.
value: Any binary value. For values that represent textual data, UTF-8 is STRONGLY recommended.

Returns kErrorNoError on success. Returns kErrorInvalid if the "key" string contains illegal characters. Returns kErrorNoMemory if adding this key would exceed the available storage.

The plugin currently does not create keys with empty value. If you need that, please email us.

### 129.45.13 Value(key as string) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to retrieve the value for a given key from a TXT Record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"
MsgBox t.Value("Hello") // lookup value
```

**Notes:** key: The ASCII string containing the key name.

Returns an empty string if the key does not exist in this TXT record, or exists with no value (to differentiate between these two cases use ContainsKey()).
See also:

- 129.45.14 Value(txtRecord as string, key as string) as string 18151

### 129.45.14 Value(txtRecord as string, key as string) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Allows you to retrieve the value for a given key from a TXT Record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

dim s as string = t.bytes
MsgBox TXTRecordMBS.Value(s, "Hello") // lookup value
```

**Notes:** txtRecord: Pointer to the received TXT Record bytes.
key: The ASCII string containing the key name.

Returns an empty string if the key does not exist in this TXT record, or exists with no value (to differentiate between these two cases use ContainsKey()).
See also:

- 129.45.13 Value(key as string) as string 18151

### 129.45.15 ValueAtIndex(index as Integer) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the key with the given index from the txt record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

MsgBox t.KeyAtIndex(0) +EndOfLine + t.ValueAtIndex(0)
```

**Notes:** index: the index you want in the range from zero to GetCount()-1.

It's also possible to iterate through values in a TXT record by simply calling ValueAtIndex() repeatedly, beginning with index zero and increasing until lasterror is set to kErrorInvalid.
See also:

- 129.45.16 ValueAtIndex(txtRecord as string, index as Integer) as string 18152

### 129.45.16 ValueAtIndex(txtRecord as string, index as Integer) as string

MBS Network Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: All.

**Function:** Returns the key with the given index from the txt record.
**Example:**

```
dim t as new TXTRecordMBS

call t.SetValue "Hello", "World"

dim s as string = t.Bytes // copy record to string

// now search in that string:
MsgBox TXTRecordMBS.KeyAtIndex(s,0) +EndOfLine + TXTRecordMBS.ValueAtIndex(s,0)
```

**Notes:** txtRecord: The txt record to search in as a string.
index: the index you want in the range from zero to GetCount()-1.

It's also possible to iterate through values in a TXT record by simply calling GetValueAtIndex() repeatedly, beginning with index zero and increasing until lasterror is set to kErrorInvalid.
See also:

- 129.45.15 ValueAtIndex(index as Integer) as string 18152

## 129.46 class UDPSocketMBS

### 129.46.1 class UDPSocketMBS

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for UDP sockets.
**Notes:** Similar to Xojo's built in UDPSocket class, but more low level and with more options.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr10
- MBS Xojo Plugins, version 18.3pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 18.0pr6
- Raw Sockets for Xojo
- MBS Xojo / Real Studio Plugins, version 14.5pr2
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

### 129.46.2 Methods

### 129.46.3 AddMembership(MultiAddress as string, InterfaceAddress as string = "")

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds this socket to a multicast group.
**Notes:** Internally this uses IPPROTO_IP/IP_ADD_MEMBERSHIP option.
Lasterror is set.

MultiAddress: The IPv4 address of the group to join.
InterfaceAddress: The IPv4 address of the network interface to use. Can be empty for any interface.

### 129.46.4 Bind(Port as Integer, IP as string = "")

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Binds the socket to the given port.
**Notes:** If IP is not empty, you can bind the socket to only the given network interface with that IPv4.
Set ReuseAddress to bind to an address which already a socket is bound to.
Lasterror is set.

### 129.46.5 Constructor

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.

### 129.46.6 Destructor

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** Closes the socket.

### 129.46.7 DropMembership(MultiAddress as string, InterfaceAddress as string = "")

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes this socket from a multicast group.
**Notes:** Internally this uses IPPROTO_IP/IP_DROP_MEMBERSHIP option.
Lasterror is set.

MultiAddress: The IPv4 address of the group to join.
InterfaceAddress: The IPv4 address of the network interface to use. Can be empty for any interface.

### 129.46.8 Poll

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Polls for activity.
**Notes:** Calls events if needed.

This is called automatically via timer by the plugin.

### 129.46.9 Read(peek as boolean = false) as DatagramMBS

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a datagram.
**Notes:** If peek is true, the data is not removed from read buffer.
On error returns nil.

### 129.46.10 SendMessage(Data as DatagramMBS) as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a datagram.
**Notes:** Please specify with port and address of datagram where package is sent to.
Returns number of bytes sent.
Lasterror is set.
See also:

- 129.46.11 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer 18156
- 129.46.12 SendMessage(Data as string, IP as String, Port as Integer) as Integer 18156

### 129.46.11 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a datagram.
**Notes:** Please specify with port and IP where package is sent to.
Returns number of bytes sent.
Lasterror is set.
See also:

- 129.46.10 SendMessage(Data as DatagramMBS) as Integer 18156
- 129.46.12 SendMessage(Data as string, IP as String, Port as Integer) as Integer 18156

### 129.46.12 SendMessage(Data as string, IP as String, Port as Integer) as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a datagram.
**Notes:** Please specify with port and IP where package is sent to.
Returns number of bytes sent.
Lasterror is set.
See also:


- 129.46.10 SendMessage(Data as DatagramMBS) as Integer 18156
- 129.46.11 SendMessage(Data as MemoryBlock, IP as String, Port as Integer) as Integer 18156


### 129.46.13 Properties

### 129.46.14 AddressFamily as Integer

MBS Network Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The address family of the socket.
**Notes:** This is either RAWSocketMBS.AddressFamilyINet (2) for IPv4 or RAWSocketMBS.AddressFamilyINet6 (Mac 30, Windows 23 and Linux 10) for IPv6.
(Read and Write property)

### 129.46.15 AvailableBytes as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of bytes available for reading.
**Notes:** Lasterror is set.
(Read only property)

### 129.46.16 BindAddress as String

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The IP used for bind operation.
**Notes:** This is set by Bind on success.
(Read and Write property)

### 129.46.17 BindPort as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The port used for bind operation.
**Notes:** This is set by Bind on success.

(Read and Write property)

### 129.46.18 Broadcast as Boolean

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether broadcasts are allowed.
**Notes:** Set to true before sending a broadcast message.
Internally this uses SOL_SOCKET/SO_BROADCAST option.
Lasterror is set.
(Read and Write property)

### 129.46.19 Handle as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal socket handle.
**Notes:** (Read and Write property)

### 129.46.20 Lasterror as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** Platform dependent.
(Read and Write property)

### 129.46.21 LocalIP as String

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries local IP.
**Notes:** Can be 0.0.0.0 if unknown.
May only be set if connected or binded.
Lasterror is set.
(Read only property)

### 129.46.22 LocalPort as Integer

MBS Network Plugin, Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries local port.
**Notes:** Lasterror is set.
Can be -1 if unknown.
(Read only property)

### 129.46.23 MulticastInterface as String

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The interface to use for multicast.
**Notes:** Internally this uses IPPROTO_IP/IP_MULTICAST_IF option.
Lasterror is set.

Assign empty string to use all interfaces.
May return 0.0.0.0 to indicate all interfaces.
(Read and Write property)

### 129.46.24 MulticastLoop as Boolean

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether multicast packets are also sent to the sending socket.
**Notes:** Internally this uses IPPROTO_IP/IP_MULTICAST_LOOP option.
Lasterror is set.
(Read and Write property)

### 129.46.25 MulticastTimeToLive as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The multicast time to live value.
**Notes:** Internally this uses IPPROTO_IP/IP_MULTICAST_TTL option.
Lasterror is set.
Range from 0 to 255.
(Read and Write property)

### 129.46.26 Protocol as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The socket protocol.
**Notes:** Is ProtocolUDP (17) for UDP sockets.
(Read and Write property)

### 129.46.27 ReceiveBufferSize as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the receiving buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Internally this uses SOL_SOCKET/SO_RCVBUF option.
Lasterror is set.
(Read and Write property)

### 129.46.28 ReuseAddress as Boolean

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows reuse of same port.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEADDR option.

see also
http://stackoverflow.com/questions/14388706/socket-options-so-reuseaddr-and-so-reuseport-how-do-they-differ-do-they-mean-t

Lasterror is set.
(Read and Write property)

### 129.46.29 ReusePort as Boolean

MBS Network Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allow reuse of same port and IP.
**Notes:** Internally this uses SOL_SOCKET/SO_REUSEPORT option.
On Windows, this is not supported, so this property sets ReuseAddress.
Lasterror is set.

(Read and Write property)

### 129.46.30 SendBufferSize as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sending buffer size.
**Notes:** The buffer size may be increased for high-volume connections, or may be decreased to limit the possible backlog of incoming data. The system places an absolute limit on these values.
Internally this uses SOL_SOCKET/SO_SNDBUF option.
Lasterror is set.
(Read and Write property)

### 129.46.31 SocketError as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native socket error.
**Notes:** Internally this uses SOL_SOCKET/SO_ERROR option.
Lasterror is set.
(Read only property)

### 129.46.32 SocketType as Integer

MBS Network Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The socket type.
**Notes:** Is SocketTypeDatagram (2) for UDP sockets.
(Read and Write property)

### 129.46.33 TimeToLive as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time to live value.
**Notes:** Internally this uses IPPROTO_IP/IP_TTL option.
Lasterror is set.
Range from 0 to 255.
(Read and Write property)

### 129.46.34 Type as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Socket type.
**Notes:** Always 2 as this is a datagram socket.
Internally this uses SOL_SOCKET/SO_TYPE option.
Lasterror is set.
(Read only property)

### 129.46.35 TypeOfService as Integer

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of service value.
**Notes:** Works only on BSD Sockets.

Possible values:
IPTOS_MINCOST = 2
IPTOS_RELIABILITY = 4
IPTOS_THROUGHPUT = 8
IPTOS_LOWDELAY = 16

Internally this uses IPPROTO_IP/IP_TOS option.
(May not work on Windows.

Lasterror is set.
(Read and Write property)

### 129.46.36 Events

### 129.46.37 DataAvailable

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when new data is available.
**Notes:** Requires the socket to be bound.

### 129.46.38 Error

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called if socket is in error state.

### 129.46.39 SendComplete

MBS Network Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The last write operation is done.

# 129.47 class WindowsDNSRecordAAAAMBS

## 129.47.1 class WindowsDNSRecordAAAAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS IPv6 (AAAA) record.
**Notes:** Be aware that IPv6 is not available on Windows XP and older.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.47.2 Methods

## 129.47.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordAAAAMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 129.47.4 Properties

## 129.47.5 Address as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The address in a human readable format.
**Notes:** (Read and Write property)

## 129.47.6 RawAddress as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The raw address as a 16byte string.
**Notes:** (Read and Write property)

# 129.48 class WindowsDNSRecordAMBS

## 129.48.1 class WindowsDNSRecordAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS address (A) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.48.2 Methods

## 129.48.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordAMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 129.48.4 Properties

## 129.48.5 Address as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IPv4 address as a string.
**Notes:** (Read and Write property)

## 129.48.6 IPAddress as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The raw address as an integer.
**Notes:** (Read and Write property)

# 129.49 class WindowsDNSRecordMBS

## 129.49.1 class WindowsDNSRecordMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for DNS query results on Windows.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.49.2 Methods

## 129.49.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 129.49.4 Query(name as string, type as Integer, options as Integer = 0) as WindowsDNSRecordMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a DNS query on Windows.
**Notes:** The DnsQuery function type is the generic query interface to the DNS namespace, and provides application developers with a DNS query resolution interface.

name: a string that represents the name of the owner of the record set that is queried.
type: A value that represents the RR DNS Record Type that is queried.
Options: A value that contains a combination of kDNSQuery* constants.

Returns the record chain on success.

Applications that call the DnsQuery function build a query using a fully-qualified DNS name and Resource Record (RR) type, and set query options depending on the type of service desired. When the kDNSQuery-Standard option is set, DNS uses the resolver cache, queries first with UDP, then retries with TCP if the response is truncated, and requests that the server to perform recursive resolution on behalf of the client to resolve the query.

Note When calling one of the DnsQuery function types, be aware that a DNS server may return multiple records in response to a query. A computer that is multihomed, for example, will receive multiple A records for the same IP address. The caller must use as many of the returned records as necessary.

Consider the following scenario, in which multiple returned records require additional activity on behalf of the application: A Query function call is made for a multihomed computer and the application finds that the address associated with the first A record is not responding. The application should then attempt to use other IP addresses specified in the (additional) A records returned from the Query function call.

### 129.49.5 Properties

### 129.49.6 A as WindowsDNSRecordAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The address record.
**Notes:** (Read and Write property)

### 129.49.7 AAAA as WindowsDNSRecordAAAAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IPv6 address record.
**Notes:** (Read and Write property)

### 129.49.8 AFSDB as WindowsDNSRecordMXMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.9 CharSet as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This value specifies the character set used in the associated function call.
**Notes:** (Read and Write property)

### 129.49.10 CNAME as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.11 DataLength as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length, in bytes, of Data.
**Notes:** (Read and Write property)

### 129.49.12 HINFO as WindowsDNSRecordTXTMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.13 ISDN as WindowsDNSRecordTXTMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.14 MB as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.15 MD as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.16 MF as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.17 MG as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.18 MINFO as WindowsDNSRecordMInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.19 MR as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.20 MX as WindowsDNSRecordMXMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.21 Name as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A pointer to a string that represents the domain name of the record set.
**Notes:** (Read and Write property)

### 129.49.22 NextRecord as WindowsDNSRecordMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The next record in the answer.
**Notes:** (Read and Write property)

### 129.49.23 NS as WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.24 Null as WindowsDNSRecordNullMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.25 RawData as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** the RAW data of this record.
**Notes:** For debugging.
(Read and Write property)

### 129.49.26 RP as WindowsDNSRecordMInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.27 RT as WindowsDNSRecordMXMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.28 Section as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This value specifies the section of interest returned from the DnsQuery function call.
**Notes:** (Read and Write property)

### 129.49.29 SOA as WindowsDNSRecordSOAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.30 TTL as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DNS RR's Time To Live value (TTL), in seconds.
**Notes:** (Read and Write property)

### 129.49.31 TXT as WindowsDNSRecordTXTMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.32 Type as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DNS record type for this record.
**Notes:** If type is kDNSTypeA, the A property is filled.
(Read and Write property)

### 129.49.33 X25 as WindowsDNSRecordTXTMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data record.
**Notes:** (Read and Write property)

### 129.49.34 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCharSetAnsi | 3 | One of the constants for the CharSet property.<br>The character set is ANSI. |
| kCharSetUnicode | 1 | One of the constants for the CharSet property.<br>The character set is Unicode. |
| kCharSetUnknown | 0 | One of the constants for the CharSet property.<br>The character set is unknown. |
| kCharSetUtf8 | 2 | One of the constants for the CharSet property.<br>The character set is UTF8. |
| kDNSClassAll | &h00ff | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassAny | &h00ff | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassCHAOS | &h0003 | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassCSNET | &h0002 | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassHESIOD | &h0004 | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassInternet | &h0001 | One of the DNS classes in native byte order (little endian on Win |
| kDNSClassNone | &h00fe | One of the DNS classes in native byte order (little endian on Win |
| kDNSQueryAcceptTruncatedResponse | &h00000001 | One of the possible flags for the Query function.<br>Returns truncated results. Does not retry under TCP. |
| kDNSQueryBypassCache | &h00000008 | One of the possible flags for the Query function.<br>Bypasses the resolver cache on the lookup. |
| kDNSQueryDontResetTTLValues | &h00100000 | One of the possible flags for the Query function.<br>If set, and if the response contains multiple records, records are<br>the TTL corresponding to the minimum value TTL from among<br>When this option is set, "Do not change the TTL of individual rec<br>returned record set is not modified. |
| kDNSQueryMulticastOnly | &h00000400 | One of the possible flags for the Query function.<br>Prevents the query from using DNS and uses only Local Link Mul<br>Resolution (LLMNR).<br>Windows Vista and Windows Server 2008 or later.: This value is |
| kDNSQueryNoHostsFile | &h00000040 | One of the possible flags for the Query function.<br>Prevents the DNS query from consulting the HOSTS file.<br>Windows 2000 Server and Windows 2000 Professional: This valu<br>ported. |
| kDNSQueryNoLocalName | &h00000020 | One of the possible flags for the Query function.<br>Directs DNS to ignore the local name.<br>Windows 2000 Server and Windows 2000 Professional: This valu<br>ported. |
| kDNSQueryNoMulticast | &h00000800 | One of the possible flags for the Query function. |
| kDNSQueryNoNetBT | &h00000080 | One of the possible flags for the Query function.<br>Prevents the DNS query from using NetBT for resolution.<br>Windows 2000 Server and Windows 2000 Professional: This valu<br>ported. |
| kDNSQueryNoRecursion | &h00000004 | One of the possible flags for the Query function.<br>Directs the DNS server to perform an iterative query (specificall<br>DNS server not to perform recursive resolution to resolve the que |
| kDNSQueryNoWireQuery | &h00000010 | One of the possible flags for the Query function.<br>Directs DNS to perform a query on the local cache only. |
| kDNSQueryReserved | &hff000000 | One of the possible flags for the Query function.<br>Reserved. |
| kDNSQueryReturnMessage | &h00000200 | One of the possible flags for the Query function.<br>Directs DNS to return the entire DNS response message.<br>Windows 2000 Server and Windows 2000 Professional: This valu<br>ported. |
| kDNSQueryStandard | &h00000000 | One of the possible flags for the Query function.<br>Standard query. |
| kDNSQueryTreatAsFQDN | &h00001000 | One of the possible flags for the Query function.<br>Prevents the DNS response from attaching suffixes to the submit<br>a name resolution process |
| kDNSQueryUseTCPOnly | &h00000002 | One of the possible flags for the Query function. |

## 129.50 class WindowsDNSRecordMInfoMBS

### 129.50.1 class WindowsDNSRecordMInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS mail information (MINFO) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.50.2 Methods

### 129.50.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordMInfoMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 129.50.4 Properties

### 129.50.5 NameErrorsMailbox as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that represents the FQDN of the mailbox to receive error messages related to the mailing list.
**Notes:** (Read and Write property)

### 129.50.6 NameMailbox as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that represents the fully qualified domain name (FQDN) of the mailbox responsible for the mailing list or mailbox specified in the record's owner name.
**Notes:** (Read and Write property)

# 129.51 class WindowsDNSRecordMXMBS

## 129.51.1 class WindowsDNSRecordMXMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS mail exchanger (MX) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.51.2 Methods

## 129.51.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordMXMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 129.51.4 Properties

## 129.51.5 NameExchange as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that represents the fully qualified domain name (FQDN) of the host willing to act as a mail exchange.
**Notes:** (Read and Write property)

## 129.51.6 Preference as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A preference given to this resource record among others of the same owner. Lower values are preferred.
**Notes:** (Read and Write property)

## 129.52 class WindowsDNSRecordNullMBS

### 129.52.1 class WindowsDNSRecordNullMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a NULL data DNS resource record
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.52.2 Methods

### 129.52.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordNullMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 129.52.4 Properties

### 129.52.5 ByteCount as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes represented in Data.
**Notes:** (Read and Write property)

### 129.52.6 Data as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The raw data as a string.
**Notes:** (Read and Write property)

# 129.53 class WindowsDNSRecordPTRMBS

## 129.53.1 class WindowsDNSRecordPTRMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS pointer (PTR) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 129.53.2 Methods

## 129.53.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordPTRMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

## 129.53.4 Properties

## 129.53.5 NameHost as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The named host.
**Notes:** (Read and Write property)

## 129.54 class WindowsDNSRecordSOAMBS

### 129.54.1 class WindowsDNSRecordSOAMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS start of authority (SOA) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.54.2 Methods

### 129.54.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordSOAMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 129.54.4 Properties

### 129.54.5 DefaultTTL as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The lower limit on the time, in seconds, that a DNS server or caching resolver are allowed to cache any resource records (RR) from the zone to which this record belongs.
**Notes:** (Read and Write property)

### 129.54.6 Expire as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, before an unresponsive zone is no longer authoritative.
**Notes:** (Read and Write property)

### 129.54.7 NameAdministrator as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that represents the name of the responsible party for the zone to which the record belongs.
**Notes:** (Read and Write property)

### 129.54.8 NamePrimaryServer as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that represents the name of the authoritative DNS server for the zone to which the record belongs.
**Notes:** (Read and Write property)

### 129.54.9 Refresh as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, before the zone containing this record should be refreshed.
**Notes:** (Read and Write property)

### 129.54.10 Retry as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time, in seconds, before retrying a failed refresh of the zone to which this record belongs.
**Notes:** (Read and Write property)

### 129.54.11 SerialNo as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the SOA record.
**Notes:** (Read and Write property)

## 129.55 class WindowsDNSRecordTXTMBS

### 129.55.1 class WindowsDNSRecordTXTMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a DNS text (TXT) record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.55.2 Methods

### 129.55.3 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless WindowsDNSRecordTXTMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 129.55.4 Strings as String()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An array of strings representing the descriptive text of the TXT resource record.

### 129.55.5 Properties

### 129.55.6 StringCount as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of strings represented in Strings array.
**Notes:** (Read and Write property)

# 129.56 class WindowsEthernetAdapterMBS

## 129.56.1 class WindowsEthernetAdapterMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** A class for the properties of an ethernet adapter.

## 129.56.2 Methods

## 129.56.3 Gateway(index as Integer) as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Returns one of the IP address of the default gateway for this adapter.
**Notes:** Index goes from 0 to GatewayGount-1.

## 129.56.4 IP(index as Integer) as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Returns one of the IP addresses associated with this adapter.
**Notes:** Index goes from 0 to IPcount-1.

## 129.56.5 Properties

## 129.56.6 AdapterName as String

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Name of the adapter.
**Notes:** (Read and Write property)

## 129.56.7 Address as String

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Hardware address for the adapter.
**Notes:** (Read and Write property)

### 129.56.8 CurrentIpAddress as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** The current IP from within the IP list.
**Notes:** This field is currently normally nil, but in the future it may point to the current IP inside the IP list.
But currently on Windows 2000 it seems to be always nil.
(Read and Write property)

### 129.56.9 Description as String

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Description for the adapter.
**Notes:** (Read and Write property)

### 129.56.10 DhcpEnabled as Boolean

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Specifies whether dynamic host configuration protocol (DHCP) is enabled for this adapter.
**Notes:** (Read and Write property)

### 129.56.11 DhcpServer as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** IP address of the DHCP server for this adapter.
**Notes:** (Read and Write property)

### 129.56.12 Gatewaycount as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** How many gateway IPs are allocated for this adapter.
**Notes:** (Read and Write property)

### 129.56.13 HaveWins as Boolean

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Specifies whether this adapter uses Windows Internet Name Service (WINS).
**Notes:** (Read and Write property)

### 129.56.14 Index as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Adapter index.
**Notes:** (Read and Write property)

### 129.56.15 IPcount as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** How many IPs are allocated for this adapter.
**Notes:** (Read and Write property)

### 129.56.16 LeaseExpires as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Time when the current DHCP lease expires.
**Notes:** (Read and Write property)

### 129.56.17 LeaseObtained as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Time when the current DHCP lease was obtained.
**Notes:** (Read and Write property)

### 129.56.18 PrimaryWinsServer as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** IP address of the primary WINS server.
**Notes:** (Read and Write property)

### 129.56.19 SecondaryWinsServer as WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** IP address of the secondary WINS server.
**Notes:** (Read and Write property)

### 129.56.20 Type as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Adapter type.
**Notes:** The type must be of the following values:

| | |
|---|---|
| MIB_IF_TYPE_OTHER | 1 |
| MIB_IF_TYPE_ETHERNET | 6 |
| MIB_IF_TYPE_TOKENRING | 9 |
| MIB_IF_TYPE_FDDI | 15 |
| MIB_IF_TYPE_PPP | 23 |
| MIB_IF_TYPE_LOOPBACK | 24 |
| MIB_IF_TYPE_SLIP | 28 |

(Read and Write property)

# 129.57 class WindowsEthernetMBS

## 129.57.1 class WindowsEthernetMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** A list of the Windows Ethernet Interfaces.
**Notes:** Requires Windows 98 or 2000 or newer.
Reports count=0 on Windows 95 and NT 4.0.

Only activate adapters are listed.

## 129.57.2 Methods

## 129.57.3 Item(index as Integer) as WindowsEthernetAdapterMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Returns the Ethernet Adapter object for the given index.
**Notes:** Index goes from 0 to count-1.

## 129.57.4 Update

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** Updates the list.
**Notes:** Calls the Destructor and than the Constructor so the list is completly rebuilt.

## 129.57.5 Properties

## 129.57.6 Count as Integer

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** How much ethernet adapters are available.
**Notes:** Note that there may be dummy or virtual adapters.
(Read and Write property)

## 129.58 class WindowsIPAddressMBS

### 129.58.1 class WindowsIPAddressMBS

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** An IP address.

### 129.58.2 Properties

### 129.58.3 IP as String

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** The IP as a string.
**Notes:** Maximum 15 bytes long.
e.g. "192.168.0.1"
(Read and Write property)

### 129.58.4 Mask as String

MBS Network Plugin, Plugin Version: 3.1, Platform: Windows, Targets: All.

**Function:** The mask for the IP.
**Notes:** e.g. "255.255.255.0"
(Read and Write property)

# 129.59 class WindowsProxyMBS

## 129.59.1 class WindowsProxyMBS

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to query the current windows proxy settings.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr5
- Need Proxy Settings?

## 129.59.2 Properties

## 129.59.3 ByPass as String

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The proxy
**Notes:** Example values:
"testserver:1234 apple.de <local>"
or
"testserver3:1234 testserver4:1234 testserver1:1234 testserver2:1234 apple.de <local>"
(Read and Write property)

## 129.59.4 Proxy as String

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current proxy setting.
**Notes:** Example values:
"testserver:1234"
or
"https=testserver2:1234 http=testserver1:1234 gopher=testserver4:1234 ftp=testserver3:1234"
(Read and Write property)

## 129.59.5 UsingProxy as Boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether a proxy is in use.
**Notes:** (Read and Write property)

## 129.60 class WindowsQOSMBS

### 129.60.1 class WindowsQOSMBS

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for Quality Windows Audio/Video Experience (qWAVE).
**Notes:** Quality Windows Audio/Video Experience (qWAVE) is the next generation Quality of Service (QOS) platform introduced in Windows Vista.
qWAVE provides new features focused on streaming multimedia and real-time content over variable bandwidth networks. These features include the following.

- Auto-discovery of end-to-end QOS compatibility.
- End-to-end bandwidth estimation of maximum link capacity (bottleneck bandwidth) and real-time available bandwidth.
- Intelligent packet prioritization.
- Congestion notification.
- Flow shaping.
- Distributed admission control, including caching to improve performance and minimize latency.

Requires Windows 6 (Vista).
**Blog Entries**

- MBS Xojo Plugins, version 21.4pr4
- MBS Xojo Plugins, version 21.2pr7
- MBS Xojo / Real Studio plug-ins in version 13.5
- MBS Xojo / Real Studio Plugins, version 13.5pr5

**Xojo Developer Magazine**

- 12.1, page 9: News

### 129.60.2 Methods

### 129.60.3 AddSocketToFlow(Socket as Integer, DestAddr as string, DestPort as Integer, TrafficType as Integer, Flags as Integer, byref FlowId as UInt32) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a socket to a flow.
**Notes:** Socket: Identifies the socket that the application will use to flow traffic.
DestAddr: The destination IP address to which the application will send traffic. DestAddr and DestPort are optional if the socket is already connected. If this parameter is specified, the remote IP address and port must match those used in the socket's connect call.
If the socket is not connected, this parameter must be specified. If the socket is already connected, this parameter does not need to be specified. In this case, if the parameter is still specified, the destination host and port must match what was specified during the socket connect call.
Since, under TCP, the socket connect call can be delayed, AddSocketToFlow can be called before a connection is established, passing in the remote system's IP address and port number in the DestAddr parameter.
DestPort: The port for the connection.
TrafficType: A QOSTrafficType* constant that specifies the type of traffic for which this flow will be used.
Flags: Optional flag values. Can be QOSNonAdaptiveFlow.
FlowID: Receives a flow identifier. On input, this value must be 0. On output, the buffer contains a flow identifier if the call succeeds.
If a socket is being added to an existing flow, this parameter will be the identifier of that flow.
An application can make use of this parameter if multiple sockets used can share the same QoS flow properties. The QoS subsystem, then does not have to incur the overhead of provisioning new flows for subsequent sockets with the same properties. Note that only non-adaptive flows can have multiple sockets attached to an existing flow.
A FlowID is an unsigned 32-bit integer.

Lasterror is set.

The use of IPv4/v6 mixed addresses is not supported in qWAVE. The address specified by the DestAddr parameter must be either IPv4 or IPv6.
If there is a requirement for network experiments over a specific network interface, the socket must be bound to that particular interface. Otherwise the most appropriate interface for the experiment, as indicated by the network stack, is assigned by the qWAVE subsystem.
Network traffic associated with this flow is not affected by making this call alone. For example, packet prioritization does not occur immediately.
There are two categories of applications that use this function: adaptive and non-adaptive. An adaptive application makes use of notifications and information in the FlowFundamentals for adapting to network changes such as congestion. The qWAVE service uses Link Layer Topology Discovery (LLTD) QoS extensions for adaptive flows which can be present on the destination device.
After calling this function adaptive A/V applications should call the SetFlowRate function to affect network traffic.
A non-adaptive application either does not adapt to changing network characteristics or is sending traffic to an endpoint that does not support adaptive capabilities as indicated by ERROR_NOT_SUPPORTED.
Non-adaptive applications, or adaptive applications making non-adaptive flows, should call this function with the QOSNonAdaptiveFlow flag. After calling this function A/V applications should call the setOutgoingDSCPValue, setOutgoingRate or setTrafficType function with a Operation. They do not need to be called unless shaping is desired.
See also:

- 129.60.4 AddSocketToFlow(Socket as Integer, TrafficType as Integer, Flags as Integer, byref FlowId as UInt32) as boolean 18190

### 129.60.4 AddSocketToFlow(Socket as Integer, TrafficType as Integer, Flags as Integer, byref FlowId as UInt32) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a socket to a flow.
**Notes:** Socket: Identifies the socket that the application will use to flow traffic.
DestAddr: The destination IP address to which the application will send traffic. DestAddr and DestPort are optional if the socket is already connected. If this parameter is specified, the remote IP address and port must match those used in the socket's connect call.
If the socket is not connected, this parameter must be specified. If the socket is already connected, this parameter does not need to be specified. In this case, if the parameter is still specified, the destination host and port must match what was specified during the socket connect call.
Since, under TCP, the socket connect call can be delayed, AddSocketToFlow can be called before a connection is established, passing in the remote system's IP address and port number in the DestAddr parameter.
DestPort: The port for the connection.
TrafficType: A QOSTrafficType* constant that specifies the type of traffic for which this flow will be used.
Flags: Optional flag values. Can be QOSNonAdaptiveFlow.
FlowID: Receives a flow identifier. On input, this value must be 0. On output, the buffer contains a flow identifier if the call succeeds.
If a socket is being added to an existing flow, this parameter will be the identifier of that flow.
An application can make use of this parameter if multiple sockets used can share the same QoS flow properties. The QoS subsystem, then does not have to incur the overhead of provisioning new flows for subsequent sockets with the same properties. Note that only non-adaptive flows can have multiple sockets attached to an existing flow.
A FlowID is an unsigned 32-bit integer.

Lasterror is set.

The use of IPv4/v6 mixed addresses is not supported in qWAVE. The address specified by the DestAddr parameter must be either IPv4 or IPv6.
If there is a requirement for network experiments over a specific network interface, the socket must be bound to that particular interface. Otherwise the most appropriate interface for the experiment, as indicated by the network stack, is assigned by the qWAVE subsystem.
Network traffic associated with this flow is not affected by making this call alone. For example, packet prioritization does not occur immediately.
There are two categories of applications that use this function: adaptive and non-adaptive. An adaptive application makes use of notifications and information in the FlowFundamentals for adapting to network changes such as congestion. The qWAVE service uses Link Layer Topology Discovery (LLTD) QoS extensions for adaptive flows which can be present on the destination device.
After calling this function adaptive A/V applications should call the SetFlowRate function to affect network traffic.
A non-adaptive application either does not adapt to changing network characteristics or is sending traffic to an endpoint that does not support adaptive capabilities as indicated by ERROR_NOT_SUPPORTED.
Non-adaptive applications, or adaptive applications making non-adaptive flows, should call this function with the QOSNonAdaptiveFlow flag. After calling this function A/V applications should call the setOutgoingDSCPValue, setOutgoingRate or setTrafficType function with a Operation. They do not need to be

called unless shaping is desired.
See also:

- 129.60.3 AddSocketToFlow(Socket as Integer, DestAddr as string, DestPort as Integer, TrafficType as Integer, Flags as Integer, byref FlowId as UInt32) as boolean 18188

### 129.60.5 Constructor

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This function initializes the QOS subsystem.
**Notes:** On success Handle property is not zero.
Lasterror is set.

Every process intending to use qWAVE must first call Constructor.
If a machine enters a power save mode that interrupts connectivity such as sleep or standby, existing and active network experiments such as QOSStartTrackingClient must be reinitiated. This recreation of the flow mirrors the cleanup and creation activities also necessary for existing sockets. A new handle must be created, and the flow must be recreated and readmitted.

### 129.60.6 getFlowFundamentals(FlowID as Integer, byref BottleneckBandwidthSet as boolean, byref BottleneckBandwidth as UInt64, byref AvailableBandwidthSet as boolean, byref AvailableBandwidth as UInt64, byref RTTSet as boolean, byref RTT as UInt32, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries flow fundamentals.
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.
Flags: Optional, can be QOSQueryFlowFresh.
BottleneckBandwidthSet: This Boolean value is set to true if the BottleneckBandwidth field contains a value.
BottleneckBandwidth: Indicates the maximum end-to-end link capacity between the source and sink device, in bits.
AvailableBandwidthSet: Set to true if the AvailableBandwidth field contains a value.
AvailableBandwidth: Indicates how much bandwidth is available for submitting traffic on the end-to-end network path between the source and sink device, in bits.
RTTSet: Set to true if the RTT field contains a value.
RTT: Measures the round-trip time between the source and sink device, in microseconds.

Lasterror is set. Returns true on success or false on failure.

### 129.60.7 getOutgoingRate(FlowID as Integer, byref Bandwidth as UInt64, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries flow rate.
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.
Bandwidth: will contain a UINT64 value that indicates the flow rate specified when requesting the contract, in bits per second.
Flags: Optional, can be QOSQueryFlowFresh.
Lasterror is set. Returns true on success or false on failure.

### 129.60.8 getPacketPriority(FlowID as Integer, byref ConformantDSCPValue as Integer, byref NonConformantDSCPValue as Integer, byref ConformantL2Value as Integer, byref NonConformantL2Value as Integer, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries packet priorities.
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.
Flags: Optional, can be QOSQueryFlowFresh.

ConformantDSCPValue: Differential Services Code Point (DSCP) mark used for flow traffic that conforms to the specified flow rate.
NonConformantDSCPValue: DSCP marking used for flow traffic that exceeds the specified flow rate. Non-conformant DSCP values are only applicable only if value is QOSUseNonConformantMarkings.
ConformantL2Value: Layer-2 (L2) tag used for flow traffic that conforms to the specified flow rate. L2 tags will not be added to packets if the end-to-end path between source and sink does not support them.
NonConformantL2Value: L2 tag used for flow traffic that exceeds the specified flow rate. Non-conformant L2 values are only applicable if value is QOSUseNonConformantMarkings.

Lasterror is set. Returns true on success or false on failure.

### 129.60.9 RemoveAllSocketsFromFlow(FlowID as Integer) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The RemoveSocketFromFlow function notifies the QOS subsystem that a previously added flow has been terminated by the application, and that the subsystem must update its internal information accordingly.
**Notes:** FlowId: A flow identifier. A QOS_FLOWID is an unsigned 32-bit integer.

Lasterror is set. Returns true on success or false on failure.
The plugin closes all flows in destructor.

### 129.60.10 RemoveSocketFromFlow(socketHandle as Integer, FlowID as Integer) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The RemoveSocketFromFlow function notifies the QOS subsystem that a previously added flow has been terminated by the application, and that the subsystem must update its internal information accordingly.
**Notes:** Socket: Socket to be removed from the flow.
Only flows created with the QOSNonAdaptiveFlow flag may have multiple sockets added to the same flow. By passing the Socket parameter in this call, each socket can be removed individually. If the Socket parameter is not passed, the entire flow will be destroyed. If only one socket was attached to the flow, passing this socket as a parameter to this function and passing 0 as a socket are equivalent calls.
FlowId: A flow identifier. A QOS_FLOWID is an unsigned 32-bit integer.

Lasterror is set. Returns true on success or false on failure.
The plugin closes all flows in destructor.

### 129.60.11 setOutgoingDSCPValue(FlowID as Integer, OutgoingDSCPValue as Integer, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the outgoing DSCP value.
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.

Lasterror is set. Returns true on success or false on failure.

If StartTrackingClient has not already been called, calling QOSSetFlow will cause the QOS subsystem to perform the following.

- Discover whether the end-to-end network path supports prioritization.
- Track end-to-end network characteristics by way of network experiments. These experiments do not place any noteworthy stress on the network.

### 129.60.12 setOutgoingRate(FlowID as Integer, Bandwidth as UInt64, ShapingBehavior as Integer, Reason as Integer, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets a new outgoing rate.
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.
Bandwidth: The rate at which data should be sent, in units of bits per second.
Note Traffic on the network is measured at the IP level, and not at the application level. The rate that is specified should account for the IP and protocol headers.
ShapingBehavior: A shaping constant that defines the shaping behavior of the flow.
Reason: A QOSFlowRate* constant that indicates the reason for a flow rate change.
Lasterror is set. Returns true on success or false on failure.

If StartTrackingClient has not already been called, calling QOSSetFlow will cause the QOS subsystem to perform the following.

- Discover whether the end-to-end network path supports prioritization.
- Track end-to-end network characteristics by way of network experiments. These experiments do not place any noteworthy stress on the network.#

### 129.60.13 setTrafficType(FlowID as Integer, TrafficType as Integer, Flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the type of traffic
**Notes:** FlowID: A flow identifier. A flow id is an unsigned 32-bit integer.
TrafficType: One of the traffic type constants.
Lasterror is set. Returns true on success or false on failure.

If StartTrackingClient has not already been called, calling QOSSetFlow will cause the QOS subsystem to perform the following.

- Discover whether the end-to-end network path supports prioritization.
- Track end-to-end network characteristics by way of network experiments. These experiments do not place any noteworthy stress on the network.#

### 129.60.14 StartTrackingClient(DestAddr as string, flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StartTrackingClient function notifies the QOS subsystem of the existence of a new client.
**Notes:** Calling this function increases the likelihood that the QOS subsystem will have gathered sufficient information on the network path to assist when calling QOSSetFlow to set the flow.
Note This call is not required to add a flow with the QOSAddSocketToFlow function although it is highly recommended. Not calling this function may require network experiments to be started during the QOSSetFlow call and can result in QOSSetFlow failing with ERROR_NETWORK_BUSY on initial use.

DestAddr: The IP address of the client device. Clients are identified by their IP address and address family. Any port number specified in the sockaddr structure will be ignored.
Flags: Reserved for future use. Must be set to 0.

On receipt of a QOSStartTrackingClient call the QoS subsystem begins gathering information about the client such as the QoS capabilities and available bandwidth on the end-to-end path.
An application should call this function as soon as it becomes aware of a client device that may need QoS flow. For example this function should be called when a media player device first connects to a media server application.
Network experiments performed by QOSStartTrackingClient do not introduce noteworthy load on the network even if no stream is started for a long period of time. The qWAVE service dynamically adjusts experiment traffic based on QoS subsystem activity.
Link Layer Topology Discovery (LLTD) must be implemented on the sink PC or device for this function to work.

Lasterror is set. Returns true on success or false on failure.

### 129.60.15 StopTrackingClient(DestAddr as string, flags as Integer = 0) as boolean

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StopTrackingClient function notifies the QoS subsystem to stop tracking a client that has previously used the StartTrackingClient function.
**Notes:** If a flow is currently in progress, this function will not affect it.

DestAddr: The IP address of the client device. Clients are identified by their IP address and address family. A port number is not required and will be ignored.
Flags: Reserved for future use.

Lasterror is set. Returns true on success or false on failure.

### 129.60.16 Properties

### 129.60.17 Handle as Integer

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 129.60.18 Lasterror as Integer

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 129.60.19 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The generic window error message for the error in lasterror property.
**Notes:** (Read and Write property)

### 129.60.20 Constants

Flow Reasons

| Constant | Value | Description |
|---|---|---|
| QOSFlowRateCongestion | 2 | Indicates that the flow has changed due to congestion. |
| QOSFlowRateContentChange | 1 | Indicates that the content of a flow has changed. |
| QOSFlowRateHigherContentEncoding | 3 | Indicates that the user has caused the flow to change. |
| QOSFlowRateNotApplicable | 0 | Indicates that there has not been a change in the flow. |
| QOSFlowRateUserCaused | 4 | Indicates that the user has caused the flow to change. |

Flags

| Constant | Value | Description |
|---|---|---|
| QOSNonAdaptiveFlow | 2 | If specified, the QoS subsystem will not gather data about the network path for this flow. As a result, functions which rely on bandwidth estimation techniques will not be available. For example, this would block QOSQueryFlow with an Operation value of QOSQueryFlowFundamentals and QOSNotifyFlow with an Operation value of QOSNotifyCongested, QOSNotifyUncongested, and QOSNotifyAvailable. |
| QOSQueryFlowFresh | 1 | The QOS subsystem will only return fresh, not cached, data. If fresh data is unavailable, it will try to obtain such data, at the expense of possibly taking more time. If this is not possible, the call will fail with the error code ERROR_RETRY.<br>This flag is only applicable when the Operation parameter is set to QOSQueryFlowFundamentals. |

Shaping Behavior

| Constant | Value | Description |
|---|---|---|
| QOSShapeAndMark | 1 | Indicates that the Windows Scheduler will be used to enforce the requeste flow rate. Data packets exceeding the rate are delayed accordingly. Packet receive conformant priority values. |
| QOSShapeOnly | 0 | Indicates that the Windows packet scheduler (Pacer) will be used to enforc the requested flow rate. Data packets that exceed the rate are delayed un til appropriate in order to maintain the specified flow rate. If the networ supports prioritization, packets will always receive conformant priority value when QOSShapeFlow is specified. |
| QOSUseNonConformantMarkings | 2 | Indicates that the flow rate requested will not be enforced. Data packets tha would exceed the flow rate will receive a priority that indicates they are non conformant. This may lead to lost and reordered packets. |

Traffic Types

| Constant | Value | Description |
|---|---|---|
| QOSTrafficTypeAudioVideo | 3 | Flow traffic has a network priority higher than QOSTrafficTypeExcellentEffort, yet lower than QOSTrafficTypeVoice. This traffic type should be used for A/V streaming scenarios such as MPEG2 streaming.<br>Sent traffic will contain a DSCP mark with a value of 0x28 and an 802.1p tag with a value of 5. |
| QOSTrafficTypeBackground | 1 | Flow traffic has a network priority lower than that of QOSTrafficTypeBestEffort. This traffic type could be used for traffic of an application doing data backup.<br>Sent traffic will contain a DSCP mark with a value of 0x08 and an 802.1p tag with a value of 2. |
| QOSTrafficTypeBestEffort | 0 | Flow traffic has the same network priority as regular traffic not associated with QOS.<br>This traffic type is the same as not specifying priority, and as a result, the DSCP mark and 802.1p tag are not added to sent traffic. |
| QOSTrafficTypeControl | 5 | Flow traffic has the highest network priority. This traffic type should only be used for the most critical of data. For example, it may be used for data carrying user inputs.<br>Sent traffic will contain a DSCP mark with a value of 0x38 and an 802.1p tag with a value of 7. |
| QOSTrafficTypeExcellentEffort | 2 | Flow traffic has a network priority higher than QOSTrafficTypeBestEffort, yet lower than QOSTrafficTypeAudioVideo. This traffic type should be used for data traffic that is more important than normal end-user scenarios, such as email.<br>Sent traffic will contain a DSCP mark with value of 0x28 and 802.1p tag with a value of 5. |
| QOSTrafficTypeVoice | 4 | Flow traffic has a network priority higher than QOSTrafficTypeAudioVideo, yet lower than QOSTrafficTypeControl. This traffic type should be used for realtime voice streams such as VOIP.<br>Sent traffic will contain a DSCP mark with a value of 0x38 and an 802.1p tag with a value of 7. |

# 129.61 class WinHTTPClientAutoProxyOptionsMBS

## 129.61.1 class WinHTTPClientAutoProxyOptionsMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WinHTTPClientAutoProxyOptionsMBS class is used to indicate to the WinHttpGetProxyForURL function whether to specify the URL of the Proxy Auto-Configuration (PAC) file or to automatically locate the URL with DHCP or DNS queries to the network.
**Notes:** see also:
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384123(v=vs.85).aspx

## 129.61.2 Methods

## 129.61.3 Constructor

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 129.61.4 Properties

## 129.61.5 AutoConfigUrl as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The URL for the config URL.
**Notes:** If Flags includes the kAutoProxyConfigURL flag, the AutoConfigUrl contains the URL of the proxy auto-configuration (PAC) file.
If Flags does not include the kAutoProxyConfigURL flag, then AutoConfigUrl must be "".
(Read and Write property)

## 129.61.6 AutoDetectFlags as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The flags for auto detecting.
**Notes:** If Flags includes the kAutoProxyAutoDetect flag, then AutoDetectFlags specifies what protocols are to be used to locate the PAC file. If both the DHCP and DNS auto detect flags are specified, then DHCP is used first; if no PAC URL is discovered using DHCP, then DNS is used.
If Flags does not include the kAutoProxyAutoDetect flag, then AutoDetectFlags must be zero.

| Value | Meaning |
|---|---|
| kAutoDetectTypeDHCP | Use DHCP to locate the proxy auto-configuration file. |
| kAutoDetectTypeDNSA | Use DNS to attempt to locate the proxy auto-configuration file at a well-known location on the domain of the local computer. |

(Read and Write property)

### 129.61.7 AutoLogonIfChallenged as Boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies whether the client's domain credentials should be automatically sent in response to an NTLM or Negotiate Authentication challenge when WinHTTP requests the PAC file.
**Notes:** If this flag is true, credentials should automatically be sent in response to an authentication challenge. If this flag is false and authentication is required to download the PAC file, the WinHttpGetProxyForUrl function fails.
(Read and Write property)

### 129.61.8 Flags as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flags for detecting proxy.
**Notes:** (Read and Write property)

### 129.61.9 Constants

Auto Detect Types

| Constant | Value | Description |
|---|---|---|
| kAutoDetectTypeDHCP | 1 | Use DHCP to locate the proxy auto-configuration file. |
| kAutoDetectTypeDNSA | 2 | Use DNS to attempt to locate the proxy auto-configuration file at a well-known location on the domain of the local computer. |

Proxy Flags

| Constant | Value | Description |
|---|---|---|
| kAutoProxyAutoDetect | 1 | Attempt to automatically discover the URL of the PAC file using both DHCP and DNS queries to the local network. |
| kAutoProxyConfigURL | 2 | Download the PAC file from the URL specified by AutoConfigUrl in the WinHTTPClientAutoProxyOptionsMBS class. |

## 129.62 class WinHTTPClientCurrentUserIEProxyConfigMBS

### 129.62.1 class WinHTTPClientCurrentUserIEProxyConfigMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for Internet Explorer proxy configuration information.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384250(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.62.2 Methods

### 129.62.3 Constructor

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 129.62.4 Properties

### 129.62.5 AutoConfigUrl as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The auto-configuration URL.
**Notes:** The auto-configuration URL if the Internet Explorer proxy configuration for the current user specifies "Use automatic proxy configuration".
(Read and Write property)

### 129.62.6 AutoDetect as Boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to auto detect proxy settings.
**Notes:** If true, indicates that the Internet Explorer proxy configuration for the current user specifies "automatically detect settings".
(Read and Write property)

### 129.62.7 Proxy as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the proxy URL if the Internet Explorer proxy configuration for the current user specifies "use a proxy server".
**Notes:** (Read and Write property)

### 129.62.8 ProxyBypass as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Optional proxy by-pass server list.
**Notes:** (Read and Write property)

## 129.63 class WinHTTPClientMBS

### 129.63.1 class WinHTTPClientMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for Windows to do http requests.
**Notes:** The plugin only implements proxy related functions.
But this class could be extended to work like HTTPSocket.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- MBS Xojo / Real Studio Plugins, version 14.1pr1

### 129.63.2 Methods

### 129.63.3 Close as boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Closes the session.

### 129.63.4 Constructor

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 129.63.5 CrackUrl(URL as string, Flags as Integer = 0) as WinHTTPClientURLComponentsMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Separates a URL into its component parts such as host name and path.
**Notes:** URL: the canonical URL to separate. WinHttpCrackUrl does not check this URL for validity or correct format before attempting to crack it.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384092(v=vs.85).aspx

### 129.63.6 DetectAutoProxyConfigUrl(AutoDetectFlags as Integer, byref AutoConfigUrl as string) as Boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Finds the URL for the Proxy Auto-Configuration (PAC) file.
**Notes:** This function reports the URL of the PAC file, but it does not download the file.

AutoDetectFlags: A data type that specifies what protocols to use to locate the PAC file. If both the DHCP and DNS auto detect flags are set, DHCP is used first; if no PAC URL is discovered using DHCP, then DNS is used.

| Value | Meaning |
|---|---|
| kAutoDetectTypeDHCP | Use DHCP to locate the proxy auto-configuration file. |
| kAutoDetectTypeDNSA | Use DNS to attempt to locate the proxy auto-configuration file at a well-known location on the domain of the local computer. |

AutoConfigUrl: String that contains the configuration URL that receives the proxy data.

Returns true if successful, or false otherwise. For extended error information, call LastError. Among the error codes returned are the following.

WinHTTP implements the Web Proxy Auto-Discovery (WPAD) protocol, often referred to as autoproxy. For more information about well-known locations, see the Discovery Process section of the WPAD protocol document.
Note that because the DetectAutoProxyConfigUrl function takes time to complete its operation, it should not be called from a UI thread.

### 129.63.7 GetDefaultProxyConfiguration as WinHTTPClientProxyInfoMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the default WinHTTP proxy configuration from the registry.
**Notes:** Returns the default proxy configuration.

### 129.63.8 GetIEProxyConfigForCurrentUser as WinHTTPClientCurrentUserIEProxyConfigMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the Internet Explorer proxy configuration for the current user.

**Notes:** Queries the Internet Explorer proxy settings for the current active network connection (for example, LAN, dial-up, or VPN connection).

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384096(v=vs.85).aspx

### 129.63.9 GetProxyForHost(URL as string, Host as string, byref proxy as string, byref proxyPort as string, AutoConfigURL as string = "") as boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries the proxy for a host.
**Notes:** This is an universal functions using InternetGetProxyInfo, DetectAutoProxyUrl and InternetQueryOption.

URL: The target URL.
Host: The hostname of the target server.

Returns true on success and sets proxy and port. Returns false on failure.
AutoConfigURL is only used on first call instead of a configured auto config URL in Internet Explorer.

### 129.63.10 GetProxyForUrl(URL as string, AutoProxyOptions as WinHTTPClientAutoProxyOptionsMBS, byref ProxyInfo as WinHTTPClientProxyInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the proxy data for the specified URL.
**Notes:** Url: Contains the URL of the HTTP request that the application is preparing to send.
AutoProxyOptions: Specifies the auto-proxy options to use.
ProxyInfo: Receives the proxy setting.

If the function succeeds, the function returns true.
If the function fails, it returns false. Lasterror is set.

This function implements the Web Proxy Auto-Discovery (WPAD) protocol for automatically configuring the proxy settings for an HTTP request. The WPAD protocol downloads a Proxy Auto-Configuration (PAC) file, which is a script that identifies the proxy server to use for a given target URL. PAC files are typically deployed by the IT department within a corporate network environment. The URL of the PAC file can either be specified explicitly or GetProxyForUrl can be instructed to automatically discover the location of the PAC file on the local network.

GetProxyForUrl supports only ECMAScript-based PAC files.
GetProxyForUrl must be called on a per-URL basis, because the PAC file can return a different proxy server for different URLs. This is useful because the PAC file enables an IT department to implement proxy server load balancing by mapping (hashing) the target URL (specified by the lpcwszUrl parameter) to a certain proxy in a proxy server array.
GetProxyForUrl caches the autoproxy URL and the autoproxy script when auto-discovery is specified in the dwFlags member of the pAutoProxyOptions structure. For more information, see Autoproxy Cache.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384097(v=vs.85).aspx

### 129.63.11 InternetGetProxyInfo(URL as string, Host as string) as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves proxy data for accessing specified resources.
**Notes:** This function can only be called by dynamically linking to "JSProxy.dll" (plugin loads this for you).
For better autoproxy support, use HTTP Services (WinHTTP) version 5.1 instead.

Url: Secifies the URL of the target HTTP resource.
HostName: Specifies the host name of the target URL.

Returns the URL of the proxy to use in an HTTP request for the specified resource.
Returns empty string on any error.

### 129.63.12 Open(UserAgent as string, AccessType as Integer, ProxyName as string = "", ProxyByPass as string = "") as boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Initializes an application's use of the WinINet functions.
**Notes:** lUserAgent: Specifies the name of the application or entity calling the WinINet functions. This name is used as the user agent in the HTTP protocol.
AccessType: Type of access required. This parameter can be one of the following values.

ProxyName: String that specifies the name of the proxy server(s) to use when proxy access is specified by setting dwAccessType to INTERNET_OPEN_TYPE_PROXY. Do not use an empty string, because InternetOpen will use it as the proxy name. The WinINet functions recognize only CERN type proxies (HTTP only) and the TIS FTP gateway (FTP only). If Microsoft Internet Explorer is installed, these functions also support SOCKS proxies. FTP requests can be made through a CERN type proxy either by

| Value | Meaning |
|---|---|
| INTERNET_OPEN_TYPE_DIRECT | Resolves all host names locally. |
| INTERNET_OPEN_TYPE_PRECONFIG | Retrieves the proxy or direct configuration from the registry. |
| INTERNET_OPEN_TYPE_PRECONFIG_WITH_NO_AUTOPROXY | Retrieves the proxy or direct configuration from the registry and prevents the use of a startup Microsoft JScript or Internet Setup (INS) file. |
| INTERNET_OPEN_TYPE_PROXY | Passes requests to the proxy unless a proxy bypass list is supplied and the name to be resolved bypasses the proxy. In this case, the function uses INTERNET_OPEN_TYPE_DIRECT. |

changing them to an HTTP request or by using InternetOpenUrl. If dwAccessType is not set to INTERNET_OPEN_TYPE_PROXY, this parameter is ignored and should be NULL. For more information about listing proxy servers, see the Listing Proxy Servers section of Enabling Internet Functionality.
ProxyBypass: Specifies an optional list of host names or IP addresses, or both, that should not be routed through the proxy when dwAccessType is set to INTERNET_OPEN_TYPE_PROXY. The list can contain wildcards. Do not use an empty string, because InternetOpen will use it as the proxy bypass list. If this parameter specifies the "<local>" macro, the function bypasses the proxy for any host name that does not contain a period.
By default, WinINet will bypass the proxy for requests that use the host names "localhost", "loopback", "127.0.0.1", or " [ ::1 ] ". This behavior exists because a remote proxy server typically will not resolve these addresses properly.
Internet Explorer 9: You can remove the local computer from the proxy bypass list using the "<-loopback>" macro.
If dwAccessType is not set to INTERNET_OPEN_TYPE_PROXY, this parameter is ignored and should be NULL.
Flags: Options. This parameter can be a combination of the following values.

| Value | Meaning |
|---|---|
| INTERNET_FLAG_ASYNC | Makes only asynchronous requests on handles descended from the handle returned from this function. |
| INTERNET_FLAG_FROM_CACHE | Does not make network requests. All entities are returned from the cache. If the requested item is not in the cache, a suitable error, such as ERROR_FILE_NOT_FOUND, is returned. |
| INTERNET_FLAG_OFFLINE | Identical to INTERNET_FLAG_FROM_CACHE. Does not make network requests. All entities are returned from the cache. If the requested item is not in the cache, a suitable error, such as ERROR_FILE_NOT_FOUND, is returned. |

Returns a valid handle that the application passes to subsequent WinINet functions. If Open fails, it returns false. To retrieve a specific error message, call GetLastError.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa385096(v=vs.85).aspx

### 129.63.13 SetDefaultProxyConfiguration(info as WinHTTPClientProxyInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the default WinHTTP proxy configuration in the registry.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384113(v=vs.85).aspx

SetDefaultProxyConfiguration changes the proxy configuration set by ProxyCfg.exe.
The default proxy configuration set by this function can be overridden for an existing WinHTTP session by calling SetOption and specifying the OptionProxy flag. The default proxy configuration can be overridden for a new session by specifying the configuration with the WinHttpOpen function.
The dwAccessType member of the WinHTTPClientProxyInfoMBS structure pointed to by pProxyInfo should be set to kAccessTypeNamedProxy if a proxy is specified. Otherwise, it should be set to kAccessTypeDefaultProxy.
Any new sessions created after calling this function use the new default proxy configuration.
Even when WinHTTP is used in asynchronous mode (that is, when WINHTTP_FLAG_ASYNC has been set in WinHttpOpen), this function operates synchronously. The return value indicates success or failure. To get extended error information, call GetLastError.
Note For Windows XP and Windows 2000, see the Run-Time Requirements section of the WinHTTP start page.

### 129.63.14 Properties

### 129.63.15 Handle as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference.
**Notes:** This is a HINTERNET type.
(Read and Write property)

### 129.63.16 Lasterror as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error.
**Notes:** see also error list:
http://msdn.microsoft.com/en-us/library/aa383770(VS.85).aspx
(Read and Write property)

### 129.63.17 LasterrorString as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** (Read and Write property)

### 129.63.18 OptionConnectTimeOut as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the connect timeout.
**Notes:** Lasterror is set.

Sets or retrieves an unsigned long integer value that contains the time-out value, in milliseconds. Setting this option to infinite (-1) will disable this timer.
If a TCP connection request takes longer than this time-out value, the request is canceled. The default timeout is 60 seconds. When you are attempting to connect to multiple IP addresses for a single host (a multihomed host), the timeout limit is for each individual connection.
(Read and Write property)

### 129.63.19 OptionProxyPassword as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the proxy password.
**Notes:** Sets or retrieves a string value that contains the password used to access the proxy.
Lasterror is set.
(Read and Write property)

### 129.63.20 OptionProxyUsername as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Get or set the proxy user name.
**Notes:** Sets or retrieves a string value that contains the user name used to access the proxy.
Lasterror is set.
(Read and Write property)

### 129.63.21 Constants

Proxy Access Types

| Constant | Value | Description |
|---|---|---|
| kAccessTypeDefaultProxy | 0 | Applies only when setting proxy information. |
| kAccessTypeNamedProxy | 3 | Internet accessed using a proxy. |
| kAccessTypeNoProxy | 1 | Internet accessed through a direct connection. |

Autodetect Type Flags

| Constant | Value | Description |
|---|---|---|
| kAutoDetectTypeDHCP | 1 | Use DHCP to locate the proxy auto-configuration file. |
| kAutoDetectTypeDNSA | 2 | Use DNS to attempt to locate the proxy auto-configuration file at a well-known location on the domain of the local computer. |

Scheme Types

| Constant | Value | Description |
|---|---|---|
| kInternetSchemeHTTP | 1 | HTTP scheme. |
| kInternetSchemeHTTPS | 2 | HTTPS scheme. |

## 129.64 class WinHTTPClientProxyInfoMBS

### 129.64.1 class WinHTTPClientProxyInfoMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for the session or default proxy configuration.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa383912(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.64.2 Methods

### 129.64.3 Constructor

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 129.64.4 Properties

### 129.64.5 AccessType as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The access type.
**Notes:** Can be kAccessTypeDefaultProxy, kAccessTypeNamedProxy or kAccessTypeNoProxy.
(Read and Write property)

### 129.64.6 Proxy as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The proxy server list.
**Notes:** (Read and Write property)

### 129.64.7 ProxyBypass as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The proxy bypass list.
**Notes:** (Read and Write property)

### 129.64.8 Constants

Proxy Access Types

| Constant | Value | Description |
|---|---|---|
| kAccessTypeDefaultProxy | 0 | Applies only when setting proxy information. |
| kAccessTypeNamedProxy | 3 | Internet accessed using a proxy. |
| kAccessTypeNoProxy | 1 | Internet accessed through a direct connection. |

## 129.65 class WinHTTPClientURLComponentsMBS

### 129.65.1 class WinHTTPClientURLComponentsMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class containing the constituent parts of an URL.
**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/aa384078(v=vs.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 129.65.2 Methods

### 129.65.3 Constructor

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 129.65.4 Properties

### 129.65.5 ExtraInfo as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The extra information, for example, ?something or #something.
**Notes:** (Read and Write property)

### 129.65.6 ExtraInfoLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length of the extra information, in characters.
**Notes:** (Read and Write property)

### 129.65.7 HostName as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The host name.
**Notes:** (Read and Write property)

### 129.65.8 HostNameLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of the host name, in characters.
**Notes:** (Read and Write property)

### 129.65.9 Password as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The password.
**Notes:** (Read and Write property)

### 129.65.10 PasswordLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of the password, in characters.
**Notes:** (Read and Write property)

### 129.65.11 Port as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Port number.
**Notes:** (Read and Write property)

### 129.65.12 Scheme as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The scheme name.
**Notes:** (Read and Write property)

### 129.65.13 SchemeID as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Internet protocol scheme.
**Notes:** Normally 1 for HTTP and 2 for HTTPS.
(Read and Write property)

### 129.65.14 SchemeLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of the scheme name, in characters.
**Notes:** (Read and Write property)

### 129.65.15 UrlPath as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The URL path.
**Notes:** (Read and Write property)

### 129.65.16 UrlPathLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of the URL path, in characters.
**Notes:** (Read and Write property)

### 129.65.17 UserName as String

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The user name.
**Notes:** (Read and Write property)

### 129.65.18 UserNameLength as Integer

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of the user name, in characters.
**Notes:** (Read and Write property)

# Chapter 130

# Nikon Cameras

## 130.1 class NikonCapInfoMBS

### 130.1.1 class NikonCapInfoMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for Capability Information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 130.1.2 Methods

### 130.1.3 Constructor

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 130.1.4 Properties

### 130.1.5 Description as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The description of this capability.
**Notes:** (Read only property)

### 130.1.6 ID as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The ID of this property.
**Notes:** See eNkMAIDCapability in Nikon's documentation.
(Read only property)

### 130.1.7 Operations as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The supported operations for this capability.
**Notes:** See eNkCapOperations in Nikon's documentation.
(Read only property)

### 130.1.8 OperationsString as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The operation value as a string for displaying.
**Notes:** (Read only property)

### 130.1.9 Type as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The type of this capability.
**Notes:** See eNkMAIDCababilityType in Nikon's documentation.
(Read only property)

### 130.1.10 TypeString as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The type value as a string for displaying.
**Notes:** (Read only property)

### 130.1.11 Visibility as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The visibility of this capability.
**Notes:** See eNkCapVisibility in Nikon's documentation.
(Read only property)

### 130.1.12 VisibilityString as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The visibility value as a string for displaying.
**Notes:** (Read only property)

## 130.2 class NikonFileInfoMBS

### 130.2.1 class NikonFileInfoMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for the File Data Delivery Structure.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 130.2.2 Methods

### 130.2.3 Constructor

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 130.2.4 Properties

### 130.2.5 DiskFile as Boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** True if the file is delivered on disk.
**Notes:** (Read and Write property)

### 130.2.6 FileDataType as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** One of eNkMAIDFileDataTypes.
**Notes:** Possible values:

| | |
|---|---|
| kNkMAIDFileDataType_NotSpecified | 0 |
| kNkMAIDFileDataType_JPEG | 1 |
| kNkMAIDFileDataType_TIFF | 2 |
| kNkMAIDFileDataType_FlashPix | 3 |
| kNkMAIDFileDataType_NIF | 4 |
| kNkMAIDFileDataType_QuickTime | 5 |
| kNkMAIDFileDataType_UserType | &h100 |

(Read and Write property)

### 130.2.7 Length as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Number of bytes in this delivery.
**Notes:** (Read and Write property)

### 130.2.8 RemoveObject as Boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** True if the object should be removed.
**Notes:** (Read and Write property)

### 130.2.9 Start as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Index of starting byte (0-based)
**Notes:** (Read and Write property)

### 130.2.10 TotalLength as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Total number of bytes to be transferred.
**Notes:** (Read and Write property)

## 130.3 class NikonImageInfoMBS

### 130.3.1 class NikonImageInfoMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for the Image Data Delivery structure.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 130.3.2 Methods

### 130.3.3 Bits(index as Integer) as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Number of bits per plane per pixel.
**Notes:** Index from 0 to 3.

### 130.3.4 Constructor

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 130.3.5 Properties

### 130.3.6 ColorSpace as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The colorspace.
**Notes:** Possible values:

(Read and Write property)

### 130.3.7 Plane as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

| | |
|---|---|
| kNkMAIDColorSpace_LineArt | 0 |
| kNkMAIDColorSpace_Grey | 1 |
| kNkMAIDColorSpace_RGB | 2 |
| kNkMAIDColorSpace_sRGB | 3 |
| kNkMAIDColorSpace_CMYK | 4 |
| kNkMAIDColorSpace_Lab | 5 |
| kNkMAIDColorSpace_LCH | 6 |
| kNkMAIDColorSpace_AppleRGB | 7 |
| kNkMAIDColorSpace_ColorMatchRGB | 8 |
| kNkMAIDColorSpace_NTSCRGB | 9 |
| kNkMAIDColorSpace_BruceRGB | 10 |
| kNkMAIDColorSpace_AdobeRGB | 11 |
| kNkMAIDColorSpace_CIERGB | 12 |
| kNkMAIDColorSpace_AdobeWideRGB | 13 |
| kNkMAIDColorSpace_AppleRGB_Compensated | 14 |

**Function:** The plane configuration.
**Notes:** (Read and Write property)

### 130.3.8 Rect as NikonRectMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The rectangle.
**Notes:** (Read and Write property)

### 130.3.9 RemoveObject as Boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** True if the object should be removed.
**Notes:** (Read and Write property)

### 130.3.10 RowBytes as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Number of bytes per row of pixels.
**Notes:** (Read and Write property)

### 130.3.11 TotalPixels as NikonSizeMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Total size of image to be transfered.
**Notes:** (Read and Write property)

## 130.4 class NikonLiveImageMBS

### 130.4.1 class NikonLiveImageMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for the live image data structure.
**Notes:** As there are 5 variants of the data structure for the different camera SDKs, some fields may not be filled for the camera you have.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr10

### 130.4.2 Methods

### 130.4.3 AFframes(index as UInt32) as NikonRectMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The auto focus frames array.
**Notes:** Index from 0 to 34 (fixed to 0 for D5100)
Area of the AF frame size and the AF frame center coordinates for thirty-five persons

### 130.4.4 Properties

### 130.4.5 AFAreaIndex as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The Autofocus area index.
**Notes:** From 0 to 34 (fixed to 0 for D5100)
(Read and Write property)

### 130.4.6 AFstate as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** AF mode status of the face detection system.
**Notes:** 0: The face detection system is not set to AF.
1: The face detection system is set to AF.
(Read and Write property)

### 130.4.7 Aperture as Double

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The aperture value.
**Notes:** Aperture = F number*100
Only for type 2 and 3.
(Read only property)

### 130.4.8 AutoFocusHeight as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The height of the auto focus area.
**Notes:** (Read and Write property)

### 130.4.9 AutoFocusWidth as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The width of the auto focus area.
**Notes:** (Read and Write property)

### 130.4.10 AutoFocusX as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The x coordinate of the auto focus area.
**Notes:** (Read and Write property)

### 130.4.11 AutoFocusY as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The y coordinate of the auto focus area.
**Notes:** (Read and Write property)

### 130.4.12 CountDownTime as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The Countdown time.
**Notes:** Countdown every one second starting from 3600 (one hour); countdown starting from thirty seconds with a rise in temperature.
(Read and Write property)

### 130.4.13 DirectionOfRotation as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The Rotation direction.
**Notes:** (Read and Write property)

### 130.4.14 DisplayCenterX as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Display center coordinate.
**Notes:** (Read and Write property)

### 130.4.15 DisplayCenterY as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Display center coordinate.
**Notes:** (Read and Write property)

### 130.4.16 DisplayHeight as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The height of the display area size.
**Notes:** (Read and Write property)

### 130.4.17 DisplayWidth as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The width of the display area size.
**Notes:** (Read and Write property)

### 130.4.18 FaceDetectionCount as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The number of persons whose faces are detected by the system.
**Notes:** From 0 to 35 (Thirty-five is the maximum number of persons for D5100.)
(Read and Write property)

### 130.4.19 FacePriorityAFMode as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Face priority AF mode.
**Notes:** 0: Face priority AF is not active.
1: Face priority AF is active.
(Read and Write property)

### 130.4.20 FocusDriveState as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Focus driving status.
**Notes:** 0: Not driving
1: Driving
(Read and Write property)

### 130.4.21 FocusResult as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Focusing judgment result.
**Notes:** 0: No information
1: Not focused
2: Focused
(Read and Write property)

### 130.4.22 Height as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Height of the JPEG image.
**Notes:** (Read and Write property)

### 130.4.23 JPEGData as MemoryBlock

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The JPEG data of the live image.
**Notes:** You can use JPEGStringToPictureMBS to decode it.
(Read and Write property)

### 130.4.24 MovieRecordingInformation as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Movie recording information.
**Notes:** 0: During LV execution
1: During movie recording
(Read and Write property)

### 130.4.25 RawData as MemoryBlock

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The raw data used to build this image object and the fill the properties.
**Notes:** (Read and Write property)

### 130.4.26 RemainingMovieRecordingTime as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Remaining time of movie recording.
**Notes:** From 0 to 1200000 [ msec ] .
It is valid during the movie recording state.
(Read and Write property)

### 130.4.27 SelectedFocusPoint as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The number of the selected focus area.
**Notes:** Range from 0 to 11.

(Read and Write property)

### 130.4.28 ShutterSpeed as Double

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The shutter speed.
**Notes:** Only for type 2 and 3.
(Read only property)

### 130.4.29 TotalHeight as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The total size of the image.
**Notes:** (Read and Write property)

### 130.4.30 TotalWidth as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The total size of the image.
**Notes:** (Read and Write property)

### 130.4.31 Width as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Width of the JPEG image.
**Notes:** (Read and Write property)

### 130.4.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAFStateDriveImpossibility | 0 | One of the values for state that AF can be driven. AF drive impossibility. |
| kAFStateDrivePossible | 1 | One of the values for state that AF can be driven. AF drive possible. |

Rotation Direction

| Constant | Value | Description |
|---|---|---|
| kDirectionClockWise | 2 | Rotate clockwise |
| kDirectionCounterClockWise | 1 | Rotate counterclockwise |
| kDirectionNone | 0 | No rotation |

Auto Focus Mode

| Constant | Value | Description |
|---|---|---|
| kFacePriorityAFModeActive | 1 | Active |
| kFacePriorityAFModeNotActive | 0 | Inactive |

Focus Driving

| Constant | Value | Description |
|---|---|---|
| kFocusDriveStateDriving | 0 | Driving |
| kFocusDriveStateNotDriving | 1 | Not driving. |

Focus Result

| Constant | Value | Description |
|---|---|---|
| kFocusResultInFocus | 2 | In Focus |
| kFocusResultNoInformation | 0 | Focused |
| kFocusResultOutOfFocus | 1 | Not focused. |

## 130.5 class NikonMBS

### 130.5.1 class NikonMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class to talk to a Nikon camera.
**Notes:** You need to get the SDKs yourself for the various cameras, so you have the PDF manuals, the C header files and the shared libraries.
**Blog Entries**

- MBS Xojo Plugins, version 17.4pr4
- MBS Xojo / Real Studio Plugins, version 13.4pr1

### 130.5.2 Methods

### 130.5.3 Acquire as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Acquires an image.

### 130.5.4 Async_ as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Performs an asynchronously operation.

### 130.5.5 AutoFocus as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Performs autofocus.
**Notes:** Performs operation kNkMAIDCapability_AutoFocus.

### 130.5.6 AvailableDatatypes as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns available data types.

### 130.5.7 Capabilities(what as Integer) as NikonCapInfoMBS()

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the list of capabilities.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.8 CapabilitiesCount(what as Integer) as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the number of capabilities.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.9 Capability(what as Integer, ID as Integer) as NikonCapInfoMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the capability with given ID.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.10 Capture as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Performs a capture.
**Notes:** Performs operation kNkMAIDCapability_Capture.

### 130.5.11 CloseData

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Closes current data object.

### 130.5.12 CloseItem

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Closes current item.

### 130.5.13 CloseModule

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Closes current module.

### 130.5.14 CloseSource

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Closes current source.

### 130.5.15 GetCapBoolean(what as Integer, ID as Integer) as Boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a boolean value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.16 GetCapDefaultBoolean(what as Integer, ID as Integer) as Boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a boolean value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.17 GetCapDefaultDouble(what as Integer, ID as Integer) as Double

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a double value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.18 GetCapDefaultInt32(what as Integer, ID as Integer) as Int32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with an Int32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.19 GetCapDefaultPoint(what as Integer, ID as Integer) as NikonPointMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a point value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.20 GetCapDefaultRect(what as Integer, ID as Integer) as NikonRectMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a rectangle value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.21 GetCapDefaultSize(what as Integer, ID as Integer) as NikonSizeMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a size value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.22 GetCapDefaultString(what as Integer, ID as Integer) as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the default value for a capability with a string value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.23 GetCapDefaultUInt32(what as Integer, ID as Integer) as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with an UInt32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.24 GetCapDouble(what as Integer, ID as Integer) as Double

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a double value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.25 GetCapEnumPacketString(what as Integer, ID as Integer, byref current as UInt32) as string()

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a packet string enum value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.26 GetCapEnumString(what as Integer, ID as Integer, byref current as UInt32) as string()

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a string enum value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.27 GetCapEnumUInt32(what as Integer, ID as Integer, byref current as UInt32) as UInt32()

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with an enum UInt32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.28 GetCapInt32(what as Integer, ID as Integer) as Int32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with an Int32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.29 GetCapPoint(what as Integer, ID as Integer) as NikonPointMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a point value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.30 GetCapRange(what as Integer, ID as Integer, byref Value as Double, byref DefaultValue as Double, byref ValueIndex as UInt32, byref DefaultIndex as UInt32, byref LowerValue as Double, byref UpperValue as Double, byref Steps as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a range value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.31 GetCapRect(what as Integer, ID as Integer) as NikonRectMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a rectangle value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.32 GetCapSize(what as Integer, ID as Integer) as NikonSizeMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a size value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.33 GetCapString(what as Integer, ID as Integer) as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with a string value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.34 GetCapUInt32(what as Integer, ID as Integer) as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a capability with an UInt32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.35 GetItemCount as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries number of items.

### 130.5.36 GetLiveViewImage(type as Integer) as NikonLiveImageMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries a live image.
**Notes:** Performs kNkMAIDCapability_GetLiveViewImage and decodes data returned into a NikonLiveImageMBS object.
Type: Which type of device you have. Value from 1 to 5.

### 130.5.37 GetSourceCount as UInt32

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the number of sources (cameras).

### 130.5.38 GetVideoImageData(Offset as UInt32, BlockSize as UInt32) as String

MBS Cameras Plugin, Plugin Version: 13.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries data of a video file.
**Notes:** Please use OpenData before to open the video.

### 130.5.39 GetVideoImageDataSize as UInt32

MBS Cameras Plugin, Plugin Version: 13.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries data size of a video.
**Notes:** Please use OpenData before to open the video.

### 130.5.40 LoadLibrary(file as folderitem) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Loads the Nikon shard library.
**Notes:** Returns true on success.
Please pass folderitem pointing to dll on Windows and dylib on Mac OS X.
See also:

- 130.5.41 LoadLibrary(path as string) as boolean 18241

### 130.5.41 LoadLibrary(path as string) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Loads the Nikon shard library.
**Notes:** Returns true on success.
Please pass string path pointing to dll on Windows and dylib on Mac OS X.
See also:

- 130.5.40 LoadLibrary(file as folderitem) as boolean 18241

### 130.5.42 OpenData(type as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens data of given type.

### 130.5.43 OpenItem(index as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens the item with the given index.
**Notes:** Index is zero based.

### 130.5.44 OpenModule as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens the module.

### 130.5.45 OpenSource(index as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens the source with the given index.
**Notes:** Index is zero based.

### 130.5.46 PreCapture as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Prepares a capture.
**Notes:** Performs operation kNkMAIDCapability_PreCapture.

### 130.5.47 SetCapBoolean(what as Integer, ID as Integer, value as Boolean)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with a boolean value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.48 SetCapDouble(what as Integer, ID as Integer, value as Double)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an double value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.49 SetCapEnumPackedString(what as Integer, ID as Integer, EnumIndex as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an enum of PacketString values.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.
You first query the enum to get the list of options, than you can set a new one by passing index here.

### 130.5.50 SetCapEnumUInt32(what as Integer, ID as Integer, Value as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an enum UInt32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.51 SetCapInt32(what as Integer, ID as Integer, value as Int32)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an Int32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.52 SetCapPoint(what as Integer, ID as Integer, value as NikonPointMBS)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with a point value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.53 SetCapRange(what as Integer, ID as Integer, Value as Double, ValueIndex as UInt32) as boolean

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with a range value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.54 SetCapRect(what as Integer, ID as Integer, value as NikonRectMBS)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with a rectangle value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.55 SetCapSize(what as Integer, ID as Integer, value as NikonSizeMBS)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an size value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.56 SetCapString(what as Integer, ID as Integer, value as String)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with a string value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.57 SetCapUInt32(what as Integer, ID as Integer, value as UInt32)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with an UInt32 value.
**Notes:** What: Selects what to query. Can be kModule, kSource, kItem or kData.

### 130.5.58 Properties

### 130.5.59 FunctionPtr as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The main entry function pointer for the Nikon library.
**Notes:** (Read only property)

### 130.5.60 Lasterror as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read only property)

### 130.5.61 LoadErrorMessage as String

MBS Cameras Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The error message from loading library.
**Notes:** Set by LoadLibrary methods to help debugging.

Windows error 193 means that 64-bit Xojo app tried to load 32-bit library or 32-bit Xojo app tried to load 64-bit library. The bit level must match between app and library. For Mac OS X the error message will tell you about wrong architecture.
(Read only property)

### 130.5.62 Events

### 130.5.63 FileDownloadComplete(info as NikonFileInfoMBS, data as Memoryblock, length as Integer)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: .

**Function:** Informs you about a finished file download.

### 130.5.64 ImageDownloadComplete(info as NikonImageInfoMBS, data as Memoryblock, length as Integer)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: .

**Function:** This event informs you about a finished event.

### 130.5.65 Progress(Command as Integer, Param as Integer, Done as UInt32, Total as UInt32, Percent as Double)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: .

**Function:** This event informs you about progress of an ongoing operation.

### 130.5.66 Constants

Selector Constants

| Constant | Value | Description |
|---|---|---|
| kData | 8 | Apply to data. |
| kDevice | 2 | Apply to device/source. |
| kItem | 4 | Apply to item. |
| kModule | 1 | Apply to module. |
| kSource | 2 | Apply to device/source. |

Data Object Types

| Constant | Value | Description |
|---|---|---|
| kDataObjTypeFile | 16 | Other file |
| kDataObjTypeImage | 1 | Image file |
| kDataObjTypeSound | 2 | Sound file |
| kDataObjTypeThumbnail | 8 | Picture thumbnail |
| kDataObjTypeVideo | 4 | Video file |

## 130.6 class NikonPointMBS

### 130.6.1 class NikonPointMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for a point.

### 130.6.2 Methods

### 130.6.3 Constructor(x as Integer = 0, y as Integer = 0)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The constructor.

### 130.6.4 Operator_Convert as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Converts the point to a string for displaying.

### 130.6.5 Properties

### 130.6.6 x as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The x coordinate.
**Notes:** (Read and Write property)

### 130.6.7 y as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The y coordinate.
**Notes:** (Read and Write property)

## 130.7 class NikonRectMBS

### 130.7.1 class NikonRectMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for a rectangle.

### 130.7.2 Methods

### 130.7.3 Constructor(x as Integer = 0, y as Integer = 0, w as Integer = 0, h as Integer = 0)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The constructor.

### 130.7.4 Operator_Convert as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Converts the rectangle to a string for displaying.

### 130.7.5 Properties

### 130.7.6 h as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The height of the rectangle.
**Notes:** (Read and Write property)

### 130.7.7 w as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The width of the rectangle.
**Notes:** (Read and Write property)

### 130.7.8 x as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The x coordinate of the rectangle.
**Notes:** (Read and Write property)

### 130.7.9 y as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The y coordinate of the rectangle.
**Notes:** (Read and Write property)

## 130.8 class NikonSizeMBS

### 130.8.1 class NikonSizeMBS

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The class for a size.

### 130.8.2 Methods

### 130.8.3 Constructor(w as Integer = 0, h as Integer = 0)

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The constructor.

### 130.8.4 Operator_Convert as String

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Converts the size to a string for displaying.

### 130.8.5 Properties

### 130.8.6 h as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The height of the size object.
**Notes:** (Read and Write property)

### 130.8.7 w as Integer

MBS Cameras Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The width of the size object.
**Notes:** (Read and Write property)

# Chapter 131

# Notifications

## 131.1 class NotificationCenterMBS

### 131.1.1 class NotificationCenterMBS

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for notifications sent on Mac OS X.
**Notes:** From Apple's help, but modified:

Distributed notifications allow an application to broadcast a message to any number of other applications without needing to know who those other applications are, or even if the other applications exist. Every application type —Cocoa, Carbon, BSD —can use distributed notifications.

An application, the target application in this case, expresses an interest in receiving a broadcasted message by registering itself with the system's distributed notification center, identifying exactly what message, or notification type, it wants to receive. The notification type is defined by an arbitrary string agreed upon by the sender and receiver of the notification. As an example, Cocoa's NSWindow class defines the notification type "NSWindowDidCloseNotification", which an NSWindow instance broadcasts when its window closes. Any other object can register to receive this notification. (This notification, however, is internal to a single application and is not distributed to the rest of the system.)

In addition to the message, the application can identify the particular object sending the message. When the sender and receiver are in the same application—in other words, using nondistributed notifications—the observed object can be anything. When using distributed notifications, though, the object must be a string. A useful choice for the observed string is the bundle identifier of the target application.

In registering for the notification, the application provides a class with an Receive event, which will later be called.

Next, the broadcasting application —your preference pane —sends the notification. It calls the system's notification center, tells the center what notification to send, and optionally passes a dictionary containing additional information. The dictionary can be used to pass the modified preferences directly to the application. Or, the preference pane can choose not to use the dictionary and instead write the changes out to disk. The notification is then used to tell the application to update its preferences from the disk.

The notification center looks up all the applications that registered to receive the given notification type from the particular instance. It then notifies each application's run loop of the notification and gives it a copy of the dictionary. The selected callback function or method is executed during the application's next pass through its run loop.

When using Preference Services, be certain to flush changes to the disk with the appropriate synchronize functions before sending notifications of changes. Otherwise, due to the caching performed by Preference Services, the disk may not accurately reflect the changes when the target receives the notification. Likewise, the target application must resynchronize its preferences after receiving the notification.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr10

### 131.1.2 Methods

### 131.1.3 Add(name as CFStringMBS, obj as CFObjectMBS, flags as Integer)

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a new callback.
**Notes:** This function costs around 24 bytes of memory per call which are never released (needed for the callback between framework and RB).

Values for the flags:

| | | |
|---|---|---|
| CFNotificationSuspensionBehaviorDrop | 1 | The server will not queue any notifications with this name and object while the process/app is in the background. |
| CFNotificationSuspensionBehaviorCoalesce | 2 | The server will only queue the last notification of the specified name and object; earlier notifications are dropped. |
| CFNotificationSuspensionBehaviorHold | 3 | The server will hold all matching notifications until the queue has been filled (queue size determined by the server) at which point the server may flush queued notifications. |
| CFNotificationSuspensionBehaviorDeliverImmediately | 4 | The server will deliver notifications matching this registration whether or not the process is in the background. When a notification with this suspension behavior is matched, it has the effect of first flushing any queued notifications. |

### 131.1.4 close(name as CFStringMBS, obj as CFObjectMBS)

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Closes the given callback.

### 131.1.5 closeAll

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Closes all registered callbacks.
**Notes:** This is called by the destructor.

### 131.1.6 Post(name as CFStringMBS, obj as CFObjectMBS, userinfo as CFDictionaryMBS, deliverImmediately as Boolean)

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Posts a new notification.
**Notes:** Obj and userinfo may be nil.
See also:

- 131.1.7 Post(name as CFStringMBS, obj as CFObjectMBS, userinfo as CFDictionaryMBS, options as Integer) 18253

### 131.1.7 Post(name as CFStringMBS, obj as CFObjectMBS, userinfo as CFDictionaryMBS, options as Integer)

MBS MacCF Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Posts a new notification.
**Example:**

```
dim n as new NotificationCenterMBS
n.Post(NewCFStringMBS("test"), nil, nil, n.kCFNotificationPostToAllSessions + n.kCFNotificationDeliverImmediately)
```

**Notes:** Obj and userinfo may be nil.
Requires Mac OS X 10.3.
For options you can use a combination with kCFNotificationDeliverImmediately=1 and kCFNotificationPostToAllSessions=2.
See also:

- 131.1.6 Post(name as CFStringMBS, obj as CFObjectMBS, userinfo as CFDictionaryMBS, deliverImmediately as Boolean) 18253

### 131.1.8 Properties

### 131.1.9 Available as boolean

MBS MacCF Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the needed framework was successfull loaded.
**Notes:** (Read only property)

### 131.1.10 Events

### 131.1.11 Received(name as CFStringMBS, obj as CFObjectMBS, userinfo as CFDictionaryMBS)

MBS MacCF Plugin, Platform: macOS, Targets: .

**Function:** A notification was received.
**Notes:** All parameters may be for any reason nil.

### 131.1.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kCFNotificationDeliverImmediately | 1 | One of the constant you can use for the Post Method. |
| kCFNotificationPostToAllSessions | 2 | One of the constant you can use for the Post Method. |

## 131.2 class NotificationMBS

### 131.2.1 class NotificationMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an application internal notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification")
NotificationMBS.send(n)
```

**Notes:** The point of notifications is to inform some other part of your application about something. For example a chart updating if the user enters data in textfields.

So you register for notifications in existing classes/windows with the NotificationReceiverMBS interface. Or you create a subclass of the NotificationObserverMBS class to receive notifications

All notifications are delivered on the same thread as the send method. If needed we could have an asyncron notification system. Please email for that.

Other notifications:

NSNotification: Notifications send from the Cocoa frameworks within your application over NSNotificationCenterMBS class or send across all applications with NSDistributedNotificationCenterMBS.

MacNotificationMBS: A notification message to the user which may have a sound, a message box and/or a jumping dock icon.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.2pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8

**Xojo Developer Magazine**

- 12.1, page 9: News

### 131.2.2 Methods

### 131.2.3 Constructor(name as string = ””, ref as Variant = nil, tag as Variant = nil)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new notification with the given values.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification")
NotificationMBS.send(n)
```

### 131.2.4 RegisterReceiver(target as NotificationReceiverMBS, name as string = ””, ref as Variant = nil)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registers a receiver.
**Notes:** You have a class/window and you add NotificationReceiverMBS to the interfaces. Xojo will add a ReceivedNotification method which looks like this:

ReceivedNotification(name as string, ref as Variant, tag as Variant, notification as NotificationMBS)

Don't forget to call UnregisterReceiver later in the Close event or destructor.

If you register with name = ”” and ref = nil, you receive all notifications. If you have a name, you get only notifications matching the name (case sensitive compare). If you have a reference object, you receive only objects for that object. And you can use both name and object.

### 131.2.5 Send(name as string, ref as object = nil, tag as Variant = nil)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a notification.
**Example:**

```
NotificationMBS.Send("DatabaseChangedNotification")
```

**Notes:** This is a convenience method which creates a new NSNotificationMBS object and sends it.

All registered receivers will get the ReceivedNotification method called as well as all registered observers will get an ReceivedNotification event.
Of course notifications are filtered by name and/or referenced object.
See also:


- 131.2.6 Send(notification as NotificationMBS) 18257


### 131.2.6 Send(notification as NotificationMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification")
NotificationMBS.send(n)
```

**Notes:** All registered receivers will get the ReceivedNotification method called as well as all registered observers will get an ReceivedNotification event.
Of course notifications are filtered by name and/or referenced object.
See also:


- 131.2.5 Send(name as string, ref as object = nil, tag as Variant = nil) 18256


### 131.2.7 SendDelayed(name as string, ref as object = nil, tag as Variant = nil)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a notification.
**Example:**

```
NotificationMBS.SendDelayed("DatabaseChangedNotification")
```

**Notes:** Same as Send method, but the notification will be delivered later on the main thread. The notification is queued and will wait until there is free CPU time.
See also:


- 131.2.8 SendDelayed(notification as NotificationMBS) 18257


### 131.2.8 SendDelayed(notification as NotificationMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification", window1, "test")
NotificationMBS.SendDelayed(n)
```

**Notes:** Same as Send method, but the notification will be delivered later on the main thread. The notification is queued and will wait until there is free CPU time.
See also:

- 131.2.7 SendDelayed(name as string, ref as object = nil, tag as Variant = nil) 18257

### 131.2.9 SendNotification

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends this notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification")
n.SendNotification
```

**Notes:** All registered receivers will get the ReceivedNotification method called as well as all registered observers will get an ReceivedNotification event.
Of course notifications are filtered by name and/or referenced object.

### 131.2.10 SendNotificationDelayed

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends a notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification")
n.SendNotificationDelayed
```

**Notes:** Same as SendNotification method, but the notification will be delivered later on the main thread. The notification is queued and will wait until there is free CPU time.

### 131.2.11 UnregisterReceiver(target as NotificationReceiverMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unregisters an receiver.

### 131.2.12 Properties

### 131.2.13 Name as String

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name for the notification.
**Example:**

```
dim n as new NotificationMBS("DatabaseChangedNotification", window1, "test")
MsgBox n.Name
```

**Notes:** (Read and Write property)

### 131.2.14 Ref as Variant

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference object.
**Notes:** Defines which object the notification references. If nil, you target all objects.
(Read and Write property)

### 131.2.15 Tag as Variant

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attached value.
**Example:**

```
dim n as new NotificationMBS
n.Tag = "Hello World"
```

**Notes:** You can use this property as you like.
This value is sent to the receivers. It allows you to pass an additional value without needing to write a

subclass of the NotificationMBS class.
(Read and Write property)

## 131.3 class NotificationObserverMBS

### 131.3.1 class NotificationObserverMBS

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for receiving notifications.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8

### 131.3.2 Methods

### 131.3.3 Constructor(name as string = """, ref as object = nil, tag as Variant = nil)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new notification observer.
**Notes:** If you register with name = "" and ref = nil, you receive all notifications. If you have a name, you get only notifications matching the name (case sensitive compare). If you have a reference object, you receive only objects for that object. And you can use both name and object.

### 131.3.4 Properties

### 131.3.5 Name as String

MBS DataTypes Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the notification to listen for.
**Notes:** (Read only property)

### 131.3.6 Ref as Object

MBS DataTypes Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The target object to listen for.
**Notes:** (Read only property)

### 131.3.7 Events

### 131.3.8 ReceivedNotification(name as string, ref as Variant, tag as Variant, notification as NotificationMBS)

MBS DataTypes Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called if a notification was received.
**Notes:** This event is registered automatically, so do not call RegisterReceiver with the NotificationObserverMBS object.

If you register with name = "" and ref = nil, you receive all notifications. If you have a name, you get only notifications matching the name (case sensitive compare). If you have a reference object, you receive only objects for that object. And you can use both name and object.

## 131.4 class NSDistributedNotificationCenterMBS

### 131.4.1 class NSDistributedNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The NSDistributedNotificationCenter class provides a way to send notifications to objects in other tasks.
**Notes:** It takes NSNotification objects and broadcasts them to any objects in other tasks that have registered for the notification with their task's default distributed notification center.

The NSDistributedNotificationCenter class implements a notification center that can distribute notifications asynchronously to tasks other than the one in which the notification was posted. An instance of this class are known as a distributed notification center.

Each task has a default distributed notification center that you access with the defaultCenter class method. There may be different types of distributed notification centers. Currently there is a single type—NSLocalNotificationCenterType. This type of distributed notification center handles notifications that can be sent between tasks on a single computer. For communication between tasks on different computers, use Distributed Objects Programming Topics.

Posting a distributed notification is an expensive operation. The notification gets sent to a system-wide server that distributes it to all the tasks that have objects registered for distributed notifications. The latency between posting the notification and the notification's arrival in another task is unbounded. In fact, when too many notifications are posted and the server's queue fills up, notifications may be dropped.
Subclass of the NSNotificationCenterMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr11
- MBS REALbasic Plugins, version 10.6pr6

### 131.4.2 Methods

### 131.4.3 addObserver(observer as NSNotificationObserverMBS, name as string, theObject as Variant, suspensionBehavior as Integer)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds an entry to the receiver's dispatch table with a specific observer and suspended-notifications behavior, and optional notification name and sender.
**Notes:** observer: Object registering as an observer. Must not be nil.
name: The name of the notification for which to register the observer; that is, only notifications with this name are delivered to the observer. When nil, the notification center doesn't use a notification's name to decide whether to deliver it to the observer.

theObject: The object whose notifications the observer wants to receive; that is, only notifications sent by this sender are delivered to the observer. When nil, the notification center doesn't use a notification's sender to decide whether to deliver it to the observer.
suspensionBehavior: Notification posting behavior when notification delivery is suspended.

The receiver does not retain notificationObserver. Therefore, you should always send removeObserver to the receiver before releasing notificationObserver.

### 131.4.4 Constructor

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new instance with the default distributed notification center, representing the local notification center for the computer.
**Notes:** Default distributed notification center for the computer.

This method calls notificationCenterForType: with an argument of NSLocalNotificationCenterType.

### 131.4.5 defaultCenter as NSDistributedNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default distributed notification center, representing the local notification center for the computer.
**Notes:** Default distributed notification center for the computer.

This method calls notificationCenterForType: with an argument of NSLocalNotificationCenterType.

### 131.4.6 notificationCenterForType(name as string) as NSDistributedNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the distributed notification center for a particular notification center type.
**Notes:** name: Notification center type being inquired about.

Currently only one type, NSLocalNotificationCenterType, is supported.

### 131.4.7 NSLocalNotificationCenterType as string

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This constant specifies the notification center type.
**Notes:** Distributes notifications to all tasks on the sender's computer.

### 131.4.8 postNotificationName(name as string, theObject as string, userInfo as dictionary, deliverImmediately as boolean)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a notification with information and an immediate-delivery specifier, and posts it to the receiver.
**Notes:** name: Name of the notification to post. Must not be nil.
theObject: Sender of the notification. May be "".
userInfo: Dictionary containing additional information. May be nil.
deliverImmediately: Specifies when to deliver the notification. When false, the receiver delivers notifications to their observers according to the suspended-notification behavior specified in the corresponding dispatch table entry. When true, the receiver delivers the notification immediately to its observers.

This is the preferred method for posting notifications.
The notificationInfo dictionary is serialized as a property list, so it can be passed to another task. In the receiving task, it is deserialized back into a dictionary. This serialization imposes some restrictions on the objects that can be placed in the notificationInfo dictionary. See XML Property Lists for details.
See also:

- 131.4.9 postNotificationName(name as string, theObject as string, userInfo as dictionary, options as UInt32) 18265

### 131.4.9 postNotificationName(name as string, theObject as string, userInfo as dictionary, options as UInt32)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a notification with information, and posts it to the receiver.
**Example:**

```
dim notifyData as string = "Hello World"
dim notifyName as string = "Test"

Dim notifyDict As New Dictionary
notifyDict.Value("nData")=notifyData
NSDistributedNotificationCenterMBS.DefaultCenter.postNotificationName(notifyName, "", notifyDict, 2)
```

**Notes:** name: Name of the notification to post. Must not be nil.
theObject: Sender of the notification. May be "".
userInfo: Dictionary containing additional information. May be nil.
options: Specifies how the notification is posted to the task and when to deliver it to its observers.

The userInfo dictionary is serialized as a property list, so it can be passed to another task. In the receiving task, it is deserialized back into a dictionary. This serialization imposes some restrictions on the objects that can be placed in the notificationInfo dictionary. See XML Property Lists for details.
See also:

- 131.4.8 postNotificationName(name as string, theObject as string, userInfo as dictionary, deliverImmediately as boolean) 18265

### 131.4.10 Properties

### 131.4.11 suspended as boolean

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A boolean value that indicates whether notification delivery is suspended.
**Notes:** The NSApplication class automatically suspends distributed notification delivery when the application is not active. Applications based on the Application Kit framework should let AppKit manage the suspension of notification delivery. Foundation-only programs may have occasional need to use this method.
(Read and Write computed property)

### 131.4.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSNotificationDeliverImmediately | 1 | One of the option constants to specify the behavior of noti the postNotificationName method. When set, the notification is delivered immediately to all of their suspension behavior or suspension state. Whe normal suspension behavior of notification observers to t |
| NSNotificationPostToAllSessions | 2 | One of the option constants to specify the behavior of noti the postNotificationName method. When set, the notification is posted to all sessions. Wh cation is sent only to applications within the same login task. |
| NSNotificationSuspensionBehaviorCoalesce | 2 | One of the constants to specify the types of notificatio behaviors. The server only queues the last notification of the specif earlier notifications are dropped. In cover methods for havior is not an explicit argument, NSNotificationSuspen is the default. |
| NSNotificationSuspensionBehaviorDeliverImmediately | 4 | One of the constants to specify the types of notificatio behaviors. The server delivers notifications matching this registr whether Suspended is set to true. When a notification behavior is matched, it has the effect of first flushing any The effect is as if setSuspended: with an argument of fa the application is suspended, followed by the notification livered, followed by a transition back to the previous suspe state. |
| NSNotificationSuspensionBehaviorDrop | 1 | One of the constants to specify the types of notificatio behaviors. The server does not queue any notifications with this n Suspended is set to false. |
| NSNotificationSuspensionBehaviorHold | 3 | One of the constants to specify the types of notificatio behaviors. The server holds all matching notifications until the queue size determined by the server), at which point the serv notifications. |

## 131.5 class NSNotificationCenterMBS

### 131.5.1 class NSNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** An NSNotificationCenter object (or simply, notification center) provides a mechanism for broadcasting information within a task.
**Notes:** An NSNotificationCenter object is essentially a notification dispatch table.

This is for sending broadcast messages from one application to other application on same computer.
For the notification center in Mac OS X 10.8, please use NSUserNotificationMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr11

### 131.5.2 Methods

### 131.5.3 addObserver(observer as NSNotificationObserverMBS, name as string="", theObject as Variant=nil)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Adds an entry to the receiver's dispatch table with an observer and optional criteria: notification name and sender.
**Notes:** observer: Object registering as an observer. This value must not be nil.
name: The name of the notification for which to register the observer; that is, only notifications with this name are delivered to the observer. If you pass nil, the notification center doesn't use a notification's name to decide whether to deliver it to the observer.
theObject: The object whose notifications the observer wants to receive; that is, only notifications sent by this sender are delivered to the observer. If you pass nil, the notification center doesn't use a notification's sender to decide whether to deliver it to the observer.

### 131.5.4 Constructor

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The constructor to create a new instance of notification center pointing to the default notification center.
**Notes:** The current task's default notification center, which is used for system notifications.

### 131.5.5 defaultCenter as NSNotificationCenterMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the task's default notification center.
**Notes:** The current task's default notification center, which is used for system notifications.

### 131.5.6 postNotification(notification as NSNotificationMBS)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Posts a given notification to the receiver.
**Notes:** notification: The notification to post. This value must not be nil.

### 131.5.7 postNotificationName(name as string)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Creates a notification with a given name and sender and posts it to the receiver.
**Notes:** name: The name of the notification.
theObject: The object posting the notification.
See also:

- 131.5.8 postNotificationName(name as string, theObject as Variant) 18269
- 131.5.9 postNotificationName(name as string, theObject as Variant, userInfo as dictionary) 18269

### 131.5.8 postNotificationName(name as string, theObject as Variant)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Creates a notification with a given name and sender and posts it to the receiver.
**Notes:** name: The name of the notification.
theObject: The object posting the notification.
See also:

- 131.5.7 postNotificationName(name as string) 18269
- 131.5.9 postNotificationName(name as string, theObject as Variant, userInfo as dictionary) 18269

### 131.5.9 postNotificationName(name as string, theObject as Variant, userInfo as dictionary)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Creates a notification with a given name, sender, and information and posts it to the receiver.
**Notes:** name: The name of the notification.
theObject: The object posting the notification.
userInfo: Information about the the notification. May be nil.

This method is the preferred method for posting notifications.
See also:

- 131.5.7 postNotificationName(name as string) 18269
- 131.5.8 postNotificationName(name as string, theObject as Variant) 18269

### 131.5.10 removeObserver(observer as NSNotificationObserverMBS)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Removes all the entries specifying a given observer from the receiver's dispatch table.
**Notes:** observer: The observer to remove. Must not be nil.

Be sure to invoke this method before notificationObserver or any object specified in addObserver is deallocated.
See also:

- 131.5.11 removeObserver(observer as NSNotificationObserverMBS, name as string, theObject as Variant=nil) 18270

### 131.5.11 removeObserver(observer as NSNotificationObserverMBS, name as string, theObject as Variant=nil)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Removes matching entries from the receiver's dispatch table.
**Notes:** notificationObserver: Observer to remove from the dispatch table. Specify an observer to remove only entries for this observer. Must not be nil, or message will have no effect.
notificationName: Name of the notification to remove from dispatch table. Specify a notification name to remove only entries that specify this notification name. When nil, the receiver does not use notification names as criteria for removal.
notificationSender: Sender to remove from the dispatch table. Specify a notification sender to remove only entries that specify this sender. When nil, the receiver does not use notification senders as criteria for removal.

Be sure to invoke this method before the observer object or any object specified in addObserver is deallocated.
See also:

- 131.5.10 removeObserver(observer as NSNotificationObserverMBS) 18270

### 131.5.12 Properties

### 131.5.13 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal reference to the notification center.
**Notes:** (Read and Write property)

## 131.6 class NSNotificationMBS

### 131.6.1 class NSNotificationMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** NSNotification objects encapsulate information so that it can be broadcast to other objects by an NSNotificationCenter object.
**Notes:** An NSNotification object (referred to as a notification) contains a name, an object, and an optional dictionary. The name is a tag identifying the notification. The object is any object that the poster of the notification wants to send to observers of that notification (typically, it is the object that posted the notification). The dictionary stores other related objects, if any. NSNotification objects are immutable objects.

You can create a notification object with the class method notificationWithName. However, you don't usually create your own notifications directly. The NSNotificationCenter method postNotificationName allow you to conveniently post a notification without creating it first.

On Windows you can use WinNotificationMBS class for similar functionality.

This is for sending broadcast messages from one application to other application on same computer.
For the notification center in Mac OS X 10.8, please use NSUserNotificationMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr4
- MBS Xojo / Real Studio Plugins, version 14.2pr3
- MBS Real Studio Plugins, version 12.1pr5
- Windows Notifications

### 131.6.2 Methods

### 131.6.3 Constructor(handle as Integer)

MBS MacBase Plugin, Plugin Version: 13.4, Platform: macOS, Targets: All.

**Function:** Creates a notification object with a NSNotification reference.
**Notes:** The object is retained and later in destructor it is released.
See also:

- 131.6.4 Constructor(name as string, theObject as Variant = nil, userInfo as dictionary = nil) 18273

### 131.6.4 Constructor(name as string, theObject as Variant = nil, userInfo as dictionary = nil)

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Creates a notification object with a specified name, object, and user information.
**Example:**

```
dim n as new NSNotificationMBS("Hello")
MsgBox n.name
```

**Notes:** name: The name for the new notification. May not be nil.
theObject: The object for the new notification. Can be nil.
userInfo: The user information dictionary for the new notification. May be nil.
See also:

- 131.6.3 Constructor(handle as Integer) 18272

### 131.6.5 notificationWithName(name as string, theObject as Variant = nil, userInfo as dictionary = nil) as NSNotificationMBS

MBS MacBase Plugin, Plugin Version: 11.3, Platform: macOS, Targets: All.

**Function:** Returns a notification object with a specified name, object, and user information.
**Example:**

```
dim n as NSNotificationMBS = NSNotificationMBS.notificationWithName("Hello")
MsgBox n.name
```

**Notes:** name: The name for the new notification. May not be nil.
theObject: The object for the new notification. Can be nil.
userInfo: The user information dictionary for the new notification. May be nil.

### 131.6.6 Print

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** Writes description for this event descriptor to the console.
**Notes:** You can see result in Console.app.

### 131.6.7 Properties

### 131.6.8 description as string

MBS MacBase Plugin, Plugin Version: 12.1, Platform: macOS, Targets: All.

**Function:** The descriptor for this notification.
**Example:**

```
dim n as NSNotificationMBS = NSNotificationMBS.notificationWithName("Hello")
MsgBox n.description
```

**Notes:** This is a text representation for debugging.
(Read only property)

### 131.6.9 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSNotification object.
**Notes:** (Read and Write property)

### 131.6.10 name as string

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the name of the notification.
**Notes:** The name of the notification. Typically you use this method to find out what kind of notification you are dealing with when you receive a notification.
Notification names can be any string. To avoid name collisions, you might want to use a prefix that's specific to your application.
(Read only property)

### 131.6.11 objectHandle as Integer

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The reference to the object.
**Notes:** May be useful for declares.
(Read only property)

### 131.6.12 objectVariant as Variant

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the object associated with the notification.
**Notes:** The object associated with the notification. This is often the object that posted this notification. It may be nil.
Typically you use this method to find out what object a notification applies to when you receive a notification.

See the FAQ for the list of supported NSObject types for variant conversion.
(Read only property)

### 131.6.13 userInfo as dictionary

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** Returns the user information dictionary associated with the receiver.
**Example:**

```
// tests dictionary conversion:

dim d as new Dictionary

dim x as new Dictionary
x.Value("Hello") = "World"

dim b as Boolean = true
dim s as Single = 2.3
dim dd as Double = 3.4
dim h as int64 = 1234

d.Value(1) = 1
d.Value(2) = 2.0
d.Value(3) = x
d.Value(4) = "Hello"
d.Value(5) = b
d.Value(6) = s
d.Value(7) = dd
d.Value(8) = h

dim n as new NSNotificationMBS("test", nil, d)

dim nd as Dictionary = n.userInfo

// check nd object
break
```

**Notes:** Returns the user information dictionary associated with the receiver. May be nil.
The user information dictionary stores any additional objects that objects receiving the notification might use.
(Read only property)

## 131.7 class NSNotificationObserverMBS

### 131.7.1 class NSNotificationObserverMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The notification class which you use to receive notifications.
**Notes:** To use this class, please create a subclass. There you can put code in the event handler to do whatever you need in case your notification is received.

Than you create in code objects form this class. Normally only one. And you call addObserver on the NSNotificationCenterMBS or NSDistributedNotificationCenterMBS objects you have to tell the system which notifications you want to receive.

Do not forget to call removeObserver on the notification center for all your observers to avoid crashes.
**Blog Entries**

- Tip of the day: Windows Notifications
- MBS Real Studio Plugins, version 12.3pr11

### 131.7.2 Methods

### 131.7.3 Constructor

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The constructor which creates the observer.
**Notes:** On success the handle property is not zero.

### 131.7.4 Destructor

MBS MacBase Plugin, Plugin Version: 12.3, Platform: macOS, Targets: All.

**Function:** The Destructor.
**Notes:** Removes in plugin version 12.3 and newer the observer from the NSNotificationCenterMBS and NSDistributedNotificationCenterMBS to avoid crashes.

### 131.7.5 Properties

### 131.7.6 Handle as Integer

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: All.

**Function:** The internal handle to the observer object.
**Notes:** (Read and Write property)

### 131.7.7 Events

### 131.7.8 GotNotification(notification as NSNotificationMBS)

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: .

**Function:** The event called if a new notification is received.
**Notes:** The MBS Plugin makes sure you receive this event always on the main thread.

## 131.8 class WinNotificationMBS

### 131.8.1 class WinNotificationMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This is a class to send broadcast message to all windows applications listening for this notification.
**Notes:** If you have several applications, you can send notifications from one to another.

Windows Desktop application: Sending and receiving notification works.
Windows Console application: Sending works.
Windows Web application: Sending works. Receives notification of own application, but of others.

This class is useful to tell other instance of your application or other application about something. Like for example whether background process is done.

On Mac OS X you can use NSNotificationMBS class for similar functionality.

With 14.2 plugins we added possibility to listen for any windows broadcast message. Like for example for WM_TIMECHANGE.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo Plugins, version 17.1pr2
- MDI Window Background in Xojo
- MBS Xojo / Real Studio Plugins, version 16.2pr1
- Tip of the day: Windows Notifications
- MBS Xojo / Real Studio Plugins, version 14.2pr9
- MBS Xojo / Real Studio Plugins, version 14.2pr5
- MonkeyBread Software releases MBS Real Studio plug-ins in version 12.1
- MBS Real Studio Plugins, version 12.1pr5
- Windows Notifications

**Xojo Developer Magazine**

- 15.3, page 11: News

### 131.8.2 Methods

### 131.8.3 Constructor

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The default constructor.
**Notes:** Creates an invisible dummy window to listen for notifications.
See also:


- 131.8.4 Constructor(Control as DesktopUIControl) 18280
- 131.8.5 Constructor(control as RectControl) 18280
- 131.8.6 Constructor(Window as DesktopWindow) 18281
- 131.8.7 Constructor(Window as window) 18281
- 131.8.8 Constructor(WindowHandle as Integer) 18282


### 131.8.4 Constructor(Control as DesktopUIControl)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The control constructor.
**Notes:** Takes an existing Xojo control and intercepts messages going there to listen for the notifications you are interested for.
The class keeps a reference to the control to make sure it is not destroyed before this object is destroyed.
See also:


- 131.8.3 Constructor 18280
- 131.8.5 Constructor(control as RectControl) 18280
- 131.8.6 Constructor(Window as DesktopWindow) 18281
- 131.8.7 Constructor(Window as window) 18281
- 131.8.8 Constructor(WindowHandle as Integer) 18282


### 131.8.5 Constructor(control as RectControl)

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** The control constructor.
**Notes:** Takes an existing Xojo control and intercepts messages going there to listen for the notifications you are interested for.
The class keeps a reference to the control to make sure it is not destroyed before this object is destroyed.
See also:

- 131.8.3 Constructor 18280
- 131.8.4 Constructor(Control as DesktopUIControl) 18280
- 131.8.6 Constructor(Window as DesktopWindow) 18281
- 131.8.7 Constructor(Window as window) 18281
- 131.8.8 Constructor(WindowHandle as Integer) 18282


### 131.8.6 Constructor(Window as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The window constructor.
**Notes:** Takes an existing Xojo Window and intercepts messages going there to listen for the notifications you are interested for.
If you listen for global notifications sent to all windows, we prefer the other constructor.
The class keeps a reference to the window to make sure it is not destroyed before this object is destroyed.
See also:


- 131.8.3 Constructor 18280
- 131.8.4 Constructor(Control as DesktopUIControl) 18280
- 131.8.5 Constructor(control as RectControl) 18280
- 131.8.7 Constructor(Window as window) 18281
- 131.8.8 Constructor(WindowHandle as Integer) 18282


### 131.8.7 Constructor(Window as window)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** The window constructor.
**Notes:** Takes an existing Xojo Window and intercepts messages going there to listen for the notifications you are interested for.
If you listen for global notifications sent to all windows, we prefer the other constructor.
The class keeps a reference to the window to make sure it is not destroyed before this object is destroyed.
See also:


- 131.8.3 Constructor 18280
- 131.8.4 Constructor(Control as DesktopUIControl) 18280
- 131.8.5 Constructor(control as RectControl) 18280
- 131.8.6 Constructor(Window as DesktopWindow) 18281
- 131.8.8 Constructor(WindowHandle as Integer) 18282

### 131.8.8 Constructor(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop only.

**Function:** The window constructor.
**Notes:** Takes an existing window and intercepts messages going there to listen for the notifications you are interested for.
If you listen for global notifications sent to all windows, we prefer the other constructor.
The class keeps a reference to the window to make sure it is not destroyed before this object is destroyed.
See also:


- 131.8.3 Constructor 18280
- 131.8.4 Constructor(Control as DesktopUIControl) 18280
- 131.8.5 Constructor(control as RectControl) 18280
- 131.8.6 Constructor(Window as DesktopWindow) 18281
- 131.8.7 Constructor(Window as window) 18281


### 131.8.9 IsListeningFor(MessageID as Integer) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this object is listening for the given message ID.
**Example:**

```
dim w as new WinNotificationMBS

const WM_TIMECHANGE = &h001E
if w.ListenForMessage(WM_TIMECHANGE) then
MsgBox str(w.IsListeningFor(WM_TIMECHANGE))
end if
```

**Notes:** Returns true if we listen for this notification name or false if not.
See also:


- 131.8.10 IsListeningFor(name as string) as boolean 18282


### 131.8.10 IsListeningFor(name as string) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this object is listening for the given notification.
**Example:**

```
dim w as new WinNotificationMBS

if w.ListenForMessage("Hello") then
MsgBox str(w.IsListeningFor("Hello"))
end if
```

**Notes:** Returns true if we listen for this notification name or false if not.
See also:

- 131.8.9 IsListeningFor(MessageID as Integer) as boolean 18282

### 131.8.11 ListenForMessage(MessageID as Integer) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Listens for given notification message id.
**Notes:** Returns true on success and false on failure.
See also:

- 131.8.12 ListenForMessage(name as string) as boolean 18283

### 131.8.12 ListenForMessage(name as string) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Listens for given notification name.
**Notes:** Returns true on success and false on failure.
See also:

- 131.8.11 ListenForMessage(MessageID as Integer) as boolean 18283

### 131.8.13 SendMessage(byref result as Integer, MessageID as Integer, Value1 as Integer = 0, Value2 as Integer = 0, TimeOut as Integer = 10) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a message to all applications listening for it.
**Example:**

```
dim w as new WinNotificationMBS
dim Result as Integer

// send a message and wait for result
```

```
if w.SendMessage(Result, 1234567, 123, 456) then
// okay
else
// failed
end if
```

**Notes:** Sends a message with given message ID.
You can pass two integer parameters.
Returns true if event was sent or false if it failed.
This doesn't tell you whether it was received by someone, but your own application receives it, too.
Timeout is in milliseconds and counts per receiving window.
Result returns the result code from the message.
See also:

- 131.8.14 SendMessage(name as string, Value1 as Integer = 0, Value2 as Integer = 0, TimeOut as Integer = 10) as boolean 18284

### 131.8.14 SendMessage(name as string, Value1 as Integer = 0, Value2 as Integer = 0, TimeOut as Integer = 10) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a message to all applications listening for it.
**Example:**

```
dim w as new WinNotificationMBS

if w.SendMessage(Result, "Hello", 123, 456) then
// okay
else
// failed
end if
```

**Notes:** You can pass two integer parameters.
Returns true if event was sent or false if it failed.
This doesn't tell you whether it was received by someone, but your own application receives it, too.
Timeout is in milliseconds and counts per receiving window.
See also:

- 131.8.13 SendMessage(byref result as Integer, MessageID as Integer, Value1 as Integer = 0, Value2 as Integer = 0, TimeOut as Integer = 10) as boolean 18283

### 131.8.15 SendMessageToWindow(WindowHandle as Integer, byref result as Integer, MessageID as Integer, Value1 as Integer = 0, Value2 as Integer = 0, TimeOut as Integer = 10) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a message to all applications listening for it.
**Notes:** Like SendMessage, but with a target window.
You can pass two integer parameters.
Returns true if event was sent or false if it failed.
This doesn't tell you whether it was received by someone, but your own application receives it, too.
Timeout is in milliseconds and counts per receiving window.

### 131.8.16 StopListeningForMessage(MessageID as Integer) as boolean

MBS Win Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stops listening for a given message ID.
**Example:**

```
dim w as new WinNotificationMBS

const WM_TIMECHANGE = &h001E
if w.ListenForMessage(WM_TIMECHANGE) then
if w.StopListeningForMessage(WM_TIMECHANGE) then
MsgBox "OK"
end if
end if
```

See also:

- 131.8.17 StopListeningForMessage(name as string) as boolean 18285

### 131.8.17 StopListeningForMessage(name as string) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stops listening for a given notification name.
**Example:**

```
dim w as new WinNotificationMBS

if w.ListenForMessage("Hello") then
if w.StopListeningForMessage("Hello") then
MsgBox "OK"
```

```
end if
end if
```

See also:

- 131.8.16 StopListeningForMessage(MessageID as Integer) as boolean 18285

### 131.8.18 Properties

### 131.8.19 WindowHandle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal window handle.
**Notes:** (Read only property)

### 131.8.20 Events

### 131.8.21 GotNotification(Message as Integer, Name as string, Value1 as Integer, Value2 as Integer, byref Result as Integer, byref Handled as boolean)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: .

**Function:** A notification was received.
**Notes:** Message: The message ID.
Name: If you registered by name, this is the name for the message ID.
Value1 and Value2 are parameters provided with message. (WPARAM and LPARAM)

If Handled is set to true, we pass back Result to the Windows system (LRESULT).
Else the default handler is called.

# Chapter 132

# OCR

## 132.1 class TessChoiceIteratorMBS

### 132.1.1 class TessChoiceIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Class to iterate over the classifier choices for a single symbol.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 132.1.2 Methods

### 132.1.3 Constructor

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 132.1.4 MoveNext as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to the next choice for the symbol and returns false if there are none left.

### 132.1.5 Properties

### 132.1.6 Confidence as Single

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the confidence of the current choice depending on the used language data.
**Notes:** If only LSTM traineddata is used the value range is 0.0 - 1.0. All choices for one symbol should roughly add up to 1.0. If only traineddata of the legacy engine is used, the number should be interpreted as a percent probability. (0.0 - 100.0) In this case probabilities won't add up to 100. Each one stands on its own.
(Read only property)

### 132.1.7 Handle as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 132.1.8 Text as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the null terminated UTF-8 encoded text string for the current choice.
**Notes:** (Read only property)

## 132.2 class TessEngineMBS

### 132.2.1 class TessEngineMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for OCR recognition using tesseract library.
**Example:**

```
Dim OCR As new TessEngineMBS // your instance of tesseract

If Not ocr.Initialize("C:\Program Files\Tesseract-OCR\tessdata", "eng") Then
MsgBox "failed to initialize"
Quit
End If

Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
Dim p As Picture = f.OpenAsPicture
OCR.SetImage(p)

// get the text
Dim OCRText As String = OCR.GetText
```

**Notes:** This replaces the older TesseractMBS class.

The new class is for Tesseract 4.x and 5.x versions.
**Blog Entries**

- MBS Xojo Plugins in version 22.3
- News from the MBS Xojo Plugins Version 21.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- Introducing Tesseract 4 to Xojo

### 132.2.2 Methods

### 132.2.3 AllWordConfidences as Integer()

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns all word confidences (between 0 and 100) in an array.
**Notes:** The number of confidences should correspond to the number of space-delimited words in GetText.

### 132.2.4 AnalyseLayout as TessPageIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Runs page layout analysis in the mode set by SetPageSegMode.
**Notes:** May optionally be called prior to Recognize to get access to just the page layout results. Returns an iterator to the results.

Returns nil on error or an empty page.

### 132.2.5 Clear

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Free up recognition results and any stored image data, without actually freeing any recognition data that would be time-consuming to reload.
**Notes:** Afterwards, you must call SetImage or TesseractRect before doing any Recognize or Get* operation.

### 132.2.6 Constructor

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Please call Initialize after this to get started.

### 132.2.7 GetAltoText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Make an XML-formatted string with Alto markup from the internal data structures.

### 132.2.8 GetAvailableLanguages as String()

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the available languages as array.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract
Dim AvailableLanguages() As String = OCR.GetAvailableLanguages
```

### 132.2.9 GetBoolVariable(Name as String, byref value as boolean) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries boolean variable value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.2.10 GetBoxText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The recognized text is returned as a char* which is coded in the same format as a box file used in training.
**Notes:** Constructs coordinates in the original image - not just the rectangle.
PageNumber is a 0-based page index that will appear in the box file.

### 132.2.11 GetDoubleVariable(Name as String, byref value as Double) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries double variable value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.2.12 GetHOCRText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Make a HTML-formatted string with hOCR markup from the internal data structures.
**Notes:** PageNumber is 0-based but will appear in the output as 1-based.

### 132.2.13 GetIntVariable(Name as String, byref value as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries integer variable value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.

Fills in value with the value of the parameter.

### 132.2.14 GetLoadedLanguages as String()

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the loaded languages as array.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract
Dim LoadedLanguages() As String = OCR.GetLoadedLanguages
```

**Notes:** Includes all languages loaded by the last Init, including those loaded as dependencies of other loaded languages.

### 132.2.15 GetLSTMBoxText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Make a box file for LSTM training from the internal data structures.
**Notes:** Constructs coordinates in the original image - not just the rectangle.
PageNumber is a 0-based page index that will appear in the box file.

### 132.2.16 GetStringVariable(Name as String) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries string variable value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.2.17 GetText as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The recognized text is returned as UTF-text.

### 132.2.18 GetTsvText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Make a TSV-formatted string from the internal data structures.
**Notes:** PageNumber is 0-based but will appear in the output as 1-based.

### 132.2.19 GetUNLVText as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The recognized text is returned as a char* which is coded as UNLV format Latin-1 with specific reject and suspect codes.

### 132.2.20 GetWordStrBoxText(PageNumber as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The recognized text is returned as a char* which is coded in the same format as a WordStr box file used in training.
**Notes:** PageNumber is a 0-based page index that will appear in the box file.

### 132.2.21 Initialize(dataPath as String, language as String, Mode as Integer = 3, configs() as String = nil) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Initializes tesseract.
**Example:**

```
Dim OCR As new TessEngineMBS // your instance of tesseract

If Not ocr.Initialize("C:\Program Files\Tesseract-OCR\tessdata", "eng") Then
MsgBox "failed to initialize"
Quit
End If
```

**Notes:** Returns true on success and false on failure.

The datapath must be the name of the tessdata directory.
The language is (usually) an ISO 639-3 string or "" will default to eng.

It is entirely safe (and eventually will be efficient too) to call Initialize multiple times on the same instance to change language, or just to reset the classifier.

The language may be a string of the form [
textasciitilde ] <lang>[ + [
textasciitilde ] <lang>] * indicating that multiple languages are to be loaded. Eg hin+eng will load Hindi and English. Languages may specify internally that they want to be loaded with one or more other languages, so the
textasciitilde sign is available to override that. Eg if hin were set to load eng by default, then hin+
textasciitilde eng would force loading only hin. The number of loaded languages is limited only by memory, with the caveat that loading additional languages will impact both speed and accuracy, as there is more work to do to decide on the applicable language, and there is more chance of hallucinating incorrect words.

Warning: On changing languages, all Tesseract parameters are reset back to their default values. (Which may vary between languages.)
If you have a rare need to set a Variable that controls initialization for a second call to Init you should explicitly call End() and then use SetVariable before Init. This is only a very rare use case, since there are very few uses that require any parameters to be set before Init.

### 132.2.22 IsValidWord(Word as String) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Check whether a word is valid according to Tesseract's language model.
**Notes:** Return false if the word is invalid, true if valid.

### 132.2.23 LibraryLoaded as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the tesseract library was loaded.
**Notes:** Should be true after succesful call to LoadLibrary.

### 132.2.24 LibraryLoadError as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last error from LoadLibrary as number.

### 132.2.25 LibraryLoadErrorMessage as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last error from LoadLibrary as text.

### 132.2.26 LoadLibrary(file as folderitem) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the tesseract library.
**Notes:** Returns true on success and false on failure.
See LibraryLoadErrorMessage for a textual description.
See also:

- 132.2.27 LoadLibrary(path as string) as boolean 18295

### 132.2.27 LoadLibrary(path as string) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads the tesseract library.
**Notes:** Returns true on success and false on failure.
See LibraryLoadErrorMessage for a textual description.

For Windows load the DLL, for Linux the tesseract.so file and for macOS the dylib file.
You may need to first load leptonica library and second the tesseract library.
See example project for sample code.
See also:

- 132.2.26 LoadLibrary(file as folderitem) as boolean 18295

### 132.2.28 PrintVariablesToFile(File as FolderItem) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Print Tesseract parameters to the given file.
**Notes:** Returns true on success.
Fails if the file can't be created.

### 132.2.29 PrintVariablesToPath(Path as String) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Print Tesseract parameters to the given file.
**Notes:** Returns true on success.
Fails if the file can't be created.

### 132.2.30 Recognize as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Recognize the image from SetAndThresholdImage, generating Tesseract internal structures.
**Notes:** Returns true on success.

Optional. The Get*Text functions below will call Recognize if needed.

After Recognize, the output is kept internally until the next SetImage.

### 132.2.31 ResultIterator as TessResultIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries a result iterator.
**Notes:** Loop over it to query details.
The result iterator is only valid until you end the engine.

### 132.2.32 SetCurrentWorkingDirectory(path as folderitem) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets current working directory.
**Notes:** Returns true on success.
See also:

- 132.2.33 SetCurrentWorkingDirectory(path as String) as boolean 18296

### 132.2.33 SetCurrentWorkingDirectory(path as String) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets current working directory.
**Notes:** Returns true on success.
See also:

• 132.2.32 SetCurrentWorkingDirectory(path as folderitem) as boolean 18296

### 132.2.34 SetImage(pic as picture)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets input image via picture.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract

Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
Dim p As Picture = f.OpenAsPicture
OCR.SetImage(p)
```

**Notes:** Pass Xojo picture and we copy the pixels.
Mask or alpha channel is ignored.

### 132.2.35 SetImageData(Data as MemoryBlock)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets input image via data.
**Notes:** Image data can be an image file content like JPEG or PNG.
Supported formats depends on what leptonica was compiled to support.
See also:

• 132.2.36 SetImageData(Data as String) 18297

### 132.2.36 SetImageData(Data as String)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets input image via data.
**Notes:** Image data can be an image file content like JPEG or PNG.
Supported formats depends on what leptonica was compiled to support.
See also:

• 132.2.35 SetImageData(Data as MemoryBlock) 18297

### 132.2.37 SetImageFile(File as FolderItem)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets input image via folderitem.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract

Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
OCR.SetImageFile(f)
```

**Notes:** Point to an image file like JPEG or PNG.
Supported formats depends on what leptonica was compiled to support.
See also:

- 132.2.38 SetImageFile(Path as String) 18298

### 132.2.38 SetImageFile(Path as String)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets input image via file path.
**Notes:** Point to an image file like JPEG or PNG.
Supported formats depends on what leptonica was compiled to support.
See also:

- 132.2.37 SetImageFile(File as FolderItem) 18297

### 132.2.39 SetRectangle(Left as Integer, Top as Integer, Width as Integer, Height as Integer)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Restrict recognition to a sub-rectangle of the image.
**Notes:** Call after SetImage.
Each SetRectangle clears the recogntion results so multiple rectangles can be recognized with the same image.

### 132.2.40 SetVariable(Name as String, Value as String)

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the value of an internal "parameter."
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract

OCR.SetVariable("tessedit_char_blacklist", "xyz")
```

**Notes:** Supply the name of the parameter and the value as a string, just as you would in a config file.
Returns false if the name lookup failed.
e.g.
SetVariable("tessedit_char_blacklist", "xyz") to ignore x, y and z.
Or
SetVariable("classify_bln_numeric_mode", "1") to set numeric-only mode.

SetVariable may be used before Init, but settings will revert to defaults on End().

Note: Must be called after Initialize(). Only works for non-init variables (init variables should be passed to Initialize()).

### 132.2.41 Properties

### 132.2.42 DeadlineMSecs as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The deadline in milliseconds.
**Notes:** (Read and Write property)

### 132.2.43 Handle as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 132.2.44 InitLanguagesAsString as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the languages string used in the last valid initialization.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract

MsgBox OCR.InitLanguagesAsString
```

**Notes:** If the last initialization specified "deu+hin" then that will be returned. If hin loaded eng automatically as well, then that will not be included in this list. To find the languages actually loaded use GetLoadedLanguages function.
(Read only property)

### 132.2.45 InputImage as Picture

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries input image for debugging.
**Notes:** (Read only property)

### 132.2.46 InputName as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of the input file.
**Notes:** Needed for training and reading a UNLV zone file, and for searchable PDF output.
(Read and Write property)

### 132.2.47 MeanTextConf as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the (average) confidence value between 0 and 100.
**Notes:** (Read only property)

### 132.2.48 PageSegMode as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current page segmentation mode.
**Example:**

```
Dim OCR As TessEngineMBS // your instance of tesseract

OCR.PageSegMode = OCR.kPageSegModeAuto
```

**Notes:** Defaults to kPageSegModeSingleBlock.
The mode is stored as an IntParam so it can also be modified by ReadConfigFile or SetVariable("tessedit_pageseg_mode", mode as string).
(Read and Write property)

### 132.2.49 Resolution as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The resolution of the source image in pixels per inch so font size information can be calculated in results.
**Notes:** Call this after SetImage functions.
(Read and Write property)

### 132.2.50 ThresholdedImage as Picture

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get a copy of the internal thresholded image from Tesseract.
**Notes:** (Read only property)

### 132.2.51 Version as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries version of tesseract library.
**Example:**

MsgBox TessEngineMBS.Version

**Notes:** e.g. "4.1.1"
(Read only property)

### 132.2.52 Events

### 132.2.53 Cancel(words as integer) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Event called regularly to allow you to cancel.
**Notes:** Return true to cancel current job.

### 132.2.54 Progress(Left as integer, Right as Integer, Top as Integer, Bottom as Integer, Progress as Integer) as boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Event called regularly to allow you to monitor progress.
**Notes:** Return true to cancel current job.

### 132.2.55 Constants

OCR Engine Running Modes

| Constant | Value | Description |
|---|---|---|
| kOcrEngineModeDefault | 3 | Specify this mode when calling init_*(), to indicate that any of t modes should be automatically inferred from the variables in the l specific config, command-line configs, or if not specified in any of t should be set to the default kOcrEngineModeTesseractOnly. |
| kOcrEngineModeLstmOnly | 1 | Run just the LSTM line recognizer. |
| kOcrEngineModeTesseractLstmCombined | 2 | Run the LSTM recognizer, but allow fallback to Tesseract when t difficult. deprecated |
| kOcrEngineModeTesseractOnly | 0 | Run Tesseract only - fastest; deprecated |

Page Layout

| Constant | Value | Description |
|---|---|---|
| kPageSegModeAuto | 3 | Fully automatic page segmentation, but no OSD. |
| kPageSegModeAutoOnly | 2 | Automatic page segmentation, but no OSD, or OCR. |
| kPageSegModeAutoOsd | 1 | Automatic page segmentation with orientation and script detection. (OSD) |
| kPageSegModeCircleWord | 9 | Treat the image as a single word in a circle. |
| kPageSegModeOsdOnly | 0 | Orientation and script detection only. |
| kPageSegModeRawLine | 13 | Treat the image as a single text line, bypassing hacks that are Tesseract-speci |
| kPageSegModeSingleBlock | 6 | Assume a single uniform block of text. (Default.) |
| kPageSegModeSingleBlockVertText | 5 | Assume a single uniform block of vertically aligned text. |
| kPageSegModeSingleChar | 10 | Treat the image as a single character. |
| kPageSegModeSingleColumn | 4 | Assume a single column of text of variable sizes. |
| kPageSegModeSingleLine | 7 | Treat the image as a single text line. |
| kPageSegModeSingleWord | 8 | Treat the image as a single word. |
| kPageSegModeSparseText | 11 | Find as much text as possible in no particular order. |
| kPageSegModeSparseTextOsd | 12 | Sparse text with orientation and script det. |

## 132.3 class TesseractChoiceIteratorMBS

### 132.3.1 class TesseractChoiceIteratorMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use TessChoiceIteratorMBS class instead. **Function:** Class to iterate over the classifier choices for a single symbol.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7

### 132.3.2 Methods

### 132.3.3 Confidence as Double

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the confidence of the current choice.
**Notes:** The number should be interpreted as a percent probability. (0.0 - 100.0)

### 132.3.4 Constructor(result as TesseractResultIteratorMBS)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Construction is from a ResultIterator that points to the symbol of interest. The ChoiceIterator allows a one-shot iteration over the choices for this symbol and after that is is useless.

### 132.3.5 NextItem as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves to the next choice for the symbol and returns false if there are none left.

### 132.3.6 Text as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the text string for the current choice.

### 132.3.7 Properties

### 132.3.8 Handle as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 132.3.9 Parent as TesseractResultIteratorMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent result iterator.
**Notes:** (Read only property)

## 132.4 class TesseractErrorExceptionMBS

### 132.4.1 class TesseractErrorExceptionMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception subclass raised for errors in OCR process.
**Notes:** Subclass of the RuntimeException class.

## 132.5 class TesseractMBS

### 132.5.1 class TesseractMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use TessEngineMBS class instead. **Function:** The plugin class to provide OCR by using the tesseract open source library.
**Notes:** See example projects on how to use it.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7
- Introducing Tesseract 4 to Xojo
- Multithreaded plugin functions can increase speed of Xojo application
- Live barcode detection with Xojo for MacOS
- Problems with killing Xojo threads with plugin calls.
- MBS Xojo / Real Studio Plugins, version 15.1pr6
- MBS Xojo / Real Studio Plugins, version 14.2pr5
- MBS Xojo / Real Studio Plugins, version 13.2pr8
- OCR for Real Studio and Filemaker

### 132.5.2 Methods

### 132.5.3 Clear

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Free up recognition results and any stored image data, without actually freeing any recognition data that would be time-consuming to reload.
**Notes:** Afterwards, you must call SetImage or TesseractRect before doing any Recognize or Get* operation.

### 132.5.4 ClearAdaptiveClassifier

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Call between pages or documents etc to free up memory and forget adaptive data.

### 132.5.5 Constructor

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Constructor which calls only InitForAnalysePage.
See also:

- 132.5.6 Constructor(folder as folderitem, lang as string) 18307
- 132.5.7 Constructor(path as string, lang as string) 18307

### 132.5.6 Constructor(folder as folderitem, lang as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes tesseract.
**Notes:** Same as Init method.
Pass folderitem to parent folder of tessdata folder and language you need.

Instances are now mostly thread-safe and totally independent, but some global parameters remain. Basically it is safe to use multiple TessBaseAPIs in different threads in parallel, UNLESS: you use SetVariable on some of the Params in classify and textord. If you do, then the effect will be to change it for all your instances.

Note that the only members that may be called before Init are: SetInputName, SetOutputName, SetVariable, Get*Variable and PrintVariables.

The language is (usually) an ISO 639-3 string or "" will default to eng.
To use multiple languages, please concat them with plus sign: e.g. "eng+deu"
See also:

- 132.5.5 Constructor 18307
- 132.5.7 Constructor(path as string, lang as string) 18307

### 132.5.7 Constructor(path as string, lang as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes tesseract.
**Notes:** Same as Init method.
Pass path to parent folder of tessdata folder and language you need.

Instances are now mostly thread-safe and totally independent, but some global parameters remain. Basically it is safe to use multiple TessBaseAPIs in different threads in parallel, UNLESS: you use SetVariable on

some of the Params in classify and textord. If you do, then the effect will be to change it for all your instances.

Note that the only members that may be called before Init are: SetInputName, SetOutputName, SetVariable, Get*Variable and PrintVariables.

The language is (usually) an ISO 639-3 string or "" will default to eng.
To use multiple languages, please concat them with plus sign: e.g. "eng+deu"
See also:


- 132.5.5 Constructor 18307
- 132.5.6 Constructor(folder as folderitem, lang as string) 18307


### 132.5.8 GetBoolVariable(name as string, byref value as boolean) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a variable as boolean value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.5.9 GetBoxText(page as Integer) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The recognized text is returned as a char* which is coded in the same format as a box file used in training.
**Notes:** Constructs coordinates in the original image - not just the rectangle. page is a 0-based page index that will appear in the box file.

### 132.5.10 GetDoubleVariable(name as string, byref value as Double) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a variable as Double value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.5.11 GetHOCRText(page as Integer) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Make a HTML-formatted string with hOCR markup from the internal data structures.
**Notes:** Page is 0-based but will appear in the output as 1-based.

### 132.5.12 GetIntVariable(name as string, byref value as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a variable as Integer value.
**Notes:** Returns true if the parameter was found among Tesseract parameters.
Fills in value with the value of the parameter.

### 132.5.13 GetLastInitLanguage as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the language used in the last valid initialization.

### 132.5.14 GetStringVariable(name as string) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries variable's value as string.

### 132.5.15 GetText as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns recognized text.
**Notes:** Calls Recognize if needed internally.

### 132.5.16 GetVariableAsString(name as string) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get value of named variable as a string, if it exists.

### 132.5.17 Init(folder as folderitem, lang as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes tesseract.
**Notes:** Pass folderitem to parent folder of tessdata folder and language you need.

Instances are now mostly thread-safe and totally independent, but some global parameters remain. Basically it is safe to use multiple TessBaseAPIs in different threads in parallel, UNLESS: you use SetVariable on some of the Params in classify and textord. If you do, then the effect will be to change it for all your instances.

Start tesseract. Returns zero on success and -1 on failure.

Note that the only members that may be called before Init are: SetInputName, SetOutputName, SetVariable, Get*Variable and PrintVariables.

The language is (usually) an ISO 639-3 string or "" will default to eng.
See also:

- 132.5.18 Init(path as string, lang as string) 18310

### 132.5.18 Init(path as string, lang as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes tesseract.
**Notes:** Pass path to parent folder of tessdata folder and language you need.

Instances are now mostly thread-safe and totally independent, but some global parameters remain. Basically it is safe to use multiple TessBaseAPIs in different threads in parallel, UNLESS: you use SetVariable on some of the Params in classify and textord. If you do, then the effect will be to change it for all your instances.

Start tesseract. Returns zero on success and -1 on failure.

Note that the only members that may be called before Init are: SetInputName, SetOutputName, SetVariable, Get*Variable and PrintVariables.

The language is (usually) an ISO 639-3 string or "" will default to eng.
See also:

- 132.5.17 Init(folder as folderitem, lang as string) 18310

### 132.5.19 InitForAnalysePage

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Init only for page layout analysis.
**Notes:** Use only for calls to SetImage and AnalysePage. Calls that attempt recognition will generate an error.

### 132.5.20 MeanTextConf as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the (average) confidence value between 0 and 100.

### 132.5.21 NumDawgs as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the number of dawgs loaded.
**Notes:** Should be bigger than 0 if data files have been loaded.

### 132.5.22 PrintVariablesToStdErr

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print Tesseract parameters to standard error.

### 132.5.23 PrintVariablesToStdOut

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print Tesseract parameters to standard output.

### 132.5.24 Recognize as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Recognize the image.
**Notes:** Returns 0 on success.
Optional. The Get*Text functions below will call Recognize if needed. After Recognize, the output is kept

internally until the next SetImage.

### 132.5.25 RecognizeMT as Integer

MBS OCR Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Recognize the image.
**Notes:** Returns 0 on success.
Optional. The Get*Text functions below will call Recognize if needed. After Recognize, the output is kept internally until the next SetImage.

Same as Recognize, but thread friendly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

### 132.5.26 ResultIterator as TesseractResultIteratorMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get an iterator to the results of LayoutAnalysis and/or Recognize.
**Notes:** This object points to data held within the TesseractMBS class, and therefore can only be used while the TesseractMBS class still exists and has not been subjected to a call of Init, SetImage, Recognize, Clear, End, DetectOS, or anything else that changes the internal PAGE_RES.

### 132.5.27 SetImage(buffer as memoryblock, width as Integer, height as Integer, BytesPerPixel as Integer, BytesPerLine as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provide an image for Tesseract to recognize as a memoryblock.
**Notes:** Returns true on success and false on failure.
See also:

- 132.5.28 SetImage(Pic as Picture) as boolean

### 132.5.28 SetImage(Pic as Picture) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provide an image for Tesseract to recognize.
**Notes:** The plugin makes a copy of the picture.
Returns true on success and false on failure.
See also:

- 132.5.27 SetImage(buffer as memoryblock, width as Integer, height as Integer, BytesPerPixel as Integer, BytesPerLine as Integer) as boolean 18312

### 132.5.29 SetInputName(name as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the name of the input file. Needed only for training and reading a UNLV zone file.

### 132.5.30 SetOutputName(name as string)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the name of the bonus output files. Needed only for debugging.

### 132.5.31 SetRectangle(left as Integer, top as Integer, width as Integer, height as Integer)

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Restrict recognition to a sub-rectangle of the image.
**Notes:** Call after SetImage. Each SetRectangle clears the recogntion results so multiple rectangles can be recognized with the same image.

### 132.5.32 SetResolution(Resolution as Integer)

MBS OCR Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the resolution of the source image in pixels per inch so font size information can be calculated in results.
**Notes:** Call this after SetImage.

### 132.5.33 SetVariable(name as string, value as string) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the value of an internal "parameter."
**Notes:** Supply the name of the parameter and the value as a string, just as you would in a config file.
Returns false if the name lookup failed.
E.g. SetVariable("tessedit_char_blacklist", "xyz"); to ignore x, y and z.
Or SetVariable("classify_bln_numeric_mode", "1"); to set numeric-only mode.
SetVariable may be used before Init, but settings will revert to defaults on End().

Note: Must be called after Init(). Only works for non-init variables (init variables should be passed to Init()).

### 132.5.34 Version as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the version identifier.

### 132.5.35 Properties

### 132.5.36 Handle as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal Object reference.
**Notes:** (Read only property)

### 132.5.37 PageSegMode as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current page segmentation mode.
**Notes:** Defaults to kPageSegModeSingleBlock.
The mode is stored as an IntParam so it can also be modified by ReadConfigFile or SetVariable("tessedit_pageseg_mode", mode as string).
(Read and Write computed property)

### 132.5.38 Constants

Page Segmentation Constants

| Constant | Value | Description |
|---|---|---|
| kPageSegModeAuto | 3 | Fully automatic page segmentation, but no OSD. |
| kPageSegModeAutoOnly | 2 | Automatic page segmentation, but no OSD, or OCR. |
| kPageSegModeAutoOSD | 1 | Automatic page segmentation with orientation and script detection. (O |
| kPageSegModeCircleWord | 9 | Treat the image as a single word in a circle. |
| kPageSegModeOSDOnly | 0 | Orientation and script detection only. |
| kPageSegModeSingleBlock | 6 | Assume a single uniform block of text. (Default.) |
| kPageSegModeSingleBlockVerticalText | 5 | Assume a single uniform block of vertically aligned text. |
| kPageSegModeSingleChar | 10 | Treat the image as a single character. |
| kPageSegModeSingleColumn | 4 | Assume a single column of text of variable sizes. |
| kPageSegModeSingleLine | 7 | Treat the image as a single text line. |
| kPageSegModeSingleWord | 8 | Treat the image as a single word. |

## 132.6 class TesseractNotInitializedExceptionMBS

### 132.6.1 class TesseractNotInitializedExceptionMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception to report about calling tesseract methods without initialization.
**Notes:** Subclass of the TesseractErrorExceptionMBS class.

## 132.7 class TesseractResultIteratorMBS

### 132.7.1 class TesseractResultIteratorMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use TessResultIteratorMBS class instead. **Function:** Class to iterate over tesseract results, providing access to all levels of the page hierarchy, without including any tesseract headers or having to handle any tesseract structures.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7

### 132.7.2 Methods

### 132.7.3 Begin

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the iterator to point to the start of the page to begin an iteration.

### 132.7.4 BoundingBox(Level as Integer, byref left as Integer, byref top as Integer, byref right as Integer, byref bottom as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the bounding rectangle of the current object at the given level.
**Notes:** Returns false if there is no such object at the current position.
The returned bounding box is guaranteed to match the size and position of the image returned by GetBinaryImage, but may clip foreground pixels from a grey image. The padding argument to GetImage can be used to expand the image to include more foreground pixels. See GetImage.

Coordinate system:
Integer coordinates are at the cracks between the pixels.
The top-left corner of the top-left pixel in the image is at (0,0).
The bottom-right corner of the bottom-right pixel in the image is at (width, height).
Every bounding box goes from the top-left of the top-left contained pixel to the bottom-right of the bottom-right contained pixel, so the bounding box of the single top-left pixel in the image is: (0,0)->(1,1).
If an image rectangle has been set in the API, then returned coordinates relate to the original (full) image, rather than the rectangle.

### 132.7.5 Confidence(Level as Integer) as Double

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the mean confidence of the current object at the given level.
**Notes:** The number should be interpreted as a percent probability. (0.0 - 100.0)

### 132.7.6 Constructor

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 132.7.7 IsAtBeginningOf(Level as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the iterator is at the start of an object at the given level.
**Notes:** Possible uses include determining if a call to Next(kLevelWord) moved to the start of a kLevelParagraph.

### 132.7.8 IsAtFinalElement(Level as Integer, element as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns whether the iterator is positioned at the last element in a given level.
**Notes:** (e.g. the last word in a line, the last line in a block)

### 132.7.9 NextItem(Level as Integer) as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves to the start of the next object at the given level in the page hierarchy, and returns false if the end of the page was reached.
**Notes:** NOTE that kLevelSymbol will skip non-text blocks, but all other level values will visit each non-text block once.
Think of non text blocks as containing a single paragraph, with a single line, with a single imaginary word.
Calls to Next with different levels may be freely intermixed.
This function iterates words in right-to-left scripts correctly, if the appropriate language has been loaded into Tesseract.

### 132.7.10 SymbolIsDropcap as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the current symbol is a dropcap.
**Notes:** If iterating at a higher level object than symbols, eg words, then this will return the attributes of the first symbol in that word.

### 132.7.11 SymbolIsSubscript as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the current symbol is a subscript.
**Notes:** If iterating at a higher level object than symbols, e.g. words, then this will return the attributes of the first symbol in that word.

### 132.7.12 SymbolIsSuperscript as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the current symbol is a superscript.
**Notes:** If iterating at a higher level object than symbols, eg words, then this will return the attributes of the first symbol in that word.

### 132.7.13 Text(Level as Integer) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the text string for the current object at the given level.

### 132.7.14 WordFontAttributes(byref bold as boolean, byref italic as boolean, byref underlined as boolean, byref monospace as boolean, byref serif as boolean, byref smallcaps as boolean, byref pointsize as Integer, byref fontid as Integer) as string

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the font attributes of the current word.
**Notes:** If iterating at a higher level object than words, e.g. textlines, then this will return the attributes of the first word in that textline.
The actual return value is a string representing a font name.

Pointsize is returned in printers points (1/72 inch.)

### 132.7.15 WordIsFromDictionary as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the current word was found in a dictionary.

### 132.7.16 WordIsNumeric as boolean

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the current word is numeric.

### 132.7.17 Properties

### 132.7.18 Handle as Integer

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Internal Object reference.
**Notes:** (Read only property)

### 132.7.19 Parent as TesseractMBS

MBS OCR Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent tesseract object.
**Notes:** (Read only property)

### 132.7.20 Constants

Level Constants

| Constant | Value | Description |
|---|---|---|
| kLevelBlock | 0 | Block of text/image/separator line. |
| kLevelParagraph | 1 | Paragraph within a block. |
| kLevelSymbol | 4 | Symbol/character within a word. |
| kLevelTextline | 2 | Line within a paragraph. |
| kLevelWord | 3 | Word within a textline. |

## 132.8 class TessPageIteratorMBS

### 132.8.1 class TessPageIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The iterator to walk over page content.
**Notes:** Class to iterate over tesseract page structure, providing access to all levels of the page hierarchy, without including any tesseract headers or having to handle any tesseract structures.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 132.8.2 Methods

### 132.8.3 Baseline(Level as Integer, byref x1 as Integer, byref y1 as Integer, byref x2 as Integer, byref y2 as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the baseline of the current object at the given level.
**Notes:** The baseline is the line that passes through (x1, y1) and (x2, y2).

Warning: with vertical text, baselines may be vertical!

Returns false if there is no baseline at the current position.

### 132.8.4 Begin

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the iterator to point to the start of the page to begin an iteration.

### 132.8.5 BinaryImage(Level as Integer) as PIcture

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a binary image of the current object at the given level.
**Notes:** The position and size match the return from BoundingBoxInternal, and so this could be upscaled with respect to the original input image.

### 132.8.6 BoundingBox(Level as Integer, byref Left as Integer, byref Top as Integer, byref Right as Integer, byref Bottom as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the bounding rectangle of the current object at the given level.
**Notes:** Returns false if there is no such object at the current position.
The returned bounding box is guaranteed to match the size and position of the image returned by GetBinaryImage, but may clip foreground pixels from a grey image. The padding argument to GetImage can be used to expand the image to include more foreground pixels. See BinaryImage below.

### 132.8.7 Constructor

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 132.8.8 CopyIterator as TessPageIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a copy of the iterator.

### 132.8.9 IsAtBeginningOf(Level as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the iterator is at the start of an object at the given level.

### 132.8.10 IsAtFinalElement(Level as Integer, element as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether the iterator is positioned at the last element in a given level. (e.g. the last word in a line, the last line in a block)

### 132.8.11 MoveNext(Level as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to the start of the next object at the given level in the page hierarchy, and returns false if the end of the page was reached.
**Notes:** NOTE that symbol will skip non-text blocks, but all other PageIteratorLevel level values will visit each non-text block once. Think of non text blocks as containing a single paragraph, with a single line, with a single imaginary word. Calls to Next with different levels may be freely intermixed. This function iterates words in right-to-left scripts correctly, if the appropriate language has been loaded into Tesseract.

### 132.8.12 Properties

### 132.8.13 BlockType as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the type of the current block.
**Notes:** (Read only property)

### 132.8.14 DeskewAngle as Single

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The deskew angle.
**Notes:** After rotating the block so the text orientation is upright, how many radians does one have to rotate the block anti-clockwise for it to be level?
-Pi/4 <= deskew_angle <= Pi/4
(Read only property)

### 132.8.15 FirstLineIndent as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The first line indent.
**Notes:** For LEFT aligned paragraphs, the first text line of paragraphs of this kind are indented this many pixels from the left edge of the rest of the paragraph.
for RIGHT aligned paragraphs, the first text line of paragraphs of this kind are indented this many pixels from the right edge of the rest of the paragraph.

This value may be negative.

if IsCrown is true, the first line of this paragraph is actually flush, and first_line_indent is set to the "common" first line indent for subsequent paragraphs in this block of text.
(Read only property)

### 132.8.16 Handle as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 132.8.17 IsCrown as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the current item is a crown.
**Notes:** True if the first line of the paragraph is aligned with the other lines of the paragraph even though subsequent paragraphs have first line indents. This typically indicates that this is the continuation of a previous paragraph or that it is the very first paragraph in the chapter.
(Read only property)

### 132.8.18 IsListItem as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether current item is a list item.
**Notes:** True if we believe this is a member of an ordered or unordered list.
(Read only property)

### 132.8.19 Justification as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries justification for current block.
**Notes:** LEFT if ragged right, or fully justified and script is left-to-right.
RIGHT if ragged left, or fully justified and script is right-to-left.
unknown if it looks like source code or we have very few lines.
(Read only property)

### 132.8.20 Orientation as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The orientation of the current block.
**Notes:** (Read only property)

### 132.8.21 TextlineOrder as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The text orientation of the current block.
**Notes:** (Read only property)

### 132.8.22 WritingDirection as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The writing direction of the current block.
**Notes:** (Read only property)

### 132.8.23 Constants

Block Types

| Constant | Value | Description |
|---|---|---|
| kBlockTypeCaptionText | 8 | Text that belongs to an image. |
| kBlockTypeEquation | 4 | Partition belonging to an equation region. |
| kBlockTypeFlowingImage | 9 | Image that lives inside a column. |
| kBlockTypeFlowingText | 1 | Text that lives inside a column. |
| kBlockTypeHeadingImage | 10 | Image that spans more than one column. |
| kBlockTypeHeadingText | 2 | Text that spans more than one column. |
| kBlockTypeHorzLine | 12 | Horizontal Line. |
| kBlockTypeInlineEquation | 5 | Partition has inline equation. |
| kBlockTypeNoise | 14 | Lies outside of any column. |
| kBlockTypePulloutImage | 11 | Image that is in a cross-column pull-out region. |
| kBlockTypePulloutText | 3 | Text that is in a cross-column pull-out region. |
| kBlockTypeTable | 6 | Partition belonging to a table region. |
| kBlockTypeUnknown | 0 | Type is not yet known. Keep as the first element. |
| kBlockTypeVerticalText | 7 | Text-line runs vertically. |
| kBlockTypeVertLine | 13 | Vertical Line. |

Justifications

| Constant | Value | Description |
|---|---|---|
| kJustificationCenter | 2 | The text lines of the paragraph are centered about a line going down through their middle of the text lines. |
| kJustificationLeft | 1 | Each line, except possibly the first, is flush to the same left tab stop. |
| kJustificationRight | 3 | Each line, except possibly the first, is flush to the same right tab stop. |
| kJustificationUnknown | 0 | Unknown. |

Level

| Constant | Value | Description |
|---|---|---|
| kLevelBlock | 0 | Block |
| kLevelParagraph | 1 | Paragraph |
| kLevelSymbol | 4 | Symbol |
| kLevelTextline | 2 | Textline |
| kLevelWord | 3 | Word |

Orientations

| Constant | Value | Description |
|---|---|---|
| kOrientationPageDown | 2 | Orientation is down. |
| kOrientationPageLeft | 3 | Orientation is left. |
| kOrientationPageRight | 1 | Orientation is right. |
| kOrientationPageUp | 0 | Orientation is up. |

Text Line Order

| Constant | Value | Description |
|---|---|---|
| kTextlineOrderLefttoRight | 0 | Mongolian is written in vertical columns top to bottom like Chinese, but the lines order left-to right. |
| kTextlineOrderRighttoLeft | 1 | In Chinese, vertical text lines are read right-to-left. |
| kTextlineOrderToptoBottom | 2 | In English, the order is top-to-bottom. |

Writing Direction

| Constant | Value | Description |
|---|---|---|
| kWritingDirectionLefttoRight | 0 | For English text, the writing direction is left-to-right. |
| kWritingDirectionRighttoLeft | 1 | For Arabic the text direction is right to left. |
| kWritingDirectionToptoBottom | 2 | For the Chinese text in the above example, the writing direction is top-to-bottom. |

## 132.9 class TessResultIteratorMBS

### 132.9.1 class TessResultIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Class to iterate over tesseract results, providing access to all levels of the page hierarchy, without including any tesseract headers or having to handle any tesseract structures.
**Notes:** WARNING! This class points to data held within the TessEngineMBS class, and therefore can only be used while the TessBaseAPI class still exists and has not been subjected to a call of Init, SetImage, Recognize, Clear, End DetectOS, or anything else that changes the internal PAGE_RES.

See also base class TessPageIteratorMBS class, which contains the bulk of the interface. TessResultIteratorMBS adds text-specific methods for access to OCR output.
Subclass of the TessPageIteratorMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 132.9.2 Methods

### 132.9.3 ChoiceIterator as TessChoiceIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries choice iterator for current object.

### 132.9.4 Confidence(Level as Integer) as Single

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the mean confidence of the current object at the given level.
**Notes:** The number should be interpreted as a percent probability. (0.0 - 100.0)

### 132.9.5 Constructor

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 132.9.6 CopyIterator as TessResultIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the result iterator.

### 132.9.7 MoveNext(Level as Integer) as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to the next choice for the symbol and returns false if there are none left.

### 132.9.8 PageIterator as TessPageIteratorMBS

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the page iterator for this result.

### 132.9.9 Text(Level as Integer) as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the UTF-8 encoded text string for the current object at the given level.

### 132.9.10 Properties

### 132.9.11 FontID as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The font ID.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.12 FontName as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The font name.
**Notes:** The font attributes of the current word.

(Read only property)

### 132.9.13 IsBold as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The bold font attribute.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.14 IsItalic as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The italic font attribute.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.15 IsMonoSpace as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The monospace font attribute.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.16 IsSerif as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The serif font attribute.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.17 IsSmallCaps as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The smallcaps font attribute.
**Notes:** The font attributes of the current word.

(Read only property)

### 132.9.18 IsUnderlined as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The underlined font attribute.
**Notes:** The font attributes of the current word.
(Read only property)

### 132.9.19 PointSize as Integer

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The point size font attribute.
**Notes:** The font attributes of the current word.
Pointsize is returned in printers points (1/72 inch.)
(Read only property)

### 132.9.20 SymbolIsDropcap as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the current symbol is a dropcap.
**Notes:** If iterating at a higher level object than symbols, eg words, then this will return the attributes of the first symbol in that word.
(Read only property)

### 132.9.21 SymbolIsSubscript as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the current symbol is a subscript.
**Notes:** If iterating at a higher level object than symbols, eg words, then this will return the attributes of the first symbol in that word.
(Read only property)

### 132.9.22 SymbolIsSuperscript as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the current symbol is a superscript.
**Notes:** If iterating at a higher level object than symbols, eg words, then this will return the attributes of the first symbol in that word.
(Read only property)

### 132.9.23 WordIsFromDictionary as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the current word was found in a dictionary.
**Notes:** (Read only property)

### 132.9.24 WordIsNumeric as Boolean

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the current word is numeric.
**Notes:** (Read only property)

### 132.9.25 WordRecognitionLanguage as String

MBS OCR Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return the name of the language used to recognize this word.
**Notes:** On error, this is empty.
(Read only property)

### 132.9.26 Constants

Level

| Constant | Value | Description |
|---|---|---|
| kLevelBlock | 0 | Block |
| kLevelParagraph | 1 | Paragraph |
| kLevelSymbol | 4 | Symbol |
| kLevelTextline | 2 | Textline |
| kLevelWord | 3 | Word |

# Chapter 133

# Open Directory

## 133.1 class ODNodeMBS

### 133.1.1 class ODNodeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An Open Directory node.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr2
- OpenDirectory Framework for Xojo

**Xojo Developer Magazine**

- 17.5, page 9: News

### 133.1.2 Methods

### 133.1.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 133.1.4 nodeDetails(byref error as NSErrorMBS) as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary containing details about a node.
**Notes:** Error: An error reference for error details. Can be nil.

Returns a dictionary containing details.

### 133.1.5 nodeDetailsForKeys(keys() as string, byref error as NSErrorMBS) as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary containing details about a node.
**Notes:** Keys: An array of keys corresponding to the values returned in the dictionary.
Error: An error reference for error details. Can be nil.

Returns a dictionary containing details about the node corresponding to keys specified by Keys.

### 133.1.6 nodeWithName(session as ODSessionMBS, name as string, byref error as NSErrorMBS) as ODNodeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a node object with a specified session and name.
**Notes:** Session: The session.
Name: The name of the node.
Error: An error reference for error details. Can be nil.

Returns the created node object.

### 133.1.7 nodeWithType(session as ODSessionMBS, type as integer, byref error as NSErrorMBS) as ODNodeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a node object with a specified session and type.
**Notes:** Session: The session.
Type: The node type.

Error: An error reference for error details.

Returns the created node object.

### 133.1.8 subnodeNames(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the names of subnodes for the node.

### 133.1.9 supportedAttributesForRecordType(RecordType as String, byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of attribute types supported by the node,Äôs records.
**Notes:** RecordType: The record type to list supported attribute types for. Can be nil.
Error: An error reference for error details. Can be nil.

Returns an array of supported attribute types.

### 133.1.10 supportedRecordTypes(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the record types supported by the node.
**Notes:** If the node does not support checking for supported record types, all possible record types are returned.

### 133.1.11 unreachableSubnodeNames(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of the subnodes of a given node that are currently unreachable.

### 133.1.12 Properties

### 133.1.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 133.1.14 nodeName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The node,Äôs name.
**Notes:** (Read only property)

### 133.1.15 Constants

Node Types

| Constant | Value | Description |
|---|---|---|
| kODNodeTypeAuthentication | &h2201 | A node used for authentication or record lookups. |
| kODNodeTypeConfigure | &h2202 | A node that specifically refers to the Directory Services configuration. |
| kODNodeTypeContacts | &h2204 | A node used for applications that handle contact data. |
| kODNodeTypeLocalNodes | &h2200 | A node that specifically looks at the local directory. |
| kODNodeTypeNetwork | &h2205 | A node used for looking up network resource type data. |

## 133.2 class ODQueryMBS

### 133.2.1 class ODQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An Open Directory query.
**Notes:** Currently only partially implemented for Xojo for reading values. If you need more, please contact Monkeybread Software.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr2
- OpenDirectory Framework for Xojo

**Xojo Developer Magazine**

- 18.3, page 50: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 9: News

### 133.2.2 Methods

### 133.2.3 Constructor(node as ODNodeMBS, inRecordTypeOrList as Variant, inAttribute as String, matchType as Integer, inQueryValueOrList as Variant, inReturnAttributeOrList as Variant, maximumResults as Integer, byref error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an query object created with provided parameters.
**Notes:** Node: The node to query.
in RecordTypeOrList: The type or types of record to query. Can be an NSString object for a single type or an NSArray object containing NSString objects for multiple types.
inAttribute: The name of the attribute to query.
MatchType: The type of query.
inQueryValueOrList: The value or values to query in the attribute. Can be a string or a memoryblock object for a single value, or an array containing string and memoryblock objects for multiple values.
inReturnAttributeOrList: The attribute or attributes to be returned from the query. Can be a string for a single attribute or an array object containing strings for multiple attributes. Passing nil is equivalent to passing kODAttributeTypeStandardOnly.
maximumResults: The maximum number of values to be returned.
Error: An error reference for error details.

### 133.2.4 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 133.2.5 queryWithNode(node as ODNodeMBS, inRecordTypeOrList as Variant, inAttribute as String, matchType as Integer, inQueryValueOrList as Variant, inReturnAttributeOrList as Variant, maximumResults as Integer, byref error as NSErrorMBS) as ODQueryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an query object created with provided parameters.
**Notes:** Node: The node to query.
in RecordTypeOrList: The type or types of record to query. Can be an NSString object for a single type or an NSArray object containing NSString objects for multiple types.
inAttribute: The name of the attribute to query.
MatchType: The type of query.
inQueryValueOrList: The value or values to query in the attribute. Can be a string or a memoryblock object for a single value, or an array containing string and memoryblock objects for multiple values.
inReturnAttributeOrList: The attribute or attributes to be returned from the query. Can be a string for a single attribute or an array object containing strings for multiple attributes. Passing nil is equivalent to passing kODAttributeTypeStandardOnly.
maximumResults: The maximum number of values to be returned.
Error: An error reference for error details.

### 133.2.6 resultsAllowingPartial(AllowPartialResults as Boolean, byref error as NSErrorMBS) as ODRecordMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns results from a query synchronously.
**Notes:** AllowPartialResults: If true, only immediately available results are returned; otherwise, the function waits until all results are available.
Error: An error reference for error details. Can be nil.

Returns the results of the query in an array of ODRecordMBS objects.

### 133.2.7 start

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Starts asynchronous search.

### 133.2.8 synchronize

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Restarts a query, disposing of any results it has obtained.
**Notes:** If the query was originally started asynchronously, the event is called with inResults set to nil, error.code set to kODErrorQuerySynchronize, and error.domain set to kODErrorDomainFramework.

### 133.2.9 Properties

### 133.2.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 133.2.11 Constants

Match Types

| Constant | Value | Description |
|---|---|---|
| kODMatchAny | 1 | is used to search for any records (typically passed with nil search value) |
| kODMatchBeginsWith | &h2002 | is searching values that begin with the provided value |
| kODMatchContains | &h2004 | is searching values that contain the provided value |
| kODMatchEndsWith | &h2003 | is searching values that end with the provided value |
| kODMatchEqualTo | &h2001 | is searching values that are equal to the provided value |
| kODMatchGreaterThan | &h2006 | is searching values greater than the provided value |
| kODMatchLessThan | &h2007 | is searching values less than the provided value |

## 133.3 class ODRecordMBS

### 133.3.1 class ODRecordMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An Open Directory record.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr2
- OpenDirectory Framework for Xojo

**Xojo Developer Magazine**

- 17.5, page 9: News

### 133.3.2 Methods

### 133.3.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 133.3.4 kODAttributeTypeAccessControlEntry as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type which stores directory access control directives.

### 133.3.5 kODAttributeTypeAddressLine1 as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Line one of multiple lines of address data for a user.

### 133.3.6 kODAttributeTypeAddressLine2 as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Line two of multiple lines of address data for a user.

### 133.3.7 kODAttributeTypeAddressLine3 as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Line three of multiple lines of address data for a user.

### 133.3.8 kODAttributeTypeAdminLimits as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** XML plist indicating what an admin user can edit. Found in kODRecordTypeUsers records.

### 133.3.9 kODAttributeTypeAdvertisedServices as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.10 kODAttributeTypeAlias as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Alias attribute, contain pointer to another node/record/attribute.

### 133.3.11 kODAttributeTypeAllAttributes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used in requesting all attribute types in a search.

### 133.3.12 kODAttributeTypeAllTypes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to indicated recommended attribute types for a record type in the Config node.

### 133.3.13 kODAttributeTypeAltSecurityIdentities as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to store alternate identities for the record. Values will have standardized form as specified by Microsoft LDAP schema (1.2.840.113556.1.4.867).

Kerberos:user\@REALM

### 133.3.14 kODAttributeTypeAreaCode as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Area code of a user's phone number.

### 133.3.15 kODAttributeTypeAttrListRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute List reference count for a process.

### 133.3.16 kODAttributeTypeAttrListRefs as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** All the attribute list references for a process.

### 133.3.17 kODAttributeTypeAttrListValueRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attr List Value reference count for a process.

### 133.3.18 kODAttributeTypeAttrListValueRefs as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** All the attribute list value references for a process.

### 133.3.19 kODAttributeTypeAuthCredential as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** An authentication credential, to be used to authenticate to a Directory.

### 133.3.20 kODAttributeTypeAuthenticationAuthority as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Determines what mechanism is used to verify or set a user's password.
If multiple values are present, the first attributes returned take precedence.
Typically found in User records (kODRecordTypeUsers).

Authentication authorities are a multi-part string separated by semi-colons.
One component is the "type" of authority, such as those listed below:

| | |
|---|---|
| "basic" | - is a crypt password |
| "ShadowHash" | - is a hashed password stored in a secure location |
| "ApplePasswordServer" | - is a password server-based account |
| "Kerberosv5" | - is a Kerberosv5 based |
| "LocalCachedUser" | - is a cached account based on an account from another node, using a ShadowHash password |
| "DisabledUser" | - is an account that has been disabled |

### 133.3.21 kODAttributeTypeAuthenticationHint as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to identify the authentication hint phrase.

### 133.3.22 kODAttributeTypeAuthMethod as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Authentication method for an authentication capable record.

### 133.3.23 kODAttributeTypeAuthorityRevocationList as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of the authority revocation list.
A certificate revocation list that defines certificate authority certificates which are no longer trusted. No user certificates are included in this list.
Usually found in kODRecordTypeCertificateAuthorities records.

### 133.3.24 kODAttributeTypeAutomaticSearchPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Automatic search path defined by the search node.

### 133.3.25 kODAttributeTypeAutomountInformation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** xDetermines what mechanism is used to verify or set a user's password.
If multiple values are present, the first attributes returned take precedence.
Typically found in User records (kODRecordTypeUsers).

### 133.3.26 kODAttributeTypeBirthday as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Single-valued attribute that defines the user's birthday.
Format is x.208 standard YYYYMMDDHHMMSSZ which we will require as GMT time.

### 133.3.27 kODAttributeTypeBootParams as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type in host or machine records for storing boot params.

### 133.3.28 kODAttributeTypeBuilding as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the building name for a user or person record.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.29 kODAttributeTypeBuildVersion as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Build version for reference.

### 133.3.30 kODAttributeTypeCACertificate as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of the certificate of a certificate authority.
Its corresponding private key is used to sign certificates.
Usually found in kODRecordTypeCertificateAuthority records.

### 133.3.31 kODAttributeTypeCapacity as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the capacity of a resource.
found in resource records (kODRecordTypeResources).
Example: 50

### 133.3.32 kODAttributeTypeCertificateRevocationList as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of the certificate revocation list.
This is a list of certificates which are no longer trusted.
Usually found in kODRecordTypeCertificateAuthority records.

### 133.3.33 kODAttributeTypeCity as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Usually, city for a user or person record.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.34 kODAttributeTypeComment as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute used for unformatted comment.

### 133.3.35 kODAttributeTypeCompany as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines the user's company.
Example: Apple Inc.

### 133.3.36 kODAttributeTypeComputers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of computers.

### 133.3.37 kODAttributeTypeConfigAvailable as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Config avail tag.

### 133.3.38 kODAttributeTypeConfigFile as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Config file name.

### 133.3.39 kODAttributeTypeContactGUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the contact GUID of a group.
Usually found in group records (kODRecordTypeGroups)

### 133.3.40 kODAttributeTypeContactPerson as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the contact person of the machine.
Found in host or machine records.

### 133.3.41 kODAttributeTypeCopyTimestamp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Timestamp used in local account caching.

### 133.3.42 kODAttributeTypeCoreFWVersion as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Core FW version for reference.

### 133.3.43 kODAttributeTypeCountry as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents country of a record entry.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.44 kODAttributeTypeCreationTimestamp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute showing date/time of record creation.
Format is x.208 standard YYYYMMDDHHMMSSZ which should be GMT time.

### 133.3.45 kODAttributeTypeCrossCertificatePair as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of a pair of certificates which verify each other. Both certificates have the same level of authority.
Usually found in kODRecordTypeCertificateAuthority records.

### 133.3.46 kODAttributeTypeCustomSearchPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Admin user configured custom search path defined by the search node.

### 133.3.47 kODAttributeTypeDataStamp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute for checksum/meta data

### 133.3.48 kODAttributeTypeDateRecordCreated as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Date of record creation.

### 133.3.49 kODAttributeTypeDepartment as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the department name of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.50 kODAttributeTypeDirRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Directory reference count for a process.

### 133.3.51 kODAttributeTypeDirRefs as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** All the directory references for a process.

### 133.3.52 kODAttributeTypeDNSDomain as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** DNS Resolver domain attribute.

### 133.3.53 kODAttributeTypeDNSName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** DNS Resolver nameserver attribute.

### 133.3.54 kODAttributeTypeDNSNameServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** DNS Resolver nameserver attribute.

### 133.3.55 kODAttributeTypeEMailAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Email address of usually a user record.

### 133.3.56 kODAttributeTypeEMailContacts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines a record's custom email addresses.
found in user records (kODRecordTypeUsers).
Example: home:johndoe\@mymail.com

### 133.3.57 kODAttributeTypeENetAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute for hardware Ethernet address (MAC address).
Found in computer records (kODRecordTypeComputers).

### 133.3.58 kODAttributeTypeExpire as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for expiration date or time depending on association.

### 133.3.59 kODAttributeTypeFaxNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the FAX numbers of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.60 kODAttributeTypeFirstName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for first name of user or person record.

### 133.3.61 kODAttributeTypeFullName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Full name of a record (e.g., "John Doe", "John Doe's Computer")

### 133.3.62 kODAttributeTypeFunctionalState as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Functional state of plugin for example.

### 133.3.63 kODAttributeTypeFWVersion as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Framework version for reference.

### 133.3.64 kODAttributeTypeGroup as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of groups.

### 133.3.65 kODAttributeTypeGroupMembers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type in group records containing lists of GUID values for members other than groups.

### 133.3.66 kODAttributeTypeGroupMembership as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Usually a list of users that below to a given group record.

### 133.3.67 kODAttributeTypeGroupServices as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** xml-plist attribute that defines a group's services.
Found in group records (kODRecordTypeGroups).

### 133.3.68 kODAttributeTypeGUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for 36 character (128 bit) unique ID. An example value is "A579E95E-CDFE-4EBC-B7E7-F2158562170F". The standard format contains 32 uppercase hex characters and four hyphen characters.

### 133.3.69 kODAttributeTypeHardwareUUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to store hardware UUID in string form for a record. Typically found in kODRecordTypeComputers.

### 133.3.70 kODAttributeTypeHomeDirectory as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Network home directory URL.

### 133.3.71 kODAttributeTypeHomeDirectoryQuota as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the allowed usage for a user's home directory in bytes.
Found in user records (kODRecordTypeUsers).

### 133.3.72 kODAttributeTypeHomeDirectorySoftQuota as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to define home directory size limit in bytes when user is notified that the hard limit is approaching.

### 133.3.73 kODAttributeTypeHomeLocOwner as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the owner of a workgroup's shared home directory.
Typically found in kODRecordTypeGroups records.

### 133.3.74 kODAttributeTypeHomePhoneNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Home telephone number of a user or person.

### 133.3.75 kODAttributeTypeHTML as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** HTML location.

### 133.3.76 kODAttributeTypeIMHandle as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the Instant Messaging handles of a user.
Values should be prefixed with the appropriate IM type
(i.e., AIM:, Jabber:, MSN:, Yahoo:, or ICQ:).
Usually found in user records (kODRecordTypeUsers).

### 133.3.77 kODAttributeTypeInternetAlias as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to track internet alias.

### 133.3.78 kODAttributeTypeIPAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** IP address expressed either as domain or IP notation.

### 133.3.79 kODAttributeTypeIPAddressAndENetAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** A pairing of IPv4 or IPv6 addresses with Ethernet addresses (e.g., "10.1.1.1/00:16:cb:92:56:41"). Usually found on kODRecordTypeComputers for use by services that need specific pairing of the two values. This should be in addition to kODAttributeTypeIPAddress, kODAttributeTypeIPv6Address and kODAttributeTypeENetAddress. This is necessary because not all directories return attribute values in a guaranteed order.

### 133.3.80 kODAttributeTypeIPv6Address as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** IPv6 address expressed in the standard notation (e.g., "fe80::236:caff:fcc2:5641")
Usually found on kODRecordTypeComputers and kODRecordTypeHosts.

### 133.3.81 kODAttributeTypeJobTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the job title of a user.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.82 kODAttributeTypeJPEGPhoto as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to store binary picture data in JPEG format.
Usually found in user, people or group records (kODRecordTypeUsers, kODRecordTypePeople, kODRecord-

TypeGroups).

### 133.3.83 kODAttributeTypeKDCAuthKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** KDC master key RSA encrypted with realm public key.

### 133.3.84 kODAttributeTypeKDCConfigData as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Contents of the kdc.conf file.

### 133.3.85 kODAttributeTypeKerberosRealm as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Supports Kerberized SMB Server services.

### 133.3.86 kODAttributeTypeKerberosServices as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** This is used to store the principals in host records (i.e., ”host”, ”vnc”, etc.)

### 133.3.87 kODAttributeTypeKeywords as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Keywords using for searching capability.

### 133.3.88 kODAttributeTypeLastName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for the last name of user or person record.

### 133.3.89 kODAttributeTypeLDAPReadReplicas as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of LDAP server URLs which can each be used to read directory data.

### 133.3.90 kODAttributeTypeLDAPSearchBaseSuffix as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Search base suffix for a LDAP server.

### 133.3.91 kODAttributeTypeLDAPWriteReplicas as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of LDAP server URLs which can each be used to write directory data.

### 133.3.92 kODAttributeTypeLocaleRelay as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.93 kODAttributeTypeLocaleSubnets as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.94 kODAttributeTypeLocalOnlySearchPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Local only search path defined by the search node.

### 133.3.95 kODAttributeTypeLocation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the location a service is available from (usually domain name).
Typically found in service record types including kODRecordTypeAFPServer, kODRecordTypeLDAPServer, and kODRecordTypeWebServer.

### 133.3.96 kODAttributeTypeMailAttribute as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Holds the mail account config data.

### 133.3.97 kODAttributeTypeMapCoordinates as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines coordinates for a user's location.
found in user records (kODRecordTypeUsers) and resource records (kODRecordTypeResources).
Example: 7.7,10.6

### 133.3.98 kODAttributeTypeMapGUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the GUID for a record's map.

### 133.3.99 kODAttributeTypeMapURI as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines the URI of a user's location.
Usually found in user records (kODRecordTypeUsers).
Example: http://example.com/bldg1

### 133.3.100 kODAttributeTypeMCXFlags as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used by ManagedClient.

### 133.3.101 kODAttributeTypeMCXSettings as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used by ManagedClient.

### 133.3.102 kODAttributeTypeMetaAmbiguousName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Searches a configured list of attributes; by default: RecordName, FullName, EMailAddress.

### 133.3.103 kODAttributeTypeMetaAugmentedAttributes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attributes that have been augmented.

### 133.3.104 kODAttributeTypeMetaAutomountMap as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to query for kODRecordTypeAutomount entries associated with a specific kODRecordTypeAutomountMap.

### 133.3.105 kODAttributeTypeMetaNodeLocation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Meta attribute returning registered node name by directory node plugin.

### 133.3.106 kODAttributeTypeMetaRecordName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Native record name, e.g. LDAP DN

### 133.3.107 kODAttributeTypeMiddleName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for the middle name of user or person record.

### 133.3.108 kODAttributeTypeMIME as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Data contained in this attribute type is a fully qualified MIME Type.

### 133.3.109 kODAttributeTypeMobileNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the mobile numbers of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.110 kODAttributeTypeModificationTimestamp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute showing date/time of record modification.
Format is x.208 standard YYYYMMDDHHMMSSZ which is required as GMT time.

### 133.3.111 kODAttributeTypeNamePrefix as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the title prefix of a user or person. ie. Mr., Ms., Mrs., Dr., etc.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.112 kODAttributeTypeNameSuffix as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the name suffix of a user or person.
i.e., Jr., Sr., etc.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.113 kODAttributeTypeNativeOnly as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used in requesting all native attribute types in a search.

### 133.3.114 kODAttributeTypeNestedGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type in group records for the list of GUID values for nested groups.

### 133.3.115 kODAttributeTypeNetGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type that indicates which netgroups its record is a member of.
Found in user and host records.

### 133.3.116 kODAttributeTypeNetGroupTriplet as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines the host, user and domain triplet combinations to support NetGroups. Each attribute value is comma separated string to maintain the triplet (e.g., host,user,domain).

### 133.3.117 kODAttributeTypeNetworkInterfaces as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.118 kODAttributeTypeNetworkNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines a network number. Usually found in network records (kODRecordTypeNetworks)

### 133.3.119 kODAttributeTypeNFSHomeDirectory as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Defines a user's home directory mount point on the local machine.

### 133.3.120 kODAttributeTypeNickName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the nickname of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.121 kODAttributeTypeNodeOptions as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Any extended options supported by the node during creation

### 133.3.122 kODAttributeTypeNodePath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type in Neighborhood records describing the DS Node to search while looking up aliases in this neighborhood.

### 133.3.123 kODAttributeTypeNodeRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Node reference count for a process.

### 133.3.124 kODAttributeTypeNodeRefs as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** All the node references for a process.

### 133.3.125 kODAttributeTypeNodeSASLRealm as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Contains the SASL realm associated with this node (if any)

### 133.3.126 kODAttributeTypeNote as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Note attribute.

### 133.3.127 kODAttributeTypeNTDomainComputerAccount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Supports Kerberized SMB Server services.

### 133.3.128 kODAttributeTypeNumTableList as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Summary of the reference table entries presented as attribute values from the Configure node.

### 133.3.129 kODAttributeTypeOperatingSystem as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Returns the operating system type where the daemon is running, e.g., Mac OS X or Mac OS X Server

### 133.3.130 kODAttributeTypeOperatingSystemVersion as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Returns the operating system version where the daemon is running, e.g., 10.6

### 133.3.131 kODAttributeTypeOrganizationInfo as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Usually the organization info of a user.

### 133.3.132 kODAttributeTypeOrganizationName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Usually the organization of a user.

### 133.3.133 kODAttributeTypeOriginalHomeDirectory as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Home directory URL used in local account caching.

### 133.3.134 kODAttributeTypeOriginalNFSHomeDirectory as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** NFS home directory used in local account caching.

### 133.3.135 kODAttributeTypeOriginalNodeName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Nodename used in local account caching.

### 133.3.136 kODAttributeTypeOwner as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the owner of a record.
Typically the value is a LDAP distinguished name.

### 133.3.137 kODAttributeTypeOwnerGUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the owner GUID of a group.
Found in group records (kODRecordTypeGroups).

### 133.3.138 kODAttributeTypePagerNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the pager numbers of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.139 kODAttributeTypeParentLocales as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.140 kODAttributeTypePassword as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Holds the password or credential value.

### 133.3.141 kODAttributeTypePasswordPlus as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Holds marker data to indicate possible authentication redirection.

### 133.3.142 kODAttributeTypePasswordPolicyOptions as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Collection of password policy options in single attribute.
Used in user presets record.

### 133.3.143 kODAttributeTypePasswordServerList as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the attribute for storing the password server's replication information.

### 133.3.144 kODAttributeTypePasswordServerLocation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Specifies the IP address or domain name of the Password Server associated with a given directory node. Found in a config record named PasswordServer.

### 133.3.145 kODAttributeTypePGPPublicKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Pretty Good Privacy public encryption key.

### 133.3.146 kODAttributeTypePhoneContacts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines a record's custom phone numbers.
found in user or people records.
Example: home fax:408-555-4444

### 133.3.147 kODAttributeTypePhoneNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Telephone number of a user.

### 133.3.148 kODAttributeTypePicture as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the path of the picture for each user displayed in the login window.
Found in user records (kODRecordTypeUsers).

### 133.3.149 kODAttributeTypePIDValue as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** PID value.

### 133.3.150 kODAttributeTypePluginIndex as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Plugin index for reference.

### 133.3.151 kODAttributeTypePlugInInfo as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Information (version, signature, about, credits, etc.) about the plug-in that is actually servicing a

particular directory node.
Has never been supported.

### 133.3.152 kODAttributeTypePort as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the port number a service is available on.
Typically found in service record types including kODRecordTypeAFPServer, kODRecordTypeLDAPServer, and kODRecordTypeWebServer.

### 133.3.153 kODAttributeTypePostalAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** The postal address usually excluding postal code.

### 133.3.154 kODAttributeTypePostalAddressContacts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines a record's alternate postal addresses.
Found in user records (kODRecordTypeUsers) and resource records (kODRecordTypeResources).

### 133.3.155 kODAttributeTypePostalCode as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** The postal code such as zip code in the USA.

### 133.3.156 kODAttributeTypePresetUserIsAdmin as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Flag to indicate whether users created from this preset are administrators by default. Found in

kODRecordTypePresetUsers records.

### 133.3.157 kODAttributeTypePrimaryComputerGUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** An attribute that defines a primary computer of the computer group.
Added to computer group record type (kODRecordTypeComputerGroups)

### 133.3.158 kODAttributeTypePrimaryComputerList as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** The GUID of the computer list with which this computer record is associated.

### 133.3.159 kODAttributeTypePrimaryGroupID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** This is the 32 bit unique ID that represents the primary group a user is part of, or the ID of a group. Format is a signed 32 bit integer represented as a string.

### 133.3.160 kODAttributeTypePrimaryLocale as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.161 kODAttributeTypePrimaryNTDomain as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Supports Kerberized SMB Server services.

### 133.3.162 kODAttributeTypePrinter1284DeviceID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines the IEEE 1284 DeviceID of a printer.
This is used when configuring a printer.

### 133.3.163 kODAttributeTypePrinterLPRHost as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Standard attribute type for kODRecordTypePrinters.

### 133.3.164 kODAttributeTypePrinterLPRQueue as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Standard attribute type for kODRecordTypePrinters.

### 133.3.165 kODAttributeTypePrinterMakeAndModel as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute for definition of the Printer Make and Model. An example value would be "HP LaserJet 2200". This would be used to determine the proper PPD file to be used when configuring a printer from the Directory. This attribute is based on the IPP Printing Specification RFC and IETF IPP-LDAP Printer Record.

### 133.3.166 kODAttributeTypePrinterType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Standard attribute type for kODRecordTypePrinters.

### 133.3.167 kODAttributeTypePrinterURI as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines the URI of a printer "ipp://address" or "smb://server/queue". This is used when configuring a printer. This attribute is based on the IPP Printing Specification RFC and IETF IPP-LDAP Printer Record.

### 133.3.168 kODAttributeTypePrinterXRISupported as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines additional URIs supported by a printer.
This is used when configuring a printer. This attribute is based on the IPP Printing Specification RFC and IETF IPP-LDAP Printer Record.

### 133.3.169 kODAttributeTypePrintServiceInfoText as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Standard attribute type for kODRecordTypePrinters.

### 133.3.170 kODAttributeTypePrintServiceInfoXML as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Standard attribute type for kODRecordTypePrinters.

### 133.3.171 kODAttributeTypePrintServiceUserData as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute for print quota configuration or statistics (XML data).
Found in user records (kODRecordTypeUsers) or print service statistics records (kODRecordTypePrintServiceUser).

### 133.3.172 kODAttributeTypeProcessName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Process Name.

### 133.3.173 kODAttributeTypeProfiles as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Profiles associated with the record.

### 133.3.174 kODAttributeTypeProfilesTimestamp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Timestamp for the profiles associated with the record.

### 133.3.175 kODAttributeTypeProtocolNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines a protocol number. Usually found in protocol records (kODRecordTypeProtocols)

### 133.3.176 kODAttributeTypeProtocols as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of protocols.

### 133.3.177 kODAttributeTypePwdAgingPolicy as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Contains the password aging policy data for an authentication capable record.

### 133.3.178 kODAttributeTypeReadOnlyNode as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Can be found using dsGetDirNodeInfo and will return one of
ReadOnly, ReadWrite, or WriteOnly strings.
Note that ReadWrite does not imply fully readable or writable

### 133.3.179 kODAttributeTypeRealUserID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used by Managed Client

### 133.3.180 kODAttributeTypeRecordName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of names/keys for this record.

### 133.3.181 kODAttributeTypeRecordType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute for a Record or a Directory Node.

### 133.3.182 kODAttributeTypeRecRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Record reference count for a process.

### 133.3.183 kODAttributeTypeRecRefs as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** All the record references for a process.

### 133.3.184 kODAttributeTypeRelationships as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines the relationship to the record type.
found in user records (kODRecordTypeUsers).
Example: brother:John

### 133.3.185 kODAttributeTypeRelativeDNPrefix as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to map the first native LDAP attribute type required in the building of the Relative Distinguished Name for LDAP record creation.

### 133.3.186 kODAttributeTypeResourceInfo as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines a resource record's info.

### 133.3.187 kODAttributeTypeResourceType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute type for the kind of resource.
found in resource records (kODRecordTypeResources).
Example: ConferenceRoom

### 133.3.188 kODAttributeTypeRPCNumber as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute that defines an RPC number. Usually found in RPC records (kODRecordTypeRPC)

### 133.3.189 kODAttributeTypeSchema as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of attribute types.

### 133.3.190 kODAttributeTypeSearchPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Search path used by the search node.

### 133.3.191 kODAttributeTypeSearchPolicy as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Search policy for the search node.

### 133.3.192 kODAttributeTypeServicesLocator as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** the URI for a record's calendar

### 133.3.193 kODAttributeTypeServiceType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the service type for the service. This is the raw service type of the service. For example a service record type of kODRecordTypeWebServer might have a service type of "http" or "https".

### 133.3.194 kODAttributeTypeSetupAdvertising as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for Setup Assistant automatic population.

### 133.3.195 kODAttributeTypeSetupAutoRegister as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for Setup Assistant automatic population.

### 133.3.196 kODAttributeTypeSetupLocation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for Setup Assistant automatic population.

### 133.3.197 kODAttributeTypeSetupOccupation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used for Setup Assistant automatic population.

### 133.3.198 kODAttributeTypeSMBAcctFlags as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Account control flag.

### 133.3.199 kODAttributeTypeSMBGroupRID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Constant for supporting PDC SMB interaction with DirectoryService.

### 133.3.200 kODAttributeTypeSMBHome as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** UNC address of Windows homedirectory mount point (\server\sharepoint).

### 133.3.201 kODAttributeTypeSMBHomeDrive as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Drive letter for homedirectory mount point.

### 133.3.202 kODAttributeTypeSMBKickoffTime as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute in support of SMB interaction.

### 133.3.203 kODAttributeTypeSMBLogoffTime as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute in support of SMB interaction.

### 133.3.204 kODAttributeTypeSMBLogonTime as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** SMB Primary Group Security ID, stored as a string attribute of up to 64 bytes. Found in user, group, and computer records (kODRecordTypeUsers, kODRecordTypeGroups, kODRecordTypeComputers).

### 133.3.205 kODAttributeTypeSMBPrimaryGroupSID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.

### 133.3.206 kODAttributeTypeSMBProfilePath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Desktop management info (dock, desktop links, etc).

### 133.3.207 kODAttributeTypeSMBPWDLastSet as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute in support of SMB interaction.

### 133.3.208 kODAttributeTypeSMBRID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute in support of SMB interaction.

### 133.3.209 kODAttributeTypeSMBScriptPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Login script path.

### 133.3.210 kODAttributeTypeSMBSID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** SMB Security ID, stored as a string attribute of up to 64 bytes.
Found in user, group, and computer records (kODRecordTypeUsers, kODRecordTypeGroups, kODRecordTypeComputers).

### 133.3.211 kODAttributeTypeSMBUserWorkstations as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of workstations user can login from (machine account names).

### 133.3.212 kODAttributeTypeStandardOnly as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used in requesting all standard attribute types in a query.

### 133.3.213 kODAttributeTypeState as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** The state or province of a country.

### 133.3.214 kODAttributeTypeStreet as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Represents the street address of a user or person.
Usually found in user or people records (kODRecordTypeUsers or kODRecordTypePeople).

### 133.3.215 kODAttributeTypeSubNodes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute of a node which lists the available subnodes of that node.

### 133.3.216 kODAttributeTypeTimePackage as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Data of Create, Modify, Backup time in UTC.

### 133.3.217 kODAttributeTypeTimeToLive as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute recommending how long to cache the record's attribute values.
Format is an unsigned 32 bit representing seconds. ie. 300 is 5 minutes.

### 133.3.218 kODAttributeTypeTotalRefCount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Total count of references for a process.

### 133.3.219 kODAttributeTypeTotalSize as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** checksum/meta data.

### 133.3.220 kODAttributeTypeTrustInformation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to describe a node's trust information.

### 133.3.221 kODAttributeTypeUniqueID as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** This is the 32 bit unique ID that represents the user in the legacy manner.
Format is a signed integer represented as a string.

### 133.3.222 kODAttributeTypeURL as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** List of URLs.

### 133.3.223 kODAttributeTypeUserCertificate as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of the user's certificate.
Usually found in user records. The certificate is data which identifies a user.
This data is attested to by a known party, and can be independently verified by a third party.

### 133.3.224 kODAttributeTypeUserPKCS12Data as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing binary data in PKCS #12 format.

Usually found in user records. The value can contain keys, certificates, and other related information and is encrypted with a passphrase.

### 133.3.225 kODAttributeTypeUserShell as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used to represent the user's shell setting.

### 133.3.226 kODAttributeTypeUserSMIMECertificate as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute containing the binary of the user's SMIME certificate.
Usually found in user records. The certificate is data which identifies a user.
This data is attested to by a known party, and can be independently verified by a third party. SMIME certificates are often used for signed or encrypted emails.

### 133.3.227 kODAttributeTypeVersion as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Version label.

### 133.3.228 kODAttributeTypeVFSDumpFreq as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute used to support mount records.

### 133.3.229 kODAttributeTypeVFSLinkDir as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute used to support mount records.

### 133.3.230 kODAttributeTypeVFSOpts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Used in support of mount records.

### 133.3.231 kODAttributeTypeVFSPassNo as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute used to support mount records.

### 133.3.232 kODAttributeTypeVFSType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** Attribute used to support mount records.

### 133.3.233 kODAttributeTypeWeblogURI as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** attribute that defines the URI of a user's weblog.
Usually found in user records (kODRecordTypeUsers).
Example: http://example.com/blog/jsmith

### 133.3.234 kODAttributeTypeXMLPlist as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the attribute type constants.
**Notes:** XML plist used.

### 133.3.235 kODRecordTypeAFPServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record type of AFP server records.

### 133.3.236 kODRecordTypeAliases as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Used to represent alias records.

### 133.3.237 kODRecordTypeAttributeTypes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies records that represent each possible attribute type.

### 133.3.238 kODRecordTypeAugments as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Used to store augmented record data.

### 133.3.239 kODRecordTypeAutomount as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Used to store automount record data.

### 133.3.240 kODRecordTypeAutomountMap as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Used to store automountMap record data.

### 133.3.241 kODRecordTypeAutoServerSetup as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Used to discover automated server setup information.

### 133.3.242 kODRecordTypeBootp as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the local node for storing bootp info.

### 133.3.243 kODRecordTypeCertificateAuthorities as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record type that contains certificate authority informatio

### 133.3.244 kODRecordTypeComputerGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies computer group records.

### 133.3.245 kODRecordTypeComputerLists as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies computer list records.

### 133.3.246 kODRecordTypeComputers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies computer records.

### 133.3.247 kODRecordTypeConfiguration as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies configuration records.

### 133.3.248 kODRecordTypeEthernets as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the node for storing ethernets.

### 133.3.249 kODRecordTypeFileMakerServers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** FileMaker servers record type that describes available FileMaker servers, used for service discovery.

### 133.3.250 kODRecordTypeFTPServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies ftp server records.

### 133.3.251 kODRecordTypeGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies group records.

### 133.3.252 kODRecordTypeHosts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies host records.

### 133.3.253 kODRecordTypeHostServices as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the local node for storing host services.

### 133.3.254 kODRecordTypeLDAPServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies LDAP server records.

### 133.3.255 kODRecordTypeLocations as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Location record type.

### 133.3.256 kODRecordTypeMounts as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies mount records.

### 133.3.257 kODRecordTypeNetDomains as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the local node for storing net domains.

### 133.3.258 kODRecordTypeNetGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the local node for storing net groups.

### 133.3.259 kODRecordTypeNetworks as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies network records.

### 133.3.260 kODRecordTypeNFS as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies NFS records.

### 133.3.261 kODRecordTypePeople as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record type that contains "People" records used for contact information.

### 133.3.262 kODRecordTypePresetComputerGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** The computer group record type used for presets in record creation.

### 133.3.263 kODRecordTypePresetComputerLists as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** The computer list record type used for presets in record creation.

### 133.3.264 kODRecordTypePresetComputers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** The computer record type used for presets in record creation.

### 133.3.265 kODRecordTypePresetGroups as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** The group record type used for presets in record creation.

### 133.3.266 kODRecordTypePresetUsers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** The user record type used for presets in record creation.

### 133.3.267 kODRecordTypePrinters as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies printer records.

### 133.3.268 kODRecordTypePrintService as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies print service records.

### 133.3.269 kODRecordTypePrintServiceUser as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Record in the local node for storing quota usage for a user.

### 133.3.270 kODRecordTypeProtocols as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies protocol records.

### 133.3.271 kODRecordTypeQTSServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies quicktime streaming server records.

### 133.3.272 kODRecordTypeQueryInformation as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Specifically to return query information inline such as skipped nodes

### 133.3.273 kODRecordTypeRecordTypes as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies records that represent each possible record type.

### 133.3.274 kODRecordTypeResources as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies resources used in group services.

### 133.3.275 kODRecordTypeRPC as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies remote procedure call records.

### 133.3.276 kODRecordTypeServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies generic server records.

### 133.3.277 kODRecordTypeServices as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies directory based service records.

### 133.3.278 kODRecordTypeSharePoints as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Share point record type.

### 133.3.279 kODRecordTypeSMBServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies SMB server records.

### 133.3.280 kODRecordTypeUsers as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies user records.

### 133.3.281 kODRecordTypeWebServer as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the record type constants.
**Notes:** Identifies web server records.

### 133.3.282 recordDetails(byref error as NSErrorMBS) as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary of attributes with their respective values.
**Notes:** Error: An error reference for error details.

Returns a dictionary of the attributes in inAttributes with their respective values.

### 133.3.283 recordDetailsForAttributes(inAttributes() as string, byref error as NSErrorMBS) as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary of attributes with their respective values.
**Notes:** inAttributes: An array of attributes. Can be nil.
Error: An error reference for error details.

Returns a dictionary of the attributes in inAttributes with their respective values.

If inAttributes is nil, all currently retrieved attributes are returned.

### 133.3.284 synchronize(byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Synchronizes the record from the directory to get current data and commit changes.
**Notes:** Returns true if the record successfully synchronizes; otherwise, false.

This method only fetches those attributes that have been fetched before.

### 133.3.285 valuesForAttribute(inAttribute as String, byref error as NSErrorMBS) as Variant()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the values of an attribute of the record.
**Notes:** inAttribute: The attribute.
Error: An error reference for error details. Can be nil.

Returns an array of attribute values. Elements are of type String or MemoryBlock.

### 133.3.286 Properties

### 133.3.287 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 133.3.288 recordName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The official name of the record.
**Notes:** (Read only property)

### 133.3.289 recordType as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The record,Äôs type.
**Notes:** (Read only property)

## 133.4 class ODSessionMBS

### 133.4.1 class ODSessionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for an Open Directory session.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr2
- OpenDirectory Framework for Xojo

**Xojo Developer Magazine**

- 18.3, page 50: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 9: News

### 133.4.2 Methods

### 133.4.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** gets default session.

### 133.4.4 defaultSession as ODSessionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a shared instance of the local session.

### 133.4.5 nodeNames(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the node names that are registered with this session.

### 133.4.6 ODSessionProxyAddress as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary.
**Notes:** The address to connect to via proxy. The value is of type string.

### 133.4.7 ODSessionProxyPassword as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary.
**Notes:** The password to connect with via proxy. The value is of type string.

### 133.4.8 ODSessionProxyPort as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary.
**Notes:** The port to connect to via proxy. The value is of type integer.

### 133.4.9 ODSessionProxyUsername as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys for the options dictionary.
**Notes:** The username to connect with via proxy. The value is of type string.

### 133.4.10 session(options as dictionary, byref Error as NSErrorMBS) as ODSessionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a session object directed over proxy to another host.
**Notes:** Options: A dictionary of options to associate with the session. Can be nil.
Error: An error reference for error details. Can be nil.

Returns the initialized session object.

### 133.4.11 UserName as String

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries user name.
**Notes:** Convenience function to query user name of current user.

### 133.4.12 Properties

### 133.4.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

# Chapter 134

# OpenCL

## 134.1 class CLCommandQueueMBS

### 134.1.1 class CLCommandQueueMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for an OpenCL command queue.
**Example:**

```
dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeGPU)
dim device as CLDeviceMBS = devices(0) // we use first one

// Create a context
dim context as new CLContextMBS(device, CLContextMBS.kErrorModeLogMessagesToSystemLog)

// Create a command queue
dim queue as new CLCommandQueueMBS(context, device, 0)
```

**Blog Entries**

- OpenCL support in our plugins

### 134.1.2 Methods

### 134.1.3 Constructor(context as CLContextMBS, device as CLDeviceMBS, flags as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Create a command-queue on a specific device.
**Example:**

```
dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeGPU)
dim device as CLDeviceMBS = devices(0) // we use first one

// Create a context
dim context as new CLContextMBS(device, CLContextMBS.kErrorModeLogMessagesToSystemLog)

// Create a command queue
dim queue as new CLCommandQueueMBS(context, device, 0)
```

**Notes:** context: Must be a valid OpenCL context.
device: Must be a device associated with context. It can either be in the list of devices specified when context is created using CLContextMBS Constructor or have the same device type as the device type specified when the context is created.
flags: Specifies a list of properties for the command-queue. This is a bit-field. Only command-queue properties specified in the table below can be set in properties; otherwise the value specified in properties is considered to be not valid.

| Command-Queue Properties | Description |
|---|---|
| kQueueOutOfOrderExecModeEnable | Determines whether the commands queued in the command-queue are executed in-order or out-of-order. If set, the commands in the command-queue are executed out-of-order. Otherwise, commands are executed in-order. |
| kQueueProfilingEnable | Enable or disable profiling of commands in the command-queue. If set, the profiling of commands is enabled. Otherwise profiling of commands is disabled. See clGetEventProfilingInfo for more information. |

The OpenCL functions that are submitted to a command-queue are enqueued in the order the calls are made but can be configured to execute in-order or out-of-order. The properties argument in clCreateCommandQueue can be used to specify the execution order.

If the kQueueOutOfOrderExecModeEnable property of a command-queue is not set, the commands enqueued to a command-queue execute in order. For example, if an application calls EnqueueNDRangeKernel to execute kernel A followed by a EnqueueNDRangeKernel to execute kernel B, the application can assume that kernel A finishes first and then kernel B is executed. If the memory objects output by kernel A are inputs to kernel B then kernel B will see the correct data in memory objects produced by execution of kernel A. If the kQueueOutOfOrderExecModeEnable property of a commandqueue is set, then there is no

guarantee that kernel A will finish before kernel B starts execution.

Applications can configure the commands enqueued to a command-queue to execute out-of-order by setting the kQueueOutOfOrderExecModeEnable property of the command-queue. This can be specified when the command-queue is created or can be changed dynamically using this Constructor. In out-of-order execution mode there is no guarantee that the enqueued commands will finish execution in the order they were queued. As there is no guarantee that kernels will be executed in order, i.e. based on when the EnqueueNDRangeKernel calls are made within a command-queue, it is therefore possible that an earlier EnqueueNDRangeKernel call to execute kernel A identified by event A may execute and/or finish later than a EnqueueNDRangeKernel call to execute kernel B which was called by the application at a later point in time. To guarantee a specific order of execution of kernels, a wait on a particular event (in this case event A) can be used. The wait for event A can be specified in the event_wait_list argument to EnqueueNDRangeKernel for kernel B.

In addition, a wait for events or a barrier command can be enqueued to the command-queue. The wait for events command ensures that previously enqueued commands identified by the list of events to wait for have finished before the next batch of commands is executed. The barrier command ensures that all previously enqueued commands in a command-queue have finished execution before the next batch of commands is executed.

Similarly, commands to read, write, copy or map memory objects that are enqueued after EnqueueNDRangeKernel, EnqueueTask or EnqueueNativeKernel commands are not guaranteed to wait for kernels scheduled for execution to have completed (if the kQueueOutOfOrderExecModeEnable property is set). To ensure correct ordering of commands, the event object returned by EnqueueNDRangeKernel, EnqueueTask or EnqueueNativeKernel can be used to enqueue a wait for event or a barrier command can be enqueued that must complete before reads or writes to the memory object(s) occur.

Lasterror is set.

### 134.1.4 Context as CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the context specified when the command-queue is created.
**Notes:** Lasterror is set.

### 134.1.5 Device as CLDeviceMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the device specified when the command-queue is created.
**Notes:** Lasterror is set.

### 134.1.6 EnqueueBarrier

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A synchronization point that enqueues a barrier operation.
**Notes:** EnqueueBarrier is a synchronization point that ensures that all queued commands in command_queue have finished execution before the next batch of commands can begin execution.

Lasterror is set.

### 134.1.7 EnqueueCopyBuffer(sourceBuffer as CLMemMBS, destBuffer as CLMemMBS, sourceOffset as Integer, destOffset as Integer, size as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy a buffer object to another buffer object.
**Notes:** sourceBuffer: the source memory object.
destBuffer: the destination memory object.
sourceOffset: The offset where to begin copying data from sourceBuffer.
destOffset: The offset where to begin copying data into destBuffer.
size: Refers to the size in bytes to copy.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in event_wait_list act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.
Lasterror is set.
See also:

- 134.1.8 EnqueueCopyBuffer(sourceBuffer as CLMemMBS, destBuffer as CLMemMBS, sourceOffset as Integer, destOffset as Integer, size as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18402

### 134.1.8 EnqueueCopyBuffer(sourceBuffer as CLMemMBS, destBuffer as CLMemMBS, sourceOffset as Integer, destOffset as Integer, size as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy a buffer object to another buffer object.
**Notes:** sourceBuffer: the source memory object.
destBuffer: the destination memory object.
sourceOffset: The offset where to begin copying data from sourceBuffer.
destOffset: The offset where to begin copying data into destBuffer.

size: Refers to the size in bytes to copy.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in event_wait_list act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.
Lasterror is set.
See also:

- 134.1.7 EnqueueCopyBuffer(sourceBuffer as CLMemMBS, destBuffer as CLMemMBS, sourceOffset as Integer, destOffset as Integer, size as Integer) 18402

### 134.1.9 EnqueueCopyBufferToImage(SourceBuffer as CLMemMBS, destImage as CLMemMBS, sourceOffset as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy a buffer object to an image object.
**Notes:** SourceBuffer: A valid buffer object.
destImage: A valid image object.

sourceOffset: The offset where to begin copying data from SourceBuffer.

destOrigin: The (x, y, z) offset in pixels where to begin copying data to destImage. If destImage is a 2D image object, the z value given by destOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If destImage is a 2D image object, the depth value given by RegionDepth must be 1.

The size in bytes of the region to be copied from SourceBuffer referred to as src_cb is computed as width * height * depth * bytes/image element if destImage is a 3D image object and is computed as width * height * bytes/image element if destImage is a 2D image object.

EventWaitList: Optionally, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional. Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Lasterror is set.
See also:

- 134.1.10 EnqueueCopyBufferToImage(SourceBuffer as CLMemMBS, destImage as CLMemMBS, sourceOffset as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18404

### 134.1.10 EnqueueCopyBufferToImage(SourceBuffer as CLMemMBS, destImage as CLMemMBS, sourceOffset as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy a buffer object to an image object.
**Notes:** SourceBuffer: A valid buffer object.
destImage: A valid image object.

sourceOffset: The offset where to begin copying data from SourceBuffer.

destOrigin: The (x, y, z) offset in pixels where to begin copying data to destImage. If destImage is a 2D image object, the z value given by destOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If destImage is a 2D image object, the depth value given by RegionDepth must be 1.

The size in bytes of the region to be copied from SourceBuffer referred to as src_cb is computed as width * height * depth * bytes/image element if destImage is a 3D image object and is computed as width * height * bytes/image element if destImage is a 2D image object.

EventWaitList: Optionally, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional. Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Lasterror is set.
See also:

- 134.1.9 EnqueueCopyBufferToImage(SourceBuffer as CLMemMBS, destImage as CLMemMBS, sourceOffset as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer) 18403


### 134.1.11 EnqueueCopyImage(sourceImage as CLMemMBS, destImage as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy image objects.
**Notes:** sourceImage: Source image.
destImage: Dest image.

sourceOrigin: Defines the starting (x, y, z) location in pixels in src_image from where to start the data copy. If src_image is a 2D image object, the z value given by sourceOriginZ must be 0.

sourceOrigin: Defines the starting (x, y, z) location in pixels in dst_image from where to start the data copy. If dst_image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If src_image or dst_image is a 2D image object, the depth value given by RegionDepth must be 1.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CommandQueue must be the same.

outEvent: Optional, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

It is currently a requirement that the sourceImage and destImage image memory objects for EnqueueCopyImage must have the exact same image format (i.e. the cl_image_format descriptor specified when sourceImage and destImage are created must match).

sourceImage and destImage can be 2D or 3D image objects allowing us to perform the following actions:

- Copy a 2D image object to a 2D image object.
- Copy a 2D image object to a 2D slice of a 3D image object.

- Copy a 2D slice of a 3D image object to a 2D image object.
- Copy a 3D image object to a 3D image object.

Lasterror is set.
See also:

- 134.1.12 EnqueueCopyImage(sourceImage as CLMemMBS, destImage as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18406

### 134.1.12 EnqueueCopyImage(sourceImage as CLMemMBS, destImage as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy image objects.
**Notes:** sourceImage: Source image.
destImage: Dest image.

sourceOrigin: Defines the starting (x, y, z) location in pixels in src_image from where to start the data copy. If src_image is a 2D image object, the z value given by sourceOriginZ must be 0.

sourceOrigin: Defines the starting (x, y, z) location in pixels in dst_image from where to start the data copy. If dst_image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If src_image or dst_image is a 2D image object, the depth value given by RegionDepth must be 1.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CommandQueue must be the same.

outEvent: Optional, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

It is currently a requirement that the sourceImage and destImage image memory objects for EnqueueCopyImage must have the exact same image format (i.e. the cl_image_format descriptor specified when

sourceImage and destImage are created must match).

sourceImage and destImage can be 2D or 3D image objects allowing us to perform the following actions:

- Copy a 2D image object to a 2D image object.
- Copy a 2D image object to a 2D slice of a 3D image object.
- Copy a 2D slice of a 3D image object to a 2D image object.
- Copy a 3D image object to a 3D image object.

Lasterror is set.
See also:

- 134.1.11 EnqueueCopyImage(sourceImage as CLMemMBS, destImage as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, destOriginX as Integer, destOriginY as Integer, destOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer) 18405

### 134.1.13 EnqueueCopyImageToBuffer(sourceImage as CLMemMBS, destBuffer as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, destOffset as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy an image object to a buffer object.
**Notes:** sourceImage: A valid image object.
destBuffer: A valid buffer object.

sourceOrigin: Defines the (x, y, z) offset in pixels in the image from where to copy. If sourceImage is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If sourceImage is a 2D image object, the depth value given by RegionDepth must be 1.

destOffset: The offset where to begin copying data into destBuffer. The size in bytes of the region to be copied referred to as dst_cb is computed as width * height * depth * bytes/image element if sourceImage is a 3D image object and is computed as width * height * bytes/image element if sourceImage is a 2D image object.

EventWaitList: Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in

event_wait_list and command_queue must be the same.

outEvent: Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Lasterror is set.
See also:

- 134.1.14 EnqueueCopyImageToBuffer(sourceImage as CLMemMBS, destBuffer as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, destOffset as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18408

### 134.1.14 EnqueueCopyImageToBuffer(sourceImage as CLMemMBS, destBuffer as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, destOffset as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to copy an image object to a buffer object.
**Notes:** sourceImage: A valid image object.
destBuffer: A valid buffer object.

sourceOrigin: Defines the (x, y, z) offset in pixels in the image from where to copy. If sourceImage is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle to copy. If sourceImage is a 2D image object, the depth value given by RegionDepth must be 1.

destOffset: The offset where to begin copying data into destBuffer. The size in bytes of the region to be copied referred to as dst_cb is computed as width * height * depth * bytes/image element if sourceImage is a 3D image object and is computed as width * height * bytes/image element if sourceImage is a 2D image object.

EventWaitList: Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Lasterror is set.
See also:

- 134.1.13 EnqueueCopyImageToBuffer(sourceImage as CLMemMBS, destBuffer as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, destOffset as Integer) 18407

### 134.1.15 EnqueueMapBuffer(buffer as CLMemMBS, BlockingMap as boolean, MapFlags as Integer, offset as Integer, size as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to map a region of the buffer object given by buffer into the host address space and returns a pointer to this mapped region.
**Notes:** BlockingMap: Optional, Indicates if the map operation is blocking or non-blocking. If BlockingMap is true, EnqueueMapBuffer does not return until the specified region in buffer can be mapped. If BlockingMap is false i.e. map operation is non-blocking, the pointer to the mapped region returned by clEnqueueMapBuffer cannot be used until the map command has completed. The event argument returns an event object which can be used to query the execution status of the map command. When the map command is completed, the application can access the contents of the mapped region using the pointer returned by EnqueueMapBuffer.
MapFlags: Is a bit-field and can be set to kMapRead to indicate that the region specified by (offset, size) in the buffer object is being mapped for reading, and/or kMapWrite to indicate that the region specified by (offset, size) in the buffer object is being mapped for writing.
buffer: A valid buffer object. The OpenCL context associated with CLCommandQueueMBS and buffer must be the same.
offset, size: The offset in bytes and the size of the region in the buffer object that is being mapped.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in EventWaitList act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.
outEvent: Returns an event object that identifies this particular copy command and can be used toquery or queue a wait for this particular command to complete.

Lasterror is set.

The contents of the regions of a memory object mapped for writing (i.e. kMapWrite is set in map_flags argument to EnqueueMapBuffer or EnqueueMapImage) are considered to be undefined until this region is unmapped. Reads and writes by a kernel executing on a device to a memory region(s) mapped for writing are undefined.

Multiple command-queues can map a region or overlapping regions of a memory object for reading (i.e. MapFlags = kMapRead). The contents of the regions of a memory object mapped for reading can also be read by kernels executing on a device(s). The behavior of writes by a kernel executing on a device to a

mapped region of a memory object is undefined. Mapping (and unmapping) overlapped regions of a buffer or image memory object for writing is undefined.

The behavior of OpenCL function calls that enqueue commands that write or copy to regions of a memory object that are mapped is undefined.

Lasterror is set.
See also:

- 134.1.16 EnqueueMapBuffer(buffer as CLMemMBS, MapFlags as Integer, offset as Integer, size as Integer) as memoryblock 18410

### 134.1.16 EnqueueMapBuffer(buffer as CLMemMBS, MapFlags as Integer, offset as Integer, size as Integer) as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to map a region of the buffer object given by buffer into the host address space and returns a pointer to this mapped region.
**Notes:** BlockingMap: Optional, Indicates if the map operation is blocking or non-blocking. If BlockingMap is true, EnqueueMapBuffer does not return until the specified region in buffer can be mapped. If BlockingMap is false i.e. map operation is non-blocking, the pointer to the mapped region returned by clEnqueueMapBuffer cannot be used until the map command has completed. The event argument returns an event object which can be used to query the execution status of the map command. When the map command is completed, the application can access the contents of the mapped region using the pointer returned by EnqueueMapBuffer.
MapFlags: Is a bit-field and can be set to kMapRead to indicate that the region specified by (offset, size) in the buffer object is being mapped for reading, and/or kMapWrite to indicate that the region specified by (offset, size) in the buffer object is being mapped for writing.
buffer: A valid buffer object. The OpenCL context associated with CLCommandQueueMBS and buffer must be the same.
offset, size: The offset in bytes and the size of the region in the buffer object that is being mapped.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in EventWaitList act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.
outEvent: Returns an event object that identifies this particular copy command and can be used toquery or queue a wait for this particular command to complete.

Lasterror is set.

The contents of the regions of a memory object mapped for writing (i.e. kMapWrite is set in map_flags argument to EnqueueMapBuffer or EnqueueMapImage) are considered to be undefined until this region is unmapped. Reads and writes by a kernel executing on a device to a memory region(s) mapped for writing are undefined.

Multiple command-queues can map a region or overlapping regions of a memory object for reading (i.e. MapFlags = kMapRead). The contents of the regions of a memory object mapped for reading can also be read by kernels executing on a device(s). The behavior of writes by a kernel executing on a device to a mapped region of a memory object is undefined. Mapping (and unmapping) overlapped regions of a buffer or image memory object for writing is undefined.

The behavior of OpenCL function calls that enqueue commands that write or copy to regions of a memory object that are mapped is undefined.

Lasterror is set.
See also:

- 134.1.15 EnqueueMapBuffer(buffer as CLMemMBS, BlockingMap as boolean, MapFlags as Integer, offset as Integer, size as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) as memoryblock 18409

### 134.1.17 EnqueueMapImage(image as CLMemMBS, BlockingMap as boolean, MapFlags as Integer, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, byref RowPitch as Integer, byref SlicePitch as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to map a region of an image object into the host address space and returns a pointer to this mapped region.
**Notes:** image: A valid image object. The OpenCL context associated with CLCommandQueueMBS and image must be the same.

BlockingMap: Optional, Indicates if the map operation is blocking or non-blocking. If BlockingMap is true, EnqueueMapImage does not return until the specified region in image can be mapped. If BlockingMap is false i.e. map operation is non-blocking, the pointer to the mapped region returned by EnqueueMapImage cannot be used until the map command has completed. The event argument returns an event object which can be used to query the execution status of the map command. When the map command is completed, the application can access the contents of the mapped region using the pointer returned by EnqueueMapImage.

MapFlags: Is a bit-field and can be set to kMapRead to indicate that the region specified by (origin, region) in the image object is being mapped for reading, and/or kMapWrite to indicate that the region specified by (origin, region) in the image object is being mapped for writing.
origin, region: Define the (x, y, z) offset in pixels and (width, height, depth) in pixels of the 2D or 3D rectangle region that is to be mapped. If image is a 2D image object, the z value given by originZ must be 0 and the depth value given by regionDepth must be 1.

RowPitch: Returns the scan-line pitch in bytes for the mapped region. This must be a non-nil value.
SlicePitch: Returns the size in bytes of each 2D slice for the mapped region. For a 2D image, zero is returned if this argument is not nil. For a 3D image, image_slice_pitch must be a non-nil value.

EventWaitList: Optional, Specify events that need to complete before EnqueueMapImage can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and CLCommandQueueMBS must be the same.

outEvent: Optional, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete. event can be nil in which case it will not be possible for the application to query the status of this command or queue a wait for this command to complete.

Lasterror is set.

If the buffer or image object is created with kMemoryUseHostPtr set in mem_flags, the following will be true:

The HostPtr specified in Constructor is guaranteed to contain the latest bits in the region being mapped when the EnqueueMapBuffer or EnqueueMapImage command has completed.
The pointer value returned by EnqueueMapBuffer or EnqueueMapImage will be derived from the HostPtr specified when the buffer or image object is created.
The contents of the regions of a memory object mapped for writing (i.e. kMapWrite is set in MapFlags argument to EnqueueMapBuffer or EnqueueMapImage) are considered to be undefined until this region is unmapped. Reads and writes by a kernel executing on a device to a memory region(s) mapped for writing are undefined.

Multiple command-queues can map a region or overlapping regions of a memory object for reading (i.e. MapFlags = kMapRead). The contents of the regions of a memory object mapped for reading can also be read by kernels executing on a device(s). The behavior of writes by a kernel executing on a device to a mapped region of a memory object is undefined. Mapping (and unmapping) overlapped regions of a buffer or image memory object for writing is undefined.

The behavior of OpenCL function calls that enqueue commands that write or copy to regions of a memory object that are mapped is undefined.
See also:

- 134.1.18 EnqueueMapImage(image as CLMemMBS, MapFlags as Integer, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, byref RowPitch as Integer, byref SlicePitch as Integer) as memoryblock 

### 134.1.18 EnqueueMapImage(image as CLMemMBS, MapFlags as Integer, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, byref RowPitch as Integer, byref SlicePitch as Integer) as memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to map a region of an image object into the host address space and returns a pointer to this mapped region.
**Notes:** image: A valid image object. The OpenCL context associated with CLCommandQueueMBS and image must be the same.

BlockingMap: Optional, Indicates if the map operation is blocking or non-blocking. If BlockingMap is true, EnqueueMapImage does not return until the specified region in image can be mapped. If BlockingMap is false i.e. map operation is non-blocking, the pointer to the mapped region returned by EnqueueMapImage cannot be used until the map command has completed. The event argument returns an event object which can be used to query the execution status of the map command. When the map command is completed, the application can access the contents of the mapped region using the pointer returned by EnqueueMapImage.

MapFlags: Is a bit-field and can be set to kMapRead to indicate that the region specified by (origin, region) in the image object is being mapped for reading, and/or kMapWrite to indicate that the region specified by (origin, region) in the image object is being mapped for writing.
origin, region: Define the (x, y, z) offset in pixels and (width, height, depth) in pixels of the 2D or 3D rectangle region that is to be mapped. If image is a 2D image object, the z value given by originZ must be 0 and the depth value given by regionDepth must be 1.

RowPitch: Returns the scan-line pitch in bytes for the mapped region. This must be a non-nil value.
SlicePitch: Returns the size in bytes of each 2D slice for the mapped region. For a 2D image, zero is returned if this argument is not nil. For a 3D image, image_slice_pitch must be a non-nil value.

EventWaitList: Optional, Specify events that need to complete before EnqueueMapImage can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and CLCommandQueueMBS must be the same.

outEvent: Optional, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete. event can be nil in which case it will not be possible for the application to query the status of this command or queue a wait for this command to complete.

Lasterror is set.

If the buffer or image object is created with kMemoryUseHostPtr set in mem_flags, the following will be true:

The HostPtr specified in Constructor is guaranteed to contain the latest bits in the region being mapped when the EnqueueMapBuffer or EnqueueMapImage command has completed.
The pointer value returned by EnqueueMapBuffer or EnqueueMapImage will be derived from the HostPtr specified when the buffer or image object is created.
The contents of the regions of a memory object mapped for writing (i.e. kMapWrite is set in MapFlags argument to EnqueueMapBuffer or EnqueueMapImage) are considered to be undefined until this region is unmapped. Reads and writes by a kernel executing on a device to a memory region(s) mapped for writing are undefined.

Multiple command-queues can map a region or overlapping regions of a memory object for reading (i.e. MapFlags = kMapRead). The contents of the regions of a memory object mapped for reading can also be read by kernels executing on a device(s). The behavior of writes by a kernel executing on a device to a mapped region of a memory object is undefined. Mapping (and unmapping) overlapped regions of a buffer or image memory object for writing is undefined.

The behavior of OpenCL function calls that enqueue commands that write or copy to regions of a memory object that are mapped is undefined.
See also:

- 134.1.17 EnqueueMapImage(image as CLMemMBS, BlockingMap as boolean, MapFlags as Integer, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, byref RowPitch as Integer, byref SlicePitch as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) as memoryblock 18411

### 134.1.19 EnqueueMarker(byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a marker command.
**Notes:** Enqueues a marker command to the command queue. The marker command returns an event which can be used to queue a wait on this marker event i.e. wait for all commands queued before the marker command to complete.

Lasterror is set.

### 134.1.20 EnqueueNativeKernel(FunctionPtr as ptr, args as memoryblock, argsSize as Integer, NumberOfMemoryObjects as Integer, MemList as memoryblock, ArgsMemoryLocations as memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a native C/C++ function not compiled using the OpenCL

compiler.
**Notes:** First a warning: Don't use this with Xojo methods. You can point to a function written in C which you made thread safe.

self: A valid command-queue. A native user function can only be executed on a command-queue created on a device that has kExceNativeKernel capability set in ExecutionCapabilities property.

FunctionPtr: A pointer to a host-callable user function.

args: A pointer to the args list that FunctionPtr should be called with.
argsSize: The size in bytes of the args list that args points to.

The data pointed to by args and argsSize bytes in size will be copied and a pointer to this copied region will be passed to FunctionPtr. The copy needs to be done because the memory objects (CLMemMBS.handle values) that args may contain need to be modified and replaced by appropriate pointers to global memory. When EnqueueNativeKernel returns, the memory region pointed to by args can be reused by the application.

NumberOfMemoryObjects: The number of buffer objects that are passed in args.

MemList: A list of valid buffer objects, if NumberOfMemoryObjects is greater than 0. The buffer object values specified in MemList are memory object handles (CLMemMBS.handle values) or nil.

ArgsMemoryLocations: A pointer to appropriate locations that args points to where memory object handles (CLMemMBS.handle values) are stored. Before the user function is executed, the memory object handles are replaced by pointers to global memory.

EventWaitList: Optionally, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optionally, Returns an event object that identifies this particular kernel execution instance.

The data pointed to by args and argsSize bytes in size will be copied and a pointer to this copied region will be passed to FunctionPtr. The copy needs to be done because the memory objects (CLMemMBS.handle values) that args may contain need to be modified and replaced by appropriate pointers to global memory. When EnqueueNativeKernel returns, the memory region pointed to by args can be reused by the application.

Lasterror is set.
See also:

- 134.1.21 EnqueueNativeKernel(FunctionPtr as ptr, args as memoryblock, argsSize as Integer, Num-

berOfMemoryObjects as Integer, MemList as memoryblock, ArgsMemoryLocations as memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 

### 134.1.21 EnqueueNativeKernel(FunctionPtr as ptr, args as memoryblock, argsSize as Integer, NumberOfMemoryObjects as Integer, MemList as memoryblock, ArgsMemoryLocations as memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a native C/C++ function not compiled using the OpenCL compiler.
**Notes:** First a warning: Don't use this with Xojo methods. You can point to a function written in C which you made thread safe.

self: A valid command-queue. A native user function can only be executed on a command-queue created on a device that has kExceNativeKernel capability set in ExecutionCapabilities property.

FunctionPtr: A pointer to a host-callable user function.

args: A pointer to the args list that FunctionPtr should be called with.
argsSize: The size in bytes of the args list that args points to.

The data pointed to by args and argsSize bytes in size will be copied and a pointer to this copied region will be passed to FunctionPtr. The copy needs to be done because the memory objects (CLMemMBS.handle values) that args may contain need to be modified and replaced by appropriate pointers to global memory. When EnqueueNativeKernel returns, the memory region pointed to by args can be reused by the application.

NumberOfMemoryObjects: The number of buffer objects that are passed in args.

MemList: A list of valid buffer objects, if NumberOfMemoryObjects is greater than 0. The buffer object values specified in MemList are memory object handles (CLMemMBS.handle values) or nil.

ArgsMemoryLocations: A pointer to appropriate locations that args points to where memory object handles (CLMemMBS.handle values) are stored. Before the user function is executed, the memory object handles are replaced by pointers to global memory.

EventWaitList: Optionally, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optionally, Returns an event object that identifies this particular kernel execution instance.

The data pointed to by args and argsSize bytes in size will be copied and a pointer to this copied region will be passed to FunctionPtr. The copy needs to be done because the memory objects (CLMemMBS.handle values) that args may contain need to be modified and replaced by appropriate pointers to global memory. When EnqueueNativeKernel returns, the memory region pointed to by args can be reused by the application.

Lasterror is set.
See also:

- 134.1.20 EnqueueNativeKernel(FunctionPtr as ptr, args as memoryblock, argsSize as Integer, NumberOfMemoryObjects as Integer, MemList as memoryblock, ArgsMemoryLocations as memoryblock) 18414

### 134.1.22 EnqueueNDRangeKernel(kernel as CLKernelMBS, GlobalWorkSize as Integer, LocalWorkSize as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a kernel on a device.
**Notes:** kernel: A valid kernel object. The OpenCL context associated with kernel and command_queue must be the same.
GlobalWorkSize: The number of global work-items.
LocalWorkSize: The number of work-items that make up a work-group (also referred to as the size of the work-group) that will execute the kernel specified by kernel.

The work-group size to be used for kernel can also be specified in the program source using the __attribute__((reqd_work_group_size(X, Y, Z)))qualifier. In this case the size of work group specified by local_work_size must match the value specified by the reqd_work_group_size __attribute__ qualifier.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Optional, Returns an event object that identifies this particular kernel execution instance. Event objects are unique and can be used to identify a particular kernel execution instance later on.

Work-group instances are executed in parallel across multiple compute units or concurrently on the same compute unit.

Each work-item is uniquely identified by a global identifier. The global ID, which can be read inside the kernel, is computed using the value given by GlobalWorkSize and global_work_offset. In OpenCL 1.0, the starting global ID is always (0, 0, ... 0). In addition, a work-item is also identified within a work-group by a unique local ID. The local ID, which can also be read by the kernel, is computed using the value given by

LocalWorkSize. The starting local ID is always (0, 0, ... 0).

Lasterror is set.
See also:


- 134.1.23 EnqueueNDRangeKernel(kernel as CLKernelMBS, GlobalWorkSize as Integer, LocalWorkSize as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18418


### 134.1.23 EnqueueNDRangeKernel(kernel as CLKernelMBS, GlobalWorkSize as Integer, LocalWorkSize as Integer, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a kernel on a device.
**Notes:** kernel: A valid kernel object. The OpenCL context associated with kernel and command_queue must be the same.
GlobalWorkSize: The number of global work-items.
LocalWorkSize: The number of work-items that make up a work-group (also referred to as the size of the work-group) that will execute the kernel specified by kernel.

The work-group size to be used for kernel can also be specified in the program source using the __attribute__((reqd_work_group_size(X, Y, Z)))qualifier. In this case the size of work group specified by local_work_size must match the value specified by the reqd_work_group_size __attribute__ qualifier.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Optional, Returns an event object that identifies this particular kernel execution instance. Event objects are unique and can be used to identify a particular kernel execution instance later on.

Work-group instances are executed in parallel across multiple compute units or concurrently on the same compute unit.

Each work-item is uniquely identified by a global identifier. The global ID, which can be read inside the kernel, is computed using the value given by GlobalWorkSize and global_work_offset. In OpenCL 1.0, the starting global ID is always (0, 0, ... 0). In addition, a work-item is also identified within a work-group by a unique local ID. The local ID, which can also be read by the kernel, is computed using the value given by LocalWorkSize. The starting local ID is always (0, 0, ... 0).

Lasterror is set.
See also:

- 134.1.22 EnqueueNDRangeKernel(kernel as CLKernelMBS, GlobalWorkSize as Integer, LocalWorkSize as Integer) 18417

### 134.1.24 EnqueueReadBuffer(buffer as CLMemMBS, BlockingRead as boolean, offset as Integer, size as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueue commands to read from a buffer object to host memory.
**Notes:** buffer: Refers to a valid buffer object.
BlockingRead: Optional, Indicates if the read operations are blocking or non-blocking. If BlockingRead is true i.e. the read command is blocking, clEnqueueReadBuffer does not return until the buffer data has been read and copied into memory pointed to by ptr.

If BlockingRead is false i.e. the read command is non-blocking, EnqueueReadBuffer queues a non-blocking read command and returns. The contents of the buffer that ptr points to cannot be used until the read command has completed. The event argument returns an event object which can be used to query the execution status of the read command. When the read command has completed, the contents of the buffer that ptr points to can be used by the application.

offset: The offset in bytes in the buffer object to read from.
size: The size in bytes of data being read.
mem: The pointer to buffer in host memory where data is to be read into.

EventWaitList: Optional, specifies events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and command_queue must be the same.

outEvent: Optional, Returns an event object that identifies this particular read command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueReadBuffer to read a region of the buffer object with the ptr argument value set to mem + offset, where mem is a pointer to the memory region specified when the buffer object being read is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

All commands that use this buffer object have finished execution before the read command begins execution
The buffer object is not mapped
The buffer object is not used by any command-queue until the read command has finished execution

Lasterror is set.
See also:

- 134.1.25 EnqueueReadBuffer(buffer as CLMemMBS, offset as Integer, size as Integer, mem as Memoryblock) 18420

### 134.1.25 EnqueueReadBuffer(buffer as CLMemMBS, offset as Integer, size as Integer, mem as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueue commands to read from a buffer object to host memory.
**Notes:** buffer: Refers to a valid buffer object.
BlockingRead: Optional, Indicates if the read operations are blocking or non-blocking. If BlockingRead is true i.e. the read command is blocking, clEnqueueReadBuffer does not return until the buffer data has been read and copied into memory pointed to by ptr.

If BlockingRead is false i.e. the read command is non-blocking, EnqueueReadBuffer queues a non-blocking read command and returns. The contents of the buffer that ptr points to cannot be used until the read command has completed. The event argument returns an event object which can be used to query the execution status of the read command. When the read command has completed, the contents of the buffer that ptr points to can be used by the application.

offset: The offset in bytes in the buffer object to read from.
size: The size in bytes of data being read.
mem: The pointer to buffer in host memory where data is to be read into.

EventWaitList: Optional, specifies events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and command_queue must be the same.

outEvent: Optional, Returns an event object that identifies this particular read command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueReadBuffer to read a region of the buffer object with the ptr argument value set to mem + offset, where mem is a pointer to the memory region specified when the buffer object being read is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

All commands that use this buffer object have finished execution before the read command begins execution
The buffer object is not mapped
The buffer object is not used by any command-queue until the read command has finished execution

Lasterror is set.
See also:

- 134.1.24 EnqueueReadBuffer(buffer as CLMemMBS, BlockingRead as boolean, offset as Integer, size as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18419

### 134.1.26 EnqueueReadImage(image as CLMemMBS, BlockingRead as boolean, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to read from a 2D or 3D image object to host memory.
**Notes:** image: Refers to a valid 2D or 3D image object.

BlockingRead: Optional. Indicates if the read operations are blocking or non-blocking.

If BlockingRead is true i.e. the read command is blocking, clEnqueueReadImage does not return until the buffer data has been read and copied into memory pointed to by mem.

If BlockingRead is false i.e. map operation is non-blocking, clEnqueueReadImage queues a non-blocking read command and returns. The contents of the buffer that mem points to cannot be used until the read command has completed. The event argument returns an event object which can be used to query the execution status of the read command. When the read command has completed, the contents of the buffer that mem points to can be used by the application.

origin: Defines the (x, y, z) offset in pixels in the image from where to read. If image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle being read. If image is a 2D image object, the depth value given by RegionDepth must be 1.

RowPitch: The length of each row in bytes. This value must be greater than or equal to the element size in bytes * width. If RowPitch is set to 0, the appropriate row pitch is calculated based on the size of each element in bytes multiplied by width.

SlicePitch: Size in bytes of the 2D slice of the 3D region of a 3D image being read. This must be 0 if image is a 2D image. This value must be greater than or equal to RowPitch * height. If SlicePitch is set to 0, the appropriate slice pitch is calculated based on the RowPitch * height.

mem: The pointer to a buffer in host memory where image data is to be read from.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional, Returns an event object that identifies this particular read command and can be used to query or queue a wait for this particular command to complete. event can be nil in which case it will not be possible for the application to query the status of this command or queue a wait for this command to complete.

Calling EnqueueReadImage to read a region of the image object with the mem argument value set to HostPtr + (sourceOriginZ * image slice pitch + sourceOriginY * image row pitch + sourceOriginX * bytes per pixel), where host_ptr is a pointer to the memory region specified when the image object being read is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

- All commands that use this image object have finished execution before the read command begins execution.
- The RowPitch and SlicePitch argument values in EnqueueReadImage must be set to the image row pitch and slice pitch.
- The image object is not mapped.
- The image object is not used by any command-queue until the read command has finished execution.

Lasterror is set.
See also:

- 134.1.27 EnqueueReadImage(image as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock) 18422

### 134.1.27 EnqueueReadImage(image as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to read from a 2D or 3D image object to host memory..
**Notes:** image: Refers to a valid 2D or 3D image object.

BlockingRead: Optional. Indicates if the read operations are blocking or non-blocking.

If BlockingRead is true i.e. the read command is blocking, clEnqueueReadImage does not return until the buffer data has been read and copied into memory pointed to by mem.

If BlockingRead is false i.e. map operation is non-blocking, clEnqueueReadImage queues a non-blocking read command and returns. The contents of the buffer that mem points to cannot be used until the read command has completed. The event argument returns an event object which can be used to query the execution status of the read command. When the read command has completed, the contents of the buffer that mem points to can be used by the application.

origin: Defines the (x, y, z) offset in pixels in the image from where to read. If image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle being read. If image is a 2D image object, the depth value given by RegionDepth must be 1.

RowPitch: The length of each row in bytes. This value must be greater than or equal to the element size in bytes * width. If RowPitch is set to 0, the appropriate row pitch is calculated based on the size of each element in bytes multiplied by width.

SlicePitch: Size in bytes of the 2D slice of the 3D region of a 3D image being read. This must be 0 if image is a 2D image. This value must be greater than or equal to RowPitch * height. If SlicePitch is set to 0, the appropriate slice pitch is calculated based on the RowPitch * height.

mem: The pointer to a buffer in host memory where image data is to be read from.

EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional, Returns an event object that identifies this particular read command and can be used to query or queue a wait for this particular command to complete. event can be nil in which case it will not be possible for the application to query the status of this command or queue a wait for this command to complete.

Calling EnqueueReadImage to read a region of the image object with the mem argument value set to HostPtr + (sourceOriginZ * image slice pitch + sourceOriginY * image row pitch + sourceOriginX * bytes per pixel), where host_ptr is a pointer to the memory region specified when the image object being read is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

- All commands that use this image object have finished execution before the read command begins execution.

- The RowPitch and SlicePitch argument values in EnqueueReadImage must be set to the image row pitch and slice pitch.
- The image object is not mapped.
- The image object is not used by any command-queue until the read command has finished execution.

Lasterror is set.
See also:

- 134.1.26 EnqueueReadImage(image as CLMemMBS, BlockingRead as boolean, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18421

### 134.1.28 EnqueueReadPicture(image as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, RegionWidth as Integer, RegionHeight as Integer, pic as picture)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Enqueues a command to read from a 2D or 3D image object to a Xojo picture object.
**Example:**

```
const size = 500

// create test picture
dim pic1 as Picture = LogoMBS(size)
// create destination picture
dim pic2 as new Picture(size, size, 32)

// get device list
dim devices() as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)
dim device as CLDeviceMBS = devices(0)

// Create context for that device
dim c as new CLContextMBS(device)

// query what format Xojo uses for pictures
dim RowPitch as Integer
dim format as CLImageFormatMBS = OpenCLMBS.GetPictureImageFormat(pic1, RowPitch)

// create a matching memory object
dim m as new CLMemMBS(c, CLMemMBS.kMemoryReadWrite, format, size, size, RowPitch)

// create command queue
dim cq as new CLCommandQueueMBS(c, device, 0)
```

```
// copy picture content into CLMem object
cq.EnqueueWritePicture(m, 0, 0, size, size, pic1)

// and copy back to second picture
cq.EnqueueReadPicture(m, 0, 0, size, size, pic2)

// finally display it
Backdrop = pic2
```

**Notes:** image: Refers to a valid 2D or 3D image object.

origin: Defines the (x, y) offset in pixels in the image from where to read.
region: Defines the (width, heigh) in pixels of the 2D or 3D rectangle being read.

pic: The Xojo picture object to write pixel data to.

This command is always blocking.
Lasterror is set.

### 134.1.29 EnqueueTask(kernel as CLKernelMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a kernel on a device.
**Notes:** kernel: A valid kernel object. The OpenCL context associated with kernel and command_queue must be the same.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is not passed or empty, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Optional, Returns an event object that identifies this particular kernel execution instance. Event objects are unique and can be used to identify a particular kernel execution instance later on.

The kernel is executed using a single work-item.

EnqueueTask is equivalent to calling EnqueueNDRangeKernel with work_dim = 1, global_work_size set to 1, and local_work_size set to 1.
Lasterror is set.
See also:

- 134.1.30 EnqueueTask(kernel as CLKernelMBS, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18426

### 134.1.30 EnqueueTask(kernel as CLKernelMBS, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to execute a kernel on a device.
**Notes:** kernel: A valid kernel object. The OpenCL context associated with kernel and command_queue must be the same.
EventWaitList: Optional, Specify events that need to complete before this particular command can be executed. If EventWaitList is not passed or empty, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.
outEvent: Optional, Returns an event object that identifies this particular kernel execution instance. Event objects are unique and can be used to identify a particular kernel execution instance later on.

The kernel is executed using a single work-item.

EnqueueTask is equivalent to calling EnqueueNDRangeKernel with work_dim = 1, global_work_size set to 1, and local_work_size set to 1.
Lasterror is set.
See also:

- 134.1.29 EnqueueTask(kernel as CLKernelMBS) 18425

### 134.1.31 EnqueueUnmapMemObject(buffer as CLMemMBS, mem as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to unmap a previously mapped region of a memory object.
**Notes:** memobj: A valid memory object. The OpenCL context associated with CLCommandQueueMBS and memobj must be the same.

mem: The host address returned by a previous call to EnqueueMapBuffer or EnqueueMapImage for memobj. Do not use this memoryblock after it has been unmapped.

EventWaitList: Optionally, Specify events that need to complete before EnqueueUnmapMemObject can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.

outEvent: Optionally, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Reads or writes from the host using the pointer returned by EnqueueMapBuffer or EnqueueMapImage are

considered to be complete.

EnqueueMapBuffer and EnqueueMapImage increments the mapped count of the memory object. The initial mapped count value of a memory object is zero. Multiple calls to EnqueueMapBuffer or EnqueueMapImage on the same memory object will increment this mapped count by appropriate number of calls. EnqueueUnmapMemObject decrements the mapped count of the memory object.

EnqueueMapBuffer and clEnqueueMapImage act as synchronization points for a region of the memory object being mapped.
See also:

- 134.1.32 EnqueueUnmapMemObject(buffer as CLMemMBS, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18427

### 134.1.32 EnqueueUnmapMemObject(buffer as CLMemMBS, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to unmap a previously mapped region of a memory object.
**Notes:** memobj: A valid memory object. The OpenCL context associated with CLCommandQueueMBS and memobj must be the same.

mem: The host address returned by a previous call to EnqueueMapBuffer or EnqueueMapImage for memobj. Do not use this memoryblock after it has been unmapped.

EventWaitList: Optionally, Specify events that need to complete before EnqueueUnmapMemObject can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.

outEvent: Optionally, Returns an event object that identifies this particular copy command and can be used to query or queue a wait for this particular command to complete.

Reads or writes from the host using the pointer returned by EnqueueMapBuffer or EnqueueMapImage are considered to be complete.

EnqueueMapBuffer and EnqueueMapImage increments the mapped count of the memory object. The initial mapped count value of a memory object is zero. Multiple calls to EnqueueMapBuffer or EnqueueMapImage on the same memory object will increment this mapped count by appropriate number of calls. EnqueueUnmapMemObject decrements the mapped count of the memory object.

EnqueueMapBuffer and clEnqueueMapImage act as synchronization points for a region of the memory object

being mapped.
See also:

- 134.1.31 EnqueueUnmapMemObject(buffer as CLMemMBS, mem as Memoryblock) 18426

### 134.1.33 EnqueueWaitForEvents(EventWaitList() as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a wait for a specific event or a list of events to complete before any future commands queued in the command-queue are executed.
**Notes:** EventWaitList: Events specified in EventWaitList act as synchronization points.

The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.

Lasterror is set.

### 134.1.34 EnqueueWriteBuffer(buffer as CLMemMBS, BlockingWrite as boolean, offset as Integer, size as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueue commands to write to a buffer object from host memory.
**Notes:** buffer: Refers to a valid buffer object.
BlockingWrite: Optional, Indicates if the write operations are blocking or nonblocking.

If blocking_write is true, the OpenCL implementation copies the data referred to by mem and enqueues the write operation in the command-queue. The memory pointed to by mem can be reused by the application after the EnqueueWriteBuffer call returns.

If blocking_write is false, the OpenCL implementation will use mem to perform a nonblocking write. As the write is non-blocking the implementation can return immediately. The memory pointed to by mem cannot be reused by the application after the call returns. The event argument returns an event object which can be used to query the execution status of the write command. When the write command has completed, the memory pointed to by mem can then be reused by the application.

offset: The offset in bytes in the buffer object to write to.
size: The size in bytes of data being written.
mem: The pointer to buffer in host memory where data is to be written from.

EventWaitList: Optional. Specifies events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.

outEvent: Optional. Returns an event object that identifies this particular write command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueWriteBuffer to update the latest bits in a region of the buffer object with the mem argument value set to host_ptr + offset, where host_ptr is a pointer to the memory region specified when the buffer object being written is created with CL_MEM_USE_HOST_PTR, must meet the following requirements in order to avoid undefined behavior:

The host memory region given by (mem + offset, size) contains the latest bits when the enqueued write command begins execution.
The buffer object is not mapped.
The buffer object is not used by any command-queue until the write command has finished execution.

Lasterror is set.
See also:

- 134.1.35 EnqueueWriteBuffer(buffer as CLMemMBS, offset as Integer, size as Integer, mem as Memoryblock) 18429

### 134.1.35 EnqueueWriteBuffer(buffer as CLMemMBS, offset as Integer, size as Integer, mem as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueue commands to write to a buffer object from host memory.
**Notes:** buffer: Refers to a valid buffer object.
BlockingWrite: Optional, Indicates if the write operations are blocking or nonblocking.

If blocking_write is true, the OpenCL implementation copies the data referred to by mem and enqueues the write operation in the command-queue. The memory pointed to by mem can be reused by the application after the EnqueueWriteBuffer call returns.

If blocking_write is false, the OpenCL implementation will use mem to perform a nonblocking write. As the write is non-blocking the implementation can return immediately. The memory pointed to by mem cannot be reused by the application after the call returns. The event argument returns an event object which can be used to query the execution status of the write command. When the write command has completed, the memory pointed to by mem can then be reused by the application.

offset: The offset in bytes in the buffer object to write to.
size: The size in bytes of data being written.
mem: The pointer to buffer in host memory where data is to be written from.

EventWaitList: Optional. Specifies events that need to complete before this particular command can be executed. If EventWaitList is empty or not passed, then this particular command does not wait on any event to complete. The events specified in EventWaitList act as synchronization points. The context associated with events in EventWaitList and CLCommandQueueMBS must be the same.

outEvent: Optional. Returns an event object that identifies this particular write command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueWriteBuffer to update the latest bits in a region of the buffer object with the mem argument value set to host_ptr + offset, where host_ptr is a pointer to the memory region specified when the buffer object being written is created with CL_MEM_USE_HOST_PTR, must meet the following requirements in order to avoid undefined behavior:

The host memory region given by (mem + offset, size) contains the latest bits when the enqueued write command begins execution.
The buffer object is not mapped.
The buffer object is not used by any command-queue until the write command has finished execution.

Lasterror is set.
See also:

- 134.1.34 EnqueueWriteBuffer(buffer as CLMemMBS, BlockingWrite as boolean, offset as Integer, size as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18428

### 134.1.36 EnqueueWriteImage(image as CLMemMBS, BlockingWrite as boolean, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to write from a 2D or 3D image object to host memory.
**Notes:** image: Refers to a valid 2D or 3D image object.

BlockingWrite: Optional. Indicates if the write operation is blocking or non-blocking.

If BlockingWrite is true the OpenCL implementation copies the data referred to by mem and enqueues the write command in the command-queue. The memory pointed to by mem can be reused by the application after the clEnqueueWriteImage call returns. If BlockingWrite is false the OpenCL implementation will use mem to perform a nonblocking write. As the write is non-blocking the implementation can return immediately. The memory pointed to by mem cannot be reused by the application after the call returns. The event argument returns an event object which can be used to query the execution status of the write command. When the write command has completed, the memory pointed to by mem can then be reused by the application.

origin: Defines the (x, y, z) offset in pixels in the image from where to write or write. If image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle being write or written. If image is a 2D image object, the depth value given by RegionDepth must be 1.

RowPitch
The length of each row in bytes. This value must be greater than or equal to the element size in bytes * width. If RowPitch is set to 0, the appropriate row pitch is calculated based on the size of each element in bytes multiplied by width.

RowPitch: Size in bytes of the 2D slice of the 3D region of a 3D image being written. This must be 0 if image is a 2D image. This value must be greater than or equal to RowPitch * height. If SlicePitch is set to 0, the appropriate slice pitch is calculated based on the RowPitch * height.

mem: The pointer to a buffer in host memory where image data is to be written to.

EventWaitList: Optional. Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional. Returns an event object that identifies this particular write command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueWriteImage to update the latest bits in a region of the image object with the mem argument value set to mem + (sourceOriginZ * image slice pitch + sourceOriginY * image row pitch + sourceOriginX * bytes per pixel), where mem is a pointer to the memory region specified when the image object being written is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

- The host memory region being written contains the latest bits when the enqueued write command begins execution.
- The RowPitch and SlicePitch argument values in EnqueueWriteImage must be set to the image row

pitch and slice pitch.

- The image object is not mapped.
- The image object is not used by any command-queue until the write command has finished execution.

See also:

- 134.1.37 EnqueueWriteImage(image as CLMemMBS,sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock) 18432

### 134.1.37 EnqueueWriteImage(image as CLMemMBS,sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Enqueues a command to write from a 2D or 3D image object to host memory.
**Notes:** image: Refers to a valid 2D or 3D image object.

BlockingWrite: Optional. Indicates if the write operation is blocking or non-blocking.

If BlockingWrite is true the OpenCL implementation copies the data referred to by mem and enqueues the write command in the command-queue. The memory pointed to by mem can be reused by the application after the clEnqueueWriteImage call returns. If BlockingWrite is false the OpenCL implementation will use mem to perform a nonblocking write. As the write is non-blocking the implementation can return immediately. The memory pointed to by mem cannot be reused by the application after the call returns. The event argument returns an event object which can be used to query the execution status of the write command. When the write command has completed, the memory pointed to by mem can then be reused by the application.

origin: Defines the (x, y, z) offset in pixels in the image from where to write or write. If image is a 2D image object, the z value given by sourceOriginZ must be 0.

region: Defines the (width, height, depth) in pixels of the 2D or 3D rectangle being write or written. If image is a 2D image object, the depth value given by RegionDepth must be 1.

RowPitch
The length of each row in bytes. This value must be greater than or equal to the element size in bytes * width. If RowPitch is set to 0, the appropriate row pitch is calculated based on the size of each element in bytes multiplied by width.

RowPitch: Size in bytes of the 2D slice of the 3D region of a 3D image being written. This must be 0 if image is a 2D image. This value must be greater than or equal to RowPitch * height. If SlicePitch is set to 0, the appropriate slice pitch is calculated based on the RowPitch * height.

mem: The pointer to a buffer in host memory where image data is to be written to.

EventWaitList: Optional. Specify events that need to complete before this particular command can be executed. The events specified in event_wait_list act as synchronization points. The context associated with events in event_wait_list and command_queue must be the same.

outEvent: Optional. Returns an event object that identifies this particular write command and can be used to query or queue a wait for this particular command to complete.

Calling EnqueueWriteImage to update the latest bits in a region of the image object with the mem argument value set to mem + (sourceOriginZ * image slice pitch + sourceOriginY * image row pitch + sourceOriginX * bytes per pixel), where mem is a pointer to the memory region specified when the image object being written is created with kMemoryUseHostPtr, must meet the following requirements in order to avoid undefined behavior:

- The host memory region being written contains the latest bits when the enqueued write command begins execution.
- The RowPitch and SlicePitch argument values in EnqueueWriteImage must be set to the image row pitch and slice pitch.
- The image object is not mapped.
- The image object is not used by any command-queue until the write command has finished execution.

See also:

- 134.1.36 EnqueueWriteImage(image as CLMemMBS, BlockingWrite as boolean, sourceOriginX as Integer, sourceOriginY as Integer, sourceOriginZ as Integer, RegionWidth as Integer, RegionHeight as Integer, RegionDepth as Integer, RowPitch as Integer, SlicePitch as Integer, mem as Memoryblock, EventWaitList() as CLEventMBS, byref outEvent as CLEventMBS) 18430

### 134.1.38 EnqueueWritePicture(image as CLMemMBS, sourceOriginX as Integer, sourceOriginY as Integer, RegionWidth as Integer, RegionHeight as Integer, pic as picture)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** Enqueues a command to write from a 2D or 3D image object to a Xojo Picture.
**Example:**

```
const size = 500

// create test picture
dim pic1 as Picture = LogoMBS(size)
// create destination picture
dim pic2 as new Picture(size, size, 32)

// get device list
dim devices() as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)
dim device as CLDeviceMBS = devices(0)

// Create context for that device
dim c as new CLContextMBS(device)

// query what format Xojo uses for pictures
dim RowPitch as Integer
dim format as CLImageFormatMBS = OpenCLMBS.GetPictureImageFormat(pic1, RowPitch)

// create a matching memory object
dim m as new CLMemMBS(c, CLMemMBS.kMemoryReadWrite, format, size, size, RowPitch)

// create command queue
dim cq as new CLCommandQueueMBS(c, device, 0)

// copy picture content into CLMem object
cq.EnqueueWritePicture(m, 0, 0, size, size, pic1)

// and copy back to second picture
cq.EnqueueReadPicture(m, 0, 0, size, size, pic2)

// finally display it
Backdrop = pic2
```

**Notes:** image: Refers to a valid 2D or 3D image object.

BlockingWrite: Optional. Indicates if the write operation is blocking or non-blocking.

origin: Defines the (x, y) offset in pixels in the image from where to write or write.

region: Defines the (width, height) in pixels of the 2D or 3D rectangle being write or written.

pic: The target Xojo picture object. This must match in the image format for the image object and the size you specified in region.

This operation is always performed blocked.
Lasterror is set.

### 134.1.39 Finish

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Blocks until all previously queued OpenCL commands in a command-queue are issued to the associated device and have completed.
**Notes:** Blocks until all previously queued OpenCL commands in command_queue are issued to the associated device and have completed.

Finish does not return until all queued commands in command_queue have been processed and completed. clFinish is also a synchronization point.

Lasterror is set.

### 134.1.40 Flush

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Issues all previously queued OpenCL commands in a command-queue to the device associated with the command-queue.
**Notes:** Issues all previously queued OpenCL commands in command_queue to the device associated with command_queue.

Flush only guarantees that all queued commands to command_queue get issued to the appropriate device. There is no guarantee that they will be complete after Flush returns.

Lasterror is set.

Any blocking commands queued in a command-queue such as EnqueueReadImage or EnqueueReadBuffer with BlockingRead set to true, EnqueueWriteImage or EnqueueWriteBuffer with BlockingWrite set to true, EnqueueMapImage or EnqueueMapBuffer with BlockingMap set to true or WaitForEvents perform an implicit flush of the command-queue.

To use event objects that refer to commands enqueued in a command-queue as event objects to wait on by commands enqueued in a different command-queue, the application must call a Flush or any blocking commands that perform an implicit flush of the command-queue where the commands that refer to these event objects are enqueued.
Lasterror is set.

### 134.1.41 Properties as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the currently specified properties for the command-queue.
**Notes:** Lasterror is set.

### 134.1.42 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the command-queue reference count.
**Notes:** Lasterror is set.

### 134.1.43 Properties

### 134.1.44 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.1.45 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

## 134.2 class CLContextMBS

### 134.2.1 class CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The OpenCL class for a context.
**Example:**

```
dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeGPU)
dim device as CLDeviceMBS = devices(0) // we use first one

// Create a context
dim context as new CLContextMBS(device, CLContextMBS.kErrorModeLogMessagesToSystemLog)
```

**Notes:** Contexts are used by the OpenCL runtime for managing objects such as command-queues, memory, program and kernel objects and for executing kernels on one or more devices specified in the context.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.2.2 Methods

### 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates an OpenCL context.
**Example:**

```
dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeGPU)
dim device as CLDeviceMBS = devices(0) // we use first one

// Create a context
dim context as new CLContextMBS(device, CLContextMBS.kErrorModeLogMessagesToSystemLog)
```

**Notes:** Platform: Optional, Specifies the platform to use.
Devices: The devices you want to use. Can be one or several devices. If you specify none, the default one is picked.
ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

Lasterror is set.
See also:


- 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18438
- 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18438
- 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18439
- 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18440
- 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18440


### 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates an OpenCL context.
**Notes:** Platform: Optional, specifies the platform to use.
Devices: The devices you want to use. Can be one or several devices. If you specify none, the default one is picked.
ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

Lasterror is set.
See also:


- 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18437
- 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18438
- 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18439
- 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18440
- 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18440


### 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Create an OpenCL context from a device type that identifies the specific device(s) to use.
**Example:**

```
dim co as new CLContextMBS(CLDeviceMBS.kDeviceTypeAll)
```

**Notes:** Platform: Optional, Specifies the platform to use.
DeviceType: A bit-field that identifies the type of device and is described in the table below.
ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

| Constants | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

Lasterror is set.
See also:


- 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18437
- 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18438
- 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18439
- 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18440
- 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18440


### 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates an OpenCL context.
**Notes:** Platform: Specifies the platform to use.
Devices: The devices you want to use. Can be one or several devices. If you specify none, the default one is picked.

ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

Lasterror is set.
See also:


- 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18437
- 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18438
- 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18438
- 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18440
- 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18440


### 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates an OpenCL context.
**Notes:** Platform: Specifies the platform to use.
Devices: The devices you want to use. Can be one or several devices. If you specify none, the default one is picked.
ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

Lasterror is set.
See also:


- 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18437
- 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18438
- 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18438
- 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18439
- 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18440


### 134.2.8 Constructor(Platform as CLPlatformMBS, DeviceType as Integer, ErrorHandlerMode as Integer = 0)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Create an OpenCL context from a device type that identifies the specific device(s) to use.
**Notes:** Platform: Optional, Specifies the platform to use.
DeviceType: A bit-field that identifies the type of device and is described in the table below.
ErrorHandlerMode: The error handler mode. Check kErrorMode* constants.

| Constants | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

Lasterror is set.
See also:


- 134.2.3 Constructor(Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18437
- 134.2.4 Constructor(Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18438
- 134.2.5 Constructor(DeviceType as Integer, ErrorHandlerMode as Integer = 0) 18438
- 134.2.6 Constructor(Platform as CLPlatformMBS, Device as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18439
- 134.2.7 Constructor(Platform as CLPlatformMBS, Devices() as CLDeviceMBS, ErrorHandlerMode as Integer = 0) 18440


### 134.2.9 Devices as CLDeviceMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the list of devices in context.
**Example:**

```
// create context for all devices
dim co as new CLContextMBS(CLDeviceMBS.kDeviceTypeAll)

// and query it for it's devices
for each d as CLDeviceMBS in co.Devices
MsgBox d.Name
next
```

### 134.2.10 GetSupportedImageFormats(flags as UInt64, type as UInt32) as CLImageFormatMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Get the list of image formats supported by an OpenCL implementation.
**Example:**

```
dim co as new CLContextMBS(CLDeviceMBS.kDeviceTypeAll)

dim formats(-1) as CLImageFormatMBS = co.GetSupportedImageFormats(CLMemMBS.kMemoryReadWrite, CLMemMBS.kMemoryTypeImage2D)
dim lines(-1) as string

for each f as CLImageFormatMBS in formats
// see constants for what this values mean
lines.Append hex(f.ImageChannelOrder)+" - "+hex(f.ImageChannelDataType)
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** self: A valid OpenCL context on which the image object(s) will be created.
flags: A bit-field that is used to specify allocation and usage information about the image memory object being created and is described in the List of supported cl_mem_flags values for clCreateBuffer
type: Describes the image type and must be either kMemoryTypeImage2D or kMemoryTypeImage3D.

Returns an array of imageformat objects.

### 134.2.11 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the context reference count.
**Example:**

```
dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeGPU)
dim device as CLDeviceMBS = devices(0) // we use first one

// Create a context
dim context as new CLContextMBS(device, CLContextMBS.kErrorModeLogMessagesToSystemLog)

MsgBox str(context.ReferenceCount) // 1

// Create a command queue
dim queue as new CLCommandQueueMBS(context, device, 0)
```

MsgBox str(context.ReferenceCount) // 2 as the command queue points to the context, too.

### 134.2.12 Properties

### 134.2.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.2.14 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.2.15 Constants

Error mode constants

| Constant | Value | Description |
|---|---|---|
| kErrorModeIgnore | 0 | |
| kErrorModeLogMessagesToStderr | 3 | Sends all log messages to the file descriptor stderr. |
| kErrorModeLogMessagesToStdout | 2 | Sends all log messages to the file descriptor stdout. |
| kErrorModeLogMessagesToSystemLog | 1 | Fowards on all log messages to the Apple System Logger. |

## 134.3 class CLDeviceMBS

### 134.3.1 class CLDeviceMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for an OpenCL Device.

### 134.3.2 Methods

### 134.3.3 AddressBits as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The default compute device address space size specified as an unsigned integer value in bits.
**Example:**

```
dim Devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)

for each p as CLDeviceMBS in Devices
MsgBox p.Name+": "+str(p.AddressBits)
next
```

**Notes:** Currently supported values are 32 or 64 bits.
Lasterror is set.

### 134.3.4 Available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns true if the device is available and false if the device is not available.
**Notes:** Lasterror is set.

### 134.3.5 CompilerAvailable as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns false if the implementation does not have a compiler available to compile the program source.
**Notes:** Is true if the compiler is available. This can be false for the embedded platform profile only.

Lasterror is set.

### 134.3.6 DeviceType as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The OpenCL device type.
**Notes:** Currently supported values are one of or a combination of: kDeviceTypeCPU, kDeviceTypeGPU, kDeviceTypeAccelerator, or kDeviceTypeDefault.
Lasterror is set.

### 134.3.7 DeviceVersion as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** OpenCL version string.
**Notes:** Returns the OpenCL version supported by the device. This version string has the following format:

OpenCL<space><major_version.minor_version><space><vendor-specific information>

The major_version.minor_version value returned will be 1.0.
Lasterror is set.

### 134.3.8 DriverVersion as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** OpenCL software driver version string in the form major_number.minor_number.
**Notes:** Lasterror is set.

### 134.3.9 EndianLittle as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns true if the OpenCL device is a little endian device and false otherwise.
**Notes:** Lasterror is set.

### 134.3.10 ErrorCorrectionSupport as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns true if the device implements error correction for the memories, caches, registers etc. in the device.
**Notes:** Returns false if the device does not implement error correction. This can be a requirement for certain clients of OpenCL.
Lasterror is set.

### 134.3.11 ExecutionCapabilities as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes the execution capabilities of the device.
**Notes:** This is a bit-field that describes one or more of the following values:

kExecKernel - The OpenCL device can execute OpenCL kernels.
kExceNativeKernel - The OpenCL device can execute native kernels.

The mandated minimum capability is kExecKernel.
Lasterror is set.

### 134.3.12 Extensions as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns a space separated list of extension names.
**Example:**

```
// show msgbox with all extensions for first device

dim devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)
dim device as CLDeviceMBS = devices(0)

dim extensions(-1) as string = split(device.Extensions," ")

dim lines(-1) as string

for each extension as string in extensions
lines.append extension
next

MsgBox Join(lines,EndOfLine)
```

**Notes:** (the extension names themselves do not contain any spaces).
The list of extension names returned currently can include one or more of the following approved extension names:

cl_khr_fp64
cl_khr_select_fprounding_mode
cl_khr_global_int32_base_atomics
cl_khr_global_int32_extended_atomics
cl_khr_local_int32_base_atomics
cl_khr_local_int32_extended_atomics
cl_khr_int64_base_atomics
cl_khr_int64_extended_atomics
cl_khr_3d_image_writes
cl_khr_byte_addressable_store
cl_khr_fp16

Lasterror is set.

### 134.3.13 GlobalMemoryCacheLineSize as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Size of global memory cache line in bytes.
**Notes:** Lasterror is set.

### 134.3.14 GlobalMemoryCacheSize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Size of global memory cache in bytes.
**Notes:** Lasterror is set.

### 134.3.15 GlobalMemoryCacheType as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Type of global memory cache supported.
**Notes:** See kCacheMemType* constants.

Lasterror is set.

### 134.3.16 GlobalMemorySize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Size of global device memory in bytes.
**Notes:** Lasterror is set.

### 134.3.17 Image2DMaxHeight as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max height of 2D image in pixels.
**Notes:** The minimum value is 8192 if ImageSupport is true.
Lasterror is set.

### 134.3.18 Image2DMaxWidth as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max width of 2D image in pixels.
**Notes:** The minimum value is 8192 if ImageSupport is true.
Lasterror is set.

### 134.3.19 Image3DMaxDepth as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max depth of 3D image in pixels.
**Notes:** The minimum value is 2048 if ImageSupport is true.
Lasterror is set.

### 134.3.20 Image3DMaxHeight as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max height of 3D image in pixels.
**Notes:** The minimum value is 2048 if ImageSupport is true.

Lasterror is set.

### 134.3.21 Image3DMaxWidth as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max width of 3D image in pixels.
**Notes:** The minimum value is 2048 if ImageSupport is true.
Lasterror is set.

### 134.3.22 ImageSupport as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns true if images are supported by the OpenCL device and false otherwise.
**Notes:** Lasterror is set.

### 134.3.23 LocalMemorySize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Size of local memory arena in bytes.
**Notes:** The minimum value is 16 KB.
Lasterror is set.

### 134.3.24 LocalMemType as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Type of local memory supported.
**Notes:** This can be set to kMemTypeLocal implying dedicated local memory storage such as SRAM, or kMemTypeGlobal.
Lasterror is set.

### 134.3.25 MaxClockFrequency as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Maximum configured clock frequency of the device in MHz.
**Notes:** Lasterror is set.

### 134.3.26 MaxComputeUnits as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The number of parallel compute cores on the OpenCL device.
**Notes:** The minimum value is 1.
Lasterror is set.

### 134.3.27 MaxConstantArgs as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max number of arguments declared with the ___constant qualifier in a kernel.
**Notes:** The minimum value is 8.
Lasterror is set.

### 134.3.28 MaxConstantBufferSize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max size in bytes of a constant buffer allocation.
**Notes:** The minimum value is 64 KB.
Lasterror is set.

### 134.3.29 MaxMemoryAllocSize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max size of memory object allocation in bytes.
**Notes:** The minimum value is max (1/4th of GlobalMemorySize, 128*1024*1024)
Lasterror is set.

### 134.3.30 MaxParameterSize as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max size in bytes of the arguments that can be passed to a kernel.
**Notes:** The minimum value is 256.

Lasterror is set.

### 134.3.31 MaxReadImageArgs as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max number of simultaneous image objects that can be read by a kernel.
**Notes:** Lasterror is set.
The minimum value is 128 if ImageSupport is true.

### 134.3.32 MaxSamplers as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Maximum number of samplers that can be used in a kernel.
**Notes:** The minimum value is 16 if ImageSupport is true.
Lasterror is set.

### 134.3.33 MaxWorkGroupSize as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Maximum number of work-items in a work-group executing a kernel using the data parallel execution model.
**Notes:** (Refer to EnqueueNDRangeKernel). The minimum value is 1.
Lasterror is set.

### 134.3.34 MaxWorkItemDimensions as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Maximum dimensions that specify the global and local work-item IDs used by the data parallel execution model.
**Notes:** (Refer to EnqueueNDRangeKernel). The minimum value is 3.
Lasterror is set.

### 134.3.35 MaxWriteImageArgs as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Max number of simultaneous image objects that can be written to by a kernel.
**Notes:** The minimum value is 8 if ImageSupport is true.
Lasterror is set.

### 134.3.36 MemoryBaseAddressAlign as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes the alignment in bits of the base address of any allocated memory object.
**Notes:** Lasterror is set.

### 134.3.37 MinDataTypeAlignSize as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The smallest alignment in bytes which can be used for any data type.
**Notes:** Lasterror is set.

### 134.3.38 Name as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Device name string.
**Example:**

```
dim Devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)

for each p as CLDeviceMBS in Devices
MsgBox p.Name
next
```

**Notes:** Lasterror is set.

### 134.3.39 Platform as CLPlatformMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The platform associated with this device.
**Notes:** Lasterror is set.

### 134.3.40 PreferredVectorWidthChar as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.
Lasterror is set.

### 134.3.41 PreferredVectorWidthDouble as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.

If the cl_khr_fp64 extension is not supported, this function must return 0.
Lasterror is set.

### 134.3.42 PreferredVectorWidthFloat as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.
Lasterror is set.

### 134.3.43 PreferredVectorWidthInt as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.
Lasterror is set.

### 134.3.44 PreferredVectorWidthLong as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.

Lasterror is set.

### 134.3.45 PreferredVectorWidthShort as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Preferred native vector width size for built-in scalar types that can be put into vectors.
**Notes:** The vector width is defined as the number of scalar elements that can be stored in the vector.
Lasterror is set.

### 134.3.46 Profile as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** OpenCL profile string.
**Notes:** Returns the profile name supported by the device (see note). The profile name returned can be one of the following strings:

FULL_PROFILE - if the device supports the OpenCL specification (functionality defined as part of the core specification and does not require any extensions to be supported).

EMBEDDED_PROFILE - if the device supports the OpenCL embedded profile.
Lasterror is set.

### 134.3.47 ProfilingTimerResolution as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes the resolution of device timer. This is measured in nanoseconds.
**Notes:** Lasterror is set.

### 134.3.48 QueueProperties as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes the command-queue properties supported by the device.
**Notes:** See kQueueOutOfOrderExecModeEnable and kQueueProfilingEnable.
Lasterror is set.

### 134.3.49 SingleFPConfig as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes single precision floating-point capability of the device.
**Notes:** The mandated minimum floating-point capability is kFPRoundToNearest+kFPInfNAN.
Lasterror is set.

### 134.3.50 Vendor as String

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Vendor name string.
**Notes:** Lasterror is set.

### 134.3.51 VendorID as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A unique device vendor identifier.
**Notes:** An example of a unique device identifier could be the PCIe ID.
Lasterror is set.

### 134.3.52 Properties

### 134.3.53 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.3.54 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.

(Read and Write property)

### 134.3.55 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFPDenorm | 1 | One of the floating point capabilities constants. denorms are supported |
| kFPFMA | 32 | One of the floating point capabilities constants. IEEE754-2008 fused multiply-add is supported |
| kFPInfNAN | 2 | One of the floating point capabilities constants. INF and quiet NaNs are supported |
| kFPRoundToInf | 16 | One of the floating point capabilities constants. Round to +ve and -ve infinity rounding modes supported |
| kFPRoundToNearest | 4 | One of the floating point capabilities constants. Round to nearest even rounding mode supported |
| kFPRoundToZero | 8 | One of the floating point capabilities constants. Round to zero rounding mode supported |

Cache memory type constants.

| Constant | Value | Description |
|---|---|---|
| kCacheMemTypeNone | 0 | |
| kCacheMemTypeReadOnlyCache | 1 | Read Only Cache. |
| kCacheMemTypeReadWriteCache | 2 | Read/Write Cache. |

Device Type Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceTypeAccelerator | 8 | Accelerator = some special acceleration device |
| kDeviceTypeAll | &Hffffffff | This is the bitmask to catch all possible types. |
| kDeviceTypeCPU | 2 | CPU = your processor |
| kDeviceTypeDefault | 1 | Default device. |
| kDeviceTypeGPU | 4 | GPU = your graphics card |

Execution Capabilities Constants

| Constant | Value | Description |
|---|---|---|
| kExceNativeKernel | 2 | The OpenCL device can execute native kernels. |
| kExecKernel | 1 | The OpenCL device can execute OpenCL kernels. |

Memory Type Constants

| Constant | Value | Description |
|---|---|---|
| kMemTypeGlobal | 2 | Dedicated local memory storage such as SRAM. |
| kMemTypeLocal | 1 | |

Queue properties constants.

| Constant | Value | Description |
|---|---|---|
| kQueueOutOfOrderExecModeEnable | 1 | Out of order execution mode enabled. |
| kQueueProfilingEnable | 2 | Profiling enabled. |

## 134.4 class CLEventMBS

### 134.4.1 class CLEventMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for an OpenCL event.
**Notes:** You can chain several operations together inside a command queue. With events you can have an item execute after another item.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.4.2 Methods

### 134.4.3 CommandExecutionStatus as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the execution status of the command identified by event.
**Notes:** See kCommandExecutionStatus* constants.
Lasterror is set.

### 134.4.4 CommandQueue as CLCommandQueueMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the command-queue associated with event.
**Notes:** Lasterror is set.

### 134.4.5 CommandType as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the command associated with event.
**Notes:** See kCommand* constants.
Lasterror is set.

### 134.4.6 ProfilingCommandEnd as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A 64-bit value that describes the current device time counter in nanoseconds when the command identified by event has finished execution on the device.
**Notes:** Lasterror is set.

### 134.4.7 ProfilingCommandQueued as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A 64-bit value that describes the current device time counter in nanoseconds when the command identified by event is enqueued in a command-queue by the host.
**Notes:** Lasterror is set.

### 134.4.8 ProfilingCommandStart as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A 64-bit value that describes the current device time counter in nanoseconds when the command identified by event starts execution on the device.
**Notes:** Lasterror is set.

### 134.4.9 ProfilingCommandSubmit as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** A 64-bit value that describes the current device time counter in nanoseconds when the command identified by event that has been enqueued is submitted by the host to the device associated with the commandqueue.
**Notes:** Lasterror is set.

### 134.4.10 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the event reference count.
**Notes:** The reference count returned should be considered immediately stale. It is unsuitable for general use in applications. This feature is provided for identifying memory leaks.
Lasterror is set.

### 134.4.11 Properties

### 134.4.12 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.4.13 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.4.14 Constants

Command Type Constants

| Constant | Value | Description |
|---|---|---|
| kCommandAcquireGLObjects | &h11FF | Acquire GL objects |
| kCommandCopyBuffer | &h11F5 | Copy Buffer |
| kCommandCopyBufferToImage | &h11FA | Copy Buffer to Image |
| kCommandCopyImage | &h11F8 | Copy Image |
| kCommandCopyImageToBuffer | &h11F9 | Copy Image to Buffer |
| kCommandMapBuffer | &h11FB | Map Buffer |
| kCommandMapImage | &h11FC | Map Image |
| kCommandMarker | &h11FE | Marker |
| kCommandNativeKernel | &h11F2 | Execute Native Kernel |
| kCommandNDRangeKernel | &h11F0 | Execute a ND Range Kernel |
| kCommandReadBuffer | &h11F3 | Read Buffer |
| kCommandReadImage | &h11F6 | Read Image |
| kCommandReleaseGLObjects | &h1200 | Release GL objects |
| kCommandTask | &h11F1 | Execute task |
| kCommandUnmapMemObject | &h11FD | Unmap memory object |
| kCommandWriteBuffer | &h11F4 | Write Buffer |
| kCommandWriteImage | &h11F7 | Write Image |

Command excecution status constants.

| Constant | Value | Description |
|---|---|---|
| kCommandExecutionStatusComplete | 0 | The command has completed. |
| kCommandExecutionStatusQueued | 3 | command has been enqueued in the command-queue. |
| kCommandExecutionStatusRunning | 1 | Device is currently executing this command. |
| kCommandExecutionStatusSubmitted | 2 | enqueued command has been submitted by the host to the device assoc with the command-queue. |

## 134.5 class CLImageFormatMBS

### 134.5.1 class CLImageFormatMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** the OpenCL class for an image format.

### 134.5.2 Properties

### 134.5.3 ImageChannelDataType as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Describes the size of the channel data type.
**Notes:** The number of bits per element determined by the ImageChannelDataType and ImageChannelOrder must be a power of two. The list of supported values is described in the table below.

| Image Channel Data Type | Description |
|---|---|
| kChannelTypeSNormInt8 | Each channel component is a normalized signed 8-bit integer value. |
| kChannelTypeSNormInt16 | Each channel component is a normalized signed 16-bit integer value. |
| kChannelTypeUNormInt8 | Each channel component is a normalized unsigned 8-bit integer value. |
| kChannelTypeUNormInt16 | Each channel component is a normalized unsigned 16-bit integer value. |
| kChannelTypeUNormShort565 | Represents a normalized 5-6-5 3-channel RGB image. The channel order must be kChannelOrderRGB. |
| kChannelTypeUNormShort555 | Represents a normalized x-5-5-5 4-channel xRGB image. The channel order must be kChannelOrderRGB. |
| kChannelTypeUNormInt101010 | Represents a normalized x-10-10-10 4-channel xRGB image. The channel order must be kChannelOrderRGB. |
| kChannelTypeSignedInt8 | Each channel component is an unnormalized signed 8-bit integer value. |
| kChannelTypeSignedInt16 | Each channel component is an unnormalized signed 16-bit integer value. |
| kChannelTypeSignedInt32 | Each channel component is an unnormalized signed 32-bit integer value. |
| kChannelTypeUnsignedInt8 | Each channel component is an unnormalized unsigned 8-bit integer value. |
| kChannelTypeUnsignedInt16 | Each channel component is an unnormalized unsigned 16-bit integer value. |
| kChannelTypeUnsignedInt32 | Each channel component is an unnormalized unsigned 32-bit integer value. |
| kChannelTypeHalfFloat | Each channel component is a 16-bit half-float value. |
| kChannelTypeFloat | Each channel component is a single precision floating-point value. |

(Read and Write property)

### 134.5.4 ImageChannelOrder as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Specifies the number of channels and the channel layout i.e. the memory layout in which channels are stored in the image.
**Notes:** Valid values are described in the table below.

| Format | Description |
|---|---|
| kChannelOrderR, or kChannelOrderA | |
| kChannelOrderIntensity | This format can only be used if channel data type = kChannelTypeUNormInt8, kChannelTypeUNormInt16, kChannelTypeSNormInt8, kChannelTypeSNormInt16, kChannelTypeHalfFloat, or kChannelTypeFloat. |
| kChannelOrderLuminance | This format can only be used if channel data type = kChannelTypeUNormInt8, kChannelTypeUNormInt16, kChannelTypeSNormInt8, kChannelTypeSNormInt16, kChannelTypeHalfFloat, or kChannelTypeFloat. |
| kChannelOrderRG, or kChannelOrderRA | |
| kChannelOrderRGB | This format can only be used if channel data type = kChannelTypeUNormShort565, kChannelTypeUNormShort555 or kChannelTypeUNormInt101010. |
| kChannelOrderRGBA | |
| kChannelOrderARGB, kChannelOrderBGRA. | This format can only be used if channel data type = kChannelTypeUNormInt8, kChannelTypeSNormInt8, kChannelTypeSignedInt8 or kChannelTypeUnsignedInt8. |

(Read and Write property)

### 134.5.5 Constants

Channel Order Constants

| Constant | Value | Description |
|---|---|---|
| kChannelOrderA | &h10B1 | |
| kChannelOrderARGB | &h10B7 | |
| kChannelOrderBGRA | &h10B6 | |
| kChannelOrderIntensity | &h10B8 | This format can only be used if channel data type = kChannelTypeUNormInt8, kChannelTypeUNormInt16, kChannelTypeSNormInt8, kChannelTypeSNormInt16, kChannelTypeHalfFloat, or kChannelTypeFloat. |
| kChannelOrderLuminance | &h10B9 | This format can only be used if channel data type = kChannelTypeUNormInt8, kChannelTypeUNormInt16, kChannelTypeSNormInt8, kChannelTypeSNormInt16, kChannelTypeHalfFloat, or kChannelTypeFloat. |
| kChannelOrderR | &h10B0 | |
| kChannelOrderRA | &h10B3 | |
| kChannelOrderRG | &h10B2 | |
| kChannelOrderRGB | &h10B4 | This format can only be used if channel data type = kChannelTypeUNormShort565, kChannelTypeUNormShort555 or kChannelTypeUNormInt101010. |
| kChannelOrderRGBA | &h10B5 | |

Channel data type constants

| Constant | Value | Description |
|---|---|---|
| kChannelTypeFloat | &h10DE | Each channel component is a single precision floating-point value. |
| kChannelTypeHalfFloat | &h10DD | Each channel component is a 16-bit half-float value. |
| kChannelTypeSignedInt16 | &h10D8 | Each channel component is an unnormalized signed 16-bit integer value. |
| kChannelTypeSignedInt32 | &h10D9 | Each channel component is an unnormalized signed 32-bit integer value. |
| kChannelTypeSignedInt8 | &h10D7 | Each channel component is an unnormalized signed 8-bit integer value. |
| kChannelTypeSNormInt16 | &h10D1 | Each channel component is a normalized signed 16-bit integer value. |
| kChannelTypeSNormInt8 | &h10D0 | Each channel component is a normalized signed 8-bit integer value. |
| kChannelTypeUNormInt101010 | &h10D6 | Represents a normalized x-10-10-10 4-channel xRGB image. The channel ord must be kChannelOrderRGB. |
| kChannelTypeUNormInt16 | &h10D3 | Each channel component is a normalized unsigned 16-bit integer value. |
| kChannelTypeUNormInt8 | &h10D2 | Each channel component is a normalized unsigned 8-bit integer value. |
| kChannelTypeUNormShort555 | &h10D5 | Represents a normalized x-5-5-5 4-channel xRGB image. The channel ord must be kChannelOrderRGB. |
| kChannelTypeUNormShort565 | &h10D4 | Represents a normalized 5-6-5 3-channel RGB image. The channel order mu be kChannelOrderRGB. |
| kChannelTypeUnsignedInt16 | &h10DB | Each channel component is an unnormalized unsigned 16-bit integer value. |
| kChannelTypeUnsignedInt32 | &h10DC | Each channel component is an unnormalized unsigned 32-bit integer value. |
| kChannelTypeUnsignedInt8 | &h10DA | Each channel component is an unnormalized unsigned 8-bit integer value. |

## 134.6 class CLKernelMBS

### 134.6.1 class CLKernelMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for an OpenCL Kernel.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.6.2 Methods

### 134.6.3 Constructor(Program as CLProgramMBS, KernelName as string)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a kernal object.
**Notes:** Program: A program object with a successfully built executable.
KernelName: A function name in the program declared with the ___kernel qualifier

A kernel is a function declared in a program. A kernel is identified by the ___kernel qualifier applied to any function in a program. A kernel object encapsulates the specific ___kernel function declared in a program and the argument values to be used when executing this ___kernel function.
Lasterror is set.

### 134.6.4 FunctionName as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the kernel function name.
**Notes:** Lasterror is set.

### 134.6.5 GetKernelCompileWorkGroupSize(device as CLDeviceMBS, byref X as Int64, byref Y as Int64, byref Z as Int64)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the work-group size specified by the ___attribute___((reqd_work_gr oup_size(X, Y, Z))) qualifier.

**Notes:** device: Identifies a specific device in the list of devices associated with kernel. The list of devices is the list of devices in the OpenCL context that is associated with kernel. If the list of devices associated with kernel is a single device, device can be a nil value.

If the work-group size is not specified using the above attribute qualifier (0, 0, 0) is returned.
Lasterror is set.

### 134.6.6 GetKernelLocalMemorySize(device as CLDeviceMBS = nil) as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the amount of local memory in bytes being used by a kernel.
**Notes:** device: Identifies a specific device in the list of devices associated with kernel. The list of devices is the list of devices in the OpenCL context that is associated with kernel. If the list of devices associated with kernel is a single device, device can be a nil value.

This includes local memory that may be needed by an implementation to execute the kernel, variables declared inside the kernel with the ___local address qualifier and local memory to be allocated for arguments to the kernel declared as pointers with the ___local address qualifier and whose size is specified with clSetKernelArg.

If the local memory size, for any pointer argument to the kernel declared with the ___local address qualifier, is not specified, its size is assumed to be 0.
Lasterror is set.

### 134.6.7 GetKernelWorkGroupSize(device as CLDeviceMBS = nil) as Int64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** This provides a mechanism for the application to query the work-group size that can be used to execute a kernel on a specific device given by device.
**Notes:** device: Identifies a specific device in the list of devices associated with kernel. The list of devices is the list of devices in the OpenCL context that is associated with kernel. If the list of devices associated with kernel is a single device, device can be a nil value.

The OpenCL implementation uses the resource requirements of the kernel (register usage etc.) to determine what this work-group size should be.
Lasterror is set.

### 134.6.8 NumberOfArguments as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the number of arguments to kernel.
**Notes:** Lasterror is set.

### 134.6.9 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the kernel reference count.
**Notes:** The reference count returned should be considered immediately stale. It is unsuitable for general use in applications. This feature is provided for identifying memory leaks.
Lasterror is set.

### 134.6.10 SetKernelArgDouble(index as Integer, value as Double)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Sets the kernel argument with the given index.
**Notes:** index: The argument index. Arguments to the kernel are referred by indices that go from 0 for the leftmost argument to n - 1, where n is the total number of arguments declared by a kernel.
value: the value.

We have currently setters for Int32, Int64, Float, Double and CLMemMBS. Please email for additional types.
Lasterror is set.

### 134.6.11 SetKernelArgFloat(index as Integer, value as Single)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Sets the kernel argument with the given index.
**Notes:** index: The argument index. Arguments to the kernel are referred by indices that go from 0 for the leftmost argument to n - 1, where n is the total number of arguments declared by a kernel.
value: the value.

We have currently setters for Int32, Int64, Float, Double and CLMemMBS. Please email for additional types.
Lasterror is set.

### 134.6.12 SetKernelArgInt32(index as Integer, value as Int32)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Sets the kernel argument with the given index.
**Notes:** index: The argument index. Arguments to the kernel are referred by indices that go from 0 for the leftmost argument to n - 1, where n is the total number of arguments declared by a kernel.
value: the value.

We have currently setters for Int32, Int64, Float, Double and CLMemMBS. Please email for additional types.
Lasterror is set.

### 134.6.13 SetKernelArgInt64(index as Integer, value as Int64)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Sets the kernel argument with the given index.
**Notes:** index: The argument index. Arguments to the kernel are referred by indices that go from 0 for the leftmost argument to n - 1, where n is the total number of arguments declared by a kernel.
value: the value.

We have currently setters for Int32, Int64, Float, Double and CLMemMBS. Please email for additional types.
Lasterror is set.

### 134.6.14 SetKernelArgMem(index as Integer, mem as CLMemMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Sets the kernel argument with the given index.
**Notes:** index: The argument index. Arguments to the kernel are referred by indices that go from 0 for the leftmost argument to n - 1, where n is the total number of arguments declared by a kernel.
value: the memory object to set for argument.

We have currently setters for Int32, Int64, Float, Double and CLMemMBS. Please email for additional types.
Lasterror is set.

### 134.6.15 Properties

### 134.6.16 Context as CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the context associated with kernel.
**Notes:** Lasterror is set.
(Read and Write property)

### 134.6.17 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.6.18 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.6.19 Program as CLProgramMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the program object associated with kernel.
**Notes:** Lasterror is set.
(Read and Write property)

## 134.7 class CLMemMBS

### 134.7.1 class CLMemMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for a OpenCL memory block.
**Example:**

```
const Size = 4096
dim context as CLContextMBS // your context
dim input as new CLMemMBS(context, CLMEMMBS.kMemoryReadOnly, 4096)
```

**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.7.2 Methods

### 134.7.3 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, Depth as Integer, RowPitch as Integer, SlicePitch as Integer, HostPtr as Memoryblock = nil)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a 3D image object.
**Notes:** context: A valid OpenCL context on which the image object is to be created.
flags: A bit-field that is used to specify allocation and usage information about the image memory object being created. See kMemory* constants.
ImageFormat: the image format properties of the image to be allocated.
Width, Height: The width and height of the image in pixels. These must be values greater than or equal to 1.
Depth: The depth of the image in pixels. This must be a value greater than 1.
RowPitch: The scan-line pitch in bytes. This must be 0 if HostPtr is nil and can be either 0 or greater than or equal to Width * size of element in bytes if HostPtr is not nil. If HostPtr is not nil and RowPitch is equal to 0, RowPitch is calculated as Width * size of element in bytes. If RowPitch is not 0, it must be a multiple of the image element size in bytes.
SlicePitch: The size in bytes of each 2D slice in the 3D image. This must be 0 if HostPtr is nil and can be either 0 or greater than or equal to RowPitch * Height if HostPtr is not nil. If HostPtr is not nil and SlicePitch equal to 0, SlicePitch is calculated as RowPitch * Height. If SlicePitch is not 0, it must be a multiple of the RowPitch.

HostPtr: A pointer to the image data that may already be allocated by the application. The size of the buffer that HostPtr points to must be greater than or equal to SlicePitch * image_depth. The size of each element in bytes must be a power of 2. The image data specified by HostPtr is stored as a linear sequence of adjacent 2D slices. Each 2D slice is a linear sequence of adjacent scanlines. Each scanline is a linear sequence of image elements.

Lasterror is set.
See also:


- 134.7.4 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, RowPitch as Integer, HostPtr as Memoryblock = nil) 18471
- 134.7.5 Constructor(Context as CLContextMBS, Flags as UInt64, Size as Integer, HostPtr as Memoryblock = nil) 18472


### 134.7.4 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, RowPitch as Integer, HostPtr as Memoryblock = nil)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a 2D image object.
**Notes:** context: A valid OpenCL context on which the image object is to be created.
flags: A bit-field that is used to specify allocation and usage information about the image memory object being created. See kMemory* constants.
ImageFormat: The format properties of the image to be allocated.
Width and Height: The width and height of the image in pixels. These must be values greater than or equal to 1.
RowPitch: The scan-line pitch in bytes. This must be 0 if HostPtr is nil and can be either 0 or greater than or equal to Width * size of element in bytes if HostPtr is not nil. If HostPtr is not nil and RowPitch is equal to 0, RowPitch is calculated as Width * size of element in bytes. If RowPitch is not 0, it must be a multiple of the image element size in bytes.
HostPtr: A pointer to the image data that may already be allocated by the application. The size of the buffer that HostPtr points to must be greater than or equal to RowPitch * Height. The size of each element in bytes must be a power of 2. The image data specified by HostPtr is stored as a linear sequence of adjacent scanlines. Each scanline is stored as a linear sequence of image elements.

Lasterror is set.
See also:


- 134.7.3 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, Depth as Integer, RowPitch as Integer, SlicePitch as Integer, HostPtr as Memoryblock = nil) 18470
- 134.7.5 Constructor(Context as CLContextMBS, Flags as UInt64, Size as Integer, HostPtr as Memoryblock = nil) 18472

### 134.7.5 Constructor(Context as CLContextMBS, Flags as UInt64, Size as Integer, HostPtr as Memoryblock = nil)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a new buffer object.
**Notes:** context: A valid OpenCL context used to create the buffer object.
flags: A bit-field that is used to specify allocation and usage information such as the memory arena that should be used to allocate the buffer object and how it will be used. The following table describes the possible values for flags:
size: The size in bytes of the buffer memory object to be allocated.
HostPtr: A memoryblock that may already be allocated by the application. The size of the buffer that HostPtr points to must be greater than or equal to the size bytes.

| Flags | Description |
|---|---|
| kMemoryReadWrite | This flag specifies that the memory object will be read and written by a kernel. This is the default. |
| kMemoryWriteOnly | This flags specifies that the memory object will be written but not read by a kernel. Reading from a buffer or image object created with kMemoryWriteOnly inside a kernel is undefined. |
| kMemoryReadOnly | This flag specifies that the memory object is a read-only memory object when used inside a kernel. Writing to a buffer or image object created with kMemoryReadOnly inside a kernel is undefined. |
| kMemoryUseHostPtr | This flag is valid only if HostPtr is not nil. If specified, it indicates that the application wants the OpenCL implementation to use memory referenced by HostPtr as the storage bits for the memory object. OpenCL implementations are allowed to cache the buffer contents pointed to by HostPtr in device memory. This cached copy can be used when kernels are executed on a device. The result of OpenCL commands that operate on multiple buffer objects created with the same HostPtr or overlapping host regions is considered to be undefined. |
| kMemoryAllocHostPtr | This flag specifies that the application wants the OpenCL implementation to allocate memory from host accessible memory. kMemoryAllocHostPtr and kMemoryUseHostPtr are mutually exclusive. |
| kMemoryCopyHostPtr | This flag is valid only if HostPtr is not nil. If specified, it indicates that the application wants the OpenCL implementation to allocate memory for the memory object and copy the data from memory referenced by HostPtr. kMemoryCopyHostPtr and kMemoryUseHostPtr are mutually exclusive. kMemoryCopyHostPtr can be used with kMemoryAllocHostPtr to initialize the contents of the cl_mem object allocated using host-accessible (e.g. PCIe) memory. |

Lasterror is set.
See also:

- 134.7.3 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, Depth as Integer, RowPitch as Integer, SlicePitch as Integer,

HostPtr as Memoryblock = nil) 18470

- 134.7.4 Constructor(Context as CLContextMBS, Flags as UInt64, ImageFormat as CLImageFormatMBS, Width as Integer, Height as Integer, RowPitch as Integer, HostPtr as Memoryblock = nil) 18471

### 134.7.6 Context as CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return context specified when memory object is created.
**Notes:** Lasterror is set.

### 134.7.7 Flags as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the flags argument value specified with Constructor.
**Notes:** Lasterror is set.

### 134.7.8 ImageDepth as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return depth of the image in pixels.
**Notes:** For a 2D image, depth equals 0.
Lasterror is set.

### 134.7.9 ImageElementSize as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return size of each element of the image memory object given by image.
**Notes:** An element is made up of n channels. The value of n is given with image format descriptor.
Lasterror is set.

### 134.7.10 ImageFormat as CLImageFormatMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return image format descriptor.
**Notes:** Lasterror is set.

### 134.7.11 ImageHeight as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return height of image in pixels.
**Notes:** Lasterror is set.

### 134.7.12 ImageRowPitch as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return size in bytes of a row of elements of the image object given by image.
**Notes:** Lasterror is set.

### 134.7.13 ImageSlicePitch as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return size in bytes of a 2D slice for the 3D image object given by image.
**Notes:** For a 2D image object this value will be 0.
Lasterror is set.

### 134.7.14 ImageWidth as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return width of image in pixels.
**Notes:** Lasterror is set.

### 134.7.15 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return memory object reference count.
**Notes:** The reference count returned should be considered immediately stale. It is unsuitable for general use in applications. This feature is provided for identifying memory leaks.
Lasterror is set.

### 134.7.16 Size as UInt64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return actual size of memory object in bytes.
**Notes:** Lasterror is set.

### 134.7.17 Type as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the memory type.
**Notes:** Either normal buffer, image 2D or image 3D.
Lasterror is set.

### 134.7.18 Properties

### 134.7.19 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.7.20 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.7.21 Target as Memoryblock

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The reference to the memoryblock if you used kMemoryUseHostPtr to create this memory object.
**Notes:** (Read and Write property)

### 134.7.22 Constants

Mapping mode constants

| Constant | Value | Description |
|---|---|---|
| kMapRead | 1 | |
| kMapWrite | 2 | |

Constants for creating a memory block.

| Constant | Value | Description |
|---|---|---|
| kMemoryAllocHostPtr | 16 | |
| kMemoryCopyHostPtr | 32 | |
| kMemoryReadOnly | 4 | |
| kMemoryReadWrite | 1 | |
| kMemoryUseHostPtr | 8 | |
| kMemoryWriteOnly | 2 | This flags specifies that the memory object will be written but not read by a kernel.<br>Reading from a buffer or image object created with kMemoryWriteOnly inside a kernel is undefined. |

Memory object types.

| Constant | Value | Description |
|---|---|---|
| kMemoryTypeBuffer | &h10F0 | A normal memory buffer. |
| kMemoryTypeImage2D | &h10F1 | 2D Image |
| kMemoryTypeImage3D | &h10F2 | 3D Image |

## 134.8 class CLPlatformMBS

### 134.8.1 class CLPlatformMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The OpenCL class for a platform.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.8.2 Methods

### 134.8.3 DeviceCount(types as Int64) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries number of devices with given types.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name+": "+str(p.DeviceCount(CLDeviceMBS.kDeviceTypeAll))+" devices"
next
```

**Notes:** types: A bitfield that identifies the type of OpenCL device. The device_type can be used to query specific OpenCL devices or all OpenCL devices available. The valid values for device_type are specified in the following table.

| cl_device_type | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

Lasterror is set.

### 134.8.4 Devices(types as Int64) as CLDeviceMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries devices with given types.
**Example:**

```
// check all platforms
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
dim lines(-1) as string

lines.Append p.Name
lines.Append ""

// and show device names
for each d as CLDeviceMBS in p.Devices(CLDeviceMBS.kDeviceTypeAll)
lines.Append d.name
next

MsgBox Join(lines,EndOfLine)
next
```

**Notes:** types: A bitfield that identifies the type of OpenCL device. The device_type can be used to query specific OpenCL devices or all OpenCL devices available. The valid values for device_type are specified in the following table.

| cl_device_type | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

Lasterror is set.

### 134.8.5 Extensions as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns a space-separated list of extension names (the extension names themselves do not contain any spaces) supported by the platform.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name+": "+p.Extensions
next
```

**Notes:** Extensions defined here must be supported by all devices associated with this platform.
Lasterror is set.

### 134.8.6 Name as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Platform name string.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name
next
```

**Notes:** Lasterror is set.

### 134.8.7 Profile as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** OpenCL profile string.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name+": "+p.Profile
```

```
next
```

**Notes:** Returns the profile name supported by the implementation. The profile name returned can be one of the following strings:

FULL_PROFILE - if the implementation supports the OpenCL specification (functionality defined as part of the core specification and does not require any extensions to be supported).

EMBEDDED_PROFILE - if the implementation supports the OpenCL embedded profile. The embedded profile is defined to be a subset for each version of OpenCL.

Lasterror is set.

### 134.8.8 Vendor as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Platform vendor string.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name+": "+p.Vendor
next
```

**Notes:** Lasterror is set.

### 134.8.9 Version as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** OpenCL version string.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name+": "+p.Version
next
```

**Notes:** Returns the OpenCL version supported by the implementation. This version string has the following format:

OpenCL<space><major_version.minor_version><space><platform-specific information>

The major_version.minor_version value returned will be 1.0.
Lasterror is set.

### 134.8.10 Properties

### 134.8.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.8.12 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

## 134.9 class CLProgramMBS

### 134.9.1 class CLProgramMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The OpenCL class for a program.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.9.2 Methods

### 134.9.3 Binaries as String()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the program binaries for all devices associated with program.
**Notes:** For each device in program, the binary returned can be the binary specified for the device when program is created with Constructor or it can be the executable binary generated by BuildProgram. If program is created with Constructor (with Source code), the binary returned is the binary generated by BuildProgram. The bits returned can be an implementation-specific intermediate representation (a.k.a. IR) or device specific executable bits or both. The decision on which information is returned in the binary is up to the OpenCL implementation.

Each entry in this array is used by the implementation as the location in memory where to copy the program binary for a specific device, if there is a binary available.

Lasterror is set.

### 134.9.4 BinarySizes as UInt64()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns an array that contains the size in bytes of the program binary for each device associated with program.
**Notes:** The size of the array is the number of devices associated with program. If a binary is not available for a device(s), a size of zero is returned.

Lasterror is set.

### 134.9.5 BuildLog(device as CLDeviceMBS) as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the build log when BuildProgram was called for device.
**Notes:** If build status of program for device is kBuildNone, an empty string is returned.
Lasterror is set.

### 134.9.6 BuildOptions(device as CLDeviceMBS) as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the build options specified by the options argument in BuildProgram for device.
**Notes:** If build status of program for device is kBuildNone, an empty string is returned.
Lasterror is set.

### 134.9.7 BuildProgram(device as CLDeviceMBS, options as string = "")

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Builds (compiles and links) a program executable from the program source or binary.
**Notes:** See other BuildProgram method for details
See also:


- 134.9.8 BuildProgram(devices() as CLDeviceMBS, options as string = "") 18483
- 134.9.9 BuildProgram(options as string = "") 18486


### 134.9.8 BuildProgram(devices() as CLDeviceMBS, options as string = "")

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Builds (compiles and links) a program executable from the program source or binary.
**Notes:**

| | |
|---|---|
| devices | Optional, a list of devices you want to build for. If you specify no device, you build for all devices. |
| device | Optional, the device you want to build for. If you specify no device, you build for all devices. |
| options | A string that describes the build options to be used for building the program executable. The list of supported options is described in "Build Options" below. |

OpenCL allows program executables to be built using the source or the binary.

The build options are categorized as pre-processor options, options for math intrinsics, options that control optimization and miscellaneous options. This specification defines a standard set of options that must be supported by an OpenCL compiler when building program executables online or offline. These may be extended by a set of vendor- or platform-specific options.

Preprocessor Options

These options control the OpenCL preprocessor which is run on each program source before actual compilation. -D options are processed in the order they are given in the options argument to clBuildProgram.
-D name
Predefine name as a macro, with definition 1.

-D name=definition
The contents of definition are tokenized and processed as if they appeared during translation phase three in a '#define' directive. In particular, the definition will be truncated by embedded newline characters.

-I dir
Add the directory dir to the list of directories to be searched for header files.

Math Intrinsics Options

These options control compiler behavior regarding floating-point arithmetic. These options trade off between speed and correctness.

-cl-single-precision-constant
Treat double precision floating-point constant as single precision constant.

-cl-denorms-are-zero
This option controls how single precision and double precision denormalized numbers are handled. If specified as a build option, the single precision denormalized numbers may be flushed to zero and if the optional extension for double precision is supported, double precision denormalized numbers may also be flushed to zero. This is intended to be a performance hint and the OpenCL compiler can choose not to flush denorms to zero if the device supports single precision (or double precision) denormalized numbers.

This option is ignored for single precision numbers if the device does not support single precision denormalized numbers i.e. kFPDenorm bit is not set in SingleFPConfig.

This option is ignored for double precision numbers if the device does not support double precision or if it does support double precison but CL_FP_DENORM bit is not set in CL_DEVICE_DOUBLE_FP_CON-

FIG.

This flag only applies for scalar and vector single precision floating-point variables and computations on these floating-point variables inside a program. It does not apply to reading from or writing to image objects.

Optimization Options

These options control various sorts of optimizations. Turning on optimization flags makes the compiler attempt to improve the performance and/or code size at the expense of compilation time and possibly the ability to debug the program.
-cl-opt-disable
This option disables all optimizations. The default is optimizations are enabled.

-cl-strict-aliasing
This option allows the compiler to assume the strictest aliasing rules.

The following options control compiler behavior regarding floating-point arithmetic. These options trade off between performance and correctness and must be specifically enabled. These options are not turned on by default since it can result in incorrect output for programs which depend on an exact implementation of IEEE 754 rules/specifications for math functions.

-cl-mad-enable
Allow a * b + c to be replaced by a mad. The mad computes a * b + c with reduced accuracy. For example, some OpenCL devices implement mad as truncate the result of a * b before adding it to c.

-cl-no-signed-zeros
Allow optimizations for floating-point arithmetic that ignore the signedness of zero. IEEE 754 arithmetic specifies the behavior of distinct +0.0 and -0.0 values, which then prohibits simplification of expressions such as x+0.0 or 0.0*x (even with -clfinite-math only). This option implies that the sign of a zero result isn't significant.

-cl-unsafe-math-optimizations
Allow optimizations for floating-point arithmetic that (a) assume that arguments and results are valid, (b) may violate IEEE 754 standard and (c) may violate the OpenCL numerical compliance requirements as defined in section 7.4 for single-precision floating-point, section 9.3.9 for double-precision floating-point, and edge case behavior in section 7.5. This option includes the -cl-no-signed-zeros and -cl-mad-enable options.

-cl-finite-math-only
Allow optimizations for floating-point arithmetic that assume that arguments and results are not NaNs or ¬±,àû. This option may violate the OpenCL numerical compliance requirements defined in in section 7.4 for single-precision floating-point, section 9.3.9 for double-precision floating-point, and edge case behavior in section 7.5.

-cl-fast-relaxed-math
Sets the optimization options -cl-finite-math-only and -cl-unsafe-math-optimizations. This allows optimizations for floating-point arithmetic that may violate the IEEE 754 standard and the OpenCL numerical compliance requirements defined in the specification in section 7.4 for single-precision floating-point, section 9.3.9 for double-precision floating-point, and edge case behavior in section 7.5. This option causes the preprocessor macro __FAST_RELAXED_MATH__ to be defined in the OpenCL program.

Options to Request or Suppress Warnings

Warnings are diagnostic messages that report constructions which are not inherently erroneous but which are risky or suggest there may have been an error. The following languageindependent options do not enable specific warnings but control the kinds of diagnostics produced by the OpenCL compiler.
-w
Inhibit all warning messages.

-Werror
Make all warnings into errors.

Lasterror is set.
See also:


- 134.9.7 BuildProgram(device as CLDeviceMBS, options as string = "") 18483
- 134.9.9 BuildProgram(options as string = "") 18486


### 134.9.9 BuildProgram(options as string = "")

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Builds (compiles and links) a program executable from the program source or binary.
**Notes:** See other BuildProgram method for details
Lasterror is set.
See also:


- 134.9.7 BuildProgram(device as CLDeviceMBS, options as string = "") 18483
- 134.9.8 BuildProgram(devices() as CLDeviceMBS, options as string = "") 18483


### 134.9.10 BuildStatus(device as CLDeviceMBS) as Int64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the build status of program for a specific device as given by device.
**Notes:** See kBuild* constants.

Lasterror is set.

### 134.9.11 Constructor(context as CLContextMBS, devices() as CLDeviceMBS, binaries() as string, status() as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a program object for a context, and loads specified binary data into the program object.
**Notes:** context: Must be a valid OpenCL context.
devices: a list of devices that are in context. The binaries are loaded for devices specified in this list.

The devices associated with the program object will be the list of devices specified by devices. The list of devices specified by devices must be devices associated with context.

binaries: An array of strings containing the program binaries to be loaded for devices specified by devices. For each device given by devices(i), the string with the program binary for that device is given by binaries(i).

The program binaries specified by binaries contain the bits that describe the program executable that will be run on the device(s) associated with context. The program binary can consist of either or both of device-specific executable(s), and/or implementation-specific intermediate representation (IR) which will be converted to the device-specific executable.

sttaus: Returns whether the program binary for each device specified in devices was loaded successfully or not. It is an array of ubound -1 and is filled by the plugin.

Lasterror is set.

OpenCL allows applications to create a program object using the program source or binary and build appropriate program executables. This allows applications to determine whether they want to use the pre-built offline binary or load and compile the program source and use the executable compiled/linked online as the program executable. This can be very useful as it allows applications to load and build program executables online on its first instance for appropriate OpenCL devices in the system. These executables can now be queried and cached by the application. Future instances of the application launching will no longer need to compile and build the program executables. The cached executables can be read and loaded by the application, which can help significantly reduce the application initialization time.
See also:


- 134.9.12 Constructor(context as CLContextMBS, line as string) 18488
- 134.9.13 Constructor(context as CLContextMBS, lines() as string) 18488

### 134.9.12 Constructor(context as CLContextMBS, line as string)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a program object for a context, and loads the source code specified by the line string into the program object.
**Notes:** context: Must be a valid OpenCL context.
line: A string with all the lines of the program.

The devices associated with the program object are the devices associated with context.

OpenCL allows applications to create a program object using the program source or binary and build appropriate program executables. This allows applications to determine whether they want to use the pre-built offline binary or load and compile the program source and use the executable compiled/linked online as the program executable. This can be very useful as it allows applications to load and build program executables online on its first instance for appropriate OpenCL devices in the system. These executables can now be queried and cached by the application. Future instances of the application launching will no longer need to compile and build the program executables. The cached executables can be read and loaded by the application, which can help significantly reduce the application initialization time.

An OpenCL program consists of a set of kernels that are identified as functions declared with the __kernel qualifier in the program source. OpenCL programs may also contain auxiliary functions and constant data that can be used by __kernel functions. The program executable can be generated online or offline by the OpenCL compiler for the appropriate target device(s).

Lasterror is set.
See also:


- 134.9.11 Constructor(context as CLContextMBS, devices() as CLDeviceMBS, binaries() as string, status() as Integer) 18487
- 134.9.13 Constructor(context as CLContextMBS, lines() as string) 18488


### 134.9.13 Constructor(context as CLContextMBS, lines() as string)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates a program object for a context, and loads the source code specified by the text strings in the lines array into the program object.
**Notes:** context: Must be a valid OpenCL context.
lines: An array of strings that make up the source code.

The devices associated with the program object are the devices associated with context.

OpenCL allows applications to create a program object using the program source or binary and build appropriate program executables. This allows applications to determine whether they want to use the pre-built offline binary or load and compile the program source and use the executable compiled/linked online as the program executable. This can be very useful as it allows applications to load and build program executables online on its first instance for appropriate OpenCL devices in the system. These executables can now be queried and cached by the application. Future instances of the application launching will no longer need to compile and build the program executables. The cached executables can be read and loaded by the application, which can help significantly reduce the application initialization time.

An OpenCL program consists of a set of kernels that are identified as functions declared with the ___kernel qualifier in the program source. OpenCL programs may also contain auxiliary functions and constant data that can be used by ___kernel functions. The program executable can be generated online or offline by the OpenCL compiler for the appropriate target device(s).

Lasterror is set.
See also:

- 134.9.11 Constructor(context as CLContextMBS, devices() as CLDeviceMBS, binaries() as string, status() as Integer) 18487
- 134.9.12 Constructor(context as CLContextMBS, line as string) 18488

### 134.9.14 Context as CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The context for this program.
**Notes:** Lasterror is set.

### 134.9.15 CreateKernelsInProgram(maxKernels as Integer = 100) as CLKernelMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Creates kernel objects for all kernel functions in program.
**Notes:** maxKernels: maximum number of kernels to return.

Kernel objects are not created for any ___kernel functions in program that do not have the same function definition across all devices for which a program executable has been successfully built.

Kernel objects can only be created once you have a program object with a valid program source or binary loaded into the program object and the program executable has been successfully built for one or more devices associated with program. No changes to the program executable are allowed while there are kernel

objects associated with a program object. This means that calls to BuildProgram return kInvalidOperation (in lasterror) if there are kernel objects attached to a program object. The OpenCL context associated with program will be the context associated with kernel. The list of devices associated with program are the devices associated with kernel. Devices associated with a program object for which a valid program executable has been built can be used to execute kernels declared in the program object.

Lasterror is set.

### 134.9.16 Devices as CLDeviceMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the list of devices associated with the program object.
**Notes:** This can be the devices associated with context on which the program object has been created or can be a subset of devices that are specified when a progam object is created.

### 134.9.17 NumDevices as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the number of devices associated with program.
**Notes:** Lasterror is set.

### 134.9.18 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the program reference count.
**Notes:** Lasterror is set.

### 134.9.19 Source as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Return the program source code specified in the Constructor.
**Notes:** The source string returned is a concatenation of all source strings specified to Constructor.

### 134.9.20 Properties

### 134.9.21 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.
(Read and Write property)

### 134.9.22 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.9.23 Constants

Build Status constants

| Constant | Value | Description |
|---|---|---|
| kBuildError | -2 | The build status returned if the last call to BuildProgram on the specified program object for device generated an error. |
| kBuildInProgress | -3 | The build status returned if the last call to BuildProgram on the specified program object for device has not finished. |
| kBuildNone | -1 | The build status returned if no build has been performed on the specified program object for device. |
| kBuildSuccess | 0 | The build status returned if the last call to BuildProgram on the specified program object for device was successful. |

## 134.10 class CLSamplerMBS

### 134.10.1 class CLSamplerMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for a Sampler.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr9
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 134.10.2 Methods

### 134.10.3 AddressingMode as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return the value specified by addressingmode argument to Constructor.

### 134.10.4 Constructor(Context as CLContextMBS, NormalizedCoords as Boolean, AddressingMode as UInt32, FilterMode as UInt32)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Creates a sampler object.
**Notes:** context: Must be a valid OpenCL context.

NormalizedCoords: Determines if the image coordinates specified are normalized (if normalized_coords is true) or not (if normalized_coords is false).

AddressingMode: Specifies how out-of-range image coordinates are handled when reading from an image. This can be set to kAddressRepeat, kAddressClampToEdge, kAddressClamp, and kAddressNone.

FilterMode: Specifies the type of filter that must be applied when reading an image. This can be kFilterNearest or kFilterLinear.

Lasterror is set.

A sampler object describes how to sample an image when the image is read in the kernel. The built-in functions to read from an image in a kernel take a sampler as an argument. The sampler arguments to the image read function can be sampler objects created using OpenCL functions and passed as argument values to the kernel or can be samplers declared inside a kernel. In this section we discuss how sampler objects are created using OpenCL functions.

### 134.10.5 Context as CLContextMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return the context specified when the sampler is created.

### 134.10.6 FilterMode as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return the value specified by filterMode argument to Constructor.

### 134.10.7 NormalizedCoords as Boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return the value specified by normalizedCoords argument to Constructor.

### 134.10.8 ReferenceCount as UInt32

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Return the sampler reference count.
**Notes:** The reference count returned should be considered immediately stale. It is unsuitable for general use in applications. This feature is provided for identifying memory leaks.

### 134.10.9 Properties

### 134.10.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The internel object reference.
**Notes:** Not zero if this object is valid.

(Read and Write property)

### 134.10.11 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Notes:** See error constants in OpenCLMBS module.
The plugin uses lasterror = -1 for the case a function is not available.
(Read and Write property)

### 134.10.12 Constants

Address mode constants

| Constant | Value | Description |
|---|---|---|
| kAddressClamp | &h1132 | |
| kAddressClampToEdge | &h1131 | |
| kAddressNone | &h1130 | |
| kAddressRepeat | &h1133 | |

Filter mode constants

| Constant | Value | Description |
|---|---|---|
| kFilterLinear | &h1141 | |
| kFilterNearest | &h1140 | |

## 134.11 module OpenCLMBS

### 134.11.1 module OpenCLMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The module for OpenCL.
**Notes:** from wikipedia:

OpenCL (Open Computing Language) is a framework for writing programs that execute across heterogeneous platforms consisting of CPUs, GPUs, and other processors. OpenCL includes a language (based on C99) for writing kernels (functions that execute on OpenCL devices), plus APIs that are used to define and then control the platforms. OpenCL provides parallel computing using task-based and data-based parallelism.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7
- Nearly 2000 new Functions in the 9.6 prerelease of MBS
- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 7.6, page 8: News

### 134.11.2 Methods

### 134.11.3 AllDeviceCount(types as Int64) as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries number of devices with given types.
**Example:**

```
dim c as Integer = OpenCLMBS.AllDeviceCount(CLDeviceMBS.kDeviceTypeCPU)
dim g as Integer = OpenCLMBS.AllDeviceCount(CLDeviceMBS.kDeviceTypeGPU)
MsgBox str(c)+" CPU and "+str(g)+" GPU"
```

**Notes:** types: A bitfield that identifies the type of OpenCL device. The device_type can be used to query specific OpenCL devices or all OpenCL devices available. The valid values for device_type are specified in the following table.

Lasterror is set.

| cl_device_type | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

### 134.11.4 AllDevices(types as Int64) as CLDeviceMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries devices with given types.
**Example:**

```
dim Devices(-1) as CLDeviceMBS = OpenCLMBS.AllDevices(CLDeviceMBS.kDeviceTypeAll)

for each p as CLDeviceMBS in Devices
MsgBox p.Name
next
```

**Notes:** types: A bitfield that identifies the type of OpenCL device. The device_type can be used to query specific OpenCL devices or all OpenCL devices available. The valid values for device_type are specified in the following table.

| cl_device_type | Description |
|---|---|
| kDeviceTypeCPU | An OpenCL device that is the host processor. The host processor runs the OpenCL implementations and is a single or multi-core CPU. |
| kDeviceTypeGPU | An OpenCL device that is a GPU. By this we mean that the device can also be used to accelerate a 3D API such as OpenGL or DirectX. |
| kDeviceTypeAccelerator | Dedicated OpenCL accelerators (for example the IBM CELL Blade). These devices communicate with the host processor using a peripheral interconnect such as PCIe. |
| kDeviceTypeDefault | The default OpenCL device in the system. |
| kDeviceTypeAll | All OpenCL devices available in the system. |

Lasterror is set.

### 134.11.5 GetExtensionFunctionAddress(name as string) as ptr

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the address of the extension function named by funcname.
**Notes:** The function GetExtensionFunctionAddress returns the address of the extension function named by funcname. The pointer returned should be cast to a function pointer type matching the extension function's definition defined in the appropriate extension specification and header file. A return value of nil indicates that the specified function does not exist for the implementation. A non-nil return value for GetExtensionFunctionAddress does not guarantee that an extension function is actually supported. The application must also make a corresponding query using CLPlatformMBS.Extensions or CLDeviceMBS.Extensions to determine if an extension is supported by the OpenCL implementation.

GetExtensionFunctionAddress may not be queried for core (non-extension) functions in OpenCL. For functions that are queryable with clGetExtensionFunctionAddress, implementations may choose to also export those functions statically from the object libraries implementing those functions. However, portable applications cannot rely on this behavior.

Since there is no way to qualify the query with a device, the function pointer returned must work for all implementations of that extension on different devices. The behavior of calling a device extension function on a device not supporting that extension is undefined.

### 134.11.6 GetPictureImageFormat(pic as picture, byref RowPitch as Integer) as CLImageFormatMBS

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries the image format this picture would need when creating a storage object with CLMemMBS.
**Example:**

```
dim p as new Picture(100,100,32)
dim rowbytes as Integer
dim format as CLImageFormatMBS = OpenCLMBS.GetPictureImageFormat(p, rowbytes)

MsgBox hex(format.ImageChannelOrder)+" "+hex(format.ImageChannelDataType)+" "+str(rowbytes)
// shows 10B7 and 10D2 and 416 on Mac OS X Carbon
```

**Notes:** As Xojo uses 4 bytes per pixel on Mac and Windows, the plugin returns ARGB (or other byte order). The alpha channel is not used as Xojo stores

### 134.11.7 isAvailable as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Whether OpenCL is available.
**Example:**

```
if not OpenCLMBS.isAvailable then
if TargetMachO and TargetX86 then
MsgBox "OpenCL not available. Please install Mac OS X 10.6 to use it."
else
MsgBox "OpenCL not available. You need a Mac with Intel processor running Mac OS X 10.6."
end if
end if
```

**Notes:** Should return true on Mac OS X 10.6 and false everywhere else.

### 134.11.8 PlatformCount as Int64

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Queries number of platforms available.
**Example:**

```
MsgBox str(OpenCLMBS.PlatformCount)
```

**Notes:** Typically you have two with modern Macs as you get both CPU and GPU listed.
Lasterror is set.

### 134.11.9 Platforms as CLPlatformMBS()

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Obtain the list of platforms available.
**Example:**

```
dim Platforms(-1) as CLPlatformMBS = OpenCLMBS.Platforms

for each p as CLPlatformMBS in Platforms
MsgBox p.Name
next
```

**Notes:** Lasterror is set.

### 134.11.10 UnloadCompiler

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Allows the implementation to release the resources allocated by the OpenCL compiler.
**Example:**

```
OpenCLMBS.UnloadCompiler
MsgBox OpenCLMBS.LastErrorMessage
```

**Notes:** This is a hint from the application and does not guarantee that the compiler will not be used in the future or that the compiler will actually be unloaded by the implementation. Calls to BuildProgram after UnloadCompiler will reload the compiler, if necessary, to build the appropriate program executable.
Lasterror is set.

### 134.11.11 WaitForEvents(events() as CLEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Waits on the host thread for commands identified by event objects to complete.
**Notes:** events: The events specified in event_list act as synchronization points.

Waits on the host thread for commands identified by event objects in event_list to complete. A command is considered complete if its execution status is kCommandExecutionStatusComplete or a negative value.

Lasterror is set.

### 134.11.12 Properties

### 134.11.13 LastError as Integer

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The last error code.
**Example:**

```
MsgBox str(OpenCLMBS.LastError)
```

**Notes:** All the functions in all the OpenCL classes set this property, too.
(Read only property)

### 134.11.14 LastErrorMessage as string

MBS MacFrameworks Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** The text message for the last error code.
**Example:**

MsgBox OpenCLMBS.LastErrorMessage

**Notes:** (Read only property)

### 134.11.15 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kBuildProgramFailure | -11 | One of the constants for OpenCL errors. |
| kCompilerNotAvailable | -3 | One of the constants for OpenCL errors. |
| kDeviceNotAvailable | -2 | One of the constants for OpenCL errors. |
| kDeviceNotFound | -1 | One of the constants for OpenCL errors. |
| kImageFormatMismatch | -9 | One of the constants for OpenCL errors. |
| kImageFormatNotSupported | -10 | One of the constants for OpenCL errors. |
| kInvalidArgIndex | -49 | One of the constants for OpenCL errors. |
| kInvalidArgSize | -51 | One of the constants for OpenCL errors. |
| kInvalidArgValue | -50 | One of the constants for OpenCL errors. |
| kInvalidBinary | -42 | One of the constants for OpenCL errors. |
| kInvalidBufferSize | -61 | One of the constants for OpenCL errors. |
| kInvalidBuildOptions | -43 | One of the constants for OpenCL errors. |
| kInvalidCommandQueue | -36 | One of the constants for OpenCL errors. |
| kInvalidContext | -34 | One of the constants for OpenCL errors. |
| kInvalidDevice | -33 | One of the constants for OpenCL errors. |
| kInvalidDeviceType | -31 | One of the constants for OpenCL errors. |
| kInvalidEvent | -58 | One of the constants for OpenCL errors. |
| kInvalidEventWaitList | -57 | One of the constants for OpenCL errors. |
| kInvalidGlobalOffset | -56 | One of the constants for OpenCL errors. |
| kInvalidGlObject | -60 | One of the constants for OpenCL errors. |
| kInvalidHostPtr | -37 | One of the constants for OpenCL errors. |
| kInvalidImageFormatDescriptor | -39 | One of the constants for OpenCL errors. |
| kInvalidImageSize | -40 | One of the constants for OpenCL errors. |
| kInvalidKernel | -48 | One of the constants for OpenCL errors. |
| kInvalidKernelArgs | -52 | One of the constants for OpenCL errors. |
| kInvalidKernelDefinition | -47 | One of the constants for OpenCL errors. |
| kInvalidKernelName | -46 | One of the constants for OpenCL errors. |
| kInvalidMemObject | -38 | One of the constants for OpenCL errors. |
| kInvalidMipLevel | -62 | One of the constants for OpenCL errors. |
| kInvalidOperation | -59 | One of the constants for OpenCL errors. |
| kInvalidPlatform | -32 | One of the constants for OpenCL errors. |
| kInvalidProgram | -44 | One of the constants for OpenCL errors. |
| kInvalidProgramExecutable | -45 | One of the constants for OpenCL errors. |
| kInvalidQueueProperties | -35 | One of the constants for OpenCL errors. |
| kInvalidSampler | -41 | One of the constants for OpenCL errors. |
| kInvalidValue | -30 | One of the constants for OpenCL errors. |
| kInvalidWorkDimension | -53 | One of the constants for OpenCL errors. |
| kInvalidWorkGroupSize | -54 | One of the constants for OpenCL errors. |
| kInvalidWorkItemSize | -55 | One of the constants for OpenCL errors. |
| kMapFailure | -12 | One of the constants for OpenCL errors. |
| kMemCopyOverlap | -8 | One of the constants for OpenCL errors. |
| kMemObjectAllocationFailure | -4 | One of the constants for OpenCL errors. |
| kOutOfHostMemory | -6 | One of the constants for OpenCL errors. |
| kOutOfResources | -5 | One of the constants for OpenCL errors. |
| kProfilingInfoNotAvailable | -7 | One of the constants for OpenCL errors. |
| kSuccess | 0 | One of the constants for OpenCL errors. |

# Chapter 135

# PDFKit

## 135.1 class CustomPDFViewMBS

### 135.1.1 class CustomPDFViewMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom PDFView.
**Notes:** Subclass of the PDFViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.5pr2
- MBS Xojo / Real Studio Plugins, version 17.0pr1
- MBS Real Studio Plugins, version 12.5pr5
- MBS Real Studio Plugins, version 12.0pr7
- Gestures on Mac OS X
- Have you checked out PDFViewMBS class?
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 135.1.2 Methods

### 135.1.3 ClearOverlay(page as PDFPageMBS, post as boolean = true)

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear overlay item for this page.
**Notes:** Is post = false, than we clear the item for pre page drawing, else for post page drawing.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.1.4 ClearOverlays

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear all overlays.
**Notes:** The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.1.5 Constructor

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom PDFView object.
See also:

- 135.1.6 Constructor(Handle as Integer) 18504
- 135.1.7 Constructor(left as Double, top as Double, width as Double, height as Double) 18504

### 135.1.6 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
See also:

- 135.1.5 Constructor 18504
- 135.1.7 Constructor(left as Double, top as Double, width as Double, height as Double) 18504

### 135.1.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new custom PDFView object.
See also:

- 135.1.5 Constructor 18504
- 135.1.6 Constructor(Handle as Integer) 18504

### 135.1.8 Destructor

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 135.1.9 Properties

### 135.1.10 Overlay(page as PDFPageMBS, post as boolean = true) as variant

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Get/Set overlay item.
**Notes:** MBS Plugin can draw a picture, NSImageMBS or PDFPageMBS below/over the PDF page.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.
(Read and Write computed property)

### 135.1.11 Events

### 135.1.12 acceptsFirstMouse(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return true if the receiver should be sent a mouseDown event for an initial mouse-down event, false if not.
**Notes:** The receiver can either return a value unconditionally or use the location of event e to determine whether or not it wants the event. The default implementation ignores the event and returns false.

Implement this event in a subclass to allow instances to respond to click-through. This allows the user to click on a view in an inactive window, activating the view with one click, instead of clicking first to make the window active and then clicking the view. Most view objects refuse a click-through attempt, so the event simply activates the window. Many control objects, however, such as instances of NSButton and NSSlider, do accept them, so the user can immediately manipulate the control without having to release the mouse button.

### 135.1.13 acceptsFirstResponder as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Whether to accept first responder.
**Notes:** Return true if your control can have the focus and false if not.

### 135.1.14 AfterDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The draw event called after a page was drawn.
**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.15 AfterDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The draw event called after a page annotations were drawn.
**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.16 AfterDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double)

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The draw event called after something was drawn.
**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.17 becomeFirstResponder as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Called when the object gets focus.
**Notes:** Return true to accept.

### 135.1.18 BeforeDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The draw event called before a page was drawn.

**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.19 BeforeDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The draw event called before a page annotations were drawn.
**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.20 BeforeDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The draw event called before a something was drawn.
**Notes:** This event may not be called on OS X 10.11 or newer.
On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.1.21 beginGestureWithEvent(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a touch gesture.
**Notes:** e: An event object representing the gesture beginning.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 135.1.22 canBecomeKeyView as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Returns whether the receiver can become key view.
**Notes:** Returns true if the receiver can become key view, false otherwise.

### 135.1.23 Close

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is destroyed.

### 135.1.24 concludeDragOperation(sender as NSDraggingInfoMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging operation is complete, signaling the receiver to perform any necessary clean-up.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

For this method to be invoked, the previous performDragOperation must have returned true.

The destination implements this method to perform any tidying up that it needs to do, such as updating its visual representation now that it has incorporated the dragged data. This message is the last message sent from sender to the destination during a dragging session.

If the sender object's animatesToDestination property was set to true in prepareForDragOperation, then the drag image is still visible. At this point you should draw the final visual representation in the view. When this method returns, the drag image is removed form the screen. If your final visual representation matches the visual representation in the drag, this is a seamless transition.

### 135.1.25 draggingEnded(sender as NSDraggingInfoMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Implement this event to be notified when a drag operation ends in some other destination.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

This method might be used by a destination doing auto-expansion in order to collapse any auto-expands.

### 135.1.26 draggingEntered(sender as NSDraggingInfoMBS) as Integer

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image enters destination bounds or frame; delegate returns dragging operation to perform.

**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NSDraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

Invoked when a dragged image enters the destination but only if the destination has registered for the pasteboard data type involved in the drag operation. Specifically, this method is invoked when the mouse pointer enters the destination's bounds rectangle (if it is a view object) or its frame rectangle (if it is a window object).

This method must return a value that indicates which dragging operation the destination will perform when the image is released. In deciding which dragging operation to return, the method should evaluate the overlap between both the dragging operations allowed by the source (obtained from sender with the draggingSourceOperationMask method) and the dragging operations and pasteboard data types the destination itself supports.

If none of the operations is appropriate, this method should return NSDragOperationNone (this is the default response if the method is not implemented by the destination). A destination will still receive draggingUpdated and draggingExited even if NSDragOperationNone is returned by this method.

### 135.1.27 draggingExited(sender as NSDraggingInfoMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragged image exits the destination's bounds rectangle (in the case of a view object) or its frame rectangle (in the case of a window object).
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

### 135.1.28 draggingSessionEndedAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS, operation as Integer)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging session has completed.
**Notes:** session: The dragging session.
screenPoint: The point where the drag ended, in screen coordinates.
operation: The drag operation. See constants for drag operation types.

Available in OS X v10.7 and later.

### 135.1.29 draggingSessionMovedToPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag moves on the screen.
**Notes:** session: The dragging session.
screenPoint: The point where the drag moved to, in screen coordinates.

Available in OS X v10.7 and later.

### 135.1.30 draggingSessionSourceOperationMaskForDraggingContext(session as NSDraggingSessionMBS, context as Integer) as Integer

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Declares the types of operations the source allows to be performed. (required)
**Notes:** session: The dragging session.
context: The dragging context. See NSDraggingContext constants for the supported values.

Return the appropriate dragging operation as defined in constants.

In the future Apple may provide more specific "within" values in the future. To account for this, for unrecognized localities, return the operation mask for the most specific context that you are concerned with.

### 135.1.31 draggingSessionWillBeginAtPoint(session as NSDraggingSessionMBS, screenPoint as NSPointMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the drag will begin.
**Notes:** session: The dragging session.
screenPoint: The point where the drag will begin, in screen coordinates.

Available in OS X v10.7 and later.

### 135.1.32 draggingUpdated(sender as NSDraggingInfoMBS) as Integer

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked periodically as the image is held within the destination area, allowing modification of the dragging operation or mouse-pointer position.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return one (and only one) of the dragging operation constants described in NSDragOperation in the NS-DraggingInfo reference. The default return value (if this method is not implemented by the destination) is the value returned by the previous draggingEntered message.

For this to be invoked, the destination must have registered for the pasteboard data type involved in the drag operation. The messages continue until the image is either released or dragged out of the window or view.

This method provides the destination with an opportunity to modify the dragging operation depending on the position of the mouse pointer inside of the destination view or window object. For example, you may have several graphics or areas of text contained within the same view and wish to tailor the dragging operation, or to ignore the drag event completely, depending upon which object is underneath the mouse pointer at the time when the user releases the dragged image and the performDragOperation method is invoked.

You typically examine the contents of the pasteboard in the draggingEntered method, where this examination is performed only once, rather than in the draggingUpdated method, which is invoked multiple times.

Only one destination at a time receives a sequence of draggingUpdated messages. If the mouse pointer is within the bounds of two overlapping views that are both valid destinations, the uppermost view receives these messages until the image is either released or dragged out.

### 135.1.33 endGestureWithEvent(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has ended a touch gesture.
**Notes:** e: An event object representing the gesture end.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 135.1.34 ignoreModifierKeysForDraggingSession(session as NSDraggingSession-MBS) as boolean

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Returns whether the modifier keys will be ignored for this dragging session.
**Notes:** session: The dragging session.

Return true if the modifier keys will be ignored, false otherwise.
Available in OS X v10.7 and later.

### 135.1.35 isOpaque as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Whether this view is opaque.

### 135.1.36 keyDown(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

### 135.1.37 keyUp(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the key events.
**Notes:** Return true if you handled this event.

### 135.1.38 magnifyWithEvent(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a pinch gesture.
**Notes:** e: An event object representing the magnify gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 135.1.39 menuForEvent(e as NSEventMBS, defaultMenu as NSMenuMBS) as NSMenuMBS

MBS PDFKit Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Overridden by subclasses to return a context-sensitive pop-up menu for a given mouse-down event.

**Notes:** theEvent: An object representing a mouse-down event.
defaultMenu: The menu as constructed by super class.

The receiver can use information in the mouse event, such as its location over a particular element of the receiver, to determine what kind of menu to return. For example, a text object might display a text-editing menu when the cursor lies over text and a menu for changing graphics attributes when the cursor lies over an embedded image.

The default implementation returns the default menu.

### 135.1.40 mouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.41 mouseDownCanMoveWindow as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** This event is called so you can decide what happens with mouse down.
**Notes:** Return true if you do not need to handle a mouse down and it can pass through to superviews; False if you need to handle the mouse down.

This allows iApp-type applications to determine the region by which a window can be moved. By default, this method returns false if the view is opaque; otherwise, it returns true. Subclasses can override this method to return a different value.

### 135.1.42 mouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.43 mouseEntered(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.44 mouseExited(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.45 mouseMoved(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.46 mouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.47 Open

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** The event called when the custom NSView is created.

### 135.1.48 otherMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 135.1.49 otherMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 135.1.50 otherMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.
Third mouse button.

### 135.1.51 performDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked after the released image has been removed from the screen, signaling the receiver to import the pasteboard data.
**Notes:** sender: The object sending the message; use it to get details about the dragging operation.

Return if the destination accepts the data, it returns true; otherwise it returns false. The default is to return false.

For this method to be invoked, the previous prepareForDragOperation message must have returned true. The destination should implement this method to do the real work of importing the pasteboard data represented by the image.

If the sender object's animatesToDestination was set to true in prepareForDragOperation, then setup any animation to arrange space for the drag items to animate to. Also at this time, enumerate through the dragging items to set their destination frames and destination images.

### 135.1.52 prepareForDragOperation(sender as NSDraggingInfoMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the image is released, allowing the receiver to agree to or refuse drag operation.

**Notes:** sender: The object sending the message; use it to get details about the dragging operation.
Returns true if the receiver agrees to perform the drag operation and false if not.
This method is invoked only if the most recent draggingEntered or draggingUpdated message returned an acceptable drag-operation value.
If you want the drag items to animate from their current location on screen to their final location in your view, set the sender object's animatesToDestination property to true in your implementation of this method.

### 135.1.53 pressureChange(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Informs the current object that a pressure change occurred on a system that supports pressure sensitivity.
**Notes:** This method is invoked automatically in response to user actions. event is the event that initiated the change in pressure.
Available in OS X v10.10.3 and later.

### 135.1.54 resignFirstResponder as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Focus is going away.
**Notes:** Return true to accept.

### 135.1.55 rightMouseDown(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.56 rightMouseDragged(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.57 rightMouseUp(e as NSEventMBS, x as Double, y as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** One of the mouse events.
**Notes:** Return true if you handled this event.

### 135.1.58 rotateWithEvent(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a rotation gesture.
**Notes:** e: An event object representing the rotate gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 135.1.59 scrollWheel(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.0, Platform: macOS, Targets: .

**Function:** Informs the subclass that the mouse's scroll wheel has moved.
**Notes:** e: An object encapsulating information about the wheel-scrolling event.

The default implementation simply passes this message to the next responder.
Return true to not pass the event.

### 135.1.60 swipeWithEvent(e as NSEventMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: .

**Function:** Informs the receiver that the user has begun a swipe gesture.
**Notes:** e: An event object representing the swipe gesture.
The event will be sent to the view under the touch in the key window.
Available in Mac OS X v10.6 and later.
Return true if you handled this event.

### 135.1.61 updateDraggingItemsForDrag(sender as NSDraggingInfoMBS)

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Invoked when the dragging images should be changed.
**Notes:** sender: The object sending the message; use this object to get details about the dragging operation.

While a destination may change the dragging images at any time, it is recommended to wait until this method is called before updating the dragging images.

This allows the system to delay changing the dragging images until it is likely that the user will drop on this destination. Otherwise, the dragging images will change too often during the drag which would be distracting to the user.

### 135.1.62 viewDidMoveToWindow

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** Informs the receiver that it has been added to a new view hierarchy.
**Notes:** The default implementation does nothing; subclasses can implement this event to perform whatever actions are necessary.

window may return nil when this method is invoked, indicating that the receiver does not currently reside in any window. This occurs when the receiver has just been removed from its superview or when the receiver has just been added to a superview that does not itself have a window. Overrides of this method may choose to ignore such cases if they are not of interest.

### 135.1.63 wantsPeriodicDraggingUpdates as boolean

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: .

**Function:** Asks the destination object whether it wants to receive periodic draggingUpdated messages.
**Notes:** Return true if the destination wants to receive periodic draggingUpdated messages, false otherwise.

If the destination returns false, these messages are sent only when the mouse moves or a modifier flag changes. Otherwise the destination gets the default behavior, where it receives periodic dragging-updated messages even if nothing changes.

## 135.2 control DesktopPDFThumbnailViewControlMBS

### 135.2.1 control DesktopPDFThumbnailViewControlMBS

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a PDFThumbnailView.
**Notes:** This control embeds a special PDFThumbnailView subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.

Does no longer work well with MacOS 10.12 or 10.13 as focus can't be set.
**Blog Entries**

- PDF Viewer controls for iOS
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 135.2.2 Properties

### 135.2.3 View as PDFThumbnailViewMBS

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.2.4 Events

### 135.2.5 BoundsChanged

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 135.2.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 135.2.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 135.2.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 135.2.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 135.2.10 FocusLost

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.2.11 FocusReceived

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.2.12 FrameChanged

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 135.2.13 MenuBarSelected

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 135.2.14 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 135.2.15 MouseDrag(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 135.2.16 MouseUp(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 135.2.17 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 135.2.18 ScaleFactorChanged(NewFactor as Double)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 135.2.19 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 135.3 control DesktopPDFViewControlMBS

### 135.3.1 control DesktopPDFViewControlMBS

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a PDFView.
**Notes:** This control embeds a special PDFView subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.
**Blog Entries**

- PDF Viewer controls for iOS
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.3pr1
- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr3
- MBS Xojo Plugins, version 19.6pr1
- MBS Xojo Plugins, version 17.6pr5
- MBS Xojo Plugins, version 17.5pr2
- MBS Xojo / Real Studio Plugins, version 17.0pr1

### 135.3.2 Methods

### 135.3.3 ClearOverlay(page as PDFPageMBS, post as boolean = true)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear overlay item for this page.
**Notes:** Is post = false, than we clear the item for pre page drawing, else for post page drawing.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.3.4 ClearOverlays

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear all overlays.
**Notes:** The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.3.5 Properties

### 135.3.6 View as PDFViewMBS

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.3.7 Overlay(page as PDFPageMBS, post as boolean = true) as variant

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Get/Set overlay item.
**Notes:** MBS Plugin can draw a picture, NSImageMBS or PDFPageMBS below/over the PDF page.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.
(Read and Write computed property)

### 135.3.8 Events

### 135.3.9 AfterDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called after something was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.3.10 AfterDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called after a page annotations were drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.3.11 AfterDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called after a page was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.3.12 BeforeDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called before a page was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.3.13 BeforeDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called before a page annotations were drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.3.14 BeforeDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The draw event called before a something was drawn.

### 135.3.15 BoundsChanged

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 135.3.16 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 135.3.17 CocoaMouseDown(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** This is called before MouseDown, but provides the original Cocoa event, so you can query additional properties.

### 135.3.18 CocoaMouseDrag(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** This is called before MouseDrag, but provides the original Cocoa event, so you can query additional properties.

### 135.3.19 CocoaMouseUp(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** This is called before MouseUp, but provides the original Cocoa event, so you can query additional properties.

### 135.3.20 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 135.3.21 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 135.3.22 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 135.3.23 FocusLost

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.3.24 FocusReceived

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.3.25 FrameChanged

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 135.3.26 MenuBarSelected

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 135.3.27 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 135.3.28 MouseDrag(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 135.3.29 MouseUp(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 135.3.30 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 135.3.31 OpenPDFforRemoteGoToAction(action as PDFActionRemoteGoToMBS)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Opens a specified page.
**Notes:** This event will be called to handle clicks on annotations containing a PDFActionRemoteGoToMBS action. The action contains a URL and a page index and point. You should open the PDF indicated by the URL and go to the page and point indicated. The easiest way to do the latter is to create a PDFDestinationMBS with the page index and point once a PDFDocumentMBS from the URL is created - then you can call: goToDestination method. The default implementation simply beeps.

### 135.3.32 PerformFind

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs a find operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application perform a Find.
The event will be called when the user clicks on an annotation with such an action.

### 135.3.33 PerformGoToPage

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Performs a go-to operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application bring up a panel allowing the

user to enter a specific page number. The event will be called when the user clicks on an annotation with such an action.

### 135.3.34 PerformPrint

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Prints the current document.
**Notes:** Certain PDFAction's may request that the PDF viewer application Print the current document. This event will be called when the user clicks on an annotation with such an action.

### 135.3.35 PrintJobTitle as String

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Overrides the job title used when the PDFView is printed.
**Notes:** Allows to override the job title when PDFView is printed. The default implementation uses the string, if any, associated with the "Title" key from the view's PDFDocumentMBS attribute dictionary. Failing that, it uses the last path component if the PDFDocumentMBS is URL-based.

### 135.3.36 ScaleFactorChanged(NewFactor as Double)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 135.3.37 WillChangeScaleFactor(scale as Double) as Double

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Overrides changes to the scale factor.
**Notes:** Allows to override changes to the scale factor. The default implementation pins scaling between 0.1 and 10.0.

If you add this event, please return a value, e.g. the passed scale value.

### 135.3.38 WillClickOnLink(URL as String)

MBS PDFKit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Handle clicks on URL links in a view.
**Notes:** If implemented, this event will be called to handle clicks on URL links within the PDFView.
The default implementation calls openURL on NSWorkspaceMBS class.

### 135.3.39 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 135.4 class PDFActionGoToMBS

### 135.4.1 class PDFActionGoToMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFActionGoTo, a subclass of PDFAction, defines methods for getting and setting the destination of a go-to action.
**Notes:** A PDFActionGoTo object represents the action of going to a specific location within the PDF document.
Subclass of the PDFActionMBS class.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

### 135.4.2 Methods

### 135.4.3 Constructor(destination as PDFDestinationMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes the go-to action.
**Notes:** destination: The destination with which to initialize the go-to action.
Available in Mac OS X v10.5 and later.

### 135.4.4 Properties

### 135.4.5 destination as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The destination associated with the action.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

## 135.5 class PDFActionMBS

### 135.5.1 class PDFActionMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFAction represents an action that is performed when, for example, a PDF annotation is activated or an outline item is clicked.
**Notes:** A PDFAction object represents an action associated with a PDF element, such as an annotation or a link, that the viewer application can perform. See the Adobe PDF Specification for more about actions and action types.

PDFAction is an abstract superclass of the following concrete classes:

- PDFActionGoToMBS
- PDFActionNamedMBS
- PDFActionRemoteGoToMBS
- PDFActionResetFormMBS
- PDFActionURLMBS

**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3

### 135.5.2 Methods

### 135.5.3 Constructor

MBS PDFKit Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** The private constructor.
**Notes:** This class is the base class for a number of annotations. So this constructor is private to make sure you don't create instances of PDFActionMBS. But you can still create instances of the subclasses.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.
See also:

- 135.5.4 Constructor(Handle as Integer) 18534

### 135.5.4 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFAction handle.
**Notes:** Please pass in a non zero handle which points to a PDFAction object.
For use with declares.
See also:

- 135.5.3 Constructor 18533

### 135.5.5 copy as PDFActionMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the action object.

### 135.5.6 Properties

### 135.5.7 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The internal reference tot he PDF action object.
**Notes:** (Read and Write property)

### 135.5.8 type as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the type of the action.
**Notes:** The PDF action type returned by this method may not correspond precisely to the name of a PDFAction subclass. For example, a PDFActionURL object might return "URI" or "Launch," depending on the original action as defined by the Adobe PDF Specification. In the PDF Kit, these two actions are handled in the single PDFActionURL subclass, and the more familiar term "URL" is used instead.

Available in Mac OS X v10.5 and later.
(Read only property)

## 135.6 class PDFActionNamedMBS

### 135.6.1 class PDFActionNamedMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFActionNamed defines methods used to work with actions in PDF documents, some of which are named in the Adobe PDF Specification.
**Notes:** A PDFActionNamed object represents an action with a defined name, such as "Go back" or "Zoom in."
Subclass of the PDFActionMBS class.

### 135.6.2 Methods

### 135.6.3 Constructor(name as Integer)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes the PDFActionName object with the specified named action.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.6.4 Properties

### 135.6.5 name as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The name of the named action.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.6.6 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPDFActionNamedFind | 8 | One of the name constants for the action.<br>The Find action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedFirstPage | 3 | One of the name constants for the action.<br>The First Page action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedGoBack | 5 | One of the name constants for the action.<br>The Go Back action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedGoForward | 6 | One of the name constants for the action.<br>The Go Forward action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedGoToPage | 7 | One of the name constants for the action.<br>The Go to Page action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedLastPage | 4 | One of the name constants for the action.<br>The Last Page action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedNextPage | 1 | One of the name constants for the action.<br>The Next Page action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedNone | 0 | One of the name constants for the action.<br>The action has no name.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedPreviousPage | 2 | One of the name constants for the action.<br>The Previous Page action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedPrint | 9 | One of the name constants for the action.<br>The Print action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedZoomIn | 10 | One of the name constants for the action.<br>The Zoom In action.<br>Available in Mac OS X v10.5 and later. |
| kPDFActionNamedZoomOut | 11 | One of the name constants for the action.<br>The Zoom Out action.<br>Available in Mac OS X v10.5 and later. |

## 135.7 class PDFActionRemoteGoToMBS

### 135.7.1 class PDFActionRemoteGoToMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFActionRemoteGoTo, a subclass of PDFAction, defines methods for getting and setting the destination of a go-to action that targets another document.
**Notes:** Available in Mac OS X v10.5 and later.
Subclass of the PDFActionMBS class.

### 135.7.2 Methods

### 135.7.3 Constructor(PageIndex as Integer, atPoint as NSPointMBS, file as folderitem)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes the remote go-to action with the specified page index, point, and document URL.
**Notes:** pageIndex: The page index of the remote document.
point: The point on the page in the remote document.
file: The file of the remote PDF document.

The PDFActionRemoteGoTo object uses a zero-based page index, not a PDFPage object. This simplifies the handling of remote destinations for documents that may not be instantiated yet.

Available in Mac OS X v10.5 and later.
See also:

- 135.7.4 Constructor(PageIndex as Integer, atPoint as NSPointMBS, url as string) 18537

### 135.7.4 Constructor(PageIndex as Integer, atPoint as NSPointMBS, url as string)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes the remote go-to action with the specified page index, point, and document URL.
**Notes:** pageIndex: The page index of the remote document.
point: The point on the page in the remote document.
url: The URL of the remote PDF document.

The PDFActionRemoteGoTo object uses a zero-based page index, not a PDFPage object. This simplifies the handling of remote destinations for documents that may not be instantiated yet.

Available in Mac OS X v10.5 and later.
See also:

- 135.7.3 Constructor(PageIndex as Integer, atPoint as NSPointMBS, file as folderitem) 18537

### 135.7.5 Properties

### 135.7.6 pageIndex as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The zero-based page index referenced by the remote go-to action.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.7.7 point as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The point, in page space, on the page referenced by the remote go-to action.
**Notes:** The point on the page of the remote document referenced by the action. If either the x value or the y value of the point is kPDFDestinationUnspecifiedValue, no position on the page is specified.

Page space is a 72-dpi coordinate system with the origin at the lower-left corner of the current page.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.7.8 URL as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The URL of the document referenced by the remote go-to action.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

## 135.8 class PDFActionResetFormMBS

### 135.8.1 class PDFActionResetFormMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFActionResetForm, a subclass of PDFAction, defines methods for getting and clearing fields in a PDF form.
**Notes:** A PDFActionResetForm object represents an action associated with a PDF form.
Subclass of the PDFActionMBS class.

### 135.8.2 Methods

### 135.8.3 Constructor

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes a reset form action.
**Notes:** Initially, there are no fields and fieldsIncludedAreCleared returns true.

Available in Mac OS X v10.5 and later.

### 135.8.4 fields as string()

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns an array of fields associated with the reset action.
**Notes:** An array of strings that corresponds to the fieldNames property of widget annotations (such as PDFAnnotationButtonWidget) on the PDF page. This method can return an empty array.

Available in Mac OS X v10.5 and later.

### 135.8.5 setFields(fields() as string)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Sets the array of fields associated with the reset action.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.8.6 Properties

### 135.8.7 fieldsIncludedAreCleared as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the fields associated with the reset action are cleared when the action is performed.
**Notes:** If true, the reset action's fields are cleared when the action is performed. If false, the fields are excluded from the reset action; that is, they are not cleared, but all other fields in the document are cleared.

Available in Mac OS X v10.5 and later.
(Read and Write property)

## 135.9 class PDFActionURLMBS

### 135.9.1 class PDFActionURLMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** PDFActionURL, a subclass of PDFAction, defines methods for getting and setting the URL associated with a URL action.
**Notes:** Subclass of the PDFActionMBS class.

### 135.9.2 Methods

### 135.9.3 Constructor(url as string)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes a URL action with the specified URL.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.9.4 Properties

### 135.9.5 URL as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The URL associated with the URL action.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

## 135.10 class PDFAnnotationButtonWidgetMBS

### 135.10.1 class PDFAnnotationButtonWidgetMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for an annotation button widget.
**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.10.2 Methods

### 135.10.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor which creates a new annotation widget.
See also:

- 135.10.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18542

### 135.10.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor which creates a new annotation widget.
See also:

- 135.10.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18542

### 135.10.5 Properties

### 135.10.6 allowsToggleToOff as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a Boolean value indicating whether a radio button behaves in a toggling manner.
**Notes:** True if clicking a radio button control that is already in the on state toggles it to the off state; otherwise false.

Available in Mac OS X v10.5 and later.
(Read only property)

### 135.10.7 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background color.
**Notes:** (Read and Write property)

### 135.10.8 caption as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The text of the label on a push button control.
**Notes:** This method applies only to the label drawn on a control of type kPDFWidgetPushButtonControl.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.9 controlType as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The control type of this widget.
**Notes:** Value is one of the following constants:

kPDFWidgetUnknownControl
kPDFWidgetPushButtonControl
kPDFWidgetRadioButtonControl
kPDFWidgetCheckBoxControl
(Read and Write property)

### 135.10.10 fieldName as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal name of a field (used for reset-form actions).
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.11 font as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font used in the control's label.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.12 fontColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font color used in the control's label.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.13 Highlighted as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value that indicates whether the control is highlighted when it is drawn.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.14 onStateValue as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The string associated with the on state of a radio button or checkbox control.
**Notes:** This is a required string for controls of types kPDFWidgetRadioButtonControl and kPDFWidgetCheckBoxControl. The off state is always labeled "Off".

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.10.15 state as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The state value.
**Notes:** (Read and Write property)

### 135.10.16 Events

### 135.10.17 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.10.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPDFWidgetCheckBoxControl | 2 | One of the control types for this widget. |
| kPDFWidgetPushButtonControl | 0 | One of the control types for this widget. |
| kPDFWidgetRadioButtonControl | 1 | One of the control types for this widget. |
| kPDFWidgetUnknownControl | -1 | One of the control types for this widget. |
| NSOffState | 0 | One of the state constants.<br>The corresponding feature is in effect nowhere. |
| NSOnState | 1 | One of the state constants.<br>The corresponding feature is in effect everywhere. |

States

| Constant | Value | Description |
|---|---|---|
| kPDFWidgetMixedState | -1 | The corresponding feature is in mixed state. |
| kPDFWidgetOffState | 0 | The corresponding feature is in effect nowhere. |
| kPDFWidgetOnState | 1 | The corresponding feature is in effect everywhere. |

## 135.11 class PDFAnnotationChoiceWidgetMBS

### 135.11.1 class PDFAnnotationChoiceWidgetMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A PDFAnnotationChoiceWidget object provides user interactivity on a page of a PDF document, in the form of pop-up menus and lists.
**Notes:** PDFAnnotationChoiceWidget inherits general annotation behavior from the PDFAnnotation class. If you use a PDFAnnotationChoiceWidget object, your application must handle hit testing, unless you are simply using PDFView to display content. This is because PDFView automatically handles hit testing for you.
Subclass of the PDFAnnotationMBS class.

### 135.11.2 Methods

### 135.11.3 choices as string()

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of strings that represent the items available in the list or pop-up menu of the choice widget annotation.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.11.4 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a PDF annotation object.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page. Available in Mac OS X v10.4 and later.
See also:

- 135.11.5 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18546

### 135.11.5 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a PDF annotation object.
See also:

- 135.11.4 Constructor(left as Double, top as Double, width as Double, height as Double) 18546

### 135.11.6 setChoices(choices() as string)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the items available in the list or pop-up menu of the choice widget annotation.
**Notes:** choices: Send an array of strings, each of which represents an item in the list or pop-up menu of the choice annotation widget.

Available in Mac OS X v10.5 and later.

### 135.11.7 Properties

### 135.11.8 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color of the widget annotation background.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.9 fieldName as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal field name associated with the widget annotation's value.
**Notes:** If the widget annotation is backed by PDF form data, it can associate an optional field name with a value or other data.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.10 font as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font used to display the text in the widget annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.11 fontColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font color used to display the text in the widget annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.12 isListChoice as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the widget annotation is a list.
**Notes:** A choice widget annotation can be either a list or a pop-up menu.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.13 stringValue as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The selection in the widget annotation.
**Notes:** If the widget annotation object is backed by PDF form data, this method returns the value associated with the appropriate field in the form object, if possible.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.11.14 Events

### 135.11.15 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

## 135.12 class PDFAnnotationCircleMBS

### 135.12.1 class PDFAnnotationCircleMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for an annotation circle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationCircleMBS(100,100,100,100)

a.border.style = PDFBorderMBS.kPDFBorderStyleBeveled

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.12.2 Methods

### 135.12.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation circle.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationCircleMBS(100,100,100,100)

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
```

```
o.Launch
```

See also:

- 135.12.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18551

### 135.12.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation circle.
See also:

- 135.12.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18550

### 135.12.5 Properties

### 135.12.6 interiorColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fill color used for drawing annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationCircleMBS(100,100,100,100)
a.interiorColor = NSColorMBS.magentaColor

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** (Read and Write property)

### 135.12.7 Events

### 135.12.8 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

# 135.13 class PDFAnnotationFreeTextMBS

## 135.13.1 class PDFAnnotationFreeTextMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a free text annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim annotations(-1) as PDFAnnotationMBS = page.annotations

for each a as PDFAnnotationMBS in annotations
if a isa PDFAnnotationFreeTextMBS then
dim ft as PDFAnnotationFreeTextMBS = PDFAnnotationFreeTextMBS(a)
MsgBox ft.contents
end if
next
```

**Notes:** Subclass of the PDFAnnotationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr3

## 135.13.2 Methods

## 135.13.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new free text annotation.
See also:

- 135.13.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18553

## 135.13.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new free text annotation.
See also:

- 135.13.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18553

### 135.13.5 NSCenterTextAlignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa text alignment constant for center.

### 135.13.6 NSRightTextAlignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa text alignment constant for right.

### 135.13.7 Properties

### 135.13.8 alignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Alignment of text within annotation bounds.
**Example:**

```
dim a as PDFAnnotationFreeTextMBS // an annotation

if a.alignment=a.NSLeftTextAlignment then
// left aligned
end if
```

**Notes:** Supported: NSLeftTextAlignment, NSRightTextAlignment and NSCenterTextAlignment.
(Read and Write property)

### 135.13.9 font as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Font associated with the text field.
**Notes:** (Read and Write property)

### 135.13.10 fontColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font color used in the text field of the annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.13.11 Events

### 135.13.12 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.13.13 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSJustifiedTextAlignment | 3 | The Cocoa text alignment constant for justified. |
| NSLeftTextAlignment | 0 | The Cocoa text alignment constant for left. |
| NSNaturalTextAlignment | 4 | The Cocoa text alignment constant for natural. |

## 135.14 class PDFAnnotationInkMBS

### 135.14.1 class PDFAnnotationInkMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for an ink annotation.
**Notes:** Subclass of the PDFAnnotationMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr4

### 135.14.2 Methods

### 135.14.3 addBezierPath(path as NSBezierPathMBS)

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds a Bezier path to an annotation.

### 135.14.4 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new ink annotation.
See also:

- 135.14.5 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18556

### 135.14.5 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new ink annotation.
See also:

- 135.14.4 Constructor(left as Double, top as Double, width as Double, height as Double) 18556

### 135.14.6 paths as NSBezierPathMBS()

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array containing the Bezier paths that make up an annotation.
**Example:**

```
dim a as new PDFAnnotationInkMBS(0, 0, 100, 100)

dim b1 as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(NSMakeRectMBS(10, 10, 10, 10))
a.addBezierPath b1

dim b2 as NSBezierPathMBS = NSBezierPathMBS.bezierPathWithRect(NSMakeRectMBS(50, 50, 20, 30))
a.addBezierPath b2

dim paths() as NSBezierPathMBS = a.paths
break
```

### 135.14.7 removeBezierPath(path as NSBezierPathMBS)

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes a Bezier path from an annotation.

### 135.14.8 Events

### 135.14.9 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

## 135.15 class PDFAnnotationLineMBS

### 135.15.1 class PDFAnnotationLineMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for a line annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim annotations(-1) as PDFAnnotationMBS = page.annotations

// show lines on first page
for each a as PDFAnnotationMBS in annotations
if a isa PDFAnnotationLineMBS then
dim l as PDFAnnotationLineMBS = PDFAnnotationLineMBS(a)
MsgBox "Line from "+l.startPoint.String+" to "+l.endPoint.String
end if
next
```

**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.15.2 Methods

### 135.15.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor for a new annotation line.
**Example:**

```
dim a as new PDFAnnotationLineMBS(100,100,100,100)
```

See also:

- 135.15.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

### 135.15.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor for a new annotation line.
See also:

- 135.15.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18558

### 135.15.5 Properties

### 135.15.6 endLineStyle as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Style used for ornaments at the line end.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationLineMBS(100,100,100,100)

a.colorValue = NSColorMBS.redColor
a.endLineStyle = a.kPDFLineStyleOpenArrow

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
```

**Notes:** (Read and Write property)

### 135.15.7 endPoint as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A point specifying the end point for line annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
```

```
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim annotations(-1) as PDFAnnotationMBS = page.annotations

// show lines on first page
for each a as PDFAnnotationMBS in annotations
if a isa PDFAnnotationLineMBS then
dim l as PDFAnnotationLineMBS = PDFAnnotationLineMBS(a)
MsgBox "Line from "+l.startPoint.String+" to "+l.endPoint.String
end if
next
```

**Notes:** (Read and Write property)

### 135.15.8 interiorColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The color used to fill the ornament at the ends of the line.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.15.9 startLineStyle as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Style used for ornaments at the line start.
**Example:**

```
dim a as new PDFAnnotationLineMBS(100,100,100,100)
a.startLineStyle = a.kPDFLineStyleSquare
```

**Notes:** (Read and Write property)

### 135.15.10 startPoint as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A point specifying the start pointfor line annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim annotations(-1) as PDFAnnotationMBS = page.annotations

// show lines on first page
for each a as PDFAnnotationMBS in annotations
if a isa PDFAnnotationLineMBS then
dim l as PDFAnnotationLineMBS = PDFAnnotationLineMBS(a)
MsgBox "Line from "+l.startPoint.String+" to "+l.endPoint.String
end if
next
```

**Notes:** (Read and Write property)

### 135.15.11 Events

### 135.15.12 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.15.13 Constants

Line Styles

| Constant | Value | Description |
|---|---|---|
| kPDFLineStyleCircle | 2 | |
| kPDFLineStyleClosedArrow | 5 | |
| kPDFLineStyleDiamond | 3 | |
| kPDFLineStyleNone | 0 | |
| kPDFLineStyleOpenArrow | 4 | |
| kPDFLineStyleSquare | 1 | |

## 135.16 class PDFAnnotationLinkMBS

### 135.16.1 class PDFAnnotationLinkMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for a link annotation.
**Example:**

```
// load a PDF
dim sourceFile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim p as new PDFDocumentMBS(sourceFile)

// get 4th page
dim page as PDFPageMBS = p.pageAtIndex(3)
// create a destination
dim dest as new PDFDestinationMBS(page, NSMakePointMBS(0,0))

// create the link annotation
dim LinkAnnotation as new PDFAnnotationLinkMBS(100,100,100,100)
LinkAnnotation.destination = dest

// add a color rect so we see the link
dim SquareAnnotation as new PDFAnnotationSquareMBS(100,100,100,100)
SquareAnnotation.colorValue = NSColorMBS.redColor

// add to the first page
p.pageAtIndex(0).addAnnotation(SquareAnnotation)
p.pageAtIndex(0).addAnnotation(LinkAnnotation)

// and write new PDF.
dim destfile as FolderItem = SpecialFolder.Desktop.Child("output.pdf")
call p.write(destfile)
```

**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.16.2 Methods

### 135.16.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor for a new annotation link.

See also:


- 135.16.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18563


### 135.16.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor for a new annotation link.
See also:


- 135.16.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18562


### 135.16.5 setHighlighted(value as boolean)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The highlight state dictates how the annotation is drawn.
**Notes:** If a user has clicked on a "Link" annotation, you should set highlighted to true and redraw it. When the user lets up, set highlighted to false and redraw again.

### 135.16.6 Properties

### 135.16.7 destination as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Destination for the link.
**Notes:** (Read and Write property)

### 135.16.8 URL as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** URL for the link.
**Notes:** (Read and Write property)

### 135.16.9 Events

### 135.16.10 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

# 135.17 class PDFAnnotationMarkupMBS

## 135.17.1 class PDFAnnotationMarkupMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a markup annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationMarkupMBS(100,100,100,100)

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** Subclass of the PDFAnnotationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr4
- MBS Real Studio Plugins, version 12.5pr5

## 135.17.2 Methods

## 135.17.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new markup annotation.
**Example:**

```
dim a as new PDFAnnotationMarkupMBS(100,100,100,100)
```

See also:

- 135.17.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18566

### 135.17.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new markup annotation.
See also:

- 135.17.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18565

### 135.17.5 quadrilateralPoints as NSPointMBS()

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Get the quadrilateral points.
**Example:**

```
dim m as new PDFAnnotationMarkupMBS(10, 20, 30, 40)
dim points() as NSPointMBS = m.quadrilateralPoints
break // see points in debugger
```

**Notes:** Array of (n * 4) NSPoints defining n quadrilaterals in page space where n is the number of quad points.
The points for each quad are ordered in a 'Z' pattern. That is, the first point should represent the upper left point representing the start of the marked-up text, the next point will be the upper right, the third point will represent the lower left of the text and the last point the lower right. Points are specified relative to the annotation's bound's origin.

### 135.17.6 setQuadrilateralPoints(points() as NSPointMBS)

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Set the quadrilateral points.
**Notes:** Array of (n * 4) NSPoints defining n quadrilaterals in page space where n is the number of quad points.
The points for each quad are ordered in a 'Z' pattern. That is, the first point should represent the upper left point representing the start of the marked-up text, the next point will be the upper right, the third point will represent the lower left of the text and the last point the lower right. Points are specified relative to the annotation's bound's origin.

### 135.17.7 Properties

### 135.17.8 markupType as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Type of mark-up (highlight, strike-out or underline).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationMarkupMBS(100,100,100,100)
a.markupType = PDFAnnotationMarkupMBS.kPDFMarkupTypeUnderline
page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** Changing the markup type also changes the annotations type to one of: "Highlight", "Strikeout", or "Underline" (these are three seperate annotation types treated here as three seperate flavors of the one PDFAnnotationMarkup class).
(Read and Write property)

### 135.17.9 Events

### 135.17.10 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.17.11 Constants

Markup Types

| Constant | Value | Description |
|---|---|---|
| kPDFMarkupTypeHighlight | 0 | Highlight |
| kPDFMarkupTypeRedact | 3 | Redact |
| kPDFMarkupTypeStrikeOut | 1 | StrikeOut |
| kPDFMarkupTypeUnderline | 2 | Underline |

# 135.18 class PDFAnnotationMBS

## 135.18.1 class PDFAnnotationMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** This is the base class for all annotations.
**Notes:** A PDFAnnotation object by itself is not useful, only the subclasses (like PDFAnnotationCircle, PDFAnnotationText) are interesting. In parsing a PDF however, any unknown or unsupported annotations will be represented as this base class. Its drawRect method merely frames the bounds of the annotation and prints the annotation type (like "TrapNet") within the box.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3
- MBS Real Studio Plugins, version 12.5pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

## 135.18.2 Methods

## 135.18.3 addBezierPath(path as NSBezierPathMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Add paths from the annotation.
**Notes:** Path points are specified in annotation space.
Used by annotations type(s): /Ink.

## 135.18.4 choices as string()

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The choices are an array of strings indicating the options (items) in either a list or pop-up menu.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Ch).

## 135.18.5 Constructor

MBS PDFKit Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** The private constructor.
**Notes:** This class is the base class for a number of annotations. So this constructor is private to make sure you don't create instances of PDFAnnotationMBS. But you can still create instances of the subclasses.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.
See also:


- 135.18.6 Constructor(Handle as Integer) 18570
- 135.18.7 Constructor(left as Double, top as Double, width as Double, height as Double) 18570
- 135.18.8 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18571


### 135.18.6 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFAnnotation handle.
**Notes:** Please pass in a non zero handle which points to a PDFAnnotation object.
For use with declares.
See also:


- 135.18.5 Constructor 18569
- 135.18.7 Constructor(left as Double, top as Double, width as Double, height as Double) 18570
- 135.18.8 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18571


### 135.18.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new annotation.
**Notes:** You need to set type once.
See also:


- 135.18.5 Constructor 18569
- 135.18.6 Constructor(Handle as Integer) 18570
- 135.18.8 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18571

### 135.18.8 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Creates a new annotation of given type.
See also:


- 135.18.5 Constructor 18569
- 135.18.6 Constructor(Handle as Integer) 18570
- 135.18.7 Constructor(left as Double, top as Double, width as Double, height as Double) 18570


### 135.18.9 copy as PDFAnnotationMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the annotation object.
**Notes:** For Mac OS X 10.7 and newer this function uses the framework function.
For Mac OS X 10.6 and older this function uses our own copy function to duplicate the annotation.

### 135.18.10 Destructor

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 135.18.11 drawWithBox(box as Integer)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draws the annotation on its associated page.
**Notes:** The annotation is drawn relative to the origin of box in page space.

Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.

For additional information see the "Constants" section in the PDFPage class.

Available in Mac OS X v10.4 and later.

### 135.18.12 lineStyleFromName(Name as String) as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Queries line style for given name.
**Notes:** Method to help with mapping PDFLineStyle to the associated name based on PDF specification
Used by annotations type(s): /Line.

### 135.18.13 nameForLineStyle(LineStyle as Integer) as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Queries name for line style.
**Notes:** Method to help with mapping PDFLineStyle to the associated name based on PDF specification
Used by annotations type(s): /Line.

### 135.18.14 paths as NSBezierPathMBS()

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Array of NSBezierPathsMBS that comprise the annotation.
**Notes:** Paths are specified in annotation space.
Used by annotations type(s): /Ink.

### 135.18.15 PDFAnnotationHighlightingModeInvert as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the highlighting mode constants.
**Notes:** Invert

### 135.18.16 PDFAnnotationHighlightingModeNone as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the highlighting mode constants.
**Notes:** No

### 135.18.17 PDFAnnotationHighlightingModeOutline as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the highlighting mode constants.
**Notes:** Outline

### 135.18.18 PDFAnnotationHighlightingModePush as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the highlighting mode constants.
**Notes:** Push

### 135.18.19 PDFAnnotationKeyAction as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.20 PDFAnnotationKeyAdditionalActions as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.21 PDFAnnotationKeyAppearanceDictionary as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.22 PDFAnnotationKeyAppearanceState as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.23 PDFAnnotationKeyBorder as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.24 PDFAnnotationKeyBorderStyle as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.25 PDFAnnotationKeyColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.26 PDFAnnotationKeyContents as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.27 PDFAnnotationKeyDate as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.28 PDFAnnotationKeyDefaultAppearance as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.29 PDFAnnotationKeyDestination as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.30 PDFAnnotationKeyFlags as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.31 PDFAnnotationKeyHighlightingMode as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.32 PDFAnnotationKeyIconName as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.33 PDFAnnotationKeyInklist as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.34 PDFAnnotationKeyInteriorColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.35 PDFAnnotationKeyLineEndingStyles as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.36 PDFAnnotationKeyLinePoints as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.37 PDFAnnotationKeyName as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.38 PDFAnnotationKeyOpen as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.39 PDFAnnotationKeyPage as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.40 PDFAnnotationKeyParent as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.41 PDFAnnotationKeyPopup as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.42 PDFAnnotationKeyQuadding as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.43 PDFAnnotationKeyQuadPoints as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.44 PDFAnnotationKeyRect as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.45 PDFAnnotationKeySubtype as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.46 PDFAnnotationKeyTextLabel as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the annotation property keys.

### 135.18.47 PDFAnnotationKeyWidgetAppearanceDictionary as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.48 PDFAnnotationKeyWidgetBackgroundColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.49 PDFAnnotationKeyWidgetBorderColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.50 PDFAnnotationKeyWidgetCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.51 PDFAnnotationKeyWidgetDefaultValue as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.52 PDFAnnotationKeyWidgetDownCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.53 PDFAnnotationKeyWidgetFieldFlags as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.54 PDFAnnotationKeyWidgetFieldType as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.55 PDFAnnotationKeyWidgetMaxLen as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.56 PDFAnnotationKeyWidgetOptions as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.57 PDFAnnotationKeyWidgetRolloverCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.58 PDFAnnotationKeyWidgetRotation as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.59 PDFAnnotationKeyWidgetTextLabelUI as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.60 PDFAnnotationKeyWidgetValue as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the key widget property keys.

### 135.18.61 PDFAnnotationLineEndingStyleCircle as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** Circle

### 135.18.62 PDFAnnotationLineEndingStyleClosedArrow as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** Closed Arrow

### 135.18.63 PDFAnnotationLineEndingStyleDiamond as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** Diamond

### 135.18.64 PDFAnnotationLineEndingStyleNone as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** No

### 135.18.65 PDFAnnotationLineEndingStyleOpenArrow as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** Open Arrow

### 135.18.66 PDFAnnotationLineEndingStyleSquare as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the line ending style constants.
**Notes:** Square

### 135.18.67 PDFAnnotationSubtypeCircle as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Circle

### 135.18.68 PDFAnnotationSubtypeFreeText as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Freetext

### 135.18.69 PDFAnnotationSubtypeHighlight as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Highlight

### 135.18.70 PDFAnnotationSubtypeInk as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Ink

### 135.18.71 PDFAnnotationSubtypeLine as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Line

### 135.18.72 PDFAnnotationSubtypeLink as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Link

### 135.18.73 PDFAnnotationSubtypePopup as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Popup

### 135.18.74 PDFAnnotationSubtypeSquare as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Square

### 135.18.75 PDFAnnotationSubtypeStamp as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Stamp

### 135.18.76 PDFAnnotationSubtypeStrikeOut as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Strike out

### 135.18.77 PDFAnnotationSubtypeText as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Text

### 135.18.78 PDFAnnotationSubtypeUnderline as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Underline

### 135.18.79 PDFAnnotationSubtypeWidget as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the subtypes.
**Notes:** Widget

### 135.18.80 PDFAnnotationTextIconTypeComment as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Comment

### 135.18.81 PDFAnnotationTextIconTypeHelp as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Help

### 135.18.82 PDFAnnotationTextIconTypeInsert as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Insert

### 135.18.83 PDFAnnotationTextIconTypeKey as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Key

### 135.18.84 PDFAnnotationTextIconTypeNewParagraph as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** New Paragraph

### 135.18.85 PDFAnnotationTextIconTypeNote as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Note

### 135.18.86 PDFAnnotationTextIconTypeParagraph as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the icon type constants.
**Notes:** Paragraph

### 135.18.87 PDFAnnotationWidgetSubtypeButton as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget subtypes.
**Notes:** Button

### 135.18.88 PDFAnnotationWidgetSubtypeChoice as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget subtypes.
**Notes:** Choice

### 135.18.89 PDFAnnotationWidgetSubtypeSignature as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget subtypes.
**Notes:** Signature

### 135.18.90 PDFAnnotationWidgetSubtypeText as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget subtypes.
**Notes:** Text

### 135.18.91 quadrilateralPoints as NSPointMBS()

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Array of n * 4 points, packed as NSValue pointValue / CGPointValue, defining n quadrilaterals in page space where n is the number of quad points.
**Notes:** The points for each quad are ordered in a 'Z' pattern. That is, the first point should represent the upper left point representing the start of the marked-up text, the next point will be the upper right, the third point will represent the lower left of the text and the last point the lower right.
Points are specified relative to the annotation's bound's origin.

### 135.18.92 removeAllAppearanceStreams

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** All appearance streams for the target annotation are removed.
**Notes:** Without an appearance stream, annotations are drawn strictly according to their parameters (color, border, font, etc.). When a PDF is saved, PDF Kit will always write out an appearance stream(s) for each annotation. If the PDF is reloaded, you will need to remove the appearance streams in order to continue to edit the annotations parameters.

Requires Mac OS X 10.5.

### 135.18.93 removeBezierPath(path as NSBezierPathMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Remove paths from the annotation.

### 135.18.94 removeValueForAnnotationKey(Key as String)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Remove the key-value pair from the annotation dictionary. Returns true on successful removal.

### 135.18.95 setBooleanValue(Key as String, value as Boolean) as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Sets a boolean value.
**Notes:** See also setValue.

### 135.18.96 setChoices(choices() as string)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The choices are an array of strings indicating the options (items) in either a list or pop-up menu.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Ch).

### 135.18.97 setQuadrilateralPoints(points() as NSPointMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Array of n * 4 points, packed as NSValue pointValue / CGPointValue, defining n quadrilaterals in page space where n is the number of quad points.
**Notes:** The points for each quad are ordered in a 'Z' pattern. That is, the first point should represent the upper left point representing the start of the marked-up text, the next point will be the upper right, the third point will represent the lower left of the text and the last point the lower right.
Points are specified relative to the annotation's bound's origin.

### 135.18.98 setRectValue(Key as String, value as NSRectMBS) as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Sets a rectangle value.
**Notes:** See also setValue.

### 135.18.99 setValue(Key as String, value as Variant) as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Allows you to set a key-value pair in this annotation's dictionary.
**Notes:** Returns true on successful assignment, false on error. Key must be valid for a PDF annotation's object type, and must have a value that is acceptable for the key type. These values can either be a string, number, array of strings or numbers, or an dictionary of the previously listed types. Some keys expect a complex type, for example the key "/C" expects a color in the format of an array of 0, 1, 3, or 4 elements, with each element being a floating-point number in the range of 0.0 - 1.0 ). As a convenience, these kind of keys will directly accept NSColorMBS values. Other convenience functions provide similar support can be found in PDFAnnotationUtilities header file. Note that you can set the environment variable "PDFKIT_LOG_ANNOTATIONS" to log any key-value assignment failures.

### 135.18.100 setValues(values() as string)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The choices are an array of strings indicating the option,Äôs export values in either a list or pop-up menu.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Ch).

### 135.18.101 valueForAnnotationKey(Key as String) as Variant

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Retrieves a deep copy of the key-value pair based on the given key; key can either be from the keys PDFAnnotationKey, or an appropriate string from the PDF specification.

### 135.18.102 values as string()

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The choices are an array of strings indicating the option,Äôs export values in either a list or pop-up menu.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Ch).

### 135.18.103 Properties

### 135.18.104 Action as PDFActionMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Optional action performed when a user clicks / taps an annotation.
**Notes:** PDF readers ignore actions except for those associated with Link or button Widget annotations.

Available in macOS 10.5 or newer
(Read and Write property)

### 135.18.105 alignment as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Alignment of text within annotation bounds. Supported: NSLeftTextAlignment, NSRightTextAlignment and NSCenterTextAlignment.
**Notes:** Used by annotations type(s): /FreeText, /Widget (field type(s): /Tx).
(Read and Write property)

### 135.18.106 allowsToggleToOff as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** For radio buttons, indicates whether clicking on widget whose state is already On toggles it Off.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.107 annotationKeyValues as Dictionary

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** List all key-value pairs for this annotation; returns a deep copy of all pairs.
**Notes:** Note that this method will not include a copy of the value for /Parent. This is by design as to avoid introducing a memory cycle. If you would like to get the /Parent propery, use valueForAnnotationKey with key PDFAnnotationKeyParent.
(Read only property)

### 135.18.108 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Background color characteristics.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

### 135.18.109 border as PDFBorderMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Optional border or border style that describes how to draw the annoation border (if any).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationSquareMBS(100,100,100,100)

a.interiorColor = NSColorMBS.greenColor
a.colorValue = NSColorMBS.redColor
a.border.lineWidth=5

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** (Read and Write property)

### 135.18.110 bounds as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The bounding box for the annotation in page space.
**Notes:** Page space is a 72-dpi coordinate system with the origin at the lower-left corner of the current page.

Available in Mac OS X v10.4 and later.
(Read and Write property)

### 135.18.111 buttonWidgetState as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The current state of a button widget annotation.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.112 buttonWidgetStateString as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The string that represents the ON state of a button widget annotation.
**Notes:** This should be set when trying to, for example, group together a set of radio buttons with the same field name.
When buttons share the same field name, their individual state strings set them apart from one another.
Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.113 caption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Label for the button. Applies to kPDFWidgetPushButtonControl only.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.114 colorValue as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** For many annotations ("Circle", "Square") the stroke color.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationLineMBS(100,100,100,100)

a.colorValue = NSColorMBS.redColor
a.endLineStyle = a.kPDFLineStyleOpenArrow

page.addAnnotation(a)
```

```
dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
```

**Notes:** Used for other annotations as well.
(Read and Write property)

### 135.18.115 comb as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Used to configure combing for PDF text fields.
**Notes:** If set, the field is automatically divided into as many equally spaced positions, or combs, as the value of the maximum length of the field. To get the maximum length, use annotaiton key: PDFAnnotationKeyWidgetMaxLen.
Used by annotations type(s): /Widget (field type(s): /Tx).
(Read and Write property)

### 135.18.116 contents as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** A string of text associated with an annotation.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationTextMBS(100,100,100,100)

a.contents="Hello"
a.colorValue = NSColorMBS.redColor

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** Often to be displayed in a pop-up when the annotation is clicked on ("FreeText" and "Text" especially).

(Read and Write property)

### 135.18.117 destination as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Destination for the link. May be nil if no destination associated with link; in this case the URL may be valid.
**Notes:** The preferred way though is to use action property.
Used by annotations type(s): /Link.
(Read and Write property)

### 135.18.118 endLineStyle as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Style used for ornaments at the lines end (optional, PDF 1.4).
**Notes:** Used by annotations type(s): /Line.
(Read and Write property)

### 135.18.119 endPoint as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Points specifying end points for line annotation (required).
**Notes:** Points are specified in annotation space.
Used by annotations type(s): /Line.
(Read and Write property)

### 135.18.120 fieldName as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Widget annotations backed by form data have (internal) field names with which to associate a value or data.
**Notes:** Can also be used for ResetForm actions.
Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

### 135.18.121 font as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Font and font color associated with the text field.
**Notes:** Used by annotations type(s): /FreeText, /Popup, /Widget (field type(s): /Btn, /Ch, and /Tx).
(Read and Write property)

### 135.18.122 fontColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Width of line used to stroke border.
**Notes:** Used by annotations type(s): /FreeText, /Widget (field type(s): /Btn, /Ch, and /Tx).
(Read and Write property)

### 135.18.123 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The handle used internally for the object reference.
**Notes:** (Read and Write property)

### 135.18.124 hasAppearanceStream as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns true if the annotation has an appearance stream.
**Notes:** Annotations with appearance streams are drawn using their stream. As a result, setting many parameters (like 'setColor' above), will have no visible effect.
(Read only property)

### 135.18.125 iconType as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The type of icon displayed in the PDF. Supported icons: "Comment", "Key", "Note", "Help", "NewParagraph", "Paragraph" and "Insert".
**Notes:** Used by annotations type(s): /Text.
(Read and Write property)

### 135.18.126 interiorColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Interior color of the annotation.
**Notes:** Used by annotations type(s): /Circle, /Line, /Square.
(Read and Write property)

### 135.18.127 isHighlighted as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The highlight state dictates how the annotation is drawn.
**Notes:** For example, if a user has clicked on a "Link" annotation, you should set highlighted to YES and redraw it. When the user lets up, set highlighted to false and redraw again.

Available in macOS 10.13 or newer or iOS 11.0 or newer.
(Read and Write property)

### 135.18.128 isPasswordField as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Used to determine if a PDF text field is a password field.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Tx).
(Read only property)

### 135.18.129 ListChoice as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** There are two flavors of Choice widget annotations, lists and pop-up menus. This method allow you to differentiate.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Ch).
(Read and Write property)

### 135.18.130 markupType as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Type of mark-up (highlight, strike-out or underline). Changing the markup type also changes the annotations type.
**Notes:** Used by annotations type(s): /Highlight, /StrikeOut, /Underline.
(Read and Write property)

### 135.18.131 maximumLength as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Maximum characters allowed (optional, zero indicates no specified maximum).
**Notes:** Used by annotations type(s): /Widget (field type(s): /Tx).
(Read and Write property)

### 135.18.132 modificationDate as date

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The modification date of the annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.18.133 modificationDateTime as DateTime

MBS PDFKit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The modification date of the annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.18.134 mouseUpAction as PDFActionMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The action performed when a user releases the mouse button within an annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.18.135 multiline as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Used to configure multiline PDF text fields.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Tx).
(Read and Write property)

### 135.18.136 Open as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Used to tell if an annotation is open or closed.
**Notes:** Used by annotations type(s): /Popup.
(Read and Write property)

### 135.18.137 page as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns the page the annotation is associated with.
**Notes:** (Read only property)

### 135.18.138 popup as Variant

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The pop-up annotation associated with an annotation.
**Notes:** The variant is a PDFAnnotationPopupMBS.

Pop-up annotations are not used with links or widgets. The bounds and open state of the pop-up annotation indicate the placement and open state of the pop-up window.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.18.139 radiosInUnison as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** For radio buttons, indicates whether a group of radio buttons will turn on and off in unison; that is if one is checked, they are all checked. If clear, the buttons are mutually exclusive.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.140 ReadOnly as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Determines if a text field should be editable or not.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

### 135.18.141 shouldDisplay as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Specifies whether it should be drawn to the display or not.
**Notes:** (Read and Write property)

### 135.18.142 shouldPrint as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Specifies whether it should be printed or not.
**Notes:** (Read and Write property)

### 135.18.143 stampName as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Name of stamp annotation.
**Notes:** Standard stamps include names like, "Approved", "Draft", "TopSecret", etc.
The name must be representable as ASCII. Very little is rendered if the annotation has no appearance stream.
Used by annotations type(s): /Stamp
(Read and Write property)

### 135.18.144 startLineStyle as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Style used for ornaments at the lines start (optional, PDF 1.4).
**Notes:** Used by annotations type(s): /Line.
(Read and Write property)

### 135.18.145 startPoint as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Points specifying start points for line annotation (required).
**Notes:** Points are specified in annotation space.
Used by annotations type(s): /Line.
(Read and Write property)

### 135.18.146 toolTip as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** String used for tooltips.
**Notes:** The base class returns contents, sub-classes may override as appropriate.
(Read only property)

### 135.18.147 type as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns the annotation type (called "Subtype" in the PDF specification since "Annot" is the type).
**Example:**

```
dim a as new PDFAnnotationTextMBS(100,100,100,100)
MsgBox a.type // Text
```

**Notes:** Examples include: "Text", "Link", "Line", etc.
(Read and Write property)

### 135.18.148 URL as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** URL for the link. May be nil if no URL action associated with link; in this case the destination may be valid.
**Notes:** The preferred way though is to via action property.
Used by annotations type(s): /Link.
(Read and Write property)

### 135.18.149 userName as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The name of the user who created the annotation.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.18.150 widgetControlType as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The type of button widget control type (radio button, push button, or checkbox).
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn).
(Read and Write property)

### 135.18.151 widgetDefaultStringValue as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The string value for a widget annotation.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

### 135.18.152 widgetFieldType as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The specific field type of a widget annotation (button, choice, or text).
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

### 135.18.153 widgetStringValue as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The string value for a widget annotation.
**Notes:** Used by annotations type(s): /Widget (field type(s): /Btn, /Ch, /Tx).
(Read and Write property)

## 135.19 class PDFAnnotationPopupMBS

### 135.19.1 class PDFAnnotationPopupMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A PDFAnnotationPopup object provides user interactivity on a PDF page in the form of a pop-up menu.
**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.19.2 Methods

### 135.19.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new annotation popup annotation with the given size.
See also:

- 135.19.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18602

### 135.19.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new annotation popup annotation with the given size.
See also:

- 135.19.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18602

### 135.19.5 Properties

### 135.19.6 isOpen as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A Boolean value indicating whether the pop-up is open.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.19.7 Events

### 135.19.8 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

## 135.20 class PDFAnnotationSquareMBS

### 135.20.1 class PDFAnnotationSquareMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for a square annotation.
**Example:**

```
// load a PDF
dim sourceFile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim p as new PDFDocumentMBS(sourceFile)

// get 4th page
dim page as PDFPageMBS = p.pageAtIndex(3)
// create a destination
dim dest as new PDFDestinationMBS(page, NSMakePointMBS(0,0))

// create the link annotation
dim LinkAnnotation as new PDFAnnotationLinkMBS(100,100,100,100)
LinkAnnotation.destination = dest

// add a color rect so we see the link
dim SquareAnnotation as new PDFAnnotationSquareMBS(100,100,100,100)
SquareAnnotation.colorValue = NSColorMBS.redColor

// add to the first page
p.pageAtIndex(0).addAnnotation(SquareAnnotation)
p.pageAtIndex(0).addAnnotation(LinkAnnotation)

// and write new PDF.
dim destfile as FolderItem = SpecialFolder.Desktop.Child("output.pdf")
call p.write(destfile)
```

**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.20.2 Methods

### 135.20.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a square annotation.

**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationSquareMBS(100,100,100,100)

a.interiorColor = NSColorMBS.greenColor
a.colorValue = NSColorMBS.redColor
a.border.lineWidth=5

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

See also:

- 135.20.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18605

### 135.20.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a square annotation.
See also:

- 135.20.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18604

### 135.20.5 Properties

### 135.20.6 interiorColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Fill color used for drawing annotation.
**Example:**

```
dim a as new PDFAnnotationSquareMBS(100,100,100,100)
a.interiorColor = NSColorMBS.greenColor
```

**Notes:** (Read and Write property)

### 135.20.7 Events

### 135.20.8 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

# 135.21 class PDFAnnotationStampMBS

## 135.21.1 class PDFAnnotationStampMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A PDFAnnotationStamp object allows you to display a word or phrase, such as "Confidential," in a PDF page.
**Example:**

```
// create new document with blank page
dim doc as new PDFDocumentMBS
dim page as new PDFPageMBS
doc.appendPage page

// make new stamp annotation
dim stamp as new PDFAnnotationStampMBS(100, 100, 100, 100)

// Name of stamp annotation.  Standard stamps include names like, "Approved", "Draft", "TopSecret",
etc.
// The name must be representable as ASCII.
// Very little is rendered if the annotation has no appearance stream.
stamp.name = "Approved"

page.addAnnotation stamp

// save to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

if doc.write(f) then
f.Launch
else
MsgBox "write failed"
end if
```

**Notes:** A PDFAnnotationStamp object should have an appearance stream associated with it; otherwise, nothing useful is rendered.
Subclass of the PDFAnnotationMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr5

### 135.21.2 Methods

### 135.21.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new annotation stamp with the given size.
See also:

- 135.21.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18608

### 135.21.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new annotation stamp with the given size.
See also:

- 135.21.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18608

### 135.21.5 Properties

### 135.21.6 name as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name associated with the stamp annotation.
**Notes:** The name must be representable in ASCII. You can set a stamp annotation's name to help you identify it, but that name is not displayed on the PDF page. You must provide the string you want displayed on the page, such as "Draft" or "Top Secret", in the appearance stream for the annotation.

Note that the name value of the stamp annotation is not necessarily identical to the user-visible appearance of the stamp annotation. For example, a stamp annotation that displays "Confidential" on a PDF page may not have a name value of "Confidential".

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.21.7 Events

### 135.21.8 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

## 135.22 class PDFAnnotationTextMBS

### 135.22.1 class PDFAnnotationTextMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for an annotation text.
**Notes:** Subclass of the PDFAnnotationMBS class.

### 135.22.2 Methods

### 135.22.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation text.
See also:

- 135.22.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18610

### 135.22.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation text.
See also:

- 135.22.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18610

### 135.22.5 Properties

### 135.22.6 iconType as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The type of icon displayed in the PDF.
**Notes:** Supported icons: ”Comment”, ”Key”, ”Note”, ”Help”, ”NewParagraph”, ”Paragraph” and ”Insert”.
(Read and Write property)

### 135.22.7 Events

### 135.22.8 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.22.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPDFTextAnnotationIconComment | 0 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconHelp | 3 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconInsert | 6 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconKey | 1 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconNewParagraph | 4 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconNote | 2 | One of the constants for use with the icontype property. |
| kPDFTextAnnotationIconParagraph | 5 | One of the constants for use with the icontype property. |

## 135.23 class PDFAnnotationTextWidgetMBS

### 135.23.1 class PDFAnnotationTextWidgetMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The PDFKit class for a text widget annotation.
**Notes:** Subclass of the PDFAnnotationMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr3

### 135.23.2 Methods

### 135.23.3 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation.
See also:

- 135.23.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil) 18612

### 135.23.4 Constructor(left as Double, top as Double, width as Double, height as Double, annotationType as String, properties as Dictionary = nil)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a new annotation.
See also:

- 135.23.3 Constructor(left as Double, top as Double, width as Double, height as Double) 18612

### 135.23.5 NSCenterTextAlignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa text alignment constant for center.

### 135.23.6 NSRightTextAlignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop only.

**Function:** The Cocoa text alignment constant for right.

### 135.23.7 Properties

### 135.23.8 alignment as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Alignment of text.
**Notes:** Supported: NSLeftTextAlignment, NSRightTextAlignment and NSCenterTextAlignment.
(Read and Write property)

### 135.23.9 attributedStringValue as NSAttributedStringMBS

MBS PDFKit Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attributed string associated with text field ( font / fontColor).
**Notes:** Available on Mac OS X 10.8 or newer.
(Read and Write property)

### 135.23.10 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The background color of the annotation text field.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.23.11 fieldName as string

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal name for the annotation text field.
**Notes:** Field names are optional, internal names that identify text fields in a PDF form. You use field names with the PDFActionResetForm action.
Note that multiple PDFAnnotationTextWidget objects with the same field name always have the same text associated with that field name. When text is entered into one of the objects, the text associated with that

field name is changed in all objects. If you need to ensure unique text for a PDFAnnotationTextWidget object, you must give it a unique field name.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.23.12 font as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Font associated with the text field.
**Notes:** (Read and Write property)

### 135.23.13 fontColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The font color used for the annotation's text field.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.23.14 isMultiline as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Configuring multiline PDF text fields.
**Notes:** (Read and Write property)

### 135.23.15 maximumLength as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of characters allowed in the annotations string.
**Notes:** A value of 0 means that there is no specified maximum.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.23.16 rotation as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The rotation angle of the annotation text field in degrees.
**Notes:** The rotation angle to be applied to the annotation text field, in degrees. The rotation angle must be a positive or negative multiple of 90 (negative angles are converted to their positive equivalents; for example -90 is changed to 270).
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.23.17 stringValue as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** String value associated with text field.
**Notes:** (Read and Write property)

### 135.23.18 Events

### 135.23.19 drawWithBox(box as Integer, g as NSGraphicsMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: .

**Function:** The event called for a custom drawing.
**Notes:** You can draw here what the annotation should show.
Return true to disable the default drawing from PDFKit.

### 135.23.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSJustifiedTextAlignment | 3 | The Cocoa text alignment constant for justified. |
| NSLeftTextAlignment | 0 | The Cocoa text alignment constant for left. |
| NSNaturalTextAlignment | 4 | The Cocoa text alignment constant for natural. |

## 135.24 class PDFAppearanceCharacteristicsMBS

### 135.24.1 class PDFAppearanceCharacteristicsMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** PDFAppearanceCharacteristics represents a dictionary that is specific to widget annotation types, containing additional information for constructing the annotation,Äôs appearance.
**Notes:** It is designed to be a representation of the /MK appearance characteristics entry in the annotation dictionary. Because the /MK entry is optional, all properties of PDFAppearanceCharacteristics are optional as well.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr2

### 135.24.2 Methods

### 135.24.3 Constructor

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The constructor.
See also:

- 135.24.4 Constructor(Handle as Integer) 18616

### 135.24.4 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Handle must point to an existing PDFAppearanceCharacteristics object.
See also:

- 135.24.3 Constructor 18616

### 135.24.5 copy as PDFAppearanceCharacteristicsMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 135.24.6 PDFAppearanceCharacteristicsKeyBackgroundColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.7 PDFAppearanceCharacteristicsKeyBorderColor as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.8 PDFAppearanceCharacteristicsKeyCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.9 PDFAppearanceCharacteristicsKeyDownCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.10 PDFAppearanceCharacteristicsKeyRolloverCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.11 PDFAppearanceCharacteristicsKeyRotation as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** One of the widget appearance characteristics keys.

### 135.24.12 Properties

### 135.24.13 appearanceCharacteristicsKeyValues as Dictionary

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** List all appearance characteristics properties as key-value pairs; returns a deep copy of all pairs.
**Notes:** Helpful for debugging.
(Read only property)

### 135.24.14 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The background color of the widget annotation.
**Notes:** (Read and Write property)

### 135.24.15 borderColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The border color of the widget annotation.
**Notes:** (Read and Write property)

### 135.24.16 caption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The widget annotation,Äôs normal caption, displayed when it is not interacting with the user.
**Notes:** (Read and Write property)

### 135.24.17 controlType as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** For button widget annotations, need to specify the control type for PDFAppearanceCharacteristicsMBS as certain attributes, i.e. captions, are only available for certain flavors.
**Notes:** Control type does not need to be set for text or choice widget annotations.
(Read and Write property)

### 135.24.18 downCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The widget's caption displayed when the user holds the mouse button while over the annotation.
**Notes:** Applies only to kPDFWidgetPushButtonControl.
(Read and Write property)

### 135.24.19 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 135.24.20 rolloverCaption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The widget's caption displayed when the user moves the mouse over the annotation.
**Notes:** Applies only to kPDFWidgetPushButtonControl.
(Read and Write property)

### 135.24.21 rotation as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The number of *degrees* by which the widget annotation is rotated counterclockwise relative to the page.
**Notes:** The value must be a multiple of 90. Default value: 0.
(Read and Write property)

## 135.25 class PDFBorderMBS

### 135.25.1 class PDFBorderMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The class for PDFKit borders.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr1
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3
- MBS Real Studio Plugins, version 12.5pr5

### 135.25.2 Methods

### 135.25.3 Constructor

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** Updated for version 21.1 to be public. Used to be private.
See also:

- 135.25.4 Constructor(Handle as Integer) 18620

### 135.25.4 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFBorder handle.
**Notes:** Please pass in a non zero handle which points to a PDFBorder object.
For use with declares.
See also:

- 135.25.3 Constructor 18620

### 135.25.5 copy as PDFBorderMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the border object.
**Notes:** Not available in Mac OS X 10.6.

### 135.25.6 dashPattern as Double()

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Gets the dash pattern for the border.
**Notes:** Refer to the description for NSBezierPath for more information.

### 135.25.7 PDFBorderKeyDashPattern as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Key for the dash pattern property.

### 135.25.8 PDFBorderKeyLineWidth as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Key for the line width property.

### 135.25.9 PDFBorderKeyStyle as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Key for the style property.

### 135.25.10 setDashPattern(values() as Double)

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Sets the dash pattern for the border.
**Notes:** Refer to the description for NSBezierPath for more information.

### 135.25.11 Properties

### 135.25.12 borderKeyValues as Dictionary

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** List all border properties as key-value pairs; returns a deep copy of all pairs.
**Notes:** Helpful for debugging.

(Read only property)

### 135.25.13 horizontalCornerRadius as single

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** For rounded-rect borders, the corner radius.
**Notes:** Deprecated in Mac OS X 10.7.
(Read and Write property)

### 135.25.14 lineWidth as Double

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Width of line used to strok border.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationSquareMBS(100,100,100,100)

a.interiorColor = NSColorMBS.greenColor
a.colorValue = NSColorMBS.redColor
a.border.lineWidth=5

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** (Read and Write property)

### 135.25.15 style as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Whether border is drawn solid, dashed etc.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim page as PDFPageMBS = doc.pageAtIndex(0)
dim a as new PDFAnnotationSquareMBS(100,100,100,100)

a.border.style = PDFBorderMBS.kPDFBorderStyleDashed

page.addAnnotation(a)

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
o.Launch
```

**Notes:** Use this constants:

| | |
|---|---|
| kPDFBorderStyleSolid | = 0 |
| kPDFBorderStyleDashed | = 1 |
| kPDFBorderStyleBeveled | = 2 |
| kPDFBorderStyleInset | = 3 |
| kPDFBorderStyleUnderline | = 4 |

(Read and Write property)

### 135.25.16 verticalCornerRadius as single

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** For rounded-rect borders, the corner radius.
**Notes:** Deprecated in Mac OS X 10.7.
(Read and Write property)

### 135.25.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPDFBorderStyleBeveled | 2 | One of the constants for the border style. |
| kPDFBorderStyleDashed | 1 | One of the constants for the border style. |
| kPDFBorderStyleInset | 3 | One of the constants for the border style. |
| kPDFBorderStyleSolid | 0 | One of the constants for the border style. |
| kPDFBorderStyleUnderline | 4 | One of the constants for the border style. |

# 135.26 class PDFDestinationMBS

## 135.26.1 class PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The class for a pdf destination.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3

## 135.26.2 Methods

## 135.26.3 compare(dest as PDFDestinationMBS) as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns a comparison result that indicates the location of the destination in the document, relative to the current position.
**Notes:** A comparison result, indicating the position of the passed-in destination relative to the current position.

If destination is between the receiver's position and the end of the document, compare returns NSOrderedAscending; if it is between the receiver's position and the beginning of the document, compare returns NSOrderedDescending. Otherwise, if destination matches the receiver's position, compare returns NSOrderedSame.

This method ignores the horizontal component of the destination point (the x value). If the destination's vertical component (or y value) is kPDFDestinationUnspecifiedValue, compare treats the destination as if its y value is the top point on the destination page.

An exception is raised if destination does not have a page associated with it or if its page is associated with a document other than the receiver's document.

Available in Mac OS X v10.5 and later.

## 135.26.4 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFDestination handle.
**Notes:** Please pass in a non zero handle which points to a PDFDestination object.
For use with declares.
See also:


- 135.26.5 Constructor(page as PDFPageMBS, point as NSPointMBS) 18626


### 135.26.5 Constructor(page as PDFPageMBS, point as NSPointMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes the destination.
**Notes:** page: The page of the destination.
point: The point of the destination, in page space.

Specify point in page space. Typically, there's no need to initialize destinations. Instead, you get them from PDFAnnotationLink, PDFOutline, or PDFView objects.

Page space is a 72-dpi coordinate system with the origin at the lower-left corner of the current page.

Available in Mac OS X v10.4 and later.
See also:


- 135.26.4 Constructor(Handle as Integer) 18625


### 135.26.6 copy as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the destination object.

### 135.26.7 kPDFDestinationUnspecifiedValue as Double

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Value used for unspecified destination.
**Example:**

MsgBox str(PDFDestinationMBS.kPDFDestinationUnspecifiedValue)

**Notes:** Unspecified value used when a destination's actual x or y value is unimportant.
Available in Mac OS X v10.5 and later.

### 135.26.8 point as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the point, in page space, that the destination refers to.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.

Available in Mac OS X v10.4 and later.

### 135.26.9 Properties

### 135.26.10 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 135.26.11 page as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Page the destination refers to (destination page).
**Notes:** (Read only property)

### 135.26.12 Zoom as Double

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Specify the scale factor the PDF viewer should assume for this destination.
**Notes:** kPDFDestinationUnspecifiedValue indicates the scale factor is unaffected.
Available in Mac OS X 10.7 and later.
(Read and Write property)

## 135.27 class PDFDocumentDelegateMBS

### 135.27.1 class PDFDocumentDelegateMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** A class for a document delegate.
**Notes:** Subclass this class to handle document events.

### 135.27.2 Events

### 135.27.3 Close

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** Called when the delegate is destroyed.

### 135.27.4 didMatchString(selection as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event for an item found.
**Notes:** If implemented by the delegate, called for every search instance found during a find. PDFDocument's implentation accumulates each PDFSelection in an array.

### 135.27.5 documentDidBeginDocumentFind

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The search started on the document.

### 135.27.6 documentDidBeginPageFind(PageIndex as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The page search started on this page.
**Notes:** PageIndex is zero based.

### 135.27.7 documentDidEndDocumentFind

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The search finished on this document.

### 135.27.8 documentDidEndPageFind(PageIndex as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The page search finished on this page.
**Notes:** PageIndex is zero based.

### 135.27.9 documentDidFindMatch(selection as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The search found an item.

### 135.27.10 documentDidUnlock

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The document has been unlocked.

### 135.27.11 Open

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** Called when the delegate is installed.

## 135.28 class PDFDocumentMBS

### 135.28.1 class PDFDocumentMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The PDFKit class for a PDF document.
**Notes:** Basicly this is the code used by Preview.app by Apple.

Destructor is dispatched to main thread to avoid bugs in OS X 10.12.
**Blog Entries**

- PDF Viewer controls for iOS
- Several ways for picture to PDF in MBS Plugins
- News from the MBS Xojo Plugins Version 21.1
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr3
- PDF printing via PDFKit
- Have you checked out PDFViewMBS class?
- MBS REALbasic Plugins Version 10.4 release notes

**Xojo Developer Magazine**

- 6.4, pages 33 to 34: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz
- 20.3, page 80: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes

### 135.28.2 Methods

### 135.28.3 appendPage(page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Appends a page to the document.

### 135.28.4 beginFindString(text as string, options as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Begins a find, searching the document for string.
**Notes:** Search results are handled via a DidFindMatch event in the delegate. Supported options are: NSCaseInsensitiveSearch, NSLiteralSearch, and NSBackwardsSearch.

### 135.28.5 beginFindStrings(texts() as string, options as integer)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Like beginFindString but it accepts an array of strings to search for.

### 135.28.6 cancelFindString

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Method to cancel a search.
**Notes:** Can be called from a user method being serviced by a find notification.

### 135.28.7 Constructor

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The constructor to create a new pdf document in memory.
**Example:**

```
dim doc as new PDFDocumentMBS // new empty document
dim page as new PDFPageMBS // new empty page

doc.Creator="Xojo"
doc.Title="Test file"

doc.insertPage page,0

dim f as FolderItem=SpecialFolder.Desktop.Child("test.pdf")

if doc.write(f) then
f.launch
end if
```

See also:


- 135.28.8 Constructor(data as memoryblock) 18632
- 135.28.9 Constructor(data as String) 18632
- 135.28.10 Constructor(file as folderitem) 18633
- 135.28.11 Constructor(Handle as Integer) 18633


### 135.28.8 Constructor(data as memoryblock)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The constructor to create a new pdf document based on a string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim b as BinaryStream = f.OpenAsBinaryFile(false)
dim s as string = b.Read(b.Length)

dim doc as new PDFDocumentMBS(s)

MsgBox doc.Title
```

See also:


- 135.28.7 Constructor 18631
- 135.28.9 Constructor(data as String) 18632
- 135.28.10 Constructor(file as folderitem) 18633
- 135.28.11 Constructor(Handle as Integer) 18633


### 135.28.9 Constructor(data as String)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** The constructor to create a new pdf document based on a string.
See also:


- 135.28.7 Constructor 18631
- 135.28.8 Constructor(data as memoryblock) 18632
- 135.28.10 Constructor(file as folderitem) 18633
- 135.28.11 Constructor(Handle as Integer) 18633

### 135.28.10 Constructor(file as folderitem)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The constructor to create a new pdf document based on a file.
**Example:**

```
dim p as PDFDocumentMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.pdf")
p=new PDFDocumentMBS(f)

MsgBox "Text from first page:"+EndOfLine+EndOfLine+p.pageAtIndex(0).stringValue
```

See also:


- 135.28.7 Constructor 18631
- 135.28.8 Constructor(data as memoryblock) 18632
- 135.28.9 Constructor(data as String) 18632
- 135.28.11 Constructor(Handle as Integer) 18633


### 135.28.11 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFDocument handle.
**Notes:** Please pass in a non zero handle which points to a PDFDocument object.
For use with declares.
See also:


- 135.28.7 Constructor 18631
- 135.28.8 Constructor(data as memoryblock) 18632
- 135.28.9 Constructor(data as String) 18632
- 135.28.10 Constructor(file as folderitem) 18633


### 135.28.12 copy as PDFDocumentMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the document object.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim p as new PDFDocumentMBS(f)

// make a copy
dim c as PDFDocumentMBS = p.copy

// remove second page
c.removePageAtIndex 1

// c has one page less
MsgBox str(p.pageCount)+" "+str(c.pageCount)
```

**Notes:** For Mac OS X 10.7 and newer this function uses the framework function.
For Mac OS X 10.6 and older this function uses our own copy function to duplicate the document.

### 135.28.13 dataRepresentation(QuartzFilter as Variant = nil) as memoryblock

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Methods to record the current state of the PDFDocument as data string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

dim o as FolderItem = SpecialFolder.Desktop.Child("out.pdf")
dim b as BinaryStream = o.CreateBinaryFile("")

b.Write doc.dataRepresentation
```

**Notes:** Optional for Mac OS X 10.6, you can pass a QuartzFilterMBS object to use that filter here.

Looks like newer macOS versions like 10.14 or later ignore the quartz filter.

### 135.28.14 exchangePageAtIndexWithPageAtIndex(indexA as Integer, indexB as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Exchanges the two pages with the given index.
**Notes:** Index is zero based.

### 135.28.15 findString(text as string, options as Integer) as PDFSelectionMBS()

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Searches entire document for string and returns an array of PDFSelections representing all instances found.
**Example:**

```
dim p as PDFDocumentMBS
dim f as FolderItem
dim sa() as PDFSelectionMBS
dim i,c as Integer
dim s as PDFSelectionMBS

const NSCaseInsensitiveSearch=1

f=SpecialFolder.Desktop.Child("test.pdf")
p=new PDFDocumentMBS(f)

if p.pageCount=0 then
MsgBox "Failed to load the PDF."
Return
end if

sa=p.findString("Plugin",NSCaseInsensitiveSearch)

if ubound(sa)<0 then
MsgBox "no item found."
else
MsgBox str(ubound(sa)+1)+" items found."
end if

s=sa(0)
s.extendSelectionAtEnd(50)
s.extendSelectionAtStart(50)

MsgBox s.stringValue // shows a bit more text before and after the location found
```

**Notes:** May return an empty array if nothing is found.
Returns nil on any error.

Supported options are:
NSCaseInsensitiveSearch, NSLiteralSearch, and NSBackwardsSearch.

### 135.28.16 findStringFromSelection(text as string, selection as PDFSelectionMBS, options as Integer) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Searches for only the next instance of string beginning after the last character of selection with options (or preceding the first character of the selection if NSBackwardsSearch is specified as a search option).
**Notes:** Returns next instance as a PDFSelection or nil if the end of the document is reached. Supported options are: NSCaseInsensitiveSearch, NSLiteralSearch, and NSBackwardsSearch. Passing in nil for selection will start the search from the beginning of the document (or end if NSBackwardsSearch is specified).

### 135.28.17 indexForPage(page as PDFPageMBS) as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a PDFPage, returns the pages index within the document.
**Notes:** Indicees are zero-based.

### 135.28.18 insertPage(page as PDFPageMBS, index as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Inserts a page in the pdf on the given index.
**Example:**

```
dim file1,file2,file3,destfile as FolderItem
dim page1,page2,page3 as PDFPageMBS
dim doc1,doc2 as PDFDocumentMBS
dim img as NSImageMBS
dim doc as PDFDocumentMBS

file1=SpecialFolder.Desktop.Child("test1.pdf")
file2=SpecialFolder.Desktop.Child("test2.pdf")
file3=SpecialFolder.Desktop.Child("logo.jpg")

doc1=new PDFDocumentMBS(file1)
doc2=new PDFDocumentMBS(file2)

MsgBox str(doc1.pageCount)

img=new NSImageMBS(file3)
```

```
Backdrop=img.CopyPicture

page1=new PDFPageMBS(img)
page2=doc1.pageAtIndex(0)
page3=doc2.pageAtIndex(0)

doc=new PDFDocumentMBS
doc.insertPage page1,0
doc.insertPage page2,1
doc.insertPage page3,2

destfile=SpecialFolder.Desktop.Child("test.pdf")
call doc.write(destfile)
```

**Notes:** Index is zero based.

### 135.28.19 Keywords as string()

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Array of Strings containing document keywords.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox join(doc.Keywords)
```

### 135.28.20 outlineItemForSelection(selection as PDFSelectionMBS) as PDFOutlineMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a PDFSelection, this method returns the child outline item the selection most closely falls beneath.
**Notes:** Since a selection may span multiple outline items, only the point representing the first character of the PDFSelection is considered. Typically, outline's indicate things like chapters for the PDF. Therefore, this method would help you identify the chapter the selection falls within.

For some PDFs this method returns nil.

### 135.28.21 pageAtIndex(index as Integer) as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns a PDFPage object representing the page at index.
**Example:**

```
dim p as PDFDocumentMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.pdf")
p=new PDFDocumentMBS(f)

MsgBox "Text from first page:"+EndOfLine+EndOfLine+p.pageAtIndex(0).stringValue
```

**Notes:** Will raise an exception if index is out of bounds. Indicees are zero-based.

### 135.28.22 PDFDocumentAuthorAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the name of the author of the document.

### 135.28.23 PDFDocumentCreationDateAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the document,Äôs creation date.

### 135.28.24 PDFDocumentCreatorAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the name of the application that created the document content.

### 135.28.25 PDFDocumentDidBeginFindNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that the beginFindString or findString method begins finding.
**Notes:** The notification object is the PDFDocument object itself.
Use with NSNotificationObserverMBS class.

### 135.28.26 PDFDocumentDidBeginPageFindNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a find operation begins working on a new page of a document.
**Notes:** You can use this notification to update a progress bar.
The notification object is the PDFDocument object itself. To determine the page, use the PDFDocument-PageIndex key to obtain userinfo of type Number.

Use with NSNotificationObserverMBS class.

### 135.28.27 PDFDocumentDidBeginPageWriteNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a write operation begins working on a page in a document.
**Notes:** The notification object is the PDFDocumentMBS object itself. To determine the page, use the PDFDocumentPageIndex key to obtain userinfo of type Number.

Use with NSNotificationObserverMBS class.

### 135.28.28 PDFDocumentDidBeginWriteNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a write operation begins working on a document.
**Notes:** The notification object is the PDFDocumentMBS object itself.

Use with NSNotificationObserverMBS class.

### 135.28.29 PDFDocumentDidEndFindNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that the beginFindString or findString method returns.
**Notes:** The beginFindString method returns immediately, so this notification is posted when the ‚Äúfind‚Äù operation is finished.
You can use this notification to know when to close or hide a progress bar.
The notification object is the PDFDocument object itself.

Use with NSNotificationObserverMBS class.

### 135.28.30 PDFDocumentDidEndPageFindNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a find operation finishes working on a page in a document.
**Notes:** You can use this notification to update a progress bar.
The notification object is the PDFDocument object itself. To determine the page, use the PDFDocumentPageIndex key to obtain userinfo of type Number.

Use with NSNotificationObserverMBS class.

### 135.28.31 PDFDocumentDidEndPageWriteNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a write operation finishes working on a page in a document.
**Notes:** The notification object is the PDFDocumentMBS object itself. To determine the page, use the PDFDocumentPageIndex key to obtain userinfo of type Number.

Use with NSNotificationObserverMBS class.

### 135.28.32 PDFDocumentDidEndWriteNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a write operation finishes working on a document.
**Notes:** The notification object is the PDFDocumentMBS object itself.

Use with NSNotificationObserverMBS class.

### 135.28.33 PDFDocumentDidFindMatchNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a string match is found in a document.
**Notes:** The notification object is the PDFDocumentMBS object itself. To determine the string selection found, use the PDFDocumentFoundSelection key to obtain userinfo of type PDFSelectionMBS.

Use with NSNotificationObserverMBS class.

### 135.28.34 PDFDocumentDidUnlockNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** A notification that a document unlocks after a unlockWithPassword message.
**Notes:** Use with NSNotificationObserverMBS class.
The notification object is the PDFDocument object itself.

### 135.28.35 PDFDocumentKeywordsAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional array of text strings containing keywords for the document.

### 135.28.36 PDFDocumentModificationDateAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the document,Äôs last-modified date.

### 135.28.37 PDFDocumentOwnerPasswordOption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the options for writing a PDF.
**Notes:** A string object for the owner's password which is required for encryption.

### 135.28.38 PDFDocumentProducerAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the name of the application that produced the PDF data for the document.

### 135.28.39 PDFDocumentSubjectAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing a description of the subject of the document.

### 135.28.40 PDFDocumentTitleAttribute as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** An optional text string containing the title of the document.

### 135.28.41 PDFDocumentUserPasswordOption as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the options for writing a PDF.
**Notes:** A string for the user's password which is optional for encryption.

### 135.28.42 PrintOperation(PrintInfo as Variant, AutoRotate as boolean = true, scalingMode as Integer = 0) as Variant

MBS PDFKit Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates print operation for PDF document.
**Example:**

```
// select a PDF
dim f as FolderItem = GetOpenFolderItem("")
if f = nil then Return

// open PDF
dim doc as new PDFDocumentMBS(f)

// define some print setting via PrintInfo
dim PrintInfo as new NSPrintInfoMBS

// start print operation
dim printOperation as NSPrintOperationMBS = doc.PrintOperation(printinfo)

printOperation.showsPrintPanel = true
printOperation.showsProgressPanel = true

call printOperation.runOperation
```

**Notes:** Returns NSPrintOperationMBS object.

### 135.28.43 removePageAtIndex(index as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Removes a page in the pdf on the given index.
**Notes:** Index is zero based.

### 135.28.44 selectionForEntireDocument as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns a selection representing text for the entire document.

### 135.28.45 selectionFromPage(StartPage as PDFPageMBS, StartCharacterIndex as Integer, EndPage as PDFPageMBS, EndCharacterIndex as Integer) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns a selection representing text from page startPage and point StartCharacterIndex to page endPage and to point EndCharacterIndex on that page.

**Notes:** Start and end page can be the same.
See also:

- 135.28.46 selectionFromPage(StartPage as PDFPageMBS, StartPointX as single, StartPointY as single, EndPage as PDFPageMBS, EndPointX as single, EndPointY as single) as PDFSelectionMBS 18644

### 135.28.46 selectionFromPage(StartPage as PDFPageMBS, StartPointX as single, StartPointY as single, EndPage as PDFPageMBS, EndPointX as single, EndPointY as single) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns a selection representing text from page startPage and point startPt to page endPage and to point endPt on that page.
**Notes:** Points are in page-space and relative to their respective pages. Start and end page can be the same (and are then equivalent to calling selectionFromPointToPoint).
See also:

- 135.28.45 selectionFromPage(StartPage as PDFPageMBS, StartCharacterIndex as Integer, EndPage as PDFPageMBS, EndCharacterIndex as Integer) as PDFSelectionMBS 18643

### 135.28.47 SetDelegate(d as PDFDocumentDelegateMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** If a PDFDocument has a delegate, delegate methods may be called for this document.

### 135.28.48 SetKeywords(keywords() as string)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Sets the array of strings containing document keywords.

### 135.28.49 unlockWithPassword(password as string) as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Unlocks an encrypted PDF with the given password.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
```

```
if doc.unlockWithPassword("mypassword") then
MsgBox "OK"
end if
```

**Notes:** Means of passing in a password to unlock encrypted PDF's. Calling unlockWithPassword will attempt to unlock the PDF. If successful, a DidUnlockDocument event is sent to the delegate. You cannot "re-lock" a PDF by passing in a bogus password. Returns true if the document is now unlocked, false otherwise (isLocked = false).

### 135.28.50 write(file as folderitem, QuartzFilter as Variant = nil) as boolean

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Methods to record the current state of the PDFDocument as a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

// modify here

dim o as FolderItem = SpecialFolder.Desktop.Child("testout.pdf")
call doc.write(o)
```

**Notes:** Returns true on success and false on failure.

There is a bug known in Mac OS X 10.4 that this function may return true even if the saving failed. So you may prefer to check the file whether it exists after write.

Optional for Mac OS X 10.6, you can pass a QuartzFilterMBS object to use that filter here.

Looks like newer macOS versions like 10.14 or later ignore the quartz filter.

### 135.28.51 writeWithOptions(file as folderitem, options as dictionary) as boolean

MBS PDFKit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Writes PDF to file with options.
**Notes:** Returns true on success and false on failure.

Some keys to use include:
CGPDFContextMBS.kCGPDFContextUserPassword
CGPDFContextMBS.kCGPDFContextTitle
CGPDFContextMBS.kCGPDFContextSubject
CGPDFContextMBS.kCGPDFContextOwnerPassword
CGPDFContextMBS.kCGPDFContextOutputIntents
CGPDFContextMBS.kCGPDFContextOutputIntent
CGPDFContextMBS.kCGPDFContextKeywords
CGPDFContextMBS.kCGPDFContextEncryptionKeyLength
CGPDFContextMBS.kCGPDFContextCreator
CGPDFContextMBS.kCGPDFContextAuthor
CGPDFContextMBS.kCGPDFContextAllowsPrinting
CGPDFContextMBS.kCGPDFContextAllowsCopying

### 135.28.52 Properties

### 135.28.53 allowsCommenting as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether you can create or modify document annotations, including form field entries.
**Notes:** Available in macOS 10.13 or newer.
(Read only property)

### 135.28.54 allowsContentAccessibility as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether you can extract content from the document, but only for the purpose of accessibility.
**Notes:** Available in macOS 10.13 or newer.
(Read only property)

### 135.28.55 allowsCopying as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Whether copying is allowed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
```

MsgBox str(doc.allowsCopying)

**Notes:** Even unlocked, encrypted PDF's may have certain restrictions regarding copying or printing placed upon them.
(Read only property)

### 135.28.56 allowsDocumentAssembly as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether you can manage a document by inserting, deleting, and rotating pages.
**Notes:** Available in macOS 10.13 or newer.
(Read only property)

### 135.28.57 allowsDocumentChanges as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether you can modify the document contents except for document attributes.
**Notes:** Available in macOS 10.13 or newer.
(Read only property)

### 135.28.58 allowsFormFieldEntry as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether you can modify form field entries even if you can't edit document annotations.
**Notes:** Available in macOS 10.13 or newer.
(Read only property)

### 135.28.59 allowsPrinting as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Whether printing is allowed.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox str(doc.allowsPrinting)
```

**Notes:** Even unlocked, encrypted PDF's may have certain restrictions regarding copying or printing placed upon them.
(Read only property)

### 135.28.60 Author as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String containing document author.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.Author
```

**Notes:** (Read and Write property)

### 135.28.61 CreationDate as Date

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Date representing document creation date.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.CreationDate.LongDate
```

**Notes:** (Read and Write property)

### 135.28.62 CreationDateTime as DateTime

MBS PDFKit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Date representing document creation date.

**Notes:** (Read and Write property)

### 135.28.63 Creator as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String containing name of app that created document content.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.Creator
```

**Notes:** (Read and Write property)

### 135.28.64 documentRef as Integer

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a CGPDFDocumentRef value for this document.
**Notes:** This is the CGPDFDocument associated with the PDFDocument object. With this object you can call many CoreGraphics API. May return 0 if the document was not created from an existing PDF file or data.

Use CGPDFDocumentMBS with Constructor taking a handle to call functions on this CGPDFDocument object.
(Read only property)

### 135.28.65 documentURL as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The document location.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.documentURL
```

**Notes:** May return nil if the document was created from data.
(Read only property)

### 135.28.66 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Function:** The internal reference to the PDF Document.
**Notes:** (Read and Write property)

### 135.28.67 isEncrypted as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Whether the PDF is encrypted.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox str(doc.isEncrypted)
```

**Notes:** With the right password, a PDF can be unlocked - nontheless, the PDF still indicates that it is encrypted - just no longer locked. Some PDF's may be encrypted but can be unlocked with the empty string. These are unlocked automatically.
(Read only property)

### 135.28.68 isFinding as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns true if document is currently searching for a string.
**Notes:** (Read only property)

### 135.28.69 isLocked as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Whether the PDF is locked.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
```

```
MsgBox str(doc.isLocked)
```

**Notes:** With the right password, a PDF can be unlocked - nontheless, the PDF still indicates that it is encrypted - just no longer locked. Some PDF's may be encrypted but can be unlocked with the empty string. These are unlocked automatically.
(Read only property)

### 135.28.70 majorVersion as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** PDF version of the PDF file (example: major version = 1, minor = 4; PDF v1.4).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox str(doc.majorVersion)+"."+str(Doc.minorVersion)
```

**Notes:** (Read only property)

### 135.28.71 minorVersion as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** PDF version of the PDF file (example: major version = 1, minor = 4; PDF v1.4).
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox str(doc.majorVersion)+"."+str(Doc.minorVersion)
```

**Notes:** (Read only property)

### 135.28.72 ModificationDate as Date

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Date representing last document modification date.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.ModificationDate.LongDate
```

**Notes:** (Read and Write property)

### 135.28.73 ModificationDateTime as DateTime

MBS PDFKit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Date representing last document modification date.
**Notes:** (Read and Write property)

### 135.28.74 outlineRoot as PDFOutlineMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns the root outline object for the PDF (or nil if none).
**Notes:** (Read and Write property)

### 135.28.75 pageCount as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The number of pages in the document.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox str(Doc.pageCount)
```

**Notes:** (Read only property)

### 135.28.76 permissionsStatus as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the permissions status of the PDF document.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)

Select case doc.permissionsStatus
case doc.kPDFDocumentPermissionsNone
MsgBox "None"
case doc.kPDFDocumentPermissionsOwner
MsgBox "Owner or no password"
case doc.kPDFDocumentPermissionsUser
MsgBox "User"
end Select
```

**Notes:** You have kPDFDocumentPermissionsNone status for an encrypted document that you have not supplied either a valid user or owner password. For a document with no encryption, you automatically have kPDFDocumentPermissionsOwner status.

Requires Mac OS X 10.6.
(Read only property)

### 135.28.77 Producer as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String containing name of app that produced PDF data.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.Producer
```

**Notes:** (Read and Write property)

### 135.28.78 stringValue as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The text of the document.
**Example:**

```
dim p as PDFDocumentMBS
dim f as FolderItem
```

```
f=SpecialFolder.Desktop.Child("test.pdf")
p=new PDFDocumentMBS(f)

MsgBox "Text from PDF Document:"+EndOfLine+EndOfLine+p.stringValue
```

**Notes:** Convenience method. Returns a string representing the entire document (each page's string concatenated with line feeds between pages).

If you need to extract the text of a PDF document cross platform or with more options, you may want to look on the DynaPDF plugin.

It seems like this string value is not always available. It works for PDF Documents created from a disc file, but not for files our test app created on runtime in memory by using PDFDocument constructor and insertpage.
(Read only property)

### 135.28.79 Subject as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String containing document subject.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.Subject
```

**Notes:** (Read and Write property)

### 135.28.80 Title as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String containing document title.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
MsgBox doc.Title
```

**Notes:** (Read and Write property)

### 135.28.81 documentAttributes as Dictionary

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The PDF meta data as a Xojo Dictionary object.
**Notes:** Returns a dictionary with PDF metadata. Metadata is optional for PDF's and so some of the keys may be missing or the entire dictionary may be empty.
(Read and Write computed property)

### 135.28.82 Constants

Document Permissions

| Constant | Value | Description |
|---|---|---|
| kPDFDocumentPermissionsNone | 0 | Document permissions status. For encrypted PDF's, supplying the owner pas word will enable owner permission status. |
| kPDFDocumentPermissionsOwner | 2 | |
| kPDFDocumentPermissionsUser | 1 | |

Page Scaling Modes

| Constant | Value | Description |
|---|---|---|
| kPDFPrintPageScaleDownToFit | 2 | |
| kPDFPrintPageScaleNone | 0 | |
| kPDFPrintPageScaleToFit | 1 | |

Search Flags

| Constant | Value | Description |
|---|---|---|
| NSBackwardsSearch | 4 | Performs searching from the end of the range toward the beginning. |
| NSCaseInsensitiveSearch | 1 | Ignores case distinctions among characters. |
| NSLiteralSearch | 2 | Performs a byte-for-byte comparison. Differing literal sequences (such as composed character sequences) that would otherwise be considered equivalent are considered not to match. Using this option can speed some operations dramatically. |

# 135.29 class PDFOutlineMBS

## 135.29.1 class PDFOutlineMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The class for a pdf outine object.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3

## 135.29.2 Methods

## 135.29.3 childAtIndex(index as Integer) as PDFOutlineMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** PDFOutline child at index.
**Notes:** Will throw exception if index is out of range.

## 135.29.4 Constructor

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Initializes a PDFOutline object.
**Notes:** If you want the PDFOutline object returned by this method to be the outline root, you must add additional PDFOutline objects to create the outline hierarchy you desire. Then, you must add the root outline object to your PDF document by assigning it to the PDFDocument OutlineRoot.

If you want the PDFOutline object returned by this method to be a child of an existing outline, you must use setLabel: to give it a label and give it either a destination or action using setDestination: or setAction:, respectively. In addition, you must add this outline object to the existing PDFOutline object as a new child, using insertChild.

Available in Mac OS X v10.4 and later.
See also:

- 135.29.5 Constructor(Handle as Integer)

### 135.29.5 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFOutline handle.
**Notes:** Please pass in a non zero handle which points to a PDFOutline object.
For use with declares.
See also:

- 135.29.4 Constructor 18656

### 135.29.6 insertChild(child as PDFOutlineMBS, index as Integer)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Inserts the specified outline object at the specified index.
**Notes:** To build a PDF outline hierarchy, use this method to add child outline objects. Before you call this method on a PDFOutline object that already has a parent, you should retain the object and call removeFromParent on it first.

Available in Mac OS X v10.5 and later.

### 135.29.7 removeFromParent

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Removes the outline object from its parent (does nothing if outline object is the root outline object).
**Notes:** Available in Mac OS X v10.5 and later.

### 135.29.8 Properties

### 135.29.9 action as PDFActionMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The action performed when users click the outline.
**Notes:** The root outline serves only as a container for the outlines it owns; it does not have an action. Note that a PDFOutline object can have either an action or a destination, not both.

If the PDFOutline object has a destination, instead of an action, action returns a PDFActionGoTo object (this is equivalent to calling destination on the PDFOutline object). For other action types, action returns

the appropriate PDF Kit action type object, such as PDFActionURL.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.29.10 destination as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The destination asscoiated with the outline item.
**Notes:** The root PDFOutline has no destination.
(Read and Write property)

### 135.29.11 document as PDFDocumentMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The PDFDocument the outline is asscoiated with.
**Notes:** (Read only property)

### 135.29.12 index as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the index of the outline.
**Notes:** The index of the outline object is relative to its siblings and from the perspective of the parent of the outline object. The root outline object, and any outline object without a parent, has an index value of 0.

Available in Mac OS X v10.5 and later.
(Read only property)

### 135.29.13 isOpen as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Whether the outline object is initially disclosed.
**Notes:** Calling isOpen on an outline object that has no children always returns false. Calling isOpen on the root outline object always returns true.

Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.29.14 label as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The label for the outline.
**Notes:** The root PDFOutline has no label and is only a container for children PDFOutlines.
(Read and Write property)

### 135.29.15 numberOfChildren as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Number of PDFOutline children this PDFOutline has.
**Notes:** (Read only property)

### 135.29.16 parent as PDFOutlineMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The parent outline object of the outline.
**Notes:** Can be nil for the root object.
Available in Mac OS X v10.5 and later.
(Read only property)

## 135.30 class PDFPageMBS

### 135.30.1 class PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The PDFKit class for a page in a pdf document.
**Example:**

```
dim file1,file2,file3,destfile as FolderItem
dim page1,page2,page3 as PDFPageMBS
dim doc1,doc2 as PDFDocumentMBS
dim img as NSImageMBS
dim doc as PDFDocumentMBS

file1=SpecialFolder.Desktop.Child("test1.pdf")
file2=SpecialFolder.Desktop.Child("test2.pdf")
file3=SpecialFolder.Desktop.Child("logo.jpg")

doc1=new PDFDocumentMBS(file1)
doc2=new PDFDocumentMBS(file2)

MsgBox str(doc1.pageCount)

img=new NSImageMBS(file3)

Backdrop=img.CopyPicture

page1=new PDFPageMBS(img)
page2=doc1.pageAtIndex(0)
page3=doc2.pageAtIndex(0)

doc=new PDFDocumentMBS
doc.insertPage page1,0
doc.insertPage page2,1
doc.insertPage page3,2

destfile=SpecialFolder.Desktop.Child("test.pdf")
call doc.write(destfile)
```

**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- Several ways for picture to PDF in MBS Plugins

- News from the MBS Xojo Plugins Version 21.1
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3
- JPEG rendering in MacOS Mojave
- MBS Plugins 11.1 Release notes
- Have you checked out PDFViewMBS class?
- MBS REALbasic plug-ins version 10.3
- MBS Plugins 10.3 Release Notes

**Xojo Developer Magazine**

- 6.4, page 34: Creating PDF Files, How to create PDFs using the MBS Plugins by Christian Schmitz
- 20.3, page 80: Great Shots With Continuity Camera, Use your iOS device to take a picture for your Mac by Stefanie Juchmes

### 135.30.2 Methods

### 135.30.3 addAnnotation(annotation as PDFAnnotationMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Methods allowing annotations to be added.

### 135.30.4 annotationAtPoint(x as single, y as single) as PDFAnnotationMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Hit-testing method returns the annotation at point (or nil if none).
**Notes:** The point is in page-space.

### 135.30.5 annotations as PDFAnnotationMBS()

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns an array containing the page's annotations.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim doc as new PDFDocumentMBS(f)
```

```
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim annotations(-1) as PDFAnnotationMBS = page.annotations

// show a msgbox with the types of all annotations
dim types(-1) as string

for each a as PDFAnnotationMBS in annotations
types.Append a.type
next

MsgBox Join(types)
```

**Notes:** The elements of the array will most likely be typed to subclasses of the PDFAnnotation class.

Available in Mac OS X v10.4 and later.

### 135.30.6 CalcTransformForBox(box as Integer) as Variant

MBS PDFKit Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** An utility function to calculate the transform needed to draw into a page.
**Notes:** Returns NSAffineTransformMBS object.

### 135.30.7 characterBoundsAtIndex(index as Integer) as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns the bounds in page-space of the character at index.
**Notes:** In the unlikely event that more than one character are at the specified point, only the first character encountered is returned.

### 135.30.8 characterIndexAtPoint(x as single, y as single) as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns the index of the character at point (in page space).
**Notes:** Returns -1 if no character at point.

### 135.30.9 Constructor

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor to create a custom PDF page.
**Example:**

```
dim doc as new PDFDocumentMBS
dim page as PDFPageMBS
dim f as FolderItem

page=new MyPDFPageMBS

doc.Creator="Xojo"
doc.Title="Test file"

doc.insertPage page,0

f=SpecialFolder.Desktop.Child("test.pdf")

if doc.write(f) then
f.launch
end if
```

**Notes:** You draw the content using drawRect event.
See also:


- 135.30.10 Constructor(Handle as Integer) 18663
- 135.30.11 Constructor(image as NSImageMBS) 18664


### 135.30.10 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFPage handle.
**Notes:** Please pass in a non zero handle which points to a PDFPage object.
For use with declares.
See also:


- 135.30.9 Constructor 18663
- 135.30.11 Constructor(image as NSImageMBS) 18664

### 135.30.11 Constructor(image as NSImageMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Creates a PDFPage for the NSImage passed in.
**Notes:** An easy way to create a PDFPage from an image to add to a PDFDocument.

Mac OS X 10.5 only.
See also:


- 135.30.9 Constructor 18663
- 135.30.10 Constructor(Handle as Integer) 18663


### 135.30.12 copy as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the page object.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim p as new PDFDocumentMBS(f)

// make a new PDF
dim c as new PDFDocumentMBS

// get first page
dim page as PDFPageMBS = p.pageAtIndex(0)

// add copy of page to new pdf
c.insertPage page.copy, 0

// c now has one page
MsgBox str(p.pageCount)+" "+str(c.pageCount)
```

### 135.30.13 Destructor

MBS PDFKit Plugin, Plugin Version: 15.0, Platform: macOS, Targets: All.

**Function:** The destructor.

### 135.30.14 Draw(g as NSGraphicsMBS, box as Integer = 0)

MBS PDFKit Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draws PDF page into graphics environment.
**Notes:** Use kPDFDisplay*Box constants for box parameter.

### 135.30.15 drawWithBox(box as Integer)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Draws the page within the specified box.
**Notes:** This method takes into account the page rotation and draws clipped to the specified box. If the page is set to display annotations, this method also draws them. This method does not clear the background. To clear the background before drawing, use NSRectFill with NSColor set (typically) to white.

### 135.30.16 removeAnnotation(annotation as PDFAnnotationMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Methods allowing annotations to be removed.

### 135.30.17 Render(dpi as Double = 72.0, box as Integer = 0, background as NSColorMBS = nil) as NSImageMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Renders a PDF Page into an image.
**Example:**

```
dim f as FolderItem = GetFolderItem("Castles.pdf")
dim doc as new PDFDocumentMBS(f)
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim image as NSImageMBS = page.Render

Backdrop = image.CopyPicture
```

**Notes:** dpi: The resolution you want to have on the image. Default 72.0. To get a scaled image with factor x, pass 72.0*x.
box: The display box. Use one of the kPDFDisplayBox* constants.
background: optional NSColorMBS object to fill the background before drawing the PDF. This will affect

only PDFs with transparent background.

Returns nil on any error.

Version 11.1pr8 adds code here to handle rotation better.
Due to bugs in Apple,Äôs PDFKit you may see memory leaks with JPEG data from PDF pages (seen in macOS 10.12).

### 135.30.18 selectionForLineAtPoint(left as single, top as single) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a point in page-space, returns a selection representing a whole line at that point.
**Notes:** May return nil if no character (and by extension no line) under point.

### 135.30.19 selectionForRange(position as Integer, length as Integer) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a range, returns a selection representing text within that range.
**Example:**

```
dim MyPDFView as PDFViewMBS // your view

dim doc as PDFDocumentMBS = MyPDFView.document
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim sel as PDFSelectionMBS = page.selectionForRange(0,5)
MyPDFView.currentSelection = sel
```

**Notes:** Will raise an exception if the range length is zero or if the range is outside the range of the characters on the page.

### 135.30.20 selectionForRect(left as single, top as single, width as single, height as single) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a rect in page-space, returns a selection representing enclosed text on page.

### 135.30.21 selectionForWordAtPoint(left as single, top as single) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Given a point in page-space, returns a selection representing a whole word at that point.
**Notes:** May return nil if no character (and by extension no word) under point.

### 135.30.22 selectionFromPointToPoint(startleft as single, starttop as single, endleft as single, endtop as single) as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns a selection representing text between startPt and endPt.
**Notes:** Point are sorted first top to bottom, left to right.

### 135.30.23 thumbnailOfSize(size as NSSizeMBS, box as integer) as NSImageMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Convenience function that returns an image of this page, with annotations, that fits the given size.
**Notes:** Note that the produced image is "size to fit": it retains the original page aspect-ratio. The size you give may not match the size of the returned image, but the returned image is guaranteed to be equal or less.

Available in macOS 10.13 or newer.

### 135.30.24 transformContextForBox(box as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Given a display box, will transform the current context to take into account the rotation of the page as well as the origin of the box with repect to the page's base coordinates system.
**Notes:** This is a convenient method to call from within drawPage or from within the draw method a PDFAnnotation subclass.

Mac OS X 10.5 only.

### 135.30.25 transformForBox(box as integer) as variant

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** This transform correctly rotates and offsets based on the given page's rotation property and the display box type.
**Notes:** Available in macOS 10.13 or newer.

### 135.30.26 Properties

### 135.30.27 attributedString as NSAttributedStringMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String (with linefeeds and in some cases spaces inserted) representing the text on the page.
**Notes:** (Read only property)

### 135.30.28 CGPDFPageHandle as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The CoreGraphics PDFPage handle.
**Notes:** (Read only property)

### 135.30.29 dataRepresentation as memoryblock

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Returns PDF data (a proper PDF document) consisting of a single page (this page).
**Notes:** Note, external page links are not preserved.
(Read only property)

### 135.30.30 displaysAnnotations as boolean

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Method to turn on or off the display of annotations when the page is drawn.
**Notes:** (Read and Write property)

### 135.30.31 document as PDFDocumentMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The PDFDocument the page is associated with.
**Notes:** (Read only property)

### 135.30.32 label as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The page label. Usually "1" for the first page, "2" for the second, etc.
**Notes:** (Read only property)

### 135.30.33 numberOfCharacters as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Number of characters on the page (including linefeeds and spaces inserted).
**Notes:** (Read only property)

### 135.30.34 rotation as Integer

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Rotation on a page.
**Notes:** Must be 0, 90, 180 or 270 (negative rotations will be "normalized" to one of 0, 90, 180 or 270). Some PDF's have an inherent rotation and so rotation may be non-zero when a PDF is first opened. (Read and Write property)

### 135.30.35 stringValue as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String (with linefeeds and in some cases spaces inserted) representing the text on the page.
**Example:**

```
dim p as PDFDocumentMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.pdf")
p=new PDFDocumentMBS(f)
```

```
MsgBox "Text from first page:"+EndOfLine+EndOfLine+p.pageAtIndex(0).stringValue
```

**Notes:** If you need to extract the text of a PDF document page cross platform or with more options, you may want to look on the DynaPDF plugin.

It seems like this string value is not always available. It works for PDF Documents created from a disc file, but not for files our test app created on runtime in memory by using PDFDocument constructor and insertpage.
(Read only property)

### 135.30.36 boundsForBox(box as Integer) as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the bounds for the specified PDF display box.
**Notes:** The PDFDisplayBox enumeration defines the various box types.

Note that only the media box is required for a PDF. If you request the bounds for the crop box, but the PDF does not include a crop box, the bounds for the media box are returned instead. If you request the bounds for other box types, and the PDF does not includes these types, the bounds for the crop box are returned instead.

The coordinates for the box are in page space, so you might need to transform the points if the page has a rotation on it. Also, note that the bounds boundsForBox returns are intersected with the page's media box.

boundsForBox throws a range exception if box is not in range.
(Read and Write computed property)

### 135.30.37 Events

### 135.30.38 drawRect(box as Integer, g as NSGraphicsMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** The event called when the PDFPage needs to be drawn.
**Example:**

```
Sub drawRect(box as Integer, g as NSGraphicsMBS)

if g.Valid then
System.DebugLog "is valid"
```

```
else
System.DebugLog "not valid"
end if

g.SetColorRGB 0,1,0

g.drawRect 200,200,200,200

g.SetColorRGB 1,0,0

g.fillRect 100,100,100,100
End Sub
```

**Notes:** Do not store the graphics reference as it is only valid in this event.
Use the kPDFDisplayBox* constants for the box value.
You can draw another PDF page here with Draw command.

To avoid drawRect causing StackOverflowException when showing in a control, please have PDF produced as file or MemoryBlock, then read it back to a new PDFDocumentMBS object and show that in a control.

### 135.30.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPDFDisplayBoxArtBox | 4 | One of the constants to use for page boxes. |

Boxes

| Constant | Value | Description |
|---|---|---|
| kPDFDisplayBoxBleedBox | 2 | |
| kPDFDisplayBoxCropBox | 1 | |
| kPDFDisplayBoxMediaBox | 0 | |
| kPDFDisplayBoxTrimBox | 3 | |

## 135.31 class PDFSelectionMBS

### 135.31.1 class PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The PDFKit class for selections.
**Example:**

```
dim MyPDFView as PDFViewMBS // your view

dim doc as PDFDocumentMBS = MyPDFView.document
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim sel as PDFSelectionMBS = page.selectionForRange(0,5)
MyPDFView.currentSelection = sel
```

**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr3

### 135.31.2 Methods

### 135.31.3 addSelection(selection as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Add a selection to this selection.
**Notes:** Selections do not have to be contiguous. If the selection added overlaps with this selection, overlaps are removed.

### 135.31.4 addSelections(selection() as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Adds the specified array of selections to the receiving selection.
**Notes:** This method provides better performance than multiple calls to addSelection if you need to add several selections to an existing selection. This is because the normalization of the selection (the removal of any overlaps between selections) occurs only once, after all selections have been added.
Available in Mac OS X v10.5 and later.

### 135.31.5 boundsForPage(page as PDFPageMBS) as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the bounds of the selection on the specified page.
**Notes:** The selection rectangle is given in page space.
Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.

### 135.31.6 Constructor(doc as PDFDocumentMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Creates an empty PDFSelection object.
**Notes:** Typically, you don't need to create a PDFSelection object, but you can use an empty PDFSelection object as a container into which you can place selections, using addSelection: and addSelections.
Available in Mac OS X v10.5 and later.
See also:

- 135.31.7 Constructor(Handle as Integer) 18673

### 135.31.7 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: All.

**Function:** Creates a new object based on a given PDFSelection handle.
**Notes:** Please pass in a non zero handle which points to a PDFSelection object.
For use with declares.
See also:

- 135.31.6 Constructor(doc as PDFDocumentMBS) 18673

### 135.31.8 copy as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 13.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the selection object.

### 135.31.9 drawForPage(page as PDFPageMBS, active as boolean)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Calls drawForPage with a default value for box parameter.
**Notes:** The default value is kPDFDisplayBoxCropBox. If active is true, drawing uses selectedTextBack-

groundColor. If false, it uses secondarySelectedControlColor.
See also:

- 135.31.10 drawForPage(page as PDFPageMBS, box as Integer, active as boolean) 18674

### 135.31.10 drawForPage(page as PDFPageMBS, box as Integer, active as boolean)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Draws the selection relative to the origin of the specified box in page space.
**Notes:** The selection is drawn using the current highlight color. If active is true, drawing uses selectedTextBackgroundColor. If false, it uses secondarySelectedControlColor. Refer to the PDFPage class for the list of available box types.

Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.
See also:

- 135.31.9 drawForPage(page as PDFPageMBS, active as boolean) 18673

### 135.31.11 extendSelectionAtEnd(chars as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Extends the selection at either end.
**Example:**

```
dim s as PDFSelectionMBS // your selection

s.extendSelectionAtEnd(50)
```

**Notes:** Selections can be extended right off onto neighboring pages even to include the entire PDF document.

### 135.31.12 extendSelectionAtStart(chars as Integer)

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Extends the selection at either end.
**Example:**

```
dim s as PDFSelectionMBS // your selection

s.extendSelectionAtStart(50)
```

**Notes:** Selections can be extended right off onto neighboring pages even to include the entire PDF document.

### 135.31.13 extendSelectionForLineBoundaries

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: All.

**Function:** Extend to the selection to the beginning and end of the currently selected lines of text.
**Notes:** If the current selection is on a single line, then this will extend it to the entire line width. If the selection is across multiple lines, then the first and last lines are expected to wholly contain their respective rows of text.

Available in macOS 10.13 or newer or iOS 11.0 or newer.

### 135.31.14 numberOfTextRangesOnPage(page as PDFPageMBS) as UInt32

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the number of contiguous ranges of text on the specified page.
**Notes:** Returns zero if page is not in selection.
A typical, simple selection will contain a single range of text.

Available in Mac OS X 10.7 and later.

### 135.31.15 pages as PDFPageMBS()

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** Array of pages covered by the selection.
**Notes:** These are sorted by page index.
Returns nil on any error.

### 135.31.16 rangeAtIndex(page as PDFPageMBS, index as Integer) as NSRangeMBS

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns a range of contiguous text at index on the specified page.
**Notes:** A simple selection. A typical, simple selection will contain a single range of text.
Available in Mac OS X 10.7 and later.

### 135.31.17 selectionsByLine as PDFSelectionMBS()

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns an array of selections, one for each line of text covered by the receiver.
**Notes:** If you call this method on a PDFSelection object that represents a paragraph, for example, selectionsByLine returns an array that contains one PDFSelection object for each line of text in the paragraph. Available in Mac OS X v10.5 and later.

### 135.31.18 Properties

### 135.31.19 attributedString as NSAttributedStringMBS

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String representing the text covered by the selection.
**Notes:** May contain line-feeds.
(Read only property)

### 135.31.20 colorValue as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** The color used to draw the selection.
**Notes:** Note that when no color has been specified for the PDFSelection objects in a document, the selections are drawn using NSColorMBS.selectedTextBackgroundColor for the active state and NSColorMBS.secondarySelectedControlColor for the inactive state.
(Read and Write property)

### 135.31.21 Handle as Integer

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** The handle used internally for the object reference.
**Notes:** (Read and Write property)

### 135.31.22 stringValue as string

MBS PDFKit Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** String representing the text covered by the selection.

**Notes:** May contain line-feeds.
(Read only property)

## 135.32 control PDFThumbnailViewControlMBS

### 135.32.1 control PDFThumbnailViewControlMBS

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a PDFThumbnailView.
**Notes:** This control embeds a special PDFThumbnailView subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.

See PDFThumbnailViewIOSControlMBS for iOS projects.
**Blog Entries**

- PDF Viewer controls for iOS
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 13.4pr7

### 135.32.2 Properties

### 135.32.3 View as PDFThumbnailViewMBS

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.32.4 Events

### 135.32.5 BoundsChanged

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 135.32.6 Close

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 135.32.7 Closing

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 135.32.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS PDFKit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 135.32.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 135.32.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 135.32.11 EnableMenuItems

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 135.32.12 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.32.13 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.32.14 FrameChanged

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 135.32.15 GotFocus

MBS PDFKit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.

**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.32.16 LostFocus

MBS PDFKit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.32.17 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 135.32.18 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 135.32.19 MouseDrag(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 135.32.20 MouseUp(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 135.32.21 Open

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 135.32.22 Opening

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 135.32.23 ScaleFactorChanged(NewFactor as Double)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 135.32.24 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 135.33 control PDFThumbnailViewIOSControlMBS

### 135.33.1 control PDFThumbnailViewIOSControlMBS

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The Xojo control for a PDFThumbnailView.
**Notes:** This control embeds a special PDFThumbnailView subclass.
Please use view property to access the underlaying object and set properties.

See PDFThumbnailViewControlMBS for desktop projects.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- PDF Viewer controls for iOS
- MBS Xojo Plugins, version 23.3pr4

**Xojo Developer Magazine**

- 21.5, page 10: News

### 135.33.2 Properties

### 135.33.3 View as PDFThumbnailViewMBS

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.33.4 Events

### 135.33.5 Close

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control is about to close.

### 135.33.6 GotFocus

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 135.33.7 LostFocus

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 135.33.8 Open

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

## 135.34 class PDFThumbnailViewMBS

### 135.34.1 class PDFThumbnailViewMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** A PDFThumbnailView object contains a set of thumbnails, each of which represents a page in a PDF document.
**Notes:** You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- PDF Viewer controls for iOS
- MBS Xojo Plugins, version 21.1pr1

### 135.34.2 Methods

### 135.34.3 Constructor

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new PDF thumbnail view with size 100/100 and position 0/0
**Example:**

```
dim t as new PDFThumbnailViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 135.34.4 Constructor(Handle as Integer) 18686
- 135.34.5 Constructor(left as Double, top as Double, width as Double, height as Double) 18687


### 135.34.4 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given PDFThumbnailView handle.
**Example:**

```
dim t as new PDFThumbnailViewMBS(0, 0, 100, 100)
dim v as new PDFThumbnailViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a PDFThumbnailView and the plugin retains this handle.
See also:


- 135.34.3 Constructor 18686
- 135.34.5 Constructor(left as Double, top as Double, width as Double, height as Double) 18687


### 135.34.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new PDF thumbnail view with the given size and position.
**Example:**

```
dim x as new PDFThumbnailViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 135.34.3 Constructor 18686
- 135.34.4 Constructor(Handle as Integer) 18686


### 135.34.6 PDFThumbnailViewDocumentEditedNotification as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Notification when PDFDocument is modified.
**Notes:** Use NSNotificationObserverMBS class to listen for this one.

### 135.34.7 selectedPages as PDFPageMBS()

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of PDF pages that correspond to the selected thumbnails in the thumbnail view.
**Notes:** If the thumbnail view allows multiple selections (if allowsMultipleSelection returns true), you can use this method to get the PDF pages that correspond to the selected thumbnails.
Available in Mac OS X v10.5 and later.

### 135.34.8 Properties

### 135.34.9 allowsDragging as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether users can drag thumbnails within the thumbnail view; that is, re-order pages in the document.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.10 allowsMultipleSelection as boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the thumbnail view allows users to select more than one thumbnail at a time.
**Notes:** By default, PDFThumbnailView allows only a single thumbnail to be selected at one time. When this is the case, you can get the PDF page that corresponds to the selected thumbnail using the PDFView method currentPage.

If you use setAllowsMultipleSelection to enable multiple selections, however, you must use selectedPages to get the pages that correspond to the set of selected thumbnails.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.11 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color used in the background of the thumbnail view.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.12 Bezeled as Boolean

MBS PDFKit Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether to use bezel for control.
**Notes:** (Read and Write property)

### 135.34.13 labelFont as NSFontMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The font used to label the thumbnails.
**Notes:** Typically, the label of a thumbnail is the page number of the page it represents.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.14 maximumNumberOfColumns as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the maximum number of columns of thumbnails the thumbnail view can display.
**Notes:** The thumbnail displays as many columns of thumbnails as fit in its size.
Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.15 PDFView as PDFViewMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The PDFView object associated with the thumbnail view.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

### 135.34.16 thumbnailSize as NSSizeMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum width and height of the thumbnails in the thumbnail view.
**Notes:** Available in Mac OS X v10.5 and later.
(Read and Write property)

## 135.35 control PDFViewControlMBS

### 135.35.1 control PDFViewControlMBS

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a PDFView.
**Notes:** This control embeds a special PDFView subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.

Can be linked to a PDFThumbnailViewControlMBS control to show the thumbnails for the pages.

See PDFViewIOSControlMBS control for iOS projects.
See WinPreviewControlMBS control for Windows targets.
**Blog Entries**

- PDF Viewer controls for iOS
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo Plugins, version 21.3pr1
- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr3
- MBS Xojo Plugins, version 19.6pr1
- MBS Xojo Plugins, version 17.6pr5
- MBS Xojo Plugins, version 17.5pr2
- MBS Xojo / Real Studio Plugins, version 17.0pr1

### 135.35.2 Methods

### 135.35.3 ClearOverlay(page as PDFPageMBS, post as boolean = true)

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear overlay item for this page.
**Notes:** Is post = false, than we clear the item for pre page drawing, else for post page drawing.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.35.4 ClearOverlays

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Clear all overlays.
**Notes:** The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.

### 135.35.5 Properties

### 135.35.6 View as PDFViewMBS

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.35.7 Overlay(page as PDFPageMBS, post as boolean = true) as variant

MBS PDFKit Plugin, Plugin Version: 17.5, Platform: macOS, Targets: Desktop only.

**Function:** Get/Set overlay item.
**Notes:** MBS Plugin can draw a picture, NSImageMBS or PDFPageMBS below/over the PDF page.
The plugin does not trigger a redraw, so change takes effect on the next time the page is drawn.
(Read and Write computed property)

### 135.35.8 Events

### 135.35.9 AfterDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called after something was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.35.10 AfterDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called after a page annotations were drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.35.11 AfterDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double)

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called after a page was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.35.12 BeforeDrawPage(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called before a page was drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.35.13 BeforeDrawPagePost(graphics as NSGraphicsMBS, page as PDFPageMBS) as boolean

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called before a page annotations were drawn.
**Notes:** On macOS 10.12.2 or later, this event is called on a non-main thread. In that case the plugin will not call this event.

### 135.35.14 BeforeDrawRect(graphics as NSGraphicsMBS, x as Double, y as Double, w as Double, h as Double) as boolean

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:** The draw event called before a something was drawn.

### 135.35.15 BoundsChanged

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 135.35.16 Close

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 135.35.17 Closing

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 135.35.18 CocoaMouseDown(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** This is called before MouseDown, but provides the original Cocoa event, so you can query additional properties.

### 135.35.19 CocoaMouseDrag(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** This is called before MouseDrag, but provides the original Cocoa event, so you can query additional properties.

### 135.35.20 CocoaMouseUp(e as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** This is called before MouseUp, but provides the original Cocoa event, so you can query additional properties.

### 135.35.21 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS PDFKit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 135.35.22 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 135.35.23 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 135.35.24 EnableMenuItems

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 135.35.25 FocusLost

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.35.26 FocusReceived

Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.35.27 FrameChanged

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 135.35.28 GotFocus

MBS PDFKit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 135.35.29 LostFocus

MBS PDFKit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 135.35.30 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 135.35.31 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 135.35.32 MouseDrag(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.

As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 135.35.33 MouseUp(x as Integer, y as Integer)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 135.35.34 Open

MBS PDFKit Plugin, Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 135.35.35 Opening

Plugin Version: 13.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 135.35.36 OpenPDFforRemoteGoToAction(action as PDFActionRemoteGoToMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Opens a specified page.
**Notes:** This event will be called to handle clicks on annotations containing a PDFActionRemoteGoToMBS action. The action contains a URL and a page index and point. You should open the PDF indicated by the URL and go to the page and point indicated. The easiest way to do the latter is to create a PDFDestinationMBS with the page index and point once a PDFDocumentMBS from the URL is created - then you can call: goToDestination method. The default implementation simply beeps.

### 135.35.37 PerformFind

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Performs a find operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application perform a Find.
The event will be called when the user clicks on an annotation with such an action.

### 135.35.38 PerformGoToPage

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Performs a go-to operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application bring up a panel allowing the user to enter a specific page number. The event will be called when the user clicks on an annotation with such an action.

### 135.35.39 PerformPrint

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Prints the current document.
**Notes:** Certain PDFAction's may request that the PDF viewer application Print the current document. This event will be called when the user clicks on an annotation with such an action.

### 135.35.40 PrintJobTitle as String

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Overrides the job title used when the PDFView is printed.
**Notes:** Allows to override the job title when PDFView is printed. The default implementation uses the string, if any, associated with the "Title" key from the view's PDFDocumentMBS attribute dictionary. Failing that, it uses the last path component if the PDFDocumentMBS is URL-based.

### 135.35.41 ScaleFactorChanged(NewFactor as Double)

MBS PDFKit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 135.35.42 WillChangeScaleFactor(scale as Double) as Double

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Overrides changes to the scale factor.
**Notes:** Allows to override changes to the scale factor. The default implementation pins scaling between 0.1 and 10.0.

If you add this event, please return a value, e.g. the passed scale value.

### 135.35.43 WillClickOnLink(URL as String)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: .

**Function:** Handle clicks on URL links in a view.
**Notes:** If implemented, this event will be called to handle clicks on URL links within the PDFView.
The default implementation calls openURL on NSWorkspaceMBS class.

### 135.35.44 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS PDFKit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 135.36 control PDFViewIOSControlMBS

### 135.36.1 control PDFViewIOSControlMBS

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The Xojo control for a PDFView.
**Notes:** This control embeds a special PDFView subclass.
Please use view property to access the underlaying object and set properties.

Can be linked to a PDFThumbnailViewIOSControlMBS control to show the thumbnails for the pages.

See PDFViewControlMBS control for desktop projects.
See WinPreviewControlMBS control for Windows targets.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- PDF Viewer controls for iOS
- MBS Xojo Plugins, version 23.3pr4

**Xojo Developer Magazine**

- 21.5, page 10: News

### 135.36.2 Properties

### 135.36.3 View as PDFViewMBS

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 135.36.4 Events

### 135.36.5 Close

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control is about to close.

### 135.36.6 GotFocus

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 135.36.7 LostFocus

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 135.36.8 Open

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 135.36.9 OpenPDFforRemoteGoToAction(action as PDFActionRemoteGoToMBS)

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Opens a specified page.
**Notes:** This event will be called to handle clicks on annotations containing a PDFActionRemoteGoToMBS action. The action contains a URL and a page index and point. You should open the PDF indicated by the URL and go to the page and point indicated. The easiest way to do the latter is to create a PDFDestinationMBS with the page index and point once a PDFDocumentMBS from the URL is created - then you can call: goToDestination method. The default implementation simply beeps.

### 135.36.10 PerformFind

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Performs a find operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application perform a Find.
The event will be called when the user clicks on an annotation with such an action.

### 135.36.11 PerformGoToPage

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Performs a go-to operation.
**Notes:** Certain PDFAction's may request that the PDF viewer application bring up a panel allowing the user to enter a specific page number. The event will be called when the user clicks on an annotation with such an action.

### 135.36.12 WillClickOnLink(URL as String)

MBS PDFKit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Handle clicks on URL links in a view.
**Notes:** If implemented, this event will be called to handle clicks on URL links within the PDFView.
The default implementation calls openURL on NSWorkspaceMBS class.

# 135.37 class PDFViewMBS

## 135.37.1 class PDFViewMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** A PDFView object encapsulates the functionality of PDF Kit into a single widget that you can add to your application.
**Notes:** PDFView may be the only class you need to deal with for adding PDF functionality to your application. It lets you display PDF data and allows users to select content, navigate through a document, set zoom level, and copy textual content to the Pasteboard. PDFView also keeps track of page history.

You can subclass PDFView to create a custom PDF viewer or better use our CustomPDFViewMBS class.

You can also create a custom PDF viewer by using the PDF Kit utility classes directly and not using PDFView at all.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- PDF Viewer controls for iOS
- News from the MBS Xojo Plugins Version 21.1
- Have you checked out PDFViewMBS class?
- MBS REALbasic Plugins, version 10.6pr2
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr8
- MBS REALbasic Plugins, version 10.3pr4

## 135.37.2 Methods

## 135.37.3 annotationsChangedOnPage(page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Tells the PDF view that an annotation on the specified page has changed.
**Notes:** When the PDFView object receives this message, it rescans for tool tips and pop-ups and informs the PDFThumbailView objects so the thumbnail images can be redrawn.
Available in Mac OS X v10.5 and later.

### 135.37.4 areaOfInterestForMouse(e as NSEventMBS) as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Returns the type of area the mouse cursor is over.
**Notes:** The PDFAreaOfInterest enumeration defines the various area types. This method is for custom subclasses of the PDFView class. Use it if you override the NSResponder class's mouseMoved: method or related methods.

### 135.37.5 areaOfInterestForPoint(p as NSPointMBS) as integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns type of area (see defines above) mouse is over.

### 135.37.6 clearSelection

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Clears the selection.
**Notes:** The view redraws as necessary but does not scroll. This call is equivalent to setting CurrentSelection=nil.

### 135.37.7 Constructor

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new PDF view with size 100/100 and position 0/0
**Example:**

```
dim t as new PDFViewMBS
```

**Notes:** On success the handle property is not zero.
See also:


- 135.37.8 Constructor(Handle as Integer) 18704
- 135.37.9 Constructor(left as Double, top as Double, width as Double, height as Double) 18705


### 135.37.8 Constructor(Handle as Integer)

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given PDFView handle.
**Example:**

```
dim t as new PDFViewMBS(0, 0, 100, 100)
dim v as new PDFViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a NSButton and the plugin retains this handle.
See also:

- 135.37.7 Constructor 18704
- 135.37.9 Constructor(left as Double, top as Double, width as Double, height as Double) 18705

### 135.37.9 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new PDF view with the given size and position.
**Example:**

```
dim x as new PDFViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 135.37.7 Constructor 18704
- 135.37.8 Constructor(Handle as Integer) 18704

### 135.37.10 convertPointFromPage(point as NSPointMBS, page as PDFPageMBS) as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a point from page space to view space.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page. View space is a coordinate system with the origin at the lower-left corner of the current PDF view.

### 135.37.11 convertPointToPage(point as NSPointMBS, page as PDFPageMBS) as NSPointMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a point from view space to page space.
**Example:**

```
// convert point from mouse event to page coordinates
Function MouseDown(x as Integer, y as Integer, Modifiers as Integer) Handles MouseDown as Boolean
Dim a As NSApplicationMBS = NSApplicationMBS.sharedApplication
Dim n As NSEventMBS = a.currentEvent
Dim v As PDFViewMBS = Me.View
Dim w As NSWindowMBS = Self.NSWindowMBS
Dim p As NSPointMBS = n.locationInWindow

System.DebugLog "p: "+str(p.x)+"/"+str(p.y)

Dim doc As PDFDocumentMBS = v.document
Dim page As PDFPageMBS = doc.pageAtIndex(0)
Dim r As NSPointMBS = v.convertPointFromView(p, Nil)

System.DebugLog "r: "+Str(r.x)+"/"+Str(r.y)

Dim d As NSPointMBS = v.convertPointToPage(r, page)

System.DebugLog "d: "+Str(d.x)+"/"+Str(d.y)
End Function
```

**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page. View space is a coordinate system with the origin at the lower-left corner of the current PDF view.

### 135.37.12 convertRectFromPage(rect as NSRectMBS, page as PDFPageMBS) as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a rectangle from page space to view space.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page. View space is a coordinate system with the origin at the lower-left corner of the current PDF view.

### 135.37.13 convertRectToPage(rect as NSRectMBS, page as PDFPageMBS) as NSRectMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a rectangle from view space to page space.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page. View space is a coordinate system with the origin at the lower-left corner of the current PDF view.

### 135.37.14 copy

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Copies the text in the selection, if any, to the Pasteboard.

### 135.37.15 drawPage(page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** For use by subclasses of PDFView for custom rendering of pages.
**Notes:** Do not invoke this method, except by invoking it on super from a subclass.

The PDFView class calls drawPage: as necessary for each visible page that requires rendering. In the PDFView class, this method erases page to white, calls page.drawInRect(pageRect,self.displayBox), and then draws the selection, if any.

You can override this method to draw on top of a PDF page or to control how pages are drawn. In these cases, invoke this method on super and then perform custom drawing on top of the PDF page.

Changed in v22.5 to work on macOS Ventura.
But if the drawPage is called by macOS on the wrong thread, we ignore that to prevent StackOverflowException from Xojo runtime.

### 135.37.16 drawPagePost(page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** For use by subclasses of PDFView for post-page rendering.
**Notes:** The default implementation of this method draws the text highlighting (if any) for the page. This method does not apply scaling or rotating to the current context to map to page space; instead, the context is in view-space coordinates (in which the origin is at the lower-left corner of the current PDF view).

Available in Mac OS X v10.5 and later.

### 135.37.17 goBack

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates back one step in the page history.
**Notes:** The page history gets built as your application calls navigation methods such as goToDestination and goToLastPage.

### 135.37.18 goForward

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates forward one step in the page history.
**Notes:** The page history gets built as your application calls navigation methods such as goToDestination and goToLastPage.

### 135.37.19 goToDestination(page as PDFDestinationMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the specified destination.
**Notes:** Destinations include a page and a point on the page specified in page space.
Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.

### 135.37.20 goToFirstPage

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the first page of the document.
**Notes:** PDF Kit records the move in its page history.

### 135.37.21 goToLastPage

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the last page of the document.
**Notes:** PDF Kit records the move in its page history.

### 135.37.22 goToNextPage

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the next page of the document.
**Notes:** PDF Kit records the move in its page history.

### 135.37.23 goToPage(page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Scrolls to the specified page.
**Notes:** PDF Kit records the move in its page history.

### 135.37.24 goToPreviousPage

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the previous page of the document.
**Notes:** PDF Kit records the move in its page history.

### 135.37.25 goToRect(rect as NSRectMBS, page as PDFPageMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the specified rectangle on the specified page.
**Notes:** If the specified rectangle is already visible, this method does nothing. This allows you to scroll the PDFView object to a specific PDFAnnotation or PDFSelection object, because both of these objects have bounds methods that return an annotation or selection position in page space.

Note that rect is specified in page-space coordinates. Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.
Available in Mac OS X v10.5 and later.

### 135.37.26 goToSelection(page as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Scrolls to the first character of the specified selection.
**Notes:** PDF Kit records the move in its page history.

### 135.37.27 highlightedSelections as PDFSelectionMBS()

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries highlighted selections.
**Notes:** Unlike the user selection (above), these selections do not go away when the user clicks in the PDFView, etc. You must explicitly remove them by passing nil to setHighlightedSelections. These methods allow you to highlight text perhaps to indicate matches from a text search. To avoid confusion you should probably make sure the PDFSelectionMBS passed in are a different color from the user's default text selection color. Commonly used for highlighting search results.

### 135.37.28 layoutDocumentView

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Performs layout of the inner views.
**Notes:** The PDFView actually contains several subviews, such as the document view (where the PDF is actually drawn) and a "matte view" (which may appear as a gray area around the PDF content, depending on the scaling). Changes to the PDF content may require changes to these inner views, so you must call this method explicitly if you use PDF Kit utility classes to add or remove a page, rotate a page, or perform other operations affecting visible layout.

This method is called automatically from PDFView methods that affect the visible layout (such as setDocument, setDisplayBox or zoomIn).

### 135.37.29 pageForPoint(point as NSPointMBS, nearest as boolean) as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the page containing a point specified in view coordinates.
**Notes:** Returns nil if there's no page at the specified point and nearest is set to false.

### 135.37.30 PDFViewAnnotationHitNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the user clicks on an annotation.

Use the "PDFAnnotationHit" key to obtain userinfo of type PDFAnnotation.

### 135.37.31 PDFViewAnnotationWillHitNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted before the user clicks an annotation.
Available in Mac OS X v10.5 and later.

### 135.37.32 PDFViewChangedHistoryNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the page history changes.

### 135.37.33 PDFViewCopyPermissionNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the user attempts to copy to the pasteboard without the appropriate permissions.

### 135.37.34 PDFViewDisplayBoxChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the display box has changed.
Available in Mac OS X v10.5 and later.

### 135.37.35 PDFViewDisplayModeChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the display mode has changed.
Available in Mac OS X v10.5 and later.

### 135.37.36 PDFViewDocumentChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when a new document is associated with the view.

### 135.37.37 PDFViewPageChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when a new page becomes the current page.

### 135.37.38 PDFViewPrintPermissionNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the user attempts to print without the appropriate permissions.

### 135.37.39 PDFViewScaleChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the scale factor changes.

### 135.37.40 PDFViewSelectionChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the notification names used with the PDF view.
**Notes:** Posted when the current selection has changed.
Available in Mac OS X v10.5 and later.

### 135.37.41 PDFViewVisiblePagesChangedNotification as string

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Notification when the scroll view has scrolled into the bounds of a new page.

### 135.37.42 performAction(action as PDFActionMBS)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Performs the specified action.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.37.43 printWithInfo(printInfo as NSRectMBS, autoRotate as Boolean)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Print the PDF document.
**Notes:** If autoRotate is true, will ignore the orientation attribute in printInfo and rather choose the orientation on a page by page basis that best fits the page to the paper size.
See also:

- 135.37.44 printWithInfo(printInfo as NSRectMBS, autoRotate as Boolean, pageScaling as Integer) 18713

### 135.37.44 printWithInfo(printInfo as NSRectMBS, autoRotate as Boolean, pageScaling as Integer)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Like the above method but allows an additional parameter to describe page scaling (see PDFDocument.h for types).
**Notes:** If pageScaling is equal to kPDFPrintPageScaleToFit each page is scaled up or down in order to best fit the paper size. Specifying kPDFPrintPageScaleDownToFit for pageScaling will only scale large pages down to fit the paper, smaller pages will not be scaled up. Passing pageScaling equal to kPDFPrintPageScaleNone is the equivalent of calling printWithInfo above.
See also:

- 135.37.43 printWithInfo(printInfo as NSRectMBS, autoRotate as Boolean) 18713

### 135.37.45 rowSizeForPage(page as PDFPageMBS) as NSSizeMBS

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the size needed to display a row of the current document page.
**Notes:** The size is dependent on the current scale factor and display attributes.

### 135.37.46 scrollSelectionToVisible

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Scrolls the view until the selection is visible.

### 135.37.47 selectAll

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Selects all text in the document.

### 135.37.48 setCurrentSelection(selection as PDFSelectionMBS, animate as boolean)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the selection, in an animated way, if desired.
**Notes:** This method behaves as setCurrentSelection, but with the addition of animation, if animate is true. The animation serves to draw the user's attention to the new selection, which can be useful when implementing search.
Available in Mac OS X v10.5 and later.

### 135.37.49 setCursorForAreaOfInterest(area as Integer)

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the type of mouse cursor according to the type of area the mouse cursor is over.
**Notes:** This method is especially useful for custom subclasses of the PDFView class.

### 135.37.50 setHighlightedSelections(selections() as PDFSelectionMBS)

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets highlighted selections.
**Notes:** Unlike the user selection (above), these selections do not go away when the user clicks in the PDFView, etc. You must explicitly remove them by passing nil to setHighlightedSelections. These methods allow you to highlight text perhaps to indicate matches from a text search. To avoid confusion you should probably make sure the PDFSelectionMBS passed in are a different color from the user's default text selection color. Commonly used for highlighting search results.

### 135.37.51 visiblePages as PDFPageMBS()

MBS PDFKit Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of PDFPageMBS objects that represent the currently visible pages.
**Notes:** Available in Mac OS X v10.5 and later.

### 135.37.52 zoomIn

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Zooms in by increasing the scaling factor.
**Notes:** Each invocation of zoomIn muliplies the scaling factor by the square root of 2.
Available in Mac OS X v10.4 and later.

### 135.37.53 zoomOut

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Zooms out by decreasing the scaling factor.
**Notes:** Each invocation of zoomOut divides the scaling factor by the square root of 2.
Available in Mac OS X v10.4 and later.

### 135.37.54 Properties

### 135.37.55 acceptsDraggedFiles as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Indicate whether dragging a file into PDFView is allowed.
**Notes:** If false (default), dragging events are not supported.
If true, a user can drag and drop a PDF file into the view and have it loaded & set as the visible document (the old document is released).

Available in macOS 10.13 or newer.
(Read and Write property)

### 135.37.56 allowsDragging as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Determines whether the view can accept new PDF documents dragged into it by the user.
**Notes:** (Read and Write property)

### 135.37.57 autoScales as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether autoscaling is set.
**Notes:** (Read and Write property)

### 135.37.58 backgroundColor as NSColorMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the view's background color.
**Notes:** A view's background is the area displayed to either side of a PDF document's pages. The background also appears between pages when page breaks are enabled. The default color is a 50% gray.
(Read and Write property)

### 135.37.59 canGoBack as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the previous page in the page history.
**Notes:** The page history gets built as your application calls navigation methods such as goToDestination and goToLastPage.
(Read only property)

### 135.37.60 canGoForward as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the next page in the page history.
**Notes:** The page history gets built as your application calls navigation methods such as goToDestination and goToLastPage.
(Read only property)

### 135.37.61 canGoToFirstPage as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the first page of the document.
**Notes:** The return value will be true unless the view is already displaying the first page.
(Read only property)

### 135.37.62 canGoToLastPage as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the last page of the document.
**Notes:** The return value will be true unless the view is already displaying the last page.
(Read only property)

### 135.37.63 canGoToNextPage as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the next page of the document.
**Notes:** The return value will be true unless the view is displaying the last page.
(Read only property)

### 135.37.64 canGoToPreviousPage as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can navigate to the previous page of the document.
**Notes:** The return value will be true unless the view is displaying the first page.
(Read only property)

### 135.37.65 canZoomIn as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can magnify the view—that is, zoom in.
**Notes:** (Read only property)

### 135.37.66 canZoomOut as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether the user can view an expanded area—that is, zoom out.
**Notes:** (Read only property)

### 135.37.67 currentDestination as PDFDestinationMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a PDFDestination object representing the current page and the current point in the view specified in page space.
**Notes:** Page space is a 72 dpi coordinate system with the origin at the lower-left corner of the current page.
(Read only property)

### 135.37.68 currentPage as PDFPageMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the current page.
**Notes:** When there are two pages in the view in a two-up mode, "current page" is the left page. For continuous modes, returns the page crossing a horizontal line halfway between the view's top and bottom bounds.
(Read only property)

### 135.37.69 currentSelection as PDFSelectionMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the current selection.
**Example:**

```
dim MyPDFView as PDFViewMBS // your view

dim doc as PDFDocumentMBS = MyPDFView.document
dim page as PDFPageMBS = doc.pageAtIndex(0)
dim sel as PDFSelectionMBS = page.selectionForRange(0,5)
MyPDFView.currentSelection = sel
```

**Notes:** Returns NULL if no selection exists.

Note that this method returns the actual instance of the current PDFSelectionMBS object. Therefore, if you want to modify it, you should make a copy of the returned selection and modify that, instead.
(Read and Write property)

### 135.37.70 displayBox as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current style of display box.
**Notes:** The available values for display boxes are defined in the Constants section in the PDFPageMBS class.
(Read and Write property)

### 135.37.71 displayDirection as Integer

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the layout direction, either vertical or horizontal, for the given display mode.
**Notes:** Defaults to vertical layout (kPDFDisplayDirectionVertical).
Available in macOS 10.13 or newer.
(Read and Write property)

### 135.37.72 displayMode as Integer

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current display mode.
**Notes:** Value can be kPDFDisplaySinglePage, kPDFDisplaySinglePageContinuous, kPDFDisplayTwoUp and kPDFDisplayTwoUpContinuous.
(Read and Write property)

### 135.37.73 displaysAsBook as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the view will display the first page as a book cover (meaningful only when the document is in two-up or two-up continuous display mode).
**Notes:** (Read and Write property)

### 135.37.74 displaysPageBreaks as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the view is displaying page breaks.
**Notes:** (Read and Write property)

### 135.37.75 displaysRTL as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies presentation of pages from right-to-left.
**Notes:** Defaults to false.
(Read and Write property)

### 135.37.76 document as PDFDocumentMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the document associated with a PDFView object.
**Notes:** (Read and Write property)

### 135.37.77 documentView as NSViewMBS

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the innermost view used by PDFView or by your PDFView subclass.
**Notes:** The innermost view is the one displaying the visible document pages. This method is useful when converting coordinates from one view to another.
(Read only property)

### 135.37.78 enableDataDetectors as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether data detection is enabled.
**Notes:** If enabled, page text will be scanned for URL's as the page becomes visible. Where
// URL's are found, Link annotations are created in place. These are temporary annotations and are not saved.

Requires Mac OS X 10.6.
(Read and Write property)

### 135.37.79 greekingThreshold as Double

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The greeking threshold to use for displaying text.
**Notes:** The default threshold is 3.0.
(Read and Write property)

### 135.37.80 interpolationQuality as Integer

MBS PDFKit Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The interpolation quality for images drawn into the PDFView context.
**Notes:** Available in Mac OS X 10.7 or later.
(Read and Write property)

### 135.37.81 maxScaleFactor as Double

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the maximum scaling factor for the PDF document.
**Notes:** Assigning this value will implicitly turn off autoScales, and allows scaleFactor to vary between these min / max scale factors
Available in macOS 10.13 or newer.
(Read and Write property)

### 135.37.82 minScaleFactor as Double

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set the minimum scaling factor for the PDF document.
**Notes:** Assigning this value will implicitly turn off autoScales, and allows scaleFactor to vary between these min / max scale factors

Available in macOS 10.13 or newer.
(Read and Write property)

### 135.37.83 pageBreakMargins as NSEdgeInsetsMBS

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The page break margins.
**Notes:** If displaysPageBreaks is enabled, you may customize the spacing between pages by defining margins for the top, bottom, left, and right of each page. Note that pageBreakMargins only allows positive values and will clamp any negative value to 0.0. By default, if displaysPageBreaks is enabled, pageBreakMargins is { 4.75, 4.0, 4.75, 4.0 } (with respect to top, left, bottom, right), otherwise it is { 0.0, 0.0, 0.0, 0.0 }
(Read and Write property)

### 135.37.84 pageShadowsEnabled as Boolean

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies if shadows should be drawn around page borders in a PDFView.
**Notes:** Defaults to true.
Available in macOS 10.14 or newer.
(Read and Write property)

### 135.37.85 scaleFactor as Double

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop & iOS.

**Function:** The scale factor for the view.
**Notes:** The default value is 1.0, corresponding to actual size.
(Read and Write property)

### 135.37.86 scaleFactorForSizeToFit as Double

MBS PDFKit Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Regardless of current autoScales mode, this returns the "size to fit" scale factor that autoScales would use for scaling the current document and layout.
**Notes:** For continuous modes this is a "fit width" scale, for non-continuous modes it is a "best fit" scale.
Available in macOS 10.13 or newer.
(Read only property)

### 135.37.87 shouldAntiAlias as Boolean

MBS PDFKit Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether to use anti-aliasing in the view.
**Notes:** (Read and Write property)

### 135.37.88 Constants

PDF Area Of Interest

| Constant | Value | Description |
|---|---|---|
| kPDFAnnotationArea | 4 | The mouse is over an annotation. |
| kPDFControlArea | 16 | The mouse is over a control. |
| kPDFIconArea | 64 | The mouse is over an icon. Available in Mac OS X v10.5 and later. |
| kPDFImageArea | 256 | Over an image. |
| kPDFLinkArea | 8 | The mouse is over a link. |
| kPDFNoArea | 0 | The mouse is over an undefined area. |
| kPDFPageArea | 1 | The mouse is over a page. |
| kPDFPopupArea | 128 | The mouse is over a popup menu. |
| kPDFTextArea | 2 | The mouse is over text. |
| kPDFTextFieldArea | 32 | The mouse is over a text field. |

Display Directions

| Constant | Value | Description |
|---|---|---|
| kPDFDisplayDirectionHorizontal | 1 | Horizontal |
| kPDFDisplayDirectionVertical | 0 | Vertical |

Display Mode

| Constant | Value | Description |
|---|---|---|
| kPDFDisplaySinglePage | 0 | The document displays one page at a time horizontally and vertically. Verti and horizontal scrolling apply only to the current page. |
| kPDFDisplaySinglePageContinuous | 1 | he document displays in continuous mode vertically, with single-page wi horizontally. Vertical scrolling applies to the entire document. |
| kPDFDisplayTwoUp | 2 | The document displays two pages side-by-side. Vertical and horizontal scroll apply only to the pair of displayed pages. |
| kPDFDisplayTwoUpContinuous | 3 | The document displays in continuous mode vertically and displays two pa side-by-side horizontally. Vertical scrolling applies to the entire document. |

Interpolation Quality Constants

| Constant | Value | Description |
|---|---|---|
| kPDFInterpolationQualityHigh | 2 | high |
| kPDFInterpolationQualityLow | 1 | low |
| kPDFInterpolationQualityNone | 0 | |

# Chapter 136

# Phidgets

## 136.1 class OldPhidgetAccelerometerMBS

### 136.1.1 class OldPhidgetAccelerometerMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetAccelerometerMBS instead. **Function:** The class for the phidget accelerometer.
**Notes:** The PhidgetAccelerometer is a component that provides a high-level programmer interface to control a PhidgetAccelerometer device connected through a USB port. The product is available as a dual axis or a 3-axis
module. With this component, the programmer can:

- Measure up to 5 Gravity (9.8 m/s2) change per axis, depending on unit purchased.
- Measures both dynamic acceleration (e.g., vibration) and static acceleration (e.g., gravity or tilt) on 2 or 3 axis.

Subclass of the OldPhidgetMBS class.

### 136.1.2 Methods

### 136.1.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

### 136.1.4 getAcceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last acceleration value received from the PhidgetAccelerometer for a particular axis.
**Notes:** Lasterror is set.

### 136.1.5 getAccelerationChangeTrigger(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the amount of change that should exist between the last reported value and the current value before an OnAccelerationChange event is fired.
**Notes:** Lasterror is set.

### 136.1.6 getAccelerationMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum accleration supported by an axis.
**Notes:** The Lasterror property is set.

### 136.1.7 getAccelerationMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum acceleraiton supported by an axis.
**Notes:** The Lasterror property is set.

### 136.1.8 getAxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of acceleration axes supported by this accelerometer.
**Notes:** The Lasterror property is set.

### 136.1.9 setAccelerationChangeTrigger(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the amount of change that should exist between the last reported value and the current value before an AccelerationChange event is fired.
**Notes:** If the AccelerationChangeTrigger is set to 0, an event will be triggered for every measurement of acceleration taken.

Lasterror is set.

### 136.1.10 Events

### 136.1.11 AccelerationChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for each change on the Acceleration.
**Notes:** Index: Index of the Accelerometer posting event
Value: Value of the Accelerometer

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.2 class OldPhidgetAdvancedServoMBS

### 136.2.1 class OldPhidgetAdvancedServoMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetRCServoMBS instead. **Function:** A class for a phidget advanced servo device.
**Notes:** On the time the plugin was written the phidget documentation did not include this class so the documentation here is limited.
Subclass of the OldPhidgetMBS class.

### 136.2.2 Methods

### 136.2.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

### 136.2.4 getAcceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the acceleration for the given index.
**Notes:** The Lasterror property is set.

### 136.2.5 getAccelerationMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum acceleration supported by a motor.
**Notes:** The Lasterror property is set.

### 136.2.6 getAccelerationMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum acceleration supported by a motor.
**Notes:** The Lasterror property is set.

### 136.2.7 getCurrent(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current value.
**Notes:** The Lasterror property is set.

### 136.2.8 getEngaged(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the engaged state of a motor.
**Notes:** This is whether the motor is powered or not.
The Lasterror property is set.

### 136.2.9 getMotorCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of motors supported by this controller.
**Notes:** The Lasterror property is set.

### 136.2.10 getPosition(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current position of an encoder.
**Notes:** The Lasterror property is set.

### 136.2.11 getPositionMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum position that a motor can go to.
**Notes:** The Lasterror property is set.

### 136.2.12 getPositionMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum position that a motor can go to.
**Notes:** The Lasterror property is set.

### 136.2.13 getServoType(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the servo type of a motor.
**Notes:** The Lasterror property is set.
For the value, check the PHIDGET_SERVO_* constants.

### 136.2.14 getSpeedRampingOn(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the speed ramping state for a motor.
**Notes:** This is whether or not velocity and acceleration are used.
The Lasterror property is set.

### 136.2.15 getStopped(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the stopped state of a motor.
**Notes:** This is true when the motor is not moving and there are no outstanding commands.

The Lasterror property is set.

### 136.2.16 getVelocity(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current velocity.
**Notes:** The Lasterror property is set.

### 136.2.17 getVelocityLimit(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last set velocity limit for a motor.
**Notes:** The Lasterror property is set.

### 136.2.18 getVelocityMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum velocity that can be set for a motor.
**Notes:** The Lasterror property is set.

### 136.2.19 getVelocityMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum velocity that can be set for a motor.
**Notes:** The Lasterror property is set.

### 136.2.20 setAcceleration(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the acceleration.
**Notes:** The Lasterror property is set.

### 136.2.21 setEngaged(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the engaged state of a motor. This is whether the motor is powered or not.
**Notes:** The Lasterror property is set.

### 136.2.22 setPosition(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current position of a motor.
**Notes:** The Lasterror property is set.

### 136.2.23 setPositionMax(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the maximum position that a motor can go to.
**Notes:** The Lasterror property is set.

### 136.2.24 setPositionMin(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the minimum position that a motor can go to.
**Notes:** The Lasterror property is set.

### 136.2.25 setServoParameters(index as Integer, min_us as Double, max_us as Double, degrees as Double, velocity_max as Double)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the servo parameters of a motor.
**Notes:** The Lasterror property is set.

| | |
|---|---|
| index | The motor index. |
| min_us | The minimum supported PCM in microseconds. |
| max_us | The maximum supported PCM in microseconds. |
| degrees | The degrees of rotation defined by the given PCM range. |
| velocity_max | The maximum velocity in degrees/second. |

### 136.2.26 setServoType(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the servo type of a motor.
**Notes:** The Lasterror property is set.
For the value, check the PHIDGET_SERVO_* constants.

### 136.2.27 setSpeedRampingOn(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the speed ramping state for a motor.
**Notes:** This is whether or not velocity and acceleration are used.
The Lasterror property is set.

### 136.2.28 setVelocityLimit(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the velocity limit for a motor.
**Notes:** The Lasterror property is set.

### 136.2.29 Events

### 136.2.30 CurrentChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The current value changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.2.31 PositionChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The position changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.2.32 VelocityChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The velocity changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.2.33 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHIDGET_SERVO_DEFAULT | 1 | One of the servo type constants. |
| PHIDGET_SERVO_FIRGELLI_L12_100_100_06_R | 17 | One of the servo type constants. |
| PHIDGET_SERVO_FIRGELLI_L12_100_50_06_R | 16 | One of the servo type constants. |
| PHIDGET_SERVO_FIRGELLI_L12_30_50_06_R | 13 | One of the servo type constants. |
| PHIDGET_SERVO_FIRGELLI_L12_50_100_06_R | 14 | One of the servo type constants. |
| PHIDGET_SERVO_FIRGELLI_L12_50_210_06_R | 15 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_805BB | 5 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_815BB | 12 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS322HD | 3 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS422 | 6 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS485HB | 10 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS5245MG | 4 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS645MG | 11 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HS785HB | 9 | One of the servo type constants. |
| PHIDGET_SERVO_HITEC_HSR1425CR | 8 | One of the servo type constants. |
| PHIDGET_SERVO_RAW_us_MODE | 2 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S2313M | 18 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S3317M | 19 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S3317SR | 20 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S4303R | 21 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S4315M | 22 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S4315R | 23 | One of the servo type constants. |
| PHIDGET_SERVO_SPRINGRC_SM_S4505B | 24 | One of the servo type constants. |
| PHIDGET_SERVO_TOWERPRO_MG90 | 7 | One of the servo type constants. |
| PHIDGET_SERVO_USER_DEFINED | 25 | One of the servo type constants. |

## 136.3 class OldPhidgetAnalogMBS

### 136.3.1 class OldPhidgetAnalogMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetVoltageInputMBS instead. **Function:** Class specific to the Phidget Analog.
**Notes:** See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.3.2 Methods

### 136.3.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new analog device instance.
**Notes:** Lasterror is set.

### 136.3.4 getEnabled(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the enabled state for an output.
**Notes:** Lasterror is set.

### 136.3.5 getOutputCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of outputs supported by this phidget analog.
**Notes:** Lasterror is set.

### 136.3.6 getVoltage(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the currently set voltage for an output, in V.
**Notes:** Lasterror is set.

### 136.3.7 getVoltageMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum settable output voltage, in V.
**Notes:** Lasterror is set.

### 136.3.8 getVoltageMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum settable output voltage, in V.
**Notes:** Lasterror is set.

### 136.3.9 setEnabled(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the enabled state for an output.
**Notes:** Lasterror is set.

### 136.3.10 setVoltage(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the voltage of an output, in V.
**Notes:** Lasterror is set.

## 136.4 class OldPhidgetBridgeMBS

### 136.4.1 class OldPhidgetBridgeMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetMBS instead.
**Function:** The class specific to the Phidget Bridge.
**Notes:** See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.4.2 Methods

### 136.4.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance.
**Notes:** Lasterror is set.

### 136.4.4 getBridgeMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum value supported by a bridge input, in mV/V. This is affected by Gain.
**Notes:** Lasterror is set.

### 136.4.5 getBridgeMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum value supported by a bridge input, in mV/V. This is affected by Gain.
**Notes:** Lasterror is set.

### 136.4.6 getBridgeValue(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current value of a bridge input, in mV/V.
**Notes:** Lasterror is set.

### 136.4.7 getDataRate as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the the data rate for the Phidget Bridge, in milliseconds.
**Notes:** Lasterror is set.

### 136.4.8 getDataRateMax as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the the maximum data rate for the Phidget Bridge, in milliseconds.
**Notes:** Lasterror is set.

### 136.4.9 getDataRateMin as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the the minimum data rate for the Phidget Bridge, in milliseconds.
**Notes:** Lasterror is set.

### 136.4.10 getEnabled(index as Integer) as Boolean

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the enabled state for an input.
**Notes:** Lasterror is set.

### 136.4.11 getGain(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the the Gain for an input.
**Notes:** Lasterror is set.

### 136.4.12 getInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of inputs supported by this phidget bridge.
**Notes:** Lasterror is set.

### 136.4.13 setDataRate(milliseconds as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the the data rate for the Phidget Bridge, in milliseconds.
**Notes:** Lasterror is set.

### 136.4.14 setEnabled(index as Integer, value as Boolean)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the enabled state for an input.
**Notes:** Lasterror is set.

### 136.4.15 setGain(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the the Gain for an input.
**Notes:** Lasterror is set.

### 136.4.16 Events

### 136.4.17 BridgeDataReceived(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The bridge data event handler.
**Notes:** This is called at a set rate as defined by data rate.

### 136.4.18 Constants

Gain Constants.

| Constant | Value | Description |
|---|---|---|
| PHIDGET_BRIDGE_GAIN_1 | 1 | Gain of 1. |
| PHIDGET_BRIDGE_GAIN_128 | 6 | Gain of 128. |
| PHIDGET_BRIDGE_GAIN_16 | 3 | Gain of 16. |
| PHIDGET_BRIDGE_GAIN_32 | 4 | Gain of 32. |
| PHIDGET_BRIDGE_GAIN_64 | 5 | Gain of 64. |
| PHIDGET_BRIDGE_GAIN_8 | 2 | Gain of 8. |
| PHIDGET_BRIDGE_GAIN_UNKNOWN | 7 | Unknown Gain. |

## 136.5 class OldPhidgetDictionaryMBS

### 136.5.1 class OldPhidgetDictionaryMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetDictionaryMBS instead. **Function:** The Phidget Dictionary is a service provided by the Phidget Webservice.
**Notes:** The Webservice maintains a centralized dictionary of key-value pairs that can be accessed and changed from any number of clients through the CPhidgetDictionary interface available in phidget21.

Note that the Webservice uses this dictionary to control access to Phidgets through the openRemote and openRemoteIP interfaces, and as such, you should never add or modify a key that starts with /PSK/ or /PCK/, unless you want to explicitly modify Phidget specific data –and this is highly discouraged, as it's very easy to break things. Listening to these keys is fine if so desired.

The intended use for the dictionary is as a central repository for communication and persistent storage of data between several client applications. As an example - a higher level interface exposed by one application –which controls the Phidgets, for others to access –rather then every client talking directly to the Phidgets themselves.

The dictionary makes use of extended regular expressions for key matching. See the end of this document for the rules of regular expressions.

See the Phidget manuals for help on regular expressions.

### 136.5.2 Methods

### 136.5.3 addKey(key as string, value as string, persistent as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a new key to the Dictionary, or modifies the value of an existing key.
**Notes:** The key can only contain numbers, letters, ‚Äò/', ‚Äò.', ‚Äò-‚Äò, ‚Äò_', and must begin with a letter, ‚Äò_' or ‚Äò/'.
The value can contain any value.
The persistent value controls whether a key will stay in the dictionary after the client that created it disconnects. If persistent == 0, the key is removed when the connection closes. Otherwise the key remains in the dictionary until it is explicitly removed.

Lasterror is set.

### 136.5.4 Close

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the file handles for this device.
**Notes:** You should always call this when finished with a Dictionary.
Lasterror is set.

### 136.5.5 Constructor

MBS Phidgets Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A dummy constructor doing nothing.
See also:

- 136.5.6 Constructor(pattern as string) 18743

### 136.5.6 Constructor(pattern as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** The Lasterror property is set.
Pattern is a regular expression that matches the keys you want to listen for in the keychange event.
See also:

- 136.5.5 Constructor 18743

### 136.5.7 GetDeviceStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the status of the device.
**Notes:** Returns:
PHIDGET_ATTACHED 0x1
PHIDGET_NOTATTACHED 0x0

Lasterror is set.

### 136.5.8 getServerAddress(byref port as Integer) as string

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the address and port.
**Notes:** The Lasterror property is set.

### 136.5.9 getServerID as string

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the server ID.
**Notes:** The Lasterror property is set.

### 136.5.10 GetServerStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the connection status of a Webservice.
**Notes:** Returns one of the following values:
1 CONNECTED
0 NOTCONNECTED

Lasterror is set.

### 136.5.11 openRemote(serverID as string, password as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This method is not yet implemented and will return EPHIDGET_UNSUPPORTED.
**Notes:** The Lasterror property is set.

### 136.5.12 openRemoteIP(addr as string, port as Integer, password as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a connection to a remote Phidget Dictionary.
**Notes:** OpenRemoteIP will block until it connects to the server, which means that when it returns with EPHIDGET_OK, this means that the connection is active. If the server is unavailable, this will return an error code.

If the connection to a webservice is disrupted while in use, an error event will be thrown, and it is recommended that an error event listener be registered for this reason.

Lasterror is set.

### 136.5.13 removeKey(pattern as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes a key, or set of keys, from the Dictionary.
**Notes:** The key name is a regular expressions pattern, and so care must be taken to only have it match the specific keys you want to remove.
Lasterror is set.

### 136.5.14 Properties

### 136.5.15 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal used CPhidgetDictionaryHandle.
**Notes:** (Read and Write property)

### 136.5.16 Lasterror as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 136.5.17 Events

### 136.5.18 Error(errorCode as Integer, errorDescription as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This error event is used for reporting asynchronous errors –mostly related to opening remote Phidgets.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.5.19 KeyChanged(key as string, value as string, reason as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event will be called on key add, remove, and change.
**Notes:** The Lasterror property is set.
It will also fire once to give an initial key value as soon as it is registered, if the key already exists.

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

Reason values:

| | |
|---|---|
| PHIDGET_DICTIONARY_VALUE_CHANGED | 1 |
| PHIDGET_DICTIONARY_ENTRY_ADDED | 2 |
| PHIDGET_DICTIONARY_ENTRY_REMOVING | 3 |
| PHIDGET_DICTIONARY_CURRENT_VALUE | 4 |

### 136.5.20 ServerConnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when a connection to the sever has been made.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.

Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.5.21 ServerDisconnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when a connection to the server has been lost.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.6 class OldPhidgetEncoderMBS

### 136.6.1 class OldPhidgetEncoderMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetEncoderMBS instead. **Function:** The class for the phidget encoder device.
**Notes:** The PhidgetEncoder is a component that provides a high-level programmer interface to control a PhidgetEncoder device connected through a USB port.
With this component, the programmer can:

- Detect changes in position of incremental and absolute encoders.
- Easily track the changes with respect to time.

Subclass of the OldPhidgetMBS class.

### 136.6.2 Methods

### 136.6.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

### 136.6.4 getEnabled(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the enabled state of an encoder. This is whether the encoder is powered or not.
**Notes:** The Lasterror property is set.

### 136.6.5 getEncoderCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of encoder inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.6.6 getIndexPosition(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries index position.
**Notes:** Gets the position of the last index pulse, as referenced to getPosition.
This will return EPHIDGET_UNKNOWN if there hasn't been an index event, or if the encoder doesn't support index.

The Lasterror property is set.

### 136.6.7 getInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of digital inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.6.8 getInputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of a digital input.
**Notes:** The Lasterror property is set.

### 136.6.9 getPosition(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current position of an encoder.
**Notes:** The Lasterror property is set.

### 136.6.10 setEnabled(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the enabled state of an encoder. This is whether the encoder is powered or not.
**Notes:** The Lasterror property is set.

### 136.6.11 setPosition(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current position of an encoder.
**Notes:** The Lasterror property is set.

### 136.6.12 Events

### 136.6.13 InputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for a change in the input.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.6.14 PositionChanged(index as Integer, position as Integer, time as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for every position change.
**Notes:** Index: Index of the Encoder firing the Event
Position: Position of the Encoder
Time: Time of change

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.7 class OldPhidgetFrequencyCounterMBS

### 136.7.1 class OldPhidgetFrequencyCounterMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetFrequencyCounterMBS instead. **Function:** Class specific to the Phidget Frequency Counter.
**Notes:** See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.7.2 Methods

### 136.7.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance.
**Notes:** Lasterror is set.

### 136.7.4 getEnabled(index as Integer) as Boolean

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the enabled state for an input.
**Notes:** Lasterror is set.

### 136.7.5 getFilter(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the filter type for an input.
**Notes:** Lasterror is set.

### 136.7.6 getFrequency(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the measured frequency of an input, in Hz.
**Notes:** Lasterror is set.

### 136.7.7 getFrequencyInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of inputs supported by this phidget frequency counter.
**Notes:** Lasterror is set.

### 136.7.8 getTimeout(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the timeout value for an input, in microseconds. This controls the lowest measurable frequency.
**Notes:** Lasterror is set.

### 136.7.9 getTotalCount(index as Integer) as Int64

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the total number of ticks that have happened since the last reset on this input.
**Notes:** Lasterror is set.

### 136.7.10 getTotalTime(index as Integer) as Int64

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the total time that has passed since the last reset on this input, in microseconds.
**Notes:** Lasterror is set.

### 136.7.11 reset(index as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets total count and total time for an input.
**Notes:** Lasterror is set.

### 136.7.12 setEnabled(index as Integer, value as Boolean)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the enabled state for an input.
**Notes:** Lasterror is set.

### 136.7.13 setFilter(index as Integer, filter as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the filter type for an input.
**Notes:** Lasterror is set.

### 136.7.14 setTimeout(index as Integer, filter as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the timeout value for an input, in microseconds.
**Notes:** Lasterror is set.

### 136.7.15 Events

### 136.7.16 Counted(index as Integer, time as Integer, counts as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when ticks have been counted on an input, or when the timeout has passed.

### 136.7.17 Constants

Filter Type Constants

| Constant | Value | Description |
|---|---|---|
| PHIDGET_FREQUENCYCOUNTER_FILTERTYPE_LOGIC_LEVEL | 2 | Logic level signal filter. |
| PHIDGET_FREQUENCYCOUNTER_FILTERTYPE_UNKNOWN | 3 | Filter type unknown. |
| PHIDGET_FREQUENCYCOUNTER_FILTERTYPE_ZERO_CROSSING | 1 | Zero crossing signal filter. |

## 136.8 class OldPhidgetGPGGAMBS

### 136.8.1 class OldPhidgetGPGGAMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPGGAMBS instead. **Function:** The class for a NMEA GGA Sentence.

### 136.8.2 Properties

### 136.8.3 altitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The altitude value.
**Notes:** (Read only property)

### 136.8.4 fixQuality as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The fix Quality.
**Notes:** (Read and Write property)

### 136.8.5 heightOfGeoid as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The height of GEO ID.
**Notes:** (Read only property)

### 136.8.6 horizontalDilution as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The horizontal dilution.
**Notes:** (Read only property)

### 136.8.7 latitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The latitude value.
**Notes:** (Read only property)

### 136.8.8 longitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The longitude value.
**Notes:** (Read only property)

### 136.8.9 numSatellites as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of satellites.
**Notes:** (Read and Write property)

### 136.8.10 time as OldPhidgetGPSTimeMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time value.
**Notes:** (Read and Write property)

## 136.9 class OldPhidgetGPGSAMBS

### 136.9.1 class OldPhidgetGPGSAMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPGSAMBS instead. **Function:** The NMEA GSA Sentence class.

### 136.9.2 Methods

### 136.9.3 satUsed(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** IDs of used sats in no real order, 0 means nothing.

### 136.9.4 Properties

### 136.9.5 fixType as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The fix type.
**Notes:** (Read and Write property)

### 136.9.6 horizDilution as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Horizontal dilution.
**Notes:** (Read only property)

### 136.9.7 mode as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mode.
**Notes:** (Read and Write property)

### 136.9.8 posnDilution as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Position dilution.
**Notes:** (Read only property)

### 136.9.9 vertDilution as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Vertical dilution.
**Notes:** (Read only property)

### 136.9.10 Constants

Fix Type values

| Constant | Value | Description |
|---|---|---|
| kFixType2D | 2 | 2D |
| kFixType3D | 3 | 3D |
| kFixTypeNo | 1 | no fix. |

Mode values

| Constant | Value | Description |
|---|---|---|
| kModeAuto | 65 | Auto |
| kModeForced | 77 | Forced |

## 136.10 class OldPhidgetGPGSVMBS

### 136.10.1 class OldPhidgetGPGSVMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPVTGMBS instead. **Function:** The NMEA GSV Sentence class.

### 136.10.2 Methods

### 136.10.3 satInfo(index as Integer) as OldPhidgetGPSSatInfoMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query the satellite information with the given index.
**Notes:** Index from 0 to 11.

### 136.10.4 Properties

### 136.10.5 satsInView as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of satellites in view.
**Notes:** (Read and Write property)

## 136.11 class OldPhidgetGPRMCMBS

### 136.11.1 class OldPhidgetGPRMCMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPRMCMBS instead. **Function:** The class for NMEA RMC Sentence

### 136.11.2 Properties

### 136.11.3 date as OldPhidgetGPSDateMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The date value.
**Notes:** (Read and Write property)

### 136.11.4 heading as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The heading value.
**Notes:** (Read only property)

### 136.11.5 latitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The latitude value.
**Notes:** (Read only property)

### 136.11.6 longitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The longitude value.
**Notes:** (Read only property)

### 136.11.7 magneticVariation as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The magnetic variation.
**Notes:** (Read only property)

### 136.11.8 mode as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mode value.
**Notes:** (Read and Write property)

### 136.11.9 speedKnots as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The speed in knots.
**Notes:** (Read only property)

### 136.11.10 status as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The status value.
**Notes:** (Read and Write property)

### 136.11.11 time as OldPhidgetGPSTimeMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The time value.
**Notes:** (Read and Write property)

## 136.12 class OldPhidgetGPSDateMBS

### 136.12.1 class OldPhidgetGPSDateMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** GPS Date in UTC.

### 136.12.2 Properties

### 136.12.3 Day as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Day of the month (1-31).
**Notes:** (Read and Write property)

### 136.12.4 Month as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Month (1-12).
**Notes:** (Read and Write property)

### 136.12.5 Year as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Year.
**Notes:** (Read and Write property)

## 136.13 class OldPhidgetGPSMBS

### 136.13.1 class OldPhidgetGPSMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPSMBS instead.
**Function:** Class specific to the Phidget GPS.
**Notes:** See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.13.2 Methods

### 136.13.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates an GPS instance.
**Notes:** Lasterror is set.

### 136.13.4 getAltitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current altitude, in meters.
**Notes:** Lasterror is set.

### 136.13.5 getDate as OldPhidgetGPSDateMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current GPS date, in UTC
**Notes:** Lasterror is set.

### 136.13.6 getHeading as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current heading, in degrees.
**Notes:** Lasterror is set.

### 136.13.7 getLatitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current latitude.
**Notes:** Lasterror is set.

### 136.13.8 getLongitude as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current longitude.
**Notes:** Lasterror is set.

### 136.13.9 getNMEAData as OldPhidgetNMEADataMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets Raw NMEA Data.
**Notes:** Lasterror is set.

### 136.13.10 getPositionFixStatus as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the position fix status.
**Notes:** Lasterror is set.

### 136.13.11 getTime as OldPhidgetGPSTimeMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current GPS time, in UTC.
**Notes:** Lasterror is set.

### 136.13.12 getVelocity as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current velocity, in km/h.
**Notes:** Lasterror is set.

### 136.13.13 Events

### 136.13.14 PositionChanged(latitude as Double, longitude as Double, altitude as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The position change event.
**Notes:** Called when any of latitude, longitude, or altitude change.

### 136.13.15 PositionFixStatusChanged(status as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The position fix status change event.
**Notes:** Called when a position fix is aquired or lost.

## 136.14 class OldPhidgetGPSSatInfoMBS

### 136.14.1 class OldPhidgetGPSSatInfoMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for Satellite info - used in GSV sentence.

### 136.14.2 Properties

### 136.14.3 Azimuth as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The azimuth value.
**Notes:** (Read and Write property)

### 136.14.4 Elevation as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The elevation value.
**Notes:** (Read and Write property)

### 136.14.5 ID as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ID.
**Notes:** (Read and Write property)

### 136.14.6 SNR as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The serial number.
**Notes:** (Read and Write property)

## 136.15 class OldPhidgetGPSTimeMBS

### 136.15.1 class OldPhidgetGPSTimeMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** GPS Time in UTC.

### 136.15.2 Properties

### 136.15.3 Hour as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hour value.
**Notes:** (Read and Write property)

### 136.15.4 Millisecond as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Milliseconds value.
**Notes:** (Read and Write property)

### 136.15.5 Minute as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minutes value.
**Notes:** (Read and Write property)

### 136.15.6 Second as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The seconds value.
**Notes:** (Read and Write property)

## 136.16 class OldPhidgetGPVTGMBS

### 136.16.1 class OldPhidgetGPVTGMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetGPVTGMBS instead. **Function:** A class for a NMEA VTG Sentence.

### 136.16.2 Properties

### 136.16.3 magneticHeading as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The magnetic heading.
**Notes:** (Read only property)

### 136.16.4 mode as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mode.
**Notes:** (Read and Write property)

### 136.16.5 speed as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The speed in km/hour.
**Notes:** (Read only property)

### 136.16.6 speedKnots as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The speed in knots.
**Notes:** (Read only property)

### 136.16.7 trueHeading as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The true heading.
**Notes:** (Read only property)

## 136.17 class OldPhidgetInterfaceKitMBS

### 136.17.1 class OldPhidgetInterfaceKitMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetHubMBS instead.
**Function:** The class for a phidget interface kit.
**Notes:** The PhidgetInterfaceKit is a component that provides a high-level programmer interface to control a PhidgetInterfaceKit device connected through a USB port.
With this component, the programmer can:

- Turn particular outputs on and off.
- Get notified of changes of state of the inputs as events.
- Configure events to fire when the analog inputs change.

The PhidgetInterfaceKit devices provide a combination of:

- Digital outputs.
- Digital inputs.
- Analog inputs.

Subclass of the OldPhidgetMBS class.

### 136.17.2 Methods

### 136.17.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

### 136.17.4 getDataRate(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Data Rate for an analog input in milliseconds.
**Notes:** The Lasterror property is set.

This is the event rate. Since we're not going to run an extra thread, the accuracy of the data rate is limited by the interrupt endpoint data rate (>=8ms).

### 136.17.5 getDataRateMax(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum supported data rate for an analog input in milliseconds.
**Notes:** The Lasterror property is set.

### 136.17.6 getDataRateMin(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum supported data rate for an analog input in milliseconds.
**Notes:** The Lasterror property is set.

### 136.17.7 getInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of digital inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.17.8 getInputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of a digital input.
**Notes:** The Lasterror property is set.

### 136.17.9 getOutputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of digital outputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.17.10 getOutputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of a digital output.
**Notes:** The Lasterror property is set.

### 136.17.11 getRatiometric as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the ratiometric state for this board.
**Notes:** The Lasterror property is set.

### 136.17.12 getSensorChangeTrigger(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the amount of change that should exist between the last reported value and the current value before an OnSensorChange event is fired.
**Notes:** To receive all events, set the SensorChangeTrigger to zero.
The Lasterror property is set.

### 136.17.13 getSensorCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of sensor (analog) inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.17.14 getSensorRawValue(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the reported actual value of the sensor between 0 - 4095.
**Notes:** This is directly proportional to the analog input, ranging from 0-5V (or 0-Vcc if Ratiometric is set to True).
Note that this value defaults to 65535 for an unitialised state. Applications that do not wish to encounter this value should use ChangeTrigger event handlers as opposed to polling the device for new data.
The Lasterror property is set.

### 136.17.15 getSensorValue(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last reported sensor value for the given index as a value from 0-1000
**Notes:** Note that this value defaults to 65535 for an unitialised state. Applications that do not wish to encounter this value should use ChangeTrigger event handlers as opposed to polling the device for new data.
The Lasterror property is set.

### 136.17.16 setDataRate(index as Integer, milliseconds as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the Data Rate for an analog input in milliseconds.
**Notes:** The Lasterror property is set.

### 136.17.17 setOutputState(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state of a digital output.
**Notes:** The Lasterror property is set.

### 136.17.18 setRatiometric(value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the ratiometric state for this board.
**Notes:** The Lasterror property is set.

### 136.17.19 setSensorChangeTrigger(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the amount of change that should exist between the last reported value and the current value before an OnSensorChange event is fired.
**Notes:** Lasterror is set.

### 136.17.20 Events

### 136.17.21 InputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called on any input change.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.17.22 OutputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Returns the number of digital outputs on this particular Phidget device.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.17.23 SensorChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called on any sensor change.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.18 class OldPhidgetIRCodeInfoMBS

### 136.18.1 class OldPhidgetIRCodeInfoMBS

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetIRCodeInfoMBS instead. **Function:** The class for a code info for the IR receiver/sender.
**Notes:** The PhidgetIR CodeInfo structure contains all information needed to transmit a code, apart from the actual code data.
Some values can be set to null to select defaults. See the product manual for more information.

### 136.18.2 Properties

### 136.18.3 bitCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of bits in the code.
**Notes:** (Read and Write property)

### 136.18.4 carrierFrequency as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Carrier frequency in Hz - defaults to 38kHz.
**Notes:** (Read and Write property)

### 136.18.5 dutyCycle as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Duty Cycle in percent (10-50).
**Notes:** Defaults to 33.
(Read and Write property)

### 136.18.6 encoding as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encoding used to encode the data.
**Notes:** See the PHIDGET_IR_ENCODING_* constants.
(Read and Write property)

### 136.18.7 gap as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gap time in us.
**Notes:** (Read and Write property)

### 136.18.8 length as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The length of the code.
**Notes:** Constant or Variable length encoding.
See PHIDGET_IR_LENGTH_* constants.
(Read and Write property)

### 136.18.9 minRepeat as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Minium number of times to repeat a code on transmit.
**Notes:** (Read and Write property)

### 136.18.10 trail as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Trail time in us - can be 0 for none.
**Notes:** (Read and Write property)

### 136.18.11 header(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The header value.
**Notes:** Header pulse and space - can be 0 for none
Index from 0 to 1.
(Read and Write computed property)

### 136.18.12 one(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The one array.
**Notes:** Pulse and Space times to represent a '1' bit, in us
Index from 0 to 1.
(Read and Write computed property)

### 136.18.13 repeat(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A series or pulse and space times to represent the repeat code.
**Notes:** Start and end with pulses and null terminate. Set to 0 for none.
Index from 0 to 25.
(Read and Write computed property)

### 136.18.14 toggleMask(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bit toggles, which are applied to the code after each transmit.
**Notes:** (Read and Write computed property)

### 136.18.15 zero(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** One of the arrays.
**Notes:** Index from 0 to 1.
Pulse and Space times to represent a '0' bit, in us.
(Read and Write computed property)

### 136.18.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHIDGET_IR_ENCODING_BIPHASE | 4 | One of the encoding constants.<br>Bi-Phase, or Manchester encoding. |
| PHIDGET_IR_ENCODING_PULSE | 3 | One of the encoding constants.<br>Pulse encoding, or Pulse Width Modulation. |
| PHIDGET_IR_ENCODING_RC5 | 5 | One of the encoding constants.<br>RC5 - a type of Bi-Phase encoding. |
| PHIDGET_IR_ENCODING_RC6 | 6 | One of the encoding constants.<br>RC6 - a type of Bi-Phase encoding. |
| PHIDGET_IR_ENCODING_SPACE | 2 | One of the encoding constants.<br>Space encoding, or Pulse Distance Modulation. |
| PHIDGET_IR_ENCODING_UNKNOWN | 1 | One of the encoding constants.<br>Unknown - the default value. |
| PHIDGET_IR_LENGTH_CONSTANT | 2 | One of the length constants.<br>Constant - the bitstream + gap length is constant. |
| PHIDGET_IR_LENGTH_UNKNOWN | 1 | One of the length constants.<br>Unknown - the default value. |
| PHIDGET_IR_LENGTH_VARIABLE | 3 | One of the length constants.<br>Variable - the bitstream has a variable length with a constant gap. |

## 136.19 class OldPhidgetIRMBS

### 136.19.1 class OldPhidgetIRMBS

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetIRMBS instead.
**Function:** The class for an IR receiver/sender.
**Notes:** Calls specific to the Phidget IR. See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.19.2 Methods

### 136.19.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** The Lasterror property is set.
On success the handle value is not zero.

### 136.19.4 getLastCode(byref bitCount as Integer) as MemoryBlock

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last code that was received.
**Notes:** The Lasterror property is set.

bitCount: set to the bit count of the code.

### 136.19.5 getLastLearnedCode(byref codeInfo as OldPhidgetIRCodeInfoMBS) as MemoryBlock

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last code that was learned.
**Notes:** The Lasterror property is set.

### 136.19.6 getRawData as MemoryBlock

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read any available raw data.
**Notes:** This should be polled continuously (every 20ms) to avoid missing data. Read data always starts with a space and ends with a pulse.
The Lasterror property is set.

### 136.19.7 Transmit(data as MemoryBlock, codeInfo as OldPhidgetIRCodeInfoMBS)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits a code according to the settings in a CodeInto object.
**Notes:** The Lasterror property is set.

data: The code to send. Data is transmitted MSBit first. MSByte is in array index 0. LSBit is right justified, so MSBit may be in bit positions 0-7 in array index 0 depending on the bit count.
codeInfo: The CodeInfo structure specifying to to send the code. Anything left as null to select default is filled in for the user.

### 136.19.8 TransmitRaw(data as MemoryBlock, length as Integer, carrierFrequency as Integer, dutyCycle as Integer, gap as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits RAW data as a series of pulses and spaces.
**Notes:** The Lasterror property is set.

data: The data to send. The array (Int32) must start and end with a pulse and each element is a positive time in us.
length: The length of the data array. Maximum length is 1024, but streams should be kept much shorter, ie. <100ms between gaps.
carrierFrequency: The Carrier Frequency in Hz. leave as 0 for default.
dutyCycle: The Duty Cycle (10-50). Leave as 0 for default.
gap: The gap time in us. This guarantees a gap time (no transmitting) after the data is sent, but can be set

to 0.

### 136.19.9 TransmitRepeat

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits a repeat of the last transmited code.
**Notes:** The Lasterror property is set.
Depending of the CodeInfo structure, this may be a retransmission of the code itself, or there may be a special repeat code.

### 136.19.10 Events

### 136.19.11 Code(data as memoryblock, bitcount as Integer, repeat as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A code was received.
**Notes:** This is called when a code has been received that could be automatically decoded.
Data is return as an array with MSB in index 0. Bit count and a repeat flag are also returned. (Int32 values)
Repeats are detected as either the same code repeated in <100ms or as a special repeat code.

### 136.19.12 Learn(data as memoryblock, code as OldPhidgetIRCodeInfoMBS)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The learn event.
**Notes:** This is called when a code has been received for long enough to be learned.
The returned CodeInfo object can be used to retransmit the same code.

### 136.19.13 RawData(tag as memoryblock)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This is called when raw data has been read from the device.
**Notes:** Raw data always starts with a space and ends with a pulse.
tag contains 4 byte integer values.

# 136.20 class OldPhidgetLEDMBS

## 136.20.1 class OldPhidgetLEDMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetLCDMBS instead.
**Function:** The class for a phidget LED device.
**Notes:** The PhidgetLED is a component that provides a high-level programmer interface to control a PhidgetLED device connected through a USB port.

With this component, the programmer can:

- Control each led individually, On/Off and Brightness.

Subclass of the OldPhidgetMBS class.

## 136.20.2 Methods

## 136.20.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** The Lasterror property is set.
On success the handle value is not zero.

## 136.20.4 getCurrentLimit as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current limit.
**Notes:** This is for all outputs.
Lasterror is set.
See the PHIDGET_LED_CURRENT_LIMIT_* constants.

### 136.20.5 getDiscreteLED(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the brightness of an individual LED.
**Notes:** The Lasterror property is set.
Range of brightness is 0-100.

### 136.20.6 getLEDCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the number of LED positions available in this Phidget.
**Notes:** The Lasterror property is set.
This property does not return the number of LEDs actually attached.

### 136.20.7 getVoltage as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the voltage.
**Notes:** Lasterror is set.
See the PHIDGET_LED_VOLTAGE_* constants.

### 136.20.8 setCurrentLimit(currentLimit as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current limit.
**Notes:** Lasterror is set.
See the PHIDGET_LED_CURRENT_LIMIT_* constants.

### 136.20.9 setDiscreteLED(index as Integer, Brightness as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the brightness of an individual LED.
**Notes:** The Lasterror property is set.
Range of brightness is 0-100.

### 136.20.10 setVoltage(Voltage as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current voltage.
**Notes:** Lasterror is set.
See the PHIDGET_LED_VOLTAGE_* constants.

### 136.20.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHIDGET_LED_CURRENT_LIMIT_20mA | 1 | One of the limit constants. 20mA |
| PHIDGET_LED_CURRENT_LIMIT_40mA | 2 | One of the limit constants. 40mA |
| PHIDGET_LED_CURRENT_LIMIT_60mA | 3 | One of the limit constants. 60mA |
| PHIDGET_LED_CURRENT_LIMIT_80mA | 4 | One of the limit constants. 80mA |
| PHIDGET_LED_VOLTAGE_1_7V | 1 | One of the voltage constants. 1.7V |
| PHIDGET_LED_VOLTAGE_2_75V | 2 | One of the voltage constants. 2.75V |
| PHIDGET_LED_VOLTAGE_3_9V | 3 | One of the voltage constants. 3.9V |
| PHIDGET_LED_VOLTAGE_5_0V | 4 | One of the voltage constants. 5.0V |

## 136.21 class OldPhidgetManagerMBS

### 136.21.1 class OldPhidgetManagerMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetManagerMBS instead. **Function:** The Phidget manager is an interface that allows for monitoring of all phidgets connected to a system, without opening them.

### 136.21.2 Methods

### 136.21.3 Close

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the file handles for this device. You should always call this when finished with a Manager.
**Notes:** Lasterror is set.

### 136.21.4 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** The Lasterror property is set.
On success the handle value is not zero.

### 136.21.5 Device(index as Integer) as OldPhidgetMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The array of the attached devices.
**Notes:** The Lasterror property is set.
You need to call getAttachedDevices before this property is valid.

### 136.21.6 getAttachedDevices

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies the list of attached devices into the Device and Count properties.
**Notes:** Lasterror is set.

### 136.21.7 GetDeviceStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the status of the device.
**Notes:** Returns:
PHIDGET_ATTACHED 0x1
PHIDGET_NOTATTACHED 0x0

Lasterror is set.

### 136.21.8 getServerAddress(byref port as Integer) as string

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the address and port.
**Notes:** The Lasterror property is set.

### 136.21.9 getServerID as string

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the server ID.
**Notes:** The Lasterror property is set.

### 136.21.10 GetServerStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the connection status of a Webservice.
**Notes:** Returns one of the following values:
1 CONNECTED
0 NOTCONNECTED

Lasterror is set.

### 136.21.11 Open

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a connection to the local Phidget Manager.
**Notes:** Lasterror is set.

### 136.21.12 openRemote(serverID as string, password as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This method is not yet implemented and will return EPHIDGET_UNSUPPORTED.
**Notes:** Lasterror is set.

### 136.21.13 openRemoteIP(addr as string, port as Integer, password as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a connection to a remote Phidget Manager.
**Notes:** OpenRemoteIP will block until it connects to the server, which means that when it returns with EPHIDGET_OK, this means that the connection is active.

If the server is unavailable, this will return an error code. If the connection to a webservice is disrupted while in use, an error event will be thrown.

Lasterror is set.

Address is the address of the computer running the Phidget Webservice.
This can be either an IP address or a hostname.
Port specifies the port of the Webservice on the remote computer.
Password specifies the password, which is required if authentication is active on the Webservice.

If authentication is not active, this can be set to "".

### 136.21.14 Properties

### 136.21.15 Count as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of devices.
**Notes:** The Lasterror property is set.
You need to call getAttachedDevices before this property is valid.
(Read and Write property)

### 136.21.16 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal used CPhidgetManagerHandle.
**Notes:** (Read and Write property)

### 136.21.17 Lasterror as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** (Read and Write property)

### 136.21.18 Events

### 136.21.19 Attach(devicehandle as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when a device is attached.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems

described in the ThreadMBS class documentation.

### 136.21.20 Detach(devicehandle as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when a device is detached.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.21.21 Error(errorCode as Integer, errorDescription as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is used for reporting asynchronous errors –mostly related to opening remote Phidgets.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.21.22 ServerConnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when a connection to the sever has been made.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.21.23 ServerDisconnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when a connection to the server has been lost.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems

described in the ThreadMBS class documentation.

## 136.22 class OldPhidgetMBS

### 136.22.1 class OldPhidgetMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetMBS instead.
**Function:** The base class of all Phidget device classes.
**Notes:** Check phidgets.com for information on this devices.
http://www.phidgets.com/
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.1
- Rewritten Phidgets Plugin

### 136.22.2 Methods

### 136.22.3 Close

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the file handles for this device.
**Notes:** You can call this while reads and writes are still outstanding; they will fail quickly.
Lasterror is set.
The destructor does a close if you forget it.

### 136.22.4 disableLogging

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disables logging on the library.
**Notes:** The Lasterror property is set.

### 136.22.5 enableLogging(level as Integer, outputFile as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables logging on the library.
**Notes:** The Lasterror property is set.
Data is written to the file specified with the output file path.
Not sure how the path must be specified. This is depending on the library used.

The levels:

| | |
|---|---|
| PHIDGET_LOG_CRITICAL | 1 |
| PHIDGET_LOG_ERROR | 2 |
| PHIDGET_LOG_WARNING | 3 |
| PHIDGET_LOG_DEBUG | 4 |
| PHIDGET_LOG_INFO | 5 |
| PHIDGET_LOG_VERBOSE | 6 |

### 136.22.6 GetDeviceClass as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the class of a Phidget.
**Notes:** See the PHIDCLASS_* constants.

### 136.22.7 GetDeviceID as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the device ID of a Phidget.
**Notes:** See the PHIDID_* constants.

### 136.22.8 GetDeviceLabel as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the Label for the Phidget.
**Notes:** The Label is a user programmable serial number stored on the Phidget - it can be used to implement a serial numbering scheme, or describe the functionality of the Phidget in a specific application.

Lasterror is set.

### 136.22.9 GetDeviceName as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns string describing the name of the Phidget.
**Notes:** For example, "Phidget InterfaceKit 8/8/8", "Phidget InterfaceKit 0/0/4", etc.
The Lasterror property is set.

### 136.22.10 GetDeviceStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the status of the device.
**Notes:** Returns:
PHIDGET_ATTACHED 0x1
PHIDGET_NOTATTACHED 0x0

Lasterror is set.

### 136.22.11 GetDeviceType as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a string describing the type of the Phidget.
**Notes:** All PhidgetInterfaceKits will return "PhidgetInterfaceKit", PhidgetRFID returns "PhidgetRFID" and so on.

Lasterror is set.

### 136.22.12 GetDeviceVersion as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a string describing the Device Version of the Phidget.
**Notes:** Lasterror is set.

### 136.22.13 GetErrorDescription(errorcode as Integer) as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a string describing the ErrorCode passed.
**Notes:** Lasterror is set.

The list of the error codes:

0 EPHIDGET_OK
1 EPHIDGET_NOTFOUND
2 EPHIDGET_NOMEMORY
3 EPHIDGET_UNEXPECTED
4 EPHIDGET_INVALIDARG
5 EPHIDGET_NOTATTACHED
6 EPHIDGET_INTERRUPTED
7 EPHIDGET_INVALID
8 EPHIDGET_NETWORK
9 EPHIDGET_UNKNOWNVAL
10 EPHIDGET_BADPASSWORD
11 EPHIDGET_UNSUPPORTED
12 EPHIDGET_DUPLICATE
13 EPHIDGET_TIMEOUT
14 EPHIDGET_OUTOFBOUNDS
15 EPHIDGET_EVENT
16 EPHIDGET_NETWORK_NOTCONNECTED
17 EPHIDGET_WRONGDEVICE

### 136.22.14 GetLibraryVersion as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** returns a string providing the version number of the API library.
**Notes:** Lasterror is set.

### 136.22.15 GetSerialNumber as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the unique serial number of this Phidget.
**Notes:** Lasterror is set.

This number is set during manufacturing, and is unique across all Phidgets.

### 136.22.16 GetServerAddress(byref port as Integer) as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the IP Address and Port of a remote Phidget device.
**Notes:** This should only be called on Phidgets that were opened with openRemote or openRemoteIP.
Lasterror is set.

### 136.22.17 GetServerID as string

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the Server ID for a remote Phidget device.
**Notes:** This method is not yet implemented and will return EPHIDGET_UNSUPPORTED.

This should only be called on Phidgets that were opened with openRemote or openRemoteIP.
The Lasterror property is set.

### 136.22.18 GetServerStatus as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer indicating the connection status of a Webservice.
**Notes:** Returns one of the following values:
1 CONNECTED
0 NOTCONNECTED

Lasterror is set.

### 136.22.19 Open(serialNumber as Integer = -1)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a connection between an PhidgetMBS object and a physical Phidget.
**Example:**

```
dim p as new PhidgetInterfaceKitMBS

p.open -1
p.waitForAttachment 0
// use the phidget
```

**Notes:** Open is pervasive. What this means is that you can call open on a device before it is plugged in, and keep the device opened across device dis- and re-connections.
Open is Asynchronous. What this means is that open will return immediately - before the device being opened is actually available.
What this means is that you need to either poll getDeviceStatus for an attached status, or handle the attach event, in order to wait for the device to become available before trying to use it.

SerialNumber specifies the desired serial number, allowing the call to open a specific Phidget. Specifying -1 for the serial number will cause it to open the first available device.
Lasterror is set.

### 136.22.20 OpenLabel(label as string = "")

MBS Phidgets Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a Phidget by label.
**Notes:** Available with phidget library from December 2011.
Labels can be up to 10 characters (UTF-8 encoding). Specify "" to open any.
Lasterror is set.

### 136.22.21 openLabelRemote(label as string, serverID as string, password as string = "")

MBS Phidgets Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a Phidget remotely by ServerID. Note that this requires Bonjour (mDNS) to be running on both the host and the server.
**Notes:** Available with phidget library from December 2011.
label: The label string. Labels can be up to 10 characters (UTF-8 encoding). Specify "" to open any.
serverID: Server ID. Specify "" to open any.
password: The Password. Can be "" if the server is running unsecured.
Lasterror is set.

### 136.22.22 openLabelRemoteIP(label as string, addr as string, port as Integer, password as string = "")

MBS Phidgets Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens a Phidget remotely by address and port, with optional label.
**Notes:** Available with phidget library from December 2011.
Lasterror is set.

label: Label string. Labels can be up to 10 characters (UTF-8 encoding). Specify "" to open any.
address: The Address. This can be a hostname or IP address.
port: The Port number. Default is 5001.
password: The Password. Can be NULL if the server is running unsecured.

### 136.22.23 openRemote(serial as Integer, serverID as string, password as string = "")

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This method is not yet implemented and will return EPHIDGET_UNSUPPORTED.
**Notes:** Lasterror is set.

### 136.22.24 openRemoteIP(serial as Integer, addr as string, port as Integer, password as string = "")

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to open a connection to a Phidget Webservice, and waits for a phidget on that connection.
**Notes:** OpenRemoteIP will block until it connects to the server, which means that when it returns with EPHIDGET_OK, this means that the connection is active. If the server is unavailable, this will return an error code. If the connection to a webservice is disrupted while in use, an error event will be thrown, and it is recommended that an error event listener be registered for this reason.
As with the regular open, openRemoteIP is pervasive and asynchronous –so long as the connection to the Webservice remains active.
SerialNumber specifies the desired serial number, allowing the call to open a specific Phidget. Specifying -1 for the serial number will cause it to open the first available device.
Address is the address of the computer running the Phidget Webservice. This can be either an IP address

or a hostname.
Port specifies the port of the Webservice on the remote computer.
Password specifies the password, which is required if authentication is active on the Webservice. If authentication is not active, this can be set to "".
Lasterror is set.

### 136.22.25 PUNK_DBL as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value used for unknown values (Double).

### 136.22.26 PUNK_FLT as single

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The value used for unknown values (Float).

### 136.22.27 SetDeviceLabel(label as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a Label –a string up to 10 characters long –to the Phidget associated with this handle.
**Notes:** SetDeviceLabel may not be available on all operating systems.
Currently it is available on MacOS X, Linux, and Windows CE.
Calling this on Windows will return EPHIDGET_UNSUPPORTED
Lasterror is set.

### 136.22.28 waitForAttachment(milliseconds as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Waits the given time till a device has been attached.
**Example:**

```
dim p as new PhidgetInterfaceKitMBS

p.open -1
```

```
p.waitForAttachment 0
// use the phidget
```

**Notes:** Lasterror is set to EPHIDGET_OK when the device is available, or to EPHIDGET_TIMEOUT if the device is not attached before the timeout expires.
Timeouts below about 300ms cannot be trusted because of initialization time, and sometimes an even larger timeout is required –ie. the first time a device is plugged into a windows machine.
A timeout of 0 is infinite.
This function can be used in conjunction with (or instead of) an attach event handler.
The Lasterror property is set.

### 136.22.29 Properties

### 136.22.30 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal used CPhidgetHandle.
**Notes:** (Read and Write property)

### 136.22.31 Lasterror as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:**

(Read and Write property)

### 136.22.32 Events

### 136.22.33 Attach

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when a device is attached.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems

| | | |
|---|---|---|
| EPHIDGET_NOTFOUND | 1 | "A Phidget matching the type and or serial number could not be found." This indicates that a Phidget being searched for (ie. via Open) could not be located. |
| EPHIDGET_NOMEMORY | 2 | "Memory could not be allocated." This indicates that there is not enough memory for the Phidgets library to create the object requested. |
| EPHIDGET_UNEXPECTED | 3 | "Unexpected Error. Contact Phidgets Inc. for support." Indicates that a serious error has occurred, or a severe bug exists within the library. |
| EPHIDGET_INVALIDARG | 4 | "Invalid argument passed to function." An argument is not valid to the requirements of the function. In many cases this refers to an invalid Phidget Handle. |
| EPHIDGET_NOTATTACHED | 5 | "Phidget not physically attached." Indicates the function requires an attached Phidget to operate. |
| EPHIDGET_INTERRUPTED | 6 | "Read/Write operation was interrupted" An error occurred while attempting to communicate with the Phidget over USB. |
| EPHIDGET_INVALID | 7 | "The Error Code is not defined." Indicates that a serious error has occurred, or a severe bug exists within the library. |
| EPHIDGET_NETWORK | 8 | "Network Error." Attempting to communicate with the Phidget via the Network has failed. |
| EPHIDGET_UNKNOWNVAL | 9 | "Value is Unknown (State not yet received from device)." A query to a value on the Phidget device has failed as the Phidget has not returned data yet. |
| EPHIDGET_BADPASSWORD | 10 | "Authorization Failed." The remote access method has failed it's authorization. |
| EPHIDGET_UNSUPPORTED | 11 | "Not Supported" This is a bad or unsupported function call. |
| EPHIDGET_DUPLICATE | 12 | "Duplicated request" A previous request to the device has already performed this function, and it is not valid to perform twice. |
| EPHIDGET_TIMEOUT | 13 | "Given timeout has been exceeded" A synchronous request has failed it's time limits. Usually this is returned when attempting WaitForConnect. |
| EPHIDGET_OUTOFBOUNDS | 14 | "Index out of Bounds" An index into the function is above or below the recognized bounds of the device. ie. when accessing a single sensor on a multisensor device. |
| EPHIDGET_EVENT | 15 | "A non-null error code was returned from an event handler" An error code was passed to a function handler. Note that correct decoding of the actual error would have to be done within the event handler itself. |
| EPHIDGET_NETWORK_NOTCONNECTED | 16 | "A connection to the server does not ex-ist." An attempt to connect to a remotely connected device or service failed due to network connectivity problems. |
| EPHIDGET_WRONGDEVICE | 17 | "Function is not applicable for this device." The wrong type of device handle was passed as an argument to a function. (ie. calling CPhidgetWeightSensor_getWeight with an Accelerometer handle) |

described in the ThreadMBS class documentation.

### 136.22.34 Detach

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when a device is detached.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.22.35 Error(errorCode as Integer, errorDescription as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

This event is used for reporting asynchronous errors - mostly related to opening remote Phidgets.
**Notes:**

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.22.36 ServerConnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is used for opening Phidgets remotely, and is called when a connection to the sever has been made.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.22.37 ServerDisconnect

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is used for opening Phidgets remotely, and is called when a connection to the server has been lost.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.22.38 Wakeup

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when the device wakes up.

### 136.22.39 WillSleep

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when the device will go to sleep.

### 136.22.40 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| EPHIDGET_BADPASSWORD | 10 | One of the error constants. Authorization exception. "No lo PASSWORD" |
| EPHIDGET_BADVERSION | 19 | One of the error constants. Version Mismatch. "No longer u SION" |
| EPHIDGET_CLOSED | 18 | One of the error constants. Phidget Closed. "Phidget handl |
| EPHIDGET_DUPLICATE | 12 | One of the error constants. Duplicate request. "Duplicated r |
| EPHIDGET_EVENT | 15 | One of the error constants. Event. "A non-null error code w is not currently used. |
| EPHIDGET_INTERRUPTED | 6 | One of the error constants. Interrupted. "Read/Write opera rently used. |
| EPHIDGET_INVALID | 7 | One of the error constants. Invalid error code. "The Error C |
| EPHIDGET_INVALIDARG | 4 | One of the error constants. Invalid argument. "Invalid argum |
| EPHIDGET_NETWORK | 8 | One of the error constants. Network. "Network Error." |
| EPHIDGET_NETWORK_NOTCONNECTED | 16 | One of the error constants. Network not connected. "A conn |
| EPHIDGET_NOMEMORY | 2 | One of the error constants. No memory. "Memory could not |
| EPHIDGET_NOTATTACHED | 5 | One of the error constants. Phidget not attached. "Phidget |
| EPHIDGET_NOTFOUND | 1 | One of the error constants. Phidget not found. "A Phidget r not be found." |
| EPHIDGET_OK | 0 | One of the error constants. Function completed successfully. |
| EPHIDGET_OUTOFBOUNDS | 14 | One of the error constants. Out of bounds. "Index out of Bo |
| EPHIDGET_TIMEOUT | 13 | One of the error constants. Timeout. "Given timeout has be |
| EPHIDGET_UNEXPECTED | 3 | One of the error constants. Unexpected. "Unexpected Error |
| EPHIDGET_UNKNOWNVAL | 9 | One of the error constants. Value unknown. "Value is Unk not yet set by user)." |
| EPHIDGET_UNSUPPORTED | 11 | One of the error constants. Unsupported. "Not Supported." |
| EPHIDGET_WRONGDEVICE | 17 | One of the error constants. Wrong device. "Function is not |
| PHIDCLASS_ACCELEROMETER | 2 | One of the HID class constants. |
| PHIDCLASS_ADVANCEDSERVO | 3 | One of the HID class constants. |
| PHIDCLASS_ANALOG | 22 | One of the HID class constants. |
| PHIDCLASS_BRIDGE | 23 | One of the HID class constants. |
| PHIDCLASS_ENCODER | 4 | One of the HID class constants. |
| PHIDCLASS_FREQUENCYCOUNTER | 21 | One of the HID class constants. |
| PHIDCLASS_GPS | 5 | One of the HID class constants. |
| PHIDCLASS_INTERFACEKIT | 7 | One of the HID class constants. |
| PHIDCLASS_IR | 19 | One of the HID class constants. |
| PHIDCLASS_LED | 8 | One of the HID class constants. |
| PHIDCLASS_MOTORCONTROL | 9 | One of the HID class constants. |
| PHIDCLASS_PHSENSOR | 10 | One of the HID class constants. |

## 136.23 class OldPhidgetMissingFunctionExceptionMBS

### 136.23.1 class OldPhidgetMissingFunctionExceptionMBS

MBS Phidgets Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetMissingFunctionExceptionMBS instead. **Function:** The class used to report that a given phidget function was not loaded from the library.
**Notes:** Check the message property.
Subclass of the RuntimeException class.

## 136.24 class OldPhidgetMotorControlMBS

### 136.24.1 class OldPhidgetMotorControlMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetDCMotorMBS instead. **Function:** The class for the phidget motor control device.
**Notes:** The PhidgetMotorControl is a component that provides a high-level programmer interface to control a PhidgetMotorControl device connected through a USB port.

With this component, the programmer can:

- Control direction, and start and stop DC motors.
- Control the velocity and acceleration of each DC motor.
- Read the limit switch.

Subclass of the OldPhidgetMBS class.

### 136.24.2 Methods

### 136.24.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
Lasterror is set.

### 136.24.4 getAcceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current acceleration.
**Notes:** Note that this value defaults to 10 upon initialisation.
The Lasterror property is set.

### 136.24.5 getAccelerationMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum acceleration supported by a motor.
**Notes:** The Lasterror property is set.

### 136.24.6 getAccelerationMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum acceleration supported by a motor.
**Notes:** The Lasterror property is set.

### 136.24.7 getBackEMF(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Back EMF voltage for a motor.
**Notes:** Lasterror is set.

### 136.24.8 getBackEMFSensingState(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Back EMF sensing state for a motor.
**Notes:** Lasterror is set.

### 136.24.9 getBraking(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Braking value for a motor.
**Notes:** Lasterror is set.
Returns the braking value, in percent.

### 136.24.10 getCurrent(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** get the current motor current consumption.
**Notes:** The Lasterror property is set.

### 136.24.11 getEncoderCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of encoder inputs supported by this board.
**Notes:** Lasterror is set.

### 136.24.12 getEncoderPosition(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the position of an encoder. This position starts at 0 every time the phidget is opened.
**Notes:** Lasterror is set.

### 136.24.13 getInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of digital inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.24.14 getInputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of a digital input.
**Notes:** The Lasterror property is set.

### 136.24.15 getMotorCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of motors supported by this controller.
**Notes:** The Lasterror property is set.

### 136.24.16 getRatiometric as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the ratiometric state.
**Notes:** Lasterror is set.

### 136.24.17 getSensorCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of sensor inputs supported by this board.
**Notes:** Lasterror is set.

### 136.24.18 getSensorRawValue(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the raw value of a sensor (12-bit).
**Notes:** Lasterror is set.

### 136.24.19 getSensorValue(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the value of a sensor.
**Notes:** Lasterror is set.

### 136.24.20 getSupplyVoltage as Double

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Supply voltage for the motors.
**Notes:** This could be higher then the actual supply voltage.
Returns the supply voltage, in volts.
Lasterror is set.

### 136.24.21 getVelocity(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current velocity of a motor.
**Notes:** The Lasterror property is set.

### 136.24.22 setAcceleration(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the Motor's Maximum accesleration.
**Notes:** Valid values are 0-100.
The Lasterror property is set.

### 136.24.23 setBackEMFSensingState(index as Integer, EMFState as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the Back EMF sensing state for a motor.
**Notes:** Lasterror is set.

### 136.24.24 setBraking(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the Braking value for a motor.
**Notes:** This is applied when velocity is 0. Default is 0%.

value: The braking value, in percent.
Lasterror is set.

### 136.24.25 setEncoderPosition(index as Integer, position as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the encoder position.
**Notes:** This can be used to set the position to a known value, and should only be called when the encoder is not moving.
Lasterror is set.

### 136.24.26 setRatiometric(value as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the ratiometric state.
**Notes:** This control the voltage reference used for sampling the analog sensors.
Lasterror is set.

### 136.24.27 setVelocity(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the velocity of a motor.
**Notes:** The Lasterror property is set.

### 136.24.28 Events

### 136.24.29 BackEMFUpdated(index as Integer, voltage as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called at a constant rate; every 16ms, when back EMF sensing is enabled for that motor.

### 136.24.30 CurrentChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The current motor current consumption changed.
**Notes:** Index: Index of the Motor firing the Event
Value: Value of the Motor Current

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.24.31 CurrentUpdated(index as Integer, current as Double)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The current update event.
**Notes:** This is called at a constant rate; every 8ms.

### 136.24.32 EncoderPositionChanged(index as Integer, time as Integer, positionChange as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The encoder position change event.
**Notes:** This is called when the encoder position changes.

### 136.24.33 EncoderPositionUpdated(index as Integer, positionChange as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The encoder position update event.
**Notes:** This is called at a constant rate; every 8ms, whether the encoder position has changed or not.

### 136.24.34 InputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The input value changed.
**Notes:** Index: Index of the Input firing the Event
State: State of the Input

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.24.35 SensorUpdated(index as Integer, sensorValue as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The sensor update event.
**Notes:** This is called at a constant rate; every 8ms.

### 136.24.36 VelocityChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when the velocity changes.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.25 class OldPhidgetNMEADataMBS

### 136.25.1 class OldPhidgetNMEADataMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** NMEA Data Structure. Contains a set of supported NMEA sentences.

### 136.25.2 Properties

### 136.25.3 GGA as OldPhidgetGPGGAMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** GPS Fix and position data.
**Notes:** (Read and Write property)

### 136.25.4 GSA as OldPhidgetGPGSAMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** GPS DOP and active satellites.
**Notes:** (Read and Write property)

### 136.25.5 GSV as OldPhidgetGPGSVMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Detailed satellite information.
**Notes:** (Read and Write property)

### 136.25.6 RMC as OldPhidgetGPRMCMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Recommended minimum data.
**Notes:** (Read and Write property)

### 136.25.7 VTG as OldPhidgetGPVTGMBS

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Heading and Speed over the Ground.
**Notes:** (Read and Write property)

## 136.26 class OldPhidgetNotInitialzedExceptionMBS

### 136.26.1 class OldPhidgetNotInitialzedExceptionMBS

MBS Phidgets Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetNotInitialzedExceptionMBS instead. **Function:** The class used to report that a given phidget object was not initialized properly.
**Notes:** Check the message property.
Subclass of the RuntimeException class.

# 136.27 class OldPhidgetPHSensorMBS

## 136.27.1 class OldPhidgetPHSensorMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetPHSensorMBS instead. **Function:** The class for a phidget PH sensor device.
**Notes:** The PhidgetPHSensor is a component that provides a high-level programmer interface to control a PhidgetPHSensor device connected through a USB port.

With this component, the programmer can:

- Read the pH of a liquid with a pH sensor.

Subclass of the OldPhidgetMBS class.

## 136.27.2 Methods

## 136.27.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

## 136.27.4 getPH as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current pH.
**Notes:** The Lasterror property is set.
Valid range is -10 to 10.
Note that this value defaults to -20. Applications not wishing to encounter this value should use Change Handlers instead of polling the device for data.

### 136.27.5 getPHChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the amount of change that should exist between the last reported value and the current value before an PHChange event is fired.
**Notes:** The Lasterror property is set.

### 136.27.6 getPHMax as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum PH that the sensor could report.
**Notes:** The Lasterror property is set.

### 136.27.7 getPHMin as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum PH that the sensor could report.
**Notes:** The Lasterror property is set.

### 136.27.8 getPotential as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current potential in volts.
**Notes:** The Lasterror property is set.
Range is 0-5v.
2.5v corresponds to a pH of 7.0.

### 136.27.9 getPotentialMax as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum potential that can be sensed.
**Notes:** The Lasterror property is set.

### 136.27.10 getPotentialMin as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum potential that can be sensed.
**Notes:** The Lasterror property is set.

### 136.27.11 setPHChangeTrigger(value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the amount of change that should exist between the last reported value and the current value before an OnPHChange event is fired.
**Notes:** The Lasterror property is set.

### 136.27.12 setTemperature(value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the ambient temperature of the PH sensor for increased accuracy.
**Notes:** This value defaults to 20 degrees celcius which is applicable for most applications.
The Lasterror property is set.

### 136.27.13 Events

### 136.27.14 PHChanged(value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called if the pH changes by more than the PH trigger.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

# 136.28 class OldPhidgetRFIDMBS

## 136.28.1 class OldPhidgetRFIDMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetRFIDMBS instead.
**Function:** The class for a phidget RFID device.
**Notes:** The PhidgetRFID is a component that provides a high-level programmer interface to control a PhidgetRFID device connected through a USB port.
With this component, the programmer can:

- Read Radio Frequency Identification tags.

Radio Frequency Identification or RFID, is a non-contact identification technology which uses a reader to read data stored on low cost tags.

The particular instance of the technology we use stores a 40-bit number on the tag. Every tag that is purchased from Phidgets Inc. is guaranteed unique.

When a RFID tag is read, the component returns the unique number contained in the RFID tag.
Subclass of the OldPhidgetMBS class.

## 136.28.2 Methods

## 136.28.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

## 136.28.4 getAntennaOn as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of the antenna.

**Notes:** The Lasterror property is set.

### 136.28.5 getLastTag(m as memoryblock) as memoryblock

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Stores the last tag in a memoryblock.
**Notes:** You need to pass in a memoryblock of the correct size for your tags.
For convenience the memoryblock is returned.

The Lasterror property is set.

### 136.28.6 getLEDOn as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of the onboard LED.
**Notes:** The Lasterror property is set.

### 136.28.7 getOutputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of outputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.28.8 getOutputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of an output.
**Notes:** The Lasterror property is set.

### 136.28.9 getTagStatus as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the tag present status.
**Notes:** This is whether or not a tag is being read by the reader.
The Lasterror property is set.

### 136.28.10 setAntennaOn(value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state of the antenna.
**Notes:** Note that the antenna must be enabled before tags will be read.
The Lasterror property is set.

### 136.28.11 setLEDOn(value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state of the onboard LED.
**Notes:** The Lasterror property is set.

### 136.28.12 setOutputState(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state of an output.
**Notes:** The Lasterror property is set.

### 136.28.13 Events

### 136.28.14 OutputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called if an output changes.

**Notes:** Index: Index of the Output firing the Event
Value: State of the Output.

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.28.15 Tag(tag as memoryblock)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An RFID Tag is read.
**Notes:** Current plugins expect a maximum tag size of 20 bytes. Not all 20 bytes may be used for the given tag.

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.28.16 TagLost(tag as memoryblock)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A RFID Tag is removed from the field.
**Notes:** Current plugins expect a maximum tag size of 20 bytes. Not all 20 bytes may be used for the given tag.

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.29 Globals

### 136.29.1 LoadPhidgetFrameworkMBS(framework as folderitem) as boolean

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the phidget framework.
**Notes:** Returns true on success and false on failure.
Path a folderitem for the phidget.framework in /library/frameworks.
Deprecated in plugin version 10.4.

### 136.29.2 LoadPhidgetLibraryMBS(file as folderitem) as boolean

MBS Phidgets Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the Phidgets shared library.
**Notes:** Returns true on success and false on failure.

Loads a Windows DLL, a Linux shared library, a Mac OS X shared library or a Mac OS X framework from the given path.
See also:

- 136.29.3 LoadPhidgetLibraryMBS(path as string) as boolean 18828

### 136.29.3 LoadPhidgetLibraryMBS(path as string) as boolean

MBS Phidgets Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the Phidgets shared library.
**Notes:** Returns true on success and false on failure.
Path can be an absolute, a relative or just a file name.

Loads a Windows DLL, a Linux shared library, a Mac OS X shared library or a Mac OS X framework from the given path.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3

See also:

• 136.29.2 LoadPhidgetLibraryMBS(file as folderitem) as boolean 18828

### 136.29.4 LoadPhidgetLinuxLibraryMBS(path as string) as boolean

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the phidget library.
**Notes:** Returns true on success and false on failure.
Pass in the path to a .so file.
Deprecated in plugin version 10.4.

### 136.29.5 LoadPhidgetWindowsDLLMBS(dllpath as string) as boolean

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the windows dll.
**Notes:** Returns true on success and false on failure.
Path can be an absolute, a relative or just a file name.
Deprecated in plugin version 10.4.

## 136.30 class OldPhidgetServoMBS

### 136.30.1 class OldPhidgetServoMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetRCServoMBS instead. **Function:** The class for a phidget servo device.
**Notes:** The PhidgetServo is a component that provides a high-level programmer interface to control a PhidgetServo device connected through a USB port.

With this component, the programmer can:

- Set the desired position for a servo motor, ranging from 0 to 180 degrees.

Subclass of the OldPhidgetMBS class.

### 136.30.2 Methods

### 136.30.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

### 136.30.4 getEngaged(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the engaged state of a motor. This is whether the motor is powered or not.
**Notes:** The Lasterror property is set.

index: The motor index.

### 136.30.5 getMotorCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of motors supported by this controller
**Notes:** The Lasterror property is set.

### 136.30.6 getPosition(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current position of a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.30.7 getPositionMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum position that a motor can be set to.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.30.8 getPositionMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum position that a motor can be set to.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.30.9 getServoType(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the servo type of a motor.
**Notes:** The Lasterror property is set.
For the value, check the PHIDGET_SERVO_* constants.

### 136.30.10 setEngaged(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the engaged state of a motor. This is whether the motor is powered or not.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.30.11 setPosition(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current position of a motor.
**Notes:** The Lasterror property is set.

index: The motor index.
position: The motor position.

### 136.30.12 setServoParameters(index as Integer, min_us as Double, max_us as Double, degrees as Double)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the servo parameters of a motor.
**Notes:** The Lasterror property is set.

| | |
|---|---|
| index | The motor index. |
| min_us | The minimum supported PCM in microseconds. |
| max_us | The maximum supported PCM in microseconds. |
| degrees | The degrees of rotation defined by the given PCM range. |

### 136.30.13 setServoType(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the servo type of a motor.
**Notes:** The Lasterror property is set.
For the value, check the PHIDGET_SERVO_* constants.

### 136.30.14 Events

### 136.30.15 MotorPositionChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called if the motor position is changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.31 class OldPhidgetSpatialEventDataMBS

### 136.31.1 class OldPhidgetSpatialEventDataMBS

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetSpatialMBS instead. **Function:** The class for event data on a spatial device.
**Notes:** Timestamped position data returned by the PhidgetSpatialMBS.SpatialData event.

### 136.31.2 Properties

### 136.31.3 TimestampMicroseconds as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The microseconds part of the Hardware timestamp.
**Notes:** (Read and Write property)

### 136.31.4 TimestampSeconds as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The seconds part of the Hardware timestamp.
**Notes:** (Read and Write property)

### 136.31.5 acceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Acceleration data for up to 3 axes.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

### 136.31.6 angularRate(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Angular rate data (Gyroscope) for up to 3 axes.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

### 136.31.7 magneticField(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Magnetic field data (Compass) for up to 3 axes.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

## 136.32 class OldPhidgetSpatialMBS

### 136.32.1 class OldPhidgetSpatialMBS

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetSpatialMBS instead. **Function:** The class to control the spatial phidget device.
**Notes:** Calls specific to the Phidget Spatial. See the product manual for more specific API details, supported functionality, units, etc.
Subclass of the OldPhidgetMBS class.

### 136.32.2 Methods

### 136.32.3 Constructor

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
Lasterror is set.

### 136.32.4 getAcceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current acceleration of an axis.
**Notes:** index: The acceleration index.
Returns the acceleration in gs.
Lasterror is set.

### 136.32.5 getAccelerationAxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of acceleration axes supplied by this board.

### 136.32.6 getAccelerationMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum accleration supported by an axis.
**Notes:** index: The acceleration index.
Lasterror is set.

### 136.32.7 getAccelerationMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum acceleration supported by an axis.
**Notes:** index: The acceleration index.

### 136.32.8 getAngularRate(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current angular rate of an axis.
**Notes:** Returns the angular rate in degrees/second.
index: The angular rate index.
Lasterror is set.

### 136.32.9 getAngularRateMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum angular rate supported by an axis.
**Notes:** index: The angular rate index.
Lasterror is set.

### 136.32.10 getAngularRateMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum angular rate supported by an axis.
**Notes:** index: The angular rate index.
Lasterror is set.

### 136.32.11 getCompassAxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of compass axes supplied by this board.
**Notes:** Lasterror is set.

### 136.32.12 getDataRate as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the data rate in milliseconds.
**Notes:** Lasterror is set.

### 136.32.13 getDataRateMax as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum supported data rate in milliseconds.
**Notes:** Lasterror is set.

### 136.32.14 getDataRateMin as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum supported data rate in milliseconds.
**Notes:** Lasterror is set.

### 136.32.15 getGyroAxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of gyroscope axes supplied by this board.
**Notes:** Lasterror is set.

### 136.32.16 getMagneticField(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current magnetic field stregth of an axis.
**Notes:** index: The magnetic field index.
Returns the magnetic field strength in Gauss.
Lasterror is set.

### 136.32.17 getMagneticFieldMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum magnetic field stregth supported by an axis.
**Notes:** index: The magnetic field index.
Lasterror is set.

### 136.32.18 getMagneticFieldMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum magnetic field stregth supported by an axis.
**Notes:** index: The magnetic field index.
Lasterror is set.

### 136.32.19 resetCompassCorrectionParameters

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the compass correction factors.
**Notes:** Magnetic field data will be presented directly as reported by the sensor.
Lasterror is set.

### 136.32.20 setCompassCorrectionParameters(magField as Double, offset0 as Double, offset1 as Double, offset2 as Double, gain0 as Double, gain1 as Double, gain2 as Double, T0 as Double, T1 as Double, T2 as Double, T3 as Double, T4 as Double, T5 as Double)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the compass correction factors. This can be used to correcting any sensor errors, including hard and soft iron offsets and sensor error factors.
**Notes:** Lasterror is set.

magField: Local magnetic field strength.
offset0: Axis 0 offset correction.
offset1: Axis 1 offset correction.
offset2: Axis 2 offset correction.
gain0: Axis 0 gain correction.
gain1: Axis 1 gain correction.
gain2: Axis 2 gain correction.
T0: Non-orthogonality correction factor 0.
T1: Non-orthogonality correction factor 1.
T2: Non-orthogonality correction factor 2.
T3: Non-orthogonality correction factor 3.
T4: Non-orthogonality correction factor 4.
T5: Non-orthogonality correction factor 5.

### 136.32.21 setDataRate(milliseconds as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the data rate in milliseconds.
**Notes:** Lasterror is set.
Note that data at rates faster then 8ms will be delivered to events as an array of data.

### 136.32.22 zeroGyro

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Zeroes the gyroscope.
**Notes:** This takes about two seconds and the gyro zxes will report 0 during the process.
This should only be called when the board is not moving.

Lasterror is set.

### 136.32.23 Events

### 136.32.24 SpatialData(data() as OldPhidgetSpatialEventDataMBS, dataCount as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when new data has been received.
**Notes:** This is called at getDataRate, up to 8ms, for faster then 8ms data, multiple sets of data are supplied in a single event.
Lasterror is set.

## 136.33 class OldPhidgetStepperMBS

### 136.33.1 class OldPhidgetStepperMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetStepperMBS instead. **Function:** A class for a phidget stepper device.
**Notes:** On the time the plugin was written the phidget documentation did not include this class so the documentation here is limited.
Subclass of the OldPhidgetMBS class.

### 136.33.2 Methods

### 136.33.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

### 136.33.4 getAcceleration(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the acceleration value.
**Notes:** The Lasterror property is set.

### 136.33.5 getAccelerationMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum acceleration supported by a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.6 getAccelerationMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum acceleration supported by a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.7 getCurrent(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current value.
**Notes:** The Lasterror property is set.

### 136.33.8 getCurrentLimit(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum position that a motor can go to.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.9 getCurrentMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum current limit.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.10 getCurrentMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum current limit.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.11 getCurrentPosition(index as Integer) as int64

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current position of a motor.
**Notes:** The Lasterror property is set.

### 136.33.12 getEngaged(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the engaged state of a motor. This is whether the motor is powered or not.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.13 getInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of digital inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.33.14 getInputState(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of a digital input.
**Notes:** The Lasterror property is set.

### 136.33.15 getMotorCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of motors supported by this controller.
**Notes:** The Lasterror property is set.

### 136.33.16 getPositionMax(index as Integer) as int64

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum velocity that can be set for a motor.
**Notes:** The Lasterror property is set.

### 136.33.17 getPositionMin(index as Integer) as int64

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum position that a motor can go to.
**Notes:** The Lasterror property is set.

### 136.33.18 getStopped(index as Integer) as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the stopped state of a motor. This is true when the motor is not moving and there are no outstanding commands.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.19 getTargetPosition(index as Integer) as int64

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last set target position of a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.20 getVelocity(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current velocity of a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.21 getVelocityLimit(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the last set velocity limit for a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.22 getVelocityMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum velocity that can be set for a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.23 getVelocityMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum velocity that can be set for a motor.
**Notes:** The Lasterror property is set.

### 136.33.24 setAcceleration(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the acceleration.
**Notes:** The Lasterror property is set.

### 136.33.25 setCurrentLimit(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current limit for a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.26 setCurrentPosition(index as Integer, value as int64)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the current position of a motor.
**Notes:** This will not move the motor, just update the position value.

index: The motor index.
value: The position.

The Lasterror property is set.

### 136.33.27 setEngaged(index as Integer, value as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the engaged state of a motor. This is whether the motor is powered or not.
**Notes:** index: The motor index.
value: The engaged state. Possible values are true and false.

The Lasterror property is set.

### 136.33.28 setTargetPosition(index as Integer, value as int64)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the target position of a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.29 setVelocityLimit(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the velocity limit for a motor.
**Notes:** index: The motor index.

The Lasterror property is set.

### 136.33.30 Events

### 136.33.31 CurrentChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The current value changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems

described in the ThreadMBS class documentation.

### 136.33.32 InputChanged(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The input value changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.33.33 ServoChanged(index as Integer, value as int64)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The servo value changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.33.34 VelocityChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when the velocity changes.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

## 136.34 class OldPhidgetTemperatureSensorMBS

### 136.34.1 class OldPhidgetTemperatureSensorMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetTemperatureSensorMBS instead. **Function:** The class for a phidget temperature sensor.
**Notes:** The PhidgetTemperatureSensor is a component that provides a high-level programmer interface to control a PhidgetTemperatureSensor device connected through a USB port.

With this component, the programmer can:

- Read the temperature of Thermocouple device.
- Read cold junction temperature.
- Get notification of temperature change.

Subclass of the OldPhidgetMBS class.

### 136.34.2 Methods

### 136.34.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

### 136.34.4 getAmbientTemperature as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the ambient (board) temperature.
**Notes:** The Lasterror property is set.

### 136.34.5 getAmbientTemperatureMax as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum temperature that the ambient onboard temperature sensor can measure.
**Notes:** The Lasterror property is set.

### 136.34.6 getAmbientTemperatureMin as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum temperature that the ambient onboard temperature sensor can measure.
**Notes:** The Lasterror property is set.

### 136.34.7 getPotential(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the potential value for the temperature sender with the given index.
**Notes:** The Lasterror property is set.

### 136.34.8 getPotentialMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum potential that a thermocouple input can measure.
**Notes:** The Lasterror property is set.

### 136.34.9 getPotentialMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum potential that a thermocouple input can measure.
**Notes:** The Lasterror property is set.

### 136.34.10 getTemperature(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current temperature in Celsius or Fahrenheit (depending on UseImperial property).
**Notes:** Index = 0 returns the temperature of the cold junction.
Index = 1 returns the temperatrue of the thermocouple.

Note that this value defaults to -500. Applications that do not wish to see this value should use Change Handlers instead of polling the device for data.

The Lasterror property is set.

### 136.34.11 getTemperatureChangeTrigger(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the amount of change that should exist between the last reported value and the current value before an TemperatureChange event is fired.
**Notes:** The Lasterror property is set.

### 136.34.12 getTemperatureInputCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of thermocouple inputs supported by this board.
**Notes:** The Lasterror property is set.

### 136.34.13 getTemperatureMax(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum temperature that can be measured by a thermocouple input. This depends on the type of thermocouple attached.
**Notes:** The Lasterror property is set.

### 136.34.14 getTemperatureMin(index as Integer) as Double

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum temperature that can be measured by a thermocouple input.
**Notes:** This depends on the type of thermocouple attached.
The Lasterror property is set.

### 136.34.15 getThermocoupleType(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the type of thermocouple set to be at a thermocouple input. By default this is K-Type.
**Notes:** The Lasterror property is set.
type: The thermocouple type.

### 136.34.16 setTemperatureChangeTrigger(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the amount of change that should exist between the last reported value and the current value before an TemperatureChange event is fired.
**Notes:** The Lasterror property is set.

### 136.34.17 setThermocoupleType(index as Integer, value as Integer)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the type of thermocouple plugged into a thermocouple input. By default this is K-Type.
**Example:**

```
dim t as OldPhidgetTemperatureSensorMBS

const PHIDGET_TEMPERATURE_SENSOR_K_TYPE = 1 // K-Type thermocouple
const PHIDGET_TEMPERATURE_SENSOR_J_TYPE = 2 // J-Type thermocouple
const PHIDGET_TEMPERATURE_SENSOR_E_TYPE = 3 // E-Type thermocouple
const PHIDGET_TEMPERATURE_SENSOR_T_TYPE = 4 // T-Type thermocouple

t.setThermocoupleType 0, PHIDGET_TEMPERATURE_SENSOR_T_TYPE
```

**Notes:** The Lasterror property is set.

### 136.34.18 Events

### 136.34.19 TemperatureChanged(index as Integer, value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The temperatur changed.
**Notes:** Index: Index of the Temperature Sensor firing the Event
Value: Value of the Temperature Sensor

With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

### 136.34.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHIDGET_TEMPERATURE_SENSOR_E_TYPE | 3 | One of the sensor type constants. E-Type thermocouple |
| PHIDGET_TEMPERATURE_SENSOR_J_TYPE | 2 | One of the sensor type constants. J-Type thermocouple |
| PHIDGET_TEMPERATURE_SENSOR_K_TYPE | 1 | One of the sensor type constants. K-Type thermocouple |
| PHIDGET_TEMPERATURE_SENSOR_T_TYPE | 4 | One of the sensor type constants. T-Type thermocouple |

# 136.35 class OldPhidgetTextLCDMBS

## 136.35.1 class OldPhidgetTextLCDMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetLCDMBS instead.
**Function:** The class for the phidget text LCD.
**Notes:** The PhidgetTextLCD is a component that provides a high-level programmer interface to control a PhidgetTextLCD device connected through a USB port.

With this component, the programmer can:

- Display text on a PhidgetTextLCD module.

Subclass of the OldPhidgetMBS class.

## 136.35.2 Methods

## 136.35.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
Lasterror is set.

## 136.35.4 getBacklight as boolean

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the state of the backlight.
**Notes:** The Lasterror property is set.

## 136.35.5 getBrightness as Integer

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the brightness of the backlight. Not supported on all TextLCDs
**Notes:** The backlight brightness has a range of 0 to 255.
The Lasterror property is set.

### 136.35.6 getColumnCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of columns per supported by this display.
**Notes:** The Lasterror property is set.

### 136.35.7 getContrast as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the contrast value from 0-255.
**Notes:** Note that this defaults to 0.
The Lasterror property is set.

### 136.35.8 getCursorBlink as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines if the cursor's blinking is on or off.
**Notes:** Note that this defaults to False.
The Lasterror property is set.

### 136.35.9 getCursorOn as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines if the cursor is on or off.
**Notes:** Note that this defaults to False.
The Lasterror property is set.

### 136.35.10 getRowCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of rows supported by this display.
**Notes:** The Lasterror property is set.

### 136.35.11 getScreen as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the active screen.
**Notes:** Lasterror is set.

### 136.35.12 getScreenCount as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of Display supported by this TextLCD.
**Notes:** Lasterror is set.

### 136.35.13 getScreenSize as Integer

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the screen size.
**Notes:** See PHIDGET_TEXTLCD_SCREEN_* constants.
Lasterror is set.

### 136.35.14 initialize

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the active screen.
**Notes:** Only supported on the TextLCD adapter.
This should be called if a screen is attached after power up, or to clear the screen after setting the size.

Lasterror is set.

### 136.35.15 setBacklight(backlightState as boolean)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state of the backlight.
**Notes:** The Lasterror property is set.

### 136.35.16 setBrightness(Brightness as Integer)

MBS Phidgets Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the brightness of the backlight. Not supported on all TextLCDs
**Notes:** The backlight brightness has a range of 0 to 255.
The Lasterror property is set.

### 136.35.17 setContrast(Contrast as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the contrast from 0-255.
**Notes:** The Lasterror property is set.

### 136.35.18 setCursorBlink(CursorBlink as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the cursor's blinking on or off.
**Notes:** The Lasterror property is set.

### 136.35.19 setCursorOn(CursorOn as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the cursor on or off.
**Notes:** This cursor is displayed at the last location that was changed.

The Lasterror property is set.

### 136.35.20 setCustomCharacter(index as Integer, val1 as Integer, val2 as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets a custom character.
**Notes:** With existing hardware, there is space for 8 custom characters : Index can range from 8 to 15.
Each character is described by a set of integers.
For more information, have a look at the TextLCD example in the examples.zip for Phidget21.

The Lasterror property is set.

### 136.35.21 setDisplayCharacter(index as Integer, column as Integer, character as Integer)

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets a single character on the display.
**Notes:** index: The row index.
column: The column index.
character: The character to display.

The Lasterror property is set.

### 136.35.22 setDisplayString(row as Integer, displayString as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the text to display on a particular row of the display.
**Notes:** Row: Row to set on display
DisplayString: String to set on display. The text will be clipped at the right edge of the display.
The Lasterror property is set.

### 136.35.23 setScreen(screenIndex as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the active screen.
**Notes:** This is the screen that all subsequent API calls will apply to.
Lasterror is set.

### 136.35.24 setScreenSize(screenSize as Integer)

MBS Phidgets Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the active screen size. Only supported on the TextLCD Adapter.
**Notes:** Lasterror is set.

### 136.35.25 Constants

Screen size constants.

| Constant | Value | Description |
|---|---|---|
| PHIDGET_TEXTLCD_SCREEN_1x16 | 4 | 1 row, 16 column screen |
| PHIDGET_TEXTLCD_SCREEN_1x40 | 10 | 1 row, 40 column screen |
| PHIDGET_TEXTLCD_SCREEN_1x8 | 2 | 1 row, 8 column screen |
| PHIDGET_TEXTLCD_SCREEN_2x16 | 5 | 2 row, 16 column screen |
| PHIDGET_TEXTLCD_SCREEN_2x20 | 7 | 2 row, 20 column screen |
| PHIDGET_TEXTLCD_SCREEN_2x24 | 9 | 2 row, 24 column screen |
| PHIDGET_TEXTLCD_SCREEN_2x40 | 11 | 2 row, 40 column screen |
| PHIDGET_TEXTLCD_SCREEN_2x8 | 3 | 2 row, 8 column screen |
| PHIDGET_TEXTLCD_SCREEN_4x16 | 6 | 4 row, 16 column screen |
| PHIDGET_TEXTLCD_SCREEN_4x20 | 8 | 4 row, 20 column screen |
| PHIDGET_TEXTLCD_SCREEN_4x40 | 12 | 4 row, 40 column screen (special case, requires both screen co |
| PHIDGET_TEXTLCD_SCREEN_NONE | 1 | no screen attached |
| PHIDGET_TEXTLCD_SCREEN_UNKNOWN | 13 | Unknown |

# 136.36 class OldPhidgetTextLEDMBS

## 136.36.1 class OldPhidgetTextLEDMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use PhidgetLCDMBS instead.
**Function:** The class for a phidget text LED.
**Notes:** On the time the plugin was written the phidget documentation did not include this class so the documentation here is limited.
Subclass of the OldPhidgetMBS class.

## 136.36.2 Methods

## 136.36.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.

## 136.36.4 getBrightness as Integer

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current brightness.
**Notes:** The Lasterror property is set.

## 136.36.5 getColumnCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of columns per supported by this display.
**Notes:** The Lasterror property is set.

### 136.36.6 getRowCount as Integer

MBS Phidgets Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of rows supported by this display.
**Notes:** The Lasterror property is set.

### 136.36.7 setBrightness(Brightness as Integer)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the brightness.
**Notes:** The Lasterror property is set.

### 136.36.8 setDisplayString(row as Integer, displayString as string)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the display string for the given row.
**Notes:** The Lasterror property is set.

# 136.37 class OldPhidgetWeightSensorMBS

## 136.37.1 class OldPhidgetWeightSensorMBS

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for a phidget weight sensor.
**Notes:** On the time the plugin was written the phidget documentation did not include this class so the documentation here is limited.
Subclass of the OldPhidgetMBS class.

## 136.37.2 Methods

## 136.37.3 Constructor

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** On success the handle value is not zero.
The Lasterror property is set.

## 136.37.4 getWeight as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the current weight.
**Notes:** The Lasterror property is set.

## 136.37.5 getWeightChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the amount of change that should exist between the last reported value and the current value before an WeightChange event is fired.
**Notes:** The Lasterror property is set.

### 136.37.6 setWeightChangeTrigger(value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the amount of change that should exist between the last reported value and the current value before an WeightChange event is fired.
**Notes:** The Lasterror property is set.

### 136.37.7 Events

### 136.37.8 WeightChanged(value as Double)

MBS Phidgets Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The weight changed.
**Notes:** With plugin version 8.5 and newer this event is executed on the main thread of your application to avoid crashes with Xojo. Events are buffered until you the main thread has time available.
Older plugins execute the event on the thread where the event was created which may lead into problems described in the ThreadMBS class documentation.

# 136.38 class PhidgetAccelerometerMBS

## 136.38.1 class PhidgetAccelerometerMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Accelerometer class is used to gather acceleration data from Phidget accelerometer boards.
**Notes:** Phidget accelerometers usually have multiple sensors, each oriented in a different axis, so multiple dimensions of acceleration can be recorded.

If the Phidget you're using also has a gyroscope and a magnetometer, you may want to use the Spatial class in order to get all of the data at the same time, in a single event.
Subclass of the PhidgetMBS class.
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## 136.38.2 Methods

## 136.38.3 Acceleration as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent acceleration value that the channel has reported.

## 136.38.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.38.5 MaxAcceleration as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the AccelerationChange event will report.

### 136.38.6 MinAcceleration as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the AccelerationChange event will report.

### 136.38.7 Properties

### 136.38.8 AccelerationChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a AccelerationChange event until the acceleration value has changed by the amount specified by the AccelerationChangeTrigger.
**Notes:** Setting the AccelerationChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.38.9 AxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of axes the channel can measure acceleration on.
**Notes:** (Read only property)

### 136.38.10 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another AccelerationChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between AccelerationChange events can also affected by the AccelerationChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.38.11 HeatingEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether self-heating temperature stabilization is enabled.
**Notes:** Set to true to enable the temperature stabilization feature of this device. This enables onboard heating elements to bring the board up to a known temperature to minimize ambient temerature effects on the sensor's reading. You can leave this setting false to conserve power consumption.This property is shared by any and all spatial-related objects on this device (Accelerometer, Gyroscope, Magnetometer, Spatial)
(Read and Write property)

### 136.38.12 MaxAccelerationChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that AccelerationChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.38.13 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.38.14 MinAccelerationChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that AccelerationChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.38.15 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.38.16 Timestamp as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent timestamp value that the channel has reported.
**Notes:** This is an extremely accurate time measurement streamed from the device.
If your application requires a time measurement, you should use this value over a local software timestamp.
(Read only property)

### 136.38.17 Events

### 136.38.18 AccelerationChanged(acceleration() as double, timestamp as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent acceleration values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a AccelerationChangeTrigger has been set to a non-zero value, the AccelerationChange event will not occur until the acceleration has changed by at least the AccelerationChangeTrigger value.

acceleration: The acceleration values.
timestamp: The timestamp value.

# 136.39 class PhidgetBLDCMotorMBS

## 136.39.1 class PhidgetBLDCMotorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The BLDC Motor class controls the power applied to attached brushless DC motors to affect its speed and direction.
**Notes:** It can also contain various other control and monitoring functions that aid in the control of brushless DC motors.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.39.2 Methods

## 136.39.3 addPositionOffset(positionOffset as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds an offset (positive or negative) to the current position.
**Notes:** This can be especially useful for zeroing position.

## 136.39.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.39.5 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For BLDC Motor channels, this will set the Target Velocity to 0. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.39.6 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.39.7 setTargetVelocityAsync(targetVelocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets target velocity asynchronously.
**Notes:** The average voltage across the motor is based on the TargetVelocity value.
At a constant load, increasing the target velocity will increase the speed of the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
Setting TargetVelocity to MinVelocity will stop the motor. See TargetBrakingStrength for more information on stopping the motor.
The units of TargetVelocity and Acceleration refer to 'duty cycle'. This is because the controller must rapidly

switch the power on/off (i.e. change the duty cycle) in order to manipulate the voltage across the motor.

Calls setTargetVelocityAsyncCompleted event later.

### 136.39.8 Properties

### 136.39.9 Acceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The rate at which the controller can change the motor's Velocity.
**Notes:** The acceleration is bounded by MinAccleration and MaxAcceleration.
Unit: duty cycle per second (duty cycle/s)
(Read and Write property)

### 136.39.10 BrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent braking strength value that the controller has reported.
**Notes:** (Read only property)

### 136.39.11 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the controller will fire another update event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
Unit: milliseconds (ms)
(Read and Write property)

### 136.39.12 MaxAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Acceleration can be set to.
**Notes:** Unit: duty cycle per second (duty cycle/s)

(Read only property)

### 136.39.13 MaxBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetBrakingStrength can be set to.
**Notes:** (Read only property)

### 136.39.14 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.39.15 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.39.16 MaxPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The upper bound of Position.
**Notes:** (Read only property)

### 136.39.17 MaxStallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The upper bound of StallVelocity.
**Notes:** (Read only property)

### 136.39.18 MaxVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetVelocity can be set to.
**Notes:** TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
(Read only property)

### 136.39.19 MinAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Acceleration can be set to.
**Notes:** Unit: duty cycle per second (duty cycle/s)
(Read only property)

### 136.39.20 MinBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetBrakingStrength can be set to.
**Notes:** (Read only property)

### 136.39.21 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.39.22 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.39.23 MinPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The lower bound of Position.
**Notes:** (Read only property)

### 136.39.24 MinStallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The lower bound of StallVelocity.
**Notes:** (Read only property)

### 136.39.25 MinVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetVelocity can be set to.
**Notes:** Set the TargetVelocity to MinVelocity to stop the motor. See TargetBrakingStrength for more information on stopping the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
(Read only property)

### 136.39.26 Position as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position value that the controller has reported.
**Notes:** Position values are calculated using Hall Effect sensors mounted on the motor, therefore, the resolution of position depends on the motor you are using.
Units for Position can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees. For more information on how to apply the RescaleFactor to your application, see your controller's User Guide.

(Read only property)

### 136.39.27 RescaleFactor as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Change the units of your parameters so that your application is more intuitive.
**Notes:** Units for Position can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees. For more information on how to apply the RescaleFactor to your application, see your controller's User Guide.
(Read and Write property)

### 136.39.28 StallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The stall velocity.
**Notes:** Before reading this description, it is important to note the difference between the units of StallVelocity and Velocity.

- Velocity is a number between -1 and 1 with units of 'duty cycle'. It simply represents the average voltage across the motor.
- StallVelocity represents a real velocity (e.g. m/s, RPM, etc.) and the units are determined by the RescaleFactor. With a RescaleFactor of 1, the default units would be in commutations per second.

If the load on your motor is large, your motor may begin rotating more slowly, or even fully stall. Depending on the voltage across your motor, this may result in a large amount of current through both the controller and the motor. In order to prevent damage in these situations, you can use the StallVelocity property.

The StallVelocity should be set to the lowest velocity you would expect from your motor. The controller will then monitor the motor's velocity, as well as the Velocity, and prevent a 'dangerous stall' from occuring. If the controller detects a dangerous stall, it will immediately reduce the Velocity (i.e. average voltage) to 0

and an error will be reported to your program.

- A 'dangerous stall' will occur faster when the Velocity is higher (i.e. when the average voltage across the motor is higher)
- A 'dangerous stall' will occur faster as (StallVelocity - motor velocity) becomes larger .

Setting StallVelocity to 0 will turn off stall protection functionality.
(Read and Write property)

### 136.39.29 TargetBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The braking value.
**Notes:** When a motor is not being actively driven forward or reverse, you can choose if the motor will be allowed to freely turn, or will resist being turned.
A low TargetBrakingStrength value corresponds to free wheeling, this will have the following effects:
The motor will continue to rotate after the controller is no longer driving the motor (i.e. Velocity is 0), due to inertia.
The motor shaft will provide little resistance to being turned when it is stopped.
A higher TargetBrakingStrength value will resist being turned, this will have the following effects:
The motor will more stop more quickly if it is in motion and braking has been requested. It will fight against the rotation of the shaft.
Braking mode is enabled by setting the Velocity to MinVelocity

(Read and Write property)

### 136.39.30 TargetVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The average voltage across the motor is based on the TargetVelocity value.
**Notes:** At a constant load, increasing the target velocity will increase the speed of the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
Setting TargetVelocity to MinVelocity will stop the motor. See TargetBrakingStrength for more information on stopping the motor.
The units of TargetVelocity and Acceleration refer to 'duty cycle'. This is because the controller must rapidly switch the power on/off (i.e. change the duty cycle) in order to manipulate the voltage across the motor.

(Read and Write property)

### 136.39.31 Velocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent velocity value that the controller has reported.
**Notes:** (Read only property)

### 136.39.32 Events

### 136.39.33 BrakingStrengthChanged(brakingStrength as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent braking strength value will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** Regardless of the DataInterval, this event will occur only when the braking strength value has changed from the previous value reported.
Braking mode is enabled by setting the Velocity to MinVelocity.

### 136.39.34 PositionChanged(position as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Regardless of the DataInterval, this event will occur only when the position value has changed from the previous value reported.
**Notes:** Position values are calculated using Hall Effect sensors mounted on the motor, therefore, the resolution of position depends on the motor you are using.
Units for Position can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees. For more information on how to apply the RescaleFactor to your application, see your controller's User Guide.

### 136.39.35 setTargetVelocityAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called when setTargetVelocityAsync finished.

### 136.39.36 VelocityUpdated(velocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent velocity value will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** This event will always occur when the DataInterval elapses. You can depend on this event for constant timing when implementing control loops in code. This is the last event to fire, giving you up-to-date access to all properties.

# 136.40 class PhidgetCapacitiveTouchMBS

## 136.40.1 class PhidgetCapacitiveTouchMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Capacitive Touch class gathers input data from capacitive buttons and sliders on Phidget boards.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.40.2 Methods

## 136.40.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.40.4 Properties

## 136.40.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another Touch event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between Touch events can also affected by the TouchValueChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

## 136.40.6 IsTouched as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent touch state that the channel has reported.
**Notes:** This will be false or true.
false is not touched
true is touched
(Read only property)

### 136.40.7 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.40.8 MaxSensitivity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Sensitivity can be set to.
**Notes:** (Read only property)

### 136.40.9 MaxTouchValue as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the Touch event will report.
**Notes:** (Read only property)

### 136.40.10 MaxTouchValueChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TouchValueChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.40.11 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.40.12 MinSensitivity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Sensitivity can be set to.
**Notes:** (Read only property)

### 136.40.13 MinTouchValue as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the Touch event will report.
**Notes:** (Read only property)

### 136.40.14 MinTouchValueChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TouchValueChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.40.15 Sensitivity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines the sensitivity of all capacitive regions on the device.
**Notes:** Higher values result in greater touch sensitivity.
The sensitivity value is bounded by MinSensitivity and MaxSensitivity.

(Read and Write property)

### 136.40.16 TouchValue as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent touch value that the channel has reported.
**Notes:** This will be 0 or 1 for button-type inputs, or a ratio between 0-1 for axis-type inputs.
This value is bounded by MinTouchValue and MaxTouchValue.
The value is not reset when the touch ends.
(Read only property)

### 136.40.17 TouchValueChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a Touch event until the touch value has changed by the amount specified by the TouchValueChangeTrigger.
**Notes:** Setting the TouchValueChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.40.18 Events

### 136.40.19 Touched(touchValue as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent touch value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a TouchValueChangeTrigger has been set to a non-zero value, the Touch event will not occur until the touch value has changed by at least the TouchValueChangeTrigger value.

touchValue:Value of the touch input axis.

### 136.40.20 TouchEnded

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The channel will report a TouchEnd event to signify that it is no longer detecting a touch.

## 136.41 class PhidgetCurrentInputMBS

### 136.41.1 class PhidgetCurrentInputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Current Input class is used to measure current flowing through the Phidget from outside sources..
**Notes:** This class may be used on a simple current sensor, or sometimes on a more complex Phidget that measures the amount of current flowing through an attached device, such as a motor controller, for diagnostic or control purposes.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.41.2 Methods

### 136.41.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.41.4 Properties

### 136.41.5 Current as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent current value that the channel has reported.
**Notes:** This value will always be between MinCurrent and MaxCurrent.
In amperes.
(Read only property)

### 136.41.6 CurrentChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a CurrentChange event until the current value has changed by the amount specified by the CurrentChangeTrigger.
**Notes:** Setting the CurrentChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
in amperes.
(Read and Write property)

### 136.41.7 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another CurrentChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between CurrentChange events can also affected by the CurrentChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.41.8 MaxCurrent as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the CurrentChange event will report.
**Notes:** (Read only property)

### 136.41.9 MaxCurrentChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that CurrentChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.41.10 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.41.11 MinCurrent as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the CurrentChange event will report.
**Notes:** (Read only property)

### 136.41.12 MinCurrentChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that CurrentChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.41.13 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.41.14 PowerSupply as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose the power supply voltage.
**Notes:** Set this to the voltage specified in the attached sensor's data sheet to power it.
Set to kPowerSupplyOff to turn off the supply to save power.
(Read and Write property)

### 136.41.15 Events

### 136.41.16 CurrentChanged(current as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent current value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a CurrentChangeTrigger has been set to a non-zero value, the CurrentChange event will not occur until the current value has changed by at least the CurrentChangeTrigger value.

## 136.42 class PhidgetDCMotorMBS

### 136.42.1 class PhidgetDCMotorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DC Motor class controls the power applied to attached DC motors to affect its speed and direction.
**Notes:** It can also contain various other control and monitoring functions that aid in the control of DC motors.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.42.2 Methods

### 136.42.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.42.4 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe

again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For DC Motor channels, this will set the Target Velocity to 0. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.42.5 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.42.6 setTargetVelocityAsync(targetVelocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets target velocity asynchronously.
**Notes:** The average voltage across the motor is based on the TargetVelocity value.
At a constant load, increasing the target velocity will increase the speed of the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
Setting TargetVelocity to MinVelocity will stop the motor. See TargetBrakingStrength for more information on stopping the motor.
The units of TargetVelocity and Acceleration refer to 'duty cycle'. This is because the controller controls velocity by rapidly switching the power on/off (i.e. changing the duty cycle) in order to manipulate the voltage across the motor.

Calls setTargetVelocityAsyncCompleted event later when done.

### 136.42.7 Properties

### 136.42.8 Acceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The rate at which the controller can change the motor's Velocity.
**Notes:** The acceleration is bounded by MinAccleration and MaxAcceleration.

Unit: duty cycle per second (duty cycle/s)
(Read and Write property)

### 136.42.9 BackEMF as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent BackEMF value that the controller has reported.
**Notes:** (Read only property)

### 136.42.10 BackEMFSensingState as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When BackEMFSensingState is enabled, the controller will measure and report the BackEMF.
**Notes:** The motor will coast (freewheel) 5% of the time while the back EMF is being measured (800ŒºS every 16ms). Therefore, at a DutyCycle of 100%, the motor will only be driven for 95% of the time.
(Read and Write property)

### 136.42.11 BrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent braking strength value that the controller has reported.
**Notes:** See TargetBrakingStrength for details.
(Read only property)

### 136.42.12 CurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The controller will limit the current through the motor to the CurrentLimit value.
**Notes:** Unit: amperes (A)
(Read and Write property)

### 136.42.13 CurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current regulator gain.
**Notes:** Depending on power supply voltage and motor coil inductance, current through the motor can change relatively slowly or extremely rapidly. A physically larger DC Motor will typically have a lower inductance, requiring a higher current regulator gain. A higher power supply voltage will result in motor current changing more rapidly, requiring a higher current regulator gain. If the current regulator gain is too small, spikes in current will occur, causing large variations in torque, and possibly damaging the motor controller. If the current regulator gain is too high, the current will jitter, causing the motor to sound 'rough', especially when changing directions.

As a rule of thumb, we recommend setting this value as follows:
(Read and Write property)

### 136.42.14 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the controller will fire another VelocityUpdate/BrakingStrengthChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
Note: BrakingStrengthChange events will only fire if a change in braking has occurred.

Unit: milliseconds (ms)
(Read and Write property)

### 136.42.15 MaxAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Acceleration can be set to.
**Notes:** Unit: duty cycle per second (duty cycle/s)
(Read only property)

### 136.42.16 MaxBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetBrakingStrength can be set to.
**Notes:** See TargetBrakingStrength for details.
(Read only property)

### 136.42.17 MaxCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that CurrentLimit can be set to.
**Notes:** Unit: amperes (A)
(Read only property)

### 136.42.18 MaxCurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that CurrentRegulatorGain can be set to.
**Notes:** (Read only property)

### 136.42.19 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)

(Read only property)

### 136.42.20 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.42.21 MaxVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetVelocity can be set to.
**Notes:** TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.

Unit: duty cycle (duty cycle)
(Read only property)

### 136.42.22 MinAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Acceleration can be set to.
**Notes:** Unit: duty cycle per second (duty cycle/s)
(Read only property)

### 136.42.23 MinBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetBrakingStrength can be set to.
**Notes:** See TargetBrakingStrength for details.
(Read only property)

### 136.42.24 MinCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that CurrentLimit can be set to.
**Notes:** Unit: amperes (A)
(Read only property)

### 136.42.25 MinCurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that CurrentRegulatorGain can be set to.
**Notes:** (Read only property)

### 136.42.26 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.42.27 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.42.28 MinVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetVelocity can be set to
**Notes:** Set the TargetVelocity to MinVelocity to stop the motor. See TargetBrakingStrength for more in-

formation on stopping the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.

Unit: duty cycle (duty cycle)
(Read only property)

### 136.42.29 TargetBrakingStrength as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This setting allows you to choose how hard the motor will resist being turned when it is not being driven forward or reverse (Velocity = 0).
**Notes:** The TargetBrakingStrength sets the relative amount of electrical braking to be applied to the DC motor, with MinBrakingStrength corresponding to no braking (free-wheeling), and MaxBrakingStrength indicating full braking.

A low TargetBrakingStrength value corresponds to free-wheeling. This means:
The motor will continue to rotate after the controller is no longer driving the motor (Velocity = 0), due to its momentum.
The motor shaft will provide little resistance to being turned when it is stopped.
As TargetBrakingStrength increases, this will engage electrical braking of the DC motor. This means:
The motor will stop more quickly if it is in motion when braking is requested.
The motor shaft will resist rotation by oustide forces.
Braking will be added gradually, according to the Acceleration setting, once the motor controller's Velocity reaches 0.0
Braking will be immediately stopped when a new (non-zero) TargetVelocity is set, and the motor will accelerate to the requested velocity.
Braking mode is enabled by setting the Velocity to 0.0
(Read and Write property)

### 136.42.30 TargetVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The target velocity.
**Notes:** The average voltage across the motor is based on the TargetVelocity value.
At a constant load, increasing the target velocity will increase the speed of the motor.
TargetVelocity is bounded by -1√óMaxVelocity and MaxVelocity, where a sign change (¬±) is indicitave of a direction change.
Setting TargetVelocity to MinVelocity will stop the motor. See TargetBrakingStrength for more information

on stopping the motor.
The units of TargetVelocity and Acceleration refer to 'duty cycle'. This is because the controller controls velocity by rapidly switching the power on/off (i.e. changing the duty cycle) in order to manipulate the voltage across the motor.
(Read and Write property)

### 136.42.31 Velocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent velocity value that the controller has reported.
**Notes:** Unit: duty cycle (duty cycle)
(Read only property)

### 136.42.32 Events

### 136.42.33 BackEMFChanged(backEMF as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent back emf value will be reported in this event.
**Notes:** backEMF: The back EMF voltage from the motor

### 136.42.34 BrakingStrengthChanged(brakingStrength as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the motor braking strength changes.
**Notes:** brakingStrength:The most recent braking strength value will be reported in this event.
This event will occur only when the value of braking strength has changed
See TargetBrakingStrength for details about what this number represents.

### 136.42.35 setTargetVelocityAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setTargetVelocityAsync completed.

### 136.42.36 VelocityUpdated(velocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs at a rate defined by the DataInterval.
**Notes:** velocity:The most recent velocity value will be reported in this event.

## 136.43 class PhidgetDictionaryMBS

### 136.43.1 class PhidgetDictionaryMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Dictionaries are useful for passing information between multiple programs using Phidgets. #
**Notes:** A common example would be to have one program controlling your application that receives commands sent via a Phidget dictionary from a web interface, as outlined in many of our articles.

Keys can be thought of as being similar to variable names, with their values as their associated value. Phidget dictionaries contain groups of related key-value pairs, and are stored on a central Phigdet Network Server. Dictionaries, and the key-value pairs within may be accessed from programs that have access to the Phigdet Network Server.

The Dictionary API supports connecting to a dictionary on the server, managing key-value pairs, and monitoring changes made to the dictionary.

More information on Phidget Dictionaries can be found on the Phidget Dictionary support page.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.43.2 Methods

### 136.43.3 add(key as String, value as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a new key value pair to the dictionary.
**Notes:** It is an error if the key already exits.

### 136.43.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** creates an instance of a Phidget channel.

### 136.43.5 Keys as String()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries all keys in a dictionary.
**Notes:** The list might not contain all of the keys in the dictionary if it is modified while you query keys. Keys added during the scan may be missed, and keys deleted during the scan may be included.

### 136.43.6 remove(key as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes the key from the dictionary.

### 136.43.7 removeAll

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes every key from the dictionary.

### 136.43.8 update(key as String, value as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Updates a key value pair in the dictionary.
**Notes:** It is an error if the key does not exist.

### 136.43.9 validDictionaryKey(key as String) as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether this is a valid key to use.
**Notes:** Returns true on success or false on failure.

### 136.43.10 Properties

### 136.43.11 Value(key as String) as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set or get the value associated with the given key from the dictionary.
**Notes:** (Read and Write computed property)

### 136.43.12 Events

### 136.43.13 Added(Key as String, Value as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a new key value pair is added to the dictionary.
**Notes:** key: The key that was added
value: The value of the new key

### 136.43.14 Removed(Key as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a key is removed from the dictionary.

### 136.43.15 Updated(Key as String, Value as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a change is made to a key value pair in the dictionary.

# 136.44 class PhidgetDigitalInputMBS

## 136.44.1 class PhidgetDigitalInputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Digital Input class is used to monitor the state of Phidget digital inputs.
**Notes:** Use digital inputs to monitor the state of buttons, switches, or switch-to-ground sensors.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.44.2 Methods

## 136.44.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.44.4 Properties

## 136.44.5 InputMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The input polarity mode for your channel.
**Notes:** See your device's User Guide for more information about what value to chooose for the InputMode.
(Read and Write property)

## 136.44.6 PowerSupply as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose the power supply voltage.
**Notes:** Set this to the voltage specified in the attached sensor's data sheet to power it.
Set to kPowerSupplyOff to turn off the supply to save power.

(Read and Write property)

### 136.44.7 State as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent state value that the channel has reported.
**Notes:** (Read only property)

### 136.44.8 Events

### 136.44.9 StateChanged(state as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event will occur when the state of the digital input has changed.
**Notes:** The value will either be 0 or 1 (true or false).

### 136.44.10 Constants

Input Modes

| Constant | Value | Description |
|---|---|---|
| kInputModeNPN | 1 | For interfacing NPN digital sensors. |
| kInputModePNP | 2 | For interfacing PNP digital sensors. |

Power Supply

| Constant | Value | Description |
|---|---|---|
| kPowerSupply12V | 2 | The sensor is provided with 12 volts. |
| kPowerSupply24V | 3 | The sensor is provided with 24 volts. |
| kPowerSupplyOff | 1 | Switch the sensor power supply off. |

# 136.45 class PhidgetDigitalOutputMBS

## 136.45.1 class PhidgetDigitalOutputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Digital Output class is used to control digital logic outputs and LED outputs on Phidgets boards.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.45.2 Methods

## 136.45.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.45.4 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For Digital Output channels, this will set the output state to FALSE. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.45.5 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.45.6 setDutyCycleAsync(dutyCycle as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the duty cycle asynchronously.
**Notes:** The DutyCycle represents the fraction of time the output is on (high).
This will override the State setting on the channel.
A DutyCycle of 1.0 translates to a high output, a DutyCycle of 0 translates to a low output.
This is equivalent to setting a State of TRUE and FALSE respectively.
A DutyCycle of 0.5 translates to an output that is high half the time, which results in an average output voltage of (output voltage x 0.5)
You can use the DutyCycle to create a dimming effect on LEDs.
If the DigitalOutput channel you are using does not support PWM, then this value may only be set to 1.0 or 0.0
You can check if your device supports PWM by checking the ChannelSubclass property, viewable by selecting Phidget API above. Your DigitalOutput channel supports PWM if it is any subclass other than NONE.

calls setDutyCycleAsyncCompleted later.

### 136.45.7 setLEDCurrentLimitAsync(LEDCurrentLimit as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The LEDCurrentLimit is the maximum amount of current that the controller will provide to the output.
**Notes:** Reference the data sheet of the LED you are using before setting this value.

Calls setLEDCurrentLimitAsyncCompleted event later.

### 136.45.8 setStateAsync(state as Boolean)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state asynchronously.
**Notes:** The State will dictate whether the output is constantly high (true) or low (false).
This will override any DutyCycle that may have been set on the channel.
Setting the State to true is the same as setting DutyCycle to 1.0, and setting the State to false is the same as setting a DutyCycle of 0.0.

Calls setStateAsyncCompleted event later.

### 136.45.9 Properties

### 136.45.10 DutyCycle as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DutyCycle represents the fraction of time the output is on (high).
**Notes:** A DutyCycle of 1.0 translates to a high output, a DutyCycle of 0 translates to a low output.
A DutyCycle of 0.5 translates to an output that is high half the time, which results in an average output voltage of (output voltage x 0.5)
You can use the DutyCycle to create a dimming effect on LEDs.

Unit: duty cycle (duty cycle)
(Read and Write property)

### 136.45.11 Frequency as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Frequency parameter sets the PWM frequency for all frequency-settable PWM outputs on the board.
**Notes:** in hertz (Hz)
(Read and Write property)

### 136.45.12 LEDCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The LEDCurrentLimit is the maximum amount of current that the controller will provide to the output.
**Notes:** Reference the data sheet of the LED you are using before setting this value.
n amperes.
(Read and Write property)

### 136.45.13 LEDForwardVoltage as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The LEDCurrentLimit is the maximum amount of current that the controller will provide to the output.
**Notes:** Reference the data sheet of the LED you are using before setting this value.
(Read and Write property)

### 136.45.14 MaxDutyCycle as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DutyCycle can be set to.
**Notes:** Unit: duty cycle (duty cycle)
(Read only property)

### 136.45.15 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.45.16 MaxFrequency as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DutyCycle can be set to.
**Notes:** in hertz (Hz)
(Read only property)

### 136.45.17 MaxLEDCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that LEDCurrentLimit can be set to.
**Notes:** in amperes.
(Read only property)

### 136.45.18 MinDutyCycle as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DutyCycle can be set to.
**Notes:** Unit: duty cycle (duty cycle)
(Read only property)

### 136.45.19 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.45.20 MinFrequency as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DutyCycle can be set to.
**Notes:** in hertz (Hz)
(Read only property)

### 136.45.21 MinLEDCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that LEDCurrentLimit can be set to.
**Notes:** in amperes.
(Read only property)

### 136.45.22 State as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The State will indicate whether the output is high (true) or low (false).
**Notes:** If a DutyCycle has been set, the state will return as true if the DutyCycle is above 0.5, or false otherwise.
(Read and Write property)

### 136.45.23 Events

### 136.45.24 setDutyCycleAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setDutyCycleAsync is done.

### 136.45.25 setLEDCurrentLimitAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setLEDCurrentLimitAsync completed.

### 136.45.26 setStateAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setStateAsync completed.

### 136.45.27 Constants

LED Forward Voltage Setting

| Constant | Value | Description |
|---|---|---|
| kLEDForwardVoltage_1_7V | 1 | 1.7V |
| kLEDForwardVoltage_2_75V | 2 | 2.75V |
| kLEDForwardVoltage_3_2V | 3 | 3.2V |
| kLEDForwardVoltage_3_9V | 4 | 3.9V |
| kLEDForwardVoltage_4_0V | 5 | 4.0V |
| kLEDForwardVoltage_4_8V | 6 | 4.8V |
| kLEDForwardVoltage_5_0V | 7 | 5.0V |
| kLEDForwardVoltage_5_6V | 8 | 5.6V |

## 136.46 class PhidgetDistanceSensorMBS

### 136.46.1 class PhidgetDistanceSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Distance Sensor class gathers data from the distance sensor on a Phidget board.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr1
- Rewritten Phidgets Plugin

### 136.46.2 Methods

### 136.46.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.46.4 SonarReflectionsAmplitudes as UInt32()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent reflection values that the channel has reported.
**Notes:** The amplitude values are relative amplitudes of the reflections that are normalized to an arbitrary scale.

### 136.46.5 SonarReflectionsDistances as UInt32()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent reflection values that the channel has reported.
**Notes:** The distance values will always be between MinDistance and MaxDistance.
The closest reflection will be placed at index 0 of the distances array, and the furthest reflection at index 7

### 136.46.6 Properties

### 136.46.7 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between events can also affected by the change trigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.46.8 Distance as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent distance value that the channel has reported.
**Notes:** This value will always be between MinDistance and MaxDistance.
in milliseconds.
(Read only property)

### 136.46.9 DistanceChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue an event until the distance value has changed by the amount specified by the DistanceChangeTrigger.
**Notes:** Setting the DistanceChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.

in milliseconds.
(Read and Write property)

### 136.46.10 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.46.11 MaxDistance as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum distance that a event will report.
**Notes:** in milliseconds.
(Read only property)

### 136.46.12 MaxDistanceChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DistanceChangeTrigger can be set to.
**Notes:** in milliseconds.
(Read only property)

### 136.46.13 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.46.14 MinDistance as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum distance that a event will report.
**Notes:** in milliseconds.
(Read only property)

### 136.46.15 MinDistanceChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DistanceChangeTrigger can be set to.
**Notes:** in milliseconds.
(Read only property)

### 136.46.16 SonarQuietMode as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When set to true, the device will operate more quietly.
**Notes:** The measurable range is reduced when operating in quiet mode.
(Read and Write property)

### 136.46.17 Events

### 136.46.18 DistanceChanged(distance as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent distance value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a DistanceChangeTrigger has been set to a non-zero value, the DistanceChange event will not occur until the distance has changed by at least the DistanceChangeTrigger value.

### 136.46.19 SonarReflectionsUpdated(distances() as UInt32, amplitudes() as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent reflections the channel has detected will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a DistanceChangeTrigger has been set to a non-zero value, the SonarReflectionsUpdate event will not occur until the distance has changed by at least the DistanceChangeTrigger value.
The closest reflection will be placed at index 0 of the distances array, and the furthest reflection at index 7.
If you are only interested in the closest reflection, you can simply use the DistanceChange event.
The values reported as amplitudes are relative amplitudes of the reflections that are normalized to an arbitrary scale.

distances: The reflection values
amplitudes: The amplitude values
count: The number of reflections detected

# 136.47 class PhidgetEncoderMBS

## 136.47.1 class PhidgetEncoderMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Encoder class is used to read position data from quadrature encoders in order to track linear or rotary movement.
**Notes:** If the device supports an index pin as a reference point, you can also access it through this class.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.47.2 Methods

## 136.47.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.47.4 Properties

## 136.47.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another PositionChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between PositionChange events can also affected by the PositionChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.47.6 Enabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The enabled state of the encoder.
**Notes:** (Read and Write property)

### 136.47.7 IndexPosition as Int64

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position of the index channel calculated by the Phidgets library.
**Notes:** The index channel will usually pulse once per rotation.
Setting the encoder position will move the index position the same amount so their relative position stays the same.
Index position is tracked locally as the last position at which the index was triggered. Setting position will only affect the local copy of the index position value. This means that index positions seen by multiple network applications may not agree.
(Read only property)

### 136.47.8 IOMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The encoder interface mode. Match the mode to the type of encoder you have attached.
**Notes:** It is recommended to only change this when the encoder disabled in order to avoid unexpected results.
(Read and Write property)

### 136.47.9 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.47.10 MaxPositionChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that PositionChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.47.11 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.47.12 MinPositionChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that PositionChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.47.13 Position as Int64

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position value calculated by the Phidgets library.
**Notes:** Position counts quadrature edges within a quadrature cycle. This means there are four counts per full quadrature cycle.
Position is tracked locally as the total position change from the time the channel is opened. Setting position will only affect the local copy of the position value. This means that positions seen by multiple network applications may not agree.
(Read and Write property)

### 136.47.14 PositionChangeTrigger as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a PositionChange event until the position value has changed by the amount specified by the PositionChangeTrigger.
**Notes:** Setting the PositionChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.47.15 Events

### 136.47.16 PositionChanged(positionChange as Integer, timeChange as double, indexTriggered as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a PositionChangeTrigger has been set to a non-zero value, the PositionChange event will not occur until the position has changed by at least the PositionChangeTrigger value.

positionChange: The amount the position changed since the last change event
timeChange: The time elapsed since the last change event in milliseconds
indexTriggered: True if the index was passed since the last change event

### 136.47.17 Constants

Encoder Interface Modes

| Constant | Value | Description |
|---|---|---|
| kEncoderIOModeCollector10K | 5 | Line Driver 10K, 10kŒ© pull-down resistors will be applied to the input lines. |
| kEncoderIOModeCollector2K2 | 4 | Open Collector 2.2K, 2.2kŒ© pull-up resistors will be applied to the input lines. |
| kEncoderIOModeLineDriver10K | 3 | Open Collector 10K, 10kŒ© pull-up resistors will be applied to the input lines. |
| kEncoderIOModeLineDriver2K2 | 2 | Line Driver 2.2K, 2.2kŒ© pull-down resistors will be applied to the input lines. |
| kEncoderIOModePushPull | 1 | Push-Pull, No additional pull-up or pull-down resistors will be applied to the input lines. |

# 136.48 class PhidgetErrorExceptionMBS

## 136.48.1 class PhidgetErrorExceptionMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The error exception.
**Notes:** Whenever a Phidget function returns an error, we raise an exception and put the error number into the exceptions.
Subclass of the RuntimeException class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.49 class PhidgetFrequencyCounterMBS

### 136.49.1 class PhidgetFrequencyCounterMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Frequency Counter class is used to measure the frequency of pulses in an electronic signal, or to count the pulses in the signal.
**Notes:** Such signals can come from other electronics, or certain sensors that have a pulse output.
Subclass of the PhidgetMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr1
- Rewritten Phidgets Plugin
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

### 136.49.2 Methods

### 136.49.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.49.4 reset

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the Count and TimeElapsed.
**Notes:** For best results, reset should be called when the channel is disabled.

### 136.49.5 Properties

### 136.49.6 Count as UInt64

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent count value the channel has reported.
**Notes:** The count represents the total number of pulses since the the channel was opened, or last reset.
(Read only property)

### 136.49.7 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another CountChange/FrequencyChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.

Unit: milliseconds (ms)
(Read and Write property)

### 136.49.8 Enabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables or disables the channel.
**Notes:** When a channel is disabled, it will not longer register counts, therefore the TimeElapsed and Count will not be updated until the channel is re-enabled.
(Read and Write property)

### 136.49.9 FilterType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines the signal type that the channel responds to.
**Notes:** The filter type is chosen based on the type of input signal. See the PhidgetFrequencyCounter_FilterType entry under Enumerations for more information.

(Read and Write property)

### 136.49.10 Frequency as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent frequency value that the channel has reported.
**Notes:** This value will always be between 0 Hz and MaxFrequency.
in Hertz.
(Read only property)

### 136.49.11 FrequencyCutoff as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The frequency at which zero hertz is assumed.
**Notes:** This means any frequency at or below the FrequencyCutoff value will be reported as 0 Hz.
This property is stored locally, so other users who have this Phidget open over a network connection won't see the effects of your selected cutoff.
(Read and Write property)

### 136.49.12 InputMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The input polarity mode for your channel.
**Notes:** See your device's User Guide for more information about what value to chooose for the InputMode
(Read and Write property)

### 136.49.13 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.49.14 MaxFrequency as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the FrequencyChange event will report.
**Notes:** (Read only property)

### 136.49.15 MaxFrequencyCutoff as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that FrequencyCutoff can be set to.
**Notes:** (Read only property)

### 136.49.16 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.49.17 MinFrequencyCutoff as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that FrequencyCutoff can be set to.
**Notes:** (Read only property)

### 136.49.18 PowerSupply as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose the power supply voltage.
**Notes:** Set this to the voltage specified in the attached sensor's data sheet to power it.
Set to POWER_SUPPLY_OFF to turn off the supply to save power.

(Read and Write property)

### 136.49.19 TimeElapsed as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The amount of time the frequency counter has been enabled for.
**Notes:** This property complements Count, the total number of pulses detected since the channel was opened, or last reset.
(Read only property)

### 136.49.20 Events

### 136.49.21 CountChanged(counts as UInt64, timeChange as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** counts: The pulse count of the signal
timeChange: The change in elapsed time since the last change

### 136.49.22 FrequencyChanged(frequency as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent frequency value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** frequency: The calculated frequency of the signal.

### 136.49.23 Constants

Filter Types

| Constant | Value | Description |
|---|---|---|
| kFilterTypeLogicLevel | 2 | Logic level |
| kFilterTypeZeroCrossing | 1 | Zero crossing |

Input Modes

| Constant | Value | Description |
|---|---|---|
| kInputModeNPN | 1 | For interfacing NPN digital sensors. |
| kInputModePNP | 2 | For interfacing PNP digital sensors. |

Power Supply

| Constant | Value | Description |
|---|---|---|
| kPowerSupply12V | 2 | The sensor is provided with 12 volts |
| kPowerSupply24V | 3 | The sensor is provided with 24 volts |
| kPowerSupplyOff | 1 | Switch the sensor power supply off. |

## 136.50 class PhidgetGPGGAMBS

### 136.50.1 class PhidgetGPGGAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA GGA Sentence.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

### 136.50.2 Methods

### 136.50.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 136.50.4 Properties

### 136.50.5 altitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mean sea level altitude.
**Notes:** (Read and Write property)

### 136.50.6 fixQuality as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** GPS quality indicator.
**Notes:** (Read and Write property)

### 136.50.7 heightOfGeoid as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Geoidal separation.
**Notes:** (Read and Write property)

### 136.50.8 horizontalDilution as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Horizontal dilution of precision.
**Notes:** (Read and Write property)

### 136.50.9 latitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Latitude.
**Notes:** (Read and Write property)

### 136.50.10 longitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Longitude.
**Notes:** (Read and Write property)

### 136.50.11 numSatellites as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of satellites in use.
**Notes:** (Read and Write property)

# 136.51 class PhidgetGPGSAMBS

## 136.51.1 class PhidgetGPGSAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA GSA sentence
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

## 136.51.2 Methods

## 136.51.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 136.51.4 Properties

## 136.51.5 fixType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Fix type.
**Notes:** 1 = no fix, 2 = 2D, 3 = 3D.
(Read and Write property)

## 136.51.6 horizDilution as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Horizontal dilution of precision.
**Notes:** (Read and Write property)

### 136.51.7 mode as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manual/Automatic mode.
**Notes:** A = auto, M = manual.
(Read and Write property)

### 136.51.8 posnDilution as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Position dilution of precision.
**Notes:** (Read and Write property)

### 136.51.9 vertDilution as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Vertical dilution of precision.
**Notes:** (Read and Write property)

### 136.51.10 satUsed(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Satellite IDs.
**Notes:** Index in range of 0 to 11.
(Read and Write computed property)

# 136.52 class PhidgetGPRMCMBS

## 136.52.1 class PhidgetGPRMCMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA RMC sentence.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

## 136.52.2 Methods

## 136.52.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 136.52.4 Properties

## 136.52.5 heading as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Heading over ground in degrees.
**Notes:** (Read and Write property)

## 136.52.6 latitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Latitude.
**Notes:** (Read and Write property)

### 136.52.7 longitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Longitude.
**Notes:** (Read and Write property)

### 136.52.8 magneticVariation as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Magnetic variation.
**Notes:** (Read and Write property)

### 136.52.9 mode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mode indicator.
**Notes:** (Read and Write property)

### 136.52.10 speedKnots as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Speed over ground in knots.
**Notes:** (Read and Write property)

### 136.52.11 status as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Status of the data
**Notes:** (Read and Write property)

## 136.53 class PhidgetGPSMBS

### 136.53.1 class PhidgetGPSMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The GPS class is used to configure and gather data from Phidgets GPS sensors, and gives you access to variables from GPS data packets.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin
- MBS Real Studio Plugins, version 12.0pr6
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

### 136.53.2 Methods

### 136.53.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.53.4 NMEAData as PhidgetGPSNMEAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the NMEA data structure.

### 136.53.5 Properties

### 136.53.6 Altitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The altitude above mean sea level in meters.
**Notes:** (Read only property)

### 136.53.7 Date as Date

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The UTC date of the last received position.
**Notes:** Returns time and date as date object.
(Read only property)

### 136.53.8 DateTime as DateTime

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The UTC date of the last received position.
**Notes:** Returns time and date as datetime object.
(Read only property)

### 136.53.9 Heading as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current true course over ground of the GPS.
**Notes:** Heading over ground in degrees.
(Read only property)

### 136.53.10 Latitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The latitude of the GPS in degrees.
**Notes:** (Read only property)

### 136.53.11 Longitude as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The longitude of the GPS.
**Notes:** (Read only property)

### 136.53.12 PositionFixState as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The status of the position fix.
**Notes:** True if a fix is available and latitude, longitude, and altitude can be read. False if the fix is not available.
(Read only property)

### 136.53.13 Velocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current speed over ground of the GPS.
**Notes:** (Read only property)

### 136.53.14 Events

### 136.53.15 HeadingChanged(heading as double, velocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when a heading change occurs.
**Notes:** heading: The current heading.
velocity: The current velocity.

### 136.53.16 PositionChanged(latitude as double, longitude as double, altitude as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent values the channel has measured will be reported in this event, which occurs when the GPS position changes.
**Notes:** latitude: The current latitude.
longitude: The current longitude.
altitude: The current altitude.

### 136.53.17 PositionFixStateChanged(positionFixState as Boolean)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a position fix is obtained or lost.
**Notes:** positionFixState:The state of the position fix.
True indicates a fix is obtained. False indicates no fix found.

## 136.54 class PhidgetGPSNMEAMBS

### 136.54.1 class PhidgetGPSNMEAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The NMEA Data structure.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 136.54.2 Methods

### 136.54.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 136.54.4 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 136.54.5 Properties

### 136.54.6 GGA as PhidgetGPGGAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA GGA Sentence.
**Notes:** (Read and Write property)

### 136.54.7 GSA as PhidgetGPGGAMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA GSA Sentence.
**Notes:** (Read and Write property)

### 136.54.8 RMC as PhidgetGPRMCMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA RMC Sentence.
**Notes:** (Read and Write property)

### 136.54.9 VTG as PhidgetGPVTGMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA VTG Sentence.
**Notes:** (Read and Write property)

## 136.55 class PhidgetGPVTGMBS

### 136.55.1 class PhidgetGPVTGMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** NMEA VTG sentence.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- New Phidgets supported

### 136.55.2 Methods

### 136.55.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 136.55.4 Properties

### 136.55.5 magneticHeading as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Magnetic heading.
**Notes:** (Read and Write property)

### 136.55.6 mode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Mode indicator.
**Notes:** (Read and Write property)

### 136.55.7 speed as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Speed over ground in km/h.
**Notes:** (Read and Write property)

### 136.55.8 speedKnots as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Speed over ground in knots.
**Notes:** (Read and Write property)

### 136.55.9 trueHeading as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True heading over ground.
**Notes:** (Read and Write property)

## 136.56 class PhidgetGyroscopeMBS

### 136.56.1 class PhidgetGyroscopeMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Gyroscope class reports rotational data from the Phidget containing a gyroscope chip for use in your code.
**Notes:** Phidget gyroscopes usually have multiple sensors, each oriented in a different axis, so multiple dimensions of heading can be recorded.

If the Phidget you're using also has an accelerometer and a magnetometer, you may want to use the Spatial classin order to get all of the data at the same time, in a single event.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.56.2 Methods

### 136.56.3 AngularRate as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent angular rate value that the channel has reported.
**Notes:** This value will always be between MinAngularRate and MaxAngularRate.

### 136.56.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.56.5 MaxAngularRate as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the AngularRateUpdate event will report.

### 136.56.6 MinAngularRate as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the AngularRateUpdate event will report.

### 136.56.7 zero

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Re-zeros the gyroscope in 1-2 seconds.
**Notes:** The device must be stationary when zeroing.
The angular rate will be reported as 0.0¬∞/s while zeroing.
Zeroing the gyroscope is a method of compensating for the drift that is inherent to all gyroscopes. See your device's User Guide for more information on dealing with drift.

### 136.56.8 Properties

### 136.56.9 AxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of axes the channel can measure angular rate on.
**Notes:** See your device's User Guide for more information about the number of axes and their orientation.
(Read only property)

### 136.56.10 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another AngularRateUpdate event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
Unit: milliseconds (ms)
(Read and Write property)

### 136.56.11 HeatingEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set to true to enable the temperature stabilization feature of this device.
**Notes:** This enables onboard heating elements to bring the board up to a known temperature to minimize ambient temerature effects on the sensor's reading. You can leave this setting false to conserve power consumption.This property is shared by any and all spatial-related objects on this device (Accelerometer, Gyroscope, Magnetometer, Spatial)

HeatingEnabled: Whether self-heating temperature stabilization is enabled
(Read and Write property)

### 136.56.12 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.56.13 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.56.14 Timestamp as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent timestamp value that the channel has reported.
**Notes:** This is an extremely accurate time measurement streamed from the device.
If your application requires a time measurement, you should use this value over a local software timestamp.
(Read only property)

### 136.56.15 Events

### 136.56.16 AngularRateUpdated(angularRate() as double, timestamp as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent angular rate and timestamp values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** angularRate: The angular rate values
timestamp: The timestamp value

## 136.57 class PhidgetHubMBS

### 136.57.1 class PhidgetHubMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hub class allows you to control power to VINT hub ports.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.57.2 Methods

### 136.57.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.57.4 setPortPower(Port as Integer, State as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Controls power to the VINT Hub Ports.
**Notes:** port: The Hub port
state: The power state

# 136.58 class PhidgetHumiditySensorMBS

## 136.58.1 class PhidgetHumiditySensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Humidity Sensor class gathers relative humidity data from the Phidget and makes it available to your code.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.58.2 Methods

## 136.58.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.58.4 Properties

## 136.58.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another HumidityChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between HumidityChange events can also affected by the HumidityChangeTrigger.
Unit: milliseconds (ms)
(Read and Write property)

## 136.58.6 Humidity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent humidity value that the channel has reported.
**Notes:** This value will always be between MinHumidity and MaxHumidity.
(Read only property)

### 136.58.7 HumidityChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a HumidityChange event until the humidity value has changed by the amount specified by the HumidityChangeTrigger.
**Notes:** Setting the HumidityChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
(Read and Write property)

### 136.58.8 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.58.9 MaxHumidity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that the HumidityChange event will report.
**Notes:** (Read only property)

### 136.58.10 MaxHumidityChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that HumidityChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.58.11 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.58.12 MinHumidity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that the HumidityChange event will report.
**Notes:** (Read only property)

### 136.58.13 MinHumidityChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that HumidityChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.58.14 Events

### 136.58.15 HumidityChanged(humidity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent humidity value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a HumidityChangeTrigger has been set to a non-zero value, the HumidityChange event will not occur until the humidity has changed by at least the HumidityChangeTrigger value.

humidity: The ambient relative humidity

## 136.59 class PhidgetIRCodeInfoMBS

### 136.59.1 class PhidgetIRCodeInfoMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The PhidgetIR CodeInfo structure contains all information needed to transmit a code, apart from the actual code data.
**Notes:** Some values can be set to null to select defaults.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr7

### 136.59.2 Properties

### 136.59.3 bitCount as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of bits in the code.
**Notes:** (Read only property)

### 136.59.4 carrierFrequency as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Carrier frequency in Hz - defaults to 38kHz
**Notes:** (Read only property)

### 136.59.5 dutyCycle as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Duty Cycle in percent (0.1-0.5).
**Notes:** Defaults to 0.33

Unit: duty cycle (duty cycle)
(Read and Write property)

### 136.59.6 encoding as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Encoding technique used to encode the data.
**Notes:** (Read only property)

### 136.59.7 gap as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gap time in microseconds.
**Notes:** (Read only property)

### 136.59.8 length as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Constant or Variable length encoding.
**Notes:** (Read only property)

### 136.59.9 minRepeat as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Minium number of times to repeat a code on transmit.
**Notes:** (Read only property)

### 136.59.10 trail as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Trail time in microseconds.
**Notes:** Can be zero for no trail.
(Read only property)

### 136.59.11 header(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Header pulse and space.
**Notes:** Can be zero for no header.
Index in range of 0 to 1.
(Read and Write computed property)

### 136.59.12 one(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pulse and Space times to represent a '1' bit, in microseconds
**Notes:** Index in range of 0 to 1.
(Read and Write computed property)

### 136.59.13 repeat(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A series or pulse and space times to represent the repeat code.
**Notes:** Start and end with pulses and null terminate. Set to 0 for none.
Index in range of 0 to 25.
(Read and Write computed property)

### 136.59.14 toggleMask(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bit toggles, which are applied to the code after each transmit.
**Notes:** index from 0 to 32.
(Read and Write computed property)

### 136.59.15 zero(index as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pulse and Space times to represent a '0' bit, in microseconds
**Notes:** Index in range of 0 to 1.
(Read and Write computed property)

### 136.59.16 Constants

Encoding

| Constant | Value | Description |
|---|---|---|
| kEncodingBiPhase | 4 | Bi-Phase, or Manchester encoding |
| kEncodingPulse | 3 | Pulse encoding, or Pulse Width Modulation |
| kEncodingRC5 | 5 | RC5 - a type of Bi-Phase encoding |
| kEncodingRC6 | 6 | RC6 - a type of Bi-Phase encoding |
| kEncodingSpace | 2 | Space encoding, or Pulse Distance Modulation |
| kEncodingUnknown | 1 | Unknown - the default value |

Length Types

| Constant | Value | Description |
|---|---|---|
| kLengthConstant | 2 | Constant - the bitstream and gap length is constant |
| kLengthUnknown | 1 | Unknown - the default value |
| kLengthVariable | 3 | Variable - the bitstream has a variable length with a constant gap |

## 136.60 class PhidgetIRMBS

### 136.60.1 class PhidgetIRMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Infrared Remote class lets you read and transmit command codes from infrared remotes that the majority of household appliances use.
**Notes:** You can use this class to construct and transmit commands from scratch, or learn and retransmit codes from the remote controller of your appliance.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin
- MBS REALbasic Plugins, version 10.6pr7

### 136.60.2 Methods

### 136.60.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.60.4 getLastCode(byref bitCount as UInt32) as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last code the channel has received.
**Notes:** The code is represented by a hexadecimal string (array of bytes).

### 136.60.5 getLastLearnedCode(byref codeInfo as PhidgetIRCodeInfoMBS) as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last code the channel has learned.
**Notes:** The code is represented by a hexadecimal string (array of bytes).

The codeInfo structure holds data that describes the learned code.

### 136.60.6 transmit(code as String, codeInfo as PhidgetIRCodeInfoMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits a code
**Notes:** code data is transmitted MSBit first.
MSByte is in array index 0 of code
LSBit is right justified, therefore, MSBit may be in bit position 0-7 (of array index 0) depending on the bit count.

code:code data
codeInfo:contains the data for characterizing the code.

### 136.60.7 transmitRaw(data as MemoryBlock, carrierFrequency as UInt32, dutyCycle as double, gap as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits raw data as a series of pulses and spaces.
**Notes:** data: data to send.
dataLen: length of the data array
carrierFrequency: carrier frequency in Hz
dutyCycle: the duty cycle
gap: the gap time.

data must start and end with a pulse.
Each element is a positive time in Œºs
dataLength has a maximum length of 200, however, streams should be kept must shorter than this (less than 100ms between gaps).
dataLength must be an odd number
Leave carrierFrequency as 0 for default.
carrierFrequency has a range of 10kHz - 1MHz
Leave dutyCycle as 0 for default
dutyCycle can have a value between 0.1 and 0.5
Specifying a gap will guarantee a gap time (no transmitting) after data is sent.
gap time is in Œºs
gap time can be set to 0

### 136.60.8 transmitRepeat

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Transmits a repeat of the last transmited code.
**Notes:** Depending on the CodeInfo structure, this may be a retransmission of the code itself, or there may be a special repeat code.

### 136.60.9 Events

### 136.60.10 CodeReceived(code as string, bitCount as Integer, isRepeat as Boolean)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is fired every time a code is received and correctly decoded.
**Notes:** code: The code string
bitCount: The length of the received code in bits
isRepeat: true if a repeat is detected

The code is represented by a hexadecimal string (array of bytes) with a length of 1/4 of bitCount.
The MSBit is considered to be the first bit received and will be in array index 0 of code
Repeat will be true if a repeat is detected (either timing wise or via a repeat code)
False repeasts can happen if two separate button presses happen close together

### 136.60.11 Learned(code as string, codeInfo as PhidgetIRCodeInfoMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event fires when a button has been held down long enough for the channel to have learned the CodeInfo values.
**Notes:** A code is usually learned after 1 second, or after 4 repeats.

### 136.60.12 RawDataReceived(data as MemoryBlock)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event will fire every time the channel gets more data.
**Notes:** This will happen at most once every 8ms.

# 136.61 class PhidgetLCDMBS

## 136.61.1 class PhidgetLCDMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The LCD class allows you to control various liquid crystal displays.
**Notes:** It offers control of displayed text as well as screen settings and custom character creation.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.61.2 Methods

## 136.61.3 Clear

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears all pixels in the current frame buffer.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

## 136.61.4 ClearAsync

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears all pixels in the current frame buffer.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

Calls ClearAsyncCompleted event later.

## 136.61.5 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.61.6 copy(sourceFramebuffer as Integer, destFramebuffer as Integer, sourceX1 as Integer, sourceY1 as Integer, sourceX2 as Integer, sourceY2 as Integer, destX as Integer, destY as Integer, inverted as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies all pixels from a specified rectangular region to another.
**Notes:** sourceFramebuffer: Index number of the frame buffer containing the source rectangle
destFramebuffer: Index number of the frame buffer containing the destination rectangle
sourceX1: X coordinate of upper left corner of source rectangle
sourceY1: Y coordinate of upper left corner of source rectangle
sourceX2: X coordinate of bottom right corner of source rectangle
sourceY2: Y coordinate of bottom right corner of source rectangle
destX: X coordinate of upper left corner of destination rectangle
destY: Y coordinate of upper left corner of destination rectangle
inverted: If true, copied pixels are inverted

### 136.61.7 copyAsync(sourceFramebuffer as Integer, destFramebuffer as Integer, sourceX1 as Integer, sourceY1 as Integer, sourceX2 as Integer, sourceY2 as Integer, destX as Integer, destY as Integer, inverted as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies all pixels from a specified rectangular region to another.
**Notes:** sourceFramebuffer: Index number of the frame buffer containing the source rectangle
destFramebuffer: Index number of the frame buffer containing the destination rectangle
sourceX1: X coordinate of upper left corner of source rectangle
sourceY1: Y coordinate of upper left corner of source rectangle
sourceX2: X coordinate of bottom right corner of source rectangle
sourceY2: Y coordinate of bottom right corner of source rectangle
destX: X coordinate of upper left corner of destination rectangle
destY: Y coordinate of upper left corner of destination rectangle
inverted: If true, copied pixels are inverted

Calls copyAsyncCompleted event later.

### 136.61.8 drawLine(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a straight line in the current frame buffer between two specified points.

**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x1: X coordinate of the first point
y1: Y coordinate of the first point
x2: X coordinate of the second point
y2: Y coordinate of the second point

### 136.61.9 drawLineAsync(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a straight line in the current frame buffer between two specified points.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x1: X coordinate of the first point
y1: Y coordinate of the first point
x2: X coordinate of the second point
y2: Y coordinate of the second point

CallsdrawLineAsyncCompleted event later.

### 136.61.10 drawPixel(x as Integer, y as Integer, pixelState as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws, erases, or inverts a single specified pixel.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x: The X coordinate of the pixel
y: The Y coordinate of the pixel
pixelState: The new state of the pixel.

### 136.61.11 drawPixelAsync(x as Integer, y as Integer, pixelState as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws, erases, or inverts a single specified pixel.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x: The X coordinate of the pixel
y: The Y coordinate of the pixel
pixelState: The new state of the pixel.

Calls drawPixelAsyncCompleted event later.

### 136.61.12 drawRect(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, filled as Integer, inverted as Integer = 0)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a rectangle in the current frame buffer using the specified points.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x1: The X coordinate of the top-left corner of the rectangle
y1: The Y coordinate of the top-left corner of the rectangle
x2: The X coordinate of the bottom-right corner of the rectangle
y2: The Y coordinate of the bottom-right corner of the rectangle
filled: If true, the rectangle will be solid. If false, just a single pixel outline.
inverted: If true, clears the region instead of drawing

### 136.61.13 drawRectAsync(x1 as Integer, y1 as Integer, x2 as Integer, y2 as Integer, filled as Integer, inverted as Integer = 0)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a rectangle in the current frame buffer using the specified points.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

x1: The X coordinate of the top-left corner of the rectangle
y1: The Y coordinate of the top-left corner of the rectangle
x2: The X coordinate of the bottom-right corner of the rectangle
y2: The Y coordinate of the bottom-right corner of the rectangle
filled: If true, the rectangle will be solid. If false, just a single pixel outline.
inverted: If true, clears the region instead of drawing

Calls drawRectAsyncCompleted event later.

### 136.61.14 Flush

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Flushes the buffered LCD contents to the LCD screen.

### 136.61.15 FlushAsync

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Flushes the buffered LCD contents to the LCD screen.
**Notes:** Calls FlushAsyncCompleted event later.

### 136.61.16 getFontSize(Font as Integer, byref Width as Integer, byref Height as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the size of the specified font.
**Notes:** font: The specified font
width: The width of the font
height: The height of the font

### 136.61.17 Initialize

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the Text LCD display.

### 136.61.18 MaxCharacters(font as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum number of characters that can fit on the frame buffer for the specified font.
**Notes:** font: The specified font
maxCharacters: The maximum number of characters for the font

### 136.61.19 saveFrameBuffer(frameBuffer as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes the specified frame buffer to flash memory
**Notes:** Use sparingly. The flash memory is only designed to be written to 10,000 times before it may become unusable. This method can only be called one time each time the channel is opened.

### 136.61.20 saveFrameBufferAsync(frameBuffer as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes the specified frame buffer to flash memory
**Notes:** Use sparingly. The flash memory is only designed to be written to 10,000 times before it may become unusable. This method can only be called one time each time the channel is opened.

Calls saveFrameBufferAsyncCompleted event later.

### 136.61.21 setCharacterBitmap(Font as Integer, Character as String, Bitmap as MemoryBlock)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a bitmap and select a character to represent it.
**Notes:** Now, when you use the specific character, the bitmap will show in it's place.

font: The font the character belongs to
character: The character to be changed, in a null-terminated string.
bitmap: Bitmap array as Memoryblock.

### 136.61.22 setCharacterBitmapAsync(Font as Integer, Character as String, Bitmap as MemoryBlock)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a bitmap and select a character to represent it.
**Notes:** Now, when you use the specific character, the bitmap will show in it's place.

font: The font the character belongs to
character: The character to be changed, in a null-terminated string.
bitmap: Bitmap array as Memoryblock.

Calls setCharacterBitmapAsyncCompleted event later.

### 136.61.23 setFontSize(Font as Integer, Width as Integer, Height as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the size of the specified font.
**Notes:** font: The specified font
width: The width of the font
height: The height of the font

### 136.61.24 writeBitmap(xPosition as Integer, yPosition as Integer, xSize as Integer, ySize as Integer, Bitmap as MemoryBlock)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a bitmap to the current frame buffer at the given location.
**Notes:** Each byte in the array represents one pixel in row-major order.
Changes made to the frame buffer must be flushed to the LCD screen using flush.

xPosition: The X coordinate of the bitmap
yPosition: The Y coordinate of the bitmap
xSize: The length of each row in the bitmap
ySize: The number of rows in the bitmap
bitmap: The bitmap to be drawn

### 136.61.25 writeBitmapAsync(xPosition as Integer, yPosition as Integer, xSize as Integer, ySize as Integer, Bitmap as MemoryBlock)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Draws a bitmap to the current frame buffer at the given location.
**Notes:** Each byte in the array represents one pixel in row-major order.
Changes made to the frame buffer must be flushed to the LCD screen using flush.

xPosition: The X coordinate of the bitmap
yPosition: The Y coordinate of the bitmap
xSize: The length of each row in the bitmap
ySize: The number of rows in the bitmap
bitmap: The bitmap to be drawn

Calls writeTextAsyncCompleted event later.

### 136.61.26 writeText(Font as Integer, xPosition as Integer, yPosition as Integer, Text as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes text to the current frame buffer at the specified location.
**Notes:** Changes made to the frame buffer must be flushed to the LCD screen using flush.

font: The font of the text
xPosition: The X position of the start of the text string
yPosition: The Y position of the start of the text string
text: The text to be written

### 136.61.27 writeTextAsync(Font as Integer, xPosition as Integer, yPosition as Integer, Text as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write text asynchronously.
**Notes:** Writes text to the current frame buffer at the specified location.
Changes made to the frame buffer must be flushed to the LCD screen using flush.

font: The font of the text
xPosition: The X position of the start of the text string
yPosition: The Y position of the start of the text string
text: The text to be written

Calls writeTextAsyncCompleted event later.

### 136.61.28 Properties

### 136.61.29 Backlight as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Backlight affects the brightness of the LCD screen.
**Notes:** Backlight is bounded by MinBackLight and MaxBacklight.
(Read and Write property)

### 136.61.30 Contrast as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Contrast level of the text or graphic pixels.
**Notes:** A higher contrast will make the image darker.
Contrast is bounded by MinContrast and MaxContrast.
(Read and Write property)

### 136.61.31 CursorBlink as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When CursorBlink is true, the device will cause the cursor to periodically blink.
**Notes:** (Read and Write property)

### 136.61.32 CursorOn as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When CursorOn is true, the device will underline to the cursor position.
**Notes:** (Read and Write property)

### 136.61.33 FrameBuffer as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The frame buffer that is currently being used.
**Notes:** Commands sent to the device are performed on this buffer.
(Read and Write property)

### 136.61.34 Height as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The height of the LCD screen attached to the channel.
**Notes:** (Read only property)

### 136.61.35 MaxBacklight as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Backlight can be set to.
**Notes:** (Read only property)

### 136.61.36 MaxContrast as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Contrast can be set to.
**Notes:** (Read only property)

### 136.61.37 MinBacklight as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Backlight can be set to.
**Notes:** (Read only property)

### 136.61.38 MinContrast as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Contrast can be set to.
**Notes:** (Read only property)

### 136.61.39 ScreenSize as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The size of the LCD screen attached to the channel.
**Notes:** (Read and Write property)

### 136.61.40 Sleeping as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The on/off state of Sleeping.
**Notes:** Putting the device to sleep turns off the display and backlight in order to save power.
The device will still take commands while asleep, and will wake up if the screen is flushed, or if the contrast or backlight are changed.
When the device wakes up, it will return to its last known state, taking into account any changes that happened while asleep.
(Read and Write property)

### 136.61.41 Width as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The width of the LCD screen attached to the channel.
**Notes:** (Read only property)

### 136.61.42 Events

### 136.61.43 clearAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when clearAsync completes.

### 136.61.44 copyAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when copyAsync completes.

### 136.61.45 drawLineAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when drawLineAsync completes.

### 136.61.46 drawPixelAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when drawPixelAsync completes.

### 136.61.47 drawRectAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when drawRectAsync completes.

### 136.61.48 flushAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when flushAsync completes.

### 136.61.49 saveFrameBufferAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when saveFrameBufferAsync completes.

### 136.61.50 setCharacterBitmapAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setCharacterBitmapAsync completes.

### 136.61.51 writeBitmapAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when writeBitmapAsync completes.

### 136.61.52 writeTextAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when writeTextAsync completes.

### 136.61.53 Constants

Fonts

| Constant | Value | Description |
|---|---|---|
| kFont5x8 | 4 | 5px by 8px font |
| kFont6x10 | 3 | 6px by 10px font |
| kFont6x12 | 5 | 6px by 12px font |
| kFontUser1 | 1 | User-defined font #1 |
| kFontUser2 | 2 | User-defined font #2 |

Pixel States

| Constant | Value | Description |
|---|---|---|
| kPixelStateInvert | 2 | Invert the pixel state |
| kPixelStateOff | 0 | Pixel off state |
| kPixelStateOn | 1 | Pixel on state |

Screen Sizes

| Constant | Value | Description |
|---|---|---|
| kScreenSize1x16 | 4 | 1x16, One row, 16 column text screen |
| kScreenSize1x40 | &ha | 1x40, One row, 40 column text screen |
| kScreenSize1x8 | 2 | 1x8, One row, eight column text screen |
| kScreenSize2x16 | 5 | 2x16, Two row, 16 column text screen |
| kScreenSize2x20 | 7 | 2x20, Two row, 20 column text screen |
| kScreenSize2x24 | 9 | 2x24, Two row, 24 column text screen |
| kScreenSize2x40 | &hb | 2x40, Two row, 40 column text screen |
| kScreenSize2x8 | 3 | 2x8, Two row, eight column text screen |
| kScreenSize4x16 | 6 | 4x16, Four row, 16 column text screen |
| kScreenSize4x20 | 8 | 4x20, Four row, 20 column text screen. |
| kScreenSize4x40 | &hc | 4x40, Four row, 40 column text screen |
| kScreenSize64x128 | &hd | 64x128, 64px by 128px graphic screen |
| kScreenSizeNone | 1 | No Screen, Screen size unknown. |

# 136.62 class PhidgetLightSensorMBS

## 136.62.1 class PhidgetLightSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Light Sensor class gathers data from the light sensor on a Phidget board.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.62.2 Methods

## 136.62.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.62.4 Properties

## 136.62.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another IlluminanceChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between IlluminanceChange events can also affected by the IlluminanceChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.62.6 Illuminance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent illuminance value that the channel has reported.
**Notes:** This value will always be between MinIlluminance and MaxIlluminance.
(Read only property)

### 136.62.7 IlluminanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a IlluminanceChange event until the illuminance value has changed by the amount specified by the IlluminanceChangeTrigger.
**Notes:** Setting the IlluminanceChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
(Read and Write property)

### 136.62.8 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.62.9 MaxIlluminance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the IlluminanceChange event will report.
**Notes:** (Read only property)

### 136.62.10 MaxIlluminanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that IlluminanceChangeTrigger can be set to.
**Notes:** In lux.
(Read only property)

### 136.62.11 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.62.12 MinIlluminance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the IlluminanceChange event will report.
**Notes:** (Read only property)

### 136.62.13 MinIlluminanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that IlluminanceChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.62.14 Events

### 136.62.15 IlluminanceChanged(illuminance as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent illuminance value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a IlluminanceChangeTrigger has been set to a non-zero value, the IlluminanceChange event will not occur until the illuminance has changed by at least the IlluminanceChangeTrigger value.

illuminance: The current illuminance

# 136.63 class PhidgetLogMBS

## 136.63.1 class PhidgetLogMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class hosting the log facilities.

## 136.63.2 Methods

## 136.63.3 addSource(source as String, LogLevel as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds a source to the Phidget logging system.
**Notes:** This is useful for declaring a source and setting its log level before sending any messages.

source: The source name
level: The log level of the source

## 136.63.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.63.5 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

## 136.63.6 disable

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disables logging within the Phidget library.

### 136.63.7 disableNetwork

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disable networking.

### 136.63.8 disableRotating

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disables automatic rotation of the log file.

### 136.63.9 enable(LogLevel as Integer, destination as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables logging within the Phidget library.
**Notes:** LogLevel: The logging level
destination: The log file path, or "" for STDOUT

### 136.63.10 enableNetwork(address as string, port as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable networking.

### 136.63.11 enableRotating

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables automatic rotation of the log file (the default).

### 136.63.12 getRotating(byref size as UInt64, byref keepCount as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current log rotation parameters.
**Notes:** size: The file size above which the log file should be rotated.
keepCount: The number of log files that will be kept after rotation.

### 136.63.13 Log(LogLevel as Integer, Message as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a message to the Phidget library log.
See also:

- 136.63.14 Log(LogLevel as Integer, Source as String, Message as String) 18977

### 136.63.14 Log(LogLevel as Integer, Source as String, Message as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a message to the Phidget library log.
See also:

- 136.63.13 Log(LogLevel as Integer, Message as String) 18977

### 136.63.15 rotate

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manually rotate the log file.
**Notes:** This will only have an effect if automatic rotation is disabled and the log file is larger than the specified maximum file size.

### 136.63.16 setRotating(size as UInt64, keepCount as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets log rotation parameters.
**Notes:** size: The file size above which the file should be rotated in bytes. Min: 32768 (32 KiB) Def: 10485760 (10 MiB)
keepCount: The number of log files that should be kept after rotation. Min: 0 Def: 1 Max: 64

### 136.63.17 Sources as String()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries current list of log sources.

### 136.63.18 Properties

### 136.63.19 isRotating as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines if the library is automatically rotating the log file.
**Notes:** (Read only property)

### 136.63.20 Level as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the log level for the phidget22 source..
**Notes:** (Read and Write property)

### 136.63.21 SourceLevel(source as String) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the log level of the specified log source.
**Notes:** (Read and Write computed property)

### 136.63.22 Constants

Log Levels

| Constant | Value | Description |
|---|---|---|
| LogLevelCritical | 1 | Critical |
| LogLevelDebug | 5 | Debug |
| LogLevelError | 2 | Errors |
| LogLevelInfo | 4 | Information |
| LogLevelVerbose | 6 | Verbose |
| LogLevelWarning | 3 | Warnings |

## 136.64 class PhidgetMagnetometerMBS

### 136.64.1 class PhidgetMagnetometerMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Magnetometer class gathers magnetic compass data from Phidget boards.
**Notes:** Phidget magnetometers usually have multiple sensors, each oriented in a different axis, so multiple dimensions of compass bearing can be recorded.

If the Phidget you're using also has a gyroscope and an accelerometer, you may want to use the Spatial class in order to get all of the data at the same time, in a single event.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.64.2 Methods

### 136.64.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.64.4 MagneticField as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent field strength value that the channel has reported.
**Notes:** This value will always be between MinMagneticField and MaxMagneticField.

### 136.64.5 MaxMagneticField as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the MagneticFieldChange event will report.Any readings outside this range will result in a Saturation event.
**Notes:** This check is done after calibration values have been applied, which will affect your magnetometer's

range accordingly.

### 136.64.6 MinMagneticField as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the MagneticFieldChange event will report.Any readings outside this range will result in a Saturation event.
**Notes:** This check is done after calibration values have been applied, which will affect your magnetometer's range accordingly.

### 136.64.7 resetCorrectionParameters

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the CompassCorrectionParameters to their default values.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the CompassCorrectionParameters for your specific situation. See your device's User Guide for more information.

### 136.64.8 saveCorrectionParameters

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Saves the CalibrationParameters.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the CompassCorrectionParameters for your specific situation. See your device's User Guide for more information.

### 136.64.9 setCorrectionParameters(magneticField as double, offset0 as double, offset1 as double, offset2 as double, gain0 as double, gain1 as double, gain2 as double, T0 as double, T1 as double, T2 as double, T3 as double, T4 as double, T5 as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calibrate your device for the environment it will be used in.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the CompassCorrectionParameters for your specific situation. See your device's User Guide for more information.

magneticField: Ambient magnetic field value.
offset0: Provided by calibration program.
offset1: Provided by calibration program.
offset2: Provided by calibration program.
gain0: Provided by calibration program.
gain1: Provided by calibration program.
gain2: Provided by calibration program.
T0: Provided by calibration program.
T1: Provided by calibration program.
T2: Provided by calibration program.
T3: Provided by calibration program.
T4: Provided by calibration program.
T5: Provided by calibration program.

### 136.64.10 Properties

### 136.64.11 AxisCount as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of axes the channel can measure field strength on.
**Notes:** See your device's User Guide for more information about the number of axes and their orientation.
(Read only property)

### 136.64.12 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another MagneticFieldChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between MagneticFieldChange events can also affected by the MagneticFieldChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.64.13 HeatingEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether self-heating temperature stabilization is enabled.
**Notes:** Set to true to enable the temperature stabilization feature of this device. This enables onboard heating elements to bring the board up to a known temperature to minimize ambient temerature effects on the sensor's reading. You can leave this setting false to conserve power consumption.This property is shared by any and all spatial-related objects on this device (Accelerometer, Gyroscope, Magnetometer, Spatial)
(Read and Write property)

### 136.64.14 MagneticFieldChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a MagneticFieldChange event until the field strength value has changed by the amount specified by the MagneticFieldChangeTrigger.
**Notes:** Setting the MagneticFieldChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.64.15 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.64.16 MaxMagneticFieldChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that MagneticFieldChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.64.17 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.64.18 MinMagneticFieldChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that MagneticFieldChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.64.19 Timestamp as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent timestamp value that the channel has reported. This is an extremely accurate time measurement streamed from the device.
**Notes:** If your application requires a time measurement, you should use this value over a local software timestamp.
(Read only property)

### 136.64.20 Events

### 136.64.21 MagneticFieldChanged(magneticField() as double, timestamp as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent magnetic field values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a MagneticFieldChangeTrigger has been set to a non-zero value, the MagneticFieldChange event will not occur until the field strength has changed by at least the MagneticFieldChangeTrigger value.

magneticField: The magnetic field values. Index from 0 to 2.
timestamp: The timestamp value

## 136.65 class PhidgetManagerMBS

### 136.65.1 class PhidgetManagerMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Phidget Manager allows tracking of which Phidgets are available to be controlled from the current program.
**Notes:** This is useful for listing all available Phidgets so you can select which ones to use at runtime.

You do not need to use a Phidget Manager if you know what Phidgets will be required for your application in advance.

Phidget channels that become available will each send an Attach event, and Phidgets that are removed from the system will send corresponding Detach events. If you are using a Phidget Manager, your program is responsible for keeping track of available Phidgets using these events.

Please use LoadLibrary shared method in PhidgetManagerMBS class to load Phidgets library before using the classes.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr4
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr4

### 136.65.2 Methods

### 136.65.3 Close

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes a Phidget Manager that has been opened.

### 136.65.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.65.5 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 136.65.6 LoadLibrary(file as FolderItem) as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the Phidgets library from given location.
**Notes:** Returns true on success or false on failure.
See LibraryLoadError property for error message.
See also:

- 136.65.7 LoadLibrary(path as String) as Boolean 18987

### 136.65.7 LoadLibrary(path as String) as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the Phidgets library from given file path.
**Example:**

```
// where is the library?

#If TargetWindows
Const path = "Phidget22.dll"
#Else TargetMacOS Then
Const path = "/Library/Frameworks/Phidget22.framework"
#EndIf

If PhidgetManagerMBS.LoadLibrary(path) Then

MessageBox "OK"

Else

MessageBox PhidgetManagerMBS.LibraryLoadError
Return

End If
```

**Notes:** Returns true on success or false on failure.
See LibraryLoadError property for error message.
See also:

- 136.65.6 LoadLibrary(file as FolderItem) as Boolean 18987

### 136.65.8 Open

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens the Phidget Manager.
**Notes:** Be sure to register Attach and Detach event handlers for the Manager before opening it, to ensure you program doesn't miss the events reported for devices already connected to your system.

### 136.65.9 Properties

### 136.65.10 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 136.65.11 LibraryLoaded as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the phidgets library was loaded.
**Notes:** (Read only property)

### 136.65.12 LibraryLoadError as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error message from LoadLibrary call.
**Notes:** (Read only property)

### 136.65.13 Events

### 136.65.14 Attached(phid as PhidgetMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a channel is attached.
**Notes:** Phidget channels you get from the manager are informational only, you can read information about them such as serial number, class, name, etc. but they are not opened. In order to interact with one, you must create and open a Phidget object of the correct type.

### 136.65.15 Detached(phid as PhidgetMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a channel is detached.
**Notes:** Phidget channels you get from the manager are informational only, you can read information about them such as serial number, class, name, etc. but they are not opened. In order to interact with one, you must create and open a Phidget object of the correct type.

### 136.65.16 Error(errorCode as Integer, errorString as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An error occurred.

## 136.66 class PhidgetMBS

### 136.66.1 class PhidgetMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The core Phidget class deals with functionality common to all Phidgets, such as opening and closing them, or setting Attach, Detach and Event handlers.
**Notes:** This class is also used to specify the associations between the Phidget software objects and their corresponding physical devices, and makes it possible to determine which Phidget is which in cases where it might otherwise be ambiguous.

This class contains various functions such as Release, Retain, and getParent designed to be used with the Phidget Manager. These specialized functions may be safely ignored if your application does not require a Manager. You can check the Manager API for more information.

All errors are reported as exceptions.
And MBS Plugin schedules all events to raise on main thread, so you can easily update GUI.

Please use LoadLibrary shared method in PhidgetManagerMBS class to load Phidgets library before using the classes
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 136.66.2 Methods

### 136.66.3 ChildDevices as PhidgetMBS()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries child devices for hub.

### 136.66.4 close

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes a Phidget channel that has been opened.
**Notes:** Close will release the channel on the Phidget device, and should be called prior to delete.

### 136.66.5 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** Overwritten by subclasses.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 136.66.6 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 136.66.7 DeviceChannelCount(ChannelClass as Integer) as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of channels of the specified channel class on the device.
**Notes:** Pass kChannelClassNothing to get the total number of channels.

### 136.66.8 open

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens the Phidget channel.
**Notes:** The specific channel to be opened can be specified by setting any of the following properties:

DeviceSerialNumber
DeviceLabel
Channel
HubPort
IsHubPortDevice
ServerName
IsLocal
IsRemote

Open will return immediately, with the attachment process proceeding asynchronously. Use the Attach event or Attached property to determine when the channel is ready to use.

### 136.66.9 openWaitForAttachment(timeoutMs as UInt32 = 1000)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Opens the Phidget channel and waits a defined amount of time for the device to attach.
**Notes:** The specific channel to be opened can be specified by setting any of the following properties:

DeviceSerialNumber
DeviceLabel
Channel
HubPort
IsHubPortDevice
ServerName
IsLocal
IsRemote

OpenWaitForAttachment() will block until the channel is attached or a timeout occurs. A timeout value of 0 will wait forever.

### 136.66.10 Poll

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks for pending events to dispatch.
**Notes:** Our plugin dispatches events in two ways. If the event is raised on main thread, it will be raised directly. But if it arrives on other threads, it's queued and then dispatched via a timer on the main thread when there is idle time.
This poll method allows you to dispatch queued events now.

### 136.66.11 resetLibrary

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes all channels, and stops all threads.
**Notes:** The library is reset to a newly loaded state. All channel handles have been freed.
This function is intended for use in special cases where the library cannot be unloaded between program

runs, such as LabVIEW and Unity Editor.

### 136.66.12 writeDeviceLabel(deviceLabel as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a label to the device in the form of a string in the device flash memory.
**Notes:** This label can then be used to identify the device, and will persist across power cycles.

The label can be at most 10 UTF-16 code units. Most unicode characters take up a single code unit, but some, such as emoji, can take several.

Some older devices can not have their labels set from Windows. For these devices the label should be set from Linux or macOS.

Note: You should be careful when writing labels in your code, because the label is stored in flash which can only be re-written around 10,000 times before it will no longer write. If your program is complex, be sure to test it thoroughly before using WriteLabel to avoid accidentally burning out the flash.

### 136.66.13 Properties

### 136.66.14 Attached as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the attached status of channel.
**Notes:** A Phidget is attached after it has been opened and the Phidget library finds and connects to the corresponding hardware device.
Most API calls are only valid on attached Phidgets.
(Read only property)
See also:

- 136.66.50 Attached 19002

### 136.66.15 Channel as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel index of the channel on the device.
**Notes:** Specifies the channel index to be opened. The default channel is 0. Set to kChannelAny to open any channel on the specified device.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.16 ChannelClass as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the channel class of the channel.
**Notes:** (Read only property)

### 136.66.17 ChannelClassName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the channel class the channel belongs to.
**Notes:** (Read only property)

### 136.66.18 ChannelName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the channel's name.
**Notes:** This name serves as a description of the specific nature of the channel.
(Read only property)

### 136.66.19 ChannelSubclass as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the subclass for this channel.
**Notes:** Allows for identifying channels with specific characteristics without needing to know the exact device and channel index.

(Read only property)

### 136.66.20 ClientVersionMajor as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The major version of the client.
**Notes:** (Read only property)

### 136.66.21 ClientVersionMinor as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minor version of the client.
**Notes:** (Read only property)

### 136.66.22 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another change event.
**Notes:** Unit: milliseconds (ms)
(Read and Write property)

### 136.66.23 DeviceClass as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the device class for the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.24 DeviceClassName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the device class for the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.25 DeviceID as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the DeviceID for the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.26 DeviceLabel as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The device channel.
**Notes:** Gets the label of the Phidget which this channel is a part of. A device label is a custom string used to more easily identify a Phidget. Labels are written to a Phidget using writeDeviceLabel(), or by right-clicking the device and setting a label in the Phidget Control Panel for Windows.

Specifies the label of the Phidget to be opened. Leave un-set to open any label. A device label is a custom string used to more easily identify a Phidget. Labels are written to a Phidget using Phidget_writeDeviceLabel(), or by right-clicking the device and setting a label in the Phidget Control Panel for Windows.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.27 DeviceName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.28 DeviceSerialNumber as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the Phidget which this channel is a part of.
**Notes:** If the channel is part of a VINT device, this will be the serial number of the VINT Hub the device is attached to.

Specifies the serial number of the Phidget to be opened. Leave un-set, or set to kSerialNumberAny to open any serial number.
If the channel is part of a VINT device, this will be the serial number of the VINT Hub the device is attached to.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.29 DeviceSKU as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the SKU (part number) of the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.30 DeviceVersion as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the firmware version of the Phidget which this channel is a part of.
**Notes:** (Read only property)

### 136.66.31 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 136.66.32 Hub as PhidgetMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the hub that this channel is attached to.
**Notes:** (Read only property)

### 136.66.33 HubPort as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the hub port index of the VINT Hub port that the channel is attached to.
**Notes:** Specifies the hub port index of the VINT Hub port to open this channel on. Leave un-set, or set to kHubPortAny to open the channel on any VINT Hub port

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.34 HubPortCount as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of VINT ports present on the VINT Hub that the channel is attached to.
**Notes:** (Read only property)

### 136.66.35 IsChannel as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True if the handle is for a channel.
**Notes:** Returns true if the PhidgetHandle is for a channel. Mostly for use alongside Phidget_getParent() to distinguish channel handles from device handles.
(Read only property)

### 136.66.36 IsHubPortDevice as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether this channel is a VINT Hub port channel, or part of a VINT device attached to a hub port.
**Notes:** Specifies whether this channel should be opened on a VINT Hub port directly, or on a VINT device attached to a hub port.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.37 IsLocal as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True when this channel is attached directly on the local machine, or false otherwise.
**Notes:** Set to True if the channel is to be opened locally, and not over a network. If both this and IsRemote are set to False (the default), the channel will be opened either locally or remotely, on whichever matching channel is found first.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property while the channel is open is undefined.
(Read and Write property)

### 136.66.38 IsRemote as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** True when this channel is attached via a Phidget network server, or false otherwise.
**Notes:** Set to True if the channel is to be opened remotely, rather than locally. If both this and IsLocal are set to False (the default), the channel will be opened either locally or remotely, on whichever matching channel is found first.

In order for your program to have access to remote Phidgets, you must use the Networking API to EnableServerDiscovery or AddServer.

If setting this property, it must be set before the channel is opened. The behaviour of setting this property

while the channel is open is undefined.
(Read and Write property)

### 136.66.39 LibraryVersion as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the version of the Phidget library being used by the program in human readable form.
**Notes:** (Read only property)

### 136.66.40 LibraryVersionNumber as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the version of the Phidget library being used by the program as a version number string.
**Notes:** (Read only property)

### 136.66.41 MeshMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The mesh mode.
**Notes:** (Read and Write property)

### 136.66.42 Parent as PhidgetMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the handle of the parent device of the given Phidget handle.
**Notes:** For example, this would refer to the device the channel is a part of, or the Hub that a device is plugged into.

This is useful when used alongside a Phidget Manager to create device trees like the one in the Phidget Control Panel.

Phidget_release() must be called on the handle returned by this function to release the reference created by

this call.

This can be used to travel up the device tree and get device information at each step.
The root device will return a null handle
Parent handles always refer to devices. See IsChannel()
(Read only property)

### 136.66.43 ServerHostname as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the hostname of the Phidget network server for network attached Phidgets.
**Notes:** Fails if the channel is not connected to a Phidget network server.
(Read only property)

### 136.66.44 ServerName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the Phidget network server the channel is attached to, if any.
**Notes:** Fails if the channel is not connected to a Phidget network server.
(Read and Write property)

### 136.66.45 ServerPeerName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the peer name of the channel's server.
**Notes:** Gets the peer name (address and port) of the Phidget server for network attached Phidgets, formatted as: address:port
Fails if the channel is not connected to a Phidget network server.
(Read only property)

### 136.66.46 ServerUniqueName as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the unique name for the server the channel is attached to, if any.
**Notes:** This is either a unique mDNS name, or the name specified in addServer
Fails if the channel is not connected to a Phidget network server.
(Read only property)

### 136.66.47 ServerVersionMajor as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The major version of the server.
**Notes:** (Read only property)

### 136.66.48 ServerVersionMinor as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minor version of the server.
**Notes:** (Read only property)

### 136.66.49 Events

### 136.66.50 Attached

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the channel is attached to a physical channel on a Phidget.
**Notes:** This event is the recommended place to configuration properties of the channel such as the data interval or change trigger.
See also:

- 136.66.14 Attached as Boolean 18993

### 136.66.51 Detached

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the channel is detached from a Phidget device channel.
**Notes:** This typically occurs when the Phidget device is removed from the system.

### 136.66.52 Error(errorCode as Integer, errorString as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when an error condition has been detected.
**Notes:** See the documentation for your specific channel class to see what error events it might throw.

### 136.66.53 PropertyChanged(propertyName as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when a property is changed externally from the user channel, usually from a network client attached to the same channel.

### 136.66.54 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kChannelAny | -1 | The constant for any channel.<br>Pass to Channel to open any channel. |
| kHubPortAny | -1 | The constant for any port.<br>Pass to HubPort to open any hub port. |
| kIRMaxCodeBitCount | &h80 | One of the constants for IR sender/receiver. |
| kIRMaxCodeStrLength | &h21 | One of the constants for IR sender/receiver. |
| kIRRawDataLongSpace | &hffffffff | One of the constants for IR sender/receiver. |
| kLabelAny | "" | The constant to pick any label.<br>Pass to DeviceLabel to open any label. |
| kSerialNumberAny | -1 | The constant for any serial number.<br>Pass to DeviceSerialNumber to open any serial number. |
| kServerAuthRequired | 1 | A flag constant for server. |

Channel Class

| Constant | Value | Description |
|---|---|---|
| kChannelClassAccelerometer | 1 | Accelerometer channel |
| kChannelClassBLDCMotor | &H23 | BLDC motor channel |
| kChannelClassCapacitiveTouch | &He | Capacitive Touch channel |
| kChannelClassCurrentinput | 2 | Current input channel |
| kChannelClassCurrentoutput | &H26 | Current output channel |
| kChannelClassDataAdapter | 3 | Data Adapter |
| kChannelClassDcmotor | 4 | DC motor channel |
| kChannelClassDictionary | &H24 | Dictionary |
| kChannelClassDigitalInput | 5 | Digital input channel |
| kChannelClassDigitalOutput | 6 | Digital output channel |
| kChannelClassDistanceSensor | 7 | Distance sensor channel |
| kChannelClassEncoder | 8 | Encoder channel |
| kChannelClassFirmwareUpgrade | &H20 | Firmware Upgrade |
| kChannelClassFrequencyCounter | 9 | Frequency counter channel |
| kChannelClassGeneric | &H21 | Generic channel |
| kChannelClassGps | &Ha | GPS channel |
| kChannelClassGyroscope | &Hc | Gyroscope channel |
| kChannelClassHub | &Hd | VINT Hub channel |
| kChannelClassHumiditySensor | &Hf | Humidity sensor channel |
| kChannelClassIR | &H10 | IR channel |
| kChannelClassLcd | &Hb | LCD channel |
| kChannelClassLightSensor | &H11 | Light sensor channel |
| kChannelClassMagnetometer | &H12 | Magnetometer channel |
| kChannelClassMeshdongle | &H13 | Mesh Dongle |
| kChannelClassMotorPositionController | &H22 | Motor position control channel. |
| kChannelClassNothing | 0 | Unknown |
| kChannelClassPhSensor | &H25 | pH sensor channel |
| kChannelClassPowerguard | &H14 | Power guard channel |
| kChannelClassPressureSensor | &H15 | Pressure sensor channel |
| kChannelClassRCServo | &H16 | RC Servo channel |
| kChannelClassResistanceInput | &H17 | Resistance input channel |
| kChannelClassRFID | &H18 | RFID channel |
| kChannelClassSoundSensor | &H19 | Sound sensor channel |
| kChannelClassSpatial | &H1A | Spatial channel |
| kChannelClassStepper | &H1B | Stepper channel |
| kChannelClassTemperatureSensor | &H1C | Temperature sensor channel |
| kChannelClassVoltageInput | &H1D | Voltage input channel |
| kChannelClassVoltageOutput | &H1E | Voltage output channel |
| kChannelClassVoltageRatioInput | &H1F | Voltage ratio input channel |

Channel Sub Class

| Constant | Value | Description |
|---|---|---|
| kChannelSubClassDigitaloutputDutyCycle | &H10 | Digital output duty cycle |
| kChannelSubClassDigitaloutputFrequency | &H12 | Digital output frequency |
| kChannelSubClassDigitaloutputLedDriver | &H11 | Digital output LED driver |
| kChannelSubClassEncoderModeSettable | &H60 | Encoder IO mode settable |
| kChannelSubClassLCDGraphic | &H50 | Graphic LCD |
| kChannelSubClassLCDText | &H51 | Text LCD |
| kChannelSubClassNone | 1 | No subclass |
| kChannelSubClassSpatialAhrs | &H70 | Spatial AHRS/IMU |
| kChannelSubClassTemperaturesensorRtd | &H20 | Temperature sensor RTD |
| kChannelSubClassTemperaturesensorThermocouple | &H21 | Temperature sensor thermocouple |
| kChannelSubClassVoltageInputSensorPort | &H30 | Voltage sensor port |
| kChannelSubClassVoltageRatioInputBridge | &H41 | Voltage ratio bridge input |
| kChannelSubClassVoltageRatioInputSensorPort | &H40 | Voltage ratio sensor port |

Device Class

| Constant | Value | Description |
|---|---|---|
| kDeviceClassAccelerometer | 1 | PhidgetAccelerometer device |
| kDeviceClassAdvancedServo | 2 | PhidgetAdvancedServo device |
| kDeviceClassAnalog | 3 | PhidgetAnalog device |
| kDeviceClassBridge | 4 | PhidgetBridge device |
| kDeviceClassDataAdapter | &H19 | PhidgetDataAdapter device |
| kDeviceClassDictionary | &H18 | Dictionary device |
| kDeviceClassEncoder | 5 | PhidgetEncoder device |
| kDeviceClassFirmwareUpgrade | &H17 | Firmware Upgrade |
| kDeviceClassFrequencyCounter | 6 | PhidgetFrequencyCounter device |
| kDeviceClassGeneric | &H16 | Generic class. |
| kDeviceClassGPS | 7 | PhidgetGPS device |
| kDeviceClassHub | 8 | Phidget VINT Hub device |
| kDeviceClassInterfaceKit | 9 | PhidgetInterfaceKit device |
| kDeviceClassIR | &Ha | PhidgetIR device |
| kDeviceClassLed | &Hb | PhidgetLED device |
| kDeviceClassMeshDongle | &Hc | Mesh Dongle |
| kDeviceClassMotorControl | &Hd | PhidgetMotorControl device |
| kDeviceClassNothing | 0 | Unknown device. |
| kDeviceClassPhsensor | &He | PhidgetPHSensor device |
| kDeviceClassRFID | &Hf | PhidgetRFID device |
| kDeviceClassServo | &H10 | PhidgetServo device |
| kDeviceClassSpatial | &H11 | PhidgetSpatial device |
| kDeviceClassStepper | &H12 | PhidgetStepper device |
| kDeviceClassTemperatureSensor | &H13 | PhidgetTemperatureSensor device |
| kDeviceClassTextLCD | &H14 | PhidgetTextLCD device |
| kDeviceClassVint | &H15 | Phidget VINT Hub device |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kError2Big | &H36 | |
| kErrorAccess | 7 | Access (Permission) Issue: Access to the resource (file) is denied. This can happen when enabling logging. |
| kErrorAgain | &H16 | |
| kErrorBadPassword | &H25 | |
| kErrorBadVersion | &H37 | |
| kErrorBusy | 9 | Resource Busy: Specified resource is in use. This error code is not normally used. |
| kErrorClosed | &H38 | Closed: Channel was closed. This can happen if a channel is closed while openWaitForAttachment is waiting. |
| kErrorConnRef | &H23 | |
| kErrorConnReset | &H2E | |
| kErrorDuplicate | &H1B | Duplicate: Duplicated request. Can happen with some Net API calls, such as trying to add the same server twice. |
| kErrorEof | &H1F | |
| kErrorEventBadConnection | &H1011 | |
| kErrorEventBadPower | &H1008 | |
| kErrorEventBadVersion | 1 | |
| kErrorEventBusy | 2 | |
| kErrorEventDispatch | 4 | |
| kErrorEventEnergyDump | &H100E | |
| kErrorEventFailSafe | &H100C | |
| kErrorEventFailure | 5 | |
| kErrorEventInvalidState | &H1010 | |
| kErrorEventMotorStall | &H100F | |
| kErrorEventNetwork | 3 | |
| kErrorEventOk | &H1000 | |
| kErrorEventOutOfRange | &H1007 | |
| kErrorEventOverCurrent | &H1006 | |
| kErrorEventOverrun | &H1002 | |
| kErrorEventOverTemp | &H1005 | |
| kErrorEventOverVoltage | &H100B | |
| kErrorEventPacketLost | &H1003 | |
| kErrorEventSaturation | &H1009 | |
| kErrorEventVoltageError | &H100D | |
| kErrorEventWrap | &H1004 | |
| kErrorExist | &Ha | |
| kErrorFailSafe | &H3B | |
| kErrorFault | 8 | |
| kErrorFBig | &H11 | |
| kErrorHostUnreach | &H30 | |
| kErrorInterrupted | 4 | Op Interrupted: The operation was interrupted; either from an error, or because the device was closed. |
| kErrorInvalid | &Hd | Invalid: Invalid or malformed command. This can be caused by sending a command to a device which is not supported in it's current configuration. |
| kErrorInvalidArg | &H15 | Invalid Argument: One or more of the parameters passed to the function is not accepted by the channel in its current configuration. This may also be an indication that a NULL pointer was passed where a valid pointer is required. |
| kErrorInvalidPacket | &H35 | |
| kErrorIO | 5 | |
| kErrorIsdir | &Hc | |
| kErrorKeepAlive | &H3A | |
| kErrorMFile | &Hf | |
| kErrorNetUnavail | &H2D | |
| kErrorNFile | &He | |
| kErrorNoDev | &H28 | |
| kErrorNoEnt | 2 | No Such Entity: The specified entity does not exist. This is usually a result of Net or Log API calls. |

Device IDs

| Constant | Value | Description |
|---|---|---|
| kID1000 | 2 | PhidgetServo 1-Motor (1000) |
| kID1001 | 3 | PhidgetServo 4-Motor (1001) |
| kID1002 | 4 | PhidgetAnalog 4-Output (1002) |
| kID1008 | 5 | PhidgetAccelerometer 2-Axis (1008) |
| kID1010_1013_1018_1019 | 6 | PhidgetInterfaceKit 8/8/8 (1010, 1013, 1018, 1019) |
| kID1011 | 7 | PhidgetInterfaceKit 2/2/2 (1011) |
| kID1012 | 8 | PhidgetInterfaceKit 0/16/16 (1012) |
| kID1014 | 9 | PhidgetInterfaceKit 0/0/4 (1014) |
| kID1015 | &ha | PhidgetLinearTouch (1015) |
| kID1016 | &hb | PhidgetCircularTouch (1016) |
| kID1017 | &hc | PhidgetInterfaceKit 0/0/8 (1017) |
| kID1023 | &hd | PhidgetRFID (1023) |
| kID1024 | &he | PhidgetRFID Read-Write (1024) |
| kID1030 | &hf | PhidgetLED-64 (1030) |
| kID1031 | &h10 | PhidgetLED-64 Advanced (1031) |
| kID1032 | &h11 | PhidgetLED-64 Advanced (1032) |
| kID1040 | &h12 | PhidgetGPS (1040) |
| kID1041 | &h13 | PhidgetSpatial 0/0/3 Basic (1041) |
| kID1042 | &h14 | PhidgetSpatial 3/3/3 Basic (1042) |
| kID1043 | &h15 | PhidgetSpatial Precision 0/0/3 High Resolution (1043) |
| kID1044 | &h16 | PhidgetSpatial Precision 3/3/3 High Resolution (1044) |
| kID1045 | &h17 | PhidgetTemperatureSensor IR (1045) |
| kID1046 | &h18 | PhidgetBridge 4-Input (1046) |
| kID1047 | &h19 | PhidgetEncoder HighSpeed 4-Input (1047) |
| kID1048 | &h1a | PhidgetTemperatureSensor 4-input (1048) |
| kID1049 | &h1b | PhidgetSpatial 0/0/3 (1049) |
| kID1051 | &h1c | PhidgetTemperatureSensor 1-Input (1051) |
| kID1052 | &h1d | PhidgetEncoder Mechanical (1052) |
| kID1053 | &h1e | PhidgetAccelerometer 2-Axis (1053) |
| kID1054 | &h1f | PhidgetFrequencyCounter (1054) |
| kID1055 | &h20 | PhidgetIR (1055) |
| kID1056 | &h21 | PhidgetSpatial 3/3/3 (1056) |
| kID1057 | &h22 | PhidgetEncoder HighSpeed (1057) |
| kID1058 | &h23 | PhidgetPHSensor (1058) |
| kID1059 | &h24 | PhidgetAccelerometer 3-Axis (1059) |
| kID1060 | &h25 | PhidgetMotorControl LV (1060) |
| kID1061 | &h26 | PhidgetAdvancedServo 8-Motor (1061) |
| kID1062 | &h27 | PhidgetStepper Unipolar 4-Motor (1062) |
| kID1063 | &h28 | PhidgetStepper Bipolar 1-Motor (1063) |
| kID1064 | &h29 | PhidgetMotorControl HC (1064) |
| kID1065 | &h2a | PhidgetMotorControl 1-Motor (1065) |
| kID1066 | &h2b | PhidgetAdvancedServo 1-Motor (1066) |
| kID1067 | &h2c | PhidgetStepper Bipolar HC (1067) |
| kID1202_1203 | &h2d | PhidgetTextLCD 20x2 with PhidgetInterfaceKit 8/8/8 (1201, 1202, 1203) |
| kID1204 | &h2e | PhidgetTextLCD Adapter (1204) |
| kID1215_1218 | &h2f | PhidgetTextLCD 20x2 (1215/1216/1217/1218) |
| kID1219_1222 | &h30 | PhidgetTextLCD 20x2 with PhidgetInterfaceKit 0/8/8 (1219, 1220, 1221, 1222) |
| kIDADP1000 | &h31 | pH Adapter |
| kIDADP1001 | &h84 | RS232 Adapter |
| kIDADPRS485_422 | &h85 | RS485/422 Prototype |
| kIDADPSerial | &h86 | Serial Prototype |
| kIDCURLOOP | &h7a | 4-20mA Output |
| kIDDAQ1000 | &h33 | Analog Input Module x8 |
| kIDDAQ1200 | &h34 | Digital Input 4 |
| kIDDAQ1300 | &h35 | Digital Input 4 Isolated |
| kIDDAQ1301 | &h36 | Digital Input 16 |
| kIDDAQ1400 | &h37 | Versatile Input |
| kIDDAQ1500 | &h38 | Bridge |

Mesh Modes

| Constant | Value | Description |
|---|---|---|
| kMeshModeRouter | 1 | Router mode |
| kMeshModeSleepyEndDevice | 2 | Sleepy end device mode |

Timeouts

| Constant | Value | Description |
|---|---|---|
| kTimeoutDefault | 300000000 | Pass to OpenWaitForAttachment() for the default timeout. |
| kTimeoutInfinite | 0 | Pass to OpenWaitForAttachment() for an infinite timeout. |

## 136.67 class PhidgetMissingFunctionExceptionMBS

### 136.67.1 class PhidgetMissingFunctionExceptionMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception to report a missing function.
**Notes:** This exception type is raised when a library function should be called, but is not available.
Subclass of the RuntimeException class.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

# 136.68 class PhidgetMotorPositionControllerMBS

## 136.68.1 class PhidgetMotorPositionControllerMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Motor Position Controller class controlls the position, velocity and acceleration of the attached motor.
**Notes:** It also contains various other control and monitoring functions that aid in the control of the motor.

For specifics on how to use this class, we recommend watching our video on the Phidget Motor Position Controller class.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.68.2 Methods

## 136.68.3 addPositionOffset(positionOffset as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds an offset (positive or negative) to the current position.
**Notes:** Useful for zeroing position.

## 136.68.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.68.5 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to

enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For Motor Position Controller channels, this will disengage the controller. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.68.6 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.68.7 setTargetVelocityAsync(targetVelocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets target velocity asynchronously.
**Notes:** Calls setTargetVelocityAsyncCompleted later.

### 136.68.8 Properties

### 136.68.9 Acceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The rate at which the controller can change the motor's velocity.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read and Write property)

### 136.68.10 CurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Motor current limit
**Notes:** The controller will limit the current through the motor to this value.

Unit: amperes (A)
(Read and Write property)

### 136.68.11 CurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current Regulator Gain.
**Notes:** Depending on power supply voltage and motor coil inductance, current through the motor can change relatively slowly or extremely rapidly. A physically larger DC Motor will typically have a lower inductance, requiring a higher current regulator gain. A higher power supply voltage will result in motor current changing more rapidly, requiring a higher current regulator gain. If the current regulator gain is too small, spikes in current will occur, causing large variations in torque, and possibly damaging the motor controller. If the current regulator gain is too high, the current will jitter, causing the motor to sound 'rough', especially when changing directions. Each DC Motor we sell specifies a suitable current regulator gain.
(Read and Write property)

### 136.68.12 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the controller will fire another CurrentChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between CurrentChange events can also affected by the CurrentChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.68.13 DeadBand as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Depending on your system, it may not be possible to bring the position error (TargetPosition - Position) to zero.
**Notes:** A small error can lead to the motor continually 'hunting' for a target position, which can cause unwanted effects. By setting a non-zero DeadBand, the position controller will relax control of the motor within the deadband, preventing the 'hunting' behavior.
Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read and Write property)

### 136.68.14 DutyCycle as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent duty cycle value that the controller has reported.
**Notes:** This value will be between -1 and 1 where a sign change (¬±) is indicitave of a direction change.
Note that DutyCycle is merely an indication of the average voltage across the motor. At a constant load, an increase in DutyCycle indicates an increase in motor speed.
The units of DutyCycle refer to 'duty cycle'. This is because the controller must rapidly switch the power on/off (i.e. change the duty cycle) in order to manipulate the voltage across the motor.

Unit: duty cycle (duty cycle)
(Read only property)

### 136.68.15 Engaged as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When engaged, a motor has the ability to be positioned. When disengaged, no commands are sent to the motor.
**Notes:** This function is useful for completely relaxing a motor once it has reached the target position.
(Read and Write property)

### 136.68.16 FanMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The FanMode dictates the operating condition of the fan.
**Notes:** Choose between on, off, or automatic (based on temperature).
If the FanMode is set to automatic, the fan will turn on when the temperature reaches 70¬∞C and it will remain on until the temperature falls below 55¬∞C.
If the FanMode is off, the controller will still turn on the fan if the temperature reaches 85¬∞C and it will remain on until it falls below 70¬∞C.
(Read and Write property)

### 136.68.17 IOMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The encoder interface mode. Match the mode to the type of encoder you have attached.
**Notes:** It is recommended to only change this when the encoder disabled in order to avoid unexpected results.
(Read and Write property)

### 136.68.18 Kd as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Derivative gain constant.
**Notes:** A higher Kd will help reduce oscillations.
(Read and Write property)

### 136.68.19 Ki as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Integral gain constant.
**Notes:** The integral term will help eliminate steady-state error.
(Read and Write property)

### 136.68.20 Kp as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Proportional gain constant.
**Notes:** A small Kp value will result in a less responsive controller, however, if Kp is too high, the system can become unstable.
(Read and Write property)

### 136.68.21 MaxAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Acceleration can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.22 MaxCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum current limit that can be set for the device.
**Notes:** Unit: amperes (A)
(Read only property)

### 136.68.23 MaxCurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum current regulator gain for the device.
**Notes:** (Read only property)

### 136.68.24 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.68.25 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.68.26 MaxPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetPosition can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.27 MaxStallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The upper bound of StallVelocity.
**Notes:** (Read only property)

### 136.68.28 MaxVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that VelocityLimit can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.29 MinAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Acceleration can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.30 MinCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum current limit that can be set for the device.
**Notes:** Unit: amperes (A)
(Read only property)

### 136.68.31 MinCurrentRegulatorGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum current regulator gain for the device.
**Notes:** (Read only property)

### 136.68.32 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.68.33 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.68.34 MinPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetPosition can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.35 MinStallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The lower bound of StallVelocity.
**Notes:** (Read only property)

### 136.68.36 MinVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that VelocityLimit can be set to.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the

RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.37 Position as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position value that the controller has reported.
**Notes:** This value will always be between MinPosition and MaxPosition.
Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read only property)

### 136.68.38 RescaleFactor as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Change the units of your parameters so that your application is more intuitive.
**Notes:** Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read and Write property)

### 136.68.39 StallVelocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Before reading this description, it is important to note the difference between the units of StallVelocity and Velocity.
**Notes:** Velocity is a number between -1 and 1 with units of 'duty cycle'. It simply represents the average voltage across the motor.
StallVelocity represents a real velocity (e.g. m/s, RPM, etc.) and the units are determined by the RescaleFactor. With a RescaleFactor of 1, the default units would be in commutations per second.

If the load on your motor is large, your motor may begin rotating more slowly, or even fully stall. Depending on the voltage across your motor, this may result in a large amount of current through both the controller and the motor. In order to prevent damage in these situations, you can use the StallVelocity property.

The StallVelocity should be set to the lowest velocity you would expect from your motor. The controller will then monitor the motor's velocity, as well as the Velocity, and prevent a 'dangerous stall' from occuring. If

the controller detects a dangerous stall, it will immediately disengage the motor (i.e. Engaged will be set to false) and an error will be reported to your program.

A 'dangerous stall' will occur faster when the Velocity is higher (i.e. when the average voltage across the motor is higher)
A 'dangerous stall' will occur faster as (StallVelocity - motor velocity) becomes larger.

Setting StallVelocity to 0 will turn off stall protection functionality.
(Read and Write property)

### 136.68.40 TargetPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the controller is configured and the TargetPosition is set, the motor will try to reach the TargetPostiion.
**Notes:** If the DeadBand is non-zero, the final position of the motor may not match the TargetPosition
Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read and Write property)

### 136.68.41 VelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When moving, the motor velocity will be limited by this value.
**Notes:** VelocityLimit is bounded by MinVelocityLimit and MaxVelocityLimit.
Units for Position, VelocityLimit, Acceleration, and DeadBand can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
(Read and Write property)

### 136.68.42 Events

### 136.68.43 DutyCycleUpdated(dutyCycle as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent duty cycle value will be reported in this event, which occurs when the DataInterval has elapsed.

**Notes:** This event will always occur when the DataInterval elapses. You can depend on this event for constant timing when implementing control loops in code. This is the last event to fire, giving you up-to-date access to all properties.

### 136.68.44 PositionChanged(position as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent position value will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** Regardless of the DataInterval, this event will occur only when the position value has changed from the previous value reported.
Units for Position can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.

position: The position value

### 136.68.45 setTargetVelocityAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called by setTargetVelocityAsync when completed.

### 136.68.46 Constants

Encoder interface mode

| Constant | Value | Description |
|---|---|---|
| kEncoderIOModeCollector10K | 5 | Open Collector 10K, 10kŒ© pull-up resistors will be applied to the input lines. |
| kEncoderIOModeCollector2K2 | 4 | Open Collector 2.2K, 2.2kŒ© pull-up resistors will be applied to the input lines. |
| kEncoderIOModeLineDriver10K | 3 | Line Driver 10K, 10kŒ© pull-down resistors will be applied to the input lines. |
| kEncoderIOModeLineDriver2K2 | 2 | Line Driver 2.2K, 2.2kŒ© pull-down resistors will be applied to the input lines. |
| kEncoderIOModePushPull | 1 | Push-Pull, No additional pull-up or pull-down resistors will be applied to the input lines. |

Fan Modes

| Constant | Value | Description |
|---|---|---|
| kFanModeAuto | 3 | The fan will be automatically controlled based on temperature. |
| kFanModeOff | 1 | Turns the fan off. |
| kFanModeOn | 2 | Turns the fan on. |

# 136.69 class PhidgetNetMBS

## 136.69.1 class PhidgetNetMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for managing servers.
**Notes:** The Phidget NET class controls all network functionality of a Phidget program, and allows for the use of remote Phidgets in your program. It can be used to enable automated Phidget server discovery over the local network, and to connect to or reject specific servers.

For basic use of the Net class, the only functions you need to worry about are EnableServerDiscovery and AddServer. In most cases, you can use EnableServerDiscovery with server type kServerTypeDeviceRemote to automatically connect to Phidget servers on your local network. You can use AddServer to connect to servers that aren't discoverable on your local network.

To connect to a password-protected discoverable server on your local network, you can use SetServerPassword to specify the password to connect to that server.

If for some reason you need to prevent your program from discovering a non-password-protected server on your local network, you can call DisableServer directly after calling EnableServerDiscovery.

You must enable server discovery or add at least one server before setting other properties of this class, such as disabling servers, or setting server passwords. Similarly, server discovery must remain enabled, or at least one server must remain added, to maintain memory of those preferences.

## 136.69.2 Methods

## 136.69.3 addServer(serverName as String, address as String, port as Integer, password as String, Flags as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers a server that the client (your program) will try to connect to.
**Notes:** The client will continually try to connect to the server, increasing the time between each attempt to a maximum interval of 16 seconds.

This call is intended for use when server discovery is not enabled, or to connect to a server that is not discoverable.

The server name used by this function does not have to match the name of the server running on the host machine. Only the address, port, and password need to match.

This call will fail if a server with the same name has already been discovered.

This call will fail if SetServerPassword() has already been called with the same server name, as SetServerPassword() registers the server entry anticipating the discovery of the server.

### 136.69.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.69.5 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 136.69.6 disableServer(serverName as String, flags as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Prevents attempts to automatically connect to a server.
**Notes:** By default the client (your program) will continually attempt to connect to added or discovered servers.This call will disable those attempts, but will not close an already established connection.

### 136.69.7 disableServerDiscovery(serverType as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Disables the dynamic discovery of servers that publish their identity.
**Notes:** DisableServerDiscovery() does not disconnect already established connections.

### 136.69.8 enableServer(serverName as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables attempts to connect to a discovered server, if attempts were previously disabled by DisableServer().
**Notes:** All servers are enabled by default.

This call will fail if the server was not previously added, disabled or discovered.

### 136.69.9 enableServerDiscovery(serverType as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the dynamic discovery of servers that publish their identity to the network.
**Notes:** Currently Multicast DNS is used to discover and publish Phidget servers.
To connect to remote Phidgets, call this function with server type kServerTypeDeviceRemote.

EnableServerDiscovery must be called once for each server type your program requires. Multiple calls for the same server type are ignored

This call will fail with the error code EPHIDGET_UNSUPPORTED if your computer does not have the required mDNS support. We recommend using Bonjour Print Services on Windows and Mac, or Avahi on Linux.

### 136.69.10 removeAllServers

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes all servers.

### 136.69.11 removeServer(serverName as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Removes a registration for a server that the client (your program) is trying to connect to.
**Notes:** If the client is currently connected to the server, the connection will be closed.

If the server was discovered (not added by AddServer()), the connection may be reestablished if and when the server is rediscovered. DisableServer() should be used to prevent the reconnection of a discovered server

### 136.69.12 setServerPassword(serverName as String, password as String)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the password that will be used to attempt to connect to the server.
**Notes:** If the server has not already been added or discovered, a placeholder server entry will be registered to use this password on the server once it is discovered.

serverName: The name of the server
password: The password to use for the server (empty string if no password)

### 136.69.13 Events

### 136.69.14 ServerAdded(server as PhidgetServerMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Subscribe to this event if you would like to know when a server has been added.

### 136.69.15 ServerRemoved(server as PhidgetServerMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Subscribe to this event if you would like to know when a server has been removed.

# 136.70 class PhidgetNotInitialzedExceptionMBS

## 136.70.1 class PhidgetNotInitialzedExceptionMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception to report an access of a not initialized object.
**Notes:** We raise this exception if handle is zero, so the object was not properly initialized.
Subclass of the RuntimeException class.
**Blog Entries**

- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

## 136.71 class PhidgetPHSensorMBS

### 136.71.1 class PhidgetPHSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The PH Sensor class gathers data from a pH sensor type Phidget board.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.71.2 Methods

### 136.71.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.71.4 Properties

### 136.71.5 CorrectionTemperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set this property to the measured temperature of the solution to correct the slope of the pH conversion for temperature.
**Notes:** Unit: degrees celsius (¬∞C)
(Read and Write property)

### 136.71.6 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another PHChange event.

**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between PHChange events can also affected by the PHChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.71.7 MaxCorrectionTemperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that CorrectionTemperature can be set to.
**Notes:** Unit: degrees celsius (¬∞C)
(Read only property)

### 136.71.8 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.71.9 MaxPH as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the PHChange event will report.
**Notes:** (Read only property)

### 136.71.10 MaxPHChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that PHChangeTrigger can be set to.
**Notes:** Unit: pH (pH)
(Read only property)

### 136.71.11 MinCorrectionTemperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that CorrectionTemperature can be set to.
**Notes:** Unit: degrees celsius (¬∞C)
(Read only property)

### 136.71.12 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.71.13 MinPH as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the PHChange event will report.
**Notes:** (Read only property)

### 136.71.14 MinPHChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that PHChangeTrigger can be set to.
**Notes:** Unit: pH (pH)
(Read only property)

### 136.71.15 PH as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent pH value that the channel has reported.
**Notes:** This value will always be between MinPH and MaxPH.

(Read only property)

### 136.71.16 PHChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a PHChange event until the pH value has changed by the amount specified by the PHChangeTrigger.
**Notes:** Setting the PHChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
Unit: pH (pH)
(Read and Write property)

### 136.71.17 Events

### 136.71.18 PHChanged(PH as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent pH value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a PHChangeTrigger has been set to a non-zero value, the PHChange event will not occur until the pH has changed by at least the PHChangeTrigger value.

PH: The current pH.

## 136.72 class PhidgetPowerGuardMBS

### 136.72.1 class PhidgetPowerGuardMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Power Guard class controls the safety features and thresholds of a programmable power guard Phidget board.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.72.2 Methods

### 136.72.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.72.4 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For PowerGuard channels, this will disable the output. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.72.5 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.72.6 Properties

### 136.72.7 FanMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The FanMode dictates the operating condition of the fan.
**Notes:** Choose between on, off, or automatic (based on temperature).
If the FanMode is set to automatic, the fan will turn on when the temperature reaches 70¬∞C and it will remain on until the temperature falls below 55¬∞C.
If the FanMode is off, the device will still turn on the fan if the temperature reaches 85¬∞C and it will remain on until it falls below 70¬∞C.
(Read and Write property)

### 136.72.8 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.72.9 MaxOverVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that OverVoltage can be set to.
**Notes:** Unit: volts (V)
(Read only property)

### 136.72.10 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.72.11 MinOverVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that OverVoltage can be set to.
**Notes:** Unit: volts (V)
(Read only property)

### 136.72.12 OverVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The device constantly monitors the output voltage, and if it exceeds the OverVoltage value, it will disconnect the input from the output.
**Notes:** This functionality is critical for protecting power supplies from regenerated voltage coming from motors. Many power supplies assume that a higher than output expected voltage is related to an internal failure to the power supply, and will permanently disable themselves to protect the system. A typical safe value is to set OverVoltage to 1-2 volts higher than the output voltage of the supply. For instance, a 12V supply would be protected by setting OverVoltage to 13V.
The device will connect the input to the output again when the voltage drops to (OverVoltage - 1V)
Unit: volts (V)
(Read and Write property)

### 136.72.13 PowerEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When PowerEnabled is true, the device will connect the input to the output and begin monitoring.
**Notes:** The output voltage is constantly monitored and will be automatically disconnected from the input when the output exceeds the OverVoltage value.
PowerEnabled allows the device to operate as a Solid State Relay, powering on or off all devices connected to the output.
(Read and Write property)

### 136.72.14 Constants

Fan Modes

| Constant | Value | Description |
|---|---|---|
| kFanModeAuto | 3 | The fan will be automatically controlled based on temperature. |
| kFanModeOff | 1 | Turns the fan off. |
| kFanModeOn | 2 | Turns the fan on. |

## 136.73 class PhidgetPressureSensorMBS

### 136.73.1 class PhidgetPressureSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Pressure Sensor class gathers data from the pressure sensor on a Phidget board.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.73.2 Methods

### 136.73.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.73.4 Properties

### 136.73.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another PressureChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between PressureChange events can also affected by the PressureChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.73.6 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.73.7 MaxPressure as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the PressureChange event will report.
**Notes:** Unit: kilopascals (kPa)
(Read only property)

### 136.73.8 MaxPressureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that PressureChangeTrigger can be set to.
**Notes:** Unit: kilopascals (kPa)
(Read only property)

### 136.73.9 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.73.10 MinPressure as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the PressureChange event will report.
**Notes:** Unit: kilopascals (kPa)
(Read only property)

### 136.73.11 MinPressureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that PressureChangeTrigger can be set to.
**Notes:** Unit: kilopascals (kPa)
(Read only property)

### 136.73.12 Pressure as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent pressure value that the channel has reported.
**Notes:** This value will always be between MinPressure and MaxPressure.
Unit: kilopascals (kPa)
(Read only property)

### 136.73.13 PressureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a PressureChange event until the pressure value has changed by the amount specified by the PressureChangeTrigger.
**Notes:** Setting the PressureChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
Unit: kilopascals (kPa)
(Read and Write property)

### 136.73.14 Events

### 136.73.15 PressureChanged(pressure as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent pressure value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a PressureChangeTrigger has been set to a non-zero value, the PressureChange event will not occur until the pressure has changed by at least the PressureChangeTrigger value.

## 136.74 class PhidgetRCServoMBS

### 136.74.1 class PhidgetRCServoMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RC Servo class controls the signal being sent to the servo motors from the Phidget controller in order to control their position.
**Notes:** This class provides control of the position, velocity, acceleration, and supply voltage of the attached servo.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.74.2 Methods

### 136.74.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.74.4 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe

again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For RC Servo channels, this will disengage the controller. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.74.5 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.74.6 setTargetPositionAsync(targetPosition as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the target position asynchronously.
**Notes:** Calls the setTargetPositionAsyncCompleted event later.

### 136.74.7 Properties

### 136.74.8 Acceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:**

When changing velocity, the RC servo motor will accelerate/decelerate at this rate.
The acceleration is bounded by MaxAcceleration and MinAcceleration.
**Notes:**

Using the default settings this acceleration will correspond acceleration of servo arm in degrees/s2, for many standard RC servos.
SpeedRampingState controls whether or not the acceleration value is actually applied when trying to reach a target position.
There is a practical limit on how fast your RC servo motor can accelerate. This is based on the load and physical design of the motor.
The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.9 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the controller will fire another PositionChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.

Unit: milliseconds (ms)
(Read and Write property)

### 136.74.10 Engaged as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Phidget return code.
**Notes:** When engaged, a RC servo motor has the ability to be positioned. When disengaged, no commands are sent to the RC servo motor.

There is no position feedback to the controller, so the RC servo motor will immediately snap to the TargetPosition after being engaged from a disengaged state.
This property is useful for relaxing a servo once it has reached a given position.
If you are concerned about tracking position accurately, you should not disengage the motor while IsMoving is true.
(Read and Write property)

### 136.74.11 IsMoving as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** IsMoving returns true if the RC servo motor is currently in motion.
**Notes:** The controller cannot know if the RC servo motor is physically moving. When <code >IsMoving is false, it simply means there are no commands in the pipeline to the RC servo motor.
(Read only property)

### 136.74.12 MaxAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum acceleration that Acceleration can be set to.
**Notes:** This value depends on MinPosition/MaxPosition and MinPulseWidth/MaxPulseWidth.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.13 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.74.14 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.74.15 MaxPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum position TargetPosition can be set to.
**Notes:** The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.16 MaxPulseWidth as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The MaxPulseWidth represents the maximum pulse width that your RC servo motor specifies.
**Notes:** This value can be found in the data sheet of most RC servo motors.
The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.17 MaxPulseWidthLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum pulse width that MaxPulseWidth can be set to.
**Notes:** See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.18 MaxTorque as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Torque can be set to.
**Notes:** Torque is a ratio of the maximum available torque, therefore the minimum torque is a unitless constant.
(Read only property)

### 136.74.19 MaxVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum velocity VelocityLimit can be set to.
**Notes:** This value depends on MinPosition/MaxPosition and MinPulseWidth/MaxPulseWidth.
See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.20 MinAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Acceleration can be set to.
**Notes:** This value depends on MinPosition/MaxPosition and MinPulseWidth/MaxPulseWidth.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.21 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.74.22 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** (Read only property)

### 136.74.23 MinPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum position that TargetPosition can be set to.
**Notes:** The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.24 MinPulseWidth as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The MinPulseWidth represents the minimum pulse width that your RC servo motor specifies.
**Notes:** This value can be found in the data sheet of most RC servo motors.
The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.25 MinPulseWidthLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum pulse width that MinPulseWidth can be set to.
**Notes:** See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact

to move your servo.
(Read only property)

### 136.74.26 MinTorque as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Torque can be set to.
**Notes:** Torque is a ratio of the maximum available torque, therefore the minimum torque is a unitless constant.
(Read only property)

### 136.74.27 MinVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum velocity VelocityLimit can be set to.
**Notes:** See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.28 Position as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position of the RC servo motor that the controller has reported.
**Notes:** This value will always be between MinPosition and MaxPosition.
Using the default settings this position will correspond to the rotation of the servo arm in degrees, for many standard RC servos.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.29 SpeedRampingState as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The speed ramping state value
**Notes:** When speed ramping state is enabled, the controller will take the Acceleration and Velocity properties into account when moving the RC servo motor, usually resulting in smooth motion. If speed ramping state is not enabled, the controller will simply set the RC servo motor to the requested position.
(Read and Write property)

### 136.74.30 TargetPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The target position.
**Notes:** If the RC servo motor is configured and TargetPosition is set, the controller will continuously try to reach targeted position.

The target position is bounded by MinPosition and MaxPosition.
Using the default settings this position will correspond to the rotation of the servo arm in degrees, for many standard RC servos.
If the RC servo motor is not engaged, then the position cannot be read.
The position can still be set while the RC servo motor is not engaged. Once engaged, the RC servo motor will snap to position, assuming it is not there already.
The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

Position and Pulse Width

An RC servo motor's position is controlled using a type of Pulse Width Modulation, sending voltage pulses of a given time span, or Pulse Width to the servo.
The servo translates the Pulse Width of the control signal to a corresponding position of the servo arm.
Knowing this, a servo's range of motion can be thought of in terms of a MinPulseWidth and a MaxPulseWidth corresponding to range of pulse widths that produce the servo arm's full range of movement.
In Phidget22, you can adjust the MinPulseWidth and MaxPulseWidth stored by the library to match the desired range of movement you expect from your servo.
Since directly setting the timing of RC servo pulse widths is not very intuitive for most purpses, we map these pulse widths to a user-defied Minimum and Maximum Position.This allows you to define the servo's position in terms best suited to your application, such as degrees, fractions of a rotation, or even some measure of speed for a continuous-rotation servo.
By setting the servo's Target Position to MaxPosition, the controller will send pulses of MaxPulseWidth to the servo.
Similarly, MinPosition will send pulses of MinPulseWidth to the servo

MaxPosition can be set smaller than MinPosition to invert movement of the servo, if it helps your application.
Setting a TargetPosition will transate the position between MinPosition and MaxPosition to a corresponding Pulse Width between MinPulseWidth and MaxPulseWidth, in turn sending the servo arm to the desired position.
Setting VelocityLimit and Acceleration for your servo will limit the rate of change of the servo's position in terms of one UserUnit per second (or /s2). Here, a UserUnit is whatever distance is maked by the change of the TargetPosition by 1.0

Adjusting the Servo's Limits

To tune your program to a specific servo:
First adjust the servo's range of motion by setting the MaxPulseWidth and MinPulseWidth. You can use the default values for these (or the ones on your servo's datasheet) as a starting point.
Send the servo to MaxPosition and MinPosition to check the results. Repeat steps 1 and 2 as nessesarry.
Set the MaxPosition and MinPosition to match whatever numbers you find best suited to your application.
(Read and Write property)

### 136.74.31 Torque as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Torque is a ratio of the maximum available torque.
**Notes:** The torque is bounded by MinTorque and MaxTorque
Increasing the torque will increase the speed and power consumption of the RC servo motor.
(Read and Write property)

### 136.74.32 Velocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The velocity that the RC servo motor is being driven at.
**Notes:** A negative value means the RC servo motor is moving towards a lower position.
The velocity range of the RC servo motor will be from -VelocityLimit to VelocityLimit, depending on direction.
This is not the actual physical velocity of the RC servo motor.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read only property)

### 136.74.33 VelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When moving, the RC servo motor velocity will be limited by this value.
**Notes:** The velocity limit is bounded by MinVelocityLimit and MaxVelocityLimit.
Using the default settings this velocity will correspond to the maximum speed of rotation of servo arm in degrees/s, for many standard RC servos.
SpeedRampingState controls whether or not the velocity limit value is actually applied when trying to reach a target position.
The velocity range of the RC servo motor will be from -VelocityLimit to VelocityLimit, depending on direction.
Note that when this value is set to 0, the RC servo motor will not move.
There is a practical limit on how fast your servo can rotate, based on the physical design of the motor.
The units for Position,Velocity, and Acceleration are configured by scaling the internal timing (set with MinPulseWidth and MaxPulseWidth) to a user specified range with MinPosition and MaxPosition.

See TargetPosition for a deeper explanation of how the settings of your RC Servo controller interact to move your servo.
(Read and Write property)

### 136.74.34 Voltage as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The supply voltage for the RC servo motor.
**Notes:** If your controller supports multiple RC servo motors, every motor will have the same supply voltage. It is not possible to set individual supply voltages.
(Read and Write property)

### 136.74.35 Events

### 136.74.36 PositionChanged(position as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event that occurs when the position changes on a RC servo motor.
**Notes:** position: The position value

### 136.74.37 setTargetPositionAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when setTargetPositionAsync completes.

### 136.74.38 TargetPositionReached(position as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the RC servo motor has reached the TargetPosition.
**Notes:** The controller cannot know if the RC servo motor has physically reached the target position. When TargetPosition is reached, it simply means the controller pulse width output is matching its target.

### 136.74.39 VelocityChanged(velocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event that occurs when the velocity changes on a RC servo motor.
**Notes:** velocity: The velocity value

### 136.74.40 Constants

Voltages

| Constant | Value | Description |
|---|---|---|
| kVoltage5V | 1 | Run all servos on 5V DC |
| kVoltage6V | 2 | Run all servos on 6V DC |
| kVoltage7_4V | 3 | Run all servos on 7.4V DC |

## 136.75 class PhidgetResistanceInputMBS

### 136.75.1 class PhidgetResistanceInputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Resistance Input class measures the resistance of a circuit connected to the Phidget, which is used to read resistance-based sensors such as platinum RTDs.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.75.2 Methods

### 136.75.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.75.4 Properties

### 136.75.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another ResistanceChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between ResistanceChange events can also affected by the ResistanceChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.75.6 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.75.7 MaxResistance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the ResistanceChange event will report.
**Notes:** Unit: ohms (Œ©)
(Read only property)

### 136.75.8 MaxResistanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that ResistanceChangeTrigger can be set to.
**Notes:** Unit: ohms (Œ©)
(Read only property)

### 136.75.9 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.75.10 MinResistance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the ResistanceChange event will report.
**Notes:** When the device is also being used as a TemperatureSensor the MinResistance and MaxResistance will not represent the true input range. This is a side effect of increasing accuracy on the temperature channel.
Unit: ohms (Œ©)

(Read only property)

### 136.75.11 MinResistanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that the ResistanceChangeTrigger can be set to.
**Notes:** Unit: ohms (Œ©)
(Read only property)

### 136.75.12 Resistance as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent resistance value that the channel has reported.
**Notes:** This value will always be between MinResistance and MaxResistance.
The Resistance value will change when the device is also being used as a temperature sensor. This is a side effect of increasing accuracy on the temperature channel.
Unit: ohms (Œ©)
(Read only property)

### 136.75.13 ResistanceChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a ResistanceChange event until the resistance value has changed by the amount specified by the ResistanceChangeTrigger.
**Notes:** Setting the ResistanceChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering

Unit: ohms (Œ©)
(Read and Write property)

### 136.75.14 RTDWireSetup as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Select the RTD wiring configuration.
**Notes:** More information about RTD wiring can be found in the user guide.
(Read and Write property)

### 136.75.15 Events

### 136.75.16 ResistanceChanged(resistance as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent resistance value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a ResistanceChangeTrigger has been set to a non-zero value, the ResistanceChange event will not occur until the resistance has changed by at least the ResistanceChangeTrigger value.

resistance: The resistance value

### 136.75.17 Constants

RTD wiring configuration

| Constant | Value | Description |
|---|---|---|
| RTD_WIRE_SETUP_2WIRE | 1 | Configures the device to make resistance calculations based on a 2-wire RTD setup. |
| RTD_WIRE_SETUP_3WIRE | 2 | Configures the device to make resistance calculations based on a 3-wire RTD setup. |
| RTD_WIRE_SETUP_4WIRE | 3 | Configures the device to make resistance calculations based on a 4-wire RTD setup. |

## 136.76 class PhidgetRFIDMBS

### 136.76.1 class PhidgetRFIDMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RFID class provides methods for Phidget RFID boards to read and write (if writing is supported) to RFID tags.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.76.2 Methods

### 136.76.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.76.4 LastTag(byref tagString as String, byref protocol as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets the most recently read tag's data, even if that tag is no longer within read range.
**Notes:** Only valid after at least one tag has been read.

tagString: The data stored on the most recently read tag
protocol: Protocol of the most recently read tag

### 136.76.5 Write(tagString as String, protocol as Integer, lockTag as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes data to the tag being currently read by the reader.
**Notes:** You cannot write to a read-only or locked tag.

tagString: The data to write to the tag
protocol: The communication protocol to use
lockTag: If true, permanently locks the tag so that it cannot be re-written after this write.

### 136.76.6 Properties

### 136.76.7 AntennaEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The on/off state of the antenna.
**Notes:** You can turn the antenna off to save power.
You must turn the antenna on in order to detect and read RFID tags.
(Read and Write property)

### 136.76.8 TagPresent as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This property is true if a compatibile RFID tag is being read by the reader.
**Notes:** TagPresent will remain true until the tag is out of range and can no longer be read.
(Read only property)

### 136.76.9 Events

### 136.76.10 TagFound(tag as String, protocol as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when an RFID tag is read.
**Notes:** Tag: Data from the tag
Protocol: Communication protocol of the tag

### 136.76.11 TagLost(tag as String, protocol as Integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when an RFID tag that was being read is removed from the read range.
**Notes:** Tag: Data from the lost tag

Protocol: Communication protocol of the lost tag

### 136.76.12 Constants

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolEM4100 | 1 | EM4100 |
| kProtocolISO11785_FDX_B | 2 | ISO11785 FDX B |
| kProtocolPhidgets | 3 | PhidgetTAG |

# 136.77 class PhidgetServerMBS

## 136.77.1 class PhidgetServerMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class to describe a known server.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.4pr1

## 136.77.2 Methods

## 136.77.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 136.77.4 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

## 136.77.5 Properties

## 136.77.6 Address as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The address of the server.
**Notes:** (Read only property)

### 136.77.7 Flags as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Flags describing the server state.
**Notes:** Flag is 1, if the server requires a password to authenticate.
(Read only property)

### 136.77.8 Handle as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 136.77.9 Host as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The hostname of the server.
**Notes:** (Read only property)

### 136.77.10 Name as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of the server.
**Notes:** (Read only property)

### 136.77.11 Port as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The port number of the server.
**Notes:** (Read only property)

### 136.77.12 ServerType as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Name of the server type.
**Notes:** (Read only property)

### 136.77.13 Type as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The server type.
**Notes:** (Read only property)

### 136.77.14 Constants

Server Types

| Constant | Value | Description |
|---|---|---|
| kServerTypeDevice | 2 | Device |
| kServerTypeDeviceListener | 1 | Device Listener |
| kServerTypeDeviceRemote | 3 | Phidget22 Server<br>Server discovery with this server type allows discovery of servers hosting Phidget devices. Enabling server discovery with this server type allows automated connection to these servers, and the Phidgets connected to them. Enabling server discovery with this server type will also enable ServerAdded and ServerRemoved events for this server type. |
| kServerTypeNone | 0 | |
| kServerTypeSBC | 7 | Phidget SBC<br>Server discovery with this server type detects the presence of Phidget SBCs on the network. Enabling server discovery with this server type will enable ServerAdded and ServerRemoved events for this server type. |
| kServerTypeWww | 5 | WWW |
| kServerTypeWwwListener | 4 | WWW Listener |
| kServerTypeWwwRemote | 6 | Phidget22 Web server<br>Server discovery with this server type detects the presence of Phidget web servers used to communicate with in-browser JavaScript. Enabling server discovery with this server type will enable ServerAdded and ServerRemoved events for this server type. |

## 136.78 class PhidgetSoundSensorMBS

### 136.78.1 class PhidgetSoundSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Sound Sensor class gathers data from the sound sensor on a Phidget board.
**Notes:** If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.78.2 Methods

### 136.78.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.78.4 Octaves as Double()

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The unweighted value of each frequency band.
**Notes:** The following frequency bands are represented:
octaves [ 0 ] = 31.5 Hz
octaves [ 1 ] = 63 Hz
octaves [ 2 ] = 125 Hz
octaves [ 3 ] = 250 Hz
octaves [ 4 ] = 500 Hz
octaves [ 5 ] = 1 kHz
octaves [ 6 ] = 2 kHz
octaves [ 7 ] = 4 kHz
octaves [ 8 ] = 8 kHz
octaves [ 9 ] = 16 kHz

### 136.78.5 Properties

### 136.78.6 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another SPLChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between SPLChange events can also affected by the SPLChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.78.7 dB as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent dB SPL value that has been calculated.
**Notes:** This value is bounded by MaxdB.
(Read only property)

### 136.78.8 dBA as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent dBA SPL value that has been calculated.
**Notes:** The dBA SPL value is calculated by applying a A-weighted filter to the Octaves data.
(Read only property)

### 136.78.9 dBC as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent dBC SPL value that has been calculated.
**Notes:** The dBC SPL value is calculated by applying a C-weighted filter to the Octaves data.
(Read only property)

### 136.78.10 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.78.11 MaxdB as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the SPLChange event will report.
**Notes:** (Read only property)

### 136.78.12 MaxSPLChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that SPLChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.78.13 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.78.14 MinSPLChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that SPLChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.78.15 NoiseFloor as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum SPL value that the channel can accurately measure.
**Notes:** Input SPLs below this level will not produce an output from the microphone.
(Read only property)

### 136.78.16 SPLChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a SPLChange event until the dB value has changed by the amount specified by the SPLChangeTrigger.
**Notes:** Setting the SPLChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.78.17 SPLRange as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When selecting a range, first decide how sensitive you want the microphone to be.
**Notes:** Select a smaller range when you want more sensitivity from the microphone.
If a Saturation event occurrs, increase the range.
(Read and Write property)

### 136.78.18 Events

### 136.78.19 SPLChanged(dB as Double, dBA as Double, dBC as Double, octaves() as Double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent SPL values the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a SPLChangeTrigger has been set to a non-zero value, the SPLChange event will not occur until the dB SPL value has changed by at least the SPLChangeTrigger value.
The dB SPL value is calculated from the Octaves data.
The dBA SPL value is calculated by applying a A-weighted filter to the Octaves data.

The dBC SPL value is calculated by applying a C-weighted filter to the Octaves data.
The following frequency bands are represented:

octaves [ 0 ] = 31.5 Hz
octaves [ 1 ] = 63 Hz
octaves [ 2 ] = 125 Hz
octaves [ 3 ] = 250 Hz
octaves [ 4 ] = 500 Hz
octaves [ 5 ] = 1 kHz
octaves [ 6 ] = 2 kHz
octaves [ 7 ] = 4 kHz
octaves [ 8 ] = 8 kHz
octaves [ 9 ] = 16 kHz

dB: The dB SPL value.
dBA: The dBA SPL value.
dBC: The dBC SPL value.
Octaves: The dB SPL value for each band.

### 136.78.20 Constants

The measurement range.

| Constant | Value | Description |
|---|---|---|
| SPLRange102dB | 1 | Range 102dB |
| SPLRange82dB | 2 | Range 82dB |

# 136.79 class PhidgetSpatialMBS

## 136.79.1 class PhidgetSpatialMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Spatial class simultaneously gathers data from the acceleromter, gyroscope and magnetometer on a Phidget board.
**Notes:** You can also use the individual classes for these sensors if you want to handle the data in separate events.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr2
- MBS REALbasic Plugins, version 10.6pr7

## 136.79.2 Methods

## 136.79.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.79.4 resetMagnetometerCorrectionParameters

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the MagnetometerCorrectionParameters to their default values.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the MagnetometerCorrectionParameters for your specific situation. See your device's User Guide for more information.

## 136.79.5 saveMagnetometerCorrectionParameters

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Saves the MagnetometerCorrectionParameters.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the MagnetometerCorrection-Parameters for your specific situation. See your device's User Guide for more information.

### 136.79.6 setAHRSParameters(angularVelocityThreshold as double, AngularVelocityDeltaThreshold as double, accelerationThreshold as double, magTime as double, accelTime as double, biasTime as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calibrate your device for the environment it will be used in.
**Notes:** Setting these parameters will allow you to tune the AHRS algorithm on the device to your specific application.

angularVelocityThreshold: The maximum angular velocity reading where the device is assumed to be "at rest"
AngularVelocityDeltaThreshold: The acceptable amount of change in angular velocity between measurements before movement is assumed.
accelerationThreshold: The maximum acceleration applied to the device (minus gravity) where it is assumed to be "at rest". This is also the maximum acceleration allowable before the device stops correcting to the acceleration vector.
magTime: The time it will take to correct the heading 95% of the way to aligning with the compass (in seconds),up to 15 degrees of error. Beyond 15 degrees, this is the time it will take for the bearing to move 45 degrees towards the compass reading. Remember you can zero the algorithm at any time to instantly realign the spatial with acceleration and magnetic field vectors regardless of magnitude.
accelTime: The time it will take to correct the pitch and roll 95% of the way to aligning with the accelerometer (in seconds).
biasTime: The time it will take to have the gyro biases settle to within 95% of the measured steady state (in seconds).

### 136.79.7 setMagnetometerCorrectionParameters(magneticField as double, offset0 as double, offset1 as double, offset2 as double, gain0 as double, gain1 as double, gain2 as double, T0 as double, T1 as double, T2 as double, T3 as double, T4 as double, T5 as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calibrate your device for the environment it will be used in.
**Notes:** Due to physical location, hard and soft iron offsets, and even bias errors, your device should be calibrated. We have created a calibration program that will provide you with the MagnetometerCorrection-

Parameters for your specific situation. See your device's User Guide for more information.

magneticField: Ambient magnetic field value.
offset0: Provided by calibration program.
offset1: Provided by calibration program.
offset2: Provided by calibration program.
gain0: Provided by calibration program.
gain1: Provided by calibration program.
gain2: Provided by calibration program.
T0: Provided by calibration program.
T1: Provided by calibration program.
T2: Provided by calibration program.
T3: Provided by calibration program.
T4: Provided by calibration program.
T5: Provided by calibration program.

### 136.79.8 zeroAlgorithm

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Zeros the AHRS algorithm.

### 136.79.9 zeroGyro

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Re-zeros the gyroscope in 1-2 seconds.
**Notes:** The device must be stationary when zeroing.
The angular rate will be reported as 0.0¬∞/s while zeroing.
Zeroing the gyroscope is a method of compensating for the drift that is inherent to all gyroscopes. See your device's User Guide for more information on dealing with drift.

### 136.79.10 Properties

### 136.79.11 Algorithm as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Selects the IMU/AHRS algorithm.

**Notes:** (Read and Write property)

### 136.79.12 AlgorithmMagnetometerGain as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The gain for the magnetometer in the AHRS algorithm.
**Notes:** Lower gains reduce sensor noise while slowing response time.
(Read and Write property)

### 136.79.13 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another SpatialData event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.

Unit: milliseconds (ms)
(Read and Write property)

### 136.79.14 HeatingEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether self-heating temperature stabilization is enabled.
**Notes:** Set to true to enable the temperature stabilization feature of this device.
This enables on-board heating elements to bring the board up to a known temperature to minimize ambient temperature effects on the sensor's reading. You can leave this setting false to conserve power consumption.This property is shared by any and all spatial-related objects on this device (Accelerometer, Gyroscope, Magnetometer, Spatial)
(Read and Write property)

### 136.79.15 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.79.16 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.79.17 Events

### 136.79.18 AlgorithmData(quaternion() as double, timestamp as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent IMU/AHRS Quaternion will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** quaternion: The quaternion value - [ x, y, z, w ]
timestamp: The timestamp value

### 136.79.19 SpatialData(acceleration() as double, angularRate() as double, magneticField() as double, timestamp as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent values that your channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** acceleration: The acceleration vaulues
angularRate: The angular rate values
magneticField: The field strength values
timestamp: The timestamp value

### 136.79.20 Constants

Filter Types

| Constant | Value | Description |
|---|---|---|
| kFilterTypeLogicLevel | 2 | Logic level |
| kFilterTypeZeroCrossing | 1 | Zero crossing |

Input Modes

| Constant | Value | Description |
|---|---|---|
| kInputModeNPN | 1 | For interfacing NPN digital sensors. |
| kInputModePNP | 2 | For interfacing PNP digital sensors. |

Power Supply

| Constant | Value | Description |
|---|---|---|
| kPowerSupply12V | 2 | The sensor is provided with 12 volts |
| kPowerSupply24V | 3 | The sensor is provided with 24 volts |
| kPowerSupplyOff | 1 | Switch the sensor power supply off. |

Spatial Algorithm

| Constant | Value | Description |
|---|---|---|
| kSpatialAlgorithmAHRS | 1 | AHRS algorithm, incorporating magnetometer data for yaw correction. |
| kSpatialAlgorithmIMU | 2 | IMU algorithm, using gyro and accelerometer, but not magnetometer. |
| kSpatialAlgorithmNone | 0 | No AHRS algorithm is used. |

# 136.80 class PhidgetStepperMBS

## 136.80.1 class PhidgetStepperMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Stepper class powers and controls the stepper motor connected to the Phidget controller, allowing you to change the position, velocity, acceleration, and current limit.
**Notes:** Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

## 136.80.2 Methods

## 136.80.3 addPositionOffset(positionOffset as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds an offset (positive or negative) to the current position and target position.
**Notes:** This is especially useful for zeroing position.

## 136.80.4 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.80.5 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe

timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For Stepper channels, this will disengage the motor. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.80.6 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set. See EnableFailsafe for details.
**Notes:** This function will fail if no failsafe timer has been set for the channel.

### 136.80.7 setTargetPositionAsync(targetPosition as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets target position asynchronously.
**Notes:** If the controller is configured and the TargetPosition is set, the Stepper motor will move towards the TargetPosition at the specified Acceleration and Velocity.

TargetPosition is only used when the ControlMode is set to step mode.
Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.

Calls setTargetPositionAsyncCompleted event later when done.

### 136.80.8 Properties

### 136.80.9 Acceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The rate at which the controller can change the motor's Velocity.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
Changing the acceleration value while the stepper is in motion (especially at speeds higher than 1000 1/16th steps/s) can cause unpredictable results due to the inability of the processor tocalculate a new acceleration curve quickly enough. Generally you should wait until the motor is stationary until calling this function.
(Read and Write property)

### 136.80.10 ControlMode as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Use step mode when you want to set a TargetPosition for the Stepper motor.
**Notes:** Use run mode when you simply want the Stepper motor to rotate continuously in a specific direction.Changing the control mode while the motor is running will result in the following behaviour:
Step ->Run : The motor will keep moving in the direction it's currently going, and will accelerate to max velocity.
Run ->Step : The motor will set the target position to infinity in the direction it's currently going, at the current velocity.
(Read and Write property)

### 136.80.11 CurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current through the motor will be limited by the CurrentLimit.
**Notes:** See your Stepper motor's data sheet for more information about what value the CurrentLimit should be.

Unit: amperes (A)

(Read and Write property)

### 136.80.12 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the controller will fire another PositionChange/VelocityChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.

Unit: milliseconds (ms)
(Read and Write property)

### 136.80.13 Engaged as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When this property is true, the controller will supply power to the motor coils.
**Notes:** The controller must be Engaged in order to move the Stepper motor, or have it hold position.
(Read and Write property)

### 136.80.14 HoldingCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The HoldingCurrentLimit will activate when the TargetPosition has been reached.
**Notes:** It will limit current through the motor.
When the motor is not stopped, the current through the motor is limited by the CurrentLimit.
If no HoldingCurrentLimit is specified, the CurrentLimit value will persist when the motor is stopped.
Reference your controller's User Guide for more information about how the HoldingCurrentLimit and CurrentLimit can be used in your application.
(Read and Write property)

### 136.80.15 IsMoving as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** IsMoving returns true while the controller is sending commands to the motor.
**Notes:** Note: there is no feedback to the controller, so it does not know whether the motor shaft is actually moving or not.
(Read only property)

### 136.80.16 MaxAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Acceleration can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.17 MaxCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that CurrentLimit and HoldingCurrentLimit can be set to.
**Notes:** Reference your controller's User Guide for more information about how the HoldingCurrentLimit and CurrentLimit can be used in your application.

Unit: amperes (A)
(Read only property)

### 136.80.18 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.80.19 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.80.20 MaxPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TargetPosition can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.21 MaxVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that VelocityLimit can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.22 MinAcceleration as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Acceleration can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.23 MinCurrentLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that CurrentLimit and HoldingCurrentLimit can be set to.
**Notes:** Reference your controller's User Guide for more information about how the HoldingCurrentLimit and CurrentLimit can be used in your application.

Unit: amperes (A)
(Read only property)

### 136.80.24 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.80.25 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** in milliseconds.
(Read only property)

### 136.80.26 MinPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TargetPosition can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.27 MinVelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that VelocityLimit can be set to.
**Notes:** Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.28 Position as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent position value that the controller has reported.
**Notes:** This value will always be between MinPosition and MaxPosition.
Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.29 RescaleFactor as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Applies a factor to the [ user units ] per step to all movement parameters to make the units in your application is more intuitive.
**Notes:** For example, starting from position 0 and setting a new position with a rescale factor, the stepper will move Position / RescaleFactor steps.
In this way, units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor. The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read and Write property)

### 136.80.30 TargetPosition as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** If the controller is configured and the TargetPosition is set, the Stepper motor will move towards

the TargetPosition at the specified Acceleration and Velocity.
**Notes:** TargetPosition is only used when the ControlMode is set to step mode.
Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read and Write property)

### 136.80.31 Velocity as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent velocity value that the controller has reported.
**Notes:** This value is bounded by MinVelocityLimit and MaxVelocityLimit.
Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read only property)

### 136.80.32 VelocityLimit as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** When moving, the Stepper motor velocity will be limited by this value.
**Notes:** The VelocityLimit is bounded by MinVelocityLimit and MaxVelocityLimit.
When in step mode, the MinVelocityLimit has a value of 0. This is because the sign (¬±) of the TargetPosition will indicate the direction.
When in run mode, the MinVelocityLimit has a value of -MaxVelocityLimit. This is because there is no target position, so the direction is defined by the sign (¬±) of the VelocityLimit.
Units for Position, Velocity, and Acceleration can be set by the user through the RescaleFactor.The RescaleFactor allows you to use more intuitive units such as rotations, or degrees.
The default units for this motor controller are 1/16steps per count.
(Read and Write property)

### 136.80.33 Events

### 136.80.34 PositionChanged(position as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the controller updates the stepper motor position.
**Notes:** This event will still fire even if the motor is blocked from physically moving or misses steps.

### 136.80.35 setTargetPositionAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when target position is set asynchronously.

### 136.80.36 Stopped

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the motor controller stops.
**Notes:** The motor may still be physically moving if the inertia is great enough to make it misstep.

### 136.80.37 VelocityChanged(velocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Occurs when the stepper motor velocity changes.
**Notes:** velocity: Velocity of the stepper. Sign indicates direction.

### 136.80.38 Constants

Control Modes

| Constant | Value | Description |
|---|---|---|
| kControlModeRun | 1 | Control the motor by selecting a target velocity (sign indicates direction). The motor will rotate continously in the chosen direction. |
| kControlModeStep | 0 | Control the motor by setting a target position. |

# 136.81 class PhidgetTemperatureSensorMBS

## 136.81.1 class PhidgetTemperatureSensorMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Temperature Sensor class gathers data from the temperature sensor on a Phidget board. #
**Notes:** This includes on-board ambient temperature sensors, connected thermocouples or platinum RTDs, and IR temperature sensors. This class is also used to measure the temperature on some high-power Phidget boards such as motor controllers for safety reasons.

If you're using a simple 0-5V sensor that does not have its own firmware, use the VoltageInput or VoltageRatioInput class instead, as specified for your device.
Subclass of the PhidgetMBS class.
**Blog Entries**

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## 136.81.2 Methods

## 136.81.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 136.81.4 Properties

## 136.81.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another TemperatureChange event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between TemperatureChange events can also affected by the TemperatureChangeTrigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.81.6 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.81.7 MaxTemperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the TemperatureChange event will report.
**Notes:** In degrees celsius.
(Read only property)

### 136.81.8 MaxTemperatureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that TemperatureChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.81.9 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.81.10 MinTemperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the TemperatureChange event will report.
**Notes:** In degrees celsius.

(Read only property)

### 136.81.11 MinTemperatureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that TemperatureChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.81.12 RTDType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTDType must correspond to the RTD type you are using in your application.
**Notes:** If you are unsure which RTDType to use, visit your device's User Guide for more information.
(Read and Write property)

### 136.81.13 RTDWireSetup as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The RTDWireSetup must correspond to the wire configuration you are using in your application.
**Notes:** If you are unsure which RTDWireSetup to use, visit your device's User Guide for more information.
(Read and Write property)

### 136.81.14 Temperature as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent temperature value that the channel has reported.
**Notes:** This value will always be between MinTemperature and MaxTemperature.
in degrees celsius.
(Read only property)

### 136.81.15 TemperatureChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a TemperatureChange event until the temperature value has changed by the amount specified by the TemperatureChangeTrigger.
**Notes:** Setting the TemperatureChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
In degrees celsius.
(Read and Write property)

### 136.81.16 ThermocoupleType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ThermocoupleType must correspond to the thermocouple type you are using in your application.
**Notes:** If you are unsure which ThermocoupleType to use, visit the Thermocouple Primer for more information.
(Read and Write property)

### 136.81.17 Events

### 136.81.18 TemperatureChanged(temperature as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent temperature value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a TemperatureChangeTrigger has been set to a non-zero value, the TemperatureChange event will not occur until the temperature has changed by at least the TemperatureChangeTrigger value.

### 136.81.19 Constants

RTD Sensor Types

| Constant | Value | Description |
|---|---|---|
| kRTDTypePT1000_3850 | 2 | Configures the RTD type as a PT1000 with a 3850ppm curve. |
| kRTDTypePT1000_3920 | 4 | Configures the RTD type as a PT100 with a 3920ppm curve. |
| kRTDTypePT100_3850 | 1 | Configures the RTD type as a PT100 with a 3850ppm curve. |
| kRTDTypePT100_3920 | 3 | Configures the RTD type as a PT100 with a 3920ppm curve. |

RTD wiring configuration

| Constant | Value | Description |
|---|---|---|
| kRTDWireSetup2Wire | 1 | Configures the device to make resistance calculations based on a 2-wire RTD setup. |
| kRTDWireSetup3Wire | 2 | Configures the device to make resistance calculations based on a 3-wire RTD setup. |
| kRTDWireSetup4Wire | 3 | Configures the device to make resistance calculations based on a 4-wire RTD setup. |

Thermocouple Types

| Constant | Value | Description |
|---|---|---|
| kThermoCoupleTypeE | 3 | Configures the thermocouple input as a E-Type thermocouple. |
| kThermoCoupleTypeJ | 1 | Configures the thermocouple input as a J-Type thermocouple. |
| kThermoCoupleTypeK | 2 | Configures the thermocouple input as a K-Type thermocouple. |
| kThermoCoupleTypeT | 4 | Configures the thermocouple input as a T-Type thermocouple. |

## 136.82 class PhidgetUnitInfoMBS

### 136.82.1 class PhidgetUnitInfoMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name, symbol, and Phidgets enumeration of the units of the sensor value calculated from the analog sensor's measurements.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 136.82.2 Methods

### 136.82.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 136.82.4 Destructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 136.82.5 Properties

### 136.82.6 Name as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name.
**Notes:** (Read only property)

### 136.82.7 Symbol as String

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The symbol.
**Notes:** (Read only property)

### 136.82.8 Unit as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The unit.
**Notes:** (Read only property)

### 136.82.9 Constants

Units

| Constant | Value | Description |
|---|---|---|
| kUnitAmpere | 10 | Ampere |
| kUnitBoolean | 1 | Boolean |
| kUnitCentimeter | 5 | Centimeter |
| kUnitDecibel | 3 | Decibel |
| kUnitDegreeCelcius | 13 | Degree Celcius |
| kUnitGauss | 15 | Gauss |
| kUnitGram | 7 | gram |
| kUnitKilogram | 8 | Kilogram |
| kUnitKiloPascal | 11 | Kilo Pascal |
| kUnitLux | 14 | Lux |
| kUnitMeter | 6 | Meter |
| kUnitMilliampere | 9 | Milliampere |
| kUnitMillimeter | 4 | Millimeter |
| kUnitNone | 0 | Unitless |
| kUnitPercent | 2 | Percent |
| kUnitPH | 16 | pH |
| kUnitVolt | 12 | Volt |
| kUnitWatt | 17 | Watt |

## 136.83 class PhidgetVoltageInputMBS

### 136.83.1 class PhidgetVoltageInputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Voltage Input class measures the voltage across the input of a Phidget with a voltage input.
**Notes:** This may be a sensor designed to measure voltage directly, or it could be an input designed to interface with 0-5V sensors.

For 0-5V sensors, this class supports conversion to sensor data with units specific to the Phidget sensor being used, to make reading these sensors easy.
Subclass of the PhidgetMBS class.
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### 136.83.2 Methods

### 136.83.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.83.4 Properties

### 136.83.5 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between events can also affected by the change trigger values.

Unit: milliseconds (ms)
(Read and Write property)

### 136.83.6 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.83.7 MaxVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the VoltageChange event will report.
**Notes:** In volts.
(Read only property)

### 136.83.8 MaxVoltageChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that VoltageChangeTrigger can be set to.
**Notes:** In volts.
(Read only property)

### 136.83.9 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.83.10 MinVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the VoltageChange event will report.
**Notes:** In volts.
(Read only property)

### 136.83.11 MinVoltageChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that VoltageChangeTrigger can be set to.
**Notes:** In volts.
(Read only property)

### 136.83.12 PowerSupply as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose the power supply voltage.
**Notes:** Set this to the voltage specified in the attached sensor's data sheet to power it.
Set to POWER_SUPPLY_OFF to turn off the supply to save power.
(Read and Write property)

### 136.83.13 SensorType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** We sell a variety of analog sensors that do not have their own API, they simply output a voltage that can be converted to a digital value using a specific formula.
**Notes:** By matching the SensorType to your analog sensor, the correct formula will automatically be applied to data when you get the SensorValue or subscribe to the SensorChange event.

- The SensorChange event has its own change trigger associated with it: SensorValueChangeTrigger.
- Any data from getting the SensorValue or subscribing to the SensorChange event will have a SensorUnit associated with it.

Note: Unlike other properties such as DeviceSerialNumber or Channel, SensorType is set after the device is opened, not before.
(Read and Write property)

### 136.83.14 SensorUnit as PhidgetUnitInfoMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The unit of measurement that applies to the sensor values of the SensorType that has been selected.
**Notes:** Helps keep track of the type of information being calculated from the voltage input.
(Read only property)

### 136.83.15 SensorValue as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent sensor value that the channel has reported.
**Notes:** Use SensorUnit to get the measurement units that are associated with the SensorValue.
(Read only property)

### 136.83.16 SensorValueChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a SensorChange event until the sensor value has changed by the amount specified by the SensorValueChangeTrigger.
**Notes:** Setting the SensorChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.83.17 Voltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent voltage value that the channel has reported.
**Notes:** This value will always be between MinVoltage and MaxVoltage.
In volts.
(Read only property)

### 136.83.18 VoltageChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a VoltageChange event until the voltage value has changed by the amount specified by the VoltageChangeTrigger.
**Notes:** Setting the VoltageChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering.
In volts.
(Read and Write property)

### 136.83.19 VoltageRange as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The voltage range you choose should allow you to measure the full range of your input signal.
**Notes:** A larger VoltageRange equates to less resolution.
If a Saturation event occurs, increase the voltage range.
(Read and Write property)

### 136.83.20 Events

### 136.83.21 SensorChanged(sensorValue as double, sensorUnit as PhidgetUnitInfoMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent sensor value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a SensorValueChangeTrigger has been set to a non-zero value, the SensorChange event will not occur until the sensor value has changed by at least the SensorValueChangeTrigger value.
This event only fires when SensorType is not set to kSensorTypeVoltage.

### 136.83.22 VoltageChanged(voltage as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent voltage value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a VoltageChangeTrigger has been set to a non-zero value, the VoltageChange event will not occur until the voltage has changed by at least the VoltageChangeTrigger value.

If SensorType is supported and set to anything other then kSensorTypeVoltage, this event will not fire.
In volts.

### 136.83.23 Constants

Power Supply

| Constant | Value | Description |
|---|---|---|
| kPowerSupply12V | 2 | The sensor is provided with 12 volts |
| kPowerSupply24V | 3 | The sensor is provided with 24 volts |
| kPowerSupplyOff | 1 | Switch the sensor power supply off. |

Sensor Types

| Constant | Value | Description |
|---|---|---|
| kSensorType1114 | &h2b84 | 1114 - Temperature Sensor |
| kSensorType1117 | &h2ba2 | 1117 - Voltage Sensor |
| kSensorType1123 | &h2bde | 1123 - Precision Voltage Sensor |
| kSensorType1127 | &h2c06 | 1127 - Precision Light Sensor |
| kSensorType1130ORP | &h2c26 | 1130 - ORP Adapter |
| kSensorType1130PH | &h2c25 | 1130 - pH Adapter |
| kSensorType1132 | &h2c38 | 1132 - 4-20mA Adapter |
| kSensorType1133 | &h2c42 | 1133 - Sound Sensor |
| kSensorType1135 | &h2c56 | 1135 - Precision Voltage Sensor |
| kSensorType1142 | &h2c9c | 1142 - Light Sensor 1000 lux |
| kSensorType1143 | &h2ca6 | 1143 - Light Sensor 70000 lux |
| kSensorType3500 | &h88b8 | 3500 - AC Current Sensor 10Amp |
| kSensorType3501 | &h88c2 | 3501 - AC Current Sensor 25Amp |
| kSensorType3502 | &h88cc | 3502 - AC Current Sensor 50Amp |
| kSensorType3503 | &h88d6 | 3503 - AC Current Sensor 100Amp |
| kSensorType3507 | &h88fe | 3507 - AC Voltage Sensor 0-250V (50Hz) |
| kSensorType3508 | &h8908 | 3508 - AC Voltage Sensor 0-250V (60Hz) |
| kSensorType3509 | &h8912 | 3509 - DC Voltage Sensor 0-200V |
| kSensorType3510 | &h891c | 3510 - DC Voltage Sensor 0-75V |
| kSensorType3511 | &h8926 | 3511 - DC Current Sensor 0-10mA |
| kSensorType3512 | &h8930 | 3512 - DC Current Sensor 0-100mA |
| kSensorType3513 | &h893a | 3513 - DC Current Sensor 0-1A |
| kSensorType3514 | &h8944 | 3514 - AC Active Power Sensor 0-250V*0-30A (50Hz) |
| kSensorType3515 | &h894e | 3515 - AC Active Power Sensor 0-250V*0-30A (60Hz) |
| kSensorType3516 | &h8958 | 3516 - AC Active Power Sensor 0-250V*0-5A (50Hz) |
| kSensorType3517 | &h8962 | 3517 - AC Active Power Sensor 0-250V*0-5A (60Hz) |
| kSensorType3518 | &h896c | 3518 - AC Active Power Sensor 0-110V*0-5A (60Hz) |
| kSensorType3519 | &h8976 | 3519 - AC Active Power Sensor 0-110V*0-15A (60Hz) |
| kSensorType3584 | &h8c00 | 3584 - 0-50A DC Current Transducer |
| kSensorType3585 | &h8c0a | 3585 - 0-100A DC Current Transducer |
| kSensorType3586 | &h8c14 | 3586 - 0-250A DC Current Transducer |
| kSensorType3587 | &h8c1e | 3587 - +-50A DC Current Transducer |
| kSensorType3588 | &h8c28 | 3588 - +-100A DC Current Transducer |
| kSensorType3589 | &h8c32 | 3589 - +-250A DC Current Transducer |
| kSensorTypeMOT2002High | &h4e36 | MOT2002 - Motion Sensor High Sensitivity |
| kSensorTypeMOT2002Low | &h4e34 | MOT2002 - Motion Sensor Low Sensitivity |
| kSensorTypeMOT2002Med | &h4e35 | MOT2002 - Motion Sensor Medium Sensitivity |
| kSensorTypeVCP4114 | &ha0b4 | VCP4114 - +-25A DC Current Transducer |
| kSensorTypeVoltage | 0 | Generic voltage sensor, Default. Configures the channel to be a generic voltage sensor. Unit is volts. |

Voltage Ranges

| Constant | Value | Description |
|---|---|---|
| kVoltageRange1000mV | 6 | Range ¬±1000mV DC |
| kVoltageRange10mV | 1 | Range ¬±10mV DC |
| kVoltageRange15V | 9 | Range ¬±15V DC |
| kVoltageRange200mV | 3 | Range ¬±200mV DC |
| kVoltageRange2V | 7 | Range ¬±2V DC |
| kVoltageRange312_5mV | 4 | Range ¬±312.5mV DC |
| kVoltageRange400mV | 5 | Range ¬±400mV DC |
| kVoltageRange40mV | 2 | Range ¬±40mV DC |
| kVoltageRange40V | 10 | Range ¬±40V DC |
| kVoltageRange5V | 8 | Range ¬±5V DC |
| kVoltageRangeAUTO | 11 | Auto-range mode changes based on the present voltage measurements. |

## 136.84 class PhidgetVoltageOutputMBS

### 136.84.1 class PhidgetVoltageOutputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Voltage Output class controls the variable DC voltage output on a Phidget board.
**Notes:** This class provides settings for the output voltage as well as various safety controls.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.84.2 Methods

### 136.84.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.84.4 enableFailsafe(failsafeTime as UInt32)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enables the failsafe feature for the channel, with a given failsafe time.
**Notes:** The failsafe feature is intended for use in applications where it is important for the channel to enter a known safe state if the program controlling it locks up or crashes. If you do not enable the failsafe feature, the channel will carry out whatever instructions it was last given until it is explicitly told to stop.

Enabling the failsafe feature starts a recurring failsafe timer for the channel. Once the failsafe timer is enabled, it must be reset within the specified time or the channel will enter a failsafe state. The failsafe timer may be reset either by calling this function again, or using the ResetFailsafe function. Resetting the failsafe timer will reload the timer with the specified failsafe time, starting when the message to reset the timer is received by the Phidget.

For example: if the failsafe is enabled with a failsafe time of 1000ms, you will have 1000ms to reset the failsafe timer. Every time the failsafe timer is reset, you will have 1000ms from that time to reset the failsafe again.

If the failsafe timer is not reset before it runs out, the channel will enter a failsafe state. For Voltage Output channels, this will set the output voltage to 0V. Once the channel enters the failsafe state, it will reject any further input until the channel is reopened.

To prevent the channel from falsely entering the failsafe state, we recommend resetting the failsafe timer as frequently as is practical for your applicaiton. A good rule of thumb is to not let more than a third of the failsafe time pass before resetting the timer.

Once the failsafe timer has been set, it cannot be disabled by any means other than closing and reopening the channel.

### 136.84.5 resetFailsafe

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Resets the failsafe timer, if one has been set.
**Notes:** See EnableFailsafe for details.
This function will fail if no failsafe timer has been set for the channel.

### 136.84.6 setVoltageAsync(targetVelocity as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the voltage value that the channel will output.
**Notes:** The Voltage value is bounded by MinVoltage and MaxVoltage.
The voltage value will not be output until Enabled is set to true.

Run asynchronously in the background and calls setVoltageAsyncCompleted event when done.

### 136.84.7 Properties

### 136.84.8 Enabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable the output voltage by setting Enabled to true.
**Notes:** Disable the output by seting Enabled to false to save power.

(Read and Write property)

### 136.84.9 MaxFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** In milliseconds.
(Read only property)

### 136.84.10 MaxVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that Voltage can be set to.
**Notes:** In volts.
(Read only property)

### 136.84.11 MinFailsafeTime as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that failsafeTime can be set to when calling EnableFailsafe.
**Notes:** In milliseconds.
(Read only property)

### 136.84.12 MinVoltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that Voltage can be set to.
**Notes:** In volts.
(Read only property)

### 136.84.13 Voltage as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The voltage value that the channel will output.
**Notes:** The Voltage value is bounded by MinVoltage and MaxVoltage.
The voltage value will not be output until Enabled is set to true.
(Read and Write property)

### 136.84.14 VoltageOutputRange as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose a VoltageOutputRange that best suits your application.
**Notes:** Changing the VoltageOutputRange will also affect the MinVoltage and MaxVoltage values.
(Read and Write property)

### 136.84.15 Events

### 136.84.16 setVoltageAsyncCompleted(ReturnCode as integer)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called by setVoltageAsync.

### 136.84.17 Constants

Output Voltage Range

| Constant | Value | Description |
|---|---|---|
| kVoltageOutputRange10V | 1 | ¬±10V DC |
| kVoltageOutputRange5V | 2 | 0-5V DC |

## 136.85 class PhidgetVoltageRatioInputMBS

### 136.85.1 class PhidgetVoltageRatioInputMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Voltage Ratio Input class is used for measuring the ratio between the voltage supplied to and the voltage returned from an attached sensor or device.
**Notes:** This is useful for interfacing with ratiometric sensors or wheatstone bridge based sensors.

For ratiometric sensors, this class supports conversion to sensor data with units specific to the Phidget sensor being used, to make reading these sensors easy.
Subclass of the PhidgetMBS class.
**Blog Entries**

- Rewritten Phidgets Plugin

### 136.85.2 Methods

### 136.85.3 Constructor

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 136.85.4 Properties

### 136.85.5 BridgeEnabled as Boolean

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable power to and data from the input by setting BridgeEnabled to true.
**Notes:** (Read and Write property)

### 136.85.6 BridgeGain as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Choose a BridgeGain that best suits your application.
**Notes:** For more information about the range and accuracy of each BridgeGain to decide which best suits your application, see your device's User Guide.
(Read and Write property)

### 136.85.7 DataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The DataInterval is the time that must elapse before the channel will fire another event.
**Notes:** The data interval is bounded by MinDataInterval and MaxDataInterval.
The timing between events can also affected by the change trigger.

Unit: milliseconds (ms)
(Read and Write property)

### 136.85.8 MaxDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.85.9 MaxVoltageRatio as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value the VoltageRatioChange event will report.
**Notes:** (Read only property)

### 136.85.10 MaxVoltageRatioChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The maximum value that VoltageRatioChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.85.11 MinDataInterval as UInt32

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that DataInterval can be set to.
**Notes:** Unit: milliseconds (ms)
(Read only property)

### 136.85.12 MinVoltageRatio as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value the VoltageRatioChange event will report.
**Notes:** (Read only property)

### 136.85.13 MinVoltageRatioChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value that VoltageRatioChangeTrigger can be set to.
**Notes:** (Read only property)

### 136.85.14 SensorType as Integer

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries sensor type.
**Notes:** We sell a variety of analog sensors that do not have their own API, they simply output a voltage that can be converted to a digital value using a specific formula. By matching the SensorType to your analog sensor, the correct formula will automatically be applied to data when you get the SensorValue or subscribe to the SensorChange event.

The SensorChange event has its own change trigger associated with it: SensorValueChangeTrigger.

Any data from getting the SensorValue or subscribing to the SensorChange event will have a SensorUnit

associated with it.

Note: Unlike other properties such as DeviceSerialNumber or Channel, SensorType is set after the device is opened, not before.
(Read and Write property)

### 136.85.15 SensorUnit as PhidgetUnitInfoMBS

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The unit of measurement that applies to the sensor values of the SensorType that has been selected.
**Notes:** Helps keep track of the type of information being calculated from the voltage ratio input.
(Read only property)

### 136.85.16 SensorValue as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent sensor value that the channel has reported.
**Notes:** Use SensorUnit to get the measurement units that are associated with the SensorValue.
(Read only property)

### 136.85.17 SensorValueChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a SensorChange event until the sensor value has changed by the amount specified by the SensorValueChangeTrigger.
**Notes:** Setting the SensorChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.85.18 VoltageRatio as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The most recent voltage ratio value that the channel has reported.
**Notes:** This value will always be between MinVoltageRatio and MaxVoltageRatio.
(Read only property)

### 136.85.19 VoltageRatioChangeTrigger as Double

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The channel will not issue a VoltageRatioChange event until the voltage ratio value has changed by the amount specified by the VoltageRatioChangeTrigger.
**Notes:** Setting the VoltageRatioChangeTrigger to 0 will result in the channel firing events every DataInterval. This is useful for applications that implement their own data filtering
(Read and Write property)

### 136.85.20 Events

### 136.85.21 SensorChanged(sensorValue as double, sensorUnit as PhidgetUnitInfoMBS)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent sensor value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a SensorValueChangeTrigger has been set to a non-zero value, the SensorChange event will not occur until the sensor value has changed by at least the SensorValueChangeTrigger value.
This event only fires when SensorType is not set to SENSOR_TYPE_VOLTAGERATIO

sensorValue: The sensor value
sensorUnit: The sensor unit information corresponding to the SensorValue.
Helps keep track of the type of information being calculated from the voltage ratio input.

### 136.85.22 VoltageRatioChanged(voltageRatio as double)

MBS Phidgets Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The most recent voltage ratio value the channel has measured will be reported in this event, which occurs when the DataInterval has elapsed.
**Notes:** If a VoltageRatioChangeTrigger has been set to a non-zero value, the VoltageRatioChange event will not occur until the voltage has changed by at least the VoltageRatioChangeTrigger value.
If SensorType is supported and set to anything other then SENSOR_TYPE_VOLTAGERATIO, this event

will not fire.

### 136.85.23 Constants

Bridge gain amplification

| Constant | Value | Description |
|---|---|---|
| kBridgeGain1 | 1 | 1x Amplification |
| kBridgeGain128 | 8 | 128x Amplification |
| kBridgeGain16 | 5 | 16x Amplification |
| kBridgeGain2 | 2 | 2x Amplification |
| kBridgeGain32 | 6 | 32x Amplification |
| kBridgeGain4 | 3 | 4x Amplification |
| kBridgeGain64 | 7 | 64x Amplification |
| kBridgeGain8 | 4 | 8x Amplification |

Sensor Types

| Constant | Value | Description |
|---|---|---|
| kSensorType1101_Sharp_2D120X | &h2b03 | 1101 - IR Distance Adapter, with Sharp Distance Sensor 2D120X (4-30cm |
| kSensorType1101_Sharp_2Y0A02 | &h2b05 | 1101 - IR Distance Adapter, with Sharp Distance Sensor 2Y0A02 (20-150 |
| kSensorType1101_Sharp_2Y0A21 | &h2b04 | 1101 - IR Distance Adapter, with Sharp Distance Sensor 2Y0A21 (10-80c |
| kSensorType1102 | &h2b0c | 1102 - IR Reflective Sensor 5mm |
| kSensorType1103 | &h2b16 | 1103 - IR Reflective Sensor 10cm |
| kSensorType1104 | &h2b20 | 1104 - Vibration Sensor |
| kSensorType1105 | &h2b2a | 1105 - Light Sensor |
| kSensorType1106 | &h2b34 | 1106 - Force Sensor |
| kSensorType1107 | &h2b3e | 1107 - Humidity Sensor |
| kSensorType1108 | &h2b48 | 1108 - Magnetic Sensor |
| kSensorType1109 | &h2b52 | 1109 - Rotation Sensor |
| kSensorType1110 | &h2b5c | 1110 - Touch Sensor |
| kSensorType1111 | &h2b66 | 1111 - Motion Sensor |
| kSensorType1112 | &h2b70 | 1112 - Slider 60 |
| kSensorType1113 | &h2b7a | 1113 - Mini Joy Stick Sensor |
| kSensorType1115 | &h2b8e | 1115 - Pressure Sensor |
| kSensorType1116 | &h2b98 | 1116 - Multi-turn Rotation Sensor |
| kSensorType1118_AC | &h2bad | 1118 - 50Amp Current Sensor AC |
| kSensorType1118_DC | &h2bae | 1118 - 50Amp Current Sensor DC |
| kSensorType1119_AC | &h2bb7 | 1119 - 20Amp Current Sensor AC |
| kSensorType1119_DC | &h2bb8 | 1119 - 20Amp Current Sensor DC |
| kSensorType1120 | &h2bc0 | 1120 - FlexiForce Adapter |
| kSensorType1121 | &h2bca | 1121 - Voltage Divider |
| kSensorType1122_AC | &h2bd5 | 1122 - 30 Amp Current Sensor AC |
| kSensorType1122_DC | &h2bd6 | 1122 - 30 Amp Current Sensor DC |
| kSensorType1124 | &h2be8 | 1124 - Precision Temperature Sensor |
| kSensorType1125_Humidity | &h2bf3 | 1125 - Humidity Sensor |
| kSensorType1125_Temperature | &h2bf4 | 1125 - Temperature Sensor |
| kSensorType1126 | &h2bfc | 1126 - Differential Air Pressure Sensor +- 25kPa |
| kSensorType1128 | &h2c10 | 1128 - MaxBotix EZ-1 Sonar Sensor |
| kSensorType1129 | &h2c1a | 1129 - Touch Sensor |
| kSensorType1131 | &h2c2e | 1131 - Thin Force Sensor |
| kSensorType1134 | &h2c4c | 1134 - Switchable Voltage Divider |
| kSensorType1136 | &h2c60 | 1136 - Differential Air Pressure Sensor +-2 kPa |
| kSensorType1137 | &h2c6a | 1137 - Differential Air Pressure Sensor +-7 kPa |
| kSensorType1138 | &h2c74 | 1138 - Differential Air Pressure Sensor 50 kPa |
| kSensorType1139 | &h2c7e | 1139 - Differential Air Pressure Sensor 100 kPa |
| kSensorType1140 | &h2c88 | 1140 - Absolute Air Pressure Sensor 20-400 kPa |
| kSensorType1141 | &h2c92 | 1141 - Absolute Air Pressure Sensor 15-115 kPa |
| kSensorType1146 | &h2cc4 | 1146 - IR Reflective Sensor 1-4mm |
| kSensorType3120 | &h79e0 | 3120 - Compression Load Cell (0-4.5 kg) |
| kSensorType3121 | &h79ea | 3121 - Compression Load Cell (0-11.3 kg) |
| kSensorType3122 | &h79f4 | 3122 - Compression Load Cell (0-22.7 kg) |
| kSensorType3123 | &h79fe | 3123 - Compression Load Cell (0-45.3 kg) |
| kSensorType3130 | &h7a44 | 3130 - Relative Humidity Sensor |
| kSensorType3520 | &h8980 | 3520 - Sharp Distance Sensor (4-30cm) |
| kSensorType3521 | &h898a | 3521 - Sharp Distance Sensor (10-80cm) |
| kSensorType3522 | &h8994 | 3522 - Sharp Distance Sensor (20-150cm) |
| kSensorTypeVoltageRatio | 0 | Generic ratiometric sensor, Default. Configures the channel to be a ge ratiometric sensor. Unit is volts/volt. |

# Chapter 137

# Photos

## 137.1 control DesktopPHLivePhotoControlMBS

### 137.1.1 control DesktopPHLivePhotoControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A view that displays a Live Photo—a picture that also includes motion and sound from the moments just before and after its capture.
**Notes:** Use a Live Photo view to display the photo and control playback of its motion and sound content.

In macOS, Live Photo objects are available only when editing Live Photo content in a photo editing extension that runs in the Photos app—see the PHContentEditingInputMBS class to access Live Photo content in an editing session.

By default, a Live Photo view uses its own gesture recognizer to allow the user to play the motion and sound content of a Live Photo with the same interactions and visual effects seen in the Photos app. To customize this gesture recognizer—for example, to install it on a different view for proper event handling in your app,Äôs view hierarchy—use the playbackGestureRecognizer property.

To animate the view briefly to hint that a picture is a Live Photo, use the startPlayback method with the PlaybackStyleHint option.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr1

**Xojo Developer Magazine**

- 18.3, page 57: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 137.1.2 Methods

### 137.1.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

### 137.1.4 startPlayback(style as integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Begins playback of Live Photo content in the view.
**Notes:** style: An option for how much of the Live Photo,Äôs motion and sound content to play. See PHLivePhotoViewPlaybackStyle.

Use the style parameter to choose whether to play the full motion and sound content of the Live Photo or only a brief section.

Typically, an app does not need to directly control playback, because a Live Photo view provides interactive playback control. Use this method only when non-interactive playback is appropriate—for example, to briefly animate the content to indicate that a view contains a Live Photo rather than a still image.

### 137.1.5 stopPlayback

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Ends playback of Live Photo content in the view.
See also:

- 137.1.6 stopPlayback(animated as boolean) 19110

### 137.1.6 stopPlayback(animated as boolean)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Ends playback of Live Photo content in the view.
See also:

- 137.1.5 stopPlayback 19110

### 137.1.7 Properties

### 137.1.8 audioVolume as Single

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The audio gain to apply to the Live Photo,Äôs movie content during playback.
**Notes:** Values for this property must be between 0.0 and 1.0, inclusive. A value of 1.0 (the default) plays audio content from the Live Photo at full volume (relative to the system volume). A value of 0.0 is equivalent to setting the muted property to true.
(Read and Write property)

### 137.1.9 ContentMode as Integer

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The content mode.
**Notes:** (Read and Write property)

### 137.1.10 LivePhoto as PHLivePhotoMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Live Photo displayed in the view.
**Notes:** (Read and Write property)

### 137.1.11 livePhotoBadgeView as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A view for displaying Live Photo status.
**Notes:** The PHLivePhotoViewMBS uses this subview to display icons indicating the existence or status of Live Photo content. Photos manages the content displayed in the badge view, so you don,Äôt need to do anything with view,Äôs content—instead, this property provides access to the badge view so you can change where it appears in your view hierarchy if needed. For example, if you display a Live Photo view within a scroll view, you can move the badge view so that its position remains constant while the scroll view scrolls.

(Read only property)

### 137.1.12 muted as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether the view plays the audio content of its Live Photo.
**Notes:** The default value is false, indicating that the view plays audio content along with the motion content of its Live Photo. Change this value to true to play motion content but not audio content.
(Read and Write property)

### 137.1.13 View as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 137.1.14 Events

### 137.1.15 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 137.1.16 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 137.1.17 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 137.1.18 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 137.1.19 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 137.1.20 didEndPlaybackWithStyle(playbackStyle as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the delegate that Live Photo playback has ended.
**Notes:** playbackStyle: The style of playback, indicating whether the content was played in full or briefly previewed.

### 137.1.21 FocusLost

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 137.1.22 FocusReceived

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 137.1.23 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 137.1.24 MenuBarSelected

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 137.1.25 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 137.1.26 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 137.1.27 MouseUp(x As Integer, y As Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 137.1.28 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 137.1.29 ScaleFactorChanged(NewFactor as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 137.1.30 willBeginPlaybackWithStyle(playbackStyle as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Notifies the control that Live Photo playback is about to begin.
**Notes:** playbackStyle: The style of playback, indicating whether the content is to be played in full or briefly previewed.

### 137.1.31 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 137.1.32 Constants

Content Modes

| Constant | Value | Description |
|---|---|---|
| ContentModeAspectFill | 1 | Aspect Fill. |
| ContentModeAspectFit | 0 | Aspect Fit. |

Playback Styles

| Constant | Value | Description |
|---|---|---|
| PlaybackStyleFull | 1 | Plays back the entire motion and sound content of the Live Photo, including transition effects at the start and end. |
| PlaybackStyleHint | 2 | Plays back only a brief section of the motion content of the Live Photo, without sound. |
| PlaybackStyleUndefined | 0 | This value is invalid for use. |

## 137.2 class PHAdjustmentDataMBS

### 137.2.1 class PHAdjustmentDataMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A description of the edits made to an asset's photo, video, or Live Photo content, which allows your app to reconstruct or revert the effects of prior editing sessions.
**Notes:** When a user edits an asset, Photos saves a PHAdjustmentData object along with the modified image or video data. This object provides an application-defined ,Äúrecipe,Äù you can use to reconstruct the edit. For example, if your app applies filters to a photo, you might might create adjustment data that identifies which filters the user picked, the parameters for each, and the order to apply the filters in. Later, the user can resume working with those filters and parameters by using your app or another app that understands your adjustment data format. When iCloud Photos is enabled, a user can revert or resume edits made on a different device.

You work with adjustment data when editing an asset, using either the requestContentEditingInputWithOptions method or a photo extension view controller that implements the PHContentEditingController protocol.

- When you begin an edit (through a PHContentEditingInputMBS object), examine the editing input,Äôs adjustmentData property to decide whether the last edit made to the asset is compatible with your app. If so, you can allow the user to resume working with that edit. If not, you can make further edits to the last saved version of the photo.

- When you commit an edit (through a PHContentEditingOutputMBS object), provide a new adjustment whose data represents the changes your app made.

For each asset, Photos stores only one PHAdjustmentDataMBS object, representing the most recent edit made to the asset,Äôs content.

### 137.2.2 Methods

### 137.2.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.11 or newer.

### 137.2.4 Constructor(formatIdentifier as string, formatVersion as string, data as Memoryblock)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes an adjustment object with the specified format and data.
**Notes:** formatIdentifier: A string that uniquely identifies the format of the adjustment data.
formatVersion: A version number for the adjustment data format.
data: A serialized form of whatever information is needed to reconstruct the adjustment.

Returns an initialized adjustment object.

To uniquely identify the adjustments your app makes, use the the formatIdentifier and formatVersion parameters. These parameters help you determine whether and how to interpret the adjustment data when working with an edited asset later. For best results, use reverse-DNS-style identifiers and monotonically increasing version numbers.
For example, in the first version of your app, you might save adjustment data using the identifier com.example.myApp and version 1.0. If a later version of your app adds incompatible information to the adjustment data, you can use the same identifier and increase the version number to 2.0.

Use the data parameter to store whatever information is useful to your app for reconstructing an edit. For example, if your app applies Core Image filters to photos, you can use this parameter to store a serialized property list that describes the filters and their parameters.

Because Photos limits the size of adjustment data, you should keep your edit information short and descriptive. Don,Äôt use image data to describe an edit—instead, save only the minimal information that is needed to recreate the edit.
Your app must provide a non-empty Memoryblock for the data parameter. If you cannot provide relevant data to describe an edit, you may pass data that encodes an NSUUID object.

### 137.2.5 Properties

### 137.2.6 data as Memoryblock

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Data that contains the information necessary to reconstruct the adjustment.
**Notes:** Use this property to resume working with the last edit that was made to an asset. For example, if your app applies Core Image filters to photos, this property may hold a serialized property list that describes the filters and their parameters. Use the formatIdentifier and formatVersion properties to determine whether the adjustment data saved with an asset is in a format that your app can understand.
(Read only property)

### 137.2.7 formatIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string uniquely identifying the format of the adjustment data.
**Notes:** Set this identifier when you create an adjustment object with the constructor. For best results, identify your organization or product using a reverse-DNS-style name, such as com.example.myApp.

Read this property, and the formatVersion property, to determine whether the adjustment data saved with an asset was created by your app or is otherwise compatible with your app.
(Read only property)

### 137.2.8 formatVersion as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A version number for the adjustment data format.
**Notes:** Set this identifier when creating an adjustment object with the constructor.
Read this property, and the formatIdentifier property, to determine whether the adjustment data saved with an asset was created by your app or is otherwise compatible with your app.
For example, in the first version of your app, you might save adjustment data using the identifier com.example.myApp and version 1.0. If a later version of your app adds incompatible information to the adjustment data, you can use the same identifier and increase the version number to 2.0.
(Read only property)

### 137.2.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 137.3 class PHAssetChangeRequestMBS

### 137.3.1 class PHAssetChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A request to create, delete, change metadata for, or edit the content of a Photos asset, for use in a photo library change block.
**Notes:** You use the PHAssetChangeRequest class to request changes for PHAssetMBS objects. To make changes to assets in the Photos library, create a change request by using the appropriate class method for the change you want to perform.

- Call one of the methods listed in Adding New Assets to create a new asset from an image or video file.
- Call the deleteAssets: method to delete existing assets.
- Call the changeRequestForAsset: method to modify an asset,Äôs content or metadata.

A change request for creating or modifying an asset works like a mutable version of the asset object. Use the change request,Äôs properties to request changes to the corresponding properties of the asset itself.

After Photos runs the change block and calls your completion handler, the asset,Äôs state reflects the changes that you requested in the block.

If you create or use a change request object outside a photo library change block, Photos raises an Objective-C exception. For details on change blocks, see PHPhotoLibraryMBS.

### 137.3.2 Methods

### 137.3.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.3.4 changeRequestForAsset(asset as PHAssetMBS) as PHAssetChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for modifying the specified asset.
**Notes:** asset: The asset to be modified.

Returns an asset change request.

Before editing an asset, use its canPerformEditOperation method to see if the asset allows editing.

After you create a change request within a photo library change block, propose changes to the original asset,Äôs properties by setting the corresponding properties of the change request. After Photos runs your change block, the asset,Äôs properties reflect your changes. For details on change blocks, see PHPhotoLibraryMBS.

To edit an asset,Äôs image or video content, first begin a content editing session with the asset,Äôs requestContentEditingInputWithOptions method. You commit a content edit by setting the contentEditingOutput property of a change request within a change block. For more information about asset content editing, see PHAssetMBS.

### 137.3.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.3.6 creationRequestForAssetFromImage(image as NSImageMBS) as PHAssetChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new image asset to the Photos library.
**Notes:** image: An image.

Returns an asset creation request.

Call this method within a photo library change block to create a new asset. For details on change blocks, see PHPhotoLibraryMBS.
To reference the newly created asset later in the same change block or after the change block completes, use the placeholderForCreatedAsset property to retrieve a placeholder object.

### 137.3.7 creationRequestForAssetFromImageAtFile(file as FolderItem) as PHAssetChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new image asset to the Photos library, using the image file at the specified URL.
**Notes:** file: A URL for an image file.

Returns an asset creation request.

Call this method within a photo library change block to create a new asset. For details on change blocks, see PHPhotoLibraryMBS.

To set metadata properties of the newly created asset, use the corresponding properties of the change request (listed in Modifying Assets). To reference the newly created asset later in the same change block or after the change block completes, use the placeholderForCreatedAsset property to retrieve a placeholder object.

### 137.3.8 creationRequestForAssetFromVideoAtFileURL(file as FolderItem) as PHAssetChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new video asset to the Photos library, using the video file at the specified URL.
**Notes:** file: A folderitem for a video file.

Returns an asset creation request.

Call this method within a photo library change block to create a new asset. For details on change blocks, see PHPhotoLibraryMBS.

To set metadata properties of the newly created asset, use the corresponding properties of the change request (listed in Modifying Assets). To reference the newly created asset later in the same change block or after the change block completes, use the placeholderForCreatedAsset property to retrieve a placeholder object.

### 137.3.9 deleteAssets(assets() as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests that the specified assets be deleted.
**Notes:** assets: An array of PHAssetMBS objects to be deleted.

Call this method within a photo library change block to delete assets. For details on change blocks, see PHPhotoLibraryMBS.

### 137.3.10 revertAssetContentToOriginal

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Request to revert any edits made to the asset,Äôs content.
**Notes:** When an asset has been edited, Photos stores multiple versions of the asset: the original version of the asset as it was first captured or imported, and the input and output of the most recent edit. (You work with asset versions when requesting to edit an asset,Äôs content—see PHContentEditingInputRequestOptions.) Call this method to revert to the original version of the asset, discarding all edits.

This request fails if original content for the asset is not available on the current device (for example, if iCloud Photo Library is enabled and the user has edited the asset on a different device). Use PHAssetResourceManagerMBS to ensure that original asset content is downloaded to the current device before making this request.

### 137.3.11 Properties

### 137.3.12 contentEditingOutput as PHContentEditingOutputMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The output of an asset content editing session.
**Notes:** To edit an asset,Äôs image or video content, you must first begin a content editing session with the asset,Äôs requestContentEditingInputWithOptions method. You commit a content edit by setting the contentEditingOutput property of a change request within a change block. For more information about asset content editing, see PHAssetMBS.
(Read and Write property)

### 137.3.13 creationDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The date and time at which the asset claims to have been originally created.
**Notes:** Set this property to change the creation date of an asset.
(Read and Write property)

### 137.3.14 creationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date and time at which the asset claims to have been originally created.
**Notes:** Set this property to change the creation date of an asset.
(Read and Write property)

### 137.3.15 Favorite as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the asset is marked as one of the user,Äôs favorites.
**Notes:** (Read and Write property)

### 137.3.16 Hidden as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the asset is hidden in collections.
**Notes:** Hidden assets do not appear in the Moments interface in the Photos app.
(Read and Write property)

### 137.3.17 location as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The location information saved with the asset.
**Notes:** Typically, an asset,Äôs location metadata identifies the place where the asset was captured. Use this property to provide a different location.

We pass result, the CLLocationMBS object, as variant to avoid plugin dependencies.
(Read and Write property)

### 137.3.18 placeholderForCreatedAsset as PHObjectPlaceholderMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A placeholder object for the asset that the change request creates.
**Notes:** Use this property if you need to reference the asset created by a change request within the same change block.
(Read only property)

## 137.4 class PHAssetCollectionChangeRequestMBS

### 137.4.1 class PHAssetCollectionChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A request to create, delete, or modify a Photos asset collection, for use in a photo library change block.
**Notes:** You use the PHAssetCollectionChangeRequestMBS class to request changes for PHAssetCollectionMBS objects. To make changes to asset collections (such as user-created albums) in the Photos library, create a change request using the appropriate class method for the change you want to perform.

- Call the creationRequestForAssetCollectionWithTitle: method to create a new asset collection.
- Call the deleteAssetCollections: method to delete existing asset collections.
- Call the changeRequestForAssetCollection: or changeRequestForAssetCollection:assets: method to modify a collection,Äôs metadata or list of member assets.

Before creating a change request, use the canPerformEditOperation: method to verify that the collection allows the edit operation you,Äôre requesting. If you attempt to perform an unsupported edit operation, Photos throws an exception.
A change request for creating or modifying an asset collection works like a mutable version of the asset collection object. Use the change request,Äôs properties and instance methods to request changes to the asset collection itself.

After Photos runs the change block and calls your completion handler, the asset collection,Äôs state reflects the changes you requested in the block.
If you create or use a change request object outside a photo library change block, Photos raises an Objective-C exception. For details on change blocks, see PHPhotoLibraryMBS.
Subclass of the PHChangeRequestMBS class.

### 137.4.2 Methods

### 137.4.3 addAsset(asset as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Add the specified asset to the asset collection.
**Notes:** asset: The PHAsset object to be added to the asset collection.

If you created the change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method, Photos inserts the new assets after the existing assets in the collection.

Otherwise, the arrangement of the new assets relative to others in the collection is undefined.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAsset-CollectionWithAssets method) do not support adding or removing content.

### 137.4.4 addAssets(assets() as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Add the specified assets to the asset collection.
**Notes:** assets: An array of PHAsset objects to be added to the asset collection.

If you created the change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method, Photos inserts the new assets after the existing assets in the collection. Otherwise, the arrangement of the new assets relative to others in the collection is undefined.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAsset-CollectionWithAssets method) do not support adding or removing content.

### 137.4.5 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.4.6 changeRequestForAssetCollection(assetCollection as PHAssetCollection-MBS) as PHAssetCollectionChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for modifying the specified asset collection.
**Notes:** assetCollection: The asset collection to be modified.

Returns an asset collection change request.

After you create a change request within a photo library change block, propose changes to the collection,Äôs title or list of member assets with the properties and instance methods of the change request. After Photos

runs your change block, the asset collection reflects your changes. For details on change blocks, see PHPhotoLibraryMBS.

Use this method when modifying an asset collection,Äôs metadata or when adding or removing assets without regard to their arrangement. To work with indexes in the list of member assets, use the changeRequestForAssetCollection method instead.
See also:

- 137.4.7 changeRequestForAssetCollection(assetCollection as PHAssetCollectionMBS, assets as PHFetchResultMBS) as PHAssetCollectionChangeRequestMBS 19127

### 137.4.7 changeRequestForAssetCollection(assetCollection as PHAssetCollectionMBS, assets as PHFetchResultMBS) as PHAssetCollectionChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for modifying the specified asset collection, with a fetch result for tracking changes.
**Notes:** assetCollection: The asset collection to be modified.
assets: A fetch result listing the assets in the collection.

Returns an asset collection change request.

After you create a change request within a photo library change block, you propose changes to the collection,Äôs title or list of member assets with the properties and instance methods of the change request. After Photos runs your change block, the asset collection reflects your changes. For details on change blocks, see PHPhotoLibraryMBS.

Use this method when you need to insert, remove, or rearrange assets at specified indexes in the asset collection,Äôs list of member assets. By passing in a fetch result reflecting what your app sees as the current state of the collection,Äôs membership, the Photos framework can ensure that the indexes you specify are valid even if the collection has changed since you last fetched it. If you don,Äôt need to work with indexes in the list of member assets, you can use the changeRequestForAssetCollection method instead.
See also:

- 137.4.6 changeRequestForAssetCollection(assetCollection as PHAssetCollectionMBS) as PHAssetCollectionChangeRequestMBS 19126

### 137.4.8 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.4.9 creationRequestForAssetCollectionWithTitle(title as string) as PHAssetCollectionChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new asset collection to the Photos library.
**Notes:** image: A name for the new asset collection.

Returns an asset collection creation request.

Call this method within a photo library change block to create a new asset collection. For details on change blocks, see PHPhotoLibraryMBS.
To add assets to the newly created asset collection or change its title, use the methods listed in Modifying Asset Collections. To reference the newly created asset collection later in the same change block or after the change block completes, use the placeholderForCreatedAssetCollection property to retrieve a placeholder object.

### 137.4.10 deleteAssetCollections(Collections() as PHCollectionListMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests that the specified asset collections be deleted.
**Notes:** assetCollections: An array of PHAssetCollectionMBS objects to be deleted.

Call this method within a photo library change block to delete asset collections. For details on change blocks, see PHPhotoLibraryMBS.

### 137.4.11 insertAsset(asset as PHAssetMBS, index as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Insert the specified asset into the collection at the specified indexes.
**Notes:** asset: A PHAssetMBS object to be inserted into the asset collection.
index: The index at which the asset should be inserted. The count of locations in this index set must equal the count of assets.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before inserting assets.

For a detailed discussion of how the index set you specify maps to insertions in the list of assets, see the similar NSMutableArray method insertObjects.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.

### 137.4.12 insertAssets(assets() as PHAssetMBS, indexes as NSIndexSetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts the specified assets into the collection at the specified indexes.
**Notes:** assets: An array of PHAssetMBS objects to be inserted into the asset collection.
indexes: The indexes at which the assets should be inserted. The count of locations in this index set must equal the count of assets.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before inserting assets.

For a detailed discussion of how the index set you specify maps to insertions in the list of assets, see the similar NSMutableArray method insertObjects.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.

### 137.4.13 moveAsset(fromIndex as Integer, toIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Move the asset at the specified index in the asset collection to a new index.
**Notes:** fromIndex: The indexes of the asset to be moved in the asset collection.
toIndex: The index at which to place the moved asset, relative to the collection,Äôs ordering after removing the items at indexes.

When you call this method, Photos first removes the items in the indexes parameter from the collection, and then inserts them at the location specified by the toIndex parameter.
To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before rearranging assets.

### 137.4.14 moveAssets(fromIndexes as NSIndexSetMBS, toIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the assets at the specified indexes in the asset collection to a new index.
**Notes:** fromIndexes: The indexes of the assets to be moved in the asset collection.
toIndex: The index at which to place the moved assets, relative to the collection,Äôs ordering after removing the items at indexes.

When you call this method, Photos first removes the items in the indexes parameter from the collection, and then inserts them at the location specified by the toIndex parameter.
To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before rearranging assets.

### 137.4.15 removeAsset(asset as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the specified asset from the asset collection.
**Notes:** asset: A PHAssetMBS object to be removed from the asset collection.

This method removes assets from the collection based on their identity (determined by the localIdentifier property of each asset). To remove objects at specified indexes, use the removeAssets method.

Transient asset collections (such as those created with the transientAssetCollectionWithAssets:title: method) do not support adding or removing content.
See also:

- 137.4.16 removeAsset(AtIndex as Integer) 19130

### 137.4.16 removeAsset(AtIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the asset at the specified index from the asset collection.
**Notes:** index: The index of the asset to be removed from the asset collection.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before removing assets. To remove objects based on their identities (without regard to their indexes in the collection), use the removeAssets: method.

Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.
See also:

- 137.4.15 removeAsset(asset as PHAssetMBS) 19130

### 137.4.17 removeAssets(assets() as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the specified assets from the asset collection.
**Notes:** assets: An array of PHAssetMBS objects to be removed from the asset collection.

This method removes assets from the collection based on their identity (determined by the localIdentifier property of each asset). To remove objects at specified indexes, use the removeAssets method.

Transient asset collections (such as those created with the transientAssetCollectionWithAssets:title: method) do not support adding or removing content.
See also:

- 137.4.18 removeAssets(AtIndexes as NSIndexSetMBS) 19131

### 137.4.18 removeAssets(AtIndexes as NSIndexSetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the assets at the specified indexes from the asset collection.
**Notes:** indexes: The indexes of the assets to be removed from the asset collection.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before removing assets. To remove objects based on their identities (without regard to their indexes in the collection), use the removeAssets: method.

Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.
See also:

- 137.4.17 removeAssets(assets() as PHAssetMBS) 19131

### 137.4.19 replaceAsset(AtIndex as Integer, asset as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Replaces the asset at the specified index in the asset collection with the specified asset.
**Notes:** index: The index of the asset to be replaced in the asset collection.
asset: A PHAssetMBS object to be inserted into (or moved within) the asset collection.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before rearranging assets.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.

### 137.4.20 replaceAssets(AtIndexes as NSIndexSetMBS, assets() as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Replaces the assets at the specified indexes in the asset collection with the specified assets.
**Notes:** indexes: The indexes of the assets to be replaced in the asset collection.
assets: An array of PHAssetMBS objects to be inserted into (or moved within) the asset collection.

To ensure that the index set you specify is valid even if the asset collection has changed since you fetched it, create a change request with a snapshot of the asset collection,Äôs contents using the changeRequestForAssetCollection method before rearranging assets.

Assets from My Photo Stream or iCloud Shared Albums and assets synced to the device through iTunes cannot be added to collections. Transient asset collections (such as those created with the transientAssetCollectionWithAssets method) do not support adding or removing content.

### 137.4.21 Properties

### 137.4.22 placeholderForCreatedAssetCollection as PHObjectPlaceholderMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A placeholder object for the asset collection that the change request creates.
**Notes:** Use this property if you need to reference the asset collection created by a change request within the same change block.
(Read only property)

### 137.4.23 title as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The displayed name of the asset collection.
**Notes:** Set this property to change the asset collection,Äôs title.
(Read and Write property)

## 137.5 class PHAssetCollectionMBS

### 137.5.1 class PHAssetCollectionMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A representation of a Photos asset grouping, such as a moment, user-created album, or smart album.
**Notes:** In the Photos framework, collection objects (including asset collections) do not directly reference their member objects, and there are no other objects that directly reference collection objects. To retrieve the members of an asset collection, fetch them with a PHAsset class method such as fetchAssetsInAssetCollection. To find asset collections, use one of the methods listed in Fetching Asset Collections.

Important
Accessing or modifying the Photos library requires explicit authorization from the user. The first time you call one of the methods listed in Fetching Asset Collections, Photos automatically prompts the user for authorization. (Alternatively, you can use the PHPhotoLibraryMBS.requestAuthorization method to prompt the user at a time of your choosing.)

Your app,Äôs Info.plist file must provide a value for the NSPhotoLibraryUsageDescription key that explains to the user why your app is requesting Photos access. Apps linked on or after iOS 10.0 will crash if this key is not present.

Like assets and collection lists, asset collections are immutable. To create, rename, or delete asset collections, or to add, remove, or rearrange members in an asset collection, create a PHAssetCollectionChangeRequestMBS object within a photo library change block. For details on using change requests and change blocks to update the photo library, see PHPhotoLibraryMBS.
Subclass of the PHCollectionMBS class.
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### 137.5.2 Methods

### 137.5.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.5.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.5.5 fetchAssetCollectionsContainingAsset(asset as PHAssetMBS, type as Integer, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves asset collections of the specified type containing the specified asset.
**Notes:** asset: A Photos asset.
type: An asset collection type, such as an album or a moment. See Type constants.
options: Options that specify a filter predicate and sort order for the fetched asset collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAssetCollectionMBS objects, or an empty fetch result if no objects match the request.

### 137.5.6 fetchAssetCollectionsWithALAssetGroupURLs(assetGroupURLs() as string, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves asset collections using URLs provided by the Assets Library framework.
**Notes:** assetGroupURLs: An array of URLs, each an asset group URL that was previously retrieved from an ALAssetsGroupMBS object.
options: Options that specify a filter predicate and sort order for the fetched asset collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAssetCollectionMBS objects, or an empty fetch result if no objects match the request.

The Assets Library framework is deprecated in iOS 8.0 and later, replaced by the Photos framework. Use this method if your app has previously stored URLs from ALAssetsGroupMBS objects and you need to retrieve the corresponding Photos framework objects.

### 137.5.7 fetchAssetCollectionsWithLocalIdentifiers(identifiers() as string, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves asset collections with the specified unique identifiers.
**Notes:** identifiers: An array of strings, each the localIdentifier string of an asset collection.
options: Options that specify a filter predicate and sort order for the fetched asset collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAssetCollectionMBS objects, or an empty fetch result if no objects match the request.

### 137.5.8 fetchAssetCollectionsWithType(type as Integer, subType as integer, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves asset collections of the specified type and subtype.
**Notes:** type: A type of asset collection, such as an album or a moment. See Type constants.
subtype: A subtype of asset collection. See Subtype constants.
options: Options that specify a filter predicate and sort order for the fetched asset collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAssetCollectionMBS objects, or an empty fetch result if no objects match the request.

By default, the returned PHFetchResultMBS object contains all asset collections with the specified type and subtype. To retrieve a more specific set of asset collections, provide a PHFetchOptionsMBS object containing a filter predicate.

### 137.5.9 localizedLocationNames as String()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The names of locations grouped by the collection (an array of strings).
**Notes:** This property applies only to asset collections whose type is PHAssetCollectionTypeMoment. The Photos app automatically creates moments to group assets by time and location. A moment might group assets captured in multiple locations, so this array can contain multiple names. For other asset collection types, this property,Äôs value is nil.

### 137.5.10 transientAssetCollectionWithAssetFetchResult(fetchResult as PHAssetMBS, title as string) as PHAssetCollectionMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a temporary asset collection containing the assets from the specified fetch result.
**Notes:** fetchResult: A fetch result containing one or more PHAssetMBS objects.
title: A name for the new temporary asset collection.

Returns a new asset collection.

Transient asset collections are not saved to local storage or iCloud and do not appear in the Photos application or other apps using the Photos framework. A transient collection can be useful if you,Äôve designed a UI for displaying the contents of a collection and want to display an arbitrary set of assets.

### 137.5.11 transientAssetCollectionWithAssets(assets() as PHAssetMBS, title as string) as PHAssetCollectionMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a temporary asset collection containing the specified assets.
**Notes:** assets: An array of PHAssetMBS objects.
title: A name for the new temporary asset collection.

Returns a new asset collection.

Transient asset collections are not saved to local storage or iCloud and do not appear in the Photos app or other apps using the Photos framework. A transient collection can be useful if you,Äôve designed a UI for displaying the contents of a collection and want to display an arbitrary set of assets.

### 137.5.12 Properties

### 137.5.13 approximateLocation as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A location representing those of all assets in the collection.
**Notes:** The Photos app automatically creates moments to group assets by time and location. A moment can contain photos from several locations in close proximity. In such cases, this property describes the general area containing the locations of all assets in the moment.
This property applies only to asset collections whose type is TypeMoment. For other asset collection types, this property,Äôs value is nil.

We pass result, the CLLocationMBS object, as variant to avoid plugin dependencies.
(Read only property)

### 137.5.14 assetCollectionSubtype as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtype of the asset collection.
**Notes:** Use subtypes to make minor distinctions between collections of the same type. For albums, for example, you might distinguish user-created albums from those synced from iPhoto. See Subtype constants for possible values.
(Read only property)

### 137.5.15 assetCollectionType as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of the asset collection, such as an album or a moment.
**Notes:** (Read only property)

### 137.5.16 endDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The latest creation date among all assets in the asset collection.
**Notes:** This property applies only to asset collections whose type is TypeMoment. For other asset collection types, this property,Äôs value is nil.
(Read only property)

### 137.5.17 endDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The latest creation date among all assets in the asset collection.
**Notes:** This property applies only to asset collections whose type is TypeMoment. For other asset collection types, this property,Äôs value is nil.
(Read only property)

### 137.5.18 estimatedAssetCount as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The estimated number of assets in the asset collection.
**Notes:** This count may not match the current number of assets in the collection. To get the most recent count, fetch the collection,Äôs assets with the fetchAssetsInAssetCollection method and read the count property of the fetch result.
If asset count information is not available for the collection, this property,Äôs value is NSNotFound.
(Read only property)

### 137.5.19 startDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The earliest creation date among all assets in the asset collection.
**Notes:** This property applies only to asset collections whose type is TypeMoment. For other asset collection types, this property,Äôs value is nil.
(Read only property)

### 137.5.20 startDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The earliest creation date among all assets in the asset collection.
**Notes:** This property applies only to asset collections whose type is TypeMoment. For other asset collection types, this property,Äôs value is nil.
(Read only property)

### 137.5.21 Constants

SubTypes

| Constant | Value | Description |
|---|---|---|
| SubtypeAlbumCloudShared | 101 | An iCloud Shared Photo Stream. |
| SubtypeAlbumImported | 6 | An album imported from a camera or external storage. |
| SubtypeAlbumMyPhotoStream | 100 | The user,Äôs personal iCloud Photo Stream. |
| SubtypeAlbumRegular | 2 | An album created in the Photos app. |
| SubtypeAlbumSyncedAlbum | 5 | An album synced to the device from iPhoto. |
| SubtypeAlbumSyncedEvent | 3 | An Event synced to the device from iPhoto. |
| SubtypeAlbumSyncedFaces | 4 | A Faces group synced to the device from iPhoto. |
| SubtypeAny | -1 | A bit mask representing all possible subtypes. |
| SubtypeSmartAlbumAllHidden | 205 | A smart album that groups all assets hidden from the Moments view i Photos app. |
| SubtypeSmartAlbumAnimated | 214 | A smart album that groups all image animation assets. |
| SubtypeSmartAlbumBursts | 207 | A smart album that groups all burst photo sequences in the photo librar |
| SubtypeSmartAlbumDepthEffect | 212 | A smart album that groups all images captured using the Depth Effect ca mode on compatible devices. |
| SubtypeSmartAlbumFavorites | 203 | A smart album that groups all assets that the user has marked as favorit |
| SubtypeSmartAlbumGeneric | 200 | A smart album of no more specific subtype. |
| SubtypeSmartAlbumLivePhotos | 213 | A smart album that groups all Live Photo assets. |
| SubtypeSmartAlbumLongExposures | 215 | A smart album that groups all Live Photo assets where the Long Exp variation is enabled. |
| SubtypeSmartAlbumPanoramas | 201 | A smart album that groups all panorama photos in the photo library. |
| SubtypeSmartAlbumRecentlyAdded | 206 | A smart album that groups assets that were recently added to the photo lib |
| SubtypeSmartAlbumScreenshots | 211 | A smart album that groups all images captured using the device,Äôs scree function. |
| SubtypeSmartAlbumSelfPortraits | 210 | A smart album that groups all photos and videos captured using the devic front-facing camera. |
| SubtypeSmartAlbumSlomoVideos | 208 | A smart album that groups all Slow-Mo videos in the photo library. |
| SubtypeSmartAlbumTimelapses | 204 | A smart album that groups all time-lapse videos in the photo library. |
| SubtypeSmartAlbumUnableToUpload | 216 | Unable to upload album. |
| SubtypeSmartAlbumUserLibrary | 209 | A smart album that groups all assets that originate in the user,Äôs own li (as opposed to assets from iCloud Shared Albums). |
| SubtypeSmartAlbumVideos | 202 | A smart album that groups all video assets in the photo library. |

Types

| Constant | Value | Description |
|---|---|---|
| TypeAlbum | 1 | An album in the Photos app. |
| TypeMoment | 3 | A moment in the Photos app. Deprecated by Apple. |
| TypeSmartAlbum | 2 | A smart album whose contents update dynamically. |

## 137.6 class PHAssetCreationRequestMBS

### 137.6.1 class PHAssetCreationRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A request to create a new Photos asset from underlying data resources, for use in a photo library change block.
**Notes:** A PHAssetCreationRequestMBS object, used within a photo library change block, constructs a new photo or video asset from data resources, and adds it to the Photos library. This class works in terms of the raw data resources that together form an asset, so you can use it together with the PHAssetResource class to perform a complete copy (or backup and restore) of an asset,Äôs underlying resources. To instead simply create a new asset from an image object, image file, or video file, see the superclass PHAssetChangeRequestMBS.

To create a new asset from data resources, first start a change block using the shared PHPhotoLibraryMBS method performChanges or performChangesAndWait. Then, within the change block:

1. Within the change block, create a new asset creation request with the creationRequestForAsset method.
2. Add image, video, or data resources using the methods listed in Providing Data Resources for the New Asset.
3. (Optional.) Set metadata for the new asset using methods and properties of the superclass PHAssetChangeRequestMBS.

After Photos runs the change block and calls your completion handler, the new asset is created in the Photos library.
If you instantiate or use this class outside a photo library change block, Photos throws an exception. For details on change blocks, see PHPhotoLibrary.
Subclass of the PHAssetChangeRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 137.6.2 Methods

### 137.6.3 addResource(type as Integer, data as MemoryBlock, options as PHAssetResourceCreationOptionsMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a data resource to the asset being created, using the specified data.
**Notes:** type: The role of this data resource in constructing an asset. For details, see type constants.
data: The data for the asset resource.
options: Options affecting how Photos constructs the asset resource and incorporates its data into the Photos library. For details, see PHAssetResourceCreationOptionsMBS class.

Photos imports the asset resource data only when it executes the PHPhotoLibraryMBS change block in which you create a PHAssetCreationRequest object and call this method. If you attempt to create an asset with invalid data or an invalid combination of resources, Photos reports an error in the completion handler of your PHPhotoLibraryMBS call.
See also:


- 137.6.4 addResource(type as Integer, data as String, options as PHAssetResourceCreationOptionsMBS = nil) 19142
- 137.6.5 addResource(type as Integer, file as FolderItem, options as PHAssetResourceCreationOptionsMBS = nil) 19142


### 137.6.4 addResource(type as Integer, data as String, options as PHAssetResourceCreationOptionsMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a data resource to the asset being created, using the specified data.
**Notes:** type: The role of this data resource in constructing an asset. For details, see type constants.
data: The data for the asset resource.
options: Options affecting how Photos constructs the asset resource and incorporates its data into the Photos library. For details, see PHAssetResourceCreationOptionsMBS class.

Photos imports the asset resource data only when it executes the PHPhotoLibraryMBS change block in which you create a PHAssetCreationRequest object and call this method. If you attempt to create an asset with invalid data or an invalid combination of resources, Photos reports an error in the completion handler of your PHPhotoLibraryMBS call.
See also:


- 137.6.3 addResource(type as Integer, data as MemoryBlock, options as PHAssetResourceCreationOptionsMBS = nil) 19141
- 137.6.5 addResource(type as Integer, file as FolderItem, options as PHAssetResourceCreationOptionsMBS = nil) 19142


### 137.6.5 addResource(type as Integer, file as FolderItem, options as PHAssetResourceCreationOptionsMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a data resource to the asset being created, using the file at the specified URL.
**Notes:** type: The role of this data resource in constructing an asset. For details, see type constants.
file: The URL to a local file containing data for the asset resource.
options: Options affecting how Photos constructs the asset resource and incorporates its data into the Photos library. For details, see PHAssetResourceCreationOptionsMBS.

Photos imports the asset resource data only when it executes the PHPhotoLibrary change block in which you create a PHAssetCreationRequestMBS object and call this method. If you attempt to create an asset with invalid data or an invalid combination of resources, Photos reports an error in the completion handler of your PHPhotoLibraryMBS call.
See also:


- 137.6.3 addResource(type as Integer, data as MemoryBlock, options as PHAssetResourceCreationOptionsMBS = nil) 19141
- 137.6.4 addResource(type as Integer, data as String, options as PHAssetResourceCreationOptionsMBS = nil) 19142


### 137.6.6 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.6.7 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.6.8 creationRequestForAsset as PHAssetCreationRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new asset to the Photos library using asset resources.
**Notes:** Call this method within a photo library change block to create a new asset. For details on change blocks, see PHPhotoLibraryMBS. After calling this method, and before returning from the change block use the methods listed in Providing Data Resources for the New Asset to specify one or more data resources for the asset.

To set metadata properties of the newly created asset, use the corresponding properties of the change request (provided by the superclass PHAssetChangeRequestMBS and listed in Modifying Assets). To reference the newly created asset later in the same change block or after the change block completes, use the placeholderForCreatedAsset property to retrieve a placeholder object.

### 137.6.9 supportsAssetResourceTypes(types() as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether Photos supports creating an asset with the specified combination of resource types.
**Notes:** types: An array of numbers, each the raw value of a PHAssetResourceType identifier.
Return true if Photos supports the specified combination of resource types; otherwise, false.

When you request creation of an asset from resource data, Photos does not validate that the resources can construct a complete asset until the complete PHPhotoLibrary performChanges change block executes. (If an asset cannot be constructed from the provided resources, Photos calls the completionHandler you provide in that method with an error describing the failure.) To perform preflight validation before executing an asset creation request, use this method to verify that the set of resource types from which you want to create an asset are correct.

This method verifies only that the collection of asset resource types is valid (for example, ensuring that you do not attempt to construct a photo asset without image data), so it is still possible for an asset creation request to fail if the data itself is incomplete or invalid. However, calling by using this method you can avoid some kinds of asset creation failure before performing the expensive operation of reading (and potentially downloading or transmitting) asset resource data.

### 137.6.10 Constants

Resource Types

| Constant | Value | Description |
|---|---|---|
| TypeAdjustmentBasePairedVideo | 11 | The resource provides an unaltered version of the video data for a Live Phot asset for use in reconstructing recent edits.<br>Requires MacOS 10.15 or newer. |
| TypeAdjustmentBasePhoto | 8 | The resource provides an unaltered version of its photo asset for use in for us in reconstructing recent edits. |
| TypeAdjustmentBaseVideo | 12 | The resource provides an unaltered version of the video data for video asset fo use in reconstructing recent edits.<br>Requires MacOS 10.15 or newer. |
| TypeAdjustmentData | 7 | The resource provides data for use in reconstructing recent edits to its asset. |
| TypeAlternatePhoto | 4 | The resource provides photo data that is not the primary form of its asset. |
| TypeAudio | 3 | The resource provides original audio data for its asset. |
| TypeFullSizePairedVideo | 10 | The resource provides the current video data component of a Live Photo asset<br>Requires MacOS 10.15 or newer. |
| TypeFullSizePhoto | 5 | The resource provides photo data at the highest available size and quality fo its asset. |
| TypeFullSizeVideo | 6 | The resource provides video data at the highest available size and quality fo its asset. |
| TypePairedVideo | 9 | The resource provides the original video data component of a Live Photo asset |
| TypePhoto | 1 | The resource provides original photo data for its asset. |
| TypeVideo | 2 | The resource provides original video data for its asset. |

## 137.7 class PHAssetMBS

### 137.7.1 class PHAssetMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class representating of an image, video, or Live Photo in the Photos library.
**Notes:** You fetch assets to begin working with them. Use the class methods listed in Fetching Assets to retrieve one or more PHAsset instances representing the assets you want to display or edit.

Assets contain only metadata. The underlying image or video data for any given asset might not be stored on the local device. However, depending on how you plan to use this data, you may not need to download all of it. If you need to populate a collection view with thumbnail images, the Photos framework can manage downloading, generating, and caching thumbnails for each asset. For details, see PHImageManagerMBS.

Asset objects are immutable. To edit an asset,Äôs metadata (such as marking it as a favorite photo), create a PHAssetChangeRequestMBS object within a photo library change block. For more details on using change requests and change blocks to update the photo library, see PHPhotoLibraryMBS.
Subclass of the PHObjectMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
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### 137.7.2 Methods

### 137.7.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.7.4 cancelContentEditingInputRequest(requestID as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels a request for editing the asset,Äôs content.
**Notes:** requestID: The numeric identifier of the request to be canceled.

When you request asset editing information with the requestContentEditingInputWithOptions method, the asset returns a numeric identifier for the request. To cancel the request before it completes, provide this

identifier when calling the cancelContentEditingInputRequest method.

### 137.7.5 canPerformEditOperation(editOperation as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether the asset supports the specified editing operation.
**Notes:** editOperation: The operation to be tested.

Returns true if the asset supports the the specified editing operation; otherwise, false.

If an asset supports editing, you can create a PHAssetChangeRequestMBS object inside a PHPhotoLibraryMBS change block to submit a change.

### 137.7.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.7.7 fetchAssets(options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves all assets matching the specified options.
**Notes:** options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS class.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result if no objects match the request.

By default, fetch results do not include photos synced to the device through iTunes or stored in iCloud Shared Albums. To change this behavior, use the includeAssetSourceTypes property in the options parameter.

### 137.7.8 fetchAssetsInAssetCollection(assetCollection as PHAssetCollectionMBS, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves assets from the specified asset collection.
**Notes:** assetCollection: The asset collection from which to fetch assets.
options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS class.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result if no objects match the request.

By default, the returned PHFetchResultMBS object contains all assets in the specified collection. To retrieve a more specific set of assets, provide a PHFetchOptionsMBS object containing a filter predicate.

### 137.7.9 fetchAssetsWithBurstIdentifier(burstIdentifier as String, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves assets with the specified burst photo sequence identifier.
**Notes:** burstIdentifier: A burst identifier string, as provided by the burstIdentifier property of an asset.
options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result if no objects match the request.

A burst photo sequence, as seen in the Photos app, corresponds to a group of Photos assets that share the same burstIdentifier string.

By default, the returned PHFetchResultMBS object contains only the representative asset and any user-picked photos from the burst sequence. To retrieve all photos in the burst sequence, provide a PHFetchOptionsMBS object containing a filter predicate.

### 137.7.10 fetchAssetsWithLocalIdentifiers(identifiers() as String, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves assets with the specified local-device-specific unique identifiers.
**Notes:** identifiers: An array of strings, each the localIdentifier string of an asset.
options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS class.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result if no objects match the request.

### 137.7.11 fetchAssetsWithMediaType(mediaType as Integer, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves assets with the specified media type.
**Notes:** mediaType: A media type, such as image or video. See type constants.
options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result if no objects match the request.

By default, the returned PHFetchResultMBS object contains all assets with the specified type. To retrieve a more specific set of assets, provide a PHFetchOptionsMBS object containing a filter predicate.

By default, fetch results do not include photos synced to the device through iTunes or stored in iCloud Shared Albums. To change this behavior, use the includeAssetSourceTypes property in the options parameter.

### 137.7.12 fetchKeyAssetsInAssetCollection(assetCollection as PHAssetCollectionMBS, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves assets marked as key assets in the specified asset collection.
**Notes:** assetCollection: The asset collection from which to fetch assets.
options: Options that specify a filter predicate and sort order for the fetched assets, or nil to use default options. For details, see PHFetchOptionsMBS class.

Returns a fetch result that contains the requested PHAsset objects, or an empty fetch result or nil if no objects match the request.

Most asset collections contain a key asset, which the Photos app displays as a proxy for the collection. Different types of asset collections have different ways of specifying one or more key assets. For example, in the Camera Roll collection, the most recently captured photo or video is the key asset.

This method returns nil if the assetCollection parameter references a transient asset collection (such as one created with the transientAssetCollectionWithAssets method).

### 137.7.13 PHContentEditingInputCancelledKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys indicating the status of an asset content editing request.
**Notes:** A Boolean value indicating whether the image request was canceled. (boolean)

If you call the cancelContentEditingInputRequest method to cancel a request, Photos calls your result handler delegate with the value true for this key.

### 137.7.14 PHContentEditingInputErrorKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys indicating the status of an asset content editing request.
**Notes:** An error that occurred while attempting to load the asset data, NSErrorMBS.

Photos provides an error object for this key if it cannot provide asset data for your handler block,Äôs contentEditingInput parameter. Examine the error object for information about the cause of the error.

### 137.7.15 PHContentEditingInputResultIsInCloudKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys indicating the status of an asset content editing request.
**Notes:** A Boolean value indicating whether the asset data is stored on the local device or must be downloaded from iCloud.

If true, no asset data was provided because the asset data must be downloaded from iCloud. To do this, submit another request, specifying true for the networkAccessAllowed option.

### 137.7.16 requestContentEditingInputWithOptions(options as PHContentEditingInputRequestOptionsMBS, CompletionDelegate as RequestContentEditingInputWithOptionsCompletedMBS, tag as variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests asset information for beginning a content editing session.
**Notes:** options: Options affecting how Photos handles an edit session request.

Returns a numeric identifier for the request. Pass this identifier to the cancelContentEditingInputRequest method if you need to cancel the request before it completes.

When you call this method, Photos downloads the asset,Äôs image or video data (if necessary) and prepares it for editing, then calls your completionHandler ddelegate to provide a PHContentEditingInputMBS object you use for editing.

To complete the edit, create a PHContentEditingOutputMBS object from the editing input to provide the edited asset data. Then, commit the edit by posting a change block to the shared PHPhotoLibrary object. In the block, create a PHAssetChangeRequestMBS object and set its contentEditingOutput property to the editing output you created.

### 137.7.17 Properties

### 137.7.18 burstIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unique identifier shared by photo assets from the same burst sequence.
**Notes:** When the user takes a sequence of photos in burst mode with the Camera app (on supported devices), the Photos app user interface groups the resulting assets together. The Photos framework identifies a burst sequence as a group of assets sharing the same burst identifier string.
(Read only property)

### 137.7.19 burstSelectionTypes as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The selection type of the asset in a burst photo sequence.
**Notes:** When the user takes a sequence of photos in burst mode with the Camera app (on supported devices), the Photos app user interface groups the resulting assets together and allows the user to select favorite members of the sequence. Photos also automatically marks members of the sequence as potential user favorites. See PHAssetBurstSelectionType for possible values.

Because an asset may have more than one selection type, you use bit masks to identify an asset.
(Read only property)

### 137.7.20 creationDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The date and time at which the asset was originally created.
**Notes:** (Read only property)

### 137.7.21 creationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date and time at which the asset was originally created.
**Notes:** (Read only property)

### 137.7.22 duration as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The duration, in seconds, of the video asset.
**Notes:** For photo assets, the duration is always zero.
(Read only property)

### 137.7.23 Favorite as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the user has marked the asset as a favorite.
**Notes:** (Read only property)

### 137.7.24 Hidden as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the user has hidden the asset.
**Notes:** Hidden assets do not appear in the Moments interface in the Photos app and are not returned when fetching the contents of a moment collection.
(Read only property)

### 137.7.25 location as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The location information saved with the asset.
**Notes:** Typically, an asset,Äôs location metadata identifies the place where the asset was captured.

We pass result, the CLLocationMBS object, as variant to avoid plugin dependencies.
(Read only property)

### 137.7.26 mediaSubtypes as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtypes of the asset, identifying special kinds of assets such as panoramic photo or high-framerate video.
**Notes:** See subtype constants for possible values.
Because an asset may have more than one subtype, you use these values as bit masks to identify an asset.
(Read only property)

### 137.7.27 mediaType as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of the asset, such as video or audio.
**Notes:** See Type constants.
(Read only property)

### 137.7.28 modificationDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The date and time at which the asset was last modified.
**Notes:** Photos updates the modification date when an asset,Äôs image or video content or metadata changes.
(Read only property)

### 137.7.29 modificationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date and time at which the asset was last modified.
**Notes:** Photos updates the modification date when an asset,Äôs image or video content or metadata changes.
(Read only property)

### 137.7.30 pixelHeight as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height, in pixels, of the asset,Äôs image or video data.
**Notes:** If the asset,Äôs content has been edited, this property describes the size of the current version of the asset.
(Read only property)

### 137.7.31 pixelWidth as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width, in pixels, of the asset,Äôs image or video data.
**Notes:** If the asset,Äôs content has been edited, this property describes the size of the current version of the asset.
(Read only property)

### 137.7.32 playbackStyle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The playback style for the asset.
**Notes:** (Read only property)

### 137.7.33 RepresentsBurst as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the asset is the representative photo from a burst photo sequence.
**Notes:** When the user takes a sequence of photos in burst mode with the Camera app (on supported devices), the Photos app user interface groups the resulting assets together. One asset represents the entire sequence in displayed collections.
(Read only property)

### 137.7.34 sourceType as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The means by which the asset entered the user,Äôs Photos library.
**Notes:** Assets from some sources can be edited, deleted, or added to collections; assets from other sources do not support these operations. For details, see SourceType constants.
(Read only property)

### 137.7.35 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| MediaSubtypeNone | 0 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset has no subtype. This is the default subtype for most photo and video assets. |
| MediaSubtypePhotoDepthEffect | 16 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a photo captured with the Camera app's Portrait mode effect. |
| MediaSubtypePhotoHDR | 2 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a High Dynamic Range photo. |
| MediaSubtypePhotoLive | 8 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a Live Photo that includes movement and sounds from the mo just before and after its capture. To display a Live Photo asset with its associated video content, retr PHLivePhotoMBS object using the PHImageManagerMBS class and as to a PHLivePhotoViewMBS object. |
| MediaSubtypePhotoPanorama | 1 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a large-format panorama photo. |
| MediaSubtypePhotoScreenshot | 4 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is an image captured with the device,Äôs screenshot feature. |
| MediaSubtypeVideoHighFrameRate | &h20000 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a high-frame-rate video. High-frame-rate videos are created by the Slow-Mo feature in the Came on an iOS device. |
| MediaSubtypeVideoStreamed | &h10000 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a video whose contents are always streamed over a networ nection. This subtype identifies video assets that are never stored on the local such as shared videos in a subscribed iCloud Photo Stream. |
| MediaSubtypeVideoTimelapse | &h40000 | One of the constants identifying specific variations of asset media, su panorama or screenshot photos and time lapse or high frame rate video. The asset is a time-lapse video. |

Burst Selection Type

| Constant | Value | Description |
|---|---|---|
| BurstSelectionTypeAutoPick | 1 | Photos has automatically identified the asset as a potential user favorite. |
| BurstSelectionTypeNone | 0 | The asset is not marked as a favorite member of its burst sequence or is not a member of a burst sequence. |
| BurstSelectionTypeUserPick | 2 | The user has marked the asset as a favorite member of its burst sequence. |

Edit Operations

| Constant | Value | Description |
|---|---|---|
| EditOperationContent | 2 | The asset,Äôs photo or video content can be edited. |
| EditOperationDelete | 1 | The asset can be deleted from the photo library. |
| EditOperationProperties | 3 | The asset,Äôs metadata properties can be edited. |

Media Types

| Constant | Value | Description |
|---|---|---|
| MediaTypeAudio | 3 | The asset is an audio file. |
| MediaTypeImage | 1 | The asset is a photo or other static image. |
| MediaTypeUnknown | 0 | The asset,Äôs type is unknown. |
| MediaTypeVideo | 2 | The asset is a video file. |

Asset Playback Styles

| Constant | Value | Description |
|---|---|---|
| PlaybackStyleImage | 1 | The asset should be displayed as a still image. |
| PlaybackStyleImageAnimated | 2 | The asset should be displayed as an animated image. |
| PlaybackStyleLivePhoto | 3 | The asset should be displayed as a Live Photo. |
| PlaybackStyleUnsupported | 0 | The asset has an unsupported or undefined media playback type. |
| PlaybackStyleVideo | 4 | The asset should be displayed as a video. |
| PlaybackStyleVideoLooping | 5 | The asset should be displayed as a looping video. |

Source Types

| Constant | Value | Description |
|---|---|---|
| SourceTypeCloudShared | 2 | The asset originates from an iCloud Shared Album.<br>Assets from shared albums cannot be edited and do not appear in Moments collections. |
| SourceTypeiTunesSynced | 4 | The asset originates from a Mac or PC and is present on the device through iTunes sync.<br>iTunes-synced assets cannot be edited or deleted. |
| SourceTypeNone | 0 | Source information is not available for the asset. |
| SourceTypeUserLibrary | 1 | The asset is part of the user,Äôs main Photos library.<br>The main library contains both assets that originate on the device (such as photos and videos captured with the Camera app or screenshots) and assets synchronized through iCloud Photo Library or My Photo Stream. These assets appear in Moments collections and can be edited or deleted. |

### 137.7.36 Delegates

### 137.7.37 RequestContentEditingInputWithOptionsCompletedMBS(Asset as PHAssetMBS, Options as PHContentEditingInputRequestOptionsMBS, tag as variant, contentEditingInput as PHContentEditingInputMBS, info as Dictionary)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls when the requested asset editing information is ready.
**Notes:** contentEditingInput: An object that describes the asset for editing and provides methods for loading the image or video content to be edited.
info: A dictionary providing information about the status of the request. See Editing Request Info Keys for possible keys and values.

## 137.8 class PHAssetResourceCreationOptionsMBS

### 137.8.1 class PHAssetResourceCreationOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the creation of a new Photos asset from underlying resources.
**Notes:** You use this class when creating an asset for addition to the Photos library with a PHAssetCreationRequestMBS object.

### 137.8.2 Methods

### 137.8.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.8.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.8.5 copy as PHAssetResourceCreationOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Copies the options object.

### 137.8.6 Properties

### 137.8.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.8.8 originalFilename as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The filename for the asset resource being created.
**Notes:** You can use this property to track the original name of the file from which you import an asset resource even if you use the addResourceWithType method to create a resource from data instead of from a file. After creating the asset, this information is available in the originalFilename property of the corresponding PHAssetResourceMBS object.

If you do not specify a value for this property and are using the addResourceWithType method to create a resource, Photos infers the filename from that method,Äôs fileURL parameter. Otherwise, Photos automatically generates a filename.
(Read and Write property)

### 137.8.9 shouldMoveFile as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether Photos moves or duplicates files when creating an asset resource.
**Notes:** This property applies only when creating an asset resource with the addResourceWithType method. If this value is true, Photos moves the specified file into the Photos library to create the asset resource, removing the original file after the asset has been successfully created. When using this option, Photos does not make an intermediary copy of the resource data, so no additional storage space is required.

If this value is false (the default), Photos copies the contents of the original file into the Photos library.

Attempting to move a file that is currently open or has hard links fails.
(Read and Write property)

### 137.8.10 uniformTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The uniform type identifier for the resource.
**Notes:** If you do not specify a value for this property, Photos infers the data type from the type value you specify when adding the resource to a creation request.
For details in uniform type identifiers, see Uniform Type Identifiers Overview.
(Read and Write property)

## 137.9 class PHAssetResourceManagerMBS

### 137.9.1 class PHAssetResourceManagerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A resource manager for the data storage underlying a Photos asset.
**Notes:** An asset can have multiple underlying data resources—for example, both original and edited versions—each of which is represented by a PHAssetResourceMBS object. Unlike the PHImageManagerMBS class, which provides and caches the primary representations of assets as thumbnails, image objects, or video objects, the asset resource manager provides direct access to these underlying data resources.

Available in MacOS 10.15 or newer.

### 137.9.2 Methods

### 137.9.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.9.4 cancelDataRequest(requestID as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels an asynchronous request.
**Notes:** requestID: The numeric identifier of the request to be canceled.

When you perform an asynchronous request for asset resource data using the requestDataForAssetResource method, the image manager returns a numeric identifier for the request. To cancel the request before it completes, provide this identifier when calling the cancelDataRequest method.

### 137.9.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.9.6 defaultManager as PHAssetResourceManagerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the shared asset resource manager object.
**Notes:** This method always returns the same asset resource manager object, which is shared for all uses in your app.

### 137.9.7 requestDataForAssetResource(resource as PHAssetResourceMBS, options as PHAssetResourceRequestOptionsMBS, DataReceivedHandler as RequestDataForAssetResourceDataReceivedMBS, CompleteHandler as RequestDataForAssetResourceCompletedMBS, tag as variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests the underlying data for the specified asset resource, to be delivered asynchronously.
**Notes:** resource: The asset resource for which to request data.
options: Options specifying how Photos should handle the request and notify your app of progress. For details, see PHAssetResourceRequestOptionsMBS.

Returns a numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelDataRequest: method.

When you call this method, Photos begins asynchronously reading the underlying data for the asset resource. Depending on the options you specify and the current state of the asset, Photos may download asset data from the network.

While reading (or downloading) asset resource data, Photos calls your handler block at least once, progressively providing chunks of data. After reading all of the data, Photos calls your completionHandler block to indicate that the data is complete. (At this point, the complete data for the asset is the concatenation of the data parameters from all calls to your handler block.) If Photos cannot finish reading or downloading asset resource data, it calls your completionHandler block with a description of the error. Photos can also call the completionHandler block with a non-nil error when the data is complete if the user cancels downloading.

### 137.9.8 writeDataForAssetResource(resource as PHAssetResourceMBS, file as FolderItem, options as PHAssetResourceRequestOptionsMBS, CompleteHandler as WriteDataForAssetResourceCompletedMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests the underlying data for the specified asset resource, to be asynchronously written to a local file.
**Notes:** resource: The asset resource for which to request data.
fileURL: A URL identifying the local filename at which to write the asset resource,Äôs data.
options: Options specifying how Photos should handle the request and notify your app of progress. For details, see PHAssetResourceRequestOptionsMBS.

When you call this method, Photos begins asynchronously reading the underlying data for the asset resource. Depending on the options you specify and the current state of the asset, Photos may download asset data from the network.

While reading (or downloading) asset resource data, Photos progressively writes the data into the specified file. After writing all of the data, or if an error prevents reading all of the data, Photos calls your delegate.

### 137.9.9 Properties

### 137.9.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.9.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHInvalidAssetResourceDataRequestID | 0 | The invalid request ID. |

### 137.9.12 Delegates

### 137.9.13 RequestDataForAssetResourceCompletedMBS(resource as PHAssetResourceMBS, options as PHAssetResourceRequestOptionsMBS, Error as NSErrorMBS, Tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that photos calls after the request has been fulfilled or has failed.
**Notes:** error: If the request has failed, an NSErrorMBS object describing the failure; otherwise nil.

### 137.9.14 RequestDataForAssetResourceDataReceivedMBS(resource as PHAssetResourceMBS, options as PHAssetResourceRequestOptionsMBS, Data as MemoryBlock, Tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls to provide the requested data.
**Notes:** data: The requested asset resource data.

### 137.9.15 WriteDataForAssetResourceCompletedMBS(resource as PHAssetResourceMBS, options as PHAssetResourceRequestOptionsMBS, File as FolderItem, Error as NSErrorMBS, Tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that photos calls after the request has been fulfilled or has failed.
**Notes:** error: If the request has failed, an NSErrorMBS object describing the failure; otherwise nil.

## 137.10 class PHAssetResourceMBS

### 137.10.1 class PHAssetResourceMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An underlying data resource associated with a photo, video, or Live Photo asset in the Photos library.
**Notes:** Each PHAssetMBS object references one or more resources. Use these objects to work with those resources directly, like when backing up or restoring assets.

- A photo asset can contain both JPEG and RAW files representing the same photo.
- A Live Photo asset contains both still photo and video resources.
- An edited asset contains resources representing asset content before and after the edit, as well as a resource corresponding to the PHAdjustmentDataMBS object that describes the edit.

To work with the data contained in an asset resource, fetch it using the PHAssetResourceManagerMBS class. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 137.10.2 Methods

### 137.10.3 assetResourcesForAsset(asset as PHAssetMBS) as PHAssetResourceMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the list of data resources associated with an asset.
**Notes:** asset: A photo or video asset in the Photos library.

Returns the asset,Äôs resources.

Asset resource objects describe the data files that an asset represents. An asset can contain multiple resources—for example, an edited photo asset contains resources for both the original and edited images, as well as for the PHAdjustmentDataMBS object describing the edit. To work with one of these files, fetch the underlying data using the PHAssetResourceManagerMBS class.

### 137.10.4 assetResourcesForLivePhoto(livePhoto as PHLivePhotoMBS) as PHAssetResourceMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the list of data resources associated with a Live Photo object.
**Notes:** livePhoto: A Live Photo object.

Returns the underlying resources that constitute the Live Photo.

A Live Photo is a picture, taken with a compatible device, that includes movement and sound from the moments just before and after its capture. A PHLivePhoto object represents the displayable combination of image, motion, and sound data. You can obtain such objects from the Photos library using the PHImageManagerMBS class or construct them from asset resources exported from a Photos library using the PHLivePhotoMBS class.

Use this method to export the underlying resources that constitute a Live Photo. For example, a social networking app can retrieve those data files and upload them to a server. Then, on another user,Äôs device, the app downloads those data files and uses the PHLivePhoto class to re-create a Live Photo object for display using the PHLivePhotoViewMBS class.

### 137.10.5 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.10.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.10.7 Properties

### 137.10.8 assetLocalIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unique identifier for the asset object this resource is associated with.
**Notes:** This property,Äôs value corresponds to the localIdentifier property of the PHAssetMBS object that owns this asset resource. If you,Äôve obtained an asset resource without a reference to its owning asset, use the fetchAssetsWithLocalIdentifiers method with this identifier to retrieve the correct PHAssetMBS object. (Read only property)

### 137.10.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.10.10 originalFilename as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The original filename of the asset resource from when it was created or imported.
**Notes:** (Read only property)

### 137.10.11 Type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The relationship of this asset resource to its owning asset.
**Notes:** An asset can contain multiple resources, and different resources contribute to the asset in different ways. For details and examples, see resource types.
(Read only property)

### 137.10.12 uniformTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The uniform type identifier for the asset resource,Äôs image or video data.
**Notes:** For more information, see Uniform Type Identifiers Overview in Apple's documentation.
(Read only property)

## 137.11 class PHAssetResourceRequestOptionsMBS

### 137.11.1 class PHAssetResourceRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the delivery of underlying asset data that you request from the asset resource manager.
**Notes:** You use this class when requesting the underlying data for photo, video, and Live Photo asset resources from a PHAssetResourceManagerMBS object.

Requires MacOS 10.15 or newer.

### 137.11.2 Methods

### 137.11.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.11.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.11.5 copy as PHAssetResourceRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the request options.

### 137.11.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.11.7 SetProgressHandler(ProgressHandler as ProgressHandlerMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the delegate that Photos calls periodically while downloading the asset resource data.
**Notes:** If you request an asset resource whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress.

### 137.11.8 Properties

### 137.11.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.11.10 NetworkAccessAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether Photos can download the requested asset resource data from iCloud.
**Notes:** If true, and the requested resource data is not stored on the local device, Photos downloads that data from iCloud. To be notified of the download,Äôs progress, use the progressHandler property to provide a block that Photos calls periodically while downloading the resource data. If false (the default), and the resource data is not on the local device, Photos calls the completionHandler block you provided in your request, with an NSErrorMBS object indicating that the resource requires network access.
(Read and Write property)

### 137.11.11 ProgressHandler as ProgressHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls periodically while downloading the asset resource data.
**Notes:** If you request an asset resource whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress.
(Read and Write property)

### 137.11.12 Delegates

### 137.11.13 ProgressHandlerMBS(progress as double, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls while downloading asset resource data from iCloud. Used by the progressHandler property.
**Notes:** If you request an asset resource whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress.

progress: A floating-point value indicating the progress of the download. A value of 0.0 indicates that the download has just started, and a value of 1.0 indicates the download is complete.

## 137.12 class PHCachingImageManagerMBS

### 137.12.1 class PHCachingImageManagerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that facilitates retrieving or generating preview thumbnails, optimized for batch preloading large numbers of assets.
**Notes:** For quick performance when you are working with many assets, a caching image manager can prepare asset images in the background in order to eliminate delays when you later request individual images. For example, use a caching image manager when you want to populate a collection view or similar UI with thumbnails of photo or video assets.

Much of the key functionality of the PHCachingImageManager class is defined by its superclass, PHImageManagerMBS. For details, see PHImageManagerMBS.

To use a caching image manager:
1. Create a PHCachingImageManager instance. (This step replaces using the shared PHImageManager instance.)
2. Use PHAsset class methods to fetch the assets you,Äôre interested in.
3. To prepare images for those assets, call the startCachingImagesForAssets:targetSize:contentMode:options: method with the target size, content mode, and options you plan to use when later requesting images for each individual asset.
4. When you need an image for an individual asset, call the requestImageForAsset:targetSize:contentMode:options:resultHandler: method, and pass the same parameters you used when preparing that asset.

If the image you request is among those already prepared, the PHCachingImageManager object immediately returns that image. Otherwise, Photos prepares the image on demand and caches it for later use.
Subclass of the PHImageManagerMBS class.

### 137.12.2 Methods

### 137.12.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.12.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.12.5 startCachingImagesForAssets(assets() as PHAssetMBS, targetSize as CGSizeMBS, contentMode as Integer, options as PHImageRequestOptionsMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:**

Prepares image representations of the specified assets for later use.

**Notes:**

assets: An array of PHAssetMBS objects for which to prepare image representations.
targetSize: The size of the images to be prepared.
contentMode: An option for how to fit the images to the aspect ratio of the requested size. For details, see PHImageContentMode.
options: Options specifying how Photos should handle the request, format the requested images, and notify your app of progress or errors. For details, see PHImageRequestOptions.

When you call this method, Photos begins to fetch image data and generates thumbnail images on a background thread. At any time afterward, you can use the requestImageForAsset:targetSize method to request individual images from the cache. If Photos has finished preparing a requested image, that method provides the image immediately.

Photos caches images with the exact target size, content mode, and options you specify in this method. If you later request an image with, for example, a different target size than you passed when calling this method, Photos cannot make use of the cache and so it must fetch or generate a new image.

### 137.12.6 stopCachingImagesForAllAssets

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels all image preparation that is currently in progress.

### 137.12.7 stopCachingImagesForAssets(assets() as PHAssetMBS, targetSize as CGSizeMBS, contentMode as Integer, options as PHImageRequestOptionsMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels image preparation for the specified assets and options.
**Notes:** assets: The array of specific PHAssetMBS objects for which image preparation is in progress but is no longer needed.
targetSize: The target size with which you requested image preparation.
contentMode: The content mode with which you requested image preparation.
options: The options with which you requested image preparation.

This method cancels image preparation for the specified assets with the specified options. Use it when image preparation that might be in progress is no longer needed. For example, if you prepare images for a collection view filled with photo thumbnails and then the user chooses a different thumbnail size for your collection view, call this method to cancel generating thumbnail images at the old size.

### 137.12.8 Properties

### 137.12.9 allowsCachingHighQualityImages as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the image manager prepares high-quality images.
**Notes:** If true (the default), the image manager prepares images at high quality. This option produces better images, at a high performance cost.
For faster performance when preparing large numbers of images—such as while the user is scrolling quickly through a collection of thumbnails—set this property to false.
(Read and Write property)

## 137.13 class PHChangeMBS

### 137.13.1 class PHChangeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A description of a change that occurred in the photo library.
**Notes:** Photos provides PHChangeMBS objects to notify your app of changes to the assets and collections managed by the Photos app. To receive change information, implement the DidChange event in your PHPhotoLibraryMBS subclass.

After Photos provides you with a change object, you use its methods to get a change details object. Call the changeDetailsForObject or changeDetailsForFetchResult method, passing an asset or collection object you,Äôve previously fetched or a fetch result containing several such objects. The resulting PHObjectChangeDetailsMBS or PHFetchResultChangeDetailsMBS object describes any changes that have happened to the object or fetch result since you last fetched it.

### 137.13.2 Methods

### 137.13.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.13.4 changeDetailsForFetchResult(FetchResult as PHFetchResultMBS) as PHFetchResultChangeDetailsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns detailed change information for a fetch result.
**Notes:** object: A fetch result.

Returns a change details object, or nil if there have been no changes affecting the fetch result,Äôs contents.

When Photos calls your change observer,Äôs photoLibraryDidChange method, call the changeDetailsForObject method to get detailed change information about the results of a fetch you,Äôve previously performed. If there have been any changes in the Photos library affecting the fetch, the resulting PHFetchResultChangeDetailsMBS object tells you if any contents in the fetch result have been added, removed, or changed since you fetched it. If there have been no changes since you performed the fetch, this method returns nil.

Typically, if your app displays the members of a collection (such as an album or moment), you use a method such as fetchAssetsInAssetCollection to retrieve those members and then keep the resulting PHFetchResultMBS object. You can then pass that fetch result to this method to learn about changes to the collection, such as whether new members have been added to it (and which indexes to insert them at in your UI).

To find out about changes to an object,Äôs properties, such as a collection,Äôs title or an asset,Äôs metadata, use the changeDetailsForObject: method.

### 137.13.5 changeDetailsForObject(PHObject as PHObjectMBS) as PHObjectChangeDetailsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns detailed change information for the specified asset or collection.
**Notes:** object: A PHAssetMBS, PHAssetCollectionMBS, or PHCollectionListMBS object.

Returns a change details object, or nil if there have been no changes to the specified asset or collection.

When Photos calls your change observer,Äôs photoLibraryDidChange: method, call the changeDetailsForObject method to get detailed change information about an asset or collection you,Äôve previously fetched. If the asset or collection has changed since you last fetched it, the resulting PHObjectChangeDetailsMBS object describes the changes. If there are no changes between the fetched object and the current state of the asset or collection it represents in the Photos library, this method returns nil.
For an asset collection or collection list, this method and the PHObjectChangeDetailsMBS object it returns describe changes only to the collection,Äôs properties. If you are instead interested in changes to the collection,Äôs membership, use the changeDetailsForFetchResult method.

### 137.13.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.13.7 Properties

### 137.13.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 137.14 class PHChangeRequestMBS

## 137.14.1 class PHChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A request to create, delete, change metadata for, or edit the content of a Photos asset, for use in a photo library change delegate.
**Notes:** You use the PHAssetChangeRequestMBS class to request changes for PHAssetMBS objects. To make changes to assets in the Photos library, create a change request by using the appropriate class method for the change you want to perform.

- Call one of the methods listed in Adding New Assets to create a new asset from an image or video file.
- Call the deleteAssets: method to delete existing assets.
- Call the changeRequestForAsset: method to modify an asset,Äôs content or metadata.

A change request for creating or modifying an asset works like a mutable version of the asset object. Use the change request,Äôs properties to request changes to the corresponding properties of the asset itself.

After Photos runs the change block and calls your completion handler, the asset,Äôs state reflects the changes that you requested in the block.

If you create or use a change request object outside a photo library change block, Photos raises an Objective-C exception. For details on change blocks, see PHPhotoLibraryMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 137.14.2 Methods

## 137.14.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

## 137.14.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.14.5 Properties

### 137.14.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 137.15 class PHCloudIdentifierMBS

### 137.15.1 class PHCloudIdentifierMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A cloud identifier for a Photos project extension.
**Notes:** The user can choose to store Photos project extensions in iCloud. The cloud identifier uniquely references project extensions in the cloud by string serialization. When a project's global identifier can't be determined from its local identifier, the notFoundIdentifier identifier is provided in that array slot.

### 137.15.2 Methods

### 137.15.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.15.4 Constructor(stringValue as String)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Deserializes a cloud identifier from its string value.

### 137.15.5 notFoundIdentifier as PHCloudIdentifierMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The global identifier used in an array slot for items that couldn't be found.

### 137.15.6 Properties

### 137.15.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.15.8 stringValue as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string version of the cloud identifier to use in serialization.
**Notes:** (Read only property)

# 137.16 class PHCollectionListChangeRequestMBS

## 137.16.1 class PHCollectionListChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A request to create, delete, or modify a Photos collection list, for use in a photo library change block.
**Notes:** You use the PHCollectionListChangeRequest class to request changes for PHCollectionList objects. To make changes to collection lists (such as folders containing user-created albums) in the Photos library, create a change request using the appropriate class method for the change you want to perform.

- Call the creationRequestForCollectionListWithTitle method to create a new asset collection.
- Call the deleteCollectionLists: method to delete existing asset collections.
- Call the changeRequestForCollectionList: or changeRequestForCollectionList method to modify a collection,Äôs metadata or its list of child collections.

Before creating a change request, use the canPerformEditOperation: method to verify that the collection allows the edit operation you,Äôre requesting. If you attempt to perform an unsupported edit operation, Photos throws an exception.
A change request for creating or modifying a collection list works like a mutable version of the collection list object. Use the change request,Äôs properties and instance methods to request changes to the collection list itself.

After Photos runs the change delegate and calls your completion handler, the collection list,Äôs state reflects the changes you requested in the delegate.

If you create or use a change request object outside a photo library change delegate, Photos raises an Objective-C exception. For details on change delegates, see PHPhotoLibraryMBS.
Subclass of the PHChangeRequestMBS class.

## 137.16.2 Methods

## 137.16.3 addChildCollections(collections() as PHCollectionMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Add the specified collections as children of the collection list.
**Notes:** collections: An array of PHCollectionMBS objects (asset collections or other collection lists) to be added to the collection list.

If you created the change request with a snapshot of the collection list,Äôs contents using the changeRequestForCollectionList method, Photos inserts the new children after the existing child collections in the collection list. Otherwise, the arrangement of the new children relative to others in the collection is undefined.

### 137.16.4 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.16.5 changeRequestForCollectionList(collectionList as PHCollectionListMBS) as PHCollectionListChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for modifying the specified collection list.
**Notes:** collectionList: The collection list to be modified.

Returns a collection list change request.

After you create a change request within a photo library change block, propose changes to the collection,Äôs title or list of child collections with the properties and instance methods of the change request. After Photos runs your change block, the collection list reflects your changes. For details on change blocks, see PHPhotoLibraryMBS.
Use this method when modifying a collection list,Äôs metadata or when adding or removing child collections without regard to their arrangement. To work with indexes in the list of child collections, use the changeRequestForCollectionList method instead.
See also:

- 137.16.6 changeRequestForCollectionList(collectionList as PHCollectionListMBS, childCollections as PHFetchResultMBS) as PHCollectionListChangeRequestMBS 19182

### 137.16.6 changeRequestForCollectionList(collectionList as PHCollectionListMBS, childCollections as PHFetchResultMBS) as PHCollectionListChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for modifying the specified collection list, with a fetch result for tracking changes.
**Notes:** collectionList: The collection list to be modified.

childCollections: A fetch result listing the child collections in the collection.

Returns a collection list change request.

After you create a change request within a photo library change block, propose changes to the collection,Äôs title or list of child collections with the properties and instance methods of the change request. After Photos runs your change block, the collection list reflects your changes. For details on change blocks, see PHPhotoLibraryMBS.

Use this method when you need to insert, remove, or rearrange collections at specified indexes in the collection list. By passing in a fetch result reflecting what your app sees as the current state of the collection,Äôs membership, the Photos framework can ensure that the indexes you specify are valid even if the collection has changed since you last fetched it. If you don,Äôt need to work with indexes in the list of child collections, you can use the changeRequestForCollectionList method instead.
See also:

- 137.16.5 changeRequestForCollectionList(collectionList as PHCollectionListMBS) as PHCollectionListChangeRequestMBS 19182

### 137.16.7 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.16.8 creationRequestForCollectionListWithTitle(title as string) as PHCollectionListChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a request for adding a new collection list to the Photos library.
**Notes:** title: A name for the new collection list.

Returns a collection list creation request.

Call this method within a photo library change block to create a new collection list. For details on change blocks, see PHPhotoLibraryMBS.
To add collections to the newly created collection list or to change its title, use the methods listed in Modifying Collection Lists. To reference the newly created collection collection list later in the same change delegate or after the change delegate completes, use the placeholderForCreatedCollectionListMBS property to retrieve a placeholder object.

### 137.16.9 deleteCollectionLists(collectionLists() as PHCollectionListMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests to delete the specified asset collections.
**Notes:** collectionLists: An array of PHCollectionListMBS objects to be deleted.

Call this method within a photo library change block to delete collection lists. For details on change blocks, see PHPhotoLibraryMBS.

Deleting a collection list also deletes any child collections it contains. To preserve those collections, remove them from the collection list (with the removeChildCollections or removeChildCollectionsAtIndexes method) before deleting it. Deleting a collection list does not delete assets contained in its child collections.

### 137.16.10 insertChildCollections(collections() as PHCollectionMBS, indexes as NSIndexSetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Inserts the specified collections into the collection list at the specified indexes.
**Notes:** collections: An array of PHCollectionMBS objects (asset collections or other collection lists) to be inserted into the collection list.
indexes: The indexes at which the collections should be inserted. The count of locations in this index set must equal the count of collections.

To ensure that the index set you specify is valid even if the collection list has changed since you fetched it, create a change request with a snapshot of the collection list,Äôs contents using the changeRequestForCollectionList method before inserting child collections.
For a detailed discussion of how the index set you specify maps to insertions in the collection list, see the similar NSMutableArray method insertObjects.

### 137.16.11 moveChildCollections(AtIndexes as NSIndexSetMBS, toIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Moves the child collections at the specified indexes in the collection list to a new index.
**Notes:** indexes: The indexes of the child collections to be moved in the collection list.
toIndex: The index at which to place the moved child collections, relative to the collection list,Äôs ordering after removing the items at indexes.

When you call this method, Photos first removes the items in the indexes parameter from the collection, and

then inserts them at the location specified by the toIndex parameter.
To ensure that the index set you specify is valid even if the collection list has changed since you fetched it, create a change request with a snapshot of the collection list,Äôs contents using the changeRequestForCollectionList method before rearranging child collections.

### 137.16.12 removeChildCollections(AtIndexes as NSIndexSetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the child collections at the specified indexes from the collection list.
**Notes:** indexes: The indexes of the child collections to be removed from the collection list.

To ensure that the index set you specify is valid even if the collection list has changed since you fetched it, create a change request with a snapshot of the collection list,Äôs contents using the changeRequestForCollectionList method before removing child collections. To remove objects based on their identities (without regard to their indexes in the collection), use the removeChildCollections method.
See also:

- 137.16.13 removeChildCollections(collections() as PHCollectionMBS) 19185

### 137.16.13 removeChildCollections(collections() as PHCollectionMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the specified child collections from the collection list.
**Notes:** collections: An array of PHCollectionMBS objects (asset collections or other collection lists) to be removed from the collection list.

This method removes child collections from the collection list based on their identity (determined by the localIdentifier property of each collection). To remove objects at specified indexes, use the removeChildCollections method.
See also:

- 137.16.12 removeChildCollections(AtIndexes as NSIndexSetMBS) 19185

### 137.16.14 replaceChildCollections(AtIndexes as NSIndexSetMBS, ChildCollections() as PHCollectionMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Replaces the child collections at the specified indexes in the collection list with the specified collections.
**Notes:** indexes: The indexes of the child collections to be replaced in the collection list.

collections: An array of PHCollectionMBS objects (asset collections or other collection lists) to be inserted into (or moved within) the collection list.

To ensure that the index set you specify is valid even if the collection list has changed since you fetched it, create a change request with a snapshot of the collection list,Äôs contents using the changeRequestForCollectionList method before rearranging child collections.

### 137.16.15 Properties

### 137.16.16 placeholderForCreatedCollectionList as PHObjectPlaceholderMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A placeholder object for the collection list that the change request creates.
**Notes:** Use this property if you need to reference the collection created by a change request within the same change block. For details on change blocks, see PHPhotoLibraryMBS.
(Read only property)

### 137.16.17 title as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The displayed name of the collection list.
**Notes:** Set this property to change the collection list,Äôs title.
(Read and Write property)

# 137.17 class PHCollectionListMBS

## 137.17.1 class PHCollectionListMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A group containing Photos asset collections, such as Moments, Years, or folders of user-created albums.
**Notes:** In the Photos framework, collection objects (including asset collections) do not directly reference their member objects, and there are no other objects that directly reference collection objects. To retrieve the members of a collection list, fetch them with a PHCollectionMBS class method such as fetchCollectionsInCollectionList. To find objects at the root of the collection list hierarchy (such as album folders with no parent folders), use the fetchTopLevelUserCollectionsWithOptions method.

Accessing or modifying the Photos library requires explicit authorization from the user. The first time you call one of the methods listed in Fetching Collection Lists, Photos automatically prompts the user for authorization. (Alternatively, you can use the PHPhotoLibraryMBS requestAuthorization: method to prompt the user at a time of your choosing.)

Your app,Äôs Info.plist file must provide a value for the NSPhotoLibraryUsageDescription key that explains to the user why your app is requesting Photos access. Apps linked on or after iOS 10.0 will crash if this key is not present.

Like assets and asset collections, collection lists are immutable. To create, rename, or delete collection lists, or to add, remove, or rearrange members in a collection list, create a PHCollectionListChangeRequestMBS object within a photo library change block. For details on using change requests and change blocks to update the photo library, see PHPhotoLibraryMBS.
Subclass of the PHCollectionMBS class.

## 137.17.2 Methods

## 137.17.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

## 137.17.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.17.5 fetchCollectionListsContainingCollection(collection as PHCollectionMBS, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves collection lists that contain the specified collection.
**Notes:** collection: An asset collection or another collection list.
options: Options that specify a filter predicate and sort order for the fetched collection lists, or nil to use default options. For details, see PHFetchOptionsMBS class.

Returns a fetch result that contains the requested PHCollectionList objects, or an empty fetch result if no objects match the request.

Different kinds of collections have different containment possibilities. For example, an asset collection whose type is TypeAlbum may be contained in a folder, or have no containing collection list. A folder, in turn, may be contained in another folder. An asset collection whose type is TypeMoment is always contained by two collection lists: a moment cluster and a moment year.

### 137.17.6 fetchCollectionListsWithLocalIdentifiers(identifiers() as string, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves collection lists with the specified local-device-specific unique identifiers.
**Notes:** identifiers: An array of strings, each the localIdentifier string of a collection list.
options: Options that specify a filter predicate and sort order for the fetched collection lists, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHCollectionListMBS objects, or an empty fetch result if no objects match the request.

### 137.17.7 fetchCollectionListsWithType(collectionListType as Integer, subtype as Integer, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves collection lists of the specified type.
**Notes:** collectionListType: A type of collection list. See PHCollectionListType.

subtype: A subtype of collection list. See PHCollectionListSubtype.
options: Options that specify a filter predicate and sort order for the fetched collection lists, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHCollectionListMBS objects, or an empty fetch result if no objects match the request.

By default, the returned PHFetchResult object contains all collection lists with the specified type and subtype. To retrieve a more specific set of collection lists, provide a PHFetchOptionsMBS object containing a filter predicate.

### 137.17.8 localizedLocationNames as String()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The names of locations grouped by the collection (an array of strings).
**Notes:** For a collection list representing a group of moments, as seen in the Collections view in the Photos app, this property lists the location names associated with each moment in the group. For other types of collection list, this property,Äôs value is nil.

### 137.17.9 transientCollectionListWithCollections(collections() as PHCollectionMBS, title as String) as PHCollectionListMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a temporary collection list that contains the specified asset collections.
**Notes:** collections: An array of PHAssetCollectionMBS objects.
title: A name for the new temporary collection list.

Returns a new collection list.

Transient collection lists are not saved to local storage or iCloud and do not appear in the Photos application or other apps using the Photos framework. A transient collection can be useful if you,Äôve designed a UI for displaying the contents of a collection list and want to display an arbitrary set of collections.

### 137.17.10 transientCollectionListWithCollectionsFetchResult(fetchResult as PHFetchResultMBS, title as String) as PHCollectionListMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a temporary collection list containing the asset collections in the specified fetch result.
**Notes:** fetchResult: A fetch result that contains one or more PHAssetCollection objects.
title: A name for the new temporary collection list.

Returns a new collection list.

Transient collection lists are not saved to local storage or iCloud and do not appear in the Photos application or other apps using the Photos framework. A transient collection can be useful if you,Äôve designed a UI for displaying the contents of a collection list and want to display an arbitrary set of collections.

### 137.17.11 Properties

### 137.17.12 collectionListSubtype as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of asset collection grouping the collection list represents.
**Notes:** Use subtypes to make minor distinctions between collection lists of the same type, such as moment clusters and moment years. See Subtype constants.
(Read only property)

### 137.17.13 collectionListType as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of asset collection group that the collection list represents.
**Notes:** A collection list may represent an upper level of the Moments hierarchy shown in the Photos app, a folder that contains albums, or a smart folder synced from iPhoto.
(Read only property)

### 137.17.14 endDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The latest creation date among all assets in the collection list.
**Notes:** This property applies only to collection lists whose type is TypeMomentList. For other collection list types, this property,Äôs value is nil.
(Read only property)

### 137.17.15 endDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The latest creation date among all assets in the collection list.
**Notes:** This property applies only to collection lists whose type is TypeMomentList. For other collection list types, this property,Äôs value is nil.
(Read only property)

### 137.17.16 startDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The earliest creation date among all assets in the collection list.
**Notes:** This property applies only to collection lists whose type is TypeMomentList. For other collection list types, this property,Äôs value is nil.
(Read only property)

### 137.17.17 startDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The earliest creation date among all assets in the collection list.
**Notes:** This property applies only to collection lists whose type is TypeMomentList. For other collection list types, this property,Äôs value is nil.
(Read only property)

### 137.17.18 Constants

Sub Types

| Constant | Value | Description |
|---|---|---|
| SubtypeAny | -1 | Use this value to fetch collection lists of all possible subtypes. |
| SubtypeMomentListCluster | 1 | The collection list is a moment cluster, grouping several related moments. |
| SubtypeMomentListYear | 2 | The collection list is a moment year, grouping all moments from one or more calendar years. |
| SubtypeRegularFolder | 100 | The collection list is a folder containing albums or other folders. |
| SubtypeSmartFolderEvents | 200 | The collection list is a smart folder containing one or more Events synced from iPhoto. |
| SubtypeSmartFolderFaces | 201 | The collection list is a smart folder containing one or more Faces synced from iPhoto. |

Types

| Constant | Value | Description |
|---|---|---|
| TypeFolder | 2 | A folder containing asset collections of type PHAssetCollectionTypeAlbum or PHAssetCollectionTypeSmartAlbum. |
| TypeMomentList | 1 | A group of asset collections of type PHAssetCollectionTypeMoment. Moment lists include both moment clusters and moment years. Moment clusters appear as ,ÄúCollections,Äù in the Photos app, grouping individual moments. Years group all moments containing assets created in the same calendar year. |
| TypeSmartFolder | 3 | A smart folder synced to the device. |

# 137.18 class PHCollectionMBS

## 137.18.1 class PHCollectionMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The abstract superclass for Photos asset collections and collection lists.
**Notes:** You do not create or work with instances of this class directly. Instead, use one of its two concrete subclasses, PHAssetCollectionMBS or PHCollectionListMBS.

- A PHAssetCollectionMBS object represents a collection of photo or video assets, such as an album, moment, or Shared Photo Stream.
- A PHCollectionListMBS object represents a collection that contains other collections, such as a a folder containing albums or the set of all moments in a calendar year.

Accessing or modifying the Photos library requires explicit authorization from the user. The first time you call one of the methods listed in Fetching Collections, Photos automatically prompts the user for authorization. (Alternatively, you can use the PHPhotoLibraryMBS requestAuthorization method to prompt the user at a time of your choosing.)

Your app,Äôs Info.plist file must provide a value for the NSPhotoLibraryUsageDescription key that explains to the user why your app is requesting Photos access. Apps linked on or after iOS 10.0 will crash if this key is not present.
Subclass of the PHObjectMBS class.

## 137.18.2 Methods

## 137.18.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

## 137.18.4 canPerformEditOperation(anOperation as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether the collection supports the specified editing operation.
**Notes:** anOperation: A bit mask of editing operations to be tested.

Returns true if the asset supports the specified editing operation; otherwise, false.

If an asset collection or collection list supports editing, you can create a PHAssetCollectionChangeRequestMBS or PHCollectionListChangeRequestMBS object inside a PHPhotoLibraryMBS change block to submit a change.

### 137.18.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.18.6 fetchCollectionsInCollectionList(collectionList as PHCollectionListMBS, options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves collections from the specified collection list.
**Notes:** collectionList: The collection list from which to fetch collections.
options: Options that specify a filter predicate and sort order for the fetched collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHCollectionMBS objects, or an empty fetch result if no objects match the request.

By default, the returned PHFetchResultMBS object contains all collections in the specified collection list. To retrieve a more specific set of assets, provide a PHFetchOptionsMBS object that contains a filter predicate.

### 137.18.7 fetchTopLevelUserCollections(options as PHFetchOptionsMBS = nil) as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves collections from the root of the photo library,Äôs hierarchy of user-created albums and folders.
**Notes:** options: Options that specify a filter predicate and sort order for the fetched collections, or nil to use default options. For details, see PHFetchOptionsMBS.

Returns a fetch result that contains the requested PHCollection objects, or an empty fetch result if no objects match the request.

### 137.18.8 Properties

### 137.18.9 canContainAssets as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the collection can contain assets.
**Notes:** If this value is true, the collection is a PHAssetCollection object; otherwise, false. For details on asset collections, see PHAssetCollectionMBS.
(Read only property)

### 137.18.10 canContainCollections as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the collection can contain other collections.
**Notes:** If this value is true, the collection is a PHCollectionList object; otherwise, false. For details on collection lists, see PHCollectionListMBS.
(Read only property)

### 137.18.11 localizedTitle as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The localized name of the collection.
**Notes:** This property,Äôs value can be either a user-supplied name for a user-created collection, or the localized name of a collection built into the Photos app.
(Read only property)

### 137.18.12 Constants

Edit Operations

| Constant | Value | Description |
|---|---|---|
| EditOperationAddContent | 3 | The collection supports adding items that already exist elsewhere in the photo library. |
| EditOperationCreateContent | 4 | The collection supports creating new items. |
| EditOperationDelete | 6 | The collection itself can be deleted. |
| EditOperationDeleteContent | 1 | The collection supports deleting the items it contains. |
| EditOperationRearrangeContent | 5 | The collection supports reordering the arrangement of items it contains. |
| EditOperationRemoveContent | 2 | The collection supports removing the items it contains. |
| EditOperationRename | 7 | The collection itself can be renamed. |

# 137.19 class PHContentEditingInputMBS

## 137.19.1 class PHContentEditingInputMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container that provides information about and access to the image, video, or Live Photo content of an asset to be edited.
**Notes:** To edit an asset,Äôs photo or video content:

1. Fetch a PHAsset object that represents the photo or video to be edited.
2. Call the asset,Äôs requestContentEditingInputWithOptions method to retrieve a PHContentEditingInputMBS object.
3. Apply your edits to the asset. To allow a user to continue working with the edit later (for example, to adjust the parameters of a photo filter), create a PHAdjustmentDataMBS object describing the changes.
4. Initialize a PHContentEditingOutputMBS object. For photo- or video-only assets, use the editing output,Äôs properties to provide edited asset data. For Live Photo assets, create a PHLivePhotoEditingContextMBS object to edit the Live Photo content.
5. Use a photo library change block to commit the edit. In the block, create a PHAssetChangeRequestMBS object and set its contentEditingOutput property to the editing output that you created. For more details, see PHPhotoLibraryMBS.

You can also edit assets from photo editing extensions. In this case, instead of working with a PHAsset object, you implement methods in the PHContentEditingControllerMBS protocol. Photos provides a PHContentEditingInputMBS object when your extension begins editing. When editing is complete, Photos requests a PHContentEditingOutputMBS object that contains the edited asset content.

## 137.19.2 Methods

## 137.19.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.11 or newer.

## 137.19.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.19.5 Properties

### 137.19.6 adjustmentData as PHAdjustmentDataMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that describes the most recent edit to the asset,Äôs content.
**Notes:** Adjustment data describes the ,Äúrecipe,Äù for the last edit made to an asset,Äôs photo or video content. For example, a photo editing app can use this property to read information about a set of filters applied to a photo. With this information, your app can later allow a user to change the filter parameters.
(Read only property)

### 137.19.7 audiovisualAsset as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The video asset, as an AVAssetMBS object.
**Notes:** This object provides access to the video asset as a collection of tracks and metadata. For details on working with AVAssetMBS objects.

We pass result, the AVAssetMBS object, as variant to avoid plugin dependencies.
(Read only property)

### 137.19.8 creationDate as Date

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The date and time when the asset was originally created.
**Notes:** (Read only property)

### 137.19.9 creationDateTime as DateTime

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date and time when the asset was originally created.
**Notes:** (Read only property)

### 137.19.10 displaySizeImage as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An image of the asset,Äôs contents, appropriately sized for display.
**Notes:** This property does not provide the full-sized image for a photo asset but rather a scaled-down image appropriate for use in a photo editing user interface. To load the full-sized asset image, use the fullSizeImageURL property.
(Read only property)

### 137.19.11 fullSizeImageOrientation as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The Exif display orientation of the full-size image file.
**Notes:** This property's value is a raw numeric value describing the encoded image orientation according to the TIFF and Exif specifications. To more easily work with such values, convert this value to the CGImagePropertyOrientation type.
(Read only property)

### 137.19.12 fullSizeImageURL as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL to a file that contains the full-sized image data.
**Notes:** Typically, your app or extension does not need to load a full-sized image for use in an editing UI. Instead, use the displaySizeImage property to retrieve an image suitable for screen display. You can then load the full-sized image on a background queue so that it will be ready by the time the user finishes editing the display-size image. At that time, apply the user,Äôs adjustments to the full-sized image and then use the PHContentEditingOutputMBS class to commit the edit to the photo library.
(Read only property)

### 137.19.13 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.19.14 livePhoto as PHLivePhotoMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unedited Live Photo content of the editing input.
**Notes:** To edit the video and photo content of the Live Photo, create a PHLivePhotoEditingContextMBS

object using this PHContentEditingInputMBS object.
If the editing input does not represent a Live Photo, this property,Äôs value is nil, indicating that you cannot use this PHContentEditingInputMBS object to create a Live Photo editing context.
(Read only property)

### 137.19.15 location as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The location information that was saved with the asset.
**Notes:** Typically, an asset,Äôs location metadata identifies the place where the asset was captured.

We pass result, the CLLocationMBS object, as variant to avoid plugin dependencies.
(Read only property)

### 137.19.16 mediaSubtypes as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subtypes of the asset, identifying special kinds of assets such as a panoramic photo or a high-frame-rate video.
**Notes:** See MediaSubtype* constants for possible values.
Because an asset can have more than one subtype, use these values as bit masks to identify an asset.
(Read only property)

### 137.19.17 mediaType as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of the asset, such as video or audio.
**Notes:** See MediaType* constants.
(Read only property)

### 137.19.18 playbackStyle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The playback style for the asset.
**Notes:** (Read only property)

### 137.19.19 uniformTypeIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The uniform type identifier for the asset,Äôs image or video data.
**Notes:** (Read only property)

### 137.19.20 Constants

Asset Playback Styles

| Constant | Value | Description |
|---|---|---|
| PlaybackStyleImage | 1 | The asset should be displayed as a still image. |
| PlaybackStyleImageAnimated | 2 | The asset should be displayed as an animated image. |
| PlaybackStyleLivePhoto | 3 | The asset should be displayed as a Live Photo. |
| PlaybackStyleUnsupported | 0 | The asset has an unsupported or undefined media playback type. |
| PlaybackStyleVideo | 4 | The asset should be displayed as a video. |
| PlaybackStyleVideoLooping | 5 | The asset should be displayed as a looping video. |

## 137.20 class PHContentEditingInputRequestOptionsMBS

### 137.20.1 class PHContentEditingInputRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the delivery of image or video data when you request to edit the content of a Photos asset.
**Notes:** You use the PHContentEditingInputRequestOptionsMBS class with the requestContentEditingInputWithOptions method for editing the contents of a PHAssetMBS object.
This class does not affect photo editing extensions.

### 137.20.2 Methods

### 137.20.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.20.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.20.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.20.6 SetCanHandleAdjustmentData(CanHandleAdjustmentData as CanHandleAdjustmentDataMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets delegate to be called when Photos needs to determine whether your app can continue previous edits made to an asset.

**Notes:** When an asset is edited, Photos stores a PHAdjustmentDataMBS object provided by the app or extension that edited the asset. This object provides all information necessary to reconstruct the edited asset using the original asset data. When your app requests to edit an asset, Photos calls this block to inquire whether your app can handle the asset,Äôs past adjustments.

### 137.20.7 SetProgressHandler(ProgressHandler as ProgressHandlerMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the delegate Photos calls periodically while downloading the asset.
**Notes:** If you request an asset whose data is not on the local device, and have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress and allow canceling the download.

### 137.20.8 Properties

### 137.20.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.20.10 NetworkAccessAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether Photos can download the requested asset from iCloud if needed.
**Notes:** If true (the default), Photos downloads the asset requested for editing if it is not stored on the local device. To be notified of the download,Äôs progress, use the PHContentEditingInputRequestOptionsMBS property to provide a delegate that Photos calls periodically while downloading the asset.
(Read and Write property)

### 137.20.11 ProgressHandler as ProgressHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate Photos calls periodically while downloading the asset.
**Notes:** If you request an asset whose data is not on the local device, and have enabled downloading with the

networkAccessAllowed property, Photos calls your block periodically to report progress and allow canceling the download.
(Read and Write property)

### 137.20.12 Delegates

### 137.20.13 CanHandleAdjustmentDataMBS(adjustmentData as PHAdjustmentDataMBS, tag as Variant) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate takes the following parameter.
**Notes:** adjustmentData: A PHAdjustmentDataMBS object you can use to determine whether your app can work with past edits made to the asset. Typically, you make this decision based on the adjustment data,Äôs formatIdentifier and formatVersion properties.

If your method returns true, Photos provides the original asset data for editing. Your app uses the adjustment data to alter, add to, or reapply previous edits. (For example, an adjustment data may describe filters applied to a photo. Your app reapplies those filters and allows the user to change filter parameters, add new filters, or remove filters.)
If your method returns false, Photos provides the most recent asset data—the rendered output of all previous edits—for editing.

### 137.20.14 ProgressHandlerMBS(progress as double, byref stop as boolean, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate takes the following parameters.
**Notes:** progress: A floating-point value indicating the progress of the download. A value of 0.0 indicates the download has just started, and a value of 1.0 indicates the download is complete.
stop: Set stop to true inside the block to cancel the download.

# 137.21 class PHContentEditingOutputMBS

## 137.21.1 class PHContentEditingOutputMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container to which you provide the results of editing the photo, video, or Live Photo content of a Photos asset.
**Notes:** To edit an asset,Äôs photo or video content:

1. Fetch a PHAssetMBS object that represents the photo or video to be edited.
2. Call the asset,Äôs requestContentEditingInputWithOptions method to retrieve a PHContentEditingInputMBS object. This object provides information about the asset, the asset data to be edited, and a preview image for display.
3. Apply your edits to the asset. To allow a user to continue working with the edit later (for example, to adjust the parameters of a photo filter), create a PHAdjustmentDataMBS object describing the changes.
4. Initialize a PHContentEditingOutput object. For photo- or video-only assets, provide the edited content with the renderedContentURL property. For Live Photo assets, create a PHLivePhotoEditingContext object to edit the Live Photo content and pass your content editing output to the saveLivePhotoToOutput method. For all asset types, provide your adjustment data with the adjustmentData property of the content editing output.
5. Use a photo library change block to commit the edit. (For details, see PHPhotoLibraryMBS.) In the block, create a PHAssetChangeRequestMBS object and set its contentEditingOutput property to the editing output that you created.

Each PHPhotoLibraryperformChanges call prompts the user for permission to edit the contents of the photo library—to edit multiple assets in one batch, create multiple PHAssetChangeRequest objects within the same change block, each with its own corresponding PHContentEditingOutput object.

You can also edit assets from photo editing extensions. In this case, instead of working with a PHAssetMBS object, you implement methods in the PHContentEditingController protocol. Photos provides a PHContentEditingOutputMBS object when your extension begins editing. When editing is complete, Photos requests a PHContentEditingOutputMBS object that contains the edited asset content.

Requires MacOS 10.11 or newer.

## 137.21.2 Methods

## 137.21.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.11 or newer.

### 137.21.4 Constructor(contentEditingInput as PHContentEditingInputMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an editing output from the specified editing input.
**Notes:** contentEditingInput: An object providing information about the asset to be edited.

Returns an initialized content editing output.

To complete the edit, use the renderedContentURL property to provide the edited asset content. Then, use the PHAssetChangeRequestMBS class or PHContentEditingController protocol to commit the edit to storage.
See also:

- 137.21.5 Constructor(placeholderForCreatedAsset as PHObjectPlaceholderMBS) 19206

### 137.21.5 Constructor(placeholderForCreatedAsset as PHObjectPlaceholderMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an editing output for use in adding a new asset to the photo library.
**Notes:** placeholderForCreatedAsset: A placeholder object that ties the editing output to a PHAssetChangeRequest object for creating a new asset.

Returns an initialized content editing output.

Use this method if you want to add a new asset to the Photos library with edited content, as opposed to editing the content of an asset after adding it to the library. For example, you might use this option if your app applies filters to photos it captures with the device camera—instead of saving only the filtered image to the Photos library, your app can save both the filtered and the original image, allowing the user to revert to the original image or apply different filters later.
See also:

- 137.21.4 Constructor(contentEditingInput as PHContentEditingInputMBS) 19206

### 137.21.6 Properties

### 137.21.7 adjustmentData as PHAdjustmentDataMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object describing the changes made to the asset.
**Notes:** You use adjustment data to describe the ,Äúrecipe,Äù for an edit that later edits can make use of. For example, a photo editing app can use this property to save information about the filters applied to a

photo. Later, the same app (or another app that understands its adjustment data format) can load the filter information, change the filter parameters, and reapply the filters to the original photo.

If you write new asset content to the URL specified by the renderedContentURL property, you must also provide a new, distinct PHAdjustmentDataMBS object describing your edit. Passing a preexisting adjustment data object (that describes an earlier edit) results in undefined behavior.
(Read only property)

### 137.21.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.21.9 renderedContentURL as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL at which to write a file containing edited asset content.
**Notes:** Read this property to find a URL for writing edited asset content. Then, if editing a photo asset, write the altered photo image to a file in JPEG format at this URL. If editing a video asset, export the video to a QuickTime (.mov) file at this URL.

Edited asset content must incorporate (or ,Äúbake in,Äù) the intended orientation of the asset. That is, the orientation metadata (if any) that you write in the output image or video file must declare the ,Äúup,Äù orientation, and the image or video data must appear right-side up when presented without orientation metadata.

For Live Photo content, you don,Äôt write output to this URL. Instead, pass the editing output object to the saveLivePhotoToOutput method.
(Read only property)

## 137.22 class PHFetchOptionsMBS

### 137.22.1 class PHFetchOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options that affect the filtering, sorting, and management of results that Photos returns when you fetch asset or collection objects.
**Notes:** Using class methods on the PHAssetMBS, PHCollectionMBS, PHAssetCollectionMBS, and PHCollectionListMBS classes to fetch assets or collections produces a PHFetchResultMBS object containing the requested objects. The options you specify control which objects the fetch result includes, how those objects are arranged in the fetch result, and how Photos should notify your app of changes to the fetch result.

Photos supports only a restricted set of keys for the predicate and sortDescriptors properties. The set of available keys depends on which class you,Äôre using to fetch assets or collections—see Table 1 for the list of keys supported by each class.

Supported predicate and sort descriptor keys

| Class for Fetch Method | Supported Keys |
|---|---|
| PHAsset | SELF, localIdentifier, creationDate, modificationDate, mediaType, mediaSubtypes, duration, pixelWidth, pixelHeight, favorite (or isFavorite), hidden (or isHidden), burstIdentifier |
| PHAssetCollection | SELF, localIdentifier, localizedTitle (or title), startDate, endDate, estimatedAssetCount |
| PHCollectionList | SELF, localIdentifier, localizedTitle (or title), startDate, endDate |
| PHCollection (can fetch a mix of PHCollectionList and PHAssetCollection objects) | SELF, localIdentifier, localizedTitle (or title), startDate, endDate |

Available in MacOS 10.13 or newer.

### 137.22.2 Methods

### 137.22.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.22.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.22.5 copy as PHFetchOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 137.22.6 setSortDescriptors(sortDescriptors() as NSSortDescriptorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the list of sort descriptors, specifying an order for the fetched objects.

### 137.22.7 sortDescriptors as NSSortDescriptorMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A list of sort descriptors, specifying an order for the fetched objects.

### 137.22.8 Properties

### 137.22.9 fetchLimit as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum number of objects to include in the fetch result.
**Notes:** With the default fetch limit of zero, Photos returns all requested assets or collections in a fetch result. Change this value to fetch more efficiently in situations where a potentially very large result is not needed. For example, to fetch only the most recently captured asset, call the fetchAssetsWithOptions method, using the sortDescriptors property to sort in descending date order, and setting a fetch limit of one.
(Read and Write property)

### 137.22.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.22.11 includeAllBurstAssets as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the fetch result includes all assets from burst photo sequences.
**Notes:** When the user takes a sequence of photos in burst mode with the Camera app (on supported devices), the Photos app user interface groups the resulting assets together and allows the user to select favorite members of the sequence. Photos also automatically marks members of the sequence as potential user favorites.

If the value is false (the default), fetches that include burst photo sequences return only the user-picked members and representative asset of each sequence. If the value is true, such fetches include all assets in each sequence.
(Read and Write property)

### 137.22.12 includeAssetSourceTypes as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The set of source types for which to include assets in the fetch result.
**Notes:** Asset source types identify the means by which an asset enters the Photos library, and affect the possible actions you can perform on an asset. For example, assets synced from iTunes cannot be edited or deleted.

The SourceType type is an option set—to include multiple source types in the same query, combine type constants with the bitwise OR operator. See SourceType constants in PHAssetMBS class.
(Read and Write property)

### 137.22.13 includeHiddenAssets as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the fetch result includes assets marked as hidden.
**Notes:** If the value is false (the default), fetches exclude assets whose hidden property is true. If the value is true, fetches include all assets regardless of their hidden state.
(Read and Write property)

### 137.22.14 predicate as NSPredicateMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A predicate that specifies which properties to select results by and that also specifies any constraints on selection.
**Notes:** Construct a predicate with the properties of the class of objects that you want to fetch
(Read and Write property)

### 137.22.15 wantsIncrementalChangeDetails as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether your app receives detailed change information for the objects in the fetch result.
**Notes:** If you have registered a change observer with the shared PHPhotoLibraryMBS object, fetching assets or collections automatically registers your observer to receive information about later changes to the fetch result and about the objects it contains. For a fetch result, change information (a PHFetchResultChangeDetailsMBS object) can include a detailed list of incremental differences from the previous state of the fetch result, such as new photos captured since the original fetch.

If true (the default), Photos sends detailed incremental changes when such information is available. If false, Photos tells your app only when the fetch result has changed (in which case you can perform the fetch again to receive updated results).
(Read and Write property)

## 137.23 class PHFetchResultChangeDetailsMBS

### 137.23.1 class PHFetchResultChangeDetailsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A description of changes that occurred in the set of asset or collection objects listed in a fetch result.
**Notes:** A PHFetchResultChangeDetailsMBS object provides detailed information about the differences between two fetch results—one that you previously obtained and an updated one that would result if you performed the same fetch again. The change details object provides information useful for updating a UI that lists the contents of a fetch result, such as the indexes of added, removed, and rearranged objects.

### 137.23.2 Methods

### 137.23.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.23.4 changeDetailsFromFetchResult(fromResult as PHFetchResultMBS, toFetchResult as PHFetchResultMBS, changedObjects() as PHObjectMBS) as PHFetchResultChangeDetailsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a change details object that summarizes the differences between two fetch results.
**Notes:** fromResult: A fetch result to be treated as the ‚Äúbefore‚Äù state in the resulting change details object.
toResult: A fetch result to be treated as the ‚Äúafter‚Äù state in the resulting change details object.
changedObjects: An collection of objects to manually note as changed between the two fetch results.

Typically, you use the PHChangeMBS class to retrieve PHFetchResultChangeDetailsMBS objects describing any changes that have occurred since you performed a fetch, but you can also use this method to get a change details object that summarizes the difference between two arbitrary PHFetchResultMBS objects. In this case, Photos cannot automatically determine when the same objects are present in both fetch results but those objects‚Äô content has changed, so the changedIndexes and changedObjects properties are empty.

However, you can use the changedObjects parameter to manually note objects as changed. For example, consider a view controller that maintains a base fetch result representing a list of albums, and a transient

collection that filters the list according to the user,Äôs search terms.

### 137.23.5 changedObjects() as PHObjectMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The objects in the fetch result whose content or metadata have been updated.
**Notes:** An array of PHAssetMBS, PHAssetCollectionMBS, or PHCollectionListMBS objects.
If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.

### 137.23.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.23.7 enumerateMoves(theDelegate as enumerateMovesHandlerMBS, Tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Runs the specified block for each case where an object has moved from one index to another in the fetch result.
**Notes:** The toIndex parameter in the handler block is relative to the state of the fetch result after you,Äôve applied the changes described by the removedIndexes, insertedIndexes and changedIndexes properties. Therefore, if you use this method to update a collection view or similar user interface displaying the contents of the fetch result, update your UI to reflect insertions, removals, and changes before you process moves.

### 137.23.8 insertedObjects() as PHObjectMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The new items that have been inserted in the fetch result.
**Notes:** This array can contain PHAssetMBS, PHAssetCollectionMBS or PHCollectionListMBS objects, or some combination thereof.
If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.

### 137.23.9 removedObjects() as PHObjectMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The items that have been removed from the fetch result.
**Notes:** This array can contain PHAssetMBS, PHAssetCollectionMBS, or PHCollectionListMBS objects, or some combination thereof.
If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.

### 137.23.10 Properties

### 137.23.11 changedIndexes as NSIndexSetMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The indexes of objects in the fetch result whose content or metadata have been updated.
**Notes:** Use this index set to update elements in a collection view or similar user interface that displays the contents of the fetch result. These indexes are relative to the original fetch result (the fetchResultBeforeChanges property) after you,Äôve applied the changes described by the removedIndexes and insertedIndexes properties; when updating your app,Äôs interface, apply changes after removals and insertions and before moves.

If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.
(Read only property)

### 137.23.12 fetchResultAfterChanges as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current fetch result, incorporating recent changes.
**Notes:** You can use this object to inspect the current state of the fetched objects even if the hasIncrementalChanges property,Äôs value is false. Using this fetch result is equivalent to performing once more the same fetch that returned the original fetch result.
(Read only property)

### 137.23.13 fetchResultBeforeChanges as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The original fetch result, without recent changes.
**Notes:** This property,Äôs value is the same object you passed to the changeDetailsForFetchResult method to request change details.

(Read only property)

### 137.23.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.23.15 hasIncrementalChanges as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether changes to the fetch result can be described incrementally.
**Notes:** If this value is true, use the insertedIndexes, removedIndexes, and changedIndexes properties (or the insertedObjects, removedObjects, and changedObjects properties) to find out which objects in the fetch result have been added, removed, or updated. You can also use the hasMoves property and enumerateMoves method to find out which objects in the fetch result have been rearranged. These properties can be useful for updating a collection view or similar interface that displays the fetch result,Äôs contents.

If this value is false, the fetch result is too different from its original state for incremental change information to be meaningful. Use the fetchResultAfterChanges property to get the fetch result,Äôs current membership. (If displaying the fetch result,Äôs contents, reload your user interface to match the new fetch result.)
(Read only property)

### 137.23.16 hasMoves as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether objects have been rearranged in the fetch result.
**Notes:** If this value is true, use the enumerateMoves method to find out which elements have been moved and what their new indexes are.
(Read only property)

### 137.23.17 insertedIndexes as NSIndexSetMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The indexes where new objects have been inserted in the fetch result.
**Notes:** Use this index set can to insert elements in a collection view or similar user interface that displays

the contents of the fetch result. These indexes are relative to the original fetch result (the fetchResultBeforeChanges property) after you,Äôve applied the changes described by the removedIndexes property; when updating your app,Äôs interface, apply insertions after removals and before changes and moves.

If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.
(Read only property)

### 137.23.18 removedIndexes as NSIndexSetMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The indexes from which objects have been removed from the fetch result.
**Notes:** Use this index set to remove elements from a collection view or similar user interface that displays the contents of the fetch result. These indexes are relative to the original fetch result (the fetchResultBeforeChanges property); when updating your app,Äôs interface, apply removals before insertions, changes, and moves.
If the hasIncrementalChanges property,Äôs value is false, this property,Äôs value is nil.
(Read only property)

### 137.23.19 Delegates

### 137.23.20 enumerateMovesHandlerMBS(fromIndex as Integer, toIndex as Integer, tag as variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls to provide details about which objects in the fetch result have moved to which indexes.
**Notes:** fromIndex: The index of an object in the original fetch result.
toIndex: The index to which the object has moved in the new fetch result.

## 137.24 class PHFetchResultMBS

### 137.24.1 class PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An ordered list of assets or collections returned from a Photos fetch method.
**Notes:** When you use class methods on the PHAssetMBS, PHCollectionMBS, PHAssetCollectionMBS, and PHCollectionListMBS classes to retrieve objects, Photos provides the resulting objects in a fetch result. You access the contents of a fetch result with various methods. Unlike an array, however, a PHFetchResult object dynamically loads its contents from the Photos library as needed, providing optimal performance even when handling a large number of results.

A fetch result provides thread-safe access to its contents. After a fetch, the fetch result,Äôs count value is constant, and all objects in the fetch result keep the same localIdentifier value. (To get updated content for a fetch, register a change observer with the shared PHPhotoLibraryMBS object.)

A fetch result caches its contents, keeping a batch of objects around the most recently accessed index. Because objects outside of the batch are no longer cached, accessing these objects results in refetching those objects. This process can result in changes to values previously read from those objects.
**Blog Entries**

- Show Live Photos in your Xojo application

### 137.24.2 Methods

### 137.24.3 allObjects as Variant()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries all objects as array.

### 137.24.4 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.24.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.24.6 containsObject(anObject as Variant) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether the specified object is present in the fetch result.
**Notes:** anObject: An object.

Returns true if anObject is present in the fetch result, otherwise false.

This method determines whether anObject is present in the fetch result by sending an isEqual: message to each of the fetch result,Äôs objects (and passing anObject as the parameter to each isEqual message).

### 137.24.7 copy as PHFetchResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the result set.

### 137.24.8 countOfAssetsWithMediaType(MediaType as Integer) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the number of assets in the fetch result of a specified type.
**Notes:** mediaType: The type of assets to count, such as image or video. See MediaType constants.

Returns the number of assets in the fetch result of the specified type.

The first time you call this method, Photos enumerates the contents of the fetch result to count those of the specified type, then caches the result. Subsequent calls with the same mediaType parameter return the cached value.
This method counts only the PHAssetMBS objects in a fetch result. If a fetch result contains only PHAssetCollectionMBS or PHCollectionListMBS objects, the return value is 0.

### 137.24.9 indexOfObject(anObject as Variant) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the lowest index whose corresponding object in the fetch result is equal to the specified object.
**Notes:** anObject: An object.

Returns the lowest index whose corresponding object in the fetch result is equal to anObject, or NSNotFound if no such object is in the fetch result.

Starting at index 0, this method sends an isEqual message to each object in the fetch result until it finds a match or reaches the end of the fetch result. This method passes the anObject parameter to each isEqual message.
See also:

- 137.24.10 indexOfObject(anObject as Variant, range as NSRangeMBS) as Integer 19219

### 137.24.10 indexOfObject(anObject as Variant, range as NSRangeMBS) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the lowest index within the specified range whose corresponding object in the fetch result is equal to the specified object.
**Notes:** anObject: An object.
range: The range of indexes in the fetch result within which to search for anObject.

Returns the lowest index within range whose corresponding object in the fetch result is equal to anObject, or NSNotFound if no such object is in the fetch result.

Starting at range.location, this method sends an isEqual message to each object in the fetch result until it finds a match or reaches the end of the fetch result. This method passes the anObject parameter to each isEqual message.
Raises an exception (NSExceptionMBS class) if the range parameter represents a range that doesn,Äôt exist in the fetch result.
See also:

- 137.24.9 indexOfObject(anObject as Variant) as Integer 19218

### 137.24.11 objectAtIndex(index as Integer) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the object located at the specified index.
**Notes:** index: An index within the bounds of the fetch result.

Returns the object located at index in the fetch result.

Raises an exception (NSExceptionMBS class) if index is beyond the end of the fetch result (that is, greater than or equal to the value of the count property).

### 137.24.12 objectsAtIndexes(indexes as NSIndexSetMBS) as Variant()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array containing the objects in the fetch result at the indexes in the specified index set.
**Notes:** indexes: An index set containing indexes within the bounds of the fetch result.

Returns an array containing the objects in the fetch result at the indexes specified by indexes.

The ordering of the returned array follows the index set. That is, in the returned array, an object with a higher index in the index set comes after any object with a smaller index in the index set.
Raises an exception (NSExceptionMBS) if any index in the index set is beyond the end of the fetch result (that is, greater than or equal to the value of the count property).

### 137.24.13 Properties

### 137.24.14 count as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of objects in the fetch result.
**Notes:** (Read only property)

### 137.24.15 firstObject as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first object in the fetch result.
**Notes:** You specify the ordering of a fetch result in the PHFetchOptionsMBS object you pass to a fetch method.
Returns nil if the fetch result is empty.
(Read only property)

### 137.24.16 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.24.17 lastObject as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The last object in the fetch result.
**Notes:** You specify the ordering of a fetch result in the PHFetchOptionsMBS object you pass to a fetch method.
Returns nil if the fetch result is empty.
(Read only property)

### 137.24.18 Constants

Edit Operation

| Constant | Value | Description |
|---|---|---|
| EditOperationContent | 2 | The asset,Äôs photo or video content can be edited.<br>To begin the process of editing an asset, use the requestContentEditingInputWithOptions method. |
| EditOperationDelete | 1 | The asset can be deleted from the photo library.<br>To delete one or more assets, create a change request with the deleteAssets method inside a PHPhotoLibrary change block. |
| EditOperationProperties | 3 | The asset,Äôs metadata properties can be edited.<br>To change an asset,Äôs properties, create a change request with the changeRequestForAsset method inside a PHPhotoLibraryMBS change block. |

Media Types

| Constant | Value | Description |
|---|---|---|
| MediaTypeAudio | 3 | The asset is an audio file. |
| MediaTypeImage | 1 | The asset is a photo or other static image. |
| MediaTypeUnknown | 0 | The asset,Äôs type is unknown. |
| MediaTypeVideo | 2 | The asset is a video file. |

Asset Playback Styles

| Constant | Value | Description |
|---|---|---|
| PlaybackStyleImage | 1 | The asset should be displayed as a still image. |
| PlaybackStyleImageAnimated | 2 | The asset should be displayed as an animated image. |
| PlaybackStyleLivePhoto | 3 | The asset should be displayed as a Live Photo. |
| PlaybackStyleUnsupported | 0 | The asset has an unsupported or undefined media playback type. |
| PlaybackStyleVideo | 4 | The asset should be displayed as a video. |
| PlaybackStyleVideoLooping | 5 | The asset should be displayed as a looping video. |

# 137.25 class PHImageManagerMBS

## 137.25.1 class PHImageManagerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that facilitates retrieving or generating preview thumbnails and asset data.
**Notes:** Use these methods to fetch full-size photo assets or thumbnail images, or to retrieve AVFoundation objects for playing, exporting, and manipulating video assets.

To load image or video data:
1. Use the PHAsset class to fetch the asset you,Äôre interested in.
2. Call the defaultManager method to retrieve the shared image manager object.
3. Use one of the methods listed in Requesting Images and Requesting Video Objects to load the asset,Äôs image or video data.

The image manager caches the asset images and data it provides, so later requests for the same assets with similar parameters will return results more quickly.

If you need to load image data for many assets together, use the PHCachingImageManagerMBS class to ,Äúpreheat,Äù the cache by loading images you expect to need soon. For example, when populating a collection view with photo asset thumbnails, you can cache images ahead of the current scroll position.

Available in MacOS 10.13 or later.
**Blog Entries**

- Show Live Photos in your Xojo application

## 137.25.2 Methods

## 137.25.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

## 137.25.4 cancelImageRequest(requestID as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels an asynchronous request.

**Notes:** requestID: The numeric identifier of the request to be canceled.

When you perform an asynchronous request for image data using the requestImageForAsset method, or for a video object using one of the methods listed in Requesting Video Objects, the image manager returns a numeric identifier for the request. To cancel the request before it completes, provide this identifier when calling the cancelImageRequest method.

### 137.25.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.25.6 defaultManager as PHImageManagerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the shared image manager object.
**Notes:** This method always returns the same image manager object, which is shared for all uses in your app.

### 137.25.7 MaximumSize as CGSizeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A special value for requesting original image data or the largest rendered image available.
**Notes:** When you use the PHImageManagerMaximumSize option, Photos provides the largest image available for the asset without scaling or cropping. (That is, it ignores the resizeMode option.)

### 137.25.8 PHImageCancelledKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary.
**Notes:** A key whose value indicates whether the image request was canceled.

This key provides information about an image loading result in the resultHandler block for methods listed in Requesting Images. The corresponding value is a Boolean value.If you call the cancelImageRequest method to cancel a request, Photos calls your result handler block with the value true for this key.

### 137.25.9 PHImageErrorKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary.
**Notes:** A key whose value is an error that occurred when Photos attempted to load the image.

This key provides information about an image loading result in the resultHandler block for methods listed in Requesting Images. The corresponding value is an NSErrorMBS object.Photos provides an error object for this key if it cannot provide an image for your handler block,Äôs result parameter. Examine the error object for information about the cause of the error.

### 137.25.10 PHImageResultIsDegradedKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary.
**Notes:** A key whose value indicates whether the result image is a low-quality substitute for the requested image.

This key provides information about an image loading result in the resultHandler block for methods listed in Requesting Images. The corresponding value is a Boolean value. If true, the result parameter of your resultHandler block contains a low-quality image because Photos could not yet provide a higher-quality image. Depending on your settings in the PHImageRequestOptions object that you provided with the request, Photos may call your result handler delegate again to provide a higher-quality image.

### 137.25.11 PHImageResultIsInCloudKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary.
**Notes:** A key whose value indicates whether photo asset data is stored on the local device or must be downloaded from iCloud.

This key provides information about an image loading result in the resultHandler delegate for methods listed in Requesting Images. The corresponding value is a Boolean value.

If true, no image was provided, because the asset data must be downloaded from iCloud. To download the data, submit another request, and specify true for the networkAccessAllowed option.

### 137.25.12 PHImageResultRequestIDKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary.
**Notes:** A key whose value is a unique identifier for the image request.

This key provides information about an image loading result in the resultHandler block for methods listed in Requesting Images. The corresponding value is an integer value. This identifier matches that returned when making a request. You can use it with the cancelImageRequest method to cancel requests with pending results that are no longer needed.

### 137.25.13 RequestAVAssetForVideo(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, exportPreset as String, CompletionHandler as RequestAVAssetForVideoCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests AVFoundation objects representing the video asset,Äôs content and state, to be loaded asynchronously.
**Notes:** asset: The video asset for which video objects are to be loaded.
options: Options specifying how Photos should handle the request and notify your app of progress or errors. For details, see PHVideoRequestOptionsMBS class.

Returns a numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

When you call this method, Photos downloads the video data (if necessary) and creates AVFoundation objects. It then calls your resultHandler block to provide the requested video.

Use this method when you want to work with the arrangement of audio and video tracks that an asset contains. If you plan to use the asset only for playback, call the requestPlayerItemForVideo method. If you plan to export the asset data, call the requestExportSessionForVideo method.

### 137.25.14 RequestExportSessionForVideo(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, exportPreset as String, CompletionHandler as RequestExportSessionForVideoCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests an export session for writing the video asset,Äôs data to a file, to be loaded asynchronously.
**Notes:** asset: The video asset for which an export session is to be created.
options: Options specifying how Photos should handle the request and notify your app of progress or errors. For details, see PHVideoRequestOptionsMBS.
exportPreset: The export preset name for exporting the asset. For available presets, see AVAssetExportSessionMBS.

A numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

When you call this method, Photos downloads the video data (if necessary) and creates an export session. It then calls your resultHandler delegate to provide the requested video.
For additional export options, use the requestAVAssetForVideo method and then create AVAssetReader and AVAssetWriterMBS objects to transcode and output the video asset,Äôs data.

### 137.25.15 RequestImageDataAndOrientationForAsset(asset as PHAssetMBS, options as PHImageRequestOptionsMBS, CompletionHandler as RequestImageForAssetCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests the largest represented image as data bytes and EXIF orientation for the specified asset.
**Notes:** asset: The asset for which to load image data.
options: Options specifying how Photos should handle the request, format the requested image, and notify your app of progress or errors.

If PHImageRequestOptionsMBS.VersionCurrent is requested and the asset has adjustments, the largest rendered image data is returned. In all other cases, the original image data is returned.
For further details, see PHImageRequestOptionsMBS class.

Returns a numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

When you call this method, Photos loads the largest available representation of the image asset, then calls your resultHandler block to provide the requested data. Depending on the options you specify and the current state of the asset, Photos may download asset data from the network.

By default, this method executes asynchronously. If you call it from a background thread, you may change the synchronous property of the options parameter to true to block the calling thread until either the requested image is ready or an error occurs, at which time Photos calls your result handler. This method

ignores the deliveryMode option—Photos calls your result handler block exactly once.

If the version option is set to PHImageRequestOptionsMBS.VersionCurrent, Photos provides rendered image data, including the results of any edits that have been made to the asset content. Otherwise, Photos provides the originally captured image data for the asset.

### 137.25.16 RequestImageForAsset(asset as PHAssetMBS, targetSize as CGSizeMBS, contentMode as Integer, options as PHImageRequestOptionsMBS, CompletionHandler as RequestImageForAssetCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests an image representation for the specified asset.
**Notes:** asset: The asset whose image data is to be loaded.
targetSize: The target size of image to be returned.
contentMode: An option for how to fit the image to the aspect ratio of the requested size. For details, see PHImageContentMode.
options: Options specifying how Photos should handle the request, format the requested image, and notify your app of progress or errors. For details, see PHImageRequestOptionsMBS class.

Returns a numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

When you call this method, Photos loads or generates an image of the asset at, or near, the size you specify. Next, it calls your resultHandler block to provide the requested image. To serve your request more quickly, Photos may provide an image that is slightly larger than the target size—either because such an image is already cached or because it can be generated more efficiently. Depending on the options you specify and the current state of the asset, Photos may download asset data from the network.

By default, this method executes asynchronously. If you call it from a background thread you may change the synchronous property of the options parameter to true to block the calling thread until either the requested image is ready or an error occurs, at which time Photos calls your result handler.

For an asynchronous request, Photos may call your result handler block more than once. Photos first calls the block to provide a low-quality image suitable for displaying temporarily while it prepares a high-quality image. (If low-quality image data is immediately available, the first call may occur before the method returns.) When the high-quality image is ready, Photos calls your result handler again to provide it. If the image manager has already cached the requested image at full quality, Photos calls your result handler only once. The PHImageResultIsDegradedKey key in the result handler,Äôs info parameter indicates when Photos is providing a temporary low-quality image.

You can use this method for both photo and video assets —for a video asset, an image request provides a thumbnail image or poster frame.

### 137.25.17 RequestImageForAssetSync(asset as PHAssetMBS, targetSize as CGSizeMBS, contentMode as Integer, options as PHImageRequestOptionsMBS, byref Info as Dictionary) as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests an image representation for the specified asset synchronously.
**Notes:** asset: The asset whose image data is to be loaded.
targetSize: The target size of image to be returned.
contentMode: An option for how to fit the image to the aspect ratio of the requested size. For details, see PHImageContentMode.
options: Options specifying how Photos should handle the request, format the requested image, and notify your app of progress or errors. For details, see PHImageRequestOptionsMBS class.

Returns the image.

### 137.25.18 RequestLivePhotoForAsset(asset as PHAssetMBS, targetSize as CGSizeMBS, contentMode as Integer, options as PHLivePhotoRequestOptionsMBS, CompletionHandler as RequestLivePhotoForAssetCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests a Live Photo representation for the specified asset.
**Notes:** asset: The asset whose Live Photo data is to be loaded.
targetSize: The target size of Live Photo to be returned.
contentMode: An option for how to fit the image to the aspect ratio of the requested size. For details, see PHImageContentMode.
options: Options specifying how Photos should handle the request, format the requested image, and notify your app of progress or errors. For details, see PHLivePhotoRequestOptionsMBS class.

Returns a numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

A Live Photo is a picture, taken with a supported device, that includes movement and sound from the moments just before and after its capture. Much like how a UIImage object represents a ready-to-use form of an image, a PHLivePhotoMBS object represents a Live Photo whose image, motion, and sound data are prepared for display. Use this method to request an asset,Äôs Live Photo form; after Photos calls your resultHandler delegate to provide the Live Photo, you can display it using the PHLivePhotoViewMBS class.

Use this method only when you plan to display the motion and sound content associated with a Live Photo. In contexts where you need only a still image for a Live Photo asset—for example, when loading thumbnails to display in a photo chooser interface—use the requestImageForAsset method instead.

When you call this method, Photos loads or generates a PHLivePhotoMBS object for the asset at, or near, the size you specify. Next, it calls your resultHandler block to provide the requested image. To serve your request more quickly, Photos may provide an image that is slightly larger than the target size—either because such an image is already cached or because it can be generated more efficiently. Depending on the options you specify and the current state of the asset, Photos may download asset data from the network. This method always executes asynchronously.

Photos may call your result handler block more than once. Photos first calls the block to provide a low-quality image suitable for displaying temporarily while it prepares a high-quality image. (If low-quality image data is immediately available, the first call may occur before the method returns.) When the high-quality image is ready, Photos calls your result handler again to provide it. If the image manager has already cached the requested image at full quality, Photos calls your result handler only once. The PHImageResultIsDegraded-Key key in the result handler,Äôs info parameter indicates when Photos is providing a temporary low-quality image.

### 137.25.19 RequestPlayerItemForVideo(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, CompletionHandler as RequestPlayerItemForVideoCompletedMBS, tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests a representation of the video asset for playback, to be loaded asynchronously.
**Notes:** asset: The video asset to be played back.
options: Options specifying how Photos should handle the request and notify your app of progress or errors. For details, see PHVideoRequestOptionsMBS.

A numeric identifier for the request. If you need to cancel the request before it completes, pass this identifier to the cancelImageRequest method.

When you call this method, Photos downloads the video data (if necessary) and creates a player item. It then calls your resultHandler block to provide the requested video.

Use this method when you want to simply play back the video asset as it currently exists. For more detailed options or to work with the asset,Äôs audio and video tracks, use the requestAVAssetForVideo method instead.

### 137.25.20 Properties

### 137.25.21 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.25.22 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| PHInvalidImageRequestID | 0 | A special value provided for asynchronous image requests that cannot be canceled. |

Content Modes

| Constant | Value | Description |
|---|---|---|
| ContentModeAspectFill | 1 | Scales the image so that it completely fills the target size. |
| ContentModeAspectFit | 0 | Scales the image so that its larger dimension fits the target size. |
| ContentModeDefault | 0 | Fits the image to the requested size using the default option, PHImageContentModeAspectFit.<br>Use this content mode when requesting a full-sized image using the PHImageManagerMBS.MaximumSize value for the target size. In this case, the image manager does not scale or crop the image. |

### 137.25.23 Delegates

### 137.25.24 RequestAVAssetForVideoCompletedMBS(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, AVAsset as Variant, AVAudioMix as Variant, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls after loading the asset,Äôs data.
**Notes:** asset: An object that provides access to the video asset as a collection of tracks and metadata. For details on working with AVAsset objects, see AVFoundation Programming Guide.
audioMix: Use this object to rearrange the asset,Äôs audio tracks, edit additional audio into the mix, or configure an AVAssetReaderOutput object for exporting the asset,Äôs audio data. If nil, the asset uses a default audio mix.
info: A dictionary providing information about the status of the request. See Image Result Info Keys for possible keys and values.

We pass AVAsset, the AVAssetMBS object, as variant to avoid plugin dependencies.
Same for AVAudioMix with AVAudioMixMBS object.

### 137.25.25 RequestExportSessionForVideoCompletedMBS(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, exportPreset as string, exportSession as Variant, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls after loading the asset,Äôs data and preparing the export session.
**Notes:** exportSession: An AVAssetExportSessionMBS object that you can use for writing the video asset,Äôs data to a file.
info: A dictionary that provides information about the status of the request. See Image Result Info Keys for possible keys and values.

We pass AVAsset, the AVAssetExportSessionMBS object, as variant to avoid plugin dependencies.

### 137.25.26 RequestImageDataAndOrientationForAssetCompletedMBS(asset as PHAssetMBS, options as PHImageRequestOptionsMBS, imageData as MemoryBlock, dataUTI as String, orientation as Integer, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate called, exactly once, when image loading is complete, providing the requested image or information about the status of the request.
**Notes:** imageData: The requested image.
dataUTI: The uniform type identifier for the image.
orientation: The EXIF orientation for the image, as a CGImagePropertyOrientation.
info: A dictionary providing information about the status of the request.

### 137.25.27 RequestImageForAssetCompletedMBS(asset as PHAssetMBS, options as PHImageRequestOptionsMBS, result as NSImageMBS, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate to be called when image loading is complete, providing the requested image or information about the status of the request.
**Notes:** result: The requested image.

info: A dictionary providing information about the status of the request. See Image Result Info Keys for possible keys and values.

### 137.25.28 RequestLivePhotoForAssetCompletedMBS(asset as PHAssetMBS, options as PHImageRequestOptionsMBS, livePhoto as PHLivePhotoMBS, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate to be called when image loading is complete, providing the requested image or information about the status of the request.
**Notes:** result: The requested Live Photo object.
info: A dictionary providing information about the status of the request. See Image Result Info Keys for possible keys and values.

### 137.25.29 RequestPlayerItemForVideoCompletedMBS(asset as PHAssetMBS, options as PHVideoRequestOptionsMBS, playerItem as Variant, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate Photos calls after loading the asset,Äôs data and preparing the player item.
**Notes:** playerItem: An AVPlayerItemMBS object that you can use for playing back the video asset.
info: A dictionary providing information about the status of the request. See Image Result Info Keys for possible keys and values.

We pass playerItem, the AVPlayerItemMBS object, as variant to avoid plugin dependencies.

## 137.26 class PHImageRequestOptionsMBS

### 137.26.1 class PHImageRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the delivery of still image representations of Photos assets you request from an image manager.
**Notes:** Available on macOS 10.13 or newer.

### 137.26.2 Methods

### 137.26.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.26.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.26.5 copy as PHImageRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the request.

### 137.26.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.26.7 SetProgressHandler(ProgressHandler as ProgressHandlerMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the delegate that Photos calls periodically while downloading the image.
**Notes:** If you request an image whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your delegate periodically to report progress and to allow you to cancel the download.

### 137.26.8 Properties

### 137.26.9 DeliveryMode as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The requested image quality and delivery priority.
**Notes:** Use this property to tell Photos to provide an image quickly (possibly sacrificing image quality), to provide a high-quality image (possibly sacrificing speed), or to provide both automatically if needed. See DeliveryMode constants.
(Read and Write property)

### 137.26.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.26.11 NetworkAccessAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether Photos can download the requested image from iCloud.
**Notes:** If true, and the requested image is not stored on the local device, Photos downloads the image from iCloud. To be notified of the download,Äôs progress, use the progressHandler property to provide a delegate that Photos calls periodically while downloading the image. If false (the default), and the image is not on the local device, the PHImageResultIsInCloudKey value in the result handler,Äôs info dictionary indicates that the image is not available unless you enable network access.
(Read and Write property)

### 137.26.12 normalizedCropRect as CGRectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A rectangle for requesting a cropped version of the original image.
**Notes:** To request a cropped image, specify the crop rectangle in a unit coordinate space relative to the image. In this coordinate system, the point { 0.0,0.0 } refers to the upper left corner of the image, and the point { 1.0,1.0 } refers to the opposite corner regardless of the image,Äôs aspect ratio.
This property defaults to zero rectangle, which specifies no cropping.
If you specify a crop rectangle, you must also specify the PHImageRequestOptionsResizeModeExact option for the resizeMode property.
(Read and Write property)

### 137.26.13 ProgressHandler as ProgressHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls periodically while downloading the image.
**Notes:** If you request an image whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your delegate periodically to report progress and to allow you to cancel the download.
(Read and Write property)

### 137.26.14 ResizeMode as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mode that specifies how to resize the requested image.
**Notes:** Use this property to choose how to fit the image to the target size you specified when requesting image data. See PHImageRequestOptionsResizeMode.
(Read and Write property)

### 137.26.15 Synchronous as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether Photos processes the image request synchronously.
**Notes:** If false (the default), the requestImageForAsset method returns immediately. Depending on the deliveryMode property, Photos may call your resultHandler delegate before the method returns, at some later time, or both.
If true, the requestImageForAsset method blocks the calling thread until image data is ready or an error occurs. Photos calls your result handler delegate exactly once.

Perform synchronous requests from a background thread only.
(Read and Write property)

### 137.26.16 Version as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The version of the image to be requested.
**Notes:** Use this property to request a version of the image with or without adjustments, or to request high-quality original data (for example, a RAW file) if such is available. See Version constants.
(Read and Write property)

### 137.26.17 Constants

Delivery Modes

| Constant | Value | Description |
|---|---|---|
| DeliveryModeFastFormat | 2 | Photos provides only a fast-loading image, possibly sacrificing image quality. |
| DeliveryModeHighQualityFormat | 1 | Photos provides only the highest-quality image available, regardless of how much time it takes to load. |
| DeliveryModeOpportunistic | 0 | Photos automatically provides one or more results in order to balance image quality and responsiveness. |

Resize Mode

| Constant | Value | Description |
|---|---|---|
| ResizeModeExact | 2 | Photos resizes the image to match the target size exactly.<br>Resizing to exactly match a target size is less efficient than using the fast resizing option.<br>You must choose this option if you use the normalizedCropRect property to request a cropped image. |
| ResizeModeFast | 1 | Photos efficiently resizes the image to a size similar to, or slightly larger than, the target size.<br>With this option, Photos can use image subsampling to quickly provide an image at a size roughly matching the target size. |
| ResizeModeNone | 0 | Photos does not resize the image asset. |

Version Modes

| Constant | Value | Description |
|---|---|---|
| VersionCurrent | 0 | Request the most recent version of the image asset (the one that reflects all edits). |
| VersionOriginal | 2 | Request the original, highest-fidelity version of the image asset. |
| VersionUnadjusted | 1 | Request a version of the image asset without adjustments. |

### 137.26.18 Delegates

### 137.26.19 ProgressHandlerMBS(progress as double, error as NSErrorMBS, byref stop as boolean, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls while downloading asset data from iCloud. Used by the progressHandler property.
**Notes:** If you request an image whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress and to allow you to cancel the download.

Photos calls this block in an arbitrary serial queue. Dispatch to the main thread if your handler needs to update the user interface.

The method takes the following parameters:
progress: A floating-point value indicating the progress of the download. A value of 0.0 indicates that the download has just started, and a value of 1.0 indicates the download is complete.
error: An NSErrorMBS object describing an error that occurred when attempting to download the image, or nil if no errors have occurred.
stop: A pointer to a Boolean value. To cancel the download, set stop to true inside the block.
info: A dictionary providing additional information about the status of the image request. See Image Result Info Keys for possible keys and values. For example, a true value for the key PHImageResultIsDegradedKey indicates that Photos may send the full-quality version of the image later, depending on the value of the image request,Äôs deliveryMode property.

If the method call is asynchronously dispatched to main thread, the stop property does not work.

# 137.27 control PHLivePhotoControlMBS

## 137.27.1 control PHLivePhotoControlMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A view that displays a Live Photo—a picture that also includes motion and sound from the moments just before and after its capture.
**Notes:** Use a Live Photo view to display the photo and control playback of its motion and sound content.

In macOS, Live Photo objects are available only when editing Live Photo content in a photo editing extension that runs in the Photos app—see the PHContentEditingInputMBS class to access Live Photo content in an editing session.

By default, a Live Photo view uses its own gesture recognizer to allow the user to play the motion and sound content of a Live Photo with the same interactions and visual effects seen in the Photos app. To customize this gesture recognizer—for example, to install it on a different view for proper event handling in your app,Äôs view hierarchy—use the playbackGestureRecognizer property.

To animate the view briefly to hint that a picture is a Live Photo, use the startPlayback method with the PlaybackStyleHint option.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr1

**Xojo Developer Magazine**

- 18.3, page 57: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

## 137.27.2 Methods

## 137.27.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this control is available.

### 137.27.4 startPlayback(style as integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Begins playback of Live Photo content in the view.
**Notes:** style: An option for how much of the Live Photo,Äôs motion and sound content to play. See PHLivePhotoViewPlaybackStyle.

Use the style parameter to choose whether to play the full motion and sound content of the Live Photo or only a brief section.

Typically, an app does not need to directly control playback, because a Live Photo view provides interactive playback control. Use this method only when non-interactive playback is appropriate—for example, to briefly animate the content to indicate that a view contains a Live Photo rather than a still image.

### 137.27.5 stopPlayback

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Ends playback of Live Photo content in the view.
See also:

- 137.27.6 stopPlayback(animated as boolean) 19240

### 137.27.6 stopPlayback(animated as boolean)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Ends playback of Live Photo content in the view.
See also:

- 137.27.5 stopPlayback 19240

### 137.27.7 Properties

### 137.27.8 audioVolume as Single

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The audio gain to apply to the Live Photo,Äôs movie content during playback.
**Notes:** Values for this property must be between 0.0 and 1.0, inclusive. A value of 1.0 (the default) plays audio content from the Live Photo at full volume (relative to the system volume). A value of 0.0 is equivalent to setting the muted property to true.

(Read and Write property)

### 137.27.9 ContentMode as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The content mode.
**Notes:** (Read and Write property)

### 137.27.10 LivePhoto as PHLivePhotoMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The Live Photo displayed in the view.
**Notes:** (Read and Write property)

### 137.27.11 livePhotoBadgeView as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A view for displaying Live Photo status.
**Notes:** The PHLivePhotoViewMBS uses this subview to display icons indicating the existence or status of Live Photo content. Photos manages the content displayed in the badge view, so you don,Äôt need to do anything with view,Äôs content—instead, this property provides access to the badge view so you can change where it appears in your view hierarchy if needed. For example, if you display a Live Photo view within a scroll view, you can move the badge view so that its position remains constant while the scroll view scrolls.
(Read only property)

### 137.27.12 muted as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether the view plays the audio content of its Live Photo.
**Notes:** The default value is false, indicating that the view plays audio content along with the motion content of its Live Photo. Change this value to true to play motion content but not audio content.
(Read and Write property)

### 137.27.13 View as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 137.27.14 Events

### 137.27.15 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 137.27.16 Close

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 137.27.17 Closing

Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 137.27.18 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 137.27.19 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 137.27.20 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 137.27.21 didEndPlaybackWithStyle(playbackStyle as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Notifies the delegate that Live Photo playback has ended.
**Notes:** playbackStyle: The style of playback, indicating whether the content was played in full or briefly previewed.

### 137.27.22 EnableMenuItems

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 137.27.23 FocusLost

Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 137.27.24 FocusReceived

Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 137.27.25 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 137.27.26 GotFocus

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 137.27.27 LostFocus

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 137.27.28 MenuBarSelected

Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 137.27.29 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 137.27.30 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 137.27.31 MouseUp(x As Integer, y As Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 137.27.32 Open

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 137.27.33 Opening

Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 137.27.34 ScaleFactorChanged(NewFactor as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 137.27.35 willBeginPlaybackWithStyle(playbackStyle as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Notifies the control that Live Photo playback is about to begin.
**Notes:** playbackStyle: The style of playback, indicating whether the content is to be played in full or briefly previewed.

### 137.27.36 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 137.27.37 Constants

Content Modes

| Constant | Value | Description |
|---|---|---|
| ContentModeAspectFill | 1 | Aspect Fill. |
| ContentModeAspectFit | 0 | Aspect Fit. |

Playback Styles

| Constant | Value | Description |
|---|---|---|
| PlaybackStyleFull | 1 | Plays back the entire motion and sound content of the Live Photo, including transition effects at the start and end. |
| PlaybackStyleHint | 2 | Plays back only a brief section of the motion content of the Live Photo, without sound. |
| PlaybackStyleUndefined | 0 | This value is invalid for use. |

## 137.28 class PHLivePhotoEditingContextMBS

### 137.28.1 class PHLivePhotoEditingContextMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An editing session for modifying the photo, video, and audio content of a Live Photo.
**Notes:** A Live Photo is a picture, captured by a supported iOS device, that includes motion and sound from the moments just before and after it was taken. Editing the content of a Live Photo works much like editing other asset types:

1. In an app using the Photos framework, fetch a PHAsset object that represents the Live Photo to edit, and use that object,Äôs requestContentEditingInputWithOptions method to retrieve a PHContentEditingInputMBS object.
In a photo editing extension that runs within the Photos app, your extension,Äôs main view controller (which adopts the PHContentEditingController protocol) receives a PHContentEditingInputMBS object when the user chooses to edit a Live Photo with your extension.
2. Create a Live Photo editing context with the initWithLivePhotoEditingInput initializer.
You can create a Live Photo editing context only from PHContentEditingInputMBS object that represents a Live Photo. Use the livePhoto property of the editing input to verify that it has live Photo content.
3. Use the frameProcessor property to define a block to be used in processing the Live Photo,Äôs visual content. Photos will call this block repeatedly to process each frame of the Live Photo,Äôs video and still photo content.
4. Create a PHContentEditingOutputMBS object to store the results of your edit, then call the saveLivePhotoToOutput:options to process the Live Photo and save it to your editing output object. This method applies your frameProcessor to each frame.
Note
You can also use the prepareLivePhotoForPlaybackWithTargetSize method to process a preview-quality version of the Live Photo to display in your app,Äôs UI during editing.
5. To allow a user to continue working with the edit later (for example, to adjust the parameters of a filter), create a PHAdjustmentDataMBS object describing your changes, and store it in the adjustmentData property of your editing output.
6. In an app using the Photos framework, use a photo library change block to commit the edit. (For details, see PHPhotoLibrary.) In the block, create a PHAssetChangeRequestMBS object and set its contentEditingOutput property to the editing output that you created.
In a photo editing extension, provide the PHContentEditingOutputMBS object that you created in your main view controller,Äôs finishContentEditing method.

When you use either of the methods listed in Processing an Editing Context,Äôs Live Photo, Photos calls your frameProcessor delegate repeatedly to process each frame of the Live Photo,Äôs video and still photo content. In that block, a PHLivePhotoFrameMBS object provides the Live Photo,Äôs existing content as a CIImageMBS object. You use Core Image to modify the image, then provide the result of your edits by returning a CIImageMBS object representing the result of processing the input image.

Core Image provides several ways to process the Live Photo,Äôs visual content. You can use the built-in filters listed in Core Image Filter Reference or create CIFilterMBS subclasses using custom graphics kernel

code. Or, to use other image processing technologies, you can directly access and modify image content in pixel buffers, Metal textures, or IOSurfaceRef objects with a custom CIImageProcessorKernel subclass.

### 137.28.2 Methods

### 137.28.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.12 or newer.

### 137.28.4 cancel

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Aborts any Live Photo processing in progress.
**Notes:** This method applies only after you,Äôve begun processing a Live Photo for display or output with the initWithLivePhotoEditingInput or saveLivePhotoToOutput method. After you call this method, Photos calls your completion handler and provides an error with the PHLivePhotoEditingErrorCodeAborted error code.

### 137.28.5 Constructor(livePhotoInput as PHContentEditingInputMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a Live Photo editing context for the specified editing input.
**Notes:** livePhotoInput: A content editing input object representing the Live Photo for which to perform editing.

Returns a new Live Photo editing context, or nil if the provided content editing input does not represent a Live Photo.

In an app using the Photos framework, you obtain a PHContentEditingInputMBS object by calling requestContentEditingInputWithOptions method of a PHAssetMBS object that you,Äôve previously fetched.
In a photo editing extension that runs within the Photos app, your extension,Äôs main view controller (which adopts the PHContentEditingController protocol) receives a PHContentEditingInputMBS object when the user chooses to edit a Live Photo with your extension.

You can create a Live Photo editing context only from PHContentEditingInputMBS object that represents a Live Photo. Use the livePhoto property of the editing input to verify that it has live Photo content.

### 137.28.6 PHLivePhotoShouldRenderAtPlaybackTime as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether processing should occur during or before playback.
**Notes:** The value for this key is an NSNumber object with a Boolean value. With the default value of false, Photos always renders your edits immediately when you call the Constructor, calling your frameProcessor block for each frame in the Live Photo,Äôs video and still photo content.

When you specify a value of true, Photos can defer rendering until playback time, calling your frameProcessor block only for photo and video frames that need to be displayed. However, in this case Photos may still choose to pre-render your edits if needed.

This option does not apply when rendering for output with the saveLivePhotoToOutput method.

### 137.28.7 prepareLivePhotoForPlayback(targetSize as CGSizeMBS, options as Dictionary = nil, completionHandler as PrepareLivePhotoForPlaybackCompletedMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Processes a Live Photo with your edits for viewing.
**Notes:** targetSize: The size of the view in which you plan to preview the edited Live Photo output.
options: Options that affect Live Photo rendering. See Live Photo Processing Options.

Use this method to generate preview versions of the edited Live Photo—for example, to display in your editing UI.

### 137.28.8 saveLivePhotoToOutput(ContentEditingOutput as PHContentEditingOutputMBS, options as Dictionary = nil, completionHandler as PrepareLivePhotoForPlaybackCompletedMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Processes and saves a full-quality Live Photo as the output of your editing session.
**Notes:** output: The photo editing output to receive the rendered Live Photo, created from the same PHContentEditingInputMBS object you used to begin this Live Photo editing context.
options: Options that affect Live Photo rendering. See Live Photo Processing Options.

Use this method when you have finished an editing session and need to provide rendered output in a PHContentEditingOutputMBS object. Unlike when rendering output for a photo or video asset, you don,Äôt need to provide rendered output using the renderedContentURL property of the editing output object. Instead, create a PHContentEditingOutputMBS object using the Constructor initializer, passing the same PHContentEditingInputMBS object you used in the FrameProcessing delegate initializer to start this Live Photo editing context. Then pass that editing output object to this method, and Photos renders the Live Photo and provides it to the editing output.

Don,Äôt forget to describe your edits in a PHAdjustmentDataMBS object and provide that to the adjustmentData property of your content editing output. Providing adjustment data allows your app (or photo editing extension) to non-destructively resume working with an edit later, whether on the same device or on another Mac or iOS device using iCloud Photo Library.

After this method,Äôs completion handler signals successful rendering, you use the content editing output to complete the edit. In an app using the Photos framework, create a PHAssetChangeRequestMBS object inside a changes, and set its contentEditingOutput property to your editing output. In a photo editing extension running in the Photos app, your main view controller provides content editing output when requested by the finishContentEditing method.

### 137.28.9 SetFrameProcessor(FrameProcessor as FrameProcessorMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets a delegate to be called by Photos for processing each frame of the Live Photo,Äôs visual content.
**Notes:** Use this property to define the image processing to be performed on each frame of the Live Photo. Setting this property does not begin processing; instead, after you call one of the methods listed in Processing an Editing Context,Äôs Live Photo, Photos executes your block repeatedly to process each frame of the Live Photo,Äôs video and still photo content.

In your frame processor block, use the image property of the provided PHLivePhotoFrameMBS object to access the image to be processed, and return a CIImageMBS object representing the result of your processing. For example, the following code sets up a processor block to apply a simple sepia-tone filter, then calls the saveLivePhotoToOutput method to begin processing the Live Photo for output.

### 137.28.10 Properties

### 137.28.11 audioVolume as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The audio gain to apply to the processed Live Photo.
**Notes:** Values must be between 0.0 and 1.0, inclusive. A value of 1.0 (the default) leaves the audio content of the Live Photo unchanged. A value of 0.0 mutes all audio in the output Live Photo.
Setting this property does not process the Live Photo content; instead, it sets the audio gain to be applied when you later process the Live Photo using one of the methods listed in Processing an Editing Context,Äôs Live Photo.
(Read and Write property)

### 137.28.12 duration as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The duration, in seconds, of the Live Photo.
**Notes:** (Read only property)

### 137.28.13 fullSizeImage as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unedited still photo content of the Live Photo.
**Notes:** Value is CIImageMBS.
Use this property to display the unedited Live Photo,Äôs photo content, or to provide still-image previews in your editing UI.

For the best interactive editing performance, use a Metal, OpenGL, or OpenGL ES view and corresponding Core Image context to render editing results. See Processing Images in Core Image Programming Guide for details and examples.

This image does not reflect the Live Photo,Äôs orientation metadata. Adjust your rendering based on the orientation property to ensure that the image appears to the user in the correct orientation.
(Read only property)

### 137.28.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.28.15 orientation as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The image orientation of the Live Photo.
**Notes:** This fullSizeImage object does not reflect the Live Photo,Äôs orientation metadata. Use this property when displaying that image to ensure that it appears to the user in the correct orientation.
(Read only property)

### 137.28.16 photoTime as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset, in seconds, from the beginning of the Live Photo,Äôs duration to the time corresponding to its still photo.
**Notes:** To create time-based effects in your frameProcessor block, use this property together with the duration property.
(Read only property)

### 137.28.17 Delegates

### 137.28.18 FrameProcessorMBS(frame as PHLivePhotoFrameMBS, byref error as NSErrorMBS, tag as Variant) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate for a block Photos calls to process Live Photo frames.
**Notes:** Result of delegate method must be a CIImageMBS object.

To apply edits to a Live Photo, define a block with this signature and assign it to the frameProcessor property of a Live Photo editing context. Then call the initWithLivePhotoEditingInput: to prepare a preview-quality version of your edits for display, or the saveLivePhotoToOutput method to produce full-quality final output. When you call one of those methods, Photos calls your frame processor block repeatedly—processing each frame of the Live Photo,Äôs video content as well as its still photo content—to render the output.

This delegates takes the following parameters:

frame: A PHLivePhotoFrameMBS object describing the frame image to be processed.
error: If your delegate cannot successfully process the frame, set this to an error object describing the failure.

Your block should return a CIImageMBS object representing the result of your edits, or nil to indicate that your image processing has failed and the Live Photo edit should be aborted. Use the frame parameter,Äôs

image property to access the image to be edited.

### 137.28.19 PrepareLivePhotoForPlaybackCompletedMBS(options as Dictionary, livePhoto as PHLivePhotoMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls on the main queue after processing is complete.
**Notes:** livePhoto: The rendered Live Photo, suitable for displaying in a PHLivePhotoViewMBS object.
error: If preparing the edited Live Photo for display succeeds, this parameter is nil. If processing fails, the livePhoto parameter is nil, and this parameter contains an error object describing the failure.

### 137.28.20 SaveLivePhotoToOutputCompletedMBS(output as PHContentEditingOutputMBS, options as Dictionary, success as Boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls on the main queue after rendering is complete.
**Notes:** success: True if rendering succeeds; otherwise false.
error: If rendering succeeds, this parameter is nil. If rendering fails, this parameter contains an error object describing the failure.

# 137.29 class PHLivePhotoFrameMBS

## 137.29.1 class PHLivePhotoFrameMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container that provides image content for a single frame of a Live Photo in an editing context.
**Notes:** You don,Äôt create classes that implement this protocol. Instead, you provide a frameProcessor block when editing a Live Photo with the PHLivePhotoEditingContextMBS class. When you process your edits for output or display, Photos calls your block repeatedly to process each frame of the Live Photo,Äôs video and still photo content. On each call, Photos provides the frame,Äôs image content and associated information in an object that adopts this protocol. In that block, you use that object,Äôs image property to access the image to be edited, then perform your edits and return another CIImageMBS object representing the result of processing the input image.

Requires macOS 10.12 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 137.29.2 Methods

## 137.29.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.12 or newer.

## 137.29.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 137.29.5 Properties

## 137.29.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.29.7 Image as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The image content of the frame to be processed.
**Notes:** Value is CIImageMBS object.
Core Image provides several ways to perform your adjustments to this image:

- Create a single CIFilterMBS object, or a chain of filters. Set this image as the kCIInputImageKey parameter of the first filter in the chain, and use the last filter,Äôs outputImage property to access the result. Each CIFilter object can be a built-in filter or a custom filter subclass that you create.
- Use the imageByApplyingFilter method to conveniently apply one of the many built-in Core Image filters.
- Access pixel buffers directly and apply custom image processing using a custom CIImageProcessorKernelMBS subclass.

In all cases, you obtain another CIImageMBS object representing the result of your adjustments. Return that image from your frameProcessor block. (See the frameProcessor description for example code.)
(Read only property)

### 137.29.8 renderScale as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The scale factor of the frame image relative to the Live Photo,Äôs photo content.
**Notes:** Photos calls your frameProcessor block repeatedly, both to process each frame of the Live Photo,Äôs video content and to process the Live Photo,Äôs still photo content. Video frames can be a different size than still photo content—use this value to scale any of your image processing parameters that depend on the image,Äôs size.
(Read only property)

### 137.29.9 time as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The time offset, in seconds, of this frame relative to the start of the Live Photo.
**Notes:** You can use this value to vary your image processing over time, creating animated effects.
(Read only property)

### 137.29.10 Type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The type of image content in this frame.
**Notes:** Photos calls your frameProcessor block repeatedly, both to process each frame of the Live Photo,Äôs video content and to process the Live Photo,Äôs still photo content. Use this property to distinguish photo content from video frames—for example, to add a watermark only to still photo content.
(Read only property)

### 137.29.11 Constants

Types

| Constant | Value | Description |
|---|---|---|
| TypePhoto | 0 | The image is a still photo. |
| TypeVideo | 1 | The image is a single frame from the Live Photo,Äôs video content. |

## 137.30 class PHLivePhotoMBS

### 137.30.1 class PHLivePhotoMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A displayable representation of a Live Photo—a picture that includes motion and sound from the moments just before and after its capture.
**Notes:** In macOS, you can use this class to display edits in progress for Live Photo content in a photo editing extension.

For guidance on how to integrate Live Photos with your app,Äôs user experience, see Live Photos in iOS Human Interface Guidelines.

The PHLivePhotoMBS class serves in much the same role for Live Photos as the NSImageMBS class serves for static images. A NSImageMBS object represents not the data file an image is loaded from, but instead a ready-to-use image that can be displayed in a view—similarly, a PHLivePhotoMBS object represents a Live Photo ready to display with motion and sound using a PHLivePhotoViewMBS object, not an entry in the Photos library or the data resources that constitute a Live Photo. (To work with Live Photos as elements of the Photos library, use the PHAsset class. To work with the data files that constitute a Live Photo, use the PHAssetResourceMBS class.)
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5

### 137.30.2 Methods

### 137.30.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.12 or newer.

### 137.30.4 cancelLivePhotoRequestWithRequestID(requestID as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels an asynchronous request.
**Notes:** requestID: The numeric identifier of the request to be canceled.

When you use the requestLivePhotoWithResourceFileURLs method to asynchronously load a Live Photo from resource files, the method returns a numeric identifier for the request. To cancel the request before it completes, provide the identifier when calling the cancelLivePhotoRequestWithRequestID method.

### 137.30.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.30.6 copy as PHLivePhotoMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 137.30.7 PHLivePhotoInfoCancelledKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary in RequestLivePhotoWithResourceFileURLsMBS delegate.
**Notes:** A Boolean value indicating whether the Live Photo loading request was canceled.

### 137.30.8 PHLivePhotoInfoErrorKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary in RequestLivePhotoWithResourceFileURLsMBS delegate.
**Notes:** An error that occurred while attempting to load the requested Live Photo.

### 137.30.9 PHLivePhotoInfoIsDegradedKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for the info dictionary in RequestLivePhotoWithResourceFileURLsMBS delegate.

**Notes:** A Boolean value indicating whether the result Live Photo is a low-quality substitute for the requested Live Photo.

If true, the result parameter of your resultHandler block contains a still or low-quality Live Photo, and Photos will call your result delegate method again to provide the full motion and sound content of the Live Photo. If false, Photos has provided all possible data and will not call your result handler again.

### 137.30.10 requestLivePhotoWithResourceFileURLs(Files() as FolderItem, placeholderImage as NSImageMBS = nil, targetSize as CGSizeMBS, contentMode as Integer, theDelegate as RequestLivePhotoWithResourceFileURLsMBS, Tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asynchronously loads a Live Photo from the specified resource files.
**Notes:** fileURLs: An array of Folderitems containing the resource URLs that constitute a Live Photo, as obtained using the PHAssetResource class.
image: A static image to represent the Live Photo before its full content has been loaded and validated.
targetSize: The target size of Live Photo to be returned. Pass zero size to obtain the requested Live Photo at its original size.
contentMode: An option for how to fit the image to the aspect ratio of the requested size. For details, see PHLivePhotoMBS class.
See also:

- 137.30.11 requestLivePhotoWithResourceFileURLs(fileURLs() as String, placeholderImage as NSImageMBS = nil, targetSize as CGSizeMBS, contentMode as Integer, theDelegate as RequestLivePhotoWithResourceFileURLsMBS, Tag as Variant = nil) as Integer 19260

### 137.30.11 requestLivePhotoWithResourceFileURLs(fileURLs() as String, placeholderImage as NSImageMBS = nil, targetSize as CGSizeMBS, contentMode as Integer, theDelegate as RequestLivePhotoWithResourceFileURLsMBS, Tag as Variant = nil) as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asynchronously loads a Live Photo from the specified resource files.
**Notes:** fileURLs: An array of Folderitems containing the resource URLs that constitute a Live Photo, as obtained using the PHAssetResource class.
image: A static image to represent the Live Photo before its full content has been loaded and validated.
targetSize: The target size of Live Photo to be returned. Pass zero size to obtain the requested Live Photo at its original size.
contentMode: An option for how to fit the image to the aspect ratio of the requested size. For details, see PHLivePhotoMBS class.
See also:

- 137.30.10 requestLivePhotoWithResourceFileURLs(Files() as FolderItem, placeholderImage as NSImageMBS = nil, targetSize as CGSizeMBS, contentMode as Integer, theDelegate as RequestLivePhotoWithResourceFileURLsMBS, Tag as Variant = nil) as Integer 19260


### 137.30.12 Properties

### 137.30.13 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.30.14 Height as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size, in pixels, of the Live Photo.
**Notes:** (Read only property)

### 137.30.15 Width as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size, in pixels, of the Live Photo.
**Notes:** (Read only property)

### 137.30.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| RequestIDInvalid | 0 | The value for an invalid request ID. |

Content Modes

| Constant | Value | Description |
|---|---|---|
| ContentModeAspectFill | 1 | Scales the image so that it completely fills the target size. |
| ContentModeAspectFit | 0 | Scales the image so that its larger dimension fits the target size. |
| ContentModeDefault | 0 | Fits the image to the requested size using the default option, ContentModeAspectFit. |

### 137.30.17 Delegates

### 137.30.18 RequestLivePhotoWithResourceFileURLsMBS(LivePhoto as PHLivePhotoMBS, placeholderImage as NSImageMBS, targetSize as CGSizeMBS, contentMode as Integer, tag as variant, info as Dictionary)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The method called when live photo is loaded.
**Notes:** LivePhoto: The requested Live Photo object.
info: A dictionary providing information about the status of the request. See PHLivePhotoMBS class for possible keys and values.

Method may be called twice if there is a low res and high res version.

# 137.31 class PHLivePhotoRequestOptionsMBS

## 137.31.1 class PHLivePhotoRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the delivery of Live Photo assets you request from an image manager.
**Notes:** A Live Photo is a picture that includes movement and sound from the moments just before and after its capture.
Available in MacOS 10.15 or newer.

## 137.31.2 Methods

## 137.31.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

## 137.31.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

## 137.31.5 copy as PHLivePhotoRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the options object.

## 137.31.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.31.7 SetProgressHandler(ProgressHandler as ProgressHandlerMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the delegate which Photos calls periodically while downloading the Live Photo.
**Notes:** If you request a Live Photo whose data is not on the local device, and you have enabled downloading with the PHLivePhotoRequestOptionsMBS property, Photos calls your block periodically to report progress and to allow you to cancel the download.

### 137.31.8 Properties

### 137.31.9 DeliveryMode as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The requested Live Photo quality and delivery priority.
**Notes:** Use this property to tell Photos to provide a Live Photo quickly (possibly sacrificing image quality), to provide a high-quality Live Photo (possibly sacrificing speed), or to provide both automatically if needed. See DeliveryMode constants.
(Read and Write property)

### 137.31.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.31.11 NetworkAccessAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether Photos can download the requested Live Photo data from iCloud.
**Notes:** If true, and the requested Live Photo data is not stored on the local device, Photos downloads that data from iCloud. To be notified of the download,Äôs progress, use the progressHandler property to provide a block that Photos calls periodically while downloading. If false (the default), and the Live Photo data is not on the local device, the PHImageResultIsInCloudKey value in the result handler,Äôs info dictionary indicates that the data is not available unless you enable network access.
(Read and Write property)

### 137.31.12 ProgressHandler as ProgressHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate which Photos calls periodically while downloading the Live Photo.
**Notes:** If you request a Live Photo whose data is not on the local device, and you have enabled downloading with the PHLivePhotoRequestOptionsMBS property, Photos calls your block periodically to report progress and to allow you to cancel the download.
(Read and Write property)

### 137.31.13 Version as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The version of the Live Photo to be requested.
**Notes:** Use this property to request a version of the Live Photo with or without adjustments. See Version constants.
(Read and Write property)

### 137.31.14 Constants

Delivery Modes

| Constant | Value | Description |
|---|---|---|
| DeliveryModeFastFormat | 2 | Photos provides only a fast-loading image, possibly sacrificing image quality. |
| DeliveryModeHighQualityFormat | 1 | Photos provides only the highest-quality image available, regardless of how much time it takes to load. |
| DeliveryModeOpportunistic | 0 | Photos automatically provides one or more results in order to balance image quality and responsiveness. |

Version Type

| Constant | Value | Description |
|---|---|---|
| VersionCurrent | 0 | Request the most recent version of the image asset (the one that reflects all edits). |
| VersionOriginal | 2 | Request the original, highest-fidelity version of the image asset. |
| VersionUnadjusted | 1 | Request a version of the image asset without adjustments. |

### 137.31.15 Delegates

### 137.31.16 ProgressHandlerMBS(progress as double, error as NSErrorMBS, byref stop as boolean, info as Dictionary, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls periodically while downloading the Live Photo..
**Notes:** If you request a Live Photo whose data is not on the local device, and you have enabled downloading with the progressHandler property in PHLivePhotoRequestOptionsMBS class, Photos calls your block periodically to report progress and to allow you to cancel the download.

progress: A floating-point value indicating the progress of the download. A value of 0.0 indicates that the download has just started, and a value of 1.0 indicates the download is complete.
error: An NSErrorMBS object describing an error that occurred when attempting to download the image, or nil if no errors have occurred.
stop: A Boolean value. To cancel the download, set stop to true inside the method.
info: A dictionary providing additional information about the status of the image request. See Image Result Info Keys for possible keys and values. For example, a true value for the key PHImageResultIsDegradedKey indicates that Photos may send the full-quality version of the image later, depending on the value of the image request,Äôs deliveryMode property.

If this method is dispatched asynchronously to the main thread, the stop property doesn't work.

# 137.32 class PHObjectChangeDetailsMBS

## 137.32.1 class PHObjectChangeDetailsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A description of changes that occurred in an asset or collection object.
**Notes:** A PHObjectChangeDetailsMBS object provides detailed information about differences between two states of an asset or collection object—one that you previously obtained and an updated state that would result if you fetched that entity again. You observe changes via events in PHPhotoLibraryMBS object. When Photos notifies your observer of a change, you get change details by passing the object you,Äôre interested in to the changeDetailsForObject method.

For an asset collection or collection list, a PHObjectChangeDetailsMBS object describe changes only to the collection,Äôs properties. If you are instead interested in changes to the collection,Äôs membership, fetch the collection,Äôs contents and use the changeDetailsForFetchResult: method to track changes to the fetch result.

Needs macOS 10.13 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 137.32.2 Methods

## 137.32.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

## 137.32.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.32.5 Properties

### 137.32.6 assetContentChanged as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the asset,Äôs photo or video content has changed.
**Notes:** If this value true, you can use the PHImageManagerMBS class to retrieve updated content.
This value is false if the asset has not changed or if the change details do not refer to a PHAssetMBS object.
(Read only property)

### 137.32.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.32.8 objectAfterChanges as PHObjectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that reflects the current state of the asset or collection it represents.
**Notes:** Read this object,Äôs properties to retrieve updated metadata for the asset or collection. Using this object is equivalent to repeating the same fetch that returned the original object.
(Read only property)

### 137.32.9 objectBeforeChanges as PHObjectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that reflects the original state of the asset or collection it represents.
**Notes:** This property,Äôs value is the same object you passed to the changeDetailsForObject to request change details.
(Read only property)

### 137.32.10 objectWasDeleted as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the object has been deleted from the Photos library.

**Notes:** If this value is true, the asset or collection has been permanently deleted from the Photos library.

To instead track the removal of assets from collections (or collections from collection lists), fetch the collection,Äôs contents and use the changeDetailsForFetchResult method to track changes to the fetch result. (Read only property)

## 137.33 class PHObjectMBS

### 137.33.1 class PHObjectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The abstract superclass for Photos model objects (assets and collections).
**Notes:** You do not create or use instances of this class directly. Instead, work with instances of its concrete subclasses —PHAssetMBS, PHAssetCollectionMBS, PHCollectionListMBS, and PHObjectPlaceholderMBS.

Because the PHObjectMBS class implements the isEqual and hash methods in terms of its localIdentifier property, you can use techniques that depend on these methods to keep track of asset and collection objects. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 137.33.2 Methods

### 137.33.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.33.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.33.5 copy as PHObjectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 137.33.6 Properties

### 137.33.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.33.8 localIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A unique string that persistently identifies the object.
**Notes:** Use this string to find the object by using the fetchAssetsWithLocalIdentifiers, fetchAssetCollectionsWithLocalIdentifiers, or fetchCollectionListsWithLocalIdentifiers method.
(Read only property)

## 137.34 class PHObjectPlaceholderMBS

### 137.34.1 class PHObjectPlaceholderMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A read-only proxy representing a Photos asset or collection object yet to be created by a change request.
**Notes:** You obtain object placeholders when you use change requests to create assets, collections, or collection lists. After the change request completes, you can use the object placeholder to fetch the newly created object. You can also use an object placeholder to make additional change requests involving the object to be created.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 137.34.2 Methods

### 137.34.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.34.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.34.5 Properties

### 137.34.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

# 137.35 class PHPhotoLibraryMBS

## 137.35.1 class PHPhotoLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A shared object that manages access and changes to the user,Äôs shared photo library.
**Notes:** The shared PHPhotoLibraryMBS object represents the entire set of assets and collections managed by the Photos app, including both assets stored on the local device and (if enabled) those stored in iCloud Photos. You use this object for the following tasks:

- Getting or verifying the user's permission for your app to access Photos content.
- Making changes to assets and collections; for example, editing asset metadata or content, inserting new assets, or rearranging the members of a collection.
- Registering for update messages sent when changes are made to the library.

Requires MacOS 10.13 or newer.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- Show Live Photos in your Xojo application

**Videos**

- XDC 2020 MBS Plugins Presentation

## 137.35.2 Methods

## 137.35.3 authorizationStatus as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns information about your app,Äôs authorization to access the user,Äôs photo library.
**Notes:** Returns the current authorization status.

Accessing the photo library always requires explicit permission from the user. The first time your app uses PHAssetMBS, PHCollectionMBS, PHAssetCollectionMBS, or PHCollectionListMBS methods to fetch content from the library, or uses one of the methods listed in Applying Changes to the Photo Library to request changes to library content, Photos automatically and asynchronously prompts the user to request authorization.

Important
Your app,Äôs Info.plist file must provide a value for the NSPhotoLibraryUsageDescription key that explains to the user why your app is requesting Photos access. Apps linked on or after iOS 10 will crash if this key is not present.

After the user grants permission, the system remembers the choice for future use in your app, but the user can change this choice at any time using the Settings app. If the user has denied your app photo library access, not yet responded to the permission prompt, or cannot grant access due to restrictions, any attempts to fetch photo library content will return empty PHFetchResultMBS objects, and any attempts to perform changes to the photo library will fail.

Tip
Use the DidChange event to observe photo library changes before fetching content. After the user grants access to the photo library for your app, Photos sends change messages for any empty fetch results you retrieved beforehand, notifying you that library content for those fetches is now available.

If this method returns PHAuthorizationStatusNotDetermined, you can call the requestAuthorization method to prompt the user for photo library access permission.

### 137.35.4 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.35.5 cloudIdentifiersForLocalIdentifiers(localIdentifiers() as String) as PHCloudIdentifierMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries cloud identifiers for local identifiers.

### 137.35.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.35.7 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.35.8 localIdentifiersForCloudIdentifiers(cloudIdentifiers() as PHCloudIdentifierMBS) as String()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries local identifiers for cloud identifiers.

### 137.35.9 performChanges(ChangeBlock as ChangeBlockMBS, CompletionHandler as ChangeCompletionHandlerMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asynchronously runs a block that requests changes to be performed in the photo library.
**Notes:** We call back to main thread for delegates, so please keep main thread available.

### 137.35.10 PHLocalIdentifierNotFound as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the error constants.
**Notes:** The local identifier was not found.

### 137.35.11 PHPhotosErrorDomain as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The error domain for Photos errors.

### 137.35.12 requestAuthorization(CompletionHandler as RequestAuthorizationCompletedMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests the user,Äôs permission, if needed, to access the photo library.
**Notes:** CompletionHandler: Photos calls this delegate upon determining your app,Äôs authorization to access the photo library.

Accessing the photo library always requires explicit permission from the user. The first time your app uses PHAssetMBS, PHCollectionMBS, PHAssetCollectionMBS, or PHCollectionListMBS methods to fetch content from the library, or uses one of the methods listed in Applying Changes to the Photo Library to request changes to library content, Photos automatically and asynchronously prompts the user to request authorization. Alternatively, you can call this method to prompt the user at a time of your choosing.

Important:
Your app,Äôs Info.plist file must provide a value for the NSPhotoLibraryUsageDescription key that explains to the user why your app is requesting Photos access. Apps linked on or after iOS 10 will crash if this key is not present.

After the user grants permission, the system remembers the choice for future use in your app, but the user can change this choice at any time using the Settings app. If the user has denied your app photo library access, not yet responded to the permission prompt, or cannot grant access due to restrictions, any attempts to fetch photo library content will return empty PHFetchResultMBS objects, and any attempts to perform changes to the photo library will fail.

Use the DidChange event to observe photo library changes before fetching content. After the user grants access to the photo library for your app, Photos sends change messages for any empty fetch results you retrieved beforehand, notifying you that library content for those fetches is now available.

This method always returns immediately. If the user has previously granted or denied photo library access permission, it executes the delegate when called; otherwise, it displays an alert and executes the block only after the user has responded to the alert.

### 137.35.13 sharedPhotoLibrary as PHPhotoLibraryMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Retrieves the shared photo library object.
**Notes:** The singleton photo library object.

### 137.35.14 Properties

### 137.35.15 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.35.16 unavailabilityReason as NSErrorMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The error object to give reason for unavailability.
**Notes:** (Read only property)

### 137.35.17 Events

### 137.35.18 DidBecomeUnavailable

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** The Photos library did become unavailable.

### 137.35.19 DidChange(changes as PHChangeMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:**

Tells you that a set of changes has occurred in the Photos library.
Required.
**Notes:**

change: An object representing the changes.

Use the provided PHChangeMBS object to find out which, if any, of the albums or collections you,Äôre interested in have changed and get detailed change information. Call the change object,Äôs changeDetailsForObject method to get information about changes to an asset,Äôs contents or metadata properties or about a collection,Äôs metadata properties. Call the change object,Äôs changeDetailsForFetchResult to get information about changes to a collection,Äôs list of members (or to any other fetch result).

### 137.35.20 Constants

Authorization Status

| Constant | Value | Description |
|---|---|---|
| PHAuthorizationStatusAuthorized | 3 | The user has explicitly granted your app access to the photo library. |
| PHAuthorizationStatusDenied | 2 | The user has explicitly denied your app access to the photo library. |
| PHAuthorizationStatusNotDetermined | 0 | Explicit user permission is required for photo library access, but the us not yet granted or denied such permission. |
| PHAuthorizationStatusRestricted | 1 | Your app is not authorized to access the photo library, and the user c grant such permission. |

Errors

| Constant | Value | Description |
|---|---|---|
| PHPhotosErrorInvalid | -1 | Invalid error? |
| PHPhotosErrorLibraryVolumeOffline | 3114 | Library volume offline. |
| PHPhotosErrorRelinquishingLibraryBundleToWriter | 3142 | Relinquishing library bundle to writer |
| PHPhotosErrorSwitchingSystemPhotoLibrary | 3143 | Failed to switch system photo library. |
| PHPhotosErrorUserCancelled | 3072 | The user cancelled. |

### 137.35.21 Delegates

### 137.35.22 ChangeBlockMBS(tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that requests changes to be performed.
**Notes:** This delegate takes no parameters and has no return value.

### 137.35.23 ChangeCompletionHandlerMBS(success as boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A delegate that Photos calls after the change block completes and Photos performs the requested changes.
**Notes:** success: True if Photos successfully applied the changes requested in the block; otherwise, false.
error: If an error occurs, an NSError object describing the error; otherwise, nil.

# 137.36 class PHPickerConfigurationMBS

## 137.36.1 class PHPickerConfigurationMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** An object that contains information about how to configure a picker view controller.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MBS Xojo Plugins, version 23.2pr1
- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5
- MBS Xojo Plugins, version 22.5pr1

## 137.36.2 Methods

## 137.36.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new configuration object.
**Notes:** This configuration doesn,Äôt return asset identifiers. To create configuration object with the system photo library use the other constructor.
See also:

- 137.36.4 Constructor(PhotoLibrary as Variant) 19279

## 137.36.4 Constructor(PhotoLibrary as Variant)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new configuration object for a photo library.
**Notes:** photoLibrary: The library from which to pick photos and videos.

Please pass a PHPhotoLibraryMBS class.
See also:

- 137.36.3 Constructor 19279

### 137.36.5 copy as PHPickerConfigurationMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the configuration object.

### 137.36.6 preselectedAssetIdentifiers as String()

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** An array of asset identifiers to preselect in the picker.

### 137.36.7 setPreselectedAssetIdentifiers(Identifiers() as String)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Sets an array of asset identifiers to preselect in the picker.
**Notes:** Preselection works only when initializing a PHPickerConfigurationMBS object with a photo library. Otherwise, the system returns an error.

The number of preselected asset identifiers can exceed your selection limit. The system disables the done action until the selection count is lower than selectionLimit.
Additionally, when you configure a picker with preselected identifiers:
Results include all preselected identifiers when canceling the picker.
Results don,Äôt include item providers for preselected assets that remain selected.
When deselecting all assets, the system keeps the done action enabled.

### 137.36.8 Properties

### 137.36.9 DisabledCapabilities as Integer

MBS iOS Plugin, Plugin Version: 23.4, Platform: iOS, Targets: Desktop & iOS.

**Function:** Capabilities of the picker that should be disabled.
**Notes:** Default is CapabilitiesNone.
For macOS 14 and iOS 17 or newer.
(Read and Write property)

### 137.36.10 Filter as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The filter you apply to restrict the asset types the picker displays.
**Notes:** By default, a configuration object displays all asset types: images, Live Photos, and videos.
(Read and Write property)

### 137.36.11 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.36.12 Mode as Integer

MBS iOS Plugin, Plugin Version: 23.4, Platform: iOS, Targets: Desktop & iOS.

**Function:** The mode of the picker.
**Notes:** Default is ModeDefault.
For macOS 14 and iOS 17 or newer.
(Read and Write property)

### 137.36.13 PreferredAssetRepresentationMode as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A mode that determines which representation to use if an asset contains more than one.
**Notes:** An asset can contain many representations under the same uniform type identifier, or you can prefer a specific format. This mode determines which representation a result uses if many exist.

The system may perform additional transcoding to convert the asset you request to the compatable representation. Use PHPickerConfigurationMBS.AssetRepresentationModeCurrent to avoid transcoding, if possible.
(Read and Write property)

### 137.36.14 Selection as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The selection behavior for the picker.
**Notes:** (Read and Write property)

### 137.36.15 SelectionLimit as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The maximum number of selections the user can make.
**Notes:** The default value is 1. Setting the value to 0 sets the selection limit to the maximum that the system supports.
(Read and Write property)

### 137.36.16 Constants

Asset Representation Modes

| Constant | Value | Description |
|---|---|---|
| AssetRepresentationModeAutomatic | 0 | A mode that indicates that the system chooses the appropriate asset repr tation. |
| AssetRepresentationModeCompatible | 2 | A mode that uses the most compatible asset representation. |
| AssetRepresentationModeCurrent | 1 | A mode that uses the current representation to avoid transcoding, if poss |

Capabilities

| Constant | Value | Description |
|---|---|---|
| CapabilitiesCollectionNavigation | 4 | The sidebar or the albums tab. |
| CapabilitiesNone | 0 | No specified capabilities. |
| CapabilitiesSearch | 1 | The search bar. |
| CapabilitiesSelectionActions | 8 | The "Cancel" and the "Add" (if possible) button. |
| CapabilitiesSensitivityAnalysisIntervention | 16 | Show intervention UI explaining potential risks for kids or teens if asset is selected. Analysis and intervention will only be performed if nications Safety" is enabled in ScreenTime. |
| CapabilitiesStagingArea | 2 | The staging area. |

Modes

| Constant | Value | Description |
|---|---|---|
| ModeCompact | 1 | Compact picker mode (single row). |
| ModeDefault | 0 | Default picker mode. |

Selection Behavior

| Constant | Value | Description |
|---|---|---|
| SelectionContinuous | 2 | Selection can be delivered continuously.<br>For macOS 14 and iOS 17 or newer. |
| SelectionContinuousAndOrdered | 3 | Selection can be delivered continuously and uses the selection order made by the user. Selected assets are numbered.<br>For macOS 14 and iOS 17 or newer. |
| SelectionDefault | 0 | Uses the default selection behavior. |
| SelectionOrdered | 1 | Uses the selection order made by the user, numbering the selected assets. |

## 137.37 class PHPickerFilterMBS

### 137.37.1 class PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A type that defines the filter to apply to the photo library.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1

### 137.37.2 Methods

### 137.37.3 anyFilterMatchingSubfilters(filters() as PHPickerFilterMBS) as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new filter by combining the filters in the array.
**Notes:** filters: The list of filters to combine into a new filter.

### 137.37.4 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.37.5 copy as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the filter object.

### 137.37.6 imagesFilter as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents images, and includes Live Photos.

### 137.37.7 livePhotosFilter as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents Live Photos.

### 137.37.8 videosFilter as PHPickerFilterMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents video assets.

### 137.37.9 Properties

### 137.37.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 137.38 class PHPickerResultMBS

### 137.38.1 class PHPickerResultMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Types that represent a selected asset from the user,Äôs photo library.
**Notes:** When you get result objects in a real application and you like to allow more than a few pictures, you may need to manage the jobs to download:

- Have a queue for the result objects to be downloaded.
- Check what types are available on each.
- Download what you need, e.g. HEIC or JPEG representation.
- Have a timer to start downloads and make sure you have only a limited number of parallel downloads like e.g. 4.
- Monitor which downloads failed and keep the NSErrorMBS for logging them.
- Show progress dialog for the download, e.g. with our ProgressHUDMBS class.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5
- MBS Xojo Plugins, version 22.5pr1

### 137.38.2 Methods

### 137.38.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 137.38.4 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.38.5 hasItemConformingToTypeIdentifier(typeIdentifier as string) as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether an item provider contains a data representation conforming to a specified uniform type identifier (UTI) and to specified open-in-place behavior.

### 137.38.6 loadFileRepresentationForTypeIdentifier(typeIdentifier as string, handler as LoadFileRepresentationCompletedMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Asynchronously loads the requested type to a temporary file.
**Notes:** You can show a progress dialog and use progressCurrent and progressTotal values.
Calls delegate later when download is finished.

### 137.38.7 TypeIdentifiers as String()

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Returns the array of type identifiers for the item provider, listed in the same order in which they were registered.

### 137.38.8 Properties

### 137.38.9 assetIdentifier as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The selected asset,Äôs local identifier.
**Notes:** (Read only property)

### 137.38.10 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.38.11 progressCurrent as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The number of bytes downloaded so far.
**Notes:** This allows you to periodically check how far a download is and show a progress dialog.
Only valid after calling loadFileRepresentationForTypeIdentifier method.
(Read only property)

### 137.38.12 progressTotal as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The total size of a download.
**Notes:** This allows you to periodically check how far a download is and show a progress dialog.
Only valid after calling loadFileRepresentationForTypeIdentifier method.
(Read only property)

### 137.38.13 Delegates

### 137.38.14 LoadFileRepresentationCompletedMBS(File as FolderItem, error as NSErrorMBS, result as PHPickerResultMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The delegate called when loadFileRepresentationForTypeIdentifier is finished.
**Notes:** Called on main thread.

# 137.39 class PHPickerViewControllerMBS

## 137.39.1 class PHPickerViewControllerMBS

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A view controller that provides the user interface for choosing assets from the photo library.
**Notes:** The PHPickerViewController class is an alternative to UIImagePickerController.
PHPickerViewController improves stability and reliability, and includes several benefits to developers and users, such as the following:

- Deferred image loading and recovery UI
- Reliable handling of large and complex assets, like RAW and panoramic images
- User-selectable assets that aren,Äôt available for UIImagePickerController
- Configuration of the picker to display only Live Photos
- Availability of PHLivePhotoMBS objects without library access
- Stricter validations against invalid inputs

You can present a picker object only once; you can,Äôt reuse it across sessions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- MBS Xojo Plugins, version 23.2pr1
- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr1

## 137.39.2 Methods

## 137.39.3 Constructor(configuration as PHPickerConfigurationMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Creates a new picker view controller with the configuration you specify.
**Notes:** configuration: The configuration with which to initialize the view controller.

### 137.39.4 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.39.5 Dismiss

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Dismisses the controller.

### 137.39.6 Present

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Presents the controller.

### 137.39.7 Properties

### 137.39.8 configuration as PHPickerConfigurationMBS

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The configuration you specify when creating the picker.
**Notes:** (Read only property)

### 137.39.9 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.39.10 popover as Variant

MBS iOS Plugin, Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The NSPopoverMBS object if used.
**Notes:** Allows access to the popover on macOS.

(Read only property)

### 137.39.11 PopOverHeight as Integer

MBS iOS Plugin, Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The desired height for the popover.
**Notes:** We use this size to initialize it. Default is 500.
(Read and Write property)

### 137.39.12 PopOverWidth as Integer

MBS iOS Plugin, Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The desired width for the popover.
**Notes:** We use this size to initialize it. Default is 600.
(Read and Write property)

### 137.39.13 Events

### 137.39.14 didFinishPicking(Result() as PHPickerResultMBS)

MBS iOS Plugin, Plugin Version: 22.5, Platforms: macOS, iOS, Targets: .

**Function:** Notifies the delegate that the user completed a selection or dismissed the picker using the cancel button.
**Notes:** picker: The currently presented picker view controller.
results: The results of the user,Äôs selections.

The system doesn,Äôt automatically dismiss the picker after calling this method, but the plugin does.

## 137.40 class PHProjectChangeRequestMBS

### 137.40.1 class PHProjectChangeRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A request to change asset data in a Photos project extension.
**Notes:** Make a project change request to alter a project's title or metadata. Respond to project change requests by updating your user interface as assets are added, modified, or removed.

Available in macOS 10.13 or newer.
Subclass of the PHChangeRequestMBS class.

### 137.40.2 Methods

### 137.40.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

### 137.40.4 Constructor(project as PHProjectMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a change request around the specified project.
**Notes:** project: The project being changed in the request.

### 137.40.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 137.40.6 removeAssets(assets() as PHAssetMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified assets from the project.
**Notes:** assets: A collection of PHAssets to be removed from the project.

### 137.40.7 Properties

### 137.40.8 keyAsset as PHAssetMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the key asset representing the project.
**Notes:** Setting a key asset has been deprecated in macOS 10.14. Use ProjectPreviewImage to provide a rendered preview image instead of designating a key asset.
(Read and Write property)

### 137.40.9 projectExtensionData as Memoryblock

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Compressed project-specific data to use in the change request.
**Notes:** The total size of stored data is limited to 1 MB; attempting to store more data will result in an error. Don't include rasterized images that can be locally cached. Limit stored data to compressed project-specific data.
(Read and Write property)

### 137.40.10 projectPreviewImage as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The project preview in Photos.
**Notes:** When setting, please pass a rendered project preview with dimensions of 1024 x 1024.

PhotoKit requires that you set a project preview in the following situations:

- Whenever the project changes in a way that requires a new preview.
- During or after execution of the beginProjectWithExtensionContext protocol method.
- During or after execution of the resumeProjectWithExtensionContext protocol method.

(Read and Write property)

### 137.40.11 title as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The title of the change request.
**Notes:** (Read and Write property)

# 137.41 class PHProjectMBS

## 137.41.1 class PHProjectMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A representation of a Photos app project extension.
**Notes:** This class represents the project when extended from macOS Photos. Projects can have the following types:

- Book
- Calendar
- Card
- Prints
- Slideshow
- Wall decor

Users create projects by selecting one or more assets, right-clicking the selection, and grouping the assets, much like an album collection. Your app treats the project as a separate entity, represented as a PHProject. Subclass of the PHAssetCollectionMBS class.

## 137.41.2 Methods

## 137.41.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.13 or newer.

## 137.41.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 137.41.5 Properties

### 137.41.6 hasProjectPreview as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** A property that indicates whether a project preview was previously set.
**Notes:** To set the preview, use ProjectPreviewImage property.
(Read only property)

### 137.41.7 projectExtensionData as Memoryblock

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop only.

**Function:** Data associated with the project extension.
**Notes:** (Read only property)

## 137.42 class PHVideoRequestOptionsMBS

### 137.42.1 class PHVideoRequestOptionsMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of options affecting the delivery of video asset data that you request from an image manager.
**Notes:** Available on MacOS 10.15 or newer.

### 137.42.2 Methods

### 137.42.3 available as boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether class is available.
**Notes:** Should return true on MacOS 10.15 or newer.

### 137.42.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 137.42.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 137.42.6 SetProgressHandler(ProgressHandler as ProgressHandlerMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the delegate that Photos calls periodically while downloading the video.
**Notes:** If you request a video whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your delegate periodically to report progress and to allow you to cancel the download.

### 137.42.7 Properties

### 137.42.8 DeliveryMode as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mode specifying the requested video quality and delivery priority.
**Notes:** Use this property to tell Photos to provide a video quickly (possibly sacrificing image quality) or to provide a high-quality video (possibly sacrificing speed). This option applies only when requesting the current version of the video (that is, only when the version property is VersionCurrent).
The default option is DeliveryModeAutomatic. See DeliveryMode.
(Read and Write property)

### 137.42.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 137.42.10 NetworkAccessAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether Photos can download the requested video from iCloud.
**Notes:** If true, and the requested video is not stored on the local device, Photos downloads the video from iCloud. To be notified of the download,Äôs progress, use the progressHandler property to provide a delegate that Photos calls periodically while downloading the video. If false (the default), and the video is not on the local device, the PHImageResultIsInCloudKey value in the result handler,Äôs info dictionary indicates that the video is not available unless you enable network access.
(Read and Write property)

### 137.42.11 ProgressHandler as ProgressHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls periodically while downloading the video.
**Notes:** If you request a video whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your delegate periodically to report progress and to allow you to cancel the download.
(Read and Write property)

### 137.42.12 Version as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The version of the video to request.
**Notes:** If a video asset has been edited, use this property to request a video with or without adjustments. The default option is VersionCurrent. See Version constants.
(Read and Write property)

### 137.42.13 Constants

Delivery Modes

| Constant | Value | Description |
|---|---|---|
| DeliveryModeAutomatic | 0 | Photos automatically determines which quality of video data to provide b on the request and current conditions. |
| DeliveryModeFastFormat | 3 | Photos provides whatever quality of video can be most quickly loaded. |
| DeliveryModeHighQualityFormat | 1 | Photos provides only the highest quality video available. |
| DeliveryModeMediumQualityFormat | 2 | Photos provides a video of moderate quality unless a higher quality versio locally cached. |

Version Mode

| Constant | Value | Description |
|---|---|---|
| VersionCurrent | 0 | Request the most recent version of the video asset, reflecting all edits. The resulting video is the rendered output from all previously made adjustments. |
| VersionOriginal | 1 | Request a version of the video asset without adjustments. The resulting video is the originally captured or imported version of the asset, regardless of any edits that have been made. |

### 137.42.14 Delegates

### 137.42.15 ProgressHandlerMBS(progress as double, tag as Variant, error as NSErrorMBS, byref stop as Boolean, info as Dictionary)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate that Photos calls while downloading asset data from iCloud.
**Notes:** If you request a video asset whose data is not on the local device, and you have enabled downloading with the networkAccessAllowed property, Photos calls your block periodically to report progress and allow canceling the download.

The method takes the following parameters:

progress: A floating-point value indicating the progress of the download. A value of 0.0 indicates the download has just started, and a value of 1.0 indicates the download is complete.
error: An NSErrorMBS object describing an error that occurred when attempting to download the video, or nil if no errors have occurred.
stop: A pointer to a Boolean value. To cancel the download, set stop to true inside the method.
info: A dictionary providing additional information about the status of the video request. See Image Result Info Keys for possible keys and values.

If the event is dispatched asynchronously to main thread, the stop property will not work.

# Chapter 138

# Pictures Import and Export

## 138.1 Globals

### 138.1.1 BitRotateMBS(Degree as Integer, InputData as Ptr, OutputData as Ptr, Width as Integer, Height as Integer, InputRowBytes as Integer = -1, OutputRowBytes as Integer = -1) as boolean

MBS Images Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Rotates 1bit image in memory.
**Example:**

```
Dim InputTIFF As TiffPictureMBS // your input file
Dim OutputTIFF as TiffPictureMBS // your output file

Dim inMB As MemoryBlock = InputTIFF.Scanlines(0, InputTIFF.Height)
Dim outMB As New MemoryBlock(OutputTIFF.BytesPerRow * (OutputTIFF.Height + 8))

Const PlateRotation = 90

Dim b As Boolean = BitRotateMBS(PlateRotation, inMB, outMB, InputTIFF.Width, InputTIFF.Height,
InputTIFF.BytesPerRow, OutputTIFF.BytesPerRow)

Break
```

**Notes:** Degree can be -360, -270, -180, -90, 0, 90, 180 or 270 to rotate counter clockwise.
InputData points to an 1bit image with given width and height. InputRowBytes if defined tells how many bytes per row are used in the input image. If <= 0, we calculate it. OutputRowBytes defines row bytes for output image, which is different for 90/270 rotation.
Returns true on success or false on failure.
The function is optimized for 180 degree to be quicker if image size is multiply of 8.

For 90 and 270 degree, there is an optimization if width and height are a multiply of 8.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4
- MBS Xojo Plugins, version 18.4pr5
- MBS Xojo Plugins, version 18.4pr4

**Xojo Developer Magazine**

- 17.1, page 11: News
- 16.6, page 9: News

### 138.1.2 BMPStringtoPictureMBS(data as string) as picture

MBS Picture Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a BMP picture from a string.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim s as string = p.BMPDataMBS
dim q as Picture = BMPStringtoPictureMBS(s)
window1.Backdrop = q
```

**Notes:** This function is endian safe and supports 1, 4, 8, 16, 24, 32 bit BMP images.
For 32bit images the alpha value is ignored.
Returns nil on any error.
Only uncompressed BMP files are supported.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr13
- MBS REALbasic Plugins, version 10.6pr9
- MonkeyBread Software Releases the MBS Plugins 8.2

**Xojo Developer Magazine**

- 21.5, page 74: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 138.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer

MBS Images Plugin, Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splits a one bit CMYK file into different files.
**Notes:** Source file has 1 bit for each channel.
Error code is returned which is 0 for no error.
CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

CallbackTarget can be nil or must be an object with a method with the following declaration: "Progress(RowIndex as Integer, RowCount as Integer)"

Errorcodes:

| | |
|---|---|
| 1 | not used |
| 2 | Failed to open f |
| 3 | Failed to open fc |
| 4 | Failed to open fm |
| 5 | Failed to open fy |
| 6 | Failed to open fk |
| 7 | Width<1 |
| 8 | Height<1 |
| 9 | Allocating read buffer failed |
| 10 | Allocating write buffer failed for c |
| 11 | Allocating write buffer failed for m |
| 12 | Allocating write buffer failed for y |
| 13 | Allocating write buffer failed for k |
| 14 | Read failed |
| 15 | Write failed for c |
| 16 | Write failed for m |
| 17 | Write failed for y |
| 18 | Write failed for k |

See also:

- 138.1.4 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as

folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer 19304

### 138.1.4 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer

MBS Images Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splits a one bit CMYK file into different files.
**Notes:** Source file has 1 bit for each channel.
Error code is returned which is 0 for no error.
CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

CallbackTarget can be nil or must be an object with a method with the following declaration: "Progress(RowIndex as Integer, RowCount as Integer)"

ReadLines and WriteLines define how many rows to read in one I/O operation.

Errorcodes:

See also:

- 138.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer 19303

## 138.2 class PNGOptimizerMBS

### 138.2.1 class PNGOptimizerMBS

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class is a wrapper for the OptiPNG command line tool.
**Example:**

```
dim p as Picture = LogoMBS(500)

dim fi as FolderItem = SpecialFolder.Desktop.Child("test unoptimized.png")
if not fi.SaveAsPNGMBS(p,0) then
MsgBox "Failed to save PNG file."
```

| | |
|---|---|
| 1 | not used |
| 2 | Failed to open f |
| 3 | Failed to open fc |
| 4 | Failed to open fm |
| 5 | Failed to open fy |
| 6 | Failed to open fk |
| 7 | Width<1 |
| 8 | Height<1 |
| 9 | Allocating read buffer failed |
| 10 | Allocating write buffer failed for c |
| 11 | Allocating write buffer failed for m |
| 12 | Allocating write buffer failed for y |
| 13 | Allocating write buffer failed for k |
| 14 | Read failed |
| 15 | Write failed for c |
| 16 | Write failed for m |
| 17 | Write failed for y |
| 18 | Write failed for k |

```
Return
end if

dim fo as FolderItem = SpecialFolder.Desktop.Child("test optimized.png")
fo.Delete // delete if existed before

dim o as new PNGOptimizerMBS

o.YieldTicks=10 // give time for other threads
o.InputFile=fi
o.OutputFile=fo

if o.Optimize then
MsgBox "OK: Saved "+str(o.BytesSaved)
fo.Launch
else
MsgBox "failed"
end if
```

**Notes:** OptiPNG: Advanced PNG optimization program.
http://optipng.sourceforge.net/

Copyright (C) 2001-2008 Cosmin Truta.
OptiPNG is open-source software, and is distributed under the same licensing and warranty terms as libpng.

PNG optimization is described in detail in the PNG-Tech article "A guide to PNG optimization"
http://www.cs.toronto.edu/
textasciitilde cosmin/pngtech/optipng.html

The idea of running multiple compression trials with different PNG filters and zlib parameters is inspired from the pngcrush program by Glenn Randers-Pehrson.
The idea of performing lossless image reductions is inspired from the pngrewrite program by Jason Summers.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr3
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3
- MonkeyBread Software Releases the MBS REALbasic plugins 8.7

### 138.2.2 Methods

### 138.2.3 Optimize as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The main optimization function.
**Notes:** Returns true on success and false on failure.

### 138.2.4 Properties

### 138.2.5 BytesSaved as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** After the optimization this property shows how many bytes were saved.
**Notes:** (Read and Write property)

### 138.2.6 Debug as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables debug output.
**Notes:** (Read and Write property)

### 138.2.7 Fix as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enable error recovery.
**Notes:** (Read and Write property)

### 138.2.8 Force as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enforce writing of a new output file.
**Notes:** If the input image has a digital signature, the library will not optimize the file unless force=true.
(Read and Write property)

### 138.2.9 full as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to produce a full report on IDAT (might reduce speed).
**Notes:** (Read and Write property)

### 138.2.10 InputFile as FolderItem

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The file to process.
**Notes:** (Read and Write property)

### 138.2.11 interlace as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The interlace type (0-1).
**Notes:** Set by default to -1 for undefined.
(Read and Write property)

### 138.2.12 KeepBackup as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to keep a backup of the modified files.
**Notes:** If the file exists and KeepBackup=false an error is reported. If you set KeepBackup=True the old file is renamed.
(Read and Write property)

### 138.2.13 NoBitDepthReduction as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to not do a bit depth reduction.
**Notes:** Reducing the bit depth of the image data can reduce the file size.
(Read and Write property)

### 138.2.14 NoColorTypeReduction as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to not do a color type reduction.
**Notes:** If your PNG file has only 256 colors in use, the optimizer can use a color palette to save space.
(Read and Write property)

### 138.2.15 NoIDATRecompression as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to not recompress the image data.
**Notes:** (Read and Write property)

### 138.2.16 NoPaletteReduction as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to not reduce the palette.
**Notes:** If not all colors are used, the palette can be reduced in its size.
(Read and Write property)

### 138.2.17 OptimizationLevel as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The optimization level.
**Notes:** A value between 0 and 7.
Default is 2.
(Read and Write property)

### 138.2.18 OutputFile as FolderItem

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output file.
**Notes:** (Read and Write property)

### 138.2.19 Overwrite as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Overwrite existing files.
**Notes:** (Read and Write property)

### 138.2.20 Preserve as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to preserve file attributes if possible.
**Notes:** (Read and Write property)

### 138.2.21 Quiet as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Run in quiet mode.
**Notes:** (Read and Write property)

### 138.2.22 simulate as Boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the optimization runs only in simulation mode.
**Notes:** No file is written in simulation mode.
(Read and Write property)

### 138.2.23 Snip as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cut one image out of multi-image or animation files.
**Notes:** (Read and Write property)

### 138.2.24 StripAll as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Strip metadata objects .
**Notes:** (Read and Write property)

### 138.2.25 Verbose as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Run in verbose mode / show copyright and version info.
**Notes:** (Read and Write property)

### 138.2.26 YieldTicks as Integer

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim p as new PNGOptimizerMBS
p.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.

(Read and Write property)

### 138.2.27 Events

### 138.2.28 Log(message as string)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to output a message to the log file.
**Notes:** You may want to show that to your advantaged users.

### 138.2.29 Panic(message as string)

MBS Images Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called if something really bad happend and the app needs to quit.

### 138.2.30 Progress(index as Integer, count as Integer)

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for reporting ongoing process in the trials.
**Notes:** The library will try several PNG settings and report progress so you can update a progress bar.

### 138.2.31 ProgressBegin

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called before the library starts to optimize.
**Notes:** You may want to show a progress dialog here.

### 138.2.32 ProgressEnd

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called after the library finished.
**Notes:** You may want to hide your progress dialog here.

# Chapter 139

# PNG

## 139.1 Globals

### 139.1.1 PictureToPNGStringMBS(pic as picture, gamma as single = 0.0) as string

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a picture to a PNG string.
**Notes:** If the picture has no mask, no alpha channel is written to the file.
Returns "" on any error.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

- 139.1.2 PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19313
- 139.1.3 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single = 0.0) as string 19314
- 139.1.4 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19315

### 139.1.2 PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a palette based RGB picture as a PNG file.
**Notes:** If the picture has no mask, no alpha channel is written to the file.
Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

See also:

- 139.1.1 PictureToPNGStringMBS(pic as picture, gamma as single = 0.0) as string 19313
- 139.1.3 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single = 0.0) as string 19314
- 139.1.4 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19315

### 139.1.3 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single = 0.0) as string

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a picture to a PNG string.
**Notes:** Returns "" on any error.

It uses the mask passed. If nil, no alpha channel is written to the file.
The mask from the picture is ignored.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:


- 139.1.1 PictureToPNGStringMBS(pic as picture, gamma as single = 0.0) as string 19313
- 139.1.2 PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19313
- 139.1.4 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19315


### 139.1.4 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a picture to a PNG string.
**Notes:** Returns "" on any error.

It uses the mask passed. If nil, no alpha channel is written to the file.
The mask from the picture is ignored.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

**Blog Entries**

- Inside REAL Studio Web Edition

See also:


- 139.1.1 PictureToPNGStringMBS(pic as picture, gamma as single = 0.0) as string 19313
- 139.1.2 PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string 19313
- 139.1.3 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single = 0.0) as string 19314


### 139.1.5 PNGStringToPictureMBS(data as string, gamma as single = 0.0, AllowDamaged as boolean = false) as picture

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads PNG data from a string variable.
**Notes:** If the picture has an alpah channel the returned picture will have a mask.

Returns picture on success and nil on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr1

### 139.1.6 PNGStringToPNGPictureMBS(data as string, gamma as single = 0.0, AllowDamaged as boolean = false) as PNGPictureMBS

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads PNG data from a string variable.
**Notes:** Returns PNGPictureMBS object on success and nil on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.

## 139.2 class PNGpictureMBS

### 139.2.1 class PNGpictureMBS

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a PNG picture.
**Notes:** Based on LibPNG.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr11
- MBS Real Studio Plugins, version 12.5pr8
- MBS Real Studio Plugins, version 11.3pr1

### 139.2.2 Methods

### 139.2.3 CombinePictureWithMask as picture

MBS Images Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new picture which is created using the picture and it's mask.
**Example:**

```
dim t as TiffPictureMBS
' ...
canvas1.backdrop=t.CombinePictureWithMask
```

### 139.2.4 PNGLibVersion as string

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the PNG library compiled into the plugin.
**Notes:** Please ask if you need a newer version.

### 139.2.5 Properties

### 139.2.6 height as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture.
**Notes:** (Read and Write property)

### 139.2.7 mask as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mask of the picture.
**Notes:** May be nil.
(Read and Write property)

### 139.2.8 pict as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture data of the picture.
**Notes:** If this image is all black, you may use a different gamma setting.
(Read and Write property)

### 139.2.9 width as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture.
**Notes:** (Read and Write property)

### 139.2.10 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDefaultGamma | 0 | The default gamma constant.<br>Pass this value to get the default gamma. |
| kDefaultNoGamma | -1 | The no gamma constant.<br>Pass this value to not do any gamma correction. |

## 139.3 class PNGReaderMBS

### 139.3.1 class PNGReaderMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for reading PNG files.
**Example:**

```
dim Current as PictureMBS // global
dim f as FolderItem

f=GetopenFolderItem(FileTypes.Png)

if f<>Nil then
Current=nil

dim p as new PNGReaderMBS

if p.OpenFile(f) then
if p.ApplyOptions(0) then

Current=new PictureMBS(p.Width,p.Height,PictureMBS.ImageFormatRGB)

dim i,c as Integer

c=p.Height-1
for i=0 to c
Current.RowInFormat(i, PictureMBS.ImageFormatRGBA)=p.ReadRow
next

end if
end if
end if
```

**Notes:** Use this class to read PNG files row by row as memoryblock.

Based on LibPNG.
**Blog Entries**

- MBS Xojo Plugins, version 20.4pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr7
- MBS Xojo Plugins, version 20.2pr4

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5
- MBS Xojo Plugins, version 19.5pr8
- MBS Xojo Plugins in version 19.0
- MBS Plugins 11.1 Release notes
- MBS Plugins 10.3 Release Notes
- MBS REALbasic plug-ins version 9.4

**Xojo Developer Magazine**

- 18.1, page 10: News
- 17.2, page 11: News

### 139.3.2 Methods

### 139.3.3 ApplyOptions(gamma as double = 0.0, ScreenGamma as double = -1.0) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies various options.
**Notes:** The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

Added ScreenGamma parameter in plugin version 15.2. If you set both gamma and Screengamma to a value >0.0, the plugin will use those gamma values. If both are equal, no gamma correction is made.

16-bit images are always reduced to 8-bit images.

Returns true on success and false on failure. Calls ReadHeader method if needed.

### 139.3.4 CombinePictureWithMask as picture

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines the pict and the mask property to a picture with mask.

### 139.3.5 Open(file as folderitem, data as string) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens either the data string or the file.
**Notes:** Returns true on success.

### 139.3.6 OpenData(data as string) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a PNG file from the data string.
**Notes:** Returns true on success.

### 139.3.7 OpenFile(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file.
**Example:**

```
Dim p As New PNGReaderMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")

If p.OpenFile(f) Then
If p.ApplyOptions Then
If p.ReadPicture Then
window1.Backdrop = p.Pict
End If
end if
End If
```

**Notes:** Returns true on success.
See also:

- 139.3.8 OpenFile(Path as String) as boolean 19321

### 139.3.8 OpenFile(Path as String) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file.
**Example:**

```
Dim p As New PNGReaderMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim path As String = f.NativePath

If p.OpenFile(path) Then
If p.ApplyOptions Then
If p.ReadPicture Then
window1.Backdrop = p.Pict
End If
end if
End If
```

**Notes:** Returns true on success.
See also:

- 139.3.7 OpenFile(file as folderitem) as boolean 19321

### 139.3.9 OpenSpecialData(data as string) as boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Same as OpenData but with special handling of the png data.
**Example:**

```
dim f as FolderItem = getfolderitem("mbs.png")
dim b as BinaryStream = f.OpenAsBinaryFile(false) // BinaryStream.Open(f) in newer RB versions
dim s as string = b.Read(B.Length)

dim p as new PNGReaderMBS
if p.OpenSpecialData(s) then
if p.ApplyOptions(0) then
if p.ReadPicture then
Backdrop = p.Pict
Title = "OK"
else
Title = "Failed to read picture."
end if
else
Title = "Failed to apply options."
end if
else
Title = "Failed to open picture."
end if
```

**Notes:** This function can be used to read PNG files made for the Apple iPhone. The PNG is converted from the Apple format to the normal PNG format and passed to OpenData. In the SourceData property you can get the modified PNG data. Still this modified PNG data has the channels swapped, so you should read the image with the pict property.

On Mac OS X 10.8, the NSImage class also reads iOS optimized PNG files.

Deprecated as it does not read all files and we can't fix this old code. Please use a command line tool to convert instead.

### 139.3.10 PNGLibVersion as string

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the PNG library compiled into the plugin.

### 139.3.11 ReadEXIF(byref exif as string) as boolean

MBS Images Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the EXIF data block.
**Notes:** Returns true on success or false on failure.

### 139.3.12 ReadHeader as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads header of PNG.
**Notes:** This reads header and fill properties Width, Height, ColorType, OriginalColorType, InterlaceType and BitDepth.
Returns true on success and false on failure.

### 139.3.13 ReadICCProfile(byref name as string, byref compression as Integer, byref profile as string) as boolean

MBS Images Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the ICC Profile from the PNG file.
**Notes:** Name is the profile name, compression the method used to compress the profile data and profile a string with the content of the profile as binary data.

Returns true on success.

### 139.3.14 ReadPicture as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the picture into the pict and mask properties.
**Notes:** Returns true on success.

### 139.3.15 ReadRow as memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the next row as a memoryblock.
**Example:**

```
dim fSource as FolderItem = SpecialFolder.Desktop.Child("test.png") // some png with alpha
dim oPNGInput as new PNGReaderMBS

If oPNGInput.OpenFile(fSource) Then
If oPNGInput.ApplyOptions(0) Then

dim imgSource as New PictureMBS(oPNGInput.Width, oPNGInput.Height, PictureMBS.ImageFormatRGBA)

' Read row by row the file and puts it in a PictureMBS instance

dim nMax as Integer = oPNGInput.Height - 1
For nInd as Integer = 0 To nMax
imgSource.RowInFormat(nInd, PictureMBS.ImageFormatRGBA, true) = oPNGInput.ReadRow()
Next

' show only alpha/mask channel
Backdrop=imgSource.AlphaChannel.CopyPicture

' show Picture without mask
Backdrop=imgSource.CopyPicture

' show picture with mask
Backdrop=imgSource.CopyPictureWithMask

End If
End If
```

**Notes:** Returns nil on any error.
Format is RGBA as in the example with 4 bytes per pixel.
See also:

- 139.3.16 ReadRow(mem as memoryblock) as boolean 19325

### 139.3.16 ReadRow(mem as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the next row into the given memoryblock.
**Notes:** Returns false on any error and true on success.
Format is RGBA as in the example with 4 bytes per pixel.
Make sure the memoryblock is big enough. Else you risk a crash.

See also PNGReaderMBS.RowBytes.

ReadRow with reusing memoryblock is faster than allocating a new one for each row.
See also:

- 139.3.15 ReadRow as memoryblock 19324

### 139.3.17 ReadRowAlphaOnly(mem as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the next row into the given memoryblock.
**Notes:** Returns false on any error and true on success.
Format is alpha channel as in the example with one byte per pixel.
Make sure the memoryblock has size from RowBytes property. Else you risk a crash.
The data in memoryblock is width bytes long, 1/4 of the size of the memoryblock.

See also PNGReaderMBS.RowBytes.

ReadRow with reusing memoryblock is faster than allocating a new one for each row.

### 139.3.18 ReadRowMaskOnly(mem as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the next row into the given memoryblock.
**Notes:** Returns false on any error and true on success.

Format is mask (inverse alpha) as in the example with one byte per pixel.
Make sure the memoryblock has size from RowBytes property. Else you risk a crash.
The data in memoryblock is width bytes long, 1/4 of the size of the memoryblock.

See also PNGReaderMBS.RowBytes.
ReadRow with reusing memoryblock is faster than allocating a new one for each row.

### 139.3.19 ReadsRGBTag(byref file_srgb_intent as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the sRGB tag.
**Notes:** Returns true if the value was read into the given variable.

### 139.3.20 RowBytes as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of each row in bytes.

### 139.3.21 Properties

### 139.3.22 AllowDamaged as Boolean

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to return picture for files with damaged content.
**Notes:** e.g. a half downloaded PNG file can still be processed and may give you a preview for the file.
(Read and Write property)

### 139.3.23 BitDepth as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bit depth of the PNG file.
**Notes:** The original value from file headers, not updated by ApplyOptions, even if we convert e.g. 1 bit to gray for you.
(Read and Write property)

### 139.3.24 ChunkCacheMax as UInt32

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum cache size for caching chunks.
**Notes:** The PNG specification sets no limit on the number of ancillary chunks allowed in a PNG datastream. By default, libpng imposes a limit of a total of 1000 sPLT, tEXt, iTXt, zTXt, and unknown chunks to be stored.
You can change the limit on the total number of such hunks that will be stored, with this property, where &h7fffffff means unlimited.
(Read and Write property)

### 139.3.25 ChunkMallocMax as UInt64

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum allocation size for one chunk.
**Example:**

```
dim png as new PNGReaderMBS
png.chunkMallocMax=32 * 1024 * 1024
```

**Notes:** Libpng imposes a limit of 8 Megabytes (8,000,000 bytes) on the amount of memory that a compressed chunk other than IDAT can occupy, when decompressed.
You can query or change this limit with with this property.
Any chunks that would cause either of these limits to be exceeded will be ignored.
(Read and Write property)

### 139.3.26 ColorType as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color type of the PNG file.
**Notes:** The value is a combination of this constants:

```
PNG_COLOR_MASK_PALETTE   = 1
PNG_COLOR_MASK_COLOR     = 2
PNG_COLOR_MASK_ALPHA     = 4
```

The PNG library will convert on reading every row into 32bit RGBA, so don't worry about this.

The OriginalColorType property is the color type of the file. ColorType property reports what ApplyOptions changed it to, so you know what ReadRow will put in the MemoryBlock.
(Read and Write property)

### 139.3.27 CompressionBufferSize as UInt64

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The zlib compression buffer size.
**Notes:** You can change the zlib compression buffer size to be used while reading compressed data with this property where the default size is 8192 bytes. Note that the buffer size is changed immediately and the buffer is reallocated immediately, instead of setting a flag to be acted upon later.
(Read and Write property)

### 139.3.28 ExpandGrayToRGB as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether grayscale images are expanded to RGB.
**Notes:** Set before ApplyOptions if you need this option.
Default is true.

Shall set transformations such that the grayscale image is converted to 24-bit RGB.

see png_set_gray_to_rgb function in libpng documentation.
(Read and Write property)

### 139.3.29 HasTransparency as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a transparency block is included for palette images (tRNS).
**Notes:** Set by ReadHeader or ApplyOptions.
(Read only property)

### 139.3.30 Height as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture in pixels.

**Notes:** (Read and Write property)

### 139.3.31 InterlaceType as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The interlace setting.
**Notes:** (Read and Write property)

### 139.3.32 Interlacing as Integer

MBS Images Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the png file is interlaced.
**Notes:** Value is 1 if not interlaced and 7 if interlaced.
(Read and Write property)

### 139.3.33 InvertAlpha as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether alpha values should be inverted.
**Notes:** Set before ApplyOptions if you need this option.
Default is false.

see png_set_invert_alpha function in libpng documentation.
(Read and Write property)

### 139.3.34 Mask as Picture

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mask of the picture.
**Notes:** (Read and Write property)

### 139.3.35 OriginalColorType as Integer

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The original color type of the PNG file.
**Notes:** The value is a combination of this constants:

```
PNG_COLOR_MASK_PALETTE   = 1
PNG_COLOR_MASK_COLOR     = 2
PNG_COLOR_MASK_ALPHA     = 4
```

The PNG library will convert on reading every row into 32bit RGBA, so don't worry about this.

The OriginalColorType property is the color type of the file. ColorType property reports what ApplyOptions changed it to, so you know what ReadRow will put in the MemoryBlock.
(Read and Write property)

### 139.3.36 Pict as Picture

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture read.
**Notes:** (Read and Write property)

### 139.3.37 RGBToGray as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to convert RGB to grayscale.
**Example:**

```
dim png as PNGReaderMBS

// ask for gray only
png.RGBToGray = True

// avoid extra filler bytes for missing alpha channel
png.UseFiller = false
```

**Notes:** Set before ApplyOptions if you need this option.
Default is false.

see png_set_rgb_to_gray function in libpng documentation.
(Read and Write property)

### 139.3.38 RGBToGrayErrorAction as Integer

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Error handling option for Reduce RGB to grayscale.
**Notes:** Can be 1 for none, 2 for warn or 3 for error.
Default is 1.
(Read and Write property)

### 139.3.39 RGBToGrayGreen as Double

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green coefficient to use for RGB to Gray conversion.
**Notes:** Default is -1 for default coefficients.
(Read and Write property)

### 139.3.40 RGBToGrayRed as Double

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The green coefficient to use for RGB to Gray conversion.
**Notes:** Default is -1 for default coefficients.
(Read and Write property)

### 139.3.41 SourceData as String

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source data used in Open functions.
**Example:**

```
dim p as PNGReaderMBS // your reader

// write data to file
dim fo as FolderItem = SpecialFolder.Desktop.Child("mbsout.png")
dim bo as BinaryStream = fo.CreateBinaryFile("") // BinaryStream.Create(fo,true) in newer RB Versions

bo.Write p.SourceData
```

**Notes:** If you used OpenSpecialData, the data here is the PNG without the Apple modifications, but still with swapped colors.

This property is set by the OpenSpecialData, Open and OpenData functions.
(Read and Write property)

### 139.3.42 SourceFile as FolderItem

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The folderitem passed to the Open functions.
**Notes:** This property is set by the Open and OpenFile functions.
(Read and Write property)

### 139.3.43 SourcePath as String

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source file path.
**Notes:** (Read and Write property)

### 139.3.44 StripAlpha as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to strip alpha.
**Notes:** Set before ApplyOptions if you need this option.
Default is false.

see png_set_strip_alpha function in libpng documentation.
(Read and Write property)

### 139.3.45 SwapRB as Boolean

MBS Images Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to swap red and blue channels.
**Example:**

```
dim p as new PNGReaderMBS
p.SwapRB = true
```

**Notes:** The PNG files for the iPhone have swapped channels so the iPhone does not need to swap them for display. One of the tricks Apple uses for making the iPhone faster.
This flag is set to true by OpenSpecialData.
(Read and Write property)

### 139.3.46 UseFiller as Boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether filler byte is used for RGB.
**Notes:** Set by ApplyOptions if needed.
Defines whether RGB is extended to 4 bytes with an extra filler byte if needed.

see png_set_filler function in libpng documentation.
(Read and Write property)

### 139.3.47 UserHeightMaximum as UInt32

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height maximum.
**Notes:** The PNG specification allows the width and height of an image to be as large as 2^31-1 (0x7fffffff), or about 2.147 billion rows and columns.
For safety, libpng imposes a default limit of 1 million rows and columns.
Larger images will be rejected immediately with a png_error() call. If you wish to change these limits, you can use this property to set your own limits (libpng may reject some very wide images anyway because of potential buffer overflow conditions).
(Read and Write property)

### 139.3.48 UserWidthMaximum as UInt32

MBS Images Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width maximum.
**Notes:** The PNG specification allows the width and height of an image to be as large as 2^31-1 (0x7fffffff), or about 2.147 billion rows and columns.
For safety, libpng imposes a default limit of 1 million rows and columns.
Larger images will be rejected immediately with a png_error() call. If you wish to change these limits, you can use this property to set your own limits (libpng may reject some very wide images anyway because of potential buffer overflow conditions).
(Read and Write property)

### 139.3.49 Width as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture in pixels.
**Notes:** (Read and Write property)

### 139.3.50 Events

### 139.3.51 Error(msg as string)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PNG library has an error message for you.
**Notes:** Processing will stop soon.

### 139.3.52 Warning(msg as string)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PNG library has a warning for you.

## 139.4 class PNGWriterMBS

### 139.4.1 class PNGWriterMBS

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to write a PNG file.
**Example:**

```
dim Current as PictureMBS // your picture
dim f as FolderItem

f=GetsaveFolderItem(FileTypes.Png,"test.png")

if f<>Nil then
const PNG_COLOR_MASK_PALETTE = 1
const PNG_COLOR_MASK_COLOR = 2
const PNG_COLOR_MASK_ALPHA = 4

dim p as new PNGWriterMBS

p.Width=Current.Width
p.Height=Current.Height
p.Type=PNG_COLOR_MASK_COLOR
p.bpc=3
p.Rowbytes=p.Width*p.bpc

if p.OpenWriteDestination(f) then
if p.SetHeader(false, -1) then
if p.SetGamma(0) then
if p.WriteInfo then
dim i,c as Integer

c=p.Height-1
for i=0 to c
p.WriteRow current.RowInFormat(i, Current.ImageFormatRGB)
next

if p.WriteEnd then
MsgBox "OK"
end if
end if
end if
end if
end if
end if
```

**Notes:** You can use this class to write PNG files by row.

Based on LibPNG.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr6
- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 19.0pr6
- MBS Xojo / Real Studio Plugins, version 15.0pr11
- MBS Real Studio Plugins, version 11.3pr13
- MBS REALbasic plug-ins version 9.4

**Xojo Developer Magazine**

- 17.2, page 11: News

### 139.4.2 Methods

### 139.4.3 CloseDestination

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the file.

### 139.4.4 Finish as string

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes the PNG file and returns the PNG file content as string.
**Notes:** Returns "" on any error.

### 139.4.5 OpenWriteDestination(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the file to write.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim p As New PNGWriterMBS
```

```
Dim pic As Picture = LogoMBS(500)

If p.OpenWriteDestination(f) Then
If p.SetRGBPicture(pic) Then
If p.SetHeader(False, -1) Then
If p.SetGamma(0) Then
If p.WriteInfo Then
If p.WriteRows Then
If p.WriteEnd Then
MsgBox "OK"
End If
End If
End If
End If
End If
End If
End If
```

**Notes:** If you pass nil for the file, the data is collected in memory and you can get it on the end using the Finish method.
See also:

- 139.4.6 OpenWriteDestination(Path as String) as boolean 19337

### 139.4.6 OpenWriteDestination(Path as String) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the file to write.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim path As String = file.NativePath

Dim p As New PNGWriterMBS
Dim pic As Picture = LogoMBS(500)

If p.OpenWriteDestination(path) Then
If p.SetRGBPicture(pic) Then
If p.SetHeader(False, -1) Then
If p.SetGamma(0) Then
If p.WriteInfo Then
If p.WriteRows Then
If p.WriteEnd Then
MsgBox "OK"
End If
```

```
End If
End If
End If
End If
End If
End If
```

**Notes:** If you pass "" for the file, the data is collected in memory and you can get it on the end using the Finish method.
See also:

- 139.4.5 OpenWriteDestination(file as folderitem) as boolean 19336

### 139.4.7 PNGLibVersion as string

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the PNG library compiled into the plugin.

### 139.4.8 SetAlphaData(alphas() as Integer, colors() as color) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the alpha data and the color palette.
**Notes:** The array can have up to 256 colors.
The color and the alpha arrays must have the same size.
Returns true on success.

### 139.4.9 SetAlphas as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the alpha data to the file.
**Notes:** You must call SetAlphaData before.
Returns true on success.

### 139.4.10 SetEXIF(EXIFData as string) as boolean

MBS Images Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the EXIF data block.
**Notes:** Returns true on success or false on failure.

### 139.4.11 SetGamma(gamma as Double = 0.0) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the gamma value and other options for the PNG file.
**Notes:** Returns on success.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

Default for Mac is 1.8 and for Windows 2.2.
If you use SRGB, the Gamma must be 2.2.

### 139.4.12 SetGrayPicture(pict as picture, mask as picture = nil) as boolean

MBS Images Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a picture into the internal buffers for writing a Grayscale image file.
**Notes:** This method sets width, height, type and bpc properties.
Returns true on success.

Mask can be nil.

### 139.4.13 SetHeader(Interlace as boolean = false, Filter as Integer = -1, Compression as Integer = -1) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the header options for the PNG file.
**Notes:** Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

Compression can be between 0 (none) to 9 (max). Default is 6. Value -1 means the plugin will not change from default of PNG library. Normally you have no better compression for setting higher than 6, but only burn more CPU power.

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

### 139.4.14 SetICCProfile(name as string, CompressionType as Integer, Profile as string) as boolean

MBS Images Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a ICC Profile to the PNG.
**Notes:** Name is the profile name as an ASCII string.
CompressionType is always 0 (PNG_COMPRESSION_TYPE_BASE).

### 139.4.15 SetPalette as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the palette data.
**Notes:** Returns true on success.

### 139.4.16 SetPaletteData(colors() as color) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color palette.
**Notes:** The array can have up to 256 colors.
Returns true on success.

### 139.4.17 SetPalettePicture(pict as picture) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a picture into the internal buffers.
**Notes:** You need to define the color palette before calling this method.

This method sets width, height, type and bpc properties.
Returns true on success.

### 139.4.18 SetResolution(ResolutionHorizontal as Integer, ResolutionVertical as Integer, Unit as Integer) as boolean

MBS Images Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the resolution of the PNG.
**Notes:** Unit is ResolutionUnknown, ResolutionMeter or ResolutionDPI.
Internally the PNG saves only in dots per meter, so the plugin converts DPI to DPM for you.

### 139.4.19 SetRGBPicture(pict as picture, mask as picture = nil) as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a picture into the internal buffers.
**Example:**

```
// Write a RGBA PNG file
dim current as Picture = LogoMBS(500)

// create a mask
dim g as Graphics = current.Mask.Graphics
g.ForeColor = &cFFFFFF
g.FillRect 0,0,500,500
g.ForeColor = &c000000
g.FillOval 0,0,500,500

// show in window
window1.Backdrop = current

// and write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")

dim p as new PNGWriterMBS

if p.OpenWriteDestination(f) then // open file
if p.SetRGBPicture(current, current.mask) then // set picture to write
if p.SetHeader(false, -1) then // setup file header
if p.SetGamma(0) then // and default gamma
if p.WriteInfo then // write file header
if p.WriteRows then // write pixels
if p.WriteEnd then // and write file end
p = nil // cleanup
```

```
f.Launch
end if
end if
end if
end if
end if
end if
end if
```

**Notes:** This method sets width, height, type and bpc properties.
Returns true on success.

Mask can be nil.

### 139.4.20 SetRows(rows() as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Uses the given memoryblocks for row data.
**Notes:** The memory is not copied, so keep the array alive!
This method sets height. You need to set width, bpc, type and rowbytes.
Returns true on success.

### 139.4.21 SetsRGB(intent as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the sRGB intent.
**Notes:** Possible values:

```
const PNG_sRGB_INTENT_PERCEPTUAL   = 0
const PNG_sRGB_INTENT_RELATIVE     = 1
const PNG_sRGB_INTENT_SATURATION   = 2
const PNG_sRGB_INTENT_ABSOLUTE     = 3
```

### 139.4.22 WriteEnd as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes the writing.

**Notes:** Returns true on success.

Do not call if you use WriteRows.

### 139.4.23 WriteInfo as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the PNG file header.
**Notes:** Returns true on success.

Do not call if you use WriteRows.

### 139.4.24 WriteRow(row as memoryblock)

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes one row of image data.
**Notes:** The data must be in the RGBA format with one byte per value.
(4 bytes per Pixel)

Returns true on success.

Do not call if you use WriteRows.

### 139.4.25 WriteRows as boolean

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the picture from memory to the file.
**Example:**

```
// Write a RGB PNG file
dim current as Picture = LogoMBS(500)
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")

dim p as new PNGWriterMBS

if p.OpenWriteDestination(f) then // open file
if p.SetRGBPicture(current) then // set picture to write
if p.SetHeader(false, -1) then // setup file header
```

```
if p.SetGamma(0) then // and default gamma
if p.WriteInfo then // write file header
if p.WriteRows then // write pixels
if p.WriteEnd then // and write file end
p = nil // cleanup
f.Launch
end if
end if
end if
end if
end if
end if
end if
```

**Notes:** If you call this method, you need to call SetRGBPicture or SetPalettePicture before and you can't call WriteInfo, WriteRow and WriteEnd.

### 139.4.26 Properties

### 139.4.27 bpc as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bytes per pixel.
**Notes:** Should be 3 for RGB, 1 for palette pictures and 4 for RGB with Alpha.
(Read and Write property)

### 139.4.28 Height as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture to write.
**Notes:** (Read and Write property)

### 139.4.29 Rowbytes as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bytes per row.
**Notes:** (Read and Write property)

### 139.4.30 Type as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color type.
**Notes:** The value is a combination of this constants:

```
PNG_COLOR_MASK_PALETTE   = 1
PNG_COLOR_MASK_COLOR     = 2
PNG_COLOR_MASK_ALPHA     = 4
```

(Read and Write property)

### 139.4.31 Width as Integer

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture to write.
**Notes:** (Read and Write property)

### 139.4.32 Events

### 139.4.33 Error(msg as string)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PNG library has an error message for you.
**Notes:** Processing will stop soon.

### 139.4.34 Warning(msg as string)

MBS Images Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The PNG library has a warning for you.

### 139.4.35 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ResolutionDPI | 2 | One of the resolution unit type constants. The unit for points per inch. |
| ResolutionMeter | 1 | One of the resolution unit type constants. The unit for points per meter. |
| ResolutionUnknown | 0 | One of the resolution unit type constants. |

Type Constants

| Constant | Value | Description |
|---|---|---|
| TypeGray | 0 | Gray |
| TypeGrayA | 4 | Gray with Alpha |
| TypePalette | 1 | Palette |
| TypeRGB | 2 | RGB |
| TypeRGBA | 6 | RGB with Alpha. |

# Chapter 140

# Power

## 140.1 class IOPMAssertionMBS

### 140.1.1 class IOPMAssertionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for PowerManagement assertions.
**Notes:** You use this class to block a Mac from sleeping display, disk or whole machine.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr9

### 140.1.2 Methods

### 140.1.3 AssertionsByProcess as Dictionary

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a dictionary listing all assertions, grouped by their owning process.
**Notes:** Notes: One process may have multiple assertions. Several processes may have asserted the same assertion to different levels.

On success, this returns a dictionary of assertions per process. At the top level, keys to the Dictionary are pids stored as Integer. The value associated with each pid is an array of active assertions. Each entry in the array is an assertion represented as a Dictionary. See the keys kIOPMAssertionTypeKey and kIOPMAssertionLevelKey.

### 140.1.4 AssertionsStatus as Dictionary

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a list of available assertions and their system-wide levels.
**Notes:** The system-wide level is the maximum of all individual assertions' levels.

On success, this returns a Dictionary of all assertions currently available.
The keys in the dictionary are the assertion types, and the value of each is a CFNumber that represents the aggregate level for that assertion.

### 140.1.5 Constructor(type as string, level as Integer, name as string)

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Calls internally CreateWithName function.

### 140.1.6 CreateWithDescription(AssertionType as string, Name as string, Details as string = "", HumanReadableReason as string = "", LocalizationBundlePath as string = "", Timeout as Double = 0, TimeoutAction as string = "") as IOPMAssertionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an IOPMAssertion.
**Notes:** This is the preferred API to call to create an assertion. It allows the caller to specify the Name, Details, and HumanReadableReason at creation time. There are other keys that can further describe an assertion, but most developers don't need to use them. Use SetProperty or CreateWithProperties if you need to specify properties that aren't available here.

AssertionType: An assertion type constant. Caller must specify this argument.
Name: A String value to correspond to key kIOPMAssertionNameKey. Caller must specify this argument.
Details: A String value to correspond to key kIOPMAssertionDetailsKey. Caller my pass "", but it helps power users and administrators identify the reasons for this assertion.
HumanReadableReason: A String value to correspond to key kIOPMAssertionHumanReadableReasonKey. Caller may pass "", but if it's specified OS X may display it to users to describe the active assertions on their system.
LocalizationBundlePath: A String value to correspond to key kIOPMAssertionLocalizationBundlePathKey. This bundle path should include a localization for the string HumanReadableReason. Caller may pass "", but this argument is required if caller specifies HumanReadableReason.
Timeout: Specifies a timeout for this assertion. Pass 0 for no timeout.
TimeoutAction: Specifies a timeout action. Caller my pass "". If a timeout is specified but a TimeoutAction is not, the default timeout action is kIOPMAssertionTimeoutActionTurnOff.

On success this function returns a new assertion.

### 140.1.7 CreateWithHandle(Handle as Integer) as IOPMAssertionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new object with retaining given handle.

### 140.1.8 CreateWithName(type as string, level as Integer, name as string) as IOPMAssertionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Dynamically requests a system behavior from the power management system.
**Notes:** Create is deprecated in favor of CreateWithProperties. Please use that version of this API instead.

No special privileges are necessary to make this call - any process may activate a power assertion. Caller must specify an AssertionName - "" is not a valid input.

| | |
|---|---|
| Type | The String assertion type to request from the PM system. |
| Level | Pass kIOPMAssertionLevelOn or kIOPMAssertionLevelOff. |
| Name | A string that describes the name of the caller and the activity being handled by this assertion (e.g. "Mail Compacting Mailboxes"). Name may be no longer than 128 characters. |

On success, returns an IOPMAssertionMBS object.

### 140.1.9 CreateWithProperties(AssertionProperties as Dictionary) as IOPMAssertionMBS

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an IOPMAssertion with more flexibility than CreateWithDescription.
**Notes:** AssertionProperties: Dictionary providing the properties of the assertion that need to be created.
On successful return, returns the assertion.

Create a new PM assertion - the caller must specify the type of assertion, initial level, and its properties as IOPMAssertionDictionaryKeys keys in the AssertionProperties dictionary. The following keys are recommend and/or required to be specified in the AssertionProperties dictionary argument.

- Required kIOPMAssertionTypeKey define the assertion type.
- Required kIOPMAssertionValueKey define an inital value.
- Required kIOPMAssertionNameKey Caller must describe the name for the activity that requires the change in behavior provided by the assertion.
- Optional kIOPMAssertionDetailsKey Caller may describe context-specific data about the assertion.
- Optional kIOPMAssertionHumanReadableReasonKey Caller may describe the reason for creating the assertion in a localizable String. This should be a human readable phrase that describes the actions the calling process is taking while the assertion is held, like "Downloading TV episodes", or "Compiling Projects"
- Optional kIOPMAssertionLocalizationBundlePathKey Caller may provide its bundle's path, where OS X can localize for GUI display the String specified by kIOPMAssertionHumanReadableReasonKey.
- Optional kIOPMAssertionPlugInIDKey if the caller is a plugin with a different identity than the process it's loaded in.
- Optional kIOPMAssertionFrameworkIDKey if the caller is a framework acting on behalf of a process.
- Optional The caller may specify a timeout.

### 140.1.10 DeclareUserActivity(AssertionName as string, userType as Integer, byref AssertionID as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Declares that the user is active on the system.
**Notes:** This causes the display to power on and postpone display sleep up to the user's display sleep Energy Saver settings. If you prefer to hold the display awake for a longer period and you know how long you'd like to hold it, consider taking assertion kIOPMAssertionTypePreventUserIdleDisplaySleep using CreateWithDescription instead.

No special privileges are necessary to make this call - any process may call this API. Caller must specify an AssertionName.

AssertionName: A string that describes the name of the caller and the activity being handled by this assertion (e.g. "Mail Compacting Mailboxes"). Name may be no longer than 128 characters.
userType: This parameter specifies if the active user is located locally in front of the system or connected to the system over the network. Various components of the system are maintained at different power levels depending on user location.

On Success, unique id will be returned in this parameter. Caller may call this function again with the unique id retured previously to report continous user activity. The unique id returned by this function may change on each call depending on how frequently this function call is repeated and the current display sleep timer value. If you make this call more than once, track the returned value for assertionID, and pass it in as an argument on each call.

Returns kIOReturnSuccess (0) on success, any other return indicates PM could not successfully activate the specified assertion.

### 140.1.11 Properties as Dictionary

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Copies details about an IOPMAssertion.
**Notes:** Returns a dictionary describing an IOPMAssertion's specifications and current state.

### 140.1.12 SetProperty(key as string, value as Variant) as boolean

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets a property in the assertion.
**Example:**

```
dim t as string = IOPMAssertionMBS.kIOPMAssertionTypePreventUserIdleDisplaySleep
dim l as Integer = IOPMAssertionMBS.kIOPMAssertionLevelOn
dim a as IOPMAssertionMBS = IOPMAssertionMBS.CreateWithName(t, l, "Working")
if a.SetProperty(IOPMAssertionMBS.kIOPMAssertionNameKey, "test") then
MsgBox a.name
end if
```

**Notes:** Only the process that created an assertion may change its properties.
key: The string key to modify.
Value: The property to set. It must be a number or string, as specified by the property key named in key.
Returns false on any error and true on success.

### 140.1.13 Properties

### 140.1.14 Details as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The details for this assertion.
**Notes:** You may provide extra, contextual information about an assertion for admins and for debugging in this key. Setting this key in an assertion dictionary is optional.

Please name your assertion something unique with kIOPMAssertionNameKey first.
If you have more data to describe this assertion, put it here as a String.

Example: OS X creates an assertion named com.apple.powermanagement.tty to prevent sleep for remote-logged in users. To identify the cause for these assertions, OS X sets kIOPMAssertionDetailsKey to the String device path of the active remote session(s), e.g. "/dev/ttys000" or "/dev/ttys004"

The String you associate with this key does not have to be localizable (OS X will not attempt to localize it.)
(Read and Write property)

### 140.1.15 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle to the assertion.
**Notes:** Zero is not a valid ID.
(Read only property)

### 140.1.16 HumanReadableReason as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Optional valie that provides a localizable string for OS X to display PM Assertions in the GUI.
**Notes:** The caller should specify this string in CreateWithProperties.
If present, OS X may display this string, localized to the user's language, to explain changes in system behavior caused by the assertion.

If set, the caller must also specify a bundle path for the key kIOPMAssertionLocalizationBundlePathKey.
The bundle at that path should contain localization info for the specified string.
(Read and Write property)

### 140.1.17 Level as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The assertion level.
**Notes:** (Read and Write property)

### 140.1.18 LocalizationBundlePath as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Refers to a string, identifying the path to the caller's bundle, which contains localization info.
**Notes:** (Read and Write property)

### 140.1.19 Name as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the assertion.
**Example:**

```
dim t as string = IOPMAssertionMBS.kIOPMAssertionTypePreventUserIdleDisplaySleep
dim l as Integer = IOPMAssertionMBS.kIOPMAssertionLevelOn
dim a as IOPMAssertionMBS = IOPMAssertionMBS.CreateWithName(t, l, "Working")
MsgBox a.Name
```

**Notes:** kIOPMAssertionNameKey describes the the activity the assertion is protecting. The creator should specify a String value for this key in the dictionary passed to CreateWithProperties.

The assertion name is separate from the assertion type's behavior - specify a String like "Checking mail" or "Compiling" that describes the task that this assertion protects.

The String you associate with this key does not have to be localizable (OS X will not attempt to localize it.)
(Read and Write property)

### 140.1.20 RetainCount as Integer

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The retain count of the object.
**Notes:** (Read only property)

### 140.1.21 Timeout as Double

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies an outer bound, in seconds, that this assertion should be asserted.
**Notes:** If your application hangs, or is unable to complete its assertion task in a reasonable amount of time, specifying a timeout allows PM to disable your assertion so the system can resume normal activity.
Once a timeout with the kIOPMAssertionTimeoutActionTurnOff assertion fires, the level will be set to kIOPMAssertionTimeoutActionTurnOff. The assertion may be re-armed by calling IOPMAssertionSetLevel.
(Read and Write property)

### 140.1.22 TimeoutAction as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies the action to take upon timeout expiration.
**Notes:** Specifying the timeout action only has meaning if you also specify an kIOPMAssertionTimeoutKey. If the caller does not specify a timeout action, the default action is kIOPMAssertionTimeoutActionTurnOff.
(Read and Write property)

### 140.1.23 Type as String

MBS MacOSX Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The assertion type.
**Notes:** The value for this key will be a CFStringRef, with the value of the assertion type specified at creation time.
Note that OS X may substitute a support assertion type string if the caller specifies a deprecated assertion type; in that case the value for this key could differ from the caller-provided assertion type.
(Read and Write property)

### 140.1.24 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kIOPMAssertionDetailsKey | "Details" | One of the keys for the properties<br>You may provide extra, contextual<br>and for debugging in this key. Se<br>optional.<br>Please name your assertion someth<br>first.<br>If you have more data to describe t<br>Example: OS X creates an asserti<br>to prevent sleep for remote-logged<br>assertions, OS X sets kIOPMAsser<br>the active remote session(s), e.g. "<br>The String you associate with this<br>will not attempt to localize it.)<br>Describe your assertion as thoroug<br>can you can set to add explanation<br>* Optional kIOPMAssertionNameI<br>* Optional kIOPMAssertionHuman<br>* Optional kIOPMAssertionLocaliz |
| kIOPMAssertionFrameworkIDKey | "FrameworkBundleID" | One of the keys for the properties |
| kIOPMAssertionHumanReadableReasonKey | "HumanReadableReason" | One of the keys for the properties<br>Optional key that provides a locali<br>tions in the GUI.<br>The caller should specify this strin<br>If present, OS X may display this<br>explain changes in system behavior<br>If set, the caller must also specify a<br>LocalizationBundlePathKey.<br>The bundle at that path should con<br>This key may be specified in the di<br>This key may be present in the dic<br>Describe your assertion as thoroug<br>can you can set to add explanation<br>* Required kIOPMAssertionNameI<br>* Optional kIOPMAssertionDetails |
| kIOPMAssertionLevelKey | "AssertLevel" | One of the keys for the properties<br>The Dictionary key for assertion le<br>The value for this key will be an i<br>or kIOPMAssertionLevelOn.<br>The level reflects the assertion's l<br>MAssertionSetLevel. |
| kIOPMAssertionLevelOff | 0 | Level for a disabled assertion, pass |
| kIOPMAssertionLevelOn | 255 | Level for an enabled assertion, pass |
| kIOPMAssertionLocalizationBundlePathKey | "BundlePath" | One of the keys for the properties<br>Refers to a string, identifying the<br>localization info. |
| kIOPMAssertionNameKey | "AssertName" | One of the keys for the properties<br>The Dictionary key for assertion na<br>creating an assertion.<br>kIOPMAssertionNameKey describe<br>The creator should specify a String<br>to CreateWithProperties.<br>The assertion name is separate fro<br>String like "Checking mail" or "C<br>assertion protects.<br>The String you associate with this<br>will not attempt to localize it.)<br>Describe your assertion as thoroug<br>can you can also set to add explan |

User Activity Constants

| Constant | Value | Description |
|---|---|---|
| kIOPMUserActiveLocal | 0 | User is local on the system |
| kIOPMUserActiveRemote | 1 | Remote User connected to the system. |

## 140.2 class IOPMMBS

### 140.2.1 class IOPMMBS

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The Mac OS X class which can control the energy settings.
**Example:**

```
dim p as new IOPMMBS

Listbox1.AddRow "EthernetWakeOnLANSettings: "+str(p.EthernetWakeOnLANSettings)
Listbox1.AddRow "GeneralAggressiveness: "+str(p.GeneralAggressiveness)
Listbox1.AddRow "MinutesToDim: "+str(p.MinutesToDim)
Listbox1.AddRow "MinutesToSleep: "+str(p.MinutesToSleep)
Listbox1.AddRow "MinutesToSpinDown: "+str(p.MinutesToSpinDown)
Listbox1.AddRow "MotionSensor: "+str(p.MotionSensor)
Listbox1.AddRow "PowerSource: "+str(p.PowerSource)
Listbox1.AddRow "SetProcessorSpeed: "+str(p.SetProcessorSpeed)
```

**Notes:** The functions and properties are not described from Apple.

### 140.2.2 Properties

### 140.2.3 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference for the power manager.
**Notes:** If this value is zero, the properties will not work.
(Read and Write property)

### 140.2.4 EthernetWakeOnLANSettings as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The setting for whether ethernet wake on LAN.
**Notes:** Value is 1 if you enable this option in the energy system control panel and 0 if you disable it.
(Read and Write computed property)

### 140.2.5 GeneralAggressiveness as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The general aggressiveness.
**Notes:** (Read and Write computed property)

### 140.2.6 MinutesToDim as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The minutes until the display is dimmed.
**Example:**

```
dim p as new IOPMMBS
p.MinutesToDim=10 // dim display in 10 minutes
```

**Notes:** This value is the same as in the energy system control panel.
(Read and Write computed property)

### 140.2.7 MinutesToSleep as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time in minutes until the Mac goes to sleep.
**Example:**

```
dim p as new IOPMMBS
p.MinutesToSleep=10 // sleep display in 10 minutes
```

**Notes:** (Read and Write computed property)

### 140.2.8 MinutesToSpinDown as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The time in minutes until the hard discs spin down.
**Notes:** If you enable the spin down option in the energy system control panel, this value is 10 and if you disable it, it is 180.
(Read and Write computed property)

### 140.2.9 MotionSensor as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The setting for the motion sensor.
**Notes:** (Read and Write computed property)

### 140.2.10 PowerSource as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The power source settings.
**Notes:** Constants for this property:

const kIOPMInternalPower = 1
const kIOPMExternalPower = 2
(Read and Write computed property)

### 140.2.11 SetProcessorSpeed as Integer

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The setting for the processor speed.
**Notes:** (Read and Write computed property)

## 140.3 class IOPowerSourcesMBS

### 140.3.1 class IOPowerSourcesMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to look on all the power sources on a Mac OS X based computer.
**Example:**

```
dim i as IOPowerSourcesMBS
dim j,n as Integer

i=new IOPowerSourcesMBS

n=i.Count-1
for j=0 to n
CFShowMBS i.Item(j) // Print battery info to console.
next
```

**Notes:** Requires Mac OS X.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr3
- MBS Xojo / Real Studio Plugins, version 16.4pr9

### 140.3.2 Methods

### 140.3.3 ExternalPowerAdapterDetails as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a CFDictionary that describes the attached (AC) external power adapter (if any external power adapter is attached.
**Example:**

```
dim d as CFDictionaryMBS = IOPowerSourcesMBS.ExternalPowerAdapterDetails
dim dic as Dictionary = d.Dictionary

dim lines() as string
lines.Append "AdapterRevision: "+dic.Lookup("AdapterRevision", "")
lines.Append "AdapterID: "+dic.Lookup("AdapterID", "")
lines.Append "FamilyCode: "+dic.Lookup("FamilyCode", "")
lines.Append "SerialNumber: "+dic.Lookup("SerialNumber", "")
lines.Append "Watts: "+dic.Lookup("Watts", "")
```

MsgBox Join(lines, EndOfLine)

**Notes:** Returns a CFDictionary on success.
If no adapter is attached, or if there's an error, returns nil.

### 140.3.4 Item(index as Integer) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Ask for the power source description with the given index.
**Example:**

```
dim i as new IOPowerSourcesMBS
i.Update
MsgBox i.Item(0).XML.Str // shows dictionary for first power source
```

**Notes:** Indes is from 0 to count-1.

### 140.3.5 Update

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries for new power sources and updates the item array.
**Example:**

```
dim i as new IOPowerSourcesMBS
i.Update
MsgBox str(i.Count)
```

### 140.3.6 Properties

### 140.3.7 Count as Integer

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of registered power sources.
**Example:**

```
dim i as new IOPowerSourcesMBS
i.Update
```

MsgBox str(i.Count)

**Notes:** (Read only property)

### 140.3.8 Events

### 140.3.9 Changed

MBS MacCF Plugin, Plugin Version: 4.0, Platform: macOS, Targets: .

**Function:** The state of one power source changed.
**Notes:** Whenever something changes around the power sources, you are notified with this event.

## 140.4 class SleepNotificationMBS

### 140.4.1 class SleepNotificationMBS

MBS MacOSX Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to listen for sleep notifications on Mac OS X .
**Notes:** Uses IOKit.

Your application can use the sleep event to deny idle sleep, i.e. sleep after a period of inactivity. Applications should not deny idle sleep unless absolutely necessary.

The kIOMessage* constants in this class are declared in the Mac OS X headers, but they are not all used by the system.

In the plugins is the WakeNotifierMBS class and the SleepNotificationMBS class. WakeNotifierMBS uses the API coming from Mac OS and it can delay sleep. SleepNotificationMBS works on the lower Next APIs.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.1pr1

### 140.4.2 Properties

### 140.4.3 running as Boolean

MBS MacOSX Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether this notification class is working.
**Notes:** Value is true on MachO targets.
(Read and Write property)

### 140.4.4 Events

### 140.4.5 Sleep(message as int64) as boolean

MBS MacOSX Plugin, Plugin Version: 8.0, Platform: macOS, Targets: .

**Function:** A message was received.
**Notes:** Use the constants to check what message you got.

Return true to deny or false to allow.

On the Can Messages the plugin informs the system about Deny or Allow, but on the Will messages, it will not answer if you return true, so the system will wait for an answer and delay sleep. There seems to be no way to delay more than 30 seconds when the user selects the sleep menu command.

The message parameter is an int64 in Plugin version 9.7 so the integer comparison to the constants works better.

### 140.4.6 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kIOMessageCanSystemPowerOff | &he0000240 | One of the message constants. |
| kIOMessageCanSystemSleep | &he0000270 | One of the message constants.<br>Idle sleep is about to kick in.<br>Applications have a chance to prevent sleep by returning true in the sl<br>Most applications should not prevent idle sleep.<br>Power Management waits up to 30 seconds for you to either allow or<br>sleep. If you don't acknowledge this power change by returning tru<br>the system will wait 30 seconds then go to sleep. |
| kIOMessageSystemHasPoweredOn | &he0000300 | One of the message constants. |
| kIOMessageSystemWillNotPowerOff | &he0000260 | One of the message constants. |
| kIOMessageSystemWillNotSleep | &he0000290 | One of the message constants. |
| kIOMessageSystemWillPowerOff | &he0000250 | One of the message constants. |
| kIOMessageSystemWillPowerOn | &he0000320 | One of the message constants. |
| kIOMessageSystemWillRestart | &he0000310 | One of the message constants. |
| kIOMessageSystemWillSleep | &he0000280 | One of the message constants. |

## 140.5 class WakeNotifierMBS

### 140.5.1 class WakeNotifierMBS

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Notification and statistics about sleeping off a Mac.
**Notes:** For Mac OS X 10.5.6 you see the SleepDemand and the WakeUp events when your Mac sleeps and wakes up.

In the plugins is the WakeNotifierMBS class and the SleepNotificationMBS class. WakeNotifierMBS uses the API coming from Mac OS and it can delay sleep. SleepNotificationMBS works on the lower Next APIs.

### 140.5.2 Properties

### 140.5.3 CallEvents as boolean

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** whether or not to call the events of this class.
**Notes:** Default is false.
(Read and Write property)

### 140.5.4 DisableSleep as boolean

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Diabled sleep if a sleep request comes?
**Notes:** Not used if you have code in the SleepRequest event handler.
(Read and Write property)

### 140.5.5 HadSleeped as boolean

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sleeped since last reset?
**Notes:** You can set this value to false to reset it.
(Read and Write property)

### 140.5.6 LastSleepTime as Double

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last time in absolute seconds when falled asleep.
**Notes:** Changed type from integer to double in version 4.2.
Value is the same as in date.totalseconds.
(Read and Write property)

### 140.5.7 LastWakeTime as Double

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last time in absolute seconds when waken up.
**Notes:** Changed type from integer to double in version 4.2.
Value is the same as in date.totalseconds.
(Read and Write property)

### 140.5.8 SleepCount as Integer

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Count of sleep demands.
**Notes:** (Read only property)

### 140.5.9 SleepEventCount as Integer

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Counts how often the Power Manager calls the sleep notification function.
**Notes:** For debugging so you know that sleep requests are handled.
(Read and Write property)

### 140.5.10 Valid as boolean

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns True if the sleep event handler could be installed.
**Notes:** False, if no Power Manager is installed.
(Read only property)

### 140.5.11 WakeCount as Integer

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Count of waking up.
**Notes:** (Read only property)

### 140.5.12 Events

### 140.5.13 SleepDemand

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: .

**Function:** Called just before falling asleep.

### 140.5.14 SleepRequest as boolean

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: .

**Function:** Can be go sleeping?
**Notes:** Return true to deny sleeping.
Returning nothing or false will put the Mac to sleep.

### 140.5.15 SleepRevoke

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: .

**Function:** Called when a sleep request was denied by an application or a device driver.

### 140.5.16 WakeUp

MBS MacClassic Plugin, Plugin Version: 2.6, Platform: macOS, Targets: .

**Function:** Called when the Mac wakes up.

## 140.6 class WindowsPowerStateMBS

### 140.6.1 class WindowsPowerStateMBS

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to watch for power changes on a computer using Microsoft Windows as operation system.
**Notes:** Not all Windows versions call the same/all events.
Your application needs to run the event loop, so events get delivered.

This function listens for WM_POWERBROADCAST sent to all applications.

see
https://msdn.microsoft.com/en-us/library/windows/desktop/aa373247(v=vs.85).aspx

You need to run ListenForSuspendResumeNotification to receive suspend/resume events.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr5
- MBS Xojo Plugins, version 23.4pr3

### 140.6.2 Methods

### 140.6.3 ListenForBatteryCapacityChanged

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers for battery capacity change events.
**Notes:** Triggers BatteryCapacityChanged event later.

### 140.6.4 ListenForLidSwitchStateChanged

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers for lid switch state change events.
**Notes:** Triggers LidSwitchStateChanged event later.

### 140.6.5 ListenForPowerSourceChanged

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers for power source events.
**Notes:** Triggers PowerSourceChanged event later.

### 140.6.6 ListenForSuspendResumeNotification

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers for suspend and resume events.

### 140.6.7 Events

### 140.6.8 BatteryCapacityChanged(Percentage as Integer)

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** The remaining battery capacity has changed.
**Notes:** The granularity varies from system to system but the finest granularity is 1 percent. The Percentage parameter that indicates the current battery capacity remaining as a percentage from 0 through 100.

### 140.6.9 BatteryLow

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The BatteryLow event is broadcast to notify applications that battery power is low.
**Notes:** Support for this event was removed in Windows Vista bei Microsoft.

### 140.6.10 LidSwitchStateChanged(LidState as Integer)

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** The state of the lid has changed (open or closed).
**Notes:** The event won't be called until a lid device is found and its current state is known.

0 - The lid is closed.
1 - The lid is opened.

### 140.6.11 OEMEvent(eventcode as Integer)

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The OEMEvent event is broadcast when an APM BIOS signals an APM OEM event.
**Notes:** eventcode: A DWORD value that specifies the OEM-defined event code that was signaled by the system's APM BIOS. OEM event codes are in the range &h0200 - &h02FF.

Because not all APM BIOS implementations provide OEM event notifications, this event may never be broadcast on some computers.

Support for this event was removed in Windows Vista bei Microsoft.

### 140.6.12 PowerSettingChange(data as MemoryBlock)

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** A power setting change event has been received.
**Notes:** This is the raw event with data.
We also call BatteryCapacityChanged, PowerSourceChanged and LidSwitchStateChanged events if their GUIDs are happening.

The data memoryblock contains POWERBROADCAST_SETTING data, where first 16 bytes are the GUID for the type of change. Then follows the 32-bit integer for data length and the data specific to the event.

see
https://learn.microsoft.com/en-us/windows/win32/api/winuser/ns-winuser-powerbroadcast_setting

### 140.6.13 PowerSourceChanged(power as Integer)

MBS Win Plugin, Plugin Version: 23.4, Platform: Windows, Targets: .

**Function:** The system power source has changed.
**Notes:** PowerSourceAC (0) - The computer is powered by an AC power source (or similar, such as a laptop powered by a 12V automotive adapter).
PowerSourceDC (1) - The computer is powered by an onboard battery power source.
PowerSourceUPS (2) - The computer is powered by a short-term power source such as a UPS device.

Only called if you called ListenForPowerSourceChanged once.

### 140.6.14 PowerStatusChange

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The PowerStatusChange event is broadcast when a change in the power status of the computer is detected, such as a switch from battery power to A/C.
**Notes:** The system also broadcasts this event when remaining battery power slips below the threshold specified by the user or if the battery power changes by a specified percentage.

### 140.6.15 QueryStandby(PromptUser as boolean) as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The QueryStandby event is broadcast to request permission to set the computer into standby mode.
**Notes:** An application that grants permission should carry out preparations for the suspension before returning.

PromptUser: If true, the application can prompt the user for directions on how to prepare for the suspension; otherwise, the application must prepare without user interaction.

Return true to deny the request, false to grant the request.

An application should process this event by first determining whether permission to go to standby mode can be granted. It must not grant permission if doing so would cause a loss of data. The application can prompt the user for directions on how to prepare for suspension only if PromptUser is set.

The system allows approximately 20 seconds for an application to remove the message that is sending the QueryStandby event from the application's message queue. If an application does not remove the message from its queue in less then 20 seconds, the system will assume that the application is in a non-responsive state, and that the application agrees to the sleep request. Applications that do not process their message queues may have their operations interrupted. After it removes the message from the message queue, an application can take as much time as needed to perform any required operations before entering the sleep state. Any operations that could take longer then 20 seconds should be performed at this time, since the system allows only 20 seconds for operations to complete during standby processing.

### 140.6.16 QueryStandbyFailed

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The QueryStandbyFailed event is broadcast as a notification that permission to go to standby mode was denied.

**Notes:** This event is broadcast if any application or driver returned false to a previous QueryStandby event.

### 140.6.17 QuerySuspend(PromptUser as boolean) as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The QuerySuspend event is broadcast to request permission to suspend the computer.
**Notes:** An application that grants permission should carry out preparations for the suspension before returning.

PromptUser: If true, the application can prompt the user for directions on how to prepare for the suspension; otherwise, the application must prepare without user interaction.

Return true to deny the request, false to grant the request.

An application should process this event by first determining whether permission to suspend can be granted. It must not grant permission if doing so would cause a loss of data. The application can prompt the user for directions on how to prepare for suspension only if PromptUser is set.

The system allows approximately 20 seconds for an application to remove the message that is sending the QuerySuspend event from the application's message queue. If an application does not remove the message from its queue in less then 20 seconds, the system will assume that the application is in a non-responsive state, and that the application agrees to the sleep request. Applications that do not process their message queues may have their operations interrupted. After it removes the message from the message queue, an application can take as much time as needed to perform any required operations before entering the sleep state. Any operations that could take longer then 20 seconds should be performed at this time, since the system allows only 20 seconds for operations to complete during Suspend processing.

Support for this event was removed in Windows Vista bei Microsoft.

### 140.6.18 QuerySuspendFailed

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The QuerySuspendFailed event is broadcast as a notification that permission to suspend the computer was denied.
**Notes:** This event is broadcast if any application or driver returned false to a previous QuerySuspend event.

Support for this event was removed in Windows Vista bei Microsoft.

### 140.6.19 ResumeAutomatic

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The ResumeAutomatic event is broadcast when the computer wakes up automatically to handle an event.
**Notes:** An application will not generally respond unless it is handling the event, because the user is not present.

### 140.6.20 ResumeCritical

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The ResumeCritical event is broadcast as a notification that the system has resumed operation.
**Notes:** This event can indicate that some or all applications did not receive a Suspend event. For example, this event can be broadcast after a critical suspension caused by a failing battery.

Support for this event was removed in Windows Vista bei Microsoft.

### 140.6.21 ResumeStandby

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The ResumeStandby event is broadcast as a notification that the system has resumed operation after being put to standby.

### 140.6.22 ResumeSuspend

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The ResumeSuspend event is broadcast as a notification that the system has resumed operation after being suspended.

### 140.6.23 Standby

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The Standby event is broadcast immediately before the computer enters a standby state.
**Notes:** This event is typically broadcast when all applications and installable drivers have returned okay to a previous QueryStandby event.

### 140.6.24 Suspend

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: .

**Function:** The Suspend event is broadcast immediately before the computer enters a suspended state.
**Notes:** This event is typically broadcast when all applications and installable drivers have returned okay to a previous QuerySuspend event.

### 140.6.25 Constants

Lid States

| Constant | Value | Description |
|---|---|---|
| LidClosed | 0 | The lid is closed. |
| LidOpened | 1 | The lid is opened. |

Power Source States

| Constant | Value | Description |
|---|---|---|
| PowerSourceAC | 0 | The computer is powered by an AC power source (or similar, such as a laptop powered by a 12V automotive adapter). |
| PowerSourceDC | 1 | The computer is powered by an onboard battery power source. |
| PowerSourceUPS | 2 | The computer is powered by a short-term power source such as a UPS device. |

# Chapter 141

# Printing

## 141.1 Globals

### 141.1.1 NewCPMPageFormatMBS as CPMPageFormatMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new page format object.
**Notes:** Returns nil on any error.

### 141.1.2 NewCPMPrintSessionMBS as CPMPrintSessionMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new print session object.
**Example:**

```
'get a print session

// print this PDF
dim pathPrinted as FolderItem=GetFolderItem("test.pdf")

dim thePrintSession as CPMPrintSessionMBS = NewCPMPrintSessionMBS
if thePrintSession = nil then Return

'get default page format and print settings and attach it to the print settings
dim thePageFormat as CPMPageFormatMBS = NewCPMPageFormatMBS
dim thePrintSettings as CPMPrintSettingsMBS = NewCPMPrintSettingsMBS
thePrintSession.DefaultPageFormat thePageFormat
thePrintSession.DefaultPrintSettings thePrintSettings
```

```
'show the print dialog
if not thePrintSession.PrintDialog(thePrintSettings,thePageFormat) then return

'open the file which will be printed
dim thePdfDocument as CGPDFDocumentMBS = pathPrinted.OpenAsCGPDFDocumentMBS

' limit page counts to the one we have
dim LastPage as Integer = thePdfDocument.PageCount
if thePrintSettings.LastPage<lastpage then
lastpage=thePrintSettings.LastPage
end if

' you get better progress bar if you tell how many pages will come
thePrintSettings.LastPage=lastpage

'begin the printing
thePrintSession.BeginDocument(thePrintSettings, thePageFormat)

'loop over the number of copies
for currentCopy as Integer = 1 to thePrintSettings.Copies

'loop over the pages
for currentPage as Integer = thePrintSettings.FirstPage to LastPage

'prepage the page
dim PrintRect as CPMRectMBS =thePageFormat.AdjustedPageSize
dim CGRect as CGRectMBS =CGMakeRectMBS(PrintRect.left, PrintRect.top, PrintRect.Width, Print-
Rect.Height)
thePrintSession.BeginPage(thePageFormat, nil)
dim thePrintContext as CGContextMBS = thePrintSession.PageContext
if thePrintContext = Nil then return

'print the page
thePrintContext.DrawCGPDFDocument thePdfDocument, CGRect, currentPage

'end the page
thePrintContext = nil
thePrintSession.EndPage
next

next

'end the printing
thePrintSession.EndDocument
```

**Notes:** Returns nil on any error.

### 141.1.3 NewCPMPrintSettingsMBS as CPMPrintSettingsMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new print settings object.
**Notes:** Returns nil on any error.

## 141.2 class CPMLanguageInfoMBS

### 141.2.1 class CPMLanguageInfoMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a language info.
**Notes:** Only a data class.

### 141.2.2 Properties

### 141.2.3 Level as String

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The level string of the printer.
**Notes:** (Read and Write property)

### 141.2.4 Release as String

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The release string of the printer.
**Notes:** (Read and Write property)

### 141.2.5 Version as String

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The version string of the printer.
**Notes:** (Read and Write property)

## 141.3 class CPMPageFormatMBS

### 141.3.1 class CPMPageFormatMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a page format.

### 141.3.2 Methods

### 141.3.3 AdjustedPageSize as CPMRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The adjusted page size.
**Notes:** Lasterror is set.

### 141.3.4 AdjustedPaperSize as CPMRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The adjusted page size.
**Notes:** Lasterror is set.

### 141.3.5 Constructor

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new page format object.

### 141.3.6 CopySettings(Destination as CPMPageFormatMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Copies the settings to another pageformat object.

### 141.3.7 CreateDataRepresentation(Format as Integer = 0) as String

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a data representation of a PMPageFormat object as a data string.
**Example:**

```
dim p as new CPMPageFormatMBS
p.orientation = p.kPMLandscape
dim d as string = p.CreateDataRepresentation
break // check in debugger
```

**Notes:** Use CreateWithDataRepresentation to create a CPMPageFormatMBS from a string created by this call.
Format can be kPMDataFormatXMLDefault, kPMDataFormatXMLMinimal or kPMDataFormatXMLCompressed.

### 141.3.8 CreateWithDataRepresentation(Data as String) as CPMPageFormatMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a PMPageFormat object from a data representation created with CreateDataRepresentation.
**Example:**

```
dim p as new CPMPageFormatMBS
p.orientation = p.kPMLandscape
dim d as string = p.CreateDataRepresentation

dim other as CPMPageFormatMBS = CPMPageFormatMBS.CreateWithDataRepresentation(d)
MsgBox str(other.Orientation)
```

**Notes:** Returns nil in case of error.

### 141.3.9 PrinterID as String

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Obtains the formatting printer for the pageformat.
**Notes:** Will either return the formatting printer for the pageformat or will return nil if the pageformat doesn't have that information.

### 141.3.10 UnadjustedPageSize as CPMRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The unadjusted page size.
**Notes:** Lasterror is set.

### 141.3.11 UnadjustedPaperSize as CPMRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The unadjusted page size.
**Notes:** Lasterror is set.

### 141.3.12 Properties

### 141.3.13 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the page format.
**Notes:** It's a PMPageFormat which you find in CMTypes.h in the Toolbox.
(Read and Write property)

### 141.3.14 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last command.
**Notes:** 0 if successfull, -1 if function is not available or a required parameter was not set. Else a Mac OS error code.
(Read and Write property)

### 141.3.15 release as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** whether the destructor will release the handle.
**Notes:** (Read and Write property)

### 141.3.16 Orientation as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The page orientation.
**Example:**

```
dim p as new CPMPageFormatMBS
p.orientation = p.kPMLandscape
```

**Notes:** Lasterror is set.

Possible values:

| | | |
|---|---|---|
| kPMPortrait | 1 | |
| kPMLandscape | 2 | |
| kPMReversePortrait | 3 | will revert to kPortrait for current drivers |
| kPMReverseLandscape | 4 | will revert to kLandscape for current drivers |

(Read and Write computed property)

### 141.3.17 Scale as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The page scaling.
**Notes:** Lasterror is set.
Value is 100 for 100%.
(Read and Write computed property)

### 141.3.18 Constants

Data Formats

| Constant | Value | Description |
|---|---|---|
| kPMDataFormatXMLCompressed | 2 | kPMDataFormatXMLCompressed is only compatible and usable with Mac O X version 10.5 and later. Data in this format can be only be reconsistuted int the equivalent printing manager object with the appropriate PMXXXCreat WithDataRepresentation function. The data representation produced when u ing kPMDataFormatXMLCompressed is approximately 20 times smaller tha kPMDataFormatXMLDefault. This format is a good choice when executio on versions of Mac OS X prior to 10.5 is not necessary and the minimum dat size is important. |
| kPMDataFormatXMLDefault | 0 | Specifies a data format that is compatible with all Mac OS X versions. Dat in this format can be used with the PMUnflattenXXX routines present in a versions of Mac OS X prior to 10.5. However, this data representation is muc larger than the more modern data representations described below. |
| kPMDataFormatXMLMinimal | 1 | XMLMinimal is only compatible and usable with Mac OS X version 10.5 an later. Data in this format can be only be reconsistuted into the equivalent prin ing manager object with the appropriate CreateWithDataRepresentation fun tion. The data representation produced when using kPMDataFormatXMLMi imal is approximately 3-5 times smaller than kPMDataFormatXMLDefaul This format is a good choice when execution on versions of Mac OS X prior t 10.5 is not necessary and an uncompressed XML representation of the data needed. |

Orientation Constants

| Constant | Value | Description |
|---|---|---|
| kPMLandscape | 2 | Landscape |
| kPMPortrait | 1 | Portrait |
| kPMReverseLandscape | 4 | Reverse Landscape |
| kPMReversePortrait | 3 | Reverse Portrait |

## 141.4 class CPMPrinterMBS

### 141.4.1 class CPMPrinterMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a printer.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr5
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

### 141.4.2 Methods

### 141.4.3 Constructor(name as string)

MBS MacCG Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a new printer object given the printer name.
**Notes:** Raises exception if lookup fails.
This accepts both CUPS names and the Mac GUI names in printing control panel.

### 141.4.4 CreateFromPrinterID(PrinterID as String) as CPMPrinterMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Create a PMPrinter instance from the supplied printerID.
**Example:**

```
dim p as CPMPrinterMBS = CPMPrinterMBS.CreateFromPrinterID("Brother_DCP_8085DN")
MsgBox p.name
```

### 141.4.5 CreateGenericPrinter as CPMPrinterMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a generic PMPrinter.

### 141.4.6 CreateLocalPrinterList as CPMPrinterMBS()

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of local printers.
**Example:**

```
dim a() as CPMPrinterMBS = CPMPrinterMBS.CreateLocalPrinterList
for each p as CPMPrinterMBS in a
MsgBox p.Name
next
```

### 141.4.7 DescriptionURL as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the description URL for this printer.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox printer.DescriptionURL
```

**Notes:** Should be the path to a PPD file for a laser printer.
Lasterror is set.

### 141.4.8 DeviceURI as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Hand back the URI of the printer's device.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox printer.DeviceURI
```

**Notes:** On success returns a CFURLMBS object describing the printer's device.
Lasterror is set.

### 141.4.9 DriverCreator as String

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns a 4 letter code for the creator of the printer.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "DriverCreator: "+str(printer.DriverCreator)
```

**Notes:** Lasterror is set.

### 141.4.10 DriverReleaseInfo as CPMVersionMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries printer driver version.

### 141.4.11 HostName as string

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Hand back the host name of the print server hosting the printer's print queue.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "HostName: "+str(printer.HostName)
```

**Notes:** Lasterror is set.

### 141.4.12 ID as string

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the ID of the string.

### 141.4.13 IndexedPrinterResolution(index as Integer) as CPMResolutionMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns a printer resolution.
**Notes:** Lasterror is set.
Index is from 1 to ResolutionCount.

### 141.4.14 IsDefault as boolean

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this printer is the default printer.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "IsDefault: "+str(printer.IsDefault)
```

### 141.4.15 IsFavorite as boolean

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Return true if the printer is in the user's favorite printer list.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "IsFavorite: "+str(printer.IsFavorite)
```

### 141.4.16 IsPostScriptCapable as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Can this printer do postscript?
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter
```

```
MsgBox "IsPostScriptCapable: "+str(printer.IsPostScriptCapable)
```

**Notes:** Lasterror is set.

### 141.4.17 IsPostScriptPrinter as boolean

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** If the result is true if the printer is a PostScript printer.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "IsPostScriptPrinter: "+str(printer.IsPostScriptPrinter)
```

**Notes:** A PostScript printer is one whose driver takes PostScript directly.

### 141.4.18 IsRemote as boolean

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Hand back a boolean indicating whether the printer is hosted by remote print server.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox "IsRemote: "+str(printer.IsRemote)
```

**Notes:** If result is true, the print queue represents a printer hosted and managed by a remote print server.

If result is false, the print queue represents a directly connected printer, a network printer, or a remote printer that is locally managed. Consult the queue's device URI to determine the type of connection that is used to communicate with the printer.

Whether a printer is remote is derived from the CUPS printer-type attribute for the print queue.

### 141.4.19 LanguageInfo as CPMLanguageInfoMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns language information about the printer.
**Notes:** Lasterror is set.

### 141.4.20 Location as string

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the location of the printer.

### 141.4.21 MakeAndModelName as string

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** A string with the name for the model and the maker.
**Notes:** Lasterror is set.
Returns "" on any error.

### 141.4.22 Name as string

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name of the string.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS
dim printer as CPMPrinterMBS = session.CurrentPrinter

MsgBox printer.name
```

### 141.4.23 ResolutionCount as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns how much resolutions are supported by the printer.
**Notes:** Lasterror is set.

### 141.4.24 SetDefault

MBS MacCG Plugin, Plugin Version: 9.2, Platform: macOS, Targets: Desktop only.

**Function:** Set the default printer for the current user.
**Notes:** It is not typical for an application to set the current default printer for the user; the printing system itself takes care of managing the default printer.
This function should be used only in rare circumstances.

Requires Mac OS X 10.5.

### 141.4.25 State as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries printer state.
**Example:**

```
dim p as CPMPrinterMBS = CPMPrinterMBS.CreateFromPrinterID("Brother_DCP_8085DN")
MsgBox str(p.State)
```

**Notes:** Can be kPMPrinterIdle, kPMPrinterProcessing or kPMPrinterStopped.

### 141.4.26 Properties

### 141.4.27 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the printer.
**Notes:** It's a PMPrinter which you find in CMTypes.h in the Toolbox.
(Read and Write property)

### 141.4.28 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last command.
**Notes:** 0 if successfull, -1 if function is not available or a required parameter was not set. Else a Mac OS error code.

(Read and Write property)

### 141.4.29 release as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** whether the destructor will release the handle.
**Notes:** (Read and Write property)

### 141.4.30 Constants

Printer States

| Constant | Value | Description |
|---|---|---|
| kPMPrinterIdle | 3 | Printer is idle. |
| kPMPrinterProcessing | 4 | Printer is processing. |
| kPMPrinterStopped | 5 | Printer is stopped. |

## 141.5 class CPMPrintSessionMBS

### 141.5.1 class CPMPrintSessionMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a print session.
**Notes:** Works only in Carbon Stuff and can only be used with CGContext which works only on Mac OS X.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr5

### 141.5.2 Methods

### 141.5.3 BeginDocument(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Begins a new document with the given settings.
**Notes:** Lasterror is set.

### 141.5.4 BeginDocumentNoDialog(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Begins a new document with the given settings.
**Notes:** Doesn't use the print progress dialog.
Lasterror is set.

### 141.5.5 BeginPage(pageformat as CPMPageFormatMBS, rect as CPMRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Begins a new page.
**Notes:** Lasterror is set.

### 141.5.6 BeginPageNoDialog(pageformat as CPMPageFormatMBS, rect as CPMRectMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Begins a new page.
**Notes:** Doesn't use the print progress dialog.
Lasterror is set.

### 141.5.7 Constructor

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new print session object.

### 141.5.8 CreatePrinterList(list() as string)

MBS MacCG Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a list of all printers.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS

dim list() as string
session.CreatePrinterList(list)

MsgBox join(list, EndOfLine)
```

**Notes:** List is an array of strings with the names of the printers.
Lasterror is set.
See also:

- 141.5.9 CreatePrinterList(list() as string, byref index as Integer, byref currentprinter as CPMPrinterMBS) 19393

### 141.5.9 CreatePrinterList(list() as string, byref index as Integer, byref currentprinter as CPMPrinterMBS)

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a list of all printers.
**Example:**

```
dim session as CPMPrintSessionMBS = NewCPMPrintSessionMBS

dim list() as string
dim currentprinter as CPMPrinterMBS
dim index as Integer
session.CreatePrinterList(list, index, currentprinter)

MsgBox join(list, EndOfLine)
```

**Notes:** List is an array of strings with the names of the printers.
Index is the index of the current printer inside this list.
CurrentPrinter is the current printer selected.
Lasterror is set.
See also:

- 141.5.8 CreatePrinterList(list() as string) 19393

### 141.5.10 DefaultPageFormat(pageformat as CPMPageFormatMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the page format object to the default settings.
**Notes:** Lasterror is set.

### 141.5.11 DefaultPrintSettings(printsettings as CPMPrintSettingsMBS)

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Sets the settings object to the default settings.
**Notes:** Lasterror is set.

### 141.5.12 EndDocument

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Ends the current document.
**Notes:** Lasterror is set.

### 141.5.13 EndDocumentNoDialog

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Ends the current document.
**Notes:** Doesn't use the print progress dialog.
Lasterror is set.

### 141.5.14 EndPage

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Ends the current page.
**Notes:** Lasterror is set.

### 141.5.15 EndPageNoDialog

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Ends the current page.
**Notes:** Doesn't use the print progress dialog.
Lasterror is set.

### 141.5.16 GetDestinationFormat(printsettings as CPMPrintSettingsMBS) as String

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the destination format value.
**Notes:** Lasterror is set.

### 141.5.17 GetDestinationLocation(printsettings as CPMPrintSettingsMBS) as String

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the destination location value.
**Notes:** Lasterror is set.

### 141.5.18 GetDestinationType(printsettings as CPMPrintSettingsMBS) as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Returns the destination type value.
**Notes:** Lasterror is set.

### 141.5.19 kPMDocumentFormatDefault as String

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the document format.

### 141.5.20 kPMDocumentFormatPDF as String

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the document format.

### 141.5.21 kPMDocumentFormatPostScript as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the document format.

### 141.5.22 kPMGraphicsContextCoreGraphics as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the graphics context.

### 141.5.23 kPMGraphicsContextDefault as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** One of the constants for the graphics context.

### 141.5.24 PageContext as CGContextMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGContext object for the current page.
**Notes:** Lasterror is set.

### 141.5.25 PageSetupDialog(pageformat as CPMPageFormatMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Shows the page setup dialog.
**Notes:** Lasterror is set.

### 141.5.26 PrintDialog(settings as CPMPrintSettingsMBS, pageformat as CPMPageFormatMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Shows the print dialog.
**Notes:** Lasterror is set.

### 141.5.27 SetDestination(printsettings as CPMPrintSettingsMBS, desttype as Integer, destformat as String, desturl as String)

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets a new destination.
**Notes:** Some destinations so you may need to specify a format, else you can pass "" for the default format. Some destinations require a URL to a file.

Destination type codes:

| | |
|---|---|
| kPMDestinationInvalid | 0 |
| kPMDestinationPrinter | 1 |
| kPMDestinationFile | 2 |
| kPMDestinationFax | 3 |
| kPMDestinationPreview | 4 |

Destformat strings:

| | |
|---|---|
| kPMDocumentFormatPDF | application/pdf |
| kPMDocumentFormatPICT | application/vnd.apple.printing-pict |
| kPMDocumentFormatPICTPS | application/vnd.apple.printing-pict-ps |
| kPMDocumentFormatPostScript | application/postscript |

Lasterror is set.

### 141.5.28 UseSheets(docWindow as window)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies that a printing dialog should be displayed as a sheet.
**Notes:** docWindow: The window to which the sheet dialog should be attached.
Lasterror is set. (-1 for the docWindow parameter being nil)

### 141.5.29 ValidatePageFormat(pageformat as CPMPageFormatMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Validates the page format.
**Notes:** Lasterror is set.

### 141.5.30 ValidatePrintSettings(printsettings as CPMPrintSettingsMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Validates the print settings.
**Notes:** Lasterror is set.

### 141.5.31 Properties

### 141.5.32 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the print session.
**Notes:** It's a PMPrintSession which you find in CMTypes.h in the Toolbox.
(Read and Write property)

### 141.5.33 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last command.
**Notes:** 0 if successfull, -1 if function is not available or a required parameter was not set. Else a Mac OS error code.
(Read and Write property)

### 141.5.34 release as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** whether the destructor will release the handle.
**Notes:** (Read and Write property)

### 141.5.35 SheetTarget as Window

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop only.

**Function:** The window set by UseSheets.
**Notes:** This property is to reference the window used for the sheets so Xojo does not destroy the window too early.
(Read and Write property)

### 141.5.36 CurrentPrinter as CPMPrinterMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The current printer for this session.
**Notes:** Lasterror is set.
Setting this can only be done on Mac OS X.
(Read and Write computed property)

### 141.5.37 CurrentPrinterName as string

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** The current printer for this session by name.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 141.5.38 Events

### 141.5.39 SheetDone(WindowHandle as Integer, accepted as boolean)

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: .

**Function:** This event is called for a finished print sheet.
**Notes:** Accepted is false if the cancel button was used. True if OK was clicked.

### 141.5.40 Constants

Destination Types

| Constant | Value | Description |
|---|---|---|
| kPMDestinationFax | 3 | Fax |
| kPMDestinationFile | 2 | File |
| kPMDestinationInvalid | 0 | Invalid |
| kPMDestinationPreview | 4 | Preview |
| kPMDestinationPrinter | 1 | Printer |
| kPMDestinationProcessPDF | 5 | Process to PDF |
| kPMDestinationTypeDefault | 1 | Default is printer. |

## 141.6 class CPMPrintSettingsMBS

### 141.6.1 class CPMPrintSettingsMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a print session.

### 141.6.2 Methods

### 141.6.3 Constructor

MBS MacCG Plugin, Plugin Version: 9.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new print settings object.

### 141.6.4 CopyPrintSettings(dest as CPMPrintSettingsMBS)

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Copes the settings to the other settings.

### 141.6.5 CreateDataRepresentation(Format as Integer = 0) as String

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns a data representation of a PMPageFormat object as a data string.
**Example:**

```
dim p as new CPMPrintSettingsMBS
p.Collate = true
p.Duplex = p.kPMDuplexTumble
dim data as string = p.CreateDataRepresentation
Break // check in debugger
```

### 141.6.6 CreateWithDataRepresentation(Data as String) as CPMPrintSettingsMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a PMPageFormat object from a data representation created with CreateDataRepresentation.

### 141.6.7 Dictionary as Dictionary

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Represent these print settings as a dictionary.

### 141.6.8 GetPageRange(byref minPage as UInt32, byref maxPage as UInt32)

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries the page range to print.
**Notes:** Obtains the valid range of pages that can be printed.
The default page range is 1 - (all pages). The page range is something that is set by the application. It is NOT the first and last page to print. It serves as limits for setting the first and last page.

### 141.6.9 Keys as String()

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Queries list of keys.
**Example:**

```
dim p as new CPMPrintSettingsMBS
p.Collate = true
p.Duplex = p.kPMDuplexTumble
dim keys() as string = p.keys
Break // check in debugger
```

### 141.6.10 SetPageRange(minPage as UInt32, maxPage as UInt32)

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the page range to print.

### 141.6.11 Properties

### 141.6.12 handle as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The handle for the print settings.
**Notes:** It's a PMPrintSettings which you find in CMTypes.h in the Toolbox.
(Read and Write property)

### 141.6.13 Lasterror as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The error code from the last command.
**Notes:** 0 if successfull, -1 if function is not available or a required parameter was not set. Else a Mac OS error code.
(Read and Write property)

### 141.6.14 release as boolean

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** whether the destructor will release the handle.
**Notes:** (Read and Write property)

### 141.6.15 Collate as boolean

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The collate setting.
**Notes:** (Read and Write computed property)

### 141.6.16 Copies as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The number of copies that the user requests to be printed.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 141.6.17 Duplex as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The duplex setting.
**Notes:** (Read and Write computed property)

### 141.6.18 FirstPage as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The number of the first page to print.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 141.6.19 JobName as String

MBS MacCG Plugin, Plugin Version: 12.1, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the name of a print job.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 141.6.20 LastPage as Integer

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The number of the last page to print.
**Example:**

```
'get a print session

// print this PDF
dim pathPrinted as FolderItem=GetFolderItem("test.pdf")

dim thePrintSession as CPMPrintSessionMBS = NewCPMPrintSessionMBS
if thePrintSession = nil then Return

'get default page format and print settings and attach it to the print settings
dim thePageFormat as CPMPageFormatMBS = NewCPMPageFormatMBS
dim thePrintSettings as CPMPrintSettingsMBS = NewCPMPrintSettingsMBS
thePrintSession.DefaultPageFormat thePageFormat
thePrintSession.DefaultPrintSettings thePrintSettings
```

```
'show the print dialog
if not thePrintSession.PrintDialog(thePrintSettings,thePageFormat) then return

'open the file which will be printed
dim thePdfDocument as CGPDFDocumentMBS = pathPrinted.OpenAsCGPDFDocumentMBS

' limit page counts to the one we have
dim LastPage as Integer = thePdfDocument.PageCount
if thePrintSettings.LastPage<lastpage then
lastpage=thePrintSettings.LastPage
end if

' you get better progress bar if you tell how many pages will come
thePrintSettings.LastPage=lastpage

'begin the printing
thePrintSession.BeginDocument(thePrintSettings, thePageFormat)

'loop over the number of copies
for currentCopy as Integer = 1 to thePrintSettings.Copies

'loop over the pages
for currentPage as Integer = thePrintSettings.FirstPage to LastPage

'prepage the page
dim PrintRect as CPMRectMBS =thePageFormat.AdjustedPageSize
dim CGRect as CGRectMBS =CGMakeRectMBS(PrintRect.left, PrintRect.top, PrintRect.Width, Print-
Rect.Height)
thePrintSession.BeginPage(thePageFormat, nil)
dim thePrintContext as CGContextMBS = thePrintSession.PageContext
if thePrintContext = Nil then return

'print the page
thePrintContext.DrawCGPDFDocument thePdfDocument, CGRect, currentPage

'end the page
thePrintContext = nil
thePrintSession.EndPage
next

next

'end the printing
thePrintSession.EndDocument
```

**Notes:** Lasterror is set.

(Read and Write computed property)

### 141.6.21 Value(key as String) as Variant

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The value in settings.
**Example:**

```
dim p as new CPMPrintSettingsMBS
p.Collate = true
dim value as Variant = p.value("com.apple.print.PrintSettings.PMCopyCollate")
Break // check in debugger
```

**Notes:** (Read and Write computed property)

### 141.6.22 Constants

Duplex Modes

| Constant | Value | Description |
|---|---|---|
| kPMDuplexNone | 1 | Duplex off. |
| kPMDuplexNoTumble | 2 | Duplex with no tumble. |
| kPMDuplexTumble | 3 | Duplex with tumble. |
| kPMSimplexTumble | 4 | No duplex. |

## 141.7 class CPMRectMBS

### 141.7.1 class CPMRectMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a rectangle.
**Notes:** Only a data class.

### 141.7.2 Properties

### 141.7.3 Bottom as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The bottom distance to the border.
**Notes:** (Read and Write property)

### 141.7.4 Height as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The height of the rectangle.
**Notes:** Setting the height changes the bottom property.
(Read and Write property)

### 141.7.5 Left as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The left distance to the border.
**Notes:** (Read and Write property)

### 141.7.6 Right as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The right distance to the border.
**Notes:** (Read and Write property)

### 141.7.7 Top as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The top distance to the border.
**Notes:** (Read and Write property)

### 141.7.8 Width as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The width of the rectangle.
**Notes:** Setting the height changes the right property.
(Read and Write property)

## 141.8 class CPMResolutionMBS

### 141.8.1 class CPMResolutionMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class for a resolution.
**Notes:** Only a data class.

### 141.8.2 Properties

### 141.8.3 Horizontal as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The horizontal resolution.
**Notes:** (Read and Write property)

### 141.8.4 Vertical as Double

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** The vertical resolution.
**Notes:** (Read and Write property)

## 141.9 class CPMVersionMBS

### 141.9.1 class CPMVersionMBS

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for version information.

### 141.9.2 Properties

### 141.9.3 CountryCode as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The country code.
**Notes:** (Read and Write property)

### 141.9.4 LongVersion as String

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The long version string.
**Notes:** (Read and Write property)

### 141.9.5 ShortVersion as String

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The short version string.
**Notes:** (Read and Write property)

### 141.9.6 VersionMajor as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The major version number.
**Notes:** (Read and Write property)

### 141.9.7 VersionMinor as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The minor version number.
**Notes:** (Read and Write property)

### 141.9.8 VersionRevision as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The reversion number.
**Notes:** (Read and Write property)

### 141.9.9 VersionStage as Integer

MBS MacCG Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The version stage.
**Notes:** (Read and Write property)

## 141.10 class WindowsAddPrintJobMBS

### 141.10.1 class WindowsAddPrintJobMBS

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to send raw data to a printer.
**Example:**

```
// Print Postscript directly to Postscript printer
const PrinterName = "Brother DCP-8085DN"

dim w as new WindowsAddPrintJobMBS

if not w.OpenPrinter(PrinterName) then
MsgBox "OpenPrinter failed. Is the printer name correct in the source code?"
Return
end if

const DocName = "My Document"

if not w.StartDocPrinter("My Document", w.kDataFormatRAW) then
MsgBox "StartDocPrinter failed."
Return
end if

MsgBox "Print Job ID: "+str(w.JobID)

call w.StartPagePrinter

dim PostScript as string = "%!PS"+EndOfLine.UNIX+".1 setgray"+EndOfLine.UNIX+"0 0 100 100 rect-
fill"+EndOfLine.UNIX+"showpage"+EndOfLine.UNIX

dim BytesSent as Integer = w.WritePrinter(PostScript)

MsgBox str(BytesSent)+" bytes of "+str(lenb(PostScript))+" bytes sent."

call w.EndPagePrinter
call w.EndDocPrinter

w = nil // close printer
```

**Notes:** Perfect for printing postscript data to a postscript printer.
You can use this class in several ways:

1. OpenPrinter, AddJob, WriteJob and ScheduleJob.

2. OpenPrinter, StartDocPrinter, StartPagePrinter, WritePrinter, EndPagePrinter, EndDocPrinter and ClosePrinter.
3. OpenPrinter, StartDocPrinter, WritePrinter, EndDocPrinter and ClosePrinter.

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.2pr1
- More on printing on Windows
- MBS Plugins 10.3 Release Notes

### 141.10.2 Methods

### 141.10.3 AddJob as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new print job.
**Notes:** Returns true on success and false on failure.

### 141.10.4 ClosePrinter

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes printer connection.

### 141.10.5 EndDocPrinter as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The EndDocPrinter function ends a print job for the specified printer.
**Notes:** If the function succeeds, the return value is a true.

The EndDocPrinter function returns an error if the print job was not started by calling the StartDocPrinter function.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.

5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it may fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.

### 141.10.6 EndPagePrinter as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The EndPagePrinter function notifies the print spooler that the application is at the end of a page in a print job.
**Notes:** If the function succeeds, the return value is a true.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.

### 141.10.7 OpenPrinter(PrinterName as string) as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens the printer for printing.
**Notes:** Returns true on success and false on failure.
PrinterName can be "" for the default printer.

### 141.10.8 ScheduleJob as boolean

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Schedules the printing.
**Notes:** Returns true on success and false on failure.

### 141.10.9 StartDocPrinter(DocName as string, Datatype as string) as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StartDocPrinter function notifies the print spooler that a document is to be spooled for printing.
**Example:**

```
// Print Postscript directly to Postscript printer
const PrinterName = "Brother DCP-8085DN"

dim w as new WindowsAddPrintJobMBS

if not w.OpenPrinter(PrinterName) then
MsgBox "OpenPrinter failed. Is the printer name correct in the source code?"
Return
end if

const DocName = "My Document"

if not w.StartDocPrinter("My Document", w.kDataFormatRAW) then
MsgBox "StartDocPrinter failed."
Return
end if

MsgBox "Print Job ID: "+str(w.JobID)

call w.StartPagePrinter

dim PostScript as string = "%!PS"+EndOfLine.UNIX+".1 setgray"+EndOfLine.UNIX+"0 0 100 100 rectfill"+EndOfLine.UNIX+"showpage"+EndOfLine.UNIX

dim BytesSent as Integer = w.WritePrinter(PostScript)

MsgBox str(BytesSent)+" bytes of "+str(lenb(PostScript))+" bytes sent."

call w.EndPagePrinter
call w.EndDocPrinter

w = nil // close printer
```

**Notes:** DocName: A string that specifies the name of the document.
OutputFile: Optional a path string or a folderitem that specifies the name of an output file. To print to a printer, set this to "" or nil or leave away.
Datatype: A string that identifies the type of data used to record the document.

If the function succeeds, the return value is true and the JobID property is set.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.
See also:

- 141.10.10 StartDocPrinter(DocName as string, OutputFile as folderitem, Datatype as string) as boolean 19416
- 141.10.11 StartDocPrinter(DocName as string, OutputFilePath as string, Datatype as string) as boolean 19418

### 141.10.10 StartDocPrinter(DocName as string, OutputFile as folderitem, Datatype as string) as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StartDocPrinter function notifies the print spooler that a document is to be spooled for printing.
**Example:**

```
// Print Postscript directly to Postscript printer
const PrinterName = "Brother DCP-8085DN"

dim w as new WindowsAddPrintJobMBS

if not w.OpenPrinter(PrinterName) then
```

```
MsgBox "OpenPrinter failed. Is the printer name correct in the source code?"
Return
end if

const DocName = "My Document"

// output to a file
dim file as FolderItem = SpecialFolder.Desktop.Child("test.ps")

if not w.StartDocPrinter("My Document", file, w.kDataFormatRAW) then
MsgBox "StartDocPrinter failed."
Return
end if

MsgBox "Print Job ID: "+str(w.JobID)

call w.StartPagePrinter

dim PostScript as string = "%!PS"+EndOfLine.UNIX+".1 setgray"+EndOfLine.UNIX+"0 0 100 100 rect-
fill"+EndOfLine.UNIX+"showpage"+EndOfLine.UNIX

dim BytesSent as Integer = w.WritePrinter(PostScript)

MsgBox str(BytesSent)+" bytes of "+str(lenb(PostScript))+" bytes sent."

call w.EndPagePrinter
call w.EndDocPrinter

w = nil // close printer
```

**Notes:** DocName: A string that specifies the name of the document.
OutputFile: Optional a path string or a folderitem that specifies the name of an output file. To print to a printer, set this to "" or nil or leave away.
Datatype: A string that identifies the type of data used to record the document.

If the function succeeds, the return value is true and the JobID property is set.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.

6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.
See also:

- 141.10.9 StartDocPrinter(DocName as string, Datatype as string) as boolean 19415
- 141.10.11 StartDocPrinter(DocName as string, OutputFilePath as string, Datatype as string) as boolean 19418

### 141.10.11 StartDocPrinter(DocName as string, OutputFilePath as string, Datatype as string) as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StartDocPrinter function notifies the print spooler that a document is to be spooled for printing.
**Example:**

```
// Print Postscript directly to Postscript printer
const PrinterName = "Brother DCP-8085DN"

dim w as new WindowsAddPrintJobMBS

if not w.OpenPrinter(PrinterName) then
MsgBox "OpenPrinter failed. Is the printer name correct in the source code?"
Return
end if

const DocName = "My Document"

// output to a file
dim file as string = "C:\test.ps"

if not w.StartDocPrinter("My Document", file, w.kDataFormatRAW) then
MsgBox "StartDocPrinter failed."
Return
end if

MsgBox "Print Job ID: "+str(w.JobID)

call w.StartPagePrinter

dim PostScript as string = "%!PS"+EndOfLine.UNIX+".1 setgray"+EndOfLine.UNIX+"0 0 100 100 rect-
```

```
fill"+EndOfLine.UNIX+"showpage"+EndOfLine.UNIX

dim BytesSent as Integer = w.WritePrinter(PostScript)

MsgBox str(BytesSent)+" bytes of "+str(lenb(PostScript))+" bytes sent."

call w.EndPagePrinter
call w.EndDocPrinter

w = nil // close printer
```

**Notes:** DocName: A string that specifies the name of the document.
OutputFile: Optional a path string or a folderitem that specifies the name of an output file. To print to a printer, set this to "" or nil or leave away.
Datatype: A string that identifies the type of data used to record the document.

If the function succeeds, the return value is true and the JobID property is set.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.
See also:

- 141.10.9 StartDocPrinter(DocName as string, Datatype as string) as boolean 19415
- 141.10.10 StartDocPrinter(DocName as string, OutputFile as folderitem, Datatype as string) as boolean 19416

### 141.10.12 StartPagePrinter as boolean

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The StartPagePrinter function notifies the spooler that a page is about to be printed on the specified printer.

**Notes:** If the function succeeds, the return value is a true.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.
4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.

### 141.10.13 WriteJob(data as string) as Integer

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds data to the spool file.
**Notes:** You need to pass raw data for the printer, e.g. postscript data.
Returns the number of bytes written.
So lenb(data) should be equal to the result.
Only available between a call to AddJob and ScheduleJob.

### 141.10.14 WritePrinter(data as string) as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WritePrinter function notifies the print spooler that data should be written to the specified printer.
**Notes:** data: The data that should be written to the printer.

If the function succeeds, the return value is a true.

The sequence for a print job is as follows:

1. To begin a print job, call StartDocPrinter.
2. To begin each page, call StartPagePrinter.
3. To write data to a page, call WritePrinter.

4. To end each page, call EndPagePrinter.
5. Repeat 2, 3, and 4 for as many pages as necessary.
6. To end the print job, call EndDocPrinter.

When a high-level document (such as an Adobe PDF or Microsoft Word file) or other printer data (such PCL, PS, or HPGL) is sent directly to a printer, the print settings defined in the document take precedent over Windows print settings.

When a page in a spooled file exceeds approximately 350 MB, it can fail to print and not send an error message. For example, this can occur when printing large EMF files. The page size limit depends on many factors including the amount of virtual memory available, the amount of memory allocated by calling processes, and the amount of fragmentation in the process heap.

### 141.10.15 Properties

### 141.10.16 JobID as Integer

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The JobID of this print.
**Notes:** For information only.
Maybe be useful for the user to find this print job later.
(Read and Write property)

### 141.10.17 JobPath as String

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file name of the temporary file used.
**Notes:** Just for information and only available between a call to AddJob and ScheduleJob.
(Read and Write property)

### 141.10.18 lastError as Integer

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Zero for no error.
-1 if the plugin has a problem like invalid parameter or called on Mac/Linux.
others are Windows error codes.
(Read and Write property)

### 141.10.19 lastErrorMessage as String

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The localized text message for LastError property.
**Notes:** (Read and Write property)

### 141.10.20 PrinterHandle as Integer

MBS Win Plugin, Plugin Version: 6.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the printer.
**Notes:** (Read and Write property)

### 141.10.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDataFormatRAW | "RAW" | One of the data format constants.<br>Use this constant if you send to both local and networked printers that us GDI-based printer drivers. |
| kDataFormatXPS_PASS | "XPS_PASS" | One of the data format constants.<br>Use this constant to send printer control data directly to printers that us XPSDrv printer drivers. |

## 141.11 class WindowsDeviceModeMBS

### 141.11.1 class WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for device modue information for a Windows printer.
**Example:**

```
dim d as new WindowsDeviceModeMBS
dim name as string = "My printer"

// here we define which values we want to change
d.Fields = d.DM_ORIENTATION
// and change value
d.Orientation = d.DMORIENT_PORTRAIT

dim w as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name)
if w.ChangePrinterSettings(d, 2) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Basicly this class wraps the Windows DEVMODE structure.

For more information on the DEVMODE structure, visit this website:
http://msdn.microsoft.com/en-us/library/dd183565(VS.85).aspx
**Blog Entries**

- MBS Xojo Plugins, version 17.6pr4
- Detect PrinterSetup data format
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.3
- MBS Xojo Plugins, version 17.3pr7
- MBS Xojo Plugins, version 17.2pr3
- Print to Printer in Xojo on Windows
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3
- Updating PrinterSetup.SetupString on Windows
- More on printing on Windows
- MBS REALbasic Plugins Version 10.4 release notes

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.5, page 9: News

### 141.11.2 Methods

### 141.11.3 ApplyToSetupString(SetupString as String) as string

MBS Win Plugin, Plugin Version: 17.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Applies current device mode to the given setup string.
**Example:**

```
dim p as new PrinterSetup

if p.PageSetupDialog then

dim w as WindowsDeviceModeMBS = WindowsDeviceModeMBS.FromSetupString(s)

w.Copies = 3
w.Fields = BitwiseOr(w.Fields, w.DM_COPIES)

dim s as string = w.SetupString
dim t as string = w.ApplyToSetupString(s)

Break // check

end if
```

**Notes:** The setup string contains a device mode and we replace the one from Xojo with our own. The other information is kept the same.

### 141.11.4 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new empty device mode.
**Notes:** Size is set for you to default name of the data structure.

### 141.11.5 FromRawData(data as memoryblock, Unicode as boolean = true) as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new WindowsDeviceModeMBS object with given data.
**Notes:** The data is expected to the in format of DEVMODEW structure with some extra data and the right values inside.
If Unicode is true, we use DEVMODEW and if Unicode is false, we use DEVMODEA structure.
See also:

- 141.11.6 FromRawData(data as string, Unicode as boolean = true) as WindowsDeviceModeMBS 19425

### 141.11.6 FromRawData(data as string, Unicode as boolean = true) as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new WindowsDeviceModeMBS object with given data.
**Notes:** The data is expected to the in format of DEVMODEW structure with some extra data and the right values inside.
If Unicode is true, we use DEVMODEW and if Unicode is false, we use DEVMODEA structure.
See also:

- 141.11.5 FromRawData(data as memoryblock, Unicode as boolean = true) as WindowsDeviceModeMBS 19425

### 141.11.7 FromSetupString(SetupString as String) as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initialized DevMode object from setup string.
**Example:**

```
dim p as new PrinterSetup

// setup something
call p.PageSetupDialog

// now we have nice setupstring
dim ss as string = p.SetupString

// parse it in device mode
dim d as WindowsDeviceModeMBS = WindowsDeviceModeMBS.FromSetupString(ss)

// duplex is?
MsgBox "Duplex: "+str(d.Duplex)
```

```
// change printer
d.DeviceName = "Deskjet 2540 series#:2"

// enable duplex
d.Fields = BitwiseOr(d.Fields, d.DM_DUPLEX)
d.Duplex = d.DMDUP_HORIZONTAL

// now duplex is?
MsgBox "Duplex: "+str(d.Duplex)

// get back as setup string
dim da as string = d.SetupString

if da = "" then
MsgBox "failed to create setup string"
Return
end if

// assign back
p.SetupString = da

// take a look
call p.PageSetupDialog

// and print something
dim g as Graphics = OpenPrinter(p)

g.DrawString "Page 1", 20, 20
g.NextPage
g.DrawString "Page 2", 20, 20
```

**Notes:** You can pass string from PrinterSetup.SetupString.

Supports Xojo 2017r1 with 17.3 plugins.

### 141.11.8 RawData(Unicode as boolean = true) as memoryblock

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies the raw data of the WindowsDeviceModeMBS class.
**Notes:** Returns nil on any error.
If Unicode is true, we use DEVMODEW and if Unicode is false, we use DEVMODEA structure.

### 141.11.9 SetupString(ActualHorizontalResolution as integer, ActualVerticalResolution as integer, MaxHorizontalResolution as integer, MaxVerticalResolution as integer, MarginLeft as integer = 2500, MarginRight as integer = 2500, MarginTop as integer = 2500, MarginBottom as integer = 2500, MinMarginLeft as integer = 0, MinMarginRight as integer = 0, MinMarginTop as integer = 0, MinMarginBottom as integer = 0, PageSetupFlags as integer = 8) as string

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a setup string from devmode.
**Notes:** This setupstring is empty on error.
If not empty, you can assign to PrinterSetup.SetupString.

Please pass reasonable flags.
Check existing SetupStrings from Xojo for possible values.
Resolution parameters can e.g. bei 72.

Supports Xojo 2017r1 with 17.3 plugins.
See also:

- 141.11.10 SetupString(Margin as Integer = 2500) as string 19427

### 141.11.10 SetupString(Margin as Integer = 2500) as string

MBS Win Plugin, Plugin Version: 14.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a setup string from devmode.
**Example:**

```
dim p as new PrinterSetup

// setup something
call p.PageSetupDialog

// now we have nice setupstring
dim ss as string = p.SetupString

// parse it in device mode
dim d as WindowsDeviceModeMBS = WindowsDeviceModeMBS.FromSetupString(ss)

// duplex is?
MsgBox "Duplex: "+str(d.Duplex)

// change printer
d.DeviceName = "Deskjet 2540 series#:2"
```

```
// enable duplex
d.Fields = BitwiseOr(d.Fields, d.DM_DUPLEX)
d.Duplex = d.DMDUP_HORIZONTAL

// now duplex is?
MsgBox "Duplex: "+str(d.Duplex)

// get back as setup string
dim da as string = d.SetupString

if da = "" then
MsgBox "failed to create setup string"
Return
end if

// assign back
p.SetupString = da

// take a look
call p.PageSetupDialog

// and print something
dim g as Graphics = OpenPrinter(p)

g.DrawString "Page 1", 20, 20
g.NextPage
g.DrawString "Page 2", 20, 20
```

**Notes:** This setupstring is empty on error.
If not empty, you can assign to PrinterSetup.SetupString.

Supports Xojo 2017r1 with 17.3 plugins.
See also:

- 141.11.9 SetupString(ActualHorizontalResolution as integer, ActualVerticalResolution as integer, MaxHorizontalResolution as integer, MaxVerticalResolution as integer, MarginLeft as integer = 2500, MarginRight as integer = 2500, MarginTop as integer = 2500, MarginBottom as integer = 2500, MinMarginLeft as integer = 0, MinMarginRight as integer = 0, MinMarginTop as integer = 0, MinMarginBottom as integer = 0, PageSetupFlags as integer = 8) as string 

### 141.11.11 Properties

### 141.11.12 Collate as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies whether collation should be used when printing multiple copies.
**Notes:** This member is ignored unless the printer driver indicates support for collation by setting the dmFields member to DM_COLLATE.
This member can be one of the following values:

| Value | Meaning |
|---|---|
| DMCOLLATE_TRUE | Collate when printing multiple copies. |
| DMCOLLATE_FALSE | Do not collate when printing multiple copies. |

(Read and Write property)

### 141.11.13 Color as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Switches between color and monochrome on color printers.
**Notes:** The following are the possible values:
DMCOLOR_COLOR
DMCOLOR_MONOCHROME
(Read and Write property)

### 141.11.14 Copies as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Selects the number of copies printed if the device supports multiple-page copies.
**Example:**

```
dim w as WindowsDeviceModeMBS // your device mode object

w.Copies = 3
w.Fields = BitwiseOr(w.Fields, w.DM_COPIES)
```

**Notes:** (Read and Write property)

### 141.11.15 Data as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The raw data pointer to the DEVMODEW structure.
**Notes:** (Read only property)

### 141.11.16 DefaultSource as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the paper source.
**Notes:** Use the DMBIN_* constants.
(Read and Write property)

### 141.11.17 DeviceName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the "friendly" name of the printer or display; for example, "PCL/HP LaserJet" in the case of PCL/HP LaserJet.
**Notes:** This string is unique among device drivers. Note that this name may be truncated to fit in the dmDeviceName field.
(Read and Write property)

### 141.11.18 DitherType as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies how dithering is to be done.
**Notes:** The member can be one of the following predefined values, or a driver-defined value greater than or equal to the value of DMDITHER_USER.

| Value | Meaning |
|---|---|
| DMDITHER_NONE | No dithering. |
| DMDITHER_COARSE | Dithering with a coarse brush. |
| DMDITHER_FINE | Dithering with a fine brush. |
| DMDITHER_LINEART | Line art dithering, a special dithering method that produces well defined borders between black, white, and gray scaling. It is not suitable for images that include continuous graduations in intensity and hue, such as scanned photographs. |
| DMDITHER_GRAYSCALE | Device does gray scaling. |

(Read and Write property)

### 141.11.19 DriverExtra as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the number of bytes of private driver-data that follow this structure. If a device driver does not use device-specific information, set this member to zero.
**Notes:** (Read and Write property)

### 141.11.20 DriverVersion as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The driver version number assigned by the driver developer.
**Notes:** (Read and Write property)

### 141.11.21 Duplex as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Selects duplex or double-sided printing for printers capable of duplex printing.
**Notes:** Following are the possible values.

| Value | Meaning |
|---|---|
| DMDUP_SIMPLEX | Normal (nonduplex) printing. |
| DMDUP_HORIZONTAL | Short-edge binding, that is, the long edge of the page is horizontal. |
| DMDUP_VERTICAL | Long-edge binding, that is, the long edge of the page is vertical. |

(Read and Write property)

### 141.11.22 Fields as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies whether certain properties have been initialized.
**Notes:** If a property is initialized, its corresponding bit is set, otherwise the bit is clear. A driver supports only those properties that are appropriate for the printer or display technology.

Use the DM_* constants which match by name their property. So the DM_ORIENTATION bit value is related to the Orientation property.
(Read and Write property)

### 141.11.23 FormName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string array that specifies the name of the form to use; for example, "Letter" or "Legal".
**Notes:** A complete set of names can be retrieved by using the GetPrinterFormats function on the WindowsPrinterListMBS class.
(Read and Write property)

### 141.11.24 ICMIntent as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies which color matching method, or intent, should be used by default.
**Notes:** This member is primarily for non-ICM applications. ICM applications can establish intents by using the ICM functions. This member can be one of the following predefined values, or a driver defined value greater than or equal to the value of DMICM_USER.

| Value | Meaning |
|---|---|
| DMICM_ABS_COLORIMETRIC | Color matching should optimize to match the exact color requested without white point mapping. This value is most appropriate for use with proofing. |
| DMICM_COLORIMETRIC | Color matching should optimize to match the exact color requested. This value is most appropriate for use with business logos or other images when an exact color match is desired. |
| DMICM_CONTRAST | Color matching should optimize for color contrast. This value is the most appropriate choice for scanned or photographic images when dithering is desired. |
| DMICM_SATURATE | Color matching should optimize for color saturation. This value is the most appropriate choice for business graphs when dithering is not desired. |

(Read and Write property)

### 141.11.25 ICMMethod as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies how ICM is handled.
**Notes:** For a non-ICM application, this member determines if ICM is enabled or disabled. For ICM applications, the system examines this member to determine how to handle ICM support. This member can

be one of the following predefined values, or a driver-defined value greater than or equal to the value of DMICMMETHOD_USER.

| Value | Meaning |
|---|---|
| DMICMMETHOD_NONE | Specifies that ICM is disabled. |
| DMICMMETHOD_SYSTEM | Specifies that ICM is handled by Windows. |
| DMICMMETHOD_DRIVER | Specifies that ICM is handled by the device driver. |
| DMICMMETHOD_DEVICE | Specifies that ICM is handled by the destination device. |

The printer driver must provide a user interface for setting this member. Most printer drivers support only the DMICMMETHOD_SYSTEM or DMICMMETHOD_NONE value. Drivers for PostScript printers support all values.
(Read and Write property)

### 141.11.26 LogPixels as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of pixels per logical inch.
**Notes:** Printer drivers do not use this member.
(Read and Write property)

### 141.11.27 MediaType as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the type of media being printed on.
**Notes:** The member can be one of the following predefined values, or a driver-defined value greater than or equal to the value of DMMEDIA_USER.

| Value | Meaning |
|---|---|
| DMMEDIA_STANDARD | Plain paper. |
| DMMEDIA_GLOSSY | Glossy paper. |
| DMMEDIA_TRANSPARENCY | Transparent film. |

(Read and Write property)

### 141.11.28 Nup as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies where the NUP is done.
**Notes:** It can be one of the following.

| Value | Meaning |
|---|---|
| DMNUP_SYSTEM | The print spooler does the NUP. |
| DMNUP_ONEUP | The application does the NUP. |

(Read and Write property)

### 141.11.29 Orientation as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printer devices only, selects the orientation of the paper.
**Example:**

```
dim d as new WindowsDeviceModeMBS
dim name as string = "My printer"

// here we define which values we want to change
d.Fields = d.DM_ORIENTATION
// and change value
d.Orientation = d.DMORIENT_PORTRAIT

dim w as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name)
if w.ChangePrinterSettings(d, 2) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** This member can be either DMORIENT_PORTRAIT (1) or DMORIENT_LANDSCAPE (2).
(Read and Write property)

### 141.11.30 PaperLength as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printer devices only, overrides the length of the paper specified by the PaperSize member, either for custom paper sizes or for devices such as dot-matrix printers that can print on a page of arbitrary length.

**Notes:** These values, along with all other values in this structure that specify a physical length, are in tenths of a millimeter.
(Read and Write property)

### 141.11.31 PaperSize as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printer devices only, selects the size of the paper to print on.
**Notes:** This member can be set to zero if the length and width of the paper are both set by the PaperLength and PaperWidth members. Otherwise, the PaperSize member can be set to a device specific value greater than or equal to DMPAPER_USER or to one of the following predefined values with DMPAPER_* constants.
(Read and Write property)

### 141.11.32 PaperWidth as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printer devices only, overrides the width of the paper specified by the PaperSize member.
**Notes:** Unit is tenths of a millimeter.
(Read and Write property)

### 141.11.33 PrintQuality as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the printer resolution.
**Notes:** There are four predefined device-independent values:

DMRES_HIGH
DMRES_MEDIUM
DMRES_LOW
DMRES_DRAFT

If a positive value is specified, it specifies the number of dots per inch (DPI) and is therefore device dependent.
(Read and Write property)

### 141.11.34 Scale as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the factor by which the printed output is to be scaled.
**Notes:** The apparent page size is scaled from the physical page size by a factor of Scale /100. For example, a letter-sized page with a dmScale value of 50 would contain as much data as a page of 17- by 22-inches because the output text and graphics would be half their original height and width.
(Read and Write property)

### 141.11.35 Size as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the size, in bytes, of the DEVMODE structure, not including any private driver-specific data that might follow the structure's public members.
**Notes:** You don't need to set this field normally as the plugin does that for you.
(Read and Write property)

### 141.11.36 SpecVersion as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The version number of the initialization data specification on which the structure is based.
**Notes:** You don't need to set this field normally as the plugin does that for you.
(Read and Write property)

### 141.11.37 TTOption as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies how TrueType fonts should be printed.
**Notes:** This member can be one of the following values:

| Value | Meaning |
|---|---|
| DMTT_BITMAP | Prints TrueType fonts as graphics. This is the default action for dot-matrix printers. |
| DMTT_DOWNLOAD | Downloads TrueType fonts as soft fonts. This is the default action for Hewlett-Packard printers that use Printer Control Language (PCL). |
| DMTT_DOWNLOAD_OUTLINE | Downloads TrueType fonts as outline soft fonts. |
| DMTT_SUBDEV | Substitutes device fonts for TrueType fonts. This is the default action for PostScript printers. |

(Read and Write property)

### 141.11.38 YResolution as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the y-resolution, in dots per inch, of the printer.
**Notes:** If the printer initializes this member, the PrintQuality member specifies the x-resolution, in dots per inch, of the printer.
(Read and Write property)

### 141.11.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DMBIN_AUTO | 7 | One of the source bin constants. Auto |
| DMBIN_CASSETTE | 14 | One of the source bin constants. Cassette |
| DMBIN_ENVELOPE | 5 | One of the source bin constants. Envelope |
| DMBIN_ENVMANUAL | 6 | One of the source bin constants. Envelope Manual. |
| DMBIN_FORMSOURCE | 15 | One of the source bin constants. Form Source. |
| DMBIN_LARGECAPACITY | 11 | One of the source bin constants. Large Capacity |
| DMBIN_LARGEFMT | 10 | One of the source bin constants. Large Format |
| DMBIN_LOWER | 2 | One of the source bin constants. Lower |
| DMBIN_MANUAL | 4 | One of the source bin constants. Manual |
| DMBIN_MIDDLE | 3 | One of the source bin constants. Middle |
| DMBIN_ONLYONE | 1 | One of the source bin constants. Only One. |
| DMBIN_SMALLFMT | 9 | One of the source bin constants. Small Format |
| DMBIN_TRACTOR | 8 | One of the source bin constants. Tractor |
| DMBIN_UPPER | 1 | One of the source bin constants. Upper |
| DMBIN_USER | 256 | One of the source bin constants. User |
| DMCOLLATE_FALSE | 0 | One of the collate mode constants. Do not collate when printing multiple copies |
| DMCOLLATE_TRUE | 1 | One of the collate mode constants. Collate when printing multiple copies. |
| DMCOLOR_COLOR | 2 | One of the color mode constants. Color |
| DMCOLOR_MONOCHROME | 1 | One of the color mode constants. Monochrome. |
| DMDITHER_COARSE | 2 | One of the dither constants. Dithering with a coarse brush. |
| DMDITHER_ERRORDIFFUSION | 5 | One of the dither constants. |
| DMDITHER_FINE | 3 | One of the dither constants. Dithering with a fine brush. |
| DMDITHER_GRAYSCALE | 10 | One of the dither constants. Device does gray scaling. |
| DMDITHER_LINEART | 4 | One of the dither constants. Line art dithering, a special dithering metho ders between black, white, and gray scalin that include continuous graduations in intens tographs. |
| DMDITHER_NONE | 1 | One of the dither constants. No dithering. |
| DMDITHER_RESERVED6 | 6 | One of the dither constants. |
| DMDITHER_RESERVED7 | 7 | One of the dither constants. |
| DMDITHER_RESERVED8 | 8 | One of the dither constants. |
| DMDITHER_RESERVED9 | 9 | One of the dither constants. |
| DMDITHER_USER | 256 | One of the dither constants. |
| DMDUP_HORIZONTAL | 3 | One of the duplex mode constants. |

## 141.12 class WindowsGraphicsInfoMBS

### 141.12.1 class WindowsGraphicsInfoMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class gives information for Windows Device contexts.
**Example:**

```
dim g as Graphics = OpenPrinter
dim info as WindowsGraphicsInfoMBS = g.WindowsGraphicsInfoMBS

MsgBox _
"Printer physical page size: "+str(info.PhysicalWidth)+" "+str(info.PhysicalHeight)+_
EndOfLine+_
"Useable paper size: "+str(info.ResolutionX)+ " x "+str(info.ResolutionY)+_
EndOfLine+_
"Paper size: "+str(info.SizeX)+" x "+str(info.Sizey)+" mm"
```

**Notes:** Main use currently is to learn about native resolution of a printer graphics object.
**Blog Entries**

- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr5
- MBS Real Studio Plugins, version 12.1pr6
- More on printing on Windows

**Xojo Developer Magazine**

- 16.5, page 9: News

### 141.12.2 Methods

### 141.12.3 Constructor

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initializes properties for main screen.
See also:


- 141.12.4 Constructor(c as control) 19440
- 141.12.5 Constructor(c as DesktopControl) 19440

- 141.12.6 Constructor(g as graphics) 19441
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441
- 141.12.9 Constructor(w as window) 19442


### 141.12.4 Constructor(c as control)

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this control object.
See also:


- 141.12.3 Constructor 19439
- 141.12.5 Constructor(c as DesktopControl) 19440
- 141.12.6 Constructor(g as graphics) 19441
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441
- 141.12.9 Constructor(w as window) 19442


### 141.12.5 Constructor(c as DesktopControl)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this control object.
See also:


- 141.12.3 Constructor 19439
- 141.12.4 Constructor(c as control) 19440
- 141.12.6 Constructor(g as graphics) 19441
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441
- 141.12.9 Constructor(w as window) 19442

### 141.12.6 Constructor(g as graphics)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this graphics object.
See also:


- 141.12.3 Constructor 19439
- 141.12.4 Constructor(c as control) 19440
- 141.12.5 Constructor(c as DesktopControl) 19440
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441
- 141.12.9 Constructor(w as window) 19442


### 141.12.7 Constructor(p as Picture)

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this picture object.
See also:


- 141.12.3 Constructor 19439
- 141.12.4 Constructor(c as control) 19440
- 141.12.5 Constructor(c as DesktopControl) 19440
- 141.12.6 Constructor(g as graphics) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441
- 141.12.9 Constructor(w as window) 19442


### 141.12.8 Constructor(w as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this window object.
See also:


- 141.12.3 Constructor 19439
- 141.12.4 Constructor(c as control) 19440
- 141.12.5 Constructor(c as DesktopControl) 19440

- 141.12.6 Constructor(g as graphics) 19441
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.9 Constructor(w as window) 19442


### 141.12.9 Constructor(w as window)

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop only.

**Function:** Initializes properties for this window object.
See also:


- 141.12.3 Constructor 19439
- 141.12.4 Constructor(c as control) 19440
- 141.12.5 Constructor(c as DesktopControl) 19440
- 141.12.6 Constructor(g as graphics) 19441
- 141.12.7 Constructor(p as Picture) 19441
- 141.12.8 Constructor(w as DesktopWindow) 19441


### 141.12.10 Properties

### 141.12.11 AspectX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Relative width of a device pixel used for line drawing.
**Notes:** (Read and Write property)

### 141.12.12 AspectXY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Diagonal width of the device pixel used for line drawing.
**Notes:** (Read and Write property)

### 141.12.13 AspectY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Relative height of a device pixel used for line drawing.
**Notes:** (Read and Write property)

### 141.12.14 BitsPerPixel as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of adjacent color bits for each pixel.
**Example:**

```
dim p as new Picture(200, 200, 32)
dim info as new WindowsGraphicsInfoMBS(p.Graphics)

MsgBox "Color Depth: "+str(info.BitsPerPixel)
```

**Notes:** As example gives a display device context, the bits per pixel is the screen depth.
(Read and Write property)

### 141.12.15 BrushesCount as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of device-specific brushes.
**Notes:** (Read and Write property)

### 141.12.16 ColorCount as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of entries in the device's color table, if the device has a color depth of no more than 8 bits per pixel.
**Notes:** For devices with greater color depths, 1 is returned.
(Read and Write property)

### 141.12.17 DesktopResolutionX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Horizontal width of entire desktop in pixels.
**Example:**

```
dim p as new Picture(200, 200, 32)
dim info as new WindowsGraphicsInfoMBS(p.Graphics)

MsgBox "Size of Windows Desktop: "+str(info.DesktopResolutionX)+ " x "+str(info.DesktopResolutionY)
```

**Notes:** (Read and Write property)

### 141.12.18 DesktopResolutionY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Vertical height of entire desktop in pixels.
**Example:**

```
dim p as new Picture(200, 200, 32)
dim info as new WindowsGraphicsInfoMBS(p.Graphics)

MsgBox "Size of Windows Desktop: "+str(info.DesktopResolutionX)+ " x "+str(info.DesktopResolutionY)
```

**Notes:** (Read and Write property)

### 141.12.19 DriverVersion as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device driver version.
**Notes:** (Read and Write property)

### 141.12.20 FontCount as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of device-specific fonts.
**Notes:** (Read and Write property)

### 141.12.21 LogPixelsX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of pixels per logical inch along the screen width.
**Example:**

```
dim g as Graphics = OpenPrinter
dim info as WindowsGraphicsInfoMBS = g.WindowsGraphicsInfoMBS

MsgBox "Printer resolution: "+str(info.LogPixelsX)+" x "+str(info.LogPixelsY)
```

**Notes:** In a system with multiple display monitors, this value is the same for all monitors.
(Read and Write property)

### 141.12.22 LogPixelsY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of pixels per logical inch along the screen height.
**Example:**

```
dim g as Graphics = OpenPrinter
dim info as WindowsGraphicsInfoMBS = g.WindowsGraphicsInfoMBS

MsgBox "Printer resolution: "+str(info.LogPixelsX)+" x "+str(info.LogPixelsY)
```

**Notes:** In a system with multiple display monitors, this value is the same for all monitors.
(Read and Write property)

### 141.12.23 MakersCount as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of markers the device has.
**Notes:** (Read and Write property)

### 141.12.24 PenCount as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of device-specific pens.
**Notes:** (Read and Write property)

### 141.12.25 PhysicalHeight as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printing devices: the height of the physical page, in device units.
**Notes:** For example, a printer set to print at 600 dpi on 8.5-by-11-inch paper has a physical height value of 6600 device units. Note that the physical page is almost always greater than the printable area of the page, and never smaller.
(Read and Write property)

### 141.12.26 PhysicalOffsetX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printing devices: the distance from the left edge of the physical page to the left edge of the printable area, in device units.
**Notes:** For example, a printer set to print at 600 dpi on 8.5-by-11-inch paper, that cannot print on the leftmost 0.25-inch of paper, has a horizontal physical offset of 150 device units.
(Read and Write property)

### 141.12.27 PhysicalOffsetY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printing devices: the distance from the top edge of the physical page to the top edge of the printable area, in device units.
**Notes:** For example, a printer set to print at 600 dpi on 8.5-by-11-inch paper, that cannot print on the topmost 0.5-inch of paper, has a vertical physical offset of 300 device units.
(Read and Write property)

### 141.12.28 PhysicalWidth as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For printing devices: the width of the physical page, in device units.
**Notes:** For example, a printer set to print at 600 dpi on 8.5-x11-inch paper has a physical width value of 5100 device units. Note that the physical page is almost always greater than the printable area of the page, and never smaller.
(Read and Write property)

### 141.12.29 Planes as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of color planes.
**Notes:** (Read and Write property)

### 141.12.30 ResolutionX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Width, in pixels, of the screen; or for printers, the width, in pixels, of the printable area of the page.
**Notes:** (Read and Write property)

### 141.12.31 ResolutionY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Height, in raster lines, of the screen; or for printers, the height, in pixels, of the printable area of the page.
**Notes:** (Read and Write property)

### 141.12.32 ScalingFactorX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scaling factor for the x-axis of the printer.
**Notes:** (Read and Write property)

### 141.12.33 ScalingFactorY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scaling factor for the y-axis of the printer.
**Notes:** (Read and Write property)

### 141.12.34 SizeX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Width, in millimeters, of the physical screen.
**Notes:** (Read and Write property)

### 141.12.35 SizeY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Height, in millimeters, of the physical screen.
**Notes:** (Read and Write property)

### 141.12.36 Technology as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Device technology. It can be any one of the kTechnology* constants.
**Notes:** (Read and Write property)

### 141.12.37 VRefresh as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For display devices: the current vertical refresh rate of the device, in cycles per second (Hz).
**Notes:** (Read and Write property)

### 141.12.38 Constants

Technology Constants

| Constant | Value | Description |
|---|---|---|
| kTechnologyCharStream | 4 | Character stream |
| kTechnologyDisplayFile | 6 | Display file |
| kTechnologyMetaFile | 5 | Metafile |
| kTechnologyPlotter | 0 | Vector plotter |
| kTechnologyRasterCamera | 3 | Raster camera |
| kTechnologyRasterDisplay | 1 | Raster display |
| kTechnologyRasterPrinter | 2 | Raster printer |

## 141.13 class WindowsPageFormatMBS

### 141.13.1 class WindowsPageFormatMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a page format.
**Example:**

```
// change the printer name to your printer's name
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)
dim formats(-1) as WindowsPageFormatMBS = w.GetPrinterFormats

for each p as WindowsPageFormatMBS in formats
MsgBox p.Name
next
```

**Notes:** This class wraps the FORM_INFO_1 structure. You can find more information here:
http://msdn.microsoft.com/en-us/library/dd144836(v=VS.85).aspx
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr1

### 141.13.2 Properties

### 141.13.3 DisplayName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The form's display name in the language specified by LangId.
**Notes:** Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.4 Flags as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The flags for this page format.
**Notes:** The following values are defined.

(Read and Write property)

| Value | Meaning |
|---|---|
| FORM_USER | If this bit flag is set, the form has been defined by the user. Forms with this flag set are defined in the registry. |
| FORM_BUILTIN | If this bit-flag is set, the form is part of the spooler. Form definitions with this flag set do not appear in the registry. |
| FORM_PRINTER | If this bit flag is set, the form is associated with a certain printer, and its definition appears in the registry. |

### 141.13.5 ImageableAreaBottom as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.6 ImageableAreaHeight as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.7 ImageableAreaLeft as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.8 ImageableAreaRight as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.9 ImageableAreaTop as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.10 ImageableAreaWidth as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The imageable area, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.11 Keyword as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A non-localizable string identifier of the form.
**Notes:** When passed to AddForm or SetForm, this gives the caller a means of identifying the form in all locales.
Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.12 LangId as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The language of the DisplayName.
**Notes:** Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.13 Mode as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The mode.
**Notes:** Value can be 1 (Windows 2000 and newer) or 2 (Windows Vista and newer).
(Read and Write property)

### 141.13.14 MuiDll as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Multilingual User Interface localized resource DLL that contains the localized display name.
**Notes:** Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.15 Name as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the form.
**Notes:** (Read and Write property)

### 141.13.16 ResourceId as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The resource ID of the form's display name in MuiDll.
**Notes:** Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.17 SizeHeight as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.18 SizeWidth as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width, in thousandths of millimeters, of the form.
**Notes:** (Read and Write property)

### 141.13.19 StringType as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies how a localized display name for the form is obtained at runtime.
**Notes:** The following values are defined. Only one can be set in any given call to AddForm or SetForm. Both STRING_MUIDLL and STRING_LANGPAIR can be set in the WindowsPageFormatMBS (s) returned by

GetForm or GetPrinterFormats.

Can be STRING_LANGPAIR, STRING_MUIDLL or STRING_NONE.
Only available in Windows Vista and newer and only valid if mode = 2.
(Read and Write property)

### 141.13.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| FORM_BUILTIN | 1 | One of the flag constants.<br>If this bit-flag is set, the form is part of the spooler. Form definitions with this flag set do not appear in the registry. |
| FORM_PRINTER | 2 | One of the flag constants.<br>If this bit flag is set, the form is associated with a certain printer, and its definition appears in the registry. |
| FORM_USER | 0 | One of the flag constants.<br>If this bit flag is set, the form has been defined by the user. Forms with this flag set are defined in the registry. |

String Type Constants

| Constant | Value | Description |
|---|---|---|
| STRING_LANGPAIR | 4 | The display name and language ID are provided directly by DisplayName and the language is specified by LangId. |
| STRING_MUIDLL | 2 | The display name is extracted from the Multilingual User Interface localized resources DLL specified in MuiDll. The ID is in the ResourceId member. |
| STRING_NONE | 1 | There is no localized display name. |

## 141.14 class WindowsPageSetupDialogMBS

### 141.14.1 class WindowsPageSetupDialogMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The class to run the Windows Page Setup dialog.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Real Studio Plugins, version 12.1pr7

### 141.14.2 Methods

### 141.14.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 141.14.4 GetDevNames(byref DriverName as string, byref DeviceName as string, byref OutputName as string, byref flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries the strings that identify the driver, device, and output port names for a printer.
**Notes:** Returns true if values are available and false if not.

DriverName: The file name (without the extension) of the device driver. On input, this string is used to determine the printer to display initially in the dialog box.
OutputName: The device name for the physical output medium (output port).
Flags: Indicates whether the strings here identify the default printer. This string is used to verify that the default printer has not changed since the last print operation. If any of the strings do not match, a warning message is displayed informing the user that the document may need to be reformatted. On output, the Flags member is changed only if the Print Setup dialog box was displayed and the user chose the OK button. The DN_DEFAULTPRN flag is used if the default printer was selected. If a specific printer is selected, the flag is not used. All other flags in this member are reserved for internal use by the dialog box procedure for the Print property sheet or Print dialog box.

### 141.14.5 PageSetupDialog as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Creates a Page Setup dialog box that enables the user to specify the attributes of a printed page.
**Notes:** These attributes include the paper size and source, the page orientation (portrait or landscape), and the width of the page margins.

If the user clicks the OK button, the return value is true. The members of the object indicate the user's selections.
If the user cancels or closes the Page Setup dialog box or an error occurs, the return value is false. To get extended error information, use the lasterror property.

Starting with Windows Vista, the PageSetupDialog does not contain the Printer button. To switch printer selection other functions.

### 141.14.6 SetDevNames(DriverName as string, DeviceName as string, OutputName as string, flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the strings that identify the driver, device, and output port names for a printer.
**Notes:** Returns true on success and false on failure.

DriverName: The file name (without the extension) of the device driver. On input, this string is used to determine the printer to display initially in the dialog box.
OutputName: The device name for the physical output medium (output port).
Flags: Indicates whether the strings here identify the default printer. This string is used to verify that the default printer has not changed since the last print operation. If any of the strings do not match, a warning message is displayed informing the user that the document may need to be reformatted. On output, the Flags member is changed only if the Print Setup dialog box was displayed and the user chose the OK button. The DN_DEFAULTPRN flag is used if the default printer was selected. If a specific printer is selected, the flag is not used. All other flags in this member are reserved for internal use by the dialog box procedure for the Print property sheet or Print dialog box.

### 141.14.7 Properties

### 141.14.8 DevMode as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The device mode object.
**Notes:** On input, if an object is specified, the values in the corresponding DEVMODE structure are used to initialize the controls in the dialog box. On output, the dialog box sets DevMode to a new object that contains values specifying the user's selections. If the user's selections are not available, the dialog box sets DevMode to nil.

(Read and Write property)

### 141.14.9 Flags as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** A set of bit flags that you can use to initialize the Page Setup dialog box.
**Notes:** When the dialog box returns, it sets these flags to indicate the user's input.
See the PSD_* constants for possible values.
(Read and Write property)

### 141.14.10 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 141.14.11 MarginBottom as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The widths of the bottom margin.
**Notes:** If you set the PSD_MARGINS flag, rtMargin specifies the initial margin values. When PageSetupDlg returns, rtMargin contains the margin widths selected by the user. The PSD_INHUNDREDTHSOFMILLIMETERS or PSD_INTHOUSANDTHSOFINCHES flag indicates the units of measurement.
(Read and Write property)

### 141.14.12 MarginLeft as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The widths of the left margin.
**Notes:** If you set the PSD_MARGINS flag, rtMargin specifies the initial margin values. When PageSetupDlg returns, rtMargin contains the margin widths selected by the user. The PSD_INHUNDREDTHSOFMILLIMETERS or PSD_INTHOUSANDTHSOFINCHES flag indicates the units of measurement.
(Read and Write property)

### 141.14.13 MarginRight as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The widths of the right margin.
**Notes:** If you set the PSD_MARGINS flag, rtMargin specifies the initial margin values. When PageSetupDlg returns, rtMargin contains the margin widths selected by the user. The PSD_INHUNDREDTHSOFMILLIMETERS or PSD_INTHOUSANDTHSOFINCHES flag indicates the units of measurement.
(Read and Write property)

### 141.14.14 MarginTop as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The widths of the top margin.
**Notes:** If you set the PSD_MARGINS flag, rtMargin specifies the initial margin values. When PageSetupDlg returns, rtMargin contains the margin widths selected by the user. The PSD_INHUNDREDTHSOFMILLIMETERS or PSD_INTHOUSANDTHSOFINCHES flag indicates the units of measurement.
(Read and Write property)

### 141.14.15 MinMarginBottom as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The minimum allowable widths for the bottom margin.
**Notes:** The system ignores this member if the PSD_MINMARGINS flag is not set. These values must be less than or equal to the values specified in the Margin* member. The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.16 MinMarginLeft as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The minimum allowable widths for the left margin.
**Notes:** The system ignores this member if the PSD_MINMARGINS flag is not set. These values must be less than or equal to the values specified in the Margin* member. The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.17 MinMarginRight as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The minimum allowable widths for the right margin.
**Notes:** The system ignores this member if the PSD_MINMARGINS flag is not set. These values must be less than or equal to the values specified in the Margin* member. The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.18 MinMarginTop as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The minimum allowable widths for the top margin.
**Notes:** The system ignores this member if the PSD_MINMARGINS flag is not set. These values must be less than or equal to the values specified in the Margin* member. The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.19 PaperSizeX as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The dimensions of the paper selected by the user.
**Notes:** The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.20 PaperSizeY as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The dimensions of the paper selected by the user.
**Notes:** The PSD_INTHOUSANDTHSOFINCHES or PSD_INHUNDREDTHSOFMILLIMETERS flag indicates the units of measurement.
(Read and Write property)

### 141.14.21 Parent as Variant

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The window that owns the dialog box.
**Notes:** This member can be any valid window, or it can be nil if the dialog box has no owner.
Can reference a Window or DesktopWindow object.
(Read and Write property)

### 141.14.22 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| DN_DEFAULTPRN | 1 | The flag for default printer on the SetDevNames/GetDevNames flag parameter. |

Flags

| Constant | Value | Description |
|---|---|---|
| PSD_DEFAULTMINMARGINS | &h00000000 | Sets the minimum values that the user can specify for th be the minimum margins allowed by the printer. This is flag is ignored if the PSD_MARGINS and PSD_MINMAR specified. |
| PSD_DISABLEMARGINS | &h00000010 | Disables the margin controls, preventing the user from sett |
| PSD_DISABLEORIENTATION | &h00000100 | Disables the orientation controls, preventing the user fro orientation. |
| PSD_DISABLEPAPER | &h00000200 | Disables the paper controls, preventing the user from settin such as the paper size and source. |
| PSD_DISABLEPRINTER | &h00000020 | Obsolete. Windows XP/2000: Disables the Printer button, preven invoking a dialog box that contains additional printer setu |
| PSD_INHUNDREDTHSOFMILLIMETERS | &h00000008 | Indicates that hundredths of millimeters are the unit of me gins and paper size. The values in the Margin, MinMarg members are in hundredths of millimeters. You can set to override the default unit of measurement for the user's function returns, the dialog box sets this flag to indicate th |
| PSD_INTHOUSANDTHSOFINCHES | &h00000004 | Indicates that thousandths of inches are the unit of measu and paper size. The values in the Margin, MinMargin, and are in thousandths of inches. You can set this flag on in default unit of measurement for the user's locale. When th the dialog box sets this flag to indicate the units used. |
| PSD_MARGINS | &h00000002 | Causes the system to use the values specified in the Marg initial widths for the left, top, right, and bottom margins. is not set, the system sets the initial widths to one inch for |
| PSD_MINMARGINS | &h00000001 | Causes the system to use the values specified in the MinM the minimum allowable widths for the left, top, right, an The system prevents the user from entering a width that is ified minimum. If PSD_MINMARGINS is not specified, t minimum allowable widths to those allowed by the printer. |
| PSD_NONETWORKBUTTON | &h00200000 | Hides and disables the Network button. |
| PSD_NOWARNING | &h00000080 | Prevents the system from displaying a warning message whe printer. |
| PSD_RETURNDEFAULT | &h00000400 | PageSetupDialog does not display the dialog box. Instea Names and DevMode members to objects that are initiali default printer. PageSetupDlg returns an error if either Dev is not nil. |
| PSD_SHOWHELP | &h00000800 | Causes the dialog box to display the Help button. The hw must specify the window to receive the HELPMSGSTRING that the dialog box sends when the user clicks the Help bu |

# 141.15 class WindowsPrintDialogMBS

## 141.15.1 class WindowsPrintDialogMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for showing the windows print dialog.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 21.3pr2
- MBS Real Studio Plugins, version 12.1pr7

## 141.15.2 Methods

## 141.15.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

## 141.15.4 GetDevNames(byref DriverName as string, byref DeviceName as string, byref OutputName as string, byref flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries the strings that identify the driver, device, and output port names for a printer.
**Notes:** Returns true if values are available and false if not.

DriverName: The file name (without the extension) of the device driver. On input, this string is used to determine the printer to display initially in the dialog box.
OutputName: The device name for the physical output medium (output port).
Flags: Indicates whether the strings here identify the default printer. This string is used to verify that the default printer has not changed since the last print operation. If any of the strings do not match, a warning message is displayed informing the user that the document may need to be reformatted. On output, the Flags member is changed only if the Print Setup dialog box was displayed and the user chose the OK button. The DN_DEFAULTPRN flag is used if the default printer was selected. If a specific printer is selected, the flag is not used. All other flags in this member are reserved for internal use by the dialog box procedure for the Print property sheet or Print dialog box.

### 141.15.5 getPageRange(index as Integer, byref fromPage as Integer, byref toPage as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries a page range entry.

### 141.15.6 PrintDialog as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays a Print Dialog Box or a Print Setup dialog box.
**Notes:** The Print dialog box enables the user to specify the properties of a particular print job.

If the user clicks the OK button, the return value is true. The members of the object indicate the user's selections.

If the user canceled or closed the Print or Printer Setup dialog box or an error occurred, the return value is zero. To get extended error information, use the lasterror property. If the user canceled or closed the dialog box, lasterror returns zero.

This is the older function. PrintDialogEx is the newer function.
see also
http://msdn.microsoft.com/en-us/library/windows/desktop/ms646940(v=vs.85).aspx

### 141.15.7 PrintDialogEx as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays a Print property sheet that enables the user to specify the properties of a particular print job.
**Notes:** Changed from Boolean to Integer in v21.3 to allow you to distinguish between different different results. Result is either 0 for OK or an COM error code.

A Print property sheet has a General page that contains controls similar to the Print dialog box. The property sheet can also have additional application-specific and driver-specific property pages as well as the General page.
If the function succeeds, the return value is S_OK (0) and the ResultAction member contains one of the following values.

Lasterror is set.
The values of DevMode and DevNames in WindowsPrintDialogMBS may change when they are passed into

| Constant | Value | Description |
|---|---|---|
| PD_RESULT_APPLY | 2 | The user clicked the Apply button and later clicked the Cancel button. This indicates that the user wants to apply the changes made in the property sheet, but does not yet want to print. The WindowsPrintDialogMBS contains the information specified by the user at the time the Apply button was clicked. |
| PD_RESULT_CANCEL | 0 | The user clicked the Cancel button. The information in the WindowsPrintDialogMBS is unchanged. |
| PD_RESULT_PRINT | 1 | The user clicked the Print button. The WindowsPrintDialogMBS contains the information specified by the user. |

PrintDialog. This is because these members are filled on both input and output.
If PD_RETURNDC is set but PD_USEDEVMODECOPIESANDCOLLATE flag is not set, the PrintDialog functions return incorrect number of copies. To get the correct number of copies, ensure that the calling application always uses PD_USEDEVMODECOPIESANDCOLLATE with PD_RETURNDC.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/ms646942(v=vs.85).aspx

### 141.15.8 SetDevNames(DriverName as string, DeviceName as string, OutputName as string, flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the strings that identify the driver, device, and output port names for a printer.
**Notes:** Returns true on success and false on failure.

DriverName: The file name (without the extension) of the device driver. On input, this string is used to determine the printer to display initially in the dialog box.
OutputName: The device name for the physical output medium (output port).
Flags: Indicates whether the strings here identify the default printer. This string is used to verify that the default printer has not changed since the last print operation. If any of the strings do not match, a warning message is displayed informing the user that the document may need to be reformatted. On output, the Flags member is changed only if the Print Setup dialog box was displayed and the user chose the OK button. The DN_DEFAULTPRN flag is used if the default printer was selected. If a specific printer is selected, the flag is not used. All other flags in this member are reserved for internal use by the dialog box procedure for the Print property sheet or Print dialog box.

### 141.15.9 setPageRange(index as Integer, fromPage as Integer, toPage as Integer)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets a page range entry.
**Notes:** Index from 0 to 19.

### 141.15.10 Properties

### 141.15.11 Copies as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Contains the initial number of copies for the Copies edit control if DevMode is nil; otherwise, the Copies member of the DEVMODE contains the initial value.
**Notes:** When PrintDlgEx returns, nCopies contains the actual number of copies the application must print. This value depends on whether the application or the printer driver is responsible for printing multiple copies. If the PD_USEDEVMODECOPIESANDCOLLATE flag is set in the Flags member, nCopies is always 1 on return, and the printer driver is responsible for printing multiple copies. If the flag is not set, the application is responsible for printing the number of copies specified by nCopies. For more information, see the description of the PD_USEDEVMODECOPIESANDCOLLATE flag.
(Read and Write property)

### 141.15.12 DC as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The device context or an information context, depending on whether the Flags member specifies the PD_RETURNDC or PC_RETURNIC flag.
**Notes:** If neither flag is specified, the value of this member is undefined. If both flags are specified, PD_RETURNDC has priority.
(Read and Write property)

### 141.15.13 DevMode as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The device mode object.
**Notes:** On input, if an object is specified, the values in the corresponding DEVMODE structure are used to initialize the controls in the dialog box. On output, the dialog box sets DevMode to a new object that contains values specifying the user's selections. If the user's selections are not available, the dialog box sets DevMode to nil.
(Read and Write property)

### 141.15.14 ExclusionFlags as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** A set of bit flags that can exclude items from the printer driver property pages in the Print property sheet.
**Notes:** This value is used only if the PD_EXCLUSIONFLAGS flag is set in the Flags member. Exclusion flags should be used only if the item to be excluded will be included on either the General page or on an application-defined page in the Print property sheet. This member can specify the following flag.
PD_EXCL_COPIESANDCOLLATE: Excludes the Copies and Collate controls from the printer driver property pages in a Print property sheet. This flag should always be set when the application uses the default Copies and Collate controls provided by the lower portion of the General page of the Print property sheet.
(Read and Write property)

### 141.15.15 Flags as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** A set of bit flags that you can use to initialize the Print property sheet.
**Notes:** When the PrintDialog function returns, it sets these flags to indicate the user's input. This member can be one or more of the following values.

To ensure that PrintDialog returns the correct values in the Copies and Collate members of the DeviceMode, set PD_RETURNDC = TRUE and PD_USEDEVMODECOPIESANDCOLLATE = TRUE. In so doing, the Copies member of the PRINTDLG structure is always 1 and PD_COLLATE is always false.

To ensure that PrintDialog returns the correct values in nCopies and PD_COLLATE, set PD_RETURNDC = TRUE and PD_USEDEVMODECOPIESANDCOLLATE = FALSE. In so doing, dmCopies is always 1 and dmCollate is always FALSE.
Starting with Windows Vista, when you call PrintDlg or PrintDlgEx with PD_RETURNDC set to TRUE and PD_USEDEVMODECOPIESANDCOLLATE set to FALSE, the PrintDlg or PrintDlgEx function sets the number of copies in the nCopies member of the PRINTDLG structure, and it sets the number of copies in the structure represented by the hDC member of the PRINTDLG structure.
When making calls to GDI, you must ignore the value of nCopies, consider the value as 1, and use the returned hDC to avoid printing duplicate copies.
(Read and Write property)

### 141.15.16 FromPage as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The initial value for the starting page edit control.
**Notes:** When PrintDialog returns, nFromPage is the starting page specified by the user. If the Pages radio

button is selected when the user clicks the Okay button, PrintDialog sets the PD_PAGENUMS flag and does not return until the user enters a starting page value that is within the minimum to maximum page range.
If the input value for either FromPage or nToPage is outside the minimum/maximum range, PrintDlg returns an error only if the PD_PAGENUMS flag is specified; otherwise, it displays the dialog box but changes the out-of-range value to the minimum or maximum value.
This is only for PrintDialog, not for PrintDialogEx.
(Read and Write property)

### 141.15.17 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** Typical errors:
E_OUTOFMEMORY = &h8007000E // Insufficient memory.
E_INVALIDARG = &h80070057 // One or more arguments are invalid.
E_POINTER = &h80000005 // Invalid pointer.
E_HANDLE = &h80000006 // Invalid handle.
E_FAIL = &h80000008 // Unspecified error.
(Read and Write property)

### 141.15.18 MaxPage as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The maximum value for the page ranges specified in the Pages edit control.
**Notes:** If the PD_NOPAGENUMS flag is specified, this value is not valid.
(Read and Write property)

### 141.15.19 MaxPageRanges as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The size, in array elements, of the PageRanges buffer.
**Notes:** This value indicates the maximum number of page ranges that can be stored in the array. If the PD_NOPAGENUMS flag is specified, this value is not valid. If the PD_NOPAGENUMS flag is not specified, this value must be greater than zero.
The plugin supports up to 20 page ranges.
(Read and Write property)

### 141.15.20 MinPage as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The minimum value for the page ranges specified in the Pages edit control.
**Notes:** If the PD_NOPAGENUMS flag is specified, this value is not valid.
(Read and Write property)

### 141.15.21 PageRanges as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** On input, set this member to the initial number of page ranges specified.
**Notes:** When the PrintDialog function returns, PageRanges indicates the number of user-specified page ranges. If the PD_NOPAGENUMS flag is specified, this value is not valid. Use getPageRange to query page ranges or setPageRange to set them.
(Read and Write property)

### 141.15.22 Parent as Variant

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The window that owns the dialog box.
**Notes:** The window that owns the property sheet. This member must be a valid window handle; it cannot be nil.
Can reference a Window or DesktopWindow object.
(Read and Write property)

### 141.15.23 ResultAction as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** If the PrintDlgEx function returns S_OK (0), ResultAction contains the outcome of the dialog.
**Notes:** If PrintDialog returns an error, this member should be ignored. The ResultAction member can be one of the following values:

(Read and Write property)

### 141.15.24 StartPanel as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

| | |
|---|---|
| PD_RESULT_APPLY | The user clicked the Apply button and later clicked the Cancel button. This indicates that the user wants to apply the changes made in the property sheet, but does not want to print yet. The PRINTDLGEX structure contains the information specified by the user at the time the Apply button was clicked. |
| PD_RESULT_CANCEL | The user clicked the Cancel button. The information in the PRINTDLGEX structure is unchanged. |
| PD_RESULT_PRINT | The user clicked the Print button. The PRINTDLGEX structure contains the information specified by the user. |

**Function:** The property page that is initially displayed.
**Notes:** To display the General page, specify START_PAGE_GENERAL. For consistency, it is recommended that the property sheet always be started on the General page.
The plugin sets START_PAGE_GENERAL for default value.
(Read and Write property)

### 141.15.25 ToPage as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The initial value for the ending page edit control.
**Notes:** When PrintDialog returns, ToPage is the ending page specified by the user. If the Pages radio button is selected when the use clicks the Okay button, PrintDialog sets the PD_PAGENUMS flag and does not return until the user enters an ending page value that is within the minimum to maximum page range. This is only for PrintDialog, not for PrintDialogEx.
(Read and Write property)

### 141.15.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| START_PANEL_GENERAL | &hffffffff | Special value for StartPanel property to select general panel. |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| PD_ALLPAGES | 0 | The default flag that indicates that the All radio button i<br>This flag is used as a placeholder to indicate that the<br>PD_SELECTION, and PD_CURRENTPAGE flags are n |
| PD_COLLATE | &h00000010 | If this flag is set, the Collate check box is selected.<br>If this flag is set when the PrintDlgEx function returns, t<br>simulate collation of multiple copies. For more informatio<br>of the PD_USEDEVMODECOPIESANDCOLLATE flag<br>See PD_NOPAGENUMS. |
| PD_CURRENTPAGE | &h00400000 | If this flag is set, the Current Page radio button is sele<br>PD_PAGENUMS, PD_SELECTION, or PD_CURREN<br>the All radio button is selected. |
| PD_DISABLEPRINTTOFILE | &h00080000 | Disables the Print to File check box. |
| PD_EXCLUSIONFLAGS | &h01000000 | Indicates that the ExclusionFlags member identifies items<br>the printer driver property pages.<br>If this flag is not set, items will be excluded by default fro<br>property pages. The exclusions prevent the duplication<br>General page, any application-specified pages, and the pri |
| PD_EXCL_COPIESANDCOLLATE | &h00008100 | Excludes the Copies and Collate controls from the printer c<br>in a Print property sheet. This flag should always be set w<br>uses the default Copies and Collate controls provided by<br>the General page of the Print property sheet. |
| PD_HIDEPRINTTOFILE | &h00100000 | Hides the Print to File check box. |
| PD_NOCURRENTPAGE | &h00800000 | Disables the Current Page radio button. |
| PD_NONETWORKBUTTON | &h00200000 | Hides and disables the Network button. |
| PD_NOPAGENUMS | 8 | Disables the Pages radio button and the associated edit c<br>Also, it causes the Collate check box to appear in the dia |
| PD_NOSELECTION | 4 | Disables the Selection radio button. |
| PD_NOWARNING | &h00000080 | Prevents the warning message from being displayed when |
| PD_PAGENUMS | 2 | If this flag is set, the Pages radio button is selected. If n<br>GENUMS, PD_SELECTION, or PD_CURRENTPAGE<br>radio button is selected. If this flag is set when the Prin<br>turns, the PageRanges member indicates the page ranges s |
| PD_PRINTSETUP | &h00000040 | Causes the system to display the Print Setup dialog box r<br>dialog box. |
| PD_PRINTTOFILE | &h00000020 | If this flag is set, the Print to File check box is selected.<br>If this flag is set when PrintDialog returns, the Output<br>contains the string "FILE:". When you call the StartD<br>the printing operation, specify this "FILE:" string in th<br>member of the DOCINFO structure. Specifying this str<br>subsystem to query the user for the name of the output fi<br>StartDoc is available in our plugins through StartDocPri<br>dPrintJobMBS class. |
| PD_RETURNDC | &h00000100 | Causes PrintDialog to return a device context matching th<br>made in the property sheet.<br>The device context is returned in DC property. |
| PD_RETURNDEFAULT | &h00000400 | If this flag is set, the PrintDialog function does not displa<br>Instead, it sets the DevNames and DevMode members t<br>system default printer. Both DevNames and DevMode<br>PrintDialog returns an error. |
| PD_RETURNIC | &h00000200 | Similar to the PD_RETURNDC flag, except this flag ret<br>context rather than a device context.<br>If neither PD_RETURNDC nor PD_RETURNIC is spe<br>fined on output. |
| PD_SELECTION | 1 | If this flag is set, the Selection radio button is selected.<br>If none of the PD_PAGENUMS, PD_SELECTION, or PD<br>flags is set, the All radio button is selected. |
| PD_SHOWHELP | &h00000800 | Causes the dialog box to display the Help button. |
| PD_USEDEVMODECOPIES | &h00040000 | Same as PD_USEDEVMODECOPIESANDCOLLATE. |

Result Constants

| Constant | Value | Description |
|---|---|---|
| PD_RESULT_APPLY | 2 | The user clicked the Apply button and later clicked the Cancel button. This indicates that the user wants to apply the changes made in the property sheet, but does not yet want to print. The WindowsPrintDialogMBS contains the information specified by the user at the time the Apply button was clicked. |
| PD_RESULT_CANCEL | 0 | The user clicked the Cancel button. The information in the WindowsPrintDialogMBS is unchanged. |
| PD_RESULT_PRINT | 1 | The user clicked the Print button. The WindowsPrintDialogMBS contains the information specified by the user. |

## 141.16 class WindowsPrinterInfoMBS

### 141.16.1 class WindowsPrinterInfoMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for details on printer information.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName
next
```

**Notes:** This class wraps the PRINTER_INFO_2 structure on windows which you find documented here:
http://msdn.microsoft.com/en-us/library/dd162845(VS.85).aspx
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Print to Printer in Xojo on Windows
- MBS Xojo / Real Studio Plugins, version 15.2pr6
- MBS Real Studio Plugins, version 12.1pr6

### 141.16.2 Methods

### 141.16.3 Constructor

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 141.16.4 LocalPrinters as WindowsPrinterInfoMBS()

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the printers as an array.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName
```

next

**Notes:** On any error the array will be empty.

### 141.16.5 OpenPrinter(admin as boolean = false) as WindowsPrinterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens the printer so you can operate on it.
**Example:**

```
dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name)
MsgBox p.PrinterName
```

**Notes:** Admin: whether you want to get permissions to administrate.
Returns nil on any error.

### 141.16.6 Printers(flags as Integer, Name as Variant = nil) as WindowsPrinterInfoMBS()

MBS Win Plugin, Plugin Version: 15.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Printers function enumerates available printers, print servers, domains, or print providers.
**Notes:** If you call this with flags = kPrinterFlagsLocal + kPrinterFlagsConnections and name = nil, you get same as LocalPrinters function.

see also
https://msdn.microsoft.com/en-us/library/windows/desktop/dd162692(v=vs.85).aspx

### 141.16.7 Properties

### 141.16.8 AttributeFlags as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the printer attributes.
**Notes:** This member can be one of the following values:

| | | |
|---|---|---|
| PRINTER_ATTRIBUTE_QUEUED | &h00000001 | |
| PRINTER_ATTRIBUTE_DIRECT | &h00000002 | |
| PRINTER_ATTRIBUTE_DEFAULT | &h00000004 | (Windows 95) |
| PRINTER_ATTRIBUTE_SHARED | &h00000008 | |
| PRINTER_ATTRIBUTE_NETWORK | &h00000010 | |
| PRINTER_ATTRIBUTE_HIDDEN | &h00000020 | |
| PRINTER_ATTRIBUTE_LOCAL | &h00000040 | |
| PRINTER_ATTRIBUTE_ENABLE_DEVQ | &h00000080 | |
| PRINTER_ATTRIBUTE_KEEPPRINTEDJOBS | &h00000100 | |
| PRINTER_ATTRIBUTE_DO_COMPLETE_FIRST | &h00000200 | |
| PRINTER_ATTRIBUTE_WORK_OFFLINE | &h00000400 | (Windows 95) |
| PRINTER_ATTRIBUTE_ENABLE_BIDI | &h00000800 | (Windows 95) |
| PRINTER_ATTRIBUTE_RAW_ONLY | &h00001000 | |
| PRINTER_ATTRIBUTE_PUBLISHED | &h00002000 | (Windows 2000) Indicates whether the printer is published in the directory service. |

Renamed Attributes parameter to AttributeFlags in plugin version 8.2.
(Read and Write property)

### 141.16.9 AveragePPM as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the average number of pages per minute that have been printed on the printer.
**Notes:** (Read and Write property)

### 141.16.10 Comment as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that provides a brief description of the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName+": "+p.Comment
next
```

**Notes:** (Read and Write property)

### 141.16.11 CountJobs as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the number of print jobs that have been queued for the printer.
**Notes:** (Read and Write property)

### 141.16.12 Datatype as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the data type used to record the print job.
**Notes:** (Read and Write property)

### 141.16.13 DefaultPriority as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the default priority value assigned to each print job.
**Notes:** (Read and Write property)

### 141.16.14 DevMode as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WindowsDeviceModeMBS object that defines default printer data such as the paper orientation and the resolution.
**Notes:** (Read and Write property)

### 141.16.15 DriverName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the name of the printer driver.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName+": "+p.DriverName
next
```

**Notes:** (Read and Write property)

### 141.16.16 Location as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the physical location of the printer.
**Notes:** for example, "Bldg. 38, Room 1164".
(Read and Write property)

### 141.16.17 Parameters as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the default print-processor parameters.
**Notes:** (Read and Write property)

### 141.16.18 PortName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that identifies the port(s) used to transmit data to the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName+": "+p.PortName
next
```

**Notes:** If a printer is connected to more than one port, the names of each port must be separated by commas (for example, "LPT1:,LPT2:,LPT3:").
(Read and Write property)

### 141.16.19 PrinterName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the name of the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
```

```
MsgBox p.PrinterName
next
```

**Notes:** (Read and Write property)

### 141.16.20 PrintProcessor as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the name of the print processor used by the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrintProcessor
next
```

**Notes:** (Read and Write property)

### 141.16.21 Priority as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a priority value that the spooler uses to route print jobs.
**Notes:** Possible values:

| | |
|---|---|
| NO_PRIORITY | 0 |
| MAX_PRIORITY | 99 |
| MIN_PRIORITY | 1 |
| DEF_PRIORITY | 1 |

(Read and Write property)

### 141.16.22 SeparatorPageFile as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the name of the file used to create the separator page.
**Notes:** This page is used to separate print jobs sent to the printer.
(Read and Write property)

### 141.16.23 ServerName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string identifying the server that controls the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName+": "+p.ServerName
next
```

**Notes:** If this string is "", the printer is controlled locally.
(Read and Write property)

### 141.16.24 ShareName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that identifies the sharepoint for the printer.
**Example:**

```
dim printers(-1) as WindowsPrinterInfoMBS = WindowsPrinterInfoMBS.LocalPrinters

for each p as WindowsPrinterInfoMBS in printers
MsgBox p.PrinterName+": "+p.ShareName
next
```

**Notes:** This string is used only if the PRINTER_ATTRIBUTE_SHARED constant was set for the Attributes member.
(Read and Write property)

### 141.16.25 StartTime as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the earliest time at which the printer will print a job.
**Notes:** This value is expressed as minutes elapsed since 12:00 A.M. GMT (Greenwich Mean Time).
(Read and Write property)

### 141.16.26 Status as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the printer status.
**Notes:** This member can be one of the following values:

| | |
|---|---|
| PRINTER_STATUS_PAUSED | &h00000001 |
| PRINTER_STATUS_ERROR | &h00000002 |
| PRINTER_STATUS_PENDING_DELETION | &h00000004 |
| PRINTER_STATUS_PAPER_JAM | &h00000008 |
| PRINTER_STATUS_PAPER_OUT | &h00000010 |
| PRINTER_STATUS_MANUAL_FEED | &h00000020 |
| PRINTER_STATUS_PAPER_PROBLEM | &h00000040 |
| PRINTER_STATUS_OFFLINE | &h00000080 |
| PRINTER_STATUS_IO_ACTIVE | &h00000100 |
| PRINTER_STATUS_BUSY | &h00000200 |
| PRINTER_STATUS_PRINTING | &h00000400 |
| PRINTER_STATUS_OUTPUT_BIN_FULL | &h00000800 |
| PRINTER_STATUS_NOT_AVAILABLE | &h00001000 |
| PRINTER_STATUS_WAITING | &h00002000 |
| PRINTER_STATUS_PROCESSING | &h00004000 |
| PRINTER_STATUS_INITIALIZING | &h00008000 |
| PRINTER_STATUS_WARMING_UP | &h00010000 |
| PRINTER_STATUS_TONER_LOW | &h00020000 |
| PRINTER_STATUS_NO_TONER | &h00040000 |
| PRINTER_STATUS_PAGE_PUNT | &h00080000 |
| PRINTER_STATUS_USER_INTERVENTION | &h00100000 |
| PRINTER_STATUS_OUT_OF_MEMORY | &h00200000 |
| PRINTER_STATUS_DOOR_OPEN | &h00400000 |
| PRINTER_STATUS_SERVER_UNKNOWN | &h00800000 |
| PRINTER_STATUS_POWER_SAVE | &h01000000 |

Windows 95: The PRINTER_STATUS_PAGE_PUNT value specifies that the page is being "punted" (that is, not printed) because it is too complex for the printer to print.
(Read and Write property)

### 141.16.27 UntilTime as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the latest time at which the printer will print a job.
**Notes:** This value is expressed as minutes elapsed since 12:00 A.M. GMT (Greenwich Mean Time).
Status

(Read and Write property)

### 141.16.28 Constants

Printer Enumeration Flags

| Constant | Value | Description |
|---|---|---|
| kPrinterFlagsConnections | 4 | The function enumerates the list of printers to which the user has made previous connections. |
| kPrinterFlagsDefault | 1 | Default printer. |
| kPrinterFlagsLocal | 2 | If the kPrinterFlagsName flag is not also passed, the function ignores the Name parameter, and enumerates the locally installed printers. If kPrinterFlagsName is also passed, the function enumerates the local printers on Name. |
| kPrinterFlagsName | 8 | The function enumerates the printer identified by Name. This can be a server, a domain, or a print provider. If Name is nil, the function enumerates available print providers. |
| kPrinterFlagsNetwork | 64 | Network printers? |
| kPrinterFlagsRemote | 16 | Remote (non Local) printers? |
| kPrinterFlagsShared | 32 | The function enumerates printers that have the shared attribute. Cannot be used in isolation; use an OR operation to combine with another constants. |

## 141.17 class WindowsPrinterJobMBS

### 141.17.1 class WindowsPrinterJobMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for Windows print job information.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr4

### 141.17.2 Properties

### 141.17.3 Datatype as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The type of data used to record the print job.
**Notes:** (Read and Write property)

### 141.17.4 DevMode as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device-initialization and environment data for the printer driver.
**Notes:** (Read and Write property)

### 141.17.5 Document as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the user who owns the print job.
**Notes:** (Read and Write property)

### 141.17.6 DriverName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the printer driver that should be used to process the print job.
**Notes:** (Read and Write property)

### 141.17.7 JobID as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A job identifier value.
**Notes:** (Read and Write property)

### 141.17.8 MachineName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the machine that created the print job.
**Notes:** (Read and Write property)

### 141.17.9 NotifyName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the user who should be notified when the job has been printed or when an error occurs while printing the job.
**Notes:** (Read and Write property)

### 141.17.10 PagesPrinted as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of pages that have printed.
**Notes:** This value may be zero if the print job does not contain page delimiting information.
(Read and Write property)

### 141.17.11 Parameters as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Print-processor parameters.
**Notes:** (Read and Write property)

### 141.17.12 Position as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The job's position in the print queue.
**Notes:** (Read and Write property)

### 141.17.13 PrinterName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the printer for which the job is spooled.
**Notes:** (Read and Write property)

### 141.17.14 PrintProcessor as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the print processor that should be used to print the job.
**Notes:** (Read and Write property)

### 141.17.15 Priority as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The job priority.
**Notes:** This member can be one of the following values or in the range between 1 through 99 (kPriorityMin through kPriorityMax).
(Read and Write property)

### 141.17.16 Size as Int64

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size, in bytes, of the job.
**Notes:** (Read and Write property)

### 141.17.17 StartTime as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The earliest time that the job can be printed.
**Notes:** (Read and Write property)

### 141.17.18 Status as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The job status.
**Notes:** Check kJobStatus* constants for possible values.
(Read and Write property)

### 141.17.19 StatusString as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The status of the print job.
**Notes:** This member should be checked prior to Status and, if StatusString is "", the status is defined by the contents of the Status member.
(Read and Write property)

### 141.17.20 Submitted as Date

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time when the job was submitted.
**Notes:** This time value is in Universal Time Coordinate (UTC) format.
(Read and Write property)

### 141.17.21 Time as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The total time, in milliseconds, that has elapsed since the job began printing.
**Notes:** (Read and Write property)

### 141.17.22 TotalPages as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of pages required for the job.
**Notes:** This value may be zero if the print job does not contain page delimiting information.
(Read and Write property)

### 141.17.23 UntilTime as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The latest time that the job can be printed.
**Notes:** (Read and Write property)

### 141.17.24 UserName as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the user who owns the print job.
**Notes:** (Read and Write property)

### 141.17.25 Constants

Job Status Constants

| Constant | Value | Description |
|---|---|---|
| kJobStatusBlockedDeviceQueue | &h200 | The driver cannot print the job. |
| kJobStatusComplete | &h1000 | The job is sent to the printer, but may not be printed yet. (Windows XP and later) |
| kJobStatusDeleted | &h100 | Job has been deleted. |
| kJobStatusDeleting | 4 | Job is being deleted. |
| kJobStatusError | 2 | An error is associated with the job. |
| kJobStatusOffline | &h20 | Printer is offline. |
| kJobStatusPaperOut | &h40 | Printer is out of paper. |
| kJobStatusPaused | 1 | Job is paused. |
| kJobStatusPrinted | &h80 | Job has printed. |
| kJobStatusPrinting | &h10 | Job is printing. |
| kJobStatusRenderingLocally | &h4000 | Rendering. |
| kJobStatusRestart | &h800 | Job has been restarted. |
| kJobStatusRetained | &h2000 | The job has been retained in the print queue following printing. (Windows XP and later) |
| kJobStatusSpooling | 8 | Job is spooling. |
| kJobStatusUserIntervention | &h400 | Printer has an error that requires the user to do something. |

Priority Constants

| Constant | Value | Description |
|---|---|---|
| kPriorityDefault | 1 | Default priority. |
| kPriorityMax | 99 | Maximum priority. |
| kPriorityMin | 1 | Minimum priority. |
| kPriorityNo | 0 | No priority. |

# 141.18 class WindowsPrinterMBS

## 141.18.1 class WindowsPrinterMBS

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an open connection to a windows printer.
**Notes:** Objects of this class can operate on printers.
Some operations need administrative permissions. If you don't have them, lasterror is set to 5.
**Blog Entries**

- MonkeyBread Software releases MBS Real Studio plug-ins in version 12.1
- MBS Real Studio Plugins, version 12.1pr7
- MBS Real Studio Plugins, version 12.1pr6
- More on printing on Windows
- MBS Real Studio Plugins, version 12.1pr4
- MBS Real Studio Plugins, version 12.1pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr2

## 141.18.2 Methods

## 141.18.3 AddForm(form as WindowsPageFormatMBS) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The AddForm function adds a form to the list of available forms that can be selected for the specified printer.
**Example:**

```
// query default printer
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)

dim form as new WindowsPageFormatMBS

form.Mode = 1
form.Name = "MyTest"
form.DisplayName = "MyTest"
form.Flags = 0
form.SizeHeight = 100000
form.SizeWidth = 100000
form.ImageableAreaLeft = 0
```

```
form.ImageableAreaTop = 0
form.ImageableAreaRight = 100000
form.ImageableAreaBottom = 100000

if w.AddForm(form) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Form.Mode gives level of the data. Must be either 1 (old version) or 2 (newer version).

Form: The form details.

Returns true if the function succeeds and false if the function fails.

Note: This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

An application can determine which forms are available for a printer by calling the GetPrinterFormats function.
If form points to a Mode 2 form, then AddForm will fail if either a form with the specified name already exists or the Keyword value already exists.

### 141.18.4 AdvancedDocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, parent as DesktopWindow) as integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a printer-configuration dialog box for the specified printer, allowing the user to configure that printer.
**Notes:** This function is a special case of the DocumentProperties function.

parent: The parent window of the printer-configuration dialog box.

OutputDevMode: The device mode structure that will contain the configuration data specified by the user.
InputDevMode: The device mode structure that contains the configuration data used to initialize the con-

trols of the printer-configuration dialog box.

If the DocumentProperties function with these parameters is successful, the return value of AdvancedDocumentProperties is 1. Otherwise, the return value is zero.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

This function can only display the printer-configuration dialog box so a user can configure it. For more control, use DocumentProperties.
See also:


- 141.18.5 AdvancedDocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, parent as window = nil) as Integer 19487


### 141.18.5 AdvancedDocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, parent as window = nil) as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays a printer-configuration dialog box for the specified printer, allowing the user to configure that printer.
**Notes:** This function is a special case of the DocumentProperties function.

parent: The parent window of the printer-configuration dialog box.

OutputDevMode: The device mode structure that will contain the configuration data specified by the user.
InputDevMode: The device mode structure that contains the configuration data used to initialize the controls of the printer-configuration dialog box.

If the DocumentProperties function with these parameters is successful, the return value of AdvancedDocumentProperties is 1. Otherwise, the return value is zero.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

This function can only display the printer-configuration dialog box so a user can configure it. For more

control, use DocumentProperties.
See also:

- 141.18.4 AdvancedDocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, parent as DesktopWindow) as integer 19486

### 141.18.6 AllJobs as WindowsPrinterJobMBS()

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all jobs for the printer.
**Example:**

```
dim w as new WindowsPrinterMBS( WindowsPrinterMBS.GetDefaultPrinter)
dim jobs() as WindowsPrinterJobMBS = w.AllJobs
MsgBox str(UBound(jobs)+1)+" jobs"
```

**Notes:** PrinterName property must be set, so the function knows which printer.

### 141.18.7 CanPrinterPassThroughPostScript as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this printer can pass through postscript data.
**Notes:** Returns true for Postscript printers and false for other printers.

For more information on this function, visit this website:
http://msdn.microsoft.com/en-us/library/dd162831(v=VS.85).aspx

### 141.18.8 ChangePrinterSettings(value as WindowsDeviceModeMBS, Mode as Integer=2) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Changes printer settings.
**Notes:** This function opens the printer, queries current settings using GetPrinter, applies all your changes, calls DocumentProperties to verify those settings are valid for the printer and uses SetPrinter to apply the changes.
To indicate which fiels in the WindowsDeviceModeMBS object are set by you, use the fields integer value with a combination of the DM_* constants.
Returns true on success and false on failure.

Mode can be 2 (general printer information), 8 (global settings) or 9 (user settings).

For more information on the GetPrinter function, check this website:
http://msdn.microsoft.com/en-us/library/dd144911(VS.85).aspx

For more information on the SetPrinter function, check this website:
http://msdn.microsoft.com/en-us/library/dd145082(VS.85).aspx

For more information on the DocumentProperties function, check this website:
http://msdn.microsoft.com/en-us/library/dd183576(VS.85).aspx

Even if you change printer settings, other parts of the application, e.g. Xojo framework may not care.

### 141.18.9 ConfigurePort(name as string = ””, parent as window = nil, PortName as string = ””) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays the port-configuration dialog box for a port on the specified server.
**Notes:** Name: The name of the server on which the specified port exists. If this parameter is ””, the port is local.
parent: The parent window of the port-configuration dialog box.
PortName: The name of the port to be configured.

Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

Before calling the ConfigurePort function, an application should call the EnumPorts function to determine valid port names.
See also:

- 141.18.10 ConfigurePort(name as string, parent as DesktopWindow, PortName as string) as boolean 19490

### 141.18.10 ConfigurePort(name as string, parent as DesktopWindow, PortName as string) as boolean

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays the port-configuration dialog box for a port on the specified server.
**Notes:** Name: The name of the server on which the specified port exists. If this parameter is "", the port is local.
parent: The parent window of the port-configuration dialog box.
PortName: The name of the port to be configured.

Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

Before calling the ConfigurePort function, an application should call the EnumPorts function to determine valid port names.
See also:

- 141.18.9 ConfigurePort(name as string = "", parent as window = nil, PortName as string = "") as boolean 19489

### 141.18.11 ConnectToPrinterDialog(parent as DesktopWindow) as boolean

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that lets users browse and connect to printers on a network.
**Notes:** If the user selects a printer, the function attempts to create a connection to it; if a suitable driver is not installed on the server, the user is given the option of creating a printer locally.

parent: Specifies the parent window of the dialog box.

If the function succeeds and the user selects a printer, this object points to the new printer and return value is true.
If the function fails, or the user cancels the dialog box without selecting a printer, the return value is true.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

The ConnectToPrinterDialog function attempts to create a connection to the selected printer. However, if the server on which the printer resides does not have a suitable driver installed, the function offers the user the option of creating a printer locally.

An application should call DeletePrinter to delete a local printer. An application should call DeletePrinterConnection to delete a connection to a printer.
See also:

- 141.18.12 ConnectToPrinterDialog(parent as window = nil) as boolean 19491

### 141.18.12 ConnectToPrinterDialog(parent as window = nil) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays a dialog box that lets users browse and connect to printers on a network.
**Notes:** If the user selects a printer, the function attempts to create a connection to it; if a suitable driver is not installed on the server, the user is given the option of creating a printer locally.

parent: Specifies the parent window of the dialog box.

If the function succeeds and the user selects a printer, this object points to the new printer and return value is true.
If the function fails, or the user cancels the dialog box without selecting a printer, the return value is true.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

The ConnectToPrinterDialog function attempts to create a connection to the selected printer. However, if the server on which the printer resides does not have a suitable driver installed, the function offers the user the option of creating a printer locally.

An application should call DeletePrinter to delete a local printer. An application should call DeletePrinterConnection to delete a connection to a printer.
See also:

- 141.18.11 ConnectToPrinterDialog(parent as DesktopWindow) as boolean 19490

### 141.18.13 Constructor(PrinterName as string, admin as boolean = false)

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens the printer so you can operate on it.
**Notes:** Admin: whether you want to get permissions to administrate.
Raises exception if printer can't be opened. Use OpenPrinter function to avoid exception.

### 141.18.14 DeleteForm(name as string) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DeleteForm function removes a form name from the list of supported forms.
**Notes:** name: The form name to be removed.

Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

DeleteForm can only delete form names that were added by using the AddForm function.

### 141.18.15 DeleteJob(JobID as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Delete the print job.
**Notes:** Returns true on success and false on failure.

### 141.18.16 DeletePrinter as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes the specified printer object.
**Notes:** Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

If there are print jobs remaining to be processed for the specified printer, DeletePrinter marks the printer

for pending deletion, and then deletes it when all the print jobs have been printed. No print jobs can be added to a printer that is marked for pending deletion.
A printer marked for pending deletion cannot be held, but its print jobs can be held, resumed, and restarted.
If the printer is held and there are jobs for the printer, DeletePrinter fails with ERROR_ACCESS_DENIED.

Lasterror is set.

### 141.18.17 DeletePrinterConnection(name as string) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes a connection to a printer that was established by a call to AddPrinterConnection or ConnectToPrinterDialog.
**Notes:** name: The name of the printer connection to delete.
Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

The DeletePrinterConnection function does not delete any printer driver files that were copied to the server to which the printer is attached.

### 141.18.18 DocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, Prompt as boolean = false, parent as window = nil) as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The DocumentProperties function retrieves or modifies printer initialization information or displays a printer-configuration property sheet for the specified printer.
**Example:**

```
// get default printer
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(WindowsPrinterMBS.GetDefaultPrinter)

// ask for printer settings
dim s as new WindowsDeviceModeMBS
dim n as Integer = p.DocumentProperties(nil, s, true, window1)
```

**Notes:** Printername property must be set.

parent: The parent window of the printer-configuration property sheet. Can be nil.
Prompt: Whether to show dialog.

OutputDevMode: Devmode variable that receives the printer configuration data specified by the user.
InputDevMode: Optional input data which the operating system uses to initialize the property sheet controls.
Prompt: Whether the function presents the printer driver's Print Setup property sheet and then changes the settings in the printer's DeviceMode data structure to those values specified by the user.

If you provide object for InputDevMode, the function will read settings from there. If you don't pass an object (nil) or you pass incomplete settings, default settings are used to complete.
If prompt is true, the dialog is shown and user can change settings.
On the end, the current new data is stored in OutputDevMode where you can find it.

If the function displays the property sheet, the return value is either IDOK (1) or IDCANCEL (2), depending on which button the user selects.
If the function does not display the property sheet and is successful, the return value is IDOK (1).
If the function fails, the return value is less than zero.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation-factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd183576(v=vs.85).aspx
See also:

- 141.18.19 DocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, Prompt as boolean, parent as DesktopWindow) as integer 19494

### 141.18.19 DocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, Prompt as boolean, parent as DesktopWindow) as integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The DocumentProperties function retrieves or modifies printer initialization information or displays a printer-configuration property sheet for the specified printer.
**Example:**

```
// get default printer
```

```
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(WindowsPrinterMBS.GetDefaultPrinter)

// ask for printer settings
dim s as new WindowsDeviceModeMBS
dim n as Integer = p.DocumentProperties(nil, s, true, window1)
```

**Notes:** Printername property must be set.

parent: The parent window of the printer-configuration property sheet. Can be nil.
Prompt: Whether to show dialog.

OutputDevMode: Devmode variable that receives the printer configuration data specified by the user.
InputDevMode: Optional input data which the operating system uses to initialize the property sheet controls.
Prompt: Whether the function presents the printer driver's Print Setup property sheet and then changes the settings in the printer's DeviceMode data structure to those values specified by the user.

If you provide object for InputDevMode, the function will read settings from there. If you don't pass an object (nil) or you pass incomplete settings, default settings are used to complete.
If prompt is true, the dialog is shown and user can change settings.
On the end, the current new data is stored in OutputDevMode where you can find it.

If the function displays the property sheet, the return value is either IDOK (1) or IDCANCEL (2), depending on which button the user selects.
If the function does not display the property sheet and is successful, the return value is IDOK (1).
If the function fails, the return value is less than zero.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation-factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd183576(v=vs.85).aspx
See also:

- 141.18.18 DocumentProperties(InputDevMode as WindowsDeviceModeMBS, byref OutputDevMode as WindowsDeviceModeMBS, Prompt as boolean = false, parent as window = nil) as Integer 19493

### 141.18.20 GetDefaultPrinter as string

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetDefaultPrinter function retrieves the printer name of the default printer for the current user on the local computer.
**Example:**

```
msgbox WindowsPrinterMBS.GetDefaultPrinter
```

**Notes:** For more details on the GetDefaultPrinter function, check this website:
http://msdn.microsoft.com/en-us/library/dd144876(VS.85).aspx

Returns an empty string on any error.

### 141.18.21 GetForm(name as string) as WindowsPageFormatMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetForm function retrieves information about a specified form.
**Example:**

```
// query default printer
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)

// get a page format
dim f as WindowsPageFormatMBS = w.GetForm("Letter")

// and show details
MsgBox f.DisplayName+" "+str(F.SizeWidth/10000,"0.0")+" x "+str(f.SizeHeight/10000,"0.0")
```

**Notes:** name: The string that specifies the name of the form. To get the names of the forms supported by the printer, call the GetPrinterFormats function.

On failure returns nil, on success the form details.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

If the caller is remote, and the Form Mode is 2, the StringType value of the returned WindowsPageFormatMBS will always be STRING_LANGPAIR.

### 141.18.22 GetJob(JobID as Integer) as WindowsPrinterJobMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Query job with given ID from printer.
**Notes:** Returns nil on any error.
PrinterName property must be set, so the function knows which printer.

### 141.18.23 GetPrinterFormats as WindowsPageFormatMBS()

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the page formats supported by this printer.
**Notes:** On failure the array is empty.

This function uses the EnumForms for which you can find more information on this website:
http://msdn.microsoft.com/en-us/library/dd162624(v=VS.85).aspx

### 141.18.24 GetPrinterSettings(Mode as Integer=2) as WindowsDeviceModeMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries printer settings.
**Example:**

```
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)
dim dm as WindowsDeviceModeMBS = w.GetPrinterSettings
```

**Notes:** Mode can be 2 (general printer information), 8 (global settings) or 9 (user settings).

For more information on the GetPrinter function, check this website:
http://msdn.microsoft.com/en-us/library/dd144911(VS.85).aspx

### 141.18.25 GetPrinterTechnology as string

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the printer technology.
**Example:**

```
dim w as new WindowsPrinterMBS("my printer")
```

msgbox w.GetPrinterTechnology

**Notes:** Opens the printer, queries the print technology and returns that string.
For postscript printers the string should contain the word "postscript".
Returns an empty string on any error.

For details on this function, check the following website:
http://msdn.microsoft.com/en-us/library/dd144931(VS.85).aspx

### 141.18.26 OpenPrinter(PrinterName as string, admin as boolean = false) as WindowsPrinterMBS

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens the printer so you can operate on it.
**Notes:** Admin: whether you want to get permissions to administrate.
Returns nil on any error.

### 141.18.27 PauseJob(JobID as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pause the print job.
**Notes:** Returns true on success and false on failure.

### 141.18.28 PausePrinter as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pauses the printer.
**Example:**

```
dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name, true)

if p.PausePrinter then
MsgBox "OK"
else
MsgBox "Failed: "+p.LasterrorMessage+" "+str(p.Lasterror)
end if
```

**Notes:** Requires application to be run by administrator and printer opened with admin option. Else you get error 5.
Returns true on success and false on failure.

### 141.18.29 PrinterProperties(parent as DesktopWindow) as boolean

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The PrinterProperties function displays a printer-properties property sheet for the specified printer.
**Example:**

```
// get default printer
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)

// open properties dialog
if w.PrinterProperties(window1) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** Returns true on success (dialog shows) or false on error.
Parent is the parent window for the new dialog. Can be nil.
See also:

- 141.18.30 PrinterProperties(parent as window = nil) as boolean 19499

### 141.18.30 PrinterProperties(parent as window = nil) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop only.

**Function:** The PrinterProperties function displays a printer-properties property sheet for the specified printer.
**Example:**

```
// get default printer
dim w as new WindowsPrinterMBS(WindowsPrinterMBS.GetDefaultPrinter)

// open properties dialog
if w.PrinterProperties(window1) then
MsgBox "OK"
```

```
else
MsgBox "Failed"
end if
```

**Notes:** Returns true on success (dialog shows) or false on error.
Parent is the parent window for the new dialog. Can be nil.
See also:

- 141.18.29 PrinterProperties(parent as DesktopWindow) as boolean 19499

### 141.18.31 PurgePrinter as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Purges the printer.
**Example:**

```
dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name, true)

if p.PurgePrinter then
MsgBox "OK"
else
MsgBox "Failed: "+p.LasterrorMessage+" "+str(p.Lasterror)
end if
```

**Notes:** Requires application to be run by administrator and printer opened with admin option. Else you get error 5.
Returns true on success and false on failure.

### 141.18.32 ResumeJob(JobID as Integer) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resume a paused print job.
**Notes:** Returns true on success and false on failure.

### 141.18.33 ResumePrinter as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resumes the printer.
**Example:**

```
dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name, true)

if p.ResumePrinter then
MsgBox "OK"
else
MsgBox "Failed: "+p.LasterrorMessage+" "+str(p.Lasterror)
end if
```

**Notes:** Requires application to be run by administrator and printer opened with admin option. Else you get error 5.
Returns true on success and false on failure.

### 141.18.34 SetDefaultPrinter(PrinterName as string) as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Changes the default printer to the given one.
**Example:**

```
call WindowsPrinterMBS.SetDefaultPrinter("My Printer")
```

**Notes:** Returns a Windows error code. (0 for success)

For details on the Windows SetDefaultPrinter method, check here:
http://msdn.microsoft.com/en-us/library/dd162971(VS.85).aspx

### 141.18.35 SetForm(name as string, form as WindowsPageFormatMBS) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetForm function sets the form information for the specified printer.
**Notes:** name: The string that specifies the form name for which the form information is set.
Form: The form data. Mode property must be either 1 (older format) or 2 (newer format).

Returns true on success and false on failure.

This is a blocking or synchronous function and might not return immediately. How quickly this function returns depends on run-time factors such as network status, print server configuration, and printer driver implementation—factors that are difficult to predict when writing an application. Calling this function from a thread that manages interaction with the user interface could make the application appear to be unresponsive.

SetForm can be called multiple times for an existing WindowsPageFormatMBS, each call adding additional pairs of DisplayName and LangId values. All languages versions of the form will get the Size and ImageableArea values of the WindowsPageFormatMBS in the most recent call to SetForm.
If the caller is remote and the form's Mode is 2, the StringType value of the WindowsPageFormatMBS cannot be STRING_MUIDLL.

### 141.18.36 SetJob(JobID as Integer, job as WindowsPrinterJobMBS) as boolean

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets job parameters.
**Example:**

```
dim w as new WindowsPrinterMBS( WindowsPrinterMBS.GetDefaultPrinter, true)
dim jobs() as WindowsPrinterJobMBS = w.AllJobs
MsgBox str(UBound(jobs)+1)+" jobs"

// pick first
dim j as WindowsPrinterJobMBS = jobs(0)
j.Document = "Hello World"

// write back values
call w.SetJob(j.JobID, j)

// error?
if w.Lasterror<>0 then
MsgBox w.LasterrorMessage
end if
```

**Notes:** see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd162978(v=vs.85).aspx

### 141.18.37 SetPrinterSettings(value as WindowsDeviceModeMBS, Mode as Integer=2) as boolean

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets printer settings.

**Example:**

```
// switch default printer to A5 landscape paper

dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name, false)
dim d as WindowsDeviceModeMBS = p.GetPrinterSettings(9)

if d = nil then
MsgBox p.LasterrorMessage
else
d.PaperSize = d.DMPAPER_A5
d.Fields = BitwiseOr(d.Fields, d.DM_PAPERSIZE)
d.Orientation = d.DMORIENT_LANDSCAPE
d.Fields = BitwiseOr(d.Fields, d.DM_ORIENTATION)

if p.SetPrinterSettings(d, 9) then
MsgBox "OK"
else
MsgBox "Failed: "+p.LasterrorMessage
end if
end if
```

**Notes:** Mode can be 2 (general printer information), 8 (global settings) or 9 (user settings).

For more information on the GetPrinter function, check this website:
http://msdn.microsoft.com/en-us/library/dd145082(v=vs.85).aspx

### 141.18.38 Properties

### 141.18.39 Handle as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle to the printer.
**Notes:** (Read and Write property)

### 141.18.40 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last windows error code.
**Notes:** (Read and Write property)

### 141.18.41 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text message for the last error code.
**Notes:** (Read and Write property)

### 141.18.42 PrinterName as String

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the open printer in this object.
**Example:**

```
dim name as string = WindowsPrinterMBS.GetDefaultPrinter
dim p as WindowsPrinterMBS = WindowsPrinterMBS.OpenPrinter(name)
MsgBox p.PrinterName
```

**Notes:** (Read and Write property)

# Chapter 142

# Process

## 142.1 class Application

### 142.1.1 class Application

Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extends the Application class inside Xojo.

### 142.1.2 Methods

### 142.1.3 ApplicationCreatorCodeMBS as string

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns the Creator Code of the application.
**Example:**

msgbox "Hi. This application has the creator code "+app.ApplicationCreatorCodeMBS

**Notes:** Only useful on Mac OS.
If you run your app inside the Xojo IDE it will return "RBv2" which is Xojo's Creator code sind Xojo 2.0.
**Blog Entries**

- MBS Xojo Plugins, version 19.4pr1

### 142.1.4 ApplicationFileMBS as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use ExecutableFile instead.
**Function:** Gives a folderitem to the applications file.
**Example:**

msgbox "Hi. The file of this application is named "+app.ApplicationFileMBS.name

**Notes:** Inside Xojo points to the Xojo application.

This item may go in the future. Please use app.executablefile in new Xojo versions.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo Plugins, version 19.4pr1

**Xojo Developer Magazine**

- 3.1, page 42: Register Document File Types, Fill and Query the Registry by Christian Schmitz

### 142.1.5 ApplicationNameMBS as string

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name of the application.
**Example:**

msgbox "Hi. This application is named "+app.ApplicationNameMBS

**Notes:** This may not be the exact same name than the filename.

### 142.1.6 ArgumentsMBS as String()

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries arguments of process.
**Notes:** Returns nil in case of any error (low memory).
First entry in result is path to current app.
Other entries are parameters, without any quotes.

### 142.1.7 BundleFolderMBS as folderitem

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns a folderitem to the bundle's mail folder.

### 142.1.8 BundleLocalizedStringMBS(key as string) as string

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the localized string for the given key from the default table.
**Notes:** A short version for BundleLocalizedString which uses the default table.
See also:

- 142.1.9 BundleLocalizedStringMBS(key as string,fromtable as string) as string 19507

### 142.1.9 BundleLocalizedStringMBS(key as string,fromtable as string) as string

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the localized string for the given key and table.
**Example:**

```
// You may make yourself a function to look up for the key and return
// This function was not tested in a real application. May contain a bug.

function Localize(key as string, default as string) as string
dim s as string

s=app.BundleLocalizedStringMBS(key)
if s="" then
s=default // For Mac OS Classic and Windows
elseif s=key then // returns key for not localized items
msgbox "For developer: the key """+key+""" was not localized for any language."
end if

return s
end sub

// use like this
FileOpen.text=Localize("FileOpenLabel", "Open...")
```

**Notes:** The table parameter is optional to specify which ".strings"-file to use.
without table or table="" the "Localizable.strings" file is used by Mac OS X.

Returns "" (empty string) on Mac OS Classic or Windows.
See also:

- 142.1.8 BundleLocalizedStringMBS(key as string) as string 19507

### 142.1.10 BundleResourceFolderItemLocalizedMBS(ResourceName as string, ResourceType as string, SubDirectory as string) as folderitem

MBS Util Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** Searches inside the application bundle for a file.
**Example:**

```
dim f as FolderItem
f=app.BundleResourceFolderItemLocalizedMBS("logo","jpg","")
MsgBox f.NativePath
```

**Notes:** ResourceName is the filename of the resource file.
ResourceType is the file extension.
SubDirectory is the name of the directory.
This function will take care for localization folders.

### 142.1.11 BundleResourceFolderMBS as folderitem

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns a folderitem to the resource file inside the bundle.
**Example:**

```
Dim f As FolderItem = App.BundleResourceFolderMBS

If f = Nil Then
MsgBox "Failed?"
Else
MsgBox f.NativePath
End If
```

### 142.1.12 HideMeMBS as boolean

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Hides the current application.
**Notes:** Returns true if the current application was hidden.

### 142.1.13 HideOthersMBS as boolean

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Hides all applications except the current one.
**Notes:** Returns true if the other applications were hidden.

### 142.1.14 LaunchTimeMBS as Double

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the the ticks value at launch time.
**Example:**

```
dim d as date

d=new date
d.totalSeconds=d.totalSeconds-(ticks-app.launchTimeMBS)/60

msgbox d.longdate+" "+d.longtime
```

**Notes:** This value must be converted to the secondsvalue like in the example.
-1 on Windows.
For Mac OS X see the DarwinResourceUsageMBS class.

### 142.1.15 MainBundleMBS as CFBundleMBS

MBS MacCF Plugin, Platform: macOS, Targets: Desktop only.

**Function:** If your application is a bundle, this function returns your own bundle.
**Notes:** Returns nil on any error.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.1.16 NSApplicationMBS as NSApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the shared NSApplication object.
**Notes:** This method gives easy access to the NSApplicationMBS class.

The plugin makes sure that there is only one application object by returning the same object each time. Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.1.17 OverlayApplicationDockTileImageMBS(pic as CGImageMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop only.

**Function:** Adds a picture on top of the application dock title.
**Example:**

```
static n as Integer // global property
dim p as picture
dim m as picture
dim g as graphics
dim s as string
dim w,h,x as Integer

n=n+1 // add one
s=str(n)
m=New Picture(128,128,32)
p=New Picture(128,128,32)

g=p.graphics
g.textsize=24
w=g.stringwidth(s)
h=g.stringheight(s,0)
x=125-w-10
g.foreColor=rgb(255,0,0)
g.fillRoundRect x,10,10+w,10+h,20,20
g.foreColor=rgb(0,0,0)
g.drawstring s,x+5,15+g.textascent

g=m.graphics
g.foreColor=rgb(0,0,0)
g.fillRoundRect x,10,10+w,10+h,20,20

if app.OverlayApplicationDockTileImageMBS(CGCreateImageMBS(p,m)) then
end if
```

**Notes:** Changed in MBS Plugin 2.7 to use CGImages directly.
Added support for 64-bit in plugin version 16.0.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.5pr2

### 142.1.18 ProcessTimeMBS as Double

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current CPU time for the process.
**Example:**

msgbox "I got "+format(app.ProcessTimeMBS/100,"0.00")+" seconds CPU time till now."

**Notes:** On Mac OS X, the OS counts how much CPU time in given to the current process.
Returns -1 in case of an error.

You can do this function yourself if you like:

```
dim s as SoftDeclareMBS

s=new SoftDeclareMBS

if s.LoadLibrary("System.Framework") then
if s.LoadFunction("clock") then
if s.Call(0,nil) then
MsgBox "clock: "+str(s.Result)+chr(13)+"app.ProcessTime: "+str(app.ProcessTime)
end if
end if
end if
```

You may need to add Error Checking code.

### 142.1.19 RestoreApplicationDockTileImageMBS as boolean

MBS MacCG Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop only.

**Function:** Restores the application dock tile image.
**Example:**

```
if app.RestoreApplicationDockTileImageMBS then
// ok
end if
```

**Notes:** Added support for 64-bit in plugin version 16.0.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.5pr2

### 142.1.20 SetApplicationDockTileImageMBS(pic as CGImageMBS) as boolean

MBS MacCG Plugin, Plugin Version: 2.6, Platform: macOS, Targets: Desktop only.

**Function:** Sets the application dock tile image.
**Example:**

```
dim p as CGImageMBS = CGImageMBS.CreateImage(LogoMBS(500))

if app.SetApplicationDockTileImageMBS(p) then
// ok
end if
```

**Notes:** Changed in MBS Plugin 2.7 to use CGImages directly.
Added support for 64-bit in plugin version 16.0.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.5pr2

### 142.1.21 Properties

### 142.1.22 FrontmostMBS as boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns true if the application is frontmost.
**Example:**

```
app.frontmostmbs=True 'bring app to front
```

**Notes:** This property is for read and write. Writing to it brings the app to front.
Setting this property to false does nothing.

If you need to make some other application frontmost, you can use app.HideMeMBS or use the ProcessMBS class.

Implemented for Windows in version 19.2. When querying, we check if the front window belongs to our application. When setting the plugin builds a list of all FileMaker windows. Than we activate the top most of them and move all other windows in z order behind.
(Read and Write computed property)

## 142.2 class BackgroundThreadMBS

### 142.2.1 class BackgroundThreadMBS

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The thread subclass we use for the CallMethodOnThreadMBS functions.
**Example:**

```
if CallMethodOnThreadMBS(new BackgroundThreadMBS, window1, "Test") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** Subclass of the Thread class.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 20.0pr5
- MBS REALbasic Plugins Version 10.4 release notes
- About new Call functions
- MBS REALbasic Plugins, version 10.4pr8

## 142.3 module CallDelegateCrashSafeMBS

### 142.3.1 module CallDelegateCrashSafeMBS

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The module to call a delegate and catch a crash.
**Example:**

```
Try

System.DebugLog "Try the call..."

CallDelegateCrashSafeMBS AddressOf TestMethod

System.DebugLog "Call succeeded!"

Catch c As DelegateCrashExceptionMBS

System.DebugLog "Caught exception!"
System.DebugLog c.Message

End Try
```

**Notes:** We can catch the following conditions:

- Invalid pointer access
- Invalid instruction
- Floating point exception
- Wrong system call
- Broken pipe
- Bus error

We may crash ourselves on stack corruption and we print the stack trace to stderr for macOS and Linux for debugging.

If a crash is caught, there may be memory leaked as objects allocated in the called method are not freed. The call function can not be used recursively and only on one thread at the time.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr2
- News from the MBS Xojo Plugins in Version 23.0

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 23.0pr5
- Crash Protection for Xojo methods
- MBS Xojo Plugins, version 22.6pr1

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 142.3.2 Methods

### 142.3.3 CallDelegateCrashSafeMBS(m as DelegateCrashSafeMBS)

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calls a method that may crash.
**Example:**

```
Try

System.DebugLog "Try the call..."

CallDelegateCrashSafeMBS AddressOf TestMethod

System.DebugLog "Call succeeded!"

Catch c As DelegateCrashExceptionMBS

System.DebugLog "Caught exception!"
System.DebugLog c.Message

End Try
```

**Notes:** Raises DelegateCrashExceptionMBS if a crash happens.

The call function can not be used recursively and only on one thread at the time.

### 142.3.4 Properties

### 142.3.5 CallCounter as Integer

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of calls made.
**Notes:** (Read only property)

### 142.3.6 CrashCounter as Integer

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of crashes caught.
**Notes:** (Read only property)

### 142.3.7 Delegates

### 142.3.8 DelegateCrashSafeMBS()

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate definition for a simple method to call.
**Xojo Developer Magazine**

- 21.1, page 9: News

## 142.4 module CallDelegatesMBS

### 142.4.1 module CallDelegatesMBS

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for the call delegate methods.
**Notes:** Only supported on Xojo 2013r1 and newer.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr5
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0

### 142.4.2 Methods

### 142.4.3 CallDelegateOnMainThreadMBS(m as _delegateMBS)

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a delegate on the main thread.
**Example:**

```
CallDelegateOnMainThreadMBS AddressOf testString, "Hello"
CallDelegateOnMainThreadMBS AddressOf testNumbers, 5, 6
CallDelegateOnMainThreadMBS AddressOf TestNoParameters
CallDelegateOnMainThreadMBS AddressOf Test, "4th call", 4
```

**Notes:** We call the delegate on the main thread later with passing a parameter
Our plugin supports various combinations of up to 2 parameters of type string, variant, boolean, double, integer and object.
If you need more, please contact us.
Only supported on Xojo 2013r1 and newer.

If the method you call has optional parameters, you must pass all values or Xojo will throw a compile error.

### 142.4.4 CallDelegateOnPreemptiveThreadMBS(m as _delegateMBS) as Boolean

MBS Util Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Calls a delegate on a preemptive thread.
**Notes:** Experimental function to play with preemptive-threads in Xojo apps.

Some rules:

- No objects, no strings, no arrays
- Use Ptr, not Memoryblocks
- Crashes in debugger, so only use in built app
- Use #Pragma BackgroundTasks False
- Use #Pragma BreakOnExceptions False
- Use #Pragma StackOverflowChecking False
- Use #Pragma NilObjectChecking False
- No exceptions
- Delegate must be stored in global variable to avoid it getting freed early.
- You can pass up to one ptr as data parameter.
- Declares may work, but should be pre-used to make sure they don't raise an exception and are loaded.

uses thread pool on iOS, macOS and Windows. Otherwise regular threads.
See also:

- 142.4.5 CallDelegateOnPreemptiveThreadMBS(m as _delegatePtrMBS, data as Ptr) as Boolean 19519

### 142.4.5 CallDelegateOnPreemptiveThreadMBS(m as _delegatePtrMBS, data as Ptr) as Boolean

MBS Util Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a delegate on a preemptive thread and passes a ptr.
**Notes:** Experimental function to play with preemptive-threads in Xojo apps.

Some rules:

- No objects, no strings, no arrays
- Use Ptr, not Memoryblocks
- Crashes in debugger, so only use in built app

- Use #Pragma BackgroundTasks False
- Use #Pragma BreakOnExceptions False
- Use #Pragma StackOverflowChecking False
- Use #Pragma NilObjectChecking False
- No exceptions
- Delegate must be stored in global variable to avoid it getting freed early.
- You can pass up to one ptr as data parameter.
- Declares may work, but should be pre-used to make sure they don't raise an exception and are loaded.

uses thread pool on iOS, macOS and Windows. Otherwise regular threads.
See also:

- 142.4.4 CallDelegateOnPreemptiveThreadMBS(m as _delegateMBS) as Boolean 19518

## 142.5 Globals

### 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread after the given delay in seconds.
**Example:**

```
if CallMethodLaterMBS(window1, "Test", 5.0) then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with no parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread after the given delay in seconds.

Returns true on success and false on failure.
The time given is just a roughly suggestions. Actual time on the method call depends on how busy your application is.
See also:

- 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
- 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
- 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523

### 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread after the given delay in seconds.
**Example:**

```
if CallMethodLaterMBS(window1, "Test", 4.0, "Hello") then
msgbox "OK"
```

```
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with one variant parameter and no return values.

The method will be called later (Asyncronously) on the main thread after the given delay in seconds. Useful for performing non thread safe stuff like GUI functions on the main thread.

Returns true on success and false on failure.
The time given is just a roughly suggestions. Actual time on the method call depends on how busy your application is.
See also:

- 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
- 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522
- 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523

### 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread after the given delay in seconds.
**Example:**

```
if CallMethodLaterMBS(window1, "Test", 3.0, "Hello", "World") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with two variant parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread after the given delay in seconds.

Returns true on success and false on failure.
The time given is just a roughly suggestions. Actual time on the method call depends on how busy your application is.
See also:


- 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
- 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
- 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19523


### 142.5.4 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant, value3 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread after the given delay in seconds.
**Example:**

```
if CallMethodLaterMBS(window1, "Test", 3.0, "Hello", "World", 5) then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with three variant parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread after the given delay in seconds.

Returns true on success and false on failure.
The time given is just a roughly suggestions. Actual time on the method call depends on how busy your application is.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr1
- MBS Xojo / Real Studio Plugins, version 15.5pr1

See also:

- 142.5.1 CallMethodLaterMBS(target as object, name as string, afterDelay as Double) as boolean 19521
- 142.5.2 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant) as boolean 19521
- 142.5.3 CallMethodLaterMBS(target as object, name as string, afterDelay as Double, value1 as Variant, value2 as Variant) as boolean 19522


### 142.5.5 CallMethodMBS(target as object, name as string) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object.
**Example:**

```
if CallMethodMBS(window1, "Test") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with no parameters and no return values.

Returns true on success and false on failure.
See also:


- 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
- 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525
- 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526


### 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object.
**Example:**

```
if CallMethodMBS(window1, "Test", "Hello") then
msgbox "OK"
else
```

```
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with one variant parameter and no return values.

Returns true on success and false on failure.
See also:

- 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524
- 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525
- 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526

### 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object.
**Example:**

```
if CallMethodMBS(window1, "Test", "Hello", "World") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with two variant parameters and no return values.

Returns true on success and false on failure.
See also:

- 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524
- 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
- 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19526

### 142.5.8 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object.
**Example:**

```
if CallMethodMBS(window1, "Test", "Hello", "World", 5) then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with three variant parameters and no return values.

Returns true on success and false on failure.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- About new Call functions
- MBS REALbasic Plugins, version 10.4pr8

See also:

- 142.5.5 CallMethodMBS(target as object, name as string) as boolean 19524
- 142.5.6 CallMethodMBS(target as object, name as string, value1 as Variant) as boolean 19524
- 142.5.7 CallMethodMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19525

### 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread.
**Example:**

```
if CallMethodOnMainThreadMBS(window1, "Test") then
msgbox "OK"
else
msgbox "Failed"
```

```
end if
```

**Notes:** The method must be declared on the given class for the target object with no parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread.

Returns true on success and false on failure.
Deprecated, please use CallDelegatesMBS.CallDelegateOnMainThreadMBS instead.
See also:


- 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
- 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528
- 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528


### 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread.
**Example:**

```
if CallMethodOnMainThreadMBS(window1, "Test", "Hello") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with one variant parameter and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread.

Returns true on success and false on failure.
Deprecated, please use CallDelegatesMBS.CallDelegateOnMainThreadMBS instead.

See also:

- 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
- 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528
- 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528

### 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread.
**Example:**

```
if CallMethodOnMainThreadMBS(window1, "Test", "Hello", "World") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with two variant parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread.

Returns true on success and false on failure.
Deprecated, please use CallDelegatesMBS.CallDelegateOnMainThreadMBS instead.
See also:

- 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
- 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
- 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19528

### 142.5.12 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calls a method on the target object on the main thread.
**Example:**

```
if CallMethodOnMainThreadMBS(window1, "Test", "Hello", "World", 5) then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with three variant parameters and no return values.

The method will be called later (Asyncronously) on the main thread. Useful for performing non thread safe stuff like GUI functions on the main thread.

Returns true on success and false on failure.
Deprecated, please use CallDelegatesMBS.CallDelegateOnMainThreadMBS instead.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- About new Call functions
- MBS REALbasic Plugins, version 10.4pr8

See also:

- 142.5.9 CallMethodOnMainThreadMBS(target as object, name as string) as boolean 19526
- 142.5.10 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant) as boolean 19527
- 142.5.11 CallMethodOnMainThreadMBS(target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19528

### 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Calls a method on the target object on a new thread.
**Example:**

```
if CallMethodOnThreadMBS(new BackgroundThreadMBS, window1, "Test") then
msgbox "OK"
```

```
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with no parameters and no return values.

Pass in "new BackgroundThreadMBS" for the thread to use. Execution will be done later (Asynchronously) on that thread. Useful for perform some code in the background without creating a thread yourself.

Returns true on success and false on failure.
See also:


- 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
- 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531
- 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532


### 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Calls a method on the target object on a new thread.
**Example:**

```
if CallMethodOnThreadMBS(new BackgroundThreadMBS, window1, "Test", "Hello") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with one variant parameter and no return values.

Pass in "new BackgroundThreadMBS" for the thread to use. Execution will be done later (Asynchronously) on that thread. Useful for perform some code in the background without creating a thread yourself.

Returns true on success and false on failure.
See also:

- 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
- 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531
- 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532

### 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Calls a method on the target object on a new thread.
**Example:**

```
if CallMethodOnThreadMBS(new BackgroundThreadMBS, window1, "Test", "Hello", "World") then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with two variant parameters and no return values.

Pass in "new BackgroundThreadMBS" for the thread to use. Execution will be done later (Asynchronously) on that thread. Useful for perform some code in the background without creating a thread yourself.

Returns true on success and false on failure.
See also:

- 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
- 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
- 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean 19532

### 142.5.16 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant, value3 as Variant) as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Calls a method on the target object on a new thread.
**Example:**

```
if CallMethodOnThreadMBS(new BackgroundThreadMBS, window1, "Test", "Hello", "World", 5) then
msgbox "OK"
else
msgbox "Failed"
end if
```

**Notes:** The method must be declared on the given class for the target object with three variant parameters and no return values.

Pass in "new BackgroundThreadMBS" for the thread to use. Execution will be done later (Asynchronously) on that thread. Useful for perform some code in the background without creating a thread yourself.

Returns true on success and false on failure.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- About new Call functions
- MBS REALbasic Plugins, version 10.4pr8

See also:

- 142.5.13 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string) as boolean 19529
- 142.5.14 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant) as boolean 19530
- 142.5.15 CallMethodOnThreadMBS(BackgroundThread as BackgroundThreadMBS, target as object, name as string, value1 as Variant, value2 as Variant) as boolean 19531

### 142.5.17 GetDarwinVMStatisticsMBS as DarwinVMStatisticsMBS

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** Returns information about the current memory status on Mac OS X.
**Example:**

```
dim d as DarwinVMStatisticsMBS

d=GetDarwinVMStatisticsMBS

if d=nil then
msgBox "No Darwin running :-("
quit
else
dim lines(-1) as string

lines.Append format(d.pageins,"0")+" pageins"
lines.Append format(d.pageouts,"0")+" pageouts"
lines.Append format(d.pagesize,"0")+" pagesize"
lines.Append format(d.freepages,"0")+" freepages"
lines.Append format(d.activepages,"0")+" activepages"
lines.Append format(d.inactivepages,"0")+" inactivepages"
lines.Append format(d.wiredpages,"0")+" wiredpages"
lines.Append format(d.zerofillpages,"0")+" zerofillpages"
lines.Append format(d.reactivations,"0")+" reactivations"
lines.Append format(d.faults,"0")+" faults"
lines.Append format(d.cowfaults,"0")+" cowfaults"
lines.Append format(d.lookups,"0")+" lookups"
lines.Append format(d.hits,"0")+" hits"

MsgBox Join(lines,EndOfLine)
end if
```

### 142.5.18 GetDarwinResourceUsageMBS as DarwinResourceUsageMBS

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Get information about resource utilization.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralMaxResidentSetSize)
```

**Notes:** Returns nil on any error.
For more information type "man getrusage" in the Mac OS X Terminal.

### 142.5.19 SetThreadNameMBS(name as string)

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the name of current thread.
**Example:**

SetThreadNameMBS "SQL Query Thread"

**Notes:** This is useful to see thread name in crash reports or sample reports.
**Blog Entries**

- MBS Xojo plug-ins in version 16.0
- Thread Names
- MBS Xojo / Real Studio Plugins, version 15.5pr2

### 142.5.20 CountProcessesMBS as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Counts how many processes are running.
**Notes:** Short for this function:

```
function CountProcesses as Integer
dim n as Integer
dim p as ProcessMBS

p=new ProcessMBS
p.getfirstProcess
n=1
while p.getnextProcess
n=n+1
wend

return n
end if
```

### 142.5.21 GetWindowsVMStatisticsMBS as WindowsVMStatisticsMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns information about the current memory status on Windows.
**Example:**

```
dim w as WindowsVMStatisticsMBS

w=GetWindowsVMStatisticsMBS
if w<>nil then

list.AddRow format(w.pagesize,"0")
list.AddRow format(w.memoryLoad,"0")
list.AddRow format(w.availablePageFileMemory,"0")
list.AddRow format(w.availablePhysicalMemory,"0")
list.AddRow format(w.availableVirtualMemory,"0")
list.AddRow format(w.totalPageFileMemory,"0")
list.AddRow format(w.totalPhysicalMemory,"0")
list.AddRow format(w.totalVirtualMemory,"0")

else

msgBox "No Windows memory statistics..."
quit
end if
```

**Notes:** See also WindowsProcessStatisticsMBS for the application.

## 142.6 class ConsoleApplication

### 142.6.1 class ConsoleApplication

Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Console only.

**Function:** Extends the ConsoleApplication class inside Xojo.

### 142.6.2 Methods

### 142.6.3 ArgumentsMBS as String()

MBS Util Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: Console only.

**Function:** Queries arguments of process.
**Notes:** Returns nil in case of any error (low memory).
First entry in result is path to current app.
Other entries are parameters, without any quotes.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.6.4 LaunchTimeMBS as double

MBS Util Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Console only.

**Function:** Returns the the ticks value at launch time.
**Example:**

```
dim d as date

d=new date
d.totalSeconds=d.totalSeconds-(ticks-app.launchTimeMBS)/60

msgbox d.longdate+" "+d.longtime
```

**Notes:** This value must be converted to the secondsvalue like in the example.
-1 on Windows.
For Mac OS X see the DarwinResourceUsageMBS class.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.6.5 MainBundleMBS as CFBundleMBS

MBS MacCF Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Console only.

**Function:** If your application is a bundle, this function returns your own bundle.
**Notes:** Returns nil on any error.
For console application, returns the bundle referencing the console app file.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.6.6 NSApplicationMBS as NSApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Console only.

**Function:** Returns the shared NSApplication object.
**Notes:** This method gives easy access to the NSApplicationMBS class.

The plugin makes sure that there is only one application object by returning the same object each time. Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

### 142.6.7 ProcessTimeMBS as double

MBS Util Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Console only.

**Function:** Returns the current CPU time for the process.
**Example:**

```
msgbox "I got "+format(app.ProcessTimeMBS/100,"0.00")+" seconds CPU time till now."
```

**Notes:** On Mac OS X, the OS counts how much CPU time in given to the current process.
On Mac OS 9 you can get this information for any process using the ProcessMBS class.
Returns -1 in case of an error.

You can do this function yourself if you like:

```
dim s as SoftDeclareMBS

s=new SoftDeclareMBS

if s.LoadLibrary("System.Framework") then
if s.LoadFunction("clock") then
if s.Call(0,nil) then
MsgBox "clock: "+str(s.Result)+chr(13)+"app.ProcessTime: "+str(app.ProcessTime)
end if
end if
end if
```

You may need to add Error Checking code.

Works for Console, Desktop and Web projects. Version 19.4 declares this method for ConsoleApplication and Application class.

## 142.7 class DarwinGroupListMBS

### 142.7.1 class DarwinGroupListMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The list of Groups on a Mac OS X system.
**Example:**

```
dim l as new DarwinGroupListMBS
MsgBox str(l.Count)+" groups"
```

### 142.7.2 Methods

### 142.7.3 CurrentEffectiveUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The effective user ID of the calling process.
**Example:**

```
dim l as new DarwinGroupListMBS
MsgBox str(l.CurrentEffectiveUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.7.4 CurrentGroupID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real group ID of the calling process.
**Example:**

```
dim l as new DarwinGroupListMBS
MsgBox "CurrentGroupID: "+str(l.CurrentGroupID)
```

**Notes:** The real group ID is specified at login time.

### 142.7.5 CurrentUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real user ID of the calling process.
**Example:**

```
dim l as new DarwinGroupListMBS
MsgBox "CurrentUserID: "+str(l.CurrentUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.7.6 Group(index as Integer) as DarwinGroupMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Returns the Group with the given index.
**Example:**

```
dim l as new DarwinGroupListMBS
dim c as Integer = l.Count-1
dim names(-1) as string
for i as Integer = 0 to c
dim g as DarwinGroupMBS = l.Group(i)
names.Append g.Name
next
MsgBox Join(names,EndOfLine)
```

### 142.7.7 Properties

### 142.7.8 Count as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The number of Groups on this Mac OS X system.
**Example:**

```
dim l as new DarwinGroupListMBS
MsgBox str(l.Count)+" groups"
```

**Notes:** (Read only property)

## 142.8 class DarwinGroupMBS

### 142.8.1 class DarwinGroupMBS

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** A class with information about a Group on Mac OS X.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox g.Name
```

**Blog Entries**

- MBS Xojo Plugins, version 19.4pr1

### 142.8.2 Methods

### 142.8.3 CurrentEffectiveUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The effective user ID of the calling process.
**Example:**

```
dim g as new DarwinGroupMBS
MsgBox "CurrentEffectiveUserID: "+str(G.CurrentEffectiveUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.8.4 CurrentGroupID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real group ID of the calling process.
**Example:**

```
dim g as new DarwinGroupMBS
MsgBox "CurrentGroupID: "+str(G.CurrentGroupID)
```

**Notes:** The real group ID is specified at login time.

### 142.8.5 CurrentUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real user ID of the calling process.
**Example:**

```
dim g as new DarwinGroupMBS
MsgBox "CurrentUserID: "+str(G.CurrentUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.8.6 LoadGroupByID(Groupid as Integer)

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Fills the properties of this class with the values for the Group with the given ID.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox g.Name
```

### 142.8.7 LoadGroupByName(name as string)

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** Fills the properties of this class with the values for the given Group.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByName "staff"
MsgBox g.Name
```

### 142.8.8 UserName(index as Integer) as string

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The Group ID of this Group.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID

dim c as Integer = g.UserCount-1
for i as Integer = 0 to c
MsgBox g.UserName(i)
next
```

### 142.8.9 Properties

### 142.8.10 GroupID as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The group ID of the Group.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "GroupID: "+str(G.GroupID)
```

**Notes:** (Read only property)

### 142.8.11 Name as string

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The name of the Group.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "Name: "+g.Name
```

**Notes:** (Read only property)

### 142.8.12 Password as string

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The password for this group.
**Notes:** (Read only property)

### 142.8.13 Ready as Boolean

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** whether the values in this class were filled correctly.
**Notes:** (Read only property)

### 142.8.14 UserCount as Integer

MBS MacCF Plugin, Plugin Version: 3.2, Platform: macOS, Targets: All.

**Function:** The number of users in this group.
**Example:**

```
dim g as new DarwinGroupMBS
g.LoadGroupByID g.CurrentGroupID
MsgBox "UserCount: "+str(G.UserCount)
```

**Notes:** (Read only property)

## 142.9 class DarwinResourceUsageMBS

### 142.9.1 class DarwinResourceUsageMBS

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** A class for information about resource utilization.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralMaxResidentSetSize)
```

**Notes:** For more information type "man getrusage" in the Mac OS X Terminal.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr2
- MBS Xojo / Real Studio Plugins, version 15.3pr4
- MBS REALbasic Plugins, version 10.6pr9
- MBS REALbasic Plugins, version 10.6pr2

### 142.9.2 Properties

### 142.9.3 BlockInputOperations as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of block input operations.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.BlockInputOperations)
```

**Notes:** (Read only property)

### 142.9.4 BlockOutputOperations as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of block output operations.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.BlockOutputOperations)
```

**Notes:** (Read only property)

### 142.9.5 IntegralMaxResidentSetSize as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Integral max resident set size.
**Example:**

```
dim u as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
dim t as new DarwinTaskInfoMBS

MsgBox "Application Resident Size: "+str(t.ResidentSize)+EndOfLine+_
"Application Virtual Size: "+str(t.VirtualSize)+EndOfLine+_
"Application Integral Max Resident Size: "+str(u.IntegralMaxResidentSetSize)
```

**Notes:** Maximum memory usage of this app.
(Read only property)

### 142.9.6 IntegralSharedTextMemorySize as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Integral shared text memory size.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralSharedTextMemorySize)
```

**Notes:** (Read only property)

### 142.9.7 IntegralUnsharedDataSize as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Integral unshared data size.

**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralUnsharedDataSize)
```

**Notes:** (Read only property)

### 142.9.8 IntegralUnsharedStackSize as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Integral unshared stack size.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.IntegralUnsharedStackSize)
```

**Notes:** (Read only property)

### 142.9.9 InvoluntaryContextSwitches as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of involuntary context switches.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.InvoluntaryContextSwitches)
```

**Notes:** (Read only property)

### 142.9.10 MessagesReceived as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of messages received.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.MessagesReceived)
```

**Notes:** (Read only property)

### 142.9.11 MessagesSent as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of messages sent.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.MessagesSent)
```

**Notes:** (Read only property)

### 142.9.12 PageFaults as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of page faults.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.PageFaults)
```

**Notes:** (Read only property)

### 142.9.13 PageReclaims as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of page reclaims.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.PageReclaims)
```

**Notes:** (Read only property)

### 142.9.14 SignalsReceived as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of signals received.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.SignalsReceived)
```

**Notes:** (Read only property)

### 142.9.15 Swaps as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of swaps.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.Swaps)
```

**Notes:** (Read only property)

### 142.9.16 SystemTimeUsed as Double

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Seconds of system time used.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.SystemTimeUsed)
```

**Notes:** (Read only property)

### 142.9.17 UserTimeUsed as Double

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Seconds of user time used.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.UserTimeUsed)
```

**Notes:** (Read only property)

### 142.9.18 VoluntaryContextSwitches as Int64

MBS MacCF Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Number of voluntary context switches.
**Example:**

```
dim d as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
MsgBox str(d.VoluntaryContextSwitches)
```

**Notes:** (Read only property)

## 142.10 class DarwinTaskInfoMBS

### 142.10.1 class DarwinTaskInfoMBS

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** A class for your applications memory/resource usage.
**Example:**

```
dim u as DarwinResourceUsageMBS = GetDarwinResourceUsageMBS
dim t as new DarwinTaskInfoMBS

MsgBox "Application Resident Size: "+str(t.ResidentSize)+EndOfLine+_
"Application Virtual Size: "+str(t.VirtualSize)+EndOfLine+_
"Application Integral Max Resident Size: "+str(u.IntegralMaxResidentSetSize)
```

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### 142.10.2 Methods

### 142.10.3 Update as boolean

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Updates the values and returns true on success.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.UserTime)
call d.Update
MsgBox str(d.UserTime)
```

**Notes:** The constructor updates the values on creation of the object.

### 142.10.4 Properties

### 142.10.5 ContextSwitches as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of context switches.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.ContextSwitches)
```

**Notes:** (Read and Write property)

### 142.10.6 COWFaults as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of copy-on-write faults.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.COWFaults)
```

**Notes:** (Read and Write property)

### 142.10.7 Faults as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of page faults.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.Faults)
```

**Notes:** (Read and Write property)

### 142.10.8 MessagesReceived as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of messages received.
**Example:**

```
dim d as new DarwinTaskInfoMBS
```

```
MsgBox str(d.MessagesReceived)
```

**Notes:** (Read and Write property)

### 142.10.9 MessagesSent as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of messages sent.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.MessagesSent)
```

**Notes:** (Read and Write property)

### 142.10.10 PageIns as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of actual pageins.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.PageIns)
```

**Notes:** (Read and Write property)

### 142.10.11 ResidentSize as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of resident pages.
**Example:**

```
dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS
MsgBox "This application uses "+Format(d.ResidentSize,"0")+" Bytes of physical memory."
```

**Notes:** (Read and Write property)

### 142.10.12 SuspendCount as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Suspend count for task.
**Example:**

```
dim d as new DarwinTaskInfoMBS
MsgBox str(d.SuspendCount)
```

**Notes:** (Read and Write property)

### 142.10.13 SystemCallsMach as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of mach system calls.
**Example:**

```
dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS

MsgBox "This application has done so far "+Format(d.SystemCallsMach,"0")+" system calls using the Mach Interface."
```

**Notes:** (Read and Write property)

### 142.10.14 SystemCallsUnix as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of unix system calls.
**Example:**

```
dim d as DarwinTaskInfoMBS
```

d=new DarwinTaskInfoMBS

MsgBox "This application has done so far "+Format(d.SystemCallsUnix,"0")+" system calls using the Unix Interface."

**Notes:** (Read and Write property)

### 142.10.15 SystemTime as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Total system run time.
**Example:**

dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS

MsgBox "This application has used so far "+Format(d.SystemTime,"0")+" seconds of CPU time."

**Notes:** (Read and Write property)

### 142.10.16 UserTime as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Total user run time.
**Example:**

dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS

MsgBox "This application has used so far "+Format(d.UserTime,"0")+" seconds of CPU time."

**Notes:** (Read and Write property)

### 142.10.17 VirtualSize as Double

MBS MacCF Plugin, Plugin Version: 5.2, Platform: macOS, Targets: All.

**Function:** Number of virtual pages.
**Example:**

```
dim d as DarwinTaskInfoMBS

d=new DarwinTaskInfoMBS
MsgBox "This application uses "+Format(d.VirtualSize,"0")+" Bytes of the 4 GB address space."
```

**Notes:** (Read and Write property)

## 142.11 class DarwinUserListMBS

### 142.11.1 class DarwinUserListMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The list of users on a Mac OS X system.
**Example:**

```
// find the short user name
dim d as DarwinUserListMBS
dim u as string
dim p as DarwinUserMBS
dim uid,i,c as Integer

// requires MachO target
declare function getuid lib "System" () as Integer

uid=getuid

d=new DarwinUserListMBS

c=d.Count-1
for I=0 to c
p=d.User(i)
if p.UserID=uid then
MsgBox p.Name
end if
next
```

### 142.11.2 Methods

### 142.11.3 CurrentEffectiveUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The effective user ID of the calling process.
**Example:**

```
dim l as new DarwinUserListMBS
MsgBox "CurrentEffectiveUserID: "+str(l.CurrentEffectiveUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to de-

termine the real-user-id of the calling process.

### 142.11.4 CurrentGroupID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real group ID of the calling process.
**Example:**

```
dim l as new DarwinUserListMBS
MsgBox "CurrentGroupID: "+str(l.CurrentGroupID)
```

**Notes:** The real group ID is specified at login time.

### 142.11.5 CurrentUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real user ID of the calling process.
**Example:**

```
dim l as new DarwinUserListMBS
MsgBox "CurrentUserID: "+str(l.CurrentUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.11.6 User(index as Integer) as DarwinUserMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Returns the user with the given index.
**Example:**

```
// find short user name
dim d as DarwinUserListMBS
dim u as string
dim p as DarwinUserMBS
dim uid,i,c as Integer
```

```
u=SystemInformationMBS.Username
d=new DarwinUserListMBS

c=d.Count-1
for I=0 to c
p=d.User(i)
if p.LongName=u then
MsgBox p.Name
end if
next
```

### 142.11.7 Properties

### 142.11.8 Count as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The number of users on this Mac OS X system.
**Example:**

```
dim l as new DarwinUserListMBS
MsgBox "Number of users: "+str(l.Count)
```

**Notes:** (Read only property)

## 142.12 class DarwinUserMBS

### 142.12.1 class DarwinUserMBS

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** A class with information about a user on Mac OS X.
**Example:**

```
dim l as new DarwinUserMBS
l.LoadUserByID l.CurrentUserID
MsgBox l.Name+": "+l.LongName
```

### 142.12.2 Methods

### 142.12.3 CurrentEffectiveUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The effective user ID of the calling process.
**Example:**

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentEffectiveUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.12.4 CurrentGroupID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real group ID of the calling process.
**Example:**

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentGroupID)
```

**Notes:** The real group ID is specified at login time.

### 142.12.5 CurrentUserID as Integer

MBS MacCF Plugin, Plugin Version: 8.0, Platform: macOS, Targets: All.

**Function:** The real user ID of the calling process.
**Example:**

```
dim l as new DarwinUserMBS
MsgBox str(l.CurrentUserID)
```

**Notes:** The real user ID is that of the user who has invoked the program. As the effective user ID gives the process additional permissions during execution of 'set-user-ID' mode processes, getuid() is used to determine the real-user-id of the calling process.

### 142.12.6 LoadUserByID(userid as Integer)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Fills the properties of this class with the values for the user with the given ID.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByID l.CurrentUserID

MsgBox l.Name
```

### 142.12.7 LoadUserByName(name as string)

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** Fills the properties of this class with the values for the given user.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByName "cs"

MsgBox l.LongName
```

### 142.12.8 Properties

### 142.12.9 AccountExpireTime as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The time when the account will expire.
**Notes:** (Read only property)

### 142.12.10 GroupID as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The group ID of the user.
**Example:**

```
dim l as new DarwinUserMBS
l.LoadUserByID l.CurrentUserID
MsgBox str(l.GroupID)
```

**Notes:** (Read only property)

### 142.12.11 HomePath as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The home path of the user.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByName "cs"

MsgBox l.HomePath
```

**Notes:** (Read only property)

### 142.12.12 LastPasswordChangeTime as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The last time when the user changed the password.
**Notes:** (Read only property)

### 142.12.13 LongName as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The long name of the user.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByName "cs"

MsgBox l.LongName
```

**Notes:** (Read only property)

### 142.12.14 Name as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The short name of the user.
**Example:**

```
dim l as new DarwinUserListMBS

dim c as Integer = l.Count-1
for i as Integer = 0 to c
dim u as DarwinUserMBS = l.User(i)
if u.UserID = l.CurrentUserID then
MsgBox "our user name: "+u.Name
end if
next
```

**Notes:** (Read only property)

### 142.12.15 Ready as Boolean

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** whether the values in this class were filled correctly.
**Notes:** (Read only property)

### 142.12.16 Shell as string

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The path to the default shell for this user.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByID l.CurrentUserID

MsgBox l.Shell
```

**Notes:** (Read only property)

### 142.12.17 UserID as Integer

MBS MacCF Plugin, Plugin Version: 3.1, Platform: macOS, Targets: All.

**Function:** The user ID of this user.
**Example:**

```
dim l as new DarwinUserMBS

l.LoadUserByID l.CurrentUserID

MsgBox str(l.UserID)
```

**Notes:** (Read only property)

## 142.13 class DarwinVMStatisticsMBS

### 142.13.1 class DarwinVMStatisticsMBS

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** Holds information about the current Mac OS X memory status.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.pageins)+" page ins"
```

### 142.13.2 Properties

### 142.13.3 ActivePages as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The total number of pages currently in use and pageable.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.ActivePages)
```

**Notes:** (Read only property)

### 142.13.4 CowFaults as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The number of faults that caused a page to be copied (generally caused by copy-on-write faults).
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CowFaults)
```

**Notes:** (Read only property)

### 142.13.5 CPUTicksIdle as Integer

MBS MacCF Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The number of time slices used by the Idle process.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksIdle)
```

**Notes:** Calculate deltas like in the example to see usage of CPU time.
(Read only property)

### 142.13.6 CPUTicksNice as Integer

MBS MacCF Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The number of time slices used by the task switcher process.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksNice)
```

**Notes:** Calculate deltas like in the example to see usage of CPU time.
(Read only property)

### 142.13.7 CPUTicksSystem as Integer

MBS MacCF Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The number of time slices used by the system processes.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksSystem)
```

**Notes:** Calculate deltas like in the example to see usage of CPU time.
(Read only property)

### 142.13.8 CPUTicksUser as Integer

MBS MacCF Plugin, Plugin Version: 2.7, Platform: macOS, Targets: All.

**Function:** The number of time slices used by the user application processes.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.CPUTicksUser)
```

**Notes:** Calculate deltas like in the example to see usage of CPU time.
(Read only property)

### 142.13.9 Faults as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The number of times the "vm_fault" routine has been called.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Faults)
```

**Notes:** (Read only property)

### 142.13.10 FreePages as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The total number of free pages in the system.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.FreePages)
```

**Notes:** (Read only property)

### 142.13.11 Hits as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The hit count.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Hits)
```

**Notes:** (Read only property)

### 142.13.12 InactivePages as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The total number of pages on the inactive list.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.InactivePages)
```

**Notes:** (Read only property)

### 142.13.13 Lookups as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The count of lookups.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Lookups)
```

**Notes:** (Read only property)

### 142.13.14 PageIns as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The number of requests for pages from a pager (such as the inode pager).
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.pageins)
```

**Notes:** (Read only property)

### 142.13.15 PageOuts as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The number of pages that have been paged out.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.PageOuts)
```

**Notes:** (Read only property)

### 142.13.16 Pagesize as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The size of one memory page in memory.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Pagesize)
```

**Notes:** On PowerPC CPUs, it should be 4096 Bytes.
(Read only property)

### 142.13.17 Reactivations as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** the total number of pages that have been moved from the inactive list to the active list (reactivated).

**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.Reactivations)
```

**Notes:** (Read only property)

### 142.13.18 WiredPages as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The total number of pages wired down. That is, pages that cannot be paged out.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.WiredPages)
```

**Notes:** (Read only property)

### 142.13.19 ZeroFillPages as Integer

MBS MacCF Plugin, Plugin Version: 2.6, Platform: macOS, Targets: All.

**Function:** The total number of pages that have been zero-filled on demand.
**Example:**

```
dim d as DarwinVMStatisticsMBS = GetDarwinVMStatisticsMBS
MsgBox str(d.ZeroFillPages)
```

**Notes:** (Read only property)

## 142.14 class DelegateCrashExceptionMBS

### 142.14.1 class DelegateCrashExceptionMBS

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The exception raised when a delegate call crashes.
**Notes:** Raised in CallDelegateCrashSafeMBS function.
Message defines what caused the crash and ErrorNumber is the signal number (platform dependent!).

Message contains the reason, e.g.

- Delegate crashed with invalid pointer access.
- Delegate crashed with illegal instruction.
- Delegate crashed with floating point error.
- Delegate crashed with wrong system call.
- Delegate crashed with broken pipe.
- Delegate crashed with memory bus error.

Subclass of the RuntimeException class.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- Crash Protection for Xojo methods
- MBS Xojo Plugins, version 22.6pr1

## 142.15 class DesktopApplication

### 142.15.1 class DesktopApplication

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extends the Application class inside Xojo.

### 142.15.2 Methods

### 142.15.3 ApplicationNameMBS as string

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the name of the application.
**Example:**

msgbox "Hi. This application is named "+app.ApplicationNameMBS

**Notes:** This may not be the exact same name than the filename.

### 142.15.4 ArgumentsMBS as String()

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries arguments of process.
**Notes:** Returns nil in case of any error (low memory).
First entry in result is path to current app.
Other entries are parameters, without any quotes.
**Blog Entries**

- Console and GUI in one project
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.2
- MBS Xojo / Real Studio Plugins, version 15.2pr1

**Xojo Developer Magazine**

- 13.5, page 8: News

### 142.15.5 BundleFolderMBS as folderitem

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a folderitem to the bundle's mail folder.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr9

### 142.15.6 BundleLocalizedStringMBS(key as string) as string

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the localized string for the given key from the default table.
**Notes:** A short version for BundleLocalizedString which uses the default table.
See also:

- 142.15.7 BundleLocalizedStringMBS(key as string,fromtable as string) as string 19573

### 142.15.7 BundleLocalizedStringMBS(key as string,fromtable as string) as string

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the localized string for the given key and table.
**Example:**

```
// You may make yourself a function to look up for the key and return
// This function was not tested in a real application. May contain a bug.

function Localize(key as string, default as string) as string
dim s as string

s=app.BundleLocalizedStringMBS(key)
if s="" then
s=default // For Mac OS Classic and Windows
elseif s=key then // returns key for not localized items
msgbox "For developer: the key """+key+""" was not localized for any language."
end if

return s
end sub

// use like this
FileOpen.text=Localize("FileOpenLabel", "Open...")
```

**Notes:** The table parameter is optional to specify which ".strings"-file to use.
without table or table="" the "Localizable.strings" file is used by Mac OS X.

Returns "" (empty string) on Mac OS Classic or Windows.
See also:

- 142.15.6 BundleLocalizedStringMBS(key as string) as string 19573

### 142.15.8 BundleResourceFolderItemLocalizedMBS(ResourceName as string, ResourceType as string, SubDirectory as string) as folderitem

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Searches inside the application bundle for a file.
**Example:**

```
dim f as FolderItem
f=app.BundleResourceFolderItemLocalizedMBS("logo","jpg","")
MsgBox f.NativePath
```

**Notes:** ResourceName is the filename of the resource file.
ResourceType is the file extension.
SubDirectory is the name of the directory.
This function will take care for localization folders.

### 142.15.9 BundleResourceFolderMBS as folderitem

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a folderitem to the resource file inside the bundle.
**Example:**

```
Dim f As FolderItem = App.BundleResourceFolderMBS

If f = Nil Then
MsgBox "Failed?"
Else
MsgBox f.NativePath
End If
```

#### Blog Entries

- MBS Xojo Plugins, version 21.4pr2

- MBS Real Studio Plugins, version 13.0pr9

### 142.15.10 HideMeMBS as boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Hides the current application.
**Notes:** Returns true if the current application was hidden.

### 142.15.11 HideOthersMBS as boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Hides all applications except the current one.
**Notes:** Returns true if the other applications were hidden.

### 142.15.12 LaunchTimeMBS as double

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the the ticks value at launch time.
**Example:**

```
dim d as date

d=new date
d.totalSeconds=d.totalSeconds-(ticks-app.launchTimeMBS)/60

msgbox d.longdate+" "+d.longtime
```

**Notes:** This value must be converted to the secondsvalue like in the example.
-1 on Windows.
For Mac OS X see the DarwinResourceUsageMBS class.

### 142.15.13 MainBundleMBS as CFBundleMBS

MBS MacCF Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** If your application is a bundle, this function returns your own bundle.
**Notes:** Returns nil on any error.

Works for Console, Desktop and Web projects.

### 142.15.14 NSApplicationMBS as NSApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the shared NSApplication object.
**Notes:** This method gives easy access to the NSApplicationMBS class.

The plugin makes sure that there is only one application object by returning the same object each time.
Works for Console, Desktop and Web projects.

### 142.15.15 ProcessTimeMBS as double

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current CPU time for the process.
**Example:**

```
msgbox "I got "+format(app.ProcessTimeMBS/100,"0.00")+" seconds CPU time till now."
```

**Notes:** On Mac OS X, the OS counts how much CPU time in given to the current process.
Returns -1 in case of an error.

### 142.15.16 Properties

### 142.15.17 FrontmostMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns true if the application is frontmost.
**Example:**

```
app.frontmostmbs=True 'bring app to front
```

**Notes:** This property is for read and write. Writing to it brings the app to front.
Setting this property to false does nothing.

If you need to make some other application frontmost, you can use app.HideMeMBS or use the ProcessMBS

class.

Implemented for Windows, too. When querying, we check if the front window belongs to our application. When setting the plugin builds a list of all FileMaker windows. Than we activate the top most of them and move all other windows in z order behind.
(Read and Write computed property)

## 142.16 class EnvironmentMBS

### 142.16.1 class EnvironmentMBS

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Allows you to access system wide environment properties.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr3

### 142.16.2 Methods

### 142.16.3 Add(name as string,value as string) as boolean

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Add a property to the list.
**Example:**

```
dim e as EnvironmentMBS

e=new EnvironmentMBS
if e.add("authorname","Christian") then
msgbox "ok"
else
msgbox "fail"
end if
```

**Notes:** Setting this value to some new value will currently only change this value for your application and all child applications.

### 142.16.4 Get(name as string) as string

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Returns the value for a named property.
**Example:**

```
dim e as EnvironmentMBS

e=new EnvironmentMBS
msgbox e.get("windir") // normally c:\windows
```

### 142.16.5 Lines as string()

MBS Util Plugin, Plugin Version: 12.1, Platform: Windows, Targets: All.

**Function:** Returns array of definition lines of environment variables.
**Example:**

```
dim e as new EnvironmentMBS
msgbox join(e.lines, endofline)
```

**Notes:** Returned strings are in format "name=value".

### 142.16.6 Name(Index as Integer) as string

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Returns the name of the environment propertie number n.

### 142.16.7 Names as string()

MBS Util Plugin, Plugin Version: 12.1, Platform: Windows, Targets: All.

**Function:** Returns array of names of environment variables.
**Example:**

```
dim e as new EnvironmentMBS
msgbox join(e.lines, endofline)
```

### 142.16.8 Update

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Updates the object to the current environment properties.
**Notes:** This method is called by the constructor and the methods which change the environment properties.

### 142.16.9 Properties

### 142.16.10 Count as Integer

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Returns the number of environment properties.
**Example:**

```
dim e as EnvironmentMBS

e=new EnvironmentMBS
msgbox str(e.count)
```

**Notes:** (Read only property)

### 142.16.11 Value(Index as Integer) as string

MBS Util Plugin, Platform: Windows, Targets: All.

**Function:** Returns the value of the environment propertie number n.
**Notes:** Setting this value to some new value will currently only change this value for your application and all child applications.
(Read and Write computed property)

## 142.17 class MutexMBS

### 142.17.1 class MutexMBS

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a mutex.
**Notes:** This is the mutex class the threadMBS class is using internally.
A mutex is not locked by default.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr3
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8
- MonkeyBread Software Releases the MBS Plugins 8.1

### 142.17.2 Methods

### 142.17.3 Lock

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the mutex.
**Example:**

```
dim m as new MutexMBS

m.Lock
MsgBox "Got mutex."

m.Unlock
MsgBox "Released mutex."
```

**Notes:** The function returns as soon as it has access to the mutex.

Always use Lock and Unlock in a pair.

### 142.17.4 TryLock as boolean

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the mutex if possible.
**Example:**

```
dim m as new MutexMBS

if m.TryLock then
MsgBox "Got mutex."

m.Unlock
else
MsgBox "Failed to get mutex."
end if
```

**Notes:** Returns true if we got a lock and false if not.
Always use Lock and Unlock in a pair.

### 142.17.5 Unlock

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks the mutex.
**Example:**

```
dim m as new MutexMBS

m.Lock
MsgBox "Got mutex."

m.Unlock
MsgBox "Released mutex."
```

**Notes:** Always use Lock and Unlock in a pair.

### 142.17.6 Properties

### 142.17.7 Handle as Integer

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal used reference to the native mutex object.
**Example:**

```
dim m as new MutexMBS
MsgBox "Handle: "+hex(m.Handle)
```

**Notes:** Windows Mutex or PThread Mutex.
(Read and Write property)

### 142.17.8 Tag as Variant

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An object reference for your use.
**Notes:** Just for convenience.
This property was added so you can use this property for a reference so you won't need to subclass this class and add custom properties.
(Read and Write property)

## 142.18 class NamedMutexMBS

### 142.18.1 class NamedMutexMBS

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a named mutex.
**Notes:** Using a mutex on Windows and a semaphore on MacOS and Linux.

Raises UnsupportedOperationException exceptions if something fails.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr2

### 142.18.2 Methods

### 142.18.3 Constructor(Name as string)

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new mutex.
**Notes:** Name should be a simple text, but unique, so we recommend reverse domain notation.
The name should not contain a slash.
If mutex exists already, we open it. The mutex lives until the last application closed it.

If name matches the name of an existing event, semaphore, waitable timer, job, or file-mapping object, the function fails.
Raises an UnsupportedOperationException on failure.

You can open the same mutex twice and get different Xojo objects from the plugin for both.

### 142.18.4 Lock

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Locks the mutex.
**Notes:** Blocks until mutex is locked.
Please call Unlock later to unlock.

To avoid you looking up the app, we limit locking to one minute. After that you get a timeout error.

### 142.18.5 TryLock as boolean

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tries to lock the mutex.
**Notes:** Returns true if locked or false if the lock can't be set.
If false is returned another app may have a lock currently.
Please call Unlock later to unlock if you get back true.

### 142.18.6 Unlock

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unlocks the mutex.

### 142.18.7 Properties

### 142.18.8 Handle as Integer

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 142.18.9 Name as String

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the mutex.
**Notes:** (Read only property)

### 142.18.10 Tag as Variant

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag value.
**Notes:** You can use it as you like to store whatever value is needed.

(Read and Write property)

## 142.19 class NSProcessInfoActivityMBS

### 142.19.1 class NSProcessInfoActivityMBS

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The class for an activity.
**Example:**

```
dim Activity as NSProcessInfoActivityMBS // property in your window, control, thread, app
dim AllowAppNap as boolean // allow or not?

dim ProcessInfo as NSProcessInfoMBS = NSProcessInfoMBS.processInfo
if AllowAppNap then
Activity = nil
else
// disable sleep to let us make something...
Activity = ProcessInfo.beginActivity(NSProcessInfoMBS.NSActivityBackground, "Backup running")
end if
```

**Notes:** For Windows, please check WindowsThreadExecutionStateMBS to prevent system sleep.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 142.19.2 Methods

### 142.19.3 Constructor

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Private constructor.

### 142.19.4 Destructor

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The destructor.
**Notes:** If you missed to call endActivity, the destructor will do it.

### 142.19.5 Properties

### 142.19.6 Handle as Integer

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 142.19.7 Options as Integer

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The options used to create activity.
**Notes:** (Read and Write property)

### 142.19.8 Reason as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The reason used to create the activity.
**Notes:** (Read and Write property)

# 142.20 class NSProcessInfoMBS

## 142.20.1 class NSProcessInfoMBS

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** The NSProcessInfo class provides methods to access information about the current process.
**Notes:** Each process has a single, shared NSProcessInfo object, known as process information agent.

The process information agent can return such information as the arguments, environment variables, host name, or process name. The processInfo class method returns the shared agent for the current process—that is, the process whose object sent the message. For example, the following line returns the NSProcessInfo object, which then provides the name of the current process:

```
dim processInfo as new NSProcessInfoMBS
dim processName as string = processInfo.processName
```

The NSProcessInfo class also includes the operatingSystem method, which returns an enum constant identifying the operating system on which the process is executing.

NSProcessInfo objects attempt to interpret environment variables and command-line arguments in the user's default C string encoding if they cannot be converted to Unicode as UTF-8 strings. If neither conversion works, these values are ignored by the NSProcessInfo object.

For Windows, please check WindowsThreadExecutionStateMBS to prevent system sleep.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MBS Xojo Plugins, version 23.5pr5
- News from the MBS Xojo Plugins Version 21.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- MBS Xojo Plugins, version 21.3pr2
- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 21.0pr6
- MBS Xojo Plugins, version 18.5pr3
- MBS Xojo / Real Studio Plugins, version 16.4pr6
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 19.5, page 9: News

### 142.20.2 Methods

### 142.20.3 argument(index as Integer) as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns the command-line argument for the process with the given index.
**Example:**

```
dim p as new NSProcessInfoMBS

dim i,c as Integer

c=p.argumentCount-1
for i=0 to c
MsgBox p.argument(i)
next
```

### 142.20.4 arguments as string()

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the command-line arguments for the process.
**Notes:** Returns array of strings with the process's command-line arguments.

### 142.20.5 beginActivity(options as Integer, reason as string) as NSProcessInfoActivityMBS

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Begin an activity using the given options and reason.
**Example:**

```
dim Activity as NSProcessInfoActivityMBS // property in your window, control, thread, app
dim AllowAppNap as boolean // allow or not?

dim ProcessInfo as NSProcessInfoMBS = NSProcessInfoMBS.processInfo
if AllowAppNap then
Activity = nil
else
// disable sleep to let us make something...
```

```
Activity = ProcessInfo.beginActivity(NSProcessInfoMBS.NSActivityBackground, "Backup running")
end if
```

**Notes:** options: Options for the activity. See constants for possible values.
reason: A string used in debugging to indicate the reason the activity began.

Returns an object token representing the activity.

Indicate completion of the activity by calling endActivity passing the returned object as the argument.
Available in OS X v10.9 and later.

For Windows, please check WindowsThreadExecutionStateMBS to prevent system sleep.

### 142.20.6 Constructor

MBS MacBase Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 142.20.7 disableAutomaticTermination(Reason as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Decrement the counter tracking the number of automatic quit opt-out requests.
**Notes:** When this counter is greater than zero, the app will be considered 'active' and ineligible for automatic termination.
An example of using this would be disabling autoquitting when the user of an instant messaging application signs on, due to it requiring a background connection to be maintained even if the app is otherwise inactive.
Each pair of calls should have a matching "reason" argument, which can be used to easily track why an application is or is not automatically terminable.
A given reason can be used more than once at the same time (for example: two files are transferring over the network, each one disables automatic termination with the reason "file transfer in progress")

### 142.20.8 disableSuddenTermination

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Disables the application for quickly klling using sudden termination.
**Notes:** This method increments the sudden termination counter. When the termination counter reaches 0

the application allows sudden termination.

By default the sudden termination counter is set to 1. This can be overriden in your application Info.plist. See "Sudden Termination" for more information and debugging suggestions.

Available in Mac OS X v10.6 and later.

### 142.20.9 enableAutomaticTermination(Reason as string)

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Increment the counter tracking the number of automatic quit opt-out requests.
**Notes:** When this counter is greater than zero, the app will be considered 'active' and ineligible for automatic termination.
An example of using this would be disabling autoquitting when the user of an instant messaging application signs on, due to it requiring a background connection to be maintained even if the app is otherwise inactive.
Each pair of calls should have a matching "reason" argument, which can be used to easily track why an application is or is not automatically terminable.
A given reason can be used more than once at the same time (for example: two files are transferring over the network, each one disables automatic termination with the reason "file transfer in progress")

### 142.20.10 enableSuddenTermination

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Enables the application for quick killing using sudden termination.
**Notes:** This method decrements the sudden termination counter. When the termination counter reaches 0 the application allows sudden termination.

By default the sudden termination counter is set to 1. This can be overriden in your application Info.plist. See "Sudden Termination" for more information and debugging suggestions.

Available in Mac OS X v10.6 and later.

### 142.20.11 endActivity(activity as NSProcessInfoActivityMBS)

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** Ends the given activity.
**Notes:** activity: An activity object returned by beginActivity.

Available in OS X v10.9 and later.

### 142.20.12 NSActivityLatencyCritical as UInt64

MBS MacBase Plugin, Plugin Version: 13.5, Platform: macOS, Targets: All.

**Function:** One of the activity option constants.
**Notes:** Flag to indicate the activity requires the highest amount of timer and I/O precision available.
Important: Very few applications should need to use this constant.
Available in OS X v10.9 and later.
Value is &hFF00000000.

### 142.20.13 NSProcessInfoPowerStateDidChangeNotification as String

MBS MacBase Plugin, Plugin Version: 24.1, Platform: macOS, Targets: All.

**Function:** The name of the notification that is posted when the power state of a device changes.
**Notes:** After your observer receives this notification, query the lowPowerModeEnabled property to determine the current power state of the device. If Low Power Mode is active, take appropriate steps to reduce activity in your app. Otherwise, your app can resume normal operations.
The notification object is an NSProcessInfo instance.

### 142.20.14 NSProcessInfoThermalStateDidChangeNotification as String

MBS MacBase Plugin, Plugin Version: 15.2, Platform: macOS, Targets: All.

**Function:** The notification name to use with NSNotificationObserverMBS.
**Notes:** This notification is posted once the thermal state of the system has changed. Once the notification is posted, use the thermalState property to retrieve the current thermal state of the system.

You can use this opportunity to take corrective action in your application to help cool the system down. Work that could be done in the background or at opportunistic times should be using the Quality of Service levels in NSOperation or the NSBackgroundActivityScheduler API.

This notification is posted on the global dispatch queue. Register for it using the default notification center. The object associated with the notification is NSProcessInfoMBS.processInfo.

### 142.20.15 operationSystemVersion(byref Major as Integer, byref Minor as Integer, byref Patch as Integer)

MBS MacBase Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Queries operation system version.
**Notes:** One call to get all three parts.

### 142.20.16 processInfo as NSProcessInfoMBS

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: All.

**Function:** Returns the process information agent for the process.

### 142.20.17 Properties

### 142.20.18 activeProcessorCount as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Provides the number of active processing cores available on the computer.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox str(p.activeProcessorCount)
```

**Notes:** Available in Mac OS X v10.5 and later.
(Read only property)

### 142.20.19 argumentsCount as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** The number of the command-line arguments.
**Example:**

```
dim p as new NSProcessInfoMBS

dim i,c as Integer

c=p.argumentCount-1
```

```
for i=0 to c
MsgBox p.argument(i)
next
```

**Notes:** (Read only property)

### 142.20.20 automaticTerminationSupportEnabled as boolean

MBS MacBase Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Marks the calling app as supporting automatic termination.
**Notes:** Without calling this or setting the equivalent Info.plist key (NSSupportsAutomaticTermination), the above methods (disableAutomaticTermination/enableAutomaticTermination) have no effect, although the counter tracking automatic termination opt-outs is still kept up to date to ensure correctness if this is called later. Currently, passing false has no effect.
This should be called during applicationDidFinishLaunching or earlier.
(Read and Write property)

### 142.20.21 environment as dictionary

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns the variable names and their values in the environment from which the process was launched.
**Example:**

```
dim p as new NSProcessInfoMBS
dim d as Dictionary = p.environment
MsgBox str(d.Count)
```

**Notes:** (Read only property)

### 142.20.22 globallyUniqueString as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns a global unique identifier for the process.
**Example:**

```
dim p as new NSProcessInfoMBS
```

MsgBox p.globallyUniqueString // shows for example "072EC09A-4825-11DD-BDC0-001D4F46F5E0-18405-00000CA853EB5B46"

**Notes:** Returns the Global ID for the process. The ID includes the host name, process ID, and a time stamp, which ensures that the ID is unique for the network.

This method generates a new string each time it is invoked, so it also uses a counter to guarantee that strings created from the same process are unique.
(Read only property)

### 142.20.23 Handle as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** The internal reference to the NSProcessInfo object.
**Notes:** (Read and Write property)

### 142.20.24 hostName as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns the name of the host computer.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox p.hostName // for example "iMac.local"
```

**Notes:** (Read only property)

### 142.20.25 isiOSAppOnMac as Boolean

MBS MacBase Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the process is an iPhone or iPad app running on a Mac.
**Notes:** The value of this property is true only when the process is an iOS app running on a Mac. The value of the property is false for all other apps on the Mac, including Mac apps built using Mac Catalyst. The property is also false for processes running on platforms other than macOS.
(Read only property)

### 142.20.26 isLowPowerModeEnabled as Boolean

MBS MacBase Plugin, Plugin Version: 21.3, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieve the current setting of the system for the low power mode setting.
**Notes:** On systems where the low power mode is unknown or unsupported, the value returned from the lowPowerModeEnabled property is always false.
Returns true if low power mode is enabled for macOS 12 or iOS 9 and newer.
(Read only property)

### 142.20.27 operatingSystem as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns a constant to indicate the operating system on which the process is executing.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox str(p.operatingSystem) // shows 5 = NSMACHOperatingSystem
```

**Notes:** Operating system identifier. See "Constants" for a list of possible values. In Mac OS X, it's NSMACHOperatingSystem.
(Read only property)

### 142.20.28 operatingSystemName as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns a string containing the name of the operating system on which the process is executing.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox p.operatingSystemName // shows "NSMACHOperatingSystem"
```

**Notes:** Operating system name. In Mac OS X, it's "NSMACHOperatingSystem"
(Read only property)

### 142.20.29 operatingSystemVersionString as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns a string containing the version of the operating system on which the process is executing.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox p.operatingSystemVersionString // "Version 10.5.4 (Build 9E17)"
```

**Notes:** Returns the Operating system version. This string is human readable, localized, and is appropriate for displaying to the user. This string is not appropriate for parsing.
(Read only property)

### 142.20.30 operationSystemVersionMajor as Integer

MBS MacBase Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Queries major OS version.
**Notes:** (Read only property)

### 142.20.31 operationSystemVersionMinor as Integer

MBS MacBase Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Queries minor OS version.
**Notes:** (Read only property)

### 142.20.32 operationSystemVersionPatch as Integer

MBS MacBase Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Queries OS version patch level.
**Notes:** (Read only property)

### 142.20.33 physicalMemory as UInt64

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Provides the amount of physical memory on the computer.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox str(p.physicalMemory)
```

**Notes:** Available in Mac OS X v10.5 and later.
(Read only property)

### 142.20.34 processIdentifier as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Returns the identifier of the process.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox str(p.processIdentifier)
```

**Notes:** (Read only property)

### 142.20.35 processName as string

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** The name of the process.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox p.processName
```

**Notes:** The process name is used to register application defaults and is used in error messages. It does not uniquely identify the process.

You can assign a new value, but:
User defaults and other aspects of the environment might depend on the process name, so be very careful if you change it. Setting the process name in this manner is not thread safe.

(Read and Write property)

### 142.20.36 processorCount as Integer

MBS MacBase Plugin, Plugin Version: 8.4, Platform: macOS, Targets: All.

**Function:** Provides the number of processing cores available on the computer.
**Example:**

```
dim p as new NSProcessInfoMBS

MsgBox str(p.processorCount)
```

**Notes:** Available in Mac OS X v10.5 and later.
(Read only property)

### 142.20.37 systemUptime as Double

MBS MacBase Plugin, Plugin Version: 9.6, Platform: macOS, Targets: All.

**Function:** Returns the how long it has been since the computer has been restarted.
**Notes:** Returns an NSTimeInterval indicating how long system the computer has been restarted.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.20.38 thermalState as Integer

MBS MacBase Plugin, Plugin Version: 15.1, Platform: macOS, Targets: All.

**Function:** Retrieve the current thermal state of the system.
**Example:**

```
dim n as NSProcessInfoMBS = NSProcessInfoMBS.processInfo

Select case n.thermalState
case n.NSProcessInfoThermalStateNominal
MsgBox "Thermal State: Nominal"
case n.NSProcessInfoThermalStateFair
MsgBox "Thermal State: Fair"
case n.NSProcessInfoThermalStateSerious
MsgBox "Thermal State: Serious"
case n.NSProcessInfoThermalStateCritical
```

```
MsgBox "Thermal State: Critical"
else
MsgBox "Thermal State: Unknown"
end Select
```

**Notes:** On systems where thermal state is unknown or unsupported, the value returned from the thermalState property is always NSProcessInfoThermalStateNominal.

Available in Mac OS X 10.10.3 and newer.
Returns -1 if function is called on older Mac OS X versions, Linux or Windows.
(Read only property)

### 142.20.39 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSHPUXOperatingSystem | 4 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the HP UX operating system. |
| NSMACHOperatingSystem | 5 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the Mac OS X operating system. |
| NSOSF1OperatingSystem | 7 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the OSF/1 operating system. |
| NSSolarisOperatingSystem | 3 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the Solaris operating system. |
| NSSunOSOperatingSystem | 6 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the Sun OS operating system. |
| NSWindows95OperatingSystem | 2 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the Windows 95 operating system. |
| NSWindowsNTOperatingSystem | 1 | One of the following constants are provided by the NSProcessInfo class as return values for operatingSystem.<br>Indicates the Windows NT operating system. |

Activity Options

| Constant | Value | Description |
|---|---|---|
| NSActivityAutomaticTerminationDisabled | &h8000 | Flag to prevent automatic termination.<br>Available in OS X v10.9 and later. |
| NSActivityBackground | &h000000FF | Flag to indicate the app has initiated some kind of<br>result of user request.<br>Available in OS X v10.9 and later. |
| NSActivityIdleDisplaySleepDisabled | &h10000000000 | Flag to require the screen to stay powered on.<br>Available in OS X v10.9 and later. |
| NSActivityIdleSystemSleepDisabled | &h100000 | Flag to prevent idle sleep.<br>This is included in NSActivityUserInitiatedAllowing<br>Available in OS X v10.9 and later. |
| NSActivitySuddenTerminationDisabled | &h4000 | Flag to prevent sudden termination.<br>This is included in NSActivityUserInitiatedAllowing<br>Available in OS X v10.9 and later. |
| NSActivityUserInitiated | &h00FFFFFF | Flag to indicate the app is performing a user-reques<br>Available in OS X v10.9 and later. |
| NSActivityUserInitiatedAllowingIdleSystemSleep | &h00EFFFFF | Flag to indicate the app is performing a user-requ<br>system can sleep on idle.<br>Available in OS X v10.9 and later. |

Thermal State Constants

| Constant | Value | Description |
|---|---|---|
| NSProcessInfoThermalStateCritical | 3 | System performance is significantly impacted and the Mac needs to cool do<br>Recommendation: reduce application's usage of CPU, GPU, and I/O to<br>minimum level needed to respond to user actions. Consider stopping us<br>camera and other peripherals if your application is using them. |
| NSProcessInfoThermalStateFair | 1 | The system has reached a state where fans may become audible. |
| NSProcessInfoThermalStateNominal | 0 | No corrective action is needed. |
| NSProcessInfoThermalStateSerious | 2 | Fans are running at maximum speed, system performance maybe impac<br>Recommendation: reduce application's usage of CPU, GPU and I/O, if po<br>ble. Switch to lower quality visual effects, reduce frame rates. |

# 142.21 class NSRunningApplicationMBS

## 142.21.1 class NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** NSRunningApplication is a class to manipulate and provide information for a single instance of an application.
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.localizedName
```

**Notes:** Only user applications are tracked; this does not provide information about every process on the system.
Some properties of an application are fixed, such as the bundle identifier. Other properties may vary over time, such as whether the app is hidden. Properties that vary can be observed with key-value observing, in which case the description comment for the method notes this capability.
Properties that vary over time are inherently race-prone. For example, a hidden app may unhide itself at any time. To ameliorate this, properties persist until the next turn of the main run loop in a common mode. For example, if you repeatedly poll an unhidden app for its hidden property without allowing the run loop to run, it will continue to return false, even if the app hides, until the next turn of the run loop.
NSRunningApplication is thread safe, in that its properties are returned atomically. However, it is still subject to the main run loop policy described above. If you access an instance of NSRunningApplication from a background thread, be aware that its time-varying properties may change from under you as the main run loop runs (or not).
An NSRunningApplication instance remains valid after the application exits. However, most properties lose their significance, and some properties may not be available on a terminated application.

Requires Mac OS X 10.6.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr5
- MBS Real Studio Plugins, version 11.3pr9

## 142.21.2 Methods

## 142.21.3 activateWithOptions(options as Integer) as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to activate the application using the specified options.
**Notes:** options: The options to use when activating the application. See "NSApplicationActivationOptions"

for the possible values.

Returns true if the application was activated successfully, otherwise false.

This method will return false if the application has quit, or is not a type of application than can be activated.

Available in Mac OS X v10.6 and later.

### 142.21.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.localizedName
```

**Notes:** Initializes the object with the current application.
Available in Mac OS X v10.6 and later.

### 142.21.5 currentApplication as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an NSRunningApplication representing this application.
**Example:**

```
dim n as NSRunningApplicationMBS = NSRunningApplicationMBS.currentApplication

MsgBox n.localizedName
```

**Notes:** Available in Mac OS X v10.6 and later.

### 142.21.6 forceTerminate as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to force the receiver to quit.
**Notes:** Returns true if the application successfully terminated, otherwise false.

This method will return false if the application is no longer running when the forceTerminate message is sent to the receiver.

This method may return before the receiver exits; you should observe the terminated property to determine when the application terminates.

Available in Mac OS X v10.6 and later.

### 142.21.7 hide as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to hide or the application.
**Example:**

```
dim n as NSRunningApplicationMBS = NSRunningApplicationMBS.currentApplication

MsgBox str(n.hide) // hide me
```

**Notes:** The property of this value will be false if the application has already quit, or if of a type that is unable to be hidden.
Available in Mac OS X v10.6 and later.

### 142.21.8 runningApplications as NSRunningApplicationMBS()

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of NSRunningApplication representing the running applications.
**Example:**

```
dim n(-1) as NSRunningApplicationMBS = NSRunningApplicationMBS.runningApplications
dim s(-1) as string

for each r as NSRunningApplicationMBS in n
s.Append r.localizedName
next

MsgBox Join(s,EndOfLine)
```

**Notes:** Returns an array of NSRunningApplication instances.

The order of the array is unspecified, but it is stable, meaning that the relative order of particular applications will not change across multiple calls to runningApplications. See NSRunningApplication Class Reference for more information on NSRunningApplication.
Similar to the NSRunningApplication classes's properties, this property will only change when the main run loop is run in a common mode. Instead of polling, use key-value observing to be notified of changes to this array property.
This property is thread safe, in that it may be called from background threads and the result is returned atomically.

This list is not updated in a tight loop. For receiving updates, you need to have the runloop run (e.g. check regularly in a timer).

### 142.21.9 runningApplicationsWithBundleIdentifier(bundleID as string) as NSRunningApplicationMBS()

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of currently running applications with the specified bundle identifier.
**Example:**

```
dim n(-1) as NSRunningApplicationMBS = NSRunningApplicationMBS.runningApplicationsWithBundleIdentifier("com.apple.iTunes")

if UBound(n)>=0 then
MsgBox n(0).localizedName
else
MsgBox "iTunes is not running?"
end if
```

**Notes:** An array of NSRunningApplications, or an empty array if no applications match the bundle identifier.
Available in Mac OS X v10.6 and later.

### 142.21.10 runningApplicationWithProcessIdentifier(pid as Integer) as NSRunningApplicationMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the running application with the given process identifier, or nil if no application has that pid.
**Example:**

```
dim n as NSRunningApplicationMBS
dim pid as Integer

while n=nil
pid=pid+1
n=NSRunningApplicationMBS.runningApplicationWithProcessIdentifier(pid)
wend

MsgBox n.localizedName+" has PID "+str(pid)
```

**Notes:** pid: The process identifier.

Returns an instance of NSRunningApplication for the specified pid, or nil if the application has no process identifier.

Applications that do not have PIDs cannot be returned from this method.
Available in Mac OS X v10.6 and later.

### 142.21.11 terminate as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to quit the receiver normally.
**Notes:** Returns true if the application successfully terminated, otherwise false.

This method will return false if the application is no longer running when the terminate message is sent to the receiver.
This method may return before the receiver exits; you should observe the terminated property to determine when the application terminates.

Available in Mac OS X v10.6 and later.

### 142.21.12 unhide as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to unhide or the application.

**Notes:** Returns true if the application was successfully shown, otherwise false.

The property of this value will be false if the application has already quit, or if of a type that is unable to be hidden.

Available in Mac OS X v10.6 and later.

### 142.21.13 Properties

### 142.21.14 activationPolicy as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the activation policy of the application. (read-only)
**Notes:** The value returned by this property is usually fixed, but it may change through a call to activateWithOptions.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.15 active as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the application is currently frontmost. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox str(n.active)
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.16 bundleIdentifier as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the CFBundleIdentifier of the application. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS
```

MsgBox n.bundleIdentifier

**Notes:** The value of this property will be nil if the application does not have an Info.plist.
(Read only property)

### 142.21.17 bundleURL as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the URL to the application's bundle. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.bundleURL
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.18 executableArchitecture as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the URL to the application's executable. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox str(n.executableArchitecture) // shows 7
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.19 executableURL as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the URL to the application's executable. (read-only)

**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.executableURL
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.20 finishedLaunching as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver's process has finished launching, (read-only)
**Notes:** The value of this property corresponds to the running application having received an NSApplicationDidFinishLaunchingNotification notification internally. Some applications do not post this notification (applications that do not rely on NSApplication) and so are never reported as finished launching.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.21 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the NSRunningApplication object.
**Notes:** (Read and Write property)

### 142.21.22 hidden as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the application is currently hidden. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox str(n.hidden)
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.23 icon as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the icon for the receiver's application. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

dim i as NSImageMBS = n.icon

// without this call the size is 32x32 Pixel
i.setSize 512,512

Backdrop = i.CopyPictureWithMask
```

**Notes:** Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.24 launchDate as date

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the date when the application was launched. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.launchDate.ShortTime
```

**Notes:** This property is not available for all applications. Specifically, it is not available for applications that were launched not launched by LaunchServices.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.25 launchDateTime as DateTime

MBS MacCocoa Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the date when the application was launched. (read-only)
**Notes:** This property is not available for all applications. Specifically, it is not available for applications that were launched not launched by LaunchServices.

Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.26 localizedName as string

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the localized name of the application. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS

MsgBox n.localizedName
```

**Notes:** The value of this property is dependent on the current localization of the application and is suitable for presentation to the user.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.27 ownsMenuBar as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the application owns the current menu bar.
**Example:**

```
// put in a timer...
dim r as NSRunningApplicationMBS = NSRunningApplicationMBS.currentApplication
window1.Title = str(r.ownsMenuBar)
```

**Notes:** Available in Mac OS X v10.7 and later.
(Read only property)

### 142.21.28 processIdentifier as Integer

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates the process identifier (pid) of the application. (read-only)
**Example:**

```
dim n as new NSRunningApplicationMBS
```

MsgBox str(n.processIdentifier)

**Notes:** Not all applications have a pid. Applications without a return a value of -1.
Do not rely on this for comparing processes, instead compare NSRunningApplication instances using isEqual:.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.29 terminated as boolean

MBS MacCocoa Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates that the receiver's application has terminated. (read-only)
**Notes:** The value of terminated is true if the receiver's application has terminated, otherwise false.
This property is observable using key-value observing.
Available in Mac OS X v10.6 and later.
(Read only property)

### 142.21.30 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSApplicationActivateAllWindows | 1 | One of the flag constants for activateWithOptions.<br>By default, activation brings only the main and key windows forwar<br>specify NSApplicationActivateAllWindows, all of the application's wi<br>brought forward.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivateIgnoringOtherApps | 2 | One of the flag constants for activateWithOptions.<br>By default, activation deactivates the calling app (assuming it was ac<br>then the new app is activated only if there is no currently active ap<br>This prevents the new app from stealing focus from the user, if the a<br>to activate and the user has switched to a different app in the interim.<br>if you specify NSApplicationActivateIgnoringOtherApps, the applica<br>tivated regardless of the currently active app, potentially stealing f<br>the user. You should rarely pass this flag because stealing key focus<br>a very bad user experience.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivationPolicyAccessory | 1 | One of the constants used for following activation policies.<br>The application does not appear in the Dock and does not have a m<br>but it may be activated programmatically or by clicking on one of its<br>This corresponds to value of the LSUIElement key in the application's<br>being 1.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivationPolicyProhibited | 2 | One of the constants used for following activation policies.<br>The application does not appear in the Dock and may not create<br>or be activated. This corresponds to the value of the LSBackgroun<br>in the application's Info.plist being 1. This is also the default for u<br>executables that do not have Info.plists.<br>Available in Mac OS X v10.6 and later. |
| NSApplicationActivationPolicyRegular | 0 | One of the constants used for following activation policies.<br>The application is an ordinary app that appears in the Dock and m<br>user interface. This is the default for bundled apps, unless overrid<br>Info.plist.<br>Available in Mac OS X v10.6 and later. |

## 142.22 class NSXPCConnectionMBS

### 142.22.1 class NSXPCConnectionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The NSXPCConnection class provides a bi-directional communication channel between two processes.
**Notes:** This class is the primary means of creating and configuring the communication mechanism between two processes. Each process has one instance of this class to represent the endpoint in the communication channel.

Requires a setup with info.plist entries, correct permissions and code signing.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

### 142.22.2 Methods

### 142.22.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 142.22.4 CallMethod(name as string, tag as Variant, params() as Variant)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Calls method and passes parameters.
**Notes:** Returns array of variant.

### 142.22.5 Close

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Closes the connection.

### 142.22.6 Constructor(endpoint as NSXPCListenerEndpointMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Initializes an NSXPCConnection object to connect to an NSXPCListener object in another process, identified by an NSXPCListenerEndpoint object.
**Notes:** endpoint: The desired listener endpoint for the service.
Available in OS X v10.8 and later.
See also:

- 142.22.7 Constructor(MachOServiceName as string, flags as Integer) 19616
- 142.22.8 Constructor(ServiceName as string) 19616

### 142.22.7 Constructor(MachOServiceName as string, flags as Integer)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an NSXPCConnection object to connect to a LaunchAgent or LaunchDaemon with a name advertised in a launchd.plist.
**Notes:** For example, if an agent is managed with launchd and has a launchd.plist in textasciitilde /Library/LaunchAgents, this method would create a connection to that agent. The agent should use NSXPCListener to wait for new connections.

If the connection is being made to a process that is running in a privileged Mach bootstrap context (for example, a daemon started by a launchd property list in /Library/LaunchDaemons), then pass the NSXPC-ConnectionPrivileged option.

Available in OS X v10.8 and later.
See also:

- 142.22.6 Constructor(endpoint as NSXPCListenerEndpointMBS) 19615
- 142.22.8 Constructor(ServiceName as string) 19616

### 142.22.8 Constructor(ServiceName as string)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Initializes an NSXPCConnection object to connect to an NSXPCListener object in an XPC service, identified by a service name.
**Notes:** XPC services are helper processes that are usually part of your application bundle. The service should use NSXPCListener to wait for new connections.
Available in OS X v10.8 and later.
See also:

- 142.22.6 Constructor(endpoint as NSXPCListenerEndpointMBS) 19615
- 142.22.7 Constructor(MachOServiceName as string, flags as Integer) 19616

### 142.22.9 Destructor

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 142.22.10 invalidate

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Invalidates the connection.
**Notes:** When you call this method, all outstanding reply blocks, error handling blocks, and invalidation blocks are called on the message handling queue. The connection must be invalidated before it is deallocated. After a connection is invalidated, no more messages may be sent or received.

### 142.22.11 resume

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Starts or resumes handling of messages on a connection.
**Notes:** All connections start suspended. You must resume them before they start processing received messages or sending messages through the remoteObjectProxy object.
Available in OS X v10.8 and later.

### 142.22.12 suspend

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suspends the connection.
**Notes:** Suspends and resumes must be balanced before the connection may be invalidated.
Available in OS X v10.8 and later.

### 142.22.13 Properties

### 142.22.14 auditSessionIdentifier as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The BSM audit session identifier for the connecting process.
**Notes:** This attribute may be used by the listener delegate to accept or reject connections.

(Read only property)

### 142.22.15 effectiveGroupIdentifier as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The effective group ID (EGID) of the connecting process.
**Notes:** This attribute may be used by the listener delegate to accept or reject connections.
(Read only property)

### 142.22.16 effectiveUserIdentifier as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The effective user ID (EUID) of the connecting process.
**Notes:** This attribute may be used by the listener delegate to accept or reject connections.
(Read only property)

### 142.22.17 endpoint as NSXPCListenerEndpointMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** If the connection was created with an NSXPCListenerEndpoint object, returns the endpoint object used.
**Notes:** (Read only property)

### 142.22.18 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 142.22.19 processIdentifier as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The process ID (PID) of the connecting process.
**Notes:** This attribute may be used by the listener delegate to accept or reject connections.
Available in OS X v10.8 and later.

(Read only property)

### 142.22.20 serviceName as String

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The name of the XPC service that this connection was configured to connect to.
**Notes:** (Read only property)

### 142.22.21 Events

### 142.22.22 CallMethodReturned(name as string, tag as Variant, Parameters() as Variant, Results() as Variant)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The event called when method returns.

### 142.22.23 ErrorHandler(error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The error event for errors happening when calling method.

### 142.22.24 InterruptionHandler

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** The event is called if the remote process exits or crashes.
**Notes:** It may be possible to re-establish the connection by simply sending another message. The handler is invoked on the same queue as reply messages and other handlers, and it is always executed after any other messages or reply block handlers (except for the invalidation handler).

### 142.22.25 InvalidationHandler

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** This event is invoked on the same queue as reply messages and other handlers, and is always executed last (after the interruption handler, if required).

**Notes:** You may not send messages over the connection from within an invalidation handler block.

### 142.22.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSXPCConnectionPrivileged | 1 | One of the options that you can pass to a connection.<br>Use this option if connecting to a service in the privileged Mach bootstrap (for example, a daemon with a launchd.plist in /Library/LaunchDaemons).<br>Available in OS X v10.8 and later. |

# 142.23 class NSXPCListenerEndpointMBS

## 142.23.1 class NSXPCListenerEndpointMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Class that "names" a specific NSXPCListener object.
**Notes:** An instance may be retrieved from an NSXPCListener and sent over existing NSXPCConnections. A process may then use it to create a new NSXPCConnection to the original NSXPCListener.

This pattern is useful if you have a service which multiplexes work to other services. The service can act as an intermediate helper. The requesting application does not need to know specifically which service it is connecting to, just that it implements a known NSXPCInterface.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

## 142.23.2 Methods

## 142.23.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

## 142.23.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 142.23.5 Properties

## 142.23.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 142.24 class NSXPCListenerMBS

### 142.24.1 class NSXPCListenerMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The NSXPCListener class and its delegate are responsible for waiting for new incoming connections, configuring them, and accepting or rejecting them.
**Notes:** Each XPC service, launchd agent, or launchd daemon typically has at least one NSXPCListener object that listens for connections to a specified service name.
When the listener receives a new connection request, it creates a new NSXPCConnection object, then asks the delegate to inspect, configure, and resume the connection object by calling the delegate's shouldAcceptNewConnection event.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

### 142.24.2 Methods

### 142.24.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Whether this class is available.

### 142.24.4 Close

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Closes listener.

### 142.24.5 Constructor(Anonymous as boolean = false)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new listener connection.
**Notes:** If Anonymous is true: Initializes with a new anonymous listener connection.
If false: Initializes with the singleton listener used to listen for incoming connections in an XPC service.

see also:
https://developer.apple.com/library/mac/documentation/Foundation/Reference/NSXPCListener_reference/translated_content/NSXPCListener.html
See also:

• 142.24.6 Constructor(Name as string) 19623

### 142.24.6 Constructor(Name as string)

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes a listener in a LaunchAgent or LaunchDaemon which has a name advertised in a launchd.plist file.
**Notes:** For example, you might use this in an agent launched by launchd with a launchd.plist contained in textasciitilde /Library/LaunchAgents, or a daemon launched by launchd with a launchd.plist contained in /Library/LaunchDaemons.

Available in OS X v10.8 and later.
See also:

• 142.24.5 Constructor(Anonymous as boolean = false) 19622

### 142.24.7 Destructor

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The destructor.

### 142.24.8 invalidate

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Invalidates the listener.
**Notes:** After calling this method, no more connections are created. Once a listener is invalidated it may not be resumed or suspended.
Available in OS X v10.8 and later.

### 142.24.9 resume

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Starts processing of incoming requests.
**Notes:** All listeners start suspended and must be resumed before they begin processing incoming requests.

If called on the serviceListener object, this method never returns. Therefore, you should call it as the last step inside the XPC service's main function after setting up any desired initial state and configuring the

listener itself.

If called on any other NSXPCListener, the connection is resumed, and the method returns immediately.
Available in OS X v10.8 and later.

### 142.24.10 suspend

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Suspends the listener.
**Notes:** Suspends and resumes must be balanced before the listener may be invalidated.
Available in OS X v10.8 and later.

### 142.24.11 Properties

### 142.24.12 endpoint as NSXPCListenerEndpointMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** Returns an endpoint object that may be sent over an existing connection.
**Notes:** The receiver of the endpoint can use this object to create a new connection to this NSXPCListener object. The resulting NSXPCListenerEndpoint object uniquely names this listener object across connections.
(Read only property)

### 142.24.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 142.24.14 Events

### 142.24.15 CallMethod(Name as string, Parameters() as Variant) as Variant()

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Called on the listener side when a method was called on the connection.
**Notes:** Return array of variant for the results.

### 142.24.16 shouldAcceptNewConnection(newConnection as NSXPCConnectionMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: .

**Function:** Accepts or rejects a new connection to the listener.
**Notes:** To accept the connection, first configure the connection if desired, then call resume on the new connection, then return true.
To reject the connect, return a value of false. This causes the connection object to be invalidated.
In this method, you can also set up properties on the connection object, such as its exported object and interfaces. Be sure to call resume when you are finished configuring the connection object and are ready for it to receive messages.

## 142.25 class ProcessMBS

### 142.25.1 class ProcessMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Adds the class ProcessMBS to Xojo to get details about all running applications.
**Example:**

```
// Shows how to use the processInformationCFDictionary function to
// decide on Mac OS X whether an application is a background only one.

dim myProcess as ProcessMBS
dim myCFDictionary as CFDictionaryMBS
dim myCFBoolean as CFBooleanMBS
dim myCFObject as CFObjectMBS

myProcess=new ProcessMBS
myProcess.GetCurrentProcess
myCFDictionary = CFDictionaryMBS(myProcess.processInformationCFDictionary)
myCFObject = myCFDictionary.Value(newcfstringmbs("LSBackgroundOnly"))
myCFBoolean=CFBooleanMBS(myCFObject)

if myCFBoolean.Value then
MsgBox "is background"
else
MsgBox "is not background"
end if
```

**Notes:** Requires Windows 95 or Windows 2000 to run on Windows.

To find all windows on Windows, use the WindowsListMBS class.
To find all windows on Mac OS X, use the CGSWindowListMBS class.

For newer code on Mac, please check NSRunningApplicationMBS class.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 15.2pr4
- Notes on Windows 8
- MBS Real Studio Plugins, version 12.1pr2
- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr6
- MBS REALbasic plug-in 9.6
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 142.25.2 Methods

### 142.25.3 Bundle as folderitem

MBS Util Plugin, Plugin Version: 4.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bundle path.
**Notes:** Maybe nil if not available.
Returns on Mac OS X the path to the main bundle of the process.

### 142.25.4 BundleID as string

MBS Util Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the bundle identifier.
**Notes:** Maybe "" if not available.
Returns on Mac OS X the identifier to the main bundle of the process.

### 142.25.5 CurrentProcessID as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the process ID of the application.
**Example:**

MsgBox str(ProcessMBS.CurrentProcessID)

### 142.25.6 GetCurrentProcess

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Load the current Process' information into the class.
**Notes:** This should always be your Xojo application.

### 142.25.7 GetfirstProcess

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Load the first Process into the class.
**Example:**

```
dim p as ProcessMBS
p=new ProcessMBS
p.GetfirstProcess ' get first
do
msgBox p.name
loop until not p.GetNextProcess ' get next till no more
```

### 142.25.8 GetFrontProcess

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Load the frontmost Process' information into the class.

### 142.25.9 GetNextProcess as boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Load the next Process into the class.
**Example:**

```
dim p as ProcessMBS
p=new ProcessMBS
p.GetfirstProcess ' get first
do
msgBox p.name
loop until not p.GetNextProcess ' get next till no more
```

**Notes:** Returns true if successfull.

### 142.25.10 GetProcess(serial as memoryblock)

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Load the process information for the process with the given serial.

### 142.25.11 KillProcess as Integer

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Kills a Process on Mac OS X or Windows.
**Example:**

```
dim p as ProcessMBS
p=new ProcessMBS
p.getcurrentprocess
msgbox str(p.killprocess)
```

**Notes:** Returns -1 if function is not available. Else returns a Mac OS error code where 0 equals "no error".

Sets the lasterror property.

Lasterror codes on Windows:
0 - failed
1 - normal exit
2 - forced exit

If you kill the main process of a task, this can kill the sub processes, too.
See also:


- 142.25.12 KillProcess(ProcessID as Integer, timeout as Integer) as Integer 19629
- 142.25.13 KillProcess(timeoutms as Integer) as Integer 19630


### 142.25.12 KillProcess(ProcessID as Integer, timeout as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Kills a Process on Mac OS X or Windows.
**Example:**

```
const pid = 12345 // put the PID here
call ProcessMBS.KillProcess pid, 100
```

**Notes:** Returns -1 if function is not available. Else returns a Mac OS error code where 0 equals "no error".

Returns on Windows:
0 - failed
1 - normal exit
2 - forced exit

The timeout is in milliseconds.
If you kill the main process of a task, this can kill the sub processes, too.
See also:

- 142.25.11 KillProcess as Integer 19629
- 142.25.13 KillProcess(timeoutms as Integer) as Integer 19630

### 142.25.13 KillProcess(timeoutms as Integer) as Integer

MBS Util Plugin, Plugin Version: 4.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Kills a Process on Mac OS X or Windows.
**Example:**

```
dim p as ProcessMBS
p=new ProcessMBS
p.getcurrentprocess
msgbox str(p.killprocess)
```

**Notes:** Returns -1 if function is not available. Else returns a Mac OS error code where 0 equals "no error".

Sets the lasterror property.

Lasterror codes on Windows:
0 - failed
1 - normal exit
2 - forced exit

The timeout is in milliseconds. If you don't specify a timeout, 1000 ms are used.
If you kill the main process of a task, this can kill the sub processes, too.
See also:

- 142.25.11 KillProcess as Integer 19629
- 142.25.12 KillProcess(ProcessID as Integer, timeout as Integer) as Integer 19629

### 142.25.14 MacProcessSerial as memoryblock

MBS Util Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the serial number for this process as a memoryblock with binary content.
**Notes:** On Mac OS every process as its own unique ID. (If you launch one application two times, they may have everything equal except the process serial.)

The serial itself is a 8byte long memoryblock (two integer).

Returns nil on any error.

### 142.25.15 ProcessInformationCFDictionary as object

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a CFDictionaryMBS object with the properties of the process.
**Example:**

```
dim p as ProcessMBS
dim d as CFDictionaryMBS

p=new ProcessMBS

p.GetCurrentProcess

d=CFDictionaryMBS(p.ProcessInformationCFDictionary)

if d=nil then
MsgBox "This example works only on Mac OS X 10.2!"
else
// use information in dictionary
end if
```

**Notes:** Only available on Mac OS X 10.2 or newer.
(And in Mac OS X 10.2 is a bug which may lead into a crash by using this function. Fixed in Mac OS X 10.3)
The function returns a CFDictionaryMBS, but to avoid plugin dependencies, the function is declared as Object, so RB 4.5 don't crash when an application uses the process plugin and dosn't use the CF Plugin.

Result:
An immutable CFDictionary containing these keys and their values. Keys marked with an '*' are optional. Over time more keys may be added.

| Key Name | Type |
|---|---|
| "PSN" | CFNumber, kCFNumberLongLongType |
| "Flavor" | CFNumber, kCFNumberSInt32 |
| "Attributes" | CFNumber, kCFNumberSInt32 |
| "ParentPSN" | CFNumber, kCFNumberLongLong |
| "FileType" | CFString, file type |
| "FileCreator" | CFString, file creator |
| "pid" | CFNumber, kCFNumberLongType |
| "LSBackgroundOnly" | CFBoolean |
| "LSUIElement" | CFBoolean |
| "IsHiddenAttr" | CFBoolean |
| "IsCheckedInAttr" | CFBoolean |
| "RequiresClassic" | CFBoolean |
| "RequiresCarbon" | CFBoolean |
| "LSUserQuitOnly" | CFBoolean |
| "LSUIPresentationMode" | CFNumber, kCFNumberShortType |
| "BundlePath" | CFString |
| kIOBundleExecutableKey | CFString |
| kIOBundleNameKey | CFString |
| kIOBundleIdentifierKey | CFString |

### 142.25.16 QuitProcess as Integer

MBS Util Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Quits a Process on Mac OS.
**Example:**

```
dim p as ProcessMBS
p=new ProcessMBS
p.getcurrentprocess
msgbox str(p.QuitProcess)
```

**Notes:** Returns -1 if function is not available. Else returns a Mac OS error code where 0 equals "no error". Sets the lasterror property.

### 142.25.17 SameAs(other as ProcessMBS) as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if two ProcessMBS objects have the same Process.

### 142.25.18 SetFrontProcessWithOptions(options as Integer)

MBS Util Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the current process to the front.
**Example:**

```
dim p as ProcessMBS

// move my front window to the front
p=new ProcessMBS
p.GetCurrentProcess
p.SetFrontProcessWithOptions 1
```

**Notes:** If you pass 0 in the options parameter, the process is activated and all process windows are brought forward.

If you pass kSetFrontProcessFrontWindowOnly (value 1), the process is activated and the frontmost non-floating window is brought forward. (Mac OS X only)

### 142.25.19 SetServiceMode(ismode as boolean) as boolean

MBS Util Plugin, Plugin Version: 2.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** If an application is a service, it is not listed inside the Windows force quit window.
**Notes:** Works only on Windows 95, 98 and ME.

### 142.25.20 TransformProcessType(mode as Integer) as Integer

MBS Util Plugin, Plugin Version: 15.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Changes the 'type' of the process specified in the psn parameter.
**Notes:** Given a psn for an application, this call transforms that application into the given type. Foreground applications have a menu bar and appear in the Dock. Background applications do not appear in the Dock, do not have a menu bar (and should not have windows or other user interface). UIElement applications do not have a menu bar, do not appear in the dock, but may in limited circumstances present windows and user interface. If a foreground application is frontmost when transformed into a background application, it is first hidden and another application is made frontmost. A UIElement or background-only application which is transformed into a foreground application is not brought to the front (use SetFrontProcess() after

the transform if this is required) nor will it be shown if it is hidden (even if hidden automatically by being transformed into a background-only application), so the caller should use ShowHideProcess() to show the application after it is transformed into a foreground application. Applications can only transform themselves; this call cannot change the type of another application.

Returns error code (0 for success).

### 142.25.21 TransformToForegroundApplication as Integer

MBS Util Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Transforms a background application to a foreground application.
**Notes:** Returns a Mac OS error code. Returns -1 if the function is not available. You need to select a process first with Get*Process functions.
Requires Mac OS X 10.3.

You can use this call to transform a background-only application into a foreground application. A foreground application appears in the Dock (and in the Force Quit dialog) and contains a menu bar. This function does not cause the application to be brought to the front; you must set FrontProcess=true to do so.

While available starting in 10.3 "Panther," calling TransformProcessType on a UIElement application in 10.3 or 10.4 will return paramErr (-50), rendering it only usable on a full BackgroundOnly? application. Leopard supports foregrounding both UIElement and BackgroundOnly? applications.

### 142.25.22 Update

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates the classes information.
**Notes:** Use it if you want the current CPUTime value after some time.

### 142.25.23 WinFullProcessImagePath as string

MBS Util Plugin, Plugin Version: 9.6, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the full name of the executable image for the specified process.
**Notes:** Returns empty string on any error like missing permissions.
The path is in the device style "Device\Harddisk0\Partition1\WINNT\System32\test.exe".

Requires Windows Vista or Windows Server 2008 or newer.

### 142.25.24 WinGetPriorityClass(ProcessID as Integer) as Integer

MBS Util Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the priority class for the specified process.
**Notes:** You can pass ProcessID -1 to get the current process.
This value, together with the priority value of each thread of the process, determines each thread's base priority level.

If the function succeeds, the return value is the priority class of the specified process.

The process's priority class is one of the following values:

| Name | Value | Description |
|---|---|---|
| ABOVE_NORMAL_PRIORITY_CLASS | &h00008000 | Process that has priority above NORMAL_PRIORITY_CLASS but below HIGH_PRIORITY_CLASS. |
| BELOW_NORMAL_PRIORITY_CLASS | &h00004000 | Process that has priority above IDLE_PRIORITY_CLASS but below NORMAL_PRIORITY_CLASS. |
| HIGH_PRIORITY_CLASS | &h00000080 | Process that performs time-critical tasks that must be executed immediately for it to run correctly. The threads of a high-priority class process preempt the threads of normal or idle priority class processes. An example is the Task List, which must respond quickly when called by the user, regardless of the load on the operating system. Use extreme care when using the high-priority class, because a high-priority class CPU-bound application can use nearly all available cycles. |
| IDLE_PRIORITY_CLASS | &h00000040 | Process whose threads run only when the system is idle and are preempted by the threads of any process running in a higher priority class. An example is a screen saver. The idle priority class is inherited by child processes. |
| NORMAL_PRIORITY_CLASS | &h00000020 | Process with no special scheduling needs. |
| REALTIME_PRIORITY_CLASS | &h00000100 | Process that has the highest possible priority. The threads of a real-time priority class process preempt the threads of all other processes, including operating system processes performing important tasks. For example, a real-time process that executes for more than a very brief interval can cause disk caches not to flush or cause the mouse to be unresponsive. |

Every thread has a base priority level determined by the thread's priority value and the priority class of its process. The operating system uses the base priority level of all executable threads to determine which thread gets the next slice of CPU time. Threads are scheduled in a round-robin fashion at each priority level, and only when there are no executable threads at a higher level will scheduling of threads at a lower level take place.
For a table that shows the base priority levels for each combination of priority class and thread priority value, see Scheduling Priorities.
Priority class is maintained by the executive, so all processes have a priority class that can be queried.

For Mac and Linux, please use Priority.

### 142.25.25 WinModulePath as string

MBS Util Plugin, Plugin Version: 9.6, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the path the first code file in this process.
**Notes:** Returns empty string on any error like missing permissions.
The path is in the typical style "C:\path\name.exe".

### 142.25.26 WinProcessImagePath as string

MBS Util Plugin, Plugin Version: 9.6, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of the executable file for the specified process.
**Notes:** Returns empty string on any error like missing permissions.
The path is in the device style "Device\Harddisk0\Partition1\WINNT\System32\test.exe".

Requires Windows XP or Windows Server 2003 or newer.

### 142.25.27 WinSetPriorityClass(ProcessID as Integer, PriorityClass as Integer) as Integer

MBS Util Plugin, Plugin Version: 12.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the priority class for the specified process.
**Notes:** You can pass ProcessID -1 to get the current process.
This value together with the priority value of each thread of the process determines each thread's base priority level.

The process's priority class is one of the following values:

Every thread has a base priority level determined by the thread's priority value and the priority class of its process. The operating system uses the base priority level of all executable threads to determine which thread gets the next slice of CPU time. Threads are scheduled in a round-robin fashion at each priority level, and only when there are no executable threads at a higher level will scheduling of threads at a lower level take place.
For a table that shows the base priority levels for each combination of priority class and thread priority value, see Scheduling Priorities.
Priority class is maintained by the executive, so all processes have a priority class that can be queried.

Every thread has a base priority level determined by the thread's priority value and the priority class of its process. The system uses the base priority level of all executable threads to determine which thread gets the next slice of CPU time. The SetThreadPriority function enables setting the base priority level of a thread

| Name | Value | Description |
|---|---|---|
| ABOVE_NORMAL_PRIORITY_CLASS | &h00008000 | Process that has priority above NORMAL_PRIORITY_CLASS but below HIGH_PRIORITY_CLASS. |
| BELOW_NORMAL_PRIORITY_CLASS | &h00004000 | Process that has priority above IDLE_PRIORITY_CLASS but below NORMAL_PRIORITY_CLASS. |
| HIGH_PRIORITY_CLASS | &h00000080 | Process that performs time-critical tasks that must be executed immediately for it to run correctly. The threads of a high-priority class process preempt the threads of normal or idle priority class processes. An example is the Task List, which must respond quickly when called by the user, regardless of the load on the operating system. Use extreme care when using the high-priority class, because a high-priority class CPU-bound application can use nearly all available cycles. |
| IDLE_PRIORITY_CLASS | &h00000040 | Process whose threads run only when the system is idle and are preempted by the threads of any process running in a higher priority class. An example is a screen saver. The idle priority class is inherited by child processes. |
| NORMAL_PRIORITY_CLASS | &h00000020 | Process with no special scheduling needs. |
| REALTIME_PRIORITY_CLASS | &h00000100 | Process that has the highest possible priority. The threads of a real-time priority class process preempt the threads of all other processes, including operating system processes performing important tasks. For example, a real-time process that executes for more than a very brief interval can cause disk caches not to flush or cause the mouse to be unresponsive. |

relative to the priority class of its process. For more information, see Scheduling Priorities.
The *_PRIORITY_CLASS values affect the CPU scheduling priority of the process. For processes that perform background work such as file I/O, network I/O, or data processing, it is not sufficient to adjust the CPU scheduling priority; even an idle CPU priority process can easily interfere with system responsiveness when it uses the disk and memory. Processes that perform background work should use the PROCESS_MODE_BACKGROUND_BEGIN and PROCESS_MODE_BACKGROUND_END values to adjust their resource scheduling priorities; processes that interact with the user should not use PROCESS_MODE_BACKGROUND_BEGIN.
If a process is in background processing mode, the new threads it creates will also be in background processing mode. When a thread is in background processing mode, it should minimize sharing resources such as critical sections, heaps, and handles with other threads in the process, otherwise priority inversions can occur. If there are threads executing at high priority, a thread in background processing mode may not be scheduled promptly, but it will never be starved.
Each thread can enter background processing mode independently using SetThreadPriority. Do not call SetPriorityClass to enter background processing mode after a thread in the process has called SetThreadPriority to enter background processing mode. After a process ends background processing mode, it resets all threads in the process; however, it is not possible for the process to know which threads were already in background processing mode.

On any error the value is zero.
For Mac and Linux, please use Priority.

### 142.25.28 Properties

### 142.25.29 CPUTime as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of the ticks this Process did get to calculate.
**Notes:** Unit is 1/60 of a second.
On Mac OS X this value is not available and normally 0.
(Read only property)

### 142.25.30 CurrentProcess as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the application is in the current Process.
**Notes:** This should always be true because you are running Xojo as the current ProcessMBS while you ask for this.
(Read only property)

### 142.25.31 flags as Integer

MBS Util Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The flags for this process on Mac OS.
**Example:**

```
Sub Open()
// List all visible processes

dim s as string
dim p as ProcessMBS
dim d As CFDictionaryMBS
dim LSBackgroundOnly, LSUIElement As CFStringMBS
dim b As CFBooleanMBS
dim obj As CFObjectMBS
dim visible as Boolean

const modeOnlyBackground=&h00000400

LSUIElement=NewCFStringMBS("LSUIElement")
LSBackgroundOnly = NewCFStringMBS("LSBackgroundOnly")

p = new ProcessMBS
p.getfirstProcess

do
visible=True

// Mac OS X
d = CFDictionaryMBS(p.ProcessInformationCFDictionary)
```

```
if d <>nil Then
obj = d.Value(LSBackgroundOnly)
if obj isa CFBooleanMBS then
b=CFBooleanMBS(obj)

if b.value Then
visible=false
end
end if

obj= d.Value(LSUIElement)
if obj isa CFBooleanMBS then
b=CFBooleanMBS(obj)

if b.value Then
visible=false
end
end if
end if

// Mac OS 9

if BitwiseAnd(p.Flags,modeOnlyBackground)<>0 then
visible=False
end if

if visible then
ListBox1.AddRow p.Name
end if

loop until not p.GetNextProcess
End Sub
```

**Notes:** Returns 0 on any error.

Process mode flags. These flags indicate whether the process is an application or desk accessory. For applications, this field also returns information specified in the application's 'SIZE' resource. This information is returned as flags. You can refer to these flags by using these constants:

(Read only property)

| | |
|---|---|
| modeDeskAccessory | &h00020000 |
| modeMultiLaunch | &h00010000 |
| modeNeedSuspendResume | &h00004000 |
| modeCanBackground | &h00001000 |
| modeDoesActivateOnFGSwitch | &h00000800 |
| modeOnlyBackground | &h00000400 |
| modeGetFrontClicks | &h00000200 |
| modeGetAppDiedMsg | &h00000100 |
| mode32BitCompatible | &h00000080 |
| modeHighLevelEventAware | &h00000040 |
| modeLocalAndRemoteHLEvents | &h00000020 |
| modeStationeryAware | &h00000010 |
| modeUseTextEditServices | &h00000008 |

### 142.25.32 FrontProcess as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the application is in the front of all others.
**Example:**

```
dim p as new ProcessMBS
p.GetCurrentProcess
p.FrontProcess=true 'bring app to front
```

**Notes:** This property is for read and write. Writing to it brings the Process to front.
(Read and Write property)

### 142.25.33 lasterror as Integer

MBS Util Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** As this property is introduced with MBS Plugin 3.1, only a few functions set it.
0 means no error, -1 means not available and anything else is a Mac OS error code.
(Read and Write property)

### 142.25.34 LaunchProcess as ProcessMBS

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the application which launched the current one.
**Notes:** For some applications like the "loginwindow" it is nil, because there was no app to launch it other

than the system itself.
(Read only property)

### 142.25.35 MacCreator as string

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Mac Creator code for the application.
**Notes:** (Read only property)

### 142.25.36 MacType as string

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Mac Type code for the application.
**Notes:** Possible values:

| | |
|---|---|
| "APPL" | normal application |
| "appe" | background application (Classic) |
| "APPC" | Control panel application (Classic) |
| "APPD" | Desktop Accessory (Classic) |
| "FNDR" | Finder |

others may be possible.
(Read only property)

### 142.25.37 MemoryFree as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the size of the free space in the Process' memory partition.
**Notes:** On Mac OS X normally 0.
(Read only property)

### 142.25.38 MemorySize as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns size of the Process' memory partition.
**Notes:** On Mac OS X normally 0.
(Read only property)

### 142.25.39 Name as string

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of this application.
**Notes:** Added Windows support in MBS Plugin 2.7 for this property.
(Read only property)

### 142.25.40 Path as folderitem

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the path of the Process' executable file.
**Notes:** Maybe nil if not available.
Use this folderitem to get an icon for the Process.
(and this icon may be nil!)
(Read only property)

### 142.25.41 ProcessID as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the PID of the process for use in unix command line tools.
**Example:**

```
Function LoginWindowPID() as Integer
// returns Process ID of Loginwindow on Mac OS X.
// or 0 on error

dim p as ProcessMBS

p=new ProcessMBS
p.GetFirstProcess

do
if p.Name="loginwindow" then
Return p.ProcessID
end if
loop until not p.GetNextProcess
```

```
End Function
```

**Notes:** Works only on Mac OS X.
See the "CPU Focus" application for an example.

Note that this call does not make sense for Classic applications, since they all share a single UNIX process ID.
(Read only property)

### 142.25.42 Visible as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the application is visible.
**Example:**

```
// hide iTunes

dim p as new ProcessMBS

p.GetFirstProcess
do
if p.BundleID="com.apple.iTunes" then
p.Visible=false
exit
end if
loop until not p.GetNextProcess
```

**Notes:** Works only on Mac OS X.
Returns false if not supported.

Sets the lasterror property.
(Read and Write property)

### 142.25.43 Priority as Integer

MBS Util Plugin, Plugin Version: 10.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The priority of the process.
**Example:**

```
dim p as new ProcessMBS

p.GetCurrentProcess

MsgBox str(p.priority) // shows 0

p.priority = 5

MsgBox str(p.priority) // shows 5
```

**Notes:** 20 (least) to -20 (max). Setting the value may be limited due to permissions.
(Read and Write computed property)
See also:

- 142.25.44 Priority(ProcessID as Integer) as Integer 19644

### 142.25.44 Priority(ProcessID as Integer) as Integer

MBS Util Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Sets or gets priority for a process on Mac and Linux.
**Notes:** Value is in the range -20 to 20. The default priority is 0; lower priorities cause more favorable scheduling.
For Windows, please use WinSetPriorityClass and WinGetPriorityClass.
(Read and Write computed property)
See also:

- 142.25.43 Priority as Integer 19643

### 142.25.45 Constants

Process Transformation Types

| Constant | Value | Description |
|---|---|---|
| kProcessTransformToBackgroundApplication | 2 | Turn application in a background application. functional in Mac OS X 10.7 and later |
| kProcessTransformToForegroundApplication | 1 | Turn application in a foreground application. |
| kProcessTransformToUIElementApplication | 4 | Turn application in a user interface element application. functional in Mac OS X 10.7 and later |

# 142.26 class WindowsProcessMemoryInfoMBS

## 142.26.1 class WindowsProcessMemoryInfoMBS

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to get information about the memory usage of a process on Windows.
**Blog Entries**

- MBS Xojo Plugins, version 17.1pr2

## 142.26.2 Methods

## 142.26.3 Constructor

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor which fills the values into the properties.
**Example:**

```
dim w as new WindowsProcessMemoryInfoMBS
msgbox "This application uses currently "+str(w.WorkingSetSize)+" Bytes of memory."
```

**Notes:** Queries the current process memory information.
See also:

- 142.26.4 Constructor(ProcessID as Integer) 19645

## 142.26.4 Constructor(ProcessID as Integer)

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor which fills the values into the properties.
**Notes:** Queries the process memory information of the process with the given ID.
See also:

- 142.26.3 Constructor 19645

## 142.26.5 Properties

## 142.26.6 PageFaultCount as Integer

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of page faults.
**Notes:** (Read only property)

### 142.26.7 PagefileUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current space allocated for the pagefile, in bytes. Those pages may or may not be in memory.
**Notes:** (Read only property)

### 142.26.8 PeakPagefileUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak space allocated for the pagefile, in bytes.
**Notes:** (Read only property)

### 142.26.9 PeakWorkingSetSize as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak working set size, in bytes.
**Notes:** (Read only property)

### 142.26.10 ProcessID as Integer

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The process ID of the process queried.
**Notes:** Value is 0 if the query failed.
(Read only property)

### 142.26.11 QuotaNonPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak nonpaged pool usage, in bytes.
**Notes:** (Read only property)

### 142.26.12 QuotaPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current paged pool usage, in bytes.
**Notes:** (Read only property)

### 142.26.13 QuotaPeakNonPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current nonpaged pool usage, in bytes.
**Notes:** (Read only property)

### 142.26.14 QuotaPeakPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak paged pool usage, in bytes.
**Notes:** (Read only property)

### 142.26.15 WorkingSetSize as Int64

MBS Win Plugin, Plugin Version: 7.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current working set size, in bytes.
**Notes:** This is the memory your application uses.
(Read only property)

## 142.27 class WindowsProcessStatisticsMBS

### 142.27.1 class WindowsProcessStatisticsMBS

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to get information about process statistics on Windows.
**Example:**

```
dim c as new WindowsProcessStatisticsMBS
MsgBox str(C.PeakWorkingSetSize)
```

**Notes:** See also WindowsVMStatisticsMBS for the system memory usage.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr6
- MBS Real Studio Plugins, version 11.2pr4
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr7

### 142.27.2 Methods

### 142.27.3 Constructor(ProcessID as Integer = -1, Mode as Integer = 255)

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new object for given process and with given mode.
**Example:**

```
dim pid as Integer = -1
dim c as new WindowsProcessStatisticsMBS(pid, WindowsProcessStatisticsMBS.ModeMemoryCounters)
MsgBox str(C.PeakWorkingSetSize)
```

**Notes:** If ProcessID is -1, the current process is queried.
Mode can be a combination of the Mode* constants you want to query. The Mode property will later contain the Mode* constants combination of the values which are valid.

### 142.27.4 Properties

### 142.27.5 CreationTime as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A file time that receives the creation time of the process.
**Notes:** Property is valid if Mode contains ModeTimes.
(Read only property)

### 142.27.6 CycleTime as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The sum of the cycle time of all threads of the specified process.
**Notes:** Property is valid if Mode contains ModeTimes.
This value can only be queried on Windows Vista or newer.
(Read only property)

### 142.27.7 ExitTime as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A file time that receives the exit time of the process. If the process has not exited, the content of this structure is undefined.
**Notes:** Property is valid if Mode contains ModeTimes.
(Read only property)

### 142.27.8 HandleCount as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of handles in use by the process.
**Example:**

```
dim w as new WindowsProcessStatisticsMBS
dim n1 as Integer = w.HandleCount

dim x as new window1 // make a new window

w = new WindowsProcessStatisticsMBS
dim n2 as Integer = w.HandleCount
```

MsgBox str(n2)+" handles in used, "+str(n2-n1)+" used by second window"

**Notes:** Value is -1 on an error.
(Read only property)

### 142.27.9 KernelTime as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A file time structure that receives the amount of time that the process has executed in kernel mode.
**Notes:** The time that each of the threads of the process has executed in kernel mode is determined, and then all of those times are summed together to obtain this value.
Property is valid if Mode contains ModeTimes.
(Read only property)

### 142.27.10 Mode as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Which values have been queried.
**Notes:** This value is a combination of the Mode* constants.
(Read only property)

### 142.27.11 OtherOperationCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of I/O operations performed, other than read and write operations.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.12 OtherTransferCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes transferred during operations other than read and write operations.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.13 PageFaultCount as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of page faults.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.14 PagefileUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current space allocated for the pagefile, in bytes. Those pages may or may not be in memory.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.15 PeakPagefileUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak space allocated for the pagefile, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.16 PeakWorkingSetSize as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak working set size, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.17 ProcessID as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The process ID of the process queried.
**Notes:** (Read only property)

### 142.27.18 QuotaNonPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak nonpaged pool usage, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.19 QuotaPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current paged pool usage, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.20 QuotaPeakNonPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current nonpaged pool usage, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.21 QuotaPeakPagedPoolUsage as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak paged pool usage, in bytes.
**Notes:** Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.22 ReadOperationCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of read operations performed.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.23 ReadTransferCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes read.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.24 TotalIdleTime as UInt64

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The amount of time that the system has been idle.
**Notes:** (Read only property)

### 142.27.25 TotalKernelTime as UInt64

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The amount of time that the system has spent executing in Kernel mode (including all threads in all processes, on all processors).
**Notes:** This time value also includes the amount of time the system has been idle. So you may want to subtract idle time to get real kernel time.
(Read only property)

### 142.27.26 TotalUserTime as UInt64

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The amount of time that the system has spent executing in User mode (including all threads in all processes, on all processors).
**Notes:** If you need to know what is the percentage of the CPU time spent for user applications, you need to read this value two times and calculate the delta.
(Read only property)

### 142.27.27 UserTime as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A file time structure that receives the amount of time that the process has executed in user mode.
**Notes:** The time that each of the threads of the process has executed in user mode is determined, and then

all of those times are summed together to obtain this value.
Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.28 WorkingSetSize as Int64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current working set size, in bytes.
**Notes:** This is the memory your application uses.
Property is valid if Mode contains ModeMemoryCounters.
(Read only property)

### 142.27.29 WriteOperationCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of write operations performed.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.30 WriteTransferCount as UInt64

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes written.
**Notes:** Property is valid if Mode contains ModeIOCounters.
(Read only property)

### 142.27.31 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ModeHandles | 32 | One of the mode constants.<br>Whether to query the handle count. |

Mode Constants

| Constant | Value | Description |
|---|---|---|
| ModeCycleTime | 8 | Whether to query the cycle time. |
| ModeIOCounters | 2 | Whether to query the IOCounters. |
| ModeMemoryCounters | 1 | Whether to query the memory counters. |
| ModeTimes | 4 | Whether to query the time values. |
| ModeTotalTime | 16 | Whether to query the total CPU time values. Requires Windows XP with SP1. |

## 142.28 class WindowsVMStatisticsMBS

### 142.28.1 class WindowsVMStatisticsMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Holds information about the current Windows memory status.
**Notes:** See also WindowsProcessStatisticsMBS for the application.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr2
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr7

### 142.28.2 Methods

### 142.28.3 Constructor

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new statistics object with current values.
**Example:**

```
// show values in a listbox:
dim w as new WindowsVMStatisticsMBS

list.AddRow "Pagesize: "+format(w.Pagesize,"0")
list.AddRow "MemoryLoad: "+format(w.MemoryLoad,"0")
list.AddRow "AvailablePageFileMemory: "+format(w.AvailablePageFileMemory,"0")
list.AddRow "AvailablePhysicalMemory: "+format(w.AvailablePhysicalMemory,"0")
list.AddRow "AvailableVirtualMemory: "+format(w.AvailableVirtualMemory,"0")
list.AddRow "TotalPageFileMemory: "+format(w.TotalPageFileMemory,"0")
list.AddRow "TotalPhysicalMemory: "+format(w.TotalPhysicalMemory,"0")
list.AddRow "TotalVirtualMemory: "+format(w.TotalVirtualMemory,"0")
```

### 142.28.4 Properties

### 142.28.5 AllocationGranularity as Integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The granularity for the starting address at which virtual memory can be allocated.
**Notes:** Typically 64 KB.

(Read only property)

### 142.28.6 AvailablePageFileMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the number of bytes available in the paging file.
**Notes:** (Read only property)

### 142.28.7 AvailablePhysicalMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the number of bytes of physical memory available.
**Notes:** (Read only property)

### 142.28.8 AvailableVirtualMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the number of bytes of unreserved and uncommitted memory in the user mode portion of the virtual address space of the calling process.
**Notes:** (Read only property)

### 142.28.9 Memoryload as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies a number between 0 and 100 that gives a general idea of current memory utilization, in which 0 indicates no memory use and 100 indicates full memory use.
**Notes:** (Read only property)

### 142.28.10 Pagesize as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of one memory page in memory.
**Notes:** On Intel 80386 or newer CPUs, it should be 4096 Bytes.
(Read only property)

### 142.28.11 TotalPageFileMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the total number of bytes that can be stored in the paging file. Note that this number does not represent the actual physical size of the paging file on disk.
**Notes:** (Read only property)

### 142.28.12 TotalPhysicalMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the total number of bytes of physical memory.
**Notes:** (Read only property)

### 142.28.13 TotalVirtualMemory as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the total number of bytes that can be described in the user mode portion of the virtual address space of the calling process.
**Notes:** Value is 0 on any error.
(Read only property)

# Chapter 143

# ProgressView

## 143.1 class ProgressBackgroundViewMBS

### 143.1.1 class ProgressBackgroundViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The class for a background view.

### 143.1.2 Methods

### 143.1.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 143.1.4 Properties

### 143.1.5 BlurEffectStyle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The blur effect style, when using BackgroundStyleBlur.
**Notes:** Defaults to UIBlurEffectStyleLight.
(Read and Write property)

### 143.1.6 Color as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background color or the blur tint color.
**Notes:** Defaults to nil on iOS 13 and later and [ UIColor colorWithWhite:0.8f alpha:0.6f ] on older systems.
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.1.7 ColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background color or the blur tint color.
**Example:**

```
// set background color for this HUD
dim p as ProgressHUDMBS // your instance
p.backgroundView.ColorValue = &c00FF00
```

**Notes:** Defaults to nil on iOS 13 and later and [ UIColor colorWithWhite:0.8f alpha:0.6f ] on older systems.
This is the color as a Xojo color value.
(Read and Write property)

### 143.1.8 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 143.1.9 Style as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background style.
**Notes:** Defaults to BackgroundStyleBlur.
(Read and Write property)

### 143.1.10 Constants

Styles

| Constant | Value | Description |
|---|---|---|
| BackgroundStyleBlur | 1 | UIVisualEffectView or UIToolbar.layer background view. |
| BackgroundStyleSolidColor | 0 | Solid color background |

## 143.2 class ProgressBarProgressViewMBS

### 143.2.1 class ProgressBarProgressViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A flat bar progress view.

### 143.2.2 Methods

### 143.2.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 143.2.4 Properties

### 143.2.5 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 143.2.6 LineColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar border line color.
**Notes:** Defaults to white [ UIColor whiteColor ] .
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.2.7 LineColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar border line color.
**Notes:** Defaults to white.

This is the color as a Xojo color value.
(Read and Write property)

### 143.2.8 Progress as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The Progress (0.0 to 1.0).
**Notes:** (Read and Write property)

### 143.2.9 ProgressColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar progress color.
**Notes:** Defaults to white [ UIColor whiteColor ] .
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.2.10 ProgressColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar progress color.
**Notes:** Defaults to white.
This is the color as a Xojo color value.
(Read and Write property)

### 143.2.11 ProgressRemainingColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar background color.
**Notes:** Defaults to clear [ UIColor clearColor ] .
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.2.12 ProgressRemainingColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar background color.
**Notes:** Defaults to clear [ UIColor clearColor ] .
This is the color as a Xojo color value.
(Read and Write property)

## 143.3 class ProgressHUDMBS

### 143.3.1 class ProgressHUDMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Displays a simple HUD window containing a progress indicator and two optional labels for short messages.
**Notes:** This is a simple drop-in class for displaying a progress HUD view similar to Apple's private UIProgressHUD class.
The MBProgressHUD window spans over the entire space given to it by the constructor and catches all user input on this region, thereby preventing the user operations on components below the view.

To still allow touches to pass through the HUD, you can set hud.userInteractionEnabled = false.
MBProgressHUD is a UI class and should therefore only be accessed on the main thread.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo Plugins, version 22.5pr6
- MBS Xojo Plugins, version 22.5pr5
- ProgressDialog functions for iOS
- MBS Xojo Plugins, version 22.5pr4

**Xojo Developer Magazine**

- 21.1, page 34: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 143.3.2 Methods

### 143.3.3 Constructor(Control as MobileControl)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the control.
See also:


- 143.3.4 Constructor(Screen as MobileScreen) 19666
- 143.3.5 Constructor(ViewHandle as Integer) 19666

### 143.3.4 Constructor(Screen as MobileScreen)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the screen.
See also:


- 143.3.3 Constructor(Control as MobileControl) 19665
- 143.3.5 Constructor(ViewHandle as Integer) 19666


### 143.3.5 Constructor(ViewHandle as Integer)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the given view handle.
See also:


- 143.3.3 Constructor(Control as MobileControl) 19665
- 143.3.4 Constructor(Screen as MobileScreen) 19666


### 143.3.6 Destructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 143.3.7 hide(animated as boolean = true)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Hides the HUD.
**Notes:** This still calls the hudWasHidden event. This is the counterpart of the show method. Use it to hide the HUD when your task completes.

animated: If set to true the HUD will disappear using the current animationType. If set to false the HUD will not use animations while disappearing.

You may want to set RemoveFromSuperViewOnHide to false in case you like to show it again later.
See also:


- 143.3.8 hide(animated as boolean, afterDelay as Double) 19667

### 143.3.8 hide(animated as boolean, afterDelay as Double)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Hides the HUD after a delay.
**Notes:** This still calls the hudWasHidden event. This is the counterpart of the show method. Use it to hide the HUD when your task completes.

animated: If set to true the HUD will disappear using the current animationType. If set to false the HUD will not use animations while disappearing.
delay: Delay in seconds until the HUD is hidden.
See also:

- 143.3.7 hide(animated as boolean = true) 19666

### 143.3.9 show(animated as boolean = true)

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Displays the HUD.
**Notes:** You need to make sure that the main thread completes its run loop soon after this method call so that the user interface can be updated. Call this method when your task is already set up to be executed in a new thread (e.g., when using something like a thread or timer).

Animated: If set to true the HUD will appear using the current animationType. If set to false the HUD will not use animations while appearing.

### 143.3.10 Properties

### 143.3.11 AnimationType as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The animation type that should be used when the HUD is shown and hidden.
**Notes:** (Read and Write property)

### 143.3.12 backgroundView as ProgressBackgroundViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** View covering the entire HUD area, placed behind bezelView.
**Example:**

```
// set background color for this HUD
dim p as ProgressHUDMBS // your instance
p.backgroundView.ColorValue = &c00FF00
```

**Notes:** (Read only property)

### 143.3.13 bezelView as ProgressBackgroundViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The view containing the labels and indicator (or customView).
**Notes:** (Read only property)

### 143.3.14 ButtonTitle as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The title of the button.
**Notes:** (Read and Write property)

### 143.3.15 ButtonView as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A button that is placed below the labels.
**Notes:** Value is NSViewMBS object.
(Read only property)

### 143.3.16 ContentColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A color that gets forwarded to all labels and supported indicators.
**Notes:** Also sets the tintColor
for custom views on iOS 7+. Set to nil to manage color individually.
Defaults to semi-translucent black on iOS 7 and later and white on earlier iOS versions.
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.3.17 ContentColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A color that gets forwarded to all labels and supported indicators.
**Example:**

```
dim p as ProgressHUDMBS // your view

// change color to red
p.ContentColorValue = &cFF0000
```

**Notes:** Also sets the tintColor
for custom views on iOS 7+. Set to nil to manage color individually.
Defaults to semi-translucent black on iOS 7 and later and white on earlier iOS versions.
This is the color as a Xojo color value.
(Read and Write property)

### 143.3.18 defaultMotionEffectsEnabled as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** When enabled, the bezel center gets slightly affected by the device accelerometer data.
**Notes:** Defaults to false.

This can cause main thread checker assertions on certain devices. https://github.com/jdg/MBProgressHUD/issues/552
(Read and Write property)

### 143.3.19 DetailsLabelText as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The text for the details label.
**Notes:** The details text can span multiple lines.
(Read and Write property)

### 143.3.20 DetailsLabelView as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A label that holds an optional details message displayed below the labelText message.

**Notes:** The details text can span multiple lines.
Value is NSViewMBS object.
(Read only property)

### 143.3.21 graceTime as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:**

Grace period is the time (in seconds) that the invoked method may be run without showing the HUD.
**Notes:**

If the task finishes before the grace time runs out, the HUD will not be shown at all.
This may be used to prevent HUD display for very short tasks.
Defaults to 0 (no grace time).

The graceTime needs to be set before the hud is shown.
(Read and Write property)

### 143.3.22 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 143.3.23 Indicator as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The indicator control in use.
**Notes:** Either ProgressBarProgressViewMBS or ProgressRoundProgressViewMBS object.
(Read only property)

### 143.3.24 LabelText as String

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The label text.
**Notes:** The HUD is automatically resized to fit the entire text.

(Read and Write property)

### 143.3.25 LabelView as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A label that holds an optional short message to be displayed below the activity indicator. #
**Notes:** The HUD is automatically resized to fit the entire text.
Value is NSViewMBS object.
(Read only property)

### 143.3.26 margin as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The amount of space between the HUD edge and the HUD elements (labels, indicators or custom views).
**Notes:** This also represents the minimum bezel distance to the edge of the HUD view.
Defaults to 20.
(Read and Write property)

### 143.3.27 MinHeight as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum size of the HUD bezel.
**Notes:** Defaults to zero (no minimum size).
(Read and Write property)

### 143.3.28 minShowTime as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum time (in seconds) that the HUD is shown.
**Notes:** This avoids the problem of the HUD being shown and than instantly hidden.
Defaults to 0 (no minimum show time).
(Read and Write property)

### 143.3.29 MinWidth as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum size of the HUD bezel.
**Notes:** Defaults to zero (no minimum size).
(Read and Write property)

### 143.3.30 Mode as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** MBProgressHUD operation mode.
**Notes:** The default is ModeIndeterminate.
(Read and Write property)

### 143.3.31 offsetX as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The bezel offset relative to the center of the view.
**Notes:** You can use MBProgressMaxOffset and -MBProgressMaxOffset to move the HUD all the way to the screen edge in each direction.
E.g., CGPointMake(0, MBProgressMaxOffset) would position the HUD centered on the bottom edge.
(Read and Write property)

### 143.3.32 offsetY as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The bezel offset relative to the center of the view.
**Notes:** You can use MBProgressMaxOffset and -MBProgressMaxOffset to move the HUD all the way to the screen edge in each direction.
E.g., CGPointMake(0, MBProgressMaxOffset) would position the HUD centered on the bottom edge.
(Read and Write property)

### 143.3.33 Progress as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The progress of the progress indicator, from 0.0 to 1.0.
**Notes:** Defaults to 0.0.

(Read and Write property)

### 143.3.34 RemoveFromSuperViewOnHide as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Removes the HUD from its parent view when hidden.
**Notes:** Defaults to false.
(Read and Write property)

### 143.3.35 Square as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Force the HUD dimensions to be equal if possible.
**Notes:** (Read and Write property)

### 143.3.36 userInteractionEnabled as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether user events are ignored and removed from the event queue.
**Notes:** When set to false, touch, press, keyboard, and focus events intended for the view are ignored and removed from the event queue. When set to YES, events are delivered to the view normally. The default value of this property is true.

During an animation, user interactions are temporarily disabled for all views involved in the animation, regardless of the value in this property. You can disable this behavior by specifying the UIViewAnimationOptionAllowUserInteraction option when configuring the animation.
(Read and Write property)

### 143.3.37 View as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The view as NSViewMBS object.
**Notes:** Value is NSViewMBS object.
(Read only property)

### 143.3.38 Events

### 143.3.39 buttonAction

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Called when user taps the button.

### 143.3.40 hudWasHidden

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Called after the HUD was fully hidden from the screen.

### 143.3.41 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| MaxOffset | 1000000.0 | The max offset constant to move to the other border. |

Animations

| Constant | Value | Description |
|---|---|---|
| AnimationFade | 0 | Opacity animation |
| AnimationZoom | 1 | Opacity + scale animation (zoom in when appearing zoom out when disappearing) |
| AnimationZoomIn | 3 | Opacity + scale animation (zoom in style) |
| AnimationZoomOut | 2 | Opacity + scale animation (zoom out style) |

Modes

| Constant | Value | Description |
|---|---|---|
| ModeAnnularDeterminate | 3 | Ring-shaped progress view. |
| ModeCustomView | 4 | Shows a custom view. |
| ModeDeterminate | 1 | A round, pie-chart like, progress view. |
| ModeDeterminateHorizontalBar | 2 | Horizontal progress bar. |
| ModeIndeterminate | 0 | A round progress indicator. |
| ModeText | 5 | Shows only labels. |

## 143.4 class ProgressRoundProgressViewMBS

### 143.4.1 class ProgressRoundProgressViewMBS

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A progress view for showing definite progress by filling up a circle (pie chart).

### 143.4.2 Methods

### 143.4.3 Constructor

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 143.4.4 Properties

### 143.4.5 Annular as Boolean

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Display mode.
**Notes:** False = round or True = annular. Defaults to round.
(Read and Write property)

### 143.4.6 backgroundTintColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator background (non-progress) color.
**Notes:** Only applicable on iOS versions older than iOS 7.
Defaults to translucent white (alpha 0.1).
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.4.7 backgroundTintColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator background (non-progress) color.
**Notes:** Only applicable on iOS versions older than iOS 7.
Defaults to translucent white (alpha 0.1).
This is the color as a Xojo color value.
(Read and Write property)

### 143.4.8 Handle as Integer

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 143.4.9 Progress as Double

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The Progress (0.0 to 1.0).
**Notes:** (Read and Write property)

### 143.4.10 progressTintColor as Variant

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator progress color.
**Notes:** Defaults to white [ UIColor whiteColor ] .
This uses NSColorMBS to wrap the UIColor.
(Read and Write property)

### 143.4.11 progressTintColorValue as Color

MBS iOS Plugin, Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator progress color.
**Notes:** Defaults to white.
This is the color as a Xojo color value.
(Read and Write property)

# Chapter 144

# Quartz Composer

## 144.1 control DesktopQCViewControlMBS

### 144.1.1 control DesktopQCViewControlMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a QCView properly.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.1pr2

### 144.1.2 Properties

### 144.1.3 View as QCViewMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The QCView in use by this control.
**Notes:** Please use this property to access the actual view and make your settings and load the data to render.
(Read only property)

### 144.1.4 Events

### 144.1.5 BoundsChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 144.1.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 144.1.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 144.1.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 144.1.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 144.1.10 DidStartRendering

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Rendering did start notification.

### 144.1.11 DidStopRendering

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Rendering did stop notification.

### 144.1.12 FocusLost

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 144.1.13 FocusReceived

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 144.1.14 FrameChanged

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 144.1.15 MenuBarSelected

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 144.1.16 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 144.1.17 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 144.1.18 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 144.1.19 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 144.1.20 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 144.1.21 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 144.2 class QCCompositionMBS

### 144.2.1 class QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The composition class.
**Notes:** The QCComposition class represents a Quartz Composer composition that either:

- comes from the system-wide composition repository (/Library/Compositions and textasciitilde /Library/Compositions) where it can be accessed by any application through the methods of the QCCompositionRepository class
- is created from an arbitrary source (typically a file on disk) using one of its methods

This class cannot be subclassed.

A QCComposition object has the following information associated with it and that you can obtain by using the appropriate method of the QCComposition class:

- Attributes include the name and description of the composition, copyright information, and whether or not its provided by OS X (built-in).
- The protocols that the composition conforms to. A composition protocol defines a set of required and optional input parameters and output results.

Many methods of the QCRenderer, QCCompositionLayer, and QCView classes take a QCComposition object as a parameter.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr2

### 144.2.2 Methods

### 144.2.3 compositionWithData(data as MemoryBlock) as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a composition object initialized with the contents of a Quartz Composer composition file.
**Example:**

```
dim data as MemoryBlock // composition file content in MemoryBlock variable
dim q as QCCompositionMBS = QCCompositionMBS.compositionWithData(data)
```

**Notes:** data: The contents of a file created with the Quartz Composer developer tool.

Returns a Quartz Composer composition object or nil if there is an error.
See also:

- 144.2.4 compositionWithData(data as string) as QCCompositionMBS 19683

### 144.2.4 compositionWithData(data as string) as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a composition object initialized with the contents of a Quartz Composer composition file.
**Example:**

```
dim data as string // composition file content in string variable
dim q as QCCompositionMBS = QCCompositionMBS.compositionWithData(data)
```

**Notes:** data: The contents of a file created with the Quartz Composer developer tool.

Returns a Quartz Composer composition object or nil if there is an error.
See also:

- 144.2.3 compositionWithData(data as MemoryBlock) as QCCompositionMBS 19682

### 144.2.5 compositionWithFile(file as folderitem) as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a composition object initialized with a Quartz Composer composition file.
**Example:**

```
dim file as folderitem // your folderitem
dim q as QCCompositionMBS = QCCompositionMBS.compositionWithFile(file)
```

**Notes:** file: A path to a file created with the Quartz Composer developer tool (.qtz extension).

Returns a Quartz Composer composition object or nil if there is an error.
See also:

- 144.2.6 compositionWithFile(path as string) as QCCompositionMBS 19684

### 144.2.6 compositionWithFile(path as string) as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a composition object initialized with a Quartz Composer composition file.
**Example:**

```
dim path as string = "/System/Library/Compositions/Rollercoaster.qtz" // your path
dim q as QCCompositionMBS = QCCompositionMBS.compositionWithFile(path)
```

**Notes:** file: A path to a file created with the Quartz Composer developer tool (.qtz extension).

Returns a Quartz Composer composition object or nil if there is an error.
See also:

- 144.2.5 compositionWithFile(file as folderitem) as QCCompositionMBS 19683

### 144.2.7 Constructor

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 144.2.8 copy as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the composition.

### 144.2.9 getAttributes as dictionary

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the attributes of the composition.

### 144.2.10 inputKeys as string()

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array listing the keys that identify the input ports of the root patch of the composition.

### 144.2.11 outputKeys as string()

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array listing the keys that identify the output ports of the root patch of the composition.

### 144.2.12 protocols as string()

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of protocols to which the composition conforms.

### 144.2.13 QCCompositionAttributeBuiltInKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Example:**

```
dim c as QCCompositionMBS = QCCompositionMBS.compositionWithFile("/System/Library/Compositions/Rollercoaster.qtz")
dim d as Dictionary = c.getattributes
dim b as Boolean = d.Value(c.QCCompositionAttributeBuiltInKey)
MsgBox str(b)
```

**Notes:** The key for the composition origin. The associated value is a Boolean value.
True indicates the composition is built-in (provided by OS X).

### 144.2.14 QCCompositionAttributeCategoryKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Example:**

```
dim c as QCCompositionMBS = QCCompositionMBS.compositionWithFile("/System/Library/Compositions/Rollercoaster.qtz")
dim d as Dictionary = c.getattributes
dim b as string = d.Lookup(c.QCCompositionAttributeCategoryKey, "?")
MsgBox b
```

**Notes:** The composition category. The associated value is a category constant. See Categories.

### 144.2.15 QCCompositionAttributeCopyrightKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Example:**

```
dim c as QCCompositionMBS = QCCompositionMBS.compositionWithFile("/System/Library/Compositions/Rollercoaster.qtz")
dim d as Dictionary = c.getattributes
dim b as string = d.Value(c.QCCompositionAttributeCopyrightKey)
MsgBox b
```

**Notes:** The key for composition copyright information.
The associated value is a string.

### 144.2.16 QCCompositionAttributeDescriptionKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Notes:** The key for the composition description.
The associated value is a string.

### 144.2.17 QCCompositionAttributeHasConsumersKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Notes:** The key for a composition that has consumer patches. The associated value is a Boolean value.

True indicates that the composition has consumers.

### 144.2.18 QCCompositionAttributeIsTimeDependentKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Notes:** The key for the composition time dependency. The associated value is a Boolean value. True indicates that the composition is time dependent.

### 144.2.19 QCCompositionAttributeNameKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard attribute names.
**Example:**

```
dim c as QCCompositionMBS = QCCompositionMBS.compositionWithFile("/System/Library/Compositions/Rollercoaster.qtz")
dim d as Dictionary = c.getattributes
MsgBox d.Value(c.QCCompositionAttributeNameKey)
```

**Notes:** The key for the composition name.
The associated value is a string.

### 144.2.20 QCCompositionCategoryDistortion as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the category names.
**Notes:** A composition that produces a distortion effect.

### 144.2.21 QCCompositionCategoryStylize as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the category names.
**Notes:** A composition that produces a stylize effect.

### 144.2.22 QCCompositionCategoryUtility as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the category names.
**Notes:** A utility composition.

### 144.2.23 QCCompositionInputAudioPeakKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A number input port whose key is inputAudioPeak. The value must be in the [ 0,1 ] range as a mono signal with no decay applied.

### 144.2.24 QCCompositionInputAudioSpectrumKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A structure input port whose key is inputAudioSpectrum. The structure must contain 16 values in the [ 0,1 ] range representing 16 spectrum bands of the mono signal from low to high frequencies with no decay applied.

### 144.2.25 QCCompositionInputDestinationImageKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** An image input port whose key is inputDestinationImage.

### 144.2.26 QCCompositionInputImageKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** An image input port whose key is inputImage.

### 144.2.27 QCCompositionInputPaceKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A number input port whose key is inputPace. The value must be in the [ 0,1 ] range.

### 144.2.28 QCCompositionInputPreviewModeKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A Boolean input port whose key is inputPreviewMode. When the value of this input port is set to TRUE, the composition that provides this port must be able to run in a low-quality mode that produces a preview of the composition.

### 144.2.29 QCCompositionInputPrimaryColorKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A color input port whose key is inputPrimaryColor.

### 144.2.30 QCCompositionInputScreenImageKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** An image input port whose key is inputScreenImage.

### 144.2.31 QCCompositionInputSecondaryColorKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A color input port whose key is inputSecondaryColor.

### 144.2.32 QCCompositionInputSourceImageKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** An image input port whose key is inputSourceImage.

### 144.2.33 QCCompositionInputTrackInfoKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A structure input port whose key is inputTrackInfo. The structure contains optional entries, such as "name", "artist", "album", "duration", "artwork", and so on.

### 144.2.34 QCCompositionInputTrackPositionKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A number input port whose key is inputTrackPosition. The value must be expressed in seconds.

### 144.2.35 QCCompositionInputTrackSignalKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A Boolean input port whose key is inputTrackSignal.

### 144.2.36 QCCompositionInputXKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A number input port whose key is inputX. The value must be normalized to the image width with the origin on the left.

### 144.2.37 QCCompositionInputYKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard input key names.
**Notes:** A number input port whose key is inputY. The value must be normalized to the image height with

the origin at the bottom.

### 144.2.38 QCCompositionOutputImageKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard output key names.
**Notes:** An image output port whose key is outputImage.

### 144.2.39 QCCompositionOutputWebPageURLKey as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard output key names.
**Notes:** A string output port whose key is outputWebPageURL.

### 144.2.40 QCCompositionProtocolGraphicAnimation as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard protocol names.
**Notes:** A composition that renders a generic graphical animation. It has the option to use QCCompositionInputPrimaryColorKey for the primary color of the animation, QCCompositionInputSecondaryColorKey for the secondary color of the animation, QCCompositionInputPaceKey for the global pace of the animation, and QCCompositionInputPreviewModeKey to indicate if the animation should run in lower-quality for preview purposes.

Available in OS X v10.5 and later.

### 144.2.41 QCCompositionProtocolGraphicTransition as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard protocol names.
**Notes:** A composition that performs a transition between two images, using a transition time in range of 0 to 1. A conforming composition must use the input keys QCCompositionInputSourceImageKey for the starting image and QCCompositionInputDestinationImageKey for the image to transition to. The composition can optionally use QCCompositionInputPreviewModeKey to indicate if the animation should run in lower-quality for preview purposes.

### 144.2.42 QCCompositionProtocolImageFilter as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard protocol names.
**Notes:** A composition that applies an effect to a source image. A conforming composition must use the input key QCCompositionInputImageKey for the source image and QCCompositionOutputImageKey for the output image. The composition can optionally use QCCompositionInputXKey to specify the X position of the center point of the effect, QCCompositionInputYKey to specify the Y position of the center point of the effect, andQCCompositionInputPreviewModeKey to indicate if the animation should run in lower-quality for preview purposes.

### 144.2.43 QCCompositionProtocolMusicVisualizer as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard protocol names.
**Notes:** A composition that acts as a visualizer for music. A conforming composition must use the input key QCCompositionInputAudioPeakKey for the instantaneous audio peak and the QCCompositionInputAudioSpectrumKey for the instantaneous audio spectrum. It can optionally use the QCCompositionInputTrackInfoKey to indicate it receives information about the current track and the QCCompositionInputTrackSignalKey to indicate the start of a new track.

Available in OS X v10.5 and later.

### 144.2.44 QCCompositionProtocolScreenSaver as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the standard protocol names.
**Notes:** A composition that can be used as a screen saver. The composition has the option to use QCCompositionInputScreenImageKey for a screenshot image of the screen that the screen saver runs on, QCCompositionInputPreviewModeKey to indicate if the animation should run in lower-quality for preview purposes, and QCCompositionOutputWebPageURLKey for a URL to open in the default web browser when screen saver exits (only allowed if screen saver password is disabled).

Available in OS X v10.5 and later.

### 144.2.45 Properties

### 144.2.46 Description as String

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The description for the composition.
**Notes:** (Read only property)

### 144.2.47 Handle as Integer

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 144.2.48 identifier as String

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The identifier for the composition.
**Example:**

```
dim r as QCCompositionRepositoryMBS = QCCompositionRepositoryMBS.sharedCompositionRepository
dim a() As QCCompositionMBS = r.allCompositions
MsgBox a(0).identifier
```

**Notes:** The unique identifier for the composition if it comes from the composition repository; "" otherwise. (Read only property)

### 144.2.49 Name as String

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name for the composition.
**Example:**

```
dim c as QCCompositionMBS = QCCompositionMBS.compositionWithFile("/System/Library/Compositions/Rollercoaster.qtz")
MsgBox c.name
```

**Notes:** (Read only property)

## 144.3 class QCCompositionRepositoryMBS

### 144.3.1 class QCCompositionRepositoryMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The system-wide Quartz Composer composition repository.
**Example:**

```
dim r as QCCompositionRepositoryMBS = QCCompositionRepositoryMBS.sharedCompositionRepository
dim a() As QCCompositionMBS = r.allCompositions
MsgBox str(a.Ubound+1)+" compositions installed"
```

**Notes:** The QCCompositionRepository class represents a system-wide centralized repository of built-in and installed Quartz Composer compositions (/Library/Compositions and
textasciitilde /Library/Compositions). The QCCompositionRepository class cannot be subclassed.

Compositions in the repository are represented by the QCComposition class. You can use the methods of the QCCompositionRepository class to fetch all compositions or only those that meet specific criteria.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr6
- MBS Xojo / Real Studio Plugins, version 15.1pr2

### 144.3.2 Methods

### 144.3.3 allCompositions as QCCompositionMBS()

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array that contains all compositions currently in the composition repository.
**Example:**

```
dim r as QCCompositionRepositoryMBS = QCCompositionRepositoryMBS.sharedCompositionRepository
dim a() As QCCompositionMBS = r.allCompositions
MsgBox str(a.Ubound+1)+" compositions installed"
```

### 144.3.4 Compositions(protocols() as String = nil, attributes as Dictionary = nil) as QCCompositionMBS()

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of compositions that match a set of criteria.
**Example:**

```
dim r as QCCompositionRepositoryMBS = QCCompositionRepositoryMBS.sharedCompositionRepository
dim a() As QCCompositionMBS = r.Compositions( array( QCCompositionMBS.QCCompositionProtocolImageFilter))
MsgBox str(a.Ubound+1)+" compositions found"
```

**Notes:** protocols: The protocols that you want compositions to conform to. Pass nil if you don,Äôt want to filter based on the protocol. You can pass any of these protocols: QCCompositionProtocolAnimation, QCCompositionProtocolImageProducer, QCCompositionProtocolImageFilter, QCCompositionProtocolImageCompositor, QCCompositionProtocolImageTransition, and QCCompositionProtocolScreenSaverRSS.
attributes: A dictionary that contains the attributes, and their associated values, that you want compositions to match. Pass nil if you don,Äôt want to filter based on the attributes. For example, you can pass any of these attributes: QCCompositionAttributeNameKey, QCCompositionAttributeDescriptionKey, QCCompositionAttributeCopyrightKey, QCCompositionAttributeBuiltInKey, and QCCompositionAttributeTimeDependentKey.

Returns an array of QCComposition objects that meet the supplied criteria.

### 144.3.5 compositionWithIdentifier(identifier as string) as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the composition that corresponds to the identifier.
**Example:**

```
dim r as QCCompositionRepositoryMBS = QCCompositionRepositoryMBS.sharedCompositionRepository
dim c as QCCompositionMBS = r.compositionWithIdentifier("/swing")
MsgBox c.Name
```

**Notes:** identifier: A string that uniquely identifies the composition to retrieve.

Returns the composition identified by the provided string, or nil if there is no composition with that identifier in the composition repository.

### 144.3.6 Constructor

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 144.3.7 loadPlugIn(file as folderitem) as Boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to load a Quartz Composer plug-in from a .plugin bundle at the specified path and returns true on success.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.plugin")
dim r as Boolean = QCCompositionRepositoryMBS.loadPlugIn(f)

if r then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

**Notes:** This method will do nothing if the plug-in was already loaded.
See also:

- 144.3.8 loadPlugIn(path as string) as Boolean 19697

### 144.3.8 loadPlugIn(path as string) as Boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Attempts to load a Quartz Composer plug-in from a .plugin bundle at the specified path and returns true on success.
**Notes:** This method will do nothing if the plug-in was already loaded.
See also:

- 144.3.7 loadPlugIn(file as folderitem) as Boolean 19697

### 144.3.9 QCCompositionRepositoryDidUpdateNotification as string

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The new of the notification which is posted whenever the list of compositions in the composition repository is updated.

### 144.3.10 sharedCompositionRepository as QCCompositionRepositoryMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the shared instance of the composition repository.

### 144.3.11 Properties

### 144.3.12 Handle as Integer

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 144.4 control QCViewControlMBS

### 144.4.1 control QCViewControlMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The control to host a QCView properly.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.1pr2

### 144.4.2 Properties

### 144.4.3 View as QCViewMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** The QCView in use by this control.
**Notes:** Please use this property to access the actual view and make your settings and load the data to render.
(Read only property)

### 144.4.4 Events

### 144.4.5 BoundsChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 144.4.6 Close

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 144.4.7 Closing

Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 144.4.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacControls Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 144.4.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 144.4.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 144.4.11 DidStartRendering

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Rendering did start notification.

### 144.4.12 DidStopRendering

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:** Rendering did stop notification.

### 144.4.13 EnableMenuItems

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 144.4.14 FocusLost

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 144.4.15 FocusReceived

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 144.4.16 FrameChanged

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 144.4.17 GotFocus

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 144.4.18 LostFocus

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 144.4.19 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 144.4.20 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.

Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 144.4.21 MouseDrag(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 144.4.22 MouseUp(x as Integer, y as Integer)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 144.4.23 Open

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 144.4.24 Opening

Plugin Version: 15.1, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 144.4.25 ScaleFactorChanged(NewFactor as Double)

MBS MacControls Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 144.4.26 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacControls Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 144.5 class QCViewMBS

### 144.5.1 class QCViewMBS

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The QCView class is a custom NSView class that loads, plays, and controls Quartz Composer compositions.
**Notes:** It is an autonomous view that is driven by an internal timer running on the main thread.

The view can be set to render a composition automatically when it is placed onscreen. The view stops rendering when it is placed offscreen. When not rendering, the view is filled with the current erase color. The rendered composition automatically synchronizes to the vertical retrace of the monitor.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.1
- MBS Xojo / Real Studio Plugins, version 15.1pr2
- Plugins 10.1
- Playing with Quartz Compositions in REALbasic

### 144.5.2 Methods

### 144.5.3 Constructor

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Quartz composer view with size 100/100 and position 0/0
**Example:**

```
dim t as new QCViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 144.5.4 Constructor(Handle as Integer) 19706
- 144.5.5 Constructor(left as Double, top as Double, width as Double, height as Double) 19706

### 144.5.4 Constructor(Handle as Integer)

MBS MacControls Plugin, Plugin Version: 10.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given QCView handle.
**Example:**

```
dim t as new QCViewMBS(0, 0, 100, 100)
dim v as new QCViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a QCView and the plugin retains this handle.
See also:


- 144.5.3 Constructor 19705
- 144.5.5 Constructor(left as Double, top as Double, width as Double, height as Double) 19706


### 144.5.5 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new Quartz composer view with the given size and position.
**Example:**

```
dim x as new QCViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:


- 144.5.3 Constructor 19705
- 144.5.4 Constructor(Handle as Integer) 19706


### 144.5.6 erase

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Clears the view using the current erase color.

### 144.5.7 getAttributes as dictionary

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the attributes of the composition associated with the renderer.
**Notes:** Returns a dictionary that contains the attributes that describe the composition, including the input and output ports of the root patch.

The dictionary can define any of the attributes that are specified by the composition attribute keys. See QCCompositionAttributeNameKey, QCCompositionAttributeDescriptionKey, and QCCompositionAttributeCopyrightKey.

The dictionary can also contain dictionaries that correspond to the keys that identify the input and output ports of the root patch of the composition. See QCPortAttributeTypeKey, QCPortAttributeNameKey, QCPortAttributeMinimumValueKey, QCPortAttributeMaximumValueKey, and QCPortAttributeMenuItemsKey.

Available in Mac OS X v10.4 and later.

### 144.5.8 inputKeys as string()

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array that contains the keys that identify the input ports of the root patch of the composition.

### 144.5.9 loadComposition(composition as QCCompositionMBS) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads a QCComposition object into the view.
**Notes:** Returns true if successful; otherwise false.
If unsuccessful, any composition that's already loaded in the view remains loaded.

### 144.5.10 loadCompositionFromData(data as MemoryBlock) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads the composition from memoryblock.
**Notes:** If unsuccessful, returns false; any composition that's already loaded in the view remains loaded.
Available in Mac OS X v10.4 and later.
See also:

- 144.5.11 loadCompositionFromData(data as string) as boolean 19708

### 144.5.11 loadCompositionFromData(data as string) as boolean

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads the composition from data string.
**Notes:** If unsuccessful, returns false; any composition that's already loaded in the view remains loaded.
Available in Mac OS X v10.4 and later.
See also:

- 144.5.10 loadCompositionFromData(data as MemoryBlock) as boolean 19707

### 144.5.12 loadCompositionFromFile(file as folderitem) as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads the composition file located at the specified path.
**Notes:** file: A folderitem that specifies the location of a Quartz Composer composition file.

If unsuccessful, returns false; any composition that's already loaded in the view remains loaded.

Available in Mac OS X v10.4 and later.
See also:

- 144.5.13 loadCompositionFromFile(filepath as string) as boolean 19708

### 144.5.13 loadCompositionFromFile(filepath as string) as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Loads the composition file located at the specified path.
**Notes:** filepath: A string that specifies the location of a Quartz Composer composition file.

If unsuccessful, returns false; any composition that's already loaded in the view remains loaded.

Available in Mac OS X v10.4 and later.
See also:

- 144.5.12 loadCompositionFromFile(file as folderitem) as boolean 19708

### 144.5.14 outputKeys as string()

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an array that contains the keys that identify the output ports of the root patch of the composition.

### 144.5.15 pauseRendering

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Pauses rendering in the view.
**Notes:** You can nest calls to this method.
Available in Mac OS X v10.5 and later.

### 144.5.16 resumeRendering

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Resumes rendering a paused composition.
**Notes:** You can nest calls to this method.
Available in Mac OS X v10.5 and later.

### 144.5.17 setValueForInputKey(value as Variant, key as string) as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the value for an input port of a composition.
**Notes:** value: The value to set for the input port. The input port must be at the root patch of the composition. The data type of the value argument must match the input port.
key: The key associated with the input port of the composition. This method throws an exception if key is invalid.

Returns false if it cannot set the value.
Available in Mac OS X v10.4 and later.

### 144.5.18 startRendering as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Starts rendering the composition that is in the view.
**Notes:** Returns false if the composition fails to start rendering; true otherwise.
Available in Mac OS X v10.4 and later.

### 144.5.19 stopRendering

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Stops rendering the composition that is in the view.
**Notes:** Available in Mac OS X v10.4 and later.

### 144.5.20 unloadComposition

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Unloads the composition from the view.
**Notes:** If necessary, this method calls stopRendering prior to unloading the composition.
Available in Mac OS X v10.5 and later.

### 144.5.21 valueForInputKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value for an input port of a composition.
**Notes:** key: The key associated with an input port for the root patch of a composition. This method throws an exception if key is invalid.

Returns the value. The data type of returned value depends on the type of the input port.
Available in Mac OS X v10.4 and later.

### 144.5.22 valueForOutputKey(key as string) as Variant

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the value for an output port of a composition.
**Notes:** key
The key associated with an output port for the root patch of a composition. This method throws an exception if key is invalid.

Returns the value as Xojo variant. The data type of returned value depends on the type of the output port.

### 144.5.23 Properties

### 144.5.24 autostartsRendering as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether the composition that is in the view starts rendering automatically when the view is put on the screen.
**Notes:** Available in Mac OS X v10.4 and later.
(Read and Write property)

### 144.5.25 eraseColor as NSColorMBS

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The color used to erase the view.
**Notes:** Available in Mac OS X v10.4 and later.
(Read and Write property)

### 144.5.26 eventForwardingMask as Integer

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The mask used to filter which types of events are forwarded from the view to the composition during rendering.
**Notes:** mask: An event filtering mask. The mask can be a combination of any of the mask constants listed in Table below (defined in NSEventMBS) or the constant NSAnyEventMask.

(Read and Write property)

### 144.5.27 isPausedRendering as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether or not the rendering in the view is paused.
**Notes:** True if the rendering is paused; otherwise false.
Available in Mac OS X v10.5 and later.
(Read only property)

| Constant | Description |
|---|---|
| NSLeftMouseDownMask | The user pressed the left button. |
| NSLeftMouseDraggedMask | The user moved the mouse with the left button down. |
| NSLeftMouseUpMask | The user released the left button. |
| NSRightMouseDownMask | The user pressed the right button. |
| NSRightMouseDraggedMask | The user moved the mouse with the right button down. |
| NSRightMouseUpMask | The user released the right button. |
| NSOtherMouseDownMask | The user pressed the middle button, or some button other than the left or right button. |
| NSOtherMouseDraggedMask | The user moved the mouse with the middle button down, or some button other than the left or right button. |
| NSOtherMouseUpMask | The user released the middle button, or some button other than the left or right button. |
| NSMouseMovedMask | The user moved the mouse without holding down a mouse button. |
| NSScrollWheelMask | The user moved the mouse scroll wheel. |
| NSKeyDownMask | The user generated a character or characters by pressing a key. |
| NSKeyUpMask | The user released a key. |
| NSFlagsChangedMask | The user pressed or released a modifier key, or toggled the Caps Lock key. |

### 144.5.28 isRendering as boolean

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Checks whether a composition is rendering in the view.
**Notes:** Returns true if a composition is rendering in the view; false otherwise.
Available in Mac OS X v10.5 and later.
(Read only property)

### 144.5.29 loadedComposition as QCCompositionMBS

MBS MacControls Plugin, Plugin Version: 15.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the composition loaded in the view.
**Notes:** (Read only property)

### 144.5.30 maxRenderingFrameRate as Double

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** The maximum rendering frame rate.
**Notes:** Pass 0.0 to specify that there is no limit.
Available in Mac OS X v10.4 and later.
(Read and Write property)

### 144.5.31 snapshotImage as NSImageMBS

MBS MacControls Plugin, Plugin Version: 10.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns an NSImage object of the current image in the view.
**Notes:** Available in Mac OS X v10.5 and later.
(Read only property)

# Chapter 145

# QuickLook

## 145.1 control DesktopQLPreviewViewControlMBS

### 145.1.1 control DesktopQLPreviewViewControlMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a QLPreviewViewMBS.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 145.1.2 Properties

### 145.1.3 View as QLPreviewViewMBS

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view this control shows.
**Notes:** (Read only property)

### 145.1.4 Events

### 145.1.5 BoundsChanged

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 145.1.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 145.1.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 145.1.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 145.1.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 145.1.10 FocusLost

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 145.1.11 FocusReceived

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 145.1.12 FrameChanged

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 145.1.13 MenuBarSelected

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 145.1.14 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 145.1.15 MouseDrag(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 145.1.16 MouseUp(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 145.1.17 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 145.1.18 ScaleFactorChanged(NewFactor as Double)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 145.1.19 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 145.2 class QLPreviewControllerMBS

### 145.2.1 class QLPreviewControllerMBS

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A specialized view controller for previewing an item.
**Notes:** A QLPreviewController can display previews for many common file types, including the following:

- iWork documents
- Microsoft Office documents
- Rich text format, or RTF, documents
- PDF files
- Images
- Text files with a uniform type identifier that conforms to the public.text type. To learn more, see Uniform type identifiers.
- Comma-separated values, or CSV, files
- 3D models in the USDZ format with both standalone and AR views for viewing the model

The list of supported common file types may change between operating system releases. In addition, you can enable previews for your own file types by implementing your own preview extension.

With editing mode, you get the PDF markup editor right into your Xojo application.

See QLPreviewViewControlMBS for desktop macOS projects.
See WinPreviewControlMBS control for Windows targets.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr2
- Adding QuickLook preview for iOS to Xojo

### 145.2.2 Methods

### 145.2.3 AddItem(item as FolderItem)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Adds an item to the list of items to show.
**Notes:** Please call reloadData if you modify the list of items.

### 145.2.4 AddItems(items() as FolderItem)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Add multiple years.
**Notes:** Please call reloadData if you modify the list of items.

### 145.2.5 canPreviewItem(file as FolderItem) as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Returns a Boolean value that indicates whether the preview controller can display an item.
**Notes:** If the system can,Äôt display an item, but you still attempt to display it, a Quick Look preview controller displays a generic error. Always check whether you can display an item before choosing to do so.

### 145.2.6 ClearItems

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Remove all items.

### 145.2.7 Constructor

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 145.2.8 Destructor

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 145.2.9 Dismiss

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 145.2.10 Items as FolderItem()

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Queries list of items to show.

### 145.2.11 Present

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 145.2.12 refreshCurrentPreviewItem

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Asks the Quick Look preview controller to recompute the display of the current preview item.
**Notes:** Quick Look recomputes the display regardless of whether the current preview item changes.

### 145.2.13 reloadData

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Asks the preview controller to reload its data from its data source.
**Notes:** Quick Look recomputes the displayed data only if the current preview item changes.

### 145.2.14 SetItems(items() as FolderItem)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Replaces the list of items.
**Notes:** Please call reloadData if you modify the list of items.

### 145.2.15 Properties

### 145.2.16 currentPreviewItem as FolderItem

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The item displaying in the Quick Look preview controller.
**Notes:** If the preview controller isn,Äôt displaying an item, this property,Äôs value is nil.
(Read only property)

### 145.2.17 currentPreviewItemIndex as Integer

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The index within the preview item navigation list of the item displaying in the Quick Look preview controller.
**Notes:** You can change which item the preview controller displays, among those in a navigation list, by setting this property,Äôs value. If the preview controller isn,Äôt displaying an item, this property,Äôs value is -1.
(Read and Write property)

### 145.2.18 Handle as Integer

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 145.2.19 Events

### 145.2.20 DidDismiss

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview was closed.

### 145.2.21 didSaveEditedCopyOfPreviewItem(Item as FolderItem, modifiedContentsFile as FolderItem)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview item,Äôs edited content was successfully saved to a copy at the given URL.
**Notes:** The platform invokes this callback with an edited copy of the preview item at modifiedContentsFile. It invokes the callback in the following scenarios:

- The editing mode of the previewItem is EditingModeCreateCopy.
- The editing mode of the previewItem is EditingModeUpdateContents and the system can,Äôt overwrite its previewItemURL. In this case, modifiedContentsURL points to a temporary file on disk containing the edited copy.
- The editing mode of the preview item is EditingModeUpdateContents and its content type doesn,Äôt match the content type of the edited version. This mismatch means that the file type of the file at modifiedContentsURL may be different from the file type of the preview item.

The platform may invoke the callback multiple times consecutively with the successive edited versions of the preview item. It typically invokes the callback once for each time the user saves their edits.

### 145.2.22 didUpdateContentsOfPreviewItem(Item as FolderItem)

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the content of a preview was updated successfully.
**Notes:** The platform invokes this callback after the preview controller successfully overwrites the file at the previewItem location with an updated file.

The platform may invoke the callback multiple times consecutively with the successive edited versions of the preview item. It typically invokes the callback once for each time the user saves their edits.

### 145.2.23 editingModeForPreviewItem(Item as FolderItem) as Integer

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Returns a value that indicates how the preview controller handles edits to the content of the previewed file.
**Notes:** Return a value that indicates whether the previewed content is editable and how Quick Look saves the edits. If you return EditingModeUpdateContents or EditingModeCreateCopy to allow edits to a preview, make sure to implement the appropriate callbacks.

The platform invokes this callback when the preview controller loads its data. The system calls it for each preview item that it passes to the data source of the preview controller.
By default, a preview controller doesn,Äôt allow edits to a preview. However, you can implement this method to allow the user to edit the previewed document, and specify the behavior for saving changes. The supported set of edits may change over time, but currently includes adding markup to images or PDFs, as well as simple edits to video files.
If you want to update the underlying file in place, return EditingModeUpdateContents, and implement both the didUpdateContentsOfPreviewItem and didSaveEditedCopyOfPreviewItem delegate methods. The Quick Look feature calls didUpdateContentsOfPreviewItem first and updates the preview item,Äôs content. If it can,Äôt update the item directly, it invokes didSaveEditedCopyOfPreviewItem and creates a copy of the preview item,Äôs content that contains the edits.
If you prefer to always save edits to a copy of the preview item,Äôs content, return EditingModeCreateCopy and implement didSaveEditedCopyOfPreviewItem.

### 145.2.24 shouldOpenURL(URL as String, Item as FolderItem) as Boolean

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Whether the preview controller should open a URL.
**Notes:** The system invokes this method when the user taps a URL link in a preview. If you return true, the Quick Look preview controller invokes the openURL method on the UIApplication object, sending it the value of the url parameter. If you return false, the system doesn,Äôt invoke the openURL method and you can do something yourself.

If you don,Äôt implement this method, it defaults to returning true.

### 145.2.25 WillDismiss

MBS iOS Plugin, Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview is about to close.

### 145.2.26 Constants

Editing Modes

| Constant | Value | Description |
|---|---|---|
| EditingModeCreateCopy | 2 | Represents the mode to create a copy of the file and perform the edits on the copy. |
| EditingModeDisabled | 0 | Represents the mode to disable edit mode for the file. |
| EditingModeUpdateContents | 1 | Represents the mode to update the file directly without creating a copy. |

## 145.3 class QLPreviewPanelMBS

### 145.3.1 class QLPreviewPanelMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The QLPreviewPanel class implements the Preview Panel - a user interface object that displays the preview of a list of items.
**Notes:** Every application only has on instance of QLPreviewPanel.

Use QLPreviewControllerMBS to do similar on iOS or WinPreviewControlMBS for previews on Windows.
Subclass of the NSPanelMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr1
- MBS Xojo Plugins, version 19.5pr7
- MBS Real Studio Plugins, version 11.2pr7
- MBS Plugins 10.3 Release Notes

### 145.3.2 Methods

### 145.3.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether this panel is available.
**Notes:** Returns true on Snow Leopard.

### 145.3.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for a new panel.

### 145.3.5 currentPreviewItem as folderitem

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The currently previewed item in the preview panel or nil if there is none.

### 145.3.6 enterFullScreenMode(screen as NSScreenMBS)

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Enters full screen mode.
**Notes:** If panel is not on-screen, the panel will go directly to full screen mode.

### 145.3.7 exitFullScreenMode

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Exits full screen mode.

### 145.3.8 refreshCurrentPreviewItem

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Asks the Preview Panel to recompute the preview of the currently previewed item.

### 145.3.9 reloadData

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Asks the Preview Panel to reload its data from its data source.
**Notes:** This method does not refresh the visible item if it has not changed.

### 145.3.10 updateController

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** Asks the Preview Panel to update its current controller.
**Notes:** The Preview Panel automatically updates its controller (by searching the responder chain) whenever the main or key window changes. Invoke updateController if the responder chain changes without explicit notice.

### 145.3.11 Properties

### 145.3.12 currentPreviewItemIndex as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The index of the currently previewed item in the preview panel or NSNotFound (-1) if there is none.
**Notes:** (Read and Write property)

### 145.3.13 inFullScreenMode as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** True if the panel is currently open and in full screen mode.
**Notes:** (Read only property)

### 145.3.14 PreviewView as QLPreviewViewMBS

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns the preview view in the panel.
**Notes:** (Read only property)

### 145.3.15 Events

### 145.3.16 didLoadPreviewItem(file as folderitem)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called after an item has been loaded.

### 145.3.17 handleEvent(e as NSEventMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** Invoked by the preview panel when it receives an event it doesn't handle.
**Notes:** Returns true if you did not handle this event.

### 145.3.18 numberOfPreviewItems as Integer

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** The event called to ask you for the number of items that the preview panel should preview.

### 145.3.19 previewItemAtIndex(index as Integer) as folderitem

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** The event is called to ask you for the item with the given index.

### 145.3.20 sourceFrameOnScreenForPreviewItem(file as folderitem) as NSRectMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** Invoked when the preview panel opens or closes to provide a zoom effect.
**Notes:** Return a zero rect if there is no origin point, this will produce a fade of the panel. The coordinates are screen based.

### 145.3.21 transitionImageForPreviewItem(file as folderitem, byref contentRect as NSRectMBS) as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** Called to ask you for the transition image for a given preview item.
**Notes:** Invoked when the preview panel opens or closes to provide a smooth transition when zooming.

contentRect: The rect within the image that actually represents the content of the document. For example, for icons the actual rect is generally smaller than the icon itself.

Return an image the panel will crossfade with when opening or closing. You can specify the actual "document" content rect in the image in contentRect.

### 145.3.22 willLoadPreviewItem(file as folderitem)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called before an item is loaded.

## 145.4 control QLPreviewViewControlMBS

### 145.4.1 control QLPreviewViewControlMBS

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a QuickLook preview view.
**Notes:** See QLPreviewViewMBS class.

See QLPreviewControllerMBS for iOS projects.
See WinPreviewControlMBS control for Windows targets.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MBS Xojo / Real Studio Plugins, version 15.0pr8

### 145.4.2 Properties

### 145.4.3 View as QLPreviewViewMBS

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The view this control shows.
**Notes:** (Read only property)

### 145.4.4 Events

### 145.4.5 BoundsChanged

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 145.4.6 Close

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 145.4.7 Closing

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 145.4.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 145.4.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 145.4.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 145.4.11 EnableMenuItems

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 145.4.12 FocusLost

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 145.4.13 FocusReceived

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 145.4.14 FrameChanged

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 145.4.15 GotFocus

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 145.4.16 LostFocus

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 145.4.17 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 145.4.18 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 145.4.19 MouseDrag(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 145.4.20 MouseUp(x as Integer, y as Integer)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 145.4.21 Open

MBS MacFrameworks Plugin, Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 145.4.22 Opening

Plugin Version: 15.0, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 145.4.23 ScaleFactorChanged(NewFactor as Double)

MBS MacFrameworks Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 145.4.24 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS MacFrameworks Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 145.5 class QLPreviewViewMBS

### 145.5.1 class QLPreviewViewMBS

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The class for using a preview view from QuickLook in Xojo.
**Notes:** If you want to show previews of files in your application, use this view. For example if you not just want to show previews of pictures, but also from Movies, PDF, Office and iWork files.
Requires Mac OS X 10.6 or newer.

You can embed this view in a CustomNSViewMBS to get more events for mouse and keyboard.

Use QLPreviewViewControlMBS to have this view as a control.
See WinPreviewControlMBS for something similar on Windows.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr8

### 145.5.2 Methods

### 145.5.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.6 or newer.

### 145.5.4 close

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Closes the receiver, releasing the current preview item.
**Notes:** Once the receiver has closed, it will no longer accept preview items.

The application is required to call close when the receiver is no longer needed if shouldCloseWithWindow is false.
The close method will be called automatically when the window closes if shouldCloseWithWindow is true.

### 145.5.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new quicklook preview view with size 100/100 and position 0/0
**Example:**

```
dim t as new QLPreviewViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 145.5.6 Constructor(Handle as Integer) 19737
- 145.5.7 Constructor(left as Double, top as Double, width as Double, height as Double) 19737
- 145.5.8 Constructor(left as Double, top as Double, width as Double, height as Double, style as Integer) 19738

### 145.5.6 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates an object based on the given QLPreviewView handle.
**Example:**

```
dim t as new QLPreviewViewMBS(0, 0, 100, 100)
dim v as new QLPreviewViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a QLPreviewView and the plugin retains this handle.
See also:

- 145.5.5 Constructor 19737
- 145.5.7 Constructor(left as Double, top as Double, width as Double, height as Double) 19737
- 145.5.8 Constructor(left as Double, top as Double, width as Double, height as Double, style as Integer) 19738

### 145.5.7 Constructor(left as Double, top as Double, width as Double, height as Double)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new QuickLook preview view with the given size and position.
**Example:**

```
dim x as new QLPreviewViewMBS(0, 0, 100, 100)
```

**Notes:** On success the handle property is not zero.
See also:

- 145.5.5 Constructor 19737
- 145.5.6 Constructor(Handle as Integer) 19737
- 145.5.8 Constructor(left as Double, top as Double, width as Double, height as Double, style as Integer) 19738

### 145.5.8 Constructor(left as Double, top as Double, width as Double, height as Double, style as Integer)

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new QuickLook preview view with the given size and position.
**Example:**

```
dim view as new QLPreviewViewMBS(0, 0, 200, 200, QLPreviewViewMBS.StyleCompact)
```

**Notes:** On success the handle property is not zero.

On Mac OS X 10.7 or later we use the new style parameter to create a Preview view with the given style.
See also:

- 145.5.5 Constructor 19737
- 145.5.6 Constructor(Handle as Integer) 19737
- 145.5.7 Constructor(left as Double, top as Double, width as Double, height as Double) 19737

### 145.5.9 refreshPreviewItem

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Asks the Preview view to recompute the preview of the currently previewed item.

### 145.5.10 Properties

### 145.5.11 autostarts as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether playback of audio/video files automatically starts.
**Notes:** (Read and Write computed property)

### 145.5.12 previewItem as folderitem

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The current visible item in the view.
**Notes:** (Read and Write computed property)

### 145.5.13 shouldCloseWithWindow as boolean

MBS MacFrameworks Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Set whether the receiver closes when its window closes.
**Notes:** See close method.
(Read and Write computed property)

### 145.5.14 Constants

Preview View Styles

| Constant | Value | Description |
|---|---|---|
| StyleCompact | 1 | Use in inspectors. |
| StyleNormal | 0 | Use in full previews. |

# Chapter 146

# QuickTime

## 146.1 class QTAudioChannelDescriptionMBS

### 146.1.1 class QTAudioChannelDescriptionMBS

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: All.

**Function:** The description for an audio channel.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr8

### 146.1.2 Properties

### 146.1.3 ChannelFlags as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Flags that control the interpretation of Coordinates.
**Notes:** (Read and Write property)

### 146.1.4 ChannelLabel as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The AudioChannelLabel that describes the channel.
**Notes:** (Read and Write property)

### 146.1.5 Coordinates(index as Integer) as Double

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** An ordered triple that specifies a precise speaker location.
**Notes:** Index from 0 to 2.
(Read and Write computed property)

### 146.1.6 Constants

Coordinates array Indexes

| Constant | Value | Description |
|---|---|---|
| kAudioChannelCoordinates_Azimuth | 0 | For spherical coordinates, 0 is front center, positive is right, negative This is measured in degrees. |
| kAudioChannelCoordinates_BackFront | 1 | For rectangulare coordinates, negative is back and positive is front. |
| kAudioChannelCoordinates_Distance | 2 | For spherical coordinates, the units are described by flags. |
| kAudioChannelCoordinates_DownUp | 2 | For rectangulare coordinates, negative is below ground level, 0 is groun and positive is above ground level. |
| kAudioChannelCoordinates_Elevation | 1 | For spherical coordinates, +90 is zenith, 0 is horizontal, -90 is nadir. measured in degrees. |
| kAudioChannelCoordinates_LeftRight | 0 | For rectangulare coordinates, negative is left and positive is right. |

Channel Coordinate Flags

| Constant | Value | Description |
|---|---|---|
| kAudioChannelFlags_AllOff | 0 | All flags off. |
| kAudioChannelFlags_Meters | 4 | Set to indicate the units are in meters, clear to indicate the uni to the unit cube or unit sphere. |
| kAudioChannelFlags_RectangularCoordinates | 1 | The channel is specified by the cartesioan coordinates of the spe This flag is mutally exclusive with kAudioChannelFlags_Spherica |
| kAudioChannelFlags_SphericalCoordinates | 2 | The channel is specified by the spherical coordinates of the spe This flag is mutally exclusive with kAudioChannelFlags_Recta nates. |

Channel Label Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLabel_Ambisonic_W | 200 | |
| kAudioChannelLabel_Ambisonic_X | 201 | |
| kAudioChannelLabel_Ambisonic_Y | 202 | |
| kAudioChannelLabel_Ambisonic_Z | 203 | |
| kAudioChannelLabel_Center | 3 | |
| kAudioChannelLabel_CenterSurround | 9 | WAVE: "Back Center" or plain "Rear Surround" |
| kAudioChannelLabel_CenterSurroundDirect | 44 | back center, non diffuse |
| kAudioChannelLabel_ClickTrack | 304 | |
| kAudioChannelLabel_DialogCentricMix | 43 | |
| kAudioChannelLabel_Discrete | 400 | |
| kAudioChannelLabel_Discrete_0 | &h10000 | |
| kAudioChannelLabel_Discrete_1 | &h10001 | |
| kAudioChannelLabel_Discrete_10 | &h1000A | |
| kAudioChannelLabel_Discrete_11 | &h1000B | |
| kAudioChannelLabel_Discrete_12 | &h1000C | |
| kAudioChannelLabel_Discrete_13 | &h1000D | |
| kAudioChannelLabel_Discrete_14 | &h1000E | |
| kAudioChannelLabel_Discrete_15 | &h1000F | |
| kAudioChannelLabel_Discrete_2 | &h10002 | |
| kAudioChannelLabel_Discrete_3 | &h10003 | |
| kAudioChannelLabel_Discrete_4 | &h10004 | |
| kAudioChannelLabel_Discrete_5 | &h10005 | |
| kAudioChannelLabel_Discrete_6 | &h10006 | |
| kAudioChannelLabel_Discrete_65535 | &h1FFFF | |
| kAudioChannelLabel_Discrete_7 | &h10007 | |
| kAudioChannelLabel_Discrete_8 | &h10008 | |
| kAudioChannelLabel_Discrete_9 | &h10009 | |
| kAudioChannelLabel_ForeignLanguage | 305 | |
| kAudioChannelLabel_Haptic | 45 | |
| kAudioChannelLabel_HeadphonesLeft | 301 | |
| kAudioChannelLabel_HeadphonesRight | 302 | |
| kAudioChannelLabel_HearingImpaired | 40 | |
| kAudioChannelLabel_Left | 1 | |
| kAudioChannelLabel_LeftCenter | 7 | |
| kAudioChannelLabel_LeftSurround | 5 | WAVE: "Back Left" |
| kAudioChannelLabel_LeftSurroundDirect | 10 | WAVE: "Side Left" |
| kAudioChannelLabel_LeftTotal | 38 | matrix encoded 4 channels |
| kAudioChannelLabel_LeftWide | 35 | |
| kAudioChannelLabel_LFE2 | 37 | |
| kAudioChannelLabel_LFEScreen | 4 | |
| kAudioChannelLabel_Mono | 42 | |
| kAudioChannelLabel_MS_Mid | 204 | |
| kAudioChannelLabel_MS_Side | 205 | |
| kAudioChannelLabel_Narration | 41 | |
| kAudioChannelLabel_RearSurroundLeft | 33 | |
| kAudioChannelLabel_RearSurroundRight | 34 | |
| kAudioChannelLabel_Right | 2 | |
| kAudioChannelLabel_RightCenter | 8 | |
| kAudioChannelLabel_RightSurround | 6 | WAVE: "Back Right" |
| kAudioChannelLabel_RightSurroundDirect | 11 | WAVE: "Side Right" |
| kAudioChannelLabel_RightTotal | 39 | matrix encoded 4 channels |
| kAudioChannelLabel_RightWide | 36 | |
| kAudioChannelLabel_TopBackCenter | 17 | |
| kAudioChannelLabel_TopBackLeft | 16 | |
| kAudioChannelLabel_TopBackRight | 18 | |
| kAudioChannelLabel_TopCenterSurround | 12 | |
| kAudioChannelLabel_Unknown | &hFFFFFFFF | Unknown or unspecified other use. |
| kAudioChannelLabel_Unused | 0 | Channel is present, but has no intended use or destinatio |

## 146.2 class QTAudioChannelLayoutMBS

### 146.2.1 class QTAudioChannelLayoutMBS

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: All.

**Function:** The class is used to specify channel layouts in files and hardware.
**Notes:** This class does not use QuickTime functions as it only wraps data structures. And it can be used with Mac App Store and AVFoundation.

Some channel abbreviations used for the constants:

- L - left
- R - right
- C - center
- Ls - left surround
- Rs - right surround
- Cs - center surround
- Rls - rear left surround
- Rrs - rear right surround
- Lw - left wide
- Rw - right wide
- Lsd - left surround direct
- Rsd - right surround direct
- Lc - left center
- Rc - right center
- Ts - top surround
- Vhl - vertical height left
- Vhc - vertical height center
- Vhr - vertical height right
- Lt - left matrix total. for matrix encoded stereo.
- Rt - right matrix total. for matrix encoded stereo.

**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr8

### 146.2.2 Methods

### 146.2.3 GetNumberOfChannels(layoutTag as UInt32) as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Function to get the number of channels out of an AudioChannelLayoutTag.
**Notes:** The low 16 bits of an AudioChannelLayoutTag gives the number of channels except for kAudioChannelLayoutTag_UseChannelDescriptions and kAudioChannelLayoutTag_UseChannelBitmap.

### 146.2.4 Memory as Memoryblock

MBS Main Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the audio channel layout as memoryblock, so you can pass it for declares.

### 146.2.5 Properties

### 146.2.6 ChannelBitmap as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** If ChannelLayoutTag is set to kAudioChannelLayoutTag_UseChannelBitmap, this field is the channel usage bitmap.
**Notes:** (Read and Write property)

### 146.2.7 ChannelLayoutTag as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The AudioChannelLayoutTag that indicates the layout.
**Notes:** (Read and Write property)

### 146.2.8 NumberChannelDescriptions as UInt32

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The number of items in the ChannelDescriptions array.
**Notes:** (Read and Write property)

### 146.2.9 ChannelDescriptions(index as Integer) as QTAudioChannelDescriptionMBS

MBS Main Plugin, Plugin Version: 11.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** An array of AudioChannelDescriptions that describe the layout.
**Notes:** Index from 0 to NumberChannelDescriptions-1.
(Read and Write computed property)

### 146.2.10 Constants

Channel Bitmap Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelBit_Center | 4 | |
| kAudioChannelBit_CenterSurround | 256 | WAVE: "Back Center" |
| kAudioChannelBit_Left | 1 | |
| kAudioChannelBit_LeftCenter | 64 | |
| kAudioChannelBit_LeftSurround | 16 | WAVE: "Back Left" |
| kAudioChannelBit_LeftSurroundDirect | 512 | WAVE: "Side Left" |
| kAudioChannelBit_LFEScreen | 8 | |
| kAudioChannelBit_Right | 2 | |
| kAudioChannelBit_RightCenter | 128 | |
| kAudioChannelBit_RightSurround | 32 | WAVE: "Back Right" |
| kAudioChannelBit_RightSurroundDirect | 1024 | WAVE: "Side Right" |
| kAudioChannelBit_TopBackCenter | 65536 | |
| kAudioChannelBit_TopBackLeft | 32768 | |
| kAudioChannelBit_TopBackRight | 131072 | |
| kAudioChannelBit_TopCenterSurround | 2048 | |
| kAudioChannelBit_VerticalHeightCenter | 8192 | WAVE: "Top Front Center" |
| kAudioChannelBit_VerticalHeightLeft | 4096 | WAVE: "Top Front Left" |
| kAudioChannelBit_VerticalHeightRight | 16384 | WAVE: "Top Front Right" |

AAC layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_AAC_3_0 | &h720003 | C L R |
| kAudioChannelLayoutTag_AAC_4_0 | &h740004 | C L R Cs |
| kAudioChannelLayoutTag_AAC_5_0 | &h780005 | C L R Ls Rs |
| kAudioChannelLayoutTag_AAC_5_1 | &h7C0006 | C L R Ls Rs Lfe |
| kAudioChannelLayoutTag_AAC_6_0 | &h8D0006 | C L R Ls Rs Cs |
| kAudioChannelLayoutTag_AAC_6_1 | &h8E0007 | C L R Ls Rs Cs Lfe |
| kAudioChannelLayoutTag_AAC_7_0 | &h8F0007 | C L R Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_AAC_7_1 | &h7F0008 | C Lc Rc L R Ls Rs Lfe |
| kAudioChannelLayoutTag_AAC_Octagonal | &h900008 | C L R Ls Rs Rls Rrs Cs |
| kAudioChannelLayoutTag_AAC_Quadraphonic | &h6C0004 | L R Ls Rs |

AC3 layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_AC3_1_0_1 | &h950002 | C LFE |
| kAudioChannelLayoutTag_AC3_2_1_1 | &h990004 | L R Cs LFE |
| kAudioChannelLayoutTag_AC3_3_0 | &h960003 | L C R |
| kAudioChannelLayoutTag_AC3_3_0_1 | &h980004 | L C R LFE |
| kAudioChannelLayoutTag_AC3_3_1 | &h970004 | L C R Cs |
| kAudioChannelLayoutTag_AC3_3_1_1 | &h9A0005 | L C R Cs LFE |

General layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_Ambisonic_B_Format | &h6B0004 | W, X, Y, Z |
| kAudioChannelLayoutTag_Binaural | &h6A0002 | Binaural stereo (left, right) |
| kAudioChannelLayoutTag_Cube | &h700008 | left, right, rear left, rear right, top left, top right, t |
| kAudioChannelLayoutTag_DiscreteInOrder | &h930000 | Needs to be ORed with the actual number of chan |
| kAudioChannelLayoutTag_Hexagonal | &h6E0006 | L R Ls Rs C Cs – 60 degree speaker separation |
| kAudioChannelLayoutTag_MatrixStereo | &h670002 | A matrix encoded stereo stream (Lt, Rt) |
| kAudioChannelLayoutTag_MidSide | &h680002 | mid/side recording |
| kAudioChannelLayoutTag_Mono | &h640001 | a standard mono stream |
| kAudioChannelLayoutTag_Octagonal | &h6F0008 | L R Ls Rs C Cs Lw Rw – 45 degree speaker separa |
| kAudioChannelLayoutTag_Pentagonal | &h6D0005 | L R Ls Rs C – 72 degree speaker separation |
| kAudioChannelLayoutTag_Quadraphonic | &h6C0004 | L R Ls Rs – 90 degree speaker separation |
| kAudioChannelLayoutTag_Stereo | &h650002 | A standard stereo stream (L R) - implied playback |
| kAudioChannelLayoutTag_StereoHeadphones | &h660002 | A standard stereo stream (L R) - implied headpho |
| kAudioChannelLayoutTag_Unknown | &hFFFF0000 | needs to be ORed with the actual number of chan |
| kAudioChannelLayoutTag_UseChannelBitmap | &h10000 | Use the bitmap to define the mapping. |
| kAudioChannelLayoutTag_UseChannelDescriptions | 0 | Use the array of AudioChannelDescriptions to defi |
| kAudioChannelLayoutTag_XY | &h690002 | Coincident mic pair (often 2 figure 8's) |

symmetrical layouts layout constants for AudioUnit usage

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_AudioUnit_4 | &h6C0004 | |
| kAudioChannelLayoutTag_AudioUnit_5 | &h6D0005 | |
| kAudioChannelLayoutTag_AudioUnit_6 | &h6E0006 | |
| kAudioChannelLayoutTag_AudioUnit_8 | &h6F0008 | |

surround-based layout constants for AudioUnit usage

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_AudioUnit_5_0 | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_AudioUnit_5_1 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_AudioUnit_6_0 | &h8B0006 | L R Ls Rs C Cs |
| kAudioChannelLayoutTag_AudioUnit_6_1 | &h7D0007 | L R C LFE Ls Rs Cs |
| kAudioChannelLayoutTag_AudioUnit_7_0 | &h8C0007 | L R Ls Rs C Rls Rrs |
| kAudioChannelLayoutTag_AudioUnit_7_0_Front | &h940007 | L R Ls Rs C Lc Rc |
| kAudioChannelLayoutTag_AudioUnit_7_1 | &h800008 | L R C LFE Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_AudioUnit_7_1_Front | &h7E0008 | L R C LFE Ls Rs Lc Rc |

DTS layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_DTS_3_1 | &hA80004 | C L R LFE |
| kAudioChannelLayoutTag_DTS_4_1 | &hA90005 | C L R Cs LFE |
| kAudioChannelLayoutTag_DTS_6_0_A | &hAA0006 | Lc Rc L R Ls Rs |
| kAudioChannelLayoutTag_DTS_6_0_B | &hAB0006 | C L R Rls Rrs Ts |
| kAudioChannelLayoutTag_DTS_6_0_C | &hAC0006 | C Cs L R Rls Rrs |
| kAudioChannelLayoutTag_DTS_6_1_A | &hAD0007 | Lc Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_DTS_6_1_B | &hAE0007 | C L R Rls Rrs Ts LFE |
| kAudioChannelLayoutTag_DTS_6_1_C | &hAF0007 | C Cs L R Rls Rrs LFE |
| kAudioChannelLayoutTag_DTS_6_1_D | &hB60007 | C L R Ls Rs LFE Cs |
| kAudioChannelLayoutTag_DTS_7_0 | &hB00007 | Lc C Rc L R Ls Rs |
| kAudioChannelLayoutTag_DTS_7_1 | &hB10008 | Lc C Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_DTS_8_0_A | &hB20008 | Lc Rc L R Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_DTS_8_0_B | &hB30008 | Lc C Rc L R Ls Cs Rs |
| kAudioChannelLayoutTag_DTS_8_1_A | &hB40009 | Lc Rc L R Ls Rs Rls Rrs LFE |
| kAudioChannelLayoutTag_DTS_8_1_B | &hB50009 | Lc C Rc L R Ls Cs Rs LFE |

DVD defined layout Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_DVD_0 | &h640001 | C (mono) |
| kAudioChannelLayoutTag_DVD_1 | &h650002 | L R |
| kAudioChannelLayoutTag_DVD_10 | &h880004 | L R C LFE |
| kAudioChannelLayoutTag_DVD_11 | &h890005 | L R C LFE Cs |
| kAudioChannelLayoutTag_DVD_12 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_13 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_DVD_14 | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_DVD_15 | &h880004 | L R C LFE |
| kAudioChannelLayoutTag_DVD_16 | &h890005 | L R C LFE Cs |
| kAudioChannelLayoutTag_DVD_17 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_18 | &h8A0005 | L R Ls Rs LFE |
| kAudioChannelLayoutTag_DVD_19 | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_DVD_2 | &h830003 | L R Cs |
| kAudioChannelLayoutTag_DVD_20 | &h7A0006 | L R Ls Rs C LFE |
| kAudioChannelLayoutTag_DVD_3 | &h840004 | L R Ls Rs |
| kAudioChannelLayoutTag_DVD_4 | &h850003 | L R LFE |
| kAudioChannelLayoutTag_DVD_5 | &h860004 | L R LFE Cs |
| kAudioChannelLayoutTag_DVD_6 | &h870005 | L R LFE Ls Rs |
| kAudioChannelLayoutTag_DVD_7 | &h710003 | L R C |
| kAudioChannelLayoutTag_DVD_8 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_DVD_9 | &h750005 | L R C Ls Rs |

EAC layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_EAC3_6_1_A | &h9D0007 | L C R Ls Rs LFE Cs |
| kAudioChannelLayoutTag_EAC3_6_1_B | &h9E0007 | L C R Ls Rs LFE Ts |
| kAudioChannelLayoutTag_EAC3_6_1_C | &h9F0007 | L C R Ls Rs LFE Vhc |
| kAudioChannelLayoutTag_EAC3_7_1_A | &hA00008 | L C R Ls Rs LFE Rls Rrs |
| kAudioChannelLayoutTag_EAC3_7_1_B | &hA10008 | L C R Ls Rs LFE Lc Rc |
| kAudioChannelLayoutTag_EAC3_7_1_C | &hA20008 | L C R Ls Rs LFE Lsd Rsd |
| kAudioChannelLayoutTag_EAC3_7_1_D | &hA30008 | L C R Ls Rs LFE Lw Rw |
| kAudioChannelLayoutTag_EAC3_7_1_E | &hA40008 | L C R Ls Rs LFE Vhl Vhr |
| kAudioChannelLayoutTag_EAC3_7_1_F | &hA50008 | L C R Ls Rs LFE Cs Ts |
| kAudioChannelLayoutTag_EAC3_7_1_G | &hA60008 | L C R Ls Rs LFE Cs Vhc |
| kAudioChannelLayoutTag_EAC3_7_1_H | &hA70008 | L C R Ls Rs LFE Ts Vhc |
| kAudioChannelLayoutTag_EAC_6_0_A | &h9B0006 | L C R Ls Rs Cs |
| kAudioChannelLayoutTag_EAC_7_0_A | &h9C0007 | L C R Ls Rs Rls Rrs |

MPEG defined layout Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_Emagic_Default_7_1 | &h810008 | L R Ls Rs C LFE Lc Rc |
| kAudioChannelLayoutTag_MPEG_1_0 | &h640001 | C |
| kAudioChannelLayoutTag_MPEG_2_0 | &h650002 | L R |
| kAudioChannelLayoutTag_MPEG_3_0_A | &h710003 | L R C |
| kAudioChannelLayoutTag_MPEG_3_0_B | &h720003 | C L R |
| kAudioChannelLayoutTag_MPEG_4_0_A | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_MPEG_4_0_B | &h740004 | C L R Cs |
| kAudioChannelLayoutTag_MPEG_5_0_A | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_0_B | &h760005 | L R Ls Rs C |
| kAudioChannelLayoutTag_MPEG_5_0_C | &h770005 | L C R Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_0_D | &h780005 | C L R Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_1_A | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_MPEG_5_1_B | &h7A0006 | L R Ls Rs C LFE |
| kAudioChannelLayoutTag_MPEG_5_1_C | &h7B0006 | L C R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_5_1_D | &h7C0006 | C L R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_6_1_A | &h7D0007 | L R C LFE Ls Rs Cs |
| kAudioChannelLayoutTag_MPEG_7_1_A | &h7E0008 | L R C LFE Ls Rs Lc Rc |
| kAudioChannelLayoutTag_MPEG_7_1_B | &h7F0008 | C Lc Rc L R Ls Rs LFE |
| kAudioChannelLayoutTag_MPEG_7_1_C | &h800008 | L R C LFE Ls Rs Rls Rrs |
| kAudioChannelLayoutTag_SMPTE_DTV | &h820008 | L R C LFE Ls Rs Lt Rt (kAudioChannelLayoutTag_ITU_5_1 plus a matrix en |

ITU defined layout Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_ITU_1_0 | &h640001 | C |
| kAudioChannelLayoutTag_ITU_2_0 | &h650002 | L R |
| kAudioChannelLayoutTag_ITU_2_1 | &h830003 | L R Cs |
| kAudioChannelLayoutTag_ITU_2_2 | &h840004 | L R Ls Rs |
| kAudioChannelLayoutTag_ITU_3_0 | &h710003 | L R C |
| kAudioChannelLayoutTag_ITU_3_1 | &h730004 | L R C Cs |
| kAudioChannelLayoutTag_ITU_3_2 | &h750005 | L R C Ls Rs |
| kAudioChannelLayoutTag_ITU_3_2_1 | &h790006 | L R C LFE Ls Rs |
| kAudioChannelLayoutTag_ITU_3_4_1 | &h800008 | L R C LFE Ls Rs Rls Rrs |

TMH layout constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelLayoutTag_TMH_10_2_full | &h920015 | TMH_10_2_std plus: Lc Rc HI VI Haptic |
| kAudioChannelLayoutTag_TMH_10_2_std | &h910010 | L R C Vhc Lsd Rsd Ls Rs Vhl Vhr Lw Rw Csd Cs LFE1 LF |

## 146.3 class QTSoundStreamMBS

### 146.3.1 class QTSoundStreamMBS

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** A class for the QTSoundOutput component which outputs sound using a given AudioUnit.
**Notes:** Not supported for 64 bit targets.
**Blog Entries**

- MBS Real Studio Plugins, version 11.4pr2

### 146.3.2 Methods

### 146.3.3 AttachToAudioUnitComponent(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Attaches the Sound Output component to a given Audio Unit component.
**Notes:** Returns the error code. (0 for success)
You may call AudioUnitInitialize and AudioOutputUnitStart after this to start the output unit.
See also:

- 146.3.4 AttachToAudioUnitComponent(componenthandle as Integer, element as Integer) as Integer 19751

### 146.3.4 AttachToAudioUnitComponent(componenthandle as Integer, element as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Attaches the Sound Output component to a given Audio Unit component.
**Notes:** Returns the error code. (0 for success)
You may call AudioUnitInitialize and AudioOutputUnitStart after this to start the output unit.
See also:

- 146.3.3 AttachToAudioUnitComponent(componenthandle as Integer) as Integer 19751

### 146.3.5 AudioOutputUnitStart(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Starts the output unit.
**Notes:** Returns a Mac OS errro code (0 for success).

### 146.3.6 AudioUnitInitialize(componenthandle as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Initializes the output unit.
**Notes:** Returns a Mac OS errro code (0 for success).

### 146.3.7 closeComponent

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Closes the Sound Output component.

### 146.3.8 InitComponent

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Initializes the sound output component.
**Notes:** Allocates memory for example.

### 146.3.9 OpenComponent

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Opens the SoundOutput component.

### 146.3.10 OpenDefaultAudioUnitOutputComponent as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Opens the default audio unit component and returns the handle.
**Notes:** Returns 0 on any error.
The component is only available on Mac OS X, so this function will return 0 on all other platforms.

### 146.3.11 Properties

### 146.3.12 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The component handle.
**Notes:** (Read and Write property)

### 146.3.13 IsOpen as Boolean

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Whether the sound output component has been opened yet.
**Notes:** Returns false on any error.
(Read only property)

### 146.3.14 IsStreamActive as Boolean

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** True in case the stream is active.
**Notes:** Returns false on any error.
(Read only property)

### 146.3.15 PostsStatusNotifications as Boolean

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Whether status notificiations should be posted.
**Notes:** (Read and Write property)

### 146.3.16 Release as Boolean

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** Whether the constructor should release the handle.
**Notes:** (Read and Write property)

### 146.3.17 SoundOutputComponentHandle as Integer

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: All.

**Function:** The handle of the used component instance.
**Notes:** (Read only property)

# Chapter 147

# RabbitMQ

## 147.1 class RabbitMQBasicPropertiesMBS

### 147.1.1 class RabbitMQBasicPropertiesMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The basic properties class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.1.2 Methods

### 147.1.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 147.1.4 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 147.1.5 Properties

### 147.1.6 AppId as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The app-id.
**Notes:** (Read and Write property)

### 147.1.7 ClusterId as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cluster ID.
**Notes:** (Read and Write property)

### 147.1.8 ContentEncoding as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The content-encoding.
**Notes:** (Read and Write property)

### 147.1.9 ContentType as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The content-type.
**Notes:** (Read and Write property)

### 147.1.10 CorrelationId as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The correlation-id.
**Notes:** (Read and Write property)

### 147.1.11 DeliveryMode as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delivery-mode.
**Notes:** (Read and Write property)

### 147.1.12 Expiration as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The expiration.
**Notes:** (Read and Write property)

### 147.1.13 Flags as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Bit-mask of set fields.
**Notes:** (Read and Write property)

### 147.1.14 HasAppId as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagAppId.
**Notes:** (Read and Write property)

### 147.1.15 HasClusterId as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagClusterId.
**Notes:** (Read and Write property)

### 147.1.16 HasContentEncoding as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagContentEncoding.
**Notes:** (Read and Write property)

### 147.1.17 HasContentType as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagContentType.
**Notes:** (Read and Write property)

### 147.1.18 HasCorrelationId as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagCorrelationId.
**Notes:** (Read and Write property)

### 147.1.19 HasDeliveryMode as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagDeliveryMode.
**Notes:** (Read and Write property)

### 147.1.20 HasExpiration as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagExpiration.
**Notes:** (Read and Write property)

### 147.1.21 HasHeaders as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagHeaders.
**Notes:** (Read and Write property)

### 147.1.22 HasMessageId as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagMessageId.
**Notes:** (Read and Write property)

### 147.1.23 HasPriority as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagPriority.
**Notes:** (Read and Write property)

### 147.1.24 HasReplyTo as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagReplyTo.
**Notes:** (Read and Write property)

### 147.1.25 HasTimestamp as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagTimestamp.
**Notes:** (Read and Write property)

### 147.1.26 HasType as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagType.
**Notes:** (Read and Write property)

### 147.1.27 HasUserId as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience property to set/get Flags with kFlagUserId.
**Notes:** (Read and Write property)

### 147.1.28 Headers as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Dictionary with headers.
**Notes:** (Read and Write property)

### 147.1.29 MessageId as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The message ID.
**Notes:** (Read and Write property)

### 147.1.30 Priority as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The priority.
**Notes:** (Read and Write property)

### 147.1.31 ReplyTo as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The reply to field.
**Notes:** (Read and Write property)

### 147.1.32 Timestamp as UInt64

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The timestamp.
**Notes:** (Read and Write property)

### 147.1.33 Type as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The type field.
**Notes:** (Read and Write property)

### 147.1.34 UserId as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The user id.
**Notes:** (Read and Write property)

### 147.1.35 Constants

Delivery modes

| Constant | Value | Description |
|---|---|---|
| kDeliveryNonPersistent | 1 | Non-persistent message. |
| kDeliveryPersistent | 2 | Persistent message |

Field flags

| Constant | Value | Description |
|---|---|---|
| kFlagAppId | 8 | AppID field is set. |
| kFlagClusterId | 4 | ClusterId field is set. |
| kFlagContentEncoding | 16384 | ContentEncoding field is set. |
| kFlagContentType | 32768 | ContentType field is set. |
| kFlagCorrelationId | 1024 | CorrelationId field is set. |
| kFlagDeliveryMode | 4096 | DeliveryMode field is set. |
| kFlagExpiration | 256 | Expiration field is set. |
| kFlagHeaders | 8192 | Headers field is set. |
| kFlagMessageId | 128 | MessageId field is set. |
| kFlagPriority | 2048 | Priority field is set. |
| kFlagReplyTo | 512 | ReplyTo field is set. |
| kFlagTimestamp | 64 | Timestamp field is set. |
| kFlagType | 32 | Type field is set. |
| kFlagUserId | 16 | UserId field is set. |

## 147.2 class RabbitMQConnectionInfoMBS

### 147.2.1 class RabbitMQConnectionInfoMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class ot parse an URL.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.2.2 Methods

### 147.2.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Sets default values for properties.

The default values are:

- user: "guest"
- password: "guest"
- host: "localhost"
- vhost: "/"
- port: 5672

See also:

- 147.2.4 Constructor(URL as String) 19762

### 147.2.4 Constructor(URL as String)

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parse a connection URL.
**Notes:** An amqp connection url takes the form:

amqp:// [ $ USERNAME [ :$ PASSWORD ] @ ] $ HOST [ :$ PORT ] / [ $ VHOST ]

Examples:
amqp://guest:guest@localhost:5672//
amqp://guest:guest@localhost/myvhost

Any missing parts of the URL will be set to the defaults specified in other Constructor. For amqps: URLs the default port will be set to 5671 instead of 5672 for non-SSL URLs.

We raise UnsupportedOperationException if parsing failes.
See also:

- 147.2.3 Constructor 19762

### 147.2.5 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 147.2.6 Properties

### 147.2.7 Host as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The hostname of the broker.
**Notes:** (Read only property)

### 147.2.8 Password as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The password to authenticate with the broker.
**Notes:** default on most brokers is 'guest'
(Read only property)

### 147.2.9 Port as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The port that the broker is listening on.
**Notes:** default on most brokers is 5672.
(Read only property)

### 147.2.10 SSL as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to use SSL.
**Notes:** (Read only property)

### 147.2.11 User as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The username to authenticate with the broker.
**Notes:** default on most broker is 'guest'
(Read only property)

### 147.2.12 VHost as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The virtual host on the broker to connect to.
**Notes:** a good default is "/"
(Read only property)

## 147.3 class RabbitMQConnectionMBS

### 147.3.1 class RabbitMQConnectionMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a RabbitMQ connection to a server.
**Notes:** Our plugin converts from dictionary/array/variant to/from the encoded representation used in MQ automatically.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.3.2 Methods

### 147.3.3 BasicAck(channel as Integer, deliveryTag as UInt64, multiple as Boolean = false) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Acknowledges a message.
**Notes:** Does a basic.ack on a received message.

channel: the channel identifier
deliveryTag: the delivery tag of the message to be ack'd.
multiple: if true, ack all messages up to this delivery tag, if false ack only this delivery tag.

Returns error code, 0 on success, 0 >on failing to send the ack to the broker. this will not indicate failure if something goes wrong on the broker.

### 147.3.4 BasicCancel(channel as Integer, consumerTag as String) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Cancels a channel.

### 147.3.5 BasicConsume(channel as Integer, queue as String, consumerTag as String, noLocal as Boolean, noAck as Boolean, exclusive as Boolean, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Basic consume.

### 147.3.6 BasicGet(channel as Integer, queue as String, noAck as Boolean) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do a basic.get.
**Notes:** Synchronously polls the broker for a message in a queue, and retrieves the message if a message is in the queue.

channel: the channel identifier to use
queue: the queue name to retrieve from
noAck: if true the message is automatically ack'ed if false BasicAck() should be called once the message retrieved has been processed

Returns RabbitMQRPCReplyMBS object indicating success or failure

### 147.3.7 BasicNAck(channel as Integer, deliveryTag as UInt64, multiple as Boolean = false, requeue as Boolean = false) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do a basic.nack.
**Notes:** Actively reject a message, this has the same effect as BasicReject() however, BasicNAck() can negatively acknowledge multiple messages with one call much like BasicAck() can acknowledge mutliple messages with
one call.

channel: the channel identifier
deliveryTag the delivery tag of the message to reject
multiple: if set to 1 negatively acknowledge all unacknowledged messages on this channel.
requeue: indicate to the broker whether it should requeue the message or dead-letter it.

Returns error code, kStatusOK on success, an status constant value otherwise.

### 147.3.8 BasicPublish(channel as Integer, exchange as String, routingKey as String, mandatory as Boolean, immediate as Boolean, properties as RabbitMQBasicPropertiesMBS, body as String) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Publish a message to the broker.
**Notes:** Publish a message on an exchange with a routing key.

Note that at the AMQ protocol level basic.publish is an async method:
this means error conditions that occur on the broker (such as publishing to
a non-existent exchange) will not be reflected in the return value of this
function.

channel: the channel identifier
exchange: the exchange on the broker to publish to
routingKey: the routing key to use when publishing the message mandatory indicate to the broker that the message MUST be routed to a queue. If the broker cannot do this it should respond with a basic.return method.
immediate: indicate to the broker that the message MUST be delivered to a consumer immediately. If the broker cannot do this it should respond with a basic.return method.
properties: the properties associated with the message
body: the message body

kStatusOK on success, other kStatus values on failure. Note that basic.publish is an async method, the return value from this function only indicates that the message data was successfully transmitted to the broker. It does not indicate failures that occur on the broker, such as publishing to a non-existent exchange.

Possible error values:

- kStatusTimerFailure: system timer facility returned an error the message was not sent.
- kStatusHeartbeatTimeout: connection timed out waiting for a heartbeat from the broker. The message was not sent.
- kStatusNoMemory: memory allocation failed. The message was not sent.
- kStatusTableTooBig: a table in the properties was too large to fit in a single frame. Message was not sent.
- kStatusConnectionClosed: the connection was closed
- kStatusSSLError: a SSL error occurred.
- kStatusTCPError: a TCP error occurred. errno or WSAGetLastError() may provide more information.

### 147.3.9 BasicQOS(channel as Integer, prefetchSize as Integer, prefetchCount as Integer, isGlobal as boolean) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Basic QOS.

### 147.3.10 BasicRecover(channel as Integer, requeue as Boolean) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Recover a channel.

### 147.3.11 BasicReject(channel as Integer, deliveryTag as UInt64, requeue as Boolean = false) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do a basic.reject.
**Notes:** Actively reject a message that has been delivered

channel: the channel identifier
deliveryTag the delivery tag of the message to reject
requeue: indicate to the broker whether it should requeue the message or just discard it.

Returns error code, 0 on success, 0 >on failing to send the reject method to the broker.
This will not indicate failure if something goes wrong on the broker.

### 147.3.12 ChannelClose(Channel as Integer, Code as Integer = 200) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Closes an channel.
**Notes:** channel: the channel identifier
code: the reason for closing the channel, kReplySuccess is a good default.

Returns RabbitMQRPCReplyMBS object indicating success or failure

### 147.3.13 ChannelFlow(channel as Integer, active as Boolean) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Channel Flow control.

### 147.3.14 ChannelOpen(Channel as Integer) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Opens a channel.

### 147.3.15 ConfirmSelect(channel as Integer) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Confirm select.

### 147.3.16 ConnectionClose(Code as Integer = 200) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Closes a connection.

### 147.3.17 ConstantIsHardError(constantNumber as Integer) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks to see if a constant is a hard error.
**Notes:** A hard error occurs when something severe enough happens that the connection must be closed.

Returns true if its a hard error, false otherwise.

### 147.3.18 ConstantName(constantNumber as Integer) as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get constant name string from constant.

### 147.3.19 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Allocate and initialize a new connection object.

### 147.3.20 ConsumeMessage(byref envelope as RabbitMQEnvelopeMBS, timeoutValue as double = 30, flags as Integer = 0) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Wait for and consume a message.
**Notes:** Waits for a basic.deliver method on any channel, upon receipt of basic.deliver it reads that message, and returns. If any other method is received before basic.deliver, this function will return an RabbitMQRPCReplyMBS with ReplyType = ResponseTypeLibraryException, and Reply.LibraryError = kStatusUnexpectedState. The caller should then call WaitFrame() to read this frame and take appropriate action.

This function should be used after starting a consumer with the BasicConsume() function

Envelope receives new object.
Timeout is in seconds.
flags: pass in 0. Currently unused.

Returns RabbitMQRPCReplyMBS, which may contain error information.
Type of the object is RabbitMQRPCReplyMBS.ResponseTypeNormal on success.

### 147.3.21 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.
**Notes:** Closes the entire connection.

Implicitly closes all channels and informs the broker the connection
is being closed, after receiving acknowledgment from the broker it closes
the socket.

### 147.3.22 ErrorString(ErrorCode as Integer) as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the error string for the given error code.
**Notes:** Get an error string associated with an error code.

### 147.3.23 ExchangeBind(channel as Integer, destination as String, source as String, routingKey as String, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Binds an exchange.

### 147.3.24 ExchangeDeclare(channel as Integer, exchange as String, type as String, passive as Boolean, durable as Boolean, autoDelete as Boolean, internal as Boolean, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Declare an exchange.

### 147.3.25 ExchangeDelete(channel as Integer, exchange as String, ifUsed as Boolean) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Deletes an exchange.

### 147.3.26 ExchangeUnbind(channel as Integer, destination as String, source as String, routingKey as String, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Unbinds an exchange.

### 147.3.27 LoginExternal(vhost as String, channelMax as Integer, frameMax as Integer, heartbeat as Integer, Identity as String, properties as Dictionary = nil) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Login with external SASL.
**Notes:** Login to the broker passing an optional properties table.

vhost: the virtual host to connect to on the broker. The default on most brokers is "/".
channelMax: the limit for the number of channels for the connection.
0 means no limit, and is a good default (kDefaultMaxChannels) Note that the maximum number of channels the protocol supports is 65535 (2^16, with the 0-channel reserved). The server can set a lower channelMax and then the client will use the lowest of the two.
frameMax: the maximum size of an AMQP frame ont he wire to request of the broker for this connection. 4096 is the minimum size, 2^31-1 is the maximum, a good default is 131072 (128KB), or kDefaultFrameSize.
heartbeat: the number of seconds between heartbeat frame to request of the broker. A value of 0 disables heartbeats. Note rabbitmq-c only has partial support for hearts, as of v0.4.0 heartbeats are only serviced during BasicPublish(), and SimpleWaitFrame() properties a table of properties to send the broker.
sasl_method the SASL method to authenticate with the properties.

Returns error code indicating success or failure via RabbitMQRPCReplyMBS object.

- Reply.Type = kResponseNormal. Login completed successfully
- Reply.Type = kResponseLibraryException. In most cases errors from the broker when logging in will be represented by the broker closing the socket. In this case r.libraryError will be set to kStatusConnectionClosed. This error can represent a number of error conditions including: invalid vhost, authentication failure.
- Reply.Type = kResponseServerException. The broker returned an exception:
- If Reply.MethodId = kChannelCloseMethod a channel exception occurred, check decoded properties to see details of the exception. The client should SendMethod() a kChannelCloseOkMethod. The channel must be re-opened before it can be used again. Any resources associated with the channel (auto-delete exchanges, auto-delete queues, consumers) are invalid and must be recreated before attempting to use them again.
- If Reply.MethodId = kConnectionCloseMethod a connection exception occurred, check decoded properties to see details of the exception. The client SendMethod() a kConnectionCloseOkMethod and disconnect from the broker.

### 147.3.28 LoginPlain(vhost as String, channelMax as Integer, frameMax as Integer, heartbeat as Integer, Username as String, Password as String, properties as Dictionary = nil) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Login with plain SASL.
**Notes:** Login to the broker passing an optional properties table.

vhost: the virtual host to connect to on the broker. The default on most brokers is "/".
channelMax: the limit for the number of channels for the connection.
0 means no limit, and is a good default (kDefaultMaxChannels) Note that the maximum number of channels the protocol supports is 65535 (2^16, with the 0-channel reserved). The server can set a lower channelMax and then the client will use the lowest of the two.
frameMax: the maximum size of an AMQP frame ont he wire to request of the broker for this connection. 4096 is the minimum size, 2^31-1 is the maximum, a good default is 131072 (128KB), or kDefaultFrameSize.
heartbeat: the number of seconds between heartbeat frame to request of the broker. A value of 0 disables heartbeats. Note rabbitmq-c only has partial support for hearts, as of v0.4.0 heartbeats are only serviced during BasicPublish(), and SimpleWaitFrame() properties a table of properties to send the broker.
sasl_method the SASL method to authenticate with the properties.

Returns error code indicating success or failure via RabbitMQRPCReplyMBS object.

- Reply.Type = kResponseNormal. Login completed successfully
- Reply.Type = kResponseLibraryException. In most cases errors from the broker when logging in will be represented by the broker closing the socket. In this case r.libraryError will be set to kStatusConnectionClosed. This error can represent a number of error conditions including: invalid vhost, authentication failure.
- Reply.Type = kResponseServerException. The broker returned an exception:
- If Reply.MethodId = kChannelCloseMethod a channel exception occurred, check decoded properties to see details of the exception. The client should SendMethod() a kChannelCloseOkMethod. The channel must be re-opened before it can be used again. Any resources associated with the channel (auto-delete exchanges, auto-delete queues, consumers) are invalid and must be recreated before attempting to use them again.
- If Reply.MethodId = kConnectionCloseMethod a connection exception occurred, check decoded properties to see details of the exception. The client SendMethod() a kConnectionCloseOkMethod and disconnect from the broker.

### 147.3.29 MaybeReleaseBuffers

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Release connection owned memory.
**Notes:** Release memory owned by the connection object related to any channel, allowing reuse by the library. Use of any memory returned by the library before this function is called with result in undefined behavior.

Internally rabbitmq-c tries to reuse memory when possible. As a result its possible calling this function may not have a noticeable effect on memory usage.

### 147.3.30 MaybeReleaseBuffersOnChannel(channel as Integer)

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Release connection owned memory related to a channel.
**Notes:** Release memory owned by the amqp_connection_state_t object related to the specified channel, allowing reuse by the library. Use of any memory returned the library for a specific channel will result in undefined behavior.

Internally rabbitmq-c tries to reuse memory when possible. As a result its possible calling this function may not have a noticeable effect on memory usage.

### 147.3.31 MethodHasContent(constantNumber as Integer) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks whether such a method has content.
**Notes:** Returns true if content is expected.

### 147.3.32 MethodName(constantNumber as Integer) as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get method name string from method number.
**Notes:** Returns method name string.

### 147.3.33 NewTCPSocket(UseSSL as boolean = false) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates new socket.
**Notes:** Optional uses OpenSSL to create a SSL socket if UseSSL is passed with value true.

Returns true on success.

### 147.3.34 OpenSocket(Host as String, Port as Integer, TimeOut as Double = 10) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Open a socket connection.
**Notes:** This function opens a socket connection returned created with NewTCPSocket(). This function should be called after setting socket options.
Returns error code.

host: Connect to this host.
port: Connect on this remote port.
timeout: Max allowed time to spent on opening.

### 147.3.35 QueueBind(channel as Integer, queue as String, exchange as String, routingKey as String, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Binds an exchange.

### 147.3.36 QueueDeclare(channel as Integer, queue as String, passive as Boolean, durable as Boolean, exclusive as Boolean, autoDelete as Boolean, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Declare a queue.

### 147.3.37 QueueDelete(channel as Integer, queue as String, ifUnused as Boolean, ifEmpty as Boolean) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Delete a queue.

### 147.3.38 QueuePurge(channel as Integer, queue as String) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Purge a queue.

### 147.3.39 QueueUnbind(channel as Integer, queue as String, exchange as String, routingKey as String, arguments as Dictionary) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Unbind a queue.

### 147.3.40 ReadMessage(channel as Integer, byref message as RabbitMQMessageMBS, flags as Integer = 0) as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Reads the next message on a channel
**Notes:** Reads a complete message (header + body) on a specified channel. This function is intended to be used with amqp_basic_get() or when an AMQP_BASIC_DELIVERY_METHOD method is received.

channel: the channel on which to read the message from
message: The parameter receiving the message.
flags: currently unused.

Returns RabbitMQRPCReplyMBS, which may contain error information.
Type of the object is RabbitMQRPCReplyMBS.ResponseTypeNormal on success.

### 147.3.41 SendHeader as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Send initial AMQP header to the broker.
**Notes:** This is a low level function intended for those who want to interact with the broker at a very low level. Use of this function without understanding what it does will result in AMQP protocol errors.

This function sends the AMQP protocol header to the broker.

Returns error code, kStatusOK on success, a negative value on failure. Possible error codes:

- kStatusConnectionClosed: the connection to the broker was closed.
- kStatusSocketError: a socket error occurred. It is likely the underlying socket has been closed. errno or WSAGetLastError() may provide further information.
- kStatusSSLError: a SSL error occurred. The connection to the broker was closed.

### 147.3.42 SetCACert(File as FolderItem) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets CACert file with root certificates.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.43 SetCACert(Path as String) as Boolean 19777

### 147.3.43 SetCACert(Path as String) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets CACert file with root certificates.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.42 SetCACert(File as FolderItem) as Boolean 19777

### 147.3.44 SetKey(CertFile as FolderItem, KeyFile as FolderItem) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets SSL key with certificate file path and key file path.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.45 SetKey(CertPath as String, KeyPath as String) as Boolean 19777

### 147.3.45 SetKey(CertPath as String, KeyPath as String) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets SSL key with certificate file path and key file path.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.44 SetKey(CertFile as FolderItem, KeyFile as FolderItem) as Boolean 19777

### 147.3.46 SetKeyData(CertFile as FolderItem, KeyData as String) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets SSL key with certificate file and key data as PEM.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.47 SetKeyData(CertPath as String, KeyData as String) as Boolean 19778

### 147.3.47 SetKeyData(CertPath as String, KeyData as String) as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets SSL key with certificate file and key data as PEM.
**Notes:** Returns true on success and false on failure.
See also:

- 147.3.46 SetKeyData(CertFile as FolderItem, KeyData as String) as Boolean 19778

### 147.3.48 SimpleWaitFrame(byref Frame as RabbitMQFrameMBS, timeoutValue as double = 30) as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Read a single frame with a timeout.
**Notes:** Waits for the next frame to be read from the broker, up to a timespan specified by tv. The function will return kStatusTimeout if the timeout is reached. The tv value is not modified by the function.

The library may buffer frames. When an connection object has frames buffered calling SimpleWaitFrame_noblock() will return an frame without entering a blocking read(). You can test to see if an connection object has frames buffered by calling the FramesEnqueued() function.

The library has a socket read buffer. When there is data in an connection read buffer, SimpleWaitFrame() may return an frame without entering a blocking read(). You can test to see if an connection object has data in its read buffer by calling the DataInBuffer() function.

This function does not return heartbeat frames. When enabled, heartbeating is handed internally internally by the library.

Frame: receives decoded frame the frame
timeoutValue: the maximum time to wait for a frame to be read in seconds. Setting to 0 will do a non-blocking read.

Returns kStatusOK on success. An kStatus value is returned otherwise. Possible errors include:

- kStatusTimeout the timeout was reached while waiting for a frame from the broker.
- kStatusInvalidParameter the tv parameter contains an invalid value.
- kStatusNoMemory failure in allocating memory. The library is likely in an indeterminate state making recovery unlikely. Client should note the error and terminate the application
- kStatusBadAMQPData bad AMQP data was received. The connection should be shutdown immediately
- kStatusUnknownMethod: an unknown method was received from the broker. This is likely a protocol error and the connection should be shutdown immediately
- kStatusUnknownClass: a properties frame with an unknown class was received from the broker. This is likely a protocol error and the connection should be shutdown immediately
- kStatusHeartbeatTimeout: timed out while waiting for heartbeat from the broker. The connection has been closed.
- kStatusTimerFailure: system timer indicated failure.
- kStatusSocketError: a socket error occurred. The connection has been closed
- kStatusSSLError: a SSL socket error occurred. The connection has been closed.

### 147.3.49 TXCommit(channel as Integer) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Commit.

### 147.3.50 TXRollback(channel as Integer) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Rollback.

### 147.3.51 TXSelect(channel as Integer) as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Select.

### 147.3.52 Properties

### 147.3.53 ClientProperties as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the client properties table
**Notes:** Get the properties that were passed to the broker on connection.
(Read only property)

### 147.3.54 DataInBuffer as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Check to see if there is data left in the receive buffer.
**Notes:** Can be used to see if there is data still in the buffer, if so calling SimpleWaitFrame will not immediately enter a blocking read.

Returns true if there is data in the recieve buffer, false otherwise.
(Read only property)

### 147.3.55 FramesEnqueued as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks to see if there are any incoming frames ready to be read.
**Notes:** Checks to see if there are any frame objects buffered by the connection object. Having one or more frames buffered means that SimpleWaitFrame() will return a frame without potentially blocking on a read() call.

Returns true if there are frames enqueued, false otherwise.
(Read only property)

### 147.3.56 Handle as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 147.3.57 HandshakeTimeout as Double

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get or set the login handshake timeout.
**Notes:** Login performs the login handshake with the broker. This function sets the timeout associated with completing this operation from the client side.

The timeout must be set before Login is called to change from the default timeout.

Note that the RabbitMQ broker has a configurable timeout for completing the login handshake, the default is 10 seconds. rabbitmq-c has a default of 12 seconds.
(Read and Write property)

### 147.3.58 Heartbeat as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the number of seconds between heartbeats of the connection.
**Notes:** The number of seconds between heartbeats is set when connection negotiation takes place in Login.

Returns the number of seconds between heartbeats.
(Read only property)

### 147.3.59 MaximumChannel as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the maximum number of channels the connection can handle.
**Notes:** The maximum number of channels is set when connection negotiation takes place in Login.

Returns the maximum number of channels. 0 if there is no limit.
(Read only property)

### 147.3.60 MaximumFrameSize as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the maximum size of an frame the connection can handle.
**Notes:** The maximum size of an frame is set when connection negotiation takes place in Login.

Return the maximum size in bytes of an frame.
(Read only property)

### 147.3.61 RPCReply as RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the last global RPCReply
**Notes:** The API methods corresponding to most synchronous AMQP methods return a pointer to the decoded method result. Upon error, they return nil, and we need some way of discovering what, if anything, went wrong. RPCReply() returns the most recent RabbitMQRPCReplyMBS instance corresponding to such an API operation for the given connection.

Only use it for operations that do not themselves return RabbitMQRPCReplyMBS; operations that do return RabbitMQRPCReplyMBS generally do NOT update this per-connection-global RabbitMQRPCReplyMBS instance.

Returns the most recent RabbitMQRPCReplyMBS object:

- Reply.Type = kResponseNormal. Login completed successfully
- Reply.Type = kResponseLibraryException. In most cases errors from the broker when logging in will be represented by the broker closing the socket. In this case r.libraryError will be set to kStatusConnectionClosed. This error can represent a number of error conditions including: invalid vhost, authentication failure.
- Reply.Type = kResponseServerException. The broker returned an exception:
- If Reply.MethodId = kChannelCloseMethod a channel exception occurred, check decoded properties to see details of the exception. The client should SendMethod() a kChannelCloseOkMethod. The channel must be re-opened before it can be used again. Any resources associated with the channel (auto-delete exchanges, auto-delete queues, consumers) are invalid and must be recreated before attempting to use them again.
- If Reply.MethodId = kConnectionCloseMethod a connection exception occurred, check decoded properties to see details of the exception. The client SendMethod() a kConnectionCloseOkMethod and disconnect from the broker.

(Read only property)

### 147.3.62 RPCTimeout as Double

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The RPC timeout.
**Notes:** Get or set the RPC timeout.

Sets the timeout for any RPC-style AMQP command (e.g., QueueDeclare).
This timeout may be changed at any time by calling this function with a new timeout. The timeout applies individually to each RPC that is made.

The default value is 0, or an infinite timeout.

When an RPC times out, the function will return an error kStatusTimeout, and the connection will be closed.

RPC-timeouts are an advanced feature intended to be used to detect dead connections quickly when the rabbitmq-c implementation of heartbeats does not work. Do not use RPC timeouts unless you understand the implications of doing so.
(Read and Write property)

### 147.3.63 ServerProperties as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the broker properties table.
**Notes:** Returns a dictionary containing the properties advertised by the broker on connection.
(Read only property)

### 147.3.64 SocketFileDescriptor as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the socket descriptor in use by a socket object.
**Notes:** Retrieve the underlying socket descriptor. This function can be used to perform low-level socket operations that aren't supported by the socket interface. Use with caution!
(Read only property)

### 147.3.65 SSLCACertPath as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The CA certificate file path.
**Notes:** cacert Path to the CA cert file in PEM format.
(Read only property)

### 147.3.66 SSLCertPath as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The certificate file path.
**Notes:** Cert file in PEM format.
(Read only property)

### 147.3.67 SSLKeyData as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The client key.
**Notes:** A buffer containing client key in PEM format.
(Read only property)

### 147.3.68 SSLKeyPath as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The file path to the SSL key.
**Notes:** (Read only property)

### 147.3.69 SSLMaxVersion as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Maximum allowed SSL version.
**Notes:** Defaults to latest TLS version.
(Read and Write property)

### 147.3.70 SSLMinVersion as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Minimum allowed SSL version.
**Notes:** Defaults to TLS v1.0.
(Read and Write property)

### 147.3.71 SSLVerifyHostname as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enable or disable hostname verification.
**Notes:** Hostname verification checks the broker cert for a CN or SAN that matches the hostname that OpenSocket() is presented.
Peer verification is controlled by SSLVerifyPeer property.
(Read and Write property)

### 147.3.72 SSLVerifyPeer as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enable or disable peer verification.
**Notes:** Peer verification validates the certificate chain that is sent by the broker.
Hostname validation is controlled by SSLVerifyHostname.
(Read and Write property)

### 147.3.73 Version as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries version number of the library.
**Notes:** Returns the rabbitmq-c version as a string.
(Read only property)

### 147.3.74 VersionNumber as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries version number of the library.
**Notes:** Returns the rabbitmq-c version as a packed integer.

first byte is major, second byte minor, third byte patch level and last release counter.
Value = ((((Major * 256) + Minor) * 256 + Patch) * 256 + Release)
(Read only property)

### 147.3.75 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDefaultFrameSize | 131072 | Default frame size (128Kb) |
| kDefaultHeartbeat | 0 | Default heartbeat interval (0, heartbeat disabled) |
| kDefaultVHost | "/" | Default RabbitMQ vhost: "/". |
| kMaxChannels | 2047 | Default maximum number of channels (2047, RabbitMQ default limit of 2048, minus 1 for channel 0).<br>RabbitMQ set a default limit of 2048 channels per connection in v3.7.5 to prevent broken clients from leaking too many channels. |
| kProtocolPort | 5672 | Default AMQP Port. |
| kProtocolVersionMajor | 0 | AMQP protocol version major |
| kProtocolVersionMinor | 9 | AMQP protocol version minor. |
| kProtocolVersionRevision | 1 | AMQP protocol version revision. |

Status constants.

| Constant | Value | Description |
|---|---|---|
| kStatusBadAmqpData | -2 | Incorrect or corrupt data was received from the broker. This is a protocol |
| kStatusBadUrl | -8 | malformed AMQP URL |
| kStatusBrokerUnsupportedSaslMethod | -19 | Broker does not support the requested SASL mechanism. |
| kStatusConnectionClosed | -7 | The connection to the broker has been closed. |
| kStatusHeartbeatTimeout | -15 | Timed out waiting for heartbeat. |
| kStatusHostnameResolutionFailed | -5 | Unable to resolve the hostname. |
| kStatusIncompatibleAmqpVersion | -6 | The broker advertised an incompaible AMQP version. |
| kStatusInvalidParameter | -10 | An invalid parameter was passed into the function. |
| kStatusNoMemory | -1 | Memory allocation failed. |
| kStatusOk | 0 | Operation successful. |
| kStatusSocketClosed | -17 | Underlying socket is closed. |
| kStatusSocketError | -9 | A socket error occurred. |
| kStatusSocketInuse | -18 | Underlying socket is already open. |
| kStatusSslConnectionFailed | -515 | SSL handshake failed. |
| kStatusSslError | -512 | A generic SSL error occurred. |
| kStatusSslHostnameVerifyFailed | -513 | SSL validation of hostname against peer certificate failed. |
| kStatusSslPeerVerifyFailed | -514 | SSL validation of peer certificate failed. |
| kStatusTableTooBig | -11 | The dictionary object cannot be serialized because the output buffer small. |
| kStatusTcpError | -256 | A generic TCP error occurred. |
| kStatusTcpSocketlibInitError | -257 | An error occurred trying to initialize the socket library |
| kStatusTimeout | -13 | Operation timed out. |
| kStatusTimerFailure | -14 | The underlying system timer facility failed. |
| kStatusUnexpectedState | -16 | Unexpected protocol state |
| kStatusUnknownClass | -3 | An unknown AMQP class was received. This is a protocol error. |
| kStatusUnknownMethod | -4 | An unknown AMQP method was received. This is a protocol error. |
| kStatusUnsupported | -20 | Parameter is unsupported in this version. |
| kStatusWrongMethod | -12 | The wrong method was received. |

TLS Version

| Constant | Value | Description |
|---|---|---|
| kTLSv10 | 1 | TLS v1.0 |
| kTLSv11 | 2 | TLS v1.1 |
| kTLSv12 | 3 | TLS v1.2 |
| kTLSvLatest | 65535 | Latest TLS version available. |

## 147.4 class RabbitMQEnvelopeMBS

### 147.4.1 class RabbitMQEnvelopeMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Envelope object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.4.2 Methods

### 147.4.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 147.4.4 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 147.4.5 Properties

### 147.4.6 Channel as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Channel message was delivered on.
**Notes:** (Read and Write property)

### 147.4.7 ConsumerTag as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The consumer tag the message was delivered to .
**Notes:** (Read and Write property)

### 147.4.8 DeliveryTag as UInt64

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The messages delivery tag.
**Notes:** (Read and Write property)

### 147.4.9 Exchange as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The exchange this message was published to.
**Notes:** (Read and Write property)

### 147.4.10 Message as RabbitMQMessageMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The message.
**Notes:** (Read and Write property)

### 147.4.11 Redelivered as Boolean

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Flag indicating whether this message is being redelivered.
**Notes:** (Read and Write property)

### 147.4.12 RoutingKey as String

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The routing key this message was published with.
**Notes:** (Read and Write property)

## 147.5 class RabbitMQFrameMBS

### 147.5.1 class RabbitMQFrameMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An AMQP frame.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.5.2 Methods

### 147.5.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 147.5.4 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 147.5.5 Properties

### 147.5.6 BodyFragment as MemoryBlock

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The body fragment.
**Notes:** Only set if FrameType is kFrameBody.
(Read and Write property)

### 147.5.7 BodyFragmentSize as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The size of the body fragment in bytes.
**Notes:** Only set if FrameType is kFrameBody.
(Read and Write property)

### 147.5.8 BodySize as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Size of the body in bytes.
**Notes:** Only set if FrameType is kFrameHeader.
(Read and Write property)

### 147.5.9 Channel as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The channel the frame was received on.
**Notes:** (Read and Write property)

### 147.5.10 ClassID as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for the properties.
**Notes:** Only set if FrameType is kFrameHeader.
(Read and Write property)

### 147.5.11 FrameType as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The frame type.
**Notes:** See kFrameMethod, kFrameHeader and kFrameBody.
(Read and Write property)

### 147.5.12 MethodDecoded as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The decoded method content.
**Notes:** MBS Plugin has code to translate over 60 types of method structures into Xojo dictionary.
Only set if FrameType is kFrameMethod.
(Read and Write property)

### 147.5.13 MethodID as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The method ID.
**Notes:** Only set if FrameType is kFrameMethod.
(Read and Write property)

### 147.5.14 PropertiesDecoded as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The decoded properties.
**Notes:** MBS Plugin has code to translate over several types of properties structures into Xojo dictionary.
Only set if FrameType is kFrameHeader.
(Read and Write property)

### 147.5.15 Raw as MemoryBlock

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Amqp-encoded properties structure.
**Notes:** Only set if FrameType is kFrameHeader.
(Read and Write property)

### 147.5.16 RawSize as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The size of the Raw data.
**Notes:** Only set if FrameType is kFrameHeader.
(Read and Write property)

### 147.5.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFrameMinSize | 4096 | Minimum frame size. |

Method IDs

| Constant | Value | Description |
|---|---|---|
| kAccessRequestMethod | &h001E000A | |
| kAccessRequestOkMethod | &h001E000B | |
| kBasicAckMethod | &h003C0050 | |
| kBasicCancelMethod | &h003C001E | |
| kBasicCancelOkMethod | &h003C001F | |
| kBasicConsumeMethod | &h003C0014 | |
| kBasicConsumeOkMethod | &h003C0015 | |
| kBasicDeliverMethod | &h003C003C | |
| kBasicGetEmptyMethod | &h003C0048 | |
| kBasicGetMethod | &h003C0046 | |
| kBasicGetOkMethod | &h003C0047 | |
| kBasicNackMethod | &h003C0078 | |
| kBasicPublishMethod | &h003C0028 | |
| kBasicQosMethod | &h003C000A | |
| kBasicQosOkMethod | &h003C000B | |
| kBasicRecoverAsyncMethod | &h003C0064 | |
| kBasicRecoverMethod | &h003C006E | |
| kBasicRecoverOkMethod | &h003C006F | |
| kBasicRejectMethod | &h003C005A | |
| kBasicReturnMethod | &h003C0032 | |
| kChannelCloseMethod | &h00140028 | |
| kChannelCloseOkMethod | &h00140029 | |
| kChannelFlowMethod | &h00140014 | |
| kChannelFlowOkMethod | &h00140015 | |
| kChannelOpenMethod | &h0014000A | |
| kChannelOpenOkMethod | &h0014000B | |
| kConfirmSelectMethod | &h0055000A | |
| kConfirmSelectOkMethod | &h0055000B | |
| kConnectionBlockedMethod | &h000A003C | |
| kConnectionCloseMethod | &h000A0032 | |
| kConnectionCloseOkMethod | &h000A0033 | |
| kConnectionOpenMethod | &h000A0028 | |
| kConnectionOpenOkMethod | &h000A0029 | |
| kConnectionSecureMethod | &h000A0014 | |
| kConnectionSecureOkMethod | &h000A0015 | |
| kConnectionStartMethod | &h000A000A | |
| kConnectionStartOkMethod | &h000A000B | |
| kConnectionTuneMethod | &h000A001E | |
| kConnectionTuneOkMethod | &h000A001F | |
| kConnectionUnblockedMethod | &h000A003D | |
| kExchangeBindMethod | &h0028001E | |
| kExchangeBindOkMethod | &h0028001F | |
| kExchangeDeclareMethod | &h0028000A | |
| kExchangeDeclareOkMethod | &h0028000B | |
| kExchangeDeleteMethod | &h00280014 | |
| kExchangeDeleteOkMethod | &h00280015 | |
| kExchangeUnbindMethod | &h00280028 | |
| kExchangeUnbindOkMethod | &h00280033 | |
| kQueueBindMethod | &h00320014 | |
| kQueueBindOkMethod | &h00320015 | |
| kQueueDeclareMethod | &h0032000A | |
| kQueueDeclareOkMethod | &h0032000B | |
| kQueueDeleteMethod | &h00320028 | |
| kQueueDeleteOkMethod | &h00320029 | |
| kQueuePurgeMethod | &h0032001E | |
| kQueuePurgeOkMethod | &h0032001F | |
| kQueueUnbindMethod | &h00320032 | |
| kQueueUnbindOkMethod | &h00320033 | |

Properties classes

| Constant | Value | Description |
|---|---|---|
| kClassAccess | &h001E | access class id |
| kClassBasic | &h003C | basic class id |
| kClassChannel | &h0014 | channel class id |
| kClassConection | &h000A | connection class id |
| kClassConfirm | &h0055 | confirm class id |
| kClassExchange | &h0028 | exchange class id |
| kClassQueue | &h0032 | queue class id |
| kClassTX | &h005A | tx class id |

Frame Types

| Constant | Value | Description |
|---|---|---|
| kFrameBody | 3 | The BodyFragment and BodyFragmentSize properties are set. |
| kFrameEnd | 206 | Frame end type. |
| kFrameHeader | 2 | ClassID, BodySize, PropertiesDecoded, Raw and RawSize properties are set. |
| kFrameHeartbeat | 8 | Heartbeat frame type. |
| kFrameMethod | 1 | The MethodDecoded and MethodID properties are set. |

## 147.6 class RabbitMQMessageMBS

### 147.6.1 class RabbitMQMessageMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a message.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.6.2 Methods

### 147.6.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private construtor.

### 147.6.4 Properties

### 147.6.5 Body as MemoryBlock

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The message body.
**Notes:** (Read only property)

### 147.6.6 Properties as RabbitMQBasicPropertiesMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The message properties.
**Notes:** (Read only property)

### 147.6.7 Constants

Response Types

| Constant | Value | Description |
|---|---|---|
| ResponseTypeLibraryException | 2 | Library error, an error occurred in the library, examine the library error. |
| ResponseTypeNone | 0 | The library got an EOF from the socket. |
| ResponseTypeNormal | 1 | Response normal, the RPC completed successfully. |
| ResponseTypeServerException | 3 | Server exception, the broker returned an error, check reply. |

## 147.7 class RabbitMQRPCReplyMBS

### 147.7.1 class RabbitMQRPCReplyMBS

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Reply from a RPC method on the broker.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Bringing RabbitMQ to Xojo

### 147.7.2 Methods

### 147.7.3 Constructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 147.7.4 Destructor

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 147.7.5 Properties

### 147.7.6 LibraryError as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The library error code.
**Notes:** in case of ResponseTypeLibraryException this field will be set to an error code.
An error string can be retrieved using ErrorString().
(Read only property)

### 147.7.7 MethodDecoded as Dictionary

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The decoded data for the method.
**Notes:** MBS Plugin has code to translate over 60 types of method structures into Xojo dictionary.
(Read only property)

### 147.7.8 MethodId as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The method ID.
**Notes:** (Read only property)

### 147.7.9 Type as Integer

MBS RabbitMQ Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The response type.
**Notes:** See ResponseTypeLibraryException, ResponseTypeServerException, ResponseTypeNone and ResponseTypeNormal.
(Read only property)

### 147.7.10 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kAccessRefused | 403 | |
| kChannelError | 504 | |
| kCommandInvalid | 503 | |
| kConnectionForced | 320 | |
| kContentTooLarge | 311 | |
| kFrameError | 501 | |
| kInternalError | 541 | |
| kInvalidPath | 402 | |
| kNoConsumers | 313 | |
| kNoRoute | 312 | |
| kNotAllowed | 530 | |
| kNotFound | 404 | |
| kNotImplemented | 540 | |
| kPreconditionFailed | 406 | |
| kReplySuccess | 200 | Success |
| kResourceError | 506 | |
| kResourceLocked | 405 | |
| kSyntaxError | 502 | |
| kUnexpectedFrame | 505 | |

Response Types

| Constant | Value | Description |
|---|---|---|
| ResponseTypeLibraryException | 2 | The library encountered an error, check the LibraryError field. |
| ResponseTypeNone | 0 | Invalid state. |
| ResponseTypeNormal | 1 | The RPC completed successfully. |
| ResponseTypeServerException | 3 | The broker returned an exception, check the reply field. |

# Chapter 148

# RAMStream

## 148.1 class RAMStreamMBS

### 148.1.1 class RAMStreamMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allows you to use a memory bases stream.
**Notes:** If you need to concat lot's of streams, just make a RAMstream and write to it.

In the example folder is a project called "test ramstream speed" which tests the speed on concating 10000 strings which each 1000 bytes in length.

On my G4 Dual 1000 Mhz, I get this result:
String only: 22063 ticks
RAMStream: 18 ticks
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr2

### 148.1.2 Methods

### 148.1.3 close

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 148.1.4 Constructor(InitialSize as Integer=0)

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new RAMStream.
**Example:**

```
dim r as RAMStreamMBS
r=new RAMStreamMBS(1000000)
r.write "Hello"
```

**Notes:** To avoid memory fragmentation the memory grows in 32 KByte chunks.

The parameter you give is the size for the first allocation. So if you only need 2 KByte, you just pass 2048. If you don't know the size, you can pass 0 or a negative number to get the default initial size which is 32 KByte.

You can change the GrowSize property to use a different growing size.
Performance is better if resizing the memory buffer is minimized.

The stream can grow to around 2 GB.
On low memory, the initial resize will fail and length will be 0.

### 148.1.5 Look(count as Integer) as string

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes, but does not move the current position.
**Example:**

```
dim r as RamStreamMBS // your stream
dim s as string
s=r.look(100)
```

**Notes:** Like the lookahead property in a socket.

### 148.1.6 LookBlock(count as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes into a memoryblock, but leaves the current position untouched.
**Example:**

```
dim b as RAMStreamMBS
dim s as memoryblock
'...
s=b.LookBlock(5)
```

### 148.1.7 LookByte as Integer

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a byte, but leaves the current position untouched.

### 148.1.8 LookLong as Integer

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an integer, but leaves the current position untouched.

### 148.1.9 LookShort as Integer

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a short, but leaves the current position untouched.

### 148.1.10 Read(count as Integer) as string

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes into a string.
**Example:**

```
dim b as RAMStreamMBS
dim s as string
'...
s=b.read(5)
```

### 148.1.11 ReadBlock(count as Integer) as memoryblock

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes into a memoryblock.
**Example:**

```
dim b as RAMStreamMBS
dim s as memoryblock
'...
s=b.ReadBlock(5)
```

### 148.1.12 Readbyte as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an 8bit Byte from the stream.
**Example:**

```
dim b as RAMStreamMBS
dim i as Integer
'...
i=B.readbyte
```

### 148.1.13 ReadLong as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a signed 32bit Integer from the stream.
**Example:**

```
dim b as RAMStreamMBS
dim i as Integer
'...
i=B.readlong
```

**Notes:** This function is affected by the LittleEndian Setting.

### 148.1.14 ReadShort as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a signed 16bit Integer from the stream.
**Example:**

```
dim b as RAMStreamMBS
dim i as Integer
'...
i=B.readshort
```

**Notes:** This function is affected by the LittleEndian Setting.

### 148.1.15 Write(data as string)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes bytes from a string to file.

### 148.1.16 WriteBlock(data as memoryblock,count as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes count bytes from a memoryblock to file.
**Example:**

```
dim b as RAMStreamMBS
dim m as memoryblock
'...
b.writeblock m,m.size
```

### 148.1.17 WriteByte(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a byte to file.

### 148.1.18 WriteLong(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an 32bit integer to file.
**Notes:** This method is affected by the LittleEndian Setting.

### 148.1.19 WriteShort(data as Integer)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes an 16bit integer to file.
**Notes:** This method is affected by the LittleEndian Setting.

### 148.1.20 Properties

### 148.1.21 EOF as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if you are at the end of the stream.
**Notes:** (Read only property)

### 148.1.22 GrowSize as Integer

MBS Util Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size in bytes used to grow the ramstream backbuffer.
**Notes:** Default is 32 Kilobytes.
If the value is bigger than zero, it will be used as the allocation increase. Else the default value is used.
(Read and Write property)

### 148.1.23 Length as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current length of the stream.
**Notes:** You can truncate the stream by setting this property.
(Read and Write property)

### 148.1.24 LittleEndian as boolean

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decides whether to convert integers read or wrote to the file.
**Notes:** See Xojos binarystream for more details.
For native platform you may set "littleendian=targetwin32".
(Read and Write property)

### 148.1.25 MemoryUsed as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much memory is currently used for this Stream.
**Notes:** (Read and Write property)

### 148.1.26 Position as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns current position.
**Notes:** You can set the current file stream position using this property.
(Read and Write property)

## 148.2 Globals

### 148.2.1 CreateRamStreamMBS(InitialSize as Integer = 0) as RamStreamMBS

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new RAMStream.
**Example:**

```
dim r as RAMStreamMBS
r=CreateRamStreamMBS(1000000)
r.write "Hello"
```

**Notes:** To avoid memory fragmentation the memory grows in 32 KByte chunks.

The parameter you give is the size for the first allocation. So if you only need 2 KByte, you just pass 2048. If you don't know the size, you can pass 0 or a negative number to get the default initial size which is 32 KByte.

You can change the GrowSize property to use a different growing size.
Performance is better if resizing the memory buffer is minimized.

The stream can grow to around 2 GB.
Returns nil on low memory.

# Chapter 149

# RaspberryPiCamera

## 149.1 class RaspberryPiCameraFormatDescriptionMBS

### 149.1.1 class RaspberryPiCameraFormatDescriptionMBS

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for a format description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 149.1.2 Methods

### 149.1.3 Constructor

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 149.1.4 Properties

### 149.1.5 Description as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The format description.
**Notes:** (Read only property)

### 149.1.6 Flags as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The flags.
**Notes:** Currently can be 1 for compressed and 2 for emulated.
(Read only property)

### 149.1.7 Index as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Format number.
**Notes:** (Read only property)

### 149.1.8 Pixelformat as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format.
**Notes:** (Read only property)

### 149.1.9 PixelformatString as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format as text.
**Notes:** (Read only property)

### 149.1.10 Type as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The buffer type.
**Notes:** Usually 1 for video capture.
(Read only property)

## 149.2 class RaspberryPiCameraFormatMBS

### 149.2.1 class RaspberryPiCameraFormatMBS

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for format settings.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 149.2.2 Methods

### 149.2.3 Constructor

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 149.2.4 Properties

### 149.2.5 BytesPerRow as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The number of bytes per row.
**Notes:** For padding, zero if unused.
(Read and Write property)

### 149.2.6 ColorSpace as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The colorspace.
**Example:**

```
// ITU-R 601 – broadcast NTSC/PAL
const V4L2_COLORSPACE_SMPTE170M = 1

// 1125-Line (US) HDTV
const V4L2_COLORSPACE_SMPTE240M = 2

// HD and modern captures.
```

```
const V4L2_COLORSPACE_REC709 = 3

// broken BT878 extents (601, luma range 16-253 instead of 16-235)
const V4L2_COLORSPACE_BT878 = 4

// These should be useful. Assume 601 extents.
const V4L2_COLORSPACE_470_SYSTEM_M = 5
const V4L2_COLORSPACE_470_SYSTEM_BG = 6

// I know there will be cameras that send this. So, this is
// unspecified chromaticities and full 0-255 on each of the
// Y'CbCr components
const V4L2_COLORSPACE_JPEG = 7

// For RGB colourspaces, this is probably a good start.
const V4L2_COLORSPACE_SRGB = 8
```

**Notes:** Normally zero for default.
(Read and Write property)

### 149.2.7 Field as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The field.
**Example:**

```
const V4L2_FIELD_ANY = 0
// driver can choose from none, top, bottom, interlaced
// depending on whatever it thinks is approximate ...
const V4L2_FIELD_NONE = 1
// this device has no fields ...
const V4L2_FIELD_TOP = 2
// top field only
const V4L2_FIELD_BOTTOM = 3
// bottom field only
const V4L2_FIELD_INTERLACED = 4
// both fields interlaced
const V4L2_FIELD_SEQ_TB = 5
// both fields sequential into one
// buffer, top-bottom order
const V4L2_FIELD_SEQ_BT = 6
// same as above + bottom-top order
const V4L2_FIELD_ALTERNATE = 7
// both fields alternating into separate buffers
```

```
const V4L2_FIELD_INTERLACED_TB = 8
// both fields interlaced, top field
// first and the top field is transmitted first
const V4L2_FIELD_INTERLACED_BT = 9
// both fields interlaced, top field
// first and the bottom field is transmitted first
```

**Notes:** (Read and Write property)

### 149.2.8 Height as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The height of image in pixels.
**Notes:** (Read and Write property)

### 149.2.9 Pixelformat as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format.
**Notes:** (Read and Write property)

### 149.2.10 PixelformatString as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format as text.
**Notes:** (Read only property)

### 149.2.11 SizeImage as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The size of image.
**Notes:** (Read and Write property)

### 149.2.12 Type as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The type of data stream.
**Notes:** With plugin we always use 1 for video capture (V4L2_BUF_TYPE_VIDEO_CAPTURE).
(Read and Write property)

### 149.2.13 Width as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The width of image in pixels.
**Notes:** (Read and Write property)

## 149.3 class RaspberryPiCameraMBS

### 149.3.1 class RaspberryPiCameraMBS

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to get pictures from Raspberry Pi camera and similar Linux cameras.
**Blog Entries**

- MBS Plugin classes for use on Raspberry Pi
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 17.6pr3
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4

**Videos**

- Presentation from London conference about MBS Plugins.

### 149.3.2 Methods

### 149.3.3 AvailableFormats as RaspberryPiCameraFormatDescriptionMBS()

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries available formats.
**Notes:** Lasterror and ErrorMessage are set.
Can return nil in case of error.

### 149.3.4 Capture(WithPicture as boolean = true) as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Captures a new picture.
**Notes:** If WithPicture is true and pixel format is compatible (RGB 24 or 32bit), we set the picture property.
If capturing JPEG, we copy the JPEG data into the JPEG property.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.5 Close

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Closes camera device.
**Notes:** Lasterror and ErrorMessage are set.

### 149.3.6 Constructor

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 149.3.7 CurrentFormat as RaspberryPiCameraFormatMBS

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries current format.
**Notes:** Returns nil in case of error.
Lasterror and ErrorMessage are set.

### 149.3.8 InitBuffer as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes buffer.
**Notes:** This is done automatically if you capture.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.9 Open(Device as string = "/dev/video0") as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Opens the camera device.
**Notes:** You need

- a Raspberry Pi computer

- to attach the camera module
- to enable the video camera
- run a command: sudo modprobe bcm2835-v4l2
- to check if you see /dev/video0 in file system.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.10 SetCurrentFormat(format as RaspberryPiCameraFormatMBS) as boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sets current format.
**Notes:** This allows to use any format, even if we can't transform it to picture for you.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.11 SetJPEGSize(Width as Integer, Height as Integer) as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sets size and format to capture.
**Notes:** Sets JPEG format with given size.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.12 SetSize(Width as Integer, Height as Integer) as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sets size and format to capture.
**Notes:** Sets to capture RGB picture with given size.

Returns true on success.
Lasterror and ErrorMessage are set.

### 149.3.13 Properties

### 149.3.14 AutoExposureBias as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
e.g. 12.
(Read and Write property)

### 149.3.15 AutoFocusRange as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kAutoFocusRange* constants
(Read and Write property)

### 149.3.16 AutoFocusStart as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.17 AutoFocusStatus as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kAutoFocusStatus* constants
(Read and Write property)

### 149.3.18 AutoFocusStop as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.

(Read and Write property)

### 149.3.19 AutoNPresetWhiteBalance as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kWhiteBalance* constants.
e.g. value is 1 for kWhiteBalanceAuto.
(Read and Write property)

### 149.3.20 Buffer as Ptr

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pointer to the buffer.
**Notes:** For the case you want to convert yourself pixel values to a picture.
(Read only property)

### 149.3.21 BufferLength as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The length of the buffer.
**Notes:** (Read only property)

### 149.3.22 BusInfo as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device bus info.
**Notes:** e.g. "PCI:test"
(Read only property)

### 149.3.23 BytesPerRow as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The bytes per row for current image.
**Notes:** (Read only property)

### 149.3.24 CanCapture as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the device can capture video.
**Notes:** This is queried by checking if bitwiseAnd(capabilities,1) = 1.
(Read only property)

### 149.3.25 Capabilities as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Device capabilities bitmap.
**Notes:** (Read only property)

### 149.3.26 Card as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The name of the card.
**Notes:** e.g. "Hauppauge WinTV"
(Read only property)

### 149.3.27 Driver as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The name of the driver.
**Notes:** e.g. "bttv"
(Read only property)

### 149.3.28 ErrorMessage as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The error message for lasterror property.
**Notes:** (Read only property)

### 149.3.29 ExposureAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
e.g. 1000
(Read and Write property)

### 149.3.30 ExposureAuto as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kExposure* constants.
Value is e.g. 0 for kExposureAuto.
(Read and Write property)

### 149.3.31 ExposureAutoPriority as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.32 ExposureMetering as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kExposureMetering* constants
(Read and Write property)

### 149.3.33 FocusAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
May not work if you don't have a controllable focus on the camera.

(Read and Write property)

### 149.3.34 FocusAuto as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
May not work if you don't have a controllable focus on the camera.
(Read and Write property)

### 149.3.35 FocusRelative as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
May not work if you don't have a controllable focus on the camera.
(Read and Write property)

### 149.3.36 Handle as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal file handle.
**Notes:** (Read only property)

### 149.3.37 Height as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The height in pixel used for capture.
**Notes:** (Read only property)

### 149.3.38 ImageStabilization as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.

(Read and Write property)

### 149.3.39 IrisAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
May not work if you don't have a controllable iris on the camera.
(Read and Write property)

### 149.3.40 IrisRelative as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
May not work if you don't have a controllable iris on the camera.
(Read and Write property)

### 149.3.41 IsoSensitivity as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.42 IsoSensitivityAuto as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kISOSensitivity* constants.
Usually set to kISOSensitivityAuto for auto mode (1).
(Read and Write property)

### 149.3.43 JPEG as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last JPEG image data block.
**Notes:** (Read only property)

### 149.3.44 LastError as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read only property)

### 149.3.45 Lock3A as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kLock* constants.
(Read and Write property)

### 149.3.46 Opened as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether device is opened.
**Notes:** (Read only property)

### 149.3.47 PanAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.48 PanRelative as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.49 PanReset as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.50 PanSpeed as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.51 Picture as Picture

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last captured picture.
**Notes:** (Read only property)

### 149.3.52 PixelFormat as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format.
**Notes:** (Read only property)

### 149.3.53 PixelformatString as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The pixel format as text.
**Notes:** (Read only property)

### 149.3.54 Privacy as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.55 Recording as Boolean

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether we are recording currently.
**Notes:** (Read only property)

### 149.3.56 SceneMode as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** See kSceneMode* constants
(Read and Write property)

### 149.3.57 TiltAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.58 TiltRelative as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.59 TiltReset as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.60 TiltSpeed as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.61 Version as String

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The version of the driver.
**Notes:** (Read only property)

### 149.3.62 WideDynamicRange as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.63 Width as Integer

MBS Linux Plugin, Plugin Version: 16.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The width in pixel used for capture.
**Notes:** (Read only property)

### 149.3.64 ZoomAbsolute as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.65 ZoomContinuous as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.66 ZoomRelative as Integer

MBS Linux Plugin, Plugin Version: 18.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** One of the camera configuration propertires.
**Notes:** Lasterror is set.
(Read and Write property)

### 149.3.67 Constants

AutoFocusRange Values

| Constant | Value | Description |
|---|---|---|
| kAutoFocusRangeAuto | 0 | |
| kAutoFocusRangeInfinity | 3 | |
| kAutoFocusRangeMacro | 2 | |
| kAutoFocusRangeNormal | 1 | |

AutoFocusStatus Values

| Constant | Value | Description |
|---|---|---|
| kAutoFocusStatusBusy | 1 | |
| kAutoFocusStatusFailed | 4 | |
| kAutoFocusStatusIdle | 0 | |
| kAutoFocusStatusReached | 2 | |

ExposureAuto Values

| Constant | Value | Description |
|---|---|---|
| kExposureAperturePriority | 3 | |
| kExposureAuto | 0 | |
| kExposureManual | 1 | |
| kExposureShutterPriority | 2 | |

ExposureMetering Values

| Constant | Value | Description |
|---|---|---|
| kExposureMeteringAverage | 0 | |
| kExposureMeteringCenterWeighted | 1 | |
| kExposureMeteringMatrix | 3 | |
| kExposureMeteringSpot | 2 | |

IsoSensitivityAuto Values

| Constant | Value | Description |
|---|---|---|
| kISOSensitivityAuto | 1 | |
| kISOSensitivityManual | 0 | |

Lock3A Values

| Constant | Value | Description |
|---|---|---|
| kLockExposure | 1 | |
| kLockFocus | 4 | |
| kLockWhiteBalance | 2 | |

ScreenMode Values

| Constant | Value | Description |
|---|---|---|
| kSceneModeBacklight | 1 | |
| kSceneModeBeachSnow | 2 | |
| kSceneModeCandleLight | 3 | |
| kSceneModeDawnDusk | 4 | |
| kSceneModeFallColors | 5 | |
| kSceneModeFireworks | 6 | |
| kSceneModeLandscape | 7 | |
| kSceneModeNight | 8 | |
| kSceneModeNone | 0 | |
| kSceneModePartyIndoor | 9 | |
| kSceneModePortrait | 10 | |
| kSceneModeSports | 11 | |
| kSceneModeSunset | 12 | |
| kSceneModeText | 13 | |

AutoNPresetWhiteBalance Values

| Constant | Value | Description |
|---|---|---|
| kWhiteBalanceAuto | 1 | |
| kWhiteBalanceCloudy | 8 | |
| kWhiteBalanceDaylight | 6 | |
| kWhiteBalanceFlash | 7 | |
| kWhiteBalanceFluorescent | 3 | |
| kWhiteBalanceFluorescentH | 4 | |
| kWhiteBalanceHorizon | 5 | |
| kWhiteBalanceIncandescent | 2 | |
| kWhiteBalanceManual | 0 | |
| kWhiteBalanceShade | 9 | |

# Chapter 150

# Registration

## 150.1 module MBS

### 150.1.1 module MBS

MBS Main Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module with version details.
**Notes:** Those constants can be used in #if conditions.

### 150.1.2 Methods

### 150.1.3 Target as string

MBS Main Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the target where the plugin was compiled for.
**Example:**

MsgBox mbs.Target

**Notes:** Can be Win32, Linux, Carbon, Carbon-PPC or Cocoa.

### 150.1.4 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| BuildNumber | 21067 | The build num<br>The constant v |
| CompileDate | ”Mar 10 2024” | The compilatio<br>The constant v |
| CompileTime | ”09:32:50” | The compilatio<br>The constant v |
| ComputerName | ”MyMacM3” | The computer<br>Using this con<br>application itse<br>The constant v |
| Copyright | ”©2024 by Monkeybread Software” | The plugin cop |
| Day | 10 | The day of the<br>The day the pl<br>Can be used in |
| HasAudioPlugin | true | Whether the A<br>True if the Ma |
| HasAVFoundationPlugin | true | Whether the A<br>True if the Ma |
| HasBarcodePlugin | true | Whether the B<br>True if the Ma |
| HasCanonEOSDigitalPlugin | false | Whether the C<br>True if the Ma |
| HasChartDirectorPlugin | true | Whether the C<br>True if the Ma |
| HasCocoaBasePlugin | false | Whether the C<br>True if the Ma |
| HasCocoaControlsPlugin | false | Whether the C<br>True if the Ma |
| HasCocoaExtrasPlugin | false | Whether the C<br>True if the Ma |
| HasCocoaPlugin | false | Whether the C<br>True if the Ma |
| HasCompressionPlugin | true | Whether the C<br>True if the Ma |
| HasComputerControlPlugin | true | Whether the C<br>True if the Ma |
| HasControlsPlugin | false | Whether the C<br>True if the Ma |
| HasCUPSPlugin | false | Whether the C<br>True if the Ma |
| HasCURLPlugin | true | Whether the C<br>True if the Ma |
| HasDataTypesPlugin | true | Whether the D<br>True if the Ma |
| HasDirectShowPlugin | false | Whether the D<br>True if the Ma |
| HasDonglePlugin | true | Whether the D<br>True if the Ma |
| HasDynaPDFPlugin | true | Whether the D<br>True if the Ma |
| HasEncryptionPlugin | true | Whether the E<br>True if the Ma |
| HasGIFPlugin | false | Whether the G<br>True if the Ma |
| HasGraphicsMagickPlugin | true | Whether the G<br>True if the Ma |
| HasImageMagickPlugin | false | Whether the I<br>True if the Ma |

## 150.2 Globals

### 150.2.1 LogoMBS(size as Integer = 0, WithAlphaChannel as boolean = false) as Picture

MBS Main Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the MBS logo picture.
**Example:**

window1.Backdrop = LogoMBS(500)

**Notes:** Best size is 500 pixel.
This function exists to provide a sample picture for examples.
If WithAlphaChannel is true and alpha channel pictures are supported, the plugin returns a picture with alpha channel. (Cocoa, Windows or Linux target on Xojo 2011r4).

Due to a bug in console runtime from Real Software this function can only produce useful pictures with 500 pixel size in console or web applications.
**Blog Entries**

- Change brightness saturation and hue by Magick
- Sending email via gmail
- Four ways to save picture as Tiff in Xojo
- JPEGs to Movie
- Show download in a new tab
- Xojo 64-bit notes
- MBS Real Studio Plugins, version 11.3fc
- Inside REAL Studio Web Edition
- REAL Studio 2010r3

**Xojo Developer Magazine**

- 20.2, pages 82 to 83: Wifi QR Code, Embedding your Wifi password in a QR code by Stefanie Juchmes
- 19.6, pages 68 to 69: Fun with GraphicsMagick, Cool methods from the GMImageMBS class by Stefanie Juchmes
- 18.2, page 68: Drawing PDFs, Draw in a PDF like in a Graphics element by Stefanie Juchmes

### 150.2.2 MBSPluginCompileDate as string

MBS Main Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compilation date of the plugins.
**Example:**

MsgBox MBSPluginCompileDate

**Notes:** e.g. "Aug 27 2006"
Actually the compilation date of the Version Plugin part which defines this function.

### 150.2.3 MBSPluginCompileTime as string

MBS Main Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compilation Time of the plugins.
**Example:**

MsgBox MBSPluginCompileTime

**Notes:** e.g. "19:40:16"
Actually the compilation date of the Version Plugin part which defines this function.

### 150.2.4 MBSPluginVersion as string

MBS Main Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a version string from the plugin.
**Example:**

MsgBox "Build with Xojo "+RBVersionString+" and "+MBSPluginVersion

**Notes:** You can show that in your about box so your users can tell you which plugin they use.

### 150.2.5 RegisterMBSPlugin(name as string, product as string, enddate as Integer, serial as string) as boolean

MBS Main Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The function to register the plugins.
**Example:**

```
const name = "Joe Smith"
const serialnumber = "123456"
const enddate = 200710

if not RegisterMBSPlugin(name, "MBS Complete", enddate, serialnumber) then
msgBox "something wrong with the serial number of the plugins!"
end if
```

**Notes:** Returns true if name and serial number is accepted.

While you are running your project in Xojo (or Xojo) you don't need to register, but if you compile for any target, you should or nice popup windows will show that the app is not registered.

Register in an application subclass to make registering as early as possible.

In case you get this message: "RegisterMBSPlugin()', giving the message "This
item conflicts with another item of the same name" you have something else in your plugins folder, e.g. a html file.

Possible reasons for this failing:
- The calculations you make on the strings or serial number do not create the same value on every machine (Intel vs. PPC, e.g. endian problems)
- You use MBS functions before calling registration function (e.g. you register in window.open event and use the plugin for a control.)
- You mix different plugin versions in your Xojo folder.

This function works only for 2015 and newer serial numbers.

### 150.2.6 SetRegistrationMessageMBS(ID as Integer, message as string)

MBS Main Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines what messages to show.
**Example:**

```
SetRegistrationMessageMBS(0, "This application is broken. Please reinstall!")
```

**Notes:** ID currently can only be 0 and is reserved for future flags.

Currently this changes the message which is shown if plugins of different versions are found.
This typically happens if installers mix old and new libraries in an app and the user should be asked to reinstall the application.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr9

## 150.3 class RegistrationEngineMBS

### 150.3.1 class RegistrationEngineMBS

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An engine to add serial number generation to your application.
**Example:**

```
dim r as new RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="MyProduct 2008"

MsgBox r.Calc // shows: ICYR-RES4-UXQ1
```

**Notes:** If you want to add serial numbers to your application, you can use this class to write yourself a serial number generator application.
You can later in your application use this class to verify the serial number.

You may want to design your application that the serial number is written to your preferences file so you can verify it every time your application is launched. But if you do this, also save some computer related value there so you can avoid people cloning the system. For example the MAC ID, the user name, the systemfolder creation date. This way you detect whenever a preferences file is copied to another machine.

For generate and later verify serial numbers the setup of the class must match. So carefully check how your serial number should look like. A format like "MA-1234-5678-9012-V1" can be good. Use a prefix and suffix so make serial numbers from different products and different major versions look different. 12 letters are normally enough for a serial number. Especially if you use alpha numeric characters. You can of course change the alphabet string and use lower case letters.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr4

- Handllng Sales and Serial Numbers
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr11
- MBS REALbasic plug-in 9.6
- MBS REALbasic plug-ins version 9.5

### 150.3.2 Methods

### 150.3.3 Calc as string

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the serial number.

### 150.3.4 Verify(s as string) as boolean

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Verifies the serial number.
**Example:**

```
Dim r As New RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="MyProduct 2008"

Dim key As String = r.Calc

If r.Verify(key) Then
MsgBox "OK"
Else
MsgBox "Failed"
End If
```

**Notes:** If you only use upper case letter for your serial numbers, use a function like uppercase before calling verify. This way you avoid that a serial number "abc" is invalid because it is not "ABC".
Returns true on success and false on failure.

### 150.3.5 Properties

### 150.3.6 Alphabet as String

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The characters to use for serial numbers.
**Example:**

```
dim r as new RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="MyProduct 2008"

r.Alphabet="ABC123"
MsgBox r.Calc // shows: A1AC-2312-12CC

r.Alphabet="0123456789"
MsgBox r.Calc // shows: 4308-2905-4013
```

**Notes:** Must have at least two characters.
Characters must be unique.
Default is "0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ".
(Read and Write property)

### 150.3.7 BlockLength as Integer

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Length of the blocks in the serial number.
**Example:**

```
dim r as new RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="MyProduct 2008"

r.NumberLength=10
r.BlockLength=5
MsgBox r.Calc // shows: ICYRR-ES4UX

r.NumberLength=16
r.BlockLength=4
MsgBox r.Calc // shows: ICYR-RES4-UXQ1
```

**Notes:** If this value is 0, no delimeters are used.
(Read and Write property)

### 150.3.8 Delimiter as String

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The delimiter string to use for separating blocks in the serial number.
**Notes:** Default is "-".
(Read and Write property)

### 150.3.9 Mode as Integer

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mode of operation.
**Notes:** Currently always 0.
Set to 1 to use 128bit instead of 64bit number.
(Read and Write property)

### 150.3.10 NumberLength as Integer

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum length of the number.
**Example:**

```
dim r as new RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="MyProduct 2008"

r.NumberLength=10
r.BlockLength=5
MsgBox r.Calc // shows: ICYRR-ES4UX

r.NumberLength=16
r.BlockLength=4
MsgBox r.Calc // shows: ICYR-RES4-UXQ1
```

**Notes:** (Read and Write property)

### 150.3.11 Platform as Integer

MBS Util Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which platform to use for platform specific keys.
**Notes:** Value is set in the constructor to current platform, but you can change it if you want to run the key generator on a different platform.

Values are:

1 Mac
2 Windows
3 Linux

All other values behave like PlatformSpecificKeys is false.
This value is only used if PlatformSpecificKeys is true.
(Read and Write property)

### 150.3.12 PlatformSpecificKeys as Boolean

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether you want platform specific keys.
**Notes:** Set to false if you want to have Windows, Mac OS X and Linux all use the same serial numbers.
Set to true if you want to different serial numbers depending on the platform.

Default is false.
(Read and Write property)

### 150.3.13 Prefix as String

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The prefix for the serial number string.
**Notes:** (Read and Write property)

### 150.3.14 Seed as Integer

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A seed value you can set to get your serial number more unique.
**Notes:** (Read and Write property)

### 150.3.15 Suffix as String

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The suffix for the serial number string.
**Example:**

```
dim r as new RegistrationEngineMBS

r.Field(0)="Hello World"
r.Field(1)="Xojo"
r.suffix="-RB600CPFUSA-MAC"

r.BlockLength=8
r.NumberLength=32

MsgBox r.Calc
// shows: EV6GG9P2-DI533EV6-GG9P2DI5-33EV6GG9-RB600CPFUSA-MAC
// looks like a Xojo serial number ;-)
```

**Notes:** (Read and Write property)

### 150.3.16 Field(index as Integer) as string

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data fields you can use for personalized serial numbers.
**Notes:** Fill this fields with all the values you want to use for personalized serial numbers. You should use the name of the user, maybe the postal address. You can use hardware values like the MAC address or software values like the system folder creation date.
Also you may have serial numbers different between version 1.x and 2.x of your application. So you pass version information like "1" or "2". Do not pass values like "1.2.3" as this serial number won't work on "1.2.4".

Index is from 0 to 7.
(Read and Write computed property)

# Chapter 151

# Regular Expressions

## 151.1 class PCRE2CodeInfoMBS

### 151.1.1 class PCRE2CodeInfoMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for inspecting callouts.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// pattern with callout
compiler.Pattern = "A(?C3)B"

Dim code As PCRE2CodeMBS = Compiler.Compile
Dim codeInfo() As PCRE2CodeInfoMBS = code.Infos

break // look into debugger
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr4

**Xojo Developer Magazine**

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 151.1.2 Methods

### 151.1.3 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 151.1.4 Properties

### 151.1.5 CalloutNumber as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number for numbered callouts.
**Notes:** (Read only property)

### 151.1.6 CalloutString as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The callout string.
**Notes:** (Read only property)

### 151.1.7 CalloutStringLength as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Length of callout string.
**Notes:** (Read only property)

### 151.1.8 CalloutStringOffset as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Offset to string within pattern.
**Notes:** (Read only property)

### 151.1.9 NextItemLength as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Length of next item in pattern.
**Notes:** (Read only property)

### 151.1.10 PatternPosition as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Offset to next item in pattern.
**Notes:** (Read only property)

## 151.2 class PCRE2CodeMBS

### 151.2.1 class PCRE2CodeMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a compiled pattern.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile

MessageBox Str(code.CaptureCount) // shows 2
```

**Notes:** Please use this class as a chance to compile once and then reuse the compiled pattern several times to search various strings.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Embracing for each loops
- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6
- Iterate with PCRE2
- New PCRE2 Plugin for Xojo
- MBS Xojo Plugins, version 22.2pr4

**Xojo Developer Magazine**

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 20.6, pages 70 to 71: Regular Expressions with Xojo, The MBS Plugins has its own RegEx library by Stefanie Juchmes

### 151.2.2 Methods

### 151.2.3 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 151.2.4 Copy(withTables as boolean = false) as PCRE2CodeMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Makes a copy of the memory used for a compiled pattern, excluding any memory used by the JIT compiler.
**Notes:** Without a subsequent call to JITCompile(), the copy can be used only for non-JIT matching. The pointer to the character tables is copied, not the tables themselves (unless withTables is true).

### 151.2.5 Infos as PCRE2CodeInfoMBS()

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enumerate callouts in a compiled pattern.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// pattern with callout
compiler.Pattern = "A(?C3)B"

Dim code As PCRE2CodeMBS = Compiler.Compile
Dim codeInfo() As PCRE2CodeInfoMBS = code.Infos

break // look into debugger
```

**Notes:** Useful to debug the pattern.

### 151.2.6 JITCompile(Flags as Integer = 1)

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Requests JIT compilation.
**Notes:** If the just-in-time compiler is available, further processes a compiled pattern into machine code that executes much faster than the Match() interpretive matching function.

### 151.2.7 Match(Text as String, matchData as PCRE2MatchDataMBS, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Matches a compiled regular expression against a given subject string, using a matching algorithm that is similar to Perl's.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match)

// get result found
Dim TotalSubString As String = match.SubString(0)
Dim SubString1 As String = match.SubString(1)
Dim SubString2 As String = match.SubString(2)

break // see debugger
```

**Notes:** It returns offsets to what it has matched and to captured substrings via the matchData object. The return from Match() is one more than the highest numbered capturing pair that has been set (for example, 1 if there are no captures), zero if the vector of offsets is too small.
Raises exception in case of error.

A match context is needed only if you want to:

- Set up a callout function
- Set a matching offset limit
- Change the heap memory limit
- Change the backtracking match limit
- Change the backtracking depth limit

- Set custom memory management specifically for the match

StartOffsetCharacters is optional to start at a specific character in the text.
See also:

- 151.2.8 Match(Text as String, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as PCRE2MatchDataMBS 19849

### 151.2.8 Match(Text as String, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as PCRE2MatchDataMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience variant of Match function.
**Example:**

```
// Compile a pattern
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"
Dim code As PCRE2CodeMBS = Compiler.Compile

// now run a match
Dim Match1 As PCRE2MatchDataMBS = code.Match("abc") // ->nil as not found
Dim Match2 As PCRE2MatchDataMBS = code.Match("T√§st 1234,Ç¨ Case")

MessageBox match2.SubString(0)
```

**Notes:** Performs match and returns the new PCRE2MatchDataMBS object.
Returns nil in case nothing is found.
See also:

- 151.2.7 Match(Text as String, matchData as PCRE2MatchDataMBS, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as Integer 19848

### 151.2.9 MatchAll(Text as String, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as PCRE2MatchDataMBS()

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Matches pattern several times in the text.
**Example:**

```
// Compile a pattern
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d)"
Dim code As PCRE2CodeMBS = Compiler.Compile
```

```
// now run a match
Dim Matches() As PCRE2MatchDataMBS = code.MatchAll("T√§st 1234,Ç¨ Case")

Dim SubString0 As String = matches(0).SubString(0)
Dim SubString1 As String = matches(1).SubString(0)
Dim SubString2 As String = matches(2).SubString(0)
Dim SubString3 As String = matches(3).SubString(0)

// see 4 results in debugger
Break
```

**Notes:** This does a loop to go over text from start to end to match the pattern as often as it fits.
We try to avoid endless loops.

Returns an array with PCRE2MatchDataMBS objects, one for each match.

### 151.2.10 Matches(Text as String, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as PCRE2IteratorMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Runs match with an iterator.
**Example:**

```
Dim rx As New PCRE2CompilerMBS
rx.CaseLess = True
rx.DotAll = False
rx.Ungreedy = False
rx.NewLine = rx.kNewLineAnyCRLF
rx.Multiline = True
rx.Pattern = kMarkerPattern

Dim code As PCRE2CodeMBS = rx.Compile
Dim foundCount as integer

for each MatchData as PCRE2MatchDataMBS in code.Matches(TestString, 0)
foundCount = foundCount + 1
next
```

**Notes:** Returns the iterator, so you can use it with for each loop.
May raie an error if something goes wrong.

### 151.2.11 Names as String()

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries name table.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(?<AA>\d+)"

Dim code As PCRE2CodeMBS = Compiler.Compile
Dim names() As String = code.Names

Break // see debugger
```

### 151.2.12 SerializeDecode(Data as String) as PCRE2CodeMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Decodes a serialized set of compiled patterns back into a list of individual patterns.
**Example:**

```
// Compile a pattern
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"
Dim code1 As PCRE2CodeMBS = Compiler.Compile

// store somewhere compiled
Dim data As String = code1.SerializeEncode

// later rebuild it
Dim code2 As PCRE2CodeMBS = PCRE2CodeMBS.SerializeDecode(data)

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code2)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim Found As Integer = code2.Match(Text, match)

MessageBox match.SubString(0)
```

**Notes:** This is possible only on a host that is running the same version of PCRE2, with the same code unit width, and the host must also have the same endianness, pointer width and size_t type.

### 151.2.13 SerializeEncode as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Encodes a compiled pattern into a byte stream that can be saved on disc or elsewhere.
**Example:**

```
// Compile a pattern
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"
Dim code1 As PCRE2CodeMBS = Compiler.Compile

// store somewhere compiled
Dim data As String = code1.SerializeEncode

// later rebuild it
Dim code2 As PCRE2CodeMBS = PCRE2CodeMBS.SerializeDecode(data)

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code2)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim Found As Integer = code2.Match(Text, match)

MessageBox match.SubString(0)
```

**Notes:** Note that this is not an abstract format like Java or .NET. Conversion of the byte stream back into usable compiled patterns can only happen on a host that is running the same version of PCRE2, with the same code unit width, and the host must also have the same endianness, pointer width and size_t type.

### 151.2.14 Substitute(Text as String, Replacement as String, matchData as PCRE2MatchDataMBS = nil, StartOffsetCharacters as Integer = 0, MatchContext as PCRE2MatchContextMBS = nil) as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Matches a compiled regular expression against a given subject string, using a matching algorithm that is similar to Perl's.
**Example:**

```
// Compile a pattern
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d)"
Dim code As PCRE2CodeMBS = Compiler.Compile
```

```
// replace all
code.SubstituteGlobal = True

// we replace all and duplicate all digits here:
Dim newText As String = code.Substitute("T√§st 1234,Ç¨ Case", "$ 1$ 1")

Break // see result in debugger
```

**Notes:** It then makes a copy of the subject, substituting a replacement string for what was matched.

Text: The subject string
Replacement: the replacement string
matchData: The match data block, or is nil if you don't need the result.
StartOffsetCharacters: Offset in the subject at which to start matching.
MatchContext: A match context, or nil.

A match data block is needed only if you want to inspect the data from the final match that is returned in that block or if SubstituteMatched is set. A match context is needed only if you want to:

- Set up a callout function
- Set a matching offset limit
- Change the backtracking match limit
- Change the backtracking depth limit
- Set custom memory management in the match context

Raises exception in case of error.

The options are controlled via properties:

### 151.2.15 SubstringNumberFromName(Name as String) as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Finds the number of a named substring capturing parenthesis in a compiled pattern, provided that it is a unique name.
**Notes:** If the string is not found, you receive a negative value.
For other errors, we raise an exception.

| | |
|---|---|
| Anchored | Match only at the first position |
| EndAnchored | Pattern can match only at end of subject |
| NotBOL | Subject string is not the beginning of a line |
| NotEOL | Subject string is not the end of a line |
| NotEmpty | An empty string is not a valid match |
| NotEmptyAtStart | An empty string at the start of the subject is not a valid match |
| NoJit | Do not use JIT matching |
| NoUTFCheck | Do not check the subject for UTF validity (only relevant if UTF was set at compile time) |
| PartialHard | Return PCRE2_ERROR_PARTIAL (-2) for a partial match even if there is a full match |
| PartialSoft | Return PCRE2_ERROR_PARTIAL (-2) for a partial match if no full matches are found. |

### 151.2.16 Properties

### 151.2.17 AllOptions as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Final options after compiling.
**Notes:** (Read only property)

### 151.2.18 Anchored as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Match only at the first position.
**Notes:** (Read and Write property)

### 151.2.19 ArgOptions as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Options passed to Compile.
**Notes:** Should be same as Options value in PCRE2CompilerMBS.
(Read only property)

### 151.2.20 BackRefMax as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of highest backreference.
**Notes:** (Read only property)

### 151.2.21 BSR as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** What \R matches.
**Notes:** kBSRUnicode: Unicode line endings
kBSRanyCRLF: CR, LF, or CRLF only
(Read only property)

### 151.2.22 CaptureCount as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of capturing subpatterns.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile

MessageBox Str(code.CaptureCount) // shows 2
```

**Notes:** (Read only property)

### 151.2.23 DepthLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Backtracking depth limit if set.
**Notes:** (Read only property)

### 151.2.24 EndAnchored as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Pattern can match only at end of subject.
**Notes:** (Read and Write property)

### 151.2.25 ExtraOptions as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Extra options that were passed in the compile context.
**Notes:** (Read only property)

### 151.2.26 FirstCodeType as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Type of start-of-match information.
**Notes:** Value can be:
0 nothing set
1 first code unit is set
2 start of string or after newline
(Read only property)

### 151.2.27 FirstCodeUnit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** First code unit when type is 1.
**Notes:** (Read only property)

### 151.2.28 FrameSize as UInt64

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Size of backtracking frame.
**Notes:** (Read only property)

### 151.2.29 HasBackslashC as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return true if pattern contains \C.
**Notes:** (Read only property)

### 151.2.30 HasCRorLF as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return true if explicit CR or LF matches exist in the pattern.
**Notes:** (Read only property)

### 151.2.31 HeapLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Heap memory limit if set.
**Notes:** (Read only property)

### 151.2.32 JChanged as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return true if (?J) or (?-J) was used.
**Notes:** (Read only property)

### 151.2.33 JITSize as UInt64

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Size of JIT compiled code, or 0.
**Notes:** (Read only property)

### 151.2.34 LastCodeType as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Type of must-be-present information.
**Notes:** Value can be:
0 nothing set
1 code unit is set
(Read only property)

### 151.2.35 LastCodeUnit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Last code unit when type is 1.
**Notes:** (Read only property)

### 151.2.36 MatchEmpty as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Value is true if the pattern can match an empty string, false otherwise.
**Notes:** (Read only property)

### 151.2.37 MatchLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Match limit if set.
**Notes:** (Read only property)

### 151.2.38 MaxLookBehind as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Length (in characters) of the longest lookbehind assertion.
**Notes:** (Read only property)

### 151.2.39 MinLength as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Lower bound length of matching strings.
**Notes:** (Read only property)

### 151.2.40 NameCount as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Number of named subpatterns.
**Notes:** (Read only property)

### 151.2.41 NameEntrySize as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Size of name table entries.
**Notes:** (Read only property)

### 151.2.42 NewLine as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Code for the newline sequence.
**Notes:** See kNewLine* constants.
(Read only property)

### 151.2.43 NoJit as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do not use JIT matching.
**Notes:** (Read and Write property)

### 151.2.44 NotBOL as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Subject is not the beginning of a line.
**Notes:** (Read and Write property)

### 151.2.45 NotEmpty as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An empty string is not a valid match.
**Notes:** (Read and Write property)

### 151.2.46 NotEmptyAtStart as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An empty string at the start of the subject is not a valid match.
**Notes:** (Read and Write property)

### 151.2.47 NotEOL as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Subject is not the end of a line.
**Notes:** (Read and Write property)

### 151.2.48 NoUTFCheck as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do not check the subject or replacement for UTF validity (only relevant if UTF was set at compile time)
**Notes:** (Read and Write property)

### 151.2.49 Options as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The option flags.
**Notes:** You usually set the boolean properties to turn flags here on/off.
(Read and Write property)

### 151.2.50 PartialHard as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return -2 from Match() for a partial match even if there is a full match.
**Notes:** (Read and Write property)

### 151.2.51 PartialSoft as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return -2 from Match() for a partial match if no full matches are found.
**Notes:** (Read and Write property)

### 151.2.52 Size as UInt64

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Size of compiled pattern.
**Notes:** (Read only property)

### 151.2.53 SubstituteExtended as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do extended replacement processing.
**Notes:** (Read and Write property)

### 151.2.54 SubstituteGlobal as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Replace all occurrences in the subject.
**Notes:** (Read and Write property)

### 151.2.55 SubstituteLiteral as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The replacement string is literal.
**Notes:** (Read and Write property)

### 151.2.56 SubstituteMatched as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Use pre-existing match data for 1st match.
**Notes:** (Read and Write property)

### 151.2.57 SubstituteOverflowLength as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** If overflow, compute needed length.
**Notes:** (Read and Write property)

### 151.2.58 SubstituteReplacementOnly as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return only replacement string(s).
**Notes:** (Read and Write property)

### 151.2.59 SubstituteUnknownUnset as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Treat unknown group as unset.
**Notes:** (Read and Write property)

### 151.2.60 SubstituteUnsetEmpty as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Simple unset insert = empty string.
**Notes:** (Read and Write property)

### 151.2.61 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kJITComplete | 1 | One of the flags for JIT compilation. Compile code for full matching. |
| kJITPartialHard | 4 | One of the flags for JIT compilation. Compile code for hard partial matching. |
| kJITPartialSoft | 2 | One of the flags for JIT compilation. Compile code for soft partial matching. |

## 151.3 class PCRE2CompilerMBS

### 151.3.1 class PCRE2CompilerMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for compiling regular expression patterns into code.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match)

// get result found
Dim TotalSubString As String = match.SubString(0)
Dim SubString1 As String = match.SubString(1)
Dim SubString2 As String = match.SubString(2)

break // see debugger
```

#### Blog Entries

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- Iterate with PCRE2
- New PCRE2 Plugin for Xojo
- MBS Xojo Plugins, version 22.2pr4

#### Xojo Developer Magazine

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 20.6, page 70: Regular Expressions with Xojo, The MBS Plugins has its own RegEx library by Stefanie Juchmes

### 151.3.2 Methods

### 151.3.3 Compile as PCRE2CodeMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compiles a regular expression pattern into an internal form.
**Notes:** Please set pattern property before calling this.
Returns the code object or raises an exception.

### 151.3.4 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 151.3.5 Copy as PCRE2CompilerMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a copy of the object.

### 151.3.6 Properties

### 151.3.7 AllocationBytes as Int64

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries size of all memory allocations summed up.
**Notes:** Only valid if MonitorAllocations is true.
(Read only property)

### 151.3.8 AllocationCount as Int64

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries number of allocations done.
**Notes:** Only valid if MonitorAllocations is true.
(Read only property)

### 151.3.9 AllowEmptyClass as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Allow empty classes.
**Notes:** (Read and Write property)

### 151.3.10 AllowLookaroundBSK as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Allow \K in lookarounds PCRE2_EXTRA_ALLOW_SURROGATE_ESCAPES Allow \x { df800 } to \x { dfff } in UTF-8 and UTF-32 modes.
**Notes:** (Read and Write property)

### 151.3.11 AllowSurrogateEscapes as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Disables check for surrogates to allow them.
**Notes:** (Read and Write property)

### 151.3.12 AltBsux as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Alternative handling of \u, \U, and \x
**Notes:** (Read and Write property)

### 151.3.13 AltCircumflex as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Alternative handling of ^in multiline mode.
**Notes:** (Read and Write property)

### 151.3.14 AltVerbNames as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Process backslashes in verb names.
**Notes:** (Read and Write property)

### 151.3.15 Anchored as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Force pattern anchoring.
**Notes:** (Read and Write property)

### 151.3.16 AutoCallout as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compile automatic callouts.
**Notes:** (Read and Write property)

### 151.3.17 BadEscapeIsLiteral as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Treat all invalid escapes as a literal following character.
**Notes:** (Read and Write property)

### 151.3.18 BSR as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the convention for processing \R within a compile context.
**Notes:** Can be kBSRUnicode or kBSRanyCRLF.
(Read and Write property)

### 151.3.19 Caseless as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do caseless matching.
**Notes:** Set to true for caseless matching or false for case sensitive.
(Read and Write property)

### 151.3.20 CompiledWidths as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Which of 8/16/32 support was compiled.
**Notes:** (Read only property)

### 151.3.21 DefaultBSR as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Indicates what \R matches by default.
**Notes:** Either kBSRUnicode or kBSRanyCRLF.
(Read only property)

### 151.3.22 DefaultDepthLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Default backtracking depth limit.
**Notes:** (Read only property)

### 151.3.23 DefaultHeapLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Default heap memory limit.
**Notes:** (Read only property)

### 151.3.24 DefaultMatchLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Default internal resource limit.
**Notes:** (Read only property)

### 151.3.25 DefaultNewLine as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Code for the default newline sequence.
**Notes:** See kNewLine* constants.
(Read only property)

### 151.3.26 DefaultParensLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Default parentheses nesting limit.
**Notes:** (Read only property)

### 151.3.27 DollarEndonly as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** $ not to match newline at end.
**Notes:** (Read and Write property)

### 151.3.28 DotAll as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** . matches anything including NL
**Notes:** (Read and Write property)

### 151.3.29 DupNames as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Allow duplicate names for subpatterns.
**Notes:** (Read and Write property)

### 151.3.30 EndAnchored as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Pattern can match only at end of subject.
**Notes:** (Read and Write property)

### 151.3.31 ErrorOffset as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The error offset from Compile failure.
**Notes:** The error offsets in characters.
(Read and Write property)

### 151.3.32 EscapedCRIsLF as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Interpret \r as \n.
**Notes:** (Read and Write property)

### 151.3.33 Extended as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Ignore white space and # comments.
**Notes:** (Read and Write property)

### 151.3.34 ExtendedAltBSUX as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Extended alternate \u, \U, and \x handling.
**Notes:** (Read and Write property)

### 151.3.35 ExtendedMore as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** If set, the same applies, but in addition unescaped space and horizontal tab characters are ignored inside a character class.
**Notes:** (Read and Write property)

### 151.3.36 ExtraOptions as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The extra option flags.
**Notes:** You usually set the boolean properties to turn flags here on/off.
(Read and Write property)

### 151.3.37 Firstline as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Force matching to be before newline.
**Notes:** Force matching to be before newline.
(Read and Write property)

### 151.3.38 Greedy as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Don't invert greediness of quantifiers.
**Notes:** (Read and Write property)

### 151.3.39 HasJIT as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Availability of just-in-time compiler support.
**Notes:** (Read only property)

### 151.3.40 HasUnicode as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Availability of Unicode support.
**Notes:** (Read only property)

### 151.3.41 JITTarget as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Information (a string) about the target architecture for the JIT compiler
**Notes:** (Read only property)

### 151.3.42 LinkSize as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Configured internal link size (2, 3, 4)
**Notes:** (Read only property)

### 151.3.43 Literal as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Pattern characters are all literal.
**Notes:** (Read and Write property)

### 151.3.44 MatchInvalidUTF as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enable support for matching invalid UTF.
**Notes:** (Read and Write property)

### 151.3.45 MatchLine as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Pattern matches whole lines.
**Notes:** (Read and Write property)

### 151.3.46 MatchUnsetBackref as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Match unset backreferences.
**Notes:** (Read and Write property)

### 151.3.47 MatchWord as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Pattern matches "words".
**Notes:** (Read and Write property)

### 151.3.48 MaxPatternLength as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The maximum text length (in code units) of the pattern that can be compiled.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

compiler.MaxPatternLength = 10
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

// raises exception as pattern is too long
Dim code As PCRE2CodeMBS = Compiler.Compile
```

**Notes:** The default is effectively unlimited.
(Read and Write property)

### 151.3.49 MonitorAllocations as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to monitor allocations.
**Example:**

```
PCRE2CompilerMBS.MonitorAllocations = True

Dim a1 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b1 As Int64 = PCRE2CompilerMBS.AllocationBytes

Dim Compiler As New PCRE2CompilerMBS

Dim a2 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b2 As Int64 = PCRE2CompilerMBS.AllocationBytes

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile
Dim a3 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b3 As Int64 = PCRE2CompilerMBS.AllocationBytes
```

```
// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

Dim a4 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b4 As Int64 = PCRE2CompilerMBS.AllocationBytes

match = Nil

Dim a5 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b5 As Int64 = PCRE2CompilerMBS.AllocationBytes

code = Nil

Dim a6 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b6 As Int64 = PCRE2CompilerMBS.AllocationBytes

compiler = Nil

Dim a7 As Int64 = PCRE2CompilerMBS.AllocationCount
Dim b7 As Int64 = PCRE2CompilerMBS.AllocationBytes
// should be both zero on the end

Break // see debugger
```

**Notes:** Please turn on if you look for memory leaks with PCRE2.
Otherwise keep off for higher performance.

Set to true, then do a few things, cleanup and check if AllocationBytes is combing back to zero.
(Read and Write property)

### 151.3.50 Multiline as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** ^and $ match newlines within data.
**Notes:** (Read and Write property)

### 151.3.51 NeverBackslashC as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether or not \C is disabled.
**Notes:** (Read only property)

See also:


- 151.3.52 NeverBackslashC as Boolean 19875


### 151.3.52 NeverBackslashC as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Lock out the use of \C in patterns.
**Notes:** (Read and Write property)
See also:


- 151.3.51 NeverBackslashC as Boolean 19874


### 151.3.53 NeverUCP as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Lock out PCRE2_UCP, e.g. via (*UCP).
**Notes:** (Read and Write property)

### 151.3.54 NeverUTF as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Lock out PCRE2_UTF, e.g. via (*UTF).
**Notes:** (Read and Write property)

### 151.3.55 NewLine as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the newline convention within a compile context.
**Notes:** See kNewLine* constants.
(Read and Write property)

### 151.3.56 NoAutoCapture as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Disable numbered capturing parentheses (named ones available).
**Notes:** (Read and Write property)

### 151.3.57 NoAutoPossess as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Disable auto-possessification.
**Notes:** (Read and Write property)

### 151.3.58 NoDotStarAnchor as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Disable automatic anchoring for .*
**Notes:** (Read and Write property)

### 151.3.59 NoStartOptimize as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Disable match-time start optimizations.
**Notes:** (Read and Write property)

### 151.3.60 NoUTFCheck as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Do not check the pattern for UTF validity (only relevant if UTF is set)
**Notes:** (Read and Write property)

### 151.3.61 Options as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The option flags.
**Notes:** You usually set the boolean properties to turn flags here on/off.
(Read and Write property)

### 151.3.62 ParensNestLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Default parentheses nesting limit.
**Notes:** (Read and Write property)

### 151.3.63 Pattern as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The search pattern.
**Notes:** (Read and Write property)

### 151.3.64 PCRE2Version as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The PCRE2 version.
**Notes:** (Read only property)

### 151.3.65 UCP as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Use Unicode properties for \d, \w, etc.
**Notes:** (Read and Write property)

### 151.3.66 Ungreedy as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Invert greediness of quantifiers.
**Notes:** (Read and Write property)

### 151.3.67 UnicodeVersion as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The Unicode version.
**Notes:** (Read only property)

### 151.3.68 UseOffsetLimit as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Enable offset limit for unanchored matching.
**Notes:** (Read and Write property)

### 151.3.69 UTF as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Treat pattern and subjects as UTF strings.
**Notes:** (Read and Write property)

### 151.3.70 Constants

BSR

| Constant | Value | Description |
|---|---|---|
| kBSRanyCRLF | 2 | CR, LF, or CRLF only |
| kBSRUnicode | 1 | Unicode line endings |

New Line Character

| Constant | Value | Description |
|---|---|---|
| kNewLineAny | 4 | Any Unicode newline sequence. |
| kNewLineAnyCRLF | 5 | CR, LF or CRLF. |
| kNewLineCR | 1 | Carriage return only |
| kNewLineCRLF | 3 | CR followed by LF only |
| kNewLineLF | 2 | Linefeed only |
| kNewLineNul | 6 | The NUL character (binary zero) |

## 151.4 class PCRE2ExceptionMBS

### 151.4.1 class PCRE2ExceptionMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for an error in PCRE2.
**Notes:** We usually set error message and number.
Check also ErrorOffset in PCRE2CompilerMBS class.
Subclass of the RuntimeException class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- New PCRE2 Plugin for Xojo
- MBS Xojo Plugins, version 22.2pr4

**Xojo Developer Magazine**

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 151.4.2 Methods

### 151.4.3 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 151.5 class PCRE2IteratorMBS

### 151.5.1 class PCRE2IteratorMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Our iterator class to match text.
**Notes:** Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Embracing for each loops
- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr6

**Xojo Developer Magazine**

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

Interfaces: Iterator, Iterable

### 151.5.2 Methods

### 151.5.3 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 151.5.4 Iterator as Iterator

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the iterator.
**Notes:** Part of the iterable interface.
Returns self.

### 151.5.5 MoveNext as Boolean

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next position.
**Notes:** Returns true if we found something or false if we finished or didn't found anything.

### 151.5.6 Value as Variant

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries current match.
**Notes:** Returns PCRE2MatchDataMBS object for the match.

To increase performance, the object is cached and reused.
So if you like to keep it, please call Copy method to clone it.

## 151.6 class PCRE2MatchContextMBS

### 151.6.1 class PCRE2MatchContextMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a match context.
**Example:**

```
// we limit offset here
Dim context As New PCRE2MatchContextMBS
context.DepthLimit = 100
context.OffsetLimit = 3 // cause error later. 10 works

Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"
compiler.UseOffsetLimit = True

Dim code As PCRE2CodeMBS = Compiler.Compile

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match, 0, context)

// show matched text
MessageBox match.SubString(0)

// The offset_limit parameter limits how far an unanchored search can advance in the subject string. The default value is PCRE2_UNSET. The Match() functions return -1 if a match with a starting point before or at the given offset is not found. The Substitute() function makes no more substitutions.
// For example, if the pattern /abc/ is matched against "123abc" with an offset limit less than 3, the result is -1. A match can never be found if the startoffset argument of Match() or Substitute() is greater than the offset limit set in the match context.
```

**Notes:** A match context is needed only if you want to:

- Set up a callout function
- Set a matching offset limit
- Change the heap memory limit
- Change the backtracking match limit

- Change the backtracking depth limit
- Set custom memory management specifically for the match

**Blog Entries**

- Embracing for each loops
- The Top 10 from the MBS Xojo Plugins in 2022
- MBS Xojo Plugins, version 22.3pr4
- News from the MBS Xojo Plugins Version 22.2
- New PCRE2 Plugin for Xojo
- MBS Xojo Plugins, version 22.2pr4

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 151.6.2 Methods

### 151.6.3 Constructor

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a match context.

### 151.6.4 Copy as PCRE2MatchContextMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a copy of the match context.

### 151.6.5 SetStackSize(StartSize as UInt32, MaxSize as UInt32)

MBS RegEx Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates and sets a stack for use by the code compiled by the JIT compiler.
**Example:**

```
dim matchContext as PCRE2MatchContextMBS
```

```
matchContext = New PCRE2MatchContextMBS
matchContext.SetStackSize 1024*1024, 8*1024*1024
matchContext.HeapLimit = 1024 * 1024 * 16

// later pass to Match() functions
```

**Notes:** The two arguments are a starting size for the stack, and a maximum size to which it is allowed to grow.
A maximum stack size of 512KiB to 1MiB should be more than enough for any pattern.

If not set, an internal 32KiB block on the machine stack is used.

### 151.6.6 Properties

### 151.6.7 DepthLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the backtracking depth limit field in a match context.
**Notes:** (Read and Write property)

### 151.6.8 HeapLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the backtracking heap limit field in a match context.
**Notes:** (Read and Write property)

### 151.6.9 MatchLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the match limit field in a match context.
**Notes:** (Read and Write property)

### 151.6.10 OffsetLimit as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the offset limit field in a match context.
**Notes:** (Read and Write property)

## 151.7 class PCRE2MatchDataMBS

### 151.7.1 class PCRE2MatchDataMBS

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a match.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match)

// show matched text
MessageBox match.SubString(0)
```

**Notes:** The class allows you to reuse the object to hold result of a match, so only create it once and then use it with multiple strings to match.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- MBS Xojo Plugins, version 22.3pr4
- News from the MBS Xojo Plugins Version 22.2
- Iterate with PCRE2
- New PCRE2 Plugin for Xojo
- MBS Xojo Plugins, version 22.2pr4

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 20.6, page 70: Regular Expressions with Xojo, The MBS Plugins has its own RegEx library by Stefanie Juchmes

### 151.7.2 Methods

### 151.7.3 Constructor(code as PCRE2CodeMBS)

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new match data block for holding the result of a match.
**Notes:** The first argument points to a compiled pattern. The number of capturing parentheses within the pattern is used to compute the number of pairs of offsets that are required in the match data block. These form the "output vector" (ovector) within the match data block, and are used to identify the matched string and any captured substrings when matching with Match().

Use this to allocate a match data object for a specific code object.
See also:

- 151.7.4 Constructor(size as Integer) 19887

### 151.7.4 Constructor(size as Integer)

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a new match data block, which is used for holding the result of a match.
**Notes:** The first argument specifies the number of pairs of offsets that are required. These form the "output vector" (ovector) within the match data block, and are used to identify the matched string and any captured substrings when matching with Match(). There is always one pair of offsets; if size is zero, it is treated as one.

Use this to allocate a match data object with a bigger size to use it with various pattern.
See also:

- 151.7.3 Constructor(code as PCRE2CodeMBS) 19887

### 151.7.5 OffsetVector(index as Integer) as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the offset in the text for the match.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"

Dim code As PCRE2CodeMBS = Compiler.Compile
```

```
// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match)

// get result found
Dim OVector0 As Integer = match.OffsetVector(2)
Dim OVector1 As Integer = match.OffsetVector(3)
Dim Len As Integer = OVector1 - OVector0
Dim pos As Integer = OVector0
Dim OwnSubString As String = Text.Middle(pos, Len)

Break
```

**Notes:** Values in number of characters and zero based, so maybe use Middle() function on strings.
Range is 0 to OffsetVectorCount*2-1.

OffsetVector(0) and OffsetVector(1) is the total match found.
OffsetVector(2) and OffsetVector(3) is the first captured sub string.
OffsetVector(4) and OffsetVector(5) is the second captured sub string.
...
OffsetVector(OffsetVectorCount*2-2) and OffsetVector(OffsetVectorCount*2-1) is the last captured sub string.

### 151.7.6 OffsetVectors as Integer()

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries array of vector values.
**Notes:** All the values in an array for faster access.

### 151.7.7 SubString(Index as Integer) as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries substring by index.
**Example:**

```
Dim Compiler As New PCRE2CompilerMBS

// find numbers
compiler.Pattern = "(\d+)( [ $ ,Ç¨£] ?)"
```

```
Dim code As PCRE2CodeMBS = Compiler.Compile

// prepare reuable match object
Dim Match As New PCRE2MatchDataMBS(code)

// now run a match
Dim Text As String = "T√§st 1234,Ç¨ Case"
Dim n As Integer = code.Match(Text, match)

// get result found
Dim TotalSubString As String = match.SubString(0)
Dim SubString1 As String = match.SubString(1)
Dim SubString2 As String = match.SubString(2)

break // see debugger
```

See also:

- 151.7.8 SubString(Name as String) as String 19889

### 151.7.8 SubString(Name as String) as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries substring by name.
See also:

- 151.7.7 SubString(Index as Integer) as String 19888

### 151.7.9 SubStrings as String()

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** A convenience function for extracting all the captured substrings after a pattern match.

### 151.7.10 Properties

### 151.7.11 DataSize as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the size, in bytes, of the match data block that is its argument.
**Notes:** (Read only property)

### 151.7.12 Mark as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the last (*MARK), (*PRUNE), or (*THEN) name that was encountered during the matching process.
**Notes:** The name is within the compiled pattern.
(Read only property)

### 151.7.13 OffsetVectorCount as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the number of pairs of offsets in the ovector that forms part of the given match data block.
**Notes:** (Read only property)

### 151.7.14 StartPosition as Integer

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the position of the character at which the successful match started.
**Notes:** For a non-partial match, this can be different to the value of CharactersOffsetVector(0) if the pattern contains the \K escape sequence. After a partial match, however, this value is always the same as CharactersOffsetVector(0) because \K does not affect the result of a partial match.
(Read only property)

### 151.7.15 Text as String

MBS RegEx Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The text used to match against.
**Notes:** (Read and Write property)

# 151.8 class RegExMBS

## 151.8.1 class RegExMBS

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for fast Regular Expression Search in a perl compatible way.
**Example:**

```
dim r as new RegExMBS
dim searchString as string = ".o"

if r.Compile(searchString) then

dim s as string="Hello World"

dim start as Integer = 0
while r.Execute(s,start)>0

dim p as Integer = r.OffsetCharacters(0)
dim l as Integer = r.OffsetCharacters(1)-r.OffsetCharacters(0)

MsgBox "Found "+searchString+" on position "+str(p)+" with length "+str(l)+" in """+s+"""

start = r.Offset(1)
wend

else
MsgBox "failed to compile"
end if
```

**Notes:** uses the PCRE library. You may check the PCRE documentation.

The RegExMBS class has different defaults as the built in RegEx class in Xojo.

You may want to set options like this:

RB: CaseSensitive = false
MBS: CompileOptionCaseLess = true

RB: DotMatchAll = false
MBS: CompileOptionDotAll = false

RB: Greedy = true

MBS: CompileOptionUngreedy = false

RB: LineEndType = 0
MBS: CompileOptionNewLineAnyCRLF = true and ExecuteOptionNewLineAnyCRLF = true

RB: MatchEmpty = true
MBS: ExecuteOptionNotEmpty = false

and you want to set CompileOptionMultiline to true for multi line match.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2
- Iterate with PCRE2
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- RegEx Speedup
- Multithreaded plugin functions can increase speed of Xojo application
- Problems with killing Xojo threads with plugin calls.
- Mac App Store submission and RegEx Plugin
- MBS Xojo / Real Studio plug-ins in version 13.4
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**Xojo Developer Magazine**

- 21.1, page 27: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 12.4, page 73: Eureka!, Tips and Tricks for the Xojo Developer by Markus Winter
- 12.3, page 91: Group-Ease (and Subgroup-Ease), Everything You Need To Know About Subgroups by Kem Tekinay
- 11.6, page 8: News

### 151.8.2 Methods

### 151.8.3 Compile(pattern as string) as boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compiles a pattern.
**Example:**

```
dim r as new RegExMBS
dim searchString as string = ".o"

if r.Compile(searchString) then
msgbox "OK"
else
MsgBox "failed to compile"
end if
```

**Notes:** Some predefined patterns like \b do not support Unicode well, so you may work around that by using your own pattern.

Returns true on success and false on failure.
ErrorMessage, Lasterror, ErrorOffset and Handle are set.

The following table lists the error codes than may be returned by Compile(), along with the error messages that may be returned by both compiling functions.

### 151.8.4 CompileMemory(pattern as memoryblock, ByteOffset as Integer) as boolean

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compiles a pattern.
**Notes:** Same as Compile, but the text is stored in a memoryblock and must be a 0 terminated C string. Be careful to use valid UTF8 input and provide offset in byte units and not in characters.

### 151.8.5 ConfigBSR as boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer whose value indicates what character sequences the \R escape sequence matches by default.
**Notes:** A value of 0 means that \R matches any Unicode line ending sequence; a value of 1 means that \R matches only CR, LF, or CRLF. The default can be overridden when a pattern is compiled or matched.

### 151.8.6 ConfigLinkSize as Integer

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer that contains the number of bytes used for internal linkage in compiled regular expressions.
**Notes:** The value is 2, 3, or 4. Larger values allow larger regular expressions to be compiled, at the expense of slower matching. The default value of 2 is sufficient for all but the most massive patterns, since it allows the compiled pattern to be up to 64K in size.

### 151.8.7 ConfigMallocThreshold as Integer

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output is an integer that contains the threshold above which the POSIX interface uses malloc() for output vectors.

### 151.8.8 ConfigMatchLimit as Integer

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer that gives the default limit for the number of internal matching function calls in a Execute execution.

### 151.8.9 ConfigMatchLimitRecursion as Integer

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer that gives the default limit for the depth of recursion when calling the internal matching function in a Execute() execution.

### 151.8.10 ConfigNewLine as Integer

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** What newline character is used as default.
**Notes:** The output is an integer whose value specifies the default character sequence that is recognized as meaning ”newline”. The four values that are supported are: 10 for LF, 13 for CR, 3338 for CRLF, -2 for ANYCRLF, and -1 for ANY. Though they are derived from ASCII, the same values are returned in EBCDIC environments. The default should normally correspond to the standard sequence for your operating system.

### 151.8.11 ConfigStackRecurse as boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an integer that is set to one if internal recursion when running Execute() is implemented by recursive function calls that use the stack to remember their state.
**Notes:** This is the usual way that PCRE is compiled. The output is zero if PCRE was compiled to use blocks of data on the heap instead of recursive function calls. In this case, malloc and free are called to manage memory blocks on the heap, thus avoiding the use of the stack.

### 151.8.12 ConfigUnicodeProperties as boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if unicode properties are available.
**Notes:** Should be true for the plugin.

### 151.8.13 ConfigUTF8 as boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether UTF8 is supported.
**Notes:** If this ever is false, please complain. This plugin is designed to work only on UTF8 strings for best performance.

### 151.8.14 Constructor(VecSize as Integer = 0)

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** You pass here the internal vector size which limits how many substrings you can find.
For 20 substrings, you need to pass (20+1)*3 for vector size.

### 151.8.15 Escape(text as string) as string

MBS RegEx Plugin, Plugin Version: 7.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Escapes the string.
**Example:**

```
dim r as new RegExMBS
```

```
dim s as string = "Hello [ ] "
dim e as string = r.Escape(s)
MsgBox e // shows Hello \[ \]

dim d as string = r.Unescape(e)
MsgBox d // shows original string
```

**Notes:** The string is converted to UTF8 and all the RegEx special characters are escaped.
Returns "" on low memory.

### 151.8.16 Execute(start as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern again.
**Notes:** You can use this variant of execute to continue a search in the same string/memoryblock at a new starting offset.
See also:

- 151.8.17 Execute(text as string, start as Integer = 0) as Integer 19896

### 151.8.17 Execute(text as string, start as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern.
**Example:**

```
dim r as RegExMbs
dim s as string
dim c as Integer

s="123 ABC 456"

r=new RegExMBS
if r.Compile(" \D+ ") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 3 8
// 1 for number of results
// 3 for 3 bytes before the matched pattern
// 8 for the 8 bytes before the end of the matched pattern
end if
```

**Notes:** Returns the number of found offsets.
text must be in UTF-8 text encoding.
Start must be 0 for the first character and the byte offset for other chacters. Do not pass values from OffsetCharacters here!

Return values from Execute:
If Execute() fails, it returns a negative number. The following are defined in the header file:

See also:

- 151.8.16 Execute(start as Integer = 0) as Integer 19896

### 151.8.18 ExecuteMemory(text as memoryblock, ByteOffset as Integer = 0, ByteLength as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern.
**Notes:** Same as Execute, but the text is stored in a memoryblock.
Be careful to use valid UTF8 input and provide offset and length in byte units and not in characters.
If ByteLength is zero, we take the length of the memoryblock.

### 151.8.19 ExecuteMemoryMT(text as memoryblock, ByteOffset as Integer = 0, ByteLength as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern.
**Notes:** Same as ExecuteMemory, but more thread friendly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 151.8.20 ExecuteMT(start as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern.
**Notes:** Same as Execute, but more thread friendly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 151.8.21 ExecuteMT(text as string, start as Integer = 0) as Integer 19898

### 151.8.21 ExecuteMT(text as string, start as Integer = 0) as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Performs a search with the compiled pattern.
**Notes:** Same as Execute, but more thread friendly.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 151.8.20 ExecuteMT(start as Integer = 0) as Integer 19897

### 151.8.22 InfoNameEntry(Index as Integer) as string

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a name entry in the list of captures.
**Notes:** Only valid after pattern was compiled.

### 151.8.23 IsASCIIText(text as string) as boolean

MBS RegEx Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether text in string is only ASCII.
**Example:**

```
Dim s As String = "Hello World"

If RegExMBS.IsASCIIText(s) Then
MessageBox "Only 7 bit ASCII"
Else
MessageBox "Not ASCII. Some 8 bit encoding like ANSI or UTF-8."
End If
```

**Notes:** Does checks bytes of text, so doesn't look on encoding property.

### 151.8.24 Match(text as string) as boolean

MBS RegEx Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if current search pattern matches against given text.
**Example:**

```
dim r as new RegExMBS

if r.Compile("e.l") then

if r.Match("Hello") then
MsgBox "match"
end if

if r.Match("Helro") then
MsgBox "wrong match"
end if
end if
```

**Notes:** Returns true if text matches.

Does not set properties like Execute, so subString() won't work.
See also:

- 151.8.25 Match(text() as string, inverse as boolean = false) as string() 19899
- 151.8.26 Match(text() as Variant, inverse as boolean = false) as string() 19900

### 151.8.25 Match(text() as string, inverse as boolean = false) as string()

MBS RegEx Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if current search pattern matches against given text array.
**Example:**

```
dim r as new RegExMBS

r.CompileOptionCaseLess = true
```

```
if r.Compile("e.l") then

dim t() as string = array("Hello", "World", "Xojo", "test")

dim match1() as string = r.Match(t)
dim match2() as string = r.Match(t, true)

MsgBox "Matching: "+Join(match1, ", ")+EndOfLine+"Other: "+Join(match2, ", ")
end if
```

**Notes:** Returns the list of matching values.
If inverse is set to true, it returns the list of non matching values.
See also:

- 151.8.24 Match(text as string) as boolean 19899
- 151.8.26 Match(text() as Variant, inverse as boolean = false) as string() 19900

### 151.8.26 Match(text() as Variant, inverse as boolean = false) as string()

MBS RegEx Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if current search pattern matches against given variant array.
**Example:**

```
dim r as new RegExMBS

r.CompileOptionCaseLess = true

if r.Compile("e.l") then

dim dic as new Dictionary
dic.Value("Hello") = 1
dic.Value("World") = 2
dic.Value("Xojo") = 3
dic.Value("Test") = 4

dim match1() as string = r.Match(dic.keys)
dim match2() as string = r.Match(dic.keys, true)

MsgBox "Matching: "+Join(match1, ", ")+EndOfLine+"Other: "+Join(match2, ", ")
end if
```

**Notes:** The variant array should have entries which convert well to string.
Returns the list of matching values.

If inverse is set to true, it returns the list of non matching values.
See also:

- 151.8.24 Match(text as string) as boolean 19899
- 151.8.25 Match(text() as string, inverse as boolean = false) as string() 19899

### 151.8.27 Offset(index as Integer) as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the offset in the offset list with given index in bytes.
**Example:**

```
dim r as RegExMbs
dim s as string
dim c as Integer

s="123 √§√√º ABC 456"

r=new RegExMBS
if r.Compile(".√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile(".\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if
```

**Notes:** If you found a pattern in a string you get here:

Invalid indexes return 0.
Count is the number of entries here.

### 151.8.28 OffsetCharacters(index as Integer) as Integer

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get the offset in the offset list with given index in characters.
**Example:**

```
dim r as new RegExMBS
dim searchString as string = ".o"

if r.Compile(searchString) then

dim s as string="√§√√º Hello World"

if r.Execute(s,0)>0 then
dim lines(-1) as string

lines.Append str(R.Count)+" offset found."
lines.Append "In Bytes:"
lines.Append " Start of matched patern: "+str(R.Offset(0))
lines.Append " End of matched patern: "+str(R.Offset(1))
lines.Append " Length of matched patern: "+str(R.Offset(1)-r.Offset(0))

lines.Append "In Characters:"
lines.Append " Start of matched patern: "+str(R.OffsetCharacters(0))
lines.Append " End of matched patern: "+str(R.OffsetCharacters(1))
lines.Append " Length of matched patern: "+str(R.OffsetCharacters(1)-r.OffsetCharacters(0))

MsgBox Join(lines,EndOfLine)
end if

else
MsgBox "failed to compile"
end if
```

**Notes:** This function is identical to Offset(), but returns characters instead of bytes.
Works only with valid UTF-8 strings as input.
Value is calculated on each function call based on Offset(index) and current text.

If you found a pattern in a string you get here:

Invalid indexes return 0.
Count is the number of entries here.

Please note that if you just need offsets for calling Mid() function, you can get better performance by using

just Offset and MidB function. Than neither Mid and OffsetCharacters need to calculate the character offset.

### 151.8.29 Replace(NewText as string) as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the text on the current found position and returns the complete new text.
**Notes:** You need to call Execute before.
Lasterror is set.
NewText must have UTF-8 text encoding.

\0 references the whole found pattern, \1 to \15 the subexpressions.
\t is replaced with chr(9), \r and \n with chr(13) and \\with \.

### 151.8.30 ReplaceAll(Target as string, NewText as string = "") as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches the target string for current pattern and replaces all occurrences with the new text.
**Notes:** You need to call Compile before to initialize the pattern and you should call Study before to optimize the pattern.
Lasterror is set.
Target and NewText must have UTF-8 text encoding.

\0 references the whole found pattern, \1 to \15 the subexpressions.
\t is replaced with chr(9), \r and \n with chr(13) and \\with \.

### 151.8.31 ReplaceSelection(NewText as string) as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the text on the current found position and returns new text for that selection.
**Notes:** This method is for text editors where you will store result in editfield.seltext to replace the current selection.
Lasterror is set.
You need to call Execute before.
NewText must have UTF-8 text encoding.

\0 references the whole found pattern, \1 to \15 the subexpressions.
\t is replaced with chr(9), \r and \n with chr(13) and \\with \.

### 151.8.32 StringNumber(name as string) as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This convenience function finds the number of a named substring capturing parenthesis in a compiled pattern.
**Notes:** name: Name whose number is required
The yield of the function is the number of the parenthesis if the name is found, or PCRE_ERROR_NOSUBSTRING otherwise.

### 151.8.33 Study as boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** After you compiled a pattern study can optimize it.
**Notes:** Only useful if you use Execute several times.
In that case you call one time Compile, one time Study and several times Execute.
Errormessage is set.

### 151.8.34 Substring(index as Integer) as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the subexpression found with the given index.
**Notes:** Returns "" on any error.
Lasterror is set.
See also:

- 151.8.35 Substring(name as string) as string 19904

### 151.8.35 Substring(name as string) as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the subexpression found with the given name.
**Notes:** Returns "" on any error.
Lasterror is set.
See also:

- 151.8.34 Substring(index as Integer) as string 19904

### 151.8.36 Unescape(text as string) as string

MBS RegEx Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unescapes the string.
**Example:**

```
dim r as new RegExMBS

dim s as string = "Hello [ ] "
dim e as string = r.Escape(s)
MsgBox e // shows Hello \[ \]

dim d as string = r.Unescape(e)
MsgBox d // shows original string
```

**Notes:** The string is converted to UTF8 and all the RegEx special characters are escaped.
Returns "" on low memory.

### 151.8.37 Version as string

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the PCRE library as an ASCII string.

### 151.8.38 Properties

### 151.8.39 CompileOptionAnchored as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Force pattern anchoring
**Notes:** (Read and Write property)

### 151.8.40 CompileOptionAutoCallOut as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Compile automatic callouts
**Notes:** (Read and Write property)

### 151.8.41 CompileOptionBSRAnyCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option and CompileOptionBSRUnicode (which are mutually exclusive) control what the \R escape sequence matches.
**Notes:** The choice is either to match only CR, LF, or CRLF, or to match any Unicode newline sequence. The default is specified when PCRE is built. It can be overridden from within the pattern, or by setting an option when a compiled pattern is matched.
(Read and Write property)

### 151.8.42 CompileOptionBSRUnicode as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option and CompileOptionBSRAnyCRLF (which are mutually exclusive) control what the \R escape sequence matches.
**Example:**

```
dim rg As new RegExMBS
rg.CompileOptionUngreedy = false
rg.CompileOptionBSRUnicode = true

dim ts as string = "one" + EndOfLine.UNIX + "test" + chr(&h2028) + "more"

// replace all end lines with #
if rg.Compile("\R+") then

ts = rg.ReplaceAll(ts,"#")

end if

MsgBox ts
```

**Notes:** The choice is either to match only CR, LF, or CRLF, or to match any Unicode newline sequence. The default is specified when PCRE is built. It can be overridden from within the pattern, or by setting an option when a compiled pattern is matched.
(Read and Write property)

### 151.8.43 CompileOptionCaseLess as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Do caseless matching

**Example:**

```
dim r as new RegExMBS
dim searchString as string = "hello"

r.CompileOptionCaseLess=True

if r.Compile(searchString) then

dim s as string="√§√√º Hello World"

if r.Execute(s,0)>0 then
MsgBox "Found: "+mid(s, r.OffsetCharacters(0)+1, r.OffsetCharacters(1)-r.OffsetCharacters(0))
else
MsgBox "nothing found"
end if

else
MsgBox "failed to compile"
end if
```

**Notes:** (Read and Write property)

### 151.8.44 CompileOptionDollarEndOnly as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: $ not to match newline at end
**Notes:** (Read and Write property)

### 151.8.45 CompileOptionDotAll as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: . matches anything including endofline
**Example:**

```
dim r as new RegExMBS
dim searchString as string = "<.+>"

r.CompileOptionDotAll = false // finds only if true

if r.Compile(searchString) then
```

```
dim s as string="<Step enable=""True""+EndOfLine.unix+"id=""93"" name=""Beep""/>"

if r.Execute(s,0)>0 then
MsgBox "Found: "+mid(s, r.OffsetCharacters(0)+1, r.OffsetCharacters(1)-r.OffsetCharacters(0))
else
MsgBox "nothing found"
end if

else
MsgBox "failed to compile"
end if
```

**Notes:** (Read and Write property)

### 151.8.46 CompileOptionDuplicateNames as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If this bit is set, names used to identify capturing subpatterns need not be unique.
**Notes:** This can be helpful for certain types of pattern when it is known that only one instance of the named subpattern can ever be matched. There are more details of named subpatterns below; see also the pcrepattern documentation.
(Read and Write property)

### 151.8.47 CompileOptionExtended as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Ignore whitespace and # comments
**Notes:** (Read and Write property)

### 151.8.48 CompileOptionFirstLine as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Force matching to be before newline
**Notes:** (Read and Write property)

### 151.8.49 CompileOptionJavaScriptCompat as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If this option is set, PCRE's behaviour is changed in some ways so that it is compatible with JavaScript rather than Perl.
**Notes:** The changes are as follows:

(1) A lone closing square bracket in a pattern causes a compile-time error, because this is illegal in JavaScript (by default it is treated as a data character). Thus, the pattern AB ] CD becomes illegal when this option is set.

(2) At run time, a back reference to an unset subpattern group matches an empty string (by default this causes the current matching alternative to fail). A pattern such as (\1)(a) succeeds when this option is set (assuming it can find an "a" in the subject), whereas it fails by default, for Perl compatibility.
(Read and Write property)

### 151.8.50 CompileOptionMultiline as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: ^and $ match newlines within data
**Example:**

```
dim r as RegExMBS
dim n,i,c as Integer
dim s as string

s=ReplaceLineEndings(EditField1.text,EndOfLine.UNIX)

r=new RegExMBS

'r.CompileOptionFirstLine=True
r.CompileOptionMultiline=True

if r.Compile("^....$ ") then
n=0
do
c=r.Execute(s,n)

if c>0 then
MsgBox r.Substring(0)
n=r.Offset(1)
end if

loop until c=0
```

end if

**Notes:** (Read and Write property)

### 151.8.51 CompileOptionNewLineAny as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** Setting CompileOptionNewLineCR or CompileOptionNewLineLF specifies that a newline is indicated by a single character (CR or LF, respectively). Setting CompileOptionNewLineCRLF specifies that a newline is indicated by the two-character CRLF sequence. Setting CompileOptionNewLineAnyCRLF specifies that any of the three preceding sequences should be recognized. Setting CompileOptionNewLineAny specifies that any Unicode newline sequence should be recognized. The Unicode newline sequences are the three just mentioned, plus the single characters VT (vertical tab, U+000B), FF (formfeed, U+000C), NEL (next line, U+0085), LS (line separator, U+2028), and PS (paragraph separator, U+2029). The last two are recognized only in UTF-8 mode.
The newline setting in the options word uses three bits that are treated as a number, giving eight possibilities. Currently only six are used (default plus the five values above). This means that if you set more than one newline option, the combination may or may not be sensible. For example, CompileOptionNewLineCR with CompileOptionNewLineLF is equivalent to CompileOptionNewLineCRLF, but other combinations may yield unused numbers and cause an error.

The only time that a line break in a pattern is specially recognized when compiling is when PCRE_EXTENDED is set. CR and LF are whitespace characters, and so are ignored in this mode. Also, an unescaped # outside a character class indicates a comment that lasts until after the next line break sequence. In other circumstances, line break sequences in patterns are treated as literal data.
(Read and Write property)

### 151.8.52 CompileOptionNewLineAnyCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See CompileOptionNewLineAny for more details.
(Read and Write property)

### 151.8.53 CompileOptionNewLineCR as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See CompileOptionNewLineAny for more details.
(Read and Write property)

### 151.8.54 CompileOptionNewLineCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See CompileOptionNewLineAny for more details.
(Read and Write property)

### 151.8.55 CompileOptionNewLineLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See CompileOptionNewLineAny for more details.
(Read and Write property)

### 151.8.56 CompileOptionNoAutoCapture as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Disable numbered capturing parentheses (named ones available)
**Notes:** (Read and Write property)

### 151.8.57 CompileOptionNoStartOptimize as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is an option that acts at matching time; that is, it is really an option for Execute.
**Notes:** If it is set at compile time, it is remembered with the compiled pattern and assumed at matching time.
(Read and Write property)

### 151.8.58 CompileOptionNoUTF8Check as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Do not check the pattern for UTF-8 validity.
**Notes:** (Read and Write property)

### 151.8.59 CompileOptions as Integer

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal value of all the compile options.
**Notes:** You can get and set the bits using the CompileOption* Boolean properties.
(Read and Write property)

### 151.8.60 CompileOptionUngreedy as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Invert greediness of quantifiers.
**Notes:** Basicly this is about whether to find the next matching item or the last matching item in the whole string.
Matching the next item is always much faster.
(Read and Write property)

### 151.8.61 CompileOptionUnicodeCodePoints as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to support unicode code points for character classes.
**Notes:** This option changes the way PCRE processes \B, \b, \D, \d, \S, \s, \W, \w, and some of the POSIX character classes. By default, only ASCII characters are recognized, but if PCRE_UCP is set, Unicode properties are used instead to classify characters. More details are given in the section on generic character types in the pcrepattern page. If you set PCRE_UCP, matching one of the items it affects takes much longer. The option is available only if PCRE has been compiled with Unicode property support.
(Read and Write property)

### 151.8.62 CompileOptionUTF8 as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Compile: Run in UTF-8 mode.
**Notes:** (Read and Write property)

### 151.8.63 Count as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of offsets found.
**Example:**

```
dim r as new RegExMBS
dim searchString as string = ".o"

if r.Compile(searchString) then

dim s as string="√§√√º Hello World"

if r.Execute(s,0)>0 then
dim lines(-1) as string

lines.Append str(R.Count)+" offset found."
lines.Append "In Bytes:"
lines.Append " Start of matched patern: "+str(R.Offset(0))
lines.Append " End of matched patern: "+str(R.Offset(1))
lines.Append " Length of matched patern: "+str(R.Offset(1)-r.Offset(0))

lines.Append "In Characters:"
lines.Append " Start of matched patern: "+str(R.OffsetCharacters(0))
lines.Append " End of matched patern: "+str(R.OffsetCharacters(1))
lines.Append " Length of matched patern: "+str(R.OffsetCharacters(1)-r.OffsetCharacters(0))

MsgBox Join(lines,EndOfLine)
end if

else
MsgBox "failed to compile"
end if
```

**Notes:** (Read only property)

### 151.8.64 ErrorMessage as String

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last message reported.
**Notes:** Set by Study and Compile.
(Read only property)

### 151.8.65 ErrorOffset as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error offset from the compile function.
**Notes:** (Read only property)

### 151.8.66 ExecuteOptionAnchored as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: Match only at the first position
**Notes:** (Read and Write property)

### 151.8.67 ExecuteOptionBSRAnyCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option and ExecuteOptionBSRUnicode (which are mutually exclusive) control what the \R escape sequence matches.
**Notes:** The choice is either to match only CR, LF, or CRLF, or to match any Unicode newline sequence. The default is specified when PCRE is built. It can be overridden from within the pattern, or by setting an option when a compiled pattern is matched.
(Read and Write property)

### 151.8.68 ExecuteOptionBSRUnicode as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option and ExecuteOptionBSRAnyCRLF (which are mutually exclusive) control what the \R escape sequence matches.
**Example:**

```
dim rg As new RegExMBS
rg.CompileOptionUngreedy = false
rg.ExecuteOptionBSRUnicode = true

dim ts as string = "one" + EndOfLine.UNIX + "test" + chr(&h2028) + "more"

// replace all end lines with #
if rg.Compile("\R+") then

ts = rg.ReplaceAll(ts,"#")
```

```
end if

MsgBox ts
```

**Notes:** The choice is either to match only CR, LF, or CRLF, or to match any Unicode newline sequence. The default is specified when PCRE is built. It can be overridden from within the pattern, or by setting an option when a compiled pattern is matched.
(Read and Write property)

### 151.8.69 ExecuteOptionNewLineAny as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** Setting ExecuteOptionNewLineCR or ExecuteOptionNewLineLF specifies that a newline is indicated by a single character (CR or LF, respectively). Setting ExecuteOptionNewLineCRLF specifies that a newline is indicated by the two-character CRLF sequence. Setting ExecuteOptionNewLineAnyCRLF specifies that any of the three preceding sequences should be recognized. Setting ExecuteOptionNewLineAny specifies that any Unicode newline sequence should be recognized. The Unicode newline sequences are the three just mentioned, plus the single characters VT (vertical tab, U+000B), FF (formfeed, U+000C), NEL (next line, U+0085), LS (line separator, U+2028), and PS (paragraph separator, U+2029). The last two are recognized only in UTF-8 mode.
The newline setting in the options word uses three bits that are treated as a number, giving eight possibilities. Currently only six are used (default plus the five values above). This means that if you set more than one newline option, the combination may or may not be sensible. For example, ExecuteOptionNewLineCR with ExecuteOptionNewLineLF is equivalent to ExecuteOptionNewLineCRLF, but other combinations may yield unused numbers and cause an error.

The only time that a line break in a pattern is specially recognized when compiling is when PCRE_EXTENDED is set. CR and LF are whitespace characters, and so are ignored in this mode. Also, an unescaped # outside a character class indicates a comment that lasts until after the next line break sequence. In other circumstances, line break sequences in patterns are treated as literal data.
(Read and Write property)

### 151.8.70 ExecuteOptionNewLineAnyCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See ExecuteOptionNewLineAny for more details.
(Read and Write property)

### 151.8.71 ExecuteOptionNewLineCR as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See ExecuteOptionNewLineAny for more details.
(Read and Write property)

### 151.8.72 ExecuteOptionNewLineCRLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See ExecuteOptionNewLineAny for more details.
(Read and Write property)

### 151.8.73 ExecuteOptionNewLineLF as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option override the default newline definition that was chosen when PCRE was built.
**Notes:** See ExecuteOptionNewLineAny for more details.
(Read and Write property)

### 151.8.74 ExecuteOptionNoStartOptimize as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** There are a number of optimizations that Execute uses at the start of a match, in order to speed up the process.
**Notes:** For example, if it is known that an unanchored match must start with a specific character, it searches the subject for that character, and fails immediately if it cannot find it, without actually running the main matching function. This means that a special item such as (*COMMIT) at the start of a pattern is not considered until after a suitable starting point for the match has been found. When callouts or (*MARK) items are in use, these "start-up" optimizations can cause them to be skipped if the pattern is never actually used. The start-up optimizations are in effect a pre-scan of the subject that takes place before the pattern is run.
The ExecuteOptionNoStartOptimize option disables the start-up optimizations, possibly causing performance to suffer, but ensuring that in cases where the result is "no match", the callouts do occur, and that items such as (*COMMIT) and (*MARK) are considered at every possible starting position in the subject string. If ExecuteOptionNoStartOptimize is set at compile time, it cannot be unset at matching time.

Setting ExecuteOptionNoStartOptimize can change the outcome of a matching operation. Consider the pattern

(*COMMIT)ABC
When this is compiled, PCRE records the fact that a match must start with the character "A". Suppose the subject string is "DEFABC". The start-up optimization scans along the subject, finds "A" and runs the first match attempt from there. The (*COMMIT) item means that the pattern must match the current starting position, which in this case, it does. However, if the same match is run with ExecuteOptionNoStartOptimize set, the initial scan along the subject string does not happen. The first match attempt is run starting from "D" and when this fails, (*COMMIT) prevents any further matches being tried, so the overall result is "no match". If the pattern is studied, more start-up optimizations may be used. For example, a minimum length for the subject may be recorded. Consider the pattern
(*MARK:A)(X | Y)
The minimum length for a match is one character. If the subject is "ABC", there will be attempts to match "ABC", "BC", "C", and then finally an empty string. If the pattern is studied, the final attempt does not take place, because PCRE knows that the subject is too short, and so the (*MARK) is never encountered. In this case, studying the pattern does not affect the overall match result, which is still "no match", but it does affect the auxiliary information that is returned.
(Read and Write property)

### 151.8.75 ExecuteOptionNotBOL as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: Subject is not the beginning of a line
**Notes:** (Read and Write property)

### 151.8.76 ExecuteOptionNotEmpty as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: An empty string is not a valid match
**Notes:** (Read and Write property)

### 151.8.77 ExecuteOptionNotEmptyAtStart as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the options.
**Notes:** This is like ExecuteOptionNotEmpty, except that an empty string match that is not at the start of the subject is permitted. If the pattern is anchored, such a match can occur only if the pattern contains \K. Perl has no direct equivalent of ExecuteOptionNotEmpty or ExecuteOptionNotEmptyAtStart, but it does

make a special case of a pattern match of the empty string within its split() function, and when using the /g modifier. It is possible to emulate Perl's behaviour after matching a null string by first trying the match again at the same offset with ExecuteOptionNotEmptyAtStart and ExecuteOptionAnchored, and then if that fails, by advancing the starting offset (see below) and trying an ordinary match again. There is some code that demonstrates how to do this in the pcredemo sample program. In the most general case, you have to check to see if the newline convention recognizes CRLF as a newline, and if so, and the current character is CR followed by LF, advance the starting offset by two characters instead of one.
(Read and Write property)

### 151.8.78 ExecuteOptionNotEOL as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: Subject is not the end of a line
**Notes:** (Read and Write property)

### 151.8.79 ExecuteOptionNoUTF8Check as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: Do not check the subject for UTF-8 validity
**Notes:** (Read and Write property)

### 151.8.80 ExecuteOptionPartial as Boolean

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Option for Execute: Return PCRE_ERROR_PARTIAL for a partial match
**Notes:** (Read and Write property)

### 151.8.81 ExecuteOptionPartialHard as Boolean

MBS RegEx Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This option (and ExecuteOptionPartial) turn on the partial matching feature.
**Notes:** A partial match occurs if the end of the subject string is reached successfully, but there are not enough subject characters to complete the match. If this happens when ExecuteOptionPartial (but not ExecuteOptionPartialHard) is set, matching continues by testing any remaining alternatives. Only if no complete match can be found is ErrorPartial returned instead of PCRE_ERROR_NOMATCH. In other words, ExecuteOptionPartial says that the caller is prepared to handle a partial match, but only if no complete match can be found.

If ExecuteOptionPartialHard is set, it overrides ExecuteOptionPartial. In this case, if a partial match is found, Execute() immediately returns ErrorPartial, without considering any other alternatives. In other words, when ExecuteOptionPartialHard is set, a partial match is considered to be more important that an alternative complete match.

In both cases, the portion of the string that was inspected when the partial match was found is set as the first matching string. There is a more detailed discussion of partial and multi-segment matching, with examples, in the pcrepartial documentation.
(Read and Write property)

### 151.8.82 ExecuteOptions as Integer

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal value of all the execute options.
**Notes:** You can get and set the bits using the CompileOption* Boolean properties.
(Read and Write property)

### 151.8.83 Handle as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The handle to the pattern data structure.
**Notes:** (Read only property)

### 151.8.84 InfoCaptureCount as Integer

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of captures defined in the pattern.
**Notes:** Only valid after pattern was compiled.
(Read only property)

### 151.8.85 InfoNameCount as Integer

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of names defined in the pattern.
**Notes:** Only valid after pattern was compiled.
(Read only property)

### 151.8.86 InfoSize as Integer

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the size of the compiled pattern.
**Notes:** Only valid after pattern was compiled.
(Read only property)

### 151.8.87 InfoStudySize as Integer

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the study details size.
**Notes:** Only valid after calling Study.
(Read only property)

### 151.8.88 Lasterror as Integer

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code reported.
**Notes:** 0 is no error and -1 is some parameter error.
See Error* constants for other values.
(Read only property)

### 151.8.89 MatchLimit as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The match limit.
**Notes:** You can set it to a limit value. If set to zero, the plugin will use the default.

The default value for the limit can be set when PCRE is built; the default default is 10 million, which handles all but the most extreme cases. You can override the default by setting this property.
(Read and Write property)

### 151.8.90 MatchLimitRecursion as Integer

MBS RegEx Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The limit for recursion.
**Notes:** The MatchLimitRecursion field is similar to MatchLimit, but instead of limiting the total number of times that match() is called, it limits the depth of recursion. The recursion depth is a smaller number than the total number of calls, because not all calls to match() are recursive. This limit is of use only if it is set smaller than MatchLimit.

Limiting the recursion depth limits the amount of stack that can be used.

The default value for MatchLimitRecursion can be set when PCRE is built; the default default is the same value as the default for MatchLimit. You can override the default by setting this property. If value is zero, the plugin uses the default.
(Read and Write property)

### 151.8.91 Text as String

MBS RegEx Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text used for the last successfull compile call.
**Notes:** (Read only property)

### 151.8.92 TextMemory as Memoryblock

MBS RegEx Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text used for the last successfull compiletext call.
**Notes:** (Read only property)

### 151.8.93 VectorSize as Integer

MBS RegEx Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal vector size.
**Notes:** (Read only property)

### 151.8.94 Constants

Error Constants

| Constant | Value | Description |
|---|---|---|
| ErrorBadCount | -15 | This error is given if the value of the ovecsize argument is negative. |
| ErrorBadMagic | -4 | PCRE stores a 4-byte "magic number" at the start of the compiled code, to catch the case when it is passed a junk pointer and to detect when a pattern that was compiled in an environment of one endianness is run in an environment with the other endianness. This is the error that PCRE gives when the magic number is not present. |
| ErrorBadNewLine | -23 | An invalid combination of Newline options was given. |
| ErrorBadOffset | -24 | The value of startoffset was negative or greater than the length of the subject, that is, the value in length. |
| ErrorBadOption | -3 | An unrecognized bit was set in the options argument. |
| ErrorBadPartial | -13 | This code is no longer in use. It was formerly returned when the PCRE_PARTIAL option was used with a compiled pattern containing items that were not supported for partial matching. From release 8.00 onwards, there are no restrictions on partial matching. |
| ErrorBadUTF8 | -10 | A string that contains an invalid UTF-8 byte sequence was passed as a subject. However, if PCRE_PARTIAL_HARD is set and the problem is a truncated UTF-8 character at the end of the subject, ErrorShortUTF8 is used instead. |
| ErrorBadUTF8Offset | -11 | The UTF-8 byte sequence that was passed as a subject was valid, but the value of startoffset did not point to the beginning of a UTF-8 character or the end of the subject. |
| ErrorCallOut | -9 | |
| ErrorDFARecurse | -20 | |
| ErrorDFAUCond | -17 | |
| ErrorDFAUItem | -16 | |
| ErrorDFAUMLimit | -18 | |
| ErrorDFAWSSize | -19 | |
| ErrorInternal | -14 | An unexpected internal error has occurred. This error could be caused by a bug in PCRE or by overwriting of the compiled pattern. |
| ErrorMatchLimit | -8 | The backtracking limit, as specified by the match_limit field in a pcre_extra structure (or defaulted) was reached. |
| ErrorNoMatch | -1 | The subject string did not match the pattern. |
| ErrorNoSubstring | -7 | This error is used by the substring functions. |
| ErrorNull | -2 | Either code or subject was passed as "", or ovector was "" and ovecsize was not zero. |
| ErrorNullWSLimit | -22 | |
| ErrorPartial | -12 | The subject string did not match, but it did match partially. |
| ErrorPlugin | -99 | Generic error for something wrong with the plugin state.<br>Like no current regex object internally or wrong function parameters. |
| ErrorRecursionLimit | -21 | The internal recursion limit, as specified by the match_limit_recursion field in a pcre_extra structure (or defaulted) was reached. See the description above. |
| ErrorShortUTF8 | -25 | The subject string ended with an incomplete (truncated) UTF-8 character, and the PCRE_PARTIAL_HARD option was set. Without this option, ErrorBadUTF8 is returned in this situation. |
| ErrorUnknownNode | -6 | |
| ErrorUnknownOpcode | -5 | While running the pattern match, an unknown item was encountered in the compiled pattern. This error could be caused by a bug in PCRE or by overwriting of the compiled pattern. |

0 no error
1 \at end of pattern
2 \c at end of pattern
3 unrecognized character follows \
4 numbers out of order in { } quantifier
5 number too big in { } quantifier
6 missing terminating ] for character class
7 invalid escape sequence in character class
8 range out of order in character class
9 nothing to repeat
10 operand of unlimited repeat could match the empty string
11 internal error: unexpected repeat
12 unrecognized character after (?
13 POSIX named classes are supported only within a class
14 missing )
15 reference to non-existent subpattern
16 erroffset passed as NULL
17 unknown option bit(s) set
18 missing ) after comment
19 parentheses nested too deeply
20 regular expression too large
21 failed to get memory
22 unmatched parentheses
23 internal error: code overflow
24 unrecognized character after (?<
25 lookbehind assertion is not fixed length
26 malformed number after (?(
27 conditional group contains more than two branches
28 assertion expected after (?(
29 (?R or (?digits must be followed by )
30 unknown POSIX class name
31 POSIX collating elements are not supported
32 this version of PCRE is not compiled with PCRE_UTF8 support
33 spare error
34 character value in \x { ... } sequence is too large
35 invalid condition (?(0)
36 \C not allowed in lookbehind assertion
37 PCRE does not support \L, \l, \N, \U, or \u
38 number after (?C is >255
39 closing ) for (?C expected
40 recursive call could loop indefinitely
41 unrecognized character after (?P
42 syntax error after (?P
43 two named groups have the same name
44 invalid UTF-8 string
45 support for \P, \p, and \X has not been compiled
46 malformed \P or \p sequence
47 unknown property name after \P or \p

| | | |
|---|---|---|
| PCRE_ERROR_NOMATCH | -1 | The subject string did not match the pattern. |
| PCRE_ERROR_NULL | -2 | Either code or subject was passed as ””. |
| PCRE_ERROR_BADOPTION | -3 | An unrecognized bit was set in the options argument. |
| PCRE_ERROR_BADMAGIC | -4 | PCRE stores a 4-byte ”magic number” at the start of the compiled code, to catch the case when it is passed a junk pointer and to detect when a pattern that was compiled in an environment of one endianness is run in an environment with the other endianness. This is the error that PCRE gives when the magic number is not present. |
| PCRE_ERROR_UNKNOWN_NODE | -5 | While running the pattern match, an unknown item was encountered in the compiled pattern. This error could be caused by a bug in PCRE or by overwriting of the compiled pattern. |
| PCRE_ERROR_NOMEMORY | -6 | If a pattern contains back references, but the ovector that is passed to Execute() is not big enough to remember the referenced substrings, PCRE gets a block of memory at the start of matching to use for this purpose. If the call via pcre_malloc() fails, this error is given. The memory is automatically freed at the end of matching. |
| PCRE_ERROR_MATCHLIMIT | -8 | The backtracking limit, as specified by the match_limit field in a pcre_extra structure (or defaulted) was reached. |
| PCRE_ERROR_RECURSIONLIMIT | -21 | The internal recursion limit, as specified by the match_limit_recursion field in a pcre_extra structure (or defaulted) was reached. |
| PCRE_ERROR_CALLOUT | -9 | This error is never generated by Execute() itself. It is provided for use by callout functions that want to yield a distinctive error code. See the pcrecallout documentation for details. |
| PCRE_ERROR_BADUTF8 | -10 | A string that contains an invalid UTF-8 byte sequence was passed as a subject. |
| PCRE_ERROR_BADUTF8_OFFSET | -11 | The UTF-8 byte sequence that was passed as a subject was valid, but the value of startoffset did not point to the beginning of a UTF-8 character. |
| PCRE_ERROR_PARTIAL | -12 | The subject string did not match, but it did match partially. See the pcrepartial documentation for details of partial matching. |
| PCRE_ERROR_BADPARTIAL | -13 | The PCRE_PARTIAL option was used with a compiled pattern containing items that are not supported for partial matching. See the pcrepartial documentation for details of partial matching. |
| PCRE_ERROR_INTERNAL | -14 | An unexpected internal error has occurred. This error could be caused by a bug in PCRE or by overwriting of the compiled pattern. |
| PCRE_ERROR_BADCOUNT | -15 | This error is given if the value of the ovecsize argument is negative. |

| index | offset |
|---|---|
| 0 | start of matched pattern |
| 1 | end of matched pattern |
| 2 | start of subexpression 1 |
| 3 | end of subexpression 1 |
| 2*n | start of subexpression n |
| 2*n+1 | end of subexpression n |

| index | offset |
|---|---|
| 0 | start of matched pattern |
| 1 | end of matched pattern |
| 2 | start of subexpression 1 |
| 3 | end of subexpression 1 |
| 2*n | start of subexpression n |
| 2*n+1 | end of subexpression n |

# Chapter 152

# Remote Control

## 152.1 class GammaFadeMBS

### 152.1.1 class GammaFadeMBS

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** A class to perform gamma fades on Mac OS X and Windows.
**Notes:** On Mac OS X a system API is used. On Windows the GammaMBS class is used internally.
**Blog Entries**

- Cleanup Xojo Plugins
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

### 152.1.2 Methods

### 152.1.3 Constructor

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the gamma fade class and queries the current gamma values.
**Notes:** On Windows a window is needed to get the exclusive access to the gamma controls.

The Available property is set to true if the constructor was successful.
See also:

- 152.1.4 Constructor(mainwindow as DesktopWindow) 19928

- 152.1.5 Constructor(mainwindow as window) 19928

### 152.1.4 Constructor(mainwindow as DesktopWindow)

MBS ComputerControl Plugin, Plugin Version: 22.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Initializes the gamma fade class and queries the current gamma values.
**Notes:** On Windows a window is needed to get the exclusive access to the gamma controls.

The Available property is set to true if the constructor was successful.
See also:

- 152.1.3 Constructor 19927
- 152.1.5 Constructor(mainwindow as window) 19928

### 152.1.5 Constructor(mainwindow as window)

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Initializes the gamma fade class and queries the current gamma values.
**Notes:** On Windows a window is needed to get the exclusive access to the gamma controls.

The Available property is set to true if the constructor was successful.
See also:

- 152.1.3 Constructor 19927
- 152.1.4 Constructor(mainwindow as DesktopWindow) 19928

### 152.1.6 GammaFadeIn(seconds as Double) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Fades back to the normal screen.
**Notes:** Seconds is the duration of the fade in seconds. Typical 0.3 seconds.
Returns true on success and false on failure.

### 152.1.7 GammaFadeOut(seconds as Double) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Fades to a solid color.
**Notes:** Seconds is the duration of the fade in seconds. Typical 0.5 seconds.
Returns true on success and false on failure.

### 152.1.8 Properties

### 152.1.9 Available as Boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the constructor was successful.
**Notes:** True if the initialization code worked.

On Mac OS X the constructor fails to get access if there is another gamma fade running.
On Windows the access to the gamma controls can fail if you don't provide a window, the hardware can't do gamma fades (e.g. running in VMWare) or DirectX is not available.
(Read and Write property)

### 152.1.10 FadeColor as Color

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The color to use for the fade.
**Example:**

```
dim g as new GammaFadeMBS
g.FadeColor=&c0000FF // blue
```

**Notes:** Default is black.
(Read and Write property)

## 152.2 class GammaMBS

### 152.2.1 class GammaMBS

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** A class to change the gamma settings of the display.
**Notes:** You can use that class to change the gamma table. For example to invert the screen or increase/decrease one of the colors.

Works on Mac OS X and Windows.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 14.1pr1
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

**Xojo Developer Magazine**

- 6.6, page 8: News

### 152.2.2 Methods

### 152.2.3 Constructor(mainwindow as DesktopWindow, displayIndex as integer = 0)

MBS ComputerControl Plugin, Plugin Version: 22.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Initializes the gamma class and queries the current gamma values.
**Notes:** On Windows a window is needed to get the exclusive access to the gamma controls.

The Available property is set to true if the constructor was successful.
Added displayIndex parameter in plugin version 14.1 to specify on Mac which display to handle.

If you like to pass nil for the window, please pass a variable, so Xojo knows which constructor to use and you avoid a compiler error.
See also:

- 152.2.4 Constructor(mainwindow as window = nil, displayIndex as Integer = 0) 

### 152.2.4 Constructor(mainwindow as window = nil, displayIndex as Integer = 0)

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Initializes the gamma class and queries the current gamma values.
**Notes:** On Windows a window is needed to get the exclusive access to the gamma controls.

The Available property is set to true if the constructor was successful.
Added displayIndex parameter in plugin version 14.1 to specify on Mac which display to handle.

If you like to pass nil for the window, please pass a variable, so Xojo knows which constructor to use and you avoid a compiler error.
See also:

- 152.2.3 Constructor(mainwindow as DesktopWindow, displayIndex as integer = 0) 19930

### 152.2.5 SetGamma(gammaScale as Double = 1.0) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the gamma values.
**Notes:** The current table assigned to the main screen.
All values are multiplied with gammaScale

### 152.2.6 Properties

### 152.2.7 Available as Boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the constructor was successful.
**Notes:** True if the initialization code worked.

On Mac OS X the constructor fails to get access if it does not find a display with gamma controls.

On Windows the access to the gamma controls can fail if you don't provide a window, the hardware can't do gamma fades (e.g. running in VMWare) or DirectX is not available.
(Read and Write property)

### 152.2.8 Lasterror as Integer

MBS ComputerControl Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 152.2.9 Size as Integer

MBS ComputerControl Plugin, Plugin Version: 14.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The number of entries in the gamma table.
**Notes:** Should be 256 for Windows.
And 256 or 1024 for Mac.
(Read only property)

### 152.2.10 Blue(Index as Integer) as Double

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The blue value with the given index.
**Notes:** Index is from 0 to 255 and value from 0.0 to 1.0.
(Read and Write computed property)

### 152.2.11 Green(Index as Integer) as Double

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The green value with the given index.
**Notes:** Index is from 0 to 255 and value from 0.0 to 1.0.
(Read and Write computed property)

### 152.2.12 Red(Index as Integer) as Double

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The red value with the given index.
**Notes:** Index is from 0 to 255 and value from 0.0 to 1.0.
(Read and Write computed property)

## 152.3 class KeyCodesMBS

### 152.3.1 class KeyCodesMBS

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** A class for translating between key codes and ASCII characters.
**Notes:** This class is outdated, please use RemoteControlMBS module.

The list of key codes on a Mac is the same as the one used in the RB documentation for the sprite surface. Some special keys:

| | |
|---|---|
| Modifier keys | |
| kVirtualCapsLockKey | &h039 |
| kVirtualShiftKey | &h038 |
| kVirtualControlKey | &h03B |
| kVirtualOptionKey | &h03A |
| kVirtualCommandKey | &h037 |
| | |
| Editing/utility keys | |
| kVirtualHelpKey | &h072 |
| kVirtualDeleteKey | &h033 |
| kVirtualTabKey | &h030 |
| kVirtualEnterKey | &h04C |
| kVirtualReturnKey | &h024 |
| kVirtualEscapeKey | &h035 |
| kVirtualForwardDeleteKey | &h075 |
| | |
| Navigation keys | |
| kVirtualHomeKey | &h073 |
| kVirtualEndKey | &h002 |
| kVirtualPageUpKey | &h074 |
| kVirtualPageDownKey | &h079 |
| kVirtualLeftArrowKey | &h07B |
| kVirtualRightArrowKey | &h07C |
| kVirtualUpArrowKey | &h07E |
| kVirtualDownArrowKey | &h07D |

Key codes for Windows:

**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr6
- MBS Real Studio Plugins, version 11.3pr14

### 152.3.2 Methods

### 152.3.3 AsciiToKeyCode(ascii as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the keycode which is needed to be pressed to create this ASCII character.
**Notes:** You get the main key, not any modifier which may also be pressed.

### 152.3.4 KeyCodeToAscii(keycode as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the ASCII code which matches the key code.
**Example:**

```
dim k as KeyCodesMBS

k=new KeyCodesMBS

// makes a big A on a german keyboard:
MsgBox chr(k.KeyCodeToAsciiWithSecondKeyCode(0+512))
```

**Notes:** Note on a Mac:
Bit 0 to 6 are the keycode, bit 7 is 1 if key goes up and 0 if key goes down.
Bit 8 to 15 are modifier keys:

Constants for the modifier keys:

Not available in 64-bit.
See MacTextForKeyCode method in RemoteControlMBS module.

### 152.3.5 KeyCodeToAsciiWithSecondKeyCode(keycode as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 3.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the ASCII code which matches the key code with the current state.
**Example:**

```
dim k as KeyCodesMBS

k=new KeyCodesMBS
```

```
MsgBox str(k.KeyCodeToAscii(&h0A))
MsgBox chr(k.KeyCodeToAsciiWithSecondKeyCode(0))

// gives √¢ on a German Keyboard
```

**Notes:** On the first call of KeyCodeToAscii you get the ASCII char, but if you call KeyCodeToAsciiWithSecondKeyCode and the state property is not changed, you can get what the user gets if he presses several keys.
KeyCodeToAscii resets state to 0 before calling.
On Windows, KeyCodeToAscii and KeyCodeToAsciiWithSecondKeyCode are equal.

Note on a Mac:
Bit 0 to 6 are the keycode, bit 7 is 1 if key goes up and 0 if key goes down.
Bit 8 to 15 are modifier keys:

Constants for the modifier keys:

Not available in 64-bit.

### 152.3.6 TestForAsciiKeyDown(ascii as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns true if the key with the given ascii code is pressed.

### 152.3.7 TestForKeyDown(keycode as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns true if the key with the given key code is pressed.
**Example:**

```
Dim k As New KeyCodesMBS

Const VK_SHIFT = &h10 // for Windows
If k.TestForKeyDown(VK_SHIFT) Then
MsgBox "shift"
Else
MsgBox "no shift"
End If
```

### 152.3.8 Update

MBS ComputerControl Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Updates the layout so it is the current one.

### 152.3.9 Properties

### 152.3.10 LastError as Integer

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** The last function was successfull if lasterror is 0.
If the last function was not available on this machine, the value is set to -1.
Other values are Mac OS error codes.
(Read and Write property)

### 152.3.11 Name as String

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The name for the current keyboard layout.
**Notes:** On Mac OS 9 e.g. "Deutsch".
On Mac OS X e.g. "German".
On Windows 98 e.g. "00020407".
(Read only property)

### 152.3.12 State as Integer

MBS ComputerControl Plugin, Plugin Version: 3.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The last state.
**Notes:** The function KeyCodeToAscii stores a code here which the function KeyCodeToAsciiWithSecondKeyCode will use on further calls.
(Read and Write property)

| | |
|---|---|
| VK_LBUTTON | &h01 |
| VK_RBUTTON | &h02 |
| VK_CANCEL | &h03 |
| VK_MBUTTON | &h04 |
| | |
| VK_XBUTTON1 | &h05 (Windows 2000 and newer) |
| VK_XBUTTON2 | &h06 (Windows 2000 and newer) |
| | |
| VK_BACK | &h08 |
| VK_TAB | &h09 |
| | |
| VK_CLEAR | &h0C |
| VK_RETURN | &h0D |
| | |
| VK_SHIFT | &h10 |
| VK_CONTROL | &h11 |
| VK_MENU | &h12 |
| VK_PAUSE | &h13 |
| VK_CAPITAL | &h14 |
| | |
| VK_KANA | &h15 |
| VK_HANGUL | &h15 |
| VK_JUNJA | &h17 |
| VK_FINAL | &h18 |
| VK_HANJA | &h19 |
| VK_KANJI | &h19 |
| | |
| VK_ESCAPE | &h1B |
| | |
| VK_CONVERT | &h1C |
| VK_NONCONVERT | &h1D |
| VK_ACCEPT | &h1E |
| VK_MODECHANGE | &h1F |
| | |
| VK_SPACE | &h20 |
| VK_PRIOR | &h21 |
| VK_NEXT | &h22 |
| VK_END | &h23 |
| VK_HOME | &h24 |
| VK_LEFT | &h25 |
| VK_UP | &h26 |
| VK_RIGHT | &h27 |
| VK_DOWN | &h28 |
| VK_SELECT | &h29 |
| VK_PRINT | &h2A |
| VK_EXECUTE | &h2B |
| VK_SNAPSHOT | &h2C |
| VK_INSERT | &h2D |
| VK_DELETE | &h2E |
| VK_HELP | &h2F |
| | |
| VK_0 - VK_9 | are the same as ASCII "0" - "9" (&h30 - &h39) |
| VK_A - VK_Z | are the same as ASCII "A" - "Z" (&h41 - &h5A) |
| | |
| VK_LWIN | &h5B |
| VK_RWIN | &h5C |
| VK_APPS | &h5D |
| | |
| VK_SLEEP | &h5F |
| | |
| VK_NUMPAD0 | &h60 |
| VK_NUMPAD1 | &h61 |
| VK_NUMPAD2 | &h62 |
| VK_NUMPAD3 | &h63 |
| VK_NUMPAD4 | &h64 |
| VK_NUMPAD5 | &h65 |

| | | |
|---|---|---|
| shiftKey | 512 | shift key down? |
| alphaLock | 1024 | alpha lock down? |
| optionKey | 2048 | option key down? |
| controlKey | 4096 | control key down? |
| rightShiftKey | 8192 | right shift key down? |
| rightOptionKey | 16384 | right Option key down? |
| rightControlKey | 32768 | right Control key down? |


| | | |
|---|---|---|
| shiftKey | 512 | shift key down? |
| alphaLock | 1024 | alpha lock down? |
| optionKey | 2048 | option key down? |
| controlKey | 4096 | control key down? |
| rightShiftKey | 8192 | right shift key down? |
| rightOptionKey | 16384 | right Option key down? |
| rightControlKey | 32768 | right Control key down? |

## 152.4 class PresskeyMBS

### 152.4.1 class PresskeyMBS

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use RemoteControlMBS instead. **Function:** This class allows you to simulate keyboard activity.
**Notes:** This class is deprecated, please use RemoteControlMBS module.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr6

### 152.4.2 Methods

### 152.4.3 clear

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Resets this object.

### 152.4.4 mouseclick(down as boolean)

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Clicks the mouse button.
**Notes:** Clicks the mouse at current position.
Left button is used.
If you forget the mouseup you may loose control about a Mac with Mac OS X, but if you have enabled external terminal login you can login via SSH and quit Xojo from outside.

The Mac version sets the lasterror property.
See also:

- 152.4.5 MouseClick(down as boolean, rightdown as boolean) 19940

### 152.4.5 MouseClick(down as boolean, rightdown as boolean)

MBS ComputerControl Plugin, Plugin Version: 8.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Clicks the mouse with the given buttons.
**Notes:** Same as MouseClick, but with an additional rightdown parameter.
See also:

• 152.4.4 mouseclick(down as boolean) 19940

### 152.4.6 MouseMove(globalx as Integer,globaly as Integer)

MBS ComputerControl Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the mouse.
**Example:**

```
dim x,y as Integer
dim p as PresskeyMBS
p=new PresskeyMBS
x=system.mousex
y=system.mousey+10 // move ten pixels down
p.mousemove x,y
```

**Notes:** Moves the mouse on screen.
The destination must be specified in global screen coordinates.
Requires Mac OS 8.5 or newer for Mac OS Classic.

### 152.4.7 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean)

MBS ComputerControl Plugin, Plugin Version: 2.8, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the mouse.
**Notes:** Moves the mouse on screen and clicks.
The destination must be specified in global screen coordinates.
Requires Mac OS 8.5 or newer for Mac OS Classic.

The Mac version sets the lasterror property.

Mac OS X only:
Based on the values entered, the appropriate mouse-down, mouse-up, mouse-move, or mouse-drag events are generated, by comparing the new state with the current state.
See also:

• 152.4.8 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean, rightdown as boolean) 19942

### 152.4.8 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean, rightdown as boolean)

MBS ComputerControl Plugin, Plugin Version: 8.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the mouse cursor and clicks the mouse with the given buttons.
**Notes:** Same as MouseMoveClick, but with an additional rightdown parameter.
See also:

- 152.4.7 MouseMoveClick(globalx as Integer,globaly as Integer,down as boolean) 19941

### 152.4.9 press

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Presses a key.
**Example:**

```
' example for Mac OS X:
dim p as PresskeyMBS

p=new PresskeyMBS
p.shift=true
p.charcode=asc("H")
p.keycode=4
p.press 'press H
p.shift=false
p.charcode=asc("e")
p.keycode=14
p.press 'press e
p.charcode=asc("l")
p.keycode=37
p.press 'press l
p.press 'press l
p.charcode=asc("o")
p.keycode=31
p.press 'press o

' example for Windows:

editfield1.setfocus 'so we get something in it!

p=new PresskeyMBS
p.shift=true
p.charcode=asc("H")
p.virtualCode=-1 'automatically try to get this code
p.press 'press H
```

```
p.shift=false
p.virtualCode=-1 'after a call you find the virtualCode there
p.charcode=asc("e")
p.press 'press e
p.virtualCode=-1
p.charcode=asc("l")
p.press 'press l
p.press 'press l
p.virtualCode=-1
p.charcode=asc("o")
p.press 'press o
```

**Notes:** Simulates a keypress and handles the Settings for Shift, Control, Command and Option key.
Command shows no reaction in my tests for Mac OS Classic
On Windows, if you set virtualcode=-1 this method will set it to the code matching the charcode property.

The Mac version sets the lasterror property.

### 152.4.10 pressraw(down as boolean)

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Presses a key.
**Example:**

```
' Works perfectly on Mac OS X but Shift can't be done Raw on Mac OS 9:
dim p as PresskeyMBS

p=new PresskeyMBS

p.charcode=0
p.keycode=&h38
p.pressraw true 'shift down

p.charcode=asc("H")
p.keycode=4
p.pressraw true 'press H
p.pressraw false

p.charcode=0
p.keycode=&h38
p.pressraw false 'shift up

p.charcode=asc("e")
```

```
p.keycode=14
p.pressraw true 'press e
p.pressraw false
p.charcode=asc("l")
p.keycode=37
p.pressraw true 'press l
p.pressraw false
p.pressraw true 'press l
p.pressraw false
p.charcode=asc("o")
p.keycode=31
p.pressraw true 'press o
p.pressraw false
```

**Notes:** Simulates a keypress and doesn't handle the Settings for Shift, Control, Command and Option key. On Windows, if you set virtualcode=-1 this method will set it to the code matching the charcode property.

The Mac version sets the lasterror property.

### 152.4.11 Properties

### 152.4.12 Charcode as Integer

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The character you want to press.
**Example:**

```
dim p as PresskeyMBS

p=new PresskeyMBS
p.charcode=8
p.keycode=&h33
p.press // press backspace on Mac OS
```

**Notes:** On Mac OS Classic the final printed charcode inside an editfield is the one you pass.
(Read and Write property)

### 152.4.13 Command as boolean

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Tells the Press method to press down command key before and release it after it simulates the key press.
**Example:**

```
dim p as new PresskeyMBS
p.command=True
```

**Notes:** It looks like the command key is not working for Mac OS Classic.
On Windows the control key is pressed if control or command properties are true.
(Read and Write property)

### 152.4.14 Control as boolean

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Tells the Press method to press down control key before and release it after it simulates the key press.
**Example:**

```
dim p as new PresskeyMBS
p.Control=True
```

**Notes:** On Windows the control key is pressed if control or command properties are true.
(Read and Write property)

### 152.4.15 Keycode as Integer

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** For Mac OS the number of the key on the keyboard which is pressed.
**Example:**

```
dim p as PresskeyMBS
p=new PresskeyMBS
p.keycode=2
p.charcode=asc("d")
p.press 'shows a "d" on Mac OS
```

**Notes:** You find this codes in that nice tables for the codes of the Spritesurface in the Xojo books.
(Read and Write property)

### 152.4.16 Lasterror as Integer

MBS ComputerControl Plugin, Plugin Version: 3.3, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Not all functions of this class fill this property!
(Read and Write property)

### 152.4.17 Option as boolean

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Tells the Press method to press down option key before and release it after it simulates the key press.
**Example:**

```
dim p as PresskeyMBS
p.option=True
```

**Notes:** (Read and Write property)

### 152.4.18 Shift as boolean

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Tells the Press method to press down shift before and release it after it simulates the key press.
**Example:**

```
dim p as PresskeyMBS

p=new PresskeyMBS
p.shift=true
p.charcode=asc("1")
p.keycode=18
p.press 'press !
```

**Notes:** (Read and Write property)

### 152.4.19 VirtualCode as Integer

MBS ComputerControl Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The virtual keycode to press.
**Example:**

```
dim p as PresskeyMBS
p=new PresskeyMBS
p.charcode=asc("m")
p.virtualcode=-1
p.press ' makes a "m" on Windows.
```

**Notes:** If you don't know this code, just pass -1 and this value will be filled automatically using the charcode property.
After you call press or pressraw you'll find the matching virtualcode in this property.
(Read and Write property)

## 152.5 module RemoteControlMBS

### 152.5.1 module RemoteControlMBS

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This module collects methods for simulating user input with mouse and keyboard.
**Notes:** You can use this class for GUI scripting.
Requires libXtst.so.6 on Linux to be installed.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- Xojo Tips and Tricks
- MBS Xojo Plugins, version 23.5pr6
- MBS Xojo Plugins, version 23.1pr4
- News from the MBS Xojo Plugins Version 21.2
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### 152.5.2 Methods

### 152.5.3 LinuxConvertCase(keysymbol as Integer, byref lowerSymbol as Integer, byref upperSymbol as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Converts the case of the given keysymbol.
**Notes:** In lowerSymbol you will receive the key symbol for a lower case key and in upperSymbol the uppercase keys.

So passing in the key symbol of "a" or "A" will both return "a" and "A".

### 152.5.4 LinuxKeyCodeToKeySymbol(keycode as Integer, index as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns from the keyboard mapping tables the key symbol for the given key code.
**Notes:** Index is the offset in the tables. 0 for the first key symbol and 1 for the second. If the user presses shift the keyboard driver uses index=1 to access the capital letters.

### 152.5.5 LinuxKeyNameToKeySymbol(keyname as string) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Searches the key mapping list for the key symbol for a given name.
**Notes:** Returns 0 on failure.

### 152.5.6 LinuxKeySymbolToKeyCode(keysymbol as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Searches the hardware dependend key code for the given key symbol.
**Notes:** Returns 0 on any error.

### 152.5.7 LinuxKeySymbolToKeyName(keysymbol as Integer) as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the name of the key symbol.
**Notes:** Can return "" on an invalide keysymbol value.

### 152.5.8 LinuxMouseClick(ButtonID as Integer, ButtonDown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simulates a mouse click with the given button.
**Notes:** ButtonID=1 is the left mouse button.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.

### 152.5.9 LinuxMousePositionX as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.10 LinuxMousePositionY as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.11 LinuxMoveMouse(x as Integer, y as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Moves the mouse to the given position.
**Notes:** Returns true on success.

### 152.5.12 LinuxPressControlKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Presses the ctrl key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.13 LinuxPressKey(Keycode as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Presses the key with the given keycode.
**Notes:** Performs a key down and a key up event.
Returns true on success.
See also:

- 152.5.14 LinuxPressKey(Keycode as Integer, ButtonDown as boolean) as boolean 19951

### 152.5.14 LinuxPressKey(Keycode as Integer, ButtonDown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Performs a key event.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.
See also:

- 152.5.13 LinuxPressKey(Keycode as Integer) as boolean 19950

### 152.5.15 LinuxPressOptionKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Presses the alt key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.16 LinuxPressShiftKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Presses the shift key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.17 LinuxSupported as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the functions are available for simulation of keyboard and mouse events.
**Notes:** Returns true if the Xtest extension is installed.

### 152.5.18 MacCurrentProcessID as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the process ID of your application.
**Notes:** Returns 0 on any error.

### 152.5.19 MacCurrentProcessName as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the name of the current process.
**Example:**

msgbox RemoteControlMBS.MacCurrentProcessName

**Notes:** This is the name of your application.

### 152.5.20 MacDescriptionForKeyCode(keycode as Integer) as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Translates a keycode to a string for displaying.
**Notes:** Keycodes which match a special key like "Return", "F1" or "Backspace" are returned as descriptive strings.

### 152.5.21 MacDisplayNameForKeyCode(keycode as Integer) as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Translates a keycode to a string for displaying.
**Notes:** Same as MacTextForKeyCode(keycode, 4)

### 152.5.22 MacForegroundProcessID as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the process ID of the application in the foreground.
**Notes:** Returns 0 on any error.

### 152.5.23 MacFrontProcessName as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the front process.
**Example:**

```
RemoteControlMBS.MacFrontProcessName="iChat" // move iChat to front
```

**Notes:** (Read and Write computed property)

### 152.5.24 MacKeyboardLocalizedName as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The localized name of the current keyboard layout.
**Notes:** Returns "" on any error.

### 152.5.25 MacKeyboardName as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the current keyboard layout.
**Notes:** Returns "" on any error.

Added 64-bit support for version 17.0.

### 152.5.26 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clicks the mouse buttons on the given position.
**Example:**

```
// doing a context menu click with control key:

dim x,y as Integer
x=System.MouseX
y=System.MouseY

call RemoteControlMBS.PressControlKey true
```

```
call RemoteControlMBS.MacMouseClick x, y, true, true
call RemoteControlMBS.MacMouseClick x, y, true, false
call RemoteControlMBS.PressControlKey false
```

**Notes:** Returns true on success.
If updateMouseCursorPosition is true the mouse position is updated on screen.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.
See also:

- 152.5.27 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19954
- 152.5.28 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19955

### 152.5.27 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clicks the mouse buttons on the given position.
**Example:**

```
// do a right click:

dim x,y as Integer
x=System.MouseX
y=System.MouseY

call RemoteControlMBS.MacMouseClick x, y, true, false, true
call RemoteControlMBS.MacMouseClick x, y, true, false, false
```

**Notes:** Returns true on success.
If updateMouseCursorPosition is true the mouse position is updated on screen.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.
See also:

- 152.5.26 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean) as boolean 19953

- 152.5.28 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19955

### 152.5.28 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clicks the mouse buttons on the given position.
**Notes:** Returns true on success.
If updateMouseCursorPosition is true the mouse position is updated on screen.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.
See also:

- 152.5.26 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean) as boolean 19953
- 152.5.27 MacMouseClick(x as Double, y as Double, updateMouseCursorPosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19954

### 152.5.29 MacMousePositionX as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.30 MacMousePositionY as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.31 MacMouseWheel(wheel1 as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a wheel event.
**Example:**

call RemoteControlMBS.MacMouseWheel 1

**Notes:** Returns true on success.
A typical value for the wheel changes are in range from -10 to 10.
See also:

- 152.5.32 MacMouseWheel(wheel1 as Integer, wheel2 as Integer) as boolean 19956

### 152.5.32 MacMouseWheel(wheel1 as Integer, wheel2 as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Performs a wheel event.
**Example:**

call RemoteControlMBS.MacMouseWheel 10,5

**Notes:** Returns true on success.
A typical value for the wheel changes are in range from -10 to 10.
See also:

- 152.5.31 MacMouseWheel(wheel1 as Integer) as boolean 19955

### 152.5.33 MacMoveMouse(x as Double, y as Double) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Moves the mouse to the given position.
**Example:**

call RemoteControlMBS.MacMoveMouse(100,100)

**Notes:** Returns true on success.
On Mac does not generate mouse events.

### 152.5.34 MacPressCommandKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the command key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.35 MacPressControlKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the ctrl key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.36 MacPressKey(keychar as Integer, virtualkey as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the given key.
**Notes:** keychar is the ASCII code of the key you press and virtualkey is the key code.
Returns true on success.
Peforms a key down and a key up event.
See also:

- 152.5.37 MacPressKey(keychar as Integer, virtualkey as Integer, keydown as boolean) as boolean 19957

### 152.5.37 MacPressKey(keychar as Integer, virtualkey as Integer, keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the given key.
**Notes:** keychar is the ASCII code of the key you press and virtualkey is the key code.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.
See also:

- 152.5.36 MacPressKey(keychar as Integer, virtualkey as Integer) as boolean 19957

### 152.5.38 MacPressOptionKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the option key. (labeled with alt)
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.39 MacPressShiftKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Presses the shift key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.40 MacProcessCount as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Counts the high level processes.
**Example:**

```
msgBox str(remoteControlMBS.macprocessCount)
```

### 152.5.41 MacProcessName(index as Integer) as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the process with the given index.
**Example:**

```
dim i,c as Integer

// search iChat and make it visible
c=remoteControlMBS.macprocesscount
for i=0 to c-1
if remoteControlMBS.macprocessname(i)="iChat" then
```

```
remoteControlMBS.macprocessVisible(i)=true
end if
next
```

**Notes:** Index is from 0 to MacProcessCount-1.

### 152.5.42 MacProcessVisible(index as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether a process is visible or not.
**Example:**

```
dim i,c as Integer

// search Safari and make it invisible
c=remoteControlMBS.macprocesscount
for i=0 to c-1
if remoteControlMBS.macprocessname(i)="Safari" then
remoteControlMBS.macprocessVisible(i)=false
end if
next
```

**Notes:** Index is from 0 to MacProcessCount-1.
(Read and Write computed property)

### 152.5.43 MacTextForKeyCode(keycode as Integer, KeyAction as Integer, ModifierState as Integer) as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Translates a keycode to a string.
**Example:**

```
// try some keycodes like e, E, ,Ç¨ or √©
dim key as string = "@"

const kCommandKey = 1
const kShift = 2
const kCapsLock = 4
const kOption = 8
const kControl = 16
```

```
// with no modifiers
for i as Integer = 0 to 127

dim s as string = RemoteControlMBS.MacTextForKeyCode(i, 3, 0)

if StrComp(key, s, 0) = 0 then
MsgBox "Found with keycode "+str(i)
Return
end if

next

// with shift
for i as Integer = 0 to 127

dim s as string = RemoteControlMBS.MacTextForKeyCode(i, 3, kShift)

if StrComp(key, s, 0) = 0 then
MsgBox "Found with keycode "+str(i)+" with Shift"
Return
end if

next

// with option
for i as Integer = 0 to 127

dim s as string = RemoteControlMBS.MacTextForKeyCode(i, 3, kOption)

if StrComp(key, s, 0) = 0 then
MsgBox "Found with keycode "+str(i)+" with Option"
Return
end if

next
```

**Notes:** Works only with Unicode keyboard layouts which need Mac OS X 10.5.

Modifier values:

Possible constants for the Key Action:

| | |
|---|---|
| Command Key | 1 |
| Shift | 2 |
| CapsLock | 4 |
| Option | 8 |
| Control | 16 |

| | | |
|---|---|---|
| kUCKeyActionDown | 0 | The user is pressing the key. |
| kUCKeyActionUp | 1 | The user is releasing the key. |
| kUCKeyActionAutoKey | 2 | The user has the key in an "auto-key" pressed state that is, the user is holding down the key for an extended period of time and is thereby generating multiple key strokes from the single key. |
| kUCKeyActionDisplay | 3 | The user is requesting information for key display, as in the Key Caps application. |

### 152.5.44 MouseClick(x as Integer, y as Integer, down as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Performs a mouse click.
**Notes:** The mouse cursor is moved to the given position and the first mouse button is pressed.
Returns true on success.

### 152.5.45 MousePositionX as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.46 MousePositionY as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.47 MoveMouse(x as Integer, y as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Moves the mouse to the given location.
**Notes:** Returns true on success.
On Mac does not generate mouse events.

### 152.5.48 PressControlKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Presses the ctrl key.
**Notes:** Returns true on success.

### 152.5.49 PressOptionKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Presses the option key.
**Notes:** Returns true on success.

### 152.5.50 PressShiftKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Presses the shift key.
**Notes:** Returns true on success.

### 152.5.51 WinBringProcessToTop(ProcessID as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Brings all windows of process to the front.
**Notes:** Returns true if function found at least one window.

### 152.5.52 WinBringWindowToTop(WindowHandle as Integer, SetFocus as boolean = true) as boolean

MBS ComputerControl Plugin, Plugin Version: 13.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Brings a given window to front.
**Example:**

```
dim h as Integer = RemoteControlMBS.WinFindWindow("", "Calculator")
call RemoteControlMBS.WinBringWindowToTop h
```

**Notes:** Pass any window handle, including windows from other applications.
If SetFocus is true, we also set the focus.
Returns true on success.

### 152.5.53 WinCurrentProcessID as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the process ID of your application.
**Notes:** Returns 0 on any error.

### 152.5.54 WinFindWindow(ClassName as string, WindowName as string) as Integer

MBS ComputerControl Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds a window based on the classname and/or the window name.
**Example:**

```
dim h as Integer = RemoteControlMBS.WinFindWindow("SciCalc","")
msgbox hex(h)
```

**Notes:** One of the names can be an empty string so only the other name is used. Normally you should prefer the class name as it is not localized. The WindowsListMBS class can help you finding the class name of a window.
Returns 0 on any error.

### 152.5.55 WinForegroundProcessID as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the process ID of the application which owns the foreground window.
**Notes:** Returns 0 on any error.

### 152.5.56 WinFrontWindowTitle as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The title of the window which has the focus.
**Example:**

title=remoteControlMBS.winfrontWindowTitle

**Notes:** May return "" on any error.

### 152.5.57 WinIsCapsLock as boolean

MBS ComputerControl Plugin, Plugin Version: 23.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether caps lock is set.
**Example:**

```
// check state in a timer
if RemoteControlMBS.WinKeyIsCapsLock then
title = "caps lock on"
else
Title = "caps lock off"
end if
```

**Notes:** User may press the caps lock key to toggle between on and off.

### 152.5.58 WinIsNumLock as boolean

MBS ComputerControl Plugin, Plugin Version: 23.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether caps lock is set.
**Example:**

```
// check state in a timer
if RemoteControlMBS.WinIsNumLock then
title = "num lock on"
else
Title = "num lock off"
end if
```

**Notes:** User may press the num lock key to toggle between on and off.

### 152.5.59 WinIsScrollLock as boolean

MBS ComputerControl Plugin, Plugin Version: 23.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether scroll lock is set.
**Example:**

```
// check state in a timer
if RemoteControlMBS.WinIsScrollLock then
title = "scroll lock on"
else
Title = "scroll lock off"
end if
```

**Notes:** User may press the scroll lock key to toggle between on and off.
For macOS and Parallels, this key is F14 on the Mac keyboard.

### 152.5.60 WinIsWindowMinimized(WindowHandle as Integer) as Boolean

MBS ComputerControl Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether the specified window is minimized.
**Notes:** Returns true if minimized.
Use RemoteControlMBS.WinFindWindow if you need to find a window handle.

### 152.5.61 WinIsWindowVisible(WindowHandle as Integer) as Boolean

MBS ComputerControl Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks the visibility state of the specified window.

**Notes:** Returns true if visible or false if not.
Use RemoteControlMBS.WinFindWindow if you need to find a window handle.

### 152.5.62 WinKeyboardName as string

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the current Windows keyboard layout.

### 152.5.63 WinKeyIsDown(virtualkey as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Tests whether a given key is currently pressed.

### 152.5.64 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use WinMouseClick with integer parameters instead. **Function:** Peforms a mouse click on the given position.
**Notes:** If AbsolutePosition is false the given coordinates are relative to the current position.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.
See also:

- 152.5.65 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19966
- 152.5.66 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19967
- 152.5.67 WinMouseClick(x as integer, y as integer, AbsolutePosition as boolean, MouseButton1 as Integer, MouseButton2 as Integer, MouseButton3 as Integer) as boolean 19968

### 152.5.65 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use WinMouseClick with integer parameters instead. **Function:** Peforms a mouse click on the given position.
**Notes:** If AbsolutePosition is false the given coordinates are relative to the current position.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.

Deprecated. Please use the version taking integers, so you can click only one button without others.
See also:

- 152.5.64 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean) as boolean 19966
- 152.5.66 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19967
- 152.5.67 WinMouseClick(x as integer, y as integer, AbsolutePosition as boolean, MouseButton1 as Integer, MouseButton2 as Integer, MouseButton3 as Integer) as boolean 19968

### 152.5.66 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use WinMouseClick with integer parameters instead. **Function:** Peforms a mouse click on the given position.
**Notes:** If AbsolutePosition is false the given coordinates are relative to the current position.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.

Deprecated. Please use the version taking integers, so you can click only one button without others.
See also:

- 152.5.64 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean) as boolean 19966
- 152.5.65 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19966
- 152.5.67 WinMouseClick(x as integer, y as integer, AbsolutePosition as boolean, MouseButton1 as Integer, MouseButton2 as Integer, MouseButton3 as Integer) as boolean 19968

### 152.5.67 WinMouseClick(x as integer, y as integer, AbsolutePosition as boolean, MouseButton1 as Integer, MouseButton2 as Integer, MouseButton3 as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Peforms a mouse click on the given position.
**Example:**

```
Const x = 100
Const y = 100

// press right mouse button

Dim success1 As Boolean = RemoteControlMBS.WinMouseClick(x, y, True, -1, 1, -1)

// and up
Dim success2 As Boolean = RemoteControlMBS.WinMouseClick(x, y, True, -1, 0, -1)
```

**Notes:** If AbsolutePosition is false the given coordinates are relative to the current position.
Returns true on success.

Be aware that the user may get into trouble if you forget to release a mouse button you pressed before. So always call this method another time to release the mouse buttons.
Pass 1 to click mouse button down, 0 to release it or -1 to not touch the button.
See also:

- 152.5.64 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean) as boolean 19966
- 152.5.65 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean) as boolean 19966
- 152.5.66 WinMouseClick(x as Integer, y as Integer, AbsolutePosition as boolean, MouseButton1 as boolean, MouseButton2 as boolean, MouseButton3 as boolean) as boolean 19967

### 152.5.68 WinMousePositionX as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.69 WinMousePositionY as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the current mouse position.

### 152.5.70 WinMoveMouse(x as Integer, y as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves the mouse cursor to the given position.
**Notes:** Returns true on success.
Internally the coordinates are converted to normalized absolute coordinates which can lead to have the mouse one pixel off the requested position due to rounding.

### 152.5.71 WinPressControlKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Presses the ctrl key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.72 WinPressKey(ScanCode as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a key event with the given data.
**Notes:** This methods creates a keydown and a keyup event.
Returns true on success.
See also:


- 152.5.73 WinPressKey(ScanCode as Integer, keydown as boolean) as boolean 19970
- 152.5.74 WinPressKey(virtualkey as Integer, ScanCode as Integer) as boolean 19970
- 152.5.75 WinPressKey(virtualkey as Integer, ScanCode as Integer, keydown as boolean) as boolean 19970

### 152.5.73 WinPressKey(ScanCode as Integer, keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a key event with the given data.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.
See also:

- 152.5.72 WinPressKey(ScanCode as Integer) as boolean 19969
- 152.5.74 WinPressKey(virtualkey as Integer, ScanCode as Integer) as boolean 19970
- 152.5.75 WinPressKey(virtualkey as Integer, ScanCode as Integer, keydown as boolean) as boolean 19970

### 152.5.74 WinPressKey(virtualkey as Integer, ScanCode as Integer) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a key event with the given data.
**Notes:** This methods creates a keydown and a keyup event.
Returns true on success.
See also:

- 152.5.72 WinPressKey(ScanCode as Integer) as boolean 19969
- 152.5.73 WinPressKey(ScanCode as Integer, keydown as boolean) as boolean 19970
- 152.5.75 WinPressKey(virtualkey as Integer, ScanCode as Integer, keydown as boolean) as boolean 19970

### 152.5.75 WinPressKey(virtualkey as Integer, ScanCode as Integer, keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs a key event with the given data.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.
See also:

- 152.5.72 WinPressKey(ScanCode as Integer) as boolean 19969

- 152.5.73 WinPressKey(ScanCode as Integer, keydown as boolean) as boolean 19970
- 152.5.74 WinPressKey(virtualkey as Integer, ScanCode as Integer) as boolean 19970


### 152.5.76 WinPressOptionKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Presses the alt key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.77 WinPressShiftKey(keydown as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Presses the shift key.
**Notes:** Returns true on success.

Be aware that the user may get into trouble if you forget to release a key you pressed before. So always call this method another time to release the key.

### 152.5.78 WinScanCodeToVirtualKeyCode(ScanCode as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Searches the virtual key code for the given scancode.
**Notes:** Each key has a hardware dependend scan code. For each scancode you can get the virtual key code which is hardware independend.

Returns 0 on failure.

### 152.5.79 WinSendMessage(Win as DesktopWindow, Msg as integer, lParam as integer, WParam as integer) as integer

MBS ComputerControl Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sends a Windows message to a given window.
**Notes:** The result depends on the message command.
See also:

- 152.5.80 WinSendMessage(Win as window, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972
- 152.5.81 WinSendMessage(WindowHandle as Integer, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972

### 152.5.80 WinSendMessage(Win as window, Msg as Integer, lParam as Integer, WParam as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop only.

**Function:** Sends a Windows message to a given window.
**Example:**

```
const WM_CLOSE = &h0010

call RemoteControlMBS.WinSendMessage(window1, WM_CLOSE, 0, 0)
```

**Notes:** The result depends on the message command.
See also:

- 152.5.79 WinSendMessage(Win as DesktopWindow, Msg as integer, lParam as integer, WParam as integer) as integer 19971
- 152.5.81 WinSendMessage(WindowHandle as Integer, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972

### 152.5.81 WinSendMessage(WindowHandle as Integer, Msg as Integer, lParam as Integer, WParam as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a Windows message to a given window.
**Example:**

```
const WM_CLOSE = &h0010
dim h as Integer = RemoteControlMBS.WinFindWindow("SciCalc","")

call RemoteControlMBS.WinSendMessage(h, WM_CLOSE, 0, 0) // Closes Calc
```

**Notes:** The result depends on the message command.
See also:

- 152.5.79 WinSendMessage(Win as DesktopWindow, Msg as integer, lParam as integer, WParam as integer) as integer 19971
- 152.5.80 WinSendMessage(Win as window, Msg as Integer, lParam as Integer, WParam as Integer) as Integer 19972

### 152.5.82 WinShowWindow(WindowHandle as Integer, CmdShow as Integer) as Boolean

MBS ComputerControl Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shows or hides a window.
**Notes:** CmdShow can be:

| | |
|---|---|
| 0 | Hide |
| 1 | Show normal |
| 2 | Show minimized |
| 3 | Maximize |
| 4 | Show without activating |
| 5 | Show |
| 6 | Minimize |
| 7 | Show minimized without activating |
| 8 | Show normal without activating |
| 9 | Restore |
| 10 | Show default |
| 11 | Force minimized |

Use RemoteControlMBS.WinFindWindow if you need to find a window handle.

### 152.5.83 WinVirtualKeyCodeToCharCode(VirtualKeyCode as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the char code for a virtual key code.
**Notes:** Returns 0 on failure.

### 152.5.84 WinVirtualKeyCodeToScanCode(VirtualKeyCode as Integer) as Integer

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds the scan code to match the given virtual key code.
**Notes:** Returns 0 on failure.

### 152.5.85 WinVirtualKeyForASCII(Character as Integer, byref VirtualKeyCode as Integer, Byref ShiftKey as boolean, byref ControlKey as Boolean, byref AltKey as boolean) as boolean

MBS ComputerControl Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns for a given character which combination of key code and modifiers created the character.
**Notes:** For Character, you should use asc(string), but you may need to convert the string to Windows ANSI text encoding.

Returns 0 on failure.

# Chapter 153

# Resolution

## 153.1 class DisplayMBS

### 153.1.1 class DisplayMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Defines a class for accessing the displays of the screen.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr3
- MBS Xojo Plugins, version 17.2pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11
- MBS REALbasic Plugins, version 10.4pr4
- MBS Plugins 10.3 Release Notes
- MBS REALbasic plug-ins version 9.5

**Xojo Developer Magazine**

- 17.5, page 43: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 153.1.2 Methods

### 153.1.3 CanDepth(depth as Integer) As Boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns true if the monitor supports the given color depth at the current ResolutionMBS.
**Notes:** none.

### 153.1.4 FadeGamma(intensity as Integer, col As Color)

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets the gamma of the DisplayMBS
**Notes:** Intensity has to be between 0 and 1000. 1000 is normal, when it is 0, the whole DisplayMBS is in the color GammaColor.
Direct color display modes do not use color lookup tables and are usually 16, 24, or 32 bit. Not all direct color video boards support loadable gamma ramps.

See the NativeGamma documentation for more details on Windows Gamma details.

### 153.1.5 FadeGammaTo(intensity as Integer, col As Color, ticks as Integer)

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Fades the intensity and color of the gamma slowly in the given number of milliseconds.
**Notes:** Intensity has to be between 0 and 1000. 1000 is normal, when it is 0, the whole display is in the color GammaColor.
Direct color display modes do not use color lookup tables and are usually 16, 24, or 32 bit. Not all direct color video boards support loadable gamma ramps.
See the NativeGamma documentation for more details on Windows Gamma details.

### 153.1.6 GetBestResolution(width as Integer, height as Integer, depth as Integer, safe As Boolean) As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Searches for the best matching resolution.
**Notes:** Returns the best resolution which size is not smaller that the dimensions given, which has the given depth and, if safe is true, which is safe. If safe is not true, be sure that the frequency works, if you want to switch to it (for example by asking the user).

On Mac OS X till now no resolution can be called safe.
See also:

- 153.1.7 GetBestResolution(width as Integer, height as Integer, safe As Boolean) As ResolutionMBS 19977

### 153.1.7 GetBestResolution(width as Integer, height as Integer, safe As Boolean) As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Searches for the best matching resolution.
**Notes:** Returns the best resolution which size is not smaller that the dimensions given, which has the highest depth and, if safe is true, which is safe. If safe is not true, be sure that the frequency works, if you want to switch to it (for example by asking the user).
On Mac OS X till now no resolution can be called safe.
See also:

- 153.1.6 GetBestResolution(width as Integer, height as Integer, depth as Integer, safe As Boolean) As ResolutionMBS 19976

### 153.1.8 GetCurrentResolution As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the current resolution.
**Notes:** Returns the resolution the display is currently set to. This is useful if you want to switch back to the old resolution after you switched to another resolution.

### 153.1.9 GetLargestResolution(depth as Integer, safe As Boolean) As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Searches for the largest resolution with the given depth.
**Notes:** The same as GetBestResolution(width, height, depth, safe), the only difference is that it does not search for the smallest resolution but for the biggest one.
On Mac OS X till now no resolution can be called safe.
See also:

- 153.1.10 GetLargestResolution(safe As Boolean) As ResolutionMBS 19978

### 153.1.10 GetLargestResolution(safe As Boolean) As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Searches for the largest resolution.
**Notes:** If safe is true, this method returns only safe resolutions.
On Mac OS X till now no resolution can be called safe.
See also:

- 153.1.9 GetLargestResolution(depth as Integer, safe As Boolean) As ResolutionMBS 19977

### 153.1.11 GetResolution(num as Integer) As ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns a resolution.
**Notes:** Num has to be between 0 and ResolutionCount(safe)-1.

### 153.1.12 ResolutionCount(depth as Integer, safe As Boolean) as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the number of resolutions for a given depth.
**Notes:** This method returns the number of resolutions that have the given depth and, if safe is true, which are safe.
On Mac OS X till now no ResolutionMBS can be called safe.
See also:

- 153.1.13 ResolutionCount(safe As Boolean) as Integer 19978

### 153.1.13 ResolutionCount(safe As Boolean) as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns the number of resolutions.
**Notes:** This method returns the total number of resolutions this monitor supports and, if safe is true, which are safe. Safe resolutions are resolutions which will always work.
On Mac OS X till now no ResolutionMBS can be called safe.
See also:

- 153.1.12 ResolutionCount(depth as Integer, safe As Boolean) as Integer 19978

### 153.1.14 SetDepth(depth as Integer) As Boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Switches the color depth to the depth given. Returns true if attempt was successful.
**Notes:** none.

### 153.1.15 SwitchTo(width as Integer, height as Integer, depth as Integer, safe As Boolean) As Boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Switches to the given ResolutionMBS if possible.
**Notes:** This method tries to switch directly to the best ResolutionMBS which size is bigger or the same as the given dimensions and which depth is the same as the given parameter. It returnes true if it was successful. Try this function first with safe set to true. If that fails, try again with false, but after that show a dialog asking the user if that ResolutionMBS is okay. If the user presses escape or clicks cancel, you should immediatly switch back to the old ResolutionMBS.
On Mac OS X till now no ResolutionMBS can be called safe.

### 153.1.16 Update

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Updates the properties in this class.
**Notes:** Call it whenever you detect a screen resolution change to update the content of this class.
In general you should not keep DisplayMBS classes around too long because the display described may go away (one a Powerbook the external display).

### 153.1.17 Properties

### 153.1.18 Depth as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Depth of the DisplayMBS.
**Notes:** Can be 8, 16 or 32. Other screen depths are not well supported.
(Read only property)

### 153.1.19 displaynum as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** DisplayNum is the number of the DisplayMBS
**Notes:** The number is always between 0 and DisplayCount-1, where 0 is the main monitor.
(Read only property)

### 153.1.20 GammaColor as color

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The color for fading the DisplayMBS.
**Notes:** This property is read-only. To change it, use the methods of the DisplayMBS class and the Switch method of the ResolutionMBS class.
There is no fading for Windows.
(Read only property)

### 153.1.21 GammaIntensity as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** GammaIntensity is the intensity of the monitor.
**Notes:** 1000 is normal, if it is 0, the whole DisplayMBS is in the color GammaColor.
This property is read-only. To change it, use the methods of the DisplayMBS class and the Switch method of the ResolutionMBS class.
There is no fading for Windows.
(Read only property)

### 153.1.22 Height as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Height of the monitor.
**Notes:** (Read only property)

### 153.1.23 hz as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** frequency in Hz of that DisplayMBS
**Example:**

```
dim d as DisplayMBS

d=GetDisplayMBS(0)

msgBox str(d.Hz)
```

**Notes:** On Windows:
Sometimes Hz is 0, this is when Windows itself does not know the frequency (at least it is so in my emulation, Virtual PC 3.0 with Win95).
The value should never be greater as the real frequency, so you can just ignore this.
(Read only property)

### 153.1.24 Left as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The relative left offset to the other monitors.
**Notes:** Should be 0 for the main monitor.
(Read only property)

### 153.1.25 Top as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The relative top offset to the other monitors.
**Notes:** Should be 0 for the main monitor.
(Read only property)

### 153.1.26 Width as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Width of this screen.
**Notes:** (Read only property)

### 153.1.27 NativeGamma as memoryblock

MBS Util Plugin, Plugin Version: 3.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The native gamma values.
**Example:**

```
dim d as DisplayMBS // your display
d.nativegamma=newmemoryblock(3072) // all black
```

**Notes:** 3072 bytes big is this array a 256 RGB values saved in 3 single properties.

Some notes for SetDeviceGammaRamp, which is the Windows function used by the plugin:

SetDeviceGammaRamp doesn't allow all gamma ramps. It checks the gamma ramp; if it is too complex, such as the red flash when the player is shot in Quake, it rejects it.
SetDeviceGammaRamp will not currently make use of a gamma calibrator. This may change in future versions of Image Color Management (ICM), but for Windows 2000, only the DirectDraw API supports the gamma calibrators.
The existing gamma entry points is already used by GetDeviceGammaRamp and SetDeviceGammaRamp. Therefore, the display driver doesn't need to do anything special to support this new interface, as long as it already supports the Win32 Get/SetDeviceGammaRamp functions.
In addition to getting and setting gamma ramps, the new DirectDraw interface allows the new gamma ramp to be calibrated—if a gamma calibrator is installed. The mechanism that DirectDraw uses to register and communicate with the gamma calibrator is an interim mechanism that will be changed in future releases.
DirectDraw looks for an installed software calibrator and passes the gamma value to the software calibrator; the software calibrator in turn adjusts the gamma ramp according to the measured response of the monitor. The calibrator passes the gamma ramp back to DirectDraw, which passes it to the SetDeviceGammaRamp device driver interface (DDI). The result is that the game looks as intended.
For DirectDraw to use the gamma calibrator, the calibrator must register itself with DirectDraw using a registry key; DirectDraw will call it if the application wants the gamma ramp to be calibrated.
In the future, both the method by which DirectDraw communicates with the gamma calibrator, through the DDI, and the method gamma calibrators use to register themselves in the registry will change. But every part of the DirectDraw API is permanent.
ICM is the color management system in Windows; all system-level color management should be handled by ICM. For this reason, downloadable gamma ramp support will be rolled into ICM in the future, making current solutions for gamma calibrators obsolete. Until such time, we have provided a method by which applications can take advantage of the installed base of software calibrators and graphics adapters that support downloadable gamma ramps.
(Read and Write computed property)

## 153.2 Globals

### 153.2.1 DisplayCountMBS as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** DisplayCount returns the number of displays connected.
**Example:**

```
msgbox "You have "+str(DisplayCountMBS)+" screens."
```

### 153.2.2 GetDisplayMBS(num as Integer) As DisplayMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns an object of class DisplayMBS for the given DisplayMBS.
**Example:**

```
dim d as DisplayMBS

d=GetDisplayMBS(0)
msgBox str(d.width)+" x "+str(d.height)+" @ "+str(pow(2,d.depth))+" colors"
```

**Notes:** num must be: 0 <= num <displaycount

### 153.2.3 ResolutionLibraryPresentMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns true if the DisplayManager library file was found.
**Example:**

```
if not ResolutionLibraryPresentMBS then
msgbox "I'm missing the shared library 'DisplayManager'."
end if
```

**Notes:** This library should be present on all Mac OS Classic versions. (It is in the system suitcase.)
Returns always true on Windows.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 153.2.4 UpdateDisplayCountMBS

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Rebuilds the display list.
**Notes:** If new displays are attached or removed, this method needs to be called.

## 153.3 class ResolutionMBS

### 153.3.1 class ResolutionMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Defines a class for accessing the resolutions a screen.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

### 153.3.2 Methods

### 153.3.3 Switch As Boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** This function switches the DisplayMBS to the ResolutionMBS and returns true if the attempt was successful.
**Notes:** If IsSafe is false, show a dialog after the switch asking the user if that ResolutionMBS is okay. If the user presses escape or clicks cancel, you should immediatly switch back to the old ResolutionMBS. Especially on VGA-Monitors not all listed frequencies work.
On Mac OS X till now no ResolutionMBS can be called safe.

### 153.3.4 Properties

### 153.3.5 Depth as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Depth of the ResolutionMBS.
**Notes:** Can be 8, 16 or 32. Other screen depths are not well supported.
(Read only property)

### 153.3.6 displaynum as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** DisplayNum is the number of the DisplayMBS
**Notes:** The number is always between 0 and DisplayCount-1, where 0 is the main monitor.
(Read only property)

### 153.3.7 Height as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Height of the ResolutionMBS.
**Notes:** (Read only property)

### 153.3.8 hz as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** frequency in Hz of that ResolutionMBS
**Notes:** Sometimes Hz is 0, this is when Windows itself does not know the frequency (at least it is so in my emulation, Virtual PC 3.0 with Win95).
(Read only property)

### 153.3.9 issafe as boolean

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Is it a safe ResolutionMBS?
**Notes:** On Mac OS X till now no ResolutionMBS can be called safe.
(Read only property)

### 153.3.10 Left as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The relative left offset to that ResolutionMBS.
**Notes:** Should be 0 for the main monitor.
(Read only property)

### 153.3.11 ResolutionNum as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** DisplayNum is the number of the DisplayMBS.
**Notes:** ResolutionNum is the number of the DisplayMBS which always is between 0 and GetDisplayMBS(DisplayNum).ResolutionCount(false)-1.

On Windows: dis.GetCurrentResolution.resolutionNum is sometimes also -1.
(Read only property)

### 153.3.12 Top as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The relative top offset to the other monitors.
**Notes:** Should be 0 for the main monitor.
(Read only property)

### 153.3.13 Width as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Width of this ResolutionMBS.
**Notes:** (Read only property)

# Chapter 154

# RFC

## 154.1 class RFCClassDescriptionMBS

### 154.1.1 class RFCClassDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a class description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.1.2 Methods

### 154.1.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.1.4 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.1.5 Properties

### 154.1.6 AttributesCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries attribute count for class.
**Notes:** (Read only property)

### 154.1.7 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection owning this object.
**Notes:** (Read only property)

### 154.1.8 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 154.1.9 ImplementedInterfacesCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of implemented interfaces.
**Notes:** (Read only property)

### 154.1.10 Name as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the class.
**Notes:** (Read only property)

### 154.1.11 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 154.1.12 ParentClassesCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of parent classes.
**Notes:** (Read only property)

## 154.2 class RFCConnectionAttributesMBS

### 154.2.1 class RFCConnectionAttributesMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about the partner system on the other side of this RFC connection.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.2.2 Methods

### 154.2.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.2.4 Properties

### 154.2.5 client as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Client ("Mandant")
**Notes:** (Read only property)

### 154.2.6 codepage as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Own code page.
**Notes:** (Read only property)

### 154.2.7 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection used to get this information.
**Notes:** (Read only property)

### 154.2.8 cpicConvId as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CPI-C Conversation ID.
**Notes:** (Read only property)

### 154.2.9 dest as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** RFC destination.
**Notes:** (Read only property)

### 154.2.10 host as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Own host name.
**Notes:** (Read only property)

### 154.2.11 isoLanguage as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** 2-byte ISO-Language
**Notes:** (Read only property)

### 154.2.12 kernelRel as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner kernel release.
**Notes:** (Read only property)

### 154.2.13 language as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Language.
**Notes:** (Read only property)

### 154.2.14 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object for this object.
**Notes:** (Read only property)

### 154.2.15 partnerBytesPerChar as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of bytes per character in the backend's current codepage.
**Notes:** Note this is different from the semantics of the PCS parameter.
(Read only property)

### 154.2.16 partnerCodepage as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner code page.
**Notes:** (Read only property)

### 154.2.17 partnerHost as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner host name.
**Notes:** (Read only property)

### 154.2.18 partnerIP as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner IP.
**Notes:** (Read only property)

### 154.2.19 partnerIPv6 as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner IPv6.
**Notes:** (Read only property)

### 154.2.20 partnerRel as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner system release.
**Notes:** (Read only property)

### 154.2.21 partnerSystemCodepage as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner system code page.
**Notes:** (Read only property)

### 154.2.22 partnerType as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Partner type.
**Notes:** 2/3/E/R: R/2,R/3,Ext,Reg.Ext
(Read only property)

### 154.2.23 progName as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of the calling APAB program (report, module pool)
**Notes:** (Read only property)

### 154.2.24 rel as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** My system release.
**Notes:** (Read only property)

### 154.2.25 rfcRole as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RFC role.
**Notes:** C/S: RFC Client / RFC Server.
(Read only property)

### 154.2.26 sysId as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** R/3 system ID.
**Notes:** (Read only property)

### 154.2.27 sysNumber as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** R/3 system number.
**Notes:** (Read only property)

### 154.2.28 trace as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trace level (0-3)
**Notes:** (Read only property)

### 154.2.29 type as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type.
**Notes:** 2/3/E/R: R/2,R/3,Ext,Reg.Ext
(Read only property)

### 154.2.30 user as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User name.
**Notes:** (Read only property)

## 154.3 class RFCConnectionMBS

### 154.3.1 class RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for RFC connection to a SAP system.
**Example:**

```
// connect code from a sample project:

dim loginParams As New Dictionary
if app.LogOnData.SAProuterString.IsEmpty then // LogOn with server (IP-Address)
loginParams.Value("ashost") = app.LogOnData.Anwendungsserver
else // LogOn with Servername and Router-String
loginParams.Value("ashost") = app.LogOnData.SAProuterString+"/H/"+app.LogOnData.Anwendungsserver
end if
loginParams.Value("sysnr") = app.LogOnData.InstanzNr.ToText
loginParams.Value("client") = app.LogOnData.Mandant
loginParams.Value("user") = app.LogOnData.SAPBenutzer
loginParams.Value("passwd") = app.LogOnData.SAPPasswort
loginParams.Value("lang") = app.LogOnData.Sprache

app.ConnectionToSAP = New RFCConnectionMBS(loginParams)
```

**Blog Entries**

- MBS Xojo Plugins, version 20.2pr2
- Connect Xojo to SAP via RFC

### 154.3.2 Methods

### 154.3.3 CachedClassDescription(repositoryID as String, Name as String) as RFCClassDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for a cached class description.
**Notes:** This API should be used with care and is only for special scenarios, for example: 1. You know for sure, that a class description has already been cached via ClassDescription(), and don't want to open an extra rfcHandle that will never be used. In this case simply use the SAP System ID as the repositoryID. 2. You have created a hard-coded repository via RfcAddClassDesc(), which contains classes that do not exist in the backend's DDIC.

If repositoryID is "", the "default repository" is used.

repositoryID: System ID of R/3 System, for which this class description has been cached, or "" in case you want to look for it in the default repository.
Name: Name of the class.

### 154.3.4 CachedFunctionDescription(repositoryID as String, Name as String) as RFCFunctionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for a cached function description.
**Notes:** This API should be used with care and is only for special scenarios, for example: 1. You know for sure, that a function description has already been cached via FunctionDescription(), and don't want to open an extra rfcHandle that will never be used. In this case simply use the SAP System ID as the repositoryID. 2. You have created a hard-coded repository via AddFunctionDesc(), which contains function modules that do not exist in the backend's DDIC.

If repositoryID is "", the "default repository" is used.

### 154.3.5 CachedTypeDescription(repositoryID as String, Name as String) as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for a cached structure/table description.
**Notes:** Similar to TypeDescription(), but it only looks into the cache. Again it should almost never be necessary to get a metadata description of a single structure.

repositoryID: System ID of R/3 System, for which this type description has been cached, or "" in case you want to look for it in the default repository.
Name: Name of the DDIC structure/table.

### 154.3.6 Cancel

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancels the RFC call which is currently being called over the given RFC connection and closes the connection.
**Notes:** Can be used only on an RFC client connection and needs to be called from a different thread than

the one currently executing the RFC call.

### 154.3.7 ClassDescription(Name as String) as RFCClassDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the class description that is valid for the system to which connection points to.
**Notes:** If the class description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the rfcHandle. The result from the DDIC lookup will then be placed into the cache for later use.

The RFC Runtime maintains a cache for every R/3 System ID, as the meta data could be different from R/3 release to R/3 release. This is the main API that should be used.

Name: Name of the class to look up.

### 154.3.8 ClearRepository(repositoryID as String)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all metadata from the repository cache of the specified R/3 System.
**Notes:** If repositoryID is "", the "default repository" is cleared.

### 154.3.9 Constructor(LoginParams as Dictionary)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens an RFC client connection for invoking ABAP function modules in an R/3 backend.
**Example:**

```
Dim loginParams As New Dictionary
loginParams.Value("ashost") = "hostname"
loginParams.Value("sysnr") = "05"
loginParams.Value("client") = "800"
loginParams.Value("user") = "user"
loginParams.Value("passwd") = "****"
loginParams.Value("lang") = "EN"

Dim connection As New RFCConnectionMBS(loginParams)
```

**Notes:** Opens a client connection to an SAP System. The connectionParams may contain the following name-value pairs:

client, user, passwd, lang, trace and additionally one of

1. Direct application server logon: ashost, sysnr.
2. Logon with load balancing: mshost, msserv, sysid, group.

msserv is needed only, if the service of the message server is not defined as sapms<SYSID>in /etc/services.

When logging on with SNC, user&passwd are to be replaced by

snc_qop, snc_myname, snc_partnername and optionally snc_lib.
(If snc_lib is not specified, the underlying SNC layer uses the "global" GSS library defined via environment variable SNC_LIB or SNC_LIB_64.)

When logging on with SSO Ticket, you can use mysapsso2 instead of user&passwd. The old SSO format (mysapsso) is no longer supported.

Alternatively the connection parameters can be defined in the config file sapnwrfc.ini. In this case you just pass the parameter dest=... and all parameters that are missing in the sapnwrfc.ini entry into RfcOpenConnection().

For a complete list of logon parameters to be used in connectionParams as well as in the sapnwrfc.ini file, see the sample sapnwrfc.ini file in the SDK's demo folder.

If the logon was ok, constructor returns with a new object, otherwise an exception is raised.

### 154.3.10 CreateFunction(Name as String) as RFCFunctionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data container that can be used to execute function calls in the backend via Invoke.
**Notes:** The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

### 154.3.11 CreateTransaction(TransactionID as String, QueueName as String) as RFCTransactionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a container for executing a (multi-step) transactional call.
**Notes:** TransactionID: trasanction ID used to identify the transaction;
queueName: queue name associated with the transaction. If it is "" or empty, the transaction is for tRfc

### 154.3.12 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.
**Notes:** Closes an RFC connection.

### 154.3.13 FunctionDescription(Name as String) as RFCFunctionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the function description that is valid for the system to which connection points to.
**Example:**

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDETAIL")
```

**Notes:** If the function description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the connection. The result from the DDIC lookup will then be placed in the cache. The RFC Runtime maintains a cache for every SAP System ID, as the meta data may be different depending on the SAP release. This is the main API that should be used.

### 154.3.14 isConnected as Boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if we are connected.
**Notes:** Same as Ping, but returns boolean and does not raise exception.

### 154.3.15 Ping

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Ping the remote communication partner through the passed connection handle.
**Notes:** Sends a ping to the backend in order to check, whether the connection is still alive. Can be used on

both, client connections as well as server connections.

### 154.3.16 ResetServerContext

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the SAP server context ("user context / ABAP session context") associated with the given client connection, but does not close the connection.

### 154.3.17 TransactionID as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves a unique 24-digit transaction ID from the backend.

### 154.3.18 TypeDescription(Name as String) as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the structure description that is valid for the system to which connection points to.
**Notes:** If the structure description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the rfcHandle. The result from the DDIC lookup will then be placed into the cache for later use.

The RFC Runtime maintains a cache for every R/3 System ID, as the meta data could be different from R/3 release to R/3 release.

Note
Normally it should not be necessary to lookup separate structure descriptions. They are already looked up as part of the function module, in which they are used.

Name: Name of a DDIC structure or table.

### 154.3.19 Properties

### 154.3.20 ConnectionAttributes as RFCConnectionAttributesMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns details about the current client or server connection.
**Notes:** (Read only property)

### 154.3.21 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 154.4 class RFCContainerMBS

### 154.4.1 class RFCContainerMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a container in a RFC connection.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.4.2 Methods

### 154.4.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.4.4 DescribeType as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the metadata description of the given structure or table.

### 154.4.5 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.4.6 StringLength(Index as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string length for field by index.
See also:

- 154.4.7 StringLength(Name as String) as Integer 20004

### 154.4.7 StringLength(Name as String) as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string length for field by name.
See also:

- 154.4.6 StringLength(Index as Integer) as Integer 20003

### 154.4.8 Value(Index as Integer) as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience method to get value as variant.
**Notes:** When reading, we lookup data type for the property referred by index and return a matching value via variant.

Char, String, Num, Date, Time, BCD, DecF16 and DecF34 are returned as text.
Float is returned as double value.
Long, Second, Minute and Int8 is returned as Int64.
DTDay, DTWeek, DTMonth, TSecond, TMinute, CDeay, Int1, Int2 and Int values are retuned as Integer.
Table is returned as RFCTableMBS object.
Structure is returned as RFCStructureMBS object.
Byte data is returned as MemoryBlock.

For Null, ABAPObject, XMLData, BOX types we return nil.
See also:

- 154.4.9 Value(Name as String) as Variant 20004

### 154.4.9 Value(Name as String) as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience method to get value as variant.
**Notes:** When reading, we lookup data type for the property referred by name and return a matching value via variant.

Char, String, Num, Date, Time, BCD, DecF16 and DecF34 are returned as text.
Float is returned as double value.
Long, Second, Minute and Int8 is returned as Int64.
DTDay, DTWeek, DTMonth, TSecond, TMinute, CDeay, Int1, Int2 and Int values are retuned as Integer.
Table is returned as RFCTableMBS object.
Structure is returned as RFCStructureMBS object.

Byte data is returned as MemoryBlock.

For Null, ABAPObject, XMLData, BOX types we return nil.
See also:

- 154.4.8 Value(Index as Integer) as Variant 20004

### 154.4.10 Properties

### 154.4.11 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection this object belongs to.
**Notes:** (Read only property)

### 154.4.12 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 154.4.13 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object for this container.
**Notes:** (Read only property)

### 154.4.14 Values as Dictionary

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience property to see all values in debugger.
**Notes:** (Read only property)

### 154.4.15 BytesValue(Index as Integer) as Memoryblock

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set BYTE value with MemoryBlock by index.
**Notes:** When you get or set, we copy the data.
(Read and Write computed property)
See also:

- 154.4.16 BytesValue(Name as String) as Memoryblock 20006

### 154.4.16 BytesValue(Name as String) as Memoryblock

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set BYTE value with MemoryBlock by name.
**Notes:** When you get or set, we copy the data.
(Read and Write computed property)
See also:

- 154.4.15 BytesValue(Index as Integer) as Memoryblock 20005

### 154.4.17 CharsValue(Index as Integer, Size as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set chars value by name.
**Notes:** This is for fixed size char values, so you pass in size.
Please use StringValue() to benefit from plugin querying size for you of existing value.
(Read and Write computed property)
See also:

- 154.4.18 CharsValue(Name as String, Size as Integer) as String 20006

### 154.4.18 CharsValue(Name as String, Size as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set chars value by index.
**Notes:** This is for fixed size char values, so you pass in size.
Please use StringValue() to benefit from plugin querying size for you of existing value.
(Read and Write computed property)
See also:

- 154.4.17 CharsValue(Index as Integer, Size as Integer) as String 20006

### 154.4.19 DateValue(Index as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set date value by index.
**Notes:** Format is always 8 character string with format YYYYMMDD.
(Read and Write computed property)
See also:

- 154.4.20 DateValue(Name as String) as String 20007

### 154.4.20 DateValue(Name as String) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set date value by name.
**Notes:** Format is always 8 character string with format YYYYMMDD.
(Read and Write computed property)
See also:

- 154.4.19 DateValue(Index as Integer) as String 20006

### 154.4.21 FloatValue(Index as Integer) as Double

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set float value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.22 FloatValue(Name as String) as Double 20007

### 154.4.22 FloatValue(Name as String) as Double

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set float value by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.21 FloatValue(Index as Integer) as Double 20007

### 154.4.23 Int16Value(Index as Integer) as Int16

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt16 value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.24 Int16Value(Name as String) as Int16 20008

### 154.4.24 Int16Value(Name as String) as Int16

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt16 value by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.23 Int16Value(Index as Integer) as Int16 20007

### 154.4.25 Int32Value(Index as Integer) as Int32

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt32 value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.26 Int32Value(Name as String) as Int32 20008

### 154.4.26 Int32Value(Name as String) as Int32

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt32 value by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.25 Int32Value(Index as Integer) as Int32 20008

### 154.4.27 Int64Value(Index as Integer) as Int64

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set Int64 value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.28 Int64Value(Name as String) as Int64 20009

### 154.4.28 Int64Value(Name as String) as Int64

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set Int64 value by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.27 Int64Value(Index as Integer) as Int64 20008

### 154.4.29 NumberValue(Index as Integer, Size as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set numeric value by index.
**Notes:** The value of the specified field as num-char array (digits only).
Please pass length. If you don't know, please try StringValue/StringLength.
(Read and Write computed property)
See also:

- 154.4.30 NumberValue(Name as String, Size as Integer) as String 20009

### 154.4.30 NumberValue(Name as String, Size as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set numeric value by name.
**Notes:** The value of the specified field as num-char array (digits only).
Please pass length. If you don't know, please try StringValue/StringLength.
(Read and Write computed property)
See also:

- 154.4.29 NumberValue(Index as Integer, Size as Integer) as String 20009

### 154.4.31 StringValue(Index as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set string value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.32 StringValue(Name as String) as String 20010

### 154.4.32 StringValue(Name as String) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set string value by name.
**Example:**

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDETAIL")
Dim f As RFCFunctionMBS = fd.CreateFunction

f.StringValue("COMPANYID") = "000007"
f.Invoke

Dim s As RFCStructureMBS = f.StructureValue("RETURN")
Dim t As String = s.StringValue("MESSAGE")

MsgBox t
```

**Notes:** (Read and Write computed property)
See also:

- 154.4.31 StringValue(Index as Integer) as String 20009

### 154.4.33 StructureValue(Index as Integer) as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set structure value with RFCStructureMBS object by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.34 StructureValue(Name as String) as RFCStructureMBS 20010

### 154.4.34 StructureValue(Name as String) as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set structure value with RFCStructureMBS object by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.33 StructureValue(Index as Integer) as RFCStructureMBS 20010

### 154.4.35 TableValue(Index as Integer) as RFCTableMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set table value with RFCTableMBS object by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.36 TableValue(Name as String) as RFCTableMBS 20011

### 154.4.36 TableValue(Name as String) as RFCTableMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set table value with RFCTableMBS object by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.35 TableValue(Index as Integer) as RFCTableMBS 20011

### 154.4.37 TimeValue(Index as Integer) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set time value by index.
**Notes:** Format is always 6 character string with format HHMMSS.
(Read and Write computed property)
See also:

- 154.4.38 TimeValue(Name as String) as String 20011

### 154.4.38 TimeValue(Name as String) as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set time value by name.
**Notes:** Format is always 6 character string with format HHMMSS.
(Read and Write computed property)
See also:

- 154.4.37 TimeValue(Index as Integer) as String 20011

### 154.4.39 UInt8Value(Index as Integer) as UInt8

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt8 value by index.
**Notes:** (Read and Write computed property)
See also:

- 154.4.40 UInt8Value(Name as String) as UInt8 20012

### 154.4.40 UInt8Value(Name as String) as UInt8

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set UInt8 value by name.
**Notes:** (Read and Write computed property)
See also:

- 154.4.39 UInt8Value(Index as Integer) as UInt8 20011

## 154.5 class RFCErrorExceptionMBS

### 154.5.1 class RFCErrorExceptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception class to report any error.
**Notes:** Subclass of the RuntimeException class.

## 154.6 class RFCExceptionDescriptionMBS

### 154.6.1 class RFCExceptionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an exception description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.6.2 Methods

### 154.6.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.6.4 Properties

### 154.6.5 Key as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Exception key
**Notes:** (Read only property)

### 154.6.6 Message as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Error message (exception text as defined in SE37)
**Notes:** (Read only property)

## 154.7 class RFCFieldDescriptionMBS

### 154.7.1 class RFCFieldDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a field description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.7.2 Methods

### 154.7.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.7.4 Properties

### 154.7.5 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection for this field.
**Notes:** (Read only property)

### 154.7.6 decimals as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If the field is of type "packed number" (BCD), this member gives the number of decimals.
**Notes:** (Read only property)

### 154.7.7 Name as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field name.
**Notes:** (Read only property)

### 154.7.8 nucLength as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field length in bytes in a 1-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

### 154.7.9 nucOffset as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field offset in bytes in a 1-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

### 154.7.10 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 154.7.11 Type as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field data type.
**Notes:** (Read only property)

### 154.7.12 TypeDescription as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the type description for this field.
**Notes:** (Read only property)

### 154.7.13 TypeString as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type as string.
**Notes:** Convenience property so you can see type in debugger.
(Read only property)

### 154.7.14 ucLength as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field length in bytes in a 2-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

### 154.7.15 ucOffset as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Field offset in bytes in a 2-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

## 154.8 class RFCFunctionDescriptionMBS

### 154.8.1 class RFCFunctionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a function description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.8.2 Methods

### 154.8.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.8.4 CreateFunction as RFCFunctionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data container that can be used to execute function calls in the backend via Invoke.
**Notes:** The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

### 154.8.5 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.8.6 ExceptionDescription(Index as Integer) as RFCExceptionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception description by index.
See also:

- 154.8.7 ExceptionDescription(Name as String) as RFCExceptionDescriptionMBS

### 154.8.7 ExceptionDescription(Name as String) as RFCExceptionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception description by name.
See also:

- 154.8.6 ExceptionDescription(Index as Integer) as RFCExceptionDescriptionMBS 20018

### 154.8.8 ExceptionDescriptions as RFCExceptionDescriptionMBS()

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all exception descriptions.

### 154.8.9 ParameterDescription(Index as Integer) as RFCParameterDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries parameter description by index.
See also:

- 154.8.10 ParameterDescription(Name as String) as RFCParameterDescriptionMBS 20019

### 154.8.10 ParameterDescription(Name as String) as RFCParameterDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries parameter description by name.
See also:

- 154.8.9 ParameterDescription(Index as Integer) as RFCParameterDescriptionMBS 20019

### 154.8.11 ParameterDescriptions as RFCParameterDescriptionMBS()

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all parameter description as array.

### 154.8.12 Properties

### 154.8.13 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent connection.
**Notes:** (Read only property)

### 154.8.14 ExceptionCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of exceptions.
**Notes:** (Read only property)

### 154.8.15 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 154.8.16 Name as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the function.
**Notes:** (Read only property)

### 154.8.17 ParameterCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of parameters for this function.
**Notes:** (Read only property)

### 154.8.18 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

## 154.9 class RFCFunctionMBS

### 154.9.1 class RFCFunctionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a function in a RFC connection.
**Notes:** Please use values to set parameters and then call invoke.
Subclass of the RFCContainerMBS class.

### 154.9.2 Methods

### 154.9.3 Constructor(typeDescription as RFCFunctionDescriptionMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a data container that can be used to execute function calls in the backend via Invoke.
**Notes:** The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

### 154.9.4 DescribeFunction as RFCFunctionDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the function description that is valid for the system to which connection points to.
**Notes:** If the function description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the connection. The result from the DDIC lookup will then be placed in the cache. The RFC Runtime maintains a cache for every SAP System ID, as the meta data may be different depending on the SAP release. This is the main API that should be used.

### 154.9.5 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.9.6 Invoke

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a function module in the backend system so far.
**Example:**

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDETAIL")
Dim f As RFCFunctionMBS = fd.CreateFunction

f.StringValue("COMPANYID") = "000007"
f.Invoke

Dim s As RFCStructureMBS = f.StructureValue("RETURN")
Dim t As String = s.StringValue("MESSAGE")

MsgBox t
```

### 154.9.7 Properties

### 154.9.8 ParameterActive(Name as String) as Boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether a parameter is active.
**Notes:** This is particularly useful for BAPIs which have many large tables, in which you are not interested. Deactivate those and leave only those tables active, in which you are interested. This reduces network traffic and memory consumption in your application considerably.

This functionality can be used for input and output parameters. If the parameter is an input, no data for that parameter will be sent to the backend. If it's an output, the backend will be informed not to return data for that parameter.
(Read and Write computed property)

## 154.10 module RFCModuleMBS

### 154.10.1 module RFCModuleMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for globals in RFC API.
**Notes:** You can use this module and related classes to connect Xojo to SAP applications and databases.
We support MacOS, Windows and Linux.

You need to get a SAP login (maybe become SAP developer) and download ,Ä®SAP NetWeaver RFC SDK 7.50.
You need SAP license for user and maybe a developer license yourself.

Please read SAP documentation for various RFC functions to get more details.
MBS Plugin manages memory for you, does reference counting and makes API easier to use for Xojo developers.
**Blog Entries**

- Connect Xojo to SAP via RFC

### 154.10.2 Methods

### 154.10.3 LoadLibrary(file as folderitem) as boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the sapnwrfc library.
**Example:**

```
#If TargetWin32
Const path = "sapnwrfc.dll"
#Else
Dim path As FolderItem = GetFolderItem("libsapnwrfc.dylib")
Dim LibPath As String = path.parent.NativePath

Call RFCModuleMBS.SetCurrentWorkingDirectory(libPath)
#EndIf

If RFCModuleMBS.LoadLibrary(path) Then
MsgBox "Library loaded."
Else
MsgBox "Failed to load library"+EndOfLine+EndOfLine+RFCModuleMBS.LibraryLoadErrorMessage
quit
End If
```

**Notes:** Pass path to sapnwrfc.dll on Windows or libsapnwrfc.dylib on MacOS or libsapnwrfc.so on Linux. If file is installed in system path, you may just pass file name.

Returns true on success or false on failure.
The LibraryLoadErrorMessage function returns error message on failure.
See also:

- 154.10.4 LoadLibrary(path as string) as boolean 20025

### 154.10.4 LoadLibrary(path as string) as boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the sapnwrfc library.
**Notes:** Pass path to sapnwrfc.dll on Windows or libsapnwrfc.dylib on MacOS or libsapnwrfc.so on Linux. If file is installed in system path, you may just pass file name.

Returns true on success or false on failure.
The LibraryLoadErrorMessage function returns error message on failure.
See also:

- 154.10.3 LoadLibrary(file as folderitem) as boolean 20024

### 154.10.5 LocalTransactionID as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves a unique 24-digit transaction ID.
**Notes:** The API will attempt to generate a TID locally using the operating system's UUID.

### 154.10.6 ReloadIniFile

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the contents of the sapnwrfc.ini file into memory.
**Notes:** Searches the directory given by IniPath (or the current working directory) for the file sapnwrfc.ini and loads its contents into memory.

### 154.10.7 SetCurrentWorkingDirectory(path as folderitem) as boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Example:**

```
Dim path As FolderItem = GetFolderItem("libsapnwrfc.dylib")
Dim LibPath As String = path.parent.NativePath

Call RFCModuleMBS.SetCurrentWorkingDirectory(libPath)
```

**Notes:** This is often useful to make sure the DLLs in that folder are found.
See also:

- 154.10.8 SetCurrentWorkingDirectory(path as String) as boolean 20026

### 154.10.8 SetCurrentWorkingDirectory(path as String) as boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is often useful to make sure the DLLs in that folder are found.
See also:

- 154.10.7 SetCurrentWorkingDirectory(path as folderitem) as boolean 20026

### 154.10.9 Properties

### 154.10.10 IniPath as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The directory in which to search for the sapnwrfc.ini file.
**Notes:** By default the sapnwrfc library searches for the sapnwrfc.ini in the current working directory of the process. If you want to keep it in a different directory, use this function to tell the sapnwrfc library about the new path.

Note
After you have changed the directory, the NW RFC lib automatically loads the contents of the new sapnwrfc.ini file from that directory.

Pass the full (absolute) path of the directory, in which the sapnwrfc library should look for the sapnwrfc.ini file. A path relative to the current working directory of the process also works.

(Read and Write property)

### 154.10.11 LibraryLoadError as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The load error code.
**Notes:** (Read only property)

### 154.10.12 LibraryLoadErrorMessage as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The load error message.
**Notes:** (Read only property)

### 154.10.13 Loaded as Boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the library is loaded.
**Notes:** Returns true if the library contains the required functions.
(Read only property)

### 154.10.14 MajorVersion as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get information about currently loaded sapnwrfc library.
**Notes:** Major version, e.g. 7500.
(Read only property)

### 154.10.15 MinorVersion as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get information about currently loaded sapnwrfc library.
**Notes:** Minor version.
(Read only property)

### 154.10.16 PatchLevel as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get information about currently loaded sapnwrfc library.
**Notes:** Patch level of the version.
(Read only property)

### 154.10.17 TraceDir as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the directory where the NW RFC lib should write trace files.
**Notes:** This function has the same effect as the sapnwrfc.ini parameter RFC_TRACE_DIR. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note
This API call affects only new trace files that will be opened after the call. The directory of already existing trace files is not changed in order to prevent confusion and garbage data...

Pass the new directory. Can be an absolute or relative path name. The directory needs to exist prior to calling this API. The NW RFC lib will not attempt to create non-existing directories.
(Read and Write property)

### 154.10.18 TraceEncoding as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the character encoding to be used in trace files.
**Notes:** This function has the same effect as the sapnwrfc.ini parameter RFC_TRACE_ENCODING. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note
This API call affects only new trace files that will be opened after the call. The character encoding of already existing trace files is not changed in order to prevent confusion and garbage data...

Pass the new encoding. Possible values are "UTF-16", "UTF-8" and "DEFAULT". On Windows UTF-16 is recommended for faster performance. "DEFAULT" corresponds to the operating system's default character encoding, which is CP1252 or ISO-8859-1 on most Windows systems and UTF-8 on most Linux systems.
(Read and Write property)

### 154.10.19 TraceType as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes the way the NW RFC lib writes trace files.
**Notes:** This function has the same effect as the sapnwrfc.ini parameter RFC_TRACE_TYPE. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note
This API call closes currently open trace files and then changes to "one file per process" or one "file per thread". If the NW RFC lib is already using the given trace type, it does nothing.

Must be either "PROCESS" or "THREAD".
(Read and Write property)

### 154.10.20 Version as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get information about currently loaded sapnwrfc library.
**Notes:** Version as text to show to user.
(Read only property)

### 154.10.21 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorAbapClassException | 27 | The called function module raised a class based exception |
| kErrorAbapException | 5 | The called function module raised an Exception (RAISE or MESSAGE . RAISING) |
| kErrorAbapMessage | 4 | The called function module raised an E-, A- or X-Message |
| kErrorAbapRuntimeFailure | 3 | SAP system runtime error (SYSTEM_FAILURE): Shortdump on the backen side |
| kErrorAuthorizationFailure | 29 | Authorization check error |
| kErrorBufferTooSmall | 23 | The given buffer was to small to hold the entire parameter. Data has bee truncated. |
| kErrorCanceled | 7 | No longer used |
| kErrorClosed | 6 | Connection closed by the other side |
| kErrorCodepageConversionFailure | 21 | Codepage conversion error |
| kErrorCommunicationFailure | 1 | Error in Network & Communication layer |
| kErrorConversionFailure | 22 | Error while converting a parameter to the correct data type |
| kErrorExecuted | 16 | Inbound tRFC Call already executed (needs to be returned fro RFC_ON_CHECK_TRANSACTION in case the TID is already known an successfully processed before.) |
| kErrorExternalFailure | 15 | Error in external custom code. (E.g. in the function handlers or tRFC ha dlers.) Results in SYSTEM_FAILURE |
| kErrorIllegalState | 19 | The operation is not supported on that handle at the current point of tim (e.g. trying a callback on a server handle, while not in a call) |
| kErrorInvalidHandle | 13 | An invalid handle was passed to an API call |
| kErrorInvalidParameter | 20 | An invalid parameter was passed to an API call, (e.g. invalid name, type c length) |
| kErrorInvalidProtocol | 11 | The received data has an unsupported format |
| kErrorLogonFailure | 2 | Unable to logon to SAP system. Invalid password, user locked, etc. |
| kErrorMemoryInsufficient | 9 | Memory insufficient |
| kErrorNotFound | 17 | Function or structure definition not found (Metadata API) |
| kErrorNotSupported | 18 | The operation is not supported on that handle |
| kErrorOk | 0 | Everything O.K. Used by every function. (no exception) |
| kErrorRetry | 14 | ListenAndDispatch did not receive an RFC request during the timeout perio |
| kErrorSerializationFailure | 12 | A problem while serializing or deserializing RFM parameters |
| kErrorStartSapguiFailure | 26 | Failed to start and attach SAPGUI to the RFC connection. |
| kErrorTableMoveBof | 24 | Trying to move the current position before the first row of the table. |
| kErrorTableMoveEof | 25 | Trying to move the current position after the last row of the table. |
| kErrorTimeout | 8 | Time out |
| kErrorUnknownError | 28 | ”Something” went wrong, but I don’t know what... |
| kErrorVersionMismatch | 10 | Version mismatch |

## 154.11 class RFCParameterDescriptionMBS

### 154.11.1 class RFCParameterDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a parameter description.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.11.2 Methods

### 154.11.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor

### 154.11.4 Properties

### 154.11.5 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent connection.
**Notes:** (Read only property)

### 154.11.6 decimals as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gives the number of decimals in case of a packed number (BCD)
**Notes:** (Read only property)

### 154.11.7 defaultValue as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default value as defined in SE37.
**Notes:** (Read only property)

### 154.11.8 Direction as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies whether the parameter is an input, output or bi-directional parameter.
**Notes:** (Read only property)

### 154.11.9 isOptional as Boolean

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies whether this parameter is defined as optional in SE37.
**Notes:** True is optional, false non-optional.
(Read only property)

### 154.11.10 Name as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameter name.
**Notes:** (Read only property)

### 154.11.11 nucLength as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameter length in bytes in a 1-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

### 154.11.12 parameterText as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Description text of the parameter as defined in SE37.
**Notes:** (Read only property)

### 154.11.13 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

### 154.11.14 Type as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameter data type.
**Notes:** (Read only property)

### 154.11.15 TypeDescription as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The structure definition in case this parameter is a structure or table.
**Notes:** May be nil for other parameter types.
(Read only property)

### 154.11.16 TypeString as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type as string.
**Notes:** Convenience property so you can see type in debugger.
(Read only property)

### 154.11.17 ucLength as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parameter length in bytes in a 2-byte-per-SAP_CHAR system.
**Notes:** (Read only property)

### 154.11.18 Constants

Direction Modes

| Constant | Value | Description |
|---|---|---|
| kDirectionChanging | 3 | Import and export parameter. This corresponds to ABAP CHANGING parameter. |
| kDirectionExport | 2 | Export parameter. This corresponds to ABAP EXPORTING parameter. |
| kDirectionImport | 1 | Import parameter. This corresponds to ABAP IMPORTING parameter. |
| kDirectionTable | 7 | Table parameter. This corresponds to ABAP TABLES parameter. |

## 154.12 class RFCStructureMBS

### 154.12.1 class RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a structure in a RFC connection.
**Notes:** Subclass of the RFCContainerMBS class.

### 154.12.2 Methods

### 154.12.3 Clone as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the given structure and returns the handle to the new object.

### 154.12.4 Constructor(typeDescription as RFCTypeDescriptionMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an internal structure data object and returns the handle to the structure object.

### 154.12.5 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

## 154.13 class RFCTableMBS

### 154.13.1 class RFCTableMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a table in a RFC connection.
**Notes:** Subclass of the RFCContainerMBS class.

### 154.13.2 Methods

### 154.13.3 AppendNewRow as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new row and appends it at the end of the table.

### 154.13.4 AppendNewRows(numRows as Integer)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends a set of new empty rows at the end of the table and moves the table cursor to the first new row.

### 154.13.5 AppendRow(row as RFCStructureMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends the given structure at the end of the table.

### 154.13.6 Clone as RFCTableMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the given table and returns the handle to the new table.

### 154.13.7 Constructor(TypeDescription as RFCTypeDescriptionMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a internal table object and returns the handle to the table.

### 154.13.8 CurrentRow as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the structure handle to the current row.

### 154.13.9 DeleteAllRows

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes all rows from the table.

### 154.13.10 DeleteCurrentRow

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the current row from the table.

### 154.13.11 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.13.12 InsertNewRow as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new row and inserts it at the current position of the table cursor.

### 154.13.13 InsertRow(row as RFCStructureMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts the given structure at the current position of the table cursor.

### 154.13.14 MoveTo(row as Integer)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the cursor from the current position to the position specified by the index.

### 154.13.15 MoveToFirstRow

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the current position to the first row of the table.

### 154.13.16 MoveToLastRow

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the current position to the last row of the table.

### 154.13.17 MoveToNextRow

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the cursor from the current position to the next row.

### 154.13.18 MoveToPreviousRow

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Moves the cursor from the current position to the previours row.

### 154.13.19 ReserveCapacity(numRows as Integer)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reserves memory without changing the size of a table so that new rows can be appended without new memory allocation.

### 154.13.20 Properties

### 154.13.21 RowCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the number of the rows contained in the table.
**Notes:** (Read only property)

### 154.13.22 RowType as RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the type descriptor of the table rows.
**Notes:** (Read only property)

## 154.14 class RFCTransactionMBS

### 154.14.1 class RFCTransactionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a transaction.

### 154.14.2 Methods

### 154.14.3 ConfirmTransaction

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** After SubmitTransaction has finally succeeded, ConfirmTransaction cleans up the transaction handling table in the backend.
**Notes:** Caution:
After this call the backend is no longer protected against this TID. So another SubmitTransaction would result in a duplicate.

### 154.14.4 Constructor(connection as RFCConnectionMBS, TransactionID as String, QueueName as String)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a container for executing a (multi-step) transactional call.
**Notes:** TransactionID: trasanction ID used to identify the transaction;
queueName: queue name associated with the transaction. If it is "" or empty, the transaction is for tRfc

### 154.14.5 Destructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 154.14.6 InvokeInTransaction(funcHandle as RFCFunctionMBS)

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Puts a tRfc or qRfc call into the given transaction.
**Notes:** Can be used multiple times within one transaction handle.

funcHandle: function handle that identifies the Rfc function;

### 154.14.7 SubmitTransaction

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes all function modules in the backend system, that have accumulated in the transaction so far.
**Notes:** This step can be repeated until it finally succeeds (RFC_OK). The transaction handling in the backend system protects against duplicates.

### 154.14.8 Properties

### 154.14.9 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 154.14.10 TransactionID as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves a unique 24-digit transaction ID from the SAP backend system.
**Notes:** (Read only property)

## 154.15 class RFCTypeDescriptionMBS

### 154.15.1 class RFCTypeDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a type definition.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 154.15.2 Methods

### 154.15.3 Constructor

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 154.15.4 CreateStructure as RFCStructureMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an internal structure data object and returns the handle to the structure object.

### 154.15.5 CreateTable as RFCTableMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a internal table object and returns the handle to the table.

### 154.15.6 FieldDescription(Index as Integer) as RFCFieldDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the field description of the structure's indexth field.
See also:

- 154.15.7 FieldDescription(Name as String) as RFCFieldDescriptionMBS

### 154.15.7 FieldDescription(Name as String) as RFCFieldDescriptionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the field description of a field given by name.
See also:

- 154.15.6 FieldDescription(Index as Integer) as RFCFieldDescriptionMBS 20042

### 154.15.8 FieldDescriptions as RFCFieldDescriptionMBS()

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads all the field descriptions.

### 154.15.9 Properties

### 154.15.10 Connection as RFCConnectionMBS

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection owning this object.
**Notes:** (Read only property)

### 154.15.11 FieldCount as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of fields for this type.
**Notes:** (Read only property)

### 154.15.12 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 154.15.13 Name as String

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the type.
**Notes:** (Read only property)

### 154.15.14 Parent as Variant

MBS Tools Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** (Read only property)

# Chapter 155

# SATSolver

## 155.1 class LGLAbortedExceptionMBS

### 155.1.1 class LGLAbortedExceptionMBS

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The exception used to report fatal errors in SAT Solver.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr6

## 155.2 class LGLMBS

### 155.2.1 class LGLMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the SAT Solver from lingeling.
**Notes:** Based on lingeling project here:
https://github.com/arminbiere/lingeling
and
http://fmv.jku.at/lingeling/
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- MBS Xojo Plugins, version 21.3pr6
- New in the MBS Xojo Plugins 20.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 19.6pr2

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 44: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 155.2.2 Methods

### 155.2.3 Add(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a value.

### 155.2.4 Assume(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assume single units.

### 155.2.5 CAssume(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assume clause (at most one)

### 155.2.6 Clone as LGLMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the object.
**Notes:** Both 'Cloning' and 'Forking' can be used to implement 'Push & Pop', but the asymmetric forking is more similar to the classical way of implementing it, needs less resources since for instance eliminated variables do not occupy any memory in the children, but requires lifting back satisfying assignments explicitly (through the whole parent chain). If these full satisfying assignments are really needed actually cloning could be more space efficient too. Assume you want to split the solver into two instances, one with a literal set to false, the other one to true. Then cloning allows you to produce two independent branches, while for forking you need three, since the root / top solver still has to be kept for lifting back a potential assignment.

### 155.2.7 Constructor

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Creates new empty object.

### 155.2.8 DefaultOption(Name as String) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries default value for an option.

### 155.2.9 Deref(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries value.
**Notes:** neg=false, pos=true
Returns -1 if lit is bigger then MaxVar.

### 155.2.10 Failed(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks failed flag for given item.
**Notes:** neg=false, pos=true
for assumptions.

### 155.2.11 Fixate

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Add assumptions as units

### 155.2.12 Fixed(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks fixed flag.
**Notes:** neg=false, pos=true
Toplevel

### 155.2.13 FlushCache

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush all learned clauses.

### 155.2.14 FlushTimers

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush timers.

### 155.2.15 Fork as LGLMBS

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Forks the object.
**Notes:** 'Forking' copies only irredundant clauses and also uses internal variable indices of the parent as

external variable indices. Thus 'parent' and the forked off 'child' do neither exactly work the same way, nor do they use from the API point of view the same set of variables. They are satisfiability equivalent. If the child becomes unsatisfiable the parent can be assumed to be unsatisfiable too and thus 'join' would just add the empty clause to the parent. If the child produces a satisfying assignment, this assignment is turned into an assignment of the parent by 'join'. Parents can be forked multiple times. A child has exactly one parent. Parents and children can be released independently. Between 'Fork' and 'Join' no other operations but further 'Fork' are allowed. The effect ot multiple 'Join' with the same parent is unclear at this point. The same memory manager is use for the child and the parent. Options, prefix, output file and the callbacks for 'getime' and 'Abort' are copied too (if set).

Both 'Cloning' and 'Forking' can be used to implement 'Push & Pop', but the asymmetric forking is more similar to the classical way of implementing it, needs less resources since for instance eliminated variables do not occupy any memory in the children, but requires lifting back satisfying assignments explicitly (through the whole parent chain). If these full satisfying assignments are really needed actually cloning could be more space efficient too. Assume you want to split the solver into two instances, one with a literal set to false, the other one to true. Then cloning allows you to produce two independent branches, while for forking you need three, since the root / top solver still has to be kept for lifting back a potential assignment.

### 155.2.16 Freeze(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Freezes the given item.

### 155.2.17 Frozen(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries frozen state.

### 155.2.18 GetOptionMinMax(Name as String, byref min as Integer, byref max as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current value, minimum and maximum values.

### 155.2.19 HasOption(Name as String) as Boolean

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if the given option is set.

### 155.2.20 IncVar as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Increases variables by one.

### 155.2.21 Join(Child as LGLMBS) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins back forked child.

### 155.2.22 LibVersion as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries library version.
**Example:**

Print "LGL "+LGLMBS.LibVersion

### 155.2.23 Lookahead as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a good look ahead literal or zero if all potential literals have been eliminated or have been used as blocking literals in blocked clause elimination.
**Notes:** Zero is also returned if the formula is already inconsistent. The lookahead literal is made usable again, for instance if it was not frozen during a previous SAT call and thus implicitly became melted. Therefore it can be added in a unit clause.

### 155.2.24 Melt(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Melts a literal.

### 155.2.25 MeltAll

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Melt all literals.

### 155.2.26 ParseFile(File as FolderItem, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file.
**Notes:** Returns empty text on success or error message from parser.
See also:

- 155.2.27 ParseFile(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20051

### 155.2.27 ParseFile(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file.
**Notes:** Returns empty text on success or error message from parser.
See also:

- 155.2.26 ParseFile(File as FolderItem, force as boolean = false) as String 20051

### 155.2.28 ParseFileMT(File as FolderItem, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file.
**Notes:** Returns empty text on success or error message from parser.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.29 ParseFileMT(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20052

### 155.2.29 ParseFileMT(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file.
**Notes:** Returns empty text on success or error message from parser.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.28 ParseFileMT(File as FolderItem, force as boolean = false) as String 20051

### 155.2.30 ParsePath(Path as String, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given by path.
**Notes:** Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

| | |
|---|---|
| .gz | gzip |
| .xz | xz |
| .bz2 | bzip2 |
| .zip | unzip |
| .7z | 7x |

See also:

- 155.2.31 ParsePath(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20052

### 155.2.31 ParsePath(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given by path.
**Notes:** Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

| | |
|---|---|
| .gz | gzip |
| .xz | xz |
| .bz2 | bzip2 |
| .zip | unzip |
| .7z | 7x |

See also:

- 155.2.30 ParsePath(Path as String, force as boolean = false) as String 20052

### 155.2.32 ParsePathMT(Path as String, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given by path.
**Notes:** Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

| | |
|---|---|
| .gz | gzip |
| .xz | xz |
| .bz2 | bzip2 |
| .zip | unzip |
| .7z | 7x |

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.33 ParsePathMT(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20054

### 155.2.33 ParsePathMT(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given by path.
**Notes:** Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

| | |
|---|---|
| .gz | gzip |
| .xz | xz |
| .bz2 | bzip2 |
| .zip | unzip |
| .7z | 7x |

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.32 ParsePathMT(Path as String, force as boolean = false) as String 20053

### 155.2.34 ParseString(Data as String, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given it as text.
**Notes:** Returns empty text on success or error message from parser.
Please pass text with data separated with unix line endings (endofline.unix), so you may need to use ReplaceLineEndings function.
See also:

- 155.2.35 ParseString(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20054

### 155.2.35 ParseString(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given it as text.
**Notes:** Returns empty text on success or error message from parser.
Please pass text with data separated with unix line endings (endofline.unix), so you may need to use ReplaceLineEndings function.
See also:

- 155.2.34 ParseString(Data as String, force as boolean = false) as String 20054

### 155.2.36 ParseStringMT(Data as String, force as boolean = false) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given it as text.
**Notes:** Returns empty text on success or error message from parser.
Please pass text with data separated with unix line endings (endofline.unix), so you may need to use ReplaceLineEndings function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.37 ParseStringMT(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 20055

### 155.2.37 ParseStringMT(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses data file given it as text.
**Notes:** Returns empty text on success or error message from parser.
Please pass text with data separated with unix line endings (endofline.unix), so you may need to use ReplaceLineEndings function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 155.2.36 ParseStringMT(Data as String, force as boolean = false) as String 20055

### 155.2.38 Print(File as FolderItem = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print system to file or stdout.
**Notes:** Pass nil to use stdout.
Remaining in DIMACS format

### 155.2.39 PrintAll(File as FolderItem = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prints all values.
**Notes:** Including units & equivs.
Pass nil to use stdout.

### 155.2.40 PrintBanner(Name as String, Prefix as String, File as FolderItem = nil)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prints banner including version of library.
**Notes:** Pass nil to use stdout.

see lglbnr function.

### 155.2.41 PrintOptions(prefix as string, IgnoreSome as boolean)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print all options to stdout.

### 155.2.42 PrintPCS(mixed as boolean)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prints PCS file.

### 155.2.43 PrintRangeOptions

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print range options to stdout.

### 155.2.44 PrintSizes

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prints data structure sizes.

### 155.2.45 PrintStats

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prints statistics to stdout.

### 155.2.46 PrintUsage

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Print usage "-h".

### 155.2.47 ReadOptionFile(File as FolderItem) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the option file.

### 155.2.48 Reconstk(byref Start as Ptr, byref Top as Ptr)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set Start and Top to the 'start' and 'top' of the reconstruction stack, which is used in BCE, BVE and CCE for reconstructing a solution after eliminating variables or clauses.
**Notes:** These pointers are only valid until the next Sat or Simp call.

### 155.2.49 ReduceCache

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset cache size.

### 155.2.50 Representative(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return representative from equivalence class if literal is not top-level assigned nor eliminated.

### 155.2.51 ResetPhase(lit as integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set default phase of a literal.
**Notes:** Stop forcing phase in decisions.

### 155.2.52 Reusable(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if item can be reused.
**Notes:** If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

### 155.2.53 Reuse(lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reuses an item.
**Notes:** If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

### 155.2.54 Sat as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the system.
**Notes:** May output messages to stdout.

### 155.2.55 SatMT as Integer

MBS Tools Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the system.
**Notes:** May output messages to stdout.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 155.2.56 SetAPITraceFile(File as FolderItem)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a text file and let the library output to this file.
**Notes:** Logs API calls to the library.

### 155.2.57 SetID(tid as Integer, tids as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set individual ids for logging and statistics.

### 155.2.58 SetImportant(lit as integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prefer decisions on 'important' variables.

### 155.2.59 SetOutputFile(File as FolderItem)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an output file and let the library output to this file.
**Notes:** Sets output file for report.

### 155.2.60 SetPhase(lit as integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set default phase of a literal.
**Notes:** Any decision on this literal will always try this phase. Note, that this function does not have any effect on eliminated variables. Further equivalent variables share the same forced phase and thus if they are set to different default phases, only the last set operation will be kept.

### 155.2.61 SetPhases

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the phases.
**Notes:** Assume the solver is in the SATISFIABLE state (after Sat or Simp), then calling SetPhases will copy the current assignment as default phases.

### 155.2.62 SetTraceFile(File as FolderItem)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a text file and let the library output to this file.
**Notes:** Set trace output file.
Logs trace calls to the library.

### 155.2.63 Simp(iterations as integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the system.
**Notes:** Iterations must be >= 0.

### 155.2.64 TraverseAllClauses

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loops over all clauses and calls TraverseAllClauses event for each.
**Notes:** Internally calls TraverseUnits, TraverseEquivalences and TraverseRemainingClauses.
See also:

- 155.2.90 TraverseAllClauses(Lit as Integer) 20065

### 155.2.65 TraverseEquivalences

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loops over equivalences and calls TraverseEquivalences event for each.
See also:

- 155.2.91 TraverseEquivalences(Lit as Integer, Representation as Integer) 20065

### 155.2.66 TraverseRemainingClauses

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loops over remaining clauses and calls TraverseRemainingClauses event for each.
See also:

- 155.2.92 TraverseRemainingClauses(Lit as Integer) 20065

### 155.2.67 TraverseUnits

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loops over units and calls TraverseUnits event for each.
See also:

- 155.2.93 TraverseUnits(Unit as Integer) 20066

### 155.2.68 Unclone(Child as LGLMBS) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unclones the object.

### 155.2.69 Usable(lit as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether an item is usable.
**Notes:** If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

### 155.2.70 Properties

### 155.2.71 Aborted as Boolean

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The aborted status.
**Notes:** We set this to true when the processing is aborted due to an error.
See AbortMessage property for the message.
(Read and Write property)
See also:

- 155.2.89 Aborted 20065

### 155.2.72 AbortMessage as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The abort reason message.
**Notes:** (Read only property)

### 155.2.73 Bytes as Int64

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current size in bytes.
**Notes:** (Read only property)

### 155.2.74 Changed as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Model changed.
**Notes:** (Read only property)

### 155.2.75 Confs as Int64

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of conflicts.
**Notes:** (Read only property)

### 155.2.76 Decs as Int64

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of decisions.
**Notes:** (Read only property)

### 155.2.77 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 155.2.78 Inconsistent as Boolean

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Contains empty clause?
**Notes:** (Read only property)

### 155.2.79 MaxMegaBytes as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Maximum memory usage in megabytes.
**Notes:** (Read only property)

### 155.2.80 MaxVar as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries maximum index of variables.
**Notes:** (Read only property)

### 155.2.81 MegaBytes as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current size in memory as megabytes.
**Notes:** (Read only property)

### 155.2.82 Options as Dictionary

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all options with values.
**Notes:** (Read only property)

### 155.2.83 Prefix as String

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The prefix for messages.
**Notes:** (Read and Write property)

### 155.2.84 ProcessTime as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries CPU usage time used.
**Notes:** Value is -1 on Windows as we don't have the unix functions there.
(Read only property)

### 155.2.85 Props as Int64

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of propagations.
**Notes:** (Read only property)

### 155.2.86 Seconds as Double

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns time needed.
**Notes:** (Read only property)

### 155.2.87 Option(Name as String) as Integer

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets option value.
**Notes:** (Read and Write computed property)

### 155.2.88 Events

### 155.2.89 Aborted

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when processing is aborted due to an error.
**Notes:** Errors are printed to stdout.
See AbortMessage property for the message.
See also:

- 155.2.71 Aborted as Boolean 20062

### 155.2.90 TraverseAllClauses(Lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for TraverseAllClauses method.
See also:

- 155.2.64 TraverseAllClauses 20060

### 155.2.91 TraverseEquivalences(Lit as Integer, Representation as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for TraverseEquivalences method.
See also:

- 155.2.65 TraverseEquivalences 20061

### 155.2.92 TraverseRemainingClauses(Lit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for TraverseRemainingClauses method.
See also:

- 155.2.66 TraverseRemainingClauses 20061

### 155.2.93 TraverseUnits(Unit as Integer)

MBS Tools Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called for TraverseUnits method.
See also:

- 155.2.67 TraverseUnits 20061

### 155.2.94 Constants

SAT Results

| Constant | Value | Description |
|---|---|---|
| LGL_SATISFIABLE | 10 | The system is satisfiable. |
| LGL_UNKNOWN | 0 | It is not known whether it is satisfiable. |
| LGL_UNSATISFIABLE | 20 | The system is not satisfiable. |

# Chapter 156

# SceneKit

## 156.1 control DesktopSCNControlMBS

### 156.1.1 control DesktopSCNControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a SCNViewMBS.
**Notes:** This control embeds a special SCNView subclass.
Designed for Xojo 2021r3 and newer.
Please use view property to access the underlaying object and set properties.

To learn about rendering events, please check here:
https://developer.apple.com/documentation/scenekit/scnscenerendererdelegate?language=objc
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 19.6, page 45: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes

- 18.4, page 39: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 26: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

### 156.1.2 Properties

### 156.1.3 View as SCNViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 156.1.4 Events

### 156.1.5 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 156.1.6 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 156.1.7 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 156.1.8 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 156.1.9 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 156.1.10 FocusLost

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 156.1.11 FocusReceived

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 156.1.12 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 156.1.13 MenuBarSelected

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 156.1.14 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown.
If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 156.1.15 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 156.1.16 MouseUp(x As Integer, y As Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's

boundaries.

### 156.1.17 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 156.1.18 rendererDidApplyAnimations(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after actions and animations are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this method to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ‚Äúbatch‚Äù your changes).

### 156.1.19 rendererDidApplyConstraints(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked on the control once the scene renderer did apply the constraints.
**Notes:** time The time at which the constraints were simulated.

All modifications done within this method don't go through the transaction model, they are directly applied on the presentation tree.

### 156.1.20 rendererDidRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the renderer has rendered the scene.
**Notes:** scene: The scene object that was rendered.
time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this method to perform custom drawing after SceneKit has rendered a scene—for example, to draw overlay content on top of SceneKit content. You should only execute Metal or OpenGL drawing commands (and any setup required to perform them) in this method—the results of modifying SceneKit objects in this method are undefined.

- To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
- To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this method. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.1.21 rendererDidSimulatePhysics(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after physics simulations are performed.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this event exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

This event is the last opportunity SceneKit provides for you to change the scene graph before rendering.

### 156.1.22 rendererUpdate(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur before actions, animations, and physics are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

### 156.1.23 rendererWillRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Tells the control that the renderer has cleared the viewport and is about to render the scene.
**Notes:** scene: The SCNSceneMBS object to be rendered.
time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this event to perform custom drawing before SceneKit renders a scene—for example, to draw backdrop content underneath SceneKit content. You should only execute Metal or OpenGL drawing commands (and any setup required to perform them) in this event—the results of modifying SceneKit objects during this event are undefined.

To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this event. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.1.24 ScaleFactorChanged(NewFactor as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 156.1.25 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 156.2 class SCNAccelerationConstraintMBS

### 156.2.1 class SCNAccelerationConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNAccelerationConstraint caps the acceleration and velocity of a node.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.2.2 Methods

### 156.2.3 accelerationConstraint as SCNAccelerationConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNAccelerationConstraint object.

### 156.2.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNAccelerationConstraint object.

### 156.2.5 Properties

### 156.2.6 damping as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the damping factor of the receiver.
**Notes:** Optionally reduce the body's linear velocity each frame to simulate fluid/air friction. Value should be zero or greater. Defaults to 0.1. Animatable.
(Read and Write property)

### 156.2.7 decelerationDistance as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Controls the distance at which the node should start decelerating.
**Notes:** Defaults to 0. Animatable.
(Read and Write property)

### 156.2.8 maximumLinearAcceleration as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Controls the maximum linear acceleration. Defaults to MAXFLOAT. Animatable.
**Notes:** The maximum linear acceleration is in m.s^-2
(Read and Write property)

### 156.2.9 maximumLinearVelocity as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Controls the maximum linear velocity. Defaults to MAXFLOAT. Animatable.
**Notes:** The maximum linear velocity is in m.s
(Read and Write property)

## 156.3 class SCNActionMBS

### 156.3.1 class SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A simple, reusable animation that changes attributes of any node you attach it to.
**Notes:** You use actions most often to change the structure and content of the SCNNodeMBS object to which they are attached, but you can also use actions make other changes to the scene. In SceneKit, actions provide an easy way to implement animated behaviors that frequently change in response to user input.

see also
https://developer.apple.com/documentation/scenekit/scnaction
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 19.6, page 50: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, page 51: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.4, pages 48 to 49: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 39 to 42: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.3.2 Methods

### 156.3.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 156.3.4 copy as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the action.

### 156.3.5 fadeIn(duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that changes the opacity of the node to 1.0.
**Notes:** duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs opacity property animates from its current value to 1.0.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.fadeOut(Duration)

### 156.3.6 fadeOpacityBy(factor as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that adjusts the opacity of a node by a relative value.
**Notes:** factor: The amount to change the node,Äôs opacity by.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs opacity property animates to its new value.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.fadeOpacityBy(-factor, duration)

### 156.3.7 fadeOpacityTo(opacity as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that adjusts the opacity of a node to a new value.
**Notes:** opacity: The new opacity value of the node.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs opacity property animates to its new value.
This action is not reversible; the reverse of this action has the same duration but does not change anything.

### 156.3.8 fadeOut(duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that changes the opacity of the node to 0.0.
**Notes:** duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs opacity property animates from its current value to 0.0.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.fadeIn(duration)

### 156.3.9 group(actions() as SCNActionMBS) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that runs a collection of actions in parallel.
**Notes:** actions: An array of SCNActionMBS objects.

Returns a new group action object.

When the action executes, the actions that make up the group all start immediately and run in parallel. The duration of the group action is the longest duration among the collection of actions. If an action in the group has a duration less than the group,Äôs duration, the action completes and then idles until the group completes the remaining actions. This matters most when creating a repeating action that repeats a group. This action is reversible; it creates a new group action that contains the reverse of each action specified in the group.

### 156.3.10 hide as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that hides a node.

**Notes:** When the action executes, the node,Äôs hidden property is set to true.
This action is reversible; the reverse is equivalent to the unhide action.

### 156.3.11 javaScriptActionWithScript(script as string, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that executes a JavaScript script periodically over a specified duration.
**Notes:** script: A string containing JavaScript source code.
seconds: The duration of the action, in seconds.

SceneKit exposes its classes, methods, and functions in the JavaScript context that runs the script—see the SCNJavaScript.h header file for details.

When the action executes, SceneKit runs the script repeatedly until the action,Äôs duration expires. Each time SceneKit runs the script, it computes the elapsed time since the action began executing (as a fraction of the action,Äôs duration between 0.0 and 1.0) and makes it available to the script as a variable named elapsedTime. The script can also reference the SCNNode object running the action as a variable named node.
This action is not reversible; the reverse action executes the same script.

### 156.3.12 moveBy(delta as SCNVector3MBS, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that moves a node relative to its current position.
**Notes:** delta: A vector that describes the change to be applied to the node,Äôs position.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs position property animates from its current position to its new position.
This action is reversible; the reverse is created as if the following code had been executed:

```
dim reverseDelta as SCNVector3MBS = SCNVector3MBS.Vector(-delta.x, -delta.y, -delta.z)
SCNActionMBS.moveBy( reverseDelta, duration)
```

See also:

- 156.3.13 moveBy(deltaX as double, deltaY as double, deltaZ as double, duration as double) as SCNActionMBS 20081

### 156.3.13 moveBy(deltaX as double, deltaY as double, deltaZ as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that moves a node relative to its current position.
**Notes:** deltaX: The distance to move the node in the X direction of its parent node,Äôs local coordinate space.
deltaY: The distance to move the node in the Y direction of its parent node,Äôs local coordinate space.
deltaZ: The distance to move the node in the Z direction of its parent node,Äôs local coordinate space.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs position property animates from its current position to its new position.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.moveBy( -deltaX, -deltaY, -deltaZ, duration)
See also:

- 156.3.12 moveBy(delta as SCNVector3MBS, duration as double) as SCNActionMBS 20080

### 156.3.14 moveTo(location as SCNVector3MBS, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that moves a node to a new position.
**Notes:** location: The coordinates for the node,Äôs new position in its parent node,Äôs local coordinate space.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs position property animates from its current position to its new position.
This action is not reversible; the reverse of this action has the same duration but does not move the node.

### 156.3.15 removeFromParentNode as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that removes the node from its parent.
**Notes:** When the action executes, the node is immediately removed from its parent.
This action is not reversible; the reverse of this action is the same action.

### 156.3.16 repeatAction(action as SCNActionMBS, count as integer) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that repeats another action a specified number of times.
**Notes:** action: The action to be executed.
count: The number of times to execute the action.

Returns a new action object.

When the action executes, the associated action runs to completion and then repeats, until the count is reached.
This action is reversible; it creates a new action that is the reverse of the specified action and then repeats it the same number of times.

### 156.3.17 repeatActionForever(action as SCNActionMBS) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that repeats another action forever.
**Notes:** action: The action to execute.

Returns a new action object.

When the action executes, the associated action runs to completion and then repeats.
This action is reversible; it creates a new action that is the reverse of the specified action and then repeats it forever.
Note
The action to be repeated must have a non-instantaneous duration.

### 156.3.18 reversedAction as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that reverses the behavior of another action.
**Notes:** This method always returns an action object; however, not all actions are reversible. When reversed, some actions return an object that either does nothing or performs the same action as the original action. For details on how an action is reversed, see the description of the class method used to create that action.

### 156.3.19 rotateBy(xAngle as double, yAngle as double, zAngle as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that rotates the node in each of the three principal axes by angles relative to its current orientation.
**Notes:** xAngle: The amount to rotate the node counterclockwise around the x-axis of its local coordinate space, in radians.
yAngle: The amount to rotate the node counterclockwise around the y-axis of its local coordinate space, in radians.
zAngle: The amount to rotate the node counterclockwise around the z-axis of its local coordinate space, in radians.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs rotation property animates to the new angle.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.rotateBy( -xAngle, -yAngle, -zAngle, duration)

### 156.3.20 rotateByAngle(angle as double, axis as SCNVector3MBS, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that rotates the node by an angle around a specified axis.
**Notes:** angle: The amount to rotate the node counterclockwise around the specified axis, in radians.
axis: A vector in the node,Äôs local coordinate space whose direction specifies the axis of rotation.
duration: The duration, in seconds, of the animation.

Return a new action object.

When the action executes, the node,Äôs rotation property animates to the new angle.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.rotateByAngle( -angle, axis, duration)

### 156.3.21 rotateTo(xAngle as double, yAngle as double, zAngle as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that rotates the node to absolute angles in each of the three principal axes.
**Notes:** xAngle: The amount to rotate the node counterclockwise around the x-axis of its local coordinate space, in radians.
yAngle: The amount to rotate the node counterclockwise around the y-axis of its local coordinate space, in radians.
zAngle: The amount to rotate the node counterclockwise around the z-axis of its local coordinate space, in radians.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs rotation property animates to the new angle. Calling this method is equivalent to calling rotateTo() and passing false for the shortestUnitArc parameter.
This action is not reversible; the reverse of this action has the same duration but does not change anything.
See also:

- 156.3.22 rotateTo(xAngle as double, yAngle as double, zAngle as double, duration as double, shortestUnitArc as boolean) as SCNActionMBS 20084

### 156.3.22 rotateTo(xAngle as double, yAngle as double, zAngle as double, duration as double, shortestUnitArc as boolean) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that rotates the node to absolute angles in each of the three principal axes.
**Notes:** xAngle: The amount to rotate the node counterclockwise around the x-axis of its local coordinate space, in radians.
yAngle: The amount to rotate the node counterclockwise around the y-axis of its local coordinate space, in radians.
zAngle: The amount to rotate the node counterclockwise around the z-axis of its local coordinate space, in radians.
duration: The duration, in seconds, of the animation.

shortestUnitArc: If false (the default), the animation interpolates each component of the node,Äôs rotation between its current value and the new value. If true, the animation makes the most direct rotation possible from the node,Äôs current orientation to the new orientation.

Returns a new action object.

When the action executes, the node,Äôs rotation property animates to the new angle.
This action is not reversible; the reverse of this action has the same duration but does not change anything.
See also:

- 156.3.21 rotateTo(xAngle as double, yAngle as double, zAngle as double, duration as double) as SCNActionMBS 20084

### 156.3.23 rotateToAxisAngle(axisAngle as SCNVector4MBS, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that rotates the node to an absolute angle around a specified axis.
**Notes:** axisAngle: A four-component vector whose first three components are a vector in the node,Äôs local coordinate space specifying an axis and whose fourth component is the amount to rotate the node counterclockwise around that axis, in radians.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs rotation property animates to the new angle.
This action is not reversible; the reverse of this action has the same duration but does not change anything.

### 156.3.24 runBlock(del as SCNActionRunBlockMBS, tag as variant = nil) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that executes run the given method.
**Notes:** When the action executes, SceneKit calls the delegate method. This action takes place instantaneously.
This action is not reversible; the reverse action executes the same delegate method.

### 156.3.25 scaleBy(scale as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that uniformly changes the scale factor of a node by a relative value.
**Notes:** scale: The amount of change to make to all three components of the node,Äôs scale.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs scale property animates to the new value.
This action is reversible; the reverse is created as if the following code had been executed:

SCNActionMBS.scaleBy( -scale, duration)

### 156.3.26 scaleTo(scale as double, duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that uniformly changes the scale factor of a node to an absolute value.
**Notes:** scale: The new value for all three components of the node,Äôs scale.
duration: The duration, in seconds, of the animation.

Returns a new action object.

When the action executes, the node,Äôs scale property animates to the new value.
This action is not reversible; the reverse of this action has the same duration but does not change anything.

### 156.3.27 sequence(actions() as SCNActionMBS) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that runs a collection of actions sequentially.
**Notes:** actions: An array of SCNActionMBS objects.
Returns a new sequence action object.

When the action executes, the first action in the sequence starts and runs to completion. Subsequent actions in the sequence run in a similar fashion until all of the actions in the sequence have executed. The duration of the sequence action is the sum of the durations of the actions in the sequence.

This action is reversible; it creates a new sequence action that reverses the order of the actions. Each action

in the reversed sequence is itself reversed.

### 156.3.28 unhide as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that ensures a node is not hidden.
**Notes:** When the action executes, the node,Äôs hidden property is set to false.
This action is reversible; the reverse is equivalent to the hide action.

### 156.3.29 wait(duration as double) as SCNActionMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an action that idles for a specified period of time.
**Notes:** When the action executes, the action waits for the specified amount of time and then ends. This is typically used as part of a sequence of actions to insert a delay between two other actions. You might also use it in conjunction with the runAction method to trigger code that needs to run at a later time.
This action is not reversible; the reverse of this action is the same action.

### 156.3.30 Properties

### 156.3.31 duration as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The duration required to complete an action.
**Notes:** This is the expected duration of an action,Äôs animation. The actual time an action takes to complete is modified by the action,Äôs timingMode property.
(Read and Write property)

### 156.3.32 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object references.
**Notes:** (Read and Write property)

### 156.3.33 speed as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A speed factor that modifies how fast an action runs.
**Notes:** The speed factor adjusts how fast an action,Äôs animation runs. For example, a speed factor of 2.0 means the animation runs twice as fast.
(Read and Write property)

### 156.3.34 timingMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The timing mode used to execute an action.
**Notes:** For possible values, see TimingMode constants. The default value is TimingModeLinear.
(Read and Write property)

### 156.3.35 Constants

Timing Modes

| Constant | Value | Description |
|---|---|---|
| TimingModeEaseIn | 1 | Ease-in pacing. The animation begins slowly, and then speeds up as it progresses. |
| TimingModeEaseInEaseOut | 3 | Ease-in ease-out pacing. The animation begins slowly, accelerates through the middle of its duration, and then slows again before completing. |
| TimingModeEaseOut | 2 | Ease-out pacing. The animation begins quickly, and then slows as it completes. |
| TimingModeLinear | 0 | Linear pacing. The animation progresses evenly throughout its duration. |

### 156.3.36 Delegates

### 156.3.37 SCNActionRunBlockMBS(node as SCNNodeMBS, tag as variant)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate for the runBlock method.

## 156.4 class SCNAudioPlayerMBS

### 156.4.1 class SCNAudioPlayerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A controller for playback of a positional audio source in a SceneKit scene.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Laser.wav")
audioSource = New SCNAudioSourceMBS(file)
audioPlayer = New MySCNAudioPlayerMBS(audioSource)
audioSource.Volume = 1.0
audioSource.Loops = true
audioSource.load

// now build your nodes
dim someNode as SCNNodeMBS

// show scene
MyView.scene = MyScene
MyView.play

// and add player to plays
someNode.addAudioPlayer(audioPlayer)
```

**Notes:** An SCNAudioPlayerMBS object controls playback of a positional audio source in a SceneKit scene. To use positional audio, first create a reusable SCNAudioSourceMBS or AVAudioNodeMBS object to provide an audio stream. Then, create an audio player to control the playback of that audio source. Finally, attach the audio player to an SCNNodeMBS object for spatialized 3D audio playback based on the position of that node relative to the scene,Äôs audioListener node.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr3

### 156.4.2 Methods

### 156.4.3 audioPlayerWithAVAudioNode(audioNode as Variant) as SCNAudioPlayerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns an audio player (creating one if necessary) to play an audio node.
**Notes:** Please pass a AVAudioNodeMBS class.

Creating an audio player from an audio node does not attach that node to an AVAudioEngine object for mixing and playback—instead, this option allows you to build your own audio node graph for custom effects before manually adding it to the audioEngine object of the view (or other SceneKit renderer) displaying the scene. Then, after you attach the audio player to an SCNNodeMBS object, SceneKit continually updates the audio node,Äôs 3D mixing parameters to match the position of the scene node.

When you use this method, SceneKit creates an audio player for the specified AVAudioNodeMBS object or, if an audio player for that node already exists and is not in use, SceneKit reuses the existing player object.

### 156.4.4 audioPlayerWithSource(audioSource as SCNAudioSourceMBS) as SCNAudioPlayerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns an audio player (creating one if necessary) to play a simple audio source.
**Notes:** An SCNAudioSourceMBS object represents a distinct source of audio (for example, a sound file) that can be reused and shared by many player objects. Use this method to create an audio player from such a source. When you use this method, SceneKit creates an audio player for the specified SCNAudioSourceMBS object or, if an audio player for that source already exists and is not in use, SceneKit reuses the existing player object.

If instead you want to attach a more complex audio setup to a position in your scene—such as a mixer that varies several audio inputs in response to user input—build that setup using AVAudioNodeMBS objects and create a player for it with the audioPlayerWithAVAudioNode() method.

### 156.4.5 Constructor(audioSource as SCNAudioSourceMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Initializes an audio player for playing the specified simple audio source.
**Notes:** Using this initializer is typically not necessary. Instead, call the audioPlayerWithSource() method, which returns a cached audio player object if one for the specified audio source has already been created and is available for use.

### 156.4.6 Properties

### 156.4.7 audioNode as Variant

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The audio node SceneKit uses for mixing audio from this player.
**Notes:** Value is an AVAudioNodeMBS class.
(Read only property)

### 156.4.8 audioSource as SCNAudioSourceMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The source of audio played by this player.
**Notes:** An SCNAudioSourceMBS object represents a distinct source of audio—for example, a sound file—that can be reused and shared by many player objects. Use a player,Äôs audio source to configure the default values for playback parameters such as volume and reverb. To vary those parameters in real time during playback, use the audioNode property to work with the underlying AVAudioNodeMBS object.
If the player was created with the audioPlayerWithAVAudioNode() method, this property,Äôs value is nil.
(Read only property)

### 156.4.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.4.10 Events

### 156.4.11 DidFinishPlayback

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: .

**Function:** An event called by SceneKit when playback of the player,Äôs audio source has completed.
**Notes:** The block takes no parameters and returns no value. Use this block to perform actions when a sound finishes playing. For example, after a line of spoken character dialogue finishes playing, you might start playing another line of dialogue.

### 156.4.12 WillStartPlayback

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: .

**Function:** An event called by SceneKit when playback of the player,Äôs audio source is about to begin.

## 156.5 class SCNAudioSourceMBS

### 156.5.1 class SCNAudioSourceMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A simple, reusable audio source—music or sound effects loaded from a file—for use in positional audio playback.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("Laser.wav")
audioSource = New SCNAudioSourceMBS(file)
audioSource.Volume = 1.0
audioSource.Loops = true
audioSource.load

// now use for SCNAudioPlayerMBS class
```

**Notes:** To create positional audio effects, create an SCNAudioPlayerMBS object from the audio source to control playback, and add that player object to an SCNNodeMBS object in your scene. SceneKit then automatically spatializes 3D audio effects based on the position of that node relative to the scene,Äôs audioListener node.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3
- MBS Xojo Plugins, version 22.3pr3

### 156.5.2 Methods

### 156.5.3 audioSourceNamed(Name as String) as SCNAudioSourceMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Returns the audio source associated with the specified filename.
**Notes:** fileName: The name of an audio file. If this filename has not been previously requested, the method looks for an audio file with the specified name in the application,Äôs main bundle.

This method looks in the system caches for an audio source with the specified name and returns that object if it exists. If a matching audio source is not already in the cache, this method locates the audio file with the specified name in the application,Äôs main bundle, then creates a new audio source and caches it for reuse.

### 156.5.4 Constructor(File as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Initializes an audio source from the specified audio file.
See also:

- 156.5.5 Constructor(URL as String) 20094

### 156.5.5 Constructor(URL as String)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Initializes an audio source from the specified audio file.
See also:

- 156.5.4 Constructor(File as FolderItem) 20094

### 156.5.6 copy as SCNAudioSourceMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the audio source object.

### 156.5.7 Load

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Loads audio data from the source and prepares it for playing.
**Notes:** This method reads audio data from the source file (specified when initializing the audio source) and performs any decompression necessary to prepare for playing audio. Use this method to control when your app or game incurs the run-time performance cost of such work—for example, you can load all audio source before starting a game level, instead of suffering a frame rate drop upon playing a new audio source during gameplay.
This method has no effect if the shouldStream property,Äôs value is true.

### 156.5.8 Properties

### 156.5.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.5.10 Loops as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the audio source should play repeatedly.
**Notes:** If this value is true, audio players using this source automatically begin playing again after playback has finished. If this value is false (the default), the audio source plays exactly once.
(Read and Write property)

### 156.5.11 Positional as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether audio from this source uses 3D positional mixing.
**Notes:** If this value is YES (the default), SceneKit mixes audio from the source based on its position relative to the scene,Äôs audioListener node—that is, the audio source,Äôs volume, reverb, and other parameters automatically change depending on the distance to the listener and other objects in the scene. (To position an audio source in a scene, create an SCNAudioPlayerMBS player from the source and attach that player to an SCNNodeMBS object.)
If you set this property to NO, the source,Äôs audio plays with the same volume (and other mixing parameters) regardless of the listener,Äôs position.
(Read and Write property)

### 156.5.12 Rate as Single

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The default playback rate for the audio source.
**Notes:** This property determines the default rate for when a source begins playing. To vary the rate during playback through an SCNAudioPlayerMBS object, use the player,Äôs audioNode property to access real-time audio controls.
(Read and Write property)

### 156.5.13 ReverbBlend as Single

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The default blend of blend of unmodified and reverb-processed (also called dry and wet) audio

for playback of the audio source.
**Notes:** This property determines the default reverb blend for when a source begins playing. To vary the reverb blend during playback through an SCNAudioPlayerMBS object, use the player,Äôs audioNode property to access real-time audio controls.
(Read and Write property)

### 156.5.14 ShouldStream as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the audio source should stream content from its source URL when playing.
**Notes:** If this value is true, audio players using this source do not preload audio buffer data, instead reading directly from the source file while playing audio. If this value is false, SceneKit loads audio buffer data upon playing audio from the source.
(Read and Write property)

### 156.5.15 Volume as Single

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The default playback volume for the audio source.
**Notes:** This property determines the default volume for when a source begins playing. To vary the volume during playback through an SCNAudioPlayerMBS object, use the player,Äôs audioNode property to access real-time audio controls.
(Read and Write property)

## 156.6 class SCNAvoidOccluderConstraintMBS

### 156.6.1 class SCNAvoidOccluderConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNAvoidOccluderConstraint constraints place the receiver at a position that prevent nodes with the specified category to occlude the target.
**Notes:** The target node and it's children are ignored as potential occluders.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.6.2 Methods

### 156.6.3 avoidOccluderConstraintWithTarget(target as SCNNodeMBS) as SCNAvoidOccluderConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNAvoidOccluderConstraint object.

### 156.6.4 Constructor(target as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNAvoidOccluderConstraint object.

### 156.6.5 Properties

### 156.6.6 bias as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the bias the apply after moving the receiver to avoid occluders.
**Notes:** Defaults to 10e-5.
A positive bias will move the receiver closer to the target.
(Read and Write property)

### 156.6.7 occluderCategoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the category of node to consider as occluder.
**Notes:** Defaults to 1.
(Read and Write property)

### 156.6.8 target as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the target node.
**Notes:** (Read and Write property)

## 156.7 class SCNBillboardConstraintMBS

### 156.7.1 class SCNBillboardConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A constraint that orients a node to always point toward the current camera.
**Notes:** An SCNBillboardConstraint object automatically adjusts a node,Äôs orientation so that its local z-axis always points toward the pointOfView node currently being used to render the scene. For example, you can use a billboard constraint to efficiently render parts of a scene using two-dimensional sprite images instead of three-dimensional geometry—by mapping sprites onto planes affected by a billboard constraint, the sprites maintain their orientation with respect to the viewer. To attach constraints to an SCNNodeMBS object, use its constraints property.
Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.7.2 Methods

### 156.7.3 billboardConstraint as SCNBillboardConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNBillboardConstraint constraint.
**Notes:** A billboard constraint forces the receiver to look into the direction of the current point of view.

### 156.7.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNBillboardConstraint constraint.
**Notes:** A billboard constraint forces the receiver to look into the direction of the current point of view.

### 156.7.5 Properties

### 156.7.6 freeAxes as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the axes on which the billboarding orientation operates. Defaults to SCNBillboardAxisAll.

**Notes:** (Read and Write property)

### 156.7.7 Constants

Axes

| Constant | Value | Description |
|---|---|---|
| SCNBillboardAxisAll | 7 | Align an affected node such that its orientation always matches that of the view.<br>This is the default option for newly created billboard constraints. |
| SCNBillboardAxisX | 1 | Align an affected node such that its x-axis is always parallel to that of the view, leaving it free to rotate otherwise. |
| SCNBillboardAxisY | 2 | Align an affected node such that its y-axis is always parallel to that of the view, leaving it free to rotate otherwise. |
| SCNBillboardAxisZ | 4 | Align an affected node such that its z-axis is always perpendicular to the viewing plane, leaving it free to rotate otherwise. |

## 156.8 class SCNBoxMBS

### 156.8.1 class SCNBoxMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNBox represents a box with rectangular sides and optional chamfers.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.4, page 41: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 36: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 22 to 24: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.8.2 Methods

### 156.8.3 box(width as double, height as double, length as double, chamferRadius as double) as SCNBoxMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a box with given width, height, length and chamfer radius.
**Notes:** width: The width of the box.
height: The height of the box.
length: The length of the box.
chamferRadius: The chamfer radius of the box.

### 156.8.4 Constructor(width as double, height as double, length as double, chamferRadius as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a box with given width, height, length and chamfer radius.
**Notes:** width: The width of the box.
height: The height of the box.
length: The length of the box.
chamferRadius: The chamfer radius of the box.

### 156.8.5 Properties

### 156.8.6 chamferRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The chamfer radius. Animatable.
**Notes:** If the value is strictly less than 0, the geometry is empty. The default value is 0.
(Read and Write property)

### 156.8.7 chamferSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of chamfer subdivisions. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 10.
(Read and Write property)

### 156.8.8 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the box. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.8.9 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.8.10 length as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The length of the box. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.

(Read and Write property)

### 156.8.11 lengthSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Z axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.8.12 width as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the box. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.8.13 widthSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the X axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

## 156.9 class SCNCameraControllerMBS

### 156.9.1 class SCNCameraControllerMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a camera controller.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr3

### 156.9.2 Methods

### 156.9.3 clearRoll

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Clear the camera roll if any.

### 156.9.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 156.9.5 dollyToTarget(delta as double)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Zoom by moving the camera along the axis from the camera position to the target.

### 156.9.6 rollAroundTarget(delta as double)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Rotate the camera around the axis from the camera position to the target.
**Notes:** Delta is in degrees.

### 156.9.7 rotate(deltaX as double, deltaY as double)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Rotate delta is in degrees.

### 156.9.8 stopInertia

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Stop current inertia.

### 156.9.9 translateInCameraSpace(x as double, y as double, z as double)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Translate the camera along the local X/Y/Z axis.

### 156.9.10 Properties

### 156.9.11 automaticTarget as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Automatically update the target in beginInteraction.
**Notes:** Defaults to false.
(Read and Write property)

### 156.9.12 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.9.13 inertiaEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Set to true to enable inertia on endInteraction.
**Notes:** Defaults to false.
(Read and Write property)

### 156.9.14 inertiaFriction as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The friction coefficient applied to the inertia.
**Notes:** Defaults to 0.05.
(Read and Write property)

### 156.9.15 inertiaRunning as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns true if inertia is running.
**Notes:** (Read only property)

### 156.9.16 maximumHorizontalAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum and maximum horizontal view angles in degrees for SCNInteractionModeFly and SCNInteractionModeOrbitTurntable.
**Notes:** The angle constraints is not enforced if both horizontal angle properties values are set to 0.
The angle constraints will not be enforced if the initial orientation is outside the given range.
The minimum angle must be inferior to the maximum angle.
Angles are in world space and within the range [ -180, 180 ] .
Defaults to 0.0.
(Read and Write property)

### 156.9.17 maximumVerticalAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum and maximum vertical view angles in degrees for SCNInteractionModeFly and SCNInteractionModeOrbitTurntable.
**Notes:** The angle constraints is not enforced if both vertical angle properties values are set to 0.
The angle constraints will not be enforced if the initial orientation is outside the given range.
The minimum angle must be inferior to the maximum angle.

Angles are in world space and within the range [ -90, 90 ] .
Defaults to 0.0.
For example: set to minimum to 0 and maximum to 90 to only allow orbit around the top hemisphere.
(Read and Write property)

### 156.9.18 minimumHorizontalAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum and maximum horizontal view angles in degrees for SCNInteractionModeFly and SCNInteractionModeOrbitTurntable.
**Notes:** The angle constraints is not enforced if both horizontal angle properties values are set to 0.
The angle constraints will not be enforced if the initial orientation is outside the given range.
The minimum angle must be inferior to the maximum angle.
Angles are in world space and within the range [ -180, 180 ] .
Defaults to 0.0.
(Read and Write property)

### 156.9.19 minimumVerticalAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Minimum and maximum vertical view angles in degrees for SCNInteractionModeFly and SCNInteractionModeOrbitTurntable.
**Notes:** The angle constraints is not enforced if both vertical angle properties values are set to 0.
The angle constraints will not be enforced if the initial orientation is outside the given range.
The minimum angle must be inferior to the maximum angle.
Angles are in world space and within the range [ -90, 90 ] .
Defaults to 0.0.
For example: set to minimum to 0 and maximum to 90 to only allow orbit around the top hemisphere.
(Read and Write property)

### 156.9.20 pointOfView as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node describing the point of view.
**Notes:** (Read and Write property)

### 156.9.21 target as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera target in world space for orbit rotation.
**Notes:** (Read and Write property)

### 156.9.22 worldUp as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The up vector in world space used as reference for SCNInteractionModeFly and SCNInteractionModeOrbitTurntable camera modes.
**Notes:** Defaults to (0, 1, 0).
(Read and Write property)

## 156.10 class SCNCameraMBS

### 156.10.1 class SCNCameraMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of camera attributes that can be attached to a node to provide a point of view for displaying the scene.
**Notes:** To display a scene, you must designate a node whose camera property contains a camera object as the point of view.

The SCNNode object containing a camera defines a point of view—that is, the position and orientation of the camera. A camera,Äôs direction of view is always along the negative z-axis of the node,Äôs local coordinate system. To point the camera at different parts of your scene, use the position, rotation, or transform property of the node containing it. (Alternatively, to ensure that a camera always points at a particular element of your scene even when that element moves, attach a SCNLookAtConstraint object to the node containing the camera.)

An SCNCamera object itself defines the shape and, in part, the appearance of the rendered scene as seen from its point of view. By default, a camera defines a perspective projection, whose field of view (FOV) and near and far visibility limits you control using the properties listed in Adjusting Camera Perspective and illustrated below.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr3

### 156.10.2 Methods

### 156.10.3 camera as SCNCameraMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new camera object.
**Notes:** To use the camera to display a scene, attach it to the camera property of a node and then select that node using the pointOfView property of the view (or layer or renderer) rendering the scene.

### 156.10.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new camera object.
**Notes:** To use the camera to display a scene, attach it to the camera property of a node and then select that node using the pointOfView property of the view (or layer or renderer) rendering the scene.

### 156.10.5 copy as SCNCameraMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the camera.

### 156.10.6 Properties

### 156.10.7 ApertureBladeCount as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of physical camera aperture blades simulated by SceneKit for depth-of-field effects.
**Notes:** When the wantsDepthOfField setting is enabled, SceneKit renders scenes using the camera with a depth-of-field blur (also called bokeh) effect modeled after those created by a real-world physical camera. One feature of real-world camera bokeh effects is the tendency of distant bright points to blur into larger shapes based on the shape of the aperture between the camera's lens and its imaging plane (film or sensor). Physical cameras control aperture using a mechanism that moves several flat blades in or out to create a smaller or larger opening, so the natural bokeh effect in traditional photography produces polygon-shaped blur effects.
This property controls the number of blades in the simulated camera aperture, and thus the polygon shape seen in the resulting bokeh effect. For example, a blade count of 6 (the default) causes distant bright points to blur into hexagon shapes. Increasingly large blade counts result in the bokeh effect appearing more circular, as shown below.
(Read and Write property)

### 156.10.8 AutomaticallyAdjustsZRange as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the camera automatically adjusts its zNear and zFar depth limits.
**Notes:** The default value of this property is false, specifying that the camera,Äôs zNear and zFar properties control its depth limits. If you change this property,Äôs value to true, SceneKit automatically adjusts the depth limits at render time to fit the bounding box of the scene. Changing the values of the zNear and zFar properties automatically resets this property,Äôs value to false.
(Read and Write property)

### 156.10.9 averageGray as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The luminance level to use as the midpoint of a tone mapping curve.

**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties, along with this property which serves as a constant estimate of scene luminance.
The default value is 0.18. By setting this property to a higher or lower value, you can compensate for scenes with darker or brighter content. Alternatively, by setting the wantsExposureAdaptation property, you can allow SceneKit to automatically adjust exposure as the visible contents of the scene change.
This property has no effect if the wantsHDR value is false. If the exposureAdaptationDarkeningSpeedFactor value is true, SceneKit ignores this property, and instead computes the average luminance currently visible to the camera during rendering.
(Read and Write property)

### 156.10.10 bloomBlurRadius as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius, in pixels, for the blurring portion of the bloom effect applied to highlights in the rendered scene. Animatable.
**Notes:** A bloom effect adds a soft glow to highlights (areas of bright color) in the rendered scene, simulating the way bright highlights appear to the human eye or a physical camera in a real-world scene. The bloom effect combines selective brightening and blurring effects; this property controls the blur portion of the effect. A value of zero effectively disables the bloom effect, and higher values result in a broader, softer glow. The default value is 4.0 pixels.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.11 bloomIntensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The magnitude of bloom effect to apply to highlights in the rendered scene. Animatable.
**Notes:** A bloom effect adds a soft glow to highlights (areas of bright color) in the rendered scene, simulating the way bright highlights appear to the human eye or a physical camera in a real-world scene. This property controls the strength of the bloom effect; lower values result in a subtle effect, and higher values create very bright glow. The default value is 0.0, resulting in no bloom effect.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.12 bloomThreshold as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The brightness threshold at which to apply a bloom effect to highlights in the rendered scene. Animatable.
**Notes:** A bloom effect adds a soft glow to highlights (areas of bright color) in the rendered scene, simulating the way bright highlights appear to the human eye or a physical camera in a real-world scene. This property controls the brightness level required to trigger the bloom effect; lower values apply the effect to more of the scene, and higher values apply the effect only to the brightest white areas. The default value is 1.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.13 colorFringeIntensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The blend factor for fading the color fringing effect applied to the rendered scene.
**Notes:** Color fringing applies an effect that separately blurs the color components of each rendered pixel, adding subtle rainbow edge effects to the rendered scene that simulate the effects of chromatic aberration in a physical camera. Higher values for this property result in brighter, more vivid color fringing, and lower values create a subtler effect. The default value of 1.0 leaves the color fringing effect at its most vivid.
This property controls a fade between the color fringing effect and the otherwise-normally-rendered image. The colorFringeStrength property controls the breadth of the color fringing effect.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.14 colorFringeStrength as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The magnitude of color fringing effect to apply to the rendered scene.
**Notes:** Color fringing applies an effect that separately blurs the color components of each rendered pixel, adding subtle rainbow edge effects to the rendered scene that simulate the effects of chromatic aberration in a physical camera. Higher values create a more pronounced color shift, creating wider rainbow fringes; lower values spread colors across shorter distances, creating a subtler effect. The default value of 0.0 disables the color fringing effect entirely.
This property controls the breadth of color fringing. The colorFringeIntensity property controls the blend factor between the color-fringed and the otherwise-normally-rendered image.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.15 colorGrading as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A texture for applying color grading effects to the entire rendered scene.
**Notes:** The contents value for this material property must be a 3D color lookup table, or a 2D texture image that represents such a table arranged in a horizontal strip.

see also
https://developer.apple.com/documentation/scenekit/scncamera/1644114-colorgrading
(Read only property)

### 156.10.16 contrast as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** An adjustment factor to apply to the overall visual contrast of the rendered scene.
**Notes:** A value of 0.0 (the default) leaves the rendered scene unchanged. Positive values increase contrast between bright and dark areas, and negative values reduce contrast, shifting the rendered scene towards a uniform gray.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.17 exposureAdaptationBrighteningSpeedFactor as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The relative duration of automatically animated exposure transitions from dark to bright areas.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. When the wantsExposureAdaptation property is enabled, SceneKit automatically adjusts the tone mapping curve based on the average luminance currently visible to the camera, and creates automatic transitions between exposure levels.
SceneKit automatically determines the overall duration of exposure-level animations based on the values of this property and the exposureAdaptationDarkeningSpeedFactor property. The default value is 0.4, resulting in brightening animations that are slightly faster than darkening animations.
This property has no effect if either of the wantsHDR or wantsExposureAdaptation values is false.
(Read and Write property)

### 156.10.18 exposureAdaptationDarkeningSpeedFactor as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The relative duration of automatically animated exposure transitions from bright to dark areas.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. When the wantsExposureAdaptation property is enabled, SceneKit automatically adjusts the tone mapping curve based on the average luminance currently visible to the camera, and creates automatic transitions between exposure levels.
SceneKit automatically determines the overall duration of exposure-level animations based on the values of this property and the exposureAdaptationDarkeningSpeedFactor property. The default value is 0.6, resulting in darkening animations that are slightly faster than brighting animations.
This property has no effect if either of the wantsHDR or wantsExposureAdaptation values is false.
(Read and Write property)

### 156.10.19 exposureOffset as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A logarithmic bias that adjusts the results of SceneKit,Äôs tone mapping operation, brightening or darkening the visible scene.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties, along with a measure of scene luminance.
Use this property to bias the tone mapping curve. The default exposure offset is zero, specifying no bias. Positive values result in a brighter scene, and negative values result in a darker scene.
This property has no effect if the wantsHDR value is false.
(Read and Write property)

### 156.10.20 FieldOfView as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The vertical or horizontal viewing angle of the camera.
**Notes:** The projectionDirection property determines whether this fieldOfView property measures the camera's vertical or horizontal viewing angle, and SceneKit automatically calculates the viewing angle in the other direction to match the aspect ratio of the view displaying the scene. For example, a fieldOfView of 60 and the default SCNCameraProjectionDirectionVertical projection, presented fullscreen on a 16:9 display in portrait orientation, results in a vertical viewing angle of 60¬∞ and a horizontal viewing angle of 33.75¬∞.
You can choose to specify viewing angle either directly, using this fieldOfView property, or in terms that model a physical camera, using the sensorHeight and focalLength properties. Setting the fieldOfView property causes SceneKit to automatically recalculate the focalLength value, and setting the sensorHeight or focalLength property recalculates fieldOfView.
(Read and Write property)

### 156.10.21 FocalBlurSampleCount as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of pixel samples SceneKit uses to create depth-of-field blur effects.
**Notes:** When the wantsDepthOfField setting is enabled, SceneKit renders depth-of-field blur (also called bokeh) effects using a blur filter that samples multiple points in the image. Sampling a larger number of points produces a higher quality visual effect at a higher performance cost, and vice versa. The default sample count is 25.
(Read and Write property)

### 156.10.22 FocalLength as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera's focal length, in millimeters.
**Notes:** The sensorHeight and focalLength properties determine the camera's horizontal and vertical viewing angles using terms that model physical camera devices. (Alternatively, you can work with viewing angle directly though the fieldOfView property.) For example, with the default sensor height of 24 mm and default focal length of 50 mm, the vertical field of view is 60¬∞.
Setting the fieldOfView property causes SceneKit to automatically recalculate the focalLength value, and setting the sensorHeight or focalLength property recalculates fieldOfView.
(Read and Write property)

### 156.10.23 focusDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance from the camera at which objects appear in sharp focus. Animatable.
**Notes:** Objects at this distance from the camera appear perfectly focused. Objects nearer to or farther from the camera than this distance appear increasingly blurred, with the behavior of the blur effect depending on the fStop, apertureBladeCount and focalBlurSampleCount properties. The default focus distance is 2.5.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.10.24 fStop as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physical camera aperture simulated by SceneKit for depth-of-field effects. Animatable.
**Notes:** F-stop numbers describe the light-gathering area of a physical camera's imaging system, and are typically expressed as the denominator of a ratio including the camera's focal length í, such as í/2 or í/5.6. A larger denominator indicates a smaller aperture, allowing less light to pass from the camera's lens through

to the imaging plane (sensor or film), and a smaller denominator indicates a larger aperture that lets more light through.
SceneKit uses aperture measurements to simulate depth-of-field blur effects (also called bokeh) approximating those produced by a physical camera. A larger fStop number (or aperture denominator) causes most of the scene to appear in focus, with extremely close or far depths showing slight blurring; a smaller number results in only a narrow range of depths appearing in focus, and a more pronounced blur effect for the rest of the scene. The default fStop value is 5.6.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.10.25 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.10.26 maximumExposure as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum exposure value to use in tone mapping.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties, along with a measure of scene luminance.
Exposure values are exponential: a value of 1.0 doubles brightness, a value of 2.0 quadruples brightness, a value of -1.0 halves brightness, and so on. The default value is 15.0. Decreasing the value causes brighter portions of the scene to become over-exposed (uniformly white, losing definition). Increasing the value adds more dynamic range for brighter portions of the scene; however, a greater breadth of difference between the minimum and maximum exposures decreases contrast.
This property has no effect if the wantsHDR value is false.
(Read and Write property)

### 156.10.27 minimumExposure as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum exposure value to use in tone mapping.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties, along with a measure of scene luminance.

Exposure values are exponential: a value of 1.0 doubles brightness, a value of 2.0 quadruples brightness, a value of -1.0 halves brightness, and so on. The default value is -15.0. Increasing the value causes darker portions of the scene to become under-exposed (uniformly black, losing definition). Decreasing the value adds more dynamic range for darker portions of the scene; however, a greater breadth of difference between the minimum and maximum exposures decreases contrast.
This property has no effect if the wantsHDR value is false.
(Read and Write property)

### 156.10.28 motionBlurIntensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A factor that determines the intensity of motion blur effects. Animatable.
**Notes:** The default intensity of zero results in no motion blur effect. Higher values (toward a maximum of 1.0) create more pronounced motion blur effects.
Motion blur is not supported when wide-gamut color rendering is enabled. Wide-gamut rendering is enabled by default on supported devices; to opt out, set the SCNDisableWideGamut key in your app's Info.plist file.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.10.29 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A name associated with the camera object.
**Notes:** You can provide a descriptive name for a camera object to make managing your scene graph easier. Cameras loaded from a scene file may have names assigned by an artist using a 3D authoring tool. Use the SCNSceneSourceMBS class to examine cameras in a scene file without loading its scene graph.
(Read and Write property)

### 156.10.30 orthographicScale as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the camera,Äôs magnification factor when using an orthographic projection.
**Notes:** In an orthographic projection, equally sized objects appear equally sized regardless of their distance from the camera. To switch between orthographic and perspective projections, see the usesOrthographicProjection property.
(Read and Write property)

### 156.10.31 ProjectionDirection as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The axis used to determine field of view or orthographic scale.
**Notes:** The fieldOfView property measures view angle in a single primary direction, determined by this projectionDirection property. For the other direction, SceneKit automatically adjusts field of view depending on the aspect ratio of the view presenting the scene.
For example, with the default projection direction of SCNCameraProjectionDirectionVertical, setting fieldOfView to 60 results in a vertical view angle of 60¬∞. If the scene appears on a display with a 4:3 aspect ratio, the horizontal view angle is 80¬∞. However, if the scene appears on a 16:9 display, the horizontal view angle is 106¬∞.
This property has a similar effect on scaling for orthographic projections. The orthographicScale property measures the scale factor in the direction of the projectionDirection property, and SceneKit automatically calculates scale factor in the other direction according to aspect ratio.
(Read and Write property)

### 156.10.32 projectionTransform as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera,Äôs projection transformation.
**Notes:** This transformation expresses the combination of all the camera,Äôs geometric properties: projection type (perspective or orthographic), field of view, depth limits, and orthographic scale (if applicable). SceneKit uses this transformation to convert points in the camera node,Äôs coordinate space to the renderer,Äôs 2D space when rendering and processing events.
You can use this transformation directly if your app needs to convert between view and renderer coordinates for other purposes. Alternatively, if you compute your own projection transform matrix, you can set this property to override the transformation synthesized from the camera,Äôs geometric properties.
(Read and Write property)

### 156.10.33 saturation as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** An adjustment factor to apply to the overall color saturation of the rendered scene.
**Notes:** A value of 1.0 (the default) leaves scene colors unchanged. Greater values result in oversaturated colors, and a value of 0.0 makes the rendered scene entirely grayscale.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.34 screenSpaceAmbientOcclusionBias as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** An offset for modulating ambient occlusion effects.
**Notes:** Ambient occlusion is an effect that improves material shading by calculating the amounts of ambient light that reach various parts of a surface, creating shadows on parts of a geometry where incoming light is obscured by other parts of the geometry. (You can provide pre-rendered ambient occlusion effects for a material using its ambientOcclusion property.) Screen-space ambient occlusion (SSAO) provides a real-time approximation of this effect for the entire scene viewed through the camera.
This screenSpaceAmbientOcclusionBias value is used in an intermediate stage of calculating the SSAO effect, and measures a distance in scene units. Increasing or decreasing this value from its default of 0.03 can help to offset unrealistic effects produced by changing other SSAO settings.
(Read and Write property)

### 156.10.35 screenSpaceAmbientOcclusionDepthThreshold as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum depth difference, in units of scene space, at which to apply ambient occlusion effects.
**Notes:** Ambient occlusion is an effect that improves material shading by calculating the amounts of ambient light that reach various parts of a surface, creating shadows on parts of a geometry where incoming light is obscured by other parts of the geometry. (You can provide pre-rendered ambient occlusion effects for a material using its ambientOcclusion property.) Screen-space ambient occlusion (SSAO) provides a real-time approximation of this effect for the entire scene viewed through the camera.
This screenSpaceAmbientOcclusionDepthThreshold property controls the effect of relative distance from the camera on SSAO effects. Higher values create more shadowing effects between foreground and background elements of the scene, but this can result in unrealistic dark halos around foreground elements that are far from the background. Lower values avoid dark halo effects, but create less visual separation between scene elements at different distances from the camera. The default value is 0.2 units.
(Read and Write property)

### 156.10.36 screenSpaceAmbientOcclusionIntensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The intensity of the screen-space ambient occlusion effect applied in camera rendering.
**Notes:** Ambient occlusion is an effect that improves material shading by calculating the amounts of ambient light that reach various parts of a surface, creating shadows on parts of a geometry where incoming light is obscured by other parts of the geometry. (You can provide pre-rendered ambient occlusion effects for a material using its ambientOcclusion property.) Screen-space ambient occlusion (SSAO) provides a real-time approximation of this effect for the entire scene viewed through the camera.
The default value of this property is zero, disabling SSAO effects. Increasing the intensity value creates deeper, bolder shadows.

(Read and Write property)

### 156.10.37 screenSpaceAmbientOcclusionNormalThreshold as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The magnitude of the blur effect applied to create ambient occlusion shadows.
**Notes:** Ambient occlusion is an effect that improves material shading by calculating the amounts of ambient light that reach various parts of a surface, creating shadows on parts of a geometry where incoming light is obscured by other parts of the geometry. (You can provide pre-rendered ambient occlusion effects for a material using its ambientOcclusion property.) Screen-space ambient occlusion (SSAO) provides a real-time approximation of this effect for the entire scene viewed through the camera.
SSAO shadowing includes a blur effect to realistically soften differences in shadow between adjacent pixels, which depends on both the smoothness of scene geometry and this factor. Larger blur factors create a softer, more spread-out blur; smaller factors create coarser shadowing effects.
(Read and Write property)

### 156.10.38 screenSpaceAmbientOcclusionRadius as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance, in units of scene space, at which ambient occlusion takes effect.
**Notes:** Ambient occlusion is an effect that improves material shading by calculating the amounts of ambient light that reach various parts of a surface, creating shadows on parts of a geometry where incoming light is obscured by other parts of the geometry. (You can provide pre-rendered ambient occlusion effects for a material using its ambientOcclusion property.) Screen-space ambient occlusion (SSAO) provides a real-time approximation of this effect for the entire scene viewed through the camera.
SSAO effects work by storing relevant scene geometry information for each pixel, and using that information to produce per-pixel shading effects. This screenSpaceAmbientOcclusionRadius property determines the area in scene space to consider around each pixel for determining the amount of incoming ambient light blocked by surrounding geometry (and thus the amount of shadow effect to apply). The default value is 5; smaller values cause SSAO effects to apply only to finer geometry details, while larger values affect coarser details.
(Read and Write property)

### 156.10.39 SensorHeight as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The vertical size of the camera's imaging plane, in millimeters.
**Notes:** The sensorHeight and focalLength properties determine the camera's horizontal and vertical viewing angles using terms that model physical camera devices. (Alternatively, you can work with viewing angle directly though the fieldOfView property.) For example, with the default sensor height of 24 mm and default

focal length of 50 mm, the vertical field of view is 60¬∞.
Setting the fieldOfView property causes SceneKit to automatically recalculate the focalLength value, and setting the sensorHeight or focalLength property recalculates fieldOfView.
(Read and Write property)

### 156.10.40 UsesOrthographicProjection as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the camera uses an orthographic projection.
**Notes:** The default value of this property is false, specifying a perspective projection. In a perspective projection, equally sized objects nearer to the camera appear larger than those farther away.
Set the value of this property to true to specify an orthographic projection. In an orthographic projection, equally sized objects appear equally sized regardless of distance from the camera.
To control the magnification factor of an orthographic camera, use its orthographicScale property.
(Read and Write property)

### 156.10.41 vignettingIntensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The magnitude of vignette (darkening around edges) effect to apply to the rendered scene.
**Notes:** A vignette effect darkens the edges and corners of the rendered scene, simulating the effect of lens and barrel shape on the image produced by a physical camera. Higher values result in more darkening, and lower values result in a subtler effect. The default value of 0.0 results in no vignetting effect.
This property controls the level of darkening applied; the vignettingPower property controls the area of the rendered image to be darkened.
To enable this behavior, you must first enable the wantsHDR setting.
(Read and Write property)

### 156.10.42 vignettingPower as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of the rendered scene to darken with a vignette effect.
**Notes:** A vignette effect darkens the edges and corners of the rendered scene, simulating the effect of lens and barrel shape on the image produced by a physical camera. Higher values result apply the darkening effect to a broader area around the edges of the rendered image, and lower values apply the effect to a smaller area, leaving more of the rendered image at full brightness. The default value of 0.0 results in no vignetting effect.
This property controls the area of the rendered image to be darkened; the vignettingIntensity property controls the level of darkening applied to those areas.
To enable this behavior, you must first enable the wantsHDR setting.

(Read and Write property)

### 156.10.43 WantsDepthOfField as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit renders depth-of-field blur effects for the camera.
**Notes:** This value is false by default, disabling depth-of-field effects.
Enabling this property causes SceneKit to render blur effects that model those created by a physical camera device (also known as bokeh). That is, objects in the scene appear more or less blurry depending on their distance from the camera and the camera's focusDistance, and the intensity and style of the blur effect depend on the fStop and apertureBladeCount properties.

Note
For best results, also enable the wantsHDR property when using depth-of-field effects. High Dynamic Range rendering provides high contrast for distant bright points in the scene, creating more pronounced bokeh effects.
(Read and Write property)

### 156.10.44 WantsExposureAdaptation as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit automatically adjusts the exposure level.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. One measure of tone mapping is the exposure value, whose effect on the output is similar to that of the shutter speed (or exposure time) of a real-world camera—lower exposure values result in a darker image, and higher exposures result in a brighter image. You cannot adjust exposure value directly—instead, SceneKit determines a tone mapping curve (including the exposure level) from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties along with a measure of scene luminance.

If this property,Äôs value is true (the default), SceneKit automatically measures the current luminance visible to the camera during rendering, and adjusts the exposure level accordingly. Additionally, when the scene luminance changes, SceneKit automatically animates a transition to the new exposure level (see the exposureAdaptationBrighteningSpeedFactor and exposureAdaptationDarkeningSpeedFactor properties).

Note
The visual effect of automatic exposure is similar to how human visual perception adjusts to changes in environmental lighting. For example, consider a game scene where the player moves from a darkened area into full daylight. At first, the exposure value is low, allowing for visible detail in the darkened area, but

no detail in the white daylight outside. As the player moves into the daylight, the entire view becomes blindingly bright, but over a brief time the player,Äôs vision adapts: detail becomes visible in the bright area, and the darkened area loses detail.

If this property,Äôs value is false, SceneKit,Äôs tone mapping effect is constant. Instead of responding to scene luminance, SceneKit uses the averageGray property to determine the tone mapping curve.
This property has no effect if the wantsHDR value is false.
(Read and Write property)

### 156.10.45 WantsHDR as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit applies High Dynamic Range (HDR) post-processing effects to a scene.
**Notes:** When this property,Äôs value is false (the default), SceneKit performs lighting calculations in a color space whose brightness range is similar to that of the output display. This approach limits the ability to perform realistic rendering of scenes with fine details in brightness levels.
When you enable HDR rendering for a camera, SceneKit calculates lighting in a much deeper color space, preserving fine details in contrast regardless of brightness, then applies a post-processing effect called tone mapping to translate luminance values from that space to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve (including the exposure level) from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties along with a measure of scene luminance. The wantsExposureAdaptation property determines whether tone mapping effects are static or dynamically respond when the luminance visible to the camera changes.
The default value is false.
(Read and Write property)

### 156.10.46 whitePoint as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The luminance level to use as the upper end of a tone mapping curve.
**Notes:** When using a High Dynamic Range (HDR) camera, SceneKit applies a process called tone mapping to translate the wide range of luminance values in the visible scene to the narrower range of brightness values that can be shown on a display. SceneKit determines a tone mapping curve from the minimumExposure, maximumExposure, exposureOffset, and whitePoint properties, along with a measure of scene luminance.
The default value is 1.0. By setting this property to a higher or lower value, you can produce more gradual or more abrupt transitions between shadows and highlights.
This property has no effect if the wantsHDR value is false.
(Read and Write property)

### 156.10.47 zFar as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera,Äôs far depth limit. Animatable.
**Notes:** The far value determines the maximal distance between the camera and a visible surface. If a surface is farther from the camera than this distance, the surface is clipped and does not appear. The default far value is 100.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.10.48 zNear as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera's near depth limit. Animatable.
**Notes:** The near value determines the minimal distance between the camera and a visible surface. If a surface is closer to the camera than this distance, the surface is clipped and does not appear. The near value must not be zero. The default near value is 1.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.10.49 Constants

Orthographic Projection

| Constant | Value | Description |
|---|---|---|
| kProjectionDirectionHorizontal | 1 | The camera's field of view or orthographic scale are measured horizontally. |
| kProjectionDirectionVertical | 0 | The camera's field of view or orthographic scale are measured vertically. |

## 156.11 class SCNCapsuleMBS

### 156.11.1 class SCNCapsuleMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNCapsule represents a capsule with controllable height and cap radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.2, page 41: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 24 to 25: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.11.2 Methods

### 156.11.3 capsule(capRadius as double, height as double) as SCNCapsuleMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a capsule with given radius and height.
**Notes:** capRadius: The radius of the capsule.
height: The height of the capsule.

### 156.11.4 Constructor(capRadius as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a capsule with given radius and height.
**Notes:** capRadius: The radius of the capsule.
height: The height of the capsule.

### 156.11.5 Properties

### 156.11.6 capRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The cap radius of the capsule. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 0.5.
(Read and Write property)

### 156.11.7 capSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions in the cap. Animatable.
**Notes:** If the value is less than 2, the behavior is undefined. The default value is 24.
(Read and Write property)

### 156.11.8 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the capsule. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 2.
(Read and Write property)

### 156.11.9 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.11.10 radialSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the radial coordinate. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.

(Read and Write property)

## 156.12 class SCNConeMBS

### 156.12.1 class SCNConeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNCone represents a cone with controllable height, top radius and bottom radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 19.6, page 47: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.2, page 37: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 25 to 26: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.12.2 Methods

### 156.12.3 cone(topRadius as double, bottomRadius as double, height as double) as SCNConeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a cone with given top radius, bottom radius and height.
**Notes:** topRadius: The radius at the top of the cone.
bottomRadius: The radius at the bottom of the cone.
height: The height of the cone.

### 156.12.4 Constructor(topRadius as double, bottomRadius as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a cone with given top radius, bottom radius and height.
**Notes:** topRadius: The radius at the top of the cone.

bottomRadius: The radius at the bottom of the cone.
height: The height of the cone.

### 156.12.5 Properties

### 156.12.6 bottomRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius at the bottom of the cone. Animatable.
**Notes:** If the value is less than 0, the geometry is empty. The default value is 0.5.
(Read and Write property)

### 156.12.7 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the cone. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.12.8 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.12.9 radialSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the radial coordinate. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.
(Read and Write property)

### 156.12.10 topRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius at the top of the cone. Animatable.
**Notes:** If the value is less than 0, the geometry is empty. The default value is 0.
(Read and Write property)

# 156.13 class SCNConstraintMBS

## 156.13.1 class SCNConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The abstract superclass for objects that automatically adjust the position, rotation, or scale of a node based on specified rules.
**Notes:** To control the transform (position, rotation, and scale) of one or more SCNNodeMBS objects with constraints, create and configure instances of the SCNConstraint subclass that provides the behavior you want, then add those constraint objects to each node's constraints array.

When SceneKit prepares to render a scene, it examines the list of constraints attached to each node to determine the transform for that node, then applies the new transformation before displaying the scene.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.13.2 Methods

## 156.13.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

## 156.13.4 copy as SCNConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the constraint object.

## 156.13.5 Properties

## 156.13.6 Enabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether the constraint is enabled or not.
**Notes:** Defaults to true.
(Read and Write property)

### 156.13.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.13.8 Incremental as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether or not the contraint should applies incrementally and have it's effect being cumulated over the rendered frames.
**Notes:** Defaults to true on macOS 10.13, iOS 11, tvOS 11 and watchOS 4. Defaults to false in earlier versions.
(Read and Write property)

### 156.13.9 influenceFactor as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The influence of the constraint on the node,Äôs transformation.
**Notes:** Use this property to relax the effect of a constraint on the nodes it applies to. For example, consider a node containing a spotlight, constrained by an SCNLookAtConstraintMBS object to point toward another node containing a moving game character. If the constraint,Äôs influence factor is 1.0, SceneKit adjusts the spotlight node to point directly at the game character each time it renders a frame. If you reduce the influence factor to 0.5, each time SceneKit renders a frame it moves the spotlight halfway from its current orientation to the target orientation. As a result, the spotlight continues to follow the moving character, but with a slight lag.

The default influence factor is 1.0, specifying that SceneKit apply the full effect of the constraint every frame. An influence factor of 0.0 means the constraint has no effect.

This property has no effect on SCNTransformConstraintMBS objects.
(Read and Write property)

## 156.14 control SCNControlMBS

### 156.14.1 control SCNControlMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** The Xojo control for a SCNViewMBS.
**Notes:** This control embeds a special SCNView subclass.
Designed for Xojo 2013r1 and newer. May work on Xojo 2012, but not perfectly.
Please use view property to access the underlaying object and set properties.

To learn about rendering events, please check here:
https://developer.apple.com/documentation/scenekit/scnscenerendererdelegate?language=objc

You can set PreferLowPowerDevice and PreferredRenderingAPI properties before initializing a view.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 19.6, page 45: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, page 39: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 26: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

### 156.14.2 Properties

### 156.14.3 View as SCNViewMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 156.14.4 Events

### 156.14.5 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 156.14.6 Close

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 156.14.7 Closing

Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 156.14.8 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 156.14.9 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 156.14.10 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 156.14.11 EnableMenuItems

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 156.14.12 FocusLost

Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 156.14.13 FocusReceived

Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 156.14.14 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 156.14.15 GotFocus

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 156.14.16 LostFocus

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 156.14.17 MenuBarSelected

Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 156.14.18 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown.
If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 156.14.19 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 156.14.20 MouseUp(x As Integer, y As Integer)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 156.14.21 Open

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 156.14.22 Opening

Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 156.14.23 rendererDidApplyAnimations(time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after actions and animations are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this method to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

### 156.14.24 rendererDidApplyConstraints(time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Invoked on the control once the scene renderer did apply the constraints.
**Notes:** time The time at which the constraints were simulated.

All modifications done within this method don't go through the transaction model, they are directly applied on the presentation tree.

### 156.14.25 rendererDidRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the control that the renderer has rendered the scene.
**Notes:** scene: The scene object that was rendered.
time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this method to perform custom drawing after SceneKit has rendered a scene—for example, to draw overlay content on top of SceneKit content. You should only execute Metal or OpenGL drawing com-

mands (and any setup required to perform them) in this method—the results of modifying SceneKit objects in this method are undefined.

- To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
- To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this method. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.14.26 rendererDidSimulatePhysics(time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after physics simulations are performed.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this event exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

This event is the last opportunity SceneKit provides for you to change the scene graph before rendering.

### 156.14.27 rendererUpdate(time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur before actions, animations, and physics are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

### 156.14.28 rendererWillRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the control that the renderer has cleared the viewport and is about to render the scene.
**Notes:** scene: The SCNSceneMBS object to be rendered.
time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this event to perform custom drawing before SceneKit renders a scene—for example, to draw backdrop content underneath SceneKit content. You should only execute Metal or OpenGL drawing commands (and any setup required to perform them) in this event—the results of modifying SceneKit objects during this event are undefined.

To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this event. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.14.29 ScaleFactorChanged(NewFactor as double)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 156.14.30 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

## 156.15 class SCNCylinderMBS

### 156.15.1 class SCNCylinderMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNCylinder represents a cylinder with controllable height and radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 19.6, page 47: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, page 42: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 37: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 27: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.15.2 Methods

### 156.15.3 Constructor(radius as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a cylinder with given radius and height.

### 156.15.4 cylinder(radius as double, height as double) as SCNCylinderMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a cylinder with given radius and height.

### 156.15.5 Properties

### 156.15.6 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the cylinder. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.15.7 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.15.8 radialSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the radial coordinate. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.
(Read and Write property)

### 156.15.9 radius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius of the cylinder. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 0.5.
(Read and Write property)

## 156.16 class SCNDistanceConstraintMBS

### 156.16.1 class SCNDistanceConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNDistanceConstraint ensure a minimum/maximum distance with a target node.
**Notes:** Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.16.2 Methods

### 156.16.3 Constructor(target as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNDistanceConstraint constraint.

### 156.16.4 distanceConstraintWithTarget(target as SCNNodeMBS) as SCNDistanceConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNDistanceConstraint constraint.

### 156.16.5 Properties

### 156.16.6 maximumDistance as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum distance.
**Notes:** Defaults to MAXFLOAT. Animatable.
(Read and Write property)

### 156.16.7 minimumDistance as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum distance.
**Notes:** Defaults to 0. Animatable.
(Read and Write property)

### 156.16.8 target as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the target node to keep distance with.
**Notes:** (Read and Write property)

## 156.17 class SCNFloorMBS

### 156.17.1 class SCNFloorMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNFloor represents an infinite plane geometry.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

### 156.17.2 Methods

### 156.17.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a floor.
**Notes:** A floor is an infinite plane.

### 156.17.4 floor as SCNFloorMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a floor.
**Notes:** A floor is an infinite plane.

### 156.17.5 Properties

### 156.17.6 length as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The floor extent along the Z axis. Animatable.
**Notes:** If the value is equal to 0, the floor is infinite on the Z axis. The default value is 0.
(Read and Write property)

### 156.17.7 reflectionCategoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines the node categories to reflect. Defaults to all bits set.
**Notes:** (Read and Write property)

### 156.17.8 reflectionFalloffEnd as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the distance from the floor where the falloff finishes. Animatable.
**Notes:** If the value is 0 then there is no falloff. The default value is 0.
(Read and Write property)

### 156.17.9 reflectionFalloffStart as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the distance from the floor where the falloff begins. Animatable.
**Notes:** The default value is 0.
(Read and Write property)

### 156.17.10 reflectionResolutionScaleFactor as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the resolution scale factor of the buffer used to render the reflection.
**Notes:** Defaults to 1.0.
(Read and Write property)

### 156.17.11 reflectivity as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the reflectivity of the floor. Animatable.
**Notes:** If the value is greater than zero then the surface will reflect other objects in the scene. The default value is 0.25.
(Read and Write property)

### 156.17.12 width as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The floor extent along the X axis. Animatable.
**Notes:** If the value is equal to 0, the floor is infinite on the X axis. The default value is 0.
(Read and Write property)

# 156.18 class SCNGeometryElementMBS

## 156.18.1 class SCNGeometryElementMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container for index data describing how vertices connect to define a three-dimensional object, or geometry.
**Notes:** You use geometry elements together with SCNGeometrySourceMBS objects to define custom SCNGeometryMBS objects or to inspect the data that composes an existing geometry. You create a custom geometry using a three-step process:

1. Create one or more SCNGeometrySource objects, each of which defines per-vertex information such as position, surface normal, or texture coordinates for all vertices in the geometry.
2. Create at least one SCNGeometryElement object, containing an array of indices identifying vertices in the geometry sources and describing the drawing primitive that SceneKit uses to connect the vertices when rendering the geometry.
3. Create an SCNGeometry instance from the geometry sources and geometry elements.

When SceneKit renders a geometry, each geometry element corresponds to a drawing command sent to the GPU. Because different rendering states require separate drawing commands, you can define a geometry using multiple geometry elements. For example, the teapot geometry shown below has four geometry elements, so you can assign up to four SCNMaterial objects in order to render each element with a different appearance. But because each drawing command incurs a CPU time overhead when rendering, minimizing the number of elements in a custom geometry can improve rendering performance.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr5

## 156.18.2 Methods

## 156.18.3 Constructor(data as MemoryBlock, PrimitiveType as Integer, primitiveCount as Integer, bytesPerIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry element from the specified data and options.
**Notes:** data: The data describing the element.
primitiveType: The drawing primitive that connects vertices when rendering the geometry element. For possible values, see SCNGeometryPrimitiveType.
primitiveCount: The number of primitives in the element.
bytesPerIndex: The number of bytes that represent a single index value in the data.

Returns a new geometry element object.

An element,Äôs data is an array of index values identifying vertices in a geometry source. SceneKit interprets the data as an array of unsigned integers (whose size is specified by the bytesPerIndex parameter), and then connects the vertices in the order specified by this array, arranged according to the primitiveType parameter. To create a custom SCNGeometryMBS object from the geometry element, use the geometryWithSources() method.

### 156.18.4 geometryElementWithData(data as MemoryBlock, PrimitiveType as Integer, primitiveCount as Integer, bytesPerIndex as Integer) as SCNGeometryElementMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry element from the specified data and options.
**Notes:** data: The data describing the element.
primitiveType: The drawing primitive that connects vertices when rendering the geometry element. For possible values, see SCNGeometryPrimitiveType.
primitiveCount: The number of primitives in the element.
bytesPerIndex: The number of bytes that represent a single index value in the data.

Returns a new geometry element object.

An element,Äôs data is an array of index values identifying vertices in a geometry source. SceneKit interprets the data as an array of unsigned integers (whose size is specified by the bytesPerIndex parameter), and then connects the vertices in the order specified by this array, arranged according to the primitiveType parameter. To create a custom SCNGeometryMBS object from the geometry element, use the geometryWithSources() method.

### 156.18.5 Properties

### 156.18.6 bytesPerIndex as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of bytes that represent each index value in the element,Äôs data.
**Notes:** An element,Äôs data property holds an array of index values identifying vertices in a geometry source. SceneKit interprets the data as an array of unsigned integers, whose size is specified by the bytesPerIndex property.
(Read only property)

### 156.18.7 Data as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The data describing the geometry element.
**Notes:** An element,Äôs data is an array of index values identifying vertices in a geometry source. SceneKit interprets the data as an array of unsigned integers, whose size is specified by the bytesPerIndex property.
(Read only property)

### 156.18.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.18.9 maximumPointScreenSpaceRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The largest radius, measured in screen points, at which to render any point in the geometry element.
**Notes:** Some visual effects call for rendering a geometry as a collection of individual points—that is, a point cloud, not a solid surface or wireframe mesh. When you use this option, SceneKit can render each point as a small 2D surface that always faces the camera. By applying a texture or custom shader to that surface, you can efficiently render many small objects at once.
To render a geometry element as a point cloud, you must set three properties: pointSize, minimumPointScreenSpaceRadius, and maximumPointScreenSpaceRadius. Use pointSize to determine how large each point appears in world space, so that points farther away appear as smaller 2D surfaces. Use the minimum and maximum radius properties to ensure that the on-screen rendering of each point fits within a certain range of pixel sizes.
For example, to render a point cloud where each point is always one pixel wide (like a field of stars), set both the minimum and maximum sizes to one pixel. To render a group of objects whose screen sizes vary with perspective (like a set of images representing planets), set the minimum size to one pixel and the maximum size to a much larger value.
(Read and Write property)

### 156.18.10 minimumPointScreenSpaceRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The smallest radius, measured in screen points, at which to render any point in the geometry element.

**Notes:** Some visual effects call for rendering a geometry as a collection of individual points—that is, a point cloud, not a solid surface or wireframe mesh. When you use this option, SceneKit can render each point as a small 2D surface that always faces the camera. By applying a texture or custom shader to that surface, you can efficiently render many small objects at once.
To render a geometry element as a point cloud, you must set three properties: pointSize, minimumPointScreenSpaceRadius, and maximumPointScreenSpaceRadius. Use pointSize to determine how large each point appears in world space, so that points farther away appear as smaller 2D surfaces. Use the minimum and maximum radius properties to ensure that the on-screen rendering of each point fits within a certain range of pixel sizes.
For example, to render a point cloud where each point is always one pixel wide (like a field of stars), set both the minimum and maximum sizes to one pixel. To render a group of objects whose screen sizes vary with perspective (like a set of images representing planets), set the minimum size to one pixel and the maximum size to a much larger value.
(Read and Write property)

### 156.18.11 pointSize as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of each point in the geometry element, as measured in the geometry's local 3D coordinate space.
**Notes:** Some visual effects call for rendering a geometry as a collection of individual points—that is, a point cloud, not a solid surface or wireframe mesh. When you use this option, SceneKit can render each point as a small 2D surface that always faces the camera. By applying a texture or custom shader to that surface, you can efficiently render many small objects at once.
To render a geometry element as a point cloud, you must set three properties: pointSize, minimumPointScreenSpaceRadius, and maximumPointScreenSpaceRadius. Use pointSize to determine how large each point appears in world space, so that points farther away appear as smaller 2D surfaces. Use the minimum and maximum radius properties to ensure that the on-screen rendering of each point fits within a certain range of pixel sizes.
(Read and Write property)

### 156.18.12 primitiveCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of primitives in the element.
**Notes:** (Read only property)

### 156.18.13 primitiveRange as NSRangeMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The range of primitives from the geometry element to render.
**Notes:** The default value for this property is an NSRangeMBS whose location is NSNotFound (-1) and length is zero, indicating that, by default, SceneKit renders the entire set of primitives specified by a geometry element's data buffer.
You can change a geometry without redefining it by choosing to render only a subset of the primitives specified by a geometry element. To do so, set this property to a subrange of primitive indexes.
(Read and Write property)

### 156.18.14 primitiveType as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The drawing primitive that connects vertices when rendering the geometry element.
**Notes:** (Read only property)

### 156.18.15 Constants

Primitive Types

| Constant | Value | Description |
|---|---|---|
| PrimitiveTypeLine | 2 | The geometry element,Äôs data is a sequence of line segments, with each line segment described by two new vertices. |
| PrimitiveTypePoint | 3 | The geometry element,Äôs data is a sequence of unconnected points. |
| PrimitiveTypePolygon | 4 | The geometry element,Äôs data is a sequence of arbitrary polygons. see https://developer.apple.com/documentation/scenekit/scngeometryprimitivetype/scngeometryprimitivetypepolygon?language=objc |
| PrimitiveTypeTriangles | 0 | The geometry element,Äôs data is a sequence of triangles, with each triangle described by three new vertices. |
| PrimitiveTypeTriangleStrip | 1 | The geometry element,Äôs data is a sequence of triangles, with each triangle described by one new vertex and two vertices from the previous triangle. |

# 156.19 class SCNGeometryMBS

## 156.19.1 class SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A three-dimensional shape (also called a model or mesh) that can be displayed in a scene, with attached materials that define its appearance.
**Notes:** In SceneKit, geometries attached to SCNNode objects form the visible elements of a scene, and SCNMaterial objects attached to a geometry determine its appearance.

Working with Geometry Objects

You control a geometry,Äôs appearance in a scene with nodes and materials. A geometry object provides only the form of a visible object rendered by SceneKit. You specify color and texture for a geometry,Äôs surface, control how it responds to light, and add special effects by attaching materials (for details, see the methods in Managing a Geometry,Äôs Materials). You position and orient a geometry in a scene by attaching it to an SCNNode object. Multiple nodes can reference the same geometry object, allowing it to appear at different positions in a scene.

You can easily copy geometries and change their materials. A geometry object manages the association between immutable vertex data and a mutable assignment of materials. To make a geometry appear more than once in the same scene with a different set of materials, use its inherited copy method. The copy shares the underlying vertex data of the original, but can be assigned materials independently. You can thus make many copies of a geometry without incurring a significant cost to rendering performance.

You can animate a geometry object. The vertex data associated with a geometry is immutable, but SceneKit provides several ways to animate geometry. You can use a SCNMorpher or SCNSkinner object to deform a geometry,Äôs surface, or run animations created in an external 3D authoring tool and loaded from a scene file. You can also use methods in the SCNShadable protocol to add custom GLSL shader programs that alter SceneKit,Äôs rendering of a geometry.

Obtaining a Geometry Object

SceneKit provides several ways to introduce geometry objects to your app:

| Action | For further information |
|---|---|
| Load from a scene file created using external 3D authoring tools | SCNScene, SCNSceneSource |
| Use and customize SceneKit,Äôs built-in primitive shapes | SCNPlane, SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, SCNCapsule, SCNTube, and SCNTorus |
| Create 3D geometry from 2D text or B√©zier curves | SCNText, SCNShape |
| Create a custom geometry from vertex data | SCNGeometrySource, SCNGeometryElement, geometryWithSources. |

**Blog Entries**

- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 18.2, page 32: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.19.2 Methods

### 156.19.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new geometry object with no content (or default content).
**Notes:** This method creates a geometry with no visible content. You can use an empty geometry with another geometry,Äôs levelsOfDetail property to make the geometry disappear when it is too far away from the camera to usefully render.
SceneKit,Äôs SCNGeometryMBS subclasses use this method to create geometry instances with default contents. For example, if you call this method on the SCNSphereMBS class, it creates a sphere geometry whose radius property has the default value of 0.5.
You cannot add geometry sources or elements to a geometry object after creating it. To create a custom geometry from your own source and element data, use the geometryWithSources method.

### 156.19.4 copy as SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the geometry.

### 156.19.5 geometry as SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new geometry object with no content (or default content).
**Notes:** This method creates a geometry with no visible content. You can use an empty geometry with another geometry,Äôs levelsOfDetail property to make the geometry disappear when it is too far away from the camera to usefully render.
SceneKit,Äôs SCNGeometryMBS subclasses use this method to create geometry instances with default contents. For example, if you call this method on the SCNSphereMBS class, it creates a sphere geometry whose radius property has the default value of 0.5.
You cannot add geometry sources or elements to a geometry object after creating it. To create a custom geometry from your own source and element data, use the geometryWithSources method.

### 156.19.6 geometryElementAtIndex(index as Integer) as SCNGeometryElementMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the geometry element at a specified index.
**Notes:** Each SCNGeometryElementMBS object describes how vertices from the geometry,Äôs sources are combined into polygons to create the geometry,Äôs shape. Visible geometries contain at least one element.

### 156.19.7 geometryElements as SCNGeometryElementMBS()

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of geometry elements that describe the geometry,Äôs shape.
**Notes:** Each SCNGeometryElementMBS object describes how vertices from the geometry,Äôs sources are combined into polygons to create the geometry,Äôs shape. Visible geometries contain at least one element. For geometries with multiple elements, you can use the materials property to attach different materials to each element.

### 156.19.8 geometrySources as SCNGeometrySourceMBS()

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of geometry sources that provide vertex data for the geometry.
**Notes:** Each SCNGeometrySourceMBS object describes an attribute of all vertices in the geometry (such as vertex position, surface normal vector, color, or texture mapping coordinates) identified by the source,Äôs semantic property. A geometry always has at least one source (for the SCNGeometrySourceSemanticVertex semantic), typically has additional sources for use in lighting and shading, and may have other sources for skeletal animation or surface subdivision information.

### 156.19.9 geometrySourcesForSemantic(semantic as String) as SCNGeometrySourceMBS()

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the geometry sources for a specified semantic.
**Notes:** semantic: A constant identifying a semantic for which to return geometry sources. See Geometry Semantic Identifiers for possible values.

Returns an array of SCNGeometrySource objects, or nil if the geometry has no source for the specified semantic.

Each SCNGeometrySourceMBS object describes an attribute of all vertices in the geometry (such as vertex position, surface normal vector, color, or texture mapping coordinates) identified by the source,Äôs semantic

property. A geometry always has at least one source, for the SCNGeometrySourceSemanticVertex semantic, typically has additional sources for use in lighting and shading, and may have other sources for skeletal animation or surface subdivision information.
The vertex, normal, and color semantics each refer to at most one source. A geometry may have multiple sources for the SCNGeometrySourceSemanticTexcoord semantic—in this case, indices in the returned array correspond to values for the mappingChannel property used when attaching textures to materials.

### 156.19.10 geometryWithSources(sources() as SCNGeometrySourceMBS, elements() as SCNGeometryElementMBS) as SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new geometry built from the specified geometry sources and elements.
**Notes:** sources: An array of SCNGeometrySourceMBS objects describing vertices in the geometry and their attributes.
elements: An array of SCNGeometryElementMBS objects describing how to connect the geometry,Äôs vertices.

A geometry,Äôs visible content comes from the combination of geometry sources, which contain data describing its vertices, with geometry elements, which contain data describing how the vertices connect to form a surface.
Each SCNGeometrySourceMBS object describes an attribute of all vertices in the geometry (vertex position, surface normal vector, color, or texture mapping coordinates) identified by the source,Äôs semantic property. To create a custom geometry you must provide at least one source, for the SCNGeometrySourceSemanticVertex semantic. Typically, you also provide sources for normals and texture coordinates for use in lighting and shading.
Sources for the vertex, normal, and color semantics must be unique—if multiple objects in the sources array have the same semantic, SceneKit uses only the first. A geometry may have multiple sources for the SCNGeometrySourceSemanticTexcoord semantic—the order of texture coordinate sources in the sources array determines the value to use for the mappingChannel property when attaching materials.
Each SCNGeometryElementMBS object describes how vertices from the geometry sources are combined into polygons to create the geometry,Äôs shape. Creating a custom geometry requires at least one element. If the elements array contains multiple objects, their order determines the arrangement of the geometry,Äôs materials—for details, see the discussion of the materials property.

### 156.19.11 insertMaterial(Material as SCNMaterialMBS, Index as Integer)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Insert a material in the materials array at the specified index.
**Notes:** material: The material to insert.
index: Index in the materials array to insert the new material.

### 156.19.12 levelsOfDetail as SCNLevelOfDetailMBS()

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of SCNLevelOfDetail objects for managing the geometry,Äôs appearance when viewed from far away.
**Notes:** Because rendering a complex geometry incurs a performance cost, you can use level-of-detail objects to substitute simpler geometries in its place as its distance from the point of view camera increases (or its apparent size decreases). For details, see SCNLevelOfDetailMBS.

### 156.19.13 materials as SCNMaterialMBS()

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the receiver's materials array.
**Notes:** Each geometry element can be rendered using a different material. The index of the material used for a geometry element is equal to the index of that element modulo the number of materials.

### 156.19.14 materialWithName(name as string) as SCNMaterialMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Return the first material from the materials array of the receiver with the specified name.
**Notes:** name: The name of the material to retrieve.

### 156.19.15 removeMaterial(Index as Integer)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Remove the material at the specified index from the materials array.
**Notes:** index: The index of the material to remove from the 'materials' array.

### 156.19.16 replaceMaterial(Index as Integer, Material as SCNMaterialMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Remove the material at the index 'index' from the materials array of the receiver and insert 'material' in its position.
**Notes:** index: The index of the material to replace in the materials array.
material: The new material that will replace the previous one.

### 156.19.17 setLevelsOfDetail(LevelsOfDetails() as SCNLevelOfDetailMBS = nil)

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets an array of SCNLevelOfDetail objects for managing the geometry,Äôs appearance when viewed from far away.
**Notes:** Value can be nil to clear it.

### 156.19.18 setMaterials(materials() as SCNMaterialMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the materials.

### 156.19.19 Properties

### 156.19.20 edgeCreasesElement as SCNGeometryElementMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The geometry element identifying which edges of the geometry,Äôs surface should remain sharp after subdivision.
**Notes:** This geometry element,Äôs primitiveType value must be SCNGeometryPrimitiveTypeLine. The geometry element,Äôs data is an array of vertex indices, each pair of which defines a line segment identifying an edge to be treated as a crease during subdivision. Use the edgeCreasesSource property to specify the smoothness or sharpness of each crease.
(Read and Write property)

### 156.19.21 edgeCreasesSource as SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The geometry source specifying the smoothness or sharpness of edges after surface subdivision.
**Notes:** This geometry source,Äôs semantic value must be SCNGeometrySourceSemanticEdgeCrease. Its data is an array of scalar values (that is, the source,Äôs componentsPerVector value is 1). The value at an index in the geometry source determines the smoothness or sharpness of the edge identified by the primitive at the corresponding index in the edgeCreasesElement geometry element: a value of 0.0 specifies a completely smoothed edge, and a value of 10.0 or greater specifies an infinitely sharp edge.
(Read and Write property)

### 156.19.22 firstMaterial as SCNMaterialMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines the first material of the geometry. Returns nil if the geometry has no material.
**Notes:** This method is here for convenience. It is equivalent to the first object in the "materials" array above.
(Read and Write property)

### 156.19.23 geometryElementCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the number of geometry elements owned by the geometry.
**Notes:** (Read only property)

### 156.19.24 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.19.25 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A name associated with the geometry object.
**Notes:** You can provide a descriptive name for a geometry object to make managing your scene graph easier. Geometries loaded from a scene file may have names assigned by an artist using a 3D authoring tool. Use the SCNSceneSourceMBS class to examine geometries in a scene file without loading its scene graph.

Geometry names are saved when you export a scene to a file using its writeToURL method. They also appear in the Xcode scene editor.
(Read and Write property)

### 156.19.26 subdivisionLevel as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the subdivision level of the receiver.
**Notes:** Defaults to 0.
A subdivision level of 0 means no subdivision. When the ‘tessellator‘ property of the receiver is not nil, the refinement is done on the GPU.
(Read and Write property)

### 156.19.27 tessellator as SCNGeometryTessellatorMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies how the geometry should be tessellated at render time on the GPU.
**Notes:** Defaults to nil.
(Read and Write property)

### 156.19.28 wantsAdaptiveSubdivision as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies if the subdivision is adaptive or uniform.
**Notes:** Defaults to true.
Adaptive subdivision requires that the ‘tessellator‘ property of the receiver is not nil.
(Read and Write property)

## 156.20 class SCNGeometrySourceMBS

### 156.20.1 class SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container for vertex data forming part of the definition for a three-dimensional object, or geometry.
**Notes:** You use geometry sources together with SCNGeometryElement objects to define custom SCNGeometry objects or to inspect the data that composes an existing geometry.

see
https://developer.apple.com/documentation/scenekit/scngeometrysource
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr1
- MBS Xojo Plugins, version 19.3pr6
- MBS Xojo Plugins, version 19.3pr5

### 156.20.2 Methods

### 156.20.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 156.20.4 geometrySourceWithData(data as MemoryBlock, Semantic as String, vectorCount as Integer, floatComponents as boolean, componentsPerVector as Integer, bytesPerComponent as Integer, dataOffset as Integer, dataStride as Integer) as SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry source from the specified data and options.
**Notes:** data: The data for the geometry source.
semantic: The semantic value (or attribute) that the geometry source describes for each vertex. See Geometry Semantic Identifiers for available values.
vectorCount: The number of geometry source vectors.
floatComponents: A Boolean value that indicates whether vector components are floating-point values. Specify true for floating-point values, or false for integer values.
componentsPerVector: The number of scalar components in each vector.

bytesPerComponent: The size, in bytes, of each vector component.
offset: The offset, in bytes, from the beginning of the data to the first vector component to be used in the geometry source.
stride: The number of bytes from each vector to the next in the data.

Returns a new geometry source object.

sA geometry source,Äôs data is an array of vectors, each of which represents a particular attribute (or semantic) of a vertex in the geometry. The other parameters determine how SceneKit interprets this data. For example, an array of vertex positions may have three 32-bit floating-point components per vector, but an array of texture coordinates may have two 8-bit integer coponents per vector. You can use the offset and stride parameters together to interleave data for multiple geometry sources in the same array, improving rendering performance. See SCNGeometrySourceMBS for details.
To create a custom SCNGeometryMBS object from the geometry source, use the geometryWithSources method.

### 156.20.5 geometrySourceWithNormals(Normals() as SCNVector3MBS) as SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry source from an array of normal vectors.
**Notes:** normals: An array of three-component vectors, each of which represents a surface normal for the geometry source.

A new geometry source whose SCNGeometrySource property is SCNGeometrySourceSemanticNormal.

SceneKit converts this data to its own format to optimize rendering performance. To read the converted data, examine the properties of the created SCNGeometrySourceMBS object.
To create a custom SCNGeometryMBS object from the geometry source, use the geometryWithSources method.
See also:

- 156.20.6 geometrySourceWithNormals(texcoord() as CGPointMBS) as SCNGeometrySourceMBS 20163

### 156.20.6 geometrySourceWithNormals(texcoord() as CGPointMBS) as SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry source from an array of texture coordinate points.
**Notes:** texcoord: An array of points, each of which represents a texture coordinate pair for the geometry

source.

A new geometry source whose SCNGeometrySource property is SCNGeometrySourceSemanticTexcoord.

SceneKit converts this data to its own format to optimize rendering performance. To read the converted data, examine the properties of the created SCNGeometrySourceMBS object.
To create a custom SCNGeometryMBS object from the geometry source, use the geometryWithSources:elements: method.
See also:

- 156.20.5 geometrySourceWithNormals(Normals() as SCNVector3MBS) as SCNGeometrySourceMBS 20163

### 156.20.7 geometrySourceWithVertices(vertices() as SCNVector3MBS) as SCNGeometrySourceMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a geometry source from an array of vertex positions.
**Notes:** vertices: An array of three-component vectors, each of which represents a vertex position for the geometry source.

Returns a new geometry source whose SCNGeometrySource property is SCNGeometrySourceSemanticVertex.

SceneKit converts this data to its own format to optimize rendering performance. To read the converted data, examine the properties of the created SCNGeometrySourceMBS object.
To create a custom SCNGeometryMBS object from the geometry source, use the geometryWithSources method.

### 156.20.8 SCNGeometrySourceSemanticBoneIndices as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for bone index data, used for skeletal animation of skinned surfaces.
**Notes:** For a geometry source, this semantic identifies data containing skeletal animation data for each vertex in the geometry. SceneKit uses this information to determine which bone nodes in the skeleton affect the behavior of each vertex.
For a custom shader program, you use this semantic to bind SceneKit,Äôs bone index data to an input attribute of the shader.
For details on skeletal animation, see SCNSkinnerMBS.

### 156.20.9 SCNGeometrySourceSemanticBoneWeights as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for bone weight data, used for skeletal animation of skinned surfaces.
**Notes:** For a geometry source, this semantic identifies data containing skeletal animation data for each vertex in the geometry. SceneKit uses this information to determine how much a vertex,Äôs position is influenced by the positions of bone nodes in the skeleton.
For a custom shader program, you use this semantic to bind SceneKit,Äôs bone weight data to an input attribute of the shader.
For details on skeletal animation, see SCNSkinnerMBS.

### 156.20.10 SCNGeometrySourceSemanticColor as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for per-vertex color data.
**Notes:** For a geometry source, this semantic identifies data containing a color for each vertex in the geometry. SceneKit interpolates per-vertex colors across a surface to produce smooth shading. Per-vertex colors modulate those produced by lighting and a geometry,Äôs materials, if applicable.
For a custom shader program, you use this semantic to bind SceneKit,Äôs vertex color data to an input attribute of the shader.
Vertex color data is typically an array of three- or four-component vectors.

### 156.20.11 SCNGeometrySourceSemanticEdgeCrease as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for edge crease data, used for subdividing surfaces.
**Notes:** For a geometry source, this semantic identifies data containing crease data for each vertex in the geometry. SceneKit uses this information to determine the sharpness of edges and smoothness of surfaces when you change a geometry,Äôs subdivisionLevel property.
For a custom shader program, you use this semantic to bind SceneKit,Äôs edge crease data to an input attribute of the shader.
Edge crease data is an array of scalar floating-point values, where each value determines the smoothness or sharpness of the edge identified by the primitive at the corresponding index in the geometry,Äôs SceneKit Constants geometry element: A value of 0.0 specifies a completely smoothed edge, and a value of 10.0 or greater specifies an infinitely sharp edge.

### 156.20.12 SCNGeometrySourceSemanticNormal as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for surface normal data.
**Notes:** For a geometry source, this semantic identifies data containing the surface normal vector at each vertex in the geometry. SceneKit uses this information to compute lighting effects on the surface.
For a custom shader program, you use this semantic to bind SceneKit,Äôs vertex normal data to an input attribute of the shader.
Vertex normal data is typically an array of three- or four-component vectors.

### 156.20.13 SCNGeometrySourceSemanticTangent as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for surface tangent vector data.
**Notes:** For a geometry source, this semantic identifies data containing the surface tangent vector at each vertex in the geometry. SceneKit uses this information to compute advanced lighting effects on the surface.
For a custom shader program, you use this semantic to bind SceneKit,Äôs vertex tangent data to an input attribute of the shader.
Vertex tangent data is typically an array of three- or four-component vectors.

### 156.20.14 SCNGeometrySourceSemanticTexcoord as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for texture coordinate data.
**Notes:** For a geometry source, this semantic identifies data containing texture mapping coordinates for each vertex in the geometry. Unlike other semantics, a geometry may contain multiple sources for texture coordinates—each corresponds to a separate mappingChannel number that you can use when associating textured materials.
For a custom shader program, you use this semantic to bind SceneKit,Äôs texture coordinate data to one or more input attributes of the shader.
Texture coordinate data is typically an array of two-component vectors.

### 156.20.15 SCNGeometrySourceSemanticVertex as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for vertex position data.
**Notes:** For a geometry source, this semantic identifies data containing the positions of each vertex in the geometry. If you create a custom geometry using the geometryWithSources method, you must provide a geometry source for this semantic.
For a custom shader program, you use this semantic to bind SceneKit,Äôs vertex position data to an input attribute of the shader.
Vertex position data is typically an array of three- or four-component vectors.

### 156.20.16 SCNGeometrySourceSemanticVertexCrease as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic for vertex crease data, used for subdividing surfaces.
**Notes:** For a geometry source, this semantic identifies data containing crease data for each vertex in the geometry. SceneKit uses this information to determine the sharpness of corners and smoothness of surfaces when you change a geometry,Äôs subdivisionLevel property.
For a custom shader program, you use this semantic to bind SceneKit,Äôs vertex crease data to an input attribute of the shader.
Vertex crease data is an array of scalar floating-point values, where each value determines the smoothness or sharpness of the corresponding vertex: A value of 0.0 specifies a completely smoothed corner, and a value of 10.0 or greater specifies an infinitely sharp point.

### 156.20.17 Properties

### 156.20.18 bytesPerComponent as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The size, in bytes, of each vector component.
**Notes:** (Read only property)

### 156.20.19 componentsPerVector as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of scalar components in each vector.
**Notes:** (Read only property)

### 156.20.20 Data as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The data for the geometry source.
**Notes:** A geometry source,Äôs data is an array of vectors, each of which represents a particular attribute (or semantic) of a vertex in the geometry. The other properties of the geometry source determine how SceneKit interprets this data. For example, an array of vertex positions may have three 32-bit floating-point components per vector, but an array of texture coordinates may have two 8-bit integer coponents per vector.
(Read only property)

### 156.20.21 dataOffset as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset, in bytes, from the beginning of the data to the first vector component to be used in the geometry source.
**Notes:** You can use the dataOffset and dataStride parameters can be used together to interleave data for multiple geometry sources in the same array, improving rendering performance. See SCNGeometrySourceMBS for details.
(Read only property)

### 156.20.22 dataStride as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of bytes from a vector to the next one in the data.
**Notes:** You can use the dataOffset and dataStride parameters can be used together to interleave data for multiple geometry sources in the same array, improving rendering performance. See SCNGeometrySourceMBS for details.
(Read only property)

### 156.20.23 floatComponents as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether vector components are floating-point values.
**Notes:** If true, SceneKit interprets the geometry source,Äôs data as an array of vectors whose components are floating-point values. The type of floating-point value is determined by the SCNGeometrySourceMBS property: 4 bytes for float values or 8 bytes for double values.
If false, SceneKit interprets the geometry source,Äôs data as an array of vectors whose components are integer values. The type of integer value is determined by the SCNGeometrySourceMBS property; for example, 2 bytes for unsigned short values or 4 bytes for unsigned int values.
(Read only property)

### 156.20.24 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.20.25 semantic as String

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The semantic value (or attribute) the geometry source describes for each vertex.
**Notes:** A semantic describes an attribute for each vertex, such as position, color, surface normal vector, or texture coordinates.
See Geometry Semantic Identifiers for available values.
(Read only property)

### 156.20.26 vectorCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of vectors in the data.
**Notes:** (Read only property)

## 156.21 class SCNGeometryTessellatorMBS

### 156.21.1 class SCNGeometryTessellatorMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A geometry tessellator describes how a more detailed surface is calculated from the geometry's initial surface.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr5

### 156.21.2 Methods

### 156.21.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 156.21.4 copy as SCNGeometryTessellatorMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 156.21.5 Properties

### 156.21.6 Adaptive as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies if the tessellation should be uniform or adaptive.
**Notes:** Defaults to false.
(Read and Write property)

### 156.21.7 edgeTessellationFactor as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the edge tessellation factor.
**Notes:** Defaults to 1.
This has no effect for adaptive subdivision.
(Read and Write property)

### 156.21.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.21.9 insideTessellationFactor as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the inside tessellation factor.
**Notes:** Defaults to 1.
This has no effect for adaptive subdivision
(Read and Write property)

### 156.21.10 maximumEdgeLength as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the maximum edge length.
**Notes:** Defaults to 1.
This has no effect for non-adaptive subdivision
(Read and Write property)

### 156.21.11 ScreenSpace as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies if the level of tessellation should be adapted in screenSpace.
**Notes:** Defaults to false.
(Read and Write property)

### 156.21.12 smoothingMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The smoothing mode.
**Notes:** Defaults to SmoothingModeNone.
(Read and Write property)

### 156.21.13 tessellationFactorScale as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the scale factor applied to the per-patch tessellation factors.
**Notes:** Defaults to 1.
(Read and Write property)

### 156.21.14 tessellationPartitionMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the tessellation partition mode.
**Notes:** Defaults to TessellationPartitionModeInteger.

see also
https://developer.apple.com/documentation/metal/mtltessellationpartitionmode?language=objc
(Read and Write property)

### 156.21.15 Constants

Smoothing Modes

| Constant | Value | Description |
|---|---|---|
| SmoothingModeNone | 0 | |
| SmoothingModePhong | 2 | |
| SmoothingModePNTriangles | 1 | |

Tessellation Partition Modes

| Constant | Value | Description |
|---|---|---|
| TessellationPartitionModeFractionalEven | 3 | A fractional even partitioning mode. |
| TessellationPartitionModeFractionalOdd | 2 | A fractional odd partitioning mode. |
| TessellationPartitionModeInteger | 1 | An integer partitioning mode. |
| TessellationPartitionModePow2 | 0 | A power of two partitioning mode. |

## 156.22 class SCNHitTestResultMBS

### 156.22.1 class SCNHitTestResultMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Information about the result of a scene-space or view-space search for scene elements.
**Notes:** Hit-testing is the process of finding elements of a scene located at a specified point, or along a specified line segment (or ray). An SCNHitTestResult object provides details about one result from a hit-test search. There are three ways to perform a hit-test search. Use the hitTest method of an SCNViewMBS object (or other scene renderer), the hitTestWithSegment method of a node, or the rayTestWithSegment method of your scene,Äôs physics world.

When you perform a hit-test search, SceneKit looks for SCNGeometryMBS objects along the ray you specify. For each intersection between the ray and and a geometry, SceneKit creates a hit-test result to provide information about both the SCNNodeMBS object containing the geometry and the location of the intersection on the geometry,Äôs surface.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 20.2pr1

**Videos**

- XDC 2020 MBS Plugins Presentation

### 156.22.2 Methods

### 156.22.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 156.22.4 SCNHitTestBackFaceCullingKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to ignore faces not oriented toward the camera.
**Notes:** The value for this key is a Boolean value. The default value is true, specifying that back-facing polygons will not be returned as hit-test results.

### 156.22.5 SCNHitTestBoundingBoxOnlyKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to search for objects by bounding box only.
**Notes:** The value for this key is a Boolean value. The default value is false, specifying that hit-testing searches should test against node geometry. Specifying true for this option increases search performance at the expense of geometric accuracy.

### 156.22.6 SCNHitTestClipToZRangeKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to search for objects only within the depth range of the current point of view.
**Notes:** The value for this key is a Boolean value. The default value is true, specifying that hit-testing searches only objects between the zNear and zFar distances of the pointOfView camera. Specify false to include objects outside this depth range in the search.
This option is valid only when hit-testing in the screen space of an SCNSceneRenderer object with the hitTest method.

### 156.22.7 SCNHitTestIgnoreChildNodesKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to ignore child nodes when searching.
**Notes:** The value for this key is a Boolean value. The default value is false, specifying that hit-testing may return objects from any portion of the node hierarchy. Specify true to search only the node specified by the SCNHitTestRootNodeKey key.

### 156.22.8 SCNHitTestIgnoreHiddenNodesKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to ignore hidden nodes when searching.
**Notes:** The value for this key is a Boolean value. The default value is true, specifying that hit-testing should not return nodes whose hidden property value is true. Specify false to search nodes regardless of their visibility.

### 156.22.9 SCNHitTestOptionCategoryBitMask as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option to search only for objects matching a specified bitmask.
**Notes:** The value for this key is an integer value. If present, the search will return only nodes that both satisfy the hit test and have a categoryBitMask value overlapping this bitmask.

### 156.22.10 SCNHitTestOptionSearchMode as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option for the number and order of hit test results to provide.
**Notes:** The value for this key is an raw integer value of an SCNHitTestSearchMode constant.

### 156.22.11 SCNHitTestRootNodeKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The root of the node hierarchy to be searched.
**Notes:** The value for this key is an SCNNodeMBS object. Hit-testing searches only the child node hierarchy under this node. When hit-testing takes place in the screen space of an SCNSceneRenderer object with the hitTest() method, the default value is the presented scene,Äôs root node. When hit-testing is in a node using its hitTestWithSegment(), the default value is the node.

### 156.22.12 Properties

### 156.22.13 boneNode as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The hit bone.
**Notes:** Only available if the node hit has a SCNSkinnerMBS attached.
(Read only property)

### 156.22.14 faceIndex as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The index of the primitive in the geometry element intersected by the search ray.
**Notes:** (Read only property)

### 156.22.15 geometryIndex as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The index of the geometry element whose surface the search ray intersects.
**Notes:** Every SCNGeometryMBS object contains one or more SCNGeometryElementMBS objects that define how its vertices connect to form a surface. This property provides the index of the geometry element intersecting the search ray. For more information about that geometry element, use the geometry,Äôs geometryElementAtIndex method.
(Read only property)

### 156.22.16 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.22.17 localCoordinates as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point of intersection between the geometry and the search ray, in the local coordinate system of the node containing the geometry.
**Notes:** (Read only property)

### 156.22.18 localNormal as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The surface normal vector at the point of intersection, in the local coordinate system of the node containing the geometry intersected by the search ray.
**Notes:** (Read only property)

### 156.22.19 modelTransform as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The world transform matrix of the node containing the intersection.
**Notes:** Use this matrix to transform vectors from the local coordinate space of the node whose geometry is intersected by the search ray to the scene,Äôs world coordinate system.

(Read only property)

### 156.22.20 node as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node whose geometry intersects the search ray.
**Notes:** (Read only property)

### 156.22.21 worldCoordinates as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point of intersection between the geometry and the search ray, in the scene,Äôs world coordinate system.
**Notes:** (Read only property)

### 156.22.22 worldNormal as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The surface normal vector at the point of intersection, in the scene,Äôs world coordinate system.
**Notes:** (Read only property)

### 156.22.23 Constants

Hit Test Search Modes

| Constant | Value | Description |
|---|---|---|
| SCNHitTestSearchModeAll | 1 | The hit test should return all possible results, sorted from nearest to farthest. |
| SCNHitTestSearchModeAny | 2 | The hit test should return only the first object found, regardless of distance. |
| SCNHitTestSearchModeClosest | 0 | The hit test should return only the closes object found. |

# 156.23 class SCNIKConstraintMBS

## 156.23.1 class SCNIKConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A constraint that applies inverse kinematics to make a chain of nodes ,Äúreach,Äù toward a target point.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnikconstraint
Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.23.2 Methods

## 156.23.3 Constructor(chainRootNode as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNIKConstraint object with the specified parameter.
**Notes:** chainRootNode The root node of the kinematic chain.
"chainRootNode" must be an ancestor of the node on which the constraint is applied.

## 156.23.4 inverseKinematicsConstraintWithChainRootNode(chainRootNode as SCNNodeMBS) as SCNIKConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNIKConstraint object with the specified parameter.
**Notes:** chainRootNode The root node of the kinematic chain.
"chainRootNode" must be an ancestor of the node on which the constraint is applied.

## 156.23.5 Properties

## 156.23.6 chainRootNode as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the root node of the kinematic chain.
**Notes:** (Read only property)

### 156.23.7 targetPosition as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the target position (in world space coordinates) of the end joint (i.e the node that owns the IK constraint).
**Notes:** Defaults to (0,0,0). Animatable.
(Read and Write property)

# 156.24 control SCNIOSControlMBS

## 156.24.1 control SCNIOSControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The Xojo control for a SCNViewMBS.
**Notes:** This control embeds a special SCNView subclass.
Designed for Xojo 2020r2 and newer.
Please use view property to access the underlaying object and set properties.

To learn about rendering events, please check here:
https://developer.apple.com/documentation/scenekit/scnscenerendererdelegate?language=objc

You can set PreferLowPowerDevice and PreferredRenderingAPI properties before initializing a view.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- MBS Xojo Plugins, version 23.5pr7
- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3

**Xojo Developer Magazine**

- 22.1, page 9: News
- 19.2, page 9: News

## 156.24.2 Properties

## 156.24.3 View as SCNViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The view used in the control.
**Notes:** Use this object to set more options on the control.
(Read only property)

### 156.24.4 Events

### 156.24.5 Close

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to close.

### 156.24.6 GotFocus

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 156.24.7 LostFocus

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 156.24.8 Open

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 156.24.9 rendererDidApplyAnimations(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after actions and animations are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this method to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

### 156.24.10 rendererDidApplyConstraints(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked on the control once the scene renderer did apply the constraints.
**Notes:** time The time at which the constraints were simulated.

All modifications done within this method don't go through the transaction model, they are directly applied on the presentation tree.

### 156.24.11 rendererDidRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the renderer has cleared the viewport and is about to render the scene.
**Notes:** scene: The SCNSceneMBS object to be rendered.
time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this event to perform custom drawing before SceneKit renders a scene—for example, to draw backdrop content underneath SceneKit content. You should only execute Metal or OpenGL drawing commands (and any setup required to perform them) in this event—the results of modifying SceneKit objects during this event are undefined.

To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this event. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.24.12 rendererDidSimulatePhysics(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur after physics simulations are performed.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this event exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

This event is the last opportunity SceneKit provides for you to change the scene graph before rendering.

### 156.24.13 rendererUpdate(time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control to perform any updates that need to occur before actions, animations, and physics are evaluated.
**Notes:** time: The current system time, in seconds. Use this parameter for any time-based elements of your game logic.

SceneKit calls this method exactly once per frame, so long as the SCNViewMBS object (or other SCNSceneRenderer object) displaying the scene is not paused.

Implement this event to add game logic to the rendering loop. Any changes you make to the scene graph during this method are immediately reflected in the displayed scene. That is, SceneKit immediately updates the hierarchy of presentation nodes it uses to render the scene (instead of using the SCNTransactionMBS class to ,Äúbatch,Äù your changes).

### 156.24.14 rendererWillRenderScene(scene as SCNSceneMBS, time as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Tells the control that the renderer has rendered the scene.
**Notes:** scene: The scene object that was rendered.

time: The current system time, in seconds. If your custom rendering involves animation, use this parameter to compute your own animation state.

Implement this method to perform custom drawing after SceneKit has rendered a scene—for example, to draw overlay content on top of SceneKit content. You should only execute Metal or OpenGL drawing commands (and any setup required to perform them) in this method—the results of modifying SceneKit objects in this method are undefined.

- To render using Metal, use the renderer parameter to retrieve the scene renderer,Äôs currentRenderCommandEncoder object and encode your own drawing commands. If you need to reference other Metal state, see the properties listed in SCNSceneRenderer.
- To render using OpenGL, simply call the relevant OpenGL drawing commands—SceneKit automatically makes its OpenGL context the current context before calling this method. If you need to reference the OpenGL context being rendered into, examine the context property of the renderer parameter.

You must draw using the appropriate graphics technology for the view currently being rendered. Use the renderingAPI property of the renderer object to determine whether Metal or OpenGL is in use.

### 156.24.15 touchesBegan(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells this object that one or more new touches occurred in a view or window.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when a new touch is detected in a view or window. Many UIKit classes override this method and use it to handle the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

### 156.24.16 touchesCancelled(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when a system event (such as a system alert) cancels a touch sequence.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when it receives a system interruption requiring cancellation of the touch sequence. An interruption is anything that causes the application to become inactive or causes the view handling the touch events to be removed from its window. Your implementation of this method should clean up any state associated with handling the touch sequence.

Return true if you handled it as otherwise we pass it on.

### 156.24.17 touchesEnded(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when one or more fingers are raised from a view or window.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when a finger or Apple Pencil is no longer touching the screen. Many UIKit classes override this method and use it to clean up state involved in the handling of the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

### 156.24.18 touchesMoved(e as NSEventMBS, touches() as NSTouchMBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 23.5, Platform: iOS, Targets: .

**Function:** Tells the responder when one or more touches associated with an event changed.
**Notes:** e: The event to which the touches belong.

UIKit calls this method when the location or force of a touch changes. Many UIKit classes override this method and use it to handle the corresponding touch events. The default implementation of this method forwards the message up the responder chain.

Return true if you handled it as otherwise we pass it on.

# 156.25 class SCNLevelOfDetailMBS

## 156.25.1 class SCNLevelOfDetailMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An alternate resolution for a geometry that SceneKit automatically substitutes to improve rendering performance.
**Notes:** You use level-of-detail objects when you have a detailed geometry that appears at several apparent sizes in a scene. For example, the teapot model on the the left in the figure below has 256 polygons, the model at center has 1024 polygons, and the model on the right has 14,400 polygons. If all three models appear close to the camera, filling most of the rendered view, the difference in detail between them is clearly visible—but if they appear far away, taking up a small area of the view, the difference is much less obvious. Rendering higher-resolution geometries incurs a higher performance cost.

When you associate one or more level-of-detail objects with a SCNGeometryMBS object using its levelsOfDetail property, SceneKit automatically substitutes alternate geometries when appropriate. For example, the two lower-resolution teapot models seen above can be added as levels of detail for the high-resolution model. For each level of detail, you specify either a world-space distance or a screen-space radius. The measure you specify determines the threshold where SceneKit automatically renders that level of detail,Äôs alternate geometry instead of the original geometry. If you specify a distance, the alternate geometry appears when the node containing the geometry is moved that distance away from the camera. If you specify a radius, the alternate geometry appears when the pixel area covered by the rendered by the geometry is smaller than a circle of that radius.
The geometries associated with lower levels of detail need not share all attributes of the original geometry. For example, you can use different materials for levels of detail that only appear when far away from the camera, disabling expensive features such as per-pixel lighting, reflection mapping, or custom shader programs.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.3pr5

## 156.25.2 Methods

## 156.25.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 156.25.4 copy as SCNLevelOfDetailMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 156.25.5 levelOfDetailWithGeometryAndScreenSpaceRadius(geo as SCNGeometryMBS, screenSpaceRadius as Double) as SCNLevelOfDetailMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a level of detail with the specified geometry and threshold pixel radius.
**Notes:** geometry: The geometry to render for this level of detail.
radius: The maximum radius (in pixels) of the geometry,Äôs bounding sphere for this level of detail to appear.

Returns a level-of-detail object. You associate levels of detail with a SCNGeometry object using its levelsOfDetail property.

When rendering a geometry with associated levels of detail, SceneKit calculates the radius in pixels of the circle covered by a geometry,Äôs bounding sphere, then renders the geometry for the SCNLevelOfDetail object with the largest radius parameter smaller than that circle.
If you pass nil for the geometry parameter, SceneKit renders no geometry for the level of detail. Creating a level-of-detail object with no geometry allows you to skip rendering costs entirely for an object when it would appear very far away or very small.

### 156.25.6 levelOfDetailWithGeometryAndWorldSpaceDistance(geo as SCNGeometryMBS, worldSpaceDistance as Double) as SCNLevelOfDetailMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a level of detail with the specified geometry and threshold camera distance.
**Notes:** geometry: The geometry to render for this level of detail, or nil if SceneKit should render no geometry at this level of detail.
distance: The minimum distance from the current point of view for this level of detail to appear.

Returns a level-of-detail object. You associate levels of detail with a SCNGeometry object using its levelsOfDetail property.

When rendering a geometry with associated levels of detail, SceneKit calculates the distance from the current point of view to the geometry,Äôs parent node, then renders the geometry for the SCNLevelOfDetail object with the smallest distance parameter greater than that distance.
If you pass nil for the geometry parameter, SceneKit renders no geometry for the level of detail. Creating a level-of-detail object with no geometry allows you to skip rendering costs entirely for an object when it would appear very far away or very small.

### 156.25.7 Properties

### 156.25.8 geometry as SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The geometry associated with this level of detail.
**Notes:** SceneKit renders this geometry instead of the original geometry when the level of detail is appropriate. Generally, levels of detail with larger worldSpaceDistance values or smaller screenSpaceRadius values should contain less complex geometries.
If the value of this property is nil, SceneKit renders no geometry at this level of detail.
(Read only property)

### 156.25.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 156.25.10 screenSpaceRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum radius (in pixels) of the geometry,Äôs bounding sphere for this level of detail to appear.
**Notes:** When rendering a geometry with associated levels of detail, SceneKit calculates the radius in pixels of the circle covered by a geometry,Äôs bounding sphere, then renders the geometry for the SCNLevelOfDetail object with the smallest radius parameter larger than that circle.
(Read only property)

### 156.25.11 worldSpaceDistance as Double

MBS Mac64bit Plugin, Plugin Version: 19.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum distance from the current point of view for this level of detail to appear.
**Notes:** When rendering a geometry with associated levels of detail, SceneKit calculates the distance from the current point of view to the geometry,Äôs parent node, then renders the geometry for the SCNLevelOfDetailMBS object with the largest distance parameter less than that distance.
(Read only property)

## 156.26 class SCNLightMBS

### 156.26.1 class SCNLightMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A light source that can be attached to a node to illuminate the scene.
**Notes:** You illuminate your scene by attaching lights to SCNNode objects using their light property.

You set a light,Äôs type using its type property. Depending on a light,Äôs type, its position and direction may affect its behavior—you control the light,Äôs position and direction through the node that the light is attached to. The direction of a light, if applicable to its type, is along the negative z-axis of its node,Äôs local coordinate system.

A light,Äôs other properties affect how it illuminates a scene. All lights have a color property, which interacts with SCNMaterial objects to produce the pixel colors in a rendered scene. Other properties, such as attenuation, shadowing, and spot angle, can affect the behavior of certain types of lights.

The number and type of lights in a scene is a key factor in SceneKit,Äôs rendering performance. For efficient rendering, follow these tips:

- Use SceneKit lights only for dynamic light sources or lights that affect moving objects. For statically lit portions of your scene, create a light map texture in an external 3D authoring tool (also known as baked lighting) and apply it to objects in the scene using the multiply material property.
- Minimize the number of lights on each element of the scene. You can achieve most common lighting effects using no more than three lights, and you only need a single ambient light source. SceneKit only uses up to eight light sources per node when rendering, ignoring any additional lights. If you set the attenuationEndDistance property on a spotlight or omnidirectional light to limit its area of effect, SceneKit ignores the light (and its performance cost) when rendering objects outside that area. You can also use the categoryBitMask property to choose which nodes are illuminated by a light.

Requires MacOS 10.8 or newer.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 18.5pr3

**Xojo Developer Magazine**

- 19.6, pages 48 to 50: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes

### 156.26.2 Methods

### 156.26.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new light object.

### 156.26.4 copy as SCNLightMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the light.

### 156.26.5 light as SCNLightMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new light object.

### 156.26.6 SCNLightTypeAmbient as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A light that illuminates all objects in the scene from all directions.
**Notes:** Because the intensity of light from an ambient source is the same everywhere in the scene, its position and direction have no effect. Attenuation, spotlight angle, and shadow attributes do not apply to ambient lights.

### 156.26.7 SCNLightTypeDirectional as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A light source with a uniform direction and constant intensity.
**Notes:** Because a directional light illuminates all objects in the scene from the same direction and with the same intensity, so the position of the node containing the light has no effect. Attenuation and spotlight angle attributes do not apply to directional lights.

### 156.26.8 SCNLightTypeIES as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A light source whose shape, direction, and intensity of illumination is determined by a photometric profile.
**Notes:** The intensity of a photometric light varies in different directions from the light source, much like the illumination from a real-world light source. The position of the containing node determines the location of the light source, and the orientation of the node determines the relative directions specified by the photometric profile. Spotlight angle attributes do not apply to photometric lights.
For more information about photometric lights, see the IESProfileURL property.

### 156.26.9 SCNLightTypeOmni as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** An omnidirectional light, also known as a point light.
**Notes:** Because an omnidirectional light casts equal illumination in all directions, the orientation of the node containing the light has no effect. Spotlight angle and shadow attributes do not apply to directional lights.

### 156.26.10 SCNLightTypeProbe as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A sample of the environment around a point in a scene to be used in environment-based lighting.
**Notes:** A light probe describes a point in a scene in terms of the variations in color and intensity of the illumination it receives from all directions. This information can then be used in shading of materials based on their location in the scene. For example, a white object placed near blue and red walls will appear bluish on surfaces facing the blue wall and reddish on surfaces facing the red wall.
You can place light probes in a scene and generate their lighting contributions using the Xcode scene editor, or import light probes from scene file formats that support them. Lighting-related properties of the SCNLight class do not apply to light probes; their contribution to scene rendering depends entirely on the light probe content generated in Xcode.

### 156.26.11 SCNLightTypeSpot as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A light source that illuminates a cone-shaped area.
**Notes:** The position and orientation of the node containing the light determines the area lit by the spotlight, and all lighting attributes affect its appearance.

### 156.26.12 Properties

### 156.26.13 attenuationEndDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance from the light at which its intensity is completely diminished. Animatable.
**Notes:** You can apply attenuation to omnidirectional lights and spotlights, causing their intensity to diminish over a specified range of distances. At distances less than the start distance, the light,Äôs illumination is at full intensity. At distances greater than the end distance, the light provides no illumination. At distances in between the start and end distance, the attenuationFalloffExponent property defines the transition from full illumination to no illumination.
The default value is 0.0, specifying no attenuation (the light,Äôs intensity is the same at all distances).
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.14 attenuationFalloffExponent as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transition curve for the light,Äôs intensity between its attenuation start and end distances. Animatable.
**Notes:** You can apply attenuation to omnidirectional lights and spotlights, causing their intensity to diminish over a specified range of distances. At distances in between the start and end distance, the light,Äôs intensity transitions from full to no illumination according to the value of this property.
A value of 0.0 specifies no attenuation—the light,Äôs intensity is the same at all distances. A value of 1.0 specifies a linear transition, and a value of 2.0 (the default) specifies a quadratic transition curve. Higher values have little visible effect.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.15 attenuationStartDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance from the light at which its intensity begins to diminish. Animatable.
**Notes:** You can apply attenuation to omnidirectional lights and spotlights, causing their intensity to diminish over a specified range of distances. At distances less than the start distance, the light,Äôs illumination is at full intensity. At distances greater than the end distance, the light provides no illumination. At distances in between the start and end distance, the attenuationFalloffExponent property defines the transition from full illumination to no illumination.
The default value is 0.0, specifying no attenuation (the light,Äôs intensity is the same at all distances).
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.16 automaticallyAdjustsShadowProjection as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies if the shadow map projection should be done automatically or manually by the user.
**Notes:** Defaults to true.
(Read and Write property)

### 156.26.17 CastsShadow as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the light casts shadows.
**Notes:** Geometries illuminated by the light cast shadows only if the value of this property is true and the type property of the light is SCNLightTypeSpot or SCNLightTypeDirectional. The default value is false.
(Read and Write property)

### 156.26.18 Color as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color of the light. Animatable.
**Notes:** The value of this property is an NSColorMBS object. The default color is white.
You can animate changes to this property,Äôs value.

See Animating SceneKit Content:
https://developer.apple.com/documentation/scenekit/animation/animating_scenekit_content
(Read and Write property)

### 156.26.19 ForcesBackFaceCasters as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.26.20 gobo as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An image or other visual content affecting the shape and color of a light,Äôs illuminated area.
**Notes:** In photographic and stage lighting terminology, a gobo (also known as a flag or cookie) is a stencil, gel, or other object placed just in front of a light source, shaping or coloring the beam of light.
You alter the appearance of a spotlight by changing the contents property of the object permanently assigned to this property. As with other material properties, you can use a color or image, or a Core Animation layer containing animated content, as a lighting gobo.
This property applies only to lights whose type property is spot.
(Read only property)

### 156.26.21 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.26.22 Intensity as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The luminous flux, in lumens, or total brightness of the light. Animatable.
**Notes:** When working with photometric lights (see the IESProfileURL property) or physically-based rendering (see SCNLightingModelPhysicallyBased), you can leave the color property at its default white color and use the intensity and temperature to control the light using realistic parameters. When working with physically-based materials, this value the luminous flux of the light source. The default value is 1000 lumens. When not using physically-based rendering, this value (divided by 1000) serves as a multiplier for the the color property. The default value of of 1000 leaves the light color unmodulated; you can use higher values, for example, to brighten a light whose color is already the maximum red value.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.23 maximumShadowDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the maximum distance from the viewpoint from which the shadows for the receiver light won't be computed.
**Notes:** Defaults to 100.0.
(Read and Write property)

### 156.26.24 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A name associated with the light.
**Notes:** You can provide a descriptive name for a light to make managing your scene graph easier. Lights loaded from a scene file may have names assigned by an artist using a 3D authoring tool. To examine lights in a scene file without loading its scene graph, use the SCNSceneSourceMBS class.
(Read and Write property)

### 156.26.25 OrthographicScale as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The orthographic scale SceneKit uses when rendering the shadow map for a directional light.
**Notes:** SceneKit draws a shadow map image by rendering the scene from the point of view of the node containing the light. Directional lights ignore the position property of the node containing them because their light has a constant direction. Therefore, rendering a shadow map for a directional light requires an orthographic projection. Like the orthographicScale property of a camera object, this property specifies the extent of the scene ,Äúvisible to,Äù the light when rendering the shadow map.
This property applies only if the light,Äôs type property is SCNLightTypeDirectional.
(Read and Write property)

### 156.26.26 SampleDistributedShadowMaps as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Use the sample distribution of the main rendering to better fit the shadow frusta.
**Notes:** Defaults to false.
(Read and Write property)

### 156.26.27 ShadowBias as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of correction to apply to the shadow to prevent rendering artifacts.
**Notes:** Rendering shadows from a shadow map can result in artifacts where the shadow color does not appear on all pixels in a shadowed surface as intended. (This effect is typically called shadow acne.) This property specifies the error margin SceneKit uses to correct such artifacts.
The default value is 1.0.
(Read and Write property)

### 156.26.28 ShadowCascadeCount as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the number of distinct shadow maps that will be computed for the receiver light.
**Notes:** Defaults to 1. Maximum is 4.
(Read and Write property)

### 156.26.29 ShadowCascadeSplittingFactor as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies a factor to interpolate between linear splitting (0) and logarithmic splitting (1).
**Notes:** Defaults to 0.15.
(Read and Write property)

### 156.26.30 shadowColor as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color of shadows cast by the light. Animatable.
**Notes:** The value of this property is an NSColorMBS object. SceneKit blends the light,Äôs color with other colors in the rendered image to produce a shadow effect. The color,Äôs opacity (alpha value) determines the intensity of the shadows. The default shadow color is black with 50% opacity.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.31 ShadowMode as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mode SceneKit uses to render shadows.
**Notes:** The default mode is SCNShadowModeForward in iOS and in macOS 10.10 or later. In OS X v10.9 or earlier, the default mode is SCNShadowModeDeferred.
(Read and Write property)

### 156.26.32 ShadowRadius as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A number that specifies the amount of blurring around the edges of shadows cast by the light. Animatable.

**Notes:** SceneKit produces soft-edged shadows by rendering the silhouettes of geometry into a 2D shadow map and then using several weighted samples from the shadow map to determine the strength of the shadow at each pixel in the rendered scene. This property controls the radius of shadow map sampling. Lower numbers result in shadows with sharply defined, pixelated edges; higher numbers result in blurry shadows.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.33 ShadowSampleCount as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of samples from the shadow map that SceneKit uses to render each pixel.
**Notes:** SceneKit produces soft-edged shadows by rendering the silhouettes of scene geometry into a 2D shadow map and then using several weighted samples from the shadow map to determine the strength of the shadow at each pixel in the rendered scene. This property controls the number of samples from the shadow map used to render each pixel. Higher numbers result in smoother edges; lower numbers increase rendering performance.
The default value is 16 in macOS and 1 on iOS.
(Read and Write property)

### 156.26.34 spotInnerAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The angle, in degrees, of the area fully lit by a spotlight. Animatable.
**Notes:** You define the cone-shaped illuminated area of a spotlight with a position and direction (from the node containing the light) and an angle specifying the cone,Äôs width. Additionally, the illuminated area can smoothly transition from full illumination to no illumination. This property determines the width of the fully illuminated area.
The default value is 0.0, specifying that only the center of the area illuminated by the spotlight is lit at full intensity.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.35 spotOuterAngle as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The angle, in degrees, of the area partially lit by a spotlight. Animatable.
**Notes:** You define the cone-shaped illuminated area of a spotlight with a position and direction (from the node containing the light) and with an angle specifying the cone,Äôs width. Additionally, the illuminated area can smoothly transition from full illumination to no illumination. This property determines the width of the transition area.

The default value is 45.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.36 Temperature as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color temperature, in degrees Kelvin, of the light source. Animatable.
**Notes:** SceneKit determines the actual color of the light by multiplying the color value by a color corresponding to the light,Äôs temperature. The default value of 6500 K represents a pure white light (leaving the color unmodulated); lower values (down to a minimum of zero) add a ,Äúwarmer,Äù yellow or orange effect to the light source, and higher values (up to a maximum of 40000) add a ,Äúcooler,Äù blue effect.
This property affects all light types, but is especially useful when working with photometric lights (see the IESProfileURL property) or physically-based rendering (see SCNLightingModelPhysicallyBased). You can leave the color property at its default white color and use the intensity and temperature properties to control the light using realistic parameters.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.37 Type as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A constant identifying the general behavior of the light.
**Notes:** A light,Äôs type determines the shape and directionality of illumination provided by the light, as well as the set of attributes available for modifying the light,Äôs behavior. For example, light types include omnidirectional lights and spotlights. See Light Types for the full set of types and their behaviors.

see also
https://developer.apple.com/documentation/scenekit/scnlighttype
(Read and Write property)

### 156.26.38 zFar as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum distance between the light and a visible surface for casting shadows.
**Notes:** A spotlight casts shadows if its castsShadow property is true. If a surface is farther from the light than this distance, shadows are not cast against the surface.
The default value is 100.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.

(Read and Write property)

### 156.26.39 zNear as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum distance between the light and a visible surface for casting shadows. Animatable.
**Notes:** A spotlight casts shadows if its castsShadow property is true. If a surface is closer to the light than this distance, shadows are not cast against the surface.
The default value is 1.0.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.26.40 Constants

Shadow Modes

| Constant | Value | Description |
|---|---|---|
| kShadowModeDeferred | 1 | SceneKit renders shadows in a postprocessing pass.<br>In the mode, SceneKit blends shadows into the final image after the main rendering pass, so shadows can be of any color. |
| kShadowModeForward | 0 | SceneKit renders shadows during lighting computations.<br>In this mode, the color components of the light,Äôs shadowColor property do not apply. The color,Äôs alpha component determines the intensity of shadows. |
| kShadowModeModulated | 2 | SceneKit renders shadows by projecting the light,Äôs gobo image. The light does not illuminate the scene.<br>Typically, you use this mode to create a low-accuracy, high-performance shadow under a game character or similar scene element: Use an image of a radial gradient (black to white) for the light,Äôs gobo property, and use categoryBitMask properties to prevent the shadow image from appearing on the character. |

# 156.27 class SCNLookAtConstraintMBS

## 156.27.1 class SCNLookAtConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNLookAtConstraint applies on a node's orientation so that it always look at another node.
**Notes:** Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.27.2 Methods

## 156.27.3 Constructor(target as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNLookAtConstraint object with the specified target.
**Notes:** target: The target node to look at.

## 156.27.4 lookAtConstraintWithTarget(target as SCNNodeMBS) as SCNLookAtConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNLookAtConstraint object with the specified target.
**Notes:** target: The target node to look at.

## 156.27.5 Properties

## 156.27.6 gimbalLockEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies whether the receiver enables the gimbal lock. Defaults to false.
**Notes:** Enabling the gimbal lock prevents the receiver from rotating the constrained node around to roll axis.
(Read and Write property)

### 156.27.7 localFront as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Front direction in the constraint owner local space. Defaults to - [ SCNNode localFront ] . Animatable
**Notes:** (Read and Write property)

### 156.27.8 target as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the target node to look at.
**Notes:** (Read and Write property)

### 156.27.9 targetOffset as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Offset look at position in target space. Defaults to zero. Animatable
**Notes:** (Read and Write property)

### 156.27.10 worldUp as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Up reference direction in world space. Defaults to - [ SCNNode localUp ] . Animatable
**Notes:** (Read and Write property)

# 156.28 class SCNMaterialMBS

## 156.28.1 class SCNMaterialMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A set of shading attributes that define the appearance of a geometry's surface when rendered.
**Notes:** When you create a material, you define a collection of visual attributes and their options, which you can then reuse for multiple geometries in a scene.

A material has several visual properties, each of which defines a different part of SceneKit,Äôs lighting and shading process. Each visual property is an instance of the SCNMaterialPropertyMBS class that provides a solid color, texture, or other 2D content for that aspect of SceneKit,Äôs rendering. The material,Äôs lightingModelName property then determines the formula SceneKit uses to combine the visual properties with the lights in the scene to produce the final color for each pixel in the rendered scene. For more details on the rendering process, see SCNLightingModelMBS.

You attach one or more materials to an instance of the SCNGeometryMBS class using its firstMaterial or materials property. Multiple geometries can reference the same material. In this case, changing the attributes of the material changes the appearance of every geometry that uses it.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.28.2 Methods

## 156.28.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material.

## 156.28.4 copy as SCNMaterialMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the material.

## 156.28.5 material as SCNMaterialMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material object.
**Notes:** A newly created material contains an SCNMaterialPropertyMBS object for each of its eight visual properties. You change a material,Äôs appearance by setting the contents of each visual property. For information on each visual property,Äôs default contents and how it affects a material,Äôs appearance, see Visual Properties for Special Effects.

### 156.28.6 SCNLightingModelBlinn as string

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Shading that incorporates ambient, diffuse, and specular properties, where specular highlights are calculated using the Blinn-Phong formula.
**Notes:** see
https://developer.apple.com/documentation/scenekit/scnlightingmodelblinn

### 156.28.7 SCNLightingModelConstant as string

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Uniform shading that incorporates ambient lighting only.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnlightingmodelconstant

### 156.28.8 SCNLightingModelLambert as string

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Shading that incorporates ambient and diffuse properties only.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnlightingmodellambert

### 156.28.9 SCNLightingModelPhong as string

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Shading that incorporates ambient, diffuse, and specular properties, where specular highlights are calculated using the Phong formula.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnlightingmodelphong

### 156.28.10 SCNLightingModelPhysicallyBased as string

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Shading based on a realistic abstraction of physical lights and materials.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnlightingmodelphysicallybased

### 156.28.11 Properties

### 156.28.12 ambient as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that manages the material,Äôs response to ambient lighting.
**Notes:** The ambient property specifies the amount of ambient light to reflect. This property has no visual impact on scenes that have no ambient light. Setting the ambient has no effect if locksAmbientWithDiffuse is set to true.
(Read only property)

### 156.28.13 ambientOcclusion as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that provides color values to be multiplied with the ambient light affecting the material.
**Notes:** Use this property to assign an ambient occlusion texture map to a surface. This property has no effect if there is no ambient light in the scene. If this property is not nil, SceneKit ignores the ambient property.
When using physically-based shading (see SCNLightingModelPhysicallyBased), ambient occlusion approximates large-scale surface details that obscure global illumination.
(Read only property)

### 156.28.14 blendMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mode that determines how pixel colors rendered using this material blend with other pixel colors in the rendering target.
**Notes:** With the default blend mode of SCNBlendModeAlpha, materials blend according to their alpha (opacity) values—a pixel rendered with a higher alpha value appears more opaque than one with a lower alpha value. Change this property to create special effects. For example, the SCNBlendModeAdd mode can make objects appear to glow.

(Read and Write property)

### 156.28.15 colorBufferWriteMask as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether the receiver writes to the color buffer when rendered.
**Notes:** Defaults to SCNColorMaskAll.
(Read and Write property)

### 156.28.16 cullMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mode determining which faces of a surface SceneKit renders. Animatable.
**Notes:** The vertex data and normal vectors in a geometry designate which side of each polygon is to be considered its front face, and the geometry,Äôs orientation with respect to the camera determines which front surfaces are currently visible. Typically, back-facing surfaces are found only on the interior of a closed geometry, obscured by front-facing surfaces, so rendering these surfaces has a performance cost but no visible effect.
This property,Äôs default value is SCNCullBack, specifying that SceneKit should cull, or not render, back-facing surfaces. You can change this property,Äôs value to cause SceneKit to render only the back surfaces of a material instead. See SCNCullMode for available values.
You can animate changes to this property,Äôs value. See Animating SceneKit Content. Animating this property fades between the results of rendering with each state
(Read and Write property)

### 156.28.17 diffuse as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that manages the material,Äôs diffuse response to lighting.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnmaterial/1462589-diffuse
(Read only property)

### 156.28.18 displacement as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The displacement property specifies how vertex are translated in tangent space.

**Notes:** Pass a grayscale image for a simple 'elevation' or rgb image for a vector displacement.
(Read only property)

### 156.28.19 DoubleSided as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit should render both front and back faces of a surface. Animatable.
**Notes:** When this property,Äôs value is false (the default), SceneKit renders a surface using the material from one side. The vertex data and normal vectors in a geometry designate which side of each polygon is to be considered its front face, and the geometry,Äôs orientation with respect to the camera determines which front surfaces are currently visible.
If you change this property,Äôs value to true, SceneKit renders both the front and back surfaces of every polygon. SceneKit assumes the surface normals a back face to be the negative of the front face,Äôs normal vector.
You can animate changes to this property,Äôs value. See Animating SceneKit Content. Animating this property fades between the results of rendering with each state
(Read and Write property)

### 156.28.20 emission as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that defines the color emitted by each point on a surface.
**Notes:** The emission property specifies the amount of light the material emits. This emission does not light up other surfaces in the scene.
(Read only property)

### 156.28.21 fillMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines of to how to rasterize the receiver's primitives.
**Notes:** Defaults to SCNFillModeFill.
(Read and Write property)

### 156.28.22 fresnelExponent as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A factor affecting the material,Äôs reflectivity. Animatable.
**Notes:** The Fresnel exponent of a material interacts with its reflective property to determine the intensity of reflections in a surface based on its angle relative to the viewer. A higher Fresnel exponent increases the visibility of reflections when the material is viewed from a shallow angle.
(Read and Write property)

### 156.28.23 lightingModelName as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The lighting formula that SceneKit uses to render the material.
**Notes:** SceneKit provides several different lighting models, each of which combines information from a material,Äôs visual properties with the lights and other contents of a scene. For details on how each lighting model affects rendering, see Lighting Models. For details on the contribution from each visual property, see Visual Properties for Special Effects.
(Read and Write property)

### 156.28.24 LitPerPixel as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit performs lighting calculations per vertex or per pixel. Animatable.
**Notes:** When this property,Äôs value is true (the default), SceneKit performs lighting calculations independently for each rendered pixel. This approach provides better rendering quality, but can adversely impact rendering performance.
If you change this property,Äôs value to false, SceneKit performs lighting calculations for each vertex in a geometry, and allows the GPU to interpolate lighting results across the pixels in between vertices. Depending on the shape and vertex count of a geometry,Äôs surface and the material properties being rendered, this approach may improve rendering performance without much noticeable impact on visual quality.
You can animate changes to this property,Äôs value. See Animating SceneKit Content. Animating this property fades between the results of rendering with each state.
(Read and Write property)

### 156.28.25 locksAmbientWithDiffuse as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the material responds identically to both ambient and diffuse lighting. Animatable.
**Notes:** Makes the ambient property automatically match the diffuse property. Defaults to false on 10.9 and before, defaults to true otherwise. Animatable.

(Read and Write property)

### 156.28.26 metalness as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that provides color values to determine how metallic the material,Äôs surface appears.
**Notes:** This property measures only the total intensity of color values; texture contents are best defined in grayscale.
This property generally approximates aspects of a physical surface—such as index of refraction, tendency to produce sharp reflections, and tendency to produce Fresnel reflections at grazing angles—that together produce an overall metallic or nonmetallic (also called dielectric) appearance. Lower values (darker colors) cause the material to appear more like a dielectric surface. Higher values (brighter colors) cause the surface to appear more metallic.
This property applies only when the material,Äôs lightingModelName value is SCNLightingModelPhysicallyBased.
(Read only property)

### 156.28.27 multiply as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that provides color values that are multiplied with pixels in a material after all other shading is complete.
**Notes:** The multiply property specifies a color or an image used to multiply the output fragments with. The computed fragments are multiplied with the multiply value to produce the final fragments. This property may be used for shadow maps, to fade out or tint 3d objects.
(Read only property)

### 156.28.28 name as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A name associated with the material.
**Notes:** You can provide a descriptive name for a material to make managing your scene graph easier. Materials loaded from a scene file may have names assigned by an artist using a 3D authoring tool. Use the SCNSceneSourceMBS class to examine materials in a scene file without loading its scene graph.

Material names are saved when you export a scene to a file using its writeToURL method, and appear in the Xcode scene editor.
(Read and Write property)

### 156.28.29 normal as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that defines the nominal orientation of the surface at each point for use in lighting.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnmaterial/1462542-normal
(Read only property)

### 156.28.30 readsFromDepthBuffer as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether the receiver reads from the depth buffer when rendered.
**Notes:** Defaults to true.
(Read and Write property)

### 156.28.31 reflective as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that defines the reflected color for each point on a surface.
**Notes:** The reflective property specifies the reflectivity of the surface. The surface will not actually reflect other objects in the scene. This property may be used as a sphere mapping to reflect a precomputed environment.
(Read only property)

### 156.28.32 roughness as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that provides color values to determine the apparent smoothness of the surface.
**Notes:** This property measures only the total intensity of color values; texture contents are best defined in grayscale.
This property approximates the level of microscopic detail—for example tiny bumps and cracks—in a surface. By approximating these ,Äúmicrofacets,Äù as a single term, this property helps produce lighting calculations that resemble the energy-conserving laws of real-world physics, resulting in more realistic variation between matte and shiny surfaces. Lower values (darker colors) cause the material to appear shiny, with well-defined specular highlights. Higher values (brighter colors) cause specular highlights to spread out and the diffuse color of the material to become more retroreflective.
This property applies only when the material,Äôs lightingModelName value is SCNLightingModelPhysicallyBased.

(Read only property)

### 156.28.33 selfIllumination as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that provides color values representing the global illumination of the surface.
**Notes:** Self-illumination applies to all materials, but is especially useful for those using physically-based shading (see SCNLightingModelPhysicallyBased). Physically-based materials work best with environment-based lighting (see the SCNSceneMBS property lightingEnvironment), but for some materials it can be useful to let a surface itself define part of its lighting—for example, an object whose position obscures it from the ‚Äúsky‚Äù that provides the main lighting environment. When you assign contents to this property, they override the environmental lighting contribution to diffuse shading, but environmental lighting still contributes to specular effects.
(Read only property)

### 156.28.34 shininess as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The sharpness of specular highlights. Animatable.
**Notes:** The shininess of a material interacts with its specular property and the lighting in a scene to produce bright highlights on a surface. A higher value produces more sharply defined highlights, making a surface appear more smooth and glossy.
(Read and Write property)

### 156.28.35 specular as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that manages the material‚Äôs specular response to lighting.
**Notes:** The specular property specifies the amount of light to reflect in a mirror-like manner. The specular intensity increases when the point of view lines up with the direction of the reflected light.
(Read only property)

### 156.28.36 transparency as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The uniform transparency of the material. Animatable.
**Notes:** SceneKit determines the total opacity of each rendered pixel in a surface by multiplying the color

from the material,Äôs transparent property by the value of this property. Then, the material,Äôs transparencyMode property determines how pixels from the material are blended into the scene.
You can also uniformly adjust the opacity of all content attached to a node using its opacity property.
(Read and Write property)

### 156.28.37 transparencyMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mode SceneKit uses to calculate transparency for the material.
**Notes:** The default transparency mode is SCNTransparencyModeAOne. See SCNTransparencyMode for available values and their effects.
(Read and Write property)

### 156.28.38 transparent as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that determines the opacity of each point in a material.
**Notes:** The transparent property specifies the transparent areas of the material.
(Read only property)

### 156.28.39 writesToDepthBuffer as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit produces depth information when rendering the material.
**Notes:** Determines whether the receiver writes to the depth buffer when rendered. Defaults to true.
(Read and Write property)

### 156.28.40 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| SCNTransparencyModeAOne | 0 | One of the constants for the modes SceneKit uses to calculate the opacity pixels rendered with a material, used by the transparencyMode property. SceneKit derives transparency information from the alpha channel of colo The value 1.0 is opaque. |
| SCNTransparencyModeDefault | 0 | One of the constants for the modes SceneKit uses to calculate the opacity pixels rendered with a material, used by the transparencyMode property. Default |
| SCNTransparencyModeDualLayer | 3 | One of the constants for the modes SceneKit uses to calculate the opacity pixels rendered with a material, used by the transparencyMode property. Dual layer. |
| SCNTransparencyModeRGBZero | 1 | One of the constants for the modes SceneKit uses to calculate the opacity pixels rendered with a material, used by the transparencyMode property. SceneKit derives transparency information from the luminance of colors. T value 0.0 is opaque. When using this mode, SceneKit ignores the alpha value of colors in the m terial,Äôs transparent property. SceneKit calculates the luminance of a co from its red, green, and blue channels and uses the resulting value to determi the material,Äôs opacity. |
| SCNTransparencyModeSingleLayer | 2 | One of the constants for the modes SceneKit uses to calculate the opacity pixels rendered with a material, used by the transparencyMode property. Single layer. |

Blend Modes

| Constant | Value | Description |
|---|---|---|
| SCNBlendModeAdd | 1 | Blend by adding the source color to the destination color. This mode results in a brightening effect that can be useful for making objects appear to glow relative to their surroundings. |
| SCNBlendModeAlpha | 0 | Blend by multiplying source and destination color values by their corresponding alpha values. This mode is the default value of the blendMode property. |
| SCNBlendModeMax | 6 | Max |
| SCNBlendModeMultiply | 3 | Blend by multiplying the source color with the background color. This mode results in colors that are at least as dark as either of the two contributing colors. |
| SCNBlendModeReplace | 5 | Blend by replacing the destination color with the source color, ignoring alpha. |
| SCNBlendModeScreen | 4 | Blend by multiplying the inverse of the source color with the inverse of the destination color. This mode results in colors that are at least as light as either of the two contributing colors. |
| SCNBlendModeSubtract | 2 | Blend by subtracting the source color from the destination color. |

Cull Modes

| Constant | Value | Description |
|---|---|---|
| SCNCullModeBack | 0 | The mode for culling back-facing polygons (and rendering only front-facing polygons). |
| SCNCullModeFront | 1 | The mode for culling front-facing polygons (and rendering only back-facing polygons). |

Fill Modes

| Constant | Value | Description |
|---|---|---|
| SCNFillModeFill | 0 | Fill |
| SCNFillModeLines | 1 | Lines |

# 156.29 class SCNMaterialPropertyMBS

## 156.29.1 class SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container for the color or texture of one of a material,Äôs visual properties.
**Notes:** A material has several visual properties that together determine its appearance under lighting and shading. SceneKit renders each pixel in the scene by combining the information from material properties with the locations, intensities, and colors of lights.
A material property,Äôs contents can be either a color, which provides a uniform effect across the surface of a material, or a texture, which SceneKit maps across the surface of a material using texture coordinates provided by the geometry object the material is attached to. A texture, in turn, can come from any of several sources, such as an image object, a URL to an image file, a specially formatted image or set of images for use as a cube map, or even animated content provided by Core Animation, SpriteKit, or AVFoundation—for the full set of options, see the contents property.

see also
https://developer.apple.com/documentation/scenekit/scnmaterialproperty
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.29.2 Methods

## 156.29.3 Constructor(content as Variant)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property with given content.

## 156.29.4 materialPropertyWithColor(color as NSColorMBS) as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property object with the specified color.

## 156.29.5 materialPropertyWithContents(content as Variant) as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property object with the specified contents.
**Notes:** contents: The visual contents of the material property—a color, image, or source of animated content. For details, see the discussion of the contents property.

Returns a new material property object.

Newly created SCNMaterialMBS objects contain SCNMaterialPropertyMBS instances for all of their visual properties. To change a material,Äôs visual properties, you modify those instances rather than creating new material property objects.
You create new SCNMaterialPropertyMBS instances to provide textures for use with custom GLSL shaders—for details, see SCNShadableMBS.

### 156.29.6 materialPropertyWithImage(image as NSImageMBS) as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property object with the specified image.

### 156.29.7 materialPropertyWithLayer(layer as CALayerMBS) as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property object with the specified layer.

### 156.29.8 materialPropertyWithPicture(picture as Picture) as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new material property object with the specified picture.

### 156.29.9 Properties

### 156.29.10 borderColor as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A color used to fill in areas of a material,Äôs surface not covered by the material property,Äôs image contents.
**Notes:** When the material property,Äôs contents are a texture image and its texture wrapping properties are set to SCNWrapModeClampToBorder, the border color appears in areas of a textured geometry not covered by the texture image, as shown in .
(Read and Write property)

### 156.29.11 contents as Variant

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The visual contents of the material property—a color, image, or source of animated content. Animatable.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnmaterialproperty/1395372-contents
(Read and Write property)

### 156.29.12 contentsTransform as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transformation applied to the material property,Äôs visual contents. Animatable.
**Notes:** SceneKit applies this transformation to the texture coordinates provided by the geometry object the material is attached to, then uses the resulting coordinates to map the material property,Äôs contents across the surface of the material. (This transformation has no effect if the material property,Äôs contents object is a constant color.)
(Read and Write property)

### 156.29.13 intensity as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A number between 0.0 and 1.0 that modulates the effect of the material property. Animatable.
**Notes:** The default intensity is 1.0. Reducing the intensity fades out the contents of the material property, causing different effects depending on which visual property of an SCNMaterialMBS object it represents:

- For the normal property, intensity varies the apparent roughness of the normal-mapped surface. Reducing intensity makes the surface appear more smooth.
- For the multiply property, reducing intensity blends the material property,Äôs colors with white, effectively reducing the strength of the color multiplication effect.
- For all other properties, reducing intensity dims the material property,Äôs contents.

(Read and Write property)

### 156.29.14 magnificationFilter as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Texture filtering for rendering the material property,Äôs image contents at a size larger than that of the original image.
**Notes:** Texture filtering determines the appearance of a material property,Äôs contents when portions of the material surface appear larger or smaller than the original texture image. For example, the texture coordinates at a point near the camera may correspond to a small fraction of a pixel in the texture image. SceneKit uses the magnification filter to determine the color of the sampled texel at that point.
The default magnification filter is SCNFilterModeLinear.
(Read and Write property)

### 156.29.15 mappingChannel as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The source of texture coordinates for mapping the material property,Äôs image contents.
**Notes:** A geometry can have multiple independent sources of texture coordinates, each of which defines a unique mapping channel number. You can use these channels to map different visual properties of a material in different ways. For example, a geometry representing a picture frame might use one set of texture coordinates for mapping the materials of the frame itself, and another set of texture coordinates for placing a picture into the frame.
For information about creating geometries with multiple texture mapping channels, see SCNGeometryMBS.
(Read and Write property)

### 156.29.16 maxAnisotropy as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The amount of anisotropic texture filtering to be used when rendering the material property,Äôs image contents.
**Notes:** see
https://developer.apple.com/documentation/scenekit/scnmaterialproperty/1395402-maxanisotropy
(Read and Write property)

### 156.29.17 minificationFilter as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Texture filtering for rendering the material property,Äôs image contents at a size smaller than that of the original image.
**Notes:** Texture filtering determines the appearance of a material property,Äôs contents when portions of the material surface appear larger or smaller than the original texture image. For example, the texture coordinates at a point far from the camera may correspond to an area of several pixels in the texture image. SceneKit uses the minification filter to determine the color of the sampled texel at that point.
The default minification filter is SCNFilterModeLinear. See constants for available modes and their effects.
(Read and Write property)

### 156.29.18 mipFilter as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Texture filtering for using mipmaps to render the material property,Äôs image contents at a size smaller than that of the original image.
**Notes:** see
https://developer.apple.com/documentation/scenekit/scnmaterialproperty/1395398-mipfilter
(Read and Write property)

### 156.29.19 wrapS as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The wrapping behavior for the S texture coordinate.
**Notes:** Wrapping modes determine texture mapping behavior for cases where a material,Äôs texture coordinates extend outside the range from 0.0 to 1.0. For example, if you use the contentsTransform property to shrink a texture relative to the surface of a geometry, you use the wrap mode properties to determine whether the texture repeats across the surface.
The S texture coordinate measures the horizontal axis of a texture image, increasing from 0.0 at the left edge of the image to 1.0 at the right edge.
The default wrap mode is SCNWrapModeClamp. See constants for available modes and their effects.
(Read and Write property)

### 156.29.20 wrapT as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The wrapping behavior for the T texture coordinate.
**Notes:** Wrapping modes determine texture mapping behavior for cases where a material,Äôs texture coordinates extend outside the range from 0.0 to 1.0. For example, if you use the contentsTransform property to shrink a texture relative to the surface of a geometry, you use the wrap mode properties to determine whether the texture repeats across the surface.
The T texture coordinate measures the vertical axis of a texture image, increasing from 0.0 at the bottom

of the image to 1.0 at the top.
The default wrap mode is SCNWrapModeClamp.
(Read and Write property)

### 156.29.21 Constants

Filter Modes

| Constant | Value | Description |
|---|---|---|
| SCNFilterModeLinear | 2 | Texture filtering sample texels from the neighborhood of the coordinates being sampled and linearly interpolates their colors. |
| SCNFilterModeNearest | 1 | Texture filtering returns the color from only one texel, whose location is nearest to the coordinates being sampled. |
| SCNFilterModeNone | 0 | No texture filtering is applied.<br>Only valid for the mipFilter property, specifying that SceneKit should not use mip mapping. |

Wrap Modes

| Constant | Value | Description |
|---|---|---|
| SCNWrapModeClamp | 1 | Texture coordinates are clamped to the range from 0.0 to 1.0, inclusive.<br>Texture sampling in areas whose texture coordinates would fall outside this range produces texel colors from the nearest edge of the texture image. |
| SCNWrapModeClampToBorder | 3 | Texture sampling uses texture colors for coordinates in the range from 0.0 to 1.0 (inclusive) and the material property,Äôs borderColor value otherwise.<br>Texture sampling in areas whose texture coordinates would fall outside this range uses the borderColor property instead of texel colors from the texture image. |
| SCNWrapModeMirror | 4 | Texture sampling of texture coordinates outside range from 0.0 to 1.0 should behave as if the range reverses before repeating.<br>Texture sampling in areas of the material whose texture coordinates would fall outside from 0.0 to 1.0 results in tiling both texture image and its mirror image across the surface using the material. |
| SCNWrapModeRepeat | 2 | Texture sampling uses only the fractional part of texture coordinates, passing through the range from 0.0 to (but not including) 1.0.<br>Texture sampling in areas of the material whose texture coordinates would fall outside from 0.0 to 1.0 results in tiling the texture image across the surface using the material. |

# 156.30 class SCNMatrix4MBS

## 156.30.1 class SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A representation of a 4 x 4 matrix.
**Notes:** SceneKit uses matrices to represent coordinate space transformations, which in turn can represent the combined position, rotation or orientation, and scale of an object in three-dimensional space.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr6
- MBS Xojo Plugins, version 19.1pr1

## 156.30.2 Methods

## 156.30.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:** Initializes all values with zero.

## 156.30.4 copy as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the matrix.

## 156.30.5 equals(other as SCNMatrix4MBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value that indicates whether the corresponding elements of two matrices are equal.
**Notes:** self: The first matrix to be compared.
other: The first matrix to be compared.

Returns true if each element in self is exactly equal to the corresponding element in other.

This function performs a numeric (not bitwise) comparison of each pair of elements.

### 156.30.6 Identity as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The 4 x 4 identity matrix.
**Notes:** Elements on the diagonal of this matrix are 1.0; all other elements are 0.0. Multiplying another matrix by the identity matrix or multiplying the identity matrix by another matrix yields the other matrix.

### 156.30.7 Invert as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the inverse of the specified matrix.
**Notes:** The inverse matrix of the specified matrix, or the original matrix if it is not invertible.

### 156.30.8 Multiply(other as SCNMatrix4MBS) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the product of two matrices.
**Notes:** self: The multiplicand, or left operand of matrix multiplication.
other: The multiplier, or right operand of matrix multiplication.

Returns the matrix product of the self and other parameters.

Matrix multiplication is not commutative. As a transformation, the result of multiplying a matrix A by a matrix B is the transformation represented by B followed by the transformation represented by A.

### 156.30.9 Null as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The null matrix.
**Notes:** All values are zero.

### 156.30.10 Rotate(angle as double, sx as double, sy as double, sz as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new matrix created by concatenating the specified matrix with a rotation transformation.
**Notes:** mat: The matrix to be combined with a rotation.
angle: The amount of rotation, in radians, measured counterclockwise around the rotation axis.
sx: The x-component of the rotation axis.
sy: The y-component of the rotation axis.
sz: The z-component of the rotation axis.

Returns a new matrix.

The resulting transformation consists of the specified rotation followed by the transformation represented by the mat parameter.

### 156.30.11 Rotation(angle as double, x as double, y as double, z as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a matrix describing a rotation transformation.
**Notes:** angle: The amount of rotation, in radians, measured counterclockwise around the rotation axis.
x: The x-component of the rotation axis.
y: The y-component of the rotation axis.
z: The z-component of the rotation axis.

Returns a new rotation matrix.

### 156.30.12 Scale(sx as double, sy as double, sz as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new matrix created by concatenating the specified matrix with a scale transformation.
**Example:**

```
Dim i As SCNMatrix4MBS = SCNMatrix4MBS.Identity
Dim m As SCNMatrix4MBS = i.Scale(1.0, 2.0, 3.0)
Break
```

**Notes:** self: The matrix to be combined with a translation.
sx: The scale factor in the x-axis direction.
sy: The scale factor in the y-axis direction.
sz: The scale factor in the z-axis direction.

Returns a new matrix.

The resulting transformation consists of the specified scale followed by the transformation represented by the mat parameter.

### 156.30.13 Scaling(sx as double, sy as double, sz as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a matrix describing a scale transformation.
**Example:**

```
Dim m As SCNMatrix4MBS = SCNMatrix4MBS.Scaling(1.0, 2.0, 3.0)
Break
```

**Notes:** sx: The scale factor in the x-axis direction.
sy: The scale factor in the y-axis direction.
sz: The scale factor in the z-axis direction.

Returns a new scale matrix.

### 156.30.14 Translate(tx as double, ty as double, tz as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new matrix created by concatenating the specified matrix with a translation transformation.
**Notes:** self: The matrix to be combined with a translation.
tx: The translation distance in the x-axis direction.
ty: The translation distance in the y-axis direction.
tz: The translation distance in the z-axis direction.

Returns a new matrix.

The resulting transformation consists of the specified translation followed by the transformation represented by the mat parameter.

### 156.30.15 Translation(tx as double, ty as double, tz as double) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a matrix describing a translation transformation.
**Notes:** tx: The translation distance in the x-axis direction.
ty: The translation distance in the y-axis direction.
tz: The translation distance in the z-axis direction.

Returns a new translation matrix.

### 156.30.16 Properties

### 156.30.17 IsIdentity as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value that indicates whether the specified matrix is equal to the identity matrix.
**Notes:** Returns true if the elements on the matrix,Äôs diagonal are 1.0 and all other elements are 0.0.
(Read only property)

### 156.30.18 m11 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 1/1.
**Notes:** (Read and Write property)

### 156.30.19 m12 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 1/2.
**Notes:** (Read and Write property)

### 156.30.20 m13 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 1/3.
**Notes:** (Read and Write property)

### 156.30.21 m14 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 1/4.
**Notes:** (Read and Write property)

### 156.30.22 m21 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 2/1.
**Notes:** (Read and Write property)

### 156.30.23 m22 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 2/2.
**Notes:** (Read and Write property)

### 156.30.24 m23 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 2/3.
**Notes:** (Read and Write property)

### 156.30.25 m24 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 2/4.
**Notes:** (Read and Write property)

### 156.30.26 m31 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 3/1.
**Notes:** (Read and Write property)

### 156.30.27 m32 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 3/2.
**Notes:** (Read and Write property)

### 156.30.28 m33 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 3/3.
**Notes:** (Read and Write property)

### 156.30.29 m34 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 3/4.
**Notes:** (Read and Write property)

### 156.30.30 m41 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 4/1.
**Notes:** (Read and Write property)

### 156.30.31 m42 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 4/2.
**Notes:** (Read and Write property)

### 156.30.32 m43 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 4/3.
**Notes:** (Read and Write property)

### 156.30.33 m44 as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The value at 4/4.
**Notes:** (Read and Write property)

# 156.31 class SCNNodeMBS

## 156.31.1 class SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A structural element of a scene graph, representing a position and transform in a 3D coordinate space, to which you can attach geometry, lights, cameras, or other displayable content.
**Notes:** see also
https://developer.apple.com/documentation/scenekit/scnnode
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- News from the MBS Xojo Plugins Version 22.1
- Basic Forms in MBS Xojo SceneKit Plugin
- Physics example for SceneKit in Xojo
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 19.6, page 50: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 19.6, pages 47 to 48: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, pages 48 to 50: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.4, pages 41 to 46: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 41: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 36 to 38: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 31 to 32: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 21: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 32 to 33: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 30: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

### 156.31.2 Methods

### 156.31.3 addAudioPlayer(player as SCNAudioPlayerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds the specified auto player to the node and begins playback.
**Notes:** player: An audio player object.

Positional audio effects from a player attached to a node are based on that node,Äôs position relative to the audioListener position in the scene.
After playback has completed, SceneKit automatically removes the audio player from the node.

You may need to have the scene/view in play mode to hear something.

### 156.31.4 addChildNode(node as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a node to the node,Äôs array of children.
**Notes:** child: The node to be added.

Calling this method appends the node to the end of the childNodes array.

### 156.31.5 audioPlayers as SCNAudioPlayerMBS()

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The audio players currently attached to the node.
**Notes:** Positional audio effects from a player attached to a node are based on that node,Äôs position relative to the audioListener position in the scene.
After an audio player completes playback, SceneKit automatically removes it from the node. Therefore, this array always contains audio players that are currently playing back audio.

### 156.31.6 childNodes as SCNNodeMBS()

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of the node,Äôs children in the scene graph hierarchy.

### 156.31.7 childNodeWithName(Name as String, recursively as Boolean = false) as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the first node in the node,Äôs child node subtree with the specified name.
**Notes:** name: The name of the node to search for.
recursively: True to search the entire child node subtree, or false to search only the node,Äôs immediate children.

If the recursive parameter is true, SceneKit uses a preorder traversal to search the child node subtree—that is, the block searches a node before it searches each of the node,Äôs children, and it searches all children of a node before searching any of that node,Äôs sibling nodes. Otherwise, SceneKit searches only those nodes in the node,Äôs childNodes array.

### 156.31.8 clearGeometry

MBS Mac64bit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Clears geometry property.
**Example:**

```
if MyScene <>nil then
// clear geometry for all nodes in this Scene
MyScene.rootNode.clearGeometry
end if
```

**Notes:** Recursively walks over child nodes to also clear geometry by assigning nil.
Calling this method can help to mitigate problems where textures would not unload properly due to bugs in SceneKit framework.

### 156.31.9 clone as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the node and its children.
**Notes:** This method recursively copies the node and its child nodes. For a nonrecursive copy, use the inherited copy method, which creates a copy of the node without any child nodes.
Cloning or copying a node creates a duplicate of the node object, but not the geometries, lights, cameras, and other SceneKit objects attached to it—instead, each copied node shares references to these objects.

This behavior means that you can use cloning to, for example, place the same geometry at several locations

within a scene without maintaining multiple copies of the geometry and its materials. However, it also means that changes to the objects attached to one node will affect other nodes that share the same attachments. For example, to render two copies of a node using different materials, you must copy both the node and its geometry before assigning a new material.

Multiple copies of an SCNGeometryMBS object efficiently share the same vertex data, so you can copy geometries without a significant performance penalty.

### 156.31.10 constraints as SCNConstraintMBS()

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A list of constraints affecting the node,Äôs transformation.
**Notes:** An array of constraint objects. Before rendering, SceneKit evaluates all constraints attached to a node hierarchy and adjusts node transformations appropriately.
Use the SCNLookAtConstraintMBS class to make a node always point toward another node even as both are moved, or the SCNTransformConstraintMBS class to apply arbitrary transformations at constraint evaluation time.

### 156.31.11 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a new node object.
See also:

- 156.31.12 Constructor(geometry as SCNGeometryMBS) 20232

### 156.31.12 Constructor(geometry as SCNGeometryMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a node object with the specified geometry attached.
**Notes:** geometry: The geometry to be attached.

Returns a new node object with the geometry attached, or nil if initialization is not successful.
See also:

- 156.31.11 Constructor 20232

### 156.31.13 convertPositionFromNode(position as SCNVector3MBS, node as SCNNodeMBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a position to the node,Äôs local coordinate space from that of another node.
**Notes:** position: A position in the local coordinate space defined by the other node.
node: Another node in the same scene graph as the node, or nil to convert from the scene,Äôs world coordinate space.

Returns a position in the node,Äôs local coordinate space.

### 156.31.14 convertPositionToNode(position as SCNVector3MBS, node as SCNNodeMBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a position from the node,Äôs local coordinate space to that of another node.
**Notes:** position: A position in the node,Äôs local coordinate space.
node: Another node in the same scene graph as the node, or nil to convert to the scene,Äôs world coordinate space.

Returns a position in the local coordinate space defined by the other node.

### 156.31.15 convertTransformFromNode(position as SCNMatrix4MBS, node as SCNNodeMBS) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a transform to the node,Äôs local coordinate space from that of another node.
**Notes:** transform: A transform relative to the local coordinate space defined by the other node.
node: Another node in the same scene graph as the node, or nil to convert from the scene,Äôs world coordinate space.

Returns a transform relative to the node,Äôs coordinate space.

### 156.31.16 convertTransformToNode(position as SCNMatrix4MBS, node as SCNNodeMBS) as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a transform from the node,Äôs local coordinate space to that of another node.
**Notes:** transform: A transform relative to the node,Äôs coordinate space.
node: Another node in the same scene graph as the node, or nil to convert to the scene,Äôs world coordinate space.

Returns a transform relative to the local coordinate space defined by the other node.

### 156.31.17 convertVectorFromNode(position as SCNVector3MBS, node as SCNNodeMBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a direction vector to the node,Äôs local coordinate space from that of another node.
**Notes:** vector: A direction vector in the local coordinate space defined by the other node.
node: Another node in the same scene graph as the node, or nil to convert from the scene,Äôs world coordinate space.

Returns a direction vector in the node,Äôs local coordinate space.

Unlike the convertPositionFromNode method, this method ignores the translational aspect of both nodes' transforms. As such, this method is more appropriate for use with vectors that represent only directional information, such as velocity or facing.

### 156.31.18 convertVectorToNode(position as SCNVector3MBS, node as SCNNodeMBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Converts a direction vector from the node,Äôs local coordinate space to that of another node.
**Notes:** vector: A direction vector in the node,Äôs local coordinate space.
node: Another node in the same scene graph as the node, or nil to convert to the scene,Äôs world coordinate space.

Returns a direction vector in the local coordinate space defined by the other node.

Unlike the convertPositionToNode method, this method ignores the translational aspect of both nodes' transforms. As such, this method is more appropriate for use with vectors that represent only directional information, such as velocity or facing.

### 156.31.19 copy as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the node.

### 156.31.20 flattenedClone as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an optimized copy of the node and its children.
**Notes:** A new single node containing the combined geometries and materials of the node and its child node subtree.

Rendering complex node hierarchies can incur a performance cost. Each geometry and material requires a separate draw command to be sent to the GPU, and each draw command comes with a performance overhead. If you plan for a portion of your scene,Äôs node hierarchy to remain static (with respect to itself, if not the rest of the scene), use this method to create a single node containing all elements of that node hierarchy that SceneKit can render using fewer draw commands.

### 156.31.21 hitTestWithSegment(PointA as SCNVector3MBS, PointB as SCNVector3MBS, Options as Dictionary = nil) as SCNHitTestResultMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches the node,Äôs child node subtree for objects intersecting a line segment between two specified points.
**Notes:** pointA: An endpoint of the line segment to search along, specified in the node,Äôs local coordinate system.
pointB: The other endpoint of the line segment to search along, specified in the node,Äôs local coordinate system.
options: A dictionary of options affecting the search. See Key shared methods in SCNHitTestResultMBS class for acceptable values.

Returns an array of SCNHitTestResultMBS objects representing search results.

Hit-testing is the process of finding elements of a scene located along a specified line segment in the scene,Äôs coordinate space (or that of a particular node in the scene). For example, you can use this method to determine whether a projectile launched by a game character will hit its target.

To search for the scene element corresponding to a two-dimensional point in the rendered image, use the renderer,Äôs hitTest method instead.

### 156.31.22 insertChildNode(newNode as SCNNodeMBS, atIndex as Integer)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a node to the node,Äôs array of children at a specified index.

### 156.31.23 localRotateBy(rotation as SCNVector4MBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the node's orientation relative to its current orientation.
**Notes:** rotation: The axis and angle of rotation to apply, in node-local space, expressed as a quaternion.

This method rotates the node according to its pivot transform.
The effects of this method are animatable; that is, calling this method during an implicit-animation transaction animates the rotation effect.

Available in macOS 10.13 or later.

### 156.31.24 localTranslateBy(translation as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the node's position relative to its current position.
**Notes:** translation: The distance, in node-local space, by which to move the node.

The effects of this method are animatable; that is, calling this method during an implicit-animation transaction animates the move.

Available in macOS 10.13 or later.

### 156.31.25 lookAt(worldTarget as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the node's orientation so that its local forward vector points toward the specified location.

**Notes:** worldTarget: The point, in world space, to face the node toward.

Using this method is equivalent to calling the other lookAt method and passing the node's worldUp and localFront vectors for the corresponding parameters.
The effects of this method are animatable; that is, calling this method during an implicit-animation transaction animates the rotation effect.

Available in macOS 10.13 or later.
See also:

- 156.31.26 lookAt(worldTarget as SCNVector3MBS, worldUp as SCNVector3MBS, localFront as SCNVector3MBS) 20237

### 156.31.26 lookAt(worldTarget as SCNVector3MBS, worldUp as SCNVector3MBS, localFront as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the node's orientation so that the specified forward vector points toward the specified location.
**Notes:** worldTarget: The point, in world space, to face the node toward.
worldUp: The direction vector, in world space, that should appear as "up" from the rotated node's point of view.
localFront: The direction vector, in the node's local space, that should orient toward the target point.

The effects of this method are animatable; that is, calling this method during an implicit-animation transaction animates the rotation effect.

Available in macOS 10.13 or later.
See also:

- 156.31.25 lookAt(worldTarget as SCNVector3MBS) 20236

### 156.31.27 node as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a node object.
**Notes:** Returns a new node object, or nil if initialization is not successful.

### 156.31.28 nodeWithGeometry(geometry as SCNGeometryMBS) as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a node object with the specified geometry attached.
**Notes:** Returns a new node object with the geometry attached, or nil if initialization is not successful.

### 156.31.29 removeAllActions

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Ends and removes all actions from the node.
**Notes:** When SceneKit removes an action from a node, it skips any remaining animation the action would perform. However, any changes the action has already made to the node,Äôs state remain in effect.

### 156.31.30 removeAllAudioPlayers

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes all audio players attached to the node, stopping playback.

### 156.31.31 removeAudioPlayer(player as SCNAudioPlayerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the specified audio player from the node, stopping playback.
**Notes:** player: An audio player attached to the node.

This method has no effect if the player parameter does not reference an audio player directly attached to the node.

### 156.31.32 removeFromParentNode

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes the node from its parent,Äôs array of child nodes.
**Notes:** Removing nodes from the node hierarchy serves two purposes. Nodes own their contents (child nodes or attached lights, geometries, and other objects), so deallocating unneeded nodes can reduce memory usage. Additionally, SceneKit does more work at rendering time with a large, complex node hierarchy, so removing nodes whose contents you don,Äôt need to display can improve rendering performance.

### 156.31.33 replaceChildNode(oldNode as SCNNodeMBS, newNode as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a child from the node,Äôs array of children and inserts another node in its place.
**Notes:** oldNode: The existing child node to be replaced.
newNode: The node with which to replace the child node.

If both the oldNode and newNode nodes are children of the node, calling this method swaps their positions in the array. Note that removing a node from the node hierarchy may result in it being deallocated.
Calling this method results in undefined behavior if the child parameter does not refer to a child of this node.

### 156.31.34 rotateBy(worldRotation as SCNVector4MBS, worldTarget as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Changes the node's position and orientation, relative to its current transform, through a rotation around the specified point in scene space.
**Notes:** worldRotation: The axis and angle of rotation to apply, in scene space, expressed as a quaternion.
worldTarget: The center point, in scene space, about which to rotate.

The effects of this method are animatable; that is, calling this method during an implicit-animation transaction animates the rotation effect.

Available in macOS 10.13 or later.

### 156.31.35 runAction(action as SCNActionMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an action to the list of actions executed by the node.
**Notes:** action: The action to be performed.

SceneKit begins running a newly added action when it prepares to render the next frame.
See also:

- 156.31.36 runAction(action as SCNActionMBS, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20240
- 156.31.37 runAction(action as SCNActionMBS, key as string) 20240

- 156.31.38 runAction(action as SCNActionMBS, key as string, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20241

### 156.31.36 runAction(action as SCNActionMBS, del as SCNNodeRunActionCompletedMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an action to the list of actions executed by the node. SceneKit calls the specified block when the action completes.
**Notes:** action: The action to be performed.
del: The method that SceneKit calls when the action completes.
tag: The tag is passed through to delegate method.

The new action is processed the next time SceneKit prepares to render a frame.
SceneKit calls your method after the action,Äôs duration is complete. For example, in a game you could use this method to show a Game Over message after performing a fade-out action on a node that displays a player character.
See also:

- 156.31.35 runAction(action as SCNActionMBS) 20239
- 156.31.37 runAction(action as SCNActionMBS, key as string) 20240
- 156.31.38 runAction(action as SCNActionMBS, key as string, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20241

### 156.31.37 runAction(action as SCNActionMBS, key as string)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an identifiable action to the list of actions executed by the node.
**Notes:** action: The action to be performed.
key: A unique key used to identify the action.

This method is identical to runAction, but the action is stored and identified so that you can retrieve or cancel it later. If an action using the same key is already running, SceneKit removes it before adding the new action.
See also:

- 156.31.35 runAction(action as SCNActionMBS) 20239
- 156.31.36 runAction(action as SCNActionMBS, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20240
- 156.31.38 runAction(action as SCNActionMBS, key as string, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20241

### 156.31.38 runAction(action as SCNActionMBS, key as string, del as SCNNodeRunActionCompletedMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an identifiable action to the list of actions executed by the node.
**Notes:** SceneKit calls the specified block when the action completes.

action: The action to be performed.
key: A unique key used to identify the action.
del: A completion block called when the action completes.
tag: The tag is passed through to delegate method.

This method is identical to runAction, but the action is stored and identified so that you can retrieve or cancel it later. If an action using the same key is already running, SceneKit removes it before adding the new action.
SceneKit calls your method after the action,Äôs duration is complete. For example, you can use this method with a wait action to execute some code after a timed delay. If during the delay period you need to prevent the code from running, use the removeActionForKey method to cancel it.
See also:

- 156.31.35 runAction(action as SCNActionMBS) 20239
- 156.31.36 runAction(action as SCNActionMBS, del as SCNNodeRunActionCompletedMBS, tag as variant = nil) 20240
- 156.31.37 runAction(action as SCNActionMBS, key as string) 20240

### 156.31.39 SCNModelTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix for transforming coordinates from model space to scene (or world) space.

### 156.31.40 SCNModelViewProjectionTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix containing the concatenation of the Model, View, and Projection transformations.

### 156.31.41 SCNModelViewTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix containing the concatenation of the Model and View transformations.

### 156.31.42 SCNNormalTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix for transforming surface normal vectors from model space to view (or eye) space.

### 156.31.43 SCNProjectionTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix for transforming coordinates from view (or eye) space to clip space.

### 156.31.44 SCNViewTransform as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys are used for the 'semantic' argument of SCNProgramMBS.setSemantic method.
**Notes:** Transforms are SCNMatrix4 wrapped in NSValue objects.
A 4 x 4 matrix for transforming coordinates from scene (or world) space to view (or eye) space.

### 156.31.45 setConstraints(constraints() as SCNConstraintMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the list of constraints affecting the node,Äôs transformation.
**Notes:** An array of constraint objects. Before rendering, SceneKit evaluates all constraints attached to a node hierarchy and adjusts node transformations appropriately.
Use the SCNLookAtConstraintMBS class to make a node always point toward another node even as both are moved, or the SCNTransformConstraintMBS class to apply arbitrary transformations at constraint eval-

uation time.

### 156.31.46 Properties

### 156.31.47 Camera as SCNCameraMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The camera attached to the node.
**Notes:** To use a camera for displaying a scene, set the the pointOfView property of the view (or layer or renderer) displaying the scene to the node containing the camera. A camera looks in the direction of the node,Äôs negative z-axis, so you aim the camera by changing the position and orientation of the node containing it. You control geometric and optical parameters of the camera—projection, field of view, and depth of field—using the attached SCNCameraMBS object.
(Read and Write property)

### 156.31.48 CastsShadow as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit renders the node,Äôs contents into shadow maps.
**Notes:** SceneKit renders shadows by rendering a shadow map image containing silhouettes of the scene,Äôs contents, and then projecting that image onto the scene. SceneKit performs this process once for each SCNLight object in the scene whose castsShadow property is true. Because shadow map rendering re-renders portions of the scene, it incurs a performance cost. To minimize this performance cost, exclude nodes from shadow map rendering by setting the node,Äôs castsShadow property to false.

For more details on shadow rendering, see SCNLight.
(Read and Write property)

### 156.31.49 categoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mask that defines which categories the node belongs to.
**Notes:** You can assign each node in a scene to one or more categories, where each category corresponds to a bit in the bit mask. You define the mask values used in your app. When SceneKit renders a scene, it compares the each node,Äôs categoryBitMask property with the category bit masks of every other object that participates in the rendering process—lights, cameras, and techniques—using a bitwise AND operation. If the result is a nonzero value, SceneKit includes the node when rendering. The default category bit mask is 1.

Use a node,Äôs category bit mask together with:

- An SCNLightMBS object,Äôs categoryBitMask property to exclude the node from that light,Äôs illumination
- An SCNCameraMBS object,Äôs categoryBitMask property to make the node invisible to that camera
- The category bit masks in an SCNTechniqueMBS object,Äôs definition dictionary to include or exclude the node from phases of a multipass rendering technique

This property does not affect SceneKit,Äôs physics simulation. To include or exclude a node from physics interactions, use the categoryBitMask property of the node,Äôs physicsBody and physicsField objects.
(Read and Write property)

### 156.31.50 EulerAngles as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node,Äôs orientation, expressed as pitch, yaw, and roll angles in radians. Animatable.
**Notes:** The order of components in this vector matches the axes of rotation:

- Pitch (the x component) is the rotation about the node,Äôs x-axis.
- Yaw (the y component) is the rotation about the node,Äôs y-axis.
- Roll (the z component) is the rotation about the node,Äôs z-axis.

SceneKit applies these rotations relative to the node,Äôs pivot property in the reverse order of the components: first roll, then yaw, then pitch. The rotation, eulerAngles, and orientation properties all affect the rotational aspect of the node,Äôs transform property. Any change to one of these properties is reflected in the others.
You can animate changes to this property,Äôs value. See Animating SceneKit Content.
(Read and Write property)

### 156.31.51 focusBehavior as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The focus behavior for a node.
**Notes:** (Read and Write property)

### 156.31.52 Geometry as SCNGeometryMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The geometry attached to the node.
**Notes:** A node can have only one geometry attached to it. To combine geometries so they can be controlled or animated together, create a node with no geometry and add other nodes to it.
Animating the node,Äôs geometric properties can move, rotate, stretch and scale its geometry. For more advanced animations of a node,Äôs geometry, use its morpher and skinner objects.
(Read and Write property)

### 156.31.53 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 156.31.54 Hidden as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines the visibility of the node,Äôs contents. Animatable.
**Notes:** The default value of this property is false, specifying that SceneKit should render geometries and use lights attached to the node or its children. Change this property,Äôs value to true to exclude attached geometries and lights from rendering. (Cameras attached to the node or its children are not affected by this property.) Hiding a node also hides its child nodes recursively.

You can animate changes to this property,Äôs value. See Animating SceneKit Content. Hiding or showing a node in an animation results in a fade-in or fade-out effect.
(Read and Write property)

### 156.31.55 Light as SCNLightMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The light attached to the node..
**Notes:** A node can have only one light attached to it. To combine lights so they can be controlled or animated together, create a node with no light and add other nodes to it.
(Read and Write property)

### 156.31.56 localFront as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unit vector SceneKit treats as "forward" in local space for all nodes.
**Notes:** The "forward" direction of a node affects cameras and directional lighting attached to a node, as well as relative orientation and movement effects such as lookAt, SCNLookAtConstraint, and SCNBillboardConstraint.
This vector is always (0, 0, -1) for all nodes, but you can use this class property when it's convenient to refer to directions symbolically.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.57 localRight as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The direction SceneKit treats as "right" in local space for all nodes.
**Notes:** No SceneKit features depend directly on this direction's definition—it's simply a natural consequence of recognizing "forward" and "up" directions for use with cameras, directional lighting, and relative orientation operations.
This vector is always (1, 0, 0) for all nodes, but you can use this class property when it's convenient to refer to directions symbolically.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.58 localUp as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The direction SceneKit treats as "up" in local space for all nodes.
**Notes:** The "up" direction of a node affects cameras attached to a node, as well as relative orientation and movement effects such as lookAt, SCNLookAtConstraint, and SCNBillboardConstraint.
This vector is always (0, 1, 0) for all nodes, but you can use this class property when it's convenient to refer to directions symbolically.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.59 movabilityHint as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A value that indicates how SceneKit should handle the node when rendering movement-related effects.
**Notes:** This property controls how the node contributes to various motion-related effects during rendering. The default value is SCNMovabilityHintFixed. If the movability hint is SCNMovabilityHintMovable:

- The node,Äôs content is not affected by motion blur effects. (See the motionBlurIntensity camera property, which applies motion blur effects for camera movement but not subject movement.)
- The node does not contribute to environmental lighting of other objects. Environmental lighting is an aspect of physically based rendering (see SCNLightingModelPhysicallyBased), in which surfaces tend to pick up the color of other scene content around them. SceneKit performs environmental lighting by rendering light probes—small, omnidirectional snapshots of the scene,Äôs contents, as visible from at various points around the scene. Light probes are static, so nodes that are expected to move should not contribute to the lighting environment for other surfaces.

This value is merely a hint that communicates to SceneKit,Äôs rendering system about how you want to move content in your scene; it does not affect your ability to change the node,Äôs position or add animations or physics to the node.
(Read and Write property)

### 156.31.60 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A name associated with the node.
**Notes:** You can provide a descriptive name for a node to make managing your scene graph easier. Nodes loaded from a scene file may have names assigned by an artist using a 3D authoring tool. Use the childNodeWithName or childNodesPassingTest method to retrieve a node from a scene graph by its name, or the SCNSceneSource class to examine nodes in a scene file without loading its scene graph.

The names of nodes and their attached objects are saved when you export a scene to a file using its writeToURL method, and appear in the Xcode scene editor. The SceneKit statistics view (see showsStatistics) also shows the names of nodes with attached cameras.
(Read and Write property)

### 156.31.61 Opacity as Double

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The opacity value of the node. Animatable.
**Notes:** Possible values are between 0.0 (fully transparent) and 1.0 (fully opaque). The default is 1.0.
You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.31.62 orientation as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node,Äôs orientation, expressed as a quaternion. Animatable.
**Notes:** The rotation, eulerAngles, and orientation properties all affect the rotational aspect of the node,Äôs transform property. Any change to one of these properties is reflected in the others.
You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.31.63 parentNode as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node,Äôs parent in the scene graph hierarchy.
**Notes:** For a scene,Äôs rootNode object, the value of this property is nil.
(Read only property)

### 156.31.64 Paused as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether to run actions and animations attached to the node and its child nodes.
**Notes:** The default value of this property is false, specifying that SceneKit should continuously update the node,Äôs contents. Pausing a node pauses any running animations or actions. This property applies to the actions and animations attached to the node itself and those attached to any of its child or descendant nodes.
(Read and Write property)

### 156.31.65 physicsBody as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics body associated with the node.
**Notes:** The default value is nil, specifying that the node does not participate in the physics simulation at all. If you provide a physics body, SceneKit updates the node,Äôs position and orientation each time

it processes a step of its physics simulation. For more information on SceneKit,Äôs physics system, see SCNPhysicsWorldMBS.
(Read and Write property)

### 156.31.66 physicsField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics field associated with the node.
**Notes:** Physics fields apply forces to other physics bodies in a specified area around their node. For example, a SCNPhysicsDragField field slows all physics bodies that pass through its area. For a full list of field types and their effects, see SCNPhysicsFieldMBS.

A node can contain both a physics body that defines collision behavior and a physics field that defines forces in its area. For example, two nodes containing physics bodies and radial gravity fields will be attracted to one another, but will bounce off each other when they collide.
(Read and Write property)

### 156.31.67 pivot as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The pivot point for the node,Äôs position, rotation, and scale. Animatable.
**Notes:** A node,Äôs pivot is the transformation between its coordinate space and that used by its position, rotation, and scale properties. The default pivot is SCNMatrix4MBS.Identity, specifying that the node,Äôs position locates the origin of its coordinate system, its rotation is about an axis through its center, and its scale is also relative to that center point.
Changing the pivot transform alters these behaviors in many useful ways. You can:

- Offset the node,Äôs contents relative to its position. For example, by setting the pivot to a translation transform you can position a node containing a sphere geometry relative to where the sphere would rest on a floor instead of relative to its center.
- Move the node,Äôs axis of rotation. For example, with a translation transform you can cause a node to revolve around a faraway point instead of rotating around its center, and with a rotation transform you can tilt the axis of rotation.
- Adjust the center point and direction for scaling the node. For example, with a translation transform you can cause a node to grow or shrink relative to a corner instead of to its center.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.31.68 Position as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The translation applied to the node. Animatable.
**Notes:** The node,Äôs position locates it within the coordinate system of its parent, as modified by the node,Äôs pivot property. The default position is the zero vector, indicating that the node is placed at the origin of the parent node,Äôs coordinate system.
(Read and Write property)

### 156.31.69 presentationNode as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A node object representing the state of the node as it currently appears onscreen.
**Notes:** When you use implicit animation (see SCNTransaction) to change a node,Äôs properties, those node properties are set immediately to their target values, even though the animated node content appears to transition from the old property values to the new. During the animation SceneKit maintains a copy of the node, called the presentation node, whose properties reflect the transitory values determined by any in-flight animations currently affecting the node. The presentation node,Äôs properties provide a close approximation to the version of the node that is currently displayed. SceneKit also uses the presentation node when computing the results of explicit animations, physics, and constraints.

Do not modify the properties of the presentation node. (Attempting to do so results in undefined behavior.) Instead, you use the presentation node to read current animation values—for example, to create a new animation starting at those values.

The presentation node has no parent or child nodes. To access animated properties of related nodes, use the node,Äôs own parentNode and childNodes properties and the presentationNode property of each related node.
(Read only property)

### 156.31.70 RenderingOrder as Integer

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The order the node,Äôs content is drawn in relative to that of other nodes.
**Notes:** Nodes with greater rendering orders are rendered last. Defaults to zero.
(Read and Write property)

### 156.31.71 Rotation as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node,Äôs orientation, expressed as a rotation angle about an axis. Animatable.
**Notes:** The four-component rotation vector specifies the direction of the rotation axis in the first three components and the angle of rotation (in radians) in the fourth. The default rotation is the zero vector, specifying no rotation. Rotation is applied relative to the node,Äôs pivot property.
The rotation, eulerAngles, and orientation properties all affect the rotational aspect of the node,Äôs transform property. Any change to one of these properties is reflected in the others.
(Read and Write property)

### 156.31.72 Scale as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The scale factor applied to the node. Animatable.
**Notes:** Each component of the scale vector multiplies the corresponding dimension of the node,Äôs geometry. The default scale is 1.0 in all three dimensions. For example, applying a scale of (2.0, 0.5, 2.0) to a node containing a cube geometry reduces its height and increases its width and depth. Scaling is applied relative to the node,Äôs pivot property.
(Read and Write property)

### 156.31.73 transform as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transform applied to the node relative to its parent. Animatable.
**Notes:** The transformation is the combination of the node,Äôs rotation, position, and scale properties. The default transformation is SCNMatrix4MBS.Identity.

When you set the value of this property, the node,Äôs rotation, orientation, eulerAngles, position, and scale properties automatically change to match the new transform, and vice versa. SceneKit can perform this conversion only if the transform you provide is a combination of rotation, translation, and scale operations. If you set the value of this property to a skew transformation or to a nonaffine transformation, the values of these properties become undefined. Setting a new value for any of these properties causes SceneKit to compute a new transformation, discarding any skew or nonaffine operations in the original transformation.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.31.74 WorldFront as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The "forward" (-Z) direction vector relative to the node, expressed in world space.
**Notes:** Reading this property is equivalent to reading the localFront class property and using the convertVectorToNode or convertVectorFromNode method to convert that vector from the node's local coordinate space to the scene's world coordinate space.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.75 worldOrientation as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node's orientation relative to the scene's world coordinate space.
**Notes:** This quaternion isolates the rotational aspect of the node's worldTransform matrix, which in turn is the conversion of the node's transform from local space to the scene's world coordinate space. That is, it expresses the difference in axis and angle of rotation between the node and the scene's rootNode.
(Read and Write property)

### 156.31.76 WorldPosition as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node's position relative to the scene's world coordinate space.
**Notes:** his vector isolates the translational aspect of the node's worldTransform matrix, which in turn is the conversion of the node's transform from local space to the scene's world coordinate space. That is, it expresses the x, y, and z offsets of the node's position from that of the scene's rootNode, and is equivalent to reading the node's position vector and converting it to world space with the convertPositionFromNode or convertPositionToNode method.
(Read and Write property)

### 156.31.77 WorldRight as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The "right" (+X) direction vector relative to the node, expressed in world space.
**Notes:** Reading this property is equivalent to reading the localRight class property and using the convertVectorToNode or convertVectorFromNode method to convert that vector from the node's local coordinate space to the scene's world coordinate space.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.78 worldTransform as SCNMatrix4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The world transform applied to the node.
**Notes:** A world transform is the node,Äôs coordinate space transform relative to the scene,Äôs coordinate space. This transform is the concatenation of the node,Äôs transform property with that of its parent node, the parent,Äôs parent, and so on up to the rootNode object of the scene.
(Read and Write property)

### 156.31.79 WorldUp as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The "up" (+Y) direction vector relative to the node, expressed in world space.
**Notes:** Reading this property is equivalent to reading the localUp class property and using the convertVectorToNode or convertVectorFromNode method to convert that vector from the node's local coordinate space to the scene's world coordinate space.

Available in macOS 10.13 or later.
(Read only property)

### 156.31.80 Constants

Movability Hint

| Constant | Value | Description |
|---|---|---|
| SCNMovabilityHintFixed | 0 | The node is not expected to move over time. |
| SCNMovabilityHintMovable | 1 | The node is expected to move over time. |

Focus Behavior Options

| Constant | Value | Description |
|---|---|---|
| SCNNodeFocusBehaviorFocusable | 2 | Node is focusable and prevents nodes that it visually obscures from becomin focusable. |
| SCNNodeFocusBehaviorNone | 0 | Node is not focusable. |
| SCNNodeFocusBehaviorOccluding | 1 | Node is not focusable and prevents nodes that it visually obscures from becom ing focusable. |

### 156.31.81 Delegates

### 156.31.82 SCNNodeRunActionCompletedMBS(node as SCNNodeMBS, action as SCNActionMBS, key as string, tag as variant)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The delegate for the runAction method.

# 156.32 class SCNPhysicsBallSocketJointMBS

## 156.32.1 class SCNPhysicsBallSocketJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A physics behavior that connects two physics bodies and allows them to pivot around each other in any direction.
**Notes:** A ball and socket joint has three rotational degrees of freedom and zero translational degrees of freedom. You can also use a ball and socket joint to pin a body to a specific location in the coordinate space of the node containing it while allowing it to rotate freely.

Available in MacOS 10.10.
Subclass of the SCNPhysicsBehaviorMBS class.

## 156.32.2 Methods

## 156.32.3 Constructor(body as SCNPhysicsBodyMBS, anchor as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a ball and socket joint that anchors a single physics body in space and allows it to rotate freely around an anchor point.
**Notes:** body: The physics body to be controlled by the joint.
anchor: The point the body pivots around, relative to the node containing it.

Returns a new ball-and-socket-joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.32.4 Constructor(bodyA as SCNPhysicsBodyMBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, anchorB as SCNVector3MBS) 20255

## 156.32.4 Constructor(bodyA as SCNPhysicsBodyMBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, anchorB as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a ball and socket joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.

anchorA: The point at which the joint connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.
anchorB: The point at which the joint connects, relative to the node containing the second body.

Returns a new ball-and-socket-joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior: method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.32.3 Constructor(body as SCNPhysicsBodyMBS, anchor as SCNVector3MBS) 20255

### 156.32.5 jointWithBody(body as SCNPhysicsBodyMBS, anchor as SCNVector3MBS) as SCNPhysicsBallSocketJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a ball and socket joint that anchors a single physics body in space and allows it to rotate freely around an anchor point.
**Notes:** body: The physics body to be controlled by the joint.
anchor: The point the body pivots around, relative to the node containing it.

Returns a new ball-and-socket-joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.32.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, anchorB as SCNVector3MBS) as SCNPhysicsBallSocketJointMBS 20256

### 156.32.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, anchorB as SCNVector3MBS) as SCNPhysicsBallSocketJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a ball and socket joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.
anchorA: The point at which the joint connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.

anchorB: The point at which the joint connects, relative to the node containing the second body.

Returns a new ball-and-socket-joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior: method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.32.5 jointWithBody(body as SCNPhysicsBodyMBS, anchor as SCNVector3MBS) as SCNPhysicsBallSocketJointMBS 20256

### 156.32.7 Properties

### 156.32.8 anchorA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the joint connects, relative to the node containing the first body.
**Notes:** (Read and Write property)

### 156.32.9 anchorB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the joint connects, relative to the node containing the second body.
**Notes:** (Read and Write property)

### 156.32.10 bodyA as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first physics body connected by the joint.
**Notes:** (Read only property)

### 156.32.11 bodyB as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second physics body connected by the joint.
**Notes:** This property,Äôs value is nil if the joint was created using the Constructor without bodyB param-

eter.
(Read only property)

# 156.33 class SCNPhysicsBehaviorMBS

## 156.33.1 class SCNPhysicsBehaviorMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The abstract superclass for joints, vehicle simulations, and other high-level behaviors that incorporate multiple physics bodies.
**Notes:** An SCNPhysicsBehavior object defines a high-level behavior for one or more physics bodies, modifying the results of the physics simulation. Behaviors include joints that connect multiple bodies so they move together and vehicle definitions that cause a body to roll like a car. You never use this class directly; instead, you instantiate one of the subclasses that defines the kind of behavior you want to add to your physics world.Table 1 describes the kinds of behaviors you can create in SceneKit.

Behavior classes implemented by SceneKit

| Class Name | Description |
|---|---|
| SCNPhysicsHingeJointMBS | Connects two bodies and allows them to pivot around each other on a single axis. |
| SCNPhysicsBallSocketJointMBS | Connects two bodies and allows them to pivot around each other in any direction. |
| SCNPhysicsSliderJointMBS | Connects two bodies and allows them to slide or rotate relative to one another. Slider joints can also work as motors, applying a force or torque between the two bodies. |
| SCNPhysicsVehicleMBS | Simulates a physics body as the chassis of a car or other wheeled vehicle. You control a vehicle in terms of steering, braking, and acceleration, and use SCNPhysicsVehicleWheelMBS objects to define the appearance and physical properties of each of its wheels. |

To use a physics behavior, you follow these steps:
1. Create SCNPhysicsBodyMBS objects and attach them to each node that participates in the behavior.
2. Create and configure a behavior object using one of the subclasses listed in above.
3. Add the behavior to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 156.33.2 Methods

## 156.33.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 156.33.4 Properties

### 156.33.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

# 156.34 class SCNPhysicsBodyMBS

## 156.34.1 class SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics simulation attributes attached to a scene graph node.
**Notes:** Overview
When SceneKit prepares to render a new frame, it performs physics calculations on physics bodies attached to nodes in the scene. These calculations include gravity, friction, and collisions with other bodies. You can also apply your own forces and impulses to a body. After SceneKit completes these calculations, it updates the positions and orientations of the node objects before rendering the frame.

To add physics to a node, create and configure an SCNPhysicsBody object and then assign it to the physicsBody property of the SCNNode object. A physics body must be associated with a node object before you apply forces or impulses to it.

A Body,Äôs Physical Characteristics
The SCNPhysicsBody class defines the physical characteristics for the body when it is simulated by the scene. Three properties are most important for physics simulation:

- The type property, which determines how the body interacts with forces and other bodies in the simulation. Static bodies are unaffected by forces and collisions and cannot move. Dynamic bodies are affected by forces and collisions with other body types. Kinematic bodies are not affected by forces or collisions, but by moving them directly you can cause collisions that affect dynamic bodies.
- The physicsShape property, which defines the three-dimensional form of the body for collision detection purposes. Physics simulations run faster when using simple shapes instead of the fine detail of a node,Äôs visible geometry. Typically, you set a body,Äôs physics shape to a bounding box, sphere, or primitive shape that roughly matches its node,Äôs visible content. For details on creating physics shapes, see SCNPhysicsShape.
- The kinematicBody property. Applying a force or torque to a dynamic body results in an acceleration (or angular acceleration) proportional to its mass.

All values in SceneKit,Äôs physics simulation use the International System of Units (SI): The unit of mass is the kilogram; the units of force, impulse, and torque are the newton, newton-second, and newton-meter; and the unit of distance for node positions and sizes is the meter. Note that you need not attempt to provide realistic values for physical quantities—use whatever values produce the behavior or gameplay you,Äôre looking for.
For a dynamic body, you can control how the body is affected by forces or collisions. See Defining How Forces Affect a Physics Body.

Defining a Body,Äôs Category and Collisions
When you design a game that uses physics, you define the different categories of physics objects that appear

in the scene. You define different categories of physics bodies for the behaviors your want for your app. A body can be assigned to as many of these categories as you want. In addition to declaring its own categories, a physics body also declares which categories of bodies it interacts with.
Use the categoryBitMask and collisionBitMask properties to define an object,Äôs collision behavior. The constants listed in SCNPhysicsCollisionCategory provide default values for these properties. In addition, with the contactTestBitMask property you can define interactions where a pair of bodies generates contact messages (see the SCNPhysicsContactDelegate protocol) without the bodies being affected by the collision.

Related Physics Classes
Physics fields create forces that affect all bodies in an area, such as vortices and gravitational attraction. For details and a list of available field types, see SCNPhysicsField.
You can add higher-level behaviors that control interactions between multiple bodies, such as joints and wheeled vehicles. For details and a list of available behaviors, see SCNPhysicsBehavior.
A scene,Äôs physicsWorld property holds an SCNPhysicsWorld object that manages physics characteristics that affect the entire scene.

Physics and the Rendering Loop
SceneKit evaluates its physics simulation as part of the rendering loop described in SCNSceneRendererDelegate. On each pass through this loop, SceneKit determines the state of all nodes with attached physics bodies, and simulates the effects of physics on those bodies for one time step—for example, by updating the position or rotation of a body based on its velocity and angular velocity. After simulating physics, SceneKit applies the results of the physics simulation to the scene for display.

Because you can animate SceneKit content not only through physics, but also through actions and implicitly and explicitly defined animations, SceneKit applies the results of physics simulation not to the SCNNode objects in your scene, but to each node,Äôs presentationNode object that represents its currently displayed state. As such, changing properties of a node that are affected by physics requires special consideration.

If you change the transform value—or any of the other properties that are components of the transform, such as position and rotation—of a node affected by physics, SceneKit resets the physics simulation for that node. If you want to change only one component of the transform, while leaving the others at their physics-simulated values, copy the presentation node,Äôs transform before making changes.

see also
https://developer.apple.com/documentation/scenekit/scnphysicsbody?language=objc
**Blog Entries**

- Physics example for SceneKit in Xojo

### 156.34.2 Methods

### 156.34.3 applyForce(direction as SCNVector3MBS, atPosition as SCNVector3MBS, impulse as Boolean)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies a force or impulse to the body at a specific point.
**Notes:** direction: The direction and magnitude of the force (in newtons) or of the impulse (in newton-seconds).
position: The point on the body where the force or impulse should be applied, in the local coordinate system of the SCNNodeMBS object containing the physics body.
impulse: True to apply an instantaneous change in momentum; false to apply a force that affects the body at the end of the simulation step.

Applying a force or impulse to a body at a position other than its center of mass may impart both linear and angular acceleration, depending on how the body is situated in the physics world and the other forces acting upon it.
The impulse parameter determines how this method contributes to the physics simulation:

- If you specify true, SceneKit treats the direction parameter as an impulse, measured in newton-seconds, and accelerates the physics body immediately. Use this option to simulate instantaneous effects such as launching a projectile.

- If you specify false, SceneKit treats the direction parameter as a force, measured in newtons. At the end of each simulation step (by default, a step occurs once for each frame in the rendering loop), SceneKit sums all forces applied to the physics body during that step and accelerates the body according to the net effect of those forces. Use this option when you want to simulate continuous forces on the body by calling applyForce on each simulation step.

Note
The impulse parameter effectively changes the unit of magnitude. A value that results in a certain acceleration when applied continuously on each frame of the simulation results in much less acceleration if applied only during a single frame.

As with all physical quantities in SceneKit, you need not use realistic force measurements in your app—the effects of the physics simulation depend on the relative differences between forces, not on their absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.
See also:

- 156.34.4 applyForce(direction as SCNVector3MBS, impulse as Boolean) 20264

### 156.34.4 applyForce(direction as SCNVector3MBS, impulse as Boolean)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies a force or impulse to the body at its center of mass.
**Notes:** direction: The direction and magnitude of the force (in newtons) or of the impulse (in newton-seconds).
impulse: True to apply an instantaneous change in momentum; false to apply a force that affects the body at the end of the simulation step.

Applying a force or impulse to a body imparts a linear acceleration proportional to its mass.
The impulse parameter determines how this method contributes to the physics simulation:

- If you specify true, SceneKit treats the direction parameter as an impulse, measured in newton-seconds, and accelerates the physics body immediately. Use this option to simulate instantaneous effects such as launching a projectile.
- If you specify false, SceneKit treats the direction parameter as a force, measured in newtons. At the end of each simulation step (by default, a step occurs once for each frame in the rendering loop), SceneKit sums all forces applied to the physics body during that step and accelerates the body according to the net effect of those forces. Use this option when you want to simulate continuous forces on the body by calling applyForce:impulse: on each simulation step.

Note
The impulse parameter effectively changes the unit of magnitude. A value that results in a certain acceleration when applied continuously on each frame of the simulation results in much less acceleration if applied only during a single frame.

As with all physical quantities in SceneKit, you need not use realistic force measurements in your app—the effects of the physics simulation depend on the relative differences between forces, not on their absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.
See also:

- 156.34.3 applyForce(direction as SCNVector3MBS, atPosition as SCNVector3MBS, impulse as Boolean) 20263

### 156.34.5 applyTorque(torque as SCNVector4MBS, impulse as Boolean)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies a net torque or a change in angular momentum to the body.
**Notes:** torque: The direction and magnitude of the torque (in newton-meters) or of the change of angular momentum (in newton-meter-seconds), relative to the world coordinate space of the scene.
impulse: True to apply an instantaneous change in angular momentum; false to apply a torque that affects

the body at the end of the simulation step.

Applying a torque to a body changes its angular velocity by an amount related to its mass and shape, rotating it without affecting its linear acceleration. Each component of the torque vector relates to rotation about the corresponding axis in the local coordinate system of the SCNNode object containing the physics body. For example, applying a torque of { 0.0, 0.0, 1.0 } causes a node to spin counterclockwise around the world-space z-axis.
The impulse parameter determines how this method contributes to the physics simulation:

- If you specify true, SceneKit treats the direction parameter as an instantaneous change in angular momentum, measured in newton-meter-seconds.
- If you specify false, SceneKit treats the direction parameter as a torque, measured in newton-meters. At the end of each simulation step (by default, a step occurs once for each frame in the rendering loop), SceneKit sums all forces and torques applied to the physics body during that step and accelerates the body according to the net effect of those forces and torques. Use this option when you want to simulate gradual acceleration by calling applyTorque:impulse: on each simulation step.

Note
The impulse parameter effectively changes the unit of magnitude. A value that results in a certain acceleration when applied continuously on each frame of the simulation results in much less acceleration if applied only during a single frame.

As with all physical quantities in SceneKit, you need not use realistic force and torque measurements in your app—the effects of the physics simulation depend on the relative differences between forces, not on their absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.

### 156.34.6 body(type as Integer, shape as SCNPhysicsShapeMBS) as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics body with the specified type and shape.
**Notes:** type: A constant that determines how a body responds to forces and collisions. See SCNPhysicsBodyType.
shape: A physics shape defining the volume of the body for collision detection purposes.

Returns a new physics body object.

For the body to participate in collision detection or respond to forces, you must attach it to the physicsBody property of an SCNNode object in a scene.
If you pass nil for the shape parameter, SceneKit automatically creates a physics shape for the body when

you attach it to a node, based on that node,Äôs geometry property. To create a physics shape that,Äôs based on the geometries of a node and its hierarchy of children, or to control the level of detail in a physics shape, create the physics shape manually using an SCNPhysicsShape class method.

Note
For nodes containing custom geometry, the physics shape SceneKit automatically creates is a rough approximation of the geometry. This approximation, or convex hull, provides a compromise between accuracy and performance in collision detection. For the best collision detection performance, create an SCNPhysicsShape instance based on a basic geometry class (SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, or SCNCapsule).

### 156.34.7 clearAllForces

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels all continuous forces and torques acting on the physics body during the current simulation step.
**Notes:** When you pass false for the impulse parameter in the applyForce, applyForce:atPosition, or applyTorque method, SceneKit waits until the end of the current simulation step before applying its effect. At that time, SceneKit sums all forces and torques applied during that simulation step and changes the velocity or angular velocity of the body according to the net effect of those forces and torques.
Call clearAllForces to cancel any forces and torques previously applied during the current simulation step.

### 156.34.8 Constructor(type as Integer, shape as SCNPhysicsShapeMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics body with the specified type and shape.
**Notes:** type: A constant that determines how a body responds to forces and collisions. See SCNPhysicsBodyType.
shape: A physics shape defining the volume of the body for collision detection purposes.

Returns a new physics body object.

For the body to participate in collision detection or respond to forces, you must attach it to the physicsBody property of an SCNNode object in a scene.
If you pass nil for the shape parameter, SceneKit automatically creates a physics shape for the body when you attach it to a node, based on that node,Äôs geometry property. To create a physics shape that,Äôs based on the geometries of a node and its hierarchy of children, or to control the level of detail in a physics shape, create the physics shape manually using an SCNPhysicsShape class method.

Note

For nodes containing custom geometry, the physics shape SceneKit automatically creates is a rough approximation of the geometry. This approximation, or convex hull, provides a compromise between accuracy and performance in collision detection. For the best collision detection performance, create an SCNPhysicsShape instance based on a basic geometry class (SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, or SCNCapsule).

### 156.34.9 copy as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the body.

### 156.34.10 dynamicBody as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics body that can be affected by forces and collisions.
**Notes:** Use dynamic bodies for the elements of your scene that are moved by the physics simulation.
For the body to participate in collision detection or respond to forces, you must attach it to the physicsBody property of an SCNNode object in a scene.
SceneKit automatically creates a physics shape for the body when you attach it to a node, based on that node,Äôs geometry property. To create a physics shape that,Äôs based on the geometries of a node and its hierarchy of children, or to control the level of detail in a physics shape, create the physics shape manually using an SCNPhysicsShape class method.

Note
For nodes containing custom geometry, the physics shape SceneKit automatically creates is a rough approximation of the geometry. This approximation, or convex hull, provides a compromise between accuracy and performance in collision detection. For the best collision detection performance, create an SCNPhysicsShape instance based on a basic geometry class (SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, or SCNCapsule).

### 156.34.11 kinematicBody as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics body that is unaffected by forces or collisions but that can cause collisions affecting other bodies when moved.
**Notes:** Return a new physics body object.

Use kinematic bodies for scene elements that you want to control directly but whose movement manipulates other elements. For example, to allow the user to push objects around with a finger, you might create a

kinematic body and attach it to an invisible node that you move follow touch events. (In macOS, use the same technique to allow the user to move objects with the mouse pointer.)

For the body to participate in collision detection or respond to forces, you must attach it to the physicsBody property of an SCNNode object in a scene.
SceneKit automatically creates a physics shape for the body when you attach it to a node, based on that node,Äôs geometry property. To create a physics shape that,Äôs based on the geometries of a node and its hierarchy of children, or to control the level of detail in a physics shape, create the physics shape manually using an SCNPhysicsShape class method.
Note
For nodes containing custom geometry, the physics shape SceneKit automatically creates is a rough approximation of the geometry. This approximation, or convex hull, provides a compromise between accuracy and performance in collision detection. For the best collision detection performance, create an SCNPhysicsShape instance based on a basic geometry class (SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, or SCNCapsule).

### 156.34.12 resetTransform

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Updates the position and orientation of a body in the physics simulation to match that of the node to which the body is attached.
**Notes:** If you change the position or orientation of a node with an attached static or dynamic physics body, call this method afterward to ensure that the physics simulation incorporates the change. You need not call this method for kinematic bodies.
Note that dynamic and physics bodies are designed to be moved only by the physics simulation or not at all. You may use this method to move them regardless of this restriction, but at a cost to performance.

### 156.34.13 staticBody as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics body that is unaffected by forces or collisions and that cannot move.
**Notes:** Use static bodies to construct fixtures in your scene that other bodies need to collide with but that do not themselves move, such as floors, walls, and terrain.
For the body to participate in collision detection or respond to forces, you must attach it to the physicsBody property of an SCNNode object in a scene.
SceneKit automatically creates a physics shape for the body when you attach it to a node, based on that node,Äôs geometry property. To create a physics shape that,Äôs based on the geometries of a node and its hierarchy of children, or to control the level of detail in a physics shape, create the physics shape manually using an SCNPhysicsShape class method.

Note

For nodes containing custom geometry, the physics shape SceneKit automatically creates is a rough approximation of the geometry. This approximation, or convex hull, provides a compromise between accuracy and performance in collision detection. For the best collision detection performance, create an SCNPhysicsShape instance based on a basic geometry class (SCNBox, SCNSphere, SCNPyramid, SCNCone, SCNCylinder, or SCNCapsule).

### 156.34.14 Properties

### 156.34.15 AffectedByGravity as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the constant gravity of a scene accelerates the body.
**Notes:** If this property is true (the default), and the type of the body is SCNPhysicsBodyTypeDynamic, the gravity property of the scene,Äôs physicsWorld object causes the body to accelerate.
If this property is false, the body is not affected by scene gravity. This option can be useful when making physics bodies whose behavior should be governed by SCNPhysicsFieldMBS objects instead of a constant global acceleration.
(Read and Write property)

### 156.34.16 allowsResting as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that specifies whether SceneKit can automatically mark the physics body at rest.
**Notes:** If true (the default), SceneKit keeps track of whether the body is moving or affected by forces, automatically setting its Resting property to true when it is ,Äúat rest.,Äù The physics simulation runs faster when simulating fewer bodies, so treating a body as resting temporarily removes it from the simulation to improve performance.

SceneKit automatically returns a resting body to the simulation if another body collides with it, if you change its position or velocity, or if you apply a force to it. However, SceneKit uses a faster, less accurate simulation when deciding whether to change a body,Äôs isResting property back to false. If testing your app reveals unexpected physics behaviors involving resting bodies, changing those bodies,Äô allowsResting property to false may improve simulation accuracy.
(Read and Write property)

### 156.34.17 angularDamping as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A factor that reduces the body,Äôs angular velocity.
**Notes:** This property simulates the effect of rotational friction on a body. A damping factor of 0.0 specifies no loss in angular velocity, and a damping factor of 1.0 prevents the body from rotating. The default damping factor is 0.1.
(Read and Write property)

### 156.34.18 angularVelocity as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A vector describing both the current rotation axis and rotational speed (in radians per second) of the physics body.
**Notes:** A positive rotational speed indicates counterclockwise rotation (when viewed from the direction the rotation axis points in).
SceneKit,Äôs physics simulation determines the angular velocity (and corresponding change in rotation) of each dynamic physics body in the scene. You can also set a body,Äôs velocity directly to set the physics simulation in motion or influence its behavior.

The effect of reading or setting this property,Äôs value changes based on the current context:

- When invoked within a rendering loop method (any of the events), or from any other code invoked from within such a method, reading the property returns the current result of the physics simulation, and setting the property immediately applies the change.
- When invoked at any other time, reading the property returns the last value set for the property, and setting the property does not take effect until the next pass through the rendering loop.

(Read and Write property)

### 156.34.19 angularVelocityFactor as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A multiplier affecting how SceneKit applies rotations computed by the physics simulation to the node containing the physics body.
**Notes:** Use this property to constrain or restrict the effect of physics simulation on the node containing the physics body. For example, you can force a body to rotate in only one axis by setting its angular velocity factor to { 0.0, 1.0, 0.0 } .
(Read and Write property)

### 156.34.20 categoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mask that defines which categories this physics body belongs to.
**Notes:** Every physics body in a scene can be assigned to one or more categories, each corresponding to a bit in the bit mask. You define the mask values used in your game. Use this property together with the physicsShape and contactTestBitMask properties to define which physics bodies interact with each other and when your game is notified of interactions.
The default value is SCNPhysicsCollisionCategoryStatic for static bodies and SCNPhysicsCollisionCategoryDefault for dynamic and kinematic bodies.
(Read and Write property)

### 156.34.21 charge as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The electric charge of the body, in coulombs.
**Notes:** A body,Äôs charge determines its behavior when affected by an electric or magnetic field. Use the SCNPhysicsFieldMBS class to add these fields to your scene. Bodies with positive or negative charges behave differently when affected by electric or magnetic fields. The default electric charge on a physics body is 0.0, causing it to be unaffected by electric and magnetic fields.

Note that you need not use realistic measurements for the bodies in your app—the effects of the physics simulation depend on the relative masses of different bodies, not the absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.
(Read and Write property)

### 156.34.22 collisionBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mask that defines which categories of physics bodies can collide with this physics body.
**Notes:** When two physics bodies contact each other, a collision may occur. SceneKit compares the body,Äôs collision mask to the other body,Äôs category mask by performing a bitwise AND operation. If the result is a nonzero value, then the body is affected by the collision. Each body independently chooses whether it wants to be affected by the other body. For example, you might choose to avoid collision calculations that would make negligible changes to a body,Äôs velocity.

The default value is SCNPhysicsCollisionCategoryAll (a bit mask whose every bit is enabled), specifying that the body will collide with bodies of all other categories.
(Read and Write property)

### 156.34.23 contactTestBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mask that defines which categories of bodies cause intersection notifications with this physics body.
**Notes:** When two physics bodies overlap, a contact may occur. SceneKit compares the body,Äôs contact mask to the other body,Äôs category mask by performing a bitwise AND operation. If the result is a nonzero value, SceneKit creates an SCNPhysicsContactMBS object describing the contact and sends messages to the contactDelegate object of the scene,Äôs physics world. For best performance, only set bits in the contact mask for interactions you are interested in.

For applications running in OS X v10.10 or iOS 8, this property,Äôs value matches that of the collisionBitMask property—that is, SceneKit sends contact messages if and only if a collision occurs. For applications running in OS X v10.11 or iOS 9 or later, this property,Äôs value defaults to zero and need not match the collision mask—that is, a pair of bodies generates contact messages whenever the bodies intersect, regardless of whether they collide or pass through one another.
(Read and Write property)

### 156.34.24 damping as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A factor that reduces the body,Äôs linear velocity.
**Notes:** This property simulates the effect of fluid friction or air resistance on a body. A damping factor of 0.0 specifies no loss in velocity, and a damping factor of 1.0 prevents the body from moving. The default damping factor is 0.1.
(Read and Write property)

### 156.34.25 friction as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The body,Äôs resistance to sliding motion.
**Notes:** This property simulates the roughness of the body,Äôs surface. When two bodies are in contact and a force is applied that would cause them to slide against one another, the friction values for both bodies determine their resistance to motion. If both bodies,Äô friction value is 0.0, they slide freely against each other. If both bodies,Äô friction value is 1.0, they do not slide at all. The default friction is 0.5.
(Read and Write property)

### 156.34.26 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.34.27 isResting as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the physics body is at rest.
**Notes:** This property,Äôs default value is false, but SceneKit,Äôs physics simulation may automatically set it to true if the body is not moving and not affected by any forces. A resting body does not participate in the simulation until another body collides with it or you change its position or velocity or apply a force to it.
(Read only property)

### 156.34.28 mass as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mass of the body, in kilograms.
**Notes:** The mass of a body affects its momentum and how it responds to forces. The default mass for dynamic bodies is 1.0. The default mass for static and kinematic bodies is 0.0, but these bodies are unaffected by mass.

Note that you need not use realistic measurements for the bodies in your app—the effects of the physics simulation depend on the relative masses of different bodies, not the absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.
(Read and Write property)

### 156.34.29 momentOfInertia as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The body,Äôs moment of inertia, expressed in the local coordinate system of the node that contains the body.
**Notes:** A body,Äôs moment of inertia determines how it responds to torques (that is, forces with a rotational component). Each component of this vector is the moment of inertia for the corresponding principal axis (in the coordinate system containing the physics body). For example, if the x-component value of the moment vector is less than the y-component value, the body rotates more freely about its x-axis than its

y-axis.

By default, SceneKit automatically determines the body,Äôs moment of inertia based on its shape and mass. Use this property to define a custom moment of inertia (for example, to model an object of non-uniform density). Using a custom moment of inertia requires setting the usesDefaultMomentOfInertia property to false.
(Read and Write property)

### 156.34.30 physicsShape as SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that defines the solid volume of the physics body for use in collision detection.
**Notes:** The physics simulation does not use a node,Äôs visible geometry for collision detection—the simulation can run faster when using simple shapes, and it can also be useful to design your app or game using invisible collision shapes for some elements. Typically, you set a body,Äôs physics shape to a bounding box or primitive shape that roughly matches its node,Äôs visible content, but you can use a more detailed shape for more precise collision detection at a cost to performance.
For details on creating physics shapes, see SCNPhysicsShapeMBS.
(Read and Write property)

### 156.34.31 restitution as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A factor that determines how much kinetic energy the body loses or gains in collisions.
**Notes:** This property simulates the ,Äúbounciness,Äù of a body. A restitution of 1.0 means that the body loses no energy in a collision—for example, a ball dropped onto a flat surface will bounce back to the height it fell from. A restitution of 0.0 means the body does not bounce after a collision. A restitution of greater than 1.0 causes the body to gain energy in collisions. The default restitution is 0.5.
(Read and Write property)

### 156.34.32 rollingFriction as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The body,Äôs resistance to rolling motion.
**Notes:** This property simulates the traction between a rounded body and bodies it might roll against. A rolling friction of 0.0 (the default) means that a body induced to roll (for example, by being placed on an inclined surface) will continue to roll without slowing down unless otherwise acted upon, and a rolling friction of 1.0 prevents the body from rolling.
(Read and Write property)

### 156.34.33 type as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A constant that determines how the physics body responds to forces and collisions.
**Notes:** (Read and Write property)

### 156.34.34 usesDefaultMomentOfInertia as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit automatically calculates the body,Äôs moment of inertia or allows setting a custom value.
**Notes:** A body,Äôs moment of inertia determines how it responds to torques (that is, forces with a rotational component).
If this property is true (the default), SceneKit automatically determines the body,Äôs moment of inertia based on its shape and mass. Set this property to false and use the momentOfInertia property to define a custom moment of inertia (for example, to model an object of non-uniform density).
(Read and Write property)

### 156.34.35 velocity as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A vector describing both the current speed (in meters per second) and direction of motion of the physics body.
**Notes:** SceneKit,Äôs physics simulation determines the velocity (and corresponding change in position) of each dynamic physics body in the scene. You can also set a body,Äôs velocity directly to set the physics simulation in motion or influence its behavior.
The effect of reading or setting this property,Äôs value changes based on the current context:

- When invoked within a rendering loop method (any of the events), or from any other code invoked from within such a method, reading the property returns the current result of the physics simulation, and setting the property immediately applies the change.
- When invoked at any other time, reading the property returns the last value set for the property, and setting the property does not take effect until the next pass through the rendering loop.

(Read and Write property)

### 156.34.36 velocityFactor as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A multiplier affecting how SceneKit applies translations computed by the physics simulation to the node containing the physics body.
**Notes:** Use this property to constrain or restrict the effect of physics simulation on the node containing the physics body. For example, you can force a body to move in only two dimensions by setting its velocity factor to { 1.0, 1.0, 0.0 } .
(Read and Write property)

### 156.34.37 Constants

Collision Categories

| Constant | Value | Description |
|---|---|---|
| kPhysicsCollisionCategoryAll | -1 | This is the default value for a physics body,Äôs collisionBitMask property. With this collision mask, a physics body can collide with all other physic bodies. |
| kPhysicsCollisionCategoryDefault | 1 | The default categoryBitMask value for dynamic and kinematic bodies. |
| kPhysicsCollisionCategoryStatic | 2 | The default categoryBitMask value for static bodies. |

Body Types

| Constant | Value | Description |
|---|---|---|
| kTypeDynamic | 1 | A physics body that can be affected by forces and collisions. Use dynamic bodies for the elements of your scene that are moved by the physics simulation. |
| kTypeKinematic | 2 | A physics body that is unaffected by forces or collisions but that can cause collisions affecting other bodies when moved. Use kinematic bodies for scene elements that you want to control directly directly but whose movement manipulates other elements. For example, to allow the user to push objects around with a finger, you might create a kinematic body and attach it to an invisible node that you move to follow touch events. (In macOS, use the same technique to allow the user to move objects with the mouse pointer.) |
| kTypeStatic | 0 | A physics body that is unaffected by forces or collisions and cannot move. Use static bodies to construct fixtures in your scene that other bodies need to collide with but that do not themselves move, such as floors, walls, and terrain. |

# 156.35 class SCNPhysicsConeTwistJointMBS

## 156.35.1 class SCNPhysicsConeTwistJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a cone twist join.
**Notes:** Subclass of the SCNPhysicsBehaviorMBS class.

## 156.35.2 Methods

## 156.35.3 Constructor(body as SCNPhysicsBodyMBS, frame as SCNMatrix4MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a physics cone-twist joint.
**Notes:** The joint attaches "body" to the 3d location specified by "frame" and relative to the node that owns the body.
See also:

- 156.35.4 Constructor(bodyA as SCNPhysicsBodyMBS, frameA as SCNMatrix4MBS, bodyB as SCNPhysicsBodyMBS, frameB as SCNMatrix4MBS) 20277

## 156.35.4 Constructor(bodyA as SCNPhysicsBodyMBS, frameA as SCNMatrix4MBS, bodyB as SCNPhysicsBodyMBS, frameB as SCNMatrix4MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a physics cone-twist joint.
**Notes:** The joint attaches bodyA and bodyB on frameA and frameB respectively.
See also:

- 156.35.3 Constructor(body as SCNPhysicsBodyMBS, frame as SCNMatrix4MBS) 20277

## 156.35.5 jointWithBody(body as SCNPhysicsBodyMBS, frame as SCNMatrix4MBS) as SCNPhysicsConeTwistJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a physics cone-twist joint.
**Notes:** The joint attaches "body" to the 3d location specified by "frame" and relative to the node that owns the body.
See also:

- 156.35.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, frameA as SCNMatrix4MBS, bodyB as SCNPhysicsBodyMBS, frameB as SCNMatrix4MBS) as SCNPhysicsConeTwistJointMBS 20278


### 156.35.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, frameA as SCNMatrix4MBS, bodyB as SCNPhysicsBodyMBS, frameB as SCNMatrix4MBS) as SCNPhysicsConeTwistJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes and returns a physics cone-twist joint.
**Notes:** The joint attaches bodyA and bodyB on frameA and frameB respectively.
See also:


- 156.35.5 jointWithBody(body as SCNPhysicsBodyMBS, frame as SCNMatrix4MBS) as SCNPhysicsConeTwistJointMBS 20277


### 156.35.7 Properties

### 156.35.8 bodyA as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first body attached to the slider joint.
**Notes:** (Read only property)

### 156.35.9 bodyB as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second body attached to the slider joint.
**Notes:** (Read only property)

### 156.35.10 frameA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Frame for bodyA.
**Notes:** (Read and Write property)

### 156.35.11 frameB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Frame for bodyB.
**Notes:** (Read and Write property)

### 156.35.12 maximumAngularLimit1 as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum angular limits in radians in each cone tangent directions
**Notes:** (Read and Write property)

### 156.35.13 maximumAngularLimit2 as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum angular limits in radians in each cone tangent directions
**Notes:** (Read and Write property)

### 156.35.14 maximumTwistAngle as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Maximum twist angle alon the cone axis.
**Notes:** (Read and Write property)

## 156.36 class SCNPhysicsContactMBS

### 156.36.1 class SCNPhysicsContactMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Detailed information about a contact between two physics bodies in a scene,Äôs physics simulation.
**Notes:** You don't create SCNPhysicsContact instances directly; SceneKit automatically creates these objects whenever contacts occur.
To receive contact messages, implement events in your of your scene,Äôs SCNPhysicsWorld object. Next, for each physics body in your scene, set the categoryBitMask and collisionBitMask properties to define which interactions should generate contact messages.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 156.36.2 Methods

### 156.36.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 156.36.4 Properties

### 156.36.5 collisionImpulse as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The force over time of the collision, in newton-seconds.
**Notes:** This property,Äôs value tells you how hard the bodies struck each other in a collision. For example, in a game you might allow a character to proceed unhindered after a minor collision, but take damage when struck with sufficient force.
(Read only property)

### 156.36.6 contactNormal as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The normal vector at the contact point between the two physics bodies, in scene coordinates.
**Notes:** This vector tells you which direction the bodies were moving relative to one another at the time of the collision. For example, in a game you can examine this vector to have enemy characters take damage

when struck from above by the player character but damage the player character instead when they collide side-to-side.
(Read only property)

### 156.36.7 contactPoint as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The contact point between the two physics bodies, in scene coordinates.
**Notes:** (Read only property)

### 156.36.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.36.9 nodeA as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node containing the first body in the contact.
**Notes:** Use the node,Äôs physicsBody property to examine physics characteristics of the node.
(Read only property)

### 156.36.10 nodeB as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node containing the second body in the contact.
**Notes:** Use the node,Äôs physicsBody property to examine physics characteristics of the node.
(Read only property)

### 156.36.11 penetrationDistance as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance of overlap, in units of scene coordinate space, between the two physics bodies.
**Notes:** (Read only property)

### 156.36.12 sweepTestFraction as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Value between 0 and 1 giving the relative position of the physic shape when performing a convex sweep test.
**Notes:** (Read only property)

# 156.37 class SCNPhysicsFieldMBS

## 156.37.1 class SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that applies forces, such as gravitation, electromagnetism, and turbulence, to physics bodies within a certain area of effect.
**Notes:** You can create many types of field effects, such as gravitation, electromagnetism, and turbulence. To add a field effect to a scene, you create a physics field of the type you want to use and then attach it to the physicsField property of a node in the scene.
Physics fields can affect both SCNPhysicsBodyMBS objects and the particles spawned by SCNParticleSystemMBS objects.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 156.37.2 Methods

## 156.37.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 156.37.4 copy as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the field.

## 156.37.5 customField(FieldForceEvaluator as SCNFieldForceEvaluatorMBS, tag as variant = nil) as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that runs the specified block to determine the force a field applies to each object in its area of effect.
**Notes:** delegate: A method that SceneKit runs for each object in the field,Äôs area of effect.

Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNodeMBS object.

For custom physics fields, SceneKit ignores the direction, strength, falloffExponent, and minimumDistance properties. Instead, SceneKit calls your block to determine the direction and magnitude of force to apply to each physics body or particle in the field,Äôs area of effect.

Due to the dispatching of the delegate to main thread, this is not very efficient.

### 156.37.6 dragField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that slows any object in its area of effect with a force proportional to the object,Äôs velocity.
**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Like the damping and angularDamping properties of a physics body, drag fields can simulate effects such as fluid friction or air resistance. Unlike those properties, drag fields can simulate different intensities of fluid friction in different areas of your scene. For example, you can use a drag field to represent underwater areas. The default falloffExponent value for a drag field is 0.0, indicating that the field,Äôs effect is constant throughout its area of effect.

### 156.37.7 electricField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that attracts or repels objects based on their electrical charge and on their distance from the field,Äôs center.
**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Use this field type to make objects behave differently from one another when they enter a region, or to make an object's behavior different from its mass-based behavior. An electric field behaves according to the first part of the Lorentz force equation modeling real-world electromagnetic forces—the field applies a force whose magnitude is proportional to electric charge and distance.
By default, physics bodies and particle systems have no electric charge, so they are unaffected by electric and magnetic fields. Use the charge property of a physics body or the particleCharge property of a particle system to add charge-based behavior.
When the field,Äôs strength value is positive (the default), it attracts bodies whose charge is negative and repels bodies whose charge is positive. To reverse this behavior, set the field,Äôs strength property to a negative value.
The default falloffExponent value for an electric field is 2.0, indicating that the field,Äôs effect diminishes with the square of its distance from its center.

### 156.37.8 linearGravityField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that accelerates objects in a specific direction.
**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Because the force of gravity on an object is proportional to the object,Äôs mass, this force accelerates all objects in the field,Äôs area of affect by the same amount. The field,Äôs strength property measures this acceleration in meters per second per second.
By default, a linear gravity field accelerates objects in along its direction vector. To make it accelerate objects in the opposite direction, set the field,Äôs strength property to a negative value.
The default falloffExponent value for a linear gravity field is 0.0, indicating that the field,Äôs effect is constant throughout its area of effect.

### 156.37.9 magneticField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that attracts or repels objects based on their electrical charge, velocity, and distance from the field,Äôs axis.
**Notes:** A physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Use this field type to make objects behave differently from one another when they enter a region, or to make an object's behavior different from its mass based behavior. A magnetic field behaves according to the second part of the Lorentz force equation modeling real-world electromagnetic forces—the field applies a force determined by the cross product of an object,Äôs velocity vector and the magnetic field vector at the object,Äôs location, with magnitude proportional to the object,Äôs electric charge.
By default, physics bodies and particle systems have no electric charge, so they are unaffected by electric and magnetic fields. Use the charge property of a physics body or the particleCharge property of a particle system to add charge-based behavior.
When the field,Äôs strength value is positive (the default), the magnetic field vectors circulate counterclockwise relative to the field,Äôs direction vector. (That is, the magnetic field models a real-world magnetic field created by current in a wire oriented in the field,Äôs direction.) To make field vectors circulate clockwise, set the field,Äôs strength property to a negative value.

This SCNPhysicsField option models the real-world physics effect of magnetic fields on moving, electrically charged bodies, not the behavior of permanent magnets or electromagnets. To make objects in your scene simply attract or repel one another, use a different field type. For example, a field created by the radialGravityField method attracts or repels all dynamic bodies near it according to its strength property, and a field created by the electricField method selectively attracts or repels bodies according to their electric charge.
The default falloffExponent value for a magnetic field is 2.0, indicating that the field,Äôs effect diminishes with the square of distance from its center.

### 156.37.10 noiseField(smoothness as double, animationSpeed as double) as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that applies random forces to objects in its area of effect.
**Notes:** smoothness: The amount of randomness in the field. A value of 0.0 specifies maximum noise, and a value of 1.0 specifies no noise at all.
speed: The field,Äôs variation over time. Specify 0.0 for a static field.

Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Use this field type to simulate effects involving random motion, such as fireflies or gently falling snow.
In calculating the direction and strength of the field,Äôs effect on an object, SceneKit uses a Perlin simplex noise function. This function produces a velocity field that varies over time.
The default falloffExponent value for a noise field is 0.0, indicating that the field,Äôs effect is constant throughout its area of effect. This field type ignores the field,Äôs direction property.

### 156.37.11 radialGravityField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that accelerates objects toward its center.
**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Because the force of gravity on an object is proportional to the object,Äôs mass, this force accelerates all objects at the same distance from the field,Äôs center by the same amount. The field,Äôs strength property measures this acceleration in meters per second per second.
By default, a radial gravity field attracts objects toward its center. To make it repel objects instead, set the field,Äôs strength property to a negative value.
The default falloffExponent value for a radial gravity field is 2.0, indicating that the field,Äôs effect diminishes with the square of distance from its center.

### 156.37.12 springField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that pulls objects toward its center with a spring-like force.

**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

The force a spring field applies to objects in its area of effect is linearly proportional to the distance from the object to the center of the field. (That is, the field behaves according to Hooke,Äôs Law of real-world spring forces.) An object placed at the center of the field and moved away will oscillate around the center, with a period of oscillation that is proportional to the object,Äôs mass. The field,Äôs strength property scales the magnitude of the spring effect—a larger strength simulates a stiffer spring.

The default falloffExponent value for a spring field is 1.0, indicating that the field,Äôs effect diminishes linearly with distance from its center.

### 156.37.13 turbulenceField(smoothness as double, animationSpeed as double) as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field that applies random forces to objects in its area of effect, with magnitudes proportional to those objects,Äô velocities.
**Notes:** smoothness: The amount of randomness in the field. A value of 0.0 specifies maximum noise, and a value of 1.0 specifies no noise at all.
speed: The field,Äôs variation over time. Specify 0.0 for a static field.

Return a physics field object. To use the field in a scene, attach it to the physicsField property of an SCNNode object.

Like a noise field, a turbulence field applies forces in random directions to the objects that it affects. Unlike a noise field, a turbulence field applies a force whose magnitude is proportional to the speed of each affected object. For example, an object passing through a noise field shakes as it travels through the field, but an object passing through a turbulence field shakes more violently the faster it travels. The field,Äôs strength property scales the magnitude of the turbulence effect.

The default falloffExponent value for a turbulence field is 0.0, indicating that the field,Äôs effect is constant throughout its area of effect.

### 156.37.14 vortexField as SCNPhysicsFieldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a field whose forces circulate around an axis.
**Notes:** Returns a physics field object. To use the field in a scene, attach it to the physicsField property of

an SCNNode object.

The force on an object in a vortex field is tangential to the line from the object,Äôs position to the field,Äôs axis and proportional to the object,Äôs mass. (The field,Äôs axis is a line that is parallel to its direction vector and that passes through its center. For details, see the offset property.) For example, when a vortex field,Äôs area of effect contains many objects, the resulting scene resembles a tornado: The objects simultaneously revolve around and fly away from the field,Äôs center.
By default, a vortex circulates counterclockwise relative to its direction vector. To make it circulate clockwise, set the field,Äôs strength property to a negative value.
The default falloffExponent value for a vortex field is 0.0, indicating that the field,Äôs effect is constant throughout its area of effect.

### 156.37.15 Properties

### 156.37.16 Active as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the field,Äôs effect is enabled.
**Notes:** If this value is fasle, the field does not apply forces to physics bodies in its area of effect. The default value is true.
Use this property, for example, to switch fields on and off as a gameplay mechanic.
(Read and Write property)

### 156.37.17 CategoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A mask that defines which categories this physics field belongs to.
**Notes:** To determine whether a field affects a physics body, SceneKit performs a bitwise AND operation on the field,Äôs category bit mask and the body,Äôs categoryBitMask property. If the result is a nonzero value, SceneKit computes and applies the force of the field on the body. To determine whether a field affects the particles spawned by an SCNParticleSystemMBS object, SceneKit performs the same check using the categoryBitMask property of the node containing the particle system.
Use this property to create fields which affect only certain bodies in your scene. Reducing the number of bodies affected by fields can also improve simulation performance.
(Read and Write property)

### 156.37.18 direction as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The field,Äôs directional axis.
**Notes:** Some types of fields apply forces whose direction or magnitude is relative to an axis. (For details on each type of field, see the methods listed in Creating Physics Fields.) Changing the direction changes the effects of these field types.

The default direction is the vector { 0, -1, 0 } . With this direction, for example, linear gravity fields whose strength is positive cause objects to fall in the ,Äúdown,Äù direction of scene space.
(Read and Write property)

### 156.37.19 Exclusive as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the field overrides other fields whose areas of effect it overlaps.
**Notes:** If this value is true and a physics body is within this field,Äôs region, SceneKit ignores the effects of all other fields that might otherwise affect the body. The default value is false.
If you set this property to true on multiple fields in a scene, their regions should not overlap. If they do, the results are undefined.
(Read and Write property)

### 156.37.20 falloffExponent as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An exponent that determines how the field,Äôs strength diminishes with distance.
**Notes:** When SceneKit calculates the force to be applied by a field, it attenuates the field,Äôs effect by multiplying with the expression pow(distance - minRadius, -falloff). If the falloff exponent is greater than zero, the field,Äôs effect is stronger on nearby bodies than on bodies farther away from its location.
The default falloff exponent varies by field type. For details, see the methods listed in Creating Physics Fields.
(Read and Write property)

### 156.37.21 halfExtent as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A location marking the end of the field,Äôs area of effect.
**Notes:** To define a field,Äôs area of effect, use the position property of the node that contains the field and the field,Äôs halfExtent property. The center of the area of effect is the node,Äôs position. The half-extent, a position vector in the local coordinate space of the node containing the field, marks one corner of a box, and the negative of the half-extent vector marks the opposite corner of the box. For example, if a node,Äôs

position is the vector { 2.0, 2.0, 2.0 } and it contains a physics field whose half-extent is the vector { 0.5, 0.5, 0.5 } , the field,Äôs area of effect is the box extending from 1.5 to 2.5 along each axis of the scene,Äôs coordinate system.
By default, a field,Äôs area of effect is the interior of this box shape. Use the usesEllipsoidalExtent property to instead make the area of effect an ellipsoid bounded by this box. Use the scope property to choose whether the area of effect is the interior or exterior of the box (or ellipsoid).
The default half-extent is the vector { INFINITY, INFINITY, INFINITY } , specifying that the field affects bodies located anywhere in the scene.
(Read and Write property)

### 156.37.22 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.37.23 minimumDistance as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum value for distance-based effects.
**Notes:** This property determines the beginning of the field,Äôs falloff area. At distances less than the minimum, the field,Äôs effect is at full strength. At greater distances, the field,Äôs effect diminishes based on the value of the falloffExponent property. The default minimum distance is a very small (but nonzero) value.
(Read and Write property)

### 156.37.24 offset as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The offset of the field,Äôs center within its area of effect.
**Notes:** Some types of fields apply forces whose magnitude is relative to the distance between an object and the field,Äôs center. (For details on each type of field, see the methods listed in Creating Physics Fields.) Changing the offset changes the effects of these field types.

With the default offset vector { 0, 0, 0 } , the center of a field is the center of its area of effect.
(Read and Write property)

### 156.37.25 Scope as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The area affected by the field, either inside or outside its region.
**Notes:** First, define a field,Äôs region using its halfExtent property and the position property of the node containing the field. Then, use the scope property to choose whether the field,Äôs area of effect is the interior of the region (the default) or all space outside the region.
(Read and Write property)

### 156.37.26 strength as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A multiplier for the force that the field applies to objects in its area of effect.
**Notes:** Each type of physics field defines its own behavior for strength values. For details, see the methods listed in Creating Physics Fields.
(Read and Write property)

### 156.37.27 usesEllipsoidalExtent as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the field,Äôs area of effect is shaped like a box or ellipsoid.
**Notes:** If this value is false (the default), the field,Äôs area of effect is the box-shaped region of space defined by its halfExtent property and the position property of the node containing the field.

If this value is true, the field,Äôs area of effect is the ellipsoid bounded by this box-shaped region. That is, if all components of the half-extent vector are equal, the field has a spherical area of effect.
(Read and Write property)

### 156.37.28 Constants

Scopes

| Constant | Value | Description |
|---|---|---|
| kScopeInsideExtent | 0 | The field,Äôs effect applies only to objects within the region of space defined by its position and extent. |
| kScopeOutsideExtent | 1 | The field,Äôs effect applies only to objects outside the region of space defined by its position and extent. |

### 156.37.29 Delegates

### 156.37.30 SCNFieldForceEvaluatorMBS(position as SCNVector3MBS, velocity as SCNVector3MBS, mass as single, charge as single, time as double, Tag as Variant) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The signature for a delegate that SceneKit calls to determine the effect of a custom field on an object.
**Notes:** You use this type of delegate to create a custom physics field with the customFieldWithEvaluationBlock: method. SceneKit calls your delegate once for each object in the field,Äôs area of effect, on each step of the physics simulation.

Note
By default, one simulation step occurs for each frame rendered. For example, if your view renders at 60 frames per second and three bodies are in the field,Äôs area of effect, SceneKit runs your delegate 180 times per second. To avoid reduced rendering performance, take care not to perform extensive computation in this delegate.
The delegate takes the following parameters:

position: The position of the object affected by the field, in the local coordinate space of the node containing the field.
velocity: The velocity of the object affected by the field, relative to the local coordinate space of the node containing the field.
mass: The mass of the object affected by the field. (See the mass property for physics bodies and the particleMass property for particle systems.)
charge: The electrical charge of the object affected by the field. (See the charge property for physics bodies and the particleCharge property for particle systems.)
time: The elapsed time, in seconds, since the last simulation step.

Your delegate uses these parameters to compute and return an SCNVector3 force vector, which SceneKit then applies to the object affected by the field.

# 156.38 class SCNPhysicsHingeJointMBS

## 156.38.1 class SCNPhysicsHingeJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A physics behavior that connects two bodies and allows them to pivot around each other on a single axis.
**Notes:** A hinge has a single degree of freedom (rotation). You can also use a hinge joint to pin a body so that it can only move by rotating around a specific axis in the coordinate space of the node containing it.

Available in MacOS 10.10 or newer.
Subclass of the SCNPhysicsBehaviorMBS class.

## 156.38.2 Methods

## 156.38.3 Constructor(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a hinge joint that anchors a single physics body in space and lets it rotate around a specific axis.
**Notes:** body: The physics body to be controlled by the hinge joint.
axis: The direction of the axis that the body pivots around, relative to the node containing the body.
anchor: The location of the axis in the node containing the body.

Returns a new hinge joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.38.4 Constructor(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS) 20294

### 156.38.4 Constructor(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a hinge joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.
axisA: The axis that the hinge pivots around, relative to the node containing the first body.
anchorA: The point at which the hinge connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.
axisB: The axis that the hinge pivots around, relative to the node containing the second body.
anchorB: The point at which the hinge connects, relative to the node containing the second body.

Returns a new hinge joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.38.3 Constructor(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) 20293

### 156.38.5 jointWithBody(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) as SCNPhysicsHingeJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a hinge joint that anchors a single physics body in space and lets it rotate around a specific axis.
**Notes:** body: The physics body to be controlled by the hinge joint.
axis: The direction of the axis that the body pivots around, relative to the node containing the body.
anchor: The location of the axis in the node containing the body.

Returns a new hinge joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.38.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS) as SCNPhysicsHingeJointMBS 20295

### 156.38.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS) as SCNPhysicsHingeJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a hinge joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.
axisA: The axis that the hinge pivots around, relative to the node containing the first body.
anchorA: The point at which the hinge connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.
axisB: The axis that the hinge pivots around, relative to the node containing the second body.
anchorB: The point at which the hinge connects, relative to the node containing the second body.

Returns a new hinge joint behavior.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.38.5 jointWithBody(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) as SCNPhysicsHingeJointMBS 20294

### 156.38.7 Properties

### 156.38.8 anchorA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the hinge connects, relative to the node containing the first body.
**Notes:** (Read and Write property)

### 156.38.9 anchorB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the hinge connects, relative to the node containing the second body.
**Notes:** (Read and Write property)

### 156.38.10 axisA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The axis that the hinge pivots around, relative to the node containing the first body.
**Notes:** (Read and Write property)

### 156.38.11 axisB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The axis that the hinge pivots around, relative to the node containing the second body.
**Notes:** (Read and Write property)

### 156.38.12 bodyA as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first physics body connected by the joint.
**Notes:** (Read only property)

### 156.38.13 bodyB as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second physics body connected by the joint.
**Notes:** This property,Äôs value is nil if the joint was created using the Constructor without bodyB parameter.
(Read only property)

# 156.39 class SCNPhysicsShapeMBS

## 156.39.1 class SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An abstraction of a physics body,Äôs solid volume for tuning collision detection.
**Notes:** When SceneKit performs contact detection and other simulations for the SCNPhysicsBodyMBS objects in your scene, it uses physics shapes instead of the rendered geometry of visible objects. This approach both improves simulation performance and allows you to more easily design your gameplay around scene elements the player can interact with.

Simple Versus Complex Shapes
When you allow SceneKit to automatically create a physics shape, it uses the simplest possible shape roughly matching the geometry of the node the physics body is attached to. This approach maximizes simulation performance but can lead to unrealistic physics behavior for some objects.

You can make the simulation behave more realistically by defining physics shapes that more closely follow the visible geometry in your scene. This approach comes at a cost to performance, so you want to limit the amount of detail in your physics shapes. Use the highest levels of detail only on bodies for which precise collision detection is important for your app.
If you create a physics shape using one of the basic geometry classes (SCNBoxMBS, SCNSphereMBS, SCNPyramidMBS, SCNConeMBS, SCNCylinderMBS, or SCNCapsuleMBS), SceneKit uses an idealized form of that geometry for the physics shape instead of using the geometry,Äôs vertex data to simulate collisions. For example, if you create a physics shape from an SCNSphere object, SceneKit simulates collisions for any object that passes within the sphere,Äôs radius.

Because the idealized forms of simple geometries are computationally much simpler than the vertex data needed for displaying them, using basic geometries for physics shapes (or compound shapes created from basic geometries with the shapeWithShapes method) often provides the best balance between simulation accuracy and performance.

Changing a Physics Body,Äôs Shape
Physics shapes are immutable, but you can change the shape associated with a physics body by creating a new SCNPhysicsShape instance and assigning it to the body,Äôs physicsShape property.
**Blog Entries**

- Physics example for SceneKit in Xojo

### 156.39.2 Methods

### 156.39.3 Constructor(geometry as SCNGeometryMBS, Options as Dictionary = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics shape based on a geometry object.
**Notes:** geometry: A geometry object.
options: A dictionary of options affecting the level of detail of the physics shape, or nil to use default options. For applicable keys and their possible values, see Shape Creation Options Keys.

Returns a new physics shape object.

If you create a physics shape using one of the basic geometry classes (SCNBoxMBS, SCNSphereMBS, SCNPyramidMBS, SCNConeMBS, SCNCylinderMBS, or SCNCapsuleMBS), SceneKit uses an idealized form of that geometry for the physics shape instead of using the geometry,Äôs vertex data to simulate collisions. For example, if you create a physics shape from an SCNSphere object, SceneKit simulates collisions for any object that passes within the sphere,Äôs radius.

Because the idealized forms of simple geometries are computationally much simpler than the vertex data needed for displaying them, using basic geometries for physics shapes (or compound shapes created from basic geometries with the shapeWithShapes method) often provides the best balance between simulation accuracy and performance.

To use the newly created physics shape, create a physics body with the the bodyWithType method, or assign the shape to the physicsShape property of an existing body.
See also:

- 156.39.4 Constructor(node as SCNNodeMBS, Options as Dictionary = nil) 20298

### 156.39.4 Constructor(node as SCNNodeMBS, Options as Dictionary = nil)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics shape from a node or hierarchy of nodes.
**Notes:** node: A node object. The node must contain an SCNGeometryMBS object in its geometry property or have one or more child (or descendant) nodes that contain geometry.
options: A dictionary of options affecting the level of detail of the physics shape, or nil to use default options. For applicable keys and their possible values, see Shape Creation Options Keys.

Returns a new physics shape object.

To use the newly created physics shape, create a physics body with the the bodyWithType method, or assign the shape to the physicsShape property of an existing body.

The node used to create the physics shape need not be the same as the node whose physics body you attach the shape to—or even be in the scene whose physics world you use the shape in. For example, you can create a physics body for a complex object by building a hierarchy of nodes containing simple geometries (using the SCNBoxMBS and SCNSphereMBS classes), and then creating a physics shape from those nodes. The resulting physics shape, a compound of bounding boxes or convex hulls, provides a rough approximation of the complex object without a high cost to simulation performance.
See also:

- 156.39.3 Constructor(geometry as SCNGeometryMBS, Options as Dictionary = nil) 20298

### 156.39.5 copy as SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the shape.

### 156.39.6 SCNPhysicsShapeKeepAsCompoundKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option for selecting whether to create a group of independent shapes or combine them into a single shape.
**Notes:** The value for this key is a boolean value. The default value is true, specifying that SceneKit convert separate geometries into separate shapes and join the resulting shapes. If false, SceneKit creates a single shape approximating the combined form of the geometries.

### 156.39.7 SCNPhysicsShapeOptionCollisionMargin as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Collision margin of the physics shape (as a number)

### 156.39.8 SCNPhysicsShapeScaleKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option for selecting the scale factor of the shape relative to the local coordinate space of the node containing it.
**Notes:** The value for this key is a SCNVector3MBS object , whose components describe the scale factor in

each of the x-, y- and z-axis directions. The default value is the vector { 1.0, 1.0, 1.0 } , specifying no change of scale.
SceneKit,Äôs physics simulation ignores the scale property of nodes containing physics bodies when simulating collisions. Instead, use this option to provide a scale factor when creating custom physics shapes. (If you create a physics body for a node without specifying a custom shape, SceneKit uses the node,Äôs scale property to infer this scale factor at creation time.)

### 156.39.9 SCNPhysicsShapeTypeBoundingBox as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics shape is the smallest box containing the geometry.
**Notes:** This option provides the lowest level of detail and the fastest simulation performance. Use it for generally box-shaped physics bodies or when constructing a compound physics shape.

### 156.39.10 SCNPhysicsShapeTypeConcavePolyhedron as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics shape is a concave polyhedron closely following the surface of the geometry.
**Notes:** This option provides the highest level of detail, at a high cost to simulation performance. Use it only for irregularly shaped bodies where precise collision behavior is crucial to your app,Äôs design.
This shape type may only be used for static physics bodies (that is, those whose type property is SCNPhysicsBodyTypeStatic).

### 156.39.11 SCNPhysicsShapeTypeConvexHull as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics shape is a convex polyhedron roughly enclosing the geometry.
**Notes:** This option provides a moderate level of detail and simulation performance. Use it for rounded or irregularly shaped physics bodies.

### 156.39.12 SCNPhysicsShapeTypeKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An option for selecting the level of detail at which to create shapes from geometry.
**Notes:** The value for this key is one of the constants listed in Shape Types. The default type is SCNPhysicsShapeTypeConvexHull.

### 156.39.13 shapeWithGeometry(geometry as SCNGeometryMBS, Options as Dictionary = nil) as SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics shape based on a geometry object.
**Notes:** geometry: A geometry object.
options: A dictionary of options affecting the level of detail of the physics shape, or nil to use default options. For applicable keys and their possible values, see Shape Creation Options Keys.

Returns a new physics shape object.

If you create a physics shape using one of the basic geometry classes (SCNBoxMBS, SCNSphereMBS, SCNPyramidMBS, SCNConeMBS, SCNCylinderMBS, or SCNCapsuleMBS), SceneKit uses an idealized form of that geometry for the physics shape instead of using the geometry,Äôs vertex data to simulate collisions. For example, if you create a physics shape from an SCNSphere object, SceneKit simulates collisions for any object that passes within the sphere,Äôs radius.

Because the idealized forms of simple geometries are computationally much simpler than the vertex data needed for displaying them, using basic geometries for physics shapes (or compound shapes created from basic geometries with the shapeWithShapes method) often provides the best balance between simulation accuracy and performance.

To use the newly created physics shape, create a physics body with the the bodyWithType method, or assign the shape to the physicsShape property of an existing body.

### 156.39.14 shapeWithNode(node as SCNNodeMBS, Options as Dictionary = nil) as SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a physics shape from a node or hierarchy of nodes.
**Notes:** node: A node object. The node must contain an SCNGeometryMBS object in its geometry property or have one or more child (or descendant) nodes that contain geometry.
options: A dictionary of options affecting the level of detail of the physics shape, or nil to use default options. For applicable keys and their possible values, see Shape Creation Options Keys.

Returns a new physics shape object.

To use the newly created physics shape, create a physics body with the the bodyWithType method, or assign the shape to the physicsShape property of an existing body.

The node used to create the physics shape need not be the same as the node whose physics body you attach the shape to—or even be in the scene whose physics world you use the shape in. For example, you can create a physics body for a complex object by building a hierarchy of nodes containing simple geometries (using the SCNBoxMBS and SCNSphereMBS classes), and then creating a physics shape from those nodes. The resulting physics shape, a compound of bounding boxes or convex hulls, provides a rough approximation of the complex object without a high cost to simulation performance.

### 156.39.15 shapeWithShapes(shapes() as SCNPhysicsShapeMBS, transforms() as SCNMatrix4MBS = nil) as SCNPhysicsShapeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new physics shape by combining others.
**Notes:** shapes: An array of SCNPhysicsShapeMBS objects.
transforms: An array SCNMatrix4MBS values, each of which is a transform for the physics shape at the corresponding index in the shapes parameter.

Returns a new physics shape object.

An individual physics shape is defined in its own local coordinate space. Therefore, to describe the positions and orientations of multiple shapes relative to one another, you must use coordinate transformations.

### 156.39.16 sourceObject as Variant

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The object that was used to create the shape.
**Notes:** This property, along with the transforms and options properties, provides the information that was used to create the shape. You can use this information, for example, to draw editing or debugging UI in your scene.

- If the shape was created with the shapeWithGeometry method, the source object is an SCNGeometryMBS object, and the options property contains the options affecting the shape,Äôs construction from that geometry.
- If the shape was created with the shapeWithNode method, the source object is an SCNNodeMBS object, and the options property contains the options affecting the shape,Äôs construction from that node.
- If the shape was created with the shapeWithShapes method, the source object is an array of SCNPhysicsShapeMBS objects and the transforms property describes how those shapes combine to form a compound shape.

### 156.39.17 transforms as SCNMatrix4MBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The array of transforms that was used to create a compound shape.
**Notes:** You provide this array of SCNMatrix4MBS values, in the shapeWithShapes method to create a compound shape. Use this array along with the sourceObject property to recover the information that was used to create the shape.

If the shape was created with the shapeWithGeometry or shapeWithNode method, this property,Äôs value is nil.

### 156.39.18 Properties

### 156.39.19 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.39.20 options as Dictionary

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The options dictionary that was used to create the shape.
**Notes:** You provide this dictionary in the shapeWithGeometry or shapeWithNode method. Use this dictionary along with the sourceObject property to recover the information that was used to create the shape. If the shape was created with the shapeWithShapes method, this property,Äôs value is nil.
(Read only property)

## 156.40 class SCNPhysicsSliderJointMBS

### 156.40.1 class SCNPhysicsSliderJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A physics behavior that connects two bodies and allows them to slide against each other and rotate around their connecting points.
**Notes:** A slider joint can have zero, one, or two degrees of freedom depending on whether you allow it to slide or rotate. You can also use a slider joint to pin a body so that it can move only by sliding a specific axis in the coordinate space of the node containing it. You can also use a slider joint as a motor, applying a force or torque to the bodies it connects.
Subclass of the SCNPhysicsBehaviorMBS class.

### 156.40.2 Methods

### 156.40.3 Constructor(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a slider joint that anchors a single physics body in space and allows it to slide along a specific axis.
**Notes:** body: The physics body to be controlled by the joint.
axis: The axis along which the first body can slide, relative to the node containing it.
anchor: The point at which the body is pinned, in the local coordinate system of the node containing it.

Returns a new slider joint behavior.

This method defines the location where the body is anchored in the coordinate system of the node containing it. To define its sliding or rotation motion relative to that point, use the properties listed in Limiting the Motion of a Slider Joint.
For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.40.4 Constructor(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS)

### 156.40.4 Constructor(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a slider joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.
axisA: The axis along which the first body can slide, relative to the node containing it.
anchorA: The point at which the joint connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.
axisB: The axis along which the second body can slide, relative to the node containing it.
anchorB: The point at which the joint connects, relative to the node containing the second body.

Returns a new slider joint behavior.

This method defines the location where the bodies are pinned together. To define their sliding or rotation motion relative to that point, use the properties listed in Limiting the Motion of a Slider Joint.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.40.3 Constructor(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) 20304

### 156.40.5 jointWithBody(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) as SCNPhysicsSliderJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a slider joint that anchors a single physics body in space and allows it to slide along a specific axis.
**Notes:** body: The physics body to be controlled by the joint.
axis: The axis along which the first body can slide, relative to the node containing it.
anchor: The point at which the body is pinned, in the local coordinate system of the node containing it.

Returns a new slider joint behavior.

This method defines the location where the body is anchored in the coordinate system of the node containing it. To define its sliding or rotation motion relative to that point, use the properties listed in Limiting the Motion of a Slider Joint.
For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your

scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.40.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS) as SCNPhysicsSliderJointMBS 20306

### 156.40.6 jointWithBody(bodyA as SCNPhysicsBodyMBS, axisA as SCNVector3MBS, anchorA as SCNVector3MBS, bodyB as SCNPhysicsBodyMBS, axisB as SCNVector3MBS, anchorB as SCNVector3MBS) as SCNPhysicsSliderJointMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a slider joint connecting two physics bodies.
**Notes:** bodyA: The first physics body to be connected by the joint.
axisA: The axis along which the first body can slide, relative to the node containing it.
anchorA: The point at which the joint connects, relative to the node containing the first body.
bodyB: The second physics body to be connected by the joint.
axisB: The axis along which the second body can slide, relative to the node containing it.
anchorB: The point at which the joint connects, relative to the node containing the second body.

Returns a new slider joint behavior.

This method defines the location where the bodies are pinned together. To define their sliding or rotation motion relative to that point, use the properties listed in Limiting the Motion of a Slider Joint.

For a behavior to take effect, add it to the physics simulation by calling the addBehavior method on your scene,Äôs SCNPhysicsWorldMBS object. The physics bodies constrained by the joint must be attached to nodes in the scene.
See also:

- 156.40.5 jointWithBody(body as SCNPhysicsBodyMBS, axis as SCNVector3MBS, anchor as SCNVector3MBS) as SCNPhysicsSliderJointMBS 20305

### 156.40.7 Properties

### 156.40.8 anchorA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the joint connects, relative to the node containing the first body.
**Notes:** (Read and Write property)

### 156.40.9 anchorB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The point at which the joint connects, relative to the node containing the second body.
**Notes:** (Read and Write property)

### 156.40.10 axisA as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The axis along which the first body can slide, relative to the node containing it.
**Notes:** (Read and Write property)

### 156.40.11 axisB as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The axis along which the second body can slide, relative to the node containing it.
**Notes:** (Read and Write property)

### 156.40.12 bodyA as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first physics body connected by the joint.
**Notes:** (Read only property)

### 156.40.13 bodyB as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second physics body connected by the joint.
**Notes:** This property,Äôs value is nil if the joint was created using the jointWithBody method.
(Read only property)

### 156.40.14 maximumAngularLimit as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum rotation angle between the two bodies, measured in radians relative to their initial orientations.
**Notes:** The default (and maximum) value of this property is M_PI. With this value, the joint can spin counterclockwise (relative to the first body) with no limit.
Set both this property and the maximumAngularLimit property to the same value to prevent the bodies from rotating around their anchor points. (Set both properties to 0.0 to fix the bodies in their initial orientations.) Bodies whose orientation is fixed by a sliding joint may still slide, depending on the values of the minimumLinearLimit and maximumLinearLimit properties.
(Read and Write property)

### 156.40.15 maximumLinearLimit as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum distance between the anchor points of the two bodies, relative to their initial positions.
**Notes:** The default value of this property is INFINITY. With this value, the joint can slide forever in the direction of the slider axis.
Set both this property and the minimumLinearLimit property to the same value to pin the bodies together at their anchor points. (Set both properties to 0.0 to pin the bodies together at their initial positions.) Bodies pinned together by a sliding joint may still rotate, depending on the values of the minimumAngularLimit and maximumAngularLimit properties.
(Read and Write property)

### 156.40.16 minimumAngularLimit as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum rotation angle between the two bodies, measured in radians relative to their initial orientations.
**Notes:** The default (and minimum) value of this property is -M_PI. With this value, the joint can spin clockwise (relative to the first body) with no limit.
Set both this property and the maximumAngularLimit property to the same value to prevent the bodies from rotating around their anchor points. (Set both properties to 0.0 to fix the bodies in their initial orientations.) Bodies whose orientation is fixed by a sliding joint may still slide, depending on the values of the minimumLinearLimit and maximumLinearLimit properties.
(Read and Write property)

### 156.40.17 minimumLinearLimit as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum distance between the anchor points of the two bodies, relative to their initial positions.
**Notes:** The default value of this property is -INFINITY. With this value, the joint can slide forever in the direction opposite the slider axis.
Set both this property and the maximumLinearLimit property to the same value to pin the bodies together at their anchor points. (Set both properties to 0.0 to pin the bodies together at their initial positions.) Bodies pinned together by a sliding joint may still rotate, depending on the values of the minimumAngularLimit and maximumAngularLimit properties.
(Read and Write property)

### 156.40.18 motorMaximumForce as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum linear force that the joint can apply to its connected bodies, in newtons.
**Notes:** When you change the value of the motorTargetLinearVelocity property, the joint continuously applies a force of no greater than this magnitude until the bodies are moving at the target velocity. The default value is 1.0.
(Read and Write property)

### 156.40.19 motorMaximumTorque as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum torque that the joint can apply to its connected bodies, in newton-meters.
**Notes:** When you change the value of the motorTargetAngularVelocity property, the joint continuously applies a force of no greater than this magnitude until the bodies are rotating around the joint at the target angular velocity. The default value is 1.0.
(Read and Write property)

### 156.40.20 motorTargetAngularVelocity as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The angular velocity at which the joint,Äôs connected bodies should rotate around it.
**Notes:** At the default value of 0.0, the joint moves only when an external force acts on one of its connected bodies. Changing this value causes the joint to act as a rotary motor, continuously applying a torque (specified by the motorMaximumTorque property) until its connected bodies are rotating around the joint at the new angular velocity.

(Read and Write property)

### 156.40.21 motorTargetLinearVelocity as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The velocity at which the joint,Äôs connected bodies should slide.
**Notes:** At the default value of 0.0, the joint moves only when an external force acts on one of its connected bodies. Changing this value causes the joint to act as a linear motor, continuously applying a force (specified by the motorMaximumForce property) until its connected bodies are moving along the sliding axis of the joint at the new velocity.
(Read and Write property)

# 156.41 class SCNPhysicsVehicleMBS

## 156.41.1 class SCNPhysicsVehicleMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A physics behavior that modifies a physics body to behave like a car, motorcycle, or other wheeled vehicle.
**Notes:** To build a vehicle, designate an SCNPhysicsBodyMBS object as its chassis and an array of SCNPhysicsVehicleWheelMBS objects as its wheels. For each wheel, you define physical characteristics such as suspension and traction, and associate a node in your scene to provide the wheel,Äôs size and visual representation. After you construct a vehicle, you can control it in terms of acceleration, braking, and steering.

Although it,Äôs also possible to use a set of physics bodies and joints to collectively simulate a wheeled vehicle, the SCNPhysicsVehicleMBS class implements a higher-level simulation that provides realistic vehicle behavior with more efficient simulation performance.
Subclass of the SCNPhysicsBehaviorMBS class.

## 156.41.2 Methods

## 156.41.3 applyBrakingForce(value as double, index as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies a force between the specified wheel and the ground under the vehicle.
**Notes:** value: The magnitude of the torque, in newton-meters.
index: The index of the wheel applying the force.

Applying a braking force causes the wheel to slow down regardless of the direction it,Äôs currently spinning in.

As with all physical quantities in SceneKit, you need not use realistic force measurements in your app—the effects of the physics simulation depend on the relative differences between forces, not on their absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.

Calling this method applies a braking force for one step (or frame) of the physics simulation. To continuously decelerate a vehicle, call this method again on subequent simulation steps (for example, from your scene renderer delegate,Äôs renderer method) until the vehicle stops or reaches your desired speed.

### 156.41.4 applyEngineForce(value as double, index as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Applies a force between the specified wheel and the ground under the vehicle.
**Notes:** value: The magnitude of the force, in newtons.
index: The index of the wheel applying the force.

Applying a positive force turns the wheel in a direction that would move the vehicle forward; applying a negative force moves the vehicle in reverse.

As with all physical quantities in SceneKit, you need not use realistic force measurements in your app—the effects of the physics simulation depend on the relative differences between forces, not on their absolute values. You may use whatever values produce the behavior or gameplay you,Äôre looking for as long as you use them consistently.

Calling this method applies a force for one step (or frame) of the physics simulation. To continuously accelerate a vehicle, call this method again on subequent simulation steps (for example, from your scene renderer delegate,Äôs renderer method) until the vehicle reaches your desired speed.

### 156.41.5 Constructor(chassisBody as SCNPhysicsBodyMBS, wheels() as SCNPhysicsVehicleWheelMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a vehicle behavior.
**Notes:** chassisBody: A physics body to serve as the vehicle,Äôs chassis.
wheels: An array of SCNPhysicsVehicleWheel objects representing the vehicle,Äôs wheels. A vehicle must have at least one wheel.

Returns a new vehicle behavior.

Each object in the wheels array associates a node with the wheel to serve as its visual representation and defines properties for the wheel,Äôs physical characteristics. Each wheel object must reference a unique node, which should be a child of the node containing the physics body used for the vehicle,Äôs chassis. Typically, you load a node hierarchy representing the vehicle and all of its wheels from a scene file and then designate which nodes serve as the body and wheels.

For a behavior to take effect, you must add it to the physics simulation by calling the addBehavior: method on your scene,Äôs SCNPhysicsWorldMBS object.

### 156.41.6 setSteeringAngle(value as double, index as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pivots the specified wheel around its steering axis.
**Notes:** value: The angle to set the wheel at relative to its steering axis, in radians.
index: The index, in the vehicle,Äôs wheels array, of the wheel to be pivoted.

Steering angles are relative to the wheel,Äôs steeringAxis vector. With the default steering axis of { 0.0, -1.0, 0.0 } , a steering angle of 0.0 represents neutral steering, positive values steer the vehicle to the right, and negative values steer to the left.

### 156.41.7 vehicleWithChassisBody(chassisBody as SCNPhysicsBodyMBS, wheels() as SCNPhysicsVehicleWheelMBS) as SCNPhysicsVehicleMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a vehicle behavior.
**Notes:** chassisBody: A physics body to serve as the vehicle,Äôs chassis.
wheels: An array of SCNPhysicsVehicleWheel objects representing the vehicle,Äôs wheels. A vehicle must have at least one wheel.

Returns a new vehicle behavior.

Each object in the wheels array associates a node with the wheel to serve as its visual representation and defines properties for the wheel,Äôs physical characteristics. Each wheel object must reference a unique node, which should be a child of the node containing the physics body used for the vehicle,Äôs chassis. Typically, you load a node hierarchy representing the vehicle and all of its wheels from a scene file and then designate which nodes serve as the body and wheels.

For a behavior to take effect, you must add it to the physics simulation by calling the addBehavior: method on your scene,Äôs SCNPhysicsWorldMBS object.

### 156.41.8 wheels as SCNPhysicsVehicleWheelMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An array of SCNPhysicsVehicleWheelMBS objects representing the vehicle,Äôs wheels.
**Notes:** You can dynamically change the suspension and traction properties of a wheel connected to the vehicle by using the corresponding SCNPhysicsVehicleWheelMBS object.

### 156.41.9 Properties

### 156.41.10 chassisBody as SCNPhysicsBodyMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics body representing the vehicle,Äôs chassis.
**Notes:** The vehicle,Äôs chassis must be a dynamic body.
(Read only property)

### 156.41.11 speedInKilometersPerHour as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The vehicle,Äôs ground speed, in kilometers per hour.
**Notes:** (Read only property)

# 156.42 class SCNPhysicsVehicleWheelMBS

## 156.42.1 class SCNPhysicsVehicleWheelMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The appearance and physical characteristics of an individual wheel associated with an physics vehicle behavior.
**Notes:** To use wheels in a vehicle simulation, include them when creating an SCNPhysicsVehicle object with the vehicleWithChassisBody / Constructro initializer, then add the vehicle object to your scene,Äôs physics world using the physics world,Äôs addBehavior method.

Creating a Wheel
You create a wheel with an SCNNodeMBS object whose contents provide the wheel,Äôs visual representation—a geometry that rotates when the simulated vehicle rolls along a surface. The node representing a wheel must be a child of the node containing the physics body that serves as the vehicle,Äôs chassis, and each wheel in a vehicle must reference a unique node. Typically, you load a scene file that contains a node hierarchy representing the vehicle and all of its wheels. Next, you designate which nodes serve as the body and wheels.
Because the SCNPhysicsVehicleMBS behavior that a wheel is attached to manages its participation in the physics simulation, you don,Äôt need to attach a physics body to the SCNNodeMBS object representing a wheel.

Changing a Wheel,Äôs Physical Properties
The properties of a wheel define the geometry of its connection to the vehicle and simulate its size, traction, and suspension. You can change these properties after the wheel and the vehicle containing it have been added to the physics world. In this way, you can simulate effects such as variable suspension and flat tires.

Note
Vehicles and their wheels have several properties measured in real-world units (meters, centimeters, and newtons) with default values that produce realistic behavior for vehicles of size similar to an average automobile. If you design your scene on a different scale, proportionally change the values of these properties to fit the desired behavior of your app or game.

## 156.42.2 Methods

## 156.42.3 Constructor(node as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a wheel object.
**Notes:** node: The node whose contents provide the wheel,Äôs visual representation.

Returns a new wheel object.

The node representing a wheel must be a child of the node whose physics body serves as the chassis of the SCNPhysicsVehicleMBS behavior the wheel is attached to. Each wheel object must reference a unique node. To use the wheel, add it to the vehicle behavior using the addWheel method.
SceneKit uses the node,Äôs bounding box to determine the wheel,Äôs initial size, and it uses the node,Äôs position to determine the where the wheel connects to the vehicle,Äôs chassis. You can change attributes using the radius and connectionPosition properties.

### 156.42.4 copy as SCNPhysicsVehicleWheelMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the wheel.

### 156.42.5 wheelWithNode(node as SCNNodeMBS) as SCNPhysicsVehicleWheelMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a wheel object.
**Notes:** node: The node whose contents provide the wheel,Äôs visual representation.

Returns a new wheel object.

The node representing a wheel must be a child of the node whose physics body serves as the chassis of the SCNPhysicsVehicleMBS behavior the wheel is attached to. Each wheel object must reference a unique node. To use the wheel, add it to the vehicle behavior using the addWheel method.
SceneKit uses the node,Äôs bounding box to determine the wheel,Äôs initial size, and it uses the node,Äôs position to determine the where the wheel connects to the vehicle,Äôs chassis. You can change attributes using the radius and connectionPosition properties.

### 156.42.6 Properties

### 156.42.7 Axle as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The direction of the axis that the wheel spins around to move the vehicle.
**Notes:** This vector is expressed in the coordinate space of the node containing the vehicle,Äôs chassis. The default axle direction is { -1.0, 0.0, 0.0 } .

(Read and Write property)

### 156.42.8 ConnectionPosition as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The position of the wheel,Äôs connection to the vehicle,Äôs chassis.
**Notes:** This vector is expressed in the coordinate space of the node containing the vehicle,Äôs chassis. When you create a wheel from a node, SceneKit uses the node,Äôs position property as the wheel,Äôs connection point.
(Read and Write property)

### 156.42.9 FrictionSlip as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The traction between the wheel and any surface in contact with it.
**Notes:** The default value of this property is 1.0. Lower values result in better traction, and higher values make the wheel more likely to slip (causing it to spin freely instead of moving the vehicle).
(Read and Write property)

### 156.42.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.42.11 MaximumSuspensionForce as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum force of the suspension between the vehicle and the wheel, in newtons.
**Notes:** The physics simulation applies a force of no greater than this magnitude when contact with the ground causes the wheel to move relative to the vehicle. The default maximum suspension force is 6000.0.
(Read and Write property)

### 156.42.12 MaximumSuspensionTravel as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The maximum distance that the wheel is allowed to move up or down relative to its connection point, in centimeters.
**Notes:** Travel is the total distance a wheel is allowed to move (in both directions), in the coordinate system of the node containing the vehicle,Äôs chassis. The default suspension travel is 500.0.
(Read and Write property)

### 156.42.13 Node as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node providing the wheel,Äôs visual representation.
**Notes:** SceneKit automatically rotates and repositions this node in response to the physics simulation.
(Read only property)

### 156.42.14 Radius as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius of the wheel.
**Notes:** When you create a wheel from a node, its default radius is half of the largest dimension of the node,Äôs bounding box. (A wheel is always circular, even if the content of the node representing it is not.)
(Read and Write property)

### 156.42.15 SteeringAxis as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The direction of the axis that the wheel pivots around to steer the vehicle.
**Notes:** This vector is expressed in the coordinate space of the node containing the vehicle,Äôs chassis. The default steering axis is { 0.0, -1.0, 0.0 } .
When you steer a wheel using the vehicle,Äôs setSteeringAngle() method, the wheel pivots relative to this axis. For example, you can implement a vehicle whose rear wheels steer opposite its front wheels by reversing this vector,Äôs direction for the rear wheels and then applying the same steering angle to all wheels.
(Read and Write property)

### 156.42.16 SuspensionCompression as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The coefficient that limits the speed of the suspension returning to its rest length when compressed.
**Notes:** The default suspension coefficient is 4.4. Lower values cause the wheel to return to its natural position more quickly.
(Read and Write property)

### 156.42.17 SuspensionDamping as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The damping ratio that limits oscillation in the vehicle,Äôs suspension.
**Notes:** Damping ratio measures the tendency of the suspension to oscillate after a shock—in other words, for the vehicle to bounce up and down after running over a bump. The default damping ratio of 2.3 causes the wheel to return to its neutral position quickly after a shock. Values lower than 1.0 result in more oscillation.
(Read and Write property)

### 156.42.18 SuspensionRestLength as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The resting length of the suspension, in meters.
**Notes:** This property measures the length of the simulated spring between the vehicle and its wheel when the spring is not stressed by the weight of either body. When the wheel receives a shock (for example, when the vehicle runs over a bump), SceneKit adds the difference between the wheel,Äôs current position and its connection position to this rest length and then applies a force between the wheel and vehicle proportional to the total.
(Read and Write property)

### 156.42.19 SuspensionStiffness as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The spring coefficient of the suspension between the vehicle and the wheel.
**Notes:** The spring coefficient determines both how quickly the wheel returns to its natural position after a shock (for example, when the vehicle runs over a bump) and how much force from the shock it transmits to the vehicle. The default spring coefficient is 2.0.
(Read and Write property)

# 156.43 class SCNPhysicsWorldMBS

## 156.43.1 class SCNPhysicsWorldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The global simulation of collisions, gravity, joints, and other physics effects in a scene.
**Notes:** You do not create SCNPhysicsWorldMBS objects directly; instead, read the physicsWorld property of an SCNSceneMBS object. Use physics world object to perform the following tasks:

- Manage global properties of the simulation, such as its speed and constant gravity. (For more precise control of gravity and similar effects, see the SCNPhysicsFieldMBS class.)
- Register behaviors that modify interactions between the scene,Äôs physics bodies, such as joints and vehicles. For more details, see SCNPhysicsBehaviorMBS.
- Specify a delegate object to receive messages when two physics bodies contact each other
- Perform specific contact tests, and search for physics bodies in the scene using ray and sweep tests.

**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr2

**Videos**

- XDC 2020 MBS Plugins Presentation

## 156.43.2 Methods

## 156.43.3 addBehavior(behavior as SCNPhysicsBehaviorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a behavior to the physics world.
**Notes:** behavior: The behavior to be added.

Physics behaviors constrain or modify the effects of the physics simulation on sets of physics bodies. For example, the SCNPhysicsHingeJointMBS behavior causes two bodies to move as if connected by a hinge that pivots around a specific axis, and the SCNPhysicsVehicleMBS behavior causes a body to roll like a car or other wheeled vehicle.

To use a behavior in your scene, follow these steps:
1. Create SCNPhysicsBody objects and attach them to each node that participates in the behavior.

2. Create and configure a behavior object joining the physics bodies. See SCNPhysicsBehaviorMBS for a list of behavior classes.
3. Call addBehavior on your scene,Äôs physics world object to add the behavior to the physics simulation.

### 156.43.4 allBehaviors as SCNPhysicsBehaviorMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The list of behaviors affecting bodies in the physics world.

### 156.43.5 Constructor(fireContactEvents as Boolean = false)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:**

If fireContactEvents is true or you call EnableContactsEvents, we enable the contact events.

A contact is created when two physics bodies overlap and one of the physics bodies has a collisionBitMask property that overlaps with the other body,Äôs categoryBitMask property.

### 156.43.6 contactTest(body as SCNPhysicsBodyMBS, options as Dictionary = nil) as SCNPhysicsContactMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks for contacts between one physics body and any other bodies in the physics world.
**Notes:** body: The body to test for contact.
options: A dictionary of options affecting the test, or nil to use default options. For applicable keys and the possible values, see Physics Test Options Keys.

Returns an array of SCNPhysicsContactMBS objects describing contacts between the specified body and any others, or nil if the body is not in contact with any other bodies.

SceneKit sends messages to the physics world,Äôs contactdelegate object only when collisions occur between bodies whose collisionBitMask and categoryBitMask properties overlap, and only for collisions between certain types of bodies. (For details, see SCNPhysicsBodyType.) Use this method to directly test for all contacts between one body and any other bodies at a time of your choosing. For example, to implement a game with a ,Äúwall jump,Äù effect, you could call this method when the player presses the jump button to see if the player character is in contact with any walls.

See also:

- 156.43.7 contactTest(bodyA as SCNPhysicsBodyMBS, bodyB as SCNPhysicsBodyMBS, options as Dictionary = nil) as SCNPhysicsContactMBS() 20322

### 156.43.7 contactTest(bodyA as SCNPhysicsBodyMBS, bodyB as SCNPhysicsBodyMBS, options as Dictionary = nil) as SCNPhysicsContactMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks for contacts between two physics bodies.
**Notes:** bodyA: The first body (to test for contact with the second).
bodyB: The second body (to test for contact with the first).
options: A dictionary of options affecting the test, or nil to use default options. For applicable keys and the possible values, see Physics Test Options Keys.

Returns an array of SCNPhysicsContactMBS objects describing contacts between the two bodies, or nil if the bodies are not in contact.

SceneKit sends messages to the physics world,Äôs contactDelegate object only when collisions occur between bodies whose collisionBitMask and categoryBitMask properties overlap, and only for collisions between certain types of bodies. (For details, see SCNPhysicsBodyType.) Use this method to directly test for contacts between any two bodies at a time of your choosing. For example, to implement a game where the player character can pick up an item, you might call this method when the player presses the ,Äúpick up,Äù button to see if the player character is in contact with the item to be picked up.
See also:

- 156.43.6 contactTest(body as SCNPhysicsBodyMBS, options as Dictionary = nil) as SCNPhysicsContactMBS() 20321

### 156.43.8 convexSweepTest(shape as SCNPhysicsShapeMBS, fromTransform as SCNMatrix4MBS, toTransform as SCNMatrix4MBS, options as Dictionary = nil) as SCNPhysicsContactMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches for physics bodies in the space formed by moving a convex shape through the physics world.
**Notes:** shape: A physics shape. This shape must enclose a convex volume. For details on creating shapes that satisfy this requirement, see SCNPhysicsShapeMBS.
from: A transform matrix representing the initial position and orientation of the shape.
to: A transform matrix representing the final position and orientation of the shape.
options: A dictionary of options affecting the test, or nil to use default options. For applicable keys and the possible values, see Physics Test Options Keys.

Returns an array of SCNPhysicsContactMBS objects describing any contacts that would occur when moving the physics shape through the physics world.

Use this method when it,Äôs important to plan for (or avoid) collisions ahead of the physics simulation. For example, in a game you might plan maneuvers for a flying character to fit through the gaps between static bodies in the physics world

### 156.43.9 EnableContactsEvents

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Enables contact events.
**Notes:** If you connect the contact events via AddHandler, please call this method once to connect the events internally.

### 156.43.10 rayTestWithSegment(origin as SCNVector3MBS, dest as SCNVector3MBS, options as Dictionary = nil) as SCNPhysicsBehaviorMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches for physics bodies along a line segment between two points in the physics world.
**Notes:** origin: An endpoint of the line segment to search, specified in the scene,Äôs world coordinate system.
dest: The other endpoint of the line segment to search, specified in the scene,Äôs world coordinate system.
options: A dictionary of options affecting the test, or nil to use default options. For applicable keys and the possible values, see Physics Test Options Keys.

Returns an array of SCNHitTestResultMBS objects describing search results.

Use this method to implement concepts such as line of sight in your app. For example, in a game you might implement behavior for an enemy character by searching for physics bodies along a line between the enemy character,Äôs position and the player character,Äôs position

### 156.43.11 removeAllBehaviors

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes all behaviors affecting bodies in the physics world.

### 156.43.12 removeBehavior(behavior as SCNPhysicsBehaviorMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes a behavior from the physics world.

### 156.43.13 SCNPhysicsTestBackfaceCullingKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The key for choosing whether to ignore back-facing polygons in physics shapes when searching for contacts.
**Notes:** The value for this key is a Boolean value. The default value is true, specifying that the search should only return contacts with the exterior surfaces of any physics shapes. Change the value to false to consider contacts with both interior and exterior surfaces.

This key applies only to ray and convex sweep tests, and only to physics shapes created using the SCNPhysicsShapeTypeConcavePolyhedron option.

### 156.43.14 SCNPhysicsTestCollisionBitMaskKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The key for selecting which categories of physics bodies that SceneKit should test for contacts.
**Notes:** The value for this key is an unsigned Integer value. SceneKit tests for contacts only with physics bodies whose categoryBitMask property overlaps with this bit mask. The default value is SCNPhysicsCollisionCategoryAll, specifying that searches should test all physics bodies regardless of their category.

### 156.43.15 SCNPhysicsTestSearchModeAll as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the option values for SCNPhysicsTestSearchModeKey key.
**Notes:** Searches should return all contacts matching the search parameters.

### 156.43.16 SCNPhysicsTestSearchModeAny as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the option values for SCNPhysicsTestSearchModeKey key.
**Notes:** Searches should return only the first contact found regardless of its position relative to the search

parameters.

### 156.43.17 SCNPhysicsTestSearchModeClosest as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the option values for SCNPhysicsTestSearchModeKey key.
**Notes:** Searches should return only the closest contact to the beginning of the search.

### 156.43.18 SCNPhysicsTestSearchModeKey as String

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The key for selecting the number and order of contacts to be tested.
**Notes:** See Physics Test Search Modes for possible values. The default value is SCNPhysicsTestSearchModeAny.
This key applies only to ray and convex sweep tests.

### 156.43.19 updateCollisionPairs

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Forces the physics engine to reevaluate possible collisions between physics bodies.
**Notes:** By default, SceneKit checks for collisions between physics bodies only once per simulation step. If you directly change the positions of any physics bodies outside of a event, call the updateCollisionPairs method before using any of the methods listed in Searching for Physics Bodies Detecting Contacts Between Physics Bodies.

### 156.43.20 Properties

### 156.43.21 gravity as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A vector that specifies the gravitational acceleration applied to physics bodies in the physics world.
**Notes:** The components of this vector are measured in meters per second per second. The default value is (0.0,-9.8,0.0).
This property applies a constant acceleration to all physics bodies in the world, simulating the effect of gravity near the surface of the Earth. For more sophisticated gravity effects, including limited areas of effect and strength proportional to distance, use the SCNPhysicsFieldMBS class. When using fields, you may want

to set this property to the zero vector so that fields provide all gravity effects in the physics world.
(Read and Write property)

### 156.43.22 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 156.43.23 speed as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The rate at which the simulation executes.
**Notes:** The default value is 1.0, which means that the simulation runs at normal speed. A value other than the default changes the rate at which time passes in the physics simulation. For example, a speed value of 2.0 indicates that time in the physics simulation passes twice as fast as the scene,Äôs simulation time. A value of 0.0 pauses the physics simulation.

Note:
Increasing the speed of the physics simulation reduces its accuracy.
(Read and Write property)

### 156.43.24 timeStep as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The time interval between updates to the physics simulation.
**Notes:** SceneKit processes the physics simulation and updates the state of all physics bodies once per the time interval specified by this property. The default value is 1/60 second (a rate of 60 Hz).
A faster simulation rate provides more accuracy in simulation results—such as collisions between fast-moving objects—but at a higher cost in CPU time (which may in turn slow down your app,Äôs rendering frame rate). Typically, you should set this property to match your target rendering frame rate (as defined by the preferredFramesPerSecond property of the SCNViewMBS object rendering your scene).
(Read and Write property)

### 156.43.25 Events

### 156.43.26 didBeginContact(contact as SCNPhysicsContactMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the class that two bodies have come into contact.
**Notes:** contact: An object that describes the contact.

### 156.43.27 didEndContact(contact as SCNPhysicsContactMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the class that a contact has ended.
**Notes:** contact: An object that describes the contact.

### 156.43.28 didUpdateContact(contact as SCNPhysicsContactMBS)

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: .

**Function:** Tells the class that new information is available about an ongoing contact.
**Notes:** contact: An object that describes the contact.

SceneKit calls this method on each step of the physics simulation (see the timeStep property) if information about the contact changes—for example, if two bodies are sliding against one another.

## 156.44 class SCNPlaneMBS

### 156.44.1 class SCNPlaneMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNPlaneMBS represents a rectangle with controllable width and height. The plane has one visible side.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 28: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.44.2 Methods

### 156.44.3 Constructor(Width as Double, Height as Double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a plane with given width and height.

### 156.44.4 plane(Width as Double, Height as Double) as SCNPlaneMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a plane with given width and height.

### 156.44.5 Properties

### 156.44.6 cornerRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The corner radius. Animatable.
**Notes:** If the value is strictly less than 0, the geometry is empty. The default value is 0.
(Read and Write property)

### 156.44.7 cornerSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions for the rounded corners. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 10.
(Read and Write property)

### 156.44.8 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The plane extent along the Y axis. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.44.9 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. The default value is 1. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.44.10 width as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The plane extent along the X axis. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.44.11 widthSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the X axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

# 156.45 class SCNPyramidMBS

## 156.45.1 class SCNPyramidMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNPyramid represents a right pyramid with a rectangular base.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- Physics example for SceneKit in Xojo
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 29: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

## 156.45.2 Methods

## 156.45.3 Constructor(width as double, height as double, length as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a pyramid with given width, height, and length.
**Notes:** width: The width of the pyramid.
height: The height of the pyramid.
length: The length of the pyramid.

## 156.45.4 pyramid(width as double, height as double, length as double) as SCNPyramidMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a pyramid with given width, height, and length.
**Notes:** width: The width of the pyramid.
height: The height of the pyramid.
length: The length of the pyramid.

### 156.45.5 Properties

### 156.45.6 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the pyramid. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.45.7 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.45.8 length as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The length of the pyramid base. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.45.9 lengthSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Z axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.45.10 width as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The width of the pyramid base. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.

(Read and Write property)

### 156.45.11 widthSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the X axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

## 156.46 class SCNReplicatorConstraintMBS

### 156.46.1 class SCNReplicatorConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNReplicatorConstraint replicates the position/orientation/scale of a target node
**Notes:** Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.46.2 Methods

### 156.46.3 Constructor(target as SCNNodeMBS)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNReplicatorConstraint constraint.

### 156.46.4 replicatorConstraintWithTarget(target as SCNNodeMBS) as SCNReplicatorConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNReplicatorConstraint constraint.

### 156.46.5 Properties

### 156.46.6 orientationOffset as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines an addition orientation offset.
**Notes:** Defaults to no offset. Animatable.
(Read and Write property)

### 156.46.7 positionOffset as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines an addition orientation offset.
**Notes:** Defaults to no offset. Animatable.
(Read and Write property)

### 156.46.8 replicatesOrientation as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines whether or not the constraint should replicate the target orientation.
**Notes:** Defaults to true.
(Read and Write property)

### 156.46.9 replicatesPosition as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines whether or not the constraint should replicate the target position.
**Notes:** Defaults to true.
(Read and Write property)

### 156.46.10 replicatesScale as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines whether or not the constraint should replicate the target scale.
**Notes:** Defaults to true.
(Read and Write property)

### 156.46.11 scaleOffset as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines an addition scale offset.
**Notes:** Defaults to no offset. Animatable.
(Read and Write property)

### 156.46.12 target as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the target node to replicate.
**Notes:** (Read and Write property)

# 156.47 class SCNSceneMBS

## 156.47.1 class SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container for the node hierarchy and global properties that together form a displayable 3D scene.
**Notes:** To display 3D content with SceneKit, you create a scene containing a hierarchy of the nodes and attributes that together represent your visual elements. Typically, you build your assets in a 3D visual editor, then assemble them into a scene using Xcode,Äôs SceneKit Scene Editor, ready for SceneKit to render.

The simplest way to create a scene is through Xcode,Äôs SceneKit Scene Editor. Start by importing one or more assets from a 3D editor, such as Blender. Then you adjust the positions and attributes of the assets, and set global scene properties, such as lighting environment, to compose your scene. The scene editor creates a .scn file, which you save to a .scnassets folder in the app bundle. When you build your project, Xcode optimizes the scene file for your target platform.
**Blog Entries**

- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 19.6, pages 45 to 46: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, page 53: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.4, page 39: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 26 to 27: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

## 156.47.2 Methods

## 156.47.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an empty scene.

## 156.47.4 scene as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns an empty scene.
**Notes:** An empty scene contains only a root SCNNode object with no contents. To populate the scene, add children to the root node.

### 156.47.5 sceneNamed(name as string) as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Loads a scene from a file with the specified name in the app,Äôs main bundle.
**Notes:** name: The name of a scene file in the app bundle,Äôs resources directory.

Returns a new scene object, or nil if no scene could be loaded.

This method provides a convenient way to load a complete scene from a file in the app,Äôs main bundle. Calling this method is equivalent to using the NSBundle class to locate the scene file and passing the resulting URL to the sceneWithURL method, specifying no options and no error handling.

For more detailed options or to load only part of a file,Äôs scene graph, use the SCNSceneSource class.

When creating a scene using Xcode's Scene Editor or an external tool, you should copy your scene file into a directory with the .scnassets extension inside your app bundle. You should also place any image files referenced as textures from that scene in an Asset Catalog. Xcode will optimize the scene and texture resources for best performance on each target device, and prepare your texture resources for delivery features such as App Thinning and On-Demand Resources.
See also:

- 156.47.6 sceneNamed(name as string, folder as folderItem, options as Dictionary = nil) as SCNSceneMBS 20338

### 156.47.6 sceneNamed(name as string, folder as folderItem, options as Dictionary = nil) as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Loads a scene from a file with the specified name in a specific subdirectory of the app,Äôs main bundle.
**Notes:** name: The name of a scene file in the app bundle.
directory: The path to the subdirectory of the bundle,Äôs resources directory containing the scene file.
options: A dictionary of options affecting scene loading, or nil for default options. For available keys, see Scene Loading Options.

Returns a new scene object, or nil if no scene could be loaded.

This method provides a convenient way to load a complete scene from a file in the app,Äôs main bundle. Calling this method is equivalent to using the NSBundle class to locate the scene file and passing the resulting URL to the sceneWithURL method.

For more detailed options or to load only part of a file,Äôs scene graph, use the SCNSceneSource class.

When creating a scene using Xcode's Scene Editor or an external tool, you should copy your scene file into a directory with the .scnassets extension inside your app bundle. You should also place any image files referenced as textures from that scene in an Asset Catalog. Xcode will optimize the scene and texture resources for best performance on each target device, and prepare your texture resources for delivery features such as App Thinning and On-Demand Resources.
See also:

- 156.47.5 sceneNamed(name as string) as SCNSceneMBS 20338

### 156.47.7 sceneWithFile(file as folderItem, options as Dictionary = nil, byref Error as NSErrorMBS) as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Loads a scene from the specified file.
**Notes:** file: The scene file to load.
options: A dictionary of options affecting scene loading, or nil for default options. For available keys, see Scene Loading Options.
error: If an error occurs, this pointer is set to an NSError object describing the error. If you do not want error information, pass in nil.

Returns a new scene object, or nil if no scene could be loaded.

This method provides a convenient way to load a complete scene from a file at an arbitrary URL. For more detailed options or to load only part of a file,Äôs scene graph, use the SCNSceneSource class.

When creating a scene using Xcode's Scene Editor or an external tool, you should copy your scene file into a directory with the .scnassets extension inside your app bundle. You should also place any image files referenced as textures from that scene in an Asset Catalog. Xcode will optimize the scene and texture resources for best performance on each target device, and prepare your texture resources for delivery features such as App Thinning and On-Demand Resources.

### 156.47.8 sceneWithURL(FileURL as string, options as Dictionary = nil, byref Error as NSErrorMBS) as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Loads a scene from the specified URL.
**Notes:** url: The URL to the scene file to load.
options: A dictionary of options affecting scene loading, or nil for default options. For available keys, see Scene Loading Options.
error: If an error occurs, this pointer is set to an NSError object describing the error. If you do not want error information, pass in nil.

Returns a new scene object, or nil if no scene could be loaded.

This method provides a convenient way to load a complete scene from a file at an arbitrary URL. For more detailed options or to load only part of a file,Äôs scene graph, use the SCNSceneSource class.

When creating a scene using Xcode's Scene Editor or an external tool, you should copy your scene file into a directory with the .scnassets extension inside your app bundle. You should also place any image files referenced as textures from that scene in an Asset Catalog. Xcode will optimize the scene and texture resources for best performance on each target device, and prepare your texture resources for delivery features such as App Thinning and On-Demand Resources.

### 156.47.9 SCNSceneEndTimeAttributeKey as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the constant name for the attributes.
**Notes:** A floating-point value for the end time of the scene.

### 156.47.10 SCNSceneExportDestinationURL as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The final destination URL (an NSURLMBS object) for the exported scene file.
**Notes:** Use this option if you export a scene to a temporary directory and then move it to a final location. You must specify a final destination URL if your scene references external resources, such as image files for textures. SceneKit uses this URL to construct appropriate paths for external resources when writing the scene file.

### 156.47.11 SCNSceneFrameRateAttributeKey as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the constant name for the attributes.
**Notes:** A floating-point value (in an NSNumber object) for the frame rate of the scene.

This value may be present in scenes loaded from scene files produced using external tools, but has no effect on SceneKit,Äôs rendering of the scene.

### 156.47.12 SCNSceneStartTimeAttributeKey as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the constant name for the attributes.
**Notes:** A floating-point value for the start time of the scene.

### 156.47.13 SCNSceneUpAxisAttributeKey as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the constant name for the attributes.
**Notes:** An SCNVector3MBS object (in an NSValueMBS object) specifying the orientation of the scene.

This value may be present in scenes loaded from scene files produced using external tools, but has no effect on SceneKit,Äôs processing of the scene. Use this vector when combining elements from different scenes so that they appear in their expected orientation.

### 156.47.14 Properties

### 156.47.15 background as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A background to be rendered before the rest of the scene.
**Notes:** If the material property,Äôs contents object is nil, SceneKit does not draw any background before drawing the rest of the scene. (If the scene is presented in an SCNView instance, the view,Äôs background color is visible behind the contents of the scene.)
If you specify a cube map texture for the material property (see the discussion of the contents property), SceneKit renders the background as a skybox.
(Read only property)

### 156.47.16 fogColor as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The color of the fog effect to be rendered with the scene. Animatable.
**Notes:** The default fog color is white.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.47.17 fogDensityExponent as Double

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transition curve for the fog,Äôs intensity between its start and end distances. Animatable.
**Notes:** A fog effect fades out the contents of the scene with increasing distance from the pointOfView location, replacing them with increasing intensities of the fogColor color. The fogDensityExponent property determines the smoothness or abruptness of this transition.

A value of 0.0 (the default) specifies no attenuation—the fog,Äôs intensity is the same at all distances . A value of 1.0 specifies a linear transition, and a value of 2.0 specifies a quadratic transition curve. Higher values have little visible effect.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.47.18 fogEndDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance from a point of view at which the scene,Äôs contents are completely obscured by fog. Animatable.
**Notes:** A fog effect causes scene contents to become less visible the farther they are from the pointOfView node currently used for rendering. At distances less than the value of the fogStartDistance property, scene contents are fully visible. At greater distances, SceneKit blends the rendered scene contents with a constant color (specified by the fogColor property). At distances greater than the fogEndDistance property, the scene contents fade away completely and only the fog color is visible. Use fog to add atmospheric effects to your app or game, or to improve rendering performance by hiding parts of the scene that are far away from the current point of view.

The default end distance of 0.0 disables the fog effect. Change this property,Äôs value to enable fog.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.47.19 fogStartDistance as Double

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The distance from a point of view at which the scene,Äôs contents begin to be obscured by fog. Animatable.
**Notes:** A fog effect causes scene contents to become less visible the farther they are from the pointOfView node currently used for rendering. At distances less than the value of the fogStartDistance property, scene contents are fully visible. At greater distances, SceneKit blends the rendered scene contents with a constant color (specified by the fogColor property). At distances greater than the fogEndDistance property, the scene contents fade away completely and only the fog color is visible. Use fog to add atmospheric effects to your app or game, or to improve rendering performance by hiding parts of the scene that are far away from the current point of view.

The default start distance is 0.0.

You can animate changes to this property,Äôs value.
(Read and Write property)

### 156.47.20 lightingEnvironment as SCNMaterialPropertyMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A cube map texture that depicts the environment surrounding the scene,Äôs contents, used for advanced lighting effects.
**Notes:** When rendering materials with the physicallyBased lighting model, SceneKit illuminates surfaces differently according to the environment that surrounds them. For example, with physically based shading, even a diffuse surface takes on some color from the sky above it and the ground below it.

Tip: For realistic results, reuse the same contents for both the lighting environment and the background property.

For information about defining cube maps, see the discussion of the contents property.
(Read only property)

### 156.47.21 paused as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether to run actions, animations, particle systems, and physics simulations in the scene graph.
**Notes:** If false (the default), SceneKit continuously updates and renders the contents of the scene. Pausing

a scene pauses any running animations or actions attached to the scene graph, and suspends updates of the scene,Äôs physics simulation and any particle systems in the scene.
(Read and Write property)

### 156.47.22 physicsWorld as SCNPhysicsWorldMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The physics simulation associated with the scene.
**Notes:** Every scene automatically creates a physics world object to simulate physics on nodes in the scene. You use this property to access the scene,Äôs global physics properties, such as gravity, and to manage physics interactions between nodes. To make a node in the scene participate in the physics simulation, use either or both of its physicsBodyMBS and physicsFieldMBS properties.
(Read only property)

### 156.47.23 rootNode as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The root node of the scene graph.
**Notes:** All scene content—nodes, geometries and their materials, lights, cameras, and related objects—is organized in a node hierarchy with a single common root node.

Some scene files created using external tools may describe node hierarchies containing multiple root nodes. When SceneKit imports such files, their separate root nodes will be made children of a new, unique root node.

Each child node,Äôs coordinate system is defined relative to the transformation of its parent node. You should not modify the transform property of the root node.
(Read only property)

### 156.47.24 attributeForKey(key as String) as Variant

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns or sets the scene attribute for the specified key.
**Notes:** key: One of the constants described in Scene Attributes that identifies the attribute to be written.
(Read and Write computed property)

# 156.48 class SCNShapeMBS

## 156.48.1 class SCNShapeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNShape represents a 2D shape (cubic Bezier spline) than can be extruded.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.48.2 Methods

## 156.48.3 Constructor(path as NSBezierPathMBS, extrusionDepth as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a 3D representation of the given shape with the given extrusion depth.
**Notes:** path: The cubic Bezier spline to extrude.
extrusionDepth: The extrusion depth.

## 156.48.4 shape(path as NSBezierPathMBS, extrusionDepth as double) as SCNShapeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a 3D representation of the given shape with the given extrusion depth.
**Notes:** path: The cubic Bezier spline to extrude.
extrusionDepth: The extrusion depth.

## 156.48.5 Properties

## 156.48.6 chamferMode as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The sides of the text that are chamfered.
**Notes:** The default value is ChamferModeBoth.
(Read and Write property)

### 156.48.7 chamferProfile as NSBezierPathMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Describes the profile used to when "chamferRadius" is not nil.
**Notes:** When "chamferProfile" is nil we fallback on a path representing a quadrant.
The profile should be a 2D curve beginning at (0,1) and ending at (1,0). The "flatness" property is also used to flatten this path. The default value is nil.
(Read and Write property)

### 156.48.8 chamferRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The chamfer radius. Animatable.
**Notes:** Values are clamped to the range [ 0, extrusionDepth / 2 ] . The default value is 0.
(Read and Write property)

### 156.48.9 extrusionDepth as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The extrusion depth. Animatable.
**Notes:** If the value is 0, we get a mono-sided, 2D version of the shape.
(Read and Write property)

### 156.48.10 path as NSBezierPathMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The path defining the shape to be rendered.
**Notes:** The path defines the outline of the shape. The path is filled using the even-odd rule. If the path is self-intersecting, the behavior is undefined.
(Read and Write property)

### 156.48.11 Constants

Chamfer Mode

| Constant | Value | Description |
|---|---|---|
| ChamferModeBack | 2 | Apply a chamfer to only the back edge of the extruded shape. |
| ChamferModeBoth | 0 | Apply a chamfer to both front and back edges of the extruded shape. |
| ChamferModeFront | 1 | Apply a chamfer to only the front edge of the extruded shape. |

## 156.49 class SCNSliderConstraintMBS

### 156.49.1 class SCNSliderConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNSliderConstraint constraint makes a node to collide and slide against a category of nodes
**Notes:** Subclass of the SCNConstraintMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.49.2 Methods

### 156.49.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNSliderConstraint object.

### 156.49.4 sliderConstraint as SCNSliderConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a SCNSliderConstraint object.

### 156.49.5 Properties

### 156.49.6 collisionCategoryBitMask as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the category of node to collide against. Defaults to 0.
**Notes:** (Read and Write property)

### 156.49.7 offset as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the offset of the slider.
**Notes:** Defaults to (0,0,0).

(Read and Write property)

### 156.49.8 Radius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Defines the radius of the slider. Defaults to 1.
**Notes:** (Read and Write property)

## 156.50 class SCNSphereMBS

### 156.50.1 class SCNSphereMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNSphere represents a sphere with controllable radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 21 to 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 35: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 32 to 33: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 30: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 27: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

### 156.50.2 Methods

### 156.50.3 Constructor(radius as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a sphere with given radius.
**Notes:** radius: The radius of the sphere.

### 156.50.4 sphere(radius as double) as SCNSphereMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a sphere with given radius.
**Notes:** radius: The radius of the sphere.

### 156.50.5 Properties

### 156.50.6 geodesic as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Indicate if the geometry is a geosphere.
**Notes:** The default value is false.
(Read and Write property)

### 156.50.7 radius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The sphere radius. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 0.5.
(Read and Write property)

### 156.50.8 segmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of segments along both spherical coordinates. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.
(Read and Write property)

# 156.51 class SCNTextMBS

## 156.51.1 class SCNTextMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNText represents a block of text that has been extruded
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

## 156.51.2 Methods

## 156.51.3 Constructor(text as string, extrusionDepth as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a 3D representation of given text with given extrusion depth.
**Notes:** string: The text to be represented.
extrusionDepth: The extrusion depth.

## 156.51.4 text(text as string, extrusionDepth as double) as SCNTextMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a 3D representation of given text with given extrusion depth.
**Notes:** string: The text to be represented.
extrusionDepth: The extrusion depth.
See also:

- 156.51.15 text as String 20354

## 156.51.5 Properties

## 156.51.6 alignmentMode as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines how individual lines of text are horizontally aligned within the bounds.
**Notes:** For the text to be aligned you first need to set its bounds, otherwise the text is not aligned. The default value is kCAAlignmentNatural.

(Read and Write property)

### 156.51.7 attributedString as NSAttributedStringMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The text to be represented.
**Notes:** The text can be string or NSAttributedStringMBS.
(Read and Write property)

### 156.51.8 chamferProfile as NSBezierPathMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Describes the profile used to when "chamferRadius" is not nil.
**Notes:** When "chamferProfile" is nil we fallback on a path representing a quadrant.
The profile should be a 2D curve beginning at (0,1) and ending at (1,0). The "flatness" property is also used to flatten this path. The default value is nil.
(Read and Write property)

### 156.51.9 chamferRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The chamfer radius. Animatable.
**Notes:** Values are clamped to the range [ 0, extrusionDepth / 2 ] . The actual chamfer radius might be different to the one here specified: large values are clipped to a per-glyph max value. The default value is 0.
(Read and Write property)

### 156.51.10 chamferSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** The number of chamfer subdivisions. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 10.
(Read and Write property)

### 156.51.11 containerFrame as CGRectMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A container within which the text may be wrapped or truncated.
**Notes:** The text will start at the top-left corner of the rect. You need to set this property for text truncation or alignment to work. Getting this property when it has never been set returns CGRectMBS with all values zero.
(Read and Write property)

### 156.51.12 extrusionDepth as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The extrusion depth. Animatable.
**Notes:** If the value is 0, we get a mono-sided, 2D version of the text.
(Read and Write property)

### 156.51.13 flatness as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Specifies the accuracy (or smoothness) with which fonts are rendered.
**Notes:** Smaller numbers give smoother curves at the expense of more computation and heavier geometries in terms of vertices. The default value is 0.6, which yields smooth curves.
(Read and Write property)

### 156.51.14 font as NSFontMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The font used to represent the text.
**Notes:** The font property is only used when the string property is not an NSAttributedString. Defaults to the system font (12 point).
(Read and Write property)

### 156.51.15 text as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The text to be represented.
**Notes:** The text can be string or NSAttributedStringMBS.

(Read and Write property)
See also:

- 156.51.4 text(text as string, extrusionDepth as double) as SCNTextMBS 20352

### 156.51.16 textSize as CGSizeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the bounding box size the receiver occupies.
**Notes:** (Read only property)

### 156.51.17 truncationMode as String

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Describes how the text is truncated to fit within the bounds.
**Notes:** For the text to be truncated you first need to set its bounds, otherwise the text is not truncated. The default value is kCATruncationNone.
(Read and Write property)

### 156.51.18 Wrapped as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines whether the text is wrapped to fit within the bounds.
**Notes:** For the text to be wrapped you first need to set its bounds, otherwise the text is not wrapped. The default value is false.
(Read and Write property)

## 156.52 class SCNTorusMBS

### 156.52.1 class SCNTorusMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNTorus represents a torus with controllable ring radius and pipe radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.2, page 37: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 30 to 31: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

### 156.52.2 Methods

### 156.52.3 Constructor(ringRadius as double, pipeRadius as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a torus with given ring radius and pipe radius.
**Notes:** ringRadius: The radius of the ring.
pipeRadius: The radius of the pipe.

### 156.52.4 torus(ringRadius as double, pipeRadius as double) as SCNTorusMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a torus with given ring radius and pipe radius.
**Notes:** ringRadius: The radius of the ring.
pipeRadius: The radius of the pipe.

### 156.52.5 Properties

### 156.52.6 pipeRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius of the torus pipe. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 0.25.
(Read and Write property)

### 156.52.7 pipeSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions of the pipe. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 24.
(Read and Write property)

### 156.52.8 ringRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The radius of the torus ring. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 0.5.
(Read and Write property)

### 156.52.9 ringSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions of the ring. Animatable.
**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.
(Read and Write property)

## 156.53 class SCNTransformConstraintMBS

### 156.53.1 class SCNTransformConstraintMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A SCNTransformConstraint applies on the transform of a node via a custom block.
**Notes:** Subclass of the SCNConstraintMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

### 156.53.2 Methods

### 156.53.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

# 156.54 class SCNTubeMBS

## 156.54.1 class SCNTubeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** SCNTube represents a tube with controllable height, inner radius and outer radius.
**Notes:** Subclass of the SCNGeometryMBS class.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 18.4, page 44: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 31 to 33: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 22: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes

## 156.54.2 Methods

## 156.54.3 Constructor(InnerRadius as double, outerRadius as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a tube with given inner radius, outer radius and height.
**Notes:** innerRadius: The inner radius of the tube.
outerRadius: The outer radius of the tube.
height: The height of the tube.

## 156.54.4 tube(InnerRadius as double, outerRadius as double, height as double) as SCNTubeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates and returns a tube with given inner radius, outer radius and height.
**Notes:** innerRadius: The inner radius of the tube.
outerRadius: The outer radius of the tube.
height: The height of the tube.

### 156.54.5 Properties

### 156.54.6 height as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The height of the tube. Animatable.
**Notes:** If the value is less than or equal to 0, the geometry is empty. The default value is 1.
(Read and Write property)

### 156.54.7 heightSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the Y axis. Animatable.
**Notes:** If the value is less than 1, the behavior is undefined. The default value is 1.
(Read and Write property)

### 156.54.8 innerRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The inner radius of the tube. Animatable.
**Notes:** If the value is less than or equal to 0, or if it is greater than or equal to the outer radius, then the geometry is empty. The default value is 0.25.
(Read and Write property)

### 156.54.9 outerRadius as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The outer radius of the tube. Animatable.
**Notes:** If the value is less than or equal to 0, or if it is less than or equal to the inner radius, then the geometry is empty. The default value is 0.5.
(Read and Write property)

### 156.54.10 radialSegmentCount as Integer

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of subdivisions along the radial coordinate. Animatable.

**Notes:** If the value is less than 3, the behavior is undefined. The default value is 48.
(Read and Write property)

## 156.55 class SCNVector3MBS

### 156.55.1 class SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A representation of a three-component vector.
**Notes:** SceneKit uses three-component vectors for a variety of purposes, such as describing node or vertex positions, surface normals, and scale or translation transforms. The different vector components should be interpreted based on the context in which the vector is being used.
**Blog Entries**

- Basic Forms in MBS Xojo SceneKit Plugin
- Physics example for SceneKit in Xojo
- MBS Xojo Plugins, version 19.1pr1

**Xojo Developer Magazine**

- 19.6, pages 47 to 48: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, pages 50 to 51: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.4, page 48: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.4, pages 43 to 44: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 36 to 38: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 34: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, pages 27 to 32: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.2, page 21: On the Scene Again (Part 2), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 37: On the Scene, Getting Started with SceneKit by Stefanie Juchmes
- 18.1, pages 31 to 33: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

### 156.55.2 Methods

### 156.55.3 Constructor(x as double = 0.0, y as double = 0.0, z as double = 0.0)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

### 156.55.4 copy as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the vector.

### 156.55.5 equals(other as SCNVector3MBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Compares two vectors.
**Notes:** Returns true if both are equal.

### 156.55.6 Null as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns vector with all values zero.

### 156.55.7 Vector(x as double, y as double, z as double) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new vector.

### 156.55.8 Properties

### 156.55.9 x as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first component in the vector.
**Notes:** (Read and Write property)

### 156.55.10 y as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second component in the vector.
**Notes:** (Read and Write property)

### 156.55.11 z as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The third component in the vector.
**Notes:** (Read and Write property)

# 156.56 class SCNVector4MBS

## 156.56.1 class SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A representation of a four-component vector.
**Notes:** SceneKit uses four-component vectors to represent multiple kinds of data:

- Axis-angle rotation or torque. The x, y, and z fields contain the normalized x-, y-, and z-components of the rotation axis, and the w field contains the rotation angle, in radians, or torque magnitude, in newton-meters.
- Color value (or range). The x, y, z, and w fields contain the red, green, blue, and alpha components of the color, or the width of the color variation range in each component.

**Blog Entries**

- MBS Xojo Plugins, version 19.1pr1

## 156.56.2 Methods

## 156.56.3 Constructor(x as double = 0.0, y as double = 0.0, z as double = 0.0, w as double = 0.0)

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.

## 156.56.4 copy as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the vector.

## 156.56.5 equals(other as SCNVector4MBS) as boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Compares two vectors.
**Notes:** Returns true if equal.

### 156.56.6 Null as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns vector with all values zero.

### 156.56.7 Vector(x as double, y as double, z as double, w as double) as SCNVector4MBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the vector with given values.

### 156.56.8 Properties

### 156.56.9 w as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The fourth component in the vector.
**Notes:** (Read and Write property)

### 156.56.10 x as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The first component in the vector.
**Notes:** (Read and Write property)

### 156.56.11 y as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The second component in the vector.
**Notes:** (Read and Write property)

### 156.56.12 z as Double

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The third component in the vector.
**Notes:** (Read and Write property)

# 156.57 class SCNViewMBS

## 156.57.1 class SCNViewMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A view for displaying 3D SceneKit content.
**Notes:** In macOS, SCNView is a subclass of NSView. As part of the operating system,Äôs view hierarchy, an SCNView object provides a place for SceneKit content in your app,Äôs user interface. You can create a SceneKit view by using its Constructor method. To provide content for a SceneKit view, assign an SCNSceneMBS object to its scene property.

For additional important methods and properties for working with SceneKit views, see the SCNSceneRenderer protocol. (You can also render SceneKit content into an arbitrary Metal command queue or OpenGL context using the SCNRenderer class, or into a Core Animation layer on macOS using the SCNLayer class. The SCNSceneRenderer protocol defines functionality common to all three SceneKit rendering classes.)

see
https://developer.apple.com/documentation/scenekit/scnview

Requires 64bit app on macOS 10.8 or newer
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MBS Xojo Plugins, version 20.2pr1
- MBS Xojo Plugins, version 18.4pr8

**Xojo Developer Magazine**

- 19.6, page 46: Rotating Christmas Tree, Using the MBS Plugins to create an animated 3D Christmas tree by Stefanie Juchmes
- 18.4, page 39: On the Scene Again (Part 3), Getting Started with SceneKit by Stefanie Juchmes
- 18.1, page 26: On the Scene, Getting Started with SceneKit by Stefanie Juchmes

## 156.57.2 Methods

## 156.57.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new box view with size 100/100 and position 0/0
**Example:**

```
dim x as new SCNViewMBS
```

**Notes:** On success the handle property is not zero.

You can set PreferLowPowerDevice and PreferredRenderingAPI properties before initializing a view.
See also:


- 156.57.4 Constructor(Handle as Integer) 20369
- 156.57.5 Constructor(left as double, top as double, width as double, height as double) 20369


### 156.57.4 Constructor(Handle as Integer)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given NSView handle.
**Example:**

```
dim t as new SCNViewMBS(0, 0, 100, 100)
dim v as new SCNViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a SCNView and the plugin retains this handle.
See also:


- 156.57.3 Constructor 20368
- 156.57.5 Constructor(left as double, top as double, width as double, height as double) 20369


### 156.57.5 Constructor(left as double, top as double, width as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new control with the given size and position.
**Example:**

```
dim left,top,width,height as Integer
// define rectangle
dim x as new SCNViewMBS(left, top, width, height)
```

**Notes:** On success the handle property is not zero.

You can set PreferLowPowerDevice and PreferredRenderingAPI properties before initializing a view.
See also:


- 156.57.3 Constructor 20368
- 156.57.4 Constructor(Handle as Integer) 20369


### 156.57.6 hitTest(Point as CGPointMBS, Options as Dictionary = nil) as SCNHitTestResultMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Searches the renderer,Äôs scene for objects corresponding to a point in the rendered image.
**Notes:** Point: A point in the screen-space (view, layer, or GPU viewport) coordinate system of the scene renderer.
options: A dictionary of options affecting the search. See Hit Testing Options Keys for acceptable values.

Returns an array of SCNHitTestResultMBS objects representing search results.

A 2D point in the rendered screen coordinate space can refer to any point along a line segment in the 3D scene coordinate space. Hit-testing is the process of finding elements of a scene located along this line segment. For example, you can use this method to find the geometry corresponding to a click event in a SceneKit view.

### 156.57.7 isNodeInsideFrustum(node as SCNNodeMBS, pointOfView as SCNNodeMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether a node might be visible from a specified point of view.
**Notes:** node: The node whose visibility is to be tested.
pointOfView: A node defining a point of view, as used by the pointOfView property.

Returns true if the bounding box of the tested node intersects the view frustum defined by the pointOfView node; otherwise, false.

Any node containing a camera or spotlight may serve as a point of view (see the pointOfView property for details). Such a node defines a viewing frustum—a portion of the scene,Äôs coordinate space, shaped like a

truncated pyramid, that encloses all points visible from that point of view.

Use this method to test whether a node lies within the viewing frustum defined by another node (which may or may not be the scene renderer,Äôs current pointOfView node). For example, in a game scene containing multiple camera nodes, you could use this method to determine which camera is currently best for viewing a moving player character.

Note that this method does not perform occlusion testing. That is, it returns true if the tested node lies within the specified viewing frustum regardless of whether that node,Äôs contents are obscured by other geometry.

### 156.57.8 nodesInsideFrustumWithPointOfView(pointOfView as SCNNodeMBS) as SCNNodeMBS()

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns all nodes that might be visible from a specified point of view.
**Notes:** pointOfView: A node defining a point of view, as used by the pointOfView property.

Returns an array of nodes whose bounding boxes intersect the view frustum defined by the pointOfView node. If the array is empty, no nodes lie within the specified frustum.

Any node containing a camera or spotlight may serve as a point of view (see the pointOfView property for details). Such a node defines a viewing frustum—a portion of the scene,Äôs coordinate space, shaped like a truncated pyramid, that encloses all points visible from that point of view.
Use this method find all nodes whose content lies within the viewing frustum defined by another node (which may or may not be the scene renderer,Äôs current pointOfView node).
Note that this method does not perform occlusion testing. That is, the returned array includes any node that lies within the specified viewing frustum regardless of whether that node,Äôs contents are obscured by other geometry.

### 156.57.9 pause

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pauses playback of the view,Äôs scene.
**Notes:** This method has no effect if the scene is already paused.

### 156.57.10 play

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Resumes playback of the view,Äôs scene.
**Notes:** This method has no effect if the scene is not paused.

### 156.57.11 projectPoint(Point as SCNVector3MBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Projects a point from the 3D world coordinate system of the scene to the 2D pixel coordinate system of the renderer.
**Notes:** point: A point in the world coordinate system of the renderer,Äôs scene.

Returns the corresponding point in the screen-space (view, layer, or GPU viewport) coordinate system of the scene renderer.

The z-coordinate of the returned point describes the depth of the projected point relative to the near and far clipping planes of the renderer,Äôs viewing frustum (defined by its pointOfView node). Projecting a point on the near clipping plane returns a point whose z-coordinate is 0.0; projecting a point on the far clipping plane returns a point whose z-coordinate is 1.0.

### 156.57.12 snapshot as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Renders the view,Äôs scene into a new image object.

### 156.57.13 stop

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Stops playback of the view,Äôs scene and resets the scene time to its start time.

### 156.57.14 unprojectPoint(Point as SCNVector3MBS) as SCNVector3MBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Unprojects a point from the 2D pixel coordinate system of the renderer to the 3D world coordinate system of the scene.
**Notes:** point: A point in the screen-space (view, layer, or GPU viewport) coordinate system of the scene renderer.

Returns the corresponding point in the world coordinate system of the renderer,Äôs scene.

The z-coordinate of the point parameter describes the depth at which to unproject the point relative to the near and far clipping planes of the renderer,Äôs viewing frustum (defined by its pointOfView node). Unprojecting a point whose z-coordinate is 0.0 returns a point on the near clipping plane; unprojecting a point whose z-coordinate is 1.0 returns a point on the far clipping plane.

A 2D point in the rendered screen coordinate space can refer to any point along a line segment in the 3D scene coordinate space. To test for scene contents along this line—for example, to find the geometry corresponding to the location of a click event in a view—use the hitTest method.

### 156.57.15 Properties

### 156.57.16 allowsCameraControl as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the user can manipulate the current point of view that is used to render the scene.
**Notes:** If you set this property to true, SceneKit creates a camera node and handles mouse or touch events to allow the user to pan, zoom, and rotate their view of the scene. (Enabling user camera control does not modify camera objects already existing in the scene graph or the nodes containing them.)

When you enable user camera control, the defaultCameraController object handles input events and drives camera behavior. You can use that object's methods and properties to change the style of user camera interaction, and use the cameraControlConfiguration property to adjust control sensitivity.

In the default configuration, SceneKit provides the following controls:

- Pan with one finger to rotate the camera around the scene
- Pan with two fingers to translate the camera on its local xy-plane
- Pan with three fingers vertically to move the the camera forward backward
- Double-tap to switch to the next camera in the scene
- Rotate with two fingers to roll the camera (rotate on the camera node's z-axis)

Pinch to zoom in or zoom out (change the camera's fieldOfView)
The default value of this property is false. Use this option if you intend to control the camera programmatically.
(Read and Write property)

### 156.57.17 audioListener as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node representing the listener,Äôs position in the scene for use with positional audio effects.
**Notes:** When you use the SCNAudioPlayerMBS class to play sound, the resulting effect depends on the position of each audio source in the scene relative to the listener. For example, changes in relative position can cause a sound to be localized to the left or right channel for stereo headphone output.

This property determines the listener,Äôs position. If the value is nil (the default), the listener position is always the same as that of the pointOfView node. By providing a different node for this property, you can separate the listener position from the point of view—this produces an effect similar to that of a boom microphone in video production. For example, in a third-person game where the camera floats high in the sky above the player character, you might use the player character as the listener node so that sounds from positions nearest the player are loudest.
To place an audio source in the scene, use the addAudioPlayer method on an SCNNode object.
(Read and Write property)

### 156.57.18 autoenablesDefaultLighting as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit automatically adds lights to a scene.
**Notes:** If this property,Äôs value is false (the default), the only light sources SceneKit uses for rendering a scene are those contained in the scene graph. If you change the value to true, SceneKit automatically adds and places an omnidirectional light source when rendering scenes that contain no lights or only contain ambient lights.
(Read and Write property)

### 156.57.19 backgroundColor as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The background color of the view.
**Notes:** SceneKit displays this color behind the contents of the rendered scene. If the scene contents fill the view or if the scene provides its own background using the background property, the view,Äôs background color may not be visible.

This property,Äôs value must be a color that can be represented using RGBA components.
(Read and Write property)

### 156.57.20 debugOptions as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Options for drawing overlay content in a scene that can aid debugging.
**Notes:** Use these options to display overlays that show otherwise-invisible scene content—such as node bounding boxes and the extents of physics fields—for use in debugging and profiling your app. For example:

- To visualize how well each object,Äôs physics representation corresponds to its visible geometry, show the shape of each SCNPhysicsBodyMBS object in the scene with the SCNDebugOptionShowPhysicsShapes option.
- To improve rendering performance in a scene with multiple SCNLightMBS objects, show each light,Äôs area of effect with the SCNDebugOptionShowLightExtents option and ensure that each object in the scene is affected by no more than three lights.

Debug options are bit mask patterns. To display multiple debugging overlays, combine options using the bitwise OR operator.
(Read and Write property)

### 156.57.21 defaultCameraController as SCNCameraControllerMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The default camera controller for this view.
**Notes:** (Read only property)

### 156.57.22 jitteringEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit applies jittering to reduce aliasing artifacts.
**Notes:** Jittering is a process that SceneKit uses to improve the visual quality of a rendered scene. While the scene,Äôs content is still, SceneKit moves the pointOfView location very slightly (by less than a pixel in projected screen space). It then composites images rendered after several such moves to create the final rendered scene, creating an antialiasing effect that smooths the edges of rendered geometry.

By default, the value of this property is false, specifying that SceneKit should not perform jittering. Change the value to true to enable jittering.

Because the SCNViewMBS and SCNLayerMBS classes perform jittering automatically and asynchronously, enabling jittering for these classes has minimal impact on rendering performance. The SCNRenderer class performs jittering synchronously, incurring a high performance cost. With this class, jittering is suitable for rendering single frames on demand, but not for real-time rendering.
(Read and Write property)

### 156.57.23 loops as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit restarts the scene time after all animations in the scene have played.
**Notes:** If the value of this property is true (the default), SceneKit returns the scene time to zero after all animations associated with the scene have played, causing those animations to repeat. Otherwise, SceneKit stops playing the scene when all animations have completed.
(Read and Write property)

### 156.57.24 Playing as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the scene is playing.
**Notes:** If the value of this property is false (the default), SceneKit does not increment the scene time, so animations associated with the scene do not play. Change this property,Äôs value to true to start animating the scene.
(Read and Write property)

### 156.57.25 pointOfView as SCNNodeMBS

MBS Mac64bit Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The node from which the scene,Äôs contents are viewed for rendering.
**Notes:** Use a node with an SCNCameraMBS instance assigned to its camera property to view a scene. The node provides the position and direction of a virtual camera, and the camera object provides rendering parameters such as field of view and focus.
For debugging lights and shadows, you can also designate a spotlight (an SCNLightMBS object whose type property is spot) as a point of view. In this case, the light,Äôs spotInnerAngle property determines the field of view, and its zNear and zFar properties determine the near and far extents of the region that is visible onscreen (also known as the viewing frustum).

In either case, the direction of view is along the negative z-axis of the node,Äôs local coordinate space.
(Read and Write property)

### 156.57.26 PreferLowPowerDevice as Integer

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: All.

**Function:** An option for whether to select low-power-usage devices for Metal rendering.
**Notes:** SceneKit uses this option when automatically selecting a Metal device on systems with multiple GPUs. If the value is 1, SceneKit uses a device with low power usage requirements—for example, the integrated GPU on a MacBook Pro with both integrated and discrete graphics hardware.
Leaving this key unspecified is equivalent to setting its value to 0. In this case, SceneKit chooses the most capable available Metal device.

Can be set before you create a new SCNViewMBS, SCNIOSControlMBS or SCNControlMBS.
Value is -1 if not set.
(Read and Write property)

### 156.57.27 preferredFramesPerSecond as Integer

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The animation frame rate that the view uses to render its scene.
**Notes:** SceneKit chooses an actual frame rate that is as close as possible to your preferred frame rate based on the capabilities of the screen the view is displayed on. The actual frame rate is usually a factor of the maximum refresh rate of the screen to provide a consistent frame rate. For example, if the maximum refresh rate of the screen is 60 frames per second, that is also the highest frame rate the view sets as the actual frame rate. However, if you ask for a lower frame rate, SceneKit might choose 30, 20, 15 or some other factor to be the actual frame rate. For this reason, you want to choose a frame rate that your app can consistently maintain.
The default value is 60 frames per second.
(Read and Write property)

### 156.57.28 PreferredRenderingAPI as Integer

MBS Mac64bit Plugin, Plugin Version: 24.1, Platform: macOS, Targets: All.

**Function:** The rendering API to use for rendering the view (for example, Metal or OpenGL).
**Notes:** The value for is one of the SCNRenderingAPI constants.

SceneKit attempts to initialize a view using the preferred API you specify in the SCNView initializer; if the current device does not support the preferred API, SceneKit automatically falls back to a supported API.

After initialization, use the renderingAPI property to find out whether a fallback occurred. For example, if you specify the SCNRenderingAPIMetal option when initializing a view on an iOS device that does not support Metal, SceneKit defaults to the SCNRenderingAPIOpenGLES2 option instead.

Can be set before you create a new SCNViewMBS, SCNIOSControlMBS or SCNControlMBS.
Value is -1 if not set.
(Read and Write property)

### 156.57.29 renderingAPI as Integer

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The graphics technology SceneKit uses to render the scene.
**Notes:** You choose a graphics technology when initializing a scene renderer:

- When initializing a SCNViewMBS object, use the Constructor initializer and the SCNPreferredRenderingAPIKey key. Alternatively, create a view in Interface Builder and use the Rendering API control in the inspector. During initialization, the view will attempt to use the preferred API, but will fall back to a different API if the preferred one is not supported on the current hardware.
- To create a SCNRendererMBS object that renders into your own OpenGL contect, use the rendererWithContext initializer. To create a renderer for use in your own Metal workflow, use the rendererWithDevice initializer.
- The rendering technology used by a SCNLayer object is determined by Core Animation.

After initializing a renderer, this property reflects the rendering technology in use.
(Read only property)

### 156.57.30 rendersContinuously as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether the view always renders at its preferred frame rate or only when its visible content changes.
**Notes:** When this value is false (the default), the view redraws its contents only when something in its scene graph change or animates. Use this option to maximize energy efficiency.

If you change this value to true, the view redraws itself continually, at the rate specified by the preferredFramesPerSecond property, regardless of whether content is changing or animating.
(Read and Write property)

### 156.57.31 scene as SCNSceneMBS

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The scene to be displayed in the view.
**Notes:** (Read and Write property)

### 156.57.32 sceneTime as Double

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current scene time.
**Notes:** This timestamp determines how running animations behave, which is similar to how the playhead time in a video player application determines which frame of a movie to display. Scene time applies only to animations whose usesSceneTimeBase property is true, including those loaded from a scene source using the SCNSceneSourceAnimationImportPolicyPlayUsingSceneTimeBase option.

Use this property, together with the above animation options, when you want to directly control (or allow the user to directly control) the playback of animations. For example, if you,Äôre building an authoring tool for 3D assets, you might bind this property,Äôs value to a slider control for scrubbing through playback of animations in a scene file.
(Read and Write property)

### 156.57.33 showsStatistics as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether SceneKit displays rendering performance statistics in an accessory view.
**Notes:** The SceneKit statistics view displays various information about scene rendering performance and GPU resource usage, including a frames-per-second (fps) counter. In macOS, click the gear button in the statistics view to show a panel with additional controls for adjusting SceneKit,Äôs rendering of the scene.
(Read and Write property)

### 156.57.34 Constants

Antialiasing Modes

| Constant | Value | Description |
|---|---|---|
| kAntialiasingModeMultisampling16X | 4 | Multisampling 16x |
| kAntialiasingModeMultisampling2X | 1 | Multisampling 2x |
| kAntialiasingModeMultisampling4X | 2 | Multisampling 4x |
| kAntialiasingModeMultisampling8X | 3 | Multisampling 8x |
| kAntialiasingModeNone | 0 | No antialiasing. |

Debug Options

| Constant | Value | Description |
|---|---|---|
| kDebugOptionNone | 0 | Disable all debugging overlays. |
| kDebugOptionRenderAsWireframe | 64 | Display only wireframe placeholders for geometries in the scene. Unlike the SCNDebugOptionShowWireframe option, this option disables n mal surface rendering, displaying only the wireframe for each geometry. |
| kDebugOptionShowBoundingBoxes | 2 | Display the bounding boxes for any nodes with content. |
| kDebugOptionShowCameras | 1024 | Display visualizations for nodes in the scene with attached cameras and th fields of view. |
| kDebugOptionShowConstraints | 512 | Display visualizations of the constraint objects acting on nodes in the scene |
| kDebugOptionShowCreases | 256 | Display nonsmoothed crease regions for geometries affected by surface sub vision. |
| kDebugOptionShowLightExtents | 8 | Display the regions affected by each SCNLightMBS object in the scene. Only lights whose type is SCNLightTypeOmni or SCNLightTypeSpot have area of effect; directional and ambient lights affect the entire scene. |
| kDebugOptionShowLightInfluences | 4 | Display the locations of each SCNLightMBS object in the scene. |
| kDebugOptionShowPhysicsFields | 16 | Display the regions affected by each SCNPhysicsFieldMBS object in the sce |
| kDebugOptionShowPhysicsShapes | 1 | Display the physics shapes for any nodes with attached SCNPhysicsBodyM objects. |
| kDebugOptionShowSkeletons | 128 | Display visualizations of the skeletal animation parameters for relevant geom tries. |
| kDebugOptionShowWireframe | 32 | Display geometries in the scene with wireframe rendering. When this option is enabled, SceneKit still renders scene geometry with associated materials, then overlays a wireframe rendering of the same geomet You can use this option, for example, to debug material rendering issues. |

Rendering API

| Constant | Value | Description |
|---|---|---|
| kRenderingAPIMetal | 0 | Use the Metal framework for SceneKit rendering.<br>Metal provides improved graphics performance on supported devices, allows you to integrate GPU-compute tasks into a rendering workflow, and provides the same API in both iOS and macOS.<br>Used by the renderingAPI property and the SCNPreferredRenderingAPIKey option when initializing an SCNViewMBS object. |
| kRenderingAPIOpenGLCore32 | 2 | Use the OpenGL 3.2 Core Profile API for SceneKit rendering in macOS.<br>Used by the renderingAPI property and the SCNPreferredRenderingAPIKey option when initializing an SCNViewMBS object. |
| kRenderingAPIOpenGLCore41 | 3 | Use the OpenGL 4.1 Core Profile API for SceneKit rendering in macOS.<br>Used by the renderingAPI property and the SCNPreferredRenderingAPIKey option when initializing an SCNViewMBS object. |
| kRenderingAPIOpenGLLegacy | 1 | Use the Legacy OpenGL API for SceneKit rendering in macOS.<br>This option is available on all macOS systems supporting SceneKit. If you request the Metal rendering API for an SCNViewMBS object on a system that does not support Metal, SceneKit falls back to the Legacy OpenGL API.<br>Used by the renderingAPI property and the SCNPreferredRenderingAPIKey option when initializing an SCNViewMBS object. |

# Chapter 157

# Scintilla

## 157.1 control DesktopScintillaControlMBS

### 157.1.1 control DesktopScintillaControlMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Xojo control to host Scintilla editor.
**Blog Entries**

- Custom styles in Scintilla Control
- News from the MBS Xojo Plugins Version 23.3
- News from the MBS Xojo Plugins Version 23.2
- The Top 10 from the MBS Xojo Plugins in 2022
- Scintilla in Xojo for Linux 64-bit on ARM
- Xojo 2022r1
- Contextual Menus in Scintilla
- Configure Scintilla Control for HTML
- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0

**Videos**

- Scintilla for Xojo

**Xojo Developer Magazine**

- 21.4, page 10: News
- 20.6, page 9: News
- 20.2, page 9: News

### 157.1.2 Methods

### 157.1.3 AddSelection(caret as Integer, anchor as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Add a new selection from anchor to caret as the main selection retaining all other selections as additional selections.
**Notes:** Since there is always at least one selection, to set a list of selections, the first selection should be added with SetSelection() and later selections added with AddSelection().

### 157.1.4 AddStyledText(StyledText as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This behaves just like AddText, but inserts styled text.
**Notes:** See GetStyledText function.

### 157.1.5 AddTabStop(line as Integer, x as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds an explicit tabstop at the specified distance from the left (in pixels).
**Notes:** Changing tab stops produces a ChangeTabStops event.

### 157.1.6 AddText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This inserts the first length characters from the string text at the current position.
**Notes:** This will include any 0's in the string that you might have expected to stop the insert operation. The current position is set at the end of the inserted text, but it is not scrolled into view.

### 157.1.7 AddUndoAction(token as Integer, UndoFlags as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds an undo action.
**Notes:** The container can add its own actions into the undo stack by calling AddUndoAction and an Modify event will be sent to the container with the KModificationFlagsContainer flag when it is time to undo (PerformedUndo) or redo (PerformedRedo) the action. The token argument supplied is returned in the token field of the notification.
For example, if the container wanted to allow undo and redo of a 'toggle bookmark' command then it could call AddUndoAction(line, 0) each time the command is performed. Then when it receives a notification to undo or redo it toggles a bookmark on the line given by the token field. If there are different types of commands or parameters that need to be stored into the undo stack then the container should maintain a stack of its own for the document and use the current position in that stack as the argument to AddUndoAction(line). AddUndoAction commands are not combined together into a single undo transaction unless grouped with BeginUndoAction and EndUndoAction.

The flags argument can be KUndoFlagsMayCoalesce (1) if the container action may be coalesced along with any insertion and deletion actions into a single compound action, otherwise kUndoFlagsNone (0). Coalescing treats coalescible container actions as transparent so will still only group together insertions that look like typing or deletions that look like multiple uses of the Backspace or Delete keys.

### 157.1.8 AllocateBytes(bytes as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate a document buffer large enough to store a given number of bytes.
**Notes:** The document will not be made smaller than its current contents.

### 157.1.9 AllocateLineCharacterIndex(lineCharacterIndex as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate one or more indexes.
**Notes:** Most Scintilla APIs use byte positions but some applications want to use positions based on counting (UTF-32) characters or (UTF-16) code units or need to communicate with other code written in terms of characters or code units. With only byte positions, this may require examining many bytes to count characters or code units in the document but this may be sped up in some cases by indexing the line starts by character or code unit.

Different aspects of an application may need indexes for different periods and should allocate for those periods. Indexes use additional memory so releasing them can help minimize memory but they also take time to recalculate. Scintilla may also allocate indexes to support features like accessibility or input method editors.

Only one index of each type is created for a document at a time.

### 157.1.10 AllocateLines(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate line indices to match the lines argument.
**Notes:** This is an optimization that can prevent multiple reallocations of the indices as text is inserted if the application can estimate the number of lines in the document. The number of lines will not be reduced by this call.

### 157.1.11 AnnotationClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all annotations.
**Notes:** All the lines can be cleared of annotations with AnnotationClearAll which is equivalent to clearing each line (setting to "") and then deleting other memory used for this feature.

### 157.1.12 AnnotationLines(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The number of lines annotating a line can be retrieved with AnnotationLines.

### 157.1.13 AppendText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This adds the text to the end of the document.
**Notes:** This will include any 0's in the string that you might have expected to stop the operation. The current selection is not changed and the new text is not scrolled into view.

### 157.1.14 AssignCmdKey(keyDefinition as Integer, sciCommand as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This assigns the given key definition to a Scintilla command identified by sciCommand.
**Notes:** sciCommand can be any SCI_* command that has no arguments.

There is a default binding of keys to commands that is defined in the Scintilla library. You can change the mapping to suit your own requirements.

keyDefinition,Ä®: a key definition contains the key code in the low 16-bits and the key modifiers in the high 16-bits. To combine keyCode and keyMod set:,Ä®,Ä®

keyDefinition = keyCode + Bitwise.ShiftLeft(keyMod, 16)

The key code is a visible or control character or a key from the kKeys* enumeration, which contains: ,Ä®kKeysAdd, kKeysBack, kKeysDelete, kKeysDivide, kKeysDown, kKeysEnd, kKeysEscape, kKeysHome, kKeysInsert, kKeysLeft, kKeysMenu, kKeysNext (Page Down), kKeysPrior (Page Up), kKeysReturn, kKeysRight, kKeysRWin, kKeysSubtract, kKeysTab, kKeysUp, and kKeysWin.

The modifiers are a combination of zero or more of kKeyModAlt, kKeyModCtrl, kKeyModShift, kKeyModMeta, and kKeyModSuper. On OS X, the Command key is mapped to kKeyModCtrl and the Control key to kKeyModMeta. kKeyModSuper is only available on GTK which is commonly the Windows key. If you are building a table, you might want to use kKeyModNorm, which has the value 0, to mean no modifiers.

On Win32, the numeric keypad with Alt pressed can be used to enter characters by number. This can produce unexpected results in non-numlock mode when function keys are assigned so potentially problematic keys are ignored. For example, setting kKeyModAlt, kKeysUP will only be active for the Up key on the main cursor keys, not the numeric keypad.

### 157.1.15 AutoComplete

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method triggers autocompletion.
**Notes:** This has the same effect as the tab key.

### 157.1.16 AutoCompleteCancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cancels any displayed auto completion list.
**Notes:** When in auto completion mode, the list should disappear when the user types a character that can not be part of the auto completion, such as '.', '(' or ' [ ' when typing an identifier. A set of characters that will cancel autocompletion can be specified with AutoCompleteStops.

### 157.1.17 AutoCompletePosStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the value of the current position when AutoCompleteShow started display of the list.

### 157.1.18 AutoCompleteSelect(Value as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method selects an item in the autocompletion list.
**Notes:** It searches the list of words for the first that matches select. By default, comparisons are case sensitive, but you can change this with AutoCIgnoreCase. The match is character by character for the length of the select string. That is, if select is "Fred" it will match "Frederick" if this is the first item in the list that begins with "Fred". If an item is found, it is selected. If the item is not found, the autocompletion list closes if auto-hide is true (see AutoCAutoHide).
The current selection index can be retrieved with AutoCompleteCurrent.

### 157.1.19 AutoCompleteSetFillUps(characterSet as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If a fillup character is typed with an auto completion list active, the currently selected item in the list is added into the document, then the fillup character is added.
**Notes:** Common fillup characters are '(', ' [ ' and '.' but others are possible depending on the language. By default, no fillup characters are set.

### 157.1.20 AutoCompleteShow(lengthEntered as Integer, itemList as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method causes a list to be displayed.
**Notes:** lengthEntered is the number of characters of the word already entered and itemList is the list of words separated by separator characters. The initial separator character is a space but this can be set or got with AutoCompleteSeparator property.

With default settings, the list of words should be in sorted order. If set to ignore case mode with AutoCompleteIgnoreCase, then strings are matched after being converted to upper case. One result of this is that the list should be sorted with the punctuation characters ' [ ', '\', ' ] ', '^', '_', and '`' sorted after letters. Alternative handling of list order may be specified with AutoCompleteOrder property.

### 157.1.21 AutoCompleteStops(characterSet as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The characterSet argument is a string containing a list of characters that will automatically cancel the auto completion list.
**Notes:** When you start the editor, this list is empty.

### 157.1.22 BackTab

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.23 BeginUndoAction

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Starts a composed undo action.
**Notes:** Call BeginUndoAction to mark the beginning and EndUndoAction to end of a set of operations that you want to undo all as one operation but that you have to generate as several operations. Alternatively, you can use these to mark a set of operations that you do not want to have combined with the preceding or following operations if they are undone.

### 157.1.24 BraceBadLight(pos as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Shows bad brace highlight.
**Notes:** If there is no matching brace then the brace badlighting style, style kStylesCommonBraceBad (35), can be used to show the brace that is unmatched. Using a position of kInvalidPosition (-1) removes the highlight.

### 157.1.25 BraceBadLightIndicator(useSetting as Boolean, indicator as ScintillaIndicatorMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use specified indicator to highlight non matching brace instead of changing its style

### 157.1.26 BraceHighlight(posA as Integer, posB as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Up to two characters can be highlighted in a 'brace highlighting style', which is defined as style number BraceHighlight (34).
**Notes:** If you have enabled indent guides, you may also wish to highlight the indent that corresponds with the brace. You can locate the column with Column() and highlight the indent with HighlightGuide.

### 157.1.27 BraceHighlightIndicator(useSetting as Boolean, indicator as ScintillaIndicatorMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use specified indicator to highlight matching braces instead of changing their style.

### 157.1.28 BraceMatch(pos as Integer, maxReStyle as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The BraceMatch method finds a corresponding matching brace given pos, the position of one brace.
**Notes:** The brace characters handled are '(', ')', ' [ ', ' ] ', ' { ', ' } ', '<', and '>'. The search is forwards from an opening brace and backwards from a closing brace. If the character at position is not a brace character, or a matching brace cannot be found, the return value is -1. Otherwise, the return value is the position of the matching brace.
A match only occurs if the style of the matching brace is the same as the starting brace or the matching brace is beyond the end of styling. Nested braces are handled correctly. The maxReStyle parameter must currently be 0 - it may be used in the future to limit the length of brace searches.

### 157.1.29 BraceMatchNext(pos as Integer, startPos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Similar to BraceMatch, but matching starts at the explicit start position startPos instead of the implicitly next position pos ¬± 1.

### 157.1.30 CallTipCancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method cancels any displayed call tip.
**Notes:** Scintilla will also cancel call tips for you if you use any keyboard commands that are not compatible with editing the argument list of a function. Call tips are cancelled if you delete back past the position where the caret was when the tip was triggered.

### 157.1.31 CallTipSetBackColor(backColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The background colour of call tips can be set with this property;
**Notes:** The default colour is white. It is not a good idea to set a dark colour as the background as the default colour for normal calltip text is mid grey and the default colour for highlighted text is dark blue. This also sets the background colour of kStylesCommonCallTip.

### 157.1.32 CallTipSetForeColor(foreColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of call tip text can be set with this method.
**Notes:** The default colour is mid grey.
This also sets the foreground colour of kStylesCommonCallTip.

### 157.1.33 CallTipSetForeColorHighlight(foreColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of highlighted call tip text can be set with this method.
**Notes:** The default colour is dark blue.

### 157.1.34 CallTipSetHighlight(highlightStart as Integer, highlightEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This sets the region of the call tips text to display in a highlighted style.
**Notes:** highlightStart is the zero-based index into the string of the first character to highlight and highlightEnd is the index of the first character after the highlight. highlightEnd must be greater than highlightStart; highlightEnd-highlightStart is the number of characters to highlight. Highlights can extend over line ends if this is required.
Unhighlighted text is drawn in a mid grey. Selected text is drawn in a dark blue. The background is white.

These can be changed with CallTipSetBackColor, CallTipSetForeColor, and CallTipSetForeColorHighlight.

### 157.1.35 CallTipSetPosition(above as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default the calltip is displayed below the text, setting above to true will display it above the text.

### 157.1.36 CallTipShow(pos as Integer, definition as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method starts the process by displaying the call tip window.
**Notes:** If a call tip is already active, this has no effect.

pos is the position in the document at which to align the call tip. The call tip text is aligned to start 1 line below this character unless you have included up and/or down arrows in the call tip text in which case the tip is aligned to the right-hand edge of the rightmost arrow. The assumption is that you will start the text with something like "\001 1 of 3 \002".

definition is the call tip text. This can contain multiple lines separated by '\n' (Line Feed, ASCII code 10) characters. Do not include Carriage Return (ASCII code 13), as this will most likely print as an empty box. Tab (ASCII code 9) is supported if you set a tabsize with CallTipUseStyle.

The position of the caret is remembered here so that the call tip can be cancelled automatically if subsequent deletion moves the caret before this position.

Call tips are small windows displaying the arguments to a function and are displayed after the user has typed the name of the function. They normally display characters using the font facename, size and character set defined by kStylesCommonDefault. You can choose to use kStylesCommonCallTip to define the facename, size, foreground and background colours and character set with CallTipUseStyle. This also enables support for Tab characters. There is some interaction between call tips and autocompletion lists in that showing a call tip cancels any active autocompletion list, and vice versa.

Call tips can highlight part of the text within them. You could use this to highlight the current argument to a function by counting the number of commas (or whatever separator your language uses).

The mouse may be clicked on call tips and this causes a CallTipClick event to be sent to the container. Small up and down arrows may be displayed within a call tip by, respectively, including the characters '\001', or '\002'. This is useful for showing that there are overloaded variants of one function name and that the user

can click on the arrows to cycle through the overloads.
Alternatively, call tips can be displayed when you leave the mouse pointer for a while over a word in response to the DWellStart event and cancelled in response to DWellEnd. This method could be used in a debugger to give the value of a variable, or during editing to give information about the word under the pointer.

### 157.1.37 CallTipUseStyle(tabSize as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method changes the style used for call tips from KStylesCommonDefault to KStylesCommoCallTip and sets a tab size in screen pixels.
**Notes:** If tabsize is less than 1, Tab characters are not treated specially. Once this call has been used, the call tip foreground and background colours are also taken from the style.

### 157.1.38 Cancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cancels autocompletion and calltip display and drops any additional selections.

### 157.1.39 ChangeInsertion(text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Changes insert.
**Notes:** This may only be called from a kModificationFlagsInsertCheck in Modify event handler and will change the text being inserted to that provided.

### 157.1.40 ChangeLexerState(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Indicate that the internal state of a lexer has changed over a range and therefore there may be a need to redraw.

### 157.1.41 Character(position as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the character at pos in the document or 0 if pos is negative or past the end of the document.

### 157.1.42 CharacterString(position as Integer, byref Length as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This queries character at given position.
**Notes:** If the position has a multi byte UTF-8 character, we take multiple characters and return length in bytes via Length parameter.
Otherwise character is returned for 1 byte and then length is set to 1.

See also Character() to get individual bytes.

### 157.1.43 CharLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.44 CharLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.45 CharLeftRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.46 CharPositionFromPoint(x as Integer, y as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character to a point.

### 157.1.47 CharPositionFromPointClose(x as Integer, y as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character to a point.
**Notes:** Returns -1 if the point is outside the window or not close to any characters. This is similar to the previous CharPositionFromPoint method but finds characters rather than inter-character positions.

### 157.1.48 CharRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.49 CharRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.50 CharRightRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.51 ChooseCaretX

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scintilla remembers the x value of the last position horizontally moved to explicitly by the user and this value is then used when moving vertically such as by using the up and down keys.
**Notes:** This message sets the current x position of the caret as the remembered value.

### 157.1.52 Clear

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears text from current selection.

### 157.1.53 ClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Unless the document is read-only, this deletes all the text.

### 157.1.54 ClearAllCmdKeys

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This command removes all keyboard command mapping by setting an empty mapping table.

### 157.1.55 ClearAllRepresentations

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reset representations to defaults.

### 157.1.56 ClearCmdKey(keyDefinition as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This makes the given key definition do nothing by assigning the action Null to it.
**Example:**

```
dim c as DesktopScintillaControlMBS
// disable tab key for editor
c.ClearCmdKey c.kKeysTab
```

### 157.1.57 ClearDocumentStyle

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When wanting to completely restyle the document, for example after choosing a lexer, the ClearDocumentStyle method can be used to clear all styling information and reset the folding state.

### 157.1.58 ClearRegisteredImages

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all registered images.

### 157.1.59 ClearRepresentation(encodedCharacter as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reset this representation to default.

### 157.1.60 ClearSelections

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a single empty selection at 0 as the only selection.

### 157.1.61 ClearTabStops(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears explicit tabstops on a line.
**Notes:** Changing tab stops produces a ChangeTabStops event.

### 157.1.62 Colourise(start as Integer, ende as Integer = -1)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This requests the current lexer or the container (if the lexer is set to nil) to style the document between start and end.
**Notes:** If end is -1, the document is styled from start to the end. If the "fold" property is set to "1" and your lexer or container supports folding, fold levels are also set. This method causes a redraw.

### 157.1.63 ColouriseAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This requests the current lexer or the container (if the lexer is set to nil) to style the document.
**Notes:** If the "fold" property is set to "1" and your lexer or container supports folding, fold levels are also set. This method causes a redraw.

### 157.1.64 Column(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the column number of a position pos within the document taking the width of tabs into account.
**Notes:** This returns the column number of the last tab on the line before pos, plus the number of characters between the last tab and pos. If there are no tab characters on the line, the return value is the number of characters up to the position on the line. In both cases, double byte characters count as a single character. This is probably only useful with monospaced fonts.

### 157.1.65 ContractedFoldNext(lineStart as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that are contracted fold headers.
**Notes:** This is useful when saving the user's folding when switching documents or saving folding with a file. The search starts at line number lineStart and continues forwards to the end of the file. lineStart is returned if it is a contracted fold header otherwise the next contracted fold header is returned. If there are no more contracted fold headers then -1 is returned.

### 157.1.66 ConvertEOLs(EndOfLineMode as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Converts end of line characters for the document.
**Notes:** Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.

### 157.1.67 Copy

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copy current text selection and puts text on the clipboard.

### 157.1.68 CopyAllowLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Works the same as Copy() except that if the selection is empty then the current line is copied.
**Notes:** On Windows, an extra "MSDEVLineSelect" marker is added to the clipboard which is then used in SCI_PASTE to paste the whole line before the current line.

### 157.1.69 CopyRange(RangeStart as Integer, RangeEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies a range of text from the document to the system clipboard.

### 157.1.70 CopyText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies a supplied piece of text to the system clipboard.

### 157.1.71 CountCharacters(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the number of whole characters between two positions.

### 157.1.72 CountCodeUnits(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the number of whole characters between two positions.
**Notes:** This counts in UTF-16 code units.

### 157.1.73 CreateLoader(bytes as Integer = 1000000, documentOptions as Integer = 0) as ScintillaLoaderMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a loader object.
**Notes:** An application can load all of a file into a buffer it allocates on a background thread and then add the data in that buffer into a Scintilla document on the user interface thread. That technique uses extra memory to store a complete copy of the file and also means that the time that Scintilla takes to perform initial line end discovery blocks the user interface.

To avoid these issues, a loader object may be created and used to load the file.
Returns an object that supports the ScintillaLoaderMBS interface which can be used to load data and then be turned into a Scintilla document object for attachment to a view object. The bytes argument determines the initial memory allocation for the document as it is more efficient to allocate once rather than rely on the buffer growing as data is added. If CreateLoader fails then nil is returned.

See kDocumentOption* constants.

### 157.1.74 Cut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cuts current text selection and puts text on the clipboard.

### 157.1.75 DeleteBack

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.76 DeleteBackNotLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.77 DeleteRange(start as Integer, lengthDelete as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Deletes a range of text in the document.

### 157.1.78 DelLineLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.79 DelLineRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.80 DelWordLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.81 DelWordRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.82 DelWordRightEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.83 DescribeProperty(Key as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Information may be retrieved about the properties that can be set for the current lexer.

### 157.1.84 DocLineFromVisible(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When some lines are hidden and/or annotations are displayed, then a particular line in the document may be displayed at a different position to its document position.
**Notes:** This method returns the document line number that corresponds to a display line (counting the display line of the first line in the document as 0). If displayLine is less than or equal to 0, the result is 0. If displayLine is greater than or equal to the number of displayed lines, the result is the number of lines in the document.

### 157.1.85 DocumentEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.86 DocumentEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.87 DocumentStart

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.88 DocumentStartExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.89 DropSelectionN(selection as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If there are multiple selections, remove the indicated selection.
**Notes:** If this was the main selection then make the previous selection the main and if it was the first then the last selection becomes main. If there is only one selection, or there is no selection selection, then there is no effect.

### 157.1.90 EditToggleOvertype

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.91 ElementAllowsTranslucent(element as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true when the element currently allows translucent drawing when an alpha component is included.
**Notes:** This may change based on circumstances - different platforms or graphics technologies may implement translucency and newer versions of Scintilla may implement translucency for elements that did not previously support it.

### 157.1.92 ElementBaseColour(element as Integer) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the default colour of an element.
**Notes:** This may be a value defined by Scintilla or it may be derived from the operating system or platform. Which values are set from the operating system may differ between operating systems and operating system versions. When undefined the return value is 0 which is equivalent to completely transparent black. These colours may be useful when defining styles with similarities such as synthesizing dark mode styles that use the same colours as the system.

On Win32, autocompletion list colours like kElementList are currently provided by the platform layer and on Cocoa, selection background colours like kElementSelectionBack are provided.

### 157.1.93 ElementIsSet(element as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true when an element colour has been set.
**Notes:** When false indicates that a default colour or set of colours is displayed.

### 157.1.94 EmptyUndoBuffer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This command tells Scintilla to forget any saved undo or redo history.
**Notes:** It also sets the save point to the start of the undo buffer, so the document will appear to be unmodified. This does not cause the SavePointReached event to be sent to the container.

### 157.1.95 EndStyled as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End styling.
**Notes:** Scintilla keeps a record of the last character that is likely to be styled correctly. This is moved forwards when characters after it are styled and moved backwards if changes are made to the text of the document before it. Before drawing text, this position is checked to see if any styling is needed and, if so, a StyleNeeded event is sent to the container. The container can send EndStyled to work out where it needs to start styling. Scintilla will always ask to style whole lines.

### 157.1.96 EndUndoAction

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Ends a composed undo action.
**Notes:** Call BeginUndoAction to mark the beginning and EndUndoAction to end of a set of operations that you want to undo all as one operation but that you have to generate as several operations. Alternatively, you can use these to mark a set of operations that you do not want to have combined with the preceding or following operations if they are undone.

### 157.1.97 EnsureVisible(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A line may be hidden because more than one of its parent lines is contracted.
**Notes:** Both these message travels up the fold hierarchy, expanding any contracted folds until they reach the top level. The line will then be visible. If you use EnsureVisibleEnforcePolicy(), the vertical caret policy set by VisiblePolicy() is then applied.

### 157.1.98 EnsureVisibleEnforcePolicy(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A line may be hidden because more than one of its parent lines is contracted.
**Notes:** Both these message travels up the fold hierarchy, expanding any contracted folds until they reach the top level. The line will then be visible. If you use EnsureVisibleEnforcePolicy(), the vertical caret policy set by VisiblePolicy() is then applied.

### 157.1.99 EOLAnnotationClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all EOL annotations.
**Notes:** All the lines can be cleared of end of line annotations with EOLAnnotationClearAll which is equivalent to clearing each line (setting to 0) and then deleting other memory used for this feature.

### 157.1.100 ExpandChildren(Line as Integer, FoldLevel as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This is used to respond to a change to a line causing its fold level or whether it is a header to change, perhaps when adding or removing a ' { '.

**Notes:** By the time the container has received the notification that the line has changed, the fold level has already been set, so the container has to use the previous level in this call so that any range hidden underneath this line can be shown.

### 157.1.101 FindColumn(line as Integer, column as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position of a column on a line taking the width of tabs into account.
**Notes:** It treats a multi-byte character as a single column. Column numbers, like lines start at 0.

### 157.1.102 FindIndicatorFlash(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Show and animate the find indicator.
**Notes:** The indicator remains visible with FindIndicatorShow and fades out after showing for half a second with FindIndicatorFlash. FindIndicatorShow behaves similarly to the OS X TextEdit and Safari applications and is best suited to editing documentation where the search target is often a word. FindIndicatorFlash is similar to Xcode and is suited to editing source code where the match will often be located next to operators which would otherwise be hidden under the indicator's padding.

### 157.1.103 FindIndicatorHide

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Hides the find indicator.

### 157.1.104 FindIndicatorShow(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Show and animate the find indicator.
**Notes:** The indicator remains visible with FindIndicatorShow and fades out after showing for half a second with FindIndicatorFlash. FindIndicatorShow behaves similarly to the OS X TextEdit and Safari applications and is best suited to editing documentation where the search target is often a word. FindIndicatorFlash is similar to Xcode and is suited to editing source code where the match will often be located next to operators which would otherwise be hidden under the indicator's padding.

### 157.1.105 FindText(searchFlags as Integer, Text as String, byref RangeStart as Integer, byref RangeEnd as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Searches for text in the document.
**Notes:** It does not use or move the current selection. The searchFlags argument controls the search type, which includes regular expression searches.
See kFindOption* constants.

You can search backwards to find the previous occurrence of a search string by setting the end of the search range before the start.

RangeStart and RangeEnd provide the range of positions in the document to search. You can search backwards by setting RangeEnd less than RangeStart. The text parameter holds the search pattern. If your language makes the use of _TextToFind difficult, you should consider using SearchInTarget instead.

The return value is -1 if the search fails or the position of the start of the found text if it succeeds. The RangeStart and RangeEnd parameters of TextToFind are filled in with the start and end positions of the found text.

### 157.1.106 FoldAll(FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles all lines.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.1.107 FoldChildren(Line as Integer, FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles children.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.1.108 FoldLine(Line as Integer, FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles one line.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.1.109 FoldParent(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the line number of the first line before line that is marked as a fold point with kFoldLevelHeaderFlag and has a fold level less than the line.
**Notes:** If no line is found, or if the header flags and fold levels are inconsistent, the return value is -1.

### 157.1.110 FormatRange(draw as boolean, range as ScintillaRangeToFormatMBS) as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** FormatRange can be used to draw the text onto a display surface which can include a printer display surface.
**Notes:** Printed output shows text styling as on the screen, but it hides all margins except a line number margin. Markers do not appear in a margin but will change line background colour. The selection and caret are hidden.

Different platforms use different display surface ID types to print on. On Windows, these are HDCs., on GTK 3.x cairo_t *, and on Cocoa CGContextRef is used.

For macOS use Integer(g.Handle(Graphics.HandleTypes.CGContextRef)), for windows use Integer(g.Handle(Graphics.HandleTypes.HDC)), for Linux use Integer(g.Handle(Graphics.HandleTypes.CairoContext)) to get the handle.

This call renders a range of text into a device context. If you use this for printing, you will probably want to arrange a page header and footer; Scintilla does not do this for you. Each use of this message renders a range of text into a rectangular area and returns the position in the document of the next character to print.

The draw parameter controls if any output is done. Set this to false if you are paginating.

On Windows, hdc and hdcTarget should both be set to the device context handle of the output device (usually a printer). If you print to a metafile these will not be the same as Windows metafiles (unlike extended metafiles) do not implement the full API for returning information. In this case, set hdcTarget to the screen DC.

Page* properties define the rectangle { 0, 0, maxX, maxY } where maxX+1 and maxY+1 are the number of physically printable pixels in x and y.
Area* properties define the rectangle to render the text in (which will, of course, fit within the rectangle defined by Page*).
CharacterRangePosition and CharacterRangeEnd define the start position and maximum position of characters to output. All of each line within this character range is drawn.

On Cocoa, the surface IDs for printing (draw=1) should be the graphics port of the current context (CGContextRef) when the view's drawRect method is called. The Surface IDs are not really used for measurement (draw=0) but can be set to a bitmap context to avoid runtime warnings.

On GTK, the surface IDs to use can be found from the printing context.

CharacterRangePosition and CharacterRangeEnd define the start position and maximum position of characters to output. All of each line within this character range is drawn.

When printing, the most tedious part is always working out what the margins should be to allow for the non-printable area of the paper and printing a header and footer. If you look at the printing code in SciTE, you will find that most of it is taken up with this. The loop that causes Scintilla to render text is quite simple if you strip out all the margin, non-printable area, header and footer code.

### 157.1.111 FormFeed

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.112 GetLineSelEndPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the position of the end of the selection at the given line with -1 returned if no selection on this line.

### 157.1.113 GetLineSelStartPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the position of the start of the selection at the given line with -1 returned if no selection on this line.

### 157.1.114 GetNextTabStop(line as Integer, x as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the next explicit tabstop position set after the given x position, or zero if there aren't any.

### 157.1.115 GetStyledText(RangeStart as Integer, RangeEnd as Integer, byref Styledtext as MemoryBlock) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This collects styled text into a buffer using two bytes for each cell, with the character at the lower address of each pair and the style byte at the upper address.
**Notes:** Characters between the positions RangeStart and RangeEnd are copied to new MemoryBlock and put into Styledtext.
Positions outside the document return character codes and style bytes of 0.

### 157.1.116 GetTextRange(RangeStart as Integer, RangeEnd as Integer, byref Text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This collects the text between the positions RangeStart and RangeEnd and returns it in Text parameter.
**Notes:** If RangeEnd is -1, text is returned to the end of the document.
The return value is the length of the returned text.

### 157.1.117 GotoLine(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection and sets the caret at the start of line number line and scrolls the view (if needed) to make it visible.
**Notes:** The anchor position is set the same as the current position. If line is outside the lines in the document (first line is 0), the line set is the first or last.

### 157.1.118 GotoPos(pos as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection, sets the caret at caret and scrolls the view to make the caret visible, if necessary.
**Notes:** It is equivalent to SetSel(caret, caret). The anchor position is set the same as the current position.

### 157.1.119 GrabFocus

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scintilla can be told to grab the focus with GrabFocus.
**Notes:** This is needed more on GTK where focus handling is more complicated than on Windows.

### 157.1.120 HideLines(lineStart as Integer, lineEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Marks a range of lines as invisible and then redraw the display.
**Notes:** If kElementHiddenLine is set then a horizontal line is drawn in that colour to indicate that there are hidden lines.
A fold line drawn in that position overrides the hidden line indicator.

### 157.1.121 HideSelection(hide as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The normal state is to make the selection visible by drawing it as set by SetSelForeColor and SetSelBackColor.
**Notes:** However, if you hide the selection, it is drawn as normal text.

### 157.1.122 Home

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.123 HomeDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.124 HomeDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.125 HomeExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.126 HomeRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.127 HomeWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.128 HomeWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.129 IndexPositionFromLine(line as Integer, lineCharacterIndex as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries position from line via index.
**Notes:** The document line of a particular character or code unit may be found by calling LineFromIndexPosition with one of kLineCharacterIndexTypeUtf32 (1) or kLineCharacterIndexTypeUtf16 (2). The inverse action, finds the starting position of a document line either in characters or code units from the document start by calling IndexPositionFromLine with the same lineCharacterIndex argument.

### 157.1.130 Indicator(index as Integer) as ScintillaIndicatorMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries indicator with given index.
**Notes:** Index is from 0 to 35.

### 157.1.131 IndicatorAllOnFor(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve a bitmap value representing which indicators are non-zero at a position.
**Notes:** Only the first 32 indicators are represented in the result so no IME indicators are included.

### 157.1.132 IndicatorClearRange(start as Integer, lengthClear as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears a range for the current indicator.

### 157.1.133 IndicatorFillRange(start as Integer, lengthFill as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Fills a range with the current indicator.
**Notes:** See IndicatorValue property.

### 157.1.134 InitializeLexer(Lexer as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Initializes the lexer.
**Notes:** To style files in different languages, different 'lexers' are used. These are objects that are called by Scintilla with a range of text and some context information and which then set styles and folding information

for that range. Lexers for Scintilla are now provided by the Lexilla project.

Current list of buit-in lexers is:

a68k, abaqus, ada, apdl, as, asm, asn1, asy, au3, ave, avs, baan, bash, batch, bib, blitzbasic, bullant, caml, cil, clarion, clarionnocase, cmake, COBOL, coffeescript, conf, cpp, cppnocase, csound, css, d, dataflex, diff, DMAP, DMIS, ecl, edifact, eiffel, eiffelkw, erlang, errorlist, escript, f77, flagship, forth, fortran, freebasic, fsharp, gap, gui4cli, haskell, hollywood, hypertext, ihex, indent, inno, json, julia, kix, kvirc, latex, lisp, literatehaskell, lot, lout, lua, magiksf, makefile, markdown, matlab, maxima, metapost, mmixal, modula, mssql, mysql, nim, nimrod, nncrontab, nsis, null, octave, opal, oscript, pascal, powerbasic, perl, phpscript, PL/M, po, pov, powerpro, powershell, abl, props, ps, purebasic, python, r, raku, rebol, registry, ruby, rust, sas, scriptol, smalltalk, SML, sorcins, specman, spice, sql, srec, stata, fcST, TACL, tads3, TAL, tcl, tcmd, tehex, tex, txt2tags, vb, vbscript, verilog, vhdl, visualprolog, x12, xml, yaml, xojo

### 157.1.135 InsertText(Text as String, atPosition as Integer = -1)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This inserts the text string at position pos or at the current position if pos is -1.
**Notes:** If the current position is after the insertion point then it is moved along with its surrounding text but no scrolling is performed.

### 157.1.136 IsRangeWord(start as Integer, ende as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Is the range start..end a word or set of words?
**Notes:** This message checks that start is at a word start transition and that end is at a word end transition. It does not check whether there are any spaces inside the range.

### 157.1.137 LastChild(line as Integer, level as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Searches last child.
**Notes:** Searches for the next line after line, that has a folding level that is less than or equal to level and then returns the previous line number. If you set level to -1, level is set to the folding level of line line. If from is a fold point, LastChild(from, -1) returns the last line that would be in made visible or hidden by toggling the fold state.

### 157.1.138 LexerNameFromID(ID as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries name of lexer with given ID.
**Example:**

```
// constants in LexerConstants.txt in our examples folder
Const SCLEX_HTML = 4

Dim s As String = DesktopScintillaControlMBS.LexerNameFromID(SCLEX_HTML)
MessageBox s
```

### 157.1.139 LexerNames as String()

MBS Scintilla Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries list of built-in lexers.
**Notes:** Current list is:

a68k, abaqus, ada, apdl, as, asm, asn1, asy, au3, ave, avs, baan, bash, batch, bib, blitzbasic, bullant, caml, cil, clarion, clarionnocase, cmake, COBOL, coffeescript, conf, cpp, cppnocase, csound, css, d, dataflex, diff, DMAP, DMIS, ecl, edifact, eiffel, eiffelkw, erlang, errorlist, escript, f77, flagship, forth, fortran, freebasic, fsharp, gap, gui4cli, haskell, hollywood, hypertext, ihex, indent, inno, json, julia, kix, kvirc, latex, lisp, literatehaskell, lot, lout, lua, magiksf, makefile, markdown, matlab, maxima, metapost, mmixal, modula, mssql, mysql, nim, nimrod, nncrontab, nsis, null, octave, opal, oscript, pascal, powerbasic, perl, phpscript, PL/M, po, pov, powerpro, powershell, abl, props, ps, purebasic, python, r, raku, rebol, registry, ruby, rust, sas, scriptol, smalltalk, SML, sorcins, specman, spice, sql, srec, stata, fcST, TACL, tads3, TAL, tcl, tcmd, tehex, tex, txt2tags, vb, vbscript, verilog, vhdl, visualprolog, x12, xml, yaml, xojo.

### 157.1.140 lexillaLibraryLoaded as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the lexilla library got loaded.
**Notes:** Returns true if you loaded lexilla dylib/dll/so file.

### 157.1.141 Line(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries text of a line.

**Notes:** Index is zero based.

### 157.1.142 LineCopy

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.143 LineCut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.144 LineDelete

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.145 LineDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.146 LineDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.147 LineDownRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.148 LineDuplicate

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.149 LineEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.
See also:

- 157.1.150 LineEnd(line as Integer) as Integer 20418

### 157.1.150 LineEnd(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line end position for the given line.
See also:

- 157.1.149 LineEnd 20418

### 157.1.151 LineEndDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.152 LineEndDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.153 LineEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.154 LineEndPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the position at the end of the line, before any line end characters.
**Notes:** If line is the last line in the document (which does not have any end of line characters) or greater, the result is the size of the document. If line is negative the result is undefined.

### 157.1.155 LineEndRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.156 LineEndWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.157 LineEndWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.158 LineFromIndexPosition(pos as Integer, lineCharacterIndex as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line from position via index.
**Notes:** The document line of a particular character or code unit may be found by calling LineFromIndexPosition with one of kLineCharacterIndexTypeUtf32 (1) or kLineCharacterIndexTypeUtf16 (2). The inverse action, finds the starting position of a document line either in characters or code units from the document start by calling IndexPositionFromLine with the same lineCharacterIndex argument.

### 157.1.159 LineFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the line that contains the position pos in the document.
**Notes:** The return value is 0 if pos <= 0.
The return value is the last line if pos is beyond the end of the document.

### 157.1.160 LineIndentPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The position at the end of indentation of a line.

### 157.1.161 LineLength(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the length of the line, including any line end characters.
**Notes:** If line is negative or beyond the last line in the document, the result is 0. If you want the length of the line not including any end of line characters, use LineEndPosition(line) - PositionFromLine(line).

### 157.1.162 LineReverse

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.163 LineScroll(columns as Integer, lines as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This will attempt to scroll the display by the number of columns and lines that you specify.
**Notes:** Positive line values increase the line number at the top of the screen (i.e. they move the text upwards as far as the user is concerned), Negative line values do the reverse.
The column measure is the width of a space in the default style. Positive values increase the column at the left edge of the view (i.e. they move the text leftwards as far as the user is concerned). Negative values do the reverse.

### 157.1.164 LineScrollDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.165 LineScrollUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.166 LinesJoin

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Join a range of lines indicated by the target into one line by removing line end characters.
**Notes:** Where this would lead to no space between words, an extra space is inserted.

### 157.1.167 LinesSplit(pixelWidth as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Split a range of lines indicated by the target into lines that are at most pixelWidth wide.
**Notes:** Splitting occurs on word boundaries wherever possible in a similar manner to line wrapping. When pixelWidth is 0 then the width of the window is used.

### 157.1.168 LineStart(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line start position for the given line.

### 157.1.169 LineTranspose

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.170 LineUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.171 LineUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.172 LineUpRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.173 LineVisible(line as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports on the visible state of a line and returns true if it is visible and false if it is not visible.
**Notes:** This method has no effect on fold levels or fold flags.

### 157.1.174 LoadFramework(path as folderitem) as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the framework.
**Notes:** You can load Scintilla framework on macOS.
Returns true on success.

### 157.1.175 LoadLibrary(path as folderitem) as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the library.
**Notes:** You can load lexer and scintilla libraries here.
Returns true on success.

### 157.1.176 LowerCase

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.177 Margin(index as Integer) as ScintillaMarginMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries margin with given index.
**Notes:** Index ranges from 0 to 5.

### 157.1.178 MarginTextClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all texts for margin.

### 157.1.179 Marker(index as Integer) as ScintillaMarkerMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries marker with given index.
**Notes:** Index ranges from 0 to 35.

### 157.1.180 MarkerAdd(Line as Integer, markerNumber as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This function searches the document for the marker with this handle and deletes the marker if it is found.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.

### 157.1.181 MarkerAddSet(line as Integer, markerSet as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Add one or more markers to a line with a single call.
**Notes:** Add one or more markers to a line with a single call, specified in the same "one-bit-per-marker" 32-bit integer format returned by Marker() (and used by the mask-based marker search functions MarkerNext() and MarkerPrevious()). As with MarkerAdd, no check is made to see if any of the markers are already present on the targeted line.

### 157.1.182 MarkerDefineRGBAImage(markerNumber as Integer, Width as Integer, Height as Integer, ScalePercent as Integer = 100, Pixels as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a translucent pixmap to be used to draw the marker.
**Example:**

```
dim c as DesktopScintillaControlMBS // your control

// define red dot for breakpoints
Const size = 18
```

```
Dim r As New Picture(size, size) // red dot
Dim m As New Picture(size, size) // mask, a white dot on black, black is transparent
Dim rg As Graphics = r.Graphics
Dim mg As Graphics = m.Graphics

// we draw the image and the mask one
rg.DrawingColor = &c000000
rg.FillRectangle 0, 0, size, size
rg.DrawingColor = &cFF0000
rg.FillOval 0, 0, size, size
mg.DrawingColor = &c000000
mg.FillRectangle 0, 0, size, size
mg.DrawingColor = &cFFFFFF
mg.FillOval 0, 0, size, size

// now we convert to memoryblock
Dim rr As RGBSurface = r.RGBSurface
Dim mr As RGBSurface = m.RGBSurface

Dim pixels As New MemoryBlock(size * size * 4)
Dim PixelPtr As ptr = pixels
Dim o As Integer = 0
For y As Integer = 0 To size-1
For x As Integer = 0 To size-1
Dim mc As Color = mr.Pixel(x,y)
Dim rc As Color = rr.Pixel(x,y)
PixelPtr.UInt8(o+0) = rc.Red
PixelPtr.UInt8(o+1) = rc.Green
PixelPtr.UInt8(o+2) = rc.Blue
PixelPtr.UInt8(o+3) = mc.Green
o = o + 4
Next
Next

// and define the marker
c.Marker(1).Symbol = ScintillaMarkerMBS.kMarkerSymbolPixmap
c.MarkerDefineRGBAImage(1, size, size, 100, pixels)
```

**Notes:** Please pass the marker number, the size of the picture, it's scale in percent and the pixels memoryblock.

### 157.1.183 MarkerDelete(Line as Integer, markerNumber as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This searches the given line number for the given marker number and deletes it if it is present.

**Notes:** If you added the same marker more than once to the line, this will delete one copy each time it is used. If you pass in a marker number of -1, all markers are deleted from the line.

### 157.1.184 MarkerDeleteAll(markerNumber as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes markers of the given number from all lines.
**Notes:** If markerNumber is -1, it deletes all markers from all lines.

### 157.1.185 MarkerDeleteHandle(markerHandle as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Deletes a marker.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.
This function searches the document for the marker with this handle and deletes the marker if it is found.

### 157.1.186 MarkerEnableHighlight(enabled as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method allows to enable/disable the highlight folding block when it is selected.
**Notes:** (i.e. block that contains the caret)

### 157.1.187 MarkerGet(Line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns a 32-bit integer that indicates which markers were present on the line.
**Notes:** Bit 0 is set if marker 0 is present, bit 1 for marker 1 and so on.

### 157.1.188 MarkerHandleFromLine(line as Integer, which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the Nth marker handle in a given line.
**Notes:** Handles are returned by MarkerAdd. If which is greater or equal to the number of markers on a line, this returns -1;

### 157.1.189 MarkerLineFromHandle(markerHandle as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This function searches the document for the marker with this handle and returns the line number that contains it or -1 if it is not found.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.

### 157.1.190 MarkerNext(lineStart as Integer, markerMask as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that include a given set of markers.
**Notes:** The search starts at line number lineStart and continues forwards to the end of the file (MarkerNext) or backwards to the start of the file (MarkerPrevious).
The markerMask argument should have one bit set for each marker you wish to find. Set bit 0 to find marker 0, bit 1 for marker 1 and so on. The message returns the line number of the first line that contains one of the markers in markerMask or -1 if no marker is found.

### 157.1.191 MarkerNumberFromLine(line as Integer, which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the Nth marker number in a given line.
**Notes:** Handles are returned by MarkerAdd. If which is greater or equal to the number of markers on a line, this returns -1;

### 157.1.192 MarkerPrevious(lineStart as Integer, markerMask as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that include a given set of markers.
**Notes:** The search starts at line number lineStart and continues forwards to the end of the file (MarkerNext) or backwards to the start of the file (MarkerPrevious).
The markerMask argument should have one bit set for each marker you wish to find. Set bit 0 to find marker 0, bit 1 for marker 1 and so on. The message returns the line number of the first line that contains one of the markers in markerMask or -1 if no marker is found.

### 157.1.193 MoveCaretInsideView

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If the caret is off the top or bottom of the view, it is moved to the nearest line that is visible to its current position.
**Notes:** Any selection is lost.

### 157.1.194 MoveSelectedLinesDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Move the selected lines down one line, shifting the line below before the selection.
**Notes:** The selection will be automatically extended to the beginning of the selection's first line and the end of the selection's last line. If nothing was selected, the line the cursor is currently at will be selected.

### 157.1.195 MoveSelectedLinesUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Move the selected lines up one line, shifting the line above after the selection.
**Notes:** The selection will be automatically extended to the beginning of the selection's first line and the end of the selection's last line. If nothing was selected, the line the cursor is currently at will be selected.

### 157.1.196 MultiEdgeAddLine(column as Integer, edgeColour as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds a new vertical edge to the view.
**Notes:** The edge will be displayed at the given column number. The resulting edge position depends on the metric of a space character in STYLE_DEFAULT. All the edges can be cleared with MultiEdgeClearAll. MultiEdgeColumn returns the column of the Nth vertical edge (indexed from 0). If which is greater or equal to the number of vertical edges, this returns -1.

### 157.1.197 MultiEdgeClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** All the edges can be cleared with MultiEdgeClearAll.

### 157.1.198 MultiEdgeColumn(which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** MultiEdgeColumn returns the column of the Nth vertical edge (indexed from 0).
**Notes:** If which is greater or equal to the number of vertical edges, this returns -1.

### 157.1.199 MultipleSelectAddEach

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** MultipleSelectAddEach is similar to MultipleSelectAddNext but adds multiple occurrences instead of just one.

### 157.1.200 MultipleSelectAddNext

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds the next occurrence of the main selection within the target to the set of selections as main.
**Notes:** If the current selection is empty then select word around caret. The current searchFlags are used so the application may choose case sensitivity and word search options.

### 157.1.201 NewLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.202 PageDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.203 PageDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.204 PageDownRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.205 PageUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.206 PageUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.207 PageUpRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.208 ParaDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.209 ParaDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.210 ParaUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.211 ParaUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.212 Paste

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Performs the paste operation from clipboard.

### 157.1.213 PointXFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the x display pixel location of text at position pos in the document.

### 157.1.214 PointYFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the y display pixel location of text at position pos in the document.

### 157.1.215 PositionAfter(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position after another position in the document taking into account the current code page.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If called with a position within a multi byte character will return the position of the start/end of that character.

### 157.1.216 PositionBefore(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position before another position in the document taking into account the current code page.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If called with a position within a multi byte character will return the position of the start/end of that character.

### 157.1.217 PositionFromLine(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the document position that corresponds with the start of the line.
**Notes:** If line is negative, the position of the line holding the start of the selection is returned. If line is greater than the lines in the document, the return value is -1. If line is equal to the number of lines in the document (i.e. 1 line past the last line), the return value is the end of the document.

### 157.1.218 PositionFromPoint(x as Integer, y as integer) as integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character position to a point.

### 157.1.219 PositionFromPointClose(x as Integer, y as integer) as integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character position to a point.
**Notes:** Returns -1 if the point is outside the window or not close to any characters.

### 157.1.220 PositionRelative(pos as Integer, relative as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Count a number of whole characters before or after the argument position and return that position.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If the position goes past the document end then 0 is returned.

### 157.1.221 PositionRelativeCodeUnits(pos as Integer, relative as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Count a number of whole characters before or after the argument position and return that position.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If the position goes past the document end then 0 is returned.

These is the UTF-16 versions of PositionRelative() working in terms of UTF-16 code units

### 157.1.222 PropertyInt(name as String, defaultValue as Integer = 0) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Lookup a keyword:value pair using the specified key; if found, interpret the value as an integer and return it.
**Notes:** If not found (or the value is an empty string) then return the supplied default. If the keyword:value pair is found but is not a number, then return 0.

### 157.1.223 PropertyType(name as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries property type.
**Notes:** See kTypeProperty* constants.

### 157.1.224 Redo

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Undoes the effect of the last Undo operation.

### 157.1.225 RegisterRGBAImage(type as Integer, Width as Integer, Height as Integer, Pixels as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Registers an icon for auto completion.
**Example:**

```
// register red dot for auto complete later
Const size = 18

Dim r As New Picture(size, size) // red dot
Dim m As New Picture(size, size) // mask, a white dot on black, black is transparent
Dim rg As Graphics = r.Graphics
Dim mg As Graphics = m.Graphics

// we draw the image and the mask one
rg.DrawingColor = &c000000
rg.FillRectangle 0, 0, size, size
rg.DrawingColor = &cFF0000
rg.FillOval 0, 0, size, size
mg.DrawingColor = &c000000
mg.FillRectangle 0, 0, size, size
mg.DrawingColor = &cFFFFFF
mg.FillOval 0, 0, size, size

// now we convert to memoryblock
Dim rr As RGBSurface = r.RGBSurface
Dim mr As RGBSurface = m.RGBSurface

dim pixels As New MemoryBlock(size * size * 4)
Dim PixelPtr As ptr = pixels
Dim o As Integer = 0
For y As Integer = 0 To size-1
For x As Integer = 0 To size-1
Dim mc As Color = mr.Pixel(x,y)
```

```
Dim rc As Color = rr.Pixel(x,y)
PixelPtr.UInt8(o+0) = rc.Red
PixelPtr.UInt8(o+1) = rc.Green
PixelPtr.UInt8(o+2) = rc.Blue
PixelPtr.UInt8(o+3) = mc.Green
o = o + 4
Next
Next

c.RegisterRGBAImage(1, size, size, pixels)
```

**Notes:** Autocompletion list items may display an image as well as text. Each image is first registered with an integer type. Then this integer is included in the text of the list separated by a '?' from the text. For example, "fclose?2 fopen" displays image 2 before the string "fclose" and no image before "fopen". The images are in RGBA format and set with RegisterRGBAImage.
The set of registered images can be cleared with ClearRegisteredImages method and the '?' separator changed with AutoCompleteSeparator property.

### 157.1.226 ReleaseAllExtendedStyles

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Releases any extended styles allocated by the container.

### 157.1.227 ReleaseLineCharacterIndex(lineCharacterIndex as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Release one or more indexes.
**Notes:** Different aspects of an application may need indexes for different periods and should allocate for those periods. Indexes use additional memory so releasing them can help minimize memory but they also take time to recalculate. Scintilla may also allocate indexes to support features like accessibility or input method editors. Only one index of each type is created for a document at a time.

### 157.1.228 ReplaceRectangular(length as Integer, text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Replaces the selected text or empty selection with the given text.
**Notes:** The insertion is performed similarly to rectangular pastes: new lines in the given text are interpreted as moving to the next line without inserting new lines unless at the end of the document.

### 157.1.229 ReplaceSelection(text as string)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The currently selected text between the anchor and the current position is replaced by the text string.
**Notes:** If the anchor and current position are the same, the text is inserted at the caret position. The caret is positioned after the inserted text and the caret is scrolled into view.

### 157.1.230 ReplaceTarget(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Replace target area with new text.
**Notes:** After replacement, the target range refers to the replacement text. The return value is the length of the replacement string.
Note that the recommended way to delete text in the document is to set the target to the text to be removed, and to perform a replace target with an empty string.

### 157.1.231 ReplaceTargetRE(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This replaces the target using regular expressions.
**Notes:** If length is -1, text is a zero terminated string, otherwise length is the number of characters to use. The replacement string is formed from the text string with any sequences of \1 through \9 replaced by tagged matches from the most recent regular expression search. \0 is replaced with all the matched text from the most recent search. After replacement, the target range refers to the replacement text. The return value is the length of the replacement string.

### 157.1.232 ResetElementColour(element as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes the element colour returning to the default colour or set of colours.

### 157.1.233 RotateSelection

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Makes the next selection be the main selection.

### 157.1.234 scintillaLibraryLoaded as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the scintilla library got loaded.
**Notes:** Returns true on MacOS when you loaded the Scintilla.framework before.
Returns true if you loaded Scintilla.dll on Windows or Scintilla.so on Linux.

### 157.1.235 ScrollCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If the current position (this is the caret if there is no selection) is not visible, the view is scrolled to make it visible according to the current caret policy.

### 157.1.236 ScrollRange(secondary as Integer, primary as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scroll the argument positions and the range between them into view giving priority to the primary position then the secondary position.
**Notes:** The behaviour is similar to ScrollCaret with the primary position used instead of the caret. An effort is then made to ensure that the secondary position and range between are also visible. This may be used to make a search match visible.

### 157.1.237 ScrollToEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The ScrollToEnd commands scroll the document to the end without changing the selection. These commands match OS X platform conventions for the behaviour of the home and end keys. Scintilla can be made to match OS X applications by binding the home and end keys to these commands.

You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.238 ScrollToStart

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The ScrollToStart commands scroll the document to the start without changing the selection. These commands match OS X platform conventions for the behaviour of the home and end keys. Scintilla can be made to match OS X applications by binding the home and end keys to these commands.

You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.239 SearchAnchor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the search start point used by SearchNext and SearchPrev to the start of the current selection, that is, the end of the selection that is nearer to the start of the document.
**Notes:** You should always call this before calling either of SearchNext or SearchPrev.

### 157.1.240 SearchInTarget(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This searches for the first occurrence of a text string in the target defined by TargetStart and TargetEnd.
**Notes:** The search is modified by the search flags set by SearchFlags property. If the search succeeds, the target is set to the found text and the return value is the position of the start of the matching text. If the search fails, the result is -1.

See Tag() for regular expression results.

### 157.1.241 SearchNext(searchFlags as Integer, text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** SearchNext and SearchPrev search for the next and previous occurrence of the search string pointed at by text.
**Notes:** The search is modified by the searchFlags.
See kFindOption* constants.

The return value is -1 if nothing is found, otherwise the return value is the start position of the matching text. The selection is updated to show the matched text, but is not scrolled into view.

| Character | Description |
|---|---|
| . | Matches any character |
| \( | This marks the start of a region for tagging a match. |
| \) | This marks the end of a tagged region. |
| \n | Where n is 1 through 9 refers to the first through ninth tagged region when replacing. For example, if the search string was Fred\( [ 1-9 ] \)XXX and the replace string was Sam\1YYY, when applied to Fred2XXX this would generate Sam2YYY. \0 refers to all of the matching text. |
| \< | This matches the start of a word using Scintilla's definitions of words. |
| \> | This matches the end of a word using Scintilla's definition of words. |
| \x | This allows you to use a character x that would otherwise have a special meaning. For example, \[ would be interpreted as [ and not as the start of a character set. |
| [ ... ] | This indicates a set of characters, for example, [ abc ] means any of the characters a, b or c. You can also use ranges, for example [ a-z ] for any lower case character. |
| [ ^... ] | The complement of the characters in the set. For example, [ ^A-Za-z ] means any character except an alphabetic character. |
| ^ | This matches the start of a line (unless used inside a set, see above). |
| $ | This matches the end of a line. |
| * | This matches 0 or more times. For example, Sa*m matches Sm, Sam, Saam, Saaam and so on. |
| + | This matches 1 or more times. For example, Sa+m matches Sam, Saam, Saaam and so on. |

### 157.1.242 SearchPrev(searchFlags as Integer, text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** SearchNext and SearchPrev search for the next and previous occurrence of the search string pointed at by text.
**Notes:** The search is modified by the searchFlags.
See kFindOption* constants.

The return value is -1 if nothing is found, otherwise the return value is the start position of the matching text. The selection is updated to show the matched text, but is not scrolled into view.

### 157.1.243 SelectAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This selects all the text in the document.
**Notes:** The current position is not scrolled into view.

### 157.1.244 SelectionDuplicate

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.245 SelectionNEndVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Query the virtual space at start and end of each selection.
**Notes:** Selection parameter is zero based.

### 157.1.246 SelectionNStartVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Query the virtual space at start and end of each selection.
**Notes:** Selection parameter is zero based.

### 157.1.247 SetAdditionalSelBackColor(value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.

### 157.1.248 SetAdditionalSelForeColor(value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.

### 157.1.249 SetCharsDefault

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use the default sets of word and whitespace characters.
**Notes:** This sets whitespace to space, tab and other characters with codes less than &h20, with word characters set to alphanumeric and '_'.

### 157.1.250 SetDocument(otherControl as Variant)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets document for this control to be same as the other control.
**Notes:** Using this method you can allow multiple controls to share same document, e.g. for split views.

Pass nil to create new empty document.

This method does the following:
1. It removes the current window from the list held by the current document.
2. It reduces the reference count of the current document by 1.
3. If the reference count reaches 0, the document is deleted.
4. doc is set as the new document for the window.
5. If doc was 0, a new, empty document is created and attached to the window.
6. If doc was not 0, its reference count is increased by 1.

Please pass either DesktopScintillaControlMBS or DesktopDesktopScintillaControlMBS here to point to new control.

After you assigned new document, please configure styles as needed.

### 157.1.251 SetEmptySelection(caret as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection and sets the caret at caret.
**Notes:** The caret is not scrolled into view.

### 157.1.252 SetFoldFlags(FoldFlags as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets folder flags.
**Notes:** In addition to showing markers in the folding margin, you can indicate folds to the user by drawing lines in the text area. The lines are drawn in the kElementFoldLine colour if set. If it is not set then the foreground colour set for kStylesCommonDefault is used.

### 157.1.253 SetFoldMarginColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the fold margin.
**Example:**

```
// turn folder margin to red
c.SetFoldMarginColor(True, Color.red)
```

**Notes:** Defaults to system color for this.

The FoldMarginColor and the FoldMarginHighlightColor colors are used together to draw the chequerboard pattern in the folder margin.

### 157.1.254 SetFoldMarginHighlightColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the fold margin highlight.
**Notes:** Defaults to system color for this.

The FoldMarginColor and the FoldMarginHighlightColor colors are used together to draw the chequerboard pattern in the folder margin.

### 157.1.255 SetHotspotActiveBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for hotspot.
**Notes:** While the cursor hovers over text in a style with the hotspot attribute set, the default colouring can be modified and an underline drawn with these settings.

### 157.1.256 SetHotspotActiveForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for hotspot.
**Notes:** While the cursor hovers over text in a style with the hotspot attribute set, the default colouring can be modified and an underline drawn with these settings.

### 157.1.257 SetSavePoint

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method tells Scintilla that the current state of the document is unmodified.
**Notes:** This is usually done when the file is saved or loaded, hence the name "save point". As Scintilla performs undo and redo operations, it notifies the container that it has entered or left the save point with SavePointReached and SavePointLeft events, allowing the container to know if the file should be considered dirty or not.
See also: EmptyUndoBuffer or Modify property.

### 157.1.258 SetSel(anchor as Integer, caret as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets both the anchor and the current position.
**Notes:** If caret is negative, it means the end of the document. If anchor is negative, it means remove any selection (i.e. set the anchor to the same position as caret). The caret is scrolled into view after this operation.

### 157.1.259 SetSelBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to override the default selection colouring.
**Example:**

```
// use highlight color for selection and white text

dim c as DesktopScintillaControlMBS // your control
c.SetSelBackColor(True, Color.HighlightColor)
c.SetSelForeColor(True, Color.White)
```

**Notes:** With the method, the colour you provide is used if you set useSetting to true. If it is set to false, the default styled colouring is used and the fore or back argument has no effect.

### 157.1.260 SetSelection(caret as Integer, anchor as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a single selection from anchor to caret as the only selection.

### 157.1.261 SetSelForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to override the default selection colouring.
**Example:**

```
// use highlight color for selection and white text

dim c as DesktopScintillaControlMBS // your control
c.SetSelBackColor(True, Color.HighlightColor)
c.SetSelForeColor(True, Color.White)
```

**Notes:** With the method, the colour you provide is used if you set useSetting to true. If it is set to false, the default styled colouring is used and the fore or back argument has no effect.

### 157.1.262 setStatusText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Targets: Desktop only.

**Function:** Sets message of status field.

### 157.1.263 SetStyling(length as Integer, style as ScintillaStyleMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the style of length characters starting at the styling position and then increases the styling position by length, ready for the next call.
**Notes:** StartStyling should be called before the first call to this.
See also:

- 157.1.264 SetStyling(start as Integer, length as Integer, style as ScintillaStyleMBS) 20444

### 157.1.264 SetStyling(start as Integer, length as Integer, style as ScintillaStyleMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the style of length characters starting at the styling position and then increases the styling position by length, ready for the next call.
**Notes:** StartStyling should be called before the first call to this.
See also:

- 157.1.263 SetStyling(length as Integer, style as ScintillaStyleMBS) 20444

### 157.1.265 SetStylingEx(Styles as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styling for a range of text.
**Notes:** As an alternative to SetStyling, which applies the same style to each byte, you can use this method which specifies the styles for each of length bytes from the styling position and then increases the styling position by length, ready for the next call. StartStyling should be called before the first call to this.

### 157.1.266 SetTargetRange(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the start and end of the target.

### 157.1.267 SetVisiblePolicy(visiblePolicy as Integer, visibleSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This determines how the vertical positioning is determined when EnsureVisibleEnforcePolicy is called.
**Notes:** It takes kVisiblePolicySlop and kVisiblePolicyStrict flags for the visiblePolicy parameter. It is similar in operation to SetYCaretPolicy.

### 157.1.268 SetWhitespaceBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for white space.
**Notes:** By default, the colour of visible white space is determined by the lexer in use. The foreground and/or background colour of all visible white space can be set globally, overriding the lexer's colours.

### 157.1.269 SetWhitespaceForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for white space.
**Notes:** By default, the colour of visible white space is determined by the lexer in use. The foreground and/or background colour of all visible white space can be set globally, overriding the lexer's colours.

### 157.1.270 SetXCaretPolicy(caretPolicy as Integer, caretSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the caret policy.
**Notes:** See kCaretPolicy* constants.

| slop | strict | jumps | even | Caret can go to the margin | "On reaching limit (going out of visibility |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 0 | 1 | Yes | moved by one position |
| 0 | 0 | 1 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 1 | 1 | Yes | centred on the caret |
| 0 | 1 | - | 0 | Caret is always on top/on right of display | - |
| 0 | 1 | - | 1 | No, caret is always centred | - |
| 1 | 0 | 0 | 0 | Yes | moved to put caret out of the asymmetrical UZ |
| 1 | 0 | 0 | 1 | Yes | moved to put caret out of the UZ |
| 1 | 0 | 1 | 0 | Yes | moved to put caret at 3UZ of the top or right margin |
| 1 | 0 | 1 | 1 | Yes | moved to put caret at 3UZ of the margin |
| 1 | 1 | - | 0 | Caret is always at UZ of top/right margin | - |
| 1 | 1 | 0 | 1 | No, kept out of UZ | moved by one position |
| 1 | 1 | 1 | 0 | No, kept out of UZ | moved to put caret at 3UZ of the margin |

### 157.1.271 SetYCaretPolicy(caretPolicy as Integer, caretSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the caret policy.
**Notes:** See kCaretPolicy* constants.

| slop | strict | jumps | even | Caret can go to the margin | "On reaching limit (going out of visibility |
|---|---|---|---|---|---|

or going into the UZ) display is..."

| | | | | | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 0 | 1 | Yes | moved by one position |
| 0 | 0 | 1 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 1 | 1 | Yes | centred on the caret |
| 0 | 1 | - | 0 | Caret is always on top/on right of display | - |
| 0 | 1 | - | 1 | No, caret is always centred | - |
| 1 | 0 | 0 | 0 | Yes | moved to put caret out of the asymmetrical UZ |
| 1 | 0 | 0 | 1 | Yes | moved to put caret out of the UZ |
| 1 | 0 | 1 | 0 | Yes | moved to put caret at 3UZ of the top or right margin |
| 1 | 0 | 1 | 1 | Yes | moved to put caret at 3UZ of the margin |
| 1 | 1 | - | 0 | Caret is always at UZ of top/right margin | - |
| 1 | 1 | 0 | 1 | No, kept out of UZ | moved by one position |
| 1 | 1 | 1 | 0 | No, kept out of UZ | moved to put caret at 3UZ of the margin |

### 157.1.272 ShowLines(lineStart as Integer, lineEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Marks a range of lines as visible and then redraw the display.

### 157.1.273 StartRecord

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Turn macro recording on.

### 157.1.274 StartStyling(start as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This prepares for styling by setting the styling position start to start at.
**Notes:** After StartStyling, send multiple SetStyling messages for each lexical entity to style or send SetStylingEX to style in blocks.

### 157.1.275 StopRecord

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Turn macro recording off.

### 157.1.276 StringOfSpan(Span as ScintillaSpanMBS) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries text for given span.

### 157.1.277 StutteredPageDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.278 StutteredPageDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.279 StutteredPageUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.280 StutteredPageUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.281 Style(index as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries style with given index.
**Notes:** Index ranges from 0 to 255.

### 157.1.282 StyleAt(position as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the style at pos in the document, or 0 if pos is negative or past the end of the document.

### 157.1.283 StyleClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This message sets all styles to have the same attributes as the default style.
**Notes:** If you are setting up Scintilla for syntax colouring, it is likely that the lexical styles you set will be very similar. One way to set the styles is to:
1. Set kStylesCommonDefault to the common features of all styles.
2. Use StyleClearAll to copy this to all styles.
3. Set the style attributes that make your lexical styles different.

### 157.1.284 StyleResetDefault

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This message resets default style (kStylesCommonDefault) to its state when Scintilla was initialised.

### 157.1.285 SupportsFeature(feature as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Different platforms support different features and SupportsFeature can be used to check which are currently available.
**Notes:** For example, on Win32, Direct2D supports drawing translucent lines but GDI does not so SupportsFeature(kSupportsTranslucentStroke) will return 1 for Direct2D and 0 for GDI. Its possible that translucent line drawing will be implemented in a future revision to the GDI platform layer or will be implemented on particular Windows versions. This call allows applications to tailor their settings: perhaps displaying a box with translucent coloured fill on Direct2D but a hollow box on GDI.

See kSupport* constants.

### 157.1.286 SwapMainAnchorCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Moves the caret to the opposite end of the main selection.

### 157.1.287 Tab

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.288 Tag(tagNumber as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Discover what text was matched by tagged expressions in a regular expression search.
**Notes:** This is useful if the application wants to interpret the replacement string itself.

### 157.1.289 TargetFromSelection

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the target start and end to the start and end positions of the selection.

### 157.1.290 TargetWholeDocument

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the target start to the start of the document and target end to the end of the document.

### 157.1.291 TextHeight(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the height in pixels of a particular line.
**Notes:** Currently all lines are the same height.

### 157.1.292 ToggleCaretSticky

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** These method set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.
**Notes:** When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default.
When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc).
When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..).
ToggleCaretSticky switches from kCaretStickyOn and kCaretStickyWhiteSpace to kCaretStickyOff and from kCaretStickyOff to kCaretStickyOn.

### 157.1.293 ToggleFold(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Toggle a folder at the given line.
**Notes:** Each fold point may be either expanded, displaying all its child lines, or contracted, hiding all the child lines. This method toggle the folding state of the given line as long as it has the kFoldLevelHeaderFlag set. This method take care of folding or expanding all the lines that depend on the line. The display updates after this method.

### 157.1.294 ToggleFoldShowText(Line as Integer, text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Toggle a folder at the given line with hsowing text.
**Notes:** Each fold point may be either expanded, displaying all its child lines, or contracted, hiding all the child lines. This method toggle the folding state of the given line as long as it has the kFoldLevelHeaderFlag set. This method take care of folding or expanding all the lines that depend on the line. The display updates after this method.

An optional text tag may be shown to the right of the folded text with the text argument to ToggleFoldShowText. The default text for all header lines can be set with DefaultFoldDisplayText. The text is drawn with the kStylesCommonFoldDisplayText style.

### 157.1.295 Undo

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Undoes one action.
**Notes:** Or if the undo buffer has reached a EndUndoAction point, all the actions back to the corresponding BeginUndoAction.

Scintilla has multiple level undo and redo. It will continue to collect undoable actions until memory runs out. Scintilla saves actions that change the document. Scintilla does not save caret and selection movements, view scrolling and the like. Sequences of typing or deleting are compressed into single transactions to make it easier to undo and redo at a sensible level of detail. Sequences of actions can be combined into transactions that are undone as a unit. These sequences occur between BeginUndoAction and EndUndoAction messages. These transactions can be nested and only the top-level sequences are undone as units.

### 157.1.296 UpperCase

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.297 UsePopUp(popUpMode as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clicking the wrong button on the mouse pops up a short default editing menu.
**Notes:** This may be turned off with UsePopup(kPopUpNever). If you turn it off, context menu commands (in Windows, WM_CONTEXTMENU) will not be handled by Scintilla, so the parent of the Scintilla window will have the opportunity to handle the message.

### 157.1.298 UserListShow(listType as Integer, itemList as string)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Shows an user list.
**Notes:** User lists use the same internal mechanisms as autocompletion lists, and all the calls listed for autocompletion work on them; you cannot display a user list at the same time as an autocompletion list is active. They differ in the following respects:

- The AutoCChooseSingle method has no effect.,Ä®

- When the user makes a selection you are sent a UserListSelection event rather than AutoCompleteSelection.

BEWARE: if you have set fillup characters or stop characters, these will still be active with the user list, and may result in items being selected or the user list cancelled due to the user typing into the editor.

,Ä®The listType parameter is carried to the events. It must be greater than 0 as this is how Scintilla tells the difference between an autocompletion list and a user list. If you have different types of list, for example a list of buffers and a list of macros, you can use listType to tell which one has returned a selection.

### 157.1.299 VCHome

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.300 VCHomeDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.301 VCHomeDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.302 VCHomeExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.303 VCHomeRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.304 VCHomeWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.305 VCHomeWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.306 VerticalCentreCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.307 VisibleFromDocLine(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When some lines are hidden and/or annotations are displayed, then a particular line in the document may be displayed at a different position to its document position.
**Notes:** If no lines are hidden and there are no annotations, this method returns docLine. Otherwise, this returns the display line (counting the very first visible line as 0). The display line of an invisible line is the same as the previous visible line. The display line number of the first line in the document is 0. If lines are hidden and docLine is outside the range of lines in the document, the return value is -1. Lines can occupy more than one display line if they wrap.

### 157.1.308 WordEndPosition(pos as Integer, onlyWordCharacters as boolean) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the end of words using the same definition of words as used internally within Scintilla.
**Notes:** You can set your own list of characters that count as words with WordChars. The position sets the start or the search, which is forwards when searching for the end and backwards when searching for the start.

### 157.1.309 WordLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.310 WordLeftEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.311 WordLeftEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.312 WordLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.313 WordPartLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.314 WordPartLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.315 WordPartRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.316 WordPartRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.317 WordRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.318 WordRightEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.319 WordRightEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.320 WordRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.1.321 WordStartPosition(pos as Integer, onlyWordCharacters as boolean) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the start of words using the same definition of words as used internally within Scintilla.
**Notes:** You can set your own list of characters that count as words with WordChars. The position sets the start or the search, which is forwards when searching for the end and backwards when searching for the start.

### 157.1.322 WrapCount(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Document lines can occupy more than one display line if they wrap and this returns the number of display lines needed to wrap a document line.

### 157.1.323 ZoomIn

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Increases the zoom factor by one point if the current zoom factor is less than 20 points.

### 157.1.324 ZoomOut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Ddecreases the zoom factor by one point if the current zoom factor is greater than -10 points.

### 157.1.325 Properties

### 157.1.326 Accessibility as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable accessibility status.
**Notes:** Can be set to kAccessibilityEnabled to enable.
(Read and Write property)

### 157.1.327 AdditionalCaretForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Modify the appearance of additional carets so that they can be differentiated from the main caret which has its appearance.
**Notes:** (Read and Write property)

### 157.1.328 AdditionalCaretsBlink as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Modify the appearance of additional carets so that they can be differentiated from the main caret which has its appearance.
**Notes:** (Read and Write property)

### 157.1.329 AdditionalCaretsVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Determine whether to show additional carets (defaults to true).
**Notes:** (Read and Write property)

### 157.1.330 AdditionalSelAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets alpha for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.
(Read and Write property)

### 157.1.331 AdditionalSelectionTyping as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether typing, new line, cursor left/right/up/down, backspace, delete, home, and end work with multiple selections simultaneously.
**Notes:** Also allows selection and word and line deletion commands.
(Read and Write property)

### 157.1.332 AllLinesVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true if all lines are visible and false if some lines are hidden.
**Notes:** (Read only property)

### 157.1.333 Anchor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current anchor position.
**Notes:** This sets the anchor position and creates a selection between the anchor position and the current position. The caret is not scrolled into view.
(Read and Write property)

### 157.1.334 AnnotationVisible as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Annotations can be made visible in a view and there is a choice of display style when visible.
**Notes:** See kAnnotationVisible* constants.
(Read and Write property)

### 157.1.335 AutoCompleteActive as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true if there is an active auto completion list and false if there is not.
**Notes:** (Read only property)

### 157.1.336 AutoCompleteAutoHide as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, the list is cancelled if there are no viable matches (the user has typed characters that no longer match a list entry).
**Notes:** If you want to keep displaying the original list, set autoHide to false. This also effects AutoCompleteSelect.
(Read and Write property)

### 157.1.337 AutoCompleteCancelAtStart as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The default behaviour is for the list to be cancelled if the caret moves to the location it was at when the list was displayed.
**Notes:** By calling this message with a false argument, the list is not cancelled until the caret moves at least one character before the word being completed.

(Read and Write property)

### 157.1.338 AutoCompleteCaseInsensitiveBehaviour as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to ignore case on auto completion.
**Notes:** When auto completion is set to ignore case (kCaseInsensitiveBehaviourIgnoreCase), by default it will nonetheless select the first list member that matches in a case sensitive way to entered characters. This corresponds to a behaviour property of kCaseInsensitiveBehaviourRespectCase (0). If you want auto completion to ignore case at all, choose kCaseInsensitiveBehaviourIgnoreCase (1).
(Read and Write property)

### 157.1.339 AutoCompleteChooseSingle as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to choose single item directly.
**Notes:** If you use AutoCompleteChooseSingle(1) and a list has only one item, it is automatically added and no list is displayed. The default is to display the list even if there is only a single item.
(Read and Write property)

### 157.1.340 AutoCompleteCurrent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set to select an item in the autocompletion list.
**Notes:** It searches the list of words for the first that matches select. By default, comparisons are case sensitive, but you can change this with AutoCIgnoreCase. The match is character by character for the length of the select string. That is, if select is "Fred" it will match "Frederick" if this is the first item in the list that begins with "Fred". If an item is found, it is selected. If the item is not found, the autocompletion list closes if auto-hide is true (see AutoCAutoHide).
The current selection index can be retrieved with AutoCompleteCurrent.
(Read only property)

### 157.1.341 AutoCompleteCurrentText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieves the current selected text in the autocompletion list.
**Notes:** Normally the AutoCompletion event is used instead.

The value is copied to the text buffer or if not found, an empty string is returned.
(Read only property)

### 157.1.342 AutoCompleteDropRestOfWord as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When an item is selected, any word characters following the caret are first erased if dropRestOf-Word is set true.
**Notes:** The default is false.
(Read and Write property)

### 157.1.343 AutoCompleteIgnoreCase as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, matching of characters to list members is case sensitive.
**Notes:** These method let you set and get case sensitivity.
(Read and Write property)

### 157.1.344 AutoCompleteMaxHeight as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the maximum number of rows that will be visible in an auto completion list.
**Notes:** If there are more rows in the list, then a vertical scrollbar is shown. The default is 5.
(Read and Write property)

### 157.1.345 AutoCompleteMaxWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the maximum width of an auto completion list expressed as the number of characters in the longest item that will be totally visible.
**Notes:** If zero (the default) then the list's width is calculated to fit the item with the most characters. Any items that cannot be fully displayed within the available width are indicated by the presence of ellipsis.
(Read and Write property)

### 157.1.346 AutoCompleteMulti as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to auto complete multiple selections.
**Notes:** When auto completing with multiple selections present, the auto completed text can go into just the main selection with kMultiAutoCompleteOnce (0) or into each selection with kMultiAutoCompleteEach (1). The default is kMultiAutoCompleteOnce.
(Read and Write property)

### 157.1.347 AutoCompleteOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set options for auto completion.
**Notes:** See kAutoCompleteOption* constants.
(Read and Write property)

### 157.1.348 AutoCompleteOrder as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The default setting kOrderingPreSorted (0) requires that the list be provided in alphabetical sorted order.
**Notes:** Sorting the list can be done by Scintilla instead of the application with kOrderingPerformSort (1). This will take additional time.
Applications that wish to prioritize some values and show the list in order of priority instead of alphabetical order can use kOrderingCustom (2). This requires extra processing in AutoCompleteShow to create a sorted index.
Setting the order should be done before calling AutoCompleteShow.
(Read and Write property)

### 157.1.349 AutoCompleteSeparator as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the separator character used to separate words in the AutoCompleteShow list.
**Notes:** The default is the space character.
(Read and Write property)

### 157.1.350 AutoCompleteTypeSeparator as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or get the type separator for auto complete.
**Notes:** (Read and Write property)

### 157.1.351 AutomaticFold as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The automatic folding behavior.
**Notes:** The fundamental operation in folding is making lines invisible or visible. Line visibility is a property of the view rather than the document so each view may be displaying a different set of lines. From the point of view of the user, lines are hidden and displayed using fold points. Generally, the fold points of a document are based on the hierarchical structure of the document contents. In Python, the hierarchy is determined by indentation and in C++ by brace characters. This hierarchy can be represented within a Scintilla document object by attaching a numeric "fold level" to each line. The fold level is most easily set by a lexer, but you can also set it with method.

It is up to your code to set the connection between user actions and folding and unfolding. The best way to see how this is done is to search the SciTE source code for the methods used in this section of the documentation and see how they are used. You will also need to use markers and a folding margin to complete your folding implementation. The "fold" property should be set to "1" with SetProperty("fold", "1") to enable folding.

Instead of implementing all the logic for handling folding in the container, Scintilla can provide behaviour that is adequate for many applications. The automaticFold argument is a bit set defining which of the 3 pieces of folding implementation should be enabled. Most applications should be able to use the kAutomaticFoldShow and kAutomaticFoldChange flags unless they wish to implement quite different behaviour such as defining their own fold structure. kAutomaticFoldClick is more likely to be set off when an application would like to add or change click behaviour such as showing method headers only when Shift+Alt is used in conjunction with a click.
(Read and Write property)

### 157.1.352 BackSpaceUnIndents as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether backspace unindents.
**Notes:** Inside indentation white space, the tab and backspace keys can be made to indent and unindent rather than insert a tab character or delete a character with the TabIndents and BackSpaceUnIndents functions.
(Read and Write property)

### 157.1.353 Bidirectional as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or queries bidirectional support.
**Notes:** The bidirectional features in Scintilla are experimental and incomplete.

Some languages, like Arabic and Hebrew, are written from right to left instead of from left to right as English is. Documents that use multiple languages may contain both directions and this is termed "bidirectional". The default text direction may be right to left or left to right. Scintilla only correctly displays bidirectional text on some platforms. Currently, there is experimental support for bidirectional text on Win32 using DirectWrite and on macOS using Cocoa. Only UTF-8 documents will show bidirectional behaviour and only in kBidirectionalL2R mode. Some features, such as virtual space may not work with bidirectional text or may work only in some circumstances. kBidirectionalR2L may be implemented in the future.

There are additional processing and storage costs to bidirectional text. As some applications may not want to pay the costs, bidirectional support must be explicitly enabled by calling Bidirectional = kBidirectionalL2R (1) which chooses left to right as the default direction or Bidirectional = kBidirectionalR2L (2) for default right to left.

On Win32, this should be done after setting the technology to kTechnologyDirectWrite, kTechnologyDirectWriteRetain, or kTechnologyDirectWriteDC.

If the call succeeded Bidirectional query will return the same value otherwise kBidirectionalDisabled (0) is returned.
(Read and Write property)

### 157.1.354 CallTipActive as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if a call tip is active and false if it is not active.
**Notes:** (Read only property)

### 157.1.355 CallTipPosStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This property returns or sets the value of the current position when CallTipShow started to display the tip.
**Notes:** (Read and Write property)

### 157.1.356 CanPaste as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether clipboard has text and paste can be performed.
**Notes:** Returns false if document is read only or selection contains protected text.
(Read only property)

### 157.1.357 CanRedo as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether Undo was performed and a Redo step is possible.
**Notes:** You could typically use the result of this property to enable/disable the Edit menu Redo command.
(Read only property)

### 157.1.358 CanUndo as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether undo stack contains data and can be used to undo.
**Notes:** You would typically use the result of this property to enable/disable the Edit menu Undo command.
(Read only property)

### 157.1.359 CaretForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the caret.
**Example:**

```
dim ScintillaEditor as DesktopScintillaControlMBS // your control

// set cursor width and color

ScintillaEditor.CaretForeColor = Color.HighlightColor
ScintillaEditor.CaretWidth = 8
```

**Notes:** (Read and Write property)

### 157.1.360 CaretLineBackAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The caret line be drawn translucently which allows other background colours to show through.
**Notes:** hTis is done by setting the alpha (translucency) value by calling CaretLineBackAlpha. When the alpha is not kAlphaNoAlpha, the caret line is drawn after all other features so will affect the colour of all other features.
(Read and Write property)

### 157.1.361 CaretLineBackColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The background colour of the line containing the caret different
**Notes:** Set the desired background colour with CaretLineBackColor, then use CaretLineVisible = true to enable the effect. You can cancel the effect with CaretLineVisible = false.
(Read and Write property)

### 157.1.362 CaretLineFrame as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** can be used to display the caret line framed instead of filling the whole background.
**Notes:** Set width <>0 to enable this option and width = 0 to disable it.
(Read and Write property)

### 157.1.363 CaretLineHighlightSubLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Choose to highlight only the subline containing the caret instead of the whole line.
**Notes:** Default behaviour CaretLineHighlightSubLine = false the whole caret line is highlighted.
(Read and Write property)

### 157.1.364 CaretLineLayer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to make the background colour of the line containing the caret.
**Notes:** This effect may be drawn translucently over the text or opaquely on the base layer with CaretLineLayer. Background colouring has highest priority when a line has markers that would otherwise change

the background colour. When drawn translucently other background colours can show through.

See kLayer* constants.
(Read and Write property)

### 157.1.365 CaretLineVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether caret line is visible.
**Notes:** Set the desired background colour with CaretLineBackColor, then use CaretLineVisible = true to enable the effect. You can cancel the effect with CaretLineVisible = false.
(Read and Write property)

### 157.1.366 CaretLineVisibleAlways as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Choose to make the caret line always visible even when the window is not in focus.
**Notes:** Default behaviour false the caret line is only visible when the window is in focus.
(Read and Write property)

### 157.1.367 CaretPeriod as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The rate at which the caret blinks.
**Notes:** The rate at which the caret blinks can be set with CaretPeriod which determines the time in milliseconds that the caret is visible or invisible before changing state. Setting the period to 0 stops the caret blinking. The default value is 500 milliseconds.
(Read and Write property)

### 157.1.368 CaretSticky as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.
**Notes:** These messages set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.

When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default.

When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc).

When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..).

SCI_TOGGLECARETSTICKY switches from kCaretStickyOn and kCaretStickyWhiteSpace to kCaretStickyOff and from kCaretStickyOff to kCaretStickyOn.
(Read and Write property)

### 157.1.369 CaretStyle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The style of the caret.
**Notes:** There are separate styles for insert mode (lower 4-bits, kCaretStyleInsMask) and overtype mode (bit 4).

See kCaretStyle* constants.

The block caret draws most combining and multibyte character sequences successfully, though some fonts like Thai Fonts (and possibly others) can sometimes appear strange when the cursor is positioned at these characters, which may result in only drawing a part of the cursor character sequence. This is most notable on Windows platforms.
(Read and Write property)

### 157.1.370 CaretWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the line caret.
**Example:**

```
dim ScintillaEditor as DesktopScintillaControlMBS // your control

// set cursor width and color
```

ScintillaEditor.CaretForeColor = Color.HighlightColor
ScintillaEditor.CaretWidth = 8

**Notes:** can be set to a value of between 0 and 20 pixels. The default width is 1 pixel.

A width of 0 makes the caret invisible, similar to setting the caret style to kCaretStyleInvisible (though not interchangeable). This setting only affects the width of the cursor when the cursor style is set to line caret mode, it does not affect the width for a block caret.
(Read and Write property)

### 157.1.371 CharacterCategoryOptimization as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Optimize speed of character category features like determining whether a character is a space or number at the expense of memory.
**Notes:** Mostly used for Unicode documents. The countCharacters parameter determines how many character starting from 0 are added to a look-up table with one byte used for each character. It is reasonable to cover the set of characters likely to be used in a document so &h100 for simple Roman text, &h1000 to cover most simple alphabets, &h10000 to cover most of East Asian languages, and &h110000 to cover all possible characters.
(Read and Write property)

### 157.1.372 ControlCharSymbol as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The mnemonics may be replaced by a nominated symbol with an ASCII code in the range 32 to 255.
**Notes:** If you set a symbol value less than 32, all control characters are displayed as mnemonics. The symbol you set is rendered in the font of the style set for the character.

The default symbol value is 0.
(Read and Write property)

### 157.1.373 CurrentLine as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This retrieves the text of the line containing the caret and returns the position within the line of the caret.

**Notes:** (Read only property)

### 157.1.374 Cursor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current mouse cursor.
**Notes:** The cursor is normally chosen in a context sensitive way, so it will be different over the margin than when over the text. When performing a slow action, you may wish to change to a wait cursor. You set the cursor type with assignment to this property.
See kCursorShape* constants.

Cursor values 1 through 7 have defined cursors, but only kCursorShapeWait is usefully controllable. Other values of cursorType cause a pointer to be displayed. Reading the cursor property returns the last cursor type you set, or kCursorShapeNormal (-1) if you have not set a cursor type.
(Read and Write property)

### 157.1.375 DefaultFoldDisplayText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the default text displayed at the right of the folded text.
**Notes:** (Read and Write property)

### 157.1.376 DescribeKeyWordSets as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A description of all of the keyword sets separated by LF.
**Notes:** (Read only property)

### 157.1.377 DocumentOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The documentation options used to create the document.
**Notes:** (Read only property)

### 157.1.378 EdgeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the colour of the marker used to show that a line has exceeded the length set by EdgeColumn property.
**Notes:** (Read and Write property)

### 157.1.379 EdgeColumn as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the column number at which to display the long line marker.
**Notes:** When drawing lines, the column sets a position in units of the width of a space character in kStylesCommonDefault. When setting the background colour, the column is a character count (allowing for tabs) into the line.
(Read and Write property)

### 157.1.380 EdgeMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the mode used to display long lines.
**Notes:** You can choose to mark lines that exceed a given length by drawing a vertical line or by colouring the background of characters that exceed the set length.

See kEdgeVisualStyle* constants.
(Read and Write property)

### 157.1.381 EndAtLastLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** EndAtLastLine sets the scroll range so that maximum scroll position has the last line at the bottom of the view (default).
**Notes:** Setting this to false allows scrolling one page below the last line.
(Read and Write property)

### 157.1.382 EOLAnnotationVisible as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the annotation display mode.
**Notes:** End of Line Annotations can be made visible in a view and there is a choice of display style when visible.

See kEOLAnnotationVisible* constants.
(Read and Write property)

### 157.1.383 EOLMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the characters that are added into the document when the user presses the Enter key.
**Notes:** You can set eolMode to one of kEndOfLineCRLF (0), kEndOfLineCR (1), or kEndOfLineLF (2).

Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.
(Read and Write property)

### 157.1.384 ExtraAscent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The extra ascent.
**Notes:** Text is drawn with the base of each character on a 'baseline'. The height of a line is found from the maximum that any style extends above the baseline (its 'ascent'), added to the maximum that any style extends below the baseline (its 'descent'). Space may be added to the maximum ascent (ExtraAscent) and the maximum descent (ExtraDescent) to allow for more space between lines. This may done to make the text easier to read or to accommodate underlines or highlights.

The extra ascent and descent values can be negative but that should be done with care as it may lead to unexpected interference when lines share space.
(Read and Write property)

### 157.1.385 ExtraDescent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The extra descent.
**Notes:** Text is drawn with the base of each character on a 'baseline'. The height of a line is found from the maximum that any style extends above the baseline (its 'ascent'), added to the maximum that any style extends below the baseline (its 'descent'). Space may be added to the maximum ascent (ExtraAscent) and the maximum descent (ExtraDescent) to allow for more space between lines. This may done to make the text easier to read or to accommodate underlines or highlights.

The extra ascent and descent values can be negative but that should be done with care as it may lead to unexpected interference when lines share space.
(Read and Write property)

### 157.1.386 FirstVisibleLine as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve or set the line number of the first visible line in the Scintilla view.
**Notes:** The first line in the document is numbered 0. The value is a visible line rather than a document line.
(Read and Write property)

### 157.1.387 Focus as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether we have focus.
**Notes:** Scintilla can be told to grab the focus with GrabFocus. This is needed more on GTK where focus handling is more complicated than on Windows.
The internal focus flag can be set with Focus. This is used by clients that have complex focus requirements such as having their own window that gets the real focus but with the need to indicate that Scintilla has the logical focus.
(Read and Write property)

### 157.1.388 FoldDisplayTextStyle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Changes the appearance of fold text tags.
**Notes:** (Read and Write property)

### 157.1.389 FontLocale as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the locale used for font selection with language-dependent glyphs.
**Notes:** It may, depending on platform and other circumstances influence the display of text, so setting "zh-Hant" may result in traditional Chinese display and "zh-Hans" may result in simplified Chinese display. It is currently only implemented for Win32 using DirectWrite where the value is passed as the localeName argument to CreateTextFormat. The default value is US English "en-us".
(Read and Write property)

### 157.1.390 FontQuality as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Manage font quality (antialiasing method).
**Notes:** See kFontQualityQuality* constants.
(Read and Write property)

### 157.1.391 HasBorder as Boolean

MBS Scintilla Plugin, Plugin Version: 22.4, Platform: Windows, Targets: Desktop only.

**Function:** Enable/disable border for Windows.
**Notes:** If this flag is set before the control is constructed, you get the control instated on Windows with a border line.
(Read and Write property)

### 157.1.392 HighlightGuide as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When brace highlighting occurs, the indentation guide corresponding to the braces may be highlighted with the brace highlighting style, kStylesCommonBraceLight (34).
**Notes:** Set column to 0 to cancel this highlight.
(Read and Write property)

### 157.1.393 HotspotActiveBack as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries background color for hotspot.
**Notes:** (Read only property)

### 157.1.394 HotspotActiveFore as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries foreground color for hotspot.
**Notes:** (Read only property)

### 157.1.395 HotspotActiveUnderline as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** While the cursor hovers over text in a style with the hotspot attribute set, this option shows underline.
**Notes:** (Read and Write property)

### 157.1.396 HotspotSingleLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Single line mode stops a hotspot from wrapping onto next line.
**Notes:** (Read and Write property)

### 157.1.397 HScrollBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The horizontal scroll bar is only displayed if it is needed for the assumed width.
**Notes:** If you never wish to see it, call HScrollBar = false. Use HScrollBar = true to enable it again. Querying HScrollBar returns the current state. The default state is to display it when needed.
(Read and Write property)

### 157.1.398 IdleStyling as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The idel styling setting.
**Notes:** By default, kIdleStylingNone (0), syntax styling is performed for all the currently visible text before

displaying it. On very large files, this may make scrolling down slow. With kIdleStylingToVisible (1), a small amount of styling is performed before display and then further styling is performed incrementally in the background as an idle-time task. This may result in the text initially appearing uncoloured and then, some time later, it is coloured. Text after the currently visible portion may be styled in the background with kIdleStylingAfterVisible (2). To style both before and after the visible text in the background use kIdleStylingAll (3).
Since wrapping also needs to perform styling and also uses idle time, this setting has no effect when the document is displayed wrapped.
(Read and Write property)

### 157.1.399 IMEInteraction as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Configures IME interaction.
**Notes:** When entering text in Chinese, Japanese, or Korean an Input Method Editor (IME) may be displayed. The IME may be an extra window appearing above Scintilla or may be displayed by Scintilla itself as text. On some platforms there is a choice between the two techniques. A windowed IME kIMEInteractionWindowed (0) may be more similar in appearance and behaviour to the IME in other applications. An inline IME kIMEInteractionInline (1) may work better with some Scintilla features such as rectangular and multiple selection.
The windowed behaviour can be chosen with IMEInteraction = kIMEInteractionWindowed and the inline behaviour with IMEInteraction = kIMEInteractionInline. Scintilla may ignore this call in some cases. For example, the inline behaviour might only be supported for some languages.
When the inline IME mode is active, characters are added tentatively before being finalised and an CharacterAdded event (with characterSource set to kCharacterSourceTentativeInput) is sent for each character.
(Read and Write property)

### 157.1.400 Indent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the size of indentation in terms of the width of a space in KStylesCommonDefault.
**Notes:** If you set a width of 0, the indent size is the same as the tab size. There are no limits on indent sizes, but values less than 0 or large values may have undesirable effects.

Indentation (the white space at the start of a line) is often used by programmers to clarify program structure and in some languages, for example Python, it may be part of the language syntax. Tabs are normally used in editors to insert a tab character or to pad text with spaces up to the next tab.
When Scintilla is laying out a section of text, text after a tab character will usually be displayed at the next multiple of TabWidth columns from the left. However, it is also possible to explicitly set tabstops in pixels for each line.
Scintilla can be set to treat tab and backspace in the white space at the start of a line in a special way: inserting a tab indents the line to the next indent position rather than just inserting a tab at the current

character position and backspace unindents the line rather than deleting a character. Scintilla can also display indentation guides (vertical lines) to help you to generate code.
(Read and Write property)

### 157.1.401 IndentationGuides as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Indentation guides are dotted vertical lines that appear within indentation white space every indent size columns.
**Notes:** They make it easy to see which constructs line up especially when they extend over multiple pages. Style kStylesCommonIndentGuide (37) is used to specify the foreground and background colour of the indentation guides.
There are 4 indentation guide views. kIndentViewNone turns the feature off but the other 3 states determine how far the guides appear on empty lines.
(Read and Write property)

### 157.1.402 IndicatorCurrent as ScintillaIndicatorMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current indicator.
**Notes:** (Read and Write property)

### 157.1.403 IndicatorValue as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the value that will be set by calls to IndicatorFillRange.
**Notes:** (Read and Write property)

### 157.1.404 LayoutCache as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable layout cache.
**Notes:** (Read and Write property)

### 157.1.405 Length as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The length of the document in bytes.
**Notes:** (Read only property)

### 157.1.406 LexerLanguage as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the name of the current lexer.
**Notes:** (Read only property)

### 157.1.407 LibraryError as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The error message from loading the library.
**Notes:** (Read only property)

### 157.1.408 LineCharacterIndex as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns which if any indexes are active.
**Notes:** (Read only property)

### 157.1.409 LineCount as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the number of lines in the document.
**Notes:** An empty document contains 1 line. A document holding only an end of line sequence has 2 lines.
(Read only property)

### 157.1.410 LineEndTypesActive as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports the set of line ends currently interpreted by Scintilla.
**Notes:** It is LineEndTypesSupported and LineEndTypesAllowed.

See kLineEndType* constants.
(Read only property)

### 157.1.411 LineEndTypesAllowed as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, only the ASCII line ends are interpreted.
**Notes:** Unicode line ends may be requested with LineEndTypesAllowed = kLineEndTypeUnicode but this will be ineffective unless the lexer also allows you Unicode line ends.

See kLineEndType* constants.
(Read and Write property)

### 157.1.412 LineEndTypesSupported as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports the different types of line ends supported by the current lexer.
**Notes:** This is a bit set although there is currently only a single choice with either kLineEndTypeDefault (0) or kLineEndTypeUnicode (1). These values are also used by the other messages concerned with Unicode line ends.

See kLineEndType* constants.
(Read only property)

### 157.1.413 LinesOnScreen as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the number of complete lines visible on the screen.
**Notes:** With a constant line height, this is the vertical space available divided by the line separation. Unless you arrange to size your window to an integral number of lines, there may be a partial line visible at the bottom of the view.
(Read only property)

### 157.1.414 MainSelection as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries index of main selection.
**Notes:** One of the selections is the main selection which is used to determine what range of text is automatically visible. The main selection may be displayed in different colours or with a differently styled caret. Only an already existing selection can be made main.
(Read and Write property)

### 157.1.415 MarginLeft as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the width of the blank margin on left side of the text in pixels.
**Notes:** The default is to one pixel on each side.
(Read and Write property)

### 157.1.416 MarginOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Define margin options by enabling appropriate bit flags.
**Notes:** At the moment, only one flag is available kMarginOptionSubLineSelect = 1, which controls how wrapped lines are selected when clicking on margin in front of them. If kMarginOptionSubLineSelect is set only sub line of wrapped line is selected, otherwise whole wrapped line is selected. Margin options are set to kMarginOptionNone=0 by default.
(Read and Write property)

### 157.1.417 MarginRight as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the width of the blank margin on right side of the text in pixels.
**Notes:** The default is to one pixel on each side.
(Read and Write property)

### 157.1.418 Margins as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate the number of margins or find the number of margins currently allocated.
**Notes:** (Read and Write property)

### 157.1.419 MaxLineState as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the last line that has any line state.
**Notes:** (Read only property)

### 157.1.420 ModEventMask as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The modification event masks.
**Notes:** Set and get an event mask that determines which document change events are notified to the container with Modify event. For example, a container may decide to see only notifications about changes to text and not styling changes by setting ModEventMask = kModificationFlagsInsertText + kModificationFlagsDeleteText.
(Read and Write property)

### 157.1.421 Modify as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if the document is modified and false if it is unmodified.
**Notes:** The modified status of a document is determined by the undo position relative to the save point. The save point is set by SetSavePoint, usually when you have saved data to a file.
If you need to be notified when the document becomes modified, Scintilla notifies the container that it has entered or left the save point with the SavePointReached and SavePointLeft notification messages.

(Read only property)

### 157.1.422 MouseDownCaptures as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When the mouse is pressed inside Scintilla, it is captured so future mouse movement events are sent to Scintilla.
**Notes:** This behaviour may be turned off with MouseDownCaptures = false.
(Read and Write property)

### 157.1.423 MouseDwellTime as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The time the mouse must sit still, in milliseconds, to generate a DWellStart event.
**Notes:** If set to kTimeForever, the default, no dwell events are generated.
(Read and Write property)

### 157.1.424 MouseSelectionRectangularSwitch as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable the ability to switch to rectangular selection mode while making a selection with the mouse.
**Notes:** When this option is turned on, mouse selections in stream mode can be switched to rectangular mode by pressing the corresponding modifier key. They then stick to rectangular mode even when the modifier key is released again. When this option is turned off, mouse selections will always stick to the mode the selection was started in. It is off by default.
(Read and Write property)

### 157.1.425 MouseWheelCaptures as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to capture mouse wheel events.
**Notes:** On Windows, Scintilla captures all WM_MOUSEWHEEL messages if it has the focus, even if the mouse pointer is nowhere near the Scintilla editor window. This behaviour can be changed with MouseWheelCaptures = false so that Scintilla passes the WM_MOUSEWHEEL messages to its parent window. Scintilla will still react to the mouse wheel if the mouse pointer is over the editor window.

(Read and Write property)

### 157.1.426 MoveExtendsSelection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if regular caret moves will extend or reduce the selection, false if not.
**Notes:** SetSelectionMode toggles this setting between on and off.
(Read only property)

### 157.1.427 MultiPaste as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** How to do paste with multiple selection.
**Notes:** When pasting into multiple selections, the pasted text can go into just the main selection with kMultiPasteOnce=0 or into each selection with kMultiPasteEach=1. kMultiPasteOnce is the default.
(Read and Write property)

### 157.1.428 MultipleSelection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable multiple selection.
**Notes:** When multiple selection is disabled, it is not possible to select multiple ranges by holding down the Ctrl key while dragging with the mouse.

There may be multiple selections active at one time. More selections are made by holding down the Ctrl key while dragging with the mouse. The most recent selection is the main selection and determines which part of the document is shown automatically. Any selection apart from the main selection is called an additional selection. The calls in the previous section operate on the main selection. There is always at least one selection. The selection can be simplified down to just the main selection by Cancel which is normally mapped to the Esc key.

Rectangular selections are handled as multiple selections although the original rectangular range is remembered so that subsequent operations may be handled differently for rectangular selections. For example, pasting a rectangular selection places each piece in a vertical column.

Virtual space is space beyond the end of each line. The caret may be moved into virtual space but no real space will be added to the document until there is some text typed or some other text insertion command

is used.

When discontiguous selections are copied to the clipboard, each selection is added to the clipboard text in order with no delimiting characters. For rectangular selections the document's line end is added after each line's text. Rectangular selections are always copied from top line to bottom, not in the in order of selection.Virtual space is not copied.
(Read and Write property)

### 157.1.429 NamedStyles as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the number of named styles for the lexer.
**Notes:** (Read only property)

### 157.1.430 NSView as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Cocoa view for macOS.
**Notes:** Object is from NSViewMBS class.
(Read only property)

### 157.1.431 Overtype as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When overtype is enabled, each typed character replaces the character to the right of the text caret.
**Notes:** When overtype is disabled, characters are inserted at the caret. Returns true if overtyping is active, otherwise false will be returned.
(Read and Write property)

### 157.1.432 PasteConvertEndings as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to match end of line on pasting.
**Notes:** If this property is set then when text is pasted any line ends are converted to match the document's end of line mode as set with EOLMode. Defaults to true.

(Read and Write property)

### 157.1.433 Position as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current position.
**Notes:** This sets the current position and creates a selection between the anchor and the current position. The caret is not scrolled into view.
(Read and Write property)

### 157.1.434 PositionCache as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size in entries of the position cache.
**Notes:** The position cache stores position information for short runs of text so that their layout can be determined more quickly if the run recurs.
(Read and Write property)

### 157.1.435 PrintColourMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the method used to render coloured text on a printer that is probably using white paper.
**Notes:** It is especially important to consider the treatment of colour if you use a dark or black screen background. Printing white on black uses up toner and ink very many times faster than the other way around. See kPrintOption* constants.
(Read and Write property)

### 157.1.436 PrintMagnification as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Lets you to print at a different size than the screen font.
**Notes:** magnification is the number of points to add to the size of each screen font. A value of -3 or -4 gives reasonably small print.
(Read and Write property)

### 157.1.437 PrintWrapMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get and set the printer wrap mode.
**Notes:** wrapMode can be set to kWrapNone (0) or kWrapWord (1). The default is kWrapWord, which wraps printed output so that all characters fit into the print rectangle. If you set kWrapNone, each line of text generates one line of output and the line is truncated if it is too long to fit into the print area.
kWrapWord tries to wrap only between words as indicated by white space or style changes although if a word is longer than a line, it will be wrapped before the line end.
kWrapChar is not supported for printing.
(Read and Write property)

### 157.1.438 PropertyNames as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns a string with all of the valid properties separated by LF.
**Notes:** If the lexer does not support this call then an empty string is returned.
(Read only property)

### 157.1.439 PunctuationChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Similar to WordChars and WhiteSpaceChars, this message allows the user to define which chars Scintilla considers as punctuation.
**Notes:** (Read and Write property)

### 157.1.440 ReadOnly as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the read-only flag for the document.
**Notes:** If you mark a document as read only, attempts to modify the text cause the ModifyAttemptReadOnly event.
(Read and Write property)

### 157.1.441 RectangularSelectionAnchor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position for the anchor of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.1.442 RectangularSelectionAnchorVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.1.443 RectangularSelectionCaret as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position for the caret of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.

There may be multiple selections active at one time. More selections are made by holding down the Ctrl key while dragging with the mouse. The most recent selection is the main selection and determines which part of the document is shown automatically. Any selection apart from the main selection is called an additional selection. The calls in the previous section operate on the main selection. There is always at least one selection. The selection can be simplified down to just the main selection by Cancel which is normally mapped to the Esc key.

Rectangular selections are handled as multiple selections although the original rectangular range is remembered so that subsequent operations may be handled differently for rectangular selections. For example, pasting a rectangular selection places each piece in a vertical column.

Virtual space is space beyond the end of each line. The caret may be moved into virtual space but no real space will be added to the document until there is some text typed or some other text insertion command is used.

When discontiguous selections are copied to the clipboard, each selection is added to the clipboard text in order with no delimiting characters. For rectangular selections the document's line end is added after each line's text. Rectangular selections are always copied from top line to bottom, not in the in order of selection.Virtual space is not copied.
(Read and Write property)

### 157.1.444 RectangularSelectionCaretVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.1.445 RectangularSelectionModifier as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** On GTK and Qt, the key used to indicate that a rectangular selection should be created when combined with a mouse drag can be set.
**Notes:** The three possible values are kKeyModCtrl=2, kKeyModAlt=4 (default) or kKeyModSuper=8. Since kKeyModAlt may already be used by a window manager, the window manager may need configuring to allow this choice. kKeyModSuper is often a system dependent modifier key such as the Left Windows key on a Windows keyboard or the Command key on a Mac.
(Read and Write property)

### 157.1.446 ScrollWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** For performance, Scintilla does not measure the display width of the document to determine the properties of the horizontal scroll bar.
**Notes:** Instead, an assumed width is used. These messages set and get the document width in pixels assumed by Scintilla. The default value is 2000. To ensure the width of the currently visible lines can be scrolled use ScrollWidthTracking.
(Read and Write property)

### 157.1.447 ScrollWidthTracking as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If scroll width tracking is enabled then the scroll width is adjusted to ensure that all of the lines currently displayed can be completely scrolled.
**Notes:** This mode never adjusts the scroll width to be narrower.
(Read and Write property)

### 157.1.448 SearchFlags as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** These get and set the searchFlags used by SearchInTarget.
**Notes:** There are several option flags including a simple regular expression search.
See kFindOption* constants.
(Read and Write property)

### 157.1.449 SelAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or gets selection alpha value.
**Notes:** (Read and Write property)

### 157.1.450 SelectedText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This copies the currently selected text.
**Notes:** This allows for rectangular and discontiguous selections as well as simple selections. See Multiple Selection for information on how multiple and rectangular selections and virtual space are copied.
(Read only property)

### 157.1.451 SelectionEmpty as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return true if every selected range is empty else false.
**Notes:** This can be used as CanCopy or CanCut for building menu.
(Read only property)

### 157.1.452 SelectionEnd as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The end position of the selection.
**Notes:** SelectionStart and SelectionEnd return the start and end of the selection without regard to which end is the current position and which is the anchor. SelectionStart returns the smaller of the current position or the anchor position. SelectionEnd returns the larger of the two values.

Assign new value to set the selection based on the assumption that the anchor position is less than the current position.
(Read and Write property)

### 157.1.453 SelectionIsRectangle as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if the current selection is in rectangle mode, false if not.
**Notes:** (Read only property)

### 157.1.454 SelectionLayer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection background can be drawn translucently over the text or opaquely on the base layer.
**Notes:** See kLayer* constants.
(Read and Write property)

### 157.1.455 SelectionMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection mode.
**Notes:** Can be stream (kSelectionModeStream=0) or rectangular (kSelectionModeRectangle=1) or by lines (kSelectionModeLines=2) or thin rectangular (kSelectionModeThin=3). When set in these modes, regular caret moves will extend or reduce the selection, until the mode is cancelled by a call with same value or with Cancel. The get function returns the current mode even if the selection was made by mouse or with regular extended moves. SC_SEL_THIN is the mode after a rectangular selection has been typed into and ensures that no characters are selected.
(Read and Write property)

### 157.1.456 Selections as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the number of selections currently active.
**Notes:** There is always at least one selection.
(Read only property)

### 157.1.457 SelectionSpan as ScintillaSpanMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries selection start and end as a span object.
**Notes:** (Read only property)

### 157.1.458 SelectionStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The start position of the selection.
**Notes:** SelectionStart and SelectionEnd return the start and end of the selection without regard to which end is the current position and which is the anchor. SelectionStart returns the smaller of the current position or the anchor position. SelectionEnd returns the larger of the two values.

Assign new value to set the selection based on the assumption that the anchor position is less than the current position.
(Read and Write property)

### 157.1.459 SelEOLFilled as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection can be drawn up to the right hand border by setting this property.
**Notes:** (Read and Write property)

### 157.1.460 ShowInfoBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to show info bar on macOS.
**Notes:** Defaults to true.
The info bar allows you to show a status message and to do zoom levels.
(Read and Write property)

### 157.1.461 Status as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If an error occurs, Scintilla may set an internal error number that can be retrieved with this property.
**Notes:** To clear the error status call SCI_SETSTATUS(0). Status values from 1 to 999 are errors and status kStatusWarnStart (1000) and above are warnings.
See kStatus* constants.
(Read and Write property)

### 157.1.462 TabDrawMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get and set how tab characters are drawn when white space is visible.
**Notes:** See kTabDrawMode* constants.
(Read and Write property)

### 157.1.463 TabIndents as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether tab indents.
**Notes:** Inside indentation white space, the tab and backspace keys can be made to indent and unindent rather than insert a tab character or delete a character with the TabIndents and BackSpaceUnIndents functions.
(Read and Write property)

### 157.1.464 TabMinimumWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The minimum size of a tab in pixels to ensure that the tab can be seen.
**Notes:** The default value is 2. This is particularly useful with proportional fonts with fractional widths where the character before the tab may end a fraction of a pixel before a tab stop, causing the tab to only be a fraction of a pixel wide without this setting. Where displaying a miniaturized version of the document, setting this to 0 may make the miniaturized version lay out more like the normal size version.
(Read and Write property)

### 157.1.465 TabWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size of a tab as a multiple of the size of a space character in kStylesCommonDefault.

**Notes:** The default tab width is 8 characters. There are no limits on tab sizes, but values less than 1 or large values may have undesirable effects.
(Read and Write property)

### 157.1.466 TargetEnd as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End of target selection in text.
**Notes:** (Read and Write property)

### 157.1.467 TargetEndVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End of the virtual space of target selection in text.
**Notes:** This allows text to be inserted in virtual space more easily.
(Read and Write property)

### 157.1.468 TargetSpan as ScintillaSpanMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries targert start and end as a span object.
**Notes:** (Read and Write property)

### 157.1.469 TargetStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Start of the virtual space of target selection in text.
**Notes:** This allows text to be inserted in virtual space more easily.
When searching you can set start greater than end to find the last matching text in the target rather than the first matching text.
The target is also set by a successful by SearchInTarget.
(Read and Write property)

### 157.1.470 TargetStartVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Start of target selection in text.
**Notes:** When searching you can set start greater than end to find the last matching text in the target rather than the first matching text.
(Read and Write property)

### 157.1.471 TargetText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the value in the target.
**Notes:** (Read only property)

### 157.1.472 Technology as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The technology property allows choosing between different drawing APIs and options.
**Notes:** On most platforms, the only choice is kTechnologyDefault (0). On Windows Vista or later, kTechnologyDirectWrite (1), kTechnologyDirectWriteRetain (2), or kTechnologyDirectWriteDC (3) can be chosen to use the Direct2D and DirectWrite APIs for higher quality antialiased drawing. kTechnologyDirectWriteRetain differs from kTechnologyDirectWrite by requesting that the frame is retained after being presented which may prevent drawing failures on some cards and drivers. kTechnologyDirectWriteDC differs from kTechnologyDirectWrite by using DirectWrite to draw into a GDI DC.
On Win32, buffered drawing is set to a reasonable value for the technology: on for GDI and off for Direct2D as Direct2D performs its own buffering. This can be changed after setting technology with BufferDraw property.
When using DirectWrite, you can use FontLocale to set an appropriate font locale to draw text with expected language-dependent glyphs.
(Read and Write property)

### 157.1.473 Text as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the text of the document.
**Notes:** (Read and Write property)

### 157.1.474 TextLength as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The length of the document in bytes.
**Notes:** (Read only property)

### 157.1.475 UndoCollection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can control whether Scintilla collects undo information.
**Notes:** Set to true to collect information and false to stop collecting. If you stop collection, you should also use EmptyUndoBuffer to avoid the undo buffer being unsynchronized with the data in the buffer.

You might wish to turn off saving undo information if you use the Scintilla to store text generated by a program (a Log view) or in a display window where text is often deleted and regenerated.
(Read and Write property)

### 157.1.476 UseTabs as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Determines whether indentation should be created out of a mixture of tabs and spaces or be based purely on spaces.
**Notes:** Set useTabs to false (0) to create all tabs and indents out of spaces. The default is true. You can use Column() to get the column of a position taking the width of a tab into account.
(Read and Write property)

### 157.1.477 ViewEOL as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Normally, the end of line characters are hidden, but ViewEOL allows you to display (or hide) them by setting visible true (or false).
**Notes:** The visible rendering of the end of line characters is similar to (CR), (LF), or (CR+LF).

Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert

the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.
(Read and Write property)

### 157.1.478 ViewWS as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** White space can be made visible which may be useful for languages in which white space is significant, such as Python.
**Example:**

```
dim c as DesktopScintillaControlMBS // your control

// show white space
c.ViewWS = c.kWhiteSpaceVisibleAlways
```

**Notes:** Space characters appear as small centred dots and tab characters as light arrows pointing to the right. There are also ways to control the display of end of line characters. The two messages set and get the white space display mode.
See kWhiteSpaceVisible* constants.
(Read and Write property)

### 157.1.479 VirtualSpaceOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Virtual space can be enabled or disabled for rectangular selections or in other circumstances or in both.
**Notes:** There are three bit flags kVirtualSpaceRectangularSelection=1, kVirtualSpaceUserAccessible=2, and kVirtualSpaceNoWrapLineStart=4 which can be set independently.
kVirtualSpaceNone=0, the default, disables all use of virtual space.
kVirtualSpaceNoWrapLineStart prevents left arrow movement and selection from wrapping to the previous line. This is most commonly desired in conjunction with virtual space but is an independent setting so works without virtual space.
(Read and Write property)

### 157.1.480 VScrollBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, the vertical scroll bar is always displayed when required.
**Notes:** You can choose to hide or show it with VScrollBar property and get the current state with VScrollBar.
(Read and Write property)

### 157.1.481 WhitespaceChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The white space characters.
**Notes:** Similar to WordChars, this property allows the user to define which chars Scintilla considers as whitespace. Setting the whitespace chars allows the user to fine-tune Scintilla's behaviour doing such things as moving the cursor to the start or end of a word; for example, by defining punctuation chars as whitespace, they will be skipped over when the user presses ctrl+left or ctrl+right. This function should be called after WordChars as it will reset the whitespace characters to the default set. WhiteSpaceChars behaves similarly to WordChars.
(Read and Write property)

### 157.1.482 WhitespaceSize as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the size of the dots used for mark space characters.
**Notes:** The value 0 is valid and makes the dots invisible.
(Read and Write property)

### 157.1.483 WordChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Defines which characters are members of the word category.
**Notes:** The character categories are set to default values before processing this function. For example, if you don't allow '_' in your set of characters use:
WordChars = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789"

This fills the characters parameter with all the characters included in words.
The characters parameter must be large enough to hold all of the characters. If the characters parameter is 0 then the length that should be allocated to store the entire set is returned.
For multi-byte encodings, this API will not return meaningful values for &h80 and above.

(Read and Write property)

### 157.1.484 WrapIndentMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Wrapped sublines can be indented to the position of their first subline or one more indent level.
**Notes:** The default is kWrapIndentModeFixed.
(Read and Write property)

### 157.1.485 WrapMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The wrap mode.
**Notes:** Set wrapMode to kWrapWord (1) to enable wrapping on word or style boundaries, kWrapChar (2) to enable wrapping between any characters, kWrapWhiteSpace (3) to enable wrapping on whitespace, and kWrapNone (0) to disable line wrapping. kWrapChar is preferred for Asian languages where there is no white space between words.

By default, Scintilla does not wrap lines of text. If you enable line wrapping, lines wider than the window width are continued on the following lines. Lines are broken after space or tab characters or between runs of different styles. If this is not possible because a word in one style is wider than the window then the break occurs after the last character that completely fits on the line. The horizontal scroll bar does not appear when wrap mode is on.

For wrapped lines Scintilla can draw visual flags (little arrows) at end of a a subline of a wrapped line and at begin of the next subline. These can be enabled individually, but if Scintilla draws the visual flag at the beginning of the next subline this subline will be indented by one char. Independent from drawing a visual flag at the begin the subline can have an indention.

Much of the time used by Scintilla is spent on laying out and drawing text. The same text layout calculations may be performed many times even when the data used in these calculations does not change. To avoid these unnecessary calculations in some circumstances, the line layout cache can store the results of the calculations. The cache is invalidated whenever the underlying data, such as the contents or styling of the document changes. Caching the layout of the whole document has the most effect, making dynamic line wrap as much as 20 times faster but this requires 7 times the memory required by the document contents plus around 80 bytes per line.

Wrapping is not performed immediately there is a change but is delayed until the display is redrawn. This delay improves performance by allowing a set of changes to be performed and then wrapped and displayed once. Because of this, some operations may not occur as expected. If a file is read and the scroll position

moved to a particular line in the text, such as occurs when a container tries to restore a previous editing session, then the scroll position will have been determined before wrapping so an unexpected range of text will be displayed. To scroll to the position correctly, delay the scroll until the wrapping has been performed by waiting for an initial Painted event.
(Read and Write property)

### 157.1.486 WrapStartIndent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size of indentation of sublines for wrapped lines.
**Notes:** WrapStartIndent sets the size of indentation of sublines for wrapped lines in terms of the average character width in kStylesCommonDefault. There are no limits on indent sizes, but values less than 0 or large values may have undesirable effects.
The indention of sublines is independent of visual flags, but if kWrapVisualFlagStart is set an indent of at least 1 is used.
(Read and Write property)

### 157.1.487 WrapVisualFlags as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can enable the drawing of visual flags to indicate a line is wrapped.
**Notes:** Bits set in wrapVisualFlags determine which visual flags are drawn.
See kWrapVisualFlag* constants.
(Read and Write property)

### 157.1.488 WrapVisualFlagsLocation as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can set whether the visual flags to indicate a line is wrapped are drawn near the border or near the text.
**Notes:** Bits set in wrapVisualFlagsLocation set the location to near the text for the corresponding visual flag.
See kWrapVisualLocation* constants.
(Read and Write property)

### 157.1.489 XOffset as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The xOffset is the horizontal scroll position in pixels of the start of the text view.
**Notes:** A value of 0 is the normal position with the first text column visible at the left of the view.

See FirstVisibleLine property for vertical position.
(Read and Write property)

### 157.1.490 Zoom as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The zoom factor directly.
**Notes:** There is no limit set on the factors you can set, so limiting yourself to -10 to +20 to match the incremental zoom functions is a good idea.

Scintilla incorporates a "zoom factor" that lets you make all the text in the document larger or smaller in steps of one point. The displayed point size never goes below 2, whatever zoom factor you set. You can set zoom factors in the range -10 to +20 points.
(Read and Write property)
See also:

- 157.1.559 Zoom 20522

### 157.1.491 AnnotationStyle(line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styles for a line.
**Notes:** The whole of the text annotation on a line may be displayed in a particular style with AnnotationStyle or each character may be individually styled with AnnotationStyles which uses an array of bytes with each byte setting the style of the corresponding text byte similar to SetStylingEx. The text must be set first as it specifies how long the annotation is so how many bytes of styling to read. Setting an annotation will cause a ChangeAnnotation event to be sent.

Only some style attributes are active in annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.1.492 AnnotationStyles(line as Integer) as MemoryBlock

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styles for a line.

**Notes:** The whole of the text annotation on a line may be displayed in a particular style with AnnotationStyle or each character may be individually styled with AnnotationStyles which uses an array of bytes with each byte setting the style of the corresponding text byte similar to SetStylingEX. The text must be set first as it specifies how long the annotation is so how many bytes of styling to read. Setting an annotation will cause a ChangeAnnotation event to be sent.

Only some style attributes are active in annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.1.493 AnnotationText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A different string may be set for each line with AnnotationText.
**Notes:** Set to empty string to clear it.
(Read and Write computed property)

### 157.1.494 ElementColour(element as Integer) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This changes the colour of the indicated visual element overriding any current colour.
**Notes:** If the element supports translucency, then the alpha portion of the value is used. An opaque alpha value (&hff) should always be included when an opaque colour is desired as the value 0 is completely transparent and thus invisible.
(Read and Write computed property)

### 157.1.495 EOLAnnotationStyle(line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets or sets the style to use for the EOL annotation.
**Notes:** (Read and Write computed property)

### 157.1.496 EOLAnnotationText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A different string may be set for each line with EOLAnnotationText.
**Notes:** To clear end of line annotations assign EOLAnnotationText with a empty string. The whole of the

text EOLANNOTATION on a line may be displayed in a particular style with
EOLAnnotationStyle(). Setting an end of line annotation will cause a kModificationFlagsChangeEOLAnnotation notification to be sent.
Only some style attributes are active in end of line annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.

End of Line Annotations are read-only lines of text at the end of each line of editable text. End of Line Annotations can be used to display an assembler version of code for debugging or to show diagnostic messages inline or to line up different versions of text in a merge tool.
(Read and Write computed property)

### 157.1.497 FoldExpanded(line as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the expanded state of a single line.
**Notes:** The set message has no effect on the visible state of the line or any lines that depend on it. It does change the markers in the folding margin. If you ask for the expansion state of a line that is outside the document, the result is false (0).

If you just want to toggle the fold state of one line and handle all the lines that are dependent on it, it is much easier to use ToggleFold. You would use the FolderExpanded() method to process many folds without updating the display until you had finished. See FoldAll() and Expand() for examples of the use of these methods.
(Read and Write computed property)

### 157.1.498 FoldLevel(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get a 32-bit value that contains the fold level of a line and some flags associated with folding.
**Notes:** The fold level is a number in the range 0 to kFoldLevelNumberMask (&h0FFF). However, the initial fold level is set to kFoldLevelBase (&h400) to allow unsigned arithmetic on folding levels. There are two addition flag bits. kFoldLevelWhiteFlag indicates that the line is blank and allows it to be treated slightly different then its level may indicate. For example, blank lines should generally not be fold points and will be considered part of the preceding section even though they may have a lesser fold level. kFoldLevelHeaderFlag indicates that the line is a header (fold point). kFoldLevelNone is a default level that may occur before folding.

Use FoldLevel(line) AND kFoldLevelNumberMask to get the fold level of a line. Likewise, use FoldLevel(line) AND kFoldLevelNumber*Flag to get the state of the flags. To set the fold level you must or in the associated flags. For instance, to set the level to thisLevel and mark a line as being a fold point use: FoldLevel(line) = thisLevel OR kFoldLevelHeaderFlag.

This method causes the display to redraw.
(Read and Write computed property)

### 157.1.499 KeyWords(keyWordSet as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The keyword list.
**Notes:** You can set up to 9 lists of keywords for use by the current lexer. keyWordSet can be 0 to 8 (actually 0 to KEYWORDSET_MAX) and selects which keyword list to replace. keyWords is a list of keywords separated by spaces, tabs, "\n" or "\r" or any combination of these. It is expected that the keywords will be composed of standard ASCII printing characters, but there is nothing to stop you using any non-separator character codes from 1 to 255 (except common sense).
How these keywords are used is entirely up to the lexer. Some languages, such as HTML may contain embedded languages, VBScript and JavaScript are common for HTML. For HTML, key word set 0 is for HTML, 1 is for JavaScript and 2 is for VBScript, 3 is for Python, 4 is for PHP and 5 is for SGML and DTD keywords. Review the lexer code to see examples of keyword list. A fully conforming lexer sets the fourth argument of the LexerModule constructor to be a list of strings that describe the uses of the keyword lists. Alternatively, you might use set 0 for general keywords, set 1 for keywords that cause indentation and set 2 for keywords that cause unindentation. Yet again, you might have a simple lexer that colours keywords and you could change languages by changing the keywords in set 0. There is nothing to stop you building your own keyword lists into the lexer, but this means that the lexer must be rebuilt if more keywords are added.
(Read and Write computed property)

### 157.1.500 LineIndentation(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The amount of indentation on a line.
**Notes:** The indentation is measured in character columns, which correspond to the width of space characters.
(Read and Write computed property)

### 157.1.501 LineState(Line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The state for each line.
**Notes:** As well as the 8 bits of lexical state stored for each character there is also an integer stored for each line. This can be used for longer lived parse states such as what the current scripting language is in an ASP page. Assign to LineState to set the integer value and query LineState() to get the value. Changing the

value produces a ChangeLineState event.
(Read and Write computed property)

### 157.1.502 MarginStyle(Line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tyle for the margin on this line.
**Notes:** The style to use for the margin.
(Read and Write computed property)

### 157.1.503 MarginStyles(line as Integer) as MemoryBlock

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The styles for the margin on this line.
**Notes:** The MemoryBlock contains an array of bytes with each byte setting the style of the corresponding text byte similar to style index.
(Read and Write computed property)

### 157.1.504 MarginText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The text for the margin on this line.
**Notes:** Text margins are created with the type kMarginTypeText or kMarginTypeRText. A different string may be set for each line with MarginText(). The whole of the text margin on a line may be displayed in a particular style with MarginStyle() or each character may be individually styled with MarginStyles() which uses an array of bytes with each byte setting the style of the corresponding text byte similar to style index. Setting a text margin will cause a kModificationFlagsChangeMargin notification to be sent.
Only some style attributes are active in text margins: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.1.505 PropertyValue(Key as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or get properties.
**Notes:** Lookup a keyword:value pair using the specified key; if found, copy the value to the user-supplied buffer and return the length (not including the terminating 0). If not found, copy an empty string to the buffer and return 0.

If the value argument is 0 then the length that should be allocated to store the value is returned; again, the terminating 0 is not included.

You can communicate settings to lexers with keyword:value string pairs. There is no limit to the number of keyword pairs you can set, other than available memory. key is a case sensitive keyword, value is a string that is associated with the keyword. If there is already a value string associated with the keyword, it is replaced. If you pass a zero length string, the method does nothing. Both key and value are used without modification; extra spaces at the beginning or end of key are significant.
The value string can no longer refer to other keywords as was possible in older releases of Scintilla.

Lexers may only store values for keywords they support.
Currently the "fold" property is defined for most of the lexers to set the fold structure if set to "1". SCLEX_PYTHON understands "tab.timmy.whinge.level" as a setting that determines how to indicate bad indentation. Most keywords have values that are interpreted as integers. Search the lexer sources for GetPropertyInt to see how properties are used.
There is a convention for naming properties used by lexers so that the set of properties can be found by scripts. Property names should start with "lexer.<lexer>." or "fold.<lexer>." when they apply to one lexer or start with "lexer." or "fold." if they apply to multiple lexers.

Applications may discover the set of properties used by searching the source code of lexers for lines that contain GetProperty or DefineProperty and a double quoted string and extract the value of the double

quoted string as the property name. The lexilla/scripts/LexillaData.py script does this and can be used as an example. Documentation for the property may be located above the call as a multi-line comment starting with ,Ä®// property <property-name>
(Read and Write computed property)

### 157.1.506 Representation(encodedCharacter as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or gets a representation.
**Notes:** Some characters, such as control characters and invalid bytes, do not have a visual glyph or use a glyph that is hard to distinguish.

Control characters (characters with codes less than 32, or between 128 and 159 in some encodings) are displayed by Scintilla using their mnemonics inverted in a rounded rectangle. These mnemonics come from the early days of signalling, though some are still used (LF = Line Feed, BS = Back Space, CR = Carriage Return, for example).
For the low 'C0' values: "NUL", "SOH", "STX", "ETX", "EOT", "ENQ", "ACK", "BEL", "BS", "HT", "LF", "VT", "FF", "CR", "SO", "SI", "DLE", "DC1", "DC2", "DC3", "DC4", "NAK", "SYN", "ETB", "CAN", "EM", "SUB", "ESC", "FS", "GS", "RS", "US".
For the high 'C1' values: "PAD", "HOP", "BPH", "NBH", "IND", "NEL", "SSA", "ESA", "HTS", "HTJ", "VTS", "PLD", "PLU", "RI", "SS2", "SS3", "DCS", "PU1", "PU2", "STS", "CCH", "MW", "SPA", "EPA", "SOS", "SGCI", "SCI", "CSI", "ST", "OSC", "PM", "APC".
Invalid bytes are shown in a similar way with an 'x' followed by their value in hexadecimal, like "xFE".

Any character, including those normally displayed as mnemonics may be represented by a Unicode string inverted in a rounded rectangle.

For example, the Ohm sign ,Ñ¶ U+2126 looks very similar to the Greek Omega character Œ© U+03C9 so, for the UTF-8 encoding, to distinguish the Ohm sign as "U+2126 ,Ñ¶" this call could be made: Representation(",Ñ¶", "U+2126 ,Ñ¶")

The encodedCharacter parameter is a string of the bytes for one character in the current encoding. This can not be used to set a representation for multiple-character strings.
The representation parameter is an UTF-8 string with a maximum length of 200 bytes.

One exception to the single character restriction is that the two character sequence "CRLF" (Carriage Return + Line Feed) can have a representation that is visible in line end viewing (ViewEOL property) mode. If there is no representation for "CRLF" then the individual 'CR' and 'LF' representations will be seen.

The NULL (0) character is a special case and specified as an empty string.
(Read and Write computed property)

### 157.1.507 RepresentationAppearance(encodedCharacter as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The appearance may be changed using these flags.
**Notes:** If a colour is set and the appearance is set without RepresentationColour() then the representation will show in the colour of the underlying text.
(Read and Write computed property)

### 157.1.508 RepresentationColour(encodedCharacter as String) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour and translucency of a representation may be set.
**Notes:** (Read and Write computed property)

### 157.1.509 SelectionNAnchor(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the anchor of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.1.510 SelectionNAnchorVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.1.511 SelectionNCaret(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.

(Read and Write computed property)

### 157.1.512 SelectionNCaretVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.1.513 SelectionNEnd(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** et or query the end position of each already existing selection.
**Notes:** Mostly of use to query each range for its text. The selection parameter is zero-based.
(Read and Write computed property)

### 157.1.514 SelectionNStart(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the start position of each already existing selection.
**Notes:** Mostly of use to query each range for its text. The selection parameter is zero-based.
(Read and Write computed property)

### 157.1.515 Events

### 157.1.516 AutoCompleteCancelled

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Auto complete was cancelled.

### 157.1.517 AutoCompleteCharacterDeleted

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user deleted a character while autocompletion list was active.

### 157.1.518 AutoCompleteCompleted(Position as Integer, Character as Integer, Text as String, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated after an autocompletion has inserted its text.
**Notes:**

| Parameter | Description |
|---|---|
| position | The start position of the word being completed. |
| text | The text of the selection. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. See the table below. |

| Symbol | Value | Meaning |
|---|---|---|
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |

### 157.1.519 AutoCompleteSelection(Position as Integer, Character as Integer, Text as String, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user has selected an item in an autocompletion list.
**Notes:** The event is sent before the selection is inserted. Automatic insertion can be cancelled by calling AutoCCancel method before returning from the event.

| Parameter | Description |
|---|---|
| position | The start position of the word being completed. |
| text | The text of the selection. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. See the table below. |

| Symbol | Value | Meaning |
|---|---|---|
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |

### 157.1.520 AutoCompleteSelectionChange(Position as Integer, Text as String, listType as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is sent when items are highlighted in an autocompletion or user list.
**Notes:**

| Field | Usage |
|---|---|
| listType | This is set to the listType parameter from the SCI_USERLISTSHOW message or 0 for an autocompletion. |
| text | The text of the selection. |
| position | The position the list was displayed at. |

### 157.1.521 CallTipClick(Position as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated when the user clicks on a calltip.
**Notes:** This event can be used to display the next function prototype when a function name is overloaded with different arguments. The position field is set to 1 if the click is in an up arrow, 2 if in a down arrow, and 0 if elsewhere.

### 157.1.522 CharacterAdded(Character as Integer, CharacterSource as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This is sent when the user types an ordinary text character (as opposed to a command character) that is entered into the text.
**Notes:** The container can use this to decide to display a call tip or an auto completion list.
For single byte character sets, this is the byte value of the character; for UTF-8, it is the Unicode code point; for DBCS, it is (first byte * 256 + second byte) for 2 byte characters and the byte value for 1 byte characters.
This notification is sent before the character has been styled so processing that depends on styling should instead be performed in the UpdateUI event.

| Symbol | Value | Meaning |
|---|---|---|
| kCharacterSourceDirectInput | 0 | Direct input characters, including characters generated by calling keyboard commands like NewLine method. |
| kCharacterSourceTentativeInput | 1 | Tentative input characters. They are used by IME (inline mode, see IMEInteraction) to composite final string, normally different from final composited string (which is the string that has been truly added into current document), and may be withdrawn when the user cancels typing (e.g. by pressing Esc key). Some system (at least Cocoa) also use tentative input for non-IME features like using dead key to composite diacritical marks (grave accent, etc.). These characters are not added to macro recording. Most applications can simply ignore the notification when this value is set. |
| kCharacterSourceImeResult | 2 | IME (either inline or windowed mode) full composited string. Modern IME is able to composite English word or sentence, when this value is set, current character may not a Chinese, Japanese or Korean character. Currently, this is only set on Windows. |

### 157.1.523 Closing

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 157.1.524 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 157.1.525 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

You can use UsePopUp(kPopUpNever) to disable the contextual menu from Scintilla and use Xojo menus.

### 157.1.526 DoubleClick(Position as Integer, line as integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse button was double clicked in editor.
**Notes:** The position parameter is set to the text position of the double click, the line parameter is set to the line of the double click, and the modifiers parameter is set to the key modifiers held down in a similar manner to Key event.

### 157.1.527 DWellEnd(Position as Integer, X as Integer, Y as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** DWellEnd is generated after a DWellStart and the mouse is moved or other activity such as key press indicates the dwell is over.

### 157.1.528 DWellStart(Position as Integer, X as Integer, Y as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** DWellStart is generated when the user keeps the mouse in one position for the dwell period (see MouseDwellTime).

### 157.1.529 FocusIn

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is raised when Scintilla receives focus.
**Notes:** While the control can have a focus from the Xojo point of view, this event informs you that the actual text control part got focus.

So the Xojo wrapper control can have a focus and within it the text control can than have a focus and there are two different states.

### 157.1.530 FocusLost

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control lost focus.

In older Xojo versions, this event is named LostFocus.

### 157.1.531 FocusOut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is raised when it loses focus.

### 157.1.532 FocusReceived

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control got focus.
In older Xojo versions, this event is named GotFocus.

### 157.1.533 FolderToggled(Line as Integer, Position as Integer, Margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A folder was toggled due to a mouse click.
**Notes:** THis is called when a folder is hit.
MarginClicked event will also be raised.

### 157.1.534 HotSpotClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user clicks on text that is in a style with the hotspot attribute set.
**Notes:** This event can be used to link to variable definitions or web pages. In the notification handler, you should avoid calling any function that modifies the current selection or caret position. The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key event. Only the state of the Ctrl key is reported for HotspotReleaseClick.

### 157.1.535 HotSpotDoubleCLick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user double clicks on text that is in a style with the hotspot attribute set.
**Notes:** This event can be used to link to variable definitions or web pages. In the notification handler, you should avoid calling any function that modifies the current selection or caret position. The position parameter is set the text position of the double click and the modifiers field set to the key modifiers held down in a similar manner to Key event. Only the state of the Ctrl key is reported for HotspotReleaseClick.

### 157.1.536 HotspotReleaseClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user clicks on text that is in a style with the hotspot attribute set.

### 157.1.537 IndicatorClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event is generated when the user clicks the mouse on text that has an indicator.
**Notes:** The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key.

### 157.1.538 IndicatorRelease(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event is generated when the user releases the mouse on text that has an indicator.
**Notes:** The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key.

### 157.1.539 Key(Character as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Reports all keys pressed but not consumed by Scintilla.
**Notes:** Used on GTK because of some problems with keyboard focus and is not sent by the Windows version. Character holds the key code and modifiers holds the modifier flags. This notification is sent if the modifiers include kKeyModAlt or kKeyModCtrl and the key code is less than 256.

### 157.1.540 MacroRecord(Message as Integer, wParam as Integer, lParam as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for a new macro step to record.
**Notes:** The StartRecord and StopRecord method enable and disable macro recording. When enabled, each time a recordable change occurs, the MacroRecord event is sent to the container. It is up to the container to record the action. To see the complete list of SCI_* messages that are recordable, search the Scintilla source Editor.cxx for Editor::NotifyMacroRecord.

| Field | Usage |
|---|---|
| message | The SCI_* message that caused the notification. |
| wParam | The value of wParam in the SCI_* message. |
| lParam | The value of lParam in the SCI_* message. |

### 157.1.541 MarginClick(Position as Integer, modifiers as Integer, margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event tell the container that the mouse was left clicked inside a margin that was marked as sensitive.
**Notes:** This can be used to perform folding or to place breakpoints.

| Field | Usage |
|---|---|
| modifiers | The appropriate combination of kKeyModShift, kKeyModCtrl and kKeyModAlt to indicate the keys that were held down at the time of the margin click. |
| position | The position of the start of the line in the document that corresponds to the margin click. |
| margin | The margin number that was clicked. |

### 157.1.542 MarginRightClick(Position as Integer, modifiers as Integer, margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event tell the container that the mouse was right clicked inside a margin that was marked as sensitive.

**Notes:** This can be used to perform folding or to place breakpoints.

| Field | Usage |
|---|---|
| modifiers | The appropriate combination of kKeyModShift, kKeyModCtrl and kKeyModAlt to indicate the keys that were held down at the time of the margin click. |
| position | The position of the start of the line in the document that corresponds to the margin click. |
| margin | The margin number that was clicked. |

### 157.1.543 MenuBarSelected

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 157.1.544 Modified(Position as Integer, modificationType as Integer, Text as String, length as Integer, linesAdded as Integer, line as Integer, foldLevelNow as Integer, foldLevelPrev as Integer, token as Integer, annotationLinesAdded as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This notification is sent when the text or styling of the document changes or is about to change.
**Notes:** You can set a mask for the notifications that are sent to the container with ModEventMask. The parameters contains information about what changed, how the change occurred and whether this changed the number of lines in the document. No modifications may be performed while in a Modified event.

The modificationType field has bits set to tell you what has been done. The kModificationFlags* constants bits correspond to actions. They tell you if the action was done by the user, or the result of Undo or Redo of a previous action.

### 157.1.545 ModifyAttemptReadOnly

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

| Parameter | Usage |
|---|---|
| modificationType | A set of flags that identify the change(s) made. See the next table. |
| position | Start position of a text or styling change. Set to 0 if not used. |
| length | Length of the change in bytes when the text or styling changes. Set to 0 if not used. |
| linesAdded | Number of added lines. If negative, the number of deleted lines. Set to 0 if not used or no lines added or deleted. |
| text | Valid for text changes, not for style changes. If we are collecting undo information this holds a pointer to the text that is handed to the Undo system, otherwise it is zero. For user performed SC_MOD_BEFOREDELETE the text field is 0. |
| line | The line number at which a fold level or marker change occurred. This is 0 if unused and may be -1 if more than one line changed. |
| foldLevelNow | The new fold level applied to the line or 0 if this parameter is unused. |
| foldLevelPrev | The previous folding level of the line or 0 if this parameter is unused. |

| Symbol | Value | Meaning | Parameters |
|---|---|---|---|
| kModificationFlagsNone | 0 | Base value with no fields valid. Will not occur but is useful in tests. | |
| kModificationFlagsInsertText | 1 | Text has been inserted into the document. | position, length, text, linesAdded |
| kModificationFlagsDeleteText | 2 | Text has been removed from the document. | position, length, text, linesAdded |
| kModificationFlagsChangeStyle | 4 | A style change has occurred. | position, length |
| kModificationFlagsChangeFold | 8 | A folding change has occurred. | line, foldLevelNow, foldLevelPrev |
| kModificationFlagsUser | &h10 | Information: the operation was done by the user. | None |
| kModificationFlagsUndo | &h20 | Information: this was the result of an Undo. | None |
| kModificationFlagsRedo | &h40 | Information: this was the result of a Redo. | None |
| kModificationFlagsMultiStepUndoRedo | &h80 | This is part of a multi-step Undo or Redo transaction. | None |
| kModificationFlagsLastStepInUndoRedo | &h100 | This is the final step in an Undo or Redo transaction. | None |
| kModificationFlagsChangeMarker | &h200 | One or more markers has changed in a line. | line |
| kModificationFlagsBeforeInsert | &h400 | Text is about to be inserted into the document. | position, if performed by user then text in bytes, length in bytes |
| kModificationFlagsBeforeDelete | &h800 | Text is about to be deleted from the document. | position, length |
| kModificationFlagsChangeIndicator | &h4000 | An indicator has been added or removed from a range of text. | position, length |
| kModificationFlagsChangeLineState | &h8000 | A line state has changed because LineState was set. | line |
| kModificationFlagsChangeTabStops | &h200000 | The explicit tab stops on a line have changed because ClearTabstops or AddTabStop was called. | line |
| kModificationFlagsLexerState | &h80000 | The internal state of a lexer has changed over a range. | position, length |
| kModificationFlagsChangeMargin | &h10000 | A text margin has changed. | line |
| kModificationFlagsChangeAnnotation | &h20000 | An annotation has changed. | line |
| kModificationFlagsInsertCheck | &h100000 | Text is about to be inserted. The handler may change the text being inserted by calling SCI_CHANGEINSERTION. No other modifications may be made in this handler. | position, length, text |
| kModificationFlagsMultilineUndoRedo | &h1000 | This is part of an Undo or Redo with multi-line changes. | None |
| kModificationFlagsStartAction | &h2000 | This is set on a SC_PERFORMED_USER action when it is the first or only step in an undo transaction. This can be used to integrate the Scintilla undo stack with an undo stack in the container application by adding a Scintilla action to the container's stack for the currently opened container transaction or to open a new container transaction if there is no open container transaction. | None |
| &h20kModificationFlagsContainer | &h40000 | This is set on for actions that the container stored into the undo stack with AddUndoAction. | token |
| kModificationFlagsEventMaskAll | &h1FFFFFF | This is a mask for all valid flags. This is the default mask state set by ModEventMask. | None |

**Function:** When in read-only mode, this notification is sent to the container if the user tries to change the text.
**Notes:** This can be used to check the document out of a version control system. You can set the read-only state of a document with ReadOnly property.

### 157.1.546 NeedsShown(Position as Integer, length as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Scintilla has determined that a range of lines that is currently invisible should be made visible.
**Example:**

```
sub NeedsShown(Position as Integer)
dim firstLine as Integer = LineFromPosition(me.position)
dim lastLine as Integer = LineFromPosition(me.position+me.length-1)
for line as integer = firstLine to lastLine
me.EnsureVisible(line)
next
end sub
```

**Notes:** An example of where this may be needed is if the end of line of a contracted fold point is deleted. This message is sent to the container in case it wants to make the line visible in some unusual way such as making the whole document visible. Most containers will just ensure each line in the range is visible by calling EnsureVisible. The position and length fields of SCNotification indicate the range of the document that should be made visible.

The container code will be similar to the following code skeleton in the example above.
If the event is not implemented, we do similar automatically.

### 157.1.547 Opening

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 157.1.548 Painted

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Painting has just been done.
**Notes:** Useful when you want to update some other widgets based on a change in Scintilla, but want to have the paint occur first to appear more responsive.

### 157.1.549 Prepare

MBS Scintilla Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The prepare event.
**Notes:** Called before we create the control, so you can change properties like HasBorder.

### 157.1.550 SavePointLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sent to the container when the save point is entered or left, allowing the container to display a ”document dirty” indicator and change its menus.

### 157.1.551 SavePointReached

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sent to the container when the save point is entered or left, allowing the container to display a "document dirty" indicator and change its menus.

### 157.1.552 ScaleFactorChanged(NewFactor as double)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 157.1.553 SelectionChanged(updated as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Selection changed.
**Notes:** If content is changed or selection, this event is fired.

The UpdateUI event will also be called.

### 157.1.554 StyleNeeded(Position as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Queries you to provide style information.
**Example:**

```
// sample event to color digits

Sub StyleNeeded(Position as Integer) Handles StyleNeeded
#pragma BackgroundTasks false

Dim startPos As Integer = Me.EndStyled
Dim lineNumber As Integer = Me.LineFromPosition(startPos)
Dim LineStartPos As Integer = Me.PositionFromLine(lineNumber)

System.DebugLog "Style at "+Position.ToString+" from "+LineStartPos.ToString+" to "+position.ToString

Dim t As String = Me.Text
Dim pos As Integer = LineStartPos
```

```
While pos <position

Dim ch As Integer = t.Middle(pos, 1).Asc

If ch >= 48 And ch <= 57 Then
// digit
Me.SetStyling(pos, 1, Me.Style(2))
end if

pos = pos + 1
Wend
End Sub
```

**Notes:** If you used no explicit lexer to make the container act as the lexer, you will receive this notification when Scintilla is about to display or print text that requires styling.

You are required to style the text from the line that contains the position returned by EndStyled up to the position passed in position. Symbolically, you need code of the form:

```
startPos = me.EndStyled
lineNumber = LineFromPosition(startPos)
startPos = PositionFromLine(lineNumber)
ApplyStyles(startPos, position)
```

### 157.1.555 TextChanged(Position as Integer, modificationType as Integer, Text as String, length as Integer, linesAdded as Integer, line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Text changed.
**Notes:** Our plugin calls this to inform you about a text change.
No modifications may be performed while in a Modified event.
Modified event will also be raised.

### 157.1.556 UpdateUI(updated as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Either the text or styling of the document has changed or the selection range or scroll position may have changed.
**Notes:** Now would be a good time to update any container UI elements that depend on document or view state. As it is sometimes difficult to determine whether a change has occurred, these events may also fire

when there has been no actual change. The updated field is set to the bit set of things changed since the previous notification.

See kUpdate* constants.

### 157.1.557 URIDropped(text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Indicates that the user has dragged a URI such as a file name or Web address onto Scintilla.
**Notes:** The container could interpret this as a request to open the file.

### 157.1.558 UserListSelection(Position as Integer, Character as Integer, Text as String, listType as Integer, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user has selected an item in a user list.
**Notes:**

| Field | Usage |
|---|---|
| listType | This is set to the listType parameter from the UserListShow message that initiated the list. |
| text | The text of the selection. |
| position | The position the list was displayed at. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. |

### 157.1.559 Zoom

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated when the user zooms the display using the keyboard or the Zoom method is called.
**Notes:** This event can be used to recalculate positions, such as the width of the line number margin to maintain sizes in terms of characters rather than pixels.
See also:

- 157.1.490 Zoom as Integer 20501

### 157.1.560 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAlphaOpaque | 255 | One of the alpha channel constants.<br>Opaque color. |
| kAlphaTransparent | 0 | One of the alpha channel constants.<br>Full transparency. |
| kInvalidPosition | -1 | Invalid position constant. |
| kMaskFolders | &hFE000000 | The mask for folder flags. |
| kTimeForever | 10000000 | The constant for MouseDwellTime to mean forever in duration. |

Accessibility Status

| Constant | Value | Description |
|---|---|---|
| kAccessibilityDisabled | 0 | Accessibility is disabled. |
| kAccessibilityEnabled | 1 | Accessibility is enabled. |

Alpha

| Constant | Value | Description |
|---|---|---|
| kAlphaNoAlpha | 256 | Special value to indicate no alpha. |

Annotation Visibility

| Constant | Value | Description |
|---|---|---|
| kAnnotationVisibleBoxed | 2 | Annotations are indented to match the text and are surrounded by a box. |
| kAnnotationVisibleHidden | 0 | Annotations are not displayed. |
| kAnnotationVisibleIndented | 3 | Annotations are indented to match the text. |
| kAnnotationVisibleStandard | 1 | Annotations are drawn left justified with no adornment. |

Auto Completion Flags

| Constant | Value | Description |
|---|---|---|
| kAutoCompleteOptionFixedSize | 1 | On Win32 only, use a fixed size list instead of one that can be resized by the user. This also avoids a header rectangle above the list. |
| kAutoCompleteOptionNormal | 0 | Display autocompletion using default settings. |

Automatic Folding

| Constant | Value | Description |
|---|---|---|
| kAutomaticFoldChange | &h0004 | Show lines as needed when fold structure is changed. The Modified notification is still sent unless it is disabled by the container. |
| kAutomaticFoldClick | &h0002 | Handle clicks in fold margin automatically. This avoids sending the MarginClick event for folding margins. |
| kAutomaticFoldNone | &h0000 | Value with no automatic behaviour. |
| kAutomaticFoldShow | &h0001 | Automatically show lines as needed. This avoids sending the NeedsShown notification. |

Bidirectional Modes

| Constant | Value | Description |
|---|---|---|
| kBidirectionalDisabled | 0 | Disabled |
| kBidirectionalL2R | 1 | Left to Right |
| kBidirectionalR2L | 2 | Right to Left |

Caret Policy

| Constant | Value | Description |
|---|---|---|
| kCaretPolicyEven | &h08 | If not set, instead of having symmetrical UZs, the left and bottom UZs are extended up to right and top UZs respectively. This way, we favour the displaying of useful information: the beginning of lines, where most code reside, and the lines after the caret, for example, the body of a function. |
| kCaretPolicyJumps | &h10 | If set, the display is moved more energetically so the caret can move in the same direction longer before the policy is applied again. '3UZ' notation is used to indicate three time the size of the UZ as a distance to the margin. |
| kCaretPolicySlop | &h01 | If set, we can define a slop value: caretSlop. This value defines an unwanted zone (UZ) where the caret is... unwanted. This zone is defined as a number of pixels near the vertical margins, and as a number of lines near the horizontal margins. By keeping the caret away from the edges, it is seen within its context. This makes it likely that the identifier that the caret is on can be completely seen, and that the current line is seen with some of the lines following it, which are often dependent on that line. |
| kCaretPolicyStrict | &h04 | If set, the policy set by kCaretPolicySlop is enforced... strictly. The caret is centred on the display if caretSlop is not set, and cannot go in the UZ if caretSlop is set. |

Caret Sticky

| Constant | Value | Description |
|---|---|---|
| kCaretStickyOff | 0 | When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default. |
| kCaretStickyOn | 1 | When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc). |
| kCaretStickyWhiteSpace | 2 | When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..). |

Caret Styles

| Constant | Value | Description |
|---|---|---|
| kCaretStyleBlock | 2 | Draws insertion carets as blocks. |
| kCaretStyleBlockAfter | &h100 | When the caret end of a range is at the end and a block caret style is chosen, draws the block outside the selection instead of inside. This can be ored with kCaretStyleBlock or kCaretStyleBlockCurses. |
| kCaretStyleInsMask | &hF | The mask to only get the bits for insert mode. |
| kCaretStyleInvisible | 0 | Carets are not drawn at all. |
| kCaretStyleLine | 1 | Draws insertion carets as lines. This is the default. |
| kCaretStyleOverstrikeBar | 0 | Draws an overstrike caret as a bar. This is the default. |
| kCaretStyleOverstrikeBlock | &h10 | Draws an overstrike caret as a block. This should be ored with one of the first three styles. |

Case Insenstive Behavior Flags

| Constant | Value | Description |
|---|---|---|
| kCaseInsensitiveBehaviourIgnoreCase | 1 | Ignore Case |
| kCaseInsensitiveBehaviourRespectCase | 0 | Respect Case |

Character Sets

| Constant | Value | Description |
|---|---|---|
| kCharacterSetAnsi | 0 | ANSI |
| kCharacterSetArabic | 178 | Arabic |
| kCharacterSetBaltic | 186 | Baltic |
| kCharacterSetChineseBig5 | 136 | Chinese Big 5 |
| kCharacterSetCyrillic | 1251 | Cyrillic |
| kCharacterSetDefault | 1 | Default one |
| kCharacterSetEastEurope | 238 | East Europe |
| kCharacterSetGB2312 | 134 | GB 2312 |
| kCharacterSetGreek | 161 | Greek |
| kCharacterSetHangul | 129 | Hangul |
| kCharacterSetHebrew | 177 | Hebrew |
| kCharacterSetIso8859_15 | 1000 | ISO 8859-15 |
| kCharacterSetJohab | 130 | Johab |
| kCharacterSetMac | 77 | Mac |
| kCharacterSetOem | 255 | OEM |
| kCharacterSetOem866 | 866 | OEM 866 |
| kCharacterSetRussian | 204 | Russian |
| kCharacterSetShiftJis | 128 | ShiftJis |
| kCharacterSetSymbol | 2 | Symbol |
| kCharacterSetThai | 222 | Thai |
| kCharacterSetTurkish | 162 | Turkish |
| kCharacterSetVietnamese | 163 | Vietnamese |

Character Sources

| Constant | Value | Description |
|---|---|---|
| kCharacterSourceDirectInput | 0 | Direct input characters, including characters generated by calling keyboard commands like NewLine method. |
| kCharacterSourceImeResult | 2 | IME (either inline or windowed mode) full composited string. Modern IME is able to composite English word or sentence, when this value is set, current character may not a Chinese, Japanese or Korean character. Currently, this is only set on Windows. |
| kCharacterSourceTentativeInput | 1 | Tentative input characters. They are used by IME (inline mode, see IMEInteraction) to composite final string, normally different from final composited string (which is the string that has been truly added into current document), and may be withdrawn when the user cancels typing (e.g. by pressing Esc key). Some system (at least Cocoa) also use tentative input for non-IME features like using dead key to composite diacritical marks (grave accent, etc.). These characters are not added to macro recording. Most applications can simply ignore the notification when this value is set. |

Completion Methods

| Constant | Value | Description |
|---|---|---|
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |

Cursor Shapes

| Constant | Value | Description |
|---|---|---|
| kCursorShapeArrow | 2 | Normal arrow. |
| kCursorShapeNormal | -1 | The normal cursor is displayed. |
| kCursorShapeReverseArrow | 7 | Reverse arrow. |
| kCursorShapeWait | 4 | The wait cursor is displayed when the mouse is over or owned by the Scintilla window. |

Document Option

| Constant | Value | Description |
|---|---|---|
| kDocumentOptionDefault | 0 | Standard options. |
| kDocumentOptionStylesNone | &h1 | Stops allocation of memory to style characters which saves significant memory, often 40% with the whole document treated as being style 0. |
| kDocumentOptionTextLarge | &h100 | Accommodates documents larger than 2 GigaBytes in 64-bit executables. |

Long line display modes

| Constant | Value | Description |
|---|---|---|
| kEdgeVisualStyleBackground | 2 | The background colour of characters after the column limit is changed to the colour set by EdgeColor property. This is recommended for proportional fonts. |
| kEdgeVisualStyleLine | 1 | A vertical line is drawn at the column number set by EdgeColumn(). This works well for monospaced fonts. The line is drawn at a position based on the width of a space character in kStylesCommonDefault, so it may not work very well if your styles use proportional fonts or if your style have varied font sizes or you use a mixture of bold, italic and normal text. |
| kEdgeVisualStyleMultiLine | 3 | This is similar to kEdgeVisualStyleLine but in contrary to showing only one single line a configurable set of vertical lines can be shown simultaneously. This edgeMode uses a completely independent dataset that can only be configured by using the MultiEdge* methods. |
| kEdgeVisualStyleNone | 0 | Long lines are not marked. This is the default state. |

Elements

| Constant | Value | Description |
|---|---|---|
| kElementCaret | 40 | Colour of caret for main selection |
| kElementCaretAdditional | 41 | Colour of caret for additional selections |
| kElementCaretLineBack | 50 | Colour of caret line background |
| kElementFoldLine | 80 | Colour of fold lines |
| kElementHiddenLine | 81 | Colour of line drawn to show there are lines hidden at that point |
| kElementHotSpotActive | 70 | Text colour of active hot spot |
| kElementHotSpotActiveBack | 71 | Background colour of active hot spot |
| kElementList | 0 | Text colour in autocompletion lists |
| kElementListBack | 1 | Background colour of autocompletion lists |
| kElementListSelected | 2 | Text colour of selected item in autocompletion lists |
| kElementListSelectedBack | 3 | Background colour of selected item in autocompletion lists |
| kElementSelectionAdditionalBack | 13 | Background colour of additional selections |
| kElementSelectionAdditionalText | 12 | Text colour of additional selections |
| kElementSelectionBack | 11 | Background colour of main selection |
| kElementSelectionInactiveBack | 17 | Background colour of selections when another window has focus |
| kElementSelectionInactiveText | 16 | Text colour of selections when another window has focus |
| kElementSelectionSecondaryBack | 15 | Background colour of selections when another window contains the primar selection |
| kElementSelectionSecondaryText | 14 | Text colour of selections when another window contains the primary selectio |
| kElementSelectionText | 10 | Text colour of main selection |
| kElementWhiteSpace | 60 | Colour of visible white space |
| kElementWhiteSpaceBack | 61 | Colour of visible white space background |

End Of Line

| Constant | Value | Description |
|---|---|---|
| kEndOfLineCR | 1 | CR, the old Mac line ending. |
| kEndOfLineCRLF | 0 | CRLF, the Windows line ending. |
| kEndOfLineLF | 2 | LF, the unix line ending. |

End of Line Annotation

| Constant | Value | Description |
|---|---|---|
| kEOLAnnotationVisibleAngleCircle | &h102 | Surround with a ,óÑshape,óó with angled left end and curved right end. |
| kEOLAnnotationVisibleAngleFlat | &h112 | Surround with a ,óÑshape \| with angled left end and flat right end. |
| kEOLAnnotationVisibleAngles | &h122 | Surround with a ,óÑshape,ñ with angles on each end. |
| kEOLAnnotationVisibleBoxed | &h2 | End of Line Annotations are indented to match the text and are surroun by a box. |
| kEOLAnnotationVisibleCircleAngle | &h120 | Surround with a ,óñshape,ñ with curved left end and angled right end. |
| kEOLAnnotationVisibleCircleFlat | &h110 | Surround with a ,óñshape \| with curved left end and flat right end. |
| kEOLAnnotationVisibleFlatAngle | &h121 | Surround with a \| shape,ñ with flat left end and angled right end. |
| kEOLAnnotationVisibleFlatCircle | &h101 | Surround with a \| shape,óó with flat left end and curved right end. |
| kEOLAnnotationVisibleFlats | &h111 | Surround with a \| shape \| with flat ends. |
| kEOLAnnotationVisibleHidden | &h0 | End of Line Annotations are not displayed. |
| kEOLAnnotationVisibleStadium | &h100 | Surround with a ,óñstadium,óó - a rectangle with rounded ends. |
| kEOLAnnotationVisibleStandard | &h1 | End of Line Annotations are drawn left justified with no adornment. |

Search Flags

| Constant | Value | Description |
|---|---|---|
| kFindOptionCxx11RegEx | &h00800000 | This flag may be set to use C++11 <regex>instead of Scintilla's basic regular expressions. If the regular expression is invalid then -1 is returned and status is set to SC_STATUS_WARN_REGEX. The ECMAScript flag is set on the regex object and UTF-8 documents will exhibit Unicode-compliant behaviour. For MSVC, where wchar_t is 16-bits, the regular expression ".." will match a single astral-plane character. There may be other differences between compilers. Must also have kFindOptionRegExP set. |
| kFindOptionMatchCase | &h4 | A match only occurs with text that matches the case of the search string. |
| kFindOptionNone | &h0 | Default setting is case-insensitive literal match. |
| kFindOptionPosix | &h00400000 | Treat regular expression in a more POSIX compatible manner by interpreting bare ( and ) for tagged sections rather than \( and \). Has no effect when kFindOptionCxx11RegEx is set. |
| kFindOptionRegExp | &h00200000 | The search string should be interpreted as a regular expression. Uses Scintilla's base implementation unless combined with kFindOptionCxx11RegEx. |
| kFindOptionWholeWord | &h2 | A match only occurs if the characters before and after are not word characters as defined by WordChars property. |
| kFindOptionWordStart | &h00100000 | A match only occurs if the character before is not a word character as defined by WordChars. |

Folder Actions

| Constant | Value | Description |
|---|---|---|
| kFoldActionContract | 0 | Contract. |
| kFoldActionExpand | 1 | Expand. |
| kFoldActionToggle | 2 | Toggle between contracted and expanded. |

Folder Display Text Style

| Constant | Value | Description |
|---|---|---|
| kFoldDisplayTextStyleBoxed | 2 | Display the text tags with a box drawn around them. |
| kFoldDisplayTextStyleHidden | 0 | Do not display the text tags. This is the default. |
| kFoldDisplayTextStyleStandard | 1 | Display the text tags. |

Folder Flags

| Constant | Value | Description |
|---|---|---|
| kFoldFlagLevelNumbers | &h0040 | Display hexadecimal fold levels in line margin to aid debugging of folding. Th appearance of this feature may change in the future. |
| kFoldFlagLineAfterContracted | &h0010 | Draw below if not expanded |
| kFoldFlagLineAfterExpanded | &h0008 | Draw below if expanded |
| kFoldFlagLineBeforeContracted | &h0004 | Draw above if not expanded |
| kFoldFlagLineBeforeExpanded | &h0002 | Draw above if expanded |
| kFoldFlagLineState | &h0080 | Display hexadecimal line state in line margin to aid debugging of lexing an folding. May not be used at the same time as kFoldFlagLevelNumbers. |
| kFoldFlagNone | &h0000 | Default value. |

Folder Levels

| Constant | Value | Description |
|---|---|---|
| kFoldLevelBase | &h400 | The initial fold level. |
| kFoldLevelHeaderFlag | &h2000 | Indicates that the line is a header (fold point). |
| kFoldLevelNone | &h0 | Default level that may occur before folding. |
| kFoldLevelNumberMask | &h0FFF | The mask for numbers. |
| kFoldLevelWhiteFlag | &h1000 | Indicates that the line is blank and allows it to be treated slightly different then its level may indicate. |

Font Quality with Antialiasing

| Constant | Value | Description |
|---|---|---|
| kFontQualityQualityAntialiased | 2 | Antialiased |
| kFontQualityQualityDefault | 0 | Default. |
| kFontQualityQualityLcdOptimized | 3 | LCD Optimized |
| kFontQualityQualityMask | &hF | In case it is necessary to squeeze more options into this property, only a limi number of bits defined by kFontQualityQualityMask will be used for quali |
| kFontQualityQualityNonAntialiased | 1 | Non Antialiased |

Idle Styling

| Constant | Value | Description |
|---|---|---|
| kIdleStylingAfterVisible | 2 | Text after the currently visible portion may be styled in the background. |
| kIdleStylingAll | 3 | Style both before and after the visible text. |
| kIdleStylingNone | 0 | Syntax styling is performed for all the currently visible text before displaying it. |
| kIdleStylingToVisible | 1 | A small amount of styling is performed before display and then further styling is performed incrementally in the background as an idle-time task. |

IME Interaction Mode

| Constant | Value | Description |
|---|---|---|
| kIMEInteractionInline | 1 | Show inline. |
| kIMEInteractionWindowed | 0 | Show on window. |

Indentation Guides

| Constant | Value | Description |
|---|---|---|
| kIndentViewLookBoth | 3 | Indentation guides are shown beyond the actual indentation up to the level of the next non-empty line or previous non-empty line whichever is the greater. This setting is good for most languages. |
| kIndentViewLookForward | 2 | Indentation guides are shown beyond the actual indentation up to the level of the next non-empty line. If the previous non-empty line was a fold header then indentation guides are shown for one more level of indent than that line. This setting is good for Python. |
| kIndentViewNone | 0 | No indentation guides are shown. |
| kIndentViewReal | 1 | Indentation guides are shown inside real indentation white space. |

Modifier Keys

| Constant | Value | Description |
|---|---|---|
| kKeyModAlt | 4 | Alt key. (named Option on MacOS usually) |
| kKeyModCtrl | 2 | Control key (the Command key on Mac, the Ctrl key on other platforms). |
| kKeyModMeta | 16 | Meta key (the Ctrl key on Mac, the Windows key on other platforms). |
| kKeyModNorm | 0 | No modifier key. |
| kKeyModShift | 1 | Shift Key |
| kKeyModSuper | 8 | This is the same as kKeyModMeta on all platforms. |

Keys

| Constant | Value | Description |
|---|---|---|
| kKeysAdd | 310 | |
| kKeysBack | 8 | |
| kKeysDelete | 308 | |
| kKeysDivide | 312 | |
| kKeysDown | 300 | |
| kKeysEnd | 305 | |
| kKeysEscape | 7 | |
| kKeysHome | 304 | |
| kKeysInsert | 309 | |
| kKeysLeft | 302 | |
| kKeysMenu | 315 | |
| kKeysNext | 307 | |
| kKeysPrior | 306 | |
| kKeysReturn | 13 | |
| kKeysRight | 303 | |
| kKeysRWin | 314 | |
| kKeysSubtract | 311 | |
| kKeysTab | 9 | |
| kKeysUp | 301 | |
| kKeysWin | 313 | |

Layers

| Constant | Value | Description |
|---|---|---|
| kLayerBase | 0 | Draw the selection background opaquely on the base layer |
| kLayerOverText | 2 | Draw the selection background translucently over the text. |
| kLayerUnderText | 1 | Draw the selection background translucently under the text. This will not work in single phase drawing mode as there is no under-text phase. |

Layout line cache modes

| Constant | Value | Description |
|---|---|---|
| kLineCacheCaret | 1 | One line is cached. This is the default. |
| kLineCacheDocument | 3 | All lines in the document. |
| kLineCacheNone | 0 | No lines are cached. |
| kLineCachePage | 2 | Visible lines plus the line containing the caret. |

Line Character Index Types

| Constant | Value | Description |
|---|---|---|
| kLineCharacterIndexTypeNone | 0 | Bytewise. |
| kLineCharacterIndexTypeUtf16 | 2 | UTF-16 code units are indexed. |
| kLineCharacterIndexTypeUtf32 | 1 | Whole characters are indexed. |

Line End Types

| Constant | Value | Description |
|---|---|---|
| kLineEndTypeDefault | 0 | |
| kLineEndTypeUnicode | 1 | |

Margin Options

| Constant | Value | Description |
|---|---|---|
| kMarginOptionNone | 0 | Whole wrapped line is selected. |
| kMarginOptionSubLineSelect | 1 | Only sub line of wrapped line is selected. |

Modification Flags

| Constant | Value | Description |
|---|---|---|
| kModificationFlagsBeforeDelete | &h800 | Text is about to be deleted from the document. |
| kModificationFlagsBeforeInsert | &h400 | Text is about to be inserted into the document. |
| kModificationFlagsChangeAnnotation | &h20000 | An annotation has changed. |
| kModificationFlagsChangeEOLAnnotation | &h400000 | An annotation has changed. |
| kModificationFlagsChangeFold | &h8 | A folding change has occurred. |
| kModificationFlagsChangeIndicator | &h4000 | An indicator has been added or removed from a range of text. |
| kModificationFlagsChangeLineState | &h8000 | A line state has changed because SCI_SETLINESTATE was |
| kModificationFlagsChangeMargin | &h10000 | A text margin has changed. |
| kModificationFlagsChangeMarker | &h200 | One or more markers has changed in a line. |
| kModificationFlagsChangeStyle | &h4 | A style change has occurred. |
| kModificationFlagsChangeTabStops | &h200000 | The explicit tab stops on a line have changed because ClearT dTabStop was called. |
| kModificationFlagsContainer | &h40000 | This is set on for actions that the container stored into the AddUndoAction. |
| kModificationFlagsDeleteText | &h2 | Text has been removed from the document. |
| kModificationFlagsEventMaskAll | &h7FFFFF | This is a mask for all valid flags. This is the default mask sta ventMask. |
| kModificationFlagsInsertCheck | &h100000 | Text is about to be inserted. The handler may change the tex by calling ChangeInsertion method. No other modifications this handler. |
| kModificationFlagsInsertText | &h1 | Text has been inserted into the document. |
| kModificationFlagsLastStepInUndoRedo | &h100 | This is the final step in an Undo or Redo transaction. |
| kModificationFlagsLexerState | &h80000 | The internal state of a lexer has changed over a range. |
| kModificationFlagsMultilineUndoRedo | &h1000 | This is part of an Undo or Redo with multi-line changes. |
| kModificationFlagsMultiStepUndoRedo | &h80 | This is part of a multi-step Undo or Redo transaction. |
| kModificationFlagsNone | &h0 | Base value with no fields valid. Will not occur but is useful in |
| kModificationFlagsRedo | &h40 | Information: this was the result of a Redo. |
| kModificationFlagsStartAction | &h2000 | This is set on a kModificationFlagsUser action when it is the in an undo transaction. This can be used to integrate the Scin with an undo stack in the container application by adding a S the container's stack for the currently opened container transa a new container transaction if there is no open container trans |
| kModificationFlagsUndo | &h20 | Information: this was the result of an Undo. |
| kModificationFlagsUser | &h10 | Information: the operation was done by the user. |

Auto Completion for Multiple Selections

| Constant | Value | Description |
|---|---|---|
| kMultiAutoCompleteEach | 1 | Each selection. |
| kMultiAutoCompleteOnce | 0 | Only first selection. |

Multi Paste Options

| Constant | Value | Description |
|---|---|---|
| kMultiPasteEach | 1 | The paste text can go into each selection. |
| kMultiPasteOnce | 0 | The pasted text can go into just the main selection. |

Ordering Options

| Constant | Value | Description |
|---|---|---|
| kOrderingCustom | 2 | Custom sorting. |
| kOrderingPerformSort | 1 | The control will sort for you. |
| kOrderingPreSorted | 0 | You pass list pre-sorted. |

Popup Modi

| Constant | Value | Description |
|---|---|---|
| kPopUpAll | 1 | Show default editing menu if clicking on scintilla. |
| kPopUpNever | 0 | Never show default editing menu. |
| kPopUpText | 2 | Show default editing menu only if clicking on text area. |

Print Options

| Constant | Value | Description |
|---|---|---|
| kPrintOptionBlackOnWhite | 2 | Print all text as black on a white background. |
| kPrintOptionColourOnWhite | 3 | Everything prints in its own colour on a white background. |
| kPrintOptionColourOnWhiteDefaultBG | 4 | Everything prints in its own foreground colour but all styles up to and in kStylesCommonLineNumber will print on a white background. |
| kPrintOptionInvertLight | 1 | If you use a dark screen background this saves ink by inverting the ligh of all colours and printing on a white background. |
| kPrintOptionNormal | 0 | Print using the current screen colours with the exception of line number r which print on a white background. This is the default. |
| kPrintOptionScreenColours | 5 | Print using the current screen colours for both foreground and backg This is the only mode that does not set the background colour of t number margin to white. |

Representation Appearance

| Constant | Value | Description |
|---|---|---|
| kRepresentationAppearanceBlob | 1 | Draw the representation text inverted in a rounded rectangle. This is t default appearance. |
| kRepresentationAppearanceColour | &h10 | Draw the representation in the colour set with RepresentationColour() instea of in the colour of the style of the text being represented. |
| kRepresentationAppearancePlain | 0 | Draw the representation text with no decorations. |

Selection Mode

| Constant | Value | Description |
|---|---|---|
| kSelectionModeLines | 2 | Line selection. |
| kSelectionModeRectangle | 1 | Rectangular |
| kSelectionModeStream | 0 | Stream |
| kSelectionModeThin | 3 | Thin rectangular selection |

Status Codes

| Constant | Value | Description |
|---|---|---|
| kStatusBadAlloc | 2 | Memory is exhausted. |
| kStatusFailure | 1 | Generic failure. |
| kStatusOk | 0 | No failures. |
| kStatusRegEx | 1001 | Regular expression is invalid. |
| kStatusWarnStart | 1000 | Warnings start with this value. |

Support

| Constant | Value | Description |
|---|---|---|
| kSupportsFractionalStrokeWidth | 2 | Can lines be drawn with fractional widths like 1.5 or 0.5 pixels? |
| kSupportsLineDrawsFinal | 0 | Whether drawing a line draws its final position. Only false on Win32 GDI. |
| kSupportsPixelDivisions | 1 | Are logical pixels larger than physical pixels? Currently only true for macOS Cocoa with 'retina' displays. When true, creating pixmaps at twice the resolution can produce clearer output with less blur. |
| kSupportsPixelModification | 4 | Can individual pixels be modified? This is false for character cell platforms like curses. |
| kSupportsTranslucentStroke | 3 | Can translucent lines, polygons, ellipses, and text be drawn? |

Tab Draw Modes

| Constant | Value | Description |
|---|---|---|
| kTabDrawModeLongArrow | 0 | |
| kTabDrawModeStrikeOut | 1 | |

Drawing Technology

| Constant | Value | Description |
|---|---|---|
| kTechnologyDefault | 0 | Default |
| kTechnologyDirectWrite | 1 | Use DirectWrite API. |
| kTechnologyDirectWriteDC | 3 | DirectWrite to draw into a GDI DC. |
| kTechnologyDirectWriteRetain | 2 | Use DirectWrite API with retaining frame. |

Property Types

| Constant | Value | Description |
|---|---|---|
| kTypePropertyBoolean | 0 | Property is a boolean. |
| kTypePropertyInteger | 1 | Property is an integer. |
| kTypePropertyString | 2 | Property is a string. |

Undo Flags

| Constant | Value | Description |
|---|---|---|
| kUndoFlagsMayCoalesce | 1 | If the container action may be coalesced along with any insertion and deletion actions into a single compound action. |
| kUndoFlagsNone | 0 | Coalescing treats coalescible container actions as transparent so will still only group together insertions that look like typing or deletions that look like multiple uses of the Backspace or Delete keys. |

Update Flags

| Constant | Value | Description |
|---|---|---|
| kUpdateContent | &h1 | Contents, styling or markers may have been changed. |
| kUpdateHScroll | &h8 | May have scrolled horizontally. |
| kUpdateNone | &h0 | Value without any changes. |
| kUpdateSelection | &h2 | Selection may have been changed. |
| kUpdateVScroll | &h4 | May have scrolled vertically. |

Virtual Space Flags

| Constant | Value | Description |
|---|---|---|
| kVirtualSpaceNone | 0 | Disables all use of virtual space. |
| kVirtualSpaceNoWrapLineStart | 4 | Prevents left arrow movement and selection from wrapping to the previo line. This is most commonly desired in conjunction with virtual space but an independent setting so works without virtual space. |
| kVirtualSpaceRectangularSelection | 1 | Rectangular selection. |
| kVirtualSpaceUserAccessible | 2 | User accessible. |

Visibility Policy

| Constant | Value | Description |
|---|---|---|
| kVisiblePolicySlop | &h01 | If set, we can define a slop value: caretSlop. This value defines an unwanted zone (UZ) where the caret is... unwanted. This zone is defined as a number of pixels near the vertical margins, and as a number of lines near the horizontal margins. By keeping the caret away from the edges, it is seen within its context. This makes it likely that the identifier that the caret is on can be completely seen, and that the current line is seen with some of the lines following it, which are often dependent on that line. |
| kVisiblePolicyStrict | &h04 | If set, the policy set by slop is kVisiblePolicySlop... strictly. The caret is centred on the display if caretSlop is not set, and cannot go in the UZ if caretSlop is set. |

White Space Visibility

| Constant | Value | Description |
|---|---|---|
| kWhiteSpaceInvisible | 0 | The normal display mode with white space displayed as an empty background colour. |
| kWhiteSpaceVisibleAfterIndent | 2 | White space used for indentation is displayed normally but after the first visible character, it is shown as dots and arrows. |
| kWhiteSpaceVisibleAlways | 1 | White space characters are drawn as dots and arrows, |
| kWhiteSpaceVisibleOnlyInIndent | 3 | White space used for indentation is displayed as dots and arrows. |

Wrap Modes

| Constant | Value | Description |
|---|---|---|
| kWrapChar | 2 | Enable wrapping between any characters. |
| kWrapNone | 0 | Disable line wrapping. |
| kWrapWhiteSpace | 3 | Enable wrapping on whitespace. |
| kWrapWord | 1 | Enable wrapping on word or style boundaries. |

Wrap Indent Mode

| Constant | Value | Description |
|---|---|---|
| kWrapIndentModeDeepIndent | 3 | Wrapped sublines are aligned to first subline indent plus two more levels of indentation |
| kWrapIndentModeFixed | 0 | Wrapped sublines aligned to left of window plus amount set by WrapStartIndent. |
| kWrapIndentModeIndent | 2 | Wrapped sublines are aligned to first subline indent plus one more level of indentation |
| kWrapIndentModeSame | 1 | Wrapped sublines are aligned to first subline indent |

Wrap Visual Flags

| Constant | Value | Description |
|---|---|---|
| kWrapVisualFlagEnd | &h0001 | Visual flag at end of subline of a wrapped line. |
| kWrapVisualFlagMargin | &h0004 | Visual flag in line number margin. |
| kWrapVisualFlagNone | &h0000 | No visual flags |
| kWrapVisualFlagStart | &h0002 | Visual flag at begin of subline of a wrapped line. Subline is indented by at least 1 to make room for the flag. |

Wrap Visual Location

| Constant | Value | Description |
|---|---|---|
| kWrapVisualLocationDefault | &h0000 | Visual flags drawn near border |
| kWrapVisualLocationEndByText | &h0001 | Visual flag at end of subline drawn near text |
| kWrapVisualLocationStartByText | &h0002 | Visual flag at beginning of subline drawn near text |

## 157.2 control ScintillaControlMBS

### 157.2.1 control ScintillaControlMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Xojo control to host Scintilla editor.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- More Scintilla questions
- Scintilla in Xojo for Linux 64-bit on ARM
- News from the MBS Xojo Plugins Version 22.4
- MBS Xojo Plugins in version 22.4
- Scintilla in Xojo with Search and Replace
- Configure Scintilla Control for HTML
- News from the MBS Xojo Plugins Version 22.0
- One year Xojo MVP
- Adding a Scintilla based control to Xojo

**Videos**

- Scintilla for Xojo

**Xojo Developer Magazine**

- 21.4, page 10: News
- 20.6, page 9: News
- 20.2, page 9: News

### 157.2.2 Methods

### 157.2.3 AddSelection(caret as Integer, anchor as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Add a new selection from anchor to caret as the main selection retaining all other selections as additional selections.
**Notes:** Since there is always at least one selection, to set a list of selections, the first selection should be added with SetSelection() and later selections added with AddSelection().

### 157.2.4 AddStyledText(StyledText as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This behaves just like AddText, but inserts styled text.
**Notes:** See GetStyledText function.

### 157.2.5 AddTabStop(line as Integer, x as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds an explicit tabstop at the specified distance from the left (in pixels).
**Notes:** Changing tab stops produces a ChangeTabStops event.

### 157.2.6 AddText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This inserts the first length characters from the string text at the current position.
**Notes:** This will include any 0's in the string that you might have expected to stop the insert operation. The current position is set at the end of the inserted text, but it is not scrolled into view.

### 157.2.7 AddUndoAction(token as Integer, UndoFlags as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds an undo action.
**Notes:** The container can add its own actions into the undo stack by calling AddUndoAction and an Modify event will be sent to the container with the KModificationFlagsContainer flag when it is time to undo (PerformedUndo) or redo (PerformedRedo) the action. The token argument supplied is returned in the token field of the notification.
For example, if the container wanted to allow undo and redo of a 'toggle bookmark' command then it could call AddUndoAction(line, 0) each time the command is performed. Then when it receives a notification to undo or redo it toggles a bookmark on the line given by the token field. If there are different types of commands or parameters that need to be stored into the undo stack then the container should maintain a stack of its own for the document and use the current position in that stack as the argument to AddUndoAction(line). AddUndoAction commands are not combined together into a single undo transaction unless grouped with BeginUndoAction and EndUndoAction.

The flags argument can be KUndoFlagsMayCoalesce (1) if the container action may be coalesced along with any insertion and deletion actions into a single compound action, otherwise kUndoFlagsNone (0). Coalescing treats coalescible container actions as transparent so will still only group together insertions that look like

typing or deletions that look like multiple uses of the Backspace or Delete keys.

### 157.2.8 AllocateBytes(bytes as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate a document buffer large enough to store a given number of bytes.
**Notes:** The document will not be made smaller than its current contents.

### 157.2.9 AllocateLineCharacterIndex(lineCharacterIndex as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate one or more indexes.
**Notes:** Most Scintilla APIs use byte positions but some applications want to use positions based on counting (UTF-32) characters or (UTF-16) code units or need to communicate with other code written in terms of characters or code units. With only byte positions, this may require examining many bytes to count characters or code units in the document but this may be sped up in some cases by indexing the line starts by character or code unit.

Different aspects of an application may need indexes for different periods and should allocate for those periods. Indexes use additional memory so releasing them can help minimize memory but they also take time to recalculate. Scintilla may also allocate indexes to support features like accessibility or input method editors. Only one index of each type is created for a document at a time.

### 157.2.10 AllocateLines(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate line indices to match the lines argument.
**Notes:** This is an optimization that can prevent multiple reallocations of the indices as text is inserted if the application can estimate the number of lines in the document. The number of lines will not be reduced by this call.

### 157.2.11 AnnotationClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all annotations.
**Notes:** All the lines can be cleared of annotations with AnnotationClearAll which is equivalent to clearing

each line (setting to "") and then deleting other memory used for this feature.

### 157.2.12 AnnotationLines(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The number of lines annotating a line can be retrieved with AnnotationLines.

### 157.2.13 AppendText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This adds the text to the end of the document.
**Notes:** This will include any 0's in the string that you might have expected to stop the operation. The current selection is not changed and the new text is not scrolled into view.

### 157.2.14 AssignCmdKey(keyDefinition as Integer, sciCommand as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This assigns the given key definition to a Scintilla command identified by sciCommand.
**Notes:** sciCommand can be any SCI_* command that has no arguments.

There is a default binding of keys to commands that is defined in the Scintilla library. You can change the mapping to suit your own requirements.

keyDefinition,Ä®: a key definition contains the key code in the low 16-bits and the key modifiers in the high 16-bits. To combine keyCode and keyMod set:,Ä®,Ä®

keyDefinition = keyCode + Bitwise.ShiftLeft(keyMod, 16)

The key code is a visible or control character or a key from the kKeys* enumeration, which contains: ,Ä®kKeysAdd, kKeysBack, kKeysDelete, kKeysDivide, kKeysDown, kKeysEnd, kKeysEscape, kKeysHome, kKeysInsert, kKeysLeft, kKeysMenu, kKeysNext (Page Down), kKeysPrior (Page Up), kKeysReturn, kKeysRight, kKeysRWin, kKeysSubtract, kKeysTab, kKeysUp, and kKeysWin.

The modifiers are a combination of zero or more of kKeyModAlt, kKeyModCtrl, kKeyModShift, kKeyModMeta, and kKeyModSuper. On OS X, the Command key is mapped to kKeyModCtrl and the Control key to kKeyModMeta. kKeyModSuper is only available on GTK which is commonly the Windows key. If

you are building a table, you might want to use kKeyModNorm, which has the value 0, to mean no modifiers.

On Win32, the numeric keypad with Alt pressed can be used to enter characters by number. This can produce unexpected results in non-numlock mode when function keys are assigned so potentially problematic keys are ignored. For example, setting kKeyModAlt, kKeysUP will only be active for the Up key on the main cursor keys, not the numeric keypad.

### 157.2.15 AutoComplete

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method triggers autocompletion.
**Notes:** This has the same effect as the tab key.

### 157.2.16 AutoCompleteCancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cancels any displayed auto completion list.
**Notes:** When in auto completion mode, the list should disappear when the user types a character that can not be part of the auto completion, such as '.', '(' or ' [ ' when typing an identifier. A set of characters that will cancel autocompletion can be specified with AutoCompleteStops.

### 157.2.17 AutoCompletePosStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the value of the current position when AutoCompleteShow started display of the list.

### 157.2.18 AutoCompleteSelect(Value as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method selects an item in the autocompletion list.
**Notes:** It searches the list of words for the first that matches select. By default, comparisons are case sensitive, but you can change this with AutoCIgnoreCase. The match is character by character for the length of the select string. That is, if select is "Fred" it will match "Frederick" if this is the first item in the list that begins with "Fred". If an item is found, it is selected. If the item is not found, the autocompletion list closes if auto-hide is true (see AutoCAutoHide).
The current selection index can be retrieved with AutoCompleteCurrent.

### 157.2.19 AutoCompleteSetFillUps(characterSet as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If a fillup character is typed with an auto completion list active, the currently selected item in the list is added into the document, then the fillup character is added.
**Notes:** Common fillup characters are '(', ' [ ' and '.' but others are possible depending on the language. By default, no fillup characters are set.

### 157.2.20 AutoCompleteShow(lengthEntered as Integer, itemList as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method causes a list to be displayed.
**Notes:** lengthEntered is the number of characters of the word already entered and itemList is the list of words separated by separator characters. The initial separator character is a space but this can be set or got with AutoCompleteSeparator property.

With default settings, the list of words should be in sorted order. If set to ignore case mode with AutoCompleteIgnoreCase, then strings are matched after being converted to upper case. One result of this is that the list should be sorted with the punctuation characters ' [ ', '\', ' ] ', '^', '_', and '`' sorted after letters. Alternative handling of list order may be specified with AutoCompleteOrder property.

### 157.2.21 AutoCompleteStops(characterSet as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The characterSet argument is a string containing a list of characters that will automatically cancel the auto completion list.
**Notes:** When you start the editor, this list is empty.

### 157.2.22 BackTab

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.23 BeginUndoAction

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Starts a composed undo action.
**Notes:** Call BeginUndoAction to mark the beginning and EndUndoAction to end of a set of operations that you want to undo all as one operation but that you have to generate as several operations. Alternatively, you can use these to mark a set of operations that you do not want to have combined with the preceding or following operations if they are undone.

### 157.2.24 BraceBadLight(pos as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Shows bad brace highlight.
**Notes:** If there is no matching brace then the brace badlighting style, style kStylesCommonBraceBad (35), can be used to show the brace that is unmatched. Using a position of kInvalidPosition (-1) removes the highlight.

### 157.2.25 BraceBadLightIndicator(useSetting as Boolean, indicator as ScintillaIndicatorMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use specified indicator to highlight non matching brace instead of changing its style

### 157.2.26 BraceHighlight(posA as Integer, posB as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Up to two characters can be highlighted in a 'brace highlighting style', which is defined as style number BraceHighlight (34).
**Notes:** If you have enabled indent guides, you may also wish to highlight the indent that corresponds with the brace. You can locate the column with Column() and highlight the indent with HighlightGuide.

### 157.2.27 BraceHighlightIndicator(useSetting as Boolean, indicator as ScintillaIndicatorMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use specified indicator to highlight matching braces instead of changing their style.

### 157.2.28 BraceMatch(pos as Integer, maxReStyle as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The BraceMatch method finds a corresponding matching brace given pos, the position of one brace.
**Notes:** The brace characters handled are '(', ')', ' [ ', ' ] ', ' { ', ' } ', '<', and '>'. The search is forwards from an opening brace and backwards from a closing brace. If the character at position is not a brace character, or a matching brace cannot be found, the return value is -1. Otherwise, the return value is the position of the matching brace.
A match only occurs if the style of the matching brace is the same as the starting brace or the matching brace is beyond the end of styling. Nested braces are handled correctly. The maxReStyle parameter must currently be 0 - it may be used in the future to limit the length of brace searches.

### 157.2.29 BraceMatchNext(pos as Integer, startPos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Similar to BraceMatch, but matching starts at the explicit start position startPos instead of the implicitly next position pos ¬± 1.

### 157.2.30 CallTipCancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method cancels any displayed call tip.
**Notes:** Scintilla will also cancel call tips for you if you use any keyboard commands that are not compatible with editing the argument list of a function. Call tips are cancelled if you delete back past the position where the caret was when the tip was triggered.

### 157.2.31 CallTipSetBackColor(backColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The background colour of call tips can be set with this property;
**Notes:** The default colour is white. It is not a good idea to set a dark colour as the background as the default colour for normal calltip text is mid grey and the default colour for highlighted text is dark blue. This also sets the background colour of kStylesCommonCallTip.

### 157.2.32 CallTipSetForeColor(foreColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of call tip text can be set with this method.
**Notes:** The default colour is mid grey.
This also sets the foreground colour of kStylesCommonCallTip.

### 157.2.33 CallTipSetForeColorHighlight(foreColor as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of highlighted call tip text can be set with this method.
**Notes:** The default colour is dark blue.

### 157.2.34 CallTipSetHighlight(highlightStart as Integer, highlightEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This sets the region of the call tips text to display in a highlighted style.
**Notes:** highlightStart is the zero-based index into the string of the first character to highlight and highlightEnd is the index of the first character after the highlight. highlightEnd must be greater than highlightStart; highlightEnd-highlightStart is the number of characters to highlight. Highlights can extend over line ends if this is required.
Unhighlighted text is drawn in a mid grey. Selected text is drawn in a dark blue. The background is white. These can be changed with CallTipSetBackColor, CallTipSetForeColor, and CallTipSetForeColorHighlight.

### 157.2.35 CallTipSetPosition(above as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default the calltip is displayed below the text, setting above to true will display it above the text.

### 157.2.36 CallTipShow(pos as Integer, definition as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method starts the process by displaying the call tip window.
**Notes:** If a call tip is already active, this has no effect.

pos is the position in the document at which to align the call tip. The call tip text is aligned to start 1 line below this character unless you have included up and/or down arrows in the call tip text in which case the tip is aligned to the right-hand edge of the rightmost arrow. The assumption is that you will start the text with something like "\001 1 of 3 \002".

definition is the call tip text. This can contain multiple lines separated by '\n' (Line Feed, ASCII code 10) characters. Do not include Carriage Return (ASCII code 13), as this will most likely print as an empty box. Tab (ASCII code 9) is supported if you set a tabsize with CallTipUseStyle.

The position of the caret is remembered here so that the call tip can be cancelled automatically if subsequent deletion moves the caret before this position.

Call tips are small windows displaying the arguments to a function and are displayed after the user has typed the name of the function. They normally display characters using the font facename, size and character set defined by kStylesCommonDefault. You can choose to use kStylesCommonCallTip to define the facename, size, foreground and background colours and character set with CallTipUseStyle. This also enables support for Tab characters. There is some interaction between call tips and autocompletion lists in that showing a call tip cancels any active autocompletion list, and vice versa.

Call tips can highlight part of the text within them. You could use this to highlight the current argument to a function by counting the number of commas (or whatever separator your language uses).

The mouse may be clicked on call tips and this causes a CallTipClick event to be sent to the container. Small up and down arrows may be displayed within a call tip by, respectively, including the characters '\001', or '\002'. This is useful for showing that there are overloaded variants of one function name and that the user can click on the arrows to cycle through the overloads.
Alternatively, call tips can be displayed when you leave the mouse pointer for a while over a word in response to the DWellStart event and cancelled in response to DWellEnd. This method could be used in a debugger to give the value of a variable, or during editing to give information about the word under the pointer.

### 157.2.37 CallTipUseStyle(tabSize as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method changes the style used for call tips from KStylesCommonDefault to KStylesCommoCallTip and sets a tab size in screen pixels.
**Notes:** If tabsize is less than 1, Tab characters are not treated specially. Once this call has been used, the call tip foreground and background colours are also taken from the style.

### 157.2.38 Cancel

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cancels autocompletion and calltip display and drops any additional selections.

### 157.2.39 ChangeInsertion(text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Changes insert.
**Notes:** This may only be called from a kModificationFlagsInsertCheck in Modify event handler and will change the text being inserted to that provided.

### 157.2.40 ChangeLexerState(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Indicate that the internal state of a lexer has changed over a range and therefore there may be a need to redraw.

### 157.2.41 Character(position as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the character at pos in the document or 0 if pos is negative or past the end of the document.

### 157.2.42 CharacterString(position as Integer, byref Length as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This queries character at given position.
**Notes:** If the position has a multi byte UTF-8 character, we take multiple characters and return length in bytes via Length parameter.
Otherwise character is returned for 1 byte and then length is set to 1.

See also Character() to get individual bytes.

### 157.2.43 CharLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.44 CharLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.45 CharLeftRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.46 CharPositionFromPoint(x as Integer, y as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character to a point.

### 157.2.47 CharPositionFromPointClose(x as Integer, y as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character to a point.
**Notes:** Returns -1 if the point is outside the window or not close to any characters. This is similar to the previous CharPositionFromPoint method but finds characters rather than inter-character positions.

### 157.2.48 CharRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.49 CharRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.50 CharRightRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.51 ChooseCaretX

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scintilla remembers the x value of the last position horizontally moved to explicitly by the user and this value is then used when moving vertically such as by using the up and down keys.
**Notes:** This message sets the current x position of the caret as the remembered value.

### 157.2.52 Clear

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears text from current selection.

### 157.2.53 ClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Unless the document is read-only, this deletes all the text.

### 157.2.54 ClearAllCmdKeys

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This command removes all keyboard command mapping by setting an empty mapping table.

### 157.2.55 ClearAllRepresentations

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reset representations to defaults.

### 157.2.56 ClearCmdKey(keyDefinition as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This makes the given key definition do nothing by assigning the action Null to it.
**Example:**

```
dim c as ScintillaControlMBS
// disable tab key for editor
c.ClearCmdKey c.kKeysTab
```

### 157.2.57 ClearDocumentStyle

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When wanting to completely restyle the document, for example after choosing a lexer, the ClearDocumentStyle method can be used to clear all styling information and reset the folding state.

### 157.2.58 ClearRegisteredImages

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all registered images.

### 157.2.59 ClearRepresentation(encodedCharacter as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reset this representation to default.

### 157.2.60 ClearSelections

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a single empty selection at 0 as the only selection.

### 157.2.61 ClearTabStops(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears explicit tabstops on a line.
**Notes:** Changing tab stops produces a ChangeTabStops event.

### 157.2.62 Colourise(start as Integer, ende as Integer = -1)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This requests the current lexer or the container (if the lexer is set to nil) to style the document between start and end.
**Notes:** If end is -1, the document is styled from start to the end. If the "fold" property is set to "1" and your lexer or container supports folding, fold levels are also set. This method causes a redraw.

### 157.2.63 ColouriseAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This requests the current lexer or the container (if the lexer is set to nil) to style the document.
**Notes:** If the "fold" property is set to "1" and your lexer or container supports folding, fold levels are also set. This method causes a redraw.

### 157.2.64 Column(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the column number of a position pos within the document taking the width of tabs into account.
**Notes:** This returns the column number of the last tab on the line before pos, plus the number of characters between the last tab and pos. If there are no tab characters on the line, the return value is the number of

characters up to the position on the line. In both cases, double byte characters count as a single character. This is probably only useful with monospaced fonts.

### 157.2.65 ContractedFoldNext(lineStart as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that are contracted fold headers.
**Notes:** This is useful when saving the user's folding when switching documents or saving folding with a file. The search starts at line number lineStart and continues forwards to the end of the file. lineStart is returned if it is a contracted fold header otherwise the next contracted fold header is returned. If there are no more contracted fold headers then -1 is returned.

### 157.2.66 ConvertEOLs(EndOfLineMode as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Converts end of line characters for the document.
**Notes:** Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.

### 157.2.67 Copy

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copy current text selection and puts text on the clipboard.

### 157.2.68 CopyAllowLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Works the same as Copy() except that if the selection is empty then the current line is copied.
**Notes:** On Windows, an extra "MSDEVLineSelect" marker is added to the clipboard which is then used in SCI_PASTE to paste the whole line before the current line.

### 157.2.69 CopyRange(RangeStart as Integer, RangeEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies a range of text from the document to the system clipboard.

### 157.2.70 CopyText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Copies a supplied piece of text to the system clipboard.

### 157.2.71 CountCharacters(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the number of whole characters between two positions.

### 157.2.72 CountCodeUnits(start as Integer, ende as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the number of whole characters between two positions.
**Notes:** This counts in UTF-16 code units.

### 157.2.73 CreateLoader(bytes as Integer = 1000000, documentOptions as Integer = 0) as ScintillaLoaderMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Creates a loader object.
**Notes:** An application can load all of a file into a buffer it allocates on a background thread and then add the data in that buffer into a Scintilla document on the user interface thread. That technique uses extra memory to store a complete copy of the file and also means that the time that Scintilla takes to perform initial line end discovery blocks the user interface.

To avoid these issues, a loader object may be created and used to load the file.
Returns an object that supports the ScintillaLoaderMBS interface which can be used to load data and then be turned into a Scintilla document object for attachment to a view object. The bytes argument determines the initial memory allocation for the document as it is more efficient to allocate once rather than rely on the buffer growing as data is added. If CreateLoader fails then nil is returned.

See kDocumentOption* constants.

### 157.2.74 Cut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cuts current text selection and puts text on the clipboard.

### 157.2.75 DeleteBack

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.76 DeleteBackNotLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.77 DeleteRange(start as Integer, lengthDelete as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Deletes a range of text in the document.

### 157.2.78 DelLineLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.79 DelLineRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.80 DelWordLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.81 DelWordRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.82 DelWordRightEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.83 DescribeProperty(Key as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Information may be retrieved about the properties that can be set for the current lexer.

### 157.2.84 DocLineFromVisible(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When some lines are hidden and/or annotations are displayed, then a particular line in the document may be displayed at a different position to its document position.
**Notes:** This method returns the document line number that corresponds to a display line (counting the display line of the first line in the document as 0). If displayLine is less than or equal to 0, the result is 0. If displayLine is greater than or equal to the number of displayed lines, the result is the number of lines in the document.

### 157.2.85 DocumentEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.86 DocumentEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.87 DocumentStart

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.88 DocumentStartExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.89 DropSelectionN(selection as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If there are multiple selections, remove the indicated selection.
**Notes:** If this was the main selection then make the previous selection the main and if it was the first then the last selection becomes main. If there is only one selection, or there is no selection selection, then there is no effect.

### 157.2.90 EditToggleOvertype

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.91 ElementAllowsTranslucent(element as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true when the element currently allows translucent drawing when an alpha component is included.
**Notes:** This may change based on circumstances - different platforms or graphics technologies may implement translucency and newer versions of Scintilla may implement translucency for elements that did not previously support it.

### 157.2.92 ElementBaseColour(element as Integer) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the default colour of an element.
**Notes:** This may be a value defined by Scintilla or it may be derived from the operating system or platform. Which values are set from the operating system may differ between operating systems and operating system versions. When undefined the return value is 0 which is equivalent to completely transparent black. These colours may be useful when defining styles with similarities such as synthesizing dark mode styles that use the same colours as the system.

On Win32, autocompletion list colours like kElementList are currently provided by the platform layer and on Cocoa, selection background colours like kElementSelectionBack are provided.

### 157.2.93 ElementIsSet(element as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true when an element colour has been set.
**Notes:** When false indicates that a default colour or set of colours is displayed.

### 157.2.94 EmptyUndoBuffer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This command tells Scintilla to forget any saved undo or redo history.
**Notes:** It also sets the save point to the start of the undo buffer, so the document will appear to be unmodified. This does not cause the SavePointReached event to be sent to the container.

### 157.2.95 EndStyled as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End styling.
**Notes:** Scintilla keeps a record of the last character that is likely to be styled correctly. This is moved forwards when characters after it are styled and moved backwards if changes are made to the text of the document before it. Before drawing text, this position is checked to see if any styling is needed and, if so, a StyleNeeded event is sent to the container. The container can send EndStyled to work out where it needs to start styling. Scintilla will always ask to style whole lines.

### 157.2.96 EndUndoAction

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Ends a composed undo action.
**Notes:** Call BeginUndoAction to mark the beginning and EndUndoAction to end of a set of operations that you want to undo all as one operation but that you have to generate as several operations. Alternatively, you can use these to mark a set of operations that you do not want to have combined with the preceding or following operations if they are undone.

### 157.2.97 EnsureVisible(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A line may be hidden because more than one of its parent lines is contracted.
**Notes:** Both these message travels up the fold hierarchy, expanding any contracted folds until they reach

the top level. The line will then be visible. If you use EnsureVisibleEnforcePolicy(), the vertical caret policy set by VisiblePolicy() is then applied.

### 157.2.98 EnsureVisibleEnforcePolicy(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A line may be hidden because more than one of its parent lines is contracted.
**Notes:** Both these message travels up the fold hierarchy, expanding any contracted folds until they reach the top level. The line will then be visible. If you use EnsureVisibleEnforcePolicy(), the vertical caret policy set by VisiblePolicy() is then applied.

### 157.2.99 EOLAnnotationClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all EOL annotations.
**Notes:** All the lines can be cleared of end of line annotations with EOLAnnotationClearAll which is equivalent to clearing each line (setting to 0) and then deleting other memory used for this feature.

### 157.2.100 ExpandChildren(Line as Integer, FoldLevel as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This is used to respond to a change to a line causing its fold level or whether it is a header to change, perhaps when adding or removing a ' { '.
**Notes:** By the time the container has received the notification that the line has changed, the fold level has already been set, so the container has to use the previous level in this call so that any range hidden underneath this line can be shown.

### 157.2.101 FindColumn(line as Integer, column as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position of a column on a line taking the width of tabs into account.
**Notes:** It treats a multi-byte character as a single column. Column numbers, like lines start at 0.

### 157.2.102 FindIndicatorFlash(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Show and animate the find indicator.
**Notes:** The indicator remains visible with FindIndicatorShow and fades out after showing for half a second with FindIndicatorFlash. FindIndicatorShow behaves similarly to the OS X TextEdit and Safari applications and is best suited to editing documentation where the search target is often a word. FindIndicatorFlash is similar to Xcode and is suited to editing source code where the match will often be located next to operators which would otherwise be hidden under the indicator's padding.

### 157.2.103 FindIndicatorHide

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Hides the find indicator.

### 157.2.104 FindIndicatorShow(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Show and animate the find indicator.
**Notes:** The indicator remains visible with FindIndicatorShow and fades out after showing for half a second with FindIndicatorFlash. FindIndicatorShow behaves similarly to the OS X TextEdit and Safari applications and is best suited to editing documentation where the search target is often a word. FindIndicatorFlash is similar to Xcode and is suited to editing source code where the match will often be located next to operators which would otherwise be hidden under the indicator's padding.

### 157.2.105 FindText(searchFlags as Integer, Text as String, byref RangeStart as Integer, byref RangeEnd as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Searches for text in the document.
**Notes:** It does not use or move the current selection. The searchFlags argument controls the search type, which includes regular expression searches.
See kFindOption* constants.

You can search backwards to find the previous occurrence of a search string by setting the end of the search range before the start.

RangeStart and RangeEnd provide the range of positions in the document to search. You can search backwards by setting RangeEnd less than RangeStart. The text parameter holds the search pattern. If your language makes the use of _TextToFind difficult, you should consider using SearchInTarget instead.

The return value is -1 if the search fails or the position of the start of the found text if it succeeds. The RangeStart and RangeEnd parameters of TextToFind are filled in with the start and end positions of the found text.

### 157.2.106 FoldAll(FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles all lines.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.2.107 FoldChildren(Line as Integer, FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles children.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.2.108 FoldLine(Line as Integer, FoldAction as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Contracts, expands or toggles one line.
**Notes:** Provides a higher-level approach to folding instead of setting expanded flags and showing or hiding individual lines.

An individual fold can be contracted/expanded/toggled with FoldLine(). To affect all child folds as well call FoldChildren().

To affect the entire document call FoldAll(). With kFoldActionToggle the first fold header in the document is examined to decide whether to expand or contract.

### 157.2.109 FoldParent(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the line number of the first line before line that is marked as a fold point with kFoldLevelHeaderFlag and has a fold level less than the line.
**Notes:** If no line is found, or if the header flags and fold levels are inconsistent, the return value is -1.

### 157.2.110 FormatRange(draw as boolean, range as ScintillaRangeToFormatMBS) as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** FormatRange can be used to draw the text onto a display surface which can include a printer display surface.
**Notes:** Printed output shows text styling as on the screen, but it hides all margins except a line number margin. Markers do not appear in a margin but will change line background colour. The selection and caret are hidden.

Different platforms use different display surface ID types to print on. On Windows, these are HDCs., on GTK 3.x cairo_t *, and on Cocoa CGContextRef is used.

For macOS use Integer(g.Handle(Graphics.HandleTypes.CGContextRef)), for windows use Integer(g.Handle(Graphics.HandleTypes.HDC)), for Linux use Integer(g.Handle(Graphics.HandleTypes.CairoContext)) to get the handle.

This call renders a range of text into a device context. If you use this for printing, you will probably want to arrange a page header and footer; Scintilla does not do this for you. Each use of this message renders a range of text into a rectangular area and returns the position in the document of the next character to print.

The draw parameter controls if any output is done. Set this to false if you are paginating.

On Windows, hdc and hdcTarget should both be set to the device context handle of the output device (usually a printer). If you print to a metafile these will not be the same as Windows metafiles (unlike extended metafiles) do not implement the full API for returning information. In this case, set hdcTarget to the screen DC.

Page* properties define the rectangle { 0, 0, maxX, maxY } where maxX+1 and maxY+1 are the number of physically printable pixels in x and y.
Area* properties define the rectangle to render the text in (which will, of course, fit within the rectangle defined by Page*).
CharacterRangePosition and CharacterRangeEnd define the start position and maximum position of characters to output. All of each line within this character range is drawn.

On Cocoa, the surface IDs for printing (draw=1) should be the graphics port of the current context (CGContextRef) when the view's drawRect method is called. The Surface IDs are not really used for measurement (draw=0) but can be set to a bitmap context to avoid runtime warnings.

On GTK, the surface IDs to use can be found from the printing context.

CharacterRangePosition and CharacterRangeEnd define the start position and maximum position of characters to output. All of each line within this character range is drawn.

When printing, the most tedious part is always working out what the margins should be to allow for the non-printable area of the paper and printing a header and footer. If you look at the printing code in SciTE, you will find that most of it is taken up with this. The loop that causes Scintilla to render text is quite simple if you strip out all the margin, non-printable area, header and footer code.

### 157.2.111 FormFeed

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.112 GetLineSelEndPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the position of the end of the selection at the given line with -1 returned if no selection on this line.

### 157.2.113 GetLineSelStartPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the position of the start of the selection at the given line with -1 returned if no selection on this line.

### 157.2.114 GetNextTabStop(line as Integer, x as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets the next explicit tabstop position set after the given x position, or zero if there aren't any.

### 157.2.115 GetStyledText(RangeStart as Integer, RangeEnd as Integer, byref Styledtext as MemoryBlock) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This collects styled text into a buffer using two bytes for each cell, with the character at the lower address of each pair and the style byte at the upper address.
**Notes:** Characters between the positions RangeStart and RangeEnd are copied to new MemoryBlock and put into Styledtext.
Positions outside the document return character codes and style bytes of 0.

### 157.2.116 GetTextRange(RangeStart as Integer, RangeEnd as Integer, byref Text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This collects the text between the positions RangeStart and RangeEnd and returns it in Text parameter.
**Notes:** If RangeEnd is -1, text is returned to the end of the document.
The return value is the length of the returned text.

### 157.2.117 GotoLine(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection and sets the caret at the start of line number line and scrolls the view (if needed) to make it visible.
**Notes:** The anchor position is set the same as the current position. If line is outside the lines in the document (first line is 0), the line set is the first or last.

### 157.2.118 GotoPos(pos as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection, sets the caret at caret and scrolls the view to make the caret visible, if necessary.
**Notes:** It is equivalent to SetSel(caret, caret). The anchor position is set the same as the current position.

### 157.2.119 GrabFocus

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scintilla can be told to grab the focus with GrabFocus.
**Notes:** This is needed more on GTK where focus handling is more complicated than on Windows.

### 157.2.120 HideLines(lineStart as Integer, lineEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Marks a range of lines as invisible and then redraw the display.
**Notes:** If kElementHiddenLine is set then a horizontal line is drawn in that colour to indicate that there are hidden lines.
A fold line drawn in that position overrides the hidden line indicator.

### 157.2.121 HideSelection(hide as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The normal state is to make the selection visible by drawing it as set by SetSelForeColor and SetSelBackColor.
**Notes:** However, if you hide the selection, it is drawn as normal text.

### 157.2.122 Home

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.123 HomeDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.124 HomeDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.125 HomeExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.126 HomeRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.127 HomeWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.128 HomeWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.129 IndexPositionFromLine(line as Integer, lineCharacterIndex as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries position from line via index.
**Notes:** The document line of a particular character or code unit may be found by calling LineFromIndexPosition with one of kLineCharacterIndexTypeUtf32 (1) or kLineCharacterIndexTypeUtf16 (2). The inverse action, finds the starting position of a document line either in characters or code units from the document start by calling IndexPositionFromLine with the same lineCharacterIndex argument.

### 157.2.130 Indicator(index as Integer) as ScintillaIndicatorMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries indicator with given index.
**Notes:** Index is from 0 to 35.

### 157.2.131 IndicatorAllOnFor(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve a bitmap value representing which indicators are non-zero at a position.
**Notes:** Only the first 32 indicators are represented in the result so no IME indicators are included.

### 157.2.132 IndicatorClearRange(start as Integer, lengthClear as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears a range for the current indicator.

### 157.2.133 IndicatorFillRange(start as Integer, lengthFill as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Fills a range with the current indicator.
**Notes:** See IndicatorValue property.

### 157.2.134 InitializeLexer(Lexer as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Initializes the lexer.
**Notes:** To style files in different languages, different 'lexers' are used. These are objects that are called by Scintilla with a range of text and some context information and which then set styles and folding information

for that range. Lexers for Scintilla are now provided by the Lexilla project.

Current list of buit-in lexers is:

a68k, abaqus, ada, apdl, as, asm, asn1, asy, au3, ave, avs, baan, bash, batch, bib, blitzbasic, bullant, caml, cil, clarion, clarionnocase, cmake, COBOL, coffeescript, conf, cpp, cppnocase, csound, css, d, dataflex, diff, DMAP, DMIS, ecl, edifact, eiffel, eiffelkw, erlang, errorlist, escript, f77, flagship, forth, fortran, freebasic, fsharp, gap, gui4cli, haskell, hollywood, hypertext, ihex, indent, inno, json, julia, kix, kvirc, latex, lisp, literatehaskell, lot, lout, lua, magiksf, makefile, markdown, matlab, maxima, metapost, mmixal, modula, mssql, mysql, nim, nimrod, nncrontab, nsis, null, octave, opal, oscript, pascal, powerbasic, perl, phpscript, PL/M, po, pov, powerpro, powershell, abl, props, ps, purebasic, python, r, raku, rebol, registry, ruby, rust, sas, scriptol, smalltalk, SML, sorcins, specman, spice, sql, srec, stata, fcST, TACL, tads3, TAL, tcl, tcmd, tehex, tex, txt2tags, vb, vbscript, verilog, vhdl, visualprolog, x12, xml, yaml, xojo

### 157.2.135 InsertText(Text as String, atPosition as Integer = -1)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This inserts the text string at position pos or at the current position if pos is -1.
**Notes:** If the current position is after the insertion point then it is moved along with its surrounding text but no scrolling is performed.

### 157.2.136 IsRangeWord(start as Integer, ende as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Is the range start..end a word or set of words?
**Notes:** This message checks that start is at a word start transition and that end is at a word end transition. It does not check whether there are any spaces inside the range.

### 157.2.137 LastChild(line as Integer, level as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Searches last child.
**Notes:** Searches for the next line after line, that has a folding level that is less than or equal to level and then returns the previous line number. If you set level to -1, level is set to the folding level of line line. If from is a fold point, LastChild(from, -1) returns the last line that would be in made visible or hidden by toggling the fold state.

### 157.2.138 LexerNameFromID(ID as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries name of lexer with given ID.
**Example:**

```
// constants in LexerConstants.txt in our examples folder
Const SCLEX_HTML = 4

Dim s As String = ScintillaControlMBS.LexerNameFromID(SCLEX_HTML)
MessageBox s
```

### 157.2.139 LexerNames as String()

MBS Scintilla Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries list of built-in lexers.
**Notes:** Current list is:

a68k, abaqus, ada, apdl, as, asm, asn1, asy, au3, ave, avs, baan, bash, batch, bib, blitzbasic, bullant, caml, cil, clarion, clarionnocase, cmake, COBOL, coffeescript, conf, cpp, cppnocase, csound, css, d, dataflex, diff, DMAP, DMIS, ecl, edifact, eiffel, eiffelkw, erlang, errorlist, escript, f77, flagship, forth, fortran, freebasic, fsharp, gap, gui4cli, haskell, hollywood, hypertext, ihex, indent, inno, json, julia, kix, kvirc, latex, lisp, literatehaskell, lot, lout, lua, magiksf, makefile, markdown, matlab, maxima, metapost, mmixal, modula, mssql, mysql, nim, nimrod, nncrontab, nsis, null, octave, opal, oscript, pascal, powerbasic, perl, phpscript, PL/M, po, pov, powerpro, powershell, abl, props, ps, purebasic, python, r, raku, rebol, registry, ruby, rust, sas, scriptol, smalltalk, SML, sorcins, specman, spice, sql, srec, stata, fcST, TACL, tads3, TAL, tcl, tcmd, tehex, tex, txt2tags, vb, vbscript, verilog, vhdl, visualprolog, x12, xml, yaml, xojo.

### 157.2.140 lexillaLibraryLoaded as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the lexilla library got loaded.
**Notes:** Returns true if you loaded lexilla dylib/dll/so file.

### 157.2.141 Line(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries text of a line.

**Notes:** Index is zero based.

### 157.2.142 LineCopy

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.143 LineCut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.144 LineDelete

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.145 LineDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.146 LineDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.147 LineDownRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.148 LineDuplicate

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.149 LineEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.
See also:

- 157.2.150 LineEnd(line as Integer) as Integer 20574

### 157.2.150 LineEnd(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line end position for the given line.
See also:

- 157.2.149 LineEnd 20574

### 157.2.151 LineEndDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.152 LineEndDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.153 LineEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.154 LineEndPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the position at the end of the line, before any line end characters.
**Notes:** If line is the last line in the document (which does not have any end of line characters) or greater, the result is the size of the document. If line is negative the result is undefined.

### 157.2.155 LineEndRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.156 LineEndWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.157 LineEndWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.158 LineFromIndexPosition(pos as Integer, lineCharacterIndex as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line from position via index.
**Notes:** The document line of a particular character or code unit may be found by calling LineFromIndexPosition with one of kLineCharacterIndexTypeUtf32 (1) or kLineCharacterIndexTypeUtf16 (2). The inverse action, finds the starting position of a document line either in characters or code units from the document start by calling IndexPositionFromLine with the same lineCharacterIndex argument.

### 157.2.159 LineFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method returns the line that contains the position pos in the document.
**Notes:** The return value is 0 if pos <= 0.
The return value is the last line if pos is beyond the end of the document.

### 157.2.160 LineIndentPosition(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The position at the end of indentation of a line.

### 157.2.161 LineLength(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the length of the line, including any line end characters.
**Notes:** If line is negative or beyond the last line in the document, the result is 0. If you want the length of the line not including any end of line characters, use LineEndPosition(line) - PositionFromLine(line).

### 157.2.162 LineReverse

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.163 LineScroll(columns as Integer, lines as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This will attempt to scroll the display by the number of columns and lines that you specify.
**Notes:** Positive line values increase the line number at the top of the screen (i.e. they move the text upwards as far as the user is concerned), Negative line values do the reverse.
The column measure is the width of a space in the default style. Positive values increase the column at the left edge of the view (i.e. they move the text leftwards as far as the user is concerned). Negative values do the reverse.

### 157.2.164 LineScrollDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.165 LineScrollUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.166 LinesJoin

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Join a range of lines indicated by the target into one line by removing line end characters.
**Notes:** Where this would lead to no space between words, an extra space is inserted.

### 157.2.167 LinesSplit(pixelWidth as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Split a range of lines indicated by the target into lines that are at most pixelWidth wide.
**Notes:** Splitting occurs on word boundaries wherever possible in a similar manner to line wrapping. When pixelWidth is 0 then the width of the window is used.

### 157.2.168 LineStart(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries line start position for the given line.

### 157.2.169 LineTranspose

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.170 LineUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.171 LineUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.172 LineUpRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.173 LineVisible(line as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports on the visible state of a line and returns true if it is visible and false if it is not visible.
**Notes:** This method has no effect on fold levels or fold flags.

### 157.2.174 LoadFramework(path as folderitem) as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the framework.
**Notes:** You can load Scintilla framework on macOS.
Returns true on success.

### 157.2.175 LoadLibrary(path as folderitem) as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Loads the library.
**Notes:** You can load lexer and scintilla libraries here.
Returns true on success.

### 157.2.176 LowerCase

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.177 Margin(index as Integer) as ScintillaMarginMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries margin with given index.
**Notes:** Index ranges from 0 to 5.

### 157.2.178 MarginTextClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clears all texts for margin.

### 157.2.179 Marker(index as Integer) as ScintillaMarkerMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries marker with given index.
**Notes:** Index ranges from 0 to 35.

### 157.2.180 MarkerAdd(Line as Integer, markerNumber as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This function searches the document for the marker with this handle and deletes the marker if it is found.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.

### 157.2.181 MarkerAddSet(line as Integer, markerSet as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Add one or more markers to a line with a single call.
**Notes:** Add one or more markers to a line with a single call, specified in the same "one-bit-per-marker" 32-bit integer format returned by Marker() (and used by the mask-based marker search functions MarkerNext() and MarkerPrevious()). As with MarkerAdd, no check is made to see if any of the markers are already present on the targeted line.

### 157.2.182 MarkerDefineRGBAImage(markerNumber as Integer, Width as Integer, Height as Integer, ScalePercent as Integer = 100, Pixels as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a translucent pixmap to be used to draw the marker.
**Example:**

```
dim c as ScintillaControlMBS // your control

// define red dot for breakpoints
Const size = 18
```

```
Dim r As New Picture(size, size) // red dot
Dim m As New Picture(size, size) // mask, a white dot on black, black is transparent
Dim rg As Graphics = r.Graphics
Dim mg As Graphics = m.Graphics

// we draw the image and the mask one
rg.DrawingColor = &c000000
rg.FillRectangle 0, 0, size, size
rg.DrawingColor = &cFF0000
rg.FillOval 0, 0, size, size
mg.DrawingColor = &c000000
mg.FillRectangle 0, 0, size, size
mg.DrawingColor = &cFFFFFF
mg.FillOval 0, 0, size, size

// now we convert to memoryblock
Dim rr As RGBSurface = r.RGBSurface
Dim mr As RGBSurface = m.RGBSurface

Dim pixels As New MemoryBlock(size * size * 4)
Dim PixelPtr As ptr = pixels
Dim o As Integer = 0
For y As Integer = 0 To size-1
For x As Integer = 0 To size-1
Dim mc As Color = mr.Pixel(x,y)
Dim rc As Color = rr.Pixel(x,y)
PixelPtr.UInt8(o+0) = rc.Red
PixelPtr.UInt8(o+1) = rc.Green
PixelPtr.UInt8(o+2) = rc.Blue
PixelPtr.UInt8(o+3) = mc.Green
o = o + 4
Next
Next

// and define the marker
c.Marker(1).Symbol = ScintillaMarkerMBS.kMarkerSymbolPixmap
c.MarkerDefineRGBAImage(1, size, size, 100, pixels)
```

**Notes:** Please pass the marker number, the size of the picture, it's scale in percent and the pixels memoryblock.

### 157.2.183 MarkerDelete(Line as Integer, markerNumber as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This searches the given line number for the given marker number and deletes it if it is present.

**Notes:** If you added the same marker more than once to the line, this will delete one copy each time it is used. If you pass in a marker number of -1, all markers are deleted from the line.

### 157.2.184 MarkerDeleteAll(markerNumber as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes markers of the given number from all lines.
**Notes:** If markerNumber is -1, it deletes all markers from all lines.

### 157.2.185 MarkerDeleteHandle(markerHandle as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Deletes a marker.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.
This function searches the document for the marker with this handle and deletes the marker if it is found.

### 157.2.186 MarkerEnableHighlight(enabled as Boolean)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method allows to enable/disable the highlight folding block when it is selected.
**Notes:** (i.e. block that contains the caret)

### 157.2.187 MarkerGet(Line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns a 32-bit integer that indicates which markers were present on the line.
**Notes:** Bit 0 is set if marker 0 is present, bit 1 for marker 1 and so on.

### 157.2.188 MarkerHandleFromLine(line as Integer, which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the Nth marker handle in a given line.
**Notes:** Handles are returned by MarkerAdd. If which is greater or equal to the number of markers on a line, this returns -1;

### 157.2.189 MarkerLineFromHandle(markerHandle as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This function searches the document for the marker with this handle and returns the line number that contains it or -1 if it is not found.
**Notes:** The markerHandle argument is an identifier for a marker returned by MarkerAdd.

### 157.2.190 MarkerNext(lineStart as Integer, markerMask as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that include a given set of markers.
**Notes:** The search starts at line number lineStart and continues forwards to the end of the file (MarkerNext) or backwards to the start of the file (MarkerPrevious).
The markerMask argument should have one bit set for each marker you wish to find. Set bit 0 to find marker 0, bit 1 for marker 1 and so on. The message returns the line number of the first line that contains one of the markers in markerMask or -1 if no marker is found.

### 157.2.191 MarkerNumberFromLine(line as Integer, which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the Nth marker number in a given line.
**Notes:** Handles are returned by MarkerAdd. If which is greater or equal to the number of markers on a line, this returns -1;

### 157.2.192 MarkerPrevious(lineStart as Integer, markerMask as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Search efficiently for lines that include a given set of markers.
**Notes:** The search starts at line number lineStart and continues forwards to the end of the file (MarkerNext) or backwards to the start of the file (MarkerPrevious).
The markerMask argument should have one bit set for each marker you wish to find. Set bit 0 to find marker 0, bit 1 for marker 1 and so on. The message returns the line number of the first line that contains one of the markers in markerMask or -1 if no marker is found.

### 157.2.193 MoveCaretInsideView

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If the caret is off the top or bottom of the view, it is moved to the nearest line that is visible to its current position.
**Notes:** Any selection is lost.

### 157.2.194 MoveSelectedLinesDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Move the selected lines down one line, shifting the line below before the selection.
**Notes:** The selection will be automatically extended to the beginning of the selection's first line and the end of the selection's last line. If nothing was selected, the line the cursor is currently at will be selected.

### 157.2.195 MoveSelectedLinesUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Move the selected lines up one line, shifting the line above after the selection.
**Notes:** The selection will be automatically extended to the beginning of the selection's first line and the end of the selection's last line. If nothing was selected, the line the cursor is currently at will be selected.

### 157.2.196 MultiEdgeAddLine(column as Integer, edgeColour as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds a new vertical edge to the view.
**Notes:** The edge will be displayed at the given column number. The resulting edge position depends on the metric of a space character in STYLE_DEFAULT. All the edges can be cleared with MultiEdgeClearAll. MultiEdgeColumn returns the column of the Nth vertical edge (indexed from 0). If which is greater or equal to the number of vertical edges, this returns -1.

### 157.2.197 MultiEdgeClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** All the edges can be cleared with MultiEdgeClearAll.

### 157.2.198 MultiEdgeColumn(which as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** MultiEdgeColumn returns the column of the Nth vertical edge (indexed from 0).
**Notes:** If which is greater or equal to the number of vertical edges, this returns -1.

### 157.2.199 MultipleSelectAddEach

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** MultipleSelectAddEach is similar to MultipleSelectAddNext but adds multiple occurrences instead of just one.

### 157.2.200 MultipleSelectAddNext

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Adds the next occurrence of the main selection within the target to the set of selections as main.
**Notes:** If the current selection is empty then select word around caret. The current searchFlags are used so the application may choose case sensitivity and word search options.

### 157.2.201 NewLine

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.202 PageDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.203 PageDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.204 PageDownRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.205 PageUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.206 PageUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.207 PageUpRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.208 ParaDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.209 ParaDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.210 ParaUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.211 ParaUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.212 Paste

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Performs the paste operation from clipboard.

### 157.2.213 PointXFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the x display pixel location of text at position pos in the document.

### 157.2.214 PointYFromPosition(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the y display pixel location of text at position pos in the document.

### 157.2.215 PositionAfter(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position after another position in the document taking into account the current code page.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If called with a position within a multi byte character will return the position of the start/end of that character.

### 157.2.216 PositionBefore(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the position before another position in the document taking into account the current code page.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If called with a position within a multi byte character will return the position of the start/end of that character.

### 157.2.217 PositionFromLine(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the document position that corresponds with the start of the line.
**Notes:** If line is negative, the position of the line holding the start of the selection is returned. If line is greater than the lines in the document, the return value is -1. If line is equal to the number of lines in the document (i.e. 1 line past the last line), the return value is the end of the document.

### 157.2.218 PositionFromPoint(x as Integer, y as integer) as integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character position to a point.

### 157.2.219 PositionFromPointClose(x as Integer, y as integer) as integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finds the closest character position to a point.
**Notes:** Returns -1 if the point is outside the window or not close to any characters.

### 157.2.220 PositionRelative(pos as Integer, relative as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Count a number of whole characters before or after the argument position and return that position.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If the position goes past the document end then 0 is returned.

### 157.2.221 PositionRelativeCodeUnits(pos as Integer, relative as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Count a number of whole characters before or after the argument position and return that position.
**Notes:** The minimum position returned is 0 and the maximum is the last position in the document. If the position goes past the document end then 0 is returned.

These is the UTF-16 versions of PositionRelative() working in terms of UTF-16 code units

### 157.2.222 PropertyInt(name as String, defaultValue as Integer = 0) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Lookup a keyword:value pair using the specified key; if found, interpret the value as an integer and return it.
**Notes:** If not found (or the value is an empty string) then return the supplied default. If the keyword:value pair is found but is not a number, then return 0.

### 157.2.223 PropertyType(name as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries property type.
**Notes:** See kTypeProperty* constants.

### 157.2.224 Redo

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Undoes the effect of the last Undo operation.

### 157.2.225 RegisterRGBAImage(type as Integer, Width as Integer, Height as Integer, Pixels as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Registers an icon for auto completion.
**Example:**

```
// register red dot for auto complete later
Const size = 18

Dim r As New Picture(size, size) // red dot
Dim m As New Picture(size, size) // mask, a white dot on black, black is transparent
Dim rg As Graphics = r.Graphics
Dim mg As Graphics = m.Graphics

// we draw the image and the mask one
rg.DrawingColor = &c000000
rg.FillRectangle 0, 0, size, size
rg.DrawingColor = &cFF0000
rg.FillOval 0, 0, size, size
mg.DrawingColor = &c000000
mg.FillRectangle 0, 0, size, size
mg.DrawingColor = &cFFFFFF
mg.FillOval 0, 0, size, size

// now we convert to memoryblock
Dim rr As RGBSurface = r.RGBSurface
Dim mr As RGBSurface = m.RGBSurface

dim pixels As New MemoryBlock(size * size * 4)
Dim PixelPtr As ptr = pixels
Dim o As Integer = 0
For y As Integer = 0 To size-1
For x As Integer = 0 To size-1
Dim mc As Color = mr.Pixel(x,y)
```

```
Dim rc As Color = rr.Pixel(x,y)
PixelPtr.UInt8(o+0) = rc.Red
PixelPtr.UInt8(o+1) = rc.Green
PixelPtr.UInt8(o+2) = rc.Blue
PixelPtr.UInt8(o+3) = mc.Green
o = o + 4
Next
Next

c.RegisterRGBAImage(1, size, size, pixels)
```

**Notes:** Autocompletion list items may display an image as well as text. Each image is first registered with an integer type. Then this integer is included in the text of the list separated by a '?' from the text. For example, "fclose?2 fopen" displays image 2 before the string "fclose" and no image before "fopen". The images are in RGBA format and set with RegisterRGBAImage.
The set of registered images can be cleared with ClearRegisteredImages method and the '?' separator changed with AutoCompleteSeparator property.

### 157.2.226 ReleaseAllExtendedStyles

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Releases any extended styles allocated by the container.

### 157.2.227 ReleaseLineCharacterIndex(lineCharacterIndex as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Release one or more indexes.
**Notes:** Different aspects of an application may need indexes for different periods and should allocate for those periods. Indexes use additional memory so releasing them can help minimize memory but they also take time to recalculate. Scintilla may also allocate indexes to support features like accessibility or input method editors. Only one index of each type is created for a document at a time.

### 157.2.228 ReplaceRectangular(length as Integer, text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Replaces the selected text or empty selection with the given text.
**Notes:** The insertion is performed similarly to rectangular pastes: new lines in the given text are interpreted as moving to the next line without inserting new lines unless at the end of the document.

### 157.2.229 ReplaceSelection(text as string)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The currently selected text between the anchor and the current position is replaced by the text string.
**Notes:** If the anchor and current position are the same, the text is inserted at the caret position. The caret is positioned after the inserted text and the caret is scrolled into view.

### 157.2.230 ReplaceTarget(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Replace target area with new text.
**Notes:** After replacement, the target range refers to the replacement text. The return value is the length of the replacement string.
Note that the recommended way to delete text in the document is to set the target to the text to be removed, and to perform a replace target with an empty string.

### 157.2.231 ReplaceTargetRE(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This replaces the target using regular expressions.
**Notes:** If length is -1, text is a zero terminated string, otherwise length is the number of characters to use. The replacement string is formed from the text string with any sequences of \1 through \9 replaced by tagged matches from the most recent regular expression search. \0 is replaced with all the matched text from the most recent search. After replacement, the target range refers to the replacement text. The return value is the length of the replacement string.

### 157.2.232 ResetElementColour(element as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes the element colour returning to the default colour or set of colours.

### 157.2.233 RotateSelection

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Makes the next selection be the main selection.

### 157.2.234 scintillaLibraryLoaded as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether the scintilla library got loaded.
**Notes:** Returns true on MacOS when you loaded the Scintilla.framework before.
Returns true if you loaded Scintilla.dll on Windows or Scintilla.so on Linux.

### 157.2.235 ScrollCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If the current position (this is the caret if there is no selection) is not visible, the view is scrolled to make it visible according to the current caret policy.

### 157.2.236 ScrollRange(secondary as Integer, primary as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Scroll the argument positions and the range between them into view giving priority to the primary position then the secondary position.
**Notes:** The behaviour is similar to ScrollCaret with the primary position used instead of the caret. An effort is then made to ensure that the secondary position and range between are also visible. This may be used to make a search match visible.

### 157.2.237 ScrollToEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The ScrollToEnd commands scroll the document to the end without changing the selection. These commands match OS X platform conventions for the behaviour of the home and end keys. Scintilla can be made to match OS X applications by binding the home and end keys to these commands.

You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.238 ScrollToStart

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The ScrollToStart commands scroll the document to the start without changing the selection. These commands match OS X platform conventions for the behaviour of the home and end keys. Scintilla can be made to match OS X applications by binding the home and end keys to these commands.

You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.239 SearchAnchor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the search start point used by SearchNext and SearchPrev to the start of the current selection, that is, the end of the selection that is nearer to the start of the document.
**Notes:** You should always call this before calling either of SearchNext or SearchPrev.

### 157.2.240 SearchInTarget(text as string) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This searches for the first occurrence of a text string in the target defined by TargetStart and TargetEnd.
**Notes:** The search is modified by the search flags set by SearchFlags property. If the search succeeds, the target is set to the found text and the return value is the position of the start of the matching text. If the search fails, the result is -1.

See Tag() for regular expression results.

### 157.2.241 SearchNext(searchFlags as Integer, text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** SearchNext and SearchPrev search for the next and previous occurrence of the search string pointed at by text.
**Notes:** The search is modified by the searchFlags.
See kFindOption* constants.

The return value is -1 if nothing is found, otherwise the return value is the start position of the matching text. The selection is updated to show the matched text, but is not scrolled into view.

| Character | Description |
|---|---|
| . | Matches any character |
| \( | This marks the start of a region for tagging a match. |
| \) | This marks the end of a tagged region. |
| \n | Where n is 1 through 9 refers to the first through ninth tagged region when replacing. For example, if the search string was Fred\( [ 1-9 ] \)XXX and the replace string was Sam\1YYY, when applied to Fred2XXX this would generate Sam2YYY. \0 refers to all of the matching text. |
| \< | This matches the start of a word using Scintilla's definitions of words. |
| \> | This matches the end of a word using Scintilla's definition of words. |
| \x | This allows you to use a character x that would otherwise have a special meaning. For example, \[ would be interpreted as [ and not as the start of a character set. |
| [ ... ] | This indicates a set of characters, for example, [ abc ] means any of the characters a, b or c. You can also use ranges, for example [ a-z ] for any lower case character. |
| [ ^... ] | The complement of the characters in the set. For example, [ ^A-Za-z ] means any character except an alphabetic character. |
| ^ | This matches the start of a line (unless used inside a set, see above). |
| $ | This matches the end of a line. |
| * | This matches 0 or more times. For example, Sa*m matches Sm, Sam, Saam, Saaam and so on. |
| + | This matches 1 or more times. For example, Sa+m matches Sam, Saam, Saaam and so on. |

### 157.2.242 SearchPrev(searchFlags as Integer, text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** SearchNext and SearchPrev search for the next and previous occurrence of the search string pointed at by text.
**Notes:** The search is modified by the searchFlags.
See kFindOption* constants.

The return value is -1 if nothing is found, otherwise the return value is the start position of the matching text. The selection is updated to show the matched text, but is not scrolled into view.

### 157.2.243 SelectAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This selects all the text in the document.
**Notes:** The current position is not scrolled into view.

### 157.2.244 SelectionDuplicate

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.245 SelectionNEndVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Query the virtual space at start and end of each selection.
**Notes:** Selection parameter is zero based.

### 157.2.246 SelectionNStartVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Query the virtual space at start and end of each selection.
**Notes:** Selection parameter is zero based.

### 157.2.247 SetAdditionalSelBackColor(value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.

### 157.2.248 SetAdditionalSelForeColor(value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.

### 157.2.249 SetCharsDefault

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Use the default sets of word and whitespace characters.
**Notes:** This sets whitespace to space, tab and other characters with codes less than &h20, with word characters set to alphanumeric and '_'.

### 157.2.250 SetDocument(otherControl as Variant)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets document for this control to be same as the other control.
**Notes:** Using this method you can allow multiple controls to share same document, e.g. for split views.

Pass nil to create new empty document.

This method does the following:
1. It removes the current window from the list held by the current document.
2. It reduces the reference count of the current document by 1.
3. If the reference count reaches 0, the document is deleted.
4. doc is set as the new document for the window.
5. If doc was 0, a new, empty document is created and attached to the window.
6. If doc was not 0, its reference count is increased by 1.

Please pass either ScintillaControlMBS or DesktopScintillaControlMBS here to point to new control.

After you assigned new document, please configure styles as needed.

### 157.2.251 SetEmptySelection(caret as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This removes any selection and sets the caret at caret.
**Notes:** The caret is not scrolled into view.

### 157.2.252 SetFoldFlags(FoldFlags as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets folder flags.

**Notes:** In addition to showing markers in the folding margin, you can indicate folds to the user by drawing lines in the text area. The lines are drawn in the kElementFoldLine colour if set. If it is not set then the foreground colour set for kStylesCommonDefault is used.

### 157.2.253 SetFoldMarginColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the fold margin.
**Example:**

```
// turn folder margin to red
c.SetFoldMarginColor(True, Color.red)
```

**Notes:** Defaults to system color for this.

The FoldMarginColor and the FoldMarginHighlightColor colors are used together to draw the chequerboard pattern in the folder margin.

### 157.2.254 SetFoldMarginHighlightColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the fold margin highlight.
**Notes:** Defaults to system color for this.

The FoldMarginColor and the FoldMarginHighlightColor colors are used together to draw the chequerboard pattern in the folder margin.

### 157.2.255 SetHotspotActiveBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for hotspot.
**Notes:** While the cursor hovers over text in a style with the hotspot attribute set, the default colouring can be modified and an underline drawn with these settings.

### 157.2.256 SetHotspotActiveForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for hotspot.
**Notes:** While the cursor hovers over text in a style with the hotspot attribute set, the default colouring can be modified and an underline drawn with these settings.

### 157.2.257 SetSavePoint

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This method tells Scintilla that the current state of the document is unmodified.
**Notes:** This is usually done when the file is saved or loaded, hence the name "save point". As Scintilla performs undo and redo operations, it notifies the container that it has entered or left the save point with SavePointReached and SavePointLeft events, allowing the container to know if the file should be considered dirty or not.
See also: EmptyUndoBuffer or Modify property.

### 157.2.258 SetSel(anchor as Integer, caret as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets both the anchor and the current position.
**Notes:** If caret is negative, it means the end of the document. If anchor is negative, it means remove any selection (i.e. set the anchor to the same position as caret). The caret is scrolled into view after this operation.

### 157.2.259 SetSelBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to override the default selection colouring.
**Example:**

```
// use highlight color for selection and white text

dim c as ScintillaControlMBS // your control
c.SetSelBackColor(True, Color.HighlightColor)
c.SetSelForeColor(True, Color.White)
```

**Notes:** With the method, the colour you provide is used if you set useSetting to true. If it is set to false, the default styled colouring is used and the fore or back argument has no effect.

### 157.2.260 SetSelection(caret as Integer, anchor as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set a single selection from anchor to caret as the only selection.

### 157.2.261 SetSelForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to override the default selection colouring.
**Example:**

```
// use highlight color for selection and white text

dim c as ScintillaControlMBS // your control
c.SetSelBackColor(True, Color.HighlightColor)
c.SetSelForeColor(True, Color.White)
```

**Notes:** With the method, the colour you provide is used if you set useSetting to true. If it is set to false, the default styled colouring is used and the fore or back argument has no effect.

### 157.2.262 setStatusText(Text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Targets: Desktop only.

**Function:** Sets message of status field.

### 157.2.263 SetStyling(length as Integer, style as ScintillaStyleMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the style of length characters starting at the styling position and then increases the styling position by length, ready for the next call.
**Notes:** StartStyling should be called before the first call to this.
See also:

- 157.2.264 SetStyling(start as Integer, length as Integer, style as ScintillaStyleMBS) 20600

### 157.2.264 SetStyling(start as Integer, length as Integer, style as ScintillaStyleMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the style of length characters starting at the styling position and then increases the styling position by length, ready for the next call.
**Notes:** StartStyling should be called before the first call to this.
See also:

- 157.2.263 SetStyling(length as Integer, style as ScintillaStyleMBS) 20600

### 157.2.265 SetStylingEx(Styles as MemoryBlock)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styling for a range of text.
**Notes:** As an alternative to SetStyling, which applies the same style to each byte, you can use this method which specifies the styles for each of length bytes from the styling position and then increases the styling position by length, ready for the next call. StartStyling should be called before the first call to this.

### 157.2.266 SetTargetRange(start as Integer, ende as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the start and end of the target.

### 157.2.267 SetVisiblePolicy(visiblePolicy as Integer, visibleSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This determines how the vertical positioning is determined when EnsureVisibleEnforcePolicy is called.
**Notes:** It takes kVisiblePolicySlop and kVisiblePolicyStrict flags for the visiblePolicy parameter. It is similar in operation to SetYCaretPolicy.

### 157.2.268 SetWhitespaceBackColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets background color for white space.
**Notes:** By default, the colour of visible white space is determined by the lexer in use. The foreground and/or background colour of all visible white space can be set globally, overriding the lexer's colours.

### 157.2.269 SetWhitespaceForeColor(useSetting as boolean, value as Color)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets foreground color for white space.
**Notes:** By default, the colour of visible white space is determined by the lexer in use. The foreground and/or background colour of all visible white space can be set globally, overriding the lexer's colours.

### 157.2.270 SetXCaretPolicy(caretPolicy as Integer, caretSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the caret policy.
**Notes:** See kCaretPolicy* constants.

| slop | strict | jumps | even | Caret can go to the margin | "On reaching limit (going out of visibility |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 0 | 1 | Yes | moved by one position |
| 0 | 0 | 1 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 1 | 1 | Yes | centred on the caret |
| 0 | 1 | - | 0 | Caret is always on top/on right of display | - |
| 0 | 1 | - | 1 | No, caret is always centred | - |
| 1 | 0 | 0 | 0 | Yes | moved to put caret out of the asymmetrical UZ |
| 1 | 0 | 0 | 1 | Yes | moved to put caret out of the UZ |
| 1 | 0 | 1 | 0 | Yes | moved to put caret at 3UZ of the top or right margin |
| 1 | 0 | 1 | 1 | Yes | moved to put caret at 3UZ of the margin |
| 1 | 1 | - | 0 | Caret is always at UZ of top/right margin | - |
| 1 | 1 | 0 | 1 | No, kept out of UZ | moved by one position |
| 1 | 1 | 1 | 0 | No, kept out of UZ | moved to put caret at 3UZ of the margin |

### 157.2.271 SetYCaretPolicy(caretPolicy as Integer, caretSlop as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the caret policy.
**Notes:** See kCaretPolicy* constants.

| slop | strict | jumps | even | Caret can go to the margin | "On reaching limit (going out of visibility |
|---|---|---|---|---|---|

or going into the UZ) display is..."

| | | | | | |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 0 | 1 | Yes | moved by one position |
| 0 | 0 | 1 | 0 | Yes | moved to put caret on top/on right |
| 0 | 0 | 1 | 1 | Yes | centred on the caret |
| 0 | 1 | - | 0 | Caret is always on top/on right of display | - |
| 0 | 1 | - | 1 | No, caret is always centred | - |
| 1 | 0 | 0 | 0 | Yes | moved to put caret out of the asymmetrical UZ |
| 1 | 0 | 0 | 1 | Yes | moved to put caret out of the UZ |
| 1 | 0 | 1 | 0 | Yes | moved to put caret at 3UZ of the top or right margin |
| 1 | 0 | 1 | 1 | Yes | moved to put caret at 3UZ of the margin |
| 1 | 1 | - | 0 | Caret is always at UZ of top/right margin | - |
| 1 | 1 | 0 | 1 | No, kept out of UZ | moved by one position |
| 1 | 1 | 1 | 0 | No, kept out of UZ | moved to put caret at 3UZ of the margin |

### 157.2.272 ShowLines(lineStart as Integer, lineEnd as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Marks a range of lines as visible and then redraw the display.

### 157.2.273 StartRecord

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Turn macro recording on.

### 157.2.274 StartStyling(start as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This prepares for styling by setting the styling position start to start at.
**Notes:** After StartStyling, send multiple SetStyling messages for each lexical entity to style or send SetStylingEX to style in blocks.

### 157.2.275 StopRecord

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Turn macro recording off.

### 157.2.276 StringOfSpan(Span as ScintillaSpanMBS) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries text for given span.

### 157.2.277 StutteredPageDown

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.278 StutteredPageDownExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.279 StutteredPageUp

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.280 StutteredPageUpExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.281 Style(index as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries style with given index.
**Notes:** Index ranges from 0 to 255.

### 157.2.282 StyleAt(position as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the style at pos in the document, or 0 if pos is negative or past the end of the document.

### 157.2.283 StyleClearAll

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This message sets all styles to have the same attributes as the default style.
**Notes:** If you are setting up Scintilla for syntax colouring, it is likely that the lexical styles you set will be very similar. One way to set the styles is to:
1. Set kStylesCommonDefault to the common features of all styles.
2. Use StyleClearAll to copy this to all styles.
3. Set the style attributes that make your lexical styles different.

### 157.2.284 StyleResetDefault

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This message resets default style (kStylesCommonDefault) to its state when Scintilla was initialised.

### 157.2.285 SupportsFeature(feature as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Different platforms support different features and SupportsFeature can be used to check which are currently available.
**Notes:** For example, on Win32, Direct2D supports drawing translucent lines but GDI does not so SupportsFeature(kSupportsTranslucentStroke) will return 1 for Direct2D and 0 for GDI. Its possible that translucent line drawing will be implemented in a future revision to the GDI platform layer or will be implemented on particular Windows versions. This call allows applications to tailor their settings: perhaps displaying a box with translucent coloured fill on Direct2D but a hollow box on GDI.

See kSupport* constants.

### 157.2.286 SwapMainAnchorCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Moves the caret to the opposite end of the main selection.

### 157.2.287 Tab

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.288 Tag(tagNumber as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Discover what text was matched by tagged expressions in a regular expression search.
**Notes:** This is useful if the application wants to interpret the replacement string itself.

### 157.2.289 TargetFromSelection

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the target start and end to the start and end positions of the selection.

### 157.2.290 TargetWholeDocument

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the target start to the start of the document and target end to the end of the document.

### 157.2.291 TextHeight(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the height in pixels of a particular line.
**Notes:** Currently all lines are the same height.

### 157.2.292 ToggleCaretSticky

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** These method set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.
**Notes:** When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default.
When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc).
When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..).
ToggleCaretSticky switches from kCaretStickyOn and kCaretStickyWhiteSpace to kCaretStickyOff and from kCaretStickyOff to kCaretStickyOn.

### 157.2.293 ToggleFold(line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Toggle a folder at the given line.
**Notes:** Each fold point may be either expanded, displaying all its child lines, or contracted, hiding all the child lines. This method toggle the folding state of the given line as long as it has the kFoldLevelHeaderFlag set. This method take care of folding or expanding all the lines that depend on the line. The display updates after this method.

### 157.2.294 ToggleFoldShowText(Line as Integer, text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Toggle a folder at the given line with hsowing text.
**Notes:** Each fold point may be either expanded, displaying all its child lines, or contracted, hiding all the child lines. This method toggle the folding state of the given line as long as it has the kFoldLevelHeaderFlag set. This method take care of folding or expanding all the lines that depend on the line. The display updates after this method.

An optional text tag may be shown to the right of the folded text with the text argument to ToggleFoldShowText. The default text for all header lines can be set with DefaultFoldDisplayText. The text is drawn with the kStylesCommonFoldDisplayText style.

### 157.2.295 Undo

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Undoes one action.
**Notes:** Or if the undo buffer has reached a EndUndoAction point, all the actions back to the corresponding BeginUndoAction.

Scintilla has multiple level undo and redo. It will continue to collect undoable actions until memory runs out. Scintilla saves actions that change the document. Scintilla does not save caret and selection movements, view scrolling and the like. Sequences of typing or deleting are compressed into single transactions to make it easier to undo and redo at a sensible level of detail. Sequences of actions can be combined into transactions that are undone as a unit. These sequences occur between BeginUndoAction and EndUndoAction messages. These transactions can be nested and only the top-level sequences are undone as units.

### 157.2.296 UpperCase

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.297 UsePopUp(popUpMode as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Clicking the wrong button on the mouse pops up a short default editing menu.
**Notes:** This may be turned off with UsePopup(kPopUpNever). If you turn it off, context menu commands (in Windows, WM_CONTEXTMENU) will not be handled by Scintilla, so the parent of the Scintilla window will have the opportunity to handle the message.

### 157.2.298 UserListShow(listType as Integer, itemList as string)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Shows an user list.
**Notes:** User lists use the same internal mechanisms as autocompletion lists, and all the calls listed for autocompletion work on them; you cannot display a user list at the same time as an autocompletion list is active. They differ in the following respects:

- The AutoCChooseSingle method has no effect.,Ä®

- When the user makes a selection you are sent a UserListSelection event rather than AutoCompleteSelection.

BEWARE: if you have set fillup characters or stop characters, these will still be active with the user list, and may result in items being selected or the user list cancelled due to the user typing into the editor.

,Ä®The listType parameter is carried to the events. It must be greater than 0 as this is how Scintilla tells the difference between an autocompletion list and a user list. If you have different types of list, for example a list of buffers and a list of macros, you can use listType to tell which one has returned a selection.

### 157.2.299 VCHome

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.300 VCHomeDisplay

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.301 VCHomeDisplayExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.302 VCHomeExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.303 VCHomeRectExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.304 VCHomeWrap

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.305 VCHomeWrapExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.306 VerticalCentreCaret

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.307 VisibleFromDocLine(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When some lines are hidden and/or annotations are displayed, then a particular line in the document may be displayed at a different position to its document position.
**Notes:** If no lines are hidden and there are no annotations, this method returns docLine. Otherwise, this returns the display line (counting the very first visible line as 0). The display line of an invisible line is the same as the previous visible line. The display line number of the first line in the document is 0. If lines are hidden and docLine is outside the range of lines in the document, the return value is -1. Lines can occupy more than one display line if they wrap.

### 157.2.308 WordEndPosition(pos as Integer, onlyWordCharacters as boolean) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the end of words using the same definition of words as used internally within Scintilla.
**Notes:** You can set your own list of characters that count as words with WordChars. The position sets the start or the search, which is forwards when searching for the end and backwards when searching for the start.

### 157.2.309 WordLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.310 WordLeftEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.311 WordLeftEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.312 WordLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.313 WordPartLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.314 WordPartLeftExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.315 WordPartRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.316 WordPartRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The WordPart** commands are used to move between word segments marked by capitalisation (aCamelCaseIdentifier) or underscores (an_under_bar_ident).
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.317 WordRight

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.318 WordRightEnd

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.319 WordRightEndExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** The *End methods move between word ends instead of word starts.
This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.320 WordRightExtend

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The method to perform the action when this key is pressed.
**Notes:** This action extends the selection.
You can call it directly to perform this action if needed, e.g. from toolbar or menu command.

### 157.2.321 WordStartPosition(pos as Integer, onlyWordCharacters as boolean) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the start of words using the same definition of words as used internally within Scintilla.
**Notes:** You can set your own list of characters that count as words with WordChars. The position sets the start or the search, which is forwards when searching for the end and backwards when searching for the start.

### 157.2.322 WrapCount(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Document lines can occupy more than one display line if they wrap and this returns the number of display lines needed to wrap a document line.

### 157.2.323 ZoomIn

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Increases the zoom factor by one point if the current zoom factor is less than 20 points.

### 157.2.324 ZoomOut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Ddecreases the zoom factor by one point if the current zoom factor is greater than -10 points.

### 157.2.325 Properties

### 157.2.326 Accessibility as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable accessibility status.
**Notes:** Can be set to kAccessibilityEnabled to enable.
(Read and Write property)

### 157.2.327 AdditionalCaretForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Modify the appearance of additional carets so that they can be differentiated from the main caret which has its appearance.
**Notes:** (Read and Write property)

### 157.2.328 AdditionalCaretsBlink as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Modify the appearance of additional carets so that they can be differentiated from the main caret which has its appearance.
**Notes:** (Read and Write property)

### 157.2.329 AdditionalCaretsVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Determine whether to show additional carets (defaults to true).
**Notes:** (Read and Write property)

### 157.2.330 AdditionalSelAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets alpha for additional selection.
**Notes:** Modify the appearance of additional selections so that they can be differentiated from the main selection.
(Read and Write property)

### 157.2.331 AdditionalSelectionTyping as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether typing, new line, cursor left/right/up/down, backspace, delete, home, and end work with multiple selections simultaneously.
**Notes:** Also allows selection and word and line deletion commands.
(Read and Write property)

### 157.2.332 AllLinesVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true if all lines are visible and false if some lines are hidden.
**Notes:** (Read only property)

### 157.2.333 Anchor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current anchor position.
**Notes:** This sets the anchor position and creates a selection between the anchor position and the current position. The caret is not scrolled into view.
(Read and Write property)

### 157.2.334 AnnotationVisible as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Annotations can be made visible in a view and there is a choice of display style when visible.
**Notes:** See kAnnotationVisible* constants.
(Read and Write property)

### 157.2.335 AutoCompleteActive as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns true if there is an active auto completion list and false if there is not.
**Notes:** (Read only property)

### 157.2.336 AutoCompleteAutoHide as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, the list is cancelled if there are no viable matches (the user has typed characters that no longer match a list entry).
**Notes:** If you want to keep displaying the original list, set autoHide to false. This also effects AutoCompleteSelect.
(Read and Write property)

### 157.2.337 AutoCompleteCancelAtStart as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The default behaviour is for the list to be cancelled if the caret moves to the location it was at when the list was displayed.
**Notes:** By calling this message with a false argument, the list is not cancelled until the caret moves at least one character before the word being completed.

(Read and Write property)

### 157.2.338 AutoCompleteCaseInsensitiveBehaviour as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to ignore case on auto completion.
**Notes:** When auto completion is set to ignore case (kCaseInsensitiveBehaviourIgnoreCase), by default it will nonetheless select the first list member that matches in a case sensitive way to entered characters. This corresponds to a behaviour property of kCaseInsensitiveBehaviourRespectCase (0). If you want auto completion to ignore case at all, choose kCaseInsensitiveBehaviourIgnoreCase (1).
(Read and Write property)

### 157.2.339 AutoCompleteChooseSingle as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to choose single item directly.
**Notes:** If you use AutoCompleteChooseSingle(1) and a list has only one item, it is automatically added and no list is displayed. The default is to display the list even if there is only a single item.
(Read and Write property)

### 157.2.340 AutoCompleteCurrent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set to select an item in the autocompletion list.
**Notes:** It searches the list of words for the first that matches select. By default, comparisons are case sensitive, but you can change this with AutoCIgnoreCase. The match is character by character for the length of the select string. That is, if select is "Fred" it will match "Frederick" if this is the first item in the list that begins with "Fred". If an item is found, it is selected. If the item is not found, the autocompletion list closes if auto-hide is true (see AutoCAutoHide).
The current selection index can be retrieved with AutoCompleteCurrent.
(Read only property)

### 157.2.341 AutoCompleteCurrentText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieves the current selected text in the autocompletion list.
**Notes:** Normally the AutoCompletion event is used instead.

The value is copied to the text buffer or if not found, an empty string is returned.
(Read only property)

### 157.2.342 AutoCompleteDropRestOfWord as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When an item is selected, any word characters following the caret are first erased if dropRestOf-Word is set true.
**Notes:** The default is false.
(Read and Write property)

### 157.2.343 AutoCompleteIgnoreCase as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, matching of characters to list members is case sensitive.
**Notes:** These method let you set and get case sensitivity.
(Read and Write property)

### 157.2.344 AutoCompleteMaxHeight as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the maximum number of rows that will be visible in an auto completion list.
**Notes:** If there are more rows in the list, then a vertical scrollbar is shown. The default is 5.
(Read and Write property)

### 157.2.345 AutoCompleteMaxWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the maximum width of an auto completion list expressed as the number of characters in the longest item that will be totally visible.
**Notes:** If zero (the default) then the list's width is calculated to fit the item with the most characters. Any items that cannot be fully displayed within the available width are indicated by the presence of ellipsis.
(Read and Write property)

### 157.2.346 AutoCompleteMulti as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to auto complete multiple selections.
**Notes:** When auto completing with multiple selections present, the auto completed text can go into just the main selection with kMultiAutoCompleteOnce (0) or into each selection with kMultiAutoCompleteEach (1). The default is kMultiAutoCompleteOnce.
(Read and Write property)

### 157.2.347 AutoCompleteOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set options for auto completion.
**Notes:** See kAutoCompleteOption* constants.
(Read and Write property)

### 157.2.348 AutoCompleteOrder as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The default setting kOrderingPreSorted (0) requires that the list be provided in alphabetical sorted order.
**Notes:** Sorting the list can be done by Scintilla instead of the application with kOrderingPerformSort (1). This will take additional time.
Applications that wish to prioritize some values and show the list in order of priority instead of alphabetical order can use kOrderingCustom (2). This requires extra processing in AutoCompleteShow to create a sorted index.
Setting the order should be done before calling AutoCompleteShow.
(Read and Write property)

### 157.2.349 AutoCompleteSeparator as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the separator character used to separate words in the AutoCompleteShow list.
**Notes:** The default is the space character.
(Read and Write property)

### 157.2.350 AutoCompleteTypeSeparator as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or get the type separator for auto complete.
**Notes:** (Read and Write property)

### 157.2.351 AutomaticFold as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The automatic folding behavior.
**Notes:** The fundamental operation in folding is making lines invisible or visible. Line visibility is a property of the view rather than the document so each view may be displaying a different set of lines. From the point of view of the user, lines are hidden and displayed using fold points. Generally, the fold points of a document are based on the hierarchical structure of the document contents. In Python, the hierarchy is determined by indentation and in C++ by brace characters. This hierarchy can be represented within a Scintilla document object by attaching a numeric "fold level" to each line. The fold level is most easily set by a lexer, but you can also set it with method.

It is up to your code to set the connection between user actions and folding and unfolding. The best way to see how this is done is to search the SciTE source code for the methods used in this section of the documentation and see how they are used. You will also need to use markers and a folding margin to complete your folding implementation. The "fold" property should be set to "1" with SetProperty("fold", "1") to enable folding.

Instead of implementing all the logic for handling folding in the container, Scintilla can provide behaviour that is adequate for many applications. The automaticFold argument is a bit set defining which of the 3 pieces of folding implementation should be enabled. Most applications should be able to use the kAutomaticFoldShow and kAutomaticFoldChange flags unless they wish to implement quite different behaviour such as defining their own fold structure. kAutomaticFoldClick is more likely to be set off when an application would like to add or change click behaviour such as showing method headers only when Shift+Alt is used in conjunction with a click.
(Read and Write property)

### 157.2.352 BackSpaceUnIndents as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether backspace unindents.
**Notes:** Inside indentation white space, the tab and backspace keys can be made to indent and unindent rather than insert a tab character or delete a character with the TabIndents and BackSpaceUnIndents functions.
(Read and Write property)

### 157.2.353 Bidirectional as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or queries bidirectional support.
**Notes:** The bidirectional features in Scintilla are experimental and incomplete.

Some languages, like Arabic and Hebrew, are written from right to left instead of from left to right as English is. Documents that use multiple languages may contain both directions and this is termed "bidirectional". The default text direction may be right to left or left to right. Scintilla only correctly displays bidirectional text on some platforms. Currently, there is experimental support for bidirectional text on Win32 using DirectWrite and on macOS using Cocoa. Only UTF-8 documents will show bidirectional behaviour and only in kBidirectionalL2R mode. Some features, such as virtual space may not work with bidirectional text or may work only in some circumstances. kBidirectionalR2L may be implemented in the future.

There are additional processing and storage costs to bidirectional text. As some applications may not want to pay the costs, bidirectional support must be explicitly enabled by calling Bidirectional = kBidirectionalL2R (1) which chooses left to right as the default direction or Bidirectional = kBidirectionalR2L (2) for default right to left.

On Win32, this should be done after setting the technology to kTechnologyDirectWrite, kTechnologyDirectWriteRetain, or kTechnologyDirectWriteDC.

If the call succeeded Bidirectional query will return the same value otherwise kBidirectionalDisabled (0) is returned.
(Read and Write property)

### 157.2.354 CallTipActive as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if a call tip is active and false if it is not active.
**Notes:** (Read only property)

### 157.2.355 CallTipPosStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This property returns or sets the value of the current position when CallTipShow started to display the tip.
**Notes:** (Read and Write property)

### 157.2.356 CanPaste as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether clipboard has text and paste can be performed.
**Notes:** Returns false if document is read only or selection contains protected text.
(Read only property)

### 157.2.357 CanRedo as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether Undo was performed and a Redo step is possible.
**Notes:** You could typically use the result of this property to enable/disable the Edit menu Redo command.
(Read only property)

### 157.2.358 CanUndo as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether undo stack contains data and can be used to undo.
**Notes:** You would typically use the result of this property to enable/disable the Edit menu Undo command.
(Read only property)

### 157.2.359 CaretForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour of the caret.
**Example:**

```
dim ScintillaEditor as ScintillaControlMBS // your control

// set cursor width and color

ScintillaEditor.CaretForeColor = Color.HighlightColor
ScintillaEditor.CaretWidth = 8
```

**Notes:** (Read and Write property)

### 157.2.360 CaretLineBackAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The caret line be drawn translucently which allows other background colours to show through.
**Notes:** hTis is done by setting the alpha (translucency) value by calling CaretLineBackAlpha. When the alpha is not kAlphaNoAlpha, the caret line is drawn after all other features so will affect the colour of all other features.
(Read and Write property)

### 157.2.361 CaretLineBackColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The background colour of the line containing the caret different
**Notes:** Set the desired background colour with CaretLineBackColor, then use CaretLineVisible = true to enable the effect. You can cancel the effect with CaretLineVisible = false.
(Read and Write property)

### 157.2.362 CaretLineFrame as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** can be used to display the caret line framed instead of filling the whole background.
**Notes:** Set width <>0 to enable this option and width = 0 to disable it.
(Read and Write property)

### 157.2.363 CaretLineHighlightSubLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Choose to highlight only the subline containing the caret instead of the whole line.
**Notes:** Default behaviour CaretLineHighlightSubLine = false the whole caret line is highlighted.
(Read and Write property)

### 157.2.364 CaretLineLayer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can choose to make the background colour of the line containing the caret.
**Notes:** This effect may be drawn translucently over the text or opaquely on the base layer with CaretLineLayer. Background colouring has highest priority when a line has markers that would otherwise change

the background colour. When drawn translucently other background colours can show through.

See kLayer* constants.
(Read and Write property)

### 157.2.365 CaretLineVisible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether caret line is visible.
**Notes:** Set the desired background colour with CaretLineBackColor, then use CaretLineVisible = true to enable the effect. You can cancel the effect with CaretLineVisible = false.
(Read and Write property)

### 157.2.366 CaretLineVisibleAlways as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Choose to make the caret line always visible even when the window is not in focus.
**Notes:** Default behaviour false the caret line is only visible when the window is in focus.
(Read and Write property)

### 157.2.367 CaretPeriod as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The rate at which the caret blinks.
**Notes:** The rate at which the caret blinks can be set with CaretPeriod which determines the time in milliseconds that the caret is visible or invisible before changing state. Setting the period to 0 stops the caret blinking. The default value is 500 milliseconds.
(Read and Write property)

### 157.2.368 CaretSticky as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.
**Notes:** These messages set, get or toggle the caretSticky setting which controls when the last position of the caret on the line is saved.

When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default.

When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc).

When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..).

SCI_TOGGLECARETSTICKY switches from kCaretStickyOn and kCaretStickyWhiteSpace to kCaretStickyOff and from kCaretStickyOff to kCaretStickyOn.
(Read and Write property)

### 157.2.369 CaretStyle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The style of the caret.
**Notes:** There are separate styles for insert mode (lower 4-bits, kCaretStyleInsMask) and overtype mode (bit 4).

See kCaretStyle* constants.

The block caret draws most combining and multibyte character sequences successfully, though some fonts like Thai Fonts (and possibly others) can sometimes appear strange when the cursor is positioned at these characters, which may result in only drawing a part of the cursor character sequence. This is most notable on Windows platforms.
(Read and Write property)

### 157.2.370 CaretWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of the line caret.
**Example:**

```
dim ScintillaEditor as ScintillaControlMBS // your control

// set cursor width and color
```

ScintillaEditor.CaretForeColor = Color.HighlightColor
ScintillaEditor.CaretWidth = 8

**Notes:** can be set to a value of between 0 and 20 pixels. The default width is 1 pixel.

A width of 0 makes the caret invisible, similar to setting the caret style to kCaretStyleInvisible (though not interchangeable). This setting only affects the width of the cursor when the cursor style is set to line caret mode, it does not affect the width for a block caret.
(Read and Write property)

### 157.2.371 CharacterCategoryOptimization as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Optimize speed of character category features like determining whether a character is a space or number at the expense of memory.
**Notes:** Mostly used for Unicode documents. The countCharacters parameter determines how many character starting from 0 are added to a look-up table with one byte used for each character. It is reasonable to cover the set of characters likely to be used in a document so &h100 for simple Roman text, &h1000 to cover most simple alphabets, &h10000 to cover most of East Asian languages, and &h110000 to cover all possible characters.
(Read and Write property)

### 157.2.372 ControlCharSymbol as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The mnemonics may be replaced by a nominated symbol with an ASCII code in the range 32 to 255.
**Notes:** If you set a symbol value less than 32, all control characters are displayed as mnemonics. The symbol you set is rendered in the font of the style set for the character.

The default symbol value is 0.
(Read and Write property)

### 157.2.373 CurrentLine as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This retrieves the text of the line containing the caret and returns the position within the line of the caret.

**Notes:** (Read only property)

### 157.2.374 Cursor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current mouse cursor.
**Notes:** The cursor is normally chosen in a context sensitive way, so it will be different over the margin than when over the text. When performing a slow action, you may wish to change to a wait cursor. You set the cursor type with assignment to this property.
See kCursorShape* constants.

Cursor values 1 through 7 have defined cursors, but only kCursorShapeWait is usefully controllable. Other values of cursorType cause a pointer to be displayed. Reading the cursor property returns the last cursor type you set, or kCursorShapeNormal (-1) if you have not set a cursor type.
(Read and Write property)

### 157.2.375 DefaultFoldDisplayText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the default text displayed at the right of the folded text.
**Notes:** (Read and Write property)

### 157.2.376 DescribeKeyWordSets as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A description of all of the keyword sets separated by LF.
**Notes:** (Read only property)

### 157.2.377 DocumentOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The documentation options used to create the document.
**Notes:** (Read only property)

### 157.2.378 EdgeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the colour of the marker used to show that a line has exceeded the length set by EdgeColumn property.
**Notes:** (Read and Write property)

### 157.2.379 EdgeColumn as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the column number at which to display the long line marker.
**Notes:** When drawing lines, the column sets a position in units of the width of a space character in kStylesCommonDefault. When setting the background colour, the column is a character count (allowing for tabs) into the line.
(Read and Write property)

### 157.2.380 EdgeMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the mode used to display long lines.
**Notes:** You can choose to mark lines that exceed a given length by drawing a vertical line or by colouring the background of characters that exceed the set length.

See kEdgeVisualStyle* constants.
(Read and Write property)

### 157.2.381 EndAtLastLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** EndAtLastLine sets the scroll range so that maximum scroll position has the last line at the bottom of the view (default).
**Notes:** Setting this to false allows scrolling one page below the last line.
(Read and Write property)

### 157.2.382 EOLAnnotationVisible as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the annotation display mode.
**Notes:** End of Line Annotations can be made visible in a view and there is a choice of display style when visible.

See kEOLAnnotationVisible* constants.
(Read and Write property)

### 157.2.383 EOLMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the characters that are added into the document when the user presses the Enter key.
**Notes:** You can set eolMode to one of kEndOfLineCRLF (0), kEndOfLineCR (1), or kEndOfLineLF (2).

Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.
(Read and Write property)

### 157.2.384 ExtraAscent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The extra ascent.
**Notes:** Text is drawn with the base of each character on a 'baseline'. The height of a line is found from the maximum that any style extends above the baseline (its 'ascent'), added to the maximum that any style extends below the baseline (its 'descent'). Space may be added to the maximum ascent (ExtraAscent) and the maximum descent (ExtraDescent) to allow for more space between lines. This may done to make the text easier to read or to accommodate underlines or highlights.

The extra ascent and descent values can be negative but that should be done with care as it may lead to unexpected interference when lines share space.
(Read and Write property)

### 157.2.385 ExtraDescent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The extra descent.
**Notes:** Text is drawn with the base of each character on a 'baseline'. The height of a line is found from the maximum that any style extends above the baseline (its 'ascent'), added to the maximum that any style extends below the baseline (its 'descent'). Space may be added to the maximum ascent (ExtraAscent) and the maximum descent (ExtraDescent) to allow for more space between lines. This may done to make the text easier to read or to accommodate underlines or highlights.

The extra ascent and descent values can be negative but that should be done with care as it may lead to unexpected interference when lines share space.
(Read and Write property)

### 157.2.386 FirstVisibleLine as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve or set the line number of the first visible line in the Scintilla view.
**Notes:** The first line in the document is numbered 0. The value is a visible line rather than a document line.
(Read and Write property)

### 157.2.387 Focus as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether we have focus.
**Notes:** Scintilla can be told to grab the focus with GrabFocus. This is needed more on GTK where focus handling is more complicated than on Windows.
The internal focus flag can be set with Focus. This is used by clients that have complex focus requirements such as having their own window that gets the real focus but with the need to indicate that Scintilla has the logical focus.
(Read and Write property)

### 157.2.388 FoldDisplayTextStyle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Changes the appearance of fold text tags.
**Notes:** (Read and Write property)

### 157.2.389 FontLocale as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set the locale used for font selection with language-dependent glyphs.
**Notes:** It may, depending on platform and other circumstances influence the display of text, so setting "zh-Hant" may result in traditional Chinese display and "zh-Hans" may result in simplified Chinese display. It is currently only implemented for Win32 using DirectWrite where the value is passed as the localeName argument to CreateTextFormat. The default value is US English "en-us".
(Read and Write property)

### 157.2.390 FontQuality as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Manage font quality (antialiasing method).
**Notes:** See kFontQualityQuality* constants.
(Read and Write property)

### 157.2.391 HasBorder as Boolean

MBS Scintilla Plugin, Plugin Version: 22.4, Platform: Windows, Targets: Desktop only.

**Function:** Enable/disable border for Windows.
**Notes:** If this flag is set before the control is constructed, you get the control instated on Windows with a border line.
(Read and Write property)

### 157.2.392 HighlightGuide as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When brace highlighting occurs, the indentation guide corresponding to the braces may be highlighted with the brace highlighting style, kStylesCommonBraceLight (34).
**Notes:** Set column to 0 to cancel this highlight.
(Read and Write property)

### 157.2.393 HotspotActiveBack as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries background color for hotspot.
**Notes:** (Read only property)

### 157.2.394 HotspotActiveFore as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries foreground color for hotspot.
**Notes:** (Read only property)

### 157.2.395 HotspotActiveUnderline as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** While the cursor hovers over text in a style with the hotspot attribute set, this option shows underline.
**Notes:** (Read and Write property)

### 157.2.396 HotspotSingleLine as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Single line mode stops a hotspot from wrapping onto next line.
**Notes:** (Read and Write property)

### 157.2.397 HScrollBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The horizontal scroll bar is only displayed if it is needed for the assumed width.
**Notes:** If you never wish to see it, call HScrollBar = false. Use HScrollBar = true to enable it again. Querying HScrollBar returns the current state. The default state is to display it when needed.
(Read and Write property)

### 157.2.398 IdleStyling as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The idel styling setting.
**Notes:** By default, kIdleStylingNone (0), syntax styling is performed for all the currently visible text before

displaying it. On very large files, this may make scrolling down slow. With kIdleStylingToVisible (1), a small amount of styling is performed before display and then further styling is performed incrementally in the background as an idle-time task. This may result in the text initially appearing uncoloured and then, some time later, it is coloured. Text after the currently visible portion may be styled in the background with kIdleStylingAfterVisible (2). To style both before and after the visible text in the background use kIdleStylingAll (3).
Since wrapping also needs to perform styling and also uses idle time, this setting has no effect when the document is displayed wrapped.
(Read and Write property)

### 157.2.399 IMEInteraction as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Configures IME interaction.
**Notes:** When entering text in Chinese, Japanese, or Korean an Input Method Editor (IME) may be displayed. The IME may be an extra window appearing above Scintilla or may be displayed by Scintilla itself as text. On some platforms there is a choice between the two techniques. A windowed IME kIMEInteractionWindowed (0) may be more similar in appearance and behaviour to the IME in other applications. An inline IME kIMEInteractionInline (1) may work better with some Scintilla features such as rectangular and multiple selection.
The windowed behaviour can be chosen with IMEInteraction = kIMEInteractionWindowed and the inline behaviour with IMEInteraction = kIMEInteractionInline. Scintilla may ignore this call in some cases. For example, the inline behaviour might only be supported for some languages.
When the inline IME mode is active, characters are added tentatively before being finalised and an CharacterAdded event (with characterSource set to kCharacterSourceTentativeInput) is sent for each character.
(Read and Write property)

### 157.2.400 Indent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the size of indentation in terms of the width of a space in KStylesCommonDefault.
**Notes:** If you set a width of 0, the indent size is the same as the tab size. There are no limits on indent sizes, but values less than 0 or large values may have undesirable effects.

Indentation (the white space at the start of a line) is often used by programmers to clarify program structure and in some languages, for example Python, it may be part of the language syntax. Tabs are normally used in editors to insert a tab character or to pad text with spaces up to the next tab.
When Scintilla is laying out a section of text, text after a tab character will usually be displayed at the next multiple of TabWidth columns from the left. However, it is also possible to explicitly set tabstops in pixels for each line.
Scintilla can be set to treat tab and backspace in the white space at the start of a line in a special way: inserting a tab indents the line to the next indent position rather than just inserting a tab at the current

character position and backspace unindents the line rather than deleting a character. Scintilla can also display indentation guides (vertical lines) to help you to generate code.
(Read and Write property)

### 157.2.401 IndentationGuides as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Indentation guides are dotted vertical lines that appear within indentation white space every indent size columns.
**Notes:** They make it easy to see which constructs line up especially when they extend over multiple pages. Style kStylesCommonIndentGuide (37) is used to specify the foreground and background colour of the indentation guides.
There are 4 indentation guide views. kIndentViewNone turns the feature off but the other 3 states determine how far the guides appear on empty lines.
(Read and Write property)

### 157.2.402 IndicatorCurrent as ScintillaIndicatorMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current indicator.
**Notes:** (Read and Write property)

### 157.2.403 IndicatorValue as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the value that will be set by calls to IndicatorFillRange.
**Notes:** (Read and Write property)

### 157.2.404 LayoutCache as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable layout cache.
**Notes:** (Read and Write property)

### 157.2.405 Length as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The length of the document in bytes.
**Notes:** (Read only property)

### 157.2.406 LexerLanguage as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns the name of the current lexer.
**Notes:** (Read only property)

### 157.2.407 LibraryError as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The error message from loading the library.
**Notes:** (Read only property)

### 157.2.408 LineCharacterIndex as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns which if any indexes are active.
**Notes:** (Read only property)

### 157.2.409 LineCount as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the number of lines in the document.
**Notes:** An empty document contains 1 line. A document holding only an end of line sequence has 2 lines.
(Read only property)

### 157.2.410 LineEndTypesActive as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports the set of line ends currently interpreted by Scintilla.
**Notes:** It is LineEndTypesSupported and LineEndTypesAllowed.

See kLineEndType* constants.
(Read only property)

### 157.2.411 LineEndTypesAllowed as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, only the ASCII line ends are interpreted.
**Notes:** Unicode line ends may be requested with LineEndTypesAllowed = kLineEndTypeUnicode but this will be ineffective unless the lexer also allows you Unicode line ends.

See kLineEndType* constants.
(Read and Write property)

### 157.2.412 LineEndTypesSupported as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Reports the different types of line ends supported by the current lexer.
**Notes:** This is a bit set although there is currently only a single choice with either kLineEndTypeDefault (0) or kLineEndTypeUnicode (1). These values are also used by the other messages concerned with Unicode line ends.

See kLineEndType* constants.
(Read only property)

### 157.2.413 LinesOnScreen as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the number of complete lines visible on the screen.
**Notes:** With a constant line height, this is the vertical space available divided by the line separation. Unless you arrange to size your window to an integral number of lines, there may be a partial line visible at the bottom of the view.
(Read only property)

### 157.2.414 MainSelection as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries index of main selection.
**Notes:** One of the selections is the main selection which is used to determine what range of text is automatically visible. The main selection may be displayed in different colours or with a differently styled caret. Only an already existing selection can be made main.
(Read and Write property)

### 157.2.415 MarginLeft as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the width of the blank margin on left side of the text in pixels.
**Notes:** The default is to one pixel on each side.
(Read and Write property)

### 157.2.416 MarginOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Define margin options by enabling appropriate bit flags.
**Notes:** At the moment, only one flag is available kMarginOptionSubLineSelect = 1, which controls how wrapped lines are selected when clicking on margin in front of them. If kMarginOptionSubLineSelect is set only sub line of wrapped line is selected, otherwise whole wrapped line is selected. Margin options are set to kMarginOptionNone=0 by default.
(Read and Write property)

### 157.2.417 MarginRight as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the width of the blank margin on right side of the text in pixels.
**Notes:** The default is to one pixel on each side.
(Read and Write property)

### 157.2.418 Margins as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Allocate the number of margins or find the number of margins currently allocated.
**Notes:** (Read and Write property)

### 157.2.419 MaxLineState as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns the last line that has any line state.
**Notes:** (Read only property)

### 157.2.420 ModEventMask as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The modification event masks.
**Notes:** Set and get an event mask that determines which document change events are notified to the container with Modify event. For example, a container may decide to see only notifications about changes to text and not styling changes by setting ModEventMask = kModificationFlagsInsertText + kModificationFlagsDeleteText.
(Read and Write property)

### 157.2.421 Modify as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if the document is modified and false if it is unmodified.
**Notes:** The modified status of a document is determined by the undo position relative to the save point. The save point is set by SetSavePoint, usually when you have saved data to a file.
If you need to be notified when the document becomes modified, Scintilla notifies the container that it has entered or left the save point with the SavePointReached and SavePointLeft notification messages.

(Read only property)

### 157.2.422 MouseDownCaptures as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When the mouse is pressed inside Scintilla, it is captured so future mouse movement events are sent to Scintilla.
**Notes:** This behaviour may be turned off with MouseDownCaptures = false.
(Read and Write property)

### 157.2.423 MouseDwellTime as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The time the mouse must sit still, in milliseconds, to generate a DWellStart event.
**Notes:** If set to kTimeForever, the default, no dwell events are generated.
(Read and Write property)

### 157.2.424 MouseSelectionRectangularSwitch as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable the ability to switch to rectangular selection mode while making a selection with the mouse.
**Notes:** When this option is turned on, mouse selections in stream mode can be switched to rectangular mode by pressing the corresponding modifier key. They then stick to rectangular mode even when the modifier key is released again. When this option is turned off, mouse selections will always stick to the mode the selection was started in. It is off by default.
(Read and Write property)

### 157.2.425 MouseWheelCaptures as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to capture mouse wheel events.
**Notes:** On Windows, Scintilla captures all WM_MOUSEWHEEL messages if it has the focus, even if the mouse pointer is nowhere near the Scintilla editor window. This behaviour can be changed with MouseWheelCaptures = false so that Scintilla passes the WM_MOUSEWHEEL messages to its parent window. Scintilla will still react to the mouse wheel if the mouse pointer is over the editor window.

(Read and Write property)

### 157.2.426 MoveExtendsSelection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if regular caret moves will extend or reduce the selection, false if not.
**Notes:** SetSelectionMode toggles this setting between on and off.
(Read only property)

### 157.2.427 MultiPaste as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** How to do paste with multiple selection.
**Notes:** When pasting into multiple selections, the pasted text can go into just the main selection with kMultiPasteOnce=0 or into each selection with kMultiPasteEach=1. kMultiPasteOnce is the default.
(Read and Write property)

### 157.2.428 MultipleSelection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Enable or disable multiple selection.
**Notes:** When multiple selection is disabled, it is not possible to select multiple ranges by holding down the Ctrl key while dragging with the mouse.

There may be multiple selections active at one time. More selections are made by holding down the Ctrl key while dragging with the mouse. The most recent selection is the main selection and determines which part of the document is shown automatically. Any selection apart from the main selection is called an additional selection. The calls in the previous section operate on the main selection. There is always at least one selection. The selection can be simplified down to just the main selection by Cancel which is normally mapped to the Esc key.

Rectangular selections are handled as multiple selections although the original rectangular range is remembered so that subsequent operations may be handled differently for rectangular selections. For example, pasting a rectangular selection places each piece in a vertical column.

Virtual space is space beyond the end of each line. The caret may be moved into virtual space but no real space will be added to the document until there is some text typed or some other text insertion command

is used.

When discontiguous selections are copied to the clipboard, each selection is added to the clipboard text in order with no delimiting characters. For rectangular selections the document's line end is added after each line's text. Rectangular selections are always copied from top line to bottom, not in the in order of selection.Virtual space is not copied.
(Read and Write property)

### 157.2.429 NamedStyles as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the number of named styles for the lexer.
**Notes:** (Read only property)

### 157.2.430 NSView as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Cocoa view for macOS.
**Notes:** Object is from NSViewMBS class.
(Read only property)

### 157.2.431 Overtype as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** When overtype is enabled, each typed character replaces the character to the right of the text caret.
**Notes:** When overtype is disabled, characters are inserted at the caret. Returns true if overtyping is active, otherwise false will be returned.
(Read and Write property)

### 157.2.432 PasteConvertEndings as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to match end of line on pasting.
**Notes:** If this property is set then when text is pasted any line ends are converted to match the document's end of line mode as set with EOLMode. Defaults to true.

(Read and Write property)

### 157.2.433 Position as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The current position.
**Notes:** This sets the current position and creates a selection between the anchor and the current position. The caret is not scrolled into view.
(Read and Write property)

### 157.2.434 PositionCache as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size in entries of the position cache.
**Notes:** The position cache stores position information for short runs of text so that their layout can be determined more quickly if the run recurs.
(Read and Write property)

### 157.2.435 PrintColourMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the method used to render coloured text on a printer that is probably using white paper.
**Notes:** It is especially important to consider the treatment of colour if you use a dark or black screen background. Printing white on black uses up toner and ink very many times faster than the other way around. See kPrintOption* constants.
(Read and Write property)

### 157.2.436 PrintMagnification as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Lets you to print at a different size than the screen font.
**Notes:** magnification is the number of points to add to the size of each screen font. A value of -3 or -4 gives reasonably small print.
(Read and Write property)

### 157.2.437 PrintWrapMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get and set the printer wrap mode.
**Notes:** wrapMode can be set to kWrapNone (0) or kWrapWord (1). The default is kWrapWord, which wraps printed output so that all characters fit into the print rectangle. If you set kWrapNone, each line of text generates one line of output and the line is truncated if it is too long to fit into the print area.
kWrapWord tries to wrap only between words as indicated by white space or style changes although if a word is longer than a line, it will be wrapped before the line end.
kWrapChar is not supported for printing.
(Read and Write property)

### 157.2.438 PropertyNames as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Returns a string with all of the valid properties separated by LF.
**Notes:** If the lexer does not support this call then an empty string is returned.
(Read only property)

### 157.2.439 PunctuationChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Similar to WordChars and WhiteSpaceChars, this message allows the user to define which chars Scintilla considers as punctuation.
**Notes:** (Read and Write property)

### 157.2.440 ReadOnly as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the read-only flag for the document.
**Notes:** If you mark a document as read only, attempts to modify the text cause the ModifyAttemptRead-Only event.
(Read and Write property)

### 157.2.441 RectangularSelectionAnchor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position for the anchor of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.2.442 RectangularSelectionAnchorVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.2.443 RectangularSelectionCaret as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position for the caret of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.

There may be multiple selections active at one time. More selections are made by holding down the Ctrl key while dragging with the mouse. The most recent selection is the main selection and determines which part of the document is shown automatically. Any selection apart from the main selection is called an additional selection. The calls in the previous section operate on the main selection. There is always at least one selection. The selection can be simplified down to just the main selection by Cancel which is normally mapped to the Esc key.

Rectangular selections are handled as multiple selections although the original rectangular range is remembered so that subsequent operations may be handled differently for rectangular selections. For example, pasting a rectangular selection places each piece in a vertical column.

Virtual space is space beyond the end of each line. The caret may be moved into virtual space but no real space will be added to the document until there is some text typed or some other text insertion command is used.

When discontiguous selections are copied to the clipboard, each selection is added to the clipboard text in order with no delimiting characters. For rectangular selections the document's line end is added after each line's text. Rectangular selections are always copied from top line to bottom, not in the in order of selection.Virtual space is not copied.
(Read and Write property)

### 157.2.444 RectangularSelectionCaretVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of the rectangular selection.
**Notes:** After setting the rectangular selection, this is broken down into multiple selections, one for each line.
(Read and Write property)

### 157.2.445 RectangularSelectionModifier as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** On GTK and Qt, the key used to indicate that a rectangular selection should be created when combined with a mouse drag can be set.
**Notes:** The three possible values are kKeyModCtrl=2, kKeyModAlt=4 (default) or kKeyModSuper=8. Since kKeyModAlt may already be used by a window manager, the window manager may need configuring to allow this choice. kKeyModSuper is often a system dependent modifier key such as the Left Windows key on a Windows keyboard or the Command key on a Mac.
(Read and Write property)

### 157.2.446 ScrollWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** For performance, Scintilla does not measure the display width of the document to determine the properties of the horizontal scroll bar.
**Notes:** Instead, an assumed width is used. These messages set and get the document width in pixels assumed by Scintilla. The default value is 2000. To ensure the width of the currently visible lines can be scrolled use ScrollWidthTracking.
(Read and Write property)

### 157.2.447 ScrollWidthTracking as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If scroll width tracking is enabled then the scroll width is adjusted to ensure that all of the lines currently displayed can be completely scrolled.
**Notes:** This mode never adjusts the scroll width to be narrower.
(Read and Write property)

### 157.2.448 SearchFlags as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** These get and set the searchFlags used by SearchInTarget.
**Notes:** There are several option flags including a simple regular expression search.
See kFindOption* constants.
(Read and Write property)

### 157.2.449 SelAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or gets selection alpha value.
**Notes:** (Read and Write property)

### 157.2.450 SelectedText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This copies the currently selected text.
**Notes:** This allows for rectangular and discontiguous selections as well as simple selections. See Multiple Selection for information on how multiple and rectangular selections and virtual space are copied.
(Read only property)

### 157.2.451 SelectionEmpty as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return true if every selected range is empty else false.
**Notes:** This can be used as CanCopy or CanCut for building menu.
(Read only property)

### 157.2.452 SelectionEnd as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The end position of the selection.
**Notes:** SelectionStart and SelectionEnd return the start and end of the selection without regard to which end is the current position and which is the anchor. SelectionStart returns the smaller of the current position or the anchor position. SelectionEnd returns the larger of the two values.

Assign new value to set the selection based on the assumption that the anchor position is less than the current position.
(Read and Write property)

### 157.2.453 SelectionIsRectangle as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This returns true if the current selection is in rectangle mode, false if not.
**Notes:** (Read only property)

### 157.2.454 SelectionLayer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection background can be drawn translucently over the text or opaquely on the base layer.
**Notes:** See kLayer* constants.
(Read and Write property)

### 157.2.455 SelectionMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection mode.
**Notes:** Can be stream (kSelectionModeStream=0) or rectangular (kSelectionModeRectangle=1) or by lines (kSelectionModeLines=2) or thin rectangular (kSelectionModeThin=3). When set in these modes, regular caret moves will extend or reduce the selection, until the mode is cancelled by a call with same value or with Cancel. The get function returns the current mode even if the selection was made by mouse or with regular extended moves. SC_SEL_THIN is the mode after a rectangular selection has been typed into and ensures that no characters are selected.
(Read and Write property)

### 157.2.456 Selections as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Return the number of selections currently active.
**Notes:** There is always at least one selection.
(Read only property)

### 157.2.457 SelectionSpan as ScintillaSpanMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries selection start and end as a span object.
**Notes:** (Read only property)

### 157.2.458 SelectionStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The start position of the selection.
**Notes:** SelectionStart and SelectionEnd return the start and end of the selection without regard to which end is the current position and which is the anchor. SelectionStart returns the smaller of the current position or the anchor position. SelectionEnd returns the larger of the two values.

Assign new value to set the selection based on the assumption that the anchor position is less than the current position.
(Read and Write property)

### 157.2.459 SelEOLFilled as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The selection can be drawn up to the right hand border by setting this property.
**Notes:** (Read and Write property)

### 157.2.460 ShowInfoBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to show info bar on macOS.
**Notes:** Defaults to true.
The info bar allows you to show a status message and to do zoom levels.
(Read and Write property)

### 157.2.461 Status as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** If an error occurs, Scintilla may set an internal error number that can be retrieved with this property.
**Notes:** To clear the error status call SCI_SETSTATUS(0). Status values from 1 to 999 are errors and status kStatusWarnStart (1000) and above are warnings.
See kStatus* constants.
(Read and Write property)

### 157.2.462 TabDrawMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get and set how tab characters are drawn when white space is visible.
**Notes:** See kTabDrawMode* constants.
(Read and Write property)

### 157.2.463 TabIndents as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether tab indents.
**Notes:** Inside indentation white space, the tab and backspace keys can be made to indent and unindent rather than insert a tab character or delete a character with the TabIndents and BackSpaceUnIndents functions.
(Read and Write property)

### 157.2.464 TabMinimumWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The minimum size of a tab in pixels to ensure that the tab can be seen.
**Notes:** The default value is 2. This is particularly useful with proportional fonts with fractional widths where the character before the tab may end a fraction of a pixel before a tab stop, causing the tab to only be a fraction of a pixel wide without this setting. Where displaying a miniaturized version of the document, setting this to 0 may make the miniaturized version lay out more like the normal size version.
(Read and Write property)

### 157.2.465 TabWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size of a tab as a multiple of the size of a space character in kStylesCommonDefault.

**Notes:** The default tab width is 8 characters. There are no limits on tab sizes, but values less than 1 or large values may have undesirable effects.
(Read and Write property)

### 157.2.466 TargetEnd as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End of target selection in text.
**Notes:** (Read and Write property)

### 157.2.467 TargetEndVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** End of the virtual space of target selection in text.
**Notes:** This allows text to be inserted in virtual space more easily.
(Read and Write property)

### 157.2.468 TargetSpan as ScintillaSpanMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Queries targert start and end as a span object.
**Notes:** (Read and Write property)

### 157.2.469 TargetStart as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Start of the virtual space of target selection in text.
**Notes:** This allows text to be inserted in virtual space more easily.
When searching you can set start greater than end to find the last matching text in the target rather than the first matching text.
The target is also set by a successful by SearchInTarget.
(Read and Write property)

### 157.2.470 TargetStartVirtualSpace as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Start of target selection in text.
**Notes:** When searching you can set start greater than end to find the last matching text in the target rather than the first matching text.
(Read and Write property)

### 157.2.471 TargetText as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the value in the target.
**Notes:** (Read only property)

### 157.2.472 Technology as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The technology property allows choosing between different drawing APIs and options.
**Notes:** On most platforms, the only choice is kTechnologyDefault (0). On Windows Vista or later, kTechnologyDirectWrite (1), kTechnologyDirectWriteRetain (2), or kTechnologyDirectWriteDC (3) can be chosen to use the Direct2D and DirectWrite APIs for higher quality antialiased drawing. kTechnologyDirectWriteRetain differs from kTechnologyDirectWrite by requesting that the frame is retained after being presented which may prevent drawing failures on some cards and drivers. kTechnologyDirectWriteDC differs from kTechnologyDirectWrite by using DirectWrite to draw into a GDI DC.
On Win32, buffered drawing is set to a reasonable value for the technology: on for GDI and off for Direct2D as Direct2D performs its own buffering. This can be changed after setting technology with BufferDraw property.
When using DirectWrite, you can use FontLocale to set an appropriate font locale to draw text with expected language-dependent glyphs.
(Read and Write property)

### 157.2.473 Text as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Get or set the text of the document.
**Notes:** (Read and Write property)

### 157.2.474 TextLength as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The length of the document in bytes.
**Notes:** (Read only property)

### 157.2.475 UndoCollection as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can control whether Scintilla collects undo information.
**Notes:** Set to true to collect information and false to stop collecting. If you stop collection, you should also use EmptyUndoBuffer to avoid the undo buffer being unsynchronized with the data in the buffer.

You might wish to turn off saving undo information if you use the Scintilla to store text generated by a program (a Log view) or in a display window where text is often deleted and regenerated.
(Read and Write property)

### 157.2.476 UseTabs as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Determines whether indentation should be created out of a mixture of tabs and spaces or be based purely on spaces.
**Notes:** Set useTabs to false (0) to create all tabs and indents out of spaces. The default is true. You can use Column() to get the column of a position taking the width of a tab into account.
(Read and Write property)

### 157.2.477 ViewEOL as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Normally, the end of line characters are hidden, but ViewEOL allows you to display (or hide) them by setting visible true (or false).
**Notes:** The visible rendering of the end of line characters is similar to (CR), (LF), or (CR+LF).

Scintilla can handle the major line end conventions and, depending on settings and the current lexer also support additional Unicode line ends.
Scintilla can interpret any of the Macintosh (CR), Unix (LF) and Windows (CR+LF) line ends. When the user presses the Enter key, one of these line end strings is inserted into the buffer. The default is CRL+LF in Windows and LF in Unix, but this can be changed with the EOLMode proeprty. You can also convert

the entire document to one of these line endings with ConvertEOLs. Finally, you can choose to display the line endings with ViewEOL.

For the UTF-8 encoding, three additional Unicode line ends, Next Line (NEL=U+0085), Line Separator (LS=U+2028), and Paragraph Separator (PS=U+2029) may optionally be interpreted when Unicode line ends is turned on and the current lexer also supports Unicode line ends.
(Read and Write property)

### 157.2.478 ViewWS as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** White space can be made visible which may be useful for languages in which white space is significant, such as Python.
**Example:**

```
dim c as ScintillaControlMBS // your control

// show white space
c.ViewWS = c.kWhiteSpaceVisibleAlways
```

**Notes:** Space characters appear as small centred dots and tab characters as light arrows pointing to the right. There are also ways to control the display of end of line characters. The two messages set and get the white space display mode.
See kWhiteSpaceVisible* constants.
(Read and Write property)

### 157.2.479 VirtualSpaceOptions as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Virtual space can be enabled or disabled for rectangular selections or in other circumstances or in both.
**Notes:** There are three bit flags kVirtualSpaceRectangularSelection=1, kVirtualSpaceUserAccessible=2, and kVirtualSpaceNoWrapLineStart=4 which can be set independently.
kVirtualSpaceNone=0, the default, disables all use of virtual space.
kVirtualSpaceNoWrapLineStart prevents left arrow movement and selection from wrapping to the previous line. This is most commonly desired in conjunction with virtual space but is an independent setting so works without virtual space.
(Read and Write property)

### 157.2.480 VScrollBar as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** By default, the vertical scroll bar is always displayed when required.
**Notes:** You can choose to hide or show it with VScrollBar property and get the current state with VScrollBar.
(Read and Write property)

### 157.2.481 WhitespaceChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The white space characters.
**Notes:** Similar to WordChars, this property allows the user to define which chars Scintilla considers as whitespace. Setting the whitespace chars allows the user to fine-tune Scintilla's behaviour doing such things as moving the cursor to the start or end of a word; for example, by defining punctuation chars as whitespace, they will be skipped over when the user presses ctrl+left or ctrl+right. This function should be called after WordChars as it will reset the whitespace characters to the default set. WhiteSpaceChars behaves similarly to WordChars.
(Read and Write property)

### 157.2.482 WhitespaceSize as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets the size of the dots used for mark space characters.
**Notes:** The value 0 is valid and makes the dots invisible.
(Read and Write property)

### 157.2.483 WordChars as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Defines which characters are members of the word category.
**Notes:** The character categories are set to default values before processing this function. For example, if you don't allow '_' in your set of characters use:
WordChars = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789"

This fills the characters parameter with all the characters included in words.
The characters parameter must be large enough to hold all of the characters. If the characters parameter is 0 then the length that should be allocated to store the entire set is returned.
For multi-byte encodings, this API will not return meaningful values for &h80 and above.

(Read and Write property)

### 157.2.484 WrapIndentMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Wrapped sublines can be indented to the position of their first subline or one more indent level.
**Notes:** The default is kWrapIndentModeFixed.
(Read and Write property)

### 157.2.485 WrapMode as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The wrap mode.
**Notes:** Set wrapMode to kWrapWord (1) to enable wrapping on word or style boundaries, kWrapChar (2) to enable wrapping between any characters, kWrapWhiteSpace (3) to enable wrapping on whitespace, and kWrapNone (0) to disable line wrapping. kWrapChar is preferred for Asian languages where there is no white space between words.

By default, Scintilla does not wrap lines of text. If you enable line wrapping, lines wider than the window width are continued on the following lines. Lines are broken after space or tab characters or between runs of different styles. If this is not possible because a word in one style is wider than the window then the break occurs after the last character that completely fits on the line. The horizontal scroll bar does not appear when wrap mode is on.

For wrapped lines Scintilla can draw visual flags (little arrows) at end of a a subline of a wrapped line and at begin of the next subline. These can be enabled individually, but if Scintilla draws the visual flag at the beginning of the next subline this subline will be indented by one char. Independent from drawing a visual flag at the begin the subline can have an indention.

Much of the time used by Scintilla is spent on laying out and drawing text. The same text layout calculations may be performed many times even when the data used in these calculations does not change. To avoid these unnecessary calculations in some circumstances, the line layout cache can store the results of the calculations. The cache is invalidated whenever the underlying data, such as the contents or styling of the document changes. Caching the layout of the whole document has the most effect, making dynamic line wrap as much as 20 times faster but this requires 7 times the memory required by the document contents plus around 80 bytes per line.

Wrapping is not performed immediately there is a change but is delayed until the display is redrawn. This delay improves performance by allowing a set of changes to be performed and then wrapped and displayed once. Because of this, some operations may not occur as expected. If a file is read and the scroll position

moved to a particular line in the text, such as occurs when a container tries to restore a previous editing session, then the scroll position will have been determined before wrapping so an unexpected range of text will be displayed. To scroll to the position correctly, delay the scroll until the wrapping has been performed by waiting for an initial Painted event.
(Read and Write property)

### 157.2.486 WrapStartIndent as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The size of indentation of sublines for wrapped lines.
**Notes:** WrapStartIndent sets the size of indentation of sublines for wrapped lines in terms of the average character width in kStylesCommonDefault. There are no limits on indent sizes, but values less than 0 or large values may have undesirable effects.
The indention of sublines is independent of visual flags, but if kWrapVisualFlagStart is set an indent of at least 1 is used.
(Read and Write property)

### 157.2.487 WrapVisualFlags as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can enable the drawing of visual flags to indicate a line is wrapped.
**Notes:** Bits set in wrapVisualFlags determine which visual flags are drawn.
See kWrapVisualFlag* constants.
(Read and Write property)

### 157.2.488 WrapVisualFlagsLocation as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can set whether the visual flags to indicate a line is wrapped are drawn near the border or near the text.
**Notes:** Bits set in wrapVisualFlagsLocation set the location to near the text for the corresponding visual flag.
See kWrapVisualLocation* constants.
(Read and Write property)

### 157.2.489 XOffset as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The xOffset is the horizontal scroll position in pixels of the start of the text view.
**Notes:** A value of 0 is the normal position with the first text column visible at the left of the view.

See FirstVisibleLine property for vertical position.
(Read and Write property)

### 157.2.490 Zoom as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The zoom factor directly.
**Notes:** There is no limit set on the factors you can set, so limiting yourself to -10 to +20 to match the incremental zoom functions is a good idea.

Scintilla incorporates a "zoom factor" that lets you make all the text in the document larger or smaller in steps of one point. The displayed point size never goes below 2, whatever zoom factor you set. You can set zoom factors in the range -10 to +20 points.
(Read and Write property)
See also:

- 157.2.564 Zoom 20679

### 157.2.491 AnnotationStyle(line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styles for a line.
**Notes:** The whole of the text annotation on a line may be displayed in a particular style with AnnotationStyle or each character may be individually styled with AnnotationStyles which uses an array of bytes with each byte setting the style of the corresponding text byte similar to SetStylingEx. The text must be set first as it specifies how long the annotation is so how many bytes of styling to read. Setting an annotation will cause a ChangeAnnotation event to be sent.

Only some style attributes are active in annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.2.492 AnnotationStyles(line as Integer) as MemoryBlock

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets styles for a line.

**Notes:** The whole of the text annotation on a line may be displayed in a particular style with AnnotationStyle or each character may be individually styled with AnnotationStyles which uses an array of bytes with each byte setting the style of the corresponding text byte similar to SetStylingEX. The text must be set first as it specifies how long the annotation is so how many bytes of styling to read. Setting an annotation will cause a ChangeAnnotation event to be sent.

Only some style attributes are active in annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.2.493 AnnotationText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A different string may be set for each line with AnnotationText.
**Notes:** Set to empty string to clear it.
(Read and Write computed property)

### 157.2.494 ElementColour(element as Integer) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This changes the colour of the indicated visual element overriding any current colour.
**Notes:** If the element supports translucency, then the alpha portion of the value is used. An opaque alpha value (&hff) should always be included when an opaque colour is desired as the value 0 is completely transparent and thus invisible.
(Read and Write computed property)

### 157.2.495 EOLAnnotationStyle(line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Gets or sets the style to use for the EOL annotation.
**Notes:** (Read and Write computed property)

### 157.2.496 EOLAnnotationText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A different string may be set for each line with EOLAnnotationText.
**Notes:** To clear end of line annotations assign EOLAnnotationText with a empty string. The whole of the

text EOLANNOTATION on a line may be displayed in a particular style with
EOLAnnotationStyle(). Setting an end of line annotation will cause a kModificationFlagsChangeEOLAnnotation notification to be sent.
Only some style attributes are active in end of line annotations: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.

End of Line Annotations are read-only lines of text at the end of each line of editable text. End of Line Annotations can be used to display an assembler version of code for debugging or to show diagnostic messages inline or to line up different versions of text in a merge tool.
(Read and Write computed property)

### 157.2.497 FoldExpanded(line as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the expanded state of a single line.
**Notes:** The set message has no effect on the visible state of the line or any lines that depend on it. It does change the markers in the folding margin. If you ask for the expansion state of a line that is outside the document, the result is false (0).

If you just want to toggle the fold state of one line and handle all the lines that are dependent on it, it is much easier to use ToggleFold. You would use the FolderExpanded() method to process many folds without updating the display until you had finished. See FoldAll() and Expand() for examples of the use of these methods.
(Read and Write computed property)

### 157.2.498 FoldLevel(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get a 32-bit value that contains the fold level of a line and some flags associated with folding.
**Notes:** The fold level is a number in the range 0 to kFoldLevelNumberMask (&h0FFF). However, the initial fold level is set to kFoldLevelBase (&h400) to allow unsigned arithmetic on folding levels. There are two addition flag bits. kFoldLevelWhiteFlag indicates that the line is blank and allows it to be treated slightly different then its level may indicate. For example, blank lines should generally not be fold points and will be considered part of the preceding section even though they may have a lesser fold level. kFoldLevelHeaderFlag indicates that the line is a header (fold point). kFoldLevelNone is a default level that may occur before folding.

Use FoldLevel(line) AND kFoldLevelNumberMask to get the fold level of a line. Likewise, use FoldLevel(line) AND kFoldLevelNumber*Flag to get the state of the flags. To set the fold level you must or in the associated flags. For instance, to set the level to thisLevel and mark a line as being a fold point use: FoldLevel(line) = thisLevel OR kFoldLevelHeaderFlag.

This method causes the display to redraw.
(Read and Write computed property)

### 157.2.499 KeyWords(keyWordSet as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The keyword list.
**Notes:** You can set up to 9 lists of keywords for use by the current lexer. keyWordSet can be 0 to 8 (actually 0 to KEYWORDSET_MAX) and selects which keyword list to replace. keyWords is a list of keywords separated by spaces, tabs, "\n" or "\r" or any combination of these. It is expected that the keywords will be composed of standard ASCII printing characters, but there is nothing to stop you using any non-separator character codes from 1 to 255 (except common sense).
How these keywords are used is entirely up to the lexer. Some languages, such as HTML may contain embedded languages, VBScript and JavaScript are common for HTML. For HTML, key word set 0 is for HTML, 1 is for JavaScript and 2 is for VBScript, 3 is for Python, 4 is for PHP and 5 is for SGML and DTD keywords. Review the lexer code to see examples of keyword list. A fully conforming lexer sets the fourth argument of the LexerModule constructor to be a list of strings that describe the uses of the keyword lists. Alternatively, you might use set 0 for general keywords, set 1 for keywords that cause indentation and set 2 for keywords that cause unindentation. Yet again, you might have a simple lexer that colours keywords and you could change languages by changing the keywords in set 0. There is nothing to stop you building your own keyword lists into the lexer, but this means that the lexer must be rebuilt if more keywords are added.
(Read and Write computed property)

### 157.2.500 LineIndentation(line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The amount of indentation on a line.
**Notes:** The indentation is measured in character columns, which correspond to the width of space characters.
(Read and Write computed property)

### 157.2.501 LineState(Line as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The state for each line.
**Notes:** As well as the 8 bits of lexical state stored for each character there is also an integer stored for each line. This can be used for longer lived parse states such as what the current scripting language is in an ASP page. Assign to LineState to set the integer value and query LineState() to get the value. Changing the

value produces a ChangeLineState event.
(Read and Write computed property)

### 157.2.502 MarginStyle(Line as Integer) as ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tyle for the margin on this line.
**Notes:** The style to use for the margin.
(Read and Write computed property)

### 157.2.503 MarginStyles(line as Integer) as MemoryBlock

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The styles for the margin on this line.
**Notes:** The MemoryBlock contains an array of bytes with each byte setting the style of the corresponding text byte similar to style index.
(Read and Write computed property)

### 157.2.504 MarginText(line as Integer) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The text for the margin on this line.
**Notes:** Text margins are created with the type kMarginTypeText or kMarginTypeRText. A different string may be set for each line with MarginText(). The whole of the text margin on a line may be displayed in a particular style with MarginStyle() or each character may be individually styled with MarginStyles() which uses an array of bytes with each byte setting the style of the corresponding text byte similar to style index. Setting a text margin will cause a kModificationFlagsChangeMargin notification to be sent.
Only some style attributes are active in text margins: font, size/sizeFractional, bold/weight, italics, fore, back, and characterSet.
(Read and Write computed property)

### 157.2.505 PropertyValue(Key as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or get properties.
**Notes:** Lookup a keyword:value pair using the specified key; if found, copy the value to the user-supplied buffer and return the length (not including the terminating 0). If not found, copy an empty string to the buffer and return 0.

If the value argument is 0 then the length that should be allocated to store the value is returned; again, the terminating 0 is not included.

You can communicate settings to lexers with keyword:value string pairs. There is no limit to the number of keyword pairs you can set, other than available memory. key is a case sensitive keyword, value is a string that is associated with the keyword. If there is already a value string associated with the keyword, it is replaced. If you pass a zero length string, the method does nothing. Both key and value are used without modification; extra spaces at the beginning or end of key are significant.
The value string can no longer refer to other keywords as was possible in older releases of Scintilla.

Lexers may only store values for keywords they support.
Currently the "fold" property is defined for most of the lexers to set the fold structure if set to "1". SCLEX_PYTHON understands "tab.timmy.whinge.level" as a setting that determines how to indicate bad indentation. Most keywords have values that are interpreted as integers. Search the lexer sources for GetPropertyInt to see how properties are used.
There is a convention for naming properties used by lexers so that the set of properties can be found by scripts. Property names should start with "lexer.<lexer>." or "fold.<lexer>." when they apply to one lexer or start with "lexer." or "fold." if they apply to multiple lexers.

Applications may discover the set of properties used by searching the source code of lexers for lines that contain GetProperty or DefineProperty and a double quoted string and extract the value of the double

quoted string as the property name. The lexilla/scripts/LexillaData.py script does this and can be used as an example. Documentation for the property may be located above the call as a multi-line comment starting with ,Ä®// property <property-name>
(Read and Write computed property)

### 157.2.506 Representation(encodedCharacter as String) as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Sets or gets a representation.
**Notes:** Some characters, such as control characters and invalid bytes, do not have a visual glyph or use a glyph that is hard to distinguish.

Control characters (characters with codes less than 32, or between 128 and 159 in some encodings) are displayed by Scintilla using their mnemonics inverted in a rounded rectangle. These mnemonics come from the early days of signalling, though some are still used (LF = Line Feed, BS = Back Space, CR = Carriage Return, for example).
For the low 'C0' values: "NUL", "SOH", "STX", "ETX", "EOT", "ENQ", "ACK", "BEL", "BS", "HT", "LF", "VT", "FF", "CR", "SO", "SI", "DLE", "DC1", "DC2", "DC3", "DC4", "NAK", "SYN", "ETB", "CAN", "EM", "SUB", "ESC", "FS", "GS", "RS", "US".
For the high 'C1' values: "PAD", "HOP", "BPH", "NBH", "IND", "NEL", "SSA", "ESA", "HTS", "HTJ", "VTS", "PLD", "PLU", "RI", "SS2", "SS3", "DCS", "PU1", "PU2", "STS", "CCH", "MW", "SPA", "EPA", "SOS", "SGCI", "SCI", "CSI", "ST", "OSC", "PM", "APC".
Invalid bytes are shown in a similar way with an 'x' followed by their value in hexadecimal, like "xFE".

Any character, including those normally displayed as mnemonics may be represented by a Unicode string inverted in a rounded rectangle.

For example, the Ohm sign ,Ñ¶ U+2126 looks very similar to the Greek Omega character Œ© U+03C9 so, for the UTF-8 encoding, to distinguish the Ohm sign as "U+2126 ,Ñ¶" this call could be made: Representation(",Ñ¶", "U+2126 ,Ñ¶")

The encodedCharacter parameter is a string of the bytes for one character in the current encoding. This can not be used to set a representation for multiple-character strings.
The representation parameter is an UTF-8 string with a maximum length of 200 bytes.

One exception to the single character restriction is that the two character sequence "CRLF" (Carriage Return + Line Feed) can have a representation that is visible in line end viewing (ViewEOL property) mode. If there is no representation for "CRLF" then the individual 'CR' and 'LF' representations will be seen.

The NULL (0) character is a special case and specified as an empty string.
(Read and Write computed property)

### 157.2.507 RepresentationAppearance(encodedCharacter as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The appearance may be changed using these flags.
**Notes:** If a colour is set and the appearance is set without RepresentationColour() then the representation will show in the colour of the underlying text.
(Read and Write computed property)

### 157.2.508 RepresentationColour(encodedCharacter as String) as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The colour and translucency of a representation may be set.
**Notes:** (Read and Write computed property)

### 157.2.509 SelectionNAnchor(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the anchor of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.2.510 SelectionNAnchorVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.2.511 SelectionNCaret(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.

(Read and Write computed property)

### 157.2.512 SelectionNCaretVirtualSpace(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the position and amount of virtual space for the caret of each already existing selection.
**Notes:** Selection parameter is zero based.
(Read and Write computed property)

### 157.2.513 SelectionNEnd(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** et or query the end position of each already existing selection.
**Notes:** Mostly of use to query each range for its text. The selection parameter is zero-based.
(Read and Write computed property)

### 157.2.514 SelectionNStart(selection as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set or query the start position of each already existing selection.
**Notes:** Mostly of use to query each range for its text. The selection parameter is zero-based.
(Read and Write computed property)

### 157.2.515 Events

### 157.2.516 AutoCompleteCancelled

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Auto complete was cancelled.

### 157.2.517 AutoCompleteCharacterDeleted

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user deleted a character while autocompletion list was active.

### 157.2.518 AutoCompleteCompleted(Position as Integer, Character as Integer, Text as String, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated after an autocompletion has inserted its text.
**Notes:**

| Parameter | Description |
|---|---|
| position | The start position of the word being completed. |
| text | The text of the selection. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. See the table below. |

| Symbol | Value | Meaning |
|---|---|---|
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |

### 157.2.519 AutoCompleteSelection(Position as Integer, Character as Integer, Text as String, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user has selected an item in an autocompletion list.
**Notes:** The event is sent before the selection is inserted. Automatic insertion can be cancelled by calling AutoCCancel method before returning from the event.

| Parameter | Description |
|---|---|
| position | The start position of the word being completed. |
| text | The text of the selection. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. See the table below. |

| Symbol | Value | Meaning |
|---|---|---|
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |

### 157.2.520 AutoCompleteSelectionChange(Position as Integer, Text as String, listType as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is sent when items are highlighted in an autocompletion or user list.
**Notes:**

| Field | Usage |
|---|---|
| listType | This is set to the listType parameter from the SCI_USERLISTSHOW message or 0 for an autocompletion. |
| text | The text of the selection. |
| position | The position the list was displayed at. |

### 157.2.521 CallTipClick(Position as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated when the user clicks on a calltip.
**Notes:** This event can be used to display the next function prototype when a function name is overloaded with different arguments. The position field is set to 1 if the click is in an up arrow, 2 if in a down arrow, and 0 if elsewhere.

### 157.2.522 CharacterAdded(Character as Integer, CharacterSource as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This is sent when the user types an ordinary text character (as opposed to a command character) that is entered into the text.
**Notes:** The container can use this to decide to display a call tip or an auto completion list.
For single byte character sets, this is the byte value of the character; for UTF-8, it is the Unicode code point; for DBCS, it is (first byte * 256 + second byte) for 2 byte characters and the byte value for 1 byte characters.
This notification is sent before the character has been styled so processing that depends on styling should instead be performed in the UpdateUI event.

| Symbol | Value | Meaning |
|---|---|---|
| kCharacterSourceDirectInput | 0 | Direct input characters, including characters generated by calling keyboard commands like NewLine method. |
| kCharacterSourceTentativeInput | 1 | Tentative input characters. They are used by IME (inline mode, see IMEInteraction) to composite final string, normally different from final composited string (which is the string that has been truly added into current document), and may be withdrawn when the user cancels typing (e.g. by pressing Esc key). Some system (at least Cocoa) also use tentative input for non-IME features like using dead key to composite diacritical marks (grave accent, etc.). These characters are not added to macro recording. Most applications can simply ignore the notification when this value is set. |
| kCharacterSourceImeResult | 2 | IME (either inline or windowed mode) full composited string. Modern IME is able to composite English word or sentence, when this value is set, current character may not a Chinese, Japanese or Korean character. Currently, this is only set on Windows. |

### 157.2.523 Close

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 157.2.524 Closing

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 157.2.525 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 157.2.526 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

You can use UsePopUp(kPopUpNever) to disable the contextual menu from Scintilla and use Xojo menus.

### 157.2.527 DoubleClick(Position as Integer, line as integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The mouse button was double clicked in editor.
**Notes:** The position parameter is set to the text position of the double click, the line parameter is set to the line of the double click, and the modifiers parameter is set to the key modifiers held down in a similar manner to Key event.

### 157.2.528 DWellEnd(Position as Integer, X as Integer, Y as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** DWellEnd is generated after a DWellStart and the mouse is moved or other activity such as key press indicates the dwell is over.

### 157.2.529 DWellStart(Position as Integer, X as Integer, Y as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** DWellStart is generated when the user keeps the mouse in one position for the dwell period (see MouseDwellTime).

### 157.2.530 EnableMenuItems

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 157.2.531 FocusIn

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is raised when Scintilla receives focus.
**Notes:** While the control can have a focus from the Xojo point of view, this event informs you that the actual text control part got focus.

So the Xojo wrapper control can have a focus and within it the text control can than have a focus and there are two different states.

### 157.2.532 FocusLost

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.

### 157.2.533 FocusOut

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is raised when it loses focus.

### 157.2.534 FocusReceived

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control got focus.
In older Xojo versions, this event is named GotFocus.

### 157.2.535 FolderToggled(Line as Integer, Position as Integer, Margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A folder was toggled due to a mouse click.
**Notes:** THis is called when a folder is hit.

MarginClicked event will also be raised.

### 157.2.536 GotFocus

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.

### 157.2.537 HotSpotClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user clicks on text that is in a style with the hotspot attribute set.
**Notes:** This event can be used to link to variable definitions or web pages. In the notification handler, you should avoid calling any function that modifies the current selection or caret position. The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key event. Only the state of the Ctrl key is reported for HotspotReleaseClick.

### 157.2.538 HotSpotDoubleCLick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user double clicks on text that is in a style with the hotspot attribute set.
**Notes:** This event can be used to link to variable definitions or web pages. In the notification handler, you should avoid calling any function that modifies the current selection or caret position. The position parameter is set the text position of the double click and the modifiers field set to the key modifiers held down in a similar manner to Key event. Only the state of the Ctrl key is reported for HotspotReleaseClick.

### 157.2.539 HotspotReleaseClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event are generated when the user clicks on text that is in a style with the hotspot attribute set.

### 157.2.540 IndicatorClick(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event is generated when the user clicks the mouse on text that has an indicator.
**Notes:** The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key.

### 157.2.541 IndicatorRelease(Position as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** These event is generated when the user releases the mouse on text that has an indicator.
**Notes:** The position parameter is set the text position of the click or double click and the modifiers field set to the key modifiers held down in a similar manner to Key.

### 157.2.542 Key(Character as Integer, modifiers as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Reports all keys pressed but not consumed by Scintilla.
**Notes:** Used on GTK because of some problems with keyboard focus and is not sent by the Windows version. Character holds the key code and modifiers holds the modifier flags. This notification is sent if the modifiers include kKeyModAlt or kKeyModCtrl and the key code is less than 256.

### 157.2.543 LostFocus

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.

### 157.2.544 MacroRecord(Message as Integer, wParam as Integer, lParam as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event for a new macro step to record.
**Notes:** The StartRecord and StopRecord method enable and disable macro recording. When enabled, each time a recordable change occurs, the MacroRecord event is sent to the container. It is up to the container

to record the action. To see the complete list of SCI_* messages that are recordable, search the Scintilla source Editor.cxx for Editor::NotifyMacroRecord.

| Field | Usage |
|---|---|
| message | The SCI_* message that caused the notification. |
| wParam | The value of wParam in the SCI_* message. |
| lParam | The value of lParam in the SCI_* message. |

### 157.2.545 MarginClick(Position as Integer, modifiers as Integer, margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event tell the container that the mouse was left clicked inside a margin that was marked as sensitive.
**Notes:** This can be used to perform folding or to place breakpoints.

| Field | Usage |
|---|---|
| modifiers | The appropriate combination of kKeyModShift, kKeyModCtrl and kKeyModAlt to indicate the keys that were held down at the time of the margin click. |
| position | The position of the start of the line in the document that corresponds to the margin click. |
| margin | The margin number that was clicked. |

### 157.2.546 MarginRightClick(Position as Integer, modifiers as Integer, margin as ScintillaMarginMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event tell the container that the mouse was right clicked inside a margin that was marked as sensitive.
**Notes:** This can be used to perform folding or to place breakpoints.

### 157.2.547 MenuBarSelected

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

| Field | Usage |
|---|---|
| modifiers | The appropriate combination of kKeyModShift, kKeyModCtrl and kKeyModAlt to indicate the keys that were held down at the time of the margin click. |
| position | The position of the start of the line in the document that corresponds to the margin click. |
| margin | The margin number that was clicked. |

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 157.2.548 Modified(Position as Integer, modificationType as Integer, Text as String, length as Integer, linesAdded as Integer, line as Integer, foldLevelNow as Integer, foldLevelPrev as Integer, token as Integer, annotationLinesAdded as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This notification is sent when the text or styling of the document changes or is about to change.
**Notes:** You can set a mask for the notifications that are sent to the container with ModEventMask. The parameters contains information about what changed, how the change occurred and whether this changed the number of lines in the document. No modifications may be performed while in a Modified event.

| Parameter | Usage |
|---|---|
| modificationType | A set of flags that identify the change(s) made. See the next table. |
| position | Start position of a text or styling change. Set to 0 if not used. |
| length | Length of the change in bytes when the text or styling changes. Set to 0 if not used. |
| linesAdded | Number of added lines. If negative, the number of deleted lines. Set to 0 if not used or no lines added or deleted. |
| text | Valid for text changes, not for style changes. If we are collecting undo information this holds a pointer to the text that is handed to the Undo system, otherwise it is zero. For user performed SC_MOD_BEFOREDELETE the text field is 0. |
| line | The line number at which a fold level or marker change occurred. This is 0 if unused and may be -1 if more than one line changed. |
| foldLevelNow | The new fold level applied to the line or 0 if this parameter is unused. |
| foldLevelPrev | The previous folding level of the line or 0 if this parameter is unused. |

The modificationType field has bits set to tell you what has been done. The kModificationFlags* constants bits correspond to actions. They tell you if the action was done by the user, or the result of Undo or Redo of a previous action.

| Symbol | Value | Meaning | Parameters |
|---|---|---|---|
| kModificationFlagsNone | 0 | Base value with no fields valid. Will not occur but is useful in tests. | None |
| kModificationFlagsInsertText | 1 | Text has been inserted into the document. | position, length, text, linesAdded |
| kModificationFlagsDeleteText | 2 | Text has been removed from the document. | position, length, text, linesAdded |
| kModificationFlagsChangeStyle | 4 | A style change has occurred. | position, length |
| kModificationFlagsChangeFold | 8 | A folding change has occurred. | line, foldLevelNow, foldLevelPrev |
| kModificationFlagsUser | &h10 | Information: the operation was done by the user. | None |
| kModificationFlagsInsertStyle | &h20 | Information: this text was the result of an Undo. | None |
| kModificationFlagsRedo | &h40 | Information: this was the result of a Redo. | None |
| kModificationFlagsMultiStepUndoRedo | &h80 | This is part of a multi-step Undo or Redo transaction. | None |
| kModificationFlagsLastStepInUndoRedo | &h100 | This is the final step in an Undo or Redo transaction. | None |
| kModificationFlagsChangeMarker | &h200 | One or more markers has changed in a line. | line |
| kModificationFlagsBeforeInsert | &h400 | Text is about to be inserted into the document. | position, if performed by user then text in bytes, length in bytes |
| kModificationFlagsBeforeDelete | &h800 | Text is about to be deleted from the document. | position, length |
| kModificationFlagsChangeIndicator | &h4000 | An indicator has been added or removed from a range of text. | position, length |
| kModificationFlagsChangeLineState | &h8000 | A line state has changed because LineState was set. | line |
| kModificationFlagsChangeTabStops | &h20000 | The explicit tab stops on a line have changed because ClearTabStops or AddTabStop was called. | line |
| kModificationFlagsLineState | &h80000 | The internal state of a lexer has changed over a range. | position, length |
| kModificationFlagsChangeMargin | &h10000 | A text margin has changed. | line |
| kModificationFlagsChangeAnnotation | &h20000 | An annotation has changed. | line |
| kModificationFlagsContainer | &h40000 | This is a container action. The header may change the text being inserted by calling SCI_CHANGEINSERTION. No other modifications may be made in this handler. | position, length, text |
| kModificationFlagsMultiMultiUndoRedo | &h1000 | This is part of an Undo or Redo with multi-line changes. | None |
| kModificationFlagsStartAction | &h2000 | This is set on a SC_PERFORMED_USER action when it is the first or only step in an undo transaction. This can be used to integrate the Scintilla undo stack with an undo stack in the container application by adding a Scintilla action to the container's stack for the currently opened container transaction or to open a new container transaction if there is no open container transaction. | None |
| kModificationFlagsContainer | &h40000 | This is set on for actions that the container stored into the undo stack with AddUndoAction. | token |
| kModificationFlagsEventMaskAll | &h1FFFFFF | This is a mask for all valid flags. This is the default mask state set by ModEventMask. | None |

## 157.2.549 ModifyAttemptReadOnly

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** When in read-only mode, this notification is sent to the container if the user tries to change the text.
**Notes:** This can be used to check the document out of a version control system. You can set the read-only state of a document with ReadOnly property.

## 157.2.550 NeedsShown(Position as Integer, length as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Scintilla has determined that a range of lines that is currently invisible should be made visible.
**Example:**

```
sub NeedsShown(Position as Integer)
dim firstLine as Integer = LineFromPosition(me.position)
dim lastLine as Integer = LineFromPosition(me.position+me.length-1)
for line as integer = firstLine to lastLine
me.EnsureVisible(line)
next
end sub
```

**Notes:** An example of where this may be needed is if the end of line of a contracted fold point is deleted. This message is sent to the container in case it wants to make the line visible in some unusual way such as making the whole document visible. Most containers will just ensure each line in the range is visible by calling EnsureVisible. The position and length fields of SCNotification indicate the range of the document that should be made visible.

The container code will be similar to the following code skeleton in the example above.
If the event is not implemented, we do similar automatically.

### 157.2.551 Open

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 157.2.552 Opening

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 157.2.553 Painted

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Painting has just been done.
**Notes:** Useful when you want to update some other widgets based on a change in Scintilla, but want to have the paint occur first to appear more responsive.

### 157.2.554 Prepare

MBS Scintilla Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The prepare event.
**Notes:** Called before we create the control, so you can change properties like HasBorder.

### 157.2.555 SavePointLeft

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sent to the container when the save point is entered or left, allowing the container to display a ”document dirty” indicator and change its menus.

### 157.2.556 SavePointReached

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Sent to the container when the save point is entered or left, allowing the container to display a "document dirty" indicator and change its menus.

### 157.2.557 ScaleFactorChanged(NewFactor as double)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 157.2.558 SelectionChanged(updated as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Selection changed.
**Notes:** If content is changed or selection, this event is fired.

The UpdateUI event will also be called.

### 157.2.559 StyleNeeded(Position as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Queries you to provide style information.
**Example:**

```
// sample event to color digits

Sub StyleNeeded(Position as Integer) Handles StyleNeeded
#pragma BackgroundTasks false

Dim startPos As Integer = Me.EndStyled
Dim lineNumber As Integer = Me.LineFromPosition(startPos)
Dim LineStartPos As Integer = Me.PositionFromLine(lineNumber)

System.DebugLog "Style at "+Position.ToString+" from "+LineStartPos.ToString+" to "+position.ToString

Dim t As String = Me.Text
Dim pos As Integer = LineStartPos
```

```
While pos <position

Dim ch As Integer = t.Middle(pos, 1).Asc

If ch >= 48 And ch <= 57 Then
// digit
Me.SetStyling(pos, 1, Me.Style(2))
end if

pos = pos + 1
Wend
End Sub
```

**Notes:** If you used no explicit lexer to make the container act as the lexer, you will receive this notification when Scintilla is about to display or print text that requires styling.

You are required to style the text from the line that contains the position returned by EndStyled up to the position passed in position. Symbolically, you need code of the form:

```
startPos = me.EndStyled
lineNumber = LineFromPosition(startPos)
startPos = PositionFromLine(lineNumber)
ApplyStyles(startPos, position)
```

### 157.2.560 TextChanged(Position as Integer, modificationType as Integer, Text as String, length as Integer, linesAdded as Integer, line as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Text changed.
**Notes:** Our plugin calls this to inform you about a text change.
No modifications may be performed while in a Modified event.
Modified event will also be raised.

### 157.2.561 UpdateUI(updated as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Either the text or styling of the document has changed or the selection range or scroll position may have changed.
**Notes:** Now would be a good time to update any container UI elements that depend on document or view state. As it is sometimes difficult to determine whether a change has occurred, these events may also fire

when there has been no actual change. The updated field is set to the bit set of things changed since the previous notification.

See kUpdate* constants.

### 157.2.562 URIDropped(text as String)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Indicates that the user has dragged a URI such as a file name or Web address onto Scintilla.
**Notes:** The container could interpret this as a request to open the file.

### 157.2.563 UserListSelection(Position as Integer, Character as Integer, Text as String, listType as Integer, listCompletionMethod as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The user has selected an item in a user list.
**Notes:**

| Field | Usage |
|---|---|
| listType | This is set to the listType parameter from the UserListShow message that initiated the list. |
| text | The text of the selection. |
| position | The position the list was displayed at. |
| Character | If a fillup character was the method of selection, the used character, otherwise 0. |
| listCompletionMethod | A value indicating the way in which the completion occurred. |

### 157.2.564 Zoom

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is generated when the user zooms the display using the keyboard or the Zoom method is called.
**Notes:** This event can be used to recalculate positions, such as the width of the line number margin to maintain sizes in terms of characters rather than pixels.
See also:

- 157.2.490 Zoom as Integer 20657

### 157.2.565 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAlphaOpaque | 255 | One of the alpha channel constants.<br>Opaque color. |
| kAlphaTransparent | 0 | One of the alpha channel constants.<br>Full transparency. |
| kInvalidPosition | -1 | Invalid position constant. |
| kMaskFolders | &hFE000000 | The mask for folder flags. |
| kTimeForever | 10000000 | The constant for MouseDwellTime to mean forever in duration. |

Accessibility Status

| Constant | Value | Description |
|---|---|---|
| kAccessibilityDisabled | 0 | Accessibility is disabled. |
| kAccessibilityEnabled | 1 | Accessibility is enabled. |

Alpha

| Constant | Value | Description |
|---|---|---|
| kAlphaNoAlpha | 256 | Special value to indicate no alpha. |

Annotation Visibility

| Constant | Value | Description |
|---|---|---|
| kAnnotationVisibleBoxed | 2 | Annotations are indented to match the text and are surrounded by a box. |
| kAnnotationVisibleHidden | 0 | Annotations are not displayed. |
| kAnnotationVisibleIndented | 3 | Annotations are indented to match the text. |
| kAnnotationVisibleStandard | 1 | Annotations are drawn left justified with no adornment. |

Auto Completion Flags

| Constant | Value | Description |
|---|---|---|
| kAutoCompleteOptionFixedSize | 1 | On Win32 only, use a fixed size list instead of one that can be resized by the user. This also avoids a header rectangle above the list. |
| kAutoCompleteOptionNormal | 0 | Display autocompletion using default settings. |

Automatic Folding

| Constant | Value | Description |
|---|---|---|
| kAutomaticFoldChange | &h0004 | Show lines as needed when fold structure is changed. The Modified notification is still sent unless it is disabled by the container. |
| kAutomaticFoldClick | &h0002 | Handle clicks in fold margin automatically. This avoids sending the MarginClick event for folding margins. |
| kAutomaticFoldNone | &h0000 | Value with no automatic behaviour. |
| kAutomaticFoldShow | &h0001 | Automatically show lines as needed. This avoids sending the NeedsShown notification. |

Bidirectional Modes

| Constant | Value | Description |
|---|---|---|
| kBidirectionalDisabled | 0 | Disabled |
| kBidirectionalL2R | 1 | Left to Right |
| kBidirectionalR2L | 2 | Right to Left |

Caret Policy

| Constant | Value | Description |
|---|---|---|
| kCaretPolicyEven | &h08 | If not set, instead of having symmetrical UZs, the left and bottom UZs are extended up to right and top UZs respectively. This way, we favour the displaying of useful information: the beginning of lines, where most code reside, and the lines after the caret, for example, the body of a function. |
| kCaretPolicyJumps | &h10 | If set, the display is moved more energetically so the caret can move in the same direction longer before the policy is applied again. '3UZ' notation is used to indicate three time the size of the UZ as a distance to the margin. |
| kCaretPolicySlop | &h01 | If set, we can define a slop value: caretSlop. This value defines an unwanted zone (UZ) where the caret is... unwanted. This zone is defined as a number of pixels near the vertical margins, and as a number of lines near the horizontal margins. By keeping the caret away from the edges, it is seen within its context. This makes it likely that the identifier that the caret is on can be completely seen, and that the current line is seen with some of the lines following it, which are often dependent on that line. |
| kCaretPolicyStrict | &h04 | If set, the policy set by kCaretPolicySlop is enforced... strictly. The caret is centred on the display if caretSlop is not set, and cannot go in the UZ if caretSlop is set. |

Caret Sticky

| Constant | Value | Description |
|---|---|---|
| kCaretStickyOff | 0 | When set to kCaretStickyOff (0), the sticky flag is off; all text changes (and all caret position changes) will remember the caret's new horizontal position when moving to different lines. This is the default. |
| kCaretStickyOn | 1 | When set to kCaretStickyOn (1), the sticky flag is on, and the only thing which will cause the editor to remember the horizontal caret position is moving the caret with mouse or keyboard (left/right arrow keys, home/end keys, etc). |
| kCaretStickyWhiteSpace | 2 | When set to kCaretStickyWhiteSpace (2), the caret acts like mode 0 (sticky off) except under one special case; when space or tab characters are inserted. (Including pasting only space/tabs – undo, redo, etc. do not exhibit this behaviour..). |

Caret Styles

| Constant | Value | Description |
|---|---|---|
| kCaretStyleBlock | 2 | Draws insertion carets as blocks. |
| kCaretStyleBlockAfter | &h100 | When the caret end of a range is at the end and a block caret style is chosen, draws the block outside the selection instead of inside. This can be ored with kCaretStyleBlock or kCaretStyleBlockCurses. |
| kCaretStyleInsMask | &hF | The mask to only get the bits for insert mode. |
| kCaretStyleInvisible | 0 | Carets are not drawn at all. |
| kCaretStyleLine | 1 | Draws insertion carets as lines. This is the default. |
| kCaretStyleOverstrikeBar | 0 | Draws an overstrike caret as a bar. This is the default. |
| kCaretStyleOverstrikeBlock | &h10 | Draws an overstrike caret as a block. This should be ored with one of the first three styles. |

Case Insenstive Behavior Flags

| Constant | Value | Description |
|---|---|---|
| kCaseInsensitiveBehaviourIgnoreCase | 1 | Ignore Case |
| kCaseInsensitiveBehaviourRespectCase | 0 | Respect Case |

Character Sets

| Constant | Value | Description |
|---|---|---|
| kCharacterSetAnsi | 0 | ANSI |
| kCharacterSetArabic | 178 | Arabic |
| kCharacterSetBaltic | 186 | Baltic |
| kCharacterSetChineseBig5 | 136 | Chinese Big 5 |
| kCharacterSetCyrillic | 1251 | Cyrillic |
| kCharacterSetDefault | 1 | Default one |
| kCharacterSetEastEurope | 238 | East Europe |
| kCharacterSetGB2312 | 134 | GB 2312 |
| kCharacterSetGreek | 161 | Greek |
| kCharacterSetHangul | 129 | Hangul |
| kCharacterSetHebrew | 177 | Hebrew |
| kCharacterSetIso8859_15 | 1000 | ISO 8859-15 |
| kCharacterSetJohab | 130 | Johab |
| kCharacterSetMac | 77 | Mac |
| kCharacterSetOem | 255 | OEM |
| kCharacterSetOem866 | 866 | OEM 866 |
| kCharacterSetRussian | 204 | Russian |
| kCharacterSetShiftJis | 128 | ShiftJis |
| kCharacterSetSymbol | 2 | Symbol |
| kCharacterSetThai | 222 | Thai |
| kCharacterSetTurkish | 162 | Turkish |
| kCharacterSetVietnamese | 163 | Vietnamese |

Character Sources

| Constant | Value | Description |
|---|---|---|
| kCharacterSourceDirectInput | 0 | Direct input characters, including characters generated by calling keyboard commands like NewLine method. |
| kCharacterSourceImeResult | 2 | IME (either inline or windowed mode) full composited string. Modern IME is able to composite English word or sentence, when this value is set, current character may not a Chinese, Japanese or Korean character. Currently, this is only set on Windows. |
| kCharacterSourceTentativeInput | 1 | Tentative input characters. They are used by IME (inline mode, see IMEInteraction) to composite final string, normally different from final composited string (which is the string that has been truly added into current document), and may be withdrawn when the user cancels typing (e.g. by pressing Esc key). Some system (at least Cocoa) also use tentative input for non-IME features like using dead key to composite diacritical marks (grave accent, etc.). These characters are not added to macro recording. Most applications can simply ignore the notification when this value is set. |

Completion Methods

| Constant | Value | Description |
|---|---|---|
| kCompletionMethodsCommand | 5 | The AutoCSelect method triggered the completion. Character is 0. |
| kCompletionMethodsDoubleClick | 2 | A double-click triggered the completion. Character is 0. |
| kCompletionMethodsFillUp | 1 | A fillup character triggered the completion. The character used is in Character |
| kCompletionMethodsNewline | 4 | A new line or Newline method triggered the completion. Character is 0. |
| kCompletionMethodsTab | 3 | The tab key or Tab method triggered the completion. Character is 0. |

Cursor Shapes

| Constant | Value | Description |
|---|---|---|
| kCursorShapeArrow | 2 | Normal arrow. |
| kCursorShapeNormal | -1 | The normal cursor is displayed. |
| kCursorShapeReverseArrow | 7 | Reverse arrow. |
| kCursorShapeWait | 4 | The wait cursor is displayed when the mouse is over or owned by the Scintilla window. |

Document Option

| Constant | Value | Description |
|---|---|---|
| kDocumentOptionDefault | 0 | Standard options. |
| kDocumentOptionStylesNone | &h1 | Stops allocation of memory to style characters which saves significant memory, often 40% with the whole document treated as being style 0. |
| kDocumentOptionTextLarge | &h100 | Accommodates documents larger than 2 GigaBytes in 64-bit executables. |

Long line display modes

| Constant | Value | Description |
|---|---|---|
| kEdgeVisualStyleBackground | 2 | The background colour of characters after the column limit is changed to the colour set by EdgeColor property. This is recommended for proportional fonts. |
| kEdgeVisualStyleLine | 1 | A vertical line is drawn at the column number set by EdgeColumn(). This works well for monospaced fonts. The line is drawn at a position based on the width of a space character in kStylesCommonDefault, so it may not work very well if your styles use proportional fonts or if your style have varied font sizes or you use a mixture of bold, italic and normal text. |
| kEdgeVisualStyleMultiLine | 3 | This is similar to kEdgeVisualStyleLine but in contrary to showing only one single line a configurable set of vertical lines can be shown simultaneously. This edgeMode uses a completely independent dataset that can only be configured by using the MultiEdge* methods. |
| kEdgeVisualStyleNone | 0 | Long lines are not marked. This is the default state. |

Elements

| Constant | Value | Description |
|---|---|---|
| kElementCaret | 40 | Colour of caret for main selection |
| kElementCaretAdditional | 41 | Colour of caret for additional selections |
| kElementCaretLineBack | 50 | Colour of caret line background |
| kElementFoldLine | 80 | Colour of fold lines |
| kElementHiddenLine | 81 | Colour of line drawn to show there are lines hidden at that point |
| kElementHotSpotActive | 70 | Text colour of active hot spot |
| kElementHotSpotActiveBack | 71 | Background colour of active hot spot |
| kElementList | 0 | Text colour in autocompletion lists |
| kElementListBack | 1 | Background colour of autocompletion lists |
| kElementListSelected | 2 | Text colour of selected item in autocompletion lists |
| kElementListSelectedBack | 3 | Background colour of selected item in autocompletion lists |
| kElementSelectionAdditionalBack | 13 | Background colour of additional selections |
| kElementSelectionAdditionalText | 12 | Text colour of additional selections |
| kElementSelectionBack | 11 | Background colour of main selection |
| kElementSelectionInactiveBack | 17 | Background colour of selections when another window has focus |
| kElementSelectionInactiveText | 16 | Text colour of selections when another window has focus |
| kElementSelectionSecondaryBack | 15 | Background colour of selections when another window contains the primar selection |
| kElementSelectionSecondaryText | 14 | Text colour of selections when another window contains the primary selectio |
| kElementSelectionText | 10 | Text colour of main selection |
| kElementWhiteSpace | 60 | Colour of visible white space |
| kElementWhiteSpaceBack | 61 | Colour of visible white space background |

End Of Line

| Constant | Value | Description |
|---|---|---|
| kEndOfLineCR | 1 | CR, the old Mac line ending. |
| kEndOfLineCRLF | 0 | CRLF, the Windows line ending. |
| kEndOfLineLF | 2 | LF, the unix line ending. |

End of Line Annotation

| Constant | Value | Description |
|---|---|---|
| kEOLAnnotationVisibleAngleCircle | &h102 | Surround with a ,óÑshape,óó with angled left end and curved right end. |
| kEOLAnnotationVisibleAngleFlat | &h112 | Surround with a ,óÑshape \| with angled left end and flat right end. |
| kEOLAnnotationVisibleAngles | &h122 | Surround with a ,óÑshape,ñ with angles on each end. |
| kEOLAnnotationVisibleBoxed | &h2 | End of Line Annotations are indented to match the text and are surroun by a box. |
| kEOLAnnotationVisibleCircleAngle | &h120 | Surround with a ,óñshape,ñ with curved left end and angled right end. |
| kEOLAnnotationVisibleCircleFlat | &h110 | Surround with a ,óñshape \| with curved left end and flat right end. |
| kEOLAnnotationVisibleFlatAngle | &h121 | Surround with a \| shape,ñ with flat left end and angled right end. |
| kEOLAnnotationVisibleFlatCircle | &h101 | Surround with a \| shape,óó with flat left end and curved right end. |
| kEOLAnnotationVisibleFlats | &h111 | Surround with a \| shape \| with flat ends. |
| kEOLAnnotationVisibleHidden | &h0 | End of Line Annotations are not displayed. |
| kEOLAnnotationVisibleStadium | &h100 | Surround with a ,óñstadium,óó - a rectangle with rounded ends. |
| kEOLAnnotationVisibleStandard | &h1 | End of Line Annotations are drawn left justified with no adornment. |

Search Flags

| Constant | Value | Description |
|---|---|---|
| kFindOptionCxx11RegEx | &h00800000 | This flag may be set to use C++11 <regex>instead of Scintilla's basic regular expressions. If the regular expression is invalid then -1 is returned and status is set to SC_STATUS_WARN_REGEX. The ECMAScript flag is set on the regex object and UTF-8 documents will exhibit Unicode-compliant behaviour. For MSVC, where wchar_t is 16-bits, the regular expression ".." will match a single astral-plane character. There may be other differences between compilers. Must also have kFindOptionRegExP set. |
| kFindOptionMatchCase | &h4 | A match only occurs with text that matches the case of the search string. |
| kFindOptionNone | &h0 | Default setting is case-insensitive literal match. |
| kFindOptionPosix | &h00400000 | Treat regular expression in a more POSIX compatible manner by interpreting bare ( and ) for tagged sections rather than \( and \). Has no effect when kFindOptionCxx11RegEx is set. |
| kFindOptionRegExp | &h00200000 | The search string should be interpreted as a regular expression. Uses Scintilla's base implementation unless combined with kFindOptionCxx11RegEx. |
| kFindOptionWholeWord | &h2 | A match only occurs if the characters before and after are not word characters as defined by WordChars property. |
| kFindOptionWordStart | &h00100000 | A match only occurs if the character before is not a word character as defined by WordChars. |

Folder Actions

| Constant | Value | Description |
|---|---|---|
| kFoldActionContract | 0 | Contract. |
| kFoldActionExpand | 1 | Expand. |
| kFoldActionToggle | 2 | Toggle between contracted and expanded. |

Folder Display Text Style

| Constant | Value | Description |
|---|---|---|
| kFoldDisplayTextStyleBoxed | 2 | Display the text tags with a box drawn around them. |
| kFoldDisplayTextStyleHidden | 0 | Do not display the text tags. This is the default. |
| kFoldDisplayTextStyleStandard | 1 | Display the text tags. |

Folder Flags

| Constant | Value | Description |
|---|---|---|
| kFoldFlagLevelNumbers | &h0040 | Display hexadecimal fold levels in line margin to aid debugging of folding. Th appearance of this feature may change in the future. |
| kFoldFlagLineAfterContracted | &h0010 | Draw below if not expanded |
| kFoldFlagLineAfterExpanded | &h0008 | Draw below if expanded |
| kFoldFlagLineBeforeContracted | &h0004 | Draw above if not expanded |
| kFoldFlagLineBeforeExpanded | &h0002 | Draw above if expanded |
| kFoldFlagLineState | &h0080 | Display hexadecimal line state in line margin to aid debugging of lexing an folding. May not be used at the same time as kFoldFlagLevelNumbers. |
| kFoldFlagNone | &h0000 | Default value. |

Folder Levels

| Constant | Value | Description |
|---|---|---|
| kFoldLevelBase | &h400 | The initial fold level. |
| kFoldLevelHeaderFlag | &h2000 | Indicates that the line is a header (fold point). |
| kFoldLevelNone | &h0 | Default level that may occur before folding. |
| kFoldLevelNumberMask | &h0FFF | The mask for numbers. |
| kFoldLevelWhiteFlag | &h1000 | Indicates that the line is blank and allows it to be treated slightly different then its level may indicate. |

Font Quality with Antialiasing

| Constant | Value | Description |
|---|---|---|
| kFontQualityQualityAntialiased | 2 | Antialiased |
| kFontQualityQualityDefault | 0 | Default. |
| kFontQualityQualityLcdOptimized | 3 | LCD Optimized |
| kFontQualityQualityMask | &hF | In case it is necessary to squeeze more options into this property, only a limi number of bits defined by kFontQualityQualityMask will be used for quali |
| kFontQualityQualityNonAntialiased | 1 | Non Antialiased |

Idle Styling

| Constant | Value | Description |
|---|---|---|
| kIdleStylingAfterVisible | 2 | Text after the currently visible portion may be styled in the background. |
| kIdleStylingAll | 3 | Style both before and after the visible text. |
| kIdleStylingNone | 0 | Syntax styling is performed for all the currently visible text before displaying it. |
| kIdleStylingToVisible | 1 | A small amount of styling is performed before display and then further styling is performed incrementally in the background as an idle-time task. |

IME Interaction Mode

| Constant | Value | Description |
|---|---|---|
| kIMEInteractionInline | 1 | Show inline. |
| kIMEInteractionWindowed | 0 | Show on window. |

Indentation Guides

| Constant | Value | Description |
|---|---|---|
| kIndentViewLookBoth | 3 | Indentation guides are shown beyond the actual indentation up to the level of the next non-empty line or previous non-empty line whichever is the greater. This setting is good for most languages. |
| kIndentViewLookForward | 2 | Indentation guides are shown beyond the actual indentation up to the level of the next non-empty line. If the previous non-empty line was a fold header then indentation guides are shown for one more level of indent than that line. This setting is good for Python. |
| kIndentViewNone | 0 | No indentation guides are shown. |
| kIndentViewReal | 1 | Indentation guides are shown inside real indentation white space. |

Modifier Keys

| Constant | Value | Description |
|---|---|---|
| kKeyModAlt | 4 | Alt key. (named Option on MacOS usually) |
| kKeyModCtrl | 2 | Control key (the Command key on Mac, the Ctrl key on other platforms). |
| kKeyModMeta | 16 | Meta key (the Ctrl key on Mac, the Windows key on other platforms). |
| kKeyModNorm | 0 | No modifier key. |
| kKeyModShift | 1 | Shift Key |
| kKeyModSuper | 8 | This is the same as kKeyModMeta on all platforms. |

Keys

| Constant | Value | Description |
|---|---|---|
| kKeysAdd | 310 | |
| kKeysBack | 8 | |
| kKeysDelete | 308 | |
| kKeysDivide | 312 | |
| kKeysDown | 300 | |
| kKeysEnd | 305 | |
| kKeysEscape | 7 | |
| kKeysHome | 304 | |
| kKeysInsert | 309 | |
| kKeysLeft | 302 | |
| kKeysMenu | 315 | |
| kKeysNext | 307 | |
| kKeysPrior | 306 | |
| kKeysReturn | 13 | |
| kKeysRight | 303 | |
| kKeysRWin | 314 | |
| kKeysSubtract | 311 | |
| kKeysTab | 9 | |
| kKeysUp | 301 | |
| kKeysWin | 313 | |

Layers

| Constant | Value | Description |
|---|---|---|
| kLayerBase | 0 | Draw the selection background opaquely on the base layer |
| kLayerOverText | 2 | Draw the selection background translucently over the text. |
| kLayerUnderText | 1 | Draw the selection background translucently under the text. This will not work in single phase drawing mode as there is no under-text phase. |

Layout line cache modes

| Constant | Value | Description |
|---|---|---|
| kLineCacheCaret | 1 | One line is cached. This is the default. |
| kLineCacheDocument | 3 | All lines in the document. |
| kLineCacheNone | 0 | No lines are cached. |
| kLineCachePage | 2 | Visible lines plus the line containing the caret. |

Line Character Index Types

| Constant | Value | Description |
|---|---|---|
| kLineCharacterIndexTypeNone | 0 | Bytewise. |
| kLineCharacterIndexTypeUtf16 | 2 | UTF-16 code units are indexed. |
| kLineCharacterIndexTypeUtf32 | 1 | Whole characters are indexed. |

Line End Types

| Constant | Value | Description |
|---|---|---|
| kLineEndTypeDefault | 0 | |
| kLineEndTypeUnicode | 1 | |

Margin Options

| Constant | Value | Description |
|---|---|---|
| kMarginOptionNone | 0 | Whole wrapped line is selected. |
| kMarginOptionSubLineSelect | 1 | Only sub line of wrapped line is selected. |

Modification Flags

| Constant | Value | Description |
|---|---|---|
| kModificationFlagsBeforeDelete | &h800 | Text is about to be deleted from the document. |
| kModificationFlagsBeforeInsert | &h400 | Text is about to be inserted into the document. |
| kModificationFlagsChangeAnnotation | &h20000 | An annotation has changed. |
| kModificationFlagsChangeEOLAnnotation | &h400000 | An annotation has changed. |
| kModificationFlagsChangeFold | &h8 | A folding change has occurred. |
| kModificationFlagsChangeIndicator | &h4000 | An indicator has been added or removed from a range of text. |
| kModificationFlagsChangeLineState | &h8000 | A line state has changed because SCI_SETLINESTATE was |
| kModificationFlagsChangeMargin | &h10000 | A text margin has changed. |
| kModificationFlagsChangeMarker | &h200 | One or more markers has changed in a line. |
| kModificationFlagsChangeStyle | &h4 | A style change has occurred. |
| kModificationFlagsChangeTabStops | &h200000 | The explicit tab stops on a line have changed because ClearT dTabStop was called. |
| kModificationFlagsContainer | &h40000 | This is set on for actions that the container stored into the AddUndoAction. |
| kModificationFlagsDeleteText | &h2 | Text has been removed from the document. |
| kModificationFlagsEventMaskAll | &h7FFFFF | This is a mask for all valid flags. This is the default mask sta ventMask. |
| kModificationFlagsInsertCheck | &h100000 | Text is about to be inserted. The handler may change the tex by calling ChangeInsertion method. No other modifications this handler. |
| kModificationFlagsInsertText | &h1 | Text has been inserted into the document. |
| kModificationFlagsLastStepInUndoRedo | &h100 | This is the final step in an Undo or Redo transaction. |
| kModificationFlagsLexerState | &h80000 | The internal state of a lexer has changed over a range. |
| kModificationFlagsMultilineUndoRedo | &h1000 | This is part of an Undo or Redo with multi-line changes. |
| kModificationFlagsMultiStepUndoRedo | &h80 | This is part of a multi-step Undo or Redo transaction. |
| kModificationFlagsNone | &h0 | Base value with no fields valid. Will not occur but is useful in |
| kModificationFlagsRedo | &h40 | Information: this was the result of a Redo. |
| kModificationFlagsStartAction | &h2000 | This is set on a kModificationFlagsUser action when it is the in an undo transaction. This can be used to integrate the Scin with an undo stack in the container application by adding a S the container's stack for the currently opened container transa a new container transaction if there is no open container trans |
| kModificationFlagsUndo | &h20 | Information: this was the result of an Undo. |
| kModificationFlagsUser | &h10 | Information: the operation was done by the user. |

Auto Completion for Multiple Selections

| Constant | Value | Description |
|---|---|---|
| kMultiAutoCompleteEach | 1 | Each selection. |
| kMultiAutoCompleteOnce | 0 | Only first selection. |

Multi Paste Options

| Constant | Value | Description |
|---|---|---|
| kMultiPasteEach | 1 | The paste text can go into each selection. |
| kMultiPasteOnce | 0 | The pasted text can go into just the main selection. |

Ordering Options

| Constant | Value | Description |
|---|---|---|
| kOrderingCustom | 2 | Custom sorting. |
| kOrderingPerformSort | 1 | The control will sort for you. |
| kOrderingPreSorted | 0 | You pass list pre-sorted. |

Popup Modi

| Constant | Value | Description |
|---|---|---|
| kPopUpAll | 1 | Show default editing menu if clicking on scintilla. |
| kPopUpNever | 0 | Never show default editing menu. |
| kPopUpText | 2 | Show default editing menu only if clicking on text area. |

Print Options

| Constant | Value | Description |
|---|---|---|
| kPrintOptionBlackOnWhite | 2 | Print all text as black on a white background. |
| kPrintOptionColourOnWhite | 3 | Everything prints in its own colour on a white background. |
| kPrintOptionColourOnWhiteDefaultBG | 4 | Everything prints in its own foreground colour but all styles up to and in kStylesCommonLineNumber will print on a white background. |
| kPrintOptionInvertLight | 1 | If you use a dark screen background this saves ink by inverting the ligh of all colours and printing on a white background. |
| kPrintOptionNormal | 0 | Print using the current screen colours with the exception of line number r which print on a white background. This is the default. |
| kPrintOptionScreenColours | 5 | Print using the current screen colours for both foreground and backg This is the only mode that does not set the background colour of t number margin to white. |

Representation Appearance

| Constant | Value | Description |
|---|---|---|
| kRepresentationAppearanceBlob | 1 | Draw the representation text inverted in a rounded rectangle. This is t default appearance. |
| kRepresentationAppearanceColour | &h10 | Draw the representation in the colour set with RepresentationColour() instea of in the colour of the style of the text being represented. |
| kRepresentationAppearancePlain | 0 | Draw the representation text with no decorations. |

Selection Mode

| Constant | Value | Description |
|---|---|---|
| kSelectionModeLines | 2 | Line selection. |
| kSelectionModeRectangle | 1 | Rectangular |
| kSelectionModeStream | 0 | Stream |
| kSelectionModeThin | 3 | Thin rectangular selection |

Status Codes

| Constant | Value | Description |
|---|---|---|
| kStatusBadAlloc | 2 | Memory is exhausted. |
| kStatusFailure | 1 | Generic failure. |
| kStatusOk | 0 | No failures. |
| kStatusRegEx | 1001 | Regular expression is invalid. |
| kStatusWarnStart | 1000 | Warnings start with this value. |

Support

| Constant | Value | Description |
|---|---|---|
| kSupportsFractionalStrokeWidth | 2 | Can lines be drawn with fractional widths like 1.5 or 0.5 pixels? |
| kSupportsLineDrawsFinal | 0 | Whether drawing a line draws its final position. Only false on Win32 GDI. |
| kSupportsPixelDivisions | 1 | Are logical pixels larger than physical pixels? Currently only true for macOS Cocoa with 'retina' displays. When true, creating pixmaps at twice the resolution can produce clearer output with less blur. |
| kSupportsPixelModification | 4 | Can individual pixels be modified? This is false for character cell platforms like curses. |
| kSupportsTranslucentStroke | 3 | Can translucent lines, polygons, ellipses, and text be drawn? |

Tab Draw Modes

| Constant | Value | Description |
|---|---|---|
| kTabDrawModeLongArrow | 0 | |
| kTabDrawModeStrikeOut | 1 | |

Drawing Technology

| Constant | Value | Description |
|---|---|---|
| kTechnologyDefault | 0 | Default |
| kTechnologyDirectWrite | 1 | Use DirectWrite API. |
| kTechnologyDirectWriteDC | 3 | DirectWrite to draw into a GDI DC. |
| kTechnologyDirectWriteRetain | 2 | Use DirectWrite API with retaining frame. |

Property Types

| Constant | Value | Description |
|---|---|---|
| kTypePropertyBoolean | 0 | Property is a boolean. |
| kTypePropertyInteger | 1 | Property is an integer. |
| kTypePropertyString | 2 | Property is a string. |

Undo Flags

| Constant | Value | Description |
|---|---|---|
| kUndoFlagsMayCoalesce | 1 | If the container action may be coalesced along with any insertion and deletion actions into a single compound action. |
| kUndoFlagsNone | 0 | Coalescing treats coalescible container actions as transparent so will still only group together insertions that look like typing or deletions that look like multiple uses of the Backspace or Delete keys. |

Update Flags

| Constant | Value | Description |
|---|---|---|
| kUpdateContent | &h1 | Contents, styling or markers may have been changed. |
| kUpdateHScroll | &h8 | May have scrolled horizontally. |
| kUpdateNone | &h0 | Value without any changes. |
| kUpdateSelection | &h2 | Selection may have been changed. |
| kUpdateVScroll | &h4 | May have scrolled vertically. |

Virtual Space Flags

| Constant | Value | Description |
|---|---|---|
| kVirtualSpaceNone | 0 | Disables all use of virtual space. |
| kVirtualSpaceNoWrapLineStart | 4 | Prevents left arrow movement and selection from wrapping to the previo line. This is most commonly desired in conjunction with virtual space but an independent setting so works without virtual space. |
| kVirtualSpaceRectangularSelection | 1 | Rectangular selection. |
| kVirtualSpaceUserAccessible | 2 | User accessible. |

Visibility Policy

| Constant | Value | Description |
|---|---|---|
| kVisiblePolicySlop | &h01 | If set, we can define a slop value: caretSlop. This value defines an unwanted zone (UZ) where the caret is... unwanted. This zone is defined as a number of pixels near the vertical margins, and as a number of lines near the horizontal margins. By keeping the caret away from the edges, it is seen within its context. This makes it likely that the identifier that the caret is on can be completely seen, and that the current line is seen with some of the lines following it, which are often dependent on that line. |
| kVisiblePolicyStrict | &h04 | If set, the policy set by slop is kVisiblePolicySlop... strictly. The caret is centred on the display if caretSlop is not set, and cannot go in the UZ if caretSlop is set. |

White Space Visibility

| Constant | Value | Description |
|---|---|---|
| kWhiteSpaceInvisible | 0 | The normal display mode with white space displayed as an empty background colour. |
| kWhiteSpaceVisibleAfterIndent | 2 | White space used for indentation is displayed normally but after the first visible character, it is shown as dots and arrows. |
| kWhiteSpaceVisibleAlways | 1 | White space characters are drawn as dots and arrows, |
| kWhiteSpaceVisibleOnlyInIndent | 3 | White space used for indentation is displayed as dots and arrows. |

Wrap Modes

| Constant | Value | Description |
|---|---|---|
| kWrapChar | 2 | Enable wrapping between any characters. |
| kWrapNone | 0 | Disable line wrapping. |
| kWrapWhiteSpace | 3 | Enable wrapping on whitespace. |
| kWrapWord | 1 | Enable wrapping on word or style boundaries. |

Wrap Indent Mode

| Constant | Value | Description |
|---|---|---|
| kWrapIndentModeDeepIndent | 3 | Wrapped sublines are aligned to first subline indent plus two more levels of indentation |
| kWrapIndentModeFixed | 0 | Wrapped sublines aligned to left of window plus amount set by WrapStartIndent. |
| kWrapIndentModeIndent | 2 | Wrapped sublines are aligned to first subline indent plus one more level of indentation |
| kWrapIndentModeSame | 1 | Wrapped sublines are aligned to first subline indent |

Wrap Visual Flags

| Constant | Value | Description |
|---|---|---|
| kWrapVisualFlagEnd | &h0001 | Visual flag at end of subline of a wrapped line. |
| kWrapVisualFlagMargin | &h0004 | Visual flag in line number margin. |
| kWrapVisualFlagNone | &h0000 | No visual flags |
| kWrapVisualFlagStart | &h0002 | Visual flag at begin of subline of a wrapped line. Subline is indented by at least 1 to make room for the flag. |

Wrap Visual Location

| Constant | Value | Description |
|---|---|---|
| kWrapVisualLocationDefault | &h0000 | Visual flags drawn near border |
| kWrapVisualLocationEndByText | &h0001 | Visual flag at end of subline drawn near text |
| kWrapVisualLocationStartByText | &h0002 | Visual flag at beginning of subline drawn near text |

## 157.3 class ScintillaFailureExceptionMBS

### 157.3.1 class ScintillaFailureExceptionMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for an exception in Scintilla.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr2

## 157.4 class ScintillaIndicatorMBS

### 157.4.1 class ScintillaIndicatorMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for an indicator.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr2

### 157.4.2 Methods

### 157.4.3 Constructor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 157.4.4 IndicatorEnd(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Find the end of a range with one value from a position within the range.
**Notes:** Can be used to iterate through the document to discover all the indicator positions.

### 157.4.5 IndicatorStart(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Find the start of a range with one value from a position within the range.
**Notes:** Can be used to iterate through the document to discover all the indicator positions.

### 157.4.6 IndicatorValueAt(pos as Integer) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the value of a particular indicator at a position.

### 157.4.7 Properties

### 157.4.8 Alpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The alpha for drawing indicator.
**Notes:** Set and get the alpha transparency used for drawing the fill colour of the kIndicatorStyleRoundBox and kIndicatorStyleStraightBox rectangle. The alpha value can range from 0 (completely transparent) to 255 (no transparency).
(Read and Write property)

### 157.4.9 Flags as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the flags associated with an indicator.
**Notes:** There is currently one flag defined, kIndicFlagValueFore: when this flag is set the colour used by the indicator is not from the indicator's fore setting but instead from the value of the indicator at that point in the file. kIndicFlagNone is the default. This allows many colours to be displayed for a single indicator. The value is an RGB integer colour that has been ored with kIndicValueBit(&h1000000) when setting Value. To find the colour from the value, and the value with kIndicValueMask(&hFFFFFF).
(Read and Write property)

### 157.4.10 ForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the colour used to draw an indicator.
**Example:**

```
// The default indicator colours are equivalent to:

Indicator(0).ForeColor = &c007f00 // (dark green)
Indicator(1).ForeColor = &cff0000 // (light blue)
Indicator(2).ForeColor = &c0000ff // (light red)
```

**Notes:** (Read and Write property)

### 157.4.11 HoverForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the colour used to draw indicators when the mouse is over them or the caret moved into them.
**Notes:** The mouse cursor also changes when an indicator is drawn in hover style. The default is for the hover appearance to be the same as the normal appearance and calling ForeColor or Style properties will also reset the hover attribute.
(Read and Write property)

### 157.4.12 HoverStyle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the style used to draw indicators when the mouse is over them or the caret moved into them.
**Notes:** The mouse cursor also changes when an indicator is drawn in hover style. The default is for the hover appearance to be the same as the normal appearance and calling ForeColor or Style properties will also reset the hover attribute.
(Read and Write property)

### 157.4.13 Indicator as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The indicator index.
**Notes:** (Read only property)

### 157.4.14 OutlineAlpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The alpha for outline drawing.
**Notes:** Set and get the alpha transparency used for drawing the outline colour of the kIndicatorStyleRoundBox and kIndicatorStyleStraightBox rectangle. The alpha value can range from 0 (completely transparent) to 255 (no transparency).
(Read and Write property)

### 157.4.15 Parent as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The parent control.
**Notes:** (Read only property)

### 157.4.16 StrokeWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the stroke width used to draw an indicator in hundredths of a pixel.
**Notes:** The default value is 100 indicating a width of one pixel. Some indicator styles do not support setting stroke width, generally where it makes no sense (kIndicatorStylePoint) or wasn't simple (kIndicatorStyleSquigglePixmap). The indicators supporting stroke width are: kIndicatorStyleFullBoxPlain, kIndicatorStyleSquiggle, kIndicatorStyleTT, INDIC_DIAGONAL, kIndicatorStyleFullBoxStrike, kIndicatorStyleFullBoxBox, kIndicatorStyleFullBoxRoundBox, kIndicatorStyleStraightBox, kIndicatorStyleFullBox, kIndicatorStyleFullBoxDash, kIndicatorStyleFullBoxDots, kIndicatorStyleSquiggleLow.
Fractional pixel widths are possible such as 50 for half a pixel wide. On many systems a half pixel value will appear as a fainter line but it allows drawing very thin lines on systems with multiple physical pixels per logical pixel. Half (logical) pixel lines are available on macOS with 'retina' displays, see kSupportsPixelDivisions.
(Read and Write property)

### 157.4.17 Style as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The style for the indicator.
**Example:**

```
// The default indicator styles are equivalent to:

Indicator(0).style = kIndicatorStyleSquiggle
Indicator(1).style = kIndicatorStyleTT
Indicator(2).style = kIndicatorStylePlain
```

**Notes:** (Read and Write property)

### 157.4.18 Tag as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tag value.
**Notes:** A variable for you to put any reference information you like.
(Read only property)

### 157.4.19 Under as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get whether an indicator is drawn under text or over(default).
**Notes:** Drawing under text does not work with the deprecated single phase drawing mode.
(Read and Write property)

### 157.4.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kIndicValueBit | &h1000000 | The value bit set if this is a color value.<br>use Bitwise AND and kIndicValueMask to get the color value. |
| kIndicValueMask | &hFFFFFF | The mask to get the color part of the value. |

Indicator Numbers

| Constant | Value | Description |
|---|---|---|
| kIndicatorNumbersContainer | 8 | |
| kIndicatorNumbersIme | 32 | |
| kIndicatorNumbersImeMax | 35 | |
| kIndicatorNumbersMax | 35 | |

Indicator Styles

| Constant | Value | Description |
|---|---|---|
| kIndicatorStyleBox | 6 | A rectangle around the text. |
| kIndicatorStyleCompositionThick | 14 | A 2-pixel thick underline located at the bottom of the line to try to avoid touch ing the character base. Each side is inset 1 pixel so that different indicators i this style covering a range appear isolated. This is similar to an appearanc used for the target in Asian language input composition. |
| kIndicatorStyleCompositionThin | 15 | A 1-pixel thick underline located just before the bottom of the line. Each sid is inset 1 pixel so that different indicators in this style covering a range appea isolated. This is similar to an appearance used for non-target ranges in Asia language input composition. |
| kIndicatorStyleDash | 9 | A dashed underline. |
| kIndicatorStyleDiagonal | 3 | Diagonal hatching. |
| kIndicatorStyleDotBox | 12 | A dotted rectangle around the text using translucent drawing. Translucenc alternates between the alpha and outline alpha settings with the top-left pixe using the alpha setting. Alpha and OutlineAlpha control the alpha trans parency values. The default values are 30 for alpha and 50 for outline alpha To avoid excessive memory allocation the maximum width of a dotted box i 4000 pixels. |
| kIndicatorStyleDots | 10 | A dotted underline. |
| kIndicatorStyleFullBox | 16 | A rectangle around the text using translucent drawing similar to kIndica torStyleStraightBox but covering the entire character area. |
| kIndicatorStyleGradient | 20 | A vertical gradient between a colour and alpha at top to fully transparent a bottom. |
| kIndicatorStyleGradientCentre | 21 | A vertical gradient with the specified colour and alpha in the middle fading t fully transparent at top and bottom. |
| kIndicatorStyleHidden | 5 | An indicator with no visual effect. |
| kIndicatorStylePlain | 0 | Underlined with a single, straight line. |
| kIndicatorStylePoint | 18 | Draw a triangle below the start of the indicator range. |
| kIndicatorStylePointCharacter | 19 | Draw a triangle below the centre of the first character of the indicator range. |
| kIndicatorStyleRoundBox | 7 | A rectangle with rounded corners around the text using translucent drawin with the interior usually more transparent than the border. You can use Alph and OutlineAlpha property to control the alpha transparency values. Th default alpha values are 30 for fill colour and 50 for outline colour. |
| kIndicatorStyleSquiggle | 1 | A squiggly underline. Requires 3 pixels of descender space. |
| kIndicatorStyleSquiggleLow | 11 | Similar to kIndicatorStyleSquiggle but only using 2 vertical pixels so will fi under small fonts. |
| kIndicatorStyleSquigglePixmap | 13 | A version of kIndicatorStyleSquiggle that draws using a pixmap instead of a a series of line segments for performance. |
| kIndicatorStyleStraightBox | 8 | A rectangle around the text using translucent drawing with the interior usuall more transparent than the border. You can use Alpha and OutlineAlpha t control the alpha transparency values. The default alpha values are 30 fo fill colour and 50 for outline colour. This indicator does not colour the to pixel of the line so that indicators on contiguous lines are visually distinct an disconnected. |
| kIndicatorStyleStrike | 4 | Strike out. |
| kIndicatorStyleTextFore | 17 | Change the colour of the text to the indicator's fore colour. |
| kIndicatorStyleTT | 2 | A line of small T shapes. |

Flags

| Constant | Value | Description |
|---|---|---|
| kIndicFlagNone | 0 | Default value for flags. |
| kIndicFlagValueFore | 1 | When this flag is set the colour used by the indicator is not from the indicator's fore setting but instead from the value of the indicator at that point in the file. |

## 157.5 class ScintillaLoaderMBS

### 157.5.1 class ScintillaLoaderMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for loading data in chunks.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3

### 157.5.2 Methods

### 157.5.3 AddData(data as MemoryBlock) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The application should call the AddData method with each block of data read from the file.
**Notes:** AddData will return kStatusOk unless a failure, such as memory exhaustion occurs. If a failure occurs in AddData or in a file reading call then loading can be abandoned and the loader released with the Release call. When the whole file has been read, Finished should be called to load the final document into the control.
There is no need to call Release after ConvertToDocument.
See also:

- 157.5.4 AddData(data as String) as Integer 20704

### 157.5.4 AddData(data as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The application should call the AddData method with each block of data read from the file.
**Notes:** AddData will return kStatusOk unless a failure, such as memory exhaustion occurs. If a failure occurs in AddData or in a file reading call then loading can be abandoned and the loader released with the Release call. When the whole file has been read, Finished should be called to load the final document into the control.
There is no need to call Release after ConvertToDocument.
See also:

- 157.5.3 AddData(data as MemoryBlock) as Integer 20704

### 157.5.5 Constructor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 157.5.6 Finished as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Finishes the document loading.
**Notes:** Returns true on success.

### 157.5.7 Properties

### 157.5.8 Handle as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The internal objet reference.
**Notes:** (Read only property)

### 157.5.9 Parent as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The parent control.
**Notes:** (Read only property)

### 157.5.10 Tag as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tag value.
**Notes:** A variable for you to put any reference information you like.
(Read only property)

## 157.6 class ScintillaMarginMBS

### 157.6.1 class ScintillaMarginMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a margin.
**Notes:** Margin areas are used for line numbers, breakpoints or folder.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr2

### 157.6.2 Methods

### 157.6.3 Constructor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 157.6.4 Properties

### 157.6.5 BackColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A margin of type kMarginTypeBack may have its colour set with this property.
**Notes:** (Read and Write property)

### 157.6.6 Cursor as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** A reversed arrow cursor is normally shown over all margins.
**Notes:** This may be changed to a normal arrow with Cursor = kCursorShapeArrow or restored to a reversed arrow with Cursor = kCursorShapeReverseArrow.
(Read and Write property)

### 157.6.7 Layer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The layer number for this marker.
**Notes:** See kLayerBase, kLayerOverText and kLayerUnderText constants.
(Read and Write property)

### 157.6.8 Margin as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The margin number.
**Notes:** (Read only property)

### 157.6.9 Mask as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The mask is a 32-bit value.
**Notes:** Each bit corresponds to one of 32 logical symbols that can be displayed in a margin that is enabled for symbols. There is a useful constant, kMaskFolders (&hFE000000 or -33554432), that is a mask for the 7 logical symbols used to denote folding. You can assign a wide range of symbols and colours to each of the 32 logical symbols, see Markers for more information. If (mask & kMaskFolders) = 0, the margin background colour is controlled by style 33 (kStylesCommonLineNumber).
You add logical markers to a line with SCI_MARKERADD. If a line has an associated marker that does not appear in the mask of any margin with a non-zero width, the marker changes the background colour of the line. For example, suppose you decide to use logical marker 10 to mark lines with a syntax error and you want to show such lines by changing the background colour. The mask for this marker is 1 shifted left 10 times (1«10) which is 0x400. If you make sure that no symbol margin includes 0x400 in its mask, any line with the marker gets the background colour changed.
To set a non-folding margin 1 use Styles(1). Mask = not kMaskFolders which is the default set by Scintilla.
To set a folding margin 2 use Styles(2). Mask = kMaskFolders)
textasciitilde kMaskFolders is &h1FFFFFF in hexadecimal or 33554431 decimal. Of course, you may need to display all 32 symbols in a margin, in which case use Maks = -1.
(Read and Write property)

### 157.6.10 Parent as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The parent control.
**Notes:** (Read only property)

### 157.6.11 Sensitive as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Each of the five margins can be set sensitive or insensitive to mouse clicks.
**Notes:** A click in a sensitive margin sends a MarginClick event to the container. Margins that are not sensitive act as selection margins which make it easy to select ranges of lines. By default, all margins are insensitive.
(Read and Write property)

### 157.6.12 Tag as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tag value.
**Notes:** A variable for you to put any reference information you like.
(Read only property)

### 157.6.13 Type as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Set and get the type of a margin.
**Notes:** The margin argument should be 0, 1, 2, 3 or 4.
You can use the predefined constants kMarginTypeSymbol (0) and kMarginTypeNumber (1) to set a margin as either a line number or a symbol margin. A margin with application defined text may use kMarginTypeText (4) or kMarginTypeRText (5) to right justify the text. By convention, margin 0 is used for line numbers and the next two are used for symbols. You can also use the constants kMarginTypeBack (2), kMarginTypeFore (3), and kMarginTypeColour (6) for symbol margins that set their background colour to match the kCommonStylesDefault background and foreground colours or a specified colour.
(Read and Write property)

### 157.6.14 Width as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The width of a margin in pixels.
**Notes:** A margin with zero width is invisible. By default, Scintilla sets margin 1 for symbols with a width of 16 pixels, so this is a reasonable guess if you are not sure what would be appropriate. Line number margins widths should take into account the number of lines in the document and the line number style. You could

use something like Styles(kStylesCommonLineNumber).TextWidth("_99999") to get a suitable width.
(Read and Write property)

### 157.6.15 Constants

Margin Types

| Constant | Value | Description |
|---|---|---|
| kMarginTypeBack | 2 | Background colour |
| kMarginTypeColour | 6 | Color |
| kMarginTypeFore | 3 | Foreground colour |
| kMarginTypeNumber | 1 | line number |
| kMarginTypeRText | 5 | Right text |
| kMarginTypeSymbol | 0 | symbol |
| kMarginTypeText | 4 | text |

## 157.7 class ScintillaMarkerMBS

### 157.7.1 class ScintillaMarkerMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a marker.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr2

### 157.7.2 Methods

### 157.7.3 Constructor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 157.7.4 Properties

### 157.7.5 Alpha as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The degree of translucency can be chosen by setting an alpha value.
**Notes:** This is only for the content area - in margins, translucency is achieved through the color with alpha.
(Read and Write property)

### 157.7.6 BackColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The background color of the marker.
**Notes:** (Read and Write property)

### 157.7.7 BackColorSelected as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The highlight background color.
**Notes:** Sets the highlight background colour of a marker number when its folding block is selected. The default colour is &cFF0000.
(Read and Write property)

### 157.7.8 ForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The foreground color of the marker.
**Notes:** (Read and Write property)

### 157.7.9 Layer as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Defines the layer where marker is drawn.
**Notes:** When markers are drawn in the content area, either because there is no margin for them or they are of Background or Underline types, they may be drawn translucently over text or opaquely on the base layer. The layer to draw on is defined by this property.
See kLayer* constants.
(Read and Write property)

### 157.7.10 Marker as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The marker number.
**Notes:** (Read only property)

### 157.7.11 Parent as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The parent control.
**Notes:** (Read only property)

### 157.7.12 StrokeWidth as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The stroke width.
**Notes:** Sets the stroke width used to draw the marker in hundredths of a pixel. The default value is 100 indicating a single pixel wide line.
(Read and Write property)

### 157.7.13 Symbol as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The symbol used for this marker.
**Notes:** (Read and Write property)

### 157.7.14 Tag as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tag value.
**Notes:** A variable for you to put any reference information you like.
(Read only property)

### 157.7.15 Constants

Marker Outline

| Constant | Value | Description |
|---|---|---|
| kMarkerOutlineFolder | 30 | Folder entry. |
| kMarkerOutlineFolderEnd | 25 | End of folder line. |
| kMarkerOutlineFolderMidTail | 27 | Middle part of tail. |
| kMarkerOutlineFolderOpen | 31 | Open folder. |
| kMarkerOutlineFolderOpenMid | 26 | Middle of an open folder. |
| kMarkerOutlineFolderSub | 29 | Sub folder. |
| kMarkerOutlineFolderTail | 28 | The tail line on a folder. |

Marker Symbols

| Constant | Value | Description |
|---|---|---|
| kMarkerSymbolArrow | 2 | An arrow to right. |
| kMarkerSymbolArrowDown | 6 | An arrow to down. |
| kMarkerSymbolArrows | 24 | Several arrows. |
| kMarkerSymbolAvailable | 28 | Available number. |
| kMarkerSymbolBackground | 22 | Background color filled. |
| kMarkerSymbolBookmark | 31 | Bookmark symbols left to right. |
| kMarkerSymbolBoxMinus | 14 | A circle with minus. |
| kMarkerSymbolBoxMinusConnected | 15 | Box with minus and connected with line. |
| kMarkerSymbolBoxPlus | 12 | A circle with plus. |
| kMarkerSymbolBoxPlusConnected | 13 | Box with plus and connected with lines. |
| kMarkerSymbolCharacter | 10000 | Character. |
| kMarkerSymbolCircle | 0 | A circle. |
| kMarkerSymbolCircleMinus | 20 | Circle with minus. |
| kMarkerSymbolCircleMinusConnected | 21 | Circle with minus and connected with lines. |
| kMarkerSymbolCirclePlus | 18 | Circle with plus. |
| kMarkerSymbolCirclePlusConnected | 19 | Circle with plus and connected with lines. |
| kMarkerSymbolDotDotDot | 23 | Three dots. |
| kMarkerSymbolEmpty | 5 | Empty marker. |
| kMarkerSymbolFullRect | 26 | Full rectangle. |
| kMarkerSymbolLCorner | 10 | Line from top to right. |
| kMarkerSymbolLCornerCurve | 16 | Line from top to right with curve. |
| kMarkerSymbolLeftRect | 27 | Rectangle on the left side. |
| kMarkerSymbolMinus | 7 | Symbol with minus. |
| kMarkerSymbolPixmap | 25 | A picture. |
| kMarkerSymbolPlus | 8 | Symbol with plus. |
| kMarkerSymbolRgbaImage | 30 | RGBA picture. |
| kMarkerSymbolRoundRect | 1 | Round rectangle. |
| kMarkerSymbolShortArrow | 4 | Short arrow. |
| kMarkerSymbolSmallRect | 3 | Small rectangle. |
| kMarkerSymbolTCorner | 11 | Line from top to bottom with line to right. |
| kMarkerSymbolTCornerCurve | 17 | Line from top to bottom with line to right with curves. |
| kMarkerSymbolUnderline | 29 | Underline |
| kMarkerSymbolVerticalBookmark | 32 | Bookmark symbols top to bottom. |
| kMarkerSymbolVLine | 9 | Vertical line. |

## 157.8 class ScintillaRangeToFormatMBS

### 157.8.1 class ScintillaRangeToFormatMBS

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This class is used in printing and requires some of the graphics types from Platform
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- MBS Xojo Plugins, version 23.2pr1

### 157.8.2 Methods

### 157.8.3 Constructor

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The constructor.
See also:

- 157.8.4 Constructor(other as ScintillaRangeToFormatMBS) 20714

### 157.8.4 Constructor(other as ScintillaRangeToFormatMBS)

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The copy constructor.
See also:

- 157.8.3 Constructor 20714

### 157.8.5 Properties

### 157.8.6 AreaBottom as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Bottom of rectangle in which to print.
**Notes:** (Read and Write property)

### 157.8.7 AreaLeft as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Left of rectangle in which to print.
**Notes:** (Read and Write property)

### 157.8.8 AreaRight as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Right of rectangle in which to print.
**Notes:** (Read and Write property)

### 157.8.9 AreaTop as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Top of rectangle in which to print.
**Notes:** (Read and Write property)

### 157.8.10 CharacterRangeEnd as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The end of the range of characters to print.
**Notes:** CharacterRangeEnd = CharacterRangePosition + Length

You may put in 0 for CharacterRangePosition and ScintillaControl.Length for CharacterRangeEnd to print the whole document.
(Read and Write property)

### 157.8.11 CharacterRangePosition as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The position of the range of characters to print.
**Notes:** Position starts with zero.
(Read and Write property)

### 157.8.12 PageBottom as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Bottom of the physically printable page size
**Notes:** (Read and Write property)

### 157.8.13 PageHeight as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The page height.
**Notes:** Setting height will change bottom coordinate internally.
(Read and Write property)

### 157.8.14 PageLeft as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Left of the physically printable page size
**Notes:** (Read and Write property)

### 157.8.15 PageRight as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Right of the physically printable page size
**Notes:** (Read and Write property)

### 157.8.16 PageTop as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Top of the physically printable page size
**Notes:** (Read and Write property)

### 157.8.17 PageWidth as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The page width.
**Notes:** Setting width will change right coordinate internally.
(Read and Write property)

### 157.8.18 PrinterHandle as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Surface ID we print to.
**Notes:** For macOS use Integer(g.Handle(Graphics.HandleTypes.CGContextRef)), for windows use Integer(g.Handle(Graphics.HandleTypes.HDC)), for Linux use Integer(g.Handle(Graphics.HandleTypes.CairoContext)) to get the handle.
(Read and Write property)

### 157.8.19 TargetHandle as Integer

MBS Scintilla Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The Surface ID we use for measuring (may be same as hdc).
**Notes:** If zero, we use value from PrinterHandle.

For macOS use Integer(g.Handle(Graphics.HandleTypes.CGContextRef)), for windows use Integer(g.Handle(Graphics.HandleTypes.HDC)), for Linux use Integer(g.Handle(Graphics.HandleTypes.CairoContext)) to get the handle.
(Read and Write property)

## 157.9 class ScintillaSpanMBS

### 157.9.1 class ScintillaSpanMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for a span.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr2

### 157.9.2 Methods

### 157.9.3 Constructor(Location as Integer, Length as Integer)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The constructor with values.
See also:

- 157.9.4 Constructor(other as ScintillaSpanMBS) 20718

### 157.9.4 Constructor(other as ScintillaSpanMBS)

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The constructor.
See also:

- 157.9.3 Constructor(Location as Integer, Length as Integer) 20718

### 157.9.5 Equal(other as ScintillaSpanMBS) as boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether two spans are equal.

### 157.9.6 Properties

### 157.9.7 EndPosition as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The end position.
**Notes:** This is equal to Length + StartPosition.
(Read and Write property)

### 157.9.8 Length as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The length of the span.
**Notes:** (Read only property)

### 157.9.9 StartPosition as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The start position in the text.
**Notes:** Zero based.
(Read and Write property)

## 157.10 class ScintillaStyleMBS

### 157.10.1 class ScintillaStyleMBS

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The class for style definitions.
**Notes:** Styles are used to style the various text parts found via the lexer.
The lexer classifies words and assigns them a style, so you can now define how to style the words, e.g. bold keywords.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Tips and tricks for Scintilla Control
- MBS Xojo Plugins, version 21.6pr2

### 157.10.2 Methods

### 157.10.3 Constructor

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 157.10.4 TextWidth(style as Integer, text as String) as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Measures the text width for this style.
**Notes:** This returns the pixel width of a string drawn in the given style which can be used, for example, to decide how wide to make the line number margin in order to display a given number of numerals.

### 157.10.5 Properties

### 157.10.6 BackColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The text background color.
**Notes:** Text is drawn in the foreground colour. The space in each character cell that is not occupied by the character is drawn in the background colour.
(Read and Write property)

### 157.10.7 Bold as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether font is bold.
**Notes:** When you set this to true, the weight is set to kFontWeightBold, otherwise to kFontWeightNormal.
(Read and Write property)

### 157.10.8 CaseVisible as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The value of caseVisible determines how text is displayed.
**Notes:** You can set upper case (kCaseVisibleUpper, 1) or lower case (kCaseVisibleLower, 2) or camel case (kCaseVisibleCamel, 3) or display normally (kCaseVisibleMixed, 0). This does not change the stored text, only how it is displayed.
(Read and Write property)

### 157.10.9 Changeable as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether this text is editable.
**Notes:** This is an experimental and incompletely implemented style attribute. The default setting is changeable set true but when set false it makes text read-only. The user can not move the caret within not-changeable text and not-changeable text may not be deleted by the user. The application may delete not-changeable text by calling DeleteRange().
(Read and Write property)

### 157.10.10 CheckMonospaced as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether font is mono spaced.
**Notes:** This attribute indicates that the font may be monospaced over the ASCII graphics characters (' ' ,Ä¶ '
textasciitilde ', including letters ('a',Ä¶'z', 'A',Ä¶'Z') and numbers ('0',Ä¶'9')). This allows optimizing speed and memory use for some common scenarios where documents are mostly composed from ASCII characters. Fonts are rarely monospaced over all possible characters. Emoji 'üòÉ', Arabic characters 'ÿ¥' and Chinese ideographs 'Êºc' are often different widths to Roman letters. Even when a font is designed as monospaced, not all characters may be present and platforms may substitute other fonts for any missing characters with the substitute characters taking more or less space. However, fonts are often reliably monospaced over ASCII text (disregarding control characters) and many documents contain mostly ASCII characters. This setting

allows simplified position calculations for text runs that are purely ASCII graphics characters.
Before treating the font as monospaced, it is first checked over the ' ' ,Ä¶ '
textasciitilde ' range and for some known combinations of characters that may have different spacings because of kerning or ligatures. Applications may apply the 'check monospaced' attribute just to fonts known to be monospaced or on all fonts, leaving it to Scintilla to reject fonts that are proportional.
(Read and Write property)

### 157.10.11 Description as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The style description.
**Notes:** Retrieve an English-language description of a style which may be suitable for display in a user interface. This looks like "Doc comment: block comments beginning with /** or /*!".
(Read only property)

### 157.10.12 EOLFilled as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to fill till end of line.
**Notes:** If the last character in the line has a style with this attribute set, the remainder of the line up to the right edge of the window is filled with the background colour set for the last character. This is useful when a document contains embedded sections in another language such as HTML pages with embedded JavaScript. By setting eolFilled to true and a consistent background colour (different from the background colour set for the HTML styles) to all JavaScript styles then JavaScript sections will be easily distinguished from HTML.
(Read and Write property)

### 157.10.13 Font as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The fontName is a string holding the name of a font.
**Example:**

```
dim c as ScintillaControlMBS // your control
Dim style As ScintillaStyleMBS = c.Style(ScintillaStyleMBS.kStylesCommonDefault)
// Set font to be system font
style.Font = SystemInformationMBS.SystemFont
```

**Notes:** Under Windows, only the first 32 characters of the name are used, the name is decoded as UTF-8, and the name is not case sensitive. For internal caching, Scintilla tracks fonts by name and does care about the casing of font names, so please be consistent. On GTK, Pango is used to display text and the name is

sent directly to Pango without transformation. On Qt, the name is decoded as UTF-8. On Cocoa, the name is decoded as MacRoman.
(Read and Write property)

### 157.10.14 ForeColor as Color

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The text foreground color.
**Notes:** Text is drawn in the foreground colour. The space in each character cell that is not occupied by the character is drawn in the background colour.
(Read and Write property)

### 157.10.15 HotSpot as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** This style is used to mark ranges of text that can detect mouse clicks.
**Notes:** The cursor changes to a hand over hotspots, and the foreground, and background colours may change and an underline appear to indicate that these areas are sensitive to clicking. This may be used to allow hyperlinks to other documents.
(Read and Write property)

### 157.10.16 Identifiers as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The identifiers associated to a sub style.
**Notes:** (Read and Write property)

### 157.10.17 Italic as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether this style uses an italic style.
**Notes:** (Read and Write property)

### 157.10.18 Name as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Retrieve the name of a style.
**Notes:** This is a C preprocessor symbol like "SCE_C_COMMENTDOC".
(Read only property)

### 157.10.19 Parent as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The parent control.
**Notes:** (Read only property)

### 157.10.20 Size as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The font size.
**Notes:** Sizes can be set to a whole number of points with Size property or to a fractional point size in hundredths of a point with SizeFractional property by multiplying the size by 100. For example, a text size of 9.4 points is set with SizeFractional = 940.
(Read and Write property)

### 157.10.21 SizeFractional as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The font size in 100th.
**Notes:** Sizes can be set to a whole number of points with Size property or to a fractional point size in hundredths of a point with SizeFractional property by multiplying the size by 100. For example, a text size of 9.4 points is set with SizeFractional = 940.
(Read and Write property)

### 157.10.22 Style as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The style number for this style.
**Notes:** (Read only property)

### 157.10.23 Tag as Variant

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tag value.
**Notes:** A variable for you to put any reference information you like.
(Read only property)

### 157.10.24 Tags as String

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The tags of a style.
**Notes:** This is a space-separated set of words like "comment documentation".
(Read only property)

### 157.10.25 Underline as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** You can set a style to be underlined.
**Notes:** The underline is drawn in the foreground colour. All characters with a style that includes the underline attribute are underlined, even if they are white space.
(Read and Write property)

### 157.10.26 Visible as Boolean

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Whether to show this text.
**Notes:** Text is normally visible. However, you can completely hide it by giving it a style with the visible set to 0. This could be used to hide embedded formatting instructions or hypertext keywords in HTML or XML. Invisible text may not be deleted by user actions but the application may delete invisible text by calling DeleteRange().
(Read and Write property)

### 157.10.27 Weight as Integer

MBS Scintilla Plugin, Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The weight of the font.
**Notes:** The weight or boldness of a font can be set with Bold or Weight properties. The weight is a number

between 1 and 999 with 1 being very light and 999 very heavy. While any value can be used, fonts often only support between 2 and 4 weights with three weights being common enough to have symbolic names: kFontWeightNormal (400), kFontWeightSemiBold (600), and kFontWeightBold (700).
(Read and Write property)

### 157.10.28 Constants

Case Visibility

| Constant | Value | Description |
|---|---|---|
| kCaseVisibleCamel | 3 | Camel case. |
| kCaseVisibleLower | 2 | Uppercase letters. |
| kCaseVisibleMixed | 0 | Mixed case. |
| kCaseVisibleUpper | 1 | Uppercase letters. |

Font Weights

| Constant | Value | Description |
|---|---|---|
| kFontWeightBold | 700 | Bold font. |
| kFontWeightNormal | 400 | Normal font, not bold. |
| kFontWeightSemiBold | 600 | Semi bold. |

Common Styles

| Constant | Value | Description |
|---|---|---|
| kStylesCommonBraceBad | 35 | This style sets the display attributes used when marking an unmatched brace with the BraceBadLight method. |
| kStylesCommonBraceLight | 34 | This style sets the attributes used when highlighting braces with the BraceHighlight method and when highlighting the corresponding indentation with HighlightGuide. |
| kStylesCommonCallTip | 38 | Call tips normally use the font attributes defined by kStylesCommonDefault. Use of CallTipUseStyle causes call tips to use this style instead. Only the font face name, font size, foreground and background colours and character set attributes are used. |
| kStylesCommonControlChar | 36 | This style sets the font used when drawing control characters. Only the font, size, bold, italics, and character set attributes are used and not the colour attributes. See also: ControlCharSymbol method. |
| kStylesCommonDefault | 32 | This style defines the attributes that all styles receive when the StyleClearAll method is used. |
| kStylesCommonFoldDisplayText | 39 | This is the style used for drawing text tags attached to folded text. |
| kStylesCommonIndentGuide | 37 | This style sets the foreground and background colours used when drawing the indentation guides. |
| kStylesCommonLastPredefined | 39 | To make it easier for client code to discover the range of styles that are predefined, this is set to the style number of the last predefined style. |
| kStylesCommonLineNumber | 33 | This style sets the attributes of the text used to display line numbers in a line number margin. The background colour set for this style also sets the background colour for all margins that do not have any folding mask bits set. That is, any margin for which mask & kMaskFolders is 0. See Mask in ScintillaMarginMBS class for more about masks. |
| kStylesCommonMax | 255 | This is not a style but is the number of the maximum style that can be set. Styles between kStylesCommonLastPredefined and kStylesCommonMax may be used. |

# Chapter 158

# Screenshot

## 158.1 Globals

### 158.1.1 ScreenshotDisplayMBS(index as Integer) as picture

MBS Picture Plugin, Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the Screenshot from the display with the given index.
**Example:**

Backdrop = ScreenshotDisplayMBS(0)

**Notes:** Index starts at 0 for the main display.
Works on Linux only for first screen.

Plugin version 10.4 added support for multiple displays on Windows.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr7
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3

### 158.1.2 ScreenshotFromStringMBS(Width as Integer, Height as Integer, RowBytes as Integer, data as string) as picture

MBS Picture Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates the picture from a string returnd by ScreenshotStringMBS.
**Example:**

```
dim p as Picture
dim s as string

dim w,h,r as Integer

s=ScreenshotStringMBS(w,h,r)

p=ScreenshotFromStringMBS(w,h,r,s)

Backdrop=p
```

**Notes:** Returns nil on any error.
(for example if width, height and rowwidth doesn't fit together.)

### 158.1.3 ScreenshotMBS as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a picture of the screen content in screen resolution.
**Example:**

```
dim p as picture
p=screenshotMBS
```

**Notes:** For a rectangle only you can use ScreenShotRectMBS.

Plugin Version 7.2 adds Windows Vista Support.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr9

### 158.1.4 ScreenshotRectMBS(left as Integer, top as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a picture of the screen rectangle in screen resolution.
**Example:**

```
// write picture of window to desktop
#if TargetMacOS then
const f = 1
#else
dim f as double = screen(0).ScaleFactor
#endif

dim p as Picture = ScreenshotRectMBS(self.left*F, self.top*F, self.Width*F, self.Height*F)
dim ff as FolderItem = SpecialFolder.Desktop.Child("test.jpg")

p.Save(ff, p.SaveAsJPEG)
```

**Notes:** Improved in Version 3.2 to support multiple displays on Mac OS.

Plugin Version 10.4 adds Windows support.
Coordinates given in pixel on screen, so for High DPI on Windows, you need to multiply them before passing parameters.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr2
- MBS Real Studio Plugins, version 11.2pr2
- MBS REALbasic Plugins, version 11.0pr13
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3
- MBS REALbasic plug-ins version 9.3

**Xojo Developer Magazine**

- 7.4, page 8: News

### 158.1.5 ScreenshotStringDisplayMBS(byref Width as Integer, byref Height as Integer, byref RowBytes as Integer, index as Integer) as string

MBS Picture Plugin, Plugin Version: 8.6, Platform: macOS, Targets: All.

**Function:** Returns a picture of the screen content in screen resolution.
**Example:**

```
dim s as string
dim w,h,r as Integer
dim index as Integer=0

s=ScreenshotStringDisplayMBS(w,h,r, index)
```

**Notes:** Returns nil on any error.
Use ScreenshotFromStringMBS to get the picture from the string.

### 158.1.6 ScreenshotStringMBS(byref Width as Integer, byref Height as Integer, byref RowBytes as Integer) as string

MBS Picture Plugin, Plugin Version: 8.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a picture of the screen content in screen resolution.
**Example:**

```
dim s as string
dim w,h,r as Integer
s=ScreenshotStringMBS(w,h,r)
```

**Notes:** Returns nil on any error.
Use ScreenshotFromStringMBS to get the picture from the string.

# Chapter 159

# SerialPort

## 159.1 class SerialPortMBS

### 159.1.1 class SerialPortMBS

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enumerate serial ports and send/receive data.
**Notes:** While we compiled this class also for iOS, we don't expect anyone to find a serial port on an iPhone.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.4
- MBS Xojo Plugins, version 23.4pr6
- News from the MBS Xojo Plugins in Version 23.0
- MBS Xojo Plugins, version 22.6pr1
- News from the MBS Xojo Plugins Version 22.4
- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr2
- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3

**Xojo Developer Magazine**

- 21.6, page 9: News
- 20.6, page 9: News

### 159.1.2 Methods

### 159.1.3 AvailableBytes as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of bytes available in buffer.

### 159.1.4 Clear

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears incoming buffer.

### 159.1.5 Close

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes serial port.
**Notes:** This happens automatically in the destructor.

### 159.1.6 Constructor

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Please call Open() to open a device.

### 159.1.7 HasDataAvailable as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether data is available to read.

### 159.1.8 HasLine as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a line is available.
**Notes:** The plugin checks the input buffer for a newline character.

### 159.1.9 List(Mode as Integer = 0) as String()

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns list of names of serial ports.
**Notes:** Returns list of names of serial ports.
On Windows can list ports with textual name.

Mode can be 1 on Windows to return friendly names of ports.

### 159.1.10 Open(Name as String, Index as Integer = 0)

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the serial port.
**Example:**

```
dim port as new SerialPortMBS

// open a port
port.Open("COM1")

// check the path
MessageBox port.Path
```

**Notes:** You get the names from List function.
The port is opened with default settings.

Even if port is not showing in list, it may still open here, e.g. virtual COM ports on Windows.
You can open several ports with different connections, e.g. by calling Open once for each SerialPortMBS object.

### 159.1.11 OpenPath(Path as String)

MBS Util Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the special file/device/pipe.
**Notes:** This allows you to e.g. open a pipe on Windows.

### 159.1.12 Poll

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Polls to see if there is new data.
**Notes:** The plugin regularly checks if there is new data and raises the DataAvailable event if needed.

### 159.1.13 Read(MaxByteSizeToRead as Integer) as String

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads bytes from serial port and returns them as text.
**Notes:** Reads bytes from serial port and returns them as text.
The text returned may be shorter than length bytes.
See also AvailableBytes function.

### 159.1.14 ReadByte as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the byte value or an error message.
**Notes:** This is very useful for reading control characters which you can't easily put in a text in FileMaker. Like 13 for a LF (line feed) or 10 for CR (carriage return).
See also AvailableBytes function.

### 159.1.15 ReadLine as String

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a line of text from serial port.
**Notes:** The plugin buffers input and reads text until first newline character. Returns text without that newline character.

### 159.1.16 Resume

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resumes serial port.
**Notes:** While suspended, we do not trigger event and clear incoming buffer regularly.

### 159.1.17 Suspend

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Suspends serial port.
**Notes:** While suspended, we do not trigger event and clear incoming buffer regularly.
Please call Resume later.

### 159.1.18 Write(value as String) as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes written or an error message.
**Notes:** Be aware that text encoding conversion may result in different bytes than expected, so please verify on other side the text encoding matches the expectations.

### 159.1.19 WriteByte(value as Integer) as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes written.
**Notes:** This is very useful for sending control characters which you can't easily put in a text in Xojo.
Like 13 for a LF (line feed) or 10 for CR (carriage return).

### 159.1.20 Properties

### 159.1.21 Handle as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 159.1.22 Lasterror as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** The error code is zero for no error.
On Windows you get the windows system error codes and on macOS and Linux the unix system error codes.

The methods and properties raise IOException in case of errors and include the error codes.
(Read only property)

### 159.1.23 Path as String

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The path used to open the serial port.
**Example:**

```
dim port as new SerialPortMBS

// open a port
port.Open("COM1")

// check the path
MessageBox port.Path
```

**Notes:** Set by Open() method.
Value is e.g. "COM1"
(Read only property)

### 159.1.24 Suspended as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks suspension state.
**Notes:** Checks suspension state.
While suspended, we do not trigger event and clear incoming buffer regularly.
(Read only property)

### 159.1.25 Tag as Variant

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag property.
**Notes:** You can store whatever you like in this property to read it later.
(Read and Write property)

### 159.1.26 BaudRate as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets the baud rate.
**Notes:** (Read and Write computed property)

### 159.1.27 CTS as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current CTS mode.
**Notes:** If enabled, the CTS (clear-to-send) signal is monitored for output flow control.
Than if CTS is turned off, output is suspended until CTS is sent again.
(Read and Write computed property)

### 159.1.28 DataBits as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets the data bit size.
**Notes:** Value is 5, 6, 7 or 8.
(Read and Write computed property)

### 159.1.29 DSR as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets whether DSR mode is used.
**Notes:** If enabled DSR (data-set-ready) signal is monitored for output flow control.
(Read and Write computed property)

### 159.1.30 DTR as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets whether DTR (data-terminal-ready) flow control is used.
**Notes:** (Read and Write computed property)

### 159.1.31 Parity as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets parity setting.
**Notes:** Can be 0 (off), 1 (odd) or 2 (even), see constants.
(Read and Write computed property)

### 159.1.32 RTS as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets whether to use RTS (request-to-send) flow control.
**Notes:** (Read and Write computed property)

### 159.1.33 StopBits as Double

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets number of stop bits.
**Notes:** Can be 1 or 2 on Mac/Linux and 1, 1.5 or 2 on Windows.
(Read and Write computed property)

### 159.1.34 WinRTSControl as Integer

MBS Util Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The RTS (request-to-send) flow control.
**Notes:** This property gives you direct access to the RTS control setting on Windows.
And this is set to either disabled or handshake by the RTS property.

Raises an exception if used on MacOS or Linux.
(Read and Write computed property)

### 159.1.35 XON as Boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or sets if XON/XOFF flow control is used.
**Notes:** (Read and Write computed property)

### 159.1.36 Events

### 159.1.37 DataAvailable

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when data is available.
**Notes:** Please call the Read methods here to process data.

### 159.1.38 Constants

Parity

| Constant | Value | Description |
|---|---|---|
| kParityEven | 2 | Even parity |
| kParityNone | 0 | No parity |
| kParityOdd | 1 | Odd parity |

RTS Flow Control Settings

| Constant | Value | Description |
|---|---|---|
| kWinRTSControlDisabled | 0 | Disables the RTS line when the device is opened and leaves it disabled. |
| kWinRTSControlEnabled | 1 | Enables the RTS line when the device is opened and leaves it on. |
| kWinRTSControlHandshake | 2 | Enables RTS handshaking. The driver raises the RTS line when the "type-ahead" (input) buffer is less than one-half full and lowers the RTS line when the buffer is more than three-quarters full. |
| kWinRTSControlToggle | 3 | Specifies that the RTS line will be high if bytes are available for transmission. After all buffered bytes have been sent, the RTS line will be low. |

# Chapter 160

# SFPassword

## 160.1 class SFPasswordAssistantMBS

### 160.1.1 class SFPasswordAssistantMBS

MBS MacExtras Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** The class to help the user to create a new password.
**Notes:** This is an Apple internal class with no public interface. It works for Mac OS X 10.4 and should work on 10.3 and 10.5.

You need to keep the reference to the SFPasswordAssistantMBS object in a global property. If the object in Xojo is destroyed while the panel is still visible, it will crash.

Do not call Close or PerformClose methods to close this window, use BaseWindowWillClose.
Not supported for 64 bit target.
Subclass of the NSPanelMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr5
- MBS Plugins 10.3 Release Notes

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 160.1.2 Methods

### 160.1.3 BaseWindowWillClose

MBS MacExtras Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Tells the panel that the base window will close.
**Notes:** If your window which uses the panel will close, you should call that method from the CancelClose method of your window.

### 160.1.4 Constructor

MBS MacExtras Plugin, Plugin Version: 8.4, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new password assistant panel.

### 160.1.5 ShowPanel

MBS MacExtras Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** Shows the panel.
**Notes:** This method does a bit more than just show.
It will create the panel, create a new password and run the password quality check.

### 160.1.6 Properties

### 160.1.7 Password as string

MBS MacExtras Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop only.

**Function:** The current password.
**Notes:** If you set the value, the new password is checked for quality and the TextChanged event may be fired.
(Read and Write computed property)

### 160.1.8 Events

### 160.1.9 TextChanged(text as string)

MBS MacExtras Plugin, Plugin Version: 7.5, Platform: macOS, Targets: .

**Function:** The text was changed.
**Notes:** This event fires often.
It fires if the text changed (e.g. a letter was added) or sometimes it fires if the text was not changed.

So best if you need to update GUI, to check the text parameter and use timer. Restart the timer every time you get an event with a period of maybe 500 ms. So in case you don't get new events and the timer fires, you can update your GUI.

# Chapter 161

# Sharing Panel

## 161.1 class SharingPanelMBS

### 161.1.1 class SharingPanelMBS

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: Desktop & iOS.

**Function:** A view controller that you use to offer standard services from your app.
**Notes:** The system provides several standard services, such as copying items to the pasteboard, posting content to social media sites, sending items via email or SMS, and more. Apps can also define custom services.
Your app is responsible for configuring, presenting, and dismissing this view controller. Configuration for the view controller involves specifying the data objects on which the view controller should act. (You can also specify the list of custom services your app supports.)
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins, version 21.4pr4

**Xojo Developer Magazine**

- 19.6, page 10: News

### 161.1.2 Methods

### 161.1.3 AddData(Data as MemoryBlock, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add data to the list of items to share.

### 161.1.4 AddFile(File as FolderItem, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add a file as URL to the list of items to share.

### 161.1.5 AddImage(image as NSImageMBS, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add an image to the list of items to share.

### 161.1.6 AddPicture(pic as Picture, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add an image to the list of items to share.

### 161.1.7 AddStyledText(text as NSAttributedStringMBS, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add styled text to the list of items to share.
**Notes:** Subject is optional subject passed to email app.

### 161.1.8 AddText(text as string, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add text to the list of items to share.
**Notes:** Subject is optional subject passed to email app.

### 161.1.9 AddURL(URL as string, subject as string = "")

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Add an URL to the list of items to share.

### 161.1.10 Constructor

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 161.1.11 Destructor

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 161.1.12 Dismiss

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 161.1.13 ExcludedActivityTypes as String()

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Queries the list of excluded activity types.

### 161.1.14 Items as Variant()

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Copies the items to share.

### 161.1.15 Present

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 161.1.16 SetExcludedActivityTypes(ActivityTypess() as String)

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Sets the list of excluded activity types.

### 161.1.17 SetItems(items() as Variant)

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** Sets the items to share with an variant array.

### 161.1.18 UIActivityTypeAddToReadingList as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that adds the URL to Safari,Äôs reading list.
When using this service, you can provide an URL whose contents uses the http or https scheme that points to the page to add.

### 161.1.19 UIActivityTypeAirDrop as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that makes the provided content available through AirDrop.
When using this service, you can provide String, NSAttributedStringMBS, picture, and URLs as data for the activity items. You may also provide Array or Dictionary objects that contain the listed data types.

### 161.1.20 UIActivityTypeAssignToContact as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that assigns the image to a contact.
When using this service, you can provide a picture object as data for the activity items.

### 161.1.21 UIActivityTypeCopyToPasteboard as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the pasteboard.

When using this service, you can provide string, picture, URL, color, and Dictionary objects as data for the activity items.

### 161.1.22 UIActivityTypeMail as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to a new email message.

When using this service, you can provide string and picture objects and URLs pointing to local files as data for the activity items.
Optional subject for items are passed for email subject.

### 161.1.23 UIActivityTypeMarkupAsPDF as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that marks up the provided content as a PDF file.

### 161.1.24 UIActivityTypeMessage as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the Messages app.
When using this service, you can provide string and NSAttributedStringMBS objects as data for the activity items. You may also specify URLs whose contents use the sms scheme.
If the device has MMS or FaceTime enabled, you can provide picture, and URLs as data for the activity items.

### 161.1.25 UIActivityTypeOpenInIBooks as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that opens the content in iBooks.

### 161.1.26 UIActivityTypePostToFacebook as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the user,Äôs wall on Facebook.
When using this service, you can provide String, NSAttributedStringMBS, picture, and URLs as data for the activity items.

### 161.1.27 UIActivityTypePostToFlickr as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided image to the user,Äôs Flickr account.
When using this service, you can provide picture and URLs whose contents use the file scheme and point to an image. You can also use MemoryBlock whose contents are image data as data for the activity items.

### 161.1.28 UIActivityTypePostToTencentWeibo as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the user,Äôs Tencent Weibo feed.
When using this service, you can provide String, NSAttributedStringMBS, picture, and URL as data for the activity items.

### 161.1.29 UIActivityTypePostToTwitter as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the user,Äôs Twitter feed.
When using this service, you can provide String, NSAttributedStringMBS, picture, and URL as data for the

activity items.

### 161.1.30 UIActivityTypePostToVimeo as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided video to the user,Äôs Vimeo account.
When using this service, you can provide data from URL/folderItem whose contents use the file scheme and point to a video. You can use MemoryBlock objects whose contents are video data as data for the activty items.

### 161.1.31 UIActivityTypePostToWeibo as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that posts the provided content to the user,Äôs Weibo feed.
When using this service, you can provide picture and URLs whose contents use the file scheme and point to an image. You can also use MemoryBlock whose contents are image data as data for the activity items.

### 161.1.32 UIActivityTypePrint as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that prints the provided content.

When using this service, you can provide picture and MemoryBlock objects and URL/folderitem pointing to local files as data for the activity items.

### 161.1.33 UIActivityTypeSaveToCameraRoll as String

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** One of the activity types.
**Notes:** A type of activity that assigns the image or video to the user,Äôs camera roll.

When using this service, you can provide a picture as data for image-based activity items. For image and video items, you can provide an URL/file with a path to the video.

### 161.1.34 Properties

### 161.1.35 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 161.1.36 isBeingPresented as Boolean

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view controller is being presented.
**Notes:** (Read only property)

### 161.1.37 Events

### 161.1.38 Completed(activityType as String, completed as Boolean, activityError as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.4, Platform: iOS, Targets: .

**Function:** The event called after the activity view controller is dismissed.
**Notes:** Upon the completion of an activity, or the dismissal of the activity view controller, the view controller,Äôs completion block is executed. You can use this block to execute any final code related to the service. The parameters of this block are as follows:

activityType: The type of the service that was selected by the user. For custom services, this is the value returned by the activityType method of a UIActivity object. For system-defined activities, it is one of the strings listed in "Built-in Activity Types,Äù in UIActivity.
completed: True if the service was performed or false if it was not. This parameter is also set to false when the user dismisses the view controller without selecting a service.
activityError: An error object if the activity failed to complete, or nil if the the activity completed normally.

# Chapter 162

# Shell

## 162.1 Globals

### 162.1.1 ConsoleExecuteMBS(path as folderitem, arguments() as string, environment() as string) as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Executes a new application.
**Notes:** Use WindowsShellExecuteMBS on Windows.

Launch GUI tools on Mac OS X using /bin/open.
Returned value is the PID of the new process.
If the execution fails you still get a PID, but this process is terminated in a few milliseconds.

arguments must have at least one member.

See also WindowsProcessMBS and WindowsShellExecuteMBS (Windows only), NSTask (Mac only) and ShellMBS (cross platform).
See also:

- 162.1.2 ConsoleExecuteMBS(path as string, arguments() as string, environment() as string) as Integer

### 162.1.2 ConsoleExecuteMBS(path as string, arguments() as string, environment() as string) as Integer

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

**Function:** Executes a new application.
**Example:**

```
// launch an app using open

const sShellPath="/usr/bin/open"

dim a(1) as string
dim e(-1) as string

a(0)="open" // must be the application name
a(1)="/Applications/TextEdit.app" // first parameter

print str(ConsoleExecuteMBS(sShellPath,a,e))

// Launch app binary directly:

dim aa(1) as string
dim ee(-1) as string

dim f as FolderItem

f=GetFolderItem("test.app").Child("Contents").Child("MacOS").Child("test")

aa(0)=f.ShellPath

print str(ConsoleExecuteMBS(f.ShellPath,aa,ee))
```

**Notes:** Use WindowsShellExecuteMBS on Windows.

Launch GUI tools on Mac OS X using /bin/open.
Returned value is the PID of the new process.
If the execution fails you still get a PID, but this process is terminated in a few milliseconds.

arguments must have at least one member.

See also WindowsProcessMBS, WindowsShellExecuteAsAdminMBS and WindowsShellExecuteMBS (Windows only), NSTask (Mac only) and ShellMBS (cross platform).
**Blog Entries**

- MBS Xojo Plugins, version 21.5pr2

See also:

- 162.1.1 ConsoleExecuteMBS(path as folderitem, arguments() as string, environment() as string) as

Integer 20755

## 162.2 class ShellMBS

### 162.2.1 class ShellMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class in MBS Plugins to run executables.
**Example:**

```
Dim s As New ShellMBS

s.Execute "/usr/bin/whoami"
s.Wait 5

Dim output As String = s.ReadOutput
Dim errors As String = s.ReadError

Break // see in debugger

MsgBox "whoami: "+output
```

**Notes:** Via input stream, we can send data to the process.
And via output and error streams, we can read data coming back.

While this class does the same as Shell class in Xojo, we have the possibility to add more in the future.
For now you can benefit from an alternative implementation with stderr and stdout as two streams. Also we feature terminate methods to kill the child process.

See also WindowsProcessMBS, WindowsShellExecuteAsAdminMBS and WindowsShellExecuteMBS (Windows only), ConsoleExecuteMBS and NSTaskMBS (Mac only).
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr6
- News from the MBS Xojo Plugins in Version 23.0
- MBS Xojo Plugins, version 23.0pr8
- MBS Xojo Plugins, version 22.6pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo Plugins, version 21.2pr6

- MBS Xojo Plugins, version 20.1pr1
- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr6

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 19.4, page 10: News

### 162.2.2 Methods

### 162.2.3 Arguments as String()

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries arguments array.
**Example:**

```
// query execution policy in PowerShell
Dim s As New ShellMBS

s.Arguments.Append "-Command"
s.Arguments.Append "Get-ExecutionPolicy -List"

s.Execute "powershell.exe"
s.Wait 5

Dim output As String = s.ReadOutput
Dim errors As String = s.ReadError

Break // see in debugger
```

**Notes:** You can add arguments to this array.

### 162.2.4 CloseInput

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes stdin to the process.
**Notes:** Sometimes this is needed as some processes wait till stdin is closed.

### 162.2.5 CloseStreams

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Closes the streams.
**Notes:** Automatically done in destructor.

### 162.2.6 Constructor

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 162.2.7 Destructor

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 162.2.8 Execute(Executable as String)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Runs the executable.
**Example:**

```
// run PowerShell and get help
Dim s As New ShellMBS

s.SetArguments array("/?")
```

```
s.Execute "powershell.exe"
s.Wait 5

Dim output As String = s.ReadOutput
Dim errors As String = s.ReadError

Break // see in debugger
```

**Notes:** Pass path to executable to run.
Opens the streams stdin, stdout and stderr.

### 162.2.9 ExitCode as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the exit code of the terminated process.

### 162.2.10 Poll

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Polls for events.
**Notes:** This will check for pending event and fire events if needed.
Internally we call this with a timer for the shell object, but you can call this in a tight loop.

### 162.2.11 ReadError as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from stderr.
**Notes:** Queries available bytes to return all the data in the buffer.

### 162.2.12 ReadOutput as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from stdout.
**Notes:** Queries available bytes to return all the data in the buffer.

### 162.2.13 SetArguments(arguments() as String)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Assigns a new array of arguments.
**Example:**

```
Dim sh as new ShellMBS
Dim args() As String

args.Append "-c"
args.Append "5"
args.Append "monkeybreadsoftware.com"

sh.SetArguments args
```

### 162.2.14 Terminate(WinExitCode as Integer = 255) as boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Terminates the app with the given exit code.
**Notes:** ExitCode is only used on Windows.
Returns true on success.

### 162.2.15 Wait(TimeOut as double = 30.0)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Waits for process to quit.
**Notes:** Yields time and waits until time passed or process terminates.

### 162.2.16 WriteInput(data as string) as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends data to stdin of the running process.
**Notes:** Returns number of bytes written.

### 162.2.17 Properties

### 162.2.18 ApplicationName as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The path to the application.
**Notes:** Can be empty when application is part of command line.
Only for Windows.
(Read and Write property)

### 162.2.19 AvailableBytesError as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of available bytes on stderr.
**Notes:** (Read only property)

### 162.2.20 AvailableBytesOutput as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of available bytes on stdout.
**Notes:** (Read only property)

### 162.2.21 CurrentDirectory as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The current directory for the process.
**Notes:** You can set this before calling Execute to specify the start directory.
If this parameter is "", the new process will have the same current drive and directory as the calling process.
(Read and Write property)

### 162.2.22 Domain as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The domain name.
**Notes:** Only used on Windows.
You can set username and password to run app with different user. Domain is optional to specify network domain.
(Read and Write property)

### 162.2.23 Environment as Dictionary

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The environment variables to use.
**Notes:** (Read and Write property)

### 162.2.24 ErrorCode as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Last native error code.
**Notes:** Zero is success.
(Read only property)

### 162.2.25 Executable as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The command line to run.
**Notes:** On Mac and Linux just the path to executable.
If applicationName is set for Windows, this should only provide parameters.

(Read only property)

### 162.2.26 IsRunning as Boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether process is running.
**Notes:** Returns true if running or false if not.

The process may not terminate if there is still output data in the pipes. So please read error/stdout regularly.
(Read only property)

### 162.2.27 Password as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The password.
**Notes:** You can set username and password to run app with different user. Domain is optional to specify network domain.
Only for Windows.
(Read and Write property)

### 162.2.28 PID as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The process ID of the child process.
**Notes:** (Read only property)

### 162.2.29 ProcessHandle as Integer

MBS Util Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For Windows the process handle.
**Notes:** (Read only property)

### 162.2.30 Tag as Variant

MBS Util Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag property.
**Notes:** You can store whatever you like in this property to read it later.
(Read and Write property)

### 162.2.31 ThreadHandle as Integer

MBS Util Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For Windows the thread handle for the child process.
**Notes:** (Read only property)

### 162.2.32 Username as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The user name.
**Notes:** You can set username and password to run app with different user. Domain is optional to specify network domain.
Only for Windows.
(Read and Write property)

### 162.2.33 Events

### 162.2.34 Completed

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called when process terminated.

### 162.2.35 DataAvailable(AvailableBytesError as Integer, AvailableBytesOutput as Integer)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called when new data is available on stderr or stdout.
**Notes:** You need to use read commands to query data.

## 162.3 class WindowsProcessMBS

### 162.3.1 class WindowsProcessMBS

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to run processes on Windows.
**Example:**

```
// run command
dim w as new WindowsProcessMBS

w.CommandLine = "cmd /c dir"
w.CurrentDirectory = "C:"

if not w.run then
MsgBox w.LastErrorMessage
Return
end if

// wait
while w.Running
app.YieldToNextThread
wend

// show result
dim a as Integer = w.AvailableBytesOutput
dim r as string = w.ReadOutput(a)
MsgBox r
```

**Notes:** Can be used like shell, but with more windows specific options.
For interactive shell, you need to run cmd.exe yourself.
This shell is asynchronously. For synchrones mode, please write yourself a loop waiting for process to finish.

Please read Microsoft documentation for more details:
https://msdn.microsoft.com/en-us/library/windows/desktop/ms682425(v=vs.85).aspx

See also NSTask (Mac only), WindowsShellExecuteAsAdminMBS, WindowsShellExecuteMBS (Windows only), ConsoleExecuteMBS and ShellMBS (cross platform).
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo Plugins, version 21.2pr6
- MBS Xojo Plugins, version 20.0pr8

- MBS Xojo Plugins, version 19.5pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.1
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- Running command lines tools on Windows

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 19.4, page 10: News
- 15.3, page 11: News

### 162.3.2 Methods

### 162.3.3 Close

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the process.
**Notes:** Same as destructor.

### 162.3.4 PeekError(Length as Integer = 0) as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Peeks in stderr.

### 162.3.5 PeekOutput(Length as Integer = 0) as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Peeks in stdout.

### 162.3.6 ReadError(Length as Integer = 0) as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from stderr.
**Notes:** Please pass maximum number of bytes to read.

### 162.3.7 ReadOutput(Length as Integer = 0) as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from stdout.
**Notes:** Please pass maximum number of bytes to read.

### 162.3.8 Run as Boolean

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts the process.
**Notes:** Returns true on success or false on failure.

### 162.3.9 SetKillProcessWhenParentDies as boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets process to be killed automatically.
**Notes:** When Xojo application ends, the process you started is killed automatically.
Returns true if option is set or false on failure.

### 162.3.10 Terminate(ExitCode as Integer) as Boolean

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Terminates the app with the given exit code.
**Notes:** Returns true on success.

### 162.3.11 Write(Data as MemoryBlock) as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends data to stdin of the running process.
**Notes:** Returns number of bytes written.
See also:

• 162.3.12 Write(Data as String) as Integer 20770

### 162.3.12 Write(Data as String) as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends data to stdin of the running process.
**Notes:** Returns number of bytes written.
See also:

• 162.3.11 Write(Data as MemoryBlock) as Integer 20769

### 162.3.13 Properties

### 162.3.14 ApplicationName as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The path to the application.
**Notes:** Can be empty when application is part of command line.
(Read and Write property)

### 162.3.15 AvailableBytesError as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of available bytes on stderr.
**Notes:** (Read only property)

### 162.3.16 AvailableBytesOutput as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of available bytes on stdout.
**Notes:** (Read only property)

### 162.3.17 CommandLine as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The command line to run.
**Example:**

```
// Run PowerShell to query execution policy

Dim s As New WindowsProcessMBS
s.CommandLine = "powershell.exe -Command ""Get-ExecutionPolicy -List"""

if s.run then
DelayMBS 0.5

while s.Running
// wait
app.YieldToNextThread
DelayMBS 0.1
wend

dim a as Integer = s.AvailableBytesOutput
Dim output As String = s.ReadOutput(a)

Break // see in debugger

else
break // failed
end if
```

**Notes:** If applicationName is set, this should only provide parameters.
(Read and Write property)

### 162.3.18 CurrentDirectory as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current directory for the process.
**Notes:** You can set this before calling Run to specify the start directory.
If this parameter is "", the new process will have the same current drive and directory as the calling process.
(Read and Write property)

### 162.3.19 Domain as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The domain name.

**Notes:** You can set username and password to run app with different user. Domain is optional to specify network domain.
(Read and Write property)

### 162.3.20 Environment as Dictionary

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The environment variables to use.
**Example:**

```
// run command
dim w as new WindowsProcessMBS

w.CommandLine = "cmd /c echo %TEST%"

// set environment
dim env as new Dictionary
env.Value("TEST") = "Hello World"
w.Environment = env

if not w.run then
MsgBox w.LastErrorMessage
Return
end if

// wait
while w.Running
app.YieldToNextThread
wend

// show result
dim a as Integer = w.AvailableBytesOutput
dim r as string = w.ReadOutput(a)
MsgBox r
```

**Notes:** (Read and Write property)

### 162.3.21 ExitCode as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the exit code of the terminated process.

**Notes:** (Read only property)

### 162.3.22 LastError as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Last windows error code.
**Notes:** (Read only property)

### 162.3.23 LastErrorMessage as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The message text for the last error.
**Notes:** (Read only property)

### 162.3.24 Password as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The password.
**Notes:** You can set username and password to run app with different user. Domain is optional to specify network domain.
(Read and Write property)

### 162.3.25 ProcessHandle as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For Windows the process handle.
**Notes:** (Read only property)

### 162.3.26 ProcessID as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The process ID of the process.
**Notes:** (Read only property)

### 162.3.27 Running as Boolean

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks whether process is running.
**Notes:** Returns true if running or false if not.

The process may not terminate if there is still output data in the pipes. So please read error/stdout regularly.
(Read only property)

### 162.3.28 ThreadHandle as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For Windows the thread handle for the child process.
**Notes:** (Read only property)

### 162.3.29 ThreadID as Integer

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The thread ID of the main thread for the process.
**Notes:** (Read only property)

### 162.3.30 UserName as String

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The user name.
**Notes:** You can set username and password to run app with different user. Domain is optional to specify network domain.
(Read and Write property)

### 162.3.31 Events

### 162.3.32 DataAvailable(AvailableBytesOutput as Integer, AvailableBytesError as Integer)

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: .

**Function:** The event called when data is available for stdout or stderr.

### 162.3.33 Terminated(ExitCode as Integer)

MBS Win Plugin, Plugin Version: 17.1, Platform: Windows, Targets: .

**Function:** The event called when process terminated.

# Chapter 163

# SmartCard

## 163.1 class SmartCardContextMBS

### 163.1.1 class SmartCardContextMBS

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a SmartCard context.
**Example:**

```
dim c as new SmartCardContextMBS
dim list() as string = c.Readers
MsgBox Join(list, EndOfLine)
```

**Blog Entries**

- MBS Xojo Plugins, version 19.6pr1

### 163.1.2 Methods

### 163.1.3 Cancel

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Terminates all outstanding actions within a specific resource manager context.
**Notes:** The only requests that you can cancel are those that require waiting for external action by the smart card or user. Any such outstanding action requests will terminate with a status indication that the action

was canceled. This is especially useful to force outstanding GetStatusChange calls to terminate.

Lasterror is set.

### 163.1.4 Connect(reader as string, ShareMode as UInt32, PreferredProtocols as UInt32) as SmartCardMBS

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Connects to a smartcard.
**Example:**

```
dim c as new SmartCardContextMBS

dim s as SmartCardMBS
s = c.Connect("MyReader", SmartCardMBS.kShareShared, SmartCardMBS.kProtocolAny)
if s <>nil then
MsgBox "Connected"
else
MsgBox "Error: "+str(c.Lasterror)
end if
```

**Notes:** Establishes a connection (using a specific resource manager context) between the calling application and a smart card contained by a specific reader. If no card exists in the specified reader, an error is returned.

Reader: The name of the reader that contains the target card.
ShareMode: A flag that indicates whether other applications may form connections to the card. Use one of SmartCardMBS.kShare* constants. e.g. kShareExclusive
PreferredProtocols: A bitmask of acceptable protocols for the connection. Possible values may be combined with the OR operation. Use SmartCardMBS.kProtocol* constants. e.g. kProtocolT1

Lasterror and ActiveProtocol are set.
Returns on success a smartcard object, else returns nil.

### 163.1.5 Constructor

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes a smartcard context.

### 163.1.6 IsValid as boolean

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determines whether a smart card context handle is valid.
**Notes:** Returns true if valid or false if not valid.

### 163.1.7 ReaderGroups as string()

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the list of reader groups that have previously been introduced to the system.
**Notes:** The groups may be SCard$ AllReaders, SCard$ DefaultReaders, SCard$ LocalReaders and SCard$ SystemReaders.
Lasterror is set.

### 163.1.8 Readers as string()

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the list of readers within a set of named reader groups, eliminating duplicates.
**Example:**

```
dim c as new SmartCardContextMBS
dim list() as string = c.Readers
MsgBox Join(list, EndOfLine)
```

**Notes:** Lasterror is set.
See also:

- 163.1.9 Readers(ReaderGroups() as string) as string() 20779

### 163.1.9 Readers(ReaderGroups() as string) as string()

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the list of readers within a set of named reader groups, eliminating duplicates.
**Notes:** The caller supplies a list of reader groups, and receives the list of readers within the named groups. Unrecognized group names are ignored. This function only returns readers within the named groups that are currently attached to the system and available for use.

ReaderGroups: The reader groups you like to query.
Lasterror is set.
See also:

- 163.1.8 Readers as string() 20779

### 163.1.10 Properties

### 163.1.11 Available as Boolean

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the smartcard API is available.
**Notes:** This should be available on Mac and Windows.

Loads on Mac the PCSC.framework.
For Linux you need pcsclite library installed. We try to load libpcsclite.so or /usr/lib/libpcsclite.so.
On Windows we use winscard.dll built into Windows.
(Read only property)

### 163.1.12 Handle as Integer

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.1.13 Lasterror as Integer

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 163.1.14 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBadSeek | &H80100029 | An error occurred in setting the smart card file object pointer. |
| kErrorCancelled | &H80100002 | The action was canceled by an Cancel request. |
| kErrorCancelledByUser | &H8010006E | The action was canceled by the user. |
| kErrorCantDispose | &H8010000E | The system could not dispose of the media in the requested manner. |
| kErrorCardNotAuthenticated | &H8010006F | No PIN was presented to the smart card. |
| kErrorCardUnsupported | &H8010001C | The smart card does not meet minimal requirements for support. |
| kErrorCertificateUnavailable | &H8010002D | The requested certificate could not be obtained. |
| kErrorChvBlocked | &H8010006C | The card cannot be accessed because the maximum number of PIN entry tempts has been reached. |
| kErrorCommDataLost | &H8010002F | A communications error with the smart card has been detected. |
| kErrorCommError | &H80100013 | An internal communications error has been detected. |
| kErrorDirNotFound | &H80100023 | The specified directory does not exist in the smart card. |
| kErrorDuplicateReader | &H8010001B | The reader driver did not produce a unique reader name. |
| kErrorEof | &H8010006D | The end of the smart card file has been reached. |
| kErrorFileNotFound | &H80100024 | The specified file does not exist in the smart card. |
| kErrorIccCreateorder | &H80100021 | The requested order of object creation is not supported. |
| kErrorIccInstallation | &H80100020 | No primary provider can be found for the smart card. |
| kErrorInsufficientBuffer | &H80100008 | The data buffer for returned data is too small for the returned data. |
| kErrorInternalError | &H80100001 | An internal consistency check failed. |
| kErrorInvalidAtr | &H80100015 | An ATR string obtained from the registry is not a valid ATR string. |
| kErrorInvalidChv | &H8010002A | The supplied PIN is incorrect. |
| kErrorInvalidHandle | &H80100003 | The supplied handle was not valid. |
| kErrorInvalidParameter | &H80100004 | One or more of the supplied parameters could not be properly interpreted |
| kErrorInvalidTarget | &H80100005 | Registry startup information is missing or not valid. |
| kErrorInvalidValue | &H80100011 | One or more of the supplied parameter values could not be properly interpre |
| kErrorNoAccess | &H80100027 | Access is denied to the file. |
| kErrorNoDir | &H80100025 | The supplied path does not represent a smart card directory. |
| kErrorNoFile | &H80100026 | The supplied path does not represent a smart card file. |
| kErrorNoKeyContainer | &H80100030 | The requested key container does not exist on the smart card. |
| kErrorNoMemory | &H80100006 | Not enough memory available to complete this command. |
| kErrorNoReadersAvailable | &H8010002E | No smart card reader is available. |
| kErrorNoService | &H8010001D | The smart card resource manager is not running. |
| kErrorNoSmartcard | &H8010000C | The operation requires a smart card, but no smart card is currently in device. |
| kErrorNoSuchCertificate | &H8010002C | The requested certificate does not exist. |
| kErrorNotReady | &H80100010 | The reader or card is not ready to accept commands. |
| kErrorNotTransacted | &H80100016 | An attempt was made to end a nonexistent transaction. |
| kErrorPciTooSmall | &H80100019 | The PCI receive buffer was too small. |
| kErrorProtoMismatch | &H8010000F | The requested protocols are incompatible with the protocol currently in with the card. |
| kErrorReaderUnavailable | &H80100017 | The specified reader is not currently available for use. |
| kErrorReaderUnsupported | &H8010001A | The reader driver does not meet minimal requirements for support. |
| kErrorRemovedCard | &H80100069 | The smart card has been removed, so further communication is not possib |
| kErrorResetCard | &H80100068 | The smart card was reset. |
| kErrorSecurityViolation | &H8010006A | Access was denied because of a security violation. |
| kErrorServerTooBusy | &H80100031 | The smart card resource manager is too busy to complete this operation. |
| kErrorServiceStopped | &H8010001E | The smart card resource manager has shut down. |
| kErrorSharingViolation | &H8010000B | The smart card cannot be accessed because of other outstanding connecti |
| kErrorShutdown | &H80100018 | The operation has been aborted to allow the server application to exit. |
| kErrorSuccess | 0 | No error. |
| kErrorSystemCancelled | &H80100012 | The action was canceled by the system, presumably to log off or shut dow |
| kErrorTimeout | &H8010000A | The user-specified time-out value has expired. |
| kErrorUnexpected | &H8010001F | An unexpected card error has occurred. |
| kErrorUnknownCard | &H8010000D | The specified smart card name is not recognized. |
| kErrorUnknownError | &H80100014 | An internal error has been detected, but the source is unknown. |
| kErrorUnknownReader | &H80100009 | The specified reader name is not recognized. |
| kErrorUnknownResMng | &H8010002B | An unrecognized error code was returned. |
| kErrorUnpoweredCard | &H80100067 | Power has been removed from the smart card, so that further communica |

## 163.2 class SmartCardMBS

### 163.2.1 class SmartCardMBS

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a smartcard.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.2pr2
- MBS Xojo Plugins, version 19.6pr2
- MBS Xojo Plugins, version 19.6pr1
- MBS Xojo Plugins, version 19.5pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr3
- New functions for smart card reading

### 163.2.2 Methods

### 163.2.3 BeginTransaction

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Starts a transaction.
**Notes:** The function waits for the completion of all other transactions before it begins. After the transaction starts, all other applications are blocked from accessing the smart card while the transaction is in progress.

If a transaction is held on the card for more than five seconds with no operations happening on that card, then the card is reset. Calling any of the Smart Card and Reader Access Functions or Direct Card Access Functions on the card that is transacted results in the timer being reset to continue allowing the transaction to be used.
The BeginTransaction function is a smart card and reader access function. For more information about other access functions, see Smart Card and Reader Access Functions.

Lasterror is set.

### 163.2.4 CancelTransaction

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Cancels current transaction.
**Notes:** Lasterror is set.

### 163.2.5 Constructor

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 163.2.6 Control(ControlCode as Integer, input as ptr, inputLength as UInt32, output as ptr, byref outputLength as UInt32)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Direct control of the reader.
**Notes:** You can call it any time after a successful call to SmartCard.Connect and before a successful call to SmartCard.Disconnect. The effect on the state of the reader depends on the control code.

ControlCode: Control code for the operation. This value identifies the specific operation to be performed.

Input: Pointer to a buffer that contains the data required to perform the operation. This parameter can be nil if the ControlCode parameter specifies an operation that does not require input data.
inputLength: Size, in bytes, of the buffer pointed to by Input.
output: Pointer to a buffer that receives the operation's output data. This parameter can be nil if the ControlCode parameter specifies an operation that does not produce output data.
outputLength: On input the size, in bytes, of the buffer pointed to by output. On output the receives the size, in bytes, of the data stored into the buffer pointed to by output.

Lasterror is set.

### 163.2.7 Disconnect(Disposition as Integer = 0)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Terminates a connection previously opened between the calling application and a smart card in the target reader.
**Notes:** Disposition: Action to take on the card in the connected reader on close.
can be:

| | |
|---|---|
| kUnpowerCard | Power down the card and reset it (Cold Reset). |
| kResetCard | Reset the card (Warm Reset). |
| kLeaveCard | Do not do anything special on reconnect. |
| kEjectCard | Eject card. |

Lasterror is set.

### 163.2.8 EndTransaction(Disposition as Integer = 0)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Ends transaction.
**Notes:** Completes a previously declared transaction, allowing other applications to resume interactions with the card.

Disposition: Action to take on the card in the connected reader on close. Can be Eject, Leave, Reset or Unpower. See constants.

Lasterror is set.

### 163.2.9 GetAttrib(AttrId as UInt32) as Memoryblock

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the current reader attributes for the given handle.
**Notes:** It does not affect the state of the reader, driver, or card.
The plugin first queries for size of attribute and on success queries again to get the data and return it as a memoryblock.

AttrId: The attribute ID. See kAttribute* constants.

Lasterror is set.

### 163.2.10 ReadFile(FileID as MemoryBlock) as MemoryBlock

MBS Tools Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read file from smart card with APDU protocol.
**Notes:** Returns data as MemoryBlock or error message.
The first two bytes are status code.

For Swiss health cards, the relevant IDs are 2F06 and 2F07.

For Belgian EID:

| | |
|---|---|
| 4031 | ID RN |
| 4032 | SGN RN |
| 4033 | ID Address |
| 4034 | SGN Address |
| 4035 | ID Photo |

You find the IDs for files usually in documentation or your card!
For some cards you may first need to move down a hierarchy of folders to get an item via Transmit().

### 163.2.11 Reconnect(ShareMode as UInt32, PreferredProtocols as UInt32, Initialization as UInt32)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Reconnect function reestablishes an existing connection between the calling application and a smart card.
**Notes:** This function moves a card handle from direct access to general access, or acknowledges and clears an error condition that is preventing further access to the card.

Initialization can be one of the following:

| | |
|---|---|
| kUnpowerCard | Power down the card and reset it (Cold Reset). |
| kResetCard | Reset the card (Warm Reset). |
| kLeaveCard | Do not do anything special on reconnect. |

ShareMode: A flag that indicates whether other applications may form connections to the card. Use one of

SmartCardMBS.kShare* constants. e.g. kShareExclusive
PreferredProtocols: A bitmask of acceptable protocols for the connection. Possible values may be combined with the OR operation. Use SmartCardMBS.kProtocol* constants. e.g. kProtocolT1

Lasterror and ActiveProtocol are set.

### 163.2.12 SetAttrib(AttrId as UInt32, mem as Memoryblock)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the given reader attribute.
**Notes:** It does not affect the state of the reader, reader driver, or smart card. Not all attributes are supported by all readers (nor can they be set at all times) as many of the attributes are under direct control of the transport protocol.

AttrId: The attribute ID. See kAttribute* constants.
Mem: The data to store.

Lasterror is set.

### 163.2.13 SplitValues(Data as MemoryBlock) as Dictionary

MBS Tools Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Split values read from smart card.
**Notes:** Files on smartcard can contain key/value data.
Returns Dictionary with numbers (key) and values as strings.

### 163.2.14 Status(byref Reader as string, byref State as Integer, byref Protocol as Integer, byref CardID as string)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the current status of a smart card in a reader.
**Notes:** You can call it any time after a successful call to SCardConnect and before a successful call to SCardDisconnect. It does not affect the state of the reader or reader driver.

Provides reader name, state of card (see kState constants), Protocol (see kProtocol constants) and CardID.

State: Current state of the smart card in the reader. Upon success, it receives one of the following state indicators.
Protocol: Current protocol, if any. The returned value is meaningful only if the returned value of pdwState is kCardStateSpecific.
CardID: 32-byte buffer that receives the ATR string from the currently inserted card, if available.

Lasterror is set.
See also:

- 163.2.15 Status(byref State as Integer, byref Protocol as Integer, byref CardID as string) 20788

### 163.2.15 Status(byref State as Integer, byref Protocol as Integer, byref CardID as string)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Provides the current status of a smart card in a reader.
**Notes:** Same as other Status function, but without querying the name.
Lasterror is set.
See also:

- 163.2.14 Status(byref Reader as string, byref State as Integer, byref Protocol as Integer, byref CardID as string) 20787

### 163.2.16 Transmit(ioSendPci as Ptr, SendBuffer as ptr, SendLength as UInt32, ioRecvPci as ptr, RecvBuffer as Ptr, byref RecvLength as UInt32)

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sends a service request to the smart card and expects to receive data back from the card.
**Example:**

```
dim card as SmartCardMBS // your card

dim header as new memoryBlock(8)

header.Int32Value(0) = 2 // T1
header.Int32Value(4) = 8 // size of this block

dim command as new MemoryBlock(5)
command.Int8Value(0) = 0
```

```
command.Int8Value(1) = &hCA
command.Int8Value(2) = 1
command.Int8Value(3) = &h82
command.Int8Value(4) = 2

dim buffer as new MemoryBlock(512)
dim ReceiveHeader as new MemoryBlock(8)

dim RecvLength as UInt32
card.Transmit(header, command, command.Size, ReceiveHeader, buffer, RecvLength)

MsgBox "Received "+str(RecvLength)+" bytes"
```

**Notes:** ioSendPci:
A pointer to the protocol header structure for the instruction. This buffer is in the format of an SCARD_IO_REQUEST structure, followed by the specific protocol control information (PCI).
For the T=0, T=1, and Raw protocols, the PCI structure is constant. The smart card subsystem supplies a global T=0, T=1, or Raw PCI structure, which you can reference by using the symbols SCARD_PCI_T0, SCARD_PCI_T1, and SCARD_PCI_RAW respectively.

SendBuffer:
A pointer to the actual data to be written to the card.
For T=0, the data parameters are placed into the address pointed to by SendBuffer according to the following structure:

| Type | name | Description |
|---|---|---|
| Byte | Cla | The instruction class |
| Byte | Ins | The instruction code |
| Byte | P1 | Parameter to the instruction |
| Byte | P2 | Parameter to the instruction |
| Byte | P3 | Size of I/O transfer |

The data sent to the card should immediately follow the send buffer. In the special case where no data is sent to the card and no data is expected in return, P3 is not sent.

SendLength:
The length, in bytes, of the SendBuffer parameter.
For T=0, in the special case where no data is sent to the card and no data expected in return, this length must reflect that the P3 member is not being sent; the length should be 4.

ioRecvPci:
Pointer to the protocol header structure for the instruction, followed by a buffer in which to receive any

returned protocol control information (PCI) specific to the protocol in use. This parameter can be nil if no PCI is returned.

RecvBuffer:
Pointer to any data returned from the card.
For T=0, the data is immediately followed by the SW1 and SW2 status bytes. If no data is returned from the card, then this buffer will only contain the SW1 and SW2 status bytes.

RecvLength:
Supplies the length, in bytes, of the RecvBuffer parameter and receives the actual number of bytes received from the smart card. This value cannot be SCARD_AUTOALLOCATE because Transmit does not support SCARD_AUTOALLOCATE.
For T=0, the receive buffer must be at least two bytes long to receive the SW1 and SW2 status bytes.

see also
https://msdn.microsoft.com/en-us/library/windows/desktop/aa379804(v=vs.85).aspx

Lasterror is set.

### 163.2.17 Properties

### 163.2.18 ActiveProtocol as Integer

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The active protocol.
**Notes:** (Read and Write property)

### 163.2.19 Handle as Integer

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 163.2.20 Lasterror as Integer

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 163.2.21 Constants

Attribute IDs

| Constant | Value | Description |
|---|---|---|
| kAttributeAtrString | 590595 | Answer to reset (ATR) string. |
| kAttributeChannelId | 131344 | DWORD encoded as &hDDDDCCCC, where DDDD = data channel t<br>CCCC = channel number.<br>The following encodings are defined for DDDD:<br>&h01 serial I/O; CCCC is a port number.<br>&h02 parallel I/O; CCCC is a port number.<br>&h04 PS/2 keyboard port; CCCC is zero.<br>&h08 SCSI; CCCC is SCSI ID number.<br>&h10 IDE; CCCC is device number.<br>&h20 USB; CCCC is device number.<br>&hFy vendor-defined interface with y in the range zero through 15; C<br>vendor defined. |
| kAttributeCharacteristics | 393552 | Integer indicating which mechanical characteristics are supported. If<br>special characteristics are supported.<br>Note that multiple bits can be set:<br>&h00000001 Card swallowing mechanism<br>&h00000002 Card ejection mechanism<br>&h00000004 Card capture mechanism<br>All other values are reserved for future use (RFU). |
| kAttributeCurrentBwt | 524809 | Current block waiting time. |
| kAttributeCurrentClk | 524802 | Current clock rate, in kHz. |
| kAttributeCurrentCwt | 524810 | Current character waiting time. |
| kAttributeCurrentD | 524804 | Bit rate conversion factor. |
| kAttributeCurrentEbcEncoding | 524811 | Current error block control encoding.<br>0 = longitudinal redundancy check (LRC)<br>1 = cyclical redundancy check (CRC) |
| kAttributeCurrentF | 524803 | Clock conversion factor. |
| kAttributeCurrentIfsc | 524807 | Current byte size for information field size card. |
| kAttributeCurrentIfsd | 524808 | Current byte size for information field size device. |
| kAttributeCurrentIoState | 590594 | Current IO state |
| kAttributeCurrentN | 524805 | Current guard time. |
| kAttributeCurrentProtocolType | 524801 | Integer encoded as 0x0rrrpppp where rrr is RFU and should be 0x000<br>encodes the current protocol type. Whichever bit has been set indicate<br>ISO protocol is currently in use. (For example, if bit zero is set, T=0 p<br>is in effect.) |
| kAttributeCurrentW | 524806 | Current work waiting time. |
| kAttributeDefaultClk | 196897 | Default clock rate, in kHz. |
| kAttributeDefaultDataRate | 196899 | Default data rate, in bps. |
| kAttributeDeviceFriendlyNameA | 2147418115 | Reader's display name. Windows ANSI encoding. |
| kAttributeDeviceFriendlyNameW | 2147418117 | Reader's display name. Unicode encoding. |
| kAttributeDeviceInUse | 2147418114 | Reserved for future use. |
| kAttributeDeviceSystemNameA | 2147418116 | Reader's system name. Windows ANSI encoding. |
| kAttributeDeviceSystemNameW | 2147418118 | Reader's system name. Unicode encoding. |
| kAttributeDeviceUnit | 2147418113 | Instance of this vendor's reader attached to the computer. The first i<br>will be device unit 0, the next will be unit 1 (if it is the same brand of<br>and so on. Two different brands of readers will both have zero for this |
| kAttributeEscAuthrequest | 499717 | Esc authentication request |
| kAttributeEscCancel | 499715 | Esc cancel |
| kAttributeEscReset | 499712 | Esc reset |
| kAttributeExtendedBwt | 524812 | Extended block wait time. |
| kAttributeIccInterfaceStatus | 590593 | Single byte. Zero if smart card electrical contact is not active; nonzero if<br>is active. |
| kAttributeIccPresence | 590592 | Single byte indicating smart card presence:<br>0 = not present<br>1 = card present but not swallowed (applies only if reader supports sma<br>swallowing)<br>2 = card present (and swallowed if reader supports smart card swallow<br>4 = card confiscated. |

Card States

| Constant | Value | Description |
|---|---|---|
| kCardStateAbsent | 2 | There is no card in the reader. |
| kCardStateNegotiable | 32 | The card has been reset and is awaiting PTS negotiation. |
| kCardStatePowered | 16 | Power is being provided to the card, but the reader driver is unaware of the mode of the card. |
| kCardStatePresent | 4 | There is a card in the reader, but it has not been moved into position for use. |
| kCardStateSpecific | 64 | The card has been reset and specific communication protocols have been established. |
| kCardStateSwallowed | 8 | There is a card in the reader in position for use. The card is not powered. |
| kCardStateUnknown | 1 | Unknown state. |

Card Initialization Modes

| Constant | Value | Description |
|---|---|---|
| kEjectCard | 3 | Eject card. |
| kLeaveCard | 0 | Do not do anything special on reconnect. |
| kResetCard | 1 | Reset the card (Warm Reset). |
| kUnpowerCard | 2 | Power down the card and reset it (Cold Reset). |

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | 3 | Any protocol is welcome |
| kProtocolRAW | 4 | Raw protocol |
| kProtocolT0 | 1 | T=0 is the active protocol. |
| kProtocolT1 | 2 | T=1 is the active protocol. |
| kProtocolT15 | 8 | T=15 protocol (not on Windows) |
| kProtocolUndefined | 0 | kShareDirect has been specified, so that no protocol negotiation has occurred. It is possible that there is no card in the reader. |
| kProtocolUnset | 0 | Unset |

Share Modes

| Constant | Value | Description |
|---|---|---|
| kShareDirect | 3 | This application is allocating the reader for its private use, and will be controlling it directly. No other applications are allowed access to it. |
| kShareExclusive | 1 | This application is not willing to share the card with other applications. |
| kShareShared | 2 | This application is willing to share the card with other applications. |

## 163.3 class TKBERTLVRecordMBS

### 163.3.1 class TKBERTLVRecordMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An object that parses BER-encoded data and produces DER-encoded data for TLV records.
**Notes:** Available in macOS 10.12 or newer.
Subclass of the TKTLVRecordMBS class.

### 163.3.2 Methods

### 163.3.3 Constructor(tag as UInt64, data as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a BER-TLV record with the specified tag and value.
**Notes:** tag: The tag field of the record.
value: The value field of the record.

Returns a new TLV record containing the specified tag and value fields.
See also:

- 163.3.4 Constructor(tag as UInt64, records() as TKTLVRecordMBS) 20794

### 163.3.4 Constructor(tag as UInt64, records() as TKTLVRecordMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a BER-TLV record with the specified tag and an array of TLV subrecords.
**Notes:** tag: The tag field of the record.
records: The TLV subrecords of the record.

Returns a new TLV record containing the specified tag field and subrecords.
See also:

- 163.3.3 Constructor(tag as UInt64, data as MemoryBlock) 20794

### 163.3.5 dataForTag(tag as UInt64) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Encodes a specified tag using BER-TLV tag encoding rules.
**Notes:** tag: The tag value to encode.

Returns a data object that encodes a tag value using BER-TLV encoding.

## 163.4 class TKCompactTLVRecordMBS

### 163.4.1 class TKCompactTLVRecordMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An object that implements encoding using Compact-TLV encoding according to ISO 7816-4.
**Notes:** Subclass of the TKTLVRecordMBS class.

### 163.4.2 Methods

### 163.4.3 Constructor(tag as integer, data as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a TLV record with the specified tag and value.
**Notes:** tag: The tag field of the record.
value: The value field of the record.

Returns a new TLV record containing the specified tag and value fields.

## 163.5 class TKSimpleTLVRecordMBS

### 163.5.1 class TKSimpleTLVRecordMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An object that implements encoding using Simple-TLV encoding according to ISO 7816-4.
**Notes:** Subclass of the TKTLVRecordMBS class.

### 163.5.2 Methods

### 163.5.3 Constructor(tag as integer, data as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a TLV record with the specified tag and value.
**Notes:** tag: The tag field of the record.
value: The value field of the record.

Returnes a new TLV record containing the specified tag and value fields.

## 163.6 class TKSmartCardATRInterfaceGroupMBS

### 163.6.1 class TKSmartCardATRInterfaceGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A single interface-bytes group for a Smart Card ATR (Answer to Reset).
**Notes:** You access instances of this class by calling the interfaceGroupAtIndex and interfaceGroupForProtocol methods on an TKSmartCardATRMBS object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 163.6.2 Methods

### 163.6.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 163.6.4 Properties

### 163.6.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.6.6 HasProtocol as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether protocol is defined.
**Notes:** (Read only property)

### 163.6.7 HasTA as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether we have a TA value defined.
**Notes:** (Read only property)

### 163.6.8 HasTB as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether we have a TB value defined.
**Notes:** (Read only property)

### 163.6.9 HasTC as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether we have a TC value defined.
**Notes:** (Read only property)

### 163.6.10 Protocol as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The protocol for this group.
**Notes:** This property returns the protocol number. See kProtocol* constants.
This property is zero for the first interface group (global), as it has no assigned protocol.
(Read only property)

### 163.6.11 TA as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The TA interface byte of ATR group.
**Notes:** (Read only property)

### 163.6.12 TB as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The TB interface byte of ATR group.
**Notes:** (Read only property)

### 163.6.13 TC as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The TC interface byte of ATR group.
**Notes:** (Read only property)

## 163.7 class TKSmartCardATRMBS

### 163.7.1 class TKSmartCardATRMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A parsed ATR (Answer To Reset) message from a Smart Card.
**Notes:** This class declares a programmatic interface to parsing an ATR from data or a byte stream, and accessing the individual parts.

The TKSmartCardATR class parses ATR messages according to the ISO/IEC 7816-3 specification.

### 163.7.2 Methods

### 163.7.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.10 or newer.

### 163.7.4 Constructor(data as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a TKSmartCardATR object from a provided data object.
**Notes:** bytes: The ATR data to be parsed.

Returns a TKSmartCardATR object initialized with the parsed data. If bytes does not contain a valid ATR, raises UnsupportedOperationException.

### 163.7.5 historicalRecords as TKCompactTLVRecordMBS()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A list of compact TLV records parsed from historical bytes.

### 163.7.6 interfaceGroupAtIndex(index as Integer) as TKSmartCardATRInterfaceGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the interface group at the specified index.
**Notes:** index: The index of the desired interface group.

Interface group indexes start at 1, as specified by ISO 7816-3.

Returns the interface group at the specified index, or nil if not present.

### 163.7.7 interfaceGroupForProtocol(protocol as Integer) as TKSmartCardATRInterfaceGroupMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the interface group with the specified protocol.
**Notes:** protocol: The protocol used by the desired interface group.

Returns the interface group with the specified protocol, or nil if none exists.

### 163.7.8 protocols as Integer()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An array of protocols indicated in the ATR.
**Notes:** Each element in the returned array is an integer value corresponding to a member of the kProtocol* constants.
The returned protocols are ordered such that the default protocol is at index 0, and any duplicate values are removed.

### 163.7.9 Properties

### 163.7.10 bytes as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The ATR message data.
**Notes:** (Read only property)

### 163.7.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.7.12 historicalBytes as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The ATR historical bytes, not including interface bytes or the TCK (check byte).
**Notes:** (Read only property)

### 163.7.13 Constants

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | 65535 | Any available transmission protocols. |
| kProtocolNone | 0 | No transmission protocols. |
| kProtocolT0 | 1 | T=0 transmission protocol. |
| kProtocolT1 | 2 | T=1 transmission protocol. |
| kProtocolT15 | 32768 | T=15 transmission protocol. |

## 163.8 class TKSmartCardMBS

### 163.8.1 class TKSmartCardMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of a smart card.
**Notes:** This class provides an interface for managing sessions with a smart card, transmitting requests, and facilitating user interaction.
You can create a TKSmartCardMBS object when a smart card is inserted into a slot, by calling the makeSmartCard method on the corresponding TKSmartCardSlotMBS object. To start communicating with the smart card, call the beginSession method on the TKSmartCardMBS object. Once an exclusive session has been established, you transmit data using the transmitRequest:reply: method. After you,Äôve finished communicating with a smart card, you call the endSession method.
If the smart card is physically removed from its slot, the session object becomes invalid, and any further calls to transmitRequest will return an error.

### 163.8.2 Methods

### 163.8.3 beginSession(tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Begins a session with the Smart Card.
**Notes:** This method will fail if there is already an existing session for the Smart Card.
Calls to this method must be balanced with calls to endSession.

Calls beginSessionCompleted event later.

### 163.8.4 beginSessionSync(byref error as NSErrorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Begins a session with the Smart Card.
**Notes:** This is the synchronous version, which waits for callback from operation system.
Returns true on success and false on failure.

This method will fail if there is already an existing session for the Smart Card.
Calls to this method must be balanced with calls to endSession.

### 163.8.5 beginSessionWithDelegate(handler as beginSessionCompletedDelegateMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Transmits data in Application Protocol Data Unit (APDU) format to the Smart Card.
**Notes:** request: The APDU request data.

You should only call this method after a session to the Smart Card has been established using the beginSessionWithReply: method, and before the session is terminated using the endSession method.

Invokes handler later, which has this declaration:
beginSessionCompletedDelegate(success as Boolean, error as NSErrorMBS, tag as Variant)

### 163.8.6 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.8.7 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.8.8 endSession

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Completes any pending transmissions and ends the session to the Smart Card.
**Notes:** Calls to this method should balance calls to beginSession.

### 163.8.9 inSession(byref error as NSErrorMBS, tag as variant = nil) as boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Synchronously begins a session, executes the given block, and ends the session.
**Notes:** error: On return, if an error occurred when attempting to create a session or execute the block,

contains details about the error.

Returns true if the session was successfully created and the inSession event returns true; otherwise, false.
See also:

- 163.8.32 inSession(byref error as NSErrorMBS, tag as Variant) as Boolean 20812

### 163.8.10 readFileWithDelegate(FileName as MemoryBlock, handler as readFileCompletedDelegateMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Reads file with given filename.
**Notes:** This is for Belgian ID card to read a file.

You should only call this method after a session to the Smart Card has been established using the beginSessionWithReply: method, and before the session is terminated using the endSession method.

Invokes handler later, which has this declaration:
readFileCompletedDelegateMBS(FileName as MemoryBlock, Content as MemoryBlock, error as NSErrorMBS, tag as Variant)

### 163.8.11 sendIns(ins as UInt8, p1 as UInt8, p2 as UInt8, requestData as MemoryBlock, le as Integer = 0, byref sw as Uint16, byref error as NSErrorMBS) as Memoryblock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Synchronously transmits an APDU command to the card and returns the response.
**Notes:** ins: The instruction code.
p1: The first parameter.
p2: The second parameter.
requestData: The data field of the APDU, or nil if no input data field should be present—for example, a case1 or case2 APDU.
The length of the data serves as Lc field of the APDU.
le: The expected number of bytes to be returned, or zero if no output data are expected—for example, a case1 or case3 APDU. Pass 0 to accept as many bytes as the card provides.
sw: On return, contains the result code as represented by the first two bytes (SW1SW2) of the returned data.
error: On return, if an error occurred when attempting to create a session or execute the block, contains details about the error.

Returns the returned data without the first two bytes (SW1SW2), or nil if an error occurred.
See also:

- 163.8.12 sendIns(ins as UInt8, p1 as UInt8, p2 as UInt8, requestData as MemoryBlock, le as Integer = 0, tag as variant = nil) 20807

### 163.8.12 sendIns(ins as UInt8, p1 as UInt8, p2 as UInt8, requestData as MemoryBlock, le as Integer = 0, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Asynchronously transmits an APDU command to the card, returning the response in a completion handler.
**Notes:** ins: The instruction code.
p1: The first parameter.
p2: The second parameter.
requestData: The data field of the APDU, or nil if no input data field should be present—for example, a case1 or case2 APDU.
The length of the data serves as Lc field of the APDU.
le: The expected number of bytes to be returned, or zero if no output data are expected—for example, a case1 or case3 APDU. Pass 0 to accept as many bytes as the card provides.

Calls sendInsCompleted event later.
See also:

- 163.8.11 sendIns(ins as UInt8, p1 as UInt8, p2 as UInt8, requestData as MemoryBlock, le as Integer = 0, byref sw as Uint16, byref error as NSErrorMBS) as Memoryblock 20806

### 163.8.13 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the observer to call validChanged event.
**Notes:** Called for you by constructor.

### 163.8.14 transmitRequest(request as MemoryBlock, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Transmits data in Application Protocol Data Unit (APDU) format to the Smart Card.
**Notes:** request: The APDU request data.

You should only call this method after a session to the Smart Card has been established using the beginSessionWithReply: method, and before the session is terminated using the endSession method.

Calls transmitRequestCompleted method later.

### 163.8.15 transmitRequestSync(request as MemoryBlock, byref response as MemoryBlock, byref error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Transmits data in Application Protocol Data Unit (APDU) format to the Smart Card.
**Notes:** This is the synchronous version, which waits for callback from operation system.

request: The APDU request data.
response: The response.

You should only call this method after a session to the Smart Card has been established using the beginSessionWithReply: method, and before the session is terminated using the endSession method.

### 163.8.16 transmitRequestWithDelegate(request as MemoryBlock, handler as transmitRequestCompletedDelegateMBS, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Transmits data in Application Protocol Data Unit (APDU) format to the Smart Card.
**Notes:** request: The APDU request data.

You should only call this method after a session to the Smart Card has been established using the beginSessionWithReply: method, and before the session is terminated using the endSession method.

Invokes handler later, which has this declaration:
transmitRequestCompletedDelegate(request as MemoryBlock, response as MemoryBlock, error as NSErrorMBS, tag as Variant)

### 163.8.17 userInteractionForSecurePINChange(PINFormat as TKSmartCardPINFormatMBS, APDU as MemoryBlock, currentPINByteOffset as Integer, newPINByteOffset as Integer) as TKSmartCardUserInteractionForSecurePINChangeMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a new user interaction object for secure PIN change using the smart card reader facilities (typically a HW keypad).
**Notes:** PINFormat: The PIN format descriptor.
APDU: The Application Protocol Data Unit (APDU) used by the Smart Card to fill in PIN data.
currentPINByteOffset: The offset, in bytes, within the Application Protocol Data Unit (APDU) field to mark a location of a PIN block for filling in the entered PIN.
newPINByteOffset: The offset, in bytes, within the Application Protocol Data Unit (APDU) field to mark a location of a PIN block for filling in the new PIN.

Returns a new user interaction object for secure PIN verification, or nil if this feature is not supported by the Smart Card reader.

You should only call this method after a session to the Smart Card has been established using the beginSession method, and before the session is terminated using the endSession method.
Once the interaction has been successfully completed, the results are available via the resultData and resultSW properties of the returned TKSmartCardUserInteractionForSecurePINVerificationMBS object.

### 163.8.18 userInteractionForSecurePINVerification(PINFormat as TKSmartCardPINFormatMBS, APDU as MemoryBlock, PINByteOffset as Integer) as TKSmartCardUserInteractionForSecurePINVerificationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a new user interaction object for secure PIN verification using the Smart Card reader facilities.
**Notes:** PINFormat: The PIN format descriptor.
APDU: The Application Protocol Data Unit (APDU) used by the Smart Card to fill in PIN data.
PINByteOffset: The offset, in bytes, within the Application Protocol Data Unit (APDU) field to mark a location of a PIN block for filling in the entered PIN.

This parameter is not currently used. Pass 0.

Returns a new user interaction object for secure PIN verification, or nil if this feature is not supported by the Smart Card reader.

You should only call this method after a session to the Smart Card has been established using the beginSession method, and before the session is terminated using the endSession method.
Once the interaction has been successfully completed, the results are available via the resultData and resultSW properties of the returned TKSmartCardUserInteractionForSecurePINVerificationMBS object.

### 163.8.19 Properties

### 163.8.20 AllowedProtocols as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The protocols allowed for communication with the Smart Card.
**Notes:** kProtocolAny by default.
This property is consulted only when beginning a session to a Smart Card. Any changes to this property will not be reflected by the current session, if one is already established.
(Read and Write property)

### 163.8.21 cla as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The CLA byte used for APDU transmission.
**Notes:** 0 by default.
(Read and Write property)

### 163.8.22 Context as Variant

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** User-specified information.
**Notes:** This property is automatically set to nil if the Smart Card is removed or another TKSmartCardMBS object begins a session.
(Read and Write property)

### 163.8.23 CurrentProtocol as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The protocol used for communication with the Smart Card.
**Notes:** Returns kProtocolNone if no session is currently established.
(Read only property)

### 163.8.24 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.8.25 Sensitive as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether sessions established for the Smart Card should be considered sensitive.
**Notes:** False by default.
When this property is set to true, any sessions established for the receiver will begin and end by sending a reset command to the Smart Card. This is recommended anytime potentially sensitive information is transferred.
(Read and Write property)

### 163.8.26 Slot as TKSmartCardSlotMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The slot in which the Smart Card is inserted.
**Notes:** (Read only property)

### 163.8.27 UseCommandChaining as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether to use command chaining of APDU with a data field longer than 255 bytes.
**Notes:** By default, this property is set to true when the Smart Card ATR announces that command chaining is supported.
(Read and Write property)

### 163.8.28 UseExtendedLength as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether to use extended length APDU.
**Notes:** By default, this property is set to true when the Smart Card slot supports transmitting extended length commands, and the ATR announces that extended length APDU is supported.
(Read and Write property)

### 163.8.29 Valid as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the Smart Card is valid and accessible from its slot.
**Notes:** (Read only property)

### 163.8.30 Events

### 163.8.31 beginSessionCompleted(success as Boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when session begun.
**Notes:** success: Whether the session could be established successfully.
error: Contains information about the the error preventing the transaction from being established.
The NSError object is created in the TKErrorDomain domain with a code in the TKErrorCode enumeration.

### 163.8.32 inSession(byref error as NSErrorMBS, tag as Variant) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** The event called in session.
**Notes:** The event to be called in the context of the created session. This event returns a Boolean value indicating whether communication was successful.

error: To indicate that an error occurred during the session, populate this with an NSError object containing details and return false.
See also:

- 163.8.9 inSession(byref error as NSErrorMBS, tag as variant = nil) as boolean 20805

### 163.8.33 sendInsCompleted(ins as UInt8, p1 as UInt8, p2 as UInt8, requestData as MemoryBlock, le as integer, replyData as MemoryBlock, sw as UInt16, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when sendIns completed.
**Notes:** replyData: The returned data without the first two bytes (SW1SW2), or nil if an error occurred.
sw: The result code as represented by the first two bytes (SW1SW2) of the returned data.
error: If a communication error occurred or the sw result code is anything other than &h9000, contains

details about the error.

### 163.8.34 transmitRequestCompleted(request as MemoryBlock, response as MemoryBlock, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** The event called when transmit is done.
**Notes:** response: The APDU response data, or nil if communication with the Smart Card failed.
error: Contains information about the the error preventing the transaction from being established.
The NSError object is created in the TKErrorDomain domain with a code in the TKErrorCode enumeration.

### 163.8.35 ValidChanged

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when valid property changed.

### 163.8.36 Constants

Protocols

| Constant | Value | Description |
|---|---|---|
| kProtocolAny | 65535 | Any available transmission protocols. |
| kProtocolNone | 0 | No transmission protocols. |
| kProtocolT0 | 1 | T=0 transmission protocol. |
| kProtocolT1 | 2 | T=1 transmission protocol. |
| kProtocolT15 | 32768 | T=15 transmission protocol. |

Errors

| Constant | Value | Description |
|---|---|---|
| TKErrorCodeAuthenticationFailed | -5 | Authentication failed. |
| TKErrorCodeAuthenticationNeeded | -9 | Authentication is needed. |
| TKErrorCodeBadParameter | -8 | An invalid parameter was provided. |
| TKErrorCodeCanceledByUser | -4 | The operation was canceled by the user. |
| TKErrorCodeCommunicationError | -2 | A communication error occurred. |
| TKErrorCodeCorruptedData | -3 | The data was corrupted. |
| TKErrorCodeNotImplemented | -1 | The functionality is not implemented. |
| TKErrorCodeObjectNotFound | -6 | The object was not found. |
| TKErrorCodeTokenNotFound | -7 | The token was not found. |

### 163.8.37 Delegates

### 163.8.38 beginSessionCompletedDelegateMBS(success as Boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate for the beginSessionWithDelegate method.

### 163.8.39 readFileCompletedDelegateMBS(FileName as MemoryBlock, Content as MemoryBlock, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate for the readFileWithDelegate method.

### 163.8.40 transmitRequestCompletedDelegateMBS(request as MemoryBlock, response as MemoryBlock, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The delegate for the transmitRequestWithDelegate method.

## 163.9 class TKSmartCardPINFormatMBS

### 163.9.1 class TKSmartCardPINFormatMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The formatting properties for a PIN, such as character encoding and length constraints.
**Notes:** You typically interact with TKSmartCardPINFormatMBS objects when calling the userInteractionForSecurePINChange and userInteractionForSecurePINVerification methods on an instance of TKSmartCardMBS.

Available in macOS 10.11 or newer.

### 163.9.2 Methods

### 163.9.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.9.4 Properties

### 163.9.5 Charset as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The format of PIN characters.
**Notes:** kCharsetNumeric by default.
(Read and Write property)

### 163.9.6 Encoding as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The encoding of PIN characters.
**Notes:** kEncodingASCII by default.
(Read and Write property)

### 163.9.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.9.8 MaxPINLength as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The maximum number of characters to form a valid PIN.
**Notes:** 8 by default.
(Read and Write property)

### 163.9.9 MinPINLength as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The minimum number of characters to form a valid PIN.
**Notes:** 4 by default.
(Read and Write property)

### 163.9.10 PINBitOffset as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The offset, in bits, within the PIN block to mark a location for filling in the formatted PIN, which is justified with respect to the PINJustification property value.
**Notes:** 0 by default.

The value of PINBitOffset indirectly controls the internal system units indicator. If PINBitOffset is byte aligned (that is, PINBitOffset % 8 == 0), the internal representation of PINBitOffset gets converted from bits to bytes.
(Read and Write property)

### 163.9.11 PINBlockByteLength as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The total length of the PIN block in bytes.
**Notes:** 8 by default.
(Read and Write property)

### 163.9.12 PINJustification as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The justification within the PIN block.
**Notes:** kJustificationLeft by default.
(Read and Write property)

### 163.9.13 PINLengthBitOffset as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The offset, in bits, within the PIN block to mark a location for filling in the PIN length, which is always left justified.
**Notes:** 0 by default.

The value of PINLengthBitOffset indirectly controls the internal system units indicator. If PINLengthBitOffset is byte aligned (that is, PINLengthBitOffset % 8 == 0), the internal representation of PINLengthBitOffset gets converted from bits to bytes.
(Read and Write property)

### 163.9.14 PINLengthBitSize as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The size, in bits, of the PIN length field. If set to 0, PIN length is not written.
**Notes:** 0 by default.
(Read and Write property)

### 163.9.15 Constants

PIN character sets

| Constant | Value | Description |
|---|---|---|
| kCharsetAlphanumeric | 1 | PIN can be composed of digits and letters. |
| kCharsetNumeric | 0 | PIN is only composed of digits. |
| kCharsetUpperAlphanumeric | 2 | PIN can be composed of digits and uppercase letters. |

Encodings

| Constant | Value | Description |
|---|---|---|
| kEncodingASCII | 1 | Characters are encoded in ASCII format (for example, 1234 is encoded as 31h 32h 33h 34h). |
| kEncodingBCD | 2 | Characters (only digits) are encoded in BCD format (for example, 1234 is encoded as 12h 34h). |
| kEncodingBinary | 0 | Characters are encoded in Binary format (for example, 1234 is encoded as 01h 02h 03h 04h). |

PIN Justification

| Constant | Value | Description |
|---|---|---|
| kJustificationLeft | 0 | Justify to the left. |
| kJustificationRight | 1 | Justify to the right. |

# 163.10 class TKSmartCardSlotManagerMBS

## 163.10.1 class TKSmartCardSlotManagerMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An interface to all available smart card reader slots.
**Notes:** Get a list of all known smart card reader slots in the system using the slotNames property, and access individual slots by name using the getSlotWithName method.

The com.apple.security.smartcard entitlement is required in order to use TKSmartCardSlotManager.

## 163.10.2 Methods

## 163.10.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.11 or newer.

## 163.10.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

## 163.10.5 defaultManager as TKSmartCardSlotManagerMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The shared singleton Smart Card reader slot manager.
**Notes:** This method returns nil unless the com.apple.security.smartcard entitlement is enabled.

## 163.10.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.10.7 getSlotWithName(name as string, tag as variant = nil)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Asynchronously calls a block with a Smart Card reader slot for a specified name.
**Notes:** name: The name of the Smart Card reader slot.

Calls gotSlotWithName later.

### 163.10.8 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the observer to call slowNamesChanged event.
**Notes:** Called for you by constructor.

### 163.10.9 slotNamed(name as string) as TKSmartCardSlotMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the Smart Card slot with a given name.
**Notes:** Returns the slot with the specified name, or nil if no slot with that name exists.

### 163.10.10 slotNames as string()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A list of identifiers for all the Smart Card reader slots available to the system.

### 163.10.11 Properties

### 163.10.12 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.10.13 Events

### 163.10.14 gotSlotWithName(name as string, slot as TKSmartCardSlotMBS, tag as variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** The event called when the slow with the name is found.

### 163.10.15 slotNamesChanged

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when slot name list changed.

## 163.11 class TKSmartCardSlotMBS

### 163.11.1 class TKSmartCardSlotMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A single smart card reader slot in the system.
**Notes:** Use the TKSmartCardSlotManagerMBS class to manage all the smart card reader slots available to the system. You can retrieve the names of available smart card reader slots for a system using the slotNames property of a manager object, and access instances of TKSmartCardSlotMBS using the getSlotWithName method.

### 163.11.2 Methods

### 163.11.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.11.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.11.5 makeSmartCard as TKSmartCardMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates a new TKSmartCardMBS object representing the currently inserted Smart Card.
**Notes:** A new TKSmartCardMBS object, or nil if no Smart Card is currently inserted.

You can create multiple instances of TKSmartCardMBS that represent the same Smart Card. Exclusivity of data transfer is handled by sessions on the individual TKSmartCardMBS objects.

### 163.11.6 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the observer to call stateChanged event.
**Notes:** Called for you by constructor.

### 163.11.7 Properties

### 163.11.8 ATR as TKSmartCardATRMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The ATR (Answer to Reset) of the inserted Smart Card, or nil if no Smart Card is inserted or the inserted Smart Card is mute.
**Notes:** (Read only property)

### 163.11.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.11.10 maxInputLength as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The maximum length of input APDU (Application Protocol Data Unit) that the Smart Card reader slot is able to transfer to the Smart Card.
**Notes:** (Read only property)

### 163.11.11 maxOutputLength as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The maximum length of output APDU (Application Protocol Data Unit) that the Smart Card reader slot is able to transfer from the Smart Card.
**Notes:** (Read only property)

### 163.11.12 Name as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The name of the Smart Card reader slot.
**Notes:** (Read only property)

### 163.11.13 State as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The current state of the Smart Card reader slot.
**Notes:** (Read only property)

### 163.11.14 Events

### 163.11.15 StateChanged

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when state changed.

### 163.11.16 Constants

States

| Constant | Value | Description |
|---|---|---|
| kStateEmpty | 1 | The Smart Card reader slot is empty; no card is inserted. |
| kStateMissing | 0 | The Smart Card reader slot is no longer known to the system. This is the terminal state of a TKSmartCardSlotThis instance; once it has reached this state, the Smart Card reader slot cannot be reinitialized. |
| kStateMuteCard | 3 | A Smart Card is inserted, but is mute, or does not provide responses to commands. |
| kStateProbing | 2 | A Smart Card was inserted into the slot and an initial probe is in underway. |
| kStateValidCard | 4 | A Smart Card is inserted and properly answered to a reset command. |

## 163.12 class TKSmartCardTokenDriverMBS

### 163.12.1 class TKSmartCardTokenDriverMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The driver that acts as an entry point for smart card app extensions.
**Notes:** Subclass of the TKTokenDriverMBS class.

### 163.12.2 Methods

### 163.12.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

## 163.13 class TKSmartCardTokenMBS

### 163.13.1 class TKSmartCardTokenMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of a smart card based cryptographic token.#
**Notes:** Subclass of the TKTokenMBS class.

### 163.13.2 Methods

### 163.13.3 Constructor(smartCard as TKSmartCardMBS, AID as MemoryBlock, instanceID as String, tokenDriver as TKSmartCardTokenDriverMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a smart card token with the specified smart card, application identifier, and token driver.
**Notes:** smartCard: The smart card on which the created token should operate.
AID: The ISO 7816-4 application identifier for the smart card.
instanceID: A unique, persistent identifier for this token. This value is typically generated from the serial number of the target hardware.
tokenDriver: The driver associated with the created token.
See also:

- 163.13.4 Constructor(tokenDriver as TKTokenDriverMBS, instanceID as String) 20826

### 163.13.4 Constructor(tokenDriver as TKTokenDriverMBS, instanceID as String)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.13.3 Constructor(smartCard as TKSmartCardMBS, AID as MemoryBlock, instanceID as String, tokenDriver as TKSmartCardTokenDriverMBS) 20826

### 163.13.5 Properties

### 163.13.6 AID as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The ISO 7816-4 application identifiers of the Smart Card.
**Notes:** This value is specified in the Smart Card token extension's NSExtensionAttributes property list by the com.apple.ctk.aid attribute. If this attribute specifies multiple AIDs, this parameter represents the application identifier found on the card that is already preselected. If the com.apple.ctk.aid attribute is not present, no application is automatically preselected and the value of this property is nil.
(Read only property)

## 163.14 class TKSmartCardTokenSessionMBS

### 163.14.1 class TKSmartCardTokenSessionMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A token session that is based on a smart card token.
**Notes:** You can use the smartCard property to access and send APDUs to the underlying smart card.

Available on MacOS 10.12 or newer.
Subclass of the TKTokenSessionMBS class.

### 163.14.2 Methods

### 163.14.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.14.4 Constructor(token as TKTokenMBS) 20828

### 163.14.4 Constructor(token as TKTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token session with the specified token.
**Notes:** token: The token to which the initialized session is bound.

Returns a new token session created with the specified token.
See also:

- 163.14.3 Constructor 20828

### 163.14.5 Properties

### 163.14.6 smartCard as TKSmartCardMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The smart card for the active exclusive session and selected application.
**Notes:** This property can only be accessed in the implementation of a TKTokenSessionDelegate protocol

delegate method. If the associated token has a value set for the AID property, this property opens an exclusive session to the card, with the application already selected.

You should not call beginSession or endSession on the returned value. Instead, the system will take care of beginning the exclusive session and terminating it when the current token request servicing is finished.
You can store any kind of information representing state of the card using the context property. This property will be automatically set to nil if the card is reset or accessed by different TKSmartCard instance, such as by another process. You can check the context property for any previously stored values as a way to avoid costly state restoration before performing an operation.
(Read only property)

## 163.15 class TKSmartCardUserInteractionForPINOperationMBS

### 163.15.1 class TKSmartCardUserInteractionForPINOperationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of user interaction for secure PIN operations on a Smart Card reader.
**Notes:** There are two types of user interactions: those for secure PIN change and those for secure PIN validation. These interactions are instances of the TKSmartCardUserInteractionForSecurePINChangeMBS, or TKSmartCardUserInteractionForSecurePINVerificationMBS subclasses of TKSmartCardUserInteraction-ForPINOperationMBS, respectively.

You interact with instances of one of the subclasses of TKSmartCardUserInteractionForPINOperationMBS when calling the userInteractionForSecurePINChange and userInteractionForSecurePINVerification methods on an TKSmartCard object.
The result of a user interaction is available once the interaction has completed.

Available in macOS 10.11 or newer.
Subclass of the TKSmartCardUserInteractionMBS class.

### 163.15.2 Methods

### 163.15.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.15.4 PINMessageIndices as Integer()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A list of message indices referring to a predefined message table, used to specify the type and number of messages displayed during the PIN operation. nil by default.
**Notes:** If nil, the reader does not display any message (reader specific). Typically, PIN verification takes 1 message; PIN modification takes 1 –3 messages.

### 163.15.5 Properties

### 163.15.6 locale as NSLocaleMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The locale for the displayed messages.
**Notes:** If nil, the user,Äôs current locale is used. By default, this value is the current locale of the system. (Read and Write property)

### 163.15.7 PINCompletion as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The conditions under which PIN entry should be considered complete.
**Notes:** (Read and Write property)

### 163.15.8 resultData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The returned data without SW1-SW2 bytes, if any.
**Notes:** (Read and Write property)

### 163.15.9 resultSW as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The SW1-SW2 status bytes.
**Notes:** (Read and Write property)

### 163.15.10 Constants

PIN Completion

| Constant | Value | Description |
|---|---|---|
| kPINCompletionKey | 2 | Key |
| kPINCompletionMaxLength | 1 | MaxLength |
| kPINCompletionTimeout | 4 | Timeout |

## 163.16 class TKSmartCardUserInteractionForSecurePINChangeMBS

### 163.16.1 class TKSmartCardUserInteractionForSecurePINChangeMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of the user interaction for secure PIN change operations on a Smart Card reader.
**Notes:** The result of a user interaction is available once the interaction has completed.
Available in macOS 10.11+.
Subclass of the TKSmartCardUserInteractionForPINOperationMBS class.

### 163.16.2 Methods

### 163.16.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.16.4 Properties

### 163.16.5 PINConfirmation as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The way PIN confirmation is requested.
**Notes:** kPINConfirmationNone by default.
(Read and Write property)

### 163.16.6 Constants

Pin Confirmation

| Constant | Value | Description |
|---|---|---|
| kPINConfirmationCurrent | 2 | Current PIN confirmation. |
| kPINConfirmationNew | 1 | New PIN confirmation. |
| kPINConfirmationNone | 0 | No PIN confirmation. |

# 163.17 class TKSmartCardUserInteractionForSecurePINVerificationMBS

## 163.17.1 class TKSmartCardUserInteractionForSecurePINVerificationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of the user interaction for secure PIN change verification on a Smart Card reader.
**Notes:** The result of a user interaction is available once the interaction has completed.
Subclass of the TKSmartCardUserInteractionForPINOperationMBS class.

## 163.17.2 Methods

## 163.17.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

## 163.18 class TKSmartCardUserInteractionMBS

### 163.18.1 class TKSmartCardUserInteractionMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The base class for encapsulating user interaction with a Smart Card reader.
**Notes:** There are two types of user interactions: those for secure PIN change and those for secure PIN validation. These interactions are instances of the TKSmartCardUserInteractionForSecurePINChangeMBS, or TKSmartCardUserInteractionForSecurePINVerificationMBS subclasses of TKSmartCardUserInteraction-ForPINOperationMBS, respectively. TKSmartCardUserInteractionForPINOperationMBS is a subclass of TKSmartCardUserInteractionMBS.

You interact with instances of one of the subclasses of TKSmartCardUserInteractionForPINOperationwhen-MBS calling the userInteractionForSecurePINChange and userInteractionForSecurePINVerification methods on an TKSmartCardMBS object.

Available in macOS 10.11+.

### 163.18.2 Methods

### 163.18.3 Cancel as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Attempts to cancel an interaction started by calling run.
**Notes:** Returns false if the operation is not running, or if cancelation is not supported.
For certain interactions, cancellation may not be available.

### 163.18.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.18.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.18.6 Run

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Runs the user interaction and asynchronously receives a reply.
**Notes:** Calls RunCompleted event later.

### 163.18.7 Properties

### 163.18.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.18.9 initialTimeout as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The timeout, in seconds, for initial interaction.
**Notes:** If set to 0, the reader-defined default timeout is used. 0 by default.
(Read and Write property)

### 163.18.10 interactionTimeout as Double

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The timeout, in seconds, after the first key stroke.
**Notes:** If set to 0, the reader-defined default timeout is used. 0 by default.
(Read and Write property)

### 163.18.11 Events

### 163.18.12 characterEnteredInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that a valid character has been entered.

### 163.18.13 correctionKeyPressedInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that a correction key has been pressed.

### 163.18.14 invalidCharacterEnteredInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that an invalid character has been entered.

### 163.18.15 newPINConfirmationRequestedInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that the new PIN needs to be re-entered for confirmation.

### 163.18.16 newPINRequestedInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that the new PIN needs to be entered.

### 163.18.17 oldPINRequestedInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that the old PIN needs to be entered.

### 163.18.18 runCompleted(success as boolean, error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Called when run method is done.
**Notes:** success: Whether the user interaction was successful.
error: Contains information about the the error that occurred during the user interaction.
The NSError object is created in the TKErrorDomain domain with a code in the TKErrorCode enumeration.

### 163.18.19 validationKeyPressedInUserInteraction

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that the validation key has been pressed, indicating the end of PIN entry.

## 163.19 class TKTLVRecordMBS

### 163.19.1 class TKTLVRecordMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The base class encapsulating a Tag-Length-Value record.
**Notes:** The CryptoTokenKit framework provides the following concrete subclasses for various TLV record encodings:

- TKBERTLVRecordMBS for BER-TLV encoding rules
- TKSimpleTLVRecordMBS for Simple-TLV encoding according to ISO 7816-4
- TKCompactTLVRecordMBS for Compact-TLV encoding according to ISO 7816-4

Requires macOS 10.12 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 163.19.2 Methods

### 163.19.3 available as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS 10.12 or newer.

### 163.19.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 163.19.5 recordFromData(data as MemoryBlock) as TKTLVRecordMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates and returns a TLV record from by parsing the specified data.
**Notes:** data: A data object containing the serialized representation of a TLV record.

Returns a TLV record, or nil if data does not specify a valid record.

### 163.19.6 sequenceOfRecordsFromData(data as MemoryBlock) as TKTLVRecordMBS()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Creates and returns an array of TLV records from the specified data.
**Notes:** data: A data object containing the serialized representation of zero or more TLV records.

Returns a sequence of TLV records, or nil if data does not specify a sequence of valid records.

### 163.19.7 Properties

### 163.19.8 Data as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The record data, including the tag, length, and value fields.
**Notes:** (Read only property)

### 163.19.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.19.10 Tag as UInt64

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The tag field of the record.
**Notes:** (Read only property)

### 163.19.11 Value as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The value field of the record.
**Notes:** (Read only property)

# 163.20 class TKTokenAuthOperationMBS

## 163.20.1 class TKTokenAuthOperationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An authentication operation for a cryptographic token.
**Notes:** The CryptoTokenKit framework provides the following concrete subclasses: TKTokenPasswordAuthOperationMBS, for password-based authentication, and TKTokenSmartCardPINAuthOperationMBS for Smart Card PIN-based authentication.

## 163.20.2 Methods

## 163.20.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

## 163.20.4 finishWithError(byref error as NSErrorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Finishes the authentication operation.
**Notes:** error: On return, if an error occurred, contains an object with details of the error.
The NSError object is created in the TKErrorDomain domain with a code in the TKErrorCode enumeration.

Return true if the authentication operation finished successfully; otherwise false.

## 163.20.5 Properties

## 163.20.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 163.21 class TKTokenDriverMBS

### 163.21.1 class TKTokenDriverMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The abstract base class for building token drivers.
**Notes:** When working with Smart Card tokens, use or inherit from the TKSmartCardTokenDriverMBS subclass instead.

### 163.21.2 Methods

### 163.21.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.21.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.21.5 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets delegate, so events fire.
**Notes:** Called by constructor for you.

### 163.21.6 Properties

### 163.21.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.21.8 Events

### 163.21.9 createTokenForSmartCard(smartCard as TKSmartCardMBS, AID as MemoryBlock, byref error as NSErrorMBS) as TKSmartCardTokenMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that a new Smart Card is detected.
**Notes:** self: The Smart Card token driver.
smartCard: The detected Smart Card.
AID: The ISO 7816-4 application identifier that is selected on the Smart Card. If the com.apple.ctk.aid attributes is not present in the Smart Card token extension property list, no application is selected.
error: If an error occured, this parameter should be populated with an NSError object containing details about the error.

Return the token created for the Smart Card, or nil if an error occurs or the delegate decides not to provide a token.

This event is only for TKSmartCardTokenDriverMBS class.

### 163.21.10 terminateToken(token as TKTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to terminate the specified token.

## 163.22 class TKTokenKeyAlgorithmMBS

### 163.22.1 class TKTokenKeyAlgorithmMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Cryptographic algorithms used by token keys.
**Notes:** Typically, the supported algorithm for a token key can be represented by a value of the SecKeyAlgorithm enumeration. However, tokens such as Smart Cards require that input data for operations take the format of a more specific algorithm. For example, a token may accept raw data to generate a cryptographic signature, but require that raw data to be formatted according to PKCS1 padding rules. To express such a requirement, a TKTokenKeyAlgorithm object defines a target algorithm and a set of other algorithms that were used. In the previous example, the target algorithm is kSecKeyAlgorithmRSASignatureRaw and the kSecKeyAlgorithmRSASignatureDigestPKCS1v15SHA1 algorithm is also reported as being used.

Requires macOS 10.12+ or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 163.22.2 Methods

### 163.22.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 163.22.4 isAlgorithm(algorithm as string) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns whether the specified algorithm is the target operation algorithm.
**Notes:** algorithm: The algorithm to be checked.

Returns true if algorithm is the target operation algorithm; otherwise, false.

### 163.22.5 supportsAlgorithm(algorithm as string) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the specified algorithm is the target operation algorithm, or one of the other algorithms used.

**Notes:** algorithm: The algorithm to be checked.

Returns true if algorithm is the target operation algorithm or one of the other algorithms used; otherwise, false.

### 163.22.6 Properties

### 163.22.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 163.23 class TKTokenKeychainCertificateMBS

### 163.23.1 class TKTokenKeychainCertificateMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A token,Äôs certificate as stored in the keychain.
**Notes:** Subclass of the TKTokenKeychainItemMBS class.

### 163.23.2 Methods

### 163.23.3 Constructor(CertificateData as MemoryBlock, TKTokenObjectID as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token keychain certificate with data from the specified certificate reference and a given object ID.
**Notes:** CertificateData: The certificate as data block.
objectID: The object ID.

Returns a new token keychain certificate.
See also:

- 163.23.4 Constructor(TKTokenObjectID as Variant) 20846

### 163.23.4 Constructor(TKTokenObjectID as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.23.3 Constructor(CertificateData as MemoryBlock, TKTokenObjectID as Variant) 20846

### 163.23.5 Properties

### 163.23.6 data as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns a DER-encoded representation of an X.509 certificate.
**Notes:** (Read only property)

## 163.24 class TKTokenKeychainContentsMBS

### 163.24.1 class TKTokenKeychainContentsMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of the state of the keychain for a particular token.
**Notes:** Available on macOS 10.12+.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 163.24.2 Methods

### 163.24.3 certificateForObjectID(TKTokenObjectID as Variant, byref error as NSErrorMBS) as TKTokenKeychainCertificateMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the key for a specified object identifier.
**Notes:** objectID: The object identifier for the keychain item.
error: On return, if no such certificate exists, contains information about the error.

Returns the certificate, or nil if no certificate exists.

### 163.24.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 163.24.5 fillWithItems(items() as TKTokenKeychainItemMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Fills the keychain with the specified items.
**Notes:** items: The items to be added to the keychain.

All existing items for the token are first removed from the keychain before filling the keychain with items.

### 163.24.6 items as TKTokenKeychainItemMBS()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns all items for token in the keychain.

### 163.24.7 keyForObjectID(TKTokenObjectID as Variant, byref error as NSErrorMBS) as TKTokenKeychainKeyMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the key for a specified object identifier.
**Notes:** objectID: The object identifier for the keychain item.
error: On return, if no such key exists, contains information about the error.

Returns the key, or nil if no key exists.

### 163.24.8 Properties

### 163.24.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 163.25 class TKTokenKeychainItemMBS

### 163.25.1 class TKTokenKeychainItemMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An abstract base class for managing a token,Äôs contents as keychain items.
**Notes:** Don't use this base class directly. Instead, use one of its subclasses, such as TKTokenKeychainCertificateMBS for managing certificates or TKTokenKeychainKeyMBS for managing cryptographic keys.
Available on macOS 10.12+.

### 163.25.2 Methods

### 163.25.3 Constructor(TKTokenObjectID as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token keychain item with the specified object ID.

### 163.25.4 Properties

### 163.25.5 constraints as Dictionary

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Access constraints for the keychain item, keyed by TKTokenOperation values wrapped in integers.
**Notes:** (Read and Write property)

### 163.25.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.25.7 Label as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The user-visible label for the keychain item.
**Notes:** This property is equivalent to the kSecAttrLabel attribute type.
(Read and Write property)

### 163.25.8 objectID as Variant

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the object ID used for keychain item identification.
**Notes:** (Read only property)

## 163.26 class TKTokenKeychainKeyMBS

### 163.26.1 class TKTokenKeychainKeyMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A token's key as stored in the keychain.
**Notes:** Available on macOS 10.12+.
Subclass of the TKTokenKeychainItemMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5

### 163.26.2 Methods

### 163.26.3 Constructor(CertificateData as MemoryBlock, TKTokenObjectID as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token keychain key with data from the specified certificate and a given object ID.
**Notes:** certificateData: The certificate data.
objectID: The object ID.

Returns a new token keychain certificate.
See also:

- 163.26.4 Constructor(TKTokenObjectID as Variant) 20852

### 163.26.4 Constructor(TKTokenObjectID as Variant)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.26.3 Constructor(CertificateData as MemoryBlock, TKTokenObjectID as Variant) 20852

### 163.26.5 Properties

### 163.26.6 applicationTag as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private tag data.
**Notes:** This property is equivalent to the kSecAttrApplicationTag type attribute.
(Read and Write property)

### 163.26.7 canDecrypt as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the key can be used to decrypt data.
**Notes:** This property is equivalent to the kSecAttrCanDecrypt type attribute.
(Read and Write property)

### 163.26.8 canPerformKeyExchange as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the key can be used to perform Diffie-Hellman style cryptographic key exchange.
**Notes:** (Read and Write property)

### 163.26.9 canSign as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the key can be used to sign data.
**Notes:** (Read and Write property)

### 163.26.10 keySizeInBits as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The key size in bits.
**Notes:** (Read and Write property)

### 163.26.11 keyType as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The type of the key.
**Notes:** Currently, only kSecAttrKeyTypeRSA and kSecAttrKeyTypeECSECPrimeRandom are supported values.

(Read and Write property)

### 163.26.12 publicKeyData as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The public key data.
**Notes:** (Read and Write property)

### 163.26.13 publicKeyHash as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The SHA1 hash of the raw public key.
**Notes:** This property is equivalent to the kSecAttrApplicationLabel type attribute.
(Read and Write property)

### 163.26.14 SuitableForLogin as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Whether the key can be used for system login.
**Notes:** (Read and Write property)

# 163.27 class TKTokenKeyExchangeParametersMBS

## 163.27.1 class TKTokenKeyExchangeParametersMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Parameters used to perform specific key exchange operations.
**Notes:** Available on macOS 10.12+.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 163.27.2 Methods

## 163.27.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 163.27.4 Properties

## 163.27.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 163.27.6 requestedSize as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns the requested output size, in bytes, of key exchange result.
**Notes:** This property should be ignored if the output size is not configurable for the specified key exchange algorithm.
(Read only property)

## 163.27.7 sharedInfo as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Returns shared information typically used during the key derivation (KDF) step of a key exchange algorithm.
**Notes:** This property should be ignored if shared information isn,Äôt used by the specified key exchange algorithm.
(Read only property)

# 163.28 class TKTokenMBS

## 163.28.1 class TKTokenMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A representation of a hardware-based cryptographic token.
**Notes:** When working with Smart Card tokens, use or inherit from the TKSmartCardToken subclass instead.
Available in macOS 10.12+.

## 163.28.2 Methods

## 163.28.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.28.4 Constructor(tokenDriver as TKTokenDriverMBS, instanceID as String) 20857

## 163.28.4 Constructor(tokenDriver as TKTokenDriverMBS, instanceID as String)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token using the specified driver.
**Notes:** tokenDriver: The driver of the token.
instanceID: A unique, persistent identifier for this token. This value is typically generated from the serial number of the target hardware.

Returns a new token object.
See also:

- 163.28.3 Constructor 20857

## 163.28.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.28.6 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the delegate, so you receive events.
**Notes:** Called by Constructor for you.

### 163.28.7 Properties

### 163.28.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.28.9 keychainContents as TKTokenKeychainContentsMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The contents of the keychain for this token.
**Notes:** (Read only property)

### 163.28.10 tokenDriver as TKTokenDriverMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The token driver.
**Notes:** (Read only property)

### 163.28.11 Events

### 163.28.12 createSession(byref error as NSErrorMBS) as TKTokenSessionMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to create a session for the specified token.
**Notes:** token: The token.
error: If an error occurred, this method should return nil and populate this parameter with an object containing details of the error. The error object should have a domain equal to TKErrorDomain and a code

equal to a value defined by the TKErrorCode enumeration.

Return a new token session, or nil if an error occurred.

All operations for a token are performed within a session representing an authentication context. This delegate method is called whenever new authentication context is needed. For example, a client may want to perform a token operation using a keychain object that has an associated LAContext.

### 163.28.13 terminateSession(session as TKTokenSessionMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to terminate the specified token session.

## 163.29 class TKTokenPasswordAuthOperationMBS

### 163.29.1 class TKTokenPasswordAuthOperationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An authentication operation for a cryptographic token.
**Notes:** The CryptoTokenKit framework provides the following concrete subclasses: TKTokenPasswordAuthOperationMBS, for password-based authentication, and TKTokenSmartCardPINAuthOperationMBS for Smart Card PIN-based authentication.
Subclass of the TKTokenAuthOperationMBS class.

### 163.29.2 Methods

### 163.29.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

### 163.29.4 Properties

### 163.29.5 password as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The password to be filled in when the finishWithError method is called.
**Notes:** (Read and Write property)

# 163.30 class TKTokenSessionMBS

## 163.30.1 class TKTokenSessionMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A token session that manages the authentication state of a token.
**Notes:** A token session communicates with its delegate to perform operations with its token that are bound to the authentication state.

A session is always instantiated by a TKTokenMBS instance through the token's delegate when the framework detects access to the token from a new authentication session.

Never share the authentication status of a token, such as the PIN entered to unlock a smart card, with other token sessions.

## 163.30.2 Methods

## 163.30.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 163.30.4 Constructor(token as TKTokenMBS) 20861

## 163.30.4 Constructor(token as TKTokenMBS)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token session with the specified token.
**Notes:** token: The token to which the initialized session is bound.

Returns a new token session created with the specified token.
See also:

- 163.30.3 Constructor 20861

## 163.30.5 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

### 163.30.6 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the delegat, so events fire.
**Notes:** Called for you by constructor.

### 163.30.7 Properties

### 163.30.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.30.9 token as TKTokenMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The token to which the session is bound.
**Notes:** (Read only property)

### 163.30.10 Events

### 163.30.11 beginAuthForOperation(operation as Integer, constraint as Variant, byref error as NSErrorMBS) as TKTokenAuthOperationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate that authentication has begun for the specified operation and constraint.
**Notes:** self: The token session.
operation: The kind of operation.
constraint: The constraint to be satisfied.
error: If an error occurred, this method should return nil and populate this parameter with an object containing details of the error. The error object should have a domain equal to TKErrorDomain and a code equal to a value defined by the TKErrorCode enumeration.

Return the resulting context of the operation, or nil if an error occurred.

If you return an instance of a subclass of TKTokenAuthOperation that is provided by the CryptoTokenKit framework, the system will first fill in the context-specific properties, such as the password, before calling the finishWithError: method on the context.

### 163.30.12 decryptData(ciphertext as MemoryBlock, keyObjectID as Variant, algorithm as TKTokenKeyAlgorithmMBS, byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to decrypt a data object using the specified key and algorithm.
**Notes:** self: The token session.
ciphertext: The data to decrypt.
keyObjectID: The identifier of the public key object.
algorithm: The algorithm to be used for decryption.
error: If an error occurred, this method should return nil and populate this parameter with an object containing details of the error. The error object should have a domain equal to TKErrorDomain and a code equal to a value defined by the TKErrorCode enumeration.

Returns the decrypted data, or nil if an error occurred.

### 163.30.13 performKeyExchangeWithPublicKey(otherPartyPublicKeyData as MemoryBlock, keyObjectID as Variant, algorithm as TKTokenKeyAlgorithmMBS, parameters as TKTokenKeyExchangeParametersMBS, byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to perform a key exchange using the specified key and algorithm.
**Notes:** self: The token session.
otherPartyPublicKeyData: The public key of the other party.
keyObjectID: The identifier of the private key object.
algorithm: The algorithm to be used for key exchange.
parameters: Additional parameters used by algorithm to perform the key exchange.
error: If an error occurred, this method should return nil and populate this parameter with an object containing details of the error. The error object should have a domain equal to TKErrorDomain and a code equal to a value defined by the TKErrorCode enumeration.

Returns the result of the key exchange, or nil if an error occurred.

### 163.30.14 signData(dataToSign as MemoryBlock, keyObjectID as Variant, algorithm as TKTokenKeyAlgorithmMBS, byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Tells the delegate to sign a data object using the specified key and algorithm.
**Notes:** self: The token session.
data: The data to sign.
keyObjectID: The identifier of the private key object.
algorithm: The algorithm to be used for signing.
error: If an error occurred, this method should return nil and populate this parameter with an object containing details of the error. The error object should have a domain equal to TKErrorDomain and a code equal to a value defined by the TKErrorCode enumeration.

Return the signed data, or nil if an error occurred.

### 163.30.15 supportsOperation(operation as Integer, keyObjectID as Variant, algorithm as TKTokenKeyAlgorithmMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Asks the delegate whether the token session supports a given operation using the specified key and algorithm.
**Notes:** self: The token session.
operation: The operation to perform. For possible values, see kTokenOperation* constants.
keyObjectID: The identifier of the private key object.
algorithm: The algorithm to be used by the operation.

Returns true if the operation is supported; otherwise, false.

### 163.30.16 Constants

Token Operations

| Constant | Value | Description |
|---|---|---|
| kTokenOperationDecryptData | 3 | Decrypt data using a private key. |
| kTokenOperationNone | 0 | No operation. |
| kTokenOperationPerformKeyExchange | 4 | Perform a Diffie-Hellman style cryptographic key exchange using a priva |
| kTokenOperationReadData | 1 | Read raw data of a certificate. |
| kTokenOperationSignData | 2 | Create a cryptographic signature using a private key. |

# 163.31 class TKTokenSmartCardPINAuthOperationMBS

## 163.31.1 class TKTokenSmartCardPINAuthOperationMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A Smart Card PIN authentication operation.
**Notes:** Subclass of the TKTokenAuthOperationMBS class.

## 163.31.2 Methods

## 163.31.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The constructor.

## 163.31.4 Properties

## 163.31.5 APDUTemplate as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The template into which the PIN is filled in. nil by default.
**Notes:** If nil, the system will not attempt to authenticate by sending the formatted APDU to the Smart Card. Instead, the token itself is expected to perform the authentication. You are encouraged to provide an APDU template, if possible, as it allows the use of a hardware interface for secure PIN entry, provided one exists.
(Read and Write property)

## 163.31.6 PIN as String

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The PIN value resulting from performing the operation.
**Notes:** This property is set to the result of the operation after finishWithError: is called.

If the APDUTemplate property has a set value, this property is not set, as the PIN is automatically sent to the Smart Card using the specified template.
(Read and Write property)

### 163.31.7 PINByteOffset as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The offset, in bytes, within the APDU template to mark the location for filling in the PIN.
**Notes:** (Read and Write property)

### 163.31.8 PINFormat as TKSmartCardPINFormatMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The PIN format.
**Notes:** By default, this property is set to a TKSmartCardPINFormatMBS object initialized without any further configuration.
(Read and Write property)

### 163.31.9 smartCard as TKSmartCardMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** A Smart Card to which the formatted APDU is sent in order to authenticate.
**Notes:** This property is only used if the APDUTemplate property has a set value.
(Read and Write property)

# 163.32 class TKTokenWatcherMBS

## 163.32.1 class TKTokenWatcherMBS

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** An object that tracks the tokens available in the system.
**Notes:** Create a token watcher and register an insertion handler to be notified when tokens are added to the system. You can also add removal handlers for specific tokens to be notified when those tokens are removed from the system.

## 163.32.2 Methods

## 163.32.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Initializes a token watcher.

## 163.32.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The destructor.

## 163.32.5 SetDelegate

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Sets the observer to call tokenIDsChanged event.
**Notes:** Called for you by constructor.

## 163.32.6 tokenIDs as String()

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** The token IDs currently available in the system.
**Notes:** Each string in tokenIDs corresponds to the name of the token instance.

### 163.32.7 Properties

### 163.32.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 163.32.9 Events

### 163.32.10 Inserted(tokenID as string)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** The event called when the given token is inserted.

### 163.32.11 Removed(tokenID as string)

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** The event called when the given token is removed.

### 163.32.12 tokenIDsChanged

MBS Mac64bit Plugin, Plugin Version: 18.5, Platform: macOS, Targets: .

**Function:** Event called when tokenID list changed.

# Chapter 164

# Social

## 164.1 class ACAccountCredentialMBS

### 164.1.1 class ACAccountCredentialMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An ACAccountCredential object encapsulates the information needed to authenticate a user.
**Notes:** To create an account credential that uses the OAuth open authentication standard, use the Constructor.

### 164.1.2 Methods

### 164.1.3 Constructor(token as string, refreshToken as string, expiryDate as date)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes an account credential using OAuth 2.
**Notes:** token: The client application,Äôs token.
refreshToken: The client application,Äôs refresh token.
expiryDate: The date the token expires.

Accounts can optionally use the OAuth open authentication standard to authenticate your client application. Instead of the user giving their username and password to log in, the server authenticates the user, and your client application receives a token that grants it access to specific resources for a defined duration. The authentication mechanism uses a key and secret scheme similar to the public and private keys used by ssh. A token is a unique, random string of letters and numbers that is paired with a secret to protect the token from being abused. You initialize account credentials using this token and secret token.

To learn more about OAuth, go to Hueniverse OAuth.
http://hueniverse.com/oauth/
See also:


- 164.1.4 Constructor(token as string, refreshToken as string, expiryDate as dateTime) 20870
- 164.1.5 Constructor(token as string, tokenSecret as string) 20870


### 164.1.4 Constructor(token as string, refreshToken as string, expiryDate as dateTime)

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Initializes an account credential using OAuth 2.
See also:


- 164.1.3 Constructor(token as string, refreshToken as string, expiryDate as date) 20869
- 164.1.5 Constructor(token as string, tokenSecret as string) 20870


### 164.1.5 Constructor(token as string, tokenSecret as string)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes an account credential using OAuth.
**Notes:** Accounts can optionally use the OAuth open authentication standard to authenticate your client application. Instead of the user giving their username and password to log in, the server authenticates the user, and your client application receives a token that grants it access to specific resources for a defined duration. The authentication mechanism uses a key and secret scheme similar to the public and private keys used by ssh. A token is a unique, random string of letters and numbers that is paired with a secret to protect the token from being abused. You initialize account credentials using this token and secret token.

To learn more about OAuth, go to Hueniverse OAuth.
http://hueniverse.com/oauth/
See also:


- 164.1.3 Constructor(token as string, refreshToken as string, expiryDate as date) 20869
- 164.1.4 Constructor(token as string, refreshToken as string, expiryDate as dateTime) 20870


### 164.1.6 Properties

### 164.1.7 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.1.8 oauthToken as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The token used for the credential.
**Notes:** (Read and Write property)

## 164.2 class ACAccountMBS

### 164.2.1 class ACAccountMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The account class.
**Notes:** An ACAccount object encapsulates information about a user account stored in the Accounts database. You can create and retrieve accounts using an ACAccountStore object. The ACAccountStore object provides an interface to the persistent Accounts database. For each user, all account objects belong to a single ACAccountStore object.

Available in OS X v10.8 and later in 64-bit applications.

### 164.2.2 Methods

### 164.2.3 Constructor(type as ACAccountTypeMBS)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a new account of the specified type.
**Notes:** Available in OS X v10.8 and later.

### 164.2.4 Destructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 164.2.5 Properties

### 164.2.6 accountDescription as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A human-readable description of the account.
**Notes:** This property is available if the user grants the application access to this account; otherwise it is "". (Read and Write property)

### 164.2.7 accountType as ACAccountTypeMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The type of service account.
**Notes:** This property is required. You specify the account type using the Constructor. You can use the accountsWithAccountType method to retrieve all accounts of a particular type.
(Read and Write property)

### 164.2.8 credential as ACAccountCredentialMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The credential used to authenticate the user of this account.
**Notes:** This property is required and must be set before the account is saved. For privacy reasons, this property is inaccessible after the account is saved.
(Read and Write property)

### 164.2.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 164.2.10 identifier as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A unique identifier for this account.
**Notes:** Use the accountWithIdentifier method to get an account with the specified identifier.
(Read only property)

### 164.2.11 Parent as ACAccountStoreMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The account store for this account.
**Notes:** (Read only property)

### 164.2.12 username as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The username for this account.
**Notes:** This property must be set before the account is saved. After the account is saved, this property is available if the user grants the application access to this account; otherwise it is "".
(Read and Write property)

## 164.3 class ACAccountStoreMBS

### 164.3.1 class ACAccountStoreMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The ACAccountStore class provides an interface for accessing, manipulating, and storing accounts.
**Notes:** To create and retrieve accounts from the Accounts database, you must create an ACAccountStore object. Each ACAccount object belongs to a single ACAccountStore object.

Available on Mac OS X 10.8 and later in 64-bit applications.

### 164.3.2 Methods

### 164.3.3 ACAccountStoreDidChangeNotification as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** One of the notification names.
**Notes:** Posted when the accounts managed by this account store changed in the database. There is no userInfo dictionary associated with this notification.

This notification is sent if an account is saved or removed locally or externally. If you receive this notification, you should refetch all account objects.

The plugin automatically registeres this for the Changed event.

### 164.3.4 accounts as ACAccountMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The accounts managed by this account store.

### 164.3.5 accountsWithAccountType(type as ACAccountTypeMBS) as ACAccountMBS()

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns all accounts of the specified type.

### 164.3.6 accountTypeWithAccountTypeIdentifier(identifier as string) as ACAccountTypeMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns an account type that matches the specified identifier.
**Notes:** typeIdentifier: The account type identifier.

### 164.3.7 accountWithIdentifier(identifier as string) as ACAccountMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns the account with the specified identifier.

### 164.3.8 ACErrorDomain as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The error domain for account framework.

### 164.3.9 available as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether class is available.
**Notes:** Returns true on Mac OS X 10.8 in a 64-bit application.

### 164.3.10 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 164.3.11 Destructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destructor.

### 164.3.12 removeAccount(account as ACAccountMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Removes an account from the account store.
**Notes:** account: The account to remove.

This call will fail if you don't have sufficient rights to remove the account.

### 164.3.13 renewCredentialsForAccount(account as ACAccountMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Renews account credentials when the credentials are no longer valid.
**Notes:** account: The account to renew credentials.

For Twitter and Sina Weibo accounts, this method will prompt the user to go to Settings to re-enter their password.
For Facebook accounts, if the access token has become invalid due to a regular expiration, this method will obtain a new one.
If the user has deauthorized your app, this renewal request will return ACAccountCredentialRenewResultRejected.

### 164.3.14 requestAccessToAccountsWithType(accountType as ACAccountTypeMBS, dic as dictionary, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Obtains permission to access protected user properties.
**Notes:** accountType: The account type.
options: The account options.

Certain account types (such as Facebook) require an options dictionary. This method will throw an NSInvalidArgumentException if the options dictionary is not provided for such account types. Conversely, if the account type does not require an options dictionary, the options parameter must be nil.

### 164.3.15 saveAccount(account as ACAccountMBS, tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Saves an account to the Accounts database.
**Notes:** account: The account to save.

If the account type supports authentication and the account is not authenticated, the account server uses the account's credentials to authenticate it. If the authentication is successful, the account is saved; otherwise it is not saved.

### 164.3.16 Properties

### 164.3.17 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.3.18 Events

### 164.3.19 Changed

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Event called when database changed.
**Notes:** Posted when the accounts managed by this account store changed in the database. There is no userInfo dictionary associated with this notification.

This notification is sent if an account is saved or removed locally or externally. If you receive this notification, you should refetch all account objects.

### 164.3.20 removeAccountCompleted(account as ACAccountMBS, success as boolean, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The event called when account removing completed.

### 164.3.21 renewCredentialsForAccountCompleted(account as ACAccountMBS, renewResult as Integer, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** Event called when renew credentials completed.

### 164.3.22 requestAccessCompleted(granted as boolean, error as NSErrorMBS, accountType as ACAccountTypeMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The event called when requestAccessToAccountsWithType completed.

### 164.3.23 saveAccountCompleted(success as boolean, error as NSErrorMBS, account as ACAccountMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The account save completed.

### 164.3.24 Constants

Renew Status Codes

| Constant | Value | Description |
|---|---|---|
| ACAccountCredentialRenewResultFailed | 2 | A non-user-initiated cancel of the prompt. Try again. |
| ACAccountCredentialRenewResultRejected | 1 | Renewal failed because the user revoked your access to their accou |
| ACAccountCredentialRenewResultRenewed | 0 | The account,Äôs credentials have been renewed and are now asso the account. |

Errors

| Constant | Value | Description |
|---|---|---|
| ACErrorAccessDeniedByProtectionPolicy | 10 | Due to the current protection policy in effect, we couldn't fetch a cr |
| ACErrorAccessInfoInvalid | 8 | The client's access info dictionary has incorrect or missing values. |
| ACErrorAccountAlreadyExists | 5 | Account wasn't added because it already exists. |
| ACErrorAccountAuthenticationFailed | 3 | Account wasn't saved because authentication of the supplied credent |
| ACErrorAccountMissingRequiredProperty | 2 | Account wasn't saved because it is missing a required property. |
| ACErrorAccountNotFound | 6 | Account wasn't deleted because it could not be found. |
| ACErrorAccountTypeInvalid | 4 | Account wasn't saved because the account type is invalid. |
| ACErrorClientPermissionDenied | 9 | Your client does not have access to the requested data. |
| ACErrorCredentialNotFound | 11 | Yo, I tried to find your credential, but it must have run off! |
| ACErrorFetchCredentialFailed | 12 | Something bad happened on the way to the keychain |
| ACErrorInvalidClientBundleID | 16 | The client making the request does not have a valid bundle ID. |
| ACErrorPermissionDenied | 7 | The operation didn't complete because the user denied permission. |
| ACErrorRemoveCredentialFailed | 14 | Unable to remove credential |
| ACErrorStoreCredentialFailed | 13 | Unable to store credential |
| ACErrorUnknown | 1 | Unknown error |
| ACErrorUpdatingNonexistentAccount | 15 | Account save failed because the account being updated has been ren |

## 164.4 class ACAccountTypeMBS

### 164.4.1 class ACAccountTypeMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An ACAccountType object encapsulates information about all accounts of a particular type.
**Notes:** You do not create account type objects directly. To obtain an account type, use the Constructor or the accountType property of an account object. Account Type Identifiers describes the identifiers for currently supported account types. You can also use the accountsWithAccountType method to obtain all accounts of a particular type.

Available in OS X v10.8 and later in 64-bit applications.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr3

### 164.4.2 Methods

### 164.4.3 ACAccountTypeIdentifierFacebook as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifier for the Facebook account type.

### 164.4.4 ACAccountTypeIdentifierLinkedIn as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifier for the LinkedIn account type.
**Notes:** Available in OS X v10.9 and later.

### 164.4.5 ACAccountTypeIdentifierSinaWeibo as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifier for the Sina Weibo account type.

### 164.4.6 ACAccountTypeIdentifierTencentWeibo as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifier for the Tencent Weibo account type.
**Notes:** Available in OS X v10.9 and later.

### 164.4.7 ACAccountTypeIdentifierTwitter as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Identifier for the Twitter account type.

### 164.4.8 accessGranted as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the user granted the application access to accounts of this type.
**Notes:** True if the application has access to accounts of this type; otherwise false.

### 164.4.9 accountTypeDescription as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A human-readable description of the account type.

### 164.4.10 ACFacebookAppIdKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Your Facebook App ID, as it appears on the Facebook website.

### 164.4.11 ACFacebookAudienceEveryone as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Posts from your app are visible to everyone.

### 164.4.12 ACFacebookAudienceFriends as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Posts are visible only to friends.

### 164.4.13 ACFacebookAudienceKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Only required when posting permissions are requested.

### 164.4.14 ACFacebookAudienceOnlyMe as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Posts are visible to the user only.

### 164.4.15 ACFacebookPermissionsKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of of the permissions you're requesting.

### 164.4.16 ACLinkedInAppIdKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Your LinkedIn App ID (or API Key), as it appears on the LinkedIn website.

### 164.4.17 ACLinkedInPermissionsKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** An array of of the LinkedIn permissions you're requesting.

### 164.4.18 ACTencentWeiboAppIdKey as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Tencent App ID

### 164.4.19 Constructor

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 164.4.20 identifier as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The unique identifier for the account type.

### 164.4.21 Properties

### 164.4.22 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 164.5 class CustomNSSharingServiceMBS

### 164.5.1 class CustomNSSharingServiceMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The class for a custom sharing service.
**Notes:** You only use it to get your own service inside your app into sharing picker.

Please call Close method when you want to stop the service.
Subclass of the NSSharingServiceMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr9
- MBS Real Studio Plugins, version 13.1pr1
- MBS Real Studio Plugins, version 12.3pr15

### 164.5.2 Methods

### 164.5.3 Constructor(title as string, image as NSImageMBS, alternateImage as NSImageMBS = nil, DelegateHandler as NSSharingServiceDelegateMBS = nil, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a custom sharing service object.
**Notes:** title: The custom sharing service name.
image: The image that represents the sharing service
alternateImage: The alternate image that represents the sharing service
Delegate: The delegate where events are called for this service.

Custom sharing services can be added to the NSSharingServicePicker with the sharingServicesForItems event.
Available in OS X v10.8 and later.

Please call Close method when you want to stop the service.

### 164.5.4 Events

### 164.5.5 performCustomService(tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Called when user selected this service and you need to perform your work.

## 164.6 class NSSharingServiceDelegateMBS

### 164.6.1 class NSSharingServiceDelegateMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The NSSharingServiceDelegate protocol allows customization of the position and animation of the share sheet as well as be notified of the success or failure of the item being shared.
**Notes:** Available in OS X v10.8 and later.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr3
- MBS Xojo Plugins, version 21.5pr2
- MBS Real Studio Plugins, version 12.4pr1

### 164.6.2 Methods

### 164.6.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 164.6.4 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 164.6.5 Properties

### 164.6.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.6.7 Events

### 164.6.8 didCompleteForItems(service as NSSharingServiceMBS, items as NSSharingServiceItemsMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Sharing did complete.
**Notes:** When an NSSharingServiceNameCloudSharing sharing service is dismissed it will invoke this method on the delegate, with an error if there was any. If the delegate implements this method, NSSharingServiceNameCloudSharing will not send didFailToShareItems or didShareItems events.

### 164.6.9 didFailToShareItems(service as NSSharingServiceMBS, items as NSSharingServiceItemsMBS, error as NSErrorMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked when the sharing service encountered an error when sharing items.
**Notes:** sharingService: The sharing service.
items: The items being shared.
error: The error that was encountered when trying to share the item. If the error is NSUserCancelledError, the user simply cancelled the error.

Available in OS X v10.8 and later.

### 164.6.10 didSaveShare(service as NSSharingServiceMBS, share as Variant)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Cloud sharing did save.
**Notes:** When an NSSharingServiceNameCloudSharing sharing service successfully saves modifications to the CKShare, it will invoke this method on the delegate with the last-known state of the CKShareMBS on the server.

### 164.6.11 didShareItems(service as NSSharingServiceMBS, items as NSSharingServiceItemsMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked when the sharing service has finished sharing the items.
**Notes:** sharingService: The sharing service.

items: The items being shared.

Available in OS X v10.8 and later.

### 164.6.12 didStopSharing(service as NSSharingServiceMBS, share as Variant)

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Cloud sharing did stop.
**Notes:** When an NSSharingServiceNameCloudSharing sharing service stops sharing it will delete the CKShare from the server, then invoke this method on the delegate with the last-known state of the CKShareMBS.

### 164.6.13 optionsForSharingService(service as NSSharingServiceMBS, provider as Variant) as Integer

MBS MacFrameworks Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Queries what options are allowed for the share.
**Notes:** The options returned by this method describe how the user is allowed to configure the share: whether the share is public or private, and whether participants have read-only or read/write permissions. If this method is not implemented, NSCloudKitSharingServiceStandard is assumed.

### 164.6.14 sourceFrameOnScreenForShareItem(service as NSSharingServiceMBS, item as Variant) as NSRectMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked when the sharing service is performed and the sharing window is displayed, to present a transition between the original items and the sharing window.
**Notes:** sharingService: The sharing service.
item: The item being shared.

Return the rectangle, in screen coordinates, to display the transition.

### 164.6.15 sourceWindowForShareItems(service as NSSharingServiceMBS, items as NSSharingServiceItemsMBS, scope as Integer) as NSWindowMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Returns the window that contained the share items.
**Notes:** sharingService: The sharing service.
items: The items being shared.
sharingContentScope: The sharing content scope. The sharing scope can be modified from the default value of NSSharingContentScopeItem by setting a different value in the out parameter sharingContentScope.

Return the window of the shared items.

### 164.6.16 transitionImageForShareItem(service as NSSharingServiceMBS, item as Variant, contentRect as NSRectMBS) as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked to allow returning a custom transition image when sharing an item.
**Notes:** sharingService: The sharing service.
item: The shared item.
contentRect: The content rectangle is the frame of the actual content inside the transition image, excluding all decorations. For example, if the transition image is a QuickLook thumbnail, the value would be QLThumbnailGetContentRect.

Return the image to display for the sharing transition. Its size should exactly match that of the original image.

### 164.6.17 willShareItems(service as NSSharingServiceMBS, items as NSSharingServiceItemsMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked when the sharing service will share the specified items.
**Notes:** sharingService: The sharing service.
items: The items being shared.
Available in OS X v10.8 and later.

### 164.6.18 Constants

Cloud Sharing Service Options

| Constant | Value | Description |
|---|---|---|
| NSCloudKitSharingServiceAllowPrivate | 2 | The user is allowed to share privately. |
| NSCloudKitSharingServiceAllowPublic | 1 | The user is allowed to share publicly. |
| NSCloudKitSharingServiceAllowReadOnly | 16 | The user is allowed to grant participants read-only permissions. |
| NSCloudKitSharingServiceAllowReadWrite | 32 | The user is allowed to grant participants read/write permissions. |
| NSCloudKitSharingServiceStandard | 0 | Allow the user to configure the share with the standard set of optic |

Sharing Scope Constants

| Constant | Value | Description |
|---|---|---|
| NSSharingContentScopeFull | 2 | Used when sharing the whole content of the current document, for example, the URL of the webpage.<br>Available in OS X v10.8 and later. |
| NSSharingContentScopeItem | 0 | Used when sharing a clearly identified item, for example, a file represented by its icon.<br>Available in OS X v10.8 and later. |
| NSSharingContentScopePartial | 1 | Used when sharing a portion of a more global content, for example, part of a webpage.<br>Available in OS X v10.8 and later. |

## 164.7 class NSSharingServiceItemsMBS

### 164.7.1 class NSSharingServiceItemsMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** A collection class for files, images, texts and URLs.
**Example:**

```
dim p as Picture = LogoMBS(500)
dim t as new NSSharingServiceItemsMBS
dim image as new NSImageMBS(p)
t.AddImage image
t.AddText "Hello World. This is a great app!"
```

**Notes:** Create an object from this class, add some items and pass to the share methods.

### 164.7.2 Methods

### 164.7.3 AddAttributedString(AttributedString as NSAttributedStringMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds one attributed string to the collection.
See also:

- 164.7.4 AddAttributedString(AttributedStrings() as NSAttributedStringMBS) 20892

### 164.7.4 AddAttributedString(AttributedStrings() as NSAttributedStringMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds attributed strings to the collection.
See also:

- 164.7.3 AddAttributedString(AttributedString as NSAttributedStringMBS) 20892

### 164.7.5 AddFile(file as folderitem)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds one file to the collection.

### 164.7.6 AddFiles(files() as folderitem)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of files to the collection.

### 164.7.7 AddImage(image as NSImageMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds one image to the collection.

### 164.7.8 AddImages(images() as NSImageMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of images to the collection.

### 164.7.9 AddText(text as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds one text to the collection.
See also:

- 164.7.10 AddText(texts() as string) 20893

### 164.7.10 AddText(texts() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of texts to the collection.
See also:

- 164.7.9 AddText(text as string) 20893

### 164.7.11 AddURL(URL as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Add one URL to the collection.
See also:

• 164.7.12 AddURL(URLs() as string) 20894

### 164.7.12 AddURL(URLs() as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Adds an array of URLs to the collection.
See also:

• 164.7.11 AddURL(URL as string) 20893

### 164.7.13 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 164.7.14 count as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the number of items in this collection.

### 164.7.15 Images as NSImageMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns all images in the collection.

### 164.7.16 objectAtIndex(index as Integer) as Variant

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns object at the given index.
**Notes:** Index is from 0 to count-1.
Returns URLs and files as string with URL.

### 164.7.17 Texts as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns array with all texts in this collection.

### 164.7.18 URLs as string()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns array with all URLs.
**Notes:** As files are also handled as URLs, the array contains also files in the collections as URLs.

### 164.7.19 Properties

### 164.7.20 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 164.8 class NSSharingServiceMBS

### 164.8.1 class NSSharingServiceMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The NSSharingService class is used to provide a consistent user experience when sharing items on OS X.
**Notes:** For example, items can be: NSURL objects, NSString objects, NSImage objects, video (through file URLs), or any object which implements the NSPasteboardWriting protocol.

For any item or group of items, the NSSharingServiceMBS will display a sharing sheet to allow the user to pre-visualize what will be shared to the service. A sharing service can: create a post on a social network like Twitter or Facebook, send a message by email or iMessage, upload videos to viewing services, or send a file by AirDrop.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.3
- News from the MBS Xojo Plugins Version 21.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- MBS Xojo Plugins, version 21.2pr1

### 164.8.2 Methods

### 164.8.3 attachmentFileURLs as String()

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Array of file URLs representing the files that were shared.

### 164.8.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether sharing services are available.
**Notes:** Returns true on Mac OS X 10.8.

### 164.8.5 canPerformWithItems(items as NSSharingServiceItemsMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns whether the service can share all the specified items.
**Notes:** items: The items to share.

Return true if the service can share all the items; false otherwise. If items is nil, the method will return true when the service is configured.

This method can be used to validate a custom user interface such as a dedicated Twitter button. Therefore you could call it once at launch time with nil items to check whether to display the button or not, and then with real items to enable and disable the button depending on the context or selection.

Available in OS X v10.8 and later.

### 164.8.6 Close

MBS MacFrameworks Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Closes the sharing services.
**Notes:** Same as destructor, but closes now, not later.

### 164.8.7 Constructor(name as string)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Create a sharing service instance representing the specified service name.
**Notes:** name: The service name. See NSSharingServiceName* methods.

### 164.8.8 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 164.8.9 NSSharingServiceNameAddToAperture as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Adds the content to Aperture.
Available in OS X v10.8 and later.

### 164.8.10 NSSharingServiceNameAddToIPhoto as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Adds the content to iPhoto.
Available in OS X v10.8 and later.

### 164.8.11 NSSharingServiceNameAddToSafariReadingList as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Add the content to the Safari Reading List.
Available in OS X v10.8 and later.

### 164.8.12 NSSharingServiceNameCloudSharing as string

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Share via iCloud.
Available in macOS 10.12 and later.

### 164.8.13 NSSharingServiceNameComposeEmail as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Creates an email messages with the content.
Available in OS X v10.8 and later.

### 164.8.14 NSSharingServiceNameComposeMessage as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Creates a Messages methods with the content.
Available in OS X v10.8 and later.

### 164.8.15 NSSharingServiceNamePostImageOnFlickr as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the image on Flickr.
Available in OS X v10.8 and later.

### 164.8.16 NSSharingServiceNamePostOnFacebook as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Post the content to Facebook.
Available in OS X v10.8 and later.

### 164.8.17 NSSharingServiceNamePostOnSinaWeibo as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the content on a Sina Weibo, Chinese microblogging (weibo) website. Akin to a hybrid of Twitter and Facebook.
Available in OS X v10.8 and later.

### 164.8.18 NSSharingServiceNamePostOnTwitter as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the content on Twitter.
Available in OS X v10.8 and later.

### 164.8.19 NSSharingServiceNamePostVideoOnTudou as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the video on the video sharing service Tudou, based in the People's Republic of China.
Available in OS X v10.8 and later.

### 164.8.20 NSSharingServiceNamePostVideoOnVimeo as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the video on the video sharing service Vimeo.
Available in OS X v10.8 and later.

### 164.8.21 NSSharingServiceNamePostVideoOnYouku as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Posts the video on the video sharing service Youku, based in the People's Republic of China.
Available in OS X v10.8 and later.

### 164.8.22 NSSharingServiceNameSendViaAirDrop as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Sends the file via Air Drop.
Available in OS X v10.8 and later.

### 164.8.23 NSSharingServiceNameUseAsDesktopPicture as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Replaces the user's desktop image with the content.
Available in OS X v10.8 and later.

### 164.8.24 NSSharingServiceNameUseAsTwitterProfileImage as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** One of the sharing service names.
**Notes:** Replaces the Twitter profile image with the content.
Available in OS X v10.8 and later.

### 164.8.25 performWithItems(items as NSSharingServiceItemsMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Manually performs the service on the provided items.
**Notes:** items: The items to share.

In most cases this will display a sharing window.
Available in OS X v10.8 and later.

### 164.8.26 recipients as String()

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** The list of recipients.

### 164.8.27 SetDelegate(DelegateHandler as NSSharingServiceDelegateMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the delegate of the sharing service.

### 164.8.28 setRecipients(recipients() as String)

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the list of recipients.
**Example:**

```
// compose email
Dim items As New NSSharingServiceItemsMBS

// styled text from text area control
Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
items.AddAttributedString tv.textStorage

// find service
Dim service As New NSSharingServiceMBS("com.apple.share.Mail.compose")

service.subject = "Test Email"
service.setRecipients Array("test@test.test")

service.performWithItems items
```

**Notes:** List of emails for sending an email message.

### 164.8.29 sharingServiceNamed(name as string) as NSSharingServiceMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a sharing service instance representing the specified service name.
**Notes:** serviceName: The service name. See NSSharingServiceName* methods.

Returns an instance of NSSharingService for the specified service name.
Available in OS X v10.8 and later.

### 164.8.30 sharingServicesForItems(items as NSSharingServiceItemsMBS) as NSSharingServiceMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns a list of sharing services which could share all the provided items together.
**Example:**

```
// get an image
dim logo as Picture = LogoMBS(500)
Dim nsi as new NSImageMBS( logo )

// make items object
Dim nshi as new NSSharingServiceItemsMBS
nshi.AddImage nsi

// query services which are supported
Dim ssl(-1) as NSSharingServiceMBS = NSSharingServiceMBS.sharingServicesForItems( nshi )

// show services
for each s as NSSharingServiceMBS in ssl
msgBox s.title
next
```

**Notes:** items: The items to share.

Returns an array of sharing services to allow for items.

This method can be used to build a custom user interface or to populate a contextual menu.
Available in OS X v10.8 and later.

### 164.8.31 Properties

### 164.8.32 accountName as String

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Account name used for sending on Twitter or Sina Weibo
**Notes:** (Read only property)

### 164.8.33 alternateImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The alternate image representing the sharing service. (read-only)
**Notes:** Available in OS X v10.8 and later.
(Read only property)

### 164.8.34 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.8.35 image as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The primary image representing the sharing service. (read-only)
**Notes:** (Read only property)

### 164.8.36 menuItemTitle as String

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Title of the service in the Share menu.
**Notes:** Can be modified.

(Read and Write property)

### 164.8.37 messageBody as String

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Message body as string.
**Notes:** (Read only property)

### 164.8.38 permanentLink as String

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** URL to access the post on Facebook, Twitter, Sina Weibo, etc. (also known as permalink)
**Notes:** (Read only property)

### 164.8.39 subject as String

MBS MacFrameworks Plugin, Plugin Version: 21.2, Platform: macOS, Targets: Desktop only.

**Function:** Subject for email or text message.
**Example:**

```
// compose email
Dim items As New NSSharingServiceItemsMBS

// styled text from text area control
Dim tv As NSTextViewMBS = TextArea1.NSTextViewMBS
items.AddAttributedString tv.textStorage

// find service
Dim service As New NSSharingServiceMBS("com.apple.share.Mail.compose")

service.subject = "Test Email"
service.setRecipients Array("test@test.test")

service.performWithItems items
```

**Notes:** (Read and Write property)

### 164.8.40 title as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The title of the sharing service. (read-only)
**Example:**

```
// get an image
dim logo as Picture = LogoMBS(500)
Dim nsi as new NSImageMBS( logo )

// make items object
Dim nshi as new NSSharingServiceItemsMBS
nshi.AddImage nsi

// query services which are supported
Dim ssl(-1) as NSSharingServiceMBS = NSSharingServiceMBS.sharingServicesForItems( nshi )

// show services
for each s as NSSharingServiceMBS in ssl
msgBox s.title
next
```

**Notes:** (Read only property)

## 164.9 class NSSharingServicePickerMBS

### 164.9.1 class NSSharingServicePickerMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The NSSharingServicePicker class presents a list of sharing services, so that the user can choose a service to share an item.
**Notes:** When a service is chosen, the picker automatically executes it, which presents the sharing window.

The events in this class allows customizing the picker's available services, where it appears, and allows assigning the delegate object for the NSSharingService delegate.

Available in OS X v10.8 and later.

### 164.9.2 Methods

### 164.9.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether sharing services are available.
**Notes:** Returns true on Mac OS X 10.8.

### 164.9.4 Constructor(items as NSSharingServiceItemsMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Initializes a new sharing service picker for the selected items.
**Notes:** Available in OS X v10.8 and later.

### 164.9.5 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 164.9.6 showRelativeToRect(r as NSRectMBS, view as NSViewMBS, preferredEdge as Integer)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Shows the picker, populated with sharing services related to the instance items.
**Notes:** rect: The rectangle the picker should be shown relative to. The coordinates are in the view coordinate system. Passing NSRectMBS.Zero causes the view bounds to be used.
view: The view.
preferredEdge: The preferred edge of the view to display the picker. See edge constants for the possible values.

When the user selects one of the sharing services, the sharing service will be performed. This method must be called on mouseDown.

Available in OS X v10.8 and later.

### 164.9.7 Properties

### 164.9.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.9.9 Events

### 164.9.10 delegateForSharingService(service as NSSharingServiceMBS) as NSSharingServiceDelegateMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked to provide the delegate to the sharing service when the user has selected a service.
**Notes:** sharingServicePicker: The sharing service picker.
sharingService: The selected sharing service.

Return a NSSharingServiceDelegateMBS object the sharing service should use for this item's transfer.
Available in OS X v10.8 and later.

### 164.9.11 didChooseSharingService(service as NSSharingServiceMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked when the user has selected a service and before it is executed.
**Notes:** sharingServicePicker: The sharing service picker.
service: The sharing service the user selected. Invoked to give the delegate to the sharing service that is about to be executed.

Available in OS X v10.8 and later.

### 164.9.12 sharingServicesForItems(items as NSSharingServiceItemsMBS, proposedServices() as NSSharingServiceMBS) as NSSharingServiceMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Invoked to allow the delegate to customize exactly what appears in the sharing service picker before it is presented.
**Notes:** sharingServicePicker: The sharing service picker.
items: The items to share.
proposedServices: The proposed services to share the content.

Return the sharing services to use.
If you have no code in the event, the proposedServices are returned automatically.

The delegate can reorder, remove default services or add custom services before the picker is presented. It's possible to add custom services by mutating the proposedSharingServices array and adding new NSSharingService instances.

Available in OS X v10.8 and later.

### 164.9.13 Constants

Edge Constants

| Constant | Value | Description |
|---|---|---|
| NSMaxXEdge | 2 | the maximum X edge. Typically right side. |
| NSMaxYEdge | 3 | The maximum Y edge. Topically the top edge of a window. |
| NSMinXEdge | 0 | the minimum X edge. Typically left side. |
| NSMinYEdge | 1 | Minimum Y. As coordinates are upside down in the Cocoa world, this is the bottom edge of a window. |

## 164.10 class SLRequestMBS

### 164.10.1 class SLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The SLRequest object encapsulates the properties of an HTTP request, providing a convenient template for you to make requests.
**Notes:** You send a request to a social networking service to perform some operation on behalf of the user or to retrieve user information.

HTTP requests have these common components: an HTTP request method (GET, POST, PUT, or DELETE), a URL identifying the operation to perform, a set of query parameters, and an optional multipart POST body containing additional data. The values for these properties depend on the request you are sending and the target service provider. Refer to each supported social networking site,Äôs documentation for possible values. Links to documentation are provided in Table 1.

Use the requestForServiceType:requestMethod:URL:parameters: method to initialize a newly created SLRequest object passing the required property values. Use the addMultipartData:withName:type: to optionally specify a multipart POST body. After you create your request, use the performRequestWithHandler: method to send the request, specifying the handler to call when the request is done.

If you already have a sending mechanism, you can use the preparedURLRequest method to create the request that you send using an NSURLConnection object. If the request requires user authorization, set the account property to an ACAccount object.

Available in OS X v10.8 and later. 64bit only.

### 164.10.2 Methods

### 164.10.3 addMultipartData(data as memoryblock, name as string, type as string, filename as string)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Specifies a named multipart POST body for this request.
**Notes:** data: The data for the multipart POST body, such as an image or text.
name: The name of the multipart POST body. This is the name that a specific social service expects.
type: The type of the multipart POST body. This is the MIME content type of the multipart data.
filename: The filename of the attachment that you want to POST. Many social services require a filename in order to accept certain POST requests, such as uploading an image or video. If your multipart data does not require a filename, pass in nil.

Possible parameter values are dependent on the target service. This information, as well as guidance on when to use a multipart POST body, is documented by the service provider.

### 164.10.4 Available as boolean

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on OS X 10.8 and newer in a 64-bit app.

### 164.10.5 Constructor(serviceType as string, requestMethod as Integer, URL as string, parameters as dictionary)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Initializes a newly created request object with the specified properties.
**Notes:** serviceType: The social networking service type. e.g. SLServiceTypeTwitter
requestMethod: The method to use for this HTTP request. e.g. SLRequestMethodPOST
url: The destination URL for this HTTP request. The values and formatting for the URL are dependent on the target service and are documented by the service provider.
parameters: The parameters for this HTTP request. The values and formatting are dependent on the target service and are documented by the service provider.

The newly initialized request object.
Use this method to initialize an SLRequest. The value and formatting of each parameter is dependent on the target service.

### 164.10.6 performRequest(tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Performs an asynchronous request and calls the RequestHandler event when done.

### 164.10.7 preparedURLRequest as NSURLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Returns an authorized URL request that can be sent using an NSURLConnectionMBS object.
**Notes:** An OAuth-compatible NSURLRequest object that allows an app to act on behalf of the user while keeping the user,Äôs password private. The NSURLRequest is signed as OAuth1 by default, or OAuth2 by

adding the appropriate token based on the user,Äôs account.

Use this method to modify your request before sending. By setting the account correctly, this method will automatically add any necessary tokens.

### 164.10.8 SLServiceTypeFacebook as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string constant that identifies the social networking site, Facebook.

### 164.10.9 SLServiceTypeLinkedIn as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string constant that identifies the social networking site, LinkedIn.

### 164.10.10 SLServiceTypeSinaWeibo as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string constant that identifies the social networking site, Sina Weibo.

### 164.10.11 SLServiceTypeTencentWeibo as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string constant that identifies the social networking site, Tencent Weibo.

### 164.10.12 SLServiceTypeTwitter as string

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** A string constant that identifies the social networking site, Twitter.

### 164.10.13 Properties

### 164.10.14 account as ACAccountMBS

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** Account information used to authenticate the request.
**Notes:** The account is used to sign a request with OAuth1 services or to add an access token for OAuth2 services. By associating the account with the request, the necessary tokens are added automatically. The default value is nil.
(Read and Write property)

### 164.10.15 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 164.10.16 parameters as Dictionary

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The parameters for this request.
**Notes:** Use this property to look up the query parameters of the HTTP request that was set in Constructor. Possible values are dependent on the target service and are documented by the service provider.
(Read only property)

### 164.10.17 requestMethod as Integer

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The method to use for this request.
**Notes:** Use this property to look up the method of the HTTP request that was set in requestForServiceType.
(Read only property)

### 164.10.18 URL as String

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: All.

**Function:** The destination URL for this request.
**Notes:** (Read only property)

### 164.10.19 Events

### 164.10.20 performRequestCompleted(responseData as memoryblock, urlResponse as NSURLResponseMBS, error as NSErrorMBS, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 15.3, Platform: macOS, Targets: .

**Function:** The callback handler for a request..
**Notes:** responseData: The data returned by the request. The format of this data is dependent on the target service.
urlResponse: The URL response returned by the request that includes the HTTP response codes.
error: An error identifier.
Possible values are dependent on the target service and are documented by the service provider.

### 164.10.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| SLRequestMethodDELETE | 2 | One of the request types.<br>Deletes the specified resource.<br>Available in OS X v10.8 and later. |
| SLRequestMethodGET | 0 | One of the request types.<br>Requests information from the specified resource. Use a GET request to fetch information from the specified server such as character limits or a user,Äôs timeline.<br>Available in OS X v10.8 and later. |
| SLRequestMethodPOST | 1 | One of the request types.<br>Submits data to be processed. Use a POST request to submit information to the specified server such as a status update or an image.<br>Available in OS X v10.8 and later. |
| SLRequestMethodPUT | 3 | One of the request types.<br>Uses a PUT request to submit the data.<br>Available in OS X v10.9 and later. |

# Chapter 165

# Sort

## 165.1 module SortMBS

### 165.1.1 module SortMBS

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Useful sort methods for Xojo arrays.
**Example:**

```
// fill two arrays
Dim test1() As String
Dim test2() As String

For i As Integer = 1 To 100000
test1.append Str(i)
test2.append Str(i)
Next

// now sort using Xojo and MBS
Dim m1 As Double = Microseconds
test1.Sort
Dim m2 As Double = Microseconds
sortArrayMBS test2
Dim m3 As Double = Microseconds

// check times
Dim d1 As Double = m2-m1
Dim d2 As Double = m3-m2

MessageBox d1.ToString+" in Xojo, "+d2.ToString+" in MBS"
```

**Notes:** Functions to sum up values in arrays, copying values or comparing values is much faster inside the plugin, than if you code this yourself in Xojo.

Allows the usage of delegates for deciding how to sort yourself.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr1

### 165.1.2 Methods

### 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924

- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928


### 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:


- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** nDoes nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.one
See also:

- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Example:**

```
Dim s() As Integer
Dim d() As Integer

Redim s(100)

For i As Integer = 1 To 100
s(i) = i
Next
```

```
Redim d(s.ubound)

// copy all starting 20th and put at 10th in destination
CopyArrayMBS s, d, 20, -2, 10

// copy 10 entries starting 30th and put at 40th in destination
CopyArrayMBS s, d, 30, 10, 40

// copy all
CopyArrayMBS s, d

Break
```

**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Example:**

```
Dim s() As Pair
Dim d() As Pair

Redim s(100)

For i As Integer = 1 To 100
s(i) = New pair(i,i)
Next

Redim d(s.ubound)

// copy all starting 20th and put at 10th in destination
CopyArrayMBS s, d, 20, -2, 10

// copy 10 entries starting 30th and put at 40th in destination
CopyArrayMBS s, d, 30, 10, 40

// copy all
CopyArrayMBS s, d

Break
```

**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918

- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928


### 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:


- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922

- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927


### 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:


- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925

- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926

- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Example:**

```
Dim s() As String
Dim d() As String

Redim s(100)

For i As Integer = 1 To 100
s(i) = i.ToString
Next

Redim d(s.ubound)

// copy all starting 20th and put at 10th in destination
CopyArrayMBS s, d, 20, -2, 10

// copy 10 entries starting 30th and put at 40th in destination
CopyArrayMBS s, d, 30, 10, 40

// copy all
CopyArrayMBS s, d

Break
```

**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916

- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928

### 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:

- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918

- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.10 CopyArrayMBS(source() as Ptr, dest() as Ptr, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20923
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20927
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928


### 165.1.14 CopyArrayMBS(source() as UInt64, dest() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:


- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919

- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922
- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20928


### 165.1.15 CopyArrayMBS(source() as Variant, dest() as Variant, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Copies the content of one array to another array.
**Notes:** Does nothing if sourceCount is 0 or source array is empty.
SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to store in the destination array.

Performs bounds checking and may raise an OutOfBoundsException. You may need to resize the destination array to be big enough.
See also:


- 165.1.3 CopyArrayMBS(source() as Boolean, dest() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20916
- 165.1.4 CopyArrayMBS(source() as Color, dest() as Color, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20917
- 165.1.5 CopyArrayMBS(source() as Currency, dest() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.6 CopyArrayMBS(source() as Double, dest() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20918
- 165.1.7 CopyArrayMBS(source() as Int32, dest() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20919
- 165.1.8 CopyArrayMBS(source() as Int64, dest() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20920
- 165.1.9 CopyArrayMBS(source() as Object, dest() as Object, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20922

- 165.1.11 CopyArrayMBS(source() as Single, dest() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20924
- 165.1.12 CopyArrayMBS(source() as String, dest() as String, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20925
- 165.1.13 CopyArrayMBS(source() as UInt32, dest() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, destIndex as Integer = 0) 20926


### 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:


- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940

- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Example:**

```
Const u = 99999

Dim v1(u) As Double
Dim v2(u) As Double

For i As Integer = 0 To u
v1(i) = i
v2(i) = i
Next

// should be equal
Dim b1 As Boolean = EqualsArrayMBS(v1, v2)

v1(123) = 0

// should not be equal
Dim b2 As Boolean = EqualsArrayMBS(v1, v2)

// should be equal
Dim b3 As Boolean = EqualsArrayMBS(v1, v2, 200, -2, 200)
Dim b4 As Boolean = EqualsArrayMBS(v1, v2, 0, 100, 0)

// and this should be false
Dim b5 As Boolean = EqualsArrayMBS(v1, v2, 0, 200, 0)
Dim b6 As Boolean = EqualsArrayMBS(v1, v2, 1) // <- offet one in first array

Break
```

**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931

- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941


### 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935

- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941


### 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Example:**

```
Const u = 99999

Dim v1(u) As Integer
Dim v2(u) As Integer

For i As Integer = 0 To u
v1(i) = i
v2(i) = i
Next

// should be equal
Dim b1 As Boolean = EqualsArrayMBS(v1, v2)

v1(123) = 0

// should not be equal
Dim b2 As Boolean = EqualsArrayMBS(v1, v2)

// should be equal
Dim b3 As Boolean = EqualsArrayMBS(v1, v2, 200, -2, 200)
Dim b4 As Boolean = EqualsArrayMBS(v1, v2, 0, 100, 0)

// and this should be false
Dim b5 As Boolean = EqualsArrayMBS(v1, v2, 0, 200, 0)
Dim b6 As Boolean = EqualsArrayMBS(v1, v2, 1) // <- offet one in first array
```

Break

**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.

Does not call Operator_Compare as this function compares object pointers.
See also:


- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941


### 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:


- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941


### 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20940
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Example:**

```
Const u = 99999

Dim v1(u) As String
Dim v2(u) As String
```

```
For i As Integer = 0 To u
v1(i) = i.ToString
v2(i) = i.ToString
Next

// these will have same pointers, but we do compare string content if not.
v1(0) = v2(0)

// should be equal
Dim b1 As Boolean = EqualsArrayMBS(v1, v2)

v1(123) = "test"

// should not be equal
Dim b2 As Boolean = EqualsArrayMBS(v1, v2)

// should be equal
Dim b3 As Boolean = EqualsArrayMBS(v1, v2, 200, -2, 200)
Dim b4 As Boolean = EqualsArrayMBS(v1, v2, 0, 100, 0)

// and this should be false
Dim b5 As Boolean = EqualsArrayMBS(v1, v2, 0, 200, 0)
Dim b6 As Boolean = EqualsArrayMBS(v1, v2, 1) // <- offet one in first array

Break
```

**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933

- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941

### 165.1.26 EqualsArrayMBS(array1() as UInt32, array2() as UInt32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:

- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936

- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937
- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938
- 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20941


### 165.1.27 EqualsArrayMBS(array1() as UInt64, array2() as UInt64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares the content of one array to another array.
**Notes:** Returns true if they are equal in the given range.

SourceCount can be -2 to use array count - sourceIndex.
destIndex lets you pick where to start in the destination array.

Performs bounds checking and may raise an OutOfBoundsException.
See also:


- 165.1.16 EqualsArrayMBS(array1() as Boolean, array2() as Boolean, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20929
- 165.1.17 EqualsArrayMBS(array1() as Color, array2() as Color, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20930
- 165.1.18 EqualsArrayMBS(array1() as Currency, array2() as Currency, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.19 EqualsArrayMBS(array1() as Double, array2() as Double, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20931
- 165.1.20 EqualsArrayMBS(array1() as Int32, array2() as Int32, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20933
- 165.1.21 EqualsArrayMBS(array1() as Int64, array2() as Int64, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20934
- 165.1.22 EqualsArrayMBS(array1() as Object, array2() as Object, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20935
- 165.1.23 EqualsArrayMBS(array1() as Ptr, array2() as Ptr, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20936
- 165.1.24 EqualsArrayMBS(array1() as Single, array2() as Single, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20937

- 165.1.25 EqualsArrayMBS(array1() as String, array2() as String, array1offset as Integer = 0, count as Integer = -2, array2offset as Integer = 0) as Boolean 20938

### 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a boolean array.
**Example:**

```
Dim test() As Boolean = Array(False, True, False, True, False)

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a boolean array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960


### 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a color array.
**Example:**

```
Dim test() As Color = Array(&cFF000, &c00FF00, &c0000FF, &c000000, &cFFFFFF)

SortArrayMBS test

Break // see in debugger
```

// now reverse it
SortArrayMBS test, True

Break // see in debugger

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a color array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962


### 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a currency array.
**Example:**

```
Dim test() As Currency
test.Append 1.2
test.Append -1.2
test.Append 12345
test.Append 3456

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943

- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961


### 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a currency array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958

- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962


### 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sorts a date array.
**Example:**

```
Dim test() As Date
test.Append New date
test.Append New date(2023, 4, 5)
test.Append New date(2011, 3, 10)
test.Append New date(2033, 6, 22)

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955

- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961


### 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a DateTime array.
**Example:**

```
Dim test() As DateTime
test.Append DateTime.Now
test.Append DateTime.FromString("2011-04-24")
test.Append DateTime.FromString("2022-03-21")
test.Append DateTime.FromString("2033-10-10")

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953

- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962


### 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a datetime array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960

### 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a double array.
**Example:**

```
Dim test() As Double = Array(5.0, -2, 3, -4, 1)

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960

### 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a double array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962

### 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an Int32 array.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947

- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962


### 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an Int32 array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an Int64 array.
**Example:**

```
Dim test() As Integer = Array(5, -2, 3, -4, 1)

SortArrayMBS test

Break // see in debugger

// now reverse it
SortArrayMBS test, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958


### 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an Int64 array using a delegate to compare.
**Example:**

```
Public Function CompareNumber(v1 as Integer, v2 as Integer) As integer
// we compare the absolute values, so 3 and -3 are next to each other in the result
v1 = Abs(v1)
v2 = Abs(v2)

If v1 = v2 Then
Return 0
ElseIf v1 <v2 Then
Return -1
Else
Return 1
End If
End Function

Sub Test
Dim testInteger() As Integer = Array(1,3,6,1,2,-3,0,9)
SortArrayMBS testInteger, AddressOf CompareNumber

Break // see in debugger
End Sub
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958

- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960


### 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a ptr array.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962


### 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a Ptr array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.

Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a single array.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955

- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962


### 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a single array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false) 20961
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a string array.
**Example:**

```
Dim testString() As String = Array("c", "b", "e", "d", "a")

SortArrayMBS testString

Break // see in debugger

// now reverse it
SortArrayMBS testString, True

Break // see in debugger
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956

### 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a string array using a delegate to compare.
**Example:**

```
Public Function CompareString2ndWord(s1 as string, s2 as string) As integer
// sort by second word

s1 = s1.NthField(" ",2)
s2 = s2.NthField(" ",2)

Return s1.Compare(s2)
End Function

Sub Test
Dim testString() As String = Array("Hello World", "Hallo Leute", "World Test", "First Entry", "abc def",
"abc xyz")
SortArrayMBS testString, AddressOf CompareString2ndWord

Break // see in debugger
End Sub
```

**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:


- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960

### 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an UInt32 array.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.45 SortArrayMBS(theArray() as Single, descending as boolean = false) 20956
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false) 20960
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962

### 165.1.50 SortArrayMBS(theArray() as UInt32, theDelegate as SortVariantDelegateUInt32MBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an UInt32 array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945

- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.48 SortArrayMBS(theArray() as String, theDelegate as SortVariantDelegateStringMBS, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960
- 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false) 20962


### 165.1.51 SortArrayMBS(theArray() as UInt64, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an UInt64 array.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.
See also:


- 165.1.29 SortArrayMBS(theArray() as Boolean, theDelegate as SortVariantDelegateBooleanMBS, descending as boolean = false) 20943
- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.35 SortArrayMBS(theArray() as DateTime, descending as boolean = false) 20948
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.39 SortArrayMBS(theArray() as Int32, descending as boolean = false) 20951
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.49 SortArrayMBS(theArray() as UInt32, descending as boolean = false) 20960

### 165.1.52 SortArrayMBS(theArray() as UInt64, theDelegate as SortVariantDelegateUInt64MBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts an UInt64 array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.28 SortArrayMBS(theArray() as Boolean, descending as boolean = false) 20942
- 165.1.30 SortArrayMBS(theArray() as Color, descending as boolean = false) 20943
- 165.1.33 SortArrayMBS(theArray() as Currency, theDelegate as SortVariantDelegateCurrencyMBS, descending as boolean = false) 20946
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.37 SortArrayMBS(theArray() as Double, descending as boolean = false) 20950
- 165.1.40 SortArrayMBS(theArray() as Int32, theDelegate as SortVariantDelegateInt32MBS, descending as boolean = false) 20952
- 165.1.42 SortArrayMBS(theArray() as Int64, theDelegate as SortVariantDelegateInt64MBS, descending as boolean = false) 20953
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958
- 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false) 20962

### 165.1.53 SortArrayMBS(theArray() as Variant, theDelegate as SortVariantDelegateVariantMBS, descending as boolean = false)

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sorts a variant array using a delegate to compare.
**Notes:** Does nothing for arrays with theArray.count <2.
Pass true for descending to reverse the order.

Your delegate should be fast and return 0 if both values are equal, 1 if first value is bigger or -1 if first value is smaller.
See also:

- 165.1.31 SortArrayMBS(theArray() as Color, theDelegate as SortVariantDelegateColorMBS, descending as boolean = false) 20944
- 165.1.32 SortArrayMBS(theArray() as Currency, descending as boolean = false) 20945
- 165.1.34 SortArrayMBS(theArray() as Date, descending as boolean = false) 20947
- 165.1.36 SortArrayMBS(theArray() as DateTime, theDelegate as SortVariantDelegateDateTimeMBS, descending as boolean = false) 20949
- 165.1.38 SortArrayMBS(theArray() as Double, theDelegate as SortVariantDelegateDoubleMBS, descending as boolean = false) 20950
- 165.1.41 SortArrayMBS(theArray() as Int64, descending as boolean = false) 20953
- 165.1.43 SortArrayMBS(theArray() as Ptr, descending as boolean = false) 20955
- 165.1.44 SortArrayMBS(theArray() as Ptr, theDelegate as SortVariantDelegatePtrMBS, descending as boolean = false) 20955
- 165.1.46 SortArrayMBS(theArray() as Single, theDelegate as SortVariantDelegateSingleMBS, descending as boolean = false) 20957
- 165.1.47 SortArrayMBS(theArray() as String, descending as boolean = false) 20958

### 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.

Returns the sum of all values.
See also:

- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966

- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970


### 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Example:**

```
Dim v() As Currency

// just sum up some currency values
v.Add 123.4567
v.Add 1
v.add 0
v.add -56
v.add 4567

Dim m1 As Double = Microseconds
Dim sum1 As Currency = SumArrayMBS(v, True)
Dim m2 As Double = Microseconds
Dim sum2 As Currency = SumArrayMBS(v, False)
Dim m3 As Double = Microseconds

Dim d1 As Double = m2-m1
Dim d2 As Double = m3-m2
// overflow checking can make it 100 times slower

// try to cause an overflow with huge numbers
v.add 100000000000000.0000
v.add 200000000000000.0000
v.add 300000000000000.0000
v.add 400000000000000.0000

Dim sum3 As Currency = SumArrayMBS(v, False)
Dim sum4 As Currency = SumArrayMBS(v, True)
```

Break

**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
Pass true for overflow check to detect overflows for each addition. Otherwise pass false for better performance.
Returns the sum of all values.
See also:


- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970


### 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Example:**

```
Const u = 99999
Dim v(u) As Double

For i As Integer = 0 To u
v(i) = i
Next

Dim m1 As Double = Microseconds
Dim sumPlugin As Int64 = SumArrayMBS(v)
Dim m2 As Double = Microseconds
Dim sumXojo As Double
For i As Integer = 0 To u
```

```
sumXojo = sumXojo + v(i)
next
Dim m3 As Double = Microseconds

Dim timePlugin As Double = m2-m1
Dim timeXojo As Double = m3-m2
// plugin is faster than Xojo code

Break
```

**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
Returns the sum of all values.
See also:

- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970

### 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
We use Int64 as result may be bigger than Int32.
Returns the sum of all values.
See also:

- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970


### 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Example:**

```
Dim v() As Int64

// just sum up some currency values
v.Add 1234567
v.Add 1
v.add 0
v.add -56
v.add 4567

Dim m1 As Double = Microseconds
Dim sum1 As Int64 = SumArrayMBS(v, True)
Dim m2 As Double = Microseconds
Dim sum2 As Int64 = SumArrayMBS(v, False)
Dim m3 As Double = Microseconds

Dim d1 As Double = m2-m1
Dim d2 As Double = m3-m2
// overflow checking can make it 100 times slower

// try to cause an overflow with huge numbers
v.add 1000000000000000000
```

```
v.add 2000000000000000000
v.add 3000000000000000000
v.add 4000000000000000000

Dim sum3 As Int64 = SumArrayMBS(v, False)
Dim sum4 As Int64 = SumArrayMBS(v, True)

Break
```

**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
Pass true for overflow check to detect overflows for each addition. Otherwise pass false for better performance.
Returns the sum of all values.
See also:

- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970

### 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.

Returns the sum of all values.
See also:

- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970


### 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
Pass true for overflow check to detect overflows for each addition. Otherwise pass false for better performance.
Returns the sum of all values.
See also:


- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965
- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20970

### 165.1.61 SumArrayMBS(source() as UInt64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sums up all the numbers in the array.
**Example:**

```
Const u = 99999
Dim v(u) As UInt64

For i As Integer = 0 To u
v(i) = i
Next

Dim m1 As Double = Microseconds
Dim sumPlugin As UInt64 = SumArrayMBS(v, False)
Dim m2 As Double = Microseconds
Dim sumPluginOverflowChecked As UInt64 = SumArrayMBS(v, True)
Dim m3 As Double = Microseconds
Dim sumXojo As UInt64
For i As Integer = 0 To u
sumXojo = sumXojo + v(i)
Next
Dim m4 As Double = Microseconds


Dim timePlugin As Double = m2-m1
Dim timePluginOverflowChecked As Double = m3-m2
Dim timeXojo As Double = m4-m3
// plugin is faster than Xojo code

Break
```

**Notes:** You can limit range by passing in a source index and source count.
If sourceCount is -2, we sum up whole array - sourceIndex.
Pass true for overflow check to detect overflows for each addition. Otherwise pass false for better performance.
Returns the sum of all values.
See also:

- 165.1.54 SumArrayMBS(source() as Boolean, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20963
- 165.1.55 SumArrayMBS(source() as Currency, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Currency 20964
- 165.1.56 SumArrayMBS(source() as Double, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20965

- 165.1.57 SumArrayMBS(source() as Int32, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Int64 20966
- 165.1.58 SumArrayMBS(source() as Int64, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as Int64 20967
- 165.1.59 SumArrayMBS(source() as Single, sourceIndex as Integer = 0, sourceCount as Integer = -2) as Double 20968
- 165.1.60 SumArrayMBS(source() as UInt32, sourceIndex as Integer = 0, sourceCount as Integer = -2, CheckOverflow as Boolean = false) as UInt64 20969


### 165.1.62 Delegates

### 165.1.63 SortVariantDelegateBooleanMBS(v1 as Boolean, v2 as Boolean) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two boolean values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.64 SortVariantDelegateColorMBS(v1 as Color, v2 as Color) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two color values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.65 SortVariantDelegateCurrencyMBS(v1 as Currency, v2 as Currency) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two currency values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.66 SortVariantDelegateDateTimeMBS(v1 as DateTime, v2 as DateTime) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two DateTime values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.
Requires Xojo 2019r2 or newer.

### 165.1.67 SortVariantDelegateDoubleMBS(v1 as Double, v2 as Double) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two double values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.68 SortVariantDelegateInt32MBS(v1 as Int32, v2 as Int32) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two int32 values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.69 SortVariantDelegateInt64MBS(v1 as Int64, v2 as Int64) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two Int64 values.
**Example:**

```
Public Function CompareNumber(v1 as Integer, v2 as Integer) As integer
// we compare the absolute values, so 3 and -3 are next to each other in the result
v1 = Abs(v1)
v2 = Abs(v2)

If v1 = v2 Then
Return 0
ElseIf v1 <v2 Then
Return -1
Else
Return 1
End If
End Function

Sub Test
Dim testInteger() As Integer = Array(1,3,6,1,2,-3,0,9)
SortArrayMBS testInteger, AddressOf CompareNumber
```

```
Break // see in debugger
End Sub
```

**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.70 SortVariantDelegatePtrMBS(v1 as Ptr, v2 as Ptr) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two Ptr values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.71 SortVariantDelegateSingleMBS(v1 as Single, v2 as Single) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two Single values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.72 SortVariantDelegateStringMBS(v1 as String, v2 as String) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two string values.
**Example:**

```
Public Function CompareString2ndWord(s1 as string, s2 as string) As integer
// sort by second word

s1 = s1.NthField(" ",2)
s2 = s2.NthField(" ",2)

Return s1.Compare(s2)
End Function

Sub Test
Dim testString() As String = Array("Hello World", "Hallo Leute", "World Test", "First Entry", "abc def",
"abc xyz")
SortArrayMBS testString, AddressOf CompareString2ndWord

Break // see in debugger
```

```
End Sub
```

**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.73 SortVariantDelegateUInt32MBS(v1 as UInt32, v2 as UInt32) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two UInt32 values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.74 SortVariantDelegateUInt64MBS(v1 as UInt64, v2 as UInt64) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two UInt64 values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

### 165.1.75 SortVariantDelegateVariantMBS(v1 as Variant, v2 as Variant) as Integer

MBS Util Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The delegate to compare two variant values.
**Notes:** Return 0 if equal, 1 if first value is bigger or -1 if first value is smaller.

# Chapter 166

# Spamsum

## 166.1 class SpamSumMBS

### 166.1.1 class SpamSumMBS

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the spamsum tool.
**Notes:** Overview

---

spamsum is a tool for generating and testing signatures on files. The signature is designed to be particularly suitable for producing a result that can be used to compare two emails and see if they are 'similar'. This can provide the core of a SPAM detection system.

The algorithms in spamsum are in two parts. The first part generates a signature which is encoded as a string of ascii characters less than 72 characters long. The second part takes a new signature and a database of existing signatures (actually just a text file with one signature per line) and finds the existing signature that best matches the new signature. A match result in the range of 0 to 100 is generated, where 100 is a perfect match and 0 is a complete mismatch.

Signature Algorithm
---

The signature algorithm in spamsum has a number of interesting properties that make is especially suitable for SPAM detection.

- non-propogation

In most hash algorithms a change in any part of a plaintext will either change the resulting hash completely or will change all parts of the hash after the part corresponding with the changed plaintext. In the spamsum algorithm only the part of the spamsum signature that corresponds linearly with the changed part of the plaintext will be changed. This means that small changes in any part of the plaintext will leave most of the signature the same. This is essential for SPAM detection as it is common for varients of the same SPAM to have small changes in their body and we need to ensure that the matching algorithm can cope with these changes.

- alignment robustness

Most hash algorithms are very alignment sensitive. If you shift the plaintext by a byte (say by inserting a character at the start) then a completely different hash is generated. The spamsum algorithm is robust to alignment changes, and will automatically re-align the resulting signature after insertions or deletions. This works in combination with the non-propogation property to make spamsum suitable for telling if two emails are 'similar'.

The core of the spamsum algorithm is a rolling hash similar to the rolling hash used in 'rsync'. The rolling hash is used to produce a series of 'reset points' in the plaintext that depend only on the immediate context (with a default context width of seven characters) and not on the earlier or later parts of the plaintext. A stronger hash based on the FNV algorithm is then used to produce hash values of the areas between two reset points. The resulting signature comes from the concatenation of a single character from the FNV hash per reset point.

The frequency of the reset points determines how many characters in the plaintext will be used for each character of output in the signature. At startup spamsum scans the plaintext to determine how many valid input characters are in the plaintext (whitespace is ignored). The algorithm then estimates the reset frequency needed to produce a signature of length 64 and starts producing the
signature. If after the signature is produced the result is less than a third of the desired length then the reset frequency is adjusted and the signature re-generated.

Similarity Testing

Once a set of signatures has been generated you need to be able to take a new plaintext and see if it matches one of the signatures. The way this is done is to generate a spamsum signature of the new plaintext then compute a distance measure between each of the existing signatures and the new signature.

The distance measure that spamsum uses is based on the 'string edit distance'. The string edit distance is a measure of how many edit operations are required to take one of the signatures and turn it into the other. In spamsum the 'insert' and 'delete' edit operations are given a weight of 1 while substitution is given a weight of 3 and transposition is given a weight of 5.

The resulting string edit distance is then scaled to produce a 'score' in the range 0-100. A score of 100

indicates a perfect match and a score of 0 indicates a complete mismatch. If the two signatures used a different 'reset frequency' (also known as block_size) then the score is automatically set as 0.

The score is weighted so that a value of 50 is a reasonable threshold to use for a 'good match'.

Dual hashes

A significant problem with the above algorithm is the sensitivity to the chosen hash strength of the rolling hash. The initial implementation used a single hash strength chosen based on the file size and rounded to a power of 2. This works, but it means that if the two files being compared cross over a boundary then they will not be able to be compared. To reduce this problem the current implementation chooses two different hash strengths and generates two hashes for each file. This means that the two files will have to have very different lengths for their respected spamsum signatures not to share a common hash strength.

Infrastructure

spamsum is useless without a good quality database of signatures for known spam. I am hoping that the spamsum algorithm will be incorportated into a online system for capturing known SPAM (such as razor).

Author

spamsum was written by Andrew Tridgell tridge @ samba.org

### 166.1.2 Methods

### 166.1.3 Match(sum1 as string, sum2 as string) as Integer

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a percent value representing
**Example:**

```
dim s as SpamSumMBS
dim t1,t2 as string

s=new SpamSumMBS

t1=S.Spamsum("Hello Welt, wie geht es? Mir geht es manchmal gut.",0,0)
t2=S.Spamsum("Hallo Welt, wie geht es? Mir geht es manchmal gut.",0,0)
```

```
MsgBox t1+" "+t2+" "+str(s.Match(t1,t2))
// 17 percent here. This needs longer texts...
```

**Notes:** Returns a value from 0 (not equal) to 100 (equal).

### 166.1.4 Spamsum(text as string, flags as Integer, blocksize as Integer) as string

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates a checksum for a given text.
**Notes:** You can specify for flags a combination of FlagsIgnoreWhitespace=1 and FlagsIgnoreHeaders=2.
Blocksize is linked to the length of the checksum. You can try values like 0, 3 or 90 and check what is best for you.
The text strings must be longer than just a few words as they are designed to take whole emails.

### 166.1.5 Properties

### 166.1.6 FlagsIgnoreHeaders as Integer

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value used for the Spamsum call as flags.
**Notes:** Value is 2.
(Read only property)

### 166.1.7 FlagsIgnoreWhitespace as Integer

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value used for the Spamsum call as flags.
**Notes:** Value is 1.
(Read only property)

# Chapter 167

# Sparkle

## 167.1 class SUAppcastItemMBS

### 167.1.1 class SUAppcastItemMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The class for items in the appcast file.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo Plugins, version 20.3pr6
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr7

### 167.1.2 Methods

### 167.1.3 Constructor

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Private constructor.
See also:

- 167.1.4 Constructor(dict as dictionary) 20980

- 167.1.5 Constructor(dict as dictionary, byref error as string) 20980
- 167.1.6 Constructor(dict as dictionary, relativeToAppcastURL as string, byref error as string) 20980


### 167.1.4 Constructor(dict as dictionary)

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes with data from a dictionary provided by the RSS class.
See also:


- 167.1.3 Constructor 20979
- 167.1.5 Constructor(dict as dictionary, byref error as string) 20980
- 167.1.6 Constructor(dict as dictionary, relativeToAppcastURL as string, byref error as string) 20980


### 167.1.5 Constructor(dict as dictionary, byref error as string)

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Initializes with data from a dictionary provided by the RSS class.
See also:


- 167.1.3 Constructor 20979
- 167.1.4 Constructor(dict as dictionary) 20980
- 167.1.6 Constructor(dict as dictionary, relativeToAppcastURL as string, byref error as string) 20980


### 167.1.6 Constructor(dict as dictionary, relativeToAppcastURL as string, byref error as string)

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Initializes with data from a dictionary provided by the RSS class.
See also:


- 167.1.3 Constructor 20979
- 167.1.4 Constructor(dict as dictionary) 20980
- 167.1.5 Constructor(dict as dictionary, byref error as string) 20980

### 167.1.7 emptyAppcastItem as SUAppcastItemMBS

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** An empty appcast item.
**Notes:** This may be used as a potential return value in bestValidUpdateInAppcast event.

### 167.1.8 Properties

### 167.1.9 channel as String

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** The channel the update item is on if provided.
**Notes:** An update item may specify a custom channel name (such as beta) that can only be found by updaters that filter for that channel.
If no channel is provided, the update item is assumed to be on the default channel.

This is extracted from the <sparkle:channel>element.
Old applications must be using Sparkle 2 or later to interpret the channel element and to ignore unmatched channels.
(Read only property)

### 167.1.10 ContentLength as Int64

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The content length.
**Notes:** (Read only property)

### 167.1.11 CriticalUpdate as Boolean

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is a critical update.
**Notes:** (Read only property)

### 167.1.12 date as date

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The release date for this app cast item.
**Notes:** (Read only property)

### 167.1.13 DateString as String

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The date string.
**Notes:** (Read only property)

### 167.1.14 DateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The release date for this app cast item.
**Notes:** (Read only property)

### 167.1.15 DeltaUpdate as Boolean

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is a delta update.
**Notes:** (Read only property)

### 167.1.16 DeltaUpdates as Dictionary

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Dictionary with properties about delta updates.
**Notes:** (Read only property)

### 167.1.17 displayVersionString as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The display version number for this app cast item.
**Notes:** Maybe "1.1de"
(Read only property)

### 167.1.18 fileURL as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The file URL for this app cast item.
**Notes:** (Read only property)

### 167.1.19 fullReleaseNotesURL as String

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** The full release notes URL of the appcast item if provided.
**Notes:** The link should point to the product's full changelog.

Sparkle's standard user interface offers to show these full release notes when a user checks for a new update and no new update is available.

This is extracted from the <sparkle:fullReleaseNotesLink>element.
(Read only property)

### 167.1.20 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal handle used for this object.
**Notes:** (Read and Write property)

### 167.1.21 ignoreSkippedUpgradesBelowVersion as String

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Previously skipped upgrades by the user will be ignored if they skipped an update whose version precedes this version.
**Notes:** This can only be applied if the update is a 'majorUpgrade'.

This version string corresponds to the application's CFBundleVersion

This is extracted from the <sparkle:ignoreSkippedUpgradesBelowVersion>element.

Old applications must be using Sparkle 2.1 or later, otherwise this property will be ignored.
(Read only property)

### 167.1.22 InformationOnlyUpdate as Boolean

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is only an information only update.
**Notes:** Only available in newer Sparkle in 64-bit.
For older version this is always false.
(Read only property)

### 167.1.23 InfoURL as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** The info URL.
**Notes:** (Read only property)

### 167.1.24 installationType as String

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** The installation type of the update at file URL.
**Notes:** This may be:

- application - indicates this is a regular application update.
- package - indicates this is a guided package installer update.
- interactive-package - indicates this is an interactive package installer update (deprecated; use ”package” instead)

This is extracted from the sparkle:installationType attribute in the <enclosure>element.

If no installation type is provided in the enclosure, the installation type is inferred from the ‘fileURL‘ file extension instead.

If the file extension is pkg or mpkg, the installation type is package otherwise it is application

Hence, the installation type in the enclosure element only needs to be specified for package based updates distributed inside of a zip or other archive format.

Old applications must be using Sparkle 1.26 or later to support downloading bare package updates (‘pkg‘ or ‘mpkg‘) that are not additionally archived inside of a zip or other archive format.

(Read only property)

### 167.1.25 itemDescription as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The description for this app cast item.
**Notes:** (Read only property)

### 167.1.26 MacOsUpdate as Boolean

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is a MacOS update.
**Notes:** (Read only property)

### 167.1.27 majorUpgrade as Boolean

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether or not the update item is a major upgrade.
**Notes:** An update is a major upgrade if the application's bundle version doesn't meet the 'minimumAutoupdateVersion' requirement.
(Read only property)

### 167.1.28 maximumOperatingSystemVersionIsOK as Boolean

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether or not the current running system passes the 'maximumSystemVersion' requirement.
**Notes:** (Read only property)

### 167.1.29 MaximumSystemVersion as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** The maximum system version for this app cast item.
**Notes:** The update will not be offered to users with newer system versions.

(Read only property)

### 167.1.30 minimumAutoupdateVersion as String

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** The minimum bundle version string this update requires for automatically downloading and installing updates if provided.
**Notes:** If an application's bundle version meets this version requirement, it can install the new update item in the background automatically.

Otherwise if the requirement is not met, the user is always prompted to install the update. In this case, the update is assumed to be a 'majorUpgrade'.

If the update is a 'majorUpgrade' and the update is skipped by the user, other future update alerts with the same 'minimumAutoupdateVersion' will also be skipped automatically unless an update specifies 'ignoreSkippedUpgradesBelowVersion'.

This version string corresponds to the application's CFBundleVersion

This is extracted from the <sparkle:minimumAutoupdateVersion>element.
(Read only property)

### 167.1.31 minimumOperatingSystemVersionIsOK as Boolean

MBS MacExtras Plugin, Plugin Version: 22.2, Platform: macOS, Targets: Desktop only.

**Function:** Indicates whether or not the current running system passes the 'minimumSystemVersion' requirement.
**Notes:** (Read only property)

### 167.1.32 minimumSystemVersion as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The minimum system version for this app cast item.
**Notes:** The update will not be offered to users with older system versions.
(Read only property)

### 167.1.33 OSString as String

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The operation system string.
**Notes:** (Read only property)

### 167.1.34 phasedRolloutInterval as Variant

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The phased rollout interval.
**Notes:** May be nil.
(Read only property)

### 167.1.35 propertiesDictionary as dictionary

MBS MacExtras Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** A dictionary with all the properties for this item.
**Notes:** (Read only property)

### 167.1.36 releaseNotesURL as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The release notes URL for this app cast item.
**Notes:** (Read only property)

### 167.1.37 title as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The title for this app cast item.
**Example:**

```
dim a as SUAppcastItemMBS

// get item somehow
MsgBox a.title
```

**Notes:** (Read only property)

### 167.1.38 versionString as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The version string for this app cast item.
**Notes:** (Read only property)

## 167.2 class SUAppcastMBS

### 167.2.1 class SUAppcastMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The class for an appcast.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo Plugins, version 20.3pr6
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr7

### 167.2.2 Methods

### 167.2.3 Constructor

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The private construtor.

### 167.2.4 items as SUAppcastItemMBS()

MBS MacExtras Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop only.

**Function:** The items in this appcast.

### 167.2.5 Properties

### 167.2.6 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal handle for the appcast.
**Notes:** (Read and Write property)

## 167.3 class SUUpdaterMBS

### 167.3.1 class SUUpdaterMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The class for Sparkle.
**Notes:** This class is for use with the Sparkle 1.5b6 framework and implements the Cocoa classes inside this framework.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo Plugins, version 20.5pr8
- News from the MBS Xojo Plugins Version 20.3
- MBS Xojo Plugins, version 20.3pr6
- MBS Xojo / Real Studio Plugins, version 15.1pr5
- MBS Real Studio Plugins, version 11.3pr2
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

### 167.3.2 Methods

### 167.3.3 checkForUpdateInformation

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Checks for new update information.
**Notes:** This begins a "probing" check for updates which will not actually offer to update to that version. The events, though, (up to didFindValidUpdate and updaterDidNotFindUpdate), are called, so you can use that information in your UI.

### 167.3.4 checkForUpdates

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Performs a check for updates.
**Notes:** Call this method from a menu item where the user can check for updates manually. Sparkle will check for updates and report back its findings verbosely.

### 167.3.5 checkForUpdatesInBackground

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** This kicks off an update meant to be programmatically initiated.
**Notes:** That is, it will display no UI unless it actually finds an update, in which case it proceeds as usual. If the fully automated updating is turned on, however, this will invoke that behavior, and if an update is found, it will be downloaded and prepped for installation.

### 167.3.6 Constructor

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for the updater.
**Notes:** Please create only one instance of the SUUpdaterMBS class in your application using this constructor.
See also:

- 167.3.7 Constructor(Bundle as folderitem) 20991

### 167.3.7 Constructor(Bundle as folderitem)

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The constructor for the updater.
**Notes:** Targets for the update the bundle you specify. This can be used to update a preference panel for example.

Please create only one instance of the SUUpdaterMBS class in your application using this constructor.
See also:

- 167.3.6 Constructor 20991

### 167.3.8 installUpdatesIfAvailable

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** Checks for updates and, if available, immediately downloads and installs them.
**Notes:** A progress dialog is shown but the user will never be prompted to read the release notes.

You may want to respond to the userDidCancelDownload event in case the user clicks the "Cancel" button while the update is downloading.

Only available in newer Sparkle version for 64-bit.

Not available in newer Sparkle versions.

### 167.3.9 InvokeImmediateInstallation

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** If installation was moved to quit of app, you can call this method to update now.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.10 InvokeUpdate

MBS MacExtras Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop only.

**Function:** Invokes a postponed updated.
**Notes:** Call this after you returned true in shouldPostponeRelaunchForUpdate event and have time to restart.

### 167.3.11 IsFrameworkLoaded as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the framework has been loaded.
**Notes:** Returns true if the Sparkle framework has been loaded.

### 167.3.12 LoadFramework(path as folderitem) as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Loads the Sparkle framework from the given folderitem.
**Notes:** Returns false on Windows and Linux or on Mac OS X if the framework failed to load.
Return true if the framework was loaded already or was loaded successfully.

Be aware that the Sparkle Framework needs correct file permissions:

$ { APPFILENAME } /Contents/Frameworks/Sparkle.framework/Versions/A/Sparkle”
$ { APPFILENAME } /Contents/Frameworks/Sparkle.framework/Versions/A/Resources/relaunch”

If the permissions are set wrong the relaunch does not work.

You can run app from Terminal to see any error message while loading framework. You may need to code sign both the Sparkle framework and the app with your code signing certificate. Finally make sure platform (32 or 64bit) match between app and framework.

### 167.3.13 resetUpdateCycle

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Resets the update cycle.
**Notes:** Call this to appropriately schedule or cancel the update checking timer according to the preferences for time interval and automatic checks. This call does not change the date of the next check, but only the internal timer.

### 167.3.14 SUSparkleErrorDomain as String

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** The error domain for all Sparkle errors.

### 167.3.15 SUUpdaterAppcastItemNotificationKey as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the keys for user info dictionary.
**Notes:** Key for the SUAppcastItem object in the SUUpdaterDidFindValidUpdateNotification userInfo dictionaries.

### 167.3.16 SUUpdaterAppcastNotificationKey as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Key for the SUAppcast object in the SUUpdaterDidFinishLoadingAppCastNotification userInfo.

### 167.3.17 SUUpdaterDidFindValidUpdateNotification as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants for use with NSNotificationObserverMBS class.
**Notes:** Object for this notification is the updater.

### 167.3.18 SUUpdaterDidFinishLoadingAppCastNotification as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants for use with NSNotificationObserverMBS class.
**Notes:** Object for this notification is the updater.

### 167.3.19 SUUpdaterDidNotFindUpdateNotification as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** One of the notification constants for use with NSNotificationObserverMBS class.
**Notes:** Object for this notification is the updater.

### 167.3.20 SUUpdaterWillRestartNotification as String

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** The notification sent when updater will restart app.

### 167.3.21 validateMenuItem(menuItem as NSMenuItemMBS) as Boolean

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** he menu item validation used for the checkForUpdates action

### 167.3.22 Properties

### 167.3.23 automaticallyChecksForUpdates as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether update checks are performed automatically.
**Notes:** (Read and Write property)

### 167.3.24 automaticallyDownloadsUpdates as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether downloads should be downloaded automatically.
**Notes:** (Read and Write property)

### 167.3.25 decryptionPassword as String

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** A property indicating the decryption password used for extracting updates shipped as Apple Disk Images (dmg)
**Notes:** (Read and Write property)

### 167.3.26 feedURL as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The URL of the appcast feed.
**Notes:** (Read and Write property)

### 167.3.27 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal handle to the object used.
**Notes:** (Read and Write property)

### 167.3.28 hostBundle as Variant

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** The target application to update.
**Notes:** Value is a NSBundleMBS object.
You can query BundleFolder on the NSBundle object to know where your app is.
(Read only property)

### 167.3.29 httpHeaders as Dictionary

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** The HTTP headers to include with fetchAppcastFromURL call.
**Notes:** You can check this dictionary for HTTP headers.
Or make a new dictionary and assign it to this property to set http headers to include in transfer.
(Read and Write property)

### 167.3.30 lastUpdateCheckDate as date

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date of the last update check.
**Notes:** Returns nil if no check has been performed.
(Read only property)

### 167.3.31 lastUpdateCheckDateTime as DateTime

MBS MacExtras Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date of the last update check.
**Notes:** Returns nil if no check has been performed.
(Read only property)

### 167.3.32 sendsSystemProfile as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether the system profile is sent to the server.
**Notes:** (Read and Write property)

### 167.3.33 sparkleBundle as Variant

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: Desktop only.

**Function:** The sparkle bundle.
**Notes:** Value is a NSBundleMBS object.
You can query BundleFolder on the NSBundle object to know where your app is.
(Read only property)

### 167.3.34 updateCheckInterval as Double

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** After which time the next update check is performed.
**Notes:** (Read and Write property)

### 167.3.35 updateInProgress as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Whether an update is in progress.
**Notes:** (Read only property)

### 167.3.36 userAgentString as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: Desktop only.

**Function:** Which user agent string to use for the http download.
**Notes:** (Read and Write property)

### 167.3.37 Events

### 167.3.38 bestValidUpdateInAppcast(appcast as SUAppcastMBS) as SUAppcastItemMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The event called to decide which appcast item is the best to use.
**Notes:** If you're using special logic or extensions in your appcast, implement this to use your own logic for finding a valid update, if any, in the given appcast.

If you leave this event empty the default handler will be called. If you add code here, the default handle will not be called!

### 167.3.39 didAbortWithError(error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** Called after an update is aborted due to an error.

**Notes:** error: The error that caused the abort

This is a newer event which is only called in 64-bit version.

### 167.3.40 didCancelInstallUpdateOnQuit(update as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Called when an update is scheduled to be silently installed on quit and cancelled.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.41 didDismissUpdateAlertPermanently(permanently as boolean, item as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called after the user dismisses the update alert.
**Notes:** permanently: true if the alert will not appear again for this update; false if it may reappear.

### 167.3.42 didDownloadUpdate(item as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called immediately after succesfull download of the specified update.
**Notes:** item: The appcast item corresponding to the update that has been downloaded.

### 167.3.43 didExtractUpdate(item as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called immediately after extracting the specified downloaded update.
**Notes:** item: The appcast item corresponding to the update that has been extracted.

### 167.3.44 didFindValidUpdate(update as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** This event is called when a valid update is found by the update driver.
**Notes:** If you leave this event empty the default handler will be called. If you add code here, the default

handle will not be called!

Plugin version 8.7 makes sure this method is executed on the main thread.

### 167.3.45 didFinishLoadingAppcast(update as SUAppcastMBS)

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The event called when the appcast has been loaded.
**Notes:** Implement this if you want to do some special handling with the appcast once it finishes loading.

If you leave this event empty the default handler will be called. If you add code here, the default handle will not be called!

Plugin version 8.7 makes sure this method is executed on the main thread.

### 167.3.46 failedToDownloadUpdate(item as SUAppcastItemMBS, error as NSErrorMBS)

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** Called after the specified update failed to download.
**Notes:** item: The appcast item corresponding to the update that failed to download.
error: The error generated by the failed download.

This is a newer event which is only called in 64-bit version.

### 167.3.47 feedParametersForUpdater(sendingProfile as boolean) as dictionary()

MBS MacExtras Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Provide additional parameters for updater.
**Notes:** This method allows you to add extra parameters to the appcast URL, potentially based on whether or not Sparkle will also be sending along the system profile. This method should return an array of dictionaries with keys: "key", "value", "displayKey", "displayValue", the latter two being specifically for display to the user.

### 167.3.48 feedURLStringForUpdater as String

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Override this to dynamically specify the entire feed URL.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.49 pathToRelaunchForUpdater as string

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** This event is called so you can customize the installation destination of the update.
**Notes:** This event returns the path which is used to relaunch the client after the update is installed. By default, the path of the host bundle.

If you leave this event empty the default handler will be called. If you add code here, the default handle will not be called!

### 167.3.50 shouldPostponeRelaunchForUpdate(sendingProfile as SUAppcastItemMBS) as boolean

MBS MacExtras Plugin, Plugin Version: 14.0, Platform: macOS, Targets: .

**Function:** Return true to delay the relaunch until you do some processing.
**Notes:** Invoke the update later by calling InvokeUpdate method.
This is not called if the user didn't relaunch on the previous update, in that case it will immediately restart.

### 167.3.51 updaterDidNotFindUpdate

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The event called when a valid update is not found.
**Notes:** Plugin version 8.7 makes sure this method is executed on the main thread.

### 167.3.52 updaterDidRelaunchApplication

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called immediately after relaunching. SUUpdater delegate must be set before applicationDidFinishLaunching: to catch this event.

### 167.3.53 updaterDidShowModalAlert

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Called after an updater shows a modal alert window, to give the host the opportunity to hide attached windows etc. that may get in the way.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.54 updaterMayCheckForUpdates as boolean

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Use this to keep Sparkle from popping up e.g. while your setup assistant is showing.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.55 updaterShouldPromptForPermissionToCheckForUpdates as boolean

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The event to decide whether the updater should prompt for permission to check for updates.
**Notes:** Use this to override the default behavior for Sparkle prompting the user about automatic update checks.

If you leave this event empty the default handler will be called. If you add code here, the default handle will not be called!

### 167.3.56 updaterShouldRelaunchApplication as boolean

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Whether app should be relaunched.
**Notes:** Some apps *can not* be relaunched in certain circumstances. They can use this method to prevent a relaunch "hard".
New in version 1.6 of Sparkle.

### 167.3.57 updaterShouldShowUpdateAlertForScheduledUpdate(item as SUAppcastItemMBS) as boolean

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called just before the scheduled update driver prompts the user to install an update.
**Notes:** Yes to allow the update prompt to be shown (the default behavior), or no to suppress it.

### 167.3.58 updaterWillRelaunchApplication

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The event called immediately before relaunching.
**Notes:** Plugin version 8.7 makes sure this method is executed on the main thread.

The current Sparkle (1.5b6) implementation seems to force quit the application so this method is the last chance for your application to clean up.

### 167.3.59 updaterWillShowModalAlert

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Called before an updater shows a modal alert window, to give the host the opportunity to hide attached windows etc. that may get in the way.
**Notes:** New in version 1.6 of Sparkle.

### 167.3.60 userDidCancelDownload

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** Called when the user clicks the cancel button while and update is being downloaded.
**Notes:** This is a newer event which is only called in 64-bit version.

### 167.3.61 userDidSkipThisVersion(item as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called when the user clicks the Skip This Version button.

### 167.3.62 versionComparatorForUpdater as SUVersionComparisonMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** This event allows you to provide a custom version comparator.
**Notes:** If you don't implement this event or return nil, the standard version comparator will be used.

Please makes ure that the SUVersionComparisonMBS object lives longer, so it can be used later. e.g. keep a reference in an app property.

### 167.3.63 willDownloadUpdate(item as SUAppcastItemMBS, request as Variant)

MBS MacExtras Plugin, Plugin Version: 16.1, Platform: macOS, Targets: .

**Function:** Called immediately before downloading the specified update.
**Notes:** item: The appcast item corresponding to the update that is proposed to be downloaded.
request: The mutable URL request that will be used to download the update. (NSMutableURLRequestMBS object)

This is a newer event which is only called in 64-bit version.

### 167.3.64 willExtractUpdate(item as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 20.3, Platform: macOS, Targets: .

**Function:** Called immediately before extracting the specified downloaded update.
**Notes:** item: The appcast item corresponding to the update that is proposed to be extracted.

### 167.3.65 willInstallUpdate(update as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** This event is called immediately before installing the specified update.
**Notes:** If you leave this event empty the default handler will be called. If you add code here, the default handle will not be called!

Plugin version 8.7 makes sure this method is executed on the main thread.

### 167.3.66 willInstallUpdateOnQuit(update as SUAppcastItemMBS)

MBS MacExtras Plugin, Plugin Version: 14.4, Platform: macOS, Targets: .

**Function:** Called when an update is scheduled to be silently installed on quit.
**Notes:** New in version 1.6 of Sparkle.
If you like to install now instead, you can call InvokeImmediateInstallation method.

### 167.3.67 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| SUAppcastError | 1002 | An error occurred in retrieving update information. |
| SUAppcastParseError | 1000 | An error occurred while parsing the update feed. The appcast must be valid xml. |
| SUAuthenticationFailure | 4001 | Unable to grant authorization to perform action because it is explicitly turned off. |
| SUDowngradeError | 4006 | The update contains an older version. |
| SUDownloadError | 2001 | Download error. |
| SUFileCopyFailure | 4000 | File copy failed. |
| SUInstallationCancelledError | 4007 | Installation was cancelled. |
| SUInstallationError | 4005 | An error occurred while installing the update. |
| SUMissingInstallerToolError | 4003 | The installer tool is missing. |
| SUMissingUpdateError | 4002 | Couldn't find an appropriate update in the downloaded package. App name or bundle ID must match to current app. |
| SUNoUpdateError | 1001 | You already have the newest version. |
| SURelaunchError | 4004 | Failed to relaunch. |
| SURunningFromDiskImageError | 1003 | The app runs from disk image and can't update. |
| SURunningTranslocated | 1004 | The application got translocated. |
| SUSignatureError | 3001 | The signture doesn't match. |
| SUSystemPowerOffError | 5000 | The update will not be installed because the user requested for the system to power off. |
| SUTemporaryDirectoryError | 2000 | Failed to get temp file. |
| SUUnarchivingError | 3000 | Failed to unarchive the update. |

## 167.4 class SUVersionComparisonMBS

### 167.4.1 class SUVersionComparisonMBS

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** Implement this class to provide version comparison facilities for Sparkle.
**Notes:** Or use the default implementation by not implementing the versionComparatorForUpdater event.

### 167.4.2 Methods

### 167.4.3 Constructor

MBS MacExtras Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 167.4.4 Destructor

MBS MacExtras Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 167.4.5 Properties

### 167.4.6 Handle as Integer

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop only.

**Function:** The internal handle for this object.
**Notes:** (Read and Write property)

### 167.4.7 Events

### 167.4.8 compareVersion(VersionA as string, VersionB as string) as Integer

MBS MacExtras Plugin, Plugin Version: 8.6, Platform: macOS, Targets: .

**Function:** The method to compare two version strings.
**Notes:** Should return NSOrderedAscending if b >a, NSOrderedDescending if b <a, and NSOrderedSame if

they are equivalent.

This function may be called on the main thread or some other thread, so disable stack checking in your event.

### 167.4.9 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSOrderedAscending | -1 | One of the order constants. |
| NSOrderedDescending | 1 | One of the order constants. |
| NSOrderedSame | 0 | One of the order constants. |

## 167.5 class WinSparkleMBS

### 167.5.1 class WinSparkleMBS

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for WinSparkle library.
**Notes:** Please first use LoadLibrary, than set properties and finally call Initialize.
Optionally you can later call Check methods.

### 167.5.2 Methods

### 167.5.3 CheckUpdateWithoutUI

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks if an update is available.
**Example:**

WinSparkleMBS.CheckUpdateWithoutUI

**Notes:** No progress UI is shown to the user when checking. If an update is available, the usual "update available" window is shown; this function is *not* completely UI-less.
Use with caution, it usually makes more sense to use the automatic update checks on interval option or manual check with visible UI.
This function returns immediately.
This function respects "Skip this version" choice by the user.

### 167.5.4 CheckUpdateWithUI

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks if an update is available, showing progress UI to the user.
**Example:**

WinSparkleMBS.CheckUpdateWithUI

**Notes:** Normally, WinSparkle checks for updates on startup and only shows its UI when it finds an update. If the application disables this behavior, it can hook this function to "Check for updates..." menu item.

When called, background thread is started to check for updates. A small window is shown to let the user

know the progress. If no update is found, the user is told so. If there is an update, the usual "update available" window is shown.
This function returns immediately.

Because this function is intended for manual, user-initiated checks for updates, it ignores "Skip this version" even if the user checked it previously.

### 167.5.5 CheckUpdateWithUIAndInstall

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks if an update is available, showing progress UI to the user and immediately installing the update if one is available.
**Example:**

WinSparkleMBS.CheckUpdateWithUIAndInstall

**Notes:** This is useful for the case when users should almost always use the newest version of your software. When called, WinSparkle will check for updates showing a progress UI to the user. If an update is found the update prompt will be skipped and the update will be installed immediately.
If your application expects to do something after checking for updates you may wish to use DidNotFindUpdate and UpdateCancelled events.

### 167.5.6 Cleanup

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Cleans up after WinSparkle.
**Example:**

WinSparkleMBS.Cleanup

**Notes:** Should be called by the app when it's shutting down. Cancels any pending Sparkle operations and shuts down its helper threads.

### 167.5.7 Initialize

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts WinSparkle.

**Example:**

WinSparkleMBS.Initialize

**Notes:** If WinSparkle is configured to check for updates on startup, proceeds to perform the check. You should only call this function when your app is initialized and shows its main window.

This call doesn't block and returns almost immediately. If an update is available, the respective UI is shown later from a separate thread.

### 167.5.8 LoadLibrary(File as folderitem) as boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads the WinSparkle DLL.
**Example:**

```
dim f as FolderItem = GetFolderItem("WinSparkle.dll")

if WinSparkleMBS.LoadLibrary(f) then
MsgBox "OK"
else
MsgBox "Failed to load DLL."
end if
```

**Notes:** Returns true on success.
See also:

- 167.5.9 LoadLibrary(Path as string) as boolean 21009

### 167.5.9 LoadLibrary(Path as string) as boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads the WinSparkle DLL.
**Example:**

```
if WinSparkleMBS.LoadLibrary("Libs\WinSparkle.dll") then
MsgBox "OK"
else
MsgBox "Failed to load DLL."
end if
```

**Notes:** Returns true on success.
See also:

- 167.5.8 LoadLibrary(File as folderitem) as boolean 21009

### 167.5.10 Properties

### 167.5.11 AppCastURL as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets URL for the app's appcast.
**Example:**

WinSparkleMBS.AppCastURL = "https://www.monkeybreadsoftware.test/test/test.xml"

**Notes:** Only http and https schemes are supported.

If this function isn't called by the app, the URL is obtained from Windows resource named "FeedURL" of type "APPCAST".

Always use HTTPS feeds, do not use unencrypted HTTP! This is necessary to prevent both leaking user information and preventing various MITM attacks.

See https://github.com/vslavik/winsparkle/wiki/Appcast-Feeds for more information about appcast feeds.
(Read and Write property)

### 167.5.12 AppName as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Application name.
**Example:**

WinSparkleMBS.CompanyName = "Monkeybread Software"
WinSparkleMBS.AppName = "Test App"
WinSparkleMBS.AppVersion = "1.2.3"

**Notes:** This is both shown to the user and used in HTTP User-Agent header.

CompanyName and AppName are used to determine the location of WinSparkle settings in registry. (HKCU\Software\<CompanyName>\<AppName>\WinSparkle is used.)

If not set, this value is read from VERSIONINFO/StringFileInfo resources.
(Read and Write property)

### 167.5.13 AppVersion as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Version of the app, as string (e.g. "1.2" or "1.2rc1").
**Example:**

```
WinSparkleMBS.CompanyName = "Monkeybread Software"
WinSparkleMBS.AppName = "Test App"
WinSparkleMBS.AppVersion = "1.2.3"
```

**Notes:** If not set, this value is read from VERSIONINFO/StringFileInfo resources.
(Read and Write property)

### 167.5.14 AutomaticCheckForUpdates as Boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether updates are checked automatically or only through a manual call.
**Example:**

```
WinSparkleMBS.AutomaticCheckForUpdates = true
```

**Notes:** If disabled, CheckUpdateWithUI must be used explicitly.

True to have updates checked automatically, false otherwise.
Defaults to false when not yet configured (as happens on first start).
(Read and Write property)

### 167.5.15 BuildVersion as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets application build version number.
**Example:**

WinSparkleMBS.BuildVersion = "123"

**Notes:** This is the internal version number that is not normally shown to the user. It can be used for finer granularity that official release versions, e.g. for interim builds.

If this function is called, then the provided *build* number is used for comparing versions; it is compared to the "version" attribute in the appcast and corresponds to OS X Sparkle's CFBundleVersion handling. If used, then the appcast must also contain the "shortVersionString" attribute with human-readable display version string. The version passed to AppVersion property corresponds to this and is used for display.
(Read and Write property)

### 167.5.16 CanShutdown as Boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether your app can shutdown now.
**Example:**

WinSparkleMBS.CanShutdown = false

**Notes:** By default true.
Set to false when you have something like an open edited document.
(Read and Write property)

### 167.5.17 CompanyName as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the vendor.
**Example:**

WinSparkleMBS.CompanyName = "Monkeybread Software"
WinSparkleMBS.AppName = "Test App"
WinSparkleMBS.AppVersion = "1.2.3"

**Notes:** CompanyName and AppName are used to determine the location of WinSparkle settings in registry. (HKCU\Software\<CompanyName>\<AppName>\WinSparkle is used.)

If not set, this value is read from VERSIONINFO/StringFileInfo resources.
(Read and Write property)

### 167.5.18 DSAPubPEM as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The public key in PEM format.
**Notes:** If not set, the framework will look into the app resources.
(Read and Write property)

### 167.5.19 Language as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets UI language from its ISO code.
**Example:**

WinSparkleMBS.Language = "en-US"

**Notes:** Language and LanguageID properties set user interface language. One must be set before Initialize to have any effect. If none of them is called, WinSparkle detects the UI language automatically.

ISO 639 language code with an optional ISO 3116 country code, e.g. "fr", "pt-PT", "pt-BR" or "pt_BR",
(Read and Write property)

### 167.5.20 LanguageID as Integer

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets UI language from its Win32 LANGID code.
**Notes:** Language and LanguageID properties set user interface language. One must be set before Initialize to have any effect. If none of them is called, WinSparkle detects the UI language automatically.
(Read and Write property)

### 167.5.21 LastCheckTime as Integer

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the time for the last update check.
**Notes:** Default value is -1, indicating that the update check has never run.
(Read only property)

### 167.5.22 RegistryPath as String

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The registry path where settings will be stored.
**Example:**

WinSparkleMBS.RegistryPath = "Software\My App\Updates"

**Notes:** Normally, these are stored in "HKCU\Software\<company_name>\<app_name>\WinSparkle" but if your application needs to store the data elsewhere for some reason, using this function is an alternative.
Note that path is relative to HKCU/HKLM root and the root is not part of it. For example:
(Read and Write property)

### 167.5.23 UpdateCheckInterval as Integer

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The automatic update interval.
**Example:**

WinSparkleMBS.UpdateCheckInterval = 7200

**Notes:** The interval in seconds between checks for updates. The minimum update interval is 3600 seconds (1 hour).
(Read and Write property)

### 167.5.24 Events

### 167.5.25 DidFindUpdate

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: .

**Function:** Called when an update was found.

### 167.5.26 DidNotFindUpdate

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: .

**Function:** Called when an update was not found.

### 167.5.27 Error

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: .

**Function:** Called when an update failed due to an error.

### 167.5.28 ShutdownRequest

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: .

**Function:** The event to ask the host to shut down immediately after launching the installer.
**Notes:** Its implementation should gracefully terminate the application.

### 167.5.29 UpdateCancelled

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: .

**Function:** The update was cancelled.

# Chapter 168

# Special Folders

## 168.1 Globals

### 168.1.1 ALMLocationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ALMLocationsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateALMLocationsFolder function.

### 168.1.2 ALMModulesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ALMModulesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateALMModulesFolder function.

### 168.1.3 ALMPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ALMPreferencesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateALMPreferencesFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.4 AppearanceFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppearanceFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAppearanceFolder function.

### 168.1.5 AppleExtrasFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppleExtrasFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAppleExtrasFolder function.

### 168.1.6 AppleMenuFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppleMenuFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateAppleMenuFolder function.

### 168.1.7 AppleShareAuthenticationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppleShareAuthenticationFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAppleShareAuthenticationFolder function.

### 168.1.8 AppleshareAutomountServerAliasesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppleshareAutomountServerAliasesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAppleshareAutomountServerAliasesFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.9 AppleShareSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AppleShareSupportFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAppleShareSupportFolder function.

### 168.1.10 ApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ApplicationsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateApplicationsFolder function.
On Windows, only the System Domain is supported.

### 168.1.11 ApplicationSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
dim f as folderitem

f=preferencesFolderMBS(-32763)
if f=nil then // On Windows always nil
f=applicationsupportFolderMBS(-32763)
end if
```

msgBox f.NativePath

```
// example output:
// "Mac OS X:Users:cs:Library:Preferences:" on Mac OS X
// "Mac OS 9:Systemordner:Preferences" on a german Mac OS 9
// "C:\Dokumente und Einstellungen\Christian\Anwendungsdaten\" on a german Windows XP.
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateApplicationSupportFolder function.

Xojo ApplicationSupport function points to "/Library/Application Support" while ApplicationSupportFolderMBS points to different locations on my test system depending on the domain code:

-32768 ->"/Library/Application Support"
-32767 ->"/Library/Application Support"
-32766 ->nil
-32765 ->"/Library/Application Support"
-32764 ->nil
-32763 ->"/Users/cs/Library/Application Support"
-32762 ->"/Volumes/Mac OS 9/Systemordner/Application Support"
0 ->"/Library/Application Support"

At last it is your decision to use the correct one!

### 168.1.12 AssistantsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module

instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AssistantsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAssistantsFolder function.

### 168.1.13 AudioAlertSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioAlertSoundsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateAudioAlertSoundsFolder function.

### 168.1.14 AudioComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioComponentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioComponentsFolder function.

### 168.1.15 AudioDigidesignFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioDigidesignFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioDigidesignFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.16 AudioPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioPlugInsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateAudioPlugInsFolder function.

### 168.1.17 AudioPresetsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioPresetsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioPresetsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.18 AudioSoundBanksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioSoundBanksFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioSoundBanksFolder function.

### 168.1.19 AudioSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioSoundsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateAudioSoundsFolder function.

### 168.1.20 AudioSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioSupportFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioSupportFolder function.

### 168.1.21 AudioVSTFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AudioVSTFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAudioVSTFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.22 AutomatorWorkflowsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AutomatorWorkflowsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAutomatorWorkflowsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.23 AutosaveInformationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = AutosaveInformationFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateAutosaveInformationFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.24 BootTimeStartupItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = BootTimeStartupItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateBootTimeStartupItemsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.25 CachedDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CachedDataFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateCachedDataFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.26 CarbonLibraryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CarbonLibraryFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateCarbonLibraryFolder function.

### 168.1.27 ChewableItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ChewableItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateChewableItemsFolder function.

### 168.1.28 classicDesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ClassicDesktopFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateClassicDesktopFolder function.

### 168.1.29 ClassicPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ClassicPreferencesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateClassicPreferencesFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.30 ColorPickersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ColorPickersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateColorPickersFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.31 ColorSyncCMMFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ColorSyncCMMFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateColorSyncCMMFolder function.

### 168.1.32 ColorSyncFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ColorSyncFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateColorSyncFolder function.

### 168.1.33 ColorSyncProfilesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ColorSyncProfilesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateColorSyncProfilesFolder function.

### 168.1.34 ColorSyncScriptingFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ColorSyncScriptingFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateColorSyncScriptingFolder function.

### 168.1.35 ComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ComponentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateComponentsFolder function.

### 168.1.36 CompositionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CompositionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateCompositionsFolderMBS function.
**Blog Entries**

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.37 ContextualMenuItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ContextualMenuItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateContextualMenuItemsFolder function.

### 168.1.38 ControlPanelDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ControlPanelDisabledFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateControlPanelDisabledFolder function.

### 168.1.39 ControlPanelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ControlPanelFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateControlPanelFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.40 ControlStripModulesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ControlStripModulesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateControlStripModulesFolder function.

### 168.1.41 CoreServicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CoreServicesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateCoreServicesFolder function.

### 168.1.42 CreateALMLocationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateALMLocationsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the ALMLocationsFolder function.

### 168.1.43 CreateALMModulesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateALMModulesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ALMModulesFolder function.

### 168.1.44 CreateALMPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateALMPreferencesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ALMPreferencesFolder function.

### 168.1.45 CreateAppearanceFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppearanceFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the AppearanceFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.46 CreateAppleExtrasFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppleExtrasFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AppleExtrasFolder function.

### 168.1.47 CreateAppleMenuFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppleMenuFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AppleMenuFolder function.

### 168.1.48 CreateAppleShareAuthenticationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppleShareAuthenticationFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AppleShareAuthenticationFolder function.

### 168.1.49 CreateAppleshareAutomountServerAliasesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppleshareAutomountServerAliasesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AppleshareAutomountServerAliasesFolderMBS function.

### 168.1.50 CreateAppleShareSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAppleShareSupportFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AppleShareSupportFolder function.

### 168.1.51 CreateApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateApplicationsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ApplicationsFolder function.
On Windows, only the System Domain is supported.

### 168.1.52 CreateApplicationSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateApplicationSupportFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ApplicationSupportFolder function.

Xojo ApplicationSupport function points to "/Library/Application Support" while ApplicationSupportFolderMBS points to different locations on my test system depending on the domain code:

-32768 ->"/Library/Application Support"
-32767 ->"/Library/Application Support"
-32766 ->nil
-32765 ->"/Library/Application Support"
-32764 ->nil
-32763 ->"/Users/cs/Library/Application Support"
-32762 ->"/Volumes/Mac OS 9/Systemordner/Application Support"
0 ->"/Library/Application Support"

At last it is your decision to use the correct one!

### 168.1.53 CreateAssistantsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAssistantsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AssistantsFolder function.

### 168.1.54 CreateAudioAlertSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioAlertSoundsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioAlertSoundsFolder function.

### 168.1.55 CreateAudioComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioComponentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioComponentsFolder function.

### 168.1.56 CreateAudioDigidesignFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioDigidesignFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the AudioDigidesignFolderMBS function.

### 168.1.57 CreateAudioPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioPlugInsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioPlugInsFolder function.

### 168.1.58 CreateAudioPresetsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioPresetsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioPresetsFolderMBS function.

### 168.1.59 CreateAudioSoundBanksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioSoundBanksFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the AudioSoundBanksFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.60 CreateAudioSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioSoundsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioSoundsFolder function.

### 168.1.61 CreateAudioSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioSupportFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioSupportFolder function.

### 168.1.62 CreateAudioVSTFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAudioVSTFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AudioVSTFolderMBS function.

### 168.1.63 CreateAutomatorWorkflowsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAutomatorWorkflowsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AutomatorWorkflowsFolderMBS function.

### 168.1.64 CreateAutosaveInformationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateAutosaveInformationFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the AutosaveInformationFolderMBS function.

### 168.1.65 CreateBootTimeStartupItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateBootTimeStartupItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the BootTimeStartupItemsFolderMBS function.

### 168.1.66 CreateCachedDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCachedDataFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CachedDataFolder function.

### 168.1.67 CreateCarbonLibraryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCarbonLibraryFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CarbonLibraryFolder function.

### 168.1.68 CreateChewableItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateChewableItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ChewableItemsFolder function.

### 168.1.69 CreateClassicDesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateClassicDesktopFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the ClassicDesktopFolder function.

### 168.1.70 CreateClassicPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateClassicPreferencesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ClassicPreferencesFolderMBS function.

### 168.1.71 CreateColorPickersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateColorPickersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ColorPickersFolderMBS function.

### 168.1.72 CreateColorSyncCMMFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateColorSyncCMMFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the ColorSyncCMMFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.73 CreateColorSyncFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateColorSyncFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ColorSyncFolder function.

### 168.1.74 CreateColorSyncProfilesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateColorSyncProfilesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ColorSyncProfilesFolder function.

### 168.1.75 CreateColorSyncScriptingFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateColorSyncScriptingFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ColorSyncScriptingFolder function.

### 168.1.76 CreateComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateComponentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ComponentsFolder function.

### 168.1.77 CreateCompositionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCompositionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CompositionsFolderMBS function.

### 168.1.78 CreateContextualMenuItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateContextualMenuItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ContextualMenuItemsFolder function.

### 168.1.79 CreateControlPanelDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateControlPanelDisabledFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ControlPanelDisabledFolder function.

### 168.1.80 CreateControlPanelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateControlPanelFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ControlPanelFolder function.

### 168.1.81 CreateControlStripModulesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateControlStripModulesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ControlStripModulesFolder function.

### 168.1.82 CreateCoreServicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCoreServicesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CoreServicesFolder function.

### 168.1.83 CreateCurrentUserFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCurrentUserFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CurrentUserFolder function.

### 168.1.84 CreateCurrentUserRemoteFolderLocationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCurrentUserRemoteFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CurrentUserRemoteFolder function.

### 168.1.85 CreateCurrentUserRemoteFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateCurrentUserRemoteFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CurrentUserRemoteFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.86 CreateDesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDesktopFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SpecialFolder.Desktop function.

### 168.1.87 CreateDesktopPicturesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDesktopPicturesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DesktopPicturesFolder function.

### 168.1.88 CreateDeveloperApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The developer application folder.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDeveloperApplicationsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DeveloperApplicationsFolderMBS function.

### 168.1.89 CreateDeveloperDocsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDeveloperDocsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DeveloperDocsFolder function.

### 168.1.90 CreateDeveloperFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDeveloperFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DeveloperFolder function.

### 168.1.91 CreateDeveloperHelpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDeveloperHelpFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DeveloperHelpFolder function.

### 168.1.92 CreateDictionariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The folder for the dictionaries.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDictionariesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DictionariesFolderMBS function.

### 168.1.93 CreateDirectoryServicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDirectoryServicesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DirectoryServicesFolder function.

### 168.1.94 CreateDirectoryServicesPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDirectoryServicesPlugInsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DirectoryServicesPlugInsFolder function.

### 168.1.95 CreateDisplayExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDisplayExtensionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the DisplayExtensionsFolder function.

### 168.1.96 CreateDocumentationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDocumentationFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DocumentationFolder function.

### 168.1.97 CreateDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDocumentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DocumentsFolder function.
On Windows only the user and the system domain are supported.

### 168.1.98 CreateDomainLibraryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDomainLibraryFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the DomainLibraryFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.99 CreateDomainTopLevelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDomainTopLevelFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DomainTopLevelFolder function.

### 168.1.100 CreateDownloadsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateDownloadsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the DownloadsFolderMBS function.

### 168.1.101 CreateEditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateEditorsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the EditorsFolder function.

### 168.1.102 CreateExtensionDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateExtensionDisabledFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ExtensionDisabledFolder function.

### 168.1.103 CreateExtensionFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateExtensionFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ExtensionFolder function.

### 168.1.104 CreateFavoritesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFavoritesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FavoritesFolder function.

### 168.1.105 CreateFileSystemSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFileSystemSupportFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FileSystemSupportFolder function.

### 168.1.106 CreateFindByContentFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFindByContentFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FindByContentFolder function.

### 168.1.107 CreateFindByContentIndexesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFindByContentIndexesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FindByContentIndexesFolderMBS function.

### 168.1.108 CreateFindByContentPluginsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFindByContentPluginsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the FindByContentPluginsFolder function.

### 168.1.109 CreateFindSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFindSupportFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FindSupportFolder function.

### 168.1.110 CreateFolderActionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFolderActionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FolderActionsFolder function.

### 168.1.111 CreateFontCollectionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFontCollectionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the FontCollectionsFolderMBS function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.112 CreateFontsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFontsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FontsFolder function.

### 168.1.113 CreateFrameworksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateFrameworksFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the FrameworksFolder function.

### 168.1.114 CreateGenEditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateGenEditorsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the GenEditorsFolder function.

### 168.1.115 CreateHelpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateHelpFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the HelpFolder function.

### 168.1.116 CreateiMovieFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateiMovieFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the iMovieFolderMBS function.

### 168.1.117 CreateiMoviePlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateiMoviePlugInsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the iMoviePlugInsFolderMBS function.

### 168.1.118 CreateiMovieSoundEffectsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = iMovieSoundEffectsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateiMovieSoundEffectsFolderMBS function.

### 168.1.119 CreateIndexFilesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = IndexFilesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateIndexFilesFolderMBS function.

### 168.1.120 CreateInputManagersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInputManagersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InputManagersFolderMBS function.

### 168.1.121 CreateInputMethodsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InputMethodsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateInputMethodsFolderMBS function.

### 168.1.122 CreateInstallerLogsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInstallerLogsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InstallerLogsFolder function.

### 168.1.123 CreateInstallerReceiptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInstallerReceiptsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InstallerReceiptsFolder function.

### 168.1.124 CreateInternetFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInternetFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the InternetFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.125 CreateInternetPlugInFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInternetPlugInFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InternetPlugInFolder function.

### 168.1.126 CreateInternetSearchSitesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInternetSearchSitesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InternetSearchSitesFolder function.

### 168.1.127 CreateInternetSitesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateInternetSitesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the InternetSitesFolder function.

### 168.1.128 CreateISSDownloadsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateISSDownloadsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ISSDownloadsFolder function.

### 168.1.129 CreateKernelExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateKernelExtensionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the KernelExtensionsFolder function.

### 168.1.130 CreateKeyboardLayoutsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = KeyboardLayoutsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateKeyboardLayoutsFolderMBS function.

### 168.1.131 CreateKeychainFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateKeychainFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the KeychainFolder function.

### 168.1.132 CreateLauncherItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateLauncherItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the LauncherItemsFolder function.

### 168.1.133 CreateLibraryAssistantsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = LibraryAssistantsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateLibraryAssistantsFolderMBS function.

### 168.1.134 CreateLocalesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateLocalesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the LocalesFolder function.

### 168.1.135 CreateLogsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The log files folder.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateLogsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the LogsFolderMBS function.

### 168.1.136 CreateMacOSReadMesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateMacOSReadMesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the MacOSReadMesFolder function.

### 168.1.137 CreateMagicTemporaryItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MagicTemporaryItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateMagicTemporaryItemsFolderMBS function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.138 CreateManagedItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateManagedItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ManagedItemsFolderMBS function.

### 168.1.139 CreateMIDIDriversFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateMIDIDriversFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the MIDIDriversFolder function.

### 168.1.140 CreateModemScriptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateModemScriptsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ModemScriptsFolder function.

### 168.1.141 CreateMovieDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateMovieDocumentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the MovieDocumentsFolder function.

### 168.1.142 CreateMultiprocessingFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateMultiprocessingFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the MultiprocessingFolder function.

### 168.1.143 CreateMusicDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateMusicDocumentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the MusicDocumentsFolder function.

### 168.1.144 CreateOpenDocEditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateOpenDocEditorsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the OpenDocEditorsFolder function.

### 168.1.145 CreateOpenDocFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateOpenDocFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the OpenDocFolder function.

### 168.1.146 CreateOpenDocLibrariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateOpenDocLibrariesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the OpenDocLibrariesFolder function.

### 168.1.147 CreateOpenDocShellPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateOpenDocShellPlugInsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the OpenDocShellPlugInsFolder function.

### 168.1.148 CreatePictureDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePictureDocumentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PictureDocumentsFolder function.
As there is no such folder on Mac OS Classic, you always get nil there.

### 168.1.149 CreatePreferencePanesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The preferences panes folder.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePreferencePanesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PreferencePanesFolderMBS function.

### 168.1.150 CreatePreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePreferencesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the PreferencesFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.151 CreatePrinterDescriptionFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrinterDescriptionFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrinterDescriptionFolder function.

### 168.1.152 CreatePrinterDriverFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrinterDriverFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrinterDriverFolder function.

### 168.1.153 CreatePrintersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrintersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrintersFolder function.

### 168.1.154 CreatePrintingPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrintingPlugInsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrintingPlugInsFolder function.

### 168.1.155 CreatePrintMonitorDocsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrintMonitorDocsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrintMonitorDocsFolder function.

### 168.1.156 CreatePrivateFrameworksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePrivateFrameworksFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PrivateFrameworksFolder function.

### 168.1.157 CreatePublicFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreatePublicFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the PublicFolder function.

### 168.1.158 CreateQuickLookFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateQuickLookFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the QuickLookFolderMBS function.

### 168.1.159 CreateQuickTimeComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateQuickTimeComponentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the QuickTimeComponentsFolder function.

### 168.1.160 CreateQuickTimeExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateQuickTimeExtensionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the QuickTimeExtensionsFolder function.

### 168.1.161 CreateRecentApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateRecentApplicationsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the RecentApplicationsFolder function.

### 168.1.162 CreateRecentDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateRecentDocumentsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the RecentDocumentsFolder function.

### 168.1.163 CreateRecentServersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateRecentServersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the RecentServersFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.164 CreateScriptingAdditionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateScriptingAdditionsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ScriptingAdditionsFolder function.

### 168.1.165 CreateScriptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateScriptsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ScriptsFolder function.

### 168.1.166 CreateSharedLibrariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSharedLibrariesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SharedLibrariesFolder function.

### 168.1.167 CreateSharedUserDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSharedUserDataFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SharedUserDataFolder function.

### 168.1.168 CreateShutdownFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateShutdownFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ShutdownFolder function.

### 168.1.169 CreateShutdownItemsDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateShutdownItemsDisabledFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ShutdownItemsDisabledFolder function.

### 168.1.170 CreateSoundSetsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSoundSetsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SoundSetsFolder function.

### 168.1.171 CreateSpeakableItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSpeakableItemsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SpeakableItemsFolder function.

### 168.1.172 CreateSpeechFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSpeechFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SpeechFolder function.

### 168.1.173 CreateSpotlightImportersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpotlightImportersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateSpotlightImportersFolderMBS function.

### 168.1.174 CreateSpotlightMetadataCacheFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpotlightMetadataCacheFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSpotlightMetadataCacheFolderMBS function.

### 168.1.175 CreateSpotlightSavedSearchesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSpotlightSavedSearchesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SpotlightSavedSearchesFolderMBS function.

### 168.1.176 CreateStartupFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateStartupFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the StartupFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.177 CreateStartupItemsDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateStartupItemsDisabledFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the StartupItemsDisabledFolder function.

### 168.1.178 CreateStationeryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateStationeryFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the StationeryFolder function.

### 168.1.179 CreateSystemControlPanelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemControlPanelFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemControlPanelFolder function.

### 168.1.180 CreateSystemDesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemDesktopFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemDesktopFolder function.

### 168.1.181 CreateSystemExtensionDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemExtensionDisabledFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemExtensionDisabledFolder function.

### 168.1.182 CreateSystemFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemFolder function.

### 168.1.183 CreateSystemPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemPreferencesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemPreferencesFolder function.

### 168.1.184 CreateSystemSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemSoundsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemSoundsFolder function.

### 168.1.185 CreateSystemTrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateSystemTrashFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the SystemTrashFolder function.

### 168.1.186 CreateTemporaryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateTemporaryFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the TemporaryFolder function.

### 168.1.187 CreateTemporaryItemsInCacheDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateTemporaryItemsInCacheDataFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the TemporaryItemsInCacheDataFolderMBS function.

### 168.1.188 CreateTemporaryItemsInUserDomainFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateTemporaryItemsInUserDomainFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the TemporaryItemsInUserDomainFolderMBS function.

### 168.1.189 CreateTextEncodingsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateTextEncodingsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the TextEncodingsFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.190 CreateThemesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateThemesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the ThemesFolder function.

### 168.1.191 CreateTrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateTrashFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the TrashFolder function.

### 168.1.192 CreateUsersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateUsersFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the UsersFolder function.

### 168.1.193 CreateUserSpecificTmpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateUserSpecificTmpFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the UserSpecificTmpFolder function.

### 168.1.194 CreateUtilitiesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateUtilitiesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the UtilitiesFolder function.

### 168.1.195 CreateVoicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateVoicesFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.

Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the VoicesFolder function.

### 168.1.196 CreateVolumeRootFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateVolumeRootFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the VolumeRootFolder function.

### 168.1.197 CreateVolumeSettingsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateVolumeSettingsFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the VolumeSettingsFolder function.

### 168.1.198 CreateWhereToEmptyTrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CreateWhereToEmptyTrashFolderMBS(kUserDomain)
```

**Notes:** If this folder is supported by the operation system version, the folder is created and returned. If the folder could not be created or is not supported, nil is returned. If the folder allready exists, it is just returned.
Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the WhereToEmptyTrashFolder function.

### 168.1.199 CurrentUserFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CurrentUserFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateCurrentUserFolder function.

### 168.1.200 CurrentUserRemoteFolderLocationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CurrentUserRemoteFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateCurrentUserRemoteFolder function.

### 168.1.201 CurrentUserRemoteFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = CurrentUserRemoteFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateCurrentUserRemoteFolder function.

### 168.1.202 DesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DesktopFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDesktopFolder function.

### 168.1.203 DesktopPicturesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DesktopPicturesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDesktopPicturesFolder function.

### 168.1.204 DeveloperApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The developer application folder.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DeveloperApplicationsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateDeveloperApplicationsFolderMBS function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.205 DeveloperDocsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DeveloperDocsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDeveloperDocsFolder function.

### 168.1.206 DeveloperFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DeveloperFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDeveloperFolder function.

### 168.1.207 DeveloperHelpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DeveloperHelpFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateDeveloperHelpFolder function.

### 168.1.208 DictionariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The folder for the dictionaries.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DictionariesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDictionariesFolderMBSfunction.

### 168.1.209 DirectoryServicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DirectoryServicesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDirectoryServicesFolder function.

### 168.1.210 DirectoryServicesPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DirectoryServicesPlugInsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDirectoryServicesPlugInsFolder function.

### 168.1.211 DisplayExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DisplayExtensionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDisplayExtensionsFolder function.

### 168.1.212 DocumentationFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DocumentationFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateDocumentationFolder function.
On Windows only the user and the system domain are supported.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.213 DocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DocumentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDocumentsFolder function.

### 168.1.214 DomainLibraryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DomainLibraryFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDomainLibraryFolder function.

### 168.1.215 DomainTopLevelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DomainTopLevelFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateDomainTopLevelFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.216 DownloadsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = DownloadsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateDownloadsFolderMBS function.
**Blog Entries**

- Query URL from downloaded file
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.217 EditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = EditorsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateEditorsFolder function.

### 168.1.218 ExtensionDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ExtensionDisabledFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateExtensionDisabledFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.219 ExtensionFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ExtensionFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateExtensionFolder function.

### 168.1.220 FavoritesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FavoritesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFavoritesFolder function.

### 168.1.221 FileSystemSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FileSystemSupportFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateFileSystemSupportFolder function.

### 168.1.222 FindByContentFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FindByContentFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFindByContentFolder function.

### 168.1.223 FindByContentIndexesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FindByContentIndexesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFindByContentIndexesFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.224 FindByContentPluginsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FindByContentPluginsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFindByContentPluginsFolder function.

### 168.1.225 FindSupportFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FindSupportFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFindSupportFolder function.

### 168.1.226 FolderActionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FolderActionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFolderActionsFolder function.

### 168.1.227 FontCollectionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FontCollectionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFontCollectionsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.228 FontsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FontsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateFontsFolder function.

### 168.1.229 FrameworksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = FrameworksFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateFrameworksFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.230 GenEditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = GenEditorsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateGenEditorsFolder function.

### 168.1.231 HelpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = HelpFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateHelpFolder function.

### 168.1.232 iMovieFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = iMovieFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateiMovieFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.233 iMoviePlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = iMoviePlugInsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateiMoviePlugInsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.234 iMovieSoundEffectsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = iMovieSoundEffectsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateiMovieSoundEffectsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.235 IndexFilesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = IndexFilesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateIndexFilesFolderMBS function.
**Blog Entries**

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.236 InputManagersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InputManagersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInputManagersFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.237 InputMethodsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InputMethodsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInputMethodsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.238 InstallerLogsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InstallerLogsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInstallerLogsFolder function.

### 168.1.239 InstallerReceiptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InstallerReceiptsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInstallerReceiptsFolder function.

### 168.1.240 InternetFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InternetFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInternetFolder function.

### 168.1.241 InternetPlugInFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InternetPlugInFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateInternetPlugInFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.242 InternetSearchSitesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InternetSearchSitesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInternetSearchSitesFolder function.

### 168.1.243 InternetSitesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = InternetSitesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateInternetSitesFolder function.

### 168.1.244 ISSDownloadsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ISSDownloadsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateISSDownloadsFolder function.

### 168.1.245 KernelExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = KernelExtensionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateKernelExtensionsFolder function.

### 168.1.246 KeyboardLayoutsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = KeyboardLayoutsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateKeyboardLayoutsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.247 KeychainFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = KeychainFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateKeychainFolder function.

### 168.1.248 LauncherItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = LauncherItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateLauncherItemsFolder function.

### 168.1.249 LibraryAssistantsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = LibraryAssistantsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateLibraryAssistantsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.250 LocalesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = LocalesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateLocalesFolder function.

### 168.1.251 LogsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The log files folder.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = LogsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateLogsFolderMBS function.

### 168.1.252 MacOSReadMesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MacOSReadMesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateMacOSReadMesFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.253 MagicTemporaryItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MagicTemporaryItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateMagicTemporaryItemsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.254 ManagedItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ManagedItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateManagedItemsFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.255 MIDIDriversFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MIDIDriversFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateMIDIDriversFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.256 ModemScriptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ModemScriptsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateModemScriptsFolder function.

### 168.1.257 MovieDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MovieDocumentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateMovieDocumentsFolder function.

### 168.1.258 MultiprocessingFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MultiprocessingFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateMultiprocessingFolder function.

### 168.1.259 MusicDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = MusicDocumentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateMusicDocumentsFolder function.

### 168.1.260 OpenDocEditorsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = OpenDocEditorsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateOpenDocEditorsFolder function.

### 168.1.261 OpenDocFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = OpenDocFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateOpenDocFolder function.

### 168.1.262 OpenDocLibrariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = OpenDocLibrariesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateOpenDocLibrariesFolder function.

### 168.1.263 OpenDocShellPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = OpenDocShellPlugInsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateOpenDocShellPlugInsFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.264 PictureDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platforms: macOS, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PictureDocumentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePictureDocumentsFolder function.
As there is no such folder on Mac OS Classic, you always get nil there.

### 168.1.265 PreferencePanesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 3.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** The preferences panes folder.

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PreferencePanesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePreferencePanesFolderMBS function.

### 168.1.266 PreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
dim f as folderitem

f=preferencesFolderMBS(-32763)
if f=nil then // On Windows always nil
f=applicationsupportFolderMBS(-32763)
end if

msgBox f.NativePath

// example output:
// "Mac OS X:Users:cs:Library:Preferences:" on Mac OS X
// "Mac OS 9:Systemordner:Preferences" on a german Mac OS 9
// "C:\Dokumente und Einstellungen\Christian\Anwendungsdaten\" on a german Windows XP.
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePreferencesFolder function.

### 168.1.267 PrinterDescriptionFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrinterDescriptionFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePrinterDescriptionFolder function.

### 168.1.268 PrinterDriverFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrinterDriverFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePrinterDriverFolder function.

### 168.1.269 PrintersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrintersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreatePrintersFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.270 PrintingPlugInsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrintingPlugInsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePrintingPlugInsFolder function.

### 168.1.271 PrintMonitorDocsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrintMonitorDocsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePrintMonitorDocsFolder function.

### 168.1.272 PrivateFrameworksFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PrivateFrameworksFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreatePrivateFrameworksFolder function.

### 168.1.273 PublicFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = PublicFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreatePublicFolder function.

### 168.1.274 QuickLookFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = QuickLookFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateQuickLookFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.275 QuickTimeComponentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = QuickTimeComponentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateQuickTimeComponentsFolder function.

### 168.1.276 QuickTimeExtensionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = QuickTimeExtensionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateQuickTimeExtensionsFolder function.

### 168.1.277 RecentApplicationsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = RecentApplicationsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateRecentApplicationsFolder function.

### 168.1.278 RecentDocumentsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = RecentDocumentsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateRecentDocumentsFolder function.

### 168.1.279 RecentServersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = RecentServersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateRecentServersFolder function.

### 168.1.280 ScriptingAdditionsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ScriptingAdditionsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateScriptingAdditionsFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.281 ScriptsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ScriptsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateScriptsFolder function.

### 168.1.282 SharedLibrariesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SharedLibrariesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSharedLibrariesFolder function.

### 168.1.283 SharedUserDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SharedUserDataFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateSharedUserDataFolder function.

### 168.1.284 ShutdownFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ShutdownFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateShutdownFolder function.

### 168.1.285 ShutdownItemsDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ShutdownItemsDisabledFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateShutdownItemsDisabledFolder function.

### 168.1.286 SoundSetsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SoundSetsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSoundSetsFolder function.

### 168.1.287 SpeakableItemsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpeakableItemsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSpeakableItemsFolder function.

### 168.1.288 SpeechFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpeechFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateSpeechFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.289 SpotlightImportersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpotlightImportersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSpotlightImportersFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.290 SpotlightMetadataCacheFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpotlightMetadataCacheFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSpotlightMetadataCacheFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.291 SpotlightSavedSearchesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SpotlightSavedSearchesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateSpotlightSavedSearchesFolderMBS function.
**Blog Entries**

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.292 StartupFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = StartupFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateStartupFolder function.

### 168.1.293 StartupItemsDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = StartupItemsDisabledFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateStartupItemsDisabledFolder function.

### 168.1.294 StationeryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = StationeryFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateStationeryFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.295 SystemControlPanelFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemControlPanelFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemControlPanelFolder function.

### 168.1.296 SystemDesktopFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemDesktopFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemDesktopFolder function.

### 168.1.297 SystemExtensionDisabledFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemExtensionDisabledFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateSystemExtensionDisabledFolder function.

### 168.1.298 SystemFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemFolder function.

### 168.1.299 SystemPreferencesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemPreferencesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemPreferencesFolder function.

### 168.1.300 SystemSoundsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemSoundsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemSoundsFolder function.

### 168.1.301 SystemTrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = SystemTrashFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateSystemTrashFolder function.

### 168.1.302 TemporaryFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = TemporaryFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateTemporaryFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.303 TemporaryItemsInCacheDataFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = TemporaryItemsInCacheDataFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateTemporaryItemsInCacheDataFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.304 TemporaryItemsInUserDomainFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Plugin Version: 10.4, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = TemporaryItemsInUserDomainFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateTemporaryItemsInUserDomainFolderMBS function.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5

### 168.1.305 TextEncodingsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = TextEncodingsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateTextEncodingsFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.306 ThemesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = ThemesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateThemesFolder function.

### 168.1.307 TrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = TrashFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateTrashFolder function.

### 168.1.308 UsersFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = UsersFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateUsersFolder function.

### 168.1.309 UserSpecificTmpFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

**Example:**

```
const kUserDomain = -32763
dim f as folderitem = UserSpecificTmpFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateUserSpecificTmpFolder function.

### 168.1.310 UtilitiesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = UtilitiesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!

The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateUtilitiesFolder function.

### 168.1.311 VoicesFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = VoicesFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateVoicesFolder function.

### 168.1.312 VolumeRootFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = VolumeRootFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateVolumeRootFolder function.

### 168.1.313 VolumeSettingsFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = VolumeSettingsFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

Also take a look on the CreateVolumeSettingsFolder function.

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

### 168.1.314 WhereToEmptyTrashFolderMBS(domain as Integer) as folderitem

MBS Util Plugin, Platform: macOS, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
const kUserDomain = -32763
dim f as folderitem = WhereToEmptyTrashFolderMBS(kUserDomain)
```

**Notes:** Note that not every folder exists on every Mac OS Version!
The codes for domain are (The Demo includes a module for these):

| | |
|---|---|
| -32768 | On System Disk |
| -32767 | On Appropriate Disk |
| -32766 | System Domain, on Mac OS X mostly inside the folder /System. |
| -32765 | Local Domain (on Netbooting for example) |
| -32764 | Network Domain (on Netbooting for example) |
| -32763 | User Domain, on Mac OS X mostly inside the users folder. |
| -32762 | Classic Domain, the current used Classic System folder. |

Also take a look on the CreateWhereToEmptyTrashFolder function.

### 168.1.315 WindowsBurnAreaFolderMBS as folderitem

MBS Util Plugin, Plugin Version: 8.5, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns the folder which Windows uses to store temporary data for burning a CD/DVD. **Notes:** Returns nil on any error.

### 168.1.316 WindowsFolderMBS as folderitem

MBS Util Plugin, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
dim f as folderitem
f=WindowsFolderMBS
```

### 168.1.317 WindowsSystemFolderMBS as folderitem

MBS Util Plugin, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use SpecialFolder module instead. **Function:** Returns a folderitem to this folder if it exists on that system.
**Example:**

```
dim f as folderitem
f=WindowsSystemFolderMBS
```

# Chapter 169

# Speech

## 169.1 class AVSpeechSynthesisMarkerMBS

### 169.1.1 class AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** An object that contains information about the synthesized audio.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 169.1.2 Methods

### 169.1.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 169.1.4 copy as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a copy of the object.

### 169.1.5 markerWithBookmarkName(mark as string, atByteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a bookmark marker with a name and offset into the audio buffer.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

m = AVSpeechSynthesisMarkerMBS.markerWithBookmarkName("test", 1234)

MessageBox m.bookmarkName+" at "+m.byteSampleOffset.ToString
```

**Notes:** mark: The name of the bookmark.
byteSampleOffset: The byte offset into the audio buffer.

### 169.1.6 markerWithMarkerType(type as integer, TextRange as NSRangeMBS, byteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a marker with a type and location of the request,Äôs text.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

Dim range As New NSRangeMBS(5, 6)
m = AVSpeechSynthesisMarkerMBS.markerWithMarkerType(AVSpeechSynthesisMarkerMBS.SpeechSynthesisMarkerMarkWord, range, 1234)

MessageBox m.textRange.String+" at "+m.byteSampleOffset.ToString
```

**Notes:** type: The type that describes the text.
range: The location and length of the request,Äôs text.
byteSampleOffset: The byte offset into the audio buffer.

### 169.1.7 markerWithParagraphRange(TextRange as NSRangeMBS, byteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a paragraph marker with a range of the paragraph and offset into the audio buffer.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

Dim range As New NSRangeMBS(5, 6)
m = AVSpeechSynthesisMarkerMBS.markerWithParagraphRange(range, 1234)

MessageBox m.textRange.String+" at "+m.byteSampleOffset.ToString
```

**Notes:** range: The location and length of the paragraph.
byteSampleOffset: The byte offset into the audio buffer.

### 169.1.8 markerWithPhonemeString(phoneme as string, atByteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a phoneme marker with a range of the phoneme and offset into the audio buffer.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

m = AVSpeechSynthesisMarkerMBS.markerWithPhonemeString("I", 1234)

MessageBox m.phoneme+" at "+m.byteSampleOffset.ToString
```

**Notes:** phoneme: A string that represents a distinct sound.
byteSampleOffset: The byte offset into the audio buffer.

### 169.1.9 markerWithSentenceRange(TextRange as NSRangeMBS, byteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a sentence marker with a range of the sentence and offset into the audio buffer.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

Dim range As New NSRangeMBS(5, 6)
m = AVSpeechSynthesisMarkerMBS.markerWithSentenceRange(range, 1234)

MessageBox m.textRange.String+" at "+m.byteSampleOffset.ToString
```

**Notes:** range: The location and length of the word.

byteSampleOffset: The byte offset into the audio buffer.

### 169.1.10 markerWithWordRange(TextRange as NSRangeMBS, byteSampleOffset as Integer) as AVSpeechSynthesisMarkerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a word marker with a range of the word and offset into the audio buffer.
**Example:**

```
Dim m As AVSpeechSynthesisMarkerMBS

Dim range As New NSRangeMBS(5, 6)
m = AVSpeechSynthesisMarkerMBS.markerWithWordRange(range, 1234)

MessageBox m.textRange.String+" at "+m.byteSampleOffset.ToString
```

**Notes:** range: The location and length of the word.
byteSampleOffset: The byte offset into the audio buffer.

### 169.1.11 Properties

### 169.1.12 bookmarkName as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string that represents the name of a bookmark.
**Notes:** (Read and Write property)

### 169.1.13 byteSampleOffset as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The byte offset into the audio buffer.
**Notes:** (Read and Write property)

### 169.1.14 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 169.1.15 mark as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The type that describes the text.
**Notes:** (Read and Write property)

### 169.1.16 phoneme as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string that represents a distinct sound.
**Notes:** (Read and Write property)

### 169.1.17 textRange as NSRangeMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The location and length of the request,Äôs text.
**Notes:** (Read and Write property)

### 169.1.18 Constants

Marker Types

| Constant | Value | Description |
|---|---|---|
| SpeechSynthesisMarkerMarkBookmark | 4 | A type of text that represents a bookmark. |
| SpeechSynthesisMarkerMarkParagraph | 3 | A type of text that represents a paragraph. |
| SpeechSynthesisMarkerMarkPhoneme | 0 | A type of text that represents a phoneme. |
| SpeechSynthesisMarkerMarkSentence | 2 | A type of text that represents a sentence. |
| SpeechSynthesisMarkerMarkWord | 1 | A type of text that represents a word. |

## 169.2 class AVSpeechSynthesisVoiceMBS

### 169.2.1 class AVSpeechSynthesisVoiceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A distinct voice for use in speech synthesis.
**Notes:** The primary factors that distinguish a voice in speech synthesis are language, locale, and quality. Create an instance of AVSpeechSynthesisVoice to select a voice that,Äôs appropriate for the text and the language, and set it as the value of the voice property on an AVSpeechUtterance instance. The voice may optionally reflect a local variant of the language, such as Australian or South African English.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 169.2.2 Methods

### 169.2.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The private constructor.

### 169.2.4 SpeechUtteranceDefaultSpeechRate as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The default speech rate.

### 169.2.5 SpeechUtteranceMaximumSpeechRate as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The maximum speech rate.

### 169.2.6 SpeechUtteranceMinimumSpeechRate as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The minimum speech rate.

### 169.2.7 speechVoices as AVSpeechSynthesisVoiceMBS()

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves all available voices on the device.
**Example:**

```
Dim voices() As AVSpeechSynthesisVoiceMBS = AVSpeechSynthesisVoiceMBS.speechVoices

Dim Names() As String
For Each voice As AVSpeechSynthesisVoiceMBS In voices
names.append voice.name
Next

MessageBox Join(names, ", ")
```

**Notes:** Use the language property to identify each voice by its language and locale.

### 169.2.8 VoiceIdentifierAlex as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The voice that the system identifies as Alex.
**Notes:** The Alex voice is only available for the en-US language code.

### 169.2.9 voiceWithIdentifier(identifier as string) as AVSpeechSynthesisVoiceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves a voice for the identifier you specify.
**Example:**

```
Dim voice As AVSpeechSynthesisVoiceMBS = AVSpeechSynthesisVoiceMBS.voiceWithIdentifier("com.apple.voice.compact.en-GB.Daniel")

MessageBox voice.name
```

**Notes:** identifier: The unique identifier for a voice.

A voice for the specified identifier if the identifier is valid and the voice is available on the device; otherwise, nil.

### 169.2.10 voiceWithLanguage(languageCode as string) as AVSpeechSynthesisVoiceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Retrieves a voice for the BCP 47 code language code you specify.
**Example:**

```
Dim voice As AVSpeechSynthesisVoiceMBS = AVSpeechSynthesisVoiceMBS.voiceWithLanguage("en-GB")

MessageBox voice.name
```

**Notes:** language: A BCP 47 code that identifies the language and locale for a voice.

Returns a voice for the specified language and locale code if the code is valid; otherwise, nil.

Pass "" for languageCode to receive the default voice for the system,Äôs language and region.

### 169.2.11 Properties

### 169.2.12 audioFileSettings as Dictionary

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A dictionary that contains audio file settings.
**Notes:** If you want to generate speech and save it as an audio file to share or play later, use this dictionary to create an AVAudioFile instance and pass it as the settings parameter.
You can determine the AVAudioCommonFormat and interleaved properties of a voice from this dictionary. The format of this dictionary matches the data that SpeechSynthesizerBuffer event provides for the same voice.
(Read only property)

### 169.2.13 currentLanguageCode as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns the language and locale code for the user,Äôs current locale.
**Example:**

```
MessageBox AVSpeechSynthesisVoiceMBS.currentLanguageCode
```

**Notes:** A string that contains the BCP 47 language and locale code for the user,Äôs current locale.
(Read only property)

### 169.2.14 gender as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The gender for a voice.
**Notes:** (Read only property)

### 169.2.15 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 169.2.16 identifier as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The unique identifier of a voice.
**Notes:** (Read only property)

### 169.2.17 language as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A BCP 47 code that contains the voice,Äôs language and locale.
**Notes:** The language of a voice controls the conversion of text to spoken phonemes. For best results, ensure that the language of an utterance,Äôs text matches the voice for the utterance. The locale of a voice reflects regional variations in pronunciation or accent. For example, a voice with a language code of en-US speaks English text with a North American accent, and a language code of en-AU speaks English text with an Australian accent.
(Read only property)

### 169.2.18 name as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The name of a voice.
**Notes:** (Read only property)

### 169.2.19 quality as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The speech quality of a voice.
**Notes:** (Read only property)

### 169.2.20 voiceTraits as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The traits of a voice.
**Notes:** (Read only property)

### 169.2.21 Constants

Gender

| Constant | Value | Description |
|---|---|---|
| SpeechSynthesisVoiceGenderFemale | 2 | The female voice option. |
| SpeechSynthesisVoiceGenderMale | 1 | The male voice option. |
| SpeechSynthesisVoiceGenderUnspecified | 0 | The nonspecific gender option. |

Quality

| Constant | Value | Description |
|---|---|---|
| SpeechSynthesisVoiceQualityDefault | 1 | A basic quality voice that,Äôs available on the device by default. |
| SpeechSynthesisVoiceQualityEnhanced | 2 | An enhanced quality voice that you must download to use. |
| SpeechSynthesisVoiceQualityPremium | 3 | A premium quality voice that you must download to use. |

Voice Traits

| Constant | Value | Description |
|---|---|---|
| SpeechSynthesisVoiceTraitIsNoveltyVoice | 1 | The trait that indicates a voice is a novelty voice.<br>An example of a novelty voice is a character,Äôs voice in a game. |
| SpeechSynthesisVoiceTraitIsPersonalVoice | 2 | The trait that indicates a voice is a personal voice.<br>A user generates and owns a personal voice. |
| SpeechSynthesisVoiceTraitNone | 0 | The trait that indicates a voice is a regular voice. |

## 169.3 class AVSpeechSynthesizerMBS

### 169.3.1 class AVSpeechSynthesizerMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** An object that produces synthesized speech from text utterances and enables monitoring or controlling of ongoing speech.
**Notes:** To speak some text, create an AVSpeechUtteranceMBS instance that contains the text and pass it to speakUtterance on a speech synthesizer instance. You can optionally also retrieve an AVSpeechSynthesisVoiceMBS and set it on the utterance,Äôs voice property to have the speech synthesizer use that voice when speaking the utterance,Äôs text.

The speech synthesizer maintains a queue of utterances that it speaks. If the synthesizer isn,Äôt speaking, calling speakUtterance: begins speaking that utterance either immediately or after pausing for its preUtteranceDelay, if necessary. If the synthesizer is speaking, the synthesizer adds utterances to a queue and speaks them in the order it receives them.
After speech begins, you can use the synthesizer object to pause or stop speech. After pausing, you can resume the speech from its paused point or stop the speech entirely and remove all remaining utterances in the queue.
You can monitor the speech synthesizer by examining its speaking and paused properties, or by adding events.

An AVSpeechSynthesizerMBS also controls the route where the speech plays. For more information, see Directing speech output.

The system doesn,Äôt automatically retain the speech synthesizer, so you need to manually retain it until speech concludes.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr2

### 169.3.2 Methods

### 169.3.3 Constructor

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor.

### 169.3.4 continueSpeaking as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Resumes speech from its paused point.
**Notes:** Returns true if speech resumes; otherwise, false.

This method only has an effect if the speech synthesizer is in a paused state.

### 169.3.5 Destructor

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The destructor.

### 169.3.6 IPANotationAttribute as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string that contains International Phonetic Alphabet (IPA) symbols the speech synthesizer uses to control pronunciation of certain words or phrases.
**Notes:** For example, the speech synthesizer uses an AVSpeechSynthesisIPANotationAttribute instance to control pronunciation of a proper name.

### 169.3.7 pauseSpeakingAtBoundary(SpeechBoundary as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Pauses speech at the boundary you specify.
**Notes:** boundary: An enumeration that describes whether to pause speech immediately or only after the synthesizer finishes speaking the current word.

Returns true if speech pauses; otherwise, false.

The boundary parameter also affects how the speech synthesizer resumes speaking text after a pause and call to continueSpeaking. If the boundary is SpeechBoundaryImmediate, speech resumes from the exact point where it pauses, even if that point occurs in the middle of speaking a word. If the boundary is SpeechBoundaryWord, speech resumes from the word that follows the last spoken word where it pauses.

### 169.3.8 requestPersonalVoiceAuthorization

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Prompts the user to authorize your app to use personal voices.

### 169.3.9 speakUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Adds the utterance you specify to the speech synthesizer,Äôs queue.
**Notes:** utterance: An AVSpeechUtteranceMBS instance that contains text to speak.
Discussion

Warning: Attempting to enqueue the same utterance more than once throws an exception.

### 169.3.10 stopSpeakingAtBoundary(SpeechBoundary as Integer) as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Stops speech at the boundary you specify.
**Notes:** boundary: An enumeration that describes whether to stop speech immediately or only after the synthesizer finishes speaking the current word.

Returns true if speech stops; otherwise, false.

Unlike pausing a speech synthesizer, which can resume after a pause, stopping the synthesizer immediately cancels speech and removes all unspoken utterances from the synthesizer,Äôs queue.

### 169.3.11 writeUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Generates speech for the utterance and invokes the callback with the audio buffer.
**Notes:** utterance: The utterance for synthesizing speech.

Call this method to receive audio buffers to store or further process synthesized speech.

Calls SpeechSynthesizerBuffer and SpeechSynthesizerMarker events later.

### 169.3.12 Properties

### 169.3.13 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 169.3.14 isPaused as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether a speech synthesizer is in a paused state.
**Notes:** If true, the speech synthesizer is in a paused state after beginning to speak an utterance; otherwise, false.
(Read only property)

### 169.3.15 isSpeaking as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether the speech synthesizer is speaking or is in a paused state and has utterances to speak.
**Notes:** If true, the synthesizer is speaking or is in a paused state with utterances in its queue. If false, the synthesizer isn,Äôt speaking and it doesn,Äôt have any utterances in its queue.
(Read only property)

### 169.3.16 mixToTelephonyUplink as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: iOS only.

**Function:** A Boolean value that specifies whether to send synthesized speech to an active call.
**Notes:** This property has no effect when there isn,Äôt an active call.
(Read and Write property)

### 169.3.17 personalVoiceAuthorizationStatus as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Your app,Äôs authorization to use personal voices.

**Notes:** The user can grant or deny your app,Äôs request to use personal voices when they,Äôre initially prompted, and change the authorization in the Settings app. Additionally, the framework denies the request if the device doesn,Äôt support using personal voices.
(Read only property)

### 169.3.18 usesApplicationAudioSession as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: iOS only.

**Function:** A Boolean value that specifies whether the app manages the audio session.
**Notes:** If you set this value to false, the system creates a separate audio session to automatically manage speech, interruptions, and mixing and ducking the speech with other audio sources.
(Read and Write property)

### 169.3.19 Events

### 169.3.20 availableVoicesDidChange

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** An event that indicates a change in available voices for speech synthesis.
**Notes:** The system posts this notification when available voices for speech synthesis on the system change. For example, a new personal voice becomes available and the user authorized the app to access personal voices. Or new 3rd party voices become available through an app the user downloads.

### 169.3.21 didCancelSpeechUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer cancels speaking an utterance.
**Notes:** utterance: The utterance that the speech synthesizer cancels speaking.

The system only calls this method if a speech synthesizer is speaking an utterance and the system calls its stopSpeakingAtBoundary method. The system doesn,Äôt call this method if the synthesizer is in a delay between utterances when speech stops, and it doesn,Äôt call it for unspoken utterances.

### 169.3.22 didContinueSpeechUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer resumes speaking an utterance after pausing.
**Notes:** utterance: The utterance that the speech synthesizer resumes speaking.

The system only calls this method if a speech synthesizer pauses speaking and the system calls its pauseSpeakingAtBoundary method. The system doesn,Äôt call this method if the synthesizer pauses while in a delay between utterances.

### 169.3.23 didFinishSpeechUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer finishes speaking an utterance.
**Notes:** utterance: The utterance that the speech synthesizer finishes speaking.

The system ignores the final utterance,Äôs postUtteranceDelay and calls this method immediately when speech ends.

### 169.3.24 didPauseSpeechUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer pauses while speaking an utterance.
**Notes:** utterance: The utterance that the speech synthesizer pauses speaking.

The system only calls this method if a speech synthesizer is speaking an utterance and the system calls its pauseSpeakingAtBoundary method. The system doesn,Äôt call this method if the synthesizer is in a delay between utterances when speech pauses.

### 169.3.25 didStartSpeechUtterance(utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer begins speaking an utterance.
**Notes:** utterance: The utterance that the speech synthesizer starts speaking.

If the utterance,Äôs preUtteranceDelay property is greater than zero, the system calls this method after the delay completes and speech begins.

### 169.3.26 requestPersonalVoiceAuthorizationCompleted(status as Integer)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** A completion event that the system calls after the user responds to a request to authorize use of personal voices, which receives the authorization status as an argument.

### 169.3.27 SpeechSynthesizerBuffer(buffer as AVAudioBufferMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** The event that receives a buffer of generated speech.

### 169.3.28 SpeechSynthesizerMarker(markers() as AVSpeechSynthesisMarkerMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** The event that receives speech markers.

### 169.3.29 willSpeakMarker(marker as AVSpeechSynthesisMarkerMBS, utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer is about to speak a marker of an utterance,Äôs text.
**Notes:** marker: The synthesized audio that the speech synthesizer is about to speak.
utterance: The utterance that the speech synthesizer pauses speaking.

### 169.3.30 willSpeakRangeOfSpeechString(characterRange as NSRangeMBS, utterance as AVSpeechUtteranceMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: .

**Function:** Tells you when the synthesizer is about to speak a portion of an utterance,Äôs text.
**Notes:** characterRange: The range of characters in the utterance,Äôs speechString that correspond to the unit of speech the synthesizer is about to speak.
utterance: The utterance that the speech synthesizer is about to speak.

The system calls this method once for each unit of speech in the utterance,Äôs text, which is generally a word.

Tip
Implement this method if you want to provide a user interface to visually highlight each word as the synthesizer speaks it.

### 169.3.31 Constants

Speech Boundaries

| Constant | Value | Description |
|---|---|---|
| SpeechBoundaryImmediate | 0 | Indicates to pause or stop speech immediately. |
| SpeechBoundaryWord | 1 | Indicates to pause or stop speech after the synthesizer finishes speaking the current word. |

Authorization Status

| Constant | Value | Description |
|---|---|---|
| SpeechSynthesisPersonalVoiceAuthorizationStatusAuthorized | 3 | The user granted your app,Äôs request to use |
| SpeechSynthesisPersonalVoiceAuthorizationStatusDenied | 1 | The user denied your app,Äôs request to use |
| SpeechSynthesisPersonalVoiceAuthorizationStatusNotDetermined | 0 | The app hasn,Äôt requested authorization to |
| SpeechSynthesisPersonalVoiceAuthorizationStatusUnsupported | 2 | The device doesn,Äôt support personal voices |

## 169.4 class AVSpeechUtteranceMBS

### 169.4.1 class AVSpeechUtteranceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** An object that encapsulates the text for speech synthesis and parameters that affect the speech.
**Notes:** An AVSpeechUtterance is the basic unit of speech synthesis.

To synthesize speech, create an AVSpeechUtterance instance with text you want a speech synthesizer to speak. Optionally, change the voice, pitchMultiplier, volume, rate, preUtteranceDelay, or postUtteranceDelay parameters for the utterance. Pass the utterance to an instance of AVSpeechSynthesizer to begin speech, or enqueue the utterance to speak later if the synthesizer is already speaking.

Split a body of text into multiple utterances if you want to apply different speech parameters. For example, you can emphasize a sentence by increasing the pitch and decreasing the rate of that utterance relative to others, or you can introduce pauses between sentences by putting each into an utterance with a leading or trailing delay.

Set and use the AVSpeechSynthesizerMBS events to receive notifications when the synthesizer starts or finishes speaking an utterance. Create an utterance for each meaningful unit in a body of text if you want to receive notifications as its speech progresses.

### 169.4.2 Methods

### 169.4.3 Constructor(s as NSAttributedStringMBS)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an utterance with the attributed text string that you specify for the speech synthesizer to speak.
**Notes:** To speak the text, pass the utterance to an instance of AVSpeechSynthesizerMBS.
See also:

- 169.4.4 Constructor(s as string) 21247

### 169.4.4 Constructor(s as string)

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an utterance with the text string that you specify for the speech synthesizer to speak.
**Example:**

```
Dim s As New AVSpeechUtteranceMBS("test")

MessageBox s.speechString
```

See also:

- 169.4.3 Constructor(s as NSAttributedStringMBS) 21247

### 169.4.5 copy as AVSpeechUtteranceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates a copy of the object.

### 169.4.6 speechUtteranceWithAttributedString(s as NSAttributedStringMBS) as AVSpeechUtteranceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an utterance with the attributed text string that you specify for the speech synthesizer to speak.

### 169.4.7 speechUtteranceWithSSMLRepresentation(s as string) as AVSpeechUtteranceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Returns a new speech utterance with an Speech Synthesis Markup Language (SSML) string.
**Notes:** string: A string to speak that contains valid SSML markup. The initializer returns nil if you pass an invalid SSML string.

Returns a new speech utterance, or nil if the SSML string is invalid.

If using SSML to request voices that fall under certain attributes, the system may split a single utterance into multiple parts and send each to an appropriate synthesizer.
If no voice matches the properties, the utterance uses the voice set in its voice property. If you don,Äôt specify a voice, the system uses its default voice.

Note
Speech utterance properties that affect the prosody of a voice, such as its rate and pitchMultiplier, don,Äôt

apply to an utterance that uses an SSML representation.

### 169.4.8 speechUtteranceWithString(s as string) as AVSpeechUtteranceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** Creates an utterance with the text string that you specify for the speech synthesizer to speak.

### 169.4.9 Properties

### 169.4.10 attributedSpeechString as NSAttributedStringMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** An attributed string that contains the text for speech synthesis.
**Notes:** You can,Äôt change an utterance,Äôs text after initializaiton. If you want the speech synthesizer to speak different text, create a new utterance.
(Read only property)

### 169.4.11 Handle as Integer

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 169.4.12 pitchMultiplier as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The baseline pitch the speech synthesizer uses when speaking the utterance.
**Notes:** Before enqueing the utterance, set this property to a value within the range of 0.5 for lower pitch to 2.0 for higher pitch. The default value is 1.0. Setting this after enqueing the utterance has no effect.
(Read and Write property)

### 169.4.13 postUtteranceDelay as Double

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The amount of time the speech synthesizer pauses after speaking an utterance before handling the next utterance in the queue.
**Notes:** When multiple utterances exist in the queue, the speech synthesizer pauses a minimum amount of time equal to the sum of the current utterance,Äôs postUtteranceDelay and the next utterance,Äôs preUtteranceDelay.
(Read and Write property)

### 169.4.14 prefersAssistiveTechnologySettings as Boolean

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean that specifies whether assistive technology settings take precedence over the property values of this utterance.
**Notes:** If this property is true, but no assistive technology, such as VoiceOver, is on, the speech synthesizer uses the utterance property values.
(Read and Write property)

### 169.4.15 preUtteranceDelay as Double

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The amount of time the speech synthesizer pauses before speaking the utterance.
**Notes:** When multiple utterances exist in the queue, the speech synthesizer pauses a minimum amount of time equal to the sum of the current utterance,Äôs postUtteranceDelay and the next utterance,Äôs preUtteranceDelay.
(Read and Write property)

### 169.4.16 rate as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The rate the speech synthesizer uses when speaking the utterance.
**Notes:** The speech rate is a decimal representation within the range of AVSpeechUtteranceMinimumSpeechRate and AVSpeechUtteranceMaximumSpeechRate. Lower values correspond to slower speech, and higher values correspond to faster speech. The default value is AVSpeechUtteranceDefaultSpeechRate. Set this property before enqueing the utterance because setting it afterward has no effect.
(Read and Write property)

### 169.4.17 speechString as String

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** A string that contains the text for speech synthesis.
**Notes:** You can,Äôt change an utterance,Äôs text after initializaiton. If you want the speech synthesizer to speak different text, create a new utterance.
(Read only property)

### 169.4.18 voice as AVSpeechSynthesisVoiceMBS

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The voice the speech synthesizer uses when speaking the utterance.
**Notes:** If you don,Äôt specify a voice, the speech synthesizer uses the system,Äôs default voice to speak the utterance.
(Read and Write property)

### 169.4.19 volume as Single

MBS AVFoundation Plugin, Plugin Version: 24.1, Platforms: macOS, iOS, Targets: All.

**Function:** The volume the speech synthesizer uses when speaking the utterance.
**Notes:** Before enqueing the utterance, set this property to a value within the range of 0.0 for silent to 1.0 for loudest volume. The default value is 1.0. Setting this after enqueing the utterance has no effect.
(Read and Write property)

## 169.5 class NSSpeechRecognizerMBS

### 169.5.1 class NSSpeechRecognizerMBS

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to handle the cocoa speech recognition.
**Notes:** Available in Mac OS X v10.3 and later.

See newer SFSpeechRecognizerMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 169.5.2 Methods

### 169.5.3 commands as string()

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current list of commands.

### 169.5.4 Destructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 169.5.5 SetCommands(commands() as string)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the list of commands for which the receiver should listen to commands.
**Notes:** If the receiver is already listening, the current command list is updated and listening continues. commands should be an array of strings. The commands must be in U.S. English.

### 169.5.6 StartListening

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells the speech recognition engine to begin listening for commands.
**Notes:** When a command is recognized the message didRecognizeCommand is called.

### 169.5.7 StopListening

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells the speech recognition engine to suspend listening for commands.

### 169.5.8 Properties

### 169.5.9 BlocksOtherRecognizers as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver should block all other recognizers (that is, other applications attempting to understand spoken commands) when listening.
**Notes:** (Read and Write property)

### 169.5.10 DisplayedCommandsTitle as string

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the title of the commands section or "" if there is no title.
**Notes:** Commands are displayed in the Speech Commands window indented under a section with this title. (Read and Write property)

### 169.5.11 ListensInForegroundOnly as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the receiver should only enable its commands when the receiver's application is the frontmost one.
**Notes:** (Read and Write property)

### 169.5.12 Events

### 169.5.13 DidRecognizeCommand(command as string)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: .

**Function:** Invoked when the recognition engine has recognized the application command command.
**Notes:** command is one of the strings from the array passed to setCommands. The delegate typically evaluates which command was recognized and performs the related action.

## 169.6 class NSSpeechSynthesizerMBS

### 169.6.1 class NSSpeechSynthesizerMBS

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class to handle the cocoa speech synthesizing.
**Notes:** Available in Mac OS X v10.3 and later.

More details on Apple's website:
https://developer.apple.com/library/mac/documentation/Cocoa/Reference/ApplicationKit/Classes/NSSpeech-Synthesizer_Class/
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr9
- MBS Xojo / Real Studio Plugins, version 13.2pr7
- MBS Real Studio Plugins, version 13.1pr11

### 169.6.2 Methods

### 169.6.3 addSpeechDictionary(speechDictionary as dictionary)

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Registers the given speech dictionary with the receiver.
**Notes:** speechDictionary: Speech dictionary to add to the receiver's dictionaries.

See the discussion of UseSpeechDictionary in Speech Synthesis Manager Reference for more information.
Available in OS X v10.5 and later.

### 169.6.4 attributesForVoice(voice as String) as NSVoiceMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns information about a voice or nil.

### 169.6.5 availableVoice(index as Integer) as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns name of a voice.
**Notes:** The available voices can be listed using this function.
Index is from 0 to count-1.

### 169.6.6 availableVoices as String()

MBS MacCocoa Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the array with the identifiers for the available voices.
**Example:**

MsgBox Join(NSSpeechSynthesizerMBS.availableVoices)

**Notes:** Same as availableVoice() and availableVoicesCount, but this function returns an array which is very useful for for-each-loops.

### 169.6.7 availableVoicesCount as Integer

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Number of voices available.

### 169.6.8 Constructor

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the class with the default voice.
**Notes:** This constructor is needed for the events to fire.
The given voice must be valid!
See also:

- 169.6.9 Constructor(voice as string) 21256

### 169.6.9 Constructor(voice as string)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initializes the class with a voice.
**Notes:** This constructor is needed for the events to fire.
See also:

• 169.6.8 Constructor 21256

### 169.6.10 continueSpeaking

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Continues speaking after it has been paused.
**Notes:** Mac OS X 10.5 only.

### 169.6.11 defaultVoice as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the identifier of the default voice.
**Example:**

```
dim s as NSSpeechSynthesizerMBS

s=new NSSpeechSynthesizerMBS

MsgBox s.defaultVoice
```

### 169.6.12 Destructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 169.6.13 isAnyApplicationSpeaking as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether any other application is currently speaking through the sound output device.

### 169.6.14 NSSpeechCharacterModeProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.

**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS

call s.setObjectForProperty(s.NSSpeechModeLiteral, s.NSSpeechCharacterModeProperty, e)
msgBox s.objectForProperty(s.NSSpeechCharacterModeProperty, e)

call s.setObjectForProperty(s.NSSpeechModeNormal, s.NSSpeechCharacterModeProperty, e)
msgBox s.objectForProperty(s.NSSpeechCharacterModeProperty, e)
```

**Notes:** Get or set the synthesizer's current text-processing mode. A string that specifies whether the channel is currently in text input mode or phoneme input mode.
When the character-processing mode is NSSpeechModeNormal, input characters are spoken as you would expect to hear them. When the mode is NSSpeechModeLiteral, each character is spoken literally, so that the word "cat" is spoken "C–A–T".
Available in OS X v10.5 and later.

### 169.6.15 NSSpeechCommandDelimiterProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Set the embedded speech command delimiter characters to be used for the synthesizer. A dictionary that contains the delimiter information. See "Command Delimiter Keys" for the keys you can use to specify values in this dictionary.
By default, the opening delimiter is " [ [ " and the closing delimiter is " ] ] ". Your application might need to change these delimiters temporarily if those character sequences occur naturally in a text buffer that is to be spoken. Your application can also disable embedded command processing by passing empty delimiters (as empty strings). See "Speech Command Delimiter" for the keys you can use to specify values in this dictionary.
Available in OS X v10.5 and later.

### 169.6.16 NSSpeechCommandPrefix as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants speech-command delimiters keys used in NSSpeechCommandDelimiterProperty.
**Notes:** The command delimiter string that prefixes a command, by default, this is [ [ .
Available in OS X v10.5 and later.

### 169.6.17 NSSpeechCommandSuffix as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants speech-command delimiters keys used in NSSpeechCommandDelimiter-Property.
**Notes:** The command delimiter string that suffixes a command,by default, this is ] ] .
Available in OS X v10.5 and later.

### 169.6.18 NSSpeechCurrentVoiceProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Set the current voice on the synthesizer to the specified voice. A dictionary that contains the phoneme symbols and example words defined for the current synthesizer.
Your application might use this information to show the user what symbols to use when entering phonemic text directly. See "NSSpeechPhonemeSymbolsProperty Dictionary Keys" for the keys you can use to specify values in this dictionary.
Available in OS X v10.5 and later.

### 169.6.19 NSSpeechDictionaryAbbreviations as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** An array of dictionary objects containing the keys NSSpeechDictionaryEntrySpelling and NSSpeech-DictionaryEntryPhonemes.
Available in OS X v10.5 and later.

### 169.6.20 NSSpeechDictionaryEntryPhonemes as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** The phonemic representation of an entry. A string.
Available in OS X v10.5 and later.

### 169.6.21 NSSpeechDictionaryEntrySpelling as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** The spelling of an entry. A string.
Available in OS X v10.5 and later.

### 169.6.22 NSSpeechDictionaryLocaleIdentifier as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** The canonical locale identifier string describing the dictionary's locale. A locale is generally composed of three pieces of ordered information: a language code, a region code, and a variant code. Refer to documentation about NSLocale or Locales Programming Guide for more information
Available in OS X v10.5 and later.

### 169.6.23 NSSpeechDictionaryModificationDate as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** A string representation of the dictionary's last modification date in the international format (YYYY-MM-DD HH:MM:SS ¬±HHMM). If the same word appears across multiple dictionaries, the one from the dictionary with the most recent date will be used.
Available in OS X v10.5 and later.

### 169.6.24 NSSpeechDictionaryPronunciations as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify key-value pairs used to add vocabulary to the dictionary using addSpeechDictionary.
**Notes:** An array of dictionary objects containing the keys NSSpeechDictionaryEntrySpelling and NSSpeechDictionaryEntryPhonemes.

### 169.6.25 NSSpeechErrorCount as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants identify errors that may occur during speech synthesis. They are used with NSSpeechErrorsProperty.
**Notes:** The number of errors that have occurred in processing the current text string, since the last call to objectForProperty with the NSSpeechErrorsProperty property. A Number
Using the NSSpeechErrorOldestCode keys and the NSSpeechErrorNewestCode keys, you can get information about the oldest and most recent errors that occurred since the last call to objectForProperty, but you cannot get information about any intervening errors.
Available in OS X v10.5 and later.

### 169.6.26 NSSpeechErrorNewestCharacterOffset as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants identify errors that may occur during speech synthesis. They are used with NSSpeechErrorsProperty.
**Notes:** The position in the text string of the most recent error that occurred since the last call to objectForProperty with the NSSpeechErrorsProperty property. A Number.
Available in OS X v10.5 and later.

### 169.6.27 NSSpeechErrorNewestCode as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants identify errors that may occur during speech synthesis. They are used with NSSpeechErrorsProperty.
**Notes:** The error code of the most recent error that occurred since the last call to objectForProperty with the NSSpeechErrorsProperty property. A number
Available in OS X v10.5 and later.

### 169.6.28 NSSpeechErrorOldestCharacterOffset as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants identify errors that may occur during speech synthesis. They are used with NSSpeechErrorsProperty.
**Notes:** The position in the text string of the first error that occurred since the last call to objectForProperty with the NSSpeechErrorsProperty property. A number
Available in OS X v10.5 and later.

### 169.6.29 NSSpeechErrorOldestCode as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the key constants identify errors that may occur during speech synthesis. They are used with NSSpeechErrorsProperty.
**Notes:** The error code of the first error that occurred since the last call to objectForProperty with the NSSpeechErrorsProperty property. A Number
Available in OS X v10.5 and later.

### 169.6.30 NSSpeechErrorsProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Get speech-error information for the synthesizer. An Dictionary object that contains speech-error information. See "NSSpeechErrorProperty Dictionary Keys" for a description of the keys present in the dictionary.
This property lets you get information about various run-time errors that occur during speaking, such as the detection of badly formed embedded commands. Errors returned directly by the Speech Synthesis Manager are not reported here.
If your application implements the didEncounterErrorAtIndex event, the event can use this property to get error information.
Available in OS X v10.5 and later.

### 169.6.31 NSSpeechInputModeProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Get or set the synthesizer's current text-processing mode. A string that specifies whether the channel is currently in text input mode or phoneme input mode.The supported values are listed in "Speaking Modes for NSSpeechInputModeProperty."
When in phoneme-processing mode, a text string is interpreted to be a series of characters representing various phonemes and prosodic controls. Some synthesizers might support additional input-processing modes and define constants for these modes.
Available in OS X v10.5 and later.

### 169.6.32 NSSpeechModeLiteral as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants defining the available text-processing and number-processing modes for a synthesizer. This key is used with NSSpeechInputModeProperty and NSSpeechNumberModeProperty)
**Notes:** Indicates that each digit or character is spoken literally (so that 12 is spoken as "one, two", or the word "cat" is spoken as "C A T").
Available in OS X v10.5 and later.

### 169.6.33 NSSpeechModeNormal as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants defining the available text-processing and number-processing modes for a synthesizer. This key is used with NSSpeechInputModeProperty and NSSpeechNumberModeProperty)
**Notes:** Indicates that the synthesizer assembles digits into numbers (so that 12 is spoken as "twelve") and text into words.
Available in OS X v10.5 and later.

### 169.6.34 NSSpeechModePhoneme as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify input modes are used with NSSpeechInputModeProperty.
**Notes:** Indicates that the synthesizer is in phoneme-processing mode. When in phoneme-processing mode, a text buffer is interpreted to be a series of characters representing various phonemes and prosodic controls.
Available in OS X v10.5 and later.

### 169.6.35 NSSpeechModeText as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify input modes are used with NSSpeechInputModeProperty.
**Notes:** Indicates that the synthesizer is in text-processing mode.
Available in OS X v10.5 and later.

### 169.6.36 NSSpeechNumberModeProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS

call s.setObjectForProperty(s.NSSpeechModeLiteral, s.NSSpeechNumberModeProperty, e)
msgBox s.objectForProperty(s.NSSpeechNumberModeProperty, e)

call s.setObjectForProperty(s.NSSpeechModeNormal, s.NSSpeechNumberModeProperty, e)
msgBox s.objectForProperty(s.NSSpeechNumberModeProperty, e)
```

**Notes:** Get or set the synthesizer's current number-processing mode. A string that specifies whether the synthesizer is currently in normal or literal number-processing mode. The constants NSSpeechModeNormal and NSSpeechModeLiteral are the possible values of this string.
When the number-processing mode is NSSpeechModeNormal, the synthesizer assembles digits into numbers (so that "12" is spoken as "twelve"). When the mode is NSSpeechModeLiteral, each digit is spoken literally (so that "12" is spoken as "one, two").
Available in OS X v10.5 and later.

### 169.6.37 NSSpeechOutputToFileURLProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Set the speech output destination to a file or to the computer's speakers. A NSURL object. To write the speech output to a file, use the file's NSURL; to generate the sound through the computer's speakers, use nil.
Available in OS X v10.5 and later.

### 169.6.38 NSSpeechPhonemeInfoExample as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used in the NSSpeechPhonemeSymbolsProperty dictionary.
**Notes:** An example word that illustrates the use of the phoneme.
Available in OS X v10.5 and later.

### 169.6.39 NSSpeechPhonemeInfoHiliteEnd as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used in the NSSpeechPhonemeSymbolsProperty dictionary.

**Notes:** The character offset into the example word that identifies the location of the end of the phoneme.
Available in OS X v10.5 and later.

### 169.6.40 NSSpeechPhonemeInfoHiliteStart as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used in the NSSpeechPhonemeSymbolsProperty dictionary.
**Notes:** The character offset into the example word that identifies the location of the beginning of the phoneme.
Available in OS X v10.5 and later.

### 169.6.41 NSSpeechPhonemeInfoOpcode as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used in the NSSpeechPhonemeSymbolsProperty dictionary.
**Notes:** The opcode as Number.
Available in OS X v10.5 and later.

### 169.6.42 NSSpeechPhonemeInfoSymbol as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the keys used in the NSSpeechPhonemeSymbolsProperty dictionary.
**Notes:** The symbol used to represent the phoneme.
The symbol does not necessarily have a phonetic connection to the phoneme, but might simply be an abstract textual representation of it.
Available in OS X v10.5 and later.

### 169.6.43 NSSpeechPhonemeSymbolsProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Get a list of phoneme symbols and example words defined for the synthesizer. A Dictionary object that contains the phoneme symbols and example words defined for the current synthesizer
Your application might use this information to show the user what symbols to use when entering phonemic text directly. See "NSSpeechPhonemeSymbolsProperty Dictionary Keys" for a description of the keys present in the dictionary.

Available in OS X v10.5 and later.

### 169.6.44 NSSpeechPitchBaseProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS

dim n as Integer = s.objectForProperty(s.NSSpeechPitchBaseProperty, e)
msgBox str(n)
```

**Notes:** Get or set a synthesizer's baseline speech pitch. An number that specifies the baseline speech pitch. Typical voice frequencies range from around 90 hertz for a low-pitched male voice to perhaps 300 hertz for a high-pitched child's voice. These frequencies correspond to approximate pitch values in the ranges of 30.000 to 40.000 and 55.000 to 65.000, respectively.
Note: The change in speech pitch may not be noticeable until the next sentence or paragraph is spoken.
Available in OS X v10.5 and later.

### 169.6.45 NSSpeechPitchModProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS

dim n as Double = s.objectForProperty(s.NSSpeechPitchModProperty, e)
msgBox str(n)
```

**Notes:** Get or set a synthesizer's pitch modulation. A number object that specifies the synthesizer's pitch modulation.
Pitch modulation is also expressed as a floating-point value in the range of 0.000 to 127.000. These values correspond to MIDI note values, where 60.000 is equal to middle C on a piano scale. The most useful speech pitches fall in the range of 40.000 to 55.000. A pitch modulation value of 0.000 corresponds to a monotone in

which all speech is generated at the frequency corresponding to the speech pitch. Given a speech pitch value of 46.000, a pitch modulation of 2.000 would mean that the widest possible range of pitches corresponding to the actual frequency of generated text would be 44.000 to 48.000.

Note: The change in pitch modulation may not be noticeable until the next sentence or paragraph is spoken.
Available in OS X v10.5 and later.

### 169.6.46 NSSpeechRateProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS
dim value as Double = s.objectForProperty(s.NSSpeechRateProperty, e)
MsgBox str(value)
```

**Notes:** Get or set the synthesizer's baseline speech pitch. A number that specifies the synthesizer's baseline speech pitch.
Typical voice frequencies range from around 90 hertz for a low-pitched male voice to perhaps 300 hertz for a high-pitched child's voice. These frequencies correspond to approximate pitch values in the ranges of 30.000 to 40.000 and 55.000 to 65.000, respectively.
Available in OS X v10.5 and later.

### 169.6.47 NSSpeechRecentSyncProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Get the message code for the most recently encountered synchronization command. A number that specifies the most recently encountered synchronization command.

Available in OS X v10.5 and later.

### 169.6.48 NSSpeechResetProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Set a synthesizer back to its default state. There is no value associated with this property; to reset the channel to its default state, set the key to nil.
You can use this function to, for example, set speech pitch and speech rate to default values.
Available in OS X v10.5 and later.

### 169.6.49 NSSpeechStatusNumberOfCharactersLeft as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify speech status keys used with NSSpeechStatusProperty.
**Notes:** The number of characters left in the input string of text.
When the value of this key is zero, you can destroy the input string.
Available in OS X v10.5 and later.

### 169.6.50 NSSpeechStatusOutputBusy as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify speech status keys used with NSSpeechStatusProperty.
**Notes:** Indicates whether the synthesizer is currently producing speech.
A synthesizer is considered to be producing speech even at some times when no audio data is being produced through the computer's speaker. This occurs, for example, when the synthesizer is processing input, but has not yet initiated speech or when speech output is paused.
Available in OS X v10.5 and later.

### 169.6.51 NSSpeechStatusOutputPaused as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify speech status keys used with NSSpeechStatusProperty.
**Notes:** Indicates whether speech output in the synthesizer has been paused by sending the message pauseSpeakingAtBoundary.
Available in OS X v10.5 and later.

### 169.6.52 NSSpeechStatusPhonemeCode as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants identify speech status keys used with NSSpeechStatusProperty.
**Notes:** Indicates that the synthesizer is in phoneme-processing mode. When in phoneme-processing mode, a text buffer is interpreted to be a series of characters representing various phonemes and prosodic controls.
Available in OS X v10.5 and later.

### 169.6.53 NSSpeechStatusProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS

call s.startSpeakingString "Hello"

dim status as Dictionary = s.objectForProperty(s.NSSpeechStatusProperty, e)
dim CharactersLeft as Integer = status.Value(s.NSSpeechStatusNumberOfCharactersLeft)

MsgBox str(CharactersLeft)+" Characters left"
```

**Notes:** Get speech-status information for the synthesizer. A dictionary that contains speech-status information for the synthesizer. See "NSSpeechStatusProperty Dictionary Keys" for a description of the keys present in the dictionary.
Available in OS X v10.5 and later.

### 169.6.54 NSSpeechSynthesizerInfoIdentifier as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants are keys used in the NSSpeechSynthesizerInfoProperty dictionary.
**Notes:** The identifier of the speech synthesizer.
Available in OS X v10.5 and later.

### 169.6.55 NSSpeechSynthesizerInfoProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Notes:** Get information about the speech synthesizer being used on the specified synthesizer. A dictionary object that contains information about the speech synthesizer being used on the specified synthesizer. See "Speech Synthesizer Property Keys" for a description of the keys present in the dictionary.
Available in OS X v10.5 and later.

### 169.6.56 NSSpeechSynthesizerInfoVersion as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants are keys used in the NSSpeechSynthesizerInfoProperty dictionary.
**Notes:** The version of the speech synthesizer.
Available in OS X v10.5 and later.

### 169.6.57 NSSpeechVolumeProperty as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants used with setObjectForProperty and objectForProperty to get or set the characteristics of a synthesizer.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
dim e as NSErrorMBS
dim value as Double = s.objectForProperty(s.NSSpeechVolumeProperty, e)
MsgBox str(value)
```

**Notes:** Get or set the speech volume for a synthesizer. A Number that specifies the synthesizer's speech volume.
Volumes are expressed in floating-point values ranging from 0.0 through 1.0. A value of 0.0 corresponds to silence, and a value of 1.0 corresponds to the maximum possible volume. Volume units lie on a scale that is linear with amplitude or voltage. A doubling of perceived loudness corresponds to a doubling of the volume.
Available in OS X v10.5 and later.

You may prefer to simply use the volume property.

### 169.6.58 objectForProperty(PropertyName as string, byref error as NSErrorMBS) as Variant

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides the value of a receiver's property.
**Notes:** PropertyName: Property to get.
error: On output, error that occurred while obtaining the value of speechProperty.

Returns the value of speechProperty.
Available in OS X v10.5 and later.

### 169.6.59 pauseSpeakingAtBoundary(boundary as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Pauses the speaking on the given boundary.
**Example:**

```
dim s as NSSpeechSynthesizerMBS // your synthesizer
s.pauseSpeakingAtBoundary s.NSSpeechSentenceBoundary // pause on end of sentence.
```

**Notes:** Mac OS X 10.5 only.
boundary can be NSSpeechImmediateBoundary, NSSpeechSentenceBoundary or NSSpeechWordBoundary.

### 169.6.60 phonemesFromText(text as string) as string

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the phonems from a given text.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS

MsgBox s.phonemesFromText("Hello")

// shows "_hEHl1OW."
```

**Notes:** Mac OS X 10.5 only.

### 169.6.61 setObjectForProperty(value as Variant, PropertyName as string, byref error as NSErrorMBS) as boolean

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies the value of a receiver's property.
**Notes:** PropertyName: Property to set.
Error: On output, error that occurred while setting speechProperty.

Returns true when the speechProperty was set. False when there was an error, specified in error.
Available in OS X v10.5 and later.

### 169.6.62 SetVoice(voice as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the receiver's current voice.
**Notes:** Returns true on success.

### 169.6.63 StartSpeakingString(text as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Begins speaking synthesized text through the system's default sound output device.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS

s.rate=300 // not slow
s.volume=0.5 // not loud
call s.startSpeakingString "Hello World"
```

**Notes:** Returns true when synthesis starts successfully, false otherwise.

If the receiver is currently speaking synthesized speech when startSpeakingString is called, that process is stopped before text is spoken.

When synthesis of text finishes normally or is stopped, the message didFinishSpeaking(true) is called.
See also:

- 169.6.64 StartSpeakingString(text as string, file as folderitem) as boolean 

- 169.6.65 startSpeakingString(Text as String, URL as string) as boolean 21273

### 169.6.64 StartSpeakingString(text as string, file as folderitem) as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Begins synthesizing text into a sound (AIFF) file.
**Notes:** Returns true when synthesis starts successfully, false otherwise.

When synthesis of text finishes normally or is stopped, the message didFinishSpeaking(True) is called.

One example of how you might use this method is in an email program that automatically converts new messages into sound files that can be stored on an iPod for later listening.
See also:

- 169.6.63 StartSpeakingString(text as string) as boolean 21272
- 169.6.65 startSpeakingString(Text as String, URL as string) as boolean 21273

### 169.6.65 startSpeakingString(Text as String, URL as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Begins synthesizing text into a sound (AIFF) file.
**Notes:** Returns true when synthesis starts successfully, false otherwise.

When synthesis of text finishes normally or is stopped, the message didFinishSpeaking(True) is called.

One example of how you might use this method is in an email program that automatically converts new messages into sound files that can be stored on an iPod for later listening.
See also:

- 169.6.63 StartSpeakingString(text as string) as boolean 21272
- 169.6.64 StartSpeakingString(text as string, file as folderitem) as boolean 21273

### 169.6.66 StopSpeaking

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops synthesis in progress.
**Notes:** If the receiver is currently generating speech, synthesis is halted, and the message didFinishSpeaking(false) is called.

### 169.6.67 stopSpeakingAtBoundary(boundary as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops speech on the next w
**Notes:** Mac OS X 10.5 only.

### 169.6.68 Properties

### 169.6.69 IsSpeaking as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver is currently generating synthesized speech.
**Notes:** true when the receiver is generating synthesized speech, false otherwise.
(Read only property)

### 169.6.70 rate as Double

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current rate of the speech.
**Example:**

```
dim s as NSSpeechSynthesizerMBS
s=new NSSpeechSynthesizerMBS
MsgBox str(s.rate)
// shows e.g. "160"
```

**Notes:** Mac OS X 10.5 only.
The range of supported rates is not predefined by the Speech Synthesis framework; but the synthesizer may only respond to a limited range of speech rates. Average human speech occurs at a rate of 180 to 220 words per minute.
(Read and Write property)

### 169.6.71 UsesFeedbackWindow as boolean

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Indicates whether the receiver uses the speech feedback window.
**Notes:** (Read and Write property)

### 169.6.72 Voice as string

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current voice.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
MsgBox s.voice
// shows e.g. "com.apple.speech.synthesis.voice.Zarvox"
```

**Notes:** (Read and Write property)

### 169.6.73 volume as Double

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The volume of the speech.
**Example:**

```
dim s as new NSSpeechSynthesizerMBS
MsgBox str(s.volume)
// shows e.g. 1
```

**Notes:** No sound is zero, full sound one.
Mac OS X 10.5 only.

Volumes are expressed in floating-point units ranging from 0.0 through 1.0. A value of 0.0 corresponds to silence, and a value of 1.0 corresponds to the maximum possible volume. Volume units lie on a scale that is linear with amplitude or voltage. A doubling of perceived loudness corresponds to a doubling of the volume.

Setting a value outside this range is undefined.
(Read and Write property)

### 169.6.74 Events

### 169.6.75 didEncounterErrorAtIndex(characterIndex as Integer, text as string, message as string)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** An event called when an error has been found in the text while speaking.
**Notes:** Mac OS X 10.5 only.

### 169.6.76 didEncounterSyncMessage(message as string)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: .

**Function:** A sync message was found in the text.
**Notes:** See Apple Speech documentation about the special tags you need to place in the text to get this event.
Mac OS X 10.5 only.

### 169.6.77 didFinishSpeaking(finishedSpeaking as boolean)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: .

**Function:** Called when speaking through the sound output device is done.
**Notes:** finishedSpeaking is true when finished normally and false when StopSpeaking was called.

### 169.6.78 willSpeakPhoneme(phonemeOpcode as Integer)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: .

**Function:** Sent just before a synthesized phoneme is spoken through the sound output device.
**Notes:** phonemeOpcode: Phoneme that sender is about to speak into the sound output device.

One use of this method might be to animate a mouth on screen to match the generated speech.

Important: The delegate is not sent this message when the SpeechSynthesizer object is synthesizing speech to a file (startSpeakingString).

### 169.6.79 willSpeakWord(Position as Integer, Length as Integer, Text as String)

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: .

**Function:** Sent just before a synthesized word is spoken through the sound output device.
**Notes:** Position and Length: Word that sender is about to speak into the sound output device.
text: Text that is being synthesized by sender.

One use of this method might be to visually highlight the word being spoken.

Important: The delegate is not sent this message when the SpeechSynthesizer object is synthesizing speech to a file (startSpeakingString).

### 169.6.80 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSSpeechImmediateBoundary | 0 | One of the constants for the pauseSpeakingAtBoundary method. Mac OS X 10.5 only. |
| NSSpeechSentenceBoundary | 2 | One of the constants for the pauseSpeakingAtBoundary method. Mac OS X 10.5 only. |
| NSSpeechWordBoundary | 1 | One of the constants for the pauseSpeakingAtBoundary method. Mac OS X 10.5 only. |

## 169.7 class NSVoiceMBS

### 169.7.1 class NSVoiceMBS

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A voice on Mac OS X with its attributes.
**Notes:** Available in Mac OS X v10.3 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr7

### 169.7.2 Methods

### 169.7.3 Age as Integer

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The perceived age (in years) of the voice.

### 169.7.4 Constructor

MBS MacCocoa Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 169.7.5 Demotext as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A demonstration string to speak.

### 169.7.6 Gender as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The perceived gender of the voice.
**Notes:** May be either GenderNeuter ("VoiceGenderNeuter), GenderFemale ("VoiceGenderFemale"), or GenderMale ("VoiceGenderMale").

### 169.7.7 GenderFemale as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible values for the gender property.

### 169.7.8 GenderMale as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible values for the gender property.

### 169.7.9 GenderNeuter as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the possible values for the gender property.

### 169.7.10 Identifier as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A unique string identifying the voice. The identifiers of the system voices are listed below.
**Notes:** Identifiers of the Mac OS X system voices
com.apple.speech.synthesis.voice.Agnes
com.apple.speech.synthesis.voice.Albert
com.apple.speech.synthesis.voice.BadNews
com.apple.speech.synthesis.voice.Bahh
com.apple.speech.synthesis.voice.Bells
com.apple.speech.synthesis.voice.Boing
com.apple.speech.synthesis.voice.Bruce
com.apple.speech.synthesis.voice.Bubbles
com.apple.speech.synthesis.voice.Cellos
com.apple.speech.synthesis.voice.Deranged
com.apple.speech.synthesis.voice.Fred
com.apple.speech.synthesis.voice.GoodNews
com.apple.speech.synthesis.voice.Hysterical
com.apple.speech.synthesis.voice.Junior
com.apple.speech.synthesis.voice.Kathy
com.apple.speech.synthesis.voice.Organ
com.apple.speech.synthesis.voice.Princess
com.apple.speech.synthesis.voice.Ralph
com.apple.speech.synthesis.voice.Trinoids

com.apple.speech.synthesis.voice.Vicki
com.apple.speech.synthesis.voice.Victoria
com.apple.speech.synthesis.voice.Whisper
com.apple.speech.synthesis.voice.Zarvox

### 169.7.11 Language as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The language of the voice (currently US English only).
**Notes:** Language has been replaced by LocaleIdentifier in Mac OS X 10.5.

### 169.7.12 LocaleIdentifier as String

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The locale identifier.
**Example:**

```
dim v as NSVoiceMBS
dim s as NSSpeechSynthesizerMBS
dim n as string

s=new NSSpeechSynthesizerMBS

n=s.voice
v=s.attributesForVoice(n)

MsgBox n+EndOfLine+v.LocaleIdentifier
// shows for example "en_US"
```

**Notes:** Mac OS X 10.5 only.

Language has been replaced by LocaleIdentifier in Mac OS X 10.5.

### 169.7.13 Name as String

MBS MacCocoa Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of the voice suitable for display.

### 169.7.14 NSVoiceAge as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** The perceived age (in years) of the voice. A string.

### 169.7.15 NSVoiceDemoText as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** A demonstration string to speak. A String.

### 169.7.16 NSVoiceGender as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** The perceived gender of the voice.

### 169.7.17 NSVoiceIdentifier as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** A unique string identifying the voice.

Identifiers of the OS X system voices:
com.apple.speech.synthesis.voice.Agnes
com.apple.speech.synthesis.voice.Albert
com.apple.speech.synthesis.voice.Alex
com.apple.speech.synthesis.voice.BadNews
com.apple.speech.synthesis.voice.Bahh
com.apple.speech.synthesis.voice.Bells
com.apple.speech.synthesis.voice.Boing
com.apple.speech.synthesis.voice.Bruce
com.apple.speech.synthesis.voice.Bubbles
com.apple.speech.synthesis.voice.Cellos
com.apple.speech.synthesis.voice.Deranged
com.apple.speech.synthesis.voice.Fred
com.apple.speech.synthesis.voice.GoodNews
com.apple.speech.synthesis.voice.Hysterical

com.apple.speech.synthesis.voice.Junior
com.apple.speech.synthesis.voice.Kathy
com.apple.speech.synthesis.voice.Organ
com.apple.speech.synthesis.voice.Princess
com.apple.speech.synthesis.voice.Ralph
com.apple.speech.synthesis.voice.Trinoids
com.apple.speech.synthesis.voice.Vicki
com.apple.speech.synthesis.voice.Victoria
com.apple.speech.synthesis.voice.Whisper
com.apple.speech.synthesis.voice.Zarvox

### 169.7.18 NSVoiceIndividuallySpokenCharacters as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** A list of unicode character id ranges that define the unicode characters that can be spoken in character-by-character mode by this voice. ach list entry is a dictionary containing two keys: "UnicodeCharBegin", an integer value containing the beginning unicode id of this range; and "UnicodeCharBegin", an integer value containing the ending unicode id of this range.
These ranges can be used by your application to determine if the voice can speak the name of an individual character when spoken in character-by-character mode.
Some voices may not provide this attribute.
Available in OS X v10.5 and later.

### 169.7.19 NSVoiceLanguage as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** The language of the voice (currently US English only). A string
Deprecated: Use NSVoiceLocaleIdentifier instead.
Deprecated in OS X v10.5.

### 169.7.20 NSVoiceLocaleIdentifier as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** The language of the voice. A string
The canonical locale identifier string describing the voice's locale. A locale is generally composed of three pieces of ordered information: a language code, a region code, and a variant code. Refer to documentation about the NSLocale class or Locales Programming Guide for more information.

Available in OS X v10.5 and later.

### 169.7.21 NSVoiceName as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** The name of the voice suitable for display. A String.

### 169.7.22 NSVoiceSupportedCharacters as String

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the properties names.
**Notes:** A list of unicode character id ranges that define the unicode characters supported by this voice. a dictionary containing two keys: "UnicodeCharBegin", an integer value containing the beginning unicode id of this range; and "UnicodeCharBegin", an integer value containing the ending unicode id of this range. The synthesizer will convert or ignore any characters not contained in the range of supported characters.
Some voices may not provide this attribute.
Available in OS X v10.5 and later.

### 169.7.23 Properties as Dictionary

MBS MacCocoa Plugin, Plugin Version: 13.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns dictionary with all the properties for this voice.
**Notes:** This dictionary may contain additional information if Apple adds more features in newer Mac OS X versions.

## 169.8 class SpeechChannelMBS

### 169.8.1 class SpeechChannelMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSSpeechSynthesizerMBS instead. **Function:** A SpeechMBS channel.
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr9

### 169.8.2 Methods

### 169.8.3 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 169.8.4 ContinueSpeech as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Continue speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.ContinueSpeech)
```

**Notes:** Renamed from Continue to ContinueSpeech in v5.3 to fix a problem with Xojo 2005r3.

### 169.8.5 PauseEndOfSentence as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Pauses speaking at the end of the current sentence.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseEndOfSentence)
```

### 169.8.6 PauseEndOfWord as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Pauses speaking at the end of the current word.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseEndOfWord)
```

### 169.8.7 PauseImmediate as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Pauses speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PauseImmediate)
```

### 169.8.8 Reset

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Resets the SpeechMBS channel to some default values.
**Example:**

```
dim c as SpeechChannelMBS // your channel

c.reset
```

**Notes:** Resets e.g. pitchbase, pitchmodulation, volume, rate.

### 169.8.9 SetOutputFile(file as folderitem) as boolean

MBS MacClassic Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the destination file.
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel
dim f as FolderItem = SpecialFolder.Desktop.Child("test.aiff")

call c.SetOutputFile(f)
call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

**Notes:** Returns true on success and false on any error.
Requires Mac OS X 10.3.

### 169.8.10 Speak(s as string) as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Speak the given text.
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Speak("Hello"))
```

**Notes:** v5.1: Now encoding safe and stores result in lasterror property.

### 169.8.11 SpeechBusy as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns how much SpeechChannels are currently in use of you application.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeechBusy)
```

### 169.8.12 SpeechBusySystemWide as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns how much SpeechChannels are currently in use on this Mac.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeechBusySystemWide)
```

### 169.8.13 Stop as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Stops speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Stop)
```

### 169.8.14 StopEndOfSentence as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Stops speaking at the end of the current sentence.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopEndOfSentence)
```

### 169.8.15 StopEndOfWord as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Stops speaking at the end of the current word.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopEndOfWord)
```

### 169.8.16 StopImmediate as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Stops speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.StopImmediate)
```

### 169.8.17 Properties

### 169.8.18 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 5.1, Platform: macOS, Targets: Desktop only.

**Function:** The last error code.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Lasterror)
```

**Notes:** A Mac OS error code.
from the plugin -1 is bad parameter and 0 is success.
(Read only property)

### 169.8.19 Paused as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Are we paused?
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Paused)
```

**Notes:** (Read only property)

### 169.8.20 PitchBase as Double

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The pich base used for speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PitchBase)
```

**Notes:** (Read and Write property)

### 169.8.21 PitchModulation as Double

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The pich modulation used for speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.PitchModulation)
```

**Notes:** (Read and Write property)

### 169.8.22 Playing as boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Are we playing?
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.Playing)
```

**Notes:** (Read only property)

### 169.8.23 Rate as Double

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The rate used for speaking.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(C.Rate)
```

**Notes:** Normally around 175 words/minute.
(Read and Write property)

### 169.8.24 SpeakCharactersLiteral as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** whether to speak characters literal.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeakCharactersLiteral)
```

**Notes:** Speaks Hello like "H-E-L-L-O"
(Read and Write property)

### 169.8.25 SpeakNumbersLiteral as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** whether to speak numbers literal.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.SpeakNumbersLiteral)
```

**Notes:** Speaks 11 not like "elven", but like "one, one".
(Read and Write property)

### 169.8.26 TextBytesToSpeak as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** How much text is left in the text buffer?
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

call c.Speak("Hello")

MsgBox str(c.TextBytesToSpeak)
```

**Notes:** (Read only property)

### 169.8.27 Voice as VoiceMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The VoiceMBS used for that SpeechChannelMBS.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox c.Voice.Name
```

**Notes:** (Read and Write property)

### 169.8.28 Volume as Double

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The current volume.
**Example:**

```
dim c as SpeechChannelMBS // your channel

MsgBox str(c.Volume)
```

**Notes:** From 0 to 65535.
(Read and Write property)

## 169.9 class SpeechMBS

### 169.9.1 class SpeechMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSSpeechSynthesizerMBS instead. **Function:** The class for the Mac OS speech synthesizer.
**Notes:** For Mac OS X you can also use the NSSpeechSynthesizerMBS class and for recognition the NSSpeechRecognizerMBS class.

You can try Speech with some declares, but your app won't start if the Speech extension is not installed. This plugin won't stop, but simply will just tell you that the Speech is not available, so you can react in your application.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr9

### 169.9.2 Methods

### 169.9.3 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 169.9.4 DefaultVoice as VoiceMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default VoiceMBS.
**Example:**

```
dim s as new SpeechMBS
dim v as VoiceMBS = s.DefaultVoice

MsgBox v.Name
```

### 169.9.5 Speak(s as string) as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Speaks a text using the default settings.
**Example:**

```
dim s as new SpeechMBS

call s.Speak("Hello")

MsgBox "you hear me?"
```

**Notes:** Returns directly to caller.
Returns true if speaking is working.

v5.1: Now encoding safe and stores result in lasterror property.

### 169.9.6 SpeechBusy as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns how much SpeechChannels are currently in use of you application.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.SpeechBusy)
```

### 169.9.7 SpeechBusySystemWide as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns how much SpeechChannels are currently in use on this Mac.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.SpeechBusySystemWide)
```

### 169.9.8 Voice(index as Integer) as VoiceMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the VoiceMBS with this number.
**Example:**

```
dim s as new SpeechMBS

MsgBox s.Voice(1).Name
```

**Notes:** Index is from 1 to VoiceCount.

### 169.9.9 Properties

### 169.9.10 Available as Boolean

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Is SpeechMBS available?
**Notes:** (Read only property)

### 169.9.11 Lasterror as Integer

MBS MacClassic Plugin, Plugin Version: 5.1, Platform: macOS, Targets: Desktop only.

**Function:** The last error code.
**Notes:** A Mac OS error code.
from the plugin -1 is bad parameter and 0 is success.
(Read only property)

### 169.9.12 VersionMajor as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The major Version number.
**Example:**

```
dim s as SpeechMBS
s=new SpeechMBS
msgbox hex(s.VersionMajor)+"."+hex(s.versionMinor\16)+"."+hex(s.versionMinor mod 16)
```

**Notes:** (Read only property)

### 169.9.13 versionMinor as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The minor Version number.
**Example:**

```
dim s as SpeechMBS
s=new SpeechMBS
msgbox hex(s.VersionMajor)+"."+hex(s.versionMinor\16)+"."+hex(s.versionMinor mod 16)
```

**Notes:** (Read only property)

### 169.9.14 VersionRev as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The revision Version number.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.VersionRev)
```

**Notes:** (Read only property)

### 169.9.15 VersionStage as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The Stage Version number.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.VersionStage)
```

**Notes:** Some constants:

| | |
|---|---|
| developStage | &h20 |
| alphaStage | &h40 |
| betaStage | &h60 |
| finalStage | &h80 |

(Read only property)

### 169.9.16 VoiceCount as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** How much voices are present?
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.VoiceCount)
```

**Notes:** If you add or remove VoiceMBS files, please call this function as SpeechMBS can then recognice those changes.
(Read only property)

## 169.10 class VoiceMBS

### 169.10.1 class VoiceMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSVoiceMBS instead.
**Function:** This class represents a voice.
**Example:**

```
dim s as new SpeechMBS

MsgBox s.Voice(2).name
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr9

### 169.10.2 Methods

### 169.10.3 close

MBS MacClassic Plugin, Plugin Version: 3.4, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 169.10.4 NewChannel as SpeechChannelMBS

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new SpeechChannel using the given voice.
**Example:**

```
dim s as new SpeechMBS
dim c as SpeechChannelMBS = s.Voice(1).NewChannel

MsgBox str(c.Speak("Hello"))
```

**Notes:** Returns nil on any error.

### 169.10.5 Properties

### 169.10.6 age as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The approximate age in years of the individual represented by the VoiceMBS.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).age)
```

**Notes:** (Read only property)

### 169.10.7 comment as string

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Additional text information about the VoiceMBS. The information might indicate how much memory the VoiceMBS requires. Some synthesizers use this field to store a phrase that can be spoken.
**Example:**

```
dim s as new SpeechMBS
MsgBox s.Voice(1).comment
```

**Notes:** (Read only property)

### 169.10.8 file as folderitem

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The file of this VoiceMBS.
**Notes:** May be nil.
(Read only property)

### 169.10.9 gender as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The gender of this VoiceMBS.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).gender)
```

**Notes:** Some constants for this property:

| | |
|---|---|
| kNeuter | 0 |
| kMale | 1 |
| kFemale | 2 |

(Read only property)

### 169.10.10 language as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** A code that indicates the language of VoiceMBS output.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).language)
```

**Notes:** Language constants:

(Read only property)

### 169.10.11 name as string

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The name of this VoiceMBS.
**Example:**

```
dim s as new SpeechMBS
MsgBox s.Voice(1).name
```

**Notes:** (Read only property)

### 169.10.12 region as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** A code that indicates the region represented by the VoiceMBS.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).region)
```

**Notes:** Some region constants:

(Read only property)

### 169.10.13 ResID as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** There can be several voices in one file, but this VoiceMBS has this ResID.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).ResID)
```

**Notes:** (Read only property)

### 169.10.14 script as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The script code of text that the VoiceMBS can process.
**Example:**

```
dim s as new SpeechMBS
```

```
MsgBox str(s.Voice(1).script)
```

**Notes:** Script constants:

(Read only property)

### 169.10.15 version as Integer

MBS MacClassic Plugin, Platform: macOS, Targets: Desktop only.

**Function:** The version of this VoiceMBS.
**Example:**

```
dim s as new SpeechMBS

MsgBox str(s.Voice(1).Version)
```

**Notes:** (Read only property)

| | | |
|---|---|---|
| langEnglish | 0 | smRoman script |
| langFrench | 1 | smRoman script |
| langGerman | 2 | smRoman script |
| langItalian | 3 | smRoman script |
| langDutch | 4 | smRoman script |
| langSwedish | 5 | smRoman script |
| langSpanish | 6 | smRoman script |
| langDanish | 7 | smRoman script |
| langPortuguese | 8 | smRoman script |
| langNorwegian | 9 | smRoman script |
| langHebrew | 10 | smHebrew script |
| langJapanese | 11 | smJapanese script |
| langArabic | 12 | smArabic script |
| langFinnish | 13 | smRoman script |
| langGreek | 14 | Greek script using smRoman script code |
| langIcelandic | 15 | modified smRoman/Icelandic script |
| langMaltese | 16 | Roman script |
| langTurkish | 17 | modified smRoman/Turkish script |
| langCroatian | 18 | modified smRoman/Croatian script |
| langTradChinese | 19 | Chinese (Mandarin) in traditional characters |
| langUrdu | 20 | smArabic script |
| langHindi | 21 | smDevanagari script |
| langThai | 22 | smThai script |
| langKorean | 23 | smKorean script |
| langLithuanian | 24 | smCentralEuroRoman script |
| langPolish | 25 | smCentralEuroRoman script |
| langHungarian | 26 | smCentralEuroRoman script |
| langEstonian | 27 | smCentralEuroRoman script |
| langLatvian | 28 | smCentralEuroRoman script |
| langSami | 29 | language of the Sami people of N. Scandinavia |
| langFaroese | 30 | modified smRoman/Icelandic script |
| langFarsi | 31 | modified smArabic/Farsi script |
| langPersian | 31 | Synonym for langFarsi |
| langRussian | 32 | smCyrillic script |
| langSimpChinese | 33 | Chinese (Mandarin) in simplified characters |
| langFlemish | 34 | smRoman script |
| langIrishGaelic | 35 | smRoman or modified smRoman/Celtic script (without dot above) |
| langAlbanian | 36 | smRoman script |
| langRomanian | 37 | modified smRoman/Romanian script |
| langCzech | 38 | smCentralEuroRoman script |
| langSlovak | 39 | smCentralEuroRoman script |
| langSlovenian | 40 | modified smRoman/Croatian script |
| langYiddish | 41 | smHebrew script |
| langSerbian | 42 | smCyrillic script |
| langMacedonian | 43 | smCyrillic script |
| langBulgarian | 44 | smCyrillic script |
| langUkrainian | 45 | modified smCyrillic/Ukrainian script |
| langByelorussian | 46 | smCyrillic script |
| langBelorussian | 46 | Synonym for langByelorussian |
| langUzbek | 47 | Cyrillic script |
| langKazakh | 48 | Cyrillic script |
| langAzerbaijani | 49 | Azerbaijani in Cyrillic script |
| langAzerbaijanAr | 50 | Azerbaijani in Arabic script |
| langArmenian | 51 | smArmenian script |
| langGeorgian | 52 | smGeorgian script |
| langMoldavian | 53 | smCyrillic script |
| langKirghiz | 54 | Cyrillic script |
| langTajiki | 55 | Cyrillic script |
| langTurkmen | 56 | Cyrillic script |
| langMongolian | 57 | Mongolian in smMongolian script |
| langMongolianCyr | 58 | Mongolian in Cyrillic script |
| langPashto | 59 | Arabic script |

| | | |
|---|---|---|
| verUS | 0 | en_US |
| verFrance | 1 | Ffr_FR |
| verBritain | 2 | Ben_GB |
| verGermany | 3 | Dde_DE |
| verItaly | 4 | Tit_IT |
| verNetherlands | 5 | Nnl_NL |
| verFlemish | 6 | FN nl_BE Flemish (Dutch) for Belgium |
| verSweden | 7 | Ssv_SE |
| verSpain | 8 | Ees_ES Spanish for Spain |
| verDenmark | 9 | DK da_DK |
| verPortugal | 10 | PO pt_PT Portuguese for Portugal |
| verFrCanada | 11 | Cfr_CA French for Canada |
| verNorway | 12 | Hno_NO,nb_NOBokm√•l |
| verIsrael | 13 | HB he_IL,iw_IL Hebrew |
| verJapan | 14 | Jja_JP |
| verAustralia | 15 | Xen_AU English for Australia |
| verArabic | 16 | AB ar Arabic for N Africa, Arabian peninsula, Levant |
| verFinland | 17 | Kfi_FI |
| verFrSwiss | 18 | SF fr_CH French Swiss |
| verGrSwiss | 19 | SD de_CH German Swiss |
| verGreece | 20 | GR el_GR Monotonic Greek (modern) |
| verIceland | 21 | IS is_IS |
| verMalta | 22 | MA mt_MT |
| verCyprus | 23 | CY _CY Greek or Turkish language? Checking... |
| verTurkey | 24 | TU tr_TR |
| verYugoCroatian | 25 | YUCroatian for Yugoslavia; now use verCroatia (68) |
| verNetherlandsComma | 26 | ID for KCHR resource - Dutch |
| verBelgiumLuxPoint | 27 | ID for KCHR resource - Belgium |
| verCanadaComma | 28 | ID for KCHR resource - Canadian ISO |
| verCanadaPoint | 29 | ID for KCHR resource - Canadian; now unused |
| vervariantPortugal | 30 | ID for resource; now unused |
| vervariantNorway | 31 | ID for resource; now unused |
| vervariantDenmark | 32 | ID for KCHR resource - Danish Mac Plus |
| verIndiaHindi | 33 | hi_IN Hindi for India |
| verPakistanUrdu | 34 | UR ur_PK Urdu for Pakistan |
| verTurkishModified | 35 | |
| verItalianSwiss | 36 | ST it_CH Italian Swiss |
| verInternational | 37 | ZenEnglish for international use |
| | 38 | is unassigned |
| verRomania | 39 | RO ro_RO |
| verGreecePoly | 40 | grcPolytonic Greek (classical) |
| verLithuania | 41 | LT lt_LT |
| verPoland | 42 | PL pl_PL |
| verHungary | 43 | MG hu_HU |
| verEstonia | 44 | EE et_EE |
| verLatvia | 45 | LV lv_LV |
| verSami | 46 | se |
| verFaroeIsl | 47 | FA fo_FO |
| verIran | 48 | PS fa_IR Persian/Farsi |
| verRussia | 49 | RS ru_RU Russian |
| verIreland | 50 | GA ga_IE Irish Gaelic for Ireland (without dot above) |
| verKorea | 51 | KH ko_KR |
| verChina | 52 | CH zh_CN Simplified Chinese |
| verTaiwan | 53 | TA zh_TW Traditional Chinese |
| verThailand | 54 | TH th_TH |
| verScriptGeneric | 55 | SSGeneric script system (no language or script) |
| verCzech | 56 | CZ cs_CZ |
| verSlovak | 57 | SL sk_SK |
| verFarEastGeneric | 58 | FEGeneric Far East system (no language or script) |
| verMagyar | 59 | Unused; see verHungary |
| verBengali | 60 | bn Bangladesh or India |
| verByeloRussian | 61 | BY be_BY |
| verUkrainian | 62 | UA uk_UA |

| | | |
|---|---|---|
| smRoman | 0 | |
| smJapanese | 1 | |
| smTradChinese | 2 | Traditional Chinese |
| smKorean | 3 | |
| smArabic | 4 | |
| smHebrew | 5 | |
| smGreek | 6 | |
| smCyrillic | 7 | |
| smRSymbol | 8 | Right-left symbol |
| smDevanagari | 9 | |
| smGurmukhi | 10 | |
| smGujarati | 11 | |
| smOriya | 12 | |
| smBengali | 13 | |
| smTamil | 14 | |
| smTelugu | 15 | |
| smKannada | 16 | Kannada/Kanarese |
| smMalayalam | 17 | |
| smSinhalese | 18 | |
| smBurmese | 19 | |
| smKhmer | 20 | Khmer/Cambodian |
| smThai | 21 | |
| smLao | 22 | |
| smGeorgian | 23 | |
| smArmenian | 24 | |
| smSimpChinese | 25 | Simplified Chinese |
| smTibetan | 26 | |
| smMongolian | 27 | |
| smEthiopic | 28 | |
| smGeez | 28 | Synonym for smEthiopic |
| smCentralEuroRoman | 29 | For Czech, Slovak, Polish, Hungarian, Baltic langs |
| smVietnamese | 30 | |
| smExtArabic | 31 | extended Arabic |
| smUninterp | 32 | uninterpreted symbols, e.g. PaletteMBS symbols |
| smUnicodeScript | &h7E | |

## 169.11 class WinSpeechMBS

### 169.11.1 class WinSpeechMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for speech on Windows.
**Notes:** You need to install the "Microsoft Reader" to get this working.

see also:
http://msdn.microsoft.com/en-us/library/ms719576(v=vs.85).aspx
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr6
- MBS Real Studio Plugins, version 12.3pr2
- MonkeyBread Software Releases the MBS Plugins 8.1

### 169.11.2 Methods

### 169.11.3 close

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 169.11.4 DisplayUI(type as string, title as string, parent as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays the UI from the underlying text-to-speech engine's object token.
**Notes:** Type specifies which UI you want.
Title is optional the title of the window.
You can optionally specify a parent window.
Lasterror is set.
See also:


- 169.11.5 DisplayUI(type as string, title as string, parent as window) 21307
- 169.11.6 DisplayUI(type as string, title as string="") 21307

### 169.11.5 DisplayUI(type as string, title as string, parent as window)

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays the UI from the underlying text-to-speech engine's object token.
**Notes:** Type specifies which UI you want.
Title is optional the title of the window.
You can optionally specify a parent window.
Lasterror is set.
See also:

- 169.11.4 DisplayUI(type as string, title as string, parent as DesktopWindow) 21306
- 169.11.6 DisplayUI(type as string, title as string="") 21307

### 169.11.6 DisplayUI(type as string, title as string="")

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop only.

**Function:** Displays the UI from the underlying text-to-speech engine's object token.
**Notes:** Type specifies which UI you want.
Title is optional the title of the window.
You can optionally specify a parent window.
Lasterror is set.
See also:

- 169.11.4 DisplayUI(type as string, title as string, parent as DesktopWindow) 21306
- 169.11.5 DisplayUI(type as string, title as string, parent as window) 21307

### 169.11.7 IsUISupported(type as string) as boolean

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checks if the underlying text-to-speech engine's object token supports the requested UI.
**Notes:** Returns whether the specified UI is supported. True indicates the UI is supported, and false indicates the UI is not supported.
Lasterror is set.

### 169.11.8 ListVoices as boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Makes a list of voices which is later returned using the NextVoice function.

### 169.11.9 NextVoice as WinVoiceMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the next voice in the list.
**Notes:** Returns nil on the end of the list.

### 169.11.10 Pause

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pauses speech.

### 169.11.11 Resume

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resumes speech.

### 169.11.12 Skip(sentenceCount as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Causes the voice to skip forward or backward the specified number of items within the text of the current speak call.
**Notes:** sentenceCount is the number of sentences to skip. If negative, you skip backward.
Returns the actual number of items skipped.
Lasterror is set.

### 169.11.13 Speak(text as string, Purge as Boolean = false, ContainsXML as boolean = false)

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Speaks a string.
**Notes:** The string must be a 16bit unicode string.

Version 7.8 of the plugins convert to unicode automatically.

If Purge is true an existing speech will be stopped.

If ContainsXML is true, you can include xml commands in the text. See MSDN page:
http://msdn.microsoft.com/en-us/library/ms717077%28v=vs.85%29.aspx

### 169.11.14 SpeakFile(file as folderitem, unicodestring as string, AudioFormat as Integer = 0, ContainsXML as boolean = false)

MBS Win Plugin, Plugin Version: 4.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Speaks a string to a file.
**Notes:** The string must be a 16bit unicode string.
File is a valid folderitem where the WAV file is stored.
The function will not return before the speaking is complete.
Lasterror is set.

Version 7.8 of the plugins convert to unicode automatically.

For AudioFormat, please use kAudioFormat* constants. Default is 22Khz Mono which is default format for speech API.

If ContainsXML is true, you can include xml commands in the text. See MSDN page:
http://msdn.microsoft.com/en-us/library/ms717077%28v=vs.85%29.aspx

### 169.11.15 WaitUntilDone(msTimeout as Integer)

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Blocks the caller until either the voice has completed speaking or the specified time interval has elapsed.
**Notes:** msTimeout: Timeout period in milliseconds. INFINITE may be used to prevent this method from timing out.

INFINITE is -1.

Lasterror is set.

### 169.11.16 Properties

### 169.11.17 Handle as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the speech object.
**Notes:** If handle is 0 there is no Speech software installed.
(Read only property)

### 169.11.18 IsDone as Boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the voice has finished speaking.
**Notes:** Lasterror is set.
(Read only property)

### 169.11.19 IsSpeaking as Boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the voice is speaking.
**Notes:** Lasterror is set.
(Read only property)

### 169.11.20 Lasterror as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** You may get the Speech SDK from Microsoft for more details.
(Read only property)

### 169.11.21 Priority as Integer

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current voice priority level.
**Notes:** The default priority is SPVPRI_NORMAL.

Lasterror is set.

Assuming an output object which implements ISpAudio, speak requests of similar priority voices are queued, and are spoken one at a time in the order they are issued. That is, speak requests from normal priority voices are put in one queue, while speak requests from alert priority voices (with priority SPVPRI_ALERT) are put in another queue.

Alert priority voices take priority over normal voices. If one or more speak requests from alert priority voices are pending, a normal voice that is speaking will be interrupted on the next alert boundary (see ISpVoice::SetAlertBoundary). When all the queued alert priority voice speak requests have been processed, the normal voice will continue.

Voices with the SPVPRI_OVER priority speak over (mix with) all other audio in the system with no synchronization. SPVPRI_OVER priority voices only mix on Windows 2000.

If the output object does not implement ISpAudio, no serialization will occur, and all voices will be treated as if their priority is SPVPRI_OVER.
(Read and Write property)

### 169.11.22 Rate as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current text rendering rate adjustment.
**Notes:** Ranges from kMinRate to kMaxRate.
(Read and Write property)

### 169.11.23 SyncSpeakTimeout as Integer

MBS Win Plugin, Plugin Version: 8.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The timeout interval in milliseconds after which, synchronous Speak calls to this instance of the voice will timeout.
**Notes:** Timeouts occur when waiting for access to the output object. This means that for a normal priority voice (see Priority for more information on priorities) and an output device which implements ISpAudio, a timeout may occur while waiting to reacquire the output object after an interruption by an alert priority voice. For voices of both normal and alert priorities, a timeout may also occur while waiting to reacquire the output object after the voice has been paused and resumed (see Pause and Resume).

Wait times are not accumulated - that is, if a voice waits for n milliseconds to initially acquire the output object, and is then paused and resumed, it will again wait for up to msTimeout milliseconds to reacquire the output object, not msTimeout - n milliseconds.

(Read and Write property)

### 169.11.24 Voice as WinVoiceMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current used voice.
**Notes:** Set to nil to use the default voice.
(Read and Write property)

### 169.11.25 Volume as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The volume for the voice.
**Notes:** Ranges from kMinVolume to kMaxVolume.
(Read and Write property)

### 169.11.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMaxRate | 10 | The maximum for the rate property. |
| kMaxVolume | 100 | The maximum for the volume property. |
| kMinRate | -10 | The minimum for the rate property. |
| kMinVolume | 0 | The minimum for the volume property. |
| PriorityAlert | 1 | One of the priority constants. |
| PriorityNormal | 0 | One of the priority constants. |
| PriorityOver | 2 | One of the priority constants. |
| SPDUI_AddRemoveWord | "AddRemoveWord" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_AudioProperties | "AudioProperties" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_AudioVolume | "AudioVolume" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_EngineProperties | "EngineProperties" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_MicTraining | "MicTraining" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_RecoProfileProperties | "RecoProfileProperties" | One of the constants for the User Interfaces used with IsU DisplayUI. |
| SPDUI_UserTraining | "UserTraining" | One of the constants for the User Interfaces used with IsU DisplayUI. |

Audio Formats

| Constant | Value | Description |
|---|---|---|
| kAudioFormat_11kHz16BitMono | 10 | 11 kHz, 16 Bit, Mono |
| kAudioFormat_11kHz16BitStereo | 11 | 11 kHz, 16 Bit, Stereo |
| kAudioFormat_11kHz8BitMono | 8 | 11 kHz, 8 Bit, Mono |
| kAudioFormat_11kHz8BitStereo | 9 | 11 kHz, 8 Bit, Stereo |
| kAudioFormat_12kHz16BitMono | 14 | 12 kHz, 16 Bit, Mono |
| kAudioFormat_12kHz16BitStereo | 15 | 12 kHz, 16 Bit, Stereo |
| kAudioFormat_12kHz8BitMono | 12 | 12 kHz, 8 Bit, Mono |
| kAudioFormat_12kHz8BitStereo | 13 | 12 kHz, 8 Bit, Stereo |
| kAudioFormat_16kHz16BitMono | 18 | 16 kHz, 16 Bit, Mono |
| kAudioFormat_16kHz16BitStereo | 19 | 16 kHz, 16 Bit, Stereo |
| kAudioFormat_16kHz8BitMono | 16 | 16 kHz, 8 Bit, Mono |
| kAudioFormat_16kHz8BitStereo | 17 | 16 kHz, 8 Bit, Stereo |
| kAudioFormat_22kHz16BitMono | 22 | 22 kHz, 16 Bit, Mono |
| kAudioFormat_22kHz16BitStereo | 23 | 22 kHz, 16 Bit, Stereo |
| kAudioFormat_22kHz8BitMono | 20 | 22 kHz, 8 Bit, Mono |
| kAudioFormat_22kHz8BitStereo | 21 | 22 kHz, 8 Bit, Stereo |
| kAudioFormat_24kHz16BitMono | 26 | 24 kHz, 16 Bit, Mono |
| kAudioFormat_24kHz16BitStereo | 27 | 24 kHz, 16 Bit, Stereo |
| kAudioFormat_24kHz8BitMono | 24 | 24 kHz, 8 Bit, Mono |
| kAudioFormat_24kHz8BitStereo | 25 | 24 kHz, 8 Bit, Stereo |
| kAudioFormat_32kHz16BitMono | 30 | 32 kHz, 16 Bit, Mono |
| kAudioFormat_32kHz16BitStereo | 31 | 32 kHz, 16 Bit, Stereo |
| kAudioFormat_32kHz8BitMono | 28 | 32 kHz, 8 Bit, Mono |
| kAudioFormat_32kHz8BitStereo | 29 | 32 kHz, 8 Bit, Stereo |
| kAudioFormat_44kHz16BitMono | 34 | 44 kHz, 16 Bit, Mono |
| kAudioFormat_44kHz16BitStereo | 35 | 44 kHz, 16 Bit, Stereo |
| kAudioFormat_44kHz8BitMono | 32 | 44 kHz, 8 Bit, Mono |
| kAudioFormat_44kHz8BitStereo | 33 | 44 kHz, 8 Bit, Stereo |
| kAudioFormat_48kHz16BitMono | 38 | 48 kHz, 16 Bit, Mono |
| kAudioFormat_48kHz16BitStereo | 39 | 48 kHz, 16 Bit, Stereo |
| kAudioFormat_48kHz8BitMono | 36 | 48 kHz, 8 Bit, Mono |
| kAudioFormat_48kHz8BitStereo | 37 | 48 kHz, 8 Bit, Stereo |
| kAudioFormat_8kHz16BitMono | 6 | 8 kHz, 16 Bit, Mono |
| kAudioFormat_8kHz16BitStereo | 7 | 8 kHz, 16 Bit, Stereo |
| kAudioFormat_8kHz8BitMono | 4 | 8 KHz, 8 Bit, Mono |
| kAudioFormat_8kHz8BitStereo | 5 | 8 kHz, 8 Bit, Stereo |
| kAudioFormat_ADPCM_11kHzMono | 59 | ADPCM, 11 kHz, Mono |
| kAudioFormat_ADPCM_11kHzStereo | 60 | ADPCM, 11 kHz, Stereo |
| kAudioFormat_ADPCM_22kHzMono | 61 | ADPCM, 22 kHz, Mono |
| kAudioFormat_ADPCM_22kHzStereo | 62 | ADPCM, 22 kHz, Stereo |
| kAudioFormat_ADPCM_44kHzMono | 63 | ADPCM, 44 kHz, Mono |
| kAudioFormat_ADPCM_44kHzStereo | 64 | ADPCM, 44 kHz, Stereo |
| kAudioFormat_ADPCM_8kHzMono | 57 | ADPCM, 8 kHz, Mono |
| kAudioFormat_ADPCM_8kHzStereo | 58 | ADPCM, 8 kHz, Stereo |
| kAudioFormat_CCITT_ALaw_11kHzMono | 43 | CCITT, ALaw, 11 kHz, Mono |
| kAudioFormat_CCITT_ALaw_11kHzStereo | 44 | CCITT, ALaw, 11 kHz, Stereo |
| kAudioFormat_CCITT_ALaw_22kHzMono | 45 | CCITT, ALaw, 22 kHz, Mono |
| kAudioFormat_CCITT_ALaw_22kHzStereo | 46 | CCITT, ALaw, 22 kHz, Stereo |
| kAudioFormat_CCITT_ALaw_44kHzMono | 47 | CCITT, ALaw, 44 kHz, Mono |
| kAudioFormat_CCITT_ALaw_44kHzStereo | 48 | CCITT, ALaw, 44 kHz, Stereo |
| kAudioFormat_CCITT_ALaw_8kHzMono | 41 | CCITT, ALaw, 8 kHz, Mono |
| kAudioFormat_CCITT_ALaw_8kHzStereo | 42 | CCITT, ALaw, 8 kHz, Stereo |
| kAudioFormat_CCITT_uLaw_11kHzMono | 51 | CCITT, uLaw, 11 kHz, Mono |
| kAudioFormat_CCITT_uLaw_11kHzStereo | 52 | CCITT, uLaw, 11 kHz, Stereo |
| kAudioFormat_CCITT_uLaw_22kHzMono | 53 | CCITT, uLaw, 22 kHz, Mono |
| kAudioFormat_CCITT_uLaw_22kHzStereo | 54 | CCITT, uLaw, 22 kHz, Stereo |
| kAudioFormat_CCITT_uLaw_44kHzMono | 55 | CCITT, uLaw, 44 kHz, Mono |
| kAudioFormat_CCITT_uLaw_44kHzStereo | 56 | CCITT, uLaw, 44 kHz, Stereo |

## 169.12 class WinVoiceMBS

### 169.12.1 class WinVoiceMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for a voice.

### 169.12.2 Methods

### 169.12.3 Description as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the voice.
**Notes:** Returns a 16bit unicode string.

### 169.12.4 Properties

### 169.12.5 Handle as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the voice.
**Notes:** (Read only property)

### 169.12.6 Lasterror as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** (Read only property)

# Chapter 170

# SpeechRecognition

## 170.1 class SFAcousticFeatureMBS

### 170.1.1 class SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The value of a voice analysis metric.
**Notes:** Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.1.2 Methods

### 170.1.3 acousticFeatureValuePerFrame as Double()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of feature values, one value per audio frame, corresponding to a transcript segment of recorded audio.

### 170.1.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.1.5 copy as SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 170.1.6 Properties

### 170.1.7 frameDuration as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The duration of the audio frame.
**Notes:** In seconds.
(Read only property)

### 170.1.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

## 170.2 class SFSpeechAudioBufferRecognitionRequestMBS

### 170.2.1 class SFSpeechAudioBufferRecognitionRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request to recognize speech from captured audio content, such as audio from the device's microphone.
**Notes:** Use an SFSpeechAudioBufferRecognitionRequestMBS object to perform speech recognition on live audio, or on a set of existing audio buffers. For example, use this request object to route audio from a device's microphone to the speech recognizer.

The request object contains no audio initially. As you capture audio, call appendAudioPCMBuffer or appendAudioSampleBuffer to add audio samples to the request object. The speech recognizer continuously analyzes the audio you appended, stopping only when you call the endAudio method. (You must call endAudio explicitly to stop the speech recognition process.)

Requires MacOS 10.15 or later.
Subclass of the SFSpeechRecognitionRequestMBS class.
**Blog Entries**

- Playing with SpeechRecognition

### 170.2.2 Methods

### 170.2.3 appendAudioPCMBuffer(audioPCMBuffer as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Appends audio in the PCM format to the end of the recognition request.
**Notes:** audioPCMBuffer: An audio buffer (AVAudioPCMBufferMBS class) that contains audio in the PCM format.

The audio must be in a native format and uncompressed.

### 170.2.4 appendAudioSampleBuffer(sampleBuffer as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Appends audio to the end of the recognition request.
**Notes:** sampleBuffer: A buffer of audio. Must be CMSampleBufferMBS class.

The audio must be in a native format.

### 170.2.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 170.2.6 endAudio

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Marks the end of audio input for the recognition request.
**Notes:** Call this method explicitly to let the speech recognizer know that no more audio input is coming.

### 170.2.7 Properties

### 170.2.8 nativeAudioFormat as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The preferred audio format for optimal speech recognition.
**Notes:** Use the audio format in this property as a hint for optimal recording, but don't depend on the value remaining unchanged.
Value is an AVAudioFormatMBS object.
(Read only property)

## 170.3 class SFSpeechRecognitionRequestMBS

### 170.3.1 class SFSpeechRecognitionRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An abstract class representing a request to recognize speech from an audio source.
**Notes:** Do not create SFSpeechRecognitionRequestMBS objects directly. Create an SFSpeechURLRecognitionRequestMBS or SFSpeechAudioBufferRecognitionRequestMBS object instead. Use the properties of this class to configure various aspects of your request object before you start the speech recognition process. For example, use the shouldReportPartialResults property to specify whether you want partial results or only the final result of speech recognition.

Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.3.2 Methods

### 170.3.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.3.4 contextualStrings as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of phrases that should be recognized, even if they are not in the system vocabulary.
**Notes:** Use this property to specify short custom phrases that are unique to your app. You might include phrases with the names of characters, products, or places that are specific to your app. You might also include domain-specific terminology or unusual or made-up words. Assigning custom phrases to this property improves the likelihood of those phrases being recognized.
Keep phrases relatively brief, limiting them to one or two words whenever possible. Lengthy phrases are less likely to be recognized. In addition, try to limit each phrase to something the user can say without pausing. Limit the total number of phrases to no more than 100.

### 170.3.5 setContextualStrings(contextualStrings() as String)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets array of phrases that should be recognized, even if they are not in the system vocabulary.
**Notes:** Use this property to specify short custom phrases that are unique to your app. You might include phrases with the names of characters, products, or places that are specific to your app. You might also include domain-specific terminology or unusual or made-up words. Assigning custom phrases to this property improves the likelihood of those phrases being recognized.
Keep phrases relatively brief, limiting them to one or two words whenever possible. Lengthy phrases are less likely to be recognized. In addition, try to limit each phrase to something the user can say without pausing. Limit the total number of phrases to no more than 100.

### 170.3.6 Properties

### 170.3.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.3.8 interactionIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An identifier string that you use to describe the type of interaction associated with the speech recognition request.
**Notes:** If different parts of your app have different speech recognition needs, you can use this property to identify the part of your app that is making each request. For example, if one part of your app lets users speak phone numbers and another part lets users speak street addresses, consistently identifying the part of the app that makes a recognition request may help improve the accuracy of the results.
(Read and Write property)

### 170.3.9 requiresOnDeviceRecognition as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that determines whether a request must keep its audio data on the device.
**Notes:** Set this property to true to prevent an SFSpeechRecognitionRequestMBS from sending audio over the network. However, on-device requests won,Äôt be as accurate.

The request only honors this setting if the supportsOnDeviceRecognition (SFSpeechRecognizerMBS) property is also YES.
(Read and Write property)

### 170.3.10 shouldReportPartialResults as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether you want intermediate results returned for each utterance.
**Notes:** The default value of this property is true. If you want only final results (and you don't care about intermediate results), set this property to false to prevent the system from doing extra work.
(Read and Write property)

### 170.3.11 taskHint as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A value that indicates the type of speech recognition being performed.
**Notes:** The default value of this property is kTaskHintUnspecified. See SFSpeechRecognitionResultMBS for constants.
(Read and Write property)

## 170.4 class SFSpeechRecognitionResultMBS

### 170.4.1 class SFSpeechRecognitionResultMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An object containing the partial or final results of a speech recognition request.
**Notes:** Use an SFSpeechRecognitionResultMBS object to retrieve the results of a speech recognition request. You do not create these objects directly. Instead, the Speech framework creates them and passes them to the handler block or delegate object you specified when starting your speech recognition task.
A speech recognition result object contains one or more transcriptions of the current utterance. Each transcription has a confidence rating indicating how likely it is to be correct. (You can also get the transcription with the highest rating directly from the bestTranscription property.)
If you requested partial results from the speech recognizer, the transcriptions may represent only part of the total audio content. Use the final property to determine if the request contains partial or final results.

Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.4.2 Methods

### 170.4.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.4.4 copy as SFSpeechRecognitionResultMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 170.4.5 transcriptions as SFTranscriptionMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of potential transcriptions, sorted in descending order of confidence.
**Notes:** All transcriptions correspond to the same utterance, which can be a partial or final result of the

overall request. The first transcription in the array has the highest confidence rating, followed by transcriptions with decreasing confidence ratings.

### 170.4.6 Properties

### 170.4.7 bestTranscription as SFTranscriptionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The transcription with the highest confidence level.
**Notes:** (Read only property)

### 170.4.8 final as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether speech recognition is complete and whether the transcriptions are final.
**Notes:** When a speech recognition request is final, its transcriptions do not change.
(Read only property)

### 170.4.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.4.10 Constants

Task Hints

| Constant | Value | Description |
|---|---|---|
| kTaskHintConfirmation | 3 | A task that uses captured speech for short, confirmation-style requests.<br>Use this hint type when you are using speech recognition to handle confirmation commands, such as ”yes,” ”no,” or ”maybe.” |
| kTaskHintDictation | 1 | A task that uses captured speech for text entry.<br>Use this hint type when you are using speech recognition for a task that’s similar to the keyboard’s built-in dictation function. |
| kTaskHintSearch | 2 | A task that uses captured speech to specify seach terms.<br>Use this hint type when you are using speech recognition to identify search terms. |
| kTaskHintUnspecified | 0 | An unspecified type of task.<br>Use this hint type when the intended use for captured speech does not match the other task types. |

## 170.5 class SFSpeechRecognitionTaskMBS

### 170.5.1 class SFSpeechRecognitionTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A task object that you use to monitor the speech recognition progress.
**Notes:** Use an SFSpeechRecognitionTaskMBS object to determine the state of a speech recognition task, to cancel an ongoing task, or to signal the end of the task.
You do not create speech recognition task objects directly. Instead, you receive one of these objects after calling recognitionTaskWithRequest.

Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.5.2 Methods

### 170.5.3 Cancel

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Cancels the current speech recognition task.
**Notes:** You can cancel recognition tasks for both prerecorded and live audio input. For example, you might cancel a task in response to a user action or because the recording was interrupted.
When canceling a task, be sure to release any resources associated with the task, such as the audio input resources you are using to capture audio samples.

### 170.5.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.5.5 Finish

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Stops accepting new audio and finishes processing on the audio input that has already been accepted.
**Notes:** For audio buffer–based recognition, recognition does not finish until this method is called, so be sure

to call it when the audio source is exhausted.

### 170.5.6 Properties

### 170.5.7 Cancelled as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the speech recognition task was canceled.
**Notes:** By default, the value of this property is false.
(Read only property)

### 170.5.8 Error as NSErrorMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An error object that specifies the error that occurred during a speech recognition task.
**Notes:** (Read only property)

### 170.5.9 Finishing as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether audio input has stopped.
**Notes:** By default, the value of this property is false.
(Read only property)

### 170.5.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.5.11 State as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The current state of the speech recognition task.
**Notes:** Check the value of this property to get the state of the in-progress speech recognition session. For

valid values, see constants.
(Read only property)

### 170.5.12 Constants

States

| Constant | Value | Description |
|---|---|---|
| kStateCanceling | 3 | Delivery of recognition results has finished, but audio recording may be ongoing. |
| kStateCompleted | 4 | Delivery of recognition requests has finished and audio recording has stopped. |
| kStateFinishing | 2 | Audio recording has stopped, but delivery of recognition results may continue. |
| kStateRunning | 1 | Speech recognition (potentially including audio recording) is in progress. |
| kStateStarting | 0 | Speech recognition (potentially including audio recording) has not yet started. |

## 170.6 class SFSpeechRecognizerMBS

### 170.6.1 class SFSpeechRecognizerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An object you use to check for the availability of the speech recognition service, and to initiate the speech recognition process.
**Notes:** An SFSpeechRecognizerMBS object is the central object for managing the speech recognizer process. Use this object to:

- Request authorization to use speech recognition services.
- Specify the language to use during the recognition process.
- Initiate new speech recognition tasks.

Set Up Speech Recognition
Each speech recognizer supports only one language, which you specify at creation time. The successful creation of a speech recognizer does not guarantee that speech recognition services are available. For some languages, the recognizer might require an Internet connection. Use the available property to find out if speech recognition services are available for the current language.

To initiate the speech recognition process, do the following:

- Request authorization to use speech recognition.
- Create an SFSpeechRecognizerMBS object.
- Verify the availability of services using the available property of your speech recognizer object.
- Prepare your audio content.
- Create a recognition request object—an object that descends from SFSpeechRecognitionRequest.
- Call the recognitionTaskWithRequest method to begin the recognition process.

The type of recognition request object you create depends on whether you are processing an existing audio file or an incoming stream of audio. For existing audio files, create a SFSpeechURLRecognitionRequestMBS object. For audio streams, create a SFSpeechAudioBufferRecognitionRequestMBS object.

Create a Great User Experience for Speech Recognition
Here are some tips to consider when adding speech recognition support to your app.

- Be prepared to handle failures caused by speech recognition limits. Because speech recognition is a network-based service, limits are enforced so that the service can remain freely available to all apps. Individual devices may be limited in the number of recognitions that can be performed per day, and each app may be throttled globally based on the number of requests it makes per day. If a recognition request fails quickly (within a second or two of starting), check to see if the recognition service became unavailable. If it is, you may want to ask users to try again later.

- Plan for a one-minute limit on audio duration. Speech recognition places a relatively high burden on battery life and network usage. To minimize this burden, the framework stops speech recognition tasks that last longer than one minute. This limit is similar to the one for keyboard-related dictation.

- Remind the user when your app is recording. For example, display a visual indicator and play sounds at the beginning and end of speech recognition to help users understand that they're being actively recorded. You can also display speech as it is being recognized so that users understand what your app is doing and see any mistakes made during the recognition process.

- Do not perform speech recognition on private or sensitive information. Some speech is not appropriate for recognition. Don't send passwords, health or financial data, and other sensitive speech for recognition.

Requires MacOS 10.15 or later.
**Blog Entries**

- Playing with SpeechRecognition

### 170.6.2 Methods

### 170.6.3 authorizationStatus as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Returns your app's current authorization to perform speech recognition.
**Notes:** The user can reject your app's request to perform speech recognition, but your request can also be denied if speech recognition is not supported on the device. The app can also change your app's authorization status at any time from the Settings app.

### 170.6.4 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether the Speech Framework was loaded.
**Notes:** Returns true on MacOS 10.15 or newer.

### 170.6.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a speech recognizer associated with the user's default language settings.
**Notes:** Returns an initialized speech recognizer object, or nil if there was a problem creating the object.

If the user's default language is not supported for speech recognition, this method attempts to fall back to the language used by the keyboard for dictation. If that fails, this method returns nil.
Even if this method returns a valid speech recognizer object, the speech recognition services may be temporarily unavailable. To determine whether speech recognition services are available, check the available property.
See also:

- 170.6.6 Constructor(locale as NSLocaleMBS) 21332

### 170.6.6 Constructor(locale as NSLocaleMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a speech recognizer associated with the specified locale.
**Notes:** locale: The locale object representing the language you want to use for speech recognition. For a list of languages supported by the speech recognizer, see supportedLocales.

Returns an initialized speech recognizer object, or nil if the specified language was not supported.

If you specify a language that is not supported by the speech recognizer, this method attempts to fall back to the language used by the keyboard for dictation. If that fails, this method returns nil.
Even if this method returns a valid speech recognizer object, the speech recognition services may be temporarily unavailable. To determine whether speech recognition services are available, check the available property.
See also:

- 170.6.5 Constructor 21332

### 170.6.7 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The destructor.

### 170.6.8 recognitionTaskWithRequest(request as SFSpeechRecognitionRequestMBS) as SFSpeechRecognitionTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Recognizes speech from the audio source associated with the specified request, using the specified events to manage the results.
**Notes:** request: A request (encapsulated in an SFSpeechRecognitionRequestMBS object) to recognize speech from an audio source.

Returns the task object you can use to manage an in-progress recognition request.

Use this method to initiate the speech recognition process on the audio contained in the request object. This method executes asynchronously and returns a SFSpeechRecognitionTaskMBS object that you can use to cancel or finalize the recognition process later. As results become available, the method calls the methods of the provided delegate object.
Note that the SFSpeechRecognitionTaskMBS object returned by this method does not retain your delegate object. You must maintain a strong reference to your delegate while speech recognition is in progress.
See also:

- 170.6.9 recognitionTaskWithRequest(request as SFSpeechRecognitionRequestMBS, delegateHandler as recognitionTaskWithRequestCompletedMBS, tag as Variant = nil) as SFSpeechRecognitionTaskMBS 21333

### 170.6.9 recognitionTaskWithRequest(request as SFSpeechRecognitionRequestMBS, delegateHandler as recognitionTaskWithRequestCompletedMBS, tag as Variant = nil) as SFSpeechRecognitionTaskMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Executes the speech recognition request and delivers the results to the specified handler delegate.
**Notes:** request: A request (in an SFSpeechRecognitionRequestMBS object) to recognize speech from an audio source.
delegateHandler: The method to call when partial or final results are available, or when an error occurs. If the shouldReportPartialResults property is true, this event may be called multiple times to deliver the partial and final results.

The delegare has no return value and takes the following parameters:
result: A SFSpeechRecognitionResultMBS containing the partial or final transcriptions of the audio content.
error: An error object if a problem occurred. This parameter is nil if speech recognition was successful.

Request and Tag parameters are passed through to delegate.

Returns the task object you can use to manage an in-progress recognition request.

Use this method to initiate the speech recognition process on the audio contained in the request object. This method executes asynchronously and returns a SFSpeechRecognitionTaskMBS object that you can use to cancel or finalize the recognition process later. As results become available, the method calls the delegate in the delegateHandler parameter.
See also:

- 170.6.8 recognitionTaskWithRequest(request as SFSpeechRecognitionRequestMBS) as SFSpeechRecognitionTaskMBS 21333

### 170.6.10 requestAuthorization(delegateHandler as requestAuthorizationCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Asks the user to allow your app to perform speech recognition.
**Notes:** delegateHandler: The delegate to execute when your app's authorization status is known. The status parameter of the delegate contains your app's authorization status.

Call this method before performing any other tasks associated with speech recognition. This method executes asynchronously, returning shortly after you call it. At some point later, the system calls the provided handler block with the results.
When your app's authorization status is SFSpeechRecognizerAuthorizationStatusNotDetermined, this method causes the system to prompt the user to grant or deny permission for your app to use speech recognition. The prompt includes the custom message you specify in the NSSpeechRecognitionUsageDescription key of your app's Info.plist file. The user's response is saved so that future calls to this method do not prompt the user again.

Your app's Info.plist file must contain the NSSpeechRecognitionUsageDescription key with a valid usage description. If this key is not present, your app will crash when you call this method.
For more information about requesting authorization, see Asking Permission to Use Speech Recognition.

### 170.6.11 supportedLocales as NSLocaleMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Returns the set of locales that are supported by the speech recognizer.
**Notes:** This method returns the locales for which speech recognition is supported. Support for a locale does not guarantee that speech recognition is currently possible for that locale. For some locales, the speech recognizer requires an active Internet connection to communicate with Apple's servers. If the speech recognizer is currently unable to process requests, available returns NO.
Speech recognition supports the same locales that are supported by the keyboard's dictation feature. For a list of these locales, see QuickType Keyboard: Dictation.

### 170.6.12 Properties

### 170.6.13 defaultTaskHint as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A hint that indicates the type of speech recognition being requested.
**Example:**

```
dim recognizer as New MySFSpeechRecognizer
recognizer.defaultTaskHint = SFSpeechRecognitionResultMBS.kTaskHintDictation
```

**Notes:** By default, the value of this property overrides the SFSpeechRecognitionTaskHintUnspecified value for requests.
(Read and Write property)

### 170.6.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.6.15 isAvailable as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the speech recognizer is currently available.
**Notes:** When the value of this property is true, you may create new speech recognition tasks. When value of this property is false, speech recognition services are not available.
(Read only property)

### 170.6.16 locale as NSLocaleMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The locale of the speech recognizer.
**Notes:** The locale of the speech recognizer is an NSLocaleMBS object. The default value of this property is the system locale (that is, systemLocale).
(Read only property)

### 170.6.17 supportsOnDeviceRecognition as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean value that indicates whether the speech recognizer can operate without network access.
**Notes:** An SFSpeechRecognitionRequestMBS can only honor its requiresOnDeviceRecognition property if supportsOnDeviceRecognition is true. If supportsOnDeviceRecognition is false, the SFSpeechRecognizer requires a network in order to recognize speech.
(Read only property)

### 170.6.18 Events

### 170.6.19 availabilityDidChange(available as Boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you that the availability of its associated speech recognizer changed.
**Notes:** available: A Boolean value that indicates the new availability of the speech recognizer.

### 170.6.20 didDetectSpeech(task as SFSpeechRecognitionTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you when the task first detects speech in the source audio.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTaskMBS object) that represents the request.

### 170.6.21 TaskDidFinishRecognition(task as SFSpeechRecognitionTaskMBS, recognitionResult as SFSpeechRecognitionResultMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you when the final utterance is recognized.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTaskMBS object) that represents the request.
recognitionResult: A recognized utterance that contains one or more transcription hypotheses in an SFSpeechRecognitionResultMBS object.

When this method is called, the delegate should expect no further information about the utterance to be reported.

### 170.6.22 TaskDidFinishSuccessfully(task as SFSpeechRecognitionTaskMBS, successfully as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you when the recognition of all requested utterances is finished.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTaskMBS object) that represents the request.
successfully: A Boolean value that indicates whether the task was successful. When this parameter is false, use the error property of the task to get information about why the task was unsuccessful.

### 170.6.23 TaskDidHypothesizeTranscription(task as SFSpeechRecognitionTaskMBS, transcription as SFTranscriptionMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you that a hypothesized transcription is available.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTaskMBS object) that represents the request.
transcription: The hypothesized transcription in an SFTranscriptionMBS object.

This method is called for all recognitions, including partial recognitions.

### 170.6.24 TaskFinishedReadingAudio(task as SFSpeechRecognitionTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you when the task is no longer accepting new audio input, even if final processing is in progress.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTask object) that represents the request.

### 170.6.25 TaskWasCancelled(task as SFSpeechRecognitionTaskMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: .

**Function:** Tells you that the task has been canceled.
**Notes:** task: The speech recognition task (an SFSpeechRecognitionTaskMBS object) that represents the request.

A speech recognition task can be canceled by the user, by your app, or by the system.

### 170.6.26 Constants

AuthorizationStatus

| Constant | Value | Description |
|---|---|---|
| kAuthorizationStatusAuthorized | 3 | The user granted your app's request to perform speech recognition. |
| kAuthorizationStatusDenied | 1 | The user denied your app's request to perform speech recognition. |
| kAuthorizationStatusNotDetermined | 0 | The app's authorization status has not yet been determined. |
| kAuthorizationStatusRestricted | 2 | The device prevents your app from performing speech recognition. |

### 170.6.27 Delegates

### 170.6.28 recognitionTaskWithRequestCompletedMBS(request as SFSpeechRecognitionRequestMBS, result as SFSpeechRecognitionResultMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The delegate for the callback when recognition is done.

### 170.6.29 requestAuthorizationCompletedMBS(status as integer, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The delegate to call when authorization request finished.

## 170.7 class SFSpeechURLRecognitionRequestMBS

### 170.7.1 class SFSpeechURLRecognitionRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request to recognize speech in a recorded audio file.
**Notes:** Use an SFSpeechURLRecognitionRequest object to perform speech recognition on the contents of an existing audio file.

Requires MacOS 10.15 or later.
Subclass of the SFSpeechRecognitionRequestMBS class.
**Blog Entries**

- Playing with SpeechRecognition

### 170.7.2 Methods

### 170.7.3 Constructor(File as FolderItem)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a speech recognition request, initialized with the specified folderitem.
**Notes:** Use this method to create a request to recognize speech in a recorded audio file that resides at the specified URL. Pass the request to the recognizer's recognitionTaskWithRequest method to start recognition.
See also:

- 170.7.4 Constructor(URL as String) 21339

### 170.7.4 Constructor(URL as String)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a speech recognition request, initialized with the specified URL.
**Notes:** Use this method to create a request to recognize speech in a recorded audio file that resides at the specified URL. Pass the request to the recognizer's recognitionTaskWithRequest method to start recognition.
See also:

- 170.7.3 Constructor(File as FolderItem) 21339

### 170.7.5 Properties

### 170.7.6 File as FolderItem

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The folderitem of the audio file.
**Notes:** (Read only property)

### 170.7.7 URL as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The URL of the audio file.
**Notes:** (Read only property)

## 170.8 class SFTranscriptionMBS

### 170.8.1 class SFTranscriptionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A textual representation of the given speech it its entirety, as recognized by the speech recognizer.
**Notes:** Use SFTranscriptionMBS to obtain all the recognized utterances from your audio content. An utterance is a vocalized word or group of words that represent a single meaning to the speech recognizer (SFSpeechRecognizerMBS).
Use the formattedString property to retrieve the entire transcription of utterances, or use the segments property to retrieve an individual utterance (SFTranscriptionSegmentMBS).
You don,Äôt create an SFTranscriptionMBS directly. Instead, you retrieve it from an SFSpeechRecognitionResultMBS instance. The speech recognizer sends a speech recognition result to your app in one of two ways, depending on how your app started a speech recognition task.
You can start a speech recognition task by using the speech recognizer,Äôs recognitionTaskWithRequest method. When the task is complete, the speech recognizer sends an SFSpeechRecognitionResult instance to your resultHandler closure. Alternatively, you can use the speech recognizer,Äôs recognitionTaskWithRequest method to start a speech recognition task. When the task is complete, the speech recognizer uses events to send a SFSpeechRecognitionResultMBS by using the TaskDidFinishRecognition event.
An SFTranscriptionMBS represents only a potential version of the speech. It might not be an accurate representation of the utterances.

Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.8.2 Methods

### 170.8.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.8.4 copy as SFTranscriptionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 170.8.5 segments as SFTranscriptionSegmentMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of transcription segments that represent the parts of the transcription, as identified by the speech recognizer.
**Notes:** The order of the segments in the array matches the order in which the corresponding utterances occur in the spoken content.

### 170.8.6 Properties

### 170.8.7 averagePauseDuration as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The average pause duration between words, measured in seconds.
**Notes:** (Read only property)

### 170.8.8 formattedString as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The entire transcription of utterances, formatted into a single, user-displayable string.
**Notes:** (Read only property)

### 170.8.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.8.10 speakingRate as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The number of words spoken per minute.
**Notes:** (Read only property)

## 170.9 class SFTranscriptionSegmentMBS

### 170.9.1 class SFTranscriptionSegmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A discrete part of an entire transcription, as identified by the speech recognizer.
**Notes:** Use SFTranscriptionSegmentMBS to get details about a part of an overall SFTranscriptionMBS. An SFTranscriptionSegmentMBS represents an utterance, which is a vocalized word or group of words that represent a single meaning to the speech recognizer (SFSpeechRecognizerMBS).

You don,Äôt create transcription object segments directly. Instead, you access them from a transcription,Äôs segments property.
A transcription segment includes the following information:

- The text of the utterance, plus any alternative interpretations of the spoken word.
- The character range of the segment within the formattedString of its parent SFTranscriptionMBS.
- A confidence value, indicating how likely it is that the specified string matches the audible speech.
- A timestamp and duration value, indicating the position of the segment within the provided audio stream.
- A voiceAnalytics metric, indicating the likelihood of a voice in a segment, and that voice,Äôs pitch, jitter, and shimmer properties.

Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.9.2 Methods

### 170.9.3 alternativeSubstrings as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of alternate interpretations of the utterance in the transcription segment.

### 170.9.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.9.5 copy as SFTranscriptionSegmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 170.9.6 Properties

### 170.9.7 confidence as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The level of confidence the speech recognizer has in its recognition of the speech transcribed for the segment.
**Notes:** This property reflects the overall confidence in the recognition of the entire phrase. The value is 0 if there was no recognition, and it is closer to 1 when there is a high certainty that a transcription matches the user's speech exactly. For example, a confidence value of 0.94 represents a very high confidence level, and is more likely to be correct than a transcription with a confidence value of 0.72.
(Read only property)

### 170.9.8 duration as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The number of seconds it took for the user to speak the utterance represented by the segment.
**Notes:** (Read only property)

### 170.9.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.9.10 substring as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The string representation of the utterance in the transcription segment.
**Notes:** (Read only property)

### 170.9.11 substringRange as NSRangeMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The range information for the transcription segment,Äôs substring, relative to the overall transcription.
**Notes:** Use the range information to find the position of the segment within the formattedString property of the SFTranscription object containing this segment.
(Read only property)

### 170.9.12 timestamp as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The start time of the segment in the processed audio stream.
**Notes:** The timestamp is the number of seconds between the beginning of the audio content and when the user spoke the word represented by the segment. For example, if the user said the word ,Äútime,Äù one second into the transcription ,ÄúWhat time is it,Äù, the timestamp would be equal to 1.0.
(Read only property)

### 170.9.13 voiceAnalytics as SFVoiceAnalyticsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An analysis of the transcription segment,Äôs vocal properties.
**Notes:** (Read only property)

## 170.10 class SFVoiceAnalyticsMBS

### 170.10.1 class SFVoiceAnalyticsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A collection of vocal analysis metrics.
**Notes:** Requires MacOS 10.15 or later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with SpeechRecognition

### 170.10.2 Methods

### 170.10.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 170.10.4 copy as SFVoiceAnalyticsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 170.10.5 Properties

### 170.10.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 170.10.7 jitter as SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The variation in pitch in each frame of a transcription segment, expressed as a percentage of the frame,Äôs fundamental frequency.
**Notes:** (Read only property)

### 170.10.8 pitch as SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The highness or lowness of the tone (fundamental frequency) in each frame of a transcription segment, expressed as a logarithm.
**Notes:** The value is a logarithm (base e) of the normalized pitch estimate for each frame.
(Read only property)

### 170.10.9 shimmer as SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The variation in vocal volume stability (amplitude) in each frame of a transcription segment, expressed in decibels.
**Notes:** (Read only property)

### 170.10.10 voicing as SFAcousticFeatureMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The likelihood of a voice in each frame of a transcription segment, expressed as a probability in the range [ 0.0, 1.0 ] .
**Notes:** (Read only property)

# Chapter 171

# Spell Checking

## 171.1 class NSSpellCheckerMBS

### 171.1.1 class NSSpellCheckerMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The spell checker class.
**Notes:** The NSSpellChecker object is used by a client (e.g. a document in an application) to spell-check a given String.
There is only one NSSpellChecker instance per application (since spell-checking is interactive and you only have one mouse and one keyboard).

The string being spell-checked need only be valid for the duration of the call to checkSpellingOfString or countWordsInString.

Requires Mac OS X 10.2.
**Blog Entries**

- Spell Checking on Windows for Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr6
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr5
- MBS Real Studio Plugins, version 13.1pr1
- MBS Real Studio Plugins, version 11.3pr14

- MBS REALbasic plug-in 9.6

**Xojo Developer Magazine**

- 5.4, page 50: The Case of the Top 20, The mayor is caught in an explosive situation, and our boys are on the case by Toby Rush
- 17.3, page 11: News
- 15.6, page 9: News

### 171.1.2 Methods

### 171.1.3 availableLanguages as string()

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a list of the available languages.
**Notes:** Requires Mac OS X 10.5.

### 171.1.4 checkGrammarOfString(text as string, start as Integer, language as string, wrap as boolean) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates a grammatical analysis of a given string.
**Notes:** text: String to analyze.
start: Location within string at which to start the analysis.
language: Language use in string. When nil, the language selected in the Spelling panel is used.
wrap: true to specify that the analysis continue to the beginning of string when the end is reached. false to have the analysis stop at the end of string.
outDetails: Optional. On output, dictionaries describing grammar-analysis details within the flagged grammatical unit. See the NSSpellServer class for information about these dictionaries.

Returns Location of the first flagged grammatical unit.

Available in Mac OS X v10.5 and later.
See also:

- 171.1.5 checkGrammarOfString(text as string, start as Integer, language as string, wrap as boolean, Details() as dictionary) as NSRangeMBS

### 171.1.5 checkGrammarOfString(text as string, start as Integer, language as string, wrap as boolean, Details() as dictionary) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates a grammatical analysis of a given string.
**Notes:** text: String to analyze.
start: Location within string at which to start the analysis.
language: Language use in string. When nil, the language selected in the Spelling panel is used.
wrap: true to specify that the analysis continue to the beginning of string when the end is reached. false to have the analysis stop at the end of string.
outDetails: Optional. On output, dictionaries describing grammar-analysis details within the flagged grammatical unit. See the NSSpellServer class for information about these dictionaries.

Returns Location of the first flagged grammatical unit.

Available in Mac OS X v10.5 and later.
See also:

- 171.1.4 checkGrammarOfString(text as string, start as Integer, language as string, wrap as boolean) as NSRangeMBS 21350

### 171.1.6 checkSpellingOfString(text as string, start as Integer) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates a spell-check of a string.
**Notes:** Returns the range of the first misspelled word.
See also:

- 171.1.7 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean) as NSRangeMBS 21351
- 171.1.8 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean, byref WordCount as Integer) as NSRangeMBS 21352

### 171.1.7 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates a spell-check of a string.
**Notes:** Returns the range of the first misspelled word.
See also:

- 171.1.6 checkSpellingOfString(text as string, start as Integer) as NSRangeMBS 21351

- 171.1.8 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean, byref WordCount as Integer) as NSRangeMBS 21352


### 171.1.8 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean, byref WordCount as Integer) as NSRangeMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Initiates a spell-check of a string.
**Notes:** Returns the range of the first misspelled word (and optionally the wordCount by reference).
See also:

- 171.1.6 checkSpellingOfString(text as string, start as Integer) as NSRangeMBS 21351
- 171.1.7 checkSpellingOfString(text as string, start as Integer, language as string, wrap as boolean) as NSRangeMBS 21351

### 171.1.9 checkString(text as string, range as NSRangeMBS = nil, checkingTypes as Int64 = -1, options as Dictionary = nil, byref orthography as NSOrthographyMBS, byref wordCount as Integer) as NSTextCheckingResultMBS()

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requests unified text checking for the given range of the given string.
**Notes:** text: The string to check.
range: The range of the string to check.
checkingTypes: The type of checking to be performed. The possible constants are listed in NSTextCheckingType and can be combined using the C bit-wise OR operator to perform multiple checks at the same time.
options: The options dictionary specifying the types of checking to perform. See Spell Checking Option Dictionary Keys for the possible keys and expected values.

orthography: Returns by-reference, the orthography of the range of the string. See NSOrthographyMBS for more information.
wordCount: Returns by-reference, the word count for the range of the string.

Returns an array of NSTextCheckingResultMBS objects describing particular items found during checking and their individual ranges, sorted by range origin, then range end, then result type.

### 171.1.10 completionsForPartialWordRange(start as Integer, length as Integer, text as string, language as string="") as string()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Searches possible completions for the given word.
**Notes:** Returns an array of strings, in the order in which they should be presented, representing complete words that the user might be trying to type when starting by typing the partial word at the given range in the given string.

Within the text, length characters are picked starting at at position (0 based) and matched agains the dictionary defined by language.
Up to around 100 words are returned.

Requires Mac OS X 10.3.
Returns an empty string on any error.

### 171.1.11 correctionForWordRange(range as NSRangeMBS, text as string, language as string) as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a single proposed correction if a word is mis-spelled.
**Notes:** range: The range of the word to be corrected.
text: The string containing the proposed correction.
language: The language.

Returns the proposed correct string.

### 171.1.12 countWordsInString(word as string, language as string="") as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Just counts the words without checking spelling.
**Example:**

```
dim text as string = "Hello World"
dim spell as NSSpellCheckerMBS // your spellchecker

msgBox str(spell.countWordsInString(text,"en"))
```

**Notes:** Returns the number of words in text. The language argument specifies the language used in the string. If language is the empty string, the current selection in the Spelling panel's pop-up menu is used.

Returns -1 if text is nil or this spellchecker function is not available.

Returns -1 if counting words isn't supported by the spell server selected.

### 171.1.13 deletesAutospaceBetweenString(precedingString as string, followingString as string, language as String = "") as Boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Deletes auto space between strings.
**Notes:** In some cases the space automatically inserted after an accepted candidate should be deleted when the next text is typed (e.g. if it is a period or comma). This method allows clients to recognize these cases in a standardized way.

### 171.1.14 dismissCorrectionIndicatorForView(view as NSViewMBS)

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** Dismisses the correction indicator for the specified view.

### 171.1.15 forgetWord(word as string)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Removes the given word from the user dictionary.

### 171.1.16 guessesForWord(range as NSRangeMBS, word as string, language as string) as string()

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array of possible substitutions for the specified string.
**Notes:** range: The range of the string to check.
word: The string to guess
language: The language of the string

Returns an array of strings containing possible replacement words.
Available in Mac OS X v10.6 and later.
See also:

- 171.1.17 guessesForWord(word as string) as string() 

### 171.1.17 guessesForWord(word as string) as string()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array with words matching the given word.
**Example:**

```
dim a() as string
dim s as new NSSpellCheckerMBS
a=s.guessesForWord("Hell")

msgbox str(ubound(a)+1)+" suggestions."
```

**Notes:** Returns nil on any error.

Returns an array of suggested spellings for the misspelled word word. If word contains all capital letters, or its first letter is capitalized, the suggested words are capitalized in the same way.
See also:

- 171.1.16 guessesForWord(range as NSRangeMBS, word as string, language as string) as string() 21354

### 171.1.18 hasLearnedWord(word as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Checks whether a word has been learned.
**Notes:** Returns true if the word is known.
Requires Mac OS X 10.5.

### 171.1.19 ignoredWords as string()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The list of ignored words.
**Example:**

```
dim spell as new NSSpellCheckerMBS
dim f as FolderItem
dim i,c as Integer
dim t as TextOutputStream
dim n(-1) as string

f=SpecialFolder.Preferences.Child("SpellCheck RB.pref")
t=f.CreateTextFile
```

```
if t<>nil and spell<>nil then
n=spell.ignoredWords
MsgBox Join(n,EndOfLine)
end if
```

**Notes:** Returns nil on any error.

### 171.1.20 ignoreWord(word as string)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Adds the word to the ignore list so it will be ignored for spell checking in this NSSpellCheckerMBS object.
**Notes:** Requires Mac OS X 10.2.

### 171.1.21 isAutomaticCapitalizationEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic capitalization is enabled by the user.

### 171.1.22 isAutomaticDashSubstitutionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic dash substitution is enabled by the user.

### 171.1.23 isAutomaticPeriodSubstitutionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic period substitution is enabled by the user.

### 171.1.24 isAutomaticQuoteSubstitutionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic quote substitution is enabled by the user.

### 171.1.25 isAutomaticSpellingCorrectionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic spelling correction is enabled.
**Notes:** Available in Mac OS X v10.6 and later.

### 171.1.26 isAutomaticTextCompletionEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic text completion is enabled by the user.

### 171.1.27 isAutomaticTextReplacementEnabled as boolean

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether automatic spelling replacement is enabled.
**Notes:** Available in Mac OS X v10.6 and later.

### 171.1.28 languageForWordRange(range as NSRangeMBS, text as string, orthography as NSOrthographyMBS = nil) as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clients who have an NSOrthography from NSTextCheckingTypeOrthography checking and wish to determine a specific language from it for a particular word.

### 171.1.29 languageMenuEntries as string()

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The entries from the language menu of the panel.
**Notes:** Copies the list of menu entries from the panel.

Currently you can use this names to show to the user and see what languages are available. It uses a private property which works for Mac OS X 10.4 and 10.5.

For the language function you need the short names:

| | |
|---|---|
| Australian English | en_AU |
| British English | en_GB |
| Canadian English | en_CA |
| Deutsch | de |
| English | en |
| Espa√±ol | es |
| Fran√ßais | fr |
| Italiano | it |
| Multilingual | Multilingual |
| Nederlands | nl |
| Portugu√™s | pt |
| Protugu√™s do Brasil | pt_BR |
| Svenska | sv |

### 171.1.30 learnWord(word as string)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Learns the given word.
**Notes:** Requires Mac OS X 10.5.

### 171.1.31 menuForResult(TextCheckingResult as NSTextCheckingResultMBS, checkedString as string, options as Dictionary = nil, atLocation as NSPointMBS, view as NSViewMBS) as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** Provides a menu containing contextual menu items suitable for certain kinds of detected results.
**Notes:** TextCheckingResult: The NSTextCheckingResult instance for the checked string.
checkedString: The string that has been checked.
options: The options dictionary allows clients to pass in information associated with the document. See Spell Checking Option Dictionary Keys for possible key-value pairs.
location: The location, in the view,Äôs coordinate system, to display the menu.
view: The view object over which to display the contextual menu.

Returns a menu suitable for displaying as a contextual menu, or adding to another contextual menu as a submenu.

### 171.1.32 NSSpellCheckerDidChangeAutomaticCapitalizationNotification as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification named used when automatic capitalization setting changed.

### 171.1.33 NSSpellCheckerDidChangeAutomaticDashSubstitutionNotification as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification named used when automatic dash substitution setting changed.

### 171.1.34 NSSpellCheckerDidChangeAutomaticPeriodSubstitutionNotification as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification named used when automatic period substitution setting changed.

### 171.1.35 NSSpellCheckerDidChangeAutomaticQuoteSubstitutionNotification as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification named used when automatic quote substitution setting changed.

### 171.1.36 NSSpellCheckerDidChangeAutomaticSpellingCorrectionNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Use with NSNotificationObserverMBS class.
This notification is posted when the spell checker did change text using automatic spell checking correction.
The are posted to the application's default notification center.
Available in Mac OS X v10.7 and later.

### 171.1.37 NSSpellCheckerDidChangeAutomaticTextCompletionNotification as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The notification named used when automatic text completion setting changed.

### 171.1.38 NSSpellCheckerDidChangeAutomaticTextReplacementNotification as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the notification names.
**Notes:** Use with NSNotificationObserverMBS class.
This notification is posted when the spell checker changed text using automatic text replacement. The are posted application's to the default notification center.
Available in Mac OS X v10.7 and later.

### 171.1.39 NSTextCheckingDocumentAuthorKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** An string containing the name of an author to be associated with the document

Available in Mac OS X v10.6 and later.

### 171.1.40 NSTextCheckingDocumentTitleKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** A string containing the title to be associated with the document.

Available in Mac OS X v10.6 and later.

### 171.1.41 NSTextCheckingDocumentURLKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.

**Notes:** An NSURL to be associated with the document.

Available in Mac OS X v10.6 and later.

### 171.1.42 NSTextCheckingOrthographyKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** An NSOrthography instance indicating an orthography to be used as a starting point for orthography checking, or as the orthography if orthography checking is not enabled.

Available in Mac OS X v10.6 and later.

### 171.1.43 NSTextCheckingQuotesKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** An NSArray containing four strings to be used with NSTextCheckingTypeQuote (opening double quote, closing double quote, opening single quote, and closing single quote in that order); if not specified, values will be taken from user's preferences.

Available in Mac OS X v10.6 and later.

### 171.1.44 NSTextCheckingReferenceDateKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** An NSDate to be associated with the document, used as a referent for relative dates; if not specified, the current date will be used.

Available in Mac OS X v10.6 and later.

### 171.1.45 NSTextCheckingReferenceTimeZoneKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** An NSTimeZone to be associated with the document, used as a reference for dates without time zones; if not specified, the current time zone will be used.

Available in Mac OS X v10.6 and later.

### 171.1.46 NSTextCheckingRegularExpressionsKey as string

MBS MacCocoa Plugin, Plugin Version: 12.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** Available in Mac OS X 10.7 or newer.
Currently not directly supported with our plugins.

### 171.1.47 NSTextCheckingReplacementsKey as string

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** A dictionary containing replacements to be used with NSTextCheckingTypeReplacement; if not specified, values will be taken from user's preferences.

Available in Mac OS X v10.6 and later.

### 171.1.48 NSTextCheckingSelectedRangeKey as string

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the constants for the options dictionary.
**Notes:** NSValueMBS containing NSRangeMBS, should be the portion of the selected range intersecting the string being checked, or a zero-length range if there is an insertion point in or adjacent to the string being checked, or New NSRangeMBS(NSNotFound, 0) if the selection is entirely outside of the string being checked.

### 171.1.49 preventsAutocorrectionBeforeString(text as string, language as String = "") as Boolean

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** In some cases the next typing should prevent a pending correction (if it is an @, for example).
**Notes:** This method allows clients to recognize these cases in a standardized way.

### 171.1.50 recordResponse(response as Integer, correction as string, word as string, language as String = "")

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Records the user response to the correction indicator being displayed.
**Notes:** response: The user,Äôs response. The possible values are shown in NSCorrectionResponse.
correction: The corrected word. This should match the original correction.
word: The original word. This should match the original correction.
language: The language being edited. This should match the original correction.

When a correction is automatically proposed, the user may respond in one of several ways. Clients may report this to the spell checker so that it can learn from the user's response and adjust future correction behavior accordingly.

Use of this method implies that the client stored the original word and original correction at least from the point at which the user accepts it until the user edits or reverts it.

### 171.1.51 requestCandidatesForSelectedRange(selectedRange as NSRangeMBS, stringToCheck as string, types as Int64 = -1, options as Dictionary = nil, tag as Variant = nil) as Integer

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requests candidates in background.

### 171.1.52 requestCheckingOfString(stringToCheck as string, range as NSRangeMBS, types as Int64 = -1, options as Dictionary = nil, tag as Variant = nil) as Integer

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requests that the string be checked in the background.
**Notes:** stringToCheck: The string to check.
range: The range of the string to check.
types: The type of checking to be performed. The possible constants are listed in NSTextCheckingType and can be combined using the C bit-wise OR operator to perform multiple checks at the same time.
options: The options dictionary specifying the types of checking to perform. See Spell Checking Option Dictionary Keys for the possible keys and expected values.
tag: An identifier unique within the application used to inform the spell checker which document that text is

associated, potentially for many purposes, not necessarily just for ignored words. A value of 0 can be passed in for text not associated with a particular document.

The return value is a monotonically increasing sequence number that can be used to keep track of requests in flight.

Calls requestCheckingOfStringCompleted event later on main thread.

### 171.1.53 setIgnoredWords(words() as string)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the ignored word list.
**Example:**

```
dim spell as NSSpellCheckerMBS // your spellchecker

dim f as FolderItem
dim t as TextInputStream
dim words(-1),line as string

f=SpecialFolder.Preferences.Child("SpellCheck RB.pref")
t=f.OpenAsTextFile
if t<>nil and spell<>nil then

while not t.eof
line=t.ReadLine(encodings.UTF8)
if line<>"" then
words.Append line
end if
wend

spell.setIgnoredWords words

end if
```

### 171.1.54 setLanguage(language as string) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Allows programmatic setting of the language to spell-check in.
**Notes:** Normally chosen by a pop-up-list in the spelling panel and defaulted to the user's preferred language, so call this with care.

Set to "" to use the language from the panel popup menu.

### 171.1.55 sharedSpellCheckerExists as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the application's NSSpellChecker has already been created.
**Notes:** Returns true if the shared spell checker already exists, otherwise false.

### 171.1.56 spellingPanel as NSPanelMBS

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop only.

**Function:** The spelling panel used for spell checking.

### 171.1.57 unlearnWord(word as string)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Tells the spell checker to unlearn a given word.
**Notes:** Available in Mac OS X v10.5 and later.
Same as the older forgetWord.

### 171.1.58 updatePanels

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates the available panels to account for user changes.
**Notes:** This method should be called when a client changes some relevant setting, such as what kind of spelling, grammar checking, or substitutions it uses.

Available in Mac OS X v10.6 and later.

### 171.1.59 updateSpellingPanelWithGrammarString(lang as string, detail as dictionary)

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Specifies a grammar-analysis detail to highlight in the Spelling panel.
**Notes:** problemString: Problematic grammatical unit identified by checkGrammarOfString.
detail: One of the grammar-analysis details provided by checkGrammarOfString.

Available in Mac OS X v10.5 and later.

### 171.1.60 updateSpellingPanelWithMisspelledWord(word as string)

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Updates the panel with the word.
**Notes:** The checkSpellingOfString methods return the range of the misspelled word found. It is up to the client to select that word in their document and to cause the spelling panel to update itself to reflect the found misspelling. Clients can call updateSpellPanelWithMisspelledWord to insure that the spell panel is up to date.

### 171.1.61 userPreferredLanguages as string()

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Provides a subset of the available languages to be used for spell checking.
**Notes:** Returns an array containing the user's preferred languages for spell checking. The order is set in the system preferences.

If automaticallyIdentifiesLanguages is true, then text checking will automatically use this method as appropriate; otherwise, it will use the language set by Language property.

The older checkSpellingOfString and checkGrammarOfString methods will use the language set by Language property, if they are called with an empty language argument.

Available in Mac OS X v10.6 and later.

### 171.1.62 userQuotesArrayForLanguage(lang as string) as string()

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the default values for quote replacement.
**Example:**

```
dim n as new NSSpellCheckerMBS
```

```
dim en(-1) as string = n.userQuotesArrayForLanguage("en")

MsgBox Join(en," ")
```

**Notes:** An array of quote replacements used by the NSTextCheckingQuotesKey key-value pair.

Available in Mac OS X v10.6 and later.

### 171.1.63 userReplacementsDictionary as dictionary

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the dictionary used when replacing words.
**Notes:** The key-value pairs in this dictionary are used by the NSTextCheckingQuotesKey when replacing characters and words.

Available in Mac OS X v10.6 and later.

### 171.1.64 Properties

### 171.1.65 accessoryView as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The Spelling panel's accessory view.
**Notes:** The accessory view can be any custom view you want to display with the spelling panel. The accessory view is displayed below the spelling checker and the panel automatically resizes to accommodate the accessory view.

This method posts a notification named NSWindowDidResizeNotification with the Spelling panel object to the default notification center.

The accessory view or nil if there is none.
(Read and Write property)

### 171.1.66 automaticallyIdentifiesLanguages as boolean

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the spell checker will automatically identify languages.
**Notes:** Available in Mac OS X v10.6 and later.
(Read and Write property)

### 171.1.67 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The handle to the used NSSpellChecker reference.
**Notes:** (Read and Write property)

### 171.1.68 language as string

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The current language used.
**Example:**

```
dim c as NSSpellCheckerMBS

c=new NSSpellCheckerMBS

c.Language="en"

MsgBox c.Language // shows en

c.Language="Dutch"

MsgBox c.Language // shows nl

c.Language="Multilingual"

MsgBox c.Language // shows Multilingual
```

**Notes:** (Read and Write property)

### 171.1.69 Length as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last length of the position where an error was found.
**Notes:** Length is 0 if no location was found.

(Read and Write property)

### 171.1.70 Location as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last location where an error was found.
**Notes:** (Read and Write property)

### 171.1.71 substitutionsPanel as NSPanelMBS

MBS MacCocoa Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop only.

**Function:** The substitutions panel.
**Notes:** (Read only property)

### 171.1.72 substitutionsPanelAccessoryViewController as NSViewControllerMBS

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets the substitutions panel,Äôs accessory view.
**Notes:** accessoryController: The accessory view controller or nil if there is none.

The accessory view controller can accommodate any custom view you want to display with the substitutions panel. The accessory view controller,Äôs view is displayed below the substitutions list and the panel automatically resizes to accommodate the accessory view.
This method posts a notification named NSWindowDidResizeNotification with the substitutions panel object to the default notification center.
(Read only property)

### 171.1.73 Tag as Integer

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The document tag for the current document.
**Notes:** Every NSSpellCheckerMBS gets a new tag. The tag identifies which ignore list is used. This value is set automatically.
(Read and Write property)

### 171.1.74 WordFieldValue as string

MBS MacCocoa Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The word textfield content string.
**Notes:** (Read and Write computed property)

### 171.1.75 Events

### 171.1.76 Correct

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** An event sent whenever the Correct button is pressed.

### 171.1.77 FindNext

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** An event sent whenever the Find Next button is pressed.

### 171.1.78 Ignore

MBS MacCocoa Plugin, Plugin Version: 7.1, Platform: macOS, Targets: .

**Function:** An event sent whenever the Ignore button is pressed.

### 171.1.79 requestCandidatesForSelectedRangeCompleted(sequenceNumber as Integer, candidates() as NSTextCheckingResultMBS, stringToCheck as String, selectedRange as NSRangeMBS, checkingTypes as Int64, options as Dictionary, tag as Variant)

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called later by requestCandidatesForSelectedRange method.

### 171.1.80 requestCheckingOfStringCompleted(sequenceNumber as Integer, results() as NSTextCheckingResultMBS, orthography as NSOrthographyMBS, wordCount as Integer, stringToCheck as String, Range as NSRangeMBS, checkingTypes as Int64, options as Dictionary, tag as Variant)

MBS MacCocoa Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called later by requestCheckingOfString method.
**Notes:** sequenceNumber: A monotonically increasing sequence number.
results: An array of NSTextCheckingResultMBS objects describing particular items found during checking and their individual ranges, sorted by range origin, then range end, then result type..
orthography: The orthography of the string.
wordCount: The number of words in the range of the string.

### 171.1.81 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSGrammarCorrections | "NSGrammarCorrections" | One of the key constants for the dictionaries in the detai |
| NSGrammarRange | "NSGrammarRange" | One of the key constants for the dictionaries in the detai |
| NSGrammarUserDescription | "NSGrammarUserDescription" | One of the key constants for the dictionaries in the detai |

Correction indicator type Constants

| Constant | Value | Description |
|---|---|---|
| NSCorrectionIndicatorTypeDefault | 0 | The default indicator that shows a proposed correction.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionIndicatorTypeGuesses | 2 | Shows multiple alternatives from which the user may choose the approp spelling.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionIndicatorTypeReversion | 1 | Provides the option to revert to the original form after a correction has made.<br>Available in Mac OS X v10.7 and later. |

Response Constants

| Constant | Value | Description |
|---|---|---|
| NSCorrectionResponseAccepted | 1 | The user accepted the correction.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionResponseEdited | 4 | After the correction was accepted, the user edited the corrected word (to something other than its original form.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionResponseIgnored | 3 | The user continued in such a way as to ignore the correction.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionResponseNone | 0 | No response was received from the user.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionResponseRejected | 2 | The user rejected the correction by dismissing the correction indicator.<br>Available in Mac OS X v10.7 and later. |
| NSCorrectionResponseReverted | 5 | After the correction was accepted, the user reverted the correction back to the original word.<br>Available in Mac OS X v10.7 and later. |

## 171.2 class WinSpellCheckerExceptionMBS

### 171.2.1 class WinSpellCheckerExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The class for an exception with spell checking classes.
**Notes:** Subclass of the RuntimeException class.

## 171.3 class WinSpellCheckerMBS

### 171.3.1 class WinSpellCheckerMBS

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Represents a particular spell checker for a particular language.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

Dim Text As String = "Helo World"
Dim errors() As WinSpellingErrorMBS = w.Check(Text)
Dim Error As WinSpellingErrorMBS = errors(0)

MsgBox "Spelling error in """ + text.Mid(error.StartIndex+1, error.Length)+""""
```

**Notes:** Requires Windows 8.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- Spell Checking on Windows for Xojo
- MBS Xojo Plugins, version 21.2pr3

**Xojo Developer Magazine**

- 19.4, page 10: News

### 171.3.2 Methods

### 171.3.3 Add(word as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Treats the provided word as though it were part of the original dictionary.
**Notes:** The word will no longer be considered misspelled, and will also be considered as a candidate for suggestions.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.4 AutoCorrect(FromWord as String, ToWord as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Causes occurrences of one word to be replaced by another.
**Notes:** FromWord: The incorrectly spelled word to be autocorrected.
ToWord: The correctly spelled word that should replace from.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.5 Check(text as String) as WinSpellingErrorMBS()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Checks the spelling of the supplied text and returns a collection of spelling errors.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

Dim Text As String = "Helo World"
Dim errors() As WinSpellingErrorMBS = w.Check(Text)
Dim Error As WinSpellingErrorMBS = errors(0)

MsgBox "Spelling error in """ + text.Mid(error.StartIndex+1, error.Length)+""""
```

**Notes:** text: The text to check.

Returns an array of error objects.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.6 ComprehensiveCheck(text as String) as WinSpellingErrorMBS()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Checks the spelling of the supplied text in a more thorough manner than Check, and returns a collection of spelling errors.
**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.7 Constructor(languageTag as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Creates a spell checker that supports the specified language.
**Notes:** languageTag: A BCP47 language tag that identifies the language for the requested spell checker.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.8 Destructor

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 171.3.9 Ignore(word as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Ignores the provided word for the rest of this session.
**Notes:** Until this WinSpellCheckerMBS object is released, the word will no longer be considered misspelled, but it will not be considered as a candidate for suggestions.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.10 IsSupported(languageTag as String) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Determines if the specified language is supported by a registered spell checker.
**Example:**

```
If WinSpellCheckerMBS.IsSupported("en-US") Then
MsgBox "US-English is supported."
Else
MsgBox "US-English is not supported!"
End If

If WinSpellCheckerMBS.IsSupported("de-CH") Then
MsgBox "Swiss German is supported."
Else
MsgBox "Swiss German is not supported!"
```

End If

**Notes:** languageTag: A BCP47 language tag that identifies the language for the requested spell checker. e.g. "en-US"

Returns true if supported; false if not supported.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.11 OptionDescription(optionId as String) as WinSpellCheckerOptionDescriptionMBS

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the information (id, description, heading and labels) of a specific option.
**Notes:** optionId: Identifier of the option to be retrieved.
Returns WinSpellCheckerOptionDescriptionMBS interface that contains the information about optionId.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.12 OptionIds as String()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets all of the declared option identifiers.
**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.13 OptionValue(optionId as String) as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the value associated with the given option.
**Notes:** optionId: The option identifier.

Returns the value associated with optionId.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.14 RegisterUserDictionary(dictionaryPath as String, languageTag as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Registers a file to be used as a user dictionary for the current user, until unregistered.
**Notes:** dictionaryPath: The path of the dictionary file to be registered.
languageTag: The language for which this dictionary should be used. If left empty, it will be used for any language.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.15 Remove(word as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Removes a word that was previously added by Add, or set by Ignore to be ignored.
**Notes:** Word: The word to be removed from the list of added words, or from the list of ignored words. If the word is not present, nothing will be removed.

Raises exception if word is an empty string, or its length is greater than MAX_WORD_LENGTH (128).

Available on Windows 10 and later.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.16 Suggest(word as String) as String()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves spelling suggestions for the supplied text.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

Dim suggestions() As String = w.Suggest("Helo")

MsgBox Join(suggestions, EndOfLine)
```

**Notes:** word: The word or phrase to get suggestions for.

Returns the list of suggestions, returned as string array.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.17 SupportedLanguages as String()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the set of languages/dialects supported by any of the registered spell checkers.
**Example:**

MsgBox Join(WinSpellCheckerMBS.SupportedLanguages, EndOfLine)

**Notes:** The supported languages are specific, not neutral.
For Hebrew, for example, the supported language is "he-IL", not "he".

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.18 UnregisterUserDictionary(dictionaryPath as String, languageTag as String)

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Unregisters a previously registered user dictionary. The dictionary will no longer be used by the spell checking functionality.
**Notes:** dictionaryPath: The path of the dictionary file to be unregistered.
languageTag: The language for which this dictionary was used. It must match the language passed to RegisterUserDictionary.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.3.19 Properties

### 171.3.20 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 171.3.21 Id as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the identifier for this spell checker.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

MsgBox w.Id
```

**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.3.22 LanguageTag as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the BCP47 language tag this instance of the spell checker supports.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

MsgBox w.LanguageTag
```

**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.3.23 LocalizedName as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets text, suitable to display to the user, that describes this spell checker.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

MsgBox w.LocalizedName
```

**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.3.24 Events

### 171.3.25 Changed

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: .

**Function:** The changed event.
**Notes:** The SpellCheckerChanged event fires whenever the state of the spell checker changes in a way such that any text that has been checked should be rechecked. This should happen when the contents of a word list changes, when an option changes, or when the default spell checker changes.

## 171.4 class WinSpellCheckerOptionDescriptionMBS

### 171.4.1 class WinSpellCheckerOptionDescriptionMBS

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Represents the description of a spell checker option.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr3

### 171.4.2 Methods

### 171.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 171.4.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 171.4.5 Labels as String()

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the label enumerator for the spell checker option.
**Notes:** When there is a single label, the valid values for this option are 0 (not chosen) and 1 (chosen). When there is more than one label, the first label is associated with the value 0, the second with 1, and so on, effectively forming an enumeration. The labels should be in the language of the spell checker or localized to the user's UI language.

Raises WinSpellCheckerExceptionMBS in case of an error.

### 171.4.6 Properties

### 171.4.7 Description as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Get the description of the spell checker option.
**Notes:** The description explains the implications of making the various choices associated with the option. This should be in the language of the spell checker or localized to the user's UI language.

Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.4.8 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 171.4.9 Heading as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the heading for the spell checker option.
**Notes:** The heading can be used to group sets of options by placing the header on the first item of that group. This should be in the language of the spell checker or localized to the user's UI language.

Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.4.10 Id as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the identifier of the spell checker option.
**Notes:** Option identifiers all exist in the same area. Spell checker providers should use the engine identifier and the language tag (if the option is language-specific) to disambiguate potential collisions.

Specifically, the structure for naming the option identifiers should be:

For the Microsoft spell checker engine: <language tag>:<option name>. For example, ”pt-BR:2009Reform.” For spell check provider engines: <engine id>:<language tag>:<option name>(the language tag may be omitted if the option is not language specific). For example, ”samplespell:fr-FR:AccentedUppercase”.

Spell check providers are allowed to support existing Microsoft option identifiers, but they must not create new option identifiers in the Microsoft namespace. That is, spell check providers must use the engine identifier as a prefix.

An option identifier is linked to the set of labels and the semantics associated with them. If any change needs to be made between versions to the option (adding a label to the set of labels), a new option with a new identifier must be used. The only valid change that does not require a new identifier is to change from a single label to two labels and vice-versa when the semantics for values 0 and 1 do not change.

Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

## 171.5 class WinSpellingErrorMBS

### 171.5.1 class WinSpellingErrorMBS

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Provides information about a spelling error.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

// tell it to capitalize Xojo!
w.AutoCorrect "xojo", "Xojo"

Dim Text As String = "Hello xojo!"
Dim errors() As WinSpellingErrorMBS = w.check(Text)
Dim Error As WinSpellingErrorMBS = errors(0)

MsgBox "Spelling error in """ + Text.Mid(error.StartIndex+1, error.Length)+"""". Must be "+error.Replacement
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.2
- Spell Checking on Windows for Xojo
- MBS Xojo Plugins, version 21.2pr3

### 171.5.2 Methods

### 171.5.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 171.5.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 171.5.5 Properties

### 171.5.6 CorrectiveAction as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Indicates which corrective action should be taken for the spelling error.
**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.5.7 Length as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the length of the erroneous text.
**Notes:** Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.5.8 Replacement as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the text to use as replacement text when the corrective action is replace.
**Example:**

```
Dim w As New WinSpellCheckerMBS("en-US")

// tell it to capitalize Xojo!
w.AutoCorrect "xojo", "Xojo"

Dim Text As String = "Hello xojo!"
Dim errors() As WinSpellingErrorMBS = w.check(Text)
Dim Error As WinSpellingErrorMBS = errors(0)

MsgBox "Spelling error in """ + Text.Mid(error.StartIndex+1, error.Length)+"""". Must be "+error.Replacement
```

**Notes:** If the CorrectiveAction returned by CorrectiveAction is not kCorrectiveActionReplace, value is the empty string.

Raises WinSpellCheckerExceptionMBS in case of an error.

If empty, you may better go with Suggest() function in WinSpellCheckerMBS class.
(Read only property)

### 171.5.9 StartIndex as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** Gets the position in the checked text where the error begins.
**Notes:** Index is zero based!

Raises WinSpellCheckerExceptionMBS in case of an error.
(Read only property)

### 171.5.10 Text as String

MBS WinFrameworks Plugin, Plugin Version: 21.2, Platform: Windows, Targets: Desktop only.

**Function:** The text referenced.
**Notes:** For your convenience we prepare Text.Middle(StartIndex, Length) for you here.
(Read only property)

### 171.5.11 Constants

Corrective Actions

| Constant | Value | Description |
|---|---|---|
| kCorrectiveActionDelete | 3 | The user should be prompted to delete the indicated erroneous text. |
| kCorrectiveActionGetSuggestions | 1 | The user should be prompted with a list of suggestions as returned by Suggest |
| kCorrectiveActionNone | 0 | There are no errors. |
| kCorrectiveActionReplace | 2 | Replace the indicated erroneous text with the text provided in the suggestion The user does not need to be prompted. |

# Chapter 172

# Spotlight

## 172.1 class MDItemMBS

### 172.1.1 class MDItemMBS

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This is the class that represents a file and the metadata associated with the file.
**Notes:** Available in Mac OS X version 10.4 and later.
**Blog Entries**

- Query URL from downloaded file
- MBS Xojo / Real Studio Plugins, version 15.1pr8
- MBS Real Studio Plugins, version 12.3pr3
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr7
- MBS REALbasic plug-in 9.6

### 172.1.2 Methods

### 172.1.3 AllAttributes as string()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns a list with all possible attribute names in the system.
**Notes:** dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox join(item.AllAttributes, EndOfLine)

### 172.1.4 AttributeBoolean(name as string) as boolean

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value for this attribute.

### 172.1.5 AttributeDouble(name as string) as Double

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value for this attribute.

### 172.1.6 AttributeMultiValued(name as string) as boolean

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether the given attribute is an array of multiple values.

### 172.1.7 AttributeNames as string()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns an array containing the attribute names existing in the metadata item.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox join(item.AttributeNames, EndOfLine)
```

**Notes:** Available in Mac OS X version 10.4 and later.

### 172.1.8 AttributeString(name as string) as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value for this attribute.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.AttributeString(item.kMDItemFSName)
```

### 172.1.9 AttributeStringArray(name as string) as string()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value for this attribute.

### 172.1.10 AttributeType(name as string) as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The type of the attribute.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.AttributeType(item.kMDItemFSName) // "String"
```

**Notes:** Returns "Boolean", "Number", "Date" or "String".

### 172.1.11 Constructor(path as folderitem)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates an MDItem object for a file at the specified path.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim m as new MDItemMBS(f)

MsgBox m.DisplayName
```

**Notes:** path: A path to the file from which to create the MDItem.

Available in Mac OS X version 10.4 and later.

### 172.1.12 DisplayDescriptionForAttribute(name as string) as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The display description for the attribute.
**Notes:** dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.DisplayDescriptionForAttribute(item.kMDItemDisplayName)
// shows "Lokalisiert angezeigter Name der Datei" in German

### 172.1.13 DisplayNameForAttribute(name as string) as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The display name for this attribute.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.DisplayNameForAttribute(item.kMDItemDisplayName)
// shows "Anzeigename" in German
```

### 172.1.14 GetAttribute(name as string) as Variant

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value of the given attribute for the item.
**Notes:** name: The name of the desired attribute.

A variant, or nil on failure, or if the attribute does not exist, of if the attribute is not readable.

### 172.1.15 GetAttributes as dictionary

MBS MacOSX Plugin, Plugin Version: 17.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries all attributes with all names and values.
See also:

- 172.1.16 GetAttributes(names() as string) as dictionary 

### 172.1.16 GetAttributes(names() as string) as dictionary

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the values of the given attributes for the item.
**Notes:** names: An array of the names of the desired attributes.
A dictionary where the keys are the attribute names, and the values are the attribute values, or nil on failure.
If an attribute does not exist, or is unreadable, there will be no key-value pair for it in the dictionary.
See also:

- 172.1.15 GetAttributes as dictionary 21392

### 172.1.17 kMDItemAcquisitionMake as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The manufacturer of the device used to aquire the document contents. A string.

### 172.1.18 kMDItemAcquisitionModel as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The model of the device used to aquire the document contents. For example, 100, 200, 400, etc. A string.

### 172.1.19 kMDItemAlbum as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The title for a collection of media. This is analagous to a record album, or photo album. A string.

### 172.1.20 kMDItemAltitude as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The altitude of the item in meters above sea level, expressed using the WGS84 datum. Negative values lie below sea level. A number.

### 172.1.21 kMDItemAperture as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The aperture setting used to acquire the document contents. This unit is the APEX value. A number.

### 172.1.22 kMDItemAppleLoopDescriptors as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies multiple pieces of descriptive information about a loop. An array of strings.

Besides genre and instrument, files can contain descriptive information that help users in refining searches.

### 172.1.23 kMDItemAppleLoopsKeyFilterType as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies key filtering information about a loop. Loops are matched against projects that often in a major or minor key. A string.

To assist users in identifying loops that will "fit" with their compositions, loops can be tagged with one of the following key filters: "AnyKey" "Minor" "Major" "NeitherKey" "BothKeys". "AnyKey" means that it fits with anything (whether in a major key, minor key or neither). "Minor" fits with compositions in a minor key. "NeitherKey" doesn't work well with compositions that are in major or minor key. "BothKeys" means it fits with major or minor key.

### 172.1.24 kMDItemAppleLoopsLoopMode as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies how a file should be played. A string.

Tagged files can either be loops or non-loops (e.g., a cymbal crash). "Looping" indicates if the file should be treated as a loop. "Non-looping" indicates the file should not be treated as a loop.

### 172.1.25 kMDItemAppleLoopsRootKey as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies the loop's original key. The key is the root note or tonic for the loop, and does not include the scale type. A string.

### 172.1.26 kMDItemApplicationCategories as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.27 kMDItemAttributeChangeDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date and time of the last change made to a metadata attribute. A date.

### 172.1.28 kMDItemAudiences as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The audience for which the file is intended. The audience may be determined by the creator or the publisher or by a third party. An array of strings.

### 172.1.29 kMDItemAudioBitRate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The audio bit rate. A number.

### 172.1.30 kMDItemAudioChannelCount as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Number of channels in the audio data contained in the file. A number.

This integer value only represents the number of discreet channels of audio data found in the file. It does not indicate any configuration of the data in regards to a user's speaker setup.

### 172.1.31 kMDItemAudioEncodingApplication as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The name of the application that encoded the data contained in the audio file. A string.

### 172.1.32 kMDItemAudioSampleRate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Sample rate of the audio data contained in the file. The sample rate is a float value representing hz (audio_frames/second). For example: 44100.0, 22254.54. A number.

### 172.1.33 kMDItemAudioTrackNumber as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The track number of a song or composition when it is part of an album. A number (integer).

### 172.1.34 kMDItemAuthorAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute indicates the author addresses of the document.
An array of string. Requires Mac OS X 10.6.

### 172.1.35 kMDItemAuthorEmailAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute indicates the author of the emails message addresses. (This is always the email address, and not the human readable version). An array of string. Requires Mac OS X 10.5.

### 172.1.36 kMDItemAuthors as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The author, or authors, of the contents of the file. An array of strings.
The order of the authors is preserved, but does not represent the main author or relative importance of the authors.

### 172.1.37 kMDItemBitsPerSample as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The number of bits per sample. For example, the bit depth of an image (8-bit, 16-bit etc...) or the bit depth per audio sample of uncompressed audio data (8, 16, 24, 32, 64, etc..). A number.

### 172.1.38 kMDItemCameraOwner as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.39 kMDItemCFBundleIdentifier as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** If this item is a bundle, then this is the CFBundleIdentifier. A string

### 172.1.40 kMDItemCity as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Identifies city of origin according to guidelines established by the provider. A string.

For example, "New York", "Cupertino", or "Toronto".

### 172.1.41 kMDItemCodecs as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The codecs used to encode/decode the media. An array of strings.

### 172.1.42 kMDItemColorSpace as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The color space model used by the document contents. For example, "RGB", "CMYK", "YUV", or "YCbCr". A string.

### 172.1.43 kMDItemComment as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A comment related to the file. This differs from the Finder comment, kMDItemFinderComment. A string.

### 172.1.44 kMDItemComposer as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The composer of the music contained in the audio file. A string.

### 172.1.45 kMDItemContactKeywords as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A list of contacts that are associated with this document, not including the authors. An array of strings.

### 172.1.46 kMDItemContentCreationDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date that the contents of the file were created. A date.

This is different than the file creation date. Its can be used to store when the file contents were first created, or first modified.

### 172.1.47 kMDItemContentModificationDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date and time that the contents of the file were last modified. A date.

This is not necessarily the file modification date.

### 172.1.48 kMDItemContentType as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** For example, a jpeg image file will have a value of public.jpeg/public.image/public.data. The value of this attribute is set by the MDImporter. Changes to this value are lost when the file attributes are next imported.

### 172.1.49 kMDItemContentTypeTree as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Array of string

### 172.1.50 kMDItemContributors as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The entities responsible for making contributions to the content of the resource. An array of strings.

Examples of a contributor include a person, an organization or a service.

### 172.1.51 kMDItemCopyright as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The copyright owner of the file contents. A string.

### 172.1.52 kMDItemCountry as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The full, publishable name of the country or primary location where the intellectual property of the item was created, according to guidelines of the provider. A string.

### 172.1.53 kMDItemCoverage as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The extent or scope of the content of the resource. A string.

Coverage will typically include spatial location (a place name or geographic co-ordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity).

Recommended best practice is to select a value from a controlled vocabulary, and that, where appropriate, named places or time periods be used in preference to numeric identifiers such as sets of co-ordinates or date ranges.

### 172.1.54 kMDItemCreator as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Application used to create the document content (e.g. "Word", "AppleWorks", etc.). A string.

### 172.1.55 kMDItemDateAdded as string

MBS MacOSX Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This is the date that the file was moved into the current location.
Not all files will have this attribute.
Not all file systems support this attribute.

### 172.1.56 kMDItemDeliveryType as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The delivery type. Values are "Fast start" or "RTSP". A string.

### 172.1.57 kMDItemDescription as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A description of the content of the resource. The description may include an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content. A string.

### 172.1.58 kMDItemDirector as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Director of the movie. A string. Requires Mac OS X 10.5.

### 172.1.59 kMDItemDisplayName as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The localized version of the file name. A string.

### 172.1.60 kMDItemDownloadedDate as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.61 kMDItemDueDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Date this item is due. A date.

### 172.1.62 kMDItemDurationSeconds as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The duration, in seconds, of the content of file. A value of 10.5 represents media that is 10 and 1/2 seconds long. A number.

### 172.1.63 kMDItemEditors as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The list of editor/editors that has worked on this file. There could be 0 or more editors of a particular file. The order of the editors in the array is preserved, but is not intended to represent the main editor or relative importance of the editors. Type is An array of strings.

### 172.1.64 kMDItemEmailAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Email addresses related to this item. An array of strings.

### 172.1.65 kMDItemEncodingApplications as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Application used to convert the original content into it's current form. For example, a PDF file might have an encoding application set to "Distiller". An array of strings.

### 172.1.66 kMDItemExecutableArchitectures as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.67 kMDItemEXIFGPSVersion as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The version of GPSInfoIFD header that was used to generate the metadata. A string. Requires Mac OS X 10.5.

### 172.1.68 kMDItemEXIFVersion as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The version of the EXIF header used to generate the metadata. A string.

### 172.1.69 kMDItemExposureMode as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The exposure mode used to acquire the document contents. A number.

Possible values are 0 (auto exposure), 1 (manual exposure) and 2 (auto bracket).

### 172.1.70 kMDItemExposureProgram as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The class of the exposure program used by the camera to set exposure when the image is taken. Possible values include: Manual, Normal, and Aperture priority. A string.

### 172.1.71 kMDItemExposureTimeSeconds as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The exposure time, in seconds, used to acquire the document contents. A number.

### 172.1.72 kMDItemExposureTimeString as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The time of the exposure. A string.

### 172.1.73 kMDItemFinderComment as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Finder comments for this file. A string.

### 172.1.74 kMDItemFlashOnOff as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates if a camera flash was used. A number.

### 172.1.75 kMDItemFNumber as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The diameter of the diaphragm aperture in terms of the effective focal length of the lens.

### 172.1.76 kMDItemFocalLength as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The actual focal length of the lens, in millimeters. A number.

### 172.1.77 kMDItemFocalLength35mm as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.78 kMDItemFonts as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Fonts used in this item. You should store the font's full name, the postscript name, or the font family name, based on the available information. An array of strings.

### 172.1.79 kMDItemFSContentChangeDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date the file contents last changed. A date.

### 172.1.80 kMDItemFSCreationDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date and time that the file was created. A date.

### 172.1.81 kMDItemFSExists as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute is deprecated and was never implemented.

### 172.1.82 kMDItemFSHasCustomIcon as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Boolean indicating if this file has a custom icon. Type is a boolean.

### 172.1.83 kMDItemFSInvisible as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates whether the file is invisible. A boolean.

### 172.1.84 kMDItemFSIsExtensionHidden as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates whether the file extension of the file is hidden. A boolean.

### 172.1.85 kMDItemFSIsReadable as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute is deprecated and was never implemented.

### 172.1.86 kMDItemFSIsStationery as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Boolean indicating if this file is stationery. Type is a boolean.

### 172.1.87 kMDItemFSIsWriteable as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute is deprecated and was never implemented.

### 172.1.88 kMDItemFSLabel as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Index of the Finder label of the file. Possible values are 0 through 7. A number.

### 172.1.89 kMDItemFSName as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The file name of the item. A string.

### 172.1.90 kMDItemFSNodeCount as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Number of files in a directory. A number.

### 172.1.91 kMDItemFSOwnerGroupID as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The group ID of the owner of the file. A number.

### 172.1.92 kMDItemFSOwnerUserID as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The user ID of the owner of the file. A number.

### 172.1.93 kMDItemFSSize as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The size, in bytes, of the file on disk. A number.

### 172.1.94 kMDItemGenre as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Genre of the movie. A string.
Requires Mac OS X 10.5.

### 172.1.95 kMDItemGPSAreaInformation as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.96 kMDItemGPSDateStamp as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.97 kMDItemGPSDestBearing as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.98 kMDItemGPSDestDistance as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.99 kMDItemGPSDestLatitude as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.100 kMDItemGPSDestLongitude as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.101 kMDItemGPSDifferental as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.102 kMDItemGPSDOP as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.103 kMDItemGPSMapDatum as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.104 kMDItemGPSMeasureMode as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.105 kMDItemGPSProcessingMethod as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.106 kMDItemGPSStatus as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.107 kMDItemGPSTrack as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The direction of travel of the item, in degrees from true north. A number.
Requires Mac OS X 10.5.

### 172.1.108 kMDItemHasAlphaChannel as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates if this image file has an alpha channel. A boolean.

### 172.1.109 kMDItemHeadline as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A publishable entry providing a synopsis of the contents of the file. For example, "Apple Introduces the iPod Photo". A string.

### 172.1.110 kMDItemIdentifier as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A formal identifier used to reference the resource within a given context. A string.

### 172.1.111 kMDItemImageDirection as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The direction of the item's image, in degrees from true north. A number.
Requires Mac OS X 10.5.

### 172.1.112 kMDItemInformation as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Information about the item. A string.
Requires Mac OS X 10.5.

### 172.1.113 kMDItemInstantMessageAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Instant message addresses related to this item. An array of strings.

### 172.1.114 kMDItemInstructions as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Editorial instructions concerning the use of the item, such as embargoes and warnings. For example, "Second of four stories". A string.

### 172.1.115 kMDItemIsApplicationManaged as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.116 kMDItemIsGeneralMIDISequence as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates whether the MIDI sequence contained in the file is setup for use with a General MIDI device. A boolean.

### 172.1.117 kMDItemIsLikelyJunk as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.118 kMDItemISOSpeed as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The ISO speed used to acquire the document contents. A number.

### 172.1.119 kMDItemKeySignature as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The key of the music contained in the audio file. For example: C, Dm, F#m, Bb. A string.

### 172.1.120 kMDItemKeywords as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Keywords associated with this file. For example, "Birthday", "Important", etc. An array of strings.

### 172.1.121 kMDItemKind as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A description of the kind of item this file represents. A string.

### 172.1.122 kMDItemLabelIcon as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.123 kMDItemLabelID as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.124 kMDItemLabelKind as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.125 kMDItemLabelUUID as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.126 kMDItemLanguages as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates the languages of the intellectual content of the resource. Recommended best practice for the values of the Language element is defined by RFC 3066. An array of strings.

### 172.1.127 kMDItemLastUsedDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The date and time that the file was last used. This value is updated automatically by LaunchServices everytime a file is opened by double clicking, or by asking LaunchServices to open a file. A date.

### 172.1.128 kMDItemLatitude as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The latitude of the item in degrees north of the equator, expressed using the WGS84 datum. Negative values lie south of the equator. A number.
Requires Mac OS X 10.5.

### 172.1.129 kMDItemLayerNames as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The names of the layers in the file. An array of strings.

### 172.1.130 kMDItemLensModel as string

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Available in Mac OS X 10.7 and later.

### 172.1.131 kMDItemLongitude as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The longitude of the item in degrees east of the prime meridian, expressed using the WGS84 datum. Negative values lie west of the prime meridian. A number.
Requires Mac OS X 10.5.

### 172.1.132 kMDItemLyricist as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The lyricist, or text writer, of the music contained in the audio file. A string.

### 172.1.133 kMDItemMaxAperture as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The smallest f-number of the lens. Ordinarily it is given in the range of 00.00 to 99.99. A number.

### 172.1.134 kMDItemMediaTypes as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The media types present in the content. An array of strings.

### 172.1.135 kMDItemMeteringMode as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The metering mode used to take the image. A string.

Possible values are: Unknown, Average, CenterWeightedAverage, Spot, MultiSpot, Pattern, and Partial.

### 172.1.136 kMDItemMusicalGenre as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The musical genre of the song or composition contained in the audio file. For example: Jazz, Pop, Rock, Classical. A string.

### 172.1.137 kMDItemMusicalInstrumentCategory as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies the category of an instrument. A string.

Files should have an instrument associated with them ("Other Instrument" is provided as a catch-all). For some categories, such as "Keyboards", there are instrument names which provide a more detailed instrument definition, for example "Piano" or "Organ".

### 172.1.138 kMDItemMusicalInstrumentName as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Specifies the name of instrument relative to the instrument category. A string.

Files can have an instrument name associated with them if they have certain instrument categories. For example, the "Percussion" category has multiple instruments, including "Conga" and "Bongo".

### 172.1.139 kMDItemNamedLocation as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The name of the location or point of interest associated with the item. The name may be user provided. A string

### 172.1.140 kMDItemNumberOfPages as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Number of pages in the document. A number.

### 172.1.141 kMDItemOrganizations as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The company or organization that created the document. An array of strings.

### 172.1.142 kMDItemOrientation as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The orientation of the document contents. Possible values are 0 (landscape) and 1 (portrait). A number.

### 172.1.143 kMDItemOriginalFormat as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Original format of the movie.
A string.
Requires Mac OS X 10.5

### 172.1.144 kMDItemOriginalSource as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Original source of the movie. A string.
Requires Mac OS X 10.5.

### 172.1.145 kMDItemPageHeight as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Height of the document page, in points (72 points per inch). For PDF files this indicates the height of the first page only. A number.

### 172.1.146 kMDItemPageWidth as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Width of the document page, in points (72 points per inch). For PDF files this indicates the width of the first page only. A number.

### 172.1.147 kMDItemParticipants as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The list of people who are visible in an image or movie or written about in a document. Type is array of strings.
Requires Mac OS X 10.6.

### 172.1.148 kMDItemPath as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The complete path to the file. A string.

### 172.1.149 kMDItemPerformers as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Performers in the movie. An array of string.
Requires Mac OS X 10.5.

### 172.1.150 kMDItemPhoneNumbers as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Phone numbers related to this item. An array of strings.

### 172.1.151 kMDItemPixelCount as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The total number of pixels in the contents. Same as kMDItemPixelWidth x kMDItemPixelHeight. A number.

### 172.1.152 kMDItemPixelHeight as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The height, in pixels, of the contents. For example, the image height or the video frame height. A number.

### 172.1.153 kMDItemPixelWidth as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The width, in pixels, of the contents. For example, the image width or the video frame width. A number.

### 172.1.154 kMDItemProducer as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Producer of the content. A string. Requires Mac OS X 10.5.

### 172.1.155 kMDItemProfileName as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The name of the color profile used by the document contents. A string.

### 172.1.156 kMDItemProjects as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The list of projects that this file is part of. For example, if you were working on a movie all of the files could be marked as belonging to the project "My Movie". An array of strings.

### 172.1.157 kMDItemPublishers as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The entity responsible for making the resource available. For example, a person, an organization, or a service. Typically, the name of a publisher should be used to indicate the entity. An array of strings.

### 172.1.158 kMDItemRecipientAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute indicates the recipient addresses of the document. array of string. Requires Mac OS X 10.6.

### 172.1.159 kMDItemRecipientEmailAddresses as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** This attribute indicates the reciepients email addresses. (This is always the email address, and not the human readable version). An array of string.
Requires Mac OS X 10.5.

### 172.1.160 kMDItemRecipients as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Recipients of this item. An array of strings.

### 172.1.161 kMDItemRecordingDate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The recording date of the song or composition. A date.

This is in contrast to kMDItemContentCreationDate which, could indicate the creation date of an edited or 'mastered' version of the original art.

### 172.1.162 kMDItemRecordingYear as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates the year the item was recorded. For example, 1964, 2003, etc. A number.

### 172.1.163 kMDItemRedEyeOnOff as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Indicates if red-eye reduction was used to take the picture. A boolean.

Possible values are 0 (no red-eye reduction mode or unknown) and 1 (red-eye reduction used).

### 172.1.164 kMDItemResolutionHeightDPI as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Resolution height of this image in DPI. A number.

### 172.1.165 kMDItemResolutionWidthDPI as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Resolution width, in DPI, of this image. A number.

### 172.1.166 kMDItemRights as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Provides a link to information about rights held in and over the resource. A string.

Contains a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights.

If this attribute is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

### 172.1.167 kMDItemSecurityMethod as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The security or encryption method used for the file. A number.

### 172.1.168 kMDItemSpeed as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The speed of the item, in kilometers per hour. A number.

Requires Mac OS X 10.5

### 172.1.169 kMDItemStarRating as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** User rating of this item. For example, the stars rating of an iTunes track. A number.

### 172.1.170 kMDItemStateOrProvince as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Identifies the province or state of origin according to guidelines established by the provider. For example, "CA", "Ontario", or "Sussex". A string.

### 172.1.171 kMDItemStreamable as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Whether the content is prepared for streaming. A boolean.

### 172.1.172 kMDItemSubject as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Subject of the this item. Type is a string.

### 172.1.173 kMDItemSupportFileType as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** array of strings

### 172.1.174 kMDItemTempo as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** A float value that specifies the beats per minute of the music contained in the audio file. A number.

### 172.1.175 kMDItemTextContent as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Contains a text representation of the content of the document. Data in multiple fields should be combined using a whitespace character as a separator. A string.

An application's Spotlight importer provides the content of this attribute. Applications can search for values in this attribute, but are not able to read the content of this attribute directly.

### 172.1.176 kMDItemTheme as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** Theme of the this item. Type is a string.

### 172.1.177 kMDItemTimeSignature as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The time signature of the musical composition contained in the audio/MIDI file. For example: "4/4", "7/8". A string.

### 172.1.178 kMDItemTimestamp as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The timestamp on the item. This generally is used to indicate the time at which the event captured by the item took place.

Mac OS X 10.5

### 172.1.179 kMDItemTitle as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The title of the file. For example, this could be the title of a document, the name of an song, or the subject of an email message. A string.

### 172.1.180 kMDItemTotalBitRate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The total bit rate, audio and video combined, of the media. A number.

### 172.1.181 kMDItemURL as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** URL of the item.

Mac OS X 10.5

### 172.1.182 kMDItemVersion as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The version number of this file. A string

### 172.1.183 kMDItemVideoBitRate as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The video bit rate. A number.

### 172.1.184 kMDItemWhereFroms as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Example:**

```
dim file as FolderItem = DownloadsFolderMBS(0).Child("test.html")
dim item as new MDItemMBS(file)
dim value as Variant = item.GetAttribute(MDItemMBS.kMDItemWhereFroms)

if value <>nil then
dim values() as Variant = value
dim Link as String = values(0)
MsgBox link
end if
```

**Notes:** Describes where the file was obtained from. An array of strings.

For example, a downloaded file may refer to the URL, files received by email may indicate the sender's email address, message subject, etc.

### 172.1.185 kMDItemWhiteBalance as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** One of the item attribute constants.
**Notes:** The white balance setting used to acquire the document contents. Possible values are 0 (auto white balance) and 1 (manual). A number.

### 172.1.186 Properties

### 172.1.187 DisplayName as String

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The localized version of the file name.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.DisplayName // shows "Schreibtisch"
```

**Notes:** This is a shortcut for AttributeString(kMDItemDisplayName).
(Read only property)

### 172.1.188 FSName as String

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The file name of the item.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.FSName // shows "Desktop"
```

**Notes:** This is a shortcut for AttributeString(kMDItemFSName).
(Read only property)

### 172.1.189 FSSize as Int64

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The size, in bytes, of the file on disk.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox str(item.FSSize) // shows 0
```

**Notes:** This is a shortcut for AttributeString(kMDItemFSSize).
(Read only property)

### 172.1.190 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference to the item.
**Notes:** (Read and Write property)

### 172.1.191 Path as String

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The complete path to the file.
**Example:**

```
dim item as new MDItemMBS(SpecialFolder.Desktop)

MsgBox item.path // shows "/Users/cs/Desktop"
```

**Notes:** This is a shortcut for AttributeString(kMDItemPath).
(Read only property)

### 172.1.192 Tag as Variant

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The attached value.
**Notes:** You can use this property as you like.
(Read and Write property)

## 172.2 class MDQueryBatchingParamsMBS

### 172.2.1 class MDQueryBatchingParamsMBS

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** This class containing the progress notification batching parameters of an MDQuery.
**Notes:** The first notification can be triggered by the either firstmaxnum or firstmaxms limit being exceeded. Subsequent notifications are triggered by either the progressmaxnum or progressmaxms limit. The default batching parameters are undefined and subject to change.

### 172.2.2 Properties

### 172.2.3 firstMaxMS as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of milliseconds that can pass before a progress notification is sent out.
**Notes:** This value is advisory, in that the notification will be triggered "at some point after firstmaxms milliseconds have passed since the query began accumulating results", but generally not very long after, for the first progress notification.
(Read and Write property)

### 172.2.4 firstMaxNum as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of results that can accumulate before a progress notification is sent out by the MDQuery, for the first notification.
**Notes:** (Read and Write property)

### 172.2.5 progressMaxMS as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of milliseconds that can pass before a progress notification is sent out.
**Notes:** This value is advisory, in that the notification will be triggered "at some point after firstmaxms milliseconds have passed since the query began accumulating results", but generally not very long after, for progress notifications after the first, during the initial gathering phase of the query.
(Read and Write property)

### 172.2.6 progressMaxNum as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of results that can accumulate before a progress notification is sent out by the MDQuery, for notifications after the first, during the initial gathering phase of the query.
**Notes:** (Read and Write property)

### 172.2.7 updateMaxMS as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of milliseconds that can pass before a progress notification is sent out.
**Notes:** This value is advisory, in that the notification will be triggered "at some point after firstmaxms milliseconds have passed since the query began accumulating results", but generally not very long after, for update notifications after the gathering phase of the query has finished.
(Read and Write property)

### 172.2.8 updateMaxNum as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum number of results that can accumulate before an update notification is sent out by the MDQuery, for update notifications after the gathering phase of the query has finished.
**Notes:** (Read and Write property)

## 172.3 class MDQueryMBS

### 172.3.1 class MDQueryMBS

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** MDQuery encapsulates all queries against the MetaData database.
**Example:**

```
dim m as new MDQueryMBS("* == ""Hello""wcd | | kMDItemTextContent = ""Hello""c")

call m.Execute(m.kMDQuerySynchronous)

MsgBox str(m.ResultCount) // shows a lot of results
```

**Notes:** Depending on what and how you want to search, you can decide whether MDQueryMBS or CatSearchMBS is the better choice.

Available in Mac OS X version 10.4 and later.

Queries gather results or process updates only while the current thread's run loop is running. Queries normally operate asynchronously, and only send out progress notificiations as the list is being collected. The query list is kept up to date with respect to value lists and sorting as the progress notifications are sent out, so the query is in a good state during those events.

An MDQuery presents its results as if it were a simple array object. The results are MDItem.

Query Sorting Sorting the results from a query can be performed in one of two ways. First is to let the library sort the results for you by passing an array of attributes to sort on to constructor. The default sort provided by the constructor is a assending sort strings are compared using CFStringCompare() with the options kCFCompareNonliteral | kCFCompareLocalized | kCFCompareNumerically.

If used in a thread, please use a loop with calling NSRunLoopMBS.currentRunLoop.runUntilDate(nil) to give time for update events to fire.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr3
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr10
- MBS Real Studio Plugins, version 11.1pr7
- MBS REALbasic plug-in 9.6

### 172.3.2 Methods

### 172.3.3 AttributeValueOfResultAtIndex(name as string, index as UInt32) as Variant

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the value of the named attribute for the result at the given index.
**Notes:** name: The attribute name for which to return the values. If the attribute is not one of those requested in the valueListAttrs or sortingAttrs parameters to one of the query creation functions, the result will be nil.
index: The index into the query's result list. If the index is negative, or is equal to or larger than the current number of results in the query, the behavior is undefined.
Returns he value of the attribute, or nil if the attribute doesn't exist in the query on that result.

### 172.3.4 Constructor(query as MDQueryMBS, queryString as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query, which is a subset of the given query.
**Notes:** Only results matched by the given query can be matched by the query expression of this query.

query: The parent query of the new query.
queryString: The query expression string for this query. This expression in effect may further restrict the matches found by the parent query. If the string is empty the behavior is undefined.
valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are strings.
sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.
See also:


- 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string) 21434
- 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21434
- 172.3.7 Constructor(queryString as string) 21435

- 172.3.8 Constructor(queryString as string, valueListAttributes() as string) 21436
- 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21437


### 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query, which is a subset of the given query.
**Notes:** Only results matched by the given query can be matched by the query expression of this query.

query: The parent query of the new query.
queryString: The query expression string for this query. This expression in effect may further restrict the matches found by the parent query. If the string is empty the behavior is undefined.
valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are strings.
sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.
See also:


- 172.3.4 Constructor(query as MDQueryMBS, queryString as string) 21433
- 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21434
- 172.3.7 Constructor(queryString as string) 21435
- 172.3.8 Constructor(queryString as string, valueListAttributes() as string) 21436
- 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21437


### 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query, which is a subset of the given query.
**Notes:** Only results matched by the given query can be matched by the query expression of this query.

query: The parent query of the new query.
queryString: The query expression string for this query. This expression in effect may further restrict the matches found by the parent query. If the string is empty the behavior is undefined.
valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are strings.
sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.
See also:


- 172.3.4 Constructor(query as MDQueryMBS, queryString as string) 21433
- 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string) 21434
- 172.3.7 Constructor(queryString as string) 21435
- 172.3.8 Constructor(queryString as string, valueListAttributes() as string) 21436
- 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21437


### 172.3.7 Constructor(queryString as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query with the given query expression.
**Notes:** queryString: The query expression string for this query. The syntax for query expressions is explained above in the header overview documentation.

valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are string.

sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.

The handle value is zero on failure.
See also:


- 172.3.4 Constructor(query as MDQueryMBS, queryString as string) 21433
- 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string) 21434
- 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21434
- 172.3.8 Constructor(queryString as string, valueListAttributes() as string) 21436
- 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21437


### 172.3.8 Constructor(queryString as string, valueListAttributes() as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query with the given query expression.
**Notes:** queryString: The query expression string for this query. The syntax for query expressions is explained above in the header overview documentation.

valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are string.

sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.

The handle value is zero on failure.
See also:


- 172.3.4 Constructor(query as MDQueryMBS, queryString as string) 21433
- 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string) 21434
- 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21434
- 172.3.7 Constructor(queryString as string) 21435
- 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21437


### 172.3.9 Constructor(queryString as string, valueListAttributes() as string, sortingAttributes() as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a new query with the given query expression.
**Notes:** queryString: The query expression string for this query. The syntax for query expressions is explained above in the header overview documentation.

valueListAttributes: An optional array of attribute names. The query will collect the values of these attributes into uniqued lists, which can be used or displayed to summarize the results of the query, or allow a user to further qualify the items for which they are searching. This parameter may be empty if no value lists are desired. Value list collection increases CPU usage and significantly increases the memory usage of an MDQuery. The attribute names are string.

sortingAttributes: An optional array of attribute names. The query will results of the query based on the values of these attributes. The first name in the array is used as the primary sort key, the second as the secondary key, and so on. The comparison of like-typed values is a simple, literal comparison. This parameter may be empty if no sorting is desired. Sorting increases memory usage and significantly increases the CPU usage of an MDQuery. However, when possible, it is almost always cheaper to have the MDQuery do the sorting, rather than you fetching all the results and attributes from each of them and doing the sorting yourself. The attribute names are strings.

The handle value is zero on failure.
See also:


- 172.3.4 Constructor(query as MDQueryMBS, queryString as string) 21433
- 172.3.5 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string) 21434

- 172.3.6 Constructor(query as MDQueryMBS, queryString as string, valueListAttributes() as string, sortingAttributes() as string) 21434
- 172.3.7 Constructor(queryString as string) 21435
- 172.3.8 Constructor(queryString as string, valueListAttributes() as string) 21436


### 172.3.10 CountOfResultsWithAttributeValue(name as string, Value as Variant) as UInt32

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of results which have the given attribute and attribute value. Note that this count may change over time, as the query's result list is updated.
**Notes:** name: The attribute name for which to return the number of results with the given value. If the attribute is not one of those requested in the valueListAttrs parameter to one of the query creation functions, the behavior is undefined.

value: The attribute value for which to return the number of results with that value. This parameter may be nil, in which case the number of results that do not contain the named attribute is returned.

Returns the number of results with that attribute and value.

### 172.3.11 DisableUpdates

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Disables updates to the query result list.
**Notes:** This should be called before iterating through the list of results to prevent the result list from changing during the iteration. The disabled state is a counter, and disabling can be done recursively and from different threads.

### 172.3.12 EnableUpdates

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Re-enables updates to the query result list.
**Notes:** This should be called when finished iterating through the list of results, to allow changes to the result list to occur. Changes will be allowed when all the disables have been matched by a corresponding enable.

### 172.3.13 Execute(flags as Integer) as boolean

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Run the query, and populate the query with the results.
**Example:**

```
dim q as new MDQueryMBS("kMDItemContentModificationDate>=$ time.now")
// you will want to use a MDQueryMBS subclass here to catch the events

if not q.Execute(q.kMDQueryWantsUpdates) then
MsgBox "Failed to query"
end if
```

**Notes:** Queries only gather results or process updates while the current thread's run loop is running. Queries normally operate asynchronously, and send out progress and update notifications to report changes to the list of results that has been collected. Queries have two phases: the initial gathering of all currently matching results, and a second live-update phase where queries monitor the state of the system and update themselves to external changes in files or the operating environment (for example, as time advances, files which did not match the query when it was started may later match the query). Query notifications are posted within the context of the same thread which executes the query. [

here are three operational modes: (1) synchronous static queries, which collect the list of current results and then do not watch for updates to the results, (2) asynchronous static queries, which collect the results asychronously after this function returns, and then do not watch for updates to the results, and (3) asynchronous live queries which collect the initial results asychronously after this function returns, and then do watch for updates to the results, until the query is destroyed. There is little reason not to allow the fourth case, synchronous collection of initial results, followed by asynchronous monitoring for updates, so this may change in the future.

Flags: Options for the query.

Returns true if the query was started (executed in the case of a synchronous query), false otherwise. Queries cannot be executed more than once.

### 172.3.14 GetSortOptionFlagsForAttribute(fieldName as string) as Integer

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Gets the sort option flags for a sorting attribute.
**Notes:** fieldName: The attribute name for which sort option flags are to be fetched.
Returns an integer with flags. Currently can be 0 or 1.

Available on Mac OS X 10.7 or later.

### 172.3.15 IndexOfResult(it as MDItemMBS) as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current index of the given result.
**Notes:** Note that the index of a result will change over time, as the query's result list is updated.

Returns the index of the given result, or -1 if the value is not one of the query's existing results.

### 172.3.16 IsGatheringComplete as boolean

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns true if the first phase of a query, the initial result gathering, has finished.
**Notes:** A boolean indicating whether or not the first phase of a query has completed.

### 172.3.17 QueryString as string

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the query string of the query.

### 172.3.18 ResultAtIndex(index as Integer) as MDItemMBS

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current result at the given index.
**Notes:** This function causes the result object to be created if it hasn't been created already. For performance reasons, it is not advisable to ask for results that you don't need, to avoid the cost of creating them. If possible, call this function to fetch only the results you need to display or otherwise process. Note that the index of a particular result will change over time, as the query's result list is updated.

index: The index into the query's result list.

If the index is negative, or is equal to or larger than the current number of results in the query, the behavior is undefined.

Returns the MDItem currently at the given index, or if a result-create function has been set, returns the result returned by that function.

### 172.3.19 ResultCount as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of results currently collected by the query.
**Example:**

```
dim m as new MDQueryMBS("kMDItemContentModificationDate>=$ time.today")

call m.Execute(m.kMDQuerySynchronous)

MsgBox str(m.ResultCount)+" files modified today"
```

**Notes:** Note that the number of results in a query will change over time as the query's result list is updated.

### 172.3.20 Results(limit as Integer = -1) as MDItemMBS()

MBS MacOSX Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries result items.
**Notes:** Internally does what ResultAtIndex does for up to limit entries.
Limit with -1 will cause no limit.
If possible, call this function to fetch only the results you need to display or otherwise process.

### 172.3.21 SetMaxCount(size as Integer)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Use SetMaxCount to limit the number of results returned by the query engine.
**Notes:** This must be called before the query is executed.
size: The maximum number of results desired.

### 172.3.22 SetSearchScope(paths() as folderitem, options() as string)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Use SetSearchScope to limit the results returned by the query engine to those MDItem that

appear within the specified directories.
**Example:**

```
dim q as MDQueryMBS // your query

q.SetSearchScope nil, array(q.kMDQueryScopeComputer)
```

**Notes:** This may be used to limit searching to particular volumes. Tilde paths, or environment variables are not expanded. Calling this multiple times will replace the previous options. This must be called before the query is executed.

paths: An array of directories where you want to search. This array can be empty.
options: An array of scope options. Pass the kMDQueryScope* constants. This array can be empty.

### 172.3.23 SetSortOptionFlagsForAttribute(fieldName as string, flags as UInt32) as Boolean

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the sort flags for a query.
**Notes:** fieldName: The attribute name for which sort option flags are to be set.

The attribute name must have been part of the sortingFlags when the query was created.

flags: An integer containing MDQuerySortOptionFlags to be applied to the attibute

Returns a boolean, true on success, false on failure.

Available on Mac OS X 10.7 or later.

### 172.3.24 SetSortOrder(sortingAttrs() as string) as Boolean

MBS MacOSX Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sets the sort order for a query.
**Notes:** sortingAttrs An array of attribute names, as in MDQueryCreate.
The query's result set will be sorted according to the order of these attributes. All names in the array have to have been passed as sortingAttrs when the query was created. The attribute names are strings.

Returns a boolean, true on success, false on failure.

Available on Mac OS X 10.7 or later.

### 172.3.25 SortingAttributes as string()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of attribute names the query is using to sort the results.

### 172.3.26 Stop

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Stops the query from ever generating more results.
**Notes:** Queries may be executed only once, so a stopped query cannot be restarted. The query will also not generate any result updates. The query is static after this function returns. The query will do final processing of results that have come in but not yet been processed (because, say, the batching parameters hasn't triggered that yet). That may trigger a progress notification, so be aware of that if you are stopping a query from within your progress note handler; that is, during this function, a recursive progress and/or finished notification might occur, which might recursively call your notification handler. It is safe to call this function recursively. You would call this function to stop a query that is generating way too many results to be useful, but still want to access the results that have come in so far. If a query is stopped before the gathering phase finishes, it will not report itself as finished, nor will it send out a finished notification.

### 172.3.27 ValueListAttributes as string()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of attribute names for which the query is collecting the lists of values.

### 172.3.28 ValuesOfAttribute(name as string) as Variant()

MBS MacOSX Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the list of values, from the results of the query, of the named attribute.
**Notes:** The list is not ordered in any way. The list contains only one occurrence of each value. Note that this list may change over time, as the query's result list is updated.

name: The attribute name for which to return the values. If the attribute is not one of those requested in the valueListAttrs parameter to one of the query creation functions, the behavior is undefined.

Returns an array holding the value objects for that attribute.

### 172.3.29 Properties

### 172.3.30 Handle as Integer

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal reference for the MDQuery.
**Notes:** (Read and Write property)

### 172.3.31 Tag as Variant

MBS MacOSX Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The attached value.
**Notes:** You can use this property as you like.
(Read and Write property)

### 172.3.32 BatchingParameters as MDQueryBatchingParamsMBS

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The query whose batching parameters are to be set.
**Notes:** (Read and Write computed property)

### 172.3.33 Events

### 172.3.34 Finish()

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** The event called when the query has finished.
**Notes:** Called when the query has finished with the initial result-gathering phase, and may now proceed into the live-update phase (if that option was chosen when the query was executed). This event often shortly follows after the last progress notification. It is usually not necessary to update any displayed UI in response to this event, since it doesn't indicate any change in the result list of a query.

### 172.3.35 Progress(AddedItems() as MDItemMBS, ChangedItems() as MDItemMBS, RemovedItems() as MDItemMBS)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** The event sent to indicate changes to the query's results list during the initial gathering phase of a query's execution.
**Notes:** Mostly adds will occur during this phase, but removals and changes can also occur, as in any update.
For performance reasons the arrays are empty in newer Mac OS X SDK versions.
In that case please use the result functions.

### 172.3.36 Update(AddedItems() as MDItemMBS, ChangedItems() as MDItemMBS, RemovedItems() as MDItemMBS)

MBS MacOSX Plugin, Plugin Version: 9.6, Platform: macOS, Targets: .

**Function:** The event is sent to indicate changes to the query's results list during the second, live-update, phase of a query's execution.

### 172.3.37 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kMDQueryReverseSortOrderFlag | 1 | A flag constant for calling SetSortOptionFla Sort the attribute in reverse order. Available on Mac OS X 10.7 or later. |
| kMDQueryScopeAllIndexed | ”kMDQueryScopeAllIndexed” | One of the option constants for the search sc A constant, which can be passed in the scop the search should be restricted to indexed, dexed user mounted remote volumes, plus th |
| kMDQueryScopeComputer | ”kMDQueryScopeComputer” | One of the option constants for the search sc A constant, which can be passed in the scop the search should be restricted to all locally home directory (which may be on a remote |
| kMDQueryScopeComputerIndexed | ”kMDQueryScopeComputerIndexed” | One of the option constants for the search sc A constant, which can be passed in the scop the search should be restricted to indexed, l user’s home directory (which may be on a re |
| kMDQueryScopeHome | ”kMDQueryScopeHome” | One of the option constants for the search sc A constant, which can be passed in the scop the search should be restricted to the volum current user’s home directory |
| kMDQueryScopeNetwork | ”kMDQueryScopeNetwork” | One of the option constants for the search sc A constant, which can be passed in the scop the search should include all user mounted r |
| kMDQueryScopeNetworkIndexed | ”kMDQueryScopeNetworkIndexed” | One of the option constants for the search sc A constant, which can be passed in the scop the search should include indexed user mour |
| kMDQuerySynchronous | 1 | One of the constants for executing a query. Block during the gathering phase. If this pa not return until the query has finished gath loop will run in the default mode, which will mode with this run loop to execute as wel function returns immediately after starting t |
| kMDQueryWantsUpdates | 4 | One of the constants for executing a query. When set, after gathering the initial results t the system which should update the list of re cause new files to now match the query, or result list to continue to match, or no long begin to match the query are added to the re match the query expression are removed fro Currently, this parameter is ignored if the sy is subject to change, and you should always |

## 172.4 Globals

### 172.4.1 SpotlightMBS(searchString as string) as Integer

MBS MacOSX Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Displays a Spotlight search window.
**Example:**

call SpotlightMBS("Hello")

**Notes:** searchString: An initial query string. Pass "" to open the search window with no initial query string.

Returns a Mac OS error code and -1 if the function is not available and 0 on success.
Requires Mac OS X 10.4.

# Chapter 173

# SQL

## 173.1 class Database

### 173.1.1 class Database

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Xojo Database class is the base class for the database subclasses that communicate with a variety of databases.
**Notes:** Use one of the subclasses to connect to your database.

### 173.1.2 Methods

### 173.1.3 AddRow(TableName as String, row as DatabaseRow)

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts Data (a populated DatabaseRow) as a new row in TableName.

### 173.1.4 BeginTransaction

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new transaction.
**Notes:** Changes to the database made after this call can be saved with CommitTransaction or undone with RollbackTransaction.

### 173.1.5 Close

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes or disconnects the database.
**Notes:** Calling Close does not issue a Commit, but some databases will automatically Commit changes in a transaction when you Close the connection and some database will automatically Rollback changes in a transaction when the connection is closed. Refer to the documentation for your database to check what its behavior is.

For desktop applications, you will often Connect to the database when the app starts and Close it when the app quits.

For web applications, you usually Connect to the database when the Session starts and Close it when the Session quits.

### 173.1.6 Commit

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Commits an open transaction. This permanently saves changes to the database.
**Notes:** You have to have an open transaction to be able to use Commit. On SQLite (and other databases), you can start a transaction with this command:

BEGIN TRANSACTION

It can be sent using SQLExecute:

DB.SQLExecute("BEGIN TRANSACTION")

### 173.1.7 CommitTransaction

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Commits an open transaction. This permanently saves changes to the database.

### 173.1.8 Connect

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to the database so that you can begin using it.
See also:

- 173.1.9 Connect as boolean 21451

### 173.1.9 Connect as boolean

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to the database so that you can begin using it.
**Notes:** Before proceeding with database operations, test to be sure that Connect returns True.
If Connect returns False, you should also check the ErrorCode and ErrorMessage.

See Option() for various options you can set before connecting.
e.g. c.Option("SQLiteVFSFlags") = "1" for SQLite for read only access.
See also:

- 173.1.8 Connect 21450

### 173.1.10 ExecuteSQL(sql As String, ParamArray values As Variant)

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used to execute an SQL command.
**Notes:** Use this for commands that do not return any data, such as CREATE TABLE or INSERT.
See also:

- 173.1.11 ExecuteSQL(sql As String, values() As Variant) 21451

### 173.1.11 ExecuteSQL(sql As String, values() As Variant)

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used to execute an SQL command.
**Notes:** Use this for commands that do not return any data, such as CREATE TABLE or INSERT.
See also:

- 173.1.10 ExecuteSQL(sql As String, ParamArray values As Variant) 21451

### 173.1.12 InsertRecord(TableName as String, Data as DatabaseRecord)

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts Data (a populated DatabaseRecord) as a new row in TableName.
**Notes:** Always check the Error property to verity that the data was added.

### 173.1.13 Prepare(statement as String) as PreparedSQLStatement

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a PreparedSQLStatement using the SQL statement for use with the various database prepared statement classes.
**Notes:** A prepared statement is an SQL statement with parameters that has been pre-processed by the database so that it can be executed more quickly if it is re-used with different parameters. Prepared statements also mitigate the risk of SQL injection in web apps.

### 173.1.14 Rollback

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancels an open transaction restoring the database to the state it was in before the transaction began.
**Notes:** You will generally want to rollback database changes if a database error occurs within the transaction.
You have to have an open transaction to be able to use Rollback. On SQLite (and other databases), you can start a transaction with this command:

BEGIN TRANSACTION

It can be sent using SQLExecute:

DB.SQLExecute("BEGIN TRANSACTION")

### 173.1.15 RollbackTransaction

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancels an open transaction restoring the database to the state it was in before the transaction began.

### 173.1.16 SelectSQL(sql As String, ParamArray values As Variant) as RowSet

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL SELECT statement and returns the results in a RowSet.
See also:


- 173.1.17 SelectSQL(sql As String, values() As Variant) as RowSet 21453


### 173.1.17 SelectSQL(sql As String, values() As Variant) as RowSet

MBS SQL Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL SELECT statement and returns the results in a RowSet.
See also:


- 173.1.16 SelectSQL(sql As String, ParamArray values As Variant) as RowSet 21453


### 173.1.18 SQLExecute(ExecuteString as string)

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Used to execute an SQL command. Use this for commands that do not return any data, such as CREATE TABLE or INSERT. ExecuteString contains the SQL statement.
**Notes:** To avoid SQL Injection, be sure to use Prepared SQL Statements.

### 173.1.19 SQLSelect(SelectString as string) as RecordSet

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is an SQL statement that returns a RecordSet.
**Notes:** SelectString contains the SQL statement.

Typically only SQL SELECT statements return a RecordSet, but some databases return a RecordSet for SQL commands such as INSERT, UPDATE or stored procedures.

If the SQL does not return data then Nil is returned. Nil is also usually returned if there is an error in the SQL statement, but you should instead check Database.Error to check if an error occurred.

To avoid SQL Injection, be sure to use Prepared SQL Statements.

### 173.1.20 Properties

### 173.1.21 DatabaseName as String

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the database to open.
**Example:**

```
dim db as new SQLDatabaseMBS
db.DatabaseName="PostgreSQL:127.0.0.1,5432@dbname=postgres connect_timeout=10 sslmode=require"
```

**Notes:** The DatabaseName is typically used with server databases (such as MySQL or PostgreSQL) to identify the specific database to use on the server.

Please set the DatabaseName, UserName and Password properties when using SQLDatabaseMBS class. The Host property is ignored.
The database name must contain the complete information and a prefix for the kind of database.
(Read and Write property)

### 173.1.22 Error as Boolean

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if an error is returned from the database engine.
**Notes:** See the values of the ErrorCode and ErrorMessage properties to learn the specifics of the error.

You should check the Error property after each database operation to see if there was an error. If there is an error, you can display or log the ErrorCode and ErrorMessage.
(Read and Write property)

### 173.1.23 ErrorCode as Integer

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code returned from the database.
**Notes:** Error codes and error messages are different for each database.
(Read and Write property)

### 173.1.24 ErrorMessage as String

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text of the error message returned from the database.
**Notes:** Error codes and error messages are different for each database.
You should check the Error property after each database operation to see if there was an error. If there is an error, you can display or log the ErrorCode and ErrorMessage.
(Read and Write property)

### 173.1.25 Host as String

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The database host name or IP address of the database server.
**Notes:** (Read and Write property)

### 173.1.26 Password as String

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password that is required for access to the database.
**Notes:** Typically used in conjunction with UserName.
(Read and Write property)

### 173.1.27 UserName as String

MBS SQL Plugin, Plugin Version: 1.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The username that is required for access to the database.
**Notes:** (Read and Write property)

## 173.2 class DB2MBS

### 173.2.1 class DB2MBS

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for some DB2 related API commands.
**Example:**

```
dim cmd as new SQLCommandMBS // your command
dim con as new SQLConnectionMBS // your connection
dim api as DB2MBS = con.NativeAPI

// now use an API function
MsgBox str(api.SQLRowCount(cmd))
```

**Notes:** More commands are added as requested.

Deprecated in favor of direct methods on SQLCommandMBS. Please let us know if you need more DB2 specific functions.
Subclass of the SQLAPIMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.2
- MBS Xojo / Real Studio Plugins, version 13.2pr11

### 173.2.2 Methods

### 173.2.3 SQLExecDirect(cmd as SQLCommandMBS, text as string)

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes an SQL command directly without any preprocessing in the plugin.
**Example:**

```
dim cmd as new SQLCommandMBS // your command
dim con as new SQLConnectionMBS // your connection
dim api as DB2MBS = con.NativeAPI

// now use an API function
```

```
const sql = "some sql command"
api.SQLExecDirect cmd, sql
```

**Notes:** Lasterror is set.

### 173.2.4 SQLRowCount(cmd as SQLCommandMBS) as Int64

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the affected number of rows for the last operation.
**Notes:** Lasterror is set.

### 173.2.5 Properties

### 173.2.6 Lasterror as Integer

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** (Read and Write property)

## 173.3 class InformixMBS

### 173.3.1 class InformixMBS

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for Informix specific functions.
**Notes:** Deprecated in favor of direct methods on SQLConnectionMBS. Please let us know if you need more Informix specific functions.
Subclass of the SQLAPIMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0fc1

### 173.3.2 Methods

### 173.3.3 Error(cmd as SQLCommandMBS, byref SQLState as string, byref NativeError as Integer, byref ErrorMsg as string) as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the error status.

### 173.3.4 GetCursorName(cmd as SQLCommandMBS) as string

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries cursor name for given recordset.

### 173.3.5 HDBC as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns Database Connection handle.

### 173.3.6 HENV as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The environment handle.

### 173.3.7 HSTMT(cmd as SQLCommandMBS) as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the statement handle for the command object.
**Notes:** Returns 0 on any error.

### 173.3.8 SetCursorName(cmd as SQLCommandMBS, name as string) as boolean

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets cursor name for given recordset.
**Notes:** Returns true on success.

## 173.4 module InternalCubeSQLLibraryMBS

### 173.4.1 module InternalCubeSQLLibraryMBS

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for our internal CubeSQL client connector.
**Example:**

```
if InternalCubeSQLLibraryMBS.Use then
MsgBox "Using internal CubeSQL library."
else
MsgBox "Failed, so please use library file."
end if

Dim db As SQLDatabaseMBS // or SQLConnectionMBS

db.Option("ConnectionTimeout") = "30" // 30 seconds timeout
db.Option("ConnectionEncryption") = "SSL_AES256"
db.Option("SSLCertificatePath") = SSLCertificatePath

// connect...
```

**Notes:** This is a CubeSQL client library built into a plugin, so you can decide with use of MBS SQL Plugin to use this plugin instead of providing your own external copy of CubeSQL shared library.

Version 19.4 or newer have CubeSQL with SSL included.
You can use Option("ConnectionEncryption") with SSL, SSL+AES128, SSL+AES192 and SSL+AES256 as values.

If ConnectionEncryption is SSL, we can pass path from Option("SSLCertificatePath") with the certificate file.
**Blog Entries**

- CubeSQL Library for Mac
- MBS Xojo Plugins, version 18.3pr1
- CubeSQL support for MBS Xojo SQL Plugin

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

### 173.4.2 Methods

### 173.4.3 SSLVersion as String

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries SSL version of library.

### 173.4.4 Use as boolean

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registers the built in CubeSQL client library for use.
**Example:**

```
if InternalCubeSQLLibraryMBS.Use then
MsgBox "Using internal CubeSQL library."
else
MsgBox "Failed, so please use library file."
end if
```

**Notes:** So instead of having SQL Plugin load CubeSQL shared library from file, we use the one built into this plugin.

### 173.4.5 Version as String

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries version of library.

## 173.5 module InternalPostgreSQLLibraryMBS

### 173.5.1 module InternalPostgreSQLLibraryMBS

MBS SQL Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use postgres driver libraries instead. **Function:** The module for our internal PostgreSQL engine.
**Example:**

```
if InternalPostgreSQLLibraryMBS.Use then
MsgBox "Using internal PostgreSQL."
else
MsgBox "Failed, so please use library file."
end if
```

**Notes:** This is a PostgreSQL library built into a plugin, so you can decide with use of MBS SQL Plugin to use this plugin instead of providing your own external copy of PostgreSQL shared library.

Deprecated since the library version is outdated. Please use PostgreSQL libraries, e.g. from our libraries page:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7
- MBS Xojo Plugins, version 20.5pr8
- MBS Xojo Plugins, version 20.4pr1
- CubeSQL support for MBS Xojo SQL Plugin
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 173.5.2 Methods

### 173.5.3 OpenSSLVersion as String

MBS SQL Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Targets: All.

**Function:** Returns the version of the OpenSSL library.
**Example:**

```
MsgBox InternalPostgreSQLLibraryMBS.OpenSSLVersion
```

### 173.5.4 Use as boolean

MBS SQL Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Targets: All.

**Function:** Registers the built in PostgreSQL client library for use.
**Example:**

```
if InternalPostgreSQLLibraryMBS.Use then
MsgBox "Using internal PostgreSQL."
else
MsgBox "Failed, so please use library file."
end if
```

**Notes:** So instead of having SQL Plugin load libpg shared library from file, we use the one built into this plugin.

### 173.5.5 Version as Integer

MBS SQL Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Targets: All.

**Function:** Returns version of PostgreSQL version.
**Example:**

```
MsgBox str(InternalPostgreSQLLibraryMBS.Version)
// e.g. 90501 for 9.5.1
```

## 173.6 module InternalSQLiteLibraryMBS

### 173.6.1 module InternalSQLiteLibraryMBS

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for our internal SQLite3 engine.
**Example:**

```
// enable our built-in SQLite library, which supports encryption
Call InternalSQLiteLibraryMBS.Use

// where to store?
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.db")
Dim storage_database As New SQLDatabaseMBS ' SQLiteDatabase
storage_database.SQLiteEncryptionKey = "aes256:password" ' <- password with AES256 as prefix to pick algorithm
storage_database.DatabaseName = "sqlite:"+ f.NativePath

If storage_database.Connect Then

// create table if this is not yet here
storage_database.SQLExecute "Create table if not exists pics(pic_id integer PRIMARY KEY AUTOINCREMENT, name varchar(20), pic blob)"

// done
MsgBox "Ready"
Else
MsgBox storage_database.ErrorMessage
End If
```

**Notes:** This is a SQLite3 library built into a plugin, so you can decide with use of MBS SQL Plugin to use this plugin instead of providing your own external copy of SQLite shared library.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- Did you know that you can load extensions in SQLite?
- News from the MBS Xojo Plugins Version 21.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.2
- Converting Xojo project to use MBS SQL Plugin
- CubeSQL support for MBS Xojo SQL Plugin
- Use JSON functions with SQLite

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- SQLite3 command line tool in Xojo
- SQL Plugin option to include SQLite Library

**Xojo Developer Magazine**

- 14.1, page 27: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 13.5, page 8: News

### 173.6.2 Methods

### 173.6.3 CompileOption(index as Integer) as String

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries name of a compile option.
**Example:**

```
dim list() as string

for i as Integer = 0 to 100
dim s as string = InternalSQLiteLibraryMBS.CompileOption(i)
if s = "" then exit
dim b as Boolean = InternalSQLiteLibraryMBS.CompileOptionUsed(s)
dim t as string
if b then
t = ": yes"
else
t = ": no"
end if
list.Append s + t
next

MsgBox Join(list, EndOfLine)
```

**Notes:** Index index starting with zero until you get back an empty name.

### 173.6.4 CompileOptionUsed(optionName as String) as Boolean

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries if a given compile option was set on or off.
**Example:**

```
dim list() as string

for i as Integer = 0 to 100
dim s as string = InternalSQLiteLibraryMBS.CompileOption(i)
if s = "" then exit
dim b as Boolean = InternalSQLiteLibraryMBS.CompileOptionUsed(s)
dim t as string
if b then
t = ": yes"
else
t = ": no"
end if
list.Append s + t
next

MsgBox Join(list, EndOfLine)
```

**Notes:** If you need a specific option set, please contact MBS support.

### 173.6.5 DumpToFile(SqliteDBConectionHandle as Ptr, File as FolderItem, TableName as string = """, PreserveRowid as Boolean = false, Newlines as Boolean = false, DumpDataOnly as Boolean = false, DumpNoSys as Boolean = false)

MBS SQL Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dumps SQLite database to text file just like dump command in SQLite command line tool.
**Example:**

```
Call InternalSQLiteLibraryMBS.Use

Dim con As New SQLConnectionMBS

// connect....

Dim handle As ptr = con.SQLiteConnectionHandle
Dim file As FolderItem = SpecialFolder.Desktop.Child("dump.txt")
InternalSQLiteLibraryMBS.DumpToFile(handle, file)
```

**Notes:** Must use the internal SQLite database, otherwise it will crash.
Raises exception if handle or file is nil.

SQL errors are output by SQLite to the output file.

### 173.6.6 DumpToString(SqliteDBConectionHandle as Ptr, byref Data as String, MaximumSize as Integer = 10000000, TableName as string = ""), PreserveRowid as Boolean = false, Newlines as Boolean = false, DumpDataOnly as Boolean = false, DumpNoSys as Boolean = false)

MBS SQL Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Dumps SQLite database to text file just like dump command in SQLite command line tool.
**Example:**

```
Call InternalSQLiteLibraryMBS.Use

Dim con As New SQLConnectionMBS

// connect....

Dim handle As ptr = con.SQLiteConnectionHandle
dim data as string
InternalSQLiteLibraryMBS.DumpToFile(handle, data, 1000000)
```

**Notes:** Must use the internal SQLite database, otherwise it will crash.
Raises exception if handle is nil or we run out of memory.
SQL errors are output by SQLite to the output file.

Please pass size of memory we should allocate. Then we can run the dump.
if the final COMMIT is missing or the size is close to the limit you gave, you may run again with higher limit.

### 173.6.7 isKeyword(name as string) as boolean

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if an identifier is a keyword.
**Example:**

```
if InternalSQLiteLibraryMBS.isKeyword("TABLE") then
MsgBox "Table is a keyword"
else
MsgBox "Table is not a keyword!"
end if
```

### 173.6.8 Keywords as String()

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of keywords.
**Example:**

MsgBox Join(InternalSQLiteLibraryMBS.Keywords,EndOfLine)

### 173.6.9 LoadICU as Boolean

MBS SQL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads ICU libraries now.
**Example:**

```
If InternalSQLiteLibraryMBS.ICULoaded Then
MessageBox "already loaded"
ElseIf InternalSQLiteLibraryMBS LoadICU Then
MessageBox "loaded successfully"
Else
MessageBox "failed to load the unicode libraries."
End If
```

**Notes:** Returns true on success.
Normally we load them when SQLite initializes and we then add the ICU extension if we find the library.
Call this function toe explicit load them now.

If MBS Plugin can find International Components for Unicode library files, we can load them and use them for proper unicode handling in SQLite.

### 173.6.10 SourceID as String

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The source code ID.
**Example:**

MsgBox InternalSQLiteLibraryMBS.SourceID

### 173.6.11 Use as boolean

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registers the built in SQLite library for use.
**Example:**

```
if InternalSQLiteLibraryMBS.Use then
MsgBox "Using internal SQLite"
else
MsgBox "Failed, so please use library file."
end if
```

**Notes:** So instead of having SQL Plugin load sqlite3 shared library from file, we use the one built into this plugin.

### 173.6.12 Version as String

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version number.
**Example:**

```
MsgBox InternalSQLiteLibraryMBS.Version
```

### 173.6.13 VersionNumber as Integer

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the sqlite version number.
**Example:**

```
MsgBox str(InternalSQLiteLibraryMBS.VersionNumber)
```

### 173.6.14 Properties

### 173.6.15 ICUEnabled as Boolean

MBS SQL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether ICU libraries are enabled.
**Notes:** If MBS Plugin can find International Components for Unicode library files, we can load them and use them for proper unicode handling in SQLite.
Default is true to enable them, if possible.
(Read and Write property)

### 173.6.16 ICULoaded as Boolean

MBS SQL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether ICU libraries are loaded.
**Notes:** If MBS Plugin can find International Components for Unicode library files, we can load them and use them for proper unicode handling in SQLite.
(Read only property)

### 173.6.17 ICUUsed as Boolean

MBS SQL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether ICU libraries have been used.
**Notes:** Once SQLite is initialized, we set this to 1 if we passed the functionality to SQLite.
Starts with false and should later turn true if ICU libraries are loaded and enabled for usage.
(Read only property)

### 173.6.18 MemoryHighwater as Int64

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries high water memory usage mark.
**Example:**

```
MsgBox "SQLite uses "+_
str(InternalSQLiteLibraryMBS.MemoryUsed)+_
" bytes and has a high mark of "+_
str(InternalSQLiteLibraryMBS.MemoryHighwater)+" bytes."
```

**Notes:** (Read only property)

### 173.6.19 MemoryUsed as Int64

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current memory usage.
**Example:**

```
MsgBox "SQLite uses "+_
str(InternalSQLiteLibraryMBS.MemoryUsed)+_
" bytes and has a high mark of "+_
str(InternalSQLiteLibraryMBS.MemoryHighwater)+" bytes."
```

**Notes:** (Read only property)

### 173.6.20 Path as String

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries file path to the plugin library.
**Notes:** Allows you to query path for plugin library, so you can pass it to SQLite to load as extension.
(Read only property)

## 173.7 class MySQLMBS

### 173.7.1 class MySQLMBS

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for MySQL specific functionality.
**Notes:** Deprecated in favor of direct methods on SQLConnectionMBS. Please let us know if you need more MySQL or MariaDB specific functions.
Subclass of the SQLAPIMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr7
- MBS Real Studio Plugins, version 12.5pr4

### 173.7.2 Methods

### 173.7.3 AffectedRows as UInt64

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the number of affected rows in the last statement.
**Notes:** see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-affected-rows.html

### 173.7.4 Error as string

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the last error text.
**Notes:** see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-error.html

### 173.7.5 ErrorNumber as UInt32

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the last error code.
**Notes:** see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-errno.html

### 173.7.6 FieldCount as UInt32

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of columns for the most recent query on the connection.
**Notes:** see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-field-count.html

### 173.7.7 Info as string

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves an info string providing information about the most recently executed statement.
**Notes:** see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-info.html

### 173.7.8 InsertID as Int64

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last auto increment value from last insert command.
**Notes:** Please query value right after doing Insert. This value is reset when you call commit.
For mySQL and MariaDB connections.

see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-insert-id.html

### 173.7.9 NumberOfRows(cmd as SQLCommandMBS) as UInt64

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of records in a command.

### 173.7.10 SetSSL(keyPath as string, CertificatePath as string, AuthorityPath as string, authorityFolderPath as string, Cipher as string)

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets SSL connection parameters.
**Notes:** Calls mysql_ssl_set internally.
Used for establishing secure connections using SSL. It must be called before Connect(). It does nothing unless SSL support is enabled in the client library.

keyPath is the path name to the key file.
CertificatePath is the path name to the certificate file.
AuthorityPath is the path name to the certificate authority file.
authorityFolderPath is the path name to a directory that contains trusted SSL CA certificates in PEM format.
Cipher is a list of permissible ciphers to use for SSL encryption.

Any unused SSL parameters may be given as empty string.
For paths, please use folderitem.NativePath and not folderitem.ShellPath.

Please switch to using the following options on the connection:

MYSQL_SSL_KEY
MYSQL_SSL_CERT
MYSQL_SSL_CA
MYSQL_SSL_CAPATH
MYSQL_SSL_CIPHER

They should be specified before the connection is made.
e.g.

db.Option("MYSQL_SSL_CIPHER") = "DHE-RSA-AES256-SHA"

Allows to specify MySQL SSL parameters that will be used with mysql_ssl_set. MySQL API method called only when at least one parameter specified. See MySQL documentation for more information about these options.

## 173.8 class PostgreSQLAPIMBS

### 173.8.1 class PostgreSQLAPIMBS

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for Postgre SQL specific functions.
**Notes:** The Listen method and Notification event are in the SQLDatabaseMBS/SQLConnectionMBS classes directly.

Deprecated in favor of direct methods on SQLCommandMBS. Please let us know if you need more postgreSQL specific functions.
Subclass of the SQLAPIMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr1
- MBS Xojo / Real Studio Plugins, version 17.1pr1
- Postgre SQL Database Extension

### 173.8.2 Methods

### 173.8.3 DB as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The database name used to create the connection.

### 173.8.4 ErrorMessage as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.

### 173.8.5 Field(cmd as SQLCommandMBS, RecordIndex as Integer, FieldIndex as Integer) as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a field by index for the row with the RecordIndex.
See also:

- 173.8.6 Field(cmd as SQLCommandMBS, RecordIndex as Integer, FieldName as string) as string 21476

### 173.8.6 Field(cmd as SQLCommandMBS, RecordIndex as Integer, FieldName as string) as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a field by name for the row with the RecordIndex.
See also:

- 173.8.5 Field(cmd as SQLCommandMBS, RecordIndex as Integer, FieldIndex as Integer) as string 21475

### 173.8.7 FieldCount(cmd as SQLCommandMBS) as Integer

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of fields in the result.

### 173.8.8 Host as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The host used to create the connection.

### 173.8.9 Options as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The options used to create the connection.

### 173.8.10 Password as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The password used to create the connection.

### 173.8.11 Port as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The port used to create the connection.

### 173.8.12 RecordCount(cmd as SQLCommandMBS) as Integer

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of records in the result.

### 173.8.13 TTY as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tty used to create the connection.

### 173.8.14 User as string

MBS SQL Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The user name used to create the connection.

## 173.9 Globals

### 173.9.1 BuildRecordSetMBS(fieldNames() as string, values() as string) as RecordSet

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Builds a recordset from strings.
**Example:**

```
dim names() as string = array("Firstname", "Lastname")
dim values() as string

values.append "Stefan"
values.append "Miller"
values.append "Patrick"
values.append "Maier"

dim r as RecordSet = BuildRecordSetMBS(names, values)
```

**Notes:** First array has field names. Second array has all values.
As plugin can't access multi dimensional arrays, we have to flatten it into one dimension and concat all rows.
Returns nil on low memory.
Array sizes should be like: Ubound(values)+1 = (ubound(fieldNames)+1) * RecordCount

See also BuildRowSetMBS for newer Xojo versions.
**Blog Entries**

- Cleanup Xojo Plugins
- RowSet in MBS Xojo SQL Plugin
- MBS Xojo Plugins, version 20.5pr6
- RecordSet to JSON and back
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- MBS Real Studio Plugins, version 13.0pr6
- RecordSet news

### 173.9.2 BuildRowSetMBS(fieldNames() as string, values() as string) as RowSet

MBS SQL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Builds a recordset from strings.
**Example:**

```
dim names() as string = array("Firstname", "Lastname")
dim values() as string

values.append "Stefan"
values.append "Miller"
values.append "Patrick"
values.append "Maier"

dim r as RowSet = BuildRowSetMBS(names, values)
```

**Notes:** First array has field names. Second array has all values.
As plugin can't access multi dimensional arrays, we have to flatten it into one dimension and concat all rows.
Returns nil on low memory.
Array sizes should be like: Ubound(values)+1 = (ubound(fieldNames)+1) * RecordCount

RowSet requires Xojo 2019r2 or newer.
**Blog Entries**

- Cleanup Xojo Plugins
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr4
- RowSet in MBS Xojo SQL Plugin

### 173.9.3 CloneRecordSetMBS(rec as RecordSet) as RecordSet

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an in memory copy of the RecordSet.
**Notes:** This copied record set can be used instead of the original one and even after the original database connection is closed.
**Blog Entries**

- Cleanup Xojo Plugins
- RecordSet news
- MBS Real Studio Plugins, version 12.5pr13

## 173.10 class RecordSet

### 173.10.1 class RecordSet

Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The built in recordset class in Xojo.

### 173.10.2 Methods

### 173.10.3 CloneMBS as RecordSet

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an in memory copy of the RecordSet.
**Notes:** This copied record set can be used instead of the original one and even after the original database connection is closed.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.3pr5
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr13
- Cloning RecordSets

**Xojo Developer Magazine**

- 11.1, page 9: News

# 173.11 class SQLAPIMBS

## 173.11.1 class SQLAPIMBS

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This is a class for the native APIs.
**Notes:** The plugin does not implem
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 19.5pr1
- MBS REALbasic plug-ins version 9.5

## 173.11.2 Properties

## 173.11.3 ClassName as String

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class name of the underlying C++ class.
**Notes:** Sometimes useful to see a which API currently is used.
(Read only property)

## 173.11.4 Connection as Variant

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The database connection this API is used with.
**Notes:** (Read only property)

## 173.12 class SQLBLobMBS

### 173.12.1 class SQLBLobMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a blob.
**Notes:** Basicly this is a SQLStringMBS which is always marked to contain binary data. You only need this class to use the constructor with dataprovider to stream data to the database.
Subclass of the SQLLongOrLobMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 173.12.2 Methods

### 173.12.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:


- 173.12.4 Constructor(Data as MemoryBlock) 21482
- 173.12.5 Constructor(data as SQLStringMBS) 21483
- 173.12.6 Constructor(Data as string, isText as Boolean = True) 21483
- 173.12.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21483


### 173.12.4 Constructor(Data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data, e.g. for blob.
See also:


- 173.12.3 Constructor 21482
- 173.12.5 Constructor(data as SQLStringMBS) 21483
- 173.12.6 Constructor(Data as string, isText as Boolean = True) 21483
- 173.12.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21483

### 173.12.5 Constructor(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new blob object from a string object.
See also:


- 173.12.3 Constructor 21482
- 173.12.4 Constructor(Data as MemoryBlock) 21482
- 173.12.6 Constructor(Data as string, isText as Boolean = True) 21483
- 173.12.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21483


### 173.12.6 Constructor(Data as string, isText as Boolean = True)

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.12.3 Constructor 21482
- 173.12.4 Constructor(Data as MemoryBlock) 21482
- 173.12.5 Constructor(data as SQLStringMBS) 21483
- 173.12.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21483


### 173.12.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new blob object from a data provider.
**Notes:** The blocksize specifies in which sizes data is requested from the provider.
You must make sure that the data provider and this new blob object life long enough. Because the actual data is requested later when you do the update on the database.

If BlockSize is 0, the default block size is used.
See also:


- 173.12.3 Constructor 21482
- 173.12.4 Constructor(Data as MemoryBlock) 21482
- 173.12.5 Constructor(data as SQLStringMBS) 21483
- 173.12.6 Constructor(Data as string, isText as Boolean = True) 21483

## 173.13 class SQLBytesMBS

### 173.13.1 class SQLBytesMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a string of bytes.
**Notes:** Subclass of the SQLStringMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 173.13.2 Methods

### 173.13.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:


- 173.13.4 Constructor(Data as MemoryBlock) 21484
- 173.13.5 Constructor(data as SQLStringMBS) 21484
- 173.13.6 Constructor(Data as string, isText as Boolean = True) 21485


### 173.13.4 Constructor(Data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data, e.g. for blob.
See also:


- 173.13.3 Constructor 21484
- 173.13.5 Constructor(data as SQLStringMBS) 21484
- 173.13.6 Constructor(Data as string, isText as Boolean = True) 21485


### 173.13.5 Constructor(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new bytes object based on the given string object.
See also:

- 173.13.3 Constructor 21484
- 173.13.4 Constructor(Data as MemoryBlock) 21484
- 173.13.6 Constructor(Data as string, isText as Boolean = True) 21485


### 173.13.6 Constructor(Data as string, isText as Boolean = True)

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.13.3 Constructor 21484
- 173.13.4 Constructor(Data as MemoryBlock) 21484
- 173.13.5 Constructor(data as SQLStringMBS) 21484

## 173.14 class SQLCLobMBS

### 173.14.1 class SQLCLobMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a clob (character large object).
**Notes:** Basicly this is a SQLStringMBS which is always marked to contain text. You only need this class to use the constructor with dataprovider to stream data to the database.
Subclass of the SQLLongOrLobMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

### 173.14.2 Methods

### 173.14.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:

- 173.14.4 Constructor(data as SQLStringMBS) 21486
- 173.14.5 Constructor(Data as string, isText as boolean=true) 21486
- 173.14.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21487

### 173.14.4 Constructor(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new clob object from a string object.
See also:

- 173.14.3 Constructor 21486
- 173.14.5 Constructor(Data as string, isText as boolean=true) 21486
- 173.14.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21487

### 173.14.5 Constructor(Data as string, isText as boolean=true)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.14.3 Constructor 21486
- 173.14.4 Constructor(data as SQLStringMBS) 21486
- 173.14.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21487


### 173.14.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new clob object from a data provider.
**Notes:** The blocksize specifies in which sizes data is requested from the provider.
You must make sure that the data provider and this new clob object life long enough. Because the actual data is requested later when you do the update on the database.

If BlockSize is 0, the default block size is used.
See also:


- 173.14.3 Constructor 21486
- 173.14.4 Constructor(data as SQLStringMBS) 21486
- 173.14.5 Constructor(Data as string, isText as boolean=true) 21486

## 173.15 class SQLCommandMBS

### 173.15.1 class SQLCommandMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the central class for the using the SQL database access.
**Example:**

```
dim con as SQLConnectionMBS
dim cmd as SQLCommandMBS

try

con = new SQLConnectionMBS // connection object
cmd = new SQLCommandMBS // create command object

// where is the library?
con.SetFileOption con.kOptionLibraryMySQL, SpecialFolder.UserHome.Child("libmysqlclient.dylib")

// connect to database (mySQL in our example)
// server: 192.168.1.80
// port: 3306
// database: test
// name: root
// no password
con.Connect("192.168.1.80,3306@test","root","",SQLConnectionMBS.kMySQLClient)
// associate a command with connection
// connection can also be specified in SACommand constructor
cmd.Connection=con

// create table
cmd.setCommandText("Create table test_tbl(fid integer, fvarchar20 varchar(20), fblob blob)")
cmd.Execute

// insert value
cmd.setCommandText("Insert into test_tbl(fid, fvarchar20) values (1, 'Some string (1)')")
cmd.Execute

// commit changes on success
con.Commit

MsgBox("Table created, row inserted!")

catch r as SQLErrorExceptionMBS
// SAConnection::Rollback()
// can also throw an exception
// (if a network error for example),
```

```
// we will be ready
try

// on error rollback changes
if con<>nil then
con.rollback
end if
catch x as SQLErrorExceptionMBS
// ignore
end try

// show error message
MsgBox r.message
end try
```

**Notes:** The plugin can cache the recordset locally. To enable you can call SQLCommandMBS.Cache or use the Option("AutoCache") = "true" on either command or connection or database objects. The plugin will than fetch all records and store them in memory. After this you can walk over the recordset and use FetchPos, FetchFirst, FetchLast, FetchPrev and FetchNext to locate the rows you need. When you call Field() you always get last row, but to read from cached result set, please use Value() function. When using RecordSet, the values are read via Value() functions automatically.

see also
https://www.sqlapi.com/ApiDoc/class_s_a_command.html
**Blog Entries**

- MBS Xojo Plugins, version 24.0pr7
- News from the MBS Xojo Plugins Version 21.1
- RowSet in MBS Xojo SQL Plugin
- 10th birthday of MBS SQL Plugin
- Call stored procedures with output parameters
- Problems with killing Xojo threads with plugin calls.
- Upcoming Changes for our SQL Plugin
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- Multithreaded plugin functions can increase speed of Real Studio application
- MBS REALbasic Plugins Version 10.4 release notes

**Xojo Developer Magazine**

- 14.1, pages 28 to 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 14.1, pages 24 to 26: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 12.2, page 10: News

### 173.15.2 Methods

### 173.15.3 AsRecordSet as RecordSet

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a recordset using the command to query fields.
**Notes:** You can use normal RecordSet functions to walk through fields and they simply control the command object.
This is for convenience like passing RecordSet to report functions in Xojo.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

### 173.15.4 AsRowSet as RowSet

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a RowSet using the command to query fields.
**Notes:** You can use normal RowSet functions to walk through fields and they simply control the command object.
This is for convenience like passing RowSet to other functions in Xojo.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RowSet functionality.

The RowSet may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

Requires Xojo 2019r2 or newer.

### 173.15.5 Cache

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Caches values.
**Notes:** The plugin will load the whole recordset and store it in memory.
Now you can move forward/backward as needed to read data.

If you set Option("AutoCache") = "true", the plugin will call Cache automatically for all result sets.
We can only cache first result set.

### 173.15.6 Cancel

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Attempts to cancel the pending result set, or current statement execution.
**Notes:** Only if isExecuting is true, doing cancel makes sense.

Cancel can cancel the following types of processing on a statement:

A function running asynchronously on the statement.
A function running on the statement on another thread.
After an application calls a function asynchronously, it checks repeatedly to determine whether it has finished processing. While the function is processing, an application can call Cancel to cancel the function.

In a multithread application, the application can cancel a function that is running synchronously on a statement.

see also
https://www.sqlapi.com/ApiDoc/class_s_a_command.html

### 173.15.7 Close

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the specified command object.
**Notes:** Use the Close method to close the command explicitly.

A command will be implicitly closed in destructor, so you don't have to call Close method explicitly.

### 173.15.8 Constructor

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new command object with no connection and no command text.
See also:

- 173.15.9 Constructor(connection as SQLConnectionMBS, SQLCommand as String, CommandType as Integer = 0) 21492

### 173.15.9 Constructor(connection as SQLConnectionMBS, SQLCommand as String, CommandType as Integer = 0)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This constructor initializes a new SQLCommandMBS object.
**Example:**

```
// your connection
dim con as SQLConnectionMBS
dim SQL as string = "Insert into test_tbl(fid, fvarchar20) values(:id, :name)"

// create command object
dim cmd as new SQLCommandMBS(con, sql)

// assign values by name of parameter:
cmd.Param("id").setAsLong(2)
cmd.Param("name").setAsString(new SQLStringMBS("Some string (2)"))

// Insert first row
cmd.Execute
```

**Notes:** Connection: the connection to associated with the command.
SQLCommand: A string which represents command text string (an SQL statement or a stored procedure name). If it is an empty string, no command text is associated with the command, and you have to call setCommandText method later.
CommandType: The type of command like kCommandTypeUnknown, kCommandTypeSQLStatement, kCommandTypeSQLStatementRaw or kCommandTypeStoredProcedure.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.
See also:

- 173.15.8 Constructor 21492

### 173.15.10 CreateParam(name as string, ParamType as Integer, DirType as Integer=0) as SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates parameter associated with the specified command.
**Notes:** Parameters

| | |
|---|---|
| name: | A string representing the name of parameter. |
| ParamType: | Type of the parameter's value. Use the kDataType constants. |
| ParamSize: | An integer value represents parameter's value size. |
| ParamPrecision: | An integer value represents parameter's value precision. |
| ParamScale: | An integer value represents parameter's value scale. |
| DirType: | Type of the parameter. Use the kParamDirType* constants. |

Returns a new SQLParamMBS object on success or nil on any error.

Normally you should not create parameters by yourself. The Library automatically detects whether the command has parameters in terms of the command text and implicitly creates a set of SAParam objects.

Nevertheless, if you call CreateParam explicitly you have to delete all SAParam objects created automatically by the Library before. Use DestroyParams method before the first call of CreateParam method.
See also:

- 173.15.11 CreateParam(name as string, ParamType as Integer, NativeType as Integer, ParamSize as Integer, ParamPrecision as Integer, ParamScale as Integer, DirType as Integer=0) as SQLParamMBS 21493

### 173.15.11 CreateParam(name as string, ParamType as Integer, NativeType as Integer, ParamSize as Integer, ParamPrecision as Integer, ParamScale as Integer, DirType as Integer=0) as SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates parameter associated with the specified command.
**Notes:** Parameters

Returns a new SQLParamMBS object on success or nil on any error.

Normally you should not create parameters by yourself. The Library automatically detects whether the command has parameters in terms of the command text and implicitly creates a set of SAParam objects.

| | |
|---|---|
| name: | A string representing the name of parameter. |
| ParamType: | Type of the parameter's value. Use the kDataType constants. |
| ParamSize: | An integer value represents parameter's value size. |
| ParamPrecision: | An integer value represents parameter's value precision. |
| ParamScale: | An integer value represents parameter's value scale. |
| DirType: | Type of the parameter. Use the kParamDirType* constants. |

Nevertheless, if you call CreateParam explicitly you have to delete all SAParam objects created automatically by the Library before. Use DestroyParams method before the first call of CreateParam method.
See also:

- 173.15.10 CreateParam(name as string, ParamType as Integer, DirType as Integer=0) as SQLParamMBS 21493

### 173.15.12 DB2SQLExecDirect(sql as string)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes an SQL command directly without any preprocessing in the plugin.
**Example:**

```
dim cmd as new SQLCommandMBS // your command
dim con as new SQLConnectionMBS // your connection

// now use an API function
const sql = "some sql command"
cmd.DB2SQLExecDirect sql
```

**Notes:** Lasterror is set.

### 173.15.13 DB2SQLRowCount as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the affected number of rows for the last operation.
**Notes:** Lasterror is set.

### 173.15.14 DestroyParams

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Destroys all parameters associated with the specified command.
**Notes:** DestroyParams method destroys all parameters either created automatically by the Library or by user.

Normally you should not create and delete parameters by yourself. The Library automatically detects whether the command has parameters, implicitly creates a set of SAParam objects and then deletes them in SACommanddestructor. But if you have some reason to create parameters explicitly use CreateParam method and then call DestroyParams method to delete all parameters after your work with parameters is over.

### 173.15.15 Execute

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the current command.
**Example:**

```
// your connection
dim con as SQLConnectionMBS
dim SQL as string = "Insert into test_tbl(fid, fvarchar20) values(:id, :name)"

// create command object
dim cmd as new SQLCommandMBS(con, sql)

// assign values by name of parameter:
cmd.Param("id").setAsLong(2)
cmd.Param("name").setAsString(new SQLStringMBS("Some string (2)"))

// Insert first row
cmd.Execute
```

**Notes:** Use the Execute method to execute the query or stored procedure specified in the command text. Execute method calls Prepare method implicitly if needed. If the command has input parameters, they should be bound before calling Execute method. Input parameters represented by SAParam object. To bind input variables assign a value to SAParam object returning by Param or ParamByIndex methods.

A command (an SQL statement or procedure) can have a result set after executing. To check whether a result set exists use isResultSet method. If result set exists, a set of SAField objects is created after command execution. Rows from the result set can be fetched one by one using FetchNext method. To get field description or value use Field method.

Output parameters represented by SAParam objects. They are available after command execution. To get parameter description or value use Param or ParamByIndex methods.

### 173.15.16 ExecuteCommand(SQLCommand as string, CommandType as Integer=0)

MBS SQL Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the given command.
**Notes:** This is a convenience function.
Internally it calls setCommandText with the given command and calls Execute.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

### 173.15.17 ExecuteCommandMT(SQLCommand as string, CommandType as Integer=0)

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the given command.
**Notes:** This is a convenience function.
Internally it calls setCommandText with the given command and calls Execute.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

### 173.15.18 ExecuteMT

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes the current command.
**Notes:** Use the Execute method to execute the query or stored procedure specified in the command text. Execute method calls Prepare method implicitly if needed. If the command has input parameters, they should be bound before calling Execute method. Input parameters represented by SAParam object. To bind input variables assign a value to SAParam object returning by Param or ParamByIndex methods.

A command (an SQL statement or procedure) can have a result set after executing. To check whether a result set exists use isResultSet method. If result set exists, a set of SAField objects is created after command execution. Rows from the result set can be fetched one by one using FetchNext method. To get field description or value use Field method.

Output parameters represented by SAParam objects. They are available after command execution. To get parameter description or value use Param or ParamByIndex methods.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.15.19 FetchFirst as boolean

MBS SQL Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fetches first row from a result set.
**Notes:** Same as FetchNext, but jumps to the first row.
Returns true if the row was fetched; otherwise false.

Not supported for Interbase and SQLite.

When you cache the result set, you can always move within the result set.

### 173.15.20 FetchLast as boolean

MBS SQL Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fetches last row from a result set.
**Notes:** Same as FetchNext, but jumps to the last row.
Returns true if the row was fetched; otherwise false.

Not supported for Interbase and SQLite.

When you cache the result set, you can always move within the result set.

### 173.15.21 FetchNext as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fetches next row from a result set.
**Notes:** Returns true if the next row was fetched; otherwise false .

Use FetchNext method to fetch row by row from the result set.

Each column of fetched row is represented by SAField object. If a result set exists after the last command execution, a set of SAField objects is created implicitly. To check whether a result set exists use isResultSet method. FetchNext method updates value parts of SAField objects.

To get field description or value use Field method.

When you cache the result set, you can always move within the result set.

### 173.15.22 FetchPos(offset as Integer, relative as boolean = false) as boolean

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fetches a row by index.
**Notes:** Returns true if the row was fetched; otherwise false.
You may need to request recordset to be scrollable to have this work.
For that, please set Option("Scrollable") = "true" before doing the query.

When you cache the result set, you can always move within the result set.

### 173.15.23 FetchPrior as boolean

MBS SQL Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fetches previous row from a result set.
**Notes:** Returns true if the row was fetched; otherwise false.
Same as FetchNext, just going back inside the result set.

Not supported for Interbase and SQLite.

When you cache the result set, you can always move within the result set.

### 173.15.24 Field(index as Integer) as SQLFieldMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the column specified by its position in the result set.
**Example:**

```
dim c as SQLCommandMBS // your command object

// get field by name
dim f1 as SQLFieldMBS = c.Field("FirstName")

// get field by Index
dim f2 as SQLFieldMBS = c.Field(1)
```

**Notes:** index: A one-based field number in a result set.

Use Field method to access a field by its name or position in the result set.
For Cached result sets, please use Value() function to get values.

Using an index smaller than 1 and greater then the value returned by FieldCount method will result in a failed assertion.

A set of SAField objects creates implicitly after the command execution if the result set exists.SAField object contains full information about a column: name, type, size, value.

Raises OutOfBoundsException exception if index parameter is out of range.
See also:

- 173.15.25 Field(name as string) as SQLFieldMBS 21499

### 173.15.25 Field(name as string) as SQLFieldMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the column specified by its name in the result set.
**Example:**

```
dim c as SQLCommandMBS // your command object

// get field by name
dim f1 as SQLFieldMBS = c.Field("FirstName")

// get field by Index
dim f2 as SQLFieldMBS = c.Field(1)
```

**Notes:** name: A string that represents a name of the requested field.

Returns a reference to a SAField object.

Use Field method to access a field by its name or position in the result set.
For Cached result sets, please use Value() function to get values.

Using a non-existent field name will throw an exception.

A set of SAField objects creates implicitly after the command execution if the result set exists.SAField object contains full information about a column: name, type, size, value.
See also:

- 173.15.24 Field(index as Integer) as SQLFieldMBS 21498

### 173.15.26 FieldExists(name as string) as Boolean

MBS SQL Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether a field exists.
**Notes:** Returns true if field is found or false if not.

### 173.15.27 FieldNames as String()

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns an array with all the field names for quick inspection.
**Example:**

```
dim cmd as SQLCommandMBS // your command

dim FieldNames() as String = cmd.FieldNames
```

### 173.15.28 Open

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the specified command object.
**Notes:** Use the Open method to open the command explicitly.

A command will be implicitly opened by any method that needs an open command, therefore you don't have to call it explicitly.

To test whether a command is opened use isOpened method.

### 173.15.29 Param(ID as Integer) as SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the command parameter specified by its position.
**Notes:** ID: A position of parameter specified in the command text. Normally position is a number stated in the command text after a colon (for example, 1 for :1, 5 for :5).

Returns a reference to a SAParam object which is only valid as long as the param object is not deleted by the library.

Use Param method to access a parameter by its name or position (in SQL statement). If, for example, you want to walk through all the parameters use ParamByIndex method.

If parameters were not created before calling Param method the Library creates them implicitly (can query native API if needed and therefore can throw exception on error) and then returns the specified parameter.

Passing a value of name or position which does not specified in the command text will throw an exception.

SAParam object contains full information about a parameter: name, type, size, etc. Values for the input parameters can be assigned to SAParam object.
See also:

- 173.15.30 Param(name as string) as SQLParamMBS 21501

### 173.15.30 Param(name as string) as SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the command parameter specified by its name.
**Example:**

```
// your connection
dim con as SQLConnectionMBS
dim SQL as string = "Insert into test_tbl(fid, fvarchar20) values(:id, :name)"

// create command object
dim cmd as new SQLCommandMBS(con, sql)

// assign values by name of parameter:
cmd.Param("id").setAsLong(2)
```

```
cmd.Param("name").setAsString(new SQLStringMBS("Some string (2)"))

// Insert first row
cmd.Execute
```

**Notes:** Name: A string that represents a name of the requested parameter. Normally name is a string stated in the command text after a colon (for example, 'city' for :city, 'my city' for :"my city") or a parameter name in a stored procedure or function.

Returns a reference to a SAParam object which is only valid as long as the param object is not deleted by the library.

Use Param method to access a parameter by its name or position (in SQL statement). If, for example, you want to walk through all the parameters use ParamByIndex method.

If parameters were not created before calling Param method the Library creates them implicitly (can query native API if needed and therefore can throw exception on error) and then returns the specified parameter.

Passing a value of name or position which does not specified in the command text will throw an exception.

SAParam object contains full information about a parameter: name, type, size, etc. Values for the input parameters can be assigned to SAParam object.
See also:

- 173.15.29 Param(ID as Integer) as SQLParamMBS 21501

### 173.15.31 ParamByIndex(index as Integer) as SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the command parameter specified by index.
**Notes:** Index: A zero-based index of the requested parameter in the array of SAParam objects. It must be greater than or equal to 0 and 1 less than the value returned by ParamCount method.

Returns a reference to a SAParam object.

Normally you should use Param method to access a parameter by its name or position (in SQL statement). ParamByIndex method can be used if, for example, you want to walk through all the parameters.

If parameters were not created before calling ParamByIndex method the Library creates them implicitly (can query native API if needed and therefore can throw exception on error) and then returns the specified

parameter.

Passing a negative value of index or a value greater or equal than the value returned by ParamCount method will result in a failed assertion.

SAParam object contains full information about a parameter: name, type, size, etc. Values for the input parameters can be assigned to SAParam object.

Raises OutOfBoundsException exception if index parameter is out of range.

### 173.15.32 PostgreSQLField(RecordIndex as integer, FieldIndex as integer) as string

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a field by index for the row with the RecordIndex.
See also:

- 173.15.33 PostgreSQLField(RecordIndex as integer, FieldName as string) as string 21503

### 173.15.33 PostgreSQLField(RecordIndex as integer, FieldName as string) as string

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a field by name for the row with the RecordIndex.
See also:

- 173.15.32 PostgreSQLField(RecordIndex as integer, FieldIndex as integer) as string 21503

### 173.15.34 PostgreSQLFieldCount as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of fields in the result.

### 173.15.35 PostgreSQLRowCount as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of records in the result.

### 173.15.36 Prepare

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prepares command before execution.
**Notes:** Prepare method compiles the command, but does not execute it. The method detects syntax errors in command text and verifies the existence of database objects.

Execute method calls Prepare method implicitly if needed, therefore you don't have to call it explicitly.

### 173.15.37 setCommandText(SQLCommand as string, CommandType as Integer = 0)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the command text.
**Example:**

```
dim s as new SQLCommandMBS

s.setCommandText "select * from test"

MsgBox s.CommandText
```

**Notes:** SQLCommand: A string which represents command text string (an SQL statement or a stored procedure name).
CommandType: The type of command like kCommandTypeUnknown, kCommandTypeSQLStatement, kCommandTypeSQLStatementRaw or kCommandTypeStoredProcedure.

It's not necessary to set a command type explicitly, because it is defined automatically in terms of command text string. But if you still have any reason to do it, use one of the kCommandType* constants. To get command type use CommandType method.

### 173.15.38 SetParameters(Params as dictionary)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the parameters based on the keys and values in the dictionary.

**Example:**

```
dim con as SQLConnectionMBS // your connection
dim pic as picture // some picture

// get picture data
dim jpegData as MemoryBlock = pic.GetData(Picture.FormatJPEG, 80)

// parse a SQL command
dim sql as string = "Insert into BlobTest(name, image) values (:name, :image)"
dim cmd as new SQLCommandMBS(con, sql)

dim d as new Dictionary
// set by param index
d.Value(0) = "test.jpg"
// set by param name
d.Value("image") = jpegData

// set all parameters together
cmd.SetParameters d
cmd.Execute
```

**Notes:** Keys can be String, Text or numeric types. Text and String are used to pick parameters by name.
Numeric values are used to pick parameter by index (zero based).
MemoryBlock and Strings without text encoding are converted to byte values (BLOB).
Texts and Strings with encoding are converted to text values.
Raises exceptions if you pass anything which is not recognized.
Other types are translated as good as possible.

Raises OutOfBoundsException exception if index parameter is out of range.

### 173.15.39 Value(index as Integer) as SQLValueReadMBS

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value specified by its position in the result set.
**Example:**

```
dim c as SQLCommandMBS // your command object

// get field by name
dim f1 as SQLValueReadMBS = c.Value("FirstName")

// get field by Index
dim f2 as SQLValueReadMBS = c.Value(1)
```

**Notes:** You can use Value() to get values for normal or cached result sets.

index: A one-based field number in a result set.

Use Value method to access a field by its name or position in the result set.
For Cached result sets, please use Value() function to get values.

Using an index smaller than 1 and greater then the value returned by FieldCount method will result in a failed assertion.

A set of SAField objects creates implicitly after the command execution if the result set exists. SAField object contains full information about a column: name, type, size, value.

Raises OutOfBoundsException exception if index parameter is out of range.
See also:

- 173.15.40 Value(name as string) as SQLValueReadMBS 21506

### 173.15.40 Value(name as string) as SQLValueReadMBS

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value specified by its name in the result set.
**Example:**

```
dim c as SQLCommandMBS // your command object

// get value by name
dim f1 as SQLValueReadMBS = c.Value("FirstName")

// get value by Index
dim f2 as SQLValueReadMBS = c.Value(1)
```

**Notes:** You can use Value() to get values for normal or cached result sets.

name: A string that represents a name of the requested field.

Returns a reference to a SAValueRead object.

Use Value method to access a field by its name or position in the result set.
Using a non-existent field name will throw an exception.

A set of SAField objects creates implicitly after the command execution if the result set exists.SAField object contains full information about a column: name, type, size, value.
See also:

- 173.15.39 Value(index as Integer) as SQLValueReadMBS 21505

### 173.15.41 Properties

### 173.15.42 CommandCount as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of current command objects.
**Notes:** This method should help you find leaked objects by keeping track of current count from the plugin perspective.
This includes SQLCommandMBS and RecordSet objects.
(Read only property)

### 173.15.43 CommandText as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the command text associated with the SACommand object.
**Example:**

```
dim s as new SQLCommandMBS(nil, "select * from test")

MsgBox s.CommandText
```

**Notes:** Use the CommandText method to return the command text declared in SACommand constructor or setCommandText method.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.
(Read and Write property)

### 173.15.44 CommandType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the command type currently associated with the SACommand object.
**Notes:** One of the following values from SACommandType_t enum:

- kCommandTypeUnknown Command type is not defined. Library will detect command type automatically when needed.
- kCommandTypeSQLStmt Command is an SQL statement.
- kCommandTypeSQLStmtRaw Command is an SQL statement that mustn't be interpreted by SQLAPI++.
- kCommandTypeStoredProc Command is a stored procedure or a function.

Remarks

The command type can be explicitly set in SACommand constructor and setCommandText method, but it's not necessary to do it.

The CommandTypemethod returns the command type value that was specified in SACommand constructor or setCommandText method. If you declared the command type value as kCommandTypeUnknown (the default value) then command type is detected by the Library and the CommandType method returns this detected value.
(Read only property)

### 173.15.45 Connection as SQLConnectionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection for the command.
**Notes:** When you set the connection on a command object that already has associated connection, the previous association will be correctly discarded (with closing opened command if needed) and new connection will be set.

If you attempt to call any method on a SACommand object that requires database access with no valid connection, an error occurs.
(Read and Write property)

### 173.15.46 FieldCount as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of fields (columns) in a result set.
**Notes:** FieldCount method returns the number of fields created implicitly after the command execution if a result set exists.

A field is represented by SAField object. You can get field value and description using Field method.
(Read only property)

### 173.15.47 Fields as Dictionary

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provides dictionary with all fields.
**Notes:** This dictionary should help for debugging to inspect all fields and their text value.
(Read only property)

### 173.15.48 hasCache as Boolean

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether cache is active.
**Notes:** (Read only property)

### 173.15.49 isBOF as Boolean

MBS SQL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether we are at the beginning of the result set.
**Notes:** Set to true when running the query and when FetchFirst succeeds.
Otherwise false.
(Read only property)

### 173.15.50 isEOF as Boolean

MBS SQL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether we are at the end of the result set.
**Notes:** True if we are at the end of the recordset, e.g. FetchNext failed.
Set to false by Execute.

We set it to true, when something goes wrong, so Xojo's RecordSet and RowSet end looping.

We can only know, that we are not at the last one, if FetchNext internally failed to get the next record.
(Read only property)

### 173.15.51 isExecuted as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this command was already executed.
**Notes:** (Read only property)

### 173.15.52 isExecuting as Boolean

MBS SQL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this command is executing.
**Notes:** You only see this true if you use threaded queries and look on the property from another thread.
(Read only property)

### 173.15.53 isOpened as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the SACommand object is opened; otherwise false.
**Notes:** (Read only property)

### 173.15.54 isResultSet as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tests whether a result set exists after the command execution.
**Notes:** Returns true if the result set exists; otherwise false.
(Read only property)

### 173.15.55 Options as Dictionary

MBS SQL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a dictionary with all options.
**Notes:** For debugging, it may be useful to inspect options in debugger.

(Read only property)

### 173.15.56 ParamCount as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of parameters associated with the SACommand object.
**Notes:** ParamCount method returns the number of parameters created explicitly by using CreateParam method or (if parameters were not created before) creates them implicitly (can query native API if needed and therefore can throw exception on error) and returns the number of created parameters.

Command parameter is represented by SAParam object. You can look SAParam objects through and assign their values with Param and ParamByIndex methods.
(Read only property)

### 173.15.57 Parameters as Dictionary

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Provides dictionary with all parameters.
**Notes:** This dictionary should help for debugging to inspect all parameters and their text value.
(Read only property)

### 173.15.58 RowsAffected as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of rows affected by the last insert/update/delete command execution.
**Example:**

```
dim con as SQLConnectionMBS // your connection

dim sql as string = "UPDATE Test SET MyField=1"
dim c as new SQLCommandMBS(con, sql)

c.Execute

MsgBox str(c.RowsAffected)
```

**Notes:** (Read only property)

### 173.15.59 Tag as Variant

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag property.
**Example:**

```
dim c as SQLCommandMBS // your command object

// store reference to window/control, so we have it available in events
c.Tag = self
```

**Notes:** You can store here whatever you like.
(Read and Write property)

### 173.15.60 Option(name as string) as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string value of a specific command option.
**Example:**

```
dim cmd as SQLCommandMBS // your command

// turn on auto cache
cmd.Option("AutoCache") = "true"
```

**Notes:** see also:
https://www.sqlapi.com/ApiDoc/class_s_a_command.html
(Read and Write computed property)

### 173.15.61 Events

### 173.15.62 Trace(traceInfo as Integer, SQL as string)

MBS SQL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to trace SQL commands.

### 173.15.63 Working

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called while the ExecuteMT and ExecuteCommandMT methods are running.

### 173.15.64 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kOptionPreFetchRows | "PreFetchRows" | One of the option constants. |
| kParamDirTypeInput | 0 | One of the parameter direction type constants. Input parameter. |
| kParamDirTypeInputOutput | 1 | One of the parameter direction type constants. Input/output parameter. |
| kParamDirTypeOutput | 2 | One of the parameter direction type constants. Output parameter. |
| kParamDirTypeReturn | 3 | One of the parameter direction type constants. Returning parameter. |

Command Types

| Constant | Value | Description |
|---|---|---|
| kCommandTypeSQLStatement | 1 | Command is an SQL statement. |
| kCommandTypeSQLStatementRaw | 2 | Command is an SQL statement that mustn't be interpreted by SQLAPI. |
| kCommandTypeStoredProcedure | 3 | Command is a stored procedure or a function. |
| kCommandTypeUnknown | 0 | Used by default. Library detects command type automatically. |

## 173.16 class SQLConnectionMBS

### 173.16.1 class SQLConnectionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a SQL Plugin Database connection.
**Example:**

```
dim con as new SQLConnectionMBS

try

// where is the library?
con.SetFileOption con.kOptionLibraryMySQL, SpecialFolder.UserHome.Child("libmysqlclient.dylib")

// connect to database
// in this example it is Oracle,
// but can also be Sybase, Informix, DB2
// SQLServer, InterBase, SQLBase and ODBC

dim server as string = "192.168.1.80,3306@test"

con.Connect(server,"root","",SQLConnectionMBS.kMySQLClient)

MsgBox "We are connected!"

// Disconnect is optional
// autodisconnect will ocur in destructor if needed
con.Disconnect

msgbox "We are disconnected!"

catch r as RuntimeException
MsgBox r.message

// SAConnection::Rollback()
// can also throw an exception
// (if a network error for example),
// we will be ready
try

// on error rollback changes
con.Rollback

catch rr as runtimeexception
MsgBox rr.message
end try
```

end try

**Notes:** Supported databases: CubeSQL, Centura SQLBase, DB2, DuckDB, Firebird, Informix, InterBase, MariaDB, Microsoft Access, Microsoft SQL Server, MySQL, ODBC, Oracle Database Server, PostgreSQL, SQL Anywhere, SQLite, SQLCipher and Sybase.
Connect to Microsoft Access, FileMaker Server (or Pro), Microsoft Visual FoxPro and others via ODBC.

With Xojo 2013r1, you only need a database server license from Xojo, Inc. if you use the SQLDatabaseMBS class. The SQLConnectionMBS class does not require this license. But some features like getting a recordset do need the license as they refer to the SQLDatabaseMBS class.

Please free all RecordSets and SQLCommand objects before you close the SQLConnection or the SQLDatabase. The plugin keeps references from RecordSets and SQLCommand to prevent automatic destruction of the database connection. If you close a database connection while you have RecordSets and SQLCommand in use, things may go wrong.

The plugin can cache the recordset locally. To enable you can call SQLCommandMBS.Cache or use the Option("AutoCache") = "true" on either command or connection or database objects. The plugin will than fetch all records and store them in memory. After this you can walk over the recordset and use FetchPos, FetchFirst, FetchLast, FetchPrev and FetchNext to locate the rows you need. When you call Field() you always get last row, but to read from cached result set, please use Value() function. When using RecordSet, the values are read via Value() functions automatically.

You can use InternalPostgreSQLLibraryMBS or InternalSQLiteLibraryMBS if you like to use our built in SQLite or PostgreSQL database libraries.

see also
https://www.sqlapi.com/ApiDoc/class_s_a_connection.html

The class pings the database every minute by checking whether it's alive and to avoid server dropping connection. This can be disabled by setting Option("Ping") = "false". Ping is not used for SQLite.

MBS Database connections are implemented via SQLConnectionMBS and SQLCommandMBS classes. We provide a thin layer on top with SQLDatabaseMBS class to make it compatible to the Xojo database class. And when you use SQLDatabaseMBS, you can always get the matching SQLConnectionMBS objet via Connection property. Instead of SQLCommandMBS class, you may just use SelectSQL/ExecuteSQL or older SQLSelect/SQLExecute functions.

We have a collection of library files here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- 12th birthday of MBS SQL Plugin
- News from the MBS Xojo Plugins Version 20.5
- Connect to Microsoft SQL Server with MBS Xojo SQL Plugin
- LiteSync and Xojo
- New SQL Insert and Update functions for our Xojo Plugin
- CubeSQL support for MBS Xojo SQL Plugin
- SQLite in memory databases
- Wishes for little plug-in additions?
- MBS REALbasic Plugins Version 10.4 release notes

**Videos**

- MBS SQL Plugin Presentation
- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 22.1, page 9: News
- 16.1, page 10: News
- 14.1, pages 24 to 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 12.4, page 9: News

### 173.16.2 Methods

### 173.16.3 BeginTransaction

MBS SQL Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Begins a transaction.
**Notes:** This method does nothing. Why?
Well, if auto commit is on, you don't need to call this.
If auto commit is off, we call BeginTransaction for you, so if you call this method you would call it a second time and get an error.
We have this method for compatibility to other SQL database classes from Xojo.

### 173.16.4 CancelAllCommands

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancel all commands for the connection.
**Notes:** This loops over the list of commands associated with this connection and calls Cancel on them.

### 173.16.5 Commands as SQLCommandMBS()

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all command objects related to the connection.

### 173.16.6 Commit

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves any changes and ends the current transaction.
**Notes:** Use Commit method to write transaction changes permanently to a database. It commits the work of all commands that associated with that connection.

All changes to the database since the last commit are made permanent and cannot be undone. Before a commit, all changes made since the start of the transaction can be rolled back using Rollback method.

### 173.16.7 Connect(DBString as string, UserID as string, Password as string, client as Integer = 0)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the connection to a data source.
**Example:**

```
dim con as SQLConnectionMBS// your connection

// some calls for MS SQL Server:
con.Connect("srv2@pubs","", "", SQLConnectionMBS.kSQLServerClient)
con.Connect("@pubs", "", "", SQLConnectionMBS.kSQLServerClient)
con.Connect("BEDLAM\SQL2005EX_EN@pubs", "", "", SQLConnectionMBS.kSQLServerClient)
con.Connect("BEDLAM\SQLEXPRESS@master", "", "", SQLConnectionMBS.kSQLServerClient)

// for MySQL:

con.Connect("192.168.1.80,3306@test","root","password", SQLConnectionMBS.kMySQLClient)
```

```
// for Postgre SQL:

con.Connect("somedb", "name", "password",SQLConnectionMBS.kPostgreSQLClient)
// with options
con.Connect("127.0.0.1,5432@dbname=postgres connect_timeout=10 sslmode=require", "name", "password",SQL-
ConnectionMBS.kPostgreSQLClient)

// for SQLite:

con.Connect("/test.db", "", "",SQLConnectionMBS.kSQLiteClient)
```

**Notes:**

| | |
|---|---|
| DBString: | Name of database this connection will connect to (see Server specific notes). |
| UserID: | A string containing a user name to use when establishing the connection (see Server specific notes). |
| Password: | A string containing a password to use when establishing the connection. |
| client: | Optional. One of the following values from k*Client constants. |

Using the Connect method on a SAConnection object establishes the physical connection to a data source. After this method successfully completes, the connection is live and you can issue commands against it and process the results.

If you use the default value of Client parameter, you should set Client before using Connect.

To check whether a connection established use isConnected method. To check whether a connection is broken or not use isAlive method.

see also for server specific notes:
https://www.sqlapi.com/ApiDoc/class_s_a_connection.html

For IPv6 we changed plugin to use , instead of : for the port separator. So please use , to separate port from IP or host.

For Firebird, if you connect to a database and you have 32/64bit mismatch, you get error number 3.

See Option() for various options you can set before connecting.
e.g. c.Option("SQLiteVFSFlags") = "1" for SQLite for read only access.

Raises OutOfBoundsException exception if client parameter is out of range.

### 173.16.8 ConnectMT(DBString as string, UserID as string, Password as string, client as Integer = 0)

MBS SQL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens the connection to a data source.
**Notes:**

| | |
|---|---|
| DBString: | Name of database this connection will connect to (see Server specific notes). |
| UserID: | A string containing a user name to use when establishing the connection (see Server specific notes). |
| Password: | A string containing a password to use when establishing the connection. |
| client: | Optional. One of the following values from k*Client constants. |

Using the Connect method on a SAConnection object establishes the physical connection to a data source. After this method successfully completes, the connection is live and you can issue commands against it and process the results.

If you use the default value of Client parameter, you should set Client before using Connect.

To check whether a connection established use isConnected method. To check whether a connection is broken or not use isAlive method.

see also for server specific notes:
https://www.sqlapi.com/ApiDoc/class_s_a_connection.html

For IPv6 we changed plugin to use , instead of : for the port separator. So please use , to separate port from IP or host.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

The MT method will not trigger WillConnect and DidConnect events.
Raises OutOfBoundsException exception if client parameter is out of range.

### 173.16.9 CubeSQLLastInsertID as Int64

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last auto increment value from last insert command.
**Notes:** Only for CubeSQL connections. May raise error if not available.

### 173.16.10 CubeSQLReceiveData(byref data as String, byref IsEndChunk as Boolean) as Boolean

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receives a data chunk for file download.
**Notes:** Returns true on success.
Data is set with data and IsEndChunk is set to true for last chunk.

### 173.16.11 CubeSQLSendData(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data chunk for file upload.
**Notes:** This is the sendchunk function in CubeSQL.
See also:

- 173.16.12 CubeSQLSendData(data as String) 21520

### 173.16.12 CubeSQLSendData(data as String)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data chunk for file upload.
**Notes:** This is the sendchunk function in CubeSQL.
See also:

- 173.16.11 CubeSQLSendData(data as MemoryBlock) 21520

### 173.16.13 CubeSQLSendEndData

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends end data packet.
**Notes:** This is the send_enddata function in CubeSQL.

### 173.16.14 Disconnect

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Disconnects the connection from the database.
**Notes:** Closes all commands objects and RecordSets.

### 173.16.15 InsertRecord(TableName as String, Record as Dictionary)

MBS SQL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to insert a record.
**Example:**

```
dim con as SQLConnectionMBS // your database connection

dim d as new Dictionary

d.Value("ID")=2
d.Value("text")="test insert"
d.Value("other")="Just a test"

con.InsertRecord("test_tbl", d)
```

**Notes:** The plugin builds for you SQL statement with prepared statement and runs the insert command with values.
Lasterror is set or exception raised as with SQLExecute.

Internally this uses a prepared statement. You can check the generated statement via LastStatement property.

### 173.16.16 kOptionLibrarySeparator as String

MBS SQL Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** One of the option constant to specify the platform specific path separator.
**Notes:** Use with Option() to specify multiple file paths for a library.
Has a different value on the different platforms.
Value is ";" on Windows and ":" on macOS/Linux.

### 173.16.17 Listen

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Start listening for notifications.
**Notes:** Works only for PostgresSQL Client.
Please set client or connect before calling this method.

### 173.16.18 MySQLInsertID as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last auto increment value from last insert command.
**Notes:** Please query value right after doing Insert. This value is reset when you call commit.
For mySQL and MariaDB connections.

see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-insert-id.html

### 173.16.19 Rollback

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancels any changes made during the current transaction and ends the transaction.
**Notes:** Rollback method rolls back the database to the state it was in at the completion of the last commit operation. All uncommitted work is undone.

Rollback method rolls back the work of all commands that associated with that connection.

To commit all changes made since the start of the transaction use Commit method.

### 173.16.20 SetFileOption(name as string, file as folderitem)

MBS SQL Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option with passing a file path.
**Example:**

```
dim db as new SQLConnectionMBS

// where is the library?
db.SetFileOption SQLConnectionMBS.kOptionLibraryMySQL, SpecialFolder.UserHome.Child("libmysqlclient.dylib")
```

**Notes:** Allows you to specify a file path with a folderitem.

Makes sure the path is correct and you have a 32 or 64-bit library matching the architecture of your application.

### 173.16.21 SQLExecute(command as string, CommandType as Integer = 0)

MBS SQL Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and ignores result.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

### 173.16.22 SQLExecuteMT(command as string, CommandType as Integer = 0)

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and ignores result.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.16.23 SQLiteBackupFinish(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes a backup run.
**Notes:** When BackupStep has returned kErrorDone, or when the application wishes to abandon the backup

operation, the application should destroy the SQLite3BackupMBS by passing it to BackupFinish. The BackupFinish interfaces releases all resources associated with the SQLite3BackupMBS object. If BackupStep has not yet returned kErrorDone, then any active write-transaction on the destination database is rolled back. The SQLite3BackupMBS object is invalid and may not be used following a call to BackupFinish.
The value returned by BackupFinish is kErrorOK if no BackupStep errors occurred, regardless or whether or not BackupStep completed. If an out-of-memory condition or IO error occurred during any prior BackupStep call on the same SQLite3BackupMBS object, then BackupFinish returns the corresponding error code.
A return of kErrorBusy or kErrorLocked from BackupStep is not a permanent error and does not affect the return value of BackupFinish.

### 173.16.24 SQLiteBackupInit(Dest as Variant, DestName as String, Source as Variant, SourceName as String) as SQLite3BackupMBS

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a backup.
**Notes:** The backup API copies the content of one database into another. It is useful either for creating backups of databases or for copying in-memory databases to or from persistent files.

see also
http://www.sqlite.org/c3ref/backup_finish.html

Exclusive access is required to the destination database for the duration of the operation. However the source database is only read-locked while it is actually being read; it is not locked continuously for the entire backup operation. Thus, the backup may be performed on a live source database without preventing other users from reading or writing to the source database while the backup is underway.

To perform a backup operation:

- BackupInit is called once to initialize the backup,
- BackupStep is called one or more times to transfer the data between the two databases, and finally
- BackupFinish is called to release all resources associated with the backup operation.

There should be exactly one call to BackupFinish for each successful call to BackupInit.

The D and N arguments to BackupInit(D,N,S,M) are the database connection associated with the destination database and the database name, respectively. The database name is "main" for the main database, "temp" for the temporary database, or the name specified after the AS keyword in an ATTACH statement for an attached database. The S and M arguments passed to BackupInit(D,N,S,M) identify the database connection and database name of the source database, respectively. The source and destination database connections (parameters S and D) must be different or else BackupInit(D,N,S,M) will file with an error.

If an error occurs within BackupInit(D,N,S,M), then nil is returned and an error code and error message are store3d in the destination database connection D. The error code and message for the failed call to BackupInit can be retrieved using the ErrCode and ErrMessage functions. A successful call to BackupInit returns a SQLite3BackupMBS object. The SQLite3BackupMBS object may be used with the BackupStep and BackupFinish functions to perform the specified backup operation.

Concurrent Usage of Database Handles
The source database connection may be used by the application for other purposes while a backup operation is underway or being initialized. If SQLite is compiled and configured to support threadsafe database connections, then the source database connection may be used concurrently from within other threads.
However, the application must guarantee that the destination database connection is not passed to any other API (by any thread) after BackupInit is called and before the corresponding call to BackupFinish. SQLite does not currently check to see if the application incorrectly accesses the destination database connection and so no error code is reported, but the operations may malfunction nevertheless. Use of the destination database connection while a backup is in progress might also also cause a mutex deadlock.
If running in shared cache mode, the application must guarantee that the shared cache used by the destination database is not accessed while the backup is running. In practice this means that the application must guarantee that the disk file being backed up to is not accessed by any connection within the process, not just the specific connection that was passed to BackupInit.
The SQLite3BackupMBS object itself is partially threadsafe. Multiple threads may safely make multiple concurrent calls to BackupStep. However, the BackupRemaining and BackupPageCount APIs are not strictly speaking threadsafe. If they are invoked at the same time as another thread is invoking BackupStep it is possible that they return invalid values.

Source and Dest can be SQLConnectionMBS or SQLDatabaseMBS. You need to pass source and dest, even if one is self as we give you the option to decide where to pass the current database connection.

### 173.16.25 SQLiteBackupPageCount(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages in total.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.16.26 SQLiteBackupRemaining(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages remaining.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.16.27 SQLiteBackupStep(Backup as SQLite3BackupMBS, Pages as Integer) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies up to Pages pages between the source and destination databases specified by SQLite3BackupMBS object.
**Notes:** If N is negative, all remaining source pages are copied. If BackupStep(B,N) successfully copies N pages and there are still more pages to be copied, then the function resturns kErrorOK. If BackupStep(B,N) successfully finishes copying all pages from source to destination, then it returns kErrorDone. If an error occurs while running BackupStep(B,N), then an error code is returned. As well as kErrorOK and kErrorDone, a call to BackupStep may return kErrorReadOnly, kErrorNoMem, kErrorBusy, kErrorLocked, or an kErrorIOACCESS | kErrorIOXXX extended error code.
The BackupStep might return kErrorReadOnly if the destination database was opened read-only or if the destination is an in-memory database with a different page size from the source database.
If BackupStep cannot obtain a required file-system lock, then the sqlite3_busy_handler | busy-handler function is invoked (if one is specified). If the busy-handler returns non-zero before the lock is available, then kErrorBusy is returned to the caller. In this case the call to BackupStep can be retried later. If the source database connection is being used to write to the source database when BackupStep is called, then kErrorLocked is returned immediately. Again, in this case the call to BackupStep can be retried later on. (If kErrorIOACCESS | kErrorIOXXX, kErrorNoMem, or kErrorReadOnly is returned, then there is no point in retrying the call to BackupStep. These errors are considered fatal.) The application must accept that the backup operation has failed and pass the backup operation handle to the BackupFinish to release associated resources.
The first call to BackupStep obtains an exclusive lock on the destination file. The exclusive lock is not released until either BackupFinish is called or the backup operation is complete and BackupStep returns kErrorDone. Every call to BackupStep obtains a shared lock on the source database that lasts for the duration of the BackupStep call. Because the source database is not locked between calls to BackupStep, the source database may be modified mid-way through the backup process. If the source database is modified by an external process or via a database connection other than the one being used by the backup operation, then the backup will be automatically restarted by the next call to BackupStep. If the source database is modified by the using the same database connection as is used by the backup operation, then the backup database is automatically updated at the same time.

### 173.16.28 SQLiteConnectionHandle as Ptr

MBS SQL Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current connection reference for the database.
**Notes:** sqlite3 pointer for using in declares.

### 173.16.29 SQLiteEnableLoadExtension(OnOff as boolean)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables/disables extension loading for the given connection.

### 173.16.30 SQLiteLastInsertRowID as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns Last Insert Rowid.
**Notes:** Each entry in an SQLite table has a unique 64-bit signed integer key called the ROWID. The rowid is always available as an undeclared column named ROWID, OID, or _ROWID_ as long as those names are not also used by explicitly declared columns. If the table has a column of type INTEGER PRIMARY KEY then that column is another alias for the rowid.

This routine returns the rowid of the most recent successful INSERT into the database from the database connection in the first argument. If no successful INSERTs have ever occurred on that database connection, zero is returned.

(If an INSERT occurs within a trigger, then the rowid of the inserted row is returned by this routine as long as the trigger is running. But once the trigger terminates, the value returned by this routine reverts to the last value inserted before the trigger fired.)

An INSERT that fails due to a constraint violation is not a successful INSERT and does not change the value returned by this routine. ^Thus INSERT OR FAIL, INSERT OR IGNORE, INSERT OR ROLLBACK, and INSERT OR ABORT make no changes to the return value of this routine when their insertion fails. ^(When INSERT OR REPLACE encounters a constraint violation, it does not fail. The INSERT continues to completion after deleting rows that caused the constraint problem so INSERT OR REPLACE will always change the return value of this interface.)^

For the purposes of this routine, an INSERT is considered to be successful even if it is subsequently rolled back.

This function is accessible to SQL statements via the last_insert_rowid() SQL function.

If a separate thread performs a new INSERT on the same database connection while the LastInsertRowID function is running and thus changes the last insert rowid, then the value returned by LastInsertRowID is unpredictable and might not equal either the old or the new last insert rowid.

### 173.16.31 SQLiteLibVersion as String

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version string of the SQLite library.

### 173.16.32 SQLiteLoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.16.33 SQLiteLoadExtension(path as String, ByRef ErrorMessage as String) as Integer 21528

### 173.16.33 SQLiteLoadExtension(path as String, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.16.32 SQLiteLoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer 21528

### 173.16.34 SQLiteMemoryHighwater(reset as boolean = false) as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries maximum memory usage so far.
**Notes:** Can be reset with reset parameter being true.

### 173.16.35 SQLiteMemoryUsed as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries memory in use by SQLite.
**Notes:** This is memory allocated, but not yet freed.
Value is zero until SQLite3 initialized.

### 173.16.36 SQLiteReKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** You can change the key on a database using the Rekey Function.
**Notes:** An empty key decrypts the database.

Rekeying requires that every page of the database file be read, decrypted, reencrypted with the new key, then written out again. Consequently, rekeying can take a long time on a larger database.

Most SEE variants allow you to encrypt an existing database that was created using the public domain version of SQLite. This is not possible when using the authenticating version of the encryption extension in see-aes128-ccm. If you do encrypt a database that was created with the public domain version of SQLite, no nonce will be used and the file will be vulnerable to a chosen-plaintext attach. If you call SetKey() immediately after Open when you are first creating the database, space will be reserved in the database for a nonce and the encryption will be much stronger. If you do not want to encrypt right away, call SetKey() anyway, with an empty key, and the space for the nonce will be reserved in the database even though no encryption is done initially.

A public domain version of the SQLite library can read and write an encrypted database with an empty key. You only need the encryption extension if the key is non-empty.

Returns a SQLite error code.

### 173.16.37 SQLiteSetBusyHandler(MaxAttempts as Integer = 5)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs busy handler for this connection.
**Notes:** This routine sets a callback function that might be invoked whenever an attempt is made to open a database table that another thread or process has locked.

The plugin has an busy handler which will wait up to MaxAttemps and yield to other Xojo threads while waiting.
Passing 5 should wait up to 100ms.

There can only be a single busy handler defined for each [ database connection ] . Setting a new busy handler clears any previously set handler.) Note that calling SetBusyTimeout will also set or clear the busy handler.

The busy callback should not take any actions which modify the database connection that invoked the busy handler. Any such actions result in undefined behavior.

### 173.16.38 SQLiteSetBusyTimeout(TimeOutMS as Integer = 20)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This routine sets a busy handler that sleeps for a specified amount of time when a table is locked.
**Notes:** The handler will sleep multiple times until at least "ms" milliseconds of sleeping have accumulated. ^After at least "ms" milliseconds of sleeping, the handler returns 0 which causes SQLite query to return SQLite Busy or IO Blocked error.

Calling this routine with an argument less than or equal to zero turns off all busy handlers.

(There can only be a single busy handler for a particular database connection any any given moment. If another busy handler was defined (using SetBusyHandler prior to calling this routine, that other busy handler is cleared.)

### 173.16.39 SQLiteSetKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies encryption to a database connection.
**Notes:** Returns a SQLite error code.

The amount of key material actually used by the encryption extension depends on which variant of SEE you

are using. With RC4, the first 256 byte of key are used. With the AES128, the first 16 bytes of the key are used. With AES256, the first 32 bytes of key are used.

If you specify a key that is shorter than the maximum key length, then the key material is repeated as many times as necessary to complete the key. If you specify a key that is larger than the maximum key length, then the excess key material is silently ignored.

The key must begin with an ASCII prefix to specify which algorithm to use. The prefix must be one of "rc4:", "aes128:", or "aes256:". The prefix is not used as part of the key sent into the encryption algorithm. So the real key should begin on the first byte after the prefix.

The string provided to the plugin is used with it's current encoding. So be sure you use right text encoding for what you want. e.g. using "M√ºller" as key in text encoding Windows ANSI will not open a database which used that key in UTF-8 encoding.

The Xojo database encryption in SQLiteDatabase class uses AES-128 OFB.

### 173.16.40 SQLiteTableColumnMetaData(DBName as string, TableName as string, ColumnName as string, byref DataType as string, byref CollationSequence as string, byref NotNull as boolean, byref PrimaryKey as boolean, byref AutoIncrement as Boolean) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract Metadata About A Column Of A Table
**Notes:** Not available in all sqlite libraries!

This routine returns metadata about a specific column of a specific database table accessible using the database connection handle passed as the first function argument.
The column is identified by the second, third and fourth parameters to this function. The second parameter is either the name of the database (i.e. "main", "temp", or an attached database) containing the specified table or NULL. If it is NULL, then all attached databases are searched for the table using the same algorithm used by the database engine to resolve unqualified table references.
The third and fourth parameters to this function are the table and column name of the desired column, respectively. Neither of these parameters may be NULL.
Metadata is returned by writing to the memory locations passed as the 5th and subsequent parameters to this function. Any of these arguments may be NULL, in which case the corresponding element of metadata is omitted.

CollationSequence is assigned the Name of default collation sequence. NotNull is set to true if column has a NOT NULL constraint. PrimaryKey is set to true if column is part of the PRIMARY KEY and AutoIncrement is set to true if column is AUTOINCREMENT.

If the specified table is actually a view, an error code is returned.

If the specified column is "rowid", "oid" or "_rowid_" and an INTEGER PRIMARY KEY column has been explicitly declared, then the output parameters are set for the explicitly declared column. (If there is no explicitly declared INTEGER PRIMARY KEY column, then the output parameters are set as follows:

data type: "INTEGER"
collation sequence: "BINARY"
not null: false
primary key: true
auto increment: false

(This function may load one or more schemas from database files. If an error occurs during this process, or if the requested table or column cannot be found, an error code is returned and an error message left in the database connection (to be retrieved using ErrMessage).)

This API is only available if the library was compiled with the SQLITE_ENABLE_COLUMN_METADATA C-preprocessor symbol defined.

### 173.16.41 SQLiteThreadsafe as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test To See If The Library Is Threadsafe.
**Notes:** The threadsafe() function returns zero if and only if SQLite was compiled mutexing code omitted due to the SQLITE_THREADSAFE compile-time option being set to 0.

SQLite can be compiled with or without mutexes. When the SQLITE_THREADSAFE C preprocessor macro is 1 or 2, mutexes are enabled and SQLite is threadsafe. When the SQLITE_THREADSAFE macro is 0, the mutexes are omitted. Without the mutexes, it is not safe to use SQLite concurrently from more than one thread.

Enabling mutexes incurs a measurable performance penalty. So if speed is of utmost importance, it makes sense to disable the mutexes. But for maximum safety, mutexes should be enabled. The default behavior is for mutexes to be enabled.

This interface can be used by an application to make sure that the version of SQLite that it is linking against was compiled with the desired setting of the SQLITE_THREADSAFE macro.

This interface only reports on the compile-time mutex setting of the SQLITE_THREADSAFE flag. If SQLite

is compiled with SQLITE_THREADSAFE=1 or =2 then mutexes are enabled by default but can be fully or partially disabled using a call to sqlite3_config() with the verbs SQLITE_CONFIG_SINGLETHREAD, SQLITE_CONFIG_MULTITHREAD, or SQLITE_CONFIG_MUTEX. ^(The return value of the sqlite3_threadsafe() function shows only the compile-time setting of thread safety, not any run-time changes to that setting made by sqlite3_config(). In other words, the return value from sqlite3_threadsafe() is unchanged by calls to sqlite3_config().)^

See the threading mode documentation for additional information.

### 173.16.42 SQLSelect(command as string, CommandType as Integer = 0) as string

MBS SQL Plugin, Plugin Version: 10.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the first field's string value.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.
If the result is a record set, the first field from the first row is returned.
This is basicly useful for commands like "select sqlite_version()".

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

### 173.16.43 SQLSelectAsRecordSet(command as string, CommandType as Integer = 0) as RecordSet

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the result as RecordSet object.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

If Scrollable property is true, the recordset will be requested to be scrollable.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

### 173.16.44 SQLSelectAsRecordSetMT(command as string, CommandType as Integer = 0) as RecordSet

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the result as RecordSet object.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

If Scrollable property is true, the recordset will be requested to be scrollable.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.16.45 SQLSelectAsRowSet(command as string, CommandType as integer = 0) as RowSet

MBS SQL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the result as RowSet object.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RowSet functionality.

If Scrollable property is true, the RowSet will be requested to be scrollable.

The RowSet may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

For Xojo 2019r2 and newer. See SQLSelectAsRecordSet for older versions.

### 173.16.46 SQLSelectAsRowSetMT(command as string, CommandType as integer = 0) as RowSet

MBS SQL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the result as RowSet object.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RowSet functionality.

If Scrollable property is true, the RowSet will be requested to be scrollable.

The RowSet may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

For Xojo 2019r2 and newer. See SQLSelectAsRecordSetMT for older versions.

### 173.16.47 SQLSelectMT(command as string, CommandType as Integer = 0) as string

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Executes a SQL command and returns the first field's string value.
**Notes:** This is a convenience function.
Internally it creates a SQLCommandMBS with the given command and calls Execute.
If the result is a record set, the first field from the first row is returned.
This is basicly useful for commands like "select sqlite_version()".

All text strings sent to the plugin must have a defined encoding. Else the internal text encoding conversions will fail.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.16.48 UpdateRecord(TableName as String, Record as Dictionary, Keys as Dictionary)

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to update a record.
**Example:**

```
dim con as SQLConnectionMBS // your database connection

dim d as new Dictionary

d.Value("text")="new text"
d.Value("other")="second value"

con.UpdateRecord("test_tbl", d, new dictionary("ID":2))
```

**Notes:** The plugin builds for you SQL statement with prepared statement and runs the update command with given values for records with given key values.

You can put multiple field names in the keys dictionary.

Lasterror is set or exception raised as with SQLExecute.
Internally this uses a prepared statement. You can check the generated statement via LastStatement property.

### 173.16.49 Properties

### 173.16.50 AutoCommit as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether autocommit is enabled or disabled for the current connection.
**Example:**

```
Dim con as SQLConnectionMBS // your database connection
con.AutoCommit = SQLConnectionMBS.kAutoCommitOn
```

**Notes:** If autocommit is on, the database is committed automatically after each SQL command. Otherwise, transaction is committed only after Commit calling.
(Read and Write property)

### 173.16.51 Client as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current DBMS client assigned for the connection.
**Example:**

```
dim con as new SQLConnectionMBS
con.client = SQLConnectionMBS.kSQLiteClient
```

**Notes:** Raises OutOfBoundsException exception if value parameter is out of range on setting.
(Read and Write property)

### 173.16.52 ClientVersion as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the DBMS client API version number.
**Notes:** The higher word contains the major client version (the XX value in the XX.YY version number); the lower word contains the minor client version (the YY value in the XX.YY version number).

If an DBMS client was not set calling ClientVersion method will throw an exception.
(Read only property)

### 173.16.53 ConnectionCount as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of current connection objects.
**Notes:** This method should help you find leaked objects by keeping track of current count from the plugin perspective.
This includes SQLConnectionMBS and SQLDatabaseMBS objects.
(Read only property)

### 173.16.54 Error as Boolean

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether an error occurred.
**Notes:** This is set always when an error occurs and cleared if no error happened.
Be aware that the next call to a plugin function may reset error status.
If you look on this property in debugger, it's probably already cleared by the debugger querying a property.

(Read only property)

### 173.16.55 ErrorCode as Integer

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error code.
**Notes:** This is set always when an error occurs and cleared if no error happened.
(Read only property)

### 173.16.56 ErrorMessage as string

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message.
**Notes:** This is set always when an error occurs and cleared if no error happened.
(Read only property)

### 173.16.57 isAlive as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the database server connection status for a particular connection object.
**Notes:** Returns true if the database server is active and accessible; otherwise false.
This method uses the safe query execution for most supported DBMS-es. The query uses the well known database table or procedure (mysql_ping is used for MySQL or MariaDB). If the query fails the method returns false.
(Read only property)

### 173.16.58 isConnected as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the connection state for a particular connection object.
**Notes:** Returns true if connected; otherwise false.
(Read only property)

### 173.16.59 IsolationLevel as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The transaction isolation level.
**Example:**

```
dim con as SQLConnectionMBS // your connection
con.IsolationLevel = SQLConnectionMBS.kReadUncommitted
```

**Notes:** Use the kReadCommitted, kReadUncommitted, kRepeatableRead, kSerializable and kLevelUnknown constants.
(Read and Write property)

### 173.16.60 LastStatement as String

MBS SQL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last executed SQL Statement.
**Notes:** (Read only property)

### 173.16.61 NativeAPI as Variant

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns a set of functions of native DBMS client API.
**Notes:** Returns a SQLAPIMBS object.
Deprecated in version 19.5 in favor of direct methods in SQLDatabaseMBS and SQLConnectionMBS classes.
(Read only property)

### 173.16.62 Options as Dictionary

MBS SQL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a dictionary with all options.
**Notes:** For debugging, it may be useful to inspect options in debugger.
(Read only property)

### 173.16.63 RaiseExceptions as Boolean

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to raise exceptions.
**Notes:** Default is true which means we set error, ErrorCode and ErrorMessage properties and than raise SQLErrorExceptionMBS exception.
If you set to false, we don't raise the exception and you have similar behavior as with database class.
We recommend to use exceptions as they are not so easily ignored like an error property being true.
(Read and Write property)

### 173.16.64 RowsAffected as Integer

MBS SQL Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of rows affected by last DML operation.
**Notes:** Returns the number of rows affected by the last insert/update/delete command execution.

Can also return the result set rows count, usually when the result set is cached at the client side.
(Read only property)

### 173.16.65 Scrollable as Boolean

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to make internally created SQLCommand objects scrollable.
**Notes:** Since plugin version 15.0, Scrollable is false by default.
(Read and Write property)

### 173.16.66 ServerVersion as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the currently connected DBMS server version number.
**Notes:** The higher word contains the major server version (the XX value in the XX.YY version number); the lower word contains the minor server version (the YY value in the XX.YY version number).
(Read only property)

### 173.16.67 ServerVersionString as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the currently connected DBMS server version string.
**Notes:** A server version string may contain some useful information about server brand, configuration and so on. It is a good idea to display this information in all your applications.
(Read only property)

### 173.16.68 SQLiteEncryptionKey as String

MBS SQL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The encryption key to use.
**Example:**

```
dim db as new SQLConnectionMBS
db.SQLiteEncryptionKey = "Hello"
```

**Notes:** This key is applied to the database after connecting. In case of an error, the plugin raises an exception. An empty key can be used for having no encryption.
Alternatively you can use SQLite3MBS.SetKey yourself.

The amount of key material actually used by the encryption extension depends on which variant of SEE you are using. With RC4, the first 256 byte of key are used. With the AES128, the first 16 bytes of the key are used. With AES256, the first 32 bytes of key are used.

If you specify a key that is shorter than the maximum key length, then the key material is repeated as many times as necessary to complete the key. If you specify a key that is larger than the maximum key length, then the excess key material is silently ignored.

The key must begin with an ASCII prefix to specify which algorithm to use. The prefix must be one of "rc4:", "aes128:", or "aes256:". The prefix is not used as part of the key sent into the encryption algorithm. So the real key should begin on the first byte after the prefix. If no prefix is given, we default to AES 128. To be compatible to Xojo, you can use AES128.

The string provided to the plugin is used with it's current encoding. So be sure you use right text encoding for what you want. e.g. using "M√ºller" as key in text encoding Windows ANSI will not open a database which used that key in UTF-8 encoding.

The Xojo database encryption in SQLiteDatabase class uses AES-128 OFB.
(Read and Write property)

### 173.16.69 Tag as Variant

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag property.
**Notes:** You can store here whatever you like.
(Read and Write property)

### 173.16.70 VariantsKeepSQLObjects as Boolean

MBS SQL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether variants should use SQL types.
**Notes:** If set to true, we return datetime and numeric as SQLDateTimeMBS and SQLNumericMBS objects. If false, we return them as date and double.
(Read and Write property)

### 173.16.71 Option(name as string) as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A string value of a specific connection or command option.
**Example:**

```
dim c as SQLConnectionMBS // your connection

// for Microsoft SQL use OLEDB, so you don't need native SQL drivers installed...
c.Option("UseAPI") = "OLEDB"
c.Option("SQLNCLI.LIBS") = "sqlsrv32.dll" // Library included in Windows Vista and newer

// for SQLite, set flag to open database file read only:
c.Option("SQLiteVFSFlags") = "1"

// set 10 seconds timeout for MySQL
c.Option("MYSQL_OPT_CONNECT_TIMEOUT") = "10"

// turn on auto cache
c.Option("AutoCache") = "true"

// set connection timeout for ODBC:
c.Option("SQL_ATTR_CONNECTION_TIMEOUT") = "10"
```

**Notes:** see also:
https://www.sqlapi.com/ApiDoc/class_s_a_connection.html

We have a collection of library files here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
(Read and Write computed property)

### 173.16.72 Events

### 173.16.73 DidConnect

MBS SQL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called after connection was made.
**Notes:** After we got connected, you can apply various options on the new connection here.

### 173.16.74 PostgresNotification(NotificationName as string, PID as Integer, Extras as String)

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A postgresSQL notification was received.
**Notes:** Provides notification name, process ID of app and optional extra information.

### 173.16.75 Trace(traceInfo as Integer, SQL as string, Command as SQLCommandMBS)

MBS SQL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to trace SQL commands.

### 173.16.76 WillConnect

MBS SQL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called before connection is established.
**Notes:** Last chance to set connection options.

### 173.16.77 Working

MBS SQL Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called while the SQLExecuteMT and SQLSelectMT methods are running.

### 173.16.78 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kOptionAPPNAME | "APPNAME" | A constant for the options. |
| kOptionLibraryCubeSQL | "CUBESQL.LIBS" | One of the option constant to specify the library with the SetFileO<br>method.<br>Tells the plugin where to find the library for CubeSQL. Only needed<br>don't use InternalCubeSQLLibraryMBS module!<br>The value can contain multiple names and paths separated with ";" on Wi<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Windows<br>You get this library with the CubeSQL download on their homepage.<br>If no value is given, we default to<br>Windows: cubeSQL_64bit.dll;cubesql.dll<br>macOS: libcubesql_r.dylib<br>Linux: libcubesql_r.so<br>The default is set to work in most cases and try various possible library r |
| kOptionLibraryDuckDB | "DUCKDB.LIBS" | ConstantsGroup: Options to specify the library with SetFileOption<br>dim con as SQLConnectionMBS // your connection<br>dim f as FolderItem = GetFolderItem("duckdb.dll")<br>con.SetFileOption con.kOptionLibraryDuckDB, f |
| kOptionWSID | "WSID" | A constant for the options. |
| SQLiteInMemory | ":memory:" | Connection string for SQLite for a new in-memory database. |

Isolation Levels

| Constant | Value | Description |
|---|---|---|
| kANSILevel0 | 0 | ANSI Level 0 |
| kANSILevel1 | 1 | ANSI Level 1 |
| kANSILevel2 | 2 | ANSI Level 2 |
| kANSILevel3 | 3 | ANSI Level 3 |
| kLevelUnknown | -1 | Unknown |
| kReadCommitted | 1 | Read committed. |
| kReadUncommitted | 0 | Read uncommitted. |
| kRepeatableRead | 2 | Repeatable read. |
| kSerializable | 3 | Serializable. |
| kSnapshot | 4 | Changes made in other transactions can not be seen. For Microsoft SQL Server. |

Values for autocommit property

| Constant | Value | Description |
|---|---|---|
| kAutoCommitOff | 0 | Autocommit is off. |
| kAutoCommitOn | 1 | Autocommit is on. |
| kAutoCommitUnknown | -1 | Autocommit unknown |

The database client constants

| Constant | Value | Description |
|---|---|---|
| kClientNotSpecified | 0 | Client is not specified. |
| kCubeSQLClient | 13 | CubeSQL client. (coming soon) |
| kDB2Client | 6 | DB2 client. |
| kDuckDBClient | 14 | DuckDB client |
| kFirebirdClient | 4 | InterBase/Firebird client. |
| kInformixClient | 7 | Informix client. |
| kInterBaseClient | 4 | InterBase/Firebird client. |
| kMariaDBClient | 15 | MariaDB client. |
| kMySQLClient | 9 | MySQL or MariaDB client. |
| kODBCClient | 1 | ODBC client. |
| kOracleClient | 2 | Oracle client.<br>For Windows the file is "oci.dll", for Linux libclntsh.so and for Mac OS X libclntsh.dylib. |
| kPostgreSQLClient | 10 | PostgreSQL client. |
| kSQLAnywhereClient | 12 | SQL Anywhere client. |
| kSQLBaseClient | 5 | SQLbase client. |
| kSQLiteClient | 11 | SQLite client. Or spatialite. |
| kSQLServerClient | 3 | Mircosoft SQL Server client.<br>You may need to download the client packages for accessing SQL Server. Files like the SQLNCLI dll may be missing. You can download for example the Feature Pack for Microsoft SQL Server 2005 from the microsoft download page. |
| kSybaseClient | 8 | Sybase client. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBindVarNotFound | 7 | Bind variable not found. |
| kErrorClientInitFails | 6 | Initialization failed for client. |
| kErrorClientNotSet | 1 | Client not set. |
| kErrorClientNotSupported | 2 | Unsupported client type for this platform. |
| kErrorClientVersionOld | 5 | Library file is too old. |
| kErrorFieldNotFound | 8 | Field not found. |
| kErrorGetLibraryVersionFails | 4 | Failed to query library version. |
| kErrorLoadLibraryFails | 3 | Failed to load a library. For example path could be wrong or 32/64bit mismatch. |
| kErrorNoMemory | 0 | Out of memory. |
| kErrorUnknownColumnType | 11 | Unknown column type. |
| kErrorUnknownDataType | 9 | Unknown data type. |
| kErrorUnknownParameterType | 10 | Unknown parameter type. |
| kErrorWrongConversion | 12 | Failed to convert a value, e.g. string to number. |
| kErrorWrongDatetime | 13 | Can't convert text to date. |

Options to specify the library with SetFileOption

| Constant | Value | Description |
|---|---|---|
| kOptionLibraryDB2 | "DB2CLI.LIBS" | Tells the plugin where to find the library for DB2.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the DB2 download on their homepage.<br>If no value is given, we default to<br>Windows: db2clio.dll<br>macOS: libdb2.dylib<br>Linux: libdb2.so |
| kOptionLibraryFirebird | "IBASE.LIBS" | Tells the plugin where to find the library for FireBird (or Interbase<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the FireBird download on their homepage<br>If no value is given, we default to<br>Windows: ibclient64.dll;fbclient.dll;gds32.dll<br>macOS: libgds.dylib:libfbclient.dylib<br>Linux: libgds.so:libfbclient.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryInformix | "INFCLI.LIBS" | Tells the plugin where to find the library for Informix.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the Informix download on their homepage<br>If no value is given, we default to<br>Windows: ICLIT09B.DLL;ICLIT09A.DLL<br>macOS: iclit09b.dylib:iclit09a.dylib:libifcli.dylib<br>Linux: iclit09b.so:iclit09a.so:libifcli.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryInterbase | "IBASE.LIBS" | Tells the plugin where to find the library for FireBird (or Interbase<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the FireBird download on their homepage<br>If no value is given, we default to<br>Windows: ibclient64.dll;fbclient.dll;gds32.dll<br>macOS: libgds.dylib:libfbclient.dylib<br>Linux: libgds.so:libfbclient.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryMySQL | "MYSQL.LIBS" | Tells the plugin where to find the library for MySQL (or MariaDB<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the MySQL download on their homepage<br>Libs folder on our website.<br>If no value is given, we default to<br>Windows: libmySQL.dll;libmariadb.dll<br>macOS: libmysqlclient.dylib.21:libmysqlclient_r.dyli<br>client_r.18.dylib:libmysqlclient_r.16.dylib:libmysqlclient_r.15.dylib<br>mysqlclient.dylib:libmariadb.dylib.3:libmariadb.dylib.2:libmariadb.<br>Linux: libmysqlclient.so.21:libmysqlclient_r.so:libmysqlclient_<br>mysqlclient_r.so.16:libmysqlclient_r.so.15:libmysqlclient.so:libmari<br>adb.so.3:libmariadb.so.2:libmariadb.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryODBC | "ODBC.LIBS" | Tells the plugin where to find the library for ODBC.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win |

## 173.17 class SQLDatabaseMBS

### 173.17.1 class SQLDatabaseMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The database class for the SQL plugin
**Example:**

```
dim db as new SQLDatabaseMBS

// where is the library?
db.SetFileOption SQLConnectionMBS.kOptionLibrarySQLite, getfolderitem("/usr/lib/libsqlite3.0.dylib", folderitem.PathTy
Shell)

// connect to database
// in this example it is SQLite,
// but can also be Sybase, Oracle, Informix, DB2, SQLServer, InterBase, MySQL, SQLBase and ODBC

dim path as string

if TargetMacOS then
path = "/tmp/test.db" // put the database in the temporary folder
else
path = "test.db" // for Windows and Linux in the current folder the application is inside.
end if

db.DatabaseName = "sqlite:"+path

if db.Connect then

MsgBox "We are connected!"

// Disconnect is optional
// autodisconnect will ocur in destructor if needed
db.close

msgbox "We are disconnected!"
end if
```

**Notes:** You can use the SQL plugin without using Xojo built in database classes if you use the SQLConnectionMBS and SQLCommandMBS classes.

Or you use the SQLDatabaseMBS class which is a subclass of the database class and can be used with Xojo's RecordSet class. The current implementation is not complete. You can connect with passing the database URL in the DatabaseName property of the SQLDatabaseMBS class. You prefix this URL with the database

type you are using.

You can use Execute and Select to run SQL statements. Errors can be queries with the lasterror properties. For the RecordSet, you can get the column count, the column names and values and move to the next row. All the other methods like deleting a record or updating a value are not implemented and you need to use SQL commands to do this.

Supported databases: CubeSQL, Centura SQLBase, DB2, DuckDB, Firebird, Informix, InterBase, MariaDB, Microsoft Access, Microsoft SQL Server, MySQL, ODBC, Oracle Database Server, PostgreSQL, SQL Anywhere, SQLite, SQLCipher and Sybase.
Connect to Microsoft Access, FileMaker Server (or Pro), Microsoft Visual FoxPro and others via ODBC.

As field and table schema functions are not implemented, you can't use this database with the database browser features in the Xojo IDE.
The plugin does not provide RecordCount on RecordSet class. For that you need to make a extra SELECT count(*) query.

With Xojo 2013r1, you only need a database server license from Xojo, Inc. if you use the SQLDatabaseMBS class. The SQLConnectionMBS class does not require this license. But some features like getting a recordset do need the license as they refer to the SQLDatabaseMBS class.

Please free all RecordSets and SQLCommand objects before you close the SQLConnection or the SQLDatabase. The plugin keeps references from RecordSets and SQLCommand to prevent automatic destruction of the database connection. If you close a database connection while you have RecordSets and SQLCommand in use, things may go wrong.

The plugin can cache the recordset locally. To enable you can call SQLCommandMBS.Cache or use the Option("AutoCache") = "true" on either command or connection or database objects. The plugin will than fetch all records and store them in memory. After this you can walk over the recordset and use FetchPos, FetchFirst, FetchLast, FetchPrev and FetchNext to locate the rows you need. When you call Field() you always get last row, but to read from cached result set, please use Value() function. When using RecordSet, the values are read via Value() functions automatically.

You can use InternalPostgreSQLLibraryMBS or InternalSQLiteLibraryMBS if you like to use our built in SQLite or PostgreSQL database libraries.

The class pings the database every minute by checking whether it's alive and to avoid server dropping connection. This can be disabled by setting Option("Ping") = "false". Ping is not used for SQLite.

MBS Plugin 21.1 adds support for Edit/Update methods in RecordSet and RowSet classes.

MBS Database connections are implemented via SQLConnectionMBS and SQLCommandMBS classes. We

provide a thin layer on top with SQLDatabaseMBS class to make it compatible to the Xojo database class. And when you use SQLDatabaseMBS, you can always get the matching SQLConnectionMBS objet via Connection property. Instead of SQLCommandMBS class, you may just use SelectSQL/ExecuteSQL or older SQLSelect/SQLExecute functions.

We have a collection of library files here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
Subclass of the Database class.
**Blog Entries**

- MBS SQL Plugin Tips and Tricks
- RowSet in MBS Xojo SQL Plugin
- Connect to Oracle via MBS Xojo SQL Plugin
- MBS Xojo Plugins 18.3
- Crossplatform connection to Microsoft SQL Server in Xojo
- Problems with killing Xojo threads with plugin calls.
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3
- MBS Releases the MBS Real Studio Web Starter Kit in version 1.0
- MBS REALbasic Plugins Version 10.4 release notes

**Videos**

- MBS SQL Plugin Presentation
- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 21.1, page 9: News
- 21.1, page 26: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 18.5, page 10: News
- 14.1, pages 24 to 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 13.4, page 11: News
- 12.3, page 10: News

- 11.6, page 40: ChartPart 3.0, Create charts and graphs within your Xojo applications by Kevin Cully
- 11.3, page 11: News
- 11.2, page 33: Windows Installing, Using Inno Setup to Create a Windows Installer App by Marc Zeedar
- 11.1, page 9: News

### 173.17.2 Methods

### 173.17.3 BeginTransaction

MBS SQL Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Begins a transaction.
**Notes:** This method does nothing. Why?
Well, if auto commit is on, you don't need to call this.
If auto commit is off, we call BeginTransaction for you, so if you call this method you would call it a second time and get an error.
We have this method for compatibility to other SQL database classes from Xojo.

### 173.17.4 CancelAllCommands

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cancel all commands for the connection.
**Notes:** This loops over the list of commands associated with this connection and calls Cancel on them.

### 173.17.5 Commands as SQLCommandMBS()

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of all command objects related to the connection.

### 173.17.6 Connect as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to the database.
**Example:**

```
dim db as new SQLDatabaseMBS
```

```
// where is the library?
db.SetFileOption SQLConnectionMBS.kOptionLibraryMySQL, SpecialFolder.UserHome.Child("libmysqlclient.dylib")

// connect to database
// in this example it is MySQL,
// but can also be Sybase, Informix, Oracle, DB2
// SQLServer, InterBase, SQLBase and ODBC

db.DatabaseName="mysql:192.168.1.80,3306@test"

db.UserName="root"
db.Password=""

// or postgreSQL with timeout and ssl mode
db.DatabaseName="PostgreSQL:127.0.0.1,5432@dbname=postgres connect_timeout=10 sslmode=require"

if db.Connect then

MsgBox "We are connected!"

MsgBox "Server Version: "+db.Connection.ServerVersionString

// Disconnect is optional
// autodisconnect will ocur in destructor if needed

else
MsgBox db.ErrorMessage
end if
```

**Notes:** Returns true on success and false on failure.

Please set the DatabaseName, UserName and Password properties. The Host property is ignored.
The database name must contain the complete information and a prefix for the kind of database.

Use this prefixes: "CubeSQL:", "SQLAnywhere:", "ODBC:", "Oracle:", "SQLServer:", "Firebird:", "DuckDB:", "InterBase:", "SQLBase:", "DB2:", "Informix:", "Sybase:", "MySQL:", "MariaDB:", "PostgreSQL:" or "SQLite:".
Connect to Microsoft Access, FileMaker Server (or Pro), Microsoft Visual FoxPro and others via ODBC.

For IPv6 we changed plugin to use , instead of : for the port separator. So please use , to separate port from IP or host.

For Firebird, if you connect to a database and you have 32/64bit mismatch, you get error number 3.

### 173.17.7 ConnectMT as Boolean

MBS SQL Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Connects to the database.
**Notes:** Returns true on success and false on failure.

Please set the DatabaseName, UserName and Password properties. The Host property is ignored.
The database name must contain the complete information and a prefix for the kind of database.

Use this prefixes: "CubeSQL:", "SQLAnywhere:", "ODBC:", "Oracle:", "SQLServer:", "Firebird:", "DuckDB:", "InterBase:", "SQLBase:", "DB2:", "Informix:", "Sybase:", "MySQL:", "MariaDB:", "PostgreSQL:" or "SQLite:".
Connect to Microsoft Access, FileMaker Server (or Pro), Microsoft Visual FoxPro and others via ODBC.

For IPv6 we changed plugin to use , instead of : for the port separator. So please use , to separate port from IP or host.

Same as Connect, but if you run this on a thread, the plugin gives time to other threads so the rest of your application runs just fine.

The MT method will not trigger WillConnect and DidConnect events.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.17.8 Constructor(globals as SQLGlobalsMBS = nil)

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Please don't call this directly as it's called automatically with using new command.

### 173.17.9 CubeSQLLastInsertID as Int64

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last auto increment value from last insert command.
**Notes:** Only for CubeSQL connections. May raise error if not available.

### 173.17.10 CubeSQLReceiveData(byref data as String, byref IsEndChunk as Boolean) as Boolean

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Receives a data chunk for file download.
**Notes:** Returns true on success.
Data is set with data and IsEndChunk is set to true for last chunk.

### 173.17.11 CubeSQLSendData(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data chunk for file upload.
**Notes:** This is the sendchunk function in CubeSQL.
See also:

- 173.17.12 CubeSQLSendData(data as String) 21554

### 173.17.12 CubeSQLSendData(data as String)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends data chunk for file upload.
**Notes:** This is the sendchunk function in CubeSQL.
See also:

- 173.17.11 CubeSQLSendData(data as MemoryBlock) 21554

### 173.17.13 CubeSQLSendEndData

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sends end data packet.
**Notes:** This is the send_enddata function in CubeSQL.

### 173.17.14 InsertRecord(TableName as String, Record as Dictionary)

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to insert a record.
**Example:**

```
dim db as SQLDatabaseMBS // your database connection

dim d as new Dictionary

d.Value("ID")=2
d.Value("text")="test insert"
d.Value("other")="Just a test"

db.InsertRecord("test_tbl", d)

if db.Error then
MsgBox db.ErrorMessage
end if
```

**Notes:** The plugin builds for you SQL statement with prepared statement and runs the insert command with values.
Lasterror is set or exception raised as with SQLExecute.
Internally this uses a prepared statement. You can check the generated statement via LastStatement property.

### 173.17.15 Listen

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Start listening for notifications.
**Notes:** Works only for PostgresSQL Client.
Please set client or connect before calling this method.

### 173.17.16 MySQLInsertID as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last auto increment value from last insert command.
**Notes:** Please query value right after doing Insert. This value is reset when you call commit.
For mySQL and MariaDB connections.

see also
http://dev.mysql.com/doc/refman/5.1/en/mysql-insert-id.html

### 173.17.17 Prepare(statement as string) as SQLPreparedStatementMBS

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Prepares a statement.
**Notes:** Returns prepared statement or nil in case of error.
Please check ErrorMessage property for errors.

### 173.17.18 SetFileOption(name as string, file as folderitem)

MBS SQL Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option with passing a file path.
**Example:**

```
dim db as new SQLDatabaseMBS

// where is the library?
db.SetFileOption SQLConnectionMBS.kOptionLibraryMySQL, SpecialFolder.UserHome.Child("libmysqlclient.dylib")
```

**Notes:** Allows you to specify a file path with a folderitem.

Makes sure the path is correct and you have a 32 or 64-bit library matching the architecture of your application.

### 173.17.19 SQLExecute(ExecuteString as string, CommandType as Integer)

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQLExecute threaded.
**Notes:** Same as SQLExecute, but with additional CommandType parameter.

### 173.17.20 SQLExecuteMT(ExecuteString as string, CommandType as Integer = 0)

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQLExecute threaded.
**Notes:** Same as SQLExecute, but if you run this on a thread, the plugin gives time to other threads so the rest of your application runs just fine.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.17.21 SQLiteBackupFinish(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes a backup run.
**Notes:** When BackupStep has returned kErrorDone, or when the application wishes to abandon the backup operation, the application should destroy the SQLite3BackupMBS by passing it to BackupFinish. The BackupFinish interfaces releases all resources associated with the SQLite3BackupMBS object. If BackupStep has not yet returned kErrorDone, then any active write-transaction on the destination database is rolled back. The SQLite3BackupMBS object is invalid and may not be used following a call to BackupFinish.
The value returned by BackupFinish is kErrorOK if no BackupStep errors occurred, regardless or whether or not BackupStep completed. If an out-of-memory condition or IO error occurred during any prior BackupStep call on the same SQLite3BackupMBS object, then BackupFinish returns the corresponding error code.
A return of kErrorBusy or kErrorLocked from BackupStep is not a permanent error and does not affect the return value of BackupFinish.

### 173.17.22 SQLiteBackupInit(Dest as Variant, DestName as String, Source as Variant, SourceName as String) as SQLite3BackupMBS

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a backup.
**Notes:** The backup API copies the content of one database into another. It is useful either for creating backups of databases or for copying in-memory databases to or from persistent files.

see also
http://www.sqlite.org/c3ref/backup_finish.html

Exclusive access is required to the destination database for the duration of the operation. However the source database is only read-locked while it is actually being read; it is not locked continuously for the entire backup operation. Thus, the backup may be performed on a live source database without preventing other users from reading or writing to the source database while the backup is underway.

To perform a backup operation:

- BackupInit is called once to initialize the backup,
- BackupStep is called one or more times to transfer the data between the two databases, and finally

- BackupFinish is called to release all resources associated with the backup operation.

There should be exactly one call to BackupFinish for each successful call to BackupInit.

The D and N arguments to BackupInit(D,N,S,M) are the database connection associated with the destination database and the database name, respectively. The database name is "main" for the main database, "temp" for the temporary database, or the name specified after the AS keyword in an ATTACH statement for an attached database. The S and M arguments passed to BackupInit(D,N,S,M) identify the database connection and database name of the source database, respectively. The source and destination database connections (parameters S and D) must be different or else BackupInit(D,N,S,M) will file with an error.
If an error occurs within BackupInit(D,N,S,M), then nil is returned and an error code and error message are store3d in the destination database connection D. The error code and message for the failed call to BackupInit can be retrieved using the ErrCode and ErrMessage functions. A successful call to BackupInit returns a SQLite3BackupMBS object. The SQLite3BackupMBS object may be used with the BackupStep and BackupFinish functions to perform the specified backup operation.

Concurrent Usage of Database Handles
The source database connection may be used by the application for other purposes while a backup operation is underway or being initialized. If SQLite is compiled and configured to support threadsafe database connections, then the source database connection may be used concurrently from within other threads.
However, the application must guarantee that the destination database connection is not passed to any other API (by any thread) after BackupInit is called and before the corresponding call to BackupFinish. SQLite does not currently check to see if the application incorrectly accesses the destination database connection and so no error code is reported, but the operations may malfunction nevertheless. Use of the destination database connection while a backup is in progress might also also cause a mutex deadlock.
If running in shared cache mode, the application must guarantee that the shared cache used by the destination database is not accessed while the backup is running. In practice this means that the application must guarantee that the disk file being backed up to is not accessed by any connection within the process, not just the specific connection that was passed to BackupInit.
The SQLite3BackupMBS object itself is partially threadsafe. Multiple threads may safely make multiple concurrent calls to BackupStep. However, the BackupRemaining and BackupPageCount APIs are not strictly speaking threadsafe. If they are invoked at the same time as another thread is invoking BackupStep it is possible that they return invalid values.

Source and Dest can be SQLConnectionMBS or SQLDatabaseMBS. You need to pass source and dest, even if one is self as we give you the option to decide where to pass the current database connection.

### 173.17.23 SQLiteBackupPageCount(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages in total.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and

BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.17.24 SQLiteBackupRemaining(Backup as SQLite3BackupMBS) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages remaining.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.17.25 SQLiteBackupStep(Backup as SQLite3BackupMBS, Pages as Integer) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies up to Pages pages between the source and destination databases specified by SQLite3BackupMBS object.
**Notes:** If N is negative, all remaining source pages are copied. If BackupStep(B,N) successfully copies N pages and there are still more pages to be copied, then the function resturns kErrorOK. If BackupStep(B,N) successfully finishes copying all pages from source to destination, then it returns kErrorDone. If an error occurs while running BackupStep(B,N), then an error code is returned. As well as kErrorOK and kErrorDone, a call to BackupStep may return kErrorReadOnly, kErrorNoMem, kErrorBusy, kErrorLocked, or an kErrorIOACCESS | kErrorIOXXX extended error code.
The BackupStep might return kErrorReadOnly if the destination database was opened read-only or if the destination is an in-memory database with a different page size from the source database.
If BackupStep cannot obtain a required file-system lock, then the sqlite3_busy_handler | busy-handler function is invoked (if one is specified). If the busy-handler returns non-zero before the lock is available, then kErrorBusy is returned to the caller. In this case the call to BackupStep can be retried later. If the source database connection is being used to write to the source database when BackupStep is called, then kErrorLocked is returned immediately. Again, in this case the call to BackupStep can be retried later on. (If kErrorIOACCESS | kErrorIOXXX, kErrorNoMem, or kErrorReadOnly is returned, then there is no point in retrying the call to BackupStep. These errors are considered fatal.) The application must accept that the backup operation has failed and pass the backup operation handle to the BackupFinish to release associated resources.
The first call to BackupStep obtains an exclusive lock on the destination file. The exclusive lock is not released until either BackupFinish is called or the backup operation is complete and BackupStep returns kErrorDone. Every call to BackupStep obtains a shared lock on the source database that lasts for the du-

ration of the BackupStep call. Because the source database is not locked between calls to BackupStep, the source database may be modified mid-way through the backup process. If the source database is modified by an external process or via a database connection other than the one being used by the backup operation, then the backup will be automatically restarted by the next call to BackupStep. If the source database is modified by the using the same database connection as is used by the backup operation, then the backup database is automatically updated at the same time.

### 173.17.26 SQLiteConnectionHandle as Ptr

MBS SQL Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current connection reference for the database.
**Notes:** sqlite3 pointer for using in declares.

### 173.17.27 SQLiteEnableLoadExtension(OnOff as boolean)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables/disables extension loading for the given connection.

### 173.17.28 SQLiteLastInsertRowID as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns Last Insert Rowid.
**Notes:** Each entry in an SQLite table has a unique 64-bit signed integer key called the ROWID. The rowid is always available as an undeclared column named ROWID, OID, or _ROWID_ as long as those names are not also used by explicitly declared columns. If the table has a column of type INTEGER PRIMARY KEY then that column is another alias for the rowid.

This routine returns the rowid of the most recent successful INSERT into the database from the database connection in the first argument. If no successful INSERTs have ever occurred on that database connection, zero is returned.

(If an INSERT occurs within a trigger, then the rowid of the inserted row is returned by this routine as long as the trigger is running. But once the trigger terminates, the value returned by this routine reverts to the last value inserted before the trigger fired.)

An INSERT that fails due to a constraint violation is not a successful INSERT and does not change the value returned by this routine. ^Thus INSERT OR FAIL, INSERT OR IGNORE, INSERT OR ROLLBACK, and INSERT OR ABORT make no changes to the return value of this routine when their insertion fails.

^(When INSERT OR REPLACE encounters a constraint violation, it does not fail. The INSERT continues to completion after deleting rows that caused the constraint problem so INSERT OR REPLACE will always change the return value of this interface.)^

For the purposes of this routine, an INSERT is considered to be successful even if it is subsequently rolled back.

This function is accessible to SQL statements via the last_insert_rowid() SQL function.

If a separate thread performs a new INSERT on the same database connection while the LastInsertRowID function is running and thus changes the last insert rowid, then the value returned by LastInsertRowID is unpredictable and might not equal either the old or the new last insert rowid.

### 173.17.29 SQLiteLibVersion as String

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the version string of the SQLite library.

### 173.17.30 SQLiteLoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.17.31 SQLiteLoadExtension(path as String, ByRef ErrorMessage as String) as Integer 21561

### 173.17.31 SQLiteLoadExtension(path as String, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.17.30 SQLiteLoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer 21561

### 173.17.32 SQLiteMemoryHighwater(reset as boolean = false) as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries maximum memory usage so far.
**Notes:** Can be reset with reset parameter being true.

### 173.17.33 SQLiteMemoryUsed as Int64

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries memory in use by SQLite.
**Notes:** This is memory allocated, but not yet freed.
Value is zero until SQLite3 initialized.

### 173.17.34 SQLiteReKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** You can change the key on a database using the Rekey Function.
**Notes:** An empty key decrypts the database.

Rekeying requires that every page of the database file be read, decrypted, reencrypted with the new key, then written out again. Consequently, rekeying can take a long time on a larger database.

Most SEE variants allow you to encrypt an existing database that was created using the public domain version of SQLite. This is not possible when using the authenticating version of the encryption extension in see-aes128-ccm. If you do encrypt a database that was created with the public domain version of SQLite, no nonce will be used and the file will be vulnerable to a chosen-plaintext attach. If you call SetKey() immediately after Open when you are first creating the database, space will be reserved in the database for a nonce and the encryption will be much stronger. If you do not want to encrypt right away, call SetKey() anyway, with an empty key, and the space for the nonce will be reserved in the database even though no encryption is done initially.

A public domain version of the SQLite library can read and write an encrypted database with an empty key. You only need the encryption extension if the key is non-empty.

Returns a SQLite error code.

### 173.17.35 SQLiteSetBusyHandler(MaxAttempts as Integer = 5)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs busy handler for this connection.
**Notes:** This routine sets a callback function that might be invoked whenever an attempt is made to open a database table that another thread or process has locked.

The plugin has an busy handler which will wait up to MaxAttemps and yield to other Xojo threads while waiting.
Passing 5 should wait up to 100ms.

There can only be a single busy handler defined for each [ database connection ] . Setting a new busy handler clears any previously set handler.) Note that calling SetBusyTimeout will also set or clear the busy handler.

The busy callback should not take any actions which modify the database connection that invoked the busy handler. Any such actions result in undefined behavior.

### 173.17.36 SQLiteSetBusyTimeout(TimeOutMS as Integer = 20)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This routine sets a busy handler that sleeps for a specified amount of time when a table is locked.
**Notes:** The handler will sleep multiple times until at least "ms" milliseconds of sleeping have accumulated. ^After at least "ms" milliseconds of sleeping, the handler returns 0 which causes SQLite query to return SQLite Busy or IO Blocked error.

Calling this routine with an argument less than or equal to zero turns off all busy handlers.

(There can only be a single busy handler for a particular database connection any any given moment. If another busy handler was defined (using SetBusyHandler prior to calling this routine, that other busy handler is cleared.)

### 173.17.37 SQLiteSetKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies encryption to a database connection.
**Notes:** Returns a SQLite error code.

The amount of key material actually used by the encryption extension depends on which variant of SEE you are using. With RC4, the first 256 byte of key are used. With the AES128, the first 16 bytes of the key are used. With AES256, the first 32 bytes of key are used.

If you specify a key that is shorter than the maximum key length, then the key material is repeated as many times as necessary to complete the key. If you specify a key that is larger than the maximum key length, then the excess key material is silently ignored.

The key must begin with an ASCII prefix to specify which algorithm to use. The prefix must be one of "rc4:", "aes128:", or "aes256:". The prefix is not used as part of the key sent into the encryption algorithm. So the real key should begin on the first byte after the prefix.

The string provided to the plugin is used with it's current encoding. So be sure you use right text encoding for what you want. e.g. using "M√ºller" as key in text encoding Windows ANSI will not open a database which used that key in UTF-8 encoding.

The Xojo database encryption in SQLiteDatabase class uses AES-128 OFB.

### 173.17.38 SQLiteTableColumnMetaData(DBName as string, TableName as string, ColumnName as string, byref DataType as string, byref CollationSequence as string, byref NotNull as boolean, byref PrimaryKey as boolean, byref AutoIncrement as Boolean) as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract Metadata About A Column Of A Table
**Notes:** Not available in all sqlite libraries!

This routine returns metadata about a specific column of a specific database table accessible using the database connection handle passed as the first function argument.
The column is identified by the second, third and fourth parameters to this function. The second parameter is either the name of the database (i.e. "main", "temp", or an attached database) containing the specified table or NULL. If it is NULL, then all attached databases are searched for the table using the same algorithm used by the database engine to resolve unqualified table references.
The third and fourth parameters to this function are the table and column name of the desired column,

respectively. Neither of these parameters may be NULL.
Metadata is returned by writing to the memory locations passed as the 5th and subsequent parameters to this function. Any of these arguments may be NULL, in which case the corresponding element of metadata is omitted.

CollationSequence is assigned the Name of default collation sequence. NotNull is set to true if column has a NOT NULL constraint. PrimaryKey is set to true if column is part of the PRIMARY KEY and AutoIncrement is set to true if column is AUTOINCREMENT.

If the specified table is actually a view, an error code is returned.

If the specified column is "rowid", "oid" or "_rowid_" and an INTEGER PRIMARY KEY column has been explicitly declared, then the output parameters are set for the explicitly declared column. (If there is no explicitly declared INTEGER PRIMARY KEY column, then the output parameters are set as follows:

data type: "INTEGER"
collation sequence: "BINARY"
not null: false
primary key: true
auto increment: false

(This function may load one or more schemas from database files. If an error occurs during this process, or if the requested table or column cannot be found, an error code is returned and an error message left in the database connection (to be retrieved using ErrMessage).)

This API is only available if the library was compiled with the SQLITE_ENABLE_COLUMN_METADATA C-preprocessor symbol defined.

### 173.17.39 SQLiteThreadsafe as integer

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test To See If The Library Is Threadsafe.
**Notes:** The threadsafe() function returns zero if and only if SQLite was compiled mutexing code omitted due to the SQLITE_THREADSAFE compile-time option being set to 0.

SQLite can be compiled with or without mutexes. When the SQLITE_THREADSAFE C preprocessor macro is 1 or 2, mutexes are enabled and SQLite is threadsafe. When the SQLITE_THREADSAFE macro is 0, the mutexes are omitted. Without the mutexes, it is not safe to use SQLite concurrently from more than one thread.

Enabling mutexes incurs a measurable performance penalty. So if speed is of utmost importance, it makes sense to disable the mutexes. But for maximum safety, mutexes should be enabled. The default behavior is for mutexes to be enabled.

This interface can be used by an application to make sure that the version of SQLite that it is linking against was compiled with the desired setting of the SQLITE_THREADSAFE macro.

This interface only reports on the compile-time mutex setting of the SQLITE_THREADSAFE flag. If SQLite is compiled with SQLITE_THREADSAFE=1 or =2 then mutexes are enabled by default but can be fully or partially disabled using a call to sqlite3_config() with the verbs SQLITE_CONFIG_SINGLETHREAD, SQLITE_CONFIG_MULTITHREAD, or SQLITE_CONFIG_MUTEX. ^(The return value of the sqlite3_threadsafe() function shows only the compile-time setting of thread safety, not any run-time changes to that setting made by sqlite3_config(). In other words, the return value from sqlite3_threadsafe() is unchanged by calls to sqlite3_config().)^

See the threading mode documentation for additional information.

### 173.17.40 SQLSelect(SelectString as string, CommandType as Integer) as RecordSet

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQLSelect threaded.
**Notes:** Same as SQLSelect, but with additional CommandType parameter.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

If Scrollable property is true, the recordset will be requested to be scrollable.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

### 173.17.41 SQLSelectMT(SelectString as string, CommandType as Integer = 0) as RecordSet

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQLSelect threaded.
**Notes:** Same as SQLSelect, but if you run this on a thread, the plugin gives time to other threads so the rest of your application runs just fine.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

If Scrollable property is true, the recordset will be requested to be scrollable.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

### 173.17.42 UpdateRecord(TableName as String, Record as Dictionary, Keys as Dictionary)

MBS SQL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convenience function to update a record.
**Example:**

```
dim db as SQLDatabaseMBS // your database connection

dim d as new Dictionary

d.Value("text")="new text"
d.Value("other")="second value"

db.UpdateRecord("test_tbl", d, new dictionary("ID":2))

if db.Error then
MsgBox db.ErrorMessage
end if
```

**Notes:** The plugin builds for you SQL statement with prepared statement and runs the update command with given values for records with given key values.

You can put multiple field names in the keys dictionary.

Lasterror is set or exception raised as with SQLExecute.
Internally this uses a prepared statement. You can check the generated statement via LastStatement property.

### 173.17.43 Properties

### 173.17.44 AutoCommit as Integer

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether autocommit is enabled or disabled for the current connection.
**Example:**

```
Dim db as SQLDatabaseMBS // your database connection
db.AutoCommit = SQLDatabaseMBS.kAutoCommitOn
```

**Notes:** If autocommit is on, the database is committed automatically after each SQL command. Otherwise, transaction is committed only after Commit calling.
(Read and Write property)

### 173.17.45 Client as Integer

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current DBMS client assigned for the connection.
**Example:**

```
dim con as new SQLDatabaseMBS
db.client = SQLConnectionMBS.kSQLiteClient
```

**Notes:** Raises OutOfBoundsException exception if value parameter is out of range on setting.
With SQLDatabaseMBS, the client is usually taken from the DatabaseName property with a prefix, e.g. "ODBC:test".
(Read and Write property)

### 173.17.46 ClientVersion as Integer

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the DBMS client API version number.
**Notes:** The higher word contains the major client version (the XX value in the XX.YY version number); the lower word contains the minor client version (the YY value in the XX.YY version number).

If an DBMS client was not set calling ClientVersion method will throw an exception.
(Read only property)

### 173.17.47 Connection as SQLConnectionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The connection for this database used in the background.
**Notes:** Note that methods on this connection object can raise exceptions while methods on the SQLDatabaseMBS class sets the error properties.
(Read only property)

### 173.17.48 isAlive as boolean

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the database server connection status for a particular connection object.
**Notes:** Returns true if the database server is active and accessible; otherwise false.
This method uses the safe query execution for most supported DBMS-es. The query uses the well known database table or procedure (mysql_ping is used for MySQL or MariaDB). If the query fails the method returns false.
(Read only property)

### 173.17.49 isConnected as boolean

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the connection state for a particular connection object.
**Notes:** Returns true if connected; otherwise false.
(Read only property)

### 173.17.50 IsolationLevel as Integer

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The transaction isolation level.
**Notes:** Use the kReadCommitted, kReadUncommitted, kRepeatableRead, kSerializable and kLevelUnknown constants.
(Read and Write property)

### 173.17.51 LastStatement as String

MBS SQL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last executed SQL Statement.
**Notes:** (Read only property)

### 173.17.52 NativeAPI as Variant

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns a set of functions of native DBMS client API.
**Notes:** Returns a SQLAPIMBS object.
Deprecated in version 19.5 in favor of direct methods in SQLDatabaseMBS and SQLConnectionMBS classes.
(Read only property)

### 173.17.53 Options as Dictionary

MBS SQL Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a dictionary with all options.
**Notes:** For debugging, it may be useful to inspect options in debugger.
(Read only property)

### 173.17.54 RaiseExceptions as Boolean

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to raise exceptions.
**Notes:** Default is false which means we set error, ErrorCode and ErrorMessage properties and not raise SQLErrorExceptionMBS exception.
If you set to true, we do raise the exception and you have similar behavior as with SQLConnection class.
We recommend to use exceptions as they are not so easily ignored like an error property being true.
(Read and Write property)

### 173.17.55 RowsAffected as Integer

MBS SQL Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns number of rows affected by last DML operation.
**Notes:** Returns the number of rows affected by the last insert/update/delete command execution.

Can also return the result set rows count, usually when the result set is cached at the client side.
(Read only property)

### 173.17.56 Scrollable as Boolean

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to make internally created SQLCommand objects scrollable.
**Notes:** Since plugin version 15.0, Scrollable is false by default.
(Read and Write property)

### 173.17.57 ServerVersion as Integer

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the currently connected DBMS server version number.
**Notes:** The higher word contains the major server version (the XX value in the XX.YY version number); the lower word contains the minor server version (the YY value in the XX.YY version number).
(Read only property)

### 173.17.58 ServerVersionString as string

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the currently connected DBMS server version string.
**Notes:** A server version string may contain some useful information about server brand, configuration and so on. It is a good idea to display this information in all your applications.
(Read only property)

### 173.17.59 SQLiteEncryptionKey as String

MBS SQL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The encryption key to use.
**Example:**

```
// enable our built-in SQLite library, which supports encryption
Call InternalSQLiteLibraryMBS.Use

// where to store?
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.db")
Dim storage_database As New SQLDatabaseMBS ' SQLiteDatabase
storage_database.SQLiteEncryptionKey = "aes256:password" ' <- password with AES256 as prefix to pick algorithm
```

```
storage_database.DatabaseName = "sqlite:"+ f.NativePath

If storage_database.Connect Then

// create table if this is not yet here
storage_database.SQLExecute "Create table if not exists pics(pic_id integer PRIMARY KEY AUTOINCREMENT, name varchar(20), pic blob)"

// done
MsgBox "Ready"
Else
MsgBox storage_database.ErrorMessage
End If
```

**Notes:** This key is applied to the database after connecting. In case of an error, the plugin raises an exception. An empty key can be used for having no encryption.
Alternatively you can use SQLite3MBS.SetKey yourself.

The amount of key material actually used by the encryption extension depends on which variant of SEE you are using. With RC4, the first 256 byte of key are used. With the AES128, the first 16 bytes of the key are used. With AES256, the first 32 bytes of key are used.

If you specify a key that is shorter than the maximum key length, then the key material is repeated as many times as necessary to complete the key. If you specify a key that is larger than the maximum key length, then the excess key material is silently ignored.

The key must begin with an ASCII prefix to specify which algorithm to use. The prefix must be one of "rc4:", "aes128:", or "aes256:". The prefix is not used as part of the key sent into the encryption algorithm. So the real key should begin on the first byte after the prefix. If no prefix is given, we default to AES 128. To be compatible to Xojo, you can use AES128.

The string provided to the plugin is used with it's current encoding. So be sure you use right text encoding for what you want. e.g. using "M√ºller" as key in text encoding Windows ANSI will not open a database which used that key in UTF-8 encoding.

The Xojo database encryption in SQLiteDatabase class uses AES-128 OFB.
(Read and Write property)

### 173.17.60 Tag as Variant

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tag property.
**Notes:** You can store here whatever you like.
(Read and Write property)

### 173.17.61 Option(name as string) as string

MBS SQL Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option for the connection.
**Example:**

```
dim c as SQLDatabaseMBS // your database connection

// for Microsoft SQL use OLEDB, so you don't need native SQL drivers installed...
c.Option("UseAPI") = "OLEDB"
c.Option("SQLNCLI.LIBS") = "sqlsrv32.dll" // Library included in Windows Vista and newer

// for SQLite, set flag to open database file read only:
c.Option("SQLiteVFSFlags") = "1"

// turn on auto cache
c.Option("AutoCache") = "true"

// set connection timeout for ODBC:
c.Option("SQL_ATTR_CONNECTION_TIMEOUT") = "10"

// cache insert statements for AddRow/InsertRecord
c.Option("CacheInsertStatement") = "true"
```

**Notes:** We have a collection of library files here:
https://www.monkeybreadsoftware.de/xojo/download/plugin/Libs/
(Read and Write computed property)

### 173.17.62 Events

### 173.17.63 DidConnect

MBS SQL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called after connection was made.
**Notes:** After we got connected, you can apply various options on the new connection here.

### 173.17.64 PostgresNotification(NotificationName as string, PID as Integer, Extras as String)

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A postgresSQL notification was received.
**Notes:** Provides notification name, process ID of app and optional extra information.

### 173.17.65 Trace(traceInfo as Integer, SQL as string, Command as SQLCommandMBS)

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to trace SQL commands.

### 173.17.66 WillConnect

MBS SQL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Event called before connection is established.
**Notes:** Last chance to set connection options.

### 173.17.67 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kOptionLibraryCubeSQL | "CUBESQL.LIBS" | One of the option constant to specify the library with the SetFileO<br>method.<br>Tells the plugin where to find the library for CubeSQL. Only needed<br>don't use InternalCubeSQLLibraryMBS module!<br>The value can contain multiple names and paths separated with ";" on Wi<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Windows<br>You get this library with the CubeSQL download on their homepage.<br>If no value is given, we default to<br>Windows: cubeSQL_64bit.dll;cubesql.dll<br>macOS: libcubesql_r.dylib<br>Linux: libcubesql_r.so<br>The default is set to work in most cases and try various possible library n |
| kOptionLibraryDuckDB | "DUCKDB.LIBS" | ConstantsGroup: Options to specify the library with SetFileOption<br>dim con as SQLDatabaseMBS // your connection<br>dim f as FolderItem = GetFolderItem("duckdb.dll")<br>con.SetFileOption con.kOptionLibraryDuckDB, f |
| SQLiteInMemory | "Sqlite::memory:" | Connection string for SQLite for a new in-memory database.<br>Prefixed with SQLite to use directly. |

Isolation Levels

| Constant | Value | Description |
|---|---|---|
| kANSILevel0 | 0 | ANSI Level 0 |
| kANSILevel1 | 1 | ANSI Level 1 |
| kANSILevel2 | 2 | ANSI Level 2 |
| kANSILevel3 | 3 | ANSI Level 3 |
| kLevelUnknown | -1 | Unknown |
| kReadCommitted | 1 | Read committed. |
| kReadUncommitted | 0 | Read uncommitted. |
| kRepeatableRead | 2 | Repeatable read. |
| kSerializable | 3 | Serializable. |
| kSnapshot | 4 | Changes made in other transactions can not be seen. For Microsoft SQL Server. |

Values for autocommit property

| Constant | Value | Description |
|---|---|---|
| kAutoCommitOff | 0 | Autocommit is off. |
| kAutoCommitOn | 1 | Autocommit is on. |
| kAutoCommitUnknown | -1 | Autocommit unknown |

Command Types

| Constant | Value | Description |
|---|---|---|
| kCommandTypeSQLStatement | 1 | Command is an SQL statement. |
| kCommandTypeSQLStatementRaw | 2 | Command is an SQL statement that mustn't be interpreted by SQLAPI. |
| kCommandTypeStoredProcedure | 3 | Command is a stored procedure or a function. |
| kCommandTypeUnknown | 0 | Used by default. Library detects command type automatically. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorBindVarNotFound | 7 | Bind variable not found. |
| kErrorClientInitFails | 6 | Initialization failed for client. |
| kErrorClientNotSet | 1 | Client not set. |
| kErrorClientNotSupported | 2 | Unsupported client type for this platform. |
| kErrorClientVersionOld | 5 | Library file is too old. |
| kErrorFieldNotFound | 8 | Field not found. |
| kErrorGetLibraryVersionFails | 4 | Failed to query library version. |
| kErrorLoadLibraryFails | 3 | Failed to load a library. For example path could be wrong or 32/64bit mismatch. |
| kErrorNoMemory | 0 | Out of memory. |
| kErrorUnknownColumnType | 11 | Unknown column type. |
| kErrorUnknownDataType | 9 | Unknown data type. |
| kErrorUnknownParameterType | 10 | Unknown parameter type. |
| kErrorWrongConversion | 12 | Failed to convert a value, e.g. string to number. |
| kErrorWrongDatetime | 13 | Can't convert text to date. |

Options to specify the library with SetFileOption

| Constant | Value | Description |
|---|---|---|
| kOptionLibraryDB2 | "DB2CLI.LIBS" | Tells the plugin where to find the library for DB2.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the DB2 download on their homepage.<br>If no value is given, we default to<br>Windows: db2clio.dll<br>macOS: libdb2.dylib<br>Linux: libdb2.so |
| kOptionLibraryFirebird | "IBASE.LIBS" | Tells the plugin where to find the library for FireBird (or Interbase<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the Firebird download on their homepage<br>If no value is given, we default to<br>Windows: ibclient64.dll;fbclient.dll;gds32.dll<br>macOS: libgds.dylib:libfbclient.dylib<br>Linux: libgds.so:libfbclient.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryInformix | "INFCLI.LIBS" | Tells the plugin where to find the library for Informix.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the Informix download on their homepag<br>If no value is given, we default to<br>Windows: ICLIT09B.DLL;ICLIT09A.DLL<br>macOS: iclit09b.dylib:iclit09a.dylib:libifcli.dylib<br>Linux: iclit09b.so:iclit09a.so:libifcli.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryInterbase | "IBASE.LIBS" | Tells the plugin where to find the library for FireBird (or Interbase<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the FireBird download on their homepag<br>If no value is given, we default to<br>Windows: ibclient64.dll;fbclient.dll;gds32.dll<br>macOS: libgds.dylib:libfbclient.dylib<br>Linux: libgds.so:libfbclient.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryMySQL | "MYSQL.LIBS" | Tells the plugin where to find the library for MySQL (or MariaDB<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win<br>You get this library with the MySQL download on their homepage<br>Libs folder on our website.<br>If no value is given, we default to<br>Windows: libmySQL.dll;libmariadb.dll<br>macOS: libmysqlclient.dylib.21:libmysqlclient_r.dyli<br>client_r.18.dylib:libmysqlclient_r.16.dylib:libmysqlclient_r.15.dylib<br>mysqlclient.dylib:libmariadb.dylib.3:libmariadb.dylib.2:libmariadb.<br>Linux: libmysqlclient.so.21:libmysqlclient_r.so:libmysqlclient_<br>mysqlclient_r.so.16:libmysqlclient_r.so.15:libmysqlclient.so:libmari<br>adb.so.3:libmariadb.so.2:libmariadb.so<br>The default is set to work in most cases and try various possible libr |
| kOptionLibraryODBC | "ODBC.LIBS" | Tells the plugin where to find the library for ODBC.<br>The value can contain multiple names and paths separated with ";" o<br>and ":" on macOS/Linux.<br>The library extension on Mac is ".dylib", on Linux ".so" and on Win |

## 173.18 class SQLDataConsumerMBS

### 173.18.1 class SQLDataConsumerMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a data consumer.
**Notes:** If you query a clob/blob value, that value may not fit into memory, so you may prefer to get a callback for data and write it to a file in small chunks.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr4

**Xojo Developer Magazine**

- 14.1, page 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz

### 173.18.2 Events

### 173.18.3 Write(PieceType as Integer, data as string, Length as UInt32, BlobSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called to process data.
**Notes:** PieceType is kOnePiece, kFirstPiece, kLastPiece or kNextPiece.
Data is the raw data in a binary string.
Length is the number of bytes and BlobSize the size of data blocks used.

### 173.18.4 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFirstPiece | 1 | One of the piece type constants.<br>The first piece is processed. You may setup everything you need to handle the data. |
| kLastPiece | 3 | One of the piece type constants.<br>The last piece is processed. You can close files/network connections. |
| kNextPiece | 2 | One of the piece type constants.<br>The next piece is processed. Not the first one or the last one, but one between. |
| kOnePiece | 4 | One of the piece type constants.<br>The whole data stream is delivered in one call of the event. |

# 173.19 class SQLDataProviderMBS

## 173.19.1 class SQLDataProviderMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a data provider.
**Notes:** Use this to set a blob/clob object with streaming data. For example if you want to add a 1 GB big file to the database without loading it into RAM in one piece, you can use this class to read it in small chunks.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr4

**Xojo Developer Magazine**

- 14.1, page 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz

## 173.19.2 Events

## 173.19.3 Read(byref PieceType as Integer, Length as UInt32) as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event called whenever new data is needed.
**Notes:** PieceType is kOnePiece, kFirstPiece, kLastPiece or kNextPiece.
If your stream is on the end, you set this to kLastPiece.
Return the raw data in a string.
Length is the number of bytes.

## 173.19.4 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFirstPiece | 1 | One of the piece type constants.<br>The first piece is processed. You may setup everything you need to handle the data. |
| kLastPiece | 3 | One of the piece type constants.<br>The last piece is processed. You can close files/network connections. |
| kNextPiece | 2 | One of the piece type constants.<br>The next piece is processed. Not the first one or the last one, but one between. |
| kOnePiece | 4 | One of the piece type constants.<br>The whole data stream is delivered in one call of the event. |

# 173.20 class SQLDateTimeMBS

## 173.20.1 class SQLDateTimeMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL date/time value class.
**Example:**

```
dim d as new SQLDateTimeMBS(2008, 3, 4, 23, 10, 20)

MsgBox d.StringValue // shows "2008-03-04T23:10:20"
```

**Notes:** see also
https://www.sqlapi.com/ApiDoc/class_s_a_date_time.html
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr3
- MBS Xojo Plugins, version 20.4pr8
- MBS Xojo Plugins, version 19.6pr1
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- MBS Xojo / Real Studio Plugins, version 14.1pr1

**Xojo Developer Magazine**

- 19.4, page 53: Maps,ÄîPart 10, Mapping GPS data with the MapKitMBS plugin by Markus Winter

## 173.20.2 Methods

## 173.20.3 Constructor(DateTimeValue as DateTime)

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes the datetime value with the given DateTime object.
See also:


- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582

- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.4 Constructor(DateValue as Date)

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the datetime value with the given date.
See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0)

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new SQL Datetime with the given values.
See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.7 Constructor(StringValue as String) 21582

- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.6 Constructor(other as SQLDateTimeMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the SQL Date Time.
**Example:**

```
dim d as new SQLDateTimeMBS(2008, 3, 4, 23, 10, 20)
dim e as new SQLDateTimeMBS(d)

MsgBox e.StringValue // shows "2008-03-04T23:10:20"
```

See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.7 Constructor(StringValue as String)

MBS SQL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initialized a date time value from a string.
**Example:**

```
Dim d As New SQLDateTimeMBS("2021-04-12T18:46:16.242")
msgbox d.StringValue
```

```
Dim d2 As New SQLDateTimeMBS("now")
MsgBox d2.StringValue
```

**Notes:** You can pass "now" for current time, a string containing a double value for seconds since epoche or a string formatted with SQL datetime. Either with T or space as separator. If fraction is given, it should be 3 digits for milliseconds.
See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.8 Constructor(value as Double)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new SQL date time value based on the double value.
**Example:**

```
dim d as new SQLDateTimeMBS(2008, 3, 4, 23, 10, 20)
dim e as new SQLDateTimeMBS(d.DoubleValue+1) // clone with one day more

MsgBox e.StringValue // shows "2008-03-05T23:10:20"
```

See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581

- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "")

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new SQL Datetime with the given values.
**Example:**

```
dim d as new SQLDateTimeMBS(2008, 3, 4, 23, 10, 20)

MsgBox d.StringValue // shows "2008-03-04T23:10:20"
```

See also:


- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String) 21584


### 173.20.10 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer, TimeZone as String)

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new SQL Datetime with the given values.
See also:

- 173.20.3 Constructor(DateTimeValue as DateTime) 21580
- 173.20.4 Constructor(DateValue as Date) 21581
- 173.20.5 Constructor(Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0) 21581
- 173.20.6 Constructor(other as SQLDateTimeMBS) 21582
- 173.20.7 Constructor(StringValue as String) 21582
- 173.20.8 Constructor(value as Double) 21583
- 173.20.9 Constructor(Year as Integer, Month as Integer, Day as Integer, Hour as Integer, Minute as Integer, Second as Integer = 0, Fraction as Integer = 0, TimeZone as String = "") 21584


### 173.20.11 Set(DateTimeValue as DateTime)

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Assigns the datetime value with the given dateTime object.
See also:


- 173.20.12 Set(value as Date) 21585


### 173.20.12 Set(value as Date)

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Assigns the datetime value with the given date.
See also:


- 173.20.11 Set(DateTimeValue as DateTime) 21585


### 173.20.13 Properties

### 173.20.14 DateTimeValue as DateTime

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the value of this datetime object as a date object.
**Notes:** (Read only property)

### 173.20.15 DateValue as Date

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the value of this datetime object as a date object.
**Notes:** (Read only property)

### 173.20.16 Day as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the day this SADateTime object represents (1 –31).
**Notes:** (Read only property)

### 173.20.17 DayOfWeek as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the day of the week this SADateTime object represents (Sunday = 1).
**Notes:** (Read only property)

### 173.20.18 DayOfYear as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the day of the year this SADateTime object represents (Jan 1 = 1).
**Notes:** (Read only property)

### 173.20.19 DoubleValue as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The double value of this date/time.
**Notes:** Use these operators to get current date/time value using standard double representation. Days are represented by whole number increments starting with 30 December 1899, midnight as time zero. Hour values are expressed as the absolute value of the fractional part of the number.

(Read only property)

| Date and time | Representation |
|---|---|
| 30 December 1899, midnight | 0.00 |
| 1 January 1900, midnight | 2.00 |
| 4 January 1900, midnight | 5.00 |
| 4 January 1900, 6 A.M. | 5.25 |
| 4 January 1900, noon | 5.50 |
| 4 January 1900, 9 P.M. | 5.875 |

### 173.20.20 Fraction as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of the fraction of second (0 to 999,999,999) this SQLDateTime object represents.
**Notes:**

The value of the fraction field is the number of billionths of a second and ranges from 0 through 999,999,999 (1 less than 1 billion). For example, the value of the fraction field for a half-second is 500,000,000, for a thousandth of a second (one millisecond) is 1,000,000, for a millionth of a second (one microsecond) is 1,000, and for a billionth of a second (one nanosecond) is 1.
(Read only property)

### 173.20.21 hasDate as Boolean

MBS SQL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this date & time object contains a date.
**Notes:** (Read only property)

### 173.20.22 hasTime as Boolean

MBS SQL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this date & time object contains a time.
**Notes:** (Read only property)

### 173.20.23 Hour as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hour this SADateTime object represents (0 –23).
**Notes:** (Read only property)

### 173.20.24 Minute as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the minute this SADateTime object represents (0 –59).
**Notes:** (Read only property)

### 173.20.25 Month as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the month this SADateTime object represents (1 –12).
**Notes:** (Read only property)

### 173.20.26 Second as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the second this SADateTime object represents (0 –59).
**Notes:** (Read only property)

### 173.20.27 StringValue as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string value for this date/time.
**Notes:** (Read only property)

### 173.20.28 TimeZone as String

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time zone.
**Notes:** Should be in format ”00:00” and should be supported for Oracle and Postgres.
(Read and Write property)

### 173.20.29 Year as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the year this SADateTime object represents.
**Notes:** (Read only property)

# 173.21 class SQLErrorExceptionMBS

## 173.21.1 class SQLErrorExceptionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error exception class to report SQL errors.
**Notes:** The SQLDatabaseMBS class sets its error properties on an error. All other SQL classes raise exceptions where you can check the message property.
Subclass of the RuntimeException class.
**Blog Entries**

- Load PDF from MS SQL Server and display it
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Real Studio Plugins, version 13.1pr4

**Xojo Developer Magazine**

- 14.1, page 27: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz

## 173.21.2 Properties

## 173.21.3 ErrorClass as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a class of error.
**Notes:** Returns one of the following values:

| | | |
|---|---|---|
| SA_No_Error | 0 | No error occurred. |
| SA_UserGenerated_Error | 1 | User-generated error. |
| SA_Library_Error | 2 | The Library error occurred. |
| SA_DBMS_API_Error | 3 | DBMS API error occurred. |

A SQLErrorExceptionMBS object handles the next error classes:

- User-generated errors
- Library errors

- DBMS API errors

The Library errors are generated by the Library itself. It can be like detecting some mistake in passing arguments to the function or referencing the parameter with an inappropriate name. To get a Library-defined error text call ErrorMessage method.

The DBMS API errors come to the Library from the DBMS Client or Server. In this case the Library returns an error code and text Client- or Server-defined. To get error code and error text returned by the server call NativeError and ErrorMessage methods.

The User-generated exception is "SQLAPI++ compatible" exception thrown by the user. To throw user exception use throwUserException method.
(Read only property)

### 173.21.4 ErrorMessage as String

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an error text.
**Notes:** A error text depends on a class of error.

If error class is Library error the ErrorMessage method returns Library-defined error text. If error class is DBMS API error the ErrorMessage method returns an error text gotten from DBMS Server or Client. If error class is User-defined error the ErrorMessage method returns an error text specified by user (see throwUserException method).

To get the error class call ErrorClass method.
(same as Message property)
(Read only property)

### 173.21.5 ErrorPosition as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an error position in SQL statement.
**Notes:** Returns an integer value representing error position.
Not all DBMS servers allow to get error position. See Server specific notes to get detailed information about returned value.

If a command object's associated SQL statement contains any syntax errors, an exception will be thrown when you try to compile. ErrorPosition method returns the error position within the command string.

Server specific notes

| DBMS server | ErrorPosition method returned value |
|---|---|
| Oracle | ErrorPosition returns parse error offset. |
| SQL Server | ErrorPosition returns the number of line within SQL statement where error occurred. |
| Sybase | ErrorPosition returns the number of line within SQL statement where error occurred. |
| DB2 | ErrorPosition returns -1. DB2 does not support this function. |
| Informix | ErrorPosition returns -1. Informix does not support this function. |
| InterBase | ErrorPosition returns -1. InterBase does not support this function. |
| SQLBase | ErrorPosition returns character position of the syntax error within an SQL statement. The first character is position 0. |
| MySQL | ErrorPosition returns -1. MySQL does not support this function. |
| PostgreSQL | ErrorPosition returns -1. PostgreSQL does not support this function. |
| ODBC | ErrorPosition returns -1. ODBC does not support this function. |

(Read only property)

### 173.21.6 NativeError as Integer

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets a native code associated with current error.
**Notes:** Returns an integer value represents a native code associated with current error.

If error class is DBMS API error the NativeError method returns error code received from DBMS Server or Client. If error class is User-defined error the NativeError method returns an error code specified by user (see throwUserException method). If error class is Library error the NativeError method returns -1.

To get the error class call ErrorClass method.

See server specific documentation to get more information about DBMS API error code.
(same as ErrorNumber property)
(Read only property)

### 173.21.7 SQL as String

MBS SQL Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL string set when this error occurred.
**Notes:** (Read only property)

## 173.22 class SQLFieldMBS

### 173.22.1 class SQLFieldMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This is the class for a SQL field in a record.
**Notes:** Be aware that field objects exists only as long as their SQLCommand exists.

see also
https://www.sqlapi.com/ApiDoc/class_s_a_field.html
Subclass of the SQLValueReadMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr4
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo Plugins, version 18.4pr10
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- Upcoming Changes for our SQL Plugin

### 173.22.2 Methods

### 173.22.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts reading of Long or BLob(CLob) value using the given data consumer.
**Notes:** BlockSize: Size of piece of data you want to get to the consumer event.

After a command execution all output parameters are updated by their values, including Long and BLob(CLob) parameters. If you want to control piecewise reading of Long or BLob(CLob) data you should do the following:

Before a command execution set kLongOrLobReaderManual reading mode (see LongOrLobReaderMode) for Long or BLob(CLob) parameters you want to process by a data consumer. After that SQLAPI++ will skip reading output Long and BLob(CLob) parameters that you set to be read manually.
After command execution use ReadLongOrLob method for each output parameter defined to be read manually.
Note, that if the command has result set(s) (it is possible in some servers, see Server specific notes) then output parameters are available only after all result sets are completely processed using FetchNext method.
See also:

- 173.22.4 ReadLongOrLob(toFile as FolderItem) 21595
- 173.22.5 ReadLongOrLob(toStream as Writeable) 21595


### 173.22.4 ReadLongOrLob(toFile as FolderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts reading of Long or BLob(CLob) value to the given file.
**Example:**

```
dim cmd as SQLCommandMBS // your command
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim field as SQLFieldMBS = cmd.Field("image")
// read blob content to binarystream
field.ReadLongOrLob(f)
```

**Notes:** May raise IOExceptions if things go wrong.
See also:


- 173.22.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer) 21594
- 173.22.5 ReadLongOrLob(toStream as Writeable) 21595


### 173.22.5 ReadLongOrLob(toStream as Writeable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts reading of Long or BLob(CLob) value to the given writeable stream.
**Example:**

```
dim cmd as SQLCommandMBS // your command
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, true)
dim field as SQLFieldMBS = cmd.Field("image")
// read blob content to binarystream
field.ReadLongOrLob(b)
```

**Notes:** This allows you to read in chunks the data to a stream, e.g. binarystream, textoutputstream or socket.
See also:


- 173.22.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer) 21594
- 173.22.4 ReadLongOrLob(toFile as FolderItem) 21595

### 173.22.6 Properties

### 173.22.7 FieldNativeType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns native type code of the field.
**Notes:** Deprecated. Please use NativeType property instead.
(Read only property)

### 173.22.8 FieldPrecision as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns precision of the field value (the total number of allowable digits).
**Notes:** Deprecated. Please use Precision property instead.
(Read only property)

### 173.22.9 FieldScale as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns scale of the field value (the number of digits to the right of the decimal point).
**Notes:** Deprecated. Please use Scale property instead.
(Read and Write property)

### 173.22.10 FieldSize as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns field data size.
**Notes:** Deprecated. Please use Size property instead.
(Read only property)

### 173.22.11 FieldType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns field data type.
**Notes:** Value is one of the kDataType* constants.
Deprecated. Please use Type property instead.
(Read and Write property)

### 173.22.12 isFieldRequired as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Shows if it is possible for the field value to be null.
**Notes:** Returns true if the field value can be null; false otherwise.
(Read only property)

### 173.22.13 Name as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns name of the field.
**Notes:** (Read only property)

### 173.22.14 NativeType as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns native type code of the field.
**Notes:** (Read only property)

### 173.22.15 Options as Dictionary

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a dictionary with all options.
**Notes:** For debugging, it may be useful to inspect options in debugger.
(Read only property)

### 173.22.16 Pos as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a one-based position of the field in a result set.
**Notes:** (Read only property)

### 173.22.17 Precision as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns precision of the field value (the total number of allowable digits).
**Notes:** (Read only property)

### 173.22.18 Scale as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns scale of the field value (the number of digits to the right of the decimal point).
**Notes:** (Read and Write property)

### 173.22.19 Size as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns field data size.
**Notes:** (Read only property)

### 173.22.20 Type as Integer

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns field data type.
**Example:**

```
dim db as SQLConnectionMBS
dim cmd as new SQLCommandMBS(db, "select * from test")

cmd.Execute

dim f as SQLFieldMBS = cmd.Field("test")

if f.Type = f.kDataTypeLong then
MsgBox "type is long"
end if
```

**Notes:** Value is one of the kDataType* constants.
(Read and Write property)

### 173.22.21 Option(name as string) as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string value of a specific field option.
**Notes:** See for more details:
https://www.sqlapi.com/ApiDoc/class_s_a_field.html
(Read and Write computed property)

## 173.23 class SQLGlobalsMBS

### 173.23.1 class SQLGlobalsMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the global methods of the SQL plugin.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MBS Xojo Plugins, version 21.1pr2
- MBS Xojo Plugins, version 21.1pr1
- Edit and Update for SQLDatabaseMBS class
- Register MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 13.5pr3
- MBS Real Studio Plugins, version 13.0pr7
- Accessing Microsoft SQL Database from Mac/Linux
- SQL Plugin and Textencoding

### 173.23.2 Methods

### 173.23.3 FindTableName(SQL as String) as String

MBS SQL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries table name used in a SQL SELECT statement.
**Example:**

```
Dim sql As String = "SELECT First, Last FROM MyTable WHERE ID = 1"
Dim TableName As String = SQLGlobalsMBS.FindTableName(sql)

MessageBox TableName // shows MyTable
```

**Notes:** This is a helper function used by our Edit/Update methods in RecordSet.
Returns either the found table name or empty text if something got wrong. e.g. multiple tables affected due to JOIN operation.

If you find a case where the parser crashes or reports wrong result, please contact us.

### 173.23.4 GetEnv(name as string) as string

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries environment variable.
**Notes:** Returns empty string if variable is undefined.

### 173.23.5 GetVersion as String

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the SQLAPI library.

### 173.23.6 GetVersionBuild as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The build number of the SQLAPI library.

### 173.23.7 GetVersionMajor as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The major version number of the SQLAPI library.

### 173.23.8 GetVersionMinor as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minor version number of the SQLAPI library.

### 173.23.9 PutEnv(line as string) as boolean

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets environment variable.
**Notes:** Line format should be ”key=value” and returns true on success and false on failure.

### 173.23.10 RaiseException(message as string)

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raises an exception to test exception handling in SQL Plugin.
**Notes:** Raises directly a SQLErrorExceptionMBS with the given message.

### 173.23.11 RaiseSQLErrorException(UserCode as Integer, message as string)

MBS SQL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Raises an exception to test exception handling in SQL Plugin.
**Notes:** Raises a SAUserException which the plugin catches and translates to a SQLErrorExceptionMBS in Xojo.

### 173.23.12 SetCurrentWorkingDirectory(path as folderitem) as boolean

MBS SQL Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is often useful to make sure the DLLs in that folder are found.
See also:

- 173.23.13 SetCurrentWorkingDirectory(path as String) as boolean 21602

### 173.23.13 SetCurrentWorkingDirectory(path as String) as boolean

MBS SQL Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current working directory.
**Notes:** This is often useful to make sure the DLLs in that folder are found.
See also:

- 173.23.12 SetCurrentWorkingDirectory(path as folderitem) as boolean 21602

### 173.23.14 SetEnv(name as string, value as string) as boolean

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an environment variable.
**Notes:** Existing variable with same name will be overwritten.
Returns true on success and false on failure.

### 173.23.15 SetLicenseCode(n as string, enddate as Integer, v1 as Integer, v2 as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Registeres the SQL plugin and library.
**Notes:** Once you ordered a license, you receive details on how to call this method.

### 173.23.16 Setlocale(category as Integer, locale as string)

MBS SQL Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the locale to use.
**Example:**

```
// ask for English for USA with 1252 codepage
SQLGlobalsMBS.Setlocale SQLGlobalsMBS.LocaleAll, "English_United States.1252"
```

**Notes:** The Setlocale function sets the C library's notion of natural language formatting style for particular sets of routines. Each such style is called a 'locale' and is invoked using an appropriate name passed as a C string.

The setlocale() function recognizes several categories of routines. These are the categories and the sets of routines they select:

| | |
|---|---|
| LocaleAll | Set the entire locale generically. |
| LocaleCollate | Set a locale for string collation routines. This controls alphabetic ordering in strcoll() and strxfrm(). |
| LocaleCType | Set a locale for the ctype and multibyte functions. This controls recognition of upper and lower case, alphabetic or non-alphabetic characters, and so on. |
| LocaleMessages | Set a locale for message catalogs, see catopen function. |
| LocaleMonetary | Set a locale for formatting monetary values; this affects the localeconv() function. |
| LocaleNumeric | Set a locale for formatting numbers. This controls the formatting of decimal points in input and output of floating point numbers in functions such as printf() and scanf(), as well as values returned by localeconv(). |
| LocaleTime | Set a locale for formatting dates and times using the strftime() function. |

Only three locales are defined by default: the empty string "" (which denotes the native environment) and the "C" and "POSIX" locales (which denote the C-language environment). By default, C programs start in the "C" locale.

### 173.23.17 UnInitialize

MBS SQL Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Explicitly shutdown SQL engine.
**Notes:** You can call this in App Close or Destructor, but only after you destroyed all Connections, e.g. all SQLDatabaseMBS and SQLConnectionMBS objects.

### 173.23.18 UnSetEnv(name as string) as boolean

MBS SQL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes environment variable.
**Notes:** Returns true on success and false on failure.

### 173.23.19 Events

### 173.23.20 Trace(traceInfo as Integer, SQL as string, Connection as SQLConnectionMBS, Command as SQLCommandMBS)

MBS SQL Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The event to trace SQL commands.

### 173.23.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| LocaleAll | 0 | One of the locale category constants for SetLocale.<br>Set the entire locale generically. |
| LocaleCollate | 1 | One of the locale category constants for SetLocale.<br>Set a locale for string collation routines. This controls alphabetic ordering in strcoll() and strxfrm(). |
| LocaleCType | 2 | One of the locale category constants for SetLocale.<br>et a locale for the ctype(3) and multibyte(3) functions. This controls recognition of upper and lower case, alphabetic or non-alphabetic characters, and so on. |
| LocaleMessages | 6 | One of the locale category constants for SetLocale.<br>Set a locale for message catalogs, see catopen(3) function. |
| LocaleMonetary | 3 | One of the locale category constants for SetLocale.<br>Set a locale for formatting monetary values; this affects the localeconv() function. |
| LocaleNumeric | 4 | One of the locale category constants for SetLocale.<br>Set a locale for formatting numbers. This controls the formatting of decimal points in input and output of floating point numbers in functions such as printf() and scanf(), as well as values returned by localeconv(). |
| LocaleTime | 5 | One of the locale category constants for SetLocale.<br>Set a locale for formatting dates and times using the strftime() function. |

## 173.24 class SQLIntervalMBS

### 173.24.1 class SQLIntervalMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class in the SQL Plugin for an interval.

### 173.24.2 Methods

### 173.24.3 Constructor

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new zero interval.
See also:

- 173.24.4 Constructor(days as Integer, hours as Integer, minutes as Integer, seconds as Integer = 0, NanoSeconds as Integer = 0) 21606
- 173.24.5 Constructor(value as Double) 21606

### 173.24.4 Constructor(days as Integer, hours as Integer, minutes as Integer, seconds as Integer = 0, NanoSeconds as Integer = 0)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new interval with the given values.
See also:

- 173.24.3 Constructor 21606
- 173.24.5 Constructor(value as Double) 21606

### 173.24.5 Constructor(value as Double)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new interval with the given time delta.
**Example:**

```
dim n as new SQLIntervalMBS(5)

MsgBox n.StringValue // shows "120:00:00" for 120 hours
```

See also:


- 173.24.3 Constructor 21606
- 173.24.4 Constructor(days as Integer, hours as Integer, minutes as Integer, seconds as Integer = 0, NanoSeconds as Integer = 0) 21606


### 173.24.6 Dec(interval as SQLIntervalMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrements the interval.

### 173.24.7 Inc(interval as SQLIntervalMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Increments the interval.

### 173.24.8 SetInterval(days as Integer, hours as Integer, minutes as Integer, seconds as Integer = 0, NanoSeconds as Integer = 0)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the interval values.

### 173.24.9 Properties

### 173.24.10 Days as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The days in this interval.
**Notes:** (Read only property)

### 173.24.11 DoubleValue as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of this interval.
**Example:**

```
dim n as new SQLIntervalMBS(1,2,3,4)

MsgBox str(n.DoubleValue) // shows "1.085463" for 1 day, 2 hours, 3 minutes and 4 seconds
```

**Notes:** (Read only property)

### 173.24.12 Fraction as Integer

MBS SQL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fraction of a second in nano seconds.
**Notes:** Range 0..999999999.
(Read only property)

### 173.24.13 Hours as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hours value.
**Notes:** (Read only property)

### 173.24.14 Minutes as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minutes value.
**Notes:** (Read only property)

### 173.24.15 Seconds as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The seconds value.
**Notes:** (Read only property)

### 173.24.16 StringValue as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The interval as a string.
**Example:**

```
dim n as new SQLIntervalMBS(5)

MsgBox n.StringValue // shows "120:00:00" for 120 hours
```

**Notes:** (Read only property)

### 173.24.17 TotalDays as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total days value.
**Example:**

```
dim n as new SQLIntervalMBS(1,2,3,4)

MsgBox str(n.TotalDays) // shows "1"
```

**Notes:** (Read only property)

### 173.24.18 TotalHours as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total hours value.
**Example:**

```
dim n as new SQLIntervalMBS(1,2,3,4)

MsgBox str(n.TotalHours) // shows "26"
```

**Notes:** (Read only property)

### 173.24.19 TotalMinutes as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total minutes value.
**Example:**

```
dim n as new SQLIntervalMBS(1,2,3,4)

MsgBox str(n.TotalMinutes) // shows "1563"
```

**Notes:** (Read only property)

### 173.24.20 TotalSeconds as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The total seconds value.
**Notes:** dim n as new SQLIntervalMBS(1,2,3,4)

MsgBox str(n.GetTotalSeconds) // shows "93784"
(Read only property)

# 173.25 class SQLite3BackupMBS

## 173.25.1 class SQLite3BackupMBS

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The object for a running backup.
**Notes:** The backup object records state information about an ongoing online backup operation. The sqlite3_backup object is created by a call to BackupInit() and is destroyed by a call to BackupFinish().
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- SQLite Backup Functions

**Xojo Developer Magazine**

- 14.1, page 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz

## 173.25.2 Methods

## 173.25.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

## 173.25.4 Properties

## 173.25.5 Handle as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 173.26 class SQLite3MBS

### 173.26.1 class SQLite3MBS

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The class for the native SQLite API.
**Example:**

```
dim con as new SQLConnectionMBS
dim path as string = "/tmp/test.db" // change path for Windows!

con.Connect(path,"","",SQLConnectionMBS.kSQLiteClient)

dim api as SQLAPIMBS = con.NativeAPI
if api isa SQLite3MBS then
dim s as SQLite3MBS = SQLite3MBS(api)
MsgBox s.Version
end if
```

**Notes:** Deprecated in favor of direct methods on SQLConnectionMBS. Please let us know if you need more SQLite specific functions.
Subclass of the SQLAPIMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo Plugins, version 19.5pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.1
- Embedded SQLite and encryption
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- SQLite Backup Functions
- MBS REALbasic plug-ins version 9.5

**Videos**

- Presentation from London conference about MBS Plugins.

### 173.26.2 Methods

### 173.26.3 BackupFinish(Backup as SQLite3BackupMBS) as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finishes a backup run.
**Notes:** When BackupStep has returned kErrorDone, or when the application wishes to abandon the backup operation, the application should destroy the SQLite3BackupMBS by passing it to BackupFinish. The BackupFinish interfaces releases all resources associated with the SQLite3BackupMBS object. If BackupStep has not yet returned kErrorDone, then any active write-transaction on the destination database is rolled back. The SQLite3BackupMBS object is invalid and may not be used following a call to BackupFinish.
The value returned by BackupFinish is kErrorOK if no BackupStep errors occurred, regardless or whether or not BackupStep completed. If an out-of-memory condition or IO error occurred during any prior BackupStep call on the same SQLite3BackupMBS object, then BackupFinish returns the corresponding error code.
A return of kErrorBusy or kErrorLocked from BackupStep is not a permanent error and does not affect the return value of BackupFinish.

### 173.26.4 BackupInit(Dest as Variant, DestName as String, Source as Variant, SourceName as String) as SQLite3BackupMBS

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a backup.
**Notes:** The backup API copies the content of one database into another. It is useful either for creating backups of databases or for copying in-memory databases to or from persistent files.

see also
http://www.sqlite.org/c3ref/backup_finish.html

Exclusive access is required to the destination database for the duration of the operation. However the source database is only read-locked while it is actually being read; it is not locked continuously for the entire backup operation. Thus, the backup may be performed on a live source database without preventing other users from reading or writing to the source database while the backup is underway.

To perform a backup operation:

- BackupInit is called once to initialize the backup,
- BackupStep is called one or more times to transfer the data between the two databases, and finally
- BackupFinish is called to release all resources associated with the backup operation.

There should be exactly one call to BackupFinish for each successful call to BackupInit.

The D and N arguments to BackupInit(D,N,S,M) are the database connection associated with the destination database and the database name, respectively. The database name is "main" for the main database, "temp" for the temporary database, or the name specified after the AS keyword in an ATTACH statement for an attached database. The S and M arguments passed to BackupInit(D,N,S,M) identify the database connection and database name of the source database, respectively. The source and destination database connections (parameters S and D) must be different or else BackupInit(D,N,S,M) will file with an error.
If an error occurs within BackupInit(D,N,S,M), then nil is returned and an error code and error message are store3d in the destination database connection D. The error code and message for the failed call to BackupInit can be retrieved using the ErrCode and ErrMessage functions. A successful call to BackupInit returns a SQLite3BackupMBS object. The SQLite3BackupMBS object may be used with the BackupStep and BackupFinish functions to perform the specified backup operation.

Concurrent Usage of Database Handles
The source database connection may be used by the application for other purposes while a backup operation is underway or being initialized. If SQLite is compiled and configured to support threadsafe database connections, then the source database connection may be used concurrently from within other threads.
However, the application must guarantee that the destination database connection is not passed to any other API (by any thread) after BackupInit is called and before the corresponding call to BackupFinish. SQLite does not currently check to see if the application incorrectly accesses the destination database connection and so no error code is reported, but the operations may malfunction nevertheless. Use of the destination database connection while a backup is in progress might also also cause a mutex deadlock.
If running in shared cache mode, the application must guarantee that the shared cache used by the destination database is not accessed while the backup is running. In practice this means that the application must guarantee that the disk file being backed up to is not accessed by any connection within the process, not just the specific connection that was passed to BackupInit.
The SQLite3BackupMBS object itself is partially threadsafe. Multiple threads may safely make multiple concurrent calls to BackupStep. However, the BackupRemaining and BackupPageCount APIs are not strictly speaking threadsafe. If they are invoked at the same time as another thread is invoking BackupStep it is possible that they return invalid values.

Source and Dest can be SQLConnectionMBS or SQLDatabaseMBS. You need to pass source and dest, even if one is self as we give you the option to decide where to pass the current database connection.

### 173.26.5 BackupPageCount(Backup as SQLite3BackupMBS) as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages in total.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified

during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.26.6 BackupRemaining(Backup as SQLite3BackupMBS) as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of pages remaining.
**Notes:** Each call to BackupStep sets two values inside the SQLite3BackupMBS object: the number of pages still to be backed up and the total number of pages in the source databae file. The BackupRemaining and BackupPageCount interfaces retrieve these two values, respectively.
The values returned by these functions are only updated by BackupStep. If the source database is modified during a backup operation, then the values are not updated to account for any extra pages that need to be updated or the size of the source database file changing.

### 173.26.7 BackupStep(Backup as SQLite3BackupMBS, Pages as Integer) as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies up to Pages pages between the source and destination databases specified by SQLite3BackupMBS object.
**Notes:** If N is negative, all remaining source pages are copied. If BackupStep(B,N) successfully copies N pages and there are still more pages to be copied, then the function resturns kErrorOK. If BackupStep(B,N) successfully finishes copying all pages from source to destination, then it returns kErrorDone. If an error occurs while running BackupStep(B,N), then an error code is returned. As well as kErrorOK and kErrorDone, a call to BackupStep may return kErrorReadOnly, kErrorNoMem, kErrorBusy, kErrorLocked, or an kErrorIOACCESS | kErrorIOXXX extended error code.
The BackupStep might return kErrorReadOnly if the destination database was opened read-only or if the destination is an in-memory database with a different page size from the source database.
If BackupStep cannot obtain a required file-system lock, then the sqlite3_busy_handler | busy-handler function is invoked (if one is specified). If the busy-handler returns non-zero before the lock is available, then kErrorBusy is returned to the caller. In this case the call to BackupStep can be retried later. If the source database connection is being used to write to the source database when BackupStep is called, then kErrorLocked is returned immediately. Again, in this case the call to BackupStep can be retried later on. (If kErrorIOACCESS | kErrorIOXXX, kErrorNoMem, or kErrorReadOnly is returned, then there is no point in retrying the call to BackupStep. These errors are considered fatal.) The application must accept that the backup operation has failed and pass the backup operation handle to the BackupFinish to release associated resources.
The first call to BackupStep obtains an exclusive lock on the destination file. The exclusive lock is not released until either BackupFinish is called or the backup operation is complete and BackupStep returns kErrorDone. Every call to BackupStep obtains a shared lock on the source database that lasts for the duration of the BackupStep call. Because the source database is not locked between calls to BackupStep, the source database may be modified mid-way through the backup process. If the source database is modified

by an external process or via a database connection other than the one being used by the backup operation, then the backup will be automatically restarted by the next call to BackupStep. If the source database is modified by the using the same database connection as is used by the backup operation, then the backup database is automatically updated at the same time.

### 173.26.8 EnableLoadExtension(OnOff as boolean)

MBS SQL Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Enables/disables extension loading for the given connection.

### 173.26.9 ErrCode as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The ErrCode function returns the numeric result code or extended result code for the most recent failed sqlite3 API call associated with a database connection.
**Notes:** If a prior API call failed but the most recent API call succeeded, the return value from ErrCode is undefined.

### 173.26.10 ErrMessage as string

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the most recent error message in english for the given connection.

### 173.26.11 LastInsertRowID as Int64

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns Last Insert Rowid.
**Notes:** Each entry in an SQLite table has a unique 64-bit signed integer key called the ROWID. The rowid is always available as an undeclared column named ROWID, OID, or _ROWID_ as long as those names are not also used by explicitly declared columns. If the table has a column of type INTEGER PRIMARY KEY then that column is another alias for the rowid.

This routine returns the rowid of the most recent successful INSERT into the database from the database connection in the first argument. If no successful INSERTs have ever occurred on that database connection, zero is returned.

(If an INSERT occurs within a trigger, then the rowid of the inserted row is returned by this routine as long as the trigger is running. But once the trigger terminates, the value returned by this routine reverts to the last value inserted before the trigger fired.)

An INSERT that fails due to a constraint violation is not a successful INSERT and does not change the value returned by this routine. ^Thus INSERT OR FAIL, INSERT OR IGNORE, INSERT OR ROLLBACK, and INSERT OR ABORT make no changes to the return value of this routine when their insertion fails. ^(When INSERT OR REPLACE encounters a constraint violation, it does not fail. The INSERT continues to completion after deleting rows that caused the constraint problem so INSERT OR REPLACE will always change the return value of this interface.)^

For the purposes of this routine, an INSERT is considered to be successful even if it is subsequently rolled back.

This function is accessible to SQL statements via the last_insert_rowid() SQL function.

If a separate thread performs a new INSERT on the same database connection while the LastInsertRowID function is running and thus changes the last insert rowid, then the value returned by LastInsertRowID is unpredictable and might not equal either the old or the new last insert rowid.

### 173.26.12 LoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.26.13 LoadExtension(path as String, ByRef ErrorMessage as String) as Integer 21617

### 173.26.13 LoadExtension(path as String, ByRef ErrorMessage as String) as Integer

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an SQLite extension library from the named file.
**Notes:** The LoadExtension interface attempts to load an SQLite extension library contained in the file.

Returns kErrorOk on success and kErrorError if something goes wrong.
Extension loading must be enabled using EnableLoadExtension prior to calling this API, otherwise an error will be returned.
See also:

- 173.26.12 LoadExtension(file as FolderItem, ByRef ErrorMessage as String) as Integer 21617

### 173.26.14 MemoryHighwater(reset as boolean) as Int64

MBS SQL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries maximum memory usage so far.
**Notes:** Can be reset with reset parameter being true.
See also:

- 173.26.23 MemoryHighwater as Int64 21622

### 173.26.15 ReKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** You can change the key on a database using the Rekey Function.
**Notes:** An empty key decrypts the database.

Rekeying requires that every page of the database file be read, decrypted, reencrypted with the new key, then written out again. Consequently, rekeying can take a long time on a larger database.

Most SEE variants allow you to encrypt an existing database that was created using the public domain version of SQLite. This is not possible when using the authenticating version of the encryption extension in see-aes128-ccm. If you do encrypt a database that was created with the public domain version of SQLite, no nonce will be used and the file will be vulnerable to a chosen-plaintext attach. If you call SetKey() immediately after Open when you are first creating the database, space will be reserved in the database for a nonce and the encryption will be much stronger. If you do not want to encrypt right away, call SetKey() anyway, with an empty key, and the space for the nonce will be reserved in the database even though no encryption is done initially.

A public domain version of the SQLite library can read and write an encrypted database with an empty key. You only need the encryption extension if the key is non-empty.

Returns a SQLite error code.

### 173.26.16 SetBusyHandler(MaxAttempts as Integer = 5)

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs busy handler for this connection.
**Notes:** This routine sets a callback function that might be invoked whenever an attempt is made to open a database table that another thread or process has locked.

The plugin has an busy handler which will wait up to MaxAttemps and yield to other Xojo threads while waiting.
Passing 5 should wait up to 100ms.

There can only be a single busy handler defined for each [ database connection ] . Setting a new busy handler clears any previously set handler.) Note that calling SetBusyTimeout will also set or clear the busy handler.

The busy callback should not take any actions which modify the database connection that invoked the busy handler. Any such actions result in undefined behavior.

### 173.26.17 SetBusyTimeout(TimeOutMS as Integer = 20)

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This routine sets a busy handler that sleeps for a specified amount of time when a table is locked.
**Notes:** The handler will sleep multiple times until at least "ms" milliseconds of sleeping have accumulated. ^After at least "ms" milliseconds of sleeping, the handler returns 0 which causes SQLite query to return SQLite Busy or IO Blocked error.

Calling this routine with an argument less than or equal to zero turns off all busy handlers.

(There can only be a single busy handler for a particular database connection any any given moment. If another busy handler was defined (using SetBusyHandler prior to calling this routine, that other busy handler is cleared.)

### 173.26.18 SetKey(Key as String) as Integer

MBS SQL Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies encryption to a database connection.
**Notes:** Returns a SQLite error code.

The amount of key material actually used by the encryption extension depends on which variant of SEE you

are using. With RC4, the first 256 byte of key are used. With the AES128, the first 16 bytes of the key are used. With AES256, the first 32 bytes of key are used.

If you specify a key that is shorter than the maximum key length, then the key material is repeated as many times as necessary to complete the key. If you specify a key that is larger than the maximum key length, then the excess key material is silently ignored.

The key must begin with an ASCII prefix to specify which algorithm to use. The prefix must be one of "rc4:", "aes128:", or "aes256:". The prefix is not used as part of the key sent into the encryption algorithm. So the real key should begin on the first byte after the prefix.

The string provided to the plugin is used with it's current encoding. So be sure you use right text encoding for what you want. e.g. using "M√ºller" as key in text encoding Windows ANSI will not open a database which used that key in UTF-8 encoding.

The Xojo database encryption in SQLiteDatabase class uses AES-128 OFB.

### 173.26.19 TableColumnMetaData(DBName as string, TableName as string, ColumnName as string, byref DataType as string, byref CollationSequence as string, byref NotNull as boolean, byref PrimaryKey as boolean, byref AutoIncrement as Boolean) as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extract Metadata About A Column Of A Table
**Notes:** Not available in all sqlite libraries!

This routine returns metadata about a specific column of a specific database table accessible using the database connection handle passed as the first function argument.
The column is identified by the second, third and fourth parameters to this function. The second parameter is either the name of the database (i.e. "main", "temp", or an attached database) containing the specified table or NULL. If it is NULL, then all attached databases are searched for the table using the same algorithm used by the database engine to resolve unqualified table references.
The third and fourth parameters to this function are the table and column name of the desired column, respectively. Neither of these parameters may be NULL.
Metadata is returned by writing to the memory locations passed as the 5th and subsequent parameters to this function. Any of these arguments may be NULL, in which case the corresponding element of metadata is omitted.

CollationSequence is assigned the Name of default collation sequence. NotNull is set to true if column has a NOT NULL constraint. PrimaryKey is set to true if column is part of the PRIMARY KEY and AutoIncrement is set to true if column is AUTOINCREMENT.

If the specified table is actually a view, an error code is returned.

If the specified column is "rowid", "oid" or "_rowid_" and an INTEGER PRIMARY KEY column has been explicitly declared, then the output parameters are set for the explicitly declared column. (If there is no explicitly declared INTEGER PRIMARY KEY column, then the output parameters are set as follows:

data type: "INTEGER"
collation sequence: "BINARY"
not null: false
primary key: true
auto increment: false

(This function may load one or more schemas from database files. If an error occurs during this process, or if the requested table or column cannot be found, an error code is returned and an error message left in the database connection (to be retrieved using ErrMessage).)

This API is only available if the library was compiled with the SQLITE_ENABLE_COLUMN_METADATA C-preprocessor symbol defined.

### 173.26.20 Threadsafe as Integer

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test To See If The Library Is Threadsafe.
**Notes:** The threadsafe() function returns zero if and only if SQLite was compiled mutexing code omitted due to the SQLITE_THREADSAFE compile-time option being set to 0.

SQLite can be compiled with or without mutexes. When the SQLITE_THREADSAFE C preprocessor macro is 1 or 2, mutexes are enabled and SQLite is threadsafe. When the SQLITE_THREADSAFE macro is 0, the mutexes are omitted. Without the mutexes, it is not safe to use SQLite concurrently from more than one thread.

Enabling mutexes incurs a measurable performance penalty. So if speed is of utmost importance, it makes sense to disable the mutexes. But for maximum safety, mutexes should be enabled. The default behavior is for mutexes to be enabled.

This interface can be used by an application to make sure that the version of SQLite that it is linking against was compiled with the desired setting of the SQLITE_THREADSAFE macro.

This interface only reports on the compile-time mutex setting of the SQLITE_THREADSAFE flag. If SQLite

is compiled with SQLITE_THREADSAFE=1 or =2 then mutexes are enabled by default but can be fully or partially disabled using a call to sqlite3_config() with the verbs SQLITE_CONFIG_SINGLETHREAD, SQLITE_CONFIG_MULTITHREAD, or SQLITE_CONFIG_MUTEX. ^(The return value of the sqlite3_threadsafe() function shows only the compile-time setting of thread safety, not any run-time changes to that setting made by sqlite3_config(). In other words, the return value from sqlite3_threadsafe() is unchanged by calls to sqlite3_config().)^

See the threading mode documentation for additional information.

### 173.26.21 Properties

### 173.26.22 ConnectionHandle as Ptr

MBS SQL Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the current connection reference for the database.
**Notes:** sqlite3 pointer for using in declares.
(Read only property)

### 173.26.23 MemoryHighwater as Int64

MBS SQL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries maximum memory usage so far.
**Notes:** Can be reset with reset parameter.
(Read only property)
See also:

- 173.26.14 MemoryHighwater(reset as boolean) as Int64 21618

### 173.26.24 MemoryUsed as Int64

MBS SQL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries memory in use by SQLite.
**Notes:** This is memory allocated, but not yet freed.
Value is zero until SQLite3 initialized.
(Read only property)

### 173.26.25 Version as string

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version string of the SQLite library.
**Notes:** (Read only property)

### 173.26.26 VersionNumber as Integer

MBS SQL Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number of the SQLite library.
**Notes:** (Read only property)

### 173.26.27 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAbort | 4 | Callback routine requested an abort. |
| kErrorAuth | 23 | Authorization denied |
| kErrorBusy | 5 | The database file is locked. |
| kErrorCantopen | 14 | Unable to open the database file. |
| kErrorConstraint | 19 | Abort due to constraint violation. |
| kErrorCorrupt | 11 | The database disk image is malformed. |
| kErrorDone | 101 | sqlite3_step() has finished executing. |
| kErrorEmpty | 16 | Database is empty |
| kErrorError | 1 | SQL error or missing database. |
| kErrorFormat | 24 | Auxiliary database format error. |
| kErrorFull | 13 | Insertion failed because database is full. |
| kErrorInternal | 2 | Internal logic error in SQLite |
| kErrorInterrupt | 9 | Operation terminated by sqlite3_interrupt(). |
| kErrorIoerr | 10 | Some kind of disk I/O error occurred. |
| kErrorLocked | 6 | A table in the database is locked. |
| kErrorMismatch | 20 | Data type mismatch. |
| kErrorMisuse | 21 | Library used incorrectly. |
| kErrorNolfs | 22 | Uses OS features not supported on host. |
| kErrorNoMem | 7 | Out of memory. |
| kErrorNotaDB | 26 | File opened that is not a database file. |
| kErrorNotFound | 12 | NOT USED. Table or record not found. |
| kErrorOk | 0 | Successful result |
| kErrorPerm | 3 | Access permission denied. |
| kErrorProtocol | 15 | NOT USED. Database lock protocol error. |
| kErrorRange | 25 | 2nd parameter to sqlite3_bind out of range. |
| kErrorReadonly | 8 | Attempt to write a readonly database. |
| kErrorRow | 100 | sqlite3_step() has another row ready. |
| kErrorSchema | 17 | The database schema changed. |
| kErrorToobig | 18 | String or BLOB exceeds size limit. |

# 173.27 class SQLiteFunctionMBS

## 173.27.1 class SQLiteFunctionMBS

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a custom SQLite function implemented in Xojo.
**Example:**

```
// Create a custom function with a handler function:
Dim f As New SQLiteFunctionMBS
f.name = "SHA256"
f.ArgumentCount = 1
f.Flags = f.kFlagDeterministic OR f.kFlagUTF8 OR f.kFlagInnocuous
// Text encoding UTF8, function is deterministic and can be cached, function is innocuous as it depends only on parameters
AddHandler f.Perform, AddressOf PerformSHA256
functions.Append f // keep reference
```

**Notes:** You can use this with our InternalSQLiteLibraryMBS module and the SQL classes within MBS Plugin to work on SQLite databases and as extension for SQLiteDatabase in Xojo.
**Blog Entries**

- Did you know that you can load extensions in SQLite?
- MBS Xojo Plugins, version 24.1pr1

## 173.27.2 Methods

## 173.27.3 Constructor

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.
**Example:**

```
Dim f As New SQLiteFunctionMBS
f.name = "SHA256"
```

**Notes:** Please keep a reference to the function in a global array to avoid it being destroyed.

## 173.27.4 Destructor

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 173.27.5 ResultBlob(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a BLOB value to SQLite.
**Notes:** We have three variants, so you can pass string, MemoryBlock or ptr.
See also:

- 173.27.6 ResultBlob(data as ptr, size as Integer) 21626
- 173.27.7 ResultBlob(text as string) 21626

### 173.27.6 ResultBlob(data as ptr, size as Integer)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a BLOB value to SQLite.
**Notes:** We have three variants, so you can pass string, MemoryBlock or ptr.
See also:

- 173.27.5 ResultBlob(data as MemoryBlock) 21626
- 173.27.7 ResultBlob(text as string) 21626

### 173.27.7 ResultBlob(text as string)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a BLOB value to SQLite.
**Example:**

me.ResultBlob "Hello World"

**Notes:** We have three variants, so you can pass string, MemoryBlock or ptr.
See also:

- 173.27.5 ResultBlob(data as MemoryBlock) 21626
- 173.27.6 ResultBlob(data as ptr, size as Integer) 21626

### 173.27.8 ResultDouble(value as Double)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a double value back to SQLite.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
#Pragma StackOverflowChecking False

// square function
dim a as double = arguments(0).DoubleValue
ResultDouble a * a

End Sub
```

### 173.27.9 ResultError(ErrorMessage as string)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns an error message for the function call.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
#Pragma StackOverflowChecking False

dim v as string = arguments(0)
if v.length = 0 then
ResultError "Please pass text"
ResultErrorCode 12345 // custom error code
else
ResultText v + v
end if
End Sub
```

**Notes:** Sets error code to 1. Use ResultErrorCode to change this.

### 173.27.10 ResultErrorCode(ErrorCode as Integer)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets error code for the function call.

### 173.27.11 ResultInteger(value as Integer)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns an integer value back to SQLite.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
#Pragma StackOverflowChecking False

// square function
dim a as Integer = arguments(0).IntegerValue
ResultInteger a * a

End Sub
```

### 173.27.12 ResultNull

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a null value back to SQLite.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
#Pragma StackOverflowChecking False

// return NULL value
ResultNull

End Sub
```

### 173.27.13 ResultText(text as string)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a string value back to SQLite.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
```

```
#Pragma StackOverflowChecking False

ResultText "Hello World"

End Sub
```

### 173.27.14 ResultZeroBlob(Length as Integer)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a zero filled BLOB value back to SQLite.

### 173.27.15 Properties

### 173.27.16 ArgumentCount as Integer

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of arguments expected for this function.
**Notes:** Pass 0 to 127 for number of arguments or -1 for variable number of arguments.
(Read and Write property)

### 173.27.17 CallCounter as Integer

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of times the function was called.
**Notes:** (Read only property)

### 173.27.18 DatabaseCount as Integer

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of times the function was registered to a database connection.
**Notes:** (Read only property)

### 173.27.19 Enabled as Boolean

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether this function is enabled.
**Notes:** The value is checked when connecting to a new SQLite database.
Defaults to true.
(Read and Write property)

### 173.27.20 Flags as Integer

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The flags for the function.
**Example:**

```
Dim f As New SQLiteFunctionMBS

f.Flags = f.kFlagDeterministic OR f.kFlagUTF8 OR f.kFlagInnocuous
// Text encoding UTF8, function is deterministic and can be cached, function is innocuous as it depends only on parameters
```

**Notes:** See kFlag* constants.
(Read and Write property)

### 173.27.21 Name as String

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of the function.
**Notes:** (Read and Write property)

### 173.27.22 Events

### 173.27.23 Perform(ArgumentCount as Integer, Arguments() as Variant)

MBS SQL Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** The event called to perform the function.
**Example:**

```
Sub Perform(ArgumentCount as Integer, Arguments() as Variant) Handles Perform
#Pragma BackgroundTasks False
#Pragma BoundsChecking False
#Pragma StackOverflowChecking False

ResultText "Hello World"
```

End Sub

**Notes:** ArgumentCount is the number of arguments passed in the array.
Arguments contains values, which may be nil, double, integer, string, Memoryblock for BLOB.

Please use #pragmas like in the sample project to disable stack checking and background tasks for best performance. Also catch all exceptions that may happen to prevent trouble.

Call one of the result functions to return the result.

### 173.27.24 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagDeterministic | &h800 | The function always gives the same output when the input parameters are the same. |
| kFlagDirectOnly | &h80000 | The function may only be invoked from top-level SQL, and cannot be used in VIEWs or TRIGGERs nor in schema structures. |
| kFlagInnocuous | &h200000 | The function is unlikely to cause problems even if misused. An innocuous function should have no side effects and should not depend on any values other than its input parameters. |
| kFlagUTF8 | 1 | Specifies text encoding to be UTF-8. |

# 173.28 class SQLLongBinaryMBS

## 173.28.1 class SQLLongBinaryMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a long binary object.
**Notes:** Basicly this is a SQLStringMBS which is always marked to contain binary data. You only need this class to use the constructor with dataprovider to stream data to the database.
Subclass of the SQLLongOrLobMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

## 173.28.2 Methods

## 173.28.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:


- 173.28.4 Constructor(Data as MemoryBlock) 21632
- 173.28.5 Constructor(data as SQLStringMBS) 21633
- 173.28.6 Constructor(Data as string, isText as Boolean = True) 21633
- 173.28.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21633


## 173.28.4 Constructor(Data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data, e.g. for blob.
See also:


- 173.28.3 Constructor 21632
- 173.28.5 Constructor(data as SQLStringMBS) 21633
- 173.28.6 Constructor(Data as string, isText as Boolean = True) 21633
- 173.28.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21633

### 173.28.5 Constructor(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new long binary object from a string object.
See also:


- 173.28.3 Constructor 21632
- 173.28.4 Constructor(Data as MemoryBlock) 21632
- 173.28.6 Constructor(Data as string, isText as Boolean = True) 21633
- 173.28.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21633


### 173.28.6 Constructor(Data as string, isText as Boolean = True)

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.28.3 Constructor 21632
- 173.28.4 Constructor(Data as MemoryBlock) 21632
- 173.28.5 Constructor(data as SQLStringMBS) 21633
- 173.28.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21633


### 173.28.7 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new long binary object from a data provider.
**Notes:** The blocksize specifies in which sizes data is requested from the provider.
You must make sure that the data provider and this new blob object life long enough. Because the actual data is requested later when you do the update on the database.

If BlockSize is 0, the default block size is used.
See also:


- 173.28.3 Constructor 21632
- 173.28.4 Constructor(Data as MemoryBlock) 21632
- 173.28.5 Constructor(data as SQLStringMBS) 21633
- 173.28.6 Constructor(Data as string, isText as Boolean = True) 21633

# 173.29 class SQLLongCharMBS

## 173.29.1 class SQLLongCharMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for the long character data type.
**Notes:** Basicly this is a SQLStringMBS which is always marked to contain text. You only need this class to use the constructor with dataprovider to stream data to the database.
Subclass of the SQLLongOrLobMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1

## 173.29.2 Methods

## 173.29.3 Constructor

MBS SQL Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
See also:


- 173.29.4 Constructor(data as SQLStringMBS) 21634
- 173.29.5 Constructor(Data as string, isText as boolean=true) 21634
- 173.29.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21635


## 173.29.4 Constructor(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new long character object from a string object.
See also:


- 173.29.3 Constructor 21634
- 173.29.5 Constructor(Data as string, isText as boolean=true) 21634
- 173.29.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21635


## 173.29.5 Constructor(Data as string, isText as boolean=true)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.29.3 Constructor 21634
- 173.29.4 Constructor(data as SQLStringMBS) 21634
- 173.29.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32) 21635


### 173.29.6 Constructor(dataProvider as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new long character object from a data provider.
**Notes:** The blocksize specifies in which sizes data is requested from the provider.
You must make sure that the data provider and this new long character object life long enough. Because the actual data is requested later when you do the update on the database.

If BlockSize is 0, the default block size is used.
See also:


- 173.29.3 Constructor 21634
- 173.29.4 Constructor(data as SQLStringMBS) 21634
- 173.29.5 Constructor(Data as string, isText as boolean=true) 21634

## 173.30 class SQLLongOrLobMBS

### 173.30.1 class SQLLongOrLobMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The super class for Long Binary/Text and BLOB/CLOB classes.
**Notes:** Subclass of the SQLStringMBS class.

# 173.31 class SQLNotInitializedExceptionMBS

## 173.31.1 class SQLNotInitializedExceptionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception raised if you call a method on an object which was not properly initialized.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1

## 173.32 class SQLNullMBS

### 173.32.1 class SQLNullMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class used internally for null values.

# 173.33 class SQLNumericMBS

## 173.33.1 class SQLNumericMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for numeric values.
**Notes:** see also
https://www.sqlapi.com/ApiDoc/class_s_a_numeric.html
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr6
- MBS Xojo Plugins, version 23.3pr7
- MBS Xojo Plugins, version 17.2pr4
- MBS Xojo / Real Studio Plugins, version 16.5pr9
- MBS Xojo / Real Studio plug-ins in version 14.2
- MBS Xojo / Real Studio Plugins, version 14.2pr1

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## 173.33.2 Methods

## 173.33.3 Constructor

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an empty numeric object.
See also:


- 173.33.4 Constructor(value as Double) 21639
- 173.33.5 Constructor(value as string) 21640


## 173.33.4 Constructor(value as Double)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new numeric object based on the given double value.
See also:


- 173.33.3 Constructor 21639
- 173.33.5 Constructor(value as string) 21640

### 173.33.5 Constructor(value as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new numeric object based on the given string.
See also:

- 173.33.3 Constructor 21639
- 173.33.4 Constructor(value as Double) 21639

### 173.33.6 NumericWithCurrency(value as Currency) as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new numeric value object with given currency value.
**Example:**

```
// test code for currency
dim c1 as Currency = 12345678.
dim c2 as Currency = 1234567.8
dim c3 as Currency = 123456.78
dim c4 as Currency = 12345.678
dim c5 as Currency = 1234.5678
dim c6 as Currency = 123.45678

dim n1 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c1)
dim n2 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c2)
dim n3 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c3)
dim n4 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c4)
dim n5 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c5)
dim n6 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c6)

dim s1 as string = n1.StringValue
dim s2 as string = n2.StringValue
dim s3 as string = n3.StringValue
dim s4 as string = n4.StringValue
dim s5 as string = n5.StringValue
dim s6 as string = n6.StringValue

dim d1 as Double = n1.DoubleValue
dim d2 as Double = n2.DoubleValue
dim d3 as Double = n3.DoubleValue
dim d4 as Double = n4.DoubleValue
dim d5 as Double = n5.DoubleValue
dim d6 as Double = n6.DoubleValue

dim x1 as Currency = n1.CurrencyValue
```

```
dim x2 as Currency = n2.CurrencyValue
dim x3 as Currency = n3.CurrencyValue
dim x4 as Currency = n4.CurrencyValue
dim x5 as Currency = n5.CurrencyValue
dim x6 as Currency = n6.CurrencyValue

// check for errors
if x1<>c1 then break
if x2<>c2 then break
if x3<>c3 then break
if x4<>c4 then break
if x5<>c5 then break
if x6<>c6 then break

if x1*10000 <>round(d1 * 10000) then Break
if x2*10000 <>round(d2 * 10000) then Break
if x3*10000 <>round(d3 * 10000) then Break
if x4*10000 <>round(d4 * 10000) then Break
if x5*10000 <>round(d5 * 10000) then Break
if x6*10000 <>round(d6 * 10000) then Break

Break // if no break before, it's okay.
```

### 173.33.7 NumericWithDouble(value as Double) as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with the given double value.

### 173.33.8 NumericWithInt64(value as Int64) as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with the given Int64 value.

### 173.33.9 NumericWithString(value as string) as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with the given string value.
**Notes:** If string is empty, we return a number with zero as value.

### 173.33.10 NumericWithUInt64(value as UInt64) as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new number with the given unsigned integer value.

### 173.33.11 Properties

### 173.33.12 CurrencyValue as Currency

MBS SQL Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The currency value.
**Example:**

```
// test code for currency
dim c1 as Currency = 12345678.
dim c2 as Currency = 1234567.8
dim c3 as Currency = 123456.78
dim c4 as Currency = 12345.678
dim c5 as Currency = 1234.5678
dim c6 as Currency = 123.45678

dim n1 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c1)
dim n2 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c2)
dim n3 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c3)
dim n4 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c4)
dim n5 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c5)
dim n6 as SQLNumericMBS = SQLNumericMBS.NumericWithCurrency(c6)

dim s1 as string = n1.StringValue
dim s2 as string = n2.StringValue
dim s3 as string = n3.StringValue
dim s4 as string = n4.StringValue
dim s5 as string = n5.StringValue
dim s6 as string = n6.StringValue

dim d1 as Double = n1.DoubleValue
dim d2 as Double = n2.DoubleValue
dim d3 as Double = n3.DoubleValue
dim d4 as Double = n4.DoubleValue
dim d5 as Double = n5.DoubleValue
dim d6 as Double = n6.DoubleValue

dim x1 as Currency = n1.CurrencyValue
dim x2 as Currency = n2.CurrencyValue
dim x3 as Currency = n3.CurrencyValue
```

```
dim x4 as Currency = n4.CurrencyValue
dim x5 as Currency = n5.CurrencyValue
dim x6 as Currency = n6.CurrencyValue

// check for errors
if x1<>c1 then break
if x2<>c2 then break
if x3<>c3 then break
if x4<>c4 then break
if x5<>c5 then break
if x6<>c6 then break

if x1*10000 <>round(d1 * 10000) then Break
if x2*10000 <>round(d2 * 10000) then Break
if x3*10000 <>round(d3 * 10000) then Break
if x4*10000 <>round(d4 * 10000) then Break
if x5*10000 <>round(d5 * 10000) then Break
if x6*10000 <>round(d6 * 10000) then Break

Break // if no break before, it's okay.
```

**Notes:** (Read and Write property)

### 173.33.13 DoubleValue as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The double value for this number.
**Notes:** (Read and Write property)

### 173.33.14 Int64Value as Int64

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number value as an int64.
**Notes:** (Read and Write property)

### 173.33.15 precision as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum number of digits in base 10.
**Notes:** (Read only property)

### 173.33.16 scale as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of digits to the right of the decimal point.
**Notes:** (Read only property)

### 173.33.17 sign as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sign: 1 for positive numbers, 0 for negative numbers.
**Notes:** (Read only property)

### 173.33.18 StringValue as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string value of this number.
**Notes:** (Read and Write property)

### 173.33.19 UInt64Value as UInt64

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number value as an uint64.
**Notes:** (Read and Write property)

# 173.34 class SQLParamMBS

## 173.34.1 class SQLParamMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL class for parameters.
**Notes:** see also
https://www.sqlapi.com/ApiDoc/class_s_a_param.html
Subclass of the SQLValueMBS class.
**Blog Entries**

- MBS SQL Plugin Tips and Tricks
- MBS Xojo Plugins, version 20.3pr3
- MBS Xojo Plugins, version 19.5pr4
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo Plugins, version 18.4pr10
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- Upcoming Changes for our SQL Plugin

## 173.34.2 Methods

## 173.34.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Long or Lob data reading mode.
**Notes:** SQLAPI++ Library provides two ways to read Long or BLob(CLob) object's value (usually SQLField or SQLParam objects):

1. reading of Long or Lob data at once into an internal buffer (like ordinary string or binary values);
2. piecewise reading of Long or Lob data using user defined callback.

kLongOrLobReaderDefault reading mode used by default.

If you want to control piecewise reading of Long or BLob(CLob) data you should set LongOrLobReaderMode and use kLongOrLobReaderManual reading mode for Long or BLob(CLob) parameters or fields you want to process with your data consumer. After that each fetch will skip reading Long and BLob(CLob) parameters that you set to be read manually. To read field or parameter defined to be read manually you should call ReadLongOrLob method for each of them after the fetch. ReadLongOrLob method will repeatedly call the data consumer Write event.
See also:

- 173.34.4 ReadLongOrLob(toFile as FolderItem) 21646
- 173.34.5 ReadLongOrLob(toStream as Writeable) 21646


### 173.34.4 ReadLongOrLob(toFile as FolderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts reading of Long or BLob(CLob) value to the given file.
**Example:**

```
dim cmd as SQLCommandMBS // your command
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim Param as SQLParamMBS = cmd.Param("image")
// read blob content to binarystream
Param.ReadLongOrLob(f)
```

**Notes:** May raise IOExceptions if things go wrong.
See also:


- 173.34.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer) 21645
- 173.34.5 ReadLongOrLob(toStream as Writeable) 21646


### 173.34.5 ReadLongOrLob(toStream as Writeable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts reading of Long or BLob(CLob) value to the given writeable stream.
**Example:**

```
dim cmd as SQLCommandMBS // your command
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.Create(f, true)
dim param as SQLParamMBS = cmd.param("image")
// read blob content to binarystream
param.ReadLongOrLob(b)
```

**Notes:** This allows you to read in chunks the data to a stream, e.g. binarystream, textoutputstream or socket.
See also:


- 173.34.3 ReadLongOrLob(toConsumer as SQLDataConsumerMBS, BlockSize as Integer) 21645
- 173.34.4 ReadLongOrLob(toFile as FolderItem) 21646

### 173.34.6 Properties

### 173.34.7 DirType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The direction type of parameter (input, output, etc.).
**Notes:** Use the kParamDirType* constants.

Usually the Library automatically detects parameter's direction type and implicitly creates an appropriate SAParam object. But not all of DBMS clients/servers provide complete parameters information. In that situation programmer need to describe parameter's direction type explicitly. See Server specific notes for details.

https://www.sqlapi.com/ApiDoc/class_s_a_param.html
(Read and Write property)

### 173.34.8 IsInput as Boolean

MBS SQL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an input paramater.
**Notes:** Checks ParamType property internally.
(Read only property)

### 173.34.9 IsOutput as Boolean

MBS SQL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is an output paramater.
**Notes:** Checks ParamType property internally.
(Read only property)

### 173.34.10 Name as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the parameter.
**Notes:** (Read only property)

### 173.34.11 NativeType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The native type code of the parameter.
**Notes:** (Read and Write property)

### 173.34.12 Options as Dictionary

MBS SQL Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a dictionary with all options.
**Notes:** For debugging, it may be useful to inspect options in debugger.
(Read only property)

### 173.34.13 Precision as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The precision of the parameter value (the total number of allowable digits).
**Notes:** (Read and Write property)

### 173.34.14 Scale as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The scale of the parameter value (the number of digits to the right of the decimal point).
**Notes:** (Read and Write property)

### 173.34.15 Size as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter's data size.
**Notes:** (Read and Write property)

### 173.34.16 Type as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parameter's data type.
**Notes:** See the kDataType constants.
(Read and Write property)

### 173.34.17 Option(name as string) as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string value of a specific parameter option.
**Notes:** see also:
https://www.sqlapi.com/ApiDoc/class_s_a_param.html
(Read and Write computed property)

### 173.34.18 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kParamDirTypeInput | 0 | One of the parameter direction type constants. Input parameter. |
| kParamDirTypeInputOutput | 1 | One of the parameter direction type constants. Input/output parameter. |
| kParamDirTypeOutput | 2 | One of the parameter direction type constants. Output parameter. |
| kParamDirTypeReturn | 3 | One of the parameter direction type constants. Returning parameter. |

## 173.35 class SQLPositionMBS

### 173.35.1 class SQLPositionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a position value.

### 173.35.2 Methods

### 173.35.3 Constructor(withID as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Position value with an ID.
See also:

- 173.35.4 Constructor(withName as string) 21650

### 173.35.4 Constructor(withName as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new Position value with a name.
See also:

- 173.35.3 Constructor(withID as Integer) 21650

# 173.36 class SQLPreparedStatementMBS

## 173.36.1 class SQLPreparedStatementMBS

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for prepared statements if you work with SQLDatabaseMBS class.
**Notes:** If you work with SQLCommandMBS class, you can set parameters there directly.

For the SQL string you number parameters with colon and number. Like this: :1, :2, :3.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Load PDF from MS SQL Server and display it
- MBS SQL Plugin Tips and Tricks
- RowSet in MBS Xojo SQL Plugin
- MBS Plugins updated for Xojo 2019r2.1
- Problems with killing Xojo threads with plugin calls.
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio plug-ins in version 16.3
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.1
- SQLPreparedStatementMBS improvements
- Release notes for SQL or ChartDirector?

**Videos**

- MBS SQL Plugin Presentation

**Xojo Developer Magazine**

- 14.1, page 30: The MBS SQL Plugin, An alternative way to connect to databases by Christian Schmitz
- 12.3, page 10: News

Interfaces: PreparedSQLStatement

### 173.36.2 Methods

### 173.36.3 Bind(name As String, value as Variant)

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the value for one parameter.
**Example:**

```
dim db as SQLDatabaseMBS // your db connection
dim sql as string = "Insert into test_tbl(fid, fvarchar20) values(:fid, :fvarchar20)"
dim v as Variant = db.Prepare(sql)
dim p as SQLPreparedStatementMBS = v

p.BindType("fid", SQLPreparedStatementMBS.kTypeLong)
p.BindType("fvarchar20", SQLPreparedStatementMBS.kTypeString)
p.Bind("fid", 2345)
p.Bind("fvarchar20", "Hello World by name")

p.SQLExecute
```

**Notes:** Version 16.4 and newer allow you to bind BLOB fields using a Memoryblock or a String value. Older versions only accepted string.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.
See also:


- 173.36.4 Bind(name As String, value as Variant, type as Integer) 21652
- 173.36.5 Bind(Values as Dictionary) 21653
- 173.36.6 Bind(values() as Variant) 21654
- 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant) 21655
- 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer) 21656


### 173.36.4 Bind(name As String, value as Variant, type as Integer)

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines one paramater with value and type.
**Example:**

```
dim db as SQLDatabaseMBS // your db connection
dim sql as string = "Insert into test_tbl(fid, fvarchar20) values(:fid, :fvarchar20)"
dim v as Variant = db.Prepare(sql)
dim p as SQLPreparedStatementMBS = v

p.Bind("fid", 2345, SQLPreparedStatementMBS.kTypeLong)
p.Bind("fvarchar20", "Hello World by name", SQLPreparedStatementMBS.kTypeString)

p.SQLExecute
```

**Notes:** Version 16.4 and newer allow you to bind BLOB fields using a Memoryblock or a String value. Older versions only accepted string.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

With plugin version 16.4 and newer binding type is optional. In that case the type is determinated from the value type.
See also:


- 173.36.3 Bind(name As String, value as Variant) 21652
- 173.36.5 Bind(Values as Dictionary) 21653
- 173.36.6 Bind(values() as Variant) 21654
- 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant) 21655
- 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer) 21656


### 173.36.5 Bind(Values as Dictionary)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the parameters based on the keys and values in the dictionary.
**Example:**

```
dim db as SQLDatabaseMBS // your database
dim pic as Picture // some picture
```

```
dim jpegData as MemoryBlock = pic.GetData(Picture.FormatJPEG, 80)

// get an insert command
dim sql as string = "Insert into BlobTest(name, image) values (:name, :image)"
dim p as SQLPreparedStatementMBS = db.Prepare(sql)

// put parameter values in a dictionary
dim d as new Dictionary

// by param index
d.Value(0) = "logo.jpg"
// by param name
d.Value("image") = jpegData

// bind values and run it
p.Bind(d)
p.SQLExecute
```

**Notes:** The dictionary is saved to fill parameters later.
Keys can be String, Text or numeric types. Text and String are used to pick parameters by name. Numeric values are used to pick parameter by index (zero based).
MemoryBlock and Strings without text encoding are converted to byte values (BLOB).
Texts and Strings with encoding are converted to text values.
Raises exceptions if you pass anything which is not recognized.
Other types are translated as good as possible.
See also:


- 173.36.3 Bind(name As String, value as Variant) 21652
- 173.36.4 Bind(name As String, value as Variant, type as Integer) 21652
- 173.36.6 Bind(values() as Variant) 21654
- 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant) 21655
- 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer) 21656


### 173.36.6 Bind(values() as Variant)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value list with the given values.
**Notes:** You can either pass values to the SQLExecute/SQLSelect method or call Bind methods to set values.
You have to define for each parameter both the type and the value.

Version 16.4 and newer allow you to bind BLOB fields using a Memoryblock or a String value.
Older versions only accepted string.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.
See also:


- 173.36.3 Bind(name As String, value as Variant) 21652
- 173.36.4 Bind(name As String, value as Variant, type as Integer) 21652
- 173.36.5 Bind(Values as Dictionary) 21653
- 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant) 21655
- 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer) 21656


### 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the value for one parameter.
**Notes:** You can either pass values to the SQLExecute/SQLSelect method or call Bind methods to set values. You have to define for each parameter both the type and the value.

Version 16.4 and newer allow you to bind BLOB fields using a Memoryblock or a String value.
Older versions only accepted string.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

Raises OutOfBoundsException exception if index parameter is out of range.
See also:


- 173.36.3 Bind(name As String, value as Variant) 21652
- 173.36.4 Bind(name As String, value as Variant, type as Integer) 21652

- 173.36.5 Bind(Values as Dictionary) 21653
- 173.36.6 Bind(values() as Variant) 21654
- 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer) 21656


### 173.36.8 Bind(zeroBasedIndex as Integer, value as Variant, type as Integer)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines one paramater with value and type.
**Notes:** You can either pass values to the SQLExecute/SQLSelect method or call Bind methods to set values. You have to define for each parameter both the type and the value.

Version 16.4 and newer allow you to bind BLOB fields using a Memoryblock or a String value.
Older versions only accepted string.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With plugin version 16.4 and newer binding type is optional. In that case the type is determinated from the value type.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

Raises OutOfBoundsException exception if index parameter is out of range.
See also:


- 173.36.3 Bind(name As String, value as Variant) 21652
- 173.36.4 Bind(name As String, value as Variant, type as Integer) 21652
- 173.36.5 Bind(Values as Dictionary) 21653
- 173.36.6 Bind(values() as Variant) 21654
- 173.36.7 Bind(zeroBasedIndex as Integer, value as Variant) 21655


### 173.36.9 BindType(name As String, type as Integer)

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the type of one value.
**Example:**

```
dim db as SQLDatabaseMBS // your db connection
dim sql as string = "Insert into test_tbl(fid, fvarchar20) values(:fid, :fvarchar20)"
dim v as Variant = db.Prepare(sql)
dim p as SQLPreparedStatementMBS = v

p.BindType("fid", SQLPreparedStatementMBS.kTypeLong)
p.BindType("fvarchar20", SQLPreparedStatementMBS.kTypeString)
p.Bind("fid", 2345)
p.Bind("fvarchar20", "Hello World by name")

p.SQLExecute
```

**Notes:** With plugin version 16.4 and newer binding type is optional. In that case the type is determinated from the value type.
See also:


- 173.36.10 BindType(types() as Integer) 21657
- 173.36.11 BindType(zeroBasedIndex as Integer, type as Integer) 21657


### 173.36.10 BindType(types() as Integer)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the types for all values.
**Notes:** You can either pass values to the SQLExecute/SQLSelect method or call Bind methods to set values. You have to define for each parameter both the type and the value.

With plugin version 16.4 and newer binding type is optional. In that case the type is determinated from the value type.
See also:


- 173.36.9 BindType(name As String, type as Integer) 21656
- 173.36.11 BindType(zeroBasedIndex as Integer, type as Integer) 21657


### 173.36.11 BindType(zeroBasedIndex as Integer, type as Integer)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines the type of one value.
**Notes:** You can either pass values to the SQLExecute/SQLSelect method or call Bind methods to set values. You have to define for each parameter both the type and the value.

With plugin version 16.4 and newer binding type is optional. In that case the type is determinated from the value type.
See also:

- 173.36.9 BindType(name As String, type as Integer) 21656
- 173.36.10 BindType(types() as Integer) 21657

### 173.36.12 Clear

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all parameters for reusing the SQL Prepared statement.

### 173.36.13 Constructor

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless SQLPreparedStatementMBS objects by error. The only way to create an object is to use the prepare method in the database class.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 173.36.14 ExecuteSQL(ParamArray bindItems As Variant)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQL command with the given parameters.
**Notes:** You can decide whether you pass values here or call Bind methods.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

If bindItems is not nil, we bind parameters using it.
If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

This version of the function raises always exceptions, while SQLExecute only if you set RaiseException property to true.

### 173.36.15 ExecuteSQLMT(ParamArray bindItems As Variant)

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQL command with the given parameters.
**Notes:** You can decide whether you pass values here or call Bind methods.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

If bindItems is not nil, we bind parameters using it.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

This version of the function raises always exceptions, while SQLExecuteMT only if you set RaiseException property to true.

If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.36.16 SelectSQL(ParamArray bindItems As Variant) As RowSet

MBS SQL Plugin, Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the query with the given parameters.
**Notes:** Returns the RowSet object or nil on error.
You can decide whether you pass values here or call Bind methods.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

If bindItems is not nil, we bind parameters using it.
If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

This version of the function raises always exceptions, while SQLSelect only if you set RaiseException property to true.

### 173.36.17 SelectSQLMT(ParamArray bindItems As Variant) As Rowset

MBS SQL Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

Returns the RowSet object or nil on error.
You can decide whether you pass values here or call Bind methods.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

If bindItems is not nil, we bind parameters using it.
If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

This version of the function raises always exceptions, while SQLSelectMT only if you set RaiseException property to true.

The work is performed on a preemptive thread, so this function does not block the application and can yield

time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.36.18 SQLExecute(ParamArray bindItems as Variant)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQL command with the given parameters.
**Notes:** You can decide whether you pass values here or call Bind methods.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

### 173.36.19 SQLExecuteMT(ParamArray bindItems as Variant)

MBS SQL Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the SQL command with the given parameters.
**Notes:** You can decide whether you pass values here or call Bind methods.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

### 173.36.20 SQLSelect(ParamArray bindItems as Variant) As RecordSet

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the query with the given parameters.
**Notes:** Returns the recordset object or nil on error.
You can decide whether you pass values here or call Bind methods.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here. Otherwise passing an array here would create a variant array with your array as content.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

### 173.36.21 SQLSelectMT(ParamArray bindItems as Variant) As RecordSet

MBS SQL Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Runs the query with the given parameters.
**Notes:** Returns the recordset object or nil on error.
You can decide whether you pass values here or call Bind methods.

For this method to work, you need to have somewhere a property with SQLDatabaseMBS so Xojo includes our SQLDatabase plugin which provides the RecordSet functionality.

The record set may not have a valid RecordCount or have working movefirst/movelast/moveprev methods unless the underlaying database supports those and Scrollable result sets is enabled/supported.

If you like to pass an array of variant for the values, please pass this to Bind() and no parameters here.

Otherwise passing an array here would create a variant array with your array as content.

When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

### 173.36.22 Properties

### 173.36.23 BoundTypes as Dictionary

MBS SQL Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The binded types to inspect in debugger.
**Notes:** When queried, the plugin creates a copy of the dictionary for you to inspect in debugger.
Changes to the dictionary do not bind types.

Renamed to BoundTypes in version 19.4. Was BindedTypes, but that was not proper english.
(Read only property)

### 173.36.24 BoundValues as Dictionary

MBS SQL Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The binded values to inspect in debugger.
**Notes:** When queried, the plugin creates a copy of the dictionary for you to inspect in debugger.
Changes to the dictionary do not bind values.

Renamed to BoundValues in version 19.4. Was BindedValues, but that was not proper english.
(Read only property)

### 173.36.25 Scrollable as Boolean

MBS SQL Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the plugin will ask for a scrollable recordset when doing SQLSelect.
**Notes:** Since plugin version 15.0, Scrollable is false by default.
(Read and Write property)

### 173.36.26 SQL as String

MBS SQL Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL command for this prepared statement.
**Notes:** (Read and Write property)

### 173.36.27 Constants

Data Type Constants

| Constant | Value | Description |
|---|---|---|
| kTypeBlob | 16 | Binary large Object. Pass a string or memoryblock. |
| kTypeBool | 1 | Boolean |
| kTypeBytes | 13 | a binary string or MemoryBlock.<br>(which is a string without text encoding)<br>This is usually a varbinary field. kTypeLongBinary is used for bigger binary data and streamed. And kTypeBlob is used for huge streams of bytes and also transferred in chunks. In most data base systems the varchar field is stored within the record, while BLOB and CLOB are stored separately. |
| kTypeClob | 17 | Character Large Object. |
| kTypeDateTime | 10 | Date and/or Time. |
| kTypeDouble | 8 | double float value. |
| kTypeInt32 | 4 | signed 32 bit integer |
| kTypeInt64 | 6 | Signed 64-bit integer. |
| kTypeInterval | 11 | An interval.<br>Please pass SQLIntervalMBS in the variant. If the variant contains anything else, the plugin will pass nil value.<br>When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized. |
| kTypeLong | 4 | signed 32 bit integer |
| kTypeLongBinary | 14 | Long binary. |
| kTypeLongChar | 15 | Long string. |
| kTypeNull | 99 | NULL value |
| kTypeNumeric | 9 | A number (Int64 or double).<br>This can be used for Int64 or Double values. Depending of the type of number in the variant, the plugin will either make an Int64 or a double internally.<br>When passing variant for value, MemoryBlock and Strings without text encoding are converted to byte values (BLOB). Texts and Strings with encoding are converted to text values. Other types are translated as good as possible. Raises exceptions if you pass anything which is not recognized. |
| kTypeShort | 2 | signed 16 bit integer |
| kTypeString | 12 | String.<br>This is usually a varchar field. kTypeLongChar is used for bigger varchars and streamed. And kTypeClob is used for huge streams of characters (BLOB for text) and also transferred in chunks. In most data base systems the varchar field is stored within the record, while BLOB and CLOB are stored separately. |
| kTypeUInt32 | 5 | unsigned 32 bit integer |
| kTypeUInt64 | 7 | Unsigned 64-bit integer. |
| kTypeULong | 5 | unsigned 32 bit integer |
| kTypeUnknown | 0 | unknown type |
| kTypeUShort | 3 | unsigned 16 bit integer |

# 173.37 class SQLStringMBS

## 173.37.1 class SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for strings in this plugin.
**Example:**

```
dim s as new SQLStringMBS("Hello √§√√º")

MsgBox "Characters: "+str(s.GetLength)+" Bytes: "+str(s.GetBinaryLength)

dim a as string= s.CopyBinaryData
dim b as string= s.CopyText

MsgBox a // RB shows garbage as it tries to display bytes as UTF8 which does not work
MsgBox b // displays correct
```

**Notes:** A string can be text (with text encoding) or bytes (raw binary data).

see also
https://www.sqlapi.com/ApiDoc/class_s_a_string.html
**Blog Entries**

- MBS Xojo Plugins, version 24.0pr6
- MBS Real Studio Plugins, version 12.4pr9

## 173.37.2 Methods

## 173.37.3 Compare(text as SQLStringMBS) as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares this string object with another string.
**Notes:** Function performs a case-sensitive comparison of the strings, and is not affected by locale.

Returns zero if the strings are identical, <0 if this string object is less than text, or >0 if this string object is greater than text.
See also:

- 173.37.4 Compare(text as string) as Integer

### 173.37.4 Compare(text as string) as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares this string object with another string.
**Notes:** Function performs a case-sensitive comparison of the strings, and is not affected by locale.

Returns zero if the strings are identical, <0 if this string object is less than text, or >0 if this string object is greater than text.
See also:

- 173.37.3 Compare(text as SQLStringMBS) as Integer 21666

### 173.37.5 CompareNoCase(text as SQLStringMBS) as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares this string object with another string.
**Notes:** Function performs a case-insensitive comparison of the strings, and is not affected by locale.

Returns zero if the strings are identical (ignoring case), <0 if this string object is less than text (ignoring case), or >0 if this string object is greater than text (ignoring case).
See also:

- 173.37.6 CompareNoCase(text as string) as Integer 21667

### 173.37.6 CompareNoCase(text as string) as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares this string object with another string.
**Notes:** Function performs a case-insensitive comparison of the strings, and is not affected by locale.

Returns zero if the strings are identical (ignoring case), <0 if this string object is less than text (ignoring case), or >0 if this string object is greater than text (ignoring case).
See also:

- 173.37.5 CompareNoCase(text as SQLStringMBS) as Integer 21667

### 173.37.7 Constructor

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty string object.
See also:

- 173.37.8 Constructor(Data as MemoryBlock) 21668
- 173.37.9 Constructor(Data as string, isText as Boolean = True) 21668
- 173.37.10 Constructor(other as SQLStringMBS) 21668


### 173.37.8 Constructor(Data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data, e.g. for blob.
See also:


- 173.37.7 Constructor 21667
- 173.37.9 Constructor(Data as string, isText as Boolean = True) 21668
- 173.37.10 Constructor(other as SQLStringMBS) 21668


### 173.37.9 Constructor(Data as string, isText as Boolean = True)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data or text copied from the data string.
**Notes:** If isText is true, the data is interpreted as text and string encoding conversion may modify it. If isText is false the bytes are copied raw.
See also:


- 173.37.7 Constructor 21667
- 173.37.8 Constructor(Data as MemoryBlock) 21668
- 173.37.10 Constructor(other as SQLStringMBS) 21668


### 173.37.10 Constructor(other as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string object with data copied from the other string object.
See also:


- 173.37.7 Constructor 21667
- 173.37.8 Constructor(Data as MemoryBlock) 21668
- 173.37.9 Constructor(Data as string, isText as Boolean = True) 21668

### 173.37.11 CopyBinaryData as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the bytes from the internal buffer ignoring any text encoding.

### 173.37.12 CopyMemoryBlock as MemoryBlock

MBS SQL Plugin, Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the content of the string/BLOB as MemoryBlock.

### 173.37.13 CopyText as string

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the characters of this string as text.
**Notes:** Text encoding conversion may happen.

### 173.37.14 Empty

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Forces a string to have 0 length.

### 173.37.15 GetBinaryLength as UInt32

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use BinaryLength instead.
**Function:** Returns a count of the bytes in the binary data buffer.
**Notes:** Deprecated. Please use BinaryLength property.

### 173.37.16 GetLength as UInt32

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. You can use Length instead. **Function:** Returns the number of characters in a SAString object.
**Notes:** Deprecated. Please use Length property.

For multibyte character sets, GetLength counts each 8-bit character; that is, a lead and trail byte in one multibyte character are counted as two bytes.

### 173.37.17 Left(count as Integer) as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the left part of a string.

### 173.37.18 MakeLower

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes all characters in the string to lower case.

### 173.37.19 MakeUpper

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Changes all characters in the string to upper case.

### 173.37.20 Mid(first as Integer) as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the middle part of a string.
**Notes:** first: The zero-based index of the first character in this string object that is to be included in the extracted substring.
See also:

- 173.37.21 Mid(first as Integer, Count as Integer) as SQLStringMBS 21670

### 173.37.21 Mid(first as Integer, Count as Integer) as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the middle part of a string.
**Notes:** first: The zero-based index of the first character in this string object that is to be included in the extracted substring.
count: The number of characters to extract from this string object. If this parameter is not supplied, then

the remainder of the string is extracted.
See also:

- 173.37.20 Mid(first as Integer) as SQLStringMBS 21670

### 173.37.22 Operator_Convert as string

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert operation for assignment to string.
See also:

- 173.37.23 Operator_Convert(text as string) 21671

### 173.37.23 Operator_Convert(text as string)

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert operation for assigning text string.
See also:

- 173.37.22 Operator_Convert as string 21671

### 173.37.24 Right(count as Integer) as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the right part of a string.

### 173.37.25 TrimLeft

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim leading whitespace characters from the string.

### 173.37.26 TrimRight

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Trim trailing whitespace characters from the string.

### 173.37.27 Properties

### 173.37.28 BinaryLength as UInt32

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a count of the bytes in the binary data buffer.
**Notes:** (Read only property)

### 173.37.29 DebugText as String

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text content for debugging.
**Notes:** We show up to 1000 characters here for debugger.
(Read only property)

### 173.37.30 IsEmpty as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tests whether a String object contains no characters.
**Notes:** Returns true if length is zero.
(Read only property)

### 173.37.31 Length as UInt32

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of characters in a SAString object.
**Notes:** For multibyte character sets, GetLength counts each 8-bit character; that is, a lead and trail byte in one multibyte character are counted as two bytes.
(Read only property)

# 173.38 class SQLUnsupportedExceptionMBS

## 173.38.1 class SQLUnsupportedExceptionMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an exception to report that the function is not supported on this platform.
**Notes:** This one raises only if the plugin is compiled for Mac OS Classic.
Subclass of the RuntimeException class.

# 173.39 class SQLValueMBS

## 173.39.1 class SQLValueMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The SQL class for mutable values.
**Notes:** Subclass of the SQLValueReadMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr2
- MBS Xojo Plugins, version 19.2pr1
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- Upcoming Changes for our SQL Plugin
- Text data type
- MBS Xojo / Real Studio Plugins, version 14.0pr6
- Release notes for SQL or ChartDirector?
- MBS Real Studio Plugins, version 11.2pr3

**Videos**

- Presentation from London conference about MBS Plugins.

## 173.39.2 Methods

## 173.39.3 Constructor(DataType as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty value object with the given data type.

## 173.39.4 setAsBlob(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as BLob data using a memoryblock.
See also:

- 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32) 21675
- 173.39.6 setAsBlob(data as SQLStringMBS) 21675
- 173.39.7 setAsBlob(data as string) 21676
- 173.39.8 setAsBlob(file as folderItem) 21676
- 173.39.9 setAsBlob(stream as Readable) 21677


### 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as BLob data (SQLString)
**Notes:** When you call the SQLCommandMBS.Execute method all input parameters are bound with their values, including Long and BLob(CLob) parameters.
That is the time when the data provider Read event runs to get the values in the block size you specify.

The default value for the block size is 0. If you use the default value, SQLAPI++ Library will automatically use the most appropriate size for current DBMS.
See also:


- 173.39.4 setAsBlob(data as MemoryBlock) 21674
- 173.39.6 setAsBlob(data as SQLStringMBS) 21675
- 173.39.7 setAsBlob(data as string) 21676
- 173.39.8 setAsBlob(file as folderItem) 21676
- 173.39.9 setAsBlob(stream as Readable) 21677


### 173.39.6 setAsBlob(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as BLob data (SQLString)
See also:


- 173.39.4 setAsBlob(data as MemoryBlock) 21674
- 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32) 21675
- 173.39.7 setAsBlob(data as string) 21676
- 173.39.8 setAsBlob(file as folderItem) 21676
- 173.39.9 setAsBlob(stream as Readable) 21677

### 173.39.7 setAsBlob(data as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as BLob data (SQLString)
**Example:**

```
dim c as SQLCommandMBS // your command object
dim JPEGData as string // some data

c.Param("imageData").setAsBlob JPEGData
```

See also:


- 173.39.4 setAsBlob(data as MemoryBlock) 21674
- 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32) 21675
- 173.39.6 setAsBlob(data as SQLStringMBS) 21675
- 173.39.8 setAsBlob(file as folderItem) 21676
- 173.39.9 setAsBlob(stream as Readable) 21677


### 173.39.8 setAsBlob(file as folderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of file.
**Example:**

```
dim cmd as SQLCommandMBS // your command object

// pass folderitem to BLOB field
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
cmd.Param("image").setAsBlob(f)
```

**Notes:** The file will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.4 setAsBlob(data as MemoryBlock) 21674
- 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32) 21675
- 173.39.6 setAsBlob(data as SQLStringMBS) 21675

- 173.39.7 setAsBlob(data as string) 21676
- 173.39.9 setAsBlob(stream as Readable) 21677


### 173.39.9 setAsBlob(stream as Readable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of stream.
**Example:**

```
dim cmd as SQLCommandMBS // your command object

// pass BinaryStream to BLOB field
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim b as BinaryStream = BinaryStream.open(f)
cmd.Param("image").setAsBlob(b)
```

**Notes:** The stream will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.4 setAsBlob(data as MemoryBlock) 21674
- 173.39.5 setAsBlob(data as SQLDataProviderMBS, BlockSize as UInt32) 21675
- 173.39.6 setAsBlob(data as SQLStringMBS) 21675
- 173.39.7 setAsBlob(data as string) 21676
- 173.39.8 setAsBlob(file as folderItem) 21676


### 173.39.10 setAsBool(value as boolean)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as bool data.

### 173.39.11 setAsBytes(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as binary data from memoryblock.
See also:


- 173.39.12 setAsBytes(data as string) 21678

- 173.39.13 setAsBytes(value as SQLBytesMBS) 21678
- 173.39.14 setAsBytes(value as SQLStringMBS) 21678


### 173.39.12 setAsBytes(data as string)

MBS SQL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the value to be bytes with content of given string.
**Notes:** For BLOB fields or parameters.
Same as the other variant, but avoids creating extra SQLStringMBS object.
See also:


- 173.39.11 setAsBytes(data as MemoryBlock) 21677
- 173.39.13 setAsBytes(value as SQLBytesMBS) 21678
- 173.39.14 setAsBytes(value as SQLStringMBS) 21678


### 173.39.13 setAsBytes(value as SQLBytesMBS)

MBS SQL Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the value to be bytes with content of given Bytes object.
**Notes:** For BLOB fields or parameters.
Same as the other variant, but avoids creating extra SQLStringMBS object.
See also:


- 173.39.11 setAsBytes(data as MemoryBlock) 21677
- 173.39.12 setAsBytes(data as string) 21678
- 173.39.14 setAsBytes(value as SQLStringMBS) 21678


### 173.39.14 setAsBytes(value as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as binary string data (SQLString).
See also:


- 173.39.11 setAsBytes(data as MemoryBlock) 21677
- 173.39.12 setAsBytes(data as string) 21678
- 173.39.13 setAsBytes(value as SQLBytesMBS) 21678

### 173.39.15 setAsClob(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method.
**Notes:** This method should make sure you don't accidentally a memoryblock instead of a text.
See also:


- 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32) 21679
- 173.39.17 setAsClob(file as folderItem) 21679
- 173.39.18 setAsClob(stream as Readable) 21680
- 173.39.19 setAsClob(text as SQLStringMBS) 21680
- 173.39.20 setAsClob(text as string) 21681


### 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as CLob data (SQLString)
**Notes:** nWhen you call the SQLCommandMBS.Execute method all input parameters are bound with their values, including Long and BLob(CLob) parameters.
That is the time when the data provider Read event runs to get the values in the block size you specify.

The default value for the block size is 0. If you use the default value, SQLAPI++ Library will automatically use the most appropriate size for current DBMS.
See also:


- 173.39.15 setAsClob(data as MemoryBlock) 21679
- 173.39.17 setAsClob(file as folderItem) 21679
- 173.39.18 setAsClob(stream as Readable) 21680
- 173.39.19 setAsClob(text as SQLStringMBS) 21680
- 173.39.20 setAsClob(text as string) 21681


### 173.39.17 setAsClob(file as folderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of file.
**Notes:** The file will be read later when statement is executed.
May not work when using preemptive threads.
See also:

- 173.39.15 setAsClob(data as MemoryBlock) 21679
- 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32) 21679
- 173.39.18 setAsClob(stream as Readable) 21680
- 173.39.19 setAsClob(text as SQLStringMBS) 21680
- 173.39.20 setAsClob(text as string) 21681


### 173.39.18 setAsClob(stream as Readable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of stream.
**Notes:** The stream will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.15 setAsClob(data as MemoryBlock) 21679
- 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32) 21679
- 173.39.17 setAsClob(file as folderItem) 21679
- 173.39.19 setAsClob(text as SQLStringMBS) 21680
- 173.39.20 setAsClob(text as string) 21681


### 173.39.19 setAsClob(text as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as CLob data (SQLString)
See also:


- 173.39.15 setAsClob(data as MemoryBlock) 21679
- 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32) 21679
- 173.39.17 setAsClob(file as folderItem) 21679
- 173.39.18 setAsClob(stream as Readable) 21680
- 173.39.20 setAsClob(text as string) 21681

### 173.39.20 setAsClob(text as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as CLob data (SQLString)
See also:


- 173.39.15 setAsClob(data as MemoryBlock) 21679
- 173.39.16 setAsClob(data as SQLDataProviderMBS, BlockSize as UInt32) 21679
- 173.39.17 setAsClob(file as folderItem) 21679
- 173.39.18 setAsClob(stream as Readable) 21680
- 173.39.19 setAsClob(text as SQLStringMBS) 21680


### 173.39.21 setAsDate(value as date)

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets parameter's value with a date.
**Example:**

```
dim cmd as SQLCommandMBS // your command object
dim d as new date(2012,12,24,16,0,0) // some date
cmd.Param(3).setAsDate(d) // set third parameter
```

**Notes:** Same as setAsDateTime, but here we take a date object to make it more convenient.

### 173.39.22 setAsDateTime(value as dateTime)

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value with a dateTime.
**Notes:** Same as setAsDate, but here we take a dateTime object to make it more convenient.
See also:


- 173.39.23 setAsDateTime(value as SQLDateTimeMBS) 21681


### 173.39.23 setAsDateTime(value as SQLDateTimeMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as SQLDateTime data.
See also:

- 173.39.22 setAsDateTime(value as dateTime) 21681

### 173.39.24 setAsDefault

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Forces to use the default parameter's value.
**Notes:** Forces DBMS API to use the default parameter value as the input value for an input or input/output parameter in a procedure.

If DBMS API does not support the concept of "default parameter values" in stored procedures, this setting will be ignored.

If you set this flag for the parameter that doesn't have a default value, the effect is DBMS defined (e.g. an error can be returned or NULL can be bound).

To cancel using the default parameter value you should call any other SQLValue::setAs... method to bind a parameter value.

To check whether this flag is set or not use isDefault method.

### 173.39.25 setAsDouble(value as Double)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as Double data.

### 173.39.26 setAsInt32(value as Int32)

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as Int32 data.

### 173.39.27 setAsInt64(value as Int64)

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as Int64 data.

### 173.39.28 setAsInteger(value as Integer)

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as Integer data.
**Notes:** Int32 or Int64 depending whether app is 32 or 64 bit.

### 173.39.29 setAsInterval(value as SQLIntervalMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an interval value.

### 173.39.30 setAsLong(value as Int32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as Int32 data.

### 173.39.31 setAsLongBinary(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long binary data from memoryblock.
See also:


- 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32) 21683
- 173.39.33 setAsLongBinary(data as SQLStringMBS) 21684
- 173.39.34 setAsLongBinary(data as string) 21684
- 173.39.35 setAsLongBinary(file as folderItem) 21685
- 173.39.36 setAsLongBinary(stream as Readable) 21685


### 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long binary data (SQLString)
**Notes:** When you call the SQLCommandMBS.Execute method all input parameters are bound with their values, including Long and BLob(CLob) parameters.
That is the time when the data provider Read event runs to get the values in the block size you specify.

The default value for the block size is 0. If you use the default value, SQLAPI++ Library will automatically use the most appropriate size for current DBMS.
See also:

- 173.39.31 setAsLongBinary(data as MemoryBlock) 21683
- 173.39.33 setAsLongBinary(data as SQLStringMBS) 21684
- 173.39.34 setAsLongBinary(data as string) 21684
- 173.39.35 setAsLongBinary(file as folderItem) 21685
- 173.39.36 setAsLongBinary(stream as Readable) 21685

### 173.39.33 setAsLongBinary(data as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long binary data (SQLString)
See also:

- 173.39.31 setAsLongBinary(data as MemoryBlock) 21683
- 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32) 21683
- 173.39.34 setAsLongBinary(data as string) 21684
- 173.39.35 setAsLongBinary(file as folderItem) 21685
- 173.39.36 setAsLongBinary(stream as Readable) 21685

### 173.39.34 setAsLongBinary(data as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long binary data (SQLString)
See also:

- 173.39.31 setAsLongBinary(data as MemoryBlock) 21683
- 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32) 21683
- 173.39.33 setAsLongBinary(data as SQLStringMBS) 21684
- 173.39.35 setAsLongBinary(file as folderItem) 21685
- 173.39.36 setAsLongBinary(stream as Readable) 21685

### 173.39.35 setAsLongBinary(file as folderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of file.
**Notes:** The file will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.31 setAsLongBinary(data as MemoryBlock) 21683
- 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32) 21683
- 173.39.33 setAsLongBinary(data as SQLStringMBS) 21684
- 173.39.34 setAsLongBinary(data as string) 21684
- 173.39.36 setAsLongBinary(stream as Readable) 21685


### 173.39.36 setAsLongBinary(stream as Readable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of stream.
**Notes:** The stream will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.31 setAsLongBinary(data as MemoryBlock) 21683
- 173.39.32 setAsLongBinary(data as SQLDataProviderMBS, BlockSize as UInt32) 21683
- 173.39.33 setAsLongBinary(data as SQLStringMBS) 21684
- 173.39.34 setAsLongBinary(data as string) 21684
- 173.39.35 setAsLongBinary(file as folderItem) 21685


### 173.39.37 setAsLongChar(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method.
**Notes:** This method should make sure you don't accidentally a memoryblock instead of a text.
See also:


- 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32) 21686
- 173.39.39 setAsLongChar(file as folderItem) 21686

- 173.39.40 setAsLongChar(stream as Readable) 21687
- 173.39.41 setAsLongChar(text as SQLStringMBS) 21687
- 173.39.42 setAsLongChar(text as string) 21687


### 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long character data (SQLString)
**Notes:** When you call the SQLCommandMBS.Execute method all input parameters are bound with their values, including Long and BLob(CLob) parameters.
That is the time when the data provider Read event runs to get the values in the block size you specify.

The default value for the block size is 0. If you use the default value, SQLAPI++ Library will automatically use the most appropriate size for current DBMS.
See also:


- 173.39.37 setAsLongChar(data as MemoryBlock) 21685
- 173.39.39 setAsLongChar(file as folderItem) 21686
- 173.39.40 setAsLongChar(stream as Readable) 21687
- 173.39.41 setAsLongChar(text as SQLStringMBS) 21687
- 173.39.42 setAsLongChar(text as string) 21687


### 173.39.39 setAsLongChar(file as folderItem)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of file.
**Notes:** The file will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.37 setAsLongChar(data as MemoryBlock) 21685
- 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32) 21686
- 173.39.40 setAsLongChar(stream as Readable) 21687
- 173.39.41 setAsLongChar(text as SQLStringMBS) 21687
- 173.39.42 setAsLongChar(text as string) 21687

### 173.39.40 setAsLongChar(stream as Readable)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field with content of stream.
**Notes:** The stream will be read later when statement is executed.
May not work when using preemptive threads.
See also:


- 173.39.37 setAsLongChar(data as MemoryBlock) 21685
- 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32) 21686
- 173.39.39 setAsLongChar(file as folderItem) 21686
- 173.39.41 setAsLongChar(text as SQLStringMBS) 21687
- 173.39.42 setAsLongChar(text as string) 21687


### 173.39.41 setAsLongChar(text as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long character data (SQLString)
See also:


- 173.39.37 setAsLongChar(data as MemoryBlock) 21685
- 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32) 21686
- 173.39.39 setAsLongChar(file as folderItem) 21686
- 173.39.40 setAsLongChar(stream as Readable) 21687
- 173.39.42 setAsLongChar(text as string) 21687


### 173.39.42 setAsLongChar(text as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as long character data (SQLString)
See also:


- 173.39.37 setAsLongChar(data as MemoryBlock) 21685
- 173.39.38 setAsLongChar(data as SQLDataProviderMBS, BlockSize as UInt32) 21686
- 173.39.39 setAsLongChar(file as folderItem) 21686
- 173.39.40 setAsLongChar(stream as Readable) 21687
- 173.39.41 setAsLongChar(text as SQLStringMBS) 21687

### 173.39.43 setAsNull

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets value to null.

### 173.39.44 setAsNumeric(value as SQLNumericMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as SQLNumeric data.

### 173.39.45 setAsShort(value as Int16)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as short data.

### 173.39.46 setAsString(data as MemoryBlock)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method.
**Notes:** This method should make sure you don't accidentally a memoryblock instead of a text.
See also:


- 173.39.47 setAsString(value as SQLStringMBS) 21688
- 173.39.48 setAsString(value as string) 21689


### 173.39.47 setAsString(value as SQLStringMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as character string data (SQLString)
See also:


- 173.39.46 setAsString(data as MemoryBlock) 21688
- 173.39.48 setAsString(value as string) 21689

### 173.39.48 setAsString(value as string)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as character string data.
**Notes:** Same as setAsString, but for your convenience with a Xojo string instead of a SQLStringMBS object.
See also:

- 173.39.46 setAsString(data as MemoryBlock) 21688
- 173.39.47 setAsString(value as SQLStringMBS) 21688

### 173.39.49 setAsUInt32(value as UInt32)

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as UInt32 data.

### 173.39.50 setAsULong(value as UInt32)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as unsigned long data.

### 173.39.51 setAsUnknown

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's type as unknown.

### 173.39.52 setAsUShort(value as UInt16)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value as unsigned short data.
**Notes:** Sets value as unsigned short data.

### 173.39.53 setAsValueRead(value as SQLValueReadMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets parameter's value from SQLParam or SQLField objects.
**Notes:** This method allows using SQLField or SQLParam object received from one SQL statement as a parameter for another SQL statement.

### 173.39.54 setVariant(value as Variant)

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value based on a variant.
**Example:**

```
dim con as SQLConnectionMBS // your connection
dim pic as picture // some picture

// get picture data
dim jpegData as MemoryBlock = pic.GetData(Picture.FormatJPEG, 80)

// get a command for an Insert command
dim sql as string = "Insert into BlobTest(name, image) values (:name, :image)"
dim cmd as new SQLCommandMBS(con, sql)

// set values by variant
cmd.Param("name").setVariant "logo.jpg"
cmd.Param("image").setVariant jpegData

// do the insert
cmd.Execute
```

**Notes:** MemoryBlock and Strings without text encoding are converted to byte values (BLOB).
Texts and Strings with encoding are converted to text values.
Raises exceptions if you pass anything which is not recognized.
Other types are translated as good as possible.

With version 19.0 or later, you can pass folderitem to stream blob from file. This may raise exception if file can't be opened.

### 173.39.55 Properties

### 173.39.56 isDefault as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the plugin has been forced to use parameter's default value by calling setAsDe-

fault method; false otherwise.
**Notes:** (Read only property)

## 173.40 class SQLValueReadMBS

### 173.40.1 class SQLValueReadMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class used in the SQL Plugin for value objects which can be read.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr9
- MBS Xojo Plugins, version 20.5pr7
- MBS Xojo Plugins, version 19.5pr2
- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo / Real Studio Plugins, version 16.4pr5
- Text data type
- MBS Real Studio Plugins, version 12.5pr4
- Release notes for SQL or ChartDirector?
- MBS Real Studio Plugins, version 11.2pr3

### 173.40.2 Methods

### 173.40.3 asBLob as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as BLob (SQLString) data.
**Notes:** If the value of current object is NULL, asBLob method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is string (kDataTypeString), bytes (kDataTypeBytes), long binary (kDataTypeLongBinary), long character (kDataTypeLongChar), BLob (kDataTypeBLob) or CLob (kDataTypeCLob), asBLob method returns the object's value as SQLString object.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong), double (kDataTypeDouble), numeric (kDataTypeNumeric), date-time (kDataTypeDateTime) or cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.4 asBLobMemory as MemoryBlock

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as BLob data in a memoryblock.

### 173.40.5 asBLobString as String

MBS SQL Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as BLob data in a string.

### 173.40.6 asBytes as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as binary string data (SQLString).
**Notes:** If the value of current object is NULL, asBytes method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is string (kDataTypeString), bytes (kDataTypeBytes), long binary (kDataTypeLongBinary), long character (kDataTypeLongChar), BLob (kDataTypeBLob) or CLob (kDataTypeCLob), asBytes method returns the object's value as SQLString object.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong), double (kDataTypeDouble), numeric (kDataTypeNumeric) or date-time (kDataTypeDateTime), asBytes method returns a block of data with size sizeof(value's type) as SQLString object.

If the value's type of current object is cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.7 asCLob as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as CLob (SQLString) data.
**Notes:** If the value of current object is NULL, asCLob method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is string (kDataTypeString), bytes (kDataTypeBytes), long binary (kDataTypeLongBinary), long character (kDataTypeLongChar), BLob (kDataTypeBLob) or CLob (kDataTypeCLob), asCLob method returns the object's value as SQLString object.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong), double (kDataTypeDouble), numeric(kDataTypeNumeric), date-time (kDataTypeDateTime) or cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.8 asDate as Date

MBS SQL Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as date.
**Example:**

```
dim cmd as SQLCommandMBS // your command object
dim d as date = cmd.Field("mydate").asDate // read date value
```

**Notes:** If the value of current object is NULL, asDate method returns an empty date object. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is kDataTypeDateTime, asDate method returns date object.

If the value's type of current object is any data type except kDataTypeDateTime, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.9 asDateTime as SQLDateTimeMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as SQLDateTimeMBS object.
**Notes:** If the value of current object is NULL, asDateTime method returns an empty SQLDateTime object. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is kDataTypeDateTime, asDateTime method returns SQLDateTime

object.

If the value's type of current object is any data type except kDataTypeDateTime, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.10 asDateTimeValue as DateTime

MBS SQL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as date.
**Notes:** If the value of current object is NULL, asDate method returns an empty date object. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is kDataTypeDateTime, asDate method returns date object.

If the value's type of current object is any data type except kDataTypeDateTime, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.11 asInterval as SQLIntervalMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as interval (SQLIntervalMBS).

### 173.40.12 asLongBinary as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as long binary (SQLString) data.
**Notes:** If the value of current object is NULL, asLongBinary method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is string (kDataTypeString), bytes (kDataTypeBytes), long binary (kDataTypeLongBinary), long character (kDataTypeLongChar), BLob (kDataTypeBLob) or CLob (kDataTypeCLob), asLongBinary method returns the object's value as SQLString object.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong), double (kDataTypeDouble), numeric (kDataTypeNumeric), date-time (kDataTypeDateTime) or cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.13 asLongChar as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as long character (SQLString) data.
**Notes:** If the value of current object is NULL, asLongChar method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is string (kDataTypeString), bytes (kDataTypeBytes), long binary (kDataTypeLongBinary), long character (kDataTypeLongChar), BLob (kDataTypeBLob) or CLob (kDataTypeCLob), asLongChar method returns the object's value as SQLString object.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong), double (kDataTypeDouble), numeric (kDataTypeNumeric), date-time (kDataTypeDateTime) or cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.14 asNumeric as SQLNumericMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as SQLNumeric data.
**Notes:** If the value of current object is NULL, asNumeric method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is exact numeric value (kDataTypeNumeric), asNumeric method returns the original value with no conversion.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), double (kDataTypeDouble) or long (kDataTypeLong), asNumeric method converts it to SQLNumeric .

If the value's type of current object is string (kDataTypeString), asNumeric method tries to convert it

from SQLChar* value. If the conversion is possible and correct, asNumeric converts to SQLNumeric from SQLChar* value. If conversion is incorrect asNumeric method throws an exception.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.

### 173.40.15 asString as SQLStringMBS

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** returns the value as string (SQLString) data.
**Notes:** If the value of current object is NULL, asString method returns an empty string. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is bool (kDataTypeBool), asString method returns "true" or "false" string (SQLString object).

If the value's type of current object is short (kDataTypeShort), asString method converts it to decimal string (SQLString object) like function printf("%hd", ...) does.

If the value's type of current object is long (kDataTypeLong), asString method converts it to decimal string (SQLString object) like function printf("%ld", ...) does.

If the value's type of current object is double (kDataTypeDouble), asString method converts it to decimal string (SQLString object) like function printf("%g", ...) does.

If the value's type of current object is numeric (kDataTypeNumeric), asString method converts it to decimal string (SQLString object) without precision loss.

If the value's type of current object is date-time (kDataTypeDateTime), asString method converts it to string (SQLString object) like function asctime(...) does.

If the value's type of current object is string (kDataTypeString, kDataTypeLongChar, kDataTypeCLob), asString method returns the original object's value as SQLString object.

If the value's type of current object is binary (kDataTypeBytes, kDataTypeLongBinary, kDataTypeBLob), asString method converts it to hexadecimal string ( SQLString object).

If the value's type of current object is cursor (kDataTypeCursor), the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.
For numbers, this may give english decimal separator. For getting localized one, please use AsDoubleValue and use cstr() function.

### 173.40.16 Constructor(DataType as Integer)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty value object for the given data type.
See also:

- 173.40.17 Constructor(value as SQLValueReadMBS) 21698

### 173.40.17 Constructor(value as SQLValueReadMBS)

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new value object by copying the given one.
See also:

- 173.40.16 Constructor(DataType as Integer) 21698

### 173.40.18 Properties

### 173.40.19 asBool as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value of current object as bool data.
**Notes:** f the value of current object is NULL, asBool method returns false. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is bool (kDataTypeBool), asBool method returns the original value with no conversion.

If the value's type of current object is short (kDataTypeShort), long (kDataTypeLong) or double (kDataTypeDouble), asBool method converts it to bool data type. Conversion returns false if the value is 0; true otherwise.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.
(Read only property)

### 173.40.20 asDouble as Double

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** returns the value as Double data.
**Notes:** If the value of current object is NULL, asDouble method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is double (kDataTypeDouble), asDouble method returns the original value with no conversion.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), long (kDataTypeLong) or numeric (kDataTypeNumeric), asDouble method converts it to double ( kDataTypeDouble) data type.

If the value's type of current object is string (kDataTypeString), asDouble method tries to convert it to double value. If the conversion is possible and correct, asDouble returns kDataTypeDouble value. If conversion is incorrect asDouble method throws an exception.

If the value's type of current object is kDataTypeDateTime, asDouble method converts it to standard double representation. Days are represented by whole number increments starting with 30 December 1899, midnight as time zero. Hour values are expressed as the absolute value of the fractional part of the number. See SQLDateTime::operator double() for more detailes.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.
(Read only property)

### 173.40.21 asInt32 as Int32

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as Int32 data.
**Notes:** (Read only property)

### 173.40.22 asInt64 as Int64

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as Int64 data.
**Notes:** (Read only property)

### 173.40.23 asInteger as Integer

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as Integer data.
**Notes:** Either Int32 or Int64 depending on whether the application is 32 or 64 bit.
(Read only property)

### 173.40.24 asLong as Int32

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as Int32 data.
**Notes:** If the value of current object is NULL, asLong method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is long (kDataTypeLong), asLong method returns the original value with no conversion.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), double (kDataTypeDouble) or numeric (kDataTypeNumeric), asLong method converts it to long data type. Note, that in this case the returned value can be truncated.

If the value's type of current object is string (kDataTypeString), asLong method tries to convert it to long (kDataTypeLong) value. If the conversion is possible and correct, asLong returns kDataTypeLong value. If conversion is incorrect asLong method throws an exception.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.
(Read only property)

### 173.40.25 asShort as Int16

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as short.
**Notes:** If the value of current object is NULL, asShort method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is short, asShort method returns the original value with no conversion.

If the value's type of current object is bool (kDataTypeBool), long (kDataTypeLong), unsigned long (SkDataTypeULong), double (kDataTypeDouble) or numeric (kDataTypeNumeric), asShort method converts it to short data type. Note, that in this case the returned value can be truncated.

If the value's type of current object is string (kDataTypeString), asShort method tries to convert it to short value. If the conversion is possible and correct, asShort returns the value. If conversion is incorrect asShort method throws an exception.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SAValueRead object.
(Read only property)

### 173.40.26 asStringValue as String

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value string.
**Notes:** Same as asString but returns a Xojo string.
Please use SQLStringMBS and CopyBinaryData if the string you want to read is a BLOB value, else text encoding will change your data!
For numbers, this may give english decimal separator. For getting localized one, please use AsDoubleValue and use cstr() function.
(Read only property)

### 173.40.27 asUInt32 as UInt32

MBS SQL Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as UInt32 data.
**Notes:** (Read only property)

### 173.40.28 asULong as UInt32

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as an unsigned 32 bit integer value.
**Notes:** If the value of current object is NULL, asULong method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is long ( kDataTypeLong), asULong method returns the original value with no conversion.

If the value's type of current object is bool (kDataTypeBool), short (kDataTypeShort), double (kDataTypeDouble) or numeric (kDataTypeNumeric), asULong method converts it to long data type. Note, that in this case the returned value can be truncated.

If the value's type of current object is string (kDataTypeString), asULong method tries to convert it to long ( kDataTypeLong) value. If the conversion is possible and correct, asULong returns kDataTypeLong value. If conversion is incorrect asULong method throws an exception.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SQLValueRead object.
(Read only property)

### 173.40.29 asUShort as UInt16

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as unsigned short.
**Notes:** If the value of current object is NULL, asUShort method returns 0. Use isNull method to make sure if the value is NULL or not.

If the value's type of current object is unsigned short, asUShort method returns the original value with no

conversion.

If the value's type of current object is bool (kDataTypeBool), long (kDataTypeLong), unsigned long (SkDataTypeULong), double (kDataTypeDouble) or numeric (kDataTypeNumeric), asUShort method converts it to unsigned short data type. Note, that in this case the returned value can be truncated.

If the value's type of current object is string (kDataTypeString), asUShort method tries to convert it to unsigned short value. If the conversion is possible and correct, asUShort returns the value. If conversion is incorrect asUShort method throws an exception.

If the value's type of current object is any data type except the described above, the result is undefined and debug version asserts.

Use DataType method to get the value's type of SAValueRead object.
(Read only property)

### 173.40.30 asVariant as Variant

MBS SQL Plugin, Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the value as a variant.
**Notes:** This is a convenience function.
May return nil, date, number or string.
BLOB strings without encoding and text strings as UTF-8.
(Read only property)

### 173.40.31 DataType as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns SAValueRead object's data type.
**Notes:** One of the kDataType constants.
(Read only property)

### 173.40.32 isNull as boolean

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the value of current object is NULL; otherwise false.
**Notes:** (Read only property)

### 173.40.33 LongOrLobReaderMode as Integer

MBS SQL Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Long or Lob data reading mode.
**Notes:** SQLAPI++ Library provides two ways to read Long or BLob(CLob) object's value (usually SQLField or SQLParam objects):

1. reading of Long or Lob data at once into an internal buffer (like ordinary string or binary values);
2. piecewise reading of Long or Lob data using user defined callback.

kLongOrLobReaderDefault reading mode used by default.

If you want to control piecewise reading of Long or BLob(CLob) data you should set LongOrLobReaderMode and use kLongOrLobReaderManual reading mode for Long or BLob(CLob) parameters or fields you want to process with your data consumer. After that each fetch will skip reading Long and BLob(CLob) parameters that you set to be read manually. To read field or parameter defined to be read manually you should call ReadLongOrLob method for each of them after the fetch. ReadLongOrLob method will repeatedly call the data consumer Write event.
(Read and Write property)

### 173.40.34 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDataTypeInt64 | 6 | One of the field type constants<br>Signed 64-bit integer. |
| kDataTypeUInt64 | 7 | One of the field type constants<br>Unsigned 64-bit integer. |

Data Types

| Constant | Value | Description |
|---|---|---|
| kDataTypeBlob | 16 | Data type is BLob data (SQLStringMBS). |
| kDataTypeBool | 1 | Data type is a boolean. |
| kDataTypeBytes | 13 | Data type is binary string (SQLStringMBS). |
| kDataTypeClob | 17 | Data type is CLob data (SQLStringMBS). |
| kDataTypeCursor | 18 | Data type is Oracle REF CURSOR (SQLCommand). |
| kDataTypeDateTime | 10 | Data type is SQLDateTime. |
| kDataTypeDouble | 8 | This is a normal double variable. |
| kDataTypeInterval | 11 | Data type is an interval (SQLIntervalMBS). |
| kDataTypeLong | 4 | A 32 bit integer. |
| kDataTypeLongBinary | 14 | Data type is long binary data (SQLStringMBS). |
| kDataTypeLongChar | 15 | Data type is long character data (SQLStringMBS). |
| kDataTypeNumeric | 9 | Data type is SQLNumeric (used internally). |
| kDataTypeShort | 2 | Data type is a 16 bit signed integer. |
| kDataTypeSpecificToDBMS | 19 | Data type is server-specific. |
| kDataTypeString | 12 | Data type is character string (SQLString). |
| kDataTypeULong | 5 | Data type is a 32 bit unsigned integer. |
| kDataTypeUnknown | 0 | Data type is unknown. |
| kDataTypeUShort | 3 | A 16 bit unsigned integer. |

Read Modes

| Constant | Value | Description |
|---|---|---|
| kLongOrLobReaderModeDefault | 0 | Long or Lob(CLob) data reading mode is default (automatic). |
| kLongOrLobReaderModeManual | 1 | Long or Lob(CLob) data reading mode is manual. |

# Chapter 174

# Statusitem

## 174.1 class NSStatusBarButtonMBS

### 174.1.1 class NSStatusBarButtonMBS

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** StatusBarButtons are the visual representation of NSStatusItems, and are primarily displayed on the right side of the menu bar.
**Notes:** When a template image is set as the \c image property of the status bar button, it is rendered with the correct menu bar style. This guarantees that the button will look correct in various button states and appearances (such as dark menu bar).

Available on Mac OS X 10.10 and newer.
Subclass of the NSButtonMBS class.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 15.0
- MBS Xojo / Real Studio Plugins, version 15.0pr11

### 174.1.2 Methods

### 174.1.3 Available as boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on OS X 10.10.

### 174.1.4 Properties

### 174.1.5 appearsDisabled as Boolean

MBS MacControls Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether icon appears disabled.
**Notes:** When true the status bar icon has a disabled/off appearance while still being functional, such as allowing selection and actions. Defaults to false.
(Read and Write property)

## 174.2 class NSStatusItemMBS

### 174.2.1 class NSStatusItemMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** A class to handle a NSStatusitem which is a tiny little item in the menubar.
**Notes:** All methods in this class will catch exceptions from Cocoa and raise a NSExceptionMBS instead. Using the message, name and reason properties you can see what was the reason for this exception. Please report if you find a method which does not handle exceptions correct.
**Blog Entries**

- IP in menubar 4.6
- MBS Xojo Plugins, version 17.5pr9
- MBS Xojo / Real Studio Plugins, version 16.2pr1
- IP in menubar 4.5
- NSImage and image orientation
- Reducing app size with #if
- MBS Real Studio Plugins, version 11.2pr9
- One reason to upgrade REALbasic
- MBS REALbasic plug-in 9.6
- MonkeyBread Software Releases the MBS Plugins 8.2

**Xojo Developer Magazine**

- 5.6, pages 31 to 33: Third Party Plugins: Statusitems, Getting an icon in the top right of the Mac OS X menubar by Christian Schmitz

### 174.2.2 Methods

### 174.2.3 Available as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether Statusitems are available.
**Notes:** True on MachO platforms.

### 174.2.4 Close

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 174.2.5 CreateMenu as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new menu.
**Notes:** Handle is not 0 after this call was successfull.

If the NSGrayBackground option is set in the system defaults, Mac OS X 10.5 will raise an NSImageCacheException, so please install an exception handle to catch NSExceptionMBS so your application can handle that.
See also:

- 174.2.6 CreateMenu(length as single) as boolean 21710

### 174.2.6 CreateMenu(length as single) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates the StatusItem menu with the given width.
**Example:**

```
dim e as new NSStatusItemMBS
call e.CreateMenu(24) // best for a 16x16 picture
```

**Notes:** Constants:

| | |
|---|---|
| NSVariableStatusItemLength | -1 |
| NSSquareStatusItemLength | -2 |

Other values between 0 and 10000 are used for the length.
Bad values like 20000 will crash the application.

Handle is not 0 after this call was successfull.

If the NSGrayBackground option is set in the system defaults, Mac OS X 10.5 will raise an NSImageCacheException, so please install an exception handle to catch NSExceptionMBS so your application can handle that.
See also:

- 174.2.5 CreateMenu as boolean 21710

### 174.2.7 CreateMenuMiddle(length as single) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CreateMenu instead.
**Function:** Same as CreateMenu but tries to place Statusitem on the right side.
**Notes:** Uses private Apple API which may break on future Mac OS X versions. Returns false if Apple changes something in the future and the function we use will not be available. So if this function returns false, you can call CreateMenu to continue. Works on Mac OS X 10.4 to 10.6 and make the new statusitem being the rightmost one (left to Apples MenuItems).

Constants:

| | |
|---|---|
| NSVariableStatusItemLength | -1 |
| NSSquareStatusItemLength | -2 |

Other values between 0 and 10000 are used for the length.
Bad values like 20000 will crash the application.

Handle is not 0 after this call was successfull.

If the NSGrayBackground option is set in the system defaults, Mac OS X 10.5 will raise an NSImageCacheException, so please install an exception handle to catch NSExceptionMBS so your application can handle that.

Deprecated.

### 174.2.8 CreateMenuRight(length as single) as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use CreateMenu instead.
**Function:** Same as CreateMenu but tries to place Statusitem on the right side.
**Notes:** Uses private Apple API which may break on future Mac OS X versions. Returns false if Apple changes something in the future and the function we use will not be available. So if this function returns

false, you can call CreateMenu to continue. Works on Mac OS X 10.4 to 10.6 and make the new statusitem being the rightmost one.

If you run this code after you used CreateMenuRight, the new menu will be right of all other statusitems:

```
dim sh as new Shell
sh.Execute "killall","SystemUIServer"
```

Constants:

| | |
|---|---|
| NSVariableStatusItemLength | -1 |
| NSSquareStatusItemLength | -2 |

Other values between 0 and 10000 are used for the length.
Bad values like 20000 will crash the application.

Handle is not 0 after this call was successfull.

If the NSGrayBackground option is set in the system defaults, Mac OS X 10.5 will raise an NSImageCacheException, so please install an exception handle to catch NSExceptionMBS so your application can handle that.

Deprecated.

### 174.2.9 DrawStatusBarBackground(x as Double, y as Double, width as Double, height as Double, highlight as boolean)

MBS MacCocoa Plugin, Plugin Version: 7.7, Platform: macOS, Targets: Desktop only.

**Function:** Draws the menu background pattern for a custom status-bar item in regular or highlight pattern.
**Notes:** x, y, width and height: A rectangle defining the area of a custom status-bar item.
highlight: true to draw the background pattern in the standard highlight pattern, false to not highlight the pattern.

You can use this method to help a custom status-bar item emulate the behavior of a standard item.

Available in Mac OS X v10.3 and later.

### 174.2.10 MenuIsVertical as boolean

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the statusitem has a vertical orientation.
**Example:**

MsgBox str(NSStatusItemMBS.MenuIsVertical)

### 174.2.11 MenuThickness as Double

MBS MacCocoa Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The thickness of the status bar.
**Example:**

MsgBox str(NSStatusItemMBS.MenuThickness)

**Notes:** The status bar returned by systemStatusBar has a thickness of 22 pixels, the thickness of the menu bar.

### 174.2.12 popUpStatusItemMenu(menu as NSMenuMBS)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Displays a menu under a custom status bar item.
**Notes:** You can use this method to cause a popup menu to appear under a custom status bar item when the user clicks the item. Note that view must exist (that is, it must not be nil).

### 174.2.13 SendActionOn(mode as Integer)

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the conditions on which action event is called.
**Notes:** mask is set with one or more of the following bit masks described in NSEvent Constants: NSLeftMouseUpMask, NSLeftMouseDownMask, NSLeftMouseDraggedMask, and NSPeriodicMask.

mode is set with one or more of the following bit masks:

```
const NSLeftMouseDownMask       = &h00002
const NSLeftMouseUpMask         = &H00004
const NSLeftMouseDraggedMask    = &h00040
const NSPeriodicMask            = &h10000
```

### 174.2.14 Properties

### 174.2.15 alternateImage as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** An alternate image to be displayed when a status bar item is highlighted.
**Notes:** (Read and Write property)

### 174.2.16 attributedTitle as NSAttributedStringMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The attributed string that is displayed at the status item's position in the status bar.
**Notes:** If an image is also set, the title appears to the right of the image.
(Read and Write property)

### 174.2.17 Button as Variant

MBS MacCocoa Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop only.

**Function:** The button that is displayed in the status bar.
**Notes:** Value is a NSStatusBarButtonMBS object. Returned as Variant to reduce plugin dependencies.

This is created automatically on the creation of the StatusItem. Behavior customization for the button, such as image, target/action, tooltip, can be set with this property.

Available on Mac OS X 10.10 and newer.
(Read only property)

### 174.2.18 Enabled as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this status item is enabled.

**Notes:** (Read and Write property)

### 174.2.19 Handle as Integer

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The handle of the NSStatusItem object used internally.
**Notes:** (Read and Write property)

### 174.2.20 Height as single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The height of the status item.
**Notes:** Should be 22 pixels.
This is a function using undocumented features from the Apple NSStatusItem class, so there is not guarantee that it will work in future versions.
(Read only property)

### 174.2.21 HighlightMode as boolean

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the receiver is highlighted when clicked.
**Notes:** If you use HighlightMode and Menu, you need to first assign the menu and later set HighlightMode to true.
(Read and Write property)

### 174.2.22 image as NSImageMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The image that is displayed at the statusitem's position in the status bar.
**Notes:** nil if an image has not been set.
(Read and Write property)

### 174.2.23 Left as single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The left position of the status item.
**Notes:** Valid only after item was drawn the first time.
This is a function using undocumented features from the Apple NSStatusItem class, so there is not guarantee that it will work in future versions.
(Read only property)

### 174.2.24 Length as single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The length of the status item in pixels.
**Notes:** Constants for special values:

| | |
|---|---|
| NSVariableStatusItemLength | -1 |
| NSSquareStatusItemLength | -2 |

(Read and Write property)

### 174.2.25 Menu as NSMenuMBS

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The menu attached to this statusitem.
**Notes:** Nil if no menu is attached.
(Read and Write property)

### 174.2.26 Title as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The title of the status item.
**Notes:** (Read and Write property)

### 174.2.27 ToolTip as String

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The help tag for a menu item.
**Notes:** (Read and Write property)

### 174.2.28 Top as single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The top position of the status item.
**Notes:** Always 0.
This is a function using undocumented features from the Apple NSStatusItem class, so there is not guarantee that it will work in future versions.
(Read only property)

### 174.2.29 View as NSViewMBS

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the view to be used for this status menuitem.
**Notes:** Using a custom view you can draw whatever you like in the menu item.
You can set it to nil to remove the view.
(Read and Write property)

### 174.2.30 Width as single

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: Desktop only.

**Function:** The width of the status item.
**Notes:** This is a function using undocumented features from the Apple NSStatusItem class, so there is not guarantee that it will work in future versions.
(Read only property)

### 174.2.31 Window as NSWindowMBS

MBS MacCocoa Plugin, Plugin Version: 8.2, Platform: macOS, Targets: Desktop only.

**Function:** The window used for this NSStatusItem.
**Notes:** This is a function using undocumented features from the Apple NSStatusItem class, so there is not guarantee that it will work in future versions.
Returns nil on 64 bit target.
(Read only property)

### 174.2.32 Events

### 174.2.33 Action

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** The event called when the user clicks on the statusitem.
**Notes:** Mouse position can be calculated based on System.MouseX/System.MouseY relative to Left/Top. Mouse status can be read using System.MouseDown.

This event is limited. You can't for example do everything like quit an application. For using quit, start a timer which will remove the menu 500ms later and than quit 500ms later.

This event is coming from the Cocoa event system. What you can do is a bit limited when using GUI functions from Xojo. To avoid some redraw errors, you may want to start a timer and let your Xojo code run a millisecond after the menu code has finished.
Depending on what you do, you can see the menu not redrawing properly (staying highlighted) and crashes if the Xojo code modifies some global Cocoa states.

### 174.2.34 DoubleAction

MBS MacCocoa Plugin, Plugin Version: 7.2, Platform: macOS, Targets: .

**Function:** The event called when the user double clicks on the statusitem.
**Notes:** If two Action Events happen very fast, this one is called the second time so you can e.g. react on double clicks.
Mouse position can be calculated based on System.MouseX/System.MouseY relative to Left/Top. Mouse status can be read using System.MouseDown.

This event is coming from the Cocoa event system. What you can do is a bit limited when using GUI functions from Xojo. To avoid some redraw errors, you may want to start a timer and let your Xojo code run a millisecond after the menu code has finished.
Depending on what you do, you can see the menu not redrawing properly (staying highlighted) and crashes if the Xojo code modifies some global Cocoa states.

### 174.2.35 Screenshots

### 174.2.36 NSStatusItem.jpg

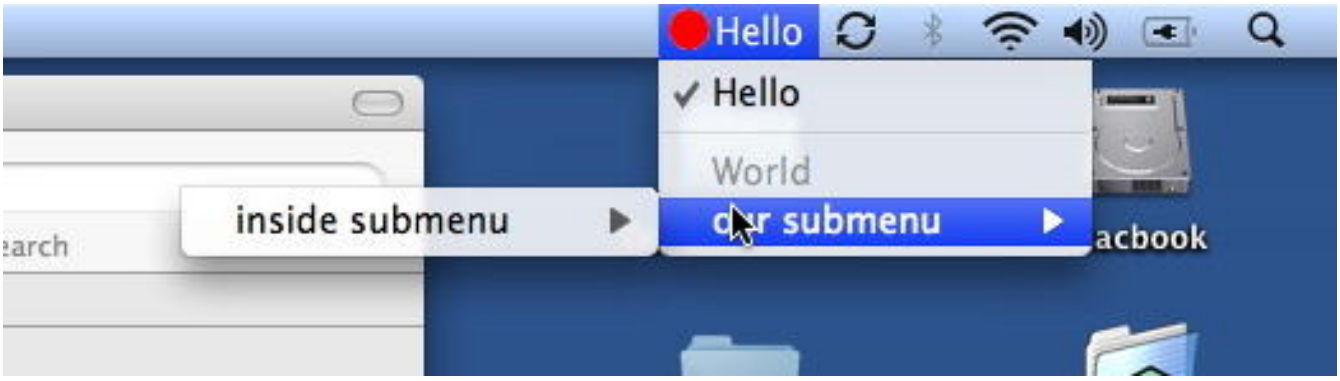


**Function:** The NSStatusItem running a menu on the top right of the menubar.

# Chapter 175

# StoreKit

## 175.1 class AppReceiptIAPMBS

### 175.1.1 class AppReceiptIAPMBS

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The class to represent an in-app purchase in the app receipt.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show purchases
dim inAppPurchases() as AppReceiptIAPMBS = r.inAppPurchases
for each p as AppReceiptIAPMBS in inAppPurchases
MsgBox str(p.quantity)+"x "+p.productIdentifier+" "+p.purchaseDate.AbbreviatedDate
next
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr8

- Validating Receipts of Mac App Store Purchases including In-App Purchases

### 175.1.2 Methods

### 175.1.3 Constructor

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 175.1.4 isActiveAutoRenewableSubscriptionForDate(d as Date) as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the auto renewable subscription is active for the given date.
**Notes:** date: The date in which the auto-renewable subscription should be active. If you are using the current date, you might not want to take it from the device in case the user has changed it.
Returns true if the auto-renewable subscription is active for the given date, false otherwise.

Auto-renewable subscription lapses are possible. If you are checking against the current date, you might want to deduct some time as tolerance.
If this method fails Apple recommends to refresh the receipt and try again once.
See also:

- 175.1.5 isActiveAutoRenewableSubscriptionForDate(d as DateTime) as boolean 21722

### 175.1.5 isActiveAutoRenewableSubscriptionForDate(d as DateTime) as boolean

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns whether the auto renewable subscription is active for the given date.
**Notes:** date: The date in which the auto-renewable subscription should be active. If you are using the current date, you might not want to take it from the device in case the user has changed it.
Returns true if the auto-renewable subscription is active for the given date, false otherwise.

Auto-renewable subscription lapses are possible. If you are checking against the current date, you might want to deduct some time as tolerance.
If this method fails Apple recommends to refresh the receipt and try again once.
See also:

- 175.1.4 isActiveAutoRenewableSubscriptionForDate(d as Date) as boolean 21722

### 175.1.6 Properties

### 175.1.7 cancellationDate as Date

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** For a transaction that was canceled by Apple customer support, the date of the cancellation.
**Notes:** (Read only property)

### 175.1.8 cancellationDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** For a transaction that was canceled by Apple customer support, the date of the cancellation.
**Notes:** (Read only property)

### 175.1.9 originalPurchaseDate as Date

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** For a transaction that restores a previous transaction, the date of the original transaction.
**Notes:** This value corresponds to the original transaction's transactionDate property.
In an auto-renewable subscription receipt, this indicates the beginning of the subscription period, even if the subscription has been renewed.
(Read only property)

### 175.1.10 originalPurchaseDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** For a transaction that restores a previous transaction, the date of the original transaction.
**Notes:** This value corresponds to the original transaction's transactionDate property.
In an auto-renewable subscription receipt, this indicates the beginning of the subscription period, even if the subscription has been renewed.
(Read only property)

### 175.1.11 originalTransactionIdentifier as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** For a transaction that restores a previous transaction, the transaction identifier of the original

transaction.
**Notes:** Otherwise, identical to the transaction identifier.
This value corresponds to the original transaction's transactionIdentifier property.
All receipts in a chain of renewals for an auto-renewable subscription have the same value for this field.
(Read only property)

### 175.1.12 productIdentifier as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The product identifier of the item that was purchased.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show purchases
dim inAppPurchases() as AppReceiptIAPMBS = r.inAppPurchases
for each p as AppReceiptIAPMBS in inAppPurchases
MsgBox str(p.quantity)+"x "+p.productIdentifier+" "+p.purchaseDate.AbbreviatedDate
next
```

**Notes:** This value corresponds to the productIdentifier property of the SKPayment object stored in the transaction,Äôs payment property.
(Read only property)

### 175.1.13 purchaseDate as Date

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date and time that the item was purchased.
**Notes:** This value corresponds to the transaction,Äôs transactionDate property.

For a transaction that restores a previous transaction, the purchase date is the date of the restoration. Use originalPurchaseDate to get the date of the original transaction.

In an auto-renewable subscription receipt, this is always the date when the subscription was purchased or renewed, regardles of whether the transaction has been restored.
(Read only property)

### 175.1.14 purchaseDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date and time that the item was purchased.
**Notes:** (Read only property)

### 175.1.15 quantity as Integer

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The number of items purchased.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show purchases
dim inAppPurchases() as AppReceiptIAPMBS = r.inAppPurchases
for each p as AppReceiptIAPMBS in inAppPurchases
MsgBox str(p.quantity)+"x "+p.productIdentifier+" "+p.purchaseDate.AbbreviatedDate
next
```

**Notes:** This value corresponds to the quantity property of the SKPayment object stored in the transaction,Äôs payment property.
(Read only property)

### 175.1.16 subscriptionExpirationDate as Date

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The expiration date for the subscription.
**Notes:** Only present for auto-renewable subscription receipts.
(Read only property)

### 175.1.17 subscriptionExpirationDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The expiration date for the subscription.
**Notes:** Only present for auto-renewable subscription receipts.

(Read only property)

### 175.1.18 transactionIdentifier as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The transaction identifier of the item that was purchased.
**Notes:** This value corresponds to the transaction's transactionIdentifier property.
(Read only property)

### 175.1.19 webOrderLineItemID as Integer

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The primary key for identifying subscription purchases.
**Notes:** (Read only property)

## 175.2 class AppReceiptMBS

### 175.2.1 class AppReceiptMBS

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The class for an app receipt.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show value
MsgBox r.bundleIdentifier
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr10
- MBS Xojo / Real Studio Plugins, version 14.3pr8
- Validating Receipts of Mac App Store Purchases including In-App Purchases

### 175.2.2 Methods

### 175.2.3 bundleReceipt as AppReceiptMBS

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns the app receipt contained in the bundle, if any and valid.
**Notes:** Extracts the receipt in ASN1 from the PKCS #7 container, and then parses the ASN1 data into a AppReceiptMBS instance. If an Apple Root certificate is available, it will also verify that the signature of the receipt is valid.
Returns the app receipt contained in the bundle, or nil if there is no receipt or if it is invalid.

### 175.2.4 Constructor

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 175.2.5 containsActiveAutoRenewableSubscriptionOfProductIdentifier(productIdentifier as string, d as date) as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns whether the receipt contains an active auto-renewable subscription for the given product identifier and for the given date.
**Notes:** productIdentifier: The identifier of the auto-renewable subscription.
date: The date in which the latest auto-renewable subscription should be active. If you are using the current date, you might not want to take it from the device in case the user has changed it.
Returns true if the latest auto-renewable subscription is active for the given date, false otherwise.

Auto-renewable subscription lapses are possible. If you are checking against the current date, you might want to deduct some time as tolerance.
If this method fails Apple recommends to refresh the receipt and try again once.
See also:

- 175.2.6 containsActiveAutoRenewableSubscriptionOfProductIdentifier(productIdentifier as string, d as dateTime) as boolean 21728

### 175.2.6 containsActiveAutoRenewableSubscriptionOfProductIdentifier(productIdentifier as string, d as dateTime) as boolean

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Returns whether the receipt contains an active auto-renewable subscription for the given product identifier and for the given date.
**Notes:** productIdentifier: The identifier of the auto-renewable subscription.
date: The date in which the latest auto-renewable subscription should be active. If you are using the current date, you might not want to take it from the device in case the user has changed it.
Returns true if the latest auto-renewable subscription is active for the given date, false otherwise.

Auto-renewable subscription lapses are possible. If you are checking against the current date, you might want to deduct some time as tolerance.
If this method fails Apple recommends to refresh the receipt and try again once.
See also:

- 175.2.5 containsActiveAutoRenewableSubscriptionOfProductIdentifier(productIdentifier as string, d as date) as boolean 21728

### 175.2.7 containsInAppPurchaseOfProductIdentifier(productIdentifier as string) as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns whether there is an in-app purchase in the receipt for the given product.
**Notes:** productIdentifier: The identifier of the product.
True if there is an in-app purchase for the given product, false otherwise.

### 175.2.8 inAppPurchases as AppReceiptIAPMBS()

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Array of in-app purchases contained in the receipt.

### 175.2.9 receiptForFile(file as folderitem) as AppReceiptMBS

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns the app receipt contained in the given file, if any and valid.
**Example:**

```
dim a as new AppReceiptVerificatorMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// testing with receipt from current Dash app
a.bundleIdentifier = "com.kapeli.dash"
a.bundleVersion = "2.1.2"

if a.verifyReceipt(r) then
MsgBox "My receipt is valid"
else
MsgBox "My receipt is invalid."
end if
```

**Notes:** Extracts the receipt in ASN1 from the PKCS #7 container, and then parses the ASN1 data into a AppReceiptMBS instance. If an Apple Root certificate is available, it will also verify that the signature of the receipt is valid.
Returns the receipt contained in the given file, or nil if there is no receipt or if it is invalid.

### 175.2.10 setAppleRootCertificate(Data as Memoryblock)

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Sets the certificate data of the Apple Root certificate that will be used to verifiy the signature of the bundle receipt.

**Notes:** If none is provided, the resource AppleIncRootCertificate.cer will be used. If no certificate is available, no signature verification will be performed.
data: The contents of the Apple Root certificate file to use.
See also:

- 175.2.11 setAppleRootCertificate(File as FolderItem) 21730

### 175.2.11 setAppleRootCertificate(File as FolderItem)

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Sets the file of the Apple Root certificate that will be used to verifiy the signature of the bundle receipt.
**Notes:** If none is provided, the resource AppleIncRootCertificate.cer will be used. If no certificate is available, no signature verification will be performed.
file: The folderitem of the Apple Root certificate.
See also:

- 175.2.10 setAppleRootCertificate(Data as Memoryblock) 21729

### 175.2.12 verifyReceiptHash as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Returns wheter the receipt hash corresponds to the device's GUID by calcuting the expected hash using the GUID, bundleIdentifierData and opaqueValue.
**Notes:** Returns true if the hash contained in the receipt corresponds to the device's GUID, false otherwise.

### 175.2.13 Properties

### 175.2.14 appVersion as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The app,Äôs version number.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show value
MsgBox r.appVersion
```

**Notes:** This corresponds to the value of CFBundleVersion (in iOS) or CFBundleShortVersionString (in OS X) in the Info.plist.
(Read only property)

### 175.2.15 bundleIdentifier as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The bundle identifier.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show value
MsgBox r.bundleIdentifier
```

**Notes:** This corresponds to the value of CFBundleIdentifier in the Info.plist file.
(Read only property)

### 175.2.16 bundleIdentifierData as Memoryblock

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The bundle identifier as data.
**Notes:** The bundle identifier as data, as contained in the receipt. Used to verifiy the receipt's hash.
(Read only property)

### 175.2.17 creationDate as Date

MBS MacCloud Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The creation date of the receipt.
**Notes:** (Read only property)

### 175.2.18 creationDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The creation date of the receipt.
**Notes:** (Read only property)

### 175.2.19 expirationDate as Date

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The date that the app receipt expires.
**Notes:** Only for apps purchased through the Volume Purchase Program. If nil, the receipt does not expire. When validating a receipt, compare this date to the current date to determine whether the receipt is expired. Do not try to use this date to calculate any other information, such as the time remaining before expiration. (Read only property)

### 175.2.20 expirationDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The date that the app receipt expires.
**Notes:** Only for apps purchased through the Volume Purchase Program. If nil, the receipt does not expire. When validating a receipt, compare this date to the current date to determine whether the receipt is expired. Do not try to use this date to calculate any other information, such as the time remaining before expiration. (Read only property)

### 175.2.21 opaqueValue as Memoryblock

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** An opaque value used as part of the SHA-1 hash.
**Notes:** (Read only property)

### 175.2.22 originalAppVersion as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The version of the app that was originally purchased.
**Example:**

```
// open a receipt
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// show value
```

MsgBox r.originalAppVersion

**Notes:** This corresponds to the value of CFBundleVersion (in iOS) or CFBundleShortVersionString (in OS X) in the Info.plist file when the purchase was originally made. In the sandbox environment, the value of this field is always "1.0".
(Read only property)

### 175.2.23 purchaseDate as Date

MBS MacCloud Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Another date.
**Notes:** Digging in a receipt we found this field and assume it is the original purchase date.
(Read only property)

### 175.2.24 purchaseDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Another date.
**Notes:** Digging in a receipt we found this field and assume it is the original purchase date.
(Read only property)

### 175.2.25 receiptHash as Memoryblock

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** A SHA-1 hash, used to validate the receipt.
**Notes:** (Read only property)

### 175.2.26 transactionDate as Date

MBS MacCloud Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Another date.
**Notes:** Digging in a receipt we found this field and assume it is the transaction date.
(Read only property)

### 175.2.27 transactionDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Another date.
**Notes:** Digging in a receipt we found this field and assume it is the transaction date.
(Read only property)

## 175.3 class AppReceiptVerificatorMBS

### 175.3.1 class AppReceiptVerificatorMBS

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Reference implementation of an app receipt verificator.
**Example:**

```
dim a as new AppReceiptVerificatorMBS

if a.verifyAppReceipt then
MsgBox "My receipt is valid"
else
MsgBox "My receipt is invalid."
end if
```

**Notes:** If security is a concern you might want to avoid using a verificator whose code is open source.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0
- MBS Xojo Plugins, version 17.6pr4
- MBS Xojo / Real Studio Plugins, version 16.0pr7
- MBS Xojo / Real Studio Plugins, version 14.3pr8
- Validating Receipts of Mac App Store Purchases including In-App Purchases

### 175.3.2 Methods

### 175.3.3 Constructor

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The constructor.

### 175.3.4 ExitApp(code as Integer = 173)

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Quits the application directly.
**Example:**

AppReceiptVerificatorMBS.ExitApp 173

**Notes:** This does not call the destructors and CancelClose events. The app is quit right away.
If you use code 173 the Finder will show error message that app needs to be downloaded again from Mac App Store.

### 175.3.5 GUID as string

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads the GUID of the Mac.
**Example:**

```
dim g as String = AppReceiptVerificatorMBS.GUID
MsgBox EncodeHex(g)
```

**Notes:** This is normally build from the MAC ID of the ethernet card.

### 175.3.6 verifyAppReceipt as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Verifies the app's receipt file.
**Example:**

```
dim a as new AppReceiptVerificatorMBS

if a.verifyAppReceipt then
MsgBox "My receipt is valid"
else
MsgBox "My receipt is invalid."
end if
```

**Notes:** Verifies the receipt by checking the integrity of the receipt, comparing its bundle identifier and bundle version to the values returned by the corresponding properties and verifying the receipt hash.

Returns true if the receipt is verified, false otherwise.
If validation fails, Apple recommends to refresh the receipt and try again.

If you set bundleVersion and/or bundleIdentifier properties, we use those values.
Else we pick them from the info.plist of the app.

### 175.3.7 verifyReceipt(Receipt as AppReceiptMBS) as boolean

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** Verifies the given receipt file.
**Example:**

```
dim a as new AppReceiptVerificatorMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("receipt")
dim r as AppReceiptMBS = AppReceiptMBS.receiptForFile(f)

// testing with receipt from current Dash app
a.bundleIdentifier = "com.kapeli.dash"
a.bundleVersion = "2.1.2"

if a.verifyReceipt(r) then
MsgBox "My receipt is valid"
else
MsgBox "My receipt is invalid."
end if
```

**Notes:** Verifies the receipt by checking the integrity of the receipt, comparing its bundle identifier and bundle version to the values returned by the corresponding properties and verifying the receipt hash.

Returns true if the receipt is verified, false otherwise.
If validation fails, Apple recommends to refresh the receipt and try again.

### 175.3.8 Properties

### 175.3.9 bundleIdentifier as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The value that will be used to validate the bundle identifier included in the app receipt.
**Notes:** Given that it is possible to modify the app bundle in jailbroken devices, setting this value from a hardcoded string might provide better protection.
Returns the given value, or the app's bundle identifier by default.
(Read and Write property)

### 175.3.10 bundleVersion as String

MBS MacCloud Plugin, Plugin Version: 14.3, Platform: macOS, Targets: All.

**Function:** The value that will be used to validate the bundle version included in the app receipt.
**Notes:** Given that it is possible to modify the app bundle in jailbroken devices, setting this value from a hardcoded string might provide better protection.
Returns the given value, or the app's bundle version by default.
(Read and Write property)

### 175.3.11 FailReason as String

MBS MacCloud Plugin, Plugin Version: 16.0, Platform: macOS, Targets: All.

**Function:** The reason for a failure.
**Notes:** This is for debugging and to help you to find the reason for why a verification fails.
(Read only property)

### 175.3.12 MACAddress as MemoryBlock

MBS MacCloud Plugin, Plugin Version: 18.0, Platform: macOS, Targets: All.

**Function:** The MAC Address to use.
**Example:**

```
// get the one of this Mac
dim m as MemoryBlock = AppReceiptVerificatorMBS.MACAddress

// now set a fake one
dim x as MemoryBlock = DecodeHex("12347890ABCD")
AppReceiptVerificatorMBS.MACAddress = x

// and display
MsgBox EncodeHex(m)+EndOfLine+EncodeHex(AppReceiptVerificatorMBS.MACAddress)
```

**Notes:** Can be queried to automatically get the one we detect.
Or set to use a custom one for testing.
(Read and Write property)

## 175.4 class SKDownloadMBS

### 175.4.1 class SKDownloadMBS

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This storeKit class gives you information about the download status of a content file.
**Notes:** Available in Mac OS X 10.8 and newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1

### 175.4.2 Methods

### 175.4.3 Constructor

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 175.4.4 contentURLForProductID(productID as string) as string

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries content URL for a product.

### 175.4.5 deleteContentForProductID(productID as string)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Deletes the content for that identifier from disk.

### 175.4.6 Properties

### 175.4.7 contentIdentifier as string

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Product identifier entered in iTunesConnect.
**Notes:** (Read only property)

### 175.4.8 contentLength as Int64

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Filesize of the asset.
**Notes:** (Read only property)

### 175.4.9 contentURL as string

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Content URL.
**Notes:** (Read only property)

### 175.4.10 contentVersion as string

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Version string of the product.
**Notes:** (Read only property)

### 175.4.11 error as NSErrorMBS

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Last error, can be nil.
**Notes:** (Read only property)

### 175.4.12 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 175.4.13 progress as Double

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Download progress.
**Notes:** (Read only property)

### 175.4.14 state as Integer

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Download state.
**Notes:** (Read only property)

### 175.4.15 timeRemaining as Double

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Estimated number of seconds remaining in the download.
**Notes:** (Read only property)

### 175.4.16 Transaction as SKPaymentTransactionMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transaction associated with the downloadable file
**Notes:** Available in MacOS 10.11 or newer.
(Read only property)

### 175.4.17 Constants

Download State Constants

| Constant | Value | Description |
|---|---|---|
| kStateActive | 1 | Active |
| kStateCancelled | 5 | Cancelled |
| kStateFailed | 4 | Failed |
| kStateFinished | 3 | Finished |
| kStatePaused | 2 | Paused |
| kStateWaiting | 0 | Waiting |

## 175.5 class SKMutablePaymentMBS

### 175.5.1 class SKMutablePaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The mutable class for SKPaymentMBS.
**Notes:** The SKMutablePayment class defines a request to the Apple App Store to process payment for additional functionality offered by your application. A payment encapsulates a string that identifies a particular product and the quantity of that item the user would like to purchase.

When a mutable payment is added to the payment queue, the payment queue copies the contents into an immutable request before queueing the request. Your application can safely change the contents of the mutable payment object.

Please also check the documentation from Apple for the SKMutablePayment class.
Subclass of the SKPaymentMBS class.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr1

### 175.5.2 Methods

### 175.5.3 Constructor(payment as SKPaymentMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a mutable copy of the given payment.
See also:

- 175.5.4 Constructor(product as SKProductMBS) 21742

### 175.5.4 Constructor(product as SKProductMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new payment for the specified product.
**Example:**

```
dim product as SKProductMBS // your product
dim queue as SKPaymentQueueMBS // your queue

dim payment as new SKMutablePaymentMBS(product)
payment.quantity = 5
```

```
MsgBox str(payment.quantity)+" units of "+product.localizedTitle

queue.addPayment payment
```

See also:

- 175.5.3 Constructor(payment as SKPaymentMBS) 21742

### 175.5.5 paymentWithProduct(product as SKProductMBS) as SKMutablePaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new payment for the specified product with the given quantity.
**Example:**

```
dim product as SKProductMBS // your product
dim payment as SKMutablePaymentMBS = SKMutablePaymentMBS.paymentWithProduct(product)

MsgBox str(payment.quantity)+" units of "+product.localizedTitle
```

**Notes:** product: The product the user wishes to purchase.
quantity: Optional quantity. If you don't pass it, we default to 1.

This factory Method in Cocoa Core Competencies uses the productIdentifier property obtained from the product parameter to create and return a new payment with that identifier.

Available in Mac OS X v10.7 and later.
See also:

- 175.5.6 paymentWithProduct(product as SKProductMBS, quantity as Integer) as SKMutablePaymentMBS 21743

### 175.5.6 paymentWithProduct(product as SKProductMBS, quantity as Integer) as SKMutablePaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new payment for the specified product with the given quantity.
**Example:**

```
dim product as SKProductMBS // your product
dim payment as SKMutablePaymentMBS = SKMutablePaymentMBS.paymentWithProduct(product, 5)
```

MsgBox str(payment.quantity)+" units of "+product.localizedTitle

**Notes:** product: The product the user wishes to purchase.
quantity: Optional quantity. If you don't pass it, we default to 1.

This factory Method in Cocoa Core Competencies uses the productIdentifier property obtained from the product parameter to create and return a new payment with that identifier.

Available in Mac OS X v10.7 and later.
See also:

- 175.5.5 paymentWithProduct(product as SKProductMBS) as SKMutablePaymentMBS 21743

### 175.5.7 Properties

### 175.5.8 applicationUsername as String

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Application-specific user identifier. Optional.
**Notes:** (Read and Write property)

### 175.5.9 productIdentifier as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string that identifies a product that can be purchased from within your application.
**Notes:** The product identifier is a string previously agreed on between your application and the Apple App Store.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 175.5.10 quantity as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of items the user wants to purchase.
**Notes:** The quantity property must be greater than 0.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 175.5.11 requestData as Memoryblock

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reserved for future use.
**Notes:** The default value is nil. If requestData is not nil, your payment will be rejected by the Apple App Store.

Available in Mac OS X v10.7 and later.
(Read and Write property)

### 175.5.12 simulatesAskToBuyInSandbox as Boolean

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that produces an ‚Äúask to buy‚Äù flow for this payment in the sandbox.
**Notes:** Available on MacOS 10.14 or newer.
(Read and Write property)

## 175.6 class SKPaymentMBS

### 175.6.1 class SKPaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a payment in the App Store.
**Notes:** The SKPayment class defines a request to the Apple App Store to process payment for additional functionality offered by your application. A payment encapsulates a string that identifies a particular product and the quantity of those items the user would like to purchase.

Please also check the documentation from Apple for the SKPayment class.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr6
- MBS Real Studio Plugins, version 11.3pr1

### 175.6.2 Methods

### 175.6.3 Constructor(product as SKProductMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new payment for the specified product.
**Example:**

```
dim product as SKProductMBS // your product
dim queue as SKPaymentQueueMBS // your queue

dim payment as new SKPaymentMBS(product)
MsgBox str(payment.quantity)+" units of "+product.localizedTitle

queue.addPayment payment
```

### 175.6.4 copy as SKPaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the object.

### 175.6.5 mutableCopy as SKMutablePaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a mutable copy of the object.

### 175.6.6 paymentWithProduct(product as SKProductMBS) as SKPaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns a new payment for the specified product.
**Example:**

```
dim product as SKProductMBS // your product
dim queue as SKPaymentQueueMBS // your queue

dim payment as SKPaymentMBS = SKPaymentMBS.paymentWithProduct(product)
MsgBox str(payment.quantity)+" units of "+product.localizedTitle

queue.addPayment payment
```

**Notes:** product: The product the user wishes to purchase.

This factory Method in Cocoa Core Competencies uses the productIdentifier property obtained from the product parameter to create and return a new payment with that identifier. The quantity property defaults to 1.

To create a SKPaymentMBS object with a quantity greater than 1, create a SKMutablePaymentMBS object, adjust its quantity property and then add it to the payment queue.

Available in Mac OS X v10.7 and later.

### 175.6.7 Properties

### 175.6.8 applicationUsername as String

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Application-specific user identifier. Optional.
**Notes:** (Read only property)

### 175.6.9 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference to the SKPayment object.
**Notes:** (Read and Write property)

### 175.6.10 productIdentifier as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string used to identify a product that can be purchased from within your application. (read-only)
**Notes:** The product identifier is a string previously agreed on between your application and the Apple App Store.

Available in Mac OS X v10.7 and later.
(Read only property)

### 175.6.11 quantity as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of items the user wants to purchase. (read-only)
**Notes:** Default value is 1.
Available in Mac OS X v10.7 and later.
(Read only property)

### 175.6.12 requestData as Memoryblock

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reserved for future use. (read-only)
**Notes:** The default value is nil. If requestData is not nil, your payment will be rejected by the Apple App Store.

Available in Mac OS X v10.7 and later.
(Read only property)

### 175.6.13 simulatesAskToBuyInSandbox as Boolean

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that produces an ‚Äúask to buy‚Äù flow for this payment in the sandbox.
**Notes:** Available on MacOS 10.14 or newer.
(Read only property)

## 175.7 class SKPaymentQueueMBS

### 175.7.1 class SKPaymentQueueMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The SKPaymentQueue class defines a queue of payment transactions to send to the Apple App Store.
**Notes:** To use the payment queue, you add one or more payments. When payments are added to the queue, Store Kit connects to the Apple App Store and presents a user interface so that the user can authorize payment. As payments are fulfilled, the payment queue updates transactions and delivers them through events.

Available in Mac OS X v10.7 and later.
Please also check the documentation from Apple for the SKPaymentQueue class.
The plugin installs a transaction observer for you.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr6
- MBS Xojo Plugins, version 18.1pr3

### 175.7.2 Methods

### 175.7.3 addPayment(payment as SKPaymentMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds a payment request to the queue.
**Notes:** payment: A payment request.

The payment request must have a product identifier registered with the Apple App Store and a quantity greater than 0. If either property is invalid, addPayment throws an exception.

When a payment request is added to the queue, the payment queue processes that request with the Apple App Store and arranges for payment from the user. When that transaction is complete or if a failure occurs, the payment queue sends the SKPaymentTransaction object that encapsulates the request to all transaction observers.

### 175.7.4 cancelDownload(download as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancel one download.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.5 cancelDownloads(downloads() as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancel a few downloads.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.6 canMakePayments as boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns whether the user is allowed to make payments.
**Example:**

```
if SKPaymentQueueMBS.canMakePayments then
MsgBox "can make payments"
else
MsgBox "not available"
end if
```

**Notes:** A Mac can be restricted from accessing the Apple App Store. For example, parents can restrict their children's ability to purchase additional content. Your application should confirm that the user is allowed to authorize payments before adding a payment to the queue. Your application may also want to alter its behavior or appearance when the user is not allowed to authorize payments.

### 175.7.7 Constructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new SKPaymentQueueMBS object.
**Notes:** Please make a subclass of this class to fill code into the events.
And please only have one instance of this class.

### 175.7.8 Destructor

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 175.7.9 finishTransaction(transaction as SKPaymentTransactionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Completes a pending transaction.
**Notes:** transaction: The transaction to finish.

Your application should call this method from a transaction observer that received a notification from the payment queue. Calling finishTransaction on a transaction removes it from the queue. Your application should call finishTransaction only after it has successfully processed the transaction and unlocked the functionality purchased by the user.

Calling finishTransaction on a transaction that is in the SKPaymentTransactionMBS.StatePurchasing state throws an exception.

### 175.7.10 pauseDownload(download as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pauses one download.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.11 pauseDownloads(downloads() as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Pauses a few downloads.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.12 restoreCompletedTransactions

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asks the payment queue to restore previously completed purchases.
**Notes:** Your application calls this method to restore transactions that were previously finished so that you can process them again. For example, your application would use this to allow a user to unlock previously purchased content onto a new device.

When you create a new product to be sold in your store, you choose whether that product can be restored or not. See the In App Purchase Programming Guide for more information.

The payment queue will deliver a new transaction for each previously completed transaction that can be restored. Each transaction includes a copy of the original transaction.

After the transactions are delivered, the payment queue calls the observer's paymentQueueRestoreCompletedTransactionsFinished event. If an error occurred while restoring transactions, the observer will be notified through its paymentQueue:restoreCompletedTransactionsFailedWithError event.

### 175.7.13 restoreCompletedTransactionsWithApplicationUsername(username as String)

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Asks the payment queue to restore previously completed purchases, providing an opaque identifier for the user,Äôs account.
**Notes:** username: An opaque identifier for the user,Äôs account on your system.

### 175.7.14 resumeDownload(download as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Resumes one download.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.15 resumeDownloads(downloads() as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Resumes a few downloads.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.16 startDownload(download as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Start one download.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.17 startDownloads(downloads() as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Starts a few downloads.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.18 transactions as SKPaymentTransactionMBS()

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an array of pending transactions.
**Notes:** The value of this property is undefined when there are no observers attached to the payment queue.

### 175.7.19 Properties

### 175.7.20 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference.
**Notes:** (Read and Write property)

### 175.7.21 Events

### 175.7.22 paymentQueueRestoreCompletedTransactionsFinished

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the observer that the payment queue has finished sending restored transactions.
**Notes:** This method is called after all restorable transactions have been processed by the payment queue. Your application is not required to do anything in this method.

### 175.7.23 removedTransactions(transactions() as SKPaymentTransactionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells an observer that one or more transactions have been removed from the queue.
**Notes:** transactions: An array of the transactions that were removed.

Your application does not typically need to implement this event but might implement it to update its own user interface to reflect that a transaction has been completed.

### 175.7.24 restoreCompletedTransactionsFailedWithError(Error as NSErrorMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells the observer that an error occurred while restoring transactions.

### 175.7.25 updatedDownloads(downloads() as SKDownloadMBS)

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent when the download state has changed.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.7.26 updatedTransactions(transactions() as SKPaymentTransactionMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Tells an observer that one or more transactions have been updated.
**Notes:** transactions: An array of the transactions that were updated.

The application should process each transaction by examining the transaction's transactionState property. If transactionState is SKPaymentTransactionStatePurchased, payment was successfully received for the desired functionality. The application should make the functionality available to the user. If transactionState is SKPaymentTransactionStateFailed, the application can read the transaction's error property to return a meaningful error to the user.

Once a transaction is processed, it should be removed from the payment queue by calling the payment queue's finishTransaction: method, passing the transaction as a parameter.

Important: Once the transaction is finished, Store Kit can not tell you that this item is already purchased. It is important that applications process the transaction completely before calling finishTransaction:.

## 175.8 class SKPaymentTransactionMBS

### 175.8.1 class SKPaymentTransactionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The SKPaymentTransactionMBS class defines objects residing in the payment queue.
**Notes:** A payment transaction is created whenever a payment is added to the payment queue. Transactions are delivered to your application when the App Store has finished processing the payment. Completed transactions provide a receipt and transaction identifier that your application can use to save a permanent record of the processed payment.

Please also check the documentation from Apple for the SKPaymentTransaction class.
Available in Mac OS X v10.7 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 175.8.2 Methods

### 175.8.3 Constructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 175.8.4 downloads as SKDownloadMBS()

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the downloads for this transaction.
**Notes:** Available in Mac OS X 10.8 and newer.

### 175.8.5 Properties

### 175.8.6 error as NSErrorMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object describing the error that occurred while processing the transaction.
**Notes:** The error property is undefined except when transactionState is set to StateFailed. Your application can read the error property to determine why the transaction failed.

(Read only property)

### 175.8.7 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference to the SKPaymentTransaction object.
**Notes:** (Read and Write property)

### 175.8.8 originalTransaction as SKPaymentTransactionMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The transaction that was restored by the App Store.
**Notes:** The contents of this property are undefined except when transactionState is set to StateRestored. When a transaction is restored, the current transaction holds a new transaction identifier, receipt, and so on. Your application will read this property to retrieve the restored transaction.
(Read only property)

### 175.8.9 payment as SKPaymentMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The payment for the transaction.
**Notes:** Each payment transaction is created in response to a payment that your application added to the payment queue.
(Read only property)

### 175.8.10 transactionDate as date

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The date the transaction was added to the App Store's payment queue.
**Notes:** The contents of this property are undefined except when transactionState is set to StatePurchased or StateRestored.
(Read only property)

### 175.8.11 transactionDateTime as DateTime

MBS MacCloud Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The date the transaction was added to the App Store's payment queue.
**Notes:** The contents of this property are undefined except when transactionState is set to StatePurchased or StateRestored.
(Read only property)

### 175.8.12 transactionIdentifier as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string that uniquely identifies a successful payment transaction.
**Notes:** The contents of this property are undefined except when transactionState is set to StatePurchased or StateRestored. The transactionIdentifier is a string that uniquely identifies the processed payment. Your application may wish to record this string as part of an audit trail for App Store purchases. See In App Purchase Programming Guide for more information.
(Read only property)

### 175.8.13 transactionState as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current state of the transaction.
**Notes:** see State* constants.
(Read only property)

### 175.8.14 Constants

Transaction State Constants

| Constant | Value | Description |
|---|---|---|
| StateDeferred | 4 | Transaction is neither purchased nor failed, yet. |
| StateFailed | 2 | The transaction failed. Check the error property to determine what happened. |
| StatePurchased | 1 | The App Store successfully processed payment. Your application should provide the content the user purchased. |
| StatePurchasing | 0 | The transaction is being processed by the App Store. |
| StateRestored | 3 | This transaction restores content previously purchased by the user. Read the originalTransaction property to obtain information about the original purchase. |

## 175.9 class SKProductDiscountMBS

### 175.9.1 class SKProductDiscountMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for product discounts.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 175.9.2 Methods

### 175.9.3 Constructor

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 175.9.4 Properties

### 175.9.5 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 175.9.6 NumberOfPeriods as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of periods this price is valid.
**Notes:** (Read only property)

### 175.9.7 PaymentMode as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The payment mode.
**Notes:** (Read only property)

### 175.9.8 Price as Double

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The price of the product.
**Notes:** (Read only property)

### 175.9.9 priceLocale as NSLocaleMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The price locale.
**Notes:** (Read only property)

### 175.9.10 PriceString as String

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The price as formatted string.
**Notes:** (Read only property)

### 175.9.11 subscriptionPeriod as SKProductSubscriptionPeriodMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The subscription period.
**Notes:** (Read only property)

### 175.9.12 Constants

Payment Modes

| Constant | Value | Description |
|---|---|---|
| kPaymentModeFreeTrial | 2 | Free trial |
| kPaymentModePayAsYouGo | 0 | Pay ss you go |
| kPaymentModePayUpFront | 1 | Pay Upfront |

# 175.10 class SKProductMBS

## 175.10.1 class SKProductMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The App Store class for a product.
**Notes:** SKProductMBS objects are returned as part of an didReceiveResponse event in SKProductsRequestMBS class and are used to provide information about a product previously registered with the Apple App Store.

Please also check the documentation from Apple for the SKProduct class.
Available in Mac OS X v10.7 and later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr6

## 175.10.2 Methods

## 175.10.3 Constructor

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 175.10.4 contentLengths as Int64()

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Array with filesizes of the assets.
**Notes:** Available in Mac OS X 10.8 and newer.

## 175.10.5 downloadContentLengths as Int64()

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** The lengths of the downloadable files available for this product.
**Notes:** The array holds Int64 values that is the size of one of the downloadable files (in bytes).

For MacOS 10.14 or newer.
Falls back to downloadLengths for older OS versions.

### 175.10.6 Properties

### 175.10.7 contentLength as Int64

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Total filesize of the assets.
**Notes:** Available in Mac OS X 10.8 and newer.
(Read only property)

### 175.10.8 contentVersion as string

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Version string of the product.
**Notes:** Available in Mac OS X 10.8 and newer.
(Read only property)

### 175.10.9 downloadable as boolean

MBS MacCloud Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this is a download item.
**Notes:** Available in Mac OS X 10.8 and newer.
(Read only property)

### 175.10.10 downloadContentLength as Int64

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop only.

**Function:** The length of the downloadable files available for this product.
**Notes:** For MacOS 10.14 or newer.
Falls back to downloadLength for older OS versions.
(Read only property)

### 175.10.11 downloadContentVersion as String

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A string that identifies which version of the content is available for download.
**Notes:** The version string is formatted as a series of integers separated by periods.

For MacOS 10.14 or newer.
Falls back to ContentVersion for older OS versions.
(Read only property)

### 175.10.12 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference to the SKProduct object.
**Notes:** (Read and Write property)

### 175.10.13 introductoryPrice as SKProductDiscountMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Introductory Price.
**Notes:** Available on MacOS 10.13.2 or later.
Value is nil on older systems.
(Read only property)

### 175.10.14 localizedDescription as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** A description of the product.
**Notes:** The description is localized based on the currentLocale property.
(Read only property)

### 175.10.15 localizedTitle as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the product.
**Notes:** The description is localized based on the currentLocale property.
(Read only property)

### 175.10.16 price as Double

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The cost of the product in the local currency.
**Notes:** Use PriceString to get a localized formatted price.
(Read only property)

### 175.10.17 priceLocale as NSLocaleMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The locale used to format the price of the product.
**Notes:** (Read only property)

### 175.10.18 priceString as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The cost of the product in the local currency.
**Notes:** We format the price in the locale currency format.
(Read only property)

### 175.10.19 productIdentifier as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The string that identifies the product to the Apple App Store.
**Notes:** (Read only property)

### 175.10.20 subscriptionGroupIdentifier as String

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The identifier of the subscription group to which the subscription belongs.
**Notes:** All auto-renewable subscriptions must be a part of a group. You create the group identifiers in App Store Connect.
Available on MacOS 10.14 or newer.
(Read only property)

### 175.10.21 subscriptionPeriod as SKProductSubscriptionPeriodMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Subscription period.
**Notes:** Available on MacOS 10.13.2 or later.
Value is nil on older systems.
(Read only property)

## 175.11 class SKProductsRequestMBS

### 175.11.1 class SKProductsRequestMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** An SKProductsRequestMBS object is used to retrieve localized information about a list of products from the Apple App Store.
**Notes:** Your application uses this request to present localized prices and other information to the user without having to maintain that list itself.

To use an SKProductsRequest object, you initialize it with a list of product identifier strings, attach a delegate, and then call the request's start method. When the request completes, you receive the didReceiveResponse event.

Please also check the documentation from Apple for the SKProductsRequest class.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Xojo Plugins, version 19.0pr6
- MBS Xojo Plugins, version 17.4pr2

### 175.11.2 Methods

### 175.11.3 cancel

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels a previously started request.
**Notes:** When you cancel a request, the events are not called with an error.

### 175.11.4 Constructor(productIdentifiers() as string)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initializes the request with the set of product identifiers.
**Notes:** productIdentifiers: The list of product identifiers for the products you wish to retrieve descriptions of.

### 175.11.5 Destructor

MBS MacCloud Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 175.11.6 start

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sends the request to the Apple App Store.
**Notes:** The results for a request are sent to the events.

### 175.11.7 Properties

### 175.11.8 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal reference to the SKProductsRequest object.
**Notes:** (Read and Write property)

### 175.11.9 Events

### 175.11.10 didFailWithError(error as NSErrorMBS)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called if the request failed to execute.
**Notes:** error: The error that caused the request to fail.

When the request fails, your application should release the request. The requestDidFinish event is not called after this method is called.

### 175.11.11 didFinish

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the request has completed.
**Notes:** This method is called after all processing of the request has been completed.

### 175.11.12 didReceiveResponse(products() as SKProductMBS, invalidProductIdentifiers() as string)

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** Called when the Apple App Store responds to the product request.
**Notes:** products: A list of products, one product for each valid product identifier provided in the original request.
invalidProductIdentifiers: An array of product identifier strings that were not recognized by the Apple App Store. This array should typically be empty.

## 175.12 class SKProductSubscriptionPeriodMBS

### 175.12.1 class SKProductSubscriptionPeriodMBS

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The class for a subscription period.
**Notes:** Available on MacOS 10.13.2.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 175.12.2 Methods

### 175.12.3 Constructor

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 175.12.4 Properties

### 175.12.5 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 175.12.6 numberOfUnits as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The number of units.
**Notes:** (Read only property)

### 175.12.7 unit as Integer

MBS MacCloud Plugin, Plugin Version: 18.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The unit of the period from day to year.
**Notes:** (Read only property)

### 175.12.8 Constants

Period units

| Constant | Value | Description |
|---|---|---|
| PeriodUnitDay | 0 | Day |
| PeriodUnitMonth | 2 | Month |
| PeriodUnitWeek | 1 | Week |
| PeriodUnitYear | 3 | Year |

# 175.13 class SKReceiptRefreshRequestMBS

## 175.13.1 class SKReceiptRefreshRequestMBS

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The SKReceiptRefreshRequest class allows an app to refresh its receipt.
**Notes:** With this API, the app can request a new receipt if the receipt is invalid or missing. In the sandbox environment, you can request a receipt with any combination of properties to test the state transitions related to Volume Purchase Plan receipts.
Requires Mac OS X 10.9.
**Blog Entries**

- MBS Xojo Plugins, version 21.2pr4
- MBS Xojo Plugins, version 19.1pr6
- MBS Xojo / Real Studio plug-ins in version 13.5
- MBS Xojo / Real Studio Plugins, version 13.5pr1

**Xojo Developer Magazine**

- 12.1, page 9: News

## 175.13.2 Methods

## 175.13.3 cancel

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels a previously started request.
**Notes:** When you cancel a request, the events are not called with an error.

## 175.13.4 Constructor(properties as dictionary = nil)

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Initialized a receipt refresh request with optional properties.
**Notes:** In the test enviroment, the properties that the new receipt should have. For keys, see SKReceipt-Property* methods.
In the production environment, set this parameter to nil.

### 175.13.5 Destructor

MBS MacCloud Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 175.13.6 SKReceiptPropertyIsExpired as string

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties in initialization.
**Notes:** A key whose value is a Boolean value, indicating whether the receipt is expired.

### 175.13.7 SKReceiptPropertyIsRevoked as string

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties in initialization.
**Notes:** A key whose value is a Boolean value, indicating whether the receipt has been revoked.

### 175.13.8 SKReceiptPropertyIsVolumePurchase as string

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** One of the keys for properties in initialization.
**Notes:** A key whose value is a Boolean value, indicating whether the receipt is is a Volume Purchase Plan receipt.

### 175.13.9 start

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sends the request to the Apple App Store.
**Notes:** The results for a request are sent to the events.

### 175.13.10 TerminateForInvalidReceipt

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Terminates an app if the license to use the app has expired.
**Notes:** Falls back to exit(173) for MacOS before 10.14.

### 175.13.11 Properties

### 175.13.12 Handle as Integer

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 175.13.13 receiptProperties as Dictionary

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The properties of the receipt. (read-only)
**Notes:** (Read only property)

### 175.13.14 Events

### 175.13.15 didFailWithError(error as NSErrorMBS)

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Called if the request failed to execute.
**Notes:** error: The error that caused the request to fail.

When the request fails, your application should release the request. The requestDidFinish event is not called after this method is called.

### 175.13.16 didFinish

MBS MacCloud Plugin, Plugin Version: 13.5, Platform: macOS, Targets: .

**Function:** Called when the request has completed.
**Notes:** This method is called after all processing of the request has been completed.

## 175.14 module StoreKitMBS

### 175.14.1 module StoreKitMBS

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Globals for the StoreKit plugin.
**Notes:** Be aware that StoreKit requires your app to be signed.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr6

### 175.14.2 Methods

### 175.14.3 appStoreReceiptURL as string

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries URL for the app store receipt file.

### 175.14.4 available as Boolean

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether the StoreKit framework is available.
**Example:**

```
msgbox "StoreKit available: "+str(StoreKitMBS.available)
```

**Notes:** Should always be true on Mac OS X 10.7 and newer.

### 175.14.5 requestReview

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Tells StoreKit to ask the user to rate or review your app, if appropriate.
**Example:**

```
If StoreKitMBS.StoreReviewAvailable Then
StoreKitMBS.requestReview
End If
```

**Notes:** Although you should call this method when it makes sense in the user experience flow of your app, the actual display of a rating/review request view is governed by App Store policy. Because this method may or may not present an alert, it's not appropriate to call it in response to a button tap or other user action.

When you call this method while your app is still in development mode, a rating/review request view is always displayed so that you can test the user interface and experience. However, this method has no effect when you call it in an app that you distribute using TestFlight.

When you call this method in your shipping app and a rating/review request view is displayed, the system handles the entire process for you. In addition, you can continue to include a persistent link in the settings or configuration screens of your app that deep-links to your App Store product page. To automatically open a page on which users can write a review in the App Store, append the query parameter action=write-review to your product URL.

Available on MacOS 10.14 or newer.
requestReview method will only work, if StoreReviewAvailable returns true.
Does nothing if called on older OS versions.

### 175.14.6 SKErrorDomain as string

MBS MacCloud Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop & iOS.

**Function:** The domain for StoreKit errors.

### 175.14.7 StoreReviewAvailable as Boolean

MBS MacCloud Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether SKStoreReviewController class is available.
**Example:**

```
If StoreKitMBS.StoreReviewAvailable Then
StoreKitMBS.requestReview
End If
```

**Notes:** requestReview method will only work, if StoreReviewAvailable returns true.

### 175.14.8 Constants

StoreKit error codes

| Constant | Value | Description |
|---|---|---|
| SKErrorClientInvalid | 1 | client is not allowed to issue the request, etc. |
| SKErrorPaymentCancelled | 2 | user cancelled the request, etc. |
| SKErrorPaymentInvalid | 3 | purchase identifier was invalid, etc. |
| SKErrorPaymentNotAllowed | 4 | this machine is not allowed to make the payment |
| SKErrorUnknown | 0 | unknown error |

# Chapter 176

# String

## 176.1 Globals

### 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for question mark or uppercase letters A to Z
MsgBox str(InStrByteRangeMBS("Hello?", "?", 65, 90)) // shows 1 as H is found.

MsgBox str(InStrByteRangeMBS("hello?", "?", 65, 90)) // shows 6 as ? is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
See also:

- 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer,

StartValue2 as Integer, EndValue2 as Integer) as Integer 21778

- 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
- 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
- 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
- 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782

### 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for question mark or uppercase letters A to Z or numbers from 0 to 9
MsgBox str(InStrByteRangeMBS("Hello?", "?", 65, 90, 48, 57)) // shows 1 as H is found.
MsgBox str(InStrByteRangeMBS("hello?", "?", 65, 90, 48, 57)) // shows 6 as ? is found
MsgBox str(InStrByteRangeMBS("Hello 123", "?", 65, 90, 48, 57)) // shows 1 as H is found.
MsgBox str(InStrByteRangeMBS("hello 123", "?", 65, 90, 48, 57)) // shows 7 as 1 is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
See also:

- 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777

- 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
- 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
- 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
- 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782


### 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for question mark, low byte values, high byte values or numbers from 0 to 9
MsgBox str(InStrByteRangeMBS("Hello?", "?", 0, 31, 127, 255, 48, 57 )) // shows 6 as ? is found.
MsgBox str(InStrByteRangeMBS("123", "?", 0, 31, 127, 255, 48, 57 )) // shows 1 as 1 is found.
MsgBox str(InStrByteRangeMBS(EndOfLine.Windows, "?", 0, 31, 127, 255, 48, 57 )) // shows 1 as chr(13) is found.
MsgBox str(InStrByteRangeMBS("Hello", "?", 0, 31, 127, 255, 48, 57 )) // shows 0 as nothing is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
See also:

- 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
- 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778

- 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
- 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781
- 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782

### 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for uppercase letters A to Z
MsgBox str(InStrByteRangeMBS("Hello?", 65, 90)) // shows 1 as H is found.

MsgBox str(InStrByteRangeMBS("hello?", 65, 90)) // shows 0 as nothing is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
See also:

- 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
- 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
- 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
- 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781

- 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782


### 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for uppercase letters A to Z or numbers from 0 to 9
MsgBox str(InStrByteRangeMBS("Hello?", 65, 90, 48, 57)) // shows 1 as H is found.
MsgBox str(InStrByteRangeMBS("hello?", 65, 90, 48, 57)) // shows 0 as nothing is found.
MsgBox str(InStrByteRangeMBS("Hello 123", 65, 90, 48, 57)) // shows 1 as H is found.
MsgBox str(InStrByteRangeMBS("hello 123", 65, 90, 48, 57)) // shows 7 as 1 is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
See also:


- 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
- 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
- 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
- 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780
- 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21782

### 176.1.6 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds bytes or byte ranges in a string.
**Example:**

```
// search for low byte values, high byte values or numbers from 0 to 9
MsgBox str(InStrByteRangeMBS("Hello?", 0, 31, 127, 255, 48, 57 )) // shows 0 as nothing is found.
MsgBox str(InStrByteRangeMBS("123", 0, 31, 127, 255, 48, 57 )) // shows 1 as 1 is found.
MsgBox str(InStrByteRangeMBS(EndOfLine.Windows, 0, 31, 127, 255, 48, 57 )) // shows 1 as chr(13) is found.
MsgBox str(InStrByteRangeMBS("Hello", 0, 31, 127, 255, 48, 57 )) // shows 0 as nothing is found.
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).

The optional find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

The StartValue/EndValue parameters define ranges of values which you consider to match.

Returns 0 if nothing is found or the position of the found character.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

See also:

- 176.1.1 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer) as Integer 21777
- 176.1.2 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21778
- 176.1.3 InStrByteRangeMBS(target as string, find as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer, StartValue3 as Integer, EndValue3 as Integer) as Integer 21779
- 176.1.4 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer) as Integer 21780

- 176.1.5 InStrByteRangeMBS(target as string, StartValue as Integer, EndValue as Integer, StartValue2 as Integer, EndValue2 as Integer) as Integer 21781

### 176.1.7 InStrBytesMBS(target as string, find as string) as Integer

MBS Util Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the first position of one of the bytes given in the find string in the target string.
**Example:**

```
MsgBox str(InStrBytesMBS("Hello", "e")) // shows 2, as e is found
MsgBox str(InStrBytesMBS("Hello", "abcd")) // shows 0, as nothing is found
MsgBox str(InStrBytesMBS("Hello World", "abcd")) // shows 11, as d is found
```

**Notes:** You may want to make sure target and find are both in the same 8bit encoding (UTF-8, MacRoman, Windows ANSI, Latin 1, ASCII, etc. but not UTF16/UTF32).
The find string defines the bytes to search. This gives you a way to see whether one of those bytes is inside or to find the first byte matching a certain value.

Returns 0 if nothing is found or the position of the found character.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

### 176.1.8 EncodingNameMBS(extends Text as string) as string

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the text encoding name for this string.
**Example:**

```
dim t as string = "Hello World"

MsgBox "InternetName: "+t.Encoding.InternetName
MsgBox "InternetNameMBS: "+t.Encoding.InternetNameMBS
MsgBox "EncodingNameMBS: "+t.EncodingNameMBS
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr6

### 176.1.9 RemoveAccentsMBS(text as string, IgnoreCase as boolean = false) as string

MBS Util Plugin, Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes accents from text.
**Example:**

```
dim s as string = "L'√©l√®ve pr√©f√©r√©"
dim a as string = RemoveAccentsMBS(s)
dim b as string = RemoveAccentsMBS(s, true)
// check values in debugger
Dim x As String = RemoveAccentsMBS("‘ ‚Äò ‚Äô ‚Äú \¶¬® √Ä √Å √Ç √É √Ñ √Ö √á √É √Ñ √Ö √á √É √Ñ √Ö √á
```

```
// 1. read a CSV file:

dim file as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = TextInputStream.open(file)

// use right encoding for your file!
t.Encoding = encodings.MacRoman

while not t.EOF
dim line as string = t.ReadLine
dim items() as string = SplitCommaSeparatedValuesMBS(line)

// process items array
wend

// 2. compare with split:

dim test as string = "Hello,""World,test"",end"

dim a() as string = split(test, ",")
dim b() as string = SplitCommaSeparatedValuesMBS(test, ",")

MsgBox Join(a,EndOfLine)+EndOfLine+EndOfLine+Join(b,EndOfLine)
```

**Notes:** This function is better for CSV data than the Split function as it handles quoted text right.
For 17.5 we rewrote this function. Now auto detects the delimiter (comma or semicolon) if none passed. Default quote character is " if nothing is passed. Please only one character for delimiter.

Version 18.0 can detect tab character, too.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo Plugins, version 22.4pr1
- MBS Xojo Plugins, version 22.2pr1
- MBS Xojo Plugins, version 19.3pr1
- MBS Xojo Plugins, version 18.6pr3
- MBS Xojo Plugins, version 18.5pr4
- MBS Xojo Plugins, version 18.0pr8
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr4

- MBS Xojo / Real Studio Plugins, version 16.5pr9

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 16.1, page 10: News

### 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns string as UTF-8 and replacing invalid UTF-8 sequences with placeholder.
**Notes:** This function is more save than simply DefineEncoding as it makes sure the returned text actually is valid UTF-8.
You can replace missing characters with empty text, question mark or any other symbol.

This function is overloaded, so you can directly pass in string, memoryblock or ptr+size.
Checks byte sequence with up to 4 byte long sequences. Does not verify whether code points are valid.
See also:

- 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786
- 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787

### 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns string as UTF-8 and replacing invalid UTF-8 sequences with placeholder.
**Example:**

```
// some random bytes
dim t as string = RandomBytesStringMBS(20, false)

// and some text
t = t + " √§√√º üòÄ"

// checked
dim s as string = CheckUTF8MBS(t, "üòÇ")

MsgBox s
```

**Notes:** This function is more save than simply DefineEncoding as it makes sure the returned text actually is valid UTF-8.
You can replace missing characters with empty text, question mark or any other symbol.

This function is overloaded, so you can directly pass in string, memoryblock or ptr+size.
Checks byte sequence with up to 4 byte long sequences. Does not verify whether code points are valid.
See also:

- 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
- 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string 21787

### 176.1.13 CheckUTF8MBS(mem as MemoryBlock, Placeholder as string) as string

MBS Util Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns string as UTF-8 and replacing invalid UTF-8 sequences with placeholder.
**Example:**

```
// some random bytes
dim t as string = RandomBytesStringMBS(20, false)

// and some text
t = t + " √§√√º üòÄ"

// checked in memoryblock
dim m as MemoryBlock = t
dim s as string = CheckUTF8MBS(m, "üòÇ")

MsgBox s
```

**Notes:** This function is more save than simply DefineEncoding as it makes sure the returned text actually is valid UTF-8.
You can replace missing characters with empty text, question mark or any other symbol.

This function is overloaded, so you can directly pass in string, memoryblock or ptr+size.
Checks byte sequence with up to 4 byte long sequences. Does not verify whether code points are valid.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr1
- MBS Xojo plug-ins in version 16.0

- MBS Xojo / Real Studio Plugins, version 16.0pr7
- CheckUTF8MBS function

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- 14.2, page 10: News

See also:

- 176.1.11 CheckUTF8MBS(data as ptr, size as Integer, Placeholder as string) as string 21786
- 176.1.12 CheckUTF8MBS(data as string, Placeholder as string) as string 21786

### 176.1.14 ClearStringContentMBS(s as String) as Boolean

MBS Util Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears string content.
**Example:**

```
// this is a constant string
Dim c As String = "Hello"

// this is an allocated string
Dim a As String = c + "World"

// try to clear both
Call ClearStringContentMBS c
Call ClearStringContentMBS a

MsgBox "const: "+c+" "+Str(Len(c))+EndOfLine+"allocated: "+a+" "+Str(Len(a))
```

**Notes:** Overwrites content of string with zeros.
We check if this is a constant string and for those do nothing.
Returns true if we zeroed content, otherwise false.

This function can help to clear memory for passwords stored in strings.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5
- MBS Xojo Plugins, version 19.5pr6
- MBS Real Studio Plugins, version 11.2pr8
- MonkeyBread Software Releases the MBS Plugins 8.2

### 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Concats the given strings with binary encoding.
**Example:**

```
dim a as string = "Hello"
dim b as string = "World"
dim c as string = ConcatBinaryStringsMBS(a,b)
dim d as string = ConvertEncoding(b, encodings.UTF16)
dim e as string = ConcatBinaryStringsMBS(a,d)

MsgBox "ConcatBinaryStringsMBS"+EndOfLine+EndOfLine+c+EndOfLine+EncodingToHexMBS(c)+EndOfLine+EndOfLine+e+EndOfLine+EncodingToHexMBS(e)
```

**Notes:** If RB concats strings the encoding is changed before concating to match the other strings.
See also:


- 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
- 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
- 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
- 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790


### 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Concats the given strings with binary encoding.
**Notes:** If RB concats strings the encoding is changed before concating to match the other strings.
See also:


- 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
- 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
- 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
- 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790

### 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Concats the given strings with binary encoding.
**Notes:** If RB concats strings the encoding is changed before concating to match the other strings.
See also:


- 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
- 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
- 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790
- 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790


### 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Concats the given strings with binary encoding.
**Notes:** If RB concats strings the encoding is changed before concating to match the other strings.
See also:


- 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
- 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
- 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
- 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string 21790


### 176.1.19 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string, f as string) as string

MBS Util Plugin, Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Concats the given strings with binary encoding.
**Notes:** If RB concats strings the encoding is changed before concating to match the other strings.
**Blog Entries**

- MBS Xojo Plugins, version 19.1pr7

See also:


- 176.1.15 ConcatBinaryStringsMBS(a as string, b as string) as string 21789
- 176.1.16 ConcatBinaryStringsMBS(a as string, b as string, c as string) as string 21789
- 176.1.17 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string) as string 21790
- 176.1.18 ConcatBinaryStringsMBS(a as string, b as string, c as string, d as string, e as string) as string 21790


### 176.1.20 ContainsWholeWordMBS(Text as String, Word as String) as boolean

MBS Util Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Checks whether text contains whole word.
**Example:**

```
// let's try a few test cases

If ContainsWholeWordMBS("Hello World", "Hello") Then
// okay
Else
Break
End If

If ContainsWholeWordMBS("Hello World", "World") Then
// okay
Else
Break
End If

If ContainsWholeWordMBS("Hello World", "ello") Then
Break
Else
// okay
End If

If ContainsWholeWordMBS("Hello World", "Worl") Then
Break
Else
// okay
End If

If ContainsWholeWordMBS("Hello World", "orld") Then
Break
Else
// okay
End If
```

```
If ContainsWholeWordMBS("Hello World!", "orld") Then
Break
Else
// okay
End If
```

**Notes:** This function is optimized for speed and should only be used with ASCII as it handles all unicode characters as word characters.
Returns true if whole word is found inside text.
Returns false if the word was either not found or is contained, but has other letters before/after.

This function should be faster than doing a RegEx with "\b" + word "\b", but the RegEx may handle unicode word delimiters better.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- News from the MBS Xojo Plugins Version 22.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1
- MBS Xojo Plugins, version 22.1pr2

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- 20.3, page 10: News

### 176.1.21 CountOccurancesMBS(s as string, find as string) as Integer

MBS Util Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts the occurances of a string.
**Example:**

```
dim s as string

s="111110001110101010111"

MsgBox str(CountOccurancesMBS(s,"1")) // 14
MsgBox str(CountOccurancesMBS(s,"0")) // 7
MsgBox str(len(s)) // 21
```

**Notes:** Returns the number of occurances of a substring in a string.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr5
- MonkeyBread Software Releases the MBS Plugins 8.2

### 176.1.22 CreateStringMBS(Length as Integer, Content as String) as string

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a string based on a pattern.
**Example:**

```
dim c as string = CreateStringMBS(20, "Hello")
dim t as string = CreateStringMBS(10, chrb(255))

Break
```

**Notes:** The content string is repeated until size is matched and returned.
The string returned has the same encoding set as the content string.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr5

### 176.1.23 DecodingFromHTMLMBS(s as string) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with HTML escaped characters.
**Example:**

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)

MsgBox text // shows: Gr√º√üe
```

**Notes:** The source string is converted to a native string if it is not allready in ASCII. Than for every character the functions looks for the unescaped character code and returns a normal unicode string.

e.g. "München" ->"M√ºnchen"

This functions uses Xojo unicode strings, so you may need to convert back to a NativeString before saveing the string to a file. (using e.g. ConvertEncoding(string, encodings.UTF8))

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.

Speed optimized in version 2.8 to be a hundret times faster.
Added Linux support in v5.1.

The result of this function is unpredictable on bad input strings.
(e.g. no encoding, or encoding does not match the content of the string)
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr7

### 176.1.24 DecodingFromMySQLMBS(s as string) as string

MBS Util Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string from MySQL.
**Example:**

MsgBox DecodingFromMySQLMBS("test\\test\%2.doc")

**Notes:** Replaces all the escapes in a mysql string like (\0, \t or \\) to their binary replacement.

### 176.1.25 DecodingFromQuotedPrintableMBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with quoted printable encoding.
**Example:**

msgbox DecodingFromQuotedPrintableMBS("Hi, =A1=92")

**Notes:** The decoded string is marked to have an ASCII encoding, but you may need to set the encoding to something like ISO. Than you need a text converter to make something printable from it.

May return "" on low memory conditions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr9

### 176.1.26 DecodingFromURLMBS(s as string) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with URL escaped characters.
**Example:**

```
dim s as string
dim t as string
dim u as string

t="Hello World √§√√º"

s= EncodingToURLMBS(t,0)

u=DecodingFromURLMBS(s,0)

SetEncodingOfStringMBS u,GetEncodingOfStringMBS(t) // restore encoding

// Hello World √§√√º
MsgBox t
// Hello%20World%20%C3%A4%C3%B6%C3%BC
MsgBox s
// Hello World √§√√º
MsgBox u
```

**Notes:** Decodes an URL encoded ASCII string. The string returned is marked as a binary string (without encoding). You need to set the encoding to whatever the original was (ISO-9660 or UTF8 for example).

e.g. "Wie%20geht's%3F" ->"Wie geht's?"

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.
See also:

- 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string 21795

### 176.1.27 DecodingFromURLMBS(s as string, options as Integer) as string

MBS Util Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with URL escaped characters.
**Example:**

```
dim s as string
```

```
dim t as string
dim u as string

t="Hello World √§√√º"

s= EncodingToURLMBS(t,1)

u=DecodingFromURLMBS(s,1)

SetEncodingOfStringMBS u,GetEncodingOfStringMBS(t) // restore encoding

// Hello World √§√√º
MsgBox t
// Hello+World+%C3%A4%C3%B6%C3%BC
MsgBox s
// Hello World √§√√º
MsgBox u
```

**Notes:** Decodes an URL encoded ASCII string. The string returned is marked as a binary string (without encoding). You need to set the encoding to whatever the original was (ISO-9660 or UTF8 for example).

e.g. "Wie%20geht's%3F" ->"Wie geht's?"

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.

Pass 1 for the options parameter to get PHP/Perl compatible output (+ instead of spaces and %20 for spaces).
Added Linux support in v5.1.
See also:

- 176.1.26 DecodingFromURLMBS(s as string) as string 21795

### 176.1.28 DecodingFromXMLMBS(s as string) as string

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with XML escaped characters.
**Notes:** see DecodingFromHTMLMBS.

### 176.1.29 DetectUnicodeMarkersMBS(s as string) as Integer

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Tries to get the unicode marker from the string.
**Example:**

```
const EncodingUnknown=0
const EncodingUTF8=1
const EncodingUTF16be=3
const EncodingUTF16le=4
const EncodingUTF32be=6
const EncodingUTF32le=7

dim text as string = "Hello World" // this text does not have a marker..

msgbox str(DetectUnicodeMarkersMBS(text))
```

**Notes:** For some UTF16 LittleEndian strings this function may return UTF32.

### 176.1.30 EncodeEmailSubjectMBS(s as string) as string

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

Encodes an email subject.
Text is encoded with UTF-8 Quoted Printable encoding.
If text does not need to be encoded (pure ASCII), we return the input text.
**Example:**

```
MsgBox EncodeEmailSubjectMBS("Hello World")+EndOfLine+EncodeEmailSubjectMBS("Test √§√√º")
```

**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr3

### 176.1.31 EncodingToHTMLMBS(s as string, options as Integer = 0) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string with HTML escaped characters.
**Example:**

```
dim f as folderItem
dim b as binaryStream

f=getsaveFolderItem("text/html","new.html")
if f<>nil then
b=f.createBinaryFile("text/html")
if b<>nil then
b.write nativeStringMBS(EncodingToHTMLMBS(editfield1.text))
b.close
end if
end if
```

**Notes:** The source string is converted to unicode if it is not allready in unicode. Than for every character the functions looks for the escaped character code and returns a HTML encoded string.

e.g. "M√ºnchen" ->"München"

This functions uses Xojo unicode strings, so you may need to convert back to a NativeString before saveing the string to a file.

Return characters (chr(10) and chr(13)) are not converted to <BR>codes.

May return "" on low memory conditions.

The result of this function is unpredictable on bad input strings.
(e.g. no encoding, or encoding does not match the content of the string)

Options can be 1 to not encode ASCII values <128, so quotes, <, >and & are not encoded.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr2
- Smileys and UTF32
- MBS Xojo / Real Studio Plugins, version 15.0pr9
- MBS Xojo / Real Studio Plugins, version 15.0pr7
- MBS Xojo / Real Studio Plugins, version 13.4pr7
- MBS Real Studio Plugins, version 11.2pr2

### 176.1.32 EncodingToQuotedPrintableMBS(s as string, LineLen as Integer = 72) as string

MBS Util Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string with quoted printable characters.
**Example:**

```
dim a as string = "Hello √§√√º!"
dim b as string = EncodingToQuotedPrintableMBS(a)
dim c as string = ConvertEncoding(a, encodings.ISOLatin1)
dim d as string = EncodingToQuotedPrintableMBS(c)
dim e as string = EncodeQuotedPrintable(a)
dim f as string = EncodeQuotedPrintable(c)

MsgBox b+EndOfLine+d+EndOfLine+e+EndOfLine+f
```

**Notes:** Line wrap is per default at 72 characters but you can pass some other positive value here.
Quoted printable encoded strings have some ISO encoding as base, you need to pass a valid ISO string to this function to get the correct result.
May return "" on low memory conditions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr9

### 176.1.33 EncodingToURLMBS(s as string) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string with URL escaped characters.
**Example:**

```
msgbox EncodingToURLMBS("Wie geht's?")
```

**Notes:** Encodings a string for an URL. Use with UTF8 or ISO-9660 encoded strings. This function does not work correctly with UTF16 strings.

e.g. "Wie geht's?" ->"Wie%20geht's%3F"

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.
See also:

• 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string 21800

### 176.1.34 EncodingToURLMBS(s as string, options as Integer) as string

MBS Util Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string with URL escaped characters.
**Example:**

```
dim s as string = "20101210 1244 - Sky Cinema +24 - Wen die Geister lieben"

MsgBox EncodingToURLMBS(s)

// gives: 20101210%201244%20-%20Sky%20Cinema%20+24%20-%20Wen%20die%20Geister%20lieben

MsgBox EncodingToURLMBS(s,1)

// gives: 20101210+1244+-+Sky+Cinema+%2B24+-+Wen+die+Geister+lieben

MsgBox EncodingToURLMBS(s,2)

// gives: 20101210%201244%20-%20Sky%20Cinema%20%2b24%20-%20Wen%20die%20Geister%20lieben
```

**Notes:** Encodings a string for an URL. Use with UTF8 or ISO-9660 encoded strings. This function does not work correctly with UTF16 strings.

e.g. "Wie geht's?" ->"Wie%20geht's%3F"

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.

Pass 1 for the options parameter to get PHP/Perl compatible output (+ instead of spaces and %20 for spaces).
Pass 2 for the options parameter to get plus to %2B and space to %20. Added in plugin version 10.6.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr8

See also:

• 176.1.33 EncodingToURLMBS(s as string) as string 21799

### 176.1.35 EncodingToXMLMBS(s as string, options as Integer = 0) as string

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string with XML escaped characters.
**Notes:** see EncodingToHTMLMBS.

### 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string()

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for strings within a data block.
**Notes:** Looks over the bytes in the data block to see if there are useful byte sequences which could be text. Returns an array with all text fragments found.

This function is UTF8 aware and will work well for UTF-8 encoded text fragments.
See also:

- 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801
- 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801

### 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string()

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for strings within a data block.
**Notes:** Looks over the bytes in the data block to see if there are useful byte sequences which could be text. Returns an array with all text fragments found.

This function is UTF8 aware and will work well for UTF-8 encoded text fragments.
See also:

- 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801
- 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string() 21801

### 176.1.38 GetStringsFromDataMBS(data as String, MinLength as Integer = 0) as string()

MBS Util Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Looks for strings within a data block.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)
dim texts() as string = GetStringsFromDataMBS(s, 3)

Break
```

**Notes:** Looks over the bytes in the data block to see if there are useful byte sequences which could be text. Returns an array with all text fragments found.

This function is UTF8 aware and will work well for UTF-8 encoded text fragments.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr1

See also:

- 176.1.36 GetStringsFromDataMBS(data as MemoryBlock, MinLength as Integer = 0) as string() 21801
- 176.1.37 GetStringsFromDataMBS(data as ptr, size as Integer, MinLength as Integer = 0) as string() 21801

### 176.1.39 GetUnicodeMarkersMBS(kind as Integer) as string

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the unicode marker with the given code.
**Example:**

```
const EncodingUnknown=0
const EncodingUTF8=1
const EncodingUTF16=2 // native
const EncodingUTF16be=3
const EncodingUTF16le=4
const EncodingUTF32=5 // native
const EncodingUTF32be=6
const EncodingUTF32le=7

msgbox EncodingToHexMBS(GetUnicodeMarkersMBS(EncodingUTF8))
```

**Notes:** If you concat strings, RB may convert the string to UTF8.

### 176.1.40 HasPostfixMBS(Text as String, Prefix as String) as boolean

MBS Util Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether text has given postfix.
**Example:**

```
dim t as string = "Hello World"
dim p as string = "Hello"
dim w as string = "World"

if HasPrefixMBS(t, p) then
// ok
else
break
MsgBox "failed?"
end if

if HasPostfixMBS(t, w) then
// ok
else
break
MsgBox "failed?"
end if

if HasPrefixMBS(t, w) then
break
MsgBox "failed?"
else
// ok
end if

if HasPostfixMBS(t, p) then
break
MsgBox "failed?"
else
// ok
end if

Break
```

**Notes:** Returns true if yes, or false if not.
We may convert text to UTF-8 to compare.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr6

### 176.1.41 HasPrefixMBS(Text as String, Prefix as String) as boolean

MBS Util Plugin, Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether text has given prefix.
**Example:**

```
dim t as string = "Hello World"
dim p as string = "Hello"
dim w as string = "World"

if HasPrefixMBS(t, p) then
// ok
else
break
MsgBox "failed?"
end if

if HasPostfixMBS(t, w) then
// ok
else
break
MsgBox "failed?"
end if

if HasPrefixMBS(t, w) then
break
MsgBox "failed?"
else
// ok
end if

if HasPostfixMBS(t, p) then
break
MsgBox "failed?"
else
// ok
end if

Break
```

**Notes:** Returns true if yes, or false if not.
We may convert text to UTF-8 to compare.
**Blog Entries**

- MBS Xojo Plugins, version 18.5pr6

### 176.1.42 HexstringMBS(input as string, hexlen as Integer, linelen as Integer, linestart as string, lineend as string, spacer as string,filler as string) as string

MBS Util Plugin, Plugin Version: 2.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a hexadecimal string.
**Example:**

```
dim s as string
s=HexstringMBS("Hello World",2,10,"<",">"+endofline,"","0")
```

**Notes:** Fails if input="" or hexlen<1 or linelen<1 or on low memory conditions.
If filler is "", filler is set to "0".

Memory requirement is around 5 times the memory for input.
or exactly:
mem=20+linelen*hexlen*(1+len(filler))+2*((linelen*hexlen*len(filler)+len(lineend)+len(linestart))*(len(input)*2/hexlen))

All strings must be in the encoding you want to have.
Can raise OutOfMemoryException on low memory.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6
- MBS Xojo / Real Studio Plugins, version 15.2pr4

### 176.1.43 IsASCIIStringMBS(s as string) as boolean

MBS Util Plugin, Plugin Version: 7.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if this string is an ASCII string.
**Notes:** False if one of the characters of the string has a numeric value of 128 or higher. (->string is not a 7 bit ASCII string)
True if all bytes are in the valid ASCII range.
See also:

- 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean 21805

### 176.1.44 IsASCIIStringMBS(s as string, mode as Integer) as boolean

MBS Util Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if this string is an ASCII string.
**Notes:** Does not work for 16bit unicode strings.
But it works fine with UTF8.

Mode values:

0 False if one of the characters of the string has a numeric value of 128 or higher. (->string is not a 7 bit ASCII string)
1 False if one of the characters of the string has a numeric value >128 or <32. (->string may not be printable in ASCII, which may require some kind of Base64 encoding to transfer it.)
2 False if one of the characters of the string has a numeric value below 32. (->string may contain line breaks or other control characters)

Added Linux support in v5.1.
See also:

- 176.1.43 IsASCIIStringMBS(s as string) as boolean 21805

### 176.1.45 JaroWinklerDistanceMBS(a as string, b as string) as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the string distance.
**Example:**

```
dim s1 as string = "Hello"
dim s2 as string = "Hallo"
dim s3 as string = "Helo"
dim s4 as string = "Helllo"

// 0 for equal, the more it goes to 1.0

dim d1 as Double = levenshteinDistanceMBS(s1,s1)
dim d2 as Double = levenshteinDistanceMBS(s1,s2)
dim d3 as Double = levenshteinDistanceMBS(s1,s3)
dim d4 as Double = levenshteinDistanceMBS(s1,s4)

dim d5 as Double = jaroWinklerDistanceMBS(s1,s1)
dim d6 as Double = jaroWinklerDistanceMBS(s1,s2)
dim d7 as Double = jaroWinklerDistanceMBS(s1,s3)
dim d8 as Double = jaroWinklerDistanceMBS(s1,s4)
```

```
break // check values in debugger
```

**Notes:** Value is normalized, so 0.0 is equal text and 1.0 is totally unequal.

see also
http://en.wikipedia.org/wiki/Jaro–Winkler_distance
**Blog Entries**

- MBS SQLite Extension in version 1.4
- MBS Real Studio Plugins, version 12.4pr10

### 176.1.46 LevenshteinDistanceMBS(a as string, b as string) as Double

MBS Util Plugin, Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Calculates the string distance.
**Example:**

```
dim s1 as string = "Hello"
dim s2 as string = "Hallo"
dim s3 as string = "Helo"
dim s4 as string = "Helllo"

// 0 for equal, the more it goes to 1.0

dim d1 as Double = levenshteinDistanceMBS(s1,s1)
dim d2 as Double = levenshteinDistanceMBS(s1,s2)
dim d3 as Double = levenshteinDistanceMBS(s1,s3)
dim d4 as Double = levenshteinDistanceMBS(s1,s4)

dim d5 as Double = jaroWinklerDistanceMBS(s1,s1)
dim d6 as Double = jaroWinklerDistanceMBS(s1,s2)
dim d7 as Double = jaroWinklerDistanceMBS(s1,s3)
dim d8 as Double = jaroWinklerDistanceMBS(s1,s4)

break // check values in debugger
```

**Notes:** Value is normalized, so 0.0 is equal text and 1.0 is totally unequal.

see also
http://en.wikipedia.org/wiki/Levenshtein_distance
**Blog Entries**

- MBS SQLite Extension in version 1.4
- MBS Real Studio Plugins, version 12.4pr10

### 176.1.47 NativeStringMBS(s as string) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a native string with the given string as content.
**Notes:** If the string in the parameter s is allready native it is returned unchanged and without allocating additional memory. Else the string is copied into a new string with native characters.
On Mac OS Classic native means MacRoman encoding, on Mac OS X it's UTF8 and on Windows the ANSI Codepage.
May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

### 176.1.48 RandomBytesStringMBS(Length as Integer, ASCII as boolean=false) as string

MBS Util Plugin, Plugin Version: 9.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a string with random content.
**Example:**

```
dim s as string

s = RandomBytesStringMBS(10, true)

MsgBox s

s = RandomBytesStringMBS(10, false)

MsgBox s
```

**Notes:** Length is the number of bytes in the string.
If ASCII is true the string returned in an ASCII string.
**Blog Entries**

- CheckUTF8MBS function

**Xojo Developer Magazine**

- 10.1, pages 71 to 72: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar

### 176.1.49 RemoveHTMLTagsMBS(AsciiTextWithTags as string) as string

MBS Util Plugin, Plugin Version: 4.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all html tags from the string.
**Example:**

```
Dim s As String = "<div><P param=""value""">Hello</P></div>"
Dim t As String = RemoveHTMLTagsMBS(s)

MsgBox t // returns "Hello"
```

**Notes:** Returns "" on low memory.
Written to be used with UTF8 strings.
Added Linux support in v5.1.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr2
- MBS Xojo Plugins, version 19.4pr8

### 176.1.50 RemoveHTMLTagsWithMBS(AsciiTextWithTags as string, Replacement as string) as string

MBS Util Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all html tags from the string and replaces them with the replacement string.
**Example:**

```
msgbox RemoveHTMLTagsWithMBS("<P>Hello</P>"," ") // returns " Hello "
```

**Notes:** Returns "" on low memory.
Written to be used with UTF8 strings.

### 176.1.51 ReplaceLineEndingsMBS(Text as String, NewLine as String, yield as boolean = false) as String

MBS Util Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces line endings.
**Example:**

```
dim s as string = "Some text"
dim t as string = ReplaceLineEndingsMBS(s, endofline.Unix)
```

**Notes:** Whether we got CR, LF, CRLF or even LFCR, we'll replace it with the given replacement text.
If yield is true, we yield to other Xojo threads every 16 MB of input text to keep other threads responsive.

Handles UTF16/UTF32 by converting first to UTF-8.
Other 8 bit encodings (or no encoding set) are passed through.

Returns new text. May raise OutOfMemoryException in case of no memory available.
**Blog Entries**

- MBS Xojo Plugins, version 19.0pr7
- New ReplaceLineEndingsMBS function

### 176.1.52 ReplaceNonPrintableCharactersMBS(s as string, replacevalue as Integer=46) as string

MBS Util Plugin, Plugin Version: 8.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces bytes in the string which are not printable with the given byte value.
**Example:**

```
MsgBox ReplaceNonPrintableCharactersMBS("Hello World")
MsgBox ReplaceNonPrintableCharactersMBS("Hello √§√√º World")
MsgBox ReplaceNonPrintableCharactersMBS("Hello √§√√º World",32)
```

**Notes:** All bytes in range 32 to 127 are copied and all others replaces with the given byte value. Default is 46 which is a dot.
Returns always an ASCII string.
On low memory this function returns an empty string.
**Blog Entries**

- New ReplaceLineEndingsMBS function

### 176.1.53 ScientificStrMBS(d as Double, digits as Integer) as string

MBS Util Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the given value formatted as scientific number with the given number of digits.
**Example:**

```
dim d as Double = 3.1415926535897
```

MsgBox ScientificStrMBS(d,6)+EndOfLine+ScientificStrMBS(d,9)

**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 176.1.54 SplitMBS(value as String, delimiter as String = " ") as String()

MBS DataTypes Plugin, Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splits string.
**Example:**

```
dim a() as string = SplitMBS("Hello World Test", " ")
dim b() as string = SplitMBS("Gr√º√üe", "")
dim c() as string = SplitMBS("Just$ test$ a$ test$ test", "$ test$ ")
```

break

**Notes:** Similar to the Split() function, but without the problems we see with Split function. See feedback cases for Split.

If delimiter is "", we return an array with all characters in string.
Else we split given string with delimiter.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- Split and Join strings
- MBS Xojo / Real Studio Plugins, version 16.4pr8
- MBS Xojo / Real Studio Plugins, version 16.4pr7
- MBS Real Studio Plugins, version 13.0pr10

**Xojo Developer Magazine**

- 14.6, page 10: News

### 176.1.55 SQLReplaceBooleanMBS(SQL as string) as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces all false/true strings with 0/1 and handles quotes correctly.
**Example:**

MsgBox SQLReplaceBooleanMBS("INSERT INTO criteria VALUES ('1','9999','0001','000001557',false);")

**Notes:** SQLite used in REALSQLDatabase does not like false and true literals for boolean values. You need to use 0 and 1. So this function helps you converting old queries using false/true.
false and true inside a quoted string are not changed.
**Blog Entries**

- MBS Plugins 10.3 Release Notes

### 176.1.56 StrCompBytesMBS(a as string, b as string) as Integer

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two strings.
**Example:**

msgbox str(StrCompBytesMBS("Hello","hello"))

**Notes:** Returns zero if the two strings are identical.
Returns 1 or -1 if the strings are different.
Empty strings are equal.

Compares the bytes of both strings independend of the text encoding.

So if a="A" in UTF-8 and b="A" in UTF-16 they will not be equal!

### 176.1.57 StrCompCharactersMBS(a as string, b as string) as Integer

MBS Util Plugin, Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compares two strings.
**Example:**

msgbox str(StrCompCharactersMBS("Hello","hello"))

**Notes:** Returns zero if the two strings are identical.
Returns 1 or -1 if the strings are different.
Empty strings are equal.

Compares the characters of both strings. If the text encodings are not equal, they are both converted to UTF-8 before comparing them.

So if a="A" in UTF-8 and b="A" in UTF-16 they will be equal!

### 176.1.58 StringANDMBS(a as string,b as string) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a binary AND on the bytes from the both strings.
**Notes:** If a is "" or memory is low, the result is "".
If b is shorter as a the b string is used several times.
The function is optimized for several cases, e.g. the case where b is only one, two or four bytes long.
Returns a string with binary encoding. Before using this function, make sure both strings have the same encoding.
Added Linux support in v5.1.

### 176.1.59 StringIsHTMLreadyMBS(s as string) as boolean

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test whether a string is html safe.
**Example:**

```
Function html(t as string) As string
#pragma disablebackgroundtasks
#pragma disableautowaitcursor

if StringIsHTMLreadyMBS(t) then
Return t
else
t=EncodingToHTMLMBS(t)
Return ConvertEncoding(t,encodings.UTF8)
end if
End Function
```

**Notes:** String which are not html safe, need to go through EncodingToHTMLMBS.
Using this function saves a lot of time!

Returns true for strings which are html safe.

### 176.1.60 StringIsXMLreadyMBS(s as string) as boolean

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Test whether a string is xml safe.
**Notes:** String which are not html safe, need to go through EncodingToXMLMBS.
Using this function saves a lot of time!

Returns true for strings which are xml safe.

### 176.1.61 StringORMBS(a as string,b as string) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a binary OR on the bytes from the both strings.
**Notes:** If a is "" or memory is low, the result is "".
If b is shorter as a the b string is used several times.
The function is optimized for several cases, e.g. the case where b is only one, two or four bytes long.
Returns a string with binary encoding. Before using this function, make sure both strings have the same encoding.
Added Linux support in v5.1.

### 176.1.62 StringXOR2MBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a binary XOR on the bytes from the both strings.
**Example:**

```
dim s as string = StringXORMBS("Hello", "World")
dim t as string = StringXOR2MBS("Hello", "World")

MsgBox EncodeHex(S)+" "+EncodeHex(t)

dim ss as string = StringXORMBS(s, "World")
dim tt as string = StringXOR2MBS(t, "World")

MsgBox ss+" "+tt
```

**Notes:** If data is "" or memory is low, the result is "".
If XorMask is shorter as data the XorMask string is used several times.
Returns a string with binary encoding. Before using this function, make sure both strings have the same encoding.

The difference between StringXORMBS and StringXOR2MBS is that the second version xors also with position of byte in string, so your text looks a little bit more random.
MaskOffset specifies where in the XorMask string to start. This is useful for partial blocks.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr8

### 176.1.63 StringXORMBS(data as string, XorMask as string, MaskOffset as Integer = 0) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies a binary XOR on the bytes from the both strings.
**Notes:** If data is "" or memory is low, the result is "".
If XorMask is shorter as data the XorMask string is used several times.
The function is optimized for several cases, e.g. the case where b is only one, two or four bytes long.
Returns a string with binary encoding. Before using this function, make sure both strings have the same encoding.
MaskOffset specifies where in the XorMask string to start. This is useful for partial blocks.

### 176.1.64 StrMBS(d as Double) as string

MBS Util Plugin, Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Formats numbers more human readable
**Example:**

```
// shows: 0.000000012339 1.234560e-8
MsgBox StrMBS(0.00000001234)+" "+str(0.00000001234)

// shows 123456789.0 1.234568e+8
MsgBox StrMBS(123456789.0)+" "+str(123456789.0)
```

**Notes:** The idea is to have a dynamically changing number of digits. We have no scientific notation and up to 15 digits visible (not counting zeros).
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr4

### 176.1.65 UnicodeStringMBS(s as string) as string

MBS Util Plugin, Plugin Version: 2.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a unicode string with the given string as content.
**Notes:** If the string in the parameter s is allready unicode it is returned unchanged and without allocating additional memory. Else the string is copied into a new string with unicode (16bit) characters.
May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

The result of this function is unpredictable on bad input strings.
(e.g. no encoding, or encoding does not match the content of the string)

### 176.1.66 ConvertUnicodeToCharacterCompositionMBS(text as string) as string

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts unicode characters to composed normalization form.
**Example:**

```
dim s1 as string = ConvertUnicodeToCharacterDecompositionMBS("√§")

MsgBox s1+": "+EncodeHex(s1)
// shows √§: 61CC88

dim s2 as string = ConvertUnicodeToCharacterCompositionMBS("√§")

MsgBox s2+": "+EncodeHex(s2)
// shows √§: C3A4
```

**Notes:** This function replaces character represented by decomposed representation with the composed representation.

see also
https://en.wikipedia.org/wiki/Unicode_equivalence
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr1

### 176.1.67 ConvertUnicodeToCharacterDecompositionMBS(text as string) as string

MBS Util Plugin, Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts unicode characters to decomposed normalization form.
**Example:**

```
dim s1 as string = ConvertUnicodeToCharacterDecompositionMBS("√§")

MsgBox s1+": "+EncodeHex(s1)
// shows √§: 61CC88

dim s2 as string = ConvertUnicodeToCharacterCompositionMBS("√§")

MsgBox s2+": "+EncodeHex(s2)
// shows √§: C3A4
```

**Notes:** This function replaces character represented by one unicode character by the decomposed variant.

see also
https://en.wikipedia.org/wiki/Unicode_equivalence
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr1
- MBS Xojo Plugins, version 20.1pr4

### 176.1.68 DecodingFromCP1252MBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with ISO 8859 encoding.
**Notes:** The source string must be really an CP1252 string!
The string returned is Unicode and you may try NativeString to make a string you can display better.

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

### 176.1.69 DecodingFromHexMBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a Hex string to a binary string.
**Example:**

```
dim s as String

s=EncodingToHexMBS("Hallo")

MsgBox DecodingFromHexMBS(s)
```

**Notes:** May return "" on low memory conditions.
Added Linux support in v5.1.
The string returned has no defined string encoding, so use DefineEncoding on the result if needed.

### 176.1.70 DecodingFromISO8859MBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decodes a string with ISO 8859 encoding.
**Example:**

```
dim s as String

s=EncodingToISO8859MBS("hallo √§√√º")

MsgBox s

s=DecodingFromISO8859MBS(s)

MsgBox s

s=NativeStringMBS(s)

MsgBox s
```

**Notes:** The source string must be really an ISO 8859-1 string!
The string returned is Unicode and you may try NativeString to make a string you can display better.

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

### 176.1.71 EncodingToCP1252MBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string encoded with Codepage 1252.
**Notes:** The string is converted to Unicode (if it's not allready Unicode) and than encoded to a CP 1252 string which is returned with encoding set to binary.
(other encodings are available, but currently not in the plugin)

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

### 176.1.72 EncodingToHexMBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encodes a binary string to a hex string.
**Example:**

```
dim s1 as string = "Hello World"
dim s2 as string = EncodingToHexMBS(s1)

dim t1 as string = "Umlauts √§√√º"
dim t2 as string = EncodingToHexMBS(t1)

dim u as new UUIDMBS
dim u1 as string = u.ValueString
dim u2 as string = EncodingToHexMBS(u1)

break // see variables in debugger
```

**Notes:** May return "" on low memory conditions.
Added Linux support in v5.1.

### 176.1.73 EncodingToISO8859MBS(s as string) as string

MBS Util Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string encoded with ISO 8859-1.
**Example:**

```
dim s as String
```

```
s=EncodingToISO8859MBS("hallo √§√√º")

MsgBox s

s=DecodingFromISO8859MBS(s)

MsgBox s

s=NativeStringMBS(s)

MsgBox s
```

**Notes:** The string is converted to Unicode (if it's not allready Unicode) and than encoded to a ISO 8859-1 string which is returned with encoding set to binary.
(other encodings are available, but currently not in the plugin)

May return "" on low memory conditions.
Strings and encoding work only perfectly for RB 4.5 or newer.
Added Linux support in v5.1.

### 176.1.74 JoinDataMBS(blocks() as memoryblock) as string

MBS DataTypes Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins an array of memoryblocks in new string.
**Example:**

```
dim s() as MemoryBlock

// make memoryblock with a space character
dim m as MemoryBlock = "Hello"

s.Append m
s.Append m
s.Append m

// now join
dim r as string = JoinDataMBS(s)

// define to be ASCII:
r = DefineEncoding(r, encodings.ASCII)

// and show
```

```
MsgBox r
```

**Notes:** Returned string has no encoding defined.
Raises OutOfMemoryException in case of low memory.
See also:

- 176.1.75 JoinDataMBS(strings() as string) as string 21821
- 176.1.76 JoinDataMBS(values() as Variant) as string 21821

### 176.1.75 JoinDataMBS(strings() as string) as string

MBS DataTypes Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins an array of strings in new string.
**Example:**

```
dim s() as string

s.Append "Hello"
s.Append " "
s.Append "World"

// now join
dim r as string = JoinDataMBS(s)

// define to be ASCII:
r = DefineEncoding(r, encodings.ASCII)

// and show
MsgBox r
```

**Notes:** Returned string has no encoding defined.
Raises OutOfMemoryException in case of low memory.
See also:

- 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
- 176.1.76 JoinDataMBS(values() as Variant) as string 21821

### 176.1.76 JoinDataMBS(values() as Variant) as string

MBS DataTypes Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins an array of variants in new string.
**Example:**

```
dim s() as Variant

// make memoryblock with a space character
dim m as new MemoryBlock(1)
m.Int8Value(0) = 32

s.Append "Hello"
s.Append m
s.Append "World"

// now join
dim r as string = JoinDataMBS(s)

// define to be ASCII:
r = DefineEncoding(r, encodings.ASCII)

// and show
MsgBox r
```

**Notes:** Variants can be memoryblocks or strings or normal objects which can give stringValue.
Returned string has no encoding defined.
Raises OutOfMemoryException in case of low memory.
**Blog Entries**

- Split and Join strings
- MBS Xojo / Real Studio Plugins, version 14.2pr3

See also:

- 176.1.74 JoinDataMBS(blocks() as memoryblock) as string 21820
- 176.1.75 JoinDataMBS(strings() as string) as string 21821

### 176.1.77 JoinStringMBS(strings() as string) as string

MBS DataTypes Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins an array of strings in new string.
**Example:**

```
dim s() as string

s.Append "Hello"
```

```
s.Append " "
s.Append "World"

dim r as string = JoinStringMBS(s)

MsgBox r
```

**Notes:** Converts all strings if necessary into UTF-8. If you want to join them as they are, please use JoinDataMBS.
Raises OutOfMemoryException in case of low memory.
See also:

- 176.1.78 JoinStringMBS(values() as Variant) as string 21823

### 176.1.78 JoinStringMBS(values() as Variant) as string

MBS DataTypes Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Joins an array of strings in new string.
**Example:**

```
dim s() as Variant

s.Append "Hello"
s.Append " "
s.Append "World"

dim r as string = JoinStringMBS(s)

MsgBox r
```

**Notes:** Converts all strings if necessary into UTF-8.
Raises OutOfMemoryException in case of low memory.
**Blog Entries**

- Split and Join strings
- MBS Xojo / Real Studio Plugins, version 14.2pr3

See also:

- 176.1.77 JoinStringMBS(strings() as string) as string 21822

### 176.1.79 StringCodePointsMBS(text as string) as UInt32()

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Query unicode code points for a text.
**Example:**

```
// take Hello World in Japanese
Dim Text As String = "„Åì„Çì„Å´„Å°„ÅØ‰ñÁïå"

// get code points
Dim v() As UInt32 = StringCodePointsMBS(Text)

// check in debugger
Break
```

**Notes:** We get text as UTF32 and return you the characters as an array of numbers.

Can be faster than Xojo's character iterator as we don't construct temporary strings and an iterator object here.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- MBS Xojo Plugins, version 21.3pr7
- Iterating character speed

## 176.2 class StringHandleMBS

### 176.2.1 class StringHandleMBS

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for attaching strings together very fast.
**Example:**

```
dim s as StringHandleMBS

s=new StringHandleMBS

// Add some text
s.Add "Hello"
s.Add " "
s.Add "World"
```

```
// Insert a string
s.Insert " great",6

// check it
MsgBox s.Copy

// Delete the great from above
s.Delete 6,7

// check
MsgBox s.Copy

// Insert again
s.Insert " great ",6

// check
MsgBox s.Copy

// Now we extract the middle, so it's deleted
MsgBox s.Extract(6,7)

// check again
MsgBox s.copy
```

**Notes:** The class initalized itself on the first use.
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr4
- News from the MBS Xojo Plugins Version 22.1
- MBS Xojo Plugins, version 22.1pr5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- MBS Xojo Plugins, version 21.3pr7
- MBS Xojo Plugins, version 21.1pr2
- MBS Xojo Plugins, version 19.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr7
- MBS Xojo Plugins, version 19.1pr6

**Xojo Developer Magazine**

- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 17.3, page 11: News

### 176.2.2 Methods

### 176.2.3 Add(data as MemoryBlock)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data from memoryblock to the string handle.
See also:

- 176.2.4 Add(data as Ptr, size as Integer) 21826
- 176.2.5 Add(data as string) 21826
- 176.2.6 Add(data as StringHandleMBS) 21827

### 176.2.4 Add(data as Ptr, size as Integer)

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds data from ptr to the string handle with given size.
**Notes:** Using invalid Ptr or size combination can cause a crash.
See also:

- 176.2.3 Add(data as MemoryBlock) 21826
- 176.2.5 Add(data as string) 21826
- 176.2.6 Add(data as StringHandleMBS) 21827

### 176.2.5 Add(data as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the string at the end of the current data.
**Notes:** Note that all strings added must have the same encoding.
See also:

- 176.2.3 Add(data as MemoryBlock) 21826
- 176.2.4 Add(data as Ptr, size as Integer) 21826
- 176.2.6 Add(data as StringHandleMBS) 21827

### 176.2.6 Add(data as StringHandleMBS)

MBS DataTypes Plugin, Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds content of other string handle to this one.
**Example:**

```
Dim s1 As New StringHandleMBS

s1.add "Hello World"

Dim s2 As New StringHandleMBS

s2.add "Got: "
s2.add s1

MessageBox s2.Copy
```

**Notes:** Just like asking first StringHandle for content as string or Memoryblock and then adding that to the target one. But without the intermediate copying.
See also:


- 176.2.3 Add(data as MemoryBlock) 21826
- 176.2.4 Add(data as Ptr, size as Integer) 21826
- 176.2.5 Add(data as string) 21826


### 176.2.7 AddByte(value as UInt8)

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a byte to the string handle.

### 176.2.8 AddInteger(value as Int64)

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a integer value to the string handle.
**Notes:** This is like AddString(str(value)).

### 176.2.9 Clear

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the string handle.
**Notes:** Resets size to zero, but does not release memory, so it can be reused.

### 176.2.10 clone as StringHandleMBS

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new StringHandleMBS object with the same content.

### 176.2.11 Constructor

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor of this class.
See also:

- 176.2.12 Constructor(InitValue as MemoryBlock) 21828
- 176.2.13 Constructor(initvalue as string) 21828

### 176.2.12 Constructor(InitValue as MemoryBlock)

MBS DataTypes Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a StringHandle and inserts the content of the memoryblock.
See also:

- 176.2.11 Constructor 21828
- 176.2.13 Constructor(initvalue as string) 21828

### 176.2.13 Constructor(initvalue as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second constructor of this class which sets the value directly to the given Xojo string.
**Example:**

```
// An utility function you can define in a module:

Function BinaryReplaceAll(s as string, a as string,b as string) As string
dim h as StringHandleMBS

h=new StringHandleMBS(s)
```

```
h.ReplaceAll(a,b)

Return h.Copy
End Function
```

See also:

- 176.2.11 Constructor 21828
- 176.2.12 Constructor(InitValue as MemoryBlock) 21828

### 176.2.14 Copy as string

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the content as a Xojo string.
**Notes:** This string will have the encoding set in the encoding property.

### 176.2.15 CopyMemory as MemoryBlock

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies content of handle in new memoryblock.

### 176.2.16 Delete(start as Integer, lengthBytes as Integer)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the bytes within the range.
**Notes:** One based like RB's string functions.
The start and length parameters use bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.17 Extract(start as Integer, lengthBytes as Integer) as string

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a part of the string.
**Notes:** One based and the returned part is removed form the string data.
The start and length parameters use bytes not charcters as unit. You can use the Copy method to get a RB

string for characterwise editing.

### 176.2.18 FindByte(value as UInt8, StartByteOffset as Integer = 1) as Integer

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds position of a given value.
**Example:**

```
Dim s As New StringHandleMBS("Hello")

// 64 = big letters
// +32 = small letters
// + 5 = for 5th letter in alphabet

Dim c As Integer = 64+32+5
Dim p As Integer = s.FindByte(c)

MsgBox "position "+Str(p)+" for letter e"
```

**Notes:** Returns one based byte offset.
Result is 0 if not found.

StartPosition added in v21.3.
See also:

- 176.2.19 FindByte(values() as UInt8, StartByteOffset as Integer = 1) as Integer 21830

### 176.2.19 FindByte(values() as UInt8, StartByteOffset as Integer = 1) as Integer

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds position of a given value.
**Example:**

```
Dim s As New StringHandleMBS("Hello Welt")

Dim values() As UInt8
values.append Asc("e")
values.append Asc("o")
Dim p As Integer = s.FindByte(values, 3)

MsgBox "position "+Str(p)+" for letter "+s.Mid(p, 1)
```

**Notes:** Values is an array of possible values to find.
For best performance avoid duplicates in that array.

Returns one based byte offset.
Result is 0 if not found.
See also:

- 176.2.18 FindByte(value as UInt8, StartByteOffset as Integer = 1) as Integer 21830

### 176.2.20 FirstNonWhiteSpace(StartByteOffset as Integer = 1) as Integer

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds first non-whitespace byte in the data starting at given offset.
**Example:**

```
Dim s As New StringHandleMBS("Hello World")
Dim p As Integer = s.FirstWhiteSpace(1)
Dim x As Integer = s.FirstNonWhiteSpace(p+1)

MsgBox "position "+Str(p)+" for white space and "+Str(x)+" for following text"
```

**Notes:** StartByteOffset is one based.
White space are space, tab and new line characters.
Returns 0 if not found.

### 176.2.21 FirstWhiteSpace(StartByteOffset as Integer = 1) as Integer

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds first whitespace byte in the data starting at given offset.
**Example:**

```
Dim s As New StringHandleMBS("Hello World")
Dim p As Integer = s.FirstWhiteSpace(1)
Dim x As Integer = s.FirstNonWhiteSpace(p+1)

MsgBox "position "+Str(p)+" for white space and "+Str(x)+" for following text"
```

**Notes:** StartByteOffset is one based.
White space are space, tab and new line characters.

Returns 0 if not found.

### 176.2.22 Insert(data as string, position as Integer)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts the string data at the given byte position.
**Notes:** One based.
Note that on Unicode the character position and the byte position are not equal!
(On 16bit Unicode charpos=2*bytepos and on US ASCII charpos=bytepos)

The position parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.23 InStr(OffsetBytes as Integer = 1, target as String, EndOffsetBytes as Integer = -1) as Integer

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for a binary string inside the StringHandle.
**Example:**

```
// We test if RB returns the same values as the plugin

dim s as String
dim h as StringHandleMBS

s="Christian"
h=new StringHandleMBS

h.Add s

MsgBox "MBS: "+str(h.InStr("is"))+", RB: "+str(InStr(s,"is"))
MsgBox "MBS: "+str(h.InStr(5,"ia"))+", RB: "+str(InStr(5,s,"ia"))
MsgBox "MBS: "+str(h.InStr("xy"))+", RB: "+str(InStr(s,"xy"))
```

**Notes:** The same as InStr but with a second parameter to specify the start of the search inside the string handled.

The srcOfs parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

Returns positive value if something is found and zero in case nothing is found.
Returns negative value in case of error.
Casesensitive search!

### 176.2.24 InStrUTF8(OffsetCharacters as Integer = 1, target as String, EndOffsetCharacters as Integer = -1) as Integer

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Searches for a binary string inside the StringHandle.
**Example:**

```
Dim sh As New StringHandleMBS
sh.Encoding = sh.encodingUTF8 // so copy gives right encoding

sh.Add "√Ñ test Hello Word √§√ºº test string."

Dim s As String = sh.Copy

MsgBox "position of text: "+Str(sh.InStr(5,"test"))+"/"+Str(s.InStrB(5,"test"))+"th byte "+_
"or "+Str(sh.InStrUTF8(5,"test"))+"/"+Str(s.InStr(5,"test"))+"th character"
```

**Notes:** This function uses UTF8 characters instead of bytes as unit.
Returns positive value if something is found and zero in case nothing is found.
Returns negative value in case of error.
The same as InStrUTF8 but with a second parameter to specify the start of the search inside the string handle.
Casesensitive search!

### 176.2.25 IsValidASCII(data as ptr, TotalByteLength as integer) as Boolean

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether given data is valid ASCII text.

### 176.2.26 IsValidUTF8(data as ptr, TotalByteLength as integer) as Boolean

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether given data is valid UTF-8 text.

### 176.2.27 Left(lengthBytes as Integer) as string

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the first left bytes of the string.
**Notes:** May return less strings if the stored string is not long enough.

The length parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.28 LeftUTF8(lengthCharacter as integer) as string

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries given number of characters from string from the left side.
**Example:**

```
Dim s As String = "Hello √√§√º!"
Dim d As New StringHandleMBS(s)

d.Encoding = d.encodingUTF8

// √ is two bytes
MsgBox d.LeftUTF8(8)+" in UTF8 and "+d.Left(8)+" in bytes"
```

### 176.2.29 Mid(startByte as Integer, lengthBytes as Integer) as string

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a part of the string.
**Notes:** One based.
The length parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.30 MidInteger(startByte As Integer, lengthBytes As Integer = -1) as Int64

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts some bytes read as ASCII text to number.
**Example:**

```
Dim s As New StringHandleMBS("123456789")

Dim v As Integer = s.MidInteger(3,3)
MsgBox str(v)
```

**Notes:** startByte is one based.

### 176.2.31 MidUTF8(startCharacter as integer, lengthCharacter as integer) as string

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries characters from UTF-8 string with given characters.
**Example:**

```
Dim s As String = "Hello √√§√º!"
Dim d As New StringHandleMBS(s)

d.Encoding = d.encodingUTF8

// √ is two bytes
MsgBox d.MidUTF8(7,4)+" in UTF8 and "+d.Mid(7,4)+" in bytes"
```

**Notes:** startCharacter starts with 1 as in Xojo's mid function.

### 176.2.32 Replace(a as String, b as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the first string found with content of a with the content of b.
**Example:**

```
dim s as StringHandleMBS

s=new StringHandleMBS

s.Add "Hallo Leutle, Hellau"

s.Replace("H","h")
s.Replace("l","i")

MsgBox s.Copy+" "+str(s.Len)
```

**Notes:** Note that all strings are compared binary and must have the same encoding.
Basicly this is just a call to instr, one to delete and one to insert.
See also:

- 176.2.33 Replace(startpos as Integer, a as String, b as string) 21836

### 176.2.33 Replace(startpos as Integer, a as String, b as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces the first string found with content of a with the content of b.
**Notes:** If you don't give a startpos parameter the call uses one and is equal to Replace(a,b).
Startpos is one based like all indexes in this class.
The startpos parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.
See also:

- 176.2.32 Replace(a as String, b as string) 21835

### 176.2.34 ReplaceAll(a as String, b as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces all strings with content of a with the content of b.
**Example:**

```
dim s as StringHandleMBS

s=new StringHandleMBS

s.Add "Hallo Leutle, Hellau"

s.Replaceall("H","h")
s.Replaceall("l","i")

MsgBox s.Copy+" "+str(s.Len)
```

**Notes:** Note that all strings are compared binary and must have the same encoding.
Basicly this is just a loop with calls to instr, to delete and to insert.
See also:

- 176.2.35 ReplaceAll(startpos as Integer, a as String, b as string) 21837

### 176.2.35 ReplaceAll(startpos as Integer, a as String, b as string)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces all strings with content of a with the content of b.
**Notes:** If you don't give a startpos parameter the call uses one and is equal to ReplaceAll(a,b).
Startpos is one based like all indexes in this class.

The startpos parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.
See also:

- 176.2.34 ReplaceAll(a as String, b as string) 21836

### 176.2.36 Reverse as StringHandleMBS

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reverses bytes in string.
**Example:**

```
Dim s As New StringHandleMBS("Hello")
Dim r As StringHandleMBS = s.Reverse

MsgBox r.Copy
```

**Notes:** Returns copy of the string with reversed order.

### 176.2.37 Right(lengthBytes as Integer) as string

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a copy of the first right bytes of the string.
**Example:**

```
// There was a small bug in the Right and the Mid function for the version 3.1 of this plugin.
// This test failed in 3.1, but works in 3.2:

dim Text as StringhandleMBS
dim Part as String

Text = New StringHandleMBS
Text.Add "." + chr(13) + chr(10)
```

```
Part = Text.Copy
' Now Part is ".<CR><LF" which is correct

if lenb(Part)<>3 then
MsgBox "Failed on Copy "+str(lenb(Part))
end if

Part = Text.Right(1)
' Now Part is "<LF>" which is correct

if lenb(Part)<>1 then
MsgBox "Failed on Right(1) "+str(lenb(Part))
end if

Part = Text.Right(2)
' Now Part is "<CR><LF>" which is correct

if lenb(Part)<>2 then
MsgBox "Failed on Right(2) "+str(lenb(Part))
end if

Part = Text.Right(3)
' Now Part is "" which is wrong!

if lenb(Part)<>3 then
MsgBox "Failed on Right(3) "+str(lenb(Part))
end if
```

**Notes:** May return less strings if the stored string is not long enough.
The length parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.38 RightUTF8(lengthCharacter as integer) as string

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries given number of characters from string from the right side.
**Example:**

```
Dim s As String = "Hello √√§√º!"
Dim d As New StringHandleMBS(s)

d.Encoding = d.encodingUTF8

// √ is two bytes
```

```
MsgBox d.RightUTF8(8)+" in UTF8 and "+d.Right(8)+" in bytes"
```

### 176.2.39 Truncate(lengthBytes as Integer)

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Truncates the string handle content.
**Notes:** Sets the length of the string back to the given value if it's greater.

The length parameter uses bytes not charcters as unit. You can use the Copy method to get a RB string for characterwise editing.

### 176.2.40 TruncateUTF8(lengthCharacters as integer)

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Truncates data to given number of UTF-8 characters.
**Example:**

```
Dim s As New StringHandleMBS("√§√√º")

// limit to 2 characters, here 4 bytes
s.TruncateUTF8 2

MsgBox s.Copy
```

### 176.2.41 UTF8Length(data as ptr, TotalByteLength as integer) as Integer

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries how many UTF-8 characters are in one memory area.
**Example:**

```
Dim s As String = "Hello √§√√º"
Dim m As MemoryBlock = s

Dim c As Integer = StringHandleMBS.UTF8Length(m, m.size)

MsgBox str(c)+" characters, "+str(m.size)+" bytes"
```

**Notes:** Please make sure ptr is a valid ptr.
This is the internal function we use ourselves for the UTF-8 related functions.

### 176.2.42 UTF8LengthToBytes(data as ptr, TotalByteLength as integer, Characters as Integer) as Integer

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries how many bytes are needed for UTF-8 characters.
**Example:**

```
Dim s As String = "Hello √§√√º"
Dim m As MemoryBlock = s

Dim c As Integer = StringHandleMBS.UTF8Length(m, m.size)
Dim b As Integer = StringHandleMBS.UTF8LengthToBytes(m, m.size, c)

MsgBox Str(c)+" characters, "+Str(b)+" bytes"
```

**Notes:** Please make sure ptr is a valid ptr.
This is the internal function we use ourselves for the UTF-8 related functions.

### 176.2.43 Properties

### 176.2.44 BlockLen as Int64

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the memory currently used for this class.
**Notes:** This value increases by BlockSize if more memory is needed.
(Read only property)

### 176.2.45 BlockSize as Int64

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the blocks to allocate for storing the data.
**Notes:** (Read and Write property)

### 176.2.46 Encoding as Int64

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The encoding to use for returned strings.
**Notes:** Only useful on Xojo 4.5 and newer.

Some example values for encoding:

| | | |
|---|---|---|
| MacRoman | 0 | Also for ASCII or binary data used. |
| WindowsLatin1 | &h0500 | ANSI codepage 1252 |
| ISOLatin1 | &h0201 | ISO 8859-1 |
| NextStepLatin | &h0B01 | NextStep encoding |
| Unicode | &h0100 | 16 bit Unicode |
| UTF8 | &h08000100 | 8 bit Unicode |
| Invalid | &hFFFFFFFF | (Binary) |
| Invalid | &hFFFF | (Binary) |

(Read and Write property)

### 176.2.47 Len as Int64

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the len in bytes of the stored string.
**Notes:** (Read only property)

### 176.2.48 LenUTF8 as Int64

MBS DataTypes Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries length of text in UTF-8 encoded characters.
**Example:**

```
Dim s As String = "Hello √√§√º!"
Dim d As New StringHandleMBS(s)

MsgBox Str(d.Len)+" bytes, "+Str(d.LenUTF8)+" characters"
```

**Notes:** Returns incorrect values if string is not UTF-8!
(Read only property)

### 176.2.49 ReplaceCount as Int64

MBS DataTypes Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** After a call to one of the Replace functions the number of items replaced.
**Notes:** (Read and Write property)

### 176.2.50 ValidASCII as Boolean

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this string handle contains valid ASCII text.
**Notes:** (Read only property)

### 176.2.51 ValidUTF8 as Boolean

MBS DataTypes Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this string handle contains valid UTF-8 text.
**Example:**

```
Dim s As New StringHandleMBS

s.Add "Hello World"

Dim validUTF8a As Boolean = s.ValidUTF8

// now make invalid
s.AddByte 222

Dim validUTF8b As Boolean = s.ValidUTF8

Break
```

**Notes:** (Read only property)

### 176.2.52 UInt16Value(offset as Integer) as UInt16

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set an UInt16 value.
**Example:**

```
Dim t As String = ConvertEncoding("Hello Welt", encodings.UTF16)
Dim s As New StringHandleMBS(t)

// offset 1 is first character, so second character is offset 3
Dim n As Integer = s.UInt16Value(3)
s.UInt16Value(3) = Asc("a")

MsgBox s.Copy

// append

s.UInt16Value(s.Len+1) = Asc("!")
MsgBox s.Copy
```

**Notes:** Offset is range checked and may raise an OutOfBoundsException.

When you assign a value and the offset is exactly size of the string handle plus one, we append the new byte. (Read and Write computed property)

### 176.2.53 UInt32Value(offset as Integer) as UInt32

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set an UInt32 value.
**Notes:** Offset is range checked and may raise an OutOfBoundsException.

When you assign a value and the offset is exactly size of the string handle plus one, we append the new byte. (Read and Write computed property)

### 176.2.54 UInt8Value(offset as Integer) as UInt8

MBS DataTypes Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a byte value.
**Example:**

```
Dim s As New StringHandleMBS("Hello Welt")

dim n as integer = s.UInt8Value(2)
s.UInt8Value(2) = Asc("a")

MsgBox s.Copy
```

```
// append

s.UInt8Value(s.Len+1) = Asc("!")
MsgBox s.Copy
```

**Notes:** Offset is range checked and may raise an OutOfBoundsException.

When you assign a value and the offset is exactly size of the string handle plus one, we append the new byte. (Read and Write computed property)

### 176.2.55 Constants

Encodings

| Constant | Value | Description |
|---|---|---|
| encodingASCII | &h0600 | ASCII encoding. |
| encodingBinary | &hFFFF | No encoding. |
| encodingLatin1 | &h0201 | ISO Latin 1 encoding. |
| encodingMacRoman | 0 | Mac Roman encoding. |
| encodingUnicode | &h0100 | Unicode UTF16 encoding. |
| encodingUTF8 | &h08000100 | UTF-8 encoding. |
| encodingWindows | &h0500 | Windows encoding. |

## 176.3 class StyledText

### 176.3.1 class StyledText

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The built-in class for styled text.

### 176.3.2 Properties

### 176.3.3 RTFDataMBS(SkipParagraphs as Boolean = false) as string

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set RTF data for this StyledText.
**Example:**

```
Dim s As New StyledText

s.Text = "Hello World"

s.Bold(0,5) = True
s.size(0,6) = 12
s.size(6,5) = 14

#if TargetDesktop
Dim m As String = s.RTFData
#EndIf

Dim r As String = s.RTFDataMBS

Break
```

**Notes:** This is a replacement for the built-in RTFData property.
We tried to make the results exactly like the original.
Speed should be a little bit faster than the official method.

Added SkipParagraphs parameter in version 21.2.
If SkipParagraphs is true, we skip to look on paragraphs, so left/center/right alignment won't be included in the output, but that is much faster.

See also RTFDataMBS and WinRTFDataMBS in TextArea and DesktopTextArea controls and RTFData

in NSTextViewMBS class.
(Read and Write computed property)

## 176.4 class TextConverterMBS

### 176.4.1 class TextConverterMBS

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for converting text from one text encoding to other one.
**Example:**

```
dim s as string = "Hello √§√√º"
dim c as new TextConverterMBS

c.Input = s
c.InputEncoding = "UTF-8"
c.OutputEncoding = "WINDOWS-1252"

c.Convert

dim output as string = c.Output

Break // see in debugger
```

**Notes:** Wraps iconv library. Please use LoadIconvLibrary function to load it. Without the library, we use fallback code, which just passes through data.

Encoding list with alternative names:

- ANSI_X3.4-1968,ANSI_X3.4-1986,ASCII,CP367,IBM367,ISO-IR-6,ISO646-US,ISO_646.IRV:1991,US,US-ASCII,CSASCII
- UTF-8
- ISO-10646-UCS-2,UCS-2,CSUNICODE
- UCS-2BE,UNICODE-1-1,UNICODEBIG,CSUNICODE11
- UCS-2LE,UNICODELITTLE
- ISO-10646-UCS-4,UCS-4,CSUCS4
- UCS-4BE
- UCS-4LE
- UTF-16
- UTF-16BE

- UTF-16LE
- UTF-32
- UTF-32BE
- UTF-32LE
- UNICODE-1-1-UTF-7,UTF-7,CSUNICODE11UTF7
- UCS-2-INTERNAL
- UCS-2-SWAPPED
- UCS-4-INTERNAL
- UCS-4-SWAPPED
- C99
- JAVA
- CP819,IBM819,ISO-8859-1,ISO-IR-100,ISO8859-1,ISO_8859-1,ISO_8859-1:1987,L1,LATIN1,CSISOLATIN1
- ISO-8859-2,ISO-IR-101,ISO8859-2,ISO_8859-2,ISO_8859-2:1987,L2,LATIN2,CSISOLATIN2
- ISO-8859-3,ISO-IR-109,ISO8859-3,ISO_8859-3,ISO_8859-3:1988,L3,LATIN3,CSISOLATIN3
- ISO-8859-4,ISO-IR-110,ISO8859-4,ISO_8859-4,ISO_8859-4:1988,L4,LATIN4,CSISOLATIN4
- CYRILLIC,ISO-8859-5,ISO-IR-144,ISO8859-5,ISO_8859-5,ISO_8859-5:1988,CSISOLATINCYRILLIC
- ARABIC,ASMO-708,ECMA-114,ISO-8859-6,ISO-IR-127,ISO8859-6,ISO_8859-6,ISO_8859-6:1987,CSISOLATINARAI
- ECMA-118,ELOT_928,GREEK,GREEK8,ISO-8859-7,ISO-IR-126,ISO8859-7,ISO_8859-7,ISO_8859-7:1987,ISO_8859 7:2003,CSISOLATINGREEK
- HEBREW,ISO-8859-8,ISO-IR-138,ISO8859-8,ISO_8859-8,ISO_8859-8:1988,CSISOLATINHEBREW
- ISO-8859-9,ISO-IR-148,ISO8859-9,ISO_8859-9,ISO_8859-9:1989,L5,LATIN5,CSISOLATIN5
- ISO-8859-10,ISO-IR-157,ISO8859-10,ISO_8859-10,ISO_8859-10:1992,L6,LATIN6,CSISOLATIN6
- ISO-8859-11,ISO8859-11,ISO_8859-11
- ISO-8859-13,ISO-IR-179,ISO8859-13,ISO_8859-13,L7,LATIN7
- ISO-8859-14,ISO-CELTIC,ISO-IR-199,ISO8859-14,ISO_8859-14,ISO_8859-14:1998,L8,LATIN8
- ISO-8859-15,ISO-IR-203,ISO8859-15,ISO_8859-15,ISO_8859-15:1998,LATIN-9
- ISO-8859-16,ISO-IR-226,ISO8859-16,ISO_8859-16,ISO_8859-16:2001,L10,LATIN10
- KOI8-R,CSKOI8R
- KOI8-U
- KOI8-RU

- CP1250,MS-EE,WINDOWS-1250
- CP1251,MS-CYRL,WINDOWS-1251
- CP1252,MS-ANSI,WINDOWS-1252
- CP1253,MS-GREEK,WINDOWS-1253
- CP1254,MS-TURK,WINDOWS-1254
- CP1255,MS-HEBR,WINDOWS-1255
- CP1256,MS-ARAB,WINDOWS-1256
- CP1257,WINBALTRIM,WINDOWS-1257
- CP1258,WINDOWS-1258
- 850,CP850,IBM850,CSPC850MULTILINGUAL
- 862,CP862,IBM862,CSPC862LATINHEBREW
- 866,CP866,IBM866,CSIBM866
- CP1131
- MAC,MACINTOSH,MACROMAN,CSMACINTOSH
- MACCENTRALEUROPE
- MACICELAND
- MACCROATIAN
- MACROMANIA
- MACCYRILLIC
- MACUKRAINE
- MACGREEK
- MACTURKISH
- MACHEBREW
- MACARABIC
- MACTHAI
- HP-ROMAN8,R8,ROMAN8,CSHPROMAN8
- NEXTSTEP
- ARMSCII-8
- GEORGIAN-ACADEMY

- GEORGIAN-PS
- KOI8-T
- CP154,CYRILLIC-ASIAN,PT154,PTCP154,CSPTCP154
- KZ-1048,RK1048,STRK1048-2002,CSKZ1048
- MULELAO-1
- CP1133,IBM-CP1133
- ISO-IR-166,TIS-620,TIS620,TIS620-0,TIS620.2529-1,TIS620.2533-0,TIS620.2533-1
- CP874,WINDOWS-874
- VISCII,VISCII1.1-1,CSVISCII
- TCVN,TCVN-5712,TCVN5712-1,TCVN5712-1:1993
- ISO-IR-14,ISO646-JP,JIS_C6220-1969-RO,JP,CSISO14JISC6220RO
- JISX0201-1976,JIS_X0201,X0201,CSHALFWIDTHKATAKANA
- ISO-IR-87,JIS0208,JIS_C6226-1983,JIS_X0208,JIS_X0208-1983,JIS_X0208-1990,X0208,CSISO87JISX0208
- ISO-IR-159,JIS_X0212,JIS_X0212-1990,JIS_X0212.1990-0,X0212,CSISO159JISX02121990
- CN,GB_1988-80,ISO-IR-57,ISO646-CN,CSISO57GB1988
- CHINESE,GB_2312-80,ISO-IR-58,CSISO58GB231280
- CN-GB-ISOIR165,ISO-IR-165
- ISO-IR-149,KOREAN,KSC_5601,KS_C_5601-1987,KS_C_5601-1989,CSKSC56011987
- EUC-JP,EUCJP,EXTENDED_UNIX_CODE_PACKED_FORMAT_FOR_JAPANESE,CSEUCPKDFMTJAPANE
- MS_KANJI,SHIFT-JIS,SHIFT_JIS,SJIS,CSSHIFTJIS
- CP932
- ISO-2022-JP,CSISO2022JP
- ISO-2022-JP-1
- ISO-2022-JP-2,CSISO2022JP2
- CP50221,ISO-2022-JP-MS
- CN-GB,EUC-CN,EUCCN,GB2312,CSGB2312
- GBK
- CP936,MS936,WINDOWS-936
- GB18030

- ISO-2022-CN,CSISO2022CN
- ISO-2022-CN-EXT
- HZ,HZ-GB-2312
- EUC-TW,EUCTW,CSEUCTW
- BIG-5,BIG-FIVE,BIG5,BIGFIVE,CN-BIG5,CSBIG5
- CP950
- BIG5-HKSCS:1999
- BIG5-HKSCS:2001
- BIG5-HKSCS:2004
- BIG5-HKSCS,BIG5-HKSCS:2008,BIG5HKSCS
- EUC-KR,EUCKR,CSEUCKR
- CP949,UHC
- CP1361,JOHAB
- ISO-2022-KR,CSISO2022KR
- CP856
- CP922
- CP943
- CP1046
- CP1124
- CP1129
- CP1161,IBM-1161,IBM1161,CSIBM1161
- CP1162,IBM-1162,IBM1162,CSIBM1162
- CP1163,IBM-1163,IBM1163,CSIBM1163
- DEC-KANJI
- DEC-HANYU
- 437,CP437,IBM437,CSPC8CODEPAGE437
- CP737
- CP775,IBM775,CSPC775BALTIC
- 852,CP852,IBM852,CSPCP852

- CP853
- 855,CP855,IBM855,CSIBM855
- 857,CP857,IBM857,CSIBM857
- CP858
- 860,CP860,IBM860,CSIBM860
- 861,CP-IS,CP861,IBM861,CSIBM861
- 863,CP863,IBM863,CSIBM863
- CP864,IBM864,CSIBM864
- 865,CP865,IBM865,CSIBM865
- 869,CP-GR,CP869,IBM869,CSIBM869
- CP1125
- EUC-JIS-2004,EUC-JISX0213
- SHIFT_JIS-2004,SHIFT_JISX0213
- ISO-2022-JP-2004,ISO-2022-JP-3
- BIG5-2003
- ISO-IR-230,TDS565
- ATARI,ATARIST
- RISCOS-LATIN1

**Blog Entries**

- MBS Xojo Plugins, version 23.6pr2
- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr9
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr3

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 37: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.3, page 11: News

### 176.4.2 Methods

### 176.4.3 Canonicalize(name as String) as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Canonicalize an encoding name.
**Example:**

```
MsgBox TextConverterMBS.Canonicalize("utf-8")
MsgBox TextConverterMBS.Canonicalize("Latin1")
```

**Notes:** The result is either a canonical encoding name, or name itself.

### 176.4.4 Constructor

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Currently enables translit and ignore by default.

### 176.4.5 Convert

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts text.
**Example:**

```
dim s as string = "Hello √§√√º"
dim c as new TextConverterMBS

c.Input = s
c.InputEncoding = "UTF-8"
c.OutputEncoding = "WINDOWS-1252"

c.Convert

dim output as string = c.Output

Break // see in debugger
```

**Notes:** Input is read from either Input or InputData properties.

ErrorCode and ErrorMessage are set.
Output is set with output data.

### 176.4.6 EncodingNames(Mode as Integer = 0) as String()

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries names of text encodings.
**Example:**

MsgBox Join(TextConverterMBS.EncodingNames(1),EndOfLine)

**Notes:** Mode 0 returns list of text encoding names.
Mode 1 returns list of text encoding names and alternative names separated by comma.
Mode 2 returns list of text encoding names and alternative names.

e.g. "CP1252,MS-ANSI,WINDOWS-1252" in the list for mode 1.

### 176.4.7 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS Util Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The TextConverterMBS class uses libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 176.4.8 Properties

### 176.4.9 ErrorCode as Integer

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Last error code from Convert method.
**Notes:** (Read and Write property)

### 176.4.10 ErrorMessage as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Text message for error.
**Notes:** (Read and Write property)

### 176.4.11 Ignore as Boolean

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to ignore errors.
**Notes:** Characters that cannot be represented in the target character set will be silently discarded.
(Read and Write property)

### 176.4.12 Input as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Input text string.
**Notes:** (Read and Write property)

### 176.4.13 InputData as MemoryBlock

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Input as memoryblock.
**Notes:** (Read and Write property)

### 176.4.14 InputEncoding as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of input encoding.
**Notes:** e.g. "UTF-8"
(Read and Write property)

### 176.4.15 InputPosition as Integer

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The input position on the end of convert.
**Notes:** If errors are not ignored, this shows error position.
(Read and Write property)

### 176.4.16 LibVersion as Integer

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The library version for iconv.
**Notes:** Returns major * 256 + minor, e.g. &h10B for 1.11.
(Read only property)

### 176.4.17 Output as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output text.
**Notes:** String may not have an encoding set, if the plugin does not recognize the encoding.
But for e.g. UTF-8, we set the text encoding.
(Read and Write property)

### 176.4.18 OutputEncoding as String

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of output encoding.
**Notes:** e.g. "UTF-8"
(Read and Write property)

### 176.4.19 OutputLength as Integer

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length of the output in bytes.
**Notes:** (Read and Write property)

### 176.4.20 Translit as Boolean

MBS Util Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to activate transliteration.
**Notes:** This means that when a character cannot be represented in the target character set, it can be approximated through one or several characters that look similar to the original character.
(Read and Write property)

## 176.5 class TextEncoding

### 176.5.1 class TextEncoding

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Built in class from Xojo for text encodings.

### 176.5.2 Methods

### 176.5.3 InternetNameMBS as string

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the name of this text encoding.
**Notes:** We have this method in MBS Plugin as InternetName function does not work on Linux/Windows. (See feedback case 30712)
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr6

# Chapter 177

# SVG

## 177.1 class ReSVGMBS

### 177.1.1 class ReSVGMBS

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to render SVG data to a picture.
**Example:**

```
// we load this file
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")

Dim p As New ReSVGMBS(file)

// and render them in their normal size:
Dim pic As picture = p.RenderToPicture(p.Width, p.Height)

// show in the window
Window1.Backdrop = pic
```

**Notes:** This uses the ReSVG library written in Rust.
ReSVG is a fast, small, portable SVG library with the goal to support the whole SVG spec.

see
https://github.com/RazrFalcon/resvg
**Blog Entries**

- MBS Xojo Plugins, version 23.5pr3

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr2

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 177.1.2 Methods

### 177.1.3 Constructor(data as MemoryBlock)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates SVG from data.
**Notes:** data: SVG data. Can contain SVG string or gzip compressed data. Must not be nil.

Raises exceptions in case of errors.
See also:

- 177.1.4 Constructor(data as String) 21860
- 177.1.5 Constructor(file as FolderItem) 21861

### 177.1.4 Constructor(data as String)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates SVG from data.
**Notes:** data: SVG data. Can contain SVG string or gzip compressed data. Must not be empty.

Raises exceptions in case of errors.
See also:

- 177.1.3 Constructor(data as MemoryBlock) 21860
- 177.1.5 Constructor(file as FolderItem) 21861

### 177.1.5 Constructor(file as FolderItem)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates SVG from file.
**Example:**

```
// we load this file
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")

Dim p As New ReSVGMBS(file)

// and render them in their normal size:
Dim pic As picture = p.RenderToPicture(p.Width, p.Height)

// show in the window
Window1.Backdrop = pic
```

**Notes:** For the files, .svg and .svgz files are supported.

Raises exceptions in case of errors.
See also:

- 177.1.3 Constructor(data as MemoryBlock) 21860
- 177.1.4 Constructor(data as String) 21860

### 177.1.6 ImageBox(byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the image bounding box.
**Notes:** Can be smaller or bigger than a view box.

Returns true on success and sets passed variables.
Return false if an image has no elements.

### 177.1.7 InitLog

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the library log.
**Notes:** Use it if you want to see any warnings.
Must be called only once.
All warnings will be printed to the ‘stderr‘.

### 177.1.8 LoadSystemFonts

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads system fonts into the internal fonts database.
**Notes:** This method is very IO intensive.

This method should be executed only once.

The system scanning is not perfect, so some fonts may be omitted. Please send a bug report in this case.
Prints warnings into the log.

Has no effect when the ‘text‘ feature is not enabled.

### 177.1.9 NodeBox(id as string, byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns node’s bounding box by ID.
**Notes:** tree Render tree.

id: Node’s ID.

Returns false if a node with such an ID does not exist.
returns false if ID is an empty string.

Returns true on success and sets passed variables.

### 177.1.10 NodeExists(id as string) as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if a renderable node with such an ID exists.
**Notes:** Return false if a node doesn't exist or ID isn't a UTF-8 string.
Return false if a node exists, but not renderable.

### 177.1.11 Render(width as Integer, Height as Integer, pixmap as Ptr, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Renders the SVG onto the pixmap.
**Notes:** FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the pixmap. If nil, we use identity transform.
width: Pixmap width.
height: Pixmap height.
pixmap: Pixmap data. Should have width * height * 4 bytes in size and contain premultiplied RGBA8888 pixels.

### 177.1.12 RenderNode(ID as string, width as Integer, Height as Integer, pixmap as Ptr, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Renders the SVG onto the pixmap.
**Notes:** id: Node's ID. Must not be "".
FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the pixmap. If nil, we use identity transform.
width: Pixmap width.
height: Pixmap height.
pixmap: Pixmap data. Should have width * height * 4 bytes in size and contain premultiplied RGBA8888 pixels.

### 177.1.13 RenderNodeToPicture(ID as string, width as Integer, Height as Integer, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil) as Picture

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Renders the SVG as picture.
**Notes:** id: Node's ID. Must not be "".
FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the picture. If nil, we use identity transform.
width: picture width.
height: picture height.

On success, we return the picture with the pixels.
Not supported for macOS 32-bit.

### 177.1.14 RenderToFile(file as FolderItem, FitToType as Integer = 0, FitToValue as single = 0.0)

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Renders SVG to file.
**Notes:** Only for macOS 32-bit.

### 177.1.15 RenderToPicture(width as Integer, Height as Integer, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil) as Picture

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Renders the SVG as picture.
**Notes:** FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the picture. If nil, we use identity transform.
width: picture width.
height: picture height.

On success, we return the picture with the pixels.
Not supported for macOS 32-bit.

### 177.1.16 ViewBox(byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the image viewbox.
**Notes:** Returns true on success and sets passed variables.

### 177.1.17 Properties

### 177.1.18 Available as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the class is available.
**Example:**

```
MessageBox "Available: "+ReSVGMBS.Available.ToString
```

**Notes:** Should return true for all targets except iOS.
(Read only property)

### 177.1.19 DPI as Double

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The target DPI.
**Notes:** Impact units conversion.
Default: 96
(Read and Write property)

### 177.1.20 FontFamily as String

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The default font family.
**Notes:** Will be used when no ‘font-family‘ attribute is set in the SVG.

Default: Times New Roman
(Read and Write property)

### 177.1.21 FontSize as Double

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The default font size.
**Notes:** Will be used when no ‘font-size‘ attribute is set in the SVG.
Default: 12
(Read and Write property)

### 177.1.22 Handle as Integer

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 177.1.23 Height as Double

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an image height.
**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")
Dim p As New ReSVGMBS(file)

MessageBox "width "+p.Width.ToString+" x height "+p.Height.ToString
```

**Notes:** The size of a canvas that required to render this SVG.
(Read only property)

### 177.1.24 ImageRendering as Integer

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The default image rendering method.
**Example:**

ReSVGMBS.ImageRendering = ReSVGMBS.kImageRenderingOptimizeQuality

**Notes:** Will be used when an SVG element's 'image-rendering' property is set to 'auto'.
Default: kImageRenderingOptimizeQuality
(Read and Write property)

### 177.1.25 IsEmpty as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Checks that tree has any nodes.
**Notes:** Returns true if tree has no nodes.
(Read only property)

### 177.1.26 KeepNamedGroups as Boolean

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Keep named groups.
**Notes:** If set to 'true', all non-empty groups with 'id' attribute will not be removed.
Default: false
(Read and Write property)

### 177.1.27 Languages as String

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A comma-separated list of languages.
**Example:**

ReSVGMBS.Languages = "en,en-US"
MessageBox ReSVGMBS.Languages

**Notes:** Will be used to resolve a ‘systemLanguage‘ conditional attribute.
Example: en,en-US.
Default: en
(Read and Write property)

### 177.1.28 ShapeRendering as Integer

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The default shape rendering method.
**Example:**

ReSVGMBS.ShapeRendering = ReSVGMBS.kShapeRenderingGeometricPrecision

**Notes:** Will be used when an SVG element’s ‘shape-rendering‘ property is set to ‘auto‘.

Default: kShapeRenderingGeometricPrecision
(Read and Write property)

### 177.1.29 TextRendering as Integer

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The default text rendering method.
**Example:**

ReSVGMBS.TextRendering = ReSVGMBS.kTextRenderingOptimizeLegibility

**Notes:** Will be used when an SVG element’s ‘text-rendering‘ property is set to ‘auto‘.
Default: kTextRenderingOptimizeLegibility
(Read and Write property)

### 177.1.30 Width as Double

MBS Images Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an image width.

**Example:**

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")
Dim p As New ReSVGMBS(file)

MessageBox "width "+p.Width.ToString+" x height "+p.Height.ToString
```

**Notes:** The size of a canvas that required to render this SVG.
(Read only property)

### 177.1.31 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorElementsLimitReached | 4 | We do not allow SVG with more than 1_000_000 elements for security reasons. |
| kErrorFileOpenFailed | 2 | Failed to open the provided file. |
| kErrorInvalidSize | 5 | SVG doesn't have a valid size.<br>Occurs when width and/or height are <= 0.<br>Also occurs if width, height and viewBox are not set. |
| kErrorMalformedGZip | 3 | Compressed SVG must use the GZip algorithm. |
| kErrorNotAnUTF8String | 1 | Only UTF-8 content are supported. |
| kErrorOK | 0 | Everything is ok. |
| kErrorParsingFailed | 6 | Failed to parse an SVG data. |

Fit Types

| Constant | Value | Description |
|---|---|---|
| kFitToTypeHeight | 2 | Fit an image to a specified height. |
| kFitToTypeOriginal | 0 | Use an original image size. |
| kFitToTypeWidth | 1 | Fit an image to a specified width. |
| kFitToTypeZoom | 3 | Zoom an image using scaling factor. |

Image Rendering

| Constant | Value | Description |
|---|---|---|
| kImageRenderingOptimizeQuality | 0 | Optimize for quality |
| kImageRenderingOptimizeSpeed | 1 | Optimize for speed |

Shape Renderings

| Constant | Value | Description |
|---|---|---|
| kShapeRenderingCrispEdges | 1 | Crisp Edges |
| kShapeRenderingGeometricPrecision | 2 | Geometric precision |
| kShapeRenderingOptimizeSpeed | 0 | Optimize speed |

Text Renderings

| Constant | Value | Description |
|---|---|---|
| kTextRenderingGeometricPrecision | 2 | Geometric precision |
| kTextRenderingOptimizeLegibility | 1 | Optimize legibility |
| kTextRenderingOptimizeSpeed | 0 | Optimize for speed |

# Chapter 178

# System

## 178.1 Globals

### 178.1.1 GetHelpTagDelayMBS as Integer

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns the delay time for the help tags.
**Example:**

msgbox str(GetHelpTagDelayMBS)

**Notes:** A positive value is for milliseconds and a negative value for microseconds.
It looks like the setting of this property is not recognized always.
This setting is also per application and not saved between sessions.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.2 GetHelpTagDisplayedMBS as boolean

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** whether the help tags are displayed.
**Notes:** This setting is per application and not saved between sessions.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.3 SetHelpTagDelayMBS(value as Integer)

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Sets the delay time for the help tags.
**Example:**

```
if GetHelpTagDelayMBS<>5000 then // change to 5 seconds
SetHelpTagDelayMBS 5000
end if
```

**Notes:** A positive value is for milliseconds and a negative value for microseconds.
It looks like the setting of this property is not recognized always.
This setting is also per application and not saved between sessions.

Xojo 2006r3 does set this value whenever a window comes to front, so if you want to set it really, use some code like in the example above in a timer to change it to your need.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.4 SetHelpTagDisplayedMBS(value as boolean)

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Sets whether the help tags are displayed.
**Notes:** This setting is per application and not saved between sessions.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.5 GetWindowsColorProfileMBS as folderitem

MBS Win Plugin, Plugin Version: 8.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the path to the color profile for the main screen on Windows.
**Example:**

```
dim f as folderitem

f=getwindowsColorProfileMBS

msgBox f.NativePath
```

**Notes:** Returns nil on any error.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr1

### 178.1.6 GetWindowsDisplayColorProfileMBS(DisplayIndex as Integer) as folderitem

MBS Win Plugin, Plugin Version: 8.6, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the path to the color profile for the given screen on Windows.
**Example:**

```
dim f as folderitem

f=GetWindowsDisplayColorProfileMBS(1)

msgBox f.NativePath
```

**Notes:** Index is zero based.
Returns nil on any error.
See also:

- 178.1.7 GetWindowsDisplayColorProfileMBS(DisplayName as String) as folderitem 21873

### 178.1.7 GetWindowsDisplayColorProfileMBS(DisplayName as String) as folderitem

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the path to the color profile for the given screen on Windows.
**Notes:** Same as GetWindowsDisplayColorProfileMBS, but without index and taking a name.
See also:

- 178.1.6 GetWindowsDisplayColorProfileMBS(DisplayIndex as Integer) as folderitem 21873

### 178.1.8 CrashNiceMBS

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crashes the application.
**Notes:** Does a nil object dereference which leads to a crash.

### 178.1.9 CrashUglyMBS

MBS Util Plugin, Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Crashes the application.
**Notes:** This function should hide the stack list so it should be impossible to know what function crashed.

It may take a second to finish it, but CrashReporter (on Mac OS X) and other tools will not be able to show you which function crashed.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr1

### 178.1.10 DelayMBS(time as Double)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stopps the application for the given time.
**Example:**

```
DelayMBS 1.5 // wait one and a half seconds
```

**Notes:** The application should take nearly 0% CPU Power till time has gone.
If you need more options like blocking other RB threads, check the DelayMBS method with mode parameter.

Another example from Kirk Clendinning:

```
Property: lastupdate as Integer

Sub YieldProcessorTime(periodticks as Integer, widthmilliseconds as Integer)
// use the Monkeybread Software delay to yeild time for a screen update
// every period*ticks for a pulse width of width milliseconds

if ticks>lastupdate+periodTicks then
delayMBS widthmilliseconds/1000
lastupdate=ticks
end if

exception err
ExceptionReport(err, "Utils:Methods:YieldProcessorTime")
end sub
```

YieldProcessorTime(15, 20) gives me a delay of 20ms every 250ms. But,

since the delayMBS yields time more efficiently than using a RB thread, this turns out to be a much more effective way to update progress bars etc.
I don't need the delay per se, but since RB still hasn't written a good yield function (that I know of) your delayMSB works instead.

Please use optional mode flags with DelayDontWaitNextEvent when using on thread.

Using DelayMBS on Web Applications can cause problems as the server is paused than for all clients, a really bad thing.
See also:

- 178.1.11 DelayMBS(time as Double, mode as Integer) 21875

### 178.1.11 DelayMBS(time as Double, mode as Integer)

MBS Util Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Stopps the application for the given time.
**Example:**

```
DelayMBS 1.5, 0 // wait one and a half seconds
```

**Notes:** Like DelayMBS with one parameter but additional mode parameter:

combine the following constants:

```
const DelayDontMPYield = 1            // Don't give additional time for other OS threads
const DelayDontRBYield = 2            // Don't give Xojo time for other Xojo threads
const DelayDontThreadYield = 4        // Don't give addition time for other OS threads
const DelayDontQuickTimeYield = 8     // Don't give time for QuickTime Movieplayer
const DelayDontWait = 16              // Don't give CPU time for other OS threads
const DelayDontWaitNextEvent = 32     // Don't give CPU time to handle events on Mac OS X to avoid beachball
                                      cursor
const DelayDontSleep = 64             // Don't give CPU time for other OS threads (Windows)
```

Using DelayDontWaitNextEvent may show the beach ball cursor, but will have the OpenDocument event working as other AppleEvents. Please use DelayDontWaitNextEvent option for running on threads.

Using DelayMBS on Web Applications can cause problems as the server is paused than for all clients, a really bad thing.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr1

- MBS Xojo / Real Studio Plugins, version 16.0pr8
- MBS Xojo / Real Studio Plugins, version 13.4pr5
- MBS Xojo / Real Studio Plugins, version 13.4pr4
- MBS Real Studio Plugins, version 13.1pr7

**Xojo Developer Magazine**

- 19.2, page 33: Shake It!, Shake any window to show an incorrect entry... on any platform, without plugins or declares! by Markus Winter

See also:

- 178.1.10 DelayMBS(time as Double) 21874

### 178.1.12 SleepMBS(time as Double)

MBS Util Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sleeps the current thread for the given time in seconds.
**Example:**

```
dim sock as TCPSocket // some socket
dim done as Boolean // some global property

do

SleepMBS(0.1) // 100 ms
sock.poll

loop until done
```

**Notes:** Sleep does not yield CPU time to other functions, so you really sleep the whole process.
Useful for console projects which sleep for a few milliseconds in a loop polling a socket.

If you need to give CPU time to socket, other threads or for quicktime movie playback, please use DelayMBS.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr9

### 178.1.13 InstallSystemExceptionHandlerMBS(Message as string = "")

MBS Main Plugin, Plugin Version: 10.4, Platforms: macOS, Linux, Targets: All.

**Function:** Installs an exception handler to show a message dialog with custom message before the app crashes.
**Example:**

InstallSystemExceptionHandlerMBS "My message"

**Notes:** If message is empty, the default message is "An unhandled C++ exception occurred. The application will now quit. A common reason for this is simply running out of memory.".

The plugin allocates some memory which we release later to make sure there is free memory for the message box.

On Windows this method does not work as currently we use static runtime on Windows which does not allow the plugin to access the runtime inside the RB framework.
**Blog Entries**

- About InstallSystemExceptionHandlerMBS

### 178.1.14 AbortMBS

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The abort function causes abnormal program termination to occur.
**Notes:** Any open streams are flushed and closed.
The abort function never returns.

### 178.1.15 ExitMBS(code as Integer)

MBS Util Plugin, Plugin Version: 8.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Perform normal program termination.
**Notes:** See "man 3 exit" on the terminal on Mac OS X or Linux for details.
You define your own error codes. Zero is no error by convention.
**Blog Entries**

- Console and GUI in one project
- Tipp of the day: Shell SSH Trouble and Workaround

### 178.1.16 GlobalIdleTimeMBS as Double

MBS MacOSX Plugin, Plugin Version: 13.2, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the current global idle time.
**Example:**

```
MsgBox Format(GlobalIdleTimeMBS,"0.0")+" seconds idle"
```

**Notes:** The return value is the number of seconds the user did not use mouse or keyboard.
Returns 0 on any error.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr5

### 178.1.17 MacGlobalIdleTimeMBS as UInt64

MBS MacOSX Plugin, Plugin Version: 10.0, Platform: macOS, Targets: Desktop only.

**Function:** Queries the current global idle time on a Mac.
**Example:**

```
MsgBox Format(MacGlobalIdleTimeMBS/1000000000.0,"0.0")+" seconds idle"
```

**Notes:** The return value is the number of nanoseconds the user did not use mouse or keyboard.
Returns 0 on any error.

Deprecated in 13.2 plugins in favor of GlobalIdleTimeMBS.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr5
- MBS REALbasic plug-ins version 10.0

### 178.1.18 MacMountServerVolumeMBS(URL as string, MountDir as String, User as String, Password as String, byref Disk as FolderItem, flags as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** This routine will mount the server specified by url at mountDir (or the default location if mountDir is empty).
**Example:**

```
dim flags as Integer = 0
dim disk as FolderItem
dim URL as string = "smb://Test.local"
dim user as string = "root"
```

```
dim pass as string = "xxx"

dim e as Integer = MacMountServerVolumeMBS(URL, "", user, pass, disk, flags)

if e = 0 then
MsgBox "OK"
else
MsgBox disk.NativePath
end if
```

**Notes:** An optional user and password can be passed in for authentication. If no user or password is provided then the underlying file system will handle authentication if required. This routine returns after the mount is complete.

url: The server to mount.
mountDir: The directory to mount the server to (default if empty).
user: String to pass as user for authentication.
password: String to pass as password for authenticated log in.
Disk: The folderItem of the newly mounted volume.
Flags: Options (such as kFSMountServerMarkDoNotDisplay and kFSMountServerMountOnMountDir).

| Constant | Value | Description |
|---|---|---|
| kFSMountServerMarkDoNotDisplay | 1 | Specify this option if you do want the volume displayed as a stand along volume in the UI. |
| kFSMountServerMountOnMountDir | 4 | Specify this option if you want the volume mounted on the mountdir passed in instead of in it. |
| kFSMountServerSuppressConnectionUI | &h40 | Specify this option if you want to suppress connection-time UI when mounting the server volume. |

Returns Mac OS X error code. Zero for success.
**Blog Entries**

- MBS Plugins updated for Xojo 2019r2
- MBS Xojo / Real Studio Plugins, version 16.1pr5

### 178.1.19 MacUnmountVolumeMBS(volume as folderItem, Force as Boolean, byref dissenter as Integer) as Integer

MBS MacOSX Plugin, Plugin Version: 16.1, Platform: macOS, Targets: All.

**Function:** This routine unmounts the volume specified by FolderItem.
**Example:**

```
dim u as Integer = VolumeCount-1
for i as Integer = 0 to u
dim v as FolderItem = volume(i)

if v.Name = "TestServer" then
dim dissenter as Integer = 0
dim e as Integer = MacUnmountVolumeMBS(v, false, dissenter)

if e = 0 then
MsgBox "Unmounted"
else
MsgBox "Failed to unmount with error "+str(e)+". The app with PID "+str(dissenter)+" blocks it."
end if
end if
next
```

**Notes:** If the volume cannot be unmounted the pid of the process which denied the unmount will be returned in the dissenter parameter. This routine returns after the unmount is complete.

Force: Specify true if you want the volume forcibly unmounted. Force unmounting a volume will very likely result in data loss since the volume will be ejected even if there are open files on it. This option should be reserved for situations such as the backing store for a volume is gone (so the data is lost regardless).

dissenter: pid of the process which denied the unmount if the unmount is denied.

Returns Mac OS X error code. Zero for success.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr5

### 178.1.20 StartDictationMBS

MBS MacOSX Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop only.

**Function:** Starts dictation.
**Notes:** This is for Carbon application. For Cocoa use methods on NSApplicationMBS.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr1

### 178.1.21 BacktraceMBS(MaxFrames as Integer = 0, skip as Integer = 2) as string()

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Targets: All.

**Function:** Queries the stack trace of the current function.
**Example:**

```
MsgBox Join(BacktraceMBS, EndOfLine)
```

**Notes:** MaxFrames: How many steps to show at maximum. Default is 128 currently.
skip: How many entries to skip. Default is 2 to not show this function.
Requires Mac OS X 10.5 or Linux.
Skip is 2 to hide this plugin function in the list.
**Blog Entries**

- MBS Xojo Plugins, version 20.1pr1
- Updater Kit 1.5 and BugReporter Kit 1.1
- MBS Real Studio Plugins, version 13.0pr1

### 178.1.22 MillisecondsMBS as Double

MBS Util Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current milliseconds time.
**Notes:** Like Microseconds in Xojo, but queries system functions for milliseconds counter.

### 178.1.23 ExitWindowsMBS(mode as Integer) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shutdown a Windows PC.
**Example:**

```
dim b as boolean
b=ExitWindowsMBS(0)
```

**Notes:** Mode constants:

Returns true if successfull.

| | | |
|---|---|---|
| LOGOFF | 0 | Shuts down all processes running in the security context of the process that called the ExitWindows function. Then it logs the user off. |
| SHUTDOWN | 1 | Shuts down the system to a point at which it is safe to turn off the power. All file buffers have been flushed to disk, and all running processes have stopped. |
| REBOOT | 2 | Shuts down the system and then restarts the system. |
| FORCE | 4 | Forces processes to terminate. When this flag is set, the system does not send the WM_QUERYENDSESSION and WM_ENDSESSION messages. This can cause the applications to lose data. Therefore, you should only use this flag in an emergency. |
| POWEROFF | 8 | Shuts down the system and turns off the power. The system must support the power-off feature. |
| FORCEIFHUNG | 16 | (Windows 2000) Forces processes to terminate if they do not respond to the WM_QUERYENDSESSION or WM_ENDSESSION message. This flag is ignored if FORCE is used. |

The ExitWindows function returns as soon as it has initiated the shutdown. The shutdown or logoff then proceeds asynchronously.

During a shutdown or log-off operation, applications that are shut down are allowed a specific amount of time to respond to the shutdown request. If the time expires, the system displays a dialog box that allows the user to forcibly shut down the application, to retry the shutdown, or to cancel the shutdown request. If the FORCE value is specified, the system always forces applications to close and does not display the dialog box. If the FORCEIFHUNG value is specified, the system forces hung applications to close and does not display the dialog box.

Windows NT: To shut down or restart the system, the calling process must use the AdjustTokenPrivileges function to enable the SE_SHUTDOWN_NAME privilege.
**Blog Entries**

- MBS Real Studio Plugins, version 12.0pr7

### 178.1.24 GetDoubleClickIntervalMBS as Integer

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the time in ticks which makes two clicks to one double click.
**Example:**

```
sub MouseUp(X as Integer, Y as Integer)
dim currentClickTicks as Integer
currentClickTicks = ticks

if (currentClickTicks - lastClickTicks) <= GetDoubleClickIntervalMBS then
if abs(x - lastClickX) <= 5 and abs (y - lastClickY) <= 5 then
DoubleClick //Fire new Doubleclick event
```

```
return
end
end

lastClickTicks = currentClickTicks
lastClickX = x
lastClickY = y
MouseUp
End sub
```

**Notes:** Time returned in ticks. One tick is 1/60 of a second.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.0pr1

### 178.1.25 GetMaximumOpenFileCountMacOSXMBS as Integer

MBS MacCF Plugin, Platforms: macOS, Linux, Targets: All.

**Function:** The number of simultan open files
**Example:**

```
msgbox str(GetMaximumOpenFileCountMacOSXMBS)
```

**Notes:** On Mac OS X per default a process can have 256 files open at the same time.
This function allows you to increase the number of open files. It seems that you can't have more than 10240 files open on Mac OS X.
Returns -2 if the function is not available and -1 if the current number of open files is unknown.

### 178.1.26 GetSystemUIModeMBS as Integer

MBS MacOSX Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current Mac OS X System UI Mode for your application.
**Notes:** Returns -1 on any error.
See SetSystemUIModeMBS for more details.
Please use presentationOptions in NSApplicationMBS for Cocoa applications.

### 178.1.27 GetSystemUIModeOptionsMBS as Integer

MBS MacOSX Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Returns the current Mac OS X System UI Mode options for your application.
**Notes:** Returns -1 on any error.
See SetSystemUIModeMBS for more details.
Please use presentationOptions in NSApplicationMBS for Cocoa applications.

### 178.1.28 MacCountryCodeMBS as string

MBS MacClassic Plugin, Plugin Version: 3.1, Platform: macOS, Targets: Desktop only.

**Function:** Returns the country code for
**Example:**

```
msgbox MacCountryCodeMBS // Shows DE in Germany.
```

**Notes:** On any error returns "".
Requires Mac OS 8.6 or newer (or Mac OS X).
Fix in Plugin version 4.0 to no longer return random strings, but now you must accept that this function may fail on Mac if it has nothing to report. (unkown reason)

### 178.1.29 OpenMacOSXPreferencesPaneMBS(name as string) as Integer

MBS MacOSX Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Opens a named preference pane on Mac OS X.
**Example:**

```
dim e as Integer
e=OpenMacOSXPreferencesPaneMBS("Network")
```

**Notes:** Returns a Mac OS X error code. For example -43 if file not found, -1 if function is not available or 0 if successfull.

Possible values for Mac OS X:
UniversalAccessPref
StartupDisk
Speech
Sound
Network
MyAccount
Mouse
LoginItems
Localization

Keyboard
Internet
Ink
General
EnergySaver
DigiHubDiscs
DesktopPictures
Dock
ColorSync
QuickTime
Classic
Bluetooth
ARDPref
DateAndTime
Accounts
Displays
SoftwareUpdate
SharingPref
ScreenSaver

See content of /System/Library/PreferencePanes/ folder.

In MacOS 10.10 or newer, better use URL schemes:
https://www.mbsplugins.de/archive/2020-04-05/MacOS_System_Preference_Links
**Blog Entries**

- MacOS System Preference Links
- MBS REALbasic plug-in 9.6

### 178.1.30 RunningOnCarbonXMBS as boolean

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if we are running Carbon on Mac OS X.
**Example:**

```
if RunningOnCarbonXMBS then
' do Stuff for Mac OS X only
end if
```

**Notes:** Does always return false on Windows and Mac OS Classic.

### 178.1.31 SetMaximumOpenFileCountMacOSXMBS(Value as Integer)

MBS MacCF Plugin, Platforms: macOS, Linux, Targets: All.

**Function:** The number of simultan open files
**Example:**

SetMaximumOpenFileCountMacOSXMBS 500

**Notes:** On Mac OS X per default a process can have 256 files open at the same time.
This function allows you to increase the number of open files. It seems that you can't have more than 10240 files open on Mac OS X.

### 178.1.32 SetSystemUIModeMBS(mode as Integer, Options as Integer)

MBS MacOSX Plugin, Plugin Version: 2.8, Platform: macOS, Targets: Desktop only.

**Function:** Sets the current System UI mode for your application.
**Notes:** Details from Apple's documentation:

Sets the presentation mode for system-provided user interface elements.

The presentation mode of an application determines which system-provided user interface elements are visible on thes screen. When the frontmost application changes its presentation mode, a kEventAppSystemUIModeChanged Carbon event is sent to all applications that have registered for the event. This event is also sent when an application is activated; it contains the newly active application's presentation mode.

Note that the system UI mode is a per-process state. Switching from a process that is suppressing system UI to another processthat is not will cause system UI elements to become visible automatically. Switching back to the first process will suppress system UI elements again.

The modes available:

The options which you can combine:

Please use presentationOptions in NSApplicationMBS for Cocoa applications.

### 178.1.33 ShowCharacterPaletteMBS

MBS MacOSX Plugin, Plugin Version: 4.1, Platform: macOS, Targets: Desktop only.

| | | |
|---|---|---|
| kUIModeNormal | 0 | In this mode, all standard system UI elements are visible. |
| kUIModeContentSuppressed | 1 | In this mode, system UI elements which cover the "content area" of the screen (the area other than the menubar) are hidden. However, these elements may automatically show themselves in response to mouse movements or other user activity; specifically, the Dock will still show itself automatically when the mouse moves into the Dock's auto-show region. |
| kUIModeContentHidden | 2 | In this mode, system UI elements which cover the "content area" of the screen (the area other than the menubar) are hidden. Unlike kUIModeContentSuppressed, most UI elements will not automatically show themselves in this mode. |
| kUIModeAllHidden | 3 | In this mode, all system UI elements, including the menubar, are hidden. Most system UI elements will not automatically show themselves in this mode. The application may request that the menubar automatically show itself while in this mode by passing the kUIOptionAutoShowMenuBar flag to SetSystemUIMode. |

**Function:** Shows the character palette.
**Example:**

ShowCharacterPaletteMBS

**Notes:** Works on Mac OS X 10.3 and newer.
We have no way to close this window.

### 178.1.34 SystemControlByNameMBS(name as string) as memoryblock

MBS MacCF Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

**Function:** The SystemControlByNameMBS function retrieves system information and allows processes with appropriate privileges to set system information.
**Example:**

```
dim m1 as MemoryBlock = SystemControlByNameMBS("hw.physicalcpu")
dim m2 as MemoryBlock = SystemControlByNameMBS("hw.logicalcpu")

MsgBox "physicalcpu: "+str(m1.Long(0))+EndOfLine+"logicalcpu: "+str(m2.Long(0))
```

**Notes:** The name is given as an ASCII string.
Returns nil on any error.
See also:

- 178.1.35 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock 21888

| | | |
|---|---|---|
| kUIOptionAutoShowMenuBar | 1 | Requests that the menubar automatically show itself when the user moves the mouse into the screen area that would ordinarily be occupied by the menubar. Only valid with kUIModeAllHidden. |
| kUIOptionAnimateMenuBar | 2 | Requests that the menubar animate on or offscreen, if the UIMode is also being changed such that the menubar will change visibility. Unlike other UI options, this option is not stored and only affects the behavior of this call to SetSystemUIMode. Valid for all modes. Available in Mac OS X 10.7 and later. |
| kUIOptionDisableAppleMenu | 4 | Disables all items in the Apple menu. Valid for all modes. |
| kUIOptionDisableProcessSwitch | 8 | The active application may not be changed while this process is active. Currently disables the Command-Tab and Command-Shift-Tab key sequences to switch the active process, and the global window rotation key sequence selected by the user in the Keyboard preference pane. SetFrontProcess may still be used to explicitly switch the active process. Only valid with modes other than kUIModeNormal. |
| kUIOptionDisableForceQuit | 16 | The Force Quit window may not be displayed while this process is active. Currently disables the Command-Option-Escape key sequence to open the Force Quit window and the Force Quit menu item in the Apple menu. Only valid with modes other than kUIModeNormal. |
| kUIOptionDisableSessionTerminate | 32 | The current login session may not be terminated while this process is active. Currently disables the Power key and the Restart, Shut Down, and Log Out menu items in the Apple menu. Only valid with modes other than kUIMode-Normal. |

### 178.1.35 SystemControlByNameMBS(name as string, input as memoryblock) as memoryblock

MBS MacCF Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

**Function:** The SystemControlByNameMBS function retrieves system information and allows processes with appropriate privileges to set system information.
**Notes:** The name is given as an ASCII string.
Returns nil on any error.
See also:

- 178.1.34 SystemControlByNameMBS(name as string) as memoryblock 21887

### 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock

MBS MacCF Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

**Function:** The SystemControlMBS function retrieves system information and allows processes with appropriate privileges to set system information.
**Example:**

```
Function IsRosetta() As boolean
Const CTL_HW = 6
Const HW_MODEL = 2

dim mib,m as MemoryBlock
```

```
mib=newMemoryBlock(8)
mib.Long(0) = CTL_HW
mib.Long(4) = HW_MODEL

m=SystemControlMBS(mib)
if m<>nil then
if m.CString(0)="PowerMac" then
Return true
end if
end if
End Function
```

**Notes:** name is a MIB which can be constructed or queried with SystemControlNameToMIBMBS.
Returns nil on any error.
See also:

- 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock 21889

### 178.1.37 SystemControlMBS(name as memoryblock, input as memoryblock) as memoryblock

MBS MacCF Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

**Function:** The SystemControlMBS function retrieves system information and allows processes with appropriate privileges to set system information.
**Notes:** Returns nil on any error.
name is a MIB which can be constructed or queried with SystemControlNameToMIBMBS.
**Xojo Developer Magazine**

- 5.1, page 45: Detecting Rosetta, Are we running under emulation? by Christian Schmitz

See also:

- 178.1.36 SystemControlMBS(name as memoryblock) as memoryblock 21888

### 178.1.38 SystemControlNameToMIBMBS(name as string) as memoryblock

MBS MacCF Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Targets: All.

**Function:** Searches the given MIB for the given name.
**Notes:** Name is an ASCII string.
Returns nil on any error.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr12

### 178.1.39 WindowsSystemMetricsMBS(what as Integer) as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WindowsSystemMetrics function retrieves various system metrics (widths and heights of display elements) and system configuration settings.
**Example:**

```
const SM_CYSMICON = 50

MsgBox str(WindowsSystemMetricsMBS(SM_CYSMICON))
```

**Notes:** All dimensions retrieved by GetSystemMetrics are in pixels.
If the function fails, the return value is zero.

Values for the what parameter:

The SM_ARRANGE setting specifies how the system arranges minimized windows, and consists of a starting position and a direction. The starting position can be one of the following values:

The direction in which to arrange can be one of the following values:

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/ms724385(v=vs.85).aspx

### 178.1.40 IsWindows95MBS as boolean

MBS Win Plugin, Plugin Version: 5.4, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Checks whether operation system is Windows 95/98/ME.
**Example:**

```
if IsWindows95MBS then
MsgBox "Windows 95/98/ME"
else
MsgBox "no Windows 95/98/ME"
end if
```

**Notes:** Returns true or false on Windows and alway false on other platforms.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.41 IsWindowsAdminUserMBS as boolean

MBS Win Plugin, Plugin Version: 5.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Checkes whether the current user is an Admin User on Windows.
**Example:**

```
if IsWindowsAdminUserMBS then
MsgBox "Is admin user."
else
MsgBox "no admin user."
end if
```

**Notes:** Returns true or false on Windows and alway false on other platforms.

### 178.1.42 IsWindowsNTMBS as boolean

MBS Win Plugin, Plugin Version: 5.4, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Checks whether operation system is Windows NT/2000/XP.
**Example:**

```
if IsWindowsNTMBS then
MsgBox "Windows NT/2000/XP"
else
MsgBox "no Windows NT/2000/XP"
end if
```

**Notes:** Returns true or false on Windows and alway false on other platforms.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr4

### 178.1.43 WindowsGetProcessIntegrityLevelMBS as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The function gets the integrity level of the current process.
**Example:**

msgbox str(WindowsGetProcessIntegrityLevelMBS)

**Notes:** Integrity level is only available on Windows Vista and newer operating systems, thus GetProcessIntegrityLevel throws a C++ exception if it is called on systems prior to Windows Vista.

Returns the integrity level of the current process. It is usually one of these values:

**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- Windows Admin functions
- MBS REALbasic Plugins, version 10.4pr3

### 178.1.44 WindowsIsApplicationRunAsAdminMBS as boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The function checks whether the current process is run as administrator.
**Example:**

msgbox str(WindowsIsApplicationRunAsAdminMBS)

**Notes:** In other words, it dictates whether the primary access token of the process belongs to user account that is a member of the local Administrators group and it is elevated.

Returns true if the primary access token of the process belongs to user account that is a member of the local Administrators group and it is elevated. Returns false if the token does not.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- Windows Admin functions
- MBS REALbasic Plugins, version 10.4pr3

### 178.1.45 WindowsIsProcessElevatedMBS as boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The function gets the elevation information of the current process.
**Example:**

msgbox str(WindowsIsProcessElevatedMBS)

**Notes:** It dictates whether the process is elevated or not. Token elevation is only available on Windows Vista and newer operating systems, thus IsProcessElevated returns always false if it is called on systems prior to Windows Vista. It is not appropriate to use this function to determine whether a process is run as administartor.

Returns true if the process is elevated. Returns false if it is not.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- Windows Admin functions
- MBS REALbasic Plugins, version 10.4pr3

### 178.1.46 WindowsIsUserInAdminGroupMBS as boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The function checks whether the primary access token of the process belongs to user account that is a member of the local Administrators group, even if it currently is not elevated.
**Example:**

msgbox str(WindowsIsUserInAdminGroupMBS)

**Notes:** Returns true if the primary access token of the process belongs to user account that is a member of the local Administrators group. Returns false if the token does not.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- Windows Admin functions
- MBS REALbasic Plugins, version 10.4pr3

## 178.2 module BuildConstantsMBS

### 178.2.1 module BuildConstantsMBS

MBS Main Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with build constants for you.
**Example:**

MsgBox BuildConstantsMBS.DateTime

**Notes:** This module provides the date and time when the plugin was loaded to the Xojo IDE.
You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact.
The examples above show when this page was rendered with our documentation tool.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr8
- Build Time Constants

### 178.2.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| Date | "10. 3.2024" | The constant for the date.<br>Format is dd.mm.yyyy like 24.12.2010.<br>This is the date when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| DateTime | "Sun Mar 10 15:46:08 2024" | The constant for the date and time.<br>This is the time when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| Day | 10 | The day. |
| Hour | 15 | The hour. |
| Minute | 46 | The minute. |
| Month | 3 | The month. |
| Second | 8 | The second. |
| Time | "15:46: 8" | The constant for the time.<br>Format is like hh:mm:ss like 11:22:33.<br>This is the time when the plugin was loaded to the Xojo IDE. You can use this constant to know in your application when it was built. Not exactly, but within a few hours exact. |
| Year | 2024 | The year. |

| | | |
|---|---|---|
| SM_ARRANGE | 56 | Flags specifying how the system arranged minimized windows. For more information about minimized windows, see the following Remarks section. |
| SM_CLEANBOOT | 67 | Value that specifies how the system was started: 0 Normal boot; 1 Fail-safe boot; 2 Fail-safe with network boot; Fail-safe boot (also called SafeBoot) bypasses the user's startup files. |
| SM_CMETRICS | 83 | (Windows 2000 or newer) |
| SM_CMONITORS | 80 | Number of display monitors on the desktop. (Windows 2000 or newer) |
| SM_CMOUSEBUTTONS | 43 | Number of buttons on mouse, or zero if no mouse is installed. |
| SM_CXBORDER | 5 | Width, in pixels, of a window border. |
| SM_CXCURSOR | 13 | Width, in pixels, of a cursor. The system cannot create cursors of other sizes. |
| SM_CXDLGFRAME | 7 | Thickness, in pixels, of the sizing border around the perimeter of a window that can be resized. (or SM_CXFIXEDFRAME) |
| SM_CXDOUBLECLK | 36 | Width, in pixels, of the rectangle around the location of a first click in a double-click sequence. The second click must occur within this rectangle for the system to consider the two clicks a double-click. (The two clicks must also occur within a specified time.) |
| SM_CXDRAG | 68 | Width, in pixels, of a rectangle centered on a drag point to allow for limited movement of the mouse pointer before a drag operation begins. This allows the user to click and release the mouse button easily without unintentionally starting a drag operation. |
| SM_CXEDGE | 45 | Width, in pixels, of a 3-D border. |
| SM_CXFRAME | 32 | Thickness, in pixels, of the sizing border around the perimeter of a window that can be resized. (or SM_CXSIZEFRAME) |
| SM_CXFULLSCREEN | 16 | Width of the client area for a full-screen window on the primary display monitor. |
| SM_CXHSCROLL | 21 | Width, in pixels, of the arrow bitmap on a horizontal scroll bar. |
| SM_CXHTHUMB | 10 | Width, in pixels, of the thumb box in a horizontal scroll bar. |
| SM_CXICON | 11 | The default width, in pixels, of an icon. TheLoadIcon function can load only icons of these dimensions. |
| SM_CXICONSPACING | 38 | Width, in pixels, of a grid cell for items in large icon view. Each item fits into a rectangle of this size when arranged. These values are always greater than or equal to SM_CXICON and SM_CYICON. |
| SM_CXMAXIMIZED | 61 | Default width, in pixels, of a maximized top-level window on the primary display monitor. |
| SM_CXMAXTRACK | 59 | Default maximum width, in pixels, of a window that has a caption and sizing borders. This metric refers to the entire desktop. The user cannot drag the window frame to a size larger than these dimensions. |
| SM_CXMENUCHECK | 71 | Width, in pixels, of the default menu check-mark bitmap. |
| SM_CXMENUSIZE | 54 | Width, in pixels, of menu bar buttons, such as the child window close button used in the multiple document interface. |
| SM_CXMIN | 28 | Minimum width, in pixels, of a window. |
| SM_CXMINIMIZED | 57 | Width, in pixels, of a normal minimized window. |
| SM_CXMINSPACING | 47 | Width, in pixels, of a grid cell for minimized windows. Each minimized window fits into a rectangle this size when arranged. These values are always greater than or equal to SM_CXMINIMIZED and SM_CYMINIMIZED. |
| SM_CXMINTRACK | 34 | Minimum tracking width, in pixels, of a window. The user cannot drag the window frame to a size smaller than these dimensions. A window can override these values by processing the WM_GETMINMAXINFO message. |
| SM_CXSCREEN | 0 | Width, in pixels, of the screen of the primary display monitor. |
| SM_CXSIZE | 30 | Width, in pixels, of a button in a window's caption or title bar. |
| SM_CXSMICON | 49 | Recommended width, in pixels, of a small icon. Small icons typically appear in window captions and in small icon view. |
| SM_CXSMSIZE | 52 | Width, in pixels, of small caption buttons. |
| SM_CXVIRTUALSCREEN | 78 | Width, in pixels, of the virtual screen. The virtual screen is the bounding rectangle of all display monitors. (Windows 98/ME and 2000 or newer) |
| SM_CXVSCROLL | 2 | Width, in pixels, of a vertical scroll bar; and height, in pixels, of the arrow bitmap on a vertical scroll bar. |
| SM_CYBORDER | 6 | Height, in pixels, of a window border. |
| SM_CYCAPTION | 4 | Height, in pixels, of a normal caption area. |
| SM_CYCURSOR | 14 | Height, in pixels, of a cursor. The system cannot create cursors of other sizes. |
| SM_CYDLGFRAME | 8 | Thickness, in pixels, of the frame around the perimeter of a window that has a caption but is not sizable. (or SM_CYFIXEDFRAME) |
| SM_CYDOUBLECLK | 37 | Height, in pixels, of the rectangle around the location of a first click in a double-click sequence. The second click must occur within this rectangle for the system to consider the two clicks a double-click. (The two clicks must also occur within a specified time.) |
| SM_CYDRAG | 69 | Height, in pixels, of a rectangle centered on a drag point to allow for limited movement of the mouse pointer before a drag operation begins. This allows the user to click and release the mouse button easily without unintentionally starting a drag operation. |
| SM_CYEDGE | 46 | Height, in pixels, of a 3-D border. |

| | | |
|---|---|---|
| ARW_BOTTOMLEFT | 0x0000L | Start at the lower-left corner of the screen (default position). |
| ARW_BOTTOMRIGHT | 0x0001L | Start at the lower-right corner of the screen. Equivalent to ARW_STARTRIGHT. |
| ARW_HIDE | 0x0008L | Hide minimized windows by moving them off the visible area of the screen. |
| ARW_TOPLEFT | 0x0002L | Start at the upper-left corner of the screen. Equivalent to ARV_STARTTOP. |
| ARW_TOPRIGHT | 0x0003L | Start at the upper-right corner of the screen. Equivalent to ARW_STARTTOP \| SRW_STARTRIGHT. |

| | | |
|---|---|---|
| ARW_DOWN | 0x0004L | Arrange vertically, top to bottom. |
| ARW_LEFT | 0x0000L | Arrange horizontally, left to right. |
| ARW_RIGHT | 0x0000L | Arrange horizontally, right to left. |
| ARW_UP | 0x0004L | Arrange vertically, bottom to top. |

| | | |
|---|---|---|
| SECURITY_MANDATORY_UNTRUSTED_RID | = &h0 | Means untrusted level. It is used by processes started by the Anonymous group. Blocks most write access. |
| SECURITY_MANDATORY_LOW_RID | = &h1000 | Means low integrity level. It is used by Protected Mode Internet Explorer. Blocks write acess to most objects (such as files and registry keys) on the system. |
| SECURITY_MANDATORY_MEDIUM_RID | = &h2000 | Means medium integrity level. It is used by normal applications being launched while UAC is enabled. |
| SECURITY_MANDATORY_HIGH_RID | = &h3000 | Means high integrity level. It is used by administrative applications launched through elevation when UAC is enabled, or normal applications if UAC is disabled and the user is an administrator. |
| SECURITY_MANDATORY_SYSTEM_RID | = &h4000 | Means system integrity level. It is used by services and other system-level applications (such as Wininit, Winlogon, Smss, etc.) |

## 178.3 class DCDeviceMBS

### 178.3.1 class DCDeviceMBS

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A representation of a device that provides a unique, authenticated token.
**Notes:** Use the shared instance of the DCDevice class to generate a token that identifies a device. Call the generateToken method to get the token, and then send it to your server.

On your server, combine the token with an authentication key that you obtain from Apple, and use the result to request access to two per-device binary digits (bits). After authenticating the device, Apple passes the current values of the bits, along with the date they were last modified, to your server. Your server applies its business logic to this information and communicates the results to your app. For more information about server-side procedures, see Accessing and Modifying Per-Device Data.

To use the DCDevice class, your app must have an app ID that you register on the Apple Developer website.

Apple records the bits for you, and reports the bits back to you, but you,Äôre responsible for keeping track of what the bits mean. You,Äôre also responsible for determining when to reset the bits for a given device; for example, when a user sells the device to someone else.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 178.3.2 Methods

### 178.3.3 available as boolean

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** Whether the class is available.
**Example:**

```
MessageBox "available: "+DCDeviceMBS.available.ToString
```

**Notes:** Returns true on macOS 10.15 and newer and iOS 11.0 or newer.

### 178.3.4 Constructor

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Initializes the object pointing to the current device one internally.

### 178.3.5 currentDevice as DCDeviceMBS

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A representation of the device for which you want to query the two bits of data.

### 178.3.6 generateToken(CompleteHandler as GenerateTokenCompletedMBS, tag as variant = nil)

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** Generates a token that identifies the current device.
**Notes:** Calls GenerateTokenCompletedMBS event later when done.

Your server uses the generated token in its requests to get or set the persistent bits for the current device. You should treat the token you receive in the completion block as single-use. Although the token remains valid long enough for your server to retry a specific request if necessary, you should not use a token multiple times. Instead, use this method to generate a new token.

The app you use to generate the token must be associated with your developer account; otherwise, the generation request fails.

### 178.3.7 Properties

### 178.3.8 Handle as Integer

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 178.3.9 Supported as Boolean

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether the device supports the DeviceCheck API.
**Example:**

MessageBox "Supported: "+DCDeviceMBS.currentDevice.Supported.ToString

**Notes:** For iOS 11.0 or newer and macOS 10.15 or newer.
(Read only property)

### 178.3.10 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| ErrorFeatureUnsupported | 1 | The feature is not supported on this device. |
| ErrorInvalidInput | 2 | Input to the server process was invalid. |
| ErrorInvalidKey | 3 | The key used is invalid. |
| ErrorServerUnavailable | 4 | The server application to talk to is not available. |
| ErrorUnknownSystemFailure | 0 | Unknown error in system. |

### 178.3.11 Delegates

### 178.3.12 GenerateTokenCompletedMBS(token as MemoryBlock, Error as NSErrorMBS, Tag as Variant)

MBS iOS Plugin, Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The event called asynchronously from generateToken when work is done.
**Notes:** token: An ephemeral token that identifies the current device.
error: The error that occurred, if any.

Your server uses the generated token in its requests to get or set the persistent bits for the current device. You should treat the token you receive in the completion block as single-use. Although the token remains valid long enough for your server to retry a specific request if necessary, you should not use a token multiple times. Instead, use this method to generate a new token.

The app you use to generate the token must be associated with your developer account; otherwise, the generation request fails.

## 178.4 class GlobalExceptionHandlerMBS

### 178.4.1 class GlobalExceptionHandlerMBS

MBS Main Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs an exception handler to show a message dialog with custom message before the app crashes.
**Notes:** The plugin allocates some memory which we release later to make sure there is free memory for the message box.

On Windows this method does not work as currently we use static runtime on Windows which does not allow the plugin to access the runtime inside the RB framework.
**Blog Entries**

- Xojo Tips and Tricks
- MBS REALbasic Plugins, version 10.6pr2

### 178.4.2 Events

### 178.4.3 GotException

MBS Main Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Called when an unhandled C++ exception was raised.
**Notes:** Your application is in a very instable state when this event is called. Don't do much here and quit soon with ExitMBS/AbortMBS.

## 178.5 class LinuxSysInfoMBS

### 178.5.1 class LinuxSysInfoMBS

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class to query memory and processor statistics.
**Example:**

```
dim l as new LinuxSysInfoMBS

MsgBox str(l.FreeRam)+" bytes free."
```

**Blog Entries**

- Updater Kit 1.5 and BugReporter Kit 1.1
- MonkeyBread Software releases MBS Real Studio plug-ins in version 12.1
- MBS Real Studio Plugins, version 12.1pr7
- Adding Linux SysInfo class

**Xojo Developer Magazine**

- 10.4, page 9: News

### 178.5.2 Methods

### 178.5.3 Constructor

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries values and fills properties.

### 178.5.4 loads(index as Integer) as Double

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** 1, 5, and 15 minute load averages.

### 178.5.5 Properties

### 178.5.6 availablePhysicalPages as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Return number of available physical pages of memory in the system.
**Notes:** (Read only property)

### 178.5.7 BufferRam as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Memory used by buffers.
**Notes:** (Read only property)

### 178.5.8 FreeHigh as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Available high memory size.
**Notes:** (Read only property)

### 178.5.9 FreeRam as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Available memory size.
**Example:**

```
dim l as new LinuxSysInfoMBS

MsgBox str(l.FreeRam)+" bytes free."
```

**Notes:** (Read only property)

### 178.5.10 FreeSwap as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Swap space still available.
**Notes:** (Read only property)

### 178.5.11 MemoryUnit as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Memory unit size in bytes.
**Notes:** (Read only property)

### 178.5.12 NumberOfProcesses as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Number of current processes.
**Example:**

```
dim l as new LinuxSysInfoMBS

MsgBox str(l.NumberOfProcesses)+" processes"
```

**Notes:** (Read only property)

### 178.5.13 NumberOfProcessors as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Return number of available processors.
**Example:**

```
dim l as new LinuxSysInfoMBS

MsgBox str(l.NumberOfProcessors)+" processors"
```

**Notes:** (Read only property)

### 178.5.14 NumberOfProcessorsConfigured as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Return number of configured processors.
**Notes:** (Read only property)

### 178.5.15 PhysicalPages as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Return number of physical pages of memory in the system.
**Notes:** (Read only property)

### 178.5.16 SharedRam as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Amount of shared memory.
**Notes:** (Read only property)

### 178.5.17 TotalHigh as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Total high memory size.
**Notes:** (Read only property)

### 178.5.18 TotalRam as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Total usable main memory size.
**Notes:** (Read only property)

### 178.5.19 TotalSwap as UInt64

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Total swap space size.
**Notes:** (Read only property)

### 178.5.20 upTime as Integer

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Seconds since boot.
**Notes:** (Read only property)

### 178.5.21 Valid as Boolean

MBS Linux Plugin, Plugin Version: 12.1, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether constructor got values.
**Notes:** Should be true on Linux and false on other platforms.
(Read only property)

## 178.6 class SignalHandlerMBS

### 178.6.1 class SignalHandlerMBS

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A signal handler for an unix signal.
**Notes:** You can use this class to catch signals like SIGALRM oder SIGQUIT.

See
http://en.wikipedia.org/wiki/Signal_(computing)
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr5
- Xojo Web signal handling
- MBS Xojo / Real Studio Plugins, version 14.2pr5
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr3
- MBS REALbasic Plugins, version 10.6pr11

**Xojo Developer Magazine**

- 12.2, page 10: News

### 178.6.2 Methods

### 178.6.3 alarm(seconds as Integer)

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Set signal timer alarm.
**Example:**

SignalHandlerMBS.alarm 1

**Notes:** The alarm() function sets a timer to deliver the signal SIGALRM to the calling process after the specified number of seconds. If an alarm has already been set with alarm() but has not been delivered, another call to alarm() will supersede the prior call. The request alarm(0) voids the current alarm and the signal SIGALRM will not be delivered.

Due to setitimer restriction the maximum number of seconds allowed is 100000000.

alarm sends signal 14 after the time out.

### 178.6.4 ClearFlag(signalIndex as Integer)

MBS Util Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the flag with given index.
**Notes:** Please call this after you got IsFlagSet.

### 178.6.5 ClearFlags

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears all flags.

### 178.6.6 ClearStacktrace(signalIndex as Integer)

MBS Util Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** Clears stored stack trace for the signal with given index.

### 178.6.7 Close

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Releases this object's resources.

### 178.6.8 IsFlagSet(signalIndex as Integer) as boolean

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a given flag was set.

### 178.6.9 QueryStacktrace(signalIndex as Integer, skip as Integer = 2) as string()

MBS Util Plugin, Plugin Version: 14.2, Platforms: macOS, Linux, Targets: All.

**Function:** Queries stack at the time the signal handler was triggered.
**Notes:** Useful to know later which code got the signal.
Works for flag handlers and for the event handlers if enabled.

### 178.6.10 SendSignal(PID as Integer, Signal as Integer) as boolean

MBS Util Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Targets: All.

**Function:** Sends a signal.
**Example:**

```
// send signal to a process
// PID is 17779 here
// 9 means kill on Mac OS X
call SignalHandlerMBS.SendSignal(17779, 9)
```

**Notes:** Returns true on success and false on failure.
Without a signal handler the target app could quit.

Lookup signal.h for the list of signals. They can be different on Mac and Linux.

### 178.6.11 SendSignalToSelf(Signal as Integer) as boolean

MBS Util Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Targets: All.

**Function:** Send a signal to the current process
**Notes:** Returns true on success and false on failure.
Without a signal handler the target app could quit.

### 178.6.12 SetDefaultHandler(signalIndex as Integer) as boolean

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Defines to use the default handler for the given signal number.
**Example:**

```
Const SIGALRM = 14
if SignalHandlerMBS.SetDefaultHandler(SIGALRM) then
```

```
MsgBox "Done"
else
MsgBox "Failed"
end if
```

**Notes:** Returns true on success and false on failure.

### 178.6.13 SetEventHandler(signalIndex as Integer, CollectStackTrace as boolean = false) as boolean

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Defines to call the Signal Event whenever a signal with the given number is received.
**Notes:** Returns true on success and false on failure.
If CollectStackTrace is true, you can later use QueryStacktrace to get the stack trace from the time the signal was captured.

### 178.6.14 SetFlagHandler(signalIndex as Integer, CollectStackTrace as boolean = false) as boolean

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Targets: All.

**Function:** Defines to set the flag whenever a signal with the given number is received.
**Notes:** Returns true on success and false on failure.
Please use IsFlagSet in your app regularly to check if the flag was set.

If CollectStackTrace is true, you can later use QueryStacktrace to get the stack trace from the time the signal was captured.

### 178.6.15 SetIgnore(signalIndex as Integer) as boolean

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Defines to ignore the event with the given number.
**Example:**

```
Const SIGALRM = 14
if SignalHandlerMBS.SetIgnore(SIGALRM) then
MsgBox "Done"
else
MsgBox "Failed"
```

```
end if
```

**Notes:** Returns true on success and false on failure.

### 178.6.16 SetPrintBacktraceAndAbortHandler(signalIndex as integer) as boolean

MBS Util Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Defines to use the plugin handler for the given signal number.
**Example:**

```
Call SignalHandlerMBS.SetPrintBacktraceAndAbortHandler(4) // illegal instruction
Call SignalHandlerMBS.SetPrintBacktraceAndAbortHandler(10) // bus error
Call SignalHandlerMBS.SetPrintBacktraceAndAbortHandler(11) // segmentation fault

// now cause a crash
Dim p As ptr = Nil
p.Int32(0) = 0
```

**Notes:** The signal is handled by the plugin. We print the backtrace and abort.
We write details to a crash.txt file in the current folder.

### 178.6.17 SignalStatus(signalIndex as Integer) as Integer

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: All.

**Function:** Queries the signal state.
**Notes:** Returns 0 (unknown), kSignalDefault, kSignalEvent, kSignalFlag or kSignalIgnored.

### 178.6.18 Events

### 178.6.19 Signal(n as Integer)

MBS Util Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Targets: .

**Function:** A signal was called and you set an event handler.
**Example:**

```
Sub Signal(n as Integer)
// restore system handler in case we get that crash again!
```

```
MySignalHandlerMBS.SetDefaultHandler n

// Mac and Linux can have different signal numbers:

#if TargetMacOS then
dim c as string = "Signal "+str(n)+" on Mac OS X"
#elseif TargetLinux then
dim c as string = "Signal "+str(n)+" on Linux"
#else
dim c as string = "Signal "+str(n)+" on ?"
#endif

dim BackTraceLines() as string
#if mbs.BuildNumber>17662 and not TargetWin32 then // new in 13.0 plugins
BackTraceLines = BacktraceMBS
#endif

// show your bug reporter (or the MBS one)
'dim b as new Bugreporter
'b.ShowExceptionReporter c, BackTraceLines

// quit now without cleaning up the RB runtime which may crash again
ExitMBS 1
End Sub
```

**Notes:** This function may be called at any time, so you need to use code which is thread safe. (see ThreadMBS class)

### 178.6.20 Constants

Signal Handler Modes

| Constant | Value | Description |
|---|---|---|
| kSignalDefault | 1 | The signal calls default handler. |
| kSignalEvent | 3 | The signal raises an event and sets the flag. |
| kSignalFlag | 4 | The signal sets a flag. |
| kSignalIgnored | 2 | The signal is ignored. |
| kSignalPrintBacktraceAndAbort | 8 | The signal is handled by the plugin. We print the backtrace and abort. |

## 178.7 module SystemInformationMBS

### 178.7.1 module SystemInformationMBS

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module to collect all the system information functions.
**Example:**

msgbox "Welcome "+SystemInformationMBS.Username+"!"

**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- News from the MBS Xojo Plugins Version 20.3
- Machine ID
- MBS Releases the MBS Xojo / Real Studio plug-ins in version 16.4
- New for Mac OS X 10.10 in MBS Xojo Plugins
- MBS Plugins 10.3 Release Notes
- MBS REALbasic plug-ins version 9.3
- MonkeyBread Software Releases the MBS Plugins 8.2

**Xojo Developer Magazine**

- 7.4, page 8: News
- 20.5, page 10: News
- 19.5, page 9: News
- 13.6, page 41: A Multicore Processing Primer, Part One by Markus Winter

### 178.7.2 Methods

### 178.7.3 AvailableRAM as Double

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size of the available memory.
**Example:**

msgBox format(SystemInformationMBS.AvailableRAM/1024/1024,"0")+" MB of RAM free."

**Notes:** This function is useful if you want to know how much memory you can allocate without the system swapping.

On Windows, Mac OS X and Linux you can normally allocate up to 2 or 3 GB of memory in your address-room. A swap file on disc is used to cache memory which does not fit into physical memory.

So if you need to allocate a buffer to store temporary data, you can use this function to calculate a good size.
For example a file copy function could use something like this:

```
// a quarter of free memory is good to leave room for some OS buffers:
buffersize=SystemInformationMBS.AvailableRAM/4

// minimum 4 MB
if buffersize<1024*1024*4 then
buffersize<1024*1024*4
end if

// maximum 128 MB to make chunks not too big and application too unresponsible
if buffersize<1024*1024*128 then
buffersize<1024*1024*128
end if
```

In older plugins this function was named AvailableRAMMBS.

### 178.7.4 BusSpeed as Double

MBS Util Plugin, Plugin Version: 11.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the speed of the System bus in Hz.
**Example:**

msgbox "Your main CPU has "+format(SystemInformationMBS.BusSpeed/1000000.0,"0")+" MHz"

### 178.7.5 Computername as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the computer.
**Example:**

msgbox "Hi, I'm "+SystemInformationMBS.Computername+"."

**Notes:** On Mac OS, the name is queried in this order:
1. Try to ask the Mac OS X Corefoundation for the name.
2. Try to ask via AppleEvents the Finder or FileSharing.
3. Read it from the system resources.

On Linux or Windows the system name.

In older plugins this function was named ComputerNameMBS.

### 178.7.6 CPUBrandString as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the CPU brand string.
**Example:**

MsgBox SystemInformationMBS.CPUBrandString

**Notes:** If it is an Intel x86 Chip or something compatible, you get strings like this: "Intel(R) Core(TM) i7 CPU M 620 @ 2.67GHz" (Same as CPUIDMBS.BrandString). But on PowerPC chips we return strings like "PowerPC G5 (970MP)" (same as CPUInfoMBS.CPUName).

May return "" if the processor is unknown.

### 178.7.7 CPUSpeed as Double

MBS Util Plugin, Plugin Version: 11.1, Platform: macOS, Targets: All.

**Function:** Returns the Speed of the main CPU in Hz.
**Example:**

msgbox "Your main CPU has "+format(SystemInformationMBS.CPUSpeed/1000000.0,"0")+" MHz"

### 178.7.8 DomainName as string

MBS Util Plugin, Plugin Version: 10.1, Platform: Windows, Targets: All.

**Function:** Returns the domain name of a Windows PC.
**Example:**

msgbox SystemInformationMBS.DomainName

**Notes:** Returns an empty string on any error.

### 178.7.9 HardDiscSerial as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the hard disc serial number of the first hard disc which has a serial number.
**Example:**

MsgBox SystemInformationMBS.HardDiscSerial

**Notes:** This function can return "" if nothing is found.
Seems to return always empty string on Mac OS X 10.4 as the system properties dictionary does not contain the serial number there.

On Windows this function sometimes returns empty string, but later works again on the same machine. Reason unknown.

In Windows 8.1 it looks like WindowsWMIMBS.InitSecurity(false) must be called at app.open time as Xojo will do some things in background when opening first window which block our queries.

### 178.7.10 HostName as string

MBS Util Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hostname for this computer.
**Example:**

MsgBox SystemInformationMBS.HostName

### 178.7.11 Is64bitWindows as boolean

MBS Util Plugin, Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the Windows you are using is a 64-bit Windows.
**Example:**

msgbox str(SystemInformationMBS.Is64bitWindows)

**Notes:** Returns true for x64 Windows editions for 32-bit applications.
This function could also be named isWoW64 for "is Windows on Windows 64 bit."
Only for Intel CPU.
Will return false if used on ARM CPU.

Returns always true on 64bit target.

### 178.7.12 isARM as Boolean

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks whether CPU is ARM.
**Example:**

```
If TargetMacOS Then
If SystemInformationMBS.isARM Then
MsgBox "Running ARM version on ARM CPU."
Elseif SystemInformationMBS.IsTranslated Then
MsgBox "Running Intel version on ARM CPU."
Else
MsgBox "Running Intel version on Intel CPU."
End If
End If
```

**Notes:** Returns true for:

- Raspberry Pi for Linux ARM

- iOS or Android on device.
- Apple Silicon Mac

Returns false for x86 CPUs, e.g. MacOS as well as iOS/Android in simulator.

### 178.7.13 isBigSur(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 11 Big Sur or newer.
**Notes:** Returns 1 if this is Big Sur or newer, otherwise 0.

### 178.7.14 isCatalina(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is MacOS 10.15 Catalina or newer.
**Example:**

MsgBox str(SystemInformationMBS.isMojave)

**Notes:** Returns true on MacOS 10.15 or newer.

### 178.7.15 isElCapitan(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is Mac OS X 10.11 El Capitan or newer.
**Example:**

MsgBox str(SystemInformationMBS.isElCapitan)

**Notes:** Returns true on Mac OS X 10.11.
If orHigher is set, it will also return true on 10.12.

### 178.7.16 isHighSierra(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 10.13 High Sierra or newer.
**Example:**

MsgBox str(SystemInformationMBS.isHighSierra)

**Notes:** Returns true on Mac OS X 10.13.
If orHigher is set, it will also return true on 10.14.

### 178.7.17 isLeopard(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Whether the operation system is Mac OS X 10.5 Leopard or newer.
**Example:**

MsgBox str(SystemInformationMBS.isLeopard)

**Notes:** Returns true on Mac OS X 10.5 or newer.

### 178.7.18 isLion(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 11.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Whether the operation system is Mac OS X 10.7 Lion or newer.
**Example:**

MsgBox str(SystemInformationMBS.isLion)

**Notes:** Returns true on Mac OS X 10.7 or newer.

### 178.7.19 isMacOSX as Boolean

MBS Util Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if being called on Mac OS X.
**Example:**

msgbox str(SystemInformationMBS.isMacOSX)

### 178.7.20 isMavericks(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is Mac OS X 10.9 Mavericks or newer.
**Example:**

MsgBox str(SystemInformationMBS.isMavericks)

**Notes:** Returns true on Mac OS X 10.9 or newer.

### 178.7.21 isMojave(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is MacOS 10.14 Mojave or newer.
**Example:**

MsgBox str(SystemInformationMBS.isMojave)

**Notes:** Returns true on MacOS 10.14 or newer.

### 178.7.22 isMonterey(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 12 Monterey or newer.
**Notes:** Returns 1 if this is Monterey or newer, otherwise 0.

### 178.7.23 isMountainLion(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Whether the operation system is Mac OS X 10.8 Mountain Lion or newer.
**Example:**

MsgBox str(SystemInformationMBS.isMountainLion)

**Notes:** Returns true on Mac OS X 10.8 or newer.

### 178.7.24 isSierra(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 10.12 Sierra or newer.
**Example:**

MsgBox str(SystemInformationMBS.isSierra)

**Notes:** Returns true on Mac OS X 10.12.
If orHigher is set, it will also return true on 10.13.

### 178.7.25 isSnowLeopard(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Whether the operation system is Mac OS X 10.6 Snow Leopard or newer.
**Example:**

MsgBox str(SystemInformationMBS.isSnowLeopard)

**Notes:** Returns true on Mac OS X 10.6 or newer.

### 178.7.26 isSonoma(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 14 Sonoma or newer.
**Notes:** Returns true if this is Sonoma or newer, otherwise false.

### 178.7.27 IsTranslated as Integer

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries whether application is translated on Apple Silicon Macs.
**Example:**

```
If TargetMacOS Then
If SystemInformationMBS.isARM Then
MsgBox "Running ARM version on ARM CPU."
Elseif SystemInformationMBS.IsTranslated Then
MsgBox "Running Intel version on ARM CPU."
Else
MsgBox "Running Intel version on Intel CPU."
End If
End If
```

**Notes:** Returns 1 if Intel code gots translated to ARM code.
Returns 0 for a native ARM application.
Returns -1 if unknown.

### 178.7.28 isVentura(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is macOS 13 Ventura or newer.
**Notes:** Returns true if this is Ventura or newer, otherwise false.

### 178.7.29 isWindows10(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if called on Windows 10.
**Example:**

msgbox str(SystemInformationMBS.isWindows10)

**Notes:** And False on Mac OS, Linux, Windows 7/Vista/XP/2000/ME/98/95/8/8.1.
If orHigher, than it returns true if OS Version is newer.

### 178.7.30 isWindows11(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if called on Windows 11.
**Example:**

msgbox str(SystemInformationMBS.isWindows11)

**Notes:** And False on Mac OS, Linux, Windows 7/Vista/XP/2000/ME/98/95/8/8.1/10.
If orHigher, than it returns true if OS Version is newer.

### 178.7.31 isWindows2000(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns true if called on Windows 2000.
**Example:**

msgbox str(SystemInformationMBS.isWindows2000)

**Notes:** And False on Mac OS X, Linux, Windows 7/XP/Vista/ME/98/95.
If orHigher, than it returns true if OS Version is newer.

### 178.7.32 isWindows7(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if called on Windows 7.
**Example:**

msgbox str(SystemInformationMBS.isWindows7)

**Notes:** And False on Mac OS X, Linux, Windows Vista/XP/2000/ME/98/95.
If orHigher, than it returns true if OS Version is newer.

### 178.7.33 isWindows8(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if called on Windows 8.
**Example:**

msgbox str(SystemInformationMBS.isWindows8)

**Notes:** And False on Mac OS X, Linux, Windows 7/Vista/XP/2000/ME/98/95.
If orHigher, than it returns true if OS Version is newer.

### 178.7.34 isWindows81(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if called on Windows 8.1
**Example:**

msgbox str(SystemInformationMBS.isWindows81)

**Notes:** And False on Mac OS X, Linux, Windows 7/Vista/XP/2000/ME/98/95/8/10.
If orHigher, than it returns true if OS Version is newer.

### 178.7.35 isWindowsVista(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns true if called on Windows Vista.
**Example:**

msgbox str(SystemInformationMBS.isWindowsVista)

**Notes:** And False on Mac OS X, Linux, Windows 7/XP/2000/ME/98/95.
If orHigher, than it returns true if OS Version is newer.

### 178.7.36 isWindowsXP(orHigher as boolean = false) as Boolean

MBS Util Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns true if called on Windows XP.
**Example:**

msgbox str(SystemInformationMBS.isWindowsXP)

**Notes:** And False on Mac OS X, Linux, Windows 7/Vista/2000/ME/98/95.
If orHigher, than it returns true if OS Version is newer.

### 178.7.37 isYosemite(orHigher as boolean = true) as boolean

MBS Util Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether the operation system is Mac OS X 10.10 Yosemite or newer.
**Example:**

MsgBox str(SystemInformationMBS.isYosemite)

**Notes:** Returns true on Mac OS X 10.10 or newer.

### 178.7.38 LogicalRAM as Double

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Returns the size of the logical installed memory.
**Example:**

msgBox format(SystemInformationMBS.LogicalRAM/1024/1024,"0")+" MB of RAM built in."

**Notes:** On Windows the total virtual memory size.
On Linux always 4 GB.

In older plugins this function was named LogicalRAMMBS.

### 178.7.39 MACAddress as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hardware ethernet address of the first ethernet card.
**Example:**

msgBox SystemInformationMBS.MACAddress

**Notes:** It returns a string with 6 bytes.
Works now with MBS Plugin 2.6 for Mac OS Classic, Carbon inside Classic and Mac OS X, but may not work for a Classic application running on Mac OS X. And may fail on some machines if no OpenTransport is running.

On Windows and Mac OS X you can have multiple ethernet cards and you should use a command line tool with the shell class to find what you need.

For example on Windows:

ipconfig /all

or on Mac OS X:

ifconfig -a

You can replace this function with usage of the NetworkInterface class in newer RB versions.

Added Linux support in version 16.4.

### 178.7.40 MACAddressString as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the hardware ethernet address of the first ethernet card.
**Example:**

msgBox SystemInformationMBS.MACAddressString

**Notes:** Same as MACAddress, but with different format of output.

You can replace this function with usage of the NetworkInterface class in newer RB versions.

The plugin asks on Mac OS X the IOKit framework for the primary ethernet interface. We are not sure what Apple really defines for being the primary one, so let's test it:

- Ethernet on and Airport off ->Ethernet MAC Address
- Ethernet off and Airport on ->Ethernet MAC Address

Added Linux support in version 16.4.

### 178.7.41 MacBoardID as string

MBS Util Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries board-id for Mac.
**Example:**

MsgBox SystemInformationMBS.MacBoardID

**Notes:** e.g. "Mac-1234567890123456"

### 178.7.42 MacBugFixVersion as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The BugFix part of the Mac OS version number.
**Example:**

MsgBox str(SystemInformationMBS.MacBugFixVersion)

**Notes:** The bug fix system version number; in 10.4.17 this would be the decimal value 17.

Intel apps running in Rosetta on Apple M1 will report 10.16 instead of 11.x.

### 178.7.43 MacHasHardwareAcceleratedCoreImage as boolean

MBS Util Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries whether hardware accerlation is used for CoreImage.
**Example:**

```
if SystemInformationMBS.MacHasHardwareAcceleratedCoreImage then
msgbox "CoreImage should be very fast."
else
msgbox "CoreImage may be slow."
end if
```

**Notes:** Queries OpenGL whether programmable fragments are supported.

### 178.7.44 MachineID(flags as Integer = 15) as string

MBS Util Plugin, Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a Machine ID for the current computer.
**Example:**

```
// this is how we build it.
dim t as string = "MachineID"+SystemInformationMBS.HardDiscSerial+SystemInformationMBS.MacSerialNumber+SystemInformationMBS.MacModel+SystemInformationMBS.CPUBrandString

// you could extend it with SystemInformationMBS.WinProductKey

dim m as string = MD5StringMBS(t)
```

MsgBox "Machine ID: "+SystemInformationMBS.MachineID+EndOfLine+"My Machine ID: "+m

**Notes:** Returns a 32 byte long hex string with a Machine ID.
Example value: "EE537483656B25996B51B7F4C99F9083".

This ID is based on the results of the MacSerialNumber, MacModel, CPUBrandString and HardDiscSerial functions. If all 4 functions have no value, the result is always "A2254DEF74A74608D76D1BA49BD2E82A". Also the result could change in future if we fix a bug in one of the functions so that the result values differ.

It is not based on the MACAddressString function as your MAC Address can change when switching between wired and wireless networks. Also we do not check the PhysicalRAM as RAM is a typical thing which changes over time.

You can store this value in some prerences/license file and later compare it agains the current value to see if the machine may have changed. In that case ask user to revalidate license, for example by asking for the serial number.

It can happen that 2 PCs have the same MachineID, typical two virtual machines. So this ID is not unique. But it is very likely that two different computers produce different MachineIDs.

Added flags parameter in 14.1:

| | | |
|---|---|---|
| flagHardDiscSerial | 1 | Use hard disk serial. |
| flagMacSerialNumber | 2 | Use Mac Serial number (on Mac) |
| flagMacModel | 4 | Use Mac Model (on Mac) |
| flagCPUBrandString | 8 | Use CPU Brand String. |
| flagWinProductKey | 16 | Use Product Key (on Windows only) |

The Machine ID may be different if one of the components returns a different result. Result may be different in whether app runs as admin or not on Windows.

In Windows 8.1 it looks like WindowsWMIMBS.InitSecurity(false) must be called at app.open time as Xojo will do some things in background when opening first window which block our queries.

### 178.7.45 MacMajorVersion as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The major Mac OS version number.

**Example:**

```
// show major version number
MsgBox str(SystemInformationMBS.MacMajorVersion)

// and show all three version numbers together:
MsgBox str(SystemInformationMBS.MacMajorVersion)+"."+str(SystemInformationMBS.MacMinorVersion)+"."+str(SystemInformationMBS.MacBugFixVersion)
```

**Notes:** The major system version number; in 10.4.17 this would be the decimal value 10.

On macOS Big Sur, this returns 11 in Apple Silicon application and 10 in Intel application.
On macOS Monterey this returns 12.
If your Intel application is build with older SDK (e.g. Xojo 2019), the result reported version will still be macOS 10.16.

### 178.7.46 MacMinorVersion as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: macOS, Targets: All.

**Function:** The minor Mac OS version number.
**Example:**

```
MsgBox str(SystemInformationMBS.MacMinorVersion)
```

**Notes:** The minor system version number; in 10.4.17 this would be the decimal value 4.

### 178.7.47 MacModel as string

MBS Util Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Mac model string.
**Example:**

```
msgbox SystemInformationMBS.MacModel
```

**Notes:** for example "<powermac7,3>".

### 178.7.48 MacROMBootVersion as string

MBS Util Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns boot ROM version string.
**Example:**

MsgBox SystemInformationMBS.MacROMBootVersion

**Notes:** e.g. "220.270.99.0.0 (iBridge: 16.16.6571.0.0,0)"

### 178.7.49 MacSerialNumber as string

MBS Util Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the serial number of your local Mac.
**Example:**

msgbox SystemInformationMBS.MacSerialNumber

**Notes:** May return an empty string in case of an error.
(e.g. when being user on Windows or if the Mac does not know its serialnumber)

### 178.7.50 MacUUID as string

MBS Util Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the unique identifier for the given Mac.
**Example:**

msgbox SystemInformationMBS.MacUUID

**Notes:** Returns "" on any error.

### 178.7.51 MacVRAMSize as Int64

MBS Util Plugin, Plugin Version: 8.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries the size of the main video graphics memory size.
**Example:**

msgbox format(SystemInformationMBS.MacVRAMSize,"0")+" Bytes VRAM."

**Notes:** Walks over the list of displays, asks on each display for its VRAM size and returns the first value found.

For some reason this seems not to return more than 256 MB of memory.

### 178.7.52 OSName as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string to display which OS Version you have.
**Example:**

msgBox SystemInformationMBS.OSName
' may show: Mac OS X

**Notes:** Return values possible:
Windows NT
Windows 2000
Windows XP
Windows Vista
Mac OS
Mac OS X
Linux

and a few other Windows versions like 6.2 alias 8.

In older plugins this function was named OSNameMBS.

### 178.7.53 OSVersionString as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a string to display which OS Version you have.
**Example:**

msgBox SystemInformationMBS.OSVersionString
' may show: Mac OS X 10.1.2

**Notes:** GetOSVersionStr returns the version string of the OS.
Some Possible values:
"System 7.5.3",
"MacOS 8",
"MacOS 9.1",
"MacOS X 10.4.1",
"Windows NT 3.5",
"Windows 2000 (Service Pack 3)".

In older plugins this function was named OSVersionStrMBS.

On macOS Big Sur, this returns 11.x in Apple Silicon application and 10.6 in Intel application.
On macOS Monterey this returns 12.x.
If your Intel application is build with older SDK (e.g. Xojo 2019), the result reported version will still be macOS 10.16.

### 178.7.54 PhysicalRAM as Double

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the size of the physical installed memory.
**Example:**

```
msgBox format(SystemInformationMBS.PhysicalRAM/1024/1024,"0")+" MB of RAM built in."
```

**Notes:** On old Windows versions some hundred KBs less for DOS.

Result changed from integer to double in plugin version 3.4 to return correct results on 2 GB RAM. In v5.2 changed to return correct values on Macs with more than 4 GB of RAM.

On Windows the total physical memory size.

In older plugins this function was named PhysicalRAMMBS.

### 178.7.55 ProcessorCount(Mode as Integer = 0) as Integer

MBS Util Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of processors on the target system.

**Example:**

```
MsgBox _
str(SystemInformationMBS.ProcessorCount(SystemInformationMBS.kProcessorCountDefault ))+" default"
+ EndOfLine + _
str(SystemInformationMBS.ProcessorCount(SystemInformationMBS.kProcessorCountLogical ))+" logical"
+ EndOfLine + _
str(SystemInformationMBS.ProcessorCount(SystemInformationMBS.kProcessorCountPhysical))+" physical"
```

**Notes:** With plugin version 18.0, we added mode parameter. Pass 2 for physical CPU (kProcessorCountPhysical) and 1 for logical CPU count (kProcessorCountLogical) on Mac/Win.

On Windows or Mac OS the number of cores.
On Linux the number of configured CPUs.

Returns 1 on any error.

### 178.7.56 ShortUsername as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the short name of the current user.
**Example:**

```
msgbox "Welcome "+SystemInformationMBS.ShortUsername+"!"
```

**Notes:** On Linux and Mac OS X the short user name.

On all other cases the same as UserName function.

### 178.7.57 SystemFont as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the name of the used system font.
**Example:**

```
msgbox "You are using the system font "+SystemInformationMBS.SystemFont+"."
```

**Notes:** On Windows the system function returns "System" for our tests. Please tell us if this function is not working for you correct on Windows.

On Linux something like "Sans 10" is returned.

In older plugins this function was named SystemFontMBS.

### 178.7.58 Username as string

MBS Util Plugin, Plugin Version: 8.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the current user.
**Example:**

```
msgbox "Welcome "+SystemInformationMBS.Username+"!"
```

**Notes:** Code for Multiple User on Mac OS 9 is build in, but I can't test it.

This is tried on Mac OS:
1. Mac OS X Username function.
2. AppleEvent to FileSharing.
3. Mulitple User Username (Mac OS 9)
4. System username from system resource.

In older plugins this function was named UserNameMBS.

### 178.7.59 WinBuildNumber as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The build number of the operating system.
**Example:**

```
MsgBox str(SystemInformationMBS.WinBuildNumber)
```

**Notes:** For example returns 2600 on Windows XP Build 2600.

### 178.7.60 WinCSDVersion as string

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A string, such as "Service Pack 3", that indicates the latest Service Pack installed on the system.
**Example:**

MsgBox SystemInformationMBS.WinCSDVersion

**Notes:** Shows here "Service Pack 3" on a Windows XP installation.
If no Service Pack has been installed, the string is empty.

### 178.7.61 WindowsAero as boolean

MBS Util Plugin, Plugin Version: 10.1, Platform: Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Whether Windows is using the Aero Interface?
**Example:**

msgbox str(SystemInformationMBS.WindowsAero)

**Notes:** True if aero is used. False if the status is unknown (e.g. on Windows XP) or Aero is not used.

### 178.7.62 WindowsNativeMachine as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the native machine type.
**Notes:** This may return ARM64 on a Windows with ARM CPU.

### 178.7.63 WindowsProcessMachine as Integer

MBS Util Plugin, Plugin Version: 22.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the machine type of the current process.
**Notes:** This may return AMD64, while running in emulation on ARM64.

### 178.7.64 WinMajorVersion as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The major version number of the operating system.
**Example:**

MsgBox str(SystemInformationMBS.WinMajorVersion)

**Notes:** Returns 5 on Windows 2000/XP and 6 on Windows Vista/7/8.

### 178.7.65 WinMinorVersion as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The minor version number of the operating system.
**Example:**

MsgBox str(SystemInformationMBS.WinMinorVersion)

**Notes:** Returns 0 on Windows 2000/Vista and 1 on Windows XP/7 and 2 on Windows 8.

### 178.7.66 WinPlatformId as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The operating system platform.
**Example:**

MsgBox str(SystemInformationMBS.WinPlatformId)

**Notes:** This member can be VER_PLATFORM_WIN32_NT (2).
e.g. 2 on Windows XP.

### 178.7.67 WinProductKey as string

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the product key of the Windows installation.
**Notes:** Returns "" on any error.

See also:

- 178.7.68 WinProductKey(path as string, name as string, keyStartIndex as Integer = 52) as string 21937

### 178.7.68 WinProductKey(path as string, name as string, keyStartIndex as Integer = 52) as string

MBS Util Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the product key of the Windows installation.
**Notes:** Returns "" on any error.
With the right path and name you can read also the office versions.

For Office 10, it looks like you need to use 808 as offset.
See also:

- 178.7.67 WinProductKey as string 21936

### 178.7.69 WinProductType as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Any additional information about the system.
**Example:**

MsgBox str(SystemInformationMBS.WinProductType)

**Notes:** e.g. 1 on Windows XP.

This member can be one of the following values:

| | | |
|---|---|---|
| VER_NT_DOMAIN_CONTROLLER | 2 | The system is a domain controller and the operating system is Windows Server 2008, Windows Server 2003, or Windows 2000 Server. |
| VER_NT_SERVER | 3 | The operating system is Windows Server 2008, Windows Server 2003, or Windows 2000 Server. Note that a server that is also a domain controller is reported as VER_NT_DOMAIN_CONTROLLER, not VER_NT_SERVER. |
| VER_NT_WORKSTATION | 1 | The operating system is Windows Vista, Windows XP Professional, Windows XP Home Edition, or Windows 2000 Professional. |

### 178.7.70 WinServicePackMajor as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The major version number of the latest Service Pack installed on the system.
**Example:**

MsgBox str(SystemInformationMBS.WinServicePackMajor)

**Notes:** For example, for Service Pack 3, the major version number is 3. If no Service Pack has been installed, the value is zero.

### 178.7.71 WinServicePackMinor as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The minor version number of the latest Service Pack installed on the system.
**Example:**

MsgBox str(SystemInformationMBS.WinServicePackMinor)

**Notes:** For example, for Service Pack 3, the minor version number is 0.

### 178.7.72 WinSuiteMask as Integer

MBS Util Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A bit mask that identifies the product suites available on the system.
**Example:**

MsgBox str(SystemInformationMBS.WinSuiteMask)

**Notes:** e.g. 256 on Windows XP.

This member can be a combination of the following values.

| | | |
|---|---|---|
| VER_SUITE_BACKOFFICE | 4 | Microsoft BackOffice components are installed. |
| VER_SUITE_BLADE | &h0400 | Windows Server 2003, Web Edition is installed. |
| VER_SUITE_COMPUTE_SERVER | &h4000 | Windows Server 2003, Compute Cluster Edition is installed. |
| VER_SUITE_DATACENTER | &h0080 | Windows Server 2008 Datacenter, Windows Server 2003, Datacenter Edition, or Windows 2000 Datacenter Server is installed. |
| VER_SUITE_ENTERPRISE | 2 | Windows Server 2008 Enterprise, Windows Server 2003, Enterprise Edition, or Windows 2000 Advanced Server is installed. Refer to the Remarks section for more information about this bit flag. |
| VER_SUITE_EMBEDDEDNT | &h0040 | Windows XP Embedded is installed. |
| VER_SUITE_PERSONAL | &h0200 | Windows Vista Home Premium, Windows Vista Home Basic, or Windows XP Home Edition is installed. |
| VER_SUITE_SINGLEUSERTS | &h0100 | Remote Desktop is supported, but only one interactive session is supported. This value is set unless the system is running in application server mode. |
| VER_SUITE_SMALLBUSINESS | 1 | Microsoft Small Business Server was once installed on the system, but may have been upgraded to another version of Windows. Refer to the Remarks section for more information about this bit flag. |
| VER_SUITE_SMALLBUSINESS_RESTRICTED | &h0020 | Microsoft Small Business Server is installed with the restrictive client license in force. Refer to the Remarks section for more information about this bit flag. |
| VER_SUITE_STORAGE_SERVER | &h2000 | Windows Storage Server 2003 R2 or Windows Storage Server 2003is installed. |
| VER_SUITE_TERMINAL | &h0010 | Terminal Services is installed. This value is always set. If VER_SUITE_TERMINAL is set but VER_SUITE_SINGLEUSERTS is not set, the system is running in application server mode. |
| VER_SUITE_WH_SERVER | &h8000 | Windows Home Server is installed. |

### 178.7.73 Constants

ProcessorCount Modes

| Constant | Value | Description |
|---|---|---|
| kProcessorCountDefault | 0 | Default behavior. |
| kProcessorCountLogical | 1 | Logical Processors |
| kProcessorCountPhysical | 2 | Physical Processors |

Windows Machine Types

| Constant | Value | Description |
|---|---|---|
| kWindowsMachineAMD64 | &h8664 | ARM in 64-bit. |
| kWindowsMachineARM32 | &h01c0 | ARM in 32-bit. |
| kWindowsMachineARM64 | &hAA64 | AMD 64-bit x86. |
| kWindowsMachineI386 | &h014c | Intel 32-bit x86. |
| kWindowsMachineUnknown | 0 | Unknown. |

# Chapter 179

# SystemConfiguration

## 179.1 class SCNetworkReachabilityMBS

### 179.1.1 class SCNetworkReachabilityMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class to check network reachability.
**Notes:** The SCNetworkReachability class allow an application to determine the status of a system's current network configuration and the reachability of a target host. In addition, the reachability can be monitored with a notification being provided when/if the status has changed.

The term "reachable" reflects whether a data packet, sent by an application into the network stack, can be sent to the the target host/address. Please note that there is no guarantee that the data packet will actually be received by the host.

Requires Mac OS X 10.3 or newer.
Subclass of the CFObjectMBS class.

### 179.1.2 Methods

### 179.1.3 CreateWithAddress(ip as string) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Creates a reference to the specified network address.
**Notes:** Returns true on success.

### 179.1.4 CreateWithAddressPair(LocalIP as string, RemoteIP as string) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Creates a reference to the specified network address.
**Notes:** Returns true on success.
LocalIP: The local address associated with a network connection.
RemoteIP: The remote address associated with a network connection.
One of the IP addresses can be empty.

### 179.1.5 CreateWithName(name as string) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Creates a reference to the specified network host/node name.
**Notes:** Returns true on success.

### 179.1.6 ErrorString(errorcode as Integer) as string

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns an error string for a given SC Error Code.
**Notes:** A utility function which works at any time.

### 179.1.7 Properties

### 179.1.8 Error as Integer

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the last error code.
**Notes:** A utility function which works with all SystemConfiguration methods.

(Read only property)

### 179.1.9 Flags as Integer

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Determines if the given target is reachable using the current network configuration.
**Notes:** Returns 0 on any error.

| | | |
|---|---|---|
| kSCStatusOK | = 0 | Success |
| kSCStatusFailed | = 1001 | Non-specific failure |
| kSCStatusInvalidArgument | = 1002 | Invalid argument |
| kSCStatusAccessError | = 1003 | Permission denied - must be root to obtain lock - could not create access/create preferences |
| kSCStatusNoKey | = 1004 | No such key |
| kSCStatusKeyExists | = 1005 | Key already defined |
| kSCStatusLocked | = 1006 | Lock already held |
| kSCStatusNeedLock | = 1007 | Lock required for this operation |
| kSCStatusNoStoreSession | = 2001 | Configuration daemon session not active |
| kSCStatusNoStoreServer | = 2002 | Configuration daemon not (no longer) available |
| kSCStatusNotifierActive | = 2003 | Notifier is currently active |
| kSCStatusNoPrefsSession | = 3001 | Preference session not active |
| kSCStatusPrefsBusy | = 3002 | Preferences update currently in progress |
| kSCStatusNoConfigFile | = 3003 | Configuration file not found |
| kSCStatusNoLink | = 3004 | No such link |
| kSCStatusStale | = 3005 | Write attempted on stale version of object |
| kSCStatusMaxLink | = 3006 | Maximum link count exceeded |
| kSCStatusReachabilityUnknown | = 4001 | Network reachability cannot be determined |

See the event for the flag constants.
(Read only property)

### 179.1.10 Events

### 179.1.11 Changed(flags as Integer)

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: .

**Function:** The reachability changed.
**Notes:** useful constants:

| | |
|---|---|
| kSCNetworkFlagsTransientConnection | = 1 |
| kSCNetworkFlagsReachable | = 2 |
| kSCNetworkFlagsConnectionRequired | = 4 |
| kSCNetworkFlagsConnectionAutomatic | = 8 |
| kSCNetworkFlagsInterventionRequired | = 5 |
| kSCNetworkFlagsIsLocalAddress | = 65536 |
| kSCNetworkFlagsIsDirect | = 131072 |

Flags that indicate whether the specified network nodename/address is reachable, requires a connection, requires some user intervention in establishing the connection, and whether the calling application must initiate the connection using the (TBD???) API.

kSCNetworkFlagsTransientConnection
This flag indicates that the specified nodename/address can be reached via a transient (e.g. PPP) connection.

kSCNetworkFlagsReachable
This flag indicates that the specified nodename/address can be reached using the current network configuration.

kSCNetworkFlagsConnectionRequired
This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established.

As an example, this status would be returned for a dialup connection that was not currently active but could handle network traffic for the target system.

kSCNetworkFlagsConnectionAutomatic
This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established. Any traffic directed to the specified name/address will initiate the connection.

kSCNetworkFlagsInterventionRequired
This flag indicates that the specified nodename/address can be reached using the current network configuration but a connection must first be established. In addition, some form of user intervention will be required to establish this connection (e.g. providing a password, authentication token, etc.).

kSCNetworkFlagsIsLocalAddress
This flag indicates that the specified nodename/address is one associated with a network interface on the current system.

kSCNetworkFlagsIsDirect
This flag indicates that network traffic to the specified nodename/address will not go through a gateway but is routed directly to one of the interfaces in the system.

## 179.2 class SCPreferencesMBS

### 179.2.1 class SCPreferencesMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for System Configuration Preferences.
**Notes:** Please remember that you may need root access to change something.

The SCPreferences classes allow an application to load and store XML configuration data in a controlled manner and provide the necessary notifications to other applications that need to be aware of configuration changes.

The stored XML configuration data is accessed using a prefsID. A
nil value indicates that the default system preferences are to be accessed.
A string which starts with a leading "/" character specifies the path to the file containing te preferences to be accessed. A string which does not start with a leading "/" character specifies a file relative to the default system preferences directory.

The Path APIs make certain assumptions about the layout of the preferences data. These APIs view the data as a collection of dictionaries of key/value pairs and an associated path name. The root path ("/") identifies the top-level dictionary. Additional path components specify the keys for sub-dictionaries.

For example, the following dictionary can be accessed via two paths. The root ("/") path would return a dictionary with all keys and values. The path "/path1" would only return the dictionary with the "key3" and "key4" properties.

```
<dict>
<key>key1</key>
<string>val1</string>
<key>key2</key>
<string>val2</string>
<key>path1</key>
<dict>
<key>key3</key>
<string>val3</string>
<key>key4</key>
<string>val4</string>
</dict>
</dict>
```

Each dictionary can also include the kSCResvLink key. The value associated with this key is interpreted as a "link" to another path. If this key is present, a call to the GetPathValue() API will return the dictionary specified by the link.

Subclass of the CFObjectMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr4
- MBS Real Studio Plugins, version 12.5pr7

### 179.2.2 Methods

### 179.2.3 AddValue(key as CFStringMBS, value as CFObjectMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Adds data for a preference key.
**Notes:** This function associates new data with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was added; false if the key already exists or if an error occurred.

### 179.2.4 ApplyChanges as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Requests that the currently stored configuration preferences be applied to the active configuration.
**Notes:** Returns true if the lock was obtained; false if an error occurred.

### 179.2.5 CommitChanges as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Commits changes made to the configuration preferences to persitent storage.
**Notes:** This function commits any changes to permanent storage. An implicit call to Lock/Unlock will be made if exclusive access has not already been established.

Note: This routine commits changes to persistent storage. Call ApplyChanges to apply the changes to the running system.

Returns true if the lock was obtained; false if an error occurred.

### 179.2.6 Create(name as CFStringMBS, prefid as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Initiates access to the per-system set of configuration preferences.
**Notes:** name: A string that describes the name of the calling process.
prefsID: A string that identifies the name of the group of preferences to be accessed/updated.

### 179.2.7 CreateUniquePathChild(prefix as CFStringMBS) as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Creates a new path component within the dictionary hierarchy.
**Notes:** prefix: A string that represents the parent path.
Returns a string representing the new (unique) child path; nil if the specified path does not exist.

### 179.2.8 CreateWithAuthorization(name as CFStringMBS, prefid as CFStringMBS, AuthorizationHandle as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 12.5, Platform: macOS, Targets: All.

**Function:** Initiates access to the per-system set of configuration preferences.
**Notes:** name: A string that describes the name of the calling process.
prefsID: A string that identifies the name of the group of preferences to be accessed/updated.
AuthorizationHandle: Handle to authorization object for root access.

### 179.2.9 ErrorString(errorcode as Integer) as string

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns an error string for a given SC Error Code.
**Notes:** A utility function which works at any time.

### 179.2.10 GetPathLink(path as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the link (if one exists) associated with the specified path.
**Notes:** path: A string that represents the path to be returned.
The dictionary associated with the specified path; nil if the path is not a link or does not exist.

### 179.2.11 GetPathValue(path as CFStringMBS) as CFDictionaryMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the dictionary associated with the specified path.
**Notes:** path: A string that represents the path to be returned.
Returns the dictionary associated with the specified path; nil if the path does not exist.

### 179.2.12 GetValue(key as CFStringMBS) as CFObjectMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the data associated with a preference key.
**Notes:** This function retrieves data associated with a key for the prefsID.

You could read stale data and not know it, unless you first call Lock.

Returns the value associated with the specified preference key; If no value was located, nil is returned.

### 179.2.13 KeyList as CFArrayMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns an array of currently defined preference keys.
**Notes:** Returns nil on any error.

### 179.2.14 Lock(wait as boolean) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Locks access to the configuration preferences.
**Notes:** This function obtains exclusive access to the configuration preferences associated with this prefsID. Clients attempting to obtain exclusive access to the preferences will either receive an kSCStatusPrefsBusy error or block waiting for the lock to be released.

wait: A boolean flag indicating whether the calling process should block waiting for another process to complete its update operation and release its lock.

Returns true if the lock was obtained; false if an error occurred.

### 179.2.15 RemovePathValue(path as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Removes the data associated with the specified path.
**Notes:** path: A string that represents the path to be returned.
Returns a boolean indicating the success (or failure) of the call.

### 179.2.16 RemoveValue(key as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Removes the data associated with a preference key.
**Notes:** This function removes the data associated with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was removed; false if the key did not exist or if an error occurred.

### 179.2.17 SetComputerName(name as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Updates the computer/host name in the system preferences.
**Notes:** In order to commit these changes to permanent storage a call must be made to CommitChanges.
A call to ApplyChanges is also required for the new name to become active.
A boolean indicating the success (or failure) of the call.

### 179.2.18 SetLocalHostName(name as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Updates the local host name in the system preferences.
**Notes:** In order to commit these changes to permanent storage a call must be made to CommitChanges.

A call to ApplyChanges is also required for the new name to become active.

### 179.2.19 SetPathLink(path as CFStringMBS, link as CFObjectMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Associates a link to a second dictionary at the specified path.
**Notes:** path: A string that represents the path to be updated.
link: A string that represents the link to be stored at the specified path.
Returns a boolean indicating the success (or failure) of the call.

### 179.2.20 SetPathValue(path as CFStringMBS, value as CFDictionaryMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Associates a dictionary with the specified path.
**Notes:** path: A string that represents the path to be updated.
value: A dictionary that represents the data to be stored at the specified path.
Returns a boolean indicating the success (or failure) of the call.

### 179.2.21 SetValue(key as CFStringMBS, value as CFObjectMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Updates the data associated with a preference key.
**Notes:** This function adds or replaces the value associated with the specified key. In order to commit these changes to permanent storage a call must be made to CommitChanges.

Returns true if the value was set; false if an error occurred.

### 179.2.22 Signature as CFBinaryDataMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns a sequence of bytes that can be used to determine if the saved configuration preferences have changed.
**Notes:** A CFBinaryDataMBS that reflects the signature of the configuration preferences at the time of the call to Create.

### 179.2.23 Unlock as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Releases exclusive access to the configuration preferences.
**Notes:** This function releases the exclusive access "lock" for this prefsID. Other clients will be now be able

to establish exclusive access to the preferences.

Returns true if the lock was obtained; false if an error occurred.

### 179.2.24 Properties

### 179.2.25 Available as Boolean

MBS MacCF Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on macOS.
(Read only property)

### 179.2.26 Error as Integer

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Returns the last error code.
**Notes:** A utility function which works with all SystemConfiguration methods.

| | | |
|---|---|---|
| kSCStatusOK | = 0 | Success |
| kSCStatusFailed | = 1001 | Non-specific failure |
| kSCStatusInvalidArgument | = 1002 | Invalid argument |
| kSCStatusAccessError | = 1003 | Permission denied - must be root to obtain lock - could not create access/create preferences |
| kSCStatusNoKey | = 1004 | No such key |
| kSCStatusKeyExists | = 1005 | Key already defined |
| kSCStatusLocked | = 1006 | Lock already held |
| kSCStatusNeedLock | = 1007 | Lock required for this operation |
| kSCStatusNoStoreSession | = 2001 | Configuration daemon session not active |
| kSCStatusNoStoreServer | = 2002 | Configuration daemon not (no longer) available |
| kSCStatusNotifierActive | = 2003 | Notifier is currently active |
| kSCStatusNoPrefsSession | = 3001 | Preference session not active |
| kSCStatusPrefsBusy | = 3002 | Preferences update currently in progress |
| kSCStatusNoConfigFile | = 3003 | Configuration file not found |
| kSCStatusNoLink | = 3004 | No such link |
| kSCStatusStale | = 3005 | Write attempted on stale version of object |
| kSCStatusMaxLink | = 3006 | Maximum link count exceeded |
| kSCStatusReachabilityUnknown | = 4001 | Network reachability cannot be determined |

(Read only property)

## 179.3 Globals

### 179.3.1 kSCNetworkReachabilityMBSTypeID as Integer

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the CoreFoundation TypeID for SCNetworkReachability.

### 179.3.2 kSCPreferencesMBSTypeID as Integer

MBS MacCF Plugin, Plugin Version: 12.4, Platform: macOS, Targets: All.

**Function:** Returns the CoreFoundation TypeID for SCPreferences.

## 179.4 class SystemConfigurationMBS

### 179.4.1 class SystemConfigurationMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** A class for the global System Configuration framework functions.
**Notes:** See the file "SCSchemaDefinitions.h" for details on the constants.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 17.1pr1
- Need Proxy Settings?

### 179.4.2 Methods

### 179.4.3 ComputerName as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the current computer name.
**Example:**

```
dim s as new SystemConfigurationMBS
msgbox s.ComputerName
```

**Notes:** Returns "" on an error.

### 179.4.4 ComputerNameEncoding as Integer

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** The encoding of the computer name.

### 179.4.5 ConsoleUser as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the name of the currently logged-in user.
**Example:**

```
dim s as new SystemConfigurationMBS
msgbox s.ConsoleUser
```

**Notes:** Returns the user currently logged into the system; "" if no user is logged in or if an error was encountered.

### 179.4.6 ConsoleUserGID as Integer

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the group ID of the currently logged-in user.
**Notes:** The group ID of the current console user.

### 179.4.7 ConsoleUserUID as Integer

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the user ID of the currently logged-in user.
**Notes:** The user ID of the current console user.

### 179.4.8 kSCCompAnyRegex as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.9 kSCCompGlobal as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.10 kSCCompHostNames as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.11 kSCCompInterface as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.12 kSCCompNetwork as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.13 kSCCompService as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.14 kSCCompSystem as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.15 kSCCompUsers as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.16 kSCDynamicStoreDomainFile as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.17 kSCDynamicStoreDomainPlugin as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.18 kSCDynamicStoreDomainPrefs as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.19 kSCDynamicStoreDomainSetup as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.20 kSCDynamicStoreDomainState as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.21 kSCDynamicStorePropNetInterfaces as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.22 kSCDynamicStorePropNetPrimaryInterface as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.23 kSCDynamicStorePropNetPrimaryService as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.24 kSCDynamicStorePropNetServiceIDs as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.25 kSCDynamicStorePropSetupCurrentSet as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.26 kSCDynamicStorePropSetupLastUpdated as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.27 kSCEntNet6to4 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.28 kSCEntNetAirPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.29 kSCEntNetDHCP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.30 kSCEntNetDNS as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.31 kSCEntNetEthernet as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.32 kSCEntNetFireWire as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.33 kSCEntNetInterface as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.34 kSCEntNetIPv4 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.35 kSCEntNetIPv6 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.36 kSCEntNetL2TP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.37 kSCEntNetLink as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.38 kSCEntNetModem as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.39 kSCEntNetPPP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.40 kSCEntNetPPPoE as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.41 kSCEntNetPPPSerial as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.42 kSCEntNetPPTP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.43 kSCEntNetProxies as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.44 kSCEntUsersConsoleUser as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.45 kSCPrefCurrentSet as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.46 kSCPrefNetworkServices as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.47 kSCPrefSets as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.48 kSCPrefSystem as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.49 kSCPropInterfaceName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.50 kSCPropMACAddress as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.51 kSCPropNet6to4Relay as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.52 kSCPropNetAirPortAllowNetCreation as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.53 kSCPropNetAirPortAuthPassword as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.54 kSCPropNetAirPortAuthPasswordEncryption as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.55 kSCPropNetAirPortJoinMode as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.56 kSCPropNetAirPortPowerEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.57 kSCPropNetAirPortPreferredNetwork as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.58 kSCPropNetAirPortSavePasswords as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.59 kSCPropNetDNSDomainName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.60 kSCPropNetDNSSearchDomains as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.61 kSCPropNetDNSServerAddresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.62 kSCPropNetDNSSortList as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.63 kSCPropNetEthernetMediaOptions as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.64 kSCPropNetEthernetMediaSubType as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.65 kSCPropNetEthernetMTU as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.66 kSCPropNetInterfaceDeviceName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.67 kSCPropNetInterfaceHardware as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.68 kSCPropNetInterfaces as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.69 kSCPropNetInterfaceSubType as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.70 kSCPropNetInterfaceSupportsModemOnHold as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.71 kSCPropNetInterfaceType as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.72 kSCPropNetIPv4Addresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.73 kSCPropNetIPv4BroadcastAddresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.74 kSCPropNetIPv4ConfigMethod as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.75 kSCPropNetIPv4DestAddresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.76 kSCPropNetIPv4DHCPClientID as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.77 kSCPropNetIPv4Router as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.78 kSCPropNetIPv4SubnetMasks as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.79 kSCPropNetIPv6Addresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.80 kSCPropNetIPv6ConfigMethod as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.81 kSCPropNetIPv6DestAddresses as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.82 kSCPropNetIPv6Flags as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.83 kSCPropNetIPv6PrefixLength as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.84 kSCPropNetIPv6Router as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.85 kSCPropNetL2TPIPSecSharedSecret as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.86 kSCPropNetL2TPIPSecSharedSecretEncryption as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.87 kSCPropNetL2TPTransport as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.88 kSCPropNetLinkActive as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.89 kSCPropNetLinkDetaching as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.90 kSCPropNetLocalHostName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.91 kSCPropNetModemConnectionScript as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.92 kSCPropNetModemConnectSpeed as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.93 kSCPropNetModemDataCompression as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.94 kSCPropNetModemDialMode as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.95 kSCPropNetModemErrorCorrection as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.96 kSCPropNetModemHoldCallWaitingAudibleAlert as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.97 kSCPropNetModemHoldDisconnectOnAnswer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.98 kSCPropNetModemHoldEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.99 kSCPropNetModemHoldReminder as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.100 kSCPropNetModemHoldReminderTime as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.101 kSCPropNetModemNote as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.102 kSCPropNetModemPulseDial as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.103 kSCPropNetModemSpeaker as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.104 kSCPropNetModemSpeed as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.105 kSCPropNetOverridePrimary as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.106 kSCPropNetPPPACSPEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.107 kSCPropNetPPPAuthEAPPlugins as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.108 kSCPropNetPPPAuthName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.109 kSCPropNetPPPAuthPassword as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.110 kSCPropNetPPPAuthPasswordEncryption as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.111 kSCPropNetPPPAuthPrompt as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.112 kSCPropNetPPPAuthProtocol as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.113 kSCPropNetPPPCCPEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.114 kSCPropNetPPPCommAlternateRemoteAddress as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.115 kSCPropNetPPPCommConnectDelay as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.116 kSCPropNetPPPCommDisplayTerminalWindow as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.117 kSCPropNetPPPCommRedialCount as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.118 kSCPropNetPPPCommRedialEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.119 kSCPropNetPPPCommRedialInterval as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.120 kSCPropNetPPPCommRemoteAddress as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.121 kSCPropNetPPPCommTerminalScript as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.122 kSCPropNetPPPCommUseTerminalScript as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.123 kSCPropNetPPPConnectTime as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.124 kSCPropNetPPPDeviceLastCause as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.125 kSCPropNetPPPDialOnDemand as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.126 kSCPropNetPPPDisconnectOnIdle as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.127 kSCPropNetPPPDisconnectOnIdleTimer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.128 kSCPropNetPPPDisconnectOnLogout as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.129 kSCPropNetPPPDisconnectOnSleep as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.130 kSCPropNetPPPDisconnectTime as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.131 kSCPropNetPPPIdleReminder as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.132 kSCPropNetPPPIdleReminderTimer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.133 kSCPropNetPPPIPCPCompressionVJ as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.134 kSCPropNetPPPLastCause as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.135 kSCPropNetPPPLCPCompressionACField as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.136 kSCPropNetPPPLCPCompressionPField as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.137 kSCPropNetPPPLCPEchoEnabled as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.138 kSCPropNetPPPLCPEchoFailure as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.139 kSCPropNetPPPLCPEchoInterval as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.140 kSCPropNetPPPLCPMRU as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.141 kSCPropNetPPPLCPMTU as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.142 kSCPropNetPPPLCPReceiveACCM as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.143 kSCPropNetPPPLCPTransmitACCM as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.144 kSCPropNetPPPLogfile as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.145 kSCPropNetPPPOverridePrimary as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.146 kSCPropNetPPPPlugins as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.147 kSCPropNetPPPRetryConnectTime as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.148 kSCPropNetPPPSessionTimer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.149 kSCPropNetPPPStatus as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.150 kSCPropNetPPPUseSessionTimer as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.151 kSCPropNetPPPVerboseLogging as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.152 kSCPropNetProxiesExceptionsList as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.153 kSCPropNetProxiesFTPEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.154 kSCPropNetProxiesFTPPassive as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.155 kSCPropNetProxiesFTPPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.156 kSCPropNetProxiesFTPProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.157 kSCPropNetProxiesGopherEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.158 kSCPropNetProxiesGopherPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.159 kSCPropNetProxiesGopherProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.160 kSCPropNetProxiesHTTPEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.161 kSCPropNetProxiesHTTPPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.162 kSCPropNetProxiesHTTPProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.163 kSCPropNetProxiesHTTPSEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.164 kSCPropNetProxiesHTTPSPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.165 kSCPropNetProxiesHTTPSProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.166 kSCPropNetProxiesRTSPEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.167 kSCPropNetProxiesRTSPPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.168 kSCPropNetProxiesRTSPProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.169 kSCPropNetProxiesSOCKSEnable as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.170 kSCPropNetProxiesSOCKSPort as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.171 kSCPropNetProxiesSOCKSProxy as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.172 kSCPropNetServiceOrder as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.173 kSCPropSystemComputerName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.174 kSCPropSystemComputerNameEncoding as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.175 kSCPropUserDefinedName as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.176 kSCPropVersion as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.177 kSCResvInactive as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.
**Notes:** Value should be "___INACTIVE___"

### 179.4.178 kSCResvLink as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.
**Notes:** Value should be "___LINK___"

### 179.4.179 kSCValNetAirPortAuthPasswordEncryptionKeychain as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.180 kSCValNetAirPortJoinModeAutomatic as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.181 kSCValNetAirPortJoinModePreferred as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.182 kSCValNetAirPortJoinModeRecent as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.183 kSCValNetAirPortJoinModeStrongest as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.184 kSCValNetInterfaceSubTypeL2TP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.185 kSCValNetInterfaceSubTypePPPoE as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.186 kSCValNetInterfaceSubTypePPPSerial as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.187 kSCValNetInterfaceSubTypePPTP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.188 kSCValNetInterfaceType6to4 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.189 kSCValNetInterfaceTypeEthernet as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.190 kSCValNetInterfaceTypeFireWire as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.191 kSCValNetInterfaceTypePPP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.192 kSCValNetIPv4ConfigMethodBOOTP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.193 kSCValNetIPv4ConfigMethodDHCP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.194 kSCValNetIPv4ConfigMethodINFORM as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.195 kSCValNetIPv4ConfigMethodLinkLocal as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.196 kSCValNetIPv4ConfigMethodManual as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.197 kSCValNetIPv4ConfigMethodPPP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.198 kSCValNetIPv6ConfigMethod6to4 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.199 kSCValNetIPv6ConfigMethodAutomatic as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.200 kSCValNetIPv6ConfigMethodManual as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.201 kSCValNetIPv6ConfigMethodRouterAdvertisement as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.202 kSCValNetL2TPIPSecSharedSecretEncryptionKeychain as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.203 kSCValNetL2TPTransportIP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.204 kSCValNetL2TPTransportIPSec as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.205 kSCValNetModemDialModeIgnoreDialTone as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.206 kSCValNetModemDialModeManual as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.207 kSCValNetModemDialModeWaitForDialTone as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.208 kSCValNetPPPAuthPasswordEncryptionKeychain as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.209 kSCValNetPPPAuthPromptAfter as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.210 kSCValNetPPPAuthPromptBefore as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.211 kSCValNetPPPAuthProtocolCHAP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.212 kSCValNetPPPAuthProtocolEAP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.213 kSCValNetPPPAuthProtocolMSCHAP1 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.214 kSCValNetPPPAuthProtocolMSCHAP2 as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.215 kSCValNetPPPAuthProtocolPAP as CFStringMBS

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Just a constant for the System Configuation API functions.

### 179.4.216 LocalHostName as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the current local host name.
**Example:**

```
dim s as new SystemConfigurationMBS
msgbox s.LocalHostName
```

**Notes:** Returns the current local host name; "" if the name has not been set or if an error was encountered.

### 179.4.217 Location as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** Gets the current location identifier.
**Example:**

```
dim s as new SystemConfigurationMBS
msgbox s.Location
```

**Notes:** Returns a string representing the current location identifier; "" if no location identifier has been defined or if an error was encountered.

### 179.4.218 MachineName as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** The local machine name.

### 179.4.219 NetworkCheckReachabilityByAddress(ip as string, byref flags as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Determines if the given network address is reachable using the current network configuration.
**Notes:** address: The network address of the desired host.
flags: An integer that will be filled with a set of SCNetworkConnectionFlags detailing the reachability of the specified address.
Returns true if the network connection flags are valid; false if the status could not be determined.
(see the SCNetworkReachabilityMBS class for more details)

### 179.4.220 NetworkCheckReachabilityByName(nodename as string, byref flags as Integer) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Determines if the given network host/node name is reachable using the current network configuration.
**Notes:** nodename: The node name of the desired host.
flags: An integer that will be filled with a set of SCNetworkConnectionFlags detailing the reachability of the specified node name.
Returns true if the network connection flags are valid; false if the status could not be determined.
(see the SCNetworkReachabilityMBS class for more details)

### 179.4.221 NetworkInterfaceRefreshConfiguration(ifname as CFStringMBS) as boolean

MBS MacCF Plugin, Plugin Version: 4.2, Platform: macOS, Targets: All.

**Function:** Sends a notification to interested configuration agents to have them immediately retry their configuration over a particular network interface.
**Notes:** This API must be invoked by root (uid == 0).
ifName: The BSD name of the network interface e.g. NewCFStringMBS("en0").
Returns true if the notification was sent; false otherwise.

### 179.4.222 ShortUserName as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** The short user name.

### 179.4.223 UserName as string

MBS MacCF Plugin, Plugin Version: 7.8, Platform: macOS, Targets: All.

**Function:** The user name.
**Notes:** The function UserName returns a string based on the read UID (RUID, as returned by getuid) of the calling process. This can result in unexpected behavior (that is, Name returning different results than ConsoleUser) for processes that manipulate their UID.

# Chapter 180

# Tapi

## 180.1 class ITAddressMBS

### 180.1.1 class ITAddressMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an address.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 180.1.2 Methods

### 180.1.3 Calls as ITCallInfoMBS()

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an array of calls currently active on the address.
**Notes:** Sets lasterror property.

### 180.1.4 Constructor

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 180.1.5 CreateCall(DestAddress as string = """, AddressType as Integer = 1, MediaTypes as Integer = 0) as TAPICallControlMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new call.
**Notes:** Creates a new Call object that can be used to make an outgoing call and returns a TAPICallControlMBS object. The newly created call is in the StateIdle state and has no media or terminals selected.

See also MediaTypes and LineAddressType constants.

### 180.1.6 Properties

### 180.1.7 AddressName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the displayable name of the address.
**Notes:** Returns the containing a displayable address name.
Sets lasterror property.
(Read only property)

### 180.1.8 DialableAddress as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the text which can be used to connect to this address.
**Notes:** The text corresponds to the destination address string that another application would use to connect to this address, such as a phone number or an e-mail name.
You can use this address with the CreateCall method.
Sets lasterror property.
(Read only property)

### 180.1.9 DoNotDisturb as Boolean

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current status of the do not disturb feature on the address.
**Notes:** The do not disturb feature may not be available on all addresses.
If true, the do not disturb feature has been activated. If false, the do not disturb feature is not active.
Sets lasterror property.

(Read and Write property)

### 180.1.10 Handle as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** This is an ITAddress* pointer.
(Read and Write property)

### 180.1.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Set by all the methods to indicate the last error.
Value is 0 if no error.
(Read and Write property)

### 180.1.12 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** (Read and Write property)

### 180.1.13 MessageWaiting as Boolean

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Determines if the address has a message waiting.
**Notes:** Returns true if a message is waiting; false, if no message is waiting.
Sets lasterror property.
(Read and Write property)

### 180.1.14 ServiceProviderName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the Telephony Service Provider (TSP) that supports this address.
**Notes:** For example, Unimdm.tsp for the Unimodem service provider or H323.tsp for the H323 service provider.
Sets lasterror property.
(Read only property)

### 180.1.15 State as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current state of the address.
**Notes:** Sets lasterror property.
Can be StateInService or StateOutOfService.
(Read only property)

### 180.1.16 Constants

Line Address Types

| Constant | Value | Description |
|---|---|---|
| LineAddressTypeDomainName | 8 | Address type is a domain name. |
| LineAddressTypeEmailName | 4 | Address type is an e-mail name. |
| LineAddressTypeIPAddress | 16 | Address type is an IP address. |
| LineAddressTypePhoneNumber | 1 | Address type is a standard phone number. |
| LineAddressTypeSDP | 2 | Address type is Session Description Protocol (SDP) conference. |

Media Types

| Constant | Value | Description |
|---|---|---|
| MediaTypeAudio | 8 | An audio media stream that is entering or leaving the computer. An entering media stream would typically be played on speakers, or sent to a handset device and a leaving stream would typically be captured through a microphone or handset device. |
| MediaTypeDataModem | 16 | A data media stream that is associated with a data modem. |
| MediaTypeG3Fax | 32 | A data media stream that is associated with a G3 protocol fax. |
| MediaTypeMultiTrack | &h10000 | A stream is on a multitrack terminal. |
| MediaTypeVideo | &h8000 | A video media stream that is entering or leaving the computer. An entering media stream would typically be rendered in a video window and a leaving media stream would typically be captured with a video camera. |

States

| Constant | Value | Description |
|---|---|---|
| StateInService | 0 | Normal state; the address can be used. |
| StateOutOfService | 1 | The address is temporarily out of service, but may go back into service at some time. |

## 180.2 class ITCallInfoMBS

### 180.2.1 class ITCallInfoMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for information about a call.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 180.2.2 Methods

### 180.2.3 Constructor

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** Lasterror is set.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 180.2.4 Properties

### 180.2.5 Address as ITAddressMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the address of the call.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.6 CalledIDName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the called location.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.7 CalledIDNumber as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of the called location.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.8 CalledPartyFriendlyName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The called party friendly name.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.9 CallerIDName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the caller.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.10 CallerIDNumber as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of the caller.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.11 CallingPartyID as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identifier of the calling party.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.12 Comment as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A comment about the call provided by the application that originated the call. The call state must be StateIdle when setting the comment.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.13 ConnectedIDName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the connected location.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.14 ConnectedIDNumber as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of the connected location.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.15 DisplayableAddress as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A displayable version of the called or calling address.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.16 Handle as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** This is an ITCallInfo* pointer.
(Read and Write property)

### 180.2.17 Lasterror as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Set by all the methods to indicate the last error.
Value is 0 if no error.
(Read and Write property)

### 180.2.18 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** (Read and Write property)

### 180.2.19 RedirectingIDName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the location that redirected the call.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.20 RedirectingIDNumber as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of the location that redirected the call.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.21 RedirectionIDName as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the location to which a call has been redirected.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.22 RedirectionIDNumber as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of the location to which a call has been redirected.
**Notes:** Lasterror is set.
(Read only property)

### 180.2.23 State as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current state call.
**Notes:** Can be StateConnected, StateDisconnected, StateHold, StateIdle, StateInProgress, StateOffering or StateQueued.
Lasterror is set.
(Read only property)

### 180.2.24 Constants

States

| Constant | Value | Description |
|---|---|---|
| StateConnected | 2 | Call has been connected to the remote end and communication can take place. |
| StateDisconnected | 3 | Call has been disconnected. There are several causes for disconnection. See the table of valid call state transitions below. |
| StateHold | 5 | The call is in the hold state. |
| StateIdle | 0 | The call has been created, but Connect has not been called yet. A call can never transition into the idle state. This is the initial state for both incoming and outgoing calls. |
| StateInProgress | 1 | Connect has been called, and the service provider is working on making a connection. This state is valid only on outgoing calls. This message is optional, because a service provider may have a call transition directly to the connected state. |
| StateOffering | 4 | A new call has appeared, and is being offered to an application. If the application has owner privileges on the call, it can either call Answer or Disconnect while the call is in the offering state. Current call privilege can be determined by calling Privilege. |
| StateQueued | 6 | The call is queued. |

## 180.3 class TAPICallControlMBS

### 180.3.1 class TAPICallControlMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The interface used by the application to connect, answer, and perform basic telephony operations on a call object.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 180.3.2 Methods

### 180.3.3 Answer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** answers an incoming call.
**Notes:** This method can succeed only if the call state is StateOffering.
Lasterror is set.

### 180.3.4 BlindTransfer(DestAddress as String)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** performs a blind or single-step transfer of the specified call to the specified destination address.
**Notes:** The application must be the owner of the call. After a successful transfer, the call state transitions to StateDisconnected.

DestAddress: Text containing destination address for the transfer.
Lasterror is set.

### 180.3.5 Conference(otherCall as TAPICallControlMBS, sync as boolean)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a consultation call to the conference in which the current call is a participant.
**Notes:** If an associated ITCallHub object does not exist, it is created.

otherCall: The consultation call.
Sync: Indicates whether the call should be conferenced synchronously (true) or asynchronously (false). See

Connect method for additional explanation.
Lasterror is set.

### 180.3.6 Connect(sync as boolean)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attempts to complete the connection of an outgoing call.
**Notes:** Sync: Boolean indicating whether connection is to be performed synchronously (true) or asynchronously (false).

If the call is asynchronous, the application will receive information about the call's progress through the TAPIMBS CallStateChanged event. Connect may return no error, but the actual connection may fail (and the application will be notified through the event).
If the call is synchronous, this method will not return until the call is in the connected state or fails.
Lasterror is set.

To make a call, please find the ITAddressMBS for the line, use CreateCall there. Than use TAPICallControlMBS.Connect here.

### 180.3.7 Constructor

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 180.3.8 Dial(DestAddress as String)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Dials the specified address.
**Notes:** DestAddress: Representation of address to be dialed. The format must conform to a standard dialable address.
Lasterror is set.

### 180.3.9 Disconnect(Mode as Integer)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Disconnects the call.

**Notes:** The call state will transition to StateDisconnected after the method completes successfully.
Pass DisconnectModeNoAnswer, DisconnectModeNormal or DisconnectModeReject.
Lasterror is set.

### 180.3.10 Finish(Mode as Integer)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Called on a consultation call to finish a conference or a transfer.
**Notes:** Pass FinishModeAsConference or FinishModeAsTransfer.
Lasterror is set.

### 180.3.11 HandoffDirect(ApplicationName as String)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Hands off the call to another application.
**Notes:** This indicates that the application no longer requires ownership of the call.

ApplicationName: Text containing the specific application name to hand off call to. Can be full path name or executable name.
Lasterror is set.

### 180.3.12 HandoffIndirect(MediaType as Integer)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Hands off the call to another application based on the media type of the call.
**Notes:** If multiple applications have registered as able to handle the types involved, TAPI will hand off to the highest-priority application, which is usually the one that registered first.
This indicates that the application no longer requires ownership of the call.

for media types, please check constants in ITAddressMBS class and this website:
http://msdn.microsoft.com/en-us/library/windows/desktop/ms734210(v=vs.85).aspx
Lasterror is set.

### 180.3.13 Hold(hold as boolean)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Places or removes the call from the hold.
**Notes:** If Hold is true and the method succeeds, the call state transitions to the StateHold state. If Hold is false, the call state transitions to StateConnected.
Lasterror is set.

### 180.3.14 ParkDirect(ParkAddress as String)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parks the call at a specified address.
**Notes:** ParkAddress: Text containing the address where the call is to be parked.
Lasterror is set.

### 180.3.15 ParkIndirect as string

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parks the call and returns the parked address.
**Notes:** Returns representation of the address where the call was parked.
Lasterror is set.

### 180.3.16 Pickup(GroupID as String)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Picks up a call alerting at the specified group identification.
**Notes:** GroupID: The group identifier to which the alerting station belongs.
Lasterror is set.

### 180.3.17 RemoveFromConference

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes the call from a conference if it is involved in one.
**Notes:** Lasterror is set.

### 180.3.18 SetQOS(MediaType as Integer, ServiceLevel as Integer)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the quality of service level for the call.
**Notes:** for media types, please check constants in ITAddressMBS class and this website:
http://msdn.microsoft.com/en-us/library/windows/desktop/ms734210(v=vs.85).aspx

Lasterror is set.

### 180.3.19 SwapHold(otherCall as TAPICallControlMBS)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Swaps the call (which is active) with the specified call on hold.
**Notes:** Swapping the active call with the call on consultation hold allows the application to toggle between these two calls. This is typical in call waiting.
OtherCall: Call, currently on hold, that is to be made active.
Lasterror is set.

### 180.3.20 Transfer(otherCall as TAPICallControlMBS, sync as boolean)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Transfers the current call to the destination address.
**Notes:** otherCall: Other interface of consultation call created for the transfer.
Sync: Indicates whether the method should be completed synchronously (true) or asynchronously (false).
Lasterror is set.

### 180.3.21 Unpark

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the call from park.
**Notes:** To unpark a call, CreateCall must be called using as the destination address the current parked location of the call.
Lasterror is set.

### 180.3.22 Properties

### 180.3.23 Handle as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** This is an ITBasicCallControl* pointer.
(Read and Write property)

### 180.3.24 Lasterror as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Set by all the methods to indicate the last error.
Value is 0 if no error.
(Read and Write property)

### 180.3.25 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** (Read and Write property)

### 180.3.26 Constants

Disconnect Modes

| Constant | Value | Description |
|---|---|---|
| DisconnectModeNoAnswer | 1 | The call is being disconnected because it has not been answered.<br>(For example, an application may set a certain amount of time for the user to answer the call. If the user does not answer, the application can call Disconnect with the NOANSWER code.)<br>Lasterror is set. |
| DisconnectModeNormal | 0 | The call is being disconnected as part of the normal cycle of the call.<br>Lasterror is set. |
| DisconnectModeReject | 2 | The user rejected the offered call.<br>Lasterror is set. |

Finish Modes

| Constant | Value | Description |
|---|---|---|
| FinishModeAsConference | 1 | A call is being added to a conference call.<br>Lasterror is set. |
| FinishModeAsTransfer | 0 | A call transfer is being finished.<br>Lasterror is set. |

QOS levels

| Constant | Value | Description |
|---|---|---|
| QualityOfServerLevelBestEffort | 2 | Quality of service level desired is ”best effort”. |
| QualityOfServerLevelIfAvailable | 1 | Quality of service level desired if available. |
| QualityOfServerLevelNeeded | 0 | Quality of service level required. |

## 180.4 class TAPIMBS

### 180.4.1 class TAPIMBS

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The central class for TAPI.
**Notes:** MBS Plugin implements TAPI (telephone API) on Windows to catch incoming calls, so you can display e.g. customer data for the phone number when customer calls. Also you can create new call objects to dial or query information on calls or addresses.

### 180.4.2 Methods

### 180.4.3 Addresses as ITAddressMBS()

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an array with all addresses.
**Notes:** Lasterror is set.

### 180.4.4 Available as boolean

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether TAPI is available.
**Notes:** Returns true on Windows and false elsewhere.

### 180.4.5 Constructor

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 180.4.6 Destructor

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 180.4.7 ListenOnAllAddresses

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of addresses and registers event handlers to receive events.
**Notes:** Please call this method to get the IncomingCall event working.
Lasterror is set.

### 180.4.8 Properties

### 180.4.9 EventFilter as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The event filter.
**Notes:** The plugin sets this to EventCallNotification + EventCallState automatically.

See constants:
http://msdn.microsoft.com/en-us/library/windows/desktop/ms734238(v=vs.85).aspx
(Read and Write property)

### 180.4.10 Handle as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** This is an ITTAPI* pointer.
(Read and Write property)

### 180.4.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Set by all the methods to indicate the last error.
Value is 0 if no error.
(Read and Write property)

### 180.4.12 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** (Read and Write property)

### 180.4.13 Events

### 180.4.14 CallStateChanged(CallInfo as ITCallInfoMBS)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: .

**Function:** The call state changed.
**Notes:** The Call state has changed.

### 180.4.15 IncomingCall(CallInfo as ITCallInfoMBS, BasicCallControl as TAPI-CallControlMBS)

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: .

**Function:** A new call is incoming.

### 180.4.16 Constants

Event Types

| Constant | Value | Description |
|---|---|---|
| EventCallNotification | &h4 | A new communications session has appeared on the address and the TAPI DLL has created a new call object. This could be a result from an incoming session, a session handed off by another application, or a session being parked on the address. |
| EventCallState | &h8 | The Call state has changed. |

# Chapter 181

# Tidy

## 181.1 class TidyAttributeMBS

### 181.1.1 class TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An attribute of a node.
**Blog Entries**

- MBS Xojo Plugins, version 17.4pr3
- MBS REALbasic Plugins, version 10.5pr4

### 181.1.2 Properties

### 181.1.3 Document as TidyDocumentMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The document of this attribute.
**Notes:** (Read only property)

### 181.1.4 ID as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The attribute ID.
**Notes:** (Read only property)

### 181.1.5 IsABBR as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ABBR attribute.
**Notes:** (Read only property)

### 181.1.6 IsALINK as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ALINK attribute.
**Notes:** (Read only property)

### 181.1.7 IsALT as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ALT attribute.
**Notes:** (Read only property)

### 181.1.8 IsBGCOLOR as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the BGCOLOR attribute.
**Notes:** (Read only property)

### 181.1.9 IsCHECKED as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the CHECKED attribute.
**Notes:** (Read only property)

### 181.1.10 IsCOLSPAN as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the COLSPAN attribute.
**Notes:** (Read only property)

### 181.1.11 IsCONTENT as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the CONTENT attribute.
**Notes:** (Read only property)

### 181.1.12 IsDATAFLD as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the DATAFLD attribute.
**Notes:** (Read only property)

### 181.1.13 IsEvent as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the Event attribute.
**Notes:** (Read only property)

### 181.1.14 IsFOR as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the FOR attribute.
**Notes:** (Read only property)

### 181.1.15 IsHEIGHT as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the HEIGHT attribute.
**Notes:** (Read only property)

### 181.1.16 IsHREF as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the HREF attribute.
**Notes:** (Read only property)

### 181.1.17 IsHTTP_EQUIV as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the HTTP_EQUIV attribute.
**Notes:** (Read only property)

### 181.1.18 IsID as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ID attribute.
**Notes:** (Read only property)

### 181.1.19 IsISMAP as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ISMAP attribute.
**Notes:** (Read only property)

### 181.1.20 IsLANG as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the LANG attribute.
**Notes:** (Read only property)

### 181.1.21 IsLANGUAGE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the LANGUAGE attribute.
**Notes:** (Read only property)

### 181.1.22 IsLINK as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the LINK attribute.
**Notes:** (Read only property)

### 181.1.23 IsLONGDESC as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the LONGDESC attribute.
**Notes:** (Read only property)

### 181.1.24 IsNAME as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the NAME attribute.
**Notes:** (Read only property)

### 181.1.25 IsOnBLUR as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnBLUR attribute.
**Notes:** (Read only property)

### 181.1.26 IsOnCLICK as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnCLICK attribute.
**Notes:** (Read only property)

### 181.1.27 IsOnFOCUS as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnFOCUS attribute.
**Notes:** (Read only property)

### 181.1.28 IsOnKEYDOWN as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnKEYDOWN attribute.
**Notes:** (Read only property)

### 181.1.29 IsOnKEYPRESS as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnKEYPRESS attribute.
**Notes:** (Read only property)

### 181.1.30 IsOnKEYUP as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnKEYUP attribute.
**Notes:** (Read only property)

### 181.1.31 IsOnMOUSEDOWN as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnMOUSEDOWN attribute.
**Notes:** (Read only property)

### 181.1.32 IsOnMOUSEMOVE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnMOUSEMOVE attribute.
**Notes:** (Read only property)

### 181.1.33 IsOnMOUSEOUT as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnMOUSEOUT attribute.
**Notes:** (Read only property)

### 181.1.34 IsOnMOUSEOVER as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnMOUSEOVER attribute.
**Notes:** (Read only property)

### 181.1.35 IsOnMOUSEUP as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the OnMOUSEUP attribute.
**Notes:** (Read only property)

### 181.1.36 IsProp as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the Prop attribute.
**Notes:** (Read only property)

### 181.1.37 IsREL as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the REL attribute.
**Notes:** (Read only property)

### 181.1.38 IsROWSPAN as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the ROWSPAN attribute.
**Notes:** (Read only property)

### 181.1.39 IsSELECTED as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the SELECTED attribute.
**Notes:** (Read only property)

### 181.1.40 IsSRC as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the SRC attribute.
**Notes:** (Read only property)

### 181.1.41 IsSTYLE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the STYLE attribute.
**Notes:** (Read only property)

### 181.1.42 IsSUMMARY as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the SUMMARY attribute.
**Notes:** (Read only property)

### 181.1.43 IsTARGET as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the TARGET attribute.
**Notes:** (Read only property)

### 181.1.44 IsTEXT as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the TEXT attribute.
**Notes:** (Read only property)

### 181.1.45 IsTITLE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the TITLE attribute.
**Notes:** (Read only property)

### 181.1.46 IsTYPE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the TYPE attribute.
**Notes:** (Read only property)

### 181.1.47 IsUSEMAP as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the USEMAP attribute.
**Notes:** (Read only property)

### 181.1.48 IsVALUE as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the VALUE attribute.
**Notes:** (Read only property)

### 181.1.49 IsVLINK as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the VLINK attribute.
**Notes:** (Read only property)

### 181.1.50 IsWIDTH as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the WIDTH attribute.
**Notes:** (Read only property)

### 181.1.51 IsXMLNS as Boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this attribute is the XMLNS attribute.
**Notes:** (Read only property)

### 181.1.52 Name as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the attribute.
**Notes:** (Read only property)

### 181.1.53 NextAttribute as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next attribute in the attribute list of the node.
**Notes:** (Read only property)

### 181.1.54 Value as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the attribute.
**Notes:** (Read only property)

## 181.2 module TidyAttrIdMBS

### 181.2.1 module TidyAttrIdMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.2.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyAttrABBR | 1 | A constant for use with the Tidy classes. |
| TidyAttrABOUT | 315 | A constant for use with the Tidy classes. |
| TidyAttrACCEPT | 2 | A constant for use with the Tidy classes. |
| TidyAttrACCEPT_CHARSET | 3 | A constant for use with the Tidy classes. |
| TidyAttrACCESSKEY | 4 | A constant for use with the Tidy classes. |
| TidyAttrACTION | 5 | A constant for use with the Tidy classes. |
| TidyAttrADD_DATE | 6 | A constant for use with the Tidy classes. |
| TidyAttrALIGN | 7 | A constant for use with the Tidy classes. |
| TidyAttrALINK | 8 | A constant for use with the Tidy classes. |
| TidyAttrALLOWFULLSCREEN | 9 | A constant for use with the Tidy classes. |
| TidyAttrALT | 10 | A constant for use with the Tidy classes. |
| TidyAttrARCHIVE | 11 | A constant for use with the Tidy classes. |
| TidyAttrARIA_ACTIVEDESCENDANT | 271 | A constant for use with the Tidy classes. |
| TidyAttrARIA_ATOMIC | 272 | A constant for use with the Tidy classes. |
| TidyAttrARIA_AUTOCOMPLETE | 273 | A constant for use with the Tidy classes. |
| TidyAttrARIA_BUSY | 274 | A constant for use with the Tidy classes. |
| TidyAttrARIA_CHECKED | 275 | A constant for use with the Tidy classes. |
| TidyAttrARIA_CONTROLS | 276 | A constant for use with the Tidy classes. |
| TidyAttrARIA_DESCRIBEDBY | 277 | A constant for use with the Tidy classes. |
| TidyAttrARIA_DISABLED | 278 | A constant for use with the Tidy classes. |
| TidyAttrARIA_DROPEFFECT | 279 | A constant for use with the Tidy classes. |
| TidyAttrARIA_EXPANDED | 280 | A constant for use with the Tidy classes. |
| TidyAttrARIA_FLOWTO | 281 | A constant for use with the Tidy classes. |
| TidyAttrARIA_GRABBED | 282 | A constant for use with the Tidy classes. |
| TidyAttrARIA_HASPOPUP | 283 | A constant for use with the Tidy classes. |
| TidyAttrARIA_HIDDEN | 284 | A constant for use with the Tidy classes. |
| TidyAttrARIA_INVALID | 285 | A constant for use with the Tidy classes. |
| TidyAttrARIA_LABEL | 286 | A constant for use with the Tidy classes. |
| TidyAttrARIA_LABELLEDBY | 287 | A constant for use with the Tidy classes. |
| TidyAttrARIA_LEVEL | 288 | A constant for use with the Tidy classes. |
| TidyAttrARIA_LIVE | 289 | A constant for use with the Tidy classes. |
| TidyAttrARIA_MULTILINE | 290 | A constant for use with the Tidy classes. |
| TidyAttrARIA_MULTISELECTABLE | 291 | A constant for use with the Tidy classes. |
| TidyAttrARIA_ORIENTATION | 292 | A constant for use with the Tidy classes. |
| TidyAttrARIA_OWNS | 293 | A constant for use with the Tidy classes. |
| TidyAttrARIA_POSINSET | 294 | A constant for use with the Tidy classes. |
| TidyAttrARIA_PRESSED | 295 | A constant for use with the Tidy classes. |
| TidyAttrARIA_READONLY | 296 | A constant for use with the Tidy classes. |
| TidyAttrARIA_RELEVANT | 297 | A constant for use with the Tidy classes. |
| TidyAttrARIA_REQUIRED | 298 | A constant for use with the Tidy classes. |
| TidyAttrARIA_SELECTED | 299 | A constant for use with the Tidy classes. |
| TidyAttrARIA_SETSIZE | 300 | A constant for use with the Tidy classes. |
| TidyAttrARIA_SORT | 301 | A constant for use with the Tidy classes. |
| TidyAttrARIA_VALUEMAX | 302 | A constant for use with the Tidy classes. |
| TidyAttrARIA_VALUEMIN | 303 | A constant for use with the Tidy classes. |
| TidyAttrARIA_VALUENOW | 304 | A constant for use with the Tidy classes. |
| TidyAttrARIA_VALUETEXT | 305 | A constant for use with the Tidy classes. |
| TidyAttrAS | 324 | A constant for use with the Tidy classes. |
| TidyAttrASYNC | 171 | A constant for use with the Tidy classes. |
| TidyAttrAUTOCOMPLETE | 172 | A constant for use with the Tidy classes. |
| TidyAttrAUTOFOCUS | 173 | A constant for use with the Tidy classes. |
| TidyAttrAUTOPLAY | 174 | A constant for use with the Tidy classes. |
| TidyAttrAXIS | 12 | A constant for use with the Tidy classes. |
| TidyAttrBACKGROUND | 13 | A constant for use with the Tidy classes. |
| TidyAttrBASEPROFILE | 311 | A constant for use with the Tidy classes. |
| TidyAttrBGCOLOR | 14 | A constant for use with the Tidy classes. |
| TidyAttrBGPROPERTIES | 15 | A constant for use with the Tidy classes. |
| TidyAttrBORDER | 16 | A constant for use with the Tidy classes. |

## 181.3 module TidyConfigCategoryMBS

### 181.3.1 module TidyConfigCategoryMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.3.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyDiagnostics | 1 | A constant for use with the Tidy classes. |
| TidyEncoding | 3 | A constant for use with the Tidy classes. |
| TidyMarkup | 0 | A constant for use with the Tidy classes. |
| TidyMiscellaneous | 4 | A constant for use with the Tidy classes. |
| TidyPrettyPrint | 2 | A constant for use with the Tidy classes. |

## 181.4 module TidyDoctypeModesMBS

### 181.4.1 module TidyDoctypeModesMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.4.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyDoctypeAuto | 2 | A constant for use with the Tidy classes. |
| TidyDoctypeHtml5 | 0 | A constant for use with the Tidy classes. |
| TidyDoctypeLoose | 4 | A constant for use with the Tidy classes. |
| TidyDoctypeOmit | 1 | A constant for use with the Tidy classes. |
| TidyDoctypeStrict | 3 | A constant for use with the Tidy classes. |
| TidyDoctypeUser | 5 | A constant for use with the Tidy classes. |

## 181.5 class TidyDocumentMBS

### 181.5.1 class TidyDocumentMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A document in the tidy library.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

**Notes:** The main class for using the tidy library in Xojo.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr1
- MBS Xojo Plugins, version 19.4pr2
- MBS Xojo Plugins, version 17.2pr2

### 181.5.2 Methods

### 181.5.3 AccessWarningCount as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of Tidy accessibility warnings encountered.

### 181.5.4 Body as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The body node in the html tree.

### 181.5.5 CleanAndRepair as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Execute configured cleanup and repair operations on parsed markup.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

### 181.5.6 ConfigErrorCount as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of Tidy configuration errors encountered.

### 181.5.7 CopyConfig(otherDocument as TidyDocumentMBS) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy current configuration settings from one document to another.

### 181.5.8 DetectedGenericXml as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Input is generic XML (not HTML or XHTML)?

### 181.5.9 DetectedHtmlVersion as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Detected HTML version: 0, 2, 3 or 4.

### 181.5.10 DetectedXhtml as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Input is XHTML?

### 181.5.11 ErrorBuffer as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the error text save in the error buffer.
**Notes:** You need to use InstallErrorBuffer before using this function.

### 181.5.12 ErrorCount as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of Tidy errors encountered.
**Notes:** If >0, output is suppressed unless ForceOutput is set.

### 181.5.13 ErrorSummary

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write more complete information about errors to current error sink.

### 181.5.14 FileExists(filename as string) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the file with that name exists.

### 181.5.15 GeneralInfo

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write more general information about markup to current error sink.

### 181.5.16 GetBooleanOption(OptionID as Integer) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the value of a boolean option.

### 181.5.17 GetIntegerOption(OptionID as Integer) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the value of an integer option.

### 181.5.18 GetStringOption(OptionID as Integer) as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the value of a string option.

### 181.5.19 Head as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The head node in the html tree.

### 181.5.20 Html as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The html node in the html tree.

### 181.5.21 InstallErrorBuffer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Installs an error buffer.
**Notes:** Use ErrorBuffer to get the text later.

### 181.5.22 LibraryVersion as string

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version number of the library.

### 181.5.23 LoadConfigFile(filename as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load an ASCII Tidy configuration file.

### 181.5.24 LoadConfigFileWithEncoding(Filename as string, CharacterEncoding as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Load a Tidy configuration file with the specified character encoding.

### 181.5.25 NextOption(Iterator as TidyIteratorMBS) as TidyOptionMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds the next option in the list.

### 181.5.26 NextRelatedOption(Iterator as TidyIteratorMBS) as TidyOptionMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get next related option.

### 181.5.27 NextUserDeclaredTag(OptionID as Integer, Iterator as TidyIteratorMBS) as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get next declared tag of specified type: TidyInlineTags, TidyBlockTags, TidyEmptyTags or TidyPreTags.
**Notes:** See TidyOptionIdMBS for constants.

### 181.5.28 OptionCharcterEncodingName(OptionID as Integer) as String

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get character encoding name.
**Notes:** Used with TidyCharEncoding, TidyOutCharEncoding, TidyInCharEncoding options.

### 181.5.29 OptionCurrentPick(OptionID as Integer) as String

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get current pick list value for option by ID.
**Notes:** Useful for enum types.

### 181.5.30 OptionForID(OptionID as Integer) as TidyOptionMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds option based on given ID.
**Notes:** Returns nil on failure.

### 181.5.31 OptionForName(OptionName as string) as TidyOptionMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds option by name.

### 181.5.32 OptionIDForName(OptionName as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Finds Option by name.
**Notes:** Returns nil on failure.

### 181.5.33 OptionList as TidyIteratorMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An iterator running through all the options available.

### 181.5.34 OptionResetToDefault(OptionID as Integer) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the option to default value.

### 181.5.35 OptionsDifferentThanDefault as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any settings different than default?

### 181.5.36 OptionsDifferentThanSnapshot as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Any settings different than snapshot?

### 181.5.37 OptionsResetAllToDefault as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset all options to their default values.

### 181.5.38 OptionsResetToSnapshot as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset config settings to snapshot (after document processing).

### 181.5.39 OptionsSnapshot as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Take a snapshot of current config settings.

### 181.5.40 ParseFile(filename as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parse markup in named file.

### 181.5.41 ParseSource(theInput as TidyInputMBS) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parse markup in given generic input source.

### 181.5.42 ParseString(data as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parse markup in given string.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

### 181.5.43 ParseStringOption(OptionName as string, value as string) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parses a string to set an option.
**Example:**

```
dim t as new TidyDocumentMBS

MsgBox str(t.OptionQuiet)
dim b1 as boolean = t.ParseStringOption("Quiet","true")
MsgBox str(t.OptionQuiet)

dim b2 as boolean = t.ParseStringOption("Quiet","false")
MsgBox str(t.OptionQuiet)
```

**Notes:** Useful if you don't know the type of the option.
Returns true on success and false on failure.

### 181.5.44 RelatedOptionsList(Option as TidyOptionMBS) as TidyIteratorMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate over a list of related options.

### 181.5.45 ReleaseDate as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get release date (version) for current library.

### 181.5.46 ReportDoctype as Integer

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The report document type.

### 181.5.47 Root as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The root node in the html tree.

### 181.5.48 RunDiagnostics as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Run configured diagnostics on parsed and repaired markup.
**Notes:** Must call CleanAndRepair first.

### 181.5.49 SaveConfig(theOutput as TidyOutputMBS) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save current settings to given output sink.
**Notes:** Only non-default values are written.

### 181.5.50 SaveConfigFile(filename as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save current settings to named file.
**Notes:** Only non-default values are written.

### 181.5.51 SaveFile(filename as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save to named file.

### 181.5.52 SaveOutput(theOutput as TidyOutputMBS) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save to given generic output.

### 181.5.53 SaveString as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Save to a string.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

**Notes:** Returns "" on failure.

The returned string has no encoding set. You need to use DefineEncoding.

### 181.5.54 SetBooleanOption(OptionID as Integer, value as boolean) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option with a given boolean value.
**Notes:** Returns true on success and false on failure.

### 181.5.55 SetCharacterEncoding(encodingName as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the input/output character encoding for parsing markup.
**Notes:** Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

### 181.5.56 SetErrorFile(filename as string) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Redirects error output to named file.
**Notes:** Returns true on success.

### 181.5.57 SetInputCharacterEncoding(encodingName as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the input character encoding for parsing markup.
**Example:**

```
dim t as new TidyDocumentMBS

MsgBox str(t.OptionInCharEncoding)
call t.SetInputCharacterEncoding "utf8"
MsgBox str(t.OptionInCharEncoding)
```

**Notes:** Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

### 181.5.58 SetIntegerOption(OptionID as Integer, value as Integer) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option with a given integer value.
**Notes:** Returns true on success and false on failure.

### 181.5.59 SetOutputCharacterEncoding(encodingName as string) as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the output character encoding for parsing markup.
**Notes:** Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

### 181.5.60 SetStringOption(OptionID as Integer, value as string) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an option with a given string value.
**Notes:** Returns true on success and false on failure.

### 181.5.61 Status as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get status of current document.

### 181.5.62 UserDeclaredTagList as TidyIteratorMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Iterate over user declared tags.

### 181.5.63 WarningCount as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of warnings encountered.

### 181.5.64 Properties

### 181.5.65 ErrorOutput as TidyOutputMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The output where the error report is written to.
**Notes:** (Read and Write property)

### 181.5.66 Handle as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal reference to the tidy document object.
**Notes:** (Read only property)

### 181.5.67 OptionAccessibilityCheck as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option accessibility-check.
**Notes:** This option specifies what level of accessibility checking, if any, that Tidy should perform.
Level 0 (Tidy Classic) is equivalent to Tidy Classic's accessibility checking.
For more information on Tidy's accessibility checking, visit Tidy's Accessibility Page (http://www.html-tidy.org/accessibility/).
(Read and Write property)

### 181.5.68 OptionAccessibilityCheckLevel as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies what level of accessibility checking, if any, that Tidy should do.
**Notes:** Level 0 is equivalent to Tidy Classic's accessibility checking. For more information on Tidy's accessibility checking, visit the Adaptive Technology Resource Centre at the University of Toronto. :

http://www.aprompt.ca/Tidy/accessibilitychecks.html
(Read and Write property)

### 181.5.69 OptionAddXmlDecl as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option add-xml-decl.
**Notes:** This option specifies if Tidy should add the XML declaration when outputting XML or XHTML. Note that if the input already includes an <?xml ... ?> declaration then this option will be ignored. If the encoding for the output is different from ascii, one of the utf* encodings, or raw, then the declaration is always added as required by the XML standard.
(Read and Write property)

### 181.5.70 OptionAddXmlSpace as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option add-xml-space.
**Notes:** This option specifies if Tidy should add xml:space="preserve" to elements such as <pre>, <style> and <script> when generating XML.
This is needed if the whitespace in such elements is to be parsed appropriately without having access to the DTD.
(Read and Write property)

### 181.5.71 OptionAltText as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option alt-text.
**Notes:** This option specifies the default alt= text Tidy uses for <img> attributes when the alt= attribute is missing.
Use with care, as it is your responsibility to make your documents accessible to people who cannot see the images.
(Read and Write property)

### 181.5.72 OptionAnchorAsName as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option anchor-as-name.
**Notes:** This option controls the deletion or addition of the name attribute in elements where it can serve as anchor.
If set to yes a name attribute, if not already existing, is added along an existing id attribute if the DTD allows it.
If set to no any existing name attribute is removed if an id attribute exists or has been added.
(Read and Write property)

### 181.5.73 OptionAsciiChars as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option ascii-chars.
**Notes:** Can be used to modify behavior of the clean option when set to yes.
If set to yes when using clean, &emdash;, ”, and other named character entities are downgraded to their closest ASCII equivalents.
(Read and Write property)

### 181.5.74 OptionAssumeXmlProcins as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option assume-xml-procins.
**Notes:** This option specifies if Tidy should change the parsing of processing instructions to require ?> as the terminator rather than >.
This option is automatically set if the input is in XML.
(Read and Write property)

### 181.5.75 OptionBare as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option bare.
**Notes:** This option specifies if Tidy should strip Microsoft specific HTML from Word 2000 documents, and output spaces rather than non-breaking spaces where they exist in the input.
(Read and Write property)

### 181.5.76 OptionBlockTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies new block-level tags.
**Notes:** This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Note you can't change the content model for elements such as <TABLE>, <UL>, <OL>and <DL>. This option is ignored in XML mode.
(Read and Write property)

### 181.5.77 OptionBodyOnly as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should print only the contents of the body tag as an HTML fragment.
**Notes:** If set to "auto", this is performed only if the body tag has been inferred. Useful for incorporating existing whole pages as a portion of another page. This option has no effect if XML output is requested.

Value is 0 for no, 1 for yes and 2 for auto.
(Read and Write property)

### 181.5.78 OptionBreakBeforeBr as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option break-before-br.
**Notes:** This option specifies if Tidy should output a line break before each <br> element.
(Read and Write property)

### 181.5.79 OptionCharEncoding as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option char-encoding.
**Notes:** This option specifies the character encoding Tidy uses for both the input and output.
For ascii Tidy will accept Latin-1 (ISO-8859-1) character values, but will use entities for all characters whose value >127.
For raw, Tidy will output values above 127 without translating them into entities.
For latin1, characters above 255 will be written as entities.
For utf8, Tidy assumes that both input and output are encoded as UTF-8.
You can use iso2022 for files encoded using the ISO-2022 family of encodings e.g. ISO-2022-JP.
For mac and win1252, Tidy will accept vendor specific character values, but will use entities for all characters whose value >127.

For unsupported encodings, use an external utility to convert to and from UTF-8.
(Read and Write property)

### 181.5.80 OptionClean as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option clean.
**Notes:** This option specifies if Tidy should perform cleaning of some legacy presentational tags (currently <i>, <b>, <center> when enclosed within appropriate inline tags, and <font>). If set to yes then legacy tags will be replaced with CSS <style> tags and structural markup as appropriate.
(Read and Write property)

### 181.5.81 OptionCoerceEndtags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option coerce-endtags.
**Notes:** This option specifies if Tidy should coerce a start tag into an end tag in cases where it looks like an end tag was probably intended; for example, given
<span>foo <b>bar<b> baz</span>
Tidy will output
<span>foo <b>bar</b> baz</span>
(Read and Write property)

### 181.5.82 OptionCssPrefix as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option css-prefix.
**Notes:** This option specifies the prefix that Tidy uses for styles rules.
By default, c will be used.
(Read and Write property)

### 181.5.83 OptionDecorateInferredUl as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option decorate-inferred-ul.
**Notes:** This option specifies if Tidy should decorate inferred <ul> elements with some CSS markup to avoid indentation to the right.

(Read and Write property)

### 181.5.84 OptionDoctype as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option doctype.
**Notes:** This option specifies the DOCTYPE declaration generated by Tidy.
If set to omit the output won't contain a DOCTYPE declaration. Note this this also implies numeric-entities is set to yes.
If set to html5 the DOCTYPE is set to <!DOCTYPE html>.
If set to auto (the default) Tidy will use an educated guess based upon the contents of the document.
If set to strict, Tidy will set the DOCTYPE to the HTML4 or XHTML1 strict DTD.
If set to loose, the DOCTYPE is set to the HTML4 or XHTML1 loose (transitional) DTD.
Alternatively, you can supply a string for the formal public identifier (FPI).
For example:
doctype: "-//ACME//DTD HTML 3.14159//EN"
If you specify the FPI for an XHTML document, Tidy will set the system identifier to an empty string. For an HTML document, Tidy adds a system identifier only if one was already present in order to preserve the processing mode of some browsers. Tidy leaves the DOCTYPE for generic XML documents unchanged.
This option does not offer a validation of document conformance.
(Read and Write property)

### 181.5.85 OptionDoctypeMode as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option doctype-mode.
**Notes:**

(Read only property)

### 181.5.86 OptionDropEmptyElements as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option drop-empty-elements.
**Notes:** This option specifies if Tidy should discard empty elements.
(Read and Write property)

### 181.5.87 OptionDropEmptyParas as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option drop-empty-paras.
**Notes:** This option specifies if Tidy should discard empty paragraphs.
(Read and Write property)

### 181.5.88 OptionDropFontTags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option drop-font-tags.
**Notes:** Deprecated; do not use. This option is destructive to <font> tags, and it will be removed from future versions of Tidy. Use the clean option instead.
If you do set this option despite the warning it will perform as clean except styles will be inline instead of put into a CSS class. <font> tags will be dropped completely and their styles will not be preserved.
If both clean and this option are enabled, <font> tags will still be dropped completely, and other styles will be preserved in a CSS class instead of inline.
See clean for more information.
(Read and Write property)

### 181.5.89 OptionDropPropAttrs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip out proprietary attributes, such as MS data binding attributes.
**Notes:** (Read and Write property)

### 181.5.90 OptionDropProprietaryAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option drop-proprietary-attributes.
**Notes:** This option specifies if Tidy should strip out proprietary attributes, such as Microsoft data binding attributes. Additionally attributes that aren't permitted in the output version of HTML will be dropped if used with strict-tags-attributes.
(Read and Write property)

### 181.5.91 OptionDuplicateAttrs as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** One of the options.
**Notes:** (Read and Write property)

### 181.5.92 OptionEmacs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should change the format for reporting errors and warnings to a format that is more easily parsed by GNU Emacs.
**Notes:** (Read and Write property)

### 181.5.93 OptionEmacsFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Used internally.
**Notes:** (Read and Write property)

### 181.5.94 OptionEmptyTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies new empty inline tags.
**Notes:** This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Remember to also declare empty tags as either inline or blocklevel. This option is ignored in XML mode.
(Read and Write property)

### 181.5.95 OptionEncloseBlockText as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option enclose-block-text.
**Notes:** This option specifies if Tidy should insert a <p> element to enclose any text it finds in any element that allows mixed content for HTML transitional but not HTML strict.

(Read and Write property)

### 181.5.96 OptionEncloseBodyText as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should enclose any text it finds in the body element within a <P>element.
**Notes:** This is useful when you want to take existing HTML and use it with a style sheet.
(Read and Write property)

### 181.5.97 OptionEncloseText as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option enclose-text.
**Notes:** This option specifies if Tidy should enclose any text it finds in the body element within a <p> element.
This is useful when you want to take existing HTML and use it with a style sheet.
(Read and Write property)

### 181.5.98 OptionErrFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies the error file Tidy uses for errors and warnings.
**Notes:** Normally errors and warnings are output to ”stderr”.
(Read and Write property)

### 181.5.99 OptionErrorFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option error-file.
**Notes:** This option specifies the error file Tidy uses for errors and warnings. Normally errors and warnings are output to stderr.
(Read and Write property)

### 181.5.100 OptionEscapeCdata as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option escape-cdata.
**Notes:** This option specifies if Tidy should convert <! [ CDATA [ ] ] > sections to normal text.
(Read and Write property)

### 181.5.101 OptionEscapeScripts as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option escape-scripts.
**Notes:** This option causes items that look like closing tags, like </g to be escaped to <\/g. Set this option to 'no' if you do not want this.
(Read and Write property)

### 181.5.102 OptionFixBackslash as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option fix-backslash.
**Notes:** This option specifies if Tidy should replace backslash characters \in URLs with forward slashes /.
(Read and Write property)

### 181.5.103 OptionFixBadComments as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option fix-bad-comments.
**Notes:** This option specifies if Tidy should replace unexpected hyphens with = characters when it comes across adjacent hyphens.
The default is yes.
This option is provided for users of Cold Fusion which uses the comment syntax: <!— —>.
(Read and Write property)

### 181.5.104 OptionFixComments as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should replace unexpected hyphens with "=" characters when it comes across adjacent hyphens.
**Notes:** The default is yes. This option is provided for users of Cold Fusion which uses the comment syntax: <!— —>
(Read and Write property)

### 181.5.105 OptionFixUri as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option fix-uri.
**Notes:** This option specifies if Tidy should check attribute values that carry URIs for illegal characters and if such are found, escape them as HTML4 recommends.
(Read and Write property)

### 181.5.106 OptionForceOutput as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option force-output.
**Notes:** This option specifies if Tidy should produce output even if errors are encountered.
Use this option with care; if Tidy reports an error, this means Tidy was not able to (or is not sure how to) fix the error, so the resulting output may not reflect your intention.
(Read and Write property)

### 181.5.107 OptionGdoc as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option gdoc.
**Notes:** This option specifies if Tidy should enable specific behavior for cleaning up HTML exported from Google Docs.
(Read and Write property)

### 181.5.108 OptionGnuEmacs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option gnu-emacs.
**Notes:** This option specifies if Tidy should change the format for reporting errors and warnings to a format that is more easily parsed by GNU Emacs.
(Read and Write property)

### 181.5.109 OptionGnuEmacsFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option gnu-emacs-file.
**Notes:** Used internally.
(Read and Write property)

### 181.5.110 OptionHideComments as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option hide-comments.
**Notes:** This option specifies if Tidy should print out comments.
(Read and Write property)

### 181.5.111 OptionHideEndtags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option hide-endtags.
**Notes:** This option is an alias for omit-optional-tags.
(Read and Write property)

### 181.5.112 OptionHtmlOut as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate pretty printed output, writing it as HTML.
**Notes:** (Read and Write property)

### 181.5.113 OptionInCharEncoding as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies the character encoding Tidy uses for the input.
**Notes:** See char-encoding for more info.
(Read and Write property)

### 181.5.114 OptionIndent as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option indent.
**Notes:** This option specifies if Tidy should indent block-level tags.
If set to auto Tidy will decide whether or not to indent the content of tags such as <title>, <h1>-<h6>, <li>, <td>, or <p> based on the content including a block-level element.
Setting indent to yes can expose layout bugs in some browsers.
Use the option indent-spaces to control the number of spaces or tabs output per level of indent, and indent-with-tabs to specify whether spaces or tabs are used.
(Read and Write property)

### 181.5.115 OptionIndentAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option indent-attributes.
**Notes:** This option specifies if Tidy should begin each attribute on a new line.
(Read and Write property)

### 181.5.116 OptionIndentCdata as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option indent-cdata.
**Notes:** This option specifies if Tidy should indent <! [ CDATA [ ] ] > sections.
(Read and Write property)

### 181.5.117 OptionIndentContent as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** One of the options.
**Notes:** (Read and Write property)

### 181.5.118 OptionIndentSpaces as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option indent-spaces.
**Notes:** This option specifies the number of spaces or tabs that Tidy uses to indent content when indent is enabled.
Note that the default value for this option is dependent upon the value of indent-with-tabs (see also).
(Read and Write property)

### 181.5.119 OptionIndentWithTabs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option indent-with-tabs.
**Notes:** This option specifies if Tidy should indent with tabs instead of spaces, assuming indent is yes.
Set it to yes to indent using tabs instead of the default spaces.
Use the option indent-spaces to control the number of tabs output per level of indent. Note that when indent-with-tabs is enabled the default value of indent-spaces is reset to 1.
Note tab-size controls converting input tabs to spaces. Set it to zero to retain input tabs.
(Read and Write property)

### 181.5.120 OptionInlineTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies new non-empty inline tags. This option takes a space or comma separated list of tag names.
**Notes:** Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. This option is ignored in XML mode.
(Read and Write property)

### 181.5.121 OptionInputEncoding as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option input-encoding.
**Notes:** This option specifies the character encoding Tidy uses for the input. See char-encoding for more

info.
(Read and Write property)

### 181.5.122 OptionInputXml as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option input-xml.
**Notes:** This option specifies if Tidy should use the XML parser rather than the error correcting HTML parser.
(Read and Write property)

### 181.5.123 OptionJoinClasses as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option join-classes.
**Notes:** This option specifies if Tidy should combine class names to generate a single, new class name if multiple class assignments are detected on an element.
(Read and Write property)

### 181.5.124 OptionJoinStyles as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option join-styles.
**Notes:** This option specifies if Tidy should combine styles to generate a single, new style if multiple style values are detected on an element.
(Read and Write property)

### 181.5.125 OptionKeepFileTimes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should keep the original modification time of files that Tidy modifies in place.
**Notes:** The default is no. Setting the option to yes allows you to tidy files without causing these files to be uploaded to a web server when using a tool such as SiteCopy. Note this feature is not supported on some platforms.
(Read and Write property)

### 181.5.126 OptionKeepTime as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option keep-time.
**Notes:** This option specifies if Tidy should keep the original modification time of files that Tidy modifies in place.
Setting the option to yes allows you to tidy files without changing the file modification date, which may be useful with certain tools that use the modification date for things such as automatic server deployment.
Note this feature is not supported on some platforms.
(Read and Write property)

### 181.5.127 OptionLanguage as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option language.
**Notes:** Currently not used, but this option specifies the language Tidy would use if it were properly localized. For example: en.
(Read and Write property)

### 181.5.128 OptionLiteralAttribs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should ensure that whitespace characters within attribute values are passed through unchanged.
**Notes:** (Read and Write property)

### 181.5.129 OptionLiteralAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option literal-attributes.
**Notes:** This option specifies how Tidy deals with whitespace characters within attribute values.
If the value is no Tidy normalizes attribute values by replacing any newline or tab with a single space, and further by replacing any contiguous whitespace with a single space.
To force Tidy to preserve the original, literal values of all attributes and ensure that whitespace within attribute values is passed through unchanged, set this option to yes.
(Read and Write property)

### 181.5.130 OptionLogicalEmphasis as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option logical-emphasis.
**Notes:** This option specifies if Tidy should replace any occurrence of <i> with <em> and any occurrence of <b> with <strong>. Any attributes are preserved unchanged.
This option can be set independently of the clean option.
(Read and Write property)

### 181.5.131 OptionLowerLiterals as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option lower-literals.
**Notes:** This option specifies if Tidy should convert the value of an attribute that takes a list of predefined values to lower case.
This is required for XHTML documents.
(Read and Write property)

### 181.5.132 OptionMakeBare as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip Microsoft specific HTML from Word 2000 documents, and output spaces rather than non-breaking spaces where they exist in the input.
**Notes:** (Read and Write property)

### 181.5.133 OptionMakeClean as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip out surplus presentational tags and attributes replacing them by style rules and structural markup as appropriate.
**Notes:** It works well on the HTML saved by Microsoft Office products.
(Read and Write property)

### 181.5.134 OptionMark as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add a meta element to the document head to indicate that the document has been tidied.
**Notes:** Tidy won't add a meta element if one is already present.
(Read and Write property)

### 181.5.135 OptionMarkup as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option markup.
**Notes:** This option specifies if Tidy should generate a pretty printed version of the markup. Note that Tidy won't generate a pretty printed version if it finds significant errors (see force-output).
(Read and Write property)

### 181.5.136 OptionMergeDivs as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option merge-divs.
**Notes:** This option can be used to modify the behavior of clean when set to yes.
This option specifies if Tidy should merge nested <div> such as <div><div>...</div></div>.
If set to auto the attributes of the inner <div> are moved to the outer one. Nested <div> with id attributes are not merged.
If set to yes the attributes of the inner <div> are discarded with the exception of class and style.
(Read and Write property)

### 181.5.137 OptionMergeEmphasis as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option merge-emphasis.
**Notes:** This option specifies if Tidy should merge nested <b> and <i> elements; for example, for the case
<b class="rtop-2">foo <b class="r2-2">bar</b> baz</b>,
Tidy will output <b class="rtop-2">foo bar baz</b>.
(Read and Write property)

### 181.5.138 OptionMergeSpans as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option merge-spans.
**Notes:** This option can be used to modify the behavior of clean when set to yes.
This option specifies if Tidy should merge nested <span> such as <span><span>...</span></span&gt
The algorithm is identical to the one used by merge-divs.
(Read and Write property)

### 181.5.139 OptionNcr as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option ncr.
**Notes:** This option specifies if Tidy should allow numeric character references.
(Read and Write property)

### 181.5.140 OptionNewBlocklevelTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option new-blocklevel-tags.
**Notes:** This option specifies new block-level tags. This option takes a space or comma separated list of tag names.
Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.
Note you can't change the content model for elements such as <table>, <ul>, <ol> and <dl>.
This option is ignored in XML mode.
(Read and Write property)

### 181.5.141 OptionNewEmptyTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option new-empty-tags.
**Notes:** This option specifies new empty inline tags. This option takes a space or comma separated list of tag names.
Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.
Remember to also declare empty tags as either inline or blocklevel.
This option is ignored in XML mode.

(Read and Write property)

### 181.5.142 OptionNewInlineTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option new-inline-tags.
**Notes:** This option specifies new non-empty inline tags. This option takes a space or comma separated list of tag names.
Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.
This option is ignored in XML mode.
(Read and Write property)

### 181.5.143 OptionNewline as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option newline.
**Notes:** The default is appropriate to the current platform.
Genrally CRLF on PC-DOS, Windows and OS/2; CR on Classic Mac OS; and LF everywhere else (Linux, Mac OS X, and Unix).
(Read and Write property)

### 181.5.144 OptionNewPreTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option new-pre-tags.
**Notes:** This option specifies new tags that are to be processed in exactly the same way as HTML's <pre> element. This option takes a space or comma separated list of tag names.
Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.
Note you cannot as yet add new CDATA elements.
This option is ignored in XML mode.
(Read and Write property)

### 181.5.145 OptionNumEntities as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should output entities other than the built-in HTML entities (&, <, > and ") in the numeric rather than the named entity form.
**Notes:** Only entities compatible with the DOCTYPE declaration generated are used. Entities that can be represented in the output encoding are translated correspondingly.
(Read and Write property)

### 181.5.146 OptionNumericEntities as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option numeric-entities.
**Notes:** This option specifies if Tidy should output entities other than the built-in HTML entities (&, <, >, and ") in the numeric rather than the named entity form.
Only entities compatible with the DOCTYPE declaration generated are used.
Entities that can be represented in the output encoding are translated correspondingly.
(Read and Write property)

### 181.5.147 OptionOmitOptionalTags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option omit-optional-tags.
**Notes:** This option specifies if Tidy should omit optional start tags and end tags when generating output. Setting this option causes all tags for the <html>, <head>, and <body> elements to be omitted from output, as well as such end tags as </p>, </li>, </dt>, </dd>, </option>, </tr>, </td>, and </th>.
This option is ignored for XML output.
(Read and Write property)

### 181.5.148 OptionOutCharEncoding as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies the character encoding Tidy uses for the output.
**Notes:** See char-encoding for more info. May only be different from input-encoding for Latin encodings (ascii, latin0, latin1, mac, win1252, ibm858).
(Read and Write property)

### 181.5.149 OptionOutFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies the output file Tidy uses for markup.
**Notes:** Normally markup is written to "stdout".
(Read and Write property)

### 181.5.150 OptionOutputBom as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-bom.
**Notes:** This option specifies if Tidy should write a Unicode Byte Order Mark character (BOM; also known as Zero Width No-Break Space; has value of U+FEFF) to the beginning of the output, and only applies to UTF-8 and UTF-16 output encodings.
If set to auto this option causes Tidy to write a BOM to the output only if a BOM was present at the beginning of the input.
A BOM is always written for XML/XHTML output using UTF-16 output encodings.
(Read and Write property)

### 181.5.151 OptionOutputEncoding as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-encoding.
**Notes:** This option specifies the character encoding Tidy uses for the output.
Note that this may only be different from input-encoding for Latin encodings (ascii, latin0, latin1, mac, win1252, ibm858).
See char-encoding for more information
(Read and Write property)

### 181.5.152 OptionOutputFile as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-file.
**Notes:** This option specifies the output file Tidy uses for markup. Normally markup is written to stdout.
(Read and Write property)

### 181.5.153 OptionOutputHtml as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-html.
**Notes:** This option specifies if Tidy should generate pretty printed output, writing it as HTML.
(Read and Write property)

### 181.5.154 OptionOutputXhtml as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-xhtml.
**Notes:** This option specifies if Tidy should generate pretty printed output, writing it as extensible HTML. This option causes Tidy to set the DOCTYPE and default namespace as appropriate to XHTML, and will use the corrected value in output regardless of other sources.
For XHTML, entities can be written as named or numeric entities according to the setting of numeric-entities.
The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

### 181.5.155 OptionOutputXml as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option output-xml.
**Notes:** This option specifies if Tidy should pretty print output, writing it as well-formed XML.
Any entities not defined in XML 1.0 will be written as numeric entities to allow them to be parsed by an XML parser.
The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

### 181.5.156 OptionPreserveEntities as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option preserve-entities.
**Notes:** This option specifies if Tidy should preserve well-formed entities as found in the input.
(Read and Write property)

### 181.5.157 OptionPreTags as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies new tags that are to be processed in exactly the same way as HTML's <PRE>element.
**Notes:** This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Note you can not as yet add new CDATA elements (similar to <SCRIPT>). This option is ignored in XML mode.
(Read and Write property)

### 181.5.158 OptionPunctuationWrap as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option punctuation-wrap.
**Notes:** This option specifies if Tidy should line wrap after some Unicode or Chinese punctuation characters.
(Read and Write property)

### 181.5.159 OptionPunctWrap as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap after some Unicode or Chinese punctuation characters.
**Notes:** (Read and Write property)

### 181.5.160 OptionQuiet as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option quiet.
**Notes:** This option specifies if Tidy should output the summary of the numbers of errors and warnings, or the welcome or informational messages.
(Read and Write property)

### 181.5.161 OptionQuoteAmpersand as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option quote-ampersand.
**Notes:** This option specifies if Tidy should output unadorned & characters as &.

(Read and Write property)

### 181.5.162 OptionQuoteMarks as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option quote-marks.
**Notes:** This option specifies if Tidy should output " characters as " as is preferred by some editing environments.
The apostrophe character ' is written out as ' since many web browsers don't yet support '.
(Read and Write property)

### 181.5.163 OptionQuoteNbsp as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option quote-nbsp.
**Notes:** This option specifies if Tidy should output non-breaking space characters as entities, rather than as the Unicode character value 160 (decimal).
(Read and Write property)

### 181.5.164 OptionRepeatedAttributes as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option repeated-attributes.
**Notes:** This option specifies if Tidy should keep the first or last attribute, if an attribute is repeated, e.g. has two align attributes.
(Read and Write property)

### 181.5.165 OptionReplaceColor as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option replace-color.
**Notes:** This option specifies if Tidy should replace numeric values in color attributes with HTML/XHTML color names where defined, e.g. replace #ffffff with white.
(Read and Write property)

### 181.5.166 OptionShowBodyOnly as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option show-body-only.
**Notes:** This option specifies if Tidy should print only the contents of the body tag as an HTML fragment. If set to auto, this is performed only if the body tag has been inferred.
Useful for incorporating existing whole pages as a portion of another page.
This option has no effect if XML output is requested.
(Read and Write property)

### 181.5.167 OptionShowErrors as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option show-errors.
**Notes:** This option specifies the number Tidy uses to determine if further errors should be shown. If set to 0, then no errors are shown.
(Read and Write property)

### 181.5.168 OptionShowInfo as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option show-info.
**Notes:** This option specifies if Tidy should display info-level messages.
(Read and Write property)

### 181.5.169 OptionShowMarkup as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate a pretty printed version of the markup.
**Notes:** Note that Tidy won't generate a pretty printed version if it finds significant errors (see force-output).
(Read and Write property)

### 181.5.170 OptionShowWarnings as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option show-warnings.
**Notes:** This option specifies if Tidy should suppress warnings. This can be useful when a few errors are hidden in a flurry of warnings.
(Read and Write property)

### 181.5.171 OptionSkipNested as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option skip-nested.
**Notes:** This option specifies that Tidy should skip nested tags when parsing script and style data.
(Read and Write property)

### 181.5.172 OptionSlideStyle as String

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option slide-style.
**Notes:** This option has no function and is deprecated.
(Read and Write property)

### 181.5.173 OptionSortAttributes as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option sort-attributes.
**Notes:** This option specifies that Tidy should sort attributes within an element using the specified sort algorithm. If set to alpha, the algorithm is an ascending alphabetic sort.
(Read and Write property)

### 181.5.174 OptionSplit as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option split.
**Notes:** This option has no function and is deprecated.
(Read and Write property)

### 181.5.175 OptionStrictTagsAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option strict-tags-attributes.
**Notes:** This options ensures that tags and attributes are applicable for the version of HTML that Tidy outputs. When set to yes (the default) and the output document type is a strict doctype, then Tidy will report errors. If the output document type is a loose or transitional doctype, then Tidy will report warnings. Additionally if drop-proprietary-attributes is enabled, then not applicable attributes will be dropped, too. When set to no, these checks are not performed.
(Read and Write property)

### 181.5.176 OptionTabSize as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option tab-size.
**Notes:** This option specifies the number of columns that Tidy uses between successive tab stops. It is used to map tabs to spaces when reading the input.
(Read and Write property)

### 181.5.177 OptionTidyMark as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option tidy-mark.
**Notes:** This option specifies if Tidy should add a meta element to the document head to indicate that the document has been tidied.
Tidy won't add a meta element if one is already present.
(Read and Write property)

### 181.5.178 OptionUppercaseAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option uppercase-attributes.
**Notes:** This option specifies if Tidy should output attribute names in upper case.
The default is no, which results in lower case attribute names, except for XML input, where the original case is preserved.
(Read and Write property)

### 181.5.179 OptionUpperCaseAttrs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should output attribute names in upper case.
**Notes:** The default is no, which results in lower case attribute names, except for XML input, where the original case is preserved.
(Read and Write property)

### 181.5.180 OptionUppercaseTags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option uppercase-tags.
**Notes:** This option specifies if Tidy should output tag names in upper case.
The default is no which results in lower case tag names, except for XML input where the original case is preserved.
(Read and Write property)

### 181.5.181 OptionVerticalSpace as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option vertical-space.
**Notes:** This option specifies if Tidy should add some extra empty lines for readability.
The default is no.
If set to auto Tidy will eliminate nearly all newline characters.
(Read and Write property)

### 181.5.182 OptionVertSpace as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add some empty lines for readability.
**Notes:** (Read and Write property)

### 181.5.183 OptionWord2000 as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option word-2000.
**Notes:** This option specifies if Tidy should go to great pains to strip out all the surplus stuff Microsoft Word 2000 inserts when you save Word documents as "Web pages". It doesn't handle embedded images or VML.
You should consider using Word's "Save As: Web Page, Filtered".
(Read and Write property)

### 181.5.184 OptionWrap as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap.
**Notes:** This option specifies the right margin Tidy uses for line wrapping.
Tidy tries to wrap lines so that they do not exceed this length.
Set wrap to 0(zero) if you want to disable line wrapping.
(Read and Write property)

### 181.5.185 OptionWrapAsp as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-asp.
**Notes:** This option specifies if Tidy should line wrap text contained within ASP pseudo elements, which look like: <% ... %>.
(Read and Write property)

### 181.5.186 OptionWrapAttributes as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-attributes.
**Notes:** This option specifies if Tidy should line-wrap attribute values, meaning that if the value of an attribute causes a line to exceed the width specified by wrap, Tidy will add one or more line breaks to the value, causing it to be wrapped into multiple lines.
Note that this option can be set independently of wrap-script-literals. By default Tidy replaces any newline or tab with a single space and replaces any sequences of whitespace with a single space.
To force Tidy to preserve the original, literal values of all attributes, and ensure that whitespace characters within attribute values are passed through unchanged, set literal-attributes to yes.
(Read and Write property)

### 181.5.187 OptionWrapAttVals as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap attribute values, for easier editing.
**Notes:** This option can be set independently of wrap-script-literals.
(Read and Write property)

### 181.5.188 OptionWrapJste as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-jste.
**Notes:** This option specifies if Tidy should line wrap text contained within JSTE pseudo elements, which look like: <# ... #>.
(Read and Write property)

### 181.5.189 OptionWrapLen as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies the right margin Tidy uses for line wrapping.
**Notes:** Tidy tries to wrap lines so that they do not exceed this length. Set wrap to zero if you want to disable line wrapping.
(Read and Write property)

### 181.5.190 OptionWrapPhp as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-php.
**Notes:** This option specifies if Tidy should line wrap text contained within PHP pseudo elements, which look like: <?php ... ?>.
(Read and Write property)

### 181.5.191 OptionWrapScriptlets as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap string literals that appear in script attributes.
**Notes:** Tidy wraps long script string literals by inserting a backslash character before the line break.
(Read and Write property)

### 181.5.192 OptionWrapScriptLiterals as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-script-literals.
**Notes:** This option specifies if Tidy should line wrap string literals that appear in script attributes.
Tidy wraps long script string literals by inserting a backslash character before the line break.
(Read and Write property)

### 181.5.193 OptionWrapSection as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap text contained within <! [ ... ] >section tags.
**Notes:** (Read and Write property)

### 181.5.194 OptionWrapSections as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option wrap-sections.
**Notes:** This option specifies if Tidy should line wrap text contained within <! [ ... ] > section tags.
(Read and Write property)

### 181.5.195 OptionWriteBack as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tidy option write-back.
**Notes:** This option specifies if Tidy should write back the tidied markup to the same file it read from.
You are advised to keep copies of important files before tidying them, as on rare occasions the result may not be what you expect.
(Read and Write property)

### 181.5.196 OptionXhtmlOut as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate pretty printed output, writing it as extensible HTML.
**Notes:** This option causes Tidy to set the DOCTYPE and default namespace as appropriate to XHTML. If a DOCTYPE or namespace is given they will checked for consistency with the content of the document. In the case of an inconsistency, the corrected values will appear in the output. For XHTML, entities can be written as named or numeric entities according to the setting of the "numeric-entities" option. The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

### 181.5.197 OptionXmlDecl as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add the XML declaration when outputting XML or XHTML.
**Notes:** Note that if the input already includes an <?xml ... ?>declaration then this option will be ignored. If the encoding for the output is different from "ascii", one of the utf encodings or "raw", the declaration is always added as required by the XML standard.
(Read and Write property)

### 181.5.198 OptionXmlOut as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should pretty print output, writing it as well-formed XML.
**Notes:** Any entities not defined in XML 1.0 will be written as numeric entities to allow them to be parsed by a XML parser. The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

### 181.5.199 OptionXmlPIs as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** One of the options.
**Notes:** (Read and Write property)

### 181.5.200 OptionXmlSpace as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add xml:space="preserve" to elements such as <PRE>, <STYLE>and <SCRIPT>when generating XML.
**Notes:** This is needed if the whitespace in such elements is to be parsed appropriately without having access to the DTD.
(Read and Write property)

### 181.5.201 OptionXmlTags as Boolean

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Set this option if the input is xml.
**Notes:** (Read and Write property)

### 181.5.202 Events

### 181.5.203 Filter(level as Integer, line as Integer, column as Integer, message as string) as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The filter called for every error and warning.
**Notes:** Callback to filter messages by diagnostic level: info, warning, etc. Just set diagnostic output handler to redirect all diagnostics output.

Return false to proceed with output, true to cancel.

### 181.5.204 PrettyPrintProgress(line as Integer, column as Integer, destLine as Integer)

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Reports progress on the print process.

## 181.6 module TidyDupAttrModesMBS

### 181.6.1 module TidyDupAttrModesMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.6.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyKeepFirst | 0 | A constant for use with the Tidy classes. |
| TidyKeepLast | 1 | A constant for use with the Tidy classes. |

## 181.7 class TidyInputMBS

### 181.7.1 class TidyInputMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Delivers raw bytes of input.

### 181.7.2 Events

### 181.7.3 EndOfFile as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Return true if all your data is processed.
**Notes:** Return false if more data is available for the GetByte call.

### 181.7.4 GetByte as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Read one byte and returns it to the tidy library.

### 181.7.5 UngetByte(value as Integer)

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Returns a byte to the buffer for later processing.

## 181.8 class TidyIteratorMBS

### 181.8.1 class TidyIteratorMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An iterator for various uses.

### 181.8.2 Properties

### 181.8.3 Handle as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal reference to the tidy iterator object.
**Notes:** (Read only property)

## 181.9 module TidyLineEndingMBS

### 181.9.1 module TidyLineEndingMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.9.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyCR | 2 | A constant for use with the Tidy classes. |
| TidyCRLF | 1 | A constant for use with the Tidy classes. |
| TidyLF | 0 | A constant for use with the Tidy classes. |

## 181.10 class TidyNodeMBS

### 181.10.1 class TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A node in the document parse tree.
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### 181.10.2 Properties

### 181.10.3 Child as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The child node of this node.
**Example:**

```
dim t as TidyDocumentMBS // the tidy document
dim n as TidyNodeMBS
dim c as TidyNodeMBS

// iterating over root and its children (for more children you need recursion)
n=t.Root
while n<>nil
MsgBox n.Text

c=n.Child
while c<>nil
MsgBox c.Text
c=c.NextNode
wend

n=n.NextNode
wend
```

**Notes:** (Read only property)

### 181.10.4 Column as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position of this node.
**Notes:** (Read only property)

### 181.10.5 Document as TidyDocumentMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The document of this node.
**Notes:** (Read only property)

### 181.10.6 FirstAttribute as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first attribute for this node.
**Notes:** (Read only property)

### 181.10.7 GetABBR as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ABBR attribute for this node.
**Notes:** (Read only property)

### 181.10.8 GetALINK as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ALINK attribute for this node.
**Notes:** (Read only property)

### 181.10.9 GetALT as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ALT attribute for this node.
**Notes:** (Read only property)

### 181.10.10 GetBGCOLOR as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first BGCOLOR attribute for this node.
**Notes:** (Read only property)

### 181.10.11 GetCHECKED as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first CHECKED attribute for this node.
**Notes:** (Read only property)

### 181.10.12 GetCOLSPAN as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first COLSPAN attribute for this node.
**Notes:** (Read only property)

### 181.10.13 GetCONTENT as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first CONTENT attribute for this node.
**Notes:** (Read only property)

### 181.10.14 GetDATAFLD as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first DATAFLD attribute for this node.
**Notes:** (Read only property)

### 181.10.15 GetFOR as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first FOR attribute for this node.
**Notes:** (Read only property)

### 181.10.16 GetHEIGHT as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first HEIGHT attribute for this node.
**Notes:** (Read only property)

### 181.10.17 GetHREF as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first HREF attribute for this node.
**Notes:** (Read only property)

### 181.10.18 GetHTTP_EQUIV as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first HTTP_EQUIV attribute for this node.
**Notes:** (Read only property)

### 181.10.19 GetID as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ID attribute for this node.
**Notes:** (Read only property)

### 181.10.20 GetISMAP as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ISMAP attribute for this node.
**Notes:** (Read only property)

### 181.10.21 GetLANG as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first LANG attribute for this node.
**Notes:** (Read only property)

### 181.10.22 GetLANGUAGE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first LANGUAGE attribute for this node.
**Notes:** (Read only property)

### 181.10.23 GetLINK as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first LINK attribute for this node.
**Notes:** (Read only property)

### 181.10.24 GetLONGDESC as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first LONGDESC attribute for this node.
**Notes:** (Read only property)

### 181.10.25 GetNAME as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first NAME attribute for this node.
**Notes:** (Read only property)

### 181.10.26 GetOnBLUR as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnBLUR attribute for this node.
**Notes:** (Read only property)

### 181.10.27 GetOnCLICK as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnCLICK attribute for this node.
**Notes:** (Read only property)

### 181.10.28 GetOnFOCUS as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnFOCUS attribute for this node.
**Notes:** (Read only property)

### 181.10.29 GetOnKEYDOWN as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnKEYDOWN attribute for this node.
**Notes:** (Read only property)

### 181.10.30 GetOnKEYPRESS as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnKEYPRESS attribute for this node.
**Notes:** (Read only property)

### 181.10.31 GetOnKEYUP as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnKEYUP attribute for this node.
**Notes:** (Read only property)

### 181.10.32 GetOnMOUSEDOWN as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnMOUSEDOWN attribute for this node.
**Notes:** (Read only property)

### 181.10.33 GetOnMOUSEMOVE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnMOUSEMOVE attribute for this node.
**Notes:** (Read only property)

### 181.10.34 GetOnMOUSEOUT as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnMOUSEOUT attribute for this node.
**Notes:** (Read only property)

### 181.10.35 GetOnMOUSEOVER as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnMOUSEOVER attribute for this node.
**Notes:** (Read only property)

### 181.10.36 GetOnMOUSEUP as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first OnMOUSEUP attribute for this node.
**Notes:** (Read only property)

### 181.10.37 GetREL as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first REL attribute for this node.
**Notes:** (Read only property)

### 181.10.38 GetROWSPAN as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first ROWSPAN attribute for this node.
**Notes:** (Read only property)

### 181.10.39 GetSELECTED as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first SELECTED attribute for this node.
**Notes:** (Read only property)

### 181.10.40 GetSRC as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first SRC attribute for this node.
**Notes:** (Read only property)

### 181.10.41 GetSTYLE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first STYLE attribute for this node.
**Notes:** (Read only property)

### 181.10.42 GetSUMMARY as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first SUMMARY attribute for this node.
**Notes:** (Read only property)

### 181.10.43 GetTARGET as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first TARGET attribute for this node.
**Notes:** (Read only property)

### 181.10.44 GetTEXT as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first TEXT attribute for this node.
**Notes:** (Read only property)

### 181.10.45 GetTITLE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first TITLE attribute for this node.
**Notes:** (Read only property)

### 181.10.46 GetTYPE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first TYPE attribute for this node.
**Notes:** (Read only property)

### 181.10.47 GetUSEMAP as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first USEMAP attribute for this node.
**Notes:** (Read only property)

### 181.10.48 GetVALUE as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first VALUE attribute for this node.
**Notes:** (Read only property)

### 181.10.49 GetVLINK as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first VLINK attribute for this node.
**Notes:** (Read only property)

### 181.10.50 GetWIDTH as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first WIDTH attribute for this node.
**Notes:** (Read only property)

### 181.10.51 GetXMLNS as TidyAttributeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The first XMLNS attribute for this node.
**Notes:** (Read only property)

### 181.10.52 Handle as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal reference to the tidy node object.
**Notes:** (Read only property)

### 181.10.53 HasText as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether there is text attached to this node.
**Notes:** Returns true if yes.
(Read only property)

### 181.10.54 ID as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The node ID.
**Notes:** (Read only property)

### 181.10.55 IsDATALIST as Boolean

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this node is a data list.
**Notes:** (Read only property)

### 181.10.56 IsProperty as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the node is a property.
**Notes:** (Read only property)

### 181.10.57 Line as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The position of this node.
**Notes:** (Read only property)

### 181.10.58 Name as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of this node.
**Notes:** (Read only property)

### 181.10.59 NextNode as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The next node in the node list of the parent node.
**Notes:** (Read only property)

### 181.10.60 NodeIsA as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a A node.
**Notes:** (Read only property)

### 181.10.61 NodeIsADDRESS as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a ADDRESS node.
**Notes:** (Read only property)

### 181.10.62 NodeIsAPPLET as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a APPLET node.
**Notes:** (Read only property)

### 181.10.63 NodeIsAREA as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a AREA node.
**Notes:** (Read only property)

### 181.10.64 NodeIsB as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a B node.
**Notes:** (Read only property)

### 181.10.65 NodeIsBASE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BASE node.
**Notes:** (Read only property)

### 181.10.66 NodeIsBASEFONT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BASEFONT node.
**Notes:** (Read only property)

### 181.10.67 NodeIsBIG as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BIG node.
**Notes:** (Read only property)

### 181.10.68 NodeIsBLINK as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BLINK node.
**Notes:** (Read only property)

### 181.10.69 NodeIsBLOCKQUOTE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BLOCKQUOTE node.
**Notes:** (Read only property)

### 181.10.70 NodeIsBODY as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BODY node.
**Notes:** (Read only property)

### 181.10.71 NodeIsBR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a BR node.
**Notes:** (Read only property)

### 181.10.72 NodeIsCAPTION as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a CAPTION node.
**Notes:** (Read only property)

### 181.10.73 NodeIsCENTER as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a CENTER node.
**Notes:** (Read only property)

### 181.10.74 NodeIsCOL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a COL node.
**Notes:** (Read only property)

### 181.10.75 NodeIsCOLGROUP as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a COLGROUP node.
**Notes:** (Read only property)

### 181.10.76 NodeIsDD as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a DD node.
**Notes:** (Read only property)

### 181.10.77 NodeIsDIR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a DIR node.
**Notes:** (Read only property)

### 181.10.78 NodeIsDIV as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a DIV node.
**Notes:** (Read only property)

### 181.10.79 NodeIsDL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a DL node.
**Notes:** (Read only property)

### 181.10.80 NodeIsDT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a DT node.
**Notes:** (Read only property)

### 181.10.81 NodeIsEM as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a EM node.
**Notes:** (Read only property)

### 181.10.82 NodeIsEMBED as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a EMBED node.
**Notes:** (Read only property)

### 181.10.83 NodeIsFONT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a FONT node.
**Notes:** (Read only property)

### 181.10.84 NodeIsFORM as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a FORM node.
**Notes:** (Read only property)

### 181.10.85 NodeIsFRAME as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a FRAME node.
**Notes:** (Read only property)

### 181.10.86 NodeIsFRAMESET as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a FRAMESET node.
**Notes:** (Read only property)

### 181.10.87 NodeIsH1 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H1 node.
**Notes:** (Read only property)

### 181.10.88 NodeIsH2 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H2 node.
**Notes:** (Read only property)

### 181.10.89 NodeIsH3 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H3 node.
**Notes:** (Read only property)

### 181.10.90 NodeIsH4 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H4 node.
**Notes:** (Read only property)

### 181.10.91 NodeIsH5 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H5 node.
**Notes:** (Read only property)

### 181.10.92 NodeIsH6 as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a H6 node.
**Notes:** (Read only property)

### 181.10.93 NodeIsHEAD as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a HEAD node.
**Notes:** (Read only property)

### 181.10.94 NodeIsHeader as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a Header node.
**Notes:** (Read only property)

### 181.10.95 NodeIsHR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a HR node.
**Notes:** (Read only property)

### 181.10.96 NodeIsHTML as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a HTML node.
**Notes:** (Read only property)

### 181.10.97 NodeIsI as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a I node.
**Notes:** (Read only property)

### 181.10.98 NodeIsIFRAME as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a IFRAME node.
**Notes:** (Read only property)

### 181.10.99 NodeIsIMG as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a IMG node.
**Notes:** (Read only property)

### 181.10.100 NodeIsINPUT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a INPUT node.
**Notes:** (Read only property)

### 181.10.101 NodeIsISINDEX as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a ISINDEX node.
**Notes:** (Read only property)

### 181.10.102 NodeIsLABEL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a LABEL node.
**Notes:** (Read only property)

### 181.10.103 NodeIsLAYER as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a LAYER node.
**Notes:** (Read only property)

### 181.10.104 NodeIsLI as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a LI node.
**Notes:** (Read only property)

### 181.10.105 NodeIsLINK as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a LINK node.
**Notes:** (Read only property)

### 181.10.106 NodeIsLISTING as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a LISTING node.
**Notes:** (Read only property)

### 181.10.107 NodeIsMAP as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a MAP node.
**Notes:** (Read only property)

### 181.10.108 NodeIsMARQUEE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a MARQUEE node.
**Notes:** (Read only property)

### 181.10.109 NodeIsMENU as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a MENU node.
**Notes:** (Read only property)

### 181.10.110 NodeIsMETA as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a META node.
**Notes:** (Read only property)

### 181.10.111 NodeIsNOBR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a NOBR node.
**Notes:** (Read only property)

### 181.10.112 NodeIsNOFRAMES as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a NOFRAMES node.
**Notes:** (Read only property)

### 181.10.113 NodeIsNOSCRIPT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a NOSCRIPT node.
**Notes:** (Read only property)

### 181.10.114 NodeIsOBJECT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a OBJECT node.
**Notes:** (Read only property)

### 181.10.115 NodeIsOL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a OL node.
**Notes:** (Read only property)

### 181.10.116 NodeIsOPTGROUP as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a OPTGROUP node.
**Notes:** (Read only property)

### 181.10.117 NodeIsOPTION as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a OPTION node.
**Notes:** (Read only property)

### 181.10.118 NodeIsP as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a P node.
**Notes:** (Read only property)

### 181.10.119 NodeIsPARAM as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a PARAM node.
**Notes:** (Read only property)

### 181.10.120 NodeIsPRE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a PRE node.
**Notes:** (Read only property)

### 181.10.121 NodeIsQ as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a Q node.
**Notes:** (Read only property)

### 181.10.122 NodeIsS as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a S node.
**Notes:** (Read only property)

### 181.10.123 NodeIsSCRIPT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a SCRIPT node.
**Notes:** (Read only property)

### 181.10.124 NodeIsSELECT as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a SELECT node.
**Notes:** (Read only property)

### 181.10.125 NodeIsSMALL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a SMALL node.
**Notes:** (Read only property)

### 181.10.126 NodeIsSPACER as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a SPACER node.
**Notes:** (Read only property)

### 181.10.127 NodeIsSPAN as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a SPAN node.
**Notes:** (Read only property)

### 181.10.128 NodeIsSTRIKE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a STRIKE node.
**Notes:** (Read only property)

### 181.10.129 NodeIsSTRONG as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a STRONG node.
**Notes:** (Read only property)

### 181.10.130 NodeIsSTYLE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a STYLE node.
**Notes:** (Read only property)

### 181.10.131 NodeIsTABLE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TABLE node.
**Notes:** (Read only property)

### 181.10.132 NodeIsTD as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TD node.
**Notes:** (Read only property)

### 181.10.133 NodeIsText as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a Text node.
**Notes:** (Read only property)

### 181.10.134 NodeIsTEXTAREA as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TEXTAREA node.
**Notes:** (Read only property)

### 181.10.135 NodeIsTH as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TH node.
**Notes:** (Read only property)

### 181.10.136 NodeIsTITLE as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TITLE node.
**Notes:** (Read only property)

### 181.10.137 NodeIsTR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a TR node.
**Notes:** (Read only property)

### 181.10.138 NodeIsU as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a U node.
**Notes:** (Read only property)

### 181.10.139 NodeIsUL as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a UL node.
**Notes:** (Read only property)

### 181.10.140 NodeIsWBR as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a WBR node.
**Notes:** (Read only property)

### 181.10.141 NodeIsXMP as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this is a XMP node.
**Notes:** (Read only property)

### 181.10.142 Parent as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent node of this node.
**Notes:** (Read only property)

### 181.10.143 PrevNode as TidyNodeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The previous node in the node list of the parent node.
**Notes:** (Read only property)

### 181.10.144 Text as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text of this node.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As TidyNodeMBS=t.Root

MsgBox s.Text
```

**Notes:** This text has no encoding defined.
(Read only property)

### 181.10.145 Type as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The type of this node.
**Notes:** (Read only property)

### 181.10.146 Value as string

MBS Tools Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The decoded value of the node as UTF-8 String.
**Example:**

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim nodes(-1) as TidyNodeMBS
dim root as TidyNodeMBS = t.Root

// we iterate over all child nodes

nodes.Append root.Child
nodes.Append root.NextNode

while UBound(nodes)>=0
dim n as TidyNodeMBS = nodes.Pop

if n<>Nil then

nodes.Append n.Child // maybe a child?
nodes.Append n.NextNode // maybe a sibiling?

if n.HasText then
MsgBox n.Value // Shows "Hello World"
end if
end if
wend
```

**Notes:** (Read only property)

## 181.11 module TidyNodeTypeMBS

### 181.11.1 module TidyNodeTypeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.11.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyNodeAsp | 10 | A constant for use with the Tidy classes. |
| TidyNodeCDATA | 8 | A constant for use with the Tidy classes. |
| TidyNodeComment | 2 | A constant for use with the Tidy classes. |
| TidyNodeDocType | 1 | A constant for use with the Tidy classes. |
| TidyNodeEnd | 6 | A constant for use with the Tidy classes. |
| TidyNodeJste | 11 | A constant for use with the Tidy classes. |
| TidyNodePhp | 12 | A constant for use with the Tidy classes. |
| TidyNodeProcIns | 3 | A constant for use with the Tidy classes. |
| TidyNodeRoot | 0 | A constant for use with the Tidy classes. |
| TidyNodeSection | 9 | A constant for use with the Tidy classes. |
| TidyNodeStart | 5 | A constant for use with the Tidy classes. |
| TidyNodeStartEnd | 7 | A constant for use with the Tidy classes. |
| TidyNodeText | 4 | A constant for use with the Tidy classes. |
| TidyNodeXmlDecl | 13 | A constant for use with the Tidy classes. |

## 181.12 module TidyOptionIdMBS

### 181.12.1 module TidyOptionIdMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.12.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyAccessibilityCheckLevel | 84 | A constant for use with the Tidy classes. |
| TidyAltText | 11 | A constant for use with the Tidy classes. |
| TidyAnchorAsName | 93 | A constant for use with the Tidy classes. |
| TidyAsciiChars | 71 | A constant for use with the Tidy classes. |
| TidyBlockTags | 81 | A constant for use with the Tidy classes. |
| TidyBodyOnly | 64 | A constant for use with the Tidy classes. |
| TidyBreakBeforeBR | 40 | A constant for use with the Tidy classes. |
| TidyBurstSlides | 41 | A constant for use with the Tidy classes. |
| TidyCharEncoding | 4 | A constant for use with the Tidy classes. |
| TidyCoerceEndTags | 21 | A constant for use with the Tidy classes. |
| TidyCSSPrefix | 79 | A constant for use with the Tidy classes. |
| TidyDecorateInferredUL | 89 | A constant for use with the Tidy classes. |
| TidyDoctype | 9 | A constant for use with the Tidy classes. |
| TidyDoctypeMode | 8 | A constant for use with the Tidy classes. |
| TidyDropEmptyElems | 37 | A constant for use with the Tidy classes. |
| TidyDropEmptyParas | 38 | A constant for use with the Tidy classes. |
| TidyDropFontTags | 36 | A constant for use with the Tidy classes. |
| TidyDropPropAttrs | 35 | A constant for use with the Tidy classes. |
| TidyDuplicateAttrs | 10 | A constant for use with the Tidy classes. |
| TidyEmacs | 61 | A constant for use with the Tidy classes. |
| TidyEmacsFile | 62 | A constant for use with the Tidy classes. |
| TidyEmptyTags | 82 | A constant for use with the Tidy classes. |
| TidyEncloseBlockText | 57 | A constant for use with the Tidy classes. |
| TidyEncloseBodyText | 56 | A constant for use with the Tidy classes. |
| TidyErrFile | 13 | A constant for use with the Tidy classes. |
| TidyEscapeCdata | 74 | A constant for use with the Tidy classes. |
| TidyEscapeScripts | 97 | A constant for use with the Tidy classes. |
| TidyFixBackslash | 52 | A constant for use with the Tidy classes. |
| TidyFixComments | 39 | A constant for use with the Tidy classes. |
| TidyFixUri | 65 | A constant for use with the Tidy classes. |
| TidyForceOutput | 69 | A constant for use with the Tidy classes. |
| TidyGDocClean | 33 | A constant for use with the Tidy classes. |
| TidyHideComments | 67 | A constant for use with the Tidy classes. |
| TidyHideEndTags | 23 | A constant for use with the Tidy classes. |
| TidyHtmlOut | 27 | A constant for use with the Tidy classes. |
| TidyInCharEncoding | 5 | A constant for use with the Tidy classes. |
| TidyIndentAttributes | 53 | A constant for use with the Tidy classes. |
| TidyIndentCdata | 68 | A constant for use with the Tidy classes. |
| TidyIndentContent | 20 | A constant for use with the Tidy classes. |
| TidyIndentSpaces | 1 | A constant for use with the Tidy classes. |
| TidyInlineTags | 80 | A constant for use with the Tidy classes. |
| TidyJoinClasses | 72 | A constant for use with the Tidy classes. |
| TidyJoinStyles | 73 | A constant for use with the Tidy classes. |
| TidyKeepFileTimes | 58 | A constant for use with the Tidy classes. |
| TidyLanguage | 75 | A constant for use with the Tidy classes. |
| TidyLiteralAttribs | 63 | A constant for use with the Tidy classes. |
| TidyLogicalEmphasis | 34 | A constant for use with the Tidy classes. |
| TidyLowerLiterals | 66 | A constant for use with the Tidy classes. |
| TidyMakeBare | 31 | A constant for use with the Tidy classes. |
| TidyMakeClean | 32 | A constant for use with the Tidy classes. |
| TidyMark | 60 | A constant for use with the Tidy classes. |
| TidyMergeDivs | 88 | A constant for use with the Tidy classes. |
| TidyMergeEmphasis | 87 | A constant for use with the Tidy classes. |
| TidyMergeSpans | 92 | A constant for use with the Tidy classes. |
| TidyNCR | 76 | A constant for use with the Tidy classes. |
| TidyNewline | 7 | A constant for use with the Tidy classes. |
| TidyNumEntities | 42 | A constant for use with the Tidy classes. |
| TidyOmitOptionalTags | 22 | A constant for use with the Tidy classes. |

## 181.13 class TidyOptionMBS

### 181.13.1 class TidyOptionMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An option in the tidy preferences.

### 181.13.2 Methods

### 181.13.3 Category as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Category of the option.

### 181.13.4 DefaultBoolean as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default value for a boolean property.

### 181.13.5 DefaultInteger as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default value for an integer property.

### 181.13.6 DefaultString as String

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default value for a string property.

### 181.13.7 Description as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Description of the option.

### 181.13.8 ID as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get ID of given Option.

### 181.13.9 IsReadOnly as boolean

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Is Option read-only?

### 181.13.10 Name as string

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get name of given Option.

### 181.13.11 Type as Integer

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get datatype of given Option.

### 181.13.12 Properties

### 181.13.13 Document as TidyDocumentMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The document of this option.
**Notes:** (Read only property)

### 181.13.14 Handle as Integer

MBS Tools Plugin, Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal reference to the tidy option object.
**Notes:** (Read only property)

## 181.14 module TidyOptionTypeMBS

### 181.14.1 module TidyOptionTypeMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.14.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyBoolean | 2 | A constant for use with the Tidy classes. |
| TidyInteger | 1 | A constant for use with the Tidy classes. |
| TidyString | 0 | A constant for use with the Tidy classes. |

## 181.15 class TidyOutputMBS

### 181.15.1 class TidyOutputMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Accepts raw bytes of output from the tidy library.

### 181.15.2 Events

### 181.15.3 WriteByte(value as Integer)

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Adds one byte to the output buffer.

## 181.16 module TidyReportLevelKeysMBS

### 181.16.1 module TidyReportLevelKeysMBS

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The module for report level keys.

### 181.16.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyAccessString | 603 | A constant for use with the Tidy classes. |
| TidyBadDocumentString | 605 | A constant for use with the Tidy classes. |
| TidyConfigString | 602 | A constant for use with the Tidy classes. |
| TidyErrorString | 604 | A constant for use with the Tidy classes. |
| TidyFatalString | 606 | A constant for use with the Tidy classes. |
| TidyInfoString | 600 | A constant for use with the Tidy classes. |
| TidyWarningString | 601 | A constant for use with the Tidy classes. |

# 181.17 module TidyReportLevelMBS

## 181.17.1 module TidyReportLevelMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

## 181.17.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyAccess | 3 | A constant for use with the Tidy classes. |
| TidyBadDocument | 5 | A constant for use with the Tidy classes. |
| TidyConfig | 2 | A constant for use with the Tidy classes. |
| TidyError | 4 | A constant for use with the Tidy classes. |
| TidyFatal | 6 | A constant for use with the Tidy classes. |
| TidyInfo | 0 | A constant for use with the Tidy classes. |
| TidyWarning | 1 | A constant for use with the Tidy classes. |

## 181.18 module TidyTagIdMBS

### 181.18.1 module TidyTagIdMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.18.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyTagA | 1 | A constant for use with the Tidy classes. |
| TidyTagABBR | 2 | A constant for use with the Tidy classes. |
| TidyTagACRONYM | 3 | A constant for use with the Tidy classes. |
| TidyTagADDRESS | 4 | A constant for use with the Tidy classes. |
| TidyTagALIGN | 5 | A constant for use with the Tidy classes. |
| TidyTagAPPLET | 6 | A constant for use with the Tidy classes. |
| TidyTagAREA | 7 | A constant for use with the Tidy classes. |
| TidyTagARTICLE | 123 | A constant for use with the Tidy classes. |
| TidyTagASIDE | 124 | A constant for use with the Tidy classes. |
| TidyTagAUDIO | 125 | A constant for use with the Tidy classes. |
| TidyTagB | 8 | A constant for use with the Tidy classes. |
| TidyTagBASE | 9 | A constant for use with the Tidy classes. |
| TidyTagBASEFONT | 10 | A constant for use with the Tidy classes. |
| TidyTagBDI | 126 | A constant for use with the Tidy classes. |
| TidyTagBDO | 11 | A constant for use with the Tidy classes. |
| TidyTagBGSOUND | 12 | A constant for use with the Tidy classes. |
| TidyTagBIG | 13 | A constant for use with the Tidy classes. |
| TidyTagBLINK | 14 | A constant for use with the Tidy classes. |
| TidyTagBLOCKQUOTE | 15 | A constant for use with the Tidy classes. |
| TidyTagBODY | 16 | A constant for use with the Tidy classes. |
| TidyTagBR | 17 | A constant for use with the Tidy classes. |
| TidyTagBUTTON | 18 | A constant for use with the Tidy classes. |
| TidyTagCANVAS | 127 | A constant for use with the Tidy classes. |
| TidyTagCAPTION | 19 | A constant for use with the Tidy classes. |
| TidyTagCENTER | 20 | A constant for use with the Tidy classes. |
| TidyTagCITE | 21 | A constant for use with the Tidy classes. |
| TidyTagCODE | 22 | A constant for use with the Tidy classes. |
| TidyTagCOL | 23 | A constant for use with the Tidy classes. |
| TidyTagCOLGROUP | 24 | A constant for use with the Tidy classes. |
| TidyTagCOMMAND | 128 | A constant for use with the Tidy classes. |
| TidyTagCOMMENT | 25 | A constant for use with the Tidy classes. |
| TidyTagDATALIST | 129 | A constant for use with the Tidy classes. |
| TidyTagDD | 26 | A constant for use with the Tidy classes. |
| TidyTagDEL | 27 | A constant for use with the Tidy classes. |
| TidyTagDETAILS | 130 | A constant for use with the Tidy classes. |
| TidyTagDFN | 28 | A constant for use with the Tidy classes. |
| TidyTagDIALOG | 131 | A constant for use with the Tidy classes. |
| TidyTagDIR | 29 | A constant for use with the Tidy classes. |
| TidyTagDIV | 30 | A constant for use with the Tidy classes. |
| TidyTagDL | 31 | A constant for use with the Tidy classes. |
| TidyTagDT | 32 | A constant for use with the Tidy classes. |
| TidyTagEM | 33 | A constant for use with the Tidy classes. |
| TidyTagEMBED | 34 | A constant for use with the Tidy classes. |
| TidyTagFIELDSET | 35 | A constant for use with the Tidy classes. |
| TidyTagFIGCAPTION | 132 | A constant for use with the Tidy classes. |
| TidyTagFIGURE | 133 | A constant for use with the Tidy classes. |
| TidyTagFONT | 36 | A constant for use with the Tidy classes. |
| TidyTagFOOTER | 134 | A constant for use with the Tidy classes. |
| TidyTagFORM | 37 | A constant for use with the Tidy classes. |
| TidyTagFRAME | 38 | A constant for use with the Tidy classes. |
| TidyTagFRAMESET | 39 | A constant for use with the Tidy classes. |
| TidyTagH1 | 40 | A constant for use with the Tidy classes. |
| TidyTagH2 | 41 | A constant for use with the Tidy classes. |
| TidyTagH3 | 42 | A constant for use with the Tidy classes. |
| TidyTagH4 | 43 | A constant for use with the Tidy classes. |
| TidyTagH5 | 44 | A constant for use with the Tidy classes. |
| TidyTagH6 | 45 | A constant for use with the Tidy classes. |
| TidyTagHEAD | 46 | A constant for use with the Tidy classes. |

## 181.19 module TidyTriStateMBS

### 181.19.1 module TidyTriStateMBS

MBS Tools Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A module with constants for use with the Tidy classes.

### 181.19.2 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TidyAutoState | 2 | A constant for use with the Tidy classes. |
| TidyNoState | 0 | A constant for use with the Tidy classes. |
| TidyYesState | 1 | A constant for use with the Tidy classes. |

# Chapter 182

# TIFF

## 182.1 Globals

### 182.1.1 CombineBitCMYKtoRGBMBS(CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, byref output as picture, CacheSizeRead as Integer) as Integer

MBS Images Plugin, Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines 1bit raw image files to one 8bit RGB tiff.
**Example:**

```
dim t(4) as FolderItem
dim dC(4), dM(4), dY(4), dK(4) as Double
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer
dim p as Picture

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
dY(1)=0.0
//Yellow
```

```
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, Sonderfarbe, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15

//Bilder
t(0)=GetFolderItem("test.Cyan.bit")
t(1)=GetFolderItem("test.Magenta.bit")
t(2)=GetFolderItem("test.Yellow.bit")
t(3)=GetFolderItem("test.Black.bit")
t(4)=GetFolderItem("test.S0.bit")

for i=0 to 4
nC(i)=dC(i)*1000.0
nM(i)=dM(i)*1000.0
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next

// Scale 1/n, 1/3, 1/2, 1, 2, 3, n

Title=str(CombineBitCMYKtoRGBMBS(nC,nM,nY,nK, t, 1, 545,567,0,0,545,567,p,0))
Backdrop=p
Width=p.Width
Height=p.Height
```

**Notes:** All arrays have the same size specifying for each 1bit grayscale source image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error. CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

### 182.1.2 TIFFStringToPictureMBS(data as string) as picture

MBS Images Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff string and returns the RGB image for this tiff file.
**Notes:** Returns nil on any error.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.
**Blog Entries**

- Tip of the day: Corrupt pictures

### 182.1.3 TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS

MBS Images Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff string and returns a TiffPictureMBS object.
**Notes:** if you want to read the picture after this line you need to call ReadBW, ReadRGB or use the Scanline methods.
Returns nil on any error.

### 182.1.4 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines 1bit tiff image files to one CMYK tiff.
**Notes:** All arrays have the same size specifying for each 1bit grayscale source image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error. Compression can be set before data is written to current tiff which is for output. The tiff object for output must be perfectly setup before using this function.

### 182.1.5 CombineBitCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, CacheSizeRead as Integer) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines 1bit raw image files to one CMYK tiff.
**Notes:** All arrays have the same size specifying for each 1bit grayscal esource image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error.
CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

### 182.1.6 CombineTiffCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines Grayscale tiff images to one CMYK tiff.
**Example:**

```
const PLANARCONFIG_CONTIG=1
const PHOTOMETRIC_RGB=2
const FILLORDER_MSB2LSB=1
const PHOTOMETRIC_SEPARATED=5

dim u,v,ot,t(4) as TiffPictureMBS
dim f as FolderItem
dim pnach as Picture
dim dC(4), dM(4), dY(4), dK(4) as Double
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
```

```
dY(1)=0.0
//Yellow
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15

//Bilder
f=GetFolderItem("test.Cyan.tif")
t(0)=f.OpenAsTiffMBS

f=GetFolderItem("test.Magenta.tif")
t(1)=f.OpenAsTiffMBS

f=GetFolderItem("test.Yellow.tif")
t(2)=f.OpenAsTiffMBS

f=GetFolderItem("test.Black.tif")
t(3)=f.OpenAsTiffMBS

f=GetFolderItem("test.S0.tif")
t(4)=f.OpenAsTiffMBS

for i=0 to 4
nC(i)=dC(i)*1000.0
nM(i)=dM(i)*1000.0
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next

f=GetFolderItem("resultCMYK.tif")
ot=new TiffPictureMBS
if ot.Create(f) then
v=t(0)
u=ot
u.Width=v.Width
u.Height=v.Height
u.RowsPerStrip=v.Height
```

```
u.BitsPerSample=8
u.SamplesPerPixel=4
u.ResolutionUnit=v.ResolutionUnit
u.HorizontalPosition=v.HorizontalPosition
u.HorizontalResolution=v.HorizontalResolution
u.VerticalPosition=v.VerticalPosition
u.VerticalResolution=v.VerticalResolution
u.Orientation=v.Orientation
u.PlanarConfig=PLANARCONFIG_CONTIG
u.Photometric=PHOTOMETRIC_SEPARATED
u.FillOrder=FILLORDER_MSB2LSB
Title=str(CombineTiffCMYKtoCMYKMBS(ot, nC,nM,nY,nK,t))
ot.Close
end if

//Neues Bild anzeigen
pnach=f.OpenAsPicture
if pnach<>Nil then
Window1.Width=pNach.Width
Window1.Height=pNach.Height
Window1.Backdrop=pNach
end if
```

**Notes:** All arrays have the same size specifying for each 8bit grayscal esource image the colors to be used in the final image.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before.
The plugin sets width and height for the output tiff.

### 182.1.7 CombineTiffCMYKtoRGBMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines Grayscale tiff images to one RGB tiff.
**Example:**

```
const PLANARCONFIG_CONTIG=1
const PHOTOMETRIC_RGB=2
const FILLORDER_MSB2LSB=1

dim u,v,ot,t(4) as TiffPictureMBS
dim f as FolderItem
dim pnach as Picture
```

```
dim dC(4), dM(4), dY(4), dK(4) as Double
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
dY(1)=0.0
//Yellow
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15

//Bilder
f=GetFolderItem("test.Cyan.tif")
t(0)=f.OpenAsTiffMBS

f=GetFolderItem("test.Magenta.tif")
t(1)=f.OpenAsTiffMBS

f=GetFolderItem("test.Yellow.tif")
t(2)=f.OpenAsTiffMBS

f=GetFolderItem("test.Black.tif")
t(3)=f.OpenAsTiffMBS

f=GetFolderItem("test.S0.tif")
t(4)=f.OpenAsTiffMBS

for i=0 to 4
nC(i)=dC(i)*1000.0
```

```
nM(i)=dM(i)*1000.0
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next

f=GetFolderItem("resultRGB.tif")
ot=new TiffPictureMBS
if ot.Create(f) then
v=t(0)
u=ot
u.Width=v.Width
u.Height=v.Height
u.RowsPerStrip=v.Height
u.BitsPerSample=8
u.SamplesPerPixel=3
u.ResolutionUnit=v.ResolutionUnit
u.HorizontalPosition=v.HorizontalPosition
u.HorizontalResolution=v.HorizontalResolution
u.VerticalPosition=v.VerticalPosition
u.VerticalResolution=v.VerticalResolution
u.Orientation=v.Orientation
u.PlanarConfig=PLANARCONFIG_CONTIG
u.Photometric=PHOTOMETRIC_RGB
u.FillOrder=FILLORDER_MSB2LSB
Title=str(CombineTiffCMYKtoRGBMBS(ot, nC,nM,nY,nK,t))
ot.Close
end if

//Neues Bild anzeigen
pnach=f.OpenAsPicture
if pnach<>Nil then
Window1.Width=pNach.Width
Window1.Height=pNach.Height
Window1.Backdrop=pNach
end if
```

**Notes:** All arrays have the same size specifying for each 8bit grayscal esource image the colors to be used in the final image.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before.

### 182.1.8 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, TiffData as TiffPictureMBS, scalex as Double, scaley as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines a one bit gray tiff image to one 1 bit gray tiff.
**Notes:** Basicly only scales the data.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before.
The plugin sets width and height for the output tiff.

### 182.1.9 CombineTiff8BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Combines 8bit tiff image files to one CMYK tiff.
**Notes:** All arrays have the same size specifying for each 8bit grayscale source image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error.
Compression can be set before data is written to current tiff which is for output. The tiff object for output must be perfectly setup before using this function.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.3pr11

## 182.2 class TiffPictureMBS

### 182.2.1 class TiffPictureMBS

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A class for a Tiff picture.
**Example:**

```
Dim p As Picture = LogoMBS(500)

// save tiff file
```

```
Dim t As New TiffPictureMBS
Dim file4 As FolderItem = SpecialFolder.Desktop.Child("test4.tif")

t.Pict = p

If t.Create(file4) Then
If t.WriteRGB Then
t.Close
// ok
Else
Break
End If
Else
Break
End If
```

**Notes:** Bases on libtiff.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo Plugins, version 19.5pr6
- Four ways to save picture as Tiff in Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr2
- MBS Xojo Plugins 18.3
- MBS Xojo Plugins, version 18.3pr1
- Handling errors is important!
- MBS REALbasic plug-in 9.6
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

**Xojo Developer Magazine**

- 16.5, page 9: News

### 182.2.2 Methods

### 182.2.3 AddCustomTag(Tag as Integer, FieldReadCount as Integer, FieldWriteCount as Integer, FieldType as Integer, FieldBit as Integer, OkToChange as Integer, PassCount as Integer, FieldName as string) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a custom tag.
**Example:**

```
const TIFFTAG_ASCIITAG = 40666
const TIFFTAG_LONGTAG = 40667
const TIFFTAG_SHORTTAG = 40668
const TIFFTAG_RATIONALTAG = 40669
const TIFFTAG_FLOATTAG = 40670
const TIFFTAG_DOUBLETAG = 40671
const TIFFTAG_BYTE = 40672

const TIFFTAG_SOFTWARE=305

const TIFF_BYTE=1
const TIFF_ASCII=2
const TIFF_SHORT=3 // integer 16 bit signed
const TIFF_LONG=4 // integer 32 bit
const TIFF_FLOAT=11
const TIFF_DOUBLE=12

const FIELD_CUSTOM = 65

dim t as new TiffPictureMBS

// open tiff

if not t.AddCustomTag(TIFFTAG_ASCIITAG, -1, -1, TIFF_ASCII, FIELD_CUSTOM, 1, 0, "MyString")
then
MsgBox "AddCustomTag failed1."
end if
```

**Notes:** See tiff documentation for details.

### 182.2.4 AddImage as boolean

MBS Images Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes existing picture and header information to file and starts a new one.
**Example:**

```
dim t as TiffPictureMBS
dim f as FolderItem
dim p as Picture

f=SpecialFolder.Desktop.Child("test.tif")
t=new TiffPictureMBS
if t.Create(f) then

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,0,0)
p.Graphics.FillOval 0,0,100,100
t.Pict=p
if t.WriteRGB then
if t.AddImage then
p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(0,0,255)
p.Graphics.FillOval 0,0,100,100
t.Pict=p
if t.WriteRGB then
MsgBox "Written multi picture tiff."
end if
end if
end if
end if
```

**Notes:** Returns true on success and false on any error.

Calls TIFFWriteDirectory internally.

### 182.2.5 close

MBS Images Plugin, Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Closes the Tiff handle.
**Notes:** In 5.1 and older the destructor.
In 5.2 and later only closes the tiff handle so you can still read the pictures, the output or input buffer.

### 182.2.6 CombinePictureWithMask as picture

MBS Images Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a new picture which is created using the picture and it's mask.
**Example:**

```
dim t as TiffPictureMBS
' ...
canvas1.backdrop=t.CombinePictureWithMask
```

### 182.2.7 Create(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty tiff file.
**Example:**

```
dim p as Picture
dim f as FolderItem
dim t as TiffPictureMBS

p=New Picture(100,100,32)

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p

if t.Create(f) then
if t.WriteRGB then
t.Close
MsgBox "Ok"
f.Launch
end if
end if
```

**Notes:** Returns true on success.
See also:

- 182.2.8 Create(file as folderitem, endian as Integer) as boolean 22132
- 182.2.9 Create(Path as String, endian as integer = 0) as boolean 22132

### 182.2.8 Create(file as folderitem, endian as Integer) as boolean

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty tiff file.
**Example:**

```
Dim t As New TiffPictureMBS
t.Pict = LogoMBS(500)

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")

If t.Create(f, 0) Then
If t.WriteRGB Then
t.Close

// open in viewer
f.Launch
End If
End If
```

**Notes:** Returns true on success.

Endian settings:

| | |
|---|---|
| 0 | Default (System) |
| 1 | BigEndian (Mac) |
| 2 | LittleEndian (Win) |

See also:

- 182.2.7 Create(file as folderitem) as boolean 22131
- 182.2.9 Create(Path as String, endian as integer = 0) as boolean 22132

### 182.2.9 Create(Path as String, endian as integer = 0) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new empty tiff file.
**Example:**

```
Dim t As New TiffPictureMBS
t.Pict = LogoMBS(500)

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim p as string = f.NativePath

If t.Create(p) Then
If t.WriteRGB Then
t.Close

// open in viewer
f.Launch
End If
End If
```

**Notes:** Returns true on success.

Endian settings:

| | |
|---|---|
| 0 | Default (System) |
| 1 | BigEndian (Mac) |
| 2 | LittleEndian (Win) |

See also:

- 182.2.7 Create(file as folderitem) as boolean 22131
- 182.2.8 Create(file as folderitem, endian as Integer) as boolean 22132

### 182.2.10 CreateString(Size as Integer) as boolean

MBS Images Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string based tiff writer.
**Example:**

```
Function PictureToTiffStringMBS(pic as picture) As string
dim t as TiffPictureMBS

t=new TiffPictureMBS
if t.CreateString(&h100000) then
t.Pict=pic
```

```
if t.WriteRGB then
t.Close
Return t.OutputBuffer
end if
end if
End Function
```

**Notes:** Same as the Create() function, but memory based. You can now use functions like Scanline(), WriteSW() or WriteRGB() to put the picture data.

Returns true on success.
The Warning and Error events may show you reasons why it does not work.

The size parameter you pass in is a guess for the initial size of the memory block used. If more data is written, the memory block is resized, but it is quite slow to resize a memoryblock, so make a good guess!

You can and should use this function to write yourself a PictureToTiffString function. The plugin can not well make such a function as there are thousands of possible parameters combination you may want to use. (compared to the JPEG library where you only have the compression level parameter.)
See also:

- 182.2.11 CreateString(Size as Integer, Mode as string) as boolean 22134

### 182.2.11 CreateString(Size as Integer, Mode as string) as boolean

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new string based tiff writer.
**Notes:** Same as the other CreateString method, but you can pass a mode string to the library.

mode="wb" for big endian and mode="wl" for little endian.
See also:

- 182.2.10 CreateString(Size as Integer) as boolean 22133

### 182.2.12 Flush as boolean

MBS Images Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Flush causes any pending writes for the specified file (including writes for the current directory) to be done.
**Notes:** In normal operation this call is never needed - the library automatically does any flushing required.

### 182.2.13 FlushData as boolean

MBS Images Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** FlushData flushes any pending image data for the specified file to be written out; directory-related data are not flushed.
**Notes:** In normal operation this call is never needed √Ö | the library automatically does any flushing required.

### 182.2.14 GetColorMap(byref red as memoryblock, byref green as memoryblock, byref blue as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries the color map for a paletten image.
**Notes:** The memoryblock must be 2^bitspersample * 2 bytes big.
Returns true on success and false on failure.

### 182.2.15 GetColorProfile as string

MBS Images Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the color profile data stored in the tiff file.
**Example:**

```
dim f as FolderItem
dim t as TiffPictureMBS
dim s as string
dim p as LCMS2ProfileMBS

f=SpecialFolder.Desktop.Child("horsehead_steinberg_big.tif")

t=f.OpenAsTiffMBS

s=t.GetColorProfile

p = LCMS2ProfileMBS.OpenProfileFromString(s)

MsgBox p.Name
```

**Notes:** Returns "" on any error.

### 182.2.16 GetData(Tag as Integer) as string

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the string stored for this tag.

### 182.2.17 GetField(Tag as Integer, mem as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.
The memoryblock you pass in must be big enough to hold whatever data the library stores there.

### 182.2.18 GetFieldByte(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.19 GetFieldCount(Tag as Integer, byref count as Integer, mem as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Example:**

```
'TIFF Tag ImageID
'
'IFD Image
'Code 32781 (hex 0x800D)
'Name ImageID
'Type ASCII
'Count N
'Default None
'Description
'
```

```
'OPI-related.
'
'ImageID is the full pathname of the original, high-resolution image, or any other identifying string that uniquely identifies the original image.
'
'The high-resolution image is not required to be in TIFF format. It can be in any format that an OPI Consumer wishes to support.

DIm tiffImport As TiffPictureMBS
Dim xx as string

tiffImport = New TiffPictureMBS
Call tiffImport.Open(SpecialFolder.Desktop.Child("test.tif"))

// the memoryblock is a storage for the data. In this case a pointer to the CString
dim m as MemoryBlock=NewMemoryBlock(4)
dim count as Integer

if tiffImport.GetFieldCount(32781, count, m) then
MsgBox str(count)
MsgBox m.Ptr(0).CString(0)
end if

tiffImport.close
```

**Notes:** This is the special version using memoryblock so you can use it for reading values with a count value.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.20 GetFieldDefaultedByte(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.21 GetFieldDefaultedDouble(Tag as Integer, byref value as Double) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.22 GetFieldDefaultedInteger(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.23 GetFieldDefaultedShort(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.24 GetFieldDefaultedSingle(Tag as Integer, byref value as Single) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.25 GetFieldDefaultedString(Tag as Integer, byref value as String) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Example:**

```
dim t as TiffPictureMBS
dim f as FolderItem
dim s as string

f=SpecialFolder.Desktop.Child("ChristianSchmitz.tif")
t=f.OpenAsTiffMBS

const TIFFTAG_SOFTWARE=305

if t.GetFieldDefaultedString(TIFFTAG_SOFTWARE, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if
```

**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.
The string is returned with ascii encoding. You may need to define a different encoding is this is not correct.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

### 182.2.26 GetFieldDouble(Tag as Integer, byref value as Double) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.

Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.27 GetFieldInteger(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.28 GetFieldMemory(Tag as Integer, byref ItemCount as Integer) as memoryblock

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** This is the special version using memoryblock so you can use it for reading values with a count value.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.29 GetFieldShort(Tag as Integer, byref value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.30 GetFieldSingle(Tag as Integer, byref value as Single) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.

Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.31 GetFieldString(Tag as Integer, byref value as string) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the value associated with the given tag id.
**Example:**

```
dim t as TiffPictureMBS
dim f as FolderItem
dim s as string

f=SpecialFolder.Desktop.Child("test.tif")
t=f.OpenAsTiffMBS

const TIFFTAG_SOFTWARE=305

if t.GetFieldString(TIFFTAG_SOFTWARE, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if

const TIFFTAG_HOSTCOMPUTER=316

if t.GetFieldString(TIFFTAG_HOSTCOMPUTER, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if

const TIFFTAG_IMAGEDESCRIPTION=270

if t.GetFieldString(TIFFTAG_IMAGEDESCRIPTION, s) then
MsgBox "TIFFTAG_IMAGEDESCRIPTION"+EndOfLine+s
end if

const TIFFTAG_MAKE=271

if t.GetFieldString(TIFFTAG_MAKE, s) then
MsgBox "TIFFTAG_MAKE"+EndOfLine+s
end if

const TIFFTAG_ARTIST=315

if t.GetFieldString(TIFFTAG_ARTIST, s) then
MsgBox "TIFFTAG_ARTIST"+EndOfLine+s
end if
```

**Notes:** Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.
The string is returned with ascii encoding. You may need to define a different encoding is this is not correct.

### 182.2.32 GetXMP as string

MBS Images Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the xmp metadata package stored in the tiff file.
**Example:**

```
dim f as FolderItem
dim t as TiffPictureMBS
dim s as string

f=SpecialFolder.Desktop.Child("test.tif")

t=f.OpenAsTiffMBS

s=t.GetXMP

MsgBox left(s,500)
```

**Notes:** Returns "" on any error.

### 182.2.33 ImageCount as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of images in the TIFF file.
**Notes:** Returns 0 on any error.

### 182.2.34 ImageIndex as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current image index.
**Notes:** 0 based.

### 182.2.35 IsLastImage as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the current picture is the last picture.
**Notes:** Useful if you walk through all pictures using NextImage.

### 182.2.36 MirrorVertical(output as TiffPictureMBS) as boolean

MBS Images Plugin, Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Mirrors the current picture to another tiff object.
**Notes:** You may be able to pass the current tiff file as the output one if you have it open for read and write.
Returns true on success and false on failure.
Works for any color depth or color mode.

### 182.2.37 NextImage as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the next image in the TIFF file.
**Notes:** Returns true on success and false on any error.
See also:

- 182.2.38 NextImage(HeaderOnly as boolean) as boolean 22143

### 182.2.38 NextImage(HeaderOnly as boolean) as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the next image.
**Notes:** If HeaderOnly is false the current picture is read into the pict&mask properties.
See also:

- 182.2.37 NextImage as boolean 22143

### 182.2.39 Open(file as folderitem) as boolean

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff file for readonly access.
**Notes:** You need to use the ReadRGB method or the Scanline property to get data from this file.
Returns true on success.
See also:

- 182.2.40 Open(file as folderitem, Mode as string) as boolean 22144
- 182.2.41 Open(Path as String, Mode as string) as boolean 22144


### 182.2.40 Open(file as folderitem, Mode as string) as boolean

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff file for read/write access.
**Example:**

```
dim file as folderitem = SpecialFolder.desktop.child("test.tif")
dim st as new MyTiff

// open for appending
if not st.Open(file,"r+") then
MsgBox "Open Tiff failed!"
else
// change one setting
st.Copyright = "Hello World"

// and save
call st.SaveImage
st.Close
end if
```

**Notes:** Same as the other Open method, but you can pass a mode string to the library.

The open mode parameter can include the following flags in addition to the "r" (Read), "w" (Write), and "a" (Append) flags. Note however that option flags must follow the read-write-append specification.

See also:


- 182.2.39 Open(file as folderitem) as boolean 22143
- 182.2.41 Open(Path as String, Mode as string) as boolean 22144


### 182.2.41 Open(Path as String, Mode as string) as boolean

MBS Images Plugin, Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff file for read/write access.
**Example:**

```
Dim t As New TiffPictureMBS
```

```
// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")
Dim p As String = f.NativePath

If t.Open(p, "r") Then

If t.ReadRGB Then

window1.Backdrop = t.Pict

End If
End If
```

**Notes:** Same as the other Open method, but you can pass a mode and path as string to the library.

The open mode parameter can include the following flags in addition to the "r" (Read), "w" (Write), and "a" (Append) flags. Note however that option flags must follow the read-write-append specification.

See also:

- 182.2.39 Open(file as folderitem) as boolean 22143
- 182.2.40 Open(file as folderitem, Mode as string) as boolean 22144

### 182.2.42 OpenString(data as string) as boolean

MBS Images Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff image located in a binary string.
**Example:**

```
Function TiffStringToPicture(data as string) As picture
dim t as MyTiffPictureMBS

t=new MyTiffPictureMBS

if t.OpenString(data) then
if t.ReadRGB then
return t.Pict
// you could add the mask here.
end if
end if

Return nil // failed
End Function
```

**Notes:** Same as the Open() function, but memory based. You can now use functions like Scanline(), ReadSW() or ReadRGB() to get the picture data.

Returns true on success.
The Warning and Error events may show you reasons why it does not work.
The string you pass is saved in the data property of the class for later use.

You can and should use this function to write yourself a TiffStringToPicture function.
See also:

- 182.2.43 OpenString(data as string, Mode as string) as boolean 22146

### 182.2.43 OpenString(data as string, Mode as string) as boolean

MBS Images Plugin, Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a tiff image located in a binary string.
**Notes:** Same as the other OpenString method, but you can pass a mode string to the library.
See also:

- 182.2.42 OpenString(data as string) as boolean 22145

### 182.2.44 RawStripSize(strip as UInt32) as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes in a raw strip (i.e. not decoded).

### 182.2.45 ReadBW as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture in BW mode.
**Example:**

```
dim f as FolderItem
dim p as Picture
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("Multipage fax.tif")
t=f.OpenAsTiffMBS(true)
```

```
if t.ReadBW then
title=str(t.ImageCount)

p=t.pict
Title=str(p.Depth)
Canvas1.Backdrop=p
end if
```

**Notes:** Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 182.2.46 ReadBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean 22147

### 182.2.46 ReadBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture in BW mode.
**Example:**

```
dim f as FolderItem
dim p as Picture
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("Multipage fax.tif")
t=f.OpenAsTiffMBS(true)

if t.ReadBW(0,0,t.width/2,t.height/2) then
title=str(t.ImageCount)

p=t.pict
Title=str(p.Depth)
Canvas1.Backdrop=p
end if
```

**Notes:** Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 182.2.45 ReadBW as boolean 22146

### 182.2.47 ReadEncodedStrip(strip as UInt32, byref data as Memoryblock) as UInt32

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read and decode a strip of data from an open TIFF file.
**Notes:** Read the specified strip of data and place up to size bytes of decompressed information in the (user supplied) data buffer.

The value of strip is a "raw strip number". That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2). To read a full strip of data the data buffer should typically be at least as large as the number returned by StripSize.
The library attempts to hide bit- and byte-ordering differences between the image and the native machine by converting data to the native machine order. Bit reversal is done if the FillOrder tag is opposite to the native machine bit order. 16- and 32-bit samples are automatically byte-swapped if the file was written with a byte order opposite to the native machine byte order,

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedStrip returns -1 if an error was encountered.

### 182.2.48 ReadEncodedTile(tile as UInt32, byref data as Memoryblock) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Read and decode a tile of data from an open TIFF file.
**Notes:** Read the specified tile of data and place up to size bytes of decompressed information in the (user supplied) data buffer.

The value of tile is a "raw tile number". That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2). ComputeTile automatically does this when

converting an (x,y,z,sample) coordinate quadruple to a tile number. To read a full tile of data the data buffer should be at least as large as the value returned by TileSize.

The library attempts to hide bit- and byte-ordering differences between the image and the native machine by converting data to the native machine order. Bit reversal is done if the FillOrder tag is opposite to the native machine bit order. 16- and 32-bit samples are automatically byte-swapped if the file was written with a byte order opposite to the native machine byte order,

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedTile returns ,àí1 if an error was encountered.

### 182.2.49 ReadPreviewBW as boolean

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture in BW mode as a preview.
**Notes:** This method is faster than ReadBW, because it reads only every 8th line and every 8th pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 182.2.50 ReadPreviewBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean 22149

### 182.2.50 ReadPreviewBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture in BW mode as a preview.
**Notes:** This method is faster than ReadBW, because it reads only every 8th line and every 8th pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and

the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 182.2.49 ReadPreviewBW as boolean 22149

### 182.2.51 ReadPreviewRGB(ReduceFactor as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a CMYK or RGB picture and stores it in the pict and name properties.
**Notes:** This method is faster than ReadRGB, because it reads only every ReduceFactorth line and every ReduceFactorth pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success.
ReadRGB does converting on the picture data if needed so you can read CMYK, RGB, BW and other image data using this function.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

### 182.2.52 ReadRawStrip(strip as UInt32, byref data as Memoryblock) as UInt32

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the undecoded contents of a strip of data from an open TIFF file.
**Notes:** Read the contents of the specified strip into the (user supplied) data buffer. Note that the value of strip is a "raw strip number". That is, the caller must take into account whether or not the data is organized in separate planes (PlanarConfiguration=2). To read a full strip of data the data buffer should typically be at least as large as the number returned by StripSize.

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedStrip returns -1 if an error was encountered.

### 182.2.53 ReadRawTile(tile as UInt32, byref data as Memoryblock) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return an undecoded tile of data from an open TIFF file.
**Notes:**

Read the contents of the specified tile into the (user supplied) data buffer. Note that the value of tile is a "raw tile number". That is, the caller must take into account whether or not the data is organized in separate planes (PlanarConfiguration=2). ComputeTile automatically does this when converting an (x,y,z,sample) coordinate quadruple to a tile number. To read a full tile of data the data buffer should typically be at least as large as the value returned by TileSize.

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedTile returns ,àí1 if an error was encountered.

### 182.2.54 ReadRGB as boolean

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a CMYK or RGB picture and stores it in the pict and name properties.
**Notes:** Returns true on success.
ReadRGB does converting on the picture data if needed so you can read CMYK, RGB, BW and other image data using this function.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.
See also:

- 182.2.55 ReadRGB(byref ErrorMessage as string, Dest as MemoryBlock = nil) as memoryblock 22151

### 182.2.55 ReadRGB(byref ErrorMessage as string, Dest as MemoryBlock = nil) as memoryblock

MBS Images Plugin, Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the image into a memoryblock as RGB.
**Notes:** The Scanline() array gives you the raw uncompressed data. But this method decodes the data into a RGBA image.

The Memoryblock has the size of 4*width*height. Each pixel has one byte for red, one byte for green, one byte for blue and one byte for alpha. If no alpha is in the file, all pixels have the same alpha of 255.

If the decompression fails the function returns nil. (e.g. out of memory).
If the decoding fails, you also get an error message.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

If dest is not nil and big enough, the plugin will use it and return it on success. This can avoid additional memory allocations which can cost CPU time (especially to clear the bytes).
See also:

- 182.2.54 ReadRGB as boolean 22151

### 182.2.56 ReadRGBMemoryBegin(byref ErrorMessage as string) as boolean

MBS Images Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Starts a RGBA reader for the given TIFF picture.
**Notes:** Like ReadRGB, but with ReadRGBMemoryBegin, ReadRGBMemoryEnd and ReadRGBMemoryStep you can read the RGBA data in portions.

The Memoryblock returned by ReadRGBMemoryStep has the size of 4*width*height. Each pixel has one byte for red, one byte for green, one byte for blue and one byte for alpha. If no alpha is in the file, all pixels have the same alpha of 255.

If the decompression fails the function returns false. (e.g. out of memory).
If the decoding fails, you also get an error message.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

### 182.2.57 ReadRGBMemoryEnd

MBS Images Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Cleans up the internal data structures created by ReadRGBMemoryBegin.

### 182.2.58 ReadRGBMemoryStep(x as Integer, y as Integer, width as Integer, height as Integer, Dest as MemoryBlock = nil) as memoryblock

MBS Images Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the image into a memoryblock as RGBA.
**Example:**

```
dim t as new TiffPictureMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim e as string

if t.Open(f) then
```

```
if t.ReadRGBMemoryBegin(e) then

dim w as Integer = t.Width
dim h as Integer = t.Height

dim p as new PictureMBS(w, h, PictureMBS.ImageFormatRGB)

for y as Integer = 0 to h-1 step 100

dim m as MemoryBlock = t.ReadRGBMemoryStep(0, y, w, 100)

for i as Integer = 0 to 99
p.RowInFormat(i+y, PictureMBS.ImageFormatRGBA)=m
next

next

t.ReadRGBMemoryEnd
Backdrop = p.copypicture(0,0,1000,1000) // display a portion
end if

end if
```

**Notes:** As you see in the example, you can use this method to easily read huge TIFF files into a PictureMBS object.

If the decompression fails the function returns nil. (e.g. out of memory).
Please make sure that the range in x and y, width and height is right.

If dest is not nil and big enough, the plugin will use it and return it on success. This can avoid additional memory allocations which can cost CPU time (especially to clear the bytes).

### 182.2.59 ReadWithLUT(ColorLookupTable() as color) as boolean

MBS Images Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture with a Color Lookup Table.
**Notes:** Returns true on success and false on any error.
Works with 8, 16 amd 32 bits per sample. And with 1 or 3 samples per pixels (Gray or RGB). The lookup table has 256 entries for 8 bit and 65536 entries for 16/32 bit.
This method uses the YieldTicks property and may yield time to other threads.
See also:

- 182.2.60 ReadWithLUT(ColorLookupTable() as color, left as Integer, top as Integer, width as Integer, height as Integer) as boolean 22154


### 182.2.60 ReadWithLUT(ColorLookupTable() as color, left as Integer, top as Integer, width as Integer, height as Integer) as boolean

MBS Images Plugin, Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads the current picture with a Color Lookup Table.
**Notes:** Returns true on success and false on any error.
Works with 8, 16 amd 32 bits per sample. And with 1 or 3 samples per pixels (Gray or RGB). The lookup table has 256 entries for 8 bit and 65536 entries for 16/32 bit.
This method uses the YieldTicks property and may yield time to other threads.
See also:


- 182.2.59 ReadWithLUT(ColorLookupTable() as color) as boolean 22153


### 182.2.61 RewriteDirectory as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes existing picture and header information to file replacing the old data.
**Notes:** Returns true on success and false on any error.
As the data is added to the file and just the reference to the old data is deleted, the filesize will grow.

Calls TIFFReWriteDirectory internally. Same as SaveImage.

### 182.2.62 SaveImage as boolean

MBS Images Plugin, Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes existing picture and header information to file replacing the old data.
**Notes:** Returns true on success and false on any error.
As the data is added to the file and just the reference to the old data is deleted, the filesize will grow.

Calls TIFFReWriteDirectory internally. Same as RewriteDirectory.

### 182.2.63 Scanline(mem as Ptr, index as Integer, sample as Integer = 0) as boolean

MBS Images Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads an image scanline in a memoryblock.
**Notes:** Returns false on any error.
Thee Memoryblock must be big enough. The BytesPerRow functions returns the number of bytes needed.
The first scanline has the index of 0.
This is the fastest way to read scanlines. You provide the memoryblock and you can reuse it for all calls to this method for one tiff.
See also:

- 182.2.138 Scanline(index as Integer, sample as Integer = 0) as memoryblock 22185

### 182.2.64 ScanlinesScaled(index as integer, count as integer, sample as integer = 0, scaleFactor as Integer = 1) as memoryblock

MBS Images Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get image scanlines scaled down as one memoryblock.
**Notes:** Returns nil on any error.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0. Count is the number of scanlines you want to read/write.

If scaleFactor is >1, we scale down and return scaleFactor rows reduced to one row.

This scaling down is to quicker get preview pictures.

### 182.2.65 SetColorMap(red as memoryblock, green as memoryblock, blue as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color map for a paletten image.
**Notes:** The memoryblock must be 2^bitspersample * 2 bytes big.
Returns true on success and false on failure.

### 182.2.66 SetColorProfile(ProfileData as String) as boolean

MBS Images Plugin, Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color profile for this tiff file.
**Example:**

```
Dim p As New Picture(100,100,32)
```

```
Dim ImageFile As FolderItem = SpecialFolder.Desktop.Child("test.tif")
Dim ProfileFile As FolderItem = SpecialFolder.Desktop.Child("Generic RGB Profile.icc")

Dim t As New TiffPictureMBS
t.Pict = p

Dim ProfileStream As BinaryStream = BinaryStream.Open(ProfileFile)
Dim ProfileData As String = ProfileStream.Read(ProfileStream.Length)

If t.Create(ImageFile) Then
// set profile before writing
If t.SetColorProfile(ProfileData) Then
// now write picture
If t.WriteRGB Then
t.Close

ImageFile.Launch
Else
Break
End If
Else
Break
End If
Else
Break
End If
```

**Notes:** Returns true on success and false on failure.

### 182.2.67 SetData(Tag as Integer, data as string) as boolean

MBS Images Plugin, Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes the string for this tag.

### 182.2.68 SetFieldByte(Tag as Integer, value as Integer) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.

Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.69 SetFieldDouble(Tag as Integer, value as Double) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.70 SetFieldInteger(Tag as Integer, value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Example:**

```
dim t as TiffPictureMBS
dim f as FolderItem

const TIFFTAG_IMAGELENGTH=257 // integer
const TIFFTAG_IMAGEWIDTH=256 // integer

f=GetTemporaryFolderItem
t=new TiffPictureMBS

if t.Create(f) then

if t.SetFieldInteger(TIFFTAG_IMAGELENGTH,100) then
if t.Height=100 then
MsgBox "ok"
end if
end if

end if
```

**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.71 SetFieldMemory(Tag as Integer, ItemCount as Integer, data as memoryblock) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Notes:** This is the special version of the setter which passes a memoryblock and a count value so you can set an array using this method.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.72 SetFieldShort(Tag as Integer, value as Integer) as boolean

MBS Images Plugin, Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.73 SetFieldSingle(Tag as Integer, value as Single) as boolean

MBS Images Plugin, Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the tiff data field with the given tag to the given value.
**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

### 182.2.74 SetFieldString(Tag as Integer, value as string) as boolean

MBS Images Plugin, Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets one of the fields to the value of the string.
**Example:**

```
dim m,p as Picture
dim f as FolderItem
dim t as TiffPictureMBS
dim g as Graphics
dim s as string
```

```
// make pictures
p=New Picture(100,100,32)
m=New Picture(100,100,32)

p.Graphics.ForeColor=Rgb(0,255,0) // fill green
p.Graphics.Fillrect 0,0,100,100

p.Graphics.ForeColor=Rgb(255,0,0) // fill red
p.Graphics.FillOval 0,0,100,100

m.Graphics.ForeColor=Rgb(0,0,0) // fill black (invisible so green not seen)
m.Graphics.Fillrect 0,0,100,100

m.Graphics.ForeColor=Rgb(255,255,255) // fill white (Visible)
m.Graphics.FillOval 0,0,100,100

// save
f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p
t.Mask=m

if t.Create(f) then
if t.WriteRGB then

const TIFFTAG_SOFTWARE=305

s="Example Software"
call t.SetFieldString TIFFTAG_SOFTWARE,s

const TIFFTAG_HOSTCOMPUTER=316

s="Example HostComputer"
call t.SetFieldString TIFFTAG_HOSTCOMPUTER,s

const TIFFTAG_IMAGEDESCRIPTION=270

s="Example ImageDescription"
call t.SetFieldString TIFFTAG_IMAGEDESCRIPTION,s

const TIFFTAG_MAKE=271

s="Example Make"
call t.SetFieldString TIFFTAG_MAKE,s

const TIFFTAG_ARTIST=315
```

```
s="Example Artist"
call t.SetFieldString TIFFTAG_ARTIST,s

t.Close
MsgBox "Ok"
f.Launch
end if
end if
```

**Notes:** Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.
You have to pass in the string with the correct encoding.

### 182.2.75 SetImageIndex(index as Integer) as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current image index and reads the new image.
**Example:**

```
dim t as TiffPictureMBS // your tiff picture

if t.SetImageIndex(1) then
Canvas1.Backdrop=t.pict
end if
```

**Notes:** Reads automatically a RGB picture for you, so the pict property is filled on success.
Returns true on success.
Index is zero based.
See also:

- 182.2.76 SetImageIndex(index as Integer, HeaderOnly as boolean) as boolean 22160

### 182.2.76 SetImageIndex(index as Integer, HeaderOnly as boolean) as boolean

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the current image index.
**Notes:** If HeaderOnly is false the current picture is read into the pict&mask properties.

Returns true on success.
See also:

- 182.2.75 SetImageIndex(index as Integer) as boolean 22160

### 182.2.77 SetXMP(ProfileData as String) as boolean

MBS Images Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the xmp metadata package for this tiff file.
**Notes:** Returns true on success and false on failure.

### 182.2.78 VStripSize(nrows as UInt32) as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes in a strip with nrows rows of data.

### 182.2.79 VTileSize(nrows as UInt32) as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes in a row-aligned tile with nrows of data.

### 182.2.80 WriteBW as boolean

MBS Images Plugin, Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write a black & white image.
**Example:**

```
dim p as Picture
dim f as FolderItem
dim t as TiffPictureMBS

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(0,0,0)
p.Graphics.FillOval 0,0,100,100

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
```

```
if t.Create(f) then
t.Pict=p
if t.WriteBW then
MsgBox "ok"
end if
end if

Backdrop=p
```

**Notes:** Uses the pictures in the pict property to write a picture.
Currently masks are not supported.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_MINISBLACK
BitsPerSample = 1
SamplesPerPixel = 1
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.

### 182.2.81 WriteEncodedStrip(strip as UInt32, data as Memoryblock, size as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compress and write a strip of data to an open TIFF file.
**Notes:** Compress size bytes of raw data from buf and write the result to the specified strip; replacing any previously written data. Note that the value of strip is a ‚Äò‚Äòraw strip number." That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2).

The library writes encoded data using the native machine byte order. Correctly implemented TIFF readers are expected to do any necessary byte-swapping to correctly process image data with BitsPerSample greater

than 8.

The strip number must be valid according to the current settings of the ImageLength and RowsPerStrip tags. An image may be dynamically grown by increasing the value of ImageLength prior to each call to WriteEncodedStrip.

Returns ,àí1 is returned if an error was encountered. Otherwise, the value of size is returned.
If size is zero, we use the size of memoryblock.

### 182.2.82 WriteEncodedTile(tile as UInt32, data as Memoryblock, size as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compress and write a tile of data to an open TIFF file.
**Notes:** Compress size bytes of raw data from buf and append the result to the end of the specified tile. Note that the value of tile is a "raw tile number". That is, the caller must take into account whether or not the data are organized in separate places (PlanarConfiguration=2). ComputeTile automatically does this when converting an (x,y,z,sample) coordinate quadruple to a tile number.

The library writes encoded data using the native machine byte order. Correctly implemented TIFF readers are expected to do any necessary byte-swapping to correctly process image data with BitsPerSample greater than 8.

Returns ,àí1 is returned if an error was encountered. Otherwise, the value of size is returned.

If size is zero, we use the size of memoryblock.

### 182.2.83 WriteGray as boolean

MBS Images Plugin, Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write a grayscale image with 256 colors.
**Example:**

```
dim t as TiffPictureMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
if t.Create(f) then
```

```
t.Pict=LogoMBS(500)
call t.WriteGray
t.Close
end if
```

**Notes:** Uses the pictures in the pict property to write a picture.
Currently masks are not supported.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_MINISBLACK
BitsPerSample = 8
SamplesPerPixel = 1
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.
Version 13.1 of our plugins writes a 16 bit Gray image if you set BitsPerSample to 16 before calling this method.

### 182.2.84 WriteRawStrip(strip as UInt32, data as Memoryblock, size as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write a strip of raw data to an open TIFF file.
**Notes:** Append size bytes of raw data to the specified strip.

The strip number must be valid according to the current settings of the ImageLength and RowsPerStrip tags. An image may be dynamically grown by increasing the value of ImageLength prior to each call to WriteRawStrip.

Returns -1 is returned if an error occurred. Otherwise, the value of size is returned.

If size is zero, we use the size of memoryblock.

### 182.2.85 WriteRawTile(tile as UInt32, data as Memoryblock, size as Integer = 0) as Integer

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Write a tile of raw data to an open TIFF file
**Notes:** Append size bytes of raw data to the specified tile.
Returns ,àí1 is returned if an error occurred. Otherwise, the value of size is returned.
If size is zero, we use the size of memoryblock.

### 182.2.86 WriteRGB as boolean

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a RGB image.
**Example:**

```
dim m,p as Picture
dim f as FolderItem
dim t as TiffPictureMBS
dim g as Graphics

p=New Picture(100,100,32)
m=New Picture(100,100,32)

p.Graphics.ForeColor=Rgb(0,255,0) // fill green
p.Graphics.Fillrect 0,0,100,100

p.Graphics.ForeColor=Rgb(255,0,0) // fill red
p.Graphics.FillOval 0,0,100,100

m.Graphics.ForeColor=Rgb(0,0,0) // fill black (invisible so green not seen)
m.Graphics.Fillrect 0,0,100,100

m.Graphics.ForeColor=Rgb(255,255,255) // fill white (Visible)
m.Graphics.FillOval 0,0,100,100

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p
```

```
t.Mask=m

if t.Create(f) then
if t.WriteRGB then
t.Close
MsgBox "Ok"
f.Launch
end if
end if
```

**Notes:** Uses the pictures in the mask and pict properties to write a picture.
If mask is set, the picture is saved with an alpha channel.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_RGB
BitsPerSample = 8
SamplesPerPixel = 3
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.

### 182.2.87 Properties

### 182.2.88 BitsPerSample as Integer

MBS Images Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The count of bits for each pixel component.
**Notes:** Should normally by 8 for RGB images.
(Read and Write property)

### 182.2.89 BytesPerRow as Int64

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number of bytes needed for each row in a scan line.
**Notes:** 0 on any error.
(Read only property)

### 182.2.90 Compression as Integer

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The compression used.
**Notes:** some constants:

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.91 Copyright as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The copyright notice of this image.
**Example:**

```
dim file as folderitem = SpecialFolder.desktop.child("test.tif")
dim st as new MyTiff

// open for appending
if not st.Open(file,"r+") then
MsgBox "Open Tiff failed!"
else
// change one setting
st.Copyright = "Hello World"

// and save
call st.SaveImage
st.Close
end if
```

**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.92 CurrentDirOffset as Integer

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries current directory offset.
**Notes:** (Read only property)

### 182.2.93 CurrentRow as Integer

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the current row, respectively, that is being read or written.
**Notes:** These values are updated each time a read or write is done.
(Read only property)

### 182.2.94 CurrentStrip as Integer

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the current strip, respectively, that is being read or written.
**Notes:** These values are updated each time a read or write is done.
(Read only property)

### 182.2.95 CurrentTile as Integer

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Return the current tile, respectively, that is being read or written.
**Notes:** These values are updated each time a read or write is done.
(Read only property)

### 182.2.96 DateTime as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Date and time of the TIFF file.
**Notes:** Check some TIFF files for the format used.

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.97 DocumentName as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the document.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.98 ExtraSamples as MemoryBlock

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The settings for the extra samples.
**Notes:** A memoryblock filled with an array of shorts (16bit integers).

constants:

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.99 FillOrder as Integer

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill order of the bits in a byte.
**Notes:** constants:

(MSB = Most significant bit, LSB = Least significant bit)

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.100 height as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The height of the picture.
**Notes:** (Read and Write property)

### 182.2.101 HorizontalPosition as Single

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The x Offset of this image in the drawing area.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.102 HorizontalResolution as Single

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal resolution used.
**Notes:** Value depends on ResolutionUnit value.

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.103 HostComputer as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Name of the machine where the tiff file was created.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

l When creating a new file force information be written with Little-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

b When creating a new file force information be written with Big-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

L Force image data that is read or written to be treated with bits filled from Least Significant Bit (LSB) to Most Significant Bit (MSB). Note that this is the opposite to the way the library has worked from its inception.

B Force image data that is read or written to be treated with bits filled from Most Significant Bit (MSB) to Least Significant Bit (LSB); this is the default.

H Force image data that is read or written to be treated with bits filled in the same order as the native CPU.

M Enable the use of memory-mapped files for images opened read-only. If the underlying system does not support memory-mapped files or if the specific image being opened cannot be memory-mapped then the library will fallback to using the normal system interface for reading information. By default the library will attempt to use memory-mapped files.

m Disable the use of memory-mapped files.

C Enable the use of "strip chopping" when reading images that are comprised of a single strip or tile of uncompressed data. Strip chopping is a mechanism by which the library will automatically convert the single-strip image to multiple strips, each of which has about 8 Kilobytes of data. This facility can be useful in reducing the amount of memory used to read an image because the library normally reads each strip in its entirety. Strip chopping does however alter the apparent contents of the image because when an image is divided into multiple strips it looks as though the underlying file contains multiple separate strips. Finally, note that default handling of strip chopping is a compile-time configuration parameter. The default behaviour, for backwards compatibility, is to enable strip chopping.

c Disable the use of strip chopping when reading images.

l When creating a new file force information be written with Little-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

b When creating a new file force information be written with Big-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

L Force image data that is read or written to be treated with bits filled from Least Significant Bit (LSB) to Most Significant Bit (MSB). Note that this is the opposite to the way the library has worked from its inception.

B Force image data that is read or written to be treated with bits filled from Most Significant Bit (MSB) to Least Significant Bit (LSB); this is the default.

H Force image data that is read or written to be treated with bits filled in the same order as the native CPU.

M Enable the use of memory-mapped files for images opened read-only. If the underlying system does not support memory-mapped files or if the specific image being opened cannot be memory-mapped then the library will fallback to using the normal system interface for reading information. By default the library will attempt to use memory-mapped files.

m Disable the use of memory-mapped files.

C Enable the use of ”strip chopping” when reading images that are comprised of a single strip or tile of uncompressed data. Strip chopping is a mechanism by which the library will automatically convert the single-strip image to multiple strips, each of which has about 8 Kilobytes of data. This facility can be useful in reducing the amount of memory used to read an image because the library normally reads each strip in its entirety. Strip chopping does however alter the apparent contents of the image because when an image is divided into multiple strips it looks as though the underlying file contains multiple separate strips. Finally, note that default handling of strip chopping is a compile-time configuration parameter. The default behaviour, for backwards compatibility, is to enable strip chopping.

c Disable the use of strip chopping when reading images.

| | | |
|---|---|---|
| COMPRESSION_NONE | 1 | dump mode |
| COMPRESSION_CCITTRLE | 2 | CCITT modified Huffman RLE |
| COMPRESSION_CCITTFAX3 | 3 | CCITT Group 3 fax encoding |
| COMPRESSION_CCITT_T4 | 3 | CCITT T.4 (TIFF 6 name) |
| COMPRESSION_CCITTFAX4 | 4 | CCITT Group 4 fax encoding |
| COMPRESSION_CCITT_T6 | 4 | CCITT T.6 (TIFF 6 name) |
| COMPRESSION_LZW | 5 | Lempel-Ziv & Welch |
| COMPRESSION_OJPEG | 6 | !6.0 JPEG |
| COMPRESSION_JPEG | 7 | %JPEG DCT compression |
| COMPRESSION_NEXT | 32766 | NeXT 2-bit RLE |
| COMPRESSION_CCITTRLEW | 32771 | #1 w/ word alignment |
| COMPRESSION_PACKBITS | 32773 | Macintosh RLE |
| COMPRESSION_THUNDERSCAN | 32809 | ThunderScan RLE |
| COMPRESSION_IT8CTPAD | 32895 | IT8 CT w/padding |
| COMPRESSION_IT8LW | 32896 | IT8 Linework RLE |
| COMPRESSION_IT8MP | 32897 | IT8 Monochrome picture |
| COMPRESSION_IT8BL | 32898 | IT8 Binary line art |
| COMPRESSION_PIXARFILM | 32908 | Pixar companded 10bit LZW |
| COMPRESSION_PIXARLOG | 32909 | Pixar companded 11bit ZIP |
| COMPRESSION_DEFLATE | 32946 | Deflate compression |
| COMPRESSION_ADOBE_DEFLATE | 8 | Deflate compression, as recognized by Adobe |
| COMPRESSION_DCS | 32947 | Kodak DCS encoding |
| COMPRESSION_JBIG | 34661 | ISO JBIG |
| COMPRESSION_SGILOG | 34676 | SGI Log Luminance RLE |
| COMPRESSION_SGILOG24 | 34677 | SGI Log 24-bit packed |

| | | |
|---|---|---|
| EXTRASAMPLE_UNSPECIFIED | 0 | unspecified data |
| EXTRASAMPLE_ASSOCALPHA | 1 | associated alpha data (pre multiplied) |
| EXTRASAMPLE_UNASSALPHA | 2 | unassociated alpha data (mask in RB) |

| | |
|---|---|
| FILLORDER_MSB2LSB | 1 (default) |
| FILLORDER_LSB2MSB | 2 |

### 182.2.104 ImageDescription as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Information about the image.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.105 InputBuffer as String

MBS Images Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The string passed for OpenString.
**Notes:** Used for the read requests from the Tiff library.
(Read only property)

### 182.2.106 IsBigEndian as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether file is big endian.
**Notes:** (Read only property)

### 182.2.107 IsByteSwapped as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether bytes are swapped.
**Notes:** Returns true if the image data was in a different byte-order than the host machine. Zero is returned if the TIFF file and local host byte-orders are the same.
Note that ReadTile(), ReadStrip() and ReadScanline() functions already normally perform byte swapping to local host order if needed.
(Read only property)

### 182.2.108 IsMSB2LSB as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if the image data is being returned with bit 0 as the most significant bit.
**Notes:** (Read only property)

### 182.2.109 IsTiled as Boolean

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a non-zero value if the image data has a tiled organization.
**Notes:** Zero is returned if the image data is organized in strips.
(Read only property)

### 182.2.110 IsUpSampled as Boolean

MBS Images Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether data is upsampled.
**Notes:** Returns a non-zero value if image data returned through the read interface routines is being upsampled. This can be useful to applications that want to calculate I/O buffer sizes to reflect this usage (though the usual strip and tile size routines already do this).
(Read only property)

### 182.2.111 JPEGQuality as Integer

MBS Images Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The JPEG quality.
**Example:**

```
dim logo as Picture = LogoMBS(500)
dim pic as new PictureMBS(logo)

// save tiff with jpeg compression
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim t as TiffPictureMBS

if pic <>nil then
t = new TiffPictureMBS

if t.Create(F) then

t.Height = pic.Height
t.Width = pic.Width

t.RowsPerStrip = 1
t.PlanarConfig = t.kPlanarConfigContig
t.Photometric = t.kPhotometricRGB
t.BitsPerSample = 8
t.SamplesPerPixel = 3
```

```
t.FillOrder = t.kFillOrderMSB2LSB
t.Orientation = t.kOrientationTopLeft
t.ResolutionUnit = t.kResUnitInch
t.VerticalResolution = 72.0
t.HorizontalResolution = 72.0
t.Compression = t.kCompressionJPEG
t.RowsPerStrip = 32
t.JPEGQuality = 75

// copy lines
for i as Integer = 0 to t.Height - 1
t.Scanline(i) = pic.RowInFormat(i, PictureMBS.ImageFormatRGB)
next

t.Close
end if
end if
```

**Notes:** Default is 75.
(Read and Write property)

### 182.2.112 Make as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scanner manufacturer name.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.113 mask as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The mask of the picture.
**Notes:** May be nil.
(Read and Write property)

### 182.2.114 Model as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scanner model name/number.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.115 NumberOfStrips as UInt32

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of strips in the image.
**Notes:** (Read only property)

### 182.2.116 NumberOfTiles as UInt32

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of tiles in the image.
**Notes:** (Read only property)

### 182.2.117 Orientation as Integer

MBS Images Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The orientation of this image.
**Example:**

```
// creates a tif file with a horizontal flipped image
// red rectangle is on the left in the image data, but with orientation tag it should be displayed on the right side.
// Mac OS X Preview.app shows it correctly.

dim p as Picture
dim t as TiffPictureMBS
dim f as FolderItem

const ORIENTATION_TOPLEFT = 1 //* row 0 top, col 0 lhs */
const ORIENTATION_TOPRIGHT = 2 //* row 0 top, col 0 rhs */
const ORIENTATION_BOTRIGHT = 3 //* row 0 bottom, col 0 rhs */
const ORIENTATION_BOTLEFT = 4 //* row 0 bottom, col 0 lhs */
const ORIENTATION_LEFTTOP = 5 //* row 0 lhs, col 0 top */
const ORIENTATION_RIGHTTOP = 6 //* row 0 rhs, col 0 top */
const ORIENTATION_RIGHTBOT = 7 //* row 0 rhs, col 0 bottom */
const ORIENTATION_LEFTBOT = 8 //* row 0 lhs, col 0 bottom */
```

```
p=New Picture(150,100,32)

p.Graphics.ForeColor=rgb(255,0,0)
p.Graphics.FillRect 0,0,10,10

t=new TiffPictureMBS
f=SpecialFolder.Desktop.Child("test.tif")

if t.Create(f) then
t.Pict=p

t.Orientation=ORIENTATION_TOPRIGHT
if t.WriteRGB then
end if
t.Orientation=ORIENTATION_TOPRIGHT

t.Close
end if
```

**Notes:** Orientation:

The orientation of the image with respect to the rows and columns.
Tag = 274 (112.H)
Type = SHORT
N = 1
1 = The 0th row represents the visual top of the image, and the 0th column represents the visual left-hand side.
2 = The 0th row represents the visual top of the image, and the 0th column represents the visual right-hand side.
3 = The 0th row represents the visual bottom of the image, and the 0th column represents the visual right-hand side.
4 = The 0th row represents the visual bottom of the image, and the 0th column represents the visual left-hand side.
5 = The 0th row represents the visual left-hand side of the image, and the 0th column represents the visual top.
6 = The 0th row represents the visual right-hand side of the image, and the 0th column represents the visual top.
7 = The 0th row represents the visual right-hand side of the image, and the 0th column represents the visual bottom.
8 = The 0th row represents the visual left-hand side of the image, and the 0th column represents the visual bottom.

Default is 1.
Support for orientations other than 1 is not a Baseline TIFF requirement.
(This text was sent in by David Austin)

(Read and Write property)

### 182.2.118 OutputBuffer as String

MBS Images Plugin, Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current output data from the CreateString function.
**Notes:** Between CreateString and Close the plugin will record all the output data and you can get a copy using this property.
(Read only property)

### 182.2.119 PageName as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the current page.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.120 Photometric as Integer

MBS Images Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A property of the TIFF image.
**Example:**

```
// read and write a BW fax tiff with compression

dim d as new OpenDialog()
dim f as FolderItem = GetFolderItem("myfax.tiff")
if f = nil then
return
end if

dim tiff as new TiffPictureMBS()
if not tiff.Open(f) then
MsgBox("Error while opening.")
return
end if

if not tiff.ReadBW() then
MsgBox("Error reading.")
end if
```

```
dim tiff2 as TiffPictureMBS = new TiffPictureMBS()

dim f2 as FolderItem = SpecialFolder.Desktop.Child("Copy.tiff")
if not tiff2.Create(f2) then
MsgBox("Error creating file.")
end if

const COMPRESSION_CCITTFAX3=3
const WhiteIsZero=0
const BlackIsZero=1

tiff2.Pict = tiff.pict
tiff2.Photometric=WhiteIsZero
tiff2.Compression=COMPRESSION_CCITTFAX3
if not tiff2.WriteBW() then
MsgBox("Error writing.") // Error
end if

tiff2.Close()
```

**Notes:** PhotometricInterpretation:
The color space of the image data.
Tag = 262 (106.H)
Type = SHORT
N = 1

0 = WhiteIsZero. For bilevel and grayscale images: 0 is imaged as white. 2**BitsPerSample-1 is imaged as black. This is the normal value for Compression=2.

1 = BlackIsZero. For bilevel and grayscale images: 0 is imaged as black. 2**BitsPerSample-1 is imaged as white. If this value is specified for Compression=2, the image should display and print reversed.

2 = RGB. In the RGB model, a color is described as a combination of the three primary colors of light (red, green, and blue) in particular concentrations. For each of the three components, 0 represents minimum intensity, and 2**BitsPerSample - 1 represents maximum intensity. Thus an RGB value of (0,0,0) represents black, and (255,255,255) represents white, assuming 8-bit components. For PlanarConfiguration = 1, the components are stored in the indicated order: first Red, then Green, then Blue. For PlanarConfiguration = 2, the StripOffsets for the component planes are stored in the indicated order: first the Red component plane StripOffsets, then the Green plane StripOffsets, then the Blue plane StripOffsets.

3= Palette color. In this model, a color is described with a single component. The value of the component is used as an index into the red, green and blue curves in the ColorMap field to retrieve an RGB triplet that defines the color. When PhotometricInterpretation=3 is used, ColorMap must be present and SamplesPer-

Pixel must be 1.

4 = Transparency Mask. This means that the image is used to define an irregularly shaped region of another image in the same TIFF file. SamplesPerPixel and BitsPerSample must be 1. PackBits compression is recommended. The 1-bits define the interior of the region; the 0-bits define the exterior of the region. A reader application can use the mask to determine which parts of the image to display. Main image pixels that correspond to 1-bits in the transparency mask are imaged to the screen or printer, but main image pixels that correspond to 0-bits in the mask are not displayed or printed. The image mask is typically at a higher resolution than the main image, if the main image is grayscale or color so that the edges can be sharp.

There is no default for PhotometricInterpretation, and it is required. Do not rely on applications defaulting to what you want.
(This text was sent in by David Austin)

For more details see:
http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf
(Read and Write property)

### 182.2.121 pict as picture

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The picture data of the picture.
**Notes:** (Read and Write property)

### 182.2.122 PlanarConfig as Integer

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The storage organization used.
**Notes:** Value is 1 for a single image plane and 2 for separated planes.

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.123 RasterScanlineSize as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the raster scanline size.
**Notes:** Returns the size in bytes of a complete decoded and packed raster scanline.

Note that this value may be different from the value returned by ScanlineSize if data is stored as separate planes.
(Read only property)

### 182.2.124 ResolutionUnit as Integer

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Which unit is used for the Resolution values.
**Notes:** constants:

| | | |
|---|---|---|
| RESUNIT_NONE | 1 | no meaningful units |
| RESUNIT_INCH | 2 | english |
| RESUNIT_CENTIMETER | 3 | metric |

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.125 RowsPerStrip as Integer

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A property of the TIFF image.
**Notes:** Should be same as the height for our uses. (with one strip)
(Read and Write property)

### 182.2.126 SampleFormat as Integer

MBS Images Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The data sample format.
**Notes:** Value is 1 for unsigned integer, 2 for signed integer, 3 for IEEE floating point, 4 for untyped data (e.g. JPEG compressed), 5 for complex signed int and 6 for complex IEEE floating point.
(Read and Write property)

### 182.2.127 SamplesPerPixel as Integer

MBS Images Plugin, Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The count of components used for each pixel.
**Notes:** SamplesPerPixel= 1=Grayscale, 3=RGB, 4=CMYK, ...
Photometric= 0 or 1=Grayscale depending on white point, 2=RGB, 5=CMYK, ...

For other formats see:
http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf
(Read and Write property)

### 182.2.128 Software as String

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The software name used to make this image.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.129 StripSize as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the equivalent size for a strip of data as it would be returned in a call to ReadEncodedStrip or as it would be expected in a call to WriteEncodedStrip.
**Notes:** (Read only property)

### 182.2.130 TileRowSize as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of bytes of a row of data in a tile.
**Notes:** (Read only property)

### 182.2.131 TileSize as UInt64

MBS Images Plugin, Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the equivalent size for a tile of data as it would be returned in a call to ReadTile or as it would be expected in a call to WriteTile.
**Notes:** (Read only property)

### 182.2.132 Version as Integer

MBS Images Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the Tiff library used.
**Notes:** Updated to 3.7.1 in plugin version 5.0.
(Read only property)

### 182.2.133 VersionString as String

MBS Images Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The version of the Tiff library used.
**Example:**

```
dim z as new TiffPictureMBS

MsgBox z.VersionString

// shows for example:
// LIBTIFF, Version 3.9.4
// Copyright (c) 1988-1996 Sam Leffler
// Copyright (c) 1991-1996 Silicon Graphics, Inc.
```

**Notes:** (Read only property)

### 182.2.134 VerticalPosition as Single

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The y Offset of this image in the drawing area.
**Notes:** The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.135 VerticalResolution as Single

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical resolution used.
**Notes:** Value depends on ResolutionUnit value.

The data for this property is stored in the Tiff file.
(Read and Write property)

### 182.2.136 width as Integer

MBS Images Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The width of the picture.
**Notes:** (Read and Write property)

### 182.2.137 YieldTicks as Integer

MBS Images Plugin, Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How much time is given back to Xojo for other ticks.
**Example:**

```
dim t as new TiffPictureMBS
t.YieldTicks=6 // only use 1/10th of a second
```

**Notes:** If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

### 182.2.138 Scanline(index as Integer, sample as Integer = 0) as memoryblock

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An image scanline.
**Notes:** Returns nil on any error.
If you set the value, make sure the Memoryblock is big enough. The BytesPerRow functions returns the number of bytes needed.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0.
(Read and Write computed property)
See also:

- 182.2.63 Scanline(mem as Ptr, index as Integer, sample as Integer = 0) as boolean 22154

### 182.2.139 Scanlines(index as Integer, count as Integer, sample as Integer = 0, lineStepScanlines as Integer = 1, lineStepReturn as Integer = 1) as memoryblock

MBS Images Plugin, Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set image scanlines as one memoryblock.
**Notes:** Returns nil on any error.
If you set the value, make sure the Memoryblock is big enough. The BytesPerRow functions returns the number of bytes needed.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0. Count is the number of scanlines you want to read/write.

If lineStepScanlines is >1, we skip scan lines so we read less data.
If lineStepReturn is >1, we return only every nth row.

If rows can be read with skipping, you should try lineStepScanlines = 2 or more for skipping lines.
If that doesn't work due to tiled data, you can use lineStepReturn = 2 or more.
This skipping is to quicker get preview pictures.
(Read and Write computed property)

### 182.2.140 Events

### 182.2.141 Error(libModule as string, message as string)

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event called whenever an error is to be reported.

### 182.2.142 Progress(line as Integer, total as Integer)

MBS Images Plugin, Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Reports changes in progress.
**Notes:** Used in CombineBitCMYKtoCMYK, CombineTiffCMYKtoRGB and CombineTiffCMYKtoCMYK methods.

### 182.2.143 Warning(libModule as string, message as string)

MBS Images Plugin, Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An event called whenever a warning is to be reported.

### 182.2.144 Constants

Compression Constants

| Constant | Value | Description |
|---|---|---|
| kCompressionAdobeDeflate | 8 | Deflate compression, as recognized by Adobe |
| kCompressionCCITTFAX3 | 3 | CCITT Group 3 fax encoding |
| kCompressionCCITTFAX4 | 4 | CCITT Group 4 fax encoding |
| kCompressionCCITTRLE | 2 | CCITT modified Huffman RLE |
| kCompressionCCITTRLEW | 32771 | |
| kCompressionCCITT_T4 | 3 | CCITT T.4 (TIFF 6 name) |
| kCompressionCCITT_T6 | 4 | CCITT T.6 (TIFF 6 name) |
| kCompressionDCS | 32947 | Kodak DCS encoding |
| kCompressionDeflate | 32946 | Deflate compression |
| kCompressionIT8BL | 32898 | IT8 Binary line art |
| kCompressionIT8CTPAD | 32895 | IT8 CT w/padding |
| kCompressionIT8LW | 32896 | IT8 Linework RLE |
| kCompressionIT8MP | 32897 | IT8 Monochrome picture |
| kCompressionJBIG | 34661 | ISO JBIG |
| kCompressionJP2000 | 34712 | Leadtools JPEG2000 |
| kCompressionJPEG | 7 | JPEG DCT compression |
| kCompressionLZMA | 34925 | LZMA2 |
| kCompressionLZW | 5 | Lempel-Ziv & Welch |
| kCompressionNeXT | 32766 | NeXT 2-bit RLE |
| kCompressionNone | 1 | No compression. |
| kCompressionOJPEG | 6 | !6.0 JPEG |
| kCompressionPackBits | 32773 | Macintosh RLE |
| kCompressionPixarFilm | 32908 | Pixar companded 10bit LZW |
| kCompressionPixarLog | 32909 | Pixar companded 11bit ZIP |
| kCompressionSGILOG | 34676 | SGI Log Luminance RLE |
| kCompressionSGILOG24 | 34677 | SGI Log 24-bit packed |
| kCompressionThunderScan | 32809 | ThunderScan RLE |

Fill Order Constants

| Constant | Value | Description |
|---|---|---|
| kFillOrderLSB2MSB | 2 | Least significant ->most |
| kFillOrderMSB2LSB | 1 | Most significant ->least |

Orientation Constants

| Constant | Value | Description |
|---|---|---|
| kOrientationBottomLeft | 4 | row 0 bottom, col 0 lhs |
| kOrientationBottomRight | 3 | row 0 bottom, col 0 rhs |
| kOrientationLeftBottom | 8 | row 0 lhs, col 0 bottom |
| kOrientationLeftTop | 5 | row 0 lhs, col 0 top |
| kOrientationRightBottom | 7 | row 0 rhs, col 0 bottom |
| kOrientationRightTop | 6 | row 0 rhs, col 0 top |
| kOrientationTopLeft | 1 | row 0 top, col 0 lhs |
| kOrientationTopRight | 2 | row 0 top, col 0 rhs |

Photometric Constants

| Constant | Value | Description |
|---|---|---|
| kPhotometricCIELab | 8 | !1976 CIE L*a*b* |
| kPhotometricICCLab | 9 | ICC L*a*b* [ Adobe TIFF Technote 4 ] |
| kPhotometricITULab | 10 | ITU L*a*b* |
| kPhotometricLogL | 32844 | CIE Log2(L) |
| kPhotometricLogLUV | 32845 | CIE Log2(L) (u',v') |
| kPhotometricMask | 4 | $ holdout mask |
| kPhotometricMinIsBlack | 1 | Min value is black. |
| kPhotometricMinIsWhite | 0 | Min value is white. |
| kPhotometricPalette | 3 | color map indexed |
| kPhotometricRGB | 2 | RGB color model |
| kPhotometricSeparated | 5 | !color separations |
| kPhotometricYCBCR | 6 | !CCIR 601 |

planar config Constants

| Constant | Value | Description |
|---|---|---|
| kPlanarConfigContig | 1 | Single image plane. |
| kPlanarConfigSeparate | 2 | Separate planes of data. |

Predictor Values

| Constant | Value | Description |
|---|---|---|
| kPredictorFloatingPoint | 3 | Floating point predictor |
| kPredictorHorizontal | 2 | Horizontal differencing |
| kPredictorNone | 1 | no prediction scheme used |

Resolution Unit Constants

| Constant | Value | Description |
|---|---|---|
| kResUnitCentimeter | 3 | Metric |
| kResUnitInch | 2 | English |
| kResUnitNone | 1 | no meaningful units |

# Chapter 183

# Timecode

## 183.1 class LTCDecoderMBS

### 183.1.1 class LTCDecoderMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the timecode decoder.

### 183.1.2 Methods

### 183.1.3 Constructor(apv as Integer, queueSize as Integer)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a new LTC decoder.
**Notes:** apv: audio-frames per video frame. This is just used for initial settings, the speed is tracked dynamically. setting this in the right ballpark is needed to properly decode the first LTC frame in a sequence. queueSize: length of the internal queue to store decoded frames to SMPTEDecoderWrite.

Raises an out of memory exception if initialization fails.

### 183.1.4 Destructor

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 183.1.5 FlushQueue

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remove all LTC frames from the internal queue.

### 183.1.6 Read as LTCFrameMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decoded LTC frames are placed in a queue.
**Notes:** This function retrieves a frame from the queue, and stores it a new LTCFrameMBS object.
See also:

- 183.1.7 Read(frame as LTCFrameMBS) as Boolean 22190

### 183.1.7 Read(frame as LTCFrameMBS) as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decoded LTC frames are placed in a queue.
**Notes:** This function retrieves a frame from the queue, and stores it the given LTCFrameMBS object.
You should prefer this method and reuse frame objects.
See also:

- 183.1.6 Read as LTCFrameMBS 22190

### 183.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts floating point audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.size by dividing by 4.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22191
- 183.1.10 WriteSingle(data as String, posinfo as UInt64 = 0) 22191

### 183.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts floating point audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:


- 183.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0) 22190
- 183.1.10 WriteSingle(data as String, posinfo as UInt64 = 0) 22191


### 183.1.10 WriteSingle(data as String, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts floating point audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.lenb by dividing by 4.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:


- 183.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0) 22190
- 183.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22191


### 183.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts SInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.size by dividing by 2.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22192
- 183.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0) 22192


### 183.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts SInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:


- 183.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0) 22191
- 183.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0) 22192


### 183.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts SInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.lenb by dividing by 2.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:


- 183.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0) 22191
- 183.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22192


### 183.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts UInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.size by dividing by 2.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22193
- 183.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0) 22193

### 183.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts UInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0) 22192
- 183.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0) 22193

### 183.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Wrapper around WriteUInt8 that accepts UInt16 audio samples.
Note: internally libltc uses 8 bit only.

Data: Buffer with data
size: number of samples to parse. Calculated from data.lenb by dividing by 2.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0) 22192
- 183.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22193

### 183.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data
Count: number of samples to parse. Taken from data.size.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22194
- 183.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0) 22194

### 183.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data
Count: number of samples to parse.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0) 22193
- 183.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0) 22194

### 183.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Feed the LTC decoder with new audio samples.
**Notes:** Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data
Count: number of samples to parse. Taken from data.lenb.
posinfo: (optional, recommended) sample-offset in the audio-stream.
See also:

- 183.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0) 22193
- 183.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 22194

### 183.1.20 Properties

### 183.1.21 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 183.1.22 QueueLength as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Count number of LTC frames currently in the queue.
**Notes:** Returns number of queued frames.
(Read only property)

## 183.2 class LTCEncoderMBS

### 183.2.1 class LTCEncoderMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The timecode encoder.

### 183.2.2 Methods

### 183.2.3 Constructor(SampleRate as Double, FPS as Double, TVStandard as Integer, Flags as Integer)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Allocate and initialize LTC audio encoder.
**Notes:** EncoderReinit internally see, see notes there.

SampleRate: audio sample rate (eg. 48000)
FPS: video-frames per second (e.g. 25.0)
TVStandard: the TV standard to use for Binary Group Flag bit position
flags: binary combination of flags like LTC_NO_PARITY and LTC_BGF_DONT_TOUCH.

### 183.2.4 CopyBuffer as MemoryBlock

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the accumulated encoded audio to the given sample-buffer and flush the internal buffer.
**Notes:** Allocates new MemoryBlock and puts bytes inside.
Returns nil if there is no data.

### 183.2.5 CopyBufferString as String

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copy the accumulated encoded audio to the given sample-buffer and flush the internal buffer.
**Notes:** Allocates new memory for string and puts bytes inside.

### 183.2.6 DecrementTimecode as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Move the encoder to the previous timecode frame.
**Notes:** This is useful for encoding reverse LTC.

### 183.2.7 Destructor

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 183.2.8 EncodeByte(byte as UInt8, speed as Double) as boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Generate LTC audio for given byte of the LTC-frame and place it into the internal buffer.
**Notes:** see also GetBuffer and BufferPtr

LTC has 10 bytes per frame: 0 <= bytecnt <10 use TimeCode property to set the current frame before Encoding.

The default output signal is @ -3dBFS (38..218 at 8 bit unsigned). see also SetVolume

if speed is <0, the bits are encoded in reverse.
slowdown >10.0 requires custom buffer sizes; see \ref SetBufferSize.

byte: byte of the LTC-frame to encode 0..9
speed: vari-speed, <1.0 faster, >1.0 slower ; must be != 0

Returns true on success, -1 if byte is invalid or buffer overflow (speed >10.0)

### 183.2.9 EncodeFrame

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encode a full LTC frame at fixed speed.
**Notes:** This is equivalent to calling EncodeByte 10 times for bytes 0..9 with speed 1.0.

Note: The internal buffer must be empty before calling this function.
Otherwise it may overflow. This is usually the case if it is read with GetBuffer after calling this function.

The default internal buffersize is exactly one full LTC frame at speed 1.0.
See also:

- 183.2.10 EncodeFrame(Speed as Double) 22198

### 183.2.10 EncodeFrame(Speed as Double)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Encode a full LTC frame at fixed speed.
**Notes:** This is equivalent to calling EncodeByte 10 times for bytes 0..9 with given speed.
Speed should be around 1.0 for normal speed.

Note: The internal buffer must be empty before calling this function.
Otherwise it may overflow. This is usually the case if it is read with GetBuffer after calling this function.

The default internal buffersize is exactly one full LTC frame at speed 1.0.
See also:

- 183.2.9 EncodeFrame 22197

### 183.2.11 EncoderReinit(SampleRate as Double, FPS as Double, TVStandard as Integer, Flags as Integer) as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Change the encoder settings without re-allocating any library internal data structure (realtime safe).
**Notes:** Changing the fps and or sample-rate implies a buffer flush, and biphase state reset.

This call will fail if the internal buffer is too small to hold one full LTC frame. Use SetBufferSize to prepare an internal buffer large enough to accommodate all SampleRate, fps combinations that you would like to re-init to.

The LTC frame payload data is not modified by this call, however, the flag-bits of the LTC-Frame are updated:
If fps equals to 29.97 or 30000.0/1001.0, the LTCFrame's 'dfbit' bit is set to 1 to indicate drop-frame timecode.

Unless the LTC_BGF_DONT_TOUCH flag is set the BGF1 is set or cleared depending on LTC_TC_CLOCK and BGF0,2 according to LTC_USE_DATE and the given standard.

ColFrame is cleared and the parity recomputed (unless LTC_NO_PARITY is given).

SampleRate: audio sample rate (eg. 48000)
FPS: video-frames per second (e.g. 25.0)
TVStandard: the TV standard to use for Binary Group Flag bit position
Flags: binary combination of flags.

Returns 0 on success.

### 183.2.12 FlushBuffer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset the write-pointer of the encoder-buffer.

### 183.2.13 GetBuffer(byref size as Integer, flush as boolean) as Ptr

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a pointer to the accumulated encoded audio-data.
**Notes:** size: if set, the number of valid bytes in the buffer is stored in the buffer.
Flush: call FlushBuffer - reset the buffer write-pointer.

Returns pointer to encoder-buffer.

### 183.2.14 IncrementTimecode as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Move the encoder to the next timecode frame.

### 183.2.15 Reset

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets ecoder state.
**Notes:** Flushes buffer, reset biphase state.

### 183.2.16 SetBufferSize(SampleRate as Double, FPS as Double) as boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Configure a custom size for the internal buffer.
**Notes:** This is needed if you are planning to call EncoderReinit or if you want to keep more than one LTC frame's worth of data in the library's internal buffer.

The buffer-size is (1 + sample_rate / fps) bytes. resizing the internal buffer will flush all existing data in it - alike \ref FlushBuffer.

SampleRate: audio sample rate (eg. 48000)
FPS: video-frames per second (e.g. 25.0)

Returns 0 on success, -1 if allocation fails (which makes the encoder unusable, call discard the object or realloc the buffer)

### 183.2.17 SetFilter(RiseTime as Double)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set encoder signal rise-time / signal filtering.
**Notes:** LTC signal should have a rise time of 40us +/- 10 us. by default the encoder honors this and low-pass filters the output depending on the sample-rate.

If you want a perfect square wave, set 'rise_time' to 0.

Note EncoderReinit resets the filter-time-constant to use the default 40us for the given sample-rate, overriding any value previously set with SetFilter.

RiseTime the signal rise-time in us (10^(-6) sec), set to 0 for perfect square wave, default 40.0

### 183.2.18 SetVolume(dBFS as double) as boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the volume of the generated LTC signal.
**Notes:** Typically LTC is sent at 0dBu ; in EBU callibrated systems that corresponds to -18dBFS. - by default libltc creates -3dBFS

since libltc generated 8bit audio-data, the minimum dBFS is about -42dB which corresponds to 1 bit.

0dB corresponds to a signal range of 127
1..255 with 128 at the center.

dBFS: the volume in dB full-scale (<= 0.0)

Returns true on success, false if the value was out of range

### 183.2.19 Properties

### 183.2.20 BufferPtr as Ptr

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieve a pointer to the accumulated encoded audio-data.
**Notes:** (Read only property)

### 183.2.21 BufferSize as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Query the length of the internal buffer.
**Notes:** It is allocated to hold audio-frames for exactly one LTC frame for the given sample-rate and frame-rate. ie. (1 + sample-rate / fps) bytes

Note this returns the total size of the buffer, not the used/free part. See also BufferPtr.

Returns size of the allocated internal buffer.
(Read only property)

### 183.2.22 Filter as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current filter setting.
**Notes:** (Read and Write property)

### 183.2.23 Flags as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The flags used to create the encoder.
**Notes:** (Read only property)

### 183.2.24 FPS as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The FPS setting.
**Notes:** (Read only property)

### 183.2.25 Frame as LTCFrameMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Low-level access to the internal LTCFrame data.
**Notes:** Note: be careful to about dfbit flag in LTCFrameMBS object, the encoder sets this [ only ] upon initialization.
(Read and Write property)

### 183.2.26 Handle as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 183.2.27 SampleRate as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The current sample rate.
**Notes:** (Read only property)

### 183.2.28 Standard as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The TV Standard.
**Notes:** (Read only property)

### 183.2.29 TimeCode as LTCSMPTETimecodeMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set the SMPTETimecode for the encoder LTC-frame.
**Notes:** The next call to EncodeByte or EncodeFrame will encode this time to LTC audio-samples.
Internally this call uses TimeToFrame because the LTCEncoder operates on LTCframes only.
(Read and Write property)

### 183.2.30 UserBits as UInt32

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set a 32-bits unsigned integer from the user-data bits.
**Notes:** It is written LSB first continiously int the eight user fields.
(Read and Write property)

## 183.3 class LTCFrameExtMBS

### 183.3.1 class LTCFrameExtMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extended LTC frame - includes audio-sample position offsets, volume, etc.
**Notes:** Note: For TV systems, the sample in the LTC audio data stream where the LTC Frame starts is not necessarily at the same time as the video-frame which is described by the LTC Frame.

offStart denotes the time of the first transition of bit 0 in the LTC frame.

For 525/60 Television systems, the first transition shall occur at the beginning of line 5 of the frame with which it is associated. The tolerance is ¬± 1.5 lines.

For 625/50 systems, the first transition shall occur at the beginning of line 2 ¬± 1.5 lines of the frame with which it is associated.

Only for 1125/60 systems, the first transition occurs exactly at the vertical sync timing reference of the frame. ¬± 1 line.
Subclass of the LTCFrameMBS class.

### 183.3.2 Properties

### 183.3.3 OffEnd as Int64

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OffEnd the sample in the stream corresponding to the end of the LTC frame.
**Notes:** (Read and Write property)

### 183.3.4 OffStart as Int64

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** OffStart the approximate sample in the stream corresponding to the start of the LTC frame.
**Notes:** (Read and Write property)

### 183.3.5 Reverse as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If non-zero, a reverse played LTC frame was detected.
**Notes:** Since the frame was reversed, it started at offEnd and finishes as offStart (offEnd >offStart). (Note: in reverse playback the (reversed) sync-word of the next/previous frame is detected, this offset is corrected).
(Read and Write property)

### 183.3.6 SampleMax as UInt8

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The maximum input sample signal for this frame (0..255).
**Notes:** (Read and Write property)

### 183.3.7 SampleMin as UInt8

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minimum input sample signal for this frame (0..255).
**Notes:** (Read and Write property)

### 183.3.8 Volume as Double

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The volume of the input signal in dbFS.
**Notes:** (Read and Write property)

### 183.3.9 biphaseTics(index as Integer) as Single

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Detailed timing info.
**Notes:** Phase of the LTC signal; the time between each bit in the LTC-frame in audio-frames. Summing all 80 values in the array will yield audio-frames/LTC-frame = (offEnd - offStart + 1).
Range of index is 0 to 79.
(Read and Write computed property)

## 183.4 class LTCFrameMBS

### 183.4.1 class LTCFrameMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor for a new empty frame.

### 183.4.2 Methods

### 183.4.3 Clone as LTCFrameExtMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clones the frame.
**Notes:** Returns always LTCFrameExtMBS object.
Extended fields may not be set if LTCFrameMBS is cloned.

### 183.4.4 Constructor

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new frame.
**Notes:** Internally calls Reset to set soem default values.
See also:


- 183.4.5 Constructor(InputTimecode as LTCSMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0) 22206
- 183.4.6 Constructor(other as LTCFrameMBS) 22207


### 183.4.5 Constructor(InputTimecode as LTCSMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translate SMPTETimecode into its binary LTC representation and set the LTC frame's parity bit accordingly.
**Notes:** InputTimecode: timecode input
TVStandard: the TV standard to use for parity bit assignment
Flags: flags binary combination of flag values - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.
If LTC_USE_DATE is given, user-fields in LTCFrame will be set from the date in SMPTETimecode,

otherwise the user-bits are not modified. All non-timecode fields remain untouched - except for the parity bit unless LTC_NO_PARITY is given.
See also:

- 183.4.4 Constructor 22206
- 183.4.6 Constructor(other as LTCFrameMBS) 22207

### 183.4.6 Constructor(other as LTCFrameMBS)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Initializes a frame with copying data from existing frame.
See also:

- 183.4.4 Constructor 22206
- 183.4.5 Constructor(InputTimecode as LTCSMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0) 22206

### 183.4.7 FrameAlignment(samples_per_frame as Double, TVStandard as Integer) as UInt64

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** LTCFrame sample alignment offset.
**Notes:** There is a relative offset of the LTC-Frame start and the TV-frame.
The first bit of a LTC frame corresponds to a specific line in the actual video frame. When decoding this offset needs to be subtracted from the LTC-frame's audio-sample-time to match the TV-frame's start position.

For film frames or HDV the offset is zero.

samples_per_frame: audio-samples per timecode-frame (eg. 1920 = 48000/25)
TVStandard: the TV standard

Returns the offset in samples.

### 183.4.8 FrameDecrement(fps as integer, TVStandard as integer, Flags as integer = 0) as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decrement the timecode by one Frame (1/framerate seconds) and set the Frame's parity bit accordingly (see SetParity)
**Notes:** fps: integer framerate (for drop-frame-timecode set frame->dfbit and round-up the fps).
TVStandard: the TV standard to use for parity bit assignment. If set to 1 the 25fps standard is enabled and LTC Frame bit 59 instead of 27 is used for the parity. It only has only has effect flag bit 4 (LTC_NO_PARITY) is cleared.
Flags: binary combination of flags - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.

If the bit 0 is set (1) interpret user-data as date and decrement date if timecode wraps at 24h.
(Note: leap-years are taken into account, but since the year is two-digit only, the 100,400yr rules are ignored. "00" is assumed to be year 2000 which was a leap year.) bit 3 (8) indicates that the parity bit should not be touched.

Returns true if timecode was wrapped around at 23:59:59:ff, false otherwise.

### 183.4.9 FrameIncrement(fps as integer, TVStandard as integer, Flags as integer = 0) as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Increment the timecode by one Frame (1/framerate seconds) and set the Frame's parity bit accordingly (see SetParity)
**Notes:** fps integer framerate (for drop-frame-timecode set frame->dfbit and round-up the fps).
TVStandard: the TV standard to use for parity bit assignment. If set to 1 the 25fps standard is enabled and LTC Frame bit 59 instead of 27 is used for the parity. It only has only has effect flag bit 4 (LTC_NO_PARITY) is cleared.
flags: binary combination of LTC_BG_FLAGS - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.

If the bit 0 (1) is set (1) interpret user-data as date and increment date if timecode wraps after 24h.
(Note: leap-years are taken into account, but since the year is two-digit only, the 100,400yr rules are ignored. "00" is assumed to be year 2000 which was a leap year.)

Returns true if timecode was wrapped around after 23:59:59:ff, false otherwise

### 183.4.10 ParseBCGFlags(TVStandard as Integer) as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Parse Binary Group Flags into standard independent format.
**Notes:** bit 0 (1) - BGF 0,
bit 1 (2) - BGF 1,

bit 2 (4) - BGF 2

TVStandard: the TV standard to use – see LTCFrameMBS class for BGF assignment.
Returns LTC Binary Group Flags.

### 183.4.11 Reset

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reset all values of a LTC FRAME to zero, except for the sync-word (0x3FFD) at the end.
**Notes:** The sync word is set according to architecture (big/little endian).
Also set the Frame's parity bit accordingly (see SetParity)

### 183.4.12 SetParity(TVStandard as Integer)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the parity of the LTC frame.
**Notes:** Bi-Phase Mark Phase Correction bit (bit 27 - or 59) may be set or cleared so that that every 80-bit word contains an even number of zeroes. This means that the phase in every Sync Word will be the same.

This is merely cosmetic; the motivation to keep the polarity of the waveform constant is to make finding the Sync Word visibly (on a scope) easier.

There is usually no need to call this function directly. The encoder utility functions TimeToFrame, FrameIncrement and FrameDecrement include a call to it.

Standard: If 1 (aka LTC_TV_625_50) , the 25fps mode (bit 59 - aka binary_group_flag_bit2) is used, otherwise the 30fps, 24fps mode (bit 27 – biphase_mark_phase_correction) is set or cleared.

### 183.4.13 Properties

### 183.4.14 BinaryGroupFlagBit0 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** indicate user-data char encoding, see table above - bit 43.
**Notes:** 1 bit value, so only 0 or 1.
(Read and Write property)

### 183.4.15 BinaryGroupFlagBit1 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** indicate timecode is local time wall-clock, see table above - bit 58.
**Notes:** 1 bit value, so only 0 or 1.
(Read and Write property)

### 183.4.16 BinaryGroupFlagBit2 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** indicate user-data char encoding (or parity with 25fps), see table above - bit 59.
**Notes:** 1 bit value, so only 0 or 1.
(Read and Write property)

### 183.4.17 BiphaseMarkPhaseCorrection as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The Bi-Phase Mark Phase Correction Bit.
**Notes:** The Bi-Phase Mark Phase Correction Bit (Bit 27 or 59) may be set or cleared so that that every 80-bit word contains an even number of zeroes. This means that the phase of the pulse train in every Sync Word will be the same.
(Read and Write property)

### 183.4.18 ColFrame as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Colour-frame: timecode intentionally synchronized to a colour TV field sequence
**Notes:** 1 bit value, so only 0 or 1.
(Read and Write property)

### 183.4.19 Data as MemoryBlock

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The raw frame data as memoryblock.
**Notes:** When setting you can either pass 368 or 364 bytes (LTCFrameExt) or 10 bytes (LTCFrame)
(Read and Write property)

### 183.4.20 DFBit as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** indicated drop-frame timecode.
**Notes:** 1 bit value, so only 0 or 1.
(Read and Write property)

### 183.4.21 Frames as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set frames field.
**Notes:** Computed by the MBS Plugin for you as a convenience from both frames_tens and frames_unit.
(Read and Write property)

### 183.4.22 FrameTens as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE framenumber BCD tens 0..3.
**Notes:** (Read and Write property)

### 183.4.23 FrameUnits as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE framenumber BCD unit 0..9.
**Notes:** (Read and Write property)

### 183.4.24 Hours as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set hours field.
**Notes:** Computed by the MBS Plugin for you as a convenience from both hours_tens and hours_unit.
(Read and Write property)

### 183.4.25 HoursTens as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE hours BCD tens 0..2.
**Notes:** (Read and Write property)

### 183.4.26 HoursUnits as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE hours BCD unit 0..9.
**Notes:** (Read and Write property)

### 183.4.27 Mins as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set minutes field.
**Notes:** Computed by the MBS Plugin for you as a convenience from both minutes_tens and minutes_unit. (Read and Write property)

### 183.4.28 MinsTens as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE minutes BCD tens 0..6.
**Notes:** (Read and Write property)

### 183.4.29 MinsUnits as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE minutes BCD unit 0..9.
**Notes:** (Read and Write property)

### 183.4.30 Secs as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set seconds field.
**Notes:** Computed by the MBS Plugin for you as a convenience from both seconds_tens and seconds_unit.
(Read and Write property)

### 183.4.31 SecsTens as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE seconds BCD tens 0..6
**Notes:** (Read and Write property)

### 183.4.32 SecsUnits as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SMPTE seconds BCD unit 0..9
**Notes:** (Read and Write property)

### 183.4.33 SyncWord as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sync word file.
**Notes:** (Read and Write property)

### 183.4.34 TimeCode as LTCSMPTETimecodeMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert binary LTCFrame into a SMPTETimecode.
**Notes:** (Read only property)

### 183.4.35 User1 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

### 183.4.36 User2 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.37 User3 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.38 User4 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.39 User5 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.40 User6 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.41 User7 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.42 User8 as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** User defined bits.
**Notes:** You can set them as you like, but be aware you only have 4 bits here (value 0 to 15).
Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

### 183.4.43 UserBits as UInt32

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all user bits as one 32-bit value.
**Notes:** (Read only property)

## 183.5 module LTCMBS

### 183.5.1 module LTCMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The central module for global LTC methods.
**Notes:** This plugin part can load libltc, a library to encode and decode linear timecode.

Linear (or Longitudinal) Timecode (LTC) is an encoding of timecode data as a Manchester-Biphase encoded audio signal.
The audio signal is commonly recorded on a VTR track or other storage media.

libltc facilitates decoding and encoding of LTC from/to timecode, including SMPTE date support.

see
https://github.com/x42/libltc
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr1

**Xojo Developer Magazine**

- 18.3, page 10: News

### 183.5.2 Methods

### 183.5.3 FrameToTime(OutputTimecode as LTCSMPTETimecodeMBS, InputFrame as LTCFrameMBS, Flags as Integer = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert binary LTCFrame into a SMPTETimecode.
**Notes:** Binary combination of flags - here only LTC_USE_DATE is relevant.
if LTC_USE_DATE is set, the user-fields in LTCFrame will be parsed into the date variable of SMPTETimecode. otherwise the date information in the SMPTETimecode is set to zero.

### 183.5.4 LoadLibrary(file as folderitem) as boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads LTC library from a file.
**Notes:** Please get a libltc.dll/so/dylib for your platform and tell the plugin where to load it here.

Returns true on success and false on failure.
See LibraryLoadErrorMessage and LibraryLoadError in case of error.
See also:

- 183.5.5 LoadLibrary(path as string) as boolean 22217

### 183.5.5 LoadLibrary(path as string) as boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads LTC library from a file path.
**Notes:** Please get a libltc.dll/so/dylib for your platform and tell the plugin where to load it here.

Returns true on success and false on failure.
See LibraryLoadErrorMessage and LibraryLoadError in case of error.
See also:

- 183.5.4 LoadLibrary(file as folderitem) as boolean 22216

### 183.5.6 TimeToFrame(OutputFrame as LTCFrameMBS, InputTimecode as LTCSMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Translate SMPTETimecode into its binary LTC representation and set the LTC frame's parity bit accordingly.
**Notes:** OutputFrame: the frame to be set
InputTimecode: timecode input
TVStandard: the TV standard to use for parity bit assignment
Flags: flags binary combination of flag values - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.
If LTC_USE_DATE is given, user-fields in LTCFrame will be set from the date in SMPTETimecode, otherwise the user-bits are not modified. All non-timecode fields remain untouched - except for the parity bit unless LTC_NO_PARITY is given.

### 183.5.7 Properties

### 183.5.8 LibraryLoaded as Boolean

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the library is loaded.
**Notes:** (Read only property)

### 183.5.9 LibraryLoadError as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The load error code.
**Notes:** (Read only property)

### 183.5.10 LibraryLoadErrorMessage as String

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The load error message.
**Notes:** (Read only property)

### 183.5.11 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| LTC_FRAME_BIT_COUNT | 80 | The bit count for a raw 80 bit LTC frame |

Encoder and LTCframe flags

| Constant | Value | Description |
|---|---|---|
| LTC_BGF_DONT_TOUCH | 4 | Encoder init or re-init does not touch the BGF bits (initial values after initialization is zero) |
| LTC_NO_PARITY | 8 | Parity bit is left untouched when setting or in/decrementing the encoder frame-number |
| LTC_TC_CLOCK | 2 | The Timecode is wall-clock aka freerun. This also sets BGF1 (unless LTC_BGF_DONT_TOUCH is given) |
| LTC_USE_DATE | 1 | LTCFrame <>SMPTETimecode converter and LTCFrame increment/decrement use date, also set BGF2 to '1' when encoder is initialized or re-initialized (unless LTC_BGF_DONT_TOUCH is given) |

TV Standards

| Constant | Value | Description |
|---|---|---|
| LTC_TV_1125_60 | 2 | 30fps |
| LTC_TV_525_60 | 0 | 30fps |
| LTC_TV_625_50 | 1 | 25fps |
| LTC_TV_FILM_24 | 3 | 24fps |

## 183.6 class LTCSMPTETimecodeMBS

### 183.6.1 class LTCSMPTETimecodeMBS

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a human readable time representation, decimal values.

### 183.6.2 Methods

### 183.6.3 Constructor

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor to create a new empty timecode.
See also:

- 183.6.4 Constructor(other as LTCSMPTETimecodeMBS) 22220

### 183.6.4 Constructor(other as LTCSMPTETimecodeMBS)

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Constructors a new time object with copying given values.
See also:

- 183.6.3 Constructor 22220

### 183.6.5 Properties

### 183.6.6 Data as MemoryBlock

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets or sets data of this smtp timecode with a memoryblock.
**Notes:** (Read and Write property)

### 183.6.7 Date as Date

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get or set time stamp via date.
**Notes:** When setting we take the year mod 100 to fill years field and frame field is set to zero.

When querying we return year + 2000 if year <67 and otherwise year + 1900, so we can have a year range of 1967 to 2066.
(Read and Write property)

### 183.6.8 DateTime as DateTime

MBS Tools Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Get or set time stamp via date.
**Notes:** When setting we take the year mod 100 to fill years field and frame field is set to zero.

When querying we return year + 2000 if year <67 and otherwise year + 1900, so we can have a year range of 1967 to 2066.
(Read and Write property)

### 183.6.9 Days as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The days field.
**Notes:** day of month 1..31
(Read and Write property)

### 183.6.10 Frame as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The frame field.
**Notes:** sub-second frame 0..(FPS - 1)
(Read and Write property)

### 183.6.11 Hours as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hours field.
**Notes:** hour 0..23

(Read and Write property)

### 183.6.12 Mins as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minutes field.
**Notes:** minute 0..60
(Read and Write property)

### 183.6.13 Months as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month field.
**Notes:** valid months are 1..12
(Read and Write property)

### 183.6.14 Secs as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The seconds field.
**Notes:** second 0..60
(Read and Write property)

### 183.6.15 TimeZone as String

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time zone field.
**Notes:** the timezone is maximum 5 characters: "+HHMM" textual representation
(Read and Write property)

### 183.6.16 Years as Integer

MBS Tools Plugin, Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The years field.
**Notes:** LTC-date uses 2-digit year 00.99.

(Read and Write property)

# Chapter 184

# TimeZone

## 184.1 class TimeZoneMBS

### 184.1.1 class TimeZoneMBS

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. You can use TimeZone instead.
**Function:** Allows you to access information about the current time zone.
**Example:**

```
dim t as new TimeZoneMBS
MsgBox str(t.GmtDeltaTotalseconds)
```

**Notes:** on Mac OS Cocoa applications, better use newer NSTimezoneMBS class.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 20.2pr7
- MBS Xojo / Real Studio Plugins, version 14.2pr5

### 184.1.2 Properties

### 184.1.3 DaylightName as String

MBS Util Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A description for daylight saving time.
**Example:**

```
dim t as new TimeZoneMBS
MsgBox t.DaylightName
```

**Notes:** For example, "PDT" could indicate Pacific Daylight Time. This string can be empty.
e.g. "Mitteleurop√§ische Sommerzeit"
On Mac, please use NSTimeZoneMBS class.
(Read only property)

### 184.1.4 GmtDeltaHours as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the GMT offset in hours.
**Example:**

```
dim t as TimeZoneMBS

t=new TimeZoneMBS

msgbox format(t.GmtDeltaHours,"+00")+ ":" +format(t.GmtDeltaminutes,"00")+ ":" +format(t.GmtDeltaseconds,"00")
```

**Notes:** On Windows this information is not available.
(Read only property)

### 184.1.5 GmtDeltaMinutes as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the GMT offset in minutes.
**Example:**

```
dim t as TimeZoneMBS

t=new TimeZoneMBS

msgbox format(t.GmtDeltaHours,"+00")+ ":" +format(t.GmtDeltaminutes,"00")+ ":" +format(t.GmtDeltaseconds,"00")
```

**Notes:** On Windows this information is not available.
(Read only property)

### 184.1.6 GmtDeltaSeconds as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the GMT offset in seconds.
**Example:**

```
dim t as TimeZoneMBS

t=new TimeZoneMBS

msgbox format(t.GmtDeltaHours,"+00")+ ":" +format(t.GmtDeltaminutes,"00")+ ":" +format(t.GmtDeltaseconds,"00")
```

**Notes:** (Read only property)

### 184.1.7 GmtDeltaTotalseconds as Integer

MBS Util Plugin, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** Returns the GMT offset in seconds.
**Example:**

```
dim t as new TimeZoneMBS

MsgBox str(t.GmtDeltaTotalseconds)
```

**Notes:** (Read only property)

### 184.1.8 Latitude as Double

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the latitude of the current position on earth.
**Example:**

```
dim longdeg,longmin as Integer
dim t as TimeZoneMBS
```

```
t=new TimeZoneMBS

longdeg=floor(t.longitude*90)
longmin=floor((t.longitude*90-longdeg)*60)

statictext1.text=format(longdeg,"0")+"¬∞"
statictext2.text=format(longmin,"0")+"'"
```

**Notes:** On Windows this information is not available.
(Read only property)

### 184.1.9 Longitude as Double

MBS Util Plugin, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the longitude of the current position on earth.
**Example:**

```
dim latdeg,latmin as Integer
dim t as TimeZoneMBS

t=new TimeZoneMBS

latdeg=floor(t.latitude*90)
latmin=floor((t.latitude*90-latdeg)*60)

statictext1.text=format(latdeg,"0")+"¬∞"
statictext2.text=format(latmin,"0")+"'"
```

**Notes:** On Windows this information is not available.
(Read only property)

### 184.1.10 StandardName as String

MBS Util Plugin, Plugin Version: 14.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A description for standard time.
**Example:**

```
dim t as new TimeZoneMBS
MsgBox t.StandardName
```

**Notes:** For example, "EST" could indicate Eastern Standard Time. This string can be empty.
e.g. "Mitteleurop√§ische Zeit"
On Mac, please use NSTimeZoneMBS class.
(Read only property)

# Chapter 185

# TouchBar

## 185.1 class LAContextMBS

### 185.1.1 class LAContextMBS

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** The class for local authentication via password or TouchID.
**Blog Entries**

- Xojo 2021r1
- MBS Xojo Plugins Version 21.0 News
- MBS Xojo Plugins, version 18.4pr3
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio Plugins, version 17.0pr1

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar
- 15.2, page 9: News

### 185.1.2 Methods

### 185.1.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Whether the class is available.
**Notes:** Returns true on OS X 10.10 and newer in 64-bit application.

### 185.1.4 canEvaluatePolicy(Policy as Integer, byref Error as NSErrorMBS) as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Determines if a particular policy can be evaluated.
**Example:**

```
try
dim e as NSErrorMBS

if lc.canEvaluatePolicy(lc.PolicyDeviceOwnerAuthenticationWithBiometrics, e) then
List.AddRow "Can authenticate with biometrics."
else
List.AddRow "Can't authenticate with biometrics."
end if
if e <>nil then
List.AddRow "Error: "+e.LocalizedDescription
end if

catch ex as NSExceptionMBS

List.AddRow "Exception: "+ex.Message

end try
```

**Notes:** Policies can have certain requirements which, when not satisfied, would always cause the policy evaluation to fail. Examples can be a passcode set or a fingerprint enrolled with Touch ID. This method allows easy checking for such conditions.

Applications should consume the returned value immediately and avoid relying on it for an extensive period of time. At least, it is guaranteed to stay valid until the application enters background.

policy: Policy for which the preflight check should be run.

error: contains error information if policy evaluation is not possible.

Returns true if the policy can be evaluated, false otherwise.

### 185.1.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** The constructor.

### 185.1.6 evaluatePolicy(Policy as Integer, localizedReason as String, Tag as Variant = nil)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Evaluates the specified policy.
**Example:**

```
dim lc as LAContextMBS // your context

try

lc.evaluatePolicy(lc.PolicyDeviceOwnerAuthenticationWithBiometrics, "We need to test.")

catch ex as NSExceptionMBS

List.AddRow "Exception: "+ex.Message

end try
```

**Notes:** Policy evaluation may involve prompting user for various kinds of interaction or authentication. Actual behavior is dependent on evaluated policy, device type, and can be affected by installed configuration profiles.

Be sure to keep a strong reference to the context while the evaluation is in progress. Otherwise, an evaluation would be canceled when the context is being deallocated.

The method does not block. Instead the event is called asynchronously when evaluation finishes.

Implications of successful policy evaluation are policy specific. In general, this operation is not idempotent. Policy evaluation may fail for various reasons, including

user cancel, system cancel and others, see error codes.

policy: Policy to be evaluated.
localizedReason: Application reason for authentication. This string must be provided in correct localization and should be short and clear. It will be eventually displayed in the authentication dialog subtitle. A name of the calling application will be already displayed in title, so it should not be duplicated here.

### 185.1.7 invalidate

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Invalidates the context.
**Notes:** The context is invalidated automatically when it is (auto)released. This method allows invalidating it manually while it is still in scope.

Invalidation terminates any existing policy evaluation and the respective call will fail with LAErrorAppCancel. After the context has been invalidated, it can not be used for policy evaluation and an attempt to do so will fail with LAErrorInvalidContext.

Invalidating a context that has been already invalidated has no effect.

### 185.1.8 isCredentialSet(CredentialType as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Reveals if credential was set with this context.
**Notes:** type: Type of credential we are asking for.

Return true on success, false otherwise.

### 185.1.9 setCredential(credential as MemoryBlock, Type as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Sets a credential to this context.
**Notes:** Some policies allow to bind application-provided credential with them.
This method allows credential to be passed to the right context.

credential: Credential to be used with subsequent calls. Setting this parameter to nil will remove any existing credential of the specified type.

Type: Type of the provided credential.

Return true if the credential was set successfully, false otherwise.

### 185.1.10 TouchIDAuthenticationMaximumAllowableReuseDuration as Double

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** The maximum value for LAContext touchIDAuthenticationAllowableReuseDuration property.
**Notes:** Returns -1 if value is not available.

### 185.1.11 Properties

### 185.1.12 biometryType as Integer

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: All.

**Function:** Indicates the type of the biometry supported by the device.
**Notes:** This property is set when canEvaluatePolicy has been called for a biometric policy.
The default value is BiometryTypeNone.
(Read only property)

### 185.1.13 evaluatedPolicyDomainState as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Contains policy domain state.
**Notes:** This property is set only when evaluatePolicy is called and succesful Touch ID authentication was performed, or when canEvaluatePolicy succeeds for a biometric policy. It stays nil for all other cases. If finger database was modified (fingers were removed or added), evaluatedPolicyDomainState data will change. Nature of such database changes cannot be determined but comparing data of evaluatedPolicyDomainState after different evaluatePolicy will reveal the fact database was changed between calls.
(Read only property)

### 185.1.14 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** The internal object handle.
**Notes:** (Read and Write property)

### 185.1.15 interactionNotAllowed as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Allows running authentication in non-interactive mode.
**Notes:** If the context is used in a keychain query by the means of kSecUseAuthenticationContext, then setting this property to YES has the same effect as passing kSecUseNoAuthenticationUI in the query, i.e. the keychain call will eventually fail with errSecInteractionNotAllowed instead of displaying the authentication UI.

If this property is used with a LocalAuthentication evaluation, it will eventually fail with kErrorNotInteractive instead of displaying the authentication UI.
(Read and Write property)

### 185.1.16 localizedCancelTitle as String

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Cancel button title.
**Notes:** Allows cancel button title customization. A default title "Cancel" is used when this property is set to empty string.
Requires MacOS 10.13 or newer.
(Read and Write property)

### 185.1.17 localizedFallbackTitle as String

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Fallback button title.
**Example:**

```
dim lc as new MyLAContextMBS
lc.localizedFallbackTitle = "Just a test"
```

**Notes:** Allows fallback button title customization. A default title "Enter Password" is used when this property is left nil. If set to empty string, the button will be hidden.
(Read and Write property)

### 185.1.18 localizedReason as String

MBS Mac64bit Plugin, Plugin Version: 18.4, Platform: macOS, Targets: All.

**Function:** Allows setting the default localized authentication reason on context.
**Notes:** A localized string from this property is displayed in the authentication UI if the caller didn't specify its own authentication reason (e.g. a keychain operation with kSecUseAuthenticationContext). This property is ignored if the authentication reason was provided by caller.
Requires MacOS 10.13 or newer.
(Read and Write property)

### 185.1.19 touchIDAuthenticationAllowableReuseDuration as Double

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: All.

**Function:** Time interval for accepting a successful Touch ID unlock from the past.
**Notes:** This property can be set with a time interval in seconds. If the device was successfully unlocked by Touch ID within this time interval, then Touch ID authentication on this context will succeed automatically and the reply block will be called without prompting user for Touch ID.

The default value is 0, meaning that no previous TouchID authentication can be reused.

The maximum supported interval is 5 minutes and setting the value beyond 5 minutes does not increase the accepted interval.
(Read and Write property)

### 185.1.20 Events

### 185.1.21 evaluatePolicyResult(Success as Boolean, error as NSErrorMBS, Policy as Integer, localizedReason as String, tag as Variant)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** The event called for the result of evaluatePolicy method.
**Notes:** success: Reply parameter that is true if the policy has been evaluated successfully or false if the evaluation failed.

error: Reply parameter that is nil if the policy has been evaluated successfully, or it contains error information about the evaluation failure.

Typical error codes returned by this call are:
ErrorUserFallback if user tapped the fallback button

ErrorUserCancel if user has tapped the Cancel button
ErrorSystemCancel if some system event interrupted the evaluation (e.g. Home button pressed).

### 185.1.22 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kLAErrorDomain | "com.apple.LocalAuthentication" | The error domain for Local Authentication. |

Biometry Types

| Constant | Value | Description |
|---|---|---|
| BiometryTypeFaceID | 2 | The device supports Face ID. |
| BiometryTypeNone | 0 | The device does not support biometry. |
| BiometryTypeTouchID | 1 | The device supports Touch ID. |

Credential Types

| Constant | Value | Description |
|---|---|---|
| CredentialTypeApplicationPassword | 0 | The credential type for an application password. |
| CredentialTypeSmartCardPIN | 1 | Smart card PIN provided by application.<br>If not set, LocalAuthentication will ask users for the smart card PIN w<br>necessary. Applications can provide the PIN using setCredential method.<br>such case, LocalAuthentication will not show the smart card PIN user interf<br>When entered from the LocalAuthentication user interface, the PIN is sto<br>as UTF-8 encoded string. |

Error Codes

| Constant | Value | Description |
|---|---|---|
| kErrorAppCancel | -9 | Authentication was canceled by application (e.g. invalidate was called while authentication was in progress). |
| kErrorAuthenticationFailed | -1 | Authentication was not successful, because user failed to provide valid credentials. |
| kErrorBiometryLockout | -8 | Authentication was not successful, because there were too many failed Biometry attempts and Biometry is now locked. Passcode is required to unlock Biometry, e.g. evaluating PolicyDeviceOwnerAuthenticationWithBiometrics will ask for passcode as a prerequisite. |
| kErrorBiometryNotAvailable | -6 | Authentication could not start, because Biometry is not available on the device. |
| kErrorBiometryNotEnrolled | -7 | Authentication could not start, because Biometry has no enrolled fingers. |
| kErrorInvalidContext | -10 | LAContext passed to this call has been previously invalidated. |
| kErrorPasscodeNotSet | -5 | Authentication could not start, because passcode is not set on the device. |
| kErrorSystemCancel | -4 | Authentication was canceled by system (e.g. another application went to foreground). |
| kErrorTouchIDLockout | -8 | Authentication was not successful, because there were too many failed Touch ID attempts and Touch ID is now locked. Passcode is required to unlock Touch ID, e.g. evaluating PolicyDeviceOwnerAuthenticationWithBiometrics will ask for passcode as a prerequisite. |
| kErrorTouchIDNotAvailable | -6 | Authentication could not start, because Touch ID is not available on the device. |
| kErrorTouchIDNotEnrolled | -7 | Authentication could not start, because Touch ID has no enrolled fingers. |
| kErrorUserCancel | -2 | Authentication was canceled by user (e.g. tapped Cancel button). |
| kErrorUserFallback | -3 | Authentication was canceled, because the user tapped the fallback button (Enter Password). |

Policies

| Constant | Value | Description |
|---|---|---|
| PolicyDeviceOwnerAuthentication | 2 | Device owner is going to be authenticated by biome<br>Touch ID or user password authentication is requ<br>available, not enrolled or locked out, then the user i<br>away.<br>Touch ID authentication dialog behaves similarly<br>cyDeviceOwnerAuthenticationWithBiometrics. How<br>button does not end the authentication. Instead, it s<br>mechanism to user password. |
| PolicyDeviceOwnerAuthenticationWithBiometrics | 1 | The policy for owner authentication with biometrics |
| PolicyDeviceOwnerAuthenticationWithBiometricsOrWatch | 4 | Device owner is going to be authenticated by biome<br>Watch or biometric authentication is required. If no<br>can be found, it behaves as PolicyDeviceOwnerAuth<br>Similarly, if biometry is unavailable it behaves as P<br>ticationWithWatch.<br>Watch authentication dialog looks and behaves simi<br>When both mechanisms are available, user is asked<br>authentication will run in parallel. |
| PolicyDeviceOwnerAuthenticationWithWatch | 3 | Watch authentication is required. If no nearby pa<br>found,<br>kErrorWatchNotAvailable is returned.<br>Watch authentication dialog looks and behaves simi<br>ant. Users can confirm authentication by double-c<br>their watch. |

## 185.2 class NSColorPickerTouchBarItemMBS

### 185.2.1 class NSColorPickerTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar item showing a color picker.
**Notes:** Subclass of the NSTouchBarItemMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.2.2 Methods

### 185.2.3 colorPicker(identifier as string) as NSColorPickerTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a bar item containing a button with the standard color picker icon that invokes the color picker.
**Example:**

```
dim t as NSColorPickerTouchBarItemMBS = NSColorPickerTouchBarItemMBS.colorPicker("test")
t.customizationLabel = "Drawing Color"
```

**Notes:** You may want to use AddHandler method to add an event handler to this object.
See also:

- 185.2.4 colorPicker(identifier as string, buttonImage as NSImageMBS) as NSColorPickerTouchBarItemMBS 22241

### 185.2.4 colorPicker(identifier as string, buttonImage as NSImageMBS) as NSColorPickerTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a bar item containing a button with the provided image that invokes the color picker.
**Notes:** You may want to use AddHandler method to add an event handler to this object.
See also:

- 185.2.3 colorPicker(identifier as string) as NSColorPickerTouchBarItemMBS 22241

### 185.2.5 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Example:**

```
dim t as new NSColorPickerTouchBarItemMBS("test")
t.customizationLabel = "Drawing Color"
```

**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.2.6 strokeColorPicker(identifier as string) as NSColorPickerTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a bar item containing a button with the standard stroke color picker icon that invokes the color picker.
**Notes:** You may want to use AddHandler method to add an event handler to this object.
Should be used when the item is used for picking stroke colors.

### 185.2.7 textColorPicker(identifier as string) as NSColorPickerTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a bar item containing a button with the standard text color picker icon that invokes the color picker.
**Notes:** You may want to use AddHandler method to add an event handler to this object.
Should be used when the item is used for picking text colors.

### 185.2.8 Properties

### 185.2.9 color as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The selected color of the picker.
**Notes:** (Read and Write property)

### 185.2.10 colorList as NSColorListMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The color list displayed in the list color picker.
**Notes:** Defaults to the standard system color list. Setting a custom color list will disable the additional tints/shades that appear on long-press.
(Read and Write property)

### 185.2.11 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Example:**

```
dim t as new NSColorPickerTouchBarItemMBS("test")
t.customizationLabel = "Drawing Color"
```

**Notes:** The default value is empty string.
(Read and Write property)

### 185.2.12 enabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Enables or disabled the color picker.
**Notes:** If it is currently being shown in a popover, it will be dismissed.
(Read and Write property)

### 185.2.13 showsAlpha as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not the picker should allow picking a color with non-1.0 alpha.
**Notes:** Defaults to "not NSColor.ignoresAlpha".
(Read and Write property)

### 185.2.14 Events

### 185.2.15 Action

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The color picker changed color.

## 185.3 class NSCustomTouchBarItemMBS

### 185.3.1 class NSCustomTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar item showing a custom view.
**Notes:** Subclass of the NSTouchBarItemMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.3.2 Methods

### 185.3.3 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Example:**

```
dim t as new NSCustomTouchBarItemMBS("test")
t.customizationLabel = "My Test"
```

**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.3.4 Properties

### 185.3.5 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Example:**

```
dim t as new NSCustomTouchBarItemMBS("test")
t.customizationLabel = "Drawing Color"
```

**Notes:** The default value is empty string.
(Read and Write property)

### 185.3.6 view as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A view to be displayed in the touch bar in the location corresponding to this item.
**Notes:** By default, the getter for this property will return this item's view controller's view. If this property is set explicitly, the view controller will be set to nil.
(Read and Write property)

### 185.3.7 viewController as NSViewControllerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A view controller whose view is to be displayed in the touch bar in the location corresponding to this item.
**Notes:** By default, this property is nil.
When set, this item's view property will automatically return the view associated with this view controller.
(Read and Write property)

## 185.4 class NSGroupTouchBarItemMBS

### 185.4.1 class NSGroupTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar item showing a group.
**Notes:** Subclass of the NSTouchBarItemMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

### 185.4.2 Methods

### 185.4.3 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Example:**

```
dim t as new NSGroupTouchBarItemMBS("test")
t.customizationLabel = "My Group"
```

**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.4.4 groupItemWithIdentifier(identifier as string, items() as NSTouchBarItemMBS) as NSGroupTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns an autoreleased NSGroupTouchBarItem with a groupTouchBar built from the given items array.
**Example:**

```
dim t as NSGroupTouchBarItemMBS = NSGroupTouchBarItemMBS.groupItemWithIdentifier("test")
t.customizationLabel = "My Group"
```

**Notes:** Customization is not enabled by default when creating a NSGroupTouchBarItem this way.

### 185.4.5 Properties

### 185.4.6 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Notes:** The default value is empty string.
(Read and Write property)

### 185.4.7 groupTouchBar as NSViewControllerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A touch bar, presented seamlessly as part of the touch bar this item is hosted in.
**Notes:** This touch bar may have its own principal item, and can be customized (or not) per the normal touch bar customization rules.
By default this is an empty touch bar that cannot be customized.
(Read and Write property)

## 185.5 class NSPopoverTouchBarItemMBS

### 185.5.1 class NSPopoverTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar item showing a popover.
**Notes:** Subclass of the NSTouchBarItemMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.5.2 Methods

### 185.5.3 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.5.4 dismissPopover

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** This method will restore the previously visible main touch bar.
**Notes:** This method can be invoked explicitly to order out a popover if interacting with an item inside it should close it.

### 185.5.5 showPopover

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Replaces the main touch bar with this item's popover touch bar.
**Notes:** If this item is not visible, this method will have no effect. If this item ceases to be visible, the popover touch bar will automatically be ordered out.

### 185.5.6 Properties

### 185.5.7 collapsedRepresentation as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The view displayed when the item is in its hosted touch bar.
**Notes:** By default, this is an NSButton whose target is this popover item, whose action is showPopover, and whose image and title are bound to this item's collapsedRepresentationImage and collapsedRepresentationLabel respectively.
(Read and Write property)

### 185.5.8 collapsedRepresentationImage as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The image displayed by the button used by default for the default collapsed representation.
**Notes:** If the collapsedRepresentation button has been replaced by a different view, this property may not have any effect.
(Read and Write property)

### 185.5.9 collapsedRepresentationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string displayed by the button used by default for the default collapsed representation.
**Notes:** If the collapsedRepresentation button has been replaced by a different view, this property may not have any effect. This property is archived.
(Read and Write property)

### 185.5.10 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Notes:** The default value is empty string.
(Read and Write property)

### 185.5.11 popoverTouchBar as NSTouchBarMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The touch bar displayed when this item is "popped."
**Notes:** By default this is an empty touch bar that cannot be customized. This property is archived.
(Read and Write property)

### 185.5.12 pressAndHoldTouchBar as NSTouchBarMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A touchbar to be used exclusively for press-and-hold popovers.
**Notes:** This touch bar can be the same as the one used for "popoverTouchBar" property, but does not have to be. When non-nil this touch bar will be displayed while the user holds their finger down on the collapsed representation and released when the user raises their finger. This tracking behavior is automatic, but popovers with custom collapsed representations will still need to send showPopover to start tracking.
(Read and Write property)

### 185.5.13 showsCloseButton as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** When true, automatically displays a close button in the popover.
**Notes:** When false it is the responsibility of the client to dismiss the popover.
(Read and Write property)

## 185.6 class NSSliderTouchBarItemMBS

### 185.6.1 class NSSliderTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar item showing a slider.
**Notes:** Subclass of the NSTouchBarItemMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Xojo Developer Magazine**

- 15.5, page 35: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.6.2 Methods

### 185.6.3 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.customizationLabel = "My Slider"
```

**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.6.4 Properties

### 185.6.5 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Notes:** The default value is empty string.
(Read and Write property)

### 185.6.6 label as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The text label displayed along with the slider.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.label = "Pen Size"
```

**Notes:** If set to nil, the label will not have space reserved in the item.
(Read and Write property)

### 185.6.7 maxValue as Double

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The maximum value of the slider.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.minValue = 0.0
t.maxValue = 1.0
t.value = 0.5
```

**Notes:** (Read and Write property)

### 185.6.8 minValue as Double

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The minimum value of the slider.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.minValue = 0.0
t.maxValue = 1.0
t.value = 0.5
```

**Notes:** (Read and Write property)

### 185.6.9 slider as NSSliderMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The slider displayed by the bar item.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.minValue = 0.0
t.maxValue = 1.0
t.value = 0.5
```

**Notes:** It is automatically created, but can be set to a custom subclass.
Value, minValue, maxValue, etc can all be read and set through the slider.
(Read and Write property)

### 185.6.10 value as Double

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The current value of the slider.
**Notes:** (Read and Write property)

### 185.6.11 Events

### 185.6.12 Action

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The slider changed.

## 185.7 class NSTouchBarItemMBS

### 185.7.1 class NSTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a touch bar item.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Videos**

- TouchBar with MBS Xojo Plugin

**Xojo Developer Magazine**

- 15.5, pages 42 to 44: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar
- 15.5, page 39: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar
- 15.5, page 37: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.7.2 Methods

### 185.7.3 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Example:**

```
if NSTouchBarItemMBS.Available then
MsgBox "This Mac may have a TouchBar or not."
else
MsgBox "This Mac is too old for a TouchBar."
end if
```

**Notes:** Returns true on macOS 10.12.1 and newer, if the version with TouchBar support is installed.

### 185.7.4 Constructor(identifier as string)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The designated initializer.
**Notes:** This instantiates a new touch bar item with the specified initializer.

### 185.7.5 NSTouchBarItemIdentifierFixedSpaceLarge as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The identifier of an item appropriate for use as a large space in the touch bar.
**Example:**

```
// create flexible space item
dim t as new NSTouchBarItemMBS(NSTouchBarItemMBS.NSTouchBarItemIdentifierFixedSpaceLarge)
```

**Notes:** Generally, you can use this identifier in a touch bar's itemIdentifiers array, and it will instantiate that space for you.

### 185.7.6 NSTouchBarItemIdentifierFixedSpaceSmall as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The identifier of an item appropriate for use as a small space in the touch bar.
**Example:**

```
// create fixed space item
dim t as new NSTouchBarItemMBS(NSTouchBarItemMBS.NSTouchBarItemIdentifierFixedSpaceSmall)
```

**Notes:** Generally, you can use this identifier in a touch bar's itemIdentifiers array, and it will instantiate that space for you.

### 185.7.7 NSTouchBarItemIdentifierFlexibleSpace as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The identifier of an item appropriate for use as a flexible space in the touch bar.
**Example:**

```
// create flexible space item
dim t as new NSTouchBarItemMBS(NSTouchBarItemMBS.NSTouchBarItemIdentifierFlexibleSpace)
```

**Notes:** Generally, you can use this identifier in a touch bar's itemIdentifiers array, and it will instantiate that space for you.

### 185.7.8 NSTouchBarItemIdentifierOtherItemsProxy as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The identifier of the special "other items proxy."
**Example:**

```
// create proxy item
dim t as new NSTouchBarItemMBS(NSTouchBarItemMBS.NSTouchBarItemIdentifierOtherItemsProxy)
```

**Notes:** Generally, you can use this identifier in a touch bar's itemIdentifiers array, and a special proxy item will be instantiated for you. When the touch bar containing this item is visible, touch bars provided by items closer to the first responder will be nested inside the space denoted for this item. Space items on either side of this item will be automatically massaged to handle cases where the touch bar containing this identifier is itself the bar closest to the first responder (or closer bars are empty.)
Note that a touch bar lacking this item identifier will be replaced in its entirety by touch bars closer to the first responder.

### 185.7.9 Properties

### 185.7.10 customizationLabel as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The localized string labelling this item during user customization.
**Notes:** The default value is empty string.
(Read only property)

### 185.7.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 185.7.12 identifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The identifier of this item.
**Notes:** Apart from spaces, item identifiers should be globally unique.
(Read only property)

### 185.7.13 view as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Intended for subclassing.
**Notes:** By default, this method returns this item's view controller's view.
(Read only property)

### 185.7.14 viewController as NSViewControllerMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Intended for subclassing.
**Notes:** By default, this method returns nil.
(Read only property)

### 185.7.15 visibilityPriority as Single

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** If there are more items in the touch bar than can be displayed, some will be hidden.
**Example:**

```
dim t as NSSliderTouchBarItemMBS = new NSSliderTouchBarItemMBS("test")
t.visibilityPriority = t.PriorityLow
```

**Notes:** Items with high visibility priority will be hidden after items with low visibility priority.
(Read and Write property)

### 185.7.16 visible as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** When true, this item is attached to a visible touch bar, and is being displayed.
**Notes:** Note that some types of items are never considered visible, for example spaces, other items proxys, and groups.
This property is key value observable.
(Read only property)

### 185.7.17 Events

### 185.7.18 Hidden

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called when the item is hidden.

### 185.7.19 Shown

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called when the item is shown.

### 185.7.20 Constants

Visibility Priority

| Constant | Value | Description |
|---|---|---|
| PriorityHigh | 1000 | nItems with high visibility priority will be hidden after items with low visibility priority.one |
| PriorityLow | -1000 | nItems with high visibility priority will be hidden after items with low visibility priority.one |
| PriorityNormal | 0 | nItems with high visibility priority will be hidden after items with low visibility priority.one |

## 185.8 class NSTouchBarMBS

### 185.8.1 class NSTouchBarMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The class for a TouchBar on a new MacBook Pro.
**Blog Entries**

- MBS Xojo Plugins, version 17.3pr1
- MBS Xojo / Real Studio Plugins, version 16.5pr7
- MBS Xojo / Real Studio Plugins, version 16.5pr5

**Videos**

- TouchBar with MBS Xojo Plugin
- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.5, page 41: Touch√©, Using Apple's Touch Bar with Xojo by Marc Zeedar

### 185.8.2 Methods

### 185.8.3 AssignToApp

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Assigns the TouchBar to be the main TouchBar for the whole app.

### 185.8.4 AssignToWindow(window as DesktopWindow)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Assigns the TouchBar to be the given window.
**Notes:** The TouchBar on MacBook Pro will show this entries, if the given window is the front window.
See also:


- 185.8.5 AssignToWindow(window as NSWindowMBS) 22261
- 185.8.6 AssignToWindow(window as window) 22261

### 185.8.5 AssignToWindow(window as NSWindowMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Assigns the TouchBar to be the given window.
**Notes:** The TouchBar on MacBook Pro will show this entries, if the given window is the front window.
See also:


- 185.8.4 AssignToWindow(window as DesktopWindow) 22260
- 185.8.6 AssignToWindow(window as window) 22261


### 185.8.6 AssignToWindow(window as window)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Assigns the TouchBar to be the given window.
**Notes:** The TouchBar on MacBook Pro will show this entries, if the given window is the front window.
See also:


- 185.8.4 AssignToWindow(window as DesktopWindow) 22260
- 185.8.5 AssignToWindow(window as NSWindowMBS) 22261


### 185.8.7 Available as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Example:**

```
if NSTouchBarMBS.Available then
MsgBox "This Mac may have a TouchBar or not."
else
MsgBox "This Mac is too old for a TouchBar."
end if
```

**Notes:** Returns true on macOS 10.12.1 and newer, if the version with TouchBar support is installed.

### 185.8.8 Constructor

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 185.8.9 customizationAllowedItemIdentifiers as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The items that are presented in the customization palette for the user to add to the touch bar.
**Notes:** These items will be presented to the user in the order specified in this array.

### 185.8.10 customizationRequiredItemIdentifiers as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Some items are too important to be removed.
**Notes:** The corresponding item identifiers should be listed here. During customization the user will be prevented from removing these items from the touch bar.

### 185.8.11 defaultItemIdentifiers as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** An array of identifiers specifying the items in this touch bar.
**Notes:** When constructing the instantiated items array, the identifiers in this array will be fed through the itemForIdentifier method.
Item identifiers should be globally unique, excepting NSTouchBarItemIdentifierFixedSpaceSmall, NSTouchBarItemIdentifierFixedSpaceLarge, NSTouchBarItemIdentifierFlexibleSpace, and NSTouchBarItemIdentifierOtherItemsProxy.

This array also corresponds to the item ordering for the receiver in the ‚Äúdefault set‚Äù in the customization palette.

### 185.8.12 itemForIdentifier(identifier as string) as NSTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns an instantiated NSTouchBarItem for the given identifier.
**Notes:** Items are resolved from the following locations, in order:

- items already in the instantiated items array
- items in the defaultTouchBarItems set
- items returned from the delegate's -touchBar:makeItemForIdentifier: method
- some special identifiers are handled automatically

NSTouchBarItemIdentifierFixedSpaceSmall ->NSTouchBar will automatically create a standard small space
NSTouchBarItemIdentifierFixedSpaceLarge ->NSTouchBar will automatically create a standard large space
NSTouchBarItemIdentifierFlexibleSpace ->NSTouchBar will automatically create a standard flexible space
NSTouchBarItemIdentifierOtherItemsProxy ->NSTouchBar will automatically create a special item that acts as a proxy for the items of touch bars closer to the first responder.

### 185.8.13 itemIdentifiers as String()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The resolved array of item identifiers. If the bar has not been customized this will match the defaultItemIdentifiers.

### 185.8.14 RemoveTouchBarFromApp

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes TouchBar for app.

### 185.8.15 RemoveTouchBarFromWindow(window as NSWindowMBS)

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes TouchBar for window.
See also:

- 185.8.16 RemoveTouchBarFromWindow(window as window) 22263

### 185.8.16 RemoveTouchBarFromWindow(window as window)

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes TouchBar for window.
See also:

- 185.8.15 RemoveTouchBarFromWindow(window as NSWindowMBS) 22263

### 185.8.17 setCustomizationAllowedItemIdentifiers(Identifiers() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the items that are presented in the customization palette for the user to add to the touch bar.
**Notes:** These items will be presented to the user in the order specified in this array.

### 185.8.18 setCustomizationRequiredItemIdentifiers(Identifiers() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the items are too important to be removed.
**Notes:** The corresponding item identifiers should be listed here. During customization the user will be prevented from removing these items from the touch bar.

### 185.8.19 setDefaultItemIdentifiers(Identifiers() as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the array of identifiers specifying the items in this touch bar.

### 185.8.20 setTemplateItems(Identifiers() as NSTouchBarItemMBS)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the template item identifiers.
**Notes:** Items in this set are the first step in resolving instantiated items from their identifiers.
If an item identifier is specified in the itemIdentifiers array, and an item with that identifier is in this set, it will be added to the items array in the corresponding location.

### 185.8.21 templateItems as NSTouchBarItemMBS()

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Items in this set are the first step in resolving instantiated items from their identifiers.
**Notes:** If an item identifier is specified in the itemIdentifiers array, and an item with that identifier is in this set, it will be added to the items array in the corresponding location.

### 185.8.22 toggleTouchBarCustomizationPalette

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Show or dismiss the customization palette for the currently displayed touch bars.
**Notes:** NSApplication validates this selector against whether the current touch bars are customizable and, if configured on a menu item, will standardize and localize the title. If the current system does not have touch bar support, the menu item will be automatically hidden.

### 185.8.23 Properties

### 185.8.24 automaticCustomizeTouchBarMenuItemEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether or not a menu item to customize the touch bar can be automatically added to the main menu.
**Notes:** It will only actually be added when a touch bar hardware or simulator is present. Defaults to false. Setting this property to True is the recommended way to add the customization menu item. But if non-standard placement of the menu item is needed, creating a menu item with an action of toggleTouchBarCustomizationPalette can be used instead.
(Read and Write property)

### 185.8.25 customizationIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A string uniquely identifying this bar for customization purposes.
**Notes:** All bars with this identifier will have their items coordinated automatically during customization or instantiation.
Touch bars lacking a customizationIdentifier are not customizable.
(Read and Write property)

### 185.8.26 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 185.8.27 principalItemIdentifier as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Specifying a principal item identifier communicates that the item with that identifier has special significance to this touch bar.
**Notes:** Currently, that item will be placed in the center of the resolved touch row. Note that multiple visible bars may each specify a principal item identifier - but only one of them can have the request honored. (Read and Write property)

### 185.8.28 visible as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** When true, the touch bar is attached to an eligible touch bar provider, and its items are displayable, assuming adequate space.
**Notes:** (Read only property)

### 185.8.29 Events

### 185.8.30 DidEnterCustomization

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The customization did start.

### 185.8.31 DidExitCustomization

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The customization did exit.

### 185.8.32 Hidden

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called when the bar is hidden.

### 185.8.33 makeItemForIdentifier(identifier as string) as NSTouchBarItemMBS

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** When constructing the items array, this event will be invoked to construct a touch bar item if that item cannot be found in the defaultItems set.

### 185.8.34 Shown

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** The event called when the bar is shown.

### 185.8.35 WillEnterCustomization

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The customization will start soon.

### 185.8.36 WillExitCustomization

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The customization will exit soon.

# Chapter 186

# Twain

## 186.1 class TwainIdentityMBS

### 186.1.1 class TwainIdentityMBS

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Provides identification information about a TWAIN entity.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 186.1.2 Methods

### 186.1.3 Constructor

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The private constructor.

### 186.1.4 Properties

### 186.1.5 Id as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** A unique, internal identifier for the TWAIN entity.
**Notes:** This field is only filled by the Source Manager. Neither an application nor a Source should fill this field. The Source uses the contents of this field to "identify" which application is invoking the operation sent

to the Source.
(Read and Write property)

### 186.1.6 Manufacturer as String

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** String identifying the manufacturer of the application or Source. e.g. "Aldus".
**Notes:** (Read and Write property)

### 186.1.7 ProductFamily as String

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Tells an application that performs device-specific operations which product family the Source supports.
**Notes:** This is useful when a new Source has been released and the application doesn't know about the particular Source but still wants to perform Custom operations with it. e.g. "ScanMan".
(Read and Write property)

### 186.1.8 ProductName as String

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** A string uniquely identifying the Source.
**Notes:** This is the string that will be displayed to the user at Source select-time. This string must uniquely identify your Source for the user, and should identify the application unambiguously for Sources that care. e.g. "ScanJet IIc".
(Read and Write property)

### 186.1.9 ProtocolMajor as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Major number of latest TWAIN version that this element supports.
**Notes:** (Read and Write property)

### 186.1.10 ProtocolMinor as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Minor number of latest TWAIN version that this element supports.
**Notes:** (Read and Write property)

### 186.1.11 SupportedGroups as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Supported grosups.
**Notes:** The application will normally set this field to specify which Data Group(s) it wants the Source Manager to sort Sources by when presenting the Select Source dialog, or returning a list of available Sources. The application sets this prior to invoking a SelectDS operation.

- The application may also set this field to specify which Data Group(s) it wants the Source to be able to acquire and transfer. The application must do this prior to sending the Source its EnableDS operation.
- The Source must set this field to specify which Data Group(s) it can acquire. It will do this in response to a OpenDS.
- Beginning with TWAIN 2.0 the Source Manager reserves the most significant two byes in the SupportedGroups for the Data Flags (&h0001000 to &hFFFF0000).

DF_DSM2–identifies the Source Manager as TWAIN 2.0 compliant DF_APP2 –is set by an Application that is TWAIN 2.0 compliant DF_DS2–is set by a Source that is TWAIN 2.0 compliant
(Read and Write property)

### 186.1.12 Version as TwainVersionMBS

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The version information.
**Notes:** (Read and Write property)

## 186.2 class TwainImageInfoMBS

### 186.2.1 class TwainImageInfoMBS

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Describes the "real" image data, that is, the complete image being transferred between the Source and application.
**Notes:** The Source may transfer the data in a different format–the information may be transferred in "strips" or "tiles" in either compressed or uncompressed form. See the TW_IMAGEMEMXFER structure for more information.
The term "sample" is referred to a number of times in this structure. It holds the same meaning as in the TIFF specification. A sample is a contiguous body of image data that can be categorized by the channel or "ink color" it was captured to describe. In an R-G-B (Red-Green-Blue) image, such as on your TV or computer's CRT, each color channel is composed of a specific color. There are 3 samples in an R-G-B; Red, Green, and Blue. A C-Y-M-K image has 4 samples. A Grayscale or Black and White image has a single sample.
Note: The value -1 in ImageWidth and ImageLength are special cases. It is possible for a Sourcetonot-knoweitheritsWidthorLength. Applicationsneedtoconsiderthiswhen allocating memory or otherwise dealing with the size of the Image.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 186.2.2 Methods

### 186.2.3 BitsPerSample(index as Integer) as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** For each sample, the number of bits of information.
**Notes:** 24-bit R-G-B will typically have 8 bits of information in each sample (8+8+8). Some 8-bit color is sampled at 3 bits Red, 3 bits Green, and 2 bits Blue. Such a scheme would put 3, 3, and 2 into the first 3 elements of this array. The supplied array allows up to 8 samples. Samples are not limited to 8 bits. However, both the application and Source must simultaneously support sample sizes greater than 8 bits per color.

Index from 0 to 7.

### 186.2.4 Constructor

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The private constructor.

### 186.2.5 Properties

### 186.2.6 BitsPerPixel as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The number of bits in each image pixel (or bit depth).
**Notes:** This value is invariant across the image. 24-bit R-G-B has BitsPerPixel = 24. 40-bit C-M-Y-K has BitsPerPixel=40. 8-bit Grayscale has BitsPerPixel = 8. Black and White has BitsPerPixel = 1.
(Read and Write property)

### 186.2.7 Compression as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The compression method used to process the data being transferred.
**Notes:** Default is no compression.
(plugin currently only supports no compression)
(Read and Write property)

### 186.2.8 ImageLength as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** How tall/long, in pixels, the image to be transferred is.
**Notes:** If the Source doesn't know, set this field to -1 (hand scanners may do this).
-1 can only be used if the application has set ICAP_UNDEFINEDIMAGESIZE to TRUE.
(the plugin doesn't support undefined image size)
(Read and Write property)

### 186.2.9 ImageWidth as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** How wide, in pixels, the entire image to be transferred is.
**Notes:** If the Source doesn't know, set this field to -1 (hand scanners may do this).
-1 can only be used if the application has set ICAP_UNDEFINEDIMAGESIZE to TRUE.
(the plugin doesn't support undefined image size)
(Read and Write property)

### 186.2.10 PixelType as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** This is the highest categorization for how the data being transferred should be interpreted by the application.
**Notes:** This is how the application can tell if the data is Black and White, Grayscale, or Color. Currently, the only color type defined is "tri-stimulus", or color described by three characteristics. Most popular color description methods use tri- stimulus descriptors. For simplicity, the constant used to identify tri-stimulus color is called TWPT_RBG, for R-G-B color. There is no default for this value. Fill this field with the appropriate TWPT_xxxx constant.

The plugin does currently only support RGB, GRAY, BW and PALETTE.
(Read and Write property)

### 186.2.11 Planar as Boolean

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Whether image is planar.
**Notes:** If SamplesPerPixel >1, indicates whether the samples follow one another on a pixel-by-pixel basis (R-G-B-R-G-B-R-G-B...) as is common with a one-pass scanner or all the pixels for each sample are grouped together (complete group of R, complete group of G, complete group of B) as is common with a three-pass scanner. If the pixel-by-pixel method (also known as "chunky") is used, the Source should set Planar = false. If the grouped method (also called "planar") is used, the Source should set Planar = true.
(Read and Write property)

### 186.2.12 RowBytes as Integer

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Windows, Targets: All.

**Function:** The number of bytes in a row.
**Notes:** This is not exactly the value as you may expect as Twain needs some rounding.
(Read and Write property)

### 186.2.13 SamplesPerPixel as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The number of samples being returned.
**Notes:** For R-G-B, this field would be set to 3. For C-M-Y-K, 4. For Grayscale or Black and White, 1.
(Read and Write property)

### 186.2.14 XResolution as Double

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Horizontal resolution.
**Notes:** In pixels per inch.
(Read and Write property)

### 186.2.15 YResolution as Double

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** Vertical resolution.
**Notes:** In pixels per inch.
(Read and Write property)

## 186.3 class TwainImageLayoutMBS

### 186.3.1 class TwainImageLayoutMBS

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The class for an image layout.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 13.1pr4

### 186.3.2 Methods

### 186.3.3 Constructor

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The private constructor.

### 186.3.4 Properties

### 186.3.5 Bottom as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The bottom coordinate of the item.
**Notes:** (Read and Write property)

### 186.3.6 DocumentNumber as Integer

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The document number.
**Notes:** (Read and Write property)

### 186.3.7 FrameNumber as Integer

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The frame number.
**Notes:** (Read and Write property)

### 186.3.8 Height as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The height of the item.
**Notes:** (Read only property)

### 186.3.9 Left as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The left coordinate of the item.
**Notes:** (Read and Write property)

### 186.3.10 PageNumber as Integer

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The page number.
**Notes:** (Read and Write property)

### 186.3.11 Right as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The right coordinate of the item.
**Notes:** (Read and Write property)

### 186.3.12 Top as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The top coordinate of the item.
**Notes:** (Read and Write property)

### 186.3.13 Width as Double

MBS Picture Plugin, Plugin Version: 13.1, Platforms: macOS, Windows, Targets: All.

**Function:** The width of the item.
**Notes:** (Read only property)

## 186.4 class TwainMBS

### 186.4.1 class TwainMBS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The plugin class for scanning with TWAIN compatible scanners.
**Notes:** Use is like this:

- Declare subclass of TwainMBS so you can get events.
- Create new instance of your subclass and store object in some window/app/module property.
- For Windows call InstallEvent.
- To scan, call Acquire method.
- If driver runs synchronously, a modal window shows and you get back a picture object right away when scanning is done.
- If driver runs asynchronously, it shows a non modal window and you receive events.
- In TransferReady event you can call TransferImage method. In example a timer is triggered so this runs in the window.
- To cleanup, use DisableDS and CloseDS methods.
- We recommend only to have one instance of the TwainMBS object.

When Xojo or Xojo is used (32 bit), we can of course only see and use devices with 32 bit drivers.
Once Xojo will be ported to 64bit, we can only talk to 64bit drivers.

For 64-bit on Windows you can find 64-bit TwainDSM.dll here:
https://github.com/twain/twain-dsm
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo / Real Studio Plugins, version 15.2pr8
- MBS Xojo / Real Studio Plugins, version 15.1pr9
- MBS Xojo / Real Studio Plugins, version 15.0pr10
- MBS Xojo / Real Studio Plugins, version 13.5pr8
- MBS Xojo / Real Studio Plugins, version 13.3pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.0pr10
- MBS Real Studio Plugins, version 13.0pr7
- MBS Real Studio Plugins, version 12.5pr8

### 186.4.2 Methods

### 186.4.3 Acquire(modal as boolean = false, showUI as boolean = true) as picture

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Acquires a new picture.
**Notes:** Lasterror is set.
Plugin asks for asynchronously operation, so this function returns nil and success in lasterror.
If data source must be used with modal UI, this function returns with picture.

Modal can be true to ask for modal dialog. Seems to be only supported on Mac.

### 186.4.4 AllDevices as TwainIdentityMBS()

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Returns array with all devices.
**Example:**

```
dim twain as TwainMBS // your twain object
dim devices() as TwainIdentityMBS = twain.AllDevices
dim found as Boolean
dim NameToFind as string = "MyScanner123"

for each device as TwainIdentityMBS in devices

if device.ProductName = NameToFind then
found = true

// lets use this one
twain.SelectDS(device)

if twain.Lasterror <>0 then
MsgBox "Failed to select "+device.ProductName
else
'MsgBox "OK"
exit
end if
end if
next

if not found then
MsgBox "No scanner found named: "+NameToFind
end if
```

### 186.4.5 AppIdentity as TwainIdentityMBS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries app identity.
**Notes:** That's the identity the plugin used to register with twain library.

### 186.4.6 CanBW as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether device supports black and white pixel type.
**Notes:** Lasterror is set.

### 186.4.7 CanGray as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether device supports gray pixel type.
**Notes:** Lasterror is set.

### 186.4.8 CanPalette as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether current device supports palette pixel type.
**Notes:** Lasterror is set.

### 186.4.9 CanRGB as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether current device supports RGB pixel type.
**Notes:** Lasterror is set.

### 186.4.10 CloseDS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Close data source.
**Notes:** Lasterror is set.

### 186.4.11 CloseDSM

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Closes the data source manager.
**Notes:** Lasterror is set.

### 186.4.12 Constructor(Country as Integer, Language as Integer)

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Initializes Twain engine with given localization.
**Notes:** Lasterror is set.

### 186.4.13 DisableDS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Diables data source.
**Notes:** Lasterror is set.

### 186.4.14 DontUnload

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Informs the plugin to not unload the twain library.
**Notes:** This avoids a crash for some people.

### 186.4.15 DSIdentity as TwainIdentityMBS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries the details on the data source.
**Notes:** Lasterror is set.

### 186.4.16 GetEnumerationCapability(ID as Integer, byref ItemType as Integer, byref Count as Integer, byref CurrentIndex as Integer, byref DefaultIndex as Integer) as Integer()

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries an enum capability.
**Example:**

```
dim t as TwainMBS // your twain object

// check supported sizes

const ICAP_SUPPORTEDSIZES = &h1122
dim type5 as Integer
dim EnumCount as Integer = 0
dim EnumItemType as Integer = 0
dim EnumCurrentIndex as Integer = 0
dim EnumDefaultIndex as Integer = 0
dim EnumValues() as Integer = t.GetEnumerationCapability(ICAP_SUPPORTEDSIZES, EnumItemType,
EnumCount, EnumCurrentIndex, EnumDefaultIndex)
dim e5 as Integer = t.Lasterror
dim c5 as Integer = t.ConditionCode
```

**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
This should work fine for all integer enum types like boolean, 8, 16 or 32 bit integers.
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.17 GetIntegerCapability(ID as Integer, byref Type as Integer) as Integer

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries an integer capability.
**Example:**

```
dim t as TwainMBS // your twain object

t.OpenDS
```

```
if t.Lasterror <>0 then
MsgBox "Failed to open device: "+str(t.Lasterror)
Return
end if

const CAP_FEEDERENABLED = &h1002
const CAP_FEEDERLOADED = &h1003
const TWRC_FAILURE = 1
const TWCC_CAPUNSUPPORTED = 13

// query before
dim type1 as Integer
dim n1 as Integer = t.GetIntegerCapability(CAP_FEEDERENABLED, type1)
dim e1 as Integer = t.Lasterror
dim c1 as Integer = t.ConditionCode

// set on
t.SetBoolCapability CAP_FEEDERENABLED, true
dim e2 as Integer = t.Lasterror
dim c2 as Integer = t.ConditionCode

// query after
dim type3 as Integer
dim n3 as Integer = t.GetIntegerCapability(CAP_FEEDERENABLED, type3)
dim e3 as Integer = t.Lasterror
dim c3 as Integer = t.ConditionCode

// now query loaded?
dim type4 as Integer
dim n4 as Integer = t.GetIntegerCapability(CAP_FEEDERLOADED, type4)
dim e4 as Integer = t.Lasterror
dim c4 as Integer = t.ConditionCode

if e4 = TWRC_FAILURE AND c4 = TWCC_CAPUNSUPPORTED then
// not supported!
Break
end if
```

**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
This should work fine for all integer types like boolean, 8, 16 or 32 bit integers.
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.18 ImageInfo as TwainImageInfoMBS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries information about current image.
**Notes:** Lasterror is set.

### 186.4.19 IsDSEnabled as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether data source is enabled.

### 186.4.20 OpenDS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens the data source.

### 186.4.21 OpenDSM

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Opens Data source Manager.
**Notes:** Lasterror is set.

### 186.4.22 ProcessEvents

MBS Picture Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop only.

**Function:** Process events in plugin.
**Notes:** Only for Windows needed for some Twain drivers. You call it after you run Acquire to let the plugin wait for the events to start the transfer.
When transfer is ready or dialog is cancelled, this method ends.
On Mac OS X or Linux this method does nothing so it's no problem calling it.

### 186.4.23 SelectDS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Queries dialog to ask the user to select a data source.
**Notes:** Lasterror is set.
See also:

- 186.4.24 SelectDS(device as TwainIdentityMBS) 22286

### 186.4.24 SelectDS(device as TwainIdentityMBS)

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Selects the given device without dialog.
**Example:**

```
dim twain as TwainMBS // your twain object
dim devices() as TwainIdentityMBS = twain.AllDevices
dim found as Boolean
dim NameToFind as string = "MyScanner123"

for each device as TwainIdentityMBS in devices

if device.ProductName = NameToFind then
found = true

// lets use this one
twain.SelectDS(device)

if twain.Lasterror <>0 then
MsgBox "Failed to select "+device.ProductName
else
'MsgBox "OK"
exit
end if
end if
next

if not found then
MsgBox "No scanner found named: "+NameToFind
end if
```

**Notes:** Lasterror is set.
See also:

- 186.4.23 SelectDS 22285

### 186.4.25 SetBoolCapability(ID as Integer, Value as Boolean)

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with boolean.
**Example:**

```
dim t as TwainMBS // your twain object

t.OpenDS

if t.Lasterror <>0 then
MsgBox "Failed to open device: "+str(t.Lasterror)
Return
end if

const CAP_FEEDERENABLED = &h1002
const CAP_FEEDERLOADED = &h1003
const TWRC_FAILURE = 1
const TWCC_CAPUNSUPPORTED = 13

// query before
dim type1 as Integer
dim n1 as Integer = t.GetIntegerCapability(CAP_FEEDERENABLED, type1)
dim e1 as Integer = t.Lasterror
dim c1 as Integer = t.ConditionCode

// set on
t.SetBoolCapability CAP_FEEDERENABLED, true
dim e2 as Integer = t.Lasterror
dim c2 as Integer = t.ConditionCode

// query after
dim type3 as Integer
dim n3 as Integer = t.GetIntegerCapability(CAP_FEEDERENABLED, type3)
dim e3 as Integer = t.Lasterror
dim c3 as Integer = t.ConditionCode

// now query loaded?
dim type4 as Integer
dim n4 as Integer = t.GetIntegerCapability(CAP_FEEDERLOADED, type4)
dim e4 as Integer = t.Lasterror
dim c4 as Integer = t.ConditionCode

if e4 = TWRC_FAILURE AND c4 = TWCC_CAPUNSUPPORTED then
// not supported!
Break
end if
```

**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
You may see problems if you use this method on a capability which is not a boolean.
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.26 SetFloatCapability(ID as Integer, Value as Double)

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with floating point value.
**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
You may see problems if you use this method on a capability which is not a floating point value (FIX32).
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.27 SetInt32Capability(ID as Integer, Value as Int32)

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with 32 bit integer.
**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
You may see problems if you use this method on a capability which is not a 32 bit integer.
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.28 SetUInt16Capability(ID as Integer, Value as UInt16)

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Sets a capability with 16 bit integer.
**Notes:** Please review Twain Documentation for details.
Please open data source before via OpenDS method.
You may see problems if you use this method on a capability which is not a 16 bit integer.
Sets lasterror and condition code.
(if lasterror is 1 and condition code is 13, the capability is not supported)

### 186.4.29 SupportsMemoryTransfer as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether the twain data source supports memory transfers.
**Notes:** As our plugin uses only memory transfers, the source must support this in order to work with our plugin.

### 186.4.30 TransferImage as picture

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Transfers an image.
**Notes:** Lasterror is set.
Image data is converted to a normal RGB picture.
Can return nil on any error.
The events TransferStarted, TransferEnded and TransferProgress are called when a transfer is running.

### 186.4.31 Properties

### 186.4.32 AutoFeed as Integer

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether plugin should auto feed (if feeder is enabled).
**Notes:** Value is -1 if you didn't set it before.
This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable auto feed. If the scanner does not support auto feeding, the scanner will ignore this setting.
(Read and Write property)

### 186.4.33 AutomaticBorderDetection as Integer

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether plugin should enable automatic border detection.
**Notes:** Value is -1 if you didn't set it before.
This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable auto border detection. If the scanner does not support this feature, the scanner will ignore this setting.
0 = off, 1 = on, -1 = default/undefined.
(Read and Write property)

### 186.4.34 AutomaticBrightness as Integer

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Enables or disables the Source's Auto-brightness function (if any).
**Notes:** The plugin will apply this setting on the next scan.
Value is 0 to disable, 1 to enable or -1 if undefined/default.
(Read and Write property)

### 186.4.35 AutomaticRotate as Integer

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to enable automatic rotation when next scan starts.
**Notes:** Value is -1 if you didn't set it before.
This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable automatic rotation. If the scanner does not support this feature, the scanner will ignore this setting.
(Read and Write property)

### 186.4.36 Brightness as Double

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The brightness setting to use.
**Notes:** The plugin will apply this setting on the next scan.
Source should normalize the values into the range. Make sure that a '0' value is available as the Current Value when the Source starts up. If the Source's ¬± range is asymmetric about the '0' value, set range maxima to ¬±1000 and scale homogeneously from the '0' value in each direction. This will yield a positive range whose step size differs from the negative range's step size.
Plugin uses value -10000 for undefined/default.
(Read and Write property)

### 186.4.37 ConditionCode as Integer

MBS Picture Plugin, Plugin Version: 14.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The condition code.
**Notes:** If error code in Lasterror is 1, this Condition value is set.
(-1 if unknown)

Possible codes:

| | | |
|---|---|---|
| TWCC_SUCCESS | 0 | Success |
| TWCC_BUMMER | 1 | Failure due to unknown causes |
| TWCC_LOWMEMORY | 2 | Not enough memory to perform operation |
| TWCC_NODS | 3 | No Data Source |
| TWCC_MAXCONNECTIONS | 4 | DS is connected to max possible applications |
| TWCC_OPERATIONERROR | 5 | DS or DSM reported error, application shouldn't |
| TWCC_BADCAP | 6 | Unknown capability |
| TWCC_BADPROTOCOL | 9 | Unrecognized MSG DG DAT combination |
| TWCC_BADVALUE | 10 | Data parameter out of range |
| TWCC_SEQERROR | 11 | DG DAT MSG out of expected sequence |
| TWCC_BADDEST | 12 | Unknown destination Application/Source in DSM_Entry |
| TWCC_CAPUNSUPPORTED | 13 | Capability not supported by source |
| TWCC_CAPBADOPERATION | 14 | Operation not supported by capability |
| TWCC_CAPSEQERROR | 15 | Capability has dependancy on other capability |
| TWCC_DENIED | 16 | File System operation is denied (file is protected) |
| TWCC_FILEEXISTS | 17 | Operation failed because file already exists. |
| TWCC_FILENOTFOUND | 18 | File not found |
| TWCC_NOTEMPTY | 19 | Operation failed because directory is not empty |
| TWCC_PAPERJAM | 20 | The feeder is jammed |
| TWCC_PAPERDOUBLEFEED | 21 | The feeder detected multiple pages |
| TWCC_FILEWRITEERROR | 22 | Error writing the file (meant for things like disk full conditions) |
| TWCC_CHECKDEVICEONLINE | 23 | The device went offline prior to or during this operation |

(Read and Write property)

### 186.4.38 Contrast as Double

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The contrast setting to use.
**Notes:** The plugin will apply this setting on the next scan.
Scale the values available internally into a homogeneous range between -1000 and 1000. Make sure that a '0' value is available as the Current value when the Source starts up. If the Source's ¬± range is asymmetric about the '0' value, set range maxima to ¬±1000 and scale homogeneously from the '0' value in each direction. This will yield a positive range whose step size differs from the negative range's step size.
(Read and Write property)

### 186.4.39 DiscardBlankPages as Integer

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to have the scanner ask to discard blank pages.
**Notes:** Value is -1 if you didn't set it before.
This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable blank pages discarding. If the scanner does not support this feature, the scanner will ignore this setting.
(Read and Write property)

### 186.4.40 Duplex as Integer

MBS Picture Plugin, Plugin Version: 13.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to enable duplex when next scan starts.
**Notes:** This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable duplex. If the scanner does not support duplex, the scanner will ignore this setting.
Value is -1 if not set, 0 to disable and 1 to enable.
(Read and Write property)

### 186.4.41 FeederEnabled as Integer

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to enable feeder when next scan starts.
**Notes:** This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable feeder. If the scanner does not support the feeder, the scanner will ignore this setting.
Value is -1 if not set, 0 to disable and 1 to enable.
(Read and Write property)

### 186.4.42 Gamma as Double

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Gamma correction value for the image data.
**Notes:** The plugin will apply this setting on the next scan.
Default value 2.2. The setting is -10000 if not set.
(Read and Write property)

### 186.4.43 Highlight as Double

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Specifies which value in an image should be interpreted as the lightest highlight.
**Notes:** The plugin will apply this setting on the next scan.
All values lighter than this value will be clipped to this value. Whether lighter values are smaller or larger can be determined by examining the Current value of PixelFlavor.
If more or less than 8 bits are used to describe the image, the actual data values should be normalized to fit within the 0-255 range. The normalization need not result in a homogeneous distribution if the original distribution was not homogeneous.

Value can be between 0 and 255.

Value can be between 0 and 255.
Plugin uses value -10000 for undefined/default.
(Read and Write property)

### 186.4.44 Lasterror as Integer

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 186.4.45 Orientation as Integer

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The orientation for the scanner.
**Notes:** This value is stored and next time you call Acquire the plugin will ask the scanner to enable/disable feeder. If the scanner does not support the feeder, the scanner will ignore this setting.

Value can be:

| | |
|---|---|
| 0 | 0 degree |
| 1 | 90 degree |
| 2 | 180 degree |
| 3 | 270 degree |
| 0 | Portrait |
| 3 | Landscape |

(Read and Write property)

### 186.4.46 Parent as Variant

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The parent window.
**Notes:** Can reference a Window or DesktopWindow object.

(Read and Write property)

### 186.4.47 PendingTransferCount as Integer

MBS Picture Plugin, Plugin Version: 13.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** How many pages are pending.
**Notes:** So when you transfer you can make a loop and run until PendingTransferCount is zero.
PendingTransferCount may be -1 or 65535 for unknown number of pages.
(Read and Write property)

### 186.4.48 PixelType as Integer

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The pixel type requested.
**Notes:** Value can be 0 for BW, 1 for Gray, 2 for RGB, 3 for Palette.
The plugin can request als CMY (4), CMYK (5), YUV (6), YUVK (7) and CIEXYZ (8), but can't currently decode those.

Value is -1 if you didn't set it before.
This value is stored and next time you call Acquire the plugin will ask the scanner to use the given pixel type. If the scanner does not support this feature, the scanner will ignore this setting.
(Read and Write property)

### 186.4.49 ProvideSliceData as Boolean

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to pass Memoryblock with data with Progress event for new rows arrived.
**Notes:** (Read and Write property)

### 186.4.50 ProvideSlicePicture as Boolean

MBS Picture Plugin, Plugin Version: 12.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether to pass picture with Progress event for new rows arrived.
**Notes:** (Read and Write property)

### 186.4.51 ResX as Double

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The horizontal resolution for scanning.
**Notes:** This value is stored and next time you call Acquire the plugin will ask the scanner to use this resolution. If the scanner does not support the resolution, the scanner will use the last valid setting.
Use -1 to use the default setting.
(Read and Write property)

### 186.4.52 ResY as Double

MBS Picture Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The vertical resolution for scanning.
**Notes:** This value is stored and next time you call Acquire the plugin will ask the scanner to use this resolution. If the scanner does not support the resolution, the scanner will use the last valid setting.
Use -1 to use the default setting.
(Read and Write property)

### 186.4.53 Shadow as Double

MBS Picture Plugin, Plugin Version: 13.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Specifies which value in an image should be interpreted as the darkest shadow.
**Notes:** The plugin will apply this setting on the next scan.
All values darker than this value will be clipped to this value.

Whether darker values are smaller or larger can be determined by examining the Current value of PixelFlavor.
Source

If more or less than 8 bits are used to describe the image, the actual data values should be normalized to fit within the 0-255 range. The normalization need not result in a homogeneous distribution if the original distribution was not homogeneous.
(Read and Write property)

### 186.4.54 DefaultDevice as TwainIdentityMBS

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The default device.

**Notes:** (Read and Write computed property)

### 186.4.55 Imagelayout as TwainImageLayoutMBS

MBS Picture Plugin, Plugin Version: 15.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Get/Set the image layout.
**Notes:** Lasterror is set. DataSource must be open.
(Read and Write computed property)

### 186.4.56 Events

### 186.4.57 CloseRequest

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: .

**Function:** Closes a request.
**Notes:** Lasterror is set.

### 186.4.58 TransferEnded(pic as picture, ImageInfo as TwainImageInfoMBS, sliced as boolean, layout as TwainImageLayoutMBS)

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: .

**Function:** The transfer finished.
**Notes:** Pic: The final picture. Nil if sliced is true.
ImageInfo: Details about the image format.
Sliced: Whether the image was transferred in slices.

### 186.4.59 TransferProgress(percent as Double, dataRead as Int64, DataSize as Int64, ImageInfo as TwainImageInfoMBS, NewDataSize as Integer, NewData as Memoryblock, NewPicture as Picture, layout as TwainImageLayoutMBS, Columns as Integer, Rows as Integer, XOffset as Integer, YOffset as Integer)

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: .

**Function:** The progress event.
**Notes:** Percent: The percent value (0 to 100) of the progress.
dataRead: Number of bytes read.

DataSize: Total size of image in bytes.
ImageInfo: Details about the image format.
NewDataSize: The number of bytes received.
NewData: The memoryblock for the new data. Use NewDataSize to copy right amount of data as this memoryblock has no size value set.
NewPicture: The picture for the new data.
Layout: The image layout.
Columns: Number of columns got in this slice.
Rows: Number of rows got in this slice.
XOffset: Column start for this slice.
YOffset: Row start for this slice.

NewData is only valid if you set ProvideSliceData to true.
NewPicture is only valid if you set ProvideSlicePicture to true.

### 186.4.60 TransferReady

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: .

**Function:** Called to tell you that a transfer is waiting.
**Notes:** The user pressed button to start scan.
Please call TransferImage method when you are ready.

### 186.4.61 TransferStarted(DataSize as Int64, ImageInfo as TwainImageInfoMBS, layout as TwainImageLayoutMBS) as boolean

MBS Picture Plugin, Plugin Version: 12.3, Platforms: macOS, Windows, Targets: .

**Function:** A transfer started.
**Notes:** DataSize total numnber of bytes expected.
ImageInfo: details on the image we receive.

You can return true to have the plugin not created one big picture.
A 42 inch scanner normally creates huge images, so you only can process them in slices.

### 186.4.62 Constants

Country codes

| Constant | Value | Description |
|---|---|---|
| TWCY_AFGHANISTAN | 1001 | |
| TWCY_ALBANIA | 355 | |
| TWCY_ALGERIA | 213 | |
| TWCY_AMERICANSAMOA | 684 | |
| TWCY_ANDORRA | 033 | |
| TWCY_ANGOLA | 1002 | |
| TWCY_ANGUILLA | 8090 | |
| TWCY_ANTIGUA | 8091 | |
| TWCY_ARGENTINA | 54 | |
| TWCY_ARMENIA | 374 | |
| TWCY_ARUBA | 297 | |
| TWCY_ASCENSIONI | 247 | |
| TWCY_AUSTRALIA | 61 | |
| TWCY_AUSTRIA | 43 | |
| TWCY_AZERBAIJAN | 994 | |
| TWCY_BAHAMAS | 8092 | |
| TWCY_BAHRAIN | 973 | |
| TWCY_BANGLADESH | 880 | |
| TWCY_BARBADOS | 8093 | |
| TWCY_BELARUS | 375 | |
| TWCY_BELGIUM | 32 | |
| TWCY_BELIZE | 501 | |
| TWCY_BENIN | 229 | |
| TWCY_BERMUDA | 8094 | |
| TWCY_BHUTAN | 1003 | |
| TWCY_BOLIVIA | 591 | |
| TWCY_BOSNIAHERZGO | 387 | |
| TWCY_BOTSWANA | 267 | |
| TWCY_BRAZIL | 55 | |
| TWCY_BRITAIN | 6 | |
| TWCY_BRITVIRGINIS | 8095 | |
| TWCY_BRUNEI | 673 | |
| TWCY_BULGARIA | 359 | |
| TWCY_BURKINAFASO | 1004 | |
| TWCY_BURMA | 1005 | |
| TWCY_BURUNDI | 1006 | |
| TWCY_CAMAROON | 237 | |
| TWCY_CAMBODIA | 855 | |
| TWCY_CANADA | 2 | |
| TWCY_CAPEVERDEIS | 238 | |
| TWCY_CAYMANIS | 8096 | |
| TWCY_CENTRALAFREP | 1007 | |
| TWCY_CHAD | 1008 | |
| TWCY_CHILE | 56 | |
| TWCY_CHINA | 86 | |
| TWCY_CHRISTMASIS | 1009 | |
| TWCY_COCOSIS | 1009 | |
| TWCY_COLOMBIA | 57 | |
| TWCY_COMOROS | 1010 | |
| TWCY_CONGO | 1011 | |
| TWCY_COOKIS | 1012 | |
| TWCY_COSTARICA | 506 | |
| TWCY_CROATIA | 385 | |
| TWCY_CUBA | 005 | |
| TWCY_CYPRUS | 357 | |
| TWCY_CZECHOSLOVAKIA | 42 | |
| TWCY_CZECHREPUBLIC | 420 | |
| TWCY_DENMARK | 45 | |

Language codes

| Constant | Value | Description |
|---|---|---|
| TWLG_AFRIKAANS | 14 | |
| TWLG_ALBANIA | 15 | |
| TWLG_ARABIC | 16 | |
| TWLG_ARABIC_ALGERIA | 17 | |
| TWLG_ARABIC_BAHRAIN | 18 | |
| TWLG_ARABIC_EGYPT | 19 | |
| TWLG_ARABIC_IRAQ | 20 | |
| TWLG_ARABIC_JORDAN | 21 | |
| TWLG_ARABIC_KUWAIT | 22 | |
| TWLG_ARABIC_LEBANON | 23 | |
| TWLG_ARABIC_LIBYA | 24 | |
| TWLG_ARABIC_MOROCCO | 25 | |
| TWLG_ARABIC_OMAN | 26 | |
| TWLG_ARABIC_QATAR | 27 | |
| TWLG_ARABIC_SAUDIARABIA | 28 | |
| TWLG_ARABIC_SYRIA | 29 | |
| TWLG_ARABIC_TUNISIA | 30 | |
| TWLG_ARABIC_UAE | 31 | |
| TWLG_ARABIC_YEMEN | 32 | |
| TWLG_ASSAMESE | 87 | |
| TWLG_BASQUE | 33 | |
| TWLG_BENGALI | 88 | |
| TWLG_BIHARI | 89 | |
| TWLG_BODO | 90 | |
| TWLG_BULGARIAN | 35 | |
| TWLG_BYELORUSSIAN | 34 | |
| TWLG_CATALAN | 36 | |
| TWLG_CHINESE | 37 | |
| TWLG_CHINESE_HONGKONG | 38 | |
| TWLG_CHINESE_PRC | 39 | |
| TWLG_CHINESE_SIMPLIFIED | 41 | |
| TWLG_CHINESE_SINGAPORE | 40 | |
| TWLG_CHINESE_TAIWAN | 42 | |
| TWLG_CHINESE_TRADITIONAL | 43 | |
| TWLG_CROATIA | 44 | |
| TWLG_CZECH | 45 | |
| TWLG_DAN | 0 | |
| TWLG_DANISH | 0 | |
| TWLG_DOGRI | 91 | |
| TWLG_DUT | 1 | |
| TWLG_DUTCH | 1 | |
| TWLG_DUTCH_BELGIAN | 46 | |
| TWLG_ENG | 2 | |
| TWLG_ENGLISH | 2 | |
| TWLG_ENGLISH_AUSTRALIAN | 47 | |
| TWLG_ENGLISH_CANADIAN | 48 | |
| TWLG_ENGLISH_IRELAND | 49 | |
| TWLG_ENGLISH_NEWZEALAND | 50 | |
| TWLG_ENGLISH_SOUTHAFRICA | 51 | |
| TWLG_ENGLISH_UK | 52 | |
| TWLG_ENGLISH_USA | 13 | |
| TWLG_ESTONIAN | 53 | |
| TWLG_FAEROESE | 54 | |
| TWLG_FARSI | 55 | |
| TWLG_FCF | 3 | |
| TWLG_FIN | 4 | |
| TWLG_FINNISH | 4 | |
| TWLG_FRENCH | 5 | |

Pixel Format Constants

| Constant | Value | Description |
|---|---|---|
| TWPT_BW | 0 | Black & White |
| TWPT_CIEXYZ | 8 | CIEXYZ |
| TWPT_CMY | 4 | CMY |
| TWPT_CMYK | 5 | CMYK |
| TWPT_GRAY | 1 | Grayscale |
| TWPT_PALETTE | 3 | Indexed color Palette |
| TWPT_RGB | 2 | RGB |
| TWPT_YUV | 6 | YUV |
| TWPT_YUVK | 7 | YUVK |

Error codes

| Constant | Value | Description |
|---|---|---|
| TWRC_CANCEL | 3 | Operation has been canceled. |
| TWRC_CHECKSTATUS | 2 | Intended for use with Capability and ImageLayout. Operation failed to com pletely perform the desired operation. For example, setting Brightness to when its range is -1000 to 1000 with a step of 200. The data source may op to set the value to 0 and return this status.<br>The application should confirm its last setting, if it depends on getting th exact value it requested. |
| TWRC_DATANOTAVAILABLE | 9 | Intended for use with extended ImageInfo. There is no data available for th requested item.<br>Scanning may continue. The decision to continue with scanning is at the di cretion of the application, depending on which field reported this status. |
| TWRC_DSEVENT | 4 | Intended for use with DAT_EVENT. The data source processed the event.<br>The application must not take any further action on this message. |
| TWRC_ENDOFLIST | 7 | Intended for use with DAT_IDENTITY and DAT_FILESYSTEM.<br>There are no more items to enumerate in this list. If a call is needed to clos the list, it must be called next. |
| TWRC_FAILURE | 1 | May be returned by any operation. An error has occurred.<br>The application must call status functions, and refer to the condition code fo more information. |
| TWRC_INFONOTSUPPORTED | 8 | Intended for use with DAT_EXTIMAGEINFO. The requested TWEI_ data either not supported by this data source, or is not supported for this particula image.<br>Scanning may continue. The decision to continue with scanning is at the di cretion of the application, depending on which field reported this status. |
| TWRC_NOTDSEVENT | 5 | Intended for use with DAT_EVENT. The data source did not process th event.<br>The application passes the message to its own dialogs. |
| TWRC_SUCCESS | 0 | Operation was successful.<br>The application continues as normal. |
| TWRC_XFERDONE | 6 | Intended for use with the Image Transfer operations. The image has been full transferred.<br>The application must be in state 7. It should call GetImageInfo, if it needs t collect metadata for this image. |

## 186.5 class TwainVersionMBS

### 186.5.1 class TwainVersionMBS

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The class for version details.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 186.5.2 Methods

### 186.5.3 Constructor

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The private constructor.

### 186.5.4 Properties

### 186.5.5 Country as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The primary country where your Source or application is intended to be distributed.
**Notes:** e.g. Germany.
(Read and Write property)

### 186.5.6 Info as String

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** General information string - fill in as needed.
**Notes:** e.g. "1.0b3 Beta release".
(Read and Write property)

### 186.5.7 Language as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The primary language for your Source or application.
**Notes:** e.g. TWLG_GER.
(Read and Write property)

### 186.5.8 MajorNum as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** This refers to your application or Source's major revision number.
**Notes:** e.g. The 2 in "version 2.1".
(Read and Write property)

### 186.5.9 MinorNum as Integer

MBS Picture Plugin, Plugin Version: 12.2, Platforms: macOS, Windows, Targets: All.

**Function:** The incremental revision number of your application or Source.
**Notes:** e.g. The 1 in "version 2.1".
(Read and Write property)

# Chapter 187

# USB

## 187.1 class HIDAPIDeviceInfoMBS

### 187.1.1 class HIDAPIDeviceInfoMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for device information.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4

### 187.1.2 Properties

### 187.1.3 BusType as Integer

MBS USB Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Underlying bus type.
**Notes:** Not all bus types are actually implemented for all platforms.
(Read only property)

### 187.1.4 InterfaceNumber as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The USB interface which this logical device represents.
**Notes:** Valid on both Linux implementations in all cases, and valid on the Windows implementation only if the device contains more than one interface.
(Read only property)

### 187.1.5 ManufacturerString as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Manufacturer String.
**Notes:** (Read only property)

### 187.1.6 NextDevice as HIDAPIDeviceInfoMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Next device.
**Notes:** (Read only property)

### 187.1.7 Path as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Platform-specific device path.
**Notes:** (Read only property)

### 187.1.8 ProductID as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Device Product ID.
**Notes:** (Read only property)

### 187.1.9 ProductString as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Product string.
**Notes:** (Read only property)

### 187.1.10 ReleaseNumber as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Device Release Number in binary-coded decimal, also known as Device Version Number.
**Notes:** (Read only property)

### 187.1.11 SerialNumber as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Serial Number.
**Notes:** (Read only property)

### 187.1.12 Usage as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Usage for this Device/Interface.
**Notes:** (Read only property)

### 187.1.13 UsagePage as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Usage Page for this Device/Interface.
**Notes:** (Read only property)

### 187.1.14 VendorID as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Device Vendor ID.
**Notes:** (Read only property)

### 187.1.15 Constants

Bus Types

| Constant | Value | Description |
|---|---|---|
| BusTypeBluetooth | 2 | Bluetooth or Bluetooth LE bus |
| BusTypeI2C | 3 | I2C bus |
| BusTypeSPI | 4 | SPI bus |
| BusTypeUnknown | 0 | Unknown bus type |
| BusTypeUSB | 1 | USB bus |

## 187.2 class HIDAPIDeviceMBS

### 187.2.1 class HIDAPIDeviceMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a HIDAPI device.
**Notes:** For HIDAPI see website:
https://github.com/signal11/hidapi

The MBS Plugin includes a copy of hidapi for Mac, Windows and Linux.
The linux version needs libudev installed.

You can optionally load a different version of hidapi with LoadLibrary methods.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr4
- MBS Xojo Plugins, version 21.2pr3
- MBS Xojo Plugins, version 19.1pr2
- MBS Xojo / Real Studio Plugins, version 16.1pr3

### 187.2.2 Methods

### 187.2.3 Close

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Close a HID device.

### 187.2.4 Constructor

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.2.5 Enumerate(VendorID as Integer = 0, ProduceID as Integer = 0) as HIDAPIDeviceInfoMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enumerate the HID Devices.
**Notes:** This function returns a linked list of all the HID devices attached to the system which match VendorID and ProduceID. If VendorID is set to 0 then any vendor matches. If ProduceID is set to 0 then any product matches. If VendorID and ProduceID are both set to 0, then all HID devices will be returned.

### 187.2.6 GetFeatureReport(ReportID as Integer, MaxLength as Integer) as MemoryBlock

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a feature report from a HID device.
**Notes:** Set the first byte of Data to the Report ID of the report to be read. Make sure to allow space for this extra byte in data. Upon return, the first byte will still contain the Report ID, and the report data will start in data.UInt8(1).

ReportID: The report ID to read.

This function returns the number of bytes read plus one for the report ID (which is still in the first byte), or -1 on error.

### 187.2.7 GetInputReport(ReportID as Integer, MaxLength as Integer) as MemoryBlock

MBS USB Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a input report from a HID device.
**Notes:** MaxLength is how many bytes we allocate for receiving buffer.

Returns the data read, which has the report ID as first byte.

### 187.2.8 GetReportDescriptor as MemoryBlock

MBS USB Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a report descriptor from a HID device.
**Notes:** Returns the data or nil in case of an error.

### 187.2.9 IndexedString(Index as Integer, MaxLen as Integer = 1024) as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a string from a HID device, based on its string index.
**Notes:** Index: The index of the string to get.
maxlen: The maximum length for read buffer.
Returns text read.

### 187.2.10 Init as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initialize the HIDAPI library.
**Notes:** This function initializes the HIDAPI library. Calling it is not strictly necessary, as it will be called automatically by Enumerate() and any of the Open*() functions if it is needed. This function should be called at the beginning of execution however, if there is a chance of HIDAPI handles being opened by different threads simultaneously.
This function returns 0 on success and -1 on error.

### 187.2.11 LoadError as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The load error message.

### 187.2.12 LoadLibrary(File as FolderItem) as boolean

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the library.
**Notes:** Returns true on success.
You can load a custom libhidapi.dylib (Mac), libhidapi.so (Linux) or libhidapi.dll (Windows).

But since MBS Plugin contains the code, you may not need to load a custom library.
See also:

- 187.2.13 LoadLibrary(Path as string) as boolean 22312

### 187.2.13 LoadLibrary(Path as string) as boolean

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the library.
**Notes:** Returns true on success.
You can load a custom libhidapi.dylib (Mac), libhidapi.so (Linux) or libhidapi.dll (Windows).

But since MBS Plugin contains the code, you may not need to load a custom library.
See also:

- 187.2.12 LoadLibrary(File as FolderItem) as boolean 22311

### 187.2.14 Open(VendorID as Integer, ProduceID as Integer, SerialNumber as String = "") as HIDAPIDeviceMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Open a HID device using a Vendor ID (VID), Product ID (PID) and optionally a serial number.
**Notes:** If SerialNumber is "", the first device with the specified VID and PID is opened.
VendorID: The Vendor ID (VID) of the device to open.
ProduceID: The Product ID (PID) of the device to open.
SerialNumber: The Serial Number of the device to open (Optionally "").

This function returns a pointer to a HIDAPIDeviceMBS object on success or nil on failure.

### 187.2.15 OpenPath(path as string) as HIDAPIDeviceMBS

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Open a HID device by its path name.
**Notes:** The path name be determined by calling Enumerate(), or a platform-specific path name can be used (eg: /dev/hidraw0 on Linux).
Path: The path name of the device to open
This function returns a pointer to a HIDAPIDeviceMBS object on success or nil on failure.

For macOS path must be one of:

- in format 'DevSrvsID:<RegistryEntryID>' (as returned by Enumerate().
- a valid path to an IOHIDDevice in the IOService plane (as returned by Path property in IORegistryMBS class, e.g.: "IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/EHC1@1D,7/AppleUSBEHCI/PLAYSTATION(R)3 Controller@fd120000/IOUSBInterface@0/IOUSBHIDDriver");

Second format is for compatibility with paths accepted by older versions of HIDAPI.

### 187.2.16 Read(MaxLength as Integer) as MemoryBlock

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read an Input report from a HID device.
**Notes:** Input reports are returned to the host through the INTERRUPT IN endpoint. The first byte will contain the Report number if the device uses numbered reports.

MaxLength: The number of bytes to read. For devices with multiple reports, make sure to read an extra byte for the report number.

This function returns the actual number of bytes read and -1 on error. If no packet was available to be read and the handle is in non-blocking mode, this function returns 0.

### 187.2.17 ReadTimeOut(MaxLength as Integer, TimeoutMS as Integer) as MemoryBlock

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read an Input report from a HID device with timeout.
**Notes:** Input reports are returned to the host through the INTERRUPT IN endpoint. The first byte will contain the Report number if the device uses numbered reports.

MaxLength: The number of bytes to read. For devices with multiple reports, make sure to read an extra byte for the report number.

TimeoutMS: timeout in milliseconds or -1 for blocking wait.

This function returns the actual number of bytes read and -1 on error. If no packet was available to be read within the timeout period, this function returns 0.

### 187.2.18 SendFeatureReport(data as MemoryBlock) as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send a Feature report to the device.
**Notes:** Feature reports are sent over the Control endpoint as a Set_Report transfer. The first byte of Data must contain the Report ID. For devices which only support a single report, this must be set to 0. The remaining bytes contain the report data. Since the Report ID is mandatory, calls to SendFeatureReport() will always contain one more byte than the report contains. For example, if a hid report is 16 bytes long, 17 bytes must be passed to SendFeatureReport(): the Report ID (or 0, for devices which do not use numbered reports), followed by the report data (16 bytes). In this example, the length passed in would be 17.

dat:a The data to send, including the report number as the first byte.

This function returns the actual number of bytes written and -1 on error.
See also:

- 187.2.19 SendFeatureReport(data as String) as Integer 22314

### 187.2.19 SendFeatureReport(data as String) as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Send a Feature report to the device.
**Notes:** Feature reports are sent over the Control endpoint as a Set_Report transfer. The first byte of Data must contain the Report ID. For devices which only support a single report, this must be set to 0. The remaining bytes contain the report data. Since the Report ID is mandatory, calls to SendFeatureReport() will always contain one more byte than the report contains. For example, if a hid report is 16 bytes long, 17 bytes must be passed to SendFeatureReport(): the Report ID (or 0, for devices which do not use numbered reports), followed by the report data (16 bytes). In this example, the length passed in would be 17.

dat:a The data to send, including the report number as the first byte.

This function returns the actual number of bytes written and -1 on error.
See also:

- 187.2.18 SendFeatureReport(data as MemoryBlock) as Integer 22314

### 187.2.20 Shutdown as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Finalize the HIDAPI library.
**Notes:** This function frees all of the static data associated with HIDAPI. It should be called at the end of execution to avoid memory leaks.
This function returns 0 on success and -1 on error.

### 187.2.21 VersionString as String

MBS USB Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries version number of the library.
**Example:**

```
// shows 0.10.1
MsgBox HIDAPIDeviceMBS.VersionString
```

### 187.2.22 Write(data as MemoryBlock) as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write an Output report to a HID device.
**Notes:** The first byte of data must contain the Report ID. For devices which only support a single report, this must be set to 0x0. The remaining bytes contain the report data. Since the Report ID is mandatory, calls to Write() will always contain one more byte than the report contains. For example, if a hid report is 16 bytes long, 17 bytes must be passed to Write(), the Report ID (or 0x0, for devices with a single report), followed by the report data (16 bytes). In this example, the length passed in would be 17.
Write() will send the data on the first OUT endpoint, if one exists. If it does not, it will send the data through the Control Endpoint (Endpoint 0).

data: The data to send, including the report number as the first byte.

This function returns the actual number of bytes written and -1 on error.
Length of data to send is data.size.
See also:

- 187.2.23 Write(data as String) as Integer 22316

### 187.2.23 Write(data as String) as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Write an Output report to a HID device.
**Notes:** The first byte of data must contain the Report ID. For devices which only support a single report, this must be set to 0x0. The remaining bytes contain the report data. Since the Report ID is mandatory, calls to Write() will always contain one more byte than the report contains. For example, if a hid report is 16 bytes long, 17 bytes must be passed to Write(), the Report ID (or 0x0, for devices with a single report), followed by the report data (16 bytes). In this example, the length passed in would be 17.
Write() will send the data on the first OUT endpoint, if one exists. If it does not, it will send the data through the Control Endpoint (Endpoint 0).

data: The data to send, including the report number as the first byte.

This function returns the actual number of bytes written and -1 on error.
Length of data to send is LenB(data).
See also:

- 187.2.22 Write(data as MemoryBlock) as Integer 22315

### 187.2.24 Properties

### 187.2.25 DeviceHandle as Integer

MBS USB Plugin, Plugin Version: 16.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The device handle used.
**Notes:** For Windows a HANDLE to the open device, for Mac a IOHIDDeviceRef reference and Linux the handle from open function.
(Read only property)

### 187.2.26 DeviceInfo as HIDAPIDeviceInfoMBS

MBS USB Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the device info for this device.
**Notes:** Returns nil in case of errors.
(Read only property)

### 187.2.27 Error as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a string describing the last error which occurred.
**Notes:** This function returns a string containing the last error which occurred or "" if none has occurred.

This provides errors per device.
(Read only property)

### 187.2.28 FeatureReportLength as Integer

MBS USB Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The length of a feature report.
**Notes:** Not implemented for Linux.
Returns -1 if unknown.
On Mac this is more the maximum report length.
(Read only property)

### 187.2.29 GlobalError as String

MBS USB Plugin, Plugin Version: 24.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a string describing the last error which occurred.
**Notes:** This function returns a string containing the last error which occurred or "" if none has occurred.

GlobalError allows to catch errors without having an instance with an Error property.
Like errors from opening a device.
(Read only property)

### 187.2.30 Handle as Integer

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 187.2.31 InputReportLength as Integer

MBS USB Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The length of an input report.
**Notes:** Not implemented for Linux.
Returns -1 if unknown.
On Mac this is more the maximum report length.
(Read only property)

### 187.2.32 ManufacturerString as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Manufacturer String from a HID device.
**Notes:** (Read only property)

### 187.2.33 NonBlocking as Boolean

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the device handle to be non-blocking.
**Notes:** In non-blocking mode calls to Read() will return immediately with a value of 0 if there is no data to be read. In blocking mode, Read() will wait (block) until there is data to read before returning.
Nonblocking can be turned on and off at any time.

Value true: enable or not the nonblocking reads.
Value false: to disable nonblocking.
(Read and Write property)

### 187.2.34 OutputReportLength as Integer

MBS USB Plugin, Plugin Version: 16.1, Platforms: macOS, Windows, Targets: Desktop, Console & Web.

**Function:** The length of an output report.
**Notes:** Not implemented for Linux.
Returns -1 if unknown.
On Mac this is more the maximum report length.
(Read only property)

### 187.2.35 ProductString as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Product String from a HID device.
**Notes:** (Read only property)

### 187.2.36 SerialNumber as String

MBS USB Plugin, Plugin Version: 16.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The Serial Number String from a HID device.
**Notes:** (Read only property)

## 187.3 class LibUSBConfigDescriptorMBS

### 187.3.1 class LibUSBConfigDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class representing the standard USB configuration descriptor.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 187.3.2 Methods

### 187.3.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.3.4 GetInterface(index as Integer) as LibUSBInterfaceMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries interface by index.

### 187.3.5 Properties

### 187.3.6 AttributesBitmap as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Configuration characteristics.
**Notes:** (Read only property)

### 187.3.7 Configuration as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Index of string descriptor describing this configuration.
**Notes:** (Read only property)

### 187.3.8 ConfigurationValue as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Identifier value for this configuration.
**Notes:** (Read only property)

### 187.3.9 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Descriptor type.
**Notes:** (Read only property)

### 187.3.10 extra as MemoryBlock

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Extra descriptors.
**Notes:** (Read only property)

### 187.3.11 extraLength as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Length of the extra descriptors, in bytes.
**Notes:** (Read only property)

### 187.3.12 InterfaceDescriptors as Variant

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Array of interfaces supported by this configuration.
**Notes:** (Read only property)

### 187.3.13 Length as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Size of this descriptor (in bytes)
**Notes:** (Read only property)

### 187.3.14 MaxPower as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum power consumption of the USB device from this bus in this configuration when the device is fully opreation.
**Notes:** Expressed in units of 2 mA when the device is operating in high-speed mode and in units of 8 mA when the device is operating in super-speed mode.
(Read only property)

### 187.3.15 NumInterfaces as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of interfaces supported by this configuration.
**Notes:** (Read only property)

### 187.3.16 TotalLength as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Total length of data returned for this configuration.
**Notes:** (Read only property)

## 187.4 class LibUSBDeviceDescriptorMBS

### 187.4.1 class LibUSBDeviceDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class representing the standard USB device descriptor.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 187.4.2 Methods

### 187.4.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.4.4 Properties

### 187.4.5 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Descriptor type.
**Notes:** (Read only property)

### 187.4.6 DeviceClass as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF class code for the device.
**Notes:** (Read only property)

### 187.4.7 DeviceProtocol as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF protocol code for the device, qualified by the DeviceClass and DeviceSubClass values.
**Notes:** (Read only property)

### 187.4.8 DeviceReleaseNumber as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Device release number in binary-coded decimal.
**Notes:** (Read only property)

### 187.4.9 DeviceSubClass as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF subclass code for the device, qualified by the DeviceClass value.
**Notes:** (Read only property)

### 187.4.10 IndexManufacturer as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Index of string descriptor describing manufacturer.
**Notes:** (Read only property)

### 187.4.11 IndexProduct as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Index of string descriptor describing product.
**Notes:** (Read only property)

### 187.4.12 IndexSerialNumber as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Index of string descriptor containing device serial number.
**Notes:** (Read only property)

### 187.4.13 Length as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Size of this descriptor (in bytes).
**Notes:** (Read only property)

### 187.4.14 MaxPacketSize0 as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum packet size for endpoint 0.
**Notes:** (Read only property)

### 187.4.15 NumConfigurations as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of possible configurations.
**Notes:** (Read only property)

### 187.4.16 ProductID as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF product ID.
**Notes:** (Read only property)

### 187.4.17 USBReleaseNumber as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB specification release number in binary-coded decimal.
**Notes:** (Read only property)

### 187.4.18 VendorID as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF vendor ID.
**Notes:** (Read only property)

### 187.4.19 Constants

USB Classes

| Constant | Value | Description |
|---|---|---|
| kClassApplication | &hfe | Application |
| kClassAudio | 1 | Audio |
| kClassComm | 2 | Comm |
| kClassContentSecurity | 13 | Security |
| kClassData | 10 | Data |
| kClassDiagnosticDevice | &hdc | Diagnostic Device |
| kClassHID | 3 | HID |
| kClassHUB | 9 | HUB |
| kClassImage | 6 | Image |
| kClassMassStorage | 8 | Storage |
| kClassPerInterface | 0 | Classes per Interface |
| kClassPersonalHealthcare | 15 | Personal Healthcare |
| kClassPhysical | 5 | Physical |
| kClassPrinter | 7 | Printer |
| kClassPTP | 6 | PTP |
| kClassSmartCard | 11 | SmartCard |
| kClassVendorSpecific | 255 | Vendor Specific |
| kClassVideo | 14 | Video |
| kClassWireless | &he0 | Wireless |

## 187.5 class LibUSBDeviceMBS

### 187.5.1 class LibUSBDeviceMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a device.
**Notes:** This is both for a device as general and an open connection.

LibUSB abstracts on Mac, Windows and Linux for using USB devices. SO far it's the best generic USB interface we have.
You need libUSB dylib (mac), dll (Windows) and so (Linux) files from LibUSB. For Linux the LibUSB library is usually preinstalled with a LibUSB package, so the plugin finds it automatically.

For MacOS you can take a look on the MacUSBDeviceMBS class and the IORegistryMBS class.
See also WindowsDeviceMBS, WinUSBDeviceMBS and WinUSBMBS classes for WIndows.
**Blog Entries**

- MBS Xojo Plugins, version 18.1pr4
- LibUSB for Xojo in next MBS Plugins

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 187.5.2 Methods

### 187.5.3 AttachKernelDriver(interfaceNumber as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Re-attach an interface's kernel driver, which was previously detached using libusb_detach_kernel_driver().
**Notes:** This call is only effective on Linux and returns kErrorNotSupported on all other platforms.

This functionality is not available on Darwin or Windows.

Parameters:
interfaceNumber: the interface to attach the driver from

Lasterror is set:
0 on success
kErrorNotFound if no kernel driver was active
kErrorInvalidParam if the interface does not exist
kErrorNoDevice if the device has been disconnected
kErrorNotSupported on platforms where the functionality is not available
kErrorBusy if the driver cannot be attached because the interface is claimed by a program or driver
another error code on other failure

### 187.5.4 BulkTransfer(endpoint as Integer, data as Ptr, Length as Integer, byref ActualLength as Integer, Timeout as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a USB bulk transfer.
**Notes:** The direction of the transfer is inferred from the direction bits of the endpoint address.

For bulk reads, the length field indicates the maximum length of data you are expecting to receive. If less data arrives than expected, this function will return that data, so be sure to check the transferred output parameter.

You should also check the transferred parameter for bulk writes. Not all of the data may have been written.

Also check transferred when dealing with a timeout error code. libusb may have to split your transfer into a number of chunks to satisfy underlying O/S requirements, meaning that the timeout may expire after the first few chunks have completed. libusb is careful not to lose any data that may have been transferred; do not assume that timeout conditions indicate a complete lack of I/O.

Parameters:

| | |
|---|---|
| endpoint | the address of a valid endpoint to communicate with |
| data | a suitably-sized data buffer for either input or output (depending on endpoint) |
| length | for bulk writes, the number of bytes from data to be sent. for bulk reads, the maximum number of bytes to receive into the data buffer. |
| transferred | output location for the number of bytes actually transferred. |
| timeout | timeout (in millseconds) that this function should wait before giving up due to no response being received. For an unlimited timeout, use value 0. |

Lasterror is set to:
0 on success (and populates transferred)

kErrorTimeout if the transfer timed out (and populates transferred)
kErrorPipe if the endpoint halted
kErrorOverflow if the device offered more data, see Packets and overflows
kErrorNoDevice if the device has been disconnected
another error code on other failures

### 187.5.5 ClaimInterface(interfaceNumber as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Claim an interface on a given device handle.
**Notes:** You must claim the interface you wish to use before you can perform I/O on any of its endpoints.

It is legal to attempt to claim an already-claimed interface, in which case libusb just returns 0 without doing anything.

Claiming of interfaces is a purely logical operation; it does not cause any requests to be sent over the bus. Interface claiming is used to instruct the underlying operating system that your application wishes to take ownership of the interface.

This is a non-blocking function.

Parameters:
interfaceNumber: the bInterfaceNumber of the interface you wish to claim

Lasterror is set:
0 on success
kErrorNotFound if the requested interface does not exist
kErrorBusy if another program or driver has claimed the interface
kErrorNoDevice if the device has been disconnected
a error code on other failure

### 187.5.6 ClearHalt(endpoint as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clear the halt/stall condition for an endpoint.
**Notes:** Endpoints with halt status are unable to receive or transmit data until the halt condition is stalled.

You should cancel all pending transfers before attempting to clear the halt condition.

This is a blocking function.

Parameters:
endpoint: the endpoint to clear halt status

Returns:
0 on success
kErrorNotFound if the endpoint does not exist
kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.7 Close

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Close a device handle.
**Notes:** Should be called on all open handles before your application exits.
Internally, this function destroys the reference that was added by Open on the given device.
This is a non-blocking function; no requests are sent over the bus.

### 187.5.8 ControlTransfer(requestType as Integer, Request as Integer, Value as Integer, Index as Integer, data as Ptr, Length as Integer, Timeout as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a USB control transfer.
**Notes:** The direction of the transfer is inferred from the RequestType field of the setup packet.

The Value, Index and Length fields values should be given in host-endian byte order.

Parameters:

on success, the number of bytes actually transferred is returned.

Lasterror is set to:

| | |
|---|---|
| RequestType | the request type field for the setup packet |
| Request | the request field for the setup packet |
| Value | the value field for the setup packet |
| Index | the index field for the setup packet |
| data | a suitably-sized data buffer for either input or output (depending on direction bits within bmRequestType) |
| Length | the length field for the setup packet. The data buffer should be at least this size. |
| timeout | timeout (in millseconds) that this function should wait before giving up due to no response being received. For an unlimited timeout, use value 0. |

kErrorTimeout if the transfer timed out
kErrorPipe if the control request was not supported by the device
kErrorNoDevice if the device has been disconnected
another error code on other failures

### 187.5.9 DetachKernelDriver(interfaceNumber as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Detach a kernel driver from an interface.
**Notes:** If successful, you will then be able to claim the interface and perform I/O.
This functionality is not available on Darwin or Windows.

Parameters:
interfaceNumber: the interface to detach the driver from

Lasterror is set:
0 on success
kErrorNotFound if no kernel driver was active
kErrorInvalidParam if the interface does not exist
kErrorNoDevice if the device has been disconnected
kErrorNotSupported on platforms where the functionality is not available
another error code on other failure

### 187.5.10 Devices as LibUSBDeviceMBS()

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a list of USB devices currently attached to the system.
**Notes:** This is your entry point into finding a USB device to operate.

This return value of this function indicates the number of devices in the resultant list.

The number of devices in the outputted list.
Lasterror is set to zero on success or or any error codes according to errors encountered by the backend.

### 187.5.11 ErrorName(ErrorCode as Integer) as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a constant string with the ASCII name of a libusb error code.

### 187.5.12 GetActiveConfigDescriptor as LibUSBConfigDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the USB configuration descriptor for the currently active configuration.
**Notes:** This is a non-blocking function which does not involve any requests being sent to the device.

Lasterror is set to:
0 on success
kErrorNotFound if the device is in unconfigured state
another error code on error.

### 187.5.13 GetConfigDescriptor(Index as Integer) as LibUSBConfigDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a USB configuration descriptor based on its index.
**Notes:** This is a non-blocking function which does not involve any requests being sent to the device.

Parameters:

Lasterror is set to:
0 on success

Index the index of the configuration you wish to retrieve

kErrorNotFound if the configuration does not exist
another error code on error

### 187.5.14 GetConfigDescriptorByValue(Value as Integer) as LibUSBConfigDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a USB configuration descriptor with a specific ConfigurationValue.
**Notes:** This is a non-blocking function which does not involve any requests being sent to the device.

Value: the bConfigurationValue of the configuration you wish to retrieve.

Lasterror is set to:
0 on success
kErrorNotFound if the configuration does not exist
another error code on error

### 187.5.15 GetConfiguration as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determine the bConfigurationValue of the currently active configuration.
**Notes:** You could formulate your own control request to obtain this information, but this function has the advantage that it may be able to retrieve the information from operating system caches (no I/O involved).

If the OS does not cache this information, then this function will block while a control transfer is submitted to retrieve the information.

This function will return a value of 0 in the config output parameter if the device is in unconfigured state.

Returns Configuration value of the active configuration (only valid for return code 0)

The lasterror is set to:
0 on success

kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.16 GetDescriptor(descType as Integer, descIndex as Integer, data as Ptr, Length as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve a descriptor from the default control pipe.
**Notes:** This is a convenience function which formulates the appropriate control message to retrieve the descriptor.

Parameters:

| | |
|---|---|
| descType | the descriptor type, see libusb_descriptor_type |
| descIndex | the index of the descriptor to retrieve |
| data | output buffer for descriptor |
| length | size of data buffer |

Returns number of bytes returned in data or zero.
Sets lasterror to error code on failure

### 187.5.17 GetDeviceDescriptor as LibUSBDeviceDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the USB device descriptor for a given device.
**Notes:** This is a non-blocking function; the device descriptor is cached in memory.

Returns 0 on success or a error code on failure.

### 187.5.18 GetMaxISOPacketSize(EndPoint as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Calculate the maximum packet size which a specific endpoint is capable is sending or receiving in the duration of 1 microframe.
**Notes:** Only the active configution is examined. The calculation is based on the wMaxPacketSize field in the endpoint descriptor as described in section 9.6.6 in the USB 2.0 specifications.

If acting on an isochronous or interrupt endpoint, this function will multiply the value found in bits 0:10 by the number of transactions per microframe (determined by bits 11:12). Otherwise, this function just returns the numeric value found in bits 0:10.

This function is useful for setting up isochronous transfers, for example you might pass the return value from this function to libusb_set_iso_packet_lengths() in order to set the length field of every isochronous packet in a transfer.

Since v1.0.3.

Parameters:
endpoint: address of the endpoint in question

Returns the maximum packet size which can be sent/received on this endpoint.

The lasterror is set to:
0 for success.
kErrorNotFound if the endpoint does not exist
kErrorOther on other failure

### 187.5.19 GetMaxPacketSize(EndPoint as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function to retrieve the wMaxPacketSize value for a particular endpoint in the active device configuration.
**Notes:** This function was originally intended to be of assistance when setting up isochronous transfers, but a design mistake resulted in this function instead. It simply returns the wMaxPacketSize value without considering its contents. If you're dealing with isochronous transfers, you probably want libusb_get_max_iso_packet_size() instead.

Parameters:
endpoint: address of the endpoint in question

Returns the Max Packet Size value.

The lasterror is set:
0 for success.
kErrorNotFound if the endpoint does not exist
kErrorOther on other failure

### 187.5.20 GetStringDescriptor(descIndex as Integer, LangID as Integer = 0) as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve a descriptor from a device.
**Notes:** This is a convenience function which formulates the appropriate control message to retrieve the descriptor. The string returned is Unicode, as detailed in the USB specifications.

Parameters:

| | |
|---|---|
| descIndex | the index of the descriptor to retrieve |
| LangID | the language ID for the string descriptor |

Returns string.
Lasterror is set to zero or error code on failure.
See also:

- 187.5.21 GetStringDescriptor(descIndex as Integer, LangID as Integer = 0, data as Ptr, Length as Integer) as Integer 22337

### 187.5.21 GetStringDescriptor(descIndex as Integer, LangID as Integer = 0, data as Ptr, Length as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve a descriptor from a device.
**Notes:** This is a convenience function which formulates the appropriate control message to retrieve the descriptor. The string returned is Unicode, as detailed in the USB specifications.

Parameters:

| | |
|---|---|
| descIndex | the index of the descriptor to retrieve |
| LangID | the language ID for the string descriptor |
| data | output buffer for descriptor |
| length | size of data buffer |

Returns number of bytes returned in data.
Lasterror is set to zero or error code on failure.
See also:

- 187.5.20 GetStringDescriptor(descIndex as Integer, LangID as Integer = 0) as String 22337

### 187.5.22 GetStringDescriptorAscii(descIndex as Integer) as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve a string descriptor in ASCII.
**Notes:** Wrapper around GetStringDescriptor(). Uses the first language supported by the device.

Parameters:

| | |
|---|---|
| descIndex | the index of the descriptor to retrieve |

Returns string.
Lasterror is set to error code on failure and zero on success.
See also:

- 187.5.23 GetStringDescriptorAscii(descIndex as Integer, data as Ptr, Length as Integer) as Integer 22338

### 187.5.23 GetStringDescriptorAscii(descIndex as Integer, data as Ptr, Length as Integer) as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve a string descriptor in ASCII.
**Notes:** Wrapper around GetStringDescriptor(). Uses the first language supported by the device.

Parameters:

| | |
|---|---|
| descIndex | the index of the descriptor to retrieve |
| data | output buffer for ASCII string descriptor |
| length | size of data buffer |

Returns number of bytes returned in data.
Lasterror is set to error code on failure and zero on success.
See also:

- 187.5.22 GetStringDescriptorAscii(descIndex as Integer) as String 22338

### 187.5.24 HasCapability(Capability as UInt32) as Boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Check at runtime if the loaded library has a given capability.
**Notes:** Returns true if the running library has the capability, false otherwise.

### 187.5.25 Initialize as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initialize libusb.

### 187.5.26 InterruptTransfer(endpoint as Integer, data as Ptr, Length as Integer, byref ActualLength as Integer, Timeout as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a USB interrupt transfer.
**Notes:** The direction of the transfer is inferred from the direction bits of the endpoint address.

For interrupt reads, the length field indicates the maximum length of data you are expecting to receive. If less data arrives than expected, this function will return that data, so be sure to check the transferred output parameter.

You should also check the transferred parameter for interrupt writes. Not all of the data may have been written.

Also check transferred when dealing with a timeout error code. libusb may have to split your transfer into a number of chunks to satisfy underlying O/S requirements, meaning that the timeout may expire after the first few chunks have completed. libusb is careful not to lose any data that may have been transferred; do not assume that timeout conditions indicate a complete lack of I/O.

The default endpoint bInterval value is used as the polling interval.

Parameters:

| | |
|---|---|
| endpoint | the address of a valid endpoint to communicate with |
| data | a suitably-sized data buffer for either input or output (depending on endpoint) |
| length | for bulk writes, the number of bytes from data to be sent. for bulk reads, the maximum number of bytes to receive into the data buffer. |
| transferred | output location for the number of bytes actually transferred. |
| timeout | timeout (in millseconds) that this function should wait before giving up due to no response being received. For an unlimited timeout, use value 0. |

The lasterror property is set to:
0 on success (and populates transferred)
kErrorTimeout if the transfer timed out
kErrorPipe if the endpoint halted
kErrorOverflow if the device offered more data, see Packets and overflows
kErrorNoDevice if the device has been disconnected
another error code on other error

### 187.5.27 KernelDriverActive(interfaceNumber as Integer) as Boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Determine if a kernel driver is active on an interface.
**Notes:** If a kernel driver is active, you cannot claim the interface, and libusb will be unable to perform I/O.

This functionality is not available on Windows.

Parameters:
interfaceNumber: the interface to check

Lasterror is set:

0 if no kernel driver is active
1 if a kernel driver is active
kErrorNoDevice if the device has been disconnected
kErrorNotSupported on platforms where the functionality is not available
another error code on other failure

### 187.5.28 LibraryLoaded as Boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether library is loaded.

### 187.5.29 LibraryLoadErrorMessage as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error message from loading library.

### 187.5.30 LibVersion as LibUSBVersionMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries version of library.

### 187.5.31 LoadLibrary(file as folderitem) as boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the libusb library.
**Notes:** Returns true on success or false on failure.
The LibraryLoadErrorMessage function returns error message on failure.
See also:

- 187.5.32 LoadLibrary(path as string) as boolean 22342

### 187.5.32 LoadLibrary(path as string) as boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the libusb library.
**Notes:** Returns true on success or false on failure.
The LibraryLoadErrorMessage function returns error message on failure.
See also:

- 187.5.31 LoadLibrary(file as folderitem) as boolean 22341

### 187.5.33 Open as Boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Open a device and obtain a device handle.
**Notes:** A handle allows you to perform I/O on the device in question.

Internally, this function adds a reference to the device. This reference is removed during Close().

This is a non-blocking function; no requests are sent over the bus.

The last error to:
0 on success
kErrorNoMemory on memory allocation failure
kErrorAccess if the user has insufficient permissions
kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.34 OpenDevice(VID as Integer, PID as Integer) as LibUSBDeviceMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Convenience function for finding a device with a particular VID/PID combination.
**Notes:** This function is intended for those scenarios where you are using libusb to knock up a quick test application - it allows you to avoid calling libusb_get_device_list() and worrying about traversing/freeing the list.

This function has limitations and is hence not intended for use in real applications: if multiple devices have the same IDs it will only give you the first one, etc.

Parameters:

| | |
|---|---|
| VID | the idVendor value to search for |
| PID | the idProduct value to search for |

Returns:
a handle for the first found device, or NULL on error or if the device could not be found.

### 187.5.35 ReleaseInterface(interfaceNumber as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Release an interface previously claimed with ClaimInterface.
**Notes:** You should release all claimed interfaces before closing a device handle.

This is a blocking function. A SET_INTERFACE control request will be sent to the device, resetting interface state to the first alternate setting.

Parameters:
interfaceNumber: the bInterfaceNumber of the previously-claimed interface

The lasterror:
0 on success
kErrorNotFound if the interface was not claimed
kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.36 Reset

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Perform a USB port reset to reinitialize a device.
**Notes:** The system will attempt to restore the previous configuration and alternate settings after the reset has completed.

If the reset fails, the descriptors change, or the previous state cannot be restored, the device will appear to be disconnected and reconnected. This means that the device handle is no longer valid (you should close it)

and rediscover the device. An error code of kErrorNotFound indicates when this is the case.

This is a blocking function which usually incurs a noticeable delay.

Lasterror is set:
0 on success
kErrorNotFound if re-enumeration is required, or if the device has been disconnected
another error code on other failure

### 187.5.37 SetConfiguration(configuration as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the active configuration for a device.
**Notes:** The operating system may or may not have already set an active configuration on the device. It is up to your application to ensure the correct configuration is selected before you attempt to claim interfaces and perform other operations.

If you call this function on a device already configured with the selected configuration, then this function will act as a lightweight device reset: it will issue a SET_CONFIGURATION request using the current configuration, causing most USB-related device state to be reset (altsetting reset to zero, endpoint halts cleared, toggles reset).

You cannot change/reset configuration if your application has claimed interfaces - you should free them with libusb_release_interface() first. You cannot change/reset configuration if other applications or drivers have claimed interfaces.

A configuration value of -1 will put the device in unconfigured state. The USB specifications state that a configuration value of 0 does this, however buggy devices exist which actually have a configuration 0.

You should always use this function rather than formulating your own SET_CONFIGURATION control request. This is because the underlying operating system needs to know when such changes happen.

This is a blocking function.

Parameters:
configuration: the bConfigurationValue of the configuration you wish to activate, or -1 if you wish to put the device in unconfigured state

The lasterror is set to:

0 on success
kErrorNotFound if the requested configuration does not exist
kErrorBusy if interfaces are currently claimed
kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.38 SetDebug(level as integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set message verbosity.
**Notes:** Level 0: no messages ever printed by the library (default)
Level 1: error messages are printed to stderr
Level 2: warning and error messages are printed to stderr
Level 3: informational messages are printed to stdout, warning and error messages are printed to stderr
The default level is 0, which means no messages are ever printed. If you choose to increase the message verbosity level, ensure that your application does not close the stdout/stderr file descriptors.

You are advised to set level 3. libusb is conservative with its message logging and most of the time, will only log messages that explain error conditions and other oddities. This will help you debug your software.

If the LIBUSB_DEBUG environment variable was set when libusb was initialized, this function does nothing: the message verbosity is fixed to the value in the environment variable.

If libusb was compiled without any message logging, this function does nothing: you'll never get any messages.
If libusb was compiled with verbose debug message logging, this function does nothing: you'll always get messages from all levels.

### 187.5.39 SetInterfaceAltSetting(interfaceNumber as Integer, alternateSetting as Integer)

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Activate an alternate setting for an interface.
**Notes:** The interface must have been previously claimed with ClaimInterface().

You should always use this function rather than formulating your own SET_INTERFACE control request. This is because the underlying operating system needs to know when such changes happen.

This is a blocking function.

Parameters:

| | |
|---|---|
| interfaceNumber | the InterfaceNumber of the previously-claimed interface |
| alternateSetting | the AlternateSetting of the alternate setting to activate |

The lasterror:
0 on success
kErrorNotFound if the interface was not claimed, or the requested alternate setting does not exist
kErrorNoDevice if the device has been disconnected
another error code on other failure

### 187.5.40 Shutdown

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Deinitialize libusb.
**Notes:** Should be called after closing all open devices and before your application terminates.

### 187.5.41 Properties

### 187.5.42 BusNumber as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the number of the bus that a device is connected to.
**Notes:** (Read only property)

### 187.5.43 DeviceAddress as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the address of the device on the bus it is connected to.
**Notes:** (Read only property)

### 187.5.44 DeviceHandle as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the device.
**Notes:** (Read only property)

### 187.5.45 DeviceSpeed as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the negotiated connection speed for a device.
**Notes:** a speed value, where kSpeedUnknown means that the OS doesn't know or doesn't support returning the negotiated speed.
(Read only property)

### 187.5.46 Handle as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the open device.
**Notes:** (Read only property)

### 187.5.47 IsOpen as Boolean

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether device is open.
**Notes:** True if you called OpenDevice successful.
(Read only property)

### 187.5.48 Lasterror as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 187.5.49 Constants

Capabilities

| Constant | Value | Description |
|---|---|---|
| kCapabilitiesHasCapabilities | 0 | The HasCapability() API is available. |
| kCapabilitiesHasHIDAccess | 256 | The library can access HID devices without requiring user interventi Note that before being able to actually access an HID device, you have to call additional libusb functions such as DetachKernelDriver. |
| kCapabilitiesHasHotplug | 1 | Hotplug support is available on this platform. |
| kCapabilitiesSupportsDetachKernelDriver | 257 | The library supports detaching of the default USB driver, using De nelDriver, if one is set by the OS kernel. |

Descriptor Types

| Constant | Value | Description |
|---|---|---|
| kDescriptorTypeBOS | 6 | BOS descriptor |
| kDescriptorTypeConfig | 2 | Configuration descriptor. |
| kDescriptorTypeDevice | 1 | Device descriptor. |
| kDescriptorTypeDeviceCapabilities | 16 | Device Capability descriptor |
| kDescriptorTypeEndpoint | 5 | Endpoint descriptor. |
| kDescriptorTypeHID | &h21 | HID descriptor. |
| kDescriptorTypeHub | &h29 | Hub descriptor. |
| kDescriptorTypeInterface | 4 | Interface descriptor. |
| kDescriptorTypePhysical | &h23 | Physical descriptor. |
| kDescriptorTypeReport | &h22 | HID report descriptor. |
| kDescriptorTypeString | 3 | String descriptor. |
| kDescriptorTypeSuperSpeedEndpointCompanion | &h30 | SuperSpeed Endpoint Companion descriptor |
| kDescriptorTypeSuperSpeedHub | &h2A | SuperSpeed Hub descriptor |

Errors

| Constant | Value | Description |
|---|---|---|
| kErrorAccess | -3 | Access |
| kErrorBusy | -6 | Busy |
| kErrorInterrupted | -10 | Interrupted |
| kErrorInvalidParam | -2 | Invalid parameter |
| kErrorIO | -1 | I/O Error |
| kErrorNoDevice | -4 | No device. |
| kErrorNoMemory | -11 | Out of Memory |
| kErrorNotFound | -5 | Not found |
| kErrorNotSupported | -12 | Function not supported |
| kErrorOther | -99 | Other errors |
| kErrorOverflow | -8 | Overflow |
| kErrorPipe | -9 | Pipe |
| kErrorTimeout | -7 | Timeout |

Log Levels

| Constant | Value | Description |
|---|---|---|
| kLogLevelDebug | 4 | debug and informational messages are printed to stdout, warnings and errors to stderr |
| kLogLevelError | 1 | error messages are printed to stderr |
| kLogLevelInfo | 3 | informational messages are printed to stdout, warning and error messages are printed to stderr |
| kLogLevelNone | 0 | no messages ever printed by the library (default) |
| kLogLevelWarning | 2 | warning and error messages are printed to stderr |

Speed Levels

| Constant | Value | Description |
|---|---|---|
| kSpeedFull | 2 | The device is operating at full speed (12MBit/s). |
| kSpeedHigh | 3 | The device is operating at high speed (480MBit/s). |
| kSpeedLow | 1 | The device is operating at low speed (1.5MBit/s). |
| kSpeedSuper | 4 | The device is operating at super speed (5000MBit/s). |
| kSpeedUnknown | 0 | The OS doesn't report or know the device speed. |

## 187.6 class LibUSBEndpointDescriptorMBS

### 187.6.1 class LibUSBEndpointDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class representing the standard USB endpoint descriptor.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 187.6.2 Methods

### 187.6.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.6.4 Properties

### 187.6.5 AttributesBitmap as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Attributes which apply to the endpoint when it is configured using the bConfigurationValue.
**Notes:** (Read only property)

### 187.6.6 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Descriptor type.
**Notes:** (Read only property)

### 187.6.7 EndpointAddress as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The address of the endpoint described by this descriptor.
**Notes:** (Read only property)

### 187.6.8 EndpointDirection as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The transfer direction.
**Notes:** (Read only property)

### 187.6.9 extra as MemoryBlock

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Extra descriptors.
**Notes:** (Read only property)

### 187.6.10 extraLength as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Length of the extra descriptors, in bytes.
**Notes:** (Read only property)

### 187.6.11 Interval as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Interval for polling endpoint for data transfers.
**Notes:** (Read only property)

### 187.6.12 Length as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Size of this descriptor (in bytes)
**Notes:** (Read only property)

### 187.6.13 MaxPacketSize as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Maximum packet size this endpoint is capable of sending/receiving.
**Notes:** (Read only property)

### 187.6.14 Refresh as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For audio devices only: the rate at which synchronization feedback is provided.
**Notes:** (Read only property)

### 187.6.15 SynchAddress as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** For audio devices only: the address if the synch endpoint.
**Notes:** (Read only property)

### 187.6.16 TransferType as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The transfer type.
**Notes:** (Read only property)

### 187.6.17 Constants

Endpoint Directions

| Constant | Value | Description |
|---|---|---|
| kEndpointDirectionIn | 0 | In: device-to-host |
| kEndpointDirectionOut | 128 | Out: host-to-device. |

Transfer Types

| Constant | Value | Description |
|---|---|---|
| kTransferTypeBulk | 2 | Bulk endpoint. |
| kTransferTypeBulkStream | 4 | Bulk stream transfer. |
| kTransferTypeControl | 0 | Control endpoint. |
| kTransferTypeInterrupt | 3 | Interrupt endpoint. |
| kTransferTypeISOChronous | 1 | Isochronous endpoint. |

## 187.7 class LibUSBInterfaceDescriptorMBS

### 187.7.1 class LibUSBInterfaceDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class representing the standard USB interface descriptor.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 187.7.2 Methods

### 187.7.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.7.4 EndpointDescriptor(index as Integer) as LibUSBEndpointDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries endpoint descriptors by index.

### 187.7.5 Properties

### 187.7.6 AlternateSetting as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Value used to select this alternate setting for this interface.
**Notes:** (Read only property)

### 187.7.7 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Descriptor type.
**Notes:** (Read only property)

### 187.7.8 Endpoints as Variant

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Array of endpoint descriptors.
**Notes:** (Read only property)

### 187.7.9 extra as MemoryBlock

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Extra descriptors.
**Notes:** (Read only property)

### 187.7.10 ExtraLength as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Length of the extra descriptors, in bytes.
**Notes:** (Read only property)

### 187.7.11 IndexInterface as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Index of string descriptor describing this interface.
**Notes:** (Read only property)

### 187.7.12 InterfaceClass as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF class code for this interface.
**Notes:** (Read only property)

### 187.7.13 InterfaceNumber as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of this interface.
**Notes:** (Read only property)

### 187.7.14 InterfaceProtocol as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF protocol code for this interface, qualified by the InterfaceClass and InterfaceSubClass values.
**Notes:** (Read only property)

### 187.7.15 InterfaceSubClass as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** USB-IF subclass code for this interface, qualified by the InterfaceClass value.
**Notes:** (Read only property)

### 187.7.16 Length as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Size of this descriptor (in bytes)
**Notes:** (Read only property)

### 187.7.17 NumEndpoints as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of endpoints used by this interface (excluding the control endpoint).
**Notes:** (Read only property)

## 187.8 class LibUSBInterfaceMBS

### 187.8.1 class LibUSBInterfaceMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A collection of alternate settings for a particular USB interface.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 187.8.2 Methods

### 187.8.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.8.4 InterfaceDescriptor(index as Integer) as LibUSBInterfaceDescriptorMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries interface descriptor by index.

### 187.8.5 Properties

### 187.8.6 Count as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of alternate settings that belong to this interface.
**Notes:** (Read only property)

### 187.8.7 InterfaceDescriptors as Variant

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Array of interface descriptors.
**Notes:** (Read only property)

## 187.9 class LibUSBISOPacketDescriptorMBS

### 187.9.1 class LibUSBISOPacketDescriptorMBS

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Isochronous packet descriptor.
**Notes:** See LibUSBTransferMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2

### 187.9.2 Methods

### 187.9.3 Constructor

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 187.9.4 Properties

### 187.9.5 ActualLength as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Amount of data that was actually transferred.
**Notes:** (Read and Write property)

### 187.9.6 Length as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Length of data to request in this packet.
**Notes:** (Read and Write property)

### 187.9.7 Status as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Status code for this packet.
**Notes:** See constants in LibUSBTransferMBS class.
(Read and Write property)

## 187.10 class LibUSBTransferMBS

### 187.10.1 class LibUSBTransferMBS

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for asynchronous USB transfer.
**Notes:** The user populates this class and then submits it in order to request a transfer. After the transfer has completed, the library populates the transfer with the results and passes it back to the user.

Please check LibUSB documentation and examples for asynchronous transfers.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2

### 187.10.2 Methods

### 187.10.3 Cancel as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Cancels a running transfer.
**Notes:** Returns error code.

### 187.10.4 Constructor(ISOPackets as Integer = 0)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Allocates usb transfer object with given number of packets.

### 187.10.5 ControlTransferGetData as Ptr

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries pointer ot the setup part of the control transfer structure within the buffer.
**Notes:** Convenience function since there is a 8 byte control block in front of the data.
Returns nil if not possible.

### 187.10.6 ControlTransferGetSetup as Ptr

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries pointer ot the setup part of the control transfer structure within the buffer.
**Notes:** Convenience function since there is a 8 byte control block in front of the data.
Returns nil if not possible.

### 187.10.7 FillBulkStreamTransfer(Device as LibUSBDeviceMBS, EndPoint as Integer, StreamId as Integer, Buffer as MemoryBlock, Timeout as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the required fields for a bulk transfer using bulk streams.
**Notes:** Device: the device that will handle the transfer
endpoint: address of the endpoint where this transfer will be sent
StreamId: id for this transfer
buffer: data buffer
timeout: timeout for the transfer in milliseconds

### 187.10.8 FillBulkTransfer(Device as LibUSBDeviceMBS, EndPoint as Integer, Buffer as MemoryBlock, Timeout as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the required fields for a bulk transfer.
**Notes:** Device: the device that will handle the transfer
endpoint: address of the endpoint where this transfer will be sent
buffer: data buffer
timeout: timeout for the transfer in milliseconds

### 187.10.9 FillControlSetup(Buffer as MemoryBlock, RequestType as Integer, Request as Integer, Value as Integer, Index as Integer, Length as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the setup packet (first 8 bytes of the data buffer) for a control transfer.
**Notes:** The Index, Value and Length values should be given in host-endian byte order.

### 187.10.10 FillControlTransfer(Device as LibUSBDeviceMBS, Buffer as MemoryBlock, Timeout as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the required transfer fields for a control transfer.
**Notes:** If you pass a transfer buffer to this function, the first 8 bytes will be interpreted as a control setup packet.

Therefore the recommended approach is:

- Allocate a suitably sized MemoryBlock (including space for control setup)
- Call FillControlSetup()
- If this is a host-to-device transfer with a data stage, put the data in place after the setup packet
- Call this function
- Call Submit()

Device: the device that will handle the transfer
buffer: The data buffer. If provided, this function will interpret the first 8 bytes as a setup packet and infer the transfer length from that.
timeout: timeout for the transfer in milliseconds

### 187.10.11 FillInterruptTransfer(Device as LibUSBDeviceMBS, EndPoint as Integer, Buffer as MemoryBlock, Timeout as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the required fields for an interrupt transfer.
**Notes:** Device: the device that will handle the transfer
endpoint: address of the endpoint where this transfer will be sent
buffer: data buffer
timeout: timeout for the transfer in milliseconds

### 187.10.12 FillISOTransfer(Device as LibUSBDeviceMBS, EndPoint as Integer, Buffer as MemoryBlock, NumISOPackets as Integer, Timeout as Integer)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Helper function to populate the required \ref libusb_transfer fields for an isochronous transfer.
**Notes:** Device: the device that will handle the transfer
endpoint: address of the endpoint where this transfer will be sent
buffer: data buffer
NumISOPackets: the number of isochronous packets
timeout: timeout for the transfer in milliseconds

### 187.10.13 ISOPacketBuffer(Index as Integer) as Ptr

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries buffer pointer for the packet.
**Notes:** This points within the buffer MemoryBlock.

### 187.10.14 ISOPacketDescriptor(index as Integer) as LibUSBISOPacketDescriptorMBS

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Isochronous packet descriptors, for isochronous transfers only.
**Notes:** Queries packet with given index. Zero based.

### 187.10.15 SetISOPacketLengths(Length as UInt32)

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets length field for all packets.
**Example:**

```
// 3 buffers
Dim t As New LibUSBTransferMBS(3)
t.buffer = New MemoryBlock(100)
```

```
// set all length to 4
t.SetISOPacketLengths 4

Dim p0 As LibUSBISOPacketDescriptorMBS = t.ISOPacketDescriptor(0)
Dim p1 As LibUSBISOPacketDescriptorMBS = t.ISOPacketDescriptor(1)
Dim p2 As LibUSBISOPacketDescriptorMBS = t.ISOPacketDescriptor(2)

Break // check
```

### 187.10.16 Submit as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Submits transfer asynchronously.
**Notes:** Returns error code.

Later Completed event is called.

### 187.10.17 Properties

### 187.10.18 ActualLength as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Actual length of data that was transferred.
**Notes:** Read-only, and only for use within transfer callback function.
Not valid for isochronous endpoint transfers.
(Read only property)

### 187.10.19 Buffer as MemoryBlock

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The memory buffer to use.
**Notes:** Please assign MemoryBlock of right size as this sets length property.
(Read and Write property)

### 187.10.20 Device as LibUSBDeviceMBS

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The device that this transfer will be submitted to.
**Notes:** (Read and Write property)

### 187.10.21 Endpoint as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Address of the endpoint where this transfer will be sent.
**Notes:** (Read and Write property)

### 187.10.22 Flags as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A bitwise OR combination of flags.
**Notes:** (Read and Write property)

### 187.10.23 ISOPackets as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of isochronous packets.
**Notes:** Only used for I/O with isochronous endpoints.
(Read only property)

### 187.10.24 Length as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Length of buffer.
**Notes:** Set to length of MemoryBlock assigned to buffer property.
(Read only property)

### 187.10.25 Status as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The status of the transfer.
**Notes:** Read-only, and only for use within transfer callback function.

If this is an isochronous transfer, this field may read kTransferStatusCompleted even if there were errors in the frames. Use the status in LibUSBISOPacketDescriptorMBS in each packet to determine if errors occurred.
(Read only property)

### 187.10.26 Tag as Variant

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag for the transfer.
**Notes:** A value you can use as you like, e.g. to store reference to your window.
(Read and Write property)

### 187.10.27 Timeout as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Timeout for this transfer in millseconds.
**Notes:** A value of 0 indicates no timeout.
(Read and Write property)

### 187.10.28 Type as Integer

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Type of the endpoint.
**Notes:** See kTransferType* constants.
(Read and Write property)

### 187.10.29 Events

### 187.10.30 Completed

MBS USB Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The completion event.
**Notes:** Called when transfer is done (successful or failed).
Dispatched on main thread.

Not implemented for 32-bit Linux on Intel.

### 187.10.31 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kTransferFlagsAddZeroPacket | 4 | Terminate transfers that are a multiple of the endpoint's MaxPacketSize with an extra zero length packet.<br>This is useful when a device protocol mandates that each logical request is terminated by an incomplete packet (i.e. the logical requests are not separated by other means).<br>This flag only affects host-to-device transfers to bulk and interrupt endpoints. In other situations, it is ignored.<br>This flag only affects transfers with a length that is a multiple of the endpoint's wMaxPacketSize. On transfers of other lengths, this flag has no effect. Therefore, if you are working with a device that needs a ZLP whenever the end of the logical request falls on a packet boundary, then it is sensible to set this flag on every transfer (you do not have to worry about only setting it on transfers that end on the boundary).<br>This flag is currently only supported on Linux. On other systems, libusb_submit_transfer() will return LIBUSB_ERROR_NOT_SUPPORTED for every transfer where this flag is set.<br>Available since libusb-1.0.9. |
| kTransferFlagsShortNotOK | 1 | Report short frames as errors. |

Status Codes

| Constant | Value | Description |
|---|---|---|
| kTransferStatusCancelled | 3 | Transfer was cancelled. |
| kTransferStatusCompleted | 0 | Transfer completed without error. Note that this does not indicate that the entire amount of requested data was transferred. |
| kTransferStatusError | 1 | Transfer failed |
| kTransferStatusNoDevice | 5 | Device was disconnected |
| kTransferStatusOverflow | 6 | Device sent more data than requested |
| kTransferStatusStall | 4 | For bulk/interrupt endpoints: halt condition detected (endpoint stalled). For control endpoints: control request not supported. |
| kTransferStatusTimeout | 2 | Transfer timed out. |

Transfer Types

| Constant | Value | Description |
|---|---|---|
| kTransferTypeBulk | 2 | Bulk endpoint |
| kTransferTypeBulkStream | 4 | Stream endpoint. |
| kTransferTypeControl | 0 | Control endpoint |
| kTransferTypeInterrupt | 3 | Interrupt endpoint |
| kTransferTypeISOChronous | 1 | Isochronous endpoint |

## 187.11 class LibUSBVersionMBS

### 187.11.1 class LibUSBVersionMBS

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Class representing the libusb version.

### 187.11.2 Methods

### 187.11.3 Constructor

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Queries library version if possible.

### 187.11.4 Properties

### 187.11.5 Describe as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Output of git describe –tags at library build time.
**Notes:** (Read only property)

### 187.11.6 Major as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Library major version.
**Notes:** Currently 1.
(Read only property)

### 187.11.7 Micro as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Library micro version.
**Notes:** (Read only property)

### 187.11.8 Minor as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Library minor version.
**Notes:** (Read only property)

### 187.11.9 Nano as Integer

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Library nano version.
**Notes:** (Read only property)

### 187.11.10 RC as String

MBS USB Plugin, Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Library release candidate suffix string, e.g. ”-rc4”.
**Notes:** (Read only property)

## 187.12 class LinuxHIDInterfaceMBS

### 187.12.1 class LinuxHIDInterfaceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for linux to connect to USB HID devices.
**Notes:** For newer development, please use our HIDAPIMBS class.

The constructor does the initialisation of the HID Library and the destructor does the cleanup. This works with several instances, too.

The plugin tries to load one of libhid.so, libhid.so.0 or libhid.so.0.0.0 and one of libusb.so or libusb-0.1.so.4 from your /usr/lib folder (or where else the path environment variable points to). If the libraries are missing, this class will not work properly.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.2pr12
- MBS REALbasic Plugins, version 10.6pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr2
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 187.12.2 Methods

### 187.12.3 Available as boolean

MBS USB Plugin, Plugin Version: 10.4, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether libhid is available.
**Notes:** Not all Linux distribution have libusb and libhid installed by default.

### 187.12.4 Close as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Closes the device.
**Notes:** Returns error code. See kError* constants.

### 187.12.5 DumpTreeToStderr as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Dumps the device tree to stderr.
**Example:**

```
dim h as LinuxHIDInterfaceMBS
// open device
call h.DumpTreeToStderr
```

**Notes:** Returns error code. See kError* constants.

### 187.12.6 DumpTreeToStdout as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Dumps the device tree to stdout.
**Example:**

```
dim h as LinuxHIDInterfaceMBS
// open device
call h.DumpTreeToStdout
```

**Notes:** Returns error code. See kError* constants.

### 187.12.7 ForceOpen(theInterface as Integer, Vendor as Integer, Product as Integer, retries as Integer) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Opens the USB device with the given interface index, vendor and product codes.
**Example:**

```
dim h as new LinuxHIDInterfaceMBS

const vendor = &h7C0
const product = &h1500
const retries = 3

dim e as Integer = h.ForceOpen(0, vendor, product, retries)
```

**Notes:** Vendor or Product code can be kMatchAny (0) to match all devices.
You can use the MatchDevice event to learn which devices are there and return true there to select one.
Returns error code. See kError* constants.

### 187.12.8 GetInputReport(path() as Integer, data as memoryblock, offset as Integer, size as Integer) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Reads an input report.
**Notes:** Path: The path to the endpoint.
Data: the memoryblock to store the data.
Offset: The offset where to start inside the memoryblock.
Size: the length of the data int he memoryblock.

Returns error code. See kError* constants.

### 187.12.9 InterruptRead(EndPoint as Integer, mem as memoryblock, size as Integer, timeout as Integer) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Reads data from an endpoint with timeout.
**Notes:** EndPoint: The index of the endpoint.
mem: the memoryblock where to store the data.
size: the length of the data block to read.
timeout: the timeout in milliseconds.

Returns error code. See kError* constants.

### 187.12.10 InterruptWrite(EndPoint as Integer, mem as memoryblock, size as Integer, timeout as Integer) as Integer

MBS USB Plugin, Plugin Version: 11.0, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes data from an endpoint with timeout.
**Notes:** EndPoint: The index of the endpoint.
mem: the memoryblock where to store the data.
size: the length of the data block to read.
timeout: the timeout in milliseconds.

Returns error code. See kError* constants.

### 187.12.11 IsInitialised as boolean

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the HID library was initialised in the constructor.
**Notes:** Should always be true on linux.

### 187.12.12 IsOpen as boolean

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Whether the device is opened.
**Notes:** True if open, false if closed.

### 187.12.13 Open(theInterface as Integer, Vendor as Integer, Product as Integer) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Opens the USB device with the given interface index, vendor and product codes.
**Example:**

```
dim h as new LinuxHIDInterfaceMBS

const vendor = &h7C0
const product = &h1500

dim e as Integer = h.Open(0, vendor, product)
```

**Notes:** Vendor or Product code can be kMatchAny (0) to match all devices.
You can use the MatchDevice event to learn which devices are there and return true there to select one.
Returns error code. See kError* constants.

### 187.12.14 Reset

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Resets the device.
**Notes:** Returns error code. See kError* constants.

### 187.12.15 SetDebugLevel(level as Integer)

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sets the debug level.
**Example:**

```
dim h as new LinuxHIDInterfaceMBS
h.SetDebugLevel(h.kDebugWarnings)
```

### 187.12.16 SetDebugOutputToStderr

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Tells HID library to write debug output to stderr.
**Example:**

```
dim h as new LinuxHIDInterfaceMBS
h.SetDebugOutputToStderr
```

### 187.12.17 SetDebugOutputToStdout

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Tells HID library to write debug output to stdout.
**Example:**

```
dim h as new LinuxHIDInterfaceMBS
h.SetDebugOutputToStdout
```

### 187.12.18 SetOutputReport(path() as Integer, data as memoryblock, offset as Integer, size as Integer) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes data to the output.
**Example:**

```
dim h as LinuxHIDInterfaceMBS // your interface
dim n as Integer // some value

const IOW_PIPE_IO_PINS=0

dim m as MemoryBlock = NewMemoryBlock(4) // a device with 4 byte packets

m.Byte(3)=n
m.Byte(0)=IOW_PIPE_IO_PINS

dim path(-1) as Integer

path.Append &h00010000
path.Append 0

dim e as Integer = h.SetOutputReport(path, m, 0, m.size)
```

**Notes:** Path: The path to the endpoint.
Data: the data to write.
Offset: The offset where to start inside the memoryblock.
Size: the length of the data int he memoryblock.

Returns error code. See kError* constants.
See also:

- 187.12.19 SetOutputReport(path() as Integer, data as string) as Integer 22378

### 187.12.19 SetOutputReport(path() as Integer, data as string) as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes data to the output.
**Notes:** Path: The path to the endpoint.
Data: the data to write.

Returns error code. See kError* constants.
See also:

- 187.12.18 SetOutputReport(path() as Integer, data as memoryblock, offset as Integer, size as Integer) as Integer 22377

### 187.12.20 WriteIdentificationToStderr as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes identification to stderr.
**Notes:** Returns error code. See kError* constants.

### 187.12.21 WriteIdentificationToStdout as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes identification to stdout.
**Notes:** Returns error code. See kError* constants.

### 187.12.22 Properties

### 187.12.23 Handle as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The internal handle to the device connection.
**Notes:** (Read and Write property)

### 187.12.24 Events

### 187.12.25 MatchDevice(usbdev as LinuxUSBDeviceHandleMBS) as boolean

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: .

**Function:** The event called to decide whether you want to connect to this device.
**Example:**

```
Function MatchDevice(usbdev as LinuxUSBDeviceHandleMBS) As boolean
MsgBox usbdev.Device.Descriptor.SerialNumber
End Function
```

**Notes:** If several devices match the given vendor/product codes in Open/ForceOpen, you can decide here which one you accept.
Return true to accept a device.

### 187.12.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDebugAll | 31 | One of the debug level constants.<br>same as kDebugWarnings + kDebugTraces + kDebugNotices + kDebugErrors + kDebugAsserts |
| kDebugAsserts | 16 | One of the debug level constants. |
| kDebugErrors | 1 | One of the debug level constants. |
| kDebugNone | 0 | One of the debug level constants. |
| kDebugNotices | 4 | One of the debug level constants. |
| kDebugNoTraces | 23 | One of the debug level constants.<br>same as kDebugWarnings + kDebugNotices + kDebugErrors + kDebugAsserts |
| kDebugTraces | 8 | One of the debug level constants. |
| kDebugWarnings | 2 | One of the debug level constants. |
| kErrorAlreadyInitialised | 3 | One of the error codes.<br>Device alreay initialised. |
| kErrorDeviceAlreadyOpened | 9 | One of the error codes.<br>Device already opened. |
| kErrorDeviceNotFound | 7 | One of the error codes.<br>Device is not found. |
| kErrorDeviceNotOpened | 8 | One of the error codes.<br>Device is not opened. |
| kErrorFailAlloc | 17 | One of the error codes.<br>Failed to allocate. |
| kErrorFailClaimIFace | 11 | One of the error codes.<br>Failed to claim the interface. |
| kErrorFailCloseDevice | 10 | One of the error codes.<br>Failed to close device. |
| kErrorFailDetachDriver | 12 | One of the error codes.<br>Failed to detach driver. |
| kErrorFailFindBusses | 4 | One of the error codes.<br>Failed to find buses. |
| kErrorFailFindDevices | 5 | One of the error codes.<br>Failed to find devices. |
| kErrorFailGetReport | 20 | One of the error codes.<br>Get Report failed. |
| kErrorFailIntRead | 21 | One of the error codes. |
| kErrorFailOpenDevice | 6 | One of the error codes.<br>Failed to open device. |
| kErrorFailSetReport | 19 | One of the error codes.<br>Set Report failed. |
| kErrorHIDDescShort | 14 | One of the error codes. |
| kErrorInvalidParameter | 1 | One of the error codes.<br>Invalid Parameter. |
| kErrorNotFound | 22 | One of the error codes.<br>Device not found. |
| kErrorNotHIDDevice | 13 | One of the error codes.<br>Not a HID Device. |
| kErrorNotInitialised | 2 | One of the error codes.<br>Not initialised. |
| kErrorOutOfSpace | 18 | One of the error codes.<br>Out of space. |
| kErrorReportDescLong | 16 | One of the error codes. |
| kErrorReportDescShort | 15 | One of the error codes. |
| kErrorSuccess | 0 | One of the error codes.<br>Success. No error. |
| kMatchAny | 0 | The vendor/product ID to match any device. |

## 187.13 class LinuxUSBBusMBS

### 187.13.1 class LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for an USB Bus on Linux.
**Notes:** This class only works, if the plugin could load one of libusb.so or libusb-0.1.so.4 from your /usr/lib folder (or where else the path environment variable points to). If the libraries are missing, this class will not work properly.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr7
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 187.13.2 Methods

### 187.13.3 Buses as LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 11.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the buses list.
**Notes:** This function allows you to query the current buses and devices.
No device is opened and you just read through libusb data structures.

### 187.13.4 RescanBusses as Integer

MBS USB Plugin, Plugin Version: 14.2, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Finds all USB busses on system.
**Notes:** RescanBusses will find all of the busses on the system.
Returns the number of changes since previous call to this function (total of new busses and busses removed).

The plugin performs RescanBusses and RescanDevices automatically on application launch.

### 187.13.5 RescanDevices as Integer

MBS USB Plugin, Plugin Version: 14.2, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Find all devices on all USB devices.
**Notes:** RescanDevices will find all of the devices on each bus.

This should be called after RescanBusses.
Returns the number of changes since the previous call to this function (total of new device and devices removed).

The plugin performs RescanBusses and RescanDevices automatically on application launch. So you can call RescanDevices at any time.

### 187.13.6 Properties

### 187.13.7 Devices as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The devices attached to this bus.
**Notes:** (Read and Write property)

### 187.13.8 DirName as String

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The dir name.
**Notes:** (Read and Write property)

### 187.13.9 Location as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The location value.
**Notes:** (Read and Write property)

### 187.13.10 NextBus as LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The next bus.
**Notes:** (Read and Write property)

### 187.13.11 PrevBus as LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The previous bus.
**Notes:** (Read and Write property)

### 187.13.12 RootDevice as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The root device on this device.
**Notes:** (Read and Write property)

## 187.14 class LinuxUSBDeviceDescriptionMBS

### 187.14.1 class LinuxUSBDeviceDescriptionMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** A class for an USB device description.
**Notes:** Some linux installations require app to be run with sudo to allow reading USB device strings.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 187.14.2 Properties

### 187.14.3 cdDevice as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device version.
**Notes:** Identifies the version of the device. This value is a binary-coded decimal number.
(Read and Write property)

### 187.14.4 cdUSB as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The USB version.
**Notes:** Identifies the version of the USB specification that this descriptor structure complies with. This value is a binary-coded decimal number.
(Read and Write property)

### 187.14.5 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The descriptor type.
**Notes:** Specifies the descriptor type. Must be set to USB_DEVICE_DESCRIPTOR_TYPE.
(Read and Write property)

### 187.14.6 DeviceClass as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device class.
**Notes:** Specifies the class code of the device as assigned by the USB specification group.
See the kDeviceClass* constants.
(Read and Write property)

### 187.14.7 DeviceProtocol as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device protocol.
**Notes:** Specifies the protocol code of the device as assigned by the USB specification group.
(Read and Write property)

### 187.14.8 DeviceSubClass as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device sub class.
**Notes:** Specifies the subclass code of the device as assigned by the USB specification group.
(Read and Write property)

### 187.14.9 Manufacturer as String

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The manufacturer name string.
**Notes:** A string containing the name of the manufacturer of this device.
Some linux installations require app to be run with sudo to allow reading USB device strings.
(Read and Write property)

### 187.14.10 MaxPacketSize0 as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The maximum packet size.
**Notes:** Specifies the maximum packet size, in bytes, for endpoint zero of the device. The value must be set to 8, 16, 32, or 64.

(Read and Write property)

### 187.14.11 NumConfigurations as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The number of configurations.
**Notes:** Specifies the total number of possible configurations for the device.
(Read and Write property)

### 187.14.12 Product as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The product ID for this device.
**Notes:** Specifies the product identifier. This value is assigned by the manufacturer and is device-specific.
Only available when the device has been opened.
(Read and Write property)

### 187.14.13 ProductName as String

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The product name for this device.
**Notes:** A string that contains a description of the device.
Some linux installations require app to be run with sudo to allow reading USB device strings.
(Read and Write property)

### 187.14.14 SerialNumber as String

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The serial number string for this device.
**Notes:** A string that contains a manufacturer-determined serial number for the device.
Can be empty if the library does not know it.
Some linux installations require app to be run with sudo to allow reading USB device strings.
(Read and Write property)

### 187.14.15 Vendor as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The vendor code for this device.
**Notes:** Specifies the vendor identifier for the device as assigned by the USB specification committee.
Only available when the device has been opened.
(Read and Write property)

### 187.14.16 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceClassAudio | 1 | One of the device class constants. Audio device. |
| kDeviceClassCOMM | 2 | One of the device class constants. COMM device. |
| kDeviceClassDATA | 10 | One of the device class constants. DATA device. |
| kDeviceClassHID | 3 | One of the device class constants. HID device. |
| kDeviceClassHUB | 9 | One of the device class constants. The device is an USB HUB. |
| kDeviceClassMassStorage | 8 | One of the device class constants. A mass storage device. |
| kDeviceClassPerInterface | 0 | One of the device class constants. |
| kDeviceClassPrinter | 7 | One of the device class constants. Printer device. |
| kDeviceClassVendorSpecific | 255 | One of the device class constants. Some vendor specific device. |

## 187.15 class LinuxUSBDeviceHandleMBS

### 187.15.1 class LinuxUSBDeviceHandleMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for a device handle.
**Blog Entries**

- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

### 187.15.2 Properties

### 187.15.3 AltSetting as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Some alt setting value.
**Notes:** (Read and Write property)

### 187.15.4 Bus as LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The bus for this device handle.
**Notes:** (Read and Write property)

### 187.15.5 Config as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** A config value.
**Notes:** (Read and Write property)

### 187.15.6 Device as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The device.
**Notes:** (Read and Write property)

### 187.15.7 InterfaceIndex as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The interface index.
**Notes:** (Read and Write property)

# 187.16 class LinuxUSBDeviceMBS

## 187.16.1 class LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The class for an USB device information on Linux.
**Blog Entries**

- Showing USB Devices
- MBS Plugins 10.3 Release Notes
- MBS REALbasic Plugins, version 10.3pr4

## 187.16.2 Methods

## 187.16.3 Children(index as Integer) as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the child device with the given index.
**Notes:** Index is zero based and from 0 to ChildrenCount-1.

## 187.16.4 Properties

## 187.16.5 Bus as LinuxUSBBusMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The bus this device is attached to.
**Notes:** (Read and Write property)

## 187.16.6 ChildrenCount as Integer

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The number of child devices.
**Notes:** (Read and Write property)

### 187.16.7 Descriptor as LinuxUSBDeviceDescriptionMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The descriptior for this device.
**Notes:** (Read and Write property)

### 187.16.8 Filename as String

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The filename for this device.
**Notes:** (Read and Write property)

### 187.16.9 NextDevice as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The next device on the same level.
**Notes:** (Read and Write property)

### 187.16.10 PrevDevice as LinuxUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The previous device on the same level.
**Notes:** (Read and Write property)

# 187.17 class MacHIDMBS

## 187.17.1 class MacHIDMBS

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to work with HID devices on Mac OS X.
**Notes:** For newer development, please use our HIDAPIMBS class.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.1pr6
- MBS Xojo / Real Studio Plugins, version 15.0pr11
- MBS Xojo / Real Studio Plugins, version 14.0pr3
- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.6

## 187.17.2 Methods

## 187.17.3 Close

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Closes the active connection.

## 187.17.4 Connect

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates a connection to the current device.
**Example:**

```
Function OpenUSBDevice() As boolean
dim i as Integer
dim h as MacHIDMBS

h=FindDevice // see FindFirst example

if h=nil then
MsgBox "No XYZ device found."
Return false
end if

h.Connect
```

```
if h.Lasterror<>0 then
MsgBox "Failed to connect to USB Device."
Return false
end if

h.InstallCallback

Return true

End Function
```

**Notes:** Lasterror is set.

Lasterror values for this function:

| | |
|---|---|
| -1 | Not supported (Windows and Linux). |
| 0 | Everything okay. |
| 1 | Failed to get IOKit Plugin Interface for this IO object. |
| 2 | Failed to query interface |
| 3 | Failed to open interface |
| 4 | Failed to create async port |
| 5 | Failed to create async event source |
| 6 | no longer used |
| 7 | Failed to start queue |

### 187.17.5 Disconnect

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Disconnets current USB device.
**Notes:** Lasterror is set.

### 187.17.6 FindFirstDevice as boolean

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds the first device and loads the properties.
**Example:**

```
Function FindDevice() As MyMacHIDMBS
dim h as MyMacHIDMBS
dim p as string

h=new MyMacHIDMBS // your own subclass of MacHIDMBS so you can get events

if h.FindFirstDevice then

p=h.Product
if p="MyProduct" then
Return h
end if

while h.FindNextDevice

p=h.Product
if p="MyProduct" then
Return h
end if

wend

end if
End Function
```

**Notes:** Returns true on success and false on failure.

### 187.17.7 FindNextDevice as boolean

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Finds next device.
**Notes:** Returns true on success and false on failure.

### 187.17.8 HIDProperties as Variant

MBS USB Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries HID properties dictionary.
**Notes:** Value is a CFDictionaryMBS with details about current device. Returned as Variant to reduce plugin dependencies.

The plugin queries this dictionary to return SerialNumber, ProductID, Manufacturer, Product, VendorID and VersionNumber.

### 187.17.9 InstallCallback

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Installs the callback used for the event handler.
**Notes:** Lasterror is set.
Please use after connect. For use with ReceivedData event.

### 187.17.10 Manufacturer as string

MBS USB Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The manufacturer name.
**Notes:** On any error an empty string is returned.

### 187.17.11 Product as string

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The product string of the selected device.
**Notes:** Lasterror is set.

### 187.17.12 ProductID as Integer

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The product ID of the selected device.
**Notes:** Lasterror is set.

### 187.17.13 ReadMessage(ReportID as Integer, reportType as Integer, length as Integer) as string

MBS USB Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads a message from usb device.
**Notes:** This is for synchronously operation without the event/callback.

You can specify report id, report type and the maximum length to read.
Also set timeout property.

Doesn't work if InstallCallback with event is used.

### 187.17.14 ReadMessageMemory(ReportID as Integer, reportType as Integer, length as Integer) as memoryblock

MBS USB Plugin, Plugin Version: 14.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads a message from usb device.
**Notes:** This is for synchronously operation without the event/callback.
You can specify report id, report type and the maximum length to read.
Also set timeout property.

Doesn't work if InstallCallback with event is used.

### 187.17.15 SendMessage(data as string)

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Notes:** A connection must be open.
Lasterror is set. Lasterror -536854447 is an USB timeout.
Uses kIOHIDReportTypeOutput.
See also:

- 187.17.16 SendMessage(ReportID as Integer, reportType as Integer, data as string) 22397

### 187.17.16 SendMessage(ReportID as Integer, reportType as Integer, data as string)

MBS USB Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Notes:** A connection must be open.
Lasterror is set. Lasterror -536854447 is an USB timeout.
ReportType can be kIOHIDReportTypeOutput or kIOHIDReportTypeFeature.
See also:

- 187.17.15 SendMessage(data as string) 22397

### 187.17.17 SendMessageMemory(data as memoryblock, offset as Integer, length as Integer)

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Notes:** A connection must be open.
Lasterror is set. Lasterror -536854447 is an USB timeout.
Internally ReportID=0 is used.

While writing a crossplatform application for one specific device we saw the following thing: The data buffer for the SendMessageMemory call must be 8 bytes long on Mac (with MacHIDMBS) and 61 bytes long for Windows (with WinHIDMBS) for our HID device. We have 1 byte for the ReportID and 60 data bytes where the first 8 are set like on the Mac. So if the calls fail on Windows, try with a higher length and check the WinHIDMBS.OutputReportByteLength property.
Uses kIOHIDReportTypeOutput.
See also:

- 187.17.18 SendMessageMemory(ReportID as Integer, reportType as Integer, data as memoryblock, offset as Integer, length as Integer) 22398

### 187.17.18 SendMessageMemory(ReportID as Integer, reportType as Integer, data as memoryblock, offset as Integer, length as Integer)

MBS USB Plugin, Plugin Version: 8.6, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Notes:** A connection must be open.
Lasterror is set. Lasterror -536854447 is an USB timeout.
ReportType can be kIOHIDReportTypeOutput or kIOHIDReportTypeFeature.
See also:

- 187.17.17 SendMessageMemory(data as memoryblock, offset as Integer, length as Integer) 22398

### 187.17.19 SerialNumber as string

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The serial number of the current selected device.
**Notes:** Lasterror is set.

### 187.17.20 VendorID as Integer

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vendor ID of the selected device.
**Notes:** Lasterror is set.

### 187.17.21 VersionNumber as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device specific version number.
**Notes:** Value can be anything.
On any error, 0 is returned.

### 187.17.22 Properties

### 187.17.23 IOHIDDeviceInterface122Handle as Integer

MBS USB Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal handle for the device interface object.
**Notes:** This is of type IOHIDDeviceInterface122** from IOKit.
(Read only property)

### 187.17.24 IOHIDObjectIteratorHandle as Integer

MBS USB Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The iterator used to find USB devices.
**Notes:** This is of type io_iterator_t from IOKit.
(Read only property)

### 187.17.25 IOObjectHandle as Integer

MBS USB Plugin, Plugin Version: 15.0, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The internal object reference for current device.
**Notes:** This is of type io_object_t from IOKit.
(Read only property)

### 187.17.26 Lasterror as Integer

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Last error code.
**Notes:** 0 is success.
-1 means that the function is not available.
else Mac OS USB error codes.
See table below, e.g. error -536854447 (=&he0004051) is an USB timeout.

| Constant | Number | LastError value | Description |
|---|---|---|---|
| kIOUSBUnknownPipeErr | &h61 | &he0004061 | Pipe ref not recognized |
| kIOUSBTooManyPipesErr | &h60 | &he0004060 | Too many pipes |
| kIOUSBNoAsyncPortErr | &h5f | &he000405f | no async port |
| kIOUSBNotEnoughPipesErr | &h5e | &he000405e | not enough pipes in interface |
| kIOUSBNotEnoughPowerErr | &h5d | &he000405d | not enough power for selected configuration |
| kIOUSBEndpointNotFound | &h57 | &he0004057 | Endpoint Not found |
| kIOUSBConfigNotFound | &h56 | &he0004056 | Configuration Not found |
| kIOUSBPortWasSuspended | &h52 | &he0004052 | The transaction was returned because the port was suspended |
| kIOUSBPipeStalled | &h4f | &he000404f | Pipe has stalled, error needs to be cleared |
| kIOUSBInterfaceNotFound | &h4e | &he000404e | Interface ref not recognized |
| kIOUSBLowLatencyBufferNotPreviouslyAllocated | &h4d | &he000404d | Attempted to use user land low latency isoc calls w/out calling PrepareBuffer (on the data buffer) first |
| kIOUSBLowLatencyFrameListNotPreviouslyAllocated | &h4c | &he000404c | Attempted to use user land low latency isoc calls w/out calling PrepareBuffer (on the frame list) first |
| kIOUSBHighSpeedSplitError | &h4b | &he000404b | Error to hub on high speed bus trying to do split transaction |
| kIOUSBSyncRequestOnWLThread | &h4a | &he000404a | A synchronous USB request was made on the workloop thread (from a callback?). Only async requests are permitted in that case |
| kIOUSBDeviceNotHighSpeed | &h49 | &he0004049 | Name is deprecated, see below |
| kIOUSBDeviceTransferredToCompanion | &h49 | &he0004049 | The device has been tranferred to another controller for enumeration |
| kIOUSBClearPipeStallNotRecursive | &h48 | &he0004048 | ClearPipeStall should not be called recursively |
| kIOUSBDevicePortWasNotSuspended | &h47 | &he0004047 | Port was not suspended |
| kIOUSBEndpointCountExceeded | &h46 | &he0004046 | The endpoint was not created because the controller cannot support more endpoints |
| kIOUSBDeviceCountExceeded | &h45 | &he0004045 | The device cannot be enumerated because the controller cannot support more devices |
| kIOUSBStreamsNotSupported | &h44 | &he0004044 | The request cannot be completed because the XHCI controller does not support streams |
| kIOUSBInvalidSSEndpoint | &h43 | &he0004043 | An endpoint found in a SuperSpeed device is invalid (usually because there is no Endpoint Companion Descriptor) |
| kIOUSBTooManyTransactionsPending | &h42 | &he0004042 | The transaction cannot be submitted because it would exceed the allowed number of pending transactions |
| kIOUSBTransactionReturned | &h50 | &he0004050 | The transaction has been returned to the caller |
| kIOUSBTransactionTimeout | &h51 | &he0004051 | Transaction timed out |

(Read and Write property)

### 187.17.27 OnlyOneEventPerTick as Boolean

MBS USB Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Whether to limit ReceivedData event.
**Notes:** Some devices send a lot of measurement data.
This option allows to slow down and limit to 60 events per second.
So if device sends a thousand data records per second, we can ignore over 90% and just pick a few to display.
(Read and Write property)

### 187.17.28 TimeOut as Integer

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Timeout value to use for sending/reading USB data.
**Notes:** Please specify time in Milliseconds. Default is 500ms.
(Read and Write property)

### 187.17.29 Events

### 187.17.30 DeviceRemoved(result as Integer)

MBS USB Plugin, Plugin Version: 8.7, Platform: macOS, Targets: .

**Function:** The event called whenever the device is removed.
**Notes:** You need to call connect to install the callback which raises this event.

### 187.17.31 ReceivedData(data as string, size as Integer)

MBS USB Plugin, Plugin Version: 6.4, Platform: macOS, Targets: .

**Function:** Data was received and is available for processing.
**Example:**

```
Sub ReceivedData(data as string, size as Integer)
dim m as MemoryBlock
dim s as string
dim n,i as Integer

// Debug Output data received:

m=data

n=lenb(data)-1
for i=0 to n
s=s+str(m.Byte(i))+" "
next

s=s+"= "+data

System.DebugLog s

End Sub
```

**Notes:** Event is only called when InstallCallback was used and a connection is open.

### 187.17.32 Constants

Report Types

| Constant | Value | Description |
|---|---|---|
| kIOHIDReportTypeFeature | 2 | Feature report. |
| kIOHIDReportTypeInput | 0 | Input report. |
| kIOHIDReportTypeOutput | 1 | Output report. |

# 187.18 class MacUSBDeviceMBS

## 187.18.1 class MacUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for an USB Device on Mac OS X.
**Example:**

```
// iterate over all devices without recursion and count devices
dim devices(-1) as MacUSBDeviceMBS

devices.Append MacUSBDeviceMBS.root

dim count as Integer = -1 // do not count Mac itself

while UBound(devices)>=0
dim dev as MacUSBDeviceMBS = devices.Pop

count = count + 1

for each child as MacUSBDeviceMBS in dev.children
devices.Append child
next
wend

MsgBox str(Count)+" USB devices."
```

**Notes:** Use the root method to get the device hierarchy.

For Windows you can take a look on the WindowsDeviceMBS and WinUSBDeviceMBS classes.
For cross platform development also check LibUSBDeviceMBS classes.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Showing USB Devices
- MBS Real Studio Plugins, version 11.2pr7
- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr5
- MacUSBDeviceMBS

### 187.18.2 Methods

### 187.18.3 children as MacUSBDeviceMBS()

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The array with all the USB device having the current device as parent.

### 187.18.4 Constructor

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The private constructor.
**Notes:** This constructor makes sure you don't create useless MacUSBDeviceMBS objects by error. The only way to create an object is to use the root method to get the object hierarchy.
This constructor is private to make sure you don't create an object from this class by error. Please use designated functions to create objects.

### 187.18.5 root as MacUSBDeviceMBS

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The root of the device tree.
**Example:**

```
// display devices with serialnumbers.
dim devices(-1) as MacUSBDeviceMBS

devices.Append MacUSBDeviceMBS.root

dim lines(-1) as string

while UBound(devices)>=0
dim dev as MacUSBDeviceMBS = devices.Pop

if len(dev.SerialNumber)>0 then
lines.Append dev.name+": "+dev.serialnumber
end if

for each child as MacUSBDeviceMBS in dev.children
devices.Append child
next
wend

MsgBox Join(lines,EndOfLine)
```

**Notes:** Root is the Mac itself. Below root you find the built in USB hubs.

### 187.18.6 Properties

### 187.18.7 Address as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device address number.
**Notes:** (Read and Write property)

### 187.18.8 BusPowerAvailable as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The available bus power.
**Notes:** Value is in milli ampere.
(Read and Write property)

### 187.18.9 ClassName as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class name for this device.
**Notes:** Basicly this is what driver Apple uses.
(Read and Write property)

### 187.18.10 DeviceClass as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device class.
**Notes:** See kUSB*Class constants.

And read here:
http://www.usb.org/developers/defined_class
(Read and Write property)

### 187.18.11 DeviceMaxPacketSize as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The maximum device packet size.
**Notes:** (Read and Write property)

### 187.18.12 DeviceNumConfigs as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of configurations for this device.
**Notes:** (Read and Write property)

### 187.18.13 DeviceProtocol as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device protocol.
**Notes:** (Read and Write property)

### 187.18.14 DeviceReleaseNumber as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device release number.
**Notes:** (Read and Write property)

### 187.18.15 DeviceSpeed as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device speed.
**Notes:** (Read and Write property)

### 187.18.16 DeviceSubClass as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device sub class.
**Notes:** See kUSB*SubClass constants.
(Read and Write property)

### 187.18.17 ExtraPowerForPorts as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The extra power asked for ports.
**Notes:** Value is in milli ampere.
(Read and Write property)

### 187.18.18 Name as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The name of this device node.
**Example:**

```
// show all names of all devices in a msgbox
dim names(-1) as string

// iterate over all devices without recursion
dim devices(-1) as MacUSBDeviceMBS

devices.Append MacUSBDeviceMBS.root

while UBound(devices)>=0
dim dev as MacUSBDeviceMBS = devices.Pop
names.Append dev.name

for each child as MacUSBDeviceMBS in dev.children
devices.Append child
next
wend

MsgBox Join(names,", ")
```

**Notes:** (Read and Write property)

### 187.18.19 NumEndpoints as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of endpoints.
**Notes:** (Read and Write property)

### 187.18.20 Path as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The object path.
**Notes:** This is internally used by the kernel.
(Read and Write property)

### 187.18.21 Ports as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The number of ports on an USB hub.
**Notes:** (Read and Write property)

### 187.18.22 ProductID as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The product ID
**Notes:** (Read and Write property)

### 187.18.23 ProductName as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The product name.
**Notes:** (Read and Write property)

### 187.18.24 Properties as Dictionary

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Creates dictionary with all the properties associated for this USB device in IORegistry.
**Notes:** (Read and Write property)

### 187.18.25 RequestedPower as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Requested power.
**Notes:** Value is in milli ampere.
(Read and Write property)

### 187.18.26 SerialNumber as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The device serial number.
**Notes:** (Read and Write property)

### 187.18.27 VendorID as Integer

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vendor ID.
**Notes:** Assigned by USB Org.
(Read and Write property)

### 187.18.28 VendorName as String

MBS USB Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vendor name.
**Notes:** (Read and Write property)

### 187.18.29 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kUSBApplicationSpecificClass | 254 | One of the USB device class constants. |
| kUSBATMNetworkingSubClass | 7 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBAudioControlSubClass | 1 | One of the USB device sub class constants. For kUSBAudioInterfaceClass. |
| kUSBAudioStreamingSubClass | 2 | One of the USB device sub class constants. For kUSBAudioInterfaceClass. |
| kUSBCommAbstractSubClass | 2 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommCAPISubClass | 5 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommDirectLineSubClass | 1 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommEthernetNetworkingSubClass | 6 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommMultiChannelSubClass | 4 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommonClassSubClass | 2 | One of the USB device sub class constants. For kUSBMiscellaneousClass. |
| kUSBCommTelephoneSubClass | 3 | One of the USB device sub class constants. For kUSBCommunicationDataInterfaceClass. |
| kUSBCommunicationClass | 2 | One of the USB device class constants. |
| kUSBCompositeClass | 0 | One of the USB device class constants. |
| kUSBCompositeSubClass | 0 | One of the USB device sub class constants. |
| kUSBDataClass | 10 | One of the USB device class constants. |
| kUSBDFUSubClass | 1 | One of the USB device sub class constants. For kUSBApplicationSpecificInterfaceClass. |
| kUSBDiagnosticClass | 220 | One of the USB device class constants. |
| kUSBHIDBootInterfaceSubClass | 1 | One of the USB device sub class constants. For kUSBHIDBootInterfaceSubClass. |
| kUSBHubClass | 9 | One of the USB device class constants. |
| kUSBHubSubClass | 0 | One of the USB device sub class constants. |
| kUSBIrDABridgeSubClass | 2 | One of the USB device sub class constants. For kUSBApplicationSpecificInterfaceClass. |
| kUSBMassStorageATAPISubClass | 2 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMassStorageQIC157SubClass | 3 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMassStorageRBCSubClass | 1 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMassStorageSCSISubClass | 6 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMassStorageSFF8070iSubClass | 5 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMassStorageUFISubClass | 4 | One of the USB device sub class constants. For kUSBMassStorageInterfaceClass. |
| kUSBMIDIStreamingSubClass | 3 | One of the USB device sub class constants. For kUSBAudioInterfaceClass. |
| kUSBMiscellaneousClass | 239 | One of the USB device class constants. |
| kUSBPersonalHealthcareClass | 15 | One of the USB device class constants. |
| kUSBReprogrammableDiagnosticSubClass | 1 | One of the USB device sub class constants. For kUSBDiagnosticDeviceInterfaceClass. |
| kUSBRFControllerSubClass | 1 | One of the USB device sub class constants. For kUSBWirelessControllerInterfaceClass. |
| kUSBTestMeasurementSubClass | 3 | One of the USB device sub class constants. For kUSBApplicationSpecificInterfaceClass. |
| kUSBVendorSpecificClass | 255 | One of the USB device class constants. |
| kUSBVideoControlSubClass | 1 | One of the USB device sub class constants. |

# 187.19 class MacUSBMBS

## 187.19.1 class MacUSBMBS

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** A class to talk to an USB device.
**Notes:** Written for a client and probably not yet universally useable, so it may not work with your device.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.0pr1
- MBS Xojo / Real Studio Plugins, version 13.5pr10
- MBS Real Studio Plugins, version 13.1pr16
- MBS Real Studio Plugins, version 13.0pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr11

## 187.19.2 Methods

## 187.19.3 AbortPipe(PipeRef as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Aborts any outstanding transactions on the pipe with status kIOReturnAborted.
**Notes:** If there are outstanding asynchronous transactions on the pipe, the callbacks will happen.
Note that this command will also clear the halted bit on the endpoint in the controller, but will NOT clear the data toggle bit. If you want to clear the data toggle bit as well, see ClearPipeStall or ClearPipeStallBothEnds for more information. The interface must be open for the pipe to exist.
pipeRef: Index for the desired pipe (1 - GetNumEndpoints).
Lasterror is set to kIOReturnSuccess if successful, kIOReturnNoDevice if there is no connection to an IOService, or kIOReturnNotOpen if the interface is not open for exclusive access.

## 187.19.4 ClearPipeStall(PipeRef as Integer) as boolean

MBS USB Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Clears the halted bit and the data toggle bit on the pipe's endpoint in the controller.
**Notes:** This function also returns any outstanding transactions on the pipe with status kIOUSBTransactionReturned.
If there are outstanding asynchronous transactions on the pipe, the callbacks will happen. The data toggle may need to be resynchronized. The driver may handle this by sending a ClearFeature(ENDPOINT_HALT)

to the default control pipe, specifying the device's endpoint for this pipe.

pipeRef: Index for the desired pipe (1 - NumEndpoints).
Lasterror is set to kIOReturnSuccess if successful, kIOReturnNoDevice if there is no connection to an IOService, or kIOReturnNotOpen if the interface is not open for exclusive access.

### 187.19.5 Close

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Closes connection to the device.

### 187.19.6 ConfigurationValue as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the current configuration value set in the device (the interface will be part of that configuration.)
**Notes:** The interface does not have to be open to use this function.
Lasterror is set.

### 187.19.7 Connect as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Connects to the first device matching product and vendor IDs.
**Notes:** Returns true on success.

### 187.19.8 DeviceProduct as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the USB Product ID (idProduct) of the device.
**Notes:** The device does not have to be open to use this function.
Lasterror is set. Returns the actual product ID of the device.

### 187.19.9 DeviceReleaseNumber as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the Device Release Number (bcdDevice) of the device.
**Notes:** The device does not have to be open to use this function.
Lasterror is set.

### 187.19.10 DeviceVendor as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the USB Vendor ID (idVendor) of the device.
**Notes:** The device does not have to be open to use this function.
Lasterror is set. Returns the actual vendor ID of the device.

### 187.19.11 InterfaceClass as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the USB Class of the interface.
**Notes:** Lasterror is set.

### 187.19.12 InterfaceNumber as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the interface number (zero-based index) of this interface within the current configuration of the device.
**Notes:** Lasterror is set.

### 187.19.13 InterfaceProtocol as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the USB Protocol of the interface.
**Notes:** Lasterror is set.

### 187.19.14 InterfaceSubClass as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the USB Subclass of the interface.
**Notes:** Lasterror is set.

### 187.19.15 LocationID as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the location ID.
**Notes:** The location ID is a 32 bit number which is unique among all USB devices in the system, and which will not change on a system reboot unless the topology of the bus itself changes. The interface does not have to be open to use this function.
Lasterror is set.

### 187.19.16 NumEndpoints as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Returns the number of endpoints in this interface.
**Notes:** The interface does not have to be open to use this function.
Lasterror is set.

### 187.19.17 ReadPacket(PipeRef as Integer, MaxSize as Integer = 1024) as Memoryblock

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.

### 187.19.18 ReadRaw(PipeRef as Integer, MaxSize as Integer = 1024) as Memoryblock

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Reads data on a BULK IN or an INTERRUPT pipe.
**Notes:** Reads up to MaxSize bytes from the given pipe. Pipe is in range 1 to GetNumEndpoints.

### 187.19.19 ResetPipe(PipeRef as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Equivalent to ClearPipeStall.
**Notes:** The interface must be open for the pipe to exist.
pipeRef: Index for the desired pipe (1 - GetNumEndpoints).
Lasterror is set to kIOReturnSuccess if successful, kIOReturnNoDevice if there is no connection to an IOService, or kIOReturnNotOpen if the interface is not open for exclusive access.

### 187.19.20 WritePacket(PipeRef as Integer, Data as Memoryblock) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.
Lasterror is set.
See also:

- 187.19.21 WritePacket(PipeRef as Integer, Data as string) as boolean 22415

### 187.19.21 WritePacket(PipeRef as Integer, Data as string) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Sends data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.
Lasterror is set.
See also:

- 187.19.20 WritePacket(PipeRef as Integer, Data as Memoryblock) as boolean 22415

### 187.19.22 WriteRaw(PipeRef as Integer, Data as Memoryblock) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes data on a BULK OUT or INTERRUPT OUT pipe.
**Notes:** The interface must be open for the pipe to exist.
PipeRef: Index for the desired pipe (1 - GetNumEndpoints).
Data: the buffer of data to send.
Lasterror is set.
See also:

- 187.19.23 WriteRaw(PipeRef as Integer, Data as string) as boolean 22415

### 187.19.23 WriteRaw(PipeRef as Integer, Data as string) as boolean

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Writes data on a BULK OUT or INTERRUPT OUT pipe.
**Notes:** The interface must be open for the pipe to exist.
PipeRef: Index for the desired pipe (1 - GetNumEndpoints).
Data: the buffer of data to send.
Lasterror is set.
See also:

- 187.19.22 WriteRaw(PipeRef as Integer, Data as Memoryblock) as boolean 22415

### 187.19.24 Properties

### 187.19.25 completionTimeout as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The completion timeout.
**Notes:** Specifies a time value in milliseconds. Once the request is queued on the bus, if the entire request is not completed in this amount of time, the request will be aborted and returned.
Default is 1000.
(Read and Write property)

### 187.19.26 LastError as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 187.19.27 noDataTimeout as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The timeout for no data.
**Notes:** Specifies a time value in milliseconds. Once the request is queued on the bus, if no data is transferred in this amount of time, the request will be aborted and returned.
Default is 1000.
(Read and Write property)

### 187.19.28 ProductID as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The product ID for connecting to the device.
**Notes:** (Read and Write property)

### 187.19.29 VendorID as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The vendor ID for connecting to the device.
**Notes:** (Read and Write property)

### 187.19.30 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| kIOReturnSuccess | 0 | The error constant for no error. |
| kIOUSBConfigNotFound | &he0004056 | Configuration Not found. |
| kIOUSBDeviceNotHighSpeed | &he0004049 | The device is not a high speed device, so the EHC |
| kIOUSBDevicePortWasNotSuspended | &he0004050 | Port was not suspended. |
| kIOUSBEndpointNotFound | &he0004057 | Endpoint Not found. |
| kIOUSBHighSpeedSplitError | &he000404b | Error to hub on high speed bus trying to do split |
| kIOUSBInterfaceNotFound | &he000404e | Interface ref not recognized. |
| kIOUSBLowLatencyBufferNotPreviouslyAllocated | &he000404d | Attempted to use user land low latency isoc calls (on the data buffer) first. |
| kIOUSBLowLatencyFrameListNotPreviouslyAllocated | &he000404c | Attempted to use user land low latency isoc calls (on the frame list) first. |
| kIOUSBNoAsyncPortErr | &he000405f | No async port. |
| kIOUSBNotEnoughPipesErr | &he000405e | Not enough pipes in interface. |
| kIOUSBNotEnoughPowerErr | &he000405d | Not enough power for selected configuration. |
| kIOUSBPipeStalled | &he000404f | Pipe has stalled, error needs to be cleared. |
| kIOUSBSyncRequestOnWLThread | &he000404a | A synchronous USB request was made on the wo back?). Only async requests are permitted in that |
| kIOUSBTooManyPipesErr | &he0004060 | Too many pipes. |
| kIOUSBTransactionReturned | &he0004050 | The transaction has been returned to the caller. |
| kIOUSBTransactionTimeout | &he0004051 | Transaction timed out. |
| kIOUSBUnknownPipeErr | &he0004061 | Pipe ref not recognized. |

## 187.20 class MacUSBNotificationMBS

### 187.20.1 class MacUSBNotificationMBS

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The class for receiving notifications if an USB device has been attached or removed.
**Notes:** Please make a subclass so you can put your own code in the events.

Use WinUSBNotificationMBS for Windows.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- Showing USB Devices
- MBS Real Studio Plugins, version 11.2pr3

### 187.20.2 Methods

### 187.20.3 Constructor(vendor as Integer = 0, product as Integer = 0)

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Setup the notification system so you are informed about USB devices being attached or removed.
**Example:**

```
// look only for device with this vendor/product ID
dim m as new MyMacUSBNotificationMBS(&h5AC, &h263)
```

**Notes:** You can use vendor and product IDs to limit the class to look only for devices with matching IDs.
Lasterror is set.

### 187.20.4 GetUSBDeviceInfo(DeviceHandle as Integer, byref Vendor as string, byref Product as string, byref SerialNumber as string, byref Revision as Integer) as boolean

MBS USB Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Queries USB details for a given handle.
**Notes:** This is a convenience function to query details on the devices found within the events.
Returns true on success.

### 187.20.5 QueryBSDName(DeviceHandle as Integer) as string

MBS USB Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Function to query BSDName of a given device.
**Notes:** If the device is a disk or USB stick and has been mounted, this would give the bsd name of the disk.
Returns "" on any error.

### 187.20.6 Release(DeviceHandle as Integer)

MBS USB Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Releases an object reference when you don't need it any longer.
**Notes:** Please call Retain and Release in pairs.
Does nothing if handle is zero or when called on Linux/Windows.

### 187.20.7 Retain(DeviceHandle as Integer)

MBS USB Plugin, Plugin Version: 13.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** Retains an object reference so it is available later.
**Notes:** Please call Retain and Release in pairs.
Does nothing if handle is zero or when called on Linux/Windows.

### 187.20.8 Properties

### 187.20.9 LastError as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Zero is no error while other values are Mac OS error codes.
(Read and Write property)

### 187.20.10 Events

### 187.20.11 DeviceAdded(properties as dictionary, NewDevice as boolean, ClassName as string, DeviceName as string, DeviceHandle as Integer)

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called when the device is added.
**Notes:** You find properties like product and vendor in the dictionary.
This event can be called from the constructor for existing devices with NewDevice = false. Later events have NewDevice = true so you see that this is a new device.

DeviceName and ClassName give details on the USB item found.
DeviceHandle is the internal object reference which can be used with other helper functions in this class (io_service_t).

### 187.20.12 DeviceRemoved(properties as dictionary, NewDevice as boolean, ClassName as string, DeviceName as string, DeviceHandle as Integer)

MBS USB Plugin, Plugin Version: 11.2, Platform: macOS, Targets: .

**Function:** This event is called when the device is removed.
**Notes:** You find properties like product and vendor in the dictionary.
This event can be called from the constructor for existing devices with NewDevice = false. Later events have NewDevice = true so you see that this is a new device.

DeviceName and ClassName give details on the USB item found.
DeviceHandle is the internal object reference which can be used with other helper functions in this class (io_service_t).

# 187.21 class WinHIDMBS

## 187.21.1 class WinHIDMBS

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to work with HID devices on Windows.
**Example:**

```
dim m as new WinHIDMBS
dim s as string

#if not TargetWin32
MsgBox "This example requires Windows."
#endif

if m.FindFirstDevice then

do
ListBox1.AddRow ""

ListBox1.Cell(ListBox1.LastIndex,0)=hex(m.ProductID)
ListBox1.Cell(ListBox1.LastIndex,1)=hex(m.VendorID)
ListBox1.cell(ListBox1.LastIndex,2)=m.Product
ListBox1.cell(ListBox1.LastIndex,3)=m.Manufacturer
ListBox1.cell(ListBox1.LastIndex,4)=m.SerialNumber
ListBox1.cell(ListBox1.LastIndex,5)=hex(m.VersionNumber)

if left(m.Product,3)="RF1" then // my test device

if m.Connect then
// write 9 bytes report
// first byte is report ID plus 8 byte data
s=chr(0)+"P"+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)

MsgBox "Send bytes: "+str(m.SendMessage(s))

do
s=m.ReadMessage(17)
loop until lenb(s)>0 // until we got something
MsgBox midb(s,2) // shows result. First byte is ReportID again

m.Disconnect
end if
end if

loop until not m.FindNextDevice
```

```
end if

Title=str(ListBox1.ListCount)+" devices found."
```

**Notes:** For newer development, please use our HIDAPIMBS class.

Updated in version 10.4 of plugins to ignore devices which you don't have permissions to access them. So you will now see devices with VendorID=0 and ProductID=0.

This class can be used in three different ways. First normal with Connect and ReadMessage/SendMessage. Second with InstallListener and SendMessage/Poll functions. Third low level via GetInputReport and SetOutputReport.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 15.0pr10
- MBS Xojo / Real Studio Plugins, version 13.3pr2
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.2
- MBS Real Studio Plugins, version 11.3pr10
- Notes...
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr3
- MBS REALbasic plug-ins version 9.4

**Xojo Developer Magazine**

- 10.5, page 9: News

### 187.21.2 Methods

### 187.21.3 Close

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the active connection.

### 187.21.4 Connect as boolean

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a connection to the current device.
**Example:**

```
Function OpenUSBDevice() As boolean
dim i as Integer
dim h as WinHIDMBS

h=FindDevice // see FindFirst example

if h=nil then
MsgBox "No XYZ device found."
Return false
end if

call h.Connect

if h.Lasterror<>0 then
MsgBox "Failed to connect to USB Device."
Return false
end if

Return true

End Function
```

**Notes:** Lasterror is set.
Returns true on success and false on failure.

The plugin tries to open a read and a write connection. If both fail, connect returns false. If one is okay, it returns true.

Some devices don't allow read or write because of missing permissions.

### 187.21.5 DevicePath as string

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal path used by Windows to identify the device.
**Notes:** Only for debugging.

### 187.21.6 Disconnect

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Disconnets current USB device.
**Notes:** Lasterror is set.

### 187.21.7 FindFirstDevice as boolean

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds the first device and loads the properties.
**Example:**

```
Function FindDevice() As MyWinHIDMBS
dim h as MyWinHIDMBS
dim p as string

h=new MyWinHIDMBS // your own subclass of MacHIDMBS so you can get events

if h.FindFirstDevice then

p=h.Product
if p="MyProduct" then
Return h
end if

while h.FindNextDevice

p=h.Product
if p="MyProduct" then
Return h
end if

wend

end if
End Function
```

**Notes:** Returns true on success and false on failure.
On Windows finds only devices which can be opened for Read/Write.

### 187.21.8 FindNextDevice as boolean

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds next device.
**Notes:** Returns true on success and false on failure.

### 187.21.9 GetInputReport(data as MemoryBlock, Offset as Integer = 0, Length as Integer = 0) as boolean

MBS USB Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an input reports from a top-level collection.
**Notes:** This is very low level.
First byte of data block is report ID.
If Length is 0, we use size of memoryblock.
Returns true on success.

see also:
https://msdn.microsoft.com/en-us/library/windows/hardware/ff538945(v=vs.85).aspx

### 187.21.10 InstallListener(PollSize as Integer) as boolean

MBS USB Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Installs a second thread which performs Read.
**Example:**

```
dim h as new WinHIDMBS

call h.InstallListener 9 // 8 bytes + Report ID
```

**Notes:** Use PollString or PollMemory in a timer or a loop to get the data.
This is an alternative way compared to ReadMessage functions.

### 187.21.11 Manufacturer as string

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The manufacturer name.
**Notes:** On any error an empty string is returned.

Lasterror is set.

### 187.21.12 PollMemory as memoryblock

MBS USB Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a message from the device.
**Notes:** A connection must be open and InstallListener must be used.
Lasterror is set.
You may want to try this function in a loop or a timer till you get data.

### 187.21.13 PollString as string

MBS USB Plugin, Plugin Version: 7.8, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a message from the device.
**Example:**

```
dim m as WinHIDMBS // your WinHIDMBS object
dim s as string

do
s=m.PollString
loop until lenb(s)>0 // until we got something
MsgBox midb(s,2) // shows result. First byte is ReportID again
```

**Notes:** A connection must be open and InstallListener must be used.
Lasterror is set.
You may want to try this function in a loop or a timer till you get data.

### 187.21.14 Product as string

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product string of the selected device.
**Notes:** Lasterror is set.

### 187.21.15 ProductID as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product ID of the selected device.
**Notes:** Lasterror is set.

### 187.21.16 ReadMessage(length as Integer, timeOut as Integer = 0) as string

MBS USB Plugin, Plugin Version: 13.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a message from the device.
**Example:**

```
dim m as WinHIDMBS
dim s as string

do
s=m.ReadMessage(48)
loop until lenb(s)>0 // until we got something
MsgBox midb(s,2) // shows result. First byte is ReportID again
```

**Notes:** Length is the length of the receive buffer you want to use.
The string returned is 0 to length bytes long.
A connection must be open.
Lasterror is set.
You may want to try this function in a loop till you get data.
Timeout is a timeout value in milliseconds.

### 187.21.17 ReadMessageMemory(length as Integer, timeOut as Integer = 0) as memoryblock

MBS USB Plugin, Plugin Version: 13.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a message from the device.
**Example:**

```
dim m as WinHIDMBS
dim s as memoryblock

do
s=m.ReadMessageMemory(48)
loop until s<>nil // until we got something
MsgBox midb(s,2) // shows result. First byte is ReportID again
```

**Notes:** Length is the length of the receive buffer you want to use.

The memoryblock returned has a size of 0 to length bytes.
A connection must be open.
Lasterror is set.
You may want to try this function in a loop till you get data.
Timeout is a timeout value in milliseconds.

### 187.21.18 SendMessage(data as string) as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Example:**

```
dim m as WinHIDMBS // your hid object
dim s as string
// write 9 bytes report
// first byte is report ID plus 8 byte data
s=chr(0)+"P"+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)+chr(0)
MsgBox "Send bytes: "+str(m.SendMessage(s))
```

**Notes:** A connection must be open.
Returns number of bytes sent.

The first byte must be the Report ID which seems to be zero for most devices.

### 187.21.19 SendMessageMemory(data as memoryblock, Offset as Integer = 0, length as Integer = 0) as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends a message to the USB device.
**Notes:** A connection must be open.
Lasterror is set.
Returns number of bytes sent.

While writing a crossplatform application we saw the following thing: The data buffer for the SendMessageMemory call must be 8 bytes long on Mac for our device (with MacHIDMBS) and 61 bytes long for Windows (with WinHIDMBS) for our HID device. We have 1 byte for the ReportID and 60 data bytes where the first 8 are set like on the Mac. So if the calls fail on Windows, try with a higher length and check the WinHIDMBS.OutputReportByteLength property.

The first byte must be the Report ID which seems to be zero for most devices.
If length is zero, we use the length of memoryblock.

### 187.21.20 SerialNumber as string

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the current selected device.
**Notes:** Lasterror is set.

### 187.21.21 SetOutputReport(data as MemoryBlock, Offset as Integer = 0, Length as Integer = 0) as boolean

MBS USB Plugin, Plugin Version: 15.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends an output report.
**Notes:** This is very low level.
First byte of data block is report ID.
If Length is 0, we use size of memoryblock.
Returns true on success.

see also
https://msdn.microsoft.com/en-us/library/windows/hardware/ff539690(v=vs.85).aspx

### 187.21.22 VendorID as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vendor ID of the selected device.
**Notes:** Lasterror is set.

### 187.21.23 VersionNumber as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device specific version number.
**Notes:** Value can be anything.
On any error, 0 is returned.
Lasterror is set.

### 187.21.24 Properties

### 187.21.25 FeatureReportByteLength as Integer

MBS USB Plugin, Plugin Version: 9.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum length, in bytes, of all the feature reports, including the report identifier, if report identifiers are used, which is added to the beginning of the report data.
**Notes:** (Read and Write property)

### 187.21.26 HidHandle as Integer

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for the HID device.
**Notes:** (Read and Write property)

### 187.21.27 InputReportByteLength as Integer

MBS USB Plugin, Plugin Version: 9.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum size, in bytes, of the input reports, including the report identifier, if report identifiers are used, which is added to the beginning of the report data.
**Notes:** (Read and Write property)

### 187.21.28 Lasterror as Integer

MBS USB Plugin, Plugin Version: 7.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Last error code.
**Notes:** 0 is success.
-1 means that the function is not available.
else Windows error codes like 5 for Access Denied.
(Read and Write property)

### 187.21.29 LasterrorString as String

MBS USB Plugin, Plugin Version: 9.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code in a formatted and localized string.
**Notes:** This does not work for plugin error codes.

Like -1 if the function is not available.
(Read only property)

### 187.21.30 OutputReportByteLength as Integer

MBS USB Plugin, Plugin Version: 9.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum size, in bytes, of all the output reports, including the report identifier, if report identifiers are used, which is added to the beginning of the report data.
**Notes:** (Read and Write property)

### 187.21.31 PnPHandle as Integer

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for Plug and Play.
**Notes:** (Read and Write property)

### 187.21.32 ReadHandle as Integer

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the stream for reading data from the USB device.
**Notes:** (Read and Write property)

### 187.21.33 ThreadHandle as Integer

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for the thread which waits in the background for new data.
**Notes:** (Read and Write property)

### 187.21.34 WriteHandle as Integer

MBS USB Plugin, Plugin Version: 9.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the stream for writing data to the USB device.
**Notes:** (Read and Write property)

## 187.22 class WinUSBDeviceMBS

### 187.22.1 class WinUSBDeviceMBS

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to query USB devices.
**Example:**

```
dim devices(-1) as WinUSBDeviceMBS = WinUSBDeviceMBS.Devices

for each d as WinUSBDeviceMBS in devices
MsgBox d.Vendor+" - "+d.Product
next
```

**Blog Entries**

- Showing USB Devices
- MBS Real Studio Plugins, version 11.2pr6

### 187.22.2 Methods

### 187.22.3 Devices as WinUSBDeviceMBS()

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries a list of all USB Devices.
**Example:**

```
dim devices() as WinUSBDeviceMBS = WinUSBDeviceMBS.devices
for each d as WinUSBDeviceMBS in devices
msgbox d.vendor+" "+d.product+" "+d.serialnumber
next
```

**Notes:** Returns an emtpy array on errors.

### 187.22.4 Properties

### 187.22.5 cdUSB as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device USB version.
**Notes:** USB Specification Number which device complies too.

The cdUSB field reports the highest version of USB the device supports. The value is in binary coded decimal with a format of 0xJJMN where JJ is the major version number, M is the minor version number and N is the sub minor version number. e.g. USB 2.0 is reported as &h0200, USB 1.1 as 0x0110 and USB 1.0 as &h0100.
(Read and Write property)

### 187.22.6 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device descriptor type.
**Notes:** Device Descriptor (0x01)
(Read and Write property)

### 187.22.7 DeviceClass as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device class.
**Notes:** See constants in MacUSBDeviceMBS class.
Assigned by USB Org
(Read and Write property)

### 187.22.8 DeviceID as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device ID.
**Notes:** (Read and Write property)

### 187.22.9 DeviceProtocol as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device protocol.
**Notes:** Assigned by USB Org
(Read and Write property)

### 187.22.10 DeviceSubClass as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device sub class.
**Notes:** See constants in MacUSBDeviceMBS class.
Assigned by USB Org
(Read and Write property)

### 187.22.11 MaxEP0Size as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Maximum Packet Size for Zero Endpoint.
**Notes:** Valid Sizes are 8, 16, 32, 64
(Read and Write property)

### 187.22.12 Product as String

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product name.
**Notes:** (Read and Write property)

### 187.22.13 ProductID as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product ID of the device.
**Notes:** (Read and Write property)

### 187.22.14 SerialNumber as String

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the USB device.
**Example:**

```
dim devices(-1) as WinUSBDeviceMBS = WinUSBDeviceMBS.Devices

for each d as WinUSBDeviceMBS in devices
MsgBox d.Vendor+" - "+d.Product+": "+d.SerialNumber
```

next

**Notes:** Not all vendors save the serial number in the device.
(Read and Write property)

### 187.22.15 Vendor as String

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vendor name of the USB device.
**Notes:** (Read and Write property)

### 187.22.16 VendorID as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vendor ID of the USB device.
**Notes:** Assigned by USB Org.
(Read and Write property)

## 187.23 class WinUSBInterfaceDescriptionMBS

### 187.23.1 class WinUSBInterfaceDescriptionMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class is used by USB clients to retrieve a USB-defined interface descriptor.

### 187.23.2 Properties

### 187.23.3 AlternateSetting as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The index number of the alternate setting of the interface.
**Notes:** (Read and Write property)

### 187.23.4 DescriptorType as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The descriptor type.
**Notes:** Descriptor must be set to USB_INTERFACE_DESCRIPTOR_TYPE.
(Read and Write property)

### 187.23.5 InterfaceClass as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class code of the device that the USB specification group assigned.
**Notes:** (Read and Write property)

### 187.23.6 InterfaceIndex as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The index of a string descriptor that describes the interface.
**Notes:** For information about this field, see section 9.6.5 in the "Universal Serial Bus Revision 2.0" specification at USB Technology.
(Read and Write property)

### 187.23.7 InterfaceNumber as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The index number of the interface.
**Notes:** (Read and Write property)

### 187.23.8 InterfaceProtocol as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The protocol code of the device that the USB specification group assigned.
**Notes:** (Read and Write property)

### 187.23.9 InterfaceSubClass as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The subclass code of the device that the USB specification group assigned.
**Notes:** (Read and Write property)

### 187.23.10 Length as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length, in bytes, of the descriptor.
**Notes:** (Read and Write property)

### 187.23.11 NumEndpoints as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of endpoints that are used by the interface, excluding the default status endpoint.
**Notes:** (Read and Write property)

## 187.24 class WinUSBMBS

### 187.24.1 class WinUSBMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides access to any USB device on Windows.
**Notes:** This class provides funtions exposed by Winusb.dll, which user-mode client drivers and applications can use to communicate with USB devices.
WinUSB functions require Windows XP or later.

see also
http://msdn.microsoft.com/en-us/library/windows/hardware/ff540174(v=vs.85).aspx
and
http://msdn.microsoft.com/en-us/library/windows/hardware/ff540046(v=vs.85).aspx#winusb

For PipeIDs, please use 1, 2, 3... for output pipe IDs and &h81, &h82, &h83... for input pipes.

For Mac you can take a look on the MacUSBDeviceMBS class and the IORegistryMBS class.
See also WinUSBDeviceMBS and WindowsDeviceMBS classes.
For cross platform development also check LibUSBDeviceMBS classes.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr3
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.5
- MBS Real Studio Plugins, version 12.5pr11
- MBS Real Studio Plugins, version 12.5pr10
- MBS Real Studio Plugins, version 12.3pr17
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.2
- MBS Real Studio Plugins, version 12.2pr7
- MBS Real Studio Plugins, version 12.2pr3

### 187.24.2 Methods

### 187.24.3 AbortPipe(PipeID as Integer)

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Aborts all of the pending transfers for a pipe. This is a synchronous operation.
**Notes:** To reset a pipe associated with an endpoint in the first interface, use the WinUSBMBS object

created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: The identifier (ID) of the control pipe. The PipeID parameter is an 8-bit value that consists in a 7-bit address and a direction bit. This parameter corresponds to the EndpointAddress field in the endpoint descriptor.

Lasterror is zero on success and false on failure.

### 187.24.4 Available as boolean

MBS USB Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if winusb.dll has been found and loaded.
**Notes:** Always false on Linux and Mac OS X.

### 187.24.5 Constructor(path as string)

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a WinUSB object for the device specified by a device path.
**Example:**

```
Dim path As String = "\\?\usb#vid_0e0f&pid_0003#6&30c8ca5f&0&5# { a5dcbf10-6530-11d2-901f-00c04fb951ed
} "
Dim w As New WinUSBMBS(path)

If w.Lasterror <>0 Then
MsgBox "Lasterror: "+Str(w.Lasterror)
else
MsgBox "DeviceHandle: "+Hex(w.DeviceHandle)
End If
```

**Notes:** Use WindowsDeviceMBS class to find USB devices and their device paths.
Lasterror is set.
On success DeviceHandle and Handle properties are not nil.

When Constructor is called, the policy settings of the interface are reset to the default values.
The Constructor call queries the underlying USB stack for various descriptors and allocates enough memory to store the retrieved descriptor data.
Constructor first retrieves the device descriptor and then gets the associated configuration descriptor. From the configuration descriptor, the call derives the associated interface descriptors and stores them in an array.

The interfaces in the array are identified by zero-based indexes. An index value of 0 indicates the first interface (the default interface), a value of 1 indicates the second associated interface, and so on. Constructor parses the default interface descriptor for the endpoint descriptors and caches information such as the associated pipes or state specific data. The handle received in the InterfaceHandle parameter is a pointer to the memory block allocated for the first interface in the array.

If an application wants to use another interface on the device, it must call GetAssociatedInterface, specify the index of the interface, and retrieve a handle to the memory block allocated for the specified interface.

e.g. path like this format.
\\?\usb#vid_0e0f&pid_0003#6&30c8ca5f&0&5# { a5dcbf10-6530-11d2-901f-00c04fb951ed }

See also WinUSBDeviceMBS and WindowsDeviceMBS classes.
For cross platform development also check LibUSBDeviceMBS classes.

### 187.24.6 ControlTransfer(SetupPacket as WinUSBSetupPacketMBS, Buffer as MemoryBlock) as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Transmits control data over a default control endpoint.
**Notes:** To send a control request to the entire device or the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

SetupPacket: The 8-byte setup packet of type WinUSBSetupPacketMBS.
Buffer: A buffer that contains the data to transfer. Can be empty.

Returns the actual number of transferred bytes.
Lasterror property is set.
See also:

- 187.24.7 ControlTransfer(SetupPacket as WinUSBSetupPacketMBS, Buffer as String) as Integer 22440

### 187.24.7 ControlTransfer(SetupPacket as WinUSBSetupPacketMBS, Buffer as String) as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Transmits control data over a default control endpoint.
**Notes:** To send a control request to the entire device or the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface,

retrieved by GetAssociatedInterface.

SetupPacket: The 8-byte setup packet of type WinUSBSetupPacketMBS.
Buffer: A buffer that contains the data to transfer. Can be empty.

Returns the actual number of transferred bytes.
Lasterror property is set.
See also:

- 187.24.6 ControlTransfer(SetupPacket as WinUSBSetupPacketMBS, Buffer as MemoryBlock) as Integer 22440

### 187.24.8 DeviceSpeed as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries device speed.
**Notes:** Lasteror is set.
Use constants LowSpeed, HighSpeed and FullSpeed.

### 187.24.9 FlushPipe(PipeID as Integer)

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Discards any data that is cached in a pipe. This is a synchronous operation.
**Notes:** To reset a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: The identifier (ID) of the control pipe. The PipeID parameter is an 8-bit value that consists in a 7-bit address and a direction bit. This parameter corresponds to the EndpointAddress field in the endpoint descriptor.

Lasterror is zero on success and false on failure.

### 187.24.10 GetAssociatedInterface(index as Integer) as WinUSBMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a WinUSBMBS object for an associated interface.
**Notes:** This is a synchronous operation.

AssociatedInterfaceIndex: An index that specifies the associated interface to retrieve. A value of 0 indicates the first associated interface, a value of 1 indicates the second associated interface, and so on.

Returns new WinUBSMBS object.
The first associated interface is the interface that immediately follows the interface whose handle the WinUsb_Initialize routine retrieves.

Callers of GetAssociatedInterfacecan retrieve only one handle for each interface. If a caller attempts to retrieve more than one handle for the same interface, the routine will fail with an error of ERROR_ALREADY_EXISTS.

### 187.24.11 QueryInterfaceSettings(index as Integer) as WinUSBInterfaceDescriptionMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the interface descriptor for the specified alternate interface settings for a particular interface handle.
**Notes:** To retrieve the settings of the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

AlternateSettingNumber: A value that indicates which alternate settings to return. A value of 0 indicates the first alternate setting, a value of 1 indicates the second alternate setting, and so on.

Returns WinUSBInterfaceDescriptionMBS object on success or nil on any error.

### 187.24.12 QueryPipe(AlternateInterfaceNumber as Integer, PipeIndex as Integer) as WinUSBPipeInformationMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves information about the specified endpoint and the associated pipe for an interface.
**Notes:** To query a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

AlternateInterfaceNumber: A value that specifies the alternate interface to return the information for.
PipeIndex: A value that specifies the pipe to return information about. This value is not the same as the bEndpointAddress field in the endpoint descriptor. A PipeIndex value of 0 signifies the first endpoint that is associated with the interface, a value of 1 signifies the second endpoint, and so on. PipeIndex must be less

than the value in the NumEndpoints field of the interface descriptor.

Returns pipe information or nil on error. Also sets Lasterror property.

The QueryPipe function does not retrieve information about the control pipe.

Each interface on the USB device can have multiple endpoints. To communicate with each of these endpoints, the bus driver creates pipes for each endpoint on the interface. The pipe indices are zero-based. Therefore for n number of endpoints, the pipes' indices are set from n-1. WinUsb_QueryPipe parses the configuration descriptor to get the interface specified by the caller. It searches the interface descriptor for the endpoint descriptor associated with the caller-specified pipe. If the endpoint is found, the function populates a WinUSBPipeInformationMBS object with information from the endpoint descriptor.

### 187.24.13 ReadPipeMemory(PipeID as Integer, BufferLength as Integer) as Memoryblock

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from the specified pipe.
**Notes:** To read a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: PipeID corresponds to the EndpointAddress field in the endpoint descriptor. For information about the layout of this field, see Table 9-13 in "Universal Serial Bus Specification Revision 2.0" at USB Technology. In the EndpointAddress field, Bit 7 indicates the direction of the endpoint: 0 for OUT; 1 for IN.
BufferLength: The maximum number of bytes to read.

Returns memoryblock with the data read. This may be shorter than BufferLength.
Lasterror is set.

Lasterror is 0 if the operation succeeds. Otherwise, lasterror has the Windows error code.

If the data returned by the device is greater than a maximum transfer length, WinUSB divides the request into smaller requests of maximum transfer length and submits them serially. If the transfer length is not a multiple of the endpoint's maximum packet size (retrievable through the WinUSBPipeInformationMBS class's MaximumPacketSize member), WinUSB increases the size of the transfer to the next multiple of MaximumPacketSize.
USB packet size does not factor into the transfer for a read request. If the device responds with a packet that is too large for the client buffer, the behavior of the read request corresponds to the type of policy set on the pipe. If policy type for the pipe is ALLOW_PARTIAL_READS, WinUSB adds the remaining data to the beginning of the next transfer. If ALLOW_PARTIAL_READS is not set, the read request fails. For

more information about policy types, see WinUSB Functions for Pipe Policy Modification.

When no data is available in the endpoint (pipe is empty), ReadPipe does not return until there is data in the pipe. If an error condition occurs or the application-specified timeout expires, ReadPipe always returns false. To determine the actual reason for that return value, always check LastError. For example, in these cases the GetLastError error value indicates the actual reason:
If the application specified a timeout value in the pipe policy and that timeout expires, ReadPipe returns false and LastError is ERROR_SEM_TIMEOUT.
If an error condition occurs while reading data from the pipe, ReadPipe returns false and LastError is ERROR_GEN_FAILURE.

### 187.24.14 ReadPipePacket(PipeID as Integer, MaxSize as Integer = 1024) as Memoryblock

MBS USB Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.

### 187.24.15 ReadPipeString(PipeID as Integer, BufferLength as Integer) as string

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data from the specified pipe.
**Notes:** To read a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: PipeID corresponds to the EndpointAddress field in the endpoint descriptor. For information about the layout of this field, see Table 9-13 in "Universal Serial Bus Specification Revision 2.0" at USB Technology. In the EndpointAddress field, Bit 7 indicates the direction of the endpoint: 0 for OUT; 1 for IN.
BufferLength: The maximum number of bytes to read.

Returns string with the data read. This may be shorter than BufferLength.
Lasterror is set.

Lasterror is 0 if the operation succeeds. Otherwise, lasterror has the Windows error code.

If the data returned by the device is greater than a maximum transfer length, WinUSB divides the request into smaller requests of maximum transfer length and submits them serially. If the transfer length is not a multiple of the endpoint's maximum packet size (retrievable through the WinUSBPipeInformationMBS

class's MaximumPacketSize member), WinUSB increases the size of the transfer to the next multiple of MaximumPacketSize.
USB packet size does not factor into the transfer for a read request. If the device responds with a packet that is too large for the client buffer, the behavior of the read request corresponds to the type of policy set on the pipe. If policy type for the pipe is ALLOW_PARTIAL_READS, WinUSB adds the remaining data to the beginning of the next transfer. If ALLOW_PARTIAL_READS is not set, the read request fails. For more information about policy types, see WinUSB Functions for Pipe Policy Modification.

When no data is available in the endpoint (pipe is empty), ReadPipe does not return until there is data in the pipe. If an error condition occurs or the application-specified timeout expires, ReadPipe always returns false. To determine the actual reason for that return value, always check LastError. For example, in these cases the GetLastError error value indicates the actual reason:
If the application specified a timeout value in the pipe policy and that timeout expires, ReadPipe returns false and LastError is ERROR_SEM_TIMEOUT.
If an error condition occurs while reading data from the pipe, ReadPipe returns false and LastError is ERROR_GEN_FAILURE.

### 187.24.16 ResetPipe(PipeID as Integer)

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resets the data toggle and clears the stall condition on a pipe.
**Notes:** To reset a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: The identifier (ID) of the control pipe. The PipeID parameter is an 8-bit value that consists in a 7-bit address and a direction bit. This parameter corresponds to the EndpointAddress field in the endpoint descriptor.

Lasterror is zero on success and false on failure.

### 187.24.17 WritePipe(PipeID as Integer, Buffer as MemoryBlock) as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes data to a pipe.
**Notes:** To write to a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: PipeID corresponds to the EndpointAddress field in the endpoint descriptor. For information about

the layout of this field, see Table 9-13 in "Universal Serial Bus Specification Revision 2.0" at USB Technology.
In the bEndpointAddress field, Bit 7 indicates the direction of the endpoint: 0 for OUT; 1 for IN.
Buffer: A buffer that contains the data to write.

Returns the actual number of bytes that were written to the pipe.
Lasterror is set. Zero for success.

To create a write request, your the application must allocate a buffer, fill it with the data that you want to write to the device, and send the buffer to the host controller by calling WritePipe.
The following restrictions apply to the size of the buffer if RAW_IO is set:

- The buffer length must be a multiple of the maximum endpoint packet size.
- The length must be less than or equal to the value of MAXIMUM_TRANSFER_SIZE retrieved by GetPipePolicy.

There are no restrictions on the size of the buffer if RAW_IO is not set as the pipe's policy type. If the size of the buffer is greater than the maximum transfer length reported by MAXIMUM_TRANSFER_SIZE, WinUSB divides the request into smaller requests and submits them serially to the host controller.
A write request that contains zero-length data is forwarded down the USB stack.
See also:

- 187.24.18 WritePipe(PipeID as Integer, Buffer as String) as Integer 22446

### 187.24.18 WritePipe(PipeID as Integer, Buffer as String) as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes data to a pipe.
**Notes:** To write to a pipe associated with an endpoint in the first interface, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

PipeID: PipeID corresponds to the EndpointAddress field in the endpoint descriptor. For information about the layout of this field, see Table 9-13 in "Universal Serial Bus Specification Revision 2.0" at USB Technology.
In the bEndpointAddress field, Bit 7 indicates the direction of the endpoint: 0 for OUT; 1 for IN.
Buffer: A buffer that contains the data to write.

Returns the actual number of bytes that were written to the pipe.
Lasterror is set. Zero for success.

To create a write request, your the application must allocate a buffer, fill it with the data that you want to write to the device, and send the buffer to the host controller by calling WritePipe.

The following restrictions apply to the size of the buffer if RAW_IO is set:

- The buffer length must be a multiple of the maximum endpoint packet size.
- The length must be less than or equal to the value of MAXIMUM_TRANSFER_SIZE retrieved by GetPipePolicy.

There are no restrictions on the size of the buffer if RAW_IO is not set as the pipe's policy type. If the size of the buffer is greater than the maximum transfer length reported by MAXIMUM_TRANSFER_SIZE, WinUSB divides the request into smaller requests and submits them serially to the host controller.
A write request that contains zero-length data is forwarded down the USB stack.
See also:

- 187.24.17 WritePipe(PipeID as Integer, Buffer as MemoryBlock) as Integer 22445

### 187.24.19 WritePipePacket(PipeID as Integer, Buffer as MemoryBlock) as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.
See also:

- 187.24.20 WritePipePacket(PipeID as Integer, Buffer as String) as Integer 22447

### 187.24.20 WritePipePacket(PipeID as Integer, Buffer as String) as Integer

MBS USB Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends data packet.
**Notes:** We developed this function for a client, so it's probably useless for everyone else.
See also:

- 187.24.19 WritePipePacket(PipeID as Integer, Buffer as MemoryBlock) as Integer 22447

### 187.24.21 Properties

### 187.24.22 DeviceHandle as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle to the device.
**Notes:** (Read and Write property)

### 187.24.23 Lasterror as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 187.24.24 LasterrorMessage as String

MBS USB Plugin, Plugin Version: 16.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error message.
**Notes:** (Read and Write property)

### 187.24.25 Parent as WinUSBMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parent usb object.
**Notes:** Objects created with GetAssociatedInterface have here the parent object, so you can go back to main interface.
(Read and Write property)

### 187.24.26 Tag as Variant

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The attached value.
**Notes:** You can use this property as you like.
(Read and Write property)

### 187.24.27 USBHandle as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle to the USB device.
**Notes:** (Read and Write property)

### 187.24.28 CurrentAlternateSetting as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current alternate interface setting for an interface.
**Notes:** To get the current alternate setting in the first (default) interface on the device, use the WinUSBMBS object created with constructor. For all other interfaces, use the WinUSBMBS objects to the target interface, retrieved by GetAssociatedInterface.

Lasterror is set. You can set and get the value.
(Read and Write computed property)

### 187.24.29 PipePolicyAllowPartialReads(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to allow partial reads.
**Notes:** The default value is true. To disable set to false.
Disabling AllowPartialReads causes the read requests to fail whenever the device returns more data (on bulk and interrupt IN endpoints) than the caller requested.
Enabling AllowPartialReads causes WinUSB to save or discard the extra data when the device returns more data (on bulk and interrupt IN endpoints) than the caller requested. This behavior is defined by setting the auto flush value.
Lasterror is set.
(Read and Write computed property)

### 187.24.30 PipePolicyAutoClearStall(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether WinUSB resets the pipe in order to automatically clear the stall condition.
**Notes:** Data continues to flow on the bulk and interrupt IN endpoints again as soon as a new or a queued transfer arrives on the endpoint. This policy parameter does not affect control pipes.
Disabling AutoClearStall causes all transfers (that arrive to the endpoint after the stalled transfer) to fail until the caller manually resets the endpoint's pipe by calling ResetPipe.
Lasterror is set.
(Read and Write computed property)

### 187.24.31 PipePolicyAutoFlush(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use auto flush.
**Notes:** The default value is false (zero). To enable auto flush set to true.
auto flush must be used with AllowPartialReads enabled. If AllowPartialReads is TRUE, the value of auto flush determines the action taken by WinUSB when the device returns more data than the caller requested.
Disabling AllowPartialReads causes WinUSB to ignore the auto flush value.
Disabling auto flush with AllowPartialReads enabled causes WinUSB to save the extra data, add the data to the beginning of the caller's next read request, and send it to the caller in the next read operation.
Enabling auto flush with AllowPartialReads enabled causes WinUSB to discard the extra data remaining from the read request.
Lasterror is set.
(Read and Write computed property)

### 187.24.32 PipePolicyIgnoreShortPackets(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enabling IgnoreShortPackets causes the host controller to not complete a read operation after it receives a short packet.
**Notes:** Instead, the host controller completes the operation only after the host has read the specified number of bytes.
Disabling IgnoreShortPackets causes the host controller to complete a read operation when either the host has read the specified number of bytes or the host has received a short packet.
The default value is false. To enable set to true.
Lasterror is set.
(Read and Write computed property)

### 187.24.33 PipePolicyMaximumTransferSize(PipeID as Integer) as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum size of a USB transfer supported by WinUSB.
**Notes:** This is a read-only policy.
Lasterror is set.
(Read and Write computed property)

### 187.24.34 PipePolicyPipeTransferTimeout(PipeID as Integer) as UInt32

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the time-out interval.
**Notes:** The default value is zero.
The PipeTransferTimeout value specifies the time-out interval, in milliseconds. The host controller cancels transfers that do not complete within the specified time-out interval.

A value of zero (default) indicates that transfers do not time out because the host controller never cancels the transfer.
Lasterror is set.
(Read and Write computed property)

### 187.24.35 PipePolicyRawIO(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use Raw IO.
**Notes:** The default value is false.
Enabling raw IO causes WinUSB to send data directly to the USB driver stack, bypassing WinUSB's queuing and error handling mechanism.
The buffers that are passed to ReadPipe must be configured by the caller as follows:

- The buffer length must be a multiple of the maximum endpoint packet size.
- The length must be less than or equal to the value of PipePolicyMaximumTransferSize.

Disabling raw IO (false) does not impose any restriction on the buffers that are passed to ReadPipe.
Lasterror is set.
(Read and Write computed property)

### 187.24.36 PipePolicyResetPipeOnResume(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to reset pipe on resume.
**Notes:** True indicates that on resume from suspend, WinUSB resets the endpoint before it allows the caller to send new requests to the endpoint.
Lasterror is set.
(Read and Write computed property)

### 187.24.37 PipePolicyShortPacketTerminate(PipeID as Integer) as boolean

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the driver sends a zero-length packet at the end of every write request to the host controller.
**Notes:** Lasterror is set.
(Read and Write computed property)

### 187.24.38 Constants

Power Policy Type Constants.

| Constant | Value | Description |
|---|---|---|
| AutoSuspend | &h81 | |
| SuspendDelay | &h83 | |

Device Speed Constants

| Constant | Value | Description |
|---|---|---|
| FullSpeed | 2 | Full Speed |
| HighSpeed | 3 | High Speed |
| LowSpeed | 1 | Low Speed |

# 187.25 class WinUSBNotificationMBS

## 187.25.1 class WinUSBNotificationMBS

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for getting notifications about USB devices being connected or removed.
**Notes:** Use MacUSBNotificationMBS for Mac OS X.
**Blog Entries**

- Showing USB Devices
- MBS Real Studio Plugins, version 11.3pr15
- MBS Real Studio Plugins, version 11.2pr3

## 187.25.2 Methods

## 187.25.3 Constructor

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor initializes the notification engine.
**Notes:** On success WindowHandle and NotifyHandle is not zero.

## 187.25.4 Properties

## 187.25.5 NotifyHandle as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Internal handle to the notification system.
**Notes:** (Read and Write property)

## 187.25.6 WindowHandle as Integer

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Internal handle to the dummy window for receiving notification.
**Notes:** (Read only property)

### 187.25.7 Events

### 187.25.8 DeviceAdded(Name as string)

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: .

**Function:** This event is called when a device has been attached.
**Notes:** Name is typically for an USB device: "\\?\USB#Vid_05ac&Pid_8403#000000009833# { a5dcbf10-6530-11d2-901f-00c04fb951ed } ".
That means you can get Vendor ID and Product ID from this string. Also the unique ID and finally the class GUID.

### 187.25.9 DeviceRemoved(Name as string)

MBS USB Plugin, Plugin Version: 11.2, Platform: Windows, Targets: .

**Function:** This event is called when a device has been removed.
**Notes:** Name is typically for an USB device: "\\?\USB#Vid_05ac&Pid_8403#000000009833# { a5dcbf10-6530-11d2-901f-00c04fb951ed } ".
That means you can get Vendor ID and Product ID from this string. Also the unique ID and finally the class GUID.

# 187.26 class WinUSBPipeInformationMBS

## 187.26.1 class WinUSBPipeInformationMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for pipe details.

## 187.26.2 Properties

## 187.26.3 Interval as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pipe interval.
**Notes:** (Read and Write property)

## 187.26.4 MaximumPacketSize as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum size, in bytes, of the packets that are transmitted on the pipe.
**Notes:** (Read and Write property)

## 187.26.5 PipeId as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pipe identifier (ID).
**Notes:** (Read and Write property)

## 187.26.6 PipeType as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pipe type.
**Notes:** (Read and Write property)

### 187.26.7 Constants

Pipe Type Constants

| Constant | Value | Description |
|---|---|---|
| UsbdPipeTypeBulk | 2 | Indicates that the pipe is a bulk transfer pipe. |
| UsbdPipeTypeControl | 0 | Indicates that the pipe is a control pipe. |
| UsbdPipeTypeInterrupt | 3 | Indicates that the pipe is a interrupt pipe. |
| UsbdPipeTypeIsochronous | 1 | Indicates that the pipe is an isochronous transfer pipe. |

# 187.27 class WinUSBSetupPacketMBS

## 187.27.1 class WinUSBSetupPacketMBS

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The metadata needed to create an USB packet.

## 187.27.2 Properties

## 187.27.3 Index as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The meaning of this member varies according to the request.
**Notes:** For an explanation of this member, see the Universal Serial Bus (USB) specification.
(Read and Write property)

## 187.27.4 Length as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes to transfer.
**Notes:** (Read and Write property)

## 187.27.5 Request as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device request.
**Notes:** The values that are assigned to this member are defined in Table 9.3 of section 9.4 of the Universal Serial Bus (USB) specification.
(Read and Write property)

## 187.27.6 RequestType as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The request type.
**Notes:** The values that are assigned to this member are defined in Table 9.2 of section 9.3 of the Universal Serial Bus (USB) specification (www.usb.org).

(Read and Write property)

### 187.27.7 Value as Integer

MBS USB Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The meaning of this member varies according to the request.
**Notes:** For an explanation of this member, see the Universal Serial Bus (USB) specification.
(Read and Write property)

# Chapter 188

# User Notifications

## 188.1 class NSUserNotificationActionMBS

### 188.1.1 class NSUserNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use UNNotificationActionMBS class instead. **Function:** An action shown to the user as part of a NSUserNotification in the additionalActions property.
**Notes:** Available on Mac OS X 10.10 and newer.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 19.2pr4
- New for Mac OS X 10.10 in MBS Xojo Plugins

### 188.1.2 Methods

### 188.1.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.10 or newer. False in all other cases.

### 188.1.4 Constructor(identifier as string, title as string)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.

### 188.1.5 copy as NSUserNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a copy of this object.

### 188.1.6 Properties

### 188.1.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.1.8 Identifier as String

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal identifier for this action.
**Notes:** (Read only property)

### 188.1.9 Title as String

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** The localized title of the action.
**Notes:** (Read only property)

## 188.2 class NSUserNotificationCenterDelegateMBS

### 188.2.1 class NSUserNotificationCenterDelegateMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use UNUserNotificationCenterMBS class instead. **Function:** This class allows you to react to events from the user notification center. **Notes:** This is for sending user notifications to the Mac your Xojo application runs on. Not for remote notifications or notifications to iOS devices.
**Blog Entries**

- Mac OS X 10.8 User Notifications with Filemaker and Real Studio

### 188.2.2 Methods

### 188.2.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Must be called to have the class register itself.

### 188.2.4 Destructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The destructor.

### 188.2.5 Properties

### 188.2.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.2.7 Events

### 188.2.8 didActivateNotification(center as NSUserNotificationCenterMBS, notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent to the delegate when a user clicks on a user notification presented by the user notification center.
**Example:**

```
Sub applicationDidFinishLaunching(Notification as NSNotificationMBS)
dim userInfo as Dictionary = Notification.userInfo
dim key as string = NSApplicationMBS.NSApplicationLaunchUserNotificationKey
dim UserNotification as NSUserNotificationMBS = userInfo.Lookup(key, nil)

if UserNotification <>nil then
MsgBox UserNotification.identifier+": "+UserNotification.informativeText
end if
End Sub
```

**Notes:** center: The user notification center.
notification: The user notification object.

This would be a good time to take action in response to user interacting with a specific notification.

To take an action when your application is launched as a result of a user clicking on a notification, be sure to implement the applicationDidFinishLaunching method in the application class that implements the NSApplicationDelegateMBS class. The notification parameter to that method has a userInfo dictionary, and if that dictionary has the NSApplicationLaunchUserNotificationKey key. The value of that key is the NSUserNotification object that caused the application to launch. The NSUserNotification object is delivered to the NSApplication delegate because that message will be sent before your application has a chance to set a delegate for the NSUserNotificationCenter.

Available in OS X v10.8 and later.

### 188.2.9 didDeliverNotification(center as NSUserNotificationCenterMBS, notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent to the delegate when a notification delivery date has arrived.
**Notes:** center: The user notification center.

notification: The user notification object.

This method is always called, regardless of your application state and even if you deliver the user notification yourself using deliverNotification:.

This event is invoked before the shouldPresentNotification event.
Available in OS X v10.8 and later.

### 188.2.10 shouldPresentNotification(center as NSUserNotificationCenterMBS, notification as NSUserNotificationMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: .

**Function:** Sent to the delegate when the user notification center has decided not to present your notification.
**Notes:** center: The user notification center.
notification: The user notification object.

Return true if the user notification should be displayed regardless; false otherwise.
Available in OS X v10.8 and later.

## 188.3 class NSUserNotificationCenterMBS

### 188.3.1 class NSUserNotificationCenterMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use UNUserNotificationCenterMBS class instead. **Function:** The NSUserNotificationCenterMBS class delivers user notifications to the user from applications or helper applications.
**Example:**

```
dim u as new NSUserNotificationMBS

u.Title = "Hello World"
u.subtitle = "from Xojo."
u.informativeText = "Our first Notification from Xojo."

dim d as new date
d.Second = d.Second + 10
u.deliveryDate = d

dim c as new NSUserNotificationCenterMBS
c.scheduleNotification u
```

**Notes:** When a user notifications is delivery date has been reached, or it is manually delivered, the notification center it may display the notification to the user. The user notification center reserves the right to decide if a delivered user notification is presented to the user. For example, it may suppress the notification if the application is already frontmost (the delegate can override this action). The application can check the result of this decision by examining the presented property of a delivered user notification.

NSUserNotificationMBS instances the NSUserNotificationCenterMBS are tracking will be in one of two states: scheduled or delivered. A scheduled user notification has a deliveryDate. On that delivery date, the notification will move from being scheduled to being delivered. Note that the user notification may be displayed later than the delivery date depending on a number of factors.

A delivered user notification has an actualDeliveryDate. That is the date when it moved from being scheduled to delivered, or when it was manually delivered using the deliverNotification method.

The application and the user notification center are both ultimately subject to the user's preferences. If the user decides to hide all alerts from your application, the presented property will still behave as above, but the user will not see any animation or hear any sound.

The NSUserNotificationCenterDelegateMBS class provides more information about the delivered user notification and allows forcing the display of a user notification even if the application is frontmost.

Note: It the user wakes more than 15 minutes after a scheduled notification is scheduled to fire, it is discarded. If the notification repeats with an interval less than 15 minutes, then it expires in 1 minute. Expired notifications are just discarded, unless they repeat, in which case, they stay in the scheduled list and just fire again later.
Important Many of the NSUserNotificationCenterMBS class's methods involve talking to a server process, so calling them repeatedly can have a negative effect on performance.

This is for sending user notifications to the Mac your Xojo application runs on. Not for remote notifications or notifications to iOS devices.

The NSUserNotificationCenterMBS class and the NSUserNotificationMBS class are both thread safe.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 19.2pr3
- Mac OS X 10.8 User Notifications with Filemaker and Real Studio

### 188.3.2 Methods

### 188.3.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether user notification framework is available.
**Notes:** Returns true on Mac OS X 10.8 and false otherwise.

### 188.3.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Initializes this object to point to the default user notification center.
Available in OS X v10.8 and later.

### 188.3.5 defaultUserNotificationCenter as NSUserNotificationCenterMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the default user notification center.
**Notes:** Available in OS X v10.8 and later.

### 188.3.6 deliveredNotifications as NSUserNotificationMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** An array of all user notifications delivered to the notification center.
**Notes:** The number of notifications the user actually sees in the user interface may be less than the size of this array.

Note that these may or may not have been actually presented to the user. See the presented property in the NSUserNotificationMBS class.

Note: A scheduled user notification that specifies a deliveryRepeatInterval remains in the scheduledNotifications list, even though it has been delivered. The item that goes into the deliveredNotifications list is a copy of the user notification item.

Available in OS X v10.8 and later.

### 188.3.7 deliverNotification(notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Deliver the specified user notification.
**Example:**

```
dim u as new NSUserNotificationMBS

u.Title = "Hello World"
u.subtitle = "just a test"

dim c as new NSUserNotificationCenterMBS
c.deliverNotification u
```

**Notes:** notification: The user notification.

The notification will be presented to the user (subject to the user's preferences). The presented property of the NSUserNotification object will always be set to true if a notification is delivered using this method.

Available in OS X v10.8 and later.

### 188.3.8 removeAllDeliveredNotifications

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Remove all delivered user notifications from the user notification center.
**Notes:** Available in OS X v10.8 and later.

### 188.3.9 removeAllScheduledNotifications

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: Desktop only.

**Function:** Remove all scheduled user notifications from the user notification center.
**Notes:** Available in OS X v10.8 and later.

### 188.3.10 removeDeliveredNotification(notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Remove a delivered user notification from the user notification center.
**Notes:** notification: The user notification.

If the user notification is not in deliveredNotifications, nothing happens.

Available in OS X v10.8 and later.

### 188.3.11 removeScheduledNotification(notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Removes the specified user notification for the scheduled notifications.
**Notes:** notification: The user notification.

If the user notification's deliveryDate occurs before the cancellation finishes, the notification may still be delivered.
If the notification is not in the scheduled list, nothing happens.

Available in OS X v10.8 and later.

### 188.3.12 scheduledNotifications as NSUserNotificationMBS()

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies an array of scheduled user notifications that have not yet been delivered.
**Notes:** Newly scheduled notifications are added to the end of the array. You may also bulk-schedule notifications by setting this array. Bulk setting new scheduled notifications unschedules existing notifications.

Note: The scheduled user notification could be changing to a delivered notification at the time you are calling this method. and if that case the user notification will still be delivered.

Available in OS X v10.8 and later.

### 188.3.13 scheduleNotification(notification as NSUserNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Schedules the specified user notification.
**Notes:** notification: The user notification.

Scheduled notifications are added to the end of the notification queue.
Available in OS X v10.8 and later.

### 188.3.14 Properties

### 188.3.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 188.4 class NSUserNotificationMBS

### 188.4.1 class NSUserNotificationMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use UNNotificationMBS class instead. **Function:** The NSUserNotificationMBS class is used to configure a notification that is scheduled for display by the NSUserNotificationCenterMBS class.
**Example:**

```
dim u as new NSUserNotificationMBS

u.Title = "Hello World"
u.subtitle = "from Xojo."
u.informativeText = "Our first Notification from Xojo."

dim d as new date
d.Second = d.Second + 10
u.deliveryDate = d

dim c as new NSUserNotificationCenterMBS
c.scheduleNotification u
```

**Notes:** The NSUserNotificationMBS object not only configures the notification, when the notification is delivered information about when the notification was actually presented to the user (if at all) and other details are provided in the notification object. User applications can create NSUserNotification objects and register them with the NSUserNotificationCenterMBS object to notify the user when an application requires attention.

See NSUserNotificationCenterMBS Class Reference for more information.

Threading Information
The NSUserNotificationCenterMBS class and the NSUserNotificationMBS class are both thread safe.

This is for sending user notifications to the Mac your Xojo application runs on. Not for remote notifications or notifications to iOS devices.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 20.6pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr1

- MBS Xojo Plugins 17.2
- New for Mac OS X 10.10 in MBS Xojo Plugins
- MBS Xojo / Real Studio plug-ins in version 13.5
- MBS Xojo / Real Studio Plugins, version 13.5pr1
- Mac OS X 10.8 User Notifications with Filemaker and Real Studio

**Xojo Developer Magazine**

- 17.3, page 11: News
- 15.4, page 9: News

### 188.4.2 Methods

### 188.4.3 additionalActions as NSUserNotificationActionMBS()

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries the array of additional actions.
**Notes:** For Mac OS X 10.10 and newer. Will not cause exception if called on older versions, but simply return empty array.

An array of NSUserNotificationActionMBS objects that describe the different actions that can be taken on a notification in addition to the default action described by actionButtonTitle.

### 188.4.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether this class is available.
**Notes:** Returns true on Mac OS X 10.8 and newer.
Returns false on other operation systems, e.g. older OS X, Windows or Linux.

### 188.4.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The constructor to create a new notification.

### 188.4.6 copy as NSUserNotificationMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a clone of the notification object.

### 188.4.7 NSUserNotificationDefaultSoundName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The default sound played by the user notification center for this notification.
**Notes:** The default notification sound.
Available in OS X v10.8 and later.

### 188.4.8 Print

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Prints description of notification object to console for debugging.

### 188.4.9 setAdditionalActions(additionalActions() as NSUserNotificationActionMBS)

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Sets the array of additional actions.
**Notes:** For Mac OS X 10.10 and newer. Will not cause exception if called on older versions.

An array of NSUserNotificationActionMBS objects that describe the different actions that can be taken on a notification in addition to the default action described by actionButtonTitle.

### 188.4.10 Properties

### 188.4.11 actionButtonTitle as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the title of the action button displayed in the notification.
**Notes:** This value should localized as it will be presented to the user. The string will be truncated to a length appropriate for display and the property will be modified to reflect the truncation.

Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.12 activationType as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies what caused a user notification to occur.
**Notes:** This property specifies why the user notification was sent to to the NSUserNotificationCenterDelegateMBS didActivateNotification event. The supported values are described in constants.

Available in OS X v10.8 and later.
(Read only property)

### 188.4.13 actualDeliveryDate as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The date this notification was actually delivered.
**Notes:** The notification center will set this value if a notification is put in the scheduled list and the delivery time arrives.

If the notification is delivered directly using the deliverNotification: method of the NSUserNotificationCenterMBS class, this value will be set to the deliveryDate value. If the deliveryDate value nil this value is set to the current date.

This value is used to sort the list of notifications in the user interface.

Available in OS X v10.8 and later.
(Read only property)

### 188.4.14 actualDeliveryDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** The date this notification was actually delivered.
**Notes:** The notification center will set this value if a notification is put in the scheduled list and the delivery time arrives.

If the notification is delivered directly using the deliverNotification: method of the NSUserNotificationCen-

terMBS class, this value will be set to the deliveryDate value. If the deliveryDate value nil this value is set to the current date.

This value is used to sort the list of notifications in the user interface.

Available in OS X v10.8 and later.
(Read only property)

### 188.4.15 additionalActivationAction as NSUserNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 14.3, Platform: macOS, Targets: Desktop only.

**Function:** Queries which additional action was selected.
**Notes:** For Mac OS X 10.10 and newer. Will not cause exception if called on older versions, but always return nil.

When a user selects an additional action that action will be set on the notification's additionalActivationAction property when passed into the delegate event didActivateNotification.
(Read only property)

### 188.4.16 contentImage as NSImageMBS

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Image shown in the content of the notification.
**Notes:** (Read and Write property)

### 188.4.17 deliveryDate as date

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies when the notification should be delivered.
**Notes:** The delivery date is specified in an absolute time.
After a notification is delivered, it may be presented to the user.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.18 deliveryDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Specifies when the notification should be delivered.
**Notes:** The delivery date is specified in an absolute time.
After a notification is delivered, it may be presented to the user.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.19 deliveryRepeatInterval as NSDateComponentsMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the date components that control how often a user notification is repeated.
**Notes:** This value may be nil if the notification should not repeat.

The date component values are relative to the date the notification was delivered.

If the calendar value of the deliveryRepeatInterval is nil, the current calendar will be used to calculate the repeat interval. For example, if a notification should repeat every hour, set the hour property of the deliveryRepeatInterval to 1.

This value is ignored unless the user notification is scheduled with the NSUserNotificationCenterMBS object.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.20 deliveryTimeZone as NSTimeZoneMBS

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specify the time zone to interpret the delivery date in.
**Notes:** If this value is nil and the user switches time zones, the notification center will adjust the time of presentation to account for the time zone change.

If a notification should be delivered at a time in a specific time zone (regardless of whether the user switches time zones), set this value to the specific time zone, for example the current time zone.

Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.21 description as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Description of notification object for debugging.
**Notes:** (Read only property)

### 188.4.22 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.4.23 hasActionButton as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the notification displays an action button.
**Notes:** Set to false if the notification has no action button. This will be the case for notifications that are purely for informational purposes and have no user action.

The default value is true.

Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.24 hasReplyButton as boolean

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Set to true if the notification has a reply button.
**Notes:** The default value is false. If both this and hasActionButton are true, the reply button will be shown.
(Read and Write property)

### 188.4.25 identifier as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** This identifier is used to uniquely identify a notification.
**Notes:** A notification delivered with the same identifier as an existing notification will replace that notification, rather then display a new one.

Available in OS X 10.9 and newer.
(Read and Write property)

### 188.4.26 informativeText as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** The body text of the notification.
**Notes:** This value should localized as it will be presented to the user. The string will be truncated to a length appropriate for display and the property will be modified to reflect the truncation.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.27 otherButtonTitle as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies a custom title for the close button in an alert-style notification.
**Notes:** This value should localized as it will be presented to the user. The string will be truncated to a length appropriate for display and the property will be modified to reflect the truncation.

An empty string will cause the default localized text to be used.

Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.28 Presented as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the user notification has been presented.
**Notes:** In some cases, for example when your application is frontmost, the notification center may decide not to actually present a delivered notification. In that case, the value of this property will be false. It will be set to true if the notification was presented according to user preferences.

Available in OS X v10.8 and later.
(Read only property)

### 188.4.29 remote as boolean

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies whether the remote was generated by a push notification.
**Notes:** If this property is true then the user notification was generated by a push notification (that is, remotely); if false it was generated locally.
Available in OS X v10.8 and later.
(Read only property)

### 188.4.30 response as NSAttributedStringMBS

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** The response text.
**Notes:** When a notification has been responded to, the NSUserNotificationCenter event didActivateNotification will be called with the notification with the activationType set to NSUserNotificationActivationTypeReplied and the response set on the response property.
(Read only property)

### 188.4.31 responsePlaceholder as string

MBS MacFrameworks Plugin, Plugin Version: 13.5, Platform: macOS, Targets: Desktop only.

**Function:** Optional placeholder for inline reply field.
**Notes:** (Read and Write property)

### 188.4.32 soundName as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the name of the sound to play when the notification is delivered.
**Notes:** Passing the NSUserNotificationDefaultSoundName constant causes the default notification center sound to be played.
A value of nil means no sound is played.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.33 subtitle as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the subtitle of the notification.
**Notes:** This value should localized as it will be presented to the user. The string will be truncated to a length appropriate for display and the property will be modified to reflect the truncation.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.34 title as string

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Specifies the title of the notification.
**Notes:** This value should localized as it will be presented to the user. The string will be truncated to a length appropriate for display and the property will be modified to reflect the truncation.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.35 userInfo as dictionary

MBS MacFrameworks Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Application-specific user info that can be attached to the notification.
**Example:**

```
dim u as new NSUserNotificationMBS
dim d as new dictionary
d.value("Key") = "Value"
u.userinfo = d
```

**Notes:** All items must be property list types or an exception will be thrown.
The userInfo content must be of reasonable serialized size (less than 1k) or an exception will be thrown.
Available in OS X v10.8 and later.
(Read and Write property)

### 188.4.36 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| NSUserNotificationActivationTypeReplied | 3 | The activation type for a notification which got a reply. |

Activation Type Constant

| Constant | Value | Description |
|---|---|---|
| NSUserNotificationActivationTypeActionButtonClicked | 2 | The user clicked on the action button of the notifica<br>Available in OS X v10.8 and later. |
| NSUserNotificationActivationTypeAdditionalActionClicked | 4 | User did select an additional action.<br>Only for Mac OS X 10.10 and newer. |
| NSUserNotificationActivationTypeContentsClicked | 1 | The user clicked on the contents of the notification<br>Available in OS X v10.8 and later. |
| NSUserNotificationActivationTypeNone | 0 | The user did not interact with the notification alert<br>Available in OS X v10.8 and later. |

## 188.5 class UNCalendarNotificationTriggerMBS

### 188.5.1 class UNCalendarNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A trigger condition that causes a notification to be delivered at a specific date and time.
**Notes:** Create a UNCalendarNotificationTriggerMBS object when you want to schedule the delivery of a local notification at the specified date and time. You specify the temporal information using an NSDateComponentsMBS object, which lets you specify only the time values that matter to you. The system uses the provided information to determine the next date and time that matches the specified information.
Subclass of the UNNotificationTriggerMBS class.

### 188.5.2 Methods

### 188.5.3 Constructor(dateComponents as NSDateComponentsMBS, repeats as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a calendar trigger from the specified date components.
**Notes:** dateComponents: The temporal information to use when constructing the trigger. Provide only the date components that are relevant for your trigger.
repeats: Specify false to deliver the notification one time. Specify YES to reschedule the notification request each time the notification is delivered.

Returns a new calendar trigger based on the specified temporal information.

If you specify true for the repeats parameter, you must explicitly remove the notification request to stop the delivery of the associated notification. Use the methods of UNUserNotificationCenterMBS to remove notification requests that are no longer needed.

### 188.5.4 trigger(dateComponents as NSDateComponentsMBS, repeats as boolean) as UNCalendarNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a calendar trigger from the specified date components.
**Notes:** dateComponents: The temporal information to use when constructing the trigger. Provide only the date components that are relevant for your trigger.
repeats: Specify false to deliver the notification one time. Specify YES to reschedule the notification request each time the notification is delivered.

Returns a new calendar trigger based on the specified temporal information.

If you specify true for the repeats parameter, you must explicitly remove the notification request to stop the delivery of the associated notification. Use the methods of UNUserNotificationCenterMBS to remove notification requests that are no longer needed.

### 188.5.5 Properties

### 188.5.6 dateComponents as NSDateComponentsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The date components used to construct this object.
**Notes:** Use this property to review the date components associated with this trigger.
(Read only property)

### 188.5.7 nextTriggerDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The next date at which the trigger conditions will be met.
**Notes:** Use this property to find out when a notification associated with this trigger will next be delivered.
(Read only property)

### 188.5.8 nextTriggerDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The next date at which the trigger conditions will be met.
**Notes:** Use this property to find out when a notification associated with this trigger will next be delivered.
(Read only property)

## 188.6 class UNMutableNotificationContentMBS

### 188.6.1 class UNMutableNotificationContentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The editable content for a notification.
**Notes:** Create a UNMutableNotificationContent object when you want to specify the payload for a local notification. Specifically, use this object to specify the title and message for an alert, the sound to play, or the value to assign to your app's badge. You might also provide details about how the system handles the notification. For example, you can specify a custom launch image and a thread identifier for visually grouping related notifications.
After creating your content object, assign it to a UNNotificationRequest object, add a trigger condition, and schedule your notification. The trigger condition defines when the notification is delivered to the user. Listing 1 shows the scheduling of a local notification that displays an alert and plays a sound after a delay of five seconds. The strings for the alert's title and body are stored in the app,Äôs Localizable.strings file.
Subclass of the UNNotificationContentMBS class.

### 188.6.2 Methods

### 188.6.3 addAttachment(attachment as UNNotificationAttachmentMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Adds an attachment.

### 188.6.4 clearBadge

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Clears the badge.

### 188.6.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The constructor.

### 188.6.6 setAttachments(attachments() as UNNotificationAttachmentMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Sets an array of attachments to display in an alert-based notification.
**Notes:** Use this property to include images or movies, or to include playable audio files, with the contents of an alert. The system displays the attachments alongside the title and body of your alert. You can also customize the presentation of attachments using a notification content app extension.
All attachments must reside locally on the current device before they can be added. For local notifications, modify this property before scheduling the notification. For remote notifications, use a notification service app extension to locate and download the specified files and modify the notification content before it is delivered.
For more information on how to specify attachments, see UNNotificationAttachmentMBS.

### 188.6.7 Properties

### 188.6.8 badge as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The number to apply to the app,Äôs icon.
**Notes:** Use this property to specify the number to apply to the app,Äôs icon when the notification arrives. If your app is not authorized to display badge-based notifications, this property is ignored.
Specify the number 0 to remove the current badge, if present. Specify a number greater than 0 to display a badge with that number. Use clearBadge to leave the current badge unchanged.
(Read and Write property)

### 188.6.9 body as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized message to display in the notification alert.
**Notes:** Use this property to specify the body of the notification alert. If your app is not authorized to display alert-based notifications, this property is ignored.
The body text should contain the final text that you want to display, and should not contain any placeholder characters. To include a percent symbol (%) in the message body, use two percent symbols (%%). The system strips all other printf style escape characters from your string prior to display.
(Read and Write property)

### 188.6.10 categoryIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The identifier of the category object that represents the notification's type.
**Notes:** Use notification types to distinguish between the different types of notifications your app supports. You use this support primarily to create actionable notifications—that is, notifications with custom action buttons—and to redirect your notifications through either your notification service app extension or your notification content app extension.
Assign a value to this property that matches the identifier property of one of the UNNotificationCategory objects you previously registered with your app. If you assign a string that does not match one of your registered categories, the system displays your notification without custom actions and without routing it through your app extensions.
(Read and Write property)

### 188.6.11 sound as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The sound to play when the notification is delivered.
**Notes:** Use this property to specify the sound that you want played when the notification arrives. If your app is not authorized to play sounds for notifications, this property is ignored.
For information on how to specify sounds for your notifications, see UNNotificationSoundMBS.
(Read and Write property)

### 188.6.12 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized subtitle, containing a secondary description of the reason for the alert.
**Notes:** Use this property to specify additional context about the purpose of the notification. Subtitles offer additional context in cases where the title alone is not clear. Subtitles are not displayed in all cases. If your app is not authorized to display alert-based notifications, this property is ignored.
(Read and Write property)

### 188.6.13 summaryArgument as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The string the notification adds to the category,Äôs summary format string.
**Notes:** (Read and Write property)

### 188.6.14 summaryArgumentCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The number of items the notification adds to the category,Äôs summary format string.
**Notes:** (Read and Write property)

### 188.6.15 threadIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An identifier that you use to group related notifications together.
**Notes:** You may specify any value for the string, but assign the same thread identifier string to all notifications that you want to group together visually.
(Read and Write property)

### 188.6.16 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized title, containing the reason for the alert.
**Notes:** Use this property to specify the title of your notification alert. If your app is not authorized to display alert-based notifications, this property is ignored.
Title strings should be short, usually only a couple of words describing the reason for the notification. In watchOS, the title string is displayed as part of the short look notification interface, which has limited space.
(Read and Write property)

### 188.6.17 userInfo as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A dictionary of custom information associated with the notification.
**Notes:** Use this property to associate custom information with the notification. The contents of the dictionary are not seen by the user, but are accessible to your app or to any notification-related app extensions.
The keys in this dictionary must be property-list types—that is, they must be types that can be serialized into the property-list format.
(Read and Write property)

## 188.7 class UNNotificationActionMBS

### 188.7.1 class UNNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The class for an action for a notification.
**Notes:** Use UNNotificationAction objects to define the actions that your app can perform in response to a delivered notification. You define the actions that your app supports. For example, a meeting app might define actions for accepting or rejecting a meeting invitation. The action object itself contains the title to display in an action button and the button's appearance. After creating action objects, add them to a UNNotificationCategory object and register your categories with the system.
For information on how to define actions and categories, see Declaring Your Actionable Notification Types.

When the user selects one of your actions in response to a notification, the system notifies the delegate of the shared UNUserNotificationCenterMBS object. Specifically, the system calls the didReceiveNotificationResponse event. The response object passed to your delegate includes the identifier string of the action that was selected, which you can use to perform the corresponding task.
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1

### 188.7.2 Methods

### 188.7.3 action(identifier as string, title as string, options as integer) as UNNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an action object with the specified title and options.
**Notes:** identifier: The string that you use internally to identify the action. This string must be unique among all of your app's supported actions. When the user selects the action, the system passes this string to your app and asks you to perform the related task. This parameter must not be nil or an empty string.
title: The localized string to display to the user. This string is used as the title of a button, which is added to the notification interface. This parameter must not be nil.
options: Additional options describing how the action behaves. Include options when you need the related behavior. For a list of possible values, see constants.

### 188.7.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationAction class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.7.5 Constructor(identifier as string, title as string, options as integer)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an action object with the specified title and options.
**Notes:** identifier: The string that you use internally to identify the action. This string must be unique among all of your app's supported actions. When the user selects the action, the system passes this string to your app and asks you to perform the related task. This parameter must not be nil or an empty string.
title: The localized string to display to the user. This string is used as the title of a button, which is added to the notification interface. This parameter must not be nil.
options: Additional options describing how the action behaves. Include options when you need the related behavior. For a list of possible values, see constants.

### 188.7.6 copy as UNNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.7.7 Properties

### 188.7.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.7.9 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The unique string that your app uses to identify the action.
**Notes:** When the user selects an action, the system reports the value of this string to your app. Because all actions are handled by a single delegate method, the identifier strings for all of your app's actions must be unique.
(Read only property)

### 188.7.10 options as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The behaviors associated with the action.
**Notes:** Options should be applied to an action when the corresponding behavior is required.
(Read only property)

### 188.7.11 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized string to use as the title of the action.
**Notes:** This string is used as the title of the button that the user taps or selects in the notification interface.
(Read only property)

### 188.7.12 Constants

Options

| Constant | Value | Description |
|---|---|---|
| OptionAuthenticationRequired | 1 | The action can be performed only on an unlocked device.<br>When the user selects an action with this option, the system prompts the user to unlock the device. After unlocking, the system notifies your app of the selected action. You might use option to perform actions that require accessing data that is encrypted while the device is locked. |
| OptionDestructive | 2 | The action performs a destructive task.<br>Use this option for actions that delete user data or change the app irrevocably. The action button is displayed with special highlighting to indicate that it performs a destructive task. |
| OptionForeground | 4 | The action causes the app to launch in the foreground.<br>When the user selects an action containing this option, the system brings the app to the foreground, asking the user to unlock the device as needed. Use this option for actions that require the user to interact further with your app. Do not use this option simply to bring your app to the foreground. |
| OptionNone | 0 | The action has the default behavior. |

# 188.8 class UNNotificationAttachmentMBS

## 188.8.1 class UNNotificationAttachmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A media file associated with a notification.
**Notes:** Create a UNNotificationAttachmentMBS object when you want to include audio, image, or video content together in an alert-based notification. When creating the UNNotificationAttachmentMBS object, the file you specify must be on disk, and the file format must be one of the supported types.

You are responsible for supplying attachments before the system displays your notification's alert. For local notifications, add attachments when creating the notification,Äôs content. For remote notifications, use a notification service app extension to download the attached files and then add them to the notification's content before delivery.

The system validates attachments before displaying the associated notification. If you attach a file to a local notification request that is corrupted, invalid, or of an unsupported file type, the system doesn't schedule your request. For remote notifications, the system validates attachments after your notification service app extension finishes. Once validated, attached files are moved into the attachment data store so that they can be accessed by all of the appropriate processes. Attachments located inside an app,Äôs bundle are copied instead of moved.

Supported File Types
Table lists the types of files you can include as an attachment and the supported file formats. The table also lists the maximum size allowed for attachments of each type. An image file may contain a static image or an animated image sequence.

Supported attachment file types

| Attachment | Supported file types | Maximum size |
|---|---|---|
| Audio | kUTTypeAudioInterchangeFileFormat, kUTTypeWaveformAudio, kUTTypeMP3 and kUTTypeMPEG4Audio | 5 MB |
| Image | kUTTypeJPEG, kUTTypeGIF and kUTTypePNG | 10 MB |
| Movie | kUTTypeMPEG, kUTTypeMPEG2Video, kUTTypeMPEG4 and kUTTypeAVIMovie | 50 MB |

When creating an attachment, you can specify optional details about how to present the thumbnail image for the image or movie. Use the UNNotificationAttachmentOptionsThumbnailClippingRectKey option to use only the specified portion of an image as a thumbnail. For animated images and movies, use the UNNotificationAttachmentOptionsThumbnailTimeKey option to select which frame to use for the thumbnail image.

The amount of storage space allocated for attachments is limited for each app. To delete attachments, use the methods of the UNUserNotificationCenterMBS class to remove the notification requests that contain those attachments.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1

### 188.8.2 Methods

### 188.8.3 attachment(identifier as String, File as FolderItem, options as Dictionary = nil, byref error as NSErrorMBS) as UNNotificationAttachmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an attachment object from the specified file and options.
**Notes:** identifier: The unique identifier of the attachment. Use this string to identify the attachment later. If you specify an empty string, this method creates a unique identifier string for you.
URL: The URL of the file you want to attach to the notification. The URL must be a file URL and the file must be readable by the current process. This parameter must not be nil. For a list of supported file types, see Supported File Types.
options: A dictionary of options related to the attached file. Use the options to specify meta information about the attachment, such as the clipping rectangle to use for the resulting thumbnail.
error: An error object indicating whether a problem occurred. If the attachment was created successfully, this parameter is set to nil. If an error occurs, it is set to an error object containing information about why the attachment was not created. You may specify nil for this parameter if you do not want the error information.

Returns an attachment object containing information about the specified file or nil if the attachment could not be created.

This method verifies that the specified file is readable and that the file format is one of the supported types. When errors occur, the method provides an appropriate error object.
When you schedule a notification request containing the attachment, the attachment,Äôs file is moved to a new location to facilitate access by the appropriate processes. After the move, the only way to access the file is using the methods of the UNUserNotificationCenterMBS object.
See also:

- 188.8.4 attachment(identifier as String, URL as String, options as Dictionary = nil, byref error as NSErrorMBS) as UNNotificationAttachmentMBS 22490

### 188.8.4 attachment(identifier as String, URL as String, options as Dictionary = nil, byref error as NSErrorMBS) as UNNotificationAttachmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an attachment object from the specified file and options.
**Notes:** identifier: The unique identifier of the attachment. Use this string to identify the attachment later. If you specify an empty string, this method creates a unique identifier string for you.
URL: The URL of the file you want to attach to the notification. The URL must be a file URL and the file must be readable by the current process. This parameter must not be nil. For a list of supported file types,

see Supported File Types.
options: A dictionary of options related to the attached file. Use the options to specify meta information about the attachment, such as the clipping rectangle to use for the resulting thumbnail.
error: An error object indicating whether a problem occurred. If the attachment was created successfully, this parameter is set to nil. If an error occurs, it is set to an error object containing information about why the attachment was not created. You may specify nil for this parameter if you do not want the error information.

Returns an attachment object containing information about the specified file or nil if the attachment could not be created.

This method verifies that the specified file is readable and that the file format is one of the supported types. When errors occur, the method provides an appropriate error object.
When you schedule a notification request containing the attachment, the attachment,Äôs file is moved to a new location to facilitate access by the appropriate processes. After the move, the only way to access the file is using the methods of the UNUserNotificationCenterMBS object.
See also:

- 188.8.3 attachment(identifier as String, File as FolderItem, options as Dictionary = nil, byref error as NSErrorMBS) as UNNotificationAttachmentMBS 22490

### 188.8.5 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationAttachment class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.8.6 Constructor(identifier as String, File as FolderItem, options as Dictionary = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an attachment object from the specified file and options.
**Notes:** identifier: The unique identifier of the attachment. Use this string to identify the attachment later. If you specify an empty string, this method creates a unique identifier string for you.
URL: The URL of the file you want to attach to the notification. The URL must be a file URL and the file must be readable by the current process. This parameter must not be nil. For a list of supported file types, see Supported File Types.
options: A dictionary of options related to the attached file. Use the options to specify meta information about the attachment, such as the clipping rectangle to use for the resulting thumbnail.
error: An error object indicating whether a problem occurred. If the attachment was created successfully, this parameter is set to nil. If an error occurs, it is set to an error object containing information about why the attachment was not created. You may specify nil for this parameter if you do not want the error information.

Returns an attachment object containing information about the specified file or nil if the attachment could not be created.

This method verifies that the specified file is readable and that the file format is one of the supported types. When errors occur, the method provides an appropriate error object.
When you schedule a notification request containing the attachment, the attachment,Äôs file is moved to a new location to facilitate access by the appropriate processes. After the move, the only way to access the file is using the methods of the UNUserNotificationCenterMBS object.
See also:

- 188.8.7 Constructor(identifier as String, URL as String, options as Dictionary = nil) 22492

### 188.8.7 Constructor(identifier as String, URL as String, options as Dictionary = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an attachment object from the specified file and options.
**Notes:** identifier: The unique identifier of the attachment. Use this string to identify the attachment later. If you specify an empty string, this method creates a unique identifier string for you.
URL: The URL of the file you want to attach to the notification. The URL must be a file URL and the file must be readable by the current process. This parameter must not be nil. For a list of supported file types, see Supported File Types.
options: A dictionary of options related to the attached file. Use the options to specify meta information about the attachment, such as the clipping rectangle to use for the resulting thumbnail.
error: An error object indicating whether a problem occurred. If the attachment was created successfully, this parameter is set to nil. If an error occurs, it is set to an error object containing information about why the attachment was not created. You may specify nil for this parameter if you do not want the error information.

Returns an attachment object containing information about the specified file or nil if the attachment could not be created.

This method verifies that the specified file is readable and that the file format is one of the supported types. When errors occur, the method provides an appropriate error object.
When you schedule a notification request containing the attachment, the attachment,Äôs file is moved to a new location to facilitate access by the appropriate processes. After the move, the only way to access the file is using the methods of the UNUserNotificationCenterMBS object.
See also:

- 188.8.6 Constructor(identifier as String, File as FolderItem, options as Dictionary = nil) 22491

### 188.8.8 copy as UNNotificationAttachmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.2, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.8.9 UNNotificationAttachmentOptionsThumbnailClippingRectKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The clipping rectangle for a thumbnail image.
**Notes:** The value of this key is a dictionary containing a normalized CGRectMBS—that is, a unit rectangle whose values are in the range 0.0 to 1.0 and represent the portion of the original image that you want to display. For example, specifying an origin of (0.25, 0.25) and a size of (0.5, 0.5) defines a clipping rectangle that shows only the center portion of the image.

### 188.8.10 UNNotificationAttachmentOptionsThumbnailHiddenKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the attachment,Äôs thumbnail is hidden.
**Notes:** The value of this key is a number containing a Boolean value. When set to true, the attachment,Äôs thumbnail is not displayed. If you do not include this key, the thumbnail is shown.

### 188.8.11 UNNotificationAttachmentOptionsThumbnailTimeKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The frame number of an animation to use as a thumbnail image.
**Notes:** For animated images, the value of this key is an number containing the frame number to use as the thumbnail. For movies, the value of this key is the time (in seconds) into the movie from which to grab the thumbnail image.

### 188.8.12 UNNotificationAttachmentOptionsTypeHintKey as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A hint about an attachment,Äôs file type.
**Notes:** The value of this key is a string containing a Uniform Type Identifier (UTI) that describes the file,Äôs type. If you do not include this key, the attachment,Äôs filename extension is used to determine its type.

### 188.8.13 Properties

### 188.8.14 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.8.15 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The unique identifier for the attachment.
**Notes:** (Read only property)

### 188.8.16 type as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The UTI type of the attachment.
**Notes:** The value of this property is derived from the attachment data.
(Read only property)

### 188.8.17 URL as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The URL of the file for this attachment.
**Notes:** The file at the specified URL is security scoped to your app. Before you access it, call the startAccessingSecurityScopedResource method of NSURL.
(Read only property)

# 188.9 class UNNotificationCategoryMBS

## 188.9.1 class UNNotificationCategoryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A type of notification that your app supports and the custom actions to display with it.
**Notes:** A UNNotificationCategoryMBS object defines a type of notification that your executable can receive. You create category objects to define your app's actionable notifications—that is, notifications that have action buttons that the user can select in response to the notification. Each category object you create stores the actions and other behaviors associated with a specific type of notification. Register your category objects using the setNotificationCategories method of UNUserNotificationCenterMBS. You can register as many category objects as you want.

To apply category objects to your notifications, include the category,Äôs identifier string in the payload of any notifications you create. For local notifications, put this string in the categoryIdentifier property of the UNMutableNotificationContentMBS object that you use to specify the notification,Äôs content. For remote notifications, use this string as the value of the category key in the aps dictionary of your payload.

Categories can have associated actions, which define custom buttons to display for notifications of that category. When space is unlimited, the system displays up to 10 actions. When space is limited, the system displays at most two actions.

## 188.9.2 Methods

## 188.9.3 actions as UNNotificationActionMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The actions to display when a notification of this type is presented.
**Notes:** When displaying a notification assigned to this category, the system adds a button to the notification interface for each action in this property. These buttons are displayed after the notification,Äôs content but before the Dismiss button.
When displaying banner notifications, the system displays only the first two actions.

## 188.9.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationCategory class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.9.5 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer) as UNNotificationCategoryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions and options, a hidden previous placeholder, and the category,Äôs summary format string.
See also:

- 188.9.6 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) as UNNotificationCategoryMBS 22496
- 188.9.7 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer) as UNNotificationCategoryMBS 22497

### 188.9.6 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) as UNNotificationCategoryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions, options, and a hidden previous placeholder.
**Notes:** identifier: The unique identifier for the category. Each category that your app uses must have a unique identifier. Do not specify an empty string.
actions: The actions to display when notifications of this type are delivered. When minimal space is available, only the first two actions in the array are displayed. You may specify nil for this parameter if you do not want to display custom actions.
intentIdentifiers: The intent identifier strings that you want to associate with notifications of this type. The Intents framework defines constants for each type of intent that you can associate with your notifications.
hiddenPreviewsBodyPlaceholder: A placeholder string to display when the user has disabled notification previews for the app. Include the characters %u in the string to represent the number of notifications with the same thread identifier. (No other formatting characters are supported.) For example, the string "%u Messages" becomes "2 Messages" when there are two messages.
To specify different strings for the singular and plural cases, use the localizedUserNotificationStringForKey method of string to specify the value for this parameter. The key passed to that method contains the identifier of an entry in a .stringsdict property list of your project. A strings dictionary lets you specify different formatted strings based on the language rules, and is as described in Internationalization and Localization Guide.
options: Additional options for handling notifications of this type. For a list of possible values, see UNNotificationCategoryOptions.
See also:

- 188.9.5 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as

string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer) as UNNotificationCategoryMBS 22496

- 188.9.7 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer) as UNNotificationCategoryMBS 22497

### 188.9.7 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer) as UNNotificationCategoryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions and options.
**Notes:** identifier: The unique identifier for the category. Each category that your app uses must have a unique identifier. Do not specify an empty string.
actions: The actions to display when notifications of this type are delivered. When minimal space is available, only the first two actions in the array are displayed. You may specify nil for this parameter if you do not want to display custom actions.
intentIdentifiers: The intent identifier strings that you want to associate with notifications of this type. The Intents framework defines constants for each type of intent that you can associate with your notifications.
options: Additional options for handling notifications of this type. For a list of possible values, see UNNotificationCategoryOptions.

Returns an initialized category object.
See also:

- 188.9.5 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer) as UNNotificationCategoryMBS 22496
- 188.9.6 category(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) as UNNotificationCategoryMBS 22496

### 188.9.8 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions and options, a hidden previous placeholder, and the category,Äôs summary format string.
See also:

- 188.9.9 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) 22498

- 188.9.10 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer) 22498

### 188.9.9 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions, options, and a hidden previous placeholder.
**Notes:** identifier: The unique identifier for the category. Each category that your app uses must have a unique identifier. Do not specify an empty string.
actions: The actions to display when notifications of this type are delivered. When minimal space is available, only the first two actions in the array are displayed. You may specify nil for this parameter if you do not want to display custom actions.
intentIdentifiers: The intent identifier strings that you want to associate with notifications of this type. The Intents framework defines constants for each type of intent that you can associate with your notifications.
hiddenPreviewsBodyPlaceholder: A placeholder string to display when the user has disabled notification previews for the app. Include the characters %u in the string to represent the number of notifications with the same thread identifier. (No other formatting characters are supported.) For example, the string "%u Messages" becomes "2 Messages" when there are two messages.
To specify different strings for the singular and plural cases, use the localizedUserNotificationStringForKey method of string to specify the value for this parameter. The key passed to that method contains the identifier of an entry in a .stringsdict property list of your project. A strings dictionary lets you specify different formatted strings based on the language rules, and is as described in Internationalization and Localization Guide.
options: Additional options for handling notifications of this type. For a list of possible values, see UNNotificationCategoryOptions.
See also:

- 188.9.8 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer) 22497

- 188.9.10 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer) 22498

### 188.9.10 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, options as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a category object containing the specified actions and options.
**Notes:** identifier: The unique identifier for the category. Each category that your app uses must have a unique identifier. Do not specify an empty string.

actions: The actions to display when notifications of this type are delivered. When minimal space is available, only the first two actions in the array are displayed. You may specify nil for this parameter if you do not want to display custom actions.
intentIdentifiers: The intent identifier strings that you want to associate with notifications of this type. The Intents framework defines constants for each type of intent that you can associate with your notifications.
options: Additional options for handling notifications of this type. For a list of possible values, see UNNotificationCategoryOptions.

Returns an initialized category object.
See also:

- 188.9.8 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, categorySummaryFormat as String, options as Integer) 22497
- 188.9.9 Constructor(identifier as String, actions() as UNNotificationActionMBS, intentIdentifiers() as string, hiddenPreviewsBodyPlaceholder as String, options as Integer) 22498

### 188.9.11 copy as UNNotificationCategoryMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.9.12 intentIdentifiers as String()

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The intents related to notifications of this category.
**Notes:** When a notification is delivered, the presence of an intent identifier lets the system know that the notification is potentially related to the handling of a request made through Siri.

### 188.9.13 Properties

### 188.9.14 categorySummaryFormat as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A format string for the summary description used when the system groups the category,Äôs notifications.
**Notes:** (Read only property)

### 188.9.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.9.16 hiddenPreviewsBodyPlaceholder as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The placeholder text to display when notification previews are disabled for the app.
**Notes:** The string in this property may contain the special characters %u as a placeholder for the number of messages with the same thread identifier. If the string in this property is declared in a .stringsdict property list, the system formats the preview message using the information in that file. For more information about specifying a .stringsdict property file, see Internationalization and Localization Guide.
(Read only property)

### 188.9.17 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The unique string assigned to the category.
**Notes:** Use this string to differentiate the different types of notifications that your app can send. To assign a category to a local notification, assign this string to the categoryIdentifier property of the content object. To assign a category to a remote notification, use the string as the value of the category key in the aps dictionary of the notification payload.
(Read only property)

### 188.9.18 options as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Options for how to handle notifications of this type.
**Notes:** (Read only property)

### 188.9.19 Constants

Options

| Constant | Value | Description |
|---|---|---|
| OptionAllowInCarPlay | 2 | Allow CarPlay to display notifications of this type.<br>Apps must be approved for CarPlay overall and then you must enable CarP for the notification types you want displayed. If a category does not explic contain this option, notifications of that type are not displayed in a CarP environment. |
| OptionCustomDismissAction | 1 | Send dismiss actions to the UNUserNotificationCenter object,Äôs delegate handling. |
| OptionHiddenPreviewsShowSubtitle | 8 | Show the notification's subtitle, even if the user has disabled notification p views for the app. |
| OptionHiddenPreviewsShowTitle | 4 | Show the notification's title, even if the user has disabled notification previ for the app. |
| OptionNone | 0 | No options. |

## 188.10 class UNNotificationContentMBS

### 188.10.1 class UNNotificationContentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The uneditable content of a notification.
**Notes:** A UNNotificationContent object contains the data associated with a notification. When your app receives a notification, the associated UNNotificationRequestMBS object contains an object of this type with the content that your app received. Use the content object to get the details of the notification, including the type of notification that was delivered, any custom data you stored in the userInfo dictionary before scheduling the notification, and any attachments.
Don't create instances of this class directly. For remote notifications, the contents of this object are derived from the JSON payload that your server sends to the APNS server. For local notifications, create a UNMutableNotificationContentMBS object, and configure the contents of that object instead.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr4

### 188.10.2 Methods

### 188.10.3 attachment(Index as integer) as UNNotificationAttachmentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Queries attachment with given index.
**Notes:** Index from 0 to attachmentCount-1.

### 188.10.4 attachments as UNNotificationAttachmentMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An array of attachments to display with the notification.
**Notes:** Use this property to retrieve the images, movies, and audio files associated with your notification,Äôs content. A notification content app extension might use these values to add the associated content to its view controller.

### 188.10.5 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationContent class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.10.6 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 188.10.7 Constructor(Handle as Integer) 22503

### 188.10.7 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a UNNotificationContent reference from a declare.
The object is retained.
See also:

- 188.10.6 Constructor 22503

### 188.10.8 copy as UNNotificationContentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.10.9 mutableCopy as UNMutableNotificationContentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a mutable copy of the object.

### 188.10.10 Properties

### 188.10.11 attachmentCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The attachment count.
**Notes:** (Read only property)

### 188.10.12 badge as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The number to display as the app,Äôs icon badge.
**Notes:** When the number in this property is 0, the system does not display a badge. When the number is greater than 0, the system displays the badge with the specified number. When the value in this property is not set, the system leaves the current badge unchanged.
(Read only property)

### 188.10.13 body as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The message displayed in the notification alert.
**Notes:** The body text contains the final text that you want to display. If your app is not authorized to display alert-based notifications, this property is ignored.
If you specified two percent symbols (%%) in the message body, the system replaces it with a single percent symbol (%). The system strips all other printf style escape characters from your string prior to display.
(Read only property)

### 188.10.14 categoryIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The identifier of the app-defined category object.
**Notes:** Use notification types to distinguish between the different types of notifications your app supports. You use this support primarily to create actionable notifications—that is, notifications with custom action buttons—and to redirect your notifications through either your notification service app extension or your notification content app extension.
For remote notifications, this property is set to the value of the category key in the aps dictionary.
(Read only property)

### 188.10.15 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.10.16 sound as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The sound to play when the notification is delivered.
**Notes:** Notifications can play a default sound or a custom sound. For information on how to specify custom sounds for your notifications, see UNNotificationSoundMBS.
(Read only property)

### 188.10.17 subtitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A secondary description of the reason for the alert.
**Notes:** Subtitles offer additional context in cases where the title alone is not clear. Subtitles are not displayed in all cases. If your app is not authorized to display alert-based notifications, this property is ignored.
(Read only property)

### 188.10.18 summaryArgument as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The string the notification adds to the category,Äôs summary format string.
**Notes:** (Read only property)

### 188.10.19 summaryArgumentCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The number of items the notification adds to the category,Äôs summary format string.
**Notes:** (Read only property)

### 188.10.20 threadIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An identifier that you use to group related notifications together.
**Notes:** For remote notifications, this property is set to the value of the thread-id key in the aps dictionary.
(Read only property)

### 188.10.21 title as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A short description of the reason for the alert.
**Notes:** When a title is present, the system attempts to display a notification alert. If your app is not authorized to display alert-based notifications, this property is ignored.
Title strings should be short, usually only a couple of words describing the reason for the notification. In watchOS, the title string is displayed as part of the short look notification interface, which has limited space.
(Read only property)

### 188.10.22 userInfo as Dictionary

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A dictionary of custom information associated with the notification.
**Notes:** For remote notifications, this property contains the entire notification payload. For local notifications, you configure the property directly before scheduling the notification.
The keys in this dictionary must be property-list types—that is, they must be types that can be serialized into the property-list format.
(Read only property)

# 188.11 class UNNotificationMBS

## 188.11.1 class UNNotificationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The data for a local or remote notification that was delivered to your app.
**Notes:** A UNNotification object contains the initial notification request, which contains the notification's payload, and the date on which the notification was delivered.
Don't create notification objects directly. When handling notifications, the system delivers notification objects to your events. The UNUserNotificationCenterMBS object also maintains the list of notifications that were previously delivered, and you use the getDeliveredNotifications method to retrieve those objects.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr4
- MBS Xojo Plugins, version 20.6pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.3, page 11: News

## 188.11.2 Methods

## 188.11.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotification class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

## 188.11.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.
See also:

- 188.11.5 Constructor(Handle as Integer) 22508

### 188.11.5 Constructor(Handle as Integer)

MBS MacFrameworks Plugin, Plugin Version: 21.1, Platform: macOS, Targets: Desktop only.

**Function:** Constructor for creating an instanced based on an existing handle.
**Notes:** Useful if you get a UNNotification reference from a declare.
The object is retained.
See also:

- 188.11.4 Constructor 22507

### 188.11.6 copy as UNNotificationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.11.7 UNErrorDomain as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The error domain for notifications.

### 188.11.8 Properties

### 188.11.9 Date as Date

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The delivery date of the notification.
**Notes:** This date is displayed to the user in Notification Center.
(Read only property)

### 188.11.10 DateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The delivery date of the notification.
**Notes:** This date is displayed to the user in Notification Center.
(Read only property)

### 188.11.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.11.12 request as UNNotificationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The notification request containing the payload and trigger condition for the notification.
**Notes:** For local notifications, the request object is a copy of the one you originally configured. For remote notifications, the request object is synthesized from information received from Apple Push Notification service.
(Read only property)

### 188.11.13 Constants

Errors

| Constant | Value | Description |
|---|---|---|
| UNErrorCodeAttachmentCorrupt | 105 | The file for an attachment is corrupt. |
| UNErrorCodeAttachmentInvalidFileSize | 102 | An attachment is too large. |
| UNErrorCodeAttachmentInvalidURL | 100 | The URL for an attachment was invalid. |
| UNErrorCodeAttachmentMoveIntoDataStoreFailed | 104 | An error occurred when trying to move an attachment to the |
| UNErrorCodeAttachmentNotInDataStore | 103 | The specified attachment is not in the system data store. |
| UNErrorCodeAttachmentUnrecognizedType | 101 | The file type of an attachment is not supported. |
| UNErrorCodeNotificationInvalidNoContent | 1401 | The notification has no user-facing content, but should. |
| UNErrorCodeNotificationInvalidNoDate | 1400 | The notification does not have an associated date, but shou |
| UNErrorCodeNotificationsNotAllowed | 1 | Notifications are not allowed. |
| | | This error occurs when you try to submit a notification req |
| | | or app extension is not authorized to schedule notifications. |

## 188.12 class UNNotificationRequestMBS

### 188.12.1 class UNNotificationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A request to schedule a local notification, which includes the content of the notification and the trigger conditions for delivery.
**Notes:** Create a UNNotificationRequestMBS object when you want to schedule the delivery of a local notification. A notification request object contains a UNNotificationContentMBS object with the payload to be delivered, and it contains the UNNotificationTriggerMBS object with the conditions that trigger the delivery of the notification. To schedule the delivery of your notification, pass your request object to the addNotificationRequest method of the shared user notification center object.

After scheduling a request, you interact with UNNotificationRequestMBS objects in the following ways:

- View your app's pending notifications by calling the getPendingNotificationRequestsWithCompletion-Handler: method of your shared user notification center object.
- When a notification is delivered to your app, the provided UNNotificationMBS object contains a UNNotificationRequest object that you can inspect to get the notification details.
- Use the request's identifier to remove delivered notifications from Notification Center.

When receiving a local or remote notification, use the provided UNNotificationRequestMBS object to fetch details about the notification.

### 188.12.2 Methods

### 188.12.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationRequest class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.12.4 Constructor(identifier as string, content as UNNotificationContentMBS, trigger as UNNotificationTriggerMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a notification request object that you use to schedule a notification.
**Notes:** identifier: An identifier for the request; this parameter must not be nil. You can use this identifier

to cancel the request if it is still pending (see the removePendingNotificationRequests method).
content: The content of the notification. This parameter must not be nil.
trigger: The condition that causes the notification to be delivered. Specify nil to deliver the notification right away.

Returns a new notification request object.

Use this method when you want to schedule the delivery of a local notification. This method creates the request object that you subsequently pass to the addNotificationRequest method.
The system uses the identifier parameter to determine how to handle the request:

- If you provide a unique identifier, the system creates a new notification.
- If the identifier matches a previously delivered notification, the system alerts the user again, replaces the old notification with the new one, and places the new notification at the top of the list.
- If the identifier matches a pending request, the new request replaces the pending request.

### 188.12.5 Copy as UNNotificationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.12.6 request(identifier as string, content as UNNotificationContentMBS, trigger as UNNotificationTriggerMBS) as UNNotificationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a notification request object that you use to schedule a notification.
**Notes:** identifier: An identifier for the request; this parameter must not be nil. You can use this identifier to cancel the request if it is still pending (see the removePendingNotificationRequests method).
content: The content of the notification. This parameter must not be nil.
trigger: The condition that causes the notification to be delivered. Specify nil to deliver the notification right away.

Returns a new notification request object.

Use this method when you want to schedule the delivery of a local notification. This method creates the request object that you subsequently pass to the addNotificationRequest method.
The system uses the identifier parameter to determine how to handle the request:

- If you provide a unique identifier, the system creates a new notification.
- If the identifier matches a previously delivered notification, the system alerts the user again, replaces the old notification with the new one, and places the new notification at the top of the list.
- If the identifier matches a pending request, the new request replaces the pending request.

### 188.12.7 Properties

### 188.12.8 content as UNNotificationContentMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The content associated with the notification.
**Notes:** Use this property to access the contents of the notification.
(Read only property)

### 188.12.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.12.10 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The unique identifier for this notification request.
**Notes:** Use this string to identify notifications in your app. For example, you can pass this string to the removePendingNotificationRequests method to cancel a previously scheduled notification.
If you use the same identifier when scheduling a new notification, the system removes the previously scheduled notification with that identifier and replaces it with the new one.
For local notifications, this property is set to the value passed to the request,Äôs initializer (see the request method). For remote notifications, it is set to the value of the apns-collapse-id key that you specified in the APNs request header when generating the remote notification. If no value is set, the system automatically assigns an identifier.
(Read only property)

### 188.12.11 trigger as UNNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The conditions that trigger the delivery of the notification.
**Notes:** For notifications that have already been delivered, use this property to determine what caused the delivery to occur. For remote notifications, this property contains a UNPushNotificationTriggerMBS object. For other notifications, the type is based on the trigger condition specified in the original request.
(Read only property)

## 188.13 class UNNotificationResponseMBS

### 188.13.1 class UNNotificationResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The user,Äôs response to an actionable notification.
**Notes:** When the user interacts with a delivered notification, the system delivers a UNNotificationResponseMBS object to your app so that you can process the response. Users can interact with delivered notifications in many ways. If the notification,Äôs category had associated action buttons, they can select one of those buttons. Users can also dismiss the notification without selecting one of your actions and they can open your app. A response object tells you which option the user selected.

You don't create UNNotificationResponseMBS objects yourself. Instead, the shared user notification center object creates them and delivers them to the didReceiveNotificationResponse event. Use that method to extract any needed information from the response object and take appropriate action.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 188.13.2 Methods

### 188.13.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationResponse class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.13.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 188.13.5 copy as UNNotificationResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.13.6 UNNotificationDefaultActionIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An action that indicates the user opened the app from the notification interface.
**Notes:** The delivery of this action does not require any special configuration of notification categories. Use the didReceiveNotificationResponse event to receive this action.

### 188.13.7 UNNotificationDismissActionIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The action that indicates the user explicitly dismissed the notification interface.
**Notes:** This action is delivered only if the notification,Äôs category object was configured with the UNNotificationCategoryOptionCustomDismissAction option. To trigger this action, the user must explicitly dismiss the notification interface. For example, the user must tap the Dismiss button or swipe down on the notification interface in watchOS to trigger this action.
Ignoring a notification or flicking away a notification banner does not trigger this action.

### 188.13.8 Properties

### 188.13.9 actionIdentifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The identifier string of the action that the user selected.
**Notes:** This parameter may contain one the identifier of one of your UNNotificationActionMBS objects or it may contain a system-defined identifier. The system defined identifiers are UNNotificationDefaultActionIdentifier and UNNotificationDismissActionIdentifier, which indicate that the user opened the app or dismissed the notification without any further actions.
(Read only property)

### 188.13.10 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.13.11 notification as UNNotificationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The notification to which the user responded.
**Notes:** (Read only property)

# 188.14 class UNNotificationSettingsMBS

## 188.14.1 class UNNotificationSettingsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The object for managing notification-related settings and the authorization status of your app.
**Notes:** A UNNotificationSettingsMBS object contains the current authorization status and notification-related settings for your app. Apps must receive authorization to schedule notifications and to interact with the user. Apps that run in CarPlay must similarly receive authorization to do so. You use this object to determine what notification-related actions your app is allowed to perform. You might then use that information to enable, disable, or adjust your app's notification-related behaviors. Regardless of whether you take action, the system enforces your app's settings by preventing denied interactions from occurring.
You don't create instances of this class directly. Instead, call the getNotificationSettings method of your app,Äôs UNUserNotificationCenterMBS object to get the current settings.
For more information about requesting authorization for user interactions, see UNUserNotificationCenter.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 188.14.2 Methods

## 188.14.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationSettings class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

## 188.14.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 188.14.5 copy as UNNotificationSettingsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.14.6 settings as UNNotificationSettingsMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The last settings received via getNotificationSettingsCompleted event.
**Notes:** You call getNotificationSettings and whether you implement and handle the event or not, the settings are stored by plugin in a global variable, so you can query them here.

### 188.14.7 Properties

### 188.14.8 alertSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The authorization status for displaying alerts.
**Notes:** When the value of this property is NotificationSettingEnabled, the app is authorized to display alerts. Authorization does not guarantee that alerts always appear on the user,Äôs screen. When a device is unlocked, the alertStyle property determines the presentation style for the alert, which can include not displaying the alert at all.
The system tries to display an alert when the title, subtitle, or body properties of a UNNotificationContentMBS object contain values, or when the aps dictionary in a remote notification contains the alert key.
(Read only property)

### 188.14.9 alertStyle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The type of alert that the app may display when the device is unlocked.
**Notes:** When alerts are authorized, this property specifies the presentation style for alerts when the device is unlocked. The user may choose to display alerts as automatically disappearing banners or as modal windows that require explicit dismissal. The user may also choose not to display alerts at all.
(Read only property)

### 188.14.10 authorizationStatus as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The app's ability to schedule and receive local and remote notifications.
**Notes:** When the value of this property is AuthorizationStatusAuthorized, your app is allowed to schedule and receive local and remote notifications. When authorized, use the alertSetting, badgeSetting, and soundSetting properties to specify which types of interactions are allowed. When the value of the property is AuthorizationStatusDenied, the system doesn't deliver notifications to your app, and the system ignores any attempts to schedule local notifications.

The value of this property is AuthorizationStatusNotDetermined if your app has never requested authorization using the requestAuthorization method.
(Read only property)

### 188.14.11 badgeSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The authorization status for badging your app,Äôs icon.
**Notes:** When the value of this property is NotificationSettingEnabled, the app is authorized to badge its icon. The system tries to badge your app's icon when the badge property of a UNNotificationContentMBS object contain a value, or when the aps dictionary in a remote notification contains the badge key.
(Read only property)

### 188.14.12 criticalAlertSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The authorization status to play sounds for critical alerts.
**Notes:** When NotificationSettingEnabled, this property authorizes the app to play critical sounds that ignore Do Not Disturb and the device,Äôs mute switch.
For local notifications, the system attempts to play a critical sound when the sound property of the UNNotificationContentMBS object contains an object returned by the defaultCriticalSound property, the criticalSoundNamed method, or a related method.
For remote notifications, the system attempts to play a critical sound when the notification,Äôs payload contains a sound directory that contains the critical key.
Critical alerts require a special entitlement issued by Apple.
(Read only property)

### 188.14.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.14.14 lockScreenSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The setting that indicates whether your app,Äôs notifications appear onscreen when the device

is locked.
**Notes:** Even if the user disables lock screen notifications, your notifications may still appear onscreen when the device is unlocked.
(Read only property)

### 188.14.15 notificationCenterSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The setting that indicates whether your app,Äôs notifications are displayed in Notification Center.
**Notes:** The default value of this property is NotificationSettingEnabled.
(Read only property)

### 188.14.16 providesAppNotificationSettings as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating the system displays a button for in-app notification settings.
**Notes:** (Read only property)

### 188.14.17 showPreviewsSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The setting that indicates whether the app shows a preview of the notification's content.
**Notes:** (Read only property)

### 188.14.18 soundSetting as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The authorization status for playing sounds for incoming notifications.
**Notes:** When the value of this property is NotificationSettingEnabled, the app is authorized to play sounds. The system tries to play a sound when the sound property of the UNNotificationContentMBS object contains a value, or when the aps dictionary in a remote notification contains the sound key.
(Read only property)

### 188.14.19 Constants

Alert Style

| Constant | Value | Description |
|---|---|---|
| AlertStyleAlert | 2 | Modal alerts.<br>Alerts are displayed in a modal window that must be dismissed explicitly by the user. |
| AlertStyleBanner | 1 | Banner alerts.<br>Alerts are displayed as a slide-down banner. Banners appear for a short time and then disappear automatically if the user does nothing. |
| AlertStyleNone | 0 | No alert. |

Authorization Status

| Constant | Value | Description |
|---|---|---|
| AuthorizationStatusAuthorized | 2 | The app is authorized to schedule or receive notifications. |
| AuthorizationStatusDenied | 1 | The app isn't authorized to schedule or receive notifications. |
| AuthorizationStatusNotDetermined | 0 | The user hasn't yet made a choice about whether the app is allowed to sched notifications. |
| AuthorizationStatusProvisional | 3 | The application is provisionally authorized to post noninterruptive user not cations. |

Notification Settings

| Constant | Value | Description |
|---|---|---|
| NotificationSettingDisabled | 1 | The setting is disabled. |
| NotificationSettingEnabled | 2 | The setting is enabled. |
| NotificationSettingNotSupported | 0 | The setting is not available to your app. |

Show Preview Settings

| Constant | Value | Description |
|---|---|---|
| ShowPreviewsSettingAlways | 0 | The notification's content is always shown, even when the device is lo |
| ShowPreviewsSettingNever | 2 | The notification's content is never shown, even when the device is un |
| ShowPreviewsSettingWhenAuthenticated | 1 | The notification's content is shown only when the device is unlocked. |

## 188.15 class UNNotificationSoundMBS

### 188.15.1 class UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The sound played when a notification is delivered.
**Notes:** Create a UNNotificationSoundMBS object when you want the delivery of your notification to be accompanied by a specific sound. To play the default system sound, create your sound object using the defaultSound method. If you want to play a custom sound, create a new sound object and specify the name of the audio file that you want to play.

For local notifications, assign the sound object to the sound property of your UNMutableNotificationContentMBS object. For a remote notification, assign the name of your sound file to the sound key in the aps dictionary. You can also use a notification service app extension to add a sound file to a notification shortly before delivery. In your extension, create a UNNotificationSound object and add it to your notification content in the same way that you would for a local notification.
Audio files must already be on the user,Äôs device before they can be played. If you use a predefined set of sounds for your notifications, include the audio files in your app,Äôs bundle. For all other sounds, place a copy of the audio file in the Library/Sounds folder of your app,Äôs container directory. The UNNotificationSound object looks only in those two locations.

Prepare Sound Resources
The system sound facility plays custom alert sounds, so they must be in one of the following audio data formats:

- Linear PCM
- MA4 (IMA/ADPCM)
- ¬µLaw
- aLaw

You can package the audio data in an aiff, wav, or caf file. Sound files must be less than 30 seconds in length. If the sound file is longer than 30 seconds, the system plays the default sound instead.

You can use the afconvert command-line tool to convert sounds. For example, to convert the system sound Submarine.aiff to IMA4 audio in a CAF file, use the following command in Terminal:

afconvert /System/Library/Sounds/Submarine.aiff
textasciitilde /Desktop/sub.caf -d ima4 -f caff -v
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 188.15.2 Methods

### 188.15.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationSound class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.15.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 188.15.5 copy as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.15.6 criticalSoundNamed(name as string) as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a custom sound object for critical alerts.
**Notes:** name: The name of the sound file to play. This file must be located in the current executable,Äôs main bundle or in the Library/Sounds directory of the current app container directory. If files exist at both locations, the system uses the file from the Library/Sounds directory. This parameter must not be nil.

Returns a sound object representing a custom critical alert sound.

Critical alerts ignore the mute switch and Do Not Disturb. They require a special entitlement issued by Apple.
See also:

- 188.15.7 criticalSoundNamed(name as string, volume as double) as UNNotificationSoundMBS 22524

### 188.15.7 criticalSoundNamed(name as string, volume as double) as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a custom sound object for critical alerts with the specified volume.
**Notes:** name: The name of the sound file to play. This file must be located in the current executable,Äôs main bundle or in the Library/Sounds directory of the current app container directory. If files exist at both locations, the system uses the file from the Library/Sounds directory. This parameter must not be nil.
volume: The volume must be a value between 0.0 and 1.0.

Returns a sound object representing a custom critical alert sound at the specified volume.

Critical alerts ignore the mute switch and Do Not Disturb. They require a special entitlement issued by Apple.
See also:

- 188.15.6 criticalSoundNamed(name as string) as UNNotificationSoundMBS 22523

### 188.15.8 defaultCriticalSound as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The default sound used for critical alerts.
**Notes:** Critical alerts ingore the mute switch and Do Not Disturb. They require a special entitlement issued by Apple.

### 188.15.9 defaultCriticalSoundWithAudioVolume(volume as double) as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a sound object that plays the default critical alert sound at the specified volume.
**Notes:** volume: The volume must be a value between 0.0 and 1.0.

Returns a sound object representing the default critical alert sound at the specified volume.

Critical alerts ignore the mute switch and Do Not Disturb. They require a special entitlement issued by Apple.

### 188.15.10 defaultSound as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns an object representing the default sound for notifications.

### 188.15.11 soundNamed(name as string) as UNNotificationSoundMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a sound object that represents a custom sound file.
**Notes:** name: The name of the sound file to play. This file must be located in the current executable,Äôs main bundle or in the Library/Sounds directory of the current app container directory. This parameter must not be nil.

Returns a sound object representing the custom sound.

If a sound file with the given name exists both in the current bundle and in the Library/Sounds folder, this method chooses the file in the Library/Sounds folder.

### 188.15.12 Properties

### 188.15.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 188.16 class UNNotificationTriggerMBS

### 188.16.1 class UNNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The common behavior for subclasses that trigger the delivery of a local or remote notification.
**Notes:** The UNNotificationTrigger class is an abstract class for representing an event that triggers the delivery of a notification. You don't create instances of this class directly. Instead, you instantiate the concrete subclass that defines the trigger condition you want for your notification. You then assign the resulting object to the UNNotificationRequestMBS object that you use to schedule your notification.

Concrete trigger classes include the following:

- UNTimeIntervalNotificationTriggerMBS
- UNCalendarNotificationTriggerMBS
- UNLocationNotificationTriggerMBS
- UNPushNotificationTriggerMBS

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 188.16.2 Methods

### 188.16.3 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNNotificationTrigger class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.16.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 188.16.5 copy as UNNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 188.16.6 Properties

### 188.16.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.16.8 repeats as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the system reschedules the notification after it is delivered.
**Notes:** When this property is NO, the notification is delivered only once. When this property is YES, the notification request is rescheduled automatically, resulting in the notification being delivered each time the trigger condition is met. To unschedule the notification request, use the methods of the UNUserNotificationCenterMBS to remove the notification request.
(Read only property)

## 188.17 class UNPushNotificationTriggerMBS

### 188.17.1 class UNPushNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A trigger condition that indicates the notification was sent from Apple Push Notification Service (APNs).
**Notes:** You don't create instances of this class yourself. The system creates UNPushNotificationTrigger objects and associates them with requests that originated from Apple Push Notification service. You encounter instances of this class when managing your app,Äôs delivered notification requests, which store an object of this type in their trigger property.
Subclass of the UNNotificationTriggerMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 188.17.2 Methods

### 188.17.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

# 188.18 class UNTextInputNotificationActionMBS

## 188.18.1 class UNTextInputNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** An action that can accept user-typed text.
**Notes:** Use UNTextInputNotificationActionMBS objects to define an action that allows the user to provide a custom text-based response. When the user selects an action of this type, the system displays controls for the user to enter or dictate the text content. That text is then included in the response object that is delivered to your app.
Subclass of the UNNotificationActionMBS class.

## 188.18.2 Methods

## 188.18.3 action(identifier as string, title as string, options as integer, textInputButtonTitle as string, textInputPlaceholder as string) as UNTextInputNotificationActionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an action object that accepts text input from the user.
**Notes:** identifier: The string that you use internally to identify the action. This string must be unique among all of your app's supported actions. When the user selects the action, the system passes this string to your app and asks you to perform the related task. This parameter must not be nil or an empty string.
title: The localized string to display to the user. This string is used as the title of a button, which is added to the notification interface. This parameter must not be nil.
options: Additional options describing how the action behaves. Include options when you need the related behavior. For a list of possible values, see options.
textInputButtonTitle: The localized title of the text input button that is displayed to the user.
textInputPlaceholder: The localized placeholder text to display in the text input field.

Returns a new text input action object.

## 188.18.4 Constructor(identifier as string, title as string, options as integer, textInputButtonTitle as string, textInputPlaceholder as string)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates an action object that accepts text input from the user.
**Notes:** identifier: The string that you use internally to identify the action. This string must be unique among all of your app's supported actions. When the user selects the action, the system passes this string to your app and asks you to perform the related task. This parameter must not be nil or an empty string.

title: The localized string to display to the user. This string is used as the title of a button, which is added to the notification interface. This parameter must not be nil.
options: Additional options describing how the action behaves. Include options when you need the related behavior. For a list of possible values, see options.
textInputButtonTitle: The localized title of the text input button that is displayed to the user.
textInputPlaceholder: The localized placeholder text to display in the text input field.

Returns a new text input action object.

### 188.18.5 Properties

### 188.18.6 textInputButtonTitle as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized title of the text input button that is displayed to the user.
**Notes:** (Read only property)

### 188.18.7 textInputPlaceholder as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The localized placeholder text to display in the text input field.
**Notes:** (Read only property)

# 188.19 class UNTextInputNotificationResponseMBS

## 188.19.1 class UNTextInputNotificationResponseMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The user,Äôs response to an actionable notification, including any custom text that the user typed or dictated.
**Notes:** The system delivers a UNTextInputNotificationResponse object to your app so that you can process user-provided text content. When defining your categories, you can specify an UNTextInputNotification-ActionMBS object instead of an UNNotificationActionMBS object for your action. If you do, the system creates an UNTextInputNotificationResponseMBS object when the user selects the accompanying action, and it fills the userText property with any user-entered text.

You don't create UNTextInputNotificationResponseMBS objects yourself. Instead, the shared user notification center object creates them and delivers them to the didReceiveNotificationResponse event. Use that method to extract any needed information from the response object and take appropriate action.
Subclass of the UNNotificationResponseMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 188.19.2 Methods

## 188.19.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 188.19.4 Properties

## 188.19.5 userText as String

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The text response provided by the user.
**Notes:** If the user does not specify any text, this property contains an empty string.
(Read only property)

## 188.20 class UNTimeIntervalNotificationTriggerMBS

### 188.20.1 class UNTimeIntervalNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A trigger condition that causes a notification to be delivered after the specified amount of time elapses.
**Notes:** Create a UNTimeIntervalNotificationTrigger object when you want to schedule the delivery of a local notification after the specified number of seconds elapse. You use this type of trigger to implement timers.
Subclass of the UNNotificationTriggerMBS class.

### 188.20.2 Methods

### 188.20.3 Constructor(timeInterval as double, repeats as boolean)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a time interval trigger from the specified time value.
**Notes:** timeInterval: The time (in seconds) that must elapse from the current time before the trigger fires. This value must be greater than zero.
repeats: Specify false to deliver the notification one time. Specify true to reschedule the notification request each time the notification is delivered. If this parameter is true, the value in the timeInterval parameter must be 60 seconds or greater.

Return Value:
A new time interval trigger based on the specified temporal information.

If you specify true for the repeats parameter, you must explicitly remove the notification request to stop the delivery of the associated notification. Use the methods of UNUserNotificationCenterMBS to remove notification requests that are no longer needed.

### 188.20.4 trigger(timeInterval as double, repeats as boolean) as UNTimeIntervalNotificationTriggerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Creates a time interval trigger from the specified time value.
**Notes:** timeInterval: The time (in seconds) that must elapse from the current time before the trigger fires. This value must be greater than zero.
repeats: Specify false to deliver the notification one time. Specify true to reschedule the notification request each time the notification is delivered. If this parameter is true, the value in the timeInterval parameter

must be 60 seconds or greater.

Return Value:
A new time interval trigger based on the specified temporal information.

If you specify true for the repeats parameter, you must explicitly remove the notification request to stop the delivery of the associated notification. Use the methods of UNUserNotificationCenterMBS to remove notification requests that are no longer needed.

### 188.20.5 Properties

### 188.20.6 nextTriggerDate as Date

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: Desktop, Console & Web.

**Function:** The next date at which the trigger conditions will be met.
**Notes:** Use this property to find out when a notification associated with this trigger will next be delivered.
(Read only property)

### 188.20.7 nextTriggerDateTime as DateTime

MBS MacFrameworks Plugin, Plugin Version: 20.5, Platform: macOS, Targets: All.

**Function:** The next date at which the trigger conditions will be met.
**Notes:** Use this property to find out when a notification associated with this trigger will next be delivered.
(Read only property)

### 188.20.8 timeInterval as Double

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The time interval used to create the trigger.
**Notes:** This property contains the original time interval that you specified when creating the trigger object. The value in this property is not updated as time counts down. To find out when the trigger will fire next, call the nextTriggerDate method.
(Read only property)

## 188.21 class UNUserNotificationCenterMBS

### 188.21.1 class UNUserNotificationCenterMBS

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The central object for managing notification-related activities for your app or app extension.
**Notes:** see also
https://developer.apple.com/documentation/usernotifications/unusernotificationcenter?language=objc
**Blog Entries**

- MBS Xojo Plugins, version 20.6pr1
- MBS Xojo Plugins, version 19.2pr4

### 188.21.2 Methods

### 188.21.3 addNotificationRequest(request as UNNotificationRequestMBS, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Schedules a local notification for delivery.
**Notes:** This method schedules local notifications only; you cannot use it to schedule the delivery of remote notifications. Upon calling this method, the system begins tracking the trigger conditions associated with your request. When the trigger condition is met, the system delivers your notification. If the request does not contain a UNNotificationTriggerMBS object, the notification is delivered right away.
You may call this method from any thread of your app.

request: The request object containing the notification payload and trigger information. This parameter must not be nil.

Calls addNotificationRequestCompleted event later. Request and tag parameter is passed through.

### 188.21.4 Available as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Whether the UNUserNotificationCenter class is available.
**Notes:** Returns true on MacOS 10.14 or newer in 64-bit MacOS application.

### 188.21.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns the shared user notification center object for your app or app extension.

### 188.21.6 Destructor

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The destructor.

### 188.21.7 getDeliveredNotifications(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns a list of the app,Äôs notifications that are still displayed in Notification Center.
**Notes:** This method executes asynchronously, returning immediately and executing the provided block on a background thread when the results become available.

Calls getDeliveredNotificationsCompleted event later. Tag parameter is

### 188.21.8 getNotificationCategories(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Retrieves the app,Äôs currently registered notification categories.
**Notes:** Use this method to retrieve your app,Äôs currently registered notification types. You might use this method when you want to augment the current set of categories with new categories later on. Simply merge the returned set with any new category objects and register the updated set.

Calls getNotificationCategoriesCompleted event later. Tag parameter is passed through.

### 188.21.9 getNotificationSettings(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Requests the notification settings for this app.
**Notes:** Use this method to determine the user interactions and notification-related features that your app is authorized to use. You might then use this information to enable or disable specific notification-related

features of your app.
When the user initially grants authorization to your app, the system gives your app a set of default notification-related settings. The user may change those settings at any time to enable or disable specific capabilities. For example, the user might disable the playing of sounds when a notification arrives.

Calls getNotificationSettingsCompleted event later. Tag parameter is passed through.

### 188.21.10 getPendingNotificationRequests(tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Returns a list of all notification requests that are scheduled and waiting to be delivered.
**Notes:** This method executes asynchronously, returning immediately and executing the provided block on a secondary thread when the results are available.

Calls getPendingNotificationRequestsCompleted event later. Tag parameter is passed through.

### 188.21.11 removeAllDeliveredNotifications

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Removes all of the app,Äôs delivered notifications from Notification Center.
**Notes:** Use this method to remove all of your app,Äôs delivered notifications from Notification Center. The method executes asynchronously, returning immediately and removing the identifiers on a background thread. This method does not affect any notification requests that are scheduled, but have not yet been delivered.

### 188.21.12 removeAllPendingNotificationRequests

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Unschedules all pending notification requests.
**Notes:** This method executes asynchronously, removing all pending notification requests on a secondary thread.

### 188.21.13 removeDeliveredNotifications(identifiers() as string)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Removes the specified notification requests from Notification Center.

**Notes:** identifiers: An array of strings, each of which corresponds to a value in the identifier property of a UNNotificationRequestMBS object. This method ignores the identifiers of requests whose notifications are not currently displayed in Notification Center.

Use this method to selectively remove notifications that you no longer want displayed in Notification Center. The method executes asynchronously, returning immediately and removing the specified notifications on a background thread.

### 188.21.14 removePendingNotificationRequests(identifiers() as string)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Unschedules the specified notification requests.
**Notes:** identifiers: An array of strings, each of which contains the identifier of an active UNNotification-RequestMBS object. If the identifier belongs to a non repeating request, and the trigger condition for that request has already been met, this method ignores the identifier.

This method executes asynchronously, removing the pending notification requests on a secondary thread.

### 188.21.15 requestAuthorization(options as integer, tag as Variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Requests authorization to interact with the user when local and remote notifications are delivered to the user's device.
**Notes:** options: The authorization options your app is requesting. You may combine the available constants to request authorization for multiple items. Request only the authorization options that you plan to use. For a list of possible values, see UNAuthorizationOptions.

Calls requestAuthorizationCompleted event later. The tag parameter is passed through.

If your app's local or remote notifications involve user interactions, you must request authorization for the system to perfom those interactions on your app's behalf. Interactions include displaying an alert, playing a sound, or badging the app's icon.

Always call this method before scheduling any local notifications and before registering with the Apple Push Notification service. Typically, you call this method at launch time when configuring your app's notification support.

The first time your app ever calls the method, the system prompts the user to authorize the requested interactions. The user may grant or deny authorization, and the system stores the user,Äôs response so that

subsequent calls to this method do not prompt the user again. After determining the authorization status, the user notification center object executes the block in the completionHandler parameter. Use that block to make any adjustments to your app's behavior. For example, if authorization was denied, you might notify a remote notification server not to send notifications to the user,Äôs device.

The user may change the allowed interactions at any time in system settings. Use the getNotificationSettings method to determine what interactions are currently allowed for your app.

### 188.21.16 setNotificationCategories(categories() as UNNotificationCategoryMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** Registers your app,Äôs notification types and the custom actions that they support.
**Notes:** categories: A set of UNNotificationCategoryMBS objects, each of which contains the actions that are displayed with the notification interface. This parameter must contain all of your app,Äôs supported categories.

Call this method at launch time to register your app,Äôs actionable notification types. This method registers all of your categories at once, replacing any previously registered categories with the new ones in the categories parameter. Typically, you call this method only once.

Each object in the categories parameter contains a string for identifying the notification's type. It also contains one or more custom actions that the user may perform in response to notifications of that type. When the system displays an alert for a notification, it looks in the notification payload for one of the identifier strings from your category objects. If it finds one, it adds user-selectable buttons for each action associated with that category object. Tapping a button notifies your app of the selected action, without bringing your app to the foreground.

### 188.21.17 Properties

### 188.21.18 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 188.21.19 supportsContentExtensions as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: All.

**Function:** A Boolean value indicating whether the current device supports notification content extensions.
**Notes:** Notification content extensions let you customize the appearance of the alerts displayed for your app's notifications. The value of this property is YES for devices that support notification content extensions and NO for devices that do not support them.
(Read only property)

### 188.21.20 Events

### 188.21.21 addNotificationRequestCompleted(request as UNNotificationRequestMBS, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by addNotificationRequest method when completed.
**Notes:** error: An error object indicating whether a problem occurred. If the notification was scheduled successfully, this parameter is nil; otherwise, it is set to an error object indicating the reason for the failure.

### 188.21.22 didReceiveNotificationResponse(response as UNNotificationResponseMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Asks you to process the user's response to a delivered notification.
**Notes:** response: The user,Äôs response to the notification. This object contains the original notification and the identifier string for the selected action. If the action allowed the user to provide a textual response, this parameter contains a UNTextInputNotificationResponseMBS object.

Use this method to process the user's response to a notification. If the user selected one of your app's custom actions, the response parameter contains the identifier for that action. (The response can also indicate that the user dismissed the notification interface, or launched your app, without selecting a custom action.) At the end of your implementation, call the completionHandler block to let the system know that you are done processing the user's response. If you do not implement this method, your app never responds to custom actions.

You specify your app,Äôs notification types at app launch using UNNotificationCategoryMBS objects, and you specify the custom actions for each type using UNNotificationActionMBS objects.

### 188.21.23 getDeliveredNotificationsCompleted(notifications() as UNNotificationMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by getDeliveredNotifications method.
**Notes:** notifications: An array of UNNotificationMBS objects representing the local and remote notifications of your app that have been delivered and are still visible in Notification Center. If none of your app,Äôs notifications are visible in Notification Center, the array is empty.

### 188.21.24 getNotificationCategoriesCompleted(categories() as UNNotificationCategoryMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by getNotificationCategories method later.
**Notes:** categories: The array of UNNotificationCategoryMBS objects containing your registered notification types. If your app has not yet registered any categories, this parameter is an empty set.

### 188.21.25 getNotificationSettingsCompleted(settings as UNNotificationSettingsMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by getNotificationSettings when finished.

### 188.21.26 getPendingNotificationRequestsCompleted(requests() as UNNotificationRequestMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by getPendingNotificationRequests method.
**Notes:** requests: An array of UNNotificationRequestMBS objects representing the scheduled notification requests. If there are no scheduled requests, this array is empty.

### 188.21.27 openSettingsForNotification(notification as UNNotificationMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Asks the delegate to display the in-app notification settings.

### 188.21.28 requestAuthorizationCompleted(granted as boolean, error as NSErrorMBS, tag as variant)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Called by requestAuthorization method when completed.
**Notes:** granted: A Boolean value indicating whether authorization was granted. The value of this parameter is YES when authorization was granted for one or more options. The value is false when authorization is denied for all options.
error: An object containing error information or nil if no error occurred.

### 188.21.29 willPresentNotification(notification as UNNotificationMBS, byref options as Integer)

MBS MacFrameworks Plugin, Plugin Version: 19.1, Platform: macOS, Targets: .

**Function:** Asks you how to handle a notification that arrived while the app was running in the foreground.
**Notes:** notification: The notification that is about to be delivered. Use the information in this object to determine an appropriate course of action. For example, you might use the information to update your app,Äôs interface.

options
The option for notifying the user. Specify NotificationPresentationOptionNone to silence the notification completely. Specify other values to interact with the user. For a list of possible options, see constants.

If your app is in the foreground when a notification arrives, the shared user notification center calls this method to deliver the notification directly to your app. If you implement this method, you can take whatever actions are necessary to process the notification and update your app. When you finish, call the completionHandler block and specify how you want the system to alert the user, if at all.
If your event does not implement this method, the system behaves as if you had passed the UNNotificationPresentationOptionNone option to the completionHandler block. If you do not provide a delegate at all for the UNUserNotificationCenterMBS object, the system uses the notification,Äôs original options to alert the user.

### 188.21.30 Constants

Authorization Options

| Constant | Value | Description |
|---|---|---|
| AuthorizationOptionAlert | 4 | The ability to display alerts. |
| AuthorizationOptionAnnouncement | 128 | The ability for Siri to automatically read out messages ov |
| AuthorizationOptionBadge | 1 | The ability to update the app,Äôs badge. |
| AuthorizationOptionCarPlay | 8 | The ability to display notifications in a CarPlay environn |
| AuthorizationOptionCriticalAlert | 16 | The ability to play sounds for critical alerts.<br>Critical alerts ignore the mute switch and Do Not Disturl<br>critical alert's sound regardless of the device's mute or Do<br>You can specify a custom sound and volume.<br>Critical alerts require a special entitlement issued by App |
| AuthorizationOptionNone | 0 | No options. |
| AuthorizationOptionProvidesAppNotificationSettings | 32 | An option indicating the system should display a button fo<br>settings. |
| AuthorizationOptionProvisional | 64 | The ability to post noninterrupting notifications provisio<br>tion Center. |
| AuthorizationOptionSound | 2 | The ability to play sounds. |

Notification Presentation

| Constant | Value | Description |
|---|---|---|
| NotificationPresentationOptionAlert | 4 | Display the alert using the content provided by the notification. |
| NotificationPresentationOptionBadge | 1 | Apply the notification's badge value to the app,Äôs icon.<br>for MacOS 11.0 or newer, please use NotificationPresentationOptionBan<br>NotificationPresentationOptionList + NotificationPresentationOptionBa |
| NotificationPresentationOptionBanner | 16 | New for macOS 11.0 |
| NotificationPresentationOptionList | 8 | New for macOS 11.0 |
| NotificationPresentationOptionNone | 0 | No alert.<br>Specify this constant when you want to silence any user interactions<br>notification. |
| NotificationPresentationOptionSound | 2 | Play the sound associated with the notification. |

# 188.22 class WinUserNotificationCenterMBS

## 188.22.1 class WinUserNotificationCenterMBS

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for the window notification center.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr3
- MBS Xojo Plugins, version 18.3pr1

**Videos**

- Presentation from London conference about MBS Plugins.

## 188.22.2 Methods

## 188.22.3 Available as Boolean

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this Windows version has required functions.
**Notes:** Returns true on Windows 8.1 and Windows 10.

## 188.22.4 configureAUMI(Company as String, Name as String, SurName as String, VersionInfo as String) as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Configures the AppUserModelID for Constructor.
**Notes:** Concats strings with dot between.
Please be aware of maximum ID length of 128 characters.

## 188.22.5 Constructor(appName as string, aumi as string)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Please pass your AppUserModelID and application name.

### 188.22.6 Destructor

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 188.22.7 HideNotification(notification as WinUserNotificationMBS)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Hides a notification.
**Notes:** Boolean return value removed for MBS Plugins 22.2.

### 188.22.8 Setting as Integer

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value that tells you whether there is an app, user, or system block that prevents the display of a toast notification.
**Notes:** Returns Enabled value, if you can show notifications.

When toast notifications have been disabled at more than one level, this property value reflects the setting with the largest scope. Precedence is as follows, from largest scope to smallest:

DisabledByManifest
DisabledByGroupPolicy
DisabledForUser
DisabledForApplication

If toast notifications have been disabled both by the user and by group policy, this property returns DisabledByGroupPolicy.

### 188.22.9 ShowNotification(notification as WinUserNotificationMBS)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shows a notification.
**Notes:** Boolean return value removed for MBS Plugins 22.2.

### 188.22.10 Properties

### 188.22.11 appName as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The application name used.
**Notes:** (Read only property)

### 188.22.12 aumi as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The unique id.
**Notes:** (Read only property)

### 188.22.13 Handle as Integer

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object handle.
**Notes:** (Read only property)

### 188.22.14 Events

### 188.22.15 Activated(Notification as WinUserNotificationMBS)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: .

**Function:** The notification was activated.

### 188.22.16 Dismissed(Notification as WinUserNotificationMBS, Reason as Integer)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: .

**Function:** The notification was dismissed.
**Notes:** See DismissalReason* constants.

### 188.22.17 Failed(Notification as WinUserNotificationMBS, ErrorCode as Integer)

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: .

**Function:** Called when notification failed.

### 188.22.18 Constants

Dismissal Reasons

| Constant | Value | Description |
|---|---|---|
| DismissalReasonApplicationHidden | 1 | The application hid the notification using hide method. |
| DismissalReasonTimedOut | 2 | The notification has expired. |
| DismissalReasonUserCanceled | 0 | The user dismissed the notification. |

Limitations Modes

| Constant | Value | Description |
|---|---|---|
| SettingDisabledByGroupPolicy | 3 | An administrator has disabled all notifications on this computer through group policy. The group policy setting overrides the user's setting. |
| SettingDisabledByManifest | 4 | This app has not declared itself toast capable in its package.appxmanifest file. This setting is found on the manifest's Application UI page, under the Notification section. For an app to send toast, the Toast Capable option must be set to "Yes". |
| SettingDisabledForApplication | 1 | The user has disabled notifications for this app. |
| SettingDisabledForUser | 2 | The user or administrator has disabled all notifications for this user on this computer. |
| SettingEnabled | 0 | All notifications raised by this app can be displayed. |

# 188.23 class WinUserNotificationExceptionMBS

## 188.23.1 class WinUserNotificationExceptionMBS

MBS Win Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The exception class for user notifications.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- News from the MBS Xojo Plugins Version 22.2

## 188.24 class WinUserNotificationMBS

### 188.24.1 class WinUserNotificationMBS

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for the notification.
**Example:**

```
dim n as new WinUserNotificationMBS

n.Image = "C:\test.png"
n.text(0) = "Hello World"
n.text(1) = "Greetings from Xojo"
```

**Blog Entries**

- The Top 10 from the MBS Xojo Plugins in 2022
- Xojo 2022r4 released
- MBS Xojo Plugins, version 22.2pr3
- MBS Xojo Plugins, version 19.3pr5
- MBS Xojo Plugins, version 18.0pr7
- MBS Xojo Plugins 17.2
- MBS Xojo Plugins, version 17.2pr1

**Videos**

- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.4, page 8: News

### 188.24.2 Methods

### 188.24.3 Create

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates the OS object.
**Notes:** Please first set text/image and then when you set other properties we create the object for you. This method creates it automatically.

### 188.24.4 Properties

### 188.24.5 ExpiresOnReboot as Boolean

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether the toast notification will remain in the Notification Center after a reboot.
**Notes:** If true, notification will expire when the computer is rebooted.

Requires Windows 10, version 1903 (introduced in 10.0.18362.0)
(Read and Write property)

### 188.24.6 Group as String

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the group identifier for the notification.
**Notes:** In previous versions of Windows, the group property can be a maximum length of 16 characters long. However, in the Creators Update (15063), the maximum limit was increased to 64 characters.
(Read and Write property)

### 188.24.7 Handle as Integer

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 188.24.8 Image as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The image file path.
**Notes:** Leave empty if you don't need a picture.

May not be a network path as system needs to load it independent of your permissions.
Maybe better use image coming with application or put one in temp folder.
(Read and Write property)

### 188.24.9 NotificationMirroring as Integer

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets a value that specifies whether notification mirroring is allowed.
**Notes:** Requires Windows 10 Anniversary Edition (introduced in 10.0.14393.0)
(Read and Write property)

### 188.24.10 Priority as Integer

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the priority of the toast notification.
**Notes:** Requires Windows 10 Creators Update (introduced in 10.0.15063.0)

The priority setting provides hints on how and at what urgency level a notification should be presented to the user (whether to wake up the screen, etc). Whether the notification is displayed in high priority is based on the state and power management policy of the device.
(Read and Write property)

### 188.24.11 RemoteId as String

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets a remote id.
**Notes:** A remote id for the notification that enables the system to correlate this notification with another one generated on another device.

Requires Windows 10 Anniversary Edition (introduced in 10.0.14393.0)
(Read and Write property)

### 188.24.12 SuppressPopup as Boolean

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets whether a toast's pop-up UI is displayed on the user's screen.
**Notes:** Set to true to suppress the popup message; otherwise, false. The default value is false, meaning the toast's pop-up message will be shown. Setting this property to true places the toast notification silently into the action center. This enables your app to communicate with the user without interrupting them.
(Read and Write property)

### 188.24.13 Tag as String

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the unique identifier of this notification within the notification Group.
**Notes:** This API returns an exception if the property is set to null or the empty string.
The tag can be maximum 16 characters long. However, the Creators Update (15063) extends this limit to 64 characters.
(Read and Write property)

### 188.24.14 Text as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text to display.
**Notes:** Same as text(0).
(Read and Write property)
See also:

- 188.24.17 Text(Index as Integer) as String 22552

### 188.24.15 XMLUsed as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The XML template used.
**Notes:** For debugging.
(Read only property)

### 188.24.16 DataValues as Dictionary

MBS Win Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries or sets data values.
**Example:**

```
dim n as new WinUserNotificationMBS

// set it
Dim d As New Dictionary
d.Value("Hello") = "World"

n.DataValues = d
```

```
// query back
Dim dic As Dictionary = n.DataValues

MessageBox "Hello: "+dic.Lookup("Hello", "")
```

**Notes:** Allows you to store data for your app with the notfication.
(Read and Write computed property)

### 188.24.17 Text(Index as Integer) as String

MBS Win Plugin, Plugin Version: 17.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text lines to display.
**Notes:** Index from 0 to 2.
(Read and Write computed property)
See also:

- 188.24.14 Text as String 22551

### 188.24.18 Constants

Notification Mirroring

| Constant | Value | Description |
|---|---|---|
| NotificationMirroringAllowed | 0 | Notification mirroring is allowed. |
| NotificationMirroringDisabled | 1 | Notification mirroring is disabled. |

Priorities

| Constant | Value | Description |
|---|---|---|
| PriorityDefault | 0 | The notification should have default behavior in terms of delivery and display priority during connected standby mode. |
| PriorityHigh | 1 | The notification should be treated as high priority. For desktop PCs, this means during connected standby mode the incoming notification can turn on the screen for Surface-like devices if it doesn't have a closed lid detected. |

# Chapter 189

# Vision

## 189.1 module VisionModuleMBS

### 189.1.1 module VisionModuleMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The Vision module.
**Notes:** Global declarations for the Vision framework on MacOS.
Requires MacOS 10.13 or newer.
**Blog Entries**

- Vision Framework for Xojo

### 189.1.2 Methods

### 189.1.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether the Vision module is available.
**Notes:** Returns true on MacOS 10.13 or newer.

### 189.1.4 ElementSize(ElementType as Integer) as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries byte size of an element type.
**Notes:** Returns 4 for floats and 8 for double.

Otherwise returns zero.

### 189.1.5 ImagePointForNormalizedPoint(normalizedPoint as CGPointMBS, imageWidth as Integer, imageHeight as Integer) as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Projects a point from normalized coordinate space into image coordinates.
**Notes:** normalizedPoint: The input point, in normalized coordinate space.
imageWidth: The width of the image into whose coordinate space you're projecting the input point.
imageHeight: The height of the image into whose coordinate space you're projecting the input point.

Returns the input point projected into image coordinates.

The resulting point in image coordinate space may have nonintegral (floating-point) coordinates.

### 189.1.6 ImageRectForNormalizedRect(normalizedRect as CGRectMBS, imageWidth as Integer, imageHeight as Integer) as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Projects a rectangle from normalized coordinate space into image coordinates.
**Notes:** normalizedRect: The input rect, in normalized coordinate space.
imageWidth: The width of the image into whose coordinate space you're projecting the input rect.
imageHeight: The height of the image into whose coordinate space you're projecting the input rect.

Returns the input rect projected into image (pixel) coordinates.

### 189.1.7 NormalizedIdentityRect as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The normalized identity rectangle with origin (0,0) and unit length and width.

### 189.1.8 NormalizedRectForImageRect(imageRect as CGRectMBS, imageWidth as Integer, imageHeight as Integer) as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Normalizes a rectangle from image coordinates.
**Notes:** imageRect: The input rect, in image coordinate space.
imageWidth: The width of the image in whose coordinates the input rect resides.
imageHeight: The height of the image in whose coordinates the input rect resides.

Returns the input rect projected into normalized coordinates.

### 189.1.9 NormalizedRectIsIdentityRect(rect as CGRectMBS) as boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Returns true if the rectangle has origin (0,0) and unit length and width.
**Notes:** normalizedRect: Normalized input rect to test for identity.

Returns a Boolean value that indicates whether the input normalized rect is the identity rect.

### 189.1.10 VNErrorDomain as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The domain for NSError objects produced by Vision framework methods.

### 189.1.11 Properties

### 189.1.12 VersionNumber as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The current version number of the Vision framework.
**Notes:** (Read only property)

### 189.1.13 Constants

Error Codes

| Constant | Value | Description |
|---|---|---|
| VNErrorDataUnavailable | 17 | Error code signifying unavailable data. |
| VNErrorInternalError | 9 | Error code signifying an error internal to the Vision system. |
| VNErrorInvalidArgument | 14 | Error code signifying an invalid parameter passed to a Vision request. |
| VNErrorInvalidFormat | 2 | Error code signifying an invalid image format. |
| VNErrorInvalidImage | 13 | Error code signifying a problematic image. |
| VNErrorInvalidModel | 15 | Error code signifying an invalid model. |
| VNErrorInvalidOperation | 12 | Error code signifying an unsupported operation for a Vision request. |
| VNErrorInvalidOption | 5 | Error code signifying an invalid option in a Vision request. |
| VNErrorIOError | 6 | Error code signifying an input or output error for an image, image sequence, or Core ML model. |
| VNErrorMissingOption | 7 | Error code signifying that a Vision request is missing a required option. |
| VNErrorNotImplemented | 8 | Error code signifying a method not implemented in the underlying model. |
| VNErrorOK | 0 | Error code signifying no error. |
| VNErrorOperationFailed | 3 | Error code signifying that a request operation failed. |
| VNErrorOutOfBoundsError | 4 | Error code signifying an out-of-bounds access. |
| VNErrorOutOfMemory | 10 | Error code signifying insufficient memory to complete a Vision request. |
| VNErrorRequestCancelled | 1 | Error code signifying a canceled Vision request. |
| VNErrorUnknownError | 11 | Error code signifying an unidentifiable error. |
| VNErrorUnsupportedRevision | 16 | Error code signifying an unsupported revision number. |

### 189.1.14 Delegates

### 189.1.15 VNPerformRequestsCompletedMBS(Requests() as VNRequestMBS, result as boolean, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The delegate used for completed event calls.
**Notes:** You declare a method with (Requests() as VNRequestMBS, result as boolean, error as NSErrorMBS) as parameters and pass the method reference with addressOf or weakAddressOf to the plugin method. Later the plugin may invoke the delegate and call your method.

### 189.1.16 VNProgressHandlerMBS(Request as VNRequestMBS, fractionCompleted as double, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The delegate used for progress event calls.
**Notes:** You declare a method with (Request as VNRequestMBS, fractionCompleted as double, error as NSErrorMBS) as parameters and pass the method reference with addressOf or weakAddressOf to the plugin method. Later the plugin may invoke the delegate and call your method.

### 189.1.17 VNRequestCompletedMBS(Request as VNRequestMBS, error as NSErrorMBS, tag as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The delegate used for completed event calls.
**Notes:** You declare a method with (Request as VNRequestMBS, error as NSErrorMBS) as parameters and pass the method reference with addressOf or weakAddressOf to the plugin method. Later the plugin may invoke the delegate and call your method.

## 189.2 class VNBarcodeObservationMBS

### 189.2.1 class VNBarcodeObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Barcode information detected by an image analysis request.
**Notes:** This type of observation results from a VNDetectBarcodesRequest. It contains information about the detected barcode, including parsed payload data for supported symbology.
Available on MacOS 10.13 or newer.
Subclass of the VNRectangleObservationMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.3pr4
- Using zbar library with Xojo
- Vision Framework for Xojo

### 189.2.2 Methods

### 189.2.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

### 189.2.4 VNBarcodeSymbologyAztec as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for Aztec code recognition.

### 189.2.5 VNBarcodeSymbologyCodabar as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates Codabar symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.6 VNBarcodeSymbologyCode128 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for standard Code 128 barcode recognition.

### 189.2.7 VNBarcodeSymbologyCode39 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for standard Code 39 barcode recognition.

### 189.2.8 VNBarcodeSymbologyCode39Checksum as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for recognizing barcodes in standard Code 39 with checksum.

### 189.2.9 VNBarcodeSymbologyCode39FullASCII as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for recognizing barcodes in full ASCII Code 39.

### 189.2.10 VNBarcodeSymbologyCode39FullASCIIChecksum as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for recognizing barcodes in full ASCII Code 39 with checksum.

### 189.2.11 VNBarcodeSymbologyCode93 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for standard Code 93 barcode recognition.

### 189.2.12 VNBarcodeSymbologyCode93i as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for standard Code 93i barcode recognition.

### 189.2.13 VNBarcodeSymbologyDataMatrix as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for Data Matrix barcode recognition.

### 189.2.14 VNBarcodeSymbologyEAN13 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for EAN-13 barcode recognition.

### 189.2.15 VNBarcodeSymbologyEAN8 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for EAN-8 barcode recognition.

### 189.2.16 VNBarcodeSymbologyGS1DataBar as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates GS1 DataBar symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.17 VNBarcodeSymbologyGS1DataBarExpanded as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates GS1 DataBar Expanded symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.18 VNBarcodeSymbologyGS1DataBarLimited as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates GS1 DataBar Limited symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.19 VNBarcodeSymbologyI2of5 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for Interleaved 2 of 5 (ITF) barcode recognition.

### 189.2.20 VNBarcodeSymbologyI2of5Checksum as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for recognizing barcodes in Interleaved 2 of 5 (ITF) with checksum.

### 189.2.21 VNBarcodeSymbologyITF14 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for ITF-14 barcode recognition.

### 189.2.22 VNBarcodeSymbologyMicroPDF417 as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates MicroPDF417 symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.23 VNBarcodeSymbologyMicroQR as String

MBS MacFrameworks Plugin, Plugin Version: 21.3, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A constant that indicates MicroQR symbology.
Available in iOS 15 or macOS 12 or later.

### 189.2.24 VNBarcodeSymbologyPDF417 as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for PDF417 barcode recognition.

### 189.2.25 VNBarcodeSymbologyQR as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for QR code recognition.

### 189.2.26 VNBarcodeSymbologyUPCE as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** One of the Symbologies supported by the Vision framework.
**Notes:** A symbol indicating support for UPC-E barcode recognition.

### 189.2.27 Properties

### 189.2.28 barcodeDescriptor as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A CIBarcodeDescriptorMBS object with low-level details about the barcode and its data.
**Notes:** This object is sufficient for Core Image to regenerate the observed barcode.
(Read only property)

### 189.2.29 payloadStringValue as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The string representation of the barcode's payload.
**Notes:** Depending on the symbology of the barcode or the payload data itself, a string representation of the payload may not be available.
(Read only property)

### 189.2.30 symbology as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The symbology of the observed barcode.
**Notes:** To detect specific barcode symbologies in a Vision request, add the corresponding VNBarcodeSymbology to the supportedSymbologies property of your VNDetectBarcodesRequestMBS.
(Read only property)

## 189.3 class VNClassificationObservationMBS

### 189.3.1 class VNClassificationObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Classification information produced by an image analysis request.
**Notes:** This type of observation results from performing a VNCoreMLRequestMBS image analysis with a Core ML model whose role is classification (rather than prediction or image-to-image processing). Vision infers that an MLModel object is a classifier model if that model predicts a single feature. That is, the model's modelDescription object has a non-nil value for its predictedFeatureName property.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.3.2 Methods

### 189.3.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 189.3.4 hasMinimumPrecision(minimumPrecision as single, recall as single) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Determines whether the observation for a specific recall has a minimum precision value.
**Notes:** minimumPrecision: The minimum percentage of classification results that are relevant.
recall: The percentage of relevant results that the algorithm correctly classified.

Returns a Boolean indicating whether or not this classification observation provides a minimum percentage of relevant results that meet the desired recall criterion.

### 189.3.5 hasMinimumRecall(minimumRecall as single, precision as single) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Determines whether the observation for a specific precision has a minimum recall value.

**Notes:** minimumRecall: The minimum percentage of relevant results that the algorithm correctly classified. precision: The percentage of classification results that are relevant.

Returns a Boolean indicating whether or not this classification observation provides a minimum percentage of relevant results that meet the desired precision criterion.

### 189.3.6 Properties

### 189.3.7 hasPrecisionRecallCurve as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean variable indicating whether the observation contains precision and recall curves.
**Notes:** Precision refers to the percentage of your classification results that are relevant, while recall refers to the percentage of total relevant results correctly classified.
If this property is true, then you can call precision and recall-related methods in this observation. If this property is false, then the precision and recall-related methods won't return meaningful data.
(Read only property)

### 189.3.8 identifier as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Classification label identifying the type of observation.
**Notes:** An example classification could be a string like cat or hotdog. The model used for the classification defines the domain of strings that may result. Usually, these strings are unlocalized technical labels not meant for direct presentation to the end user.
(Read only property)

## 189.4 class VNClassifyImageRequestMBS

### 189.4.1 class VNClassifyImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request to classify an image.
**Notes:** This type of request produces a collection of VNClassificationObservationMBS objects that describe an image. Access the classifications through knownClassificationsForRevision function.

Available on MacOS 10.15 or newer.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr2
- Vision Framework for Xojo

### 189.4.2 Methods

### 189.4.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.4.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.4.5 knownClassificationsForRevision(requestRevision as Integer = 1, byref error as NSErrorMBS) as VNClassificationObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Requests the collection of classifications that the Vision framework recognizes.
**Notes:** requestRevision: The revision of the request for which classifications should be reported.
error: The address of the error variable to populate should the call fail.

Returns an array of classifications for the given revision, or nil if an error occurred.

### 189.4.6 supportedIdentifiers(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 23.3, Platform: macOS, Targets: All.

**Function:** Obtain the collection of identifiers supported by the target request.
**Notes:** This method will return the collection of all possible classification identifiers that are produced by the target request based on its current state of configuration at the time of the call.

error: The variable that will be populated with the error if the call fails.

Returns an array of classification identifiers, or nil if a failure occurs.

Requires macOS 12.0 or iOS 15.0 or newer.

## 189.5 class VNCoreMLFeatureValueObservationMBS

### 189.5.1 class VNCoreMLFeatureValueObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A collection of key-value information produced by a Core ML image analysis request.
**Notes:** This type of observation results from performing a VNCoreMLRequestMBS image analysis with a Core ML model whose role is prediction rather than classification or image-to-image processing.
Vision infers that an MLModel object is a predictor model if that model predicts multiple features. You can tell that a model predicts multiple features when its modelDescription object has a nil value for its predictedFeatureName property, or when it inserts its output in an outputDescriptionsByName dictionary.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.5.2 Methods

### 189.5.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 189.5.4 Properties

### 189.5.5 featureName as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The name used in the model description of the CoreML model that produced this observation.
**Notes:** (Read only property)

### 189.5.6 featureValue as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The feature result of a VNCoreMLRequestMBS that outputs neither a classification nor an image.
**Notes:** Refer to Core ML documentation and the model itself to learn about proper handling of the content.
Value is a MLFeatureValueMBS object.

(Read only property)

## 189.6 class VNCoreMLModelMBS

### 189.6.1 class VNCoreMLModelMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A container for a Core ML model used with Vision requests.
**Notes:** A Core ML model encapsulates the information trained from a data set used to drive Vision recognition requests. See Getting a Core ML Model for instructions on training your own. Once you have the trained model, use this class to initialize a VNCoreMLRequestMBS for identification.
**Blog Entries**

- Vision Framework for Xojo

### 189.6.2 Methods

### 189.6.3 Constructor(MLModel as Variant)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a model container to be used with VNCoreMLRequestMBS.
**Notes:** Please pass MLModelMBS object.

This method may fail if Vision does not support the created CoreML model. For example, a model that does not accept an image as any of its inputs will yield an VNErrorInvalidModel error.

### 189.6.4 modelForMLModel(MLModel as Variant) as VNCoreMLModelMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a model container to be used with VNCoreMLRequestMBS.
**Notes:** Please pass MLModelMBS object.

This method may fail if Vision does not support the created CoreML model. For example, a model that does not accept an image as any of its inputs will yield an VNErrorInvalidModel error.

### 189.6.5 Properties

### 189.6.6 featureProvider as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An optional object to support inputs outside Vision.
**Notes:** An MLFeatureProviderMBS object.

This optional object conforms to the MLFeatureProvider protocol that the model uses to predict inputs that are not supplied by Vision. Vision provides the MLModel with the image for the inputImageFeatureName via the VNRequestHandlerMBS.
A feature provider is necessary for models that have more than one required input. Models with only one image input won't use the feature provider.

Available on MacOS 10.15 or newer.
(Read only property)

### 189.6.7 inputImageFeatureName as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The name of the MLFeatureValueMBS that Vision sets from the request handler.
**Notes:** By default, Vision uses the first input found, but you can manually set that input to another featureName instead.
(Read and Write property)

## 189.7 class VNCoreMLRequestMBS

### 189.7.1 class VNCoreMLRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that uses a Core ML model to process images.
**Notes:** The results array of a Core ML-based image analysis request contains a different observation type depending on the kind of MLModel object you create the request with:

- If the model predicts a single feature (that is, the model's modelDescription object has a non-nil value for its predictedFeatureName property), Vision treats that model as a classifier: the results are VNClassificationObservationMBS objects.
- If the model's outputs include at least one output whose feature type is MLFeatureTypeImage, Vision treats that model as an image-to-image model: the results are VNPixelBufferObservationMBS objects.
- Otherwise, Vision treats the model as a general predictor model: the results are VNCoreMLFeatureValueObservationMBS objects.

Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.7.2 Methods

### 189.7.3 Constructor(model as VNCoreMLModelMBS, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.7.4 Properties

### 189.7.5 imageCropAndScaleOption as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Determine what type of croping and scaling action should be applied to the image before generating the feature print.

**Notes:** The default value for this property is VNImageCropAndScaleOptionScaleFill.
(Read and Write property)

### 189.7.6 model as VNCoreMLModelMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The Core ML model on which the request is based, wrapped in a VNCoreMLModel.
**Notes:** (Read only property)

### 189.7.7 Constants

Crop and Scale options

| Constant | Value | Description |
|---|---|---|
| VNImageCropAndScaleOptionCenterCrop | 0 | A scaling option that maintains aspect ratio to fit the short side, and centered image on its long side. |
| VNImageCropAndScaleOptionScaleFill | 2 | A scaling option that scales an image proportionally so that its short sion fills the canvas, potentially cropping along the longer dimension |
| VNImageCropAndScaleOptionScaleFit | 1 | An option that scales an image to fit the input image dimensions wl taining aspect ratio.<br>This option ensures the entire image fits into the Vision algorithm's in dimensions by scaling down the longer dimension until it fits. This op the image along the shorter dimension to maintain aspect ratio. |

## 189.8 class VNDetectBarcodesRequestMBS

### 189.8.1 class VNDetectBarcodesRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds and recognizes barcodes in an image.
**Notes:** By default, a barcode request first locates all barcodes in the input image, then analyzes each to decode payload. To specify or limit the types of barcodes sought in the request, set the symbologies property to an array of barcode types you would like to support.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3
- MBS Xojo Plugins, version 21.3pr4
- Using zbar library with Xojo
- Vision Framework for Xojo

**Xojo Developer Magazine**

- 19.5, page 9: News

### 189.8.2 Methods

### 189.8.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.8.4 setSymbologies(symbologies() as String)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets an array of symbologies that Vision should detect in the image.
**Notes:** Use this array to specify or restrict the types of symbols you want the Vision algorithm to detect. The default value leads Vision to scan for all possible symbologies.

### 189.8.5 supportedSymbologies as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of VNBarcodeSymbology objects describing the symbologies that Vision currently supports.
**Notes:** Calling this method could be an expensive operation.
See also:

- 189.8.6 supportedSymbologies(byref error as NSErrorMBS) as String() 22575

### 189.8.6 supportedSymbologies(byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 23.3, Platform: macOS, Targets: All.

**Function:** Obtain the collection of barcode symbologies that can be recognized by the request in its current configuration.
**Notes:** Calling this method could be a potentially expensive operation.
Returns an array of VNBarcodeSymbology strings describing the symbologies recognized by the request in its current configuration.
Requires macOS 12.0 or iOS 15.0 or newer.
See also:

- 189.8.5 supportedSymbologies as String() 22575

### 189.8.7 symbologies as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of symbologies that Vision should detect in the image.
**Notes:** Use this array to specify or restrict the types of symbols you want the Vision algorithm to detect. The default value leads Vision to scan for all possible symbologies.

## 189.9 class VNDetectedObjectObservationMBS

### 189.9.1 class VNDetectedObjectObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis result that provides the position and extent of a detected image feature.
**Notes:** This type of observation results from a VNTrackObjectRequestMBS. It represents a detected object that the Vision request should track.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.9.2 Methods

### 189.9.3 Constructor(boundingBox as CGRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a detected object observation based on bounding box coordinates.
**Notes:** boundingBox: The observation's bounding box, in coordinates normalized to the dimensions of the processed image, with its origin at the image's lower-left corner.
See also:

- 189.9.4 Constructor(requestRevision as Integer, boundingBox as CGRectMBS) 22576

### 189.9.4 Constructor(requestRevision as Integer, boundingBox as CGRectMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a detected object observation with the specified revision number and bounding box coordinates.
See also:

- 189.9.3 Constructor(boundingBox as CGRectMBS) 22576

### 189.9.5 Properties

### 189.9.6 boundingBox as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The bounding box of the detected object.
**Notes:** The coordinates are normalized to the dimensions of the processed image, with the origin at the

image's lower-left corner.
(Read only property)

## 189.10 class VNDetectFaceCaptureQualityRequestMBS

### 189.10.1 class VNDetectFaceCaptureQualityRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request that produces a floating-point number representing the capture quality of a given face in a photo.
**Notes:** This request produces or updates a VNFaceObservationMBS object's property faceCaptureQuality with a floating-point value. The float will be a value between 0 and 1. Faces with quality closer to 1 are better lit, sharper, and centrally positioned than faces with quality closer to 0. If the request fails, or the face observation has never been processed, the property faceCaptureQuality will be nil.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.10.2 Methods

### 189.10.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.10.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.10.5 inputFaceObservations as VNFaceObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of VNFaceObservation objects to process as part of the request.

### 189.10.6 setInputFaceObservations(faces() as VNFaceObservationMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets an array of VNFaceObservation objects to process as part of the request.

## 189.11 class VNDetectFaceLandmarksRequestMBS

### 189.11.1 class VNDetectFaceLandmarksRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds facial features (such as the eyes and mouth) in an image.
**Notes:** By default, a face landmarks request first locates all faces in the input image, then analyzes each to detect facial features.
If you've already located all the faces in an image, or want to detect landmarks in only a subset of the faces in the image, set the inputFaceObservations property to an array of VNFaceObservationMBS objects representing the faces you want to analyze. (You can either use face observations output by a VNDetectFaceRectanglesRequestMBS or manually create VNFaceObservation instances with the bounding boxes of the faces you want to analyze.)
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.11.2 Methods

### 189.11.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.11.4 inputFaceObservations as VNFaceObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of VNFaceObservation objects to process as part of the request.

### 189.11.5 setInputFaceObservations(faces() as VNFaceObservationMBS)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets an array of VNFaceObservation objects to process as part of the request.

### 189.11.6 supportsConstellation(requestRevision as Integer = 1, constellation as Integer) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean variable that indicates whether the Vision framework supports a given constellation type for a given request revision.

### 189.11.7 Properties

### 189.11.8 constellation as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A variable describing how a face landmarks request orders or enumerates the resulting features.
**Notes:** Set this variable to one of the supported constellation types detailed in VNRequestFaceLandmarksConstellation. The default value is VNRequestFaceLandmarksConstellationNotDefined.
(Read and Write property)

### 189.11.9 Constants

Constellations

| Constant | Value | Description |
|---|---|---|
| VNRequestFaceLandmarksConstellation65Points | 1 | A constellation with 65 points. |
| VNRequestFaceLandmarksConstellation76Points | 2 | A constellation with 76 points. |
| VNRequestFaceLandmarksConstellationNotDefined | 0 | An undefined constellation. |

## 189.12 class VNDetectFaceRectanglesRequestMBS

### 189.12.1 class VNDetectFaceRectanglesRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds faces within an image.
**Notes:** This request returns faces as rectangular bounding boxes with origin and size.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.12.2 Methods

### 189.12.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.13 class VNDetectHorizonRequestMBS

## 189.13.1 class VNDetectHorizonRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that determines the horizon angle in an image.
**Notes:** This request returns the horizon angle detected in an image.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.13.2 Methods

## 189.13.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

## 189.14 class VNDetectHumanRectanglesRequestMBS

### 189.14.1 class VNDetectHumanRectanglesRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds rectangular regions containing humans in an image.
**Notes:** Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.14.2 Methods

### 189.14.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.15 class VNDetectRectanglesRequestMBS

## 189.15.1 class VNDetectRectanglesRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds projected rectangular regions in an image.
**Notes:** A rectangle detection request locates regions of an image with rectangular shape, like credit cards, business cards, documents, and signs. The request returns its observations in the form of VNRectangleObservationMBS objects, which contain normalized coordinates of bounding boxes containing the rectangle.
Use this type of request to find the bounding boxes of rectangles in an image. Vision returns observations for rectangles found in all orientations and sizes, along with a confidence level to indicate how likely it is that the observation contains an actual rectangle.
To further configure or restrict the types of rectangles found, set properties on the request specifying a range of aspect ratios, sizes, and quadrature tolerance.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.15.2 Methods

## 189.15.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

## 189.15.4 Properties

## 189.15.5 maximumAspectRatio as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A float specifying the maximum aspect ratio of the rectangle to detect, defined as the shorter dimension over the longer dimension.
**Notes:** The value should range from 0.0 to 1.0, inclusive. The default value is 0.5.
(Read and Write property)

### 189.15.6 maximumObservations as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An integer specifying the maximum number of rectangles Vision returns.
**Notes:** The default value is 1.
Setting this property to 0 allows Vision algorithms to return an unlimited number of observations.
(Read and Write property)

### 189.15.7 minimumAspectRatio as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A float specifying the minimum aspect ratio of the rectangle to detect, defined as the shorter dimension over the longer dimension.
**Notes:** The value should range from 0.0 to 1.0, inclusive. The default value is 0.5.
(Read and Write property)

### 189.15.8 minimumConfidence as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A value specifying the minimum acceptable confidence level.
**Notes:** Vision won't return rectangles with a confidence score lower than the specified minimum.
The confidence score ranges from 0.0 to 1.0, inclusive, where 0.0 represents no confidence, and 1.0 represents full confidence.
(Read and Write property)

### 189.15.9 minimumSize as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A float specifying the minimum size of the rectangle to be detected, as a proportion of the smallest dimension.
**Notes:** The value should range from 0.0 to 1.0 inclusive. The default minimum size is 0.2.
Any smaller rectangles that Vision may have detected aren't returned.
(Read and Write property)

### 189.15.10 quadratureTolerance as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A float specifying the number of degrees a rectangle corner angle can deviate from 90¬∞.
**Notes:** The tolerance value should range from 0 to 45, inclusive. The default tolerance is 30.
(Read and Write property)

## 189.16 class VNDetectTextRectanglesRequestMBS

### 189.16.1 class VNDetectTextRectanglesRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds regions of visible text in an image.
**Notes:** This request returns detected text characters as rectangular bounding boxes with origin and size.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.16.2 Methods

### 189.16.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.16.4 Properties

### 189.16.5 reportCharacterBoxes as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean variable indicating interest in detecting character bounding boxes.
**Notes:** Set to true to have the detector return character bounding boxes as an array of VNRectangleObservationMBS objects.
(Read and Write property)

# 189.17 class VNFaceLandmarkRegion2DMBS

## 189.17.1 class VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** 2D geometry information for a specific facial feature.
**Notes:** This class represents the set of all facial landmark regions in 2D, exposed as properties.
Subclass of the VNFaceLandmarkRegionMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.17.2 Methods

## 189.17.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.17.4 normalizedPoints as CGPointMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A buffer in memory containing normalized landmark points.
**Notes:** Returns array with CGPointMBS representing landmark points.

## 189.17.5 pointsInImageOfSize(imageSize as CGSizeMBS) as CGPointMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A buffer in memory containing landmark points in the coordinate space of the specified image size.
**Notes:** imageSize: The pixel dimensions of the image in which to present landmark points.

## 189.17.6 precisionEstimatesPerPoint as Variant()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of precision estimates for each landmark point.
**Notes:** This property is only populated when you configure your VNDetectFaceLandmarksRequestMBS object with VNRequestFaceLandmarksConstellation76Points. For other constellation types, this array is set to nil.

# 189.18 class VNFaceLandmarkRegionMBS

## 189.18.1 class VNFaceLandmarkRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for information about a specific face landmark.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.18.2 Methods

## 189.18.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.18.4 copy as VNFaceLandmarkRegionMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

## 189.18.5 Properties

## 189.18.6 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

## 189.18.7 pointCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The number of points in the face region.
**Notes:** The value is zero if no points for a region could be found.
(Read only property)

### 189.18.8 requestRevision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The revision of the VNRequest subclass used to generate the implementing object.
**Notes:** (Read only property)

# 189.19 class VNFaceLandmarks2DMBS

## 189.19.1 class VNFaceLandmarks2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A collection of all facial features detected in a face observation, with 2D geometry information for each.
**Notes:** This class represents the set of all detectable 2D face landmarks and regions, exposed as properties. The coordinates of the face landmarks are normalized to the dimensions of the face observation,Äôs boundingBox, with the origin at the bounding box,Äôs lower-left corner. Use the VNImagePointForFaceLandmarkPointMBS function to convert normalized face landmark points into absolute points within the image,Äôs coordinate system.
Subclass of the VNFaceLandmarksMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.19.2 Methods

## 189.19.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.19.4 Properties

## 189.19.5 allPoints as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing all face landmark points.
**Notes:** (Read only property)

## 189.19.6 faceContour as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that trace the face contour from the left cheek, over the chin, to the right cheek.

**Notes:** (Read only property)

### 189.19.7 innerLips as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that outline the space between the lips.
**Notes:** (Read only property)

### 189.19.8 leftEye as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that outline the left eye.
**Notes:** (Read only property)

### 189.19.9 leftEyebrow as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that trace the left eyebrow.
**Notes:** (Read only property)

### 189.19.10 leftPupil as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing the point where the left pupil is located.
**Notes:** This value may be inaccurate if the eye is blinking.
(Read only property)

### 189.19.11 medianLine as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that trace a vertical line down the center of the face.
**Notes:** (Read only property)

### 189.19.12 nose as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that outline the nose.
**Notes:** (Read only property)

### 189.19.13 noseCrest as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that trace the center crest of the nose.
**Notes:** (Read only property)

### 189.19.14 outerLips as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that outline the outside of the lips.
**Notes:** (Read only property)

### 189.19.15 rightEye as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that outline the right eye.
**Notes:** (Read only property)

### 189.19.16 rightEyebrow as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing points that trace the right eyebrow.
**Notes:** (Read only property)

### 189.19.17 rightPupil as VNFaceLandmarkRegion2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region containing the point where the right pupil is located.
**Notes:** This value may be inaccurate if the eye is blinking.
(Read only property)

# 189.20 class VNFaceLandmarksMBS

## 189.20.1 class VNFaceLandmarksMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for containers of face landmark information.
**Notes:** This class represents the set of all detectable facial landmarks and regions, exposed as properties. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.20.2 Methods

## 189.20.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.20.4 copy as VNFaceLandmarksMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

## 189.20.5 Properties

## 189.20.6 confidence as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A confidence estimate for the detected landmarks.
**Notes:** A value of 0 indicates no confidence. A value of 1 indicates full confidence.
(Read only property)

## 189.20.7 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.20.8 requestRevision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The revision of the VNRequestMBS subclass used to generate the implementing object.
**Notes:** (Read only property)

# 189.21 class VNFaceObservationMBS

## 189.21.1 class VNFaceObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Face or facial-feature information detected by an image analysis request.
**Notes:** This type of observation results from a VNDetectFaceRectanglesRequestMBS. It contains information about facial landmarks and regions found in the image.
Subclass of the VNDetectedObjectObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.21.2 Methods

## 189.21.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.21.4 faceObservationWithRequestRevision(requestRevision as Integer = 2, boundingBox as CGRectMBS, roll as Variant, yaw as Variant) as VNFaceObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a face observation with the given revision number, bounding box, roll, and yaw.

## 189.21.5 Properties

## 189.21.6 faceCaptureQuality as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The capture quality of the face, normalized between 0.0 and 1.0.
**Notes:** The capture quality of the face allows you to compare the quality of the face in terms of its capture attributes: lighting, blur, and prime positioning. Use this metric to compare the capture quality of a face against other captures of the same face in a given set. Faces with quality closer to 1.0 are better lit, sharper, and centrally positioned than faces with quality closer to 0.0.
(Read only property)

### 189.21.7 landmarks as VNFaceLandmarks2DMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The facial features found in the detected face.
**Notes:** This property's value is nil for face observations produced by a VNDetectFaceRectanglesRequestMBS analysis. Use the VNDetectFaceLandmarksRequestMBS class to find facial features.
(Read only property)

### 189.21.8 roll as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The detected face's roll angle, as populated by the VNDetectFaceRectanglesRequestMBS.
**Notes:** The roll is reported in radians. A positive angle corresponds to counterclockwise roll. The range is [ -Pi, Pi). A nil value indicates that the roll angle hasn't been computed.
(Read only property)

### 189.21.9 yaw as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The detected face's yaw angle, as populated by the VNDetectFaceRectanglesRequestMBS.
**Notes:** The yaw is reported in radians. A positive angle corresponds to counterclockwise roll. The range is [ -Pi/2, Pi/2). A nil value indicates that the yaw angle hasn't been computed.
(Read only property)

# 189.22 class VNFeaturePrintObservationMBS

## 189.22.1 class VNFeaturePrintObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The observation resulting from a VNGenerateImageFeaturePrintRequestMBS.
**Notes:** The observations returned from a VNGenerateImageFeaturePrintRequestMBS are of this class.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.22.2 Methods

## 189.22.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

## 189.22.4 computeDistance(byref outDistance as Single, featurePrint as VNFeaturePrintObservationMBS, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Computes the distance between two observations.
**Notes:** The larger the distance the more dissimlar the feature prints are. In case of an error this method returns false with an error describing the error condition, for instance comparing two non-comparable feature prints.

## 189.22.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.22.6 Values as Double()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries values as a double array.
**Notes:** Floats are expanded to doubles for your convenience.

### 189.22.7 Properties

### 189.22.8 data as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The feature print data.
**Notes:** The data is divided into separate elements. Determine the type of element using elementType, and the number of elements using elementCount.
(Read only property)

### 189.22.9 elementCount as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The total number of elements in the data.
**Notes:** (Read only property)

### 189.22.10 elementType as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The type of each element in the data.
**Notes:** (Read only property)

### 189.22.11 Constants

Element Types

| Constant | Value | Description |
|---|---|---|
| ElementTypeDouble | 2 | The elements are double-precision floating-point numbers. |
| ElementTypeFloat | 1 | The elements are floating-point numbers. |
| ElementTypeUnknown | 0 | The element type isn't known. |

# 189.23 class VNGenerateAttentionBasedSaliencyImageRequestMBS

## 189.23.1 class VNGenerateAttentionBasedSaliencyImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Generates a heat map that identifies the parts of an image most likely to draw attention.
**Notes:** The resulting observation, VNSaliencyImageObservationMBS, encodes this data as a heat map, which you can use to highlight regions of interest.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.23.2 Methods

## 189.23.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

## 189.23.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

## 189.24 class VNGenerateImageFeaturePrintRequestMBS

### 189.24.1 class VNGenerateImageFeaturePrintRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image-based request to generate feature prints from an image.
**Notes:** This request returns an array of feature print elements in the form of data wrapped in VNFeaturePrintObservationMBS objects.
Available in MacOS 10.15 or newer.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.24.2 Methods

### 189.24.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.24.4 Properties

### 189.24.5 imageCropAndScaleOption as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Determine what type of croping and scaling action should be applied to the image before generating the feature print.
**Notes:** The default value for this property is VNImageCropAndScaleOptionScaleFill.
(Read and Write property)

### 189.24.6 Constants

Crop and Scale options

| Constant | Value | Description |
|---|---|---|
| VNImageCropAndScaleOptionCenterCrop | 0 | A scaling option that maintains aspect ratio to fit the short side, and centered image on its long side. |
| VNImageCropAndScaleOptionScaleFill | 2 | A scaling option that scales an image proportionally so that its short sion fills the canvas, potentially cropping along the longer dimension |
| VNImageCropAndScaleOptionScaleFit | 1 | An option that scales an image to fit the input image dimensions wl taining aspect ratio.<br>This option ensures the entire image fits into the Vision algorithm's in dimensions by scaling down the longer dimension until it fits. This op the image along the shorter dimension to maintain aspect ratio. |

## 189.25 class VNGenerateObjectnessBasedSaliencyImageRequestMBS

### 189.25.1 class VNGenerateObjectnessBasedSaliencyImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Generates a heat map that identifies the parts of an image most likely to represent objects.
**Notes:** The resulting observation, VNSaliencyImageObservationMBS, encodes this data as a heat map, which you can use to highlight regions of interest.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.25.2 Methods

### 189.25.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.25.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.26 class VNHomographicImageRegistrationRequestMBS

## 189.26.1 class VNHomographicImageRegistrationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that determines the perspective warp matrix needed to align the content of two images.
**Notes:** Create and perform a homographic image registration request to align content in two images through a homography. A homography is an isomorphism of projected spaces, a bijection that maps lines to lines.
Requires MacOS 10.13 or newer.
Subclass of the VNImageRegistrationRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.26.2 Methods

## 189.26.3 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.27 class VNHorizonObservationMBS

## 189.27.1 class VNHorizonObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Horizon angle information detected by an image analysis request.
**Notes:** Instances of this class result from invoking a VNDetectHorizonRequestMBS and report the angle and transform of the horizon in an image.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.27.2 Methods

## 189.27.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.27.4 Properties

## 189.27.5 angle as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Angle of the observed horizon.
**Notes:** Use the angle to orient the image in an upright position and make the detected horizon level.
(Read only property)

## 189.27.6 transform as CGAffineTransformMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Transform applied to the detected horizon.
**Notes:** Apply the transform's inverse to orient the image in an upright position and make the detected horizon level.
(Read only property)

# 189.28 class VNImageAlignmentObservationMBS

## 189.28.1 class VNImageAlignmentObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for image analysis results that describe the relative alignment of two images.
**Notes:** This abstract superclass forms the basis of image alignment or registration output. You receive its subclasses, such as VNImageTranslationAlignmentObservationMBS and VNImageHomographicAlignmentObservationMBS, by performing specific registration requests. Don't create one of these classes yourself.
Subclass of the VNObservationMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.28.2 Methods

## 189.28.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

# 189.29 class VNImageBasedRequestMBS

## 189.29.1 class VNImageBasedRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for image analysis requests that focus on a specific part of an image.
**Notes:** Other Vision request handlers that operate on still images inherit from this abstract base class. Don't use it directly.
Subclass of the VNRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.29.2 Methods

## 189.29.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.29.4 Properties

## 189.29.5 regionOfInterest as CGRectMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The region of the image in which Vision will perform the request.
**Notes:** The rectangle is normalized to the dimensions of the processed image. Its origin is specified relative to the image's lower-left corner.

The default value is { { 0, 0 } , { 1, 1 } } .

Important
The request will fail to perform if you set this property to a rectangle outside the normalized coordinate space.
(Read and Write property)

# 189.30 class VNImageHomographicAlignmentObservationMBS

## 189.30.1 class VNImageHomographicAlignmentObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Perspective warp information produced by an image alignment request.
**Notes:** This type of observation results from a VNHomographicImageRegistrationRequestMBS, informing the warpTransform performed to align the input images.
Subclass of the VNImageAlignmentObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.30.2 Methods

## 189.30.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.30.4 Properties

## 189.30.5 warpTransform as MemoryBlock

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The warp transform matrix to morph the floating image into the reference image.
**Notes:** This is a 3x3 float matrix wrapped into a memoryblock.
(Read only property)

## 189.31 class VNImageRegistrationRequestMBS

### 189.31.1 class VNImageRegistrationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for image analysis requests that align images based on their content.
**Notes:** This abstract superclass forms the basis of image alignment or registration requests. Make specific requests through one of its subclasses, VNTranslationalImageRegistrationRequestMBS or VNHomographicImageRegistrationRequestMBS. Don't create an instance of this superclass yourself.
Subclass of the VNTargetedImageRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

### 189.31.2 Methods

### 189.31.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

# 189.32 class VNImageRequestHandlerMBS

## 189.32.1 class VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An object that processes one or more image analysis requests pertaining to a single image.
**Notes:** Instantiate this handler to perform Vision requests on a single image. You specify the image and, optionally, a completion handler at the time of creation, and call performRequests to begin executing the request.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo Plugins, version 22.3pr3
- Vision Framework for Xojo

## 189.32.2 Methods

## 189.32.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.32.4 performRequests(requests() as VNRequestMBS, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules Vision requests to be performed.
**Notes:** requests: A nonempty array of VNRequestMBS instances to perform.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. If the return value is false, check the error parameter.

The function returns after all requests have either completed or failed. Check individual requests and errors for their respective successes and failures.

### 189.32.5 performRequestsAsync(requests() as VNRequestMBS, DelegateHandler as VNPerformRequestsCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules Vision requests to be performed asynchronously in background.
**Notes:** requests: A nonempty array of VNRequestMBS instances to perform.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. If the return value is false, check the error parameter.

The function returns immediately. Delegate will be called when finished.

### 189.32.6 RequestWithCGImage(CGImage as CGImageMBS, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on a Core Graphics image.
**Notes:** image: A CGImageMBS containing the image to be used for performing the requests. Image content is immutable.
orientation: The orientation of the input image. Pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

### 189.32.7 RequestWithCIImage(CIImage as Variant, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on CIImage data.
**Notes:** image: A CIImageMBS containing the image to be used for performing the requests. Image content is immutable.
orientation: The orientation of the input image. Pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

### 189.32.8 RequestWithCVPixelBuffer(CVPixelBuffer as Variant, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on a Core Video pixel buffer of a known orientation.
**Notes:** pixelBuffer: A CVPixelBufferMBS containing the image to be used for performing the requests. Buffer contents can't be changed for the lifetime of the request handler.
orientation: The orientation of the input image. Pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

### 189.32.9 RequestWithData(Data as MemoryBlock, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on an image, contained in a memoryblock.
**Notes:** imageData: Data containing the image to be used for performing the requests. Image content is immutable.
orientation: The orientation of the input image. Pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

The intended use cases of this type of initializer include compressed images and network downloads, where a client may receive a JPEG from a website or the cloud.

### 189.32.10 RequestWithFile(File as FolderItem, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on an image, at the specified folderitem.
**Notes:** File: A folderitem pointing to the image to be used for performing the requests. The image must be in a format supported by Image I/O. Image content is immutable.
orientation: The orientation of the input image. pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

### 189.32.11 RequestWithPicture(Picture as Picture, orientation as Integer = 0, Options as Dictionary = nil) as VNImageRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a handler to be used for performing requests on a picture.
**Notes:** image: A Picture containing the image to be used for performing the requests. Image content is immutable.
orientation: The orientation of the input image. Pass zero if unknown.
options: An optional dictionary containing VNImageOption keys to auxiliary image data.

### 189.32.12 VNImageOptionCameraIntrinsics as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An option to specify the camera intrinstics as an MemoryBlock object representing a matrix_float3x3.
**Notes:** see
https://developer.apple.com/documentation/vision/vnimageoptioncameraintrinsics?language=objc

### 189.32.13 VNImageOptionCIContext as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An option key to specify the CIContextMBS to be used in the handler's Core Image operations.
**Notes:** If this key isn't specified, Vision will create its own CIContext.
Specify a CIContextMBS when you've used one in processing an input CIImageMBS or executing a CIFilterMBS chain, so you can save the cost of creating a new context.

### 189.32.14 VNImageOptionProperties as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The dictionary from CGImageSourceCopyPropertiesAtIndex containing metadata for algorithms like horizon detection.

### 189.32.15 Properties

### 189.32.16 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.32.17 Constants

Orientations

| Constant | Value | Description |
|---|---|---|
| kOrientationDown | 3 | The encoded image data is rotated 180¬∞ from the image's intended display orientation. |
| kOrientationDownMirrored | 4 | The encoded image data is vertically flipped from the image's intended display orientation. |
| kOrientationLeft | 8 | The encoded image data is rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationLeftMirrored | 5 | The encoded image data is horizontally flipped and rotated 90¬∞ counter-clockwise from the image's intended display orientation. |
| kOrientationRight | 6 | The encoded image data is rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationRightMirrored | 7 | The encoded image data is horizontally flipped and rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationUp | 1 | The encoded image data matches the image's intended display orientation. |
| kOrientationUpMirrored | 2 | The encoded image data is horizontally flipped from the image's intended display orientation. |

## 189.33 class VNImageTranslationAlignmentObservationMBS

### 189.33.1 class VNImageTranslationAlignmentObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Affine transform information produced by an image alignment request.
**Notes:** This type of observation results from a VNTranslationalImageRegistrationRequestMBS, informing the alignmentTransform performed to align the input images.
Subclass of the VNImageAlignmentObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.33.2 Methods

### 189.33.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 189.33.4 Properties

### 189.33.5 alignmentTransform as CGAffineTransformMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The alignment transform to align the floating image with the reference image.
**Notes:** (Read only property)

# 189.34 class VNObservationMBS

## 189.34.1 class VNObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for analysis results.
**Notes:** Observations resulting from Vision image analysis requests inherit from this abstract base class. Do not use this abstract superclass directly.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.34.2 Methods

## 189.34.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.34.4 copy as VNObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

## 189.34.5 Properties

## 189.34.6 className as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries class name of the observation.
**Notes:** (Read only property)

## 189.34.7 Confidence as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The level of confidence in the observation's accuracy, normalized to [ 0, 1.0 ] .
**Notes:** A value of 0.0 indicates no confidence.
A value of 1.0 indicates the highest confidence. An observation that doesn't support or assign meaning to confidence also returns 1.0.
(Read only property)

### 189.34.8 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.34.9 requestRevision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The revision used in request.
**Notes:** (Read only property)

### 189.34.10 UUID as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A unique identifier assigned to the Vision observation.
**Notes:** (Read only property)

# 189.35 class VNPixelBufferObservationMBS

## 189.35.1 class VNPixelBufferObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An output image produced by a Core ML image analysis request.
**Notes:** This type of observation results from performing a VNCoreMLRequestMBS image analysis with a Core ML model whose role is image-to-image processing. For example, this observation would result from a model that analyzes the style of one image and then transfers that style to a different image.
Vision infers that an MLModel object is an image-to-image model if that model includes an image. Its modelDescription object includes an image-typed feature description in its outputDescriptionsByName dictionary.
Subclass of the VNObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.35.2 Methods

## 189.35.3 CIImage as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates CIImageMBS object for given pixel buffer.

## 189.35.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.35.5 Properties

## 189.35.6 featureName as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The name used in the model description of the CoreML model that produced this observation.
**Notes:** This value can be empty if the observation is not the result of a VNCoreMLRequest operation.
Available in MacOS 10.15 or later.
(Read only property)

### 189.35.7 pixelBuffer as Variant

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The image that results from a request with image output.
**Notes:** VNCoreMLRequestMBS produces observations that contain images in pixel buffer format. The confidence level is always 1.0.
(Read only property)

# 189.36 class VNRecognizeAnimalsRequestMBS

## 189.36.1 class VNRecognizeAnimalsRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request that will recognize various animals in an image.
**Notes:** The list of animals supported by the recognition algorithm can be queried by knownAnimalIdentifiersForRevision.
This request will generate VNRecognizedObjectObservationMBS objects with a defined boundingBox, label and confidence level.

Availalble on MacOS 10.15.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.36.2 Methods

## 189.36.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

## 189.36.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

## 189.36.5 knownAnimalIdentifiersForRevision(requestRevision as Integer = 1, byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** This class method returns a list of all animals supported by the recognition algorithm

**Notes:** This request will generate a collection of names for supported animals by current recognition algorithm.

### 189.36.6 VNAnimalIdentifierCat as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The identifier for cats.

### 189.36.7 VNAnimalIdentifierDog as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The identifier for dogs.

# 189.37 class VNRecognizedObjectObservationMBS

## 189.37.1 class VNRecognizedObjectObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A detected object observation with an array of classification labels that classify the recognized object.
**Notes:** The confidence of the classifications sum up to 1.0. Multiply the classification confidence with the confidence of this observation.

Available on MacOS 10.14 or newer.
Subclass of the VNDetectedObjectObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.37.2 Methods

## 189.37.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.37.4 labels as VNClassificationObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of observations that classify the recognized object.

## 189.38 class VNRecognizedTextMBS

### 189.38.1 class VNRecognizedTextMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A block of recognized text.
**Notes:** There can be multiple VNRecognizedTextMBS objects returned in a VNRecognizedTextObservationMBS - one for each candidate.
**Blog Entries**

- Vision Framework for Xojo

### 189.38.2 Methods

### 189.38.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.38.4 boundingBoxForRange(range as NSRangeMBS, byref error as NSErrorMBS) as VNRectangleObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Calculate the bounding box around the characters in the range of the string.
**Notes:** The bounding boxes are not guaranteed to be an exact fit around the characters and are purely meant for UI purposes and not for image processing.
Range is zero based!

### 189.38.5 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 189.38.6 copy as VNRecognizedTextMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

### 189.38.7 Properties

### 189.38.8 confidence as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The level of confidence normalized to [ 0.0, 1.0 ] where 1.0 is most confident.
**Notes:** (Read only property)

### 189.38.9 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.38.10 string as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Field that contains recognized text.
**Notes:** This is the top candidate of the recognized text.
(Read only property)

# 189.39 class VNRecognizedTextObservationMBS

## 189.39.1 class VNRecognizedTextObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A request that detects and recognizes regions of text in an image.
**Notes:** This type of observation results from a VNRecognizeTextRequestMBS. It contains information about both the location and content of text and glyphs that Vision recognized in the input image.
Subclass of the VNRectangleObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.39.2 Methods

## 189.39.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

## 189.39.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.39.5 topCandidates(maxCandidateCount as integer) as VNRecognizedTextMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Requests the n top candidates for a recognized text string.
**Notes:** maxCandidateCount: The maximum number of candidates to return. This can't exceed 10.

Returns an array of the n top candidates, sorted by decreasing confidence score.

This function returns no more than n candidates, but it may return fewer than n candidates.

### 189.39.6 Properties

### 189.39.7 string as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The top candidate's string.
**Notes:** For your convenience.
(Read only property)

### 189.39.8 topCanditate as VNRecognizedTextMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** First top candidate.
**Notes:** For your convenience.
Same as first element of topCanditates(1).
(Read only property)

## 189.40 class VNRecognizeTextRequestMBS

### 189.40.1 class VNRecognizeTextRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that finds and recognizes text in an image.
**Notes:** By default, a text recognition request first locates all possible glyphs or characters in the input image, then analyzes each string. To specify or limit the languages sought in the request, set the recognitionLanguages property to an array containing the names of the languages of text you'd like to recognize. Vision returns the result of this request in a VNRecognizedTextObservationMBS object.

Available on MacOS 10.15.
Subclass of the VNImageBasedRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.40.2 Methods

### 189.40.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.40.4 Constructor(DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.
**Notes:** When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.40.5 customWords as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of strings to supplement the recognized languages at the word recognition stage.
**Notes:** The customWords list takes precedence over the standard lexicon.

### 189.40.6 recognitionLanguages as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of languages to detect, in priority order.
**Notes:** The order of the languages in the array defines the order in which languages are used during language processing and text recognition.
Specify the languages as ISO language codes.

### 189.40.7 setCustomWords(customWords() as String)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets an array of strings to supplement the recognized languages at the word recognition stage.
**Notes:** The customWords list takes precedence over the standard lexicon.

### 189.40.8 setProgressHandler(ProgressHandler as VNProgressHandlerMBS, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets progress handler.
**Notes:** The progress handler is an optional delegate that allows clients of the request to report progress to the user or to display partial results as they become available.

### 189.40.9 setRecognitionLanguages(recognitionLanguages() as String)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Sets array of languages to detect, in priority order.
**Notes:** The order of the languages in the array defines the order in which languages are used during language processing and text recognition.
Specify the languages as ISO language codes.

### 189.40.10 supportedRecognitionLanguages(recognitionLevel as Integer, byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Requests a list of languages recognized by the specified revision.
**Example:**

```
Dim recognitionLevel As Integer = VNRecognizeTextRequestMBS.RecognitionLevelAccurate
Dim languages() As String
Dim error As NSErrorMBS

languages = VNRecognizeTextRequestMBS.supportedRecognitionLanguages(recognitionLevel, error)

MsgBox Join(languages, EndOfLine)

If error <>Nil Then
MsgBox error.LocalizedDescription
End If
```

**Notes:** recognitionLevel: The level of recognition to prioritize. Set this level to RecognitionLevelFast to prioritize speed over accuracy, and to RecognitionLevelAccurate to prioritize accuracy at the expense of speed.
error: An error that contains information about failed language support, or nil if no error occurred.

Request revision is set automatically by OS version.
Returns an array of supported languages, listed as ISO language codes.

A language supported in one recognition level may not be available in another recognition level.

Returns en-US in macOS 10.15 and iOS 13.0.
Returns en-US, fr-FR, it-IT, de-DE, es-ES and pt-BR in macOS 11.0 and iOS 14.0.
Returns en-US, fr-FR, it-IT, de-DE, es-ES, pt-BR, zh-Hans, zh-Hant in macOS 12.0
Returns en-US, fr-FR, it-IT, de-DE, es-ES, pt-BR, zh-Hans, zh-Hant, yue-Hans, yue-Hant, ko-KR, ja-JP, ru-RU, uk-UA in macOS 13.0 and iOS 16.0.
See also:

- 189.40.11 supportedRecognitionLanguages(recognitionLevel as Integer, requestRevision as Integer, byref error as NSErrorMBS) as String() 22632

### 189.40.11 supportedRecognitionLanguages(recognitionLevel as Integer, requestRevision as Integer, byref error as NSErrorMBS) as String()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Requests a list of languages recognized by the specified revision.
**Example:**

```
Dim recognitionLevel As Integer = VNRecognizeTextRequestMBS.RecognitionLevelAccurate
Dim languages() As String
Dim error As NSErrorMBS
```

```
languages = VNRecognizeTextRequestMBS.supportedRecognitionLanguages(recognitionLevel, error)

MsgBox Join(languages, EndOfLine)

If error <>Nil Then
MsgBox error.LocalizedDescription
End If
```

**Notes:** recognitionLevel: The level of recognition to prioritize. Set this level to RecognitionLevelFast to prioritize speed over accuracy, and to RecognitionLevelAccurate to prioritize accuracy at the expense of speed.
requestRevision: The revision of the text recognition algorithm for the Vision framework to use. Can be 1, 2 or 3. Or leave away for automatic mode.
error: An error that contains information about failed language support, or nil if no error occurred.

Returns an array of supported languages, listed as ISO language codes.

A language supported in one recognition level may not be available in another recognition level.

Returns en-US in macOS 10.15 and iOS 13.0.
Returns en-US, fr-FR, it-IT, de-DE, es-ES and pt-BR in macOS 11.0 and iOS 14.0.
Returns en-US, fr-FR, it-IT, de-DE, es-ES, pt-BR, zh-Hans, zh-Hant in macOS 12.0 with requestRevision = 2.
Returns en-US, fr-FR, it-IT, de-DE, es-ES, pt-BR, zh-Hans, zh-Hant, yue-Hans, yue-Hant, ko-KR, ja-JP, ru-RU, uk-UA in macOS 13.0 and iOS 16.0 with requestRevision = 3.
See also:

- 189.40.10 supportedRecognitionLanguages(recognitionLevel as Integer, byref error as NSErrorMBS) as String() 22631

### 189.40.12 Properties

### 189.40.13 indeterminate as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean set to true when a request can't determine its progress in fractions completed.
**Notes:** A value of true doesn't mean that the request will run forever. Rather, it means that the nature of the request can't be broken down into identifiable fractions to report. The progressHandler will still be called at suitable intervals.
(Read only property)

### 189.40.14 minimumTextHeight as Double

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The minimum height of the text expected to be recognized, relative to the image height.
**Notes:** Specify a floating-point number relative to the image height. For example, to limit recognition to text that is half of the image height, use 0.5. Increasing the size reduces memory consumption and expedites recognition with the tradeoff of ignoring text smaller than the minimum height. The default value is 1/32, or 0.03125.
(Read and Write property)

### 189.40.15 recognitionLevel as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A value that determines whether the request prioritizes accuracy or speed in text recognition.
**Notes:** The recognition level determines which techniques are used during the text recognition. Set this value to RecognitionLevelFast to prioritize speed over accuracy, and to RecognitionLevelAccurate for longer, more computationally intensive recognition.
(Read and Write property)

### 189.40.16 usesLanguageCorrection as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean indicating whether Vision applies language correction during the recognition process.
**Notes:** When this Boolean is set to true, Vision applies language correction during the recognition process. Disabling this property returns the raw recognition results, which provides performance benefits but less accurate results.
(Read and Write property)

### 189.40.17 Constants

Recognition Levels

| Constant | Value | Description |
|---|---|---|
| RecognitionLevelAccurate | 0 | Accurate text recognition takes more time to produce a more comprehensive result. |
| RecognitionLevelFast | 1 | Fast text recognition returns results more quickly at the expense of accuracy. |

# 189.41 class VNRectangleObservationMBS

## 189.41.1 class VNRectangleObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Information about projected rectangular regions detected by an image analysis request.
**Notes:** This type of observation results from a VNDetectRectanglesRequestMBS. It defines the four vertices of a detected rectangle.
Subclass of the VNDetectedObjectObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.41.2 Methods

## 189.41.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.41.4 rectangleObservationWithRequestRevision(requestRevision as Integer = 1, topLeft as CGPointMBS, bottomLeft as CGPointMBS, bottomRight as CGPointMBS, topRight as CGPointMBS) as VNRectangleObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A convenience initializer for creating a rectangle observation from its corner points.
**Notes:** requestRevision: The rectangle detector revision number. A higher revision indicates more recent iterations of the framework.
topLeft: The upper-left corner point.
bottomLeft: The lower-left corner point.
bottomRight: The lower-right corner point.
topRight: The upper-right corner point.

Available on MacOS 10.15 or newer.

### 189.41.5 Properties

### 189.41.6 bottomLeft as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the lower-left corner of the observation bounding box.
**Notes:** (Read only property)

### 189.41.7 bottomRight as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the lower-right corner of the observation bounding box.
**Notes:** (Read only property)

### 189.41.8 topLeft as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the upper-left corner of the observation bounding box.
**Notes:** (Read only property)

### 189.41.9 topRight as CGPointMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The coordinates of the upper-right corner of the observation bounding box.
**Notes:** (Read only property)

# 189.42 class VNRequestMBS

## 189.42.1 class VNRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for analysis requests.
**Notes:** Other Vision request handlers that perform image analysis inherit from this abstract base class. Instantiate one of its subclasses to perform image analysis.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.42.2 Methods

## 189.42.3 cancel

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Cancels the request before it can finish executing.

## 189.42.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.42.5 copy as VNRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a copy of the object.

## 189.42.6 currentRevision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The current revison supported by the request.
**Notes:** Available on MacOS 10.14 or newer.

### 189.42.7 defaultRevision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The revision of the latest request for the particular SDK linked with the client application.
**Notes:** Available on MacOS 10.14 or newer.

### 189.42.8 results as VNObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The collection of VNObservationMBS results generated by request processing.
**Notes:** If the request fails, this property is nil. Otherwise, it contains an array of VNObservationMBS subclasses specific to the VNRequest subclass.
Don't access this property until the request has finished processing.

### 189.42.9 supportedRevisions as NSIndexSetMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The collection of currently-supported algorithm versions for the class of request.
**Notes:** This method allows clients to inspect at runtime what capabilities are available for each class of VNRequest in the Vision framework.
Available on MacOS 10.14 or newer.

### 189.42.10 Properties

### 189.42.11 className as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Queries class name of the request.
**Notes:** (Read only property)

### 189.42.12 ClassPath as String

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The class path.
**Notes:** Useful for debugging to know what super classes the request has.

(Read only property)

### 189.42.13 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.42.14 preferBackgroundProcessing as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A hint to minimize the resource burden of the request.
**Notes:** If set to true, this property reduces the request's memory footprint, processing footprint, and CPU/GPU contention at the potential cost of longer execution time.
Setting this value can help ensure that Vision processing doesn't block UI updates and other rendering on the main thread.
(Read and Write property)

### 189.42.15 revision as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The specific algorithm or implementation revision that is to be used to perform the request.
**Notes:** (Read and Write property)

### 189.42.16 usesCPUOnly as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean signifying that the Vision request should execute exclusively on the CPU.
**Notes:** This value defaults to false to signify that the Vision request is free to leverage the GPU to accelerate its processing.
(Read and Write property)

## 189.43 class VNSaliencyImageObservationMBS

### 189.43.1 class VNSaliencyImageObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An observation containing a grayscale heat map of important areas across an image.
**Notes:** The heat map is a CVPixelBufferRef in a one-component floating-point pixel format. Its dimensions are 64 x 64 when fetched in real time, or 68 x 68 when requested in its deferred form.
Available on MacOS 10.15 or later.
Subclass of the VNPixelBufferObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.43.2 Methods

### 189.43.3 available as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Whether this class is available.
**Notes:** Returns true on MacOS 10.15 or newer.

### 189.43.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

### 189.43.5 salientObjects as VNRectangleObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A collection of objects describing the distinct areas of the saliency heat map.
**Notes:** The objects in this array don't follow any specific ordering. It's up to your app to iterate across the observations and apply desired ordering.
Requesting this array lazily computes the bounds of salient objects within the image.

# 189.44 class VNSequenceRequestHandlerMBS

## 189.44.1 class VNSequenceRequestHandlerMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An object that processes image analysis requests for each frame in a sequence.
**Notes:** Instantiate this handler to perform Vision requests on a series of images. Unlike the VNImageRequestHandlerMBS, you don't specify the image on creation. Instead, you supply each image frame one by one as you continue to call one of the perform methods.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- Vision Framework for Xojo

## 189.44.2 Methods

## 189.44.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

## 189.44.4 performRequestsOnCGImage(requests() as VNRequestMBS, CGImage as CGImageMBS, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on a Core Graphics image with known orientation.
**Notes:** requests: An array of VNRequestMBS requests to perform.
image: The input CGImageMBS on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.5 performRequestsOnCIImage(requests() as VNRequestMBS, CIImage as Variant, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on CIImageMBS data with known orientation.
**Notes:** requests: An array of VNRequestMBS requests to perform.
image: The input CIImageMBS on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.6 performRequestsOnCVPixelBuffer(requests() as VNRequestMBS, CVPixelBuffer as Variant, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on a Core Video pixel buffer with known orientation.
**Notes:** requests: An array of VNRequestMBS requests to perform.
pixelBuffer: The input CVPixelBufferMBS on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.7 performRequestsOnImageData(requests() as VNRequestMBS, Data as MemoryBlock, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on raw data containing an image with known orientation.
**Notes:** requests: An array of VNRequestMBS requests to perform.

imageData: The input MemoryBlock on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.8 performRequestsOnImageFile(requests() as VNRequestMBS, File as FolderItem, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on an image with known orientation, at a specific file.
**Notes:** requests: An array of VNRequestMBS requests to perform.
File: A folderitem pointing to the image on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is NO.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.9 performRequestsOnPicture(requests() as VNRequestMBS, Picture as Picture, orientation as Integer = 0, byref error as NSErrorMBS) as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Schedules one or more Vision requests to be performed on a Core Graphics image with known orientation.
**Notes:** requests: An array of VNRequestMBS requests to perform.
image: The input CGImageMBS on which to perform the request.
orientation: The orientation of the input image. Pass zero if unknown.
error: An optional error parameter populated when problems arise in scheduling the requests. Check if the return value is false.

Returns true if all requests were scheduled and performed. Check the error parameter if the return value is false.

### 189.44.10 Properties

### 189.44.11 Handle as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 189.44.12 Constants

Orientations

| Constant | Value | Description |
|---|---|---|
| kOrientationDown | 3 | The encoded image data is rotated 180¬∞ from the image's intended display orientation. |
| kOrientationDownMirrored | 4 | The encoded image data is vertically flipped from the image's intended display orientation. |
| kOrientationLeft | 8 | The encoded image data is rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationLeftMirrored | 5 | The encoded image data is horizontally flipped and rotated 90¬∞ counter-clockwise from the image's intended display orientation. |
| kOrientationRight | 6 | The encoded image data is rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationRightMirrored | 7 | The encoded image data is horizontally flipped and rotated 90¬∞ clockwise from the image's intended display orientation. |
| kOrientationUp | 1 | The encoded image data matches the image's intended display orientation. |
| kOrientationUpMirrored | 2 | The encoded image data is horizontally flipped from the image's intended display orientation. |

# 189.45 class VNTargetedImageRequestMBS

## 189.45.1 class VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for image analysis requests that operate on both the processed image and a secondary image.
**Notes:** Other Vision request handlers that operate on both the processed image and a secondary image inherit from this abstract base class. Instantiate one of its subclasses to perform image analysis, and pass in auxiliary image data by filling in the options dictionary at initialization.
Subclass of the VNImageBasedRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr5
- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo Plugins, version 21.5pr3
- Vision Framework for Xojo

## 189.45.2 Methods

## 189.45.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.45.4 TargetedImageRequestWithCGImage(CGImage as CGImageMBS, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting a Core Graphics image of known orientation, executing the completion handler when done.
**Notes:** cgImage: The targeted Core Graphics image.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Value 0 means unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.45.5 TargetedImageRequestWithCIImage(CIImage as Variant, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting a CIImageMBS of known orientation, executing the completion handler when done.
**Notes:** ciImage: The CIImage encapsulating the targeted image. Variant must be CIImageMBS.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Pass zero if unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.45.6 TargetedImageRequestWithCVPixelBuffer(CVPixelBuffer as Variant, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting an image in a CVPixelBufferMBS of known orientation, executing the completion handler when done.
**Notes:** pixelBuffer: The pixel buffer containing the targeted image. Variant must be CVPixelBufferMBS.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Pass zero if unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.45.7 TargetedImageRequestWithImageData(Data as MemoryBlock, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting a raw data image of known orientation, executing the completion handler when done.
**Notes:** imageData: The data containing the targeted image.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Pass zero if unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.45.8 TargetedImageRequestWithImageFile(File as FolderItem, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting an image of known orientation, at the specified file, executing the completion handler when done.
**Notes:** File: The file of the targeted image.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Pass 0 if unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

### 189.45.9 TargetedImageRequestWithPicture(Picture as Picture, orientation as Integer = 0, options as Dictionary, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil) as VNTargetedImageRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new request targeting a Core Graphics image of known orientation, executing the completion handler when done.

**Notes:** Picture: The targeted Core Graphics image.
orientation: The orientation of the image buffer, based on EXIF specification and superseding other orientation information. The value must be an integer from 1 to 8; see kCGImagePropertyOrientation for details. Value 0 means unknown.
options: A dictionary with options specifying auxiliary information for the image.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.46 class VNTextObservationMBS

## 189.46.1 class VNTextObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Information about regions of text detected by an image analysis request.
**Notes:** This type of observation results from a VNDetectTextRectanglesRequestMBS. It expresses the location of each detected character by its bounding box.
Available on MacOS 10.13 or newer.
Subclass of the VNRectangleObservationMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.46.2 Methods

## 189.46.3 characterBoxes as VNRectangleObservationMBS()

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An array of detected individual character bounding boxes.
**Notes:** If the associated VNDetectTextRectanglesRequestMBS request indicates interest in character boxes by setting the option VNRequestOptionReportCharacterBoxes to true, this property is non-nil. If no characters are found, it remains empty.

## 189.46.4 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The constructor.

# 189.47 class VNTrackingRequestMBS

## 189.47.1 class VNTrackingRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The abstract superclass for image analysis requests that track unique features across multiple images or video frames.
**Notes:** Instantiate a tracking request subclass to perform object tracking across multiple frames of an image. After initialization, configure the degree of accuracy by setting trackingLevel, and provide observations you would like to track by setting the inputObservation initial bounding box.
Subclass of the VNImageBasedRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.47.2 Methods

## 189.47.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

## 189.47.4 Properties

## 189.47.5 inputObservation as VNDetectedObjectObservationMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The observation object defining a region to track.
**Notes:** Providing an observation not returned from a tracker, such as a user-defined observation, begins a new tracker for the sequence. Providing an observation that was returned from a tracker continues the use of that tracker, to track the region to the next frame.
In general, unless specified in the request's documentation or header file, you must define the rectangle in normalized coordinates, with the origin at the lower-left corner.
(Read only property)

## 189.47.6 LastFrame as Boolean

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A Boolean that indicates the last frame in a tracking sequence.
**Notes:** If set to true, the current tracker will be released to the pool of available trackers when the current frame finishes processing.
(Read and Write property)

### 189.47.7 trackingLevel as Integer

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** A value for specifying whether to prioritize speed or location accuracy.
**Notes:** Use VNRequestTrackingLevelAccurate or VNRequestTrackingLevelFast.
(Read only property)

### 189.47.8 Constants

TrackingLevel

| Constant | Value | Description |
|---|---|---|
| VNRequestTrackingLevelAccurate | 0 | Tracking level that favors location accuracy over speed. |
| VNRequestTrackingLevelFast | 1 | Tracking level that favors speed over location accuracy. |

## 189.48 class VNTrackObjectRequestMBS

### 189.48.1 class VNTrackObjectRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that tracks movement of a previously identified arbitrary object across multiple images or video frames.
**Notes:** Use this type of request to track the bounding boxes around objects previously identified in an image. Vision will attempt to locate the same object from the input observation throughout the sequence.
Subclass of the VNTrackingRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

### 189.48.2 Methods

### 189.48.3 Constructor(observation as VNDetectedObjectObservationMBS, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new object tracking request with a detected object observation.
**Notes:** observation: A detected object observation with bounding box information.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.49 class VNTrackRectangleRequestMBS

## 189.49.1 class VNTrackRectangleRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that tracks movement of a previously identified rectangular object across multiple images or video frames.
**Notes:** Use this type of request to track the bounding boxes of rectangles throughout a sequence of images. Vision returns locations for rectangles found in all orientations and sizes.
Subclass of the VNTrackingRequestMBS class.
**Blog Entries**

- Vision Framework for Xojo

## 189.49.2 Methods

## 189.49.3 Constructor(observation as VNRectangleObservationMBS, DelegateHandler as VNRequestCompletedMBS = nil, tag as variant = nil)

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** Creates a new rectangle tracking request with a rectangle observation.
**Notes:** observation: A rectangle observation with bounding box and corner location information.

When work is done, the optional delegate method is invoked to provide result on success or error on failure.

# 189.50 class VNTranslationalImageRegistrationRequestMBS

## 189.50.1 class VNTranslationalImageRegistrationRequestMBS

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** An image analysis request that determines the affine transform needed to align the content of two images.
**Notes:** Create and perform a translational image registration request to align content in two images through translation.
Subclass of the VNImageRegistrationRequestMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Vision Framework for Xojo

## 189.50.2 Methods

## 189.50.3 Constructor

MBS MacFrameworks Plugin, Plugin Version: 19.4, Platform: macOS, Targets: All.

**Function:** The private constructor.

# Chapter 190

# VLC

## 190.1 class VLCAudioOutputDeviceMBS

### 190.1.1 class VLCAudioOutputDeviceMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for details on audio output devices.
**Example:**

```
Dim DeviceNames() As String

Dim devices As VLCAudioOutputDeviceMBS = mp.AudioOutputDevices
While devices <>Nil
DeviceNames.append "* "+devices.Device+": "+devices.Description

devices = devices.NextOutput
Wend

MessageBox Join(DeviceNames, EndOfLine)
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 190.1.2 Methods

### 190.1.3 Constructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 190.1.4 Destructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.1.5 Properties

### 190.1.6 Description as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The User-friendly device description.
**Notes:** (Read and Write property)

### 190.1.7 Device as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The output device ID.
**Notes:** (Read and Write property)

### 190.1.8 NextOutput as VLCAudioOutputDeviceMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The next entry in the list.
**Notes:** You can loop over entries. Last one has nil in this property.

(Read and Write property)

## 190.2 class VLCAudioOutputMBS

### 190.2.1 class VLCAudioOutputMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Description for audio output.
**Example:**

```
Dim v As VLCInstanceMBS // your VLC instance

Dim OutputModules() As String
Dim outputModule As VLCAudioOutputMBS = v.GetAudioOutputList
While outputModule <>Nil
Dim OutputModuleName As String = outputModule.Name
OutputModules.append OutputModuleName+": "+outputModule.Description
outputModule = outputModule.NextOutput
Wend

MessageBox Join(OutputModules, EndOfLine)
```

**Notes:** It contains name, description and pointer to next record.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 190.2.2 Methods

### 190.2.3 Constructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 190.2.4 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.2.5 Properties

### 190.2.6 Description as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The description for this audio output.
**Notes:** (Read and Write property)

### 190.2.7 Name as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of this audio output.
**Notes:** (Read and Write property)

### 190.2.8 NextOutput as VLCAudioOutputMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The next audio output reference.
**Notes:** (Read and Write property)

## 190.3 class VLCEqualizerMBS

### 190.3.1 class VLCEqualizerMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for equalizer in VLC.
**Notes:** Requires VLC 2.2.
**Blog Entries**

- MBS Xojo Plugins, version 18.0pr8

### 190.3.2 Methods

### 190.3.3 BandFrequency(index as Integer) as Double

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get a particular equalizer band frequency.
**Notes:** This value can be used, for example, to create a label for an equalizer band control in a user interface.

Index: index of the band, counting from zero
Returns equalizer band frequency (Hz), or -1 if there is no such band

Requires LibVLC 2.2.0 or later

### 190.3.4 Constructor(index as Integer, vlc as VLCInstanceMBS = nil)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a new equalizer, with initial frequency values copied from an existing preset.
**Notes:** The new equalizer can subsequently be applied to a media player by invoking VLCMediaPlayerMBS.SetEqualizer.

Index: index of the preset, counting from zero.

Requires VLC 2.2.
See also:

- 190.3.5 Constructor(vlc as VLCInstanceMBS = nil)

### 190.3.5 Constructor(vlc as VLCInstanceMBS = nil)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a new default equalizer, with all frequency values zeroed.
**Notes:** The new equalizer can subsequently be applied to a media player by invoking VLCMediaPlayerMBS.SetEqualizer.
Requires VLC 2.2.
See also:

- 190.3.4 Constructor(index as Integer, vlc as VLCInstanceMBS = nil) 22660

### 190.3.6 Destructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.3.7 PresetName(index as Integer) as string

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the name of a particular equalizer preset.
**Notes:** This name can be used, for example, to prepare a preset label or menu in a user interface.

index: index of the preset, counting from zero
Returns name, or "" if there is no such preset
Requires LibVLC 2.2.0 or later.

### 190.3.8 Properties

### 190.3.9 BandCount as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the number of distinct frequency bands for an equalizer.
**Notes:** Requires LibVLC 2.2.0 or later.
(Read only property)

### 190.3.10 Handle as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.3.11 Preamp as Single

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set a new pre-amplification value for an equalizer.
**Notes:** The new equalizer settings are subsequently applied to a media player by invoking VLCMediaPlayer.SetEqualizer.

The supplied amplification value will be clamped to the -20.0 to +20.0 range.

preamp value (-20.0 to 20.0 Hz)
Returns zero on success, -1 on error.

Requires LibVLC 2.2.0 or later
(Read and Write property)

### 190.3.12 PresetCount as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the number of equalizer presets.
**Notes:** Requires LibVLC 2.2.0 or later
(Read only property)

### 190.3.13 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the parent VLC instance object.
**Notes:** (Read only property)

### 190.3.14 Map(Index as Integer) as Single

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set a new amplification value for a particular equalizer frequency band.
**Notes:** The new equalizer settings are subsequently applied to a media player by invoking VLCMediaPlayerMBS.SetEqualizer.

The supplied amplification value will be clamped to the -20.0 to +20.0 range.

Value: amplification value (-20.0 to 20.0 Hz)
index, counting from zero, of the frequency band to set

Requires LibVLC 2.2.0 or later
(Read and Write computed property)

## 190.4 class VLCEventManagerMBS

### 190.4.1 class VLCEventManagerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for getting event with VLC.
**Notes:** Only the events which the parent object sends are delivered.
With 12.3pr5 and newer plugins, this function sends events to main thread as it should be.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.1pr5
- MBS Real Studio Plugins, version 12.3pr5

### 190.4.2 Methods

### 190.4.3 Constructor(Media as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes event manager for media.
See also:


- 190.4.4 Constructor(MediaDiscoverer as VLCMediaDiscovererMBS) 22664
- 190.4.5 Constructor(MediaList as VLCMediaListMBS) 22665
- 190.4.6 Constructor(MediaListPlayer as VLCMediaListPlayerMBS) 22665
- 190.4.7 Constructor(MediaPlayer as VLCMediaPlayerMBS) 22665


### 190.4.4 Constructor(MediaDiscoverer as VLCMediaDiscovererMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes event manager for media discoverer.
See also:


- 190.4.3 Constructor(Media as VLCMediaMBS) 22664
- 190.4.5 Constructor(MediaList as VLCMediaListMBS) 22665
- 190.4.6 Constructor(MediaListPlayer as VLCMediaListPlayerMBS) 22665
- 190.4.7 Constructor(MediaPlayer as VLCMediaPlayerMBS) 22665

### 190.4.5 Constructor(MediaList as VLCMediaListMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes event manager for media list.
See also:

- 190.4.3 Constructor(Media as VLCMediaMBS) 22664
- 190.4.4 Constructor(MediaDiscoverer as VLCMediaDiscovererMBS) 22664
- 190.4.6 Constructor(MediaListPlayer as VLCMediaListPlayerMBS) 22665
- 190.4.7 Constructor(MediaPlayer as VLCMediaPlayerMBS) 22665

### 190.4.6 Constructor(MediaListPlayer as VLCMediaListPlayerMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes event manager for media list player.
See also:

- 190.4.3 Constructor(Media as VLCMediaMBS) 22664
- 190.4.4 Constructor(MediaDiscoverer as VLCMediaDiscovererMBS) 22664
- 190.4.5 Constructor(MediaList as VLCMediaListMBS) 22665
- 190.4.7 Constructor(MediaPlayer as VLCMediaPlayerMBS) 22665

### 190.4.7 Constructor(MediaPlayer as VLCMediaPlayerMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Initializes event manager for media player.
See also:

- 190.4.3 Constructor(Media as VLCMediaMBS) 22664
- 190.4.4 Constructor(MediaDiscoverer as VLCMediaDiscovererMBS) 22664
- 190.4.5 Constructor(MediaList as VLCMediaListMBS) 22665
- 190.4.6 Constructor(MediaListPlayer as VLCMediaListPlayerMBS) 22665

### 190.4.8 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.4.9 Listen

MBS VLC Plugin, Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers internally events.
**Notes:** This is normally called in the constructor.
If you add event handlers later via AddHandler command, you need to call this method to have those event handlers also registered.

### 190.4.10 Properties

### 190.4.11 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.4.12 Parent as Variant

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The parent object.
**Notes:** Just a reference back, so the target object is not released too early.
(Read and Write property)

### 190.4.13 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

### 190.4.14 Events

### 190.4.15 Log(Message as String, level as Integer, Name as String, Header as String, ModuleName as String, FileName as String, Line as Integer)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A log message arrived.
**Notes:** message: The message to log.
level: message level, e.g. kLogLevelError
Name: object name
Header: object header or empty.
ModuleName: module name
FileName: The source code file name.
Line: The source code line number.

Enable this event using VLCInstanceMBS.SetLogEvent method.

### 190.4.16 MediaDiscovererEnded

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media discovered ended.

### 190.4.17 MediaDiscovererStarted

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media discoverer started.

### 190.4.18 MediaDurationChanged(newDuration as Int64)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Duration of media changed.

### 190.4.19 MediaFreed(media as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media was released.

### 190.4.20 MediaListItemAdded(item as VLCMediaMBS, index as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list item added.

### 190.4.21 MediaListItemDeleted(item as VLCMediaMBS, index as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list item deleted.

### 190.4.22 MediaListPlayerNextItemSet(item as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.23 MediaListPlayerPlayed

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list player played.

### 190.4.24 MediaListPlayerStopped

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list player stopped.

### 190.4.25 MediaListWillAddItem(item as VLCMediaMBS, index as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list will add item.

### 190.4.26 MediaListWillDeleteItem(item as VLCMediaMBS, index as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media list will delete item.

### 190.4.27 MediaMetaChanged(metatype as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Metadata changed.

### 190.4.28 MediaParsedChanged(newStatus as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Parsed status changed.

### 190.4.29 MediaPlayerBackward

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media player moved backwards.

### 190.4.30 MediaPlayerBuffering

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.31 MediaPlayerEncounteredError

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.32 MediaPlayerEndReached

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media player reached end of media.

### 190.4.33 MediaPlayerForward

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Player moved forward.

### 190.4.34 MediaPlayerLengthChanged(NewLength as Int64)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The length of the media changed.

### 190.4.35 MediaPlayerMediaChanged(item as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The media changed in the media player.

### 190.4.36 MediaPlayerNothingSpecial

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.37 MediaPlayerOpening

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The Media player is opening.

### 190.4.38 MediaPlayerPausableChanged(pausable as boolean)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media player's pausable state changed.

### 190.4.39 MediaPlayerPaused

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The player was paused.

### 190.4.40 MediaPlayerPlaying

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The player is playing.

### 190.4.41 MediaPlayerPositionChanged(newPosition as Double)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Position changed.
**Notes:** This event does not fire if you assigned new position. It is only to inform you that position changed due to playing video.

### 190.4.42 MediaPlayerScrambledChanged(newScrambled as Integer)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The scrambled property changed.

### 190.4.43 MediaPlayerSeekableChanged(seekable as boolean)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media Player's seekable status changed.

### 190.4.44 MediaPlayerSnapshotTaken(filename as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A snapshot has been taken.

### 190.4.45 MediaPlayerStopped

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media player stopped.

### 190.4.46 MediaPlayerTimeChanged(newTime as Int64)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media player reached a new time.

### 190.4.47 MediaPlayerTitleChanged(newTitle as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The title changed.

### 190.4.48 MediaPlayerVout(newCount as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.49 MediaStateChanged(newState as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** State changed on media.

### 190.4.50 MediaSubItemAdded(media as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media got a new subitem.

### 190.4.51 MediaSubItemTreeAdded(media as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** A media item got new sub items.

### 190.4.52 VlmMediaAdded(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.53 VlmMediaChanged(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.54 VlmMediaInstanceStarted(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.55 VlmMediaInstanceStatusEnd(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.56 VlmMediaInstanceStatusError(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.57 VlmMediaInstanceStatusInit(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.58 VlmMediaInstanceStatusOpening(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.59 VlmMediaInstanceStatusPause(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.60 VlmMediaInstanceStatusPlaying(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.61 VlmMediaInstanceStopped(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** One of the events.

### 190.4.62 VlmMediaRemoved(MediaName as string, InstanceName as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** Media was removed.

### 190.4.63 Constants

Log Levels

| Constant | Value | Description |
|---|---|---|
| kLogLevelDebug | 0 | Debug message |
| kLogLevelError | 4 | Error message. |
| kLogLevelNotice | 2 | Important informational message |
| kLogLevelWarning | 3 | Warning (potential error) message |

## 190.5 class VLCExitHandlerMBS

### 190.5.1 class VLCExitHandlerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** A class to receive exit events from VLC user interface.
**Notes:** As you probably use this plugin with your own user interface, you don't need this class.

### 190.5.2 Events

### 190.5.3 ExitEvent

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An exit event was received from VLC user interface.

## 190.6 class VLCInstanceMBS

### 190.6.1 class VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The main VLC class.
**Notes:** Keep the instance in memory as long as you use any other VLC classes.
Only one instance per app, please.
**Blog Entries**

- MBS Xojo Plugins, version 23.4pr7
- MBS Xojo Plugins, version 18.6pr4

### 190.6.2 Methods

### 190.6.3 AddUserInterface(name as string) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Try to start a user interface for the libvlc instance.
**Notes:** name: interface name, or nil for default.
Return true on success, false on error.

### 190.6.4 AudioOutputDevices(ModuleName as string) as VLCAudioOutputDeviceMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets a list of audio output devices for a given audio output module.
**Notes:** Not all audio outputs support this. In particular, an empty (nil)
list of devices does not imply that the specified audio output does
not work.

The list might not be exhaustive.

Some audio output devices in the list might not actually work in some circumstances. By default, it is recommended to not specify any explicit audio device.

Modulename: audio output name.

Returns a nil-terminated linked list of potential audio output devices.
Requires VLC 2.1.

### 190.6.5 ClearError

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Clears the LibVLC error status for the current thread.
**Notes:** This is optional.
By default, the error status is automatically overridden when a new error occurs, and destroyed when the thread exits.

### 190.6.6 ClearLog

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unsets the logging callback for a LibVLC instance.
**Notes:** This is rarely needed: the callback is implicitly unset when the instance is destroyed.
This function will wait for any pending callbacks invocation to complete
(causing a deadlock if called from within the callback).

Requires VLC 2.1.

### 190.6.7 Clock as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Return the current time as defined by LibVLC.
**Notes:** The unit is the microsecond.
Time increases monotonically (regardless of time zone changes and RTC adjustements).
The origin is arbitrary but consistent across the whole system (e.g. the system uptim, the time since the system was booted). On systems that support it, the POSIX monotonic clock is used.

### 190.6.8 Constructor(args() as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create and initialize a libvlc instance.
**Notes:** This functions accept a list of "command line" arguments similar to the main(). These arguments affect the LibVLC instance default configuration.

Arguments are meant to be passed from the command line to LibVLC, just like VLC media player does. The list of valid arguments depends on the LibVLC version, the operating system and platform, and set of available LibVLC plugins. Invalid or unsupported arguments will cause the function to fail (i.e. return nil). Also, some arguments may alter the behaviour or otherwise interfere with other LibVLC functions.

There is absolutely no warranty or promise of forward, backward and cross-platform compatibility with regards to this Constructor() arguments. We recommend that you do not use them, other than when debugging.

On success handle property is not nil.
For Version 19.0 of the plugins, please do not pass app path as first argument.

For MacOS, please set VLC_PLUGIN_PATH environment variable for the path to the plugins folder.

### 190.6.9 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.6.10 ErrorMessage as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns an human-readable error message for the last VLC error in the calling thread.

### 190.6.11 GetAudioFilterList as VLCModuleDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a list of audio filters that are available.
**Notes:** Return a list of module descriptions.

### 190.6.12 GetAudioOutputDeviceCount(AudioOutputName as string) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get count of devices for audio output, these devices are hardware oriented like analor or digital output of sound card.
**Notes:** AudioOutputName: name of audio output.
Returns number of devices.

### 190.6.13 GetAudioOutputDeviceID(AudioOutputName as string, index as Integer) as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get id name of device.
**Notes:** AudioOutputName: name of audio output.
Index: device index.
Returns id name of device, use for setting device.

### 190.6.14 GetAudioOutputDeviceLongName(AudioOutputName as string, index as Integer) as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get long name of device, if not available short name given.
**Notes:** AudioOutputName: name of audio output.
Index: Device Index.
Returns long name of device.

### 190.6.15 GetAudioOutputList as VLCAudioOutputMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the list of available audio outputs.
**Example:**

```
Dim v As VLCInstanceMBS // your VLC instance

Dim OutputModules() As String
Dim outputModule As VLCAudioOutputMBS = v.GetAudioOutputList
While outputModule <>Nil
Dim OutputModuleName As String = outputModule.Name
OutputModules.append OutputModuleName+": "+outputModule.Description
outputModule = outputModule.NextOutput
Wend

MessageBox Join(OutputModules, EndOfLine)
```

**Notes:** Returns list of available audio outputs. In case of error, nil is returned.

### 190.6.16 GetChangeset as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve libvlc changeset.
**Notes:** Example: "aa9bce0bc4"
Return a string containing the libvlc changeset.

### 190.6.17 GetCompiler as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve libvlc compiler version.
**Notes:** Example: "gcc version 4.2.3 (Ubuntu 4.2.3-2ubuntu6)"
Return a string containing the libvlc compiler version.

### 190.6.18 getenv(name as string) as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries the environment variable with given name.

### 190.6.19 GetLoadError as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns error string from LoadLibrary function.

### 190.6.20 GetVersion as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Retrieve libvlc version.
**Notes:** Example: "1.1.0-git The Luggage"
Return a string containing the libvlc version.

### 190.6.21 GetVideoFilterList as VLCModuleDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns a list of video filters that are available.
**Notes:** Return a list of module descriptions

### 190.6.22 LoadLibrary(path as folderitem) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the vlc library.
**Notes:** Returns true on success and false on failure.
Please point to libVLC.dylib on Mac and libVLC.dll on Windows.
See also:

- 190.6.23 LoadLibrary(path as string) as boolean 22682

### 190.6.23 LoadLibrary(path as string) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Loads the vlc library.
**Notes:** Returns true on success and false on failure.

Please point to libVLC.dylib on Mac and libVLC.dll on Windows.
See also:

- 190.6.22 LoadLibrary(path as folderitem) as boolean 22682

### 190.6.24 SetAppID(ID as string, Version as string, Icon as String)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets some meta-information about the application.
**Notes:** See also SetUserAgent().

id: Java-style application identifier, e.g. "com.acme.foobar"
version: application version numbers, e.g. "1.2.3"
icon: application icon name, e.g. "foobar"

Requires VLC 2.1.

### 190.6.25 setlocale(category as Integer, locale as string) as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the locale to use.
**Notes:** The Setlocale function sets the C library's notion of natural language formatting style for particular sets of routines. Each such style is called a 'locale' and is invoked using an appropriate name passed as a C string.

The setlocale() function recognizes several categories of routines. These are the categories and the sets of routines they select:

Only three locales are defined by default: the empty string "" (which denotes the native environment) and the "C" and "POSIX" locales (which denote the C-language environment). By default, C programs start in the "C" locale.

### 190.6.26 SetLogEvent

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

| | |
|---|---|
| LocaleAll | Set the entire locale generically. |
| LocaleCollate | Set a locale for string collation routines. This controls alphabetic ordering in strcoll() and strxfrm(). |
| LocaleCType | Set a locale for the ctype and multibyte functions. This controls recognition of upper and lower case, alphabetic or non-alphabetic characters, and so on. |
| LocaleMessages | Set a locale for message catalogs, see catopen function. |
| LocaleMonetary | Set a locale for formatting monetary values; this affects the localeconv() function. |
| LocaleNumeric | Set a locale for formatting numbers. This controls the formatting of decimal points in input and output of floating point numbers in functions such as printf() and scanf(), as well as values returned by localeconv(). |
| LocaleTime | Set a locale for formatting dates and times using the strftime() function. |

**Function:** Sets the logging callback for a LibVLC instance.
**Notes:** This function is thread-safe: it will wait for any pending callbacks invocation to complete.

Some log messages (especially debug) are emitted by LibVLC while is being initialized. These messages cannot be captured with this interface.

A deadlock may occur if this function is called from the event.

Requires VLC 2.1.

### 190.6.27 SetLogFile(File as FolderItem)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets up logging to a file.
**Notes:** Requires VLC 2.1.

### 190.6.28 SetUserAgent(AppName as string, httpUserAgent as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the application name.
**Notes:** VLC passes this as the user agent string when a protocol requires it.

name: human-readable application name, e.g. "FooBar player 1.2.3"
http: HTTP User Agent, e.g. "FooBar/1.2.3 Python/2.6.0"

### 190.6.29 WaitUserInterface

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Waits until an interface causes the instance to exit.
**Notes:** You should start at least one interface first, using AddUserInterface.

### 190.6.30 Properties

### 190.6.31 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.6.32 ExitHandler as VLCExitHandlerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Registers a callback for the LibVLC exit event.
**Notes:** This is mostly useful if you have started at least one interface with AddUserInterface. Typically, this function will wake up your application main loop (from another thread).

This function and WaitUserInterface() cannot be used at the same time.
Use either or none of them but not both.
(Read and Write computed property)

### 190.6.33 Constants

Audio Channels

| Constant | Value | Description |
|---|---|---|
| kAudioChannelDolbys | 5 | Dolbys channel |
| kAudioChannelError | -1 | Error state |
| kAudioChannelLeft | 3 | Left channel |
| kAudioChannelRight | 4 | Right channel |
| kAudioChannelRStereo | 2 | RStereo |
| kAudioChannelStereo | 1 | Stereo |

Audio Device Types

| Constant | Value | Description |
|---|---|---|
| kAudioOutputDevice2F2R | 4 | 2F2R |
| kAudioOutputDevice3F2R | 5 | 3F2R |
| kAudioOutputDeviceError | -1 | Error state |
| kAudioOutputDeviceMono | 1 | Mono |
| kAudioOutputDeviceSPDIF | 10 | SPDIF |
| kAudioOutputDeviceStereo | 2 | Stereo |
| kAudioOutputDevice_5_1 | 6 | 5.1 channel |
| kAudioOutputDevice_6_1 | 7 | 6.1 channel |
| kAudioOutputDevice_7_1 | 8 | 7.1 channel |

## 190.7 class VLCMediaDiscovererMBS

### 190.7.1 class VLCMediaDiscovererMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The plugin class for the VLC media discovery.
**Notes:** LibVLC media discovery finds available media via various means.
This corresponds to the service discovery functionality in VLC media player.
Different plugins find potential medias locally (e.g. user media directory), from peripherals (e.g. video capture device), on the local network (e.g. SAP) or on the Internet (e.g. Internet radios).

### 190.7.2 Methods

### 190.7.3 Constructor(vlc as VLCInstanceMBS, name as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Discover media service by name.
**Notes:** vlc: The VLC instance.
Name: service name.
Handle is not nil on success.

### 190.7.4 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.7.5 IsRunning as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Query if media service discover object is running.
**Notes:** Returns true if running, false if not.

### 190.7.6 LocalizedName as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the localized name.

### 190.7.7 MediaList as VLCMediaListMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get media service discover media list.

### 190.7.8 Properties

### 190.7.9 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 190.7.10 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

## 190.8 class VLCMediaLibraryMBS

### 190.8.1 class VLCMediaLibraryMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for VLC media library.

### 190.8.2 Methods

### 190.8.3 Constructor(vlc as VLCInstanceMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create an new Media Library object.
**Notes:** On success handle property is not nil.

### 190.8.4 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.8.5 Load as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Load media library.
**Notes:** Return true on success, false on error.

### 190.8.6 MediaList as VLCMediaListMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get media library subitems.

### 190.8.7 Properties

### 190.8.8 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.8.9 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

## 190.9 class VLCMediaListMBS

### 190.9.1 class VLCMediaListMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a media list.

### 190.9.2 Methods

### 190.9.3 AddMedia(item as VLCMediaMBS) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add media instance to media list.
**Notes:** item: a media instance
Return true on success, false if the media list is read-only.
The Lock should be held upon entering this function.

### 190.9.4 Constructor(vlc as VLCInstanceMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create an empty media list.
**Notes:** On success the handle property is not zero.

### 190.9.5 Count as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get count on media list items.
**Notes:** The Lock should be held upon entering this function.
Return number of items in media list.

### 190.9.6 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.9.7 GetMedia as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get media instance from this media list instance.
**Notes:** The Lock should NOT be held upon entering this function.
Returns media instance or nil.

### 190.9.8 IndexOfItem(item as VLCMediaMBS) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Find index position of List media instance in media list.
**Notes:** Warning: the function will return the first matched position.
The Lock should be held upon entering this function.

Returns position of media instance or -1 if media not found.

### 190.9.9 InsertMedia(item as VLCMediaMBS, index as Integer) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Insert media instance in media list on a position.
**Notes:** The Lock should be held upon entering this function.
item: a media instance
index: position in array where to insert

Return true on success, false if the media list is read-only.

### 190.9.10 isReadOnly as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether this media list is read-only from a user point of view.
**Notes:** Returns true if readonly and false if read/write.

### 190.9.11 ItemAtIndex(index as Integer) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** List media instance in media list at a position.
**Notes:** The Lock should be held upon entering this function.
index: position in array where to get item.
Returns instance at position index, or nil if not found.

### 190.9.12 Lock

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get lock on media list items.

### 190.9.13 Remove(index as Integer) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Remove media instance from media list on a position.
**Notes:** The Lock should be held upon entering this function.
index: position in array where to insert
Returns true on success, false if the list is read-only or the item was not found.

### 190.9.14 SetMedia(item as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Associate media instance with this media list instance.
**Notes:** If another media instance was present it will be released.

The Lock should NOT be held upon entering this function.

### 190.9.15 Unlock

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Release lock on media list items.
**Notes:** The Lock should be held upon entering this function.

### 190.9.16 Properties

### 190.9.17 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 190.9.18 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

## 190.10 class VLCMediaListPlayerMBS

### 190.10.1 class VLCMediaListPlayerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a VLC media list player.
**Notes:** This is required to especially support playlist files.
The normal media player can only play a single media, and does not handle playlist files properly.

### 190.10.2 Methods

### 190.10.3 Constructor(vlc as VLCInstanceMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create new media list player.

### 190.10.4 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.10.5 IsPlaying as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Is media list playing?
**Notes:** Return true for playing and false for not playing.

### 190.10.6 MoveNext as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Play next item from media list.
**Notes:** Return true upon success false if there is no next item.

### 190.10.7 MovePrevious as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Play previous item from media list.
**Notes:** Return true upon success false if there is no previous item.

### 190.10.8 Pause

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pause media list

### 190.10.9 Play

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Play media list.

### 190.10.10 PlayItem(item as VLCMediaMBS) as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Play the given media item.
**Notes:** Return true upon success, false if the media is not part of the media list.

### 190.10.11 PlayItemAtIndex(index as Integer) as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Play media list item at position index.
**Notes:** index: index in media list to play.

Return true upon success false if the item wasn't found.

### 190.10.12 SetMediaList(list as VLCMediaListMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the media list associated with the player.

### 190.10.13 SetMediaPlayer(player as VLCMediaPlayerMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Replace media player in media list player with this instance.

### 190.10.14 SetPlaybackMode(mode as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets the playback mode for the playlist.
**Notes:** See kPlaybackMode* constants.

### 190.10.15 State as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get current State of media list player.

### 190.10.16 Stop

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Stop playing media list.

### 190.10.17 Properties

### 190.10.18 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.10.19 List as VLCMediaListMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The list assigned to this media list player.
**Notes:** (Read and Write property)

### 190.10.20 Player as VLCMediaPlayerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The player assigned to this media list player.
**Notes:** (Read and Write property)

### 190.10.21 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

### 190.10.22 Constants

Playback Mode Constants

| Constant | Value | Description |
|---|---|---|
| kPlaybackModeDefault | 0 | Default |
| kPlaybackModeLoop | 1 | Loop |
| kPlaybackModeRepeat | 2 | Repeat |

## 190.11 class VLCMediaMBS

### 190.11.1 class VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The VLC class for a media item.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr9
- MBS Xojo / Real Studio Plugins, version 14.0pr5

### 190.11.2 Methods

### 190.11.3 AddOption(options as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add an option to the media.
**Notes:** This option will be used to determine how the media_player will read the media. This allows to use VLC's advanced reading/streaming options on a per-media basis.

The options are detailed in vlc –long-help, for instance "–sout-all"

### 190.11.4 AddOptionFlag(options as string, flags as UInt32)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Add an option to the media with configurable flags.
**Notes:** This option will be used to determine how the media_player will read the media. This allows to use VLC's advanced reading/streaming options on a per-media basis.

The options are detailed in vlc –long-help, for instance "–sout-all"

### 190.11.5 Clone as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a duplicate of media object.

### 190.11.6 Constructor(original as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Creates a copy of the media object.
See also:

- 190.11.7 Constructor(vlc as VLCInstanceMBS, URL as string) 22701

### 190.11.7 Constructor(vlc as VLCInstanceMBS, URL as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media with a certain given media resource location, for instance a valid URL.
**Notes:** Do not pass a file path here! This is for URLs.

URL: the media location

To refer to a local file with this function, the file://... URI syntax must be used (see IETF RFC3986).
We recommend using MediaWithPath() instead when dealing with local files.
See also:

- 190.11.6 Constructor(original as VLCMediaMBS) 22701

### 190.11.8 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor to cleanup the media.

### 190.11.9 Duration as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get duration (in ms) of media descriptor object item.
**Notes:** Return duration of media item or -1 on error.

### 190.11.10 IsParsed as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get Parsed status for media descriptor object.
**Notes:** Returns true if media object has been parsed otherwise it returns false.

### 190.11.11 MediaWithData(vlc as VLCInstanceMBS, data as memoryblock) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media for a certain data.
**Notes:** Internally creates temp file for the data and opens the file.
File is later deleted when VLCMediaMBS goes out of scope.
Returns new media object or nil.
See also:

- 190.11.12 MediaWithData(vlc as VLCInstanceMBS, data as string) as VLCMediaMBS 22702

### 190.11.12 MediaWithData(vlc as VLCInstanceMBS, data as string) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media for a certain data.
**Notes:** Internally creates temp file for the data and opens the file.
File is later deleted when VLCMediaMBS goes out of scope.
Returns new media object or nil.
See also:

- 190.11.11 MediaWithData(vlc as VLCInstanceMBS, data as memoryblock) as VLCMediaMBS 22702

### 190.11.13 MediaWithFile(vlc as VLCInstanceMBS, file as folderitem) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media for a certain file path.
**Notes:** file: local filesystem path as folderitem.
Returns new media object or nil.

### 190.11.14 MediaWithFileDescriptor(vlc as VLCInstanceMBS, fd as Integer) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media for an already open file descriptor.
**Notes:** The file descriptor shall be open for reading (or reading and writing).

Regular file descriptors, pipe read descriptors and character device descriptors (including TTYs) are supported on all platforms. Block device descriptors are supported where available.
Directory descriptors are supported on systems that provide fdopendir(). Sockets are supported on all platforms where they are file descriptors, i.e. all except Windows.

This library will not automatically close the file descriptor under any circumstance. Nevertheless, a file descriptor can usually only be rendered once in a media player. To render it a second time, the file descriptor should probably be rewound to the beginning with lseek().

Returns new media object or nil.

### 190.11.15 MediaWithPath(vlc as VLCInstanceMBS, Path as string) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media for a certain file path.
**Notes:** path: local filesystem path
Returns new media object or nil.

### 190.11.16 MediaWithURL(vlc as VLCInstanceMBS, URL as string) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media with a certain given media resource location, for instance a valid URL.
**Example:**

```
dim v as VLCInstanceMBS // your vlc object
dim m as VLCMediaMBS

// load with URL
m = VLCMediaMBS.MediaWithURL(v, "https://www.monkeybreadsoftware.com/filemaker/video/WriteInvoice-iPhone.m4v")

// or with file URL:
m = VLCMediaMBS.MediaWithURL(v, moviefile.URLPath)
```

**Notes:** URL: the media location
Returns the new media object or nil.
To refer to a local file with this function, the file://... URI syntax must be used (see IETF RFC3986).
We recommend using MediaWithPath() instead when dealing with local files.

### 190.11.17 Meta(type as Integer) as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Read the meta of the media.
**Notes:** If the media has not yet been parsed this will return an empty string.

This methods automatically calls ParseAsync(), so after calling it you may receive a MediaMetaChanged event. If you prefer a synchronous version ensure that you call Parse() before get_meta().

### 190.11.18 MRL as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the media resource locator (mrl) from a media descriptor object.

### 190.11.19 NewAsNode(vlc as VLCInstanceMBS, name as string) as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a media as an empty node with a given name.
**Notes:** Name: The name of the new node.
Returns new media object or nil.

### 190.11.20 Parse

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Parse a media.
**Notes:** This fetches (local) meta data and tracks information.
The method is synchronous.

### 190.11.21 ParseAsync

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Parse a media.
**Notes:** This fetches (local) meta data and tracks information.
The method is the asynchronous of Parse.
To track when this is over you can listen to MediaParsedChanged event. However if the media was already parsed you will not receive this event.

### 190.11.22 SaveMeta as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Save the meta previously set.
**Notes:** Return true if the write operation was successfull.

### 190.11.23 SetMeta(meta as Integer, value as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the meta of the media
**Notes:** This function will not save the meta, call SaveMeta in order to save the meta.

meta: Which meta data. See kMeta* constants.
Value: the media's meta

### 190.11.24 State as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get current state of media descriptor object.
**Notes:** See kState* constants.

### 190.11.25 Stats as VLCMediaStatsMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the current statistics about the media.
**Notes:** Returns statistics for media.

### 190.11.26 SubItems as VLCMediaListMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get subitems of media descriptor object.

### 190.11.27 TrackInfos as VLCMediaTrackInfoMBS()

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get media descriptor's elementary streams description.
**Notes:** Note, you need to call Parse or play the media at least once before calling this function.
Not doing this will result in an empty array.

### 190.11.28 Tracks as VLCMediaTrackMBS()

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get media descriptor's elementary streams description.
**Notes:** Note, you need to call Parse or play the media at least once before calling this function.
Not doing this will result in an empty array.

Requires LibVLC 2.1.0 and later.

Returns an array of track objects.

### 190.11.29 Properties

### 190.11.30 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.11.31 Tag as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The media descriptor's user_data.
**Notes:** This is a value you can use as you like.
This value survives even if the VLCMediaMBS object is destroyed and later recreated with the same VLC media object behind.
(Read and Write property)

### 190.11.32 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

### 190.11.33 Constants

Metadata Types Constants

| Constant | Value | Description |
|---|---|---|
| kMetaActors | 22 | Actors |
| kMetaAlbum | 4 | Album |
| kMetaAlbumArtist | 23 | Album artist |
| kMetaArtist | 1 | Artist |
| kMetaArtworkURL | 15 | Artwork URL |
| kMetaCopyright | 3 | Copyright |
| kMetaDate | 8 | Date |
| kMetaDescription | 6 | Description |
| kMetaDirector | 18 | Director |
| kMetaDiscNumber | 24 | Disc number |
| kMetaDiscTotal | 25 | Disc total |
| kMetaEncodedBy | 14 | Encode By |
| kMetaEpisode | 20 | Episode |
| kMetaGenre | 2 | Genre |
| kMetaLanguage | 11 | Language |
| kMetaNowPlaying | 12 | Now Playing |
| kMetaPublisher | 13 | Publisher |
| kMetaRating | 7 | Rating |
| kMetaSeason | 19 | Season |
| kMetaSetting | 9 | Setting |
| kMetaShowName | 21 | ShowName |
| kMetaTitle | 0 | Title |
| kMetaTrackID | 16 | Track ID |
| kMetaTrackNumber | 5 | Track Number |
| kMetaTrackTotal | 17 | Total |
| kMetaURL | 10 | URL |

Media Option Constants

| Constant | Value | Description |
|---|---|---|
| kOptionTrusted | 2 | Trusted |
| kOptionUnique | 16 | Unique |

State Constants

| Constant | Value | Description |
|---|---|---|
| kStateBuffering | 2 | Buffering |
| kStateEnded | 6 | Ended |
| kStateError | 7 | Error |
| kStateNothingSpecial | 0 | Nothing special. Video closed for example. |
| kStateOpening | 1 | Opening |
| kStatePaused | 4 | Paused |
| kStatePlaying | 3 | Playing |
| kStateStopped | 5 | Stopped |

Track Type Constants

| Constant | Value | Description |
|---|---|---|
| kTrackTypeAudio | 0 | Audio |
| kTrackTypeText | 2 | Text |
| kTrackTypeUnknown | -1 | Unknown type |
| kTrackTypeVideo | 1 | Video |

## 190.12 class VLCMediaPlayerMBS

### 190.12.1 class VLCMediaPlayerMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The VLC class for video playback.
**Blog Entries**

- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 18.6pr4
- MBS Xojo / Real Studio Plugins, version 15.4pr5
- MBS Xojo / Real Studio Plugins, version 14.0pr5
- MBS Xojo / Real Studio Plugins, version 13.4pr6
- MBS Xojo / Real Studio Plugins, version 13.4pr5
- MBS Real Studio Plugins, version 12.3pr2

**Xojo Developer Magazine**

- 17.2, page 11: News

### 190.12.2 Methods

### 190.12.3 Constructor(media as VLCMediaMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create a Media Player object from a Media.
**Notes:** On success handle is not nil.
See also:

- 190.12.4 Constructor(VLCInstance as VLCInstanceMBS) 22710

### 190.12.4 Constructor(VLCInstance as VLCInstanceMBS)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Create an empty Media Player object.
**Notes:** On success handle is not nil.
See also:

• 190.12.3 Constructor(media as VLCMediaMBS) 22710

### 190.12.5 CopyCGImage as Variant

MBS VLC Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies current frame as CGImageMBS.
**Notes:** This method set HasNewFrame to false.

### 190.12.6 CopyMemory as memoryblock

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies current frame as memoryblock.
**Notes:** This method set HasNewFrame to false.
The format depends on what you passed to VideoSetFormat.
Byte order usually is BGRA.

### 190.12.7 CopyPicture as Picture

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies current frame as picture.
**Notes:** This method set HasNewFrame to false.
If using CGContext, this returns a CGImageMBS. Else a Picture.

With version 19.0, this returns always a picture.

### 190.12.8 CopyToMemory(dest as Ptr, offset as Integer, RowBytes as Integer) as boolean

MBS VLC Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Copies current frame into a given memory block.
**Notes:** Offset: Position of first byte in memoryblock.
RowBytes: The row size in bytes of your memoryblock.

This way you can have your frame go into a buffer of bigger width/height representing an OpenGL texture for example.
Byte order usually is BGRA.

### 190.12.9 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.12.10 GetChapterCountForTitle(title as Integer) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get title chapter count.
**Notes:** Return number of chapters in title, or -1.

### 190.12.11 GetChapterDescription(index as Integer) as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the description of available chapters for specific title.
**Notes:** Return list containing description of available chapter for title with index.

### 190.12.12 GetMemory as Ptr

MBS VLC Plugin, Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Returns pointer to memory with current frame.
**Notes:** This method set HasNewFrame to false.
The format depends on what you passed to VideoSetFormat.

### 190.12.13 Navigate(Navigate as Integer)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Navigate through DVD Menu.

### 190.12.14 NextChapter

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set next chapter (if applicable)

### 190.12.15 NextFrame

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Display the next frame (if supported)

### 190.12.16 Pause

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Toggle pause (no effect if there is no media)
See also:

- 190.12.17 Pause(pause as boolean) 22713

### 190.12.17 Pause(pause as boolean)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Pause or resume (no effect if there is no media)
**Notes:** pause: play/resume if false, pause if true.
See also:

- 190.12.16 Pause 22713

### 190.12.18 Play as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Plays video.
**Notes:** Return true if playback started (and was already started), or false on error.

### 190.12.19 PreviousChapter

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set previous chapter (if applicable)

### 190.12.20 SetAudioOutput(AudioOutputName as string) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set the audio output.
**Notes:** Change will be applied after stop and play.
Name: name of audio output.
Return true on success.

### 190.12.21 SetAudioOutputDevice(AudioOutputName as string, deviceID as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set audio output device. Changes are only effective after stop and play.
**Notes:** AudioOutputName: name of audio output.
deviceID: device ID.

### 190.12.22 SetEqualizer(Equalizer as VLCEqualizerMBS = nil)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Apply new equalizer settings to a media player.
**Notes:** It is possible to apply new equalizer settings to a media player whether the media player is currently playing media or not.

Invoking this method will immediately apply the new equalizer settings to the audio output of the currently playing media if there is any.
If there is no currently playing media, the new equalizer settings will be applied later if and when new media is played.

Equalizer settings will automatically be applied to subsequently played media.

To disable the equalizer for a media player invoke this method passing nil for the equalizer parameter.

The media player does not keep a reference to the supplied equalizer so it is safe for an application to release the equalizer reference any time after this method returns.

Requires VLC 2.2.

### 190.12.23 SetSubtitleFile(filename as string) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set new video subtitle file.
**Notes:** filename: new video subtitle file
Returns the success status.

### 190.12.24 SetVideoTitleDisplay(position as Integer, timeout as Integer)

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set if, and how, the video title will be shown when media is played.
**Notes:** position: position at which to display the title, or kVideoTitleDisplayPositionDisable to prevent the title from being displayed.
timeout: title display timeout in milliseconds (ignored if libvlc_position_disable)

Requires VLC 2.1.

### 190.12.25 Stop

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Stop (no effect if there is no media)

### 190.12.26 ToggleFullScreen

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Toggle fullscreen status on non-embedded video outputs.
**Notes:** See also Fullscreen property.

### 190.12.27 ToggleMute

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Toggle mute status.

### 190.12.28 ToggleTeletext

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Toggle teletext transparent status on video output.

### 190.12.29 VideoGetCursor(num as Integer, byref px as Integer, byref py as Integer) as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the mouse pointer coordinates over a video.
**Notes:** Coordinates are expressed in terms of the decoded video resolution, not in terms of pixels on the screen/viewport (to get the latter, you can query your windowing system directly).

Either of the coordinates may be negative or larger than the corresponding dimension of the video, if the cursor is outside the rendering area.

The coordinates may be out-of-date if the pointer is not located on the video rendering area. LibVLC does not track the pointer if it is outside of the video widget.

LibVLC does not support multiple pointers (it does of course support multiple input devices sharing the same pointer) at the moment.

num: number of the video (starting from, and most commonly 0)
px: get the abscissa.
py: get the ordinate.
Returns true on success, false if the specified video does not exist

### 190.12.30 VideoGetSize(num as Integer, byref px as UInt32, byref py as UInt32) as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the pixel dimensions of a video.
**Notes:** num: number of the video (starting from, and most commonly 0)
px: get the pixel width [ OUT ]
py: get the pixel height [ OUT ]
Return true on success, false if the specified video does not exist.

### 190.12.31 VideoSetCallback(width as integer, height as integer, CGContextHandle as integer = 0)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Sets video callbacks, so the plugin can provide current frame with CopyPicture method.
**Notes:** You can use CopyPicture and CopyMemory methods to query new frame content.
The hasNewFrame property tells you whether a new frame is available.
The plugin will optionally draw the frames into the CGContext you provide.
Please use CopyCGImage to get a CGImage from image buffer.

### 190.12.32 VideoSetDeinterlace(Mode as string)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable or disable deinterlace filter.
**Notes:** Mode: Type of deinterlace filter, "" to disable.

### 190.12.33 VideoSetFormat(chroma as string, width as UInt32, height as UInt32, pitch as UInt32)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set decoded video chroma and dimensions.
**Notes:** This only works in combination with SetVideoCallbacks().
chroma: a four-characters string identifying the chroma (e.g. "RV32" or "YUYV")
width: pixel width
height: pixel height
pitch: line pitch (in bytes)

All pixel planes are expected to have the same pitch.

### 190.12.34 VideoSetKeyInput(on as boolean)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable or disable key press events handling, according to the LibVLC hotkeys configuration.
**Notes:** By default and for historical reasons, keyboard events are handled by the LibVLC video widget.

On X11, there can be only one subscriber for key press and mouse click events per window. If your application has subscribed to those events for the X window ID of the video widget, then LibVLC will not be able to handle key presses and mouse clicks in any case.

This function is only implemented for X11 and Win32 at the moment.

on: true to handle key press events, false to ignore them.

### 190.12.35 VideoSetLogoString(option as Integer, logo as String)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set logo option as string.
**Notes:** Options that take a different type value are ignored.

### 190.12.36 VideoSetMouseInput(on as boolean)

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable or disable mouse click events handling.
**Notes:** By default, those events are handled. This is needed for DVD menus to work, as well as a few video filters such as "puzzle".

This function is only implemented for X11 and Win32 at the moment.

on: true to handle mouse click events, false to ignore them.

### 190.12.37 VideoTakeSnapshot(num as Integer, path as string, width as Integer, height as Integer) as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Take a snapshot of the current video window.
**Notes:** If width AND height is 0, original size is used.
If width XOR height is 0, original aspect-ratio is preserved. (e.g. width = 0 and height = -1)

num: number of video output (typically 0 for the first/only one)
Path: the path where to save the screenshot to
Width: the snapshot's width
Height: the snapshot's height

Returns true on success, false if the video was not found

### 190.12.38 Properties

### 190.12.39 AGL as UInt32

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the agl handler where the media player should render its video output.
**Notes:** Returns the agl handler or 0 if none where set.
(Read and Write property)

### 190.12.40 AspectRatio as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/set current video aspect ratio.
**Notes:** Set new video aspect-ratio or "" to reset to default. Invalid aspect ratios are ignored.
Get the video aspect ratio or "" if unspecified.

The value must be something like "4:3", "16:9", "16:10", ...
(Read and Write property)

### 190.12.41 AudioChannel as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current audio channel.
**Notes:** (Read and Write property)

### 190.12.42 AudioDelay as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current audio delay in microseconds.
**Notes:** The audio delay will be reset to zero each time the media changes.
(Read and Write property)

### 190.12.43 AudioOutputDevices as VLCAudioOutputDeviceMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Gets a list of potential audio output devices,
**Example:**

```
Dim DeviceNames() As String

Dim devices As VLCAudioOutputDeviceMBS = mp.AudioOutputDevices
While devices <>Nil
DeviceNames.append "* "+devices.Device+": "+devices.Description
```

```
devices = devices.NextOutput
Wend

MessageBox Join(DeviceNames, EndOfLine)
```

**Notes:** See also SetAudioOutputDevice method.

Not all audio outputs support enumerating devices.
The audio output may be functional even if the list is empty (nil).

The list may not be exhaustive.

Some audio output devices in the list might not actually work in some circumstances. By default, it is recommended to not specify any explicit audio device.

Returns a nil-terminated linked list of potential audio output devices.
Requires LibVLC 2.2.0 or later.
(Read only property)

### 190.12.44 AudioOutputDeviceType as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set/Get current audio device type.
**Notes:** Device type describes something like character of output sound - stereo sound, 2.1, 5.1 etc.
(Read and Write property)

### 190.12.45 AudioTrack as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current audio track.
**Notes:** Get or set current audio track.
(Read and Write property)

### 190.12.46 AudioTrackCount as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get number of available audio tracks.
**Notes:** Returns the number of available audio tracks (int), or -1 if unavailable.
(Read only property)

### 190.12.47 CanPause as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Can this media player be paused?
**Notes:** Returns true if the media player can pause.
(Read only property)

### 190.12.48 Chapter as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/set movie chapter.
**Notes:** Returns chapter number currently playing, or -1 if there is no media.
Sets movie chapter (if applicable).
(Read and Write property)

### 190.12.49 ChapterCount as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get movie chapter count.
**Notes:** Returns number of chapters in movie, or -1.
(Read only property)

### 190.12.50 CropGeometry as string

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set current crop filter geometry.
**Notes:** Returns the crop filter geometry or "" if unset.
Set with new crop filter geometry ("" to unset).

Seems to be broken in our tests inside libVLC.
(Read and Write property)

### 190.12.51 FPS as Double

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get movie fps rate
**Notes:** Returns frames per second (fps) for this playing movie, or 0 if unspecified.
(Read only property)

### 190.12.52 FullScreen as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Enable or disable fullscreen.
**Notes:** With most window managers, only a top-level windows can be in full-screen mode. Hence, this function will not operate properly if XWindow property was used to embed the video in a non-top-level window. In that case, the embedding window must be reparented to the root window before fullscreen mode is enabled. You will want to reparent it back to its normal parent when disabling fullscreen.
(Read and Write property)

### 190.12.53 GetAudioTrackDescription as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the description of available audio tracks.
**Notes:** Returns list with description of available audio tracks, or nil.
(Read only property)

### 190.12.54 GetSPUDescription as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the description of available video subtitles.
**Notes:** Return list containing description of available video subtitles or nil.
(Read only property)

### 190.12.55 GetVideoTitleDescription as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the description of available titles.
**Notes:** Return list containing description of available titles.
(Read only property)

### 190.12.56 Handle as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 190.12.57 HasNewFrame as Boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether a new frame is available.
**Notes:** (Read and Write property)

### 190.12.58 HasVOut as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** How many video outputs does this media player have?
**Notes:** Return the number of video outputs.

(Read only property)

### 190.12.59 Height as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get current video height.
**Notes:** Returns the video pixel height or 0 if not applicable.
(Read only property)

### 190.12.60 HWND as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set a Win32/Win64 API window handle (HWND) where the media player should render its video output.
**Notes:** If LibVLC was built without Win32/Win64 API output support, then this has no effects.

Get the Windows API window handle (HWND) previously set with this property. The handle will be returned even if LibVLC is not currently outputting any video to it.
Currently not supported by our plugin.
(Read and Write property)

### 190.12.61 IsPlaying as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether player is playing.
**Notes:** (Read only property)

### 190.12.62 IsSeekable as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Is this media player seekable?
**Notes:** Returns true if the media player can seek.

(Read only property)

### 190.12.63 Length as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the current movie length (in ms).
**Notes:** Return the movie length (in ms), or -1 if there is no media.
(Read only property)

### 190.12.64 Media as VLCMediaMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set current media.
**Notes:** (Read and Write property)

### 190.12.65 Mute as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current mute status.
**Notes:** If true then mute, otherwise unmute.
(Read and Write property)

### 190.12.66 NSObject as Ptr

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the NSView handler where the media player should render its video output.
**Notes:** Currently not supported by our plugin.
(Read and Write property)

### 190.12.67 Position as Double

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set movie position.
**Notes:** Movie position as percentage between 0.0 and 1.0.
Returns movie position, or -1. in case of error.
Set movie position. This has no effect if playback is not enabled. This might not work depending on the underlying input format and protocol.
(Read and Write property)

### 190.12.68 ProgramScrambled as boolean

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Check if the current program is scrambled.
**Notes:** true if the current program is scrambled.
Requires VLC 2.2.
(Read only property)

### 190.12.69 Rate as Double

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the requested movie play rate.
**Notes:** Depending on the underlying media, the requested rate may be different from the real playback rate.
(Read and Write property)

### 190.12.70 Scale as Double

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the current video scaling factor.
**Notes:** That is the ratio of the number of pixels on screen to the number of pixels in the original decoded video in each dimension. Zero is a special value; it will adjust the video to the output window/drawable (in windowed mode) or the entire screen.

Note that not all video outputs support scaling.
(Read and Write property)

### 190.12.71 SPU as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set current video subtitle.
**Notes:** Returns the video subtitle selected, or -1 if none.
(Read and Write property)

### 190.12.72 SPUCount as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the number of available video subtitles.
**Notes:** (Read only property)

### 190.12.73 SPUDelay as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the current subtitle delay.
**Notes:** This affects the timing of when the subtitle will be displayed.
Positive values means subtitles are being displayed later, while negative values will result in subtitles being displayed earlier.
The subtitle delay will be reset to zero each time the media changes.
(Read and Write property)

### 190.12.74 State as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get current movie state.
**Notes:** Returns the current state of the media player (playing, paused, ...)
(Read only property)

### 190.12.75 Tag as Variant

MBS VLC Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The tag value.
**Notes:** You can store whatever you like in this property.
(Read only property)

### 190.12.76 Time as Int64

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set the current movie time (in ms).
**Notes:** Return the movie time (in ms), or -1 if there is no media.
Set the movie time (in ms). This has no effect if no media is being played.
Not all formats and protocols support this.
(Read and Write property)

### 190.12.77 Title as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Set/Get movie title.
**Notes:** Returns title number currently playing, or -1.
(Read and Write property)

### 190.12.78 TitleCount as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get movie title count.
**Notes:** Returns title number count, or -1.
(Read only property)

### 190.12.79 VideoTeleText as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set current teletext page requested.
**Notes:** (Read and Write property)

### 190.12.80 VideoTrack as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set video track.
**Notes:** (Read and Write property)

### 190.12.81 VideoTrackCount as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get number of available video tracks.
**Notes:** Returns the number of available video tracks.
(Read only property)

### 190.12.82 VideoTrackDescription as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get the description of available video tracks.
**Notes:** Returns list with description of available video tracks, or nil on error.
(Read only property)

### 190.12.83 VLC as VLCInstanceMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the VLC instance.
**Notes:** (Read only property)

### 190.12.84 Volume as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Current software audio volume.
**Notes:** The volume in percents.
0 = mute, 100 = nominal / 0dB.
(Read and Write property)

### 190.12.85 Width as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get current video width.
**Notes:** Returns the video pixel width or 0 if not applicable.
(Read only property)

### 190.12.86 WillPlay as boolean

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Is the player able to play.
**Notes:** (Read only property)

### 190.12.87 XWindow as UInt32

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set an X Window System drawable where the media player should render its video output.
**Notes:** If LibVLC was built without X11 output support, then this has no effects.

The specified identifier must correspond to an existing Input/Output class X11 window. Pixmaps are not supported. The caller shall ensure that the X11 server is the same as the one the VLC instance has been configured with. This function must be called before video playback is started; otherwise it will only take effect after playback stop and restart.

Get the X Window System window identifier previously set with this property. Note that this will return the identifier even if VLC is not currently using it (for instance if it is playing an audio-only input).

Currently not supported by our plugin.
(Read and Write property)

### 190.12.88 VideoAdjust(option as Integer) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/set adjust option as Integer.
**Notes:** option: See kAdjust* constants.
Options that take a different type value are ignored.

Using kAdjustEnable with value 0 stops adjust filter. With other values you start adjust filter.
(Read and Write computed property)

### 190.12.89 VideoAdjustFloat(option as Integer) as single

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/set adjust option as float.
**Notes:** option: See kAdjust* constants.
Options that take a different type value are ignored.
(Read and Write computed property)

### 190.12.90 VideoLogo(option as Integer) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set logo option as Integer.
**Notes:** Options that take a different type value are ignored.
Passing kLogoEnable as option value has the side effect of starting (arg not 0) or stopping (arg 0) the logo filter.
(Read and Write computed property)

### 190.12.91 VideoMarquee(option as Integer) as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get, Enable, disable or set an integer marquee option.
**Notes:** Setting kMarqueeEnable has the side effect of enabling (arg not 0) or disabling (arg 0) the marq filter.
(Read and Write computed property)

### 190.12.92 VideoMarqueeString(option as Integer) as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Get/Set a string marquee option value
**Notes:** (Read and Write computed property)

### 190.12.93 Constants

Adjust Constants

| Constant | Value | Description |
|---|---|---|
| kAdjustBrightness | 2 | Brightness |
| kAdjustContrast | 1 | Contrast |
| kAdjustEnable | 0 | Enable |
| kAdjustGamma | 5 | Gamma |
| kAdjustHue | 3 | Hue |
| kAdjustSaturation | 4 | Saturation |

Audio channels Constants

| Constant | Value | Description |
|---|---|---|
| kAudioChannelDolbys | 5 | Dolbys |
| kAudioChannelError | -1 | Error |
| kAudioChannelLeft | 3 | Left channel |
| kAudioChannelRight | 4 | Right channel |
| kAudioChannelRStereo | 2 | RStereo |
| kAudioChannelStereo | 1 | Stereo |

Audio device type Constants

| Constant | Value | Description |
|---|---|---|
| kAudioOutputDevice_2F2R | 4 | 2F2R |
| kAudioOutputDevice_3F2R | 5 | 3F2R |
| kAudioOutputDevice_5_1 | 6 | 5/1 |
| kAudioOutputDevice_6_1 | 7 | 6/1 |
| kAudioOutputDevice_7_1 | 8 | 7/1 |
| kAudioOutputDevice_Error | -1 | Error |
| kAudioOutputDevice_Mono | 1 | Mono |
| kAudioOutputDevice_SPDIF | 10 | SPDIF |
| kAudioOutputDevice_Stereo | 2 | Stereo |

Option Parameters for VideoLogo

| Constant | Value | Description |
|---|---|---|
| kLogoDelay | 4 | Delay |
| kLogoEnable | 0 | Enable/Disable |
| kLogoFile | 1 | File path.<br>Use with VideoSetLogoString: ”file,d,t;file,d,t;...” |
| kLogoOpacity | 6 | Opacity |
| kLogoPosition | 7 | Position |
| kLogoRepeat | 5 | Repeat |
| kLogoX | 2 | X Position |
| kLogoY | 3 | Y Position |

Marq options definition Constants

| Constant | Value | Description |
|---|---|---|
| kMarqueeColor | 2 | Color |
| kMarqueeEnable | 0 | Enable |
| kMarqueeOpacity | 3 | Opacity |
| kMarqueePosition | 4 | Position |
| kMarqueeRefresh | 5 | Refresh |
| kMarqueeSize | 6 | Size |
| kMarqueeText | 1 | Text |
| kMarqueeTimeout | 7 | Timeout |
| kMarqueeX | 8 | X |
| kMarqueeY | 9 | Y |

Navigation Mode Constants

| Constant | Value | Description |
|---|---|---|
| kNavigateActivate | 0 | Activate |
| kNavigateDown | 2 | Down |
| kNavigateLeft | 3 | Left |
| kNavigateRight | 4 | Right |
| kNavigateUp | 1 | Up |

State Constants

| Constant | Value | Description |
|---|---|---|
| kStateBuffering | 2 | Buffering |
| kStateEnded | 6 | Ended |
| kStateError | 7 | Error |
| kStateNothingSpecial | 0 | Nothing special. Video closed for example. |
| kStateOpening | 1 | Opening |
| kStatePaused | 4 | Paused |
| kStatePlaying | 3 | Playing |
| kStateStopped | 5 | Stopped |

Video Title Display Positions

| Constant | Value | Description |
|---|---|---|
| kVideoTitleDisplayPositionBottom | 6 | Bottom |
| kVideoTitleDisplayPositionBottomLeft | 7 | Bottom Left |
| kVideoTitleDisplayPositionBottomRight | 8 | Bottom Right |
| kVideoTitleDisplayPositionCenter | 0 | Center |
| kVideoTitleDisplayPositionDisable | -1 | Disabled |
| kVideoTitleDisplayPositionLeft | 1 | Left |
| kVideoTitleDisplayPositionRight | 2 | Right |
| kVideoTitleDisplayPositionTop | 3 | Top |
| kVideoTitleDisplayPositionTopLeft | 4 | Top Left |
| kVideoTitleDisplayPositionTopRight | 5 | Top Right |

## 190.13 class VLCMediaStatsMBS

### 190.13.1 class VLCMediaStatsMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for media statistics.

### 190.13.2 Properties

### 190.13.3 DecodedAudio as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decoded audio.
**Notes:** (Read and Write property)

### 190.13.4 DecodedVideo as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Decoded video.
**Notes:** (Read and Write property)

### 190.13.5 DemuxBitrate as Single

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Bitrate for demux input.
**Notes:** (Read and Write property)

### 190.13.6 DemuxCorrupted as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Demux corrupted.
**Notes:** (Read and Write property)

### 190.13.7 DemuxDiscontinuity as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The demux discontinuity.
**Notes:** (Read and Write property)

### 190.13.8 DemuxRead_bytes as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of read bytes by demuxer.
**Notes:** (Read and Write property)

### 190.13.9 DisplayedPictures as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of displayed video frames.
**Notes:** (Read and Write property)

### 190.13.10 InputBitrate as Single

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The input bit rate.
**Notes:** (Read and Write property)

### 190.13.11 LostAbuffers as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of lost audio buffers.
**Notes:** (Read and Write property)

### 190.13.12 LostPictures as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of lost video frames.
**Notes:** (Read and Write property)

### 190.13.13 PlayedAbuffers as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of played Audio buffers.
**Notes:** (Read and Write property)

### 190.13.14 ReadBytes as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of bytes read from input.
**Notes:** (Read and Write property)

### 190.13.15 SendBitrate as Single

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The sending bit rate.
**Notes:** (Read and Write property)

### 190.13.16 SentBytes as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of bytes sent.
**Notes:** (Read and Write property)

### 190.13.17 SentPackets as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Number of packets sent.
**Notes:** (Read and Write property)

## 190.14 class VLCMediaTrackInfoMBS

### 190.14.1 class VLCMediaTrackInfoMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for track information.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr2

### 190.14.2 Methods

### 190.14.3 Constructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 190.14.4 Destructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.14.5 Properties

### 190.14.6 Channels as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of channels in an audio track.
**Notes:** (Read and Write property)

### 190.14.7 Codec as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track's codec identifier.
**Notes:** (Read and Write property)

### 190.14.8 CodecString as String

MBS VLC Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track's codec identifier as string.
**Notes:** (Read and Write property)

### 190.14.9 Height as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The height in pixel of a video track.
**Notes:** (Read and Write property)

### 190.14.10 ID as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track'S ID.
**Notes:** (Read and Write property)

### 190.14.11 Level as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The codec's level.
**Notes:** (Read and Write property)

### 190.14.12 Profile as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The codec's profile.
**Notes:** (Read and Write property)

### 190.14.13 Rate as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The rate for an audio track.
**Notes:** e.g. 44000 Hz.
(Read and Write property)

### 190.14.14 Type as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track type.
**Notes:** Can be TrackAudio, TrackText, TrackVideo or TrackUnknown.
(Read and Write property)

### 190.14.15 Width as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The width in pixel of a video track.
**Notes:** (Read and Write property)

### 190.14.16 Constants

Track Types

| Constant | Value | Description |
|---|---|---|
| TrackAudio | 0 | Audio |
| TrackText | 2 | Text track, e.g. subtitles. |
| TrackUnknown | -1 | Unknown |
| TrackVideo | 1 | Video |

## 190.15 class VLCMediaTrackMBS

### 190.15.1 class VLCMediaTrackMBS

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for the media track.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 190.15.2 Methods

### 190.15.3 Constructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 190.15.4 Destructor

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.15.5 Properties

### 190.15.6 Bitrate as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The bitrate.
**Notes:** (Read and Write property)

### 190.15.7 Channels as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The number of channels.
**Notes:** (Read and Write property)

### 190.15.8 Codec as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The codec ID.
**Notes:** (Read and Write property)

### 190.15.9 CodecString as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The codec ID as 4 letter text.
**Notes:** (Read and Write property)

### 190.15.10 Description as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track description.
**Notes:** (Read and Write property)

### 190.15.11 Encoding as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The text encoding for subtitles.
**Notes:** (Read and Write property)

### 190.15.12 FrameRate as Double

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The framerate.
**Notes:** (Read and Write property)

### 190.15.13 FrameRateDen as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The framerate.
**Notes:** (Read and Write property)

### 190.15.14 FrameRateNum as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The framerate.
**Notes:** (Read and Write property)

### 190.15.15 Height as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The height of a video track.
**Notes:** (Read and Write property)

### 190.15.16 ID as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the track.
**Notes:** (Read and Write property)

### 190.15.17 Language as String

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The language for this track.
**Notes:** (Read and Write property)

### 190.15.18 Level as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The codec specific level value.
**Notes:** (Read and Write property)

### 190.15.19 OriginalCode as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The original code for codec.
**Notes:** (Read and Write property)

### 190.15.20 Profile as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Codec specific profile value.
**Notes:** (Read and Write property)

### 190.15.21 Rate as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The sound rate in Hz.
**Notes:** (Read and Write property)

### 190.15.22 Sar as Double

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The aspect ratio.
**Notes:** (Read and Write property)

### 190.15.23 SarDen as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The aspect ratio.
**Notes:** (Read and Write property)

### 190.15.24 SarNum as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The aspect ratio.
**Notes:** (Read and Write property)

### 190.15.25 Type as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track type.
**Notes:** (Read and Write property)

### 190.15.26 Width as Integer

MBS VLC Plugin, Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The width of a video track.
**Notes:** (Read and Write property)

### 190.15.27 Constants

Track Types

| Constant | Value | Description |
|---|---|---|
| TrackAudio | 0 | Audio |
| TrackText | 2 | Text |
| TrackUnknown | -1 | Unknown type |
| TrackVideo | 1 | Video |

## 190.16 class VLCMissingFunctionExceptionMBS

### 190.16.1 class VLCMissingFunctionExceptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The exception which is raised if you call a function which is not available.
**Notes:** Either your VLC shared library does not have the function or you did not yet load the library.
Subclass of the RuntimeException class.

# 190.17 class VLCModuleDescriptionMBS

## 190.17.1 class VLCModuleDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a module description.

## 190.17.2 Methods

## 190.17.3 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

## 190.17.4 Properties

## 190.17.5 Help as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The help text.
**Notes:** (Read and Write property)

## 190.17.6 LongName as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The long name.
**Notes:** (Read and Write property)

## 190.17.7 Name as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The name of the module.
**Notes:** (Read and Write property)

### 190.17.8 NextModule as VLCModuleDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The link to the next module.
**Notes:** (Read and Write property)

### 190.17.9 ShortName as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The short name.
**Notes:** (Read and Write property)

## 190.18 class VLCNotInitializedExceptionMBS

### 190.18.1 class VLCNotInitializedExceptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** This exception is raised if you call a method on an uninitialized object.
**Notes:** Should not happen. And if it happens, you have a bug in your code.
Subclass of the RuntimeException class.

## 190.19 class VLCTrackDescriptionMBS

### 190.19.1 class VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Description for video, audio tracks and subtitles.
**Notes:** It contains id, name (description string) and reference to next record.

### 190.19.2 Methods

### 190.19.3 Destructor

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 190.19.4 Properties

### 190.19.5 ID as Integer

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track ID.
**Notes:** (Read and Write property)

### 190.19.6 Name as String

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The track name.
**Notes:** (Read and Write property)

### 190.19.7 NextTrack as VLCTrackDescriptionMBS

MBS VLC Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The next track in the list.
**Notes:** (Read and Write property)

# Chapter 191

# WebKit2

## 191.1 control DesktopWKWebViewControlMBS

### 191.1.1 control DesktopWKWebViewControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A WKWebView object displays interactive web content, such as for an in-app browser.
**Example:**

```
// print a WKWebViewControlMBS to PDF file:

dim browser as WKWebViewControlMBS // your control showing website
Dim pi As NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo

Dim f As FolderItem = SpecialFolder.Desktop.Child("test.pdf")
pi.SetSaveDestination f

Dim po As NSPrintOperationMBS = browser.printOperation(pi)

po.showsPrintPanel = False
po.showsProgressPanel = False

If po.runOperation Then
f.launch
End If
```

**Notes:** This is a control to use WebKit in 32-bit and WebKit 2 in 64-bit.
Most of the events provided by Xojo for the control will not work.
But we can add features over time as needed.

Let us know if you need a method from WKWebView or an event from WKNavigationDelegate or WKUIDelegate.

**Blog Entries**

- News from the MBS Xojo Plugins Version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- Three new controls for iOS in Xojo
- HTMLViewer JavaScript communication for Xojo
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins in version 19.0
- HTMLViewer JavaScript communication for Xojo
- Custom JavaScript messages to WKWebViewControlMBS
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0

**Videos**

- XDC 2020 MBS Plugins Presentation
- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 18.3, page 43: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 41: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News
- 16.2, page 9: News
- 15.2, page 10: News

### 191.1.2 Methods

### 191.1.3 addScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Adds a script message handler.
**Example:**

```
// register once
browser.addScriptMessageHandler "test"
// later use in javascript:
browser.EvaluateJavaScript("window.webkit.messageHandlers.test.postMessage('Hello');")
```

**Notes:** Name: The name of the message handler.

Adding a script message handler with name name causes the JavaScript function window.webkit.messageHandlers.name.postMessage(messageBody) to be defined in all frames in all web views that use the user content controller.

### 191.1.4 addUserScript(userScript as WKUserScriptMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Adds an user script.

### 191.1.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Evaluates JavaScript.
**Example:**

```
Dim e As NSErrorMBS

// returns array of variants with doubles
Dim v As Variant = DesktopWKWebViewControlMBS1.EvaluateJavaScript("o = [ 1,2,3 ] ;", e)
Dim vd() As Variant = v

// returns array of variants with strings
Dim vv As Variant = DesktopWKWebViewControlMBS1.EvaluateJavaScript("o = [ ""a"",""b"",""d"" ] ;",
e)
```

```
Dim vs() As Variant = vv

// returns dictionary
Dim v3 As Variant = DesktopWKWebViewControlMBS1.EvaluateJavaScript("o = { a:1 } ", e)
Dim dd As Dictionary = v3

Break
```

**Notes:** Synchronous version which waits for JavaScript to return the value.
Error is set in case of errors.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.1.6 EvaluateJavaScript(JavaScript as String, Tag as String = "") 22760

### 191.1.6 EvaluateJavaScript(JavaScript as String, Tag as String = "")

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Evaluates JavaScript.
**Notes:** Calls later JavaScriptEvaluated event with result and passed tag value.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.1.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant 22759

### 191.1.7 goBack

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to the back item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.1.8 goForward

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to the forward item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.1.9 goToBackForwardListItem(Item as WKBackForwardListItemMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to an item from the back-forward list and sets it as the current item.
**Notes:** item: The item to which to navigate. Must be one of the items in the web view's back-forward list.

Sets Navigation property.

### 191.1.10 LoadData(Data as MemoryBlock, MIMEType as String, textEncodingName as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.LoadData "<p>Hello World</p>", "text/html", "UTF-8", ""
```

**Notes:** data: The data to use as the contents of the webpage.
MIMEType: The MIME type of the data.
characterEncodingName: The data's character encoding name.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.1.11 LoadFileURL(File as FolderItem, readAccessItem as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested file.
**Example:**

```
Dim w as DesktopWKWebViewControlMBS // your web viewer
Dim HTMLFile as folderItem = getfolderItem("test.html")
```

```
// pass folderitem parent to allow read to other files in same folder
w.LoadFileURL HTMLFile, HTMLFile.parent
```

**Notes:** Navigates to the requested file URL on the filesystem.
file: The file URL to which to navigate.
readAccessItem: The file or folder to allow read access to.
If readAccessItem references a single file, only that file may be loaded by WebKit.
If readAccessItem references a directory, files inside that file may be loaded by WebKit.

Sets Navigation property.

### 191.1.12 LoadHTML(htmlText as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.LoadHTML "<p>Hello World</p>"
```

**Notes:** htmlText: The string to use as the contents of the webpage.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.1.13 LoadURL(URL as string)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested URL.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

call browser.LoadURL "https://www.mbsplugins.de/xojo"
```

**Notes:** Sets Navigation property.
Sets Navigation property.

### 191.1.14 LoadURLRequest(Request as NSURLRequestMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested URL.
**Notes:** Sets Navigation property.

### 191.1.15 printOperation(printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a print operation for the current web viewer.
**Example:**

```
dim browser as DesktopWKWebViewControlMBS // your web viewer
Dim pi As NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
Dim po As NSPrintOperationMBS = browser.printOperation(pi)

po.showsPrintPanel = True
po.showsProgressPanel = True

po.runOperationModalForWindow(Self)
```

**Notes:** Works for WebKit 1.x and 2.x.

For WebKit 2.x may run into endless loop for some websites due to bugs in Apple's WebKit framework.

### 191.1.16 reload

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the current page.
**Example:**

```
Public Sub Reload(browser as DesktopWKWebViewControlMBS, force as Boolean)
If force Then
Call browser.reloadFromOrigin
Else
Call browser.reload
```

```
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.1.17 reloadFromOrigin

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the current page, performing end-to-end revalidation using cache-validating conditionals if possible.
**Example:**

```
Public Sub Reload(browser as DesktopWKWebViewControlMBS, force as Boolean)
If force Then
call browser.reloadFromOrigin
Else
call browser.reload
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.1.18 removeAllUserScripts

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes all associated user scripts.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.removeAllUserScripts
```

### 191.1.19 removeScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes a script message handler.
**Notes:** name: The name of the message handler to remove.

### 191.1.20 runOpenPanelWithParametersCompleted(URLs() as NSURLMBS)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Pass result for a runOpenPanelWithParameters event here.
**Notes:** Pass nil to indicate cancel was pressed.

### 191.1.21 setMagnification(magnification as double, pointX as double, pointY as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Scales the page content by a specified factor and centers the result on a specified point.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

// zoom to 200% on 100/100
browser.setMagnification(2, 100, 100)
```

**Notes:** magnification: The factor by which to scale the content.
x/y: The point (in view space) to center magnification on. As usual with Cocoa, bottom is y = 0.

For MacOS 64-bit only.

### 191.1.22 setUsePrivateBrowsing(value as Boolean)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to create DesktopWKWebViewControlMBS with private browsing enabled.
**Example:**

```
DesktopWKWebViewControlMBS.setUsePrivateBrowsing True
```

**Notes:** Set this property to true before creating the DesktopWKWebViewControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

### 191.1.23 stopLoading

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Stops loading all resources on the current page.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.stopLoading
```

### 191.1.24 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Requests a snapshot.
**Notes:** This is synchronous version which waits for image to be finished.
In case of error the result is nil and error may be set.
See also:

- 191.1.25 takeSnapshot(tag as string = "") 22766

### 191.1.25 takeSnapshot(tag as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Requests a snapshot.
**Notes:** Calls later takeSnapshotCompleted event.
Tag is passed to event to distinguish various snapshot requests.
See also:

- 191.1.24 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS 22766

### 191.1.26 userScripts as WKUserScriptMBS()

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The user scripts associated with the user content controller.

### 191.1.27 Properties

### 191.1.28 AcceptTabs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 191.1.29 allowFileAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Allow file access for file URLs.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.allowFileAccessFromFileURLs = True
```

**Notes:** Access to files is allowed for some files.
Please check WebKit documentation for details.

Set allowFileAccessFromFileURLs and allowUniversalAccessFromFileURLs to true to disable all the security checks to block local file access for websites. allowUniversalAccessFromFileURLs would allow all file URLs. allowFileAccessFromFileURLs would only allow in same path.
(Read and Write property)

### 191.1.30 allowsBackForwardNavigationGestures as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether horizontal swipe gestures will trigger back-forward list navigations.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.allowsBackForwardNavigationGestures = True
```

**Notes:** The default value is false.
Available for 64-bit on macOS 10.10 or newer.
(Read and Write property)

### 191.1.31 allowsLinkPreview as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether pressing on a link displays a preview of the destination for the link.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsLinkPreview = True
```

**Notes:** (Read and Write property)

### 191.1.32 allowsMagnification as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether magnify gestures will change the web view,Äôs magnification.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsMagnification = True
```

**Notes:** The default value is false. You can set the magnification property even if allowsMagnification is set to false.
For MacOS 64-bit only.
(Read and Write property)

### 191.1.33 allowUniversalAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Allow universal file access for URLs.
**Notes:** Any file URL will be loaded if true.

Please check WebKit documentation for details.

Does not work in MacOS 10.14.
(Read and Write property)

### 191.1.34 backForwardList as WKBackForwardListMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The web view's back-forward list.
**Notes:** (Read only property)

### 191.1.35 CanGoBack as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether there is a back item in the back-forward list that can be navigated to.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "CanGoBack: "+If(Browser.CanGoBack, "yes", "no")
```

**Notes:** (Read only property)

### 191.1.36 CanGoForward as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether there is a forward item in the back-forward list that can be navigated to.
**Example:**

```
'Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "CanGoForward: "+If(Browser.CanGoForward, "yes", "no")
```

**Notes:** (Read only property)

### 191.1.37 customUserAgent as String

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The custom user agent string.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.customUserAgent = "MyBrowser/1.0"
```

**Notes:** If no custom user agent string has been set, this is set to "".
Available in 32-bit. Available in 64-bit for macOS 10.11 or newer.
(Read and Write property)

### 191.1.38 developerExtrasEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether developer extras are enabled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

// enable context menu entry to show developer extras
browser.developerExtrasEnabled = True
```

**Notes:** For WebKit 2 (64bit) to enable the context menu to inspect items.
(Read and Write property)

### 191.1.39 EstimatedProgress as Double

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** An estimate of what fraction of the current navigation has been loaded.
**Notes:** This value ranges from 0.0 to 1.0 based on the total number of bytes expected to be received, including the main document and all of its potential subresources. After a navigation loading completes, the estimatedProgress remains at 1.0 until a new navigation starts, at which point the estimatedProgress is reset to 0.0.
(Read only property)

### 191.1.40 hasOnlySecureContent as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether all resources on the page have been loaded through securely encrypted connections.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "hasOnlySecureContent: "+If(Browser.hasOnlySecureContent, "yes", "no")
```

**Notes:** Only set for 64-bit, always false on 32-bit.
(Read only property)

### 191.1.41 IsLoading as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the view is currently loading content.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

// load a page
browser.LoadURL "https://www.mbsplugins.de/xojo"

// wait synchronously for website loading
While browser.IsLoading
DelayMBS 0.1
Wend

MsgBox "loaded"
```

**Notes:** (Read only property)

### 191.1.42 javaEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether java is enabled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance
```

```
MsgBox "JavaScript Enabled: "+If(Browser.javaEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.1.43 javaScriptCanOpenWindowsAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether javascript can open new windows.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

// disable popup windows
Browser.javaScriptCanOpenWindowsAutomatically = False
```

**Notes:** (Read and Write property)

### 191.1.44 javaScriptEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether javascript is enabled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaScriptEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.1.45 loadsImagesAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to load images automatically.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

// disable loading of images
browser.loadsImagesAutomatically = False#
```

**Notes:** (Read and Write property)

### 191.1.46 magnification as Double

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The factor by which the page content is currently scaled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.magnification = 2.0
```

**Notes:** The default value is 1.0.
For MacOS 64-bit only.
(Read and Write property)

### 191.1.47 minimumFontSize as Double

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The minimum font size to use.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

browser.minimumFontSize = 20
```

**Notes:** (Read and Write property)

### 191.1.48 Navigation as WKNavigationMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The current navigation action.
**Notes:** (Read only property)

### 191.1.49 plugInsEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether plugins are enabled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "plugInsEnabled: "+If(Browser.plugInsEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.1.50 privateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether private browsing is enabled.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox "privateBrowsing: "+If(Browser.privateBrowsing, "yes", "no")
```

**Notes:** If enabled, no data should be stored for cookies or cache on disk, so it's cleared when web viewer is destroyed (Inkognito mode).
Default is non-private mode for the web viewer.

For WebKit 2.x, it looks like you can't change mode after web viewer was created.
So use UsePrivateBrowsing there.
(Read and Write property)

### 191.1.51 Title as String

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The page title.

**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox Browser.Title
```

**Notes:** (Read only property)

### 191.1.52 URL as String

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The active URL.
**Example:**

```
Dim browser As DesktopWKWebViewControlMBS // your instance

MsgBox Browser.URL
```

**Notes:** This is the URL that should be reflected in the user interface.
(Read only property)

### 191.1.53 UsePrivateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to create DesktopWKWebViewControlMBS with private browsing enabled.
**Example:**

```
WVWebViewModuleMBS.UsePrivateBrowsing = True
```

**Notes:** Set this property to true before creating the DesktopWKWebViewControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

Due to a bug in Xojo 2019r2 and older, please use WVWebViewModuleMBS.UsePrivateBrowsing property instead.
(Read and Write property)

### 191.1.54 View as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The used view.
**Notes:** Should be either a WebView (32bit) or WKWebView (64bit).
(Read only property)

### 191.1.55 WKWebView as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The used WKWebViewMBS view.
**Notes:** Always a WKWebViewMBS in 64-bit, but nil for 32-bit applications.
(Read only property)

### 191.1.56 Events

### 191.1.57 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 191.1.58 Closing

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 191.1.59 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 191.1.60 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 191.1.61 CreateWebView(URL as String, request as NSURLRequestMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Creates a new web view.
**Notes:** If needed we can add configuration, windowFeatures and navigationAction parameters in future version.

Return a web viewer control or nil.

The web view returned must be created with the specified configuration. WebKit will load the request in the returned web view.

If you do not implement this method or return nil, the web view will cancel the navigation.

### 191.1.62 decidePolicyForNavigationAction(navigationAction as WKNavigationActionMBS, decisionHandler as WKPolicyForNavigationActionDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation.
**Notes:** Please inspect navigationAction to find the information about what action happened.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

If you want to open this in a new window/tab, please call decisionHandler.Cancel method here, take the URL and load it in the new WebView in the new window/tab.

Like the CancelClose event in Xojo, you can call decisionHandler.Cancel method to call it.

### 191.1.63 decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation after its response is known.
**Example:**

```
Sub decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS) Handles decidePolicyForNavigationResponse
dim MimeType as string = navigationResponse.response.MIMEType

if MimeType = "application/zip" or _
MimeType = "application/x-tar" or _
MimeType = "application/octet-stream" then
// we download archive files
decisionHandler.Download
else
// allow normal website to load
decisionHandler.Allow

end if
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

### 191.1.64 DidClose

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The webviewer closed.
**Notes:** Notifies your app that the DOM window object's close() method completed successfully.

Your app should remove the web view from the view hierarchy and update the UI as needed, such as by closing the containing browser tab or window.

### 191.1.65 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 191.1.66 didCommitNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when content starts arriving for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.1.67 didFailNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when an error occurs during a committed main frame navigation.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.1.68 didFailProvisionalNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when an error occurs while starting to load data for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.1.69 didFinishNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a main frame navigation completes.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.
Same as DocumentComplete in HTMLViewer.

### 191.1.70 DidReceiveAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the app to respond to an authentication challenge.
**Notes:** challenge: The authentication challenge.

AuthChallengeDisposition: The option to use to handle the challenge. For a list of options, see AuthChallenge* constants.
credential: The credential to use for authentication when the disposition parameter contains the value AuthChallengeUseCredential. Specify nil to continue without a credential.

If you don,Äôt implement this method, the web view responds to the authentication challenge with the AuthChallengeRejectProtectionSpace disposition.

### 191.1.71 didReceiveScriptMessage(Body as Variant, name as String)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a script message is received from a webpage.
**Notes:** body: The body of the message. Automatic translated from Javascript types.
name: The name of the message handler to which the message is sent.

### 191.1.72 didReceiveServerRedirectForProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a server redirect is received for the main frame.
**Notes:** Added navigation parameter with version 20.3.

Sets Navigation property.

### 191.1.73 didStartProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Invoked when a main frame navigation starts.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.1.74 downloadDecideDestinationUsingResponse(download as WKDownloadMBS, response as NSURLResponseMBS, suggestedFilename as String, byref destination as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the app to provide a file destination where the system should write the download data.
**Notes:** download: The download that needs a file destination where the systems should write the download data.
response: A response from the server for an HTTP request, or a synthesized response for a blob download.
suggestedFilename: A string with a filename suggestion to use in creating the file destination.
destination: A file destination where the systems should write the download data.

Set destination to where to store the file. Or set to nil to cancel.

The suggested filename can come from the response or from the web content.
The destination file URL must meet the following requirements:

- It,Äôs a file that doesn,Äôt exist.
- It,Äôs in a directory that exists.
- It,Äôs in a directory that WebKit can write to.

### 191.1.75 downloadDidFailWithError(download as WKDownloadMBS, error as NSErrorMBS, resumeData as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells your app that the download failed, with error information and data you can use to restart the download.
**Notes:** download: The download that failed.

error: An error describing what caused the download to fail.
resumeData: A data object you use to restart the download.

To restart a failed download, call resumeDownloadFromResumeData with resumeData.

### 191.1.76 downloadDidFinish(download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** This event tells you that the download finished.
**Notes:** download: The download that finished.

### 191.1.77 downloadDidReceiveAuthenticationChallenge(download as WKDownloadMBS, challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the delegate to respond to an authentication challenge.
**Notes:** download: The download that received the authentication challenge.
challenge: The authentication challenge.

Determine how to respond to the authentication challenge in this method. Then set AuthChallengeDisposition to AuthChallenge* constants and pass the credentials to use.

If you don,Äôt implement this method, the web view responds to the challenge with AuthChallengeRejectProtectionSpace.

### 191.1.78 downloadWillPerformHTTPRedirection(download as WKDownloadMBS, response as NSURLResponseMBS, request as NSURLRequestMBS, byref DownloadRedirectPolicy as Integer)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the delegate to respond to the download,Äôs redirect response.
**Notes:** download: The download that receives the redirect response.
response: The redirect response.
request: The new request the web view sends as a result of the redirect response.

Set DownloadRedirectPolicy to either DownloadRedirectPolicyAllow or DownloadRedirectPolicyCancel.

A download redirect policy that indicates whether to proceed with the redirect.

Determine whether to proceed with the redirect. Then invoke the decisionHandler closure, providing a download redirect policy that indicates whether to proceed with the redirect.

If you don,Äôt implement this event, the web view proceeds with all redirects.

### 191.1.79 EstimatedProgressChanged(estimatedProgress as double, oldEstimatedProgress as double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The estimated progress for loading the webpage changed.
**Notes:** This event may be called often, so don't do much here!

### 191.1.80 FocusLost

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 191.1.81 FocusReceived

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 191.1.82 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 191.1.83 JavaScriptEvaluated(JavaScript as String, Result as Variant, Error as NSErrorMBS, Tag as String)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** JavaScript was evaluated.
**Notes:** Error is only set with 64-bit, not with 32-bit.
Tag is passed from EvaluateJavaScript call.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.

### 191.1.84 MenuBarSelected

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 191.1.85 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 191.1.86 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 191.1.87 MouseUp(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 191.1.88 navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that a navigation action became a download.
**Example:**

```
Sub navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WKDownloadMBS) Handles navigationActionDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationAction: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.1.89 navigationResponseDidBecomeDownload(navigationResponse as WKNavigationResponseMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that a navigation response became a download.
**Example:**

```
Sub navigationResponseDidBecomeDownload(navigationResponse as WKNavigationResponseMBS, download as WKDownloadMBS) Handles navigationResponseDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.1.90 Opening

Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 191.1.91 runJavaScriptAlertPanel(initiatedByFrame as WKFrameInfoMBS, message as String)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript alert panel.
**Notes:** message: The message to display.

If you do not implement this method, the web view will behave as if the user selected the OK button.

### 191.1.92 runJavaScriptConfirmPanel(initiatedByFrame as WKFrameInfoMBS, message as String) as boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript confirm panel.
**Notes:** message: The message to display.

Return true if the user chose OK, false if the user chose Cancel.

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.1.93 runJavaScriptTextInputPanel(initiatedByFrame as WKFrameInfoMBS, prompt as String, defaultText as String) as String

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript text input panel.
**Notes:** message: The message to display.
defaultText: The initial text to display in the text entry field.

Return the entered text if the user chose OK, otherwise "".

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.1.94 runOpenPanelWithParameters(initiatedByFrame as WKFrameInfoMBS, allowsMultipleSelection as Boolean, allowsDirectories as Boolean)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: .

**Function:** Displays a file upload panel.
**Notes:** Please call runOpenPanelWithParametersCompleted method later with result. Pass the selected URLs if the user chose "OK", otherwise nil.

You can use sheet window for the file picker and later call the runOpenPanelWithParametersCompleted method or call it right in the event if you do it synchronously.

If this method is not implemented, the web view behaves as if the user selected the Cancel button.

Not available on iOS. Implemented for macOS 64-bit applications.

### 191.1.95 ScaleFactorChanged(NewFactor as Double)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 191.1.96 takeSnapshotCompleted(image as NSImageMBS, error as NSErrorMBS, tag as string)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Called when snapshot of website is completed.
**Notes:** If snapshot creation failed, error is set.

### 191.1.97 TitleChanged(Title as String, oldTitle as string)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** The title of the webpage changed.

### 191.1.98 WebContentProcessDidTerminate

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that the web view,Äôs content process was terminated.
**Notes:** Web views use a separate process to render and manage web content. WebKit calls this method when the process for the specified web view terminates for any reason.

### 191.1.99 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 191.1.100 Constants

Authentication Challenge Responses

| Constant | Value | Description |
|---|---|---|
| AuthChallengeCancelAuthenticationChallenge | 2 | Cancel the entire request. The provided credential parameter is |
| AuthChallengePerformDefaultHandling | 1 | Use the default handling for the challenge as though this delegate not implemented. The provided credential parameter is ignored. |
| AuthChallengeRejectProtectionSpace | 3 | Reject this challenge, and call the authentication delegate meth the next authentication protection space. The provided credent is ignored. |
| AuthChallengeUseCredential | 0 | Use the specified credential, which may be nil. |

Redirect Policy

| Constant | Value | Description |
|---|---|---|
| DownloadRedirectPolicyAllow | 1 | Allow a redirect to proceed. |
| DownloadRedirectPolicyCancel | 0 | Cancel the redirect action. |

## 191.2 class WKBackForwardListItemMBS

### 191.2.1 class WKBackForwardListItemMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKBackForwardListItem object represents a webpage in the back-forward list of a web view.
**Notes:** For 32-bit a WebHistoryItem object, for 64-bit a WKBackForwardListItem object.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5

### 191.2.2 Methods

### 191.2.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.2.4 Properties

### 191.2.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.2.6 initialURL as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL of the initial request that created this item.
**Notes:** (Read only property)

### 191.2.7 title as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The title of the webpage represented by this item.
**Notes:** (Read only property)

### 191.2.8 URL as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The URL of the webpage represented by this item.
**Notes:** (Read only property)

## 191.3 class WKBackForwardListMBS

### 191.3.1 class WKBackForwardListMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKBackForwardList object is a list of webpages previously visited in a web view that can be reached by going back or forward.
**Notes:** For 32-bit a WebBackForwardList object, for 64-bit a WKBackForwardList object.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 20.0pr5

### 191.3.2 Methods

### 191.3.3 backList as WKBackForwardListItemMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The portion of the list preceding the current item.
**Notes:** The items are in the order in which they were originally visited.

### 191.3.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
See also:

- 191.3.5 Constructor(WKWebView as WKWebViewMBS) 22792

### 191.3.5 Constructor(WKWebView as WKWebViewMBS)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries back forward list for a web view.
See also:

- 191.3.4 Constructor 22792

### 191.3.6 forwardList as WKBackForwardListItemMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The portion of the list following the current item.
**Notes:** The items are in the order in which they were originally visited.

### 191.3.7 itemAtIndex(index as Integer) as WKBackForwardListItemMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the item at a specified distance from the current item.
**Notes:** index: Index of the desired list item relative to the current item:
0 for the current item, -1 for the immediately preceding item, 1 for the immediately following item, and so on.

Returns the item at the specified distance from the current item, or nil if the index parameter exceeds the limits of the list.

### 191.3.8 Properties

### 191.3.9 backItem as WKBackForwardListItemMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The item immediately preceding the current item, or nil if there isn't one.
**Notes:** (Read only property)

### 191.3.10 currentItem as WKBackForwardListItemMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The current item.
**Notes:** (Read only property)

### 191.3.11 forwardItem as WKBackForwardListItemMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The item immediately following the current item, or nil if there isn't one.
**Notes:** (Read only property)

### 191.3.12 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 191.4 class WKDownloadMBS

### 191.4.1 class WKDownloadMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that represents the download of a web resource.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3

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- 20.5, page 10: News

### 191.4.2 Methods

### 191.4.3 Cancel

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Cancels the download, and optionally captures data so that you can resume the download later.

### 191.4.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.4.5 Properties

### 191.4.6 file as FolderItem

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The target file as folderitem.
**Notes:** (Read only property)

### 191.4.7 fileURL as String

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The target file as URL.
**Notes:** (Read only property)

### 191.4.8 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.4.9 originalRequest as NSURLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that represents the request that initiated the download.
**Notes:** (Read only property)

### 191.4.10 totalBytesExpected as Int64

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Total number of bytes expected to download.
**Notes:** (Read only property)

### 191.4.11 totalBytesWritten as Int64

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Number of bytes written to temp file.
**Notes:** (Read only property)

### 191.4.12 webView as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The web view where the download initiated.
**Notes:** (Read only property)

## 191.5 class WKFrameInfoMBS

### 191.5.1 class WKFrameInfoMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** An object that contains information about a frame on a webpage.
**Notes:** An instance of this class is a transient, data-only object; it does not uniquely identify a frame across multiple event calls.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3

**Xojo Developer Magazine**

- 20.5, page 10: News

### 191.5.2 Methods

### 191.5.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.5.4 Properties

### 191.5.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.5.6 isMainFrame as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the frame is the web site's main frame or a subframe.
**Notes:** (Read only property)

### 191.5.7 request as NSURLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The frame,Äôs current request.
**Notes:** (Read only property)

### 191.5.8 webView as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The matching web viewer.
**Notes:** (Read only property)

## 191.6 class WKHTTPCookieStoreMBS

### 191.6.1 class WKHTTPCookieStoreMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that manages the HTTP cookies associated with a particular WKWebsiteDataStore.
**Example:**

```
Dim CookieStore As WKHTTPCookieStoreMBS = WKWebViewControlMBS1.WKWebView.HTTPCookieStore
Dim cookies() As NSHTTPCookieMBS = CookieStore.AllCookies
Dim cookie As NSHTTPCookieMBS = cookies(0)

// now check in debugger
Break
```

**Notes:** Requires macOS 10.13 or iOS 11.0 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr4

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- 18.3, page 10: News

### 191.6.2 Methods

### 191.6.3 AllCookies as NSHTTPCookieMBS()

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** Fetches all stored cookies.
**Example:**

```
Dim CookieStore As WKHTTPCookieStoreMBS = WKWebViewControlMBS1.WKWebView.HTTPCookieStore
Dim cookies() As NSHTTPCookieMBS = CookieStore.AllCookies
Dim cookie As NSHTTPCookieMBS = cookies(0)

// now check in debugger
Break
```

### 191.6.4 Constructor(WKWebView as WKWebViewMBS)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The constructor.
**Notes:** Creates an object for the http cookie store used by web view.
Adds an observer to the cookie store to call DidChange event.

### 191.6.5 deleteCookie(cookie as NSHTTPCookieMBS, wait as boolean = true)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** Deletes the specified cookie.
**Notes:** By default waits for this to complete.
Otherwise this is set asynchronously.

### 191.6.6 Destructor

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 191.6.7 setCookie(cookie as NSHTTPCookieMBS, wait as boolean = true)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** Sets a cookie.
**Notes:** By default waits for this to complete.
Otherwise this is set asynchronously.

### 191.6.8 Properties

### 191.6.9 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.6.10 Events

### 191.6.11 DidChange

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: .

**Function:** Called when the cookies in the cookie store have changed.

## 191.7 class WKNavigationActionMBS

### 191.7.1 class WKNavigationActionMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** An object that contains information about an action that causes navigation to occur.
**Notes:** Use a WKNavigationAction object to make policy decisions about whether to allow navigation within your app,Äôs web view. You don,Äôt create WKNavigationAction objects directly. Instead, the web view creates them and delivers them to the appropriate delegate objects. Use the methods of your delegate to analyze the action and determine whether to allow the resulting navigation to occur.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3
- MBS Xojo Plugins in version 22.3

### 191.7.2 Methods

### 191.7.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.7.4 Properties

### 191.7.5 buttonNumber as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The number of the mouse button causing the navigation to be requested.
**Notes:** (Read only property)

### 191.7.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.7.7 modifierFlags as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: Desktop only.

**Function:** The modifier keys that were in effect when the navigation was requested.
**Notes:** (Read only property)

### 191.7.8 navigationType as Integer

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The type of action that triggered the navigation.
**Notes:** See constants.
(Read only property)

### 191.7.9 newWindow as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Whether this targets a new window.
**Notes:** (Read only property)

### 191.7.10 request as NSURLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The navigation's request.
**Notes:** (Read only property)

### 191.7.11 shouldPerformDownload as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A value indicating whether the web content used a download attribute to indicate that this should be downloaded.
**Notes:** Requires macOS 11.3 or iOS 14.5.

This is only true if WebKit saw a download attribut ein the html link.
(Read only property)

### 191.7.12 sourceFrame as WKFrameInfoMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The frame requesting the navigation.
**Notes:** (Read only property)

### 191.7.13 targetFrame as WKFrameInfoMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The target frame, or nil if this is a new window navigation.
**Notes:** (Read only property)

### 191.7.14 Constants

Navigation Types

| Constant | Value | Description |
|---|---|---|
| NavigationTypeBackForward | 2 | An item from the back-forward list was requested. |
| NavigationTypeFormResubmitted | 4 | A form was resubmitted (for example by going back, going forward, or reloading). |
| NavigationTypeFormSubmitted | 1 | A form was submitted. |
| NavigationTypeLinkActivated | 0 | A link with an href attribute was activated by the user. |
| NavigationTypeOther | -1 | Navigation is taking place for some other reason. |
| NavigationTypeReload | 3 | The webpage was reloaded. |

## 191.8 class WKNavigationMBS

### 191.8.1 class WKNavigationMBS

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKNavigation object contains information for tracking the loading progress of a webpage.
**Notes:** A navigation object is returned from the web view load methods and is also passed to the navigation delegate methods to uniquely identify a webpage load from start to finish. It has no method or properties of its own.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- MBS Xojo Plugins, version 20.3pr5

### 191.8.2 Methods

### 191.8.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.8.4 Properties

### 191.8.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The handle for the navigation action.
**Notes:** (Read only property)

### 191.8.6 request as NSURLRequestMBS

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The request.
**Notes:** May be nil if not available.
(Read only property)

## 191.9 class WKNavigationResponseMBS

### 191.9.1 class WKNavigationResponseMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKNavigationResponse object contains information about a navigation response, used for making policy decisions.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr5

### 191.9.2 Methods

### 191.9.3 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.9.4 Properties

### 191.9.5 canShowMIMEType as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether WebKit can display the response,Äôs MIME type natively.
**Notes:** (Read only property)

### 191.9.6 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.9.7 isForMainFrame as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the frame being navigated is the main frame.
**Notes:** (Read only property)

### 191.9.8 response as NSURLResponseMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The frame,Äôs response.
**Notes:** Allowing a navigation response with a MIME type that can,Äôt be shown will cause the navigation to fail.
(Read only property)

# 191.10 class WKPolicyForNavigationActionDecisionHandlerMBS

## 191.10.1 class WKPolicyForNavigationActionDecisionHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The class for the decision handler to tell webkit what to do with the navigation action.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 191.10.2 Methods

## 191.10.3 Allow

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Allow the navigation action to continue.

## 191.10.4 Cancel

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Cancel this navigation action.

## 191.10.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

## 191.10.6 Download

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Change the navigation action to a download.

## 191.11 class WKPolicyForNavigationResponseDecisionHandlerMBS

### 191.11.1 class WKPolicyForNavigationResponseDecisionHandlerMBS

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The class for the decision handler to tell webkit what to do with the navigation response.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.3

### 191.11.2 Methods

### 191.11.3 Allow

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Allow the response to proceed.

### 191.11.4 Cancel

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Cancel the navigation.

### 191.11.5 Constructor

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 191.11.6 Download

MBS Mac64bit Plugin, Plugin Version: 22.3, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Change the navigation response to a download.

# 191.12 class WKPreferencesMBS

## 191.12.1 class WKPreferencesMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKPreferences object encapsulates the preference settings for a web view.
**Notes:** The preferences object associated with a web view is specified by its web view configuration.
Available on MacOS 10.10 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr6
- MBS Xojo Plugins, version 21.5pr4
- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- News from the MBS Xojo Plugins Version 20.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1

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- 18.3, page 10: News

## 191.12.2 Methods

## 191.12.3 Constructor(WKWebView as WKWebViewMBS)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries preferences object for a web view.

### 191.12.4 Properties

### 191.12.5 crossOriginResourcePolicyEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to enable/disable cross origin resource policy.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences

w.crossOriginResourcePolicyEnabled = False
```

**Notes:** Disabling some cross policy checks may allow JavaScript to access a website loaded in a frame.

Default is true.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.6 defaultFontSize as Integer

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The default font size for fonts.
**Example:**

```
HTMLViewer1.WKWebView.Preferences.defaultFontSize = 10
```

**Notes:** (Read and Write property)

### 191.12.7 developerExtrasEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether developer extras are enabled.
**Example:**

```
HTMLViewer1.WKWebView.Preferences.developerExtrasEnabled = true
```

**Notes:** Set to true, so you can inspect elements via contextual menus.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.8 ElementFullscreenEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether a web view can display content full screen.
**Notes:** The default value for this preference is false.
Requires macOS 12.3 or newer.
(Read and Write property)

### 191.12.9 FraudulentWebsiteWarningEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether warnings should be shown for suspected fraudulent content such as phishing or malware.
**Notes:** The default value is true. This feature is currently available in the following region: China.
(Read and Write property)

### 191.12.10 fullScreenEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to allow fullscreen mode.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences
w.fullScreenEnabled = true
```

**Notes:** Default is false.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).

(Read and Write property)

### 191.12.11 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.12.12 javaEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether Java is enabled.
**Example:**

WKWebViewControlMBS1.WKWebView.Preferences.javaEnabled = False

**Notes:** The default value is false.
Deprecated for macOS 10.15.
(Read and Write property)

### 191.12.13 javaScriptCanOpenWindowsAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether JavaScript can open windows without user interaction.
**Example:**

WKWebViewControlMBS1.WKWebView.Preferences.javaScriptCanOpenWindowsAutomatically = False

**Notes:** The default value is false in iOS and true in macOS.
(Read and Write property)

### 191.12.14 javaScriptEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether JavaScript is enabled.
**Example:**

WKWebViewControlMBS1.WKWebView.Preferences.javaScriptEnabled = False

**Notes:** The default value is true. Setting this property to false disables JavaScripts that are loaded or executed by the web page. This setting does not affect user scripts. See WKUserScriptMBS class.
(Read and Write property)

### 191.12.15 loadsImagesAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether images are loaded automatically.
**Example:**

HTMLViewer1.WKWebView.Preferences.loadsImagesAutomatically = False

**Notes:** (Read and Write property)

### 191.12.16 logsPageMessagesToSystemConsoleEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether page log messages go to system console.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences
w.logsPageMessagesToSystemConsoleEnabled = true
```

**Notes:** Default is false.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.17 mediaDevicesEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to allow access to media devices in JavaScript.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences
w.mediaDevicesEnabled = true
w.mediaStreamEnabled = true
```

**Notes:** Default is false.

You may need to enable mediaStreamEnabled and mediaDevicesEnabled together to allow WebRTC. Also you need permissions to access camera and microphone via AVFoundation functions.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.18 mediaStreamEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to allow access to media streaming in JavaScript.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences
w.mediaDevicesEnabled = true
w.mediaStreamEnabled = true
```

**Notes:** Default is false.

You may need to enable mediaStreamEnabled and mediaDevicesEnabled together to allow WebRTC. Also you need permissions to access camera and microphone via AVFoundation functions.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.19 minimumFontSize as Double

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum font size in points.
**Example:**

WKWebViewControlMBS1.WKWebView.Preferences.minimumFontSize = 20

**Notes:** The default value is 0.
(Read and Write property)

### 191.12.20 plugInsEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether plug-ins are enabled.
**Example:**

WKWebViewControlMBS1.WKWebView.Preferences.plugInsEnabled = False

**Notes:** The default value is false.
Deprecated for macOS 10.15.
(Read and Write property)

### 191.12.21 shouldPrintBackgrounds as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether webkit draws background on printing.
**Example:**

HTMLViewer1.WKWebView.Preferences.shouldPrintBackgrounds = False

**Notes:** (Read and Write property)

### 191.12.22 siteSpecificQuirksModeEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean that indicates whether to apply site-specific compatibility workarounds.
**Notes:** The default value for this preference is true.
Requires macOS 12.3 or newer.
(Read and Write property)

### 191.12.23 standardFontFamily as String

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the standard font family.
**Notes:** (Read and Write property)

### 191.12.24 tabFocusesLinks as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop only.

**Function:** If tabFocusesLinks is true, the tab key will focus links and form controls.
**Notes:** The Option key temporarily reverses this preference.
(Read and Write property)

### 191.12.25 telephoneNumberDetectionIsEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether phone number detection in text is enabled.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences

w.telephoneNumberDetectionIsEnabled = True
```

**Notes:** Default is false.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

### 191.12.26 TextInteractionEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether text interactions are enabled.
**Notes:** Requires macOS 12.0 or iOS 15.0 or newer.
(Read and Write property)

### 191.12.27 webSecurityEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to enable/disable web security.
**Example:**

```
Dim w As WKPreferencesMBS = HTMLViewer1.WKWebViewMBS.Preferences
w.webSecurityEnabled = False
```

**Notes:** Default is true.

This property is included in the WebKit project, but not documented by Apple, so use with care and be aware that it may break in future (or gets officially documented in a future version of macOS).
(Read and Write property)

## 191.13 class WKUserScriptMBS

### 191.13.1 class WKUserScriptMBS

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A WKUserScript object represents a script that can be injected into a webpage.
**Notes:** Requires MacOS 10.10 or newer.
64-bit target only.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5
- MBS Xojo Plugins, version 19.5pr8

### 191.13.2 Methods

### 191.13.3 Constructor(Source as String, injectionTime as Integer, isForMainFrameOnly as Boolean)

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns an initialized user script that can be added to a user content controller.
**Notes:** source: The script,Äôs source code.
injectionTime: The time when the script should be injected into the webpage. Either InjectionTimeAtDocumentStart
or InjectionTimeAtDocumentEnd.
isForMainFrameOnly: A Boolean value indicating whether the script should be injected only into the main frame (YES) or into all frames (NO).

### 191.13.4 Properties

### 191.13.5 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.13.6 injectionTime as Integer

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The time when the script should be injected into the webpage.
**Notes:** Either InjectionTimeAtDocumentStart or InjectionTimeAtDocumentEnd.
(Read only property)

### 191.13.7 isForMainFrameOnly as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the script should be injected only into the main frame (true) or into all frames (false).
**Notes:** (Read only property)

### 191.13.8 Source as String

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop & iOS.

**Function:** The script,Äôs source code.
**Notes:** (Read only property)

### 191.13.9 Constants

InjectionTime

| Constant | Value | Description |
|---|---|---|
| InjectionTimeAtDocumentEnd | 1 | Inject the script after the document finishes loading, but before other subresources finish loading. |
| InjectionTimeAtDocumentStart | 0 | Inject the script after the document element is created, but before any other content is loaded. |

## 191.14 class WKWebViewConfigurationMBS

### 191.14.1 class WKWebViewConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A collection of properties used to initialize a web view.
**Notes:** Using the WKWebViewConfiguration class, you can determine how soon a webpage is rendered, how media playback is handled, the granularity of items that the user can select, and many other options. WKWebViewConfiguration is only used when a web view is first initialized. You cannot use this class to change the web view's configuration after it has been created.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr6
- News from the MBS Xojo Plugins Version 20.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1
- MBS Xojo Plugins, version 20.1pr4

### 191.14.2 Methods

### 191.14.3 Constructor(WKWebView as WKWebViewMBS)

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates Xojo object referencing configuration object for web viewer.

### 191.14.4 copy as WKWebViewConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the configuration object.

### 191.14.5 Properties

### 191.14.6 allowsAirPlayForMediaPlayback as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether AirPlay is allowed.
**Notes:** The default value is true.
(Read and Write property)

### 191.14.7 allowsInlineMediaPlayback as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that indicates whether HTML5 videos play inline or use the native full-screen controller.
**Notes:** Set this property to true to play videos inline, or false to use the native full-screen controller. When adding a video element to an HTML document on iPhone, you must also include the playsinline attribute. The default value of this property is false for iPhone and true for iPad.
(Read and Write property)

### 191.14.8 allowsPictureInPictureMediaPlayback as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that indicates whether HTML5 videos can play Picture in Picture.
**Notes:** The default value of this property is true.
(Read and Write property)

### 191.14.9 applicationNameForUserAgent as String

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The name of the application as used in the user agent string.
**Notes:** (Read and Write property)

### 191.14.10 Handle as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 191.14.11 limitsNavigationsToAppBoundDomains as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the web view limits navigation to pages within the app,Äôs domain.
**Notes:** Requires macOS 11.0 or newer.
(Read and Write property)

### 191.14.12 mediaTypesRequiringUserActionForPlayback as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Determines which media types require a user gesture to begin playing.
**Notes:** Use AudiovisualMediaTypeNone to indicate that no user gestures are required to begin playing media.
(Read and Write property)

### 191.14.13 Preferences as WKPreferencesMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The preference object to be used by the web view.
**Notes:** (Read and Write property)

### 191.14.14 suppressesIncrementalRendering as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the web view suppresses content rendering until it is fully loaded into memory.
**Notes:** The default value is false.
(Read and Write property)

### 191.14.15 upgradeKnownHostsToHTTPS as Boolean

MBS Mac64bit Plugin, Plugin Version: 23.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that indicates whether the web view should automatically upgrade supported HTTP requests to HTTPS.
**Notes:** Requires macOS 11.3 or newer.

(Read and Write property)

### 191.14.16 userInterfaceDirectionPolicy as Integer

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** The directionality of user interface elements.
**Notes:** The default value is serInterfaceDirectionPolicyContent. For other possible values, see constants.
Available on MacOS 10.12 or newer.

The policy used to determine the directionality of user interface elements in a web view.
When UserInterfaceDirectionPolicyContent is specified, the directionality of user interface elements is affected by the dir attribute or the direction CSS property. When UserInterfaceDirectionPolicySystem is specified, the directionality of user interface elements is affected by the direction of the view.
(Read and Write property)

### 191.14.17 Constants

Audiovisual Media Types

| Constant | Value | Description |
|---|---|---|
| AudiovisualMediaTypeAll | -1 | All media types require a user gesture to begin playing. |
| AudiovisualMediaTypeAudio | 1 | Media types containing audio require a user gesture to begin playing. |
| AudiovisualMediaTypeNone | 0 | No media types require a user gesture to begin playing. |
| AudiovisualMediaTypeVideo | 2 | Media types containing video require a user gesture to begin playing. |

User Interface Direction Policy

| Constant | Value | Description |
|---|---|---|
| UserInterfaceDirectionPolicyContent | 0 | The directionality follows the CSS/HTML/XHTML specifications. This is default value of userInterfaceDirectionPolicy. |
| UserInterfaceDirectionPolicySystem | 1 | The directionality follows the view's userInterfaceLayoutDirection propert |

## 191.15 control WKWebViewControlMBS

### 191.15.1 control WKWebViewControlMBS

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** A WKWebView object displays interactive web content, such as for an in-app browser.
**Example:**

```
// print a WKWebViewControlMBS to PDF file:

dim browser as WKWebViewControlMBS // your control showing website
Dim pi As NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo

Dim f As FolderItem = SpecialFolder.Desktop.Child("test.pdf")
pi.SetSaveDestination f

Dim po As NSPrintOperationMBS = browser.printOperation(pi)

po.showsPrintPanel = False
po.showsProgressPanel = False

If po.runOperation Then
f.launch
End If
```

**Notes:** This is a control to use WebKit in 32-bit and WebKit 2 in 64-bit.
Most of the events provided by Xojo for the control will not work.
But we can add features over time as needed.
Let us know if you need a method from WKWebView or an event from WKNavigationDelegate or WKUIDelegate.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- Three new controls for iOS in Xojo
- HTMLViewer JavaScript communication for Xojo
- MBS Xojo Plugins in version 19.0
- HTMLViewer JavaScript communication for Xojo
- Custom JavaScript messages to WKWebViewControlMBS

- Enable Web Inspector for WebViewer
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0

**Videos**

- XDC 2020 MBS Plugins Presentation
- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 18.3, page 43: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 41: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes
- 17.2, page 10: News
- 16.2, page 9: News
- 15.2, page 10: News

### 191.15.2 Methods

### 191.15.3 addScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** Adds a script message handler.
**Example:**

```
// register once
browser.addScriptMessageHandler "test"
// later use in javascript:
browser.EvaluateJavaScript("window.webkit.messageHandlers.test.postMessage('Hello');")
```

**Notes:** Name: The name of the message handler.

Adding a script message handler with name name causes the JavaScript function window.webkit.messageHandlers.name.postMessage(messageBody) to be defined in all frames in all web views that use the user content controller.

### 191.15.4 addUserScript(userScript as WKUserScriptMBS)

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Adds an user script.

### 191.15.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Evaluates JavaScript.
**Example:**

```
Dim e As NSErrorMBS

// returns array of variants with doubles
Dim v As Variant = WKWebViewControlMBS1.EvaluateJavaScript("o = [ 1,2,3 ] ;", e)
Dim vd() As Variant = v

// returns array of variants with strings
Dim vv As Variant = WKWebViewControlMBS1.EvaluateJavaScript("o = [ ""a"",""b"",""d"" ] ;", e)
Dim vs() As Variant = vv

// returns dictionary
Dim v3 As Variant = WKWebViewControlMBS1.EvaluateJavaScript("o = { a:1 } ", e)
Dim dd As Dictionary = v3

Break
```

**Notes:** Synchronous version which waits for JavaScript to return the value.
Error is set in case of errors.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.15.6 EvaluateJavaScript(JavaScript as String, Tag as String = "") 22828

### 191.15.6 EvaluateJavaScript(JavaScript as String, Tag as String = "")

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** Evaluates JavaScript.

**Notes:** Calls later JavaScriptEvaluated event with result and passed tag value.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.15.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant 22828

### 191.15.7 goBack

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to the back item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.15.8 goForward

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to the forward item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.15.9 goToBackForwardListItem(Item as WKBackForwardListItemMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to an item from the back-forward list and sets it as the current item.
**Notes:** item: The item to which to navigate. Must be one of the items in the web view's back-forward list.

Sets Navigation property.

### 191.15.10 LoadData(Data as MemoryBlock, MIMEType as String, textEncodingName as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance
```

```
browser.LoadData "<p>Hello World</p>", "text/html", "UTF-8", ""
```

**Notes:** data: The data to use as the contents of the webpage.
MIMEType: The MIME type of the data.
characterEncodingName: The data's character encoding name.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.15.11 LoadFileURL(File as FolderItem, readAccessItem as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested file.
**Example:**

```
Dim w as WKWebViewControlMBS // your web viewer
Dim HTMLFile as folderItem = getfolderItem("test.html")

// pass folderitem parent to allow read to other files in same folder
w.LoadFileURL HTMLFile, HTMLFile.parent
```

**Notes:** Navigates to the requested file URL on the filesystem.
file: The file URL to which to navigate.
readAccessItem: The file or folder to allow read access to.
If readAccessItem references a single file, only that file may be loaded by WebKit.
If readAccessItem references a directory, files inside that file may be loaded by WebKit.

Sets Navigation property.

### 191.15.12 LoadHTML(htmlText as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.LoadHTML "<p>Hello World</p>"
```

**Notes:** htmlText: The string to use as the contents of the webpage.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.15.13 LoadURL(URL as string)

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested URL.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

call browser.LoadURL "https://www.mbsplugins.de/xojo"
```

**Notes:** Sets Navigation property.
Sets Navigation property.

### 191.15.14 LoadURLRequest(Request as NSURLRequestMBS)

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Navigates to a requested URL.
**Notes:** Sets Navigation property.

### 191.15.15 printOperation(printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Creates a print operation for the current web viewer.
**Example:**

```
dim browser as WKWebViewControlMBS // your web viewer
Dim pi As NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
Dim po As NSPrintOperationMBS = browser.printOperation(pi)

po.showsPrintPanel = True
po.showsProgressPanel = True
```

po.runOperationModalForWindow(Self)

**Notes:** Works for WebKit 1.x and 2.x.

For WebKit 2.x may run into endless loop for some websites due to bugs in Apple's WebKit framework.

### 191.15.16 reload

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the current page.
**Example:**

```
Public Sub Reload(browser as WKWebViewControlMBS, force as Boolean)
If force Then
Call browser.reloadFromOrigin
Else
Call browser.reload
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.15.17 reloadFromOrigin

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Reloads the current page, performing end-to-end revalidation using cache-validating conditionals if possible.
**Example:**

```
Public Sub Reload(browser as WKWebViewControlMBS, force as Boolean)
If force Then
call browser.reloadFromOrigin
Else
call browser.reload
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.15.18 removeAllUserScripts

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes all associated user scripts.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.removeAllUserScripts
```

### 191.15.19 removeScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** Removes a script message handler.
**Notes:** name: The name of the message handler to remove.

### 191.15.20 runOpenPanelWithParametersCompleted(URLs() as NSURLMBS)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: Desktop only.

**Function:** Pass result for a runOpenPanelWithParameters event here.
**Notes:** Pass nil to indicate cancel was pressed.

### 191.15.21 setMagnification(magnification as double, pointX as double, pointY as double)

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** Scales the page content by a specified factor and centers the result on a specified point.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

// zoom to 200% on 100/100
browser.setMagnification(2, 100, 100)
```

**Notes:** magnification: The factor by which to scale the content.
x/y: The point (in view space) to center magnification on. As usual with Cocoa, bottom is y = 0.

For MacOS 64-bit only.

### 191.15.22 setUsePrivateBrowsing(value as Boolean)

MBS Mac64bit Plugin, Plugin Version: 20.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to create WKWebViewControlMBS with private browsing enabled.
**Example:**

```
WKWebViewControlMBS.setUsePrivateBrowsing True
```

**Notes:** Set this property to true before creating the WKWebViewControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

### 191.15.23 stopLoading

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** Stops loading all resources on the current page.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.stopLoading
```

### 191.15.24 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Requests a snapshot.
**Notes:** This is synchronous version which waits for image to be finished.
In case of error the result is nil and error may be set.
See also:

- 191.15.25 takeSnapshot(tag as string = "") 22835


### 191.15.25 takeSnapshot(tag as string = "")

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: Desktop only.

**Function:** Requests a snapshot.
**Notes:** Calls later takeSnapshotCompleted event.
Tag is passed to event to distinguish various snapshot requests.
See also:


- 191.15.24 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS 22834


### 191.15.26 userScripts as WKUserScriptMBS()

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** The user scripts associated with the user content controller.

### 191.15.27 Properties

### 191.15.28 AcceptTabs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the control should accept tab keys.
**Notes:** If true, the plugin will not forward the tab keydown/keyup events to Xojo, because Xojo would do switch to next control.
(Read and Write property)

### 191.15.29 allowFileAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** Allow file access for file URLs.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.allowFileAccessFromFileURLs = True
```

**Notes:** Access to files is allowed for some files.
Please check WebKit documentation for details.

Set allowFileAccessFromFileURLs and allowUniversalAccessFromFileURLs to true to disable all the security checks to block local file access for websites. allowUniversalAccessFromFileURLs would allow all file URLs. allowFileAccessFromFileURLs would only allow in same path.
(Read and Write property)

### 191.15.30 allowsBackForwardNavigationGestures as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether horizontal swipe gestures will trigger back-forward list navigations.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.allowsBackForwardNavigationGestures = True
```

**Notes:** The default value is false.
Available for 64-bit on macOS 10.10 or newer.
(Read and Write property)

### 191.15.31 allowsLinkPreview as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value that determines whether pressing on a link displays a preview of the destination for the link.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsLinkPreview = True
```

**Notes:** (Read and Write property)

### 191.15.32 allowsMagnification as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether magnify gestures will change the web view,Äôs magnification.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsMagnification = True
```

**Notes:** The default value is false. You can set the magnification property even if allowsMagnification is set to false.
For MacOS 64-bit only.
(Read and Write property)

### 191.15.33 allowUniversalAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 18.0, Platform: macOS, Targets: Desktop only.

**Function:** Allow universal file access for URLs.
**Notes:** Any file URL will be loaded if true.
Please check WebKit documentation for details.

Does not work in MacOS 10.14.
(Read and Write property)

### 191.15.34 backForwardList as WKBackForwardListMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** The web view's back-forward list.
**Notes:** (Read only property)

### 191.15.35 CanGoBack as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether there is a back item in the back-forward list that can be navigated to.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "CanGoBack: "+If(Browser.CanGoBack, "yes", "no")
```

**Notes:** (Read only property)

### 191.15.36 CanGoForward as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether there is a forward item in the back-forward list that can be navigated to.
**Example:**

```
'Dim browser As WKWebViewControlMBS // your instance

MsgBox "CanGoForward: "+If(Browser.CanGoForward, "yes", "no")
```

**Notes:** (Read only property)

### 191.15.37 customUserAgent as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** The custom user agent string.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.customUserAgent = "MyBrowser/1.0"
```

**Notes:** If no custom user agent string has been set, this is set to "".
Available in 32-bit. Available in 64-bit for macOS 10.11 or newer.
(Read and Write property)

### 191.15.38 developerExtrasEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether developer extras are enabled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

// enable context menu entry to show developer extras
browser.developerExtrasEnabled = True
```

**Notes:** For WebKit 2 (64bit) to enable the context menu to inspect items.
(Read and Write property)

### 191.15.39 EstimatedProgress as Double

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** An estimate of what fraction of the current navigation has been loaded.
**Notes:** This value ranges from 0.0 to 1.0 based on the total number of bytes expected to be received, including the main document and all of its potential subresources. After a navigation loading completes, the estimatedProgress remains at 1.0 until a new navigation starts, at which point the estimatedProgress is reset to 0.0.
(Read only property)

### 191.15.40 hasOnlySecureContent as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether all resources on the page have been loaded through securely encrypted connections.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "hasOnlySecureContent: "+If(Browser.hasOnlySecureContent, "yes", "no")
```

**Notes:** Only set for 64-bit, always false on 32-bit.
(Read only property)

### 191.15.41 IsLoading as Boolean

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether the view is currently loading content.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

// load a page
browser.LoadURL "https://www.mbsplugins.de/xojo"

// wait synchronously for website loading
While browser.IsLoading
DelayMBS 0.1
Wend

MsgBox "loaded"
```

**Notes:** (Read only property)

### 191.15.42 javaEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether java is enabled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.15.43 javaScriptCanOpenWindowsAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether javascript can open new windows.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

// disable popup windows
Browser.javaScriptCanOpenWindowsAutomatically = False
```

**Notes:** (Read and Write property)

### 191.15.44 javaScriptEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether javascript is enabled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaScriptEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.15.45 loadsImagesAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether to load images automatically.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

// disable loading of images
browser.loadsImagesAutomatically = False#
```

**Notes:** (Read and Write property)

### 191.15.46 magnification as Double

MBS Mac64bit Plugin, Plugin Version: 19.4, Platform: macOS, Targets: Desktop only.

**Function:** The factor by which the page content is currently scaled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.magnification = 2.0
```

**Notes:** The default value is 1.0.
For MacOS 64-bit only.
(Read and Write property)

### 191.15.47 minimumFontSize as Double

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** The minimum font size to use.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

browser.minimumFontSize = 20
```

**Notes:** (Read and Write property)

### 191.15.48 Navigation as WKNavigationMBS

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** The current navigation action.
**Notes:** (Read only property)

### 191.15.49 plugInsEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.3, Platform: macOS, Targets: Desktop only.

**Function:** Whether plugins are enabled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "plugInsEnabled: "+If(Browser.plugInsEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.15.50 privateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether private browsing is enabled.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox "privateBrowsing: "+If(Browser.privateBrowsing, "yes", "no")
```

**Notes:** If enabled, no data should be stored for cookies or cache on disk, so it's cleared when web viewer is destroyed (Inkognito mode).
Default is non-private mode for the web viewer.

For WebKit 2.x, it looks like you can't change mode after web viewer was created.
So use UsePrivateBrowsing there.
(Read and Write property)

### 191.15.51 Title as String

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** The page title.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox Browser.Title
```

**Notes:** (Read only property)

### 191.15.52 URL as String

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** The active URL.
**Example:**

```
Dim browser As WKWebViewControlMBS // your instance

MsgBox Browser.URL
```

**Notes:** This is the URL that should be reflected in the user interface.
(Read only property)

### 191.15.53 UsePrivateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to create WKWebViewControlMBS with private browsing enabled.
**Example:**

WVWebViewModuleMBS.UsePrivateBrowsing = True

**Notes:** Set this property to true before creating the WKWebViewControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

Due to a bug in Xojo 2019r2 and older, please use WVWebViewModuleMBS.UsePrivateBrowsing property instead.
(Read and Write property)

### 191.15.54 View as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: Desktop only.

**Function:** The used view.
**Notes:** Should be either a WebView (32bit) or WKWebView (64bit).
(Read only property)

### 191.15.55 WKWebView as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** The used WKWebViewMBS view.
**Notes:** Always a WKWebViewMBS in 64-bit, but nil for 32-bit applications.
(Read only property)

### 191.15.56 Events

### 191.15.57 BoundsChanged

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the bounds, but not the frame, changed.

### 191.15.58 Close

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 191.15.59 Closing

Plugin Version: 16.4, Platform: macOS, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 191.15.60 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Mac64bit Plugin, Plugin Version: 22.1, Platform: macOS, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 191.15.61 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 191.15.62 CreateWebView(URL as String, request as NSURLRequestMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: .

**Function:** Creates a new web view.
**Notes:** If needed we can add configuration, windowFeatures and navigationAction parameters in future version.

Return a web viewer control or nil.

The web view returned must be created with the specified configuration. WebKit will load the request in the returned web view.

If you do not implement this method or return nil, the web view will cancel the navigation.

### 191.15.63 decidePolicyForNavigationAction(navigationAction as WKNavigationActionMBS, decisionHandler as WKPolicyForNavigationActionDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation.
**Notes:** Please inspect navigationAction to find the information about what action happened.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

If you want to open this in a new window/tab, please call decisionHandler.Cancel method here, take the URL and load it in the new WebView in the new window/tab.

Like the CancelClose event in Xojo, you can call decisionHandler.Cancel method to call it.

### 191.15.64 decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation after its response is known.

**Example:**

```
Sub decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS) Handles decidePolicyForNavigationResponse
dim MimeType as string = navigationResponse.response.MIMEType

if MimeType = "application/zip" or _
MimeType = "application/x-tar" or _
MimeType = "application/octet-stream" then
// we download archive files
decisionHandler.Download
else
// allow normal website to load
decisionHandler.Allow

end if
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

### 191.15.65 DidClose

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: .

**Function:** The webviewer closed.
**Notes:** Notifies your app that the DOM window object's close() method completed successfully.

Your app should remove the web view from the view hierarchy and update the UI as needed, such as by closing the containing browser tab or window.

### 191.15.66 didCloseContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Did close contextual menu.
**Notes:** Allows you to restart any animation you may have stopped in the willShowContextualMenu event.

### 191.15.67 didCommitNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when content starts arriving for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.15.68 didFailNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when an error occurs during a committed main frame navigation.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.15.69 didFailProvisionalNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when an error occurs while starting to load data for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.15.70 didFinishNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when a main frame navigation completes.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.
Same as DocumentComplete in HTMLViewer.

### 191.15.71 DidReceiveAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the app to respond to an authentication challenge.
**Notes:** challenge: The authentication challenge.

AuthChallengeDisposition: The option to use to handle the challenge. For a list of options, see AuthChallenge* constants.
credential: The credential to use for authentication when the disposition parameter contains the value AuthChallengeUseCredential. Specify nil to continue without a credential.

If you don,Äôt implement this method, the web view responds to the authentication challenge with the AuthChallengeRejectProtectionSpace disposition.

### 191.15.72 didReceiveScriptMessage(Body as Variant, name as String)

MBS Mac64bit Plugin, Plugin Version: 18.0, Platform: macOS, Targets: .

**Function:** Invoked when a script message is received from a webpage.
**Notes:** body: The body of the message. Automatic translated from Javascript types.
name: The name of the message handler to which the message is sent.

### 191.15.73 didReceiveServerRedirectForProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when a server redirect is received for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.15.74 didStartProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 17.0, Platform: macOS, Targets: .

**Function:** Invoked when a main frame navigation starts.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.15.75 downloadDecideDestinationUsingResponse(download as WKDownloadMBS, response as NSURLResponseMBS, suggestedFilename as String, byref destination as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the app to provide a file destination where the system should write the download data.
**Notes:** download: The download that needs a file destination where the systems should write the download data.
response: A response from the server for an HTTP request, or a synthesized response for a blob download.
suggestedFilename: A string with a filename suggestion to use in creating the file destination.
destination: A file destination where the systems should write the download data.

Set destination to where to store the file. Or set to nil to cancel.

The suggested filename can come from the response or from the web content.
The destination file URL must meet the following requirements:

- It,Äôs a file that doesn,Äôt exist.
- It,Äôs in a directory that exists.
- It,Äôs in a directory that WebKit can write to.

### 191.15.76 downloadDidFailWithError(download as WKDownloadMBS, error as NSErrorMBS, resumeData as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells your app that the download failed, with error information and data you can use to restart the download.
**Notes:** download: The download that failed.
error: An error describing what caused the download to fail.
resumeData: A data object you use to restart the download.

To restart a failed download, call resumeDownloadFromResumeData with resumeData.

### 191.15.77 downloadDidFinish(download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** This event tells you that the download finished.
**Notes:** download: The download that finished.

### 191.15.78 downloadDidReceiveAuthenticationChallenge(download as WKDownloadMBS, challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the delegate to respond to an authentication challenge.
**Notes:** download: The download that received the authentication challenge.
challenge: The authentication challenge.

Determine how to respond to the authentication challenge in this method. Then set AuthChallengeDisposition to AuthChallenge* constants and pass the credentials to use.

If you don,Äôt implement this method, the web view responds to the challenge with AuthChallengeRejectProtectionSpace.

### 191.15.79 downloadWillPerformHTTPRedirection(download as WKDownloadMBS, response as NSURLResponseMBS, request as NSURLRequestMBS, byref DownloadRedirectPolicy as Integer)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Asks the delegate to respond to the download,Äôs redirect response.
**Notes:** download: The download that receives the redirect response.
response: The redirect response.
request: The new request the web view sends as a result of the redirect response.

Set DownloadRedirectPolicy to either DownloadRedirectPolicyAllow or DownloadRedirectPolicyCancel.

A download redirect policy that indicates whether to proceed with the redirect.

Determine whether to proceed with the redirect. Then invoke the decisionHandler closure, providing a download redirect policy that indicates whether to proceed with the redirect.

If you don,Äôt implement this event, the web view proceeds with all redirects.

### 191.15.80 EnableMenuItems

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 191.15.81 EstimatedProgressChanged(estimatedProgress as double, oldEstimatedProgress as double)

MBS Mac64bit Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The estimated progress for loading the webpage changed.
**Notes:** This event may be called often, so don't do much here!

### 191.15.82 FocusLost

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 191.15.83 FocusReceived

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In older Xojo versions, this event is named GotFocus.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 191.15.84 FrameChanged

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The event called when the frame changed.
**Notes:** This event notifies you, that the control changed it's bounding frame, which is position and/or size.

### 191.15.85 GotFocus

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control itself got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.
**Notes:**

This only fires if the control itself got focus and not a sub control.

### 191.15.86 JavaScriptEvaluated(JavaScript as String, Result as Variant, Error as NSErrorMBS, Tag as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** JavaScript was evaluated.
**Notes:** Error is only set with 64-bit, not with 32-bit.
Tag is passed from EvaluateJavaScript call.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.

### 191.15.87 LostFocus

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The control lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

This only fires if the control itself lost focus and not a sub control.

### 191.15.88 MenuBarSelected

Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 191.15.89 MouseDown(x as Integer, y as Integer, Modifiers as Integer) As Boolean

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was pressed inside the control,Äôs region at the location passed in to x, y.
**Notes:** The coordinates x and y are local to the control, i.e. they represent the position of the mouse click relative to the upper-left corner or the Control.
Return True if you are going to handle the MouseDown. In such a case:

- The Action event, if any, will not execute and the state of the object will not change.
- You will receive the MouseDrag and MouseUp events.

If you return False, the system handles the MouseDown so the above event handlers do not get called.

### 191.15.90 MouseDrag(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** This event fires continuously after the mouse button was pressed inside the Control.
**Notes:** Mouse location is local to the control passed in to x, y.
As this event is fired continuously (hundreds of time per second), it is your responsibility to determine if the mouse has really moved.

### 191.15.91 MouseUp(x as Integer, y as Integer)

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The mouse button was released.
**Notes:** Use the x and y parameters to determine if the mouse button was released within the control's boundaries.

### 191.15.92 navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that a navigation action became a download.
**Example:**

```
Sub navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WK-
DownloadMBS) Handles navigationActionDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationAction: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.15.93 navigationResponseDidBecomeDownload(navigationResponse as WK-NavigationResponseMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that a navigation response became a download.
**Example:**

```
Sub navigationResponseDidBecomeDownload(navigationResponse as WKNavigationResponseMBS, down-
load as WKDownloadMBS) Handles navigationResponseDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.15.94 Open

MBS Mac64bit Plugin, Plugin Version: 16.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 191.15.95 Opening

Plugin Version: 16.4, Platform: macOS, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 191.15.96 runJavaScriptAlertPanel(initiatedByFrame as WKFrameInfoMBS, message as String)

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript alert panel.
**Notes:** message: The message to display.

If you do not implement this method, the web view will behave as if the user selected the OK button.

### 191.15.97 runJavaScriptConfirmPanel(initiatedByFrame as WKFrameInfoMBS, message as String) as boolean

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript confirm panel.
**Notes:** message: The message to display.

Return true if the user chose OK, false if the user chose Cancel.

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.15.98 runJavaScriptTextInputPanel(initiatedByFrame as WKFrameInfoMBS, prompt as String, defaultText as String) as String

MBS Mac64bit Plugin, Plugin Version: 16.5, Platform: macOS, Targets: .

**Function:** Displays a JavaScript text input panel.
**Notes:** message: The message to display.
defaultText: The initial text to display in the text entry field.

Return the entered text if the user chose OK, otherwise "".

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.15.99 runOpenPanelWithParameters(initiatedByFrame as WKFrameInfoMBS, allowsMultipleSelection as Boolean, allowsDirectories as Boolean)

MBS Mac64bit Plugin, Plugin Version: 22.0, Platform: macOS, Targets: .

**Function:** Displays a file upload panel.
**Notes:** Please call runOpenPanelWithParametersCompleted method later with result. Pass the selected URLs if the user chose "OK", otherwise nil.

You can use sheet window for the file picker and later call the runOpenPanelWithParametersCompleted method or call it right in the event if you do it synchronously.

If this method is not implemented, the web view behaves as if the user selected the Cancel button.

Not available on iOS. Implemented for macOS 64-bit applications.

### 191.15.100 ScaleFactorChanged(NewFactor as Double)

MBS Mac64bit Plugin, Plugin Version: 17.1, Platform: macOS, Targets: .

**Function:** The backing store scale factor has changed.
**Notes:** Please invalidate any cached bitmaps or other relevant state.

### 191.15.101 takeSnapshotCompleted(image as NSImageMBS, error as NSErrorMBS, tag as string)

MBS Mac64bit Plugin, Plugin Version: 17.4, Platform: macOS, Targets: .

**Function:** Called when snapshot of website is completed.
**Notes:** If snapshot creation failed, error is set.

### 191.15.102 TitleChanged(Title as String, oldTitle as string)

MBS Mac64bit Plugin, Plugin Version: 19.0, Platform: macOS, Targets: .

**Function:** The title of the webpage changed.

### 191.15.103 WebContentProcessDidTerminate

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: macOS, Targets: .

**Function:** Tells the app that the web view,Äôs content process was terminated.
**Notes:** Web views use a separate process to render and manage web content. WebKit calls this method when the process for the specified web view terminates for any reason.

### 191.15.104 willShowContextualMenu(menu as NSMenuMBS, NSEvent as NSEventMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: macOS, Targets: .

**Function:** Will show contextual menu.
**Notes:** Your chance to modify the menu before it is shown, e.g. to add menu entries.

### 191.15.105 Constants

Authentication Challenge Responses

| Constant | Value | Description |
|---|---|---|
| AuthChallengeCancelAuthenticationChallenge | 2 | Cancel the entire request. The provided credential parameter is |
| AuthChallengePerformDefaultHandling | 1 | Use the default handling for the challenge as though this delegate not implemented. The provided credential parameter is ignored. |
| AuthChallengeRejectProtectionSpace | 3 | Reject this challenge, and call the authentication delegate meth the next authentication protection space. The provided credent is ignored. |
| AuthChallengeUseCredential | 0 | Use the specified credential, which may be nil. |

Redirect Policy

| Constant | Value | Description |
|---|---|---|
| DownloadRedirectPolicyAllow | 1 | Allow a redirect to proceed. |
| DownloadRedirectPolicyCancel | 0 | Cancel the redirect action. |

## 191.16 control WKWebViewIOSControlMBS

### 191.16.1 control WKWebViewIOSControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A WKWebView object displays interactive web content, such as for an in-app browser.
**Notes:** This is a control is for iOS only and uses 64-bit.

But we can add features over time as needed.
Let us know if you need a method from WKWebView or an event from WKNavigationDelegate or WKUIDelegate.
**Blog Entries**

- MBS Xojo Plugins, version 22.4pr1
- MBS Xojo Plugins, version 22.1pr6
- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- Three new controls for iOS in Xojo
- MBS Xojo Plugins, version 20.6pr3

### 191.16.2 Methods

### 191.16.3 addScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Adds a script message handler.
**Example:**

```
// register once
browser.addScriptMessageHandler "test"
// later use in javascript:
browser.EvaluateJavaScript("window.webkit.messageHandlers.test.postMessage('Hello');")
```

**Notes:** Name: The name of the message handler.

Adding a script message handler with name name causes the JavaScript function window.webkit.messageHandlers.name.postMessage(messageBody) to be defined in all frames in all web views that use the user content controller.

### 191.16.4 addUserScript(userScript as WKUserScriptMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Adds an user script.

### 191.16.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Evaluates JavaScript.
**Example:**

```
Dim e As NSErrorMBS

// returns array of variants with doubles
Dim v As Variant = WKWebViewIOSControlMBS1.EvaluateJavaScript("o = [ 1,2,3 ] ;", e)
Dim vd() As Variant = v

// returns array of variants with strings
Dim vv As Variant = WKWebViewIOSControlMBS1.EvaluateJavaScript("o = [ ""a"",""b"",""d"" ] ;", e)
Dim vs() As Variant = vv

// returns dictionary
Dim v3 As Variant = WKWebViewIOSControlMBS1.EvaluateJavaScript("o = { a:1 } ", e)
Dim dd As Dictionary = v3

Break
```

**Notes:** Synchronous version which waits for JavaScript to return the value.
Error is set in case of errors.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.16.6 EvaluateJavaScript(JavaScript as String, Tag as String = "") 22861

### 191.16.6 EvaluateJavaScript(JavaScript as String, Tag as String = "")

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Evaluates JavaScript.

**Notes:** Calls later JavaScriptEvaluated event with result and passed tag value.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.
See also:

- 191.16.5 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant 22861

### 191.16.7 goBack

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to the back item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.16.8 goForward

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to the forward item in the back-forward list.
**Notes:** Sets Navigation property.

### 191.16.9 goToBackForwardListItem(Item as WKBackForwardListItemMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to an item from the back-forward list and sets it as the current item.
**Notes:** item: The item to which to navigate. Must be one of the items in the web view's back-forward list.

Sets Navigation property.

### 191.16.10 LoadData(Data as MemoryBlock, MIMEType as String, textEncodingName as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance
```

```
browser.LoadData "<p>Hello World</p>", "text/html", "UTF-8", ""
```

**Notes:** data: The data to use as the contents of the webpage.
MIMEType: The MIME type of the data.
characterEncodingName: The data's character encoding name.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.16.11 LoadFileURL(File as FolderItem, readAccessItem as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to a requested file.
**Notes:** Navigates to the requested file URL on the filesystem.
file: The file URL to which to navigate.
readAccessItem: The file or folder to allow read access to.
If readAccessItem references a single file, only that file may be loaded by WebKit.
If readAccessItem references a directory, files inside that file may be loaded by WebKit.

Sets Navigation property.

### 191.16.12 LoadHTML(htmlText as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.LoadHTML "<p>Hello World</p>"
```

**Notes:** htmlText: The string to use as the contents of the webpage.
baseURL: A URL used to resolve relative URLs within the document.

Sets Navigation property.

### 191.16.13 LoadURL(URL as string)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to a requested URL.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

call browser.LoadURL "https://www.mbsplugins.de/xojo"
```

**Notes:** Sets Navigation property.
Sets Navigation property.

### 191.16.14 LoadURLRequest(Request as NSURLRequestMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Navigates to a requested URL.
**Notes:** Sets Navigation property.

### 191.16.15 reload

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Reloads the current page.
**Example:**

```
Public Sub Reload(browser as WKWebViewIOSControlMBS, force as Boolean)
If force Then
Call browser.reloadFromOrigin
Else
Call browser.reload
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.16.16 reloadFromOrigin

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Reloads the current page, performing end-to-end revalidation using cache-validating conditionals if possible.
**Example:**

```
Public Sub Reload(browser as WKWebViewIOSControlMBS, force as Boolean)
If force Then
call browser.reloadFromOrigin
Else
call browser.reload
End If
End Sub
```

**Notes:** Sets Navigation property.

### 191.16.17 removeAllUserScripts

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Removes all associated user scripts.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.removeAllUserScripts
```

### 191.16.18 removeScriptMessageHandler(Name as String)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Removes a script message handler.
**Notes:** name: The name of the message handler to remove.

### 191.16.19 setUsePrivateBrowsing(value as Boolean)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether to create WKWebViewIOSControlMBS with private browsing enabled.
**Example:**

```
WKWebViewIOSControlMBS.setUsePrivateBrowsing True
```

**Notes:** Set this property to true before creating the WKWebViewIOSControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

### 191.16.20 stopLoading

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Stops loading all resources on the current page.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.stopLoading
```

### 191.16.21 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Requests a snapshot.
**Notes:** This is synchronous version which waits for image to be finished.
In case of error the result is nil and error may be set.
See also:

- 191.16.22 takeSnapshot(tag as string = "") 22866

### 191.16.22 takeSnapshot(tag as string = "")

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Requests a snapshot.
**Notes:** Calls later takeSnapshotCompleted event.
Tag is passed to event to distinguish various snapshot requests.
See also:

- 191.16.21 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS 22866

### 191.16.23 userScripts as WKUserScriptMBS()

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The user scripts associated with the user content controller.

### 191.16.24 Properties

### 191.16.25 allowFileAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Allow file access for file URLs.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.allowFileAccessFromFileURLs = True
```

**Notes:** Access to files is allowed for some files.
Please check WebKit documentation for details.

Set allowFileAccessFromFileURLs and allowUniversalAccessFromFileURLs to true to disable all the security checks to block local file access for websites. allowUniversalAccessFromFileURLs would allow all file URLs. allowFileAccessFromFileURLs would only allow in same path.
(Read and Write property)

### 191.16.26 allowsBackForwardNavigationGestures as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether horizontal swipe gestures will trigger back-forward list navigations.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.allowsBackForwardNavigationGestures = True
```

**Notes:** The default value is false.
Available for 64-bit on macOS 10.10 or newer.
(Read and Write property)

### 191.16.27 allowsLinkPreview as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether pressing on a link displays a preview of the destination for the link.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsLinkPreview = True
```

**Notes:** (Read and Write property)

### 191.16.28 allowUniversalAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Allow universal file access for URLs.
**Notes:** Any file URL will be loaded if true.
Please check WebKit documentation for details.

Does not work in MacOS 10.14.
(Read and Write property)

### 191.16.29 backForwardList as WKBackForwardListMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The web view's back-forward list.
**Notes:** (Read only property)

### 191.16.30 CanGoBack as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether there is a back item in the back-forward list that can be navigated to.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance
```

```
MsgBox "CanGoBack: "+If(Browser.CanGoBack, "yes", "no")
```

**Notes:** (Read only property)

### 191.16.31 CanGoForward as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether there is a forward item in the back-forward list that can be navigated to.
**Example:**

```
'Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox "CanGoForward: "+If(Browser.CanGoForward, "yes", "no")
```

**Notes:** (Read only property)

### 191.16.32 customUserAgent as String

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The custom user agent string.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.customUserAgent = "MyBrowser/1.0"
```

**Notes:** If no custom user agent string has been set, this is set to "".
Available in 32-bit. Available in 64-bit for macOS 10.11 or newer.
(Read and Write property)

### 191.16.33 developerExtrasEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether developer extras are enabled.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

// enable context menu entry to show developer extras
browser.developerExtrasEnabled = True
```

**Notes:** For WebKit 2 (64bit) to enable the context menu to inspect items.
(Read and Write property)

### 191.16.34 EstimatedProgress as Double

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** An estimate of what fraction of the current navigation has been loaded.
**Notes:** This value ranges from 0.0 to 1.0 based on the total number of bytes expected to be received, including the main document and all of its potential subresources. After a navigation loading completes, the estimatedProgress remains at 1.0 until a new navigation starts, at which point the estimatedProgress is reset to 0.0.
(Read only property)

### 191.16.35 hasOnlySecureContent as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether all resources on the page have been loaded through securely encrypted connections.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox "hasOnlySecureContent: "+If(Browser.hasOnlySecureContent, "yes", "no")
```

**Notes:** Only set for 64-bit, always false on 32-bit.
(Read only property)

### 191.16.36 IsLoading as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view is currently loading content.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

// load a page
browser.LoadURL "https://www.mbsplugins.de/xojo"

// wait synchronously for website loading
While browser.IsLoading
DelayMBS 0.1
Wend

MsgBox "loaded"
```

**Notes:** (Read only property)

### 191.16.37 javaScriptCanOpenWindowsAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether javascript can open new windows.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

// disable popup windows
Browser.javaScriptCanOpenWindowsAutomatically = False
```

**Notes:** (Read and Write property)

### 191.16.38 javaScriptEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether javascript is enabled.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaScriptEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.16.39 loadsImagesAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether to load images automatically.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

// disable loading of images
browser.loadsImagesAutomatically = False#
```

**Notes:** (Read and Write property)

### 191.16.40 minimumFontSize as Double

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The minimum font size to use.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

browser.minimumFontSize = 20
```

**Notes:** (Read and Write property)

### 191.16.41 Navigation as WKNavigationMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The current navigation action.
**Notes:** (Read only property)

### 191.16.42 privateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether private browsing is enabled.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox "privateBrowsing: "+If(Browser.privateBrowsing, "yes", "no")
```

**Notes:** If enabled, no data should be stored for cookies or cache on disk, so it's cleared when web viewer is destroyed.
Default is non-private mode for the web viewer.

For WebKit 2.x, it looks like you can't change mode after web viewer was created.
So use UsePrivateBrowsing there.
(Read and Write property)

### 191.16.43 Title as String

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The page title.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox Browser.Title
```

**Notes:** (Read only property)

### 191.16.44 URL as String

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The active URL.
**Example:**

```
Dim browser As WKWebViewIOSControlMBS // your instance

MsgBox Browser.URL
```

**Notes:** This is the URL that should be reflected in the user interface.
(Read only property)

### 191.16.45 UsePrivateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** Whether to create WKWebViewIOSControlMBS with private browsing enabled.
**Example:**

WVWebViewModuleMBS.UsePrivateBrowsing = True

**Notes:** Set this property to true before creating the WKWebViewIOSControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.

Due to a bug in Xojo 2019r2 and older, please use WVWebViewModuleMBS.UsePrivateBrowsing property instead.
(Read and Write property)

### 191.16.46 View as NSViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The used view.
**Notes:** Should be either a WKWebView (64bit).
(Read only property)

### 191.16.47 WKWebView as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: iOS only.

**Function:** The used WKWebViewMBS view.
**Notes:** Always a WKWebViewMBS in 64-bit, but nil for 32-bit applications.
(Read only property)

### 191.16.48 Events

### 191.16.49 Close

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to close.

### 191.16.50 CreateWebView(URL as String, request as NSURLRequestMBS) as WKWebViewIOSControlMBS

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Creates a new web view.
**Notes:** If needed we can add configuration, windowFeatures and navigationAction parameters in future version.

Return a web viewer control or nil.

The web view returned must be created with the specified configuration. WebKit will load the request in the returned web view.

If you do not implement this method or return nil, the web view will cancel the navigation.

### 191.16.51 decidePolicyForNavigationAction(navigationAction as WKNavigationActionMBS, decisionHandler as WKPolicyForNavigationActionDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation.
**Notes:** Please inspect navigationAction to find the information about what action happened.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

If you want to open this in a new window/tab, please call decisionHandler.Cancel method here, take the URL and load it in the new WebView in the new window/tab.

Like the CancelClose event in Xojo, you can call decisionHandler.Cancel method to call it.

### 191.16.52 decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Decides whether to allow or cancel a navigation after its response is known.
**Example:**

```
Sub decidePolicyForNavigationResponse(navigationResponse as WKNavigationResponseMBS, decisionHandler as WKPolicyForNavigationResponseDecisionHandlerMBS) Handles decidePolicyForNavigationResponse
dim MimeType as string = navigationResponse.response.MIMEType

if MimeType = "application/zip" or _
MimeType = "application/x-tar" or _
MimeType = "application/octet-stream" then
// we download archive files
decisionHandler.Download
else
// allow normal website to load
decisionHandler.Allow

end if
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response.

You can show a dialog to ask user and once you know the decision call a method on decisionHandler object to report the decision.

### 191.16.53 DidClose

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The webviewer closed.
**Notes:** Notifies your app that the DOM window object's close() method completed successfully.

Your app should remove the web view from the view hierarchy and update the UI as needed, such as by closing the containing browser tab or window.

### 191.16.54 didCommitNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when content starts arriving for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.16.55 didFailNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when an error occurs during a committed main frame navigation.
**Notes:** Sets Navigation property.

### 191.16.56 didFailProvisionalNavigation(navigation as WKNavigationMBS, Error as NSErrorMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when an error occurs while starting to load data for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.16.57 didFinishNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when a main frame navigation completes.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.
Same as DocumentComplete in HTMLViewer.

### 191.16.58 DidReceiveAuthenticationChallenge(challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Asks the app to respond to an authentication challenge.
**Notes:** challenge: The authentication challenge.

AuthChallengeDisposition: The option to use to handle the challenge. For a list of options, see AuthChallenge* constants.
credential: The credential to use for authentication when the disposition parameter contains the value AuthChallengeUseCredential. Specify nil to continue without a credential.

If you don,Äôt implement this method, the web view responds to the authentication challenge with the AuthChallengeRejectProtectionSpace disposition.

### 191.16.59 didReceiveScriptMessage(Body as Variant, name as String)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when a script message is received from a webpage.
**Notes:** body: The body of the message. Automatic translated from Javascript types.
name: The name of the message handler to which the message is sent.

### 191.16.60 didReceiveServerRedirectForProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when a server redirect is received for the main frame.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.16.61 didStartProvisionalNavigation(navigation as WKNavigationMBS)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Invoked when a main frame navigation starts.
**Notes:** Added navigation parameter with version 20.3.
Sets Navigation property.

### 191.16.62 downloadDecideDestinationUsingResponse(download as WKDownloadMBS, response as NSURLResponseMBS, suggestedFilename as String, byref destination as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Asks the app to provide a file destination where the system should write the download data.

**Notes:** download: The download that needs a file destination where the systems should write the download data.
response: A response from the server for an HTTP request, or a synthesized response for a blob download.
suggestedFilename: A string with a filename suggestion to use in creating the file destination.
destination: A file destination where the systems should write the download data.

Set destination to where to store the file. Or set to nil to cancel.

The suggested filename can come from the response or from the web content.
The destination file URL must meet the following requirements:

- It,Äôs a file that doesn,Äôt exist.
- It,Äôs in a directory that exists.
- It,Äôs in a directory that WebKit can write to.

### 191.16.63 downloadDidFailWithError(download as WKDownloadMBS, error as NSErrorMBS, resumeData as MemoryBlock)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Tells your app that the download failed, with error information and data you can use to restart the download.
**Notes:** download: The download that failed.
error: An error describing what caused the download to fail.
resumeData: A data object you use to restart the download.

To restart a failed download, call resumeDownloadFromResumeData with resumeData.

### 191.16.64 downloadDidFinish(download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** This event tells you that the download finished.
**Notes:** download: The download that finished.

### 191.16.65 downloadDidReceiveAuthenticationChallenge(download as WKDownloadMBS, challenge as NSURLAuthenticationChallengeMBS, byref AuthChallengeDisposition as Integer, byref credentials as NSURLCredentialMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Asks the delegate to respond to an authentication challenge.
**Notes:** download: The download that received the authentication challenge.
challenge: The authentication challenge.

Determine how to respond to the authentication challenge in this method. Then set AuthChallengeDisposition to AuthChallenge* constants and pass the credentials to use.

If you don,Äôt implement this method, the web view responds to the challenge with AuthChallengeRejectProtectionSpace.

### 191.16.66 downloadWillPerformHTTPRedirection(download as WKDownloadMBS, response as NSURLResponseMBS, request as NSURLRequestMBS, byref DownloadRedirectPolicy as Integer)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Asks the delegate to respond to the download,Äôs redirect response.
**Notes:** download: The download that receives the redirect response.
response: The redirect response.
request: The new request the web view sends as a result of the redirect response.

Set DownloadRedirectPolicy to either DownloadRedirectPolicyAllow or DownloadRedirectPolicyCancel.

A download redirect policy that indicates whether to proceed with the redirect.

Determine whether to proceed with the redirect. Then invoke the decisionHandler closure, providing a download redirect policy that indicates whether to proceed with the redirect.

If you don,Äôt implement this event, the web view proceeds with all redirects.

### 191.16.67 EstimatedProgressChanged(estimatedProgress as double, oldEstimatedProgress as double)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The estimated progress for loading the webpage changed.
**Notes:** This event may be called often, so don't do much here!

### 191.16.68 GotFocus

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control itself got focus.
**Notes:** This only fires if the control itself got focus and not a sub control.

### 191.16.69 JavaScriptEvaluated(JavaScript as String, Result as Variant, Error as NSErrorMBS, Tag as String)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** JavaScript was evaluated.
**Notes:** Error is only set with 64-bit, not with 32-bit.
Tag is passed from EvaluateJavaScript call.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.

### 191.16.70 LostFocus

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control lost focus.
**Notes:** This only fires if the control itself lost focus and not a sub control.

### 191.16.71 navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Tells the app that a navigation action became a download.
**Example:**

```
Sub navigationActionDidBecomeDownload(navigationAction as WKNavigationActionMBS, download as WK-
DownloadMBS) Handles navigationActionDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationAction: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.16.72 navigationResponseDidBecomeDownload(navigationResponse as WK-NavigationResponseMBS, download as WKDownloadMBS)

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Tells the app that a navigation response became a download.
**Example:**

```
Sub navigationResponseDidBecomeDownload(navigationResponse as WKNavigationResponseMBS, down-
load as WKDownloadMBS) Handles navigationResponseDidBecomeDownload
System.DebugLog CurrentMethodName

// add download to your list of downloads you monitor
End Sub
```

**Notes:** navigationResponse: Descriptive information about the navigation response that turned into a download.
download: An object that represents the download of a web resource.

Implement this method to begin tracking download progress.

### 191.16.73 Open

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The control is about to was created and you can initialize it.

### 191.16.74 runJavaScriptAlertPanel(initiatedByFrame as WKFrameInfoMBS, message as String)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Displays a JavaScript alert panel.
**Notes:** message: The message to display.

If you do not implement this method, the web view will behave as if the user selected the OK button.

### 191.16.75 runJavaScriptConfirmPanel(initiatedByFrame as WKFrameInfoMBS, message as String) as boolean

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Displays a JavaScript confirm panel.
**Notes:** message: The message to display.

Return true if the user chose OK, false if the user chose Cancel.

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.16.76 runJavaScriptTextInputPanel(initiatedByFrame as WKFrameInfoMBS, prompt as String, defaultText as String) as String

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Displays a JavaScript text input panel.
**Notes:** message: The message to display.
defaultText: The initial text to display in the text entry field.

Return the entered text if the user chose OK, otherwise "".

If you do not implement this method, the web view will behave as if the user selected the Cancel button.

### 191.16.77 takeSnapshotCompleted(image as NSImageMBS, error as NSErrorMBS, tag as string)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** Called when snapshot of website is completed.
**Notes:** If snapshot creation failed, error is set.

### 191.16.78 TitleChanged(Title as String, oldTitle as string)

MBS Mac64bit Plugin, Plugin Version: 21.0, Platform: iOS, Targets: .

**Function:** The title of the webpage changed.

### 191.16.79 WebContentProcessDidTerminate

MBS Mac64bit Plugin, Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Tells the app that the web view,Äôs content process was terminated.
**Notes:** Web views use a separate process to render and manage web content. WebKit calls this method when the process for the specified web view terminates for any reason.

### 191.16.80 Constants

Authentication Challenge Responses

| Constant | Value | Description |
|---|---|---|
| AuthChallengeCancelAuthenticationChallenge | 2 | Cancel the entire request. The provided credential parameter is |
| AuthChallengePerformDefaultHandling | 1 | Use the default handling for the challenge as though this delegate not implemented. The provided credential parameter is ignored. |
| AuthChallengeRejectProtectionSpace | 3 | Reject this challenge, and call the authentication delegate meth the next authentication protection space. The provided credent is ignored. |
| AuthChallengeUseCredential | 0 | Use the specified credential, which may be nil. |

Redirect Policy

| Constant | Value | Description |
|---|---|---|
| DownloadRedirectPolicyAllow | 1 | Allow a redirect to proceed. |
| DownloadRedirectPolicyCancel | 0 | Cancel the redirect action. |

# 191.17 class WKWebViewMBS

## 191.17.1 class WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An object that displays interactive web content, such as for an in-app browser.
**Notes:** see
https://developer.apple.com/documentation/webkit/wkwebview

If something is missing, please let us know and we can add it for you.
Subclass of the NSViewMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 20.5pr7
- News from the MBS Xojo Plugins Version 20.4
- Tip fo the day: Print to PDF for WebView
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- Two weeks with Xojo 2020r1
- Xojo 2020r1 available
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- New in the MBS Xojo Plugins 20.0
- Upgrading our HTMLViewer functions for Internet Explorer

**Xojo Developer Magazine**

- 18.6, page 10: News

## 191.17.2 Methods

## 191.17.3 addUserScript(userScript as WKUserScriptMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Adds an user script.

### 191.17.4 Constructor

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new web view with size 100/100 and position 0/0
**Example:**

```
dim x as new WebViewMBS
```

**Notes:** On success the handle property is not zero.
See also:

- 191.17.5 Constructor(Handle as Integer) 22886
- 191.17.6 Constructor(left as double, top as double, width as double, height as double) 22886

### 191.17.5 Constructor(Handle as Integer)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates an object based on the given WKWebView handle.
**Example:**

```
dim t as new WKWebViewMBS(0, 0, 100, 100)
dim v as new WKWebViewMBS(t.handle)

MsgBox str(v.Bounds.Width)+" x "+str(v.Bounds.Height)
```

**Notes:** The handle is casted to a WKWebView and the plugin retains this handle.
See also:

- 191.17.4 Constructor 22886
- 191.17.6 Constructor(left as double, top as double, width as double, height as double) 22886

### 191.17.6 Constructor(left as double, top as double, width as double, height as double)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Creates a new button with the given size and position.
**Example:**

```
dim w as new WKWebViewMBS(0,0,800,600)
```

w.LoadHTMLString "Hello World",""

**Notes:** On success the handle property is not zero.
See also:

- 191.17.4 Constructor 22886
- 191.17.5 Constructor(Handle as Integer) 22886

### 191.17.7 copy

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Copies current text selection.

### 191.17.8 cut

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Cuts current text selection.

### 191.17.9 deleteSelection

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Deletes current text selection.

### 191.17.10 EvaluateJavaScript(JavaScript as String, byref Error as NSErrorMBS) as Variant

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Evaluates JavaScript.
**Example:**

```
Dim w As WKWebViewMBS = WKWebViewControlMBS1.WKWebView
Dim e As NSErrorMBS

// returns array of variants with doubles
Dim v As Variant = w.EvaluateJavaScript("o = [ 1,2,3 ] ;", e)
```

```
Dim vd() As Variant = v

// returns array of variants with strings
Dim vv As Variant = w.EvaluateJavaScript("o = [ ""a"",""b"",""d"" ] ;", e)
Dim vs() As Variant = vv

// returns dictionary
Dim v3 As Variant = w.EvaluateJavaScript("o = { a:1 } ", e)
Dim dd As Dictionary = v3

Break
```

**Notes:** Synchronous version which waits for JavaScript to return the value.
Error is set in case of errors.

Result is converted from JavaScript data types to Xojo datatypes, usually variants, dictionaries or array of variants.

### 191.17.11 goBack

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the back item in the back-forward list.

### 191.17.12 goForward

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to the forward item in the back-forward list.

### 191.17.13 goToBackForwardListItem(Item as WKBackForwardListItemMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to an item from the back-forward list and sets it as the current item.
**Notes:** item: The item to which to navigate. Must be one of the items in the web view's back-forward list.

### 191.17.14 handlesURLScheme(urlScheme as String) as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Checks whether or not WKWebViews handle the given URL scheme by default.
**Notes:** urlScheme: The URL scheme to check.

Returns true if supported.

### 191.17.15 HTMLText as String

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries HTML text for the current main page.
**Notes:** This is live, so any changes made after loading will be included.

### 191.17.16 LoadData(Data as MemoryBlock, MIMEType as String, textEncodingName as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.LoadData "<p>Hello World</p>", "text/html", "UTF-8", ""
```

**Notes:** data: The data to use as the contents of the webpage.
MIMEType: The MIME type of the data.
characterEncodingName: The data's character encoding name.
baseURL: A URL used to resolve relative URLs within the document.

### 191.17.17 LoadFileURL(File as FolderItem, readAccessItem as FolderItem)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to a requested file.
**Example:**

```
Dim w as WKWebViewMBS // your web viewer
Dim HTMLFile as folderItem = getfolderItem("test.html")
```

```
// pass folderitem parent to allow read to other files in same folder
w.LoadFileURL HTMLFile, HTMLFile.parent
```

**Notes:** Navigates to the requested file URL on the filesystem.
file: The file URL to which to navigate.
readAccessItem: The file or folder to allow read access to.
If readAccessItem references a single file, only that file may be loaded by WebKit.
If readAccessItem references a directory, files inside that file may be loaded by WebKit.

### 191.17.18 LoadHTML(htmlText as String, baseURL as string = "")

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Sets the webpage contents and base URL.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.LoadHTML "<p>Hello World</p>"
```

**Notes:** htmlText: The string to use as the contents of the webpage.
baseURL: A URL used to resolve relative URLs within the document.

### 191.17.19 LoadURL(URL as string)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to a requested URL.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.LoadURL "https://www.mbsplugins.de/xojo"
```

### 191.17.20 LoadURLRequest(Request as NSURLRequestMBS)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Navigates to a requested URL.

### 191.17.21 MainResourceData(byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries the source data from the webviewer.
**Notes:** Returns nil in case of error.
Also sets error parameter to NSErrorMBS for details on the error.

### 191.17.22 paste

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Pastes clipboard into current position in document.

### 191.17.23 PDFData(byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Create a PDF document representation from the web page currently displayed in the WKWebView.
**Notes:** Returns PDF data of new PDF Document.
If the data is written to a file the resulting file is a valid PDF document.

Available in macOS 11.0 or newer.
May also work if Safari 14 is installed on older macOS versions.

### 191.17.24 PlainText as String

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries plain text for the current main page.
**Notes:** This is live, so any changes made after loading will be included.

### 191.17.25 printOperation(printInfo as NSPrintInfoMBS) as NSPrintOperationMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Creates a print operation for the current web viewer.
**Example:**

```
dim browser as WKWebViewMBS // your web viewer
Dim pi As NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
Dim po As NSPrintOperationMBS = browser.printOperation(pi)

po.showsPrintPanel = True
po.showsProgressPanel = True

po.runOperationModalForWindow(Self)
```

**Notes:** Works for WebKit 1.x and 2.x.

For WebKit 2.x may run into endless loop for some websites due to bugs in Apple's WebKit framework.

### 191.17.26 reload

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reloads the current page.
**Example:**

```
Public Sub Reload(browser as WKWebViewMBS, force as Boolean)
If force Then
browser.reloadFromOrigin
Else
browser.reload
End If
End Sub
```

### 191.17.27 reloadFromOrigin

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Reloads the current page, performing end-to-end revalidation using cache-validating conditionals if possible.
**Example:**

```
Public Sub Reload(browser as WKWebViewMBS, force as Boolean)
If force Then
browser.reloadFromOrigin
Else
browser.reload
End If
```

```
End Sub
```

### 191.17.28 removeAllUserScripts

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Removes all associated user scripts.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.removeAllUserScripts
```

### 191.17.29 selectAll

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop only.

**Function:** Selects all.

### 191.17.30 setMagnification(magnification as double, pointX as double, pointY as double)

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** Scales the page content by a specified factor and centers the result on a specified point.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

// zoom to 200% on 100/100
browser.setMagnification(2, 100, 100)
```

**Notes:** magnification: The factor by which to scale the content.
x/y: The point (in view space) to center magnification on. As usual with Cocoa, bottom is y = 0.

For MacOS 64-bit only.

### 191.17.31 stopLoading

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Stops loading all resources on the current page.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.stopLoading
```

### 191.17.32 takeSnapshot(byref error as NSErrorMBS) as NSImageMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Requests a snapshot.
**Example:**

```
// get a webview reference
Dim web As WKWebViewMBS = HTMLViewer1.WKWebViewMBS

// take snapshot
Dim error As NSErrorMBS
Dim image As NSImageMBS = web.takeSnapshot(error)

If error <>Nil Then
MsgBox error.LocalizedDescription
return
End If

// save as PNG
Dim png As String = image.PNGRepresentation

// write to file
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim b As BinaryStream = BinaryStream.Create(f, True)
b.Write png
```

**Notes:** This is synchronous version which waits for image to be finished.
In case of error the result is nil and error may be set.

### 191.17.33 userScripts as WKUserScriptMBS()

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The user scripts associated with the user content controller.

### 191.17.34 WebArchiveData(byref error as NSErrorMBS) as MemoryBlock

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries web archive data for the website.
**Example:**

```
Dim w As WKWebViewMBS = HTMLViewer1.WKWebViewMBS

Dim error As NSErrorMBS
Dim data As MemoryBlock = w.WebArchiveData(error)

Break // inspect in debugger
```

**Notes:** May return nil in case of error and maybe report the NSError in case of an error.

### 191.17.35 Properties

### 191.17.36 allowFileAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Allow file access for file URLs.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowFileAccessFromFileURLs = True
```

**Notes:** Access to files is allowed for some files.
Please check WebKit documentation for details.

Set allowFileAccessFromFileURLs and allowUniversalAccessFromFileURLs to true to disable all the security checks to block local file access for websites. allowUniversalAccessFromFileURLs would allow all file URLs. allowFileAccessFromFileURLs would only allow in same path.

(Read and Write property)

### 191.17.37 allowsBackForwardNavigationGestures as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether horizontal swipe gestures will trigger back-forward list navigations.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsBackForwardNavigationGestures = True
```

**Notes:** The default value is false.
(Read and Write property)

### 191.17.38 allowsLinkPreview as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value that determines whether pressing on a link displays a preview of the destination for the link.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsLinkPreview = True
```

**Notes:** (Read and Write property)

### 191.17.39 allowsMagnification as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** A Boolean value indicating whether magnify gestures will change the web view,Äôs magnification.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.allowsMagnification = True
```

**Notes:** The default value is false. You can set the magnification property even if allowsMagnification is set to false.
For MacOS 64-bit only.
(Read and Write property)

### 191.17.40 allowUniversalAccessFromFileURLs as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Allow universal file access for URLs.
**Notes:** Any file URL will be loaded if true.
Please check WebKit documentation for details.

Does not work in MacOS 10.14.
(Read and Write property)

### 191.17.41 backForwardList as WKWebViewMBS

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The web view's back-forward list.
**Notes:** (Read only property)

### 191.17.42 backgroundColor as NSColorMBS

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** The background color.
**Example:**

```
Dim w As WKWebViewMBS = HTMLViewer1.WKWebViewMBS // your webviewer

w.drawsBackground = False
w.backgroundColor = NSColorMBS.clearColor
```

**Notes:** If background is not drawn and/or transparent, you may see through.
Requires also CSS to have web view page transparent.
(Read and Write property)

### 191.17.43 CanGoBack as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether there is a back item in the back-forward list that can be navigated to.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "CanGoBack: "+If(Browser.CanGoBack, "yes", "no")
```

**Notes:** (Read only property)

### 191.17.44 CanGoForward as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether there is a forward item in the back-forward list that can be navigated to.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "CanGoForward: "+If(Browser.CanGoForward, "yes", "no")
```

**Notes:** (Read only property)

### 191.17.45 Configuration as WKWebViewConfigurationMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Returns the configuration used to initialize the WKWebView.
**Notes:** (Read only property)

### 191.17.46 customUserAgent as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The custom user agent string.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.customUserAgent = "MyBrowser/1.0"
```

**Notes:** If no custom user agent string has been set, this is set to "".
Available in 32-bit. Available in 64-bit for macOS 10.11 or newer.
(Read and Write property)

### 191.17.47 developerExtrasEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether developer extras are enabled.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

// enable context menu entry to show developer extras
browser.developerExtrasEnabled = True
```

**Notes:** Enables the context menu to inspect items.
(Read and Write property)

### 191.17.48 drawsBackground as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.4, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to draw background for the view.
**Example:**

```
Dim w As WKWebViewMBS = HTMLViewer1.WKWebViewMBS // your webviewer

w.drawsBackground = False
w.backgroundColor = NSColorMBS.clearColor
```

**Notes:** If background is not drawn and/or transparent, you may see through.
Requires also CSS to have web view page transparent.
(Read and Write property)

### 191.17.49 EstimatedProgress as Double

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** An estimate of what fraction of the current navigation has been loaded.
**Notes:** This value ranges from 0.0 to 1.0 based on the total number of bytes expected to be received, including the main document and all of its potential subresources. After a navigation loading completes, the estimatedProgress remains at 1.0 until a new navigation starts, at which point the estimatedProgress is reset to 0.0.
(Read only property)

### 191.17.50 hasOnlySecureContent as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether all resources on the page have been loaded through securely encrypted connections.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "hasOnlySecureContent: "+If(Browser.hasOnlySecureContent, "yes", "no")
```

**Notes:** Only set for 64-bit, always false on 32-bit.
(Read only property)

### 191.17.51 HTTPCookieStore as WKHTTPCookieStoreMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Convenience property to directly query HTTP cookie store for WKWebview configuration.
**Example:**

```
Dim CookieStore As WKHTTPCookieStoreMBS = WKWebViewControlMBS1.WKWebView.HTTPCookieStore
Dim cookies() As NSHTTPCookieMBS = CookieStore.AllCookies
Dim cookie As NSHTTPCookieMBS = cookies(0)

// now check in debugger
Break
```

**Notes:** (Read only property)

### 191.17.52 IsLoading as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** A Boolean value indicating whether the view is currently loading content.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

// load a page
browser.LoadURL "https://www.mbsplugins.de/xojo"

// wait synchronously for website loading
While browser.IsLoading
DelayMBS 0.1
Wend

MsgBox "loaded"
```

**Notes:** (Read only property)

### 191.17.53 javaEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether java is enabled.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.17.54 javaScriptCanOpenWindowsAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether javascript can open new windows.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

// disable popup windows
Browser.javaScriptCanOpenWindowsAutomatically = False
```

**Notes:** (Read and Write property)

### 191.17.55 javaScriptEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** JavaScript was evaluated.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "JavaScript Enabled: "+If(Browser.javaScriptEnabled, "yes", "no")
```

**Notes:** Error is only set with 64-bit, not with 32-bit.
Tag is passed from EvaluateJavaScript call.
(Read and Write property)

### 191.17.56 loadsImagesAutomatically as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether to load images automatically.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

// disable loading of images
browser.loadsImagesAutomatically = False
```

**Notes:** (Read and Write property)

### 191.17.57 magnification as Double

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop only.

**Function:** The factor by which the page content is currently scaled.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.magnification = 2.0
```

**Notes:** The default value is 1.0.
For MacOS 64-bit only.
(Read and Write property)

### 191.17.58 mediaType as String

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The media type for the WKWebView.
**Notes:** The value of mediaType will override the normal value of the CSS media property.
Setting the value to "" will restore the normal value.
The default value is "".

Available in macOS 11.0 or newer.
(Read and Write property)

### 191.17.59 MIMEType as String

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** Queries current mime type for showing document.
**Notes:** Should be "text/html" for a website or "application/pdf" for a PDF document.
(Read only property)

### 191.17.60 minimumFontSize as Double

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The minimum font size to use.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

browser.minimumFontSize = 20
```

**Notes:** (Read and Write property)

### 191.17.61 pageZoom as Double

MBS Mac64bit Plugin, Plugin Version: 20.3, Platform: macOS, Targets: Desktop & iOS.

**Function:** The factor by which page content is scaled relative to the viewport.
**Notes:** The default value is 1.0.
Changing this value is equivalent to web content setting the CSS "zoom" property on all page content.

Available in macOS 11.0 or newer.
(Read and Write property)

### 191.17.62 plugInsEnabled as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether plugins are enabled.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "plugInsEnabled: "+If(Browser.plugInsEnabled, "yes", "no")
```

**Notes:** (Read and Write property)

### 191.17.63 Preferences as WKPreferencesMBS

MBS Mac64bit Plugin, Plugin Version: 20.1, Platform: macOS, Targets: Desktop & iOS.

**Function:** Convenience property to directly query HTTP cookie store for WKWebview preferences.
**Notes:** (Read only property)

### 191.17.64 privateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** Whether private browsing is enabled.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox "privateBrowsing: "+If(Browser.privateBrowsing, "yes", "no")
```

**Notes:** If enabled, no data should be stored for cookies or cache on disk, so it's cleared when web viewer is destroyed.
Default is non-private mode for the web viewer.

It looks like you can't change mode after web viewer was created.
(Read and Write property)

### 191.17.65 Title as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The page title.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox Browser.Title
```

**Notes:** (Read only property)

### 191.17.66 URL as String

MBS Mac64bit Plugin, Plugin Version: 20.0, Platform: macOS, Targets: Desktop & iOS.

**Function:** The active URL.
**Example:**

```
Dim browser As WKWebViewMBS // your instance

MsgBox Browser.URL
```

**Notes:** This is the URL that should be reflected in the user interface.
(Read only property)

# 191.18 module WVWebViewModuleMBS

## 191.18.1 module WVWebViewModuleMBS

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** The module for global options to WKWebView.
**Example:**

WVWebViewModuleMBS.UsePrivateBrowsing = True

**Blog Entries**

- MBS Xojo Plugins, version 19.5pr5

## 191.18.2 Properties

## 191.18.3 UsePrivateBrowsing as Boolean

MBS Mac64bit Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether to create WKWebViewControlMBS with private browsing enabled.
**Example:**

WVWebViewModuleMBS.UsePrivateBrowsing = True

**Notes:** Set this property to true before creating the WKWebViewControlMBS control, so the plugin can enable private browsing.
Set to false later to create a normal control again.

You may want to set this to true or false before the window opens and control initialized.
(Read and Write property)

# Chapter 192

# WebView2

## 192.1 control DesktopWebView2ControlMBS

### 192.1.1 control DesktopWebView2ControlMBS

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The MBS control for the Chrome based WebView2 control from Microsoft.
**Notes:**

Read about WebView2 control here:

https://developer.microsoft.com/en-us/microsoft-edge/webview2/

There you also fine the installers needed to install it, unless you have the 2021 version of Windows, which may include it preinstalled.

If you use this control on macOS and Linux, it will do nothing.
On Windows if the control fails to initialize, the Opened event will not fire.
But if it fires, it will be some time after the open event fired as initialization is asynchronous.

If you call LoadURL, LoadHTML or set URL property too early, we cache that and perform the action later when the web viewer is initialized properly.

If you add an event, we register it with the C++ control. So if you don't specify an event, you may get the default behavior.
**Blog Entries**

- Performance improvements in Xojo

- New in MBS Xojo Plugins in version 23.1
- WebView2 and Cookies in Xojo
- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- Upgrading WebKit for Windows support
- News from the MBS Xojo Plugins in version 21.5
- New desktop controls
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- WebView2 for Xojo

**Xojo Developer Magazine**

- 21.6, page 8: News
- 19.6, page 10: News
- 19.3, page 10: News
- 19.2, page 9: News
- 19.1, page 11: News

### 192.1.2 Methods

### 192.1.3 AddScriptToExecuteOnDocumentCreated(JavaScript as String, tag as variant = nil)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Add the provided JavaScript to a list of scripts that should be executed after the global object has been created, but before the HTML document has been parsed and before any other script included by the HTML document is executed.
**Notes:** This method injects a script that runs on all top-level document and child frame page navigations. This method runs asynchronously, and you must wait for the completion handler to finish before the injected script is ready to run. When this method completes, the handler's Invoke method is called with the id of the injected script. id is a string. To remove the injected script, use RemoveScriptToExecuteOnDocumentCreated.
Note that if an HTML document has sandboxing of some kind via sandbox properties or the Content-Security-Policy HTTP header this will affect the script run here. So, for example, if the 'allow-modals' keyword is not set then calls to the alert function will be ignored.

Calls AddScriptToExecuteOnDocumentCreatedCompleted event later when done.

### 192.1.4 AddWebResourceRequestedFilter(URL as String, resourceType as Integer)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Adds a URI and resource context filter to the WebResourceRequested event.
**Notes:** The URI parameter can be a wildcard string ('*': zero or more, '?': exactly one). See kWebResourceContext constants for description of resource context filters.

### 192.1.5 AvailableCoreWebView2BrowserVersionString as string

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The available version of the WebView2 browser.
**Notes:** Allows you to query the browser version before creating a control.
Returns empty text if none is available.

### 192.1.6 CanGoBack as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the WebView can navigate to a previous page in the navigation history.
**Notes:** The HistoryChanged event will fire if CanGoBack changes value.

Returns false if the browser is not yet initialized.

### 192.1.7 CanGoForward as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the WebView can navigate to a next page in the navigation history.
**Notes:** The HistoryChanged event will fire if CanGoForward changes value.

Returns false if the browser is not yet initialized.

### 192.1.8 CapturePreview(ImageFormat as Integer = 0)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Capture an image of what WebView is displaying.

**Notes:** Specify the format of the image with the imageFormat parameter. The resulting image binary data is passed to the CapturePreviewCompleted event.

Calls CapturePreviewCompleted event when done or failed.

### 192.1.9 ClearSelection

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to clear current selection.
**Notes:** This is the reverse for SelectAll.

### 192.1.10 ClearVirtualHostNameToFolderMapping(hostName as String)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop only.

**Function:** Clears a host name mapping for local folder that was added by SetVirtualHostNameToFolderMapping.
**Notes:** hostName: The host name to be removed from the mapping.

### 192.1.11 Copy

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to copy current selection to clipboard.

### 192.1.12 CreatePrintSettings as WebView2PrintSettingsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Creates the WebView2PrintSettingsMBS object used by the PrintToPdf method.

### 192.1.13 Cut

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to cut current selection.
**Notes:** May do a copy, if selection is read only.

### 192.1.14 ExecuteScript(JavaScript as String, tag as variant = nil)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Execute JavaScript code from the javascript parameter in the current top level document rendered in the WebView.
**Example:**

```
dim web as DesktopWebView2ControlMBS // your control

web.ExecuteScript "1+5" , "tag value"

// triggers ExecuteScriptCompeleted later with result "6"

web.ExecuteScript "window.chrome.webview.postMessage( { 'Test': 'Hello, world!' } );"

// triggers later WebMessageReceived later
```

**Notes:** This will execute asynchronously and when complete, if a handler is provided in the ExecuteScriptCompletedHandler parameter, its Invoke method will be called with the result of evaluating the provided JavaScript. The result value is a JSON encoded string. If the result is undefined, contains a reference cycle, or otherwise cannot be encoded into JSON, the JSON null value will be returned as the string 'null'. Note that a function that has no explicit return value returns undefined. If the executed script throws an unhandled exception, then the result is also 'null'. This method is applied asynchronously. If the method is called after NavigationStarting event during a navigation, the script will be executed in the new document when loading it, around the time ContentLoading is fired. ExecuteScript will work even if IsScriptEnabled is set to false.

Calls ExecuteScriptCompleted event later.

### 192.1.15 ExecuteScriptSync(JavaScript as String, byref ErrorCode as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Execute JavaScript code from the javascript parameter in the current top level document rendered in the WebView.
**Example:**

```
dim web as DesktopWebView2ControlMBS // your control

dim errorCode as integer
dim s as string = web.ExecuteScriptSync("1+2", errorCode)

Break // s contains 3
```

**Notes:** Same as ExecuteScript, but waits for event and returns result directly.
errorCode is zero on success.
Result is JSON as text, e.g. "null" if there is no result.

### 192.1.16 GoBack

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Navigates the WebView to the previous page in the navigation history.

### 192.1.17 GoForward

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Navigates the WebView to the next page in the navigation history.

### 192.1.18 HTMLText as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries HTML text of the current website.
**Example:**

```
dim web as DesktopWebView2ControlMBS // your control

dim text as string = web.plaintext
dim html as string = web.HTMLText

break // check in debugger
```

**Notes:** Please don't call directly from NavigationCompleted event since that can freeze. Better use timer.CallLater to call a method later to do this a millisecond later.

### 192.1.19 LoadHTML(HTML as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Initiates a navigation to htmlContent as source HTML of a new document.
**Notes:** The htmlContent parameter may not be larger than 2 MB in total size. The origin of the new page will be about:blank.

### 192.1.20 LoadURL(URL as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Cause a navigation of the top level document to the specified URI.
**Notes:** See the navigation events for more information. Note that this starts a navigation and the corresponding NavigationStarting event will fire sometime after this Navigate call completes.

### 192.1.21 OpenDevToolsWindow

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Opens the DevTools window for the current document in the WebView.
**Notes:** Does nothing if called when the DevTools window is already open.

### 192.1.22 Paste

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to paste clipboard content into the current field.
**Notes:** This may do nothing if there is nothing to paste or nothing to receive (no field in focus).

### 192.1.23 PlainText as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries plain text of the current website.
**Example:**

```
dim web as DesktopWebView2ControlMBS // your control

dim text as string = web.plaintext
dim html as string = web.HTMLText

break // check in debugger
```

**Notes:** Please don't call directly from NavigationCompleted event since that can freeze. Better use timer.CallLater to call a method later to do this a millisecond later.

### 192.1.24 PostWebMessageAsJson(webMessageAsJson as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Post the specified webMessage to the top level document in this WebView.
**Notes:** The top level document's window.chrome.webview's message event fires. JavaScript in that document may subscribe and unsubscribe to the event via the following:

window.chrome.webview.addEventListener('message', handler)
window.chrome.webview.removeEventListener('message', handler)

The event args is an instance of MessageEvent. The IsWebMessageEnabled setting must be true or this method will fail with E_INVALIDARG. The event arg's data property is the webMessage string parameter parsed as a JSON string into a JavaScript object. The event arg's source property is a reference to the window.chrome.webview object. See add_WebMessageReceived for information on sending messages from the HTML document in the WebView to the host. This message is sent asynchronously. If a navigation occurs before the message is posted to the page, then the message will not be sent.

### 192.1.25 PostWebMessageAsString(webMessageAsString as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** This is a helper for posting a message that is a simple string rather than a JSON string representation of a JavaScript object..
**Notes:** This behaves in exactly the same manner as PostWebMessageAsJson but the window.chrome.webview message event arg's data property will be a string with the same value as webMessageAsString. Use this instead of PostWebMessageAsJson if you want to communicate via simple strings rather than JSON objects.

### 192.1.26 Print

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to show print dialog.

### 192.1.27 PrintToPdf(Path as String, PrintSettings as WebView2PrintSettingsMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Print the current page to PDF asynchronously with the provided settings.
**Notes:** Use Path to specify the path to the PDF file. The host should provide an absolute path, including file name. If the path points to an existing file, the file will be overwritten. If the path is not valid, the method fails with E_INVALIDARG.

The async PrintToPdf operation completes when the data has been written to the PDF file. At this time the PrintCompleted event is invoked. If the application exits before printing is complete, the file is not saved. Only one Printing operation can be in progress at a time. If PrintToPdf is called while a printing operation is in progress, the event is immediately invoked with isSuccessful set to false.

Requires WebView2 in version 1.0.1020.30 or later.

### 192.1.28 Reload

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Reload the current page.
**Notes:** This is similar to navigating to the URI of current top level document including all navigation events firing and respecting any entries in the HTTP cache. But, the back/forward history will not be modified.

### 192.1.29 RemoveScriptToExecuteOnDocumentCreated(ID as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Remove the corresponding JavaScript added using AddScriptToExecuteOnDocumentCreated with the specified script id.

### 192.1.30 RemoveWebResourceRequestedFilter(URL as String, resourceType as Integer)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Removes a matching WebResource filter that was previously added for the WebResourceRequested event.
**Notes:** If the same filter was added multiple times, then it will need to be removed as many times as it was added for the removal to be effective. Raises exception with E_INVALIDARG for a filter that was never

added.

### 192.1.31 SelectAll

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to select all text.

### 192.1.32 SetVirtualHostNameToFolderMapping(hostName as String, folderPath as String, accessKind as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop only.

**Function:** Sets a mapping between a virtual host name and a folder path to make available to web sites via that host name.
**Notes:** hostName: A virtual host name.
folderPath: A folder path name to be mapped to the virtual host name. The length must not exceed the Windows MAX_PATH limit.
accessKind: The level of access to resources under the virtual host from other sites.

See kHostResourceAccessKind* constants.

### 192.1.33 Stop

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Stop all navigations and pending resource fetches.
**Notes:** Does not stop scripts.

### 192.1.34 Properties

### 192.1.35 AdditionalBrowserArguments as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Additional browser arguments can be specified to change the behavior of the WebView.
**Notes:** These will be passed to the browser process as part of the command line. See Run Chromium with Flags for more information about command line switches to browser process. If the app is launched with a command line switch –edge-webview-switches=xxx the value of that switch (xxx in the above example) will also be appended to the browser process command line. Certain switches like –user-data-dir are internal and

important to WebView. Those switches will be ignored even if specified. If the same switches are specified multiple times, the last one wins. There is no attempt to merge the different values of the same switch, except for disabled and enabled features. The features specified by –enable-features and –disable-features will be merged with simple logic: the features will be the union of the specified features and built-in features, and if a feature is disabled, it will be removed from the enabled features list. App process's command line –edge-webview-switches value are processed after the additionalBrowserArguments parameter is processed. Certain features are disabled internally and can't be enabled. If parsing failed for the specified switches, they will be ignored. Default is to run browser process with no extra flags.
(Read and Write property)

### 192.1.36 AllowSingleSignOnUsingOSPrimaryAccount as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The AllowSingleSignOnUsingOSPrimaryAccount property is used to enable single sign on with Azure Active Directory (AAD) resources inside WebView using the logged in Windows account and single sign on with web sites using Microsoft account associated with the login in Windows account.
**Notes:** Default is disabled. Universal Windows Platform apps must also declare enterpriseCloudSSO restricted capability for the single sign on to work.
(Read and Write property)

### 192.1.37 areBrowserAcceleratorKeysEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether all accelerator keys are enabled.
**Notes:** When this setting is set to false, it disables all accelerator keys that access features specific to a web browser, including but not limited to:

- Ctrl-F and F3 for Find on Page
- Ctrl-P for Print
- Ctrl-R and F5 for Reload
- Ctrl-Plus and Ctrl-Minus for zooming
- Ctrl-Shift-C and F12 for DevTools
- Special keys for browser functions, such as Back, Forward, and Search

It does not disable accelerator keys related to movement and text editing, such as:

- Home, End, Page Up, and Page Down

- Ctrl-X, Ctrl-C, Ctrl-V
- Ctrl-A for Select All
- Ctrl-Z for Undo

Those accelerator keys will always be enabled unless they are handled in the AcceleratorKeyPressed event. This setting has no effect on the AcceleratorKeyPressed event. The event will be fired for all accelerator keys, whether they are enabled or not.

The default value for AreBrowserAcceleratorKeysEnabled is true.

Needs WebView2 in version 1.0.864.35 or newer.
(Read and Write property)

### 192.1.38 AreDefaultContextMenusEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The AreDefaultContextMenusEnabled property is used to prevent default context menus from being shown to user in WebView.
**Notes:** It is true by default.
(Read and Write property)

### 192.1.39 AreDefaultScriptDialogsEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** AreDefaultScriptDialogsEnabled is used when loading a new HTML document.
**Notes:** If set to false, then WebView won't render the default JavaScript dialog box (Specifically those shown by the JavaScript alert, confirm, prompt functions and beforeunload event). Instead, if an event handler is set via add_ScriptDialogOpening, WebView will send an event that will contain all of the information for the dialog and allow the host app to show its own custom UI. It is true by default.
(Read and Write property)

### 192.1.40 AreDevToolsEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** AreDevToolsEnabled controls whether the user is able to use the context menu or keyboard shortcuts to open the DevTools window.
**Notes:** It is true by default.

(Read and Write property)

### 192.1.41 AreHostObjectsAllowed as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The AreHostObjectsAllowed property is used to control whether host objects are accessible from the page in WebView.
**Notes:** It is true by default.
(Read and Write property)

### 192.1.42 BrowserExecutableFolder as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The path to the browser executable to use.
**Notes:** Must be assigned very early, e.g. in Configure event, before initialization of the control runs.

Use browserExecutableFolder to specify whether WebView2 controls use a fixed or installed version of the WebView2 Runtime that exists on a user machine. To use a fixed version of the WebView2 Runtime, pass the relative folder path that contains the fixed version of the WebView2 Runtime to browserExecutable-Folder. To create WebView2 controls that use the installed version of the WebView2 Runtime that exists on user machines, pass a empty string to browserExecutableFolder. In this scenario, the API tries to find a compatible version of the WebView2 Runtime that is installed on the user machine (first at the machine level, and then per user) using the selected channel preference. The path of fixed version of the WebView2 Runtime should not contain \Edge\Application\. When such a path is used, the API fails with HRESULT_FROM_WIN32(ERROR_NOT_SUPPORTED).
(Read and Write property)

### 192.1.43 BrowserVersionString as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The browser version info of the current environment, including channel name if it is not the stable channel.
**Notes:** This matches the format of the AvailableCoreWebView2BrowserVersionString API. Channel names are 'beta', 'dev', and 'canary'.
(Read only property)

### 192.1.44 ContainsFullScreenElement as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates if the WebView contains a fullscreen HTML element.
**Notes:** (Read only property)

### 192.1.45 CookieManager as WebView2CookieManagerMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the cookie manager object associated with this webview.
**Notes:** Requires WebView2 version 1.0.705.50 from January 2021.
(Read only property)
See also:

- 192.1.46 CookieManager as WebView2CookieManagerMBS 22922

### 192.1.46 CookieManager as WebView2CookieManagerMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the cookie manager object associated with this web view.
**Notes:** (Read only property)
See also:

- 192.1.45 CookieManager as WebView2CookieManagerMBS 22922

### 192.1.47 DefaultBackgroundColor as Color

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The DefaultBackgroundColor property is the color WebView renders underneath all web content.
**Example:**

```
// set transparent in Opened event:

web.DefaultBackgroundColor = &cFFFFFFFF
```

**Notes:** This means WebView renders this color when there is no web content loaded such as before the initial navigation or between navigations. This also means web pages with undefined css background properties or background properties containing transparent pixels will render their contents over this color. Web pages with defined and opaque background properties that span the page will obscure the DefaultBackgroundColor and display normally. The default value for this property is white to resemble the native browser experience.

The Color is specified by the color that represents an RGBA value. The A represents an Alpha value, meaning DefaultBackgroundColor can be transparent. In the case of a transparent DefaultBackgroundColor WebView will render hosting app content as the background. This Alpha value is not supported on Windows 7. Any A value other than 255 will result in an exception on Windows 7. It is supported on all other WebView compatible platforms.

Semi-transparent colors are not currently supported by this API and setting DefaultBackgroundColor to a semi-transparent color will fail with an exception. The only supported alpha values are 0 and 255, all other values will result in exception. DefaultBackgroundColor can only be an opaque color or transparent.

Requires version 1.0.774.44 of Webview2 or newer.
Can't be set in Open event as the control is not yet ready.
(Read and Write property)

### 192.1.48 DocumentTitle as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The title for the current top level document.
**Notes:** If the document has no explicit title or is otherwise empty, a default that may or may not match the URI of the document will be used.
(Read only property)

### 192.1.49 IsBuiltInErrorPageEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsBuiltInErrorPageEnabled property is used to disable built in error page for navigation failure and render process failure.
**Notes:** It is true by default. When disabled, blank page will be shown when related error happens.
(Read and Write property)

### 192.1.50 IsGeneralAutofillEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether autofill for information like names, street and email addresses, phone numbers, and arbitrary input is enabled.
**Notes:** This excludes password and credit card information. When IsGeneralAutofillEnabled is false, no suggestions appear, and no new information is saved. When IsGeneralAutofillEnabled is true, information is saved, suggestions appear and clicking on one will populate the form fields. The default value is true.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.1.51 IsPasswordAutosaveEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether autosave for password information is enabled.
**Notes:** The IsPasswordAutosaveEnabled property behaves independently of the IsGeneralAutofillEnabled property. When IsPasswordAutosaveEnabled is false, no new password data is saved and no Save/Update Password prompts are displayed. However, if there was password data already saved before disabling this setting, then that password information is auto-populated, suggestions are shown and clicking on one will populate the fields. When IsPasswordAutosaveEnabled is true, password information is auto-populated, suggestions are shown and clicking on one will populate the fields, new data is saved, and a Save/Update Password prompt is displayed. The default value is false.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.1.52 IsPinchZoomEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Enable or disable pitch zoom.
**Notes:** Pinch-zoom, referred to as "Page Scale" zoom, is performed as a post-rendering step, it changes the page scale factor property and scales the surface the web page is rendered onto when user performs a pinch zooming action.

It does not change the layout but rather changes the viewport and clips the web content, the content outside of the viewport isn't visible onscreen and users can't reach this content using mouse.
The IsPinchZoomEnabled property enables or disables the ability of the end user to use a pinching motion on touch input enabled devices to scale the web content in the WebView2. It defaults to TRUE. When set to FALSE, the end user cannot pinch zoom after the next navigation. Disabling/Enabling IsPinchZoomEnabled only affects the end user's ability to use pinch motions and does not change the page scale factor. This API only affects the Page Scale zoom and has no effect on the existing browser zoom properties (IsZoomControlEnabled and ZoomFactor) or other end user mechanisms for zooming.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.1.53 IsScriptEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Controls if JavaScript execution is enabled in all future navigations in the WebView.
**Notes:** This only affects scripts in the document; scripts injected with ExecuteScript will run even if script is disabled. It is true by default.
(Read and Write property)

### 192.1.54 IsStatusBarEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** IsStatusBarEnabled controls whether the status bar will be displayed.
**Notes:** The status bar is usually displayed in the lower left of the WebView and shows things such as the URI of a link when the user hovers over it and other information. It is true by default.
(Read and Write property)

### 192.1.55 IsWebMessageEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsWebMessageEnabled property is used when loading a new HTML document.
**Notes:** If set to true, communication from the host to the WebView's top level HTML document is allowed via PostWebMessageAsJson, PostWebMessageAsString, and window.chrome.webview's message event (see PostWebMessageAsJson documentation for details). Communication from the WebView's top level HTML document to the host is allowed via window.chrome.webview's postMessage function and add_WebMessageReceived method (see add_WebMessageReceived documentation for details). If set to false, then communication is disallowed. PostWebMessageAsJson and PostWebMessageAsString will fail with E_ACCESSDENIED and window.chrome.webview.postMessage will fail by throwing an instance of an Error object. It is true by default.
(Read and Write property)

### 192.1.56 IsZoomControlEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsZoomControlEnabled property is used to prevent the user from impacting the zoom of the WebView.
**Notes:** It is true by default. When disabled, user will not be able to zoom using ctrl+/- or ctrl+mouse wheel, but the zoom can be set via ZoomFactor API.
(Read and Write property)

### 192.1.57 Language as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The default language that WebView will run with.
**Notes:** It applies to browser UIs like context menu and dialogs. It also applies to the accept-languages HTTP header that WebView sends to web sites. It is in the format of language [ -country ] where language is the 2 letter code from ISO 639 and country is the 2 letter code from ISO 3166.
(Read and Write property)

### 192.1.58 ProcessID as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The process id of the browser process that hosts the WebView.
**Notes:** (Read only property)

### 192.1.59 TargetCompatibleBrowserVersion as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The version of the Edge WebView2 Runtime binaries required to be compatible with the calling application.
**Notes:** This defaults to the Edge WebView2 Runtime version that corresponds with the version of the SDK the application is using. The format of this value is the same as the format of the BrowserVersionString property and other BrowserVersion values. Only the version part of the BrowserVersion value is respected. The channel suffix, if it exists, is ignored. The version of the Edge WebView2 Runtime binaries actually used may be different from the specified TargetCompatibleBrowserVersion. They are only guaranteed to be compatible. You can check the actual version on the BrowserVersionString property on the control.
(Read and Write property)

### 192.1.60 URL as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The URI of the current top level document.
**Notes:** This value potentially changes as a part of the SourceChanged event firing for some cases such as navigating to a different site or fragment navigations. It will remain the same for other types of navigations such as page reloads or history.pushState with the same URL as the current page.

If assigned, calls LoadURL method.
(Read and Write property)

### 192.1.61 UserAgent as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The User Agent.
**Notes:** The default value is the default User Agent of the Microsoft Edge browser.

This property may be overridden if the User-Agent header is set in a request. If the parameter is empty the User Agent will not be updated and the current User Agent will remain.

Needs WebView2 in version 1.0.864.35 or newer.
(Read and Write property)

### 192.1.62 UserDataFolder as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The user data folder location.
**Example:**

```
Dim w As DesktopWebView2ControlMBS // your control

Dim SupportFolder As FolderItem = SpecialFolder.ApplicationData.Child("MyApp")
SupportFolder.CreateAsFolder

w.UserDataFolder = SupportFolder.NativePath
```

**Notes:** Must be assigned very early, e.g. in Configure event, before initialization of the control runs.

You may specify the userDataFolder to change the default user data folder location for WebView2. The path is either an absolute file path or a relative file path that is interpreted as relative to the compiled code for the current process. For UWP apps, the default user data folder is the app data folder for the package. For non-UWP apps, the default user data ( { Executable File Name } .WebView2) folder is created in the same directory next to the compiled code for the app. WebView2 creation fails if the compiled code is running in a directory in which the process does not have permission to create a new directory. The app is responsible to clean up the associated user data folder when it is done.
(Read and Write property)

### 192.1.63 ZoomFactor as Double

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The ZoomFactor property.

**Notes:** (Read and Write property)

### 192.1.64 Events

### 192.1.65 AddScriptToExecuteOnDocumentCreatedCompleted(JavaScript as String, ErrorCode as Integer, ID as String, Tag as Variant)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report that AddScriptToExecuteOnDocumentCreated is done and provide the ID.

### 192.1.66 CapturePreviewCompleted(ImageFormat as Integer, ErrorCode as Integer, PictureData as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called when CapturePreview call is done.
**Notes:** We pass you the image data as a string, so you can e.g. write it to a PNG or JPEG file.
Otherwise ErrorCode tells you the reason for the error.

### 192.1.67 Closing

Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 192.1.68 Configure

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called while initializing, where you can apply properties just before plugin reads them.
**Notes:** Can be used to set UserDataFolder property.

### 192.1.69 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 192.1.70 ContainsFullScreenElementChanged

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** ContainsFullScreenElementChanged fires when the ContainsFullScreenElement property changes.
**Notes:** This means that an HTML element inside the WebView is entering fullscreen to the size of the WebView or leaving fullscreen. This event is useful when, for example, a video element requests to go fullscreen. The listener of ContainsFullScreenElementChanged can then resize the WebView in response.

### 192.1.71 ContentLoading(isErrorPage as Boolean, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The content loading event.d
**Notes:** ContentLoading fires before any content is loaded, including scripts added with AddScriptToExecuteOnDocumentCreated. ContentLoading will not fire if a same page navigation occurs (such as through fragment navigations or history.pushState navigations). This follows the NavigationStarting and SourceChanged events and precedes the HistoryChanged and NavigationCompleted events.

### 192.1.72 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 192.1.73 DocumentTitleChanged

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report a document title change.
**Notes:** DocumentTitleChanged fires when the DocumentTitle property of the WebView changes and may

fire before or after the NavigationCompleted event.

### 192.1.74 ExecuteScriptCompleted(JavaScript as String, ErrorCode as Integer, resultObjectAsJson as String, Tag as Variant)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report ExecuteScript method is done.

### 192.1.75 FocusLost

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:**

LostFocus fires when WebView lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

In the case where MoveFocusRequested event is fired, the focus is still on WebView when MoveFocusRequested event fires. LostFocus only fires afterwards when app's code or default action of MoveFocusRequested event set focus away from WebView.

### 192.1.76 FocusReceived

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:**

GotFocus fires when WebView got focus.
In older Xojo versions, this event is named GotFocus.

### 192.1.77 FrameNavigationCompleted(isSuccess as Boolean, ErrorStatus as Integer, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** FrameNavigationCompleted fires when a child frame has completely loaded (body.onload has fired) or loading stopped with error.

### 192.1.78 FrameNavigationStarting(URL as String, IsUserInitiated as Boolean, IsRedirected as Boolean, NavigationID as UInt64) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** FrameNavigationStarting fires when a child frame in the WebView requests permission to navigate to a different URI. This will fire for redirects as well.
**Notes:** Corresponding navigations can be blocked until the event handler returns.
Return true to block the request.

### 192.1.79 HistoryChanged

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report history change.
**Notes:** HistoryChanged listens to the change of navigation history for the top level document. Use HistoryChanged to check if CanGoBack/CanGoForward value has changed. HistoryChanged also fires for using GoBack/GoForward. HistoryChanged fires after SourceChanged and ContentLoading.

### 192.1.80 MenuBarSelected

MBS WinFrameworks Plugin, Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 192.1.81 NavigationCompleted(isSuccess as Boolean, ErrorStatus as Integer, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report a navigation action completed.
**Notes:** NavigationCompleted fires when the WebView has completely loaded (body.onload has fired) or loading stopped with error.

Please don't process directly here, but maybe call a method with timer.CallLater to do processing like using HTMLText or PlainText functions.

Like the DocumentCompleted event in Xojo.

### 192.1.82 NavigationStarting(URL as String, IsUserInitiated as Boolean, IsRedirected as Boolean, NavigationID as UInt64) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report a navigation action.
**Notes:** NavigationStarting fires when the WebView main frame is requesting permission to navigate to a different URI. This will fire for redirects as well.
Corresponding navigations can be blocked until the event handler returns.

Return true to cancel it like Xojo's CancelLoad event.

This event is great to check the URL. If you like to block it, you may just return true. If the user initiated the request, you may instead want to load a warning page. Also check the URL and decide whether to turn scripting on or off.

### 192.1.83 NewWindowRequested(URL as String, IsUserInitiated as Boolean, WindowFeatures as WebView2WindowFeaturesMBS, byref NewWindow as Variant) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called when a new window needs to be opened.
**Notes:** Return true to indicate you handled the event.
If you create a new window with a DesktopWebView2ControlMBS (or DesktopDesktopWebView2ControlMBS), you can put it in NewWindow property.

IsUserInitiated:
True when the new window request was initiated through a user gesture.

Examples of user initiated requests are:
Selecting an anchor tag with target
Programmatic window open from a script that directly run as a result of user interaction such as via onclick handlers.
Non-user initiated requests are programmatic window opens from a script that are not directly triggered by user interaction, such as those that run while loading a new page or via timers. The Microsoft Edge popup blocker is disabled for WebView so the app is able to use this flag to block non-user initiated popups.

URL: The target uri of the new window requested.

NewWindow: Set the new control to use.

If the NewWindow is set, the top-level window returns as the opened WindowProxy. The NewWindow property should be set to a control that has not been navigated previously. Don't use methods that cause navigation or interact with the DOM on this web view. Setting event handlers, changing Settings properties, or other methods are fine to call. Changes to settings should be made before NewWindow is called to ensure that those settings take effect for the newly setup WebView. Once the NewWindow is set the underlying web contents of this CoreWebView2 will be replaced and navigated as appropriate for the new window. After setting new window it cannot be changed and error will be return otherwise.

### 192.1.84 Opened

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called when browser initialization is done.
**Notes:** Typical event flow is like this:

- Configure
- Open
- Window.Open
- Opened

Opened is called a few milliseconds later.

If you load an URL, the events happen like this:

- NavigationStarting
- SourceChanged
- ContentLoading
- HistoryChanged
- DocumentTitleChanged
- NavigationCompleted

### 192.1.85 Opening

Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 192.1.86 PermissionRequested(URL as String, PermissionKind as Integer, IsUserInitiated as Boolean, byref State as Integer)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to query permissions from user.
**Notes:** PermissionRequested fires when content in a WebView requests permission to access some privileged resources.
If a deferral is not taken on the event args, the subsequent scripts can be blocked until the event handler returns. If a deferral is taken, then the scripts are blocked until the deferral is completed.

URL: The origin of the web content that requests the permission.
PermissionKind: The type of the permission that is requested.
IsUserInitiated: True when the permission request was initiated through a user gesture.
State: The status of a permission request, i.e.

Please assign State the answer you like to provide.

### 192.1.87 PrintCompleted(Path as String, errorCode as Integer, isSuccessful as boolean)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** Receives the result of the PrintToPdf method.
**Notes:** If the print to PDF operation succeeds, isSuccessful is true. Otherwise, if the operation failed, isSuccessful is set to false. An invalid path returns E_INVALIDARG in errorCode.

### 192.1.88 ProcessFailed(processFailedKind as Integer)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** ProcessFailed fires when a WebView process is terminated unexpectedly or becomes unresponsive.

### 192.1.89 SourceChanged(isNewDocument as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event to report a change in the URL.
**Notes:** SourceChanged fires when the Source property changes. SourceChanged fires for navigating to a different site or fragment navigations. It will not fire for other types of navigations such as page reloads or history.pushState with the same URL as the current page. SourceChanged fires before ContentLoading for navigation to a new document.

### 192.1.90 WebMessageReceived(Source as String, webMessageAsJson as String, webMessageAsString as String)

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called for a web message.
**Notes:** WebMessageReceived fires when the IsWebMessageEnabled setting is set and the top level document of the WebView calls window.chrome.webview.postMessage. The postMessage function is void postMessage(object) where object is any object supported by JSON conversion.

webMessageAsString is empty if we can't serialize it to text.

### 192.1.91 WindowCloseRequested

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event where JavaScript asks to close window.
**Notes:** WindowCloseRequested fires when content inside the WebView requested to close the window, such as after window.close is called. The app should close the WebView and related app window if that makes sense to the app.

### 192.1.92 ZoomFactorChanged

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** ZoomFactorChanged fires when the ZoomFactor property of the WebView changes.
**Notes:** The event could fire because the caller modified the ZoomFactor property, or due to the user manually modifying the zoom. When it is modified by the caller via the ZoomFactor property, the internal zoom factor is updated immediately and there will be no ZoomFactorChanged event. WebView associates the last used zoom factor for each site. Therefore, it is possible for the zoom factor to change when navigating to a different page. When the zoom factor changes due to this, the ZoomFactorChanged event fires right after the ContentLoading event.

### 192.1.93 Constants

Image Formats

| Constant | Value | Description |
|---|---|---|
| kCapturePreviewImageFormatJPEG | 1 | JPEG format. |
| kCapturePreviewImageFormatPNG | 0 | PNG format. |

HostResourceAccessKind

| Constant | Value | Description |
|---|---|---|
| kHostResourceAccessKindAllow | 1 | All cross origin resource access is allowed, including accesses that are subj to Cross-Origin Resource Sharing(CORS) check. The behavior is similar t web site sends back http header Access-Control-Allow-Origin: *. |
| kHostResourceAccessKindDeny | 0 | All cross origin resource access is denied, including normal sub resource acc as src of a script or image element. |
| kHostResourceAccessKindDenyCors | 2 | Cross origin resource access is allowed for normal sub resource access like src of a script or image element, while any access that subjects to CORS ch will be denied. |

Permission Kind

| Constant | Value | Description |
|---|---|---|
| kPermissionKindCamera | 2 | Permission to capture video. |
| kPermissionKindClipboardRead | 6 | Permission to read system clipboard without a user gesture. |
| kPermissionKindGeoLocation | 3 | Permission to access geolocation. |
| kPermissionKindMicrophone | 1 | Permission to capture audio. |
| kPermissionKindNotifications | 4 | Permission to send web notifications. |
| kPermissionKindOtherSensors | 5 | Permission to access generic sensor. |
| kPermissionKindUnknownPermission | 0 | Unknown permission. |

Permission States

| Constant | Value | Description |
|---|---|---|
| kPermissionStateAllow | 1 | Grant the permission request. |
| kPermissionStateDefault | 0 | Use default browser behavior, which normally prompt users for decision. |
| kPermissionStateDeny | 2 | Deny the permission request. |

Process Failure Kinds

| Constant | Value | Description |
|---|---|---|
| kProcessFailedKindBrowserProcessExited | 0 | Indicates the browser process terminated unexpectedly. |
| kProcessFailedKindRenderProcessExited | 1 | Indicates the render process terminated unexpectedly. |
| kProcessFailedKindRenderProcessUnresponsive | 2 | Indicates the render process becomes unresponsive. |

Error Status Values

| Constant | Value | Description |
|---|---|---|
| kWebErrorStatusCannotConnect | 12 | Cannot connect to destination. |
| kWebErrorStatusCertificateCommonNameIsIncorrect | 1 | The SSL certificate common name does not match the we |
| kWebErrorStatusCertificateExpired | 2 | The SSL certificate has expired. |
| kWebErrorStatusCertificateIsInvalid | 5 | The SSL certificate is invalid –this could mean the certi the public key pins for the host name, the certificate is sig authority or using a weak sign algorithm, the certificate violate name constraints, the certificate contains a weak validity period is too long, lack of revocation information anism, non-unique host name, lack of certificate transpar the certificate is chained to a legacy Symantec root. |
| kWebErrorStatusCertificateRevoked | 4 | The SSL certificate has been revoked. |
| kWebErrorStatusClientCertificateContainsErrors | 3 | The SSL client certificate contains errors. |
| kWebErrorStatusConnectionAborted | 9 | The connection was aborted. |
| kWebErrorStatusConnectionReset | 10 | The connection was reset. |
| kWebErrorStatusDisconnected | 11 | The Internet connection has been lost. |
| kWebErrorStatusErrorHttpInvalidServerResponse | 8 | The server returned an invalid or unrecognized response. |
| kWebErrorStatusHostNameNotResolved | 13 | Could not resolve provided host name. |
| kWebErrorStatusOperationCanceled | 14 | The operation was canceled. |
| kWebErrorStatusRedirectFailed | 15 | The request redirect failed. |
| kWebErrorStatusServerUnreachable | 6 | The host is unreachable. |
| kWebErrorStatusTimeout | 7 | The connection has timed out. |
| kWebErrorStatusUnexpectedError | 16 | An unexpected error occurred. |
| kWebErrorStatusUnknown | 0 | An unknown error occurred. |

Web Resource Context

| Constant | Value | Description |
|---|---|---|
| kWebResourceContextAll | 0 | All resources. |
| kWebResourceContextCspViolationReport | 15 | CSP Violation Reports. |
| kWebResourceContextDocument | 1 | Document resources. |
| kWebResourceContextEventSource | 10 | EventSource API communication. |
| kWebResourceContextFetch | 8 | Fetch API communication. |
| kWebResourceContextFont | 5 | Font resources. |
| kWebResourceContextImage | 3 | Image resources. |
| kWebResourceContextManifest | 12 | Web App Manifests. |
| kWebResourceContextMedia | 4 | Other media resources such as videos. |
| kWebResourceContextOther | 16 | Other resources. |
| kWebResourceContextPing | 14 | Ping requests. |
| kWebResourceContextScript | 6 | Script resources. |
| kWebResourceContextSignedExchange | 13 | Signed HTTP Exchanges. |
| kWebResourceContextStylesheet | 2 | CSS resources. |
| kWebResourceContextTextTrack | 9 | TextTrack resources. |
| kWebResourceContextWebSocket | 11 | WebSocket API communication. |
| kWebResourceContextXMLHttpRequest | 7 | XML HTTP requests. |

## 192.2 control WebView2ControlMBS

### 192.2.1 control WebView2ControlMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The MBS control for the Chrome based WebView2 control from Microsoft.
**Notes:**

Read about WebView2 control here:

https://developer.microsoft.com/en-us/microsoft-edge/webview2/

There you also fine the installers needed to install it, unless you have the 2021 version of Windows, which may include it preinstalled.

If you use this control on macOS and Linux, it will do nothing.
On Windows if the control fails to initialize, the Opened event will not fire.
But if it fires, it will be some time after the open event fired as initialization is asynchronous.

If you call LoadURL, LoadHTML or set URL property too early, we cache that and perform the action later when the web viewer is initialized properly.

If you add an event, we register it with the C++ control. So if you don't specify an event, you may get the default behavior.

All functions may raise WebView2ExceptionMBS in case of errors.
**Blog Entries**

- WebView2 for Xojo upgrades
- New in MBS Xojo Plugins in version 23.1
- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- Upgrading WebKit for Windows support
- News from the MBS Xojo Plugins in version 21.5
- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0

**Xojo Developer Magazine**

- 21.6, page 8: News
- 19.6, page 10: News
- 19.3, page 10: News
- 19.2, page 9: News
- 19.1, page 11: News

### 192.2.2 Methods

### 192.2.3 AddScriptToExecuteOnDocumentCreated(JavaScript as String, tag as variant = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Add the provided JavaScript to a list of scripts that should be executed after the global object has been created, but before the HTML document has been parsed and before any other script included by the HTML document is executed.
**Notes:** This method injects a script that runs on all top-level document and child frame page navigations. This method runs asynchronously, and you must wait for the completion handler to finish before the injected script is ready to run. When this method completes, the handler's Invoke method is called with the id of the injected script. id is a string. To remove the injected script, use RemoveScriptToExecuteOnDocumentCreated.
Note that if an HTML document has sandboxing of some kind via sandbox properties or the Content-Security-Policy HTTP header this will affect the script run here. So, for example, if the 'allow-modals' keyword is not set then calls to the alert function will be ignored.

Calls AddScriptToExecuteOnDocumentCreatedCompleted event later when done.

### 192.2.4 AddWebResourceRequestedFilter(URL as String, resourceType as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Adds a URI and resource context filter to the WebResourceRequested event.
**Notes:** The URI parameter can be a wildcard string ('*': zero or more, '?': exactly one). See kWebResourceContext constants for description of resource context filters.

### 192.2.5 AvailableCoreWebView2BrowserVersionString as string

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The available version of the WebView2 browser.
**Notes:** Allows you to query the browser version before creating a control.
Returns empty text if none is available.

### 192.2.6 CanGoBack as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the WebView can navigate to a previous page in the navigation history.
**Notes:** The HistoryChanged event will fire if CanGoBack changes value.

Returns false if the browser is not yet initialized.

### 192.2.7 CanGoForward as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if the WebView can navigate to a next page in the navigation history.
**Notes:** The HistoryChanged event will fire if CanGoForward changes value.

Returns false if the browser is not yet initialized.

### 192.2.8 CapturePreview(ImageFormat as Integer = 0)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Capture an image of what WebView is displaying.
**Notes:** Specify the format of the image with the imageFormat parameter. The resulting image binary data is passed to the CapturePreviewCompleted event.

Calls CapturePreviewCompleted event when done or failed.

### 192.2.9 ClearSelection

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to clear current selection.
**Notes:** This is the reverse for SelectAll.

### 192.2.10 ClearVirtualHostNameToFolderMapping(hostName as String)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop only.

**Function:** Clears a host name mapping for local folder that was added by SetVirtualHostNameToFolderMapping.
**Notes:** hostName: The host name to be removed from the mapping.

### 192.2.11 Copy

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to copy current selection to clipboard.

### 192.2.12 CreatePrintSettings as WebView2PrintSettingsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Creates the WebView2PrintSettingsMBS object used by the PrintToPdf method.

### 192.2.13 Cut

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to cut current selection.
**Notes:** May do a copy, if selection is read only.

### 192.2.14 ExecuteScript(JavaScript as String, tag as variant = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Execute JavaScript code from the javascript parameter in the current top level document rendered in the WebView.
**Example:**

```
dim web as WebView2ControlMBS // your control
```

```
web.ExecuteScript "1+5" , "tag value"

// triggers ExecuteScriptCompeleted later with result "6"

web.ExecuteScript "window.chrome.webview.postMessage( { 'Test': 'Hello, world!' } );"

// triggers later WebMessageReceived later
```

**Notes:** This will execute asynchronously and when complete, if a handler is provided in the ExecuteScriptCompletedHandler parameter, its Invoke method will be called with the result of evaluating the provided JavaScript. The result value is a JSON encoded string. If the result is undefined, contains a reference cycle, or otherwise cannot be encoded into JSON, the JSON null value will be returned as the string 'null'. Note that a function that has no explicit return value returns undefined. If the executed script throws an unhandled exception, then the result is also 'null'. This method is applied asynchronously. If the method is called after NavigationStarting event during a navigation, the script will be executed in the new document when loading it, around the time ContentLoading is fired. ExecuteScript will work even if IsScriptEnabled is set to false.

Calls ExecuteScriptCompleted event later.

### 192.2.15 ExecuteScriptSync(JavaScript as String, byref ErrorCode as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop only.

**Function:** Execute JavaScript code from the javascript parameter in the current top level document rendered in the WebView.
**Example:**

```
dim web as WebView2ControlMBS // your control

dim errorCode as integer
dim s as string = web.ExecuteScriptSync("1+2", errorCode)

Break // s contains 3
```

**Notes:** Same as ExecuteScript, but waits for event and returns result directly.
errorCode is zero on success.
Result is JSON as text, e.g. "null" if there is no result.

### 192.2.16 GoBack

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Navigates the WebView to the previous page in the navigation history.

### 192.2.17 GoForward

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Navigates the WebView to the next page in the navigation history.

### 192.2.18 HTMLText as String

MBS WinFrameworks Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries HTML text of the current website.
**Example:**

```
dim web as WebView2ControlMBS // your control

dim text as string = web.plaintext
dim html as string = web.HTMLText

break // check in debugger
```

**Notes:** Please don't call directly from NavigationCompleted event since that can freeze. Better use timer.CallLater to call a method later to do this a millisecond later.

### 192.2.19 LoadHTML(HTML as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Initiates a navigation to htmlContent as source HTML of a new document.
**Notes:** The htmlContent parameter may not be larger than 2 MB in total size. The origin of the new page will be about:blank.

### 192.2.20 LoadURL(URL as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Cause a navigation of the top level document to the specified URI.
**Notes:** See the navigation events for more information. Note that this starts a navigation and the corresponding NavigationStarting event will fire sometime after this Navigate call completes.

### 192.2.21 OpenDevToolsWindow

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Opens the DevTools window for the current document in the WebView.
**Notes:** Does nothing if called when the DevTools window is already open.

### 192.2.22 Paste

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to paste clipboard content into the current field.
**Notes:** This may do nothing if there is nothing to paste or nothing to receive (no field in focus).

### 192.2.23 PlainText as String

MBS WinFrameworks Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop only.

**Function:** Queries plain text of the current website.
**Example:**

```
dim web as WebView2ControlMBS // your control

dim text as string = web.plaintext
dim html as string = web.HTMLText

break // check in debugger
```

**Notes:** Please don't call directly from NavigationCompleted event since that can freeze. Better use timer.CallLater to call a method later to do this a millisecond later.

### 192.2.24 PostWebMessageAsJson(webMessageAsJson as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Post the specified webMessage to the top level document in this WebView.

**Notes:** The top level document's window.chrome.webview's message event fires. JavaScript in that document may subscribe and unsubscribe to the event via the following:

window.chrome.webview.addEventListener('message', handler)
window.chrome.webview.removeEventListener('message', handler)

The event args is an instance of MessageEvent. The IsWebMessageEnabled setting must be true or this method will fail with E_INVALIDARG. The event arg's data property is the webMessage string parameter parsed as a JSON string into a JavaScript object. The event arg's source property is a reference to the window.chrome.webview object. See add_WebMessageReceived for information on sending messages from the HTML document in the WebView to the host. This message is sent asynchronously. If a navigation occurs before the message is posted to the page, then the message will not be sent.

### 192.2.25 PostWebMessageAsString(webMessageAsString as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** This is a helper for posting a message that is a simple string rather than a JSON string representation of a JavaScript object..
**Notes:** This behaves in exactly the same manner as PostWebMessageAsJson but the window.chrome.webview message event arg's data property will be a string with the same value as webMessageAsString. Use this instead of PostWebMessageAsJson if you want to communicate via simple strings rather than JSON objects.

### 192.2.26 Print

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to show print dialog.

### 192.2.27 PrintToPdf(Path as String, PrintSettings as WebView2PrintSettingsMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Print the current page to PDF asynchronously with the provided settings.
**Notes:** Use Path to specify the path to the PDF file. The host should provide an absolute path, including file name. If the path points to an existing file, the file will be overwritten. If the path is not valid, the method fails with E_INVALIDARG.

The async PrintToPdf operation completes when the data has been written to the PDF file. At this time the

PrintCompleted event is invoked. If the application exits before printing is complete, the file is not saved. Only one Printing operation can be in progress at a time. If PrintToPdf is called while a printing operation is in progress, the event is immediately invoked with isSuccessful set to false.

Requires WebView2 in version 1.0.1020.30 or later.

### 192.2.28 Reload

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Reload the current page.
**Notes:** This is similar to navigating to the URI of current top level document including all navigation events firing and respecting any entries in the HTTP cache. But, the back/forward history will not be modified.

### 192.2.29 RemoveScriptToExecuteOnDocumentCreated(ID as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Remove the corresponding JavaScript added using AddScriptToExecuteOnDocumentCreated with the specified script id.

### 192.2.30 RemoveWebResourceRequestedFilter(URL as String, resourceType as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Removes a matching WebResource filter that was previously added for the WebResourceRequested event.
**Notes:** If the same filter was added multiple times, then it will need to be removed as many times as it was added for the removal to be effective. Raises exception with E_INVALIDARG for a filter that was never added.

### 192.2.31 SelectAll

MBS WinFrameworks Plugin, Plugin Version: 22.2, Platform: Windows, Targets: Desktop only.

**Function:** Asks webview to select all text.

### 192.2.32 SetVirtualHostNameToFolderMapping(hostName as String, folderPath as String, accessKind as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.4, Platform: Windows, Targets: Desktop only.

**Function:** Sets a mapping between a virtual host name and a folder path to make available to web sites via that host name.
**Notes:** hostName: A virtual host name.
folderPath: A folder path name to be mapped to the virtual host name. The length must not exceed the Windows MAX_PATH limit.
accessKind: The level of access to resources under the virtual host from other sites.

See kHostResourceAccessKind* constants.

### 192.2.33 Stop

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Stop all navigations and pending resource fetches.
**Notes:** Does not stop scripts.

### 192.2.34 Properties

### 192.2.35 AdditionalBrowserArguments as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Additional browser arguments can be specified to change the behavior of the WebView.
**Notes:** These will be passed to the browser process as part of the command line. See Run Chromium with Flags for more information about command line switches to browser process. If the app is launched with a command line switch –edge-webview-switches=xxx the value of that switch (xxx in the above example) will also be appended to the browser process command line. Certain switches like –user-data-dir are internal and important to WebView. Those switches will be ignored even if specified. If the same switches are specified multiple times, the last one wins. There is no attempt to merge the different values of the same switch, except for disabled and enabled features. The features specified by –enable-features and –disable-features will be merged with simple logic: the features will be the union of the specified features and built-in features, and if a feature is disabled, it will be removed from the enabled features list. App process's command line –edge-webview-switches value are processed after the additionalBrowserArguments parameter is processed. Certain features are disabled internally and can't be enabled. If parsing failed for the specified switches, they will be ignored. Default is to run browser process with no extra flags.
(Read and Write property)

### 192.2.36 AllowSingleSignOnUsingOSPrimaryAccount as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The AllowSingleSignOnUsingOSPrimaryAccount property is used to enable single sign on with Azure Active Directory (AAD) resources inside WebView using the logged in Windows account and single sign on with web sites using Microsoft account associated with the login in Windows account.
**Notes:** Default is disabled. Universal Windows Platform apps must also declare enterpriseCloudSSO restricted capability for the single sign on to work.
(Read and Write property)

### 192.2.37 areBrowserAcceleratorKeysEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether all accelerator keys are enabled.
**Notes:** When this setting is set to false, it disables all accelerator keys that access features specific to a web browser, including but not limited to:

- Ctrl-F and F3 for Find on Page
- Ctrl-P for Print
- Ctrl-R and F5 for Reload
- Ctrl-Plus and Ctrl-Minus for zooming
- Ctrl-Shift-C and F12 for DevTools
- Special keys for browser functions, such as Back, Forward, and Search

It does not disable accelerator keys related to movement and text editing, such as:

- Home, End, Page Up, and Page Down
- Ctrl-X, Ctrl-C, Ctrl-V
- Ctrl-A for Select All
- Ctrl-Z for Undo

Those accelerator keys will always be enabled unless they are handled in the AcceleratorKeyPressed event. This setting has no effect on the AcceleratorKeyPressed event. The event will be fired for all accelerator keys, whether they are enabled or not.

The default value for AreBrowserAcceleratorKeysEnabled is true.

Needs WebView2 in version 1.0.864.35 or newer.
(Read and Write property)

### 192.2.38 AreDefaultContextMenusEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The AreDefaultContextMenusEnabled property is used to prevent default context menus from being shown to user in WebView.
**Notes:** It is true by default.
(Read and Write property)

### 192.2.39 AreDefaultScriptDialogsEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** AreDefaultScriptDialogsEnabled is used when loading a new HTML document.
**Notes:** If set to false, then WebView won't render the default JavaScript dialog box (Specifically those shown by the JavaScript alert, confirm, prompt functions and beforeunload event). Instead, if an event handler is set via add_ScriptDialogOpening, WebView will send an event that will contain all of the information for the dialog and allow the host app to show its own custom UI. It is true by default.
(Read and Write property)

### 192.2.40 AreDevToolsEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** AreDevToolsEnabled controls whether the user is able to use the context menu or keyboard shortcuts to open the DevTools window.
**Notes:** It is true by default.
(Read and Write property)

### 192.2.41 AreHostObjectsAllowed as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The AreHostObjectsAllowed property is used to control whether host objects are accessible from the page in WebView.
**Notes:** It is true by default.

(Read and Write property)

### 192.2.42 BrowserExecutableFolder as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The path to the browser executable to use.
**Notes:** Must be assigned very early, e.g. in Configure event, before initialization of the control runs.

Use browserExecutableFolder to specify whether WebView2 controls use a fixed or installed version of the WebView2 Runtime that exists on a user machine. To use a fixed version of the WebView2 Runtime, pass the relative folder path that contains the fixed version of the WebView2 Runtime to browserExecutableFolder. To create WebView2 controls that use the installed version of the WebView2 Runtime that exists on user machines, pass a empty string to browserExecutableFolder. In this scenario, the API tries to find a compatible version of the WebView2 Runtime that is installed on the user machine (first at the machine level, and then per user) using the selected channel preference. The path of fixed version of the WebView2 Runtime should not contain \Edge\Application\. When such a path is used, the API fails with HRESULT_FROM_WIN32(ERROR_NOT_SUPPORTED).
(Read and Write property)

### 192.2.43 BrowserVersionString as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The browser version info of the current environment, including channel name if it is not the stable channel.
**Notes:** This matches the format of the AvailableCoreWebView2BrowserVersionString API. Channel names are 'beta', 'dev', and 'canary'.
(Read only property)

### 192.2.44 ContainsFullScreenElement as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates if the WebView contains a fullscreen HTML element.
**Notes:** (Read only property)

### 192.2.45 CookieManager as WebView2CookieManagerMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the cookie manager object associated with this webview.
**Notes:** Requires WebView2 version 1.0.705.50 from January 2021.
(Read only property)

### 192.2.46 DefaultBackgroundColor as Color

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The DefaultBackgroundColor property is the color WebView renders underneath all web content.
**Example:**

```
// set transparent in Opened event:

web.DefaultBackgroundColor = &cFFFFFFFF
```

**Notes:** This means WebView renders this color when there is no web content loaded such as before the initial navigation or between navigations. This also means web pages with undefined css background properties or background properties containing transparent pixels will render their contents over this color. Web pages with defined and opaque background properties that span the page will obscure the DefaultBackgroundColor and display normally. The default value for this property is white to resemble the native browser experience.

The Color is specified by the color that represents an RGBA value. The A represents an Alpha value, meaning DefaultBackgroundColor can be transparent. In the case of a transparent DefaultBackgroundColor WebView will render hosting app content as the background. This Alpha value is not supported on Windows 7. Any A value other than 255 will result in an exception on Windows 7. It is supported on all other WebView compatible platforms.

Semi-transparent colors are not currently supported by this API and setting DefaultBackgroundColor to a semi-transparent color will fail with an exception. The only supported alpha values are 0 and 255, all other values will result in exception. DefaultBackgroundColor can only be an opaque color or transparent.

Requires version 1.0.774.44 of Webview2 or newer.
Can't be set in Open event as the control is not yet ready.
(Read and Write property)

### 192.2.47 DocumentTitle as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The title for the current top level document.
**Notes:** If the document has no explicit title or is otherwise empty, a default that may or may not match the URI of the document will be used.

(Read only property)

### 192.2.48 IsBuiltInErrorPageEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsBuiltInErrorPageEnabled property is used to disable built in error page for navigation failure and render process failure.
**Notes:** It is true by default. When disabled, blank page will be shown when related error happens.
(Read and Write property)

### 192.2.49 IsGeneralAutofillEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether autofill for information like names, street and email addresses, phone numbers, and arbitrary input is enabled.
**Notes:** This excludes password and credit card information. When IsGeneralAutofillEnabled is false, no suggestions appear, and no new information is saved. When IsGeneralAutofillEnabled is true, information is saved, suggestions appear and clicking on one will populate the form fields. The default value is true.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.2.50 IsPasswordAutosaveEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether autosave for password information is enabled.
**Notes:** The IsPasswordAutosaveEnabled property behaves independently of the IsGeneralAutofillEnabled property. When IsPasswordAutosaveEnabled is false, no new password data is saved and no Save/Update Password prompts are displayed. However, if there was password data already saved before disabling this setting, then that password information is auto-populated, suggestions are shown and clicking on one will populate the fields. When IsPasswordAutosaveEnabled is true, password information is auto-populated, suggestions are shown and clicking on one will populate the fields, new data is saved, and a Save/Update Password prompt is displayed. The default value is false.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.2.51 IsPinchZoomEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop only.

**Function:** Enable or disable pitch zoom.
**Notes:** Pinch-zoom, referred to as "Page Scale" zoom, is performed as a post-rendering step, it changes the page scale factor property and scales the surface the web page is rendered onto when user performs a pinch zooming action.

It does not change the layout but rather changes the viewport and clips the web content, the content outside of the viewport isn't visible onscreen and users can't reach this content using mouse.
The IsPinchZoomEnabled property enables or disables the ability of the end user to use a pinching motion on touch input enabled devices to scale the web content in the WebView2. It defaults to TRUE. When set to FALSE, the end user cannot pinch zoom after the next navigation. Disabling/Enabling IsPinchZoomEnabled only affects the end user's ability to use pinch motions and does not change the page scale factor. This API only affects the Page Scale zoom and has no effect on the existing browser zoom properties (IsZoomControlEnabled and ZoomFactor) or other end user mechanisms for zooming.

Needs WebView2 in version 1.0.902.49 or newer.
(Read and Write property)

### 192.2.52 IsScriptEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Controls if JavaScript execution is enabled in all future navigations in the WebView.
**Notes:** This only affects scripts in the document; scripts injected with ExecuteScript will run even if script is disabled. It is true by default.
(Read and Write property)

### 192.2.53 IsStatusBarEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** IsStatusBarEnabled controls whether the status bar will be displayed.
**Notes:** The status bar is usually displayed in the lower left of the WebView and shows things such as the URI of a link when the user hovers over it and other information. It is true by default.
(Read and Write property)

### 192.2.54 IsWebMessageEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsWebMessageEnabled property is used when loading a new HTML document.
**Notes:** If set to true, communication from the host to the WebView's top level HTML document is allowed via PostWebMessageAsJson, PostWebMessageAsString, and window.chrome.webview's message event (see PostWebMessageAsJson documentation for details). Communication from the WebView's top level HTML document to the host is allowed via window.chrome.webview's postMessage function and add_WebMessageReceived method (see add_WebMessageReceived documentation for details). If set to false, then communication is disallowed. PostWebMessageAsJson and PostWebMessageAsString will fail with E_ACCESSDENIED and window.chrome.webview.postMessage will fail by throwing an instance of an Error object. It is true by default.
(Read and Write property)

### 192.2.55 IsZoomControlEnabled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The IsZoomControlEnabled property is used to prevent the user from impacting the zoom of the WebView.
**Notes:** It is true by default. When disabled, user will not be able to zoom using ctrl+/- or ctrl+mouse wheel, but the zoom can be set via ZoomFactor API.
(Read and Write property)

### 192.2.56 Language as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The default language that WebView will run with.
**Notes:** It applies to browser UIs like context menu and dialogs. It also applies to the accept-languages HTTP header that WebView sends to web sites. It is in the format of language [ -country ] where language is the 2 letter code from ISO 639 and country is the 2 letter code from ISO 3166.
(Read and Write property)

### 192.2.57 ProcessID as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The process id of the browser process that hosts the WebView.
**Notes:** (Read only property)

### 192.2.58 TargetCompatibleBrowserVersion as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The version of the Edge WebView2 Runtime binaries required to be compatible with the calling application.
**Notes:** This defaults to the Edge WebView2 Runtime version that corresponds with the version of the SDK the application is using. The format of this value is the same as the format of the BrowserVersionString property and other BrowserVersion values. Only the version part of the BrowserVersion value is respected. The channel suffix, if it exists, is ignored. The version of the Edge WebView2 Runtime binaries actually used may be different from the specified TargetCompatibleBrowserVersion. They are only guaranteed to be compatible. You can check the actual version on the BrowserVersionString property on the control.
(Read and Write property)

### 192.2.59 URL as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The URI of the current top level document.
**Notes:** This value potentially changes as a part of the SourceChanged event firing for some cases such as navigating to a different site or fragment navigations. It will remain the same for other types of navigations such as page reloads or history.pushState with the same URL as the current page.

If assigned, calls LoadURL method.
(Read and Write property)

### 192.2.60 UserAgent as String

MBS WinFrameworks Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop only.

**Function:** The User Agent.
**Notes:** The default value is the default User Agent of the Microsoft Edge browser.

This property may be overridden if the User-Agent header is set in a request. If the parameter is empty the User Agent will not be updated and the current User Agent will remain.

Needs WebView2 in version 1.0.864.35 or newer.
(Read and Write property)

### 192.2.61 UserDataFolder as String

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The user data folder location.
**Example:**

```
Dim w As WebView2ControlMBS // your control

Dim SupportFolder As FolderItem = SpecialFolder.ApplicationData.Child("MyApp")
SupportFolder.CreateAsFolder

w.UserDataFolder = SupportFolder.NativePath
```

**Notes:** Must be assigned very early, e.g. in Configure event, before initialization of the control runs.

You may specify the userDataFolder to change the default user data folder location for WebView2. The path is either an absolute file path or a relative file path that is interpreted as relative to the compiled code for the current process. For UWP apps, the default user data folder is the app data folder for the package. For non-UWP apps, the default user data ( { Executable File Name } .WebView2) folder is created in the same directory next to the compiled code for the app. WebView2 creation fails if the compiled code is running in a directory in which the process does not have permission to create a new directory. The app is responsible to clean up the associated user data folder when it is done.
(Read and Write property)

### 192.2.62 ZoomFactor as Double

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The ZoomFactor property.
**Notes:** (Read and Write property)

### 192.2.63 Events

### 192.2.64 AddScriptToExecuteOnDocumentCreatedCompleted(JavaScript as String, ErrorCode as Integer, ID as String, Tag as Variant)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report that AddScriptToExecuteOnDocumentCreated is done and provide the ID.

### 192.2.65 CapturePreviewCompleted(ImageFormat as Integer, ErrorCode as Integer, PictureData as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event called when CapturePreview call is done.
**Notes:** We pass you the image data as a string, so you can e.g. write it to a PNG or JPEG file.

Otherwise ErrorCode tells you the reason for the error.

### 192.2.66 Close

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

The control is about to close.
In Xojo version 2021r3 and newer this event is named Closing.

### 192.2.67 Closing

Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

The control is about to close.
In older Xojo versions, this event is named Close.

### 192.2.68 Configure

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event called while initializing, where you can apply properties just before plugin reads them.
**Notes:** Can be used to set UserDataFolder property.

### 192.2.69 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 192.2.70 ContainsFullScreenElementChanged

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** ContainsFullScreenElementChanged fires when the ContainsFullScreenElement property changes.
**Notes:** This means that an HTML element inside the WebView is entering fullscreen to the size of the Web-

View or leaving fullscreen. This event is useful when, for example, a video element requests to go fullscreen. The listener of ContainsFullScreenElementChanged can then resize the WebView in response.

### 192.2.71 ContentLoading(isErrorPage as Boolean, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The content loading event.d
**Notes:** ContentLoading fires before any content is loaded, including scripts added with AddScriptToExecuteOnDocumentCreated. ContentLoading will not fire if a same page navigation occurs (such as through fragment navigations or history.pushState navigations). This follows the NavigationStarting and SourceChanged events and precedes the HistoryChanged and NavigationCompleted events.

### 192.2.72 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 192.2.73 DocumentTitleChanged

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report a document title change.
**Notes:** DocumentTitleChanged fires when the DocumentTitle property of the WebView changes and may fire before or after the NavigationCompleted event.

### 192.2.74 EnableMenuItems

MBS WinFrameworks Plugin, Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:**

The event where you can enable menu items.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 192.2.75 ExecuteScriptCompleted(JavaScript as String, ErrorCode as Integer, resultObjectAsJson as String, Tag as Variant)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report ExecuteScript method is done.

### 192.2.76 FocusLost

Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

LostFocus fires when WebView lost focus.
In older Xojo versions, this event is named LostFocus.
**Notes:**

In the case where MoveFocusRequested event is fired, the focus is still on WebView when MoveFocusRequested event fires. LostFocus only fires afterwards when app's code or default action of MoveFocusRequested event set focus away from WebView.

### 192.2.77 FocusReceived

Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

GotFocus fires when WebView got focus.
In older Xojo versions, this event is named GotFocus.

### 192.2.78 FrameNavigationCompleted(isSuccess as Boolean, ErrorStatus as Integer, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** FrameNavigationCompleted fires when a child frame has completely loaded (body.onload has fired) or loading stopped with error.

### 192.2.79 FrameNavigationStarting(URL as String, IsUserInitiated as Boolean, IsRedirected as Boolean, NavigationID as UInt64) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** FrameNavigationStarting fires when a child frame in the WebView requests permission to navigate to a different URI. This will fire for redirects as well.
**Notes:** Corresponding navigations can be blocked until the event handler returns.
Return true to block the request.

### 192.2.80 GotFocus

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

GotFocus fires when WebView got focus.
In Xojo version 2021r3 and newer this event is named FocusReceived.

### 192.2.81 HistoryChanged

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report history change.
**Notes:** HistoryChanged listens to the change of navigation history for the top level document. Use HistoryChanged to check if CanGoBack/CanGoForward value has changed. HistoryChanged also fires for using GoBack/GoForward. HistoryChanged fires after SourceChanged and ContentLoading.

### 192.2.82 LostFocus

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

LostFocus fires when WebView lost focus.
In Xojo version 2021r3 and newer this event is named FocusLost.
**Notes:**

In the case where MoveFocusRequested event is fired, the focus is still on WebView when MoveFocusRequested event fires. LostFocus only fires afterwards when app's code or default action of MoveFocusRequested event set focus away from WebView.

### 192.2.83 MenuBarSelected

Plugin Version: 22.1, Platform: Windows, Targets: .

**Function:**

The event where you can enable menu items.
In older Xojo versions, this event is named EnableMenuItems.

### 192.2.84 NavigationCompleted(isSuccess as Boolean, ErrorStatus as Integer, NavigationID as UInt64)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report a navigation action completed.
**Notes:** NavigationCompleted fires when the WebView has completely loaded (body.onload has fired) or loading stopped with error.

Please don't process directly here, but maybe call a method with timer.CallLater to do processing like using HTMLText or PlainText functions.

Like the DocumentCompleted event in Xojo.

### 192.2.85 NavigationStarting(URL as String, IsUserInitiated as Boolean, IsRedirected as Boolean, NavigationID as UInt64) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report a navigation action.
**Notes:** NavigationStarting fires when the WebView main frame is requesting permission to navigate to a different URI. This will fire for redirects as well.
Corresponding navigations can be blocked until the event handler returns.

Return true to cancel it like Xojo's CancelLoad event.

This event is great to check the URL. If you like to block it, you may just return true. If the user initiated the request, you may instead want to load a warning page. Also check the URL and decide whether to turn scripting on or off.

### 192.2.86 NewWindowRequested(URL as String, IsUserInitiated as Boolean, WindowFeatures as WebView2WindowFeaturesMBS, byref NewWindow as Variant) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: .

**Function:** The event called when a new window needs to be opened.

**Notes:** Return true to indicate you handled the event.
If you create a new window with a WebView2ControlMBS (or DesktopWebView2ControlMBS), you can put it in NewWindow property.

IsUserInitiated:
True when the new window request was initiated through a user gesture.

Examples of user initiated requests are:
Selecting an anchor tag with target
Programmatic window open from a script that directly run as a result of user interaction such as via onclick handlers.
Non-user initiated requests are programmatic window opens from a script that are not directly triggered by user interaction, such as those that run while loading a new page or via timers. The Microsoft Edge popup blocker is disabled for WebView so the app is able to use this flag to block non-user initiated popups.

URL: The target uri of the new window requested.

NewWindow: Set the new control to use.

If the NewWindow is set, the top-level window returns as the opened WindowProxy. The NewWindow property should be set to a control that has not been navigated previously. Don't use methods that cause navigation or interact with the DOM on this web view. Setting event handlers, changing Settings properties, or other methods are fine to call. Changes to settings should be made before NewWindow is called to ensure that those settings take effect for the newly setup WebView. Once the NewWindow is set the underlying web contents of this CoreWebView2 will be replaced and navigated as appropriate for the new window. After setting new window it cannot be changed and error will be return otherwise.

### 192.2.87 Open

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In Xojo version 2021r3 and newer this event is named Opening.

### 192.2.88 Opened

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event called when browser initialization is done.
**Notes:** Typical event flow is like this:

- Configure
- Open
- Window.Open
- Opened

Opened is called a few milliseconds later.

If you load an URL, the events happen like this:

- NavigationStarting
- SourceChanged
- ContentLoading
- HistoryChanged
- DocumentTitleChanged
- NavigationCompleted

### 192.2.89 Opening

Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:**

The control is about to was created and you can initialize it.
In older Xojo versions, this event is named Open.

### 192.2.90 PermissionRequested(URL as String, PermissionKind as Integer, IsUserInitiated as Boolean, byref State as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to query permissions from user.
**Notes:** PermissionRequested fires when content in a WebView requests permission to access some privileged resources.
If a deferral is not taken on the event args, the subsequent scripts can be blocked until the event handler returns. If a deferral is taken, then the scripts are blocked until the deferral is completed.

URL: The origin of the web content that requests the permission.
PermissionKind: The type of the permission that is requested.
IsUserInitiated: True when the permission request was initiated through a user gesture.
State: The status of a permission request, i.e.

Please assign State the answer you like to provide.

### 192.2.91 PrintCompleted(Path as String, errorCode as Integer, isSuccessful as boolean)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** Receives the result of the PrintToPdf method.
**Notes:** If the print to PDF operation succeeds, isSuccessful is true. Otherwise, if the operation failed, isSuccessful is set to false. An invalid path returns E_INVALIDARG in errorCode.

### 192.2.92 ProcessFailed(processFailedKind as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** ProcessFailed fires when a WebView process is terminated unexpectedly or becomes unresponsive.

### 192.2.93 SourceChanged(isNewDocument as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event to report a change in the URL.
**Notes:** SourceChanged fires when the Source property changes. SourceChanged fires for navigating to a different site or fragment navigations. It will not fire for other types of navigations such as page reloads or history.pushState with the same URL as the current page. SourceChanged fires before ContentLoading for navigation to a new document.

### 192.2.94 WebMessageReceived(Source as String, webMessageAsJson as String, webMessageAsString as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event called for a web message.
**Notes:** WebMessageReceived fires when the IsWebMessageEnabled setting is set and the top level document

of the WebView calls window.chrome.webview.postMessage. The postMessage function is void postMessage(object) where object is any object supported by JSON conversion.

webMessageAsString is empty if we can't serialize it to text.

### 192.2.95 WindowCloseRequested

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** The event where JavaScript asks to close window.
**Notes:** WindowCloseRequested fires when content inside the WebView requested to close the window, such as after window.close is called. The app should close the WebView and related app window if that makes sense to the app.

### 192.2.96 ZoomFactorChanged

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: .

**Function:** ZoomFactorChanged fires when the ZoomFactor property of the WebView changes.
**Notes:** The event could fire because the caller modified the ZoomFactor property, or due to the user manually modifying the zoom. When it is modified by the caller via the ZoomFactor property, the internal zoom factor is updated immediately and there will be no ZoomFactorChanged event. WebView associates the last used zoom factor for each site. Therefore, it is possible for the zoom factor to change when navigating to a different page. When the zoom factor changes due to this, the ZoomFactorChanged event fires right after the ContentLoading event.

### 192.2.97 Constants

Image Formats

| Constant | Value | Description |
|---|---|---|
| kCapturePreviewImageFormatJPEG | 1 | JPEG format. |
| kCapturePreviewImageFormatPNG | 0 | PNG format. |

HostResourceAccessKind

| Constant | Value | Description |
|---|---|---|
| kHostResourceAccessKindAllow | 1 | All cross origin resource access is allowed, including accesses that are subj to Cross-Origin Resource Sharing(CORS) check. The behavior is similar t web site sends back http header Access-Control-Allow-Origin: *. |
| kHostResourceAccessKindDeny | 0 | All cross origin resource access is denied, including normal sub resource acc as src of a script or image element. |
| kHostResourceAccessKindDenyCors | 2 | Cross origin resource access is allowed for normal sub resource access like src of a script or image element, while any access that subjects to CORS ch will be denied. |

Permission Kind

| Constant | Value | Description |
|---|---|---|
| kPermissionKindCamera | 2 | Permission to capture video. |
| kPermissionKindClipboardRead | 6 | Permission to read system clipboard without a user gesture. |
| kPermissionKindGeoLocation | 3 | Permission to access geolocation. |
| kPermissionKindMicrophone | 1 | Permission to capture audio. |
| kPermissionKindNotifications | 4 | Permission to send web notifications. |
| kPermissionKindOtherSensors | 5 | Permission to access generic sensor. |
| kPermissionKindUnknownPermission | 0 | Unknown permission. |

Permission States

| Constant | Value | Description |
|---|---|---|
| kPermissionStateAllow | 1 | Grant the permission request. |
| kPermissionStateDefault | 0 | Use default browser behavior, which normally prompt users for decision. |
| kPermissionStateDeny | 2 | Deny the permission request. |

Process Failure Kinds

| Constant | Value | Description |
|---|---|---|
| kProcessFailedKindBrowserProcessExited | 0 | Indicates the browser process terminated unexpectedly. |
| kProcessFailedKindRenderProcessExited | 1 | Indicates the render process terminated unexpectedly. |
| kProcessFailedKindRenderProcessUnresponsive | 2 | Indicates the render process becomes unresponsive. |

Error Status Values

| Constant | Value | Description |
|---|---|---|
| kWebErrorStatusCannotConnect | 12 | Cannot connect to destination. |
| kWebErrorStatusCertificateCommonNameIsIncorrect | 1 | The SSL certificate common name does not match the we |
| kWebErrorStatusCertificateExpired | 2 | The SSL certificate has expired. |
| kWebErrorStatusCertificateIsInvalid | 5 | The SSL certificate is invalid –this could mean the certi the public key pins for the host name, the certificate is sig authority or using a weak sign algorithm, the certificate violate name constraints, the certificate contains a weak validity period is too long, lack of revocation information anism, non-unique host name, lack of certificate transpar the certificate is chained to a legacy Symantec root. |
| kWebErrorStatusCertificateRevoked | 4 | The SSL certificate has been revoked. |
| kWebErrorStatusClientCertificateContainsErrors | 3 | The SSL client certificate contains errors. |
| kWebErrorStatusConnectionAborted | 9 | The connection was aborted. |
| kWebErrorStatusConnectionReset | 10 | The connection was reset. |
| kWebErrorStatusDisconnected | 11 | The Internet connection has been lost. |
| kWebErrorStatusErrorHttpInvalidServerResponse | 8 | The server returned an invalid or unrecognized response. |
| kWebErrorStatusHostNameNotResolved | 13 | Could not resolve provided host name. |
| kWebErrorStatusOperationCanceled | 14 | The operation was canceled. |
| kWebErrorStatusRedirectFailed | 15 | The request redirect failed. |
| kWebErrorStatusServerUnreachable | 6 | The host is unreachable. |
| kWebErrorStatusTimeout | 7 | The connection has timed out. |
| kWebErrorStatusUnexpectedError | 16 | An unexpected error occurred. |
| kWebErrorStatusUnknown | 0 | An unknown error occurred. |

Web Resource Context

| Constant | Value | Description |
|---|---|---|
| kWebResourceContextAll | 0 | All resources. |
| kWebResourceContextCspViolationReport | 15 | CSP Violation Reports. |
| kWebResourceContextDocument | 1 | Document resources. |
| kWebResourceContextEventSource | 10 | EventSource API communication. |
| kWebResourceContextFetch | 8 | Fetch API communication. |
| kWebResourceContextFont | 5 | Font resources. |
| kWebResourceContextImage | 3 | Image resources. |
| kWebResourceContextManifest | 12 | Web App Manifests. |
| kWebResourceContextMedia | 4 | Other media resources such as videos. |
| kWebResourceContextOther | 16 | Other resources. |
| kWebResourceContextPing | 14 | Ping requests. |
| kWebResourceContextScript | 6 | Script resources. |
| kWebResourceContextSignedExchange | 13 | Signed HTTP Exchanges. |
| kWebResourceContextStylesheet | 2 | CSS resources. |
| kWebResourceContextTextTrack | 9 | TextTrack resources. |
| kWebResourceContextWebSocket | 11 | WebSocket API communication. |
| kWebResourceContextXMLHttpRequest | 7 | XML HTTP requests. |

## 192.3 class WebView2CookieManagerMBS

### 192.3.1 class WebView2CookieManagerMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Creates, adds or updates, gets, or or view the cookies.
**Notes:** The changes would apply to the context of the user profile. That is, other WebViews under the same user profile could be affected.

All functions may raise WebView2ExceptionMBS in case of errors.
Requires WebView2 version 1.0.705.50 from January 2021.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- WebView2 and Cookies in Xojo
- MBS Xojo Plugins, version 23.1pr4

### 192.3.2 Methods

### 192.3.3 AddOrUpdateCookie(cookie as WebView2CookieMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Adds or updates a cookie with the given cookie data; may overwrite cookies with matching name, domain, and path if they exist.
**Notes:** This method will fail if the domain of the given cookie is not specified.

### 192.3.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.
See also:

- 192.3.5 Constructor(cookie as WebView2CookieMBS) 22968

### 192.3.5 Constructor(cookie as WebView2CookieMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The copy constructor.
**Notes:** Enables you to make a subclass and then initialize it with an existing cookie manager.
See also:

- 192.3.4 Constructor 22968

### 192.3.6 CopyCookie(Cookie as WebView2CookieMBS) as WebView2CookieMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Creates a cookie whose params matches those of the specified cookie.

### 192.3.7 CreateCookie(Name as String, Value as String, Domain as String, Path as String) as WebView2CookieMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Create a cookie object with a specified name, value, domain, and path.
**Notes:** One can set other optional properties after cookie creation. This only creates a cookie object and it is not added to the cookie manager until you call AddOrUpdateCookie. Leading or trailing whitespace(s), empty string, and special characters are not allowed for name. See WebView2CookieMBS class for more details.

### 192.3.8 DeleteAllCookies

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Deletes all cookies under the same profile.
**Notes:** This could affect other WebViews under the same user profile.

### 192.3.9 DeleteCookie(cookie as WebView2CookieMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Deletes a cookie whose name and domain/path pair match those of the specified cookie.

### 192.3.10 DeleteCookies(Name as String, URI as string)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Deletes cookies with matching name and uri.
**Notes:** Cookie name is required. All cookies with the given name where domain and path match provided URI are deleted.

### 192.3.11 DeleteCookiesWithDomainAndPath(Name as String, Domain as string, Path as String)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Deletes cookies with matching name and domain/path pair.
**Notes:** Cookie name is required. If domain is specified, deletes only cookies with the exact domain. If path is specified, deletes only cookies with the exact path.

### 192.3.12 GetCookies(URI as String = "")

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets a list of cookies matching the specific URI.
**Notes:** If uri is empty string or null, all cookies under the same profile are returned. You can modify the cookie objects by calling AddOrUpdateCookie, and the changes will be applied to the webview.

Calls GotCookies event later.

### 192.3.13 GetCookiesSync(URI as String = "") as WebView2CookieMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets a list of cookies matching the specific URI.
**Example:**

```
dim web as WebView2ControlMBS // your control
Dim cookiemanager As WebView2CookieManagerMBS = web.CookieManager

// get all cookies synchronously
Dim cookies() As WebView2CookieMBS = cookiemanager.GetCookiesSync
```

**Notes:** If uri is empty string or null, all cookies under the same profile are returned. You can modify the cookie objects by calling AddOrUpdateCookie, and the changes will be applied to the webview.

This is the synchronous version, where we wait for cookies.

### 192.3.14 Properties

### 192.3.15 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 192.3.16 Events

### 192.3.17 GotCookies(ErrorCode as Integer, Cookies() as WebView2CookieMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** Called when GetCookies finished.

## 192.4 class WebView2CookieMBS

### 192.4.1 class WebView2CookieMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Provides a set of properties that are used to manage a cookie.
**Notes:** All functions may raise WebView2ExceptionMBS in case of errors.
Requires WebView2 version 1.0.705.50 from January 2021.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- WebView2 and Cookies in Xojo
- MBS Xojo Plugins, version 23.1pr4

### 192.4.2 Methods

### 192.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 192.4.4 Properties

### 192.4.5 Domain as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The domain for which the cookie is valid.
**Notes:** The default is the host that this cookie has been received from. Note that, for instance, ".bing.com", "bing.com", and "www.bing.com" are considered different domains.
(Read only property)

### 192.4.6 Expires as Double

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The expiration date and time for the cookie as the number of seconds since the UNIX epoch.
**Notes:** The default is -1.0, which means cookies are session cookies by default.

Cookies are session cookies and will not be persistent if Expires is set to -1.0. NaN, infinity, and any negative value set other than -1.0 is disallowed.
(Read and Write property)

### 192.4.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 192.4.8 IsHttpOnly as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Whether this cookie is http-only.
**Notes:** True if a page script or other active content cannot access this cookie. The default is false.
(Read and Write property)

### 192.4.9 IsSecure as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The security level of this cookie.
**Notes:** True if the client is only to return the cookie in subsequent requests if those requests use HTTPS. The default is false. Note that cookie that requests kCookieSameSiteKindNone but is not marked Secure will be rejected.
(Read and Write property)

### 192.4.10 IsSession as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Whether this is a session cookie. The default is false.
**Notes:** (Read only property)

### 192.4.11 Name as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Cookie name.
**Notes:** (Read only property)

### 192.4.12 Path as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The path for which the cookie is valid.
**Notes:** The default is "/", which means this cookie will be sent to all pages on the Domain.
(Read only property)

### 192.4.13 SameSite as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** SameSite status of the cookie which represents the enforcement mode of the cookie.
**Notes:** The default is kCookieSameSiteKindLax.
(Read and Write property)

### 192.4.14 Value as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Cookie value.
**Notes:** (Read and Write property)

### 192.4.15 Constants

Same Site Rules

| Constant | Value | Description |
|---|---|---|
| kCookieSameSiteKindLax | 1 | Lax. |
| kCookieSameSiteKindNone | 0 | None. |
| kCookieSameSiteKindStrict | 2 | Strict. |

## 192.5 class WebView2ExceptionMBS

### 192.5.1 class WebView2ExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The class for the exceptions raised by our WebView2 control.
**Notes:** Subclass of the RuntimeException class.

## 192.6 class WebView2PrintSettingsMBS

### 192.6.1 class WebView2PrintSettingsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Settings used by the PrintToPdf method.
**Notes:** Other programmatic printing is not currently supported, but Microsoft may add more later.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- WebView2 for Xojo upgrades
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- MBS Xojo Plugins, version 23.2pr5

**Xojo Developer Magazine**

- 21.4, page 10: News

### 192.6.2 Methods

### 192.6.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 192.6.4 Properties

### 192.6.5 Collation as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Printer collation.
**Notes:** See kCollation* constants for descriptions of collation.
The default value is kCollationDefault.

Printing uses default value of printer's collation if an invalid value is provided for the specific printer.

This value is ignored in PrintToPdf method.
(Read and Write property)

### 192.6.6 ColorMode as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Printer color mode.
**Notes:** See kColorMode* constants for descriptions of color modes.
The default value is kColorModeDefault.

Printing uses default value of printer supported color if an invalid value is provided for the specific printer.
(Read and Write property)

### 192.6.7 Copies as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Number of copies to print.
**Notes:** Minimum value is 1 and the maximum copies count is 999. The default value is 1.
(Read and Write property)

### 192.6.8 Duplex as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Printer duplex settings.
**Notes:** See kDuplex* constants for descriptions of duplex.
The default value is CoreWebView2PrintDuplex.Default.
Printing uses default value of printer's duplex if an invalid value is provided for the specific printer.
This value is ignored in PrintToPdf method.
(Read and Write property)

### 192.6.9 FooterURI as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The URI in the footer if ShouldPrintHeaderAndFooter is true.
**Notes:** The default value is the current URI. If an empty string value is provided, no URI is shown in the footer.
(Read and Write property)

### 192.6.10 HeaderTitle as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The title in the header if ShouldPrintHeaderAndFooter is true.
**Notes:** The default value is the title of the current document. If an empty string value is provided, no title is shown in the header.
(Read and Write property)

### 192.6.11 MarginBottom as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The bottom margin in inches.
**Notes:** The default is 1 cm, or
textasciitilde 0.4 inches. A margin cannot be less than zero. If an invalid value is provided, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.12 MarginLeft as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The left margin in inches.
**Notes:** The default is 1 cm, or
textasciitilde 0.4 inches. A margin cannot be less than zero. If an invalid value is provided, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.13 MarginRight as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The right margin in inches.
**Notes:** The default is 1 cm, or
textasciitilde 0.4 inches. A margin cannot be less than zero. If an invalid value is provided, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.14 MarginTop as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The top margin in inches.
**Notes:** The default is 1 cm, or
textasciitilde 0.4 inches. A margin cannot be less than zero. If an invalid value is provided, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.15 Orientation as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The orientation can be portrait or landscape.
**Notes:** The default orientation is portrait. See kOrientation* constants.
(Read and Write property)

### 192.6.16 PageHeight as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The page height in inches.
**Notes:** The default height is 11 inches. If the provided page height is less than or equal to zero, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.17 PageRanges as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Page range to print.
**Notes:** Defaults to empty string, which means print all pages. The PageRanges property is a list of page ranges specifying one or more pages that should be printed separated by commas. Any whitespace between page ranges is ignored. A valid page range is either a single integer identifying the page to print, or a range in the form [ start page ] - [ last page ] where start page and last page are integers identifying the first and last inclusive pages respectively to print. Every page identifier is an integer greater than 0 unless wildcards are used (see below examples). The first page is 1.

In a page range of the form [ start page ] - [ last page ] the start page number must be larger than 0 and less than or equal to the document's total page count. If the start page is not present, then 1 is used as the start page. The last page must be larger than the start page. If the last page is not present, then the document

total page count is used as the last page.

Repeating a page does not print it multiple times. To print multiple times, use the Copies property.

The pages are always printed in ascending order, even if specified in non-ascending order.
If page range is not valid or if a page is greater than document total page count, ArgumentException is thrown.

The following examples assume a document with 20 total pages.

| Example | Result | Notes |
|---|---|---|
| "2" | Page 2 | |
| "1-4, 9, 3-6, 10, 11" | Pages 1-6, 9-11 | |
| "1-4, -6" | Pages 1-6 | The "-6" is interpreted as "1-6". |
| "2-" | Pages 2-20 | The "2-" is interpreted as "pages 2 to the end of the document". |
| "4-2, 11, -6" | Invalid | "4-2" is an invalid range. |
| "-" | Pages 1-20 | The "-" is interpreted as "page 1 to the end of the document". |
| "1-4dsf, 11" | Invalid | |
| "2-2" | Page 2 | |

(Read and Write property)

### 192.6.18 PagesPerSide as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** Prints multiple pages of a document on a single piece of paper.
**Notes:** Choose from 1, 2, 4, 6, 9 or 16. The default value is 1.

If an invalid value is provided, ArgumentException is thrown.

Below examples shows print output for PagesPerSide and Duplex.

| PagesPerSide | Total pages | Two-sided printing | Result |
|---|---|---|---|
| 1 | 1 | - | 1 page on the front side. |
| 2 | 1 | Yes | 1 page on the front side. |
| 2 | 4 | - | 2 pages on the first paper and 2 pages on the next paper. |
| 2 | 4 | Yes | 2 pages on the front side and 2 pages on back side. |
| 4 | 4 | Yes | 4 pages on the front side. |
| 4 | 8 | Yes | 4 pages on the front side and 4 pages on the back side. |

(Read and Write property)

### 192.6.19 PageWidth as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The page width in inches.
**Notes:** The default width is 8.5 inches. If the provided page width is less than or equal to zero, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.20 PrinterName as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The name of the printer to use.
**Notes:** Defaults to empty string. If the printer name is empty string or null, then it prints to the default printer on the user OS.

If provided printer name doesn't match with the name of any installed printers on the user OS, the method returns with CoreWebView2PrintStatus.PrinterUnavailable.

Use DeviceInformation.FindAllAsync to get the list of local printers with AQS as "System.Devices.HardwareIds:
textasciitilde
textasciitilde "PRINTENUM\LocalPrintQueue""

This value is ignored in PrintToPdf method
(Read and Write property)

### 192.6.21 ScaleFactor as Double

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The scale factor is a value between 0.1 and 2.0.
**Notes:** The default is 1.0. If an invalid value is provided, the current value is not changed and an ArgumentException is thrown.
(Read and Write property)

### 192.6.22 ShouldPrintBackgrounds as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** True if background colors and images should be printed.
**Notes:** The default value is false.
(Read and Write property)

### 192.6.23 ShouldPrintHeaderAndFooter as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** True if header and footer should be printed.
**Notes:** The default value is false. The header consists of the date and time of printing, and the title of the page. The footer consists of the URI and page number. The height of the header and footer is 0.5 cm, or textasciitilde 0.2 inches.
(Read and Write property)

### 192.6.24 ShouldPrintSelectionOnly as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** True if only the current end user's selection of HTML in the document should be printed.
**Notes:** The default value is false.
(Read and Write property)

### 192.6.25 Constants

Collation

| Constant | Value | Description |
|---|---|---|
| kCollationCollated | 1 | Indicate that the collation has been selected for the printed output. |
| kCollationDefault | 0 | The default collation for a printer. |
| kCollationUncollated | 2 | Indicate that the collation has not been selected for the printed output. |

Color Modes

| Constant | Value | Description |
|---|---|---|
| kColorModeColor | 1 | Indicate that the printed output will be in color. |
| kColorModeDefault | 0 | The default color mode for a printer. |
| kColorModeGrayScale | 2 | Indicate that the printed output will be in shades of gray. |

Duplex Modes

| Constant | Value | Description |
|---|---|---|
| kDuplexDefault | 0 | The default duplex for a printer. |
| kDuplexOneSided | 1 | Print on only one side of the sheet. |
| kDuplexTwoSidedLongEdge | 2 | Print on both sides of the sheet, flipped along the long edge. |
| kDuplexTwoSidedShortEdge | 3 | Print on both sides of the sheet, flipped along the short edge. |

Orientations

| Constant | Value | Description |
|---|---|---|
| kOrientationLandscape | 1 | Print the page(s) in landscape orientation. |
| kOrientationPortrait | 0 | Print the page(s) in portrait orientation. |

## 192.7 class WebView2WindowFeaturesMBS

### 192.7.1 class WebView2WindowFeaturesMBS

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The window features for a WebView popup window.
**Notes:** The fields match the windowFeatures passed to window.open as specified in Window features on MDN. There is no requirement for you to respect the values. If your app does not have corresponding UI features (for example, no toolbar) or if all instance of WebView are opened in tabs and do not have distinct size or positions, then your app does not respect the values. You may want to respect values, but perhaps only some apply to the UI of you app. Accordingly, you may respect all, some, or none of the properties as appropriate for your app. For all numeric properties, if the value that is passed to window.open is outside the range of an unsigned 32bit int, the resulting value is the absolute value of the maximum for unsigned 32bit integer. If you are not able to parse the value an integer, it is considered 0. If the value is a floating point value, it is rounded down to an integer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr5

### 192.7.2 Methods

### 192.7.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 192.7.4 Properties

### 192.7.5 HasPosition as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies left and top values.
**Notes:** (Read and Write property)

### 192.7.6 HasSize as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies height and width values.
**Notes:** (Read and Write property)

### 192.7.7 Height as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the height of the window.
**Notes:** Minimum value is 100. If HasSize is set to false, this field is ignored.
(Read and Write property)

### 192.7.8 Left as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the left position of the window.
**Notes:** If HasPosition is set to false, this field is ignored.
(Read and Write property)

### 192.7.9 ShouldDisplayMenuBar as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates that the menu bar is displayed.
**Notes:** (Read and Write property)

### 192.7.10 ShouldDisplayScrollBars as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates that the scroll bars are displayed.
**Notes:** (Read and Write property)

### 192.7.11 ShouldDisplayStatus as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates that the status bar is displayed.
**Notes:** (Read and Write property)

### 192.7.12 ShouldDisplayToolbar as Boolean

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Indicates that the browser toolbar is displayed.
**Notes:** (Read and Write property)

### 192.7.13 Top as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the top position of the window.
**Notes:** If HasPosition is set to false, this field is ignored.
(Read and Write property)

### 192.7.14 Width as Integer

MBS WinFrameworks Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the width of the window.
**Notes:** Minimum value is 100. If HasSize is set to false, this field is ignored.
(Read and Write property)

# Chapter 193

# Window

## 193.1 class DesktopWindow

### 193.1.1 class DesktopWindow

Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extends Xojo's Window Class.
**Example:**

window1.HasNoTitleBarMBS = true

**Notes:** In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.1.2 Methods

### 193.1.3 ActivateWindowMBS

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Activates the window.
**Notes:** This function does more than just show. if the window has been minimized, it will restore it. Also the window is moved to front and made the current window for keyboard input.

Sadly windows limits which windows can go to front, so some windows may not come to front unless they are clicked on.

As activation can be asynchronously, the window may activate later, e.g. after current method ends.

For MacOS Cocoa apps, we simply bring the window to the front.

### 193.1.4 BackingScaleFactorMBS as double

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scale factor representing the number of backing store pixels corresponding to each linear unit in window space on this window.
**Notes:** This is generally only necessary when building a bitmap context or image whose resolution needs to match that of a particular Window. Note that a Window's backing scale factor can change over time, such as when the window moves from one display to another, or when a display's resolution changes, so clients should not cache the value returned by this function.

If platform does not support scaling factor, we return 1.0. (on Windows, Linux and older Mac OS X)
Supported for Carbon and Cocoa windows.

For apps which are not enabled for retina support, the function returns 1. So you only see 2 here if app is Cocoa, display is retina and info.plist has the NSHighResolutionCapable key.

### 193.1.5 CGContextMBS as CGContextMBS

MBS MacCG Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGContextMBS object for the given Window.
**Example:**

```
dim CGContext as CGContextMBS
dim OverlayPic as Picture=LogoMBS(500)
dim contentpicture as CGImageMBS= CGCreateImageMBS(OverlayPic)

CGContext=window1.CGContextMBS

CGContext.ClearRect CGMakeRectMBS(0, 0, OverlayPic.width, OverlayPic.height)
CGContext.DrawPicture contentpicture, CGMakeRectMBS(0, 0, OverlayPic.width, OverlayPic.height)
```

**Notes:** Requires Mac OS X to work.
Please make sure the CGContextMBS object is released in the paint event if you use it there, so all the drawings are flushed. Not releasing it my be visible in missing statictext or other strange graphics effects.

But on a Cocoa window the context is not always available, so in the window paint event, you can context from Graphics object.

### 193.1.6 CleanUpTransparentMBS(refValue as integer)

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cleans up transparency support for a Xojo window.
**Example:**

```
dim p as Integer // property on Windows

p = window1.MakeTransparentMBS

// later in close event

window1.CleanUpTransparentMBS p
```

**Notes:** Call this in the close event of a window passing the value you got from the MakeTransparentMBS call.
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel.

### 193.1.7 ClearTransparencyMBS

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Clears transparency of a window.

### 193.1.8 CollapsableMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if this window is collapsed. You can set it.
**Example:**

```
mainwindow.collapsedMBS=false 'show window
```

**Notes:** Collapseable windows are the normal document windows.
You can't collapse dialogs or floating windows well.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.1.9 ConstrainWindowToScreenMBS(animate as Boolean)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Makes sure the window is on one screen visible.
**Notes:** Implemented on Mac for both Carbon and Cocoa.

### 193.1.10 GTKWindow as GTKWindowMBS

MBS Linux Plugin, Plugin Version: 21.5, Platform: Linux, Targets: Desktop only.

**Function:** Queries a GTKWindow object for this window.
**Notes:** Returns only a valid object on linux.
On other platforms, this function returns nil.

### 193.1.11 HideKeyboardMBS

MBS Win Plugin, Plugin Version: 23.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Hides the keyboard.
**Notes:** On Windows same as ShowKeyboardMBS, but may not launch the keyboard.

If you called ShowKeyboardMBS before, you can call this function to hide it.

### 193.1.12 InvalidateShadowMBS

MBS MacOSX Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** This method causes a window's shadow to be recalculated.
**Notes:** InvalidateShadowMBS is not typically used by applications. However, it may be useful for applications with customized window frames that change shape dynamically; in this case, after the application has drawn the new window shape, the window shadow must be recalculated to follow the new window shape.

This method causes the window shadow to be immediately recalculated and redrawn based on the current contents of the window's back buffer. For best performance and visual appearance, you should follow these steps when invalidating a window shadow: disable updates with DisableScreenUpdatesMBS, draw, flush, invalidate the shadow, and enable updates. For a compositing window, after invalidating any views that should be redrawn, you will need to explicitly draw and flush using HIWindowFlush, rather than waiting for the event loop to draw and flush the window, because you cannot disable updates or invalidate the window shadow if drawing is done via the event loop.

### 193.1.13 IsFullScreenMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Queries whether window is fullscreen.
**Notes:** Indicates that a window has fullscreen appearance.
A fullscreen window does not draw its titlebar, and may have special handling for its toolbar.
Available in Mac OS X v10.7 and later.

### 193.1.14 MakeTransparentMBS as integer

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Installs transparency support to a Xojo window.
**Example:**

```
dim p as Integer // property on Windows

p = window1.MakeTransparentMBS

// later in close event

window1.CleanUpTransparentMBS p
```

**Notes:** Will return non zero value if successfull.
The window doesn't change if you don't use the CGContextMBS property.

Requires Mac OS X, Windows 2000 or Windows XP to work. The window must be a document window.

Set MacProcID of the window to 1104 and you can make it transparent without a title bar. (on Mac OS X)

With plugin version 11.1, we now return a value which should store with the window. Later in the Close event, you call CleanUpTransparentMBS passing this value.

Added Cocoa support in 11.3 plugins.
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel. Calls to MakeTransparentMBS and CleanUpTransparentMBS are not required for Linux.

### 193.1.15 NSPanelMBS as NSPanelMBS

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSPanel for the given Xojo window.
**Example:**

MsgBox window1.NSPanelMBS.Title

**Notes:** Works only for Cocoa Windows in Cocoa target which are floating panels.

### 193.1.16 NSToolbarMBS as NSToolbarMBS

MBS MacControls Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** The window's toolbar.
**Notes:** So you can get the toolbar without going over NSWindowMBS.
But there you can assign a new toolbar...

### 193.1.17 NSWindowMBS as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSWindow for the given Xojo window.
**Example:**

MsgBox window1.NSWindowMBS.Title

**Notes:** Works only for Cocoa Windows in Cocoa target and for Carbon Windows in carbon targets.

### 193.1.18 RefreshThreadSafeMBS(immediately As Boolean = False)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Refresh the rectangle.
**Notes:** This method is to allow you to refresh in a thread without a problem.

If called on main thread, the plugin will simply call Refresh method directly.
If called on other threads the plugin will schedule to call Refresh method a short time later on the main thread.
See also:

- 193.1.19 RefreshThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, immediately As Boolean = False)

### 193.1.19 RefreshThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, immediately As Boolean = False)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Refresh the rectangle.
**Notes:** This method is to allow you to refresh in a thread without a problem.

If called on main thread, the plugin will simply call RefreshRect method directly.
If called on other threads the plugin will schedule to call RefreshRect method a short time later on the main thread.
See also:

- 193.1.18 RefreshThreadSafeMBS(immediately As Boolean = False) 22992

### 193.1.20 RemoveWindowProxyIconMBS

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Removes any Proxy Icon from the Window.
**Example:**

```
mainwindow.RemoveWindowProxyIconMBS
```

**Notes:** Requires Mac OS 8.5 or newer.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.1.21 ScreenshotWindowMBS as picture

MBS Picture Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns the content of the window buffer on Mac OS X.
**Example:**

```
dim p as Picture
p=mainwindow.screenshotWindowMBS
```

**Notes:** Only for Mac OS X. Image is taken from window back buffer.
This will not capture overlay windows.

On Xojo 2006 or newer, please add a self. on front of the method call in case you want to use the method on the current window.

### 193.1.22 ScreenshotWindowRectMBS(left as integer, top as integer, width as integer, height as integer) as picture

MBS Picture Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a part of the content of the window buffer on Mac OS X.
**Example:**

```
dim p as picture
p=mainwindow.ScreenshotWindowRectMBS(100,100,200,200)
```

**Notes:** Only for Mac OS X. Image is taken from window back buffer.
This will not capture overlay windows.

On Xojo 2006 or newer, please add a self. on front of the method call in case you want to use the method on the current window.

### 193.1.23 SetTransparencyMBS(value as integer) as boolean

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Your window can have transparency on Mac OS X.
**Example:**

```
if window1.SetTransparencyMBS(127) then
'fine
else
'error
end if
```

**Notes:** Use values between 0 and 255.
Requires Mac OS X, Windows 2000 or Windows XP to work.
May be limited to simple windows like normal document windows.
You need to call MakeTransparent before to install transparency.
(this function was replaced in v4.4)
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel.

### 193.1.24 SetWindowFeedbackSettingMBS(Feedback as Integer, value as Variant) as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Sets the feedback configuration for a window.
**Example:**

```
const FEEDBACK_TOUCH_CONTACTVISUALIZATION = 1
const FEEDBACK_PEN_BARRELVISUALIZATION = 2
const FEEDBACK_PEN_TAP = 3
const FEEDBACK_PEN_DOUBLETAP = 4
const FEEDBACK_PEN_PRESSANDHOLD = 5
const FEEDBACK_PEN_RIGHTTAP = 6
const FEEDBACK_TOUCH_TAP = 7
const FEEDBACK_TOUCH_DOUBLETAP = 8
const FEEDBACK_TOUCH_PRESSANDHOLD = 9
const FEEDBACK_TOUCH_RIGHTTAP = 10
const FEEDBACK_GESTURE_PRESSANDTAP = 11


dim r as Boolean = self.SetWindowFeedbackSettingMBS(FEEDBACK_TOUCH_TAP, true)

if r then
dim value as Boolean
dim b as Boolean = self.WindowFeedbackSettingMBS(FEEDBACK_TOUCH_TAP, value)
if b then
MsgBox "WindowFeedbackSettingMBS: "+str(value)
end if
end if
```

**Notes:** Returns true if successful; otherwise, returns false.

Value can be nil to reset value. Or true/false to set it.
Requires Windows 8 or Windows Server 2012 in desktop apps only.

| Constant Name | Value | Description |
|---|---|---|
| FEEDBACK_TOUCH_CONTACTVISUALIZATION | 1 | Feedback for a touch contact event. |
| FEEDBACK_PEN_BARRELVISUALIZATION | 2 | Feedback for a pen barrel-button event. |
| FEEDBACK_PEN_TAP | 3 | Feedback for a pen tap event. |
| FEEDBACK_PEN_DOUBLETAP | 4 | Feedback for a pen double-tap event. |
| FEEDBACK_PEN_PRESSANDHOLD | 5 | Feedback for a pen press-and-hold event. |
| FEEDBACK_PEN_RIGHTTAP | 6 | Feedback for a pen right-tap event. |
| FEEDBACK_TOUCH_TAP | 7 | Feedback for a touch tap event. |
| FEEDBACK_TOUCH_DOUBLETAP | 8 | Feedback for a touch double-tap event. |
| FEEDBACK_TOUCH_PRESSANDHOLD | 9 | Feedback for a touch press-and-hold event. |
| FEEDBACK_TOUCH_RIGHTTAP | 10 | Feedback for a touch right-tap event. |
| FEEDBACK_GESTURE_PRESSANDTAP | 11 | Feedback for a press-and-tap gesture. |

### 193.1.25 SetWindowIconMBS(Type as integer, File as FolderItem, IconID as integer) as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Sets the window icon using the icon in the file.
**Example:**

```
call window1.SetWindowIconMBS(0,getfolderitem("icon.ico"),1)
```

**Notes:** Returns true on success and false on failure.
What image depths are used and supported depends on the Windows version.

Type is 0 for a small icon and 1 for a big icon.
See also:

- 193.1.26 SetWindowIconMBS(Type as integer, Icon as Picture, Mask as Picture) as Boolean 22996

### 193.1.26 SetWindowIconMBS(Type as integer, Icon as Picture, Mask as Picture) as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Sets the window icon using the given picture with mask.
**Example:**

```
dim p as Picture
dim m as Picture

// random colored circle image
p=New Picture(16,16,32)
p.Graphics.ForeColor=&c000000
p.Graphics.FillRect 0,0,16,16
p.Graphics.ForeColor=rgb(rnd*256,rnd*256,rnd*256)
p.Graphics.Filloval 0,0,16,16

// circle mask
m=New Picture(16,16,32)
m.Graphics.ForeColor=&cFFFFFF // transparent
m.Graphics.Fillrect 0,0,16,16
m.Graphics.ForeColor=&c000000 // color
m.Graphics.Filloval 0,0,16,16

Canvas1.Backdrop=p // show in canvas
Canvas2.Backdrop=m
```

call window1.SetWindowIconMBS(0,p,m)

**Notes:** The mask picture ist converted to black/white.
What image depths are used and supported depends on the Windows version.
Returns true on success and false on failure.

Possible values for type:

| | |
|---|---|
| ICON_BIG = 1 | Set the large icon for the window. |
| ICON_SMALL = 0 | Set the small icon for the window. |

See also:

- 193.1.25 SetWindowIconMBS(Type as integer, File as FolderItem, IconID as integer) as Boolean 22996

### 193.1.27 SetWindowMaskMBS(p as picture, redraw as Boolean, transparentColor as color) as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Sets the mask of a window.
**Notes:** Redraw decides whether the window is redrawn after it has been changed.
Returns true if successfull.

If you want to do the same on Mac OS X, check the example projects "transparent window" and the Photoshop Splash Screen example.

### 193.1.28 ShowHideToolbarMBS(animate as Boolean, value as Boolean)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Shows or hides the toolbar.
**Notes:** Only working on MacOS.

### 193.1.29 ShowKeyboardMBS

MBS Win Plugin, Plugin Version: 23.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Shows the keyboard viewer.
**Notes:** On Windows you can trigger this a second time to hide it.

See also ShowCharacterPaletteMBS function.

### 193.1.30 SmoothResizeCenteredMBS(width as integer,height as integer)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the window smoothly to all directions.
**Example:**

```
dim w,h as Integer

// get destination dimension

w=300
h=200

// Resize

window1.SmoothResizeCenteredMBS w,h

// Now resize via RB to make it permament.

width=w
height=h
```

**Notes:** You need to set the new size using Xojo's Windows properties, too. (no longer needed with Xojo)
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.1.31 SmoothResizeMBS(width as integer,height as integer)

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the window smoothly.
**Example:**

```
dim w,h as Integer

// get destination dimension

w=300
```

h=200

// Resize

window1.SmoothResizeMBS w,h

// Now resize via RB to make it permament.

width=w
height=h

**Notes:** You need to set the new size using Xojo's Windows properties, too. (no longer needed with Xojo)
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.1.32 ToggleFullScreenMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Toggles fullscreen mode for this window.
**Notes:** Returns true on success.
If an application supports fullscreen, it should add a menu item to the View menu with toggleFullScreen as the action.
Available in Mac OS X v10.7 and later.
This method does not much if you don't mark a window to be the primary fullscreen window.

### 193.1.33 UpdateNowMBS

MBS MacOSX Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** On MacOS all windows are doublebuffered and the OS updates the screen from time to time. This method forces a screen update.
**Example:**

Mainwindow.UpdateNowMBS

**Notes:** Updated for 64-bit in plugin version 18.3.

### 193.1.34 UpdateNowRectMBS(left as integer, top as integer, width as integer, height as integer)

MBS MacOSX Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** On Mac OS all windows are doublebuffered and the OS updates the screen from time to time. This method forces a screen update for a part of your window.
**Example:**

Mainwindow.UpdateNowRectMBS Mainwindow.text.left, Mainwindow.text.top, Mainwindow.text.width, Mainwindow.text.height

### 193.1.35 WinAnimateWindowMBS(Flags as integer, Time as integer=200) as boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** The AnimateWindow function enables you to produce special effects when showing or hiding windows.
**Example:**

```
dim flags as Integer

const AW_SLIDE = &h040000 // Uses slide animation. By default, roll animation is used. This flag is ignored when used with AW_CENTER.
const AW_ACTIVATE = &h020000 // Activates the window. Do not use this value with AW_HIDE.
const AW_BLEND = &h080000 // Uses a fade effect. This flag can be used only if hwnd is a top-level window.
const AW_HIDE = &h010000 //Hides the window. By default, the window is shown.
const AW_CENTER = &h10 // Makes the window appear to collapse inward if AW_HIDE is used or expand outward if the AW_HIDE is not used. The various direction flags have no effect.
const AW_HOR_POSITIVE = 1 // Animates the window from left to right. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_HOR_NEGATIVE = 2 // Animates the window from right to left. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_VER_POSITIVE = 4 // Animates the window from top to bottom. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_VER_NEGATIVE = 8 // Animates the window from bottom to top. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.

window2.hide

flags=BitwiseOr(AW_SLIDE, AW_HOR_POSITIVE)

if window2.WinAnimateWindowMBS(flags, 1000) then
window2.show
```

```
else
MsgBox "Animatin failed."
end if
```

**Notes:** There are four types of animation: roll, slide, collapse or expand, and alpha-blended fade.

self: The window to animate. The calling thread must own this window.
Time: Specifies how long it takes to play the animation, in milliseconds. Typically, an animation takes 200 milliseconds to play.
Flags: Specifies the type of animation. This parameter can be one or more of the following values. Note that, by default, these flags take effect when showing a window. To take effect when hiding a window, use AW_HIDE and a bitwiseor operator with the appropriate flags.

| | | |
|---|---|---|
| AW_SLIDE | = &h040000 | Uses slide animation. By default, roll animation is used. This flag is ignored when used with AW_CENTER. |
| AW_ACTIVATE | = &h020000 | Activates the window. Do not use this value with AW_HIDE. |
| AW_BLEND | = &h080000 | Uses a fade effect. This flag can be used only if hwnd is a top-level window. |
| AW_HIDE | = &h010000 | Hides the window. By default, the window is shown. |
| AW_CENTER | = &h10 | Makes the window appear to collapse inward if AW_HIDE is used or expand outward if the AW_HIDE is not used. The various direction flags have no effect. |
| AW_HOR_POSITIVE | = 1 | Animates the window from left to right. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_HOR_NEGATIVE | = 2 | Animates the window from right to left. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_VER_POSITIVE | = 4 | Animates the window from top to bottom. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_VER_NEGATIVE | = 8 | Animates the window from bottom to top. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |

Return Value:
If the function succeeds, the return value is true.
If the function fails, the return value is false.
The function will fail in the following situations:

- If the window uses the window region. Windows XP: This does not cause the function to fail.
- If the window is already visible and you are trying to show the window.
- If the window is already hidden and you are trying to hide the window.
- If there is no direction specified for the slide or roll animation.
- When trying to animate a child window with AW_BLEND.
- If the thread does not own the window. Note that, in this case, AnimateWindow fails but GetLastError returns ERROR_SUCCESS. To get extended error information, call the GetLastError function.

To show or hide a window without special effects, use Show.
When using slide or roll animation, you must specify the direction. It can be either AW_HOR_POSITIVE, AW_HOR_NEGATIVE, AW_VER_POSITIVE, or AW_VER_NEGATIVE.
You can combine AW_HOR_POSITIVE or AW_HOR_NEGATIVE with AW_VER_POSITIVE or AW_VER_NEGATIVE to animate a window diagonally.
The window procedures for the window and its child windows should handle any WM_PRINT or WM_PRINTCLIENT messages. Dialog boxes, controls, and common controls already handle WM_PRINTCLIENT. The default window procedure already handles WM_PRINT.
If a child window is displayed partially clipped, when it is animated it will have holes where it is clipped.
AnimateWindow supports RTL windows.
Avoid animating a window that has a drop shadow because it produces visually distracting, jerky animations.

### 193.1.36 WindowFeedbackSettingMBS(Feedback as Integer, byref value as boolean, IncludeAncestors as Boolean = false) as Boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the feedback configuration for a window.
**Notes:** IncludeAncestors: Specifies that the parent window chain should be checked.

Returns true if the specified feedback setting is configured on the specified window. Otherwise, it returns false (and config won't be modified).

Requires Windows 8 [ desktop apps only ] or Windows Server 2012 [ desktop apps only ] .

| Constant Name | Value | Description |
|---|---|---|
| FEEDBACK_TOUCH_CONTACTVISUALIZATION | 1 | Feedback for a touch contact event. |
| FEEDBACK_PEN_BARRELVISUALIZATION | 2 | Feedback for a pen barrel-button event. |
| FEEDBACK_PEN_TAP | 3 | Feedback for a pen tap event. |
| FEEDBACK_PEN_DOUBLETAP | 4 | Feedback for a pen double-tap event. |
| FEEDBACK_PEN_PRESSANDHOLD | 5 | Feedback for a pen press-and-hold event. |
| FEEDBACK_PEN_RIGHTTAP | 6 | Feedback for a pen right-tap event. |
| FEEDBACK_TOUCH_TAP | 7 | Feedback for a touch tap event. |
| FEEDBACK_TOUCH_DOUBLETAP | 8 | Feedback for a touch double-tap event. |
| FEEDBACK_TOUCH_PRESSANDHOLD | 9 | Feedback for a touch press-and-hold event. |
| FEEDBACK_TOUCH_RIGHTTAP | 10 | Feedback for a touch right-tap event. |
| FEEDBACK_GESTURE_PRESSANDTAP | 11 | Feedback for a press-and-tap gesture. |

### 193.1.37 WinFlashWindowMBS(Invert as boolean)

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Flashes Window.
**Example:**

window1.WinFlashWindowMBS true

**Notes:** Flashes the specified window one time. It does not change the active state of the window.

Invert: If this parameter is true, the window is flashed from one state to the other. If it is false, the window is returned to its original state (either active or inactive).

When an application is minimized and this parameter is true, the taskbar window button flashes active/inactive. If it is false, the taskbar window button flashes inactive, meaning that it does not change colors. It flashes, as if it were being redrawn, but it does not provide the visual invert clue to the user.

Flashing a window means changing the appearance of its caption bar as if the window were changing from inactive to active status, or vice versa. (An inactive caption bar changes to an active caption bar; an active caption bar changes to an inactive caption bar.)
Typically, a window is flashed to inform the user that the window requires attention but that it does not currently have the keyboard focus.
The FlashWindow function flashes the window only once; for repeated flashing, the application should create a system timer.

### 193.1.38 WinHideTooltipMBS as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Hides all tooltips.
**Notes:** You can call that in window.deactivate event to hide tooltips which did not hide themselves.
Returns number of hidden tooltips.

### 193.1.39 Properties

### 193.1.40 CanBeVisibleWithoutLoginMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window can be visible before login.
**Example:**

window1.CanBeVisibleWithoutLoginMBS = true

**Notes:** This window can be made visible prior to user login. By default, in Mac OS X 10.5 and later no windows can be visible before a user logs into the system; this protects the user against certain types of malicious use of insecure applications. However, some software, such as input methods or other accessibility

software, may need to deliberately make windows available prior to user login. Such software should add this window attribute to its windows. Available for all windows in Mac OS X 10.5 and later.
(Read and Write computed property)

### 193.1.41 CGColorSpaceMBS as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the colorspace profile for this window.
**Example:**

```
dim c as CGColorSpaceMBS = window1.CGColorSpaceMBS

if c<>Nil then
MsgBox str(c.NumberOfComponents)
else
MsgBox "nil"
end if
```

**Notes:** Requires MacOS 10.6 or newer.

On Cocoa, the NSColorSpace is queried and the matching CGColorspace is returned. For setting a NSColorSpace is created for the given CGColorspace.
In Carbon applications, the CoreGraphics color space is passed directly.
(Read and Write computed property)

### 193.1.42 CollapsedMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if this window can be collapsed.
**Example:**

```
MsgBox str(window1.CollapsableMBS)
```

**Notes:** Collapseable windows are the normal document windows.
You can't collapse dialogs or floating windows well.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.43 FullScreenAuxiliaryMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is setup as being the auxiliary fullscreen window.
**Notes:** (Read and Write computed property)

### 193.1.44 FullScreenPrimaryMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is setup as being the primary fullscreen window.
**Notes:** If true, the window receives the fullscreen widget in the title bar.
(Read and Write computed property)

### 193.1.45 HasBorderMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Decides whether the window has a border.
**Example:**

```
mainwindow.HasborderMBS=false ' Remove border
```

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it). This option removes the title bar. HasCaptionMBS removes even more.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.46 HasCaptionMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether the window has a caption (a title bar)
**Example:**

```
Window1.HasCaptionMBS=false
```

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.47 HasCloseBoxMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a CloseBox.
**Example:**

mainwindow.HasCloseboxMBS=false 'remove closebox

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.48 HasCollapseBoxMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a Collapsebox.
**Example:**

mainwindow.HasCollapseBoxMBS=false 'remove Collapsebox

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.49 HasMaximizeBoxMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has a Maximize Button.
**Example:**

mainwindow.HasMaximizeBoxMBS=false 'remove Maximize button

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.50 HasMinimizeBoxMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has a Minimize Button.
**Example:**

mainwindow.HasMinimizeBoxMBS=false 'remove Minimize button

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.51 HasNoShadowMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has no shadow.
**Example:**

mainwindow.HasNoShadowMBS=true 'remove shadow

**Notes:** Available for all windows on Mac OS X. This attribute is automatically given to windows of kOverlayWindowClass.

Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.52 HasNoTitleBarMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSWindowMBS for Cocoa instead. **Function:** For Document, Floating, and Utility windows, this attribute allows you to hide the title bar of a window.
**Example:**

```
window1.HasNoTitleBarMBS = true

// for Cocoa:
window1.HasCloseBoxMBS = false
window1.HasCollapseBoxMBS = false
window1.IsResizableMBS = false
window1.HasNoTitleBarMBS = true
```

**Notes:** For Mac OS X 10.4 or later.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.53 HasSystemMenuMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether the window has a system menu inside the title bar.
**Example:**

Window1.HasSystemMenuMBS=false

**Notes:** This property has only an effect on Windows. It will disable the system menu and also the minimize, maximize and close buttons. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.54 HasToolbarButtonMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a toolbar button.
**Example:**

mainwindow.HasToolbarButtonMBS=true 'shows Toolbar Button

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
The Button is shown on next redraw of the window frame.

Use the CarbonWindowsEventsMBS class to receive events when the button is pressed.

Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.55 IgnoreClicksMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Can be used to control whether mouse clicks are ignored for this window.
**Example:**

Window1.IgnoreClicksMBS=true

**Notes:** Whether this window never receives mouse events, even in areas that are opaque. Instead, clicks on the window will be passed through to windows beneath it. Available for all windows on Mac OS X 10.2 and later.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.56 IsIconicMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window is inside the taskbar.
**Example:**

```
MsgBox str(window1.IsIconicMBS)
```

**Notes:** If you set IsIconic to true the window is minimized and if you set it to false the window size and position is restored.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.57 IsMetalWindowMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window uses the Metal appearance.
**Example:**

```
if window1.Frame = window.FrameTypeMetal then
MsgBox "Window is metal. "+str(window1.IsMetalWindowMBS)
else
MsgBox "Window is not metal. "+str(window1.IsMetalWindowMBS)
end if
```

**Notes:** Available for document windows on Mac OS X 10.2 and later, and for floating windows on Mac OS X 10.3 and later. Drawers can also be metal, but dynamically adjust their appearance based on their parent

window's appearance; it is not necessary to specify this attribute for a metal drawer.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.58 IsResizableMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is resizeable.
**Example:**

Window1.IsResizableMBS=false

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

Use GrowBoxTransparentMBS on Composite Mac OS windows to enable the transparent grow box.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Works in Cocoa.
(Read and Write computed property)

### 193.1.59 IsZoomedMacMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the window is zoomed.
**Example:**

MsgBox str(window1.IsZoomedMacMBS)

**Notes:** Requires Mac OS 8.5 or newer.
Seems not to work correctly on RB 5.5.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.1.60 IsZoomedMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has been maximized.
**Example:**

MsgBox str(window1.IsZoomedMBS)

**Notes:** If you set IsZoomed to true the window is maximized and if you set it to false the window size and position is restored.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Works on Cocoa.
(Read and Write computed property)

### 193.1.61 ModifiedMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** You can set or get the value of the modified state.
**Example:**

mainwindow.modifiedMBS=true

**Notes:** Requires Mac OS 8.5 or newer.
As long as you don't set modified to false the window keeps to tell you that it's modified. Not sure why, so just set modified to false early in creating the window.
(Read and Write computed property)

### 193.1.62 ToolbarVisibleMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether the toolbar is shown in this window or not.
**Notes:** Value is false on any error.
Only working on MacOS.
(Read and Write computed property)

### 193.1.63 TransparencyMBS as single

MBS Util Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The transparency of the window on Mac OS X, Windows 2000 and Windows XP.
**Notes:** 1 for opaque, 0 for invisible.
Return 1 on any error. On Windows it returns always 1 as the current transparency value can't be queried.
You need to call MakeTransparent before to install transparency.
(Read and Write computed property)

### 193.1.64 UnifiedTitleAndToolbarMBS as Boolean

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has an unified title and toolbar look.
**Example:**

```
window1.UnifiedTitleAndToolbarMBS = true
```

**Notes:** This window draws its window title and toolbar using a unified appearance that has no separator between the two areas. A window may not have both UnifiedTitleAndToolbar and Metal appearance. If a window already has the metal attribute, attempting to set the Unified attribute will cause ChangeWindows to return an error, and vice versa. This constant was not added to this header file until Mac OS X 10.5, but it is actually available at runtime on Mac OS X 10.4 and later for windows of kDocumentWindowClass. However, on Mac OS X 10.5 and later, kHIWindowBitUnifiedTitleAndToolbar no longer has any effect, since all windows with toolbars now have a unified look.
(Read and Write computed property)

### 193.1.65 WindowProxyIconFileMBS as folderitem

MBS Util Plugin, Plugin Version: 21.5, Platform: macOS, Targets: Desktop only.

**Function:** That's the icon to the window which belongs to the file.
**Example:**

```
dim f as folderItem
```

```
f=getopenFolderItem("special/any")
if f<>nil then
window1.WindowProxyIconFileMBS=f
end if
```

**Notes:** Requires Mac OS 8.5 or newer.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.66 WinMenuHandleMBS as integer

MBS Util Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** A property to access the handle used for the menu of a Window.
**Example:**

```
dim menu as Integer // global

if menu=0 then
menu=Window1.WinMenuHandleMBS // read it on the first window
else
Window1.winmenuHandleMBS=menu // set it on the second window
end if
```

**Notes:** Used in the example "Menu in every Window" to have a menubar in every window on Windows. But never forget to quit your app after all windows were closed.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.1.67 WinTopMostWindowMBS as boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop only.

**Function:** Whether a window is staying on the top of the other windows.
**Example:**

```
window1.WinTopMostWindowMBS=true
```

**Notes:** If true the window stays in front of other windows. Default is false for Xojo windows and true for

overlays.
(Read and Write computed property)

## 193.2 class GTKWindowMBS

### 193.2.1 class GTKWindowMBS

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** The class to control a GTKWindow.
**Notes:** We can directly modify a window on Linux using this class.
If you need methods to do something special, please do not hesitate to email us.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr1
- MBS Real Studio Plugins, version 13.0pr1

**Xojo Developer Magazine**

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### 193.2.2 Methods

### 193.2.3 Constructor(win as DesktopWindow)

MBS Linux Plugin, Plugin Version: 22.0, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new GTKWindow object pointing to a given window.
**Notes:** Raises exception on Mac/Win to prevent you from creating invalid object.
See also:

- 193.2.4 Constructor(win as window) 23016

### 193.2.4 Constructor(win as window)

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Creates a new GTKWindow object pointing to a given window.
**Notes:** Raises exception on Mac/Win to prevent you from creating invalid object.
See also:

- 193.2.3 Constructor(win as DesktopWindow) 23016

### 193.2.5 Deiconify

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to deiconify (i.e. unminimize) the specified window.
**Notes:** Note that you shouldn't assume the window is definitely deiconified afterward, because other entities (e.g. the user or window manager) could iconify it again before your code which assumes deiconification gets to run.

### 193.2.6 Fullscreen

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to place window in the fullscreen state.
**Notes:** Note that you shouldn't assume the window is definitely full screen afterward, because other entities (e.g. the user or window manager) could unfullscreen it again, and not all window managers honor requests to fullscreen windows. But normally the window will end up fullscreen. Just don't write code that crashes if not.

### 193.2.7 Iconify

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to iconify (i.e. minimize) the specified window.
**Notes:** Note that you shouldn't assume the window is definitely iconified afterward, because other entities (e.g. the user or window manager) could deiconify it again, or there may not be a window manager in which case iconification isn't possible, etc. But normally the window will end up iconified. Just don't write code that crashes if not.

It's permitted to call this function before showing a window, in which case the window will be iconified before it ever appears onscreen.

### 193.2.8 IsComposited as Boolean

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Whether this window can rely on having its alpha channel drawn correctly.
**Notes:** On X11 this function returns whether a compositing manager is running for window's screen.

### 193.2.9 Maximize

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to maximize window, so that it becomes full-screen.
**Notes:** Note that you shouldn't assume the window is definitely maximized afterward, because other entities (e.g. the user or window manager) could unmaximize it again, and not all window managers support maximization. But normally the window will end up maximized. Just don't write code that crashes if not.

It's permitted to call this function before showing a window, in which case the window will be maximized when it appears onscreen initially.

### 193.2.10 SetIcon(pic as picture)

MBS Linux Plugin, Plugin Version: 14.0, Platform: Linux, Targets: Desktop only.

**Function:** Assigns an icon to the picture.
**Notes:** The operation system will scale the picture to required size, so please use bigger images.
Please use picture with alpha channel for best result.

### 193.2.11 SetKeepAbove(setting as boolean)

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to keep window above, so that it stays on top.
**Notes:** Note that you shouldn't assume the window is definitely above afterward, because other entities (e.g. the user or window manager) could not keep it above, and not all window managers support keeping windows above. But normally the window will end kept above. Just don't write code that crashes if not.

It's permitted to call this function before showing a window, in which case the window will be kept above when it appears onscreen initially.

Note that, according to the Extended Window Manager Hints specification, the above state is mainly meant for user preferences and should not be used by applications e.g. for drawing attention to their dialogs.

### 193.2.12 SetKeepBelow(setting as boolean)

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to keep window below, so that it stays in bottom.
**Notes:** Note that you shouldn't assume the window is definitely below afterward, because other entities (e.g. the user or window manager) could not keep it below, and not all window managers support putting windows below. But normally the window will be kept below. Just don't write code that crashes if not.

It's permitted to call this function before showing a window, in which case the window will be kept below when it appears onscreen initially.

Note that, according to the Extended Window Manager Hints specification, the above state is mainly meant for user preferences and should not be used by applications e.g. for drawing attention to their dialogs.

### 193.2.13 Stick

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to stick window, which means that it will appear on all user desktops.
**Notes:** Note that you shouldn't assume the window is definitely stuck afterward, because other entities (e.g. the user or window manager) could unstick it again, and some window managers do not support sticking windows. But normally the window will end up stuck. Just don't write code that crashes if not.

It's permitted to call this function before showing a window.

### 193.2.14 Unfullscreen

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to toggle off the fullscreen state for window.
**Notes:** Note that you shouldn't assume the window is definitely not full screen afterward, because other entities (e.g. the user or window manager) could fullscreen it again, and not all window managers honor requests to unfullscreen windows. But normally the window will end up restored to its normal state. Just don't write code that crashes if not.

### 193.2.15 Unmaximize

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to unmaximize window.
**Notes:** Note that you shouldn't assume the window is definitely unmaximized afterward, because other entities (e.g. the user or window manager) could maximize it again, and not all window managers honor requests to unmaximize. But normally the window will end up unmaximized. Just don't write code that crashes if not.

### 193.2.16 Unstick

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Asks to unstick window, which means that it will appear on only one of the user's desktops.
**Notes:** Note that you shouldn't assume the window is definitely unstuck afterward, because other entities (e.g. the user or window manager) could stick it again. But normally the window will end up stuck. Just don't write code that crashes if not.

### 193.2.17 Properties

### 193.2.18 Handle as Integer

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** The internal window handle.
**Notes:** (Read and Write property)

### 193.2.19 AcceptFocus as Boolean

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Get/Set whether window should receive focus.
**Notes:** Windows may set a hint asking the desktop environment not to receive the input focus. This function sets this hint.
(Read and Write computed property)

### 193.2.20 Opacity as Double

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Get or set the Opacity of this window.
**Notes:** Request the windowing system to make window partially transparent, with opacity 0 being fully transparent and 1 fully opaque. (Values of the opacity parameter are clamped to the [ 0,1 ] range.) On X11 this has any effect only on X screens with a compositing manager running. See isComposited.
(Read and Write computed property)

### 193.2.21 Resizable as Boolean

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Get or set whether the user can resize a window.
**Notes:** (Read and Write computed property)

### 193.2.22 Title as string

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Get or set the window title.
**Notes:** The title of a window will be displayed in its title bar; on the X Window System, the title bar is rendered by the window manager, so exactly how the title appears to users may vary according to a user's exact configuration. The title should help a user distinguish this window from other windows they may have open. A good title might include the application name and current document filename, for example.
(Read and Write computed property)

## 193.3 class MAAttachedWindowMBS

### 193.3.1 class MAAttachedWindowMBS

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** A class for attached windows in Cocoa.
**Notes:** For Mac OS X 10.7 you can use NSPopoverMBS. This class does something similar for Mac OS X 10.4 to 10.7.

Base on MAAttachedWindow code by Matt Gemmell.
See his website http://mattgemmell.com/

Below are the positions the attached window can be displayed at.

ote that these positions are relative to the point passed to the constructor, e.g. MAPositionBottomRight will put the window below the point and towards the right, MAPositionTop will horizontally center the window above the point, MAPositionRightTop will put the window to the right and above the point, and so on.

You can also pass MAPositionAutomatic and the attached window will try to position itself sensibly, based on available screen-space.

Notes regarding automatically-positioned attached windows:

(a) The window prefers to position itself horizontally centered below the specified point. This gives a certain enhanced visual sense of an attachment/relationship.

(b) The window will try to align itself with its parent window (if any); i.e. it will attempt to stay within its parent window's frame if it can.

(c) The algorithm isn't perfect. :) If in doubt, do your own calculations and then explicitly request that the window attach itself to a particular side.

Notes regarding accessor methods:

1. The border is drawn inside the viewMargin area, expanding inwards; it does not increase the width/height of the window. You can use the BorderWidth and ViewMargin methods together to achieve the exact look/geometry you want. (viewMargin is the distance between the edge of the view and the window edge.)

2. The specified setter methods are primarily intended to be used _before_ the window is first shown. If

you use them while the window is already visible, be aware that they may cause the window to move and/or resize, in order to stay anchored to the point specified in the initializer. They may also cause the view to move within the window, in order to remain centered there.

Note that the HasArrow method can safely be used at any time, and will not cause moving/resizing of the window. This is for convenience, in case you want to add or remove the arrow in response to user interaction. For example, you could make the attached window movable by its background, and if the user dragged it away from its initial point, the arrow could be removed. This would duplicate how Aperture's attached windows behave.

3. drawsRoundCornerBesideArrow takes effect when the arrow is being drawn at a corner, i.e. when it's not at one of the four primary compass directions. In this situation, if drawsRoundCornerBesideArrow is true (the default), then that corner of the window will be rounded just like the other three corners, thus the arrow will be inset slightly from the edge of the window to allow room for the rounded corner. If this value is false, the corner beside the arrow will be a square corner, and the other three corners will be rounded.

This is useful when you want to attach a window very near the edge of another window, and don't want the attached window's edge to be visually outside the frame of the parent window.

4. Note that to retrieve the background color of the window, you should use the windowBackgroundColor method, instead of backgroundColor. This is because we draw the entire background of the window (rounded path, arrow, etc) in an NSColor pattern image, and set it as the backgroundColor of the window.
Subclass of the NSWindowMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 22.5pr7
- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 20.5pr8
- MBS Real Studio Plugins, version 11.3pr4
- Lion features for Real Studio
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

### 193.3.2 Methods

### 193.3.3 attachedWindow(view as NSViewMBS, point as NSPointMBS = nil, window as NSWindowMBS = nil, onSide as Integer = 12, distance as Double = 0.0) as MAAttachedWindowMBS

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new attached window.
**Notes:** view: The view to display in the attached window. Must not be nil.
point: The point to which the attached window should be attached. If you are also specifying a parent window, the point should be in the coordinate system of that parent window. If you are not specifying a window, the point should be in the screen's coordinate space. This value is required.
window: The parent window to attach this one to. Note that no actual relationship is created (particularly, this window is not made a childWindow of the parent window). Default: nil.
onSide: The side of the specified point on which to attach this window. Default: MAPositionAutomatic.
distance: How far from the specified point this window should be. Default: 0.

Returns a new attached window.

### 193.3.4 Constructor(view as NSViewMBS, point as NSPointMBS = nil, window as NSWindowMBS = nil, onSide as Integer = 12, distance as Double = 0.0)

MBS MacExtras Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new attached window.
**Notes:** After constructor finished without exception, please check handle property for success. Handle is zero on failure.

view: The view to display in the attached window. Must not be nil.
point: The point to which the attached window should be attached. If you are also specifying a parent window, the point should be in the coordinate system of that parent window. If you are not specifying a window, the point should be in the screen's coordinate space. This value is required.
window: The parent window to attach this one to. Note that no actual relationship is created (particularly, this window is not made a childWindow of the parent window). Default: nil.
onSide: The side of the specified point on which to attach this window. Default: MAPositionAutomatic.
distance: How far from the specified point this window should be. Default: 0.

### 193.3.5 setBackgroundImage(image as NSImageMBS)

MBS MacExtras Plugin, Plugin Version: 13.4, Platform: macOS, Targets: Desktop only.

**Function:** Here you can set the background image.

### 193.3.6 setPoint(point as NSPointMBS, side as Integer)

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Sets the position and redraws window.

### 193.3.7 side as Integer

MBS MacExtras Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Which side the attached window is showing at.
**Notes:** If you passed automatic side mode to Constructor or attachedWindow method, you can query here which side was chosen.

### 193.3.8 Properties

### 193.3.9 arrowBaseWidth as Double

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The arrow base width.
**Notes:** Default is 20.
(Read and Write computed property)

### 193.3.10 arrowHeight as Double

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The height of the arrow.
**Notes:** Default is 16.
(Read and Write computed property)

### 193.3.11 borderColor as NSColorMBS

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The border color.
**Notes:** Default is white.
(Read and Write computed property)

### 193.3.12 borderWidth as Double

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The border width.
**Notes:** Default is 2.
(Read and Write computed property)

### 193.3.13 cornerRadius as Double

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The corner radius.
**Notes:** Default is 8.
(Read and Write computed property)

### 193.3.14 drawsRoundCornerBesideArrow as boolean

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether to draw round corners beside arrow.
**Notes:** Default is true.
(Read and Write computed property)

### 193.3.15 hasArrow as boolean

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether the window shows an arrow.
**Notes:** Default is true.
(Read and Write computed property)

### 193.3.16 viewMargin as Double

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The view margin.
**Notes:** Default is 2.
(Read and Write computed property)

### 193.3.17 windowBackgroundColor as NSColorMBS

MBS MacExtras Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** The window background color.
**Notes:** Default is 25% dark gray.
(Read and Write computed property)

### 193.3.18 Constants

Position constants

| Constant | Value | Description |
|---|---|---|
| MAPositionAutomatic | 12 | automatic |
| MAPositionBottom | 1 | bottom |
| MAPositionBottomLeft | 10 | bottom left |
| MAPositionBottomRight | 11 | bottom right |
| MAPositionLeft | 0 | left |
| MAPositionLeftBottom | 5 | left bottom |
| MAPositionLeftTop | 4 | left top |
| MAPositionRight | 2 | right |
| MAPositionRightBottom | 7 | right bottom |
| MAPositionRightTop | 6 | right top |
| MAPositionTop | 3 | top |
| MAPositionTopLeft | 8 | top left |
| MAPositionTopRight | 9 | top right |

## 193.4 Globals

### 193.4.1 DisableScreenUpdatesMBS

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Temporarily disables redraw of the screen after changes to window geometry or window contents.
**Notes:** It is appropriate to disable updates if you are moving or resizing multiple windows and you want all of the geometry changes to appear onscreen simulataneously. In most other cases, you should strive to avoid disabling screen updates. The window server will automatically re-enable updates (and print a message to the Console log) if you leave updates disabled for a sufficiently long period of time, currently about 1 second.

The window server records the number of calls to DisableScreenUpdates and does not re-enable updates until a matching number of calls to EnableScreenUpdates have been made.

Updated for 64-bit in plugin version 18.3.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr3

### 193.4.2 EnableScreenUpdatesMBS

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** Re-enables redraw of the screen after changes to window geometry or window contents.
**Notes:** Screen redraw is not actually enabled until the number of calls to EnableScreenUpdatesMBS matches the number of calls to DisableScreenUpdatesMBS.

Updated for 64-bit in plugin version 18.3.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr3

### 193.4.3 MenuBarHeightMBS as Integer

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the height of the menubar in pixels.
**Example:**

```
msgbox "The menubar is "+str(MenuBarHeightMBS)+" pixels height."
```

**Notes:** Requires the appearance manager.

Without plugin, you can use this:

```
declare function GetThemeMenuBarHeight lib "Carbon" (p as ptr) as Integer

dim l as Integer
dim p as memoryBlock
p=newmemoryBlock(10)

error=GetThemeMenuBarHeight(p) // 0 if okay.
menuheight=p.short(0) // in pixels. 22 on Mac OS X.
```

Added Cocoa support in plugin version 10.0.

## 193.5 class OverlayMBS

### 193.5.1 class OverlayMBS

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** This class gives you a window overlaying all other windows with an alpha channel.
**Example:**

```
dim o as OverlayMBS
dim p as Picture

o=new OverlayMBS(100,100,300,300)

p=New Picture(300,300,32)
p.Graphics.ForeColor=&c000000
p.Graphics.FillRect 0,0,300,300

o.Pict=p

p=New Picture(300,300,32)
p.Graphics.ForeColor=&c000000
p.Graphics.FillOval 0,0,300,300
p.Graphics.ForeColor=&cFFFFFF
p.Graphics.FillOval 100,100,100,100

o.Mask=p

o.UpdateShow
```

```
// wait 5 seconds to see the window
DelayMBS 5
```

**Notes:** Requires Mac OS X 10.3.9 or Windows 2000 or newer.

Cocoa implementation added with Mac OS X 10.4 class.
To support high resolution mode on Mac OS X high resolution displays, please make the picture+mask exact the double width and height of the window.
**Blog Entries**

- MBS Xojo Plugins, version 24.1pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- MBS Xojo / Real Studio plug-ins version 16.2
- Video playback with mask on OS X
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.0
- High Resolution is coming
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic plug-ins version 9.4
- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2
- MonkeyBread Software Releases the MBS REALbasic plugins 8.7

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- 12.2, page 10: News

### 193.5.2 Methods

### 193.5.3 Close

MBS Overlay Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Calls the destructor.
**Notes:** Closes the window and releases all memory used from the overlay.

### 193.5.4 Constructor(left as Integer, top as Integer, width as Integer, height as Integer, MacAttributes as Integer, WinExStyle as Integer, WinStyle as Integer)

MBS Overlay Plugin, Plugin Version: 10.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The advanced constructor where you can pass flags for Mac and Windows directly.
**Notes:** Windows ExStyle flags:

| | |
|---|---|
| WS_EX_DLGMODALFRAME | &h00000001 |
| WS_EX_NOPARENTNOTIFY | &h00000004 |
| WS_EX_TOPMOST | &h00000008 |
| WS_EX_ACCEPTFILES | &h00000010 |
| WS_EX_TRANSPARENT | &h00000020 |
| WS_EX_MDICHILD | &h00000040 |
| WS_EX_TOOLWINDOW | &h00000080 |
| WS_EX_WINDOWEDGE | &h00000100 |
| WS_EX_CLIENTEDGE | &h00000200 |
| WS_EX_CONTEXTHELP | &h00000400 |
| WS_EX_RIGHT | &h00001000 |
| WS_EX_LEFT | &h00000000 |
| WS_EX_RTLREADING | &h00002000 |
| WS_EX_LTRREADING | &h00000000 |
| WS_EX_LEFTSCROLLBAR | &h00004000 |
| WS_EX_RIGHTSCROLLBAR | &h00000000 |
| WS_EX_CONTROLPARENT | &h00010000 |
| WS_EX_STATICEDGE | &h00020000 |
| WS_EX_APPWINDOW | &h00040000 |
| WS_EX_OVERLAPPEDWINDOW | (WS_EX_WINDOWEDGE + WS_EX_CLIENTEDGE) |
| WS_EX_PALETTEWINDOW | (WS_EX_WINDOWEDGE + WS_EX_TOOLWINDOW + WS_EX_TOPMOST) |
| WS_EX_LAYERED | &h00080000 |
| WS_EX_NOINHERITLAYOUT | &h00100000 |
| WS_EX_LAYOUTRTL | &h00400000 |
| WS_EX_NOACTIVATE | &h08000000 |

Windows Style flags:

See also:

- 193.5.5 Constructor(left as Integer, top as Integer, width as Integer, height as Integer, WindowsNoActivate as boolean = false, WindowsTopMost as boolean=true) 23032

| | |
|---|---|
| WS_OVERLAPPED | &h00000000 |
| WS_POPUP | &h80000000 |
| WS_CHILD | &h40000000 |
| WS_MINIMIZE | &h20000000 |
| WS_VISIBLE | &h10000000 |
| WS_DISABLED | &h08000000 |
| WS_CLIPSIBLINGS | &h04000000 |
| WS_CLIPCHILDREN | &h02000000 |
| WS_MAXIMIZE | &h01000000 |
| WS_CAPTION | &h00C00000 |
| WS_BORDER | &h00800000 |
| WS_DLGFRAME | &h00400000 |
| WS_VSCROLL | &h00200000 |
| WS_HSCROLL | &h00100000 |
| WS_SYSMENU | &h00080000 |
| WS_THICKFRAME | &h00040000 |
| WS_GROUP | &h00020000 |
| WS_TABSTOP | &h00010000 |
| WS_MINIMIZEBOX | &h00020000 |
| WS_MAXIMIZEBOX | &h00010000 |

### 193.5.5 Constructor(left as Integer, top as Integer, width as Integer, height as Integer, WindowsNoActivate as boolean = false, WindowsTopMost as boolean=true)

MBS Overlay Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Creates a new window.
**Example:**

```
// a dark window with round edges

dim m,p as Picture
static o as OverlayMBS

const rect_width=300
const rect_height=300
const round_rect_int=30

p=New Picture(rect_width,rect_height,32)
m=New Picture(rect_width,rect_height,32)

p.Graphics.ForeColor = RGB( 20,20,20 )
p.Graphics.DrawRect 0, 0, rect_width, rect_height
p.Graphics.FillRect 0, 0, rect_width, rect_height

// fill the window mask with around 10% transparency
```

```
m.Graphics.ForeColor = RGB( 20,20,20 )
m.Graphics.FillRoundRect 0, 0, rect_width, rect_height, round_rect_int, round_rect_int

// write text into picture
p.Graphics.ForeColor=&cFFFFFF
p.Graphics.DrawString "Hello",10,20

// make the text not transparent
m.Graphics.ForeColor=&c000000
m.Graphics.DrawString "Hello",10,20

o=new OverlayMBS(200,200,rect_width, rect_height, true)
o.Pict=p
o.Mask=m
o.UpdateShow
```

**Notes:** Requires Mac OS X 10.3.9 or Windows 2000 or newer.
On success the handle property is not zero.

If WindowsNoActivate the window is setup to not become the front window. This may be a better setup for a toolbar like window.
If WindowsTopMost is false the window is not floating in front of all other windows.

Seems like WindowsNoActivate on Windows works better if you call Show(4) right after the constructor.

For proper support of high resolutions, the pictures used here may need to be 2x or 3x times the window size.
See also:

- 193.5.4 Constructor(left as Integer, top as Integer, width as Integer, height as Integer, MacAttributes as Integer, WinExStyle as Integer, WinStyle as Integer) 23031

### 193.5.6 Hide

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Hides the window.

### 193.5.7 InvalidateShadow

MBS Overlay Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** Invalidates the shadow of the window.
**Notes:** As soon as possible the operation system will recalculate the shadow.
Works only on Mac OS X with Carbon or Cocoa window.

### 193.5.8 Move(left as Integer, top as Integer)

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Moves the window on the screen to the given position.

### 193.5.9 Resize(width as Integer, height as Integer)

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Resizes the window.
**Notes:** You need to provide bigger picture before you call this method.

### 193.5.10 SetFocus

MBS Overlay Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The method to call to set focus to the overlay window.
**Notes:** Works for Windows and macOS Cocoa.

### 193.5.11 Show(WindowsShowMode as Integer = 0)

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Shows the window onscreen.
**Notes:** Values for the Windows show mode:

default 0
SW_SHOWNORMAL 1
SW_NORMAL 1
SW_SHOWMINIMIZED 2
SW_SHOWMAXIMIZED 3
SW_MAXIMIZE 3
SW_SHOWNOACTIVATE 4
SW_SHOW 5
SW_MINIMIZE 6
SW_SHOWMINNOACTIVE 7

SW_SHOWNA 8
SW_RESTORE 9
SW_SHOWDEFAULT 10
SW_FORCEMINIMIZE 11

### 193.5.12 Update

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Updates the window.
**Notes:** After you draw new content into the pict and mask pictures, you call this method to apply changes to the window.
See also:

- 193.5.13 Update(NSImage as Variant) 23035

### 193.5.13 Update(NSImage as Variant)

MBS Overlay Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Updates overlay window with given NSImage.
**Notes:** Please pass NSImageMBS object.

Version 16.2 and newer also accepts CGImageMBS object here.
If you pass picture, we use it as CGImage or NSImage depending on what picture type you pass.
See also:

- 193.5.12 Update 23035

### 193.5.14 UpdateShow

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Shows the window and performs an update.
**Notes:** Runs Update and Show internally.

### 193.5.15 Properties

### 193.5.16 Alpha as Double

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The alpha value of the window.
**Notes:** 0 is invisible and 1.0 is visible.
(Read and Write property)

### 193.5.17 AutoCaptureMouse as Boolean

MBS Overlay Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop only.

**Function:** Whether the mouse should be captured automatically on Windows.
**Notes:** If you return true from MouseDown the mouse is catched. This way you can get the drag events even if the mouse moves out of the window.
On MouseUp the mouse is released.
(Read and Write property)

### 193.5.18 CurrentImage as Variant

MBS Overlay Plugin, Plugin Version: 14.2, Platform: macOS, Targets: Desktop only.

**Function:** Last image drawn.
**Notes:** For debugging only.
CGImageMBS or NSImageMBS depending on what you set.
(Read only property)

### 193.5.19 Height as Integer

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The height of the window.
**Notes:** Using Resize method is more efficient than assigning width and height properties.
(Read and Write property)

### 193.5.20 IgnoreMouseClicks as Boolean

MBS Overlay Plugin, Plugin Version: 8.7, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether this window should react to mouse clicks.
**Notes:** In Mac OS X 10.7 and newer setting IgnoreMouseClicks = false does not give the same behavior as without setting this property before.

Implemented for windows in v24.1.
(Read and Write property)

### 193.5.21 Left as Integer

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The position of the window.
**Example:**

```
static o as OverlayMBS // keep the variable global somewhere. Static or part of a module or in app class.

o = new OverlayMBS(100,100,100,100)

o.Pict = LogoMBS(100)
o.mask = LogoMBS(100)

o.Left = 200

o.UpdateShow
```

**Notes:** Using Move method is more efficient than assigning left and top properties.
(Read and Write property)

### 193.5.22 Mask as Picture

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The mask for the window.
**Notes:** You need to create and assign your own image.
If you assign nil for the mask, the plugin uses the mask or alpha channel of the picture.

For proper support of high resolutions, the pictures used here may need to be 2x or 3x times the window size.
(Read and Write property)

### 193.5.23 MovableByWindowBackground as Boolean

MBS Overlay Plugin, Plugin Version: 24.1, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** A Boolean value that indicates whether the window is movable by clicking and dragging anywhere in its background.
**Notes:** The value of this property is true when the window is movable by clicking and dragging anywhere

in its background; otherwise, false.

Works on macOS and Windows.
(Read and Write property)

### 193.5.24 NSView as Variant

MBS Overlay Plugin, Plugin Version: 15.3, Platform: macOS, Targets: Desktop only.

**Function:** The NSView showing the content of the overlay.
**Notes:** (Read only property)

### 193.5.25 NSWindow as Variant

MBS Overlay Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop only.

**Function:** Returns a reference to the NSWindowMBS object which you can use to make additional settings to the overlay window.
**Example:**

```
dim o as OverlayMBS // your window

dim n as NSWindowMBS = o.NSWindow
// this window should not hide if app hides
n.canHide = false
```

**Notes:** Only for the Cocoa target in Xojo.
(Read only property)

### 193.5.26 Pict as Picture

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The picture for the window content.
**Notes:** You need to provide your own picture here.
Pict and Mask pictures must have the same size.

Alpha Channel Pictures are not really supported.
But for Mac OS X an alpha channel picture does currently work.

For proper support of high resolutions, the pictures used here may need to be 2x or 3x times the window size.
(Read and Write property)

### 193.5.27 Top as Integer

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The position of the window.
**Example:**

```
static o as OverlayMBS // keep the variable global somewhere. Static or part of a module or in app class.

o = new OverlayMBS(100,100,100,100)

o.Pict = LogoMBS(100)
o.mask = LogoMBS(100)

o.top = 200

o.UpdateShow
```

**Notes:** Using Move method is more efficient than assigning left and top properties.
(Read and Write property)

### 193.5.28 Visible as Boolean

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Whether the window is visible.
**Example:**

```
dim o as OverlayMBS
// ....
o.visible=true
```

**Notes:** True if visible, false if hidden.
(Read and Write property)

### 193.5.29 Width as Integer

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The width of the window.
**Notes:** Using Resize method is more efficient than assigning width and height properties.
(Read and Write property)

### 193.5.30 WindowHandle as Integer

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The internal used window handle.
**Notes:** On Mac OS a WindowRef and on Windows a HWND.
(Read only property)

### 193.5.31 WindowID as Integer

MBS Overlay Plugin, Plugin Version: 10.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries the CoreGraphics Window ID for the given window.
**Notes:** Returns 0 on any error.
This ID can be used for CGWindowListCreateImageMBS.
(Read only property)

### 193.5.32 WindowsClassName as String

MBS Overlay Plugin, Plugin Version: 18.4, Platform: Windows, Targets: Desktop only.

**Function:** The Windows' window class name.
**Notes:** (Read only property)

### 193.5.33 hasShadow as boolean

MBS Overlay Plugin, Plugin Version: 13.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the window has a shadow.
**Notes:** (Read and Write computed property)

### 193.5.34 Title as string

MBS Overlay Plugin, Plugin Version: 11.0, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** The title of the window.
**Notes:** This name is not visible as the window has no title bar.
But if you see the window in some window list, this title property will give your overlay window a name.
(Read and Write computed property)

### 193.5.35 WinIsTopMost as boolean

MBS Overlay Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether a window is staying on the top of the other windows.
**Notes:** If true the window stays in front of other windows. Default is false for Xojo windows and true for overlays.
(Read and Write computed property)

### 193.5.36 Events

### 193.5.37 Draw(CGContext as Variant, NSGraphicsContext as Variant)

MBS Overlay Plugin, Plugin Version: 18.4, Platform: macOS, Targets: .

**Function:** Draws the content of the window.
**Example:**

```
Sub Draw(CGContext as Variant, NSGraphicsContext as Variant)
dim c as CGContextMBS = CGContext
dim n as NSGraphicsMBS = NSGraphicsContext
// draw here
End Sub
```

**Notes:** The drawing area is cleared for you.
Please put the given parameters in the local variables with correct type.
We use variants here to reduce plugin dependencies.

With version 19.5, the don't clear content anymore for you, so you may need to call ClearRect if needed.

### 193.5.38 GotFocus

MBS Overlay Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: .

**Function:** The event called when focus is set on the overlay window.
**Notes:** Works for Windows and macOS Cocoa.

### 193.5.39 KeyDown(key as String, keyCode as Integer, modifiers as integer) as Boolean

MBS Overlay Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: .

**Function:** The key down event.
**Notes:** The plugin translates keycodes into key as text, but also provides keycode and modifier flags.
Works for Windows and macOS Cocoa.

### 193.5.40 KeyUp(key as String, keyCode as Integer, modifiers as integer) as Boolean

MBS Overlay Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: .

**Function:** The key up event.
**Notes:** The plugin translates keycodes into key as text, but also provides keycode and modifier flags.
Works for Windows and macOS Cocoa.

### 193.5.41 LostFocus

MBS Overlay Plugin, Plugin Version: 17.4, Platforms: macOS, Windows, Targets: .

**Function:** The event called when focus is lost on the overlay window.
**Notes:** Works for Windows and macOS Cocoa.

### 193.5.42 menuForEvent(NSEvent as variant) as Variant

MBS Overlay Plugin, Plugin Version: 17.3, Platform: macOS, Targets: .

**Function:** Provide a contextual menu for Cocoa Mac.
**Notes:** NSEvent is an NSEventMBS object.
Please return NSMenuMBS object. (and please keep a reference somewhere)

### 193.5.43 MouseDown(x as Integer, y as Integer, modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the user clicks with the mouse inside the window.
**Notes:** Return true if you handled this event.
modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.44 MouseDragged(x as Integer, y as Integer, modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the user moves the mouse over the window while the mouse is pressed.
**Notes:** Return true if you handled this event.
modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.45 MouseEnter(x as Integer, y as Integer, modifiers as Integer)

MBS Overlay Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: .

**Function:** This is event is called when mouse enters window.
**Notes:** modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.46 MouseExit(x as Integer, y as Integer, modifiers as Integer)

MBS Overlay Plugin, Plugin Version: 13.0, Platforms: macOS, Windows, Targets: .

**Function:** This is event is called when mouse leaves window.
**Notes:** modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.47 MouseMoved(x as Integer, y as Integer, modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the user moves the mouse over the window.
**Notes:** Return true if you handled this event.
modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.48 MouseUp(x as Integer, y as Integer, modifiers as Integer) as boolean

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the user releases the mousebutton inside the window.
**Notes:** Return true if you handled this event.

modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.49 MouseWheel(x as Integer, y as Integer, dx as Double, dy as Double, modifiers as Integer)

MBS Overlay Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called when the user uses the mouse wheel inside the window.
**Notes:** modifiers: Platform dependent keyboard modifiers. Different values for Carbon, Cocoa and Windows!

For Cocoa to set mouse cursor, please use NSCursorMBS class.

### 193.5.50 WindowBoundsChanged

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called whenever the size of the window changes.
**Notes:** Can also be called on position changes.

### 193.5.51 WindowClosed

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the window is closed.

### 193.5.52 WindowHidden

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the window is hidden.
**Notes:** Cocoa support added for version 14.0.

### 193.5.53 WindowShown

MBS Overlay Plugin, Plugin Version: 8.6, Platforms: macOS, Windows, Targets: .

**Function:** This event is called when the window is shown.
**Notes:** Cocoa support added for version 14.0.

### 193.5.54 Constants

Modifiers

| Constant | Value | Description |
|---|---|---|
| kModifierFlagCommand | 1048576 | The command key is pressed.<br>Use with BitwiseAnd(Modifiers, kModifierFlagCommand) <>0 to check if the flag is set in key events. |
| kModifierFlagControl | 262144 | The control key is pressed.<br>Use with BitwiseAnd(Modifiers, kModifierFlagControl) <>0 to check if the flag is set in key events. |
| kModifierFlagOption | 524288 | The option (alt) key is pressed.<br>Use with BitwiseAnd(Modifiers, kModifierFlagOption) <>0 to check if the flag is set in key events. |
| kModifierFlagShift | 131072 | The shift key is pressed.<br>Use with BitwiseAnd(Modifiers, kModifierFlagShift) <>0 to check if the flag is set in key events. |

## 193.6 class Window

### 193.6.1 class Window

Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Extends Xojo's Window Class.
**Example:**

window1.HasNoTitleBarMBS = true

**Notes:** In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

### 193.6.2 Methods

### 193.6.3 ActivateWindowMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Activates the window.
**Notes:** This function does more than just show. if the window has been minimized, it will restore it. Also the window is moved to front and made the current window for keyboard input.

Sadly windows limits which windows can go to front, so some windows may not come to front unless they are clicked on.

As activation can be asynchronously, the window may activate later, e.g. after current method ends.

For MacOS Cocoa apps, we simply bring the window to the front.
**Blog Entries**

- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr1
- SetFrontMost for Windows

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 42: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 193.6.4 BackingScaleFactorMBS as Double

MBS Util Plugin, Plugin Version: 12.3, Platform: macOS, Targets: Desktop only.

**Function:** Returns the scale factor representing the number of backing store pixels corresponding to each linear unit in window space on this window.
**Notes:** This is generally only necessary when building a bitmap context or image whose resolution needs to match that of a particular Window. Note that a Window's backing scale factor can change over time, such as when the window moves from one display to another, or when a display's resolution changes, so clients should not cache the value returned by this function.

If platform does not support scaling factor, we return 1.0. (on Windows, Linux and older Mac OS X)
Supported for Carbon and Cocoa windows.

For apps which are not enabled for retina support, the function returns 1. So you only see 2 here if app is Cocoa, display is retina and info.plist has the NSHighResolutionCapable key.
**Blog Entries**

- MBS Real Studio Plugins, version 12.4pr1
- MBS Real Studio Plugins, version 12.3pr13
- High Resolution is coming
- MBS Real Studio Plugins, version 12.3pr5

### 193.6.5 CGContextMBS as CGContextMBS

MBS MacCG Plugin, Plugin Version: 2.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a new CGContextMBS object for the given Window.
**Example:**

```
dim CGContext as CGContextMBS
dim OverlayPic as Picture=LogoMBS(500)
dim contentpicture as CGImageMBS= CGCreateImageMBS(OverlayPic)

CGContext=window1.CGContextMBS

CGContext.ClearRect CGMakeRectMBS(0, 0, OverlayPic.width, OverlayPic.height)
CGContext.DrawPicture contentpicture, CGMakeRectMBS(0, 0, OverlayPic.width, OverlayPic.height)
```

**Notes:** Requires Mac OS X to work.
Please make sure the CGContextMBS object is released in the paint event if you use it there, so all the drawings are flushed. Not releasing it my be visible in missing statictext or other strange graphics effects.

But on a Cocoa window the context is not always available, so in the window paint event, you can context from Graphics object.

### 193.6.6 CleanUpTransparentMBS(refValue as Integer)

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Cleans up transparency support for a Xojo window.
**Example:**

```
dim p as Integer // property on Windows

p = window1.MakeTransparentMBS

// later in close event

window1.CleanUpTransparentMBS p
```

**Notes:** Call this in the close event of a window passing the value you got from the MakeTransparentMBS call.
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

### 193.6.7 ClearTransparencyMBS

MBS Util Plugin, Plugin Version: 5.0, Platform: macOS, Targets: Desktop only.

**Function:** Clears transparency of a window.

### 193.6.8 CollapsableMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if this window can be collapsed.
**Example:**

MsgBox str(window1.CollapsableMBS)

**Notes:** Collapseable windows are the normal document windows.
You can't collapse dialogs or floating windows well.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.

### 193.6.9 ConstrainWindowToScreenMBS(animate as boolean)

MBS Util Plugin, Plugin Version: 10.5, Platform: macOS, Targets: Desktop only.

**Function:** Makes sure the window is on one screen visible.
**Notes:** Implemented on Mac for both Carbon and Cocoa.
**Blog Entries**

- MBS REALbasic Plugins, version 10.6pr6

### 193.6.10 GTKWindow as GTKWindowMBS

MBS Linux Plugin, Plugin Version: 13.0, Platform: Linux, Targets: Desktop only.

**Function:** Queries a GTKWindow object for this window.
**Notes:** Returns only a valid object on linux.
On other platforms, this function returns nil.

### 193.6.11 HideKeyboardMBS

MBS Win Plugin, Plugin Version: 23.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Hides the keyboard.
**Notes:** On Windows same as ShowKeyboardMBS, but may not launch the keyboard.

If you called ShowKeyboardMBS before, you can call this function to hide it.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- MBS Xojo Plugins, version 23.2pr1

### 193.6.12 InvalidateRectThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Invalidate the rectangle.
**Notes:** This method is to allow you to invalidate in a thread without a problem.

If called on main thread, the plugin will simply call InvalidateRect method directly.
If called on other threads the plugin will schedule to call InvalidateRect method a short time later on the main thread.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr3

### 193.6.13 InvalidateShadowMBS

MBS MacOSX Plugin, Plugin Version: 8.7, Platform: macOS, Targets: Desktop only.

**Function:** This method causes a window's shadow to be recalculated.
**Notes:** InvalidateShadowMBS is not typically used by applications. However, it may be useful for applications with customized window frames that change shape dynamically; in this case, after the application has drawn the new window shape, the window shadow must be recalculated to follow the new window shape.

This method causes the window shadow to be immediately recalculated and redrawn based on the current contents of the window's back buffer. For best performance and visual appearance, you should follow these steps when invalidating a window shadow: disable updates with DisableScreenUpdatesMBS, draw, flush, invalidate the shadow, and enable updates. For a compositing window, after invalidating any views that should be redrawn, you will need to explicitly draw and flush using HIWindowFlush, rather than waiting for the event loop to draw and flush the window, because you cannot disable updates or invalidate the window shadow if drawing is done via the event loop.

### 193.6.14 InvalidateThreadSafeMBS(EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Invalidate the window.
**Notes:** This method is to allow you to invalidate in a thread without a problem.

If called on main thread, the plugin will simply call Invalidate method directly.
If called on other threads the plugin will schedule to call Invalidate method a short time later on the main thread.
**Blog Entries**

- MBS Xojo Plugins, version 20.0pr6
- MBS Xojo Plugins, version 19.5pr3
- MBS Real Studio Plugins, version 13.0pr5

### 193.6.15 IsFullScreenMBS as Boolean

MBS Util Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Queries whether window is fullscreen.
**Notes:** Indicates that a window has fullscreen appearance.
A fullscreen window does not draw its titlebar, and may have special handling for its toolbar.
Available in Mac OS X v10.7 and later.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr6
- Lion features for Real Studio
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

### 193.6.16 MakeTransparentMBS as Integer

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Installs transparency support to a Xojo window.
**Example:**

```
dim p as Integer // property on Windows

p = window1.MakeTransparentMBS

// later in close event

window1.CleanUpTransparentMBS p
```

**Notes:** Will return non zero value if successfull.
The window doesn't change if you don't use the CGContextMBS property.

Requires Mac OS X, Windows 2000 or Windows XP to work. The window must be a document window.

Set MacProcID of the window to 1104 and you can make it transparent without a title bar. (on Mac OS X)

With plugin version 11.1, we now return a value which should store with the window. Later in the Close event, you call CleanUpTransparentMBS passing this value.

Added Cocoa support in 11.3 plugins.
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel. Calls to MakeTransparentMBS and CleanUpTransparentMBS are not required for Linux.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr3
- MBS REALbasic Plugins, version 11.2pr1
- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr5

**Xojo Developer Magazine**

- 10.1, page 76: Using Plugins, Working with the Monkeybread Plugins by Marc Zeedar

### 193.6.17 NSPanelMBS as NSPanelMBS

MBS MacBase Plugin, Plugin Version: 12.5, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSPanel for the given Xojo window.
**Example:**

MsgBox window1.NSPanelMBS.Title

**Notes:** Works only for Cocoa Windows in Cocoa target which are floating panels.

### 193.6.18 NSToolbarMBS as NSToolbarMBS

MBS MacControls Plugin, Plugin Version: 11.3, Platform: macOS, Targets: Desktop only.

**Function:** The window's toolbar.
**Notes:** So you can get the toolbar without going over NSWindowMBS.
But there you can assign a new toolbar...

### 193.6.19 NSWindowMBS as NSWindowMBS

MBS MacBase Plugin, Plugin Version: 9.7, Platform: macOS, Targets: Desktop only.

**Function:** Creates a NSWindow for the given Xojo window.
**Example:**

MsgBox window1.NSWindowMBS.Title

**Notes:** Works only for Cocoa Windows in Cocoa target and for Carbon Windows in carbon targets.

### 193.6.20 RefreshRectThreadSafeMBS(X As Integer, Y As Integer, Width As Integer, Height As Integer, EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Refresh the rectangle.
**Notes:** This method is to allow you to refresh in a thread without a problem.

If called on main thread, the plugin will simply call RefreshRect method directly.
If called on other threads the plugin will schedule to call RefreshRect method a short time later on the main thread.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr3

### 193.6.21 RefreshThreadSafeMBS(EraseBackground as boolean = true)

MBS Util Plugin, Plugin Version: 19.5, Platform: macOS, Targets: Desktop only.

**Function:** Refresh the rectangle.
**Notes:** This method is to allow you to refresh in a thread without a problem.

If called on main thread, the plugin will simply call Refresh method directly.
If called on other threads the plugin will schedule to call Refresh method a short time later on the main thread.
**Blog Entries**

- MBS Xojo Plugins, version 19.5pr3
- MBS Real Studio Plugins, version 13.0pr5

### 193.6.22 RemoveWindowProxyIconMBS

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Removes any Proxy Icon from the Window.
**Example:**

```
mainwindow.RemoveWindowProxyIconMBS
```

**Notes:** Requires Mac OS 8.5 or newer.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr4

### 193.6.23 ScreenshotWindowMBS as picture

MBS Picture Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns the content of the window buffer on Mac OS X.
**Example:**

```
dim p as Picture
p=mainwindow.screenshotWindowMBS
```

**Notes:** Only for Mac OS X. Image is taken from window back buffer.
This will not capture overlay windows.

On Xojo 2006 or newer, please add a self. on front of the method call in case you want to use the method on the current window.
**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MBS Xojo Plugins, version 22.2pr2
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8

### 193.6.24 ScreenshotWindowRectMBS(left as Integer, top as Integer, width as Integer, height as Integer) as picture

MBS Picture Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns a part of the content of the window buffer on Mac OS X.
**Example:**

```
dim p as picture
p=mainwindow.ScreenshotWindowRectMBS(100,100,200,200)
```

**Notes:** Only for Mac OS X. Image is taken from window back buffer.
This will not capture overlay windows.

On Xojo 2006 or newer, please add a self. on front of the method call in case you want to use the method on the current window.
**Blog Entries**

- MBS Xojo Plugins, version 22.2pr2
- MBS Plugins 11.1 Release notes
- MBS Real Studio Plugins, version 11.1pr8
- Tipp of the day: Blank HTMLViewer

### 193.6.25 SetTransparencyMBS(value as Integer) as boolean

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** Your window can have transparency on Mac OS X.
**Example:**

```
if window1.SetTransparencyMBS(127) then
'fine
else
'error
end if
```

**Notes:** Use values between 0 and 255.
Requires Mac OS X, Windows 2000 or Windows XP to work.
May be limited to simple windows like normal document windows.
You need to call MakeTransparent before to install transparency.
(this function was replaced in v4.4)
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel.

### 193.6.26 SetWindowFeedbackSettingMBS(Feedback as Integer, value as Variant) as Boolean

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Sets the feedback configuration for a window.
**Example:**

```
const FEEDBACK_TOUCH_CONTACTVISUALIZATION = 1
const FEEDBACK_PEN_BARRELVISUALIZATION = 2
const FEEDBACK_PEN_TAP = 3
const FEEDBACK_PEN_DOUBLETAP = 4
const FEEDBACK_PEN_PRESSANDHOLD = 5
const FEEDBACK_PEN_RIGHTTAP = 6
const FEEDBACK_TOUCH_TAP = 7
const FEEDBACK_TOUCH_DOUBLETAP = 8
const FEEDBACK_TOUCH_PRESSANDHOLD = 9
const FEEDBACK_TOUCH_RIGHTTAP = 10
const FEEDBACK_GESTURE_PRESSANDTAP = 11


dim r as Boolean = self.SetWindowFeedbackSettingMBS(FEEDBACK_TOUCH_TAP, true)

if r then
dim value as Boolean
dim b as Boolean = self.WindowFeedbackSettingMBS(FEEDBACK_TOUCH_TAP, value)
if b then
MsgBox "WindowFeedbackSettingMBS: "+str(value)
end if
end if
```

**Notes:** Returns true if successful; otherwise, returns false.

Value can be nil to reset value. Or true/false to set it.
Requires Windows 8 or Windows Server 2012 in desktop apps only.

| Constant Name | Value | Description |
|---|---|---|
| FEEDBACK_TOUCH_CONTACTVISUALIZATION | 1 | Feedback for a touch contact event. |
| FEEDBACK_PEN_BARRELVISUALIZATION | 2 | Feedback for a pen barrel-button event. |
| FEEDBACK_PEN_TAP | 3 | Feedback for a pen tap event. |
| FEEDBACK_PEN_DOUBLETAP | 4 | Feedback for a pen double-tap event. |
| FEEDBACK_PEN_PRESSANDHOLD | 5 | Feedback for a pen press-and-hold event. |
| FEEDBACK_PEN_RIGHTTAP | 6 | Feedback for a pen right-tap event. |
| FEEDBACK_TOUCH_TAP | 7 | Feedback for a touch tap event. |
| FEEDBACK_TOUCH_DOUBLETAP | 8 | Feedback for a touch double-tap event. |
| FEEDBACK_TOUCH_PRESSANDHOLD | 9 | Feedback for a touch press-and-hold event. |
| FEEDBACK_TOUCH_RIGHTTAP | 10 | Feedback for a touch right-tap event. |
| FEEDBACK_GESTURE_PRESSANDTAP | 11 | Feedback for a press-and-tap gesture. |

**Blog Entries**

- MBS Xojo Plugins, version 17.5pr6

**Videos**

- Presentation from London conference about MBS Plugins.

### 193.6.27 SetWindowIconMBS(Type as Integer, File as FolderItem, IconID as Integer) as Boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop only.

**Function:** Sets the window icon using the icon in the file.
**Example:**

```
call window1.SetWindowIconMBS(0,getfolderitem("icon.ico"),1)
```

**Notes:** Returns true on success and false on failure.
What image depths are used and supported depends on the Windows version.

Type is 0 for a small icon and 1 for a big icon.
See also:

- 193.6.28 SetWindowIconMBS(Type as Integer, Icon as Picture, Mask as Picture) as Boolean 23057

### 193.6.28 SetWindowIconMBS(Type as Integer, Icon as Picture, Mask as Picture) as Boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop only.

**Function:** Sets the window icon using the given picture with mask.
**Example:**

```
dim p as Picture
dim m as Picture

// random colored circle image
p=New Picture(16,16,32)
p.Graphics.ForeColor=&c000000
p.Graphics.FillRect 0,0,16,16
p.Graphics.ForeColor=rgb(rnd*256,rnd*256,rnd*256)
p.Graphics.Filloval 0,0,16,16
```

```
// circle mask
m=New Picture(16,16,32)
m.Graphics.ForeColor=&cFFFFFF // transparent
m.Graphics.Fillrect 0,0,16,16
m.Graphics.ForeColor=&c000000 // color
m.Graphics.Filloval 0,0,16,16

Canvas1.Backdrop=p // show in canvas
Canvas2.Backdrop=m

call window1.SetWindowIconMBS(0,p,m)
```

**Notes:** The mask picture ist converted to black/white.
What image depths are used and supported depends on the Windows version.
Returns true on success and false on failure.

Possible values for type:

| | |
|---|---|
| ICON_BIG = 1 | Set the large icon for the window. |
| ICON_SMALL = 0 | Set the small icon for the window. |

See also:

- 193.6.27 SetWindowIconMBS(Type as Integer, File as FolderItem, IconID as Integer) as Boolean 23057

### 193.6.29 SetWindowMaskMBS(p as picture, redraw as Boolean, transparentColor as color) as Boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the mask of a window.
**Notes:** Redraw decides whether the window is redrawn after it has been changed.
Returns true if successfull.

If you want to do the same on Mac OS X, check the example projects "transparent window" and the Photoshop Splash Screen example.
**Xojo Developer Magazine**

- 2.6, page 49: IRC Bots: Easy! Part II, Part II

### 193.6.30 ShowHideToolbarMBS(animate as boolean, value as boolean)

MBS Util Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** Shows or hides the toolbar.
**Notes:** Only working on MacOS.

### 193.6.31 ShowKeyboardMBS

MBS Win Plugin, Plugin Version: 23.2, Platforms: macOS, Windows, Targets: Desktop only.

**Function:** Shows the keyboard viewer.
**Notes:** On Windows you can trigger this a second time to hide it.

See also ShowCharacterPaletteMBS function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- MBS Xojo Plugins, version 23.2pr1

### 193.6.32 SmoothResizeCenteredMBS(width as Integer,height as Integer)

MBS Util Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the window smoothly to all directions.
**Example:**

```
dim w,h as Integer

// get destination dimension

w=300
h=200

// Resize

window1.SmoothResizeCenteredMBS w,h

// Now resize via RB to make it permament.

width=w
height=h
```

**Notes:** You need to set the new size using Xojo's Windows properties, too. (no longer needed with Xojo) In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr3

### 193.6.33 SmoothResizeMBS(width as Integer,height as Integer)

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Resizes the window smoothly.
**Example:**

```
dim w,h as Integer

// get destination dimension

w=300
h=200

// Resize

window1.SmoothResizeMBS w,h

// Now resize via RB to make it permament.

width=w
height=h
```

**Notes:** You need to set the new size using Xojo's Windows properties, too. (no longer needed with Xojo) In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Works on Cocoa on 10.4 and newer.
**Blog Entries**

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr13

### 193.6.34 ToggleFullScreenMBS as Boolean

MBS Util Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Toggles fullscreen mode for this window.
**Notes:** Returns true on success.
If an application supports fullscreen, it should add a menu item to the View menu with toggleFullScreen as the action.
Available in Mac OS X v10.7 and later.
This method does not much if you don't mark a window to be the primary fullscreen window.
**Blog Entries**

- Lion features for Real Studio
- MBS Real Studio Plugins, version 11.2pr11
- MBS Real Studio Plugins, version 11.2pr9

### 193.6.35 UpdateNowMBS

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Function:** On MacOS all windows are doublebuffered and the OS updates the screen from time to time. This method forces a screen update.
**Example:**

Mainwindow.UpdateNowMBS

**Notes:** Updated for 64-bit in plugin version 18.3.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr3

### 193.6.36 UpdateNowRectMBS(left as Integer, top as Integer, width as Integer, height as Integer)

MBS MacOSX Plugin, Platform: macOS, Targets: Desktop only.

**Function:** On Mac OS all windows are doublebuffered and the OS updates the screen from time to time. This method forces a screen update for a part of your window.
**Example:**

Mainwindow.UpdateNowRectMBS Mainwindow.text.left, Mainwindow.text.top, Mainwindow.text.width, Mainwindow.text.height

**Notes:** Updated for 64-bit in plugin version 18.3.

### 193.6.37 WinAnimateWindowMBS(Flags as Integer, Time as Integer=200) as boolean

MBS Win Plugin, Plugin Version: 9.4, Platform: Windows, Targets: Desktop only.

**Function:** The AnimateWindow function enables you to produce special effects when showing or hiding windows.
**Example:**

```
dim flags as Integer

const AW_SLIDE = &h040000 // Uses slide animation. By default, roll animation is used. This flag is ignored when used with AW_CENTER.
const AW_ACTIVATE = &h020000 // Activates the window. Do not use this value with AW_HIDE.
const AW_BLEND = &h080000 // Uses a fade effect. This flag can be used only if hwnd is a top-level window.
const AW_HIDE = &h010000 //Hides the window. By default, the window is shown.
const AW_CENTER = &h10 // Makes the window appear to collapse inward if AW_HIDE is used or expand outward if the AW_HIDE is not used. The various direction flags have no effect.
const AW_HOR_POSITIVE = 1 // Animates the window from left to right. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_HOR_NEGATIVE = 2 // Animates the window from right to left. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_VER_POSITIVE = 4 // Animates the window from top to bottom. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.
const AW_VER_NEGATIVE = 8 // Animates the window from bottom to top. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND.

window2.hide

flags=BitwiseOr(AW_SLIDE, AW_HOR_POSITIVE)

if window2.WinAnimateWindowMBS(flags, 1000) then
window2.show
else
MsgBox "Animatin failed."
end if
```

**Notes:** There are four types of animation: roll, slide, collapse or expand, and alpha-blended fade.

self: The window to animate. The calling thread must own this window.
Time: Specifies how long it takes to play the animation, in milliseconds. Typically, an animation takes 200 milliseconds to play.
Flags: Specifies the type of animation. This parameter can be one or more of the following values. Note that, by default, these flags take effect when showing a window. To take effect when hiding a window, use AW_HIDE and a bitwiseor operator with the appropriate flags.

| | | |
|---|---|---|
| AW_SLIDE | = &h040000 | Uses slide animation. By default, roll animation is used. This flag is ignored when used with AW_CENTER. |
| AW_ACTIVATE | = &h020000 | Activates the window. Do not use this value with AW_HIDE. |
| AW_BLEND | = &h080000 | Uses a fade effect. This flag can be used only if hwnd is a top-level window. |
| AW_HIDE | = &h010000 | Hides the window. By default, the window is shown. |
| AW_CENTER | = &h10 | Makes the window appear to collapse inward if AW_HIDE is used or expand outward if the AW_HIDE is not used. The various direction flags have no effect. |
| AW_HOR_POSITIVE | = 1 | Animates the window from left to right. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_HOR_NEGATIVE | = 2 | Animates the window from right to left. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_VER_POSITIVE | = 4 | Animates the window from top to bottom. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |
| AW_VER_NEGATIVE | = 8 | Animates the window from bottom to top. This flag can be used with roll or slide animation. It is ignored when used with AW_CENTER or AW_BLEND. |

Return Value:
If the function succeeds, the return value is true.
If the function fails, the return value is false.
The function will fail in the following situations:

- If the window uses the window region. Windows XP: This does not cause the function to fail.
- If the window is already visible and you are trying to show the window.
- If the window is already hidden and you are trying to hide the window.
- If there is no direction specified for the slide or roll animation.
- When trying to animate a child window with AW_BLEND.
- If the thread does not own the window. Note that, in this case, AnimateWindow fails but GetLastError returns ERROR_SUCCESS. To get extended error information, call the GetLastError function.

To show or hide a window without special effects, use Show.
When using slide or roll animation, you must specify the direction. It can be either AW_HOR_POSITIVE, AW_HOR_NEGATIVE, AW_VER_POSITIVE, or AW_VER_NEGATIVE.
You can combine AW_HOR_POSITIVE or AW_HOR_NEGATIVE with AW_VER_POSITIVE or AW_VER_NEGATIVE to animate a window diagonally.
The window procedures for the window and its child windows should handle any WM_PRINT or WM_PRINTCLIENT messages. Dialog boxes, controls, and common controls already handle WM_PRINTCLIENT. The default window procedure already handles WM_PRINT.
If a child window is displayed partially clipped, when it is animated it will have holes where it is clipped.
AnimateWindow supports RTL windows.
Avoid animating a window that has a drop shadow because it produces visually distracting, jerky animations.
**Blog Entries**

- MBS REALbasic plug-ins version 9.4

### 193.6.38 WindowFeedbackSettingMBS(Feedback as Integer, byref value as boolean, IncludeAncestors as Boolean = false) as Boolean

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the feedback configuration for a window.
**Notes:** IncludeAncestors: Specifies that the parent window chain should be checked.

Returns true if the specified feedback setting is configured on the specified window. Otherwise, it returns false (and config won't be modified).

Requires Windows 8 [ desktop apps only ] or Windows Server 2012 [ desktop apps only ] .

| Constant Name | Value | Description |
|---|---|---|
| FEEDBACK_TOUCH_CONTACTVISUALIZATION | 1 | Feedback for a touch contact event. |
| FEEDBACK_PEN_BARRELVISUALIZATION | 2 | Feedback for a pen barrel-button event. |
| FEEDBACK_PEN_TAP | 3 | Feedback for a pen tap event. |
| FEEDBACK_PEN_DOUBLETAP | 4 | Feedback for a pen double-tap event. |
| FEEDBACK_PEN_PRESSANDHOLD | 5 | Feedback for a pen press-and-hold event. |
| FEEDBACK_PEN_RIGHTTAP | 6 | Feedback for a pen right-tap event. |
| FEEDBACK_TOUCH_TAP | 7 | Feedback for a touch tap event. |
| FEEDBACK_TOUCH_DOUBLETAP | 8 | Feedback for a touch double-tap event. |
| FEEDBACK_TOUCH_PRESSANDHOLD | 9 | Feedback for a touch press-and-hold event. |
| FEEDBACK_TOUCH_RIGHTTAP | 10 | Feedback for a touch right-tap event. |
| FEEDBACK_GESTURE_PRESSANDTAP | 11 | Feedback for a press-and-tap gesture. |

**Blog Entries**

- MBS Xojo Plugins, version 17.5pr6

### 193.6.39 WinFlashWindowMBS(Invert as boolean)

MBS Util Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** Flashes Window.
**Example:**

window1.WinFlashWindowMBS true

**Notes:** Flashes the specified window one time. It does not change the active state of the window.

Invert: If this parameter is true, the window is flashed from one state to the other. If it is false, the window is returned to its original state (either active or inactive).

When an application is minimized and this parameter is true, the taskbar window button flashes active/inactive. If it is false, the taskbar window button flashes inactive, meaning that it does not change colors. It

flashes, as if it were being redrawn, but it does not provide the visual invert clue to the user.

Flashing a window means changing the appearance of its caption bar as if the window were changing from inactive to active status, or vice versa. (An inactive caption bar changes to an active caption bar; an active caption bar changes to an inactive caption bar.)
Typically, a window is flashed to inform the user that the window requires attention but that it does not currently have the keyboard focus.
The FlashWindow function flashes the window only once; for repeated flashing, the application should create a system timer.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.2pr2

### 193.6.40 WinHideTooltipMBS as Integer

MBS Win Plugin, Plugin Version: 16.1, Platform: Windows, Targets: Desktop only.

**Function:** Hides all tooltips.
**Notes:** You can call that in window.deactivate event to hide tooltips which did not hide themselves.
Returns number of hidden tooltips.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.1pr4

### 193.6.41 Properties

### 193.6.42 CanBeVisibleWithoutLoginMBS as Boolean

MBS Util Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window can be visible before login.
**Example:**

window1.CanBeVisibleWithoutLoginMBS = true

**Notes:** This window can be made visible prior to user login. By default, in Mac OS X 10.5 and later no windows can be visible before a user logs into the system; this protects the user against certain types of malicious use of insecure applications. However, some software, such as input methods or other accessibility software, may need to deliberately make windows available prior to user login. Such software should add this window attribute to its windows. Available for all windows in Mac OS X 10.5 and later.
(Read and Write computed property)

### 193.6.43 CGColorSpaceMBS as CGColorSpaceMBS

MBS MacCG Plugin, Plugin Version: 10.4, Platform: macOS, Targets: Desktop only.

**Function:** Get or set the colorspace profile for this window.
**Example:**

```
dim c as CGColorSpaceMBS = window1.CGColorSpaceMBS

if c<>Nil then
MsgBox str(c.NumberOfComponents)
else
MsgBox "nil"
end if
```

**Notes:** Requires MacOS 10.6 or newer.

On Cocoa, the NSColorSpace is queried and the matching CGColorspace is returned. For setting a NSColorSpace is created for the given CGColorspace.
In Carbon applications, the CoreGraphics color space is passed directly.
(Read and Write computed property)

### 193.6.44 collapsedMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if this window is collapsed. You can set it.
**Example:**

```
mainwindow.collapsedMBS=false 'show window
```

**Notes:** Collapseable windows are the normal document windows.
You can't collapse dialogs or floating windows well.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.45 FullScreenAuxiliaryMBS as Boolean

MBS Util Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is setup as being the auxiliary fullscreen window.
**Notes:** (Read and Write computed property)

### 193.6.46 FullScreenPrimaryMBS as Boolean

MBS Util Plugin, Plugin Version: 11.2, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is setup as being the primary fullscreen window.
**Notes:** If true, the window receives the fullscreen widget in the title bar.
(Read and Write computed property)

### 193.6.47 HasborderMBS as boolean

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Decides whether the window has a border.
**Example:**

```
mainwindow.HasborderMBS=false ' Remove border
```

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it). This option removes the title bar. HasCaptionMBS removes even more.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.48 HasCaptionMBS as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether the window has a caption (a title bar)
**Example:**

```
Window1.HasCaptionMBS=false
```

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.49 HasCloseBoxMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a CloseBox.
**Example:**

mainwindow.HasCloseboxMBS=false 'remove closebox

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.50 HasCollapseBoxMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a Collapsebox.
**Example:**

mainwindow.HasCollapseBoxMBS=false 'remove Collapsebox

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.51 HasMaximizeBoxMBS as boolean

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has a Maximize Button.
**Example:**

mainwindow.HasMaximizeBoxMBS=false 'remove Maximize button

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.52 HasMinimizeBoxMBS as boolean

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has a Minimize Button.
**Example:**

mainwindow.HasMinimizeBoxMBS=false 'remove Minimize button

**Notes:** This property has only an effect on Windows. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.53 HasNoShadowMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has no shadow.
**Example:**

mainwindow.HasNoShadowMBS=true 'remove shadow

**Notes:** Available for all windows on Mac OS X. This attribute is automatically given to windows of kOverlayWindowClass.

Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.54 HasNoTitleBarMBS as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Deprecated:** This item is deprecated and should no longer be used. You can use NSWindowMBS for Cocoa instead. **Function:** For Document, Floating, and Utility windows, this attribute allows you to hide the title bar of a window.
**Example:**

```
window1.HasNoTitleBarMBS = true

// for Cocoa:
window1.HasCloseBoxMBS = false
window1.HasCollapseBoxMBS = false
window1.IsResizableMBS = false
window1.HasNoTitleBarMBS = true
```

**Notes:** For Mac OS X 10.4 or later.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in Plugin version 10.4.
(Read and Write computed property)

### 193.6.55 HasSystemMenuMBS as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop only.

**Function:** Whether the window has a system menu inside the title bar.
**Example:**

Window1.HasSystemMenuMBS=false

**Notes:** This property has only an effect on Windows. It will disable the system menu and also the minimize, maximize and close buttons. The window needs to be redrawn before the change is visible (for example move it).

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.56 HasToolbarButtonMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has a toolbar button.
**Example:**

mainwindow.HasToolbarButtonMBS=true 'shows Toolbar Button

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
The Button is shown on next redraw of the window frame.

Use the CarbonWindowsEventsMBS class to receive events when the button is pressed.

Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.57 IgnoreClicksMBS as Boolean

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Can be used to control whether mouse clicks are ignored for this window.
**Example:**

Window1.IgnoreClicksMBS=true

**Notes:** Whether this window never receives mouse events, even in areas that are opaque. Instead, clicks on the window will be passed through to windows beneath it. Available for all windows on Mac OS X 10.2 and later.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.58 IsIconicMBS as boolean

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window is inside the taskbar.
**Example:**

```
MsgBox str(window1.IsIconicMBS)
```

**Notes:** If you set IsIconic to true the window is minimized and if you set it to false the window size and position is restored.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.59 IsMetalWindowMBS as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window uses the Metal appearance.
**Example:**

```
if window1.Frame = window.FrameTypeMetal then
MsgBox "Window is metal. "+str(window1.IsMetalWindowMBS)
else
MsgBox "Window is not metal. "+str(window1.IsMetalWindowMBS)
end if
```

**Notes:** Available for document windows on Mac OS X 10.2 and later, and for floating windows on Mac OS

X 10.3 and later. Drawers can also be metal, but dynamically adjust their appearance based on their parent window's appearance; it is not necessary to specify this attribute for a metal drawer.

You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.60 IsResizableMBS as Boolean

MBS Util Plugin, Plugin Version: 7.4, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window is resizeable.
**Example:**

Window1.IsResizableMBS=false

**Notes:** You can read the state on Mac Classic, but you can only change it on Mac Carbon.
Returns false on any error.

Use GrowBoxTransparentMBS on Composite Mac OS windows to enable the transparent grow box.

In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Works in Cocoa.
(Read and Write computed property)

### 193.6.61 IsZoomedMacMBS as boolean

MBS Util Plugin, Plugin Version: 3.2, Platform: macOS, Targets: Desktop only.

**Function:** Returns true if the window is zoomed.
**Example:**

MsgBox str(window1.IsZoomedMacMBS)

**Notes:** Requires Mac OS 8.5 or newer.

Seems not to work correctly on RB 5.5.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.62 IsZoomedMBS as boolean

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** Returns true if this window has been maximized.
**Example:**

MsgBox str(window1.IsZoomedMBS)

**Notes:** If you set IsZoomed to true the window is maximized and if you set it to false the window size and position is restored.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Works on Cocoa.
(Read and Write computed property)

### 193.6.63 ModifiedMBS as boolean

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** You can set or get the value of the modified state.
**Example:**

mainwindow.modifiedMBS=true

**Notes:** Requires Mac OS 8.5 or newer.
As long as you don't set modified to false the window keeps to tell you that it's modified. Not sure why, so just set modified to false early in creating the window.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.64 ToolbarVisibleMBS as boolean

MBS Util Plugin, Plugin Version: 4.0, Platform: macOS, Targets: Desktop only.

**Function:** Whether the toolbar is shown in this window or not.
**Notes:** Value is false on any error.
Only working on MacOS.
(Read and Write computed property)

### 193.6.65 TransparencyMBS as single

MBS Util Plugin, Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The transparency of the window on Mac OS X, Windows 2000 and Windows XP.
**Notes:** 1 for opaque, 0 for invisible.
Return 1 on any error. On Windows it returns always 1 as the current transparency value can't be queried.
You need to call MakeTransparent before to install transparency.
(added Windows support in version 4.4)
Linux supported added with 14.0, but works only with Linux desktop which support alpha channel.
(Read and Write computed property)

### 193.6.66 UnifiedTitleAndToolbarMBS as Boolean

MBS Util Plugin, Plugin Version: 8.1, Platform: macOS, Targets: Desktop only.

**Function:** Whether this window has an unified title and toolbar look.
**Example:**

window1.UnifiedTitleAndToolbarMBS = true

**Notes:** This window draws its window title and toolbar using a unified appearance that has no separator between the two areas. A window may not have both UnifiedTitleAndToolbar and Metal appearance. If a window already has the metal attribute, attempting to set the Unified attribute will cause ChangeWindows to return an error, and vice versa. This constant was not added to this header file until Mac OS X 10.5, but it is actually available at runtime on Mac OS X 10.4 and later for windows of kDocumentWindowClass. However, on Mac OS X 10.5 and later, kHIWindowBitUnifiedTitleAndToolbar no longer has any effect, since all windows with toolbars now have a unified look.
(Read and Write computed property)

### 193.6.67 WindowProxyIconFileMBS as folderitem

MBS Util Plugin, Platform: macOS, Targets: Desktop only.

**Function:** That's the icon to the window which belongs to the file.
**Example:**

```
dim f as folderItem

f=getopenFolderItem("special/any")
if f<>nil then
window1.WindowProxyIconFileMBS=f
end if
```

**Notes:** Requires Mac OS 8.5 or newer.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.

Added Cocoa support in plugin version 10.0.
(Read and Write computed property)

### 193.6.68 WinMenuHandleMBS as Integer

MBS Util Plugin, Platform: Windows, Targets: Desktop only.

**Function:** A property to access the handle used for the menu of a Window.
**Example:**

```
dim menu as Integer // global

if menu=0 then
menu=Window1.WinMenuHandleMBS // read it on the first window
else
Window1.winmenuHandleMBS=menu // set it on the second window
end if
```

**Notes:** Used in the example "Menu in every Window" to have a menubar in every window on Windows. But never forget to quit your app after all windows were closed.
In Xojo 2005 and newer you need to use self. in front of the method as the propertyname alone is not accepted.
(Read and Write computed property)

### 193.6.69 WinTopMostWindowMBS as boolean

MBS Win Plugin, Plugin Version: 9.6, Platform: Windows, Targets: Desktop only.

**Function:** Whether a window is staying on the top of the other windows.

**Example:**

window1.WinTopMostWindowMBS=true

**Notes:** If true the window stays in front of other windows. Default is false for Xojo windows and true for overlays.
(Read and Write computed property)

# Chapter 194

# Windows

## 194.1 control DesktopWinPreviewControlMBS

### 194.1.1 control DesktopWinPreviewControlMBS

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The preview control for Windows.
**Notes:** Used to show PDF documents on Windows using the built-in preview handler on Windows 10 and newer.
Can also be used to use other built-in preview handlers on Windows by setting classID.

Since the control is handled by Windows, the key and mouse events are not expected to work.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- PDF Viewer controls for iOS
- PDF Viewer control for Windows
- MBS Xojo Plugins, version 23.3pr2

**Xojo Developer Magazine**

- 21.5, page 10: News

### 194.1.2 Methods

### 194.1.3 LoadData(data as MemoryBlock)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.
See also:

- 194.1.4 LoadData(data as string) 23080

### 194.1.4 LoadData(data as string)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.
See also:

- 194.1.3 LoadData(data as MemoryBlock) 23080

### 194.1.5 LoadFile(file as folderitem)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given file.
**Notes:** Lasterror is set.
If the preview handler does not support reading file, the plugin reads the file and passes as data.

If the file path is invalid, the preview will show a file not found error message.

### 194.1.6 Properties

### 194.1.7 classID as String

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The class ID for the previewer to use.
**Notes:** If empty, uses PDF viewer.
Available preview classes in a typical Windows 10 installation:

| Class ID | Description |
|---|---|
| { 13D3C4B8-B179-4ebb-BF62-F704173E7448 } | Windows Contact Preview Handler |
| { 1531d583-8375-4d3f-b5fb-d23bbd169f22 } | Windows TXT Previewer |
| { 53BEDF0B-4E5B-4183-8DC9-B844344FA104 } | Microsoft Windows MAPI Preview Handler |
| { 8a7cae0e-5951-49cb-bf20-ab3fa1e44b01 } | Windows Font previewer |
| { 92dbad9f-5025-49b0-9078-2d78f935e341 } | Microsoft Windows Mail Mime Preview Handler |
| { a42c2ccb-67d3-46fa-abe6-7d2f3488c7a3 } | Windows RTF Previewer |
| { b9815375-5d7f-4ce2-9245-c9d4da436930 } | Microsoft Windows Mail Mime Preview Handler |
| { BFD468D2-D0A0-4bdc-878C-E69C2F5B435D } | Microsoft Windows Mail Html Preview Handler |
| { E64164EB-1AE0-4C50-BAEF-A413C2B3A4BC } | Microsoft 3MF Shell Thumbnail and Preview Handler |
| { f8b8412b-dea3-4130-b36c-5e8be73106ac } | Microsoft Windows Mail Html Preview Handler |
| { 3A84F9C2-6164-485C-A7D9-4B27F8AC009E } | Microsoft PDF Previewer |
| { DC6EFB56-9CFA-464D-8880-44885D7DC193 } | Adobe PDF Preview Handler for Vista |

(Read and Write property)

### 194.1.8 Lasterror as Integer

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 194.1.9 LasterrorString as String

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The error message for the error number in the lasterror property.
**Notes:** (Read only property)

### 194.1.10 Events

### 194.1.11 Closing

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The close event.
In older Xojo versions, this event is named Close.

### 194.1.12 Configure

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** The event called while initializing, where you can apply properties just before plugin reads them.
**Notes:** e.g. set classID here in code.

### 194.1.13 ConstructContextualMenu(base as DesktopMenuItem, x as Integer, y as Integer) As Boolean

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 194.1.14 ContextualMenuItemSelected(selectedItem As DesktopMenuItem) As Boolean

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 194.1.15 FocusLost

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The lost focus event.
In older Xojo versions, this event is named LostFocus.

### 194.1.16 FocusReceived

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The got focus event.
In older Xojo versions, this event is named GotFocus.

### 194.1.17 MenuBarSelected

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The enable menu items event.
In older Xojo versions, this event is named EnableMenuItems.

### 194.1.18 Opening

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The open event.
In older Xojo versions, this event is named Open.

## 194.2 class DirectDrawGraphicsMBS

### 194.2.1 class DirectDrawGraphicsMBS

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for drawing with DirectDraw 2D into a graphics context in Xojo.
**Example:**

```
dim p as Picture = BitmapForCaching(me.Width, me.Height)
dim g as graphics = p.Graphics

// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

// now draw a few things
dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
call d.CreateStrokeStyle 0, 0, 0, 0, 0, d.DashStyleDash

const size = 50
const offset = 10
const delta = offset + size

d.FillRectangle offset + delta * 0, offset + 0 * delta, offset + delta * 0 + size, offset + 0 * delta +
size
d.DrawRectangle offset + delta * 0, offset + 1 * delta, offset + delta * 0 + size, offset + 1 * delta + size

d.FillEllipse offset + delta * 1 + size/2, offset + 0 * delta + size/2, size /2, size /2
d.DrawEllipse offset + delta * 1 + size/2, offset + 1 * delta + size/2, size /2, size /2

d.FillRoundedRectangle offset + delta * 2, offset + 0 * delta, offset + delta * 2 + size, offset + 0 *
delta + size, 20, 20
d.DrawRoundedRectangle offset + delta * 2, offset + 1 * delta, offset + delta * 2 + size, offset + 1 * delta
+ size, 20, 20

// save to desktop
dim f as FolderItem = SpecialFolder.Desktop.Child("directdraw.jpg")
p.Save(f, Picture.Formats.JPEG, picture.QualityMaximum)

// show in window
window1.Backdrop = p
```

**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Drawing with DirectDraw in Xojo
- MBS Xojo Plugins, version 20.3pr3

### 194.2.2 Methods

### 194.2.3 ClearStrokeStyle

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Clears stroke style.
**Notes:** If no stroke style is defined, a default one is used.

### 194.2.4 Constructor(Graphics as Graphics)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
d.DrawLine 10, 10, 190,190

Backdrop = p
```

**Notes:** Pass the graphics in a paint event or from a picture.

Requires Xojo 2019r2 or newer.

### 194.2.5 CreateSolidColorBrush(c as Color) as Boolean

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new solid color brush that has the specified color and a base opacity of 1.0.
**Example:**

```
dim d as new DirectDrawGraphicsMBS(g)

// make full blue with no alpha
call d.CreateSolidColorBrush(&c0000FFFF)
```

**Notes:** Pass the red, green, blue, and alpha values of the brush's color as a Xojo color.
See also:

- 194.2.6 CreateSolidColorBrush(red as Single, green as Single, blue as Single, alpha as Single = 1.0) as Boolean 23086

### 194.2.6 CreateSolidColorBrush(red as Single, green as Single, blue as Single, alpha as Single = 1.0) as Boolean

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new solid color brush that has the specified color and a base opacity of 1.0.
**Notes:** Pass the red, green, blue, and alpha values of the brush's color.
Range of values is from 0.0 to 1.0.
See also:

- 194.2.5 CreateSolidColorBrush(c as Color) as Boolean 23086

### 194.2.7 CreateStrokeStyle(startCap as Integer = 0, endCap as Integer = 0, dashCap as Integer = 0, lineJoin as Integer = 0, miterLimit as Single = 1.0, dashStyle as Integer = 0, dashOffset as Single = 0, Dashes() as Single = nil) as Boolean

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates an stroke style that describes start cap, dash pattern, and other features of a stroke.
**Notes:** Creates and sets the stroke style. Returns true on success and false on failure.

### 194.2.8 Destructor

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

| | |
|---|---|
| startCap | The cap applied to the start of all the open figures in a stroked geometry. |
| endCap | The cap applied to the end of all the open figures in a stroked geometry. |
| dashCap | The shape at either end of each dash segment. |
| lineJoin | A value that describes how segments are joined. This value is ignored for a vertex if the segment flags specify that the segment should have a smooth join. |
| miterLimit | The limit of the thickness of the join on a mitered corner. This value is always treated as though it is greater than or equal to 1.0. |
| dashStyle | A value that specifies whether the stroke has a dash pattern and, if so, the dash style. |
| dashOffset | A value that specifies an offset in the dash sequence. A positive dash offset value shifts the dash pattern, in units of stroke width, toward the start of the stroked geometry. A negative dash offset value shifts the dash pattern, in units of stroke width, toward the end of the stroked geometry. |
| Dashes | An array whose elements are set to the length of each dash and space in the dash pattern. The first element sets the length of a dash, the second element sets the length of a space, the third element sets the length of a dash, and so on. The length of each dash and space in the dash pattern is the product of the element value in the array and the stroke width. |

**Function:** The destructor.

### 194.2.9 DrawEllipse(x as single, y as single, radiusX as single, radiusY as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Draws the outline of the specified ellipse using the specified stroke style.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
call d.CreateStrokeStyle 0, 0, 0, 0, 0, d.DashStyleDash
d.DrawEllipse 100, 100, 90, 90

Backdrop = p
```

**Notes:** x/y: The position of the ellipse to draw, in device-independent pixels.
radiusX/radiusY: The radius of the ellipse to draw, in device-independent pixels.

Uses current brush, strokeWidth and strokeStyle.

### 194.2.10 DrawLine(x1 as single, y1 as single, x2 as single, y2 as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Draws a line between the specified points using the specified stroke style.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
d.DrawLine 10, 10, 190,190

Backdrop = p
```

**Notes:** x1/y1: The start point of the line, in device-independent pixels.
x2/y2: The end point of the line, in device-independent pixels.

Uses current brush, strokeWidth and strokeStyle.

### 194.2.11 DrawRectangle(left as single, top as single, right as single, bottom as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Draws the outline of a rectangle that has the specified dimensions and stroke style.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
```

```
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
call d.CreateStrokeStyle 0, 0, 0, 0, 0, d.DashStyleDash
d.DrawRectangle 10, 10, 190, 190

Backdrop = p
```

**Notes:** Pass the dimensions of the rectangle to draw, in device-independent pixels.

Uses current brush, strokeWidth and strokeStyle.

### 194.2.12 DrawRoundedRectangle(left as single, top as single, right as single, bottom as single, radiusX as single, radiusY as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Draws the outline of the specified rounded rectangle using the specified stroke style.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)
call d.CreateStrokeStyle 0, 0, 0, 0, 0, d.DashStyleDash
d.DrawRoundedRectangle 10, 10, 190, 190, 20, 20

Backdrop = p
```

**Notes:** Pass the dimensions of the rounded rectangle to draw, in device-independent pixels.

Uses current brush, strokeWidth and strokeStyle.

### 194.2.13 FillEllipse(x as single, y as single, radiusX as single, radiusY as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Paints the interior of the specified ellipse.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)

d.FillEllipse 100, 100, 90, 90

Backdrop = p
```

**Notes:** The position and radius, in device-independent pixels, of the ellipse to paint.
Uses current brush.

### 194.2.14 FillRectangle(left as single, top as single, right as single, bottom as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Paints the interior of the specified rectangle.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)

d.FillRectangle 10, 10, 190, 190

Backdrop = p
```

**Notes:** The dimension of the rectangle to paint, in device-independent pixels.
Uses current brush.

### 194.2.15 FillRoundedRectangle(left as single, top as single, right as single, bottom as single, radiusX as single, radiusY as single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Paints the interior of the specified rounded rectangle.
**Example:**

```
dim p as new Picture(200,200)
dim g as Graphics = p.Graphics
// Clear image with white
g.DrawingColor = &cFFFFFF
g.FillRectangle 0, 0, g.Width, g.Height

dim d as new DirectDrawGraphicsMBS(g)

call d.CreateSolidColorBrush(&cFF0000)

d.FillRoundedRectangle 10, 10, 190, 190, 20, 20

Backdrop = p
```

**Notes:** The dimensions of the rounded rectangle to paint, in device independent pixels.
Uses current brush.

### 194.2.16 GetTransform(byref m11 as Single, byref m12 as Single, byref m21 as Single, byref m22 as Single, byref dx as Single, byref dy as Single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the current transform of the render target.

### 194.2.17 RestoreDrawingState

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Restores the current drawing state.

**Notes:** Our plugin manages the stack of drawing states saved.
We raise an exception if your calls to restore are not balanced with save.

### 194.2.18 SaveDrawingState

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Saves the current drawing state.
**Notes:** Our plugin manages the stack of drawing states saved, so you can restore them later.

### 194.2.19 SetTransform(m11 as Single, m12 as Single, m21 as Single, m22 as Single, dx as Single, dy as Single)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Applies the specified transform to the render target, replacing the existing transformation.
**Notes:** All subsequent drawing operations occur in the transformed space.

### 194.2.20 Properties

### 194.2.21 AntialiasMode as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The antialiasing mode of the render target.
**Notes:** The antialiasing mode applies to all subsequent drawing operations, excluding text and glyph drawing operations.
To specify the antialiasing mode for text and glyph operations, use the SetTextAntialiasMode method.
(Read and Write property)

### 194.2.22 brushHandle as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference for current brush.
**Notes:** Reference to ID2D1Brush object.
(Read and Write property)

### 194.2.23 DPIX as Single

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Return the render target's dots per inch (DPI).
**Notes:** The horizontal DPI of the render target.
(Read only property)

### 194.2.24 DPIY as Single

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Return the render target's dots per inch (DPI).
**Notes:** The vertical DPI of the render target.
(Read only property)

### 194.2.25 factoryHandle as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference for the factory.
**Notes:** Reference to ID2D1Factory object.
(Read and Write property)

### 194.2.26 Handle as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** Reference to ID2D1RenderTarget object.
(Read and Write property)

### 194.2.27 Height as Single

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the render target in device-independent pixels.
**Notes:** (Read only property)

### 194.2.28 PixelHeight as UInt32

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the render target in device pixels.
**Notes:** (Read only property)

### 194.2.29 PixelWidth as UInt32

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the render target in device pixels.
**Notes:** (Read only property)

### 194.2.30 strokeStyleHandle as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference for current stroke style.
**Notes:** Reference to ID2D1StrokeStyle object.
(Read and Write property)

### 194.2.31 strokeWidth as Single

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The stroke width to use.
**Notes:** Default is 1.

The width of the stroke, in device-independent pixels. The value must be greater than or equal to 0.0. If this parameter isn't specified, it defaults to 1.0. The stroke is centered on the line.
(Read and Write property)

### 194.2.32 TextAntialiasMode as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the antialiasing mode to use for subsequent text and glyph drawing operations.
**Notes:** The antialiasing mode to use for subsequent text and glyph drawing operations.
(Read and Write property)

### 194.2.33 Width as Single

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the render target in device-independent pixels.
**Notes:** (Read only property)

### 194.2.34 Constants

Anti Alias Modes

| Constant | Value | Description |
|---|---|---|
| AntiAliasModeAliased | 1 | Objects are aliased in most cases. Objects are antialiased only when they are drawn to a render target created by the CreateDxgiSurfaceRenderTarget method and Direct3D multisampling has been enabled on the backing DirectX Graphics Infrastructure (DXGI) surface. |
| AntiAliasModePerPrimitive | 0 | Edges are antialiased using the Direct2D per-primitive method of high-quality antialiasing. |

Cap Styles

| Constant | Value | Description |
|---|---|---|
| CapStyleFlat | 0 | A cap that does not extend past the last point of the line. Comparable to cap used for objects other than lines. |
| CapStyleRound | 0 | A semicircle that has a diameter equal to the line thickness. |
| CapStyleSquare | 0 | Half of a square that has a length equal to the line thickness. |
| CapStyleTriangle | 0 | An isosceles right triangle whose hypotenuse is equal in length to the thickness of the line. |

Dash Styles

| Constant | Value | Description |
|---|---|---|
| DashStyleCustom | 5 | The dash pattern is specified by an array of floating-point values. |
| DashStyleDash | 1 | A dash followed by a gap of equal length. The dash and the gap are each twice as long as the stroke thickness. The equivalent dash array for D2D1_DASH_STYLE_DASH is { 2, 2 } . |
| DashStyleDashDot | 3 | A dash, followed by a gap, followed by a dot, followed by another gap. The equivalent dash array for D2D1_DASH_STYLE_DASH_DOT is { 2, 2, 0, 2 } . |
| DashStyleDashDotDot | 4 | A dash, followed by a gap, followed by a dot, followed by another gap, followed by another dot, followed by another gap. The equivalent dash array for D2D1_DASH_STYLE_DASH_DOT_DOT is { 2, 2, 0, 2, 0, 2 } . |
| DashStyleDot | 2 | A dot followed by a longer gap. The equivalent dash array for D2D1_DASH_STYLE_DOT is { 0, 2 } . |
| DashStyleSolid | 0 | A solid line with no breaks. |

Line Join

| Constant | Value | Description |
|---|---|---|
| LineJoinBevel | 1 | Beveled vertices. |
| LineJoinMiter | 0 | Regular angular vertices. |
| LineJoinMiterOrBevel | 3 | Regular angular vertices unless the join would extend beyond the miter limit; otherwise, beveled vertices. |
| LineJoinRound | 2 | Rounded vertices. |

Text Anti Alias Modes

| Constant | Value | Description |
|---|---|---|
| TextAntiAliasModeAliased | 1 | Do not use antialiasing. |
| TextAntiAliasModeClearType | 1 | Use ClearType antialiasing. |
| TextAntiAliasModeDefault | 0 | Use the system default. See Remarks. |
| TextAntiAliasModeGrayscale | 1 | Use grayscale antialiasing. |

## 194.3 class MapiFileMBS

### 194.3.1 class MapiFileMBS

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class contain information about a file containing a message attachment stored as a temporary file.
**Example:**

```
dim file as new MapiFileMBS
dim t as TextOutputStream
dim f as FolderItem

// write a temp file
f=SpecialFolder.Desktop.Child("test.txt")
t=TextOutputStream.Create(f)
t.WriteLine "Test file content"
t.Close

// create file
file=new MapiFileMBS
file.Path=f
file.Filename="test file"
file.Position=-1

// next add it to message
```

**Notes:** Important:
Simple MAPI is not installed by Exchange Server 2003 or later. However, Simple MAPI is supported for use with Exchange 2003. To function properly, the underlying Exchange or Microsoft Outlook®MAPI subsystem must be properly installed on the client computer.

### 194.3.2 Properties

### 194.3.3 Filename as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The attachment filename seen by the recipient, which may differ from the filename in the PathName member if temporary files are being used.
**Notes:** If the FileName member is empty, the filename from PathName is used.
(Read and Write property)

### 194.3.4 Flags as Integer

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The flags.
**Notes:** Currently not used with the plugin.
(Read and Write property)

### 194.3.5 Path as FolderItem

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The path of the attached file.
**Notes:** When this property is set the PathName property is filled with the absolute path. If you query this property, you get the PathName property as a folderitem.
So this property was made for your convenience.
(Read and Write property)

### 194.3.6 PathName as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The fully qualified path of the attached file.
**Notes:** This path should include the disk drive letter and directory name.
(Read and Write property)

### 194.3.7 Position as Integer

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An integer used to indicate where in the message text to render the attachment.
**Notes:** Attachments replace the character found at a certain position in the message text. That is, attachments replace the character in the MapiMessage NoteText property at offset nPosition (nPosition is zero based!). A value of -1 means the attachment position is not indicated; the client application will have to provide a way for the user to access the attachment.
(Read and Write property)

## 194.4 class MapiMessageMBS

### 194.4.1 class MapiMessageMBS

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a message.
**Example:**

```
dim m as new MapiMessageMBS
dim r as new MapiRecipientMBS
dim o as new MapiRecipientMBS

o.Address="SMTP:sender@example.com"
o.Name="Me"
o.Type=o.TypeOriginator

r.Address="SMTP:receiver@example.com"
r.Name="You"
r.Type=o.TypeTo

m.AddRecipient r
m.Originator=o
m.Subject="Test Email"
m.NoteText="Hello World"
m.Flags=0

dim SendFlags as integer = m.kSendFlagDialog + m.kSendFlagLogonDialog

title=str(m.SendMail(self, SendFlags, false))
```

**Blog Entries**

- MBS Xojo Plugins, version 18.5pr6
- Problems with killing Xojo threads with plugin calls.
- MBS Xojo / Real Studio Plugins, version 15.1pr1

### 194.4.2 Methods

### 194.4.3 AddFile(file as MapiFileMBS)

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a file to the message file list.
**Notes:** file must be not nil.

### 194.4.4 AddRecipient(recipient as MapiRecipientMBS)

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a recipient to the message.
**Notes:** recipient must be nil.

### 194.4.5 IsAvailable as boolean

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether MAPI is available.
**Notes:** Checks whether the library was loaded and whether the MAPI Registry key exists, so this has been initialized.
(mail account may not exist)

Returns true if MAPI can be used.

### 194.4.6 IsUnicodeAvailable as boolean

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether MAPI is available with unicode.
**Notes:** Checks whether the library was loaded and whether the MAPI Registry key exists, so this has been initialized.
(mail account may not exist)

Returns true if MAPI can be used with unicode.

### 194.4.7 SendMail(parent as DesktopWindow, SendFlags as Integer, Threaded as Boolean) as integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Sends an email.
**Notes:** Parameters:

parent:

The parent window for the dialogs used. If not nil the dialogs used will be modal.

SendFlags: Send flags. Default in older plugin versions was kSendFlagDialog when DisplayDialog parameter is true and kSendFlagLogonDialog if DisplayLogonDialog parameter was true.

Error codes:

| | |
|---|---|
| const SUCCESS_SUCCESS = 0 | No error. |
| const MAPI_USER_ABORT = 1 | The user canceled one of the dialog boxes. No message was sent. |
| const MAPI_E_FAILURE = 2 | One or more unspecified errors occurred. No message was sent. |
| const MAPI_E_LOGON_FAILURE = 3 | There was no default logon, and the user failed to log on successfully when the logon dialog box was displayed. No message was sent. |
| const MAPI_E_DISK_FULL = 4 | |
| const MAPI_E_INSUFFICIENT_MEMORY = 5 | There was insufficient memory to proceed. No message was sent. |
| const MAPI_E_ACCESS_DENIED = 6 | |
| const MAPI_E_TOO_MANY_SESSIONS = 8 | |
| const MAPI_E_TOO_MANY_FILES = 9 | There were too many file attachments. No message was sent. |
| const MAPI_E_TOO_MANY_RECIPIENTS = 10 | There were too many recipients. No message was sent. |
| const MAPI_E_ATTACHMENT_NOT_FOUND = 11 | The specified attachment was not found. No message was sent. |
| const MAPI_E_ATTACHMENT_OPEN_FAILURE = 12 | The specified attachment could not be opened. No message was sent. |
| const MAPI_E_ATTACHMENT_WRITE_FAILURE = 13 | |
| const MAPI_E_UNKNOWN_RECIPIENT = 14 | |
| const MAPI_E_BAD_RECIPTYPE = 15 | The type of a recipient was not TypeTO, TypeCC, or TypeBCC. No message was sent. |
| const MAPI_E_NO_MESSAGES = 16 | |
| const MAPI_E_INVALID_MESSAGE = 17 | |
| const MAPI_E_TEXT_TOO_LARGE = 18 | The text in the message was too large. No message was sent. |
| const MAPI_E_INVALID_SESSION = 19 | |
| const MAPI_E_TYPE_NOT_SUPPORTED = 20 | |
| const MAPI_E_AMBIGUOUS_RECIPIENT = 21 | A recipient matched more than one of the recipient descriptor structures and Dialog is false. No message was sent. |
| const MAPI_E_MESSAGE_IN_USE = 22 | |
| const MAPI_E_NETWORK_FAILURE = 23 | |
| const MAPI_E_INVALID_EDITFIELDS = 24 | |
| const MAPI_E_INVALID_RECIPS = 25 | One or more recipients were invalid or did not resolve to any address. |
| const MAPI_E_NOT_SUPPORTED = 26 | |

The MAPI SendMail function sends a standard message, with or without any user interaction. The profile must be configured so that MAPISendMail can open the default service providers without requiring user interaction.

Client applications can provide a full or partial list of recipient names, subject text, file attachments, or message text. If any information is missing, MAPISendMail can prompt the user for it. If no information is missing, either the message can be sent as is or the user can be prompted to verify the information, changing values if necessary.

A successful return from MAPISendMail does not necessarily imply recipient validation. The message might not have been sent to all recipients. Depending on the transport provider, recipient validation can be a lengthy process.

A "" value for the Subject indicates that there is no text for the subject of the message. A "" value for the

NoteText member indicates that there is no message text. Some client applications can truncate subject lines that are too long or contain carriage returns, line feeds, or form feeds.

Each paragraph should be terminated with a CR (0x0d), an LF (0x0a), or a CRLF pair (0x0d0a). MAPISendMail wraps lines as appropriate. If the text exceeds system limits, the function returns the MAPI_E_TEXT_TOO_LARGE value.

The MessageType property is used only by non-IPM applications. Applications that handle IPM messages can set it to "".

The number of attachments per message can be limited in some messaging systems. If the limit is exceeded, the MAPI_E_TOO_MANY_FILES value is returned. File attachments are copied to the message before MAPISendMail returns; therefore, later changes to the files do not affect the contents of the message. The files must be closed when they are copied. Do not attempt to display attachments outside the range of the message text.

Some messaging systems can limit the number of recipients per message. If the client application passes a non-nil value indicating a number of recipients exceeding the system limit, MAPISendMail returns the MAPI_E_TOO_MANY_RECIPIENTS value. If the recipient array is empty, the Dialog parameter must be true in the call to MAPISendMail.

Note that the recipients can include either an entry identifier, the recipient's name, an address, or a name and address pair. The following table shows how MAPISendMail handles the variety of information that can be specified:

| Information | Action |
|---|---|
| entry identifier | No name resolution; the name and address are ignored. |
| name | Name resolved using the Simple MAPI resolution rules. |
| address | No name resolution; address is used for both message delivery and for displaying the recipient name. |
| name and address | No name resolution; name used only for displaying the recipient name. |

Client applications that send messages to custom recipients can avoid name resolution. Such clients should set the Address member of the recipient to the custom address.

MAPISendMail does not require an originator-type recipient to send a message.

Important Simple MAPI is not installed by Exchange Server 2003 or later. However, Simple MAPI is supported for use with Exchange 2003. To function properly, the underlying Exchange or Microsoft Outlook®MAPI subsystem must be properly installed on the client computer.
See also:

- 194.4.8 SendMail(parent as window, SendFlags as Integer, Threaded as Boolean) as integer 23103
- 194.4.9 SendMail(SendFlags as Integer, Threaded as Boolean) as integer 23105


### 194.4.8 SendMail(parent as window, SendFlags as Integer, Threaded as Boolean) as integer

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop only.

**Function:** Sends an email.
**Notes:** Parameters:

parent:
The parent window for the dialogs used. If not nil the dialogs used will be modal.

SendFlags: Send flags. Default in older plugin versions was kSendFlagDialog when DisplayDialog parameter is true and kSendFlagLogonDialog if DisplayLogonDialog parameter was true.

Error codes:

| | |
|---|---|
| const SUCCESS_SUCCESS = 0 | No error. |
| const MAPI_USER_ABORT = 1 | The user canceled one of the dialog boxes. No message was sent. |
| const MAPI_E_FAILURE = 2 | One or more unspecified errors occurred. No message was sent. |
| const MAPI_E_LOGON_FAILURE = 3 | There was no default logon, and the user failed to log on successfully when the logon dialog box was displayed. No message was sent. |
| const MAPI_E_DISK_FULL = 4 | |
| const MAPI_E_INSUFFICIENT_MEMORY = 5 | There was insufficient memory to proceed. No message was sent. |
| const MAPI_E_ACCESS_DENIED = 6 | |
| const MAPI_E_TOO_MANY_SESSIONS = 8 | |
| const MAPI_E_TOO_MANY_FILES = 9 | There were too many file attachments. No message was sent. |
| const MAPI_E_TOO_MANY_RECIPIENTS = 10 | There were too many recipients. No message was sent. |
| const MAPI_E_ATTACHMENT_NOT_FOUND = 11 | The specified attachment was not found. No message was sent. |
| const MAPI_E_ATTACHMENT_OPEN_FAILURE = 12 | The specified attachment could not be opened. No message was sent. |
| const MAPI_E_ATTACHMENT_WRITE_FAILURE = 13 | |
| const MAPI_E_UNKNOWN_RECIPIENT = 14 | |
| const MAPI_E_BAD_RECIPTYPE = 15 | The type of a recipient was not TypeTO, TypeCC, or TypeBCC. No message was sent. |
| const MAPI_E_NO_MESSAGES = 16 | |
| const MAPI_E_INVALID_MESSAGE = 17 | |
| const MAPI_E_TEXT_TOO_LARGE = 18 | The text in the message was too large. No message was sent. |
| const MAPI_E_INVALID_SESSION = 19 | |
| const MAPI_E_TYPE_NOT_SUPPORTED = 20 | |
| const MAPI_E_AMBIGUOUS_RECIPIENT = 21 | A recipient matched more than one of the recipient descriptor structures and Dialog is false. No message was sent. |
| const MAPI_E_MESSAGE_IN_USE = 22 | |
| const MAPI_E_NETWORK_FAILURE = 23 | |
| const MAPI_E_INVALID_EDITFIELDS = 24 | |
| const MAPI_E_INVALID_RECIPS = 25 | One or more recipients were invalid or did not resolve to any address. |
| const MAPI_E_NOT_SUPPORTED = 26 | |

The MAPI SendMail function sends a standard message, with or without any user interaction. The profile must be configured so that MAPISendMail can open the default service providers without requiring user

interaction.

Client applications can provide a full or partial list of recipient names, subject text, file attachments, or message text. If any information is missing, MAPISendMail can prompt the user for it. If no information is missing, either the message can be sent as is or the user can be prompted to verify the information, changing values if necessary.

A successful return from MAPISendMail does not necessarily imply recipient validation. The message might not have been sent to all recipients. Depending on the transport provider, recipient validation can be a lengthy process.

A "" value for the Subject indicates that there is no text for the subject of the message. A "" value for the NoteText member indicates that there is no message text. Some client applications can truncate subject lines that are too long or contain carriage returns, line feeds, or form feeds.

Each paragraph should be terminated with a CR (0x0d), an LF (0x0a), or a CRLF pair (0x0d0a). MAPISendMail wraps lines as appropriate. If the text exceeds system limits, the function returns the MAPI_E_TEXT_TOO_LARGE value.

The MessageType property is used only by non-IPM applications. Applications that handle IPM messages can set it to "".

The number of attachments per message can be limited in some messaging systems. If the limit is exceeded, the MAPI_E_TOO_MANY_FILES value is returned. File attachments are copied to the message before MAPISendMail returns; therefore, later changes to the files do not affect the contents of the message. The files must be closed when they are copied. Do not attempt to display attachments outside the range of the message text.

Some messaging systems can limit the number of recipients per message. If the client application passes a non-nil value indicating a number of recipients exceeding the system limit, MAPISendMail returns the MAPI_E_TOO_MANY_RECIPIENTS value. If the recipient array is empty, the Dialog parameter must be true in the call to MAPISendMail.

Note that the recipients can include either an entry identifier, the recipient's name, an address, or a name and address pair. The following table shows how MAPISendMail handles the variety of information that can be specified:

Client applications that send messages to custom recipients can avoid name resolution. Such clients should set the Address member of the recipient to the custom address.

MAPISendMail does not require an originator-type recipient to send a message.

| Information | Action |
|---|---|
| entry identifier | No name resolution; the name and address are ignored. |
| name | Name resolved using the Simple MAPI resolution rules. |
| address | No name resolution; address is used for both message delivery and for displaying the recipient name. |
| name and address | No name resolution; name used only for displaying the recipient name. |

Important Simple MAPI is not installed by Exchange Server 2003 or later. However, Simple MAPI is supported for use with Exchange 2003. To function properly, the underlying Exchange or Microsoft Outlook®MAPI subsystem must be properly installed on the client computer.
See also:

- 194.4.7 SendMail(parent as DesktopWindow, SendFlags as Integer, Threaded as Boolean) as integer 23100
- 194.4.9 SendMail(SendFlags as Integer, Threaded as Boolean) as integer 23105

### 194.4.9 SendMail(SendFlags as Integer, Threaded as Boolean) as integer

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sends an email.
**Notes:** This method is without parent window for dialogs, so you can use it in a console project.
See also:

- 194.4.7 SendMail(parent as DesktopWindow, SendFlags as Integer, Threaded as Boolean) as integer 23100
- 194.4.8 SendMail(parent as window, SendFlags as Integer, Threaded as Boolean) as integer 23103

### 194.4.10 Properties

### 194.4.11 ConversationID as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string identifying the conversation thread to which the message belongs.
**Notes:** Some messaging systems can ignore and not return this member.
(Read and Write property)

### 194.4.12 DateReceived as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string indicating the date when the message was received.
**Notes:** The format is YYYY/MM/DD HH:MM, using a 24-hour clock.
(Read and Write property)

### 194.4.13 Flags as Integer

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bitmask of message status flags.
**Notes:** Can be a combination of kFlagsReceiptRequested, kFlagsSent and kFlagsUnread.
(Read and Write property)

### 194.4.14 MessageType as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string indicating a non-IPM type of message.
**Notes:** Client applications can select message types for their non-IPM messages. Clients that only support IPM messages can ignore the MessageType member when reading messages and set it to empty when sending messages.
(Read and Write property)

### 194.4.15 NoteText as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string containing the message text.
**Notes:** If this member is empty, there is no message text.
(Read and Write property)

### 194.4.16 Originator as MapiRecipientMBS

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The reference to the originator of this message.
**Notes:** (Read and Write property)

### 194.4.17 Subject as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text string describing the message subject, typically limited to 256 characters or less.
**Notes:** If this member is empty, the user has not entered subject text.
(Read and Write property)

### 194.4.18 UseUnicode as Boolean

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use Unicode API.
**Notes:** Microsoft offers both unicode and ANSI interfaces.
By default UseUnicode is true and you can set it to false to use ANSI interface if needed.
If no unicode interface is needed, we automatically use the ANSI interface.
(Read and Write property)

### 194.4.19 Constants

Message Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsReceiptRequested | 2 | A receipt notification is requested. Client applications set this flag when sending a message.<br>Note: Most email applications ignore the receipt notifications. |
| kFlagsSent | 4 | The message has been sent. |
| kFlagsUnread | 1 | The message has not been read. |

Send Flags

| Constant | Value | Description |
|---|---|---|
| kSendFlagDialog | 8 | Display a send note UI<br>A dialog box should be displayed to prompt the user for recipients and other sending options. When Dialog is false, at least one recipient must be specified. |
| kSendFlagLogonDialog | 1 | Display logon UI.<br>A dialog box should be displayed to prompt the user to log on if required. When the DisplayLogonDialog is false, the client application does not display a logon dialog box and returns an error value if the user is not logged on. SendMail ignores this flag if the MessageID parameter is empty. |
| kSendFlagNewSession | 2 | Don't use shared session<br>Create a new session. |

## 194.5 class MapiRecipientMBS

### 194.5.1 class MapiRecipientMBS

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class contains information about a message sender or recipient.
**Example:**

```
dim o as new MapiRecipientMBS

o.Address="SMTP:sender@example.com"
o.Name="Me"
o.Type=o.TypeOriginator

// next add it to message
```

### 194.5.2 Properties

### 194.5.3 Address as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Optional the recipient or sender's address.
**Example:**

```
dim o as new MapiRecipientMBS
o.Address="SMTP:sender@example.com"
o.Name="Me"
o.Type=o.TypeOriginator
```

**Notes:** This address is provider-specific message delivery data. Generally, the messaging system provides such addresses for inbound messages. For outbound messages, the Address member can point to an address entered by the user for a recipient not in an address book (that is, a custom recipient). The format of an address pointed to by the Address member is [ address type ] [ e-mail address ] . Examples of valid addresses are FAX:206-555-1212 and SMTP:M@X.COM.
(Read and Write property)

### 194.5.4 Name as String

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the recipient.

**Notes:** (Read and Write property)

### 194.5.5 Type as Integer

MBS Win Plugin, Plugin Version: 8.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains a numeric value that indicates the type of recipient.
**Example:**

```
dim o as new MapiRecipientMBS
o.Address="SMTP:you@example.com"
o.Name="You"
o.Type=o.TypeTo
```

**Notes:** Use one of the Type constants.
(Read and Write property)

### 194.5.6 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| TypeBCC | 3 | One of the constants for the type property. Indicates a recipient of a blind copy. |
| TypeCC | 2 | One of the constants for the type property. Indicates a recipient of a message copy. |
| TypeOriginator | 0 | One of the constants for the type property. Indicates the original sender of the message. |
| TypeTo | 1 | One of the constants for the type property. Indicates a primary message recipient. |

## 194.6 class TaskDialogButtonMBS

### 194.6.1 class TaskDialogButtonMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a button.

### 194.6.2 Properties

### 194.6.3 Default as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this is default button.
**Notes:** Only one button can be default.
(Read and Write property)

### 194.6.4 Enabled as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to enable this button.
**Notes:** Default: true.

This is a live property. Setting it while dialog is open changes the button state.
(Read and Write property)

### 194.6.5 ID as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The unique ID for the button.
**Notes:** The IDs should be unique for all buttons.
(Read and Write property)

### 194.6.6 Text as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The caption for the button.
**Notes:** (Read and Write property)

### 194.6.7 Visible as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this button is visible.
**Notes:** Default true.
(Read and Write property)

## 194.7 class TaskDialogMBS

### 194.7.1 class TaskDialogMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a dialog in Windows.
**Notes:** This class function creates, displays, and operates a task dialog. The task dialog contains application-defined icons, messages, title, verification check box, command links, push buttons, and radio buttons.

Requires Windows Vista or newer.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio Plugins, version 16.2pr2
- New TaskDialog Class

### 194.7.2 Methods

### 194.7.3 AppendButton(button as TaskDialogButtonMBS)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a button.
**Example:**

```
dim td as TaskDialogMBS

dim b as new TaskDialogButtonMBS
b.Text = "Hello"
b.ID = 123

td.AppendButton b
```

### 194.7.4 AppendRadioButton(button as TaskDialogButtonMBS)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds a radio button.
**Example:**

```
dim td as TaskDialogMBS

dim b as new TaskDialogButtonMBS
b.Text = "Hello"
b.ID = 123

td.AppendRadioButton b
```

### 194.7.5 CloseDialog

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the dialog.

### 194.7.6 FindButtonByID(ID as Integer) as TaskDialogButtonMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Finds button by ID.
**Notes:** This searches buttons and radiobuttons for given ID.
It will not find common buttons.
Returns button if found or nil if not found.

### 194.7.7 ShowDialog as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shows the dialog.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = BitwiseOr(td.kCommonButtonOK, td.kCommonButtonCancel)
td.Content = "Hello World"

if td.ShowDialog then

if td.SelectedButton = td.kIDOK then
MsgBox "OK"
else
MsgBox "Cancel"
end if
```

```
else
MsgBox "Failed"
end if
```

**Notes:** Returns true if everything worked right.
Returns false if creation of dialog failed.

Requires Windows Vista or newer.

### 194.7.8 Properties

### 194.7.9 AllowDialogCancellation as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to allow cancel.
**Notes:** Indicates that the dialog should be able to be closed using Alt-F4, Escape, and the title bar's close button even if no cancel button is specified in either the CommonButtons or Buttons members.
(Read and Write property)

### 194.7.10 CanBeMinimized as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the task dialog can be minimized.
**Notes:** (Read and Write property)

### 194.7.11 CollapsedControlText as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used to label the button for expanding the expandable information.
**Notes:** This member is ignored when the ExpandedInformation member is empty. If this member is empty and the CollapsedControlText is specified, then the CollapsedControlText value will be used for this member as well.
(Read and Write property)

### 194.7.12 CommonButtons as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the push buttons displayed in the task dialog.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = BitwiseOr(td.kCommonButtonOK, td.kCommonButtonCancel)
td.Content = "Hello World"

if td.ShowDialog then

if td.SelectedButton = td.kIDOK then
MsgBox "OK"
else
MsgBox "Cancel"
end if

else
MsgBox "Failed"
end if
```

**Notes:** If no common buttons are specified and no custom buttons are specified through buttons array, the task dialog will contain the OK button by default. This parameter may be a combination of flags from the following group:

| | |
|---|---|
| kCommonButtonOK | The task dialog contains the push button: OK. |
| kCommonButtonYes | The task dialog contains the push button: Yes. |
| kCommonButtonNo | The task dialog contains the push button: No. |
| kCommonButtonCancel | The task dialog contains the push button: Cancel. If this button is specified, the task dialog will respond to typical cancel actions (Alt-F4 and Escape). |
| kCommonButtonRetry | The task dialog contains the push button: Retry. |
| kCommonButtonClose | The task dialog contains the push button: Close. |

(Read and Write property)

### 194.7.13 Content as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used for the dialog's primary content.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = BitwiseOr(td.kCommonButtonOK, td.kCommonButtonCancel)
td.Content = "Hello World"

if td.ShowDialog then

if td.SelectedButton = td.kIDOK then
MsgBox "OK"
else
MsgBox "Cancel"
end if

else
MsgBox "Failed"
end if
```

**Notes:** If the EnableHyperlinks flag is true, then this string may contain hyperlinks in the form: <A HREF="executablestring">Hyperlink Text</A>.
WARNING: Enabling hyperlinks when using content from an unsafe source may cause security vulnerabilities.
(Read and Write property)

### 194.7.14 DefaultButton as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The default button for the task dialog.
**Notes:** This may be any of the values specified in ID of one of the buttons, or one of the IDs corresponding to the buttons specified in the CommonButtons property.

| | |
|---|---|
| kIDCancel | Make the Cancel button the default. |
| kIDNo | Make the No button the default. |
| kIDOk | Make the OK button the default. |
| kIDRetry | Make the Retry button the default. |
| kIDYes | Make the Yes button the default. |
| kIDClose | Make the Close button the default. |

You can also mark buttons default with their default flag.
(Read and Write property)

### 194.7.15 DefaultRadioButton as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The button ID of the radio button that is selected by default.
**Notes:** If this value does not correspond to a button ID, the first button in the array is selected by default. You can also mark buttons default with their default flag.
(Read and Write property)

### 194.7.16 DialogHandle as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the dialog.
**Notes:** This is only valid (and non zero) while dialog is visible.
(Read only property)

### 194.7.17 EnableHyperlinks as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to enable hyperlinks.
**Notes:** Enables hyperlink processing for the strings specified in the Content, ExpandedInformation and Footer members. When enabled, these members may point to strings that contain hyperlinks in the following form:

<A HREF="executablestring">Hyperlink Text</A>

Warning: Enabling hyperlinks when using content from an unsafe source may cause security vulnerabilities.

Note: Task Dialogs will not actually execute any hyperlinks. Hyperlink execution must be handled in the HyperlinkClicked event.
(Read and Write property)

### 194.7.18 ExpandedByDefault as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the string specified by the ExpandedInformation member is displayed when the dialog is initially displayed.
**Notes:** This flag is ignored if the ExpandedInformation member is empty.

(Read and Write property)

### 194.7.19 ExpandedControlText as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used to label the button for collapsing the expandable information.
**Notes:** This member is ignored when the ExpandedInformation member is empty. If this member is empty and the CollapsedControlText is specified, then the CollapsedControlText value will be used for this member as well.
(Read and Write property)

### 194.7.20 ExpandedInformation as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used for displaying additional information.
**Notes:** The additional information is displayed either immediately below the content or below the footer text depending on whether the ExpandFooterArea flag is true. If the EnableHyperlinks flag is true, then this string may contain hyperlinks in the form: <A HREF="executablestring">Hyperlink Text</A>.
WARNING: Enabling hyperlinks when using content from an unsafe source may cause security vulnerabilities.
(Read and Write property)

### 194.7.21 ExpandFooterArea as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether expand footer area is displayed at the bottom.
**Notes:** Indicates that the string specified by the ExpandedInformation member is displayed at the bottom of the dialog's footer area instead of immediately after the dialog's content. This flag is ignored if the ExpandedInformation member is empty.
(Read and Write property)

### 194.7.22 Flags as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The flags.
**Notes:** You should not need to set flags as we have properties for all relevant flags.

(Read and Write property)

### 194.7.23 Footer as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used in the footer area of the task dialog.
**Notes:** If EnableHyperlinks is true, this can show clickable links.
(Read and Write property)

### 194.7.24 FooterIconPicture as Picture

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A picture to be used as Icon that is to be displayed in the footer of the task dialog.
**Notes:** The picture must have a valid mask.
(Read and Write property)

### 194.7.25 Icon as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The icon to be displayed in the task dialog.
**Notes:** Can be one of the kIcon* constants.
Or you set IconPicture property.
(Read and Write property)

### 194.7.26 IconPicture as Picture

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The icon to be displayed in the task dialog.
**Notes:** The picture must have a valid mask.
(Read and Write property)

### 194.7.27 MainInstruction as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used for the main instruction.
**Notes:** (Read and Write property)

### 194.7.28 NoDefaultRadioButton as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that no default item will be selected.
**Notes:** (Read and Write property)

### 194.7.29 parent as Variant

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** Parent window.
**Notes:** Can reference a Window or DesktopWindow object.
(Read and Write property)

### 194.7.30 parentHandle as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Parent window handle.
**Notes:** (Read and Write property)

### 194.7.31 PositionRelativeToWindow as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that the task dialog is positioned (centered) relative to the window specified by parent.
**Notes:** If the flag is not supplied (or no parent member is specified), the task dialog is positioned (centered) relative to the monitor.
(Read and Write property)

### 194.7.32 ProgressbarMax as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum of progress bar.
**Notes:** Default is 100.

This is a live property. Setting it while dialog is open will change the control.
(Read and Write property)

### 194.7.33 ProgressbarMin as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The minimum value of the progress bar.
**Notes:** This is a live property. Setting it while dialog is open will change the control.
(Read and Write property)

### 194.7.34 ProgressbarState as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The state of the progress bar.
**Notes:** Default kProgressbarNone.
Can be set to other states to turn on progressbar.
(Read and Write property)

### 194.7.35 ProgressbarValue as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current value of the progress bar.
**Notes:** This is a live property. Setting it while dialog is open will change the control.
(Read and Write property)

### 194.7.36 RightToLeftLayout as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates that text is displayed reading right to left.
**Notes:** (Read and Write property)

### 194.7.37 SelectedButton as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the clicked button.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = BitwiseOr(td.kCommonButtonOK, td.kCommonButtonCancel)
td.Content = "Hello World"

if td.ShowDialog then

if td.SelectedButton = td.kIDOK then
MsgBox "OK"
else
MsgBox "Cancel"
end if

else
MsgBox "Failed"
end if
```

**Notes:** (Read and Write property)

### 194.7.38 SelectedRadioButton as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the selected radio button.
**Notes:** (Read and Write property)

### 194.7.39 Showing as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether dialog is currently showing.
**Notes:** (Read and Write property)

### 194.7.40 TimedOut as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether we got a timeout.
**Notes:** (Read only property)

### 194.7.41 timeoutMS as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The timeout for the dialog.
**Notes:** In Milliseconds. The dialog closes after given time.
(Read and Write property)

### 194.7.42 VerificationChecked as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The state of the verification checkbox.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = td.kCommonButtonOK
td.Content = "Hello World"

'td.VerificationChecked = true
td.VerificationText = "Don't show again"

call td.ShowDialog

if td.VerificationChecked then
MsgBox "and we will not show again"
end if
```

**Notes:** Before: Indicates whether the verification checkbox in the dialog is checked when the dialog is initially displayed.
After: True if the verification checkbox was checked when the dialog was dismissed.

This is a live property. Changing it while the dialog is open will change the checkbox.
(Read and Write property)

### 194.7.43 VerificationEnabled as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The enable state of the verification checkbox.
**Notes:** Can be true to enable the checkbox or false to disable.
(Read and Write property)

### 194.7.44 VerificationText as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used to label the verification checkbox.
**Example:**

```
dim td as new TaskDialogMBS

td.CommonButtons = td.kCommonButtonOK
td.Content = "Hello World"

'td.VerificationChecked = true
td.VerificationText = "Don't show again"

call td.ShowDialog

if td.VerificationChecked then
MsgBox "and we will not show again"
end if
```

**Notes:** If this parameter is empty, the verification checkbox is not displayed in the task dialog. If the VerificationEnabled is false, the checkbox is not enabled.
(Read and Write property)

### 194.7.45 Width as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the task dialog's client area, in dialog units.
**Notes:** If 0, the task dialog manager will calculate the ideal width.
(Read and Write property)

### 194.7.46 WindowTitle as String

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string to be used for the task dialog title.

**Notes:** (Read and Write property)

### 194.7.47 Yield as Boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to yield time.
**Notes:** Whether the plugin should yield time to other Xojo threads while dialog is open.
(Read and Write property)

### 194.7.48 Button(index as Integer) as TaskDialogButtonMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Array of the custom buttons that are to be displayed in the task dialog.
**Notes:** You can create TaskDialogButtonMBS objects and assign them to indexes in the array.
(Read and Write computed property)

### 194.7.49 RadioButton(index as Integer) as TaskDialogButtonMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Array of the custom radio buttons that are to be displayed in the task dialog.
**Notes:** You can create TaskDialogButtonMBS objects and assign them to indexes in the array.
(Read and Write computed property)

### 194.7.50 Events

### 194.7.51 ButtonClicked(ID as Integer) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that a button has been selected.
**Notes:** The command ID of the button is specified by ID.
To prevent the task dialog from closing, the application must return true, otherwise the task dialog is closed and the button ID is returned via the original application call.

### 194.7.52 Close

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the Task Dialog has been destroyed.

### 194.7.53 Constructed

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the Task Dialog has been created but has not been displayed yet.
**Notes:** You can adjust here if you need.

### 194.7.54 ExpandButtonClicked(Expanded as Boolean)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the expand button has been selected.

### 194.7.55 Help

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the F1 key has been pressed while the Task Dialog has focus.

### 194.7.56 HyperlinkClicked(link as string)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that a hyperlink has been selected.

### 194.7.57 Navigated

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that navigation has occurred.

### 194.7.58 Open

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the Task Dialog has been created.

### 194.7.59 RadioButtonClicked(ID as Integer) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that a radio button has been selected.
**Notes:** The command ID of the radio button is specified by ID.

### 194.7.60 Timer(Time as Integer)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the Task Dialog timer has fired.
**Notes:** The total elapsed time is specified by Time. You can update the progress bar by setting ProgressbarValue.

This is called regularly so you can do background work.
(or check time and dismiss dialog automatically)

### 194.7.61 VerificationClicked(Checked as Boolean)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Indicates that the Task Dialog verification check box has been selected.

### 194.7.62 Constants

Common Buttons

| Constant | Value | Description |
|---|---|---|
| kCommonButtonCancel | 8 | The task dialog contains the push button: Cancel. If this button is specified, the task dialog will respond to typical cancel actions (Alt-F4 and Escape). |
| kCommonButtonClose | 32 | The task dialog contains the push button: Close. |
| kCommonButtonNo | 4 | The task dialog contains the push button: No. |
| kCommonButtonOK | 1 | The task dialog contains the push button: OK. |
| kCommonButtonRetry | 16 | The task dialog contains the push button: Retry. |
| kCommonButtonYes | 2 | The task dialog contains the push button: Yes. |

Icon Constants

| Constant | Value | Description |
|---|---|---|
| kIconApplication | 5 | An application icon appears in the task dialog. |
| kIconError | 2 | A stop-sign icon appears in the task dialog. |
| kIconInformation | 3 | An icon consisting of a lowercase letter i in a circle appears in the task dialog. |
| kIconNone | 0 | No icon. |
| kIconShield | 4 | A shield icon appears in the task dialog. |
| kIconWarning | 1 | An exclamation-point icon appears in the task dialog. |

Standard Button IDs

| Constant | Value | Description |
|---|---|---|
| kIDAbort | 3 | Abort button |
| kIDCancel | 2 | Cancel button |
| kIDIgnore | 5 | Ignore button |
| kIDNo | 7 | No button |
| kIDOK | 1 | OK Button |
| kIDRetry | 4 | Retry Button |
| kIDYes | 6 | Yes Button |

Progressbar State

| Constant | Value | Description |
|---|---|---|
| kProgressbarError | 3 | Error state. |
| kProgressbarMarquee | 8 | Marquee state |
| kProgressbarNone | 0 | No progress bar. |
| kProgressbarNormal | 1 | Normal progressbar |
| kProgressbarPause | 2 | Paused progress bar |

## 194.8 class TimerMBS

### 194.8.1 class TimerMBS

MBS Win Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The class for a timer.
**Notes:** This timer can work with smaller periods than the normal Xojo timers on Windows.
Works on Mac OS X and Linux, too.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- Unblock menus while threads are running
- MBS Xojo Plugins, version 22.6pr1
- MBS Xojo Plugins, version 20.5pr8
- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1
- MBS Xojo Plugins, version 19.1pr5
- MBS Xojo Plugins, version 17.4pr3
- MBS Xojo / Real Studio Plugins, version 14.4pr1
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.3
- New Timer for Windows

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News
- 17.3, page 11: News

### 194.8.2 Methods

### 194.8.3 Constructor(Period as Integer, Threaded as boolean = true)

MBS Win Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Please pass a period between 1 and 999 Milliseconds.

The timer will try to be as exact as possible, but if main thread is busy, action events are delayed.

Threaded decides on Windows whether you like the high performance version with a thread in background or just a regular timer.

### 194.8.4 Destructor

MBS Win Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 194.8.5 Properties

### 194.8.6 Enabled as Boolean

MBS Win Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether timer is enabled.
**Notes:** Default is true, but you can set to false to disable the timer for some time.
(Read and Write property)

### 194.8.7 Period as Integer

MBS Win Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** The period used.
**Notes:** In milliseconds.
(Read only property)

### 194.8.8 Threaded as Boolean

MBS Win Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether this timer uses a thread.
**Notes:** Only true on Windows if you requested a thread.
(Read only property)

### 194.8.9 Yield as Boolean

MBS Win Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Whether we should yield to keep other processes running.
**Example:**

```
// start timer to yield in order to keep threads running when you use PopupMenus
// in app.open:
#if TargetWindows
Static timer As TimerMBS

timer = New TimerMBS(50, False)
timer.Yield = True
#endif
```

**Notes:** Setting yield to true tells the plugin to yield time to other threads and timers in the Xojo application. By yielding with a non threaded TimerMBS, you can keep menus activate on Windows.
(Read and Write property)

### 194.8.10 Events

### 194.8.11 Action

MBS Win Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The action event.

## 194.9 Globals

### 194.9.1 GetWindowsErrorMessageMBS(ErrorCode as Integer) as String

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Formats a windows error message for the given error code.
**Example:**

EditField1.text = GetWindowsErrorMessageMBS(-2147352567)

**Notes:** Returns empty string for unknown error codes.
**Blog Entries**

- MBS Real Studio Plugins, version 12.1pr6

### 194.9.2 InitMessageFilterMBS

MBS Win Plugin, Plugin Version: 18.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initializes COM message filter.
**Notes:** If a COM message can't be handled right away, COM may show a standard dialog to retry, switch task or cancel, which may bring your app in an endless dialog series. MBS Plugin implements a message filter which delays messages till the current processing is done and avoids the dialog. So long running options can perform well.
**Blog Entries**

- MBS Xojo Plugins 18.3
- Putting an end to the Server Busy Dialog in Xojo and FileMaker
- MBS Xojo Plugins, version 18.3pr2

**Videos**

- Presentation from Munich conference about MBS Plugins.

### 194.9.3 WindowsExecuteMBS(ApplicationName as string, CommandLine as string, CurrentDirectory as string, byref PID as integer, Flags as integer = 0, ShowWindow as Integer = -1) as integer

MBS Win Plugin, Plugin Version: 11.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new process and its primary thread. The new process runs in the security context of the calling process.
**Example:**

```
dim error, pid as Integer

pid = 0

error = WindowsExecuteMBS("", "explorer.exe", "", pid)
if error = 0 then
MsgBox "Launched explorer with process id: "+str(pid)
else
MsgBox "Error: "+str(error)
end if

pid = 0

error = WindowsExecuteMBS("", "notepad.exe ""C:\boot.ini""", "", pid)
if error = 0 then
MsgBox "Launched Notepad with process id: "+str(pid)
else
MsgBox "Error: "+str(error)
end if
```

**Notes:** ApplicationName:
The name of the module to be executed. This module can be a Windows-based application. It can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer.

The string can specify the full path and file name of the module to execute or it can specify a partial name. In the case of a partial name, the function uses the current drive and current directory to complete the specification. The function will not use the search path. This parameter must include the file name extension; no default extension is assumed.

The ApplicationName parameter can be empty. In that case, the module name must be the first white space–delimited token in the CommandLine string. If you are using a long file name that contains a space, use quoted strings to indicate where the file name ends and the arguments begin; otherwise, the file name is ambiguous. For example, consider the string "c:\program files\sub dir\program name". This string can be interpreted in a number of ways. The system tries to interpret the possibilities in the following order:

- c:\program.exe files\sub dir\program name
- c:\program files\sub.exe dir\program name
- c:\program files\sub dir\program.exe name
- c:\program files\sub dir\program name.exe

If the executable module is a 16-bit application, ApplicationName should be empty, and the string pointed

to by CommandLine should specify the executable module as well as its arguments.

To run a batch file, you must start the command interpreter; set ApplicationName to cmd.exe and set CommandLine to the following arguments: /c plus the name of the batch file.

CommandLine:
The command line to be executed. The maximum length of this string is 32,767 characters.. If ApplicationName is empty, the module name portion of CommandLine is limited to MAX_PATH (256) characters.

The CommandLine parameter can be empty. In that case, the function uses the string pointed to by ApplicationName as the command line.

If both ApplicationName and CommandLine are non-empty, the ApplicationName string specifies the module to execute, and the CommandLine string specifies the command line. The new process can use GetCommandLine to retrieve the entire command line. Console processes written in C can use the argc and argv arguments to parse the command line. Because argv [ 0 ] is the module name, C programmers generally repeat the module name as the first token in the command line.

If ApplicationName is empty, the first white space–delimited token of the command line specifies the module name. If you are using a long file name that contains a space, use quoted strings to indicate where the file name ends and the arguments begin (see the explanation for the ApplicationName parameter). If the file name does not contain an extension, .exe is appended. Therefore, if the file name extension is .com, this parameter must include the .com extension. If the file name ends in a period (.) with no extension, or if the file name contains a path, .exe is not appended. If the file name does not contain a directory path, the system searches for the executable file in the following sequence:

- The directory from which the application loaded.
- The current directory for the parent process.
- The 32-bit Windows system directory. Use the GetSystemDirectory function to get the path of this directory.
- The 16-bit Windows system directory. There is no function that obtains the path of this directory, but it is searched. The name of this directory is System.
- The Windows directory. Use the GetWindowsDirectory function to get the path of this directory.
- The directories that are listed in the PATH environment variable. Note that this function does not search the per-application path specified by the App Paths registry key. To include this per-application path in the search sequence, use the ShellExecute function.
- The system adds a terminating null character to the command-line string to separate the file name from the arguments. This divides the original string into two strings for internal processing.

CurrentDirectory:
The full path to the current directory for the process. The string can also specify a UNC path.

If this parameter is empty, the new process will have the same current drive and directory as the calling process. (This feature is provided primarily for shells that need to start an application and specify its initial drive and working directory.)

pid:
The variable to store the process ID of the new process.

Returns 0 for success or a windows error code for any error.

Note that the function returns before the process has finished initialization. If a required DLL cannot be located or fails to initialize, the process is terminated. To get the termination status of a process, call GetExitCodeProcess.

Possible Flags:

ShowWindow can be values for ShowWindow function to define how first window of new application is shown. Available values:

**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 21.0pr8
- MBS REALbasic Plugins, version 11.0pr13

### 194.9.4 WindowsRunAsMBS(Username as string, Domain as string, Password as string, LoginFlags as Integer, ApplicationName as string, CommandLine as string, CurrentDirectory as string, byref PID as Integer, Flags as Integer = -1) as Integer

MBS Win Plugin, Plugin Version: 13.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs an application with a different user login.
**Notes:** Please see Microsoft website for details:
http://msdn.microsoft.com/en-us/library/windows/desktop/ms682431(v=vs.85).aspx

The plugin passes parameters. If Flags is -1, we use CREATE_DEFAULT_ERROR_MODE Or CREATE_NEW_CONSOLE Or CREATE_NEW_PROCESS_GROUP.
The StartupInfo handles are closed and the PID is returned in the PID parameter.

Returns the Windows error code on failure. Else we return zero for success. On Mac and Linux the result is always -1.

### 194.9.5 WindowsShellExecuteAsAdminMBS(ParentWindowHandle as integer, File as string, Parameters as string = """, Directory as string = """, ShowCmd as integer = 5) as integer

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs given file as admin.
**Example:**

```
// run me as admin
Dim r As Integer = WindowsShellExecuteAsAdminMBS(0, app.ExecutableFile.NativePath, "", "", 3)

If r <>0 Then
MsgBox "error: "+Str(r)
End If
```

**Notes:** See also WindowsShellExecuteMBS function.
Returns Windows error code, zero on success.

ShowCmd values are shown in documentation WindowsExecuteMBS function.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr4

**Xojo Developer Magazine**

- 19.3, page 10: News

### 194.9.6 WinGetSysColorMBS(Index as Integer) as Color

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the current color of the specified display element.
**Notes:** Display elements are the parts of a window and the display that appear on the system display screen.

Index: The display element whose color is to be retrieved. This parameter can be one of the following values.

Specifies the left side color in the color gradient of an active window's title bar if the gradient effect is enabled.

Specifies the left side color in the color gradient of an inactive window's title bar if the gradient effect is enabled.

Windows 2000: This value is not supported.

Windows 2000: This value is not supported.

The function returns the red, green, blue (RGB) color value of the given element.

### 194.9.7 WinOpenFolderAndSelectItemsMBS(folder as folderitem, files() as folderItem, ShowOnDesktop as Boolean = false, EditName as Boolean = false) as Integer

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens a Windows Explorer window with specified items in a particular folder selected.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.rtf")
dim folder as FolderItem = file.Parent

dim r as Integer = WinOpenFolderAndSelectItemsMBS(folder, array(file))

if r = 0 then
MsgBox "OK"
else
MsgBox "Error: "+str(r)
end if
```

**Notes:** Please pass a folder to open. Pass the files you want to select in that folder.
Returns Windows error code. Zero for success.

Under Windows XP the flag parameters are ignored. They work in Windows Vista and newer:

Editname: Pass true to select an item and put its name in edit mode. This flag can only be used when a single item is being selected. For multiple item selections, it is ignored.

ShowOnDesktop: Pass true to select the item or items on the desktop rather than in a Windows Explorer

window. Note that if the desktop is obscured behind open windows, it will not be made visible.

For Mac, please use NSWorkspaceMBS.selectfile function.
**Blog Entries**

- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- MBS Xojo / Real Studio Plugins, version 14.4pr3

### 194.9.8 WinSetSysColorMBS(Index as Integer, value as Color) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the colors for the specified display elements.
**Notes:** Display elements are the various parts of a window and the display that appear on the system display screen.
If the function succeeds, the return value is true.
For indexes, please check WinGetSysColorMBS.

### 194.9.9 WindowsShellExecuteMBS(ParentWindowHandle as Integer, Operation as string, File as string, Parameters as string = """, Directory as string = """, ShowCmd as Integer = 5) as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Performs an operation on a specified file.
**Example:**

```
dim e as Integer
dim f as FolderItem

// show documents folder

f = SpecialFolder.Documents
e = WindowsShellExecuteMBS(0, "explore", f.NativePath, "", "", 10)

// Launch Notepad application

e = WindowsShellExecuteMBS(0, "", "notepad.exe", "", "", 10)

// launch file, folder or application

f = SpecialFolder.Desktop.Child("Auto1.JPG")
e = WindowsShellExecuteMBS(0, "", f.NativePath, "", "", 10)
```

**Notes:** Use ConsoleExecuteMBS on Mac OS X and Linux.

ParentWindowHandle:
A handle to the owner window used for displaying a UI or error messages. This value can be 0 if the operation is not associated with a window. You can pass window.handle from a Xojo window.

Operation:
A string, referred to in this case as a verb, that specifies the action to be performed. The set of available verbs depends on the particular file or folder. Generally, the actions available from an object's shortcut menu are available verbs. The following verbs are commonly used:

File:
A string that specifies the file or object on which to execute the specified verb. To specify a Shell namespace object, pass the fully qualified parse name. Note that not all verbs are supported on all objects. For example, not all document types support the "print" verb. If a relative path is used for the Directory parameter do not use a relative path for File.

Parameters:
If File specifies an executable file, this parameter is a string that specifies the parameters to be passed to the application. The format of this string is determined by the verb that is to be invoked. If File specifies a document file, Parameters should be "".

Directory:
A string that specifies the default (working) directory for the action. If this value is NULL, the current working directory is used. If a relative path is provided at File, do not use a relative path for Directory.

ShowCmd:
The flags that specify how an application is to be displayed when it is opened. If File specifies a document file, the flag is simply passed to the associated application. It is up to the application to decide how to handle it.

Return Value:
If the function succeeds, it returns a value greater than 32. If the function fails, it returns an error value that indicates the cause of the failure. The return value is cast as an HINSTANCE for backward compatibility with 16-bit Windows applications.

This method allows you to execute any commands in a folder's shortcut menu or stored in the registry.
To open a folder, use either of the following calls:

WindowsShellExecuteMBS(handle, "", <fully_qualified_path_to_folder>, "", "", SW_SHOWNORMAL);
or
WindowsShellExecuteMBS(handle, "open", <fully_qualified_path_to_folder>, "", "", SW_SHOWNOR-

MAL);

To explore a folder, use the following call:
WindowsShellExecuteMBS(handle, "explore", <fully_qualified_path_to_folder>, "", "", SW_SHOWNORMAL);
To launch the Shell's Find utility for a directory, use the following call.

WindowsShellExecuteMBS(handle, "find", <fully_qualified_path_to_folder>, "", "", 0);

If Operation is empty, the function opens the file specified by File. If Operation is "open" or "explore", the function attempts to open or explore the folder.

Note The Launch folder windows in a separate process setting in Folder Options affects ShellExecute. If that option is disabled (the default setting), ShellExecute uses an open Explorer window rather than launch a new one. If no Explorer window is open, ShellExecute launches a new one.

See also ConsoleExecuteMBS, WindowsShellExecuteAsAdminMBS, WindowsProcessMBS (Windows only), NSTask (Mac only) and ShellMBS (cross platform).

### 194.9.10 DriveToUNCPathMBS(Driver as string) as string

MBS Win Plugin, Plugin Version: 13.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the system tables for which UNC network path belongs to a mapped drive.
**Example:**

msgbox DriveToUNCPathMBS("W:")

**Notes:** Please pass the local drive name, which is drive letter and double colon.
Returns empty string on any error.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.2pr5

### 194.9.11 GetFullWindowsNameMBS(UserName as string, Domain as string) as string

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the full username of an user in a domain.
**Example:**

```
dim ShortName as string = "your short name"
dim Domain as string = "your domain"

MsgBox GetFullWindowsNameMBS(ShortName, Domain)
```

**Notes:** Returns an empty string on any error.

Use a current Windows NT-style domain, and a username that exists on the PDC.

This will work with any NT-Style PDC (tested on XP bound to Mac OS X Server running SMB as PDC). Windows 2000/2003 and 2008 should also work.

## 194.10 class WindowsADSystemInfoMBS

### 194.10.1 class WindowsADSystemInfoMBS

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class retrieves data about the local computer if it is running a Windows operating system in a Windows domain.
**Notes:** For example, you can get the domain, site, and distinguished name of the local computer.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.3
- MBS Xojo Plugins, version 19.3pr2

**Xojo Developer Magazine**

- 18.3, page 50: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 17.5, page 10: News

### 194.10.2 Methods

### 194.10.3 AnyDCName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the DNS name of a domain controller in the local computer's domain.
**Notes:** Lasterror is set.

### 194.10.4 Constructor

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Raises unsupportedOperationException on failure.

### 194.10.5 DCSiteName(Server as String) as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the name of the Active Directory site that contains the local computer.
**Notes:** Server: DNS name of the service server.

An Active Directory site is one or more well-connected TCP/IP subnets holding Active Directory domain controllers
Lasterror is set.

### 194.10.6 RefreshSchemaCache

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Refreshes the Active Directory schema cache.
**Notes:** When you call this method, it does a Put() of the schemaUpdateNow function on the RootDSE. Normally, when you make changes to the schema, they are not updated to the RootDSE until the next automatic update. This method does an immediate update to the schema so that you can view the changes to the schema.
Lasterror is set.

### 194.10.7 Properties

### 194.10.8 ComputerName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the distinguished name of the local computer.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.9 DomainDNSName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the DNS name of the local computer's domain, such as "domainName.companyName.com".
**Notes:** Lasterror is set.
(Read only property)

### 194.10.10 DomainShortName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the short name of the local computer's domain, such as "domainName".
**Notes:** Lasterror is set.
(Read only property)

### 194.10.11 ForestDNSName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the DNS name of the local computer's forest.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.12 Handle as Integer

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 194.10.13 IsNativeMode as Boolean

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Determines whether the local computer's domain is in native or mixed mode.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.14 Lasterror as Integer

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error reported by any of the properties/methods.
**Notes:** (Read and Write property)

### 194.10.15 PDCRoleOwner as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the distinguished name of the directory service agent (DSA) object for the DC that owns the primary domain controller role in the local computer's domain.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.16 SchemaRoleOwner as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the distinguished name of the directory service agent (DSA) object for the DC that owns the schema master role in the local computer's forest.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.17 SiteName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the site name of the local computer.
**Notes:** Lasterror is set.
(Read only property)

### 194.10.18 UserName as String

MBS Win Plugin, Plugin Version: 19.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the Active Directory distinguished name of the current user, which is the logged-on user or the user impersonated by the calling thread.
**Notes:** Lasterror is set.
(Read only property)

| Constant | Value | Description |
|---|---|---|
| CREATE_BREAKAWAY_FROM_JOB | &h01000000 | The child processes of a process associated with a job are not associated with the job. If the calling process is not associated with a job, this constant has no effect. If the calling process is associated with a job, the job must set the JOB_OBJECT_LIMIT_BREAKAWAY_OK limit. |
| CREATE_DEFAULT_ERROR_MODE | &h04000000 | The new process does not inherit the error mode of the calling process. Instead, the new process gets the default error mode. This feature is particularly useful for multi-threaded shell applications that run with hard errors disabled. The default behavior is for the new process to inherit the error mode of the caller. Setting this flag changes that default behavior. |
| CREATE_NEW_CONSOLE | &h00000010 | The new process has a new console, instead of inheriting its parent's console (the default). For more information, see Creation of a Console. This flag cannot be used with DETACHED_PROCESS. |
| CREATE_NEW_PROCESS_GROUP | &h00000200 | The new process is the root process of a new process group. The process group includes all processes that are descendants of this root process. The process identifier of the new process group is the same as the process identifier, which is returned in the lpProcessInformation parameter. Process groups are used by the GenerateConsoleCtrlEvent function to enable sending a CTRL+BREAK signal to a group of console processes. If this flag is specified, CTRL+C signals will be disabled for all processes within the new process group. This flag is ignored if specified with CREATE_NEW_CONSOLE. |
| CREATE_NO_WINDOW | &h08000000 | The process is a console application that is being run without a console window. Therefore, the console handle for the application is not set. This flag is ignored if the application is not a console application, or if it is used with either CREATE_NEW_CONSOLE or DETACHED_PROCESS. |
| CREATE_PROTECTED_PROCESS | &h00040000 | The process is to be run as a protected process. The system restricts access to protected processes and the threads of protected processes. For more information on how processes can interact with protected processes, see Process Security and Access Rights. To activate a protected process, the binary must have a special signature. This signature is provided by Microsoft but not currently available for non-Microsoft binaries. There are currently four protected processes: media foundation, audio engine, Windows error reporting, and system. Components that load into these binaries must also be signed. Multimedia companies can leverage the first two protected processes. For more information, see Overview of the Protected Media Path. Windows Server 2003 and Windows XP/2000: This value is not supported. |
| CREATE_PRESERVE_CODE_AUTHZ_LEVEL | &h02000000 | Allows the caller to execute a child process that bypasses the process restrictions that would normally be applied automatically to the process. Windows 2000: This value is not supported. |
| CREATE_SEPARATE_WOW_VDM | &h00000800 | This flag is valid only when starting a 16-bit Windows-based application. If set, the new process runs in a private Virtual DOS Machine (VDM). By default, all 16-bit Windows-based applications run as threads in a single, shared VDM. The advantage of running separately is that a crash only terminates the single VDM; any other programs running in distinct VDMs continue to function normally. Also, 16-bit Windows-based applications that are run in separate VDMs have separate input queues. That means that if one application stops responding momentarily, applications in separate VDMs continue to receive input. The disadvantage of running separately is that it takes significantly more memory to do so. You should use this flag only if the user requests that 16-bit applications should run in their own VDM. |
| CREATE_SHARED_WOW_VDM | &h00001000 | The flag is valid only when starting a 16-bit Windows-based application. If the DefaultSeparateVDM switch in the Windows section of WIN.INI is TRUE, this flag overrides the switch. The new process is run in the shared Virtual DOS Machine. |
| CREATE_SUSPENDED | &h00000004 | The primary thread of the new process is created in a suspended state, and does not run until the ResumeThread function is called. |
| CREATE_UNICODE_ENVIRONMENT | &h00000400 | If this flag is set, the environment block pointed to by lpEnvironment uses Unicode characters. Otherwise, the environment block uses ANSI characters. |
| DEBUG_ONLY_THIS_PROCESS | &h00000002 | The calling thread starts and debugs the new process. It can receive all related debug events using the WaitForDebugEvent function. |
| DEBUG_PROCESS | &h00000001 | The calling thread starts and debugs the new process and all child processes created by the new process. It can receive all related debug events using the WaitForDebugEvent function. A process that uses DEBUG_PROCESS becomes the root of a debugging chain. This continues until another process in the chain is created with DEBUG_PROCESS. If this flag is combined with DEBUG_ONLY_THIS_PROCESS, the caller debugs only the new process, not any child processes. |
| DETACHED_PROCESS | &h00000008 | For console processes, the new process does not inherit its parent's console (the default). The new process can call the AllocConsole function at a later time to create a console. For more information, see Creation of a Console. This value cannot be used with CREATE_NEW_CONSOLE. |
| EXTENDED_STARTUPINFO_PRESENT | &h00080000 | The process is created with extended startup information; the lpStartupInfo parameter specifies a STARTUPINFOEX structure. Windows Server 2003 and Windows XP/2000: This value is not supported. |
| INHERIT_PARENT_AFFINITY | &h00010000 | The process inherits its parent's affinity. If the parent process has threads in more than one processor group, the new process inherits the group-relative affinity of an arbitrary group in use by the parent. Windows Server 2008, Windows Vista, Windows Server 2003, and Windows XP/2000: This value is not supported. |
| ABOVE_NORMAL_PRIORITY_CLASS | &h00008000 | Process that has priority above NORMAL_PRIORITY_CLASS but below HIGH_PRIORITY_CLASS. |
| BELOW_NORMAL_PRIORITY_CLASS | &h00004000 | Process that has priority above IDLE_PRIORITY_CLASS but below NORMAL_PRIORITY_CLASS. |

| Constants | Value | Meaning |
|---|---|---|
| SW_FORCEMINIMIZE | 11 | Minimizes a window, even if the thread that owns the window is not responding. This flag should only be used when minimizing windows from a different thread. |
| SW_HIDE | 0 | Hides the window and activates another window. |
| SW_MAXIMIZE | 3 | Maximizes the specified window. |
| SW_MINIMIZE | 6 | Minimizes the specified window and activates the next top-level window in the Z order. |
| SW_RESTORE | 9 | Activates and displays the window. If the window is minimized or maximized, the system restores it to its original size and position. An application should specify this flag when restoring a minimized window. |
| SW_SHOW | 5 | Activates the window and displays it in its current size and position. |
| SW_SHOWDEFAULT | 10 | Sets the show state based on the SW_ value specified in the STARTUPINFO structure passed to the CreateProcess function by the program that started the application. |
| SW_SHOWMAXIMIZED | 3 | Activates the window and displays it as a maximized window. |
| SW_SHOWMINIMIZED | 2 | Activates the window and displays it as a minimized window. |
| SW_SHOWMINNOACTIVE | 7 | Displays the window as a minimized window. This value is similar to SW_SHOWMINIMIZED, except the window is not activated. |
| SW_SHOWNA | 8 | Displays the window in its current size and position. This value is similar to SW_SHOW, except that the window is not activated. |
| SW_SHOWNOACTIVATE | 4 | Displays a window in its most recent size and position. This value is similar to SW_SHOWNORMAL, except that the window is not activated. |
| SW_SHOWNORMAL | 1 | Activates and displays a window. If the window is minimized or maximized, the system restores it to its original size and position. An application should specify this flag when displaying the window for the first time. |

| Name | Value | Meaning |
|---|---|---|
| COLOR_3DDKSHADOW | 21 | Dark shadow for three-dimensional display elements. |
| COLOR_3DFACE | 15 | Face color for three-dimensional display elements and for dialog box backgrounds. |
| COLOR_3DHIGHLIGHT | 20 | Highlight color for three-dimensional display elements (for edges facing the light source.) |
| COLOR_3DHILIGHT | 20 | Highlight color for three-dimensional display elements (for edges facing the light source.) |
| COLOR_3DLIGHT | 22 | Light color for three-dimensional display elements (for edges facing the light source.) |
| COLOR_3DSHADOW | 16 | Shadow color for three-dimensional display elements (for edges facing away from the light source). |
| COLOR_ACTIVEBORDER | 10 | Active window border. |
| COLOR_ACTIVECAPTION | 2 | Active window title bar. |

| | | |
|---|---|---|
| COLOR_APPWORKSPACE | 12 | Background color of multiple document interface (MDI) applications. |
| COLOR_BACKGROUND | 1 | Desktop. |
| COLOR_BTNFACE | 15 | Face color for three-dimensional display elements and for dialog box backgrounds. |
| COLOR_BTNHIGHLIGHT | 20 | Highlight color for three-dimensional display elements (for edges facing the light source.) |
| COLOR_BTNHILIGHT | 20 | Highlight color for three-dimensional display elements (for edges facing the light source.) |
| COLOR_BTNSHADOW | 16 | Shadow color for three-dimensional display elements (for edges facing away from the light source). |
| COLOR_BTNTEXT | 18 | Text on push buttons. |
| COLOR_CAPTIONTEXT | 9 | Text in caption, size box, and scroll bar arrow box. |
| COLOR_DESKTOP | 1 | Desktop. |
| COLOR_GRADIENTACTIVECAPTION | 27 | Right side color in the color gradient of an active window's title bar. COLOR_ACTIVECAPTION specifies the left side color. Use SPI_GETGRADIENTCAPTIONS with the SystemParametersInfo function to determine whether the gradient effect is enabled. |
| COLOR_GRADIENTINACTIVECAPTION | 28 | Right side color in the color gradient of an inactive window's title bar. COLOR_INACTIVECAPTION specifies the left side color. |
| COLOR_GRAYTEXT | 17 | Grayed (disabled) text. This color is set to 0 if the current display driver does not support a solid gray color. |
| COLOR_HIGHLIGHT | 13 | Item(s) selected in a control. |
| COLOR_HIGHLIGHTTEXT | 14 | Text of item(s) selected in a control. |
| COLOR_HOTLIGHT | 26 | Color for a hyperlink or hot-tracked item. |
| COLOR_INACTIVEBORDER | 11 | Inactive window border. |
| COLOR_INACTIVECAPTION | 3 | Inactive window caption. |
| COLOR_INACTIVECAPTIONTEXT | 19 | Color of text in an inactive caption. |
| COLOR_INFOBK | 24 | Background color for tooltip controls. |
| COLOR_INFOTEXT | 23 | Text color for tooltip controls. |
| COLOR_MENU | 4 | Menu background. |
| COLOR_MENUHILIGHT | 29 | The color used to highlight menu items when the menu appears as a flat menu (see SystemParametersInfo). The highlighted menu item is outlined with COLOR_HIGHLIGHT. |
| COLOR_MENUBAR | 30 | The background color for the menu bar when menus appear as flat menus (see SystemParametersInfo). However, COLOR_MENU continues to specify the background color of the menu popup. |
| COLOR_MENUTEXT | 7 | Text in menus. |
| COLOR_SCROLLBAR | 0 | Scroll bar gray area. |
| COLOR_WINDOW | 5 | Window background. |
| COLOR_WINDOWFRAME | 6 | Window frame. |
| COLOR_WINDOWTEXT | 8 | Text in windows. |

| | |
|---|---|
| edit | Launches an editor and opens the document for editing. If File is not a document file, the function will fail. |
| explore | Explores a folder specified by File. |
| find | Initiates a search beginning in the directory specified by Directory. |
| open | Opens the item specified by the File parameter. The item can be a file or folder. |
| print | Prints the file specified by File. If File is not a document file, the function fails. |
| "" | In systems prior to Windows 2000, the default verb is used if it is valid and available in the registry. If not, the "open" verb is used. In Windows 2000 and later, the default verb is used if available. If not, the "open" verb is used. If neither verb is available, the system uses the first verb listed in the registry. |

| | | |
|---|---|---|
| SW_HIDE | 0 | Hides the window and activates another window. |
| SW_MAXIMIZE | 3 | Maximizes the specified window. |
| SW_MINIMIZE | 6 | Minimizes the specified window and activates the next top-level window in the z-order. |
| SW_RESTORE | 9 | Activates and displays the window. If the window is minimized or maximized, Windows restores it to its original size and position. An application should specify this flag when restoring a minimized window. |
| SW_SHOW | 5 | Activates the window and displays it in its current size and position. |
| SW_SHOWDEFAULT | 10 | Sets the show state based on the SW_ flag specified in the STARTUPINFO structure passed to the CreateProcess function by the program that started the application. An application should call ShowWindow with this flag to set the initial show state of its main window. |
| SW_SHOWMAXIMIZED | 3 | Activates the window and displays it as a maximized window. |
| SW_SHOWMINIMIZED | 2 | Activates the window and displays it as a minimized window. |
| SW_SHOWMINNOACTIVE | 7 | Displays the window as a minimized window. The active window remains active. |
| SW_SHOWNA | 8 | Displays the window in its current state. The active window remains active. |
| SW_SHOWNOACTIVATE | 4 | Displays a window in its most recent size and position. The active window remains active. |
| SW_SHOWNORMAL | 1 | Activates and displays a window. If the window is minimized or maximized, Windows restores it to its original size and position. An application should specify this flag when displaying the window for the first time. |

| Return code | Description |
|---|---|
| 0 | The operating system is out of memory or resources. |
| ERROR_FILE_NOT_FOUND = 2 | The specified file was not found. |
| ERROR_PATH_NOT_FOUND = 3 | The specified path was not found. |
| ERROR_BAD_FORMAT = 11 | The .exe file is invalid (non-Win32 .exe or error in .exe image). |
| SE_ERR_ACCESSDENIED = 5 | The operating system denied access to the specified file. |
| SE_ERR_ASSOCINCOMPLETE = 27 | The file name association is incomplete or invalid. |
| SE_ERR_DDEBUSY = 30 | The DDE transaction could not be completed because other DDE transactions were being processed. |
| SE_ERR_DDEFAIL = 29 | The DDE transaction failed. |
| SE_ERR_DDETIMEOUT = 28 | The DDE transaction could not be completed because the request timed out. |
| SE_ERR_DLLNOTFOUND = 32 | The specified DLL was not found. |
| SE_ERR_FNF = 2 | The specified file was not found. |
| SE_ERR_NOASSOC = 31 | There is no application associated with the given file name extension. This error will also be returned if you attempt to print a file that is not printable. |
| SE_ERR_OOM = 8 | There was not enough memory to complete the operation. |
| SE_ERR_PNF = 3 | The specified path was not found. |
| SE_ERR_SHARE = 26 | A sharing violation occurred. |

## 194.11 module WindowsBitmapMBS

### 194.11.1 module WindowsBitmapMBS

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Windows bitmap handling module.
**Notes:** In this module we collect a few useful conversion functions for handling bitmap in Xojo.
Please contact us if you have idea for new function.
**Blog Entries**

- MBS Releases the MBS Xojo / Real Studio plug-ins in version 15.1

**Xojo Developer Magazine**

- 13.4, page 10: News

### 194.11.2 Methods

### 194.11.3 BitmapToDIB(HBitmap as Ptr, HPalette as Ptr = nil) as Ptr

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Converts a HBitmap to a HDIB.
**Notes:** HPalette is optional a color palette handle for images with 8 bit or less per pixel.

### 194.11.4 DeleteBitmap(HBitmap as Ptr)

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Frees a HDIB or HBITMAP.
**Notes:** You need to free the images you allocate to make sure memory is released.

### 194.11.5 DIBToBitmap(HDIB as Ptr, HPalette as Ptr = nil) as Ptr

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Converts a HDIB to HBitmap.
**Notes:** HPalette is optional a color palette handle for images with 8 bit or less per pixel.
Returns nil in case of no memory.

### 194.11.6 DuplicateHBitmap(HBitmap as Ptr, Width as Integer, Height as Integer) as Ptr

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Duplicates a bitmap handle.
**Notes:** Please use DeleteBitmap later to free bitmap.

### 194.11.7 HBitmapInfo(HBitmap as Ptr, byref Width as Integer, byref Height as Integer, byref WidthBytes as Integer, byref Planes as Integer, byref BitsPixel as Integer) as Boolean

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Queries details about a bitmap handle.
**Notes:** Returns true on success.

### 194.11.8 HBitmapToPicture(HBitmap as Ptr, UsingDraw as boolean = false) as Picture

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Converts a HBITMAP to Xojo picture.
**Notes:** If UsingDraw is true, the plugin creates a new HBitmap and draws picture inside.
Else if UsingDraw is false, the plugin copies picture and mask into a new picture.

UsingDraw with false works only for 24 or 32 bit images with one plane.
See also:

- 194.11.9 HBitmapToPicture(HBitmap as Ptr, Width as Integer, Height as Integer) as Picture 23151

### 194.11.9 HBitmapToPicture(HBitmap as Ptr, Width as Integer, Height as Integer) as Picture

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Converts a HBITMAP to Xojo picture.
**Notes:** Draws the HBitmap in a new picture of the given size.
This method can be used to resize the bitmap on the fly while drawing.
See also:

- 194.11.8 HBitmapToPicture(HBitmap as Ptr, UsingDraw as boolean = false) as Picture 23151

### 194.11.10 PictureToHBitmap(Pic as Picture) as Ptr

MBS Picture Plugin, Plugin Version: 15.1, Platform: Windows, Targets: All.

**Function:** Queries HBitmap of a picture.
**Notes:** As Xojo picture's are internally HBitmaps, the plugin returns the handle of the picture.
No copy is made and you should not free the image. If you need a copy, please use DuplicateHBitmap function.

Please use DeleteBitmap later to free bitmap.

# 194.12 class WindowsClipboardMBS

## 194.12.1 class WindowsClipboardMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The windows clipboard class.
**Notes:** Use it to access the clipboard on Windows.

Be aware that in the constructor we open the clipboard connection. Since Xojo may itself like to look into the clipboard to decide whether to enable copy & paste events, our clipboard connection may get taken or times out. Only one app at a time can have clipboard access.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr5
- MBS Xojo Plugins, version 17.4pr3
- Windows, Xojo and the Clipboard
- MBS Xojo / Real Studio Plugins, version 16.5pr4
- MBS Xojo / Real Studio Plugins, version 15.1pr7
- [ ANN ] MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.4
- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- Teaser: Clipboard classes

**Videos**

- Presentation from Munich conference about MBS Plugins.

**Xojo Developer Magazine**

- 15.6, page 9: News

## 194.12.2 Methods

## 194.12.3 Clear

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Clears the contents of the clipboard.

### 194.12.4 ClipboardFormats as Integer()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an array with all clipboard formats currently in the clipboard.

### 194.12.5 ClipboardSequenceNumber as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the clipboard sequence number for the current window station.
**Notes:** The return value is the clipboard sequence number. If you do not have WINSTA_ACCESSCLIPBOARD access to the window station, the function returns zero.

The system keeps a serial number for the clipboard for each window station. This number is incremented whenever the contents of the clipboard change or the clipboard is emptied. You can track this value to determine whether the clipboard contents have changed and optimize creating DataObjects. If clipboard rendering is delayed, the sequence number is not incremented until the changes are rendered.

### 194.12.6 Constructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Connects to the clipboard.
**Notes:** As the clipboard has exclusive access, do not keep WindowsClipboardMBS objects around. Best you only use them within a method so once the method ends, everything is released.

### 194.12.7 CountClipboardFormats as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the number of different data formats currently on the clipboard.
**Notes:** If the function succeeds, the return value is the number of different data formats currently on the clipboard.

If the function fails, the return value is zero.

### 194.12.8 Destructor

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Automatically closes the clipboard.

### 194.12.9 EnumClipboardFormats(format as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enumerates the data formats currently available on the clipboard.
**Notes:** Clipboard data formats are stored in an ordered list. To perform an enumeration of clipboard data formats, you make a series of calls to the EnumClipboardFormats function. For each call, the format parameter specifies an available clipboard format, and the function returns the next available clipboard format.

format: A clipboard format that is known to be available.

To start an enumeration of clipboard formats, set format to zero. When format is zero, the function retrieves the first available clipboard format. For subsequent calls during an enumeration, set format to the result of the previous EnumClipboardFormats call.

If the function succeeds, the return value is the clipboard format that follows the specified format, namely the next available clipboard format.

If the function fails, the return value is zero.
If there are no more clipboard formats to enumerate, the return value is zero.

You must open the clipboard before enumerating its formats. Use the OpenClipboard function to open the clipboard. The EnumClipboardFormats function fails if the clipboard is not open.

The EnumClipboardFormats function enumerates formats in the order that they were placed on the clipboard. If you are copying information to the clipboard, add clipboard objects in order from the most descriptive clipboard format to the least descriptive clipboard format. If you are pasting information from the clipboard, retrieve the first clipboard format that you can handle. That will be the most descriptive clipboard format that you can handle.

The system provides automatic type conversions for certain clipboard formats. In the case of such a format, this function enumerates the specified format, then enumerates the formats to which it can be converted. For more information, see Standard Clipboard Formats and Synthesized Clipboard Formats.

### 194.12.10 GetClipboardFormatName(format as Integer) as string

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves from the clipboard the name of the specified registered format. The function copies the name to the specified buffer.
**Example:**

```
// show items on clipboard

dim w as new WindowsClipboardMBS
dim types(-1) as integer = w.ClipboardFormats
dim names() as string

for each type as integer in types
dim n as string = w.GetClipboardFormatName(type)

n = str(type)+" "+n

names.append n
next

MsgBox Join(names,EndOfLine)
```

### 194.12.11 GetData(type as Integer) as string

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves data from the clipboard in a specified format.
**Notes:** Format: A clipboard format.

If the function succeeds, the return value is the string with the clipboard data in the specified format.

If the function fails, the return value is "".

An application can enumerate the available formats in advance by using the EnumClipboardFormats function.

### 194.12.12 GetDIB as Picture

MBS Win Plugin, Plugin Version: 17.4, Platform: Windows, Targets: Desktop only.

**Function:** Queries DIB picture on the clipboard.
**Notes:** Returns nil on any error.
This is using DIB type in clipboard for a Device Independent Bitmap.

Please use GetPicture for bitmap handles.

### 194.12.13 GetFiles as string()

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of file paths on the clipboard.
**Notes:** This is for working with Explorers copy & paste feature.

### 194.12.14 GetPicture as Picture

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop only.

**Function:** Queries bitmap on the clipboard.
**Notes:** Returns nil on any error.
This is using BITMAP type in clipboard for a bitmap handle.

Please use GetDIB for Device Independent Bitmap.

### 194.12.15 IsClipboardFormatAvailable(type as Integer) as boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Determines whether the clipboard contains data in the specified format.
**Notes:** type: A standard or registered clipboard format.

If the clipboard format is available, the return value is true.
If the clipboard format is not available, the return value is false.

Typically, an application that recognizes only one clipboard format would call this function when processing the EnableMenuItems event. The application would then enable or disable the Paste menu item, depending on the return value.

### 194.12.16 RegisterClipboardFormat(type as string) as Integer

MBS Win Plugin, Plugin Version: 13.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers a new clipboard format. This format can then be used as a valid clipboard format.
**Example:**

```
dim TypeHTML as Integer
dim TypeRTF as Integer

TypeHTML = WindowsClipboardMBS.RegisterClipboardFormat("HTML Format")
TypeRTF = WindowsClipboardMBS.RegisterClipboardFormat("Rich Text Format")
```

**Notes:** If the function succeeds, the return value identifies the registered clipboard format.
If the function fails, the return value is zero.

If a registered format with the specified name already exists, a new format is not registered and the return value identifies the existing format. This enables more than one application to copy and paste data using the same registered clipboard format. Note that the format name comparison is case-insensitive.
Registered clipboard formats are identified by values in the range &hC000 through &hFFFF.

### 194.12.17 SetData(type as Integer, rawData as string) as boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Places data on the clipboard in a specified clipboard format.
**Notes:** Format: The clipboard format. This parameter can be a registered format or any of the standard clipboard formats.
rawData: A string with the data in the specified format.

If the function succeeds, the return value is true.
If the function fails, the return value is false.

The system performs implicit data format conversions between certain clipboard formats when an application calls the GetClipboardData function. For example, if the kTypeOEMTEXT format is on the clipboard, a window can retrieve data in the kTypeTEXT format. The format on the clipboard is converted to the requested format on demand. For more information, see Synthesized Clipboard Formats.

### 194.12.18 SetDIB(pic as Picture) as boolean

MBS Win Plugin, Plugin Version: 17.4, Platform: Windows, Targets: Desktop only.

**Function:** Puts a DIB picture on the clipboard.
**Notes:** Returns true on success.
This is using DIB type in clipboard for a bitmap handle.

Please use SetPicture for Device Independent Bitmap.

### 194.12.19 SetFiles(paths() as string) as boolean

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Puts a list of file paths on the clipboard.
**Notes:** This is for working with Explorers copy & paste feature.
Returns true on success.
Folder paths may work better if they have no training backslash.

### 194.12.20 SetPicture(pic as Picture) as boolean

MBS Win Plugin, Plugin Version: 14.4, Platform: Windows, Targets: Desktop only.

**Function:** Puts a bitmap picture on the clipboard.
**Notes:** Returns true on success.
This is using BITMAP type in clipboard for a bitmap handle.

Please use SetDIB for Device Independent Bitmap.

### 194.12.21 Properties

### 194.12.22 Valid as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A flag whether the constructor got a clipboard connection.
**Notes:** (Read and Write property)

### 194.12.23 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kTypeBitmap | 2 | One of standard clipboard formats defined by the system.<br>A handle to a bitmap (HBITMAP). |
| kTypeDIB | 8 | One of standard clipboard formats defined by the system.<br>A memory object containing a BITMAPINFO structure followed by the bitmap bits. |
| kTypeDIBV5 | 17 | One of standard clipboard formats defined by the system.<br>A memory object containing a BITMAPV5HEADER structure followed by the bitmap color space information and the bitmap bits. |
| kTypeDIF | 5 | One of standard clipboard formats defined by the system.<br>Software Arts' Data Interchange Format. |
| kTypeENHMetaFile | 14 | One of standard clipboard formats defined by the system.<br>A handle to an enhanced metafile (HENHMETAFILE). |
| kTypeHDROP | 15 | One of standard clipboard formats defined by the system.<br>A handle to type HDROP that identifies a list of files. An application can retrieve information about the files by passing the handle to the DragQueryFile function. |
| kTypeLocale | 16 | One of standard clipboard formats defined by the system.<br>The data is a handle to the locale identifier associated with text in the clipboard. When you close the clipboard, if it contains kTypeText data but no kTypeLocale data, the system automatically sets the kTypeLocale format to the current input language. You can use the kTypeLocale format to associate a different locale with the clipboard text.<br>An application that pastes text from the clipboard can retrieve this format to determine which character set was used to generate the text.<br>Note that the clipboard does not support plain text in multiple character sets. To achieve this, use a formatted text data type such as RTF instead.<br>The system uses the code page associated with kTypeLocale to implicitly convert from kTypeText to kTypeUnicodeText. Therefore, the correct code page table is used for the conversion. |
| kTypeMetaFilePict | 3 | One of standard clipboard formats defined by the system.<br>Handle to a metafile picture format as defined by the METAFILEPICT structure. When passing a kTypeMetaFilePict handle by means of DDE, the application responsible for deleting hMem should also free the metafile referred to by the kTypeMetaFilePict handle. |
| kTypeOEMText | 7 | One of standard clipboard formats defined by the system.<br>Text format containing characters in the OEM character set. Each line ends with a carriage return/linefeed (CR-LF) combination. A null character signals the end of the data. |
| kTypePalette | 9 | One of standard clipboard formats defined by the system.<br>Handle to a color palette. Whenever an application places data in the clipboard that depends on or assumes a color palette, it should place the palette on the clipboard as well.<br>If the clipboard contains data in the kTypePalette (logical color palette) format, the application should use the SelectPalette and RealizePalette functions to realize (compare) any other data in the clipboard against that logical palette.<br>When displaying clipboard data, the clipboard always uses as its current palette any object on the clipboard that is in the kTypePalette format. |
| kTypePenData | 10 | One of standard clipboard formats defined by the system.<br>Data for the pen extensions to the Microsoft Windows for Pen Computing |
| kTypeRIFF | 11 | One of standard clipboard formats defined by the system.<br>Represents audio data more complex than can be represented in a CF_WAVE standard wave format. |
| kTypeSylk | 4 | One of standard clipboard formats defined by the system.<br>Microsoft Symbolic Link (SYLK) format. |
| kTypeText | 1 | One of standard clipboard formats defined by the system.<br>Text format. Each line ends with a carriage return/linefeed (CR-LF) combination. A null character signals the end of the data. Use this format for ANSI text. |

# 194.13 class WindowsDeviceMBS

## 194.13.1 class WindowsDeviceMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class is for device
**Example:**

```
dim devices(-1) as WindowsDeviceMBS = WindowsDeviceMBS.Devices
for each device as WindowsDeviceMBS in devices
msgbox device.Description
next
```

**Notes:** For Mac you can take a look on the MacUSBDeviceMBS class and the IORegistryMBS class.
See also WinUSBDeviceMBS and WinUSBMBS classes.
For cross platform development also check LibUSBDeviceMBS classes.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr7
- New MBS REALbasic Plugin Version 10.4
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11
- MacUSBDeviceMBS
- MBS REALbasic Plugins, version 10.4pr4

## 194.13.2 Methods

## 194.13.3 CompatibleIDs as string()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The list of compatible IDs for a device.
**Notes:** A device has only one device ID that is the most specific ID for a device. A device can also have less specific hardware IDs and compatible IDs. Windows first tries to find an INF file that matches the device ID. If it does not find such a match, Windows next tries to find a match to one of the less specific hardware IDs or compatible IDs.

### 194.13.4 Devices(ClassGUID as string, present as boolean = true) as WindowsDeviceMBS()

MBS Win Plugin, Plugin Version: 11.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all devices on the system matching the given Class GUID.
**Example:**

```
const PortsGUID = " { 4D36E978-E325-11CE-BFC1-08002BE10318 } "
dim devices(-1) as WindowsDeviceMBS = WindowsDeviceMBS.Devices(PortsGUID)
```

**Notes:** If present is true, only devices currently present on the system are returned.
The array is empty on any error.

| Class | { GUID } | Device Description |
|---|---|---|
| CDROM | { 4D36E965-E325-11CE-BFC1-08002BE10318 } | CD/DVD/Blu-ray drives |
| DiskDrive | { 4D36E967-E325-11CE-BFC1-08002BE10318 } | Hard drives |
| Display | { 4D36E968-E325-11CE-BFC1-08002BE10318 } | Video adapters |
| FDC | { 4D36E969-E325-11CE-BFC1-08002BE10318 } | Floppy controllers |
| FloppyDisk | { 4D36E980-E325-11CE-BFC1-08002BE10318 } | Floppy drives |
| HDC | { 4D36E96A-E325-11CE-BFC1-08002BE10318 } | Hard drive controllers |
| HIDClass | { 745A17A0-74D3-11D0-B6FE-00A0C90F57DA } | Some USB devices |
| 1394 | { 6BDD1FC1-810F-11D0-BEC7-08002BE2092F } | IEEE 1394 host controller |
| Image | { 6BDD1FC6-810F-11D0-BEC7-08002BE2092F } | Cameras and scanners |
| Keyboard | { 4D36E96B-E325-11CE-BFC1-08002BE10318 } | Keyboards |
| Modem | { 4D36E96D-E325-11CE-BFC1-08002BE10318 } | Modems |
| Mouse | { 4D36E96F-E325-11CE-BFC1-08002BE10318 } | Mice and pointing devices |
| Media | { 4D36E96C-E325-11CE-BFC1-08002BE10318 } | Audio and video devices |
| Net | { 4D36E972-E325-11CE-BFC1-08002BE10318 } | Network adapters |
| Ports | { 4D36E978-E325-11CE-BFC1-08002BE10318 } | Serial and parallel ports |
| SCSIAdapter | { 4D36E97B-E325-11CE-BFC1-08002BE10318 } | SCSI and RAID controllers |
| System | { 4D36E97D-E325-11CE-BFC1-08002BE10318 } | System buses, bridges, etc. |
| USB | { 36FC9E60-C465-11CF-8056-444553540000 } | USB host controllers and hubs |

See also:

- 194.13.5 Devices(present as boolean = true) as WindowsDeviceMBS() 23162

### 194.13.5 Devices(present as boolean = true) as WindowsDeviceMBS()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all devices on the system.
**Notes:** If present is true, only devices currently present on the system are returned.
The array is empty on any error.
See also:

- 194.13.4 Devices(ClassGUID as string, present as boolean = true) as WindowsDeviceMBS() 23162

### 194.13.6 HardwareID as string()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The list of hardware IDs for a device.

### 194.13.7 LocationPaths as string()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location of the device in the device tree.
**Notes:** Windows Server 2003 and later.

### 194.13.8 LowerFilters as string()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The names of a device's lower-filter drivers.

### 194.13.9 UpperFilters as string()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The names of a device's upper filter drivers.

### 194.13.10 Properties

### 194.13.11 Address as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's address.
**Notes:** (Read and Write property)

### 194.13.12 BusNumber as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's bus number.
**Notes:** (Read and Write property)

### 194.13.13 BusTypeGUID as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GUID for the device's bus type.
**Notes:** (Read and Write property)

### 194.13.14 Capabilities as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device capabilities.
**Notes:** A combination of the kDeviceCapability* constants.
(Read and Write property)

### 194.13.15 Characteristics as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device characteristics.
**Notes:** (Read and Write property)

### 194.13.16 ClassGUID as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GUID that represents the device setup class of a device.
**Notes:** (Read and Write property)

### 194.13.17 ClassName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device setup class of a device.
**Notes:** (This property should be named Class, but was renamed ClassName as Class is a reserved word in Xojo)

(Read and Write property)

### 194.13.18 ConfigFlags as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's configuration flags.
**Notes:** (Read and Write property)

### 194.13.19 Description as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The description of a device.
**Notes:** Maybe localized.
(Read and Write property)

### 194.13.20 DeviceID as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** If a device is associated with this device entry, here you have the ID string for this device.
**Notes:** (Read and Write property)

### 194.13.21 DevicePath as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For devices with device ID, this is the device path.
**Notes:** (Read and Write property)

### 194.13.22 DeviceType as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's type.
**Notes:** See kDeviceType* constants.
(Read and Write property)

### 194.13.23 Driver as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that identifies the device's software key (sometimes called the driver key).
**Notes:** (Read and Write property)

### 194.13.24 EnumeratorName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The string that contains the name of the device's enumerator.
**Notes:** (Read and Write property)

### 194.13.25 Exclusive as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether a user can obtain exclusive use of the device.
**Notes:** The value is true if exclusive use is allowed, or false otherwise.
(Read and Write property)

### 194.13.26 FriendlyName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The friendly name of a device.
**Notes:** (Read and Write property)

### 194.13.27 HID as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the plugin found additional HID details on the device.
**Notes:** (Read and Write property)

### 194.13.28 HIDAccessible as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the plugin was able to access the device and query the properties.
**Notes:** HIDAccessible is true if and only if HID is also true.
(Read and Write property)

### 194.13.29 HIDFeatureReportByteLength as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length of the HID feature reports for this USB HID device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.30 HIDInputReportByteLength as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length of the HID input reports for this USB HID device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.31 HIDManufacturerName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The manufacturer name for this device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.32 HIDOutputReportByteLength as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The length of the HID output reports for this USB HID device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.33 HIDProductID as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product ID for this USB device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.34 HIDProductName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product name for this HID Device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.35 HIDSerialNumber as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number for this USB device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.36 HIDVendorID as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vendor ID for this USB device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.37 HIDVersionNumber as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The version number for this HID Device.
**Notes:** Only valid if HID and HIDAccessible are true.
(Read and Write property)

### 194.13.38 InstallState as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The install state of this device.
**Notes:** See kInstallState* constants.
(Read and Write property)

### 194.13.39 LegacyBusType as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's legacy bus type.
**Notes:** (Read and Write property)

### 194.13.40 LocationInformation as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The hardware location of a device.
**Notes:** (Read and Write property)

### 194.13.41 Manufacturer as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the device manufacturer.
**Notes:** (Read and Write property)

### 194.13.42 PhysicalDeviceObjectName as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name that is associated with the device's PDO.
**Notes:** (Read and Write property)

### 194.13.43 RemovalPolicy as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's current removal policy.
**Notes:** Windows XP and later
(Read and Write property)

### 194.13.44 RemovalPolicyHWDefault as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's hardware-specified default removal policy.
**Notes:** Windows XP and later
(Read and Write property)

### 194.13.45 RemovalPolicyOverride as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's override removal policy (if it exists) from the registry.
**Notes:** Windows XP and later
(Read and Write property)

### 194.13.46 SecurityDescriptor as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device's security descriptor.
**Notes:** The format of security descriptor strings is described in Microsoft Windows SDK documentation.
(Read and Write property)

### 194.13.47 Service as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The service name for a device.
**Notes:** (Read and Write property)

### 194.13.48 UINumber as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The UINumber.
**Notes:** Specifies a number associated with the device that can be displayed in the user interface.

This number is typically a user-perceived slot number, such as a number printed next to the slot on the board, or some other number that makes locating the physical device easier for the user. For buses with no such convention, or when the UINumber is unknown, the bus driver leaves this member at its default value

of -1.
(Read and Write property)

### 194.13.49 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDeviceCapabilityDockDevice | 8 | One of the capabilities constants. Dock Device |
| kDeviceCapabilityEjectSupported | 2 | One of the capabilities constants. Eject Supported |
| kDeviceCapabilityHardwareDisabled | 256 | One of the capabilities constants. Hardware Disabled |
| kDeviceCapabilityLockSupported | 1 | One of the capabilities constants. Lock Supported |
| kDeviceCapabilityNonDynamic | 512 | One of the capabilities constants. Non Dynamic |
| kDeviceCapabilityRAWDeviceOK | 64 | One of the capabilities constants. Raw Device OK |
| kDeviceCapabilityRemovable | 4 | One of the capabilities constants. Removable |
| kDeviceCapabilitySilentInstall | 32 | One of the capabilities constants. Silent Install |
| kDeviceCapabilitySurpriseRemovalOK | 128 | One of the capabilities constants. Surprise Removal OK |
| kDeviceCapabilityUniqueID | 16 | One of the capabilities constants. Unique ID |
| kDeviceType8042Port | &h27 | One of the device type constants. |
| kDeviceTypeACPI | &h32 | One of the device type constants. |
| kDeviceTypeBattery | &h29 | One of the device type constants. |
| kDeviceTypeBeep | &h01 | One of the device type constants. |
| kDeviceTypeBusExtender | &h2a | One of the device type constants. |
| kDeviceTypeCDROM | &h02 | One of the device type constants. |
| kDeviceTypeCDROWFileSystem | &h03 | One of the device type constants. |
| kDeviceTypeChanger | &h30 | One of the device type constants. |
| kDeviceTypeController | &h04 | One of the device type constants. |
| kDeviceTypeDataLink | &h05 | One of the device type constants. |
| kDeviceTypeDFS | &h06 | One of the device type constants. |
| kDeviceTypeDFSFileSystem | &h35 | One of the device type constants. |
| kDeviceTypeDFSVolume | &h36 | One of the device type constants. |
| kDeviceTypeDisk | &h07 | One of the device type constants. |
| kDeviceTypeDiskFileSystem | &h08 | One of the device type constants. |
| kDeviceTypeDVD | &h33 | One of the device type constants. |
| kDeviceTypeFileSystem | &h09 | One of the device type constants. |
| kDeviceTypeFips | &h3a | One of the device type constants. |
| kDeviceTypeFullscreenVideo | &h34 | One of the device type constants. |
| kDeviceTypeInportPort | &h0a | One of the device type constants. |
| kDeviceTypeKeyboard | &h0b | One of the device type constants. |
| kDeviceTypeKS | &h2f | One of the device type constants. |
| kDeviceTypeKSec | &h39 | One of the device type constants. |
| kDeviceTypeMailslot | &h0c | One of the device type constants. |
| kDeviceTypeMassStorage | &h2d | One of the device type constants. |
| kDeviceTypeMidiIn | &h0d | One of the device type constants. |
| kDeviceTypeMidiOut | &h0e | One of the device type constants. |
| kDeviceTypeModem | &h2b | One of the device type constants. |
| kDeviceTypeMouse | &h0f | One of the device type constants. |
| kDeviceTypeMultiUncProvider | &h10 | One of the device type constants. |
| kDeviceTypeNamedPipe | &h11 | One of the device type constants. |
| kDeviceTypeNetwork | &h12 | One of the device type constants. |
| kDeviceTypeNetworkBrowser | &h13 | One of the device type constants. |
| kDeviceTypeNetworkFileSystem | &h14 | One of the device type constants. |
| kDeviceTypeNetworkRedirector | &h28 | One of the device type constants. |
| kDeviceTypeNull | &h15 | One of the device type constants. |
| kDeviceTypeParallelPort | &h16 | One of the device type constants. |
| kDeviceTypePhysicalNetcard | &h17 | One of the device type constants. |

# 194.14 class WindowsDiscInfoMBS

## 194.14.1 class WindowsDiscInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to query details on a disc drive on Windows.
**Example:**

```
dim discs(-1) as WindowsDiscInfoMBS = WindowsDiscInfoMBS.Devices

for each disc as WindowsDiscInfoMBS in discs
MsgBox disc.ModelNumber
next
```

**Blog Entries**

- MBS Xojo Plugins, version 17.5pr8
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr4

## 194.14.2 Methods

## 194.14.3 Device(file as folderitem) as WindowsDiscInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the device with the given path.
**Example:**

```
// volume(0) is boot volume
dim disc as WindowsDiscInfoMBS = WindowsDiscInfoMBS.Device(volume(0))
```

**Notes:** Returns nil on any error (like missing permissions).
Seems like on Windows Vista/7 you need admin rights to query this.
The path of the folderitem must be something starting with a drive letter.
See also:

- 194.14.4 Device(path as string) as WindowsDiscInfoMBS 23174

### 194.14.4 Device(path as string) as WindowsDiscInfoMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the device with the given path.
**Example:**

```
dim disc as WindowsDiscInfoMBS = WindowsDiscInfoMBS.Device("C")
```

**Notes:** Returns nil on any error (like missing permissions).
Seems like on Windows Vista/7 you need admin rights to query this.
Path must be something starting with a drive letter.
See also:

- 194.14.3 Device(file as folderitem) as WindowsDiscInfoMBS 23173

### 194.14.5 Devices() as WindowsDiscInfoMBS()

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the device list.
**Example:**

```
// enumerate all drives
dim discs(-1) as WindowsDiscInfoMBS = WindowsDiscInfoMBS.Devices
```

**Notes:** Returns empty array on error.
May get more information on Windows Vista/7 if application runs as administrator.

### 194.14.6 Properties

### 194.14.7 BufferSize as Int64

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The buffer size of the disc controller.
**Notes:** This value is set if Mode contains 1.
(Read only property)

### 194.14.8 BytesPerSector as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of bytes per sector.
**Notes:** This value is set if Mode contains 4.
Typically 512 bytes, but that can increase in the future.
(Read and Write property)

### 194.14.9 Drive as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The drive number.
**Notes:** (Read and Write property)

### 194.14.10 Fixed as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this device is fixed.
**Notes:** This value is set if Mode contains 1 or 4.
(Read and Write property)

### 194.14.11 Mode as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This value shows which properties of the instance have been set with values.
**Notes:** Mode is a bitwise or combination of values 1, 2 or 4. So value is 6 if mode 2 and 4 are set. You can test with bitwiseand(mode,mask). For example if bitwiseAnd(mode,4)=4 then BytesPerSector is valid.
(Read and Write property)

### 194.14.12 ModelNumber as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The model number string for this device.
**Example:**

```
dim discs(-1) as WindowsDiscInfoMBS = WindowsDiscInfoMBS.Devices
```

```
for each disc as WindowsDiscInfoMBS in discs
MsgBox disc.ModelNumber
next
```

**Notes:** This string is not available for all discs.
This value is set if Mode contains 1 or 2.
(Read and Write property)

### 194.14.13 ProductRevision as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product revision string.
**Notes:** This string is not available for all discs.
This value is set if Mode contains 2.
(Read and Write property)

### 194.14.14 Removable as Boolean

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this device is removable.
**Notes:** This value is set if Mode contains 1 or 4.
(Read and Write property)

### 194.14.15 RevisionNumber as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The revision number of the disc.
**Notes:** This string is not available for all discs.
This value is set if Mode contains 1.
(Read and Write property)

### 194.14.16 SectorsPerTrack as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of sectors per track.
**Notes:** This value is set if Mode contains 4.

(Read and Write property)

### 194.14.17 SerialNumber as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the device.
**Notes:** This string is not available for all discs.
This value is set if Mode contains 1 or 2.
(Read and Write property)

### 194.14.18 Size as Int64

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of this disc in bytes.
**Notes:** This value is set if Mode contains 1 or 4.
(Read only property)

### 194.14.19 TracksPerCylinder as Integer

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of tracks per cylinder.
**Notes:** This value is set if Mode contains 4.
(Read and Write property)

### 194.14.20 VendorId as String

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vendor ID of the disc.
**Notes:** This value is set if Mode contains 2.
This string is not available for all discs.
(Read and Write property)

## 194.15 class WindowsDisplayMBS

### 194.15.1 class WindowsDisplayMBS

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for details on displays.
**Blog Entries**

- MBS Xojo Plugins, version 23.2pr1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.1
- MBS Xojo Plugins, version 18.1pr6
- MBS Xojo Plugins, version 18.1pr1

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 194.15.2 Methods

### 194.15.3 Displays as WindowsDisplayMBS()

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of displays.
**Notes:** Returns nil in case of error.

### 194.15.4 Properties

### 194.15.5 DeviceInstanceID as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device instance ID in setup database.
**Notes:** (Read only property)

### 194.15.6 DeviceName as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device name of display.
**Notes:** (Read only property)

### 194.15.7 DisplayAdapterActive as Boolean

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether a monitor is presented as being "on" by the respective GDI view.
**Notes:** (Read only property)

### 194.15.8 DisplayAdapterDeviceID as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device ID for the display adapter.
**Notes:** (Read only property)

### 194.15.9 DisplayAdapterDeviceKey as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The display adapter device key.
**Notes:** (Read only property)

### 194.15.10 DisplayAdapterDeviceName as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The adapter device name.
**Notes:** (Read only property)

### 194.15.11 DisplayAdapterDeviceString as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device context string.
**Notes:** This is a description of the display adapter.
(Read only property)

### 194.15.12 DisplayAdapterRemovable as Boolean

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device is removable; it cannot be the primary display.
**Notes:** (Read only property)

### 194.15.13 DisplayAdapterStateFlags as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The state flags.
**Notes:** (Read only property)

### 194.15.14 DisplayMonitorActive as Boolean

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether a monitor is presented as being "on" by the respective GDI view.
**Notes:** (Read only property)

### 194.15.15 DisplayMonitorDeviceID as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device ID for the display monitor.
**Notes:** (Read only property)

### 194.15.16 DisplayMonitorDeviceKey as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The display monitor device key.
**Notes:** (Read only property)

### 194.15.17 DisplayMonitorDeviceName as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The monitor device name.
**Notes:** (Read only property)

### 194.15.18 DisplayMonitorDeviceString as String

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device context string.
**Notes:** This is a description of the display monitor.
(Read only property)

### 194.15.19 DisplayMonitorRemovable as Boolean

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device is removable; it cannot be the primary display.
**Notes:** (Read only property)

### 194.15.20 DisplayMonitorStateFlags as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The state flags.
**Notes:** (Read only property)

### 194.15.21 Height as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the display in pixels.
**Notes:** (Read only property)

### 194.15.22 HeightDPI as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DPI for the display.
**Notes:** Calculated based on HeightInch property.
Value is zero if we don't know.

(Read only property)

### 194.15.23 HeightInch as Double

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The physical height of the screen in inches.
**Notes:** Value is zero if we don't know.
(Read only property)

### 194.15.24 HeightMM as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The physical height of the screen in millimeters.
**Notes:** Value is zero if we don't know.
(Read only property)

### 194.15.25 LogPixelsX as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of pixels per logical inch along the screen width.
**Notes:** In a system with multiple display monitors, this value is the same for all monitors.

e.g. 200% is 96 * 2 = 192
(Read only property)

### 194.15.26 LogPixelsY as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of pixels per logical inch along the screen height.
**Notes:** In a system with multiple display monitors, this value is the same for all monitors.

e.g. 200% is 96 * 2 = 192
(Read only property)

### 194.15.27 MonitorHandle as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for the monitor.
**Notes:** (Read only property)

### 194.15.28 MonitorHeight as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The monitor height.
**Notes:** (Read only property)

### 194.15.29 MonitorWidth as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The monitor width.
**Notes:** (Read only property)

### 194.15.30 MonitorX as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The position of monitor.
**Notes:** The display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read only property)

### 194.15.31 MonitorY as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The position of monitor.
**Notes:** The display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read only property)

### 194.15.32 Primary as Boolean

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this is primary display.
**Notes:** (Read only property)

### 194.15.33 Width as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the display in pixels.
**Notes:** (Read only property)

### 194.15.34 WidthDPI as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DPI for the display.
**Notes:** Calculated based on WidthInch property.
Value is zero if we don't know.
(Read only property)

### 194.15.35 WidthInch as Double

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The physical width of the screen in inches.
**Notes:** Value is zero if we don't know.
(Read only property)

### 194.15.36 WidthMM as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The physical width of the screen in millimeters.
**Notes:** Value is zero if we don't know.
(Read only property)

### 194.15.37 WorkHeight as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The work area height in pixels.
**Notes:** (Read only property)

### 194.15.38 WorkWidth as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The work area width in pixels.
**Notes:** (Read only property)

### 194.15.39 WorkX as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The work area position.
**Notes:** The work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area in rcMonitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read only property)

### 194.15.40 WorkY as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The work area position.
**Notes:** The work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area in rcMonitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read only property)

### 194.15.41 X as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The position of the display in the virtual desktop space.
**Notes:** Primary display is always at 0/0.

(Read only property)

### 194.15.42 Y as Integer

MBS Win Plugin, Plugin Version: 18.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The position of the display in the virtual desktop space.
**Notes:** Primary display is always at 0/0.
(Read only property)

# 194.16 class WindowsFileCopyMBS

## 194.16.1 class WindowsFileCopyMBS

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to help you copying files on Windows using system functions.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Xojo Plugins, version 19.6pr3
- MBS Xojo Plugins, version 18.1pr1
- MBS Xojo Plugins, version 17.6pr2
- Tip of day: Move file/folder to trash
- MBS Real Studio Plugins, version 12.4pr3
- Tip of the day: Move to trash

## 194.16.2 Methods

## 194.16.3 CopyFileEx(ExistingFileName as folderitem, NewFileName as folderitem, Flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies an existing file to a new file, notifying the application of its progress through the progress event.
**Notes:** Returns true on success and false on failure.

ExistingFileName: The name of an existing file.
NewFileName: The name of the new file.
Flags: Flags that specify how the file is to be copied. This parameter can be a combination of the CopyFile* constants.
See also:

- 194.16.4 CopyFileEx(ExistingFileName as String, NewFileName as String, Flags as Integer) as boolean 23187

## 194.16.4 CopyFileEx(ExistingFileName as String, NewFileName as String, Flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies an existing file to a new file, notifying the application of its progress through the progress event.
**Notes:** Returns true on success and false on failure.

ExistingFileName: The name of an existing file.
NewFileName: The name of the new file.
Flags: Flags that specify how the file is to be copied. This parameter can be a combination of the CopyFile* constants.
See also:

- 194.16.3 CopyFileEx(ExistingFileName as folderitem, NewFileName as folderitem, Flags as Integer) as boolean 23187

### 194.16.5 CopyFileSimple(ExistingFileName as folderitem, NewFileName as folderitem, FailIfExists as boolean=false) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies an existing file to a new file.
**Notes:** ExistingFileName: The name of an existing file.
NewFileName: The name of the new file.
FailIfExists: If this parameter is true and the new file specified by NewFileName already exists, the function fails. If this parameter is false and the new file already exists, the function overwrites the existing file and succeeds.

Returns true on success and false on failure.
See also:

- 194.16.6 CopyFileSimple(ExistingFileName as String, NewFileName as String, FailIfExists as boolean=false) as boolean 23188

### 194.16.6 CopyFileSimple(ExistingFileName as String, NewFileName as String, FailIfExists as boolean=false) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies an existing file to a new file.
**Notes:** ExistingFileName: The name of an existing file.
NewFileName: The name of the new file.
FailIfExists: If this parameter is true and the new file specified by NewFileName already exists, the function fails. If this parameter is false and the new file already exists, the function overwrites the existing file and succeeds.

Returns true on success and false on failure.
See also:

- 194.16.5 CopyFileSimple(ExistingFileName as folderitem, NewFileName as folderitem, FailIfExists as boolean=false) as boolean 23188

### 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192

- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197


### 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197


### 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197


### 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197


### 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.

Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197

### 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197

### 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190
- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193

- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23197


### 194.16.14 FileOperationCopy(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copy the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.7 FileOperationCopy(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23189
- 194.16.8 FileOperationCopy(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23190

- 194.16.9 FileOperationCopy(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23191
- 194.16.10 FileOperationCopy(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23192
- 194.16.11 FileOperationCopy(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23193
- 194.16.12 FileOperationCopy(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23194
- 194.16.13 FileOperationCopy(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23196


### 194.16.15 FileOperationDelete(file as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes files and folders.
**Example:**

```
dim w as new WindowsFileCopyMBS

dim f as FolderItem = SpecialFolder.Desktop.Child("test.test")

if w.FileOperationDelete(f, 0, "Hello") then
MsgBox "OK"
else
MsgBox "Failed "+str(w.Lasterror)
end if
```

**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.
See also:


- 194.16.16 FileOperationDelete(filepathes as string, Flags as Integer, ProgressTitle as string="") as boolean 23199
- 194.16.17 FileOperationDelete(filepathes() as string, Flags as Integer, ProgressTitle as string="") as boolean 23199

- 194.16.18 FileOperationDelete(files() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200


### 194.16.16 FileOperationDelete(filepathes as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes files and folders.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.
See also:


- 194.16.15 FileOperationDelete(file as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23198
- 194.16.17 FileOperationDelete(filepathes() as string, Flags as Integer, ProgressTitle as string="") as boolean 23199
- 194.16.18 FileOperationDelete(files() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200


### 194.16.17 FileOperationDelete(filepathes() as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes files and folders.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.
See also:


- 194.16.15 FileOperationDelete(file as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23198
- 194.16.16 FileOperationDelete(filepathes as string, Flags as Integer, ProgressTitle as string="") as boolean 23199

- 194.16.18 FileOperationDelete(files() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200


### 194.16.18 FileOperationDelete(files() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes files and folders.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.
See also:


- 194.16.15 FileOperationDelete(file as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23198
- 194.16.16 FileOperationDelete(filepathes as string, Flags as Integer, ProgressTitle as string="") as boolean 23199
- 194.16.17 FileOperationDelete(filepathes() as string, Flags as Integer, ProgressTitle as string="") as boolean 23199


### 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position.
Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208


### 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.

Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208

### 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208

### 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206

- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208


### 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201

- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208


### 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208


### 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position. Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member

specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:


- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean 23208


### 194.16.26 FileOperationMove(source() as string, dest() as string, Flags as Integer, ProgressTitle as string="") as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Move the files specified in the source parameter to the location specified in the dest parameter.
**Notes:** This method has several varations so you can call it with a folderitem or a string to specify a file or folder. You can also pass an array of folderitems or strings to delete several files/folders in one operation.

source:
These names should be fully-qualified paths to prevent unexpected results.
Standard Microsoft MS-DOS wildcard characters, such as "*", are permitted only in the file-name position.
Using a wildcard character elsewhere in the string will lead to unpredictable results.

dest:
The destination file or directory name. Wildcard characters are not allowed. Their use will lead to unpredictable results.

Copy and Move operations can specify destination directories that do not exist. In those cases, the system attempts to create them and normally displays a dialog box to ask the user if they want to create the new directory. To suppress this dialog box and have the directories created silently, set the FileOperationNoConfirmationMkDir flag in Flags.
For Copy and Move operations, the buffer can contain multiple destination file names if the fFlags member specifies FileOperationMultiDestFiles.
Use fully-qualified paths. Using relative paths is not prohibited, but can have unpredictable results.

Use the FileOperation* constants for the flags.
If a dialog is displayed, the window used in the parent property is used for the parent window.
If ProgressTitle is not empty, this string is used to specify the progress window title text.

Returns true on success and false on failure.
See also:

- 194.16.19 FileOperationMove(source as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23200
- 194.16.20 FileOperationMove(source as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23201
- 194.16.21 FileOperationMove(source as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23202
- 194.16.22 FileOperationMove(source() as folderitem, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23204
- 194.16.23 FileOperationMove(source() as folderitem, dest() as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23205
- 194.16.24 FileOperationMove(source() as string, dest as folderitem, Flags as Integer, ProgressTitle as string="") as boolean 23206
- 194.16.25 FileOperationMove(source() as string, dest as string, Flags as Integer, ProgressTitle as string="") as boolean 23207

### 194.16.27 MoveFileSimple(ExistingFileName as folderitem, NewFileName as folderitem) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves an existing file or a directory, including its children.
**Notes:** ExistingFileName:The current name of the file or directory on the local computer.

NewFileName: The new name for the file or directory. The new name must not already exist. A new file may be on a different file system or drive. A new directory must be on the same drive.

Returns true on success and false on failure.

The MoveFile function will move (rename) either a file or a directory (including its children) either in the same directory or across directories. The one caveat is that the MoveFile function will fail on directory moves when the destination is on a different volume.

If a file is moved across volumes, MoveFile does not move the security descriptor with the file. The file will be assigned the default security descriptor in the destination directory.

The MoveFile function coordinates its operation with the link tracking service, so link sources can be tracked as they are moved.
See also:


- 194.16.28 MoveFileSimple(ExistingFileName as String, NewFileName as String) as boolean 23210


### 194.16.28 MoveFileSimple(ExistingFileName as String, NewFileName as String) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves an existing file or a directory, including its children.
**Notes:** ExistingFileName:The current name of the file or directory on the local computer.

NewFileName: The new name for the file or directory. The new name must not already exist. A new file may be on a different file system or drive. A new directory must be on the same drive.

Returns true on success and false on failure.

The MoveFile function will move (rename) either a file or a directory (including its children) either in the same directory or across directories. The one caveat is that the MoveFile function will fail on directory moves when the destination is on a different volume.

If a file is moved across volumes, MoveFile does not move the security descriptor with the file. The file will be assigned the default security descriptor in the destination directory.

The MoveFile function coordinates its operation with the link tracking service, so link sources can be tracked as they are moved.
See also:

- 194.16.27 MoveFileSimple(ExistingFileName as folderitem, NewFileName as folderitem) as boolean 23209

### 194.16.29 MoveFileWithProgress(ExistingFileName as folderitem, NewFileName as folderitem, Flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves a file or directory, including its children.
**Notes:** ExistingFileName: The name of the existing file or directory on the local computer.

If Flags specifies MOVEFILE_DELAY_UNTIL_REBOOT, the file cannot exist on a remote share because delayed operations are performed before the network is available.

NewFileName: The new name of the file or directory on the local computer.

When moving a file, NewFileName can be on a different file system or volume. If NewFileName is on another drive, you must set the MOVEFILE_COPY_ALLOWED flag in Flags.

When moving a directory, ExistingFileName and NewFileName must be on the same drive.

If Flags specifies MOVEFILE_DELAY_UNTIL_REBOOT and NewFileName is nil, MoveFileWithProgress registers ExistingFileName to be deleted when the system restarts. The function fails if it cannot access the registry to store the information about the delete operation. If ExistingFileName refers to a directory, the system removes the directory at restart only if the directory is empty.

Flags: The move options. This parameter can be one or more of the following values: MoveFileCopyAllowed, MoveFileReplaceExisting, MoveFileCreateHardLink, MoveFileDelayUntilReboot and MoveFileWriteThrough.

Return Value: If the function succeeds, the return value is true. If the function fails, the return value is false.

When moving a file across volumes, if the Progress event returns PROGRESS_CANCEL due to the user canceling the operation, MoveFileWithProgress will return zero and GetLastError will return ERROR_REQUEST_ABORTED. The existing file is left intact.

When moving a file across volumes, if the Progress event returns PROGRESS_STOP due to the user stopping the operation, MoveFileWithProgress will return zero and GetLastError will return ERROR_REQUEST_ABORTED. The existing file is left intact.
See also:

- 194.16.30 MoveFileWithProgress(ExistingFileName as String, NewFileName as String, Flags as Integer) as boolean 23212

### 194.16.30 MoveFileWithProgress(ExistingFileName as String, NewFileName as String, Flags as Integer) as boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves a file or directory, including its children.
**Notes:** ExistingFileName: The name of the existing file or directory on the local computer.

If Flags specifies MOVEFILE_DELAY_UNTIL_REBOOT, the file cannot exist on a remote share because delayed operations are performed before the network is available.

NewFileName: The new name of the file or directory on the local computer.

When moving a file, NewFileName can be on a different file system or volume. If NewFileName is on another drive, you must set the MOVEFILE_COPY_ALLOWED flag in Flags.

When moving a directory, ExistingFileName and NewFileName must be on the same drive.

If Flags specifies MOVEFILE_DELAY_UNTIL_REBOOT and NewFileName is "", MoveFileWithProgress registers ExistingFileName to be deleted when the system restarts. The function fails if it cannot access the registry to store the information about the delete operation. If ExistingFileName refers to a directory, the system removes the directory at restart only if the directory is empty.

Flags: The move options. This parameter can be one or more of the following values: MoveFileCopyAllowed, MoveFileReplaceExisting, MoveFileCreateHardLink, MoveFileDelayUntilReboot and MoveFileWriteThrough.

Return Value: If the function succeeds, the return value is true. If the function fails, the return value is false.

When moving a file across volumes, if the Progress event returns PROGRESS_CANCEL due to the user canceling the operation, MoveFileWithProgress will return zero and GetLastError will return ERROR_REQUEST_ABORTED. The existing file is left intact.

When moving a file across volumes, if the Progress event returns PROGRESS_STOP due to the user stopping the operation, MoveFileWithProgress will return zero and GetLastError will return ERROR_REQUEST_ABORTED. The existing file is left intact.
See also:

- 194.16.29 MoveFileWithProgress(ExistingFileName as folderitem, NewFileName as folderitem, Flags as Integer) as boolean 

### 194.16.31 Properties

### 194.16.32 Lasterror as Integer

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** This value is typically zero on success and -1 if the function is not supported by the plugin.

The FileOperation* functions have special error codes as following, but other methods have normal Windows Error codes:

| | | |
|---|---|---|
| DE_SAMEFILE | = &h71 | The source and destination files are the same file. |
| DE_MANYSRC1DEST | = &h72 | Multiple file paths were specified in the source buffer, but only one destination file path. |
| DE_DIFFDIR | = &h73 | Rename operation was specified but the destination path is a different directory. Use the move operation instead. |
| DE_ROOTDIR | = &h74 | The source is a root directory, which cannot be moved or renamed. |
| DE_OPCANCELLED | = &h75 | The operation was cancelled by the user, or silently cancelled if the appropriate flags were supplied to SHFileOperation. |
| DE_DESTSUBTREE | = &h76 | The destination is a subtree of the source. |
| DE_ACCESSDENIEDSRC | = &h78 | Security settings denied access to the source. |
| DE_PATHTOODEEP | = &h79 | The source or destination path exceeded or would exceed MAX_PATH. |
| DE_MANYDEST | = &h7A | The operation involved multiple destination paths, which can fail in the case of a move operation. |
| DE_INVALIDFILES | = &h7C | The path in the source or destination or both was invalid. |
| DE_DESTSAMETREE | = &h7D | The source and destination have the same parent folder. |
| DE_FLDDESTISFILE | = &h7E | The destination path is an existing file. |
| DE_FILEDESTISFLD | = &h80 | The destination path is an existing folder. |
| DE_FILENAMETOOLONG | = &h81 | The name of the file exceeds MAX_PATH. |
| DE_DEST_IS_CDROM | = &h82 | The destination is a read-only CD-ROM, possibly unformatted. |
| DE_DEST_IS_DVD | = &h83 | The destination is a read-only DVD, possibly unformatted. |
| DE_DEST_IS_CDRECORD | = &h84 | The destination is a writable CD-ROM, possibly unformatted. |
| DE_FILE_TOO_LARGE | = &h85 | The file involved in the operation is too large for the destination media or file system. |
| DE_SRC_IS_CDROM | = &h86 | The source is a read-only CD-ROM, possibly unformatted. |
| DE_SRC_IS_DVD | = &h87 | The source is a read-only DVD, possibly unformatted. |
| DE_SRC_IS_CDRECORD | = &h88 | The source is a writable CD-ROM, possibly unformatted. |
| DE_ERROR_MAX | = &hB7 | MAX_PATH was exceeded during the operation. |
| UnknownError | = &h402 | An unknown error occurred. This is typically due to an invalid path in the source or destination. This error does not occur on Windows Vista and later. |
| ERRORONDEST | = &h10000 | An unspecified error occurred on the destination. |
| DE_ROOTDIR \| ERRORONDEST | = &h10074 | Destination is a root directory and cannot be renamed. |

(Read and Write property)

### 194.16.33 MultiThreaded as Boolean

MBS Win Plugin, Plugin Version: 12.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to use helper thread for better GUI responsiveness.
**Notes:** This property allows you to call this method in a Thread. The plugin will perform the actual operation on a helper thread, so it does not block Xojo's threading. Your GUI can continue to run this way. Progress event fires asynchronously.
(Read and Write property)

### 194.16.34 OperationsAborted as Boolean

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This flag is set by the FileOperation method to indicate whether the operation was aborted.
**Notes:** (Read and Write property)

### 194.16.35 Parent as Variant

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: Desktop only.

**Function:** The parent window for the FileOperation methods.
**Notes:** Can reference a Window or DesktopWindow object.
(Read and Write property)

### 194.16.36 Events

### 194.16.37 Progress(TotalFileSize as int64, TotalBytesTransferred as int64, StreamSize as int64, StreamBytesTransferred as Int64, StreamNumber as Integer, Reason as Integer) as Integer

MBS Win Plugin, Plugin Version: 9.2, Platform: Windows, Targets: .

**Function:** It is called when a portion of a copy or move operation is completed.
**Notes:** This event is called by the CopyFileEx and the MoveFileWithProgress methods.

TotalFileSize: The total size of the file, in bytes.
TotalBytesTransferred: The total number of bytes transferred from the source file to the destination file since the copy operation began.
StreamSize: The total size of the current file stream, in bytes.
StreamBytesTransferred: The total number of bytes in the current stream that have been transferred from the source file to the destination file since the copy operation began.
StreamNumber: A handle to the current stream. The first time CopyProgressRoutine is called, the stream number is 1.
Reason: CallbackChunkFinished or CallbackStreamSwitched.

Return ProgressCancel, ProgressStop, ProgressContinue or ProgressQuiet.
If you use multithreading option, you may receive additional events after you cancelled or stopped the operation due to the events coming asynchronously.

### 194.16.38 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CallbackChunkFinished | 0 | One of the reason constants for the Progress event.<br>Another part of the data file was copied. |
| CallbackStreamSwitched | 1 | One of the reason constants for the Progress event.<br>Another stream was created and is about to be copied. This is th<br>reason given when the callback routine is first invoked. |
| CopyFileAllowDecryptedDestination | 8 | One of the constants used with CopyFileEx.<br>An attempt to copy an encrypted file will succeed even if the destin<br>cannot be encrypted. Windows 2000: This value is not supported. |
| CopyFileCopySymLink | &h800 | One of the constants used with CopyFileEx.<br>If the source file is a symbolic link, the destination file is also a sym<br>pointing to the same file that the source symbolic link is pointing to.<br>Server 2003 and Windows XP/2000: This value is not supported. |
| CopyFileFailIfExists | 1 | One of the constants used with CopyFileEx.<br>The copy operation fails immediately if the target file already exists |
| CopyFileOpenSourceForWrite | 4 | One of the constants used with CopyFileEx.<br>The file is copied and the original file is opened for write access. |
| CopyFileRestartable | 2 | One of the constants used with CopyFileEx.<br>Progress of the copy is tracked in the target file in case the copy<br>failed copy can be restarted at a later time by specifying the same<br>source and dest as those used in the call that failed. |
| FileOperationAllowUndo | &h40 | One of the flag constants for the FileOperation methods.<br>Preserve undo information, if possible.<br>Prior to Windows Vista, operations could be undone only from the sa<br>that performed the original operation.<br>In Windows Vista and later systems, the scope of the undo is a us<br>Any process running in the user session can undo another operation.<br>state is held in the Explorer.exe process, and as long as that process i<br>it can coordinate the undo functions.<br>If the source file parameter does not contain fully qualified path and<br>this flag is ignored. |
| FileOperationFilesOnly | &h80 | One of the flag constants for the FileOperation methods.<br>Perform the operation only on files (not on folders) if a wildcard file<br>is specified. |
| FileOperationMultiDestFiles | 1 | One of the flag constants for the FileOperation methods.<br>The destination multiple destination files (one for each source fil<br>rather than one directory where all source files are to be deposited. |
| FileOperationNoConfirmation | &h10 | One of the flag constants for the FileOperation methods.<br>Respond with Yes to All for any dialog box that is displayed. |
| FileOperationNoConfirmationMkDir | &h200 | One of the flag constants for the FileOperation methods.<br>Do not ask the user to confirm the creation of a new directory if the<br>requires one to be created. |
| FileOperationNoConnectedElements | &H2000 | One of the flag constants for the FileOperation methods.<br>Do not move connected files as a group. Only move the specified fil |
| FileOperationNoCopySecurityAttributes | &h800 | One of the flag constants for the FileOperation methods.<br>Do not copy the security attributes of the file. The destination file r<br>security attributes of its new folder. |
| FileOperationNoErrorUI | &h400 | One of the flag constants for the FileOperation methods.<br>Do not display a dialog to the user if an error occurs. |
| FileOperationNoRecursion | &h1000 | One of the flag constants for the FileOperation methods.<br>Only perform the operation in the local directory. Don't operate<br>into subdirectories, which is the default behavior. |
| FileOperationRenameCollision | 8 | One of the flag constants for the FileOperation methods.<br>Give the file being operated on a new name in a move, copy, or rename<br>if a file with the target name already exists at the destination. |
| FileOperationSilent | 4 | One of the flag constants for the FileOperation methods.<br>Do not display a progress dialog box. |
| FileOperationSimpleProgress | &h100 | One of the flag constants for the FileOperation methods.<br>Display a progress dialog box but do not show individual file nam |

# 194.17 class WindowsFileInfoMBS

## 194.17.1 class WindowsFileInfoMBS

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The window file information class.
**Example:**

```
dim f as FolderItem = SelectFolder

if f<>Nil then
dim w as new WindowsFileInfoMBS(f)
MsgBox str(w.FileIndex)
end if
```

**Notes:** The identifier that is stored in the FileIndex members is called the file ID. Support for file IDs is file system-specific. File IDs are not guaranteed to be unique over time, because file systems are free to reuse them. In some cases, the file ID for a file can change over time.

In the FAT file system, the file ID is generated from the first cluster of the containing directory and the byte offset within the directory of the entry for the file. Some defragmentation products change this byte offset. (Windows in-box defragmentation does not.) Thus, a FAT file ID can change over time. Renaming a file in the FAT file system can also change the file ID, but only if the new file name is longer than the old one.

In the NTFS file system, a file keeps the same file ID until it is deleted. You can replace one file with another file without changing the file ID by using the ReplaceFile function. However, the file ID of the replacement file, not the replaced file, is retained as the file ID of the resulting file.

Not all file systems can record creation and last access time, and not all file systems record them in the same manner. For example, on a Windows FAT file system, create time has a resolution of 10 milliseconds, write time has a resolution of 2 seconds, and access time has a resolution of 1 day (the access date). On the NTFS file system, access time has a resolution of 1 hour. For more information, see File Times.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5
- MBS Xojo Plugins, version 18.5pr8

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

**Xojo Developer Magazine**

- 17.5, page 43: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

### 194.17.2 Methods

### 194.17.3 Constructor(file as folderitem)

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor using a folderitem.
**Notes:** On success the valid property is set to true.
See also:

- 194.17.4 Constructor(handle as Integer) 23218
- 194.17.5 Constructor(path as string) 23218
- 194.17.6 Constructor(stream as BinaryStream) 23219

### 194.17.4 Constructor(handle as Integer)

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor using a Windows File Handle.
**Notes:** On success the valid property is set to true.
See also:

- 194.17.3 Constructor(file as folderitem) 23218
- 194.17.5 Constructor(path as string) 23218
- 194.17.6 Constructor(stream as BinaryStream) 23219

### 194.17.5 Constructor(path as string)

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor using a file path.
**Notes:** On success the valid property is set to true.
See also:

- 194.17.3 Constructor(file as folderitem) 23218
- 194.17.4 Constructor(handle as Integer) 23218
- 194.17.6 Constructor(stream as BinaryStream) 23219

### 194.17.6 Constructor(stream as BinaryStream)

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor using a binarystream.
**Notes:** On success the valid property is set to true.
See also:


- 194.17.3 Constructor(file as folderitem) 23218
- 194.17.4 Constructor(handle as Integer) 23218
- 194.17.5 Constructor(path as string) 23218


### 194.17.7 Properties

### 194.17.8 CreationDate as Date

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A date that specifies when a file or directory is created.
**Notes:** If the underlying file system does not support creation time, this member is nil.
(Read only property)

### 194.17.9 CreationTime as UInt64

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An UInt64 that specifies when a file or directory is created.
**Notes:** If the underlying file system does not support creation time, this member is zero (0).
(Read only property)

### 194.17.10 FileAttributes as Integer

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file attributes.
**Notes:** For possible values and their descriptions, see kFileAttribute* constants.
(Read only property)

### 194.17.11 FileIndex as UInt64

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The unique identifier that is associated with a file.
**Notes:** The identifier and the volume serial number uniquely identify a file on a single computer. To determine whether two open handles represent the same file, combine the identifier and the volume serial number for each file and compare them.
(Read only property)

### 194.17.12 FileSize as UInt64

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file size.
**Notes:** (Read only property)

### 194.17.13 LastAccessDate as Date

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For a file, the structure specifies the last time that a file is read from or written to.
**Notes:** For a directory, the structure specifies when the directory is created. For both files and directories, the specified date is correct, but the time of day is always set to midnight. If the underlying file system does not support the last access time, this member is nil.
(Read only property)

### 194.17.14 LastAccessTime as UInt64

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For a file, the structure specifies the last time that a file is read from or written to.
**Notes:** For a directory, the structure specifies when the directory is created. For both files and directories, the specified date is correct, but the time of day is always set to midnight. If the underlying file system does not support the last access time, this member is zero (0).
(Read only property)

### 194.17.15 LastWriteDate as Date

MBS Win Plugin, Plugin Version: 18.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For a file, the structure specifies the last time that a file is written to.
**Notes:** For a directory, the structure specifies when the directory is created. If the underlying file system does not support the last write time, this member is nil.

(Read only property)

### 194.17.16 LastWriteTime as UInt64

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** For a file, the structure specifies the last time that a file is written to.
**Notes:** For a directory, the structure specifies when the directory is created. If the underlying file system does not support the last write time, this member is zero (0).
(Read only property)

### 194.17.17 NumberOfLinks as Integer

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of links to this file.
**Notes:** For the FAT file system this member is always 1. For the NTFS file system, it can be more than 1.
(Read only property)

### 194.17.18 Valid as Boolean

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the constructor got the values.
**Notes:** (Read only property)

### 194.17.19 VolumeSerialNumber as Integer

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The serial number of the volume that contains a file.
**Notes:** (Read only property)

### 194.17.20 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kFileAttributeArchive | 32 | One of the file attribute constants.<br>A file or directory that is an archive file or directory. Applications typicall use this attribute to mark files for backup or removal. |
| kFileAttributeCompressed | 2048 | One of the file attribute constants.<br>A file or directory that is compressed. For a file, all of the data in the file compressed. For a directory, compression is the default for newly created file and subdirectories. |
| kFileAttributeDevice | 64 | One of the file attribute constants.<br>This value is reserved for system use. |
| kFileAttributeDirectory | 16 | One of the file attribute constants.<br>The handle that identifies a directory. |
| kFileAttributeEncrypted | 16384 | One of the file attribute constants.<br>A file or directory that is encrypted. For a file, all data streams in the file ar encrypted. For a directory, encryption is the default for newly created files an subdirectories. |
| kFileAttributeHidden | 2 | One of the file attribute constants.<br>The file or directory is hidden. It is not included in an ordinary director listing. |
| kFileAttributeNormal | 128 | One of the file attribute constants.<br>A file that does not have other attributes set. This attribute is valid only whe used alone. |
| kFileAttributeNotContentIndexed | 8192 | One of the file attribute constants.<br>The file or directory is not to be indexed by the content indexing service. |
| kFileAttributeOffline | 4096 | One of the file attribute constants.<br>The data of a file is not available immediately. This attribute indicates that th file data is physically moved to offline storage. This attribute is used by Remot Storage, which is the hierarchical storage management software. Application should not arbitrarily change this attribute. |
| kFileAttributeReadonly | 1 | One of the file attribute constants.<br>A file that is read-only. Applications can read the file, but cannot write to it o delete it. This attribute is not honored on directories. For more informatio see "You cannot view or change the Read-only or the System attributes o folders in Windows Server 2003, in Windows XP, or in Windows Vista". |
| kFileAttributeReparsePoint | 1024 | One of the file attribute constants.<br>A file or directory that has an associated reparse point, or a file that is symbolic link. |
| kFileAttributeSparseFile | 512 | One of the file attribute constants.<br>A file that is a sparse file. |
| kFileAttributeSystem | 4 | One of the file attribute constants.<br>A file or directory that the operating system uses a part of, or uses exclusivel |
| kFileAttributeTemporary | 256 | One of the file attribute constants.<br>A file that is being used for temporary storage. File systems avoid writing dat back to mass storage if sufficient cache memory is available, because typicall an application deletes a temporary file after the handle is closed. In tha scenario, the system can entirely avoid writing the data. Otherwise, the dat is written after the handle is closed. |
| kFileAttributeVirtual | 65536 | One of the file attribute constants.<br>This value is reserved for system use. |

# 194.18 class WindowsFileStreamMBS

## 194.18.1 class WindowsFileStreamMBS

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for file streams on Windows.
**Notes:** Windows can store more than one data stream in a file.

(on Mac/Linux, please check the ExtendedAttributesMBS module)
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 16.4pr5

## 194.18.2 Methods

## 194.18.3 Constructor

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

## 194.18.4 List(file as folderitem) as WindowsFileStreamMBS()

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Lists file streams in a file at given folderitem.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim w() as WindowsFileStreamMBS = WindowsFileStreamMBS.List(f)
```

Break

**Notes:** Returns nil in case of error.
Else returns an array with stream details.

Requires Windows Vista or newer. Raises exception on Windows XP.
See also:

- 194.18.5 List(Path as String) as WindowsFileStreamMBS() 23224

### 194.18.5 List(Path as String) as WindowsFileStreamMBS()

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Lists file streams in a file at given path.
**Notes:** Returns nil in case of error.
Else returns an array with stream details.

Requires Windows Vista or newer. Raises exception on Windows XP.
See also:

- 194.18.4 List(file as folderitem) as WindowsFileStreamMBS() 23223

### 194.18.6 Properties

### 194.18.7 Name as String

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the stream.
**Notes:** (Read only property)

### 194.18.8 Size as UInt64

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size in bytes.
**Notes:** (Read only property)

# 194.19 class WindowsFileVersionMBS

## 194.19.1 class WindowsFileVersionMBS

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to read Windows version information from a file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetInternalName
end if
```

**Blog Entries**

- MBS Plugins 10.3 Release Notes
- Tipp of the day: WindowsFileVersionMBS

## 194.19.2 Methods

## 194.19.3 FileVersion as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file version in an user readable string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.FileVersion
end if
```

**Notes:** format is "1.2.3.4".

## 194.19.4 GetCompanyName as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key CompanyName.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetCompanyName
end if
```

### 194.19.5 GetFileDescription as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key FileDescription.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetFileDescription
end if
```

### 194.19.6 GetFileVersion as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key FileVersion.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetFileVersion
end if
```

### 194.19.7 GetInternalName as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key InternalName.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetInternalName
end if
```

### 194.19.8 GetLegalCopyright as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key LegalCopyright.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetLegalCopyright
end if
```

### 194.19.9 GetOriginalFilename as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key OriginalFilename.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetOriginalFilename
end if
```

### 194.19.10 GetProductName as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key ProductName.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
```

```
if w.OpenFile(f) then
MsgBox w.GetProductName
end if
```

### 194.19.11 GetProductVersion as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns value for key ProductVersion.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetProductVersion
end if
```

### 194.19.12 OpenFile(file as folderitem) as boolean

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads file information from a given file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox w.GetCompanyName
end if
```

**Notes:** Returns true on success and false on failure.

### 194.19.13 ProductVersion as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The product version in an user readable string.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
```

```
if w.OpenFile(f) then
MsgBox w.ProductVersion
end if
```

**Notes:** format is "1.2.3.4"

### 194.19.14 QueryBinaryValue(key as string) as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Low level function to read a binary item from the information resource.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
// we define encoding as UTF16 as we know the value for ProductName is an UTF16 string.
MsgBox DefineEncoding(w.QueryBinaryValue("ProductName"), encodings.UTF16)
end if
```

**Notes:** Returns "" on any error.

### 194.19.15 QueryUnicodeValue(key as string) as string

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Low level function to read an unicode string item from the information resource.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.QueryUnicodeValue("ProductName"))
end if
```

**Notes:** Returns "" on any error.

### 194.19.16 Properties

### 194.19.17 FileDateLS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** File date number. Lower part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileDateLS)
end if
```

**Notes:** Filedate is a 64 bit integer. This is the lower 32 bit part.

Specifies the least significant 32 bits of the file's 64-bit binary creation date and time stamp.
(Read and Write property)

### 194.19.18 FileDateMS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** File date number. Higher part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileDateMS)
end if
```

**Notes:** Filedate is a 64 bit integer. This is the higher 32 bit part.

Specifies the most significant 32 bits of the file's 64-bit binary creation date and time stamp.
(Read and Write property)

### 194.19.19 FileFlags as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file flags.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileFlags)
end if
```

**Notes:** Contains a bitmask that specifies the Boolean attributes of the file. This member can include one or more of the following values.

| | | |
|---|---|---|
| VS_FF_DEBUG | = 1 | The file contains debugging information or is compiled with debugging features enabled. |
| VS_FF_INFOINFERRED | = 16 | The file's version structure was created dynamically; therefore, some of the members in this structure may be empty or incorrect. This flag should never be set in a file's VS_VERSIONINFO data. |
| VS_FF_PATCHED | = 4 | The file has been modified and is not identical to the original shipping file of the same version number. |
| VS_FF_PRERELEASE | = 2 | The file is a development version, not a commercially released product. |
| VS_FF_PRIVATEBUILD | = 8 | The file was not built using standard release procedures. If this flag is set, the StringFileInfo structure should contain a PrivateBuild entry. |
| VS_FF_SPECIALBUILD | = 32 | The file was built by the original company using standard release procedures but is a variation of the normal file of the same version number. If this flag is set, the StringFileInfo structure should contain a SpecialBuild entry. |

(Read and Write property)

### 194.19.20 FileOS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file os settings.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileOS)
end if
```

**Notes:** Specifies the operating system for which this file was designed. This member can be one of the following values.

| | | |
|---|---|---|
| VOS_DOS | = &h00010000 | The file was designed for MS-DOS. |
| VOS_NT | = &h00040000 | The file was designed for Windows NT. |
| VOS___WINDOWS16 | = &h00000001 | The file was designed for 16-bit Windows. |
| VOS___WINDOWS32 | = &h00000004 | The file was designed for 32-bit Windows. |
| VOS_OS216 | = &h00020000 | The file was designed for 16-bit OS/2. |
| VOS_OS232 | = &h00030000 | The file was designed for 32-bit OS/2. |
| VOS___PM16 | = &h00000002 | The file was designed for 16-bit Presentation Manager. |
| VOS___PM32 | = &h00000003 | The file was designed for 32-bit Presentation Manager. |
| VOS_UNKNOWN | = &h00000000 | The operating system for which the file was designed is unknown to the system. |

An application can combine these values to indicate that the file was designed for one operating system running on another. The following FileOS values are examples of this, but are not a complete list.

| | | |
|---|---|---|
| VOS_DOS_WINDOWS16 | = &h00010001 | The file was designed for 16-bit Windows running on MS-DOS. |
| VOS_DOS_WINDOWS32 | = &h00010004 | The file was designed for 32-bit Windows running on MS-DOS. |
| VOS_NT_WINDOWS16 | = ? | The file was designed for Windows NT. |
| VOS_OS216_PM16 | = &h00020002 | The file was designed for 16-bit Presentation Manager running on 16-bit OS/2. |
| VOS_OS232_PM32 | = &h00030003 | The file was designed for 32-bit Presentation Manager running on 32-bit OS/2. |

(Read and Write property)

### 194.19.21 FileSubtype as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Windows file subtype code.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileSubType)
end if
```

**Notes:** Specifies the function of the file. The possible values depend on the value of FileType. For all values of FileType not described in the following list, FileSubtype is zero.

If FileType is VFT_DRV, FileSubtype can be one of the following values.

If FileType is VFT_FONT, FileSubtype can be one of the following values.

If FileType is VFT_VXD, FileSubtype contains the virtual device identifier included in the virtual device

| | | |
|---|---|---|
| VFT2_UNKNOWN | = 0 | The driver type is unknown by the system. |
| VFT2_DRV_COMM | = 10 | The file contains a communications driver. |
| VFT2_DRV_PRINTER | = 1 | The file contains a printer driver. |
| VFT2_DRV_KEYBOARD | = 2 | The file contains a keyboard driver. |
| VFT2_DRV_LANGUAGE | = 3 | The file contains a language driver. |
| VFT2_DRV_DISPLAY | = 4 | The file contains a display driver. |
| VFT2_DRV_MOUSE | = 5 | The file contains a mouse driver. |
| VFT2_DRV_NETWORK | = 6 | The file contains a network driver. |
| VFT2_DRV_SYSTEM | = 7 | The file contains a system driver. |
| VFT2_DRV_INSTALLABLE | = 8 | The file contains an installable driver. |
| VFT2_DRV_SOUND | = 9 | The file contains a sound driver. |
| VFT2_DRV_VERSIONED_PRINTER | = 10 | The file contains a versioned printer driver. |

| | | |
|---|---|---|
| VFT2_UNKNOWN | = 0 | The font type is unknown by the system. |
| VFT2_FONT_RASTER | = 1 | The file contains a raster font. |
| VFT2_FONT_VECTOR | = 2 | The file contains a vector font. |
| VFT2_FONT_TRUETYPE | = 3 | The file contains a TrueType font. |

control block.
All FileSubtype values not listed here are reserved.
(Read and Write property)

### 194.19.22 FileType as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Windows file type code.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileType)
end if
```

**Notes:** Specifies the general type of file. This member can be one of the following values. All other values are reserved.

(Read and Write property)

### 194.19.23 FileVersionLS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

| | | |
|---|---|---|
| VFT_UNKNOWN | = 0 | The file type is unknown to the system. |
| VFT_APP | = 1 | The file contains an application. |
| VFT_DLL | = 2 | The file contains a DLL. |
| VFT_DRV | = 3 | The file contains a device driver. If dwFileType is VFT_DRV, FileSubtype contains a more specific description of the driver. |
| VFT_FONT | = 4 | The file contains a font. If dwFileType is VFT_FONT, FileSubtype contains a more specific description of the font file. |
| VFT_VXD | = 5 | The file contains a virtual device. |
| VFT_STATIC_LIB | = 7 | The file contains a static-link library. |

**Function:** File version number. Lower part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileVersionLS)
end if
```

**Notes:** Fileversion is a 64 bit integer. This is the lower 32 bit part.

Specifies the least significant 32 bits of the file's binary version number. This member is used with FileVersionMS to form a 64-bit value used for numeric comparisons.
(Read and Write property)

### 194.19.24 FileVersionMS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** File version number. Higher part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.FileVersionMS)
end if
```

**Notes:** Fileversion is a 64 bit integer. This is the higher 32 bit part.

Specifies the most significant 32 bits of the file's binary version number. This member is used with FileVer-

sionLS to form a 64-bit value used for numeric comparisons.
(Read and Write property)

### 194.19.25 LangCharset as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The language charset to use.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.LangCharset)
end if
```

**Notes:** OpenFile sets this to the default value.
You can change it later.
Value is used on each call of GetOriginalFilename, GetFileVersion, GetCompanyName, GetProductName, GetInternalName, GetProductVersion, GetFileDescription, GetLegalCopyright, QueryUnicodeValue and QueryBinaryValue.
(Read and Write property)

### 194.19.26 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** Lasterror means no error has happend.
Normally a Windows error code.
(Read and Write property)

### 194.19.27 ProductVersionLS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Product version number. Lower part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
```

```
MsgBox str(w.ProductVersionLS)
end if
```

**Notes:** Productversion is a 64 bit integer. This is the lower 32 bit part.

Specifies the least significant 32 bits of the binary version number of the product with which this file was distributed. This member is used with ProductVersionMS to form a 64-bit value used for numeric comparisons.
(Read and Write property)

### 194.19.28 ProductVersionMS as Integer

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Product version number. Higher part.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.ProductVersionMS)
end if
```

**Notes:** Productversion is a 64 bit integer. This is the higher 32 bit part.

Specifies the most significant 32 bits of the binary version number of the product with which this file was distributed. This member is used with ProductVersionLS to form a 64-bit value used for numeric comparisons.
(Read and Write property)

### 194.19.29 RawData as String

MBS Win Plugin, Plugin Version: 10.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the data of the file version record as string.
**Notes:** (Read only property)

### 194.19.30 Success as Boolean

MBS Win Plugin, Plugin Version: 6.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether last call to OpenFile was successful.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("dbgview.exe")
dim w as new WindowsFileVersionMBS
if w.OpenFile(f) then
MsgBox str(w.Success)
end if
```

**Notes:** (Read and Write property)

## 194.20 class WindowsGraphicsDeviceContextMBS

### 194.20.1 class WindowsGraphicsDeviceContextMBS

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The class to safely access a HDC of a graphics object.
**Notes:** The plugin will get the handle in constructor and release it in destructor/close.
**Blog Entries**

- MBS Xojo Plugins, version 21.1pr4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- MBS Xojo Plugins, version 20.3pr5

### 194.20.2 Methods

### 194.20.3 Close

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Closes the handle by releasing memory.
**Notes:** Same as destructor.

### 194.20.4 Constructor(c as control)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a control object.
**Notes:** Queries HDC for control object.
Raises exceptions on failure.
See also:


- 194.20.5 Constructor(c as DesktopControl) 23239
- 194.20.6 Constructor(g as graphics) 23239
- 194.20.7 Constructor(p as Picture) 23239
- 194.20.8 Constructor(w as DesktopWindow) 23240
- 194.20.9 Constructor(w as window) 23240

### 194.20.5 Constructor(c as DesktopControl)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a control object.
**Notes:** Queries HDC for control object.
Raises exceptions on failure.
See also:


- 194.20.4 Constructor(c as control) 23238
- 194.20.6 Constructor(g as graphics) 23239
- 194.20.7 Constructor(p as Picture) 23239
- 194.20.8 Constructor(w as DesktopWindow) 23240
- 194.20.9 Constructor(w as window) 23240


### 194.20.6 Constructor(g as graphics)

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a graphics object.
**Notes:** Queries HDC for graphics object.
Raises exceptions on failure.
See also:


- 194.20.4 Constructor(c as control) 23238
- 194.20.5 Constructor(c as DesktopControl) 23239
- 194.20.7 Constructor(p as Picture) 23239
- 194.20.8 Constructor(w as DesktopWindow) 23240
- 194.20.9 Constructor(w as window) 23240


### 194.20.7 Constructor(p as Picture)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a picture object.
**Notes:** Queries HDC for picture object.
Raises exceptions on failure.
See also:


- 194.20.4 Constructor(c as control) 23238
- 194.20.5 Constructor(c as DesktopControl) 23239

- 194.20.6 Constructor(g as graphics) 23239
- 194.20.8 Constructor(w as DesktopWindow) 23240
- 194.20.9 Constructor(w as window) 23240


### 194.20.8 Constructor(w as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a window object.
**Notes:** Queries HDC for window object.
Raises exceptions on failure.
See also:


- 194.20.4 Constructor(c as control) 23238
- 194.20.5 Constructor(c as DesktopControl) 23239
- 194.20.6 Constructor(g as graphics) 23239
- 194.20.7 Constructor(p as Picture) 23239
- 194.20.9 Constructor(w as window) 23240


### 194.20.9 Constructor(w as window)

MBS Win Plugin, Plugin Version: 21.1, Platform: Windows, Targets: Desktop only.

**Function:** The constructor for a window object.
**Notes:** Queries HDC for window object.
Raises exceptions on failure.
See also:


- 194.20.4 Constructor(c as control) 23238
- 194.20.5 Constructor(c as DesktopControl) 23239
- 194.20.6 Constructor(g as graphics) 23239
- 194.20.7 Constructor(p as Picture) 23239
- 194.20.8 Constructor(w as DesktopWindow) 23240


### 194.20.10 Properties

### 194.20.11 Graphics as Graphics

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The references graphics object.
**Notes:** (Read only property)

### 194.20.12 Handle as Integer

MBS Win Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The handle.
**Notes:** This is HDC to be used with declares.
(Read only property)

## 194.21 class WindowsGUIResourcesMBS

### 194.21.1 class WindowsGUIResourcesMBS

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Class to retrieves the count of handles to graphical user interface (GUI) objects in use by the specified process.
**Notes:** Allows you to monitor how many handles you use from GDI.
As they are limited, your app will crash if it hits a limit.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.2
- Windows GUI Resources
- MBS Xojo Plugins, version 18.2pr8

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from Xojo Developer Conference 2019 in Miami.

### 194.21.2 Methods

### 194.21.3 Constructor

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Examines current process and sets properties.

If the constructor succeeds, the properties are set to the count of handles to GUI objects in use by the process. If no GUI objects are in use, the return value is zero.

A process without a graphical user interface does not use GUI resources, therefore, GetGuiResources will return zero.
See also:

- 194.21.4 Constructor(ProcessID as integer) 23242

### 194.21.4 Constructor(ProcessID as integer)

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Examines given process and sets properties.

If the constructor succeeds, the properties are set to the count of handles to GUI objects in use by the process. If no GUI objects are in use, the return value is zero.

A process without a graphical user interface does not use GUI resources, therefore, GetGuiResources will return zero.
See also:

- 194.21.3 Constructor 23242

### 194.21.5 Properties

### 194.21.6 GDIObjectCount as Integer

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The count of GDI objects.
**Notes:** (Read only property)

### 194.21.7 GDIObjectPeak as Integer

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak count of GDI objects.
**Notes:** (Read only property)

### 194.21.8 LastError as Integer

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error from Windows.
**Notes:** Should be zero on success.
But could give error code like permissions denied, if you want to examine another process.
(Read only property)

### 194.21.9 UserObjectCount as Integer

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The count of USER objects.
**Notes:** (Read only property)

### 194.21.10 UserObjectPeak as Integer

MBS Win Plugin, Plugin Version: 18.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The peak count of USER objects.
**Notes:** (Read only property)

# 194.22 class WindowsIniMBS

## 194.22.1 class WindowsIniMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to handle INI files on Windows.
**Notes:** Ini files are build by this:

[ Sectionname ]
key1=value1

[ Appname ]
key2=value2

An ini file contains one or more sections which are labeled with a name of a section or in the Win.ini file with the application name.
Each section is filled with one or more key = value pairs.
**Blog Entries**

- MBS Real Studio Plugins, version 13.0pr10

## 194.22.2 Methods

## 194.22.3 GetPrivateProfileInt(appname as string, keyname as string, defaultValue as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads an integer value from the ini file.
**Notes:** This is the function to work on a private ini file.
Returns the default value on any error.

## 194.22.4 GetPrivateProfileSection(appname as string) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a section from an ini file.
**Notes:** This is the function to work on a private ini file.
The string is built using CStrings (with ending chr(0)).
Returns "" on any error.

### 194.22.5 GetPrivateProfileString(appname as string, keyname as string, defaultValue as string = "") as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a string from an ini file.
**Example:**

```
dim l as new WindowsIniMBS

l.filename="c:\test.ini"

dim value as string = l.GetPrivateProfileString("appname","keyname")
msgBox "Read: "+value
```

**Notes:** This is the function to work on a private ini file.
Returns the default value on any error.

### 194.22.6 GetPrivateProfileStruct(section as string, keyname as string, size as Integer) as memoryblock

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads a structure from an ini file.
**Notes:** This is the function to work on a private ini file.
Size is the size of the memoryblock returned.
Returns nil on any error.
A checksum is checked to verify that the data is unchanged.

### 194.22.7 GetProfileInt(appname as string, keyname as string, defaultValue as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer value of the Win.ini file.
**Notes:** Returns the default value on any error.

### 194.22.8 GetProfileSection(appname as string) as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns a profile section of the Win.ini file.
**Notes:** The string is built using CStrings (with ending chr(0)).

Returns "" on any error.

### 194.22.9 GetProfileString(appname as string, keyname as string, defaultValue as string = "") as string

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an integer value of the Win.ini file.
**Example:**

```
dim l as new WindowsIniMBS

l.filename="c:\test.ini"

dim value as string = l.GetProfileString("appname","keyname")
msgBox "Read: "+value
```

**Notes:** Searches for a string.
All three parameters are not allowed to be empty. And you must pass trimmed strings (no space on the left and/or right side)
Returns the default string on any error.

### 194.22.10 WritePrivateProfileSection(appname as string, value as string) as boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Write a section to an ini file.
**Notes:** This is the function to work on a private ini file.
Value is an array of strings concated with chr(0) as the delimiter.
Returns true if successfull.

### 194.22.11 WritePrivateProfileString(appname as string, keyname as string, value as string) as boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes a string to an ini file.
**Example:**

```
dim l as windowsIniMBS

l=new windowsIniMBS
```

```
l.filename="c:\test.ini"

if l.writePrivateProfileString("appname","keyname","value") then
msgBox "ok"
end if
```

**Notes:** This is the function to work on a private ini file.

### 194.22.12 WritePrivateProfileStruct(section as string, keyname as string, mem as memoryblock, size as Integer) as boolean

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes a memoryblock as a structure to a ini file.
**Notes:** This is the function to work on a private ini file.
Returns true if successfull.
A checksum is stored to verify later whether the data was changed.

### 194.22.13 Properties

### 194.22.14 BufferSize as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the buffer used for reading strings from the INI files.
**Notes:** Should not be bigger than 32767 bytes on Windows 95/98/ME.
Default size is 32000.
(Read and Write property)

### 194.22.15 Filename as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file path of the private profile file to use.
**Notes:** e.g. "C:\Test.ini" or just "myapp.ini".
(Read and Write property)

# 194.23 class WindowsKeyboardLayoutMBS

## 194.23.1 class WindowsKeyboardLayoutMBS

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a keyboard layout on Windows.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr8

## 194.23.2 Methods

## 194.23.3 Constructor

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new keyboard layout object with current layout.
**Example:**

```
dim w as new WindowsKeyboardLayoutMBS
MsgBox w.name
```

See also:

- 194.23.4 Constructor(SubLanguageID as Integer, PrimaryLanguageID as Integer) 23249

## 194.23.4 Constructor(SubLanguageID as Integer, PrimaryLanguageID as Integer)

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new keyboard layout object with the given ID.
See also:

- 194.23.3 Constructor 23249

## 194.23.5 KeyboardLayoutName as string

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns the name of the current keyboard layout name.
**Example:**

msgbox WindowsKeyboardLayoutMBS.KeyboardLayoutName

### 194.23.6 List as WindowsKeyboardLayoutMBS()

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop only.

**Function:** Returns a list of all keyboard layouts installed.
**Example:**

```
dim list() as WindowsKeyboardLayoutMBS = WindowsKeyboardLayoutMBS.List
MsgBox str(UBound(list)+1)+" keyboard layouts."
```

### 194.23.7 Properties

### 194.23.8 Handle as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal ID of the keyboard layout.
**Notes:** (Read only property)

### 194.23.9 Name as String

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the name of the keyboard layout.
**Example:**

```
dim w as new WindowsKeyboardLayoutMBS
MsgBox w.name
```

**Notes:** (Read only property)

### 194.23.10 PrimaryLanguageID as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The primary ID for this language.

**Notes:** (Read and Write property)

### 194.23.11 SubLanguageID as Integer

MBS Win Plugin, Plugin Version: 12.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The sub language ID.
**Notes:** This is needed as there are for example 16 different English variants.
(Read and Write property)

### 194.23.12 Constants

Language Constants.

| Constant | Value | Description |
|---|---|---|
| LangAfrikaans | &h36 | |
| LangAlbanian | &h1C | |
| LangAlsatian | &h84 | |
| LangAmharic | &h5E | |
| LangArabic | &h01 | |
| LangArmenian | &h2B | |
| LangAssamese | &h4D | |
| LangAzeri | &h2C | |
| LangBashkir | &h6D | |
| LangBasque | &h2D | |
| LangBelarusian | &h23 | |
| LangBengali | &h45 | |
| LangBosnian | &h1A | |
| LangBosnianNeutral | &h781A | |
| LangBreton | &h7E | |
| LangBulgarian | &h02 | |
| LangCatalan | &h03 | |
| LangChinese | &h04 | |
| LangChineseSimplified | &h04 | |
| LangChineseTraditional | &h7C04 | |
| LangCorsican | &h83 | |
| LangCroatian | &h1A | |
| LangCzech | &h05 | |
| LangDanish | &h06 | |
| LangDari | &h8C | |
| LangDivehi | &h65 | |
| LangDutch | &h13 | |
| LangEnglish | &h09 | |
| LangEstonian | &h25 | |
| LangFaeroese | &h38 | |
| LangFarsi | &h29 | |
| LangFilipino | &h64 | |
| LangFinnish | &h0B | |
| LangFrench | &h0C | |
| LangFrisian | &h62 | |
| LangGalician | &h56 | |
| LangGeorgian | &h37 | |
| LangGerman | &h07 | |
| LangGreek | &h08 | |
| LangGreenlandic | &h6F | |
| LangGujarati | &h47 | |
| LangHausa | &h68 | |
| LangHebrew | &h0D | |
| LangHindi | &h39 | |
| LangHungarian | &h0E | |
| LangIcelandic | &h0F | |
| LangIgbo | &h70 | |
| LangIndonesian | &h21 | |
| LangInuktitut | &h5D | |
| LangInvariant | &h7F | |
| LangIrish | &h3C | |
| LangItalian | &h10 | |
| LangJapanese | &h11 | |
| LangKannada | &h4B | |
| LangKashmiri | &h60 | |
| LangKazak | &h3F | |
| LangKhmer | &h53 | |
| LangKiche | &h86 | |

Sub Language Constants.

| Constant | Value | Description |
|---|---|---|
| SublangAfrikaansSouthAfrica | &h01 | |
| SublangAlbanianAlbania | &h01 | |
| SublangAlsatianFrance | &h01 | |
| SublangAmharicEthiopia | &h01 | |
| SublangArabicAlgeria | &h05 | |
| SublangArabicBahrain | &h0F | |
| SublangArabicEgypt | &h03 | |
| SublangArabicIraq | &h02 | |
| SublangArabicJordan | &h0B | |
| SublangArabicKuwait | &h0D | |
| SublangArabicLebanon | &h0C | |
| SublangArabicLibya | &h04 | |
| SublangArabicMorocco | &h06 | |
| SublangArabicOman | &h08 | |
| SublangArabicQatar | &h10 | |
| SublangArabicSaudiArabia | &h01 | |
| SublangArabicSyria | &h0A | |
| SublangArabicTunisia | &h07 | |
| SublangArabicUae | &h0E | |
| SublangArabicYemen | &h09 | |
| SublangArmenianArmenia | &h01 | |
| SublangAssameseIndia | &h01 | |
| SublangAzeriCyrillic | &h02 | |
| SublangAzeriLatin | &h01 | |
| SublangBashkirRussia | &h01 | |
| SublangBasqueBasque | &h01 | |
| SublangBelarusianBelarus | &h01 | |
| SublangBengaliBangladesh | &h02 | |
| SublangBengaliIndia | &h01 | |
| SublangBosnianBosniaHerzegovinaCyrillic | &h08 | |
| SublangBosnianBosniaHerzegovinaLatin | &h05 | |
| SublangBretonFrance | &h01 | |
| SublangBulgarianBulgaria | &h01 | |
| SublangCatalanCatalan | &h01 | |
| SublangChineseHongkong | &h03 | |
| SublangChineseMacau | &h05 | |
| SublangChineseSimplified | &h02 | |
| SublangChineseSingapore | &h04 | |
| SublangChineseTraditional | &h01 | |
| SublangCorsicanFrance | &h01 | |
| SublangCroatianBosniaHerzegovinaLatin | &h04 | |
| SublangCroatianCroatia | &h01 | |
| SublangCustomDefault | &h03 | |
| SublangCustomUnspecified | &h04 | |
| SublangCzechCzechRepublic | &h01 | |
| SublangDanishDenmark | &h01 | |
| SublangDariAfghanistan | &h01 | |
| SublangDefault | &h01 | |
| SublangDivehiMaldives | &h01 | |
| SublangDutch | &h01 | |
| SublangDutchBelgian | &h02 | |
| SublangEnglishAus | &h03 | |
| SublangEnglishBelize | &h0A | |
| SublangEnglishCan | &h04 | |
| SublangEnglishCaribbean | &h09 | |
| SublangEnglishEire | &h06 | |
| SublangEnglishIndia | &h10 | |
| SublangEnglishJamaica | &h08 | |

# 194.24 class WindowsKeyFilterMBS

## 194.24.1 class WindowsKeyFilterMBS

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to filter several windows keyboard shortcuts with a low level event filter.
**Notes:** There is no need to keep the instance as all internal data is stored in global variables.

Key codes for Windows:

**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr5

## 194.24.2 Methods

## 194.24.3 Install as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Install the event filter.
**Notes:** Returns true on success and false on failure.
Second call in an application will return false unless Uninstall was called between.

## 194.24.4 Uninstall as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Uninstalls the event filter.
**Notes:** You only call this after Install returned true.

## 194.24.5 Properties

## 194.24.6 BlockAlt as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the alt key.
**Notes:** (Read and Write property)

### 194.24.7 BlockAltEscape as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Alt-Escape key combination.
**Notes:** (Read and Write property)

### 194.24.8 BlockAltF4 as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the ALT-F4 key combination.
**Notes:** By default this one closes the application.
(Read and Write property)

### 194.24.9 BlockAltTab as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the ALT-Tab key combination.
**Notes:** This combination is for task switching.
(Read and Write property)

### 194.24.10 BlockApplicationWindowsKey as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the application windows key.
**Notes:** (Read and Write property)

### 194.24.11 BlockBack as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the back key.
**Notes:** (Read and Write property)

### 194.24.12 BlockCancel as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Cancel key.
**Notes:** (Read and Write property)

### 194.24.13 BlockCapital as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the CapsLock key.
**Notes:** (Read and Write property)

### 194.24.14 BlockClear as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Clear key.
**Notes:** (Read and Write property)

### 194.24.15 BlockControl as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the control key.
**Notes:** (Read and Write property)

### 194.24.16 BlockControlAltDelete as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Control-Alt-Delete key combination.
**Notes:** Sorry, does not have any effect as this key combination is processed earlier in event chain.
(Read and Write property)

### 194.24.17 BlockControlEscape as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Control-Escape key combination.
**Notes:** (Read and Write property)

### 194.24.18 BlockDelete as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the delete key.
**Notes:** (Read and Write property)

### 194.24.19 BlockDown as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the down key.
**Notes:** (Read and Write property)

### 194.24.20 BlockEnd as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the end key.
**Notes:** (Read and Write property)

### 194.24.21 BlockEscape as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the escape key.
**Notes:** (Read and Write property)

### 194.24.22 BlockExecute as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the execute key.
**Notes:** (Read and Write property)

### 194.24.23 BlockF1 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F1 key.
**Notes:** (Read and Write property)

### 194.24.24 BlockF10 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F10 key.
**Notes:** (Read and Write property)

### 194.24.25 BlockF11 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F11 key.
**Notes:** (Read and Write property)

### 194.24.26 BlockF12 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F12 key.
**Notes:** (Read and Write property)

### 194.24.27 BlockF13 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F13 key.
**Notes:** (Read and Write property)

### 194.24.28 BlockF14 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F14 key.
**Notes:** (Read and Write property)

### 194.24.29 BlockF15 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F15 key.
**Notes:** (Read and Write property)

### 194.24.30 BlockF16 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F16 key.
**Notes:** (Read and Write property)

### 194.24.31 BlockF17 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F17 key.
**Notes:** (Read and Write property)

### 194.24.32 BlockF18 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F18 key.
**Notes:** (Read and Write property)

### 194.24.33 BlockF19 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F19 key.
**Notes:** (Read and Write property)

### 194.24.34 BlockF2 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F2 key.
**Notes:** (Read and Write property)

### 194.24.35 BlockF20 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F20 key.
**Notes:** (Read and Write property)

### 194.24.36 BlockF21 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F21 key.
**Notes:** (Read and Write property)

### 194.24.37 BlockF22 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F22 key.
**Notes:** (Read and Write property)

### 194.24.38 BlockF23 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F23 key.
**Notes:** (Read and Write property)

### 194.24.39 BlockF24 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F24 key.
**Notes:** (Read and Write property)

### 194.24.40 BlockF3 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F3 key.
**Notes:** (Read and Write property)

### 194.24.41 BlockF4 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F4 key.
**Notes:** (Read and Write property)

### 194.24.42 BlockF5 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F5 key.
**Notes:** (Read and Write property)

### 194.24.43 BlockF6 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F6 key.
**Notes:** (Read and Write property)

### 194.24.44 BlockF7 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F7 key.
**Notes:** (Read and Write property)

### 194.24.45 BlockF8 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F8 key.
**Notes:** (Read and Write property)

### 194.24.46 BlockF9 as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the F9 key.
**Notes:** (Read and Write property)

### 194.24.47 BlockHelp as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the help key.
**Notes:** (Read and Write property)

### 194.24.48 BlockHome as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the home key.
**Notes:** (Read and Write property)

### 194.24.49 BlockInsert as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the insert key.
**Notes:** (Read and Write property)

### 194.24.50 BlockLeft as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the left key.
**Notes:** (Read and Write property)

### 194.24.51 BlockLeftButton as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the left mouse button.
**Notes:** (Read and Write property)

### 194.24.52 BlockLeftWindowsKey as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the left windows key.
**Notes:** (Read and Write property)

### 194.24.53 BlockMiddleButton as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the middle mouse button.
**Notes:** (Read and Write property)

### 194.24.54 BlockPause as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the pause key.
**Notes:** (Read and Write property)

### 194.24.55 BlockPrint as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the print key.
**Notes:** BlockSnapshot is to block screenshots.
(Read and Write property)

### 194.24.56 BlockReturn as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the return key.
**Notes:** (Read and Write property)

### 194.24.57 BlockRight as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the right key.
**Notes:** (Read and Write property)

### 194.24.58 BlockRightButton as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the right mouse button.
**Notes:** (Read and Write property)

### 194.24.59 BlockRightWindowsKey as boolean

MBS Win Plugin, Plugin Version: 6.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the right windows key.
**Notes:** (Read and Write property)

### 194.24.60 BlockSelect as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the select key.
**Notes:** (Read and Write property)

### 194.24.61 BlockShift as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the shift key.
**Notes:** (Read and Write property)

### 194.24.62 BlockShiftSpace as boolean

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the Shift-Space key combination.
**Notes:** This combination is for making non-breakable spaces.
(Read and Write property)

### 194.24.63 BlockSleep as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the sleep key.
**Notes:** (Read and Write property)

### 194.24.64 BlockSnapshot as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the snapshot key.
**Notes:** This is the print key to do screenshots.
(Read and Write property)

### 194.24.65 BlockSpace as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the space key.
**Notes:** (Read and Write property)

### 194.24.66 BlockTab as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the tab key.
**Notes:** (Read and Write property)

### 194.24.67 BlockUp as Boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to filter the up key.
**Notes:** (Read and Write property)

### 194.24.68 BlockKey(virtualkeycode as Integer) as boolean

MBS Win Plugin, Plugin Version: 7.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to block a key with a specific virtual key code.
**Notes:** You can set this to true for all keys you want to block.
The virtual key codes are in the windows header files.
For most common keys this class has properties. More can be added.
(Read and Write computed property)

### 194.24.69 Events

### 194.24.70 KeyDown(vkCode as Integer, scanCode as Integer, flags as Integer, time as Integer) as Boolean

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: .

**Function:** The key down event.
**Notes:** vkCode: Specifies a virtual-key code. The code must be a value in the range 1 to 254.
scanCode: Specifies a hardware scan code for the key.
flags: Specifies the extended-key flag, event-injected flag, context code, and transition-state flag. This member is specified as follows.
time: Specifies the time stamp for this message.

the flag bits are like this:
bit 0: Specifies whether the key is an extended key, such as a function key or a key on the numeric keypad. The value is 1 if the key is an extended key; otherwise, it is 0.
bit 4: Specifies whether the event was injected. The value is 1 if the event was injected; otherwise, it is 0.
bit 5: Specifies the context code. The value is 1 if the ALT key is pressed; otherwise, it is 0.
bit 7: Specifies the transition state. The value is 0 if the key is pressed and 1 if it is being released.
Other bits are reserved.

There can be only one WindowsKeyFilterMBS object in your application which receives this events.

We have currently no idea in what context this event is received. And you should return as soon as possible as this event may be called a lot of times and can block user input.

Return true if you handled the key and false if you did not handle it.
Please have this event being as fast as possible. Do not put msgbox there. Better detect a key shortcut and launch a timer to perform the action a millisecond later, so you don't block the keyboard event system.
Blocks only KeyUp or only KeyDown can lead to trouble if the internal counters for special keys get our of sync.

### 194.24.71 KeyUp(vkCode as Integer, scanCode as Integer, flags as Integer, time as Integer) as Boolean

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: .

**Function:** The key up event.
**Notes:** vkCode: Specifies a virtual-key code. The code must be a value in the range 1 to 254.
scanCode: Specifies a hardware scan code for the key.
flags: Specifies the extended-key flag, event-injected flag, context code, and transition-state flag. This member is specified as follows.
time: Specifies the time stamp for this message.

the flag bits are like this:
bit 0: Specifies whether the key is an extended key, such as a function key or a key on the numeric keypad. The value is 1 if the key is an extended key; otherwise, it is 0.
bit 4: Specifies whether the event was injected. The value is 1 if the event was injected; otherwise, it is 0.
bit 5: Specifies the context code. The value is 1 if the ALT key is pressed; otherwise, it is 0.
bit 7: Specifies the transition state. The value is 0 if the key is pressed and 1 if it is being released.
Other bits are reserved.

There can be only one WindowsKeyFilterMBS object in your application which receives this events.

We have currently no idea in what context this event is received. And you should return as soon as possible as this event may be called a lot of times and can block user input.

Return true if you handled the key and false if you did not handle it.
Please have this event being as fast as possible. Do not put msgbox there. Better detect a key shortcut and launch a timer to perform the action a millisecond later, so you don't block the keyboard event system.
Blocks only KeyUp or only KeyDown can lead to trouble if the internal counters for special keys get our of sync.

| | |
|---|---|
| VK_LBUTTON | &h01 |
| VK_RBUTTON | &h02 |
| VK_CANCEL | &h03 |
| VK_MBUTTON | &h04 |
| | |
| VK_XBUTTON1 | &h05 (Windows 2000 and newer) |
| VK_XBUTTON2 | &h06 (Windows 2000 and newer) |
| | |
| VK_BACK | &h08 |
| VK_TAB | &h09 |
| | |
| VK_CLEAR | &h0C |
| VK_RETURN | &h0D |
| | |
| VK_SHIFT | &h10 |
| VK_CONTROL | &h11 |
| VK_MENU | &h12 |
| VK_PAUSE | &h13 |
| VK_CAPITAL | &h14 |
| | |
| VK_KANA | &h15 |
| VK_HANGUL | &h15 |
| VK_JUNJA | &h17 |
| VK_FINAL | &h18 |
| VK_HANJA | &h19 |
| VK_KANJI | &h19 |
| | |
| VK_ESCAPE | &h1B |
| | |
| VK_CONVERT | &h1C |
| VK_NONCONVERT | &h1D |
| VK_ACCEPT | &h1E |
| VK_MODECHANGE | &h1F |
| | |
| VK_SPACE | &h20 |
| VK_PRIOR | &h21 |
| VK_NEXT | &h22 |
| VK_END | &h23 |
| VK_HOME | &h24 |
| VK_LEFT | &h25 |
| VK_UP | &h26 |
| VK_RIGHT | &h27 |
| VK_DOWN | &h28 |
| VK_SELECT | &h29 |
| VK_PRINT | &h2A |
| VK_EXECUTE | &h2B |
| VK_SNAPSHOT | &h2C |
| VK_INSERT | &h2D |
| VK_DELETE | &h2E |
| VK_HELP | &h2F |
| | |
| VK_0 - VK_9 | are the same as ASCII "0" - "9" (&h30 - &h39) |
| VK_A - VK_Z | are the same as ASCII "A" - "Z" (&h41 - &h5A) |
| | |
| VK_LWIN | &h5B |
| VK_RWIN | &h5C |
| VK_APPS | &h5D |
| | |
| VK_SLEEP | &h5F |
| | |
| VK_NUMPAD0 | &h60 |
| VK_NUMPAD1 | &h61 |
| VK_NUMPAD2 | &h62 |
| VK_NUMPAD3 | &h63 |
| VK_NUMPAD4 | &h64 |
| VK_NUMPAD5 | &h65 |

## 194.25 class WindowsListMBS

### 194.25.1 class WindowsListMBS

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to list all the windows on a Windows system.
**Notes:** To find all processes on Mac, use the ProcessMBS class.
To find all windows on Mac OS X, use the CGSWindowListMBS class.
**Blog Entries**

- MBS Xojo Plugins, version 19.2pr1
- SetFrontMost for Windows
- MBS Xojo / Real Studio Plugins, version 16.4pr1

### 194.25.2 Methods

### 194.25.3 ActivateWindow(index as integer)

MBS Win Plugin, Plugin Version: 19.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Activates the window.
**Notes:** This function does more than just show. if the window has been minimized, it will restore it. Also the window is moved to front and made the current window for keyboard input.

Sadly windows limits which windows can go to front, so some windows may not come to front unless they are clicked on.

As activation can be asynchronously, the window may activate later, e.g. after current method ends.

### 194.25.4 Constructor

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor which queries the values.
See also:


- 194.25.5 Constructor(win as DesktopWindow) 23271
- 194.25.6 Constructor(win as window) 23271
- 194.25.7 Constructor(WindowHandle as Integer) 23271

### 194.25.5 Constructor(win as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor which queries the values.
**Notes:** If win is not nil, we lookup child windows of this window.
See also:

- 194.25.4 Constructor 23270
- 194.25.6 Constructor(win as window) 23271
- 194.25.7 Constructor(WindowHandle as Integer) 23271

### 194.25.6 Constructor(win as window)

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop only.

**Function:** The constructor which queries the values.
**Notes:** If win is not nil, we lookup child windows of this window.
See also:

- 194.25.4 Constructor 23270
- 194.25.5 Constructor(win as DesktopWindow) 23271
- 194.25.7 Constructor(WindowHandle as Integer) 23271

### 194.25.7 Constructor(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor which queries the values.
**Notes:** If WindowHandle is not zero, we lookup child windows of this window.
See also:

- 194.25.4 Constructor 23270
- 194.25.5 Constructor(win as DesktopWindow) 23271
- 194.25.6 Constructor(win as window) 23271

### 194.25.8 Focus as Integer

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the handle to the window that has the keyboard focus, if the window is attached to the calling thread's message queue.

**Notes:** If the calling thread's message queue does not have an associated window with the keyboard focus, the return value is 0.

### 194.25.9 ForegroundWindow as Integer

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a handle to the foreground window (the window with which the user is currently working).
**Notes:** The system assigns a slightly higher priority to the thread that creates the foreground window than it does to other threads.
The return value is a handle to the foreground window. The foreground window can be 0 in certain circumstances, such as when a window is losing activation.

### 194.25.10 Update

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the values and returns true on success.

### 194.25.11 WindowClassName(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the window class name of the window with the given index.
**Notes:** For example "SciCalc" for the calc.exe main window.

This may send a message to the thread owning the window and if that one doesn't answer quickly, the call may wait for an answer.
You may want to skip your own process windows to not wait for your own threads.

### 194.25.12 WindowClassNameFromHandle(Handle as Integer) as String

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the window class name of the window with the given handle.
**Notes:** For example "SciCalc" for the calc.exe main window.

### 194.25.13 WindowHandle(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.14 WindowHeight(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.15 WindowIconic(index as Integer) as boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the window with the given index is minimized.

### 194.25.16 WindowImageFileName(index as Integer) as string

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the path to the execuable file of the process which owns the window with the given index.
**Notes:** Requires Windows XP or newer.
Returns an empty string on any error.

### 194.25.17 WindowLeft(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The x position of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.18 WindowProcessID(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The process ID of the process which ows the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.19 WindowText(index as Integer) as string

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the title of the window with the given index.
**Notes:** This may send a message to the thread owning the window and if that one doesn't answer quickly, the call may wait for an answer.
You may want to skip your own process windows to not wait for your own threads.

### 194.25.20 WindowTextFromHandle(Handle as Integer) as String

MBS Win Plugin, Plugin Version: 15.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the title of the window with the given handle.
**Notes:** This may send a message to the thread owning the window and if that one doesn't answer quickly, the call may wait for an answer.
You may want to skip your own process windows to not wait for your own threads.

### 194.25.21 WindowThreadHandle(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The thread handle of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.22 WindowTop(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y position of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.23 WindowVisible(index as Integer) as boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the window with the given index is visible.

### 194.25.24 WindowWidth(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the window with the given index.
**Notes:** This value is updated by the Constructor and the Update method.

### 194.25.25 WindowZoomed(index as Integer) as boolean

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the window with the given index is zoomed.

### 194.25.26 Properties

### 194.25.27 CurrentProcessID as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current process ID.
**Notes:** This value is updated by the Constructor and the Update method.
(Read and Write property)

### 194.25.28 CurrentThreadID as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current thread ID.
**Notes:** This value is updated by the Constructor and the Update method.
(Read and Write property)

### 194.25.29 DesktopWindowHandle as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the desktop window.
**Notes:** This value is updated by the Constructor and the Update method.

(Read and Write property)

### 194.25.30 ForegroundWindowHandle as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the foreground window.
**Notes:** This value is updated by the Constructor and the Update method.
(Read and Write property)

### 194.25.31 ParentWindowHandle as Integer

MBS Win Plugin, Plugin Version: 16.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the parent window.
**Notes:** This value is set by the Constructor.
(Read and Write property)

### 194.25.32 WindowCount as Integer

MBS Win Plugin, Plugin Version: 8.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of windows.
**Notes:** This value is updated by the Constructor and the Update method.
(Read and Write property)

# 194.26 class WindowsMonitorMBS

## 194.26.1 class WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to query monitor details on Windows.
**Example:**

```
for each m as WindowsMonitorMBS in WindowsMonitorMBS.AllMonitors
MsgBox m.DeviceName+": "+str(m.Left)+"x"+str(m.top)+" "+str(m.Width)+"x"+str(m.Height)
next
```

**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr2

## 194.26.2 Methods

## 194.26.3 AllMonitors as WindowsMonitorMBS()

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all monitors.
**Example:**

```
for each m as WindowsMonitorMBS in WindowsMonitorMBS.AllMonitors
MsgBox m.DeviceName+": "+str(m.Left)+"x"+str(m.top)+" "+str(m.Width)+"x"+str(m.Height)
next
```

**Notes:** Returns an array with an entry for each monitor connected to this computer.
See also:

- 194.26.4 AllMonitors(monitors() as WindowsMonitorMBS) as Integer 23277

## 194.26.4 AllMonitors(monitors() as WindowsMonitorMBS) as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries all monitors.
**Notes:** Returns the number of monitors found and sets the monitor objects in the array.
if the array is too short, you get the first ubound(monitors)+1 fonts set there.
See also:

• 194.26.3 AllMonitors as WindowsMonitorMBS() 23277

### 194.26.5 MonitorFromPoint(x as Integer, y as Integer, flags as Integer = 0) as WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The MonitorFromPoint function retrieves a handle to the display monitor that contains a specified point.
**Example:**

```
dim m as WindowsMonitorMBS = WindowsMonitorMBS.MonitorFromPoint(1900, 1000)

if m = nil then
MsgBox "Your display is smaller than 1900 x 1000"
else
MsgBox m.DeviceName
end if
```

**Notes:** x and y: The point of interest in virtual-screen coordinates.
Flags: Determines the function's return value if the point is not contained within any display monitor.

This parameter can be one of the following values.

| Value | Meaning |
|---|---|
| kDefaultToNearest | Returns a handle to the display monitor that is nearest to the point. |
| kDefaultToNull | Returns nil. |
| kDefaultToPrimary | Returns a handle to the primary display monitor. |

If the point is contained by a display monitor, the return value is that display monitor.
If the point is not contained by a display monitor, the return value depends on the value of flags.

### 194.26.6 MonitorFromRect(left as Integer, top as Integer, width as Integer, height as Integer, flags as Integer = 0) as WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The MonitorFromRect function retrieves the display monitor that has the largest area of intersection with a specified rectangle.
**Example:**

```
dim m as WindowsMonitorMBS = WindowsMonitorMBS.MonitorFromRect(0,0,100,100)
```

MsgBox m.DeviceName

**Notes:** left, top, width, height: The rectangle of interest in virtual-screen coordinates.
Flags: Determines the function's return value if the rectangle does not intersect any display monitor.

This parameter can be one of the following values.

| Value | Meaning |
|---|---|
| kDefaultToNearest | Returns a handle to the display monitor that is nearest to the rectangle. |
| kDefaultToNull | Returns nil. |
| kDefaultToPrimary | Returns a handle to the primary display monitor. |

If the rectangle intersects one or more display monitor rectangles, the return value is the display monitor that has the largest area of intersection with the rectangle.
If the rectangle does not intersect a display monitor, the return value depends on the value of Flags.

### 194.26.7 MonitorFromWindow(win as DesktopWindow, flags as integer = 0) as WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The MonitorFromWindow function retrieves the display monitor that has the largest area of intersection with the bounding rectangle of a specified window.
**Notes:** win: The window of interest.
Flags: Determines the function's return value if the window does not intersect any display monitor.

This parameter can be one of the following values:

| Value | Meaning |
|---|---|
| kDefaultToNearest | Returns the display monitor that is nearest to the window. |
| kDefaultToNull | Returns nil. |
| kDefaultToPrimary | Returns the primary display monitor. |

If the window intersects one or more display monitor rectangles, the return value is the display monitor that has the largest area of intersection with the window.

If the window does not intersect a display monitor, the return value depends on the value of Flags.
If the window is currently minimized, MonitorFromWindow uses the rectangle of the window before it was

minimized.
See also:

- 194.26.8 MonitorFromWindow(win as window, flags as Integer = 0) as WindowsMonitorMBS 23280
- 194.26.9 MonitorFromWindow(WindowHandle as Integer, flags as Integer = 0) as WindowsMonitorMBS 23281

### 194.26.8 MonitorFromWindow(win as window, flags as Integer = 0) as WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop only.

**Function:** The MonitorFromWindow function retrieves the display monitor that has the largest area of intersection with the bounding rectangle of a specified window.
**Example:**

```
dim m as WindowsMonitorMBS = WindowsMonitorMBS.MonitorFromWindow(window1)
MsgBox m.DeviceName
```

**Notes:** win: The window of interest.
Flags: Determines the function's return value if the window does not intersect any display monitor.

This parameter can be one of the following values:

| Value | Meaning |
|---|---|
| kDefaultToNearest | Returns the display monitor that is nearest to the window. |
| kDefaultToNull | Returns nil. |
| kDefaultToPrimary | Returns the primary display monitor. |

If the window intersects one or more display monitor rectangles, the return value is the display monitor that has the largest area of intersection with the window.

If the window does not intersect a display monitor, the return value depends on the value of Flags.
If the window is currently minimized, MonitorFromWindow uses the rectangle of the window before it was minimized.
See also:

- 194.26.7 MonitorFromWindow(win as DesktopWindow, flags as integer = 0) as WindowsMonitorMBS 23279
- 194.26.9 MonitorFromWindow(WindowHandle as Integer, flags as Integer = 0) as WindowsMonitorMBS 23281

### 194.26.9 MonitorFromWindow(WindowHandle as Integer, flags as Integer = 0) as WindowsMonitorMBS

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The MonitorFromWindow function retrieves the display monitor that has the largest area of intersection with the bounding rectangle of a specified window.
**Example:**

```
dim m as WindowsMonitorMBS = WindowsMonitorMBS.MonitorFromWindow(window1.handle)
MsgBox m.DeviceName
```

**Notes:** WindowHandle: A handle to the window of interest.
Flags: Determines the function's return value if the window does not intersect any display monitor.

This parameter can be one of the following values:

| Value | Meaning |
|---|---|
| kDefaultToNearest | Returns the display monitor that is nearest to the window. |
| kDefaultToNull | Returns nil. |
| kDefaultToPrimary | Returns the primary display monitor. |

If the window intersects one or more display monitor rectangles, the return value is the display monitor that has the largest area of intersection with the window.

If the window does not intersect a display monitor, the return value depends on the value of Flags.
If the window is currently minimized, MonitorFromWindow uses the rectangle of the window before it was minimized.
See also:

- 194.26.7 MonitorFromWindow(win as DesktopWindow, flags as integer = 0) as WindowsMonitorMBS 23279
- 194.26.8 MonitorFromWindow(win as window, flags as Integer = 0) as WindowsMonitorMBS 23280

### 194.26.10 Properties

### 194.26.11 Bottom as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bottom value of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the

monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values. (Read and Write property)

### 194.26.12 DeviceName as String

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that specifies the device name of the monitor being used.
**Notes:** (Read and Write property)

### 194.26.13 Height as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values. (Read and Write property)

### 194.26.14 HMonitor as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal window handle for this monitor.
**Notes:** (Read and Write property)

### 194.26.15 IsPrimary as Boolean

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this is the primary display monitor.
**Notes:** (Read and Write property)

### 194.26.16 Left as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The left position of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.

(Read and Write property)

### 194.26.17 Right as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The right value of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.18 Top as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The top position of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.19 Width as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the display monitor.
**Notes:** Specifies the display monitor rectangle, expressed in virtual-screen coordinates. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.20 WorkBottom as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bottom value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.21 WorkHeight as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.22 WorkLeft as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The left value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.23 WorkRight as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The right value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.24 WorkTop as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The top value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.

(Read and Write property)

### 194.26.25 WorkWidth as Integer

MBS Win Plugin, Plugin Version: 11.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width value from useable screen area.
**Notes:** Specifies the work area rectangle of the display monitor that can be used by applications, expressed in virtual-screen coordinates. Windows uses this rectangle to maximize an application on the monitor. The rest of the area of the monitor contains system windows such as the task bar and side bars. Note that if the monitor is not the primary display monitor, some of the rectangle's coordinates may be negative values.
(Read and Write property)

### 194.26.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kDefaultToNearest | 2 | One of the flag constants.<br>Return the display monitor that is nearest to the window, point or rectangle. |
| kDefaultToNull | 0 | One of the flag constants.<br>Returns nil if no monitor matches is located at point, window or rectangle. |
| kDefaultToPrimary | 1 | One of the flag constants.<br>Returns the primary display monitor if point, rect or window does not point to a monitor. |

## 194.27 class WindowsPipeMBS

### 194.27.1 class WindowsPipeMBS

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a Windos Pipe.
**Notes:** A replacement for IPCSocket on Windows.
Can be used in two applications to exchange data.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5
- MBS Xojo Plugins, version 19.5pr1
- New Windows Pipe class for Xojo

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 51: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 194.27.2 Methods

### 194.27.3 Close

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Closes the pipe.
**Notes:** Called by destructor automatically.

### 194.27.4 Constructor

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 194.27.5 CreatePipe(Name as string, MessageMode as Boolean = false, BufferSize as Integer = &h100000, AllowAllUsers as Boolean = false) as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a named pipe.
**Notes:** Buffersize defines the size for input/output buffers.
Returns true on success or false on failure.
Lasterror is set.

Normally the pipe allows only same user.
But if AllowAllUsers is true, you can talk to other users or from service to user.

If name does not start with \then we prefix it with "\\.\Pipe\".

### 194.27.6 OpenPipe(Name as string) as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Opens an existing named pipe from client side.
**Notes:** Returns true on success or false on failure.
Lasterror is set.

If name does not start with \then we prefix it with "\\.\Pipe\".

### 194.27.7 Peek(ByteCount as Integer) as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data without removing it from the buffer.
**Notes:** Reads up to the given number of bytes.
BytesRead property is set and data is returned.
LastError property is set.

### 194.27.8 PeekAll as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads all data without removing it from the buffer.
**Notes:** Reads whole message or in byte mode

BytesRead property is set and data is returned.
LastError property is set.

### 194.27.9 Read(ByteCount as Integer) as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads data.
**Notes:** Reads up to the given number of bytes.
BytesRead property is set and data is returned.
LastError property is set.

### 194.27.10 ReadAll as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads all data.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Dim r As String = pipe.ReadAll
Dim d As String = DefineEncoding(r, Encodings.UTF8)

List.AddRow d
```

**Notes:** Reads whole message or in byte mode what is available.
BytesRead property is set and data is returned.
LastError property is set.

### 194.27.11 Write(data as MemoryBlock)

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes data.
**Notes:** Lasterror is set.
BytesWritten is set to number of bytes sent.
See also:

- 194.27.12 Write(data as string)

### 194.27.12 Write(data as string)

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes data.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Dim d As String = ConvertEncoding(MessageField.Text, encodings.UTF8)
If d.Len >0 Then
pipe.Write d
MessageField.Text = ""
End If
```

**Notes:** Lasterror is set.
BytesWritten is set to number of bytes sent.
See also:

- 194.27.11 Write(data as MemoryBlock) 23288

### 194.27.13 Properties

### 194.27.14 BytesAvailable as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of bytes available in buffer.
**Notes:** (Read only property)

### 194.27.15 BytesRead as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of bytes read.
**Notes:** (Read and Write property)

### 194.27.16 BytesWritten as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of bytes written.
**Notes:** (Read and Write property)

### 194.27.17 Handle as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle for the pipe.
**Notes:** (Read only property)

### 194.27.18 InputBufferSize as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The input buffer size.
**Notes:** (Read only property)

### 194.27.19 IsClient as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this is client or server side.
**Notes:** True if this is client side.
(Read only property)

### 194.27.20 IsMessageMode as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this pipe is in message mode.
**Notes:** (Read only property)

### 194.27.21 IsOpen as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether pipe is open.
**Notes:** (Read only property)

### 194.27.22 IsServer as Boolean

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this is client or server side.
**Notes:** True if this is server side.
(Read only property)

### 194.27.23 LastError as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** A Windows error code.
(Read and Write property)

### 194.27.24 MessageBytesAvailable as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries number of bytes available for current message.
**Notes:** (Read only property)

### 194.27.25 Name as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the pipe.
**Notes:** This is name as used in CreatePipe or OpenPipe method.
(Read and Write property)

### 194.27.26 NamedPipeClientComputerName as String

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the client computer name for the specified named pipe.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Msgbox "NamedPipeClientComputerName: "+pipe.NamedPipeClientComputerName
```

**Notes:** (Read only property)

### 194.27.27 NamedPipeClientProcessId as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the client process identifier for the specified named pipe.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Msgbox "NamedPipeClientProcessId: "+str(pipe.NamedPipeClientProcessId)
```

**Notes:** (Read only property)

### 194.27.28 NamedPipeClientSessionId as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the client session identifier for the specified named pipe.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Msgbox "NamedPipeClientSessionId: "+str(pipe.NamedPipeClientSessionId)
```

**Notes:** (Read only property)

### 194.27.29 NamedPipeServerProcessId as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the server process identifier for the specified named pipe.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Msgbox "NamedPipeServerProcessId: "+str(pipe.NamedPipeServerProcessId)
```

**Notes:** (Read only property)

### 194.27.30 NamedPipeServerSessionId as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the server session identifier for the specified named pipe.
**Example:**

```
dim Pipe as WindowsPipeMBS // your pipe

Msgbox "NamedPipeServerSessionId: "+str(pipe.NamedPipeServerSessionId)
```

**Notes:** (Read only property)

### 194.27.31 OutputBufferSize as Integer

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The output buffer size.
**Notes:** (Read only property)

### 194.27.32 Events

### 194.27.33 Connected

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: .

**Function:** The connected event.
**Notes:** Called when pipe is connected on either client or server side.

### 194.27.34 DataAvailable(BytesAvailable as Integer, MessageBytesAvailable as Integer)

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: .

**Function:** The event called when new data is available.

### 194.27.35 PipeBroken

MBS Win Plugin, Plugin Version: 19.5, Platform: Windows, Targets: .

**Function:** The event called when pipe breaks.
**Notes:** The plugin will stop calling DataAvailable handler.
You can call Close and CreatePipe method to open pipe again.

# 194.28 class WindowsPreviewHandlerMBS

## 194.28.1 class WindowsPreviewHandlerMBS

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** The class for showing previews on windows.
**Notes:** This is linke a control which you can put into a window to show a preview for a file.

Uses IPreviewHandler class from Microsoft, so also see here:
https://docs.microsoft.com/en-us/windows/win32/api/shobjidl_core/nn-shobjidl_core-ipreviewhandler
https://docs.microsoft.com/de-de/windows/win32/shell/preview-handlers

The preview handlers we find are those listed in the registry here:
Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\PreviewHandlers

See WinPreviewControlMBS control to use this class as a control.
**Blog Entries**

- MBS Xojo Plugins, version 23.3pr4
- PDF Viewer control for Windows
- MBS Xojo Plugins, version 23.3pr2
- MBS Xojo Plugins, version 22.4pr5
- MBS Xojo Plugins, version 21.6pr3
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.3
- MBS Real Studio Plugins, version 12.3pr11
- File Previews on Windows

**Xojo Developer Magazine**

- 10.6, page 10: News

## 194.28.2 Methods

## 194.28.3 Constructor(ClassID as string)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Initializes the object with loading the class with the given classid.
**Notes:** You find those ClassIDs in the registry (See example project).

See HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\PreviewHandlers in the registry.

### 194.28.4 DoPreview

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Directs the preview handler to load data from the source specified in an earlier Initialize method call, and to begin rendering to the previewer window.
**Notes:** Lasterror is set.

If the previewer window has not yet been created, then it must be created after this method has been called. The preview handler is responsible for painting the area specified in SetWindow or SetRect. If these methods are called while the preview handler is rendering, the window must be reparented/resized without stopping or restarting the rendering of the item.
This method should be called only after SetWindow has been called.
Aditionally, this method should be called only after Constructor has been called.

### 194.28.5 InitWithData(data as MemoryBlock)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.

You need to call Preview next on success to show a preview.
See also:

- 194.28.6 InitWithData(data as string) 23296

### 194.28.6 InitWithData(data as string)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.

You need to call Preview next on success to show a preview.
See also:

• 194.28.5 InitWithData(data as MemoryBlock) 23296

### 194.28.7 InitWithFile(file as folderitem)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given file.
**Notes:** Lasterror is set.
If the preview handler does not support reading file, the plugin reads the file and passes as data.

You need to call Preview next on success to show a preview.

If the file path is invalid, the preview will show a file not found error message.

### 194.28.8 SetBackgroundColor(red as Integer, green as Integer, blue as Integer)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the background color of the preview handler.
**Notes:** Lasterror is set.
Not all preview handlers implement this method.

### 194.28.9 SetFocus

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Directs the preview handler to set focus to itself.
**Notes:** Lasterror is set.

### 194.28.10 SetFont(size as Integer, font as string)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the font attributes to be used for text within the preview handler.
**Notes:** Lasterror is set.
Not all preview handlers implement this method.

### 194.28.11 SetRect(left as Integer, top as Integer, width as Integer, height as Integer)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Directs the preview handler to change the area within the parent hwnd that it draws into.
**Notes:** Lasterror is set.

If called before the preview handler window has been created, the new rectangle replaces the rectangle previously received in the SetWindow call.
If called after the preview handler window has been created, the preview handler window must be resized.
If the preview handler is already rendering, then the preview must be resized without interrupting the render process.

### 194.28.12 SetTextColor(red as Integer, green as Integer, blue as Integer)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the color of the text within the preview handler.
**Notes:** Lasterror is set.
Not all preview handlers implement this method.

### 194.28.13 SetWindow(win as ContainerControl)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent of the preview to be the container with it's size.
**Notes:** We query size of the container automatically to set the right size independent of the screen scaling.
See also:


- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303

- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer)

MBS Win Plugin, Plugin Version: 22.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent to a container control.
**Notes:** Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.15 SetWindow(win as Control)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent of the preview to be the control with it's size.
**Notes:** e.g. use a Canvas to host the preview.

We query size of the container automatically to set the right size independent of the screen scaling.
See also:

- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer)

MBS Win Plugin, Plugin Version: 22.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent to a control.
**Notes:** Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303

- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305


### 194.28.17 SetWindow(win as DesktopContainer)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent of the preview to be the container with it's size.
**Notes:** We query size of the container automatically to set the right size independent of the screen scaling.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer)

MBS Win Plugin, Plugin Version: 22.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent to a desktop container control.
**Notes:** Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298

- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.19 SetWindow(win as DesktopControl)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent of the preview to be the control with it's size.
**Notes:** e.g. use a Canvas to host the preview.

We query size of the container automatically to set the right size independent of the screen scaling.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303

- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305


### 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer)

MBS Win Plugin, Plugin Version: 22.1, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent to a desktop control.
**Notes:** Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305


### 194.28.21 SetWindow(win as DesktopWindow)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent window of the previewer window.
**Notes:** We query size of the container automatically to set the right size independent of the screen scaling.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299

- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.18 SetWindow(win as DesktopContainer, left as integer, top as integer, width as integer, height as integer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent window of the previewer window, as well as the area within the parent to be used for the previewer window.
**Notes:** Pass the window and the area for the previewer.
Lasterror is set.

The preview handler is responsible for painting the entire area. If the previewer window has been created, the preview handler must associate the previewer window to the new parent hwnd and resize the previewer window to the area defined by the rectangle. If the previewer window has not yet been created, the preview handler must remember this information for when the previewer window is created in DoPreview.
It is preferred that this information be stored prior to calling DoPreview. Doing so increases performance at setup time for any cases where the preview does not start.

Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300

- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.23 SetWindow(win as Window) 23305
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306


### 194.28.23 SetWindow(win as Window)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent window of the previewer window.
**Notes:** We query size of the container automatically to set the right size independent of the screen scaling.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer) 23306

### 194.28.24 SetWindow(win as window, left as Integer, top as Integer, width as Integer, height as Integer)

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Sets the parent window of the previewer window, as well as the area within the parent to be used for the previewer window.
**Notes:** Pass the window and the area for the previewer.
Lasterror is set.

The preview handler is responsible for painting the entire area. If the previewer window has been created, the preview handler must associate the previewer window to the new parent hwnd and resize the previewer window to the area defined by the rectangle. If the previewer window has not yet been created, the preview handler must remember this information for when the previewer window is created in DoPreview.
It is preferred that this information be stored prior to calling DoPreview. Doing so increases performance at setup time for any cases where the preview does not start.

Coordinates in pixels.
See also:


- 194.28.13 SetWindow(win as ContainerControl) 23298
- 194.28.14 SetWindow(win as ContainerControl, left as integer, top as integer, width as integer, height as integer) 23299
- 194.28.15 SetWindow(win as Control) 23299
- 194.28.16 SetWindow(win as Control, left as integer, top as integer, width as integer, height as integer) 23300
- 194.28.17 SetWindow(win as DesktopContainer) 23301
- 194.28.19 SetWindow(win as DesktopControl) 23302
- 194.28.20 SetWindow(win as DesktopControl, left as integer, top as integer, width as integer, height as integer) 23303
- 194.28.21 SetWindow(win as DesktopWindow) 23303
- 194.28.22 SetWindow(win as DesktopWindow, left as integer, top as integer, width as integer, height as integer) 23304
- 194.28.23 SetWindow(win as Window) 23305


### 194.28.25 Unload

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Directs the preview handler to cease rendering a preview and to release all resources that have been allocated based on the item passed in during the initialization.

**Notes:** Lasterror is set.
When called, the preview window will be destroyed.

This method should be called only after Constructor has been called. All resources associated with this initialization will be released. Prior to calling DoPreview, this preview handler will be re-initialized with a call to one of the initialization interfaces and a call to SetWindow.

### 194.28.26 Properties

### 194.28.27 Handle as Integer

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 194.28.28 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 194.28.29 LasterrorString as String

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** The error message for the error number in the lasterror property.
**Notes:** (Read only property)

### 194.28.30 SupportsDataLoading as Boolean

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether the preview handler supports loading data from a string or memoryblock.
**Notes:** (Read only property)

### 194.28.31 SupportsFileLoading as Boolean

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether the preview handler supports loading files.
**Notes:** As the plugin can also load file and pass as data if needed, this function also returns true if SupportsDataLoading is also true.
(Read only property)

### 194.28.32 Window as Variant

MBS Win Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop only.

**Function:** The parent window.
**Notes:** Can reference a Window or DesktopWindow object.
(Read only property)

# 194.29 class WindowsPropertiesMBS

## 194.29.1 class WindowsPropertiesMBS

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The class for window properties.
**Example:**

```
dim w as new WindowsPropertiesMBS(self)

dim key as string = w.EdgeGestureDisableTouchWhenFullscreen

w.Value(key) = true

dim c as integer = w.count
for i as integer = 0 to c-1
dim k as string = w.key(i)
MsgBox k+" "+w.Value(k)
next
```

**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- MBS Xojo Plugins, version 17.5pr7
- MBS Xojo Plugins, version 17.5pr6
- Disable edge touch gestures in full screen windows

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.

## 194.29.2 Methods

## 194.29.3 Close

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Closes properties.
**Notes:** Same as destructor.

### 194.29.4 Commit

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Commits values.
**Notes:** Optional as window properties are set directly.
LastError and LastErrorMessage are set.

### 194.29.5 Constructor(Win as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves an object that represents a specific window's collection of properties, which allows those properties to be queried or set.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.

An application can use this function to obtain access to a window's property store so that it can set an explicit Application User Model ID (AppUserModelID) in the System.AppUserModel.ID property.

Raises FunctionNotFoundException if function is not available, PlatformNotSupportedException if not running on Windows, NilObjectException if window is nil or invalid and UnsupportedOperationException if Window properties can't be queried.
See also:

- 194.29.6 Constructor(Win as Window) 23310

### 194.29.6 Constructor(Win as Window)

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves an object that represents a specific window's collection of properties, which allows those properties to be queried or set.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.

An application can use this function to obtain access to a window's property store so that it can set an explicit Application User Model ID (AppUserModelID) in the System.AppUserModel.ID property.

Raises FunctionNotFoundException if function is not available, PlatformNotSupportedException if not running on Windows, NilObjectException if window is nil or invalid and UnsupportedOperationException if Window properties can't be queried.
See also:

- 194.29.5 Constructor(Win as DesktopWindow) 23310

### 194.29.7 Count as Integer

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries number of values.
**Example:**

```
dim w as new WindowsPropertiesMBS(self)

// show all keys with values
dim c as integer = w.count
for i as integer = 0 to c-1
dim k as string = w.key(i)
MsgBox k+" "+w.Value(k)
next
```

**Notes:** LastError and LastErrorMessage are set.

### 194.29.8 EdgeGestureDisableTouchWhenFullscreen as String

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The property name used to disable touch gesture with full screen window.
**Example:**

```
dim w as new WindowsPropertiesMBS(self)
dim key as string = w.EdgeGestureDisableTouchWhenFullscreen

w.Value(key) = true
```

### 194.29.9 Key(Index as Integer) as String

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The key with given index.
**Notes:** Index from 0 to Count-1.
Keys are passed as UUID followed by property ID.
LastError and LastErrorMessage are set.

### 194.29.10 Values as Dictionary

MBS Win Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Queries all values as dictionary.
**Notes:** The dictionary is a copy, so changes to the dictionary are not going back to the window.

### 194.29.11 Properties

### 194.29.12 Handle as Integer

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 194.29.13 LastError as Integer

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 194.29.14 LastErrorMessage as String

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** The last error message.
**Notes:** (Read and Write property)

### 194.29.15 Value(Key as String) as Variant

MBS Win Plugin, Plugin Version: 17.5, Platform: Windows, Targets: Desktop only.

**Function:** Set or query property value.
**Example:**

```
dim w as new WindowsPropertiesMBS(self)

// show all keys with values
dim c as integer = w.count
for i as integer = 0 to c-1
```

```
dim k as string = w.key(i)
MsgBox k+" "+w.Value(k)
next
```

**Notes:** Keys are passed as UUID followed by property ID.
LastError and LastErrorMessage are set.
(Read and Write computed property)

# 194.30 class WindowsReportErrorMBS

## 194.30.1 class WindowsReportErrorMBS

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an event source on Windows to report errors.
**Example:**

```
// early on app start, setup this
dim r as new WindowsReportErrorMBS("Application")

// later report something
const Category = 1
const EventID = 1000
r.Report r.kEventLogWarningType, Category, EventID, array("Hello World")
```

**Blog Entries**

- MBS Xojo Plugins Version 21.0 News
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.0
- MBS Xojo Plugins, version 20.6pr1

**Xojo Developer Magazine**

- 21.1, page 35: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 19.2, page 9: News

## 194.30.2 Methods

## 194.30.3 Constructor(SourceName as String, UNCServerName as String = "")

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a registered handle to the specified event log.
**Notes:** UNCServerName: The Universal Naming Convention (UNC) name of the remote server on which this operation is to be performed. If this parameter is "", the local computer is used.
SourceName: The name of the event source whose handle is to be retrieved. The source name must be a subkey of a log under the Eventlog registry key. Note that the Security log is for system use only.
Note This string must not contain characters prohibited in XML Attributes, with the exception of XML Escape sequences such as &lt &gl.

If the source name cannot be found, the event logging service uses the Application log. Although events will be reported , the events will not include descriptions because there are no message and category message files for looking up descriptions related to the event identifiers.

Raises exception on failure.

### 194.30.4 Report(Type as Integer, Category as Integer, EventID as Integer, Strings() as string = nil, RawData as MemoryBlock = nil)

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes an entry at the end of the event log.
**Notes:** Type: The type of event to be logged. See kEventLog* constants.
Category: The event category. This is source-specific information; the category can have any value.
EventID: The event identifier. The event identifier specifies the entry in the message file associated with the event source.
Strings: An array of strings that are merged into the message before Event Viewer displays the string to the user. This parameter must can be nil for no strings. Each string is limited to 31,839 characters.
RawData:

### 194.30.5 Properties

### 194.30.6 Handle as Integer

MBS Win Plugin, Plugin Version: 21.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle to the event source.
**Notes:** (Read and Write property)

### 194.30.7 Constants

Event Types

| Constant | Value | Description |
|---|---|---|
| kEventLogAuditFailure | 16 | Failure Audit event |
| kEventLogAuditSuccess | 8 | Success Audit event |
| kEventLogErrorType | 1 | Error event |
| kEventLogInformationType | 4 | Information event |
| kEventLogSuccess | 0 | Information event |
| kEventLogWarningType | 2 | Warning event |

## 194.31 class WindowsScriptErrorExceptionMBS

### 194.31.1 class WindowsScriptErrorExceptionMBS

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The exception class raised when an error happens while executing a script.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "VBScript"

w.AddCode "a = 1"
w.AddCode "b = 2"

w.AllowUI = false
w.ExecuteStatement "msgbox a+b" // shows exception with access denied

Exception e as WindowsScriptErrorExceptionMBS
MsgBox e.message
```

**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- Windows Scripts in REALbasic

# 194.32 class WindowsScriptErrorMBS

## 194.32.1 class WindowsScriptErrorMBS

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for error details.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "JScript"

try
w.AddCode "function Test(a,b) { 1 return a+b; } " // 1 is there to make error

dim p(-1) as string = array("Hello ", "World from JavaScript")
dim x as string = w.Run("Test", p)
catch e as WindowsScriptErrorExceptionMBS
dim error as WindowsScriptErrorMBS = w.Error
MsgBox error.Description+EndOfLine+"in "+str(error.Line)+":"+str(error.Column)
end try
```

## 194.32.2 Properties

## 194.32.3 Column as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Source code column position where the error occurred.
**Notes:** (Read and Write property)

## 194.32.4 Description as String

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Friendly description of error.
**Notes:** (Read and Write property)

### 194.32.5 Line as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Source code line number where the error occurred.
**Notes:** (Read and Write property)

### 194.32.6 Number as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Error number.
**Notes:** (Read and Write property)

### 194.32.7 Source as String

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Source of the error.
**Notes:** (Read and Write property)

### 194.32.8 Text as String

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Line of source code on which the error occurred.
**Notes:** (Read and Write property)

# 194.33 class WindowsScriptMBS

## 194.33.1 class WindowsScriptMBS

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to run Windows Scripts.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "JScript"
w.AddCode "function Test(a,b) { return a+b; } "

dim p(-1) as string = array("Hello ", "World from JavaScript")
dim x as string = w.Run("Test", p)

MsgBox x
```

**Notes:** You may also read this MSDN page:
http://msdn.microsoft.com/en-us/library/ms756007%28VS.85%29.aspx

ScriptControl from Microsoft is 32-bit only. If you need 64-bit, please install a 64-bit alternative MSScript.ocx file:
http://www.eonet.ne.jp/
textasciitilde gakana/tablacus/scriptcontrol_en.html
**Blog Entries**

- Windows Scripting
- MBS REALbasic plug-ins version 10.0
- Windows Scripts in REALbasic

## 194.33.2 Methods

## 194.33.3 AddCode(code as string)

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Add code to the global module.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "VBScript"
```

```
w.AddCode "a = 1" // define some global variables
w.AddCode "b = 2"
```

**Notes:** If you use VBScript, you don't need "dim" keyword for defining variables.

### 194.33.4 ClearError

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Clears the current error.

### 194.33.5 Eval(code as string) as string

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Evaluate an expression within the context of the global module.

### 194.33.6 ExecuteStatement(statement as string)

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Execute a statement within the context of the global module.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "VBScript"

w.AddCode "a = 1"
w.AddCode "b = 2"

w.AllowUI = true
w.ExecuteStatement "msgbox a+b" // shows 3

w.AllowUI = false
w.ExecuteStatement "msgbox a+b" // shows exception with access denied

Exception e as WindowsScriptErrorExceptionMBS
MsgBox e.message
```

### 194.33.7 Reset

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reset the scripting engine to a newly created state.

### 194.33.8 Run(functionName as string, parameters() as string) as string

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Call a procedure defined in the global module.
**Example:**

```
dim w as new WindowsScriptMBS

// First try VBScript
w.Language = "VBScript"

dim lines(-1) as string

lines.append "Function Test(a,b)"
lines.append "Test = a+b"
lines.append "End Function"

w.AddCode Join(lines, EndOfLine.Windows)

dim p(-1) as string = array("Hello ", "World from VBScript")
dim x as string = w.Run("Test", p)

'MsgBox x

// Second try JScript
w.Language = "JScript"

redim lines(-1)
lines.append "function Test(a,b)"
lines.Append " { "
lines.append "return a+b;"
lines.append " } "

w.AddCode Join(lines, EndOfLine.Windows)

p = array("Hello ", "World from JavaScript")
x = w.Run("Test", p)

MsgBox x
```

```
Exception e as WindowsScriptErrorExceptionMBS
MsgBox "Exception: "+e.message
```

### 194.33.9 Properties

### 194.33.10 AllowUI as Boolean

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enable or disable display of the UI.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = "VBScript"

w.AddCode "a = 1"
w.AddCode "b = 2"

w.AllowUI = true
w.ExecuteStatement "msgbox a+b" // shows 3

w.AllowUI = false
w.ExecuteStatement "msgbox a+b" // shows exception with access denied

Exception e as WindowsScriptErrorExceptionMBS
MsgBox e.message
```

**Notes:** (Read and Write property)

### 194.33.11 Error as WindowsScriptErrorMBS

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current error status.
**Notes:** (Read only property)

### 194.33.12 Language as String

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Language engine to use.
**Example:**

```
dim w as new WindowsScriptMBS

w.Language = w.kLanguageJScript

MsgBox w.Language // shows "JScript"

w.Language = w.kLanguageVBScript

MsgBox w.Language // shows "VBScript"
```

**Notes:** Use kLanguageVBScript or kLanguageJScript constants.
Setting this property calls reset internally.
(Read and Write property)

### 194.33.13 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** 0 is no error. -1 is a parameter error on the plugin side. All other codes are from Windows.
(Read and Write property)

### 194.33.14 SitehWnd as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The window handle for the window being parent to any window the scripts create.
**Example:**

```
dim w as new WindowsScriptMBS
w.SitehWnd = window1.handle
```

**Notes:** The window is used as the parent window for message boxes, alerts, etc.
(Read and Write property)

### 194.33.15 Timeout as Integer

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Length of time in milliseconds that a script can execute before being considered hung.
**Notes:** (Read and Write property)

### 194.33.16 UseSafeSubset as Boolean

MBS Win Plugin, Plugin Version: 10.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Force script to execute in safe mode and disallow potentially harmful actions.
**Notes:** (Read and Write property)

### 194.33.17 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kLanguageJScript | "JScript" | One of the language constants.<br>Using this constant you can switch to JavaScript. |
| kLanguageVBScript | "VBScript" | One of the language constants.<br>Using this constant you can switch to VBScript. |

# 194.34 class WindowsSerialPortsMBS

## 194.34.1 class WindowsSerialPortsMBS

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This is a class to query the serial ports on a Windows system.
**Notes:** This class was created in response to feedback report 8212: Serial Port Hangup on Windows.
**Blog Entries**

- MBS Xojo Plugins, version 19.0pr7
- MBS Xojo / Real Studio Plugins, version 14.0pr5
- Plugins 10.1

**Videos**

- Presentation from Xojo Developer Conference 2019 in Miami.

## 194.34.2 Methods

## 194.34.3 Constructor(OnlyPresent as boolean = true)

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor which builds the list of devices.

## 194.34.4 Description(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The description of this serial port.

## 194.34.5 DevicePath(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device path of this serial port.

### 194.34.6 FriendlyName(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The display name of this serial port.

### 194.34.7 Location(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location of this serial port.

### 194.34.8 QueryComDevices as String()

MBS Win Plugin, Plugin Version: 19.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries list of DOS COM Port names.
**Notes:** While Constructor builds a list based on registry information (setup database), this function will use QueryDosDevice to ask Windows about device names for DOS starting with COM in their name and return the list.

Returns nil in case of failure.

### 194.34.9 Properties

### 194.34.10 Count as Integer

MBS Win Plugin, Plugin Version: 10.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The number of serial ports found.
**Notes:** (Read and Write property)

# 194.35 class WindowsTaskbarListMBS

## 194.35.1 class WindowsTaskbarListMBS

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for windows with methods that control the taskbar.
**Notes:** It allows you to dynamically add, remove, and activate items on the taskbar.
**Blog Entries**

- Show progress in task bar on Windows
- SetProgressState on Windows
- MBS REALbasic plug-ins version 10.2

## 194.35.2 Methods

## 194.35.3 ActivateTab(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Activates an item on the taskbar.
**Notes:** The window is not actually activated; the window's item on the taskbar is merely displayed as active.
Lasterror is set.

## 194.35.4 AddTab(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds an item to the taskbar.
**Notes:** Any type of window can be added to the taskbar, but it is recommended that the window at least have the WS_CAPTION style.

Any window added with this method must be removed with the DeleteTab method when the added window is destroyed.

Lasterror is set.

## 194.35.5 DeleteTab(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes an item from the taskbar.

### 194.35.6 MarkFullscreenWindow(WindowHandle as Integer, Fullscreen as Boolean)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Marks a window as full-screen.
**Notes:** Fullscreen: A Boolean value marking the desired full-screen status of the window.

Setting the value of fFullscreen to TRUE, the Shell treats this window as a full-screen window, and the taskbar is moved to the bottom of the z-order when this window is active. Setting the value of fFullscreen to FALSE removes the full-screen marking, but does not cause the Shell to treat the window as though it were definitely not full-screen. With a FALSEfFullscreen value, the Shell depends on its automatic detection facility to specify how the window should be treated, possibly still flagging the window as full-screen.

Requires Windows XP or Windows Server 2003 or newer.
Lasterror is set.

### 194.35.7 RegisterTab(TabWindowHandle as Integer, MDIWindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Informs the taskbar that a new tab or document thumbnail has been provided for display in an application's taskbar group flyout.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.
By itself, registering a tab thumbnail alone will not result in its being displayed. You must also call SetTabOrder to instruct the group where to display it.

### 194.35.8 SetActiveAlt(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Marks a taskbar item as active but does not visually activate it.
**Notes:** SetActiveAlt marks the item associated with hwnd as the currently active item for the window's process without changing the pressed state of any item. Any user action that would activate a different tab in that process will activate the tab associated with hwnd instead. The active state of the window's item is not guaranteed to be preserved when the process associated with this window is not active. To ensure that a given tab is always active, call SetActiveAlt whenever any of your windows are activated. Calling SetActiveAlt with a nil window handle clears this state.

### 194.35.9 SetOverlayIcon(TabWindowHandle as Integer, IconHandle as Integer, Description as string)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Applies an overlay to a taskbar button to indicate application status or a notification to the user.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

TabWindowHandle:
The handle of the window whose associated taskbar button receives the overlay. This handle must belong to a calling process associated with the button's application and must be a valid HWND or the call is ignored.

IconHandle:
The handle of an icon to use as the overlay. This should be a small icon, measuring 16x16 pixels at 96 dpi. If an overlay icon is already applied to the taskbar button, that existing overlay is replaced.

This value can be 0. How a 0 value is handled depends on whether the taskbar button represents a single window or a group of windows.

- If the taskbar button represents a single window, the overlay icon is removed from the display.
- If the taskbar button represents a group of windows and a previous overlay is still available (received earlier than the current overlay, but not yet freed by a 0 value), then that previous overlay is displayed in place of the current overlay.

It is the responsibility of the calling application to free hIcon when it is no longer needed. This can generally be done after you've called SetOverlayIcon because the taskbar makes and uses its own copy of the icon.

Description:
A string that provides an alt text version of the information conveyed by the overlay, for accessibility purposes.

In versions of Windows earlier than Windows 7, applications often used icons in the notification area of the taskbar to display application status and notifications to the user. The Windows 7 taskbar allows an application to provide that same sort of user feedback through its taskbar button, centralizing more of the application information in one place. These overlays are similar to existing overlays used for shortcut icons or security notifications, displayed at the lower-right corner of the button.

The following illustration shows an overlay (the small, green square that indicates the user status as "Available") applied to the far-right taskbar button.

Windows Messenger taskbar button with an overlay to indicate an Available status.

Icon overlays serve as a contextual notification of status, and are intended to negate the need for a separate notification area status icon to communicate that information to the user. The application designer must decide during the development cycle which method—icon overlay or notification area status icon—best serves that application. Overlay icons are intended to supply important, long-standing status or notifications such as network status, messenger status, or new mail. They should not be frequently changed, nor should they be animated.

To display an overlay icon, the taskbar must be in the default large icon mode. If the taskbar is configured through Taskbar and Start Menu Properties to show small icons, overlays cannot be applied and calls to this method are ignored.

Because a single overlay is applied to the taskbar button instead of to the individual window thumbnails, this is a per-group feature rather than per-window. Requests for overlay icons can be received from individual windows in a taskbar group, but they do not queue. The last overlay received is the overlay shown. If the last overlay received is removed, the overlay that it replaced is restored so long as it is still active. As an example, windows 1, 2, and 3 set, in order, overlays A, B, and C. Because overlay C was received last, it is shown on the taskbar button. Window 2 calls SetOverlayIcon with a 0 value to remove overlay B. Window 3 then does the same to remove overlay C. Because window 1's overlay A is still active, that overlay is then displayed on the taskbar button.

If Windows Explorer shuts down unexpectedly, overlays are not restored when Windows Explorer is restored. The application should wait to receive the TaskbarButtonCreated message that indicates that Windows Explorer has restarted and the taskbar button has been re-created, and then call SetOverlayIcon again to reapply the overlay.

### 194.35.10 SetProgressState(WindowHandle as Integer, Flags as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the type and state of the progress indicator displayed on a taskbar button.
**Notes:** Use the ProgressStateFlag* constants. Flags that control the current state of the progress button. Specify only one of the following flags; all states are mutually exclusive of all others.

Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

Progress bar information is not shown in high contrast color schemes to guarantee that no accessibility needs are compromised.

Developers accustomed to the existing progress bar control should find the taskbar button progress indicator to be a similar experience both in concept and visuals. Here, the taskbar button itself becomes a progress bar. A taskbar button's progress indicator should be a reflection of a more detailed progress bar in the associated window. This allows the user to see specifics, such as the percentage number and the amount of

time remaining, that cannot be shown in a taskbar button. Also, because a taskbar button can show the progress of only a single window in a group, it allows the user to check the progress of individual windows. It also provides progress information to the user when the taskbar button cannot, such as in a high-contrast color scheme.

Note that a taskbar button progress bar is not intended for use with normally peripheral actions such as the loading of a Web page or the printing of a document. That type of progress should continue to be shown in a window's status bar.

The progress indicator is displayed between the taskbar button's icon or text and the background. If progress is shown for both the active taskbar button and an inactive button, shading in the respective progress bars is such that the active button is still obvious to the user. Also, button functionality such as the display of thumbnails continues to work normally when the button is being used to display progress.

When exiting an error or paused state, call this method again with the ProgressStateFlagNormal or ProgressStateFlagIndeterminate flag to continue in the original state or TBPF_NOPROGRESS if the operation is cancelled.

How the Taskbar Button Chooses the Progress Indicator for a Group

The taskbar button can show a progress indicator for only one window at a time. This includes the situation where the taskbar button represents a group and more than one window in that group is broadcasting progress information. In that case, the taskbar button chooses its progress display based on state priority. State priority is shown in the following table with priority 1 being the highest.

| Priority | State |
|---|---|
| 1 | ProgressStateFlagError |
| 2 | ProgressStateFlagPaused |
| 3 | ProgressStateFlagNormal |
| 4 | ProgressStateFlagIndeterminate |

Changing a window's state changes its priority in relation to other windows in the group which in turn might change which window in a group is used for the progress indicator in the taskbar button.

In the case of a priority collision between two windows that are broadcasting determinate progress, the window with the least progress is used.

Based on this priority, the indeterminate progress indicator can be displayed in the taskbar button only in these cases:

- The taskbar button does not represent a group and the single window that it represents has set ProgressStateFlagIndeterminate.
- The taskbar button represents a group, only one window in that group is broadcasting progress information, and that window has set ProgressStateFlagIndeterminate.
- The taskbar button represents a group, multiple windows in that group are broadcasting progress information, and all of those windows have set ProgressStateFlagIndeterminate.

A determinate progress indicator can be displayed in these cases:

- The taskbar button does not represent a group and the single window that it represents is broadcasting determinate progress information.
- The taskbar button represents a group, only one window in that group is broadcasting progress information, and that window is broadcasting determinate progress information.
- The taskbar button represents a group, multiple windows in that group are broadcasting progress information, at least one of those windows is broadcasting determinate progress information, and no window has set ProgressStateFlagError or ProgressStateFlagPaused.

Note that a call to SetProgressValue will switch a progress indicator currently in an indeterminate mode (ProgressStateFlagIndeterminate) to a normal (determinate) display and clear the ProgressStateFlagIndeterminate flag.

If the handle is a ptr, you need to cast it with Integer(YourPtr) to pass it.

### 194.35.11 SetProgressValue(WindowHandle as Integer, Completed as UInt64, Total as UInt64)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Displays or updates a progress bar hosted in a taskbar button to show the specific percentage completed of the full operation.
**Notes:** Completed: An application-defined value that indicates the proportion of the operation that has been completed at the time the method is called.
Total: An application-defined value that specifies the value ullCompleted will have when the operation is complete.

Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

Determinate Progress Bar Lifecycle

An application first calls SetProgressValue to begin the display of a determinate progress bar, and then calls it again as needed to update the bar as the progress changes. When progress is complete, the application must call SetProgressState with the TBPF_NOPROGRESS flag to dismiss the progress bar.

How the Taskbar Button Chooses the Progress Indicator for a Group

The taskbar button can show a progress indicator for only one window at a time. When the taskbar button represents a group and more than one of the windows in that group are broadcasting progress information, the taskbar button chooses its progress display based on the following state priority.

| Priority | State |
|---|---|
| 1 | ProgressStateFlagError |
| 2 | ProgressStateFlagPaused |
| 3 | ProgressStateFlagNormal |
| 4 | ProgressStateFlagIndeterminate |

Unless SetProgressState has set a blocking state (ProgressStateFlagError or ProgressStateFlagPaused) for the window, a call to SetProgressValue assumes the ProgressStateFlagNormal state even if it is not explicitly set. A call to SetProgressValue overrides and clears the ProgressStateFlagIndeterminate state.

In the case of a priority collision where two windows are broadcasting determinate progress, the window with the least progress is used.

Based on that priority, this determinate (specific percentage) progress indicator can be displayed in these cases:

- The taskbar button does not represent a group and the single window that it represents is broadcasting determinate progress information through this method.
- The taskbar button represents a group, only one window in that group is broadcasting progress information, and that window is broadcasting determinate progress information through this method.
- The taskbar button represents a group, multiple windows in that group are broadcasting progress information, at least one of those windows is broadcasting progress information through this method, and none of those windows has set the ProgressStateFlagError or ProgressStateFlagPaused state.

If a window in the group has set ProgressStateFlagError or ProgressStateFlagPaused, that state will be used for the button display. However, you can still make calls to SetProgressValue on other, unblocked windows in the group to update their progress in the background.

If the handle is a ptr, you need to cast it with Integer(YourPtr) to pass it.

### 194.35.12 SetTabActive(TabWindowHandle as Integer, MDIWindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Informs the taskbar that a tab or document window has been made the active window.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

TabWindowHandle: Handle of the active tab window. This handle must already be registered through RegisterTab. This value can be 0 if no tab is active.

MDIWindowHandle: Handle of the application's main window. This value tells the taskbar which group the thumbnail is a member of. This value is required and cannot be 0.

### 194.35.13 SetTabOrder(TabWindowHandle as Integer, InsertBeforeWindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Inserts a new thumbnail into a tabbed-document interface (TDI) or multiple-document interface (MDI) application's group flyout or moves an existing thumbnail to a new position in the application's group.
**Notes:** TabWindowHandle: The handle of the tab window whose thumbnail is being placed. This value is required, must already be registered through RegisterTab, and cannot be 0.
InsertBeforeWindowHandle: The handle of the tab window whose thumbnail that hwndTab is inserted to the left of. This handle must already be registered through RegisterTab. If this value is 0, the new thumbnail is added to the end of the list.

### 194.35.14 SetTabProperties(TabWindowHandle as Integer, flags as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Allows a tab to specify whether the main application frame window or the tab window should be used as a thumbnail or in the peek feature under certain circumstances.
**Notes:** An application might want to use the thumbnail or peek representation of its associated parent window if the application cannot generate its own thumbnail for a tab or for its active tab content (such as an animation) to appear live.

flags: One of the TabPropertyFlag* constants.
Available on Windows 7 or Windows Server 2008 R2 or newer.

### 194.35.15 SetThumbnailClip(TabWindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Selects a portion of a window's client area to display as that window's thumbnail in the taskbar.
**Notes:** This variant of the method clears the clip that is already in place and return to the default display of the thumbnail.

Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.
See also:

- 194.35.16 SetThumbnailClip(TabWindowHandle as Integer, x as Integer, y as Integer, w as Integer, h as Integer) 23335

### 194.35.16 SetThumbnailClip(TabWindowHandle as Integer, x as Integer, y as Integer, w as Integer, h as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Selects a portion of a window's client area to display as that window's thumbnail in the taskbar.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.
See also:

- 194.35.15 SetThumbnailClip(TabWindowHandle as Integer) 23335

### 194.35.17 SetThumbnailTooltip(TabWindowHandle as Integer, tip as string)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies or updates the text of the tooltip that is displayed when the mouse pointer rests on an individual preview thumbnail in a taskbar button flyout.
**Notes:** Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

TabWindowHandle: The handle to the window whose thumbnail displays the tooltip. This handle must belong to the calling process.

tip: The text to be displayed in the tooltip. This value can be empty, in which case the title of the window specified by WindowHandle is used as the tooltip.

### 194.35.18 UnregisterTab(TabWindowHandle as Integer)

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes a thumbnail from an application's preview group when that tab or document is closed in the application.
**Notes:** It is the responsibility of the calling application to free hwndTab through DestroyWindow. UnregisterTab must be called before the handle is freed.
Requires Windows 7 or Windows Server 2008 R2 or newer.
Lasterror is set.

### 194.35.19 Properties

### 194.35.20 Handle1 as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference for the ITaskbarList interface.
**Notes:** The ITaskbarList interface is available on Windows 2000 Professional, Windows XP or Windows 2000 Server or newer.
(Read and Write property)

### 194.35.21 Handle2 as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference for the ITaskbarList2 interface.
**Notes:** The ITaskbarList4 interface is available on Windows XP or Windows Server 2003 or newer.
(Read and Write property)

### 194.35.22 Handle3 as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference for the ITaskbarList3 interface.
**Notes:** The ITaskbarList3 interface is available on Windows 7 or Windows Server 2008 R2 or newer.
none
(Read and Write property)

### 194.35.23 Handle4 as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference for the ITaskbarList4 interface.
**Notes:** The ITaskbarList4 interface is available on Windows 7 or Windows Server 2008 R2 or newer.
(Read and Write property)

### 194.35.24 Lasterror as Integer

MBS Win Plugin, Plugin Version: 10.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code from one of the methods.
**Notes:** (Read and Write property)

### 194.35.25 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ProgressStateFlagError | 4 | One of the progress state flag constants.<br>The progress indicator turns red to show that an error has oc<br>the windows that is broadcasting progress. This is a determina<br>progress indicator is in the indeterminate state, it switches to a<br>display of a generic percentage not indicative of actual progres |
| ProgressStateFlagIndeterminate | 1 | One of the progress state flag constants.<br>The progress indicator does not grow in size, but cycles repea<br>length of the taskbar button. This indicates activity without<br>proportion of the progress is complete. Progress is taking pla<br>no prediction as to how long the operation will take. |
| ProgressStateFlagNoProgress | 0 | One of the progress state flag constants.<br>Stops displaying progress and returns the button to its norr<br>this method with this flag to dismiss the progress bar when t<br>complete or cancelled. |
| ProgressStateFlagNormal | 2 | One of the progress state flag constants.<br>The progress indicator grows in size from left to right in pr<br>estimated amount of the operation completed. This is a deter<br>indicator; a prediction is being made as to the duration of the |
| ProgressStateFlagPaused | 8 | One of the progress state flag constants.<br>he progress indicator turns yellow to show that progress is curre<br>one of the windows but can be resumed by the user. No error<br>and nothing is preventing the progress from continuing. This i<br>state. If the progress indicator is in the indeterminate state<br>a yellow determinate display of a generic percentage not indi<br>progress. |
| TabPropertyFlagNone | 0 | One of the flag values you can use with SetTabProperties.<br>No specific property values are specified. The default behavior<br>window provides a thumbnail and peek image, either live or sta<br>ate. |
| TabPropertyFlagUseAppPeekAlways | 4 | One of the flag values you can use with SetTabProperties.<br>Always use the peek image provided by the main application<br>rather than a peek image provided by the individual tab wi<br>combine this value with TabPropertyFlagUseAppPeekWhenA<br>will result in an error. |
| TabPropertyFlagUseAppPeekWhenActive | 8 | One of the flag values you can use with SetTabProperties.<br>When the application tab is active and a live representation<br>available, show the main application frame in the peek feature.<br>use the tab window. Do not combine this value with TabPr<br>AppPeekAlways; doing so will result in an error. |
| TabPropertyFlagUseAppThumbnailAlways | 1 | One of the flag values you can use with SetTabProperties.<br>Always use the thumbnail provided by the main application<br>rather than a thumbnail provided by the individual tab windo<br>bine this value with TabPropertyFlagUseAppThumbnailWhen<br>will result in an error. |
| TabPropertyFlagUseAppThumbnailWhenActive | 2 | One of the flag values you can use with SetTabProperties.<br>When the application tab is active and a live representation<br>available, use the main application frame window thumbnail.<br>use the tab window thumbnail. Do not combine this value w<br>tyFlagUseAppThumbnailAlways; doing so will result in an erro |

# 194.36 class WindowsThreadExecutionStateMBS

## 194.36.1 class WindowsThreadExecutionStateMBS

MBS Win Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the thread execution state.
**Example:**

```
dim flags as integer = WindowsThreadExecutionStateMBS.kSystemRequired
dim w as new WindowsThreadExecutionStateMBS(flags)
window1.WindowsThreadExecutionState = w // store it in property
```

**Notes:** The state is set in constructor and reset in destructor, so you can put this object in a property of a window, so when the window is destroyed, the state is reset automatically.

Enables an application to inform the system that it is in use, thereby preventing the system from entering sleep or turning off the display while the application is running.

For macOS, please check NSProcessInfoMBS class.

The system automatically detects activities such as local keyboard or mouse input, server activity, and changing window focus. Activities that are not automatically detected include disk or CPU activity and video display.

To run properly on a power-managed computer, applications such as fax servers, answering machines, backup agents, and network management applications must use both kSystemRequired when they process events. Multimedia applications, such as video players and presentation applications, must use kDisplayRequired when they display video for long periods of time without user input. Applications such as word processors, spreadsheets, browsers, and games do not need to use this.

The kAwayModeRequired value should be used only when absolutely necessary by media applications that require the system to perform background tasks such as recording television content or streaming media to other devices while the system appears to be sleeping. Applications that do not require critical background processing or that run on portable computers should not enable away mode because it prevents the system from conserving power by entering true sleep.

To enable away mode, an application uses both kAwayModeRequired; to disable away mode, let the destructor reset. When away mode is enabled, any operation that would put the computer to sleep puts it in away mode instead. The computer appears to be sleeping while the system continues to perform tasks that do not require user input. Away mode does not affect the sleep idle timer; to prevent the system from entering sleep when the timer expires, an application must also set the kSystemRequired value.

This class cannot be used to prevent the user from putting the computer to sleep. Applications should respect that the user expects a certain behavior when they close the lid on their laptop or press the power button.

This function does not stop the screen saver from executing.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr4

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 194.36.2 Methods

### 194.36.3 Constructor(Flags as Integer)

MBS Win Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the state and stores old state in property.
**Example:**

```
dim flags as integer = WindowsThreadExecutionStateMBS.kSystemRequired
dim w as new WindowsThreadExecutionStateMBS(flags)
window1.WindowsThreadExecutionState = w // store it in property
```

**Notes:** Does nothing if called on macOS, iOS or Linux.

### 194.36.4 Destructor

MBS Win Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** Puts back the old state.
Does nothing if called on macOS, iOS or Linux.

### 194.36.5 Properties

### 194.36.6 newState as Integer

MBS Win Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The new state set.
**Notes:** (Read only property)

### 194.36.7 oldState as Integer

MBS Win Plugin, Plugin Version: 23.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The old state before.
**Notes:** (Read only property)

### 194.36.8 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kAwayModeRequired | 64 | Enables away mode. Away mode should be used only by media-recording and media-distribution applications that must perform critical background processing on desktop computers while the computer appears to be sleeping. |
| kDisplayRequired | 2 | Forces the display to be on by resetting the display idle timer. |
| kSystemRequired | 1 | Forces the system to be in the working state by resetting the system idle timer. |

## 194.37 class WindowsVerticalBlankMBS

### 194.37.1 class WindowsVerticalBlankMBS

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for checking on Windows with the retrace of the display.
**Notes:** Sometimes you may want to draw only if the device is currently not touching the video memory.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr10

### 194.37.2 Methods

### 194.37.3 Constructor

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initializes the class.

### 194.37.4 GetMonitorFrequency as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the frequency of the monitor that the DirectDraw object controls.
**Notes:** Returns the monitor frequency, in Hz.
Lasterror is set.

### 194.37.5 GetScanLine as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This method retrieves the scan line that is currently being drawn on the monitor.
**Notes:** To synchronize with the vertical blank, use the WaitForVerticalBlank method.
Lasterror is set.

Scan lines are reported as zero-based integers.
The returned scan line value is between 0 and n, where scan line 0 is the first visible scan line on the screen and n is the last visible scan line, plus scan lines that occur during the vertical blank period.

So, in a case where an application is running at 640x480, and there are 12 scan lines during the vertical blank period, the values returned by this method will range from 0 to 491.

### 194.37.6 GetVerticalBlankStatus as boolean

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the status of the vertical blank.
**Notes:** Returns the status of the vertical blank. True if a vertical blank is occurring, and false otherwise.
Lasterror is set.

### 194.37.7 WaitForVerticalBlankBegin

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Helps the application synchronize itself with the vertical-blank interval.
**Notes:** WaitForVerticalBlank returns when the vertical-blank interval begins.
Lasterror is set.

### 194.37.8 WaitForVerticalBlankEnd

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Helps the application synchronize itself with the vertical-blank interval.
**Notes:** WaitForVerticalBlank returns when the vertical-blank interval ends and the display begins.
Lasterror is set.

### 194.37.9 Properties

### 194.37.10 Available as Boolean

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this class will work.
**Notes:** (Read and Write property)

### 194.37.11 Lasterror as Integer

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last windows error string.
**Notes:** (Read and Write property)

### 194.37.12 LasterrorString as String

MBS ComputerControl Plugin, Plugin Version: 12.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last windows error string.
**Notes:** (Read only property)

# 194.38 class WindowsWMIMBS

## 194.38.1 class WindowsWMIMBS

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to run queries in the Windows Management Interface.
**Example:**

```
dim w as WindowsWMIMBS

w=new WindowsWMIMBS

if w.ConnectServer("root\cimv2") then
MsgBox "ConnectServer: ok"

if w.query("WQL","SELECT * FROM Win32_Processor") then
MsgBox "query: ok"

if w.NextItem then
MsgBox "NextItem: ok"

MsgBox w.GetPropertyString("Name") // string
MsgBox str(w.GetPropertyInteger("MaxClockSpeed")) // uint32
MsgBox str(w.GetPropertyInteger("ProcessorType")) // uint16

else
MsgBox "NextItem: fail"
end if
else
MsgBox "query: fail"
end if

else
MsgBox "ConnectServer: fail"
end if
```

**Notes:** In Windows 8.1 (or later) it looks like WindowsWMIMBS.InitSecurity(false) must be called at app.Constructor time as Xojo will do some things in background when opening first window which block our queries.
Subclass of the WMIObjectMBS class.
**Blog Entries**

- Xojo News
- Windows Task Monitor written in Xojo

- MBS Real Studio Plugins, version 12.2pr6
- Detecting drive letter for an USB Stick
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 11.4pr1
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr13

### 194.38.2 Methods

### 194.38.3 CancelAsyncCall as boolean

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stops events being delivered to this WindowsWMIMBS object.
**Notes:** Lasterror is set.

### 194.38.4 ConnectServer(NetworkResource as string, Username as string="", Password as string="", Locale as string="", Authority as string="") as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Connect to WMI server.
**Example:**

```
dim w as WindowsWMIMBS // your WMI object
call w.ConnectServer("root\cimv2")
```

**Notes:** Returns true on success and false on failure.
Authority parameter added in plugin version 12.2.

### 194.38.5 Constructor

MBS Win Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 194.38.6 ExecNotificationQueryAsync(QueryLanguage as string, QueryText as string) as boolean

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ExecNotificationQueryAsync method executes a query to receive events.
**Notes:** The plugin receives events and enqueues them in a queue. You read objects from this queue in a timer and process them.
NextItem returns nil if the queue is empty.

Returns true on success and false on failure.
Lasterror is set. e.g. &h80041018 if you have syntax error in the query or &h80041058 if the query can't be parsed.

### 194.38.7 InitAuthentication(User as string, Domain as string, Password as string) as boolean

MBS Win Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initializes authentication data.
**Notes:** Call before ConnectServer.
This settings are passed to objects for authentication.

### 194.38.8 InitSecurity(AuthnLevel as Integer, ImpLevel as Integer) as boolean

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Registers security and sets the default security values for the process.
**Notes:** You can call this method before creating WindowsWMIMBS object, you can prepare security settings for remote connections.

AuthnLevel:
The default authentication level for the process. Both servers and clients use this parameter when they call CoInitializeSecurity. COM will fail calls that arrive with a lower authentication level. By default, all proxies will use at least this authentication level. This value should contain one of the authentication level constants. By default, all calls to IUnknown are made at this level.

ImpLevel:
The default impersonation level for proxies. The value of this parameter is used only when the process is a client. It should be a value from the impersonation level constants, except for kImpersonationLevelDefault, which is not for use with CoInitializeSecurity.
Outgoing calls from the client always use the impersonation level as specified. (It is not negotiated.) Incoming calls to the client can be at any impersonation level. By default, all IUnknown calls are made with this

impersonation level, so even security-aware applications should set this level carefully. To determine which impersonation levels each authentication service supports, see the description of the authentication services in COM and Security Packages. For more information about impersonation levels, see Impersonation.

Please call in App.Constructor before Xojo can initialize COM and prevent our function from working!
See also:

- 194.38.9 InitSecurity(remote as boolean) as boolean 23348

### 194.38.9 InitSecurity(remote as boolean) as boolean

MBS Win Plugin, Plugin Version: 12.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Initializes security.
**Notes:** You can call this method before creating WindowsWMIMBS object, you can prepare security settings for remote connections.

Calling InitSecurity with remote=true will initialize security with kImpersonationLevelImpersonate. If remote=false, we use kImpersonationLevelIdentity which is the default.

Please call in App.Constructor before Xojo can initialize COM and prevent our function from working!
See also:

- 194.38.8 InitSecurity(AuthnLevel as Integer, ImpLevel as Integer) as boolean 23347

### 194.38.10 NextItem as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Moves to next item in the list.
**Notes:** You need to call this at least once to move to the first item.
Returns false if no more items are there.

### 194.38.11 Query(QueryLanguage as string, QueryText as string) as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Runs a query.
**Example:**

```
dim w as WindowsWMIMBS
call w.query("WQL","SELECT * FROM Win32_Processor")
```

**Notes:** Returns true on success and false on failure.

### 194.38.12 Properties

### 194.38.13 EnumeratorHandle as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the used IEnumWbemClassObject object.
**Notes:** (Read only property)

### 194.38.14 LocatorHandle as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the used IWbemLocator object.
**Notes:** (Read only property)

### 194.38.15 ServiceHandle as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle to the used IWbemServices object.
**Notes:** (Read only property)

### 194.38.16 Constants

Authentication Level

| Constant | Value | Description |
|---|---|---|
| kAuthenticationLevelCall | 3 | Authenticates only at the beginning of each remote procedure call when server receives the request. Datagram transports use kAuthenticationLe Paket instead. |
| kAuthenticationLevelConnect | 2 | Authenticates the credentials of the client only when the client establish relationship with the server. Datagram transports always use kAuthenticat LevelPacket instead. |
| kAuthenticationLevelDefault | 0 | Tells DCOM to choose the authentication level using its normal security bla negotiation algorithm. For more information, see Security Blanket Negotiat |
| kAuthenticationLevelNone | 1 | Performs no authentication. |
| kAuthenticationLevelPacket | 4 | Authenticates that all data received is from the expected client. |
| kAuthenticationLevelPacketIntegrity | 5 | Authenticates and verifies that none of the data transferred between client server has been modified. |
| kAuthenticationLevelPacketPrivacy | 6 | Authenticates all previous levels and encrypts the argument value of each mote procedure call. |

Impersonation Level Constants

| Constant | Value | Description |
|---|---|---|
| kImpersonationLevelAnonymous | 1 | The client is anonymous to the server. The server process can impersonate the client, but the impersonation token will not contain any information and cannot be used. |
| kImpersonationLevelDefault | 0 | DCOM can choose the impersonation level using its normal security blanket negotiation algorithm. For more information, see Security Blanket Negotiation |
| kImpersonationLevelDelegate | 4 | The server process can impersonate the client's security context while acting on behalf of the client. The server process can also make outgoing calls to other servers while acting on behalf of the client, using cloaking. The server may use the client's security context on other machines to access local and remote resources as the client. When impersonating at this level, the impersonation token can be passed across any number of computer boundaries. |
| kImpersonationLevelIdentity | 2 | The server can obtain the client's identity. The server can impersonate the client for ACL checking, but it cannot access system objects as the client. |
| kImpersonationLevelImpersonate | 3 | The server process can impersonate the client's security context while acting on behalf of the client. This level of impersonation can be used to access local resources such as files. When impersonating at this level, the impersonation token can only be passed across one machine boundary. The Schannel authentication service only supports this level of impersonation. |

# 194.39 class WinExceptionMBS

## 194.39.1 class WinExceptionMBS

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to catch windows system exceptions.
**Notes:** This class was made to intercept crashes in a Xojo application.
Whenever the application crashes, this class will fire its event so you have a chance to report that crash to your user and maybe save a crash report.

Do not try to save data as this could overwrite good data with bad data. Remember your application already crashed. Maybe because of data corruption!

Only one instance can exist in your application.

## 194.39.2 Methods

## 194.39.3 Close

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes the exception handler from the system.

## 194.39.4 Properties

## 194.39.5 ExceptionAddress as Integer

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The address in memory where the exception was raised.
**Notes:** (Read only property)

## 194.39.6 ExceptionCode as Integer

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The code of this exception.
**Notes:** Normally one of the kException* constants.
(Read only property)

### 194.39.7 ExceptionFlags as Integer

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The exception flags.
**Notes:** (Read only property)

### 194.39.8 ExceptionIsNonContinuable as Boolean

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this exception allows to continue in code.
**Notes:** For example a division by zero can be continued.
(Read only property)

### 194.39.9 ExceptionName as String

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name of the exception.
**Notes:** If ExceptionCode=kExceptionAccessViolation then returns "ExceptionAccessViolation".

This is a convenience function which you can use to show the exception to the user.
(Read only property)

### 194.39.10 Events

### 194.39.11 GotException() as Integer

MBS Win Plugin, Plugin Version: 8.7, Platform: Windows, Targets: .

**Function:** The event called when an exception was received.
**Notes:** Your application has crashed on this point, but instead of seeing the Microsoft dialog to tell you that the application crashed, your application has the chance to report that problem.

Return one of the following constants: kExecuteHandler, kContinueCode, kNextHandler, kExecuteHandlerNoDialog.

The plugin already removed the crash callback from the system so if the code in this event crashes again, the system dialog shows.

### 194.39.12 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kContinueCode | 2 | One of the constants you can use for the GotException event ret This one is not recommented as it can raise the same exception a your application. |
| kExceptionAccessViolation | &hC0000005 | One of the constants for exception codes. The thread attempts to read from or write to a virtual addres does not have access. |
| kExceptionArrayBoundsExceeded | &hC000008C | One of the constants for exception codes. The thread attempts to access an array element that is out of bo underlying hardware supports bounds checking. |
| kExceptionBreakPoint | &h80000003 | One of the constants for exception codes. A breakpoint is encountered. |
| kExceptionDataTypeMisalignment | &h80000002 | One of the constants for exception codes. The thread attempts to read or write data that is misaligned on h does not provide alignment. For example, 16-bit values must 2-byte boundaries, 32-bit values on 4-byte boundaries, and so on |
| kExceptionFloatDenormalOperand | &hC000008D | One of the constants for exception codes. One of the operands in a floating point operation is denormal. value is one that is too small to represent as a standard floating |
| kExceptionFloatDivideByZero | &hC000008E | One of the constants for exception codes. The thread attempts to divide a floating point value by a floating of 0 (zero). |
| kExceptionFloatInexactResult | &hC000008F | One of the constants for exception codes. The result of a floating point operation cannot be represented decimal fraction. |
| kExceptionFloatInvalidOperation | &hC0000090 | One of the constants for exception codes. A floating point exception that is not included in this list. |
| kExceptionFloatOverflow | &hC0000091 | One of the constants for exception codes. The exponent of a floating point operation is greater than the lowed by the corresponding type. |
| kExceptionFloatStackCheck | &hC0000092 | One of the constants for exception codes. The stack has overflowed or underflowed, because of a floating po |
| kExceptionFloatUnderflow | &hC0000093 | One of the constants for exception codes. The exponent of a floating point operation is less than the magn by the corresponding type. |
| kExceptionIllegalInstruction | &hC000001D | One of the constants for exception codes. The thread tries to execute an invalid instruction. |
| kExceptionInPageError | &hC0000006 | One of the constants for exception codes. The thread tries to access a page that is not present, and the syste load the page. For example, this exception might occur if a netwo is lost while running a program over a network. |
| kExceptionIntegerDivideByZero | &hC0000094 | One of the constants for exception codes. The thread attempts to divide an integer value by an integer divis |
| kExceptionIntegerOverflow | &hC0000095 | One of the constants for exception codes. The result of an integer operation causes a carry out of the most of the result. |
| kExceptionInvalidDisposition | &hC0000026 | One of the constants for exception codes. An exception handler returns an invalid disposition to the excepti Programmers using a high-level language such as C should never exception. |
| kExceptionNonContinueableException | &hC0000025 | One of the constants for exception codes. The thread attempts to continue execution after a non-continua occurs. |
| kExceptionPrivilegedInstruction | &hC0000096 | One of the constants for exception codes. The thread attempts to execute an instruction with an operati allowed in the current computer mode. |
| kExceptionSingleStep | &h80000004 | One of the constants for exception codes. A trace trap or other single instruction mechanism signals that o is executed. |

# 194.40 class WinGestureConfigMBS

## 194.40.1 class WinGestureConfigMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** ets and sets the configuration for enabling gesture messages and the type of this configuration.
**Example:**

```
// make a config for accepting pan/rotate gestures
dim c1 as new WinGestureConfigMBS

c1.ID = c1.kGestureIDPan
c1.Want = c1.kPan
c1.Block = 0

dim c2 as new WinGestureConfigMBS
c2.ID = c2.kGestureIDRotate
c2.Want = c2.kRotate
c2.Block = 0


dim configs() as WinGestureConfigMBS
configs.Append c1
configs.Append c2

// and add to window
if WinPointerEventsMBS.SetGestureConfig(window1, configs) then
MsgBox "OK"
end if
```

**Notes:** It is impossible to disable two-finger panning and keep single finger panning. You must set the want bits for GC_PAN before you can set them for GC_PAN_WITH_SINGLE_FINGER_HORIZONTALLY or GC_PAN_WITH_SINGLE_FINGER_VERTICALLY.
An inertia vector is included in the GID_PAN message with the GF_END flag if inertia was disabled by a call to SetGestureConfig.
When you pass this structure, the dwID member contains information for a set of gestures. This determines what the other flags will mean. If you set flags for pan messages, they will be different from those flags that are set for rotation messages.
The following table indicates the various identifiers for gestures that are supported by the dwID member of the GESTURECONFIG structure. Note that setting dwID to 0 indicates that global gesture configuration flags are set.

The following flags are used when dwID is set to 0.

| Name | Value | Description |
|---|---|---|
| GID_ZOOM | 3 | Indicates configuration settings for the zoom gesture. |
| GID_PAN | 4 | Indicates the pan gesture. |
| GID_ROTATE | 5 | Indicates the rotation gesture. |
| GID_TWOFINGERTAP | 6 | Indicates the two-finger tap gesture. |
| GID_PRESSANDTAP | 7 | Indicates the press and tap gesture. |

| Name | Value | Description |
|---|---|---|
| GC_ALLGESTURES | 0x00000001 | Indicates all of the gestures. |

The following flags are used when dwID is set to GID_ZOOM.

| Name | Value | Description |
|---|---|---|
| GC_ZOOM | 0x00000001 | Indicates the zoom gesture. |

The following flags are used when dwID is set to GID_PAN.

Note Setting the GID_PAN flags in SetGestureConfig will affect the default gesture handler for panning. You should not have both dwWant and dwBlock set for the same flags; this will result in unexpected behavior. See Windows Touch Gestures for more information on panning and legacy panning support; see SetGestureConfig for examples of enabling and blocking gestures.

The following flags are used when dwID is set to GID_ROTATE.

The following flags are used when dwID is set to GID_TWOFINGERTAP.

The following flags are used when dwID is set to GID_PRESSANDTAP.

**Blog Entries**

- Windows Touch Events

**Videos**

- Presentation from Munich conference about MBS Plugins.

| Name | Value | Description |
|---|---|---|
| GC_PAN | 0x00000001 | Indicates all pan gestures. |
| GC_PAN_WITH_SINGLE_FINGER_VERTICALLY | 0x00000002 | Indicates vertical pans with one finger. |
| GC_PAN_WITH_SINGLE_FINGER_HORIZONTALLY | 0x00000004 | Indicates horizontal pans with one finger. |
| GC_PAN_WITH_GUTTER | 0x00000008 | Limits perpendicular movement to primary direction until a threshold is reached to break out of the gutter. |
| GC_PAN_WITH_INERTIA | 0x00000010 | Indicates panning with inertia to smoothly slow when pan gestures stop. |

| Name | Value | Description |
|---|---|---|
| GC_ROTATE | 0x00000001 | Indicates the rotation gesture. |

### 194.40.2 Properties

### 194.40.3 Block as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The messages to disable.
**Example:**

```
// make a config for accepting some pan gestures
dim c as new WinGestureConfigMBS

c.ID = kGestureIDPan
c.Want = c.kPanWithSingleFingerVertically + c.kPanWithGutter + c.kPanWithInteria
c.Block = c.kPanWithSingleFingerHorizontally
```

**Notes:** (Read and Write property)

### 194.40.4 ID as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identifier for the type of configuration that will have messages enabled or disabled.
**Example:**

```
// make a config for accepting some pan/rotate gestures
dim c1 as new WinGestureConfigMBS

c1.ID = 0
c1.Want = c1.kAllGestures
c1.Block = 0

dim configs() as WinGestureConfigMBS
configs.Append c1
```

| Name | Value | Description |
|---|---|---|
| GC_TWOFINGERTAP | 0x00000001 | Indicates the two-finger tap gesture. |

| Name | Value | Description |
|---|---|---|
| GC_PRESSANDTAP | 0x00000001 | Indicates the press and tap gesture. |

```
// and add to window
if WinPointerEventsMBS.SetGestureConfig(window1, configs) then
MsgBox "OK"
end if
```

**Notes:** (Read and Write property)

### 194.40.5 Want as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The messages to enable.
**Example:**

```
// make a config for accepting all gestures
dim c as new WinGestureConfigMBS

c.ID = 0 // catch all IDs
c.Want = c.kAllGestures
```

**Notes:** (Read and Write property)

### 194.40.6 Constants

Gesture Options

| Constant | Value | Description |
|---|---|---|
| kAllGestures | 1 | Indicates all of the gestures. (for ID = 0) |
| kPan | 1 | Indicates all pan gestures. |
| kPanWithGutter | 8 | Limits perpendicular movement to primary direction until a threshold reached to break out of the gutter. |
| kPanWithInteria | 16 | Indicates panning with inertia to smoothly slow when pan gestures stop. |
| kPanWithSingleFingerHorizontally | 4 | Indicates horizontal pans with one finger. |
| kPanWithSingleFingerVertically | 2 | Indicates vertical pans with one finger. |
| kPressAndTap | 1 | Indicates the press and tap gesture. |
| kRotate | 1 | Indicates the rotation gesture. |
| kTwoFingerTap | 1 | Indicates the two-finger tap gesture. |
| kZoom | 1 | Indicates the zoom gesture. (for ID = kGestureIDZoom) |

Gesture IDs

| Constant | Value | Description |
|---|---|---|
| kGestureIDBegin | 1 | Begin of gesture. |
| kGestureIDEnd | 2 | End of a gesture |
| kGestureIDPan | 4 | Pan gesture |
| kGestureIDPressAndTap | 7 | Press and Tap gesture |
| kGestureIDRotate | 5 | Rotate gesture |
| kGestureIDTwoFingerTap | 6 | Two-Finger Tap |
| kGestureIDZoom | 3 | Zoom gesture |

# 194.41 class WinGestureInfoMBS

## 194.41.1 class WinGestureInfoMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stores information about a gesture.
**Notes:** Parameters for touches:
If kFlagBegin flag is set, save Location so you have first point. And save argument to check later.

For Zoom, get second point from this class. Than you can calculate center point and zoom factor is OldArgumentsLower/NewArgumentsLower.

For Pan, check difference between last point and new point to know how much moved.

For Rotate, please check difference between old RotateAngle and new RotateAngle.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Windows Touch Events

## 194.41.2 Methods

## 194.41.3 Constructor

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

## 194.41.4 Properties

## 194.41.5 Arguments as Int64

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A 64-bit unsigned integer that contains the arguments for gestures that fit into 8 bytes.
**Notes:** (Read only property)

## 194.41.6 ArgumentsHigher as UInt32

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The higher 32bits from Arguments.
**Notes:** (Read only property)

### 194.41.7 ArgumentsLower as UInt32

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The lower 32bits from Arguments.
**Notes:** Most events just use lower bits.
(Read only property)

### 194.41.8 Flags as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The state of the gesture.
**Notes:** See kFlagBegin/kFlagInertia/kFlagEnd constants.
(Read only property)

### 194.41.9 ID as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identifier of the gesture command.
**Notes:** see kGestureID* constants.
(Read only property)

### 194.41.10 InstanceID as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An internally used identifier for the structure.
**Notes:** (Read only property)

### 194.41.11 LocationInWindowX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A x coordinate associated with the gesture.
**Notes:** This is LocationX relative to target window.

(Read only property)

### 194.41.12 LocationInWindowY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A x coordinate associated with the gesture.
**Notes:** This is LocationY relative to target window.
(Read only property)

### 194.41.13 LocationX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A x coordinate associated with the gesture.
**Notes:** These coordinates are always relative to the origin of the screen.
(Read only property)

### 194.41.14 LocationY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A x coordinate associated with the gesture.
**Notes:** These coordinates are always relative to the origin of the screen.
(Read only property)

### 194.41.15 RotateAngle as Double

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The argument as angle for rotate gesture.
**Notes:** (Read only property)

### 194.41.16 SequenceID as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An internally used identifier for the sequence.
**Notes:** (Read only property)

### 194.41.17 TargetWindow as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A handle to the window that is targeted by this gesture.
**Notes:** (Read only property)

### 194.41.18 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagBegin | 1 | A gesture is starting. |
| kFlagEnd | 4 | A gesture has finished. |
| kFlagInertia | 2 | A gesture has triggered inertia. |

Gesture IDs

| Constant | Value | Description |
|---|---|---|
| kGestureIDBegin | 1 | Begin of a gesture |
| kGestureIDEnd | 2 | End of a gesture |
| kGestureIDPan | 4 | Pan gesture |
| kGestureIDPressAndTap | 7 | Press and Tap gesture |
| kGestureIDRotate | 5 | Rotate gesture |
| kGestureIDTwoFingerTap | 6 | Two-Finger Tap |
| kGestureIDZoom | 3 | Zoom gesture |

## 194.42 class WinMouseFilterMBS

### 194.42.1 class WinMouseFilterMBS

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to filter mouse events in the whole application.
**Notes:** You may be able to intercept all mouse actions and block mouse events.

You can only have one instance to receive events at a time.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins, version 21.4pr1

**Xojo Developer Magazine**

- 19.6, page 10: News

### 194.42.2 Methods

### 194.42.3 Constructor

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 194.42.4 Properties

### 194.42.5 Enabled as Boolean

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Global flag to enable/disable it.
**Notes:** Set true to enable or false to disable.
(Read and Write property)

### 194.42.6 IncludeMouseHOver as Boolean

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to include hover events.
**Notes:** By default false to disable hover events.
Set to true to include those.
(Read and Write property)

### 194.42.7 IncludeMouseMove as Boolean

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to include move events.
**Notes:** By default false to disable move events.
Set to true to include those.
(Read and Write property)

### 194.42.8 IncludeMouseWheel as Boolean

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to include wheel events.
**Notes:** By default false to disable wheel events.
Set to true to include those.
(Read and Write property)

### 194.42.9 Events

### 194.42.10 ReceivedEvent(Message as Integer, mouseX as Integer, mouseY as Integer, windowHandle as Integer, HitTestCode as Integer, ExtraInfo as Integer) as Boolean

MBS Win Plugin, Plugin Version: 21.4, Platform: Windows, Targets: .

**Function:** Received an event.
**Notes:** Message: The identifier of the mouse message. See constants.
mouseX and mouseY: The x- and y-coordinates of the cursor, in screen coordinates.
WindowHandle: A handle to the window that will receive the mouse message corresponding to the mouse event.
HitTestCode: The hit-test value. For a list of hit-test values, see the description of the WM_NCHITTEST message.
ExtraInfo: Additional information associated with the message.

### 194.42.11 Constants

Mouse Events

| Constant | Value | Description |
|---|---|---|
| kLButtonDoubleClick | &h0203 | Left mouse button double click |
| kLButtonDown | &h0201 | Left mouse button down |
| kLButtonUp | &h0202 | Left mouse button up |
| kMButtonDoubleClick | &h0209 | Middle mouse button double click |
| kMButtonDown | &h0207 | Middle mouse button down |
| kMButtonUp | &h0208 | Middle mouse button up |
| kMouseHOver | &h02a1 | Mouse hover |
| kMouseHWheel | &h020e | Horizontal mouse wheel |
| kMouseLeave | &h02a3 | Mouse Leave |
| kMouseMove | &h0200 | Mouse moved |
| kMouseWheel | &h020a | Vertical mouse wheel |
| kRButtonDoubleClick | &h0206 | Right mouse button double click |
| kRButtonDown | &h0204 | Right mouse button down |
| kRButtonUp | &h0205 | Right mouse button up |
| kXButtonDoubleClick | &h020d | Other mouse button double click |
| kXButtonDown | &h020b | Other mouse button down |
| kXButtonUp | &h020c | Other mouse button up |

# 194.43 class WinPointerEventsMBS

## 194.43.1 class WinPointerEventsMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to capture touch events on Windows.
**Notes:** The plugin can only deliver events the Xojo runtime doesn't consume.
**Blog Entries**

- Windows Touch Events
- MBS Xojo / Real Studio Plugins, version 17.0pr4

**Videos**

- Presentation from Munich conference about MBS Plugins.

## 194.43.2 Methods

## 194.43.3 Close

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Cleans up.
**Notes:** Optional and does same as destructor, but now.
You can call this in a window's close event to shutdown the event handler class.

## 194.43.4 Constructor(control as DesktopUIControl)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor events to a control.
**Notes:** Call in a control's open event to attach event listener to the control.
See also:


- 194.43.5 Constructor(control as RectControl) 23368
- 194.43.6 Constructor(win as DesktopWindow) 23368
- 194.43.7 Constructor(win as window) 23368
- 194.43.8 Constructor(WindowHandle as Integer) 23369

### 194.43.5 Constructor(control as RectControl)

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor events to a control.
**Notes:** Call in a control's open event to attach event listener to the control.
See also:


- 194.43.4 Constructor(control as DesktopUIControl) 23367
- 194.43.6 Constructor(win as DesktopWindow) 23368
- 194.43.7 Constructor(win as window) 23368
- 194.43.8 Constructor(WindowHandle as Integer) 23369


### 194.43.6 Constructor(win as DesktopWindow)

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor events to a window.
**Notes:** Call in a window's open event to attach event listener to the window.
See also:


- 194.43.4 Constructor(control as DesktopUIControl) 23367
- 194.43.5 Constructor(control as RectControl) 23368
- 194.43.7 Constructor(win as window) 23368
- 194.43.8 Constructor(WindowHandle as Integer) 23369


### 194.43.7 Constructor(win as window)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** The constructor events to a window.
**Notes:** Call in a window's open event to attach event listener to the window.
See also:


- 194.43.4 Constructor(control as DesktopUIControl) 23367
- 194.43.5 Constructor(control as RectControl) 23368
- 194.43.6 Constructor(win as DesktopWindow) 23368
- 194.43.8 Constructor(WindowHandle as Integer) 23369

### 194.43.8 Constructor(WindowHandle as Integer)

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** This method allows you to attach to any window.
So this works in console projects, too.
With any window, not just xojo windows.
See also:


- 194.43.4 Constructor(control as DesktopUIControl) 23367
- 194.43.5 Constructor(control as RectControl) 23368
- 194.43.6 Constructor(win as DesktopWindow) 23368
- 194.43.7 Constructor(win as window) 23368


### 194.43.9 EnableMouseInPointer(enable as boolean) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Enables the mouse to act as a pointer input device and send pointer events.
**Notes:** Requires Windows 8 or newer.

If the function succeeds, the return value is true.
If the function fails, the return value is false.
To get extended error information, call GetLastError.

This function can be called only once in the context of a process lifetime. Prior to the first call, Windows Store apps run with mouse-in-pointer enabled, as do any desktop applications that consume mshtml.dll. All other desktop applications run with mouse-in-pointer disabled.

On the first call in the process lifetime, the state is changed as specified and the call succeeds.
On subsequent calls, the state will not change. If the current state is not equal to the specified state, the call fails.

Call IsMouseInPointerEnabled to verify the mouse-in-pointer state.

### 194.43.10 GetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the configuration for which Windows Touch gesture messages are sent from a window.
**Notes:** Same as other GetGestureConfig, but for a control, not a window.
See also:

- 194.43.11 GetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370
- 194.43.12 GetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370
- 194.43.13 GetGestureConfig(win as window, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23371

### 194.43.11 GetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the configuration for which Windows Touch gesture messages are sent from a window.
**Notes:** Same as other GetGestureConfig, but for a control, not a window.
See also:

- 194.43.10 GetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23369
- 194.43.12 GetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370
- 194.43.13 GetGestureConfig(win as window, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23371

### 194.43.12 GetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the configuration for which Windows Touch gesture messages are sent from a window.
**Notes:** win: The window to get the gesture configuration from.
Flags: A gesture command flag value indicating options for retrieving the gesture configuration. Can be 1 to return consolidated configuration for the specified window and its parent window chain.
Config: an array of gesture configuration structures that specify the gesture configuration.

Please pass an empty array and the plugin appends config objects.

Return function returns number of configs found.
Returns -1 in case of error.
See also:

- 194.43.10 GetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23369
- 194.43.11 GetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370
- 194.43.13 GetGestureConfig(win as window, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23371


### 194.43.13 GetGestureConfig(win as window, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the configuration for which Windows Touch gesture messages are sent from a window.
**Notes:** win: The window to get the gesture configuration from.
Flags: A gesture command flag value indicating options for retrieving the gesture configuration. Can be 1 to return consolidated configuration for the specified window and its parent window chain.
Config: an array of gesture configuration structures that specify the gesture configuration.

Please pass an empty array and the plugin appends config objects.

Return function returns number of configs found.
Returns -1 in case of error.
See also:


- 194.43.10 GetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23369
- 194.43.11 GetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370
- 194.43.12 GetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS, flags as Integer = 0) as Integer 23370


### 194.43.14 IsMouseInPointerEnabled as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates whether EnableMouseInPointer is set for the mouse to act as a pointer input device and send pointer events.
**Notes:** Requires Windows 8 or newer.

If EnableMouseInPointer is set, the return value is true.
If EnableMouseInPointer is not set, the return value is false.

EnableMouseInPointer can be called only once in the context of a process lifetime. Prior to the first call, Windows Store apps run with mouse-in-pointer enabled, as do any desktop applications that consume mshtml.dll. All other desktop applications run with mouse-in-pointer disabled.
On the first call to EnableMouseInPointer in the process lifetime, the state is changed as specified and the call succeeds.
On subsequent calls to EnableMouseInPointer, the state will not change. If the current state is not equal to the specified state, the call fails.
Call IsMouseInPointerEnabled to verify the mouse-in-pointer state.

### 194.43.15 SetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS = nil) as boolean

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Configures the messages that are sent from a window for Windows Touch gestures.
**Notes:** Same as other SetGestureConfig, but for a control, not a window.
See also:

- 194.43.16 SetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS = nil) as boolean 23372
- 194.43.17 SetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS = nil) as boolean 23373
- 194.43.18 SetGestureConfig(win as window, config() as WinGestureConfigMBS = nil) as boolean 23373

### 194.43.16 SetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS = nil) as boolean

MBS Win Plugin, Plugin Version: 17.0, Platform: Windows, Targets: Desktop only.

**Function:** Configures the messages that are sent from a window for Windows Touch gestures.
**Notes:** Same as other SetGestureConfig, but for a control, not a window.
See also:

- 194.43.15 SetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS = nil) as boolean 23372
- 194.43.17 SetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS = nil) as boolean 23373
- 194.43.18 SetGestureConfig(win as window, config() as WinGestureConfigMBS = nil) as boolean 23373

### 194.43.17 SetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS = nil) as boolean

MBS Win Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Configures the messages that are sent from a window for Windows Touch gestures.
**Notes:** Win: The window to set the gesture configuration on.
config: An array of gesture configuration structures that specify the gesture configuration.

If the function succeeds, the return value is true, else false.

If you don't expect to change the gesture configuration, call SetGestureConfig at window creation time. If you want to dynamically change the gesture configuration, call SetGestureConfig in response to GestureNotify event.
See also:


- 194.43.15 SetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS = nil) as boolean 23372
- 194.43.16 SetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS = nil) as boolean 23372
- 194.43.18 SetGestureConfig(win as window, config() as WinGestureConfigMBS = nil) as boolean 23373


### 194.43.18 SetGestureConfig(win as window, config() as WinGestureConfigMBS = nil) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** Configures the messages that are sent from a window for Windows Touch gestures.
**Notes:** Win: The window to set the gesture configuration on.
config: An array of gesture configuration structures that specify the gesture configuration.

If the function succeeds, the return value is true, else false.

If you don't expect to change the gesture configuration, call SetGestureConfig at window creation time. If you want to dynamically change the gesture configuration, call SetGestureConfig in response to GestureNotify event.
See also:


- 194.43.15 SetGestureConfig(Control as DesktopUIControl, config() as WinGestureConfigMBS = nil) as boolean 23372
- 194.43.16 SetGestureConfig(Control as RectControl, config() as WinGestureConfigMBS = nil) as boolean 23372

- 194.43.17 SetGestureConfig(win as DesktopWindow, config() as WinGestureConfigMBS = nil) as boolean 23373

### 194.43.19 Properties

### 194.43.20 WindowHandle as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The window handle.
**Notes:** (Read only property)

### 194.43.21 Events

### 194.43.22 Gesture(info as WinGestureInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Passes information about a gesture.
**Notes:** Return true, if you processed the message, else false.

### 194.43.23 GestureNotify

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Gives you a chance to set the gesture configuration.
**Notes:** When the GestureNotify event is received, the application can use SetGestureConfig to specify the gestures to receive.

### 194.43.24 PointerDeviceChange(Change as Integer, Param as Integer) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Sent to a window when there is a change in the settings of a monitor that has a digitizer attached to it.
**Notes:** This message contains information regarding the scaling of the display mode.
See kDeviceChange* constants.

### 194.43.25 PointerDeviceInRange(Param1 as Integer, Param2 as Integer) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Sent to a window when a pointer device is detected within range of an input digitizer.
**Notes:** This message contains information regarding the device and its proximity.

If the application processes this message, it should return true, else false.

### 194.43.26 PointerDeviceOutOfRange(Param1 as Integer, Param2 as Integer) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Sent to a window when a pointer device has departed the range of an input digitizer.
**Notes:** This message contains information regarding the device and its proximity.

If the application processes this message, it should return true, else false.

### 194.43.27 PointerDown(PointerID as Integer, Flags as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Posted when a pointer makes contact over the client area of a window.
**Notes:** This input message targets the window over which the pointer makes contact, and the pointer is implicitly captured to the window so that the window continues to receive input for the pointer until it breaks contact.

We provide pointer ID, flags, X and Y.

Note:
A hovering pointer has none of the button flags set. This is analogous to a mouse move with no mouse buttons down. An application can determine the buttons states of a hovering pen, for example, by calling GetPointerPenInfo and examining the flags that specify button states.

Note:
Because the pointer may make contact with the device over a non-trivial area, this point location may be a simplification of a more complex pointer area. Whenever possible, an application should use the complete pointer area information instead of the point location.

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagNew) <>0 | A flag that indicates whether this message represents the first input generated by a new pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | A flag that indicates whether this message was generated by a pointer during its lifetime. This flag is not set on messages that indicate that the pointer has left detection range |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInContact) <>0 | A flag that indicates whether this message was generated by a pointer that is in contact with the window surface. This flag is not set on messages that indicate a hovering pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagPrimary) <>0 | Indicates that this pointer has been designated as primary. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFirstButton) <>0 | A flag that indicates whether there is a primary action. This is analogous to a mouse left button down. A touch pointer will have this set when it is in contact with the digitizer surface. A pen pointer will have this set when it is in contact with the digitizer surface with no buttons pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagSecondButton) <>0 | A flag that indicates whether there is a secondary action. This is analogous to a mouse right button down. A pen pointer will have this set when it is in contact with the digitizer surface with the pen barrel button pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagThirdButton) <>0 | A flag that indicates whether there are one or more tertiary actions based on the pointer type; applications that wish to respond to tertiary actions must retrieve information specific to the pointer type to determine which tertiary buttons are pressed. For example, an application can determine the buttons states of a pen by calling GetPointerPenInfo and examining the flags that specify button states. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFourthButton) <>0 | A flag that indicates whether the specified pointer took fourth action. Applications that wish to respond to fourth actions must retrieve information specific to the pointer type to determine if the first extended mouse (XButton1) button is pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFifthButton) <>0 | A flag that indicates whether the specified pointer took fifth action. Applications that wish to respond to fifth actions must retrieve information specific to the pointer type to determine if the second extended mouse (XButton2) button is pressed. |

If an application processes this message, it should return true, else false.

Important When a window loses capture of a pointer and it receives the PointerCaptureChanged notification, it typically will not receive any further notifications. For this reason, it is important that you not make any assumptions based on evenly paired PointerDown/PointerUp or PointerEnter/PointerLeave notifications.

Each pointer has a unique pointer identifier during its lifetime. The lifetime of a pointer begins when it is first detected.
A PointerEnter event is generated if a hovering pointer is detected. A PointerDown event followed by a PointerEnter event is generated if a non-hovering pointer is detected.
During its lifetime, a pointer may generate a series of PointerUpdate events while it is hovering or in contact.
The lifetime of a pointer ends when it is no longer detected. This generates a PointerLeave event.
When a pointer is aborted, kFlagCanceled is set.
A WM_POINTERLEAVE message may also be generated when a non-captured pointer moves outside the bounds of a window.

To convert the lParam parameter to a POINTS structure, use the MAKEPOINTS macro.
To retrieve further information associated with the message, use the GetPointerInfo function.
To determine the keyboard modifier key states associated with this message, use the GetKeyState function.
For example, to detect that the ALT key was pressed, check whether GetKeyState(VK_MENU) <0.
Note that if the application does not process this message, DefWindowProc may generate one or more WM_GESTURE messages if the sequence of input from this and, possibly, other pointers is recognized as

a gesture. If a gesture is not recognized, DefWindowProc may generate mouse input.
If an application selectively consumes some pointer input and passes the rest to DefWindowProc, the resulting behavior is undefined.
When a window loses capture of a pointer and receives the WM_POINTERCAPTURECHANGED notification, it will typically not receive any further notifications. Therefore, it is important that a window does not make any assumptions of its pointer status, regardless of whether it receives evenly paired DOWN / UP or ENTER / LEAVE notifications.

### 194.43.28 PointerEnter(PointerID as Integer, Flags as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Sent to a window when a new pointer enters detection range over the window (hover) or when an existing pointer moves within the boundaries of the window.
**Notes:** We provide Pointer ID, Flags, X and Y.

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagNew) <>0 | Indicates whether this message is the first message generated by a new pointer entering detection range (hover). |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | Indicates whether this message was generated by a pointer that has not left detection range. This flag is always set for PointerEnter messages. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInContact) <>0 | A flag that indicates whether this message was generated by a pointer that is in contact. This flag is not set for a pointer in detection range (hover). |

Contains the point location of the pointer.
Note:
Because the pointer may make contact with the device over a non-trivial area, this point location may be a simplification of a more complex pointer area. Whenever possible, an application should use the complete pointer area information instead of the point location.

If an application processes this message, it should return true, else false.

The PointerEnter notification can be used by a window to provide feedback to the user while the pointer is over its surface or to otherwise react to the presence of a pointer over its surface.
This notification is only sent to the window that is receiving input for the pointer. The following table lists some of the situations in which this notification is sent.

| Action | Flags Set | Notifications Sent To |
|---|---|---|
| A new pointer enters detection range (hover). | kFlagNew and kFlagInRange | Window over which the pointer enters detection range. |
| A hovering pointer crosses within the window boundaries. | kFlagInRange | Window within which the pointer has crossed. |

Important:
When a window loses capture of a pointer and it receives the PointerCaptureChange notification, it typically will not receive any further notifications. For this reason, it is important that you not make any assumptions

based on evenly paired PointerDown/PointerUp or PointerEnter/PointerLeave notifications.

When inputs come from the mouse, as a result of mouse and pointer message integration, PointerEnter is not sent.

### 194.43.29 PointerHWheel(PointerID as Integer, Delta as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Posted to the window with foreground keyboard focus when a horizontal scroll wheel is rotated.
**Notes:** We provide, the pointer ID, the delta and x/y coordinate.
Info object provides pointer details.

To retrieve the wheel scroll units, use the inputData filed of the WinPointerInfoMBS object. This field contains a signed value and is expressed in a multiple of WHEEL_DELTA (120). A positive value indicates a rotation forward and a negative value indicates a rotation backward.
Note that the wheel inputs may be delivered even if the mouse cursor is located outside of application,Äôs window. The wheel messages are delivered in a way very similar to the keyboard inputs. The focus window of the foregournd message queue receives the wheel messages.

### 194.43.30 PointerLeave(PointerID as Integer, Flags as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Sent to a window when a pointer leaves detection range over the window (hover) or when a pointer moves outside the boundaries of the window.
**Notes:** We provide the pointer ID, Flags, X and Y values.

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | Indicates whether this message was generated by a pointer that has not left detection range. This flag is not set when the pointer leaves the detection range of the window. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInContact) <>0 | A flag that indicates whether this message was generated by a pointer that is in contact. This flag is not set for a pointer in detection range (hover). |

Note:
Because the pointer may make contact with the device over a non-trivial area, this point location may be a simplification of a more complex pointer area. Whenever possible, an application should use the complete pointer area information instead of the point location.

If an application processes this message, it should return true, else false.

The PointerLeave notification can be used by a window to change mode or stop any feedback to the user while the pointer is over the window surface.
This notification is only sent to the window that is receiving input for the pointer. The following table lists some of the situations in which this notification is sent.

| Action | Flags Set | Notifications Sent To |
|---|---|---|
| A hovering pointer crosses window boundaries. | BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | Window outside of whose boundary the pointer moved. |
| A pointer goes out of detection range. | N/A | Window for which the pointer leaves detection range. |

Important:
When a window loses capture of a pointer and it receives the PointerCaptureChange notification, it typically will not receive any further notifications. For this reason, it is important that you not make any assumptions based on evenly paired PointerDown/PointerUp or PointerEnter/PointerLeave notifications.

If contact is maintained with the input digitizer and the pointer moves outside the window, PointerLeave is not generated. PointerLeave is generated only when a hovering pointer crosses window boundaries or contact is terminated.
PointerLeave is posted to the posted message queue if the input is originated from a mouse device.

### 194.43.31 PointerUp(PointerID as Integer, Flags as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Posted when a pointer that made contact over the client area of a window breaks contact.
**Notes:** This input message targets the window over which the pointer makes contact and the pointer is, at that point, implicitly captured to the window so that the window continues to receive input messages including the WM_POINTERUP notification for the pointer until it breaks contact.

We provide pointer ID, flags, X and Y.

See Pointer Flags for more details.

Note:
A hovering pointer has none of the button flags set. This is analogous to a mouse move with no mouse buttons down. An application can determine the buttons states of a hovering pen, for example, by calling GetPointerPenInfo and examining the flags that specify button states.

Note:
Because the pointer may make contact with the device over a non-trivial area, this point location may be a simplification of a more complex pointer area. Whenever possible, an application should use the complete

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagNew) <>0 | A flag that indicates whether this message represents the first input generated by a new pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | A flag that indicates whether this message was generated by a pointer during its lifetime. This flag is not set on messages that indicate that the pointer has left detection range |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInContact) <>0 | A flag that indicates whether this message was generated by a pointer that is in contact with the window surface. This flag is not set on messages that indicate a hovering pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagPrimary) <>0 | Indicates that this pointer has been designated as primary. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFirstButton) <>0 | A flag that indicates whether there is a primary action. This is analogous to a mouse left button down. A touch pointer will have this set when it is in contact with the digitizer surface. A pen pointer will have this set when it is in contact with the digitizer surface with no buttons pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagSecondButton) <>0 | A flag that indicates whether there is a secondary action. This is analogous to a mouse right button down. A pen pointer will have this set when it is in contact with the digitizer surface with the pen barrel button pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagThirdButton) <>0 | A flag that indicates whether there are one or more tertiary actions based on the pointer type; applications that wish to respond to tertiary actions must retrieve information specific to the pointer type to determine which tertiary buttons are pressed. For example, an application can determine the buttons states of a pen by calling GetPointerPenInfo and examining the flags that specify button states. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFourthButton) <>0 | A flag that indicates whether the specified pointer took fourth action. Applications that wish to respond to fourth actions must retrieve information specific to the pointer type to determine if the first extended mouse (XButton1) button is pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFifthButton) <>0 | A flag that indicates whether the specified pointer took fifth action. Applications that wish to respond to fifth actions must retrieve information specific to the pointer type to determine if the second extended mouse (XButton2) button is pressed. |

pointer area information instead of the point location.

If an application processes this message, it should return true, else false.

Each pointer has a unique pointer identifier during its lifetime. The lifetime of a pointer begins when it is first detected.
A PointerEnter event is generated if a hovering pointer is detected. A PointerDown event followed by a PointerEnter event is generated if a non-hovering pointer is detected.
During its lifetime, a pointer may generate a series of PointerUpdate event while it is hovering or in contact.
The lifetime of a pointer ends when it is no longer detected. This generates a WM_POINTERLEAVE message.
When a pointer is aborted, kFlagCanceled is set.
A PointerLeave event may also be generated when a non-captured pointer moves outside the bounds of a window.
To obtain the horizontal and vertical position of a pointer, use the following:

If the application does not process this message, Windows may generate one or more Gesture event if the sequence of input from this and, possibly, other pointers is recognized as a gesture. If a gesture is not recognized, DefWindowProc may generate mouse input.
If an application selectively consumes some pointer input and passes the rest back to Windows, the resulting behavior is undefined.

### 194.43.32 PointerUpdate(PointerID as Integer, Flags as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Posted to provide an update on a pointer that made contact over the client area of a window or on a hovering uncaptured pointer over the client area of a window.
**Notes:** While the pointer is hovering, the message targets whichever window the pointer happens to be over. While the pointer is in contact with the surface, the pointer is implicitly captured to the window over which the pointer made contact and that window continues to receive input for the pointer until it breaks contact.

We provide pointer ID, flags, X and Y.

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagNew) <>0 | A flag that indicates whether this message represents the first input generated by a new pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInRange) <>0 | A flag that indicates whether this message was generated by a pointer during its lifetime. This flag is not set on messages that indicate that the pointer has left detection range |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagInContact) <>0 | A flag that indicates whether this message was generated by a pointer that is in contact with the window surface. This flag is not set on messages that indicate a hovering pointer. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagPrimary) <>0 | Indicates that this pointer has been designated as primary. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFirstButton) <>0 | A flag that indicates whether there is a primary action. This is analogous to a mouse left button down. A touch pointer will have this set when it is in contact with the digitizer surface. A pen pointer will have this set when it is in contact with the digitizer surface with no buttons pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagSecondButton) <>0 | A flag that indicates whether there is a secondary action. This is analogous to a mouse right button down. |

A pen pointer will have this set when it is in contact with the digitizer surface with the pen barrel button pressed.

| | |
|---|---|
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagThirdButton) <>0 | A flag that indicates whether there are one or more tertiary actions based on the pointer type; applications that wish to respond to tertiary actions must retrieve information specific to the pointer type to determine which tertiary buttons are pressed. For example, an application can determine the buttons states of a pen by calling GetPointerPenInfo and examining the flags that specify button states. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFourthButton) <>0 | A flag that indicates whether the specified pointer took fourth action. Applications that wish to respond to fourth actions must retrieve information specific to the pointer type to determine if the first extended mouse (XButton1) button is pressed. |
| BitwiseAnd(flags, WinPointerInfoMBS.kFlagFifthButton) <>0 | A flag that indicates whether the specified pointer took fifth action. Applications that wish to respond to fifth actions must retrieve information specific to the pointer type to determine if the second extended mouse (XButton2) button is pressed. |

See Pointer Flags for more details.

Note:
A hovering pointer has none of the button flags set. This is analogous to a mouse move with no mouse

buttons down. An application can determine the buttons states of a hovering pen, for example, by calling GetPointerPenInfo and examining the flags that specify button states.

Note:
Because the pointer may make contact with the device over a non-trivial area, this point location may be a simplification of a more complex pointer area. Whenever possible, an application should use the complete pointer area information instead of the point location.

If an application processes this message, it should return true, else false.

Each pointer has a unique pointer identifier during its lifetime. The lifetime of a pointer begins when it is first detected.
A PointerEnterevent is generated if a hovering pointer is detected. A PointerDown event followed by a PointerEnter event is generated if a non-hovering pointer is detected.
During its lifetime, a pointer may generate a series of PointerUpdate events while it is hovering or in contact.
The lifetime of a pointer ends when it is no longer detected. This generates a PointerLeave event.
When a pointer is aborted, kFlagCanceled is set.
A PointerLeave event may also be generated when a non-captured pointer moves outside the bounds of a window.

If the application does not process this message, Windows may generate one or more Gesture event if the sequence of input from this and, possibly, other pointers is recognized as a gesture. If a gesture is not recognized, Windows may generate mouse input.
If an application selectively consumes some pointer input and passes the rest back to Windows, the resulting behavior is undefined.
If the application does not process these messages as fast as they are generated, some moves may be coalesced. The history of inputs that were coalesced into this message can be retrieved using the GetPointerInfoHistory function.

### 194.43.33 PointerWheel(PointerID as Integer, Delta as Integer, X as Integer, Y as Integer, info as WinPointerInfoMBS) as boolean

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: .

**Function:** Posted to the window with foreground keyboard focus when a vertical scroll wheel is rotated.
**Notes:** We provide, the pointer ID, the delta and x/y coordinate.
Info object provides pointer details.

To retrieve the wheel scroll units, use the inputData filed of the WinPointerInfoMBS object. This field contains a signed value and is expressed in a multiple of WHEEL_DELTA (120). A positive value indicates a rotation forward and a negative value indicates a rotation backward.
Note that the wheel inputs may be delivered even if the mouse cursor is located outside of application,Äôs window. The wheel messages are delivered in a way very similar to the keyboard inputs. The focus window

of the foregournd message queue receives the wheel messages.

### 194.43.34 Constants

Device Change Flags

| Constant | Value | Description |
|---|---|---|
| kDeviceChangeArrival | 1 | A new device is attached. |
| kDeviceChangeAspectRatioPreserved | 2048 | The display aspect ratio. |
| kDeviceChangeMapping | 256 | The change in display to digitizer mapping. |
| kDeviceChangeModeCentered | 128 | Centered display mode. |
| kDeviceChangeModeDefault | 64 | The default display mode. |
| kDeviceChangeOrientation0 | 4 | Orientation of the device: 0¬∞ |
| kDeviceChangeOrientation180 | 16 | Orientation of the device: 180¬∞ |
| kDeviceChangeOrientation270 | 32 | Orientation of the device: 270¬∞ |
| kDeviceChangeOrientation90 | 8 | Orientation of the device: 90¬∞ |
| kDeviceChangeOrigin | 1024 | The display origin. |
| kDeviceChangeRemoval | 2 | A device has been detached. |
| kDeviceChangeResolution | 512 | Display resolution. |

# 194.44 class WinPointerInfoMBS

## 194.44.1 class WinPointerInfoMBS

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for pointer input details.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

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## 194.44.2 Methods

## 194.44.3 Constructor

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

## 194.44.4 Properties

## 194.44.5 ButtonChangeType as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Specifies the change in button state between this input and the previous input.
**Notes:** See kPointerChange* constants.
(Read only property)

## 194.44.6 frameId as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An identifier common to multiple pointers for which the source device reported an update in a single input frame.
**Notes:** For example, a parallel-mode multi-touch digitizer may report the positions of multiple touch contacts in a single update to the system.
Note that frame identifier is assigned as input is reported to the system for all pointers across all devices. Therefore, this field may not contain strictly sequential values in a single series of messages that a window receives. However, this field will contain the same numerical value for all input updates that were reported in the same input frame by a single device.

(Read only property)

### 194.44.7 HimetricLocationRawX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The screen coordinates of the pointer, in HIMETRIC units.
**Notes:** For adjusted screen coordinates, see HimetricLocation.
(Read only property)

### 194.44.8 HimetricLocationRawY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The screen coordinates of the pointer, in HIMETRIC units.
**Notes:** For adjusted screen coordinates, see HimetricLocation.
(Read only property)

### 194.44.9 HimetricLocationX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The predicted screen coordinates of the pointer, in HIMETRIC units.
**Notes:** The predicted value is based on the pointer position reported by the digitizer and the motion of the pointer. This correction can compensate for visual lag due to inherent delays in sensing and processing the pointer location on the digitizer. This is applicable to pointers of type touch. For other pointer types, the predicted value will be the same as the non-predicted value (see ptHimetricLocationRaw).
(Read only property)

### 194.44.10 HimetricLocationY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The predicted screen coordinates of the pointer, in HIMETRIC units.
**Notes:** The predicted value is based on the pointer position reported by the digitizer and the motion of the pointer. This correction can compensate for visual lag due to inherent delays in sensing and processing the pointer location on the digitizer. This is applicable to pointers of type touch. For other pointer types, the predicted value will be the same as the non-predicted value (see ptHimetricLocationRaw).
(Read only property)

### 194.44.11 historyCount as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Count of inputs that were coalesced into this message.
**Notes:** This count matches the total count of entries that can be returned by a call to GetPointerInfoHistory. If no coalescing occurred, this count is 1 for the single input represented by the message.
(Read only property)

### 194.44.12 hwndTarget as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Window to which this message was targeted.
**Notes:** If the pointer is captured, either implicitly by virtue of having made contact over this window or explicitly using the pointer capture API, this is the capture window. If the pointer is uncaptured, this is the window over which the pointer was when this message was generated.
(Read only property)

### 194.44.13 InputData as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A value whose meaning depends on the nature of input.
**Notes:** When flags indicate kFlagWheel, this value indicates the distance the wheel is rotated, expressed in multiples or factors of WHEEL_DELTA. A positive value indicates that the wheel was rotated forward and a negative value indicates that the wheel was rotated backward.
When flags indicate kFlagWheel, this value indicates the distance the wheel is rotated, expressed in multiples or factors of WHEEL_DELTA. A positive value indicates that the wheel was rotated to the right and a negative value indicates that the wheel was rotated to the left.
(Read only property)

### 194.44.14 KeyStates as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates which keyboard modifier keys were pressed at the time the input was generated.
**Notes:** May be zero or a combination of the following values:

(Read only property)

8 A SHIFT key was pressed.
4 A CTRL key was pressed.

### 194.44.15 PerformanceCount as Int64

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The value of the high-resolution performance counter when the pointer message was received (high-precision, 64 bit alternative to Time).
**Notes:** The value can be calibrated when the touch digitizer hardware supports the scan timestamp information in its input report.
(Read only property)

### 194.44.16 PixelLocationRawX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The screen coordinates of the pointer, in pixels.
**Notes:** For adjusted screen coordinates, see PixelLocation.
(Read only property)

### 194.44.17 PixelLocationRawY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The screen coordinates of the pointer, in pixels.
**Notes:** For adjusted screen coordinates, see PixelLocation.
(Read only property)

### 194.44.18 PixelLocationX as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The predicted screen coordinates of the pointer, in pixels.
**Notes:** The predicted value is based on the pointer position reported by the digitizer and the motion of the pointer. This correction can compensate for visual lag due to inherent delays in sensing and processing the pointer location on the digitizer. This is applicable to pointers of type touch. For other pointer types, the predicted value will be the same as the non-predicted value (see ptPixelLocationRaw).
(Read only property)

### 194.44.19 PixelLocationY as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The predicted screen coordinates of the pointer, in pixels.
**Notes:** The predicted value is based on the pointer position reported by the digitizer and the motion of the pointer. This correction can compensate for visual lag due to inherent delays in sensing and processing the pointer location on the digitizer. This is applicable to pointers of type touch. For other pointer types, the predicted value will be the same as the non-predicted value (see ptPixelLocationRaw).
(Read only property)

### 194.44.20 pointerFlags as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** May be any reasonable combination of flags from the flags constants.
**Notes:** See kFlag* constants.
(Read only property)

### 194.44.21 pointerId as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An identifier that uniquely identifies a pointer during its lifetime.
**Notes:** A pointer comes into existence when it is first detected and ends its existence when it goes out of detection range. Note that if a physical entity (finger or pen) goes out of detection range and then returns to be detected again, it is treated as a new pointer and may be assigned a new pointer identifier.
(Read only property)

### 194.44.22 pointerType as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The pointer type.
**Notes:** See kType* constants.
(Read only property)

### 194.44.23 sourceDevice as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Handle to the source device that can be used in calls to the raw input device API and the digitizer device API.
**Notes:** (Read only property)

### 194.44.24 Time as Integer

MBS Win Plugin, Plugin Version: 16.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The time of the event.
**Notes:** Value is 0 or the time stamp of the message, based on the system tick count when the message was received.
The application can specify the input time stamp in either Time or PerformanceCount. The value cannot be more recent than the current tick count or QueryPerformanceCount (QPC) value of the injection thread. Once a frame is injected with a time stamp, all subsequent frames must include a timestamp until all contacts in the frame go to an UP state. The custom timestamp value must also be provided for the first element in the contacts array. The time stamp values after the first element are ignored. The custom timestamp value must increment in every injection frame.
When PerformanceCount is specified, the time stamp will be converted to the current time in .1 millisecond resolution upon actual injection. If a custom PerformanceCount resulted in the same .1 millisecond window from the previous injection, ERROR_NOT_READY is returned and injection will not occur. While injection will not be invalidated immediately by the error, the next successful injection must have a PerformanceCount value that is at least 0.1 millisecond from the previously successful injection. This is also true if Time is used.
If both Time and PerformanceCount are specified in InjectTouchInput, ERROR_INVALID_PARAMETER is returned.
InjectTouchInput cannot switch between Time and PerformanceCount once injection has started.
If neither Time and PerformanceCount are specified, InjectTouchInput allocates the timestamp based on the timing of the call. If InjectTouchInput calls are repeatedly less than 0.1 millisecond apart, ERROR_NOT_READY might be returned. The error will not invalidate the input immediately, but the injection application needs to retry the same frame again for injection to succeed.
(Read only property)

### 194.44.25 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kPointerChangeFifthButtonDown | 9 | The fifth button transitioned to a pressed state. |
| kPointerChangeFifthButtonUp | 10 | The fifth button transitioned to a released state. |
| kPointerChangeFirstButtonDown | 1 | The first button transitioned to a pressed state. |
| kPointerChangeFirstButtonUp | 2 | The first button transitioned to a released state. |
| kPointerChangeFourthButtonDown | 7 | The fourth button transitioned to a pressed state. |
| kPointerChangeFourthButtonUp | 8 | The fourth button transitioned to a released state. |
| kPointerChangeNone | 0 | No change in button state. |
| kPointerChangeSecondButtonDown | 3 | The second button transitioned to a pressed state. |
| kPointerChangeSecondButtonUp | 4 | The second button transitioned to a released state. |
| kPointerChangeThirdButtonDown | 5 | The third button transitioned to a pressed state. |
| kPointerChangeThirdButtonUp | 6 | The third button transitioned to a released state. |

Flag Constants

| Constant | Value | Description |
|---|---|---|
| kFlagCanceled | &h8000 | Indicates that the pointer is departing in an abnormal manner, such as when the system receives invalid input for the pointer or when a device with active pointers departs abruptly. If the application receiving the input is in a position to do so, it should treat the interaction as not completed and reverse any effects of the concerned pointer. |
| kFlagCaptureChanged | &h200000 | Indicates that this pointer was captured by (associated with) another element and the original element has lost capture. |
| kFlagConfidence | &h4000 | Confidence is a suggestion from the source device about whether the pointer represents an intended or accidental interaction, which is especially relevant for touch pointers where an accidental interaction (such as with the palm of the hand) can trigger input. The presence of this flag indicates that the source device has high confidence that this input is part of an intended interaction. |
| kFlagDown | &h10000 | Indicates that this pointer transitioned to a down state; that is, it made contact with the digitizer surface. |
| kFlagFifthButton | &h100 | Analogous to a second extended mouse (XButton2) button down.<br>A touch pointer does not use this flag.<br>A pen pointer does not use this flag.<br>A mouse pointer has this flag set when the second extended mouse (XBUTTON2) button is down. |
| kFlagFirstButton | &h10 | Indicates a primary action, analogous to a left mouse button down.<br>A touch pointer has this flag set when it is in contact with the digitizer surface.<br>A pen pointer has this flag set when it is in contact with the digitizer surface with no buttons pressed.<br>A mouse pointer has this flag set when the left mouse button is down. |
| kFlagFourthButton | &h80 | Analogous to a first extended mouse (XButton1) button down.<br>A touch pointer does not use this flag.<br>A pen pointer does not use this flag.<br>A mouse pointer has this flag set when the first extended mouse (XBUTTON1) button is down. |
| kFlagHasTransform | &h400000 | Indicates that this pointer has an associated transform. |
| kFlagHWheel | &h100000 | Indicates input associated with a pointer h-wheel. For mouse pointers, this is equivalent to the action of the mouse horizontal scroll wheel. |
| kFlagInContact | 4 | Indicates that this pointer is in contact with the digitizer surface.<br>When this flag is not set, it indicates a hovering pointer. |
| kFlagInRange | 2 | Indicates that this pointer continues to exist. When this flag is not set, it indicates the pointer has left detection range.<br>This flag is typically not set only when a hovering pointer leaves detection range (kFlagUpdate is set) or when a pointer in contact with a window surface leaves detection range (kFlagUp is set). |
| kFlagNew | 1 | Indicates the arrival of a new pointer. |
| kFlagNone | 0 | Default |
| kFlagPrimary | &h2000 | Indicates that this pointer has been designated as the primary pointer. A primary pointer is a single pointer that can perform actions beyond those available to non-primary pointers. For example, when a primary pointer makes contact with a window,Äôs surface, it may provide the window an opportunity to activate by sending it a PointerActivate event.<br>The primary pointer is identified from all current user interactions on the system (mouse, touch, pen, and so on). As such, the primary pointer might not be associated with your app. The first contact in a multi-touch interaction is set as the primary pointer. Once a primary pointer is identified, all contacts must be lifted before a new contact can be identified as a primary pointer. For apps that don't process pointer input, only the primary pointer's events are promoted to mouse events. |
| kFlagSecondButton | &h20 | Indicates a secondary action, analogous to a right mouse button down.<br>A touch pointer does not use this flag.<br>A pen pointer has this flag set when it is in contact with the digitizer surface with the pen barrel button pressed.<br>A mouse pointer has this flag set when the right mouse button is down. |

Pointer Types

| Constant | Value | Description |
|---|---|---|
| kTypeMouse | 4 | Mouse pointer type. |
| kTypePen | 3 | Pen pointer type. |
| kTypePointer | 1 | Generic pointer type.<br>This type never appears in pointer messages or pointer data. Some data query functions allow the caller to restrict the query to specific pointer type. The kTypePointer type can be used in these functions to specify that the query is to include pointers of all types |
| kTypeTouch | 2 | Touch pointer type. |
| kTypeTouchpad | 5 | Touchpad pointer type (Windows 8.1 and later). |

# 194.45 control WinPreviewControlMBS

## 194.45.1 control WinPreviewControlMBS

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The preview control for Windows.
**Notes:** Used to show PDF documents on Windows using the built-in preview handler on Windows 10 and newer.
Can also be used to use other built-in preview handlers on Windows by setting classID.

Since the control is handled by Windows, the key and mouse events are not expected to work.

Available on Windows 10 and newer.
Use QLPreviewViewControlMBS or PDFViewControlMBS for macOS to show previews and QLPreview-ControllerMBS or PDFViewIOSControlMBS for iOS.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- PDF Viewer controls for iOS
- PDF Viewer control for Windows
- MBS Xojo Plugins, version 23.3pr2

**Xojo Developer Magazine**

- 21.5, page 10: News

## 194.45.2 Methods

## 194.45.3 LoadData(data as MemoryBlock)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.
See also:

- 194.45.4 LoadData(data as string) 23394

### 194.45.4 LoadData(data as string)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given data.
**Notes:** Lasterror is set.
If loading from data is not supported for preview, we use a temporary file instead.
See also:

- 194.45.3 LoadData(data as MemoryBlock) 23393

### 194.45.5 LoadFile(file as folderitem)

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** Loads the given file.
**Notes:** Lasterror is set.
If the preview handler does not support reading file, the plugin reads the file and passes as data.

If the file path is invalid, the preview will show a file not found error message.

### 194.45.6 Properties

### 194.45.7 classID as String

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The class ID for the previewer to use.
**Notes:** If empty, uses PDF viewer.
Available preview classes in a typical Windows 10 installation:

| Class ID | Description |
|---|---|
| { 13D3C4B8-B179-4ebb-BF62-F704173E7448 } | Windows Contact Preview Handler |
| { 1531d583-8375-4d3f-b5fb-d23bbd169f22 } | Windows TXT Previewer |
| { 53BEDF0B-4E5B-4183-8DC9-B844344FA104 } | Microsoft Windows MAPI Preview Handler |
| { 8a7cae0e-5951-49cb-bf20-ab3fa1e44b01 } | Windows Font previewer |
| { 92dbad9f-5025-49b0-9078-2d78f935e341 } | Microsoft Windows Mail Mime Preview Handler |
| { a42c2ccb-67d3-46fa-abe6-7d2f3488c7a3 } | Windows RTF Previewer |
| { b9815375-5d7f-4ce2-9245-c9d4da436930 } | Microsoft Windows Mail Mime Preview Handler |
| { BFD468D2-D0A0-4bdc-878C-E69C2F5B435D } | Microsoft Windows Mail Html Preview Handler |
| { E64164EB-1AE0-4C50-BAEF-A413C2B3A4BC } | Microsoft 3MF Shell Thumbnail and Preview Handler |
| { f8b8412b-dea3-4130-b36c-5e8be73106ac } | Microsoft Windows Mail Html Preview Handler |
| { 3A84F9C2-6164-485C-A7D9-4B27F8AC009E } | Microsoft PDF Previewer |
| { DC6EFB56-9CFA-464D-8880-44885D7DC193 } | Adobe PDF Preview Handler for Vista |

(Read and Write property)

### 194.45.8 Lasterror as Integer

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 194.45.9 LasterrorString as String

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop only.

**Function:** The error message for the error number in the lasterror property.
**Notes:** (Read only property)

### 194.45.10 Events

### 194.45.11 Close

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The close event.
In Xojo version 2021r3 and newer this event is named Closing.

### 194.45.12 Closing

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The close event.
In older Xojo versions, this event is named Close.

### 194.45.13 Configure

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** The event called while initializing, where you can apply properties just before plugin reads them.
**Notes:** e.g. set classID here in code.

### 194.45.14 ConstructContextualMenu(base as MenuItem, x as Integer, y as Integer) as Boolean

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** This event is called when it is appropriate to display a contextual menu for the control.

### 194.45.15 ContextualMenuAction(hitItem as MenuItem) as Boolean

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:** Called when a menuitem is choosen.
**Notes:** This allows the control to react on its relevant menu items. Please return true if you handled it or false to give others a chance.

### 194.45.16 EnableMenuItems

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The enable menu items event.
In Xojo version 2021r3 and newer this event is named MenuBarSelected.

### 194.45.17 FocusLost

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The lost focus event.
In older Xojo versions, this event is named LostFocus.

### 194.45.18 FocusReceived

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The got focus event.
In older Xojo versions, this event is named GotFocus.

### 194.45.19 GotFocus

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The got focus event.
In Xojo version 2021r3 and newer this event is named FocusReceived.

### 194.45.20 LostFocus

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The lost focus event.
In Xojo version 2021r3 and newer this event is named FocusLost.

### 194.45.21 MenuBarSelected

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The enable menu items event.
In older Xojo versions, this event is named EnableMenuItems.

### 194.45.22 Open

MBS Win Plugin, Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The open event.
In Xojo version 2021r3 and newer this event is named Opening.

### 194.45.23 Opening

Plugin Version: 23.3, Platform: Windows, Targets: .

**Function:**

The open event.
In older Xojo versions, this event is named Open.

# 194.46 class WinThreadPoolMBS

## 194.46.1 class WinThreadPoolMBS

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class to control Windows Thread Pool.
**Example:**

```
static pool as WinThreadPoolMBS // global or window property

pool = New WinThreadPoolMBS
pool.ThreadMaximum = 4
```

**Notes:** You can have an instance of this class to create and define a thread pool.
If you never initialize a pool with this class, the default pool is used.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.5
- Thread Pool for Windows
- MBS Xojo Plugins, version 21.5pr4

## 194.46.2 Methods

## 194.46.3 Constructor

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

## 194.46.4 Destructor

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 194.46.5 Properties

### 194.46.6 Handle as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle of the thread pool.
**Notes:** (Read and Write property)

### 194.46.7 LastError as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code.
**Notes:** (Read and Write property)

### 194.46.8 StackCommit as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The stack commit size.
**Notes:** Default is 4 KB for the default stack grow size.
The rate the stack grows.
Should be in page size multiplies, e.g. 4096.

Sets the stack reserve and commit sizes for new threads in the specified thread pool. Stack reserve and commit sizes for existing threads are not changed.
(Read and Write property)

### 194.46.9 StackReserve as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The stack reservie size.
**Example:**

```
static pool as WinThreadPoolMBS // property or global

// increase stack size from default
pool = New WinThreadPoolMBS
pool.StackReserve = 2048*1024
```

**Notes:** Default is 1 MB for the default stack size.
The rate the stack grows.
Should be in page size multiplies, e.g. 4096.

Sets the stack reserve and commit sizes for new threads in the specified thread pool. Stack reserve and commit sizes for existing threads are not changed.
(Read and Write property)

### 194.46.10 ThreadMaximum as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The upper limit for thread count.
**Example:**

```
static pool as WinThreadPoolMBS // property or global

pool = New WinThreadPoolMBS
pool.StackReserve = 2048*1024
pool.ThreadMaximum = 4
```

**Notes:** Default for Windows is 500, but it may be much lower in practice as it's relative to the number of CPU cores and jobs.
(Read and Write property)

### 194.46.11 ThreadMinimum as Integer

MBS Win Plugin, Plugin Version: 21.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The lower limit for thread count.
**Notes:** Default 0 to allow having no thread.
(Read and Write property)

## 194.47 class WMIObjectMBS

### 194.47.1 class WMIObjectMBS

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a WMI object.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 13.5pr6
- MBS Xojo / Real Studio Plugins, version 13.4pr2
- MBS Xojo / Real Studio Plugins, version 13.4pr1
- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 13.1
- MBS Real Studio Plugins, version 13.1pr15
- MBS Releases the MBS Real Studio plug-ins in version 12.0
- MBS Real Studio Plugins, version 11.4pr1

### 194.47.2 Methods

### 194.47.3 GetNames as string()

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the names of all properties in this object.

### 194.47.4 GetProperty(Name as string) as Variant

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a property as a variant.
**Notes:** Objects, booleans, strings and numbers are supported directly. Also string arrays in version 13.1. Other values are casted to string first.

### 194.47.5 GetPropertyBoolean(Name as string) as Boolean

MBS Win Plugin, Plugin Version: 13.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value as an integer.
**Notes:** Value must be of a numeric type.

### 194.47.6 GetPropertyDouble(Name as string) as Double

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value as a double.
**Notes:** Value must be of a numeric type.

### 194.47.7 GetPropertyInt64(Name as string) as Int64

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a property as an integer value.

### 194.47.8 GetPropertyInteger(Name as string) as Integer

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value as an integer.
**Example:**

```
dim w as WindowsWMIMBS // your WMI object

MsgBox str(w.GetPropertyInteger("MaxClockSpeed")) // uint32
```

**Notes:** Value must be of a numeric type.

### 194.47.9 GetPropertyObject(Name as string) as WMIObjectMBS

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a value as an object.
**Notes:** Value must be of an IUnknown type.

### 194.47.10 GetPropertyString(Name as string) as string

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a property as a string.
**Example:**

```
dim w as WindowsWMIMBS
MsgBox w.GetPropertyString("Name") // string
```

### 194.47.11 GetPropertyStringArray(Name as string) as string()

MBS Win Plugin, Plugin Version: 13.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a property as a string array.
**Example:**

```
dim w as WindowsWMIMBS
MsgBox join(w.GetPropertyStringArray("Name"), ", ")
```

### 194.47.12 GetPropertyType(Name as string) as Integer

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the type of a property.
**Notes:** You can send in the value you get here and the plugin can be changed to handle this type, too. Currently only numbers and strings are handled.

### 194.47.13 GetPropertyTypeString(Name as string) as string

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the type of a property as a string.
**Notes:** For example type 8 is returned as "string".

### 194.47.14 Properties

### 194.47.15 Handle as Integer

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Internal object reference.
**Notes:** (Read and Write property)

### 194.47.16 Lasterror as Integer

MBS Win Plugin, Plugin Version: 12.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported from one of the functions.
**Notes:** -1 is the value used by the plugin if the function is not available.
(Read and Write property)

### 194.47.17 LasterrorMessage as String

MBS Win Plugin, Plugin Version: 13.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The error message for the last error.
**Notes:** This may help to debug the errors.
(Read only property)

# Chapter 195

# Windows Console

## 195.1 class ConsoleStateMBS

### 195.1.1 class ConsoleStateMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for handling a console window state.

### 195.1.2 Properties

### 195.1.3 BackColor as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The colorcode of the background.
**Notes:** Color codes can be build up from red, blue, green and highlight.
red=1, blue=2, green=4 and highlight=8.
(Read and Write property)

### 195.1.4 CursorX as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The horizontal cursor position in characters.
**Notes:** (Read and Write property)

### 195.1.5 CursorY as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vertical cursor position in characters.
**Notes:** (Read and Write property)

### 195.1.6 Height as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the window in characters.
**Notes:** (Read and Write property)

### 195.1.7 MaxHeight as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum height of the window in characters.
**Notes:** (Read and Write property)

### 195.1.8 MaxWidth as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The maximum width of the window in characters.
**Notes:** (Read and Write property)

### 195.1.9 TextColor as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The colorcode of the text.
**Notes:** Color codes can be build up from red, blue, green and highlight.
red=1, blue=2, green=4 and highlight=8.
(Read and Write property)

### 195.1.10 Width as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the window in characters.
**Notes:** (Read and Write property)

### 195.1.11 WindowHeight as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the console window.
**Notes:** (Read and Write property)

### 195.1.12 WindowLeft as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The left position of the console window.
**Notes:** (Read and Write property)

### 195.1.13 WindowTop as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The top position of the console window.
**Notes:** (Read and Write property)

### 195.1.14 WindowWidth as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the console window.
**Notes:** (Read and Write property)

## 195.2 class WindowsConsoleMBS

### 195.2.1 class WindowsConsoleMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for handling a console window in Windows.

### 195.2.2 Methods

### 195.2.3 Close

MBS Win Plugin, Plugin Version: 4.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 195.2.4 FlushConsole

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The FlushConsole function flushes the console input buffer.
**Notes:** All input records currently in the input buffer are discarded.

### 195.2.5 ReadConsole(maxcount as Integer) as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reads maximum of maxcount characters from the input stream.

### 195.2.6 SetCursorPosition(x as Integer,y as Integer)

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the cursor position inside the console window.

### 195.2.7 SetWindowPosition(absolute as boolean, left as Integer,top as Integer, right as Integer, bottom as Integer)

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the window position and size.
**Notes:** If absolute=false, the coordinates are relative to the current one.

### 195.2.8 State as ConsoleStateMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current state of the console window.

### 195.2.9 WriteConsole(message as string) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes the message to the console.
**Notes:** Returns true if successfull.

### 195.2.10 Properties

### 195.2.11 AutoScrollAtEOL as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Automatical scrolling at end of line?
**Notes:** When writing with WriteConsole or echoing with ReadFile, the cursor moves to the beginning of the next row when it reaches the end of the current row. This causes the rows displayed in the console window to scroll up automatically when the cursor advances beyond the last row in the window. It also causes the contents of the screen buffer to scroll up (discarding the top row of the screen buffer) when the cursor advances beyond the last row in the screen buffer. If this mode is disabled, the last character in the row is overwritten with any subsequent characters.
(Read and Write property)

### 195.2.12 BackColor as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text background color used.
**Notes:** (Read and Write property)

### 195.2.13 CursorSize as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The size of the cursor in percent (from 0 to 100).
**Notes:** (Read and Write property)

### 195.2.14 CursorVisible as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Is the cursor visible?
**Notes:** (Read and Write property)

### 195.2.15 EchoInput as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Echo the input on the screen?
**Notes:** Characters read by the ReadFile function are written to the active screen buffer as they are read. This mode can be used only if the WaitForReturn mode is also enabled.
(Read and Write property)

### 195.2.16 GotConsole as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** whether the console was created inside the constructor.
**Notes:** (Read only property)

### 195.2.17 InputCodepage as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Codepage of the input stream.
**Notes:** (Read and Write property)

### 195.2.18 OutputCodepage as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Codepage of the output stream.
**Notes:** (Read and Write property)

### 195.2.19 ProcessInput as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Process input before reading?
**Notes:** Ctrl+c is processed by the system and is not placed in the input buffer. If the input buffer is being read by ReadConsole, other control keys are processed by the system and are not returned in the ReadConsole buffer. If the WaitForReturn mode is also enabled, backspace, carriage return, and linefeed characters are handled by the system.
(Read and Write property)

### 195.2.20 ProcessOutput as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Process output before reading?
**Notes:** Characters written by the WriteConsole function or echoed by the ReadFile or ReadConsole function are parsed for ASCII control sequences, and the correct action is performed. Backspace, tab, bell, carriage return, and linefeed characters are processed.
(Read and Write property)

### 195.2.21 TextColor as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text color used.
**Notes:** (Read and Write property)

### 195.2.22 Title as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The title bar of the console window.
**Notes:** (Read and Write property)

### 195.2.23 WaitForReturn as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Wait for return key on reading?
**Notes:** The ReadConsole function returns only when a carriage return character is read. If this mode is disabled, the functions return when one or more characters are available.
(Read and Write property)

### 195.2.24 Events

### 195.2.25 ConsoleClosed

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** Console was closed.

### 195.2.26 ConsoleOpened

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** Console was opened.

### 195.2.27 ControlBreak as boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** Control-Break was pressed.
**Notes:** Return true if you handled it yourself.
Return false for the default handler.

### 195.2.28 ControlC as boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** Control-C was pressed.
**Notes:** Return true if you handled it yourself.
Return false for the default handler.

### 195.2.29 Logoff as boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** The user is logging off.
**Notes:** Return true if you handled it yourself.
Return false for the default handler.

### 195.2.30 Shutdown as boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** The user is shutting down the computer.
**Notes:** Return true if you handled it yourself.
Return false for the default handler.

### 195.2.31 UserClose as boolean

MBS Win Plugin, Platform: Windows, Targets: .

**Function:** The user pressed the close button.
**Notes:** Return true if you handled it yourself.
Return false for the default handler.

### 195.2.32 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| Black | 0 | The color code for Black.<br>Read only property with value 0. |
| Blue | 1 | The color code for Blue.<br>Read only property with value 2. |
| Green | 2 | The color code for Green.<br>Read only property with value 4. |
| Highlight | 8 | The color code for Highlight.<br>Read only property with value 8. |
| Red | 4 | The color code for Red.<br>Read only property with value 1. |

# Chapter 196

# Windows ICM

## 196.1 class WindowsICMColorMBS

### 196.1.1 class WindowsICMColorMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a color value.
**Notes:** A variable of type color may be accessed as any of the supported color space colors by accessing the appropriate member of the union.

see also:
http://msdn.microsoft.com/en-us/library/dd371932(v=VS.85).aspx
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.1.2 Properties

### 196.1.3 a as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The a color value of a Lab color.
**Notes:** (Read and Write property)

### 196.1.4 b as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The b color value of a Lab color.
**Notes:** (Read and Write property)

### 196.1.5 black as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The black color value of a CMYK color.
**Notes:** (Read and Write property)

### 196.1.6 blue as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The blue value.
**Notes:** Range from 0 to 255.
(Read and Write property)

### 196.1.7 ch1 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The first channel color value of a three channel color.
**Notes:** (Read and Write property)

### 196.1.8 ch2 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The second channel color value of a three channel color.
**Notes:** (Read and Write property)

### 196.1.9 ch3 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The third channel color value of a three channel color.
**Notes:** (Read and Write property)

### 196.1.10 cyan as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The cyan color value of a CMYK color.
**Notes:** (Read and Write property)

### 196.1.11 gray as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The gray color value.
**Notes:** For grayscale color space.
(Read and Write property)

### 196.1.12 green as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The green value.
**Notes:** Range from 0 to 255.
(Read and Write property)

### 196.1.13 Index as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The index value for an indexed color space.
**Notes:** (Read and Write property)

### 196.1.14 L as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The L color value of a Lab color.
**Notes:** (Read and Write property)

### 196.1.15 magenta as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The magenta color value of a CMYK color.
**Notes:** (Read and Write property)

### 196.1.16 red as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The red value.
**Notes:** Range from 0 to 255.
(Read and Write property)

### 196.1.17 XYZ_X as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The X value of a XYZ color.
**Notes:** (Read and Write property)

### 196.1.18 XYZ_Y as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y value of a XYZ color.
**Notes:** (Read and Write property)

### 196.1.19 XYZ_Z as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Z value of a XYZ color.
**Notes:** (Read and Write property)

### 196.1.20 yellow as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The yellow color value of a CMYK color.
**Notes:** (Read and Write property)

### 196.1.21 Yxy_x as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The x value of a Yxy color.
**Notes:** (Read and Write property)

### 196.1.22 Yxy_y as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The y value of a Yxy color.
**Notes:** Yxy_YY is the first Y and Yxy_Y the second one in a Yxy color.
(Read and Write property)

### 196.1.23 Yxy_YY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The y value of a Yxy color.
**Notes:** Yxy_YY is the first Y and Yxy_Y the second one in a Yxy color.
(Read and Write property)

### 196.1.24 Channel(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The channel value of a colorspaces with 3 to 8 channels.
**Notes:** Index from 0 to 7.
(Read and Write computed property)

### 196.1.25 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| MAX_COLOR_CHANNELS | 8 | The maximum number of supported color channels. |

Color Type Constants

| Constant | Value | Description |
|---|---|---|
| COLOR_3_CHANNEL | 6 | The COLOR is in the GENERIC3CHANNEL color space. |
| COLOR_5_CHANNEL | 8 | The COLOR is in a five channel color space. |
| COLOR_6_CHANNEL | 9 | The COLOR is in a six channel color space. |
| COLOR_7_CHANNEL | 10 | The COLOR is in a seven channel color space. |
| COLOR_8_CHANNEL | 11 | The COLOR is in an eight channel color space. |
| COLOR_CMYK | 7 | The COLOR is in the CMYKCOLOR color space. |
| COLOR_GRAY | 1 | The COLOR is in the GRAYCOLOR color space. |
| COLOR_Lab | 5 | The COLOR is in the LabCOLOR color space. |
| COLOR_NAMED | 12 | The COLOR is in a named color space. |
| COLOR_RGB | 2 | The COLOR is in the RGBCOLOR color space. |
| COLOR_XYZ | 3 | The COLOR is in the XYZCOLOR color space. |
| COLOR_Yxy | 4 | The COLOR is in the YxyCOLOR color space. |

## 196.2 class WindowsICMEnumMBS

### 196.2.1 class WindowsICMEnumMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The WindowsICMEnumMBS class contains information that defines the profile enumeration constraints.
**Example:**

```
dim c as new WindowsICMEnumMBS // no options set

dim a(-1) as string = WindowsICMModuleMBS.EnumColorProfiles(c)

for each s as string in a
MsgBox s
next
```

**Notes:** see also
http://msdn.microsoft.com/en-us/library/dd316895(v=VS.85).aspx
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.2.2 Properties

### 196.2.3 Attributes0 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attributes of profile that can be any of the following values.
**Notes:**

| Constant | Meaning |
|---|---|
| ATTRIB_TRANSPARENCY | Turns transparency on. If this flag is not used, the attribute is reflective by default. |
| ATTRIB_MATTE | Turns matte display on. If this flag is not used, the attribute is glossy by default. |

(Read and Write property)

### 196.2.4 Attributes1 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attributes of profile that can be any of the following values.
**Notes:**

| Constant | Meaning |
|---|---|
| ATTRIB_TRANSPARENCY | Turns transparency on. If this flag is not used, the attribute is reflective by default. |
| ATTRIB_MATTE | Turns matte display on. If this flag is not used, the attribute is glossy by default. |

(Read and Write property)

### 196.2.5 Classs as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the profile class.
**Notes:** For a description of profile classes, see Using Device Profiles with WCS.
http://msdn.microsoft.com/en-us/library/dd372213(v=VS.85).aspx

A profile class may have any of the following values.

| Profile Class | Signature |
|---|---|
| Input Device Profile | CLASS_SCANNER |
| Display Device Profile | CLASS_MONITOR |
| Output Device Profile | CLASS_PRINTER |
| Device Link Profile | CLASS_LINK |
| Color Space Conversion Profile | CLASS_COLORSPACE |
| Abstract Profile | CLASS_ABSTRACT |
| Named Color Profile | CLASS_NAMED |
| Color Appearance Model Profile | CLASS_CAMP |
| Color Gamut Map Model Profile | CLASS_GMMP |

(Read and Write property)

### 196.2.6 CMMType as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identification number of the CMM that is used in the profile.
**Notes:** Identification numbers are registered with the ICC.
(Read and Write property)

### 196.2.7 ConnectionSpace as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A signature value that indicates the color space in which the profile connection space (PCS) is defined.
**Notes:** Can be any of the following values: SPACE_XYZ or SPACE_Lab

When the Classs member is set to CLASS_LINK, the PCS is taken from the DataColorSpace member.
(Read and Write property)

### 196.2.8 Creator as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Signature of the software that created the profile.
**Notes:** Signatures are registered with the ICC.
(Read and Write property)

### 196.2.9 DataColorSpace as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A signature value that indicates the color space in which the profile data is defined.
**Notes:** Can be any value from the SPACE_* Constants.
(Read and Write property)

### 196.2.10 DeviceClass as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the device class.
**Notes:** A device class may have one of the following values.

(Read and Write property)

| Profile Class | Signature |
|---|---|
| Input Device Profile | CLASS_SCANNER |
| Display Device Profile | CLASS_MONITOR |
| Output Device Profile | CLASS_PRINTER |

### 196.2.11 DeviceName as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** User friendly name of the device.
**Notes:** (Read and Write property)

### 196.2.12 DitheringMode as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the style of dithering that will be used when an image is displayed.
**Notes:** (Read and Write property)

### 196.2.13 Fields as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates which fields in this class are being used.
**Notes:** Can be set to any combination of the following constant values:

ET_DEVICENAME
ET_MEDIATYPE
ET_DITHERMODE
ET_RESOLUTION
ET_CMMTYPE
ET_CLASS
ET_DATACOLORSPACE
ET_CONNECTIONSPACE
ET_SIGNATURE
ET_PLATFORM
ET_PROFILEFLAGS
ET_MANUFACTURER
ET_MODEL
ET_ATTRIBUTES
ET_RENDERINGINTENT
ET_CREATOR
ET_DEVICECLASS

(Read and Write property)

### 196.2.14 Manufacturer as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identification number of the device profile manufacturer.
**Notes:** All manufacturer identification numbers are registered with the ICC.
(Read and Write property)

### 196.2.15 MediaType as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates which type of media is associated with the profile, such as a printer or screen.
**Notes:** (Read and Write property)

### 196.2.16 Model as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device manufacturer's device model number.
**Notes:** All model identification numbers are registered with the ICC.
(Read and Write property)

### 196.2.17 Platform as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The primary platform for which the profile was created.
**Notes:** The member can be set to any of the following values.

| Platform | Value |
|---|---|
| Apple Computer, Inc. | 'APPL' |
| Microsoft Corp. | 'MSFT' |
| Silicon Graphics, Inc. | 'SGI' |
| Sun Microsystems, Inc. | 'SUNW' |
| Taligent | 'TGNT' |

(Read and Write property)

### 196.2.18 ProfileFlags as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bit flags containing hints that the CMM uses to interpret the profile data and can be set to one of the following values.
**Notes:**

| Constant | Meaning |
|---|---|
| FLAG_EMBEDDEDPROFILE | The profile is embedded in a bitmap file. |
| FLAG_DEPENDENTONDATA | The profile can't be used independently of the embedded color data. Used for profiles that are embedded in bitmap files. |

(Read and Write property)

### 196.2.19 RenderingIntent as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The profile rendering intent.
**Notes:** The member can be set to one of the following values:

INTENT_PERCEPTUALINTENT_SATURATIONINTENT_RELATIVE_COLORIMETRICINTENT_ABSOLUTE_COLORIMETRIC

For more information, see Rendering Intents.
http://msdn.microsoft.com/en-us/library/dd372183(v=VS.85).aspx
(Read and Write property)

### 196.2.20 ResolutionX as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The horizontal resolution in pixels of the device on which the image will be displayed.
**Notes:** (Read and Write property)

### 196.2.21 ResolutionY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The vertical resolution in pixels of the device on which the image will be displayed.
**Notes:** (Read and Write property)

### 196.2.22 Signature as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reserved for internal use.
**Notes:** (Read and Write property)

### 196.2.23 Constants

Attribute Constants

| Constant | Value | Description |
|---|---|---|
| ATTRIB_MATTE | 2 | Turns matte display on. If this flag is not used, the attribute is glossy by default. |
| ATTRIB_TRANSPARENCY | 1 | Turns transparency on. If this flag is not used, the attribute is reflective by default. |

Profile Class Constants

| Constant | Value | Description |
|---|---|---|
| CLASS_ABSTRACT | &h61627374 | |
| CLASS_CAMP | &h6C616D70 | |
| CLASS_COLORSPACE | &h73706163 | |
| CLASS_GMMP | &h676D6D70 | |
| CLASS_LINK | &h6C696E6B | |
| CLASS_MONITOR | &h6D6E7472 | |
| CLASS_NAMED | &h6E6D636C | |
| CLASS_PRINTER | &h70727472 | |
| CLASS_SCANNER | &h73636E72 | |

Field usage flags

| Constant | Value | Description |
|---|---|---|
| ET_ATTRIBUTES | &h02000 | |
| ET_CLASS | &h00020 | |
| ET_CMMTYPE | &h00010 | |
| ET_CONNECTIONSPACE | &h00080 | |
| ET_CREATOR | &h08000 | |
| ET_DATACOLORSPACE | &h00040 | |
| ET_DEVICECLASS | &h10000 | |
| ET_DEVICENAME | &h00001 | |
| ET_DITHERMODE | &h00004 | |
| ET_MANUFACTURER | &h00800 | |
| ET_MEDIATYPE | &h00002 | |
| ET_MODEL | &h01000 | |
| ET_PLATFORM | &h00200 | |
| ET_PROFILEFLAGS | &h00400 | |
| ET_RENDERINGINTENT | &h04000 | |
| ET_RESOLUTION | &h00008 | |
| ET_SIGNATURE | &h00100 | |

Profile flag constants.

| Constant | Value | Description |
|---|---|---|
| FLAG_DEPENDENTONDATA | 2 | The profile can't be used independently of the embe profiles that are embedded in bitmap files. |
| FLAG_EMBEDDEDPROFILE | 1 | The profile is embedded in a bitmap file. |
| FLAG_ENABLE_CHROMATIC_ADAPTATION | &h02000000 | |

Platform signature

| Constant | Value | Description |
|---|---|---|
| SigMacintosh | &h4150504C | APPL = Apple Computer, Inc. |
| SigMicrosoft | &h4D534654 | MSFT = Microsoft Corp. |
| SigSGI | &h53474920 | SGI = Silicon Graphics, Inc. |
| SigSolaris | &h53554E57 | SUNW = Sun Microsystems, Inc. |
| SigTaligent | &h54474E54 | TGNT = Taligent |

Color Space Constants

| Constant | Value | Description |
|---|---|---|
| SPACE_Lab | &h4C616220 | Lab |
| SPACE_XYZ | &h58595A20 | XYZ |

# 196.3 class WindowsICMLogColorSpaceMBS

## 196.3.1 class WindowsICMLogColorSpaceMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class contains information that defines a logical color space.
**Notes:** If the CSType member is set to LCS_sRGB or LCS_WINDOWS_COLOR_SPACE, the other members of this structure are ignored, and WCS uses the sRGB color space. The Endpoints, GammaRed, GammaGreen, and GammaBlue members are used to describe the logical color space. The Endpoints member is a CIEXYZTRIPLE that contains the x, y, and z values of the color space's RGB endpoint.

The required DWORD bit format for the GammaRed, GammaGreen, and GammaBlue is an 8.8 fixed point interger left-shifted by 8 bits. The plugin takes care about that detail.

Whenever the Filename member contains a file name and the CSType member is set to LCS_CALIBRATED_RGB, WCS ignores the other members of this class. It uses the color space in the file as the color space to which this LOGCOLORSPACE structure refers.

The relation between tri-stimulus values X,Y,Z and chromaticity values x,y,z is as follows:

x = X/(X+Y+Z)
y = Y/(X+Y+Z)
z = Z/(X+Y+Z)

If the CSType member is set to LCS_sRGB or LCS_WINDOWS_COLOR_SPACE, the other members of this structure are ignored, and ICM uses the sRGB color space. Appliations should still initialize the rest of the structure since CreateProfileFromLogColorSpace ignores CSType member and uses Endpoints, GammaRed, GammaGreen, GammaBlue members to create a profile, which may not be initialized in case of LCS_sRGB or LCS_WINDOWS_COLOR_SPACE color spaces.
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

## 196.3.2 Properties

## 196.3.3 CSType as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Color space type.
**Notes:** The member can be one of the following values.

| Value | Meaning |
|---|---|
| LCS_CALIBRATED_RGB | Color values are calibrated RGB values. The values are translated using the endpoints specified by the lcsEndpoints member before being passed to the device. |
| LCS_sRGB | Color values are values are sRGB values. |
| LCS_WINDOWS_COLOR_SPACE | Color values are Windows default color space color values. |

(Read and Write property)

### 196.3.4 EndpointsBX as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The X value of the Blue Endpoint.
**Notes:** (Read and Write property)

### 196.3.5 EndpointsBY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y value of the Blue Endpoint.
**Notes:** (Read and Write property)

### 196.3.6 EndpointsBZ as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Z value of the Blue Endpoint.
**Notes:** (Read and Write property)

### 196.3.7 EndpointsGX as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The X value of the Green Endpoint.
**Notes:** (Read and Write property)

### 196.3.8 EndpointsGY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y value of the Green Endpoint.
**Notes:** (Read and Write property)

### 196.3.9 EndpointsGZ as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Z value of the Green Endpoint.
**Notes:** (Read and Write property)

### 196.3.10 EndpointsRX as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The X value of the Red Endpoint.
**Notes:** (Read and Write property)

### 196.3.11 EndpointsRY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Y value of the Red Endpoint.
**Notes:** (Read and Write property)

### 196.3.12 EndpointsRZ as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Z value of the Red Endpoint.
**Notes:** (Read and Write property)

### 196.3.13 Filename as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string that names a color profile file.
**Notes:** This member is typically set to "", but may be used to set the color space to be exactly as specified by the color profile. This is useful for devices that input color values for a specific printer, or when using an installable image color matcher. If a color profile is specified, all other members of this class should be set to reasonable values, even if the values are not completely accurate.
(Read and Write property)

### 196.3.14 GammaBlue as Double

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scale of the blue coordinate.
**Notes:** (Read and Write property)

### 196.3.15 GammaGreen as Double

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scale of the green coordinate.
**Notes:** (Read and Write property)

### 196.3.16 GammaRed as Double

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scale of the red coordinate.
**Notes:** (Read and Write property)

### 196.3.17 Intent as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The gamut mapping method.
**Notes:** This member can be one of the following values.

| Value | Value | Intent | ICC Name | Meaning |
|---|---|---|---|---|
| LCS_GM_BUSINESS | 1 | Graphic | Saturation | Maintain saturation. Used for business charts and other situations in which undithered colors are required. |
| LCS_GM_GRAPHICS | 2 | Proof | Relative Colorimetric | Maintain colorimetric match. Used for graphic designs and named colors. |
| LCS_GM_IMAGES | 4 | Picture | Perceptual | Maintain contrast. Used for photographs and natural images. |
| LCS_GM_ABS_COLORIMETRIC | 8 | Match | Absolute Colorimetric | Maintain the white point. Match the colors to their nearest color in the destination gamut. |

(Read and Write property)

### 196.3.18 Constants

Rendering Intent Constants

| Constant | Value | Description |
|---|---|---|
| INTENT_ABSOLUTE_COLORIMETRIC | 3 | Maintain the white point. Match the colors to their nearest color i nation gamut. |
| INTENT_PERCEPTUAL | 0 | Maintain contrast. Used for photographs and natural images. |
| INTENT_RELATIVE_COLORIMETRIC | 1 | Maintain colorimetric match. Used for graphic designs and named |
| INTENT_SATURATION | 2 | Maintain saturation. Used for business charts and other situatio undithered colors are required. |

Color Space Type Constants

| Constant | Value | Description |
|---|---|---|
| LCS_CALIBRATED_RGB | 0 | Color values are calibrated RGB values. The values are translate endpoints specified by the Endpoints member before being passed t |
| LCS_sRGB | &h73524742 | Color values are values are sRGB values. |
| LCS_WINDOWS_COLOR_SPACE | &h57696E20 | Color values are Windows default color space color values. |

## 196.4 module WindowsICMModuleMBS

### 196.4.1 module WindowsICMModuleMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The main module for Windows Image Color Matching functions.
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.4.2 Methods

### 196.4.3 AssociateColorProfileWithDevice(ProfileName as string, DeviceName as string) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The AssociateColorProfileWithDevice function associates a specified color profile with a specified device.
**Notes:** ProfileName: The file name of the profile to associate.
DeviceName: The name of the device to associate.

Returns true on success and false on failure.

The AssociateColorProfileWithDevice function will fail if the profile has not been installed on the computer using the InstallColorProfile function.

Note that under Windows (Windows 95 or later), the PostScript device driver for printers assumes a CMYK color model. Therefore, all PostScript printers must use a CMYK color profile. Windows 2000 does not have this limitation.

If the specified device is a monitor, this function updates the default profile.

Several profiles are typically associated with printers, based on paper and ink types. There is no default. The GDI selects the best one from the associated profiles when your application creates a device context (DC).

Scanners also have no default profile. However, it is atypical to associate more than one profile with a scanner.

AssociateColorProfileWithDevice always adds the specified profile to the current user's per-user profile association list for the specified device. Before adding the profile to the list, AssociateColorProfileWithDevice determines whether the user has previously expressed the desire to use a per-user profile association list

for the device. If so, then AssociateColorProfileWithDevice simply adds the specified profile to the existing per-user profile association list for the device. If not, then AssociateColorProfileWithDevice creates a new per-user profile association list for the device by copying the system-wide association list for that device. It then appends the specified profile to the per-user list. From that point on, the current user will be using a per-user profile association list for the specified device, as if SetUsePerUserProfiles had been called for Device with the usePerUserProfiles parameter set to TRUE.

### 196.4.4 DisassociateColorProfileFromDevice(ProfileName as string, DeviceName as string) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The DisassociateColorProfileFromDevice function disassociates a specified color profile with a specified device on a specified computer.
**Notes:** Returns true on success and false on failure.

ProfileName: The file name of the profile to disassociate.
DeviceName: The name of the device to disassociate.

If more than one profile is associated with a device, WCS uses the last one associated as the default. That is, if your application sequentially associates three profiles with a device, WCS will use the last one associated as the default. If your application then calls the DisassociateColorProfileFromDevice function to disassociate the third profile (which is the default in this example), the WCS will use the second profile as the default.

If your application disassociates all profiles from a device, WCS uses the sRGB profile as the default.

DisassociateColorProfileFromDevice always removes the specified profile from the current user's per-user profile association list for the specified device. Before removing the profile from the list, DisassociateColorProfileFromDevice determines whether the user has previously expressed the desire to use a per-user profile association list for the device. If so, then DisassociateColorProfileFromDevice simply removes the specified profile from the existing per-user profile association list for the device. If not, then DisassociateColorProfileFromDevice creates a new per-user profile association list for the device by copying the system-wide association list for that device. It then removes the specified profile from the per-user list. From that point on, the current user will be using a per-user profile association list for the specified device, as if SetUsePerUserProfiles had been called for Device with the usePerUserProfiles parameter set to TRUE.

### 196.4.5 EnumColorProfiles(criterias as WindowsICMEnumMBS) as string()

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The EnumColorProfiles function enumerates all the profiles satisfying the given enumeration criteria.

**Example:**

```
dim c as new WindowsICMEnumMBS // no options set

dim a(-1) as string = WindowsICMModuleMBS.EnumColorProfiles(c)

for each s as string in a
MsgBox s
next
```

**Notes:** On success the function returns an array of profile names.

Several profiles are typically associated with printers, based on the paper and ink types. There is a default profile for each device. For International Color Consortium (ICC) profiles, GDI selects the best one from the ICC-associated profiles when your application creates a device context (DC).

Do not attempt to use EnumColorProfiles to determine the default profile for a device. Instead, create a device context for the device and then invoke the GetICMProfile function. On Windows Vista and Windows 7, the WcsGetDefaultColorProfile function can also be used to determine a device's default color profile.

If the Fields member of WindowsICMEnumMBS that is pointed to by the criterias parameter is set to ET_DEVICENAME, this function will enumerate all of the color profiles associated with all types of devices attached to the user's computer, regardless of the device class. If the Fields member is set to ET_DEVICENAME or ET_DEVICECLASS and a device class is specified in the DeviceClass member, this function will only enumerate the profiles associated with the specified device class. If the Fields member is set only to ET_DEVICECLASS, the EnumColorProfiles function will enumerate all profiles that can be associated with that type of device.

Whenever EnumColorProfiles is examining the profiles associated with a specific device, the results depend on whether the user has chosen to use the system-wide list of profiles associated with that device, or his or her own ("per-user") list. Calling SetUsePerUserProfiles with its usePerUserProfiles parameter set to TRUE causes future calls to EnumColorProfiles to look at only the current user's per-user list of profile associations for the specified device. Calling WcsSetUsePerUserProfiles with its usePerUserProfiles parameter set to FALSE causes future calls to EnumColorProfiles to look at the system-wide list of profile associations for the specified device. If SetUsePerUserProfiles has never been called for the current user, EnumColorProfiles examines the system-wide list.

This function will provide the information for converting WCS-specific DMP information to the legacy EnumType record in enable consistent profile enumeration. The defaults will be the same as ICC if this information is not present.

Per-user/LUA support

The enumeration is specific to current user. Both system wide and current user device associations are considered. For default profile configuration, current user settings override system wide ones.

### 196.4.6 GetColorDirectory as folderitem

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetColorDirectory function retrieves the path of the Windows COLOR directory on a specified machine.
**Example:**

```
dim f as FolderItem = WindowsICMModuleMBS.GetColorDirectory

if f=nil then
MsgBox "No path?"
else
MsgBox f.NativePath
end if
```

**Notes:** On success returns folderitem for color directory. Returns nil on any error.

### 196.4.7 GetStandardColorSpaceProfile(ProfileID as Integer) as string

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetStandardColorSpaceProfile function retrieves the color profile registered for the specified standard color space.
**Example:**

```
MsgBox WindowsICMModuleMBS.GetStandardColorSpaceProfile(WindowsICMModuleMBS.LCS_WINDOWS_COLOR_S
```

**Notes:** ProfileID: Specifies the ID value of the standard color space for which to retrieve the profile. The only valid values for this parameter are LCS_sRGB and LCS_WINDOWS_COLOR_SPACE.

This function supports Windows Color System (WCS) device model profiles (DMPs) in addition to International Color Consortium (ICC) profiles. It does not support WCS CAMP or GMMP profiles and will return an error if such profiles are used.

Overview of Windows Vista Specific Functionality

This will support WCS DMPs in addition to ICC profiles. It will not support WCS CAMP or GMMP profiles and will return an error if such profiles are used with this API.

Per-user/LUA support

This will retrieve the color profile registered for the given standard color space for current user. If there is no such setting for the current user, it retrieves the system wide setting.

This uses WcsGetDefaultColorProfile with WCS_PROFILE_MANAGEMENT_SCOPE_CURRENT_USER.

This is executable in LUA context.

### 196.4.8 InstallColorProfile(file as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The InstallColorProfile function installs a given profile for use on a specified machine.
**Notes:** The profile is also copied to the COLOR directory.
Returns true on success and false on failure.

### 196.4.9 RegisterCMM(cmmID as Integer, file as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** RegisterCMM associates a specified identification value with the specified color management module dynamic link library (CMM DLL).
**Notes:** When this ID appears in a color profile, Windows can then locate the corresponding CMM so as to create a transform.

cmmID: Specifies the ID signature of the CMM registered with the International Color Consortium (ICC).

file: Points to the CMM DLL.

Returns true on success and false on failure.

### 196.4.10 SelectCMM(cmmID as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** SelectCMM allows an application to select the preferred color management module (CMM) to use.
**Notes:** cmmID: Specifies the signature of the desired CMM as registered with the International Color Consortium (ICC).

Windows 2000 only: Setting this parameter to 0 causes the WCS system to select the default CMM.

Returns true on success and false on failure.

### 196.4.11 SetStandardColorSpaceProfile(ProfileID as Integer, ProfileName as folderitem) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetStandardColorSpaceProfile function registers a specified profile for a given standard color space.
**Notes:** The profile can be queried using GetStandardColorSpaceProfile.

ProfileID: Specifies the ID value of the standard color space that the given profile represents.
Profilename: path to the profile file.

Returns true on success and false on failure.

The profile must already be installed on the system before it can be registered for a standard color space.

This function supports Windows Color System (WCS) device model profiles (DMPs) in addition to International Color Consortium (ICC) profiles. It does not support WCS CAMP or GMMP profiles and will return an error if such profiles are used.

Per-user/LUA support

This will register a specified profile for a given standard color space only for current user.

This uses SetDefaultColorProfile with WCS_PROFILE_MANAGEMENT_SCOPE_CURRENT_USER.

This is executable in LUA context if the profile is already installed, fails otherwise with access denied since install is system-wide and requires administrator privileges.

### 196.4.12 UninstallColorProfile(ProfileName as string, DeleteFile as boolean = true) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** UninstallColorProfile removes a specified color profile from a specified computer. Associated files are optionally deleted from the system.
**Notes:** ProfileName: Points to the file name of the profile to uninstall.

DeleteFile: If set to true, the function deletes the profile from the COLOR directory. If set to false, this function has no effect.

Returns true on success and false on failure.

### 196.4.13 UnregisterCMM(cmmID as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The UnregisterCMM function dissociates a specified ID value from a given color management module dynamic-link library (CMM DLL).
**Notes:** cmmID: Specifies the ID value identifying the CMM whose registration is to be removed. This is the signature of the CMM registered with the International Color Consortium (ICC).

Returns true on success and false on failure.

### 196.4.14 Constants

Info selectors for GetInfo

| Constant | Value | Description |
|---|---|---|
| CMM_DESCRIPTION | 5 | A text string that describes the color management module. |
| CMM_DLL_VERSION | 3 | Version number of the CMM DLL. |
| CMM_DRIVER_VERSION | 2 | |
| CMM_IDENT | 1 | The CMM identification signature registered with the International Color Consortium (ICC). |
| CMM_LOGOICON | 6 | The logo icon for this CMM. |
| CMM_VERSION | 4 | Version of Windows supported. |
| CMM_WIN_VERSION | 0 | Backward compatibility with Windows 95. |

Profile ID Constants

| Constant | Value | Description |
|---|---|---|
| LCS_sRGB | &h73524742 | |
| LCS_WINDOWS_COLOR_SPACE | &h57696E20 | |

## 196.5 class WindowsICMNamedProfileInfoMBS

### 196.5.1 class WindowsICMNamedProfileInfoMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class is used to store information about a named color profile.
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.5.2 Properties

### 196.5.3 Count as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Total number of named colors in the profile.
**Notes:** (Read and Write property)

### 196.5.4 CountDevCoordinates as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Total number of device coordinates for each named color.
**Notes:** (Read and Write property)

### 196.5.5 Flags as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Flags for this information record.
**Notes:** Not currently used by the default CMM.
(Read and Write property)

### 196.5.6 Prefix as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string containing the prefix for each color name.
**Notes:** (Read and Write property)

### 196.5.7 Suffix as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string containing the suffix for each color name.
**Notes:** (Read and Write property)

## 196.6 class WindowsICMProfileHeaderMBS

### 196.6.1 class WindowsICMProfileHeaderMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class contains information that describes the contents of a device profile file.
**Notes:** This header occurs at the beginning of a device profile file.
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.6.2 Properties

### 196.6.3 Attributes0 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attributes of profile.
**Notes:** (Read and Write property)

### 196.6.4 Attributes1 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Attributes of profile.
**Notes:** (Read and Write property)

### 196.6.5 Classs as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Indicates the profile class.
**Example:**

```
// some profile file
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")

// open profile read only
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PRO-
FILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXIST-
ING)

// get headers
```

```
dim h as WindowsICMProfileHeaderMBS = w.ColorProfileHeader

// show color space name
Select case h.Classs
case WindowsICMProfileHeaderMBS.CLASS_MONITOR
msgbox "Monitor"
case WindowsICMProfileHeaderMBS.CLASS_PRINTER
msgbox "Printer"
case WindowsICMProfileHeaderMBS.CLASS_SCANNER
msgbox "Scanner"
case WindowsICMProfileHeaderMBS.CLASS_LINK
msgbox "Link"
case WindowsICMProfileHeaderMBS.CLASS_ABSTRACT
msgbox "Abstract"
case WindowsICMProfileHeaderMBS.CLASS_COLORSPACE
msgbox "Colorspace"
case WindowsICMProfileHeaderMBS.CLASS_NAMED
msgbox "Named"
case WindowsICMProfileHeaderMBS.CLASS_CAMP
msgbox "Camp"
case WindowsICMProfileHeaderMBS.CLASS_GMMP
msgbox "GNMP"
else
msgbox "Unknown: "+hex(h.Classs)
end Select
```

**Notes:** For a description of profile classes, see Using Device Profiles with WCS:
http://msdn.microsoft.com/en-us/library/dd372213(v=VS.85).aspx

A profile class may have any of the values from the CLASS_* constants.

Class is written with three s here as Class is a reserved word in Xojo.
(Read and Write property)

### 196.6.6 CMMType as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identification number of the CMM that is used in the profile.
**Notes:** Identification numbers are registered with the ICC.
(Read and Write property)

### 196.6.7 ConnectionSpace as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A signature value that indicates the color space in which the profile connection space (PCS) is defined.
**Notes:** The member can be any of the following values: SPACE_XYZ or SPACE_Lab.
(Read and Write property)

### 196.6.8 Creator as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Signature of the software that created the profile.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PRO-
FILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXIST-
ING)
dim h as WindowsICMProfileHeaderMBS = w.ColorProfileHeader

MsgBox hex(h.Creator)
```

**Notes:** Signatures are registered with the ICC.
(Read and Write property)

### 196.6.9 DataColorSpace as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A signature value that indicates the color space in which the profile data is defined.
**Example:**

```
function Name() as string
dim w as WindowsICMProfileMBS // your profile
dim h as WindowsICMProfileHeaderMBS = w.ColorProfileHeader

if h=nil then Return "?"

Select case h.DataColorSpace
case WindowsICMProfileHeaderMBS.SPACE_XYZ
Return "XYZ"
case WindowsICMProfileHeaderMBS.SPACE_Lab
```

```
Return "Lab"
case WindowsICMProfileHeaderMBS.SPACE_Luv
Return "Luv"
case WindowsICMProfileHeaderMBS.SPACE_YCbCr
Return "YCbCr"
case WindowsICMProfileHeaderMBS.SPACE_Yxy
Return "Yxy"
case WindowsICMProfileHeaderMBS.SPACE_RGB
Return "RGB"
case WindowsICMProfileHeaderMBS.SPACE_GRAY
Return "GRAY"
case WindowsICMProfileHeaderMBS.SPACE_HSV
Return "HSV"
case WindowsICMProfileHeaderMBS.SPACE_HLS
Return "HLS"
case WindowsICMProfileHeaderMBS.SPACE_CMYK
Return "CMYK"
case WindowsICMProfileHeaderMBS.SPACE_CMY
Return "CMY"
case WindowsICMProfileHeaderMBS.SPACE_2_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_3_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_4_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_5_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_6_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_7_CHANNEL
Return "2 Channel"
case WindowsICMProfileHeaderMBS.SPACE_8_CHANNEL
Return "2 Channel"
else
Return "Unknown: "+hex(h.DataColorSpace)
end Select
end function
```

**Notes:** The member can be any of value from the SPACE_* Constants.
(Read and Write property)

### 196.6.10 DateTime0 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data and time that the profile was created.
**Notes:** (Read and Write property)

### 196.6.11 DateTime1 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data and time that the profile was created.
**Notes:** (Read and Write property)

### 196.6.12 DateTime2 as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The data and time that the profile was created.
**Notes:** (Read and Write property)

### 196.6.13 IlluminantX as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** X value of the Profile illuminant.
**Notes:** (Read and Write property)

### 196.6.14 IlluminantY as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Y value of the Profile illuminant.
**Notes:** (Read and Write property)

### 196.6.15 IlluminantZ as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Z value of the Profile illuminant.
**Notes:** (Read and Write property)

### 196.6.16 Manufacturer as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The identification number of the device profile manufacturer.
**Notes:** All manufacturer identification numbers are registered with the ICC.
(Read and Write property)

### 196.6.17 Model as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The device manufacturer's device model number.
**Notes:** All model identification numbers are registered with the ICC.
(Read and Write property)

### 196.6.18 Platform as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The primary platform for which the profile was created.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PRO-
FILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXIST-
ING)
dim h as WindowsICMProfileHeaderMBS = w.ColorProfileHeader

MsgBox DecodingFromHexMBS(hex(h.Platform)) // shows platform, e.g. "APPL"
```

**Notes:** The primary platform can be set to any of the following values.

| Platform | Value |
|---|---|
| Apple Computer, Inc. | 'APPL' |
| Microsoft Corp. | 'MSFT' |
| Silicon Graphics, Inc. | 'SGI' |
| Sun Microsystems, Inc. | 'SUNW' |
| Taligent | 'TGNT' |

(Read and Write property)

### 196.6.19 ProfileFlags as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Bit flags containing hints that the CMM uses to interpret the profile data.
**Notes:** The member can be set to the following values.

| Constant | Meaning |
|---|---|
| FLAG_EMBEDDEDPROFILE | The profile is embedded in a bitmap file. |
| FLAG_DEPENDENTONDATA | The profile can't be used independently of the embedded color data. Used for profiles that are embedded in bitmap files. |

(Read and Write property)

### 196.6.20 RenderingIntent as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The profile rendering intent.
**Notes:** The member can be set to one of the following values:

INTENT_PERCEPTUALINTENT_SATURATIONINTENT_RELATIVE_COLORIMETRICINTENT_ABSOLUTE_COLORIMETRIC

For more information, see Rendering Intents.
http://msdn.microsoft.com/en-us/library/dd372183(v=VS.85).aspx
(Read and Write property)

### 196.6.21 Signature as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Reserved for internal use.
**Notes:** (Read and Write property)

### 196.6.22 Version as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The version number of the profile.
**Notes:** The version number is determined by the ICC. The current major version number is &h02. The

current minor version number is &h10. The major and minor version numbers are in binary coded decimal (BCD). They must be stored in the following format.

| Byte Number | Contents |
|---|---|
| 0 | Major version number in BCD. |
| 1 | Minor version number in the most significant nibble of this byte. Bug fix version number in the least significant nibble. |
| 2 | Reserved. Must be set to 0. |
| 3 | Reserved. Must be set to 0. |

(Read and Write property)

### 196.6.23 Constants

Attribute Constants

| Constant | Value | Description |
|---|---|---|
| ATTRIB_MATTE | 2 | Turns matte display on. If this flag is not used, the attribute is glossy by default. |
| ATTRIB_TRANSPARENCY | 1 | Turns transparency on. If this flag is not used, the attribute is reflective by default. |

Profile Class Constants

| Constant | Value | Description |
|---|---|---|
| CLASS_ABSTRACT | &h61627374 | Abstract Profile |
| CLASS_CAMP | &h6C616D70 | Color Appearance Model Profile |
| CLASS_COLORSPACE | &h73706163 | Color Space Conversion Profile |
| CLASS_GMMP | &h676D6D70 | Color Gamut Map Model Profile |
| CLASS_LINK | &h6C696E6B | Device Link Profile |
| CLASS_MONITOR | &h6D6E7472 | Display Device Profile |
| CLASS_NAMED | &h6E6D636C | Named Color Profile |
| CLASS_PRINTER | &h70727472 | Output Device Profile |
| CLASS_SCANNER | &h73636E72 | Input Device Profile |

Profile Flags

| Constant | Value | Description |
|---|---|---|
| FLAG_DEPENDENTONDATA | 2 | The profile can't be used independently of the embe profiles that are embedded in bitmap files. |
| FLAG_EMBEDDEDPROFILE | 1 | The profile is embedded in a bitmap file. |
| FLAG_ENABLE_CHROMATIC_ADAPTATION | &h02000000 | |

Color Space Constants

| Constant | Value | Description |
|---|---|---|
| SPACE_2_CHANNEL | &h32434C52 | Generic 2 channel |
| SPACE_3_CHANNEL | &h33434C52 | Generic 3 channel |
| SPACE_4_CHANNEL | &h34434C52 | Generic 4 channel |
| SPACE_5_CHANNEL | &h35434C52 | Generic 5 channel |
| SPACE_6_CHANNEL | &h36434C52 | Generic 6 channel |
| SPACE_7_CHANNEL | &h37434C52 | Generic 7 channel |
| SPACE_8_CHANNEL | &h38434C52 | Generic 8 channel |
| SPACE_CMY | &h434D5920 | CMY |
| SPACE_CMYK | &h434D594B | CMYK |
| SPACE_GRAY | &h47524159 | Gray scale |
| SPACE_HLS | &h484C5320 | HLS |
| SPACE_HSV | &h48535620 | HSV |
| SPACE_Lab | &h4C616220 | Lab |
| SPACE_Luv | &h4C757620 | Luv |
| SPACE_RGB | &h52474220 | RGB |
| SPACE_XYZ | &h58595A20 | XYZ |
| SPACE_YCbCr | &h59436272 | YCbCr |
| SPACE_Yxy | &h59787920 | Yxy |

## 196.7 class WindowsICMProfileMBS

### 196.7.1 class WindowsICMProfileMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a color profile.
**Blog Entries**

- MBS Xojo / Real Studio Plugins, version 14.1pr4
- MBS Xojo / Real Studio Plugins, version 14.1pr3
- MBS Real Studio Plugins, version 11.1pr11

### 196.7.2 Methods

### 196.7.3 ConvertColorNameToIndex(name as string) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CMConvertColorNameToIndex function converts color names in a named color space to index numbers in a color profile.
**Notes:** name: The name of the color.

Returns the color index.

This function is required in the default CMM. It is optional for all other CMMs.

### 196.7.4 ConvertIndexToColorName(index as Integer) as string

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ConvertIndexToColorName transforms indices in a color space to an array of names in a named color space.
**Notes:** This function is required in the default CMM. It is optional for all other CMMs.

### 196.7.5 CountColorProfileElements as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetCountColorProfileElements function retrieves the number of tagged elements in a given color profile.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PROFILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXISTING)

MsgBox "CountColorProfileElements: "+str(w.CountColorProfileElements)
```

**Notes:** Returns number of tagged elements in the profile or 0 on any error.
This function will fail if hProfile is not a valid ICC profile.
This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP.

### 196.7.6 CreateIccProfile(options as Integer = 0) as WindowsICMProfileMBS

MBS Win Plugin, Plugin Version: 14.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts a WCS profile into an International Color Consortium (ICC) profile.
**Notes:** Options: A flag value that specifies the profile conversion options.By default, the original WCS profiles used for the conversion are embedded in the output ICC profile in a Microsoft private tag, ProfilesTag (with signature "MS000". This produces an ICC profile that is compatible with ICC software, yet retains the original WCS profile data available to code designed to parse it.The possible values of this parameter are as follows. Any bits not defined in this list are reserved and should be set to zero:

| | |
|---|---|
| WCS_DEFAULT | Specifies that the new ICC profile contains the original WCS profile in a private ProfilesTag. |
| WCS_ICCONLY | Specifies that the new ICC profile does not contain either the ProfilesTag or the original WCS profile. |

Returns new profile object.

see also
http://msdn.microsoft.com/en-us/library/windows/desktop/dd372239(v=vs.85).aspx

### 196.7.7 GetColorProfileElement(tag as Integer) as string

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetColorProfileElement function copies data from a specified tagged profile element of a

specified color profile into a buffer.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("sRGB Profile.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PROFILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXISTING)

MsgBox w.GetColorProfileElement(&h64657363) // that's the code for desc, the description
```

**Notes:** tag: Identifies the tagged element from which to copy.

This function will fail if Profile is not a valid International Color Consortium (ICC) profile.

This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP; because profile elements are implicitly associated with, and hard coded to, ICC tag types and there exist many robust XML parsing libraries.

### 196.7.8 GetColorProfileElementTag(index as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetColorProfileElementTag function retrieves the tag name specified by dwIndex in the tag table of a given International Color Consortium (ICC) color profile, where Index is a one-based index into that table.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PROFILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXISTING)
dim list(-1) as string
dim c as Integer = w.CountColorProfileElements-1

for i as Integer = 0 to c
list.Append DecodingFromHexMBS(hex(w.GetColorProfileElementTag(i)))
next

MsgBox "Tags: "+Join(list, ", ")
```

**Notes:** Index: Specifies the one-based index of the tag to retrieve.

This function will fail if Profile is not a valid ICC profile.

GetColorProfileElementTag can be used to enumerate all tags in a profile after getting the number of tags in the profile using GetCountColorProfileElements.

This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP; because profile elements are implicitly associated with, and hard coded to, ICC tag types and there exist many robust XML parsing libraries.

### 196.7.9 GetNamedProfileInfo as WindowsICMNamedProfileInfoMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetNamedProfileInfo function retrieves information about the International Color Consortium (ICC) named color profile that is specified in the first parameter.
**Notes:** This function will fail if hProfile is not a valid ICC profile.
This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP; because named profiles are explicit ICC profile types.
Returns nil on any error.

### 196.7.10 GetProfileData as string

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Given valid color profile, the GetProfileData function will return the contents of the profile.
**Notes:** If the object is a Windows Color System (WCS) handle, then the DMP is returned and the CAMP and GMMP associated with the HPROFILE are ignored.

Returns the data or an empty string on any error.
See GetColorProfileFromHandle in MSDN documentation.

### 196.7.11 IsColorProfileTagPresent(tag as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IsColorProfileTagPresent function reports whether a specified International Color Consortium (ICC) tag is present in the specified color profile.
**Notes:** tag: Specifies the ICC tag to check.

Returns true if the tag is valid and false if not.

This function will fail if Profile is not a valid ICC profile.

This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP; because profile elements are implicitly associated with and hard coded to ICC tag types and there exist many robust XML parsing libraries.

### 196.7.12 IsValid as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The IsValid function reports whether the given profile is a valid ICC profile that can be used for color management.
**Example:**

```
dim file as FolderItem = SpecialFolder.Desktop.Child("test.icc")
dim w as WindowsICMProfileMBS = WindowsICMProfileMBS.OpenProfileFile(file, WindowsICMProfileMBS.PROFILE_READ, WindowsICMProfileMBS.FILE_SHARE_READ, WindowsICMProfileMBS.OPEN_EXISTING)

MsgBox "Valid: "+str(w.IsValid)
```

**Notes:** Returns true if the profile is valid.

Only the Windows default CMM is required to export this function; it is optional for all other CMMs.

If a CMM does not support this function, Windows uses the default CMM to validate the profile.

### 196.7.13 OpenProfileData(data as string, DesiredAccess as Integer) as WindowsICMProfileMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The OpenColorProfile function opens or create a color profile.
**Notes:** file: The file where to load profile from.
DesiredAccess: Specifies how to access the given profile. This parameter must take one the following constant values.

Returns the profile on success and nil on error.

For ICC and WCS profiles, a CAMP and GMMP are provided by the function based on the current default

| Value | Meaning |
|---|---|
| PROFILE_READ | Opens the profile for read access. |
| PROFILE_READWRITE | Opens the profile for both read and write access. Has no effect for WCS XML profiles. |

CAMP and GMMP in the registry.

When OpenColorProfile encounters an ICC profile with an embedded WCS profile, and if the dwType member within the Profile structure does not take the value DONT_USE_EMBEDDED_WCS_PROFILES, it should extract and use the WCS profile(s) contained in this WcsProfilesTag. The HPROFILE returned would be a WCS HPROFILE.

When the function opens the ICC profile, it will look for a WcsProfilesTag and, if there is one, it will extract and use the original WCS profiles contained therein. (See WcsCreateIccProfile.)

An profile with WCS profile information is derived from a DMP by acquiring the default CAMP and default GMMP from the registry. An HPROFILE is a composition of a DMP, CAMP and GMMP.

### 196.7.14 OpenProfileFile(file as folderitem, DesiredAccess as Integer, ShareMode as Integer, CreationMode as Integer) as WindowsICMProfileMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The OpenColorProfile function opens or create a color profile.
**Notes:** file: The file where to load profile from.
DesiredAccess: Specifies how to access the given profile. This parameter must take one the following constant values.

| Value | Meaning |
|---|---|
| PROFILE_READ | Opens the profile for read access. |
| PROFILE_READWRITE | Opens the profile for both read and write access. Has no effect for WCS XML profiles. |

ShareMode: Specifies how the profile should be shared, if the profile is contained in a file. A value of zero prevents the profile from being shared at all. The parameter can contain one or both of the following constants (combined by addition or logical OR).

CreationMode: Specifies which actions to take on the profile while opening it, if it is contained in a file. This parameter must take one of the following constant values.

| Value | Meaning |
|---|---|
| FILE_SHARE_READ | Other open operations can be performed on the profile for read access. |
| FILE_SHARE_WRITE | Other open operations can be performed on the profile for write access. Has no effect for WCS XML profiles. |

| Value | Meaning |
|---|---|
| CREATE_NEW | Creates a new profile. Fails if the profile already exists. |
| CREATE_ALWAYS | Creates a new profile. Overwrites the profile if it exists. |
| OPEN_EXISTING | Opens the profile. Fails if it does not exist |
| OPEN_ALWAYS | Opens the profile if it exists. For ICC profiles, if the profile does not exist, creates the profile. For WCS XML profiles, if the profile does not exist, returns an error. |
| TRUNCATE_EXISTING | Opens the profile, and truncates it to zero bytes, returning a blank ICC profile. Fails if the profile doesn't exist. |

Returns the profile on success and nil on error.

For ICC and WCS profiles, a CAMP and GMMP are provided by the function based on the current default CAMP and GMMP in the registry.

When OpenColorProfile encounters an ICC profile with an embedded WCS profile, and if the dwType member within the Profile structure does not take the value DONT_USE_EMBEDDED_WCS_PROFILES, it should extract and use the WCS profile(s) contained in this WcsProfilesTag. The HPROFILE returned would be a WCS HPROFILE.

CreationMode flags CREATE_NEW, CREATE_ALWAYS, and TRUNCATE_EXISTING, will always return blank ICC HPROFILEs. If other CreationMode flags are present, InternalOpenColorProfile is called (using the flags as provided by the API) to determine whether the profile is ICC or WCS XML.

Within the ICC code path, an ICC Profile is returned using the requested sharing, access and creation flags as specified in the tables above.

Within the WCS path, the CreationMode flag OPEN_ALWAYS will fail if the profile doesn't exist, since WCS profiles cannot be created or edited within the WCS architecture (they must be edited outside of it, using MSXML6). For the same reason, dwShareMode flag FILE_SHARE_WRITE, and dwDesiredAccess flag PROFILE_READWRITE are ignored within the WCS path.

When the function opens the ICC profile, it will look for a WcsProfilesTag and, if there is one, it will extract and use the original WCS profiles contained therein. (See WcsCreateIccProfile.)

An profile with WCS profile information is derived from a DMP by acquiring the default CAMP and default

GMMP from the registry. An HPROFILE is a composition of a DMP, CAMP and GMMP.

### 196.7.15 OpenProfilePath(path as string, DesiredAccess as Integer, ShareMode as Integer, CreationMode as Integer) as WindowsICMProfileMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The OpenColorProfile function opens or create a color profile.
**Notes:** file: The file where to load profile from.
DesiredAccess: Specifies how to access the given profile. This parameter must take one the following constant values.

| Value | Meaning |
|---|---|
| PROFILE_READ | Opens the profile for read access. |
| PROFILE_READWRITE | Opens the profile for both read and write access. Has no effect for WCS XML profiles. |

ShareMode: Specifies how the profile should be shared, if the profile is contained in a file. A value of zero prevents the profile from being shared at all. The parameter can contain one or both of the following constants (combined by addition or logical OR).

| Value | Meaning |
|---|---|
| FILE_SHARE_READ | Other open operations can be performed on the profile for read access. |
| FILE_SHARE_WRITE | Other open operations can be performed on the profile for write access. Has no effect for WCS XML profiles. |

CreationMode: Specifies which actions to take on the profile while opening it, if it is contained in a file. This parameter must take one of the following constant values.

| Value | Meaning |
|---|---|
| CREATE_NEW | Creates a new profile. Fails if the profile already exists. |
| CREATE_ALWAYS | Creates a new profile. Overwrites the profile if it exists. |
| OPEN_EXISTING | Opens the profile. Fails if it does not exist |
| OPEN_ALWAYS | Opens the profile if it exists. For ICC profiles, if the profile does not exist, creates the profile. For WCS XML profiles, if the profile does not exist, returns an error. |
| TRUNCATE_EXISTING | Opens the profile, and truncates it to zero bytes, returning a blank ICC profile. Fails if the profile doesn't exist. |

Returns the profile on success and nil on error.

For ICC and WCS profiles, a CAMP and GMMP are provided by the function based on the current default CAMP and GMMP in the registry.

When OpenColorProfile encounters an ICC profile with an embedded WCS profile, and if the dwType member within the Profile structure does not take the value DONT_USE_EMBEDDED_WCS_PROFILES, it should extract and use the WCS profile(s) contained in this WcsProfilesTag. The HPROFILE returned would be a WCS HPROFILE.

CreationMode flags CREATE_NEW, CREATE_ALWAYS, and TRUNCATE_EXISTING, will always return blank ICC HPROFILEs. If other CreationMode flags are present, InternalOpenColorProfile is called (using the flags as provided by the API) to determine whether the profile is ICC or WCS XML.

Within the ICC code path, an ICC Profile is returned using the requested sharing, access and creation flags as specified in the tables above.

Within the WCS path, the CreationMode flag OPEN_ALWAYS will fail if the profile doesn't exist, since WCS profiles cannot be created or edited within the WCS architecture (they must be edited outside of it, using MSXML6). For the same reason, dwShareMode flag FILE_SHARE_WRITE, and dwDesiredAccess flag PROFILE_READWRITE are ignored within the WCS path.

When the function opens the ICC profile, it will look for a WcsProfilesTag and, if there is one, it will extract and use the original WCS profiles contained therein. (See WcsCreateIccProfile.)

An profile with WCS profile information is derived from a DMP by acquiring the default CAMP and default GMMP from the registry. An HPROFILE is a composition of a DMP, CAMP and GMMP.

### 196.7.16 SetColorProfileHeader(header as WindowsICMProfileHeaderMBS) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The SetColorProfileHeader function sets the header data in a specified ICC color profile.
**Notes:** Header: the profile header data to write to the specified profile.

Returns true on success.

This function will fail if Profile is not a valid ICC profile.

If the color profile was not opened with read/write permission, SetColorProfileHeader fails.

SetColorProfileHeader overwrites the current header in the ICC profile.

This function does not support Windows Color System (WCS) profiles CAMP, DMP, and GMMP; because profile elements are implicitly associated with and hard coded to ICC tag types and there exist many robust XML parsing libraries.

### 196.7.17 Properties

### 196.7.18 ColorProfileHeader as WindowsICMProfileHeaderMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetColorProfileHeader function retrieves or derives ICC header structure from either ICC color profile or WCS XML profile.
**Notes:** Drivers and applications should assume returning TRUE only indicates that a properly structured header is returned. Each tag will still need to be validated independently using either legacy ICM2 APIs or XML schema APIs.

To determine whether the header is derived from an ICC or DMP profile handle, check the header signature (header bytes 36-39). If the signature is "acsp" (big endian) then an ICC profile was used. If the signature is "cdmp" (big-endian) then a DMP was used.

The distinguishing features that identify a header as having been "synthesized" for a WCS DMP are:

WindowsICMProfileHeaderMBS.Signature = 'pmdc' (little endian = big endian 'cdmp')
WindowsICMProfileHeaderMBS.CMMType = '1scw' (little endian = big endian 'wcs1').
(Read only property)

### 196.7.19 Handle as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal reference to the object.
**Notes:** Value is a HPROFILE.
(Read and Write property)

### 196.7.20 Constants

Creation Mode Constants

| Constant | Value | Description |
|---|---|---|
| CREATE_ALWAYS | 2 | Creates a new profile. Overwrites the profile if it exists. |
| CREATE_NEW | 1 | Creates a new profile. Fails if the profile already exists. |
| OPEN_ALWAYS | 4 | Opens the profile if it exists. For ICC profiles, if the profile does not exist, creates the profile. For WCS XML profiles, if the profile does not exist, returns an error. |
| OPEN_EXISTING | 3 | Opens the profile. Fails if it does not exist |
| TRUNCATE_EXISTING | 5 | Opens the profile, and truncates it to zero bytes, returning a blank ICC profile. Fails if the profile doesn't exist. |

Profile sharing flags

| Constant | Value | Description |
|---|---|---|
| FILE_SHARE_READ | 1 | Other open operations can be performed on the profile for read access. |
| FILE_SHARE_WRITE | 2 | Other open operations can be performed on the profile for write access. Has no effect for WCS XML profiles. |

Profile access flags

| Constant | Value | Description |
|---|---|---|
| PROFILE_READ | 1 | Opens the profile for read access. |
| PROFILE_READWRITE | 2 | Opens the profile for both read and write access. Has no effect for WCS XML profiles. |

CreateICCProfile Flags

| Constant | Value | Description |
|---|---|---|
| WCS_DEFAULT | 0 | Specifies that the new ICC profile contains the original WCS profile in a private WcsProfilesTag. |
| WCS_ICCONLY | &h00010000 | Specifies that the new ICC profile does not contain either the WcsProfilesTag or the original WCS profile. |

## 196.8 class WindowsICMSetupMBS

### 196.8.1 class WindowsICMSetupMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This class is made to query color matching setup information from the user.
**Notes:** This class contains information that the Setup function uses to initialize the ColorManagement dialog box. After the user closes the dialog box, Setup returns information about the user's selection in this class.
**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3
- MBS Real Studio Plugins, version 11.1pr11

### 196.8.2 Methods

### 196.8.3 Setup as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Setup function creates a Color Management dialog box that lets the user choose whether to enable color management, and if so, provides control over the color profiles used and over the rendering intent.
**Notes:** Returns true if the user clicked OK and false on any error or when dialog was cancelled.

### 196.8.4 Properties

### 196.8.5 DisplayName as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string naming the monitor to be used for color management.
**Notes:** If this is not the name of a valid monitor, the first enumerated monitor is used.
(Read and Write property)

### 196.8.6 Flags as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A set of bit flags used to initialize the dialog box.
**Notes:** If set to 0 on entry, all controls assume their default states.

When the dialog box returns, these flags are set to indicate the user's input.

See CMS_* flag constants.
(Read and Write property)

### 196.8.7 MonitorProfile as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string in which to place the name of the user-selected monitor profile.
**Notes:** If the CMS_SETMONITORPROFILE flag is used, this flag can also be used to select a profile other than the monitor default when the dialog is first displayed.
(Read and Write property)

### 196.8.8 Parent as Variant

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop only.

**Function:** The parent window.
**Notes:** Can reference a Window or DesktopWindow object.
(Read and Write property)

### 196.8.9 PrinterName as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string naming the printer on which the image is to be rendered.
**Notes:** If this is not a valid printer name, the default printer is used and named in the dialog.
(Read and Write property)

### 196.8.10 PrinterProfile as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string in which to place the name of the user-selected printer profile.
**Notes:** If the CMS_SETPRINTERPROFILE flag is used, this flag can also be used to select a profile other than the printer default when the dialog is first displayed.
(Read and Write property)

### 196.8.11 ProofingIntent as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The type of color management desired for the proofed image.
**Notes:** Valid values are:

INTENT_PERCEPTUAL
INTENT_SATURATION
INTENT_RELATIVE_COLORIMETRIC
INTENT_ABSOLUTE_COLORIMETRIC

For more information, see Rendering Intents.
http://msdn.microsoft.com/en-us/library/dd372183(v=vs.85).aspx
(Read and Write property)

### 196.8.12 RenderIntent as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The type of color management desired.
**Notes:** Valid values are:

INTENT_PERCEPTUAL
INTENT_SATURATION
INTENT_RELATIVE_COLORIMETRIC
INTENT_ABSOLUTE_COLORIMETRIC

For more information, see Rendering Intents.
http://msdn.microsoft.com/en-us/library/dd372183(v=vs.85).aspx
(Read and Write property)

### 196.8.13 SourceName as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An application-specified string which describes the source profile of the item for which color management is to be performed.
**Notes:** If this is "", the Image Source control displays the name of the Windows default color profile.
(Read and Write property)

### 196.8.14 TargetProfile as String

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A string in which to place the name of the user-selected target profile for proofing.
**Notes:** If the CMS_SETTARGETPROFILE flag is used, this flag can also be used to select a profile other than the printer default when the dialog is first displayed.
(Read and Write property)

### 196.8.15 Events

### 196.8.16 Apply

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: .

**Function:** This event is invoked when the Apply button of the Color Management dialog box is selected.

### 196.8.17 Idle

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: .

**Function:** This event is called regularly if the CMS_USEHOOK flag is used.

### 196.8.18 Constants

Flag Constants

| Constant | Value | Description |
|---|---|---|
| CMS_DISABLEICM | 1 | If set on entry, this flag indicates that the "Enable Color Management" ch box is cleared, disabling all other controls. If set on exit, it means that the u does not wish color management performed. |
| CMS_DISABLEINTENT | 1024 | |
| CMS_DISABLERENDERINTENT | 2048 | |
| CMS_ENABLEPROOFING | 2 | If set on entry, this flag indicates that the Proofing controls are to be enabl and the Proofing check box is checked. If set on exit, it means that the u wishes to perform color management for a different target device than selected printer. |
| CMS_SETMONITORPROFILE | 16 | If set on entry, this flag indicates that the color management profile namec the MonitorProfile member is to be the initial selection in the monitor pro control. If the specified profile is not associated with the monitor, this flag ignored, and the default profile for the monitor is used. |
| CMS_SETPRINTERPROFILE | 32 | If set on entry, this flag indicates that the color management profile namec the PrinterProfile member is to be the initial selection in the printer pro control. If the specified profile is not associated with the printer, this flag ignored, and the default profile for the printer is used. |
| CMS_SETPROOFINTENT | 5 | Ignored unless CMS_ENABLEPROOFING is also set. If set on entry, a CMS_ENABLEPROOFING is also set, this flag indicates that the Proofi Intent member is to be used to initialize the Target Rendering Intent cont Otherwise, the control defaults to Picture rendering. This flag is set on exi proofing is enabled. |
| CMS_SETRENDERINTENT | 4 | If set on entry, this flag indicates that the RenderIntent member contains value to use to initialize the Rendering Intent control. Otherwise, the cont defaults to Picture rendering. This flag is set on exit if WCS is enabled. |
| CMS_SETTARGETPROFILE | 64 | If set on entry, this flag indicates that the color profile named in the Targ Profile member is to be the initial selection in the target profile control. If specified profile is not installed, this flag is ignored, and the default profile the printer is used. If the printer has no default profile, then the first profil alphabetical order will be displayed. |
| CMS_USEAPPLYCALLBACK | 256 | If set on entry, this flag indicates that the SetupColorMatching function sho call the Apply event. |
| CMS_USEDESCRIPTION | 512 | If set on entry, this flag instructs the Setup function to retrieve the pro description contained in the profile description tags (See ICC Profile Forn Specification v3.4). It will insert them into the Monitor Profile, Printer Prof Emulated Device Profile edit boxes in the Color Management common dia box. |
| CMS_USEHOOK | 128 | The idle event is called regularly if this flag is set. |

Rendering Intent Constants

| Constant | Value | Description |
|---|---|---|
| INTENT_ABSOLUTE_COLORIMETRIC | 3 | Maintain the white point. Match the colors to their nearest color i nation gamut. |
| INTENT_PERCEPTUAL | 0 | Maintain contrast. Used for photographs and natural images. |
| INTENT_RELATIVE_COLORIMETRIC | 1 | Maintain colorimetric match. Used for graphic designs and named |
| INTENT_SATURATION | 2 | Maintain saturation. Used for business charts and other situatio undithered colors are required. |

## 196.9 class WindowsICMTransformMBS

### 196.9.1 class WindowsICMTransformMBS

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a color transformation.
**Blog Entries**

- MBS Real Studio Plugins, version 11.1pr11

### 196.9.2 Methods

### 196.9.3 CheckColors(InputColors() as WindowsICMColorMBS, ctInput as Integer, Results() as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CheckColors function determines whether the colors in an array lie within the output gamut of a specified transform.
**Notes:** InputColors: an array of colors.
ctInput: Specifies the input color type.
Results: An array of nColors bytes that receives the results of the test.

If this function succeeds, the return value is TRUE.

If this function fails, the return value is FALSE. For extended error information, call GetLastError.

Remarks

If the input color type is not compatible with the color transform, CheckColors fails.

The function places results of the tests in the array pointed to by paResult. Each byte in the array corresponds to a COLOR element in the array pointed to by paInputColors and has an unsigned value between 0 and 255. The value 0 denotes that the color is in gamut, while a nonzero value denotes that it is out of gamut. For any integer n such that 0 <n <255, a result value of n+1 indicates that the corresponding color is at least as far out of gamut as would be indicated by a result value of n.

The out-of-gamut information in the gamut tags created in WCS use the perceptual color distance in CIECAM02, which is the mean square root in CIECAM02 Jab space. The distance in the legacy ICC profile gamut tags is the mean square root in CIELAB space. We recommend that you use the CIECAM02 space when it is available because it provides more perceptually accurate distance metrics.

### 196.9.4 Constructor(LogColorSpace as WindowsICMLogColorSpaceMBS, DestProfile as WindowsICMProfileMBS, TargetProfile as WindowsICMProfileMBS, Flags as Integer)

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateColorTransform function creates a color transform that applications can use to perform color management.
**Notes:** LogColorSpace: The input colorspace.

DestProfile: The profile of the destination device. The function determines whether the profile contains International Color Consortium (ICC) or Windows Color System (WCS) profile information.

TargetProfile: The profile of the target device. The function determines whether the profile contains ICC or WCS profile information.

Flags: Specifies flags to used control creation of the transform. See Remarks.

On success the handle property is not zero.

If the target profile is nil, the transform goes from the source logical color space to the destination profile. If the target profile is given, the transform goes from the source logical color space to the target profile and then to the destination profile. This allows previewing output meant for the target device on the destination device.

The values in Flags are intended as hints only. The color management module must determine the best way to use them.

Windows Vista: Three new flags have been added that can be used with dwFlags:

| | |
|---|---|
| PRESERVEBLACK | If this bit is set, the transform engine inserts the appropriate black generation GMMP as the last GMMP in the transform sequence. This flag only works in a pure WCS transform. |
| SEQUENTIAL_TRANSFORM | If this bit is set, each step in the WCS processing pipeline is performed for every pixel in the image and no optimized color transform is built. This flag only works in a pure WCS transform. |

Restrictions: A transform created with the SEQUENTIAL_TRANSFORM flag set may only be used in the thread on which it was created and only for one color translation call at a time. COM must be initialized prior to creating the sequential transform and must remain initialized for the lifetime of the transform object.

For details, see CMM Transform Creation Flags. All of the flags mentioned there are supported for all types

WCS_ALWAYS If this bit is set, even all-ICC transforms will use the WCS code path.

of transforms, except for FAST_TRANSLATE, which only works in a pure ICC-to-ICC transform.

The CreateColorTransform function is used outside of a device context. Colors may shift when transforming from a color profile to the same color profile. This is due to precision errors. Therefore, a color transform should not be performed under these circumstances.

The B2Ax tags are required for any profile that is the target of a transform.

WCS transform support for ICC ColorSpace profiles is limited to RGB colorspace profiles. The following ICC profile types cannot be used in a CITE-processed transform, either a mixed WCS/ICC transform or an all-ICC transform with WCS_ALWAYS set:

Non-RGB ColorSpace profiles
NamedColor profiles
n-channel profiles (where n >8)
DeviceLink profiles
Abstract profiles
See also:

- 196.9.5 Constructor(Profiles() as WindowsICMProfileMBS, Intents() as Integer, Flags as Integer, indexPreferredCMM as Integer) 23474

### 196.9.5 Constructor(Profiles() as WindowsICMProfileMBS, Intents() as Integer, Flags as Integer, indexPreferredCMM as Integer)

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The CreateMultiProfileTransform function accepts an array of profiles or a single device link profile and creates a color transform that applications can use to perform color mapping.
**Notes:** Profiles: An array of profiles to be used. The function determines whether the HPROFILEs contain International Color Consortium (ICC) or Windows Color System (WCS) profile information and processes them appropriately. When valid WCS profiles are returned by OpenColorProfile, these profiles contain the combination of DMP, CAMP, and GMMP profiles.
Intent: An array of intents to use. Each intent is one of the following values:

INTENT_PERCEPTUAL
INTENT_SATURATION
INTENT_RELATIVE_COLORIMETRIC
INTENT_ABSOLUTE_COLORIMETRIC

GMMPs are a generalization of intents. There are two possible sources of intents: the ”destination” profile and the intent list parameter to CreateMultiProfileTransform. The term ”destination” is not used since all but two of the profiles in the profile list parameter will serve as first destination and then source.

For more information, see Rendering Intents.

nIntents
Specifies the number of elements in the intents array: can either be 1 or the same value as nProfiles. For profile arrays that contain any WCS profiles, the first rendering intent is ignored and only nProfiles -1 elements are used for these profile arrays. The maximum number of nIntents is 10.

Flags: Specifies flags used to control creation of the transform.

indexPreferredCMM: Specifies the one-based index of the color profile that indicates what color management module (CMM) to use. The application developer may allow Windows to choose the CMM by setting this parameter to INDEX_DONT_CARE. See Using Color Management Modules (CMM) Third party CMMs are only available for ICC workflows. Profile arrays containing WCS profiles will ignore this flag. It is also ignored when only ICC profiles are used and when the WCS_ALWAYS flag is used.

On success the handle property is not zero.

If a device link profile is being used, the function will fail if Profiles contains more than one value.

The array of intents specifies how profiles should be combined. The nth intent is used for combining the nth profile in the array. If only one intent is specified, it is used for the first profile, and all other profiles are combined using Match intent.

The values in Flags are intended as hints only. The color management module must determine the best way to use them.

Windows Vista: Three new flags have been added that can be used with dwFlags:

| | |
|---|---|
| PRESERVEBLACK | If this bit is set, the transform engine inserts the appropriate black generation GMMP as the last GMMP in the transform sequence. This flag only works in a pure WCS transform. |
| SEQUENTIAL_TRANSFORM | If this bit is set, each step in the WCS processing pipeline is performed for every pixel in the image and no optimized color transform is built. This flag only works in a pure WCS transform. |

Restrictions: A transform created with the SEQUENTIAL_TRANSFORM flag set may only be used in the thread on which it was created and only for one color translation call at a time. COM must be initialized

prior to creating the sequential transform and must remain initialized for the lifetime of the transform object.

WCS_ALWAYS If this bit is set, even all-ICC transforms will use the WCS code path.

For details, see CMM Transform Creation Flags. All of the flags mentioned there are supported for all types of transforms, except for FAST_TRANSLATE and USE_RELATIVE_COLORIMETRIC, which only work in a pure ICC-to-ICC transform.

The CreateMultiProfileTransform function is used outside of a device context. Colors may shift when transforming from a color profile to the same color profile. This is due to precision errors. Therefore, a color transform should not be performed under these circumstances.

We recommend that there be only one GMMP between a source and destination DMP. Gamut boundary descriptions (GBDs) are created from the DMP/CAMP combinations. The subsequent GMMPs use the GDBs prior to them in the processing chain until there exists a DMP/CAMP GBD next in the sequence to be used. For example, assume a sequence DMP1, CAMP1, GMMP1, GMMP2, GMMP3, DMP2, CAMP2, GMMP4, GMMP5, CAMP3, DMP3. Then GMMP1, GMMP2 use GBD1 as their source and destination. Then GMMP3 uses GBD1 as source and GBD2 as destination. Then GMMP4 uses GBD2 as source and destination. Finally GMMP5 uses GBD2 as source and GBD3 as destination. This assumes no GMMP is identical to one next to it.

For WCS profiles, we recommend that the rendering intents be set to DWORD_MAX in order to use the GMMP within the WCS profile handle. This is because the array of rendering intents takes precedence over the rendering intents or gamut mapping models specified or contained in the profiles specified by the PROFILEs. The array of rendering intents references the default GMMP for those rendering intents. Ideally, only one gamut mapping is performed between a source and destination device by setting one or the other GMMP to NULL when creating the HPROFILE with WCS profile information. Any legacy application that uses a WCS DMP will invoke a sequence of GMMPs. GDBs are chosen based on DMPs and CAMPs. For intermediate GMMP gamut boundaries, the source and destination GBDs are used.

In summary, if ubound(Intents)=0, then the first GMM is set based on the GMMP that is set as default* for the padwIntent value, unless that value is DWORD_MAX, in which case the embedded GMM information from the second profile is used (The embedded GMM information is either a GMMP or, in the case of an ICC profile, the baseline GMM corresponding to** the intent from the profile header). The remainder of the GMMs are set based on the GMMP that is set as default* for RelativeColorimetric.

If ubound(Intents) = ubound(Profiles) - 1, then each GMM is set based on the GMMP that is set as default* for the value in the padwIntent array at the corresponding index, except where padwIntent values are DWORD_MAX. For values in the padwIntent array that are DWORD_MAX, the GMMs at corresponding positions are set based on the embedded GMM information from the second of the two profiles whose gamuts are mapped by the GMM. (Again, the embedded GMM information is either a GMMP or, in the case of an ICC profile, the baseline GMM corresponding to** the intent from the profile header).

If ubound(Intents) = ubound(Profiles), then first intent is ignored and funtion behaves as it does in the case when ubound(Intents) = ubound(Profiles) - 1.

Any other combination of padwIntents and nIntents will return an error.

- "set as default" means that the default GMMP is queried using WcsGetDefaultColorProfile with its profileManagementScope parameter set to WCS_PROFILE_MANAGEMENT_SCOPE_CURRENT_USER. This may return either current-user or system-wide defaults as described in the documentation for WcsGetDefaultColorProfile.

- "GMM corresponding to" does not mean "GMM from the GMMP set as default for". Instead it means "a constant association between ICC profile intents and baseline GMM algorithms."

WCS transform support for ICC ColorSpace profiles is limited to RGB colorspace profiles. The following ICC profile types cannot be used in a CITE-processed transform, either a mixed WCS/ICC transform or an all-ICC transform with WCS_ALWAYS set:

- Non-RGB ColorSpace profiles
- NamedColor profiles
- n-channel profiles (where n >8)
- DeviceLink profiles
- Abstract profiles

See also:

- 196.9.4 Constructor(LogColorSpace as WindowsICMLogColorSpaceMBS, DestProfile as WindowsICMProfileMBS, TargetProfile as WindowsICMProfileMBS, Flags as Integer) 23473

### 196.9.6 GetCMMInfo(what as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The GetCMMInfo function retrieves various information about the color management module (CMM) that created the specified color transform.
**Notes:** what: Specifies the information to be retrieved. This parameter can take one of the following constant values.

If this function succeeds, the return value is the information specified in What.
If this function fails, the return value is zero.

| Value | Meaning |
|---|---|
| CMM_WIN_VERSION | Retrieves the version of Windows targeted by the color management module (CMM). |
| CMM_DLL_VERSION | Retrieves the version number of the CMM. |
| CMM_IDENT | Retrieves the CMM signature registered with the International Color Consortium (ICC). |

### 196.9.7 TranslateBitmapBits(SrcBits as memoryblock, InputType as Integer, Width as Integer, Height as Integer, InputRowBytes as Integer, DestBits as memoryblock, DestType as Integer, DestRowBytes as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The TranslateBitmapBits function translates the colors of a bitmap having a defined format so as to produce another bitmap in a requested format.
**Notes:** SrcBits: Pointer to the bitmap to translate.
InputType: Specifies the format of the input bitmap. Use one of the BM_* constants.
Width: Specifies the number of pixels per scan line in the input bitmap.
Height: Specifies the number of scan lines in the input bitmap.
InputRowBytes: Specifies the number of bytes from the beginning of one scan line to the beginning of the next in the input bitmap; if set to zero, the function assumes that scan lines are padded so as to be DWORD-aligned.
DestBits: Pointer to the buffer in which to place the translated bitmap.
DestType: Specifies the format of the output bitmap. Use one of the BM_* constants.
DestRowBytes: Specifies the number of bytes from the beginning of one scan line to the beginning of the next in the output bitmap; if set to zero, the function assumes that scan lines should be padded to be DWORD-aligned.

If this function succeeds, the return value is TRUE.
If this function fails, the return value is FALSE.

Remarks

If the input and output formats are not compatible with the color transform, this function fails.

When either of the floating point BMFORMATs, BM_32b_scARGB or BM_32b_scRGB are used, the color data being translated should not contain NaN or infinity. NaN and infinity are not considered to represent legitimate color component values, and the result of translating pixels containing NaN or infinity is meaningless in color terms. NaN or infinity values in the color data being processed will be handled silently, and an error will not be returned.

### 196.9.8 TranslateColors(InputColors() as WindowsICMColorMBS, ctInput as Integer, OutputColors() as WindowsICMColorMBS, ctOutput as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The TranslateColors function translates an array of colors from the source color space to the destination color space as defined by a color transform.
**Notes:** InputColors: The input color.
ctInput: Specifies the input color type.
OutputColors: The output color.
ctOutput: Specifies the output color type.

Returns true on success and false on failure.

### 196.9.9 TranslatePictures(InputPicture as picture, OutputPicture as picture) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The TranslateBitmapBits function translates the colors of a bitmap having a defined format so as to produce another bitmap in a requested format.
**Notes:** InputPicture: input picture
OutputPicture: output picture

If this function succeeds, the return value is TRUE.
If this function fails, the return value is FALSE.

Make sure the pictures have the same size.

If the input and output formats are not compatible with the color transform, this function fails.

### 196.9.10 Properties

### 196.9.11 Handle as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal handle for the transformation.
**Notes:** (Read and Write property)

### 196.9.12 Events

### 196.9.13 Progress(Maximum as Integer, Current as Integer) as boolean

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: .

**Function:** The progress event for long operations.

### 196.9.14 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| CMM_DLL_VERSION | 3 | One of the values for the GetCMMInfo function.<br>Retrieves the version number of the CMM. |
| CMM_IDENT | 1 | One of the values for the GetCMMInfo function.<br>Retrieves the CMM signature registered with the International Color Consortium (ICC). |
| CMM_WIN_VERSION | 0 | One of the values for the GetCMMInfo function.<br>Retrieves the version of Windows targeted by the color management module (CMM). |
| INDEX_DONT_CARE | 0 | A special value for index in constructor.<br>The application developer may allow Windows to choose the CMM by setting the indexPreferredCMM parameter to INDEX_DONT_CARE for the constructor. |
| WCS_ALWAYS | &h200000 | One of the flags passed when creating a transformation.<br>If this bit is set, even all-ICC transforms will use the WCS code path. |

Transform creation Flags

| Constant | Value | Description |
|---|---|---|
| BEST_MODE | 3 | Transform will be used for the display of the highest-quality imag the target device. |
| ENABLE_GAMUT_CHECKING | &h10000 | Use this transform for gamut checking. |
| FAST_TRANSLATE | &h40000 | Look up color only. Do not interpolate the color. |
| NORMAL_MODE | 2 | Transform will be used for normal image display. Average image |
| PRESERVEBLACK | &h100000 | If this bit is set, the transform engine inserts the appropriate blac GMMP as the last GMMP in the transform sequence. This flag o a pure WCS transform. |
| PROOF_MODE | 1 | Transform will be used to preview the image. Low image quality. |
| SEQUENTIAL_TRANSFORM | &h80800000 | If this bit is set, each step in the WCS processing pipeline is p every pixel in the image and no optimized color transform is bui only works in a pure WCS transform. Restrictions: A transform created with the SEQUENTIAL_TR flag set may only be used in the thread on which it was created one color translation call at a time. COM must be initialized prio the sequential transform and must remain initialized for the lif transform object. |
| USE_RELATIVE_COLORIMETRIC | &h20000 | |

Bitmap Format Constants

| Constant | Value | Description |
|---|---|---|
| BM_10b_G3CH | &h0404 | 32 bits per pixel. 10 bits are used for each color channel. The 2 most significa bits are ignored. |
| BM_10b_Lab | &h0403 | 32 bits per pixel. 10 bits are used for each color channel. The 2 most significa bits are ignored. |
| BM_10b_RGB | 9 | 32 bits per pixel. 10 bits are used for each color channel. The 2 most significa bits are ignored. |
| BM_10b_XYZ | &h0401 | 32 bits per pixel. 10 bits are used for each color channel. The 2 most significa bits are ignored. |
| BM_10b_Yxy | &h0402 | 32 bits per pixel. 10 bits are used for each color channel. The 2 most significa bits are ignored. |
| BM_16b_G3CH | &h0504 | 64 bits per pixel. 16 bits are used for the gray-scale value. Each of the thr color channels uses 16 bits. |
| BM_16b_GRAY | &h0505 | 64 bits per pixel. 16 bits are used for the gray-scale value. All other bits a ignored. |
| BM_16b_Lab | &h0503 | 64 bits per pixel. 16 bits are used for the gray-scale value. Each of the thr color channels uses 16 bits. |
| BM_16b_RGB | 10 | 64 bits per pixel. 16 bits are used for the gray-scale value. Each of the thr color channels uses 16 bits. |
| BM_16b_XYZ | &h0501 | 64 bits per pixel. 16 bits are used for the gray-scale value. Each of the thr color channels uses 16 bits. |
| BM_16b_Yxy | &h0502 | 64 bits per pixel. 16 bits are used for the gray-scale value. Each of the thr color channels uses 16 bits. |
| BM_32b_scARGB | &h0602 | 128 bits per pixel. 32 bits are used for each color channel, as defined by t IEEE 32-bit floating point standard. |
| BM_32b_scRGB | &h0601 | 96 bits per pixel. 32 bits are used for each color channel, as defined by t IEEE 32-bit floating point standard. |
| BM_565RGB | 1 | 16 bits per pixel. 5 bits are used for red, 6 for green, and 5 for blue. |
| BM_5CHANNEL | &h0205 | 40 bits per pixel. 8 bits apiece are used for each channel. |
| BM_6CHANNEL | &h0206 | 48 bits per pixel. 8 bits apiece are used for each channel. |
| BM_7CHANNEL | &h0207 | 56 bits per pixel. 8 bits apiece are used for each channel. |
| BM_8CHANNEL | &h0208 | 64 bits per pixel. 8 bits apiece are used for each channel. |
| BM_BGRTRIPLETS | 4 | 24 bits per pixel maximum. For three channel colors, such as red, green, a blue, the total size is 24 bits per pixel. For single channel colors, such as gra the total size is 8 bits per pixel. |
| BM_CMYKQUADS | &h0020 | 32 bits per pixel. 8 bits are used for each color channel. |
| BM_G3CHTRIPLETS | &h0204 | 24 bits per pixel maximum. For three channel values, the total size is 24 b per pixel. For single channel gray scale, the total size is 8 bits per pixel. |
| BM_GRAY | &h0209 | 32 bits per pixel. Only the 8 bit gray-scale value is used. |
| BM_KYMCQUADS | &h0305 | 32 bits per pixel. 8 bits are used for each color channel. |
| BM_LabTRIPLETS | &h0203 | 24 bits per pixel maximum. For three channel, L, a, and b values, the tot size is 24 bits per pixel. For single channel gray scale, the total size is 8 b per pixel. |
| BM_NAMED_INDEX | &h0405 | 32 bits per pixel. Named color indices. Index numbering begins at one. |
| BM_R10G10B10A2 | &h0701 | Only in Windows Vista. |
| BM_R10G10B10A2_XR | &h0702 | Only in Windows Vista. |
| BM_R16G16B16A16_FLOAT | &h0703 | Only in Windows Vista. |
| BM_RGBTRIPLETS | 2 | 24 bits per pixel maximum. For three channel colors, such as red, green, a blue, the total size is 24 bits per pixel. For single channel colors, such as gra the total size is 8 bits per pixel. |
| BM_S2DOT13FIXED_scARGB | &h0604 | 64 bits per pixel. Color data is stored as one 16-bit word per channel, with fixed range of -4 to +4, inclusive. A signed format is used, with 1 bit for t sign, 2 bits for the integer portion, and 13 bits for the fractional portion. |
| BM_S2DOT13FIXED_scRGB | &h0603 | 48 bits per pixel. Color data is stored as one 16-bit word per channel, with fixed range of -4 to +4, inclusive. A signed format is used, with 1 bit for t sign, 2 bits for the integer portion, and 13 bits for the fractional portion. |
| BM_x555G3CH | &h0104 | 16 bits per pixel. G3CH color space. 5 bits per channel. The most significa bit is ignored. |
| BM_x555Lab | &h0103 | 16 bits per pixel. Lab color space. 5 bits per channel. The most significant b |

Info selectors for GetInfo

| Constant | Value | Description |
|---|---|---|
| CMM_DESCRIPTION | 5 | A text string that describes the color management module. |
| CMM_DRIVER_VERSION | 2 | |
| CMM_FROM_PROFILE | 0 | |
| CMM_LOGOICON | 6 | The logo icon for this CMM. |
| CMM_VERSION | 4 | Version of Windows supported. |
| CMM_WINDOWS_DEFAULT | &h57696E20 | |

Rendering Intent Constants

| Constant | Value | Description |
|---|---|---|
| INTENT_ABSOLUTE_COLORIMETRIC | 3 | Maintain the white point. Match the colors to their nearest color i nation gamut. |
| INTENT_PERCEPTUAL | 0 | Maintain contrast. Used for photographs and natural images. |
| INTENT_RELATIVE_COLORIMETRIC | 1 | Maintain colorimetric match. Used for graphic designs and named |
| INTENT_SATURATION | 2 | Maintain saturation. Used for business charts and other situatio undithered colors are required. |

# Chapter 197

# Windows Location

## 197.1 class WindowsLocationExceptionMBS

### 197.1.1 class WindowsLocationExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for errors in the Windows Location API.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr2

## 197.2 class WindowsLocationManagerMBS

### 197.2.1 class WindowsLocationManagerMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for accessing Location API on Windows.
**Notes:** You may need to StartEvents to later query location or receive events.

see MSDN for details:
https://docs.microsoft.com/en-us/windows/win32/locationapi/windows-location-api-portal

See CLLocationManagerMBS class for macOS.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr2

**Xojo Developer Magazine**

- 22.2, page 66: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis

### 197.2.2 Methods

### 197.2.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.

### 197.2.4 RequestPermissions(win as DesktopWindow)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Opens a system dialog box to request user permission to enable location devices.
**Notes:** win: the parent window for the dialog.
See also:

- 197.2.5 RequestPermissions(win as window)

### 197.2.5 RequestPermissions(win as window)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Opens a system dialog box to request user permission to enable location devices.
**Notes:** win: the parent window for the dialog.
See also:

- 197.2.4 RequestPermissions(win as DesktopWindow) 23486

### 197.2.6 StartEvents(RequestedReportInterval as Integer = 0)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts events.
**Notes:** Should be called once to start events and get LocationChanged or StatusChanged to work.

### 197.2.7 StopEvents

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stop events.

### 197.2.8 Properties

### 197.2.9 DesiredAccuracy as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current requested accuracy setting.
**Notes:** See kLocationDesiredAccuracyHigh and kLocationDesiredAccuracyDefault constants.
(Read and Write property)

### 197.2.10 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 197.2.11 Report as WindowsLocationMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a location report.
**Notes:** When Report is called, it may result in a notification being displayed in the taskbar, and a Location Activity event being logged in Event Viewer, if it is the application's first use of location.
(Read only property)

### 197.2.12 ReportInterval as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The requested amount of time, in milliseconds, between report events.
**Notes:** If this value is set to zero, no minimum interval is specified and your application receives events at the location sensor's default interval.
(Read and Write property)

### 197.2.13 ReportStatus as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the status for the specified report type.
**Notes:** (Read only property)

### 197.2.14 Events

### 197.2.15 LocationChanged(Report as WindowsLocationMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: .

**Function:** Called when a new location report is available.
**Notes:** If the application calls LocationChanged as a result of its first use of location, the call might cause a notification to appear in the taskbar, and cause a Location Activity event to be logged in Event Viewer.

### 197.2.16 StatusChanged(Status as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: .

**Function:** Called when a report status changes.
**Notes:** This event provides report status for new reports. The most recent reports remain available through

GetReport, regardless of the status reported by this event.

### 197.2.17 Constants

Location Desired Accuracy

| Constant | Value | Description |
|---|---|---|
| kLocationDesiredAccuracyDefault | 0 | The sensor should use the accuracy for which it can optimize power use an other cost considerations. |
| kLocationDesiredAccuracyHigh | 1 | The sensor should deliver the most accurate report possible. This include using services that might charge money, or consuming higher levels of batter power or connection bandwidth. |

Location Report Status

| Constant | Value | Description |
|---|---|---|
| kLocationReportStatusAccessDenied | 2 | No permissions have been granted to access this report type. Call Request missions. |
| kLocationReportStatusError | 1 | There was an error when creating the report, or location providers for requested type are unable to provide any data. Location providers migh currently unavailable, or location providers cannot obtain any data. For ex ple, this state may occur when a GPS sensor is indoors and no satellites a view. |
| kLocationReportStatusInitializing | 3 | The report is being initialized. |
| kLocationReportStatusNotSupported | 0 | The requested report type is not supported by the API. No location prov of the requested type are installed. |
| kLocationReportStatusRunning | 4 | The report is running. New location data for the requested report ty available. |

## 197.3 class WindowsLocationMBS

### 197.3.1 class WindowsLocationMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** WindowsLocationMBS represents a location report that contains information in the form of latitude and longitude.
**Notes:** Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr2

**Xojo Developer Magazine**

- 22.2, page 67: Find Yourself, How to determine the location of devices with MBS under Windows and Mac by Stefanie Juchmes-Simonis

### 197.3.2 Methods

### 197.3.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 197.3.4 Properties

### 197.3.5 Altitude as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the altitude, in meters.
**Notes:** Altitude is relative to the reference ellipsoid.

The Altitude property retrieves the altitude relative to the reference ellipsoid that is defined by the latest revision of the World Geodetic System (WGS 84), rather than the altitude relative to sea level.

Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
(Read only property)

### 197.3.6 AltitudeError as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the altitude error, in meters.
**Notes:** Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
(Read only property)

### 197.3.7 DateTime as DateTime

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the date and time when the report was generated.
**Notes:** Time stamps are provided as Coordinated Universal Time (UTC).
(Read only property)

### 197.3.8 ErrorRadius as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves a distance from the reported location, in meters.
**Notes:** Combined with the location reported as the origin, this radius describes the circle in which the actual location is probably located.

Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
(Read only property)

### 197.3.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 197.3.10 Latitude as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the latitude, in degrees.
**Notes:** The latitude is between -90 and 90, where north is positive.

Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
(Read only property)

### 197.3.11 Longitude as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the longitude, in degrees.
**Notes:** The longitude is between -180 and 180, where East is positive.

Querying the property may raise a WindowsLocationExceptionMBS if this field is not available.
(Read only property)

### 197.3.12 SensorID as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the ID of the sensor that generated the location report.
**Notes:** Provided as formatted UUID.
Maybe all zero if ID is not provided by OS.
(Read only property)

### 197.3.13 Timestamp as Date

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Retrieves the date and time when the report was generated.
**Notes:** Time stamps are provided as Coordinated Universal Time (UTC).
(Read only property)

# Chapter 198

# Windows Media Foundation

## 198.1 class MFPMediaItemMBS

### 198.1.1 class MFPMediaItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An item to playback.
**Notes:** Can be loaded asynchronously before playing, so you can preload the next file while another is playing.
For Windows 7, Windows Server 2008 R2 or newer.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2
- MBS Xojo Plugins, version 23.2pr1
- MBS Xojo Plugins, version 19.6pr4

### 198.1.2 Methods

### 198.1.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 198.1.4 PresentationAttribute(UUID as String) as Variant

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the media item for a presentation attribute.
**Notes:** see
https://docs.microsoft.com/windows/win32/medfound/presentation-descriptor-attributes

If needed a future MBS Plugin version could include explicit properties for some of those values.

### 198.1.5 StreamAttribute(index as Integer, UUID as String) as Variant

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the media item for a stream attribute.
**Notes:** see
https://docs.microsoft.com/windows/win32/medfound/stream-descriptor-attributes

### 198.1.6 Properties

### 198.1.7 AudioBitsPerSample as Variant

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of bits per audio sample in an audio media type.
**Notes:** e.g. 16
(Read only property)

### 198.1.8 AudioChannels as Variant

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of audio channels in an audio media type.
**Notes:** e.g. 1
(Read only property)

### 198.1.9 AudioSamplesPerSecond as Variant

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Number of audio samples per second in an audio media type.
**Notes:** e.g. 44100
(Read only property)

### 198.1.10 CanPause as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media item can pause.
**Notes:** If this flag is absent, the Pause method will likely fail.
(Read only property)

### 198.1.11 CanSeek as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media item supports seeking.
**Notes:** If this flag is absent, setting the Position property will fail.
(Read only property)

### 198.1.12 Duration as Double

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the duration of the media item.
**Notes:** (Read only property)

### 198.1.13 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 198.1.14 HasAudio as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether the media item contains an audio stream.
**Notes:** Returns the value true if the media item contains at least one audio stream, or false otherwise.

(Read only property)

### 198.1.15 HasAudioSelected as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether the media item contains an audio stream.
**Notes:** Returns the value true if at least one audio stream is selected, or false otherwise.

To select or deselect streams before playback starts, set StreamSelection(index).
(Read only property)

### 198.1.16 HasSlowSeek as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Seeking can take a long time.
**Notes:** For example, the source might download content through HTTP.
(Read only property)

### 198.1.17 HasVideo as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether the media item contains a video stream.
**Notes:** Returns the value true if the media item contains at least one video stream, or false otherwise.
(Read only property)

### 198.1.18 HasVideoSelected as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether the media item contains a video stream.
**Notes:** Returns the value true if at least one video stream is selected, or false otherwise.

To select or deselect streams before playback starts, set StreamSelection(index).
(Read only property)

### 198.1.19 IsLive as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The media item represents a live data source, such as video camera.
**Notes:** If playback is stopped and then restarted, there will be a gap in the content.
(Read only property)

### 198.1.20 IsProtected as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries whether the media item contains protected content.
**Notes:** If true then the media item contains protected content. Attempting to play this media item will cause a playback error.
(Read only property)

### 198.1.21 Metadata as Dictionary

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a dictionary that contains metadata for the source, such as author or title.
**Notes:** (Read only property)

### 198.1.22 NumberOfStreams as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of streams (audio, video, and other) in the media item.
**Notes:** (Read only property)

### 198.1.23 StartPosition as Double

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The start time for the media item.
**Notes:** The adjusted start and stop times are used the next time that SetMediaItem is called with this media item. If the media item is already set on the player, the change does not happen unless you call SetMediaItem again.
(Read and Write property)

### 198.1.24 StopPosition as Double

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The stop time for the media item.
**Notes:** The adjusted start and stop times are used the next time that SetMediaItem is called with this media item. If the media item is already set on the player, the change does not happen unless you call SetMediaItem again.
(Read and Write property)

### 198.1.25 Tag as Variant

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The tag value associated with this plugin object.
**Notes:** Can be used freely by you.
(Read and Write property)

### 198.1.26 URL as String

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the URL that was used to create the media item.
**Notes:** (Read only property)

### 198.1.27 VideoFrameRate as Variant

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Frame rate of a video media type, in frames per second.
**Notes:** The frame rate is expressed as a ratio. The upper 32 bits of the attribute value contain the numerator and the lower 32 bits contain the denominator. For example, if the frame rate is 30 frames per second (fps), the ratio is 30/1. If the frame rate is 29.97 fps, the ratio is 30,000/1001.

e.g. 2147483648016679, which gives with BitWise.ShiftRight(v, 32) the value 500000 and with BitWise-And(v, &hFFFFFFFF) the value 16679. 500000/16679 gives 29.97.
(Read only property)

### 198.1.28 StreamSelection(index as Integer) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Selects or deselects a stream.
**Notes:** Zero-based index of the stream. To get the number of streams, call NumberOfStreams.

Set to true: The stream is selected. During playback, this stream will play.
Set to false: The stream is not selected. During playback, this stream will not play.
(Read and Write computed property)

## 198.2 class MFPMediaPlayerExceptionMBS

### 198.2.1 class MFPMediaPlayerExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for an error with MFPMediaPlayerMBS class.
**Notes:** See ErrorCode and Message properties.
Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 19.6pr4

## 198.3 class MFPMediaPlayerMBS

### 198.3.1 class MFPMediaPlayerMBS

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The Windows Media Foundation Media Player class.
**Notes:** An alternative movie and audio player for Xojo.
For Windows 7, Windows Server 2008 R2 or newer.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.1
- MBS Xojo Plugins, version 20.1pr5
- New in the MBS Xojo Plugins 20.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0
- MBS Xojo Plugins, version 19.6pr4

**Videos**

- XDC 2020 MBS Plugins Presentation

**Xojo Developer Magazine**

- 18.3, page 51: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes

### 198.3.2 Methods

### 198.3.3 ClearMediaItem

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Clears the current media item.
**Notes:** This method stops playback and releases the player object's references to the current media item. This method completes asynchronously. When the operation completes, the MediaItemCleared event is invoked. The event type is

### 198.3.4 Constructor(URL as String = """, StartPlayback as Boolean = false)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance of the MFPlay player object for audio only.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Please call this in main thread of application only.
See also:

- 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl) 23502
- 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl) 23503
- 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer) 23503
- 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow) 23504
- 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window) 23505

### 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates a new instance of the MFPlay player object.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Control: A reference to a control where the video will appear. For audio-only playback, this parameter can be nil.

The control specified is used for the first selected video stream in the source.
If control is nil, MFPlay will not display any video.

Please call this in main thread of application only.
See also:

- 198.3.4 Constructor(URL as String = """, StartPlayback as Boolean = false) 23501

- 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl) 23503
- 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer) 23503
- 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow) 23504
- 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window) 23505


### 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates a new instance of the MFPlay player object.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Control: A reference to a control where the video will appear. For audio-only playback, this parameter can be nil.

The control specified is used for the first selected video stream in the source.
If control is nil, MFPlay will not display any video.

Please call this in main thread of application only.
See also:


- 198.3.4 Constructor(URL as String = """, StartPlayback as Boolean = false) 23501
- 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl) 23502
- 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer) 23503
- 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow) 23504
- 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window) 23505


### 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance of the MFPlay player object.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If

the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Handle: A handle to a window or control where the video will appear. For audio-only playback, this parameter can be nil.

The window specified is used for the first selected video stream in the source.

If windows is nil, MFPlay will not display any video.

Please call this in main thread of application only.
See also:

- 198.3.4 Constructor(URL as String = ””, StartPlayback as Boolean = false) 23501
- 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl) 23502
- 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl) 23503
- 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow) 23504
- 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window) 23505

### 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates a new instance of the MFPlay player object.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Win: A reference to a window where the video will appear. For audio-only playback, this parameter can be nil.

The window specified is used for the first selected video stream in the source.

If windows is nil, MFPlay will not display any video.

Please call this in main thread of application only.
See also:

- 198.3.4 Constructor(URL as String = """, StartPlayback as Boolean = false) 23501
- 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl) 23502
- 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl) 23503
- 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer) 23503
- 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window) 23505

### 198.3.9 Constructor(URL as String, StartPlayback as Boolean, win as Window)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates a new instance of the MFPlay player object.
**Notes:** URL: The string that contains the URL of a media file to open. This parameter can be empty. If the parameter is empty, StartPlayback must be false.
If this parameter is empty, you can open a URL later by calling CreateMediaItemFromURL.

StartPlayback: If true, playback starts automatically. If false, playback does not start until the application calls Play method. If URL is empty, this parameter is ignored.

Win: A reference to a window where the video will appear. For audio-only playback, this parameter can be nil.

The window specified is used for the first selected video stream in the source.

If windows is nil, MFPlay will not display any video.

Please call this in main thread of application only.
See also:

- 198.3.4 Constructor(URL as String = """, StartPlayback as Boolean = false) 23501
- 198.3.5 Constructor(URL as String, StartPlayback as Boolean, control as DesktopControl) 23502
- 198.3.6 Constructor(URL as String, StartPlayback as Boolean, control as RectControl) 23503
- 198.3.7 Constructor(URL as String, StartPlayback as Boolean, Handle as Integer) 23503
- 198.3.8 Constructor(URL as String, StartPlayback as Boolean, win as DesktopWindow) 23504

### 198.3.10 CreateMediaItemFromURL(URL as String, Sync as Boolean = true, tag as Variant = nil) as MFPMediaItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a media item from a URL.
**Notes:** URL: String that contains the URL of a media file.
Sync: If true, the method blocks until it completes. If false, the method does not block and completes asynchronously.

If fSync is true, we return the item on success.

This method does not queue the media item for playback. To queue the item for playback, set MediaItem property.

The CreateMediaItemFromURL method can be called either synchronously or asynchronously:

If Sync is true, the method completes synchronously and returns the new item.
If Sync is false, the method completes asynchronously. When the operation completes, the MediaItemCreated event is invoked. The event call passes the new media item.

If you make multiple asynchronous calls to CreateMediaItemFromURL, they are not guaranteed to complete in the same order. Use the tag to pass data to the event.

Currently, this method raises an error if the URL specifies any of the following protocols: rtsp*, mms*, or mcast.

### 198.3.11 FrameStep

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Steps forward one video frame.
**Notes:** This method completes asynchronously. When the operation completes, the FrameStepped event is raised.

The player object does not support frame stepping during reverse playback (that is, while the playback rate is negative).

### 198.3.12 GetVideoSourceRect(byref Left as Single, byref Top as Single, byref Right as Single, byref Bottom as Single)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the video source rectangle.
**Notes:** This rectangle defines which portion of the video is displayed. It is specified in normalized coordinates, which are defined as follows:
The upper-left corner of the video image is (0, 0).
The lower-right corner of the video image is (1, 1).
If the source rectangle is { 0, 0, 1, 1 } , the entire image is displayed. This is the default value.

### 198.3.13 InsertEffect(CLSID as String, isOptional as boolean = false) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Applies an audio or video effect to playback.
**Notes:** Please pass class id of a Media Foundation transform (MFT) that implements the effect. MFTs expose the IMFTransform interface.

isOptional specifies whether the effect is optional.

| Value | Meaning |
|---|---|
| True | The effect is optional. If the MFPlay player object cannot add the effect, it ignores the effect and continues playback. |
| False | If the MFPlay player object cannot add the effect, a playback error occurs. |

Returns index of the effect, which you pass for RemoveEffect later if needed.

The effect is applied to any media items set after the method is called. It is not applied to the current media item.

For each media item, the effect is applied to the first selected stream of the matching type (audio or video). If a media item has two selected streams of the same type, the second stream does not receive the effect. The effect is ignored if the media item does not contain a stream that matches the effect type. For example, if you set a video effect and play a file that contains just audio, the video effect is ignored, although no error is raised.

The effect is applied to all subsequent media items, until the application removes the effect. To remove an effect, call RemoveEffect or RemoveAllEffects.

If you set multiple effects of the same type (audio or video), they are applied in the same order in which you

call InsertEffect.

Remote Playback Optimizations

Audio and video effects might be incompatible with optimizations that are used for remote playback. The following remarks apply only to audio or video effects that are actually used during playback:
If you mark an audio or video effect as required, by setting fOptional to false, MFPlay disables remote playback optimizations.
Otherwise, if all audio/video effects are marked as optional, MFPlay might drop the effects, in order to enable remote playback optimizations.
In other words, required effects have priority over remote optimizations, but optional effects do not.

Non-audio, non-video effects do not affect remote optimizations. Also, if you insert a required effect but the source does not contain any streams of that type, remote optimizations are not disabled.

### 198.3.14 Pause

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Pauses playback.
**Notes:** While playback is paused, the most recent video frame is displayed, and audio is silent.

This method completes asynchronously. When the operation completes, the application's Paused event is invoked.

### 198.3.15 Play

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Starts playback.
**Notes:** This method completes asynchronously. When the operation completes, the Started event is raised.

### 198.3.16 RemoveAllEffects

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes all effects that were added with the InsertEffect method.
**Notes:** The change applies to the next media item that is set on the player. The effects are not removed from the current media item.

### 198.3.17 RemoveEffect(Handle as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes an effect that was added with the InsertEffect method.
**Notes:** Please pass the number returned by InsertEffect.

The change applies to the next media item that is set on the player. The effect is not removed from the current media item.

### 198.3.18 SetVideoSourceRect(Left as Single, Top as Single, Right as Single, Bottom as Single)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the video source rectangle.
**Notes:** MFPlay clips the video to this rectangle and stretches the rectangle to fill the video window.

This rectangle defines which portion of the video is displayed. It is specified in normalized coordinates, which are defined as follows:
The upper-left corner of the video image is (0, 0).
The lower-right corner of the video image is (1, 1).

To display the entire image, set the source rectangle to { 0, 0, 1, 1 } . This is the default value.

MFPlay stretches the source rectangle to fill the entire video window. By default, MFPlay maintains the source's correct aspect ratio, letterboxing if needed. The letterbox color is controlled by the BorderColor property.

This method fails if no media item is currently set, or if the current media item does not contain video.
To set the video position before playback starts, call this method inside your MediaItemSet event.

### 198.3.19 Shutdown

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Shuts down the MFPlay player object and releases any resources the object is using.
**Notes:** After this method is called, most IMFPMediaPlayer methods raise exception about shutdown. Also, any media items created from this instance of the player object are invalidated and most IMFPMediaItem methods also raise exceptions.

The player object automatically shuts itself down when its reference count reaches zero. You can use the Shutdown method to shut down the player before all of the references have been released.

### 198.3.20 Stop

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Stops playback.
**Notes:** This method completes asynchronously. When the operation completes, the Stopped event is raised.

### 198.3.21 UpdateVideo

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Updates the video frame.
**Notes:** This method makes sure the video is updated now, not later.

### 198.3.22 Properties

### 198.3.23 AspectRatioMode as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current aspect-ratio correction mode.
**Notes:** This mode controls whether the aspect ratio of the video is preserved during playback.
See VideoARMode* constants.
(Read and Write property)

### 198.3.24 Balance as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current audio balance.
**Notes:** The value can be any number in the following range (inclusive).

| Value | Meaning |
|---|---|
| -1.0 | The left channel is at full volume; the right channel is silent. |
| +1.0 | The right channel is at full volume; the left channel is silent. |

If the value is zero, the left and right channels are at equal volumes. The default value is zero.
(Read and Write property)

### 198.3.25 BorderColor as Color

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current color of the video border.
**Notes:** The border color is used to letterbox the video.
(Read and Write property)

### 198.3.26 Duration as Double

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the playback duration of the current media item.
**Notes:** This method calculates the playback duration, taking into account the start and stop times for the media item. To set the start and stop times, use StartPosition and StopPosition properties on the media item. To get the actual duration of the underlying media file, regardless of start and stop times, use Duration property on the item.

For example, suppose that you load a 30-second audio file and set the start time equal to 2 seconds and stop time equal to 10 seconds. The MFPMediaItemMBS.Duration method will return 30 seconds, but the MFPMediaPlayerMBS.Duration method will return 8 seconds.
(Read only property)

### 198.3.27 FastestSupportedRateForward as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the fastest supported forward playback rates.
**Notes:** Playback rates are expressed as a ratio of the current rate to the normal rate. For example, 1.0 indicates normal playback speed, 0.5 indicates half speed, and 2.0 indicates twice speed. Positive values indicate forward playback, and negative values indicate reverse playback.
(Read only property)

### 198.3.28 FastestSupportedRateReverse as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the fastest supported reverse playback rates.
**Notes:** Playback rates are expressed as a ratio of the current rate to the normal rate. For example, 1.0 indicates normal playback speed, 0.5 indicates half speed, and 2.0 indicates twice speed. Positive values indicate forward playback, and negative values indicate reverse playback.
(Read only property)

### 198.3.29 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 198.3.30 IdealVideoMaxHeight as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum height of video size that can be displayed without significantly degrading performance or image quality.
**Notes:** (Read only property)

### 198.3.31 IdealVideoMaxWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum width of video sizes that can be displayed without significantly degrading performance or image quality.
**Notes:** (Read only property)

### 198.3.32 IdealVideoMinHeight as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum height of video sizes that can be displayed without significantly degrading performance or image quality.
**Notes:** (Read only property)

### 198.3.33 IdealVideoMinWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the minimum width of video sizes that can be displayed without significantly degrading performance or image quality.
**Notes:** (Read only property)

### 198.3.34 Looping as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether to loop video.
**Notes:** If set to true, the plugin will call Play automatically when playback ended.
(Read and Write property)

### 198.3.35 MediaItem as MFPMediaItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Current media item.
**Notes:** Setting the MediaItem property is asynchronous. Therefore, while set is pending, get will not return the media item that was just set. Instead, the application should implement MediaItemSet event to know when it is done.
(Read and Write property)

### 198.3.36 Mute as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the audio is muted.
**Notes:** (Read and Write property)

### 198.3.37 NativeVideoAspectRateHeight as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The picture aspect ratio of the video.
**Notes:** (Read only property)

### 198.3.38 NativeVideoAspectRateWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The picture aspect ratio of the video.
**Notes:** (Read only property)

### 198.3.39 NativeVideoHeight as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height of the video, in pixels.
**Notes:** (Read only property)

### 198.3.40 NativeVideoWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width of the video, in pixels.
**Notes:** (Read only property)

### 198.3.41 Position as Double

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The playback position.
**Notes:** If you call this method while playback is stopped, the new position takes effect after playback resumes.

This method completes asynchronously. When the operation completes, the PositionSet event is raised.
If playback was started before SetPosition is called, playback resumes at the new position. If playback was paused, the video is refreshed to display the current frame at the new position.

If you make two consecutive calls to SetPosition, and the second call is made before the first call has completed, the second call supersedes the first. The status code for the superseded call is set to false in the event data for that call. This behavior prevents excessive latency from repeated calls to SetPosition, as each call may force the media source to perform a relatively lengthy seek operation.
(Read and Write property)

### 198.3.42 Rate as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current playback rate.
**Notes:** The playback rate is expressed as a ratio of the current rate to the normal rate. For example, 1.0 indicates normal playback, 0.5 indicates half speed, and 2.0 indicates twice speed. Positive values indicate forward playback, and negative values indicate reverse playback.
(Read and Write property)

### 198.3.43 SlowestSupportedRateForward as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the slowest supported forward playback rates.
**Notes:** Playback rates are expressed as a ratio of the current rate to the normal rate. For example, 1.0 indicates normal playback speed, 0.5 indicates half speed, and 2.0 indicates twice speed. Positive values indicate forward playback, and negative values indicate reverse playback.
(Read only property)

### 198.3.44 SlowestSupportedRateReverse as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries the slowest supported reverse playback rates.
**Notes:** Playback rates are expressed as a ratio of the current rate to the normal rate. For example, 1.0 indicates normal playback speed, 0.5 indicates half speed, and 2.0 indicates twice speed. Positive values indicate forward playback, and negative values indicate reverse playback.
(Read only property)

### 198.3.45 State as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The current playback state of the MFPlay player object.
**Notes:** See State* constants.

This property can be read after the player object has been shut down.

Many of the player methods complete asynchronously. While an asynchronous operation is pending, the current state is not updated until the operation completes. When the operation completes, the application receives an event.

(Read only property)

### 198.3.46 VideoWindow as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the window where the video is displayed.
**Notes:** Returns HWND as integer.
(Read only property)

### 198.3.47 Volume as Single

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The audio volume.
**Notes:** Volume is expressed as an attenuation level, where 0.0 indicates silence and 1.0 indicates full volume (no attenuation).

If you call this method before playback starts, the setting is applied after playback starts.
This method does not change the master volume level for the player's audio session. Instead, it adjusts the per-channel volume levels for audio stream(s) that belong to the current media item. Other streams in the audio session are not affected.
(Read and Write property)

### 198.3.48 Events

### 198.3.49 Ended

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** Playback has ended.
**Notes:** The player object sends this event when playback reaches the end of the media file.

### 198.3.50 Error

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** A playback error has occurred.

### 198.3.51 FrameStepped

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** A frame-step operation has completed.
**Notes:** This event is sent when the FrameStep method completes.

### 198.3.52 MediaItemCleared

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** The current media item was cleared.
**Notes:** This event is sent when the ClearMediaItem method completes.

### 198.3.53 MediaItemCreated(MediaItem as MFPMediaItemMBS, Tag as variant)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** A new media item was created.
**Notes:** This event is sent when the CreateMediaItemFromURL method completes.

### 198.3.54 MediaItemSet

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** A media item is ready for playback.
**Notes:** This event is sent when the SetMediaItem method completes.

### 198.3.55 Paused

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** Playback has paused.
**Notes:** This event is sent when the Pause method completes.

### 198.3.56 PositionSet

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** The MFPlay player object has seeked to a new playback position.
**Notes:** This event is sent when the Position setter completes.

### 198.3.57 RateSet(rate as Single)

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** The playback rate has changed.
**Notes:** This event is sent when the rate setter completes.

### 198.3.58 Started

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** Playback has started.
**Notes:** This event is sent when the Play method completes.

### 198.3.59 Stopped

MBS WinFrameworks Plugin, Plugin Version: 20.0, Platform: Windows, Targets: .

**Function:** Playback has stopped.
**Notes:** This event is sent when the Stop method completes.

### 198.3.60 Constants

States

| Constant | Value | Description |
|---|---|---|
| StateEmpty | 0 | Initial state. No media items have been set on the player object. |
| StatePaused | 3 | Playback is paused. |
| StatePlaying | 2 | Playback is in progress. |
| StateShutdown | 4 | The player object was shut down. This state is returned after the application calls Shutdown method. |
| StateStopped | 1 | Playback is stopped. |

Aspect Ratio Modes

| Constant | Value | Description |
|---|---|---|
| VideoARModeMask | 7 | Bitmask to validate flag values. This value is not a valid flag. |
| VideoARModeNone | 0 | Do not maintain the aspect ratio of the video. Stretch the video to fit the output rectangle. |
| VideoARModeNonLinearStretch | 4 | Apply a non-linear horizontal stretch if the aspect ratio of the destination rectangle does not match the aspect ratio of the source rectangle.<br>The non-linear stretch algorithm preserves the aspect ratio in the middle of the picture and stretches (or shrinks) the image progressively more toward the left and right. This mode is useful when viewing 4:3 content full-screen on a 16:9 display, instead of pillar-boxing. Non-linear vertical stretch is not supported, because the visual results are generally poor.<br>This mode may cause performance degradation.<br>If this flag is set, you must also set the VideoARModePreservePixel and VideoARModePreservePicture flags. |
| VideoARModePreservePicture | 1 | Preserve the aspect ratio of the video by letterboxing or within the output rectangle. |
| VideoARModePreservePixel | 2 | Correct the aspect ratio if the physical size of the display device does not match the display resolution. For example, if the native resolution of the monitor is 1600 by 1200 (4:3) but the display resolution is 1280 by 1024 (5:4), the monitor will display non-square pixels.<br>If this flag is set, you must also set the VideoARModePreservePicture flag. |

# Chapter 199

# Windows Mutex

## 199.1 class WindowsMutexMBS

### 199.1.1 class WindowsMutexMBS

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for a mutex.
**Notes:** As a mutex must have a unique name you can use this class to find out if an application is allready running.
Try to create a mutex with an unique name and if it allready exists your application was launched twice.
**Blog Entries**

- New in the MBS Xojo Plugins Version 20.2
- MBS Xojo Plugins, version 20.2pr2
- MBS Plugins 10.3 Release Notes

### 199.1.2 Methods

### 199.1.3 close

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.
**Notes:** There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

### 199.1.4 Create(name as string)

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new mutex.
**Notes:** The name must be unique and should not contain a backslash.
Use only ASCII strings for this.
Lasterror is set.

### 199.1.5 Lock

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Locks the
**Notes:** Blocks until we got the lock.
Lasterror is set.

### 199.1.6 Open(name as string)

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Trys to open a mutex with the given name.
**Notes:** Fails if the mutex does not exist.
Lasterror is set.

### 199.1.7 TryLock as Boolean

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Tries to lock the mutex.
**Notes:** Returns true if we got the lock or false if not.
Lasterror is set.

### 199.1.8 Unlock

MBS Win Plugin, Plugin Version: 20.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Unlocks the mutex.
**Notes:** Lasterror is set.

### 199.1.9 Properties

### 199.1.10 Handle as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The handle of the Mutex for use with Declares.
**Notes:** (Read and Write property)

### 199.1.11 Lasterror as Integer

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The last error code reported.
**Notes:** A windows error code.
Or 0 for okay and -1 for "Function not available or parameters wrong."
(Read and Write property)

### 199.1.12 Name as String

MBS Win Plugin, Plugin Version: 3.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The name used to create or open the mutex.
**Notes:** (Read only property)

# Chapter 200

# Windows OCR

## 200.1 class WindowsOCREngineMBS

### 200.1.1 class WindowsOCREngineMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Provides optical character recognition (OCR) functionality.
**Notes:** Requires Windows 10 (introduced in 10.0.10240.0)

o use the OCR capabilities of the OcrEngineMBS class in your app, call the RecognizeAsync method. When you call the RecognizeAsync method of the OcrEngine class, the method returns an WindowsOCRResultMBS object, which contains the recognized text and its size and position. The result is split into lines, and the lines are split into words.

- The WindowsOCRResultMBS contains a collection of WindowsOCRLineMBS objects, which you access through the Lines property of the WindowsOCRResultMBS.
- Each WindowsOCRLineMBS object contains a collection of WindowsOCRWordMBS objects, which you access through the Words property of each WindowsOCRLineMBS.
- Each WindowsOCRWordMBS object specifies the text, size, and position information of the word in the image.

Our plugin class allows you to run the OCR operation either synchronously or asynchronously. The asynchronous operation runs in the background on a separated preemptive thread, so your application GUI is not blocked and this is the preferred way.

Alternatively, you can use the synchronous versions, which block the GUI.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr2
- MBS Xojo Plugins, version 23.1pr1

**Xojo Developer Magazine**

- 21.3, page 48: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes

### 200.1.2 Methods

### 200.1.3 Available as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether this class is available.
**Example:**

```
If WindowsOCREngineMBS.Available Then
// okay
Else
MessageBox "Only for Windows 10 and newer."
End If
```

**Notes:** Returns false on Windows 8.x.
Reports true on Windows 10240 or later.

### 200.1.4 AvailableRecognizerLanguages as WindowsOCRLanguageMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns an array of all available OCR languages on the device.
**Example:**

```
Dim languages() As WindowsOCRLanguageMBS = WindowsOCREngineMBS.AvailableRecognizerLanguages

For Each n As WindowsOCRLanguageMBS In languages
MessageBox n.DisplayName+", "+n.LanguageTag
Next
```

### 200.1.5 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance of the OcrEngine class.
**Example:**

```
Dim Recognizer As New WindowsOCREngine

MessageBox Recognizer.RecognizerLanguage.DisplayName
```

**Notes:** If any language from GlobalizationPreferences.Languages can be resolved to any of the available OCR languages returns new instance of OcrEngine class, otherwise otherwise raises UnsupportedOperationException.
See also:

- 200.1.6 Constructor(Language as WindowsOCRLanguageMBS) 23527

### 200.1.6 Constructor(Language as WindowsOCRLanguageMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new instance of the OcrEngine class.
**Example:**

```
Dim Recognizer As New WindowsOCREngine("de-DE")

MessageBox Recognizer.RecognizerLanguage.DisplayName
```

**Notes:** If the specified language can be resolved to any of the OCR languages available on the device, returns new instance of OcrEngine class, otherwise raises UnsupportedOperationException.

Raises PlatformNotSupportedException when called on macOS or Linux.
See also:

- 200.1.5 Constructor 23527

### 200.1.7 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 200.1.8 IsLanguageSupported(Language as WindowsOCRLanguageMBS) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if a specified language can be resolved to any of the available OCR languages.
**Notes:** True, if the specified language can be resolved to any of the available OCR languages; otherwise, false.

### 200.1.9 RecognizeAsync(ImageFile as FolderItem)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image file and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
Calls event RecognizeCompleted later.
See also:

- 200.1.10 RecognizeAsync(Picture as Picture) 23528
- 200.1.11 RecognizeAsync(PictureData as MemoryBlock) 23528
- 200.1.12 RecognizeAsync(PictureData as String) 23529

### 200.1.10 RecognizeAsync(Picture as Picture)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We build a bitmap from the picture for Windows and then run OCR.
Calls event RecognizeCompleted later.
See also:

- 200.1.9 RecognizeAsync(ImageFile as FolderItem) 23528
- 200.1.11 RecognizeAsync(PictureData as MemoryBlock) 23528
- 200.1.12 RecognizeAsync(PictureData as String) 23529

### 200.1.11 RecognizeAsync(PictureData as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image data provided and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
Calls event RecognizeCompleted later.
See also:

- 200.1.9 RecognizeAsync(ImageFile as FolderItem) 23528
- 200.1.10 RecognizeAsync(Picture as Picture) 23528
- 200.1.12 RecognizeAsync(PictureData as String) 23529


### 200.1.12 RecognizeAsync(PictureData as String)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image data provided and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
Calls event RecognizeCompleted later.
See also:


- 200.1.9 RecognizeAsync(ImageFile as FolderItem) 23528
- 200.1.10 RecognizeAsync(Picture as Picture) 23528
- 200.1.11 RecognizeAsync(PictureData as MemoryBlock) 23528


### 200.1.13 RecognizeSync(ImageFile as FolderItem) as WindowsOCRResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image file and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
We run loops to wait and yield time to threads while waiting for the job to finish.
On success, true is returned and result is set.
In case of error, the error parameter is set with a text.

Raises NilObjectException or WindowsOCRExceptionMBS in case of an error.
See also:


- 200.1.14 RecognizeSync(Picture as Picture) as WindowsOCRResultMBS 23529
- 200.1.15 RecognizeSync(PictureData as MemoryBlock) as WindowsOCRResultMBS 23530
- 200.1.16 RecognizeSync(PictureData as String) as WindowsOCRResultMBS 23530


### 200.1.14 RecognizeSync(Picture as Picture) as WindowsOCRResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We build a bitmap from the picture for Windows and then run OCR.

Calls event RecognizeCompleted later.
We run loops to wait and yield time to threads while waiting for the job to finish.
On success, true is returned and result is set.
In case of error, the error parameter is set with a text.

Raises NilObjectException or WindowsOCRExceptionMBS in case of an error.
See also:

- 200.1.13 RecognizeSync(ImageFile as FolderItem) as WindowsOCRResultMBS 23529
- 200.1.15 RecognizeSync(PictureData as MemoryBlock) as WindowsOCRResultMBS 23530
- 200.1.16 RecognizeSync(PictureData as String) as WindowsOCRResultMBS 23530

### 200.1.15 RecognizeSync(PictureData as MemoryBlock) as WindowsOCRResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image data and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
We run loops to wait and yield time to threads while waiting for the job to finish.
On success, true is returned and result is set.
In case of error, the error parameter is set with a text.

Raises NilObjectException or WindowsOCRExceptionMBS in case of an error.
See also:

- 200.1.13 RecognizeSync(ImageFile as FolderItem) as WindowsOCRResultMBS 23529
- 200.1.14 RecognizeSync(Picture as Picture) as WindowsOCRResultMBS 23529
- 200.1.16 RecognizeSync(PictureData as String) as WindowsOCRResultMBS 23530

### 200.1.16 RecognizeSync(PictureData as String) as WindowsOCRResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Scans the specified image for text in the language specified by the RecognizerLanguage property.
**Notes:** We will ask Windows to load image from the image data and then run OCR.
Seems to work fine for JPEG and PNG files, but other formats may be supported by Windows, too.
We run loops to wait and yield time to threads while waiting for the job to finish.
On success, true is returned and result is set.
In case of error, the error parameter is set with a text.

Raises NilObjectException or WindowsOCRExceptionMBS in case of an error.
See also:


- 200.1.13 RecognizeSync(ImageFile as FolderItem) as WindowsOCRResultMBS 23529
- 200.1.14 RecognizeSync(Picture as Picture) as WindowsOCRResultMBS 23529
- 200.1.15 RecognizeSync(PictureData as MemoryBlock) as WindowsOCRResultMBS 23530


### 200.1.17 Properties

### 200.1.18 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 200.1.19 MaxImageDimension as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the maximum image pixel dimensions supported by the OCR engine.
**Example:**

```
MessageBox Recognizer.MaxImageDimension.ToString
```

**Notes:** The maximum image pixel dimensions supported by the OCR engine.
(Read only property)

### 200.1.20 RecognizerLanguage as WindowsOCRLanguageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the language being used for text recognition.
**Example:**

```
Dim Recognizer As New WindowsOCREngine

MessageBox Recognizer.RecognizerLanguage.DisplayName
```

**Notes:** (Read only property)

### 200.1.21 Events

### 200.1.22 RecognizeCompleted(ErrorMessage as String, ErrorCode as Integer, Result as WindowsOCRResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** The event called when the recognize process completes.
**Notes:** ErrorMessage: The error we report on what went wrong.
ErrorCode: The Windows error code, zero if successful.
Result: The result of the OCR that was initiated by the OcrEngine object.

### 200.1.23 Stopped(Error as Integer)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** Called by the engine in case it had to stop.
**Notes:** Provides Windows error code for the reason.

## 200.2 class WindowsOCRExceptionMBS

### 200.2.1 class WindowsOCRExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The class for an exception in the OCR classes.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr1

## 200.3 class WindowsOCRLanguageMBS

### 200.3.1 class WindowsOCRLanguageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class that provides information related to BCP-47 language tags such as the language name and the script.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr1

**Xojo Developer Magazine**

- 21.3, page 48: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes

### 200.3.2 Methods

### 200.3.3 Constructor(languageTag as String)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Language object.
**Notes:** Pass a BCP-47 language tag.

### 200.3.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 200.3.5 Properties

### 200.3.6 CurrentInputMethodLanguageTag as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the BCP-47 language tag for the currently enabled keyboard layout or Input Method Editor (IME).

**Notes:** This property returns a value for the currently active input method on the thread with keyboard input focus. Calling this on a background thread may not return the expected results.
(Read only property)

### 200.3.7 DisplayName as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a localized string that is suitable for display to the user for identifying the language.
**Notes:** (Read only property)

### 200.3.8 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 200.3.9 LanguageTag as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the normalized BCP-47 language tag for this language.
**Notes:** e.g. de-DE for Germany
(Read only property)

### 200.3.10 NativeName as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the name of the language in the language itself.
**Notes:** (Read only property)

### 200.3.11 Script as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the four-letter ISO 15924 script code of the language.
**Notes:** (Read only property)

## 200.4 class WindowsOCRLineMBS

### 200.4.1 class WindowsOCRLineMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a single line of text recognized by the OCR engine and returned as part of the WindowsOCRResultMBS.
**Notes:** When you call the RecognizeAsync method of the OcrEngine class, the method returns an WindowsOCRResultMBS object. The WindowsOCRResultMBS contains a collection of WindowsOCRLineMBS objects, which you access through the Lines property of the WindowsOCRResultMBS. Each WindowsOCRLineMBS object contains a collection of WindowsOCRWordMBS objects, which you access through the Words property of each WindowsOCRLineMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr1

**Xojo Developer Magazine**

- 21.3, page 50: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes

### 200.4.2 Methods

### 200.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 200.4.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 200.4.5 Words as WindowsOCRWordMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the collection of WindowsOCRWordMBS objects that represents the words detected in the current line of text by the RecognizeAsync method.

### 200.4.6 Properties

### 200.4.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 200.4.8 Text as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the text of the recognized line.
**Notes:** (Read only property)

## 200.5 class WindowsOCRResultMBS

### 200.5.1 class WindowsOCRResultMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Contains the results of Optical Character Recognition (OCR).
**Notes:** When you call the RecognizeAsync method of the OcrEngine class, the method returns an WindowsOCRResultMBS object. The WindowsOCRResultMBS contains a collection of WindowsOCRLineMBS objects, which you access through the Lines property of the WindowsOCRResultMBS. Each WindowsOCRLineMBS object contains a collection of WindowsOCRWordMBS objects, which you access through the Words property of each WindowsOCRLineMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr1

**Xojo Developer Magazine**

- 21.3, page 52: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes
- 21.3, page 50: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes

### 200.5.2 Methods

### 200.5.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 200.5.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 200.5.5 Lines as WindowsOCRLineMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the collection of WindowsOCRLineMBS objects that represents the lines of text detected in the image by the RecognizeAsync method.
**Notes:** When you call the RecognizeAsync method of the OcrEngine class, the method returns an WindowsOCRResultMBS object. The WindowsOCRResultMBS contains a collection of WindowsOCRLineMBS objects, which you access through the Lines property of the WindowsOCRResultMBS. Each WindowsOCRLineMBS object contains a collection of WindowsOCRWordMBS objects, which you access through the Words property of each WindowsOCRLineMBS.

### 200.5.6 Properties

### 200.5.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 200.5.8 Text as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the recognized text.
**Notes:** (Read only property)

### 200.5.9 TextAngle as Double

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the clockwise rotation of the recognized text, in degrees, around the center of the image.
**Notes:** The clockwise rotation of the recognized text, in degrees, around the center of the image. If the angle of the text can't be detected, the value of this property is null. If the image contains text at different angles, only part of the text will be recognized correctly.

Use the TextAngle property to overlay recognition results correctly on the original image. If the value of the TextAngle property is not null or 0 (zero), then to overlay the recognized text correctly on the original image, you either have to rotate the original image by the detected angle in a counter-clockwise direction, or rotate the recognized text by the detected angle in a clockwise direction.
(Read only property)

## 200.6 class WindowsOCRWordMBS

### 200.6.1 class WindowsOCRWordMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a single word in a line of text recognized by the OCR engine and returned as part of the WindowsOCRLineMBS.
**Notes:** When you call the RecognizeAsync method of the OcrEngine class, the method returns an WindowsOCRResultMBS object. The WindowsOCRResultMBS contains a collection of WindowsOCRLineMBS objects, which you access through the Lines property of the WindowsOCRResultMBS. Each WindowsOCRLineMBS object contains a collection of WindowsOCRWordMBS objects, which you access through the Words property of each WindowsOCRLineMBS.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- Windows OCR for Xojo
- MBS Xojo Plugins, version 23.1pr1

**Xojo Developer Magazine**

- 21.3, page 50: Windows OCR, Working with Windows' built-in OCR library by Stefanie Juchmes

### 200.6.2 Methods

### 200.6.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 200.6.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 200.6.5 Properties

### 200.6.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 200.6.7 Height as Single

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the size in pixels of the recognized word.
**Notes:** (Read only property)

### 200.6.8 Text as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the text of the recognized word.
**Notes:** (Read only property)

### 200.6.9 Width as Single

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the size in pixels of the recognized word.
**Notes:** (Read only property)

### 200.6.10 X as Single

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the position in pixels of the recognized word from the top left corner of image when the value of TextAngle property is 0 (zero).
**Notes:** (Read only property)

### 200.6.11 Y as Single

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the position in pixels of the recognized word from the top left corner of image when the value of TextAngle property is 0 (zero).
**Notes:** (Read only property)

# Chapter 201

# Windows PDF

## 201.1 class WindowsPDFDocumentMBS

### 201.1.1 class WindowsPDFDocumentMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a Portable Document Format (PDF) document.
**Notes:** Methods of this class return an STG_E_READFAULT error if there is a problem in reading the Portable Document Format (PDF) document.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr1
- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, pages 72 to 73: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes
- 21.5, page 10: News

### 201.1.2 Methods

### 201.1.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 201.1.4 Constructor(other as WindowsPDFDocumentMBS) 23544

### 201.1.4 Constructor(other as WindowsPDFDocumentMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
See also:

- 201.1.3 Constructor 23543

### 201.1.5 ConvertImage(ImageData as String) as String

MBS WinFrameworks Plugin, Plugin Version: 23.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Converts a picture to PNG.
**Example:**

```
// read in a HEIC image
dim f as FolderItem = SpecialFolder.Desktop.Child("IMG_4609.HEIC")
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// convert to PNG
dim p as string = WindowsPDFDocumentMBS.ConvertImage(s)

// and write out as PNG file
dim o as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim c as BinaryStream = BinaryStream.Create(o, true)
c.Write p
c.close

o.Launch
```

**Notes:** This is a little utility function to use Windows' built-in image encoders and decoders to convert various image formats like HEIF/HEIC to a PNG image.
Returns new image as string with bytes of PNG image.

### 201.1.6 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 201.1.7 LoadFromData(data as MemoryBlock, Password as String = "") as WindowsPDFDocumentMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from data in Memoryblock synchronously.
**Notes:** Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method raises an exception reporting an ERROR_WRONG_PASSWORD (1323) error if the wrong password is specified.
See also:

- 201.1.8 LoadFromData(data as String, Password as String = "") as WindowsPDFDocumentMBS 23545

### 201.1.8 LoadFromData(data as String, Password as String = "") as WindowsPDFDocumentMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from data in string synchronously.
**Notes:** Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method raises an exception reporting an ERROR_WRONG_PASSWORD (1323) error if the wrong password is specified.
See also:

- 201.1.7 LoadFromData(data as MemoryBlock, Password as String = "") as WindowsPDFDocumentMBS 23545

### 201.1.9 LoadFromDataAsync(data as MemoryBlock, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "")

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from data in MemoryBlock asynchronously.
**Notes:** Calls the given delegate later.

Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method reports an ERROR_WRONG_PASSWORD (1323) error via delegate if the wrong password is specified.
See also:

- 201.1.10 LoadFromDataAsync(data as String, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "") 23546

### 201.1.10 LoadFromDataAsync(data as String, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "")

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from data in string asynchronously.
**Notes:** Calls the given delegate later.

Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method reports an ERROR_WRONG_PASSWORD (1323) error via delegate if the wrong password is specified.
See also:

- 201.1.9 LoadFromDataAsync(data as MemoryBlock, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "") 23545

### 201.1.11 LoadFromFile(File as FolderItem, Password as String = "") as WindowsPDFDocumentMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from folderitem synchronously.
**Notes:** Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method raises an exception reporting an ERROR_WRONG_PASSWORD (1323) error if the wrong password is specified.

### 201.1.12 LoadFromFileAsync(File as FolderItem, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "")

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from folderitem asynchronously.
**Notes:** Calls the given delegate later.

Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method reports an ERROR_WRONG_PASSWORD (1323) error via delegate if the wrong password is specified.

### 201.1.13 LoadFromPath(Path as String, Password as String = "") as WindowsPDFDocumentMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from path synchronously.
**Notes:** Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method raises an exception reporting an ERROR_WRONG_PASSWORD (1323) error if the wrong password is specified.

### 201.1.14 LoadFromPathAsync(Path as String, Handler as WindowsPDFDocumentLoadedMBS, Password as String = "")

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads a PDF document from path asynchronously.
**Notes:** Calls the given delegate later.

Password: The password to open the Portable Document Format (PDF) document, if it requires one.

If the Portable Document Format (PDF) document does not require a password, this method ignores it.

This method reports an ERROR_WRONG_PASSWORD (1323) error via delegate if the wrong password is specified.

### 201.1.15 Page(Index as Integer) as WindowsPDFPageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets a page from a Portable Document Format (PDF) document.
**Notes:** The location of the Portable Document Format (PDF) page relative to its parent document. Starts at zero.

### 201.1.16 Properties

### 201.1.17 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 201.1.18 IsPasswordProtected as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets whether the Portable Document Format (PDF) document is password-protected.
**Notes:** True if the Portable Document Format (PDF) document is password-protected; otherwise, false. (Read only property)

### 201.1.19 PageCount as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of pages in the Portable Document Format (PDF) document.
**Notes:** (Read only property)

### 201.1.20 Delegates

### 201.1.21 WindowsPDFDocumentLoadedMBS(ErrorMessage as String, ErrorCode as Integer, document as WindowsPDFDocumentMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate called when loading finished.

## 201.2 class WindowsPDFExceptionMBS

### 201.2.1 class WindowsPDFExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop only.

**Function:** The class for exceptions in PDF engine.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, page 72: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

## 201.3 class WindowsPDFPageDimensionsMBS

### 201.3.1 class WindowsPDFPageDimensionsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents the dimensions of a single page in a Portable Document Format (PDF) document.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, pages 72 to 73: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 201.3.2 Methods

### 201.3.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.

### 201.3.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 201.3.5 Properties

### 201.3.6 ArtBox as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries art box.
**Notes:** Gets the size of a rectangle that contains the Portable Document Format (PDF) page's contents, including any meaningful surrounding white space, as intended by the Portable Document Format (PDF)

page's creator.
(Read only property)

### 201.3.7 BleedBox as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries bleed box.
**Notes:** Gets the size of a rectangle that specifies the clipped region of a Portable Document Format (PDF) page's contents when it is displayed.
(Read only property)

### 201.3.8 CropBox as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries crop box.
**Notes:** Gets the size of a rectangle that specifies the cropped region of a Portable Document Format (PDF) page's contents when it is displayed.
(Read only property)

### 201.3.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 201.3.10 MediaBox as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries media box.
**Notes:** Gets the size of a rectangle that defines the boundaries of the area that the Portable Document Format (PDF) page will be displayed or printed to.
(Read only property)

### 201.3.11 TrimBox as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Queries trim box.
**Notes:** Gets the size of a rectangle that specifies the intended dimensions of the Portable Document Format (PDF) page after it has been trimmed.
(Read only property)

## 201.4 class WindowsPDFPageMBS

### 201.4.1 class WindowsPDFPageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents a single page in a Portable Document Format (PDF) document.
**Blog Entries**

- News from the MBS Xojo Plugins Version 24.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0
- MBS Xojo Plugins, version 23.6pr4
- MBS Xojo Plugins, version 23.3pr2
- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, pages 72 to 73: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 201.4.2 Methods

### 201.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The private constructor.
See also:

- 201.4.4 Constructor(other as WindowsPDFPageMBS) 23554

### 201.4.4 Constructor(other as WindowsPDFPageMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The copy constructor.
See also:

- 201.4.3 Constructor 23554

### 201.4.5 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 201.4.6 RenderToMemory(Handler as RenderToMemoryFinishedMBS, Options as WindowsPDFPageRenderOptionsMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Requests asynchronous rendering of the page.
**Notes:** Calls the handler delegate later with results (or error code).
Produces a MemoryBlock with image data, which you can pass to Picture.FromData to get as picture.

Asynchronous mode will perform the work on a different thread in the background.
See also:

- 201.4.7 RenderToMemory(Options as WindowsPDFPageRenderOptionsMBS = nil) as MemoryBlock 23555

### 201.4.7 RenderToMemory(Options as WindowsPDFPageRenderOptionsMBS = nil) as MemoryBlock

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Outputs a stream of data, which represents a Portable Document Format (PDF) page's contents as image.
**Notes:** Takes a set of display settings, applies them to the output of a Portable Document Format (PDF) page's contents, and creates a stream with the customized, rendered output as an synchronous action. This asynchronous action can be used to create a customized display image of the Portable Document Format (PDF) page.

Please call RenderToStream if you need image as string, call RenderToMemory if you need a MemoryBlock and call RenderToPicture if you need a picture.
See also:

- 201.4.6 RenderToMemory(Handler as RenderToMemoryFinishedMBS, Options as WindowsPDFPageRenderOptionsMBS = nil) 23555

### 201.4.8 RenderToPicture(Options as WindowsPDFPageRenderOptionsMBS = nil) as Picture

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Outputs a stream of data, which represents a Portable Document Format (PDF) page's contents as image.
**Example:**

```
Dim page As WindowsPDFPageMBS = List.RowTagAt(index)
Dim options As New WindowsPDFPageRenderOptionsMBS

if out.Width >out.Height then
options.DestinationWidth = out.Width * 2
else
options.DestinationHeight = out.Height * 2
end if

options.setBitmapEncoderJPEG

currentimage = page.RenderToPicture(options)
out.Refresh // refresh canvas to show the picture
```

**Notes:** Takes a set of display settings, applies them to the output of a Portable Document Format (PDF) page's contents, and creates a stream with the customized, rendered output as an synchronous action. Provides the resulting stream as picture for Xojo.

Please call RenderToStream if you need image as string, call RenderToMemory if you need a MemoryBlock and call RenderToPicture if you need a picture.

### 201.4.9 RenderToStream(Handler as RenderToStreamFinishedMBS, Options as WindowsPDFPageRenderOptionsMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Requests asynchronous rendering of the page.
**Example:**

```
Dim page As WindowsPDFPageMBS // current page
page.RenderToStream AddressOf RenderToStreamFinished
```

**Notes:** Calls the handler delegate later with results (or error code).
Produces a string with the image data.

Asynchronous mode will perform the work on a different thread in the background.

See also:


- 201.4.10 RenderToStream(Options as WindowsPDFPageRenderOptionsMBS = nil) as String 23557


### 201.4.10 RenderToStream(Options as WindowsPDFPageRenderOptionsMBS = nil) as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Outputs a stream of data, which represents a Portable Document Format (PDF) page's contents as image.
**Example:**

```
Dim page As WindowsPDFPageMBS // your page
Dim options As New WindowsPDFPageRenderOptionsMBS

if out.Width >out.Height then
options.DestinationWidth = out.Width * 2
else
options.DestinationHeight = out.Height * 2
end if

options.setBitmapEncoderJPEG

dim data as string = page.RenderToStream(options)
if data.Bytes >0 then
currentimage = Picture.FromData(data)
out.Refresh // refresh canvas to show the picture
end if
```

**Notes:** Takes a set of display settings, applies them to the output of a Portable Document Format (PDF) page's contents, and creates a stream with the customized, rendered output as an synchronous action. This asynchronous action can be used to create a customized display image of the Portable Document Format (PDF) page.

Please call RenderToStream if you need image as string, call RenderToMemory if you need a MemoryBlock and call RenderToPicture if you need a picture.
See also:


- 201.4.9 RenderToStream(Handler as RenderToStreamFinishedMBS, Options as WindowsPDFPageRenderOptionsMBS = nil) 23556

### 201.4.11 Properties

### 201.4.12 Dimensions as WindowsPDFPageDimensionsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the group of dimension properties for a single page in a Portable Document Format (PDF) document.
**Notes:** (Read only property)

### 201.4.13 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 201.4.14 Index as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the relative position of the Portable Document Format (PDF) page within its parent Portable Document Format (PDF) document.
**Notes:** Return the position of the Portable Document Format (PDF) page relative to its parent Portable Document Format (PDF) document.

The first page of a Portable Document Format (PDF) document is index 0 (zero).
(Read only property)

### 201.4.15 PreferredZoom as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Portable Document Format (PDF) page's preferred magnification factor.
**Notes:** (Read only property)

### 201.4.16 Rotation as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the constant that the Portable Document Format (PDF) page will be rotated when it's displayed or printed.
**Notes:** See RotationRotate* constants.
Degrees are expressed relative to a clockwise rotation. Degrees are expressed in multiples of 90.
(Read only property)

### 201.4.17 RotationAngle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the number of degrees that the Portable Document Format (PDF) page will be rotated when it's displayed or printed.
**Notes:** Returns angle from 0 to 360¬∞.
(Read only property)

### 201.4.18 Size as WindowsPDFSizeMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets the Portable Document Format (PDF) page's size based on its related CropBox, MediaBox, and Rotation property values.
**Notes:** (Read only property)

### 201.4.19 Constants

Rotations

| Constant | Value | Description |
|---|---|---|
| RotationNormal | 0 | No rotation. |
| RotationRotate180 | 2 | A 180-degree rotation. |
| RotationRotate270 | 3 | A 270-degree rotation. |
| RotationRotate90 | 1 | A 90-degree rotation. |

### 201.4.20 Delegates

### 201.4.21 RenderToMemoryFinishedMBS(ErrorMessage as String, ErrorCode as Integer, Data as MemoryBlock)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate called when rendering of a page finished.

### 201.4.22 RenderToStreamFinishedMBS(ErrorMessage as String, ErrorCode as Integer, Data as String)

MBS WinFrameworks Plugin, Plugin Version: 24.0, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The delegate called when rendering of a page finished.

## 201.5 class WindowsPDFPageRenderOptionsMBS

### 201.5.1 class WindowsPDFPageRenderOptionsMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Represents display settings for a single page of a Portable Document Format (PDF) document, such as the page's background color and its encoding type.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, page 74: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes
- 21.5, page 72: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 201.5.2 Methods

### 201.5.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The constructor.
**Notes:** Creates and initializes a new instance of display settings for a single page of a Portable Document Format (PDF) document.

### 201.5.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The destructor.

### 201.5.5 setBitmapEncoderBMP

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets encoding type to BMP.

### 201.5.6 setBitmapEncoderJPEG

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets encoding type to JPEG.

### 201.5.7 setBitmapEncoderPNG

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets encoding type to PNG.

### 201.5.8 setBitmapEncoderTIFF

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets encoding type to TIFF.

### 201.5.9 Properties

### 201.5.10 BackgroundColor as Color

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the Portable Document Format (PDF) page's background color.
**Notes:** The default background color is White.
(Read and Write property)

### 201.5.11 BitmapEncoderId as String

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the Portable Document Format (PDF) page's encoding type to be used while the page is being converted to a bitmap.
**Notes:** (Read and Write property)

### 201.5.12 DestinationHeight as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the final size of the rendering of the Portable Document Format (PDF) page in device-independent pixels (DIPs).
**Notes:** The value for DestinationHeight is the final size of the rendered page. If DestinationHeight is not specified, the page's aspect ratio is maintained relative to the destination width.
(Read and Write property)

### 201.5.13 DestinationWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets the final size of the rendering of the Portable Document Format (PDF) page in device-independent pixels (DIPs).
**Notes:** The value for DestinationWidth is the final size of the rendered page. If DestinationWidth is not specified, the page's aspect ratio is maintained relative to the destination height.
(Read and Write property)

### 201.5.14 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 201.5.15 IsIgnoringHighContrast as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets whether the Portable Document Format (PDF) page uses the system's high contrast display setting.
**Notes:** (Read and Write property)

### 201.5.16 SourceRect as WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gets or sets a portion of the Portable Document Format (PDF) page to be displayed.
**Notes:** (Read and Write property)

## 201.6 class WindowsPDFRectMBS

### 201.6.1 class WindowsPDFRectMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a rectangle.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, pages 72 to 73: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 201.6.2 Properties

### 201.6.3 Height as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Height of rectangle.
**Notes:** (Read and Write property)

### 201.6.4 Width as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Width of rectangle.
**Notes:** (Read and Write property)

### 201.6.5 X as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The x origin position.
**Notes:** (Read and Write property)

### 201.6.6 Y as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The y origin position.
**Notes:** (Read and Write property)

## 201.7 class WindowsPDFSizeMBS

### 201.7.1 class WindowsPDFSizeMBS

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The class for a size.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.2
- Windows PDF Classes

**Xojo Developer Magazine**

- 21.5, pages 72 to 73: Windows PDF, New MBS classes let you work with PDFS on Windows. by Stefanie Juchmes

### 201.7.2 Properties

### 201.7.3 Height as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Height of rectangle.
**Notes:** (Read and Write property)

### 201.7.4 Width as Single

MBS WinFrameworks Plugin, Plugin Version: 23.2, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Width of rectangle.
**Notes:** (Read and Write property)

# Chapter 202

# Windows Photos

## 202.1 class WinPhotoAcquireDeviceSelectionDialogMBS

### 202.1.1 class WinPhotoAcquireDeviceSelectionDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Provides a dialog box for selecting the device to acquire images from.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.1.2 Methods

### 202.1.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 202.1.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.1.5 ShowModal(Window as DesktopWindow, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Displays a device selection dialog box.
**Notes:** The function returns when the user selects a device using the modal dialog box.

Window: The parent window.
DeviceFlags: Integer value containing a combination of device flags that indicate which type of devices to display. The device flags may be a combination of any of the DeviceFlags constants.

DeviceId: A string containing the ID of the selected device.
DeviceType: The type of the selected device.

Returns true if default button was clicked and a device selected.
See also:

- 202.1.6 ShowModal(Window as Window, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23568
- 202.1.7 ShowModal(WindowHandle as Integer, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23569

### 202.1.6 ShowModal(Window as Window, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a device selection dialog box.
**Notes:** The function returns when the user selects a device using the modal dialog box.

Window: The parent window.
DeviceFlags: Integer value containing a combination of device flags that indicate which type of devices to display. The device flags may be a combination of any of the DeviceFlags constants.

DeviceId: A string containing the ID of the selected device.
DeviceType: The type of the selected device.

Returns true if default button was clicked and a device selected.
See also:

- 202.1.5 ShowModal(Window as DesktopWindow, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23568
- 202.1.7 ShowModal(WindowHandle as Integer, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23569

### 202.1.7 ShowModal(WindowHandle as Integer, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Displays a device selection dialog box.
**Notes:** The function returns when the user selects a device using the modal dialog box.

WindowHandle: Handle to a parent window.
DeviceFlags: Integer value containing a combination of device flags that indicate which type of devices to display. The device flags may be a combination of any of the DeviceFlags constants.

DeviceId: A string containing the ID of the selected device.
DeviceType: The type of the selected device.

Returns true if default button was clicked and a device selected.
See also:

- 202.1.5 ShowModal(Window as DesktopWindow, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23568
- 202.1.6 ShowModal(Window as Window, DeviceFlags as Integer, byref deviceID as String, byref DeviceType as Integer) as boolean 23568

### 202.1.8 Properties

### 202.1.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.1.10 SubmitButtonText as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The text displayed in the dialog box that prompts the user to select a device.
**Notes:** (Read and Write property)

### 202.1.11 Title as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The title of the device selection dialog box.
**Notes:** (Read and Write property)

### 202.1.12 Constants

Device Flags

| Constant | Value | Description |
|---|---|---|
| DeviceFlagAllDevices | &hFFFF | Show all devices. |
| DeviceFlagCPLMode | &h10000 | Show CPL devices. |
| DeviceFlagDVDevices | 64 | Show digital video camera devices. |
| DeviceFlagFSDevices | 32 | Show removable storage devices, such as CD drives or card readers. |
| DeviceFlagShowOffline | &h20000 | Show devices that are offline. Not supported by all device types. |
| DeviceFlagSTIDevcies | 8 | Show devices of type Still Image Architecture (STI). |
| DeviceFlagTWAINDevices | 16 | Show TWAIN devices. |
| DeviceFlagWIACameras | 2 | Show cameras of type Windows Image Acquisition (WIA). |
| DeviceFlagWIAScanners | 4 | Show scanners of type Windows Image Acquisition (WIA). |
| DeviceFlagWPDDevices | 1 | Show devices of type Windows Portable Devices (WPD). |

Device Types

| Constant | Value | Description |
|---|---|---|
| DeviceTypeDV | 6 | DV device. |
| DeviceTypeFS | 5 | Specifies that the selected device is a removable drive in the file system. |
| DeviceTypeSTI | 3 | Specifies that the type of the selected device is Still Image Architecture (STI). |
| DeviceTypeTWAIN | 4 | TWAIN device |
| DeviceTypeUnknown | 0 | pecifies that the type of the selected device is unknown. |
| DeviceTypeWIA | 2 | Specifies that the type of the selected device is Windows Image Acquisition (WIA). |
| DeviceTypeWPD | 1 | Specifies that the type of the selected device is Windows Portable Devices (WPD). |

## 202.2 class WinPhotoAcquireItemMBS

### 202.2.1 class WinPhotoAcquireItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The WinPhotoAcquireItemMBS interface provides methods for working with items as they are acquired from a device.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.2.2 Methods

### 202.2.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 202.2.4 Data as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Reads the data from the file and returns it.

### 202.2.5 Delete

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Delete method deletes an item.

### 202.2.6 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.2.7 PropertyKeyCameraSequenceNumber as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The camera sequence number.

### 202.2.8 PropertyKeyDuplicateDetectionID as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The duplicate detection ID.

### 202.2.9 PropertyKeyFinalFilename as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The final file name.

### 202.2.10 PropertyKeyGroupTag as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The group tag.

### 202.2.11 PropertyKeyIntermediateFile as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The intermediate path name.

### 202.2.12 PropertyKeyOriginalFilename as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The original path name.

### 202.2.13 PropertyKeyRelativePathname as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The relative path name.

### 202.2.14 PropertyKeySkipImport as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** Whether to skip import.

### 202.2.15 PropertyKeyTransferResult as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** One of the property keys.
**Notes:** The transfer result.

### 202.2.16 SubItem(Index as Integer) as WinPhotoAcquireItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves a subitem of an item, given the index of the subitem.
**Notes:** Index: Integer containing the index of the item. Range from 0 to SubItemCount-1.

### 202.2.17 Thumbnail(width as Integer, Height as Integer) as Picture

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the thumbnail provided for an item.
**Notes:** Width and height specify the size of the thumbnail.

### 202.2.18 Properties

### 202.2.19 CanDelete as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The CanDelete method indicates whether an item may be deleted.
**Notes:** Indicates that the item can be deleted.
(Read only property)

### 202.2.20 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.2.21 ItemName as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the file name for an item.
**Notes:** The file name consists of the display name and the extension, even if the Hide extensions for known file types setting is checked in the Windows Folder Options dialog box.
(Read only property)

### 202.2.22 SubItemCount as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the number of subitems contained in an item.
**Notes:** (Read only property)

### 202.2.23 PropertyValue(key as string) as Variant

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Get or set a property for an item.
**Notes:** key: Specifies a key for the property to set.

The value is converted to/from variant.
(Read and Write computed property)

## 202.3 class WinPhotoAcquireMBS

### 202.3.1 class WinPhotoAcquireMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** This class provides methods for acquiring photos from a device.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.3.2 Methods

### 202.3.3 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as DesktopWindow, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The Acquire method acquires photos from a device.
**Notes:** PhotoAcquireSource: Pointer to an WinPhotoAcquireSourceMBS object representing the device from which to acquire photos. Initialize this object by calling CreatePhotoSource.
ShowProgress: Flag that, when set to true, indicates that a progress dialog will be shown.
Window: The parent window.
ApplicationName: string containing the application name.
PhotoAcquireProgresCallback: Pointer to an optional WinPhotoAcquireProgressCallBackMBS object. Can be nil.

To initialize the PhotoAcquireSource parameter passed to Acquire, CreatePhotoSource should be called prior to calling Acquire.
PhotoAcquireProgresCallback provides callback methods that allow you to apply further filtering or control as items are acquired.
To verify that there are items in the device before acquisition, or to selectively acquire items from the device, call InitializeItemList to enumerate the items before calling Acquire.
See also:

- 202.3.4 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as Window, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS)

- 202.3.5 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindowHandle as Integer, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS) 23577


### 202.3.4 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as Window, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Acquire method acquires photos from a device.
**Notes:** PhotoAcquireSource: Pointer to an WinPhotoAcquireSourceMBS object representing the device from which to acquire photos. Initialize this object by calling CreatePhotoSource.
ShowProgress: Flag that, when set to true, indicates that a progress dialog will be shown.
Window: The parent window.
ApplicationName: string containing the application name.
PhotoAcquireProgresCallback: Pointer to an optional WinPhotoAcquireProgressCallBackMBS object. Can be nil.

To initialize the PhotoAcquireSource parameter passed to Acquire, CreatePhotoSource should be called prior to calling Acquire.
PhotoAcquireProgresCallback provides callback methods that allow you to apply further filtering or control as items are acquired.
To verify that there are items in the device before acquisition, or to selectively acquire items from the device, call InitializeItemList to enumerate the items before calling Acquire.
See also:


- 202.3.3 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as DesktopWindow, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS) 23576
- 202.3.5 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindowHandle as Integer, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS) 23577


### 202.3.5 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindowHandle as Integer, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Acquire method acquires photos from a device.
**Notes:** PhotoAcquireSource: Pointer to an WinPhotoAcquireSourceMBS object representing the device

from which to acquire photos. Initialize this object by calling CreatePhotoSource.
ShowProgress: Flag that, when set to true, indicates that a progress dialog will be shown.
WindowHandle: The parent window handle.
ApplicationName: string containing the application name.
PhotoAcquireProgresCallback: Pointer to an optional WinPhotoAcquireProgressCallBackMBS object. Can be nil.

To initialize the PhotoAcquireSource parameter passed to Acquire, CreatePhotoSource should be called prior to calling Acquire.
PhotoAcquireProgresCallback provides callback methods that allow you to apply further filtering or control as items are acquired.
To verify that there are items in the device before acquisition, or to selectively acquire items from the device, call InitializeItemList to enumerate the items before calling Acquire.
See also:

- 202.3.3 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as DesktopWindow, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS) 23576
- 202.3.4 Acquire(PhotoAcquireSource as WinPhotoAcquireSourceMBS, ShowProgress as Boolean, ParentWindow as Window, ApplicationName as String, PhotoAcquireProgresCallback as WinPhotoAcquireProgressCallBackMBS) 23577

### 202.3.6 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 202.3.7 CreatePhotoSource(Device as String) as WinPhotoAcquireSourceMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** CreatePhotoSource method initializes an WinPhotoAcquireSourceMBS object to pass to Acquire method.
**Notes:** Device: The device name/ID.

Returns the initialized photo source to acquire photos from.

### 202.3.8 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.3.9 Results as String()

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the paths of all files successfully transferred during the most recent call to Acquire.
**Notes:** If the file transfer is aborted before any files are transferred, the result is nil.

### 202.3.10 Properties

### 202.3.11 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 202.4 class WinPhotoAcquireOptionsDialogMBS

### 202.4.1 class WinPhotoAcquireOptionsDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The standard dialog to show for options.
**Notes:** The WinPhotoAcquireOptionsDialogMBS interface is used to display an options dialog box in which the user can select photo acquisition settings such as file name formats, as well as whether or not to rotate images, to prompt for a tag name, or to erase photos from the camera after importing.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.4.2 Methods

### 202.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Please call Initialize.

### 202.4.4 Create(Window as DesktopWindow) as Integer

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The Create method creates and displays a modeless instance of the photo options dialog box, hosted within a parent window.
**Notes:** This method is for advanced users, which can position the new window via declares.

Window: The parent window.

Returns the handle for the created dialog box.

The Initialize method should be called prior to the Create method.
The parent window provides OK and Cancel buttons to the new dialog box instance.
See also:

- 202.4.5 Create(Window as Window) as Integer 23581
- 202.4.6 Create(WindowHandle as Integer) as Integer 23581


### 202.4.5 Create(Window as Window) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Create method creates and displays a modeless instance of the photo options dialog box, hosted within a parent window.
**Notes:** This method is for advanced users, which can position the new window via declares.

Window: The parent window.

Returns the handle for the created dialog box.

The Initialize method should be called prior to the Create method.
The parent window provides OK and Cancel buttons to the new dialog box instance.
See also:


- 202.4.4 Create(Window as DesktopWindow) as Integer 23580
- 202.4.6 Create(WindowHandle as Integer) as Integer 23581


### 202.4.6 Create(WindowHandle as Integer) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Create method creates and displays a modeless instance of the photo options dialog box, hosted within a parent window.
**Notes:** This method is for advanced users, which can position the new window via declares.

WindowHandle: Handle to the parent window.

Returns the handle for the created dialog box.

The Initialize method should be called prior to the Create method.
The parent window provides OK and Cancel buttons to the new dialog box instance.
See also:


- 202.4.4 Create(Window as DesktopWindow) as Integer 23580
- 202.4.5 Create(Window as Window) as Integer 23581

### 202.4.7 Destroy

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The Destroy method closes and destroys the modeless dialog box created with the Create method.
**Notes:** If you destroy the parent window, the child window will automatically be destroyed.

### 202.4.8 Initialize(RegistryRoot as String = "")

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Initializes the options dialog box and reads any saved options from the registry.
**Notes:** Initialize must be called prior to calling Create or DoModal. Failure to do so will cause Create or DoModal to fail.
If Initialize is called while the options dialog box is already displayed, an error will be returned.

RegistryRoot: (optional) String containing the registry root of a custom location to read the acquisition settings from. If this parameter is set to "", the default location will be used.

### 202.4.9 SaveData

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The SaveData method saves acquisition settings from the options dialog box to the registry so that a subsequent instance of the dialog can be initialized with the same settings.

### 202.4.10 ShowModal(Window as Window) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The DoModal method creates and displays the options dialog box as a modal dialog box.
**Notes:** Window: The dialog's parent window.
Returns the code returned when the window is closed.

The modal dialog displayed by DoModal will have OK and Cancel buttons, whereas the OK and Cancel buttons of the modeless dialog displayed by Create must be provided by the parent window.
See also:

- 202.4.11 ShowModal(WindowHandle as Integer) as Integer 

### 202.4.11 ShowModal(WindowHandle as Integer) as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The DoModal method creates and displays the options dialog box as a modal dialog box.
**Notes:** WindowHandle: Handle to the dialog's parent window.
Returns the code returned when the window is closed.

The modal dialog displayed by DoModal will have OK and Cancel buttons, whereas the OK and Cancel buttons of the modeless dialog displayed by Create must be provided by the parent window.
See also:

- 202.4.10 ShowModal(Window as Window) as Integer 23582

### 202.4.12 Properties

### 202.4.13 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 202.5 class WinPhotoAcquireProgressCallBackMBS

### 202.5.1 class WinPhotoAcquireProgressCallBackMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The WinPhotoAcquireProgressCallBackMBS interface may be implemented if you wish to do extra processing at various stages in the acquisition process.
**Blog Entries**

- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.5.2 Methods

### 202.5.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 202.5.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.5.5 Properties

### 202.5.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.5.7 Events

### 202.5.8 Cancelled(byref Cancelled as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The Cancelled method provides extended functionality when a cancellation occurs during an acquisition session.
**Notes:** The application provides the implementation of the Cancelled method.

Cancelled: a flag that, when set to true, indicates that the operation was canceled.

### 202.5.9 DirectoryCreated(Directory as String)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The DirectoryCreated method provides extended functionality when a destination directory is created during the acquisition process.
**Notes:** The application provides the implementation of the DirectoryCreated method.

Directory: containing the directory.

### 202.5.10 EndDelete(Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndDelete method provides extended functionality when deletion of files from the image source is complete.
**Notes:** The application provides the implementation of the EndDelete method.

Result: Specifies the result of the delete operation.

### 202.5.11 EndEnumeration(Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndEnumeration method provides extended functionality when enumeration of files from the image source is complete.
**Notes:** The application provides the implementation of the EndEnumeration method.
Result: Specifies the result of the enumeration operation.

### 202.5.12 EndItemDelete(ItemIndex as Integer, Item as WinPhotoAcquireItemMBS, Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndItemDelete method provides extended functionality each time a file is deleted from the image source.
**Notes:** The application provides the implementation of the EndItemDelete method.

ItemIndex: Integer value containing the item index.
Item: To the deleted WinPhotoAcquireItemMBS object.
Result: Specifies the result of the delete operation.

### 202.5.13 EndItemTransfer(ItemIndex as Integer, Item as WinPhotoAcquireItemMBS, Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndItemTransfer method provides extended functionality each time a file is transferred from the image source.
**Notes:** The application provides the implementation of the EndItemTransfer method.

ItemIndex: Integer value containing the item index.
Item: Pointer to a photo acquire item object.
Result: Specifies the result of the transfer operation.

### 202.5.14 EndSession(Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndSession method provides extended functionality when an acquisition session is completed.
**Notes:** The application provides the implementation of the EndSession method.

### 202.5.15 EndTransfer(Result as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The EndTransfer method provides extended functionality when the transfer of all files is complete.
**Notes:** The application provides the implementation of the EndTransfer method.

Result: Specifies the result of the transfer.

### 202.5.16 ErrorAdvise(Result as Integer, ErrorMessage as String, MessageType as Integer, byref ErrorAdviseResult as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The ErrorAdvise method provides custom error handling for errors that occur during acquisition.
**Notes:** The application provides the implementation of the ErrorAdvise method.

Result: Specifies the error that occurred.
ErrorMessage: the error message.
MessageType: What type of message. May be one of the following:

| Value | Description |
|---|---|
| AdviseMessageTypeSkipRetryCancel | Specifies that the error that occurred requires a Skip, Retry, or Cancel response. The ErrorAdviseResult parameter must be set to one of the following: AdviseResultSkip, AdviseResultSkipAll, AdviseResultRetry, or AdviseResultAbort. |
| AdviseMessageTypeRetryCancel | Specifies that the error that occurred requires a Retry or Cancel response. The ErrorAdviseResult parameter must be set to one of the following: AdviseResultRetry or AdviseResultAbort. |
| AdviseMessageTypeYesNo | Specifies that the error that occurred requires a Yes or No response. The ErrorAdviseResult parameter must be set to one of the following: AdviseResultYes or AdviseResultNo. |
| AdviseMessageTypeOK | Specifies that the error that occurred requires an OK response. The ErrorAdviseResult parameter must be set to AdviseResultOK. |

ErrorAdviseResult: an integer value containing the error advise result. The result should be one of the acceptable types indicated by the MessageType parameter, and must be one of the following:

| Value | Description |
|---|---|
| AdviseResultYes | Specifies a Yes response. Valid if MessageType is AdviseMessageTypeYesNo. |
| AdviseResultNo | Specifies a No response. Valid if MessageType is AdviseMessageTypeYesNo. |
| AdviseResultOK | Specifies an OK response. Valid if MessageType is AdviseMessageTypeOK. |
| AdviseResultSkip | Specifies a Skip response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel. |
| AdviseResultSkipAll | Specifies a Skip All response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel. |
| AdviseResultRetry | Specifies a Retry response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel or AdviseMessageTypeRetryCancel. |
| AdviseResultAbort | Specifies a Cancel response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel or AdviseMessageTypeRetryCancel. |

### 202.5.17 FoundItem(Item as WinPhotoAcquireItemMBS) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The FoundItem method provides extended functionality each time an item is found during enumeration of items from the device.
**Notes:** This method can be used to exclude an item from the list of items to acquire. The application provides the implementation of the FoundItem method.

Return true to exclude the item from the results of the enumeration. This would allow the caller to exclude videos or camera raw files, for instance.

### 202.5.18 GetDeleteAfterAcquire(byref DeleteAfterAcquire as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The GetDeleteAfterAcquire method returns a value indicating whether photos should be deleted after acquisition.
**Notes:** DeleteAfterAcquire: When set to true, indicates that photos should be deleted after acquisition.

### 202.5.19 GetUserInput(UserInput as WinUserInputStringMBS, byref Result as Variant, DefaultValue as Variant)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The GetUserInput method overrides the default functionality that displays a message prompting the user for string input during acquisition.
**Notes:** The application provides the implementation of the GetUserInput method.

Result: Variant representing the descriptive input to be obtained.
DefaultValue: Variant representing the default value of the input being requested.

If this method is implemented, the implementation should copy the value of the DefaultValue argument to the Result parameter.

If the progress dialog box is suppressed in Acquire, this method must be implemented in order to assign a default value to the Result parameter. Normally a value is supplied to Result in the course of prompting the user with the default dialog, but when the dialog is suppressed, the application must copy the value of the DefaultValue argument to the Result parameter.

### 202.5.20 StartDelete(Source as WinPhotoAcquireSourceMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The StartDelete method provides extended functionality when deletion of items from the device begins.
**Notes:** The implementation of StartDelete is provided by the application.

Source: the WinPhotoAcquireSourceMBS that items are being deleted from.

### 202.5.21 StartEnumeration(Source as WinPhotoAcquireSourceMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The StartEnumeration method provides extended functionality when the enumeration of items to acquire begins.
**Notes:** The application provides the implementation of the StartEnumeration method.

Source: the WinPhotoAcquireSourceMBS object that items are being enumerated from.

### 202.5.22 StartItemDelete(ItemIndex as Integer, Item as WinPhotoAcquireItemMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The StartItemDelete method provides extended functionality each time the deletion of an individual item from the device begins.
**Notes:** The application provides the implementation of the StartItemDelete method.

ItemIndex: Integer value containing the item index in the list of items to delete.
Item: The WinPhotoAcquireItemMBS object that is being deleted.

### 202.5.23 StartItemTransfer(ItemIndex as Integer, Item as WinPhotoAcquireItemMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The StartItemTransfer method provides extended functionality each time the transfer of an item begins.
**Notes:** The application provides the implementation of the StartItemTransfer method.

ItemIndex: Integer value containing the item index in the list of items to transfer.
Item: the WinPhotoAcquireItemMBS object that is to be transferred.

### 202.5.24 StartTransfer(Source as WinPhotoAcquireSourceMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The StartTransfer method provides additional processing when transfer of items from the device begins.
**Notes:** The application provides the implementation of the StartTransfer method.

### 202.5.25 UpdateDeletePercent(Percent as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The UpdateDeletePercent method provides extended functionality when the percentage of items deleted changes.
**Notes:** The application provides the implementation of the UpdateDeletePercent method.

Percent: Integer value containing the percentage of items deleted.

### 202.5.26 UpdateTransferPercent(Overall as Boolean, Percent as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** The UpdateTransferPercent method provides extended functionality when the percentage of items transferred changes.
**Notes:** The application provides the implementation of the UpdateTransferPercent method.

Overall: Flag that, when set to TRUE, indicates that the value contained in nPercent is a percentage of the overall transfer progress, rather than a percentage of an individual item's progress.
Percent: Integer value containing the percentage of items transferred.

### 202.5.27 Constants

Advise Message Types

| Constant | Value | Description |
|---|---|---|
| AdviseMessageTypeOK | 3 | Specifies that the error that occurred requires an OK response. The Error viseResult parameter must be set to AdviseResultOK. |
| AdviseMessageTypeRetryCancel | 1 | Specifies that the error that occurred requires a Skip, Retry, or Cancel respo The ErrorAdviseResult parameter must be set to one of the following: Ad eResultSkip, AdviseResultSkipAll, AdviseResultRetry, or AdviseResultAb |
| AdviseMessageTypeSkipRetryCancel | 0 | Specifies that the error that occurred requires a Retry or Cancel response. ErrorAdviseResult parameter must be set to one of the following: Advise sultRetry or AdviseResultAbort. |
| AdviseMessageTypeYesNo | 2 | Specifies that the error that occurred requires a Yes or No response. The E rAdviseResult parameter must be set to one of the following: AdviseResul or AdviseResultNo. |

Advise Results

| Constant | Value | Description |
|---|---|---|
| AdviseResultAbort | 6 | Specifies a Cancel response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel or AdviseMessageTypeRetryCancel. |
| AdviseResultNo | 1 | Specifies a No response. Valid if MessageType is AdviseMessageTypeYesNo. |
| AdviseResultOK | 2 | Specifies an OK response. Valid if MessageType is AdviseMessageTypeOK. |
| AdviseResultRetry | 5 | Specifies a Retry response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel or AdviseMessageTypeRetryCancel. |
| AdviseResultSkip | 3 | Specifies a Skip response. Valid if MessageType is AdviseMessageTypeSkipRetryCancel. |
| AdviseResultSkipAll | 4 | Specifies a Skip All response. Valid if MessageType is AdviseMessageTypeRetryCancel. |
| AdviseResultYes | 0 | Specifies a Yes response. Valid if MessageType is AdviseMessageTypeYesNo. |

## 202.6 class WinPhotoAcquireSettingsMBS

### 202.6.1 class WinPhotoAcquireSettingsMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The WinPhotoAcquireSettingsMBS interface is used to work with image acquisition settings, such as file name format.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr2
- News from the MBS Xojo Plugins Version 20.3
- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.6.2 Methods

### 202.6.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 202.6.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.6.5 InitializeFromRegistry(RegistryKey as String)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Specifies a registry key from which to initialize settings.

### 202.6.6 Properties

### 202.6.7 AcquisitionDateTime as DateTime

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The acquisition time explicitly.
**Notes:** This property is typically used to force two sessions to show the same acquisition time. If not explicitly set, acquisition time defaults to the current machine time.
(Read and Write property)

### 202.6.8 AcquisitionTime as Date

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The acquisition time explicitly.
**Notes:** This property is typically used to force two sessions to show the same acquisition time. If not explicitly set, acquisition time defaults to the current machine time.
(Read and Write property)

### 202.6.9 Flags as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The photo acquire flags.
**Notes:** (Read and Write property)

### 202.6.10 GroupTag as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The group tag for an acquisition session.
**Notes:** The group tag is stored as a keyword in each file's metadata. It is also used in the file name if the $ (GroupTag) token is present in the format string passed to OutputFileNameTemplate.
(Read and Write property)

### 202.6.11 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.

**Notes:** (Read only property)

### 202.6.12 OutputFilenameTemplate as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Specifies a format string (template) that specifies the format of file names.
**Notes:** Format strings contain a mix of path literals and tokens. A format string looks like the following:

$ (MyPicturesFolder)\$ (DateAcquired), $ (EventName)\$ (EventName) $ (SequenceNumber).$ (OriginalExtension)

The token format looks like the following, where OptionalPrefix and OptionSuffix are suppressed if the replacement for the TokenIdentifier yields a zero-length string:

$ ( [ OptionalPrefix ] TokenIdentifier:SubToken [ OptionalSuffix ] | AlternateString)

The caret ("^") is an escape character, so "^$ " would yield "$ " in the final path.
Parentheses and brackets are not allowed as literals within tokens, but can be used outside of tokens. This means you cannot use " [ ", " ] ", "(", or ")" within the OptionalString sub-token unless they are escaped with a caret ("^").
There are a few different classes of tokens, including the following:
SHGetSpecialFolder variables such as the following. These must be the first token, and can only occur once, at most:

- MyPicturesFolder
- MyDocumentsFolder

Session variables such as the following:

- SequenceNumber (The sequence number is used to avoid filename collisions; if it exists, it must be in the file name portion of the path.)
- DateAcquired
- EventName
- UserName
- MachineName

File and metadata variables such as the following:

- DateTaken
- OriginalFilename
- OriginalExtension
- CameraModel
- Width
- Height

Since these tokens are not intended to be visible to users, they will not be localized. For example, $ (DateTaken) will be the same on all versions of Microsoft Windows, regardless of locale or language settings.
As an example, suppose EventName is "Meghan's Birthday" and the naming pattern is as follows:

$ (MyPicturesFolder)\$ (DateAcquired)$ ( [ , ] EventName)\$ (EventName [ ] )$ (SequenceNumber).$ (OriginalExtension)
The resulting files would be named as follows:

C:\Documents and Settings\shauniv\My Documents\My Pictures\2003-11-14, Meghan's Birthday\Meghan's Birthday 001.jpg
C:\Documents and Settings\shauniv\My Documents\My Pictures\2003-11-14, Meghan's Birthday\Meghan's Birthday 002.jpg
C:\Documents and Settings\shauniv\My Documents\My Pictures\2003-11-14, Meghan's Birthday\Meghan's Birthday 003.jpg
C:\Documents and Settings\shauniv\My Documents\My Pictures\2003-11-14, Meghan's Birthday\Meghan's Birthday 004.jpg
(Read and Write property)

### 202.6.13 SequencePaddingWidth as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** A value indicating how wide sequential fields in filenames will be.
**Notes:** If the value passed to SetSequencePaddingWidth is nonzero and the format string specified in SetOutputFileNameTemplate contains a sequential token, this method sets the width allotted for the sequential token. For example, given the template $ (GroupTag)$ (AcquisitionSequence).$ (OriginalExtension), if padding is set to 0, a file name might appear as

"Image1.jpg"

If padding is set to 3, the file name may appear as

"Image 1.jpg"
(Read and Write property)

### 202.6.14 SequenceZeroPadding as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether zeros or spaces are used to pad sequential file names.
**Notes:** Flag that, if set to true, indicates that zeros pad sequential file names.
(Read and Write property)

### 202.6.15 Constants

Flags

| Constant | Value | Description |
|---|---|---|
| kFlagsAbortOnSettingsUpdate | &h00000800 | Abort on settings update. |
| kFlagsDeleteAfterAcquire | &h00000020 | Delete after acquire. |
| kFlagsDisableAutoRotate | &h00000002 | Disable auto rotate. |
| kFlagsDisableDbIntegration | &h00000010 | Disable DB integration. |
| kFlagsDisableDuplicateDetection | &h00000040 | Disable duplicate detection. |
| kFlagsDisableGroupTagPrompt | &h00000008 | Disable group tag prompt. |
| kFlagsDisableMetadataWrite | &h00000100 | Disable metadata write. |
| kFlagsDisablePlugins | &h00000004 | Disable plugins. |
| kFlagsDisableSettingsLink | &h00000400 | Disable settings link. |
| kFlagsDisableThumbnailProgress | &h00000200 | Disable thumbmail progress. |
| kFlagsEnableThumbnailCaching | &h00000080 | Enable thumbnail caching. On by default. |
| kFlagsImportVideoAsMultipleFiles | &h00001000 | Import videos as multiple files. |
| kFlagsNoGalleryLaunch | &h00000001 | Suppresses the explorer window launched after acquisition. |

## 202.7 class WinPhotoAcquireSourceMBS

### 202.7.1 class WinPhotoAcquireSourceMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** This class is used for acquisition of items from a device.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 22.1pr2
- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

### 202.7.2 Methods

### 202.7.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 202.7.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.7.5 InitializeItemList(ForceEnumeration as Boolean, PhotoAcquireProgress as WinPhotoAcquireProgressCallBackMBS, byref ItemCount as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The InitializeItemList method enumerates transferable items on the device and passes each item to the optional progress callback, if it is supplied.
**Notes:** ForceEnumeration: Flag that, if set to true, indicates that enumeration will be repeated even if the item list has already been initialized. If set to false, this flag indicates that repeated calls to InitializeItemList after the item list has already been initialized will not enumerate items again.
PhotoAcquireProgress: Optional. Pointer to an WinPhotoAcquireProgressCallBackMBS object for events.

ItemCount: Returns the number of items found.

If Acquire is called without first calling InitializeItemList, initialization of the item list is done implicitly. The first time the item list is initialized—either implicitly through Acquire or explicitly by calling InitializeItemList—each item is enumerated. During enumeration, if an WinPhotoAcquireProgressCallBackMBS object is passed to InitializeItemList, its implementation of StartEnumeration, FoundItem, and EndEnumeration may be used to apply further filtering or control to the list of items to be transferred.

### 202.7.6 Item(Index as Integer) as WinPhotoAcquireItemMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the WinPhotoAcquireItemMBS object at the given index in the list of items.
**Notes:** Index: The index from 0 to ItemCount-1.

### 202.7.7 Properties

### 202.7.8 DeviceId as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the identifier (ID) of the device.
**Notes:** (Read only property)

### 202.7.9 FriendlyName as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the name of the device, formatted for display.
**Notes:** (Read only property)

### 202.7.10 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.7.11 ItemCount as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Retrieves the number of items found by the InitializeItemList method.
**Notes:** (Read only property)

### 202.7.12 PhotoAcquireSettings as WinPhotoAcquireSettingsMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Obtains an IPhotoAcquireSettings object for working with acquisition settings.
**Notes:** (Read only property)

## 202.8 class WinPhotoExceptionMBS

### 202.8.1 class WinPhotoExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The class for exceptions in the Windows Photo classes.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr6

## 202.9 class WinPhotoProgressActionCallbackMBS

### 202.9.1 class WinPhotoProgressActionCallbackMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The class for an action callback.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr6

### 202.9.2 Methods

### 202.9.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

### 202.9.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.9.5 Properties

### 202.9.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.9.7 Events

### 202.9.8 DoAction(WindowHandle as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: .

**Function:** Run the action for the progress action.

# 202.10 class WinPhotoProgressDialogMBS

## 202.10.1 class WinPhotoProgressDialogMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Provides the progress dialog box that may be displayed when enumerating or importing images.
**Notes:** The dialog box is modal and runs in its own thread.
**Blog Entries**

- Windows Photos Acquire
- MBS Xojo Plugins, version 20.3pr6

## 202.10.2 Methods

## 202.10.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.

## 202.10.4 Create(ParentWindow as DesktopWindow)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** Creates and displays a progress dialog box that can be shown during image enumeration and acquisition.
**Notes:** ParentWindow: The parent window.

The dialog box that is created is modal, and runs in its own thread.
To close the dialog, call Destroy.
See also:

- 202.10.5 Create(ParentWindow as Window) 23603
- 202.10.6 Create(ParentWindowHandle as Integer) 23604

## 202.10.5 Create(ParentWindow as Window)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Creates and displays a progress dialog box that can be shown during image enumeration and acquisition.

**Notes:** ParentWindow: The parent window.

The dialog box that is created is modal, and runs in its own thread.
To close the dialog, call Destroy.
See also:

- 202.10.4 Create(ParentWindow as DesktopWindow) 23603
- 202.10.6 Create(ParentWindowHandle as Integer) 23604

### 202.10.6 Create(ParentWindowHandle as Integer)

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Creates and displays a progress dialog box that can be shown during image enumeration and acquisition.
**Notes:** ParentWindowHandle: Handle of the parent window.

The dialog box that is created is modal, and runs in its own thread.
To close the dialog, call Destroy.
See also:

- 202.10.4 Create(ParentWindow as DesktopWindow) 23603
- 202.10.5 Create(ParentWindow as Window) 23603

### 202.10.7 Destroy

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Closes and disposes of the progress dialog box shown during image enumeration and acquisition.
**Notes:** Calling Destroy is the only way to close the progress dialog box. If Destroy is not called, the dialog box will remain open. The dialog box is not automatically closed when the operation in progress completes.

### 202.10.8 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

### 202.10.9 IsCheckboxChecked(Index as Integer = 0) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The check box in the progress dialog box (typically indicating whether to delete files after transfer) is selected.
**Notes:** Index: Integer value containing the check box identifier (ID).

### 202.10.10 Properties

### 202.10.11 ActionLinkCallback as WinPhotoProgressActionCallbackMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The callback object to receive action callback.
**Notes:** (Read and Write property)

### 202.10.12 ActionLinkText as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The link text for the action item.
**Notes:** (Read and Write property)

### 202.10.13 Caption as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The caption of the progress dialog box.
**Notes:** The caption text is displayed above the progress indicator bar in the dialog box.
(Read and Write property)

### 202.10.14 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.10.15 IsCancelled as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The IsCancelled method indicates whether the operation has been canceled via the progress dialog box.
**Notes:** Returns true to indicate the action has been canceled.
(Read only property)

### 202.10.16 PercentComplete as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** A value indicating the completed portion of the current operation.
**Notes:** Integer value indicating the percentage of the operation that has completed. This value may be between 0 and 100 only.

If you pass ProgressIndeterminate to PercentComplete, the progress bar will not progress from left to right (from 0 to 100%), but will instead animate to indicate that an operation with an indeterminate end is taking place.
(Read and Write property)

### 202.10.17 Picture as Picture

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The thumbnail image displayed in the progress dialog box.
**Notes:** A bitmap thumbnail (up to 128 x 128 pixels, although it will be scaled to fit if it is too large).
(Read and Write property)

### 202.10.18 ProgressText as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The text for the progress bar in the progress dialog box.
**Notes:** (Read and Write property)

### 202.10.19 ShowsActionLink as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether to show an action link.
**Notes:** (Read and Write property)

### 202.10.20 Title as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The title of the progress dialog box.
**Notes:** (Read and Write property)

### 202.10.21 WindowHandle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The window handle for the dialog.
**Notes:** (Read only property)

### 202.10.22 CheckboxCheck(Index as Integer = 0) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether the checkbox is checked.
**Notes:** (Read and Write computed property)

### 202.10.23 CheckboxText(Index as Integer = 0) as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The text for the check box in the progress dialog box indicating whether to delete images after transfer.
**Notes:** Index: Integer containing the check box identifier (ID).
(Read and Write computed property)

### 202.10.24 CheckboxTooltip(Index as Integer = 0) as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The tooltip text for the check box in the progress dialog box.
**Notes:** Index: Integer containing the check box identifier (ID).
(Read and Write computed property)

### 202.10.25 CheckboxVisible(Index as Integer = 0) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** Whether the checkbox is visible.
**Notes:** (Read and Write computed property)

### 202.10.26 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| ProgressDialogCheckboxIDDefault | 0 | The ID of the default checkbox. |
| ProgressIndeterminate | -1 | The progress value for indeterminate. |

# 202.11 class WinUserInputStringMBS

## 202.11.1 class WinUserInputStringMBS

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The object created when asking the user for a string—for example, when obtaining the name of a tag.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 20.3pr6

## 202.11.2 Methods

## 202.11.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

## 202.11.4 Destructor

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The destructor.

## 202.11.5 MRUEntry(Index as Integer) as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The entry at the given index in the most recently used list.
**Notes:** Index from 0 to MRUCount-1.

## 202.11.6 Properties

## 202.11.7 Default as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The default string used to initialize an edit control (or equivalent).
**Notes:** (Read only property)

### 202.11.8 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 202.11.9 MaxLength as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The maximum string length the user interface (UI) should allow.
**Notes:** The maximum string length in characters.
(Read only property)

### 202.11.10 MRUCount as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The number of items in the list of most recently used items.
**Notes:** (Read only property)

### 202.11.11 Prompt as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The title of a prompt if the prompt is a modal dialog box.
**Notes:** (Read only property)

### 202.11.12 StringId as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The unlocalized canonical name for the requested string.
**Notes:** For example, when requesting a tag name, the canonical name might be ”TagName”.
(Read only property)

### 202.11.13 StringType as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** A value indicating the type of string to obtain from the user.
**Notes:** A value indicating the type of string to obtain from the user.

See UserInputDefault and UserInputPathElement constants.
(Read only property)

### 202.11.14 SubmitButtonText as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The text for the submit button.
**Notes:** (Read only property)

### 202.11.15 TooltipText as String

MBS WinFrameworks Plugin, Plugin Version: 20.3, Platform: Windows, Targets: Desktop only.

**Function:** The tooltip text displayed for a control.
**Notes:** (Read only property)

### 202.11.16 Constants

Types

| Constant | Value | Description |
|---|---|---|
| UserInputDefault | 0 | Specifies that any string is allowed. |
| UserInputPathElement | 1 | Specifies that the string will not accept characters that are illegal in file or directory names (such as * or /). |

# Chapter 203

# Windows Registry

## 203.1 class RegistryFileTypeMBS

### 203.1.1 class RegistryFileTypeMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** An easy way to register an document icon for Windows.
**Notes:** You set up the properties of this class and than you call create.
I suggest that you do it like QuickTime or Winzip. Ask the user on first run if he want's your application to register its file types.
And also provide two buttons in the Preferencesdialog to register or unregister the types.

This class works on Windows 7 only if you run the app as administrator.

This function may fail to run if permissions are denied.
Or it may only affect the shadow registry used by Windows to protect itself from having unauthorized apps editing the real registry.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr5
- Plugin notes

### 203.1.2 Methods

### 203.1.3 Create as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates this file type.
**Example:**

```
dim r as RegistryFileTypeMBS
' set properties for r
dim errorcode as Integer
errorcode=r.create
```

**Notes:** Returns:

| | |
|---|---|
| -1 | - Run on Mac OS |
| 0 | - OK |
| 1 | - Failed to create main extension key. |
| 2 | - Failed to create the description key for file type. |
| 3 | - Failed to create the key for the icon. |
| 4 | - Failed to create the key for the open description. |
| 5 | - Required parameters not provided. |

This function may fail to run if permissions are denied.
Or it may only affect the shadow registry used by Windows to protect itself from having unauthorized apps editing the real registry.

### 203.1.4 Remove as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes this file type.
**Example:**

```
dim r as RegistryFileTypeMBS
dim errorcode as Integer

errorcode=r.remove
```

**Notes:** Returns:

Note: The return values changed in MBS Plugin 3.2 to now return Windows error codes!

This function may fail to run if permissions are denied.

-1 - Run on Mac OS or parameters bad.
0 - OK
x - A Windows error code like 5 for permissions denied.

Or it may only affect the shadow registry used by Windows to protect itself from having unauthorized apps editing the real registry.

### 203.1.5 Properties

### 203.1.6 AppFile as FolderItem

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The application to launch to open the file.
**Example:**

```
dim r as new RegistryFileTypeMBS
r.Appfile=app.applicationfilembs // it is my file ;-)
```

**Notes:** (Read and Write property)

### 203.1.7 Description as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The description for this file type.
**Example:**

```
dim r as new RegistryFileTypeMBS
r.description="Monkeybread File"
```

**Notes:** The text to show in the explorer in column view.
(Read and Write property)

### 203.1.8 Extension as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The extension for this file type.
**Example:**

```
dim r as new RegistryFileTypeMBS

r.extension=".MBS"
```

**Notes:** The extension should start with a dot follow by 3 uppercase letters and it should be unique. But as there are more file types than combinations of 3 letters this may be difficult...
(Read and Write property)

### 203.1.9 FileType as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A internal unique signature for this file type.
**Example:**

```
dim r as new RegistryFileTypeMBS

r.FileType="MBSFile"
```

**Notes:** May contain any character except chr(0) and should be ANSI encoded.
(Read and Write property)

### 203.1.10 Iconfile as FolderItem

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The file with the icon.
**Example:**

```
dim r as new RegistryFileTypeMBS

r.iconfile=app.applicationfileMBS // it is my file ;-)
```

**Notes:** You can get the icon out of your application (ID 0 is the default icon).
But you can also use DLL files like "Shell32.dll" for some nice icons.
Last but not least you can use an ICO file which Iconographer can create for you from your Mac Icons.
(Read and Write property)

### 203.1.11 IconID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the Icon to use.
**Example:**

```
dim r as new RegistryFileTypeMBS

r.iconid=3
```

**Notes:** Your icon file may contain more than one icon. Here you can specify which one to use. First is ID 0.
(Read and Write property)

### 203.1.12 OpenDescription as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The text to show in the context menu for Open.
**Example:**

```
dim r as new RegistryFileTypeMBS

r.OpenDescription="Open MBS file"
```

**Notes:** If you don't provide an OpenDescription you'll get "Open".
Here you can describe the default action.
e.g. Stuffit Expander could say "Expand file".
(Read and Write property)

## 203.2 class RegistryKeyMBS

### 203.2.1 class RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you access to a Windows Registry Key.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.4
- MBS Xojo Plugins, version 17.4pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

### 203.2.2 Methods

### 203.2.3 CopyTree(keyname as string, Dest as RegistryKeyMBS) as boolean

MBS Win Plugin, Plugin Version: 17.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Copies the specified registry key, along with its values and subkeys, to the specified destination key.
**Notes:** Returns true on success and false on failure.

### 203.2.4 CreateKey(name as string, Use64bitRegistry as boolean = false) as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a new subkey.
**Notes:** If the key is allready present it is just opened.
Returns a registry key or nil on any error.

Use64bitRegistry: Pass true to create key in 64 bit view of the Registry instead of 32 bit view.

### 203.2.5 Delete(keyname as string) as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes the specified subkey key.
**Notes:** Windows 95: The Delete function deletes a subkey and all its descendants.

Windows NT: The Delete function deletes the specified subkey. The subkey to be deleted must not have subkeys.

With plugin version 3.2 the NT behavior is worked around to match the Windows 95 behavior. So all sub keys are deleted!

### 203.2.6 DeleteTree(keyname as string) as boolean

MBS Win Plugin, Plugin Version: 17.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes the subkeys and values of the specified key recursively.
**Example:**

```
dim t as RegistryKeyMBS = RegistryMBS.CurrentUser

// create some keys
dim n as RegistryKeyMBS = t.CreateKey("Hello")
dim w as RegistryKeyMBS = n.CreateKey("World")


w.Value("Test").asString = "Hello"

break // see in regedit

// delete it
if t.DeleteTree("Hello") then
MsgBox "deleted. ok"
else
MsgBox "delete failed"
end if
```

**Notes:** Returns true on success and false on failure.

### 203.2.7 Flush

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Writes all the attributes of the specified open key into the RegistryMBS.

### 203.2.8 Item(index as Integer) as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the key at the specified index.
**Notes:** May return nil on any error like missing access rights.
Some keys can't be opened, but ItemName() may return the name of the key.
See also:

- 203.2.9 Item(name as string) as RegistryKeyMBS 23620

### 203.2.9 Item(name as string) as RegistryKeyMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the key with the specified name.
**Notes:** May return nil on any error like missing access rights.
Some keys can't be opened, but ItemName() may return the name of the key.
See also:

- 203.2.8 Item(index as Integer) as RegistryKeyMBS 23620

### 203.2.10 ItemName(index as Integer) as string

MBS Win Plugin, Plugin Version: 6.3, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the key at the specified index.
**Notes:** May return "" on any error.

### 203.2.11 Value(index as Integer) as RegistryValueMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value at the specified index.
See also:

- 203.2.12 Value(name as string) as RegistryValueMBS 23620

### 203.2.12 Value(name as string) as RegistryValueMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value item with the specified name.
**Notes:** The value must not exists. So use this function to make a new key.

Use an empty name (e.g. "") for the default key value.

This method was named ValueItem in plugin version before 10.4.
See also:

- 203.2.11 Value(index as Integer) as RegistryValueMBS 23620

### 203.2.13 ValueName(index as Integer) as string

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the value with the given index.
**Notes:** May return "" on any error.

### 203.2.14 Properties

### 203.2.15 ItemCount as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the count of subkeys.
**Example:**

```
dim i,c as Integer
dim key as RegistryKeyMBS // the registry item

c=key.ItemCount-1
for i=0 to c
// do something
next
```

**Notes:** This property calls a System function to get the value. So save it in a local variable instead of calling it in a for loop. See the example.
(Read only property)

### 203.2.16 name as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the Key.
**Notes:** (Read only property)

### 203.2.17 ValueCount as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the count of values.
**Example:**

```
dim i,c as Integer
dim key as RegistryKeyMBS

c=key.ValueCount
for i=1 to c
// do something
next
```

**Notes:** This property calls a System function to get the value. So save it in a local variable instead of calling it in a for loop. See the example.
(Read only property)

## 203.3 class RegistryMBS

### 203.3.1 class RegistryMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you access to the Windows Registry.
**Notes:** Please send me an email if you need some functions which are now not included.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr10
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

### 203.3.2 Methods

### 203.3.3 classesRoot as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the ClassesRoot Tree.

### 203.3.4 CurrentConfig as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the CurrentConfig Tree.

### 203.3.5 CurrentUser as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the CurrentUser Tree.

### 203.3.6 getBinaryValue(keypath as string,valuename as string, Use64bitRegistry as boolean = false) as Memoryblock

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you a Memoryblock of the value called valuename in the key found at keypath.
**Example:**

```
const path="HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion"
dim r as new RegistryMBS
msgBox "This OS is: "+r.getBinaryValue(path, "ProductName").cstring(0)
```

**Notes:** Returns nil on any error.
Use64bitRegistry: Pass true to create key in 64 bit view of the Registry instead of 32 bit view.

### 203.3.7 getStringValue(keypath as string,valuename as string, Use64bitRegistry as boolean = false) as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you a String of the value called valuename in the key found at keypath.
**Example:**

```
const path="HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion"
dim r as new RegistryMBS
msgBox "This OS is: "+r.getStringValue(path, "ProductName")
```

**Notes:** Returns "" on any error.
Use64bitRegistry: Pass true to create key in 64 bit view of the Registry instead of 32 bit view.

### 203.3.8 Key(keypath as string, Use64bitRegistry as boolean = false) as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the given path of a key.
**Example:**

```
const path="HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion"
dim r as new RegistryMBS
msgBox r.Key(path).Name
```

**Notes:** If you need you can recreate this function in Xojo code to have some error checking. This function here will return nil on any error.

Use64bitRegistry: Pass true to create key in 64 bit view of the Registry instead of 32 bit view.

### 203.3.9 LocalMachine as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the LocalMachine Tree.

### 203.3.10 PerformanceData as RegistryKeyMBS

MBS Win Plugin, Plugin Version: 10.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the PerformanceData Tree.

### 203.3.11 Users as RegistryKeyMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you an RegistryKeyMBS object for the Users Tree.

## 203.4 class RegistryValueMBS

### 203.4.1 class RegistryValueMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Gives you access to a value of a RegistryMBS Key.
**Blog Entries**

- MBS Xojo Plugins, version 18.3pr6
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr11

### 203.4.2 Methods

### 203.4.3 Delete as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Deletes this value.
**Notes:** The RegistryValueMBS object should be destroyed after deleting.

### 203.4.4 SetBinaryMem(typ as Integer,data as Memoryblock)

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the value to the content of the memoryblock.
**Notes:** Type may be one of this values:

### 203.4.5 SetBinaryStr(typ as Integer,data as String)

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Sets the value to the content of the string.
**Notes:** Type may be one of this values:

| | |
|---|---|
| 0 | No value type |
| 1 | Nul terminated string |
| 2 | Nul terminated string (with environment variable references) |
| 3 | Free form binary |
| 4 | 32-bit number (LittleEndian) |
| 5 | 32-bit number (BigEndian) |
| 6 | Symbolic Link (unicode) |
| 7 | Multiple Unicode strings |
| 8 | Resource list in the resource map |
| 9 | Resource list in the hardware description |
| 10 | Resource requirements list |
| 11 | 64-bit number |

### 203.4.6 Properties

### 203.4.7 asBinary as Memoryblock

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as a memoryblock.
**Notes:** Can also be used to set the value.
(Read and Write property)

### 203.4.8 asBinaryString as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as a string with binary content.
**Notes:** This string may include chr(0).
Can also be used to set the value.
(Read and Write property)

### 203.4.9 asLong32 as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as a 32bit integer.
**Notes:** Can also be used to set the value.
(Read and Write property)

| | |
|---|---|
| 0 | No value type |
| 1 | Nul terminated string |
| 2 | Nul terminated string (with environment variable references) |
| 3 | Free form binary |
| 4 | 32-bit number (LittleEndian) |
| 5 | 32-bit number (BigEndian) |
| 6 | Symbolic Link (unicode) |
| 7 | Multiple Unicode strings |
| 8 | Resource list in the resource map |
| 9 | Resource list in the hardware description |
| 10 | Resource requirements list |
| 11 | 64-bit number |

### 203.4.10 asLong64 as Int64

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as a 64bit integer.
**Example:**

```
dim v as RegistryValueMBS
v.aslong64=v.aslong64+1 // add one
```

**Notes:** Can also be used to set the value.
(Read and Write property)

### 203.4.11 asString as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the value as a string.
**Notes:** Can also be used to set the value.
(Read and Write property)

### 203.4.12 isBinary as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the value is binary data.

**Notes:** (Read only property)

### 203.4.13 isLong32 as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the value is a 32 bit integer.
**Notes:** (Read only property)

### 203.4.14 isLong64 as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the value is a 64 bit Integer.
**Notes:** (Read only property)

### 203.4.15 isString as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns true if the value is a string.
**Notes:** (Read only property)

### 203.4.16 name as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the name of the Value.
**Notes:** (Read only property)

### 203.4.17 size as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the size of this value.
**Notes:** (Read only property)

### 203.4.18 type as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Returns the type of the value.
**Notes:** Type may be one of this values:

| | |
|---|---|
| 0 | No value type |
| 1 | Nul terminated string |
| 2 | Nul terminated string (with environment variable references) |
| 3 | Free form binary |
| 4 | 32-bit number (LittleEndian) |
| 5 | 32-bit number (BigEndian) |
| 6 | Symbolic Link (unicode) |
| 7 | Multiple Unicode strings |
| 8 | Resource list in the resource map |
| 9 | Resource list in the hardware description |
| 10 | Resource requirements list |
| 11 | 64-bit number |

(Read only property)

# Chapter 204

# Windows Shortcuts

## 204.1 class WindowsInternetShortcutMBS

### 204.1.1 class WindowsInternetShortcutMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to create internet shortcuts on Windows.
**Example:**

```
#if targetwin32
dim w as WindowsInternetShortcutMBS

w=new WindowsInternetShortcutMBS

w.URL="http://www.monkeybreadsoftware.de"
w.Command=3
w.Icon=windowsSystemFolder.child("shell32.dll")
w.iconID=41
w.Location=SpecialFolder.Desktop.child("A new link to explorer.lnk")
w.Working=volume(0)

if w.CreateInternetShortCut then
if w.AddInternetShortCutIcon then
msgBox "Shortcut created."
else
msgBox "Failed to add icon."
end if
else
msgBox "Failed to create shortcut."
end if
#endif
```

### 204.1.2 Methods

### 204.1.3 CreateInternetShortCut as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a shortcut on the specified location.
**Notes:** Version 10.1: Now adds the icon, too.

### 204.1.4 Properties

### 204.1.5 Command as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The code for the showing of the application.
**Notes:** Use e.g. 3 for full screen.
(Read and Write property)

### 204.1.6 Icon as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location of the icon file.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

### 204.1.7 IconID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the icon inside the icon file.
**Notes:** (Read and Write property)

### 204.1.8 Location as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location where the shortcut is created or modified.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

### 204.1.9 url as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The URL where the shortcut will point to.
**Notes:** (Read and Write property)

### 204.1.10 WorkingDirectory as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The working directory for the browser.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

## 204.2 class WindowsShortCutMBS

### 204.2.1 class WindowsShortCutMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to create shortcuts on Windows.
**Example:**

```
dim w as WindowsShortCutMBS

w = new WindowsShortCutMBS

w.Arguments = ""
w.Command = 3
w.Icon = specialfolder.system.child("shell32.dll").NativePath
w.iconID = 41
w.Location = SpecialFolder.Desktop.child("A new link to explorer.lnk").NativePath
w.Target = SpecialFolder.Windows.child("explorer.exe").NativePath
w.WorkingDirectory = volume(0).NativePath

if w.CreateShortCut then
msgBox "Shortcut created."
else
msgBox "Failed to create shortcut."
end if
```

**Blog Entries**

- MBS Xojo Plugins, version 21.6pr3

### 204.2.2 Methods

### 204.2.3 CreateShortCut as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a shortcut on the specified location.
**Notes:** Returns true on success and false on any error.
Version 10.1: Now adds the icon, too.

### 204.2.4 ResolveShortCut(DisableGUI as boolean=false, DisableSearch as boolean=false) as boolean

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Resolves the shortcut.
**Notes:** Fills the properties target, description, Argument, WorkingDirectory, Icon and IconID.
Returns false on any error.

Parameters added in plugin version 7.4:

DisableGUI:
Do not display a dialog box if the link cannot be resolved. The time-out duration will be set to the default value of 3,000 milliseconds (3 seconds).

DisableSearch:
Do not execute the search heuristics.

For more details check this page in Microsoft's documentation:
http://msdn.microsoft.com/en-us/library/bb774952(v=vs.85).aspx

### 204.2.5 Properties

### 204.2.6 Arguments as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Arguments to the application which is linked to the shortcut.
**Notes:** (Read and Write property)

### 204.2.7 Command as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The code for the showing of the application.
**Notes:** Constants which may be useful:

(Read and Write property)

| | |
|---|---|
| SW_HIDE | = 0 |
| SW_NORMAL | = 1 |
| SW_SHOWMINIMIZED | = 2 |
| SW_SHOWMAXIMIZED | = 3 |
| SW_MAXIMIZE | = 3 |
| SW_SHOWNOACTIVATE | = 4 |
| SW_SHOW | = 5 |
| SW_MINIMIZE | = 6 |
| SW_SHOWMINNOACTIVE | = 7 |
| SW_SHOWNA | = 8 |
| SW_RESTORE | = 9 |
| SW_SHOWDEFAULT | = 10 |
| SW_FORCEMINIMIZE | = 11 |

### 204.2.8 Description as String

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The description of the shortcut.
**Notes:** (Read and Write property)

### 204.2.9 Icon as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location of the icon file.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

### 204.2.10 IconID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The ID of the icon inside the icon file.
**Notes:** (Read and Write property)

### 204.2.11 Location as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The location where the shortcut is created or modified.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)

(Read and Write property)

### 204.2.12 ParentWindow as Variant

MBS Win Plugin, Plugin Version: 3.4, Platform: Windows, Targets: Desktop only.

**Function:** The parent window used when a dialog must be opened.
**Notes:** Can reference a Window or DesktopWindow object.
(Read and Write property)

### 204.2.13 Target as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The target where the shortcut will point to.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

### 204.2.14 WorkingDirectory as String

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The working directory of this shortcut.
**Notes:** (Changed from FolderItem to String in plugin version 3.4)
(Read and Write property)

# Chapter 205

# Windows Store

## 205.1 class WindowsStoreAppLicenseMBS

### 205.1.1 class WindowsStoreAppLicenseMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides license info for the current app, including licenses for products that are offered by the app.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- News from the MBS Xojo Plugins Version 20.4
- Selling Xojo apps on Windows Store

### 205.1.2 Methods

### 205.1.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.1.4 Properties

### 205.1.5 AddOnLicenses as Dictionary

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the collection of licenses for durable add-ons for which the user has entitlements to use.
**Notes:** This property does not include licenses for consumable add-ons.

Returns a map of key and value pairs, where each key is the Store ID of an add-on SKU from the Microsoft Store catalog and each value is a StoreLicense object that contains license info for the add-on.

This collection contains durable add-on licenses that are currently valid. When a license is expired or no longer valid, it will no longer be available in this collection.
(Read only property)

### 205.1.6 ExpirationDate as Int64

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the expiration date and time for the app license.
**Notes:** The expiration date and time for the app license, relative to the system clock.

For usage-limited trials, the expiration date is December 31, 9999. Usage-limited trials are currently available only to some developer accounts in Xbox managed partner programs.
(Read only property)

### 205.1.7 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets complete license data in JSON format.
**Notes:** Use the ExtendedJsonData property to access the complete data for the StoreAppLicense object as a JSON-formatted string in your code.
(Read only property)

### 205.1.8 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.

**Notes:** (Read only property)

### 205.1.9 IsActive as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the license is valid and provides the current user an entitlement to use the app.
**Notes:** (Read only property)

### 205.1.10 IsTrial as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the license is a trial license.
**Notes:** (Read only property)

### 205.1.11 IsTrialOwnedByThisUser as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the current user has an entitlement for the usage-limited trial that is associated with this app license.
**Notes:** This property is intended to be used by developers who have configured their app as a usage-limited trial in Partner Center. Usage-limited trials are currently available only to some developer accounts in Xbox managed partner programs.
(Read only property)

### 205.1.12 SkuStoreId as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the Store ID of the licensed app SKU from the Microsoft Store catalog.
**Notes:** (Read only property)

### 205.1.13 TrialTimeRemaining as Double

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the remaining time for the usage-limited trial that is associated with this app license.
**Notes:** This property is intended to be used by developers who have configured their app as a usage-limited trial in Partner Center. Usage-limited trials are currently available only to some developer accounts in Xbox managed partner programs.

Value is in seconds.
(Read only property)

### 205.1.14 TrialUniqueId as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a unique ID that identifies the combination of the current user and the usage-limited trial that is associated with this app license.
**Notes:** This property is intended to be used by developers who have configured their app as a usage-limited trial in Partner Center. Usage-limited trials are currently available only to some developer accounts in Xbox managed partner programs.
(Read only property)

## 205.2 class WindowsStoreContextMBS

### 205.2.1 class WindowsStoreContextMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The base class for Windows Store APIs.
**Example:**

```
dim context as New WindowsStoreContextMBS(Window1)
```

**Notes:** Provides members you can use to access and manage Microsoft Store-related data for the current app. For example, you can use members of this class to get Microsoft Store listing and license info for the current app, purchase the current app or products that are offered by the app, or download and install package updates for the app.

Requires Windows 10 Anniversary Edition (introduced in 10.0.14393.0)

Uses delegates, so only available for Xojo 2013 or newer.

see also
https://docs.microsoft.com/en-us/uwp/api/windows.services.store.storecontext?view=winrt-19041
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr4
- MBS Xojo Plugins, version 23.1pr3
- MBS Xojo Plugins, version 21.6pr3
- News from the MBS Xojo Plugins Version 20.4
- Selling Xojo apps on Windows Store
- MBS Xojo Plugins, version 20.4pr4

### 205.2.2 Methods

### 205.2.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.
See also:

- 205.2.4 Constructor(Parent as DesktopWindow) 23644

• 205.2.5 Constructor(Parent as Window) 23644

### 205.2.4 Constructor(Parent as DesktopWindow)

MBS WinFrameworks Plugin, Plugin Version: 22.0, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Initializes store and sets parent window to use for dialogs.
See also:

• 205.2.3 Constructor 23643

• 205.2.5 Constructor(Parent as Window) 23644

### 205.2.5 Constructor(Parent as Window)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The constructor.
**Notes:** Initializes store and sets parent window to use for dialogs.
See also:

• 205.2.3 Constructor 23643

• 205.2.4 Constructor(Parent as DesktopWindow) 23644

### 205.2.6 GetAppLicenseAsync(CompletionHandler as GetAppLicenseCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets license info for the current app, including licenses for add-ons for the current app.
**Example:**

```
dim context as New WindowsStoreContextMBS(Window1)
context.GetAppLicenseAsync AddressOf GetAppLicenseCompleted
```

**Notes:** Asynchronous version, which returns quickly and calls the given delegate later when done.

The StoreAppLicense object returned by this method provides access to licenses for add-ons and other info, such as whether the license is active. If this method is called while the device is offline, it returns the cached value of the current licenses on the device.

### 205.2.7 GetAppLicenseSync as WindowsStoreAppLicenseMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets license info for the current app, including licenses for add-ons for the current app.
**Notes:** Synchronous version, which waits for the result.

The StoreAppLicense object returned by this method provides access to licenses for add-ons and other info, such as whether the license is active. If this method is called while the device is offline, it returns the cached value of the current licenses on the device.

### 205.2.8 GetAssociatedStoreProductsAsync(productKinds() as String, CompletionHandler as GetStoreProductsCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets Microsoft Store info for the add-ons of the current app for which the user has purchased.
**Notes:** productKinds: An array of strings that specify the types of add-ons for which you want to retrieve info.

### 205.2.9 GetStoreProductForCurrentAppAsync(CompletionHandler as GetStoreProductForCurrentAppCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets Microsoft Store listing info for the current app and provides access to a method that you can use to purchase the app for the current user.
**Example:**

```
dim context as New WindowsStoreContextMBS(Window1)
context.GetStoreProductForCurrentAppAsync AddressOf GetStoreProductForCurrentAppCompleted
```

### 205.2.10 GetStoreProductsAsync(productKinds() as String, storeIds() as String, CompletionHandler as GetStoreProductsCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets Microsoft Store listing info for the specified products that are associated with the current app.
**Example:**

```
// please change ID for the item to find
```

```
Dim StoreIds() As String = Array("12345", "67890")
Dim ProductKinds() As String = Array("**Application**", "**Game**", "**Consumable**", "**UnmanagedConsumable**", "**Durable**")

context.GetStoreProductsAsync ProductKinds, StoreIds, AddressOf GetStoreProductsAsyncCompleted
```

**Notes:** productKinds: An array of strings that specify the types of products for which you want to retrieve listing info.
storeIds: An array of the Store ID strings for the products for which you want to retrieve listing info.

### 205.2.11 GetUserCollectionAsync(productKinds() as String, CompletionHandler as GetStoreProductsCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets Microsoft Store info for the add-ons of the current app for which the user has purchased.
**Notes:** productKinds: An array of strings that specify the types of add-ons for which you want to retrieve info.

### 205.2.12 RequestPurchaseAsync(CompletionHandler as RequestPurchaseCompletedMBS, StoreID as String, PurchaseProperties as WindowsStorePurchasePropertiesMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Requests the purchase for the specified app or add-on and displays the UI that is used to complete the transaction via the Microsoft Store.
**Example:**

```
dim context as New WindowsStoreContextMBS(Window1)

// please change ID for the item to purchase
Const StoreID = "9NCMFFPJRVHC"

context.RequestPurchaseAsync AddressOf RequestPurchaseCompleted, StoreID
```

**Notes:** This method provides the option to specify additional details for a specific offer within a large catalog of products that are represented by a single listing in the Microsoft Store, including the product name to display to the user during the purchase.

StoreID: The Store ID of the app or the add-on that you want to purchase for the current user.
PurchaseProperties: The optional purchase properties with display name or additional JSON.

### 205.2.13 RequestRateAndReviewAppAsync(CompletionHandler as RequestRateAndReviewAppCompletedMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Requests the user to rate and review the app.
**Example:**

```
dim context as New WindowsStoreContextMBS(Window1)
context.RequestRateAndReviewAppAsync AddressOf RequestRateAndReviewAppCompleted
```

**Notes:** This method will display the UI for the user to select a Store rating and add an optional Store review for the product.
The delegate will later be called with the result.

### 205.2.14 Properties

### 205.2.15 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.2.16 Parent as Variant

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The parent window for dialogs.
**Notes:** Can reference a Window or DesktopWindow object.
(Read and Write property)

### 205.2.17 Events

### 205.2.18 OfflineLicensesChanged

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: .

**Function:** Raised when the status of the app's license changes (for example, the trial period has expired or the user has purchased the full version of the app).
**Notes:** When this event is raised, you can get the latest app license from the Microsoft Store by calling the GetAppLicenseAsync method. The WindowsStoreAppLicenseMBS object returned by this method also contains the latest add-on licenses for the app in the AddOnLicenses property.

### 205.2.19 Constants

Asynchronous Status

| Constant | Value | Description |
|---|---|---|
| kAsyncStatusCanceled | 2 | The operation was canceled. |
| kAsyncStatusCompleted | 1 | The operation has completed. |
| kAsyncStatusError | 3 | The operation has encountered an error. |
| kAsyncStatusStarted | 0 | The operation has started. |

### 205.2.20 Delegates

### 205.2.21 GetAppLicenseCompletedMBS(ErrorCode as Integer, appLicense as WindowsStoreAppLicenseMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The delegate called when app license data was retrieved.
**Notes:** ErrorCode: The Windows error code in case of a failure.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3

### 205.2.22 GetStoreProductForCurrentAppCompletedMBS(ErrorCode as Integer, result as WindowsStoreProductResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The delegate called when query is done.
**Notes:** ErrorCode: The Windows error code in case of a failure.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3

### 205.2.23 GetStoreProductsCompletedMBS(ErrorCode as Integer, result as WindowsStoreProductQueryResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The delegate for receiving results from product query calls.
**Notes:** ErrorCode: The Windows error code in case of a failure.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3

### 205.2.24 RequestPurchaseCompletedMBS(ErrorCode as Integer, result as WindowsStorePurchaseResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The purchase completed and you can query the status.
**Notes:** ErrorCode: The Windows error code in case of a failure.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3

### 205.2.25 RequestRateAndReviewAppCompletedMBS(ErrorCode as Integer, result as WindowsStoreRateAndReviewResultMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The delegate used for RequestRateAndReviewAppAsync method.
**Notes:** ErrorCode: The Windows error code in case of a failure.
**Blog Entries**

- MBS Xojo Plugins, version 23.1pr3

## 205.3 class WindowsStoreExceptionMBS

### 205.3.1 class WindowsStoreExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The exception class to report exceptions with Windows Store.
**Notes:** Subclass of the RuntimeException class.
**Blog Entries**

- Selling Xojo apps on Windows Store

## 205.4 class WindowsStoreImageMBS

### 205.4.1 class WindowsStoreImageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Represents an image that is associated with a product listing in the Windows Store.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr3

### 205.4.2 Methods

### 205.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.4.4 Properties

### 205.4.5 Caption as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the caption for the image.
**Notes:** (Read only property)

### 205.4.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.4.7 Height as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the height of the image, in pixels.
**Notes:** (Read only property)

### 205.4.8 ImagePurposeTag as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the tag for the image.
**Notes:** (Read only property)

### 205.4.9 Uri as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URI of the image.
**Notes:** (Read only property)

### 205.4.10 Width as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the width of the image, in pixels.
**Notes:** (Read only property)

## 205.5 class WindowsStoreLicenseMBS

### 205.5.1 class WindowsStoreLicenseMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Provides license info for a durable add-on that is associated with the current app.
**Notes:** To retrieve StoreLicense objects for the durable add-ons for the current app, use the WindowsStoreAppLicenseMBS.AddOnLicenses property. This property contains only the add-on licenses that are still valid and provide the current user with an entitlement to use the add-on. When an add-on license expires or is longer valid, it will no longer be available in the WindowsStoreAppLicenseMBS.AddOnLicenses collection. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr3

### 205.5.2 Methods

### 205.5.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.5.4 Properties

### 205.5.5 ExpirationDate as Int64

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the expiration date and time for the add-on license.
**Notes:** (Read only property)

### 205.5.6 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets complete license data in JSON format.
**Notes:** (Read only property)

### 205.5.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.5.8 InAppOfferToken as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the Store ID of the licensed add-on SKU from the Microsoft Store catalog.
**Notes:** (Read only property)

### 205.5.9 IsActive as Boolean

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** This property is reserved for future use, and it is not intended to be used in the current release.
**Notes:** Currently, it always returns true.
(Read only property)

### 205.5.10 SkuStoreId as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets in the product ID for the add-on.
**Notes:** (Read only property)

## 205.6 class WindowsStorePriceMBS

### 205.6.1 class WindowsStorePriceMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Contains pricing info for a product listing in the Microsoft Store.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- Selling Xojo apps on Windows Store

### 205.6.2 Methods

### 205.6.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.6.4 Properties

### 205.6.5 CurrencyCode as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the ISO 4217 currency code for the market of the current user.
**Notes:** (Read only property)

### 205.6.6 FormattedBasePrice as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the base price for the product with the appropriate formatting for the market of the current user.
**Notes:** (Read only property)

### 205.6.7 FormattedPrice as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the purchase price for the product with the appropriate formatting for the market of the current user.
**Notes:** (Read only property)

### 205.6.8 FormattedRecurrencePrice as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the recurring price for the product with the appropriate formatting for the market of the current user, if recurring billing is enabled for this product.
**Notes:** (Read only property)

### 205.6.9 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.6.10 IsOnSale as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the product is on sale.
**Notes:** (Read only property)

### 205.6.11 SaleEndDate as Int64

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the end date for the sale period for the product, if the product is on sale.
**Notes:** (Read only property)

## 205.7 class WindowsStoreProductMBS

### 205.7.1 class WindowsStoreProductMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Represents a product that is available in the Microsoft Store.
**Notes:** Products in the Store are organized in a hierarcy of product, SKU, and availability objects. Products are represented by StoreProduct objects. The SKUs for each product are represented by StoreSku objects, and the availabilities for each SKU are represented by StoreAvailability objects. For more information, see In-app purchases and trials.
To retrieve a StoreProduct object for the current app, use the GetStoreProductForCurrentAppAsync method.
To retrieve StoreProduct objects for products that can be purchased from within the current app, use these methods.

- GetAssociatedStoreProductsAsync
- GetAssociatedStoreProductsWithPagingAsync
- GetStoreProductsAsync
- GetUserCollectionAsync
- GetUserCollectionWithPagingAsync

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- News from the MBS Xojo Plugins Version 20.4
- Selling Xojo apps on Windows Store

### 205.7.2 Methods

### 205.7.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.7.4 GetIsAnySkuInstalledAsync(CompletionHandler as GetIsAnySkuInstalledAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Indicates whether any SKU of this product is installed on the current device.
**Notes:** This method is intended to be used for products that have downloadable content (DLC).

Starts an asynchronous operation that, on successful completion, returns true if a SKU of this product is installed on the current device; otherwise, false.

### 205.7.5 Images as WindowsStoreImageMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the images from the Windows Store listing for the product.
**Notes:** Returns a collection of WindowsStoreImageMBS objects that represent the images from the Windows Store listing for the product.

### 205.7.6 Keywords as String()

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the keywords that are associated with the product in Partner Center.
**Notes:** This property only applies to StoreProduct objects that represent add-ons. These strings correspond to the value of the Keywords field in the properties page for the add-on in Partner Center.

### 205.7.7 RequestPurchaseAsync(CompletionHandler as WindowsStoreContextMBS.RequestPurchaseCompletedMBS, PurchaseProperties as WindowsStorePurchasePropertiesMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Requests the purchase for the specified app or add-on and displays the UI that is used to complete the transaction via the Microsoft Store.
**Notes:** This method provides the option to specify additional details for a specific offer within a large catalog of products that are represented by a single listing in the Microsoft Store, including the product name to display to the user during the purchase.

StoreID: The Store ID of the app or the add-on that you want to purchase for the current user.
PurchaseProperties: The optional purchase properties with display name or additional JSON.

### 205.7.8 SKUs as WindowsStoreSKUMBS()

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the list of available SKUs for the product.

### 205.7.9 Videos as WindowsStoreVideoMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the videos from the Windows Store listing for the product.
**Notes:** Returns a collection of WindowsStoreVideoMBS objects that represent the videos from the Windows Store listing for the product.

### 205.7.10 Properties

### 205.7.11 Description as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the product description from the Microsoft Store listing.
**Notes:** (Read only property)

### 205.7.12 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets complete data for the product from the Store in JSON format.
**Notes:** Use the ExtendedJsonData property to access the complete data for the StoreProduct object as a JSON-formatted string in your code.
(Read only property)

### 205.7.13 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.7.14 HasDigitalDownload as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the product has optional downloadable content (DLC).
**Notes:** (Read only property)

### 205.7.15 InAppOfferToken as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the product ID for this product, if the current StoreProduct represents an add-on.
**Notes:** Returns the product ID for this product, if the current StoreProduct represents an add-on.
(Read only property)

### 205.7.16 IsInUserCollection as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the current user has an entitlement to use the default SKU of the product.
**Notes:** (Read only property)

### 205.7.17 Language as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the language for the data in the Microsoft Store listing for the product.
**Notes:** (Read only property)

### 205.7.18 LinkURI as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URI to the Microsoft Store listing for the product.
**Notes:** An example URI is https://www.microsoft.com/store/apps/<Store ID for the product>. If there is no listing page for the product, this link resolves to the Microsoft Store home page.
(Read only property)

### 205.7.19 Price as WindowsStorePriceMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the price for the default SKU and availability for the product.
**Notes:** (Read only property)

### 205.7.20 ProductKind as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the type of the product.
**Notes:** These values are currently supported: Application, Game, Consumable, UnmanagedConsumable, and Durable.

see
https://docs.microsoft.com/en-us/uwp/api/windows.services.store.storeproduct.productkind?view=winrt-19041#Windows_
(Read only property)

### 205.7.21 StoreId as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the Store ID for this product.
**Notes:** For an app, this property corresponds to the Store ID that is available on the App identity page for the app in Partner Center.
(Read only property)

### 205.7.22 Title as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the product title from the Microsoft Store listing.
**Notes:** (Read only property)

### 205.7.23 Delegates

### 205.7.24 GetIsAnySkuInstalledAsyncCompletedMBS(ErrorCode as Integer, Installed as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The delegate triggered by GetIsAnySkuInstalledAsync when completed.

## 205.8 class WindowsStoreProductQueryResultMBS

### 205.8.1 class WindowsStoreProductQueryResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides response data for a request to retrieve details about products that can be purchased from within the current app.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 205.8.2 Methods

### 205.8.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.8.4 Properties

### 205.8.5 ExtendedError as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the collection of products returned by the request.
**Notes:** A dictionary of key and value pairs, where each key is a Store ID for the add-on and the value is a StoreProduct object that represents the add-on.
(Read only property)

### 205.8.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.8.7 Products as Dictionary

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the error code for the request, if the operation encountered an error.
**Notes:** (Read only property)

## 205.9 class WindowsStoreProductResultMBS

### 205.9.1 class WindowsStoreProductResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides response data for a request to retrieve details about the current app.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Selling Xojo apps on Windows Store

### 205.9.2 Methods

### 205.9.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.9.4 Properties

### 205.9.5 ExtendedError as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the error code for the request, if the operation encountered an error.
**Notes:** (Read only property)

### 205.9.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.9.7 Product as WindowsStoreProductMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets info about the current app.
**Notes:** (Read only property)

# 205.10 class WindowsStorePurchasePropertiesMBS

## 205.10.1 class WindowsStorePurchasePropertiesMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Contains additional details that you can pass to a purchase request for a product, including the product name to display to the user during the purchase.
**Notes:** The RequestPurchaseAsync methods of the WindowsStoreContextMBS, WindowsStoreProductMBS, WindowsStoreSkuMBS, and WindowsStoreAvailabilityMBS classes have overloads that accept an argument of this type.
**Blog Entries**

- MBS Xojo Plugins, version 20.4pr5
- Selling Xojo apps on Windows Store

## 205.10.2 Methods

## 205.10.3 Constructor(Name as String = "")

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Initializes a new instance of the StorePurchaseProperties class.
**Notes:** Optionally pass name.

## 205.10.4 Properties

## 205.10.5 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets or sets a JSON-formatted string that contains extended data to pass with the purchase request to the Microsoft Store.
**Notes:** Use the ExtendedJsonData property to access the complete data for the StorePurchaseProperties object as a JSON-formatted string in your code. For more information about the structure of the data, see Data schemas for Store products.
If you want to associate the purchase request with a custom campaign, you can add a field named DevOfferId to the JSON string that is returned by this property and then assign the updated string to this property. You can then retrieve this value later by accessing the DeveloperOfferId property of a StoreCollectionData object. Here is an example JSON string that includes a DevOfferId field: " { \"DevOfferId\": \"your campaign ID\" } ".
(Read and Write property)

### 205.10.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.10.7 Name as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets or sets the product name that is displayed to the user during the purchase.
**Notes:** The specified name appears in the title bar of the purchase UI.
(Read and Write property)

## 205.11 class WindowsStorePurchaseResultMBS

### 205.11.1 class WindowsStorePurchaseResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides response data for a request to purchase an app or product that is offered by the app.
**Notes:** The RequestPurchaseAsync methods of the StoreContext, StoreProduct, StoreSku, or StoreAvailability classes return an object of this type.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Selling Xojo apps on Windows Store

### 205.11.2 Methods

### 205.11.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.11.4 Properties

### 205.11.5 ExtendedError as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the error code for the purchase request, if the operation encountered an error.
**Notes:** (Read only property)

### 205.11.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.11.7 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the status of the purchase request.
**Notes:** (Read only property)

### 205.11.8 Constants

Purchase Status

| Constant | Value | Description |
|---|---|---|
| kStatusAlreadyPurchased | 1 | The current user has already purchased the specified app or add-on. |
| kStatusNetworkError | 3 | The purchase request did not succeed because of a network connectivity error. |
| kStatusNotPurchased | 2 | The purchase request did not succeed. |
| kStatusServerError | 4 | The purchase request did not succeed because of a server error returned by the Microsoft Store. |
| kStatusSucceeded | 0 | The purchase request succeeded. |

## 205.12 class WindowsStoreRateAndReviewResultMBS

### 205.12.1 class WindowsStoreRateAndReviewResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides response data for a request to rate and review the product.
**Notes:** Requires Windows 10, version 1809 (introduced in 10.0.17763.0)
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Selling Xojo apps on Windows Store

### 205.12.2 Methods

### 205.12.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.12.4 Properties

### 205.12.5 ExtendedError as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the error code for the request, if the operation encountered an error.
**Notes:** (Read only property)

### 205.12.6 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the complete result data for a rate and review request in JSON format.
**Notes:** This includes information to determine if a user aborted the dialog and error details if the call was not successful.

Use the ExtendedJsonData property to access the complete data for the StoreRateAndReviewResult object as a JSON-formatted string in your code.
JSON Schema:

{ "type": "object", "properties": { "status": { "enum": [ "success", "aborted" ] } , "data": { "type": "object", "properties": { "updated": { "type": "boolean" } } , "required": [ "updated" ] } , "errorDetails": { "type": "string" } } , "required": [ "status", "errorDetails" ] }
(Read only property)

### 205.12.7 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.12.8 Status as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the status for the rate and review request for the product.
**Notes:** (Read only property)

### 205.12.9 WasUpdated as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the request to rate and review had a successful updated.
**Notes:** (Read only property)

### 205.12.10 Constants

Review Status

| Constant | Value | Description |
|---|---|---|
| kStatusCanceledByUser | 1 | The request was canceled by the user. |
| kStatusError | 3 | The request encountered an error. |
| kStatusNetworkError | 2 | The request encountered a network error. |
| kStatusSucceeded | 0 | The request was successful. |

# 205.13 class WindowsStoreSKUMBS

## 205.13.1 class WindowsStoreSKUMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Provides info for a stock keeping unit (SKU) of a product in the Microsoft Store.
**Notes:** A SKU is a code that uniquely identifies a particular version of a product or service. It is a very common term used in the field of inventory management. Products in the Store are organized in a hierarcy of product, SKU, and availability objects. Products are represented by StoreProduct objects. The SKUs for each product are represented by StoreSku objects, and the availabilities for each SKU are represented by StoreAvailability objects. For more information, see In-app purchases and trials.
To access the SKUs for a product, use the Skus property of the StoreProduct for the product in which you are interested.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr5
- Selling Xojo apps on Windows Store

## 205.13.2 Methods

## 205.13.3 BundledSKUs as String()

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the list of Store IDs for the apps or add-ons that are bundled with this product SKU.

## 205.13.4 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

## 205.13.5 GetIsInstalledAsync(CompletionHandler as GetIsInstalledAsyncCompletedMBS)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Indicates whether this product SKU is installed on the current device.
**Notes:** Starts an asynchronous operation that, on successful completion, returns true if this product SKU is installed on the current device; otherwise, false.

### 205.13.6 Images as WindowsStoreImageMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the images from the Microsoft Store listing for the product SKU.
**Notes:** Returns a collection of WindowsStoreImageMBS objects that represent the images from the Microsoft Store listing for the product SKU.

### 205.13.7 RequestPurchaseAsync(CompletionHandler as WindowsStoreContextMBS.RequestPurchaseCompletedMBS, PurchaseProperties as WindowsStorePurchasePropertiesMBS = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Requests the purchase for the specified app or add-on and displays the UI that is used to complete the transaction via the Microsoft Store.
**Notes:** This method provides the option to specify additional details for a specific offer within a large catalog of products that are represented by a single listing in the Microsoft Store, including the product name to display to the user during the purchase.

StoreID: The Store ID of the app or the add-on that you want to purchase for the current user.
PurchaseProperties: The optional purchase properties with display name or additional JSON.

### 205.13.8 Videos as WindowsStoreVideoMBS()

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the videos from the Microsoft Store listing for the product SKU.
**Notes:** Returns a collection of WindowsStoreVideoMBS objects that represent the videos from the Microsoft Store listing for the product SKU.

### 205.13.9 Properties

### 205.13.10 CustomDeveloperData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the custom developer data string (also called a tag) that contains custom information about the add-on that this product SKU represents.
**Notes:** The custom developer data provides a way for developers to associate custom contextual information with an add-on. For more information about setting this value for an add-on, see Enter add-on properties.
(Read only property)

### 205.13.11 Description as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the product SKU description from the Microsoft Store listing.
**Notes:** (Read only property)

### 205.13.12 ExtendedJsonData as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets complete data for the current product SKU from the Store in JSON format.
**Notes:** Use the ExtendedJsonData property to access the complete data for the StoreSku object as a JSON-formatted string in your code.
(Read only property)

### 205.13.13 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.13.14 IsInUserCollection as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the current user has an entitlement to use the current product SKU.
**Notes:** (Read only property)

### 205.13.15 IsSubscription as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the current product SKU is a subscription with recurring billing.
**Notes:** For more information about the subscription, see the WindowsStoreSubscriptionInfoMBS class and SubscriptionInfo property.
(Read only property)

### 205.13.16 IsTrial as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets a value that indicates whether the current product SKU is a trial SKU.
**Notes:** (Read only property)

### 205.13.17 Language as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the language for the data in the Microsoft Store listing for the product SKU.
**Notes:** (Read only property)

### 205.13.18 Price as WindowsStorePriceMBS

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the price of the default availability for this product SKU.
**Notes:** (Read only property)

### 205.13.19 StoreId as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the Store ID of this product SKU.
**Notes:** The Store ID returned by this property has the format <product Store ID>/<SKU Store ID>, where:

- <product Store ID>is a 12-character alpha-numeric string, such as 9NBLGGH69M0B. This Store ID

is available in Partner Center, and it is returned by the StoreId property of the related StoreProduct object.

- <SKU Store ID>is a 4-character alpha-numeric string that identifies the SKU. An example complete Store ID returned by this property is 9NBLGGH69M0B/000N.

(Read only property)

### 205.13.20 Title as String

MBS WinFrameworks Plugin, Plugin Version: 20.4, Platform: Windows, Targets: Desktop only.

**Function:** Gets the product SKU title from the Microsoft Store listing.
**Notes:** (Read only property)

### 205.13.21 Delegates

### 205.13.22 GetIsInstalledAsyncCompletedMBS(ErrorCode as Integer, Installed as Boolean)

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The delegate triggered by GetIsInstalledAsync when finished.

## 205.14 class WindowsStoreVideoMBS

### 205.14.1 class WindowsStoreVideoMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Represents a video that is associated with a product listing in the Microsoft Store.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New in MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr3

### 205.14.2 Methods

### 205.14.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 205.14.4 Properties

### 205.14.5 Caption as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the caption for the video.
**Notes:** (Read only property)

### 205.14.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 205.14.7 Height as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the height of the video, in pixels.
**Notes:** (Read only property)

### 205.14.8 PreviewImage as WindowsStoreImageMBS

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the preview image that is displayed for the video.
**Notes:** (Read only property)

### 205.14.9 Uri as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the URI of the video.
**Notes:** (Read only property)

### 205.14.10 VideoPurposeTag as String

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the tag for the video.
**Notes:** (Read only property)

### 205.14.11 Width as Integer

MBS WinFrameworks Plugin, Plugin Version: 23.1, Platform: Windows, Targets: Desktop only.

**Function:** Gets the width of the video, in pixels.
**Notes:** (Read only property)

# Chapter 206

# Windows System Tray

## 206.1 Globals

### 206.1.1 HIconFromFileMBS(IconFile as FolderItem, IconID as Integer) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Windows Icon Handle for an icon loaded fromt he given icon file.
**Notes:** What image depths are used and supported depends on the Windows version.
IconID = 0 points to the first icon in the file.
Returns 0 on failure.

The icon file can be .ico, .exe, .dll or similar files with windows icon resource.
This function is useful for declares where you have to pass a HICON parameter.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr2

### 206.1.2 HIconFromPicturesMBS(Icon as picture, Mask as picture) as Integer

MBS Win Plugin, Plugin Version: 11.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Creates a Windows Icon Handle with the given pictures.
**Notes:** What image depths are used and supported depends on the Windows version.
Returns 0 on failure.
This function is useful for declares where you have to pass a HICON parameter.
**Blog Entries**

- MBS Plugins 11.1 Release notes
- MBS REALbasic Plugins, version 11.1pr2

## 206.2 class WindowsSystemTrayMBS

### 206.2.1 class WindowsSystemTrayMBS

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class to create an item in the system tray.
**Blog Entries**

- MBS Real Studio Plugins, version 11.3pr10
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr8

### 206.2.2 Methods

### 206.2.3 Add as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Adds the item to the system tray.
**Example:**

```
dim e as WindowsSystemTrayMBS // your system tray object

if e.add then
list.addrow "Added icon."
else
list.addrow "Failed to add icon."
end if
```

**Notes:** Returns true if successfull.
You can change the Icon&Mask or the Tooltip string.

### 206.2.4 Available as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the system tray functions are available.
**Notes:** Returns true on Windows 95 and newer.
Returns false on Mac OS and Linux.

### 206.2.5 Modify as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Modifies the item to the system tray.
**Notes:** Returns true if successfull.
You can change the Icon&Mask or the Tooltip string.

### 206.2.6 Remove as boolean

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Removes the item from the system tray.
**Notes:** Returns true if successfull.

### 206.2.7 SetFocus as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** This method resets focus back to the system try area.
**Notes:** May be useful to call as cleanup after some context menu was shown.

### 206.2.8 SetIconFile(IconFile as FolderItem, IconID as Integer) as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads an icon from the given file.
**Example:**

```
dim wst as WindowsSystemTrayMBS // your system tray

call wst.SetIconFile(file,1)
```

**Notes:** Returns true on success and false on failure.
What image depths are used and supported depends on the Windows version.

IconID = 0 points to the first icon in the file.

The icon file can be .ico, .exe, .dll or similar files with windows icon resource.

### 206.2.9 SetIconPicture(Icon as picture, Mask as picture) as boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Loads the icon from the given picture with mask.
**Example:**

```
dim myicon as picture // your picture
dim mymask as picture // the mask for the picture
dim wst as WindowsSystemTrayMBS // your system tray

call wst.SetIconPicture(myicon, mymask)
```

**Notes:** Returns true on success and false on failure.
What image depths are used and supported depends on the Windows version.

Type is 0 for a small icon and 1 for a big icon.

### 206.2.10 Properties

### 206.2.11 BalloonMode as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The balloon mode.
**Example:**

```
dim s as WindowsSystemTrayMBS

s.BalloonText = "The text for the balloon."
s.BalloonTitle = "The title for the balloon"
s.BalloonMode = 0 // Error mode
```

**Notes:** 0 is Error, 1 is Info and 2 is warning.
(Read and Write property)

### 206.2.12 BalloonText as string

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The balloon text to show.
**Example:**

```
dim wst as WindowsSystemTrayMBS // your system tray object

wst.BalloonTitle="Warning"
wst.BalloonText="You have not clicked on me the last 10 minutes."
call wst.modify
```

**Notes:** If BalloonTitle or BalloonText are not empty the balloon is shown when you call modify.
(Read and Write property)

### 206.2.13 BalloonTimeout as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The balloon timeout in milliseconds.
**Example:**

```
dim s as WindowsSystemTrayMBS

s.BalloonText = "The text for the balloon."
s.BalloonTitle = "The title for the balloon"
s.BalloonMode = 0 // Error mode
s.BalloonTimeout = 30000
```

**Notes:** A value between 10000 and 30000.
Note that Timeout is valid only in Windows 2000 and Windows XP.
(Read and Write property)
See also:

- 206.2.22 BalloonTimeout(id as Integer, MouseX as Integer, MouseY as Integer) 23687

### 206.2.14 BalloonTitle as string

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The title of the balloon tooltip.
**Example:**

```
dim s as WindowsSystemTrayMBS

s.BalloonText = "The text for the balloon."
s.BalloonTitle = "The title for the balloon"
s.BalloonMode = 0 // Error mode
```

**Notes:** If BalloonTitle or BalloonText are not empty the balloon is shown when you call modify.
(Read and Write property)

### 206.2.15 IconHandle as Integer

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The icon handle currently used for the tray object.
**Notes:** zero if no handle is there.
(Read and Write property)

### 206.2.16 ID as Integer

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** If you have more than one icon in the system tray, use this ID to see which one is referred to inside an event.
**Notes:** (Read and Write property)

### 206.2.17 Tooltip as string

MBS Win Plugin, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The help string for the tooltip.
**Example:**

```
dim e as WindowsSystemTrayMBS // global

e=new WindowsSystemTrayMBS
e.ID=12345678
e.Tooltip="some text"
e.BalloonText="some text"
e.BalloonTitle="some text"
e.BalloonMode=0
```

**Notes:** Limited to 63 characters.
(Read and Write property)

### 206.2.18 UsingNewEvents as Boolean

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** Whether the new events are enabled.
**Notes:** The plugin tries to enable new events if possible. That will only work on Windows 2000 or newer.

New events are:
BalloonTimeout
PopupOpen
ContextMenu
BalloonHide
KeySelected
BalloonUserClick
BalloonShow
Selected
(Read only property)

### 206.2.19 Events

### 206.2.20 BalloonHide(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The balloon has been hidden.

### 206.2.21 BalloonShow(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The balloon was shown.
**Notes:** You will get one balloon event when it disappears: BalloonHide, BalloonUserClick or BalloonTimeout.

### 206.2.22 BalloonTimeout(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The balloon was removed because of a timeout.
See also:

- 206.2.13 BalloonTimeout as Integer 23685

### 206.2.23 BalloonUserClick(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The user clicked on the balloon to make it away.

### 206.2.24 ContextMenu(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** You should show a context menu.

### 206.2.25 KeySelected(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The system tray item was selected by the keyboard.

### 206.2.26 MouseLeftButtonDoubleClick(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the left mouse button is pressed for a double click on the system tray icon.

### 206.2.27 MouseLeftButtonDown(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the left mouse button is pressed on the system tray icon.

### 206.2.28 MouseLeftButtonUp(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the left mouse button is released on the system tray icon.

### 206.2.29 MouseMiddleButtonDoubleClick(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the middle mouse button is pressed for a double click on the system tray icon.

### 206.2.30 MouseMiddleButtonDown(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the middle mouse button is pressed on the system tray icon.

### 206.2.31 MouseMiddleButtonUp(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the middle mouse button is released on the system tray icon.

### 206.2.32 MouseMove(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the mouse is moved over the system tray icon.

### 206.2.33 MouseRightButtonDoubleClick(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the right mouse button is pressed for a double click on the system tray icon.

### 206.2.34 MouseRightButtonDown(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the right mouse button is pressed on the system tray icon.

### 206.2.35 MouseRightButtonUp(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** Called if the right mouse button is pressed on the system tray icon.

### 206.2.36 PopupOpen(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** You should show a popup menu on the mouse position.

### 206.2.37 Selected(id as Integer, MouseX as Integer, MouseY as Integer)

MBS Win Plugin, Plugin Version: 7.4, Platform: Windows, Targets: .

**Function:** The system tray item was selected.

# Chapter 207

# Windows Taskbar State

## 207.1 class WindowsTaskbarStateMBS

### 207.1.1 class WindowsTaskbarStateMBS

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** A class for information about the settings for the Windows taskbar.
**Blog Entries**

- MBS Real Studio Plugins, version 12.2pr6

### 207.1.2 Properties

### 207.1.3 AlwaysOnTop as Boolean

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** True if the taskbar should be always on the top.
**Notes:** Value is false on any error.
Settable in plugin version 12.2 and newer.
(Read and Write property)

### 207.1.4 AutoHide as Boolean

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** True if the taskbar automatically hides itself.
**Notes:** Value is false on any error.

Settable in plugin version 12.2 and newer.
(Read and Write property)

### 207.1.5 Bottom as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The bottom value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

### 207.1.6 Height as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The height value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

### 207.1.7 Left as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The left value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

### 207.1.8 Right as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The right value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

### 207.1.9 Top as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The top value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

### 207.1.10 Width as Integer

MBS Win Plugin, Plugin Version: 3.1, Platform: Windows, Targets: Desktop, Console & Web.

**Function:** The width value of the taskbar dimensions.
**Notes:** Value is 0 on any error.
(Read and Write property)

# Chapter 208

# WindowsML

## 208.1 class WindowsMLExceptionMBS

### 208.1.1 class WindowsMLExceptionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The exception class for Windows runtime exceptions in WindowsML Plugin part.
**Notes:** All exceptions should have the HRESULT as errorNumber and the message set.
Subclass of the RuntimeException class.

## 208.2 class WinLearningModelBindingMBS

### 208.2.1 class WinLearningModelBindingMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Used to bind values to named input and output features.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- Playing with Machine Learning on Windows

### 208.2.2 Methods

### 208.2.3 BindWithDouble(name as string, shape() as Integer, values() as Double = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 64-bit floating point values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.4 BindWithFloat(name as string, shape() as Integer, values() as Single = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 32-bit floating point values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.5 BindWithFloat16(name as string, shape() as Integer, values() as Single = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 16-bit floating point values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.6 BindWithImage(name as string, file as folderItem)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given image file.
**Notes:** Maybe used with features needing image or tensor data.
See also:

- 208.2.7 BindWithImage(name as string, Path as String) 23697

### 208.2.7 BindWithImage(name as string, Path as String)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given image file.
**Notes:** Maybe used with features needing image or tensor data.
See also:

- 208.2.6 BindWithImage(name as string, file as folderItem) 23697

### 208.2.8 BindWithInt16(name as string, shape() as Integer, values() as Int16 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 16-bit signed integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.9 BindWithInt32(name as string, shape() as Integer, values() as Int32 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 32-bit signed integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.10 BindWithInt64(name as string, shape() as Integer, values() as Int64 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 64-bit signed integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.11 BindWithInt8(name as string, shape() as Integer, values() as Int8 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 8-bit signed integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.12 BindWithUInt16(name as string, shape() as Integer, values() as UInt16 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 16-bit unsigned integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.13 BindWithUInt32(name as string, shape() as Integer, values() as UInt32 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 32-bit unsigned integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.14 BindWithUInt64(name as string, shape() as Integer, values() as UInt64 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 64-bit unsigned integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.15 BindWithUInt8(name as string, shape() as Integer, values() as UInt8 = nil)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Binds a input feature with a given tensor array.
**Notes:** This is for 8-bit unsigned integer values.
Shape defines the array dimensions as given in Shape property in WinLearningModelTensorFeatureDescriptorMBS class.
If values is empty, we bind without passing values.

### 208.2.16 Clear

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Remove all bindings.

### 208.2.17 Constructor(Session as WinLearningModelSessionMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Creates a WinLearningModelBindingMBS from the specified WinLearningModelSessionMBS.

### 208.2.18 HasKey(key as string) as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Determines whether the map view contains the specified key.
**Notes:** Returns true if the map view contains the specified key; otherwise, false.

### 208.2.19 SetDefaults

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Fills all tensor arrays with empty arrays.

### 208.2.20 Properties

### 208.2.21 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 208.2.22 Session as WinLearningModelSessionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The related session.
**Notes:** (Read only property)

## 208.3 class WinLearningModelEvaluationResultMBS

### 208.3.1 class WinLearningModelEvaluationResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Get the results of the evaluation.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Playing with Machine Learning on Windows

### 208.3.2 Methods

### 208.3.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 208.3.4 GetTensorBoolean(name as string) as Boolean()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor boolean array.

### 208.3.5 GetTensorDouble(name as string) as Double()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor double array.

### 208.3.6 GetTensorFloat(name as string) as Single()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor float array.

### 208.3.7 GetTensorFloat16(name as string) as Single()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 16-bit float array.

### 208.3.8 GetTensorInt16(name as string) as Int16()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 16 bit signed integer array.

### 208.3.9 GetTensorInt32(name as string) as Int32()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 32 bit signed integer array.

### 208.3.10 GetTensorInt64(name as string) as Int64()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 64 bit signed integer array.

### 208.3.11 GetTensorInt8(name as string) as Int8()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 8 bit signed integer array.

### 208.3.12 GetTensorUInt16(name as string) as UInt16()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 16 bit unsigned integer array.

### 208.3.13 GetTensorUInt32(name as string) as UInt32()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 32 bit unsigned integer array.

### 208.3.14 GetTensorUInt64(name as string) as UInt64()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 64 bit unsigned integer array.

### 208.3.15 GetTensorUInt8(name as string) as UInt8()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Queries result feature as tensor 8 bit unsigned integer array.

### 208.3.16 OutputNames as String()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Gets the output feature names of the model.

### 208.3.17 Properties

### 208.3.18 CorrelationId as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The optional string that was passed to Evaluate function.
**Notes:** (Read only property)

### 208.3.19 ErrorStatus as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** If the evaluation failed, returns an error code for what caused the failure.
**Notes:** (Read only property)

### 208.3.20 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 208.3.21 Succeeded as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** True if the evaluation completed successfully; otherwise, false.
**Notes:** (Read only property)

## 208.4 class WinLearningModelFeatureDescriptorMBS

### 208.4.1 class WinLearningModelFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Describes the common properties that all features have.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 208.4.2 Methods

### 208.4.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 208.4.4 Properties

### 208.4.5 Description as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** A description of what this feature is used for in the model.
**Notes:** (Read only property)

### 208.4.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 208.4.7 Kind as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The kind of feature; use this to know which derived class to use.
**Notes:** Or use IsA operator in Xojo to determinate which subclass the plugin used.

(Read only property)

### 208.4.8 Name as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The name you use to bind values to this feature.
**Notes:** (Read only property)

### 208.4.9 Required as Boolean

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** If true, you must bind a value to this feature before calling Evaluate.
**Notes:** (Read only property)

### 208.4.10 Constants

Kinds

| Constant | Value | Description |
|---|---|---|
| KindImage | 3 | The feature is an image, so use WinLearningModelImageFeatureDescriptorMBS class. |
| KindMap | 2 | The feature is a map, so use WinLearningModelMapFeatureDescriptorMBS class. |
| KindSequence | 1 | The feature is a sequence, so use WinLearningModelSequenceFeatureDescriptorMBS class. |
| KindTensor | 0 | The feature is a tensor, so use WinLearningModelTensorFeatureDescriptorMBS class. |

Tensor Kind

| Constant | Value | Description |
|---|---|---|
| TensorKindBoolean | 9 | The tensor type is Boolean. |
| TensorKindComplex128 | 15 | Invalid type. |
| TensorKindComplex64 | 14 | Invalid type. |
| TensorKindDouble | 11 | The tensor type is 64-bit floating point. |
| TensorKindFloat | 1 | The tensor type is 32-bit floating point. |
| TensorKindFloat16 | 10 | The tensor type is 16-bit floating point. |
| TensorKindInt16 | 5 | The tensor type is 16-bit signed integer. |
| TensorKindInt32 | 6 | The tensor type is 32-bit signed integer. |
| TensorKindInt64 | 7 | The tensor type is 64-bit signed integer. |
| TensorKindInt8 | 3 | The tensor type is 8-bit signed integer. |
| TensorKindString | 8 | The tensor type is String. |
| TensorKindUInt16 | 4 | The tensor type is 16-bit unsigned integer. |
| TensorKindUInt32 | 12 | The tensor type is 32-bit unsigned integer. |
| TensorKindUInt64 | 13 | The tensor type is 64-bit unsigned integer. |
| TensorKindUInt8 | 2 | The tensor type is 8-bit unsigned integer. |
| TensorKindUndefined | 0 | Invalid type. |

## 208.5 class WinLearningModelImageFeatureDescriptorMBS

### 208.5.1 class WinLearningModelImageFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Describes the properties of the image the model is expecting.
**Notes:** Subclass of the WinLearningModelFeatureDescriptorMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 208.5.2 Properties

### 208.5.3 BitmapAlphaMode as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the expected alpha mode of the image.
**Notes:** (Read only property)

### 208.5.4 BitmapPixelFormat as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Specifies the expected pixel format (channel ordering, bit depth, and data type).
**Notes:** (Read only property)

### 208.5.5 Height as UInt32

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The expected image height.
**Notes:** (Read only property)

### 208.5.6 Width as UInt32

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The expected image width.
**Notes:** (Read only property)

### 208.5.7 Constants

Alpha Modes

| Constant | Value | Description |
|---|---|---|
| BitmapAlphaModeIgnore | 2 | The alpha value is ignored. |
| BitmapAlphaModePremultiplied | 0 | The alpha value has been premultiplied. Each color is first scaled by the alpha value. |
| BitmapAlphaModeStraight | 1 | The alpha value has not been premultiplied. The alpha channel indicates the transparency of the color. |

Bitmap Formats

| Constant | Value | Description |
|---|---|---|
| BitmapPixelFormatBgra8 | 87 | The pixel format is B8G8R8A8 unsigned integer. |
| BitmapPixelFormatGray16 | 57 | The pixel format is 16 bpp grayscale. |
| BitmapPixelFormatGray8 | 62 | The pixel format is 8 bpp grayscale. |
| BitmapPixelFormatNv12 | 103 | The pixel format is NV12. |
| BitmapPixelFormatP010 | 104 | The pixel format is P010. |
| BitmapPixelFormatRgba16 | 12 | The pixel format is R16B16G16A16 unsigned integer. |
| BitmapPixelFormatRgba8 | 30 | The pixel format is R8G8B8A8 unsigned integer. |
| BitmapPixelFormatUnknown | 0 | The pixel format is unknown. |
| BitmapPixelFormatYuy2 | 107 | The pixel format is YUY2. |

## 208.6 class WinLearningModelMapFeatureDescriptorMBS

### 208.6.1 class WinLearningModelMapFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The descriptor for a map, which is a collection of (key, value) pairs.
**Notes:** Subclass of the WinLearningModelFeatureDescriptorMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 208.6.2 Properties

### 208.6.3 KeyKind as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Map keys can be tensor kinds.
**Notes:** (Read only property)

### 208.6.4 ValueDescriptor as WinLearningModelFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Map values can be feature kinds.
**Notes:** (Read only property)

## 208.7 class WinLearningModelMBS

### 208.7.1 class WinLearningModelMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Represents a trained machine learning model.
**Example:**

```
dim ModelFile as FolderItem =SpecialFolder.Desktop.Child("SqueezeNet.onnx")

if not ModelFile.Exists then
MsgBox "Please download model first!"
quit
end if

dim model as WinLearningModelMBS = WinLearningModelMBS.LoadFromFile(ModelFile)

if model = nil then
msgbox "Failed to load model!"
// Check path and you need Windows 10
quit
end if
```

**Notes:** This is the main object you use to interact with Windows ML. You use it to load, bind, and evaluate trained ONNX models:

- Load the model using one of the Load method.
- Enumerate the InputFeatures and OutputFeatures and bind to your model.
- Create a LearningModelSessionMBS and evalaute.

Requires Windows 10.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins, version 20.5pr1
- Playing with Machine Learning on Windows

### 208.7.2 Methods

### 208.7.3 Constructor

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The private constructor.

### 208.7.4 InputFeatures as WinLearningModelFeatureDescriptorMBS()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** A list of the model's input features.
**Example:**

```
dim model as WinLearningModelMBS // your model

dim inputFeatures() as WinLearningModelFeatureDescriptorMBS = model.InputFeatures
for each feature as WinLearningModelFeatureDescriptorMBS in inputFeatures

list.AddRow feature.Name

next
```

### 208.7.5 LoadFromFile(File as FolderItem) as WinLearningModelMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Loads a model for Windows Machine Learning.
**Example:**

```
dim ModelFile as FolderItem =SpecialFolder.Desktop.Child("SqueezeNet.onnx")

if not ModelFile.Exists then
MsgBox "Please download model first!"
quit
end if

dim model as WinLearningModelMBS = WinLearningModelMBS.LoadFromFile(ModelFile)

if model = nil then
msgbox "Failed to load model!"
// Check path and you need Windows 10
quit
```

```
end if
```

**Notes:** Please use an onnx file as you find them on various websites, e.g. start here:
https://docs.microsoft.com/en-us/windows/ai/windows-ml/get-onnx-model

Will rasie an exception about unregistered class if called on older Windows versions before 10.

### 208.7.6 LoadFromFilePath(Path as String) as WinLearningModelMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Loads a model for Windows Machine Learning.
**Notes:** Please use an onnx file as you find them on various websites, e.g. start here:
https://docs.microsoft.com/en-us/windows/ai/windows-ml/get-onnx-model

Will rasie an exception about unregistered class if called on older Windows versions before 10.

### 208.7.7 OutputFeatures as WinLearningModelFeatureDescriptorMBS()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** A list of the model's output features.
**Example:**

```
dim model as WinLearningModelMBS // your model

dim OutputFeatures() as WinLearningModelFeatureDescriptorMBS = model.OutputFeatures
for each feature as WinLearningModelFeatureDescriptorMBS in OutputFeatures

list.AddRow feature.Name

next
```

### 208.7.8 Properties

### 208.7.9 Author as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The name of the model author.
**Notes:** (Read only property)

### 208.7.10 Description as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** A description of the model.
**Notes:** (Read only property)

### 208.7.11 Domain as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The domain of the model.
**Notes:** (Read only property)

### 208.7.12 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 208.7.13 Metadata as Dictionary

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The metadata from the ONNX model.
**Notes:** (Read only property)

### 208.7.14 Name as String

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The name of the model.
**Notes:** (Read only property)

### 208.7.15 Version as Int64

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The version of the model.
**Notes:** (Read only property)

## 208.8 class WinLearningModelSequenceFeatureDescriptorMBS

### 208.8.1 class WinLearningModelSequenceFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** A descriptor for a sequence with an array of elements.
**Notes:** Subclass of the WinLearningModelFeatureDescriptorMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 208.8.2 Properties

### 208.8.3 ElementDescriptor as WinLearningModelFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The feature descriptor for this sequence element.
**Notes:** (Read only property)

## 208.9 class WinLearningModelSessionMBS

### 208.9.1 class WinLearningModelSessionMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Used to evaluate machine learning models.
**Blog Entries**

- Playing with Machine Learning on Windows

### 208.9.2 Methods

### 208.9.3 Constructor(model as WinLearningModelMBS)

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Creates a session using the default device.
**Notes:** model: The trained machine learning model for this session.

### 208.9.4 Evaluate(bindings as WinLearningModelBindingMBS, correlationId as string = "") as WinLearningModelEvaluationResultMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Evaluate the machine learning model using the feature values bound in bindings.
**Notes:** bindings: Holder for associations between model inputs and variable instances.
correlationId: Optional user-supplied string to connect the output results.

MBS Plugins don't support all possible input/output combinations, so if you need something more, please let us know.

### 208.9.5 Properties

### 208.9.6 Handle as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 208.9.7 Model as WinLearningModelMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The trained machine learning model for this session.
**Notes:** (Read only property)

# 208.10 class WinLearningModelTensorFeatureDescriptorMBS

## 208.10.1 class WinLearningModelTensorFeatureDescriptorMBS

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** Tensors are multi-dimensional arrays of values.
**Notes:** The layout of tensors is row-major, with tightly packed contiguous data representing each dimension. The total size of a tensor is the product of the size of each dimension.
Subclass of the WinLearningModelFeatureDescriptorMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 208.10.2 Methods

## 208.10.3 Shape as Integer()

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The count and size of each dimension.

## 208.10.4 Properties

## 208.10.5 TensorKind as Integer

MBS WinFrameworks Plugin, Plugin Version: 20.5, Platform: Windows, Targets: Desktop only.

**Function:** The data type of the tensor.
**Notes:** (Read only property)

# Chapter 209

# WiringPi

## 209.1 module WiringPiMBS

### 209.1.1 module WiringPiMBS

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** The module to work with wiring pi library.
**Notes:** Deprecated as underlaying C library is deprecated.
**Blog Entries**

- Cleanup Xojo Plugins
- MBS Xojo Plugins, version 19.2pr1
- MBS Xojo / Real Studio Plugins, version 15.3pr2

### 209.1.2 Methods

### 209.1.3 analogRead(pin as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns the value read on the supplied analog input pin.
**Notes:** You will need to register additional analog modules to enable this function for devices such as the Gertboard, quick2Wire analog board, etc.

### 209.1.4 analogWrite(pin as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This writes the given value to the supplied analog pin.
**Notes:** You will need to register additional analog modules to enable this function for devices such as the Gertboard.

### 209.1.5 delay(HowLong as UInt32)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This causes program execution to pause for at least howLong milliseconds.
**Notes:** Due to the multi-tasking nature of Linux it could be longer. Note that the maximum delay is an unsigned 32-bit integer or approximately 49 days.

### 209.1.6 delayMicroseconds(HowLong as UInt32)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This causes program execution to pause for at least howLong microseconds.
**Notes:** Due to the multi-tasking nature of Linux it could be longer. Note that the maximum delay is an unsigned 32-bit integer microseconds or approximately 71 minutes.

Delays under 100 microseconds are timed using a hard-coded loop continually polling the system time, Delays over 100 microseconds are done using the system nanosleep() function –You may need to consider the implications of very short delays on the overall performance of the system, especially if using threads.

### 209.1.7 digitalRead(pin as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This function returns the value read at the given pin.
**Notes:** It will be kHIGH or kLOW (1 or 0) depending on the logic level at the pin.

### 209.1.8 digitalWrite(pin as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes the value kHIGH or kLOW (1 or 0) to the given pin which must have been previously set as an output.

**Notes:** WiringPi treats any non-zero number as kHIGH, however 0 is the only representation of kLOW.

### 209.1.9 digitalWriteByte(value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This writes the 8-bit byte supplied to the first 8 GPIO pins.
**Notes:** It,Äôs the fastest way to set all 8 bits at once to a particular value, although it still takes two write operations to the Pi,Äôs GPIO hardware.

### 209.1.10 gpioClockSet(pin as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sets the clock.

### 209.1.11 I2CRead(fd as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device read.
**Notes:** Some devices present data when you read them without having to do any register transactions.
If the return value is negative then an error has happened and you should consult errno.

### 209.1.12 I2CReadReg16(fd as Integer, reg as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device read.
**Notes:** Some devices present data when you read them without having to do any register transactions.
Read a 16-bit value from the device register indicated.

If the return value is negative then an error has happened and you should consult errno.

### 209.1.13 I2CReadReg8(fd as Integer, reg as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device read.
**Notes:** Some devices present data when you read them without having to do any register transactions.
Read an 8-bit value from the device register indicated.

If the return value is negative then an error has happened and you should consult errno.

### 209.1.14 I2CSetup(devId as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This initialises the I2C system with your given device identifier.
**Notes:** The ID is the I2C number of the device and you can use the i2cdetect program to find this out. I2CSetup() will work out which revision Raspberry Pi you have and open the appropriate device in /dev.

The return value is the standard Linux filehandle, or -1 if any error –in which case, you can consult errno as usual.

E.g. the popular MCP23017 GPIO expander is usually device Id 0x20, so this is the number you would pass into wiringPiI2CSetup().

### 209.1.15 I2CSetupInterface(device as string, devId as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This initialises the I2C system with your given device identifier and name.

### 209.1.16 I2CWrite(fd as Integer, Data as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device write.
**Notes:** Some devices accept data this way without needing to access any internal registers.
If the return value is negative then an error has happened and you should consult errno.

### 209.1.17 I2CWriteReg16(fd as Integer, reg as Integer, Data as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device write.
**Notes:** Some devices accept data this way without needing to access any internal registers.
Write a 16-bit data value into the device register indicated.

If the return value is negative then an error has happened and you should consult errno.

### 209.1.18 I2CWriteReg8(fd as Integer, reg as Integer, Data as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Simple device write.
**Notes:** Some devices accept data this way without needing to access any internal registers.
Write a 8-bit data value into the device register indicated.

If the return value is negative then an error has happened and you should consult errno.

### 209.1.19 LoadLibrary(File as FolderItem) as boolean

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Loads the library.
**Notes:** Returns true on success or false on failure.
LoadError is set in case of failure.
See also:

- 209.1.20 LoadLibrary(Path as string) as boolean 23725

### 209.1.20 LoadLibrary(Path as string) as boolean

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Loads the library.
**Notes:** Returns true on success or false on failure.
LoadError is set in case of failure.
See also:

- 209.1.19 LoadLibrary(File as FolderItem) as boolean 23725

### 209.1.21 micros as UInt32

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns a number representing the number of microseconds since your program called one of the wiringPiSetup functions.
**Notes:** It returns an unsigned 32-bit number which wraps after approximately 71 minutes.

### 209.1.22 millis as UInt32

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns a number representing the number of milliseconds since your program called one of the wiringPiSetup functions.
**Notes:** It returns an unsigned 32-bit number which wraps after 49 days.

### 209.1.23 physPinToGpio(physPin as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns the BCM_GPIO pin number of the supplied physical pin on the P1 connector.

### 209.1.24 piBoardId(byref model as Integer, byref Rev as Integer, byref Mem as Integer, byref Maker as Integer, byref OverVolted as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries board identifiers.
**Notes:** Mem is memory in Megabytes.
Maker, Model and Rev are value which match the constants in this module.

### 209.1.25 piBoardRev as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns the board revision of the Raspberry Pi.
**Notes:** It will be either 1 or 2. Some of the BCM_GPIO pins changed number and function when moving from board revision 1 to 2, so if you are using BCM_GPIO pin numbers, then you need to be aware of the differences.

### 209.1.26 piHiPri(pri as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This attempts to shift your program (or thread in a multi-threaded program) to a higher priority and enables a real-time scheduling.
**Notes:** The priority parameter should be from 0 (the default) to 99 (the maximum). This won,Äôt make your program go any faster, but it will give it a bigger slice of time when other programs are running. The priority parameter works relative to others –so you can make one program priority 1 and another priority 2 and it will have the same effect as setting one to 10 and the other to 90 (as long as no other programs are running with elevated priorities)

The return value is 0 for success and -1 for error. If an error is returned, the program should then consult the errno global variable, as per the usual conventions.

Note: Only programs running as root can change their priority. If called from a non-root program then nothing happens.

### 209.1.27 piLock(Key as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Locks a synchronization lock.
**Notes:** These allow you to synchronise variable updates from your main program to any threads running in your program. keyNum is a number from 0 to 3 and represents a ,Äúkey,Äù. When another process tries to lock the same key, it will be stalled until the first process has unlocked the same key.

You may need to use these functions to ensure that you get valid data when exchanging data between your main program and a thread –otherwise it,Äôs possible that the thread could wake-up halfway during your data copy and change the data –so the data you end up copying is incomplete, or invalid.

### 209.1.28 piMakerNames(index as Integer) as string

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Maps maker numbers to names.

### 209.1.29 piModelNames(index as Integer) as string

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Maps model numbers to names.

### 209.1.30 pinMode(pin as Integer, mode as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This sets the mode of a pin to either INPUT, OUTPUT, PWM_OUTPUT or GPIO_CLOCK.
**Notes:** Note that only wiringPi pin 1 (BCM_GPIO 18) supports PWM output and only wiringPi pin 7 (BCM_GPIO 4) supports CLOCK output modes.

This function has no effect when in Sys mode. If you need to change the pin mode, then you can do it with the gpio program in a script before you start your program.

### 209.1.31 piRevisionNames(index as Integer) as string

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Maps revision numbers to names.

### 209.1.32 piUnlock(Key as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Unlocks a synchronization lock.
**Notes:** These allow you to synchronise variable updates from your main program to any threads running in your program. keyNum is a number from 0 to 3 and represents a ,Äúkey,Äù. When another process tries to lock the same key, it will be stalled until the first process has unlocked the same key.

You may need to use these functions to ensure that you get valid data when exchanging data between your main program and a thread –otherwise it,Äôs possible that the thread could wake-up halfway during your data copy and change the data –so the data you end up copying is incomplete, or invalid.

### 209.1.33 pullUpDnControl(pin as Integer, pud as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This sets the pull-up or pull-down resistor mode on the given pin, which should be set as an input.
**Notes:** Unlike the Arduino, the BCM2835 has both pull-up an down internal resistors. The parameter pud should be; kPUD_OFF, (no pull up/down), kPUD_DOWN (pull to ground) or kPUD_UP (pull to 3.3v) The internal pull up/down resistors have a value of approximately 50KŒ© on the Raspberry Pi.

This function has no effect on the Raspberry Pi,Äôs GPIO pins when in Sys mode. If you need to acti-

vate a pull-up/pull-down, then you can do it with the gpio program in a script before you start your program.

### 209.1.34 pwmSetClock(divisor as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This sets the divisor for the PWM clock.

### 209.1.35 pwmSetMode(mode as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The PWM generator can run in 2 modes –,Äúbalanced,Äù and ,Äúmark:space,Äù.
**Notes:** The mark:space mode is traditional, however the default mode in the Pi is ,Äúbalanced,Äù. You can switch modes by supplying the parameter: kPWM_MODE_BAL or kPWM_MODE_MS.

### 209.1.36 pwmSetRange(range as UInt32)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This sets the range register in the PWM generator.
**Notes:** The default is 1024.

### 209.1.37 pwmToneWrite(pin as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes a tone.

### 209.1.38 pwmWrite(pin as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Writes the value to the PWM register for the given pin.
**Notes:** The Raspberry Pi has one on-board PWM pin, pin 1 (BMC_GPIO 18, Phys 12) and the range is 0-1024. Other PWM devices may have other PWM ranges.

This function is not able to control the Pi,Äôs on-board PWM when in Sys mode.

### 209.1.39 Read(fd as Integer, count as UInt64) as Memoryblock

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Read attempts to read count bytes of data from the object referenced by the descriptor fildes into a buffer.
**Notes:** Returns the memoryblock on success (if we got more than zero bytes).
Errno is set in case of error.

### 209.1.40 serialClose(fd as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Closes the device identified by the file descriptor given.

### 209.1.41 serialDataAvail(fd as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the number of characters available for reading, or -1 for any error condition, in which case errno will be set appropriately.

### 209.1.42 serialFlush(fd as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This discards all data received, or waiting to be send down the given device.

### 209.1.43 serialGetchar(fd as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the next character available on the serial device.
**Notes:** This call will block for up to 10 seconds if no data is available (when it will return -1)

### 209.1.44 serialOpen(device as String, Baud as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This opens and initialises the serial device and sets the baud rate.
**Notes:** It sets the port into ‚Äúraw‚Äù mode (character at a time and no translations), and sets the read timeout to 10 seconds. The return value is the file descriptor or -1 for any error, in which case errno will be set as appropriate.

### 209.1.45 serialPutchar(fd as Integer, c as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sends the single byte to the serial device identified by the given file descriptor.

### 209.1.46 serialPutData(fd as Integer, data as Memoryblock)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sends the nul-terminated string to the serial device identified by the given file descriptor.
**Notes:** This sends text with any encoding.

### 209.1.47 serialPuts(fd as Integer, text as string)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Sends the nul-terminated string to the serial device identified by the given file descriptor.
**Notes:** This sends text with UTF-8 encoding.

### 209.1.48 setPadDrive(group as Integer, value as Integer)

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This sets the ‚Äústrength‚Äù of the pad drivers for a particular group of pins.
**Notes:** There are 3 groups of pins and the drive strength is from 0 to 7. Do not use this unless you know what you are doing.

### 209.1.49 SPIDataRW(channel as Integer, data as Memoryblock) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This performs a simultaneous write/read transaction over the selected SPI bus.
**Notes:** Data that was in your buffer is overwritten by data returned from the SPI bus.

That,Äôs all there is in the helper library. It is possible to do simple read and writes over the SPI bus using the standard read() and write() system calls though –write() may be better to use for sending data to chains of shift registers, or those LED strings where you send RGB triplets of data. Devices such as A/D and D/A converters usually need to perform a concurrent write/read transaction to work.

### 209.1.50 SPIGetFd(channel as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Queries the file descriptor for a channel.

### 209.1.51 SPISetup(channel as Integer, speed as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This is the way to initialise a channel (The Pi has 2 channels; 0 and 1).
**Notes:** The speed parameter is an integer in the range 500,000 through 32,000,000 and represents the SPI clock speed in Hz.

The returned value is the Linux file-descriptor for the device, or -1 on error. If an error has happened, you may use the standard errno global variable to see why.

### 209.1.52 SPISetupMode(channel as Integer, speed as Integer, mode as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This is the way to initialise a channel (The Pi has 2 channels; 0 and 1).
**Notes:** The speed parameter is an integer in the range 500,000 through 32,000,000 and represents the SPI clock speed in Hz.

The returned value is the Linux file-descriptor for the device, or -1 on error. If an error has happened, you may use the standard errno global variable to see why.

### 209.1.53 wiringPiSetup as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes the library.
**Notes:** This initialises wiringPi and assumes that the calling program is going to be using the wiringPi

pin numbering scheme. This is a simplified numbering scheme which provides a mapping from virtual pin numbers 0 through 16 to the real underlying Broadcom GPIO pin numbers. See the pins page for a table which maps the wiringPi pin number to the Broadcom GPIO pin number to the physical location on the edge connector.

This function needs to be called with root privileges.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

### 209.1.54 wiringPiSetupGpio as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes the library.
**Notes:** This is identical to wiringPiSetup, however it allows the calling programs to use the Broadcom GPIO pin numbers directly with no re-mapping.

As above, this function needs to be called with root privileges, and note that some pins are different from revision 1 to revision 2 boards.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

### 209.1.55 wiringPiSetupPhys as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes the library.
**Notes:** Identical to wiringPiSetup, however it allows the calling programs to use the physical pin numbers on the P1 connector only.

As above, this function needs to be called with root priviliges.

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

### 209.1.56 wiringPiSetupSys as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Initializes the library.
**Notes:** This initialises wiringPi but uses the /sys/class/gpio interface rather than accessing the hardware directly. This can be called as a non-root user provided the GPIO pins have been exported before-hand using the gpio program. Pin numbering in this mode is the native Broadcom GPIO numbers –the same as wiringPiSetupGpio() above, so be aware of the differences between Rev 1 and Rev 2 boards.

Note: In this mode you can only use the pins which have been exported via the /sys/class/gpio interface before you run your program. You can do this in a separate shell-script, or by using the system() function from inside your program to call the gpio program.

Also note that some functions have no effect when using this mode as they,Äôre not currently possible to action unless called with root privileges. (although you can use system() to call gpio to set/change modes if needed)

One of the setup functions must be called at the start of your program or your program will fail to work correctly. You may experience symptoms from it simply not working to segfaults and timing issues.

### 209.1.57 wpiPinToGpio(wpiPin as Integer) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** This returns the BCM_GPIO pin number of the supplied wiringPi pin.
**Notes:** It takes the board revision into account.

### 209.1.58 Write(fd as Integer, data as Memoryblock) as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Write to a file descriptor.
**Notes:** Write attempts to write bytes to the object referenced by the descriptor fildes from the memoryblock pointed to by data.
Upon successful completion the number of bytes which were written is returned. Otherwise, a -1 is returned and the global variable errno is set to indicate the error.

### 209.1.59 Properties

### 209.1.60 ErrNo as Integer

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** The last error code from the underlaying linux functions.
**Notes:** must be called directly after a function to have the result from that function.
Calling any other function including writing a debug log, may cause this value to be reset.
(Read only property)

### 209.1.61 LoadError as String

MBS Linux Plugin, Plugin Version: 15.3, Platform: Linux, Targets: Desktop, Console & Web.

**Function:** Returns the last load error.
**Notes:** (Read only property)

### 209.1.62 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kHIGH | 1 | The constant for high value. |
| kLOW | 0 | The constant for low value. |

Pin Modes

| Constant | Value | Description |
|---|---|---|
| kGPIO_CLOCK | 3 | GPIO Clock |
| kINPUT | 0 | Input |
| kOUTPUT | 1 | Output |
| kPWM_OUTPUT | 2 | PWM Output |
| kPWM_TONE_OUTPUT | 6 | Tone Output |
| kSOFT_PWM_OUTPUT | 4 | PWM Output |
| kSOFT_TONE_OUTPUT | 5 | Tone Output |

Interrupt Levels

| Constant | Value | Description |
|---|---|---|
| kINT_EDGE_BOTH | 3 | Both |
| kINT_EDGE_FALLING | 1 | Failing |
| kINT_EDGE_RISING | 2 | Rising |
| kINT_EDGE_SETUP | 0 | Setup |

Makers

| Constant | Value | Description |
|---|---|---|
| kPI_MAKER_EGOMAN | 1 | Egoman |
| kPI_MAKER_MBEST | 4 | MBest |
| kPI_MAKER_QISDA | 3 | QISDA |
| kPI_MAKER_SONY | 2 | Sony |
| kPI_MAKER_UNKNOWN | 0 | Unknown |

Models

| Constant | Value | Description |
|---|---|---|
| kPI_MODEL_2 | 6 | Model 2 |
| kPI_MODEL_A | 1 | Model A |
| kPI_MODEL_AP | 5 | Model AP |
| kPI_MODEL_B | 2 | Model B |
| kPI_MODEL_BP | 3 | Model BP |
| kPI_MODEL_CM | 4 | Model CM |
| kPI_MODEL_UNKNOWN | 0 | unknown |

Versions

| Constant | Value | Description |
|---|---|---|
| kPI_VERSION_1 | 1 | Version 1 |
| kPI_VERSION_1_1 | 2 | Version 1.1 |
| kPI_VERSION_1_2 | 3 | Version 1.2 |
| kPI_VERSION_2 | 4 | Version 2 |
| kPI_VERSION_UNKNOWN | 0 | Unknown version |

Pull Up/Down

| Constant | Value | Description |
|---|---|---|
| kPUD_DOWN | 1 | pull to ground |
| kPUD_OFF | 0 | no pull up/down |
| kPUD_UP | 2 | pull to 3.3v |

PWM Modes

| Constant | Value | Description |
|---|---|---|
| kPWM_MODE_BAL | 1 | Balanced |
| kPWM_MODE_MS | 0 | Mark:Space |

# Chapter 210

# Wordfile

## 210.1 class WordFileMBS

### 210.1.1 class WordFileMBS

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Word file editing.
**Example:**

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then

f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

**Notes:** This is a class for reading word files and replacing text to customize document files.
Works for xml and docx files. Does not support old doc file format.

Please report document files where plugin corrupted file or failed to replace text.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

**Blog Entries**

- News from the MBS Xojo Plugins Version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0
- News from the MBS Xojo Plugins Version 21.4
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4
- MBS Xojo Plugins in version 19.2
- MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0
- MBS Xojo / Real Studio plug-ins in version 16.3
- MBS Xojo / Real Studio plug-ins version 16.2
- MBS Xojo / Real Studio plug-ins in version 15.4

**Videos**

- Presentation from Munich conference about MBS Plugins.
- Presentation from London conference about MBS Plugins.

**Xojo Developer Magazine**

- 20.2, page 10: News
- 19.6, page 10: News
- 15.2, page 10: News

### 210.1.2 Methods

### 210.1.3 addMediaFile(name as string, content as string)

MBS Tools Plugin, Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a media file image.
**Notes:** You can use this function to add a new image.
You need to add the reference in XML yourself to let the image appear somewhere in the document.

### 210.1.4 Append(other as WordFileMBS, AddPageBreak as boolean = false) as Boolean

MBS Tools Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends one word file text to other.
**Notes:** This function takes document part from other word file and copies it,Äôs xml nodes to the current document.
Please only copy from one document to other if they both are made from same template, so internal IDs for styles match.
Returns true on success or false on failure.

Added AddPageBreak parameter in version 19.2. If true, we add a page break between the old and new parts.

### 210.1.5 AppendTableRow(tag as string) as Integer

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Duplicates a table row containing a placeholder.
**Notes:** If you have tables in your template word file and you like to duplicate it, this function can do that and add the new row on the end of the table.

Returns Values

| | |
|---|---|
| 0 | success |
| 1 | Tag not found. |
| 2 | Tag found, but not in a table. |
| 3 | Missing main document part. |

### 210.1.6 Constructor

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

### 210.1.7 Contains(findText as string) as boolean

MBS Tools Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if some text exists in the document.
**Notes:** This is like HasTag function, but doesn't require markers around the text in the document.

### 210.1.8 DuplicateTableRow(tag as string) as Integer

MBS Tools Plugin, Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Duplicates a table row containing a placeholder.
**Notes:** If you have tables in your template word file and you like to duplicate it, this function can do that and add the new row on just after the row to copy.

Returns Values

| | |
|---|---|
| 0 | success |
| 1 | Tag not found. |
| 2 | Tag found, but not in a table. |
| 3 | Missing main document part. |

### 210.1.9 FieldNames as String()

MBS Tools Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries field names in the file.
**Notes:** This looks for form fields in a word file.

### 210.1.10 GetFieldText(fieldName as string, byref text as String) as boolean

MBS Tools Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries field value.
**Notes:** The plugin looks for the field with given name and queries it's text.
Returns true if field was found.

### 210.1.11 HasTag(tag as string) as boolean

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a tag exists.
**Notes:** The place holder in the document must start with ¬´ and end with ¬ª characters. The place holder you pass here, should not have those quotes.
Returns true on success or false on failure.

If you change font or style of the text within the marker, it will not be recognized. So please keep all text between and including the ¬´ and ¬ª markers (or whatever is configured) within the same font style.

### 210.1.12 MediaFiles as String()

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Lists the media files in the word document.
**Example:**

```
// read a word file:
Dim file As New FolderItem("c:\tmp\test.docx", folderitem.PathModes.Native)
Dim wordStream As BinaryStream = BinaryStream.Open(file)
Dim wordData As String = wordStream.Read(wordStream.Length)
wordStream.close
Dim word As WordFileMBS = WordFileMBS.OpenData(wordData)

// now show list of files in message box
Dim MediaFiles() As String = word.MediaFiles
MessageBox Join(MediaFiles, EndOfLine)
```

**Notes:** e.g. image1.png

### 210.1.13 OpenData(Data as MemoryBlock) as WordFileMBS

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens data as document.
**Notes:** You can pass here XML or Docx file content.
Returns nil in case of an error.
See also:

- 210.1.14 OpenData(Data as String) as WordFileMBS 23741

### 210.1.14 OpenData(Data as String) as WordFileMBS

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens data as document.
**Example:**

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then

f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

**Notes:** You can pass here XML or Docx file content.
Returns nil in case of an error.
See also:

- 210.1.13 OpenData(Data as MemoryBlock) as WordFileMBS 23741

### 210.1.15 OpenXML(XML as String) as WordFileMBS

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens XML file from text string.
**Notes:** Returns nil in case of error.

### 210.1.16 Parts as String()

MBS Tools Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries names of the parts of the document.
**Example:**

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

MsgBox w.XML("footer1")
```

**Notes:** This may tell you how many headers/footers we found in a docx file.
e.g. "footer1", "header1", "document".

### 210.1.17 RemoveTableRow(tag as string) as Integer

MBS Tools Plugin, Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a table row containing a placeholder.
**Notes:** If you have tables in your template word file and you only fill some rows, you can remove superfluous rows using this function.

Returns Values

| | |
|---|---|
| 0 | success |
| 1 | Tag not found. |
| 2 | Tag found, but not in a table. |
| 3 | Missing main document part. |

### 210.1.18 ReplaceTag(tag as string, text as string = "", All as boolean = false) as boolean

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces a placeholder with text.
**Example:**

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then

f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
```

end if

**Notes:** The place holder in the document must start with ¬´ and end with ¬ª characters. The place holder you pass here, should not have those quotes.
Returns true on success or false on failure.
If you need to replace multi line text like addresses, please use several placeholders, at least one per line.

Version 17.0 and newer can handle multi line text better for normal paragraphs with Chr(13). It creates for you new paragraphs for each line in the new text.

If you change font or style of the text within the marker, it will not be recognized. So please keep all text between and including the ¬´ and ¬ª markers (or whatever is configured) within the same font style.

### 210.1.19 SetFieldText(fieldName as string, text as String) as boolean

MBS Tools Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets field value.
**Notes:** The plugin looks for the field with given name and sets it's text.
Returns true if field was found.

### 210.1.20 SetMarkers(openMarker as String, closeMarker as String) as boolean

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the markers to look for before/after a tag.
**Notes:** Default are ¬´ and ¬ª.
Should be different and not empty.
Returns true on success or false on failure.

### 210.1.21 Substitute(findText as string, replaceText as string = """, All as boolean = false) as boolean

MBS Tools Plugin, Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replaces some text in the document with new text.
**Notes:** Like ReplaceTag function, but without markers around the tag.

Handles multi line text better for normal paragraphs with Chr(13). It creates for you new paragraphs for

each line in the new text.

If you change font or style of the text within the find text, it will not be recognized. So please keep all text within the same font style.

### 210.1.22 Tags as String()

MBS Tools Plugin, Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries list of tags.
**Notes:** Depends on the start/end markers set with OpenMarker/CloseMarker properties.

Can be very useful for debugging to query list of tags found in the document.

### 210.1.23 WriteFile(path as folderItem) as boolean

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a file to disk.
**Example:**

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then

f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

**Notes:** File extension should be correct, either docx or xml depending on what you loaded.

### 210.1.24 Properties

### 210.1.25 Caseless as Boolean

MBS Tools Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to compare tag names case insensitive.
**Notes:** Set to true for case insensitive comparison of ASCII characters.
Default is false.
(Read and Write property)

### 210.1.26 CloseMarker as String

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The close marker text.
**Notes:** Default value is "¬ª".
(Read only property)

### 210.1.27 OpenMarker as String

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The open marker text.
**Notes:** Default value is "¬´".
(Read only property)

### 210.1.28 Text as String

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts text of word file.
**Notes:** Plugin inserts a few newline characters for detected line ends.

May not give all text. If you miss something, please send us test files.
(Read only property)

### 210.1.29 XML as String

MBS Tools Plugin, Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XML found in the document.
**Notes:** (Read and Write property)
See also:

- 210.1.31 XML(part as String) as String 23747

### 210.1.30 MediaFile(name as string) as String

MBS Tools Plugin, Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries or replaces the content of a media file.
**Example:**

```
Dim word As WordFileMBS // open word document

// name one
Dim name As String = "image1.jpg"

// or pick from list
'Dim MediaFiles() As String = word.MediaFiles
'Dim name As String = MediaFiles(0) // first one

// load image
Dim ImageFile As FolderItem = SpecialFolder.Desktop.Child("new.jpg")
Dim ImageStream As BinaryStream = BinaryStream.Open(ImageFile)
Dim ImageData As String = ImageStream.Read(ImageStream.Length)

word.MediaFile(name) = ImageData
```

**Notes:** You can use this to extract images from word file.
Or to replace a placeholder image with the real image.
For replacement please make sure file type and dimensions match.
Raises KeyNotFoundException if media file with given name is not found.
(Read and Write computed property)

### 210.1.31 XML(part as String) as String

MBS Tools Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries/Sets XML for a part.
**Notes:** See Parts array for possible parts.
(Read and Write computed property)
See also:

- 210.1.29 XML as String 23746

# Chapter 211

# XL

## 211.1 class XLAutoFilterMBS

### 211.1.1 class XLAutoFilterMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for auto filter.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MBS Xojo Plugins, version 21.5pr1
- LibXL Extras for Xojo
- MBS Xojo Plugins, version 18.4pr9

### 211.1.2 Methods

### 211.1.3 AddSort(columnIndex as Integer, descending as boolean) as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the sorted column in AutoFilter by zero-based index and its sort order.
**Notes:** Used for multiple level sorting.
Returns false on error and true on success. Get error info with XLBookMBS.errorMessage.

### 211.1.4 Column(colId as Integer) as XLFilterColumnMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the AutoFilter column by zero-based index.
**Notes:** Creates it if it doesn't exist.

### 211.1.5 ColumnByIndex(colId as Integer) as XLFilterColumnMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the specified AutoFilter column which have a filter information by index.

### 211.1.6 Constructor

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 211.1.7 GetRef(byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as Boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the cell range of AutoFilter with header.
**Notes:** Returns false if error. Get error info with XLBookMBS.errorMessage.

### 211.1.8 GetSort(byref columnIndex as Integer, byref descending as Boolean) as Boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the zero-based index of sorted column in AutoFilter and its sort order.
**Notes:** Returns false if error. Get error info with XLBookMBS.errorMessage.

### 211.1.9 GetSortRange(byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as Boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the whole range of data to sort.
**Notes:** Returns false if error. Get error info with XLBookMBS.errorMessage.

### 211.1.10 SetRef(rowFirst as Integer, rowLast as Integer, colFirst as Integer, colLast as Integer)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the cell range of AutoFilter with header.

### 211.1.11 SetSort(columnIndex as Integer, descending as Boolean) as Boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the sorted column in AutoFilter by zero-based index and its sort order.
**Notes:** Returns false on error and true on success. Get error info with XLBookMBS.errorMessage.

### 211.1.12 Properties

### 211.1.13 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent object.
**Notes:** Usually the XLFilterColumnMBS object.
(Read only property)

### 211.1.14 ColumnSize as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of specified AutoFilter columns which have a filter information.
**Notes:** (Read only property)

### 211.1.15 Handle as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

## 211.2 class XLBookMBS

### 211.2.1 class XLBookMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The central class for a workbook.
**Example:**

```
// create new Excel file, pass true for XLSX format or false for older XLS format
Dim book As New XLBookMBS(True)

// add sheet
Dim sheet As XLSheetMBS = book.addSheet("Test")
Call sheet.WriteString(2, 1, "Hello World", Nil)

// write file and launch
Dim file As FolderItem = SpecialFolder.Desktop.Child("Writing data.xlsx")

If book.Save(file) Then
file.Launch
Else
MsgBox "Failed to create file."+EndOfLine+EndOfLine+book.ErrorMessage
End If
```

**Notes:** The MBS Xojo XL Plugin is based on LibXL, a powerful library to handle Excel files.

You'll need your own license for LibXL. For more information go here:
https://www.monkeybreadsoftware.de/xojo/plugin-xls.shtml

When you have obtained license file inside your XOJO project place XLBookMBS.SetKeyGlobal call with LibXL license in app.open.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MBS Xojo Plugins, version 23.3pr6
- New in MBS Xojo Plugins in version 23.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- MBS Xojo Plugins, version 23.1pr2
- LibXL Extras for Xojo
- New in the MBS Xojo Plugins Version 20.2

- Multithreaded plugin functions can increase speed of Xojo application
- MonkeyBread Software Releases the MBS Xojo Plugins in version 17.5
- Register MBS Xojo Plugins

**Xojo Developer Magazine**

- 20.5, pages 75 to 76: Create and Read Excel Spreadsheets, Using LibXL with Xojo by Stefanie Juchmes
- 20.5, pages 72 to 73: Create and Read Excel Spreadsheets, Using LibXL with Xojo by Stefanie Juchmes
- 16.1, page 10: News

### 211.2.2 Methods

### 211.2.3 AddCustomNumFormat(customNumFormat as string) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new custom number format to the workbook.
**Notes:** The format string customNumFormat indicates how to format and render the numeric value of a cell. See custom format strings guidelines (in FAQ). Returns the custom format identifier. It's used in XLFormatMBS.NumFormat. Returns 0 if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.4 AddFont(initFont as XLFontMBS = nil) as XLFontMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new font to the workbook, initial parameters can be copied from other font.
**Notes:** Returns nil if error occurs.

The initFont can be from another book.

### 211.2.5 AddFormat(initFormat as XLFormatMBS = nil) as XLFormatMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new format to the workbook, initial parameters can be copied from other format.
**Example:**

```
// define a format for red fill
Dim redBackgroundFormat As XLFormatMBS = book.AddFormat
```

```
Dim c As Color = &cFF0000
// will give back numeric value of color for RGB mode or color index
Dim n As Integer = book.PackColor(c)
// we set forecolor of the pattern to fill background!
redBackgroundFormat.PatternForegroundColor = n
redBackgroundFormat.PatternBackgroundColor = n
redBackgroundFormat.FillPattern = XLFormatMBS.FillPatternSolid

Dim row As Integer = 5 // 6th row
Dim col As Integer = 1 // Column B
Dim value As Double = 123

Call sheet.WriteNumber row, col, value, redBackgroundFormat
```

**Notes:** Returns nil if error occurs.

The initFormat can be from another book.

### 211.2.6 AddFormatFromStyle(style as Integer) as XLFormatMBS

MBS XL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new format to the workbook from the predefined style.
**Notes:** Returns nil if error occurs.
Please note that after loading a file it will be removed.
See kCellStyle* constants.

### 211.2.7 AddPicture(path as folderitem) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a picture to the workbook.
**Notes:** Returns a picture identifier. Supports BMP, DIB, PNG, JPG and WMF picture formats. Use picture identifier with XLSheetMBS.setPicture(). Returns -1 if error occurs. Get error info with XLBookMBS.ErrorMessage property.
See also:

- 211.2.8 AddPicture(path as string) as Integer 

### 211.2.8 AddPicture(path as string) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a picture to the workbook.
**Notes:** Returns a picture identifier. Supports BMP, DIB, PNG, JPG and WMF picture formats. Use picture identifier with XLSheetMBS.setPicture(). Returns -1 if error occurs. Get error info with XLBookMBS.ErrorMessage property.
See also:

- 211.2.7 AddPicture(path as folderitem) as Integer 23755

### 211.2.9 AddPictureData(data as string) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a picture to the workbook from memory buffer:
**Notes:** Returns a picture identifier. Use picture identifier with XLSheetMBS.setPicture(). Returns -1 if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.10 AddRichString as XLRichStringMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new rich string to be used in the book.

### 211.2.11 AddSheet(name as string, initSheet as XLSheetMBS = nil) as XLSheetMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new sheet to this book, returns the sheet.
**Example:**

```
// create new Excel file, pass true for XLSX format or false for XLS
Dim book As New XLBookMBS(True)

// add sheet
Dim sheet As XLSheetMBS = book.addSheet("Test")
Call sheet.WriteString(2, 1, "Hello World", Nil)

// write file and launch
Dim file As FolderItem = SpecialFolder.Desktop.Child("Writing data.xlsx")
```

```
If book.Save(file) Then
file.Launch
Else
MsgBox "Failed to create file."+EndOfLine+EndOfLine+book.ErrorMessage
End If
```

**Notes:** Use initSheet parameter if you wish to copy an existing sheet.
Must be from the same book to copy sheet.

Returns NULL if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.12 AddStyledText(StyledText as StyledText) as XLRichStringMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds styled text to the book to later assign to a cell.
**Notes:** We convert attributes like bold, italic, underline, color, font name and size.

### 211.2.13 available as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the library is available.
**Notes:** Returns false on PPC targets.

### 211.2.14 BookVersion as Integer

MBS XL Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the version number of this book.
**Example:**

```
dim b as new XLBookMBS
dim v as Integer = b.BookVersion

dim h as Integer = v \256 \256 \256
dim m as Integer = v \256 \256 mod 256
dim l as Integer = v \256 mod 256

MsgBox "libXL "+str(h)+"."+str(m)+"."+str(l)
```

**Notes:** Version number is encoded as hex number with major version, minor version and bugfix.

### 211.2.15 Constructor(xml as boolean = false)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new XLBookMBS object.
**Notes:** xml: If true, creates a book in xlsx format (xml), else one in xls format (binary).

### 211.2.16 CopyContent(dest as XLBookMBS, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies all content from one book to other book.
**Notes:** The plugin loops through all sheets and creates matching sheets on new book.
Formats and fonts are created on the fly.

This allows you to convert from XLS to XLSX or back.
Please report if something is not copied. Of course plugin can only copy what libXL supports, so stuff like movies or diagrams are not copied.

### 211.2.17 CustomNumFormat(fmt as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a custom format string for specified custom format identifier fmt.
**Notes:** See custom format string guidelines (in FAQ). Returns NULL if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.18 DefaultFont(byref fontSize as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a default font name and size for this workbook.
**Notes:** Returns "" if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.19 DelSheet(index as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a sheet with specified index.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.20 Font(index as Integer) as XLFontMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a font with defined index.
**Notes:** Index must be less than return value of fontCount method.

### 211.2.21 FontCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of fonts in this book.

### 211.2.22 Fonts as XLFontMBS()

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all defined fonts.

### 211.2.23 Format(index as Integer) as XLFormatMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a format with defined index.
**Notes:** Index must be less than return value of formatCount method.

### 211.2.24 FormatCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of formats in this book.

### 211.2.25 Formats as XLFormatMBS()

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all defined formats.

### 211.2.26 InsertSheet(index as Integer, name as string = """, initSheet as XLSheetMBS = nil) as XLSheetMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts a new sheet to this book at position index, returns the sheet.
**Notes:** Use initSheet parameter if you wish to copy an existing sheet. Must be from the same book to copy sheet.

Returns NULL if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.27 LibVersion as string

MBS XL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of library as string.
**Example:**

MsgBox XLBookMBS.LibVersion

**Notes:** Returns for example "3.8.0".
With plugin version 17.4 or newer, this returns 4 numbers, so you may see another .0 on the end.

### 211.2.28 LibVersionNumber as Integer

MBS XL Plugin, Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns version of library as number.
**Example:**

MsgBox str(XLBookMBS.LibVersionNumber)

**Notes:** Returns for example 3 * 256*256*256 + 8 * 256*256 + 0 * 256 + 0.

### 211.2.29 Load(path as folderitem) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file into memory.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

With the constructor of the XLBookMBS object you decide if you want to load XML format or older binary format. If the format of the book object doesn't match the file, it will fail.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.30 Load(path as string) as boolean 23761

### 211.2.30 Load(path as string) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file into memory.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

With the constructor of the XLBookMBS object you decide if you want to load XML format or older binary format. If the format of the book object doesn't match the file, it will fail.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.29 Load(path as folderitem) as boolean 23761

### 211.2.31 Load2(path as folderitem) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from file.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.32 Load2(path as folderitem, byref ErrorMessage as String) as XLBookMBS 23762
- 211.2.33 Load2(path as string) as XLBookMBS 23762
- 211.2.34 Load2(path as string, byref ErrorMessage as String) as XLBookMBS 23763


### 211.2.32 Load2(path as folderitem, byref ErrorMessage as String) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("XING contacts.xlsx")
dim e as string
dim b as XLBookMBS = XLBookMBS.Load2(f,e)

if b = nil then
MsgBox e
Return
end if

dim s as XLSheetMBS = b.Sheet(0)
MsgBox s.ReadString(1,1)
```

**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:


- 211.2.31 Load2(path as folderitem) as XLBookMBS 23761
- 211.2.33 Load2(path as string) as XLBookMBS 23762
- 211.2.34 Load2(path as string, byref ErrorMessage as String) as XLBookMBS 23763


### 211.2.33 Load2(path as string) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from file.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("XING contacts.xlsx")
dim b as XLBookMBS = XLBookMBS.Load2(f)

if b = nil then
MsgBox e
Return
end if

dim s as XLSheetMBS = b.Sheet(0)
MsgBox s.ReadString(1,1)
```

**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:


- 211.2.31 Load2(path as folderitem) as XLBookMBS 23761
- 211.2.32 Load2(path as folderitem, byref ErrorMessage as String) as XLBookMBS 23762
- 211.2.34 Load2(path as string, byref ErrorMessage as String) as XLBookMBS 23763


### 211.2.34 Load2(path as string, byref ErrorMessage as String) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from file.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:


- 211.2.31 Load2(path as folderitem) as XLBookMBS 23761
- 211.2.32 Load2(path as folderitem, byref ErrorMessage as String) as XLBookMBS 23762
- 211.2.33 Load2(path as string) as XLBookMBS 23762

### 211.2.35 LoadError as String

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The last error message from LoadLibrary call.
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.dylib")

if XLBookMBS.LoadLibrary(f) then
MsgBox "OK"
else
MsgBox XLBookMBS.LoadError
end if
```

### 211.2.36 LoadLibrary(File as FolderItem) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the libXL library file.
**Example:**

```
MsgBox "Version before: "+XLBookMBS.LibVersion

dim f as FolderItem = SpecialFolder.Desktop.Child("libxl.dylib")

if XLBookMBS.LoadLibrary(f) then
MsgBox "Version after: "+XLBookMBS.LibVersion
else
MsgBox XLBookMBS.LoadError
end if
```

**Notes:** Returns true on success or false on failure.

While the plugin comes with an internal libXL library, you can use this method to load a different version of the library.
See also:

- 211.2.37 LoadLibrary(Path as string) as boolean 23764

### 211.2.37 LoadLibrary(Path as string) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the libXL library file.
**Notes:** Returns true on success or false on failure.

While the plugin comes with an internal libXL library, you can use this method to load a different version of the library.
See also:

- 211.2.36 LoadLibrary(File as FolderItem) as boolean 23764

### 211.2.38 LoadMT(path as folderitem) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads from file.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.39 LoadMT(path as string) as boolean 23765

### 211.2.39 LoadMT(path as string) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads from file.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.38 LoadMT(path as folderitem) as boolean 23765

### 211.2.40 LoadPartially(path as folderitem, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file only with specified sheet index and row range into memory.

**Notes:** Returns false if error occurs or true on success.. Get error info with errorMessage function.
See also:

- 211.2.41 LoadPartially(path as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean 23766

### 211.2.41 LoadPartially(path as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file only with specified sheet index and row range into memory.
**Notes:** Returns false if error occurs or true on success.. Get error info with errorMessage function.
See also:

- 211.2.40 LoadPartially(path as folderitem, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean 23765

### 211.2.42 LoadPartiallyUsingTempFile(path as folderitem, sheetIndex as Integer, firstRow as Integer, lastRow as Integer, TempFile as folderitem) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file only with specified sheet index and row range into memory.
**Notes:** Specify a temporary file for reducing memory consumption.
Returns false if error occurs or true on success.. Get error info with errorMessage function.
See also:

- 211.2.43 LoadPartiallyUsingTempFile(path as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer, TempFile as String) as boolean 23766

### 211.2.43 LoadPartiallyUsingTempFile(path as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer, TempFile as String) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file only with specified sheet index and row range into memory.
**Notes:** Specify a temporary file for reducing memory consumption.
Returns false if error occurs or true on success.. Get error info with errorMessage function.
See also:

- 211.2.42 LoadPartiallyUsingTempFile(path as folderitem, sheetIndex as Integer, firstRow as Integer, lastRow as Integer, TempFile as folderitem) as boolean 23766

### 211.2.44 LoadRaw(data as MemoryBlock) as boolean

MBS XL Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's memory buffer.
**Notes:** Returns false if error occurs. Get error info with errorMessage property.

With the constructor of the XLBookMBS object you decide if you want to load XML format or older binary format. If the format of the book object doesn't match the file, it will fail.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.45 LoadRaw(data as string) as boolean 23767

### 211.2.45 LoadRaw(data as string) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's memory buffer.
**Notes:** Returns false if error occurs. Get error info with errorMessage property.

With the constructor of the XLBookMBS object you decide if you want to load XML format or older binary format. If the format of the book object doesn't match the file, it will fail.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.44 LoadRaw(data as MemoryBlock) as boolean 23767

### 211.2.46 LoadRaw2(data as MemoryBlock) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's memory buffer.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.47 LoadRaw2(data as MemoryBlock, byref ErrorMessage as String) as XLBookMBS 23768
- 211.2.48 LoadRaw2(data as string) as XLBookMBS 23768
- 211.2.49 LoadRaw2(data as string, byref ErrorMessage as String) as XLBookMBS 23769


### 211.2.47 LoadRaw2(data as MemoryBlock, byref ErrorMessage as String) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's memory buffer.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:


- 211.2.46 LoadRaw2(data as MemoryBlock) as XLBookMBS 23767
- 211.2.48 LoadRaw2(data as string) as XLBookMBS 23768
- 211.2.49 LoadRaw2(data as string, byref ErrorMessage as String) as XLBookMBS 23769


### 211.2.48 LoadRaw2(data as string) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's string buffer.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:


- 211.2.46 LoadRaw2(data as MemoryBlock) as XLBookMBS 23767
- 211.2.47 LoadRaw2(data as MemoryBlock, byref ErrorMessage as String) as XLBookMBS 23768
- 211.2.49 LoadRaw2(data as string, byref ErrorMessage as String) as XLBookMBS 23769

### 211.2.49 LoadRaw2(data as string, byref ErrorMessage as String) as XLBookMBS

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a xls-file from user's string buffer.
**Notes:** Autodetects if format is old (binary) or new (xml).
Returns nil if error occurs. On success returns a valid book.
Optionally returns error with ErrorMessage parameter.

Loading a file into the book object clears existing formats, sheets and fonts from previous book. You can recreate the ones you need or search them in the existing formats, fonts or sheets.
See also:

- 211.2.46 LoadRaw2(data as MemoryBlock) as XLBookMBS 23767
- 211.2.47 LoadRaw2(data as MemoryBlock, byref ErrorMessage as String) as XLBookMBS 23768
- 211.2.48 LoadRaw2(data as string) as XLBookMBS 23768

### 211.2.50 LoadRawMT(data as MemoryBlock) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads from memoryblock.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.51 LoadRawMT(data as string) as boolean 23769

### 211.2.51 LoadRawMT(data as string) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads from string.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.50 LoadRawMT(data as MemoryBlock) as boolean 23769

### 211.2.52 LoadRawPartially(data as MemoryBlock, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file from user's memory buffer.
**Notes:** data: Data buffer
sheetIndex: loads a file only with specified sheet index, -1 loads all sheets
firstRow: the first row of loaded range, -1 loads all rows until lastRow
lastRow: the last row of loaded range, -1 loads all rows after firstRow.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.53 LoadRawPartially(data as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean 23770

### 211.2.53 LoadRawPartially(data as string, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads a file from user's memory buffer.
**Notes:** data: Data buffer
sheetIndex: loads a file only with specified sheet index, -1 loads all sheets
firstRow: the first row of loaded range, -1 loads all rows until lastRow
lastRow: the last row of loaded range, -1 loads all rows after firstRow.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.52 LoadRawPartially(data as MemoryBlock, sheetIndex as Integer, firstRow as Integer, lastRow as Integer) as boolean 23770

### 211.2.54 LoadUsingTempFile(path as folderitem, TempFile as folderitem) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an entire file into memory.
**Notes:** Specify a temporary file for reducing memory consumption.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.55 LoadUsingTempFile(path as string, TempFile as String) as boolean 23771

### 211.2.55 LoadUsingTempFile(path as string, TempFile as String) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads an entire file into memory.
**Notes:** Specify a temporary file for reducing memory consumption.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.54 LoadUsingTempFile(path as folderitem, TempFile as folderitem) as boolean 23770

### 211.2.56 MoveSheet(SourceIndex as integer, DestIndex as Integer) as boolean

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Takes a sheet with SourceIndex and insert it in front of a sheet with DestIndex.
**Notes:** Returns false if error occurs and true on success.

### 211.2.57 PackColor(ColorValue as color) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packs red, green and blue components in color type.
**Example:**

```
// define a format for red fill
Dim redBackgroundFormat As XLFormatMBS = book.AddFormat
Dim c As Color = &cFF0000
// will give back numeric value of color for RGB mode or color index
Dim n As Integer = book.PackColor(c)
// we set forecolor of the pattern to fill background!
redBackgroundFormat.PatternForegroundColor = n
redBackgroundFormat.PatternBackgroundColor = n
redBackgroundFormat.FillPattern = XLFormatMBS.FillPatternSolid

Dim row As Integer = 5 // 6th row
Dim col As Integer = 1 // Column B
Dim value As Double = 123

Call sheet.WriteNumber row, col, value, redBackgroundFormat
```

See also:

- 211.2.58 PackColor(red as Integer, green as Integer, blue as Integer) as Integer 23772

### 211.2.58 PackColor(red as Integer, green as Integer, blue as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packs red, green and blue components in color type.
See also:

- 211.2.57 PackColor(ColorValue as color) as Integer 23771

### 211.2.59 PackDate(d as date) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Packs date and time information into double type.
See also:

- 211.2.60 PackDate(year as Integer, month as Integer, day as Integer, hour as Integer = 0, min as Integer = 0, sec as Integer = 0, msec as Integer = 0) as Double 23772

### 211.2.60 PackDate(year as Integer, month as Integer, day as Integer, hour as Integer = 0, min as Integer = 0, sec as Integer = 0, msec as Integer = 0) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packs date and time information into double type.
See also:

- 211.2.59 PackDate(d as date) as Double 23772

### 211.2.61 PackDateTime(d as dateTime) as double

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packs date and time information into double type.

### 211.2.62 Picture(index as Integer, byref data as string) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a picture at position index in memory buffer.
**Notes:** Parameters:
index: position in the workbook

data: reference to buffer

Returns type of picture. See PictureType* constants.

### 211.2.63 PictureCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of pictures in this workbook.

### 211.2.64 Save(path as folderitem) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves current workbook into xls-file.
**Example:**

```
// create new Excel file, pass true for XLSX format or false for older XLS format
Dim book As New XLBookMBS(True)

// add sheet
Dim sheet As XLSheetMBS = book.addSheet("Test")
Call sheet.WriteString(2, 1, "Hello World", Nil)

// write file and launch
Dim file As FolderItem = SpecialFolder.Desktop.Child("Writing data.xlsx")

If book.Save(file) Then
file.Launch
Else
MsgBox "Failed to create file."+EndOfLine+EndOfLine+book.ErrorMessage
End If
```

**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
See also:


- 211.2.65 Save(path as folderitem, UseTempFile as Boolean) as boolean 23774
- 211.2.66 Save(path as string) as boolean 23774
- 211.2.67 Save(path as string, UseTempFile as Boolean) as boolean 23774

### 211.2.65 Save(path as folderitem, UseTempFile as Boolean) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves current workbook into the file.
**Notes:** Use a temporary file for reducing memory consumption.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.64 Save(path as folderitem) as boolean 23773
- 211.2.66 Save(path as string) as boolean 23774
- 211.2.67 Save(path as string, UseTempFile as Boolean) as boolean 23774

### 211.2.66 Save(path as string) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves current workbook into xls-file.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
See also:

- 211.2.64 Save(path as folderitem) as boolean 23773
- 211.2.65 Save(path as folderitem, UseTempFile as Boolean) as boolean 23774
- 211.2.67 Save(path as string, UseTempFile as Boolean) as boolean 23774

### 211.2.67 Save(path as string, UseTempFile as Boolean) as boolean

MBS XL Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves current workbook into the file.
**Notes:** Use a temporary file for reducing memory consumption.
Returns false if error occurs or true on success. Get error info with errorMessage function.
See also:

- 211.2.64 Save(path as folderitem) as boolean 23773
- 211.2.65 Save(path as folderitem, UseTempFile as Boolean) as boolean 23774
- 211.2.66 Save(path as string) as boolean 23774

### 211.2.68 SaveMT(path as folderitem) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves document to file on disk.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.69 SaveMT(path as string) as boolean 23775

### 211.2.69 SaveMT(path as string) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves document to file on disk.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.68 SaveMT(path as folderitem) as boolean 23774

### 211.2.70 SaveRaw(byref data as MemoryBlock) as boolean

MBS XL Plugin, Plugin Version: 14.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a xls-file to internal memory buffer.
**Notes:** Returns false if error occurs. Get error info with errorMessage property.
See also:

- 211.2.71 SaveRaw(byref data as string) as boolean 23775

### 211.2.71 SaveRaw(byref data as string) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves a xls-file to internal memory buffer.
**Notes:** Returns false if error occurs. Get error info with errorMessage property.
See also:

- 211.2.70 SaveRaw(byref data as MemoryBlock) as boolean 23775

### 211.2.72 SaveRawMT(byref data as MemoryBlock) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves document to memoryblock.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.73 SaveRawMT(byref data as string) as boolean 23776

### 211.2.73 SaveRawMT(byref data as string) as boolean

MBS XL Plugin, Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Saves document to string.
**Notes:** Same as the other method without MT in name, except:

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:

- 211.2.72 SaveRawMT(byref data as MemoryBlock) as boolean 23776

### 211.2.74 SetDefaultFont(fontName as string, fontSize as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a default font name and size for this workbook.

### 211.2.75 SetKey(name as string, key as string)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets customer's license key.
**Notes:** Call this once for each XLBookMBS object and before you read or write data.

If you have keys for more than one platform, please use #if condition to make sure you pass right key for current platform.

### 211.2.76 SetKeyGlobal(name as string, key as string)

MBS XL Plugin, Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Private method to avoid you call this on an object.
**Notes:** Please call shared method in app.open.
Because if you make a new object and set key, it's too late.
See also:

- 211.2.77 SetKeyGlobal(name as string, key as string) 23777

### 211.2.77 SetKeyGlobal(name as string, key as string)

MBS XL Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets customer's license key.
**Example:**

```
// add this to app.open

#if TargetMacOS then
// Mac license
XLBookMBS.SetKeyGlobal("Your Name", "Your Key")
#elseif TargetLinux then
// Linux license
XLBookMBS.SetKeyGlobal("Your Name", "Your Key")
#elseif TargetWin32 then
// Win license
XLBookMBS.SetKeyGlobal("Your Name", "Your Key")
#else
// missing
#endif
```

**Notes:** You can call this before using the other plugin functions to set key on application startup. Simply call it in app.open event.

If you have keys for more than one platform, please use #if condition to make sure you pass right key for current platform.
See also:

- 211.2.76 SetKeyGlobal(name as string, key as string) 23777

### 211.2.78 SetLocale(locale as string)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the locale.
**Example:**

```
dim book as new XLBookMBS(false)
book.SetLocale "en_US.UTF-8"
```

**Notes:** Sets the locale for this library. It has no effect for unicode projects.

### 211.2.79 Sheet(index as Integer) as XLSheetMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the sheet with specified index.
**Notes:** Returns nil if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.2.80 SheetCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of sheets in this book.

### 211.2.81 Sheets as XLSheetMBS()

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns array with all sheets.
**Example:**

```
Function SheetByName(book as XLBookMBS, name as string) As XLSheetMBS
dim sheets() as XLSheetMBS = book.Sheets
for each s as XLSheetMBS in sheets
if s.Name = name then
Return s
end if
next
End Function
```

### 211.2.82 SheetType(index as Integer) as Integer

MBS XL Plugin, Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries type of the sheet.

### 211.2.83 UnpackColor(ColorValue as Integer) as color

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks color type to red, green and blue components.
See also:

- 211.2.84 UnpackColor(ColorValue as Integer, byref red as Integer, byref green as Integer, byref blue as Integer) 23779

### 211.2.84 UnpackColor(ColorValue as Integer, byref red as Integer, byref green as Integer, byref blue as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks color type to red, green and blue components.
See also:

- 211.2.83 UnpackColor(ColorValue as Integer) as color 23779

### 211.2.85 UnpackDate(Value as Double) as date

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Unpacks date and time information from double type.
**Notes:** Returns nil if error occurs.
See also:

- 211.2.86 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer) as boolean 23780
- 211.2.87 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer) as boolean 23780
- 211.2.88 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer, byref msec as Integer) as boolean 23780

### 211.2.86 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks date and time information from double type.
**Notes:** Returns false if error occurs.
See also:

- 211.2.85 UnpackDate(Value as Double) as date 23779
- 211.2.87 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer) as boolean 23780
- 211.2.88 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer, byref msec as Integer) as boolean 23780

### 211.2.87 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks date and time information from double type.
**Notes:** Returns false if error occurs.
See also:

- 211.2.85 UnpackDate(Value as Double) as date 23779
- 211.2.86 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer) as boolean 23780
- 211.2.88 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer, byref msec as Integer) as boolean 23780

### 211.2.88 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer, byref msec as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks date and time information from double type.
**Notes:** Returns false if error occurs.
See also:

- 211.2.85 UnpackDate(Value as Double) as date 23779
- 211.2.86 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer) as boolean 23780
- 211.2.87 UnpackDate(Value as Double, byref year as Integer, byref month as Integer, byref day as Integer, byref hour as Integer, byref min as Integer, byref sec as Integer) as boolean 23780


### 211.2.89 UnpackDateTime(Value as double) as dateTime

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Unpacks date and time information from double type.
**Notes:** Returns nil if error occurs.

### 211.2.90 Properties

### 211.2.91 ActiveSheet as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Active sheet index in this workbook.
**Notes:** (Read and Write property)

### 211.2.92 BiffVersion as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns BIFF version of binary file.
**Notes:** Used for xls format only.
(Read only property)

### 211.2.93 CalcMode as integer

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The calculation mode of workbook.
**Notes:** Cal be manual, auto or automatic except for data tables.
See CalcMode* constants.
(Read and Write property)

### 211.2.94 ErrorMessage as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the last error message.
**Notes:** (Read only property)

### 211.2.95 Handle as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.2.96 IsDate1904 as boolean

MBS XL Plugin, Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether dates are 1904 based.
**Notes:** A boolean value that indicates whether the date systems used in the workbook starts in 1904.
True indicates the date system starts in 1904, where January 1, 1904 is the first day in the system.
False indicates the workbook uses the 1900 date system, where January 1, 1900 is the first day in the system.
(Read and Write property)

### 211.2.97 IsTemplate as boolean

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the workbook is template.
**Notes:** The template flag: true - workbook is template, false - workbook is not template (default).
This flag must have a value "true" for template files (xlt and xltx).
(Read and Write property)

### 211.2.98 IsWriteProtected as Boolean

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns whether the workbook is marked as read-only.
**Notes:** (Read only property)

### 211.2.99 RefR1C1 as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the R1C1 reference mode is active.
**Notes:** (Read and Write property)

### 211.2.100 RgbMode as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the RGB mode is active. Used for xlsx format only.
**Notes:** true - RGB mode, false - Index mode (default).
In RGB mode use PackColor() and UnpackColor() methods for getting/setting colors. Used for xlsx format only.
(Read and Write property)

### 211.2.101 Constants

Call Modes

| Constant | Value | Description |
|---|---|---|
| CalcModeAuto | 1 | automatic calculation |
| CalcModeAutoNoTable | 2 | automatic except for data tables |
| CalcModeManual | 0 | manual calculation |

Cell Styles

| Constant | Value | Description |
|---|---|---|
| kCellstyle20Accent1 | 19 | |
| kCellstyle20Accent2 | 23 | |
| kCellstyle20Accent3 | 27 | |
| kCellstyle20Accent4 | 31 | |
| kCellstyle20Accent5 | 35 | |
| kCellstyle20Accent6 | 39 | |
| kCellstyle40Accent1 | 20 | |
| kCellstyle40Accent2 | 24 | |
| kCellstyle40Accent3 | 28 | |
| kCellstyle40Accent4 | 32 | |
| kCellstyle40Accent5 | 36 | |
| kCellstyle40Accent6 | 40 | |
| kCellstyle60Accent1 | 21 | |
| kCellstyle60Accent2 | 25 | |
| kCellstyle60Accent3 | 29 | |
| kCellstyle60Accent4 | 33 | |
| kCellstyle60Accent5 | 37 | |
| kCellstyle60Accent6 | 41 | |
| kCellstyleAccent1 | 22 | |
| kCellstyleAccent2, | 26 | |
| kCellstyleAccent3 | 30 | |
| kCellstyleAccent4, | 34 | |
| kCellstyleAccent5 | 38 | |
| kCellstyleAccent6, | 42 | |
| kCellstyleBad | 1 | Bad, usually red text on a light red background. |
| kCellstyleCalc | 4 | |
| kCellstyleCheckcell | 5 | |
| kCellstyleComma | 43 | Comma |
| kCellstyleComma0 | 44 | Comma [ 0 ] |
| kCellstyleCurrency | 45 | Currency |
| kCellstyleCurrency0 | 46 | Currency [ 0 ] |
| kCellstyleExplanatory | 6 | |
| kCellstyleGood | 2 | |
| kCellstyleHeading1 | 14 | |
| kCellstyleHeading2 | 15 | |
| kCellstyleHeading3 | 16 | |
| kCellstyleHeading4 | 17 | |
| kCellstyleHyperlink | 9 | |
| kCellstyleInput | 7 | Input field style |
| kCellstyleLinkedCell | 10 | Linked Cell style. |
| kCellstyleNeutral | 3 | Bad, usually brown text on a light orange background. |
| kCellstyleNormal | 0 | Normal. |
| kCellstyleNote | 11 | Note style |
| kCellstyleOutput, | 8 | Output field style |
| kCellstylePercent | 47 | Percent |
| kCellstyleTitle | 13 | Title style |
| kCellstyleTotal, | 18 | Total value style |
| kCellstyleWarning | 12 | |

Picture Format Constants

| Constant | Value | Description |
|---|---|---|
| PictureTypeDIB | 4 | DIB format |
| PictureTypeEMF | 5 | EMF format |
| PictureTypeError | &hFF | Error. Check XLBookMBS.ErrorMessage method. |
| PictureTypeGIF | 2 | GIF format. |
| PictureTypeJPEG | 1 | JPEG format |
| PictureTypePICT | 6 | Mac PICT format. |
| PictureTypePNG | 0 | PNG format |
| PictureTypeTIFF | 7 | TIFF format |
| PictureTypeWMF | 3 | WMF format |

Sheet Types

| Constant | Value | Description |
|---|---|---|
| SheetTypeChart | 1 | Sheet is a chart. |
| SheetTypeSheet | 0 | This is a normal sheet. |
| SheetTypeUnknown | 2 | Type is unknown. |

## 211.3 class XLCopyOptionsMBS

### 211.3.1 class XLCopyOptionsMBS

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The options for copying.
**Blog Entries**

- LibXL Extras for Xojo
- MBS Xojo Plugins in version 19.0
- MBS Xojo Plugins, version 19.0pr7
- MBS Xojo Plugins, version 19.0pr6

**Xojo Developer Magazine**

- 17.2, page 11: News

### 211.3.2 Methods

### 211.3.3 Constructor

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor.
**Notes:** Initializes object and sets all properties to true.

### 211.3.4 Properties

### 211.3.5 CopyColHidden as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy column hidden flags.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.6 CopyComments as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy comments.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.7 CopyFormat as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy formats.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.8 CopyHorPageBreak as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy horizontal page breaks.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.9 CopyMerge as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy merge cells.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.10 CopyNamedRanges as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy named ranges.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.11 CopyPicture as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy pictures.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.12 CopyPrintArea as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy print area.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.13 CopyPrintFit as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy print fit settings.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.14 CopyPrintRepeat as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy print repeat settings.
**Notes:** Defaults to true.
(Read and Write property)

### 211.3.15 CopyRowHidden as Boolean

MBS XL Plugin, Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to copy row hidden flags.
**Notes:** Defaults to true.
(Read and Write property)

## 211.4 class XLFilterColumnMBS

### 211.4.1 class XLFilterColumnMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for filter column.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- LibXL Extras for Xojo
- MBS Xojo Plugins, version 18.4pr9

### 211.4.2 Methods

### 211.4.3 AddFilter(Filter as String)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the filter value.

### 211.4.4 Clear

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clear the filter criteria.

### 211.4.5 Constructor

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 211.4.6 Filter(index as Integer) as String

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the filter value by index.

### 211.4.7 GetCustomFilterEx(byref Op1 as Integer, byref Value1 as String, byref Op2 as Integer, byref Value2 as String, byref andOp as Boolean) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the custom filter criteria:
**Notes:** op1 - operator used by the filter comparison in the first filter criteria;
Value1 - value used in the first filter criteria;
op2 - operator used by the filter comparison in the second filter criteria;
Value12 - value used in the second filter criteria;
andOp - flag indicating whether the two criterias have an "and" relationship. True indicates "and", false indicates "or".
Returns false if error. Get error info with XLBookMBS.errorMessage.

### 211.4.8 GetTop10(byref value as Double, byref top as boolean, byref percent as boolean) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the number of top or bottom items:
**Notes:** value - number of items;
top - top items if true otherwise bottom items;
percent - using percent instead of number items.
Returns false if error. Get error info with XLBookMBS.errorMessage.

### 211.4.9 SetCustomFilter(Op as Integer, Value as String)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the custom filter criteria:
**Notes:** op - operator used by the filter comparison in the filter criteria;
Value - value used in the filter criteria;

### 211.4.10 SetCustomFilterEx(Op1 as Integer, Value1 as String, Op2 as Integer, Value2 as String, andOp as Boolean = false)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the custom filter criteria:
**Notes:** op1 - operator used by the filter comparison in the first filter criteria;
Value1 - value used in the first filter criteria;
op2 - operator used by the filter comparison in the second filter criteria;

Value2 - value used in the second filter criteria;
andOp - flag indicating whether the two criterias have an "and" relationship. True indicates "and", false indicates "or".

### 211.4.11 SetTop10(value as Double, top as boolean = true, percent as boolean = false)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the number of top or bottom items:
**Notes:** value - number of items;
top - top items if true otherwise bottom items;
percent - using percent instead of number items.

### 211.4.12 Properties

### 211.4.13 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The owner object.
**Notes:** (Read only property)

### 211.4.14 FilterSize as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of filter values.
**Notes:** (Read only property)

### 211.4.15 FilterType as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the filter type of this AutoFilter column.
**Notes:** can be constants FilterColor, FilterCustom, FilterDynamic, FilterExt, FilterIcon, FilterNotSet, FilterTop10 or FilterValue.
(Read only property)

### 211.4.16 Handle as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.4.17 Index as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the zero-based index of this AutoFilter column.
**Notes:** (Read only property)

### 211.4.18 Constants

Filter Types

| Constant | Value | Description |
|---|---|---|
| FilterColor | 4 | Specifies the color to filter by. |
| FilterCustom | 2 | Custom filter with specified criteria. |
| FilterDynamic | 3 | Specifies dynamic filter criteria. |
| FilterExt | 6 | Defines flexible storage extensions. |
| FilterIcon | 5 | Specifies the icon to filter by. |
| FilterNotSet | 7 | No filter. |
| FilterTop10 | 1 | The top N (percent or number of items) to filter by. |
| FilterValue | 0 | Filter by specified values. |

Compare Operators

| Constant | Value | Description |
|---|---|---|
| OperatorEqual | 0 | Equal |
| OperatorGreaterThan | 1 | Greater than |
| OperatorGreaterThanOrEqual | 2 | Greater than or equal |
| OperatorLessThan | 3 | Less than |
| OperatorLessThanOrEqual | 4 | Less than or equal |
| OperatorNotEqual | 5 | Not equal |

## 211.5 class XLFontMBS

### 211.5.1 class XLFontMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a font definition.
**Example:**

```
dim book as XLBookMBS // your book
dim textFont as XLFontMBS = book.addFont()
textFont.size = 8
textFont.name = "Century Gothic"
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- LibXL Extras for Xojo
- StyledText for Excel files with LibXL 3.9 in Xojo
- MBS Xojo Plugins, version 18.4pr9

### 211.5.2 Methods

### 211.5.3 Constructor

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 211.5.4 Properties

### 211.5.5 Bold as Boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the font is bold.
**Notes:** (Read and Write property)

### 211.5.6 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The owner object.
**Notes:** As a font is only valid with the owning book, we keep a back reference here.
(Read only property)

### 211.5.7 ColorRGB as Color

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font color as color value.
**Notes:** While ColorValue may return indexed color, this property converts to a Xojo color value.
(Read and Write property)

### 211.5.8 ColorValue as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the font.
**Example:**

```
dim book as XLBookMBS // your book
dim textFont as XLFontMBS = book.addFont()
textFont.size = 8
textFont.ColorValue = XLFontMBS.ColorGray25
```

**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.5.9 Handle as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.5.10 Italic as Boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the font is italic.
**Notes:** If italic doesn't show, maybe check whether the chosen font supports italic.
(Read and Write property)

### 211.5.11 Name as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the font.
**Notes:** Default name is "Arial".
(Read and Write property)

### 211.5.12 Script as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The script style of the font.
**Notes:** (Read and Write property)

### 211.5.13 Size as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The size of the font in points.
**Notes:** (Read and Write property)

### 211.5.14 StrikeOut as Boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the font is strikeout.
**Notes:** (Read and Write property)

### 211.5.15 Underline as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The underline style of the font.
**Notes:** See Underline* constants.
(Read and Write property)

### 211.5.16 Constants

Color Constants

| Constant | Value | Description |
|---|---|---|
| ColorAqua | 49 | |
| ColorAuto | &h7Fff | |
| ColorBlack | 8 | |
| ColorBlue | 12 | |
| ColorBlueCl | 39 | |
| ColorBluegray | 54 | |
| ColorBrightgreen | 11 | |
| ColorBrown | 60 | |
| ColorCoralCf | 29 | |
| ColorDarkblue | 18 | |
| ColorDarkblueCl | 32 | |
| ColorDarkgreen | 58 | |
| ColorDarkpurpleCf | 28 | |
| ColorDarkred | 16 | |
| ColorDarkredCl | 37 | |
| ColorDarkteal | 56 | |
| ColorDarkyellow | 19 | |
| ColorDefaultBackground | 65 | Auto |
| ColorDefaultForeground | 64 | Auto |
| ColorGold | 51 | |
| ColorGray25 | 22 | |
| ColorGray40 | 55 | |
| ColorGray50 | 23 | |
| ColorGray80 | 63 | |
| ColorGreen | 17 | |
| ColorIceblueCf | 31 | |
| ColorIndigo | 62 | |
| ColorIvoryCf | 26 | |
| ColorLavender | 46 | |
| ColorLightblue | 48 | |
| ColorLightgreen | 42 | |
| ColorLightorange | 52 | |
| ColorLightturquoise | 41 | |
| ColorLightturquoiseCf | 27 | |
| ColorLightyellow | 43 | |
| ColorLime | 50 | |
| ColorNone | &H7F | No color. |
| ColorOceanblueCf | 30 | |
| ColorOlivegreen | 59 | |
| ColorOrange | 53 | |
| ColorPaleblue | 44 | |
| ColorPeriwinkleCf | 24 | |
| ColorPink | 14 | |
| ColorPinkCl | 33 | |
| ColorPlum | 61 | |
| ColorPlumCf | 25 | |
| ColorRed | 10 | |
| ColorRose | 45 | |
| ColorSeagreen | 57 | |
| ColorSkyblue | 40 | |
| ColorTan | 47 | |
| ColorTeal | 21 | |
| ColorTealCl | 38 | |
| ColorTooltip | 81 | |
| ColorTurquoise | 15 | |
| ColorTurquoiseCl | 35 | |
| ColorViolet | 20 | |
| ColorVioletCl | 36 | |

Script Style Constants

| Constant | Value | Description |
|---|---|---|
| ScriptNormal | 0 | |
| ScriptSub | 2 | |
| ScriptSuper | 1 | |

Underline Style Constants

| Constant | Value | Description |
|---|---|---|
| UnderlineDouble | 2 | |
| UnderlineDoubleacc | &H22 | |
| UnderlineNone | 0 | |
| UnderlineSingle | 1 | |
| UnderlineSingleacc | &H21 | |

## 211.6 class XLFormatMBS

### 211.6.1 class XLFormatMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for a format.
**Example:**

```
dim book as XLBookMBS // your book
// add font
dim boldFont as XLFontMBS = book.addFont()
boldFont.StrikeOut = true

// add format
dim boldFormat as XLFormatMBS = book.addFormat
boldFormat.font = boldFont

// write on a cell in first sheet
sheet = book.Sheet(0)
call sheet.WriteString(1, 1, "Sales Receipt", boldFormat)
```

**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- LibXL Extras for Xojo
- MBS Xojo Plugins, version 18.4pr9

**Xojo Developer Magazine**

- 20.5, page 73: Create and Read Excel Spreadsheets, Using LibXL with Xojo by Stefanie Juchmes

### 211.6.2 Methods

### 211.6.3 Constructor

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 211.6.4 SetBorder(border as Integer = 1)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border style.
**Notes:** See BorderStyle* constants.

### 211.6.5 SetBorderColor(ColorValue as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the border color.
**Notes:** If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.

### 211.6.6 SetFont(font as XLFontMBS) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the font for the format.
**Notes:** To create a new font use XLBookMBS.addFont(). Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.6.7 SetRotation(rotation as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the text rotation.
**Notes:** Must be a value from the following table:

| Value | Meaning |
|---|---|
| 0 - 90 | Text rotated counterclockwise 0 to 90 degrees |
| 91 - 180 | Text rotated clockwise 1 to 90 degrees |
| 255 | Vertical text |

### 211.6.8 Properties

### 211.6.9 AlignH as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The horizontal alignment.
**Notes:** See AlignH* constants.
(Read and Write property)

### 211.6.10 AlignV as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The vertical alignment.
**Notes:** See AlignV* constants.
(Read and Write property)

### 211.6.11 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The object owning this format object.
**Notes:** As a format is only valid with the owning book, we keep a back reference here.
(Read only property)

### 211.6.12 BorderBottom as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bottom border style.
**Notes:** See BorderStyle* constants.
(Read and Write property)

### 211.6.13 BorderBottomColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the bottom border.
**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see

XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.14 BorderDiagonal as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The diagonal border.
**Notes:** see BorderDiagonal* constants.
(Read and Write property)

### 211.6.15 BorderDiagonalColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the diagonal border.
**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.16 BorderDiagonalStyle as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The diagonal border style.
**Notes:** See BorderDiagonal* constants.
(Read and Write property)

### 211.6.17 BorderLeft as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The left border style.
**Notes:** See BorderStyle* constants.
(Read and Write property)

### 211.6.18 BorderLeftColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the left border.
**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.19 BorderRight as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The right border style.
**Notes:** See BorderStyle* constants.
(Read and Write property)

### 211.6.20 BorderRightColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the right border.
**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.21 BorderTop as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The top border style.
**Notes:** See BorderStyle* constants.
(Read and Write property)

### 211.6.22 BorderTopColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The color of the top border.
**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.23 FillPattern as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The fill pattern.
**Notes:** See fill pattern constants.
(Read and Write property)

### 211.6.24 Font as XLFontMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The font for the format.
**Example:**

```
// your book
dim book as XLBookMBS

// add font
dim StrikeOutFont as XLFontMBS = book.addFont()
StrikeOutFont.StrikeOut = true

// add format
dim StrikeOutFormat as XLFormatMBS = book.addFormat
StrikeOutFormat.font = StrikeOutFont

// write on a cell in first sheet
sheet = book.Sheet(0)
call sheet.WriteString(1, 1, "Sales Receipt", StrikeOutFormat)
```

**Notes:** To create a new font use XLBookMBS.addFont(). Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

(Read and Write property)

### 211.6.25 Handle as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.6.26 Hidden as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the hidden protection property is set to true.
**Notes:** (Read and Write property)

### 211.6.27 Indent as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The text indentation level.
**Notes:** Must be less than or equal to 15.
(Read and Write property)

### 211.6.28 Locked as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the locked protection property is set to true.
**Notes:** Needs to be used together with XLSheetMBS.Protect property and XLSheetMBS.SetProtectEx method to prevent editing in locked cells.
(Read and Write property)

### 211.6.29 NumFormat as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The number format identifier.
**Notes:** The identifier must be a valid built-in number format identifier or the identifier of a custom number

format. To create a custom format use XLBookMBS.addCustomNumFormat(). Or use one of the NumFormat* constants.
(Read and Write property)

### 211.6.30 PatternBackgroundColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The background color of the fill pattern.
**Example:**

```
// define a format for red fill
Dim redBackgroundFormat As XLFormatMBS = book.AddFormat
Dim c As Color = &cFF0000
// will give back numeric value of color for RGB mode or color index
Dim n As Integer = book.PackColor(c)
// we set forecolor of the pattern to fill background!
redBackgroundFormat.PatternForegroundColor = n
redBackgroundFormat.PatternBackgroundColor = n
redBackgroundFormat.FillPattern = XLFormatMBS.FillPatternSolid

Dim row As Integer = 5 // 6th row
Dim col As Integer = 1 // Column B
Dim value As Double = 123

Call sheet.WriteNumber row, col, value, redBackgroundFormat
```

**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.31 PatternForegroundColor as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The foreground color of the fill pattern.
**Example:**

```
// define a format for red fill
Dim redBackgroundFormat As XLFormatMBS = book.AddFormat
Dim c As Color = &cFF0000
```

```
// will give back numeric value of color for RGB mode or color index
Dim n As Integer = book.PackColor(c)
// we set forecolor of the pattern to fill background!
redBackgroundFormat.PatternForegroundColor = n
redBackgroundFormat.PatternBackgroundColor = n
redBackgroundFormat.FillPattern = XLFormatMBS.FillPatternSolid

Dim row As Integer = 5 // 6th row
Dim col As Integer = 1 // Column B
Dim value As Double = 123

Call sheet.WriteNumber row, col, value, redBackgroundFormat
```

**Notes:** If book is in RGB mode, you need to use UnpackColor to get red, green and blue color components or color value from the returned number. If book is not in RGB mode, you receive a color number (see XLFontMBS color constants).
If you set value and book is in RGB mode you can use PackColor function to get a numeric value for a color or color components. If the book is not in RGB mode, you can use color constants in XLFontMBS classes.
(Read and Write property)

### 211.6.32 Rotation as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the text rotation.
**Notes:** Must be a value from the following table:

| Value | Meaning |
|---|---|
| 0 - 90 | Text rotated counterclockwise 0 to 90 degrees |
| 91 - 180 | Text rotated clockwise 1 to 90 degrees |
| 255 | Vertical text |

(Read only property)

### 211.6.33 ShrinkToFit as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the cell is shrink-to-fit.
**Notes:** (Read and Write property)

### 211.6.34 Wrap as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the cell text is wrapped.
**Notes:** (Read and Write property)

### 211.6.35 Constants

Horizontal Alignment Constants

| Constant | Value | Description |
|---|---|---|
| AlignHCenter | 2 | Center |
| AlignHDistributed | 7 | Distributed |
| AlignHFill | 4 | Fill |
| AlignHGeneral | 0 | Default |
| AlignHJustify | 5 | Justify |
| AlignHLeft | 1 | Left |
| AlignHMerge | 6 | Center over several cells. |
| AlignHRight | 3 | Right |

Vertical Alignment Constants

| Constant | Value | Description |
|---|---|---|
| AlignVBottom | 2 | Bottom |
| AlignVCenter | 1 | Center |
| AlignVDistributed | 4 | Distributed |
| AlignVJustify | 3 | Justify |
| AlignVTop | 0 | Top |

Diagonal Border Style Constants

| Constant | Value | Description |
|---|---|---|
| BorderDiagonalBoth | 3 | |
| BorderDiagonalDown | 1 | |
| BorderDiagonalNone | 0 | |
| BorderDiagonalUp | 2 | |

Border Style Constants

| Constant | Value | Description |
|---|---|---|
| BorderStyleDashdot | 9 | dash and dot |
| BorderStyleDashdotdot | 11 | dash and dots |
| BorderStyleDashed | 3 | dashed |
| BorderStyleDotted | 4 | dotted |
| BorderStyleDouble | 6 | double |
| BorderStyleHair | 7 | hair style |
| BorderStyleMedium | 2 | medium |
| BorderStyleMediumdashdot | 10 | medium dash and dot |
| BorderStyleMediumdashdotdot | 12 | medium dash and dots |
| BorderStyleMediumdashed | 8 | medium dashed |
| BorderStyleNone | 0 | no border |
| BorderStyleSlantdashdot | 13 | dash and dot |
| BorderStyleThick | 5 | thick |
| BorderStyleThin | 1 | thin |

Fillpattern Style Constants

| Constant | Value | Description |
|---|---|---|
| FillPatternDiagcrosshatch | 9 | |
| FillPatternDiagstripe | 8 | |
| FillPatternGray12P5 | 17 | |
| FillPatternGray25 | 4 | |
| FillPatternGray50 | 2 | |
| FillPatternGray6P25 | 18 | |
| FillPatternGray75 | 3 | |
| FillPatternHorstripe | 5 | |
| FillPatternNone | 0 | |
| FillPatternRevdiagstripe | 7 | |
| FillPatternSolid | 1 | |
| FillPatternThickdiagcrosshatch | 10 | |
| FillPatternThindiagcrosshatch | 16 | |
| FillPatternThindiagstripe | 14 | |
| FillPatternThinhorcrosshatch | 15 | |
| FillPatternThinhorstripe | 11 | |
| FillPatternThinrevdiagstripe | 13 | |
| FillPatternThinverstripe | 12 | |
| FillPatternVerstripe | 6 | |

Number Format Constants

| Constant | Value | Description |
|---|---|---|
| NumformatAccount | 41 | account value: 5,000 |
| NumformatAccountcur | 42 | account value with currency symbol: $ 5,000 |
| NumformatAccountD2 | 43 | account value with decimal point: 5,000.00 |
| NumformatAccountD2Cur | 44 | account value with currency symbol and decimal point: $ 5,000.00 |
| NumformatCurrencyD2Negbra | 7 | monetary value with decimal point, negative in brackets: ($ 1000.00) |
| NumformatCurrencyD2NegbraRed | 8 | monetary value with decimal point, negative is red in brackets: ($ 1000.0 |
| NumformatCurrencyNegbra | 5 | monetary value, negative in brackets: (1000$ ) |
| NumformatCurrencyNegbraRed | 6 | monetary value, negative is red in brackets: (1000$ ) |
| NumformatCustom000P0EPlus0 | 48 | custom value: 15.2E+3 |
| NumformatCustomDMon | 16 | custom date value: 11-Mar |
| NumformatCustomDMonYY | 15 | custom date value: 11-Mar-09 |
| NumformatCustomH0MMSS | 46 | custom time value: 20:30:55 |
| NumformatCustomHMM | 20 | custom date value: 8:30 |
| NumformatCustomHMMAM | 18 | custom date value: 8:30 AM |
| NumformatCustomHMMSS | 21 | custom date value: 8:30:00 |
| NumformatCustomHMMSSAM | 19 | custom date value: 8:30:00 AM |
| NumformatCustomMDYYYYHMM | 22 | custom datetime value: 3/11/2009 8:30 |
| NumformatCustomMMSS | 45 | custom time value: 30:55 |
| NumformatCustomMMSS0 | 47 | custom time value: 30:55.0 |
| NumformatCustomMonYY | 17 | custom date value: Mar-09 |
| NumformatDate | 14 | date value, depends on OS settings: 3/11/2009 |
| NumformatFractionOneDig | 12 | fraction value, one digit: 10 1/2 |
| NumformatFractionTwoDig | 13 | fraction value, two digits: 10 23/95 |
| NumformatGeneral | 0 | general format |
| NumformatNumber | 1 | general number: 1000 |
| NumformatNumberD2 | 2 | number with decimal point: 1000.00 |
| NumformatNumberD2SepNegbra | 39 | number with thousands separator and decimal point, negative in brac (4,000.00) |
| NumformatNumberD2SepNegbraRed | 40 | number with thousands separator and decimal point, negative is red in brac (4,000.00) |
| NumformatNumberSep | 3 | number with thousands separator: 100,000 |
| NumformatNumberSepD2 | 4 | number with decimal point and thousands separator: 100,000.00 |
| NumformatNumberSepNegbra | 37 | number with thousands separator, negative in brackets: (4,000) |
| NumformatNumberSepNegbraRed | 38 | number with thousands separator, negative is red in brackets: (4,000) |
| NumformatPercent | 9 | percent value, multiply the cell value by 100: 75% |
| NumformatPercentD2 | 10 | percent value with decimal point, multiply the cell value by 100: 75.00% |
| NumformatScientificD2 | 11 | scientific value with E character and decimal point: 10.00E+1 |
| NumformatText | 49 | text value |

## 211.7 class XLFormControlMBS

### 211.7.1 class XLFormControlMBS

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class to represent various form controls on an Excel sheet.
**Notes:** This allows you to batch pre-fill form fields in an Excel document.
You may need Excel to create the template with the form fields.

New in LibXL 4.0.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins in version 21.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.5

**Xojo Developer Magazine**

- 21.1, page 21: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes
- 20.1, page 9: News

### 211.7.2 Methods

### 211.7.3 AddItem(value as String)

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds the item to a list box or drop-down form control.

### 211.7.4 ClearItems

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Clears all items from a list box or drop-down form control.

### 211.7.5 Constructor

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 211.7.6 FromAnchor(byref Col as Integer, byref ColOff as Integer, byref Row as Integer, byref RowOff as Integer) as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the top left location of a control within a document.

### 211.7.7 InsertItem(Index as Integer, value as String)

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Inserts the item to the specified position to a list box or drop-down form control.

### 211.7.8 Item(Index as Integer) as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the item by index from a list box or drop-down form control.
**Notes:** Index in range from zero to ItemCount-1.

### 211.7.9 ToAnchor(byref Col as Integer, byref ColOff as Integer, byref Row as Integer, byref RowOff as Integer) as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the bottom right location of a control within a document.

### 211.7.10 Properties

### 211.7.11 AltText as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Alternative text for the object.
**Notes:** (Read only property)

### 211.7.12 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The book reference.
**Notes:** (Read only property)

### 211.7.13 Checked as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether a check box is selected or a radio button is selected.
**Notes:** This attribute only applies to check box and radio button form controls.

See CheckType* constants.
(Read and Write property)

### 211.7.14 DefaultSize as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the object is at its default size.
**Notes:** (Read only property)

### 211.7.15 Disabled as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the object is allowed to run an attached macro.
**Notes:** (Read only property)

### 211.7.16 DropLines as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the number of lines in the drop-down before scroll bars are added.
**Notes:** This attribute only applies to drop-down form controls.
This value must be at least 0 and at most 30000.
(Read and Write property)

### 211.7.17 Dx as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the width of the scroll bar in pixels.
**Notes:** This attribute only applies to list boxes, scroll bars, spin boxes and drop-downs.
(Read and Write property)

### 211.7.18 FirstButton as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the object is the first button in a set of radio buttons.
**Notes:** This attribute only applies to radio button form controls.
(Read and Write property)

### 211.7.19 FmlaGroup as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cell reference in a group box is linked to.
**Notes:** Only applies to group box form controls.
(Read and Write property)

### 211.7.20 FmlaLink as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cell reference is linked to.
**Notes:** Only applies to check boxes, radio buttons, scroll bars, spin boxes, drop-downs and list boxes.
(Read and Write property)

### 211.7.21 FmlaRange as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cell reference with range of source data cells.
**Notes:** This attribute only applies to list box and drop-down form controls.
(Read and Write property)

### 211.7.22 FmlaTxbx as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The cell reference with the source data that the form control object's data is linked to.
**Notes:** This attribute applies only to label and edit box form controls.
Any cell range can be specified but only the first cell in the range is considered.
(Read and Write property)

### 211.7.23 Handle as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.7.24 Horiz as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether the scroll bar is horizontal.
**Notes:** This attribute only applies to scroll bar form controls.
(Read and Write property)

### 211.7.25 Inc as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The change in the current value of a scroll bar or a spin box form control as a result of on an increment click.
**Notes:** It must be at least 0 and at most 30000. This attribute applies only to scroll bar or spin box form controls.
(Read and Write property)

### 211.7.26 ItemCount as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the number of items in a list box or drop-down form control.
**Notes:** (Read only property)

### 211.7.27 LinkedCell as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The worksheet range linked to the control's value.
**Notes:** (Read only property)

### 211.7.28 ListFillRange as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The range of source data cells used to populate the list box.
**Notes:** (Read only property)

### 211.7.29 Locked as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the object is locked when the sheet is protected.
**Notes:** (Read only property)

### 211.7.30 Macro as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The custom function associated with the object.
**Notes:** (Read only property)

### 211.7.31 Max as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The maximum value generated by the scroll bar or by the spin box.
**Notes:** It must be at least 0 and at most 30000. This attribute only applies to scroll bars and spin boxes. (Read and Write property)

### 211.7.32 Min as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The minimum value generated by the scroll bar or by the spin box.
**Notes:** It must be at least 0 and at most 30000. This attribute only applies to scroll bars and spin box.
(Read and Write property)

### 211.7.33 MultiSel as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The indices of selected items as a comma-delimited list.
**Notes:** The list indices are one-based.
This attribute is valid only if the attribute selType has the value "multi".
This attribute applies only to list box form controls.
(Read and Write property)

### 211.7.34 Name as String

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name for this embedded control.
**Notes:** (Read only property)

### 211.7.35 ObjectType as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the form control object type.
**Notes:** See ObjectType constants.
(Read only property)

### 211.7.36 Print as Boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether the object is printed when the document is printed.
**Notes:** (Read only property)

### 211.7.37 Sel as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The index of the selected item.
**Notes:** The index is one-based.
If set to a value of 0, no items are selected.
This attribute applies only to list box and drop-down form controls.
(Read and Write property)

### 211.7.38 Constants

Check State

| Constant | Value | Description |
|---|---|---|
| CheckedTypeChecked | 1 | Object is checked or selected. |
| CheckedTypeMixed | 2 | Mixed selection. Applies only to check boxes. |
| CheckedTypeUnchecked | 0 | Object is unchecked or unselected. |

Object Types

| Constant | Value | Description |
|---|---|---|
| ObjectTypeButton | 1 | Button control |
| ObjectTypeCheckbox | 2 | Check-box control |
| ObjectTypeDialog | 11 | Dialog control |
| ObjectTypeDrop | 3 | Drop-down (combo box) control |
| ObjectTypeEditbox | 10 | Edit box control |
| ObjectTypeGbox | 4 | Group box control |
| ObjectTypeLabel | 5 | Label control |
| ObjectTypeList | 6 | List box control |
| ObjectTypeRadio | 7 | Radio button control |
| ObjectTypeScroll | 8 | Scroll bar control |
| ObjectTypeSpin | 9 | Spin box control |
| ObjectTypeUnknown | 0 | Unknown control |

## 211.8 class XLRichStringMBS

### 211.8.1 class XLRichStringMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the rich text.
**Notes:** This class allows to have more than one font within one cell.
**Blog Entries**

- LibXL Extras for Xojo
- MBS Xojo Plugins, version 20.3pr1
- New in the MBS Xojo Plugins Version 20.2
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- StyledText for Excel files with LibXL 3.9 in Xojo
- MBS Xojo Plugins, version 20.2pr4

### 211.8.2 Methods

### 211.8.3 AddFont(templateFont as XLFontMBS = nil) as XLFontMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a new font to the RichString for using with the addText() method.
**Notes:** templateFont parameter added for version 20.3.

### 211.8.4 AddStyledText(StyledText as StyledText)

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Adds styled text to the rich string.
**Notes:** We convert attributes like bold, italic, underline, color, font name and size.

### 211.8.5 AddText(text as String, font as XLFontMBS = nil)

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a piece of text (run) with the specified font to the RichString for mixing different fonts in a single cell.

### 211.8.6 Constructor(book as XLBookMBS)

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a new rich text to be used in the book.

### 211.8.7 Text(Index as Integer) as String

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a piece of text (run) with the specified index from the RichString.
See also:


- 211.8.13 Text as String 23821
- 211.8.8 Text(Index as Integer, byref font as XLFontMBS) as String 23820


### 211.8.8 Text(Index as Integer, byref font as XLFontMBS) as String

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a piece of text (run) and font with the specified index from the RichString.
See also:


- 211.8.13 Text as String 23821
- 211.8.7 Text(Index as Integer) as String 23820


### 211.8.9 Properties

### 211.8.10 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The reference to the owning book.
**Notes:** (Read only property)

### 211.8.11 Handle as Integer

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 211.8.12 StyledText as StyledText

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Queries styled text with attributes of the rich string.
**Notes:** We convert attributes like bold, italic, underline, color, font name and size.
(Read only property)

### 211.8.13 Text as String

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries all text from the rich string.
**Notes:** (Read only property)
See also:

- 211.8.7 Text(Index as Integer) as String 23820
- 211.8.8 Text(Index as Integer, byref font as XLFontMBS) as String 23820

### 211.8.14 TextCount as Integer

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of text (run) in the RichString.
**Notes:** (Read only property)

## 211.9 class XLSheetMBS

### 211.9.1 class XLSheetMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an Excel worksheet.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1
- News from the MBS Xojo Plugins in version 21.5
- News from the MBS Xojo Plugins Version 21.2
- LibXL Extras for Xojo
- Text Encoding Speedups
- News from the MBS Xojo Plugins Version 20.5
- News from the MBS Xojo Plugins Version 20.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.3
- MBS Real Studio Plugins, version 12.2fc1

**Xojo Developer Magazine**

- 21.5, page 10: News
- 20.5, pages 75 to 76: Create and Read Excel Spreadsheets, Using LibXL with Xojo by Stefanie Juchmes
- 20.5, page 73: Create and Read Excel Spreadsheets, Using LibXL with Xojo by Stefanie Juchmes
- 19.4, page 10: News

### 211.9.2 Methods

### 211.9.3 AddDataValidation(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as String, value2 as String)

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data validation for the specified range (only for xlsx files).
**Notes:** type: the type of data validation.
op: the relational operator of data validation.
rowFirst: the first row of range;
rowLast: the last row of range;
colFirst: the first column of range;
colLast: the last column of range;
value1: the first value for relational operator;
value2: the second value for ValidationOpBetween or ValidationOpNotBetween operator;
See also:

- 211.9.4 AddDataValidation(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as String, value2 as String, allowBlank as Boolean, hideDropDown as Boolean = false, showInputMessage as Boolean = true, showErrorMessage as Boolean = true, promptTitle as String = """, prompt as String = """, errorTitle as string = """, error as string = """, errorStyle as integer = 0) 23823

### 211.9.4 AddDataValidation(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as String, value2 as String, allowBlank as Boolean, hideDropDown as Boolean = false, showInputMessage as Boolean = true, showErrorMessage as Boolean = true, promptTitle as String = """, prompt as String = """, errorTitle as string = """, error as string = """, errorStyle as integer = 0)

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data validation for the specified range (only for xlsx files).
**Notes:** type: the type of data validation.
op: the relational operator of data validation.
rowFirst: the first row of range;
rowLast: the last row of range;
colFirst: the first column of range;
colLast: the last column of range;
value1: the first value for relational operator;
value2: the second value for ValidationOpBetween or ValidationOpNotBetween operator;
allowBlank: a boolean value indicating whether the data validation treats empty or blank entries as valid, 'true' means empty entries are OK and do not violate the validation constraints;
hideDropDown: a boolean value indicating whether to display the dropdown combo box for a list type data validation (ValidationTypeList);
showInputMessage: a boolean value indicating whether to display the input prompt message;
showErrorMessage: a boolean value indicating whether to display the error alert message when an invalid value has been entered, according to the criteria specified;
promptTitle: title bar text of input prompt;
prompt: message text of input prompt;
errorTitle: title bar text of error alert;

error: message text of error alert;
errorStyle: the style of error alert used for this data validation:
See also:

- 211.9.3 AddDataValidation(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as String, value2 as String) 23822

### 211.9.5 AddDataValidationDouble(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as Double, value2 as Double)

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data validation for the specified range with double or date values for the relational operator (only for xlsx files).
**Notes:** See parameters in the addDataValidation() method.
See also:

- 211.9.6 AddDataValidationDouble(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as Double, value2 as Double, allowBlank as Boolean, hideDropDown as Boolean = false, showInputMessage as Boolean = true, showErrorMessage as Boolean = true, promptTitle as String = """, prompt as String = """, errorTitle as string = """, error as string = """, errorStyle as integer = 0) 23824

### 211.9.6 AddDataValidationDouble(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as Double, value2 as Double, allowBlank as Boolean, hideDropDown as Boolean = false, showInputMessage as Boolean = true, showErrorMessage as Boolean = true, promptTitle as String = """, prompt as String = """, errorTitle as string = """, error as string = """, errorStyle as integer = 0)

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a data validation for the specified range with double or date values for the relational operator (only for xlsx files).
**Notes:** See parameters in the addDataValidation() method.
See also:

- 211.9.5 AddDataValidationDouble(type as Integer, op as integer, rowFirst as integer, colFirst as integer, rowLast as integer, colLast as integer, value1 as Double, value2 as Double) 23824

### 211.9.7 AddHyperlink(hyperlink as string, rowFirst as Integer, rowLast as Integer, colFirst as Integer, colLast as Integer)

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the new hyperlink.

### 211.9.8 AddIgnoredError(rowFirst as Integer, colFirst as Integer, rowLast as Integer, colLast as Integer, iError as Integer) as Boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds the ignored error for specified range.
**Notes:** It allows to hide green triangles on left sides of cells. For example, if a cell is formatted as text but contains a numeric value, this is considered to be a potential error because the number won't be treated as a number, for example, in calculations. It is possible to combine a few IgnoredError values with operator | .

Returns false if error occurs. Get error info with XLBookMBS.errorMessage.

### 211.9.9 AddrToRowCol(addr as string, byref row as Integer, byref col as Integer, byref rowRelative as boolean, byref colRelative as boolean)

MBS XL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts a cell reference to row and column.
**Example:**

```
// create new xls file
dim book as new XLBookMBS(false)

// create sheet
dim sheet as XLSheetMBS = book.AddSheet("Sheet1")

dim row, col as Integer
dim rowRelative, colRelative as boolean

sheet.AddrToRowCol("F7", row, col, rowRelative, colRelative)
MsgBox str(row)+" "+str(col) // shows 6 5
```

### 211.9.10 AddSelectionRange(sqref as string)

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Adds a range to the selection.

### 211.9.11 ApplyFilter

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies the AutoFilter to the sheet.

### 211.9.12 CellType(row as Integer, col as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns cell's type.
**Notes:** See CellType constants.

### 211.9.13 Clear(rowFirst as Integer = 0, rowLast as Integer = 1048575, colFirst as Integer = 0, colLast as Integer = 16383) as Boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears cells in specified area.

### 211.9.14 ClearPrintArea

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears the print area.

### 211.9.15 ClearPrintRepeats

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Clears repeated rows and columns on each page.

### 211.9.16 ColWidth(col as Integer) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns column width.

### 211.9.17 ColWidthPx(col as integer) as Integer

MBS XL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns column width in pixels.

### 211.9.18 Constructor

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The private constructor.

### 211.9.19 CopyCell(rowSrc as Integer, colSrc as Integer, rowDst as Integer, colDst as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies cell with format from (rowSrc, colSrc) to (rowDst, colDst).
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.20 CopyCellValue(dest as XLSheetMBS, SourceRow as Integer, DestRow as Integer, SourceColumn as Integer, DestColumn as Integer, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a cell from one sheet to another.
**Notes:** Source and destination sheets can be in different books.
This copies most properties and all cells.
If something is missing, please let us know.

If options is nil, we copy everything.

If source and dest sheet are the same, does same as CopyCell function.

### 211.9.21 CopyColumn(dest as XLSheetMBS, SourceColumn as Integer, DestColumn as Integer, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a column from one sheet to another.
**Notes:** Sheets can be in different books.
This copies most properties and all cells.
If something is missing, please let us know.

If options is nil, we copy everything.

### 211.9.22 CopyRow(dest as XLSheetMBS, SourceRow as Integer, DestRow as Integer, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a row from one sheet to another.
**Notes:** Sheets can be in different books.
This copies most properties and all cells.
If something is missing, please let us know.

If options is nil, we copy everything.

### 211.9.23 CopySheet(dest as XLBookMBS, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies a sheet to the other book.
**Notes:** This copies most properties and all cells.
If something is missing, please let us know.

If options is nil, we copy everything.
See also:

- 211.9.24 CopySheet(dest as XLSheetMBS, Options as XLCopyOptionsMBS = nil) 23829

### 211.9.24 CopySheet(dest as XLSheetMBS, Options as XLCopyOptionsMBS = nil)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Copies the sheet content to the other sheet.
**Notes:** This copies most properties and all cells.
If something is missing, please let us know.

If options is nil, we copy everything.
See also:

- 211.9.23 CopySheet(dest as XLBookMBS, Options as XLCopyOptionsMBS = nil) 23828

### 211.9.25 DelHyperlink(index as Integer) as Boolean

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes hyperlink by index.
**Notes:** Index: The index from 0 to HyperlinkSize.

### 211.9.26 DelMerge(row as Integer, col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes merged cells.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.27 DelMergeByIndex(index as Integer) as Boolean

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes merged cells by index.
**Notes:** Index: From 0 to MergeSize-1.

### 211.9.28 DelNamedRange(name as string, scopeId as Integer = -2) as boolean

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes the named range by name.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.errorMessage().

scopeId - index of sheet for local named range or ScopeWorkbook for global named range.

### 211.9.29 FormControl(index as integer) as XLFormControlMBS

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a form control with the specified index.
**Notes:** The index must be less than the return value of the FormControlCount property.
This allows you to batch pre-fill form fields in an Excel document.
You may need Excel to create the template with the form fields.

### 211.9.30 GetActiveCell(byref row as integer, byref col as integer) as boolean

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets an active cell of the sheet.
**Notes:** Returns true if an active cell is found otherwise returns false.

### 211.9.31 GetHorPageBreak(index as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns row with horizontal page break at position index.

### 211.9.32 GetMerge(row as Integer, col as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets merged cells for cell at row, col.
**Notes:** Result is written in rowFirst, rowLast, colFirst, colLast.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.33 GetNamedRange(name as string, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the named range coordianates by name.
**Notes:** Returns false if specified named range isn't found or error occurs. Get error info with XLBookMBS.ErrorMessage property.
See also:

- 211.9.34 GetNamedRange(name as string, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer, ScopeID as Integer, byref Hidden as Integer) as boolean 23831

### 211.9.34 GetNamedRange(name as string, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer, ScopeID as Integer, byref Hidden as Integer) as boolean

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the named range coordianates by name.
**Notes:** scopeId - index of sheet for local named range or SCOPE_WORKBOOK for global named range.
hidden - true if named range is hidden and false if isn't.
Returns false if specified named range isn't found or error occurs. Get error info with XLBookMBS.errorMessage.
See also:

- 211.9.33 GetNamedRange(name as string, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as boolean 23830

### 211.9.35 GetPicture(index as Integer, byref rowTop as Integer, byref colLeft as Integer, byref rowBottom as Integer, byref colRight as Integer, byref width as Integer, byref height as Integer, byref offsetX as Integer, byref offsetY as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a workbook picture index at position index in worksheet.
**Notes:** Output parameters:
(rowTop, colLeft) - top left position of picture;
(rowBottom, colRight) - bottom right position of picture;
width - width of picture in pixels;
height - height of picture in pixels;
offset_x - horizontal offset of picture in pixels;
offset_y - vertical offset of picture in pixels.

Use XLBookMBS.getPicture() for extracting binary data of picture by workbook picture index.
Returns -1 if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.36 GetPrintArea(byref rowFirst as Integer, byref colFirst as Integer, byref rowLast as Integer, byref colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the print area.
**Notes:** Returns false if print area isn't found.

### 211.9.37 GetPrintFit(byref wPages as Integer, byref hPages as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns whether fit to page option is enabled.
**Notes:** Output parameters:
wPages - number of pages the sheet width is fit to;
hPages - number of pages the sheet height is fit to.

### 211.9.38 GetPrintRepeatCols(byref colFirst as Integer, byref colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets repeated columns on each page from colFirst to colLast.
**Notes:** Returns false if repeated columns aren't found.

### 211.9.39 GetPrintRepeatRows(byref rowFirst as Integer, byref rowLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets repeated rows on each page from rowFirst to rowLast.
**Notes:** Returns false if repeated rows aren't found.

### 211.9.40 GetTabRgbColor(byref red as Integer, byref green as Integer, byref blue as Integer) as Boolean

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the sheet's tab RGB color.
**Notes:** Returns true if the values have been returned.

### 211.9.41 GetTopLeftView(byref row as Integer, byref col as Integer)

MBS XL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Extracts the first visible row and the leftmost visible column of the sheet.
**Example:**

```
// create new xls file
dim book as new XLBookMBS(false)

// create sheet
dim sheet as XLSheetMBS = book.AddSheet("Sheet1")

// set top left view
sheet.SetTopLeftView(2,3)

// read values
dim col, row as Integer
sheet.GetTopLeftView(row, col)

MsgBox str(Row)+", "+str(col) // shows 2, 3
```

### 211.9.42 GetVerPageBreak(index as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns column with vertical page break at position index.

### 211.9.43 GroupCols(colFirst as Integer, colLast as Integer, collapsed as boolean = true) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Groups columns from colFirst to colLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.44 GroupRows(rowFirst as Integer, rowLast as Integer, collapsed as boolean = true) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Groups rows from rowFirst to rowLast.

**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.45 Hyperlink(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as String

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the hyperlink and its coordianates by index.

### 211.9.46 HyperlinkIndex(row as integer, col as integer) as Integer

MBS XL Plugin, Plugin Version: 23.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if the cell contains a hyperlink.
**Notes:** Returns an index of hyperlink if exists, -1 if there is no hyperlink in this cell.

### 211.9.47 InsertCol(colFirst as Integer, colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts columns from colFirst to colLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Updates existing named ranges.

### 211.9.48 InsertColAndKeepRanges(colFirst as integer, colLast as integer) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts columns from colFirst to colLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Doesn't update existing named ranges.

### 211.9.49 InsertRow(rowFirst as Integer, rowLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts rows from rowFirst to rowLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

Updates existing named ranges.

### 211.9.50 InsertRowAndKeepRanges(rowFirst as integer, rowLast as integer) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Inserts rows from rowFirst to rowLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Doesn't update existing named ranges.

### 211.9.51 IsAutoFilter as boolean

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this sheet has an auto filter.
**Notes:** Returns true if there is an auto filter, otherwise false.

### 211.9.52 IsDate(row as Integer, col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks that cell contains a date or time value.

### 211.9.53 IsFormula(row as Integer, col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks that cell contains a formula.

### 211.9.54 IsRichString(row as integer, col as integer) as Boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks that the cell contains a rich string with multiple fonts.
**Notes:** If return value is true read it with the readRichString() method.

### 211.9.55 Merge(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref colFirst as Integer, byref colLast as Integer) as Boolean

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the merged cells by index.

### 211.9.56 NamedRange(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the named range coordianates by index.
See also:

- 211.9.57 NamedRange(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer, byref scopeId as Integer, byref Hidden as Boolean) as string 23836

### 211.9.57 NamedRange(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer, byref scopeId as Integer, byref Hidden as Boolean) as string

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the named range coordianates by index.
**Notes:** scopeId - index of sheet for local named range or ScopeWorkbook for global named range.
hidden - true if named range is hidden and false if isn't.
See also:

- 211.9.56 NamedRange(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer) as string 23836

### 211.9.58 ReadBlank(row as Integer, col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads format from blank cell.
**Notes:** Returns false if specified cell isn't blank or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.59 ReadBlank(row as Integer, col as Integer, byref format as XLFormatMBS) as boolean 23837

### 211.9.59 ReadBlank(row as Integer, col as Integer, byref format as XLFormatMBS) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads format from blank cell.
**Notes:** Returns false if specified cell isn't blank or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.58 ReadBlank(row as Integer, col as Integer) as boolean 23836

### 211.9.60 ReadBoolean(row as Integer, col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a boolean value and its format from cell.
**Notes:** If nil format is returned then an error occured. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.61 ReadBoolean(row as Integer, col as Integer, byref format as XLFormatMBS) as boolean 23837

### 211.9.61 ReadBoolean(row as Integer, col as Integer, byref format as XLFormatMBS) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a boolean value and its format from cell.
**Notes:** If nil format is returned then an error occured. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.60 ReadBoolean(row as Integer, col as Integer) as boolean 23837

### 211.9.62 ReadComment(row as Integer, col as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a comment from specified cell.
**Notes:** Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.63 ReadDate(row as Integer, col as Integer) as date

MBS XL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads a date/time and its format from cell.
**Notes:** Internally uses XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.64 ReadDate(row as Integer, col as Integer, byref format as XLFormatMBS) as date 23838

### 211.9.64 ReadDate(row as Integer, col as Integer, byref format as XLFormatMBS) as date

MBS XL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads a date/time and its format from cell.
**Notes:** Internally uses XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.63 ReadDate(row as Integer, col as Integer) as date 23838

### 211.9.65 ReadDateTime(row as integer, col as integer) as dateTime

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a date/time and its format from cell.
**Notes:** Internally uses XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.66 ReadDateTime(row as integer, col as integer, byref format as XLFormatMBS) as dateTime 23839

### 211.9.66 ReadDateTime(row as integer, col as integer, byref format as XLFormatMBS) as dateTime

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a date/time and its format from cell.
**Notes:** Internally uses XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.65 ReadDateTime(row as integer, col as integer) as dateTime 23838

### 211.9.67 ReadError(row as Integer, col as Integer) as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads error from cell.
**Notes:** See ErrorType* constants.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.68 ReadFormula(row as Integer, col as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a formula string and its format from cell.
**Notes:** Returns nil if specified cell doesn't contain formula or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.69 ReadFormula(row as Integer, col as Integer, byref format as XLFormatMBS) as string 23839

### 211.9.69 ReadFormula(row as Integer, col as Integer, byref format as XLFormatMBS) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a formula string and its format from cell.
**Notes:** Returns nil if specified cell doesn't contain formula or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.68 ReadFormula(row as Integer, col as Integer) as string 23839

### 211.9.70 ReadNumber(row as Integer, col as Integer) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a number or date/time and its format from cell.
**Notes:** Use XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.71 ReadNumber(row as Integer, col as Integer, byref format as XLFormatMBS) as Double 23840

### 211.9.71 ReadNumber(row as Integer, col as Integer, byref format as XLFormatMBS) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a number or date/time and its format from cell.
**Notes:** Use XLBookMBS.dateUnpack() for extract date/time parts from double.
If format is returned as nil, then error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:

- 211.9.70 ReadNumber(row as Integer, col as Integer) as Double 23840

### 211.9.72 ReadRichString(row as integer, col as integer) as XLRichStringMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a rich string with multiple fonts and its format from the cell.
**Notes:** It's possible to check if the specified cell contains a rich string with the isRichString() method.
Returns nil if the specified cell doesn't contain a string or error occurs.
Get error info with XLBookMBS.ErrorMessage property.
See also:

- 211.9.73 ReadRichString(row as integer, col as integer, byref format as XLFormatMBS) as XLRichStringMBS 23841


### 211.9.73 ReadRichString(row as integer, col as integer, byref format as XLFormatMBS) as XLRichStringMBS

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a rich string with multiple fonts and its format from the cell.
**Notes:** It's possible to check if the specified cell contains a rich string with the isRichString() method.
Returns nil if the specified cell doesn't contain a string or error occurs.
Get error info with XLBookMBS.ErrorMessage property.
See also:


- 211.9.72 ReadRichString(row as integer, col as integer) as XLRichStringMBS 23840


### 211.9.74 ReadString(row as Integer, col as Integer) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a string and its format from cell.
**Notes:** Returns "" if specified cell doesn't contain string or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:


- 211.9.75 ReadString(row as Integer, col as Integer, byref format as XLFormatMBS) as string 23841


### 211.9.75 ReadString(row as Integer, col as Integer, byref format as XLFormatMBS) as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a string and its format from cell.
**Notes:** Returns "" if specified cell doesn't contain string or error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
See also:


- 211.9.74 ReadString(row as Integer, col as Integer) as string 23841

### 211.9.76 ReadStyledText(row as integer, col as integer) as StyledText

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads rich string of a cell and converts to StyledText.
**Notes:** We convert attributes like bold, italic, underline, color, font name and size.
See also:

- 211.9.77 ReadStyledText(row as integer, col as integer, byref format as XLFormatMBS) as StyledText 23842

### 211.9.77 ReadStyledText(row as integer, col as integer, byref format as XLFormatMBS) as StyledText

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Reads rich string from a cell and returns as StyledText.
**Notes:** We convert attributes like bold, italic, underline, color, font name and size.
See also:

- 211.9.76 ReadStyledText(row as integer, col as integer) as StyledText 23842

### 211.9.78 ReadValue(row as integer, col as integer) as Variant

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a value value from a cell.
**Notes:** Depending on content we return number, boolean, text or date.
Returns nil for empty, error or blank cells.
See also:

- 211.9.79 ReadValue(row as integer, col as integer, byref format as XLFormatMBS) as Variant 23842

### 211.9.79 ReadValue(row as integer, col as integer, byref format as XLFormatMBS) as Variant

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Reads a value value from a cell.
**Notes:** Depending on content we return number, boolean, text or date.
Returns nil for empty, error or blank cells.
See also:

- 211.9.78 ReadValue(row as integer, col as integer) as Variant 23842

### 211.9.80 RemoveCol(colFirst as Integer, colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes columns from colFirst to colLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Updates existing named ranges.

### 211.9.81 RemoveColAndKeepRanges(colFirst as integer, colLast as integer) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes columns from colFirst to colLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Doesn't update existing named ranges.

### 211.9.82 RemoveComment(row as Integer, col as Integer)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a comment from the cell (only for xls format).

### 211.9.83 RemoveDataValidations

MBS XL Plugin, Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all data validations for the sheet (only for xlsx files).

### 211.9.84 RemoveFilter

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes the AutoFilter from the sheet.

### 211.9.85 RemovePicture(row as integer, col as integer) as Boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a picture in the specified position.
**Notes:** Returns false if an error occurs.

### 211.9.86 RemovePictureByIndex(index as integer) as Boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes a picture by specified index. Returns false if an error occurs.

### 211.9.87 RemoveRow(rowFirst as Integer, rowLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes rows from rowFirst to rowLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Updates existing named ranges.

### 211.9.88 RemoveRowAndKeepRanges(rowFirst as integer, rowLast as integer) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes rows from rowFirst to rowLast.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Doesn't update existing named ranges.

### 211.9.89 RemoveSelection

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Removes all selection.

### 211.9.90 RowColToAddr(row as Integer, col as Integer, rowRelative as boolean = true, colRelative as boolean = true) as string

MBS XL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Converts row and column to a cell reference.
**Example:**

```
// create new xls file
dim book as new XLBookMBS(false)

// create sheet
dim sheet as XLSheetMBS = book.AddSheet("Sheet1")

MsgBox sheet.RowColToAddr(5,5) // shows F6
MsgBox sheet.RowColToAddr(5,5,false,false) // shows $ F$ 6
```

### 211.9.91 RowHeight(row as Integer) as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns row height.

### 211.9.92 RowHeightPx(row as integer) as Integer

MBS XL Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns row height in pixels.

### 211.9.93 SelectionRange as string

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a range of the selection.

### 211.9.94 SetActiveCell(row as integer, col as integer)

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an active cell of the sheet.

### 211.9.95 SetAutoFitArea(rowFirst as Integer = 0, colFirst as Integer = 0, rowLast as Integer = -1, colLast as Integer = -1)

MBS XL Plugin, Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the borders for autofit column widths feature.
**Notes:** The method setCol with -1 width value will affect only to the specified limited area.

### 211.9.96 SetCol(colFirst as Integer, colLast as Integer, width as Double, format as XLFormatMBS = nil, hidden as boolean = false) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets column width and format for all columns from colFirst to colLast.
**Notes:** If format is nil then format is ignored. Columns may be hidden. Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

Column width measured as the number of characters of the maximum digit width of the numbers 0, 1, 2, ..., 9 as rendered in the normal style's font. Value -1 is used for autofit column widths. If format equals 0 then format is ignored. Columns may be hidden.

### 211.9.97 SetColPx(colFirst as integer, colLast as integer, width as integer, format as XLFormatMBS = nil, hidden as boolean = false) as boolean

MBS XL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets column width in pixels and format for all columns from colFirst to colLast.
**Notes:** Value -1 is used for autofit column widths.
If format equals nil then format is ignored. Columns may be hidden.
Returns false if error occurs. Get an error info with the errorMessage function in XLBookMBS class.

### 211.9.98 SetFooter(footer as string, margin as Double) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the footer text for the sheet when printed.
**Notes:** The footer text appears at the bottom of every page when printed. The length of the text must be less than or equal to 255. The footer text can contain special commands, for example a placeholder for the page number, current date or text formatting attributes. See setHeader for details. Margin is specified in inches.

### 211.9.99 SetHeader(header as string, margin as Double) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

| Code | Description |
|---|---|
| &L | specifies the beginning of the left section |
| &P | specifies the current page number |
| &N | specifies the total number of pages |
| &\d { 1,3 } | specifies the text font size, where font size is measured in points, for example: &9 or &36 |
| &S | specifies whether the strikethrough text style is on or off |
| &X | specifies whether the superscript text style is on or off |
| &Y | specifies whether the subscript text style is on or off |
| &C | specifies the beginning of the center section |
| &D | specifies a date |
| &T | specifies a time |
| &G | specifies a picture |
| &U | specifies whether the single underline text style is on or off |
| &E | specifies whether the double underline text style is on or off |
| &R | specifies the beginning of the right section |
| &Z | specifies a workbook file path |
| &F | specifies a workbook file name |
| &A | specifies a sheet name |
| &"fontname" | specifies the text font, for example: &"Comic Sans MS" |
| &B | specifies whether the bold text style is on or off |
| &I | specifies whether the italic text style is on or off |
| && | specifies an ampersand character (&) |

**Function:** Sets the header text of the sheet when printed.
**Notes:** The text appears at the top of every page when printed. The length of the text must be less than or equal to 255. The header text can contain special commands, for example a placeholder for the page number, current date or text formatting attributes. Special commands are represented by single letter with a leading ampersand ("&"). Margin is specified in inches.

### 211.9.100 SetHorPageBreak(row as Integer, pageBreak as boolean = true) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets/removes a horizontal page break.
**Example:**

```
// new document
dim x as new XLBookMBS

// add a sheet
```

| Code | Description |
|---|---|
| &L | specifies the beginning of the left section |
| &P | specifies the current page number |
| &N | specifies the total number of pages |
| &\d { 1,3 } | specifies the text font size, where font size is measured in points, for example: &9 or &36 |
| &S | specifies whether the strikethrough text style is on or off |
| &X | specifies whether the superscript text style is on or off |
| &Y | specifies whether the subscript text style is on or off |
| &C | specifies the beginning of the center section |
| &D | specifies a date |
| &T | specifies a time |
| &G | specifies a picture |
| &U | specifies whether the single underline text style is on or off |
| &E | specifies whether the double underline text style is on or off |
| &R | specifies the beginning of the right section |
| &Z | specifies a workbook file path |
| &F | specifies a workbook file name |
| &A | specifies a sheet name |
| &"fontname" | specifies the text font, for example: &"Comic Sans MS" |
| &B | specifies whether the bold text style is on or off |
| &I | specifies whether the italic text style is on or off |
| && | specifies an ampersand character (&) |

```
dim s as XLSheetMBS = x.AddSheet

// write a cell
call s.WriteString(5,5, "Hello")

// now put a page break there
if s.SetHorPageBreak(5, true) then
// and now we have one at row 5
MsgBox str(s.GetHorPageBreakCount)+" "+str(s.GetHorPageBreak(0))
end if
```

**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.101 SetMerge(rowFirst as Integer, rowLast as Integer, colFirst as Integer, colLast as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets merged cells for range: rowFirst - rowLast, colFirst - colLast.
**Example:**

```
// create new xls file
Dim book As New XLBookMBS(True)

// create sheet
dim sheet as XLSheetMBS = book.AddSheet("Sheet1")

// create a format with border
Dim borderFormat As XLFormatMBS = book.AddFormat
borderFormat.SetBorder 2
borderFormat.SetBorderColor &hFF0000

// now fill a cell and merge a few more cells.
Dim r1 As Boolean = sheet.WriteString(2, 2, "Hello World", borderFormat)
Dim r2 As Boolean = sheet.SetMerge(2, 4, 2, 4)

// write file
Dim file As FolderItem = SpecialFolder.Desktop.Child("Generate.xlsx")

if book.Save(file) then
file.Launch
else
MsgBox "Failed to create file."+EndOfLine+EndOfLine+book.ErrorMessage
end if
```

**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.102 SetNamedRange(name as string, rowFirst as Integer, rowLast as Integer, colFirst as Integer, colLast as Integer, scopeId as Integer = -2) as boolean

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the named range.
**Notes:** scopeId - index of sheet for local named range or ScopeWorkbook for global named range.
Returns false if error occurs. Get error info with XLBookMBS.errorMessage.

### 211.9.103 SetPicture(row as Integer, col as Integer, PictureID as Integer, scale as Double = 1.0, OffsetX as Integer = 0, OffsetY as Integer = 0, pos as Integer = 0)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a picture with pictureId identifier at position row and col with scale factor.
**Notes:** Use XLBookMBS.addPicture() for getting picture identifier.
See also:

- 211.9.104 SetPicture(row as Integer, col as Integer, PictureID as Integer, width as Integer, height as Integer, OffsetX as Integer = 0, OffsetY as Integer = 0, pos as Integer = 0) 23850

### 211.9.104 SetPicture(row as Integer, col as Integer, PictureID as Integer, width as Integer, height as Integer, OffsetX as Integer = 0, OffsetY as Integer = 0, pos as Integer = 0)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets a picture with pictureId identifier at position row and col with custom size.
**Notes:** Use XLBookMBS.addPicture() for getting a picture identifier.

Width and height can be -1 for default size of picture.
See also:

- 211.9.103 SetPicture(row as Integer, col as Integer, PictureID as Integer, scale as Double = 1.0, OffsetX as Integer = 0, OffsetY as Integer = 0, pos as Integer = 0) 23850

### 211.9.105 SetPrintArea(rowFirst as Integer, rowLast as Integer, colFirst as Integer, colLast as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the print area.

### 211.9.106 SetPrintFit(wPages as Integer, hPages as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Fits sheet width and sheet height to wPages and hPages respectively.

### 211.9.107 SetPrintRepeatCols(colFirst as Integer, colLast as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets repeated columns on each page from colFirst to colLast.

### 211.9.108 SetPrintRepeatRows(rowFirst as Integer, rowLast as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets repeated rows on each page from rowFirst to rowLast.

### 211.9.109 SetProtectEx(protect as boolean = true, password as string = "", enhancedProtection as Integer = -1)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Protects/unprotects the sheet with password and enchanced parameters below.
**Notes:** It is possible to combine a few EnhancedProtection values with operator BitwiseOr.

### 211.9.110 SetRow(row as Integer, height as Double, format as XLFormatMBS = nil, hidden as boolean = false) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets row height and format.
**Notes:** If format is nil then format is ignored. Row may be hidden. Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

Height is in points. If you want to convert from pixels to points you can use this calculation: points = pixels * 72 / 96. So for a height of 72 pixel, you pass 54 points.

### 211.9.111 SetRowPx(row as integer, height as integer, format as XLFormatMBS = nil, hidden as boolean = false) as boolean

MBS XL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets row height in pixels.
**Notes:** If format equals nil then format is ignored. Row may be hidden. Returns false if error occurs. Get an error info with the errorMessage function in XLBookMBS class.

### 211.9.112 SetTabColor(colorValue as Integer)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color for the sheet's tab.

### 211.9.113 SetTabRgbColor(red as Integer, green as Integer, blue as Integer)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the color for the sheet's tab.

### 211.9.114 SetTopLeftView(row as Integer, col as Integer)

MBS XL Plugin, Plugin Version: 12.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the first visible row and the leftmost visible column of the sheet.
**Example:**

```
// create new xls file
dim book as new XLBookMBS(false)

// create sheet
dim sheet as XLSheetMBS = book.AddSheet("Sheet1")

// set top left view
sheet.SetTopLeftView(2,3)

// read values
dim col, row as Integer
sheet.GetTopLeftView(row, col)

MsgBox str(Row)+", "+str(col) // shows 2, 3
```

### 211.9.115 SetVerPageBreak(row as Integer, pageBreak as boolean = true) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets/removes a vertical page break.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.116 Split(row as Integer, col as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Splits a sheet at position (row, col).
**Notes:** Splits a sheet at position (row, col) or specifies the position of frozen pane. This function allows to freeze a header at top position or freeze some columns on the right.

### 211.9.117 SplitInfo(byref row as Integer, byref col as Integer) as Boolean

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the split information (position of frozen pane) in the sheet.
**Notes:** row: vertical position of the split;
col: horizontal position of the split.
Returns true on success.

### 211.9.118 Table(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer, byref headerRowCount as Integer, byref totalsRowCount as Integer) as string

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the table parameters by index.
**Notes:** headerRowCount - the number of header rows showing at the top of the table. 0 means that the header row is not shown.
totalsRowCount - the number of totals rows that shall be shown at the bottom of the table. 0 means that the totals row is not shown.
Returns a string representing the name of the table.
See also:

- 211.9.119 Table(name as string, byref rowFirst as integer, byref rowLast as integer, byref ColFirst as integer, byref ColLast as integer, byref headerRowCount as integer, byref totalsRowCount as integer) as Boolean 23853

### 211.9.119 Table(name as string, byref rowFirst as integer, byref rowLast as integer, byref ColFirst as integer, byref ColLast as integer, byref headerRowCount as integer, byref totalsRowCount as integer) as Boolean

MBS XL Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Gets the table parameters by name.
**Notes:** headerRowCount - the number of header rows showing at the top of the table. 0 means that the

header row is not shown.
totalsRowCount - the number of totals rows that shall be shown at the bottom of the table. 0 means that the totals row is not shown.

Returns true if the table is found.
See also:

- 211.9.118 Table(index as Integer, byref rowFirst as Integer, byref rowLast as Integer, byref ColFirst as Integer, byref ColLast as Integer, byref headerRowCount as Integer, byref totalsRowCount as Integer) as string 23853

### 211.9.120 WriteBlank(row as Integer, col as Integer, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes blank cell with specified format.
**Notes:** Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.121 WriteBoolean(row as Integer, col as Integer, value as boolean, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a bool value into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteBoolean(2, 5, true, format)
```

**Notes:** If format is nil then format is ignored.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.122 WriteComment(row as Integer, col as Integer, value as string, author as string, width as Integer, height as Integer)

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a comment to the cell.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteComment(2, 5, "Sales Worldwide", "Peter", 30, 10)
```

**Notes:** row and col: cell's position
value: comment string
author: author string
width: width of text box in pixels
height: height of text box in pixels

Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.123 WriteDate(row as Integer, col as Integer, value as date, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a date/time into cell with specified format.
**Notes:** If format is nil then format is ignored. Internally uses XLBookMBS.datePack() for packing date/time parts to double.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.124 WriteDateTime(row as integer, col as integer, value as dateTime, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a date/time into cell with specified format.
**Notes:** If format is nil then format is ignored. Internally uses XLBookMBS.datePack() for packing date/time parts to double.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.

Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.125 WriteError(row as Integer, col as Integer, Error as Integer, format as XLFormatMBS = nil)

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes error into the cell with specified format.
**Notes:** If format equals nil then format is ignored.

### 211.9.126 WriteFormula(row as Integer, col as Integer, value as string, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a formula into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteFormula(2, 5, "SUM(E16:E38)", format)
```

**Notes:** If format is nil then format is ignored. Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.
As LibXL does not calculate the result of the formula, it will not encode the result in the Excel file. It does only store the formula, so an app opening the file will have to do the calculation. But QuickLook on Mac OS X does not calculate, so results do not show there.
Examples for formulas are: "TODAY()", "IF(C1>0;ABS(C1*D1);"""")", "SUM(E16:E38)" or "E39+E39*E40".

### 211.9.127 WriteFormulaBool(row as Integer, col as Integer, Expression as string, value as Boolean, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a formula expression with precalculated bool value into cell with specified format.
**Notes:** If format equals nil then format is ignored.
Returns false if error occurs. Get error info with XLBookMBS.errorMessage.

### 211.9.128 WriteFormulaNum(row as Integer, col as Integer, Expression as string, value as Double, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a formula expression with precalculated double value into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteFormulaNum(2, 5, "SUM(E16:E38)", 123.45, format)
```

**Notes:** If format equals nil then format is ignored. Returns false if error occurs. Get error info with XLBookMBS.errorMessage.

### 211.9.129 WriteFormulaString(row as Integer, col as Integer, Expression as string, value as String, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a formula expression with precalculated string value into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim DollarFormat as XLFormatMBS // the format to use

Dim Success as Boolean = Sheet.WriteFormulaNum(2, 5, "SUM(E16:E38)", "$ 123.45"", DollarFormat)
```

**Notes:** If format equals nil then format is ignored. Returns false if error occurs. Get error info with XLBookMBS.errorMessage.

### 211.9.130 WriteNumber(row as Integer, col as Integer, value as Double, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a number or date/time into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteNumber(2, 5, 123.45, format)
```

**Notes:** If format is nil then format is ignored. Use XLBookMBS.datePack() for packing date/time parts to double.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.131 WriteRichString(row as integer, col as integer, RichString as XLRichStringMBS, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a rich string with multiple fonts into the cell with the specified format.
**Notes:** Add a new rich string with the addRichString() method. If format equals nil then format is ignored.
Returns false if an error occurs. Get error info with XLBookMBS.ErrorMessage property.

### 211.9.132 WriteString(row as Integer, col as Integer, value as string, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a string into cell with specified format.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteString(2, 5, "Hello World", format)
```

**Notes:** If format is nil then format is ignored.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.133 WriteStringAsNumber(row as integer, col as integer, value as string, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Writes a number into cell with specified format and passes it as text.
**Example:**

```
Dim Sheet as XLSheetMBS // your current sheet
Dim format as XLFormatMBS // optional format

Dim Success as Boolean = Sheet.WriteStringAsNumber(2, 5, "123.45", format)
```

**Notes:** Please pass number as text here to avoid running into rounding errors with floating point numbers.

If format is nil then format is ignored. Use XLBookMBS.datePack() for packing date/time parts to double.
Returns false if error occurs. Get error info with XLBookMBS.ErrorMessage property.
Col and Row are zero based.
Please remember that Excel files have limits like 65536 rows and 256 columns.

### 211.9.134 WriteStyledText(row as integer, col as integer, StyledText as StyledText, format as XLFormatMBS = nil) as boolean

MBS XL Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

**Function:** Writes a styled text to a cell.
**Notes:** Same as building a rich string based in the StyledText and assigning it to the cell.

We convert attributes like bold, italic, underline, color, font name and size.

### 211.9.135 Properties

### 211.9.136 AutoFilter as XLAutoFilterMBS

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the AutoFilter.
**Notes:** Creates it if it doesn't exist.
Only for xml based files.
(Read only property)

### 211.9.137 Book as XLBookMBS

MBS XL Plugin, Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The parent book.
**Notes:** As a sheet is only valid with the owning book, we keep a back reference here.

(Read only property)

### 211.9.138 DefaultRowHeight as Double

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The default row height measured in point size.
**Notes:** (Read and Write property)

### 211.9.139 DisplayGridlines as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the gridlines are displayed.
**Notes:** True if gridlines are displayed and false if aren't.
(Assigning a value to this property calls setDisplayGridlines internally)
(Read and Write property)

### 211.9.140 FirstCol as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the first column in the sheet that contains a used cell.
**Notes:** (Read only property)

### 211.9.141 FirstFilledCol as Integer

MBS XL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the first column in the sheet that contains a filled cell.
**Notes:** (Read only property)

### 211.9.142 FirstFilledRow as Integer

MBS XL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the first row in the sheet that contains a filled cell.
**Notes:** (Read only property)

### 211.9.143 FirstRow as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the first row in the sheet that contains a used cell.
**Notes:** (Read only property)

### 211.9.144 Footer as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The footer text of the sheet when printed.
**Notes:** The footer text appears at the bottom of every page when printed. The length of the text must be less than or equal to 255. The footer text can contain special commands, for example a placeholder for the page number, current date or text formatting attributes. Margin is specified in inches.

| Code | Description |
|---|---|
| &L | specifies the beginning of the left section |
| &P | specifies the current page number |
| &N | specifies the total number of pages |
| &\d { 1,3 } | specifies the text font size, where font size is measured in points, for example: &9 or &36 |
| &S | specifies whether the strikethrough text style is on or off |
| &X | specifies whether the superscript text style is on or off |
| &Y | specifies whether the subscript text style is on or off |
| &C | specifies the beginning of the center section |
| &D | specifies a date |
| &T | specifies a time |
| &G | specifies a picture |
| &U | specifies whether the single underline text style is on or off |
| &E | specifies whether the double underline text style is on or off |
| &R | specifies the beginning of the right section |
| &Z | specifies a workbook file path |
| &F | specifies a workbook file name |
| &A | specifies a sheet name |
| &"fontname" | specifies the text font, for example: &"Comic Sans MS" |
| &B | specifies whether the bold text style is on or off |
| &I | specifies whether the italic text style is on or off |
| && | specifies an ampersand character (&) |

(Read only property)

### 211.9.145 FooterMargin as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The footer margin in inches.
**Notes:** (Read only property)

### 211.9.146 FormControlCount as Integer

MBS XL Plugin, Plugin Version: 21.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of form controls in this worksheet.
**Notes:** (Read only property)

### 211.9.147 GetHorPageBreakCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of horizontal page breaks in the sheet.
**Example:**

```
// new document
dim x as new XLBookMBS

// add a sheet
dim s as XLSheetMBS = x.AddSheet

// write a cell
call s.WriteString(5,5, "Hello")

// now put a page break there
if s.SetHorPageBreak(5, true) then
// and now we have one at row 5
MsgBox str(s.GetHorPageBreakCount)+" "+str(s.GetHorPageBreak(0))
end if
```

**Notes:** (Read only property)

### 211.9.148 GetVerPageBreakCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of vertical page breaks in the sheet.
**Notes:** (Read only property)

### 211.9.149 GroupSummaryBelow as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether grouping rows summary is below.
**Notes:** True if summary is below and false if isn't.
(Read and Write property)

### 211.9.150 GroupSummaryRight as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether grouping columns summary is right.
**Notes:** Returns true if summary is right and false if isn't.
(Read and Write property)

### 211.9.151 Handle as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read and Write property)

### 211.9.152 HCenter as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the sheet is centered horizontally when printed.
**Notes:** (Read and Write property)

### 211.9.153 Header as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header text of the sheet when printed.
**Notes:** The text appears at the top of every page when printed. The length of the text must be less than or equal to 255. The header text can contain special commands, for example a placeholder for the page

number, current date or text formatting attributes. Special commands are represented by single letter with a leading ampersand ("&"). Margin is specified in inches.

| Code | Description |
|---|---|
| &L | specifies the beginning of the left section |
| &P | specifies the current page number |
| &N | specifies the total number of pages |
| &\d { 1,3 } | specifies the text font size, where font size is measured in points, for example: &9 or &36 |
| &S | specifies whether the strikethrough text style is on or off |
| &X | specifies whether the superscript text style is on or off |
| &Y | specifies whether the subscript text style is on or off |
| &C | specifies the beginning of the center section |
| &D | specifies a date |
| &T | specifies a time |
| &G | specifies a picture |
| &U | specifies whether the single underline text style is on or off |
| &E | specifies whether the double underline text style is on or off |
| &R | specifies the beginning of the right section |
| &Z | specifies a workbook file path |
| &F | specifies a workbook file name |
| &A | specifies a sheet name |
| &"fontname" | specifies the text font, for example: &"Comic Sans MS" |
| &B | specifies whether the bold text style is on or off |
| &I | specifies whether the italic text style is on or off |
| && | specifies an ampersand character (&) |

(Read only property)

### 211.9.154 HeaderMargin as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The header margin in inches.
**Notes:** (Read only property)

### 211.9.155 Hidden as Integer

MBS XL Plugin, Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Specifies the visible state of this sheet.
**Notes:** See constants: SheetStateHidden, SheetStateVeryHidden, SheetStateVisible.
(Read and Write property)

### 211.9.156 HyperlinkSize as Integer

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of hyperlinks in the sheet.
**Notes:** (Read only property)

### 211.9.157 Landscape as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether to use landscape or portrait mode for printing.
**Notes:** true - pages are printed using landscape mode, false - pages are printed using portrait mode.
(Read and Write property)

### 211.9.158 LastCol as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the zero-based index of the column after the last column in the sheet that contains a used cell.
**Example:**

```
dim book as XLBookMBS // your book instance

// get first sheet
dim sheet as XLSheetMBS = book.Sheet(0)

// show index of last column
dim LastCol as Integer = sheet.LastCol

MsgBox "LastCol: " + str(LastCol)
```

**Notes:** (Read only property)

### 211.9.159 LastFilledCol as Integer

MBS XL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the zero-based index of the column after the last column in the sheet that contains a filled cell.
**Notes:** (Read only property)

### 211.9.160 LastFilledRow as Integer

MBS XL Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the zero-based index of the row after the last row in the sheet that contains a filled cell.
**Notes:** (Read only property)

### 211.9.161 LastRow as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the zero-based index of the row after the last row in the sheet that contains a used cell.
**Example:**

```
dim book as XLBookMBS // your book instance

// get first sheet
dim sheet as XLSheetMBS = book.Sheet(0)

// show index of last row
dim LastRow as Integer = sheet.LastRow

MsgBox "LastRow: " + str(LastRow)
```

**Notes:** (Read only property)

### 211.9.162 MarginBottom as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The bottom margin of the sheet in inches.
**Notes:** (Read and Write property)

### 211.9.163 MarginLeft as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The left margin of the sheet in inches.
**Notes:** (Read and Write property)

### 211.9.164 MarginRight as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The right margin of the sheet in inches.
**Notes:** (Read and Write property)

### 211.9.165 MarginTop as Double

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The top margin of the sheet in inches.
**Notes:** (Read and Write property)

### 211.9.166 MergeSize as Integer

MBS XL Plugin, Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of merged cells in this worksheet.
**Notes:** (Read only property)

### 211.9.167 Name as string

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The name of the sheet.
**Notes:** (Read and Write property)

### 211.9.168 NamedRangeCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of named ranges in the sheet.
**Notes:** (Read only property)

### 211.9.169 Paper as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The paper size.
**Notes:** See Paper* constants.
(Read and Write property)

### 211.9.170 PictureCount as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns a number of pictures in this worksheet.
**Notes:** (Read only property)

### 211.9.171 PrintGridlines as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the gridlines are printed.
**Notes:** True if gridlines are printed and false if aren't.
(Read and Write property)

### 211.9.172 PrintRowCol as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the row and column headers are printed.
**Notes:** (Read and Write property)

### 211.9.173 PrintZoom as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scaling factor for printing as a percentage.
**Notes:** (Read and Write property)

### 211.9.174 Protect as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether sheet is protected.
**Notes:** (Read and Write property)

### 211.9.175 RightToLeft as boolean

MBS XL Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the text is displayed in right-to-left mode.
**Notes:** true - the text is displayed in right-to-left mode,
false - the text is displayed in left-to-right mode.
(Read and Write property)

### 211.9.176 TabColor as Integer

MBS XL Plugin, Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The sheet's tab color.
**Notes:** For use with documents using indexed colors.
(Read and Write property)

### 211.9.177 TableSize as Integer

MBS XL Plugin, Plugin Version: 16.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the number of tables in the sheet.
**Notes:** (Read only property)

### 211.9.178 VCenter as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether the sheet is centered vertically when printed.
**Notes:** (Read and Write property)

### 211.9.179 Zoom as Integer

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The zoom level of the current view.
**Notes:** 100 is a usual view.
(Read and Write property)

### 211.9.180 CellFormat(row as Integer, col as Integer) as XLFormatMBS

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The cell's format.
**Notes:** (Read and Write computed property)

### 211.9.181 ColHidden(col as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether column is hidden.
**Notes:** (Read and Write computed property)

### 211.9.182 RowHidden(row as Integer) as boolean

MBS XL Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether row is hidden.
**Notes:** (Read and Write computed property)

### 211.9.183 Constants

Cell Type Constants

| Constant | Value | Description |
|---|---|---|
| CellTypeBlank | 4 | blank |
| CellTypeBoolean | 3 | boolean value |
| CellTypeEmpty | 0 | empty |
| CellTypeError | 5 | error |
| CellTypeNumber | 1 | number value |
| CellTypeStrictDate | 6 | strict date |
| CellTypeString | 2 | string value |

Error Type Constants

| Constant | Value | Description |
|---|---|---|
| ErrorTypeDiv0 | 7 | DIV/0! |
| ErrorTypeNA | &h2A | N/A |
| ErrorTypeName | &h1D | NAME? |
| ErrorTypeNoError | &hFF | No Error. |
| ErrorTypeNull | 0 | NULL! |
| ErrorTypeNum | &h24 | NUM! |
| ErrorTypeRef | &h17 | REF! |
| ErrorTypeValue | &h0F | VALUE! |

Ignore Errors

| Constant | Value | Description |
|---|---|---|
| IgnoreErrorDataValidation | 128 | Ignore errors when a cell's value in a Table does not comply with the Data Validation rules specified. |
| IgnoreErrorEmptyCellref | 2 | Ignore errors when formulas refer to empty cells. |
| IgnoreErrorEvalError | 1 | Ignore errors when cells contain formulas that result in an error. |
| IgnoreErrorInconsistFormula | 16 | Ignore errors when a formula in a region of your worksheet differs from other formulas in the same region. |
| IgnoreErrorInconsistRange | 8 | Ignore errors when formulas omit certain cells in a region. |
| IgnoreErrorNoError | 0 | No error. |
| IgnoreErrorNumberStoredAsText | 4 | Ignore errors when numbers are formatted as text or are preceded by an apostrophe. |
| IgnoreErrorTwodigTextyear | 32 | Ignore errors when formulas contain text formatted cells with years represented as 2 digits. |
| IgnoreErrorUnlockFormula | 64 | Ignore errors when unlocked cells contain formulas. |

Paper Format Constants

| Constant | Value | Description |
|---|---|---|
| Paper10X11 | 45 | |
| Paper10X14 | 16 | 10 x 14 in |
| Paper10X17 | 17 | 11 x 17 in |
| Paper12X11 | 90 | |
| Paper15X11 | 46 | |
| Paper9X11 | 44 | |
| PaperA2 | 66 | |
| PaperA3 | 8 | A3 297 x 420 mm |
| PaperA3Extra | 63 | |
| PaperA3ExtraTransverse | 68 | |
| PaperA3Rotated | 76 | |
| PaperA3Transverse | 67 | |
| PaperA4 | 9 | A4 210 x 297 mm |
| PaperA4Extra | 53 | |
| PaperA4Plus | 60 | |
| PaperA4Rotated | 77 | |
| PaperA4Small | 10 | A4 Small 210 x 297 mm |
| PaperA4Transverse | 55 | |
| PaperA5 | 11 | A5 148 x 210 mm |
| PaperA5Extra | 64 | |
| PaperA5Rotated | 78 | |
| PaperA5Transverse | 61 | |
| PaperA6 | 70 | |
| PaperA6Rotated | 83 | |
| PaperB4 | 12 | B4 (JIS) 250 x 354 |
| PaperB4Iso | 42 | |
| PaperB4Rotated | 79 | |
| PaperB5 | 13 | B5 (JIS) 182 x 257 mm |
| PaperB5Extra | 65 | |
| PaperB5Rotated | 80 | |
| PaperB5Transverse | 62 | |
| PaperB6 | 88 | |
| PaperB6Rotated | 89 | |
| PaperCSize | 24 | C size sheet |
| PaperDefault | 0 | Default paper size |
| PaperDoubleJapanesePostcardRotated | 82 | |
| PaperDSize | 25 | D size sheet |
| PaperEnvelope | 36 | Envelope 110 x 230 mm |
| PaperEnvelope10 | 20 | US Envelope #10 4 1/8 x 9 1/2 |
| PaperEnvelope11 | 21 | US Envelope #11 4 1/2 x 10 3/8 |
| PaperEnvelope12 | 22 | US Envelope #12 4 3/4 x 11 |
| PaperEnvelope14 | 23 | US Envelope #14 5 x 11 1/2 |
| PaperEnvelope9 | 19 | US Envelope #9 3 7/8 x 8 7/8 |
| PaperEnvelopeB4 | 33 | Envelope B4 250 x 353 mm |
| PaperEnvelopeB5 | 34 | Envelope B5 176 x 250 mm |
| PaperEnvelopeB6 | 35 | Envelope B6 176 x 125 mm |
| PaperEnvelopeC3 | 29 | Envelope C3 324 x 458 mm |
| PaperEnvelopeC4 | 30 | Envelope C4 229 x 324 mm |
| PaperEnvelopeC5 | 28 | Envelope C5 162 x 229 mm |
| PaperEnvelopeC6 | 31 | Envelope C6 114 x 162 mm |
| PaperEnvelopeC65 | 32 | Envelope C65 114 x 229 mm |
| PaperEnvelopeDL | 27 | Envelope DL 110 x 220mm |
| PaperEnvelopeInvite | 47 | |
| PaperEnvelopeMonarch | 37 | US Envelope Monarch 3.875 x 7.5 in |
| PaperESize | 26 | E size sheet |
| PaperExecutive | 7 | US Executive 7 1/4 x 10 1/2 in |
| PaperFanfold | 39 | US Std Fanfold 14 7/8 x 11 in |
| PaperFolio | 14 | Folio 8 1/2 x 13 in |

Protection Levels

| Constant | Value | Description |
|---|---|---|
| ProtectAll | 0 | Nothing is allowed except cell selections. |
| ProtectAutofilter | 4096 | Autofilters are allowed when the sheet is protected. |
| ProtectDefault | -1 | Default protection. |
| ProtectDeleteColumns | 256 | Deleting columns is allowed when the sheet is protected. |
| ProtectDeleteRows | 512 | Deleting rows is allowed when the sheet is protected. |
| ProtectFormatCells | 4 | Formatting cells is allowed when the sheet is protected. |
| ProtectFormatColumns | 8 | Formatting columns is allowed when the sheet is protected. |
| ProtectFormatRows | 16 | Formatting rows is allowed when the sheet is protected. |
| ProtectInsertColumns | 32 | Inserting columns is allowed when the sheet is protected. |
| ProtectInsertHyperlinks | 128 | Inserting hyperlinks is allowed when the sheet is protected. |
| ProtectInsertRows | 64 | Inserting rows is allowed when the sheet is protected. |
| ProtectObjects | 1 | Objects are locked when the sheet is protected. |
| ProtectPivottables | 8192 | Pivot tables are allowed when the sheet is protected. |
| ProtectScenarios | 2 | Scenarios are locked when the sheet is protected. |
| ProtectSelLockedCells | 1024 | Selection of locked cells is locked when the sheet is protected. |
| ProtectSelUnlockedCells | 16384 | Selection of unlocked cells is locked when the sheet is protected. |
| ProtectSort | 2048 | Sorting is allowed when the sheet is protected. |

Scopes

| Constant | Value | Description |
|---|---|---|
| ScopeUndefined | -2 | Undefined scope |
| ScopeWorkbook | -1 | Workbook scope. |

Visible State Constants

| Constant | Value | Description |
|---|---|---|
| SheetStateHidden | 1 | Sheet is hidden, but can be shown via the user interface. |
| SheetStateVeryHidden | 2 | Sheet is hidden and cannot be shown in the user interface. |
| SheetStateVisible | 0 | Sheet is visible |

Data Validation Error Styles

| Constant | Value | Description |
|---|---|---|
| ValidationErrstyleInformation | 2 | This data validation error style uses an information icon in the error alert. |
| ValidationErrstyleStop | 0 | This data validation error style uses a stop icon in the error alert. |
| ValidationErrstyleWarning | 1 | This data validation error style uses a warning icon in the error alert. |

Validation Operations

| Constant | Value | Description |
|---|---|---|
| ValidationOpBetween | 0 | Data validation which checks if a value is between two other values. |
| ValidationOpEqual | 2 | Data validation which checks if a value is equal to a specified value. |
| ValidationOpGreaterthan | 6 | Data validation which checks if a value is greater than a specified value. |
| ValidationOpGreaterthanorequal | 7 | Data validation which checks if a value is greater than or equal to a specified value. |
| ValidationOpLessthan | 4 | Data validation which checks if a value is less than a specified value. |
| ValidationOpLessthanorequal | 5 | Data validation which checks if a value is less than or equal to a specified value. |
| ValidationOpNotbetween | 1 | Data validation which checks if a value is not between two other values. |
| ValidationOpNotequal | 3 | Data validation which checks if a value is not equal to a specified value. |

Data Validation Types

| Constant | Value | Description |
|---|---|---|
| ValidationTypeCustom | 7 | Data validation which uses a custom formula to check the cell value. |
| ValidationTypeDate | 4 | Data validation which checks for date values satisfying the given condition. |
| ValidationTypeDecimal | 2 | Data validation which checks for decimal values satisfying the given condition. |
| ValidationTypeList | 3 | Data validation which checks for a value matching one of list of values. |
| ValidationTypeNone | 0 | No data validation. |
| ValidationTypeTextLength | 6 | Data validation which checks for text values, whose length satisfies the given condition. |
| ValidationTypeTime | 5 | Data validation which checks for time values satisfying the given condition. |
| ValidationTypeWhole | 1 | Data validation which checks for whole number values satisfying the given condition. |

# Chapter 212

# XML

## 212.1 class XMLAttributeMBS

### 212.1.1 class XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLAttributeMBS class refers to an attribute of an XML element.
**Notes:** Typically the allowable values for the attribute are defined in a documenttype definition.
XMLAttributeMBS objects inherit the XMLNodeMBS interface, but since attributes are not actually child nodes of the elements they are associated with, the DOM does not consider them part of the document tree. Thus, the XMLNodeMBS attributes parentNode, previousSibling, and nextSibling have a null value for XMLAttributeMBS objects. The DOM takes the view that attributes are properties of elements rather than having a separate identity from the elements they are associated with; this should make it more efficient to implement such features as default attributes associated with all elements of a given type. Furthermore, attribute nodes may not be immediate children of a DOMDocumentFragment. However, they can be associated with XMLElementMBS nodes contained within a DOMDocumentFragment. In short, users of the DOM need to be aware that XMLAttributeMBS nodes have some things in common with other objects inheriting the XMLNodeMBS interface, but they also are quite distinct.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Iterate over XML nodes

**Xojo Developer Magazine**

- 21.2, page 66: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes

### 212.1.2 Methods

### 212.1.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.1.4 Properties

### 212.1.5 isId as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether this attribute is known to be of type ID or not.
**Notes:** When it is and its value is unique, the ownerElement of this attribute can be retrieved using getElementById on XMLDocumentMBS.
(Read only property)

### 212.1.6 Name as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the name of this attribute.
**Notes:** (Read only property)

### 212.1.7 OwnerElement as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLElementMBS node this attribute is attached to or nil if this attribute is not in use.
**Notes:** (Read only property)

### 212.1.8 SchemaTypeInfo as XMLTypeInfoMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the type information associated with this attribute.
**Notes:** the XMLTypeInfoMBS associated with this attribute.
(Read only property)

### 212.1.9 Specified as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether this is specified.
**Notes:** Returns true if the attribute received its value explicitly in the XML document, or if a value was assigned programatically with the setValue function. Returns false if the attribute value came from the default value declared in the document's DTD.
(Read only property)

### 212.1.10 Value as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the value of the attribute.
**Notes:** The value of the attribute is returned as a string. Character and general entity references are replaced with their values.

Assign something to set the value of the attribute. A text node with the unparsed contents of the string will be created.
(Read and Write property)

## 212.2 class XMLCDATASectionMBS

### 212.2.1 class XMLCDATASectionMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** CDATA sections are used to escape blocks of text containing characters that would otherwise be regarded as markup.
**Notes:** The only delimiter that is recognized in a CDATA section is the " ] ] >" string that ends the CDATA section. CDATA sections cannot be nested. Their primary purpose is for including material such as XML fragments, without needing to escape all the delimiters.

The data attribute of the XMLTextMBS node holds the text that is contained by the CDATA section. Note that this may contain characters that need to be escaped outside of CDATA sections and that, depending on the character encoding ("charset") chosen for serialization, it may be impossible to write out some characters as part of a CDATA section.

The XMLCDATASectionMBS interface inherits from the XMLCharacterDataMBS interface through the XMLTextMBS interface. Adjacent XMLCDATASectionMBS nodes are not merged by use of the normalize method of the XMLNodeMBS interface. Because no markup is recognized within a XMLCDATASection-MBS, character numeric references cannot be used as an escape mechanism when serializing. Therefore, action needs to be taken when serializing a XMLCDATASectionMBS with a character encoding where some of the contained characters cannot be represented. Failure to do so would not produce well-formed XML.One potential solution in the serialization process is to end the CDATA section before the character, output the character using a character reference or entity reference, and open a new CDATA section for any further characters in the text node. Note, however, that some code conversion libraries at the time of writing do not return an error or exception when a character is missing from the encoding, making the task of ensuring that data is not corrupted on serialization more difficult.
Subclass of the XMLTextMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.2.2 Methods

### 212.2.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.3 class XMLCharacterDataMBS

### 212.3.1 class XMLCharacterDataMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for character data.
**Notes:** The XMLCharacterDataMBS interface extends XMLNodeMBS with a set of attributes and methods for accessing character data in the DOM. For clarity this set is defined here rather than on each object that uses these attributes and methods. No DOM objects correspond directly to XMLCharacterDataMBS, though XMLTextMBS and others do inherit the interface from it. All offsets in this interface start from 0.

As explained in the DOM spec, text strings in the DOM are represented in UTF-16, i.e. as a sequence of 16-bit units. In the following, the term 16-bit units is used whenever necessary to indicate that indexing on XMLCharacterDataMBS is done in 16-bit units.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.3.2 Methods

### 212.3.3 appendData(data as string)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Append the string to the end of the character data of the node.
**Notes:** Upon success, data provides access to the concatenation of data.

### 212.3.4 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.3.5 deleteData(offset as Integer, count as Integer)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Remove a range of characters from the node.
**Notes:** Upon success, data and length reflect the change.

offset: The offset from which to remove characters. Zero based.

count: The number of characters to delete.

If the sum of offset and count exceeds length then all characters from offset to the end of the data are deleted.

### 212.3.6 insertData(offset as Integer, data as string)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Insert a string at the specified character offset.
**Notes:** offset: The character offset at which to insert. Zero based.

### 212.3.7 replaceData(offset as Integer, count as Integer, data as string)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Replace the characters starting at the specified character offset with the specified string.
**Notes:** offset: The offset from which to start replacing.
count: The number of characters to replace.

If the sum of offset and count exceeds length, then all characters to the end of the data are replaced (i.e., the effect is the same as a remove method call with the same range, followed by an append method invocation).

### 212.3.8 substringData(offset as Integer, count as Integer) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Extracts a range of data from the node.
**Notes:** offset: Start offset of substring to extract. Zero based.
count: The number of characters to extract.

The specified substring. If the sum of offset and count exceeds the length, then all characters to the end of the data are returned.

### 212.3.9 Properties

### 212.3.10 Data as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The data content.
**Notes:** Returns the character data of the node that implements this interface.
The DOM implementation may not put arbitrary limits on the amount of data that may be stored in a XMLCharacterDataMBS node. However, implementation limits may mean that the entirety of a node's data may not fit into a single XMLCh* String. In such cases, the user may call substringData to retrieve the data in appropriately sized pieces.

Can be assigned with new data.
(Read and Write property)

### 212.3.11 Length as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the number of characters that are available through data and the substringData method below.
**Notes:** (Read only property)

## 212.4 class XMLCommentMBS

### 212.4.1 class XMLCommentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a comment in a xml document.
**Notes:** This interface inherits from CharacterData and represents the content of a comment, i.e., all the characters between the starting '<!–' and ending '–>'.
Subclass of the XMLCharacterDataMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.4.2 Methods

### 212.4.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.5 class XMLConfigurationMBS

### 212.5.1 class XMLConfigurationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLConfigurationMBS interface represents the configuration of a document and maintains a table of recognized parameters.
**Notes:** Using the configuration, it is possible to change Document.normalizeDocument behavior, such as replacing CDATASection nodes with Text nodes or specifying the type of the schema that must be used when the validation of the Document is requested. XMLConfigurationMBS objects are also used in [ DOM Level 3 Load and Save ] in the XMLParserMBS and XMLSerializerMBS interfaces.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.5.2 Methods

### 212.5.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.5.4 Properties

### 212.5.5 ByteOrderMark as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to include byte order mark byte in output.
**Notes:** (Read and Write property)

### 212.5.6 CanonicalForm as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to .
**Notes:** true: Canonicalize the document according to the rules specified in [ Canonical XML ] . Note that this is limited to what can be represented in the DOM. In particular, there is no way to specify the order of the attributes in the DOM.
false: (default) Do not canonicalize the document.
(Read and Write property)

### 212.5.7 CDataSections as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to keep CData sections in the document.
**Notes:** true: (default) Keep CDATASection nodes in the document.
false: Transform CDATASection nodes in the document into Text nodes. The new Text node is then combined with any adjacent Text node.
(Read and Write property)

### 212.5.8 Comments as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to keep comments.
**Notes:** true: (default) Keep Comment nodes in the document.
false: Discard Comment nodes in the Document.
(Read and Write property)

### 212.5.9 DataTypeNormalization as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Wether to perform data type normalization.
**Notes:** true: Exposed normalized values in the tree.
false: (default) Do not perform normalization on the tree.
(Read and Write property)

### 212.5.10 DiscardDefaultContent as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to discard default content.
**Notes:** true: (default) Use whatever information available to the implementation (i.e. XML schema, DTD, the specified flag on Attr nodes, and so on) to decide what attributes and content should be discarded or not. Note that the specified flag on Attr nodes in itself is not always reliable, it is only reliable when it is set to false since the only case where it can be set to false is if the attribute was created by the implementation. The default content won't be removed if an implementation does not have any information available.
false: Keep all attributes and all content.
(Read and Write property)

### 212.5.11 elementcontentwhitespace as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to keep all white spaces.
**Example:**

```
Dim parser As New XMLParserMBS

// configure the parser
Dim DOMConfig As XMLConfigurationMBS = p.DOMConfig
DOMConfig.ElementContentWhitespace=False

// prepare XML input
Dim Input As New XMLInputMBS
Input.InputString = kXML2

// and parse
Var xml1 As XMLDocumentMBS = p.parse(Input)

Break
```

**Notes:** true: (default) Keep all white spaces in the document.
false: Discard white space in element content while normalizing. The implementation is expected to use the isWhitespaceInElementContent flag on Text nodes to determine if a text node should be written out or not.
(Read and Write property)

### 212.5.12 Entities as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Keep entities in the document.
**Notes:** true: Keep EntityReference and Entity nodes in the document.
false: (default) Remove all EntityReference and Entity nodes from the document, putting the entity expansions directly in their place. Text nodes are into "normal" form. Only EntityReference nodes to non-defined entities are kept in the document.
(Read and Write property)

### 212.5.13 formatprettyprint as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to pretty print XML.
**Notes:** For serializing XML.

Formatting the output by adding whitespace to produce a pretty-printed, indented, human-readable form. The exact form of the transformations is not specified by this specification.
Pretty-printing changes the content of the document and may affect the validity of the document, validating implementations should preserve validity.
(Read and Write property)

### 212.5.14 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.5.15 ignoreunknowncharacterdenormalizations as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to ignore unknown character normalizations.
**Notes:** For serializing XML.

If, while verifying full normalization when [ XML 1.1 ] is supported, a character is encountered for which the normalization properties cannot be determined, then raise a "unknown-character-denormalization" warning (instead of raising an error, if this parameter is not set) and ignore any possible denormalizations caused by these characters.

Set to false to report a fatal error if a character is encountered for which the processor cannot determine the normalization properties.
(Read and Write property)

### 212.5.16 InfoSet as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to only keep the information defined in the XML Information Set.
**Notes:** true: Only keep in the document the information defined in the XML Information Set [ XML Information set ] . This forces the following features to false: namespace-declarations, validate-if-schema, entities, datatype-normalization, cdata-sections. This forces the following features to true: whitespace-in-element-content, comments, namespaces. Other features are not changed unless explicitly specified in the description of the features. Note that querying this feature with getFeature returns true only if the individual features specified above are appropriately set.
false: Setting infoset to false has no effect.

(Read and Write property)

### 212.5.17 namespacedeclarations as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to include namespace declaration attributes.
**Notes:** true: (default) Include namespace declaration attributes, specified or defaulted from the schema or the DTD, in the document. See also the section Declaring Namespaces in [ XML Namespaces ] .
false: Discard all namespace declaration attributes. The Namespace prefixes are retained even if this feature is set to false.
(Read and Write property)

### 212.5.18 NameSpaces as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to do namespace processing.
**Notes:** true: (default) Perform the namespace processing as defined in [ XML Namespaces ] .
false: Do not perform the namespace processing.
(Read and Write property)

### 212.5.19 normalizecharacters as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to do character normalization.
**Notes:** true: Perform the W3C Text Normalization of the characters [ CharModel ] in the document.
false: (default) Do not perform character normalization.
(Read and Write property)

### 212.5.20 SpaceFirstLevelElements as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to space first level elements for pretty print.
**Notes:** If true, this adds an extra line feed between the elements that are children of the document root.
(Read and Write property)

### 212.5.21 splitcdatasections as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to split the CData Sections.
**Notes:** true: (default) Split CDATA sections containing the CDATA section termination marker ' ] ] >'. When a CDATA section is split a warning is issued.
false: Signal an error if a CDATASection contains an unrepresentable character.
(Read and Write property)

### 212.5.22 Validate as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to validate against a schema.
**Notes:** true: Require the validation against a schema (i.e. XML schema, DTD, any other type or representation of schema) of the document as it is being normalized as defined by [ XML 1.0 ] . If validation errors are found, or no schema was found, the error handler is notified. Note also that normalized values will not be exposed to the schema in used unless the feature datatype-normalization is true.
Note: validate-if-schema and validate are mutually exclusive, setting one of them to true will set the other one to false.
false: (default) Only XML 1.0 non-validating processing must be done. Note that validation might still happen if validate-if-schema is true.
(Read and Write property)

### 212.5.23 validateifschema as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to validate only if a declaration for the document element can be found.
**Notes:** true: Enable validation only if a declaration for the document element can be found (independently of where it is found, i.e. XML schema, DTD, or any other type or representation of schema). If validation errors are found, the error handler is notified. Note also that normalized values will not be exposed to the schema in used unless the feature datatype-normalization is true.
Note: validate-if-schema and validate are mutually exclusive, setting one of them to true will set the other one to false.
false: (default) No validation should be performed if the document has a schema. Note that validation must still happen if validate is true.
(Read and Write property)

### 212.5.24 xmldeclaration as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to include declaration.
**Notes:** For serializing XML.

If a XMLDocumentMBS, XMLElementMBS, or XMLEntityMBS node is serialized, the XML declaration, or text declaration, should be included. The version (xmlVersion if the document is a Level 3 document and the version is non-null, otherwise use the value "1.0"), and the output encoding (see write methods for details on how to find the output encoding) are specified in the serialized XML declaration.

Do not serialize the XML and text declarations. Report a "xml-declaration-needed" warning if this will cause problems (i.e. the serialized data is of an XML version other than [ XML 1.0 ] , or an encoding would be needed to be able to re-parse the serialized data).
(Read and Write property)

## 212.6 class XMLDocumentFragmentMBS

### 212.6.1 class XMLDocumentFragmentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** XMLDocumentFragmentMBS is a "lightweight" or "minimal" XMLDocumentMBS object.
**Notes:** It is very common to want to be able to extract a portion of a document's tree or to create a new fragment of a document. Imagine implementing a user command like cut or rearranging a document by moving fragments around. It is desirable to have an object which can hold such fragments and it is quite natural to use a XMLNodeMBS for this purpose. While it is true that a XMLDocumentMBS object could fulfill this role, a XMLDocumentMBS object can potentially be a heavyweight object, depending on the underlying implementation. What is really needed for this is a very lightweight object. XMLDocumentFragmentMBS is such an object.

Furthermore, various operations – such as inserting nodes as children of another XMLNodeMBS – may take XMLDocumentFragmentMBS objects as arguments; this results in all the child nodes of the XMLDocumentFragmentMBS being moved to the child list of this node.
The children of a XMLDocumentFragmentMBS node are zero or more nodes representing the tops of any sub-trees defining the structure of the document. XMLDocumentFragmentMBS nodes do not need to be well-formed XML documents (although they do need to follow the rules imposed upon well-formed XML parsed entities, which can have multiple top nodes). For example, a XMLDocumentFragmentMBS might have only one child and that child node could be a XMLTextMBS node. Such a structure model represents neither an HTML document nor a well-formed XML document.

When a XMLDocumentFragmentMBS is inserted into a XMLDocumentMBS (or indeed any other XMLNodeMBS that may take children) the children of the XMLDocumentFragmentMBS and not the XMLDocumentFragmentMBS itself are inserted into the XMLNodeMBS. This makes the XMLDocumentFragmentMBS very useful when the user wishes to create nodes that are siblings; the XMLDocumentFragmentMBS acts as the parent of these nodes so that the user can use the standard methods from the XMLNodeMBS interface, such as insertBefore() and appendChild().
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.6.2 Methods

### 212.6.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.7 class XMLDocumentMBS

### 212.7.1 class XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLDocumentMBS interface represents the entire XML document.
**Example:**

```
// parse it
dim doc as new XMLDocumentMBS("<test id=123>abc</test>")

// and make a string:
dim s as string = doc.toString

Break // see in debugger
```

**Notes:** Conceptually, it is the root of the document tree, and provides the primary access to the document's data.

Since elements, text nodes, comments, processing instructions, etc. cannot exist outside the context of a XMLDocumentMBS, the XMLDocumentMBS interface also contains the factory methods needed to create these objects. The XMLNodeMBS objects created have a ownerDocument attribute which associates them with the XMLDocumentMBS within whose context they were created.

All methods can raise a XMLExceptionMBS object in case of a problem.
Subclass of the XMLNodeMBS class.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.5
- Embracing for each loops
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.5
- News from the MBS Xojo Plugins Version 23.4
- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- News from the MBS Xojo Plugins in Version 23.0
- News from the MBS Xojo Plugins Version 22.5
- MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5
- Iterate over XML nodes

**Xojo Developer Magazine**

- 22.1, page 9: News
- 21.5, page 10: News
- 21.2, page 68: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes
- 21.2, page 65: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes
- 21.1, page 28: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes

### 212.7.2 Methods

### 212.7.3 adoptNode(node as XMLNodeMBS) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Changes the ownerDocument of a node, its children, as well as the attached attribute nodes if there are any.
**Notes:** If the node has a parent it is first removed from its parent child list. This effectively allows moving a subtree from one document to another.
Should not be needed in Xojo apps.

### 212.7.4 ClearCache

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Frees the node cache for this document.
**Notes:** You should usually not need to use this method.

### 212.7.5 Close

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Explicitly close document.
**Notes:** This frees memory for all nodes and the XML document now.
You should usually not need to use this method.

### 212.7.6 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor to create a blank document.
**Example:**

```
// create blank document
dim doc as new XMLDocumentMBS

dim testNode as XMLElementMBS = doc.createElement("test")

System.DebugLog "doc.append"
call doc.appendChild testNode

System.DebugLog "testNode.append"
call testNode.appendChild doc.createTextNode("Hello World")

// and make a string:
dim s as string = doc.toString

Break // see in debugger
```

See also:


- 212.7.7 Constructor(data as MemoryBlock) 23893
- 212.7.8 Constructor(data as String) 23894
- 212.7.9 Constructor(file as FolderItem) 23894
- 212.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 23894


### 212.7.7 Constructor(data as MemoryBlock)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience function to parse a document from a memoryblock.
See also:


- 212.7.6 Constructor 23892
- 212.7.8 Constructor(data as String) 23894
- 212.7.9 Constructor(file as FolderItem) 23894
- 212.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 23894

### 212.7.8 Constructor(data as String)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Convenience function to parse a document from a string.
**Example:**

```
// parse it
dim doc as new XMLDocumentMBS("<test id=123>abc</test>")

// and make a string:
dim s as string = doc.toString

Break // see in debugger
```

See also:

- 212.7.6 Constructor 23892
- 212.7.7 Constructor(data as MemoryBlock) 23893
- 212.7.9 Constructor(file as FolderItem) 23894
- 212.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 23894

### 212.7.9 Constructor(file as FolderItem)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Initializes by loading an XML file.
See also:

- 212.7.6 Constructor 23892
- 212.7.7 Constructor(data as MemoryBlock) 23893
- 212.7.8 Constructor(data as String) 23894
- 212.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) 23894

### 212.7.10 Constructor(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DOMDocument object of the specified type with its document element.
**Notes:** namespaceURI: The namespace URI of the document element to create.

qualifiedName: The qualified name of the document element to be created.
DocumentType: The type of document to be created or nil. When doctype is not nil, its ownerDocument attribute is set to the document being created.
See also:


- 212.7.6 Constructor 23892
- 212.7.7 Constructor(data as MemoryBlock) 23893
- 212.7.8 Constructor(data as String) 23894
- 212.7.9 Constructor(file as FolderItem) 23894


### 212.7.11 Create as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a blank document.
See also:


- 212.7.12 Create(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) as XMLDocumentMBS 23895


### 212.7.12 Create(namespaceURI as String, qualifiedName as string, DocumentType as XMLDocumentTypeMBS = nil) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DOMDocument object of the specified type with its document element.
**Notes:** namespaceURI: The namespace URI of the document element to create.
qualifiedName: The qualified name of the document element to be created.
DocumentType: The type of document to be created or nil. When doctype is not nil, its ownerDocument attribute is set to the document being created.

Returns a new XMLDocumentMBS object.
See also:


- 212.7.11 Create as XMLDocumentMBS 23895


### 212.7.13 createAttribute(Name as String) as XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an XMLAttributeMBS of the given name.
**Notes:** Note that the XMLAttributeMBS instance can then be set on an XMLElementMBS using the setAttributeNode method. <br>To create an attribute with a qualified name and namespace URI, use the

createAttributeNS method.

name: The name of the attribute.

Returns a new XMLAttributeMBS object with the nodeName attribute set to name, and localName, prefix, and namespaceURI set to "". The value of the attribute is the empty string.

### 212.7.14 createAttributeNS(namespaceURI as String, qualifiedName as String) as XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an attribute of the given qualified name and namespace URI.
**Notes:** namespaceURI: The namespace URI of the attribute to create.
qualifiedName: The qualified name of the attribute to instantiate.

### 212.7.15 createCDATASection(Data as String) as XMLCDATASectionMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a XMLCDATASectionMBS node whose value is the specified string.

### 212.7.16 createComment(Text as String) as XMLCommentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a DOMComment node given the specified string.

### 212.7.17 createDocumentFragment as XMLDocumentFragmentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an empty XMLDocumentFragmentMBS object.

### 212.7.18 createDocumentType(Name as String, PublicID as String = "", SystemID as String = "") as XMLDocumentTypeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a XMLDocumentTypeMBS node.

### 212.7.19 createElement(Name as String) as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an element of the type specified.
**Example:**

```
Dim doc As New XMLDocumentMBS

Dim testNode As XMLElementMBS = doc.createElement("test")
Call doc.appendChild testNode

MessageBox doc.toString
```

**Notes:** Note that the instance returned implements the XMLElementMBS interface, so attributes can be specified directly on the returned object.

In addition, if there are known attributes with default values, XMLAttributeMBS nodes representing them are automatically created and attached to the element.

To create an element with a qualified name and namespace URI, use the createElementNS method.
tagName The name of the element type to instantiate. For XML, this is case-sensitive.
A new XMLElementMBS object with the nodeName attribute set to tagName, and localName, prefix, and namespaceURI set to "".

### 212.7.20 createElementNS(namespaceURI as String, qualifiedName as String) as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an element of the given qualified name and namespace URI.
**Notes:** namespaceURI: The namespace URI of the element to create.
qualifiedName: The qualified name of the element type to instantiate.

### 212.7.21 createEntity(Name as String) as XMLEntityMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a new entity.

**Notes:** name: The name of the entity to instantiate.

### 212.7.22 createEntityReference(Text as String) as XMLEntityReferenceMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an XMLEntityReferenceMBS object.
**Notes:** In addition, if the referenced entity is known, the child list of the XMLEntityReferenceMBS node is made the same as that of the corresponding XMLEntityMBS node.If any descendant of the XMLEntityMBS node has an unbound namespace prefix, the corresponding descendant of the created XMLEntityReferenceMBS node is also unbound; (its namespaceURI is nil). The DOM Level 2 does not support any mechanism to resolve namespace prefixes.

name: The name of the entity to reference.

Returns the new XMLEntityReferenceMBS object.

### 212.7.23 createNodeIterator(root as XMLNodeMBS = nil, whatToShow as Integer = &hFFFF, entityReferenceExpansion as boolean = false, filter as XMLNodeFilterMBS = nil) as XMLNodeIteratorMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a NodeIterator object.
**Notes:** NodeIterators are used to step through a set of nodes, e.g. the set of nodes in a NodeList, the document subtree governed by a particular node, the results of a query, or any other set of nodes. The set of nodes to be iterated is determined by the implementation of the NodeIterator. DOM Level 2 specifies a single NodeIterator implementation for document-order traversal of a document subtree. Instances of these iterators are created by calling createNodeIterator().

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the iterator. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false.

root: The root node of the DOM tree
whatToShow: This attribute determines which node types are presented via the iterator.
filter: The filter used to screen nodes .
entityReferenceExpansion: The value of this flag determines whether the children of entity reference nodes are visible to the iterator. If false, they will be skipped over.

### 212.7.24 createNotation(Name as String) as XMLNotationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a Notation.
**Notes:** name: The name of the notation to instantiate

Returns a XMLNotationMBS that references the newly created XMLNotationMBS node.

### 212.7.25 createProcessingInstruction(Target as String, Data as string) as XMLCDATASectionMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a XMLProcessingInstructionMBS node given the specified name and data strings.
**Notes:** target: The target part of the processing instruction.
data: The data for the node.

### 212.7.26 createTextNode(Text as String) as XMLTextMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a XMLTextMBS node given the specified string.
**Example:**

```
Dim doc As New XMLDocumentMBS
Dim element As XMLElementMBS = doc.createElement("test")

Call doc.appendChild element
Call element.appendChild doc.createTextNode("Hello World")

MessageBox doc.toString
```

### 212.7.27 createTreeWalker(root as XMLNodeMBS = nil, whatToShow as Integer = &hFFFF, entityReferenceExpansion as boolean = false, filter as XMLNodeFilterMBS = nil) as XMLTreeWalkerMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a TreeWalker object.
**Notes:** TreeWalker objects are used to navigate a document tree or subtree using the view of the document defined by its whatToShow flags and any filters that are defined for the TreeWalker. Any function which

performs navigation using a TreeWalker will automatically support any view defined by a TreeWalker.

Omitting nodes from the logical view of a subtree can result in a structure that is substantially different from the same subtree in the complete, unfiltered document. Nodes that are siblings in the TreeWalker view may be children of different, widely separated nodes in the original view. For instance, consider a Filter that skips all nodes except for XMLTextMBS nodes and the root node of a document. In the logical view that results, all text nodes will be siblings and appear as direct children of the root node, no matter how deeply nested the structure of the original document.

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the TreeWalker. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false

root: The root node of the DOM tree
whatToShow: This attribute determines which node types are presented via the tree-walker.
filter: The filter used to screen nodes
entityReferenceExpansion: The value of this flag determines whether the children of entity reference nodes are visible to the tree-walker. If false, they will be skipped over.

### 212.7.28 ElementsByTagName(TagName as String) as XMLElementMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns an array of all the XMLElementMBS(s) with a given local name and namespace URI in the order in which they are encountered in a preorder traversal of the XMLDocumentMBS tree.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)

Dim elements() As XMLElementMBS = doc.ElementsByTagName("f")

Break
```

**Notes:** TagName: The tag name of the elements to match on. The special value "*" matches all local names.

Returns a new array object containing all the matched XMLElementMBS(s).

### 212.7.29 ElementsByTagNameNS(namespaceURI as string, localName as String) as XMLElementMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns an array of all the XMLElementMBS(s) with a given local name and namespace URI in the order in which they are encountered in a preorder traversal of the XMLDocumentMBS tree.
**Notes:** namespaceURI: The namespace URI of the elements to match on. The special value "*" matches all namespaces.
localName: The local name of the elements to match on. The special value "*" matches all local names.

Returns a new array object containing all the matched XMLElementMBS(s).

### 212.7.30 evaluate(expression as String, contextNode as XMLNodeMBS, type as Integer) as XMLXPathResultMBS

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Evaluates an XPath expression string and returns a result of the specified type if possible.
**Notes:** expression: The XPath expression string to be parsed and evaluated.
contextNode: The context is context node for the evaluation of this XPath expression. Must be owned by the same document and must be a XMLDocumentMBS, XMLElementMBS, XMLAttributeMBS, XMLTextMBS, XMLCDATASectionMBS, DOMComment, XMLProcessingInstructionMBS, or XPathNamespace node.
type: If a specific type is specified, then the result will be returned as the corresponding type. This must be one of the codes of the XMLXPathResultMBS clas constants.

Retruns result of the evaluation of the XPath expression as XMLXPathResultMBS class.

Raises exception if the expression is not legal according to the rules of the DOMXPathEvaluator.
Raises exception if the result cannot be converted to return the specified type.

### 212.7.31 getElementById(elementId as String) as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the XMLElementMBS whose ID is given by elementId.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1""">abc</test><test id=""2""">def</test></doc>")

// we mark this id attribute to be the id
Dim d1 As XMLElementMBS = doc.DocumentElement.FirstElementChild
```

```
Call d1.SetIdAttribute("id", True)

// now search for it
Dim element1 As XMLElementMBS = doc.getElementById("1")
Dim element2 As XMLElementMBS = doc.getElementById("2") // not marked!

Break
```

**Notes:** If no such element exists, returns nil.
Behavior is not defined if more than one element has this ID. The DOM implementation must have information that says which attributes are of type ID. Attributes with the name "ID" are not of type ID unless so defined. Implementations that do not know whether attributes are of type ID or not are expected to return nil.

elementId: The unique id value for an element.

Returns the matching element.

### 212.7.32 importNode(node as XMLNodeMBS) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 23.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Imports a node from another document by cloning it to the current document.
**Notes:** You don't need to do this manually as the plugin will do it for you in methods as appendChild, replaceChild and insertBefore.

### 212.7.33 IterateElementsByTagName(TagName as String) as XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the elements with matching tag name.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1""">abc</test><test id=""2""">def</test></doc>")

For Each e As XMLElementMBS In doc.IterateElementsByTagName("test")
MessageBox e.toString
Next
```

**Notes:** For use with For Each Loops in Xojo.

### 212.7.34 IterateElementsByTagNameNS(namespaceURI as string, localName as String) as XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the elements with matching tag name.
**Notes:** For use with For Each Loops in Xojo.

### 212.7.35 LoadXml(data as MemoryBlock)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads XML from data.
**Notes:** Replaces current document with the new one.
See also:

- 212.7.36 LoadXml(data as String) 23903
- 212.7.37 LoadXml(file as FolderItem) 23903

### 212.7.36 LoadXml(data as String)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads xml from data.
**Notes:** Replaces current document with the new one.
See also:

- 212.7.35 LoadXml(data as MemoryBlock) 23903
- 212.7.37 LoadXml(file as FolderItem) 23903

### 212.7.37 LoadXml(file as FolderItem)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads xml file.
**Notes:** Replaces current document with the new one.
This may reference other files in same folder.
See also:

- 212.7.35 LoadXml(data as MemoryBlock) 23903
- 212.7.36 LoadXml(data as String) 23903

### 212.7.38 LoadXmlMT(data as MemoryBlock)

MBS XML Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads XML from data.
**Notes:** Replaces current document with the new one.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:


- 212.7.39 LoadXmlMT(data as String) 23904
- 212.7.40 LoadXmlMT(file as FolderItem) 23904


### 212.7.39 LoadXmlMT(data as String)

MBS XML Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads xml from data.
**Notes:** Replaces current document with the new one.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:


- 212.7.38 LoadXmlMT(data as MemoryBlock) 23904
- 212.7.40 LoadXmlMT(file as FolderItem) 23904


### 212.7.40 LoadXmlMT(file as FolderItem)

MBS XML Plugin, Plugin Version: 22.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Loads xml file.
**Notes:** Replaces current document with the new one.
This may reference other files in same folder.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
See also:


- 212.7.38 LoadXmlMT(data as MemoryBlock) 23904

• 212.7.39 LoadXmlMT(data as String) 23904

### 212.7.41 NodeFromHandle(Handle as Integer) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates a node (or subclass) object based on a handle.
**Notes:** Raises exception if this handle doesn't belong to this document.

### 212.7.42 normalizeDocument

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Normalizes the document.
**Notes:** This method acts as if the document was going through a save and load cycle, putting the document in a "normal" form. The actual result depends on the features being set. See XMLConfigurationMBS for details.

Noticeably this method normalizes XMLTextMBS nodes, makes the document "namespace wellformed", according to the algorithm described below in pseudo code, by adding missing namespace declaration attributes and adding or changing namespace prefixes, updates the replacement tree of XMLEntityReferenceMBS nodes, normalizes attribute values, etc. <br>Mutation events, when supported, are generated to reflect the changes occurring on the document. Note that this is a partial implementation. Not all the required features are implemented. Currently XMLAttributeMBS and XMLTextMBS nodes are normalized. Features to remove XMLCommentMBS and XMLCDATASectionMBS work.

### 212.7.43 renameNode(node as XMLNodeMBS, namespaceURI as String, qualifiedName as String) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 23.5, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Rename an existing node.
**Notes:** When possible this simply changes the name of the given node, otherwise this creates a new node with the specified name and replaces the existing node with the new node as described below. This only applies to nodes of type ELEMENT_NODE and ATTRIBUTE_NODE.

When a new node is created, the following operations are performed: the new node is created, any registered event listener is registered on the new node, any user data attached to the old node is removed from that node, the old node is removed from its parent if it has one, the children are moved to the new node, if the renamed node is an XMLElementMBS its attributes are moved to the new node, the new node is inserted at the position the old node used to have in its parent's child nodes list if it has one, the user data that was attached to the old node is attach to the new node, the user data event NODE_RENAMED is fired.

When the node being renamed is an XMLAttributeMBS that is attached to an XMLElementMBS, the node is first removed from the XMLElementMBS attributes map. Then, once renamed, either by modifying the existing node or creating a new one as described above, it is put back.

node: The node to rename.
namespaceURI: The new namespaceURI.
qualifiedName: The new qualified name.

### 212.7.44 Properties

### 212.7.45 DocType as XMLDocumentTypeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the document type.
**Notes:** The Document Type Declaration (see XMLDocumentTypeMBS) associated with this document. For XML documents without a document type declaration this returns nil.
The DOM Level 2 does not support editing the Document Type Declaration. docType cannot be altered in any way, including through the use of methods inherited from the XMLNodeMBS interface, such as insertNode or removeNode.
(Read only property)

### 212.7.46 DocumentElement as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a convenience attribute that allows direct access to the child node that is the root element of the document.
**Notes:** (Read only property)

### 212.7.47 DocumentURI as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The location of the document or "" if undefined.
**Notes:** Beware that when the XMLDocumentMBS supports the feature "HTML" , the href attribute of the HTML BASE element takes precedence over this attribute.
(Read and Write property)

### 212.7.48 DOMConfig as XMLConfigurationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The configuration used when normalizeDocument is invoked.
**Notes:** (Read only property)

### 212.7.49 InputEncoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The input encoding.
**Example:**

```
Dim xml As String

xml = "<?xml version='1.0' encoding='ISO-8859-1'?>" +_
EndOfLine.UNIX +_
"<doc><test>tr√§nen√ºberstr√mt</test></doc>"

// make sure the variable has the encoding declared above!
xml = ConvertEncoding(xml, encodings.ISOLatin1)

Dim doc As New XMLDocumentMBS(xml)

MessageBox doc.InputEncoding
```

**Notes:** An attribute specifying the encoding used for this document at the time of the parsing. This is "" when it is not known, such as when the XMLDocumentMBS was created in memory.
(Read only property)

### 212.7.50 StrictErrorChecking as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether errors checking is enforced or not
**Notes:** An attribute specifying whether errors checking is enforced or not. When set to false, the implementation is free to not test every possible error case normally defined on DOM operations, and not raise any XMLExceptionMBS. In case of error, the behavior is undefined. This attribute is true by defaults.
(Read and Write property)

### 212.7.51 XmlEncoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An attribute specifying, as part of the XML declaration, the encoding of this document.
**Notes:** This is "" when unspecified or when it is not known, such as when the XMLDocumentMBS was created in memory.
(Read only property)

### 212.7.52 XmlStandalone as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether this is a standalone document.
**Notes:** An attribute specifying, as part of the XML declaration, whether this document is standalone. This is false when unspecified.
(Read and Write property)

### 212.7.53 XmlVersion as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An attribute specifying, as part of the XML declaration, the version number of this document.
**Notes:** This is "" when unspecified.
(Read and Write property)

### 212.7.54 Constants

Show Values

| Constant | Value | Description |
|---|---|---|
| ShowAll | &hFFFF | Show all XMLNodeMBS(s). |
| ShowAttribute | 2 | Show XMLAttributeMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with an attribute node as its root; in this case, it means that the attribute node will appear in the first position of the iteration or traversal. Since attributes are never children of other nodes, they do not appear when traversing over the document tree. |
| ShowCDataSection | 8 | Show XMLCDATASectionMBS nodes. |
| ShowComment | &h80 | Show DOMComment nodes. |
| ShowDocument | &h100 | Show XMLDocumentMBS nodes. |
| ShowDocumentFragment | &h400 | Show XMLDocumentFragmentMBS nodes. |
| ShowDocumentType | &h200 | Show XMLDocumentTypeMBS nodes. |
| ShowElement | 1 | Show XMLElementMBS nodes. |
| ShowEntity | &h20 | Show XMLEntityMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with an XMLEntityMBS node as its root; in this case, it means that the XMLEntityMBS node will appear in the first position of the traversal. Since entities are not part of the document tree, they do not appear when traversing over the document tree. |
| ShowEntityReference | &h10 | Show XMLEntityReferenceMBS nodes. |
| ShowNotation | &h800 | Show XMLNotationMBS nodes. This is meaningful only when creating an XMLNodeIteratorMBS or XMLTreeWalkerMBS with a XMLNotationMBS node as its root; in this case, it means that the XMLNotationMBS node will appear in the first position of the traversal. Since notations are not part of the document tree, they do not appear when traversing over the document tree. |
| ShowProcessingInstruction | &h40 | Show XMLProcessingInstructionMBS nodes. |
| ShowText | 4 | Show XMLTextMBS nodes. |

## 212.8 class XMLDocumentTypeMBS

### 212.8.1 class XMLDocumentTypeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a document type.
**Notes:** Each XMLDocumentMBS has a doctype attribute whose value is either nil or a XMLDocumentTypeMBS object. The XMLDocumentTypeMBS interface in the DOM Core provides an interface to the list of entities that are defined for the document, and little else because the effect of namespaces and the various XML schema efforts on DTD representation are not clearly understood as of this writing.

The DOM Level 2 doesn't support editing XMLDocumentTypeMBS nodes.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.8.2 Methods

### 212.8.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.8.4 Entities as XMLEntityMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** A array containing the general entities, both external and internal, declared in the DTD. Parameter entities are not contained.
**Notes:** Duplicates are discarded. For example in: <!DOCTYPE<br>ex SYSTEM "ex.dtd" [ <!ENTITY foo "foo"><!ENTITY bar<br>"bar"><!ENTITY bar "bar2"><!ENTITY % baz "baz"><br>] ><ex/>

the interface provides access to foo and the first declaration of bar but not the second declaration of bar or baz. Every node in this map also implements the XMLEntityMBS interface.

The DOM Level 2 does not support editing entities, therefore entities cannot be altered in any way.

### 212.8.5 Notations as XMLNotationMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries array of notations.
**Notes:** A named node map containing the notations declared in the DTD. Duplicates are discarded. Every node in this map also implements the XMLNotationMBS interface.

The DOM Level 2 does not support editing notations, therefore notations cannot be altered in any way.

### 212.8.6 Properties

### 212.8.7 InternalSubset as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal subset as a string, or empty if there is none.
**Notes:** This is does not contain the delimiting square brackets.The actual content returned depends on how much information is available to the implementation. This may vary depending on various parameters, including the XML processor used to build the document.
(Read only property)

### 212.8.8 Name as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of DTD; i.e., the name immediately following the DOCTYPE keyword.
**Notes:** (Read only property)

### 212.8.9 PublicId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the public identifier of the external subset.
**Notes:** (Read only property)

### 212.8.10 SystemId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the system identifier of the external subset.
**Notes:** (Read only property)

## 212.9 class XMLDOMParserMBS

### 212.9.1 class XMLDOMParserMBS

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class to customize the parser and run it.
**Example:**

```
Dim xml As String = "<test id=""123""></test>"
Dim parser As New XMLDOMParserMBS

Parser.ExitOnFirstFatalError = True
parser.DoNamespaces = True
parser.DoSchema = true

// parse it
Dim doc As XMLDocumentMBS = Parser.Parse(xml)
// and make a string:
Dim s As String = doc.toString
```

Break

**Notes:** This class wraps XercesDOMParser.

This class implements the Document Object Model (DOM) interface. It should be used by applications which choose to parse and process the XML document using the DOM api's. This implementation also allows the applications to install an error and an entity handler (useful extensions to the DOM specification).

It can be used to instantiate a validating or non-validating parser, by setting a member flag.
**Blog Entries**

- News from the MBS Xojo Plugins in Version 23.0
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0
- MBS Xojo Plugins, version 22.6pr1

**Xojo Developer Magazine**

- 21.3, page 10: News
- 21.2, page 9: News

### 212.9.2 Methods

### 212.9.3 Constructor

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 212.9.4 Parse(data as MemoryBlock) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parses a XML in MemoryBlock.
**Notes:** Returns new document on success.
See also:

- 212.9.5 Parse(data as string) as XMLDocumentMBS 23914

### 212.9.5 Parse(data as string) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parses a XML string.
**Example:**

```
Dim xml As String = "<test id=""123""></test>"
Dim parser As New XMLDOMParserMBS

// parse it
Dim doc As XMLDocumentMBS = Parser.Parse(xml)
// and make a string:
Dim s As String = doc.toString

Break
```

**Notes:** Returns new document on success.
See also:

- 212.9.4 Parse(data as MemoryBlock) as XMLDocumentMBS 23914

### 212.9.6 Reset

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Reset the parser.
**Notes:** This method resets the state of the DOM driver and makes it ready for a fresh parse run.

### 212.9.7 Properties

### 212.9.8 CreateEntityReferenceNodes as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the 'include entity references' flag.
**Notes:** This method allows the user to specify whether the parser should create entity reference nodes in the DOM tree being produced. When the 'create' flag is true, the parser will create EntityReference nodes in the DOM tree.
The EntityReference nodes and their child nodes will be read-only.
When the 'create' flag is false, no EntityReference nodes will be created.

The replacement text of the entity is included in either case, either as a child of the Entity Reference node or in place at the location of the reference.

The default value is 'true'.
(Read and Write property)

### 212.9.9 DoNamespaces as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The 'do namespaces' flag
**Notes:** This method allows users to enable or disable the parser's namespace processing. When set to true, parser starts enforcing all the constraints and rules specified by the NameSpace specification.

The parser's default state is: false.
(Read and Write property)

### 212.9.10 DoSchema as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The 'do schema' flag.
**Notes:** This method allows users to enable or disable the parser's schema processing. When set to false, parser will not process any schema found.

The parser's default state is: false.

Note: If set to true, namespace processing must also be turned on.
(Read and Write property)

### 212.9.11 ExitOnFirstFatalError as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the 'exit on first error' flag.
**Notes:** This method allows users to set the parser's behaviour when it encounters the first fatal error. If set to true, the parser will exit at the first fatal error. If false, then it will report the error and continue processing.

The default value is 'true' and the parser exits on the first fatal error.
(Read and Write property)

### 212.9.12 ExternalSchemaLocation as String

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This method allows the user to specify a list of schemas to use.
**Notes:** If the targetNamespace of a schema specified using this method matches the targetNamespace of a schema occurring in the instance document in the schemaLocation attribute, or if the targetNamespace matches the namespace attribute of the "import" element, the schema specified by the user using this method will be used (i.e., the schemaLocation attribute in the instance document or on the "import" element will be effectively ignored).

The syntax is the same as for schemaLocation attributes in instance documents: e.g, "http://www.example.com file_name.xsd". The user can specify more than one XML Schema in the list.
(Read and Write property)

### 212.9.13 GenerateSyntheticAnnotations as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the 'generate synthetic annotations' flag.
**Notes:** A synthetic XSAnnotation is created when a schema component has non-schema attributes but has no child annotations so that the non-schema attributes can be recovered under PSVI.
(Read and Write property)

### 212.9.14 Handle as Integer

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.9.15 IdentityConstraintChecking as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This method allows users to enable or disable the parser's identity constraint checks.
**Notes:** By default, the parser does identity constraint checks.
The default value is true.</p>
(Read and Write property)

### 212.9.16 IncludeIgnorableWhitespace as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Set the 'include ignorable whitespace' flag
**Notes:** This method allows the user to specify whether a validating parser should include ignorable whitespaces as text nodes. It has no effect on non-validating parsers which always include non-markup text.
When set to true (also the default), ignorable whitespaces will be added to the DOM tree as text nodes. The method DOMText.isIgnorableWhitespace() will return true for those text
nodes only.
When set to false, all ignorable whitespace will be discarded and no text node is added to the DOM tree. Note: applications intended to process the "xml:space" attribute should not set this flag to false.
And this flag also overrides any schema datateye whitespace facets, that is, all ignorable whitespace will be discarded even though 'preserve' is set in schema datatype whitespace facets.
(Read and Write property)

### 212.9.17 Threaded as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether to run Parse threaded.
**Notes:** If true, the parsing is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
(Read only property)

### 212.9.18 ValidateAnnotations as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The 'validlate annotations' flag.
**Notes:** The value for specifying whether Annotations should be validated or not.
(Read and Write property)

### 212.9.19 ValidationConstraintFatal as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parser's behaviour when it encounters a validation constraint error.
**Notes:** If set to true, and the the parser will treat validation error as fatal and will exit depends on the state of "getExitOnFirstFatalError". If false, then it will report the error and continue processing.

Note: setting this true does not mean the validation error will be printed with the word "Fatal Error". It is still printed as "Error", but the parser will exit if "setExitOnFirstFatalError" is set to true.
The default value is 'false'.
(Read and Write property)

### 212.9.20 ValidationSchemaFullChecking as Boolean

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This method allows the user to turn full Schema constraint checking on/off.
**Notes:** Only takes effect if Schema validation is enabled.
If turned off, partial constraint checking is done.

Full schema constraint checking includes those checking that may be time-consuming or memory intensive. Currently, particle unique attribution constraint checking and particle derivation restriction checking are controlled by this option.

The parser's default state is: false.
(Read and Write property)

### 212.9.21 ValidationScheme as Integer

MBS XML Plugin, Plugin Version: 23.0, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The validation scheme to be used by this parser.

**Notes:** The value is one of the ValSchemes enumerated values defined by this class:

| | |
|---|---|
| ValidateNever | turn off validation |
| ValidateAlways | turn on validation |
| ValidateAuto | turn on validation if any internal/external DTD subset have been seen |

The parser's default state is: ValidateNever
(Read and Write property)

### 212.9.22 Constants

Validation

| Constant | Value | Description |
|---|---|---|
| ValidateAlways | 1 | The parser will always report validation errors. |
| ValidateAuto | 2 | The parser will report validation errors only if a grammar is specified. |
| ValidateNever | 0 | Do not report validation errors. |

## 212.10 class XMLElementMBS

### 212.10.1 class XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a XML element.
**Notes:** By far the vast majority of objects (apart from text) that authors encounter when traversing a document are XMLElementMBS nodes.

Assume the following XML document:

<elementExample id="demo">
<subelement1/>
<subelement2><subsubelement/></subelement2>
</elementExample>

When represented using DOM, the top node is an XMLElementMBS node for "elementExample", which contains two child XMLElementMBS nodes, one for "subelement1" and one for "subelement2". "subelement1" contains no child nodes.

Elements may have attributes associated with them; since the XMLElementMBS interface inherits from XMLNodeMBS, the generic XMLNodeMBS interface method getAttributes may be used to retrieve the set of all attributes for an element. There are methods on the XMLElementMBS interface to retrieve either an XMLAttributeMBS object by name or an attribute value by name. In XML, where an attribute value may contain entity references, an XMLAttributeMBS object should be retrieved to examine the possibly fairly complex sub-tree representing the attribute value. On the other hand, in HTML, where all attributes have simple string values, methods to directly access an attribute value can safely be used as a convenience.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Embracing for each loops
- MBS Xojo Plugins, version 23.4pr1
- MBS Xojo Plugins, version 22.4pr4
- Iterate over XML nodes

**Xojo Developer Magazine**

- 21.2, pages 65 to 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes

### 212.10.2 Methods

### 212.10.3 AttributeNode(Name as String) as XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves an XMLAttributeMBS node by name.
**Notes:** name: The name (nodeName) of the attribute to retrieve.

The XMLAttributeMBS node with the specified name (nodeName) or null if there is no such attribute.

### 212.10.4 AttributeNodeNS(namespaceURI as string, localName as String) as XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves an XMLAttributeMBS node by local name and namespace URI.
**Notes:** namespaceURI: The namespace URI of the attribute to retrieve.
localName: The local name of the attribute to retrieve.

The XMLAttributeMBS node with the specified attribute local name and namespace URI or nil if there is no such attribute.

### 212.10.5 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.10.6 Element(Index as Integer) as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries element with given index.
**Notes:** Returns nil if index is out of index.

### 212.10.7 ElementsByTagName(TagName as String) as XMLElementMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a DOMNodeList of all descendant elements with a given tag name, in the order in which they would be encountered in a preorder traversal of the XMLElementMBS tree.
**Notes:** name: The name of the tag to match on. The special value "*" matches all tags.

A list of matching XMLElementMBS nodes.

### 212.10.8 ElementsByTagNameNS(namespaceURI as string, localName as String) as XMLElementMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a nodes of all the DOMElements with a given local name and namespace URI in the order in which they would be encountered in a preorder traversal of the XMLDocumentMBS tree, starting from this node.
**Notes:** namespaceURI: The namespace URI of the elements to match on. The special value "*" matches all namespaces.
localName: The local name of the elements to match on. The special value "*" matches all local names.

### 212.10.9 HasAttribute(Name as String) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether an attribute exists.
**Notes:** Returns true when an attribute with a given name is specified on this element or has a default value, false otherwise.

name: The name of the attribute to look for.

Returns true if an attribute with the given name is specified on this element or has a default value, false otherwise.

### 212.10.10 HasAttributeNS(namespaceURI as string, localName as String) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Whether an attribute exists.
**Notes:** Returns true when an attribute with a given local name and namespace URI is specified on this element or has a default value, false otherwise.

namespaceURI: The namespace URI of the attribute to look for.
localName: The local name of the attribute to look for.
true: if an attribute with the given local name and namespace URI is specified or has a default value on this element, false otherwise.

### 212.10.11 IterateElements as XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the elements.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><other>abc</other><test>def</test></doc>")

Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateElements
MessageBox e.toString
Next
```

**Notes:** For use with For Each Loops in Xojo.

### 212.10.12 IterateElementsByTagName(TagName as String) as XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the elements with matching tag name.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1""">abc</test><test id=""2""">def</test></doc>")

Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateElementsByTagName("test")
MessageBox e.toString
Next
```

**Notes:** For use with For Each Loops in Xojo.

### 212.10.13 IterateElementsByTagNameNS(namespaceURI as string, localName as String) as XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the elements with matching tag name.
**Notes:** For use with For Each Loops in Xojo.

### 212.10.14 RemoveAttribute(Name as String)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Removes an attribute by name.
**Example:**

```
Dim xml As String = "<test>test</test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

DocumentElement.AttributeValue("a") = "123"

MessageBox DocumentElement.toString

DocumentElement.RemoveAttribute("a")

MessageBox DocumentElement.toString
```

**Notes:** If the removed attribute is known to have a default value, an attribute immediately appears containing the default value as well as the corresponding namespace URI, local name, and prefix when applicable.

To remove an attribute by local name and namespace URI, use the removeAttributeNS method.

### 212.10.15 RemoveAttributeNode(Node as XMLAttributeMBS)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Removes the specified attribute node.
**Notes:** If the removed XMLAttributeMBS has a default value it is immediately replaced. The replacing attribute has the same namespace URI and local name, as well as the original prefix, when applicable.

### 212.10.16 RemoveAttributeNS(namespaceURI as string, localName as string)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Removes an attribute by local name and namespace URI.
**Notes:** If the removed attribute has a default value it is immediately replaced. The replacing attribute has

the same namespace URI and local name, as well as the original prefix.

namespaceURI: The namespace URI of the attribute to remove.
localName: The local name of the attribute to remove.

### 212.10.17 SetAttributeNode(AttributeNode as XMLAttributeMBS)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a new attribute.
**Notes:** If an attribute with that name (nodeName) is already present in the element, it is replaced by the new one.
AttributeNode: The XMLAttributeMBS node to add to the attribute list.
If the AttributeNode attribute replaces an existing attribute, the replaced XMLAttributeMBS node is returned, otherwise null is returned.

If the new attribute is from another document, we clone it first.

### 212.10.18 SetAttributeNodeNS(AttributeNode as XMLAttributeMBS)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds a new attribute.
**Notes:** If an attribute with that local name and namespace URI is already present in the element, it is replaced by the new one.

AttributeNode: The XMLAttributeMBS node to add to the attribute list.
If the newAttr attribute replaces an existing attribute with the same local name and namespace URI, the replaced XMLAttributeMBS node is returned, otherwise nil is returned.

If the new attribute is from another document, we clone it first.

### 212.10.19 SetIdAttribute(name as string, isID as boolean)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets ID attribute.
**Notes:** If the parameter isId is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of XMLAttributeMBS::isId and the behavior of ElementById in XMLDocumentMBS, but does not change any schema that may be in use, in particular this does not affect the SchemaTypeInfo XMLAttributeMBS of the specified XMLAttributeMBS node. Use the value false for the

parameter isId to undeclare an attribute for being a user-determined ID attribute. To specify an XMLAttributeMBS by local name and namespace URI, use the setIdAttributeNS method.

name: The name of the XMLAttributeMBS.
isId: Whether the attribute is of type ID.

### 212.10.20 SetIdAttributeNode(idAttr as XMLAttributeMBS, isID as boolean)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the id attribute node.
**Notes:** If the parameter isId is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of isId of XMLAttributeMBS and the behavior of getElementById of XMLDocumentMBS, but does not change any schema that may be in use, in particular this does not affect the SchemaTypeInfo of XMLAttributeMBS of the specified XMLAttributeMBS node. Use the value false for the parameter isId to undeclare an attribute for being a user-determined ID attribute.

idAttr: The XMLAttributeMBS node.
isId: Whether the attribute is of type ID.

If the new attribute is from another document, we clone it first.

### 212.10.21 SetIdAttributeNS(namespaceURI as string, localName as string, isID as boolean)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets id attribute.
**Notes:** If the parameter isId is true, this method declares the specified attribute to be a user-determined ID attribute. This affects the value of isId of XMLAttributeMBS and the behavior of getElementById of XMLDocumentMBS, but does not change any schema that may be in use, in particular this does not affect the getSchemaTypeInfo of XMLAttributeMBS of the specified XMLAttributeMBS node. Use the value false for the parameter isId to undeclare an attribute for being a user-determined ID attribute.

namespaceURI: The namespace URI of the XMLAttributeMBS.
localName: The local name of the XMLAttributeMBS.
isId: Whether the attribute is of type ID.

### 212.10.22 Properties

### 212.10.23 ChildElementCount as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of child nodes that are of type XMLElementMBS.
**Notes:** Note: the count is computed every time this function is invoked

The number of XMLElementMBS objects that are direct children of this object (nested elements are not counted), or 0 if there is none.
(Read only property)

### 212.10.24 FirstElementChild as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The first child of type XMLElementMBS.
**Notes:** The XMLElementMBS object that is the first element node among the child nodes of this node, or nil if there is none.
(Read only property)

### 212.10.25 LastElementChild as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The last child of type XMLElementMBS.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// looping over elements backwards, skips e.g. text nodes and comments
Dim node As XMLElementMBS = DocumentElement.LastElementChild
While node <>Nil

// show each child
MessageBox node.toString

node = node.PreviousElementSibling
// loop ends when there is no next one
Wend
```

**Notes:** The XMLElementMBS object that is the last element node among the child nodes of this node, or nil if there is none.
(Read only property)

### 212.10.26 NextElementSibling as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The next sibling node of type XMLElementMBS.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// looping over elements skips e.g. text nodes and comments
Dim node As XMLElementMBS = DocumentElement.FirstElementChild
While node <>Nil

// show each child
MessageBox node.toString

node = node.NextElementSibling
// loop ends when there is no next one
Wend
```

**Notes:** The XMLElementMBS object that is the next sibling element node in document order, or nil if there is none.
(Read only property)

### 212.10.27 PreviousElementSibling as XMLElementMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The previous sibling node of type XMLElementMBS.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// looping over elements backwards, skips e.g. text nodes and comments
Dim node As XMLElementMBS = DocumentElement.LastElementChild
While node <>Nil
```

```
// show each child
MessageBox node.toString

node = node.PreviousElementSibling
// loop ends when there is no next one
Wend
```

**Notes:** The XMLElementMBS object that is the previous sibling element node in document order, or nil if there is none.
(Read only property)

### 212.10.28 SchemaTypeInfo as XMLTypeInfoMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the type information associated with this element.
**Notes:** (Read only property)

### 212.10.29 TagName as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of the element.
**Notes:** For example, in: <elementExample id="demo">... </elementExample>, tagName has the value "elementExample". Note that this is case-preserving in XML, as are all of the operations of the DOM.
(Read only property)

### 212.10.30 AttributeValue(Name as String) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves an attribute value by name.
**Example:**

```
Dim doc As New XMLDocumentMBS
Dim node As XMLElementMBS = doc.createElement("Hello")

node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"

Dim attrs() As XMLAttributeMBS = node.AttributeNodes
For Each a As XMLAttributeMBS In attrs
```

MessageBox a.Name+": "+a.Value
Next

**Notes:** name: The name of the attribute to retrieve.
The XMLAttributeMBS value as a string, or the empty string if that attribute does not have a specified or default value.

If assigned, adds/sets a new attribute.
If an attribute with that name is already present in the element, its value is changed to be that of the value parameter. This value is a simple string, it is not parsed as it is being set. So any markup (such as syntax to be recognized as an entity reference) is treated as literal text, and needs to be appropriately escaped by the implementation when it is written out. In order to assign an attribute value that contains entity references, the user must create an XMLAttributeMBS node plus any XMLTextMBS and XMLEntityReferenceMBS nodes, build the appropriate subtree, and use setAttributeNode to assign it as the value of an attribute.
(Read and Write computed property)

### 212.10.31 AttributeValueNS(namespaceURI as string, localName as string) as string

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Retrieves an attribute value by local name and namespace URI.
**Notes:** namespaceURI The namespace URI of the attribute to retrieve.
localName The local name of the attribute to retrieve.

Returns the XMLAttributeMBS value as a string, or an "" if that attribute does not have a specified or default value.

Adds a new attribute when assigned.
If an attribute with the same local name and namespace URI is already present on the element, its prefix is changed to be the prefix part of the qualifiedName, and its value is changed to be the value parameter. This value is a simple string, it is not parsed as it is being set. So any markup (such as syntax to be recognized as an entity reference) is treated as literal text, and needs to be appropriately escaped by the implementation when it is written out. In order to assign an attribute value that contains entity references, the user must create an XMLAttributeMBS node plus any XMLTextMBS and XMLEntityReferenceMBS nodes, build the appropriate subtree, and use setAttributeNodeNS or setAttributeNode to assign it as the value of an attribute.

namespaceURI: The namespace URI of the attribute to create or alter.
qualifiedName: The qualified name of the attribute to create or alter.
value: The value to set in string form.
(Read and Write computed property)

# 212.11 class XMLEntityMBS

## 212.11.1 class XMLEntityMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This interface represents an entity, either parsed or unparsed, in an XML document.
**Notes:** Note that this models the entity itself not the entity declaration. XMLEntityMBS declaration modeling has been left for a later Level of the DOM specification.
The nodeName attribute that is inherited from XMLNodeMBS contains the name of the entity.
An XML processor may choose to completely expand entities before the structure model is passed to the DOM; in this case there will be no XMLEntityReferenceMBS nodes in the document tree.
XML does not mandate that a non-validating XML processor read and process entity declarations made in the external subset or declared in external parameter entities. This means that parsed entities declared in the external subset need not be expanded by some classes of applications, and that the replacement value of the entity may not be available. When the replacement value is available, the corresponding XMLEntityMBS node's child list represents the structure of that replacement text. Otherwise, the child list is empty.
The DOM Level 2 does not support editing XMLEntityMBS nodes; if a user wants to make changes to the contents of an XMLEntityMBS, every related XMLEntityReferenceMBS node has to be replaced in the structure model by a clone of the XMLEntityMBS's contents, and then the desired changes must be made to each of those clones instead. XMLEntityMBS nodes and all their descendants are readonly.
An XMLEntityMBS node does not have any parent.If the entity contains an unbound namespace prefix, the namespaceURI of the corresponding node in the XMLEntityMBS node subtree is null. The same is true for XMLEntityReferenceMBS nodes that refer to this entity, when they are created using the createEntityReference method of the XMLDocumentMBS interface. The DOM Level 2 does not support any mechanism to resolve namespace prefixes.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 212.11.2 Methods

## 212.11.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.11.4 Properties

## 212.11.5 InputEncoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An attribute specifying the encoding used for this entity at the time of parsing, when it is an

external parsed entity.
**Notes:** This is empty if it an entity from the internal subset or if it is not known.
(Read only property)

### 212.11.6 NotationName as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** For unparsed entities, the name of the notation for the entity.
**Notes:** For parsed entities, this is empty.
(Read only property)

### 212.11.7 PublicId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The public identifier associated with the entity, if specified.
**Notes:** If the public identifier was not specified, this is empty.
(Read only property)

### 212.11.8 SystemId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The system identifier associated with the entity, if specified.
**Notes:** If the system identifier was not specified, this is empty.
(Read only property)

### 212.11.9 XmlEncoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An attribute specifying, as part of the text declaration, the encoding of this entity, when it is an external parsed entity.
**Notes:** This is empty otherwise.
(Read only property)

### 212.11.10 XmlVersion as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** An attribute specifying, as part of the text declaration, the version number of this entity, when it is an external parsed entity.
**Notes:** This is empty otherwise.
(Read only property)

## 212.12 class XMLEntityReferenceMBS

### 212.12.1 class XMLEntityReferenceMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for an entity reference.
**Notes:** XMLEntityReferenceMBS objects may be inserted into the structure model when an entity reference is in the source document, or when the user wishes to insert an entity reference. Note that character references and references to predefined entities are considered to be expanded by the HTML or XML processor so that characters are represented by their Unicode equivalent rather than by an entity reference. Moreover, the XML processor may completely expand references to entities while building the structure model, instead of providing XMLEntityReferenceMBS objects. If it does provide such objects, then for a given XMLEntityReferenceMBS node, it may be that there is no XMLEntityMBS node representing the referenced entity. If such an XMLEntityMBS exists, then the subtree of the XMLEntityReferenceMBS node is in general a copy of the XMLEntityMBS node subtree. However, this may not be true when an entity contains an unbound namespace prefix. In such a case, because the namespace prefix resolution depends on where the entity reference is, the descendants of the XMLEntityReferenceMBS node may be bound to different namespace URIs.
As for XMLEntityMBS nodes, XMLEntityReferenceMBS nodes and all their descendants are readonly.
Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.12.2 Methods

### 212.12.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.13 class XMLExceptionMBS

### 212.13.1 class XMLExceptionMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for exceptions in the XML world.
**Notes:** Subclass of the RuntimeException class.

## 212.14 class XMLInputMBS

### 212.14.1 class XMLInputMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This interface represents a single input source for an XML entity.
**Example:**

```
Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"

Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = xmlText

Dim parser As New XMLParserMBS
Dim doc As XMLDocumentMBS = parser.parse(Input)

// inspect document in debugger
MessageBox doc.toString
```

**Notes:** This interface allows an application to encapsulate information about an input source in a single object, which may include a public identifier, a system identifier, a byte stream (possibly with a specified encoding), and/or a character stream.

There are two places that the application will deliver this input source to the parser: as the argument to the parse method, or as the return value of the XMLResourceResolverMBS.resolveResource method.

The XMLParserMBS will use the XMLInputMBS object to determine how to read XML input. If there is a character stream available, the parser will read that stream directly; if not, the parser will use a byte stream, if available; if neither a character stream nor a byte stream is available, the parser will attempt to open a URI connection to the resource identified by the system identifier.

A XMLInputMBS object belongs to the application: the parser shall never modify it in any way (it may modify a copy if necessary).

### 212.14.2 Methods

### 212.14.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 212.14.4 Properties

### 212.14.5 BaseURI as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The base URI to be used for resolving relative URIs to absolute URIs.
**Notes:** If the baseURI is itself a relative URI, the behavior is implementation dependent.
(Read and Write property)

### 212.14.6 Encoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The encoding which will be required for use with the XML text read via a stream opened by this input source.
**Example:**

```
Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = "<test id=""123""></test>"
```

**Notes:** This is usually not set, allowing the encoding to be sensed in the usual XML way. However, in some cases, the encoding in the file is known to be incorrect because of intermediate transcoding, for instance encapsulation within a MIME document.
(Read and Write property)

### 212.14.7 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.14.8 InputMemory as MemoryBlock

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The input memoryblock.
**Notes:** (Read and Write property)

### 212.14.9 InputString as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The input string.
**Example:**

```
Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = "<test id=""123""></test>"
```

**Notes:** (Read and Write property)

### 212.14.10 IssueFatalErrorIfNotFound as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Indicates if the parser should issue fatal error if this input source is not found.
**Notes:** If set to false, the parser issue warning message instead.
Default: true
(Read and Write property)

### 212.14.11 PublicId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The public identifier for this input source.
**Notes:** The public identifier is always optional: if the application writer includes one, it will be provided as part of the location information.
(Read and Write property)

### 212.14.12 SystemId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The system identifier for this input source.
**Notes:** The system id is always required. The public id may be used to map to another system id, but the system id must always be present as a fall back.
If the system ID is a URL, it must be fully resolved.
(Read and Write property)

# 212.15 class XMLIterateAttributeNodesMBS

## 212.15.1 class XMLIterateAttributeNodesMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for the iterator over attribute nodes.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc id=""123"" value=""test""></doc>")

Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLAttributeMBS In root.IterateAttributeNodes
MessageBox e.Name+": "+e.Value
Next
```

**Notes:** Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Embracing for each loops

Interfaces: Iterator, Iterable

## 212.15.2 Methods

## 212.15.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.15.4 Iterator as Iterator

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the iterator.

### 212.15.5 MoveNext as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next attribute.
**Notes:** Returns true on success or false when the iterator has no more elements.

### 212.15.6 Value as Variant

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current value.

# 212.16 class XMLIterateChildNodesMBS

## 212.16.1 class XMLIterateChildNodesMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for the iterator over child nodes.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test>abc</test><test>def</test></doc>")

Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateChildNodes
MessageBox e.toString
Next
```

**Notes:** Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Embracing for each loops

Interfaces: Iterator, Iterable

## 212.16.2 Methods

## 212.16.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.16.4 Iterator as Iterator

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the iterator.

### 212.16.5 MoveNext as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next child node.
**Notes:** Returns true on success or false when the iterator has no more elements.

### 212.16.6 Value as Variant

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current value.

# 212.17 class XMLIterateElementsMBS

## 212.17.1 class XMLIterateElementsMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for the iterator over elements.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test id=""1""">abc</test><test id=""2""">def</test></doc>")

For Each e As XMLElementMBS In doc.IterateElementsByTagName("test")
MessageBox e.toString
Next
```

**Notes:** Used internally for for each loops.

Requires Xojo 2019r2 or newer.

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- Embracing for each loops

Interfaces: Iterator, Iterable

## 212.17.2 Methods

## 212.17.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.17.4 Iterator as Iterator

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries the iterator.

### 212.17.5 MoveNext as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to next element.
**Notes:** Returns true on success or false when the iterator has no more elements.

### 212.17.6 Value as Variant

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current value.

# 212.18 class XMLNodeFilterMBS

## 212.18.1 class XMLNodeFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Filters are objects that know how to "filter out" nodes.
**Notes:** If a XMLNodeIteratorMBS or XMLTreeWalkerMBS is given a XMLNodeFilterMBS, it applies the filter before it returns the next node. If the filter says to accept the node, the traversal logic returns it; otherwise, traversal looks for the next node and pretends that the node that was rejected was not there.

The DOM does not provide any filters. XMLNodeFilterMBS is just an class that users can implement to provide their own filters by filling in the event.

XMLNodeFilterMBSs do not need to know how to traverse from node to node, nor do they need to know anything about the data structure that is being traversed. This makes it very easy to write filters, since the only thing they have to know how to do is evaluate a single node. One filter may be used with a number of different kinds of traversals, encouraging code reuse.
**Blog Entries**

- Embracing for each loops

## 212.18.2 Methods

## 212.18.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

## 212.18.4 Destructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

## 212.18.5 Events

## 212.18.6 acceptNode(node as XMLNodeMBS) as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Test whether a specified node is visible in the logical view of a XMLTreeWalkerMBS or XMLNodeIteratorMBS.
**Notes:** This event will be called by the implementation of XMLTreeWalkerMBS and XMLNodeIteratorMBS; it is not normally called directly from user code. (Though you could do so if you wanted to use the same filter to guide your own application logic.)
node: The node to check to see if it passes the filter or not.

A constant to determine whether the node is accepted, rejected, or skipped, as defined above.

### 212.18.7 Constants

Filter Results

| Constant | Value | Description |
|---|---|---|
| FilterAccept | 1 | Accept the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will return this node. |
| FilterReject | 2 | Reject the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For XMLTreeWalkerMBS, the children of this node will also be rejected. XMLNodeIteratorMBSs treat this as a synonym for FilterSkip. |
| FilterSkip | 3 | Skip this single node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For both XMLNodeIteratorMBS and XMLTreeWalkerMBS, the children of this node will still be considered. |

# 212.19 class XMLNodeIteratorMBS

## 212.19.1 class XMLNodeIteratorMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates a list of nodes.
**Notes:** XMLNodeIteratorMBSs are used to step through a set of nodes, e.g. the set of nodes in a DOMNodeList, the document subtree governed by a particular XMLNodeMBS, the results of a query, or any other set of nodes. The set of nodes to be iterated is determined by the implementation of the XMLNodeIteratorMBS. DOM Level 2 specifies a single XMLNodeIteratorMBS implementation for document-order traversal of a document subtree. Instances of these XMLNodeIteratorMBSs are created by calling createNodeIterator().

Implements Iterable and Iterator interfaces.

This class is hidden for auto complete as you don't need to use it manually. Please use it using for each loops.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Embracing for each loops
- MBS Xojo Plugins in version 22.4
- MBS Xojo Plugins, version 22.4pr2
- New XML Plugin for Xojo

## 212.19.2 Methods

## 212.19.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.19.4 nextNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the next node in the set and advances the position of the XMLNodeIteratorMBS in the set.
**Notes:** After a XMLNodeIteratorMBS is created, the first call to nextNode() returns the first node in the set.

The next XMLNodeMBS in the set being iterated over, or null if there are no more members in that set. @exception DOMException INVALID_STATE_ERR: Raised if this method is called after the detach method was invoked.

### 212.19.5 previousNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the previous node in the set and moves the position of the XMLNodeIteratorMBS backwards in the set.
**Notes:** The previous XMLNodeMBS in the set being iterated over, or null if there are no more members in that set.

### 212.19.6 Properties

### 212.19.7 Current as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The current node.
**Notes:** Starts with the root node.
(Read only property)

### 212.19.8 Document as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The owning document.
**Notes:** (Read only property)

### 212.19.9 ExpandEntityReferences as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return the expandEntityReferences flag.
**Notes:** The value of this flag determines whether the children of entity reference nodes are visible to the XMLNodeIteratorMBS. If false, these children and their descendants will be rejected. Note that this rejection takes precedence over whatToShow and the filter. Also note that this is currently the only situation where XMLNodeIteratorMBSs may reject a complete subtree rather than skipping individual nodes.

To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the XMLNodeIteratorMBS. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false.
(Read only property)

### 212.19.10 Filter as XMLNodeFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLNodeFilterMBS used to screen nodes.
**Notes:** (Read only property)

### 212.19.11 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.19.12 Root as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The root node of the XMLNodeIteratorMBS, as specified when it was created.
**Notes:** (Read only property)

### 212.19.13 WhatToShow as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return which node types are presented via the iterator.
**Notes:** This attribute determines which node types are presented via the XMLNodeIteratorMBS. The available set of constants is defined in the XMLNodeFilterMBS interface. Nodes not accepted by whatToShow will be skipped, but their children may still be considered. Note that this skip takes precedence over the filter, if any.

Default is ShowAll.
(Read only property)

## 212.20 class XMLNodeMBS

### 212.20.1 class XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLNodeMBS interface is the primary datatype for the entire Document Object Model.
**Notes:** It represents a single node in the document tree. While all objects implementing the XMLNodeMBS interface expose methods for dealing with children, not all objects implementing the XMLNodeMBS interface may have children. For example, XMLTextMBS nodes may not have children, and adding children to such nodes results in a XMLExceptionMBS being raised.

The attributes nodeName, nodeValue and attributes are included as a mechanism to get at node information without casting down to the specific derived interface. In cases where there is no obvious mapping of these attributes for a specific nodeType (e.g., nodeValue for an XMLElementMBS or attributes for a XMLCommentMBS), this returns nil. Note that the specialized interfaces may contain additional and more convenient mechanisms to get and set the relevant information.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- Embracing for each loops
- MBS Xojo Plugins, version 23.4pr1
- News from the MBS Xojo Plugins in Version 23.0
- Xojo 2022r4 released
- MBS Xojo Plugins, version 22.6pr1
- MBS Xojo Plugins, version 22.4pr3

**Xojo Developer Magazine**

- 21.2, page 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes

### 212.20.2 Methods

### 212.20.3 appendChild(newChild as XMLNodeMBS) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Adds the node newChild to the end of the list of children of this node.
**Notes:** If the newChild is already in the tree, it is first removed.
newChild The node to add. If it is a XMLDocumentFragmentMBS object, the entire contents of the document fragment are moved into the child list of this node.

If the new node is from another document, we clone it first.

Returns the newly added node.

### 212.20.4 AttributeNode(Index as Integer) as XMLAttributeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries attribute node by index.
**Notes:** Index is zero based up to AttributeCount-1.

### 212.20.5 AttributeNodes as XMLAttributeMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries an array with all attributes.
**Example:**

```
Dim doc As New XMLDocumentMBS
Dim node As XMLElementMBS = doc.createElement("Hello")

// add some attributes
node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"

// now show them all in message dialogs
Dim attrs() As XMLAttributeMBS = node.AttributeNodes
For Each a As XMLAttributeMBS In attrs
MessageBox a.Name+": "+a.Value
Next
```

**Notes:** Gets a array containing the attributes of this node (if it is an XMLElementMBS) or null otherwise.

### 212.20.6 Child(Index as Integer) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries child node with given index.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
```

```
Dim node As XMLElementMBS = doc.DocumentElement

Dim count As Integer = node.ChildCount
Dim node0 As XMLNodeMBS = node.Child(0)
Dim node1 As XMLNodeMBS = node.Child(1)
Dim node2 As XMLNodeMBS = node.Child(2)
Dim node3 As XMLNodeMBS = node.Child(3)
'Dim node4 As XMLNodeMBS = node.Child(4) // out of bounds exception
Break // see debugger
```

**Notes:** Index is zero based up to ChildCount-1.

### 212.20.7 ChildNodes as XMLNodeMBS()

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets a DOMNodeList that contains all children of this node.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

Dim children() As XMLNodeMBS = DocumentElement.ChildNodes
For Each node As XMLNodeMBS In children
MessageBox node.toString
Next
```

**Notes:** If there are no children, this is a array containing no nodes.

The array is a static snapshot of the content of the node.

### 212.20.8 Clone(deep as Boolean) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns a duplicate of this node.
**Notes:** Pass true for deep parameter to copy all sub objects as well.

This function serves as a generic copy constructor for nodes.

The duplicate node has no parent ( parentNode returns nil.).

Cloning an XMLElementMBS copies all attributes and their values, including those generated by the XML processor to represent defaulted attributes, but this method does not copy any text it contains unless it is a deep clone, since the text is contained in a child XMLTextMBS node. Cloning any other type of node simply returns a copy of this node.
deep If true, recursively clone the subtree under the specified node; if false, clone only the node itself (and its attributes, if it is an XMLElementMBS).

### 212.20.9 compareDocumentPosition(other as XMLNodeMBS) as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Compares two nodes for their position in the document.
**Notes:** Compares the reference node, i.e. the node on which this method is being called, with a node, i.e. the one passed as a parameter, with regard to their position in the document and according to the document order.

other: The node to compare against this node.

Returns how the given node is positioned relatively to this node.

### 212.20.10 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.20.11 insertBefore(newChild as XMLNodeMBS, refChild as XMLNodeMBS) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Inserts the node newChild before the existing child node refChild.
**Notes:** If refChild is nil, insert newChild at the end of the list of children.

If newChild is a XMLDocumentFragmentMBS object, all of its children are inserted, in the same order, before refChild. If the newChild is already in the tree, it is first removed. Note that a XMLNodeMBS that has never been assigned to refer to an actual node is == nil.
newChild The node to insert.

refChild The reference node, i.e., the node before which the new node must be inserted.

If the new node is from another document, we clone it first.

Returns the new node.

### 212.20.12 isDefaultNamespace(namespaceURI as String) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This method checks if the specified namespaceURI is the default namespace or not.
**Notes:** namespaceURI: The namespace URI to look for.
Returns true if the specified namespaceURI is the default namespace, false otherwise.

### 212.20.13 isEqualNode(other as XMLNodeMBS) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Tests whether two nodes are equal.
**Notes:** This method tests for equality of nodes, not sameness (i.e., whether the two nodes are pointers to the same object) which can be tested with XMLNodeMBS::isSameNode. All nodes that are the same will also be equal, though the reverse may not be true.

Two nodes are equal if and only if the following conditions are satisfied: The two nodes are of the same type.The following string attributes are equal: nodeName, localName, namespaceURI, prefix, nodeValue , baseURI. This is: they are both null, or they have the same length and are character for character identical. The attributes node maps are equal. This is: they are both nil, or they have the same length and for each node that exists in one map there is a node that exists in the other map and is equal, although not necessarily at the same index.The childNodes node lists are equal. This is: they are both nil, or they have the same length and contain equal nodes at the same index. This is true for XMLAttributeMBS nodes as for any other type of node. Note that normalization can affect equality; to avoid this, nodes should be normalized before being compared.

For two XMLDocumentTypeMBS nodes to be equal, the following conditions must also be satisfied: The following string attributes are equal: publicId, systemId, internalSubset. The entities node maps are equal. The notations node maps are equal.

On the other hand, the following do not affect equality: the ownerDocument attribute, the specified attribute for XMLAttributeMBS nodes, the isWhitespaceInElementContent attribute for XMLTextMBS nodes, as well as any user data or event listeners registered on the nodes.

other: The node to compare equality with.

If the nodes, and possibly subtrees are equal, true otherwise false.

### 212.20.14 isSameNode(other as XMLNodeMBS) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether this node is the same node as the given one.
**Notes:** This method provides a way to determine whether two XMLNodeMBS references returned by the implementation reference the same object. When two XMLNodeMBS references are references to the same object, even if through a proxy, the references may be used completely interchangeably, such that all attributes have the same values and calling the same DOM method on either reference always has exactly the same effect.

other: The node to test against.

Returns true if the nodes are the same, false otherwise.

### 212.20.15 IterateAttributeNodes as XMLIterateAttributeNodesMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the attributes.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc id=""123"" value=""test""></doc>")

Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLAttributeMBS In root.IterateAttributeNodes
MessageBox e.Name+": "+e.Value
Next
```

**Notes:** For use with For Each Loops in Xojo.

### 212.20.16 IterateChildNodes as XMLIterateChildNodesMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates over the child nodes.
**Example:**

```
Dim doc As New XMLDocumentMBS("<doc><test>abc</test><test>def</test></doc>")
```

```
Dim root As XMLElementMBS = doc.DocumentElement
For Each e As XMLElementMBS In root.IterateChildNodes
MessageBox e.toString
Next
```

**Notes:** For use with For Each Loops in Xojo.

### 212.20.17 lookupNamespaceURI(prefix as String) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Look up the namespace URI associated to the given prefix, starting from this node.
**Notes:** The prefix to look for. If this parameter is null, the method will return the default namespace URI if any.
Returns the associated namespace URI or null if none is found.

### 212.20.18 lookupPrefix(namespaceURI as String) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Look up the prefix associated to the given namespace URI, starting from this node.
**Notes:** The default namespace declarations are ignored by this method.

namespaceURI: The namespace URI to look for.

Returns an associated namespace prefix if found, null if none is found. If more than one prefix are associated to the namespace prefix, the returned namespace prefix is implementation dependent.

### 212.20.19 Normalize

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Normalizes the node tree.
**Notes:** Puts all XMLTextMBS nodes in the full depth of the sub-tree underneath this XMLNodeMBS, including attribute nodes, into a "normal" form where only markup (e.g., tags, comments, processing instructions, CDATA sections, and entity references) separates XMLTextMBS nodes, i.e., there are neither adjacent XMLTextMBS nodes nor empty XMLTextMBS nodes. This can be used to ensure that the DOM view of a document is the same as if it were saved and re-loaded, and is useful when operations (such as XPointer lookups) that depend on a particular document tree structure are to be used.

Note: In cases where the document contains CDATASections, the normalize operation alone may not be sufficient, since XPointers do not differentiate between XMLTextMBS nodes and XMLCDATASectionMBS nodes.

### 212.20.20 removeChild(Node as XMLNodeMBS)

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Removes the child node indicated by oldChild from the list of children.
**Notes:** Returns the old node.

### 212.20.21 replaceChild(newChild as XMLNodeMBS, oldChild as XMLNodeMBS) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Replaces the child node oldChild with newChild in the list of children, and returns the oldChild node.
**Notes:** If newChild is a XMLDocumentFragmentMBS object, oldChild is replaced by all of the XMLDocumentFragmentMBS children, which are inserted in the same order.

If the newChild is already in the tree, it is first removed.
newChild The new node to put in the child list.
oldChild The node being replaced in the list.

If the new node is from another document, we clone it first.

Returns the old node.

### 212.20.22 Properties

### 212.20.23 AttributeCount as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries number of attributes.
**Example:**

```
Dim doc As New XMLDocumentMBS
Dim node As XMLElementMBS = doc.createElement("Hello")
```

```
node.AttributeValue("Hello") = "World"
node.AttributeValue("Value") = "123"
node.AttributeValue("Test") = "Value"

MessageBox node.AttributeCount.ToString // shows 3
```

**Notes:** (Read only property)

### 212.20.24 BaseURI as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The absolute base URI of this node or "" if undefined.
**Notes:** This value is computed according to. However, when the XMLDocumentMBS supports the feature "HTML" , the base URI is computed using first the value of the href attribute of the HTML BASE element if any, and the value of the documentURI attribute from the XMLDocumentMBS interface otherwise.

When the node is an XMLElementMBS, a XMLDocumentMBS or a a XMLProcessingInstructionMBS, this attribute represents the properties [ base URI ] defined in . When the node is a XMLNotationMBS, an XMLEntityMBS, or an XMLEntityReferenceMBS, this attribute represents the properties [ declaration base URI ] .
(Read only property)

### 212.20.25 ChildCount as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Queries number of child nodes.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim node As XMLElementMBS = doc.DocumentElement

MessageBox node.ChildCount.ToString+" Children"
```

**Notes:** (Read only property)

### 212.20.26 FirstChild as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the first child of this node.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

Dim node As XmlNodeMBS = DocumentElement.FirstChild
While node <>Nil

// show each child
MessageBox node.toString

node = node.NextSibling
// loop ends when there is no next one
Wend
```

**Notes:** If there is no such node, this returns nil.
(Read only property)

### 212.20.27 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.20.28 hasAttributes as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether this node (if it is an element) has any attributes.
**Notes:** Returns true if this node has any attributes, false otherwise.
(Read only property)

### 212.20.29 hasChildren as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This is a convenience method to allow easy determination of whether a node has any children.
**Example:**

```
Dim xml As String = "<test>test</test>"
```

```
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

MessageBox "HasChildren: "+DocumentElement.hasChildren.ToString // shows true

DocumentElement.removeChild DocumentElement.FirstChild

MessageBox "HasChildren after removal: "+DocumentElement.hasChildren.ToString // shows false
```

**Notes:** Returns true if the node has any children, false if the node has no children.
(Read only property)

### 212.20.30 LastChild as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the last child of this node.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// loop over nodes backwards
Dim node As XmlNodeMBS = DocumentElement.LastChild
While node <>Nil

// show each child
MessageBox node.toString

node = node.PreviousSibling
// loop ends when there is no previous one
Wend
```

**Notes:** If there is no such node, this returns nil.
(Read only property)

### 212.20.31 LocalName as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the local part of the qualified name of this node.
**Notes:** For nodes created with a DOM Level 1 method, such as createElement from the XMLDocumentMBS interface, it is "".

(Read only property)

### 212.20.32 NamespaceURI as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The namespace URI.
**Notes:** Get the namespace URI of this node, or "" if it is unspecified.
This is not a computed value that is the result of a namespace lookup based on an examination of the namespace declarations in scope. It is merely the namespace URI given at creation time.

For nodes of any type other than element and attribute and nodes created with a DOM Level 1 method, such as createElement from the XMLDocumentMBS interface, this is always "".
(Read only property)

### 212.20.33 NextSibling as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the node immediately following this node.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

Dim node As XmlNodeMBS = DocumentElement.FirstChild
While node <>Nil

// show each child
MessageBox node.toString

node = node.NextSibling
// loop ends when there is no next one
Wend
```

**Notes:** If there is no such node, this returns nil.
(Read only property)

### 212.20.34 NodeName as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The name of this node, depending on its type.
**Notes:** This property can also be used with name "Name".
(Read only property)

### 212.20.35 NodeType as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The type of this node.
**Example:**

```
Dim xml As String = "<test id=""123"">Hello</test>"
Dim doc As New XMLDocumentMBS(xml)

MessageBox doc.DocumentElement.NodeType.ToString // shows 1 for element
```

**Notes:** See Type* constants.
(Read only property)

### 212.20.36 NodeValue as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the value of this node, depending on its type.
**Notes:** Sets the value of the node.

Any node which can have a nodeValue will also accept requests to set it to a string. The exact response to this varies from node to node – Attribute, for example, stores its values in its children and has to replace them with a new Text holding the replacement value.

For most types of Node, value is null and attempting to set it will throw XMLExceptionMBS. This will also be thrown if the node is read-only.

This property can also be used with name Value.
(Read and Write property)

### 212.20.37 OwnerDocument as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the XMLDocumentMBS object associated with this node.

**Notes:** This is also the XMLDocumentMBS object used to create new nodes.
When this node is a XMLDocumentMBS or a XMLDocumentTypeMBS which is not used with any XMLDocumentMBS yet, this is nil.
(Read only property)

### 212.20.38 ParentNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the parent of this node.
**Notes:** All nodes, except XMLDocumentMBS, XMLDocumentFragmentMBS, and XMLAttributeMBS may have a parent. However, if a node has just been created and not yet added to the tree, or if it has been removed from the tree, a null XMLNodeMBS is returned.
(Read only property)

### 212.20.39 Prefix as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the namespace prefix of this node, or "" if it is unspecified.
**Notes:** Can be set.
Note that setting this attribute, when permitted, changes the nodeName attribute, which holds the qualified name, as well as the tagName and name attributes of the XMLElementMBS and XMLAttributeMBS interfaces, when applicable.

Note also that changing the prefix of an attribute, that is known to have a default value, does not make a new attribute with the default value and the original prefix appear, since the namespaceURI and localName do not change.
(Read and Write property)

### 212.20.40 PreviousSibling as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Gets the node immediately preceding this node.
**Example:**

```
Dim xml As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"
Dim doc As New XMLDocumentMBS(xml)
Dim DocumentElement As XMLElementMBS = doc.DocumentElement

// loop over nodes backwards
Dim node As XmlNodeMBS = DocumentElement.LastChild
```

```
While node <>Nil

// show each child
MessageBox node.toString

node = node.PreviousSibling
// loop ends when there is no previous one
Wend
```

**Notes:** If there is no such node, this returns nil.
(Read only property)

### 212.20.41 ReferenceCount as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The reference count.
**Notes:** Helps us to debug memory leaks.
(Read only property)

### 212.20.42 toString as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Creates an UTF-8 encoded text representation of the XML.
**Example:**

```
Dim xml As String = "<test id=""123""></test>"
Dim doc As New XMLDocumentMBS(xml)

MessageBox doc.toString
```

**Notes:** Convenience function to use XMLSerializerMBS class internally.
(Read only property)

### 212.20.43 Constants

Document Positions

| Constant | Value | Description |
|---|---|---|
| DocumentPositionContainedBy | 16 | The node is contained by the reference node. A node which is con always following, too. |
| DocumentPositionContains | 8 | The node contains the reference node. A node which contains is alv ceding, too. |
| DocumentPositionDisconnected | 1 | The two nodes are disconnected. Order between disconnected nodes implementation-specific. |
| DocumentPositionFollowing | 4 | The node follows the reference node. |
| DocumentPositionImplementationSpecific | 32 | The determination of preceding versus following is implementation-sp |
| DocumentPositionPreceding | 2 | The second node precedes the reference node. |

Types

| Constant | Value | Description |
|---|---|---|
| TypeAttribute | 2 | Attribute Node |
| TypeCDataSection | 4 | CDataSection Node |
| TypeComment | 8 | Comment Node |
| TypeDocument | 9 | Document Node |
| TypeDocumentFragment | 11 | Document Fragment |
| TypeDocumentType | 10 | Document Type Node |
| TypeElement | 1 | Element Node |
| TypeEntity | 6 | Entity Node |
| TypeEntityReferenceNode | 5 | Entity Reference Node |
| TypeNotation | 12 | Notation Node |
| TypeProcessingInstruction | 7 | Processing Instruction Node |
| TypeText | 3 | Text Node |

## 212.21 class XMLNotationMBS

### 212.21.1 class XMLNotationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This interface represents a notation declared in the DTD.
**Notes:** A notation either declares, by name, the format of an unparsed entity (see section 4.7 of the XML 1.0 specification), or is used for formal declaration of Processing Instruction targets (see section 2.6 of the XML 1.0 specification). The nodeName attribute inherited from XMLNodeMBS is set to the declared name of the notation.
The DOM Level 1 does not support editing XMLNotationMBS nodes; they are therefore readonly.
A XMLNotationMBS node does not have any parent.
Subclass of the XMLNodeMBS class.
This is a subclass of an abstract class. You can't create an instance, but you can get one from various plugin functions.

### 212.21.2 Properties

### 212.21.3 PublicId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the public identifier of this notation.
**Notes:** If the public identifier was not specified, this is "".
(Read only property)

### 212.21.4 SystemId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get the system identifier of this notation.
**Notes:** If the system identifier was not specified, this is "".
(Read only property)

# 212.22 class XMLOutputMBS

## 212.22.1 class XMLOutputMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This interface represents an output destination for data.
**Example:**

```
Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"

// now pass to write method in XMLSerializerMBS class
```

## 212.22.2 Methods

## 212.22.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

## 212.22.4 Properties

## 212.22.5 Encoding as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The encoding which will be required for use with the XML text read via a stream opened by this input source.
**Example:**

```
Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"

// now pass to write method in XMLSerializerMBS class
```

**Notes:** This is usually not set, allowing the encoding to be sensed in the usual XML way. However, in some cases, the encoding in the file is known to be incorrect because of intermediate transcoding, for instance encapsulation within a MIME document.

Pass the name of the encoding to force, e.g. "UTF-8".
(Read and Write property)

### 212.22.6 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.22.7 SystemId as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The system identifier for this input source.
**Notes:** The system id is always required. The public id may be used to map to another system id, but the system id must always be present as a fall back.

If the system ID is a URL, it must be fully resolved.
(Read and Write property)

# 212.23 class XMLParserFilterMBS

## 212.23.1 class XMLParserFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XML parser filter class.
**Notes:** The XMLParserFilterMBS class provide applications the ability to examine nodes as they are being created during the parse process.
And it lets the application decide what nodes should be in the output DOM tree or not.

## 212.23.2 Methods

## 212.23.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

## 212.23.4 Destructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

## 212.23.5 Events

## 212.23.6 acceptNode(node as XMLNodeMBS) as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** This eventn will be called by the parser at the completion of the parsing of each node.
**Notes:** The node and all of its descendants will exist and be complete. The parent node will also exist, although it may be incomplete, i.e. it may have additional children that have not yet been parsed. Attribute nodes are never passed to this function. From within this method, the new node may be freely modified - children may be added or removed, text nodes modified, etc. The state of the rest of the document outside this node is not defined, and the affect of any attempt to navigate to, or to modify any other part of the document is undefined. For validating parsers, the checks are made on the original document, before any modification by the filter. No validity checks are made on any document modifications made by the filter. If this new node is rejected, the parser might reuse the new node and any of its descendants.

node: The newly constructed element. At the time this method is called, the element is complete - it has all of its children (and their children, recursively) and attributes, and is attached as a child to its parent.

Return one of the Filter* constants.

### 212.23.7 getWhatToShow as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Tells the XMLParserMBS what types of nodes to show to the acceptNode event.
**Notes:** If a node is not shown to the filter using this attribute, it is automatically included in the DOM document being built. See XMLDocumentMBS for definition of the constants.

### 212.23.8 startElement(node as XMLElementMBS) as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** The parser will call this method after each XMLElementMBS start tag has been scanned, but before the remainder of the XMLElementMBS is processed.
**Notes:** The intent is to allow the element, including any children, to be efficiently skipped. Note that only element nodes are passed to the startElement function. The element node passed to startElement for filtering will include all of the attributes, but none of the children nodes. The XMLElementMBS may not yet be in place in the document being constructed (it may not have a parent node.) A startElement filter function may access or change the attributes for the XMLElementMBS. Changing namespace declarations will have no effect on namespace resolution by the parser.

node: The newly encountered element. At the time this method is called, the element is incomplete - it will have its attributes, but no children.

Return one of the Filter* constants.

### 212.23.9 Constants

Filter Actions

| Constant | Value | Description |
|---|---|---|
| FilterAccept | 1 | Accept the node. |
| FilterInterrupt | 4 | Interrupt the normal processing of the document. |
| FilterReject | 2 | Reject the node and its children. |
| FilterSkip | 3 | Skip this single node. The children of this node will still be considered. |

# 212.24 class XMLParserMBS

## 212.24.1 class XMLParserMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLParserMBS class provides an API for parsing XML documents and building the corresponding DOM document tree.
**Example:**

```
Dim p As New XMLParserMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.xml")

Dim doc As XMLDocumentMBS = p.parseFile(f)

// inspect document in debugger
MessageBox doc.NodeName
```

**Notes:** Please note that asynchronous mode is not yet supported in MBS Plugin.
**Blog Entries**

- MBS Xojo Plugins in version 22.4

**Xojo Developer Magazine**

- 20.6, page 8: News

## 212.24.2 Methods

## 212.24.3 abort

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Abort the loading of the document that is currently being loaded by the XMLParserMBS.
**Notes:** If the XMLParserMBS is currently not busy, a call to this method does nothing.
invoking this method will remove the installed filter

## 212.24.4 Constructor(Asynchronous as Boolean = false, schemaType as string = "")

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Create a new XMLParserMBS.
**Notes:** The newly constructed parser may then be configured by means of its XMLConfigurationMBS ob-

ject, and used to parse documents by means of its parse method.

async: The mode argument is either synchronous or asynchronous, if async is true then the XMLParserMBS that is created will operate in synchronous mode, if async is false then the XMLParserMBS that is created will operate in asynchronous mode.

schemaType: An absolute URI representing the type of the schema language used during the load of a XMLDocumentMBS using the newly created XMLParserMBS. Note that no lexical checking is done on the absolute URI. In order to create a XMLParserMBS for any kind of schema types (i.e. the XMLParserMBS will be free to use any schema found), use the value "".

Note: For W3C XML Schema [ XML Schema Part 1 ] , applications must use the value "http://www.w3.org/2001/XMLSchema For XML DTD [ XML 1.0 ] , applications must use the value "http://www.w3.org/TR/REC-xml". Other Schema languages are outside the scope of the W3C and therefore should recommend an absolute URI in order to use this method.

### 212.24.5 parse(inputSource as XMLInputMBS) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parse an XML document from a resource identified by a XMLInputMBS.
**Example:**

```
Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"

Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = xmlText

Dim parser As New XMLParserMBS
Dim doc As XMLDocumentMBS = parser.parse(Input)

// inspect document in debugger
MessageBox doc.toString
```

**Notes:** The parser owns the returned XMLDocumentMBS. It will be deleted when the parser is released.

source: The XMLInputMBS from which the source of the document is to be read.

If the XMLParserMBS is a synchronous XMLParserMBS the newly created and populated XMLDocumentMBS is returned.
If the XMLParserMBS is asynchronous then nil is returned since the document object may not yet be constructed when this method returns.

### 212.24.6 parseFile(file as FolderItem) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parses a file.
**Example:**

```
Dim p As New XMLParserMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.xml")

Dim doc As XMLDocumentMBS = p.parseFile(f)

// inspect document in debugger
MessageBox doc.NodeName
```

### 212.24.7 parseURI(URI as String) as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parse an XML document from a location identified by a URI reference [ IETF RFC 2396 ] .
**Notes:** If the URI contains a fragment identifier (see section 4.1 in [ IETF RFC 2396 ] ), the behavior is not defined by this specification, future versions of this specification may define the behavior.

The parser owns the returned XMLDocumentMBS. It will be deleted when the parser is released.

uri: The location of the XML document to be read (in Unicode)

If the XMLParserMBS is a synchronous XMLParserMBS the newly created and populated XMLDocumentMBS is returned.
If the XMLParserMBS is asynchronous then nil is returned since the document object is not yet parsed when this method returns.

### 212.24.8 parseWithContext(inputSource as XMLInputMBS, contextNode as XMLNodeMBS, Action as Integer) as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Parse an XML fragment from a resource identified by a XMLInputMBS and insert the content into an existing document at the position specified with the context and action arguments.
**Example:**

```
Dim xmlText As String = "<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>"

Dim Input As New XMLInputMBS
Input.Encoding = "UTF-8"
Input.InputString = xmlText

Dim parser As New XMLParserMBS

Dim doc As New XMLDocumentMBS("", "MyDocument")

// load new test node into the MyDocument
Dim newNode As XMLNodeMBS = parser.parseWithContext(Input, doc.DocumentElement, parser.Action-
AppendAsChildren)

// inspect document in debugger
MessageBox doc.toString
```

**Notes:** When parsing the input stream, the context node (or its parent, depending on where the result will be inserted) is used for resolving unbound namespace prefixes. The context node's ownerDocument node (or the node itself if the node of type document) is used to resolve default attributes and entity references. As the new data is inserted into the document, at least one mutation event is fired per new immediate child or sibling of the context node. If the context node is a XMLDocumentMBS node and the action is ActionReplaceChildren, then the document that is passed as the context node will be changed such that its xmlEncoding, documentURI, xmlVersion, inputEncoding, xmlStandalone, and all other such attributes are set to what they would be set to if the input source was parsed using parse(). This method is always synchronous, even if the XMLParserMBS is asynchronous (when Async() returns true). If an error occurs while parsing, the caller is notified through the ErrorHandler instance associated with the "error-handler" parameter of the XMLConfigurationMBS. When calling parseWithContext, the values of the following configuration parameters will be ignored and their default values will always be used instead: "validate", "validate-if-schema" "element-content-whitespace". Other parameters will be treated normally, and the parser is expected to call the XMLParserMBSFilter just as if a whole document was parsed.

source: The XMLInputMBS from which the source document is to be read. The source document must be an XML fragment, i.e. anything except a complete XML document (except in the case where the context node of type DOCUMENT_NODE, and the action is ActionReplaceChildren), a DOCTYPE (internal subset), entity declaration(s), notation declaration(s), or XML or text declaration(s).

contextNode: The node that is used as the context for the data that is being parsed. This node must be a XMLDocumentMBS node, a XMLDocumentFragmentMBS node, or a node of a type that is allowed as a child of an XMLElementMBS node, e.g. it cannot be an XMLAttributeMBS node.

action: This parameter describes which action should be taken between the new set of nodes being inserted and the existing children of the context node. The set of possible actions is defined in action constants.

Return the node that is the result of the parse operation. If the result is more than one top-level node,

the first one is returned.

### 212.24.9 resetCachedGrammarPool

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Clear the cached grammar pool.

### 212.24.10 resetDocumentPool

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Reset the documents vector pool and release all the associated memory back to the system.
**Notes:** When parsing a document using a DOM parser, all memory allocated for a DOM tree is associated to the DOM document.

If you do multiple parse using the same DOM parser instance, then multiple DOM documents will be generated and saved in a vector pool. All these documents (and thus all the allocated memory) won't be deleted until the parser instance is destroyed.

If you don't need these DOM documents anymore and don't want to destroy the DOM parser instance at this moment, then you can call this method to reset the document vector pool and release all the allocated memory back to the system.

It is an error to call this method if you are in the middle of a parse (e.g. in the mid of a progressive parse).

### 212.24.11 URIText(ID as Integer) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the string corresponding to a URI id from the URI string pool.
**Notes:** ID: id of the string in the URI string pool.

Returns the URI string corresponding to the URI id.

### 212.24.12 Properties

### 212.24.13 Asynchronous as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return whether the parser is asynchronous.
**Notes:** Value is true if the XMLParserMBS is asynchronous and false if it is synchronous.
(Read only property)

### 212.24.14 Busy as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return whether the parser is busy parsing.
**Notes:** Value is true if the XMLParserMBS is currently busy loading a document, otherwise false.
(Read only property)

### 212.24.15 DOMConfig as XMLConfigurationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Get a pointer to the XMLConfigurationMBS object used when parsing an input source.
**Example:**

```
Dim parser As New XMLParserMBS

// configure the parser
Dim DOMConfig As XMLConfigurationMBS = p.DOMConfig
DOMConfig.ElementContentWhitespace=False

// prepare XML input
Dim Input As New XMLInputMBS
Input.InputString = kXML2

// and parse
Var xml1 As XMLDocumentMBS = p.parse(Input)

Break
```

**Notes:** This XMLConfigurationMBS is specific to the parse operation.
No parameter values from this XMLConfigurationMBS object are passed automatically to the XMLConfigurationMBS object on the XMLDocumentMBS that is created, or used, by the parse operation. The DOM application is responsible for passing any needed parameter values from this XMLConfigurationMBS object

to the XMLConfigurationMBS object referenced by the XMLDocumentMBS object.
(Read only property)

### 212.24.16 Filter as XMLParserFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The parse filter.
**Notes:** When the application provides a filter, the parser will call out to the filter at the completion of the construction of each XMLElementMBS node. The filter implementation can choose to remove the element from the document being constructed or to terminate the parse early. The filter is invoked after the operations requested by the XMLConfigurationMBS parameters have been applied. For example, if "validate" is set to true, the validation is done before invoking the filter.

Currently filter can only work in synchronous mode.
(Read and Write property)

### 212.24.17 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.24.18 SrcOffset as Int64

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the current src offset within the input source.
**Notes:** (Read only property)

### 212.24.19 Constants

Actions

| Constant | Value | Description |
|---|---|---|
| ActionAppendAsChildren | 1 | Append the result of the parse operation as children of the context node. For this action to work, the context node must be a XMLElementMBS or a XMLDocumentFragmentMBS. |
| ActionInsertAfter | 4 | Insert the result of the parse operation as the immediately following sibling of the context node. For this action to work the context node's parent must be a XMLElementMBS or a XMLDocumentFragmentMBS. |
| ActionInsertBefore | 3 | Insert the result of the parse operation as the immediately preceding sibling of the context node. For this action to work the context node's parent must be a XMLElementMBS or a XMLDocumentFragmentMBS. |
| ActionReplace | 5 | Replace the context node with the result of the parse operation. For this action to work, the context node must have a parent, and the parent must be a XMLElementMBS or a XMLDocumentFragmentMBS. |
| ActionReplaceChildren | 2 | Replace all the children of the context node with the result of the parse operation. For this action to work, the context node must be a XMLElementMBS, a XMLDocumentMBS, or a XMLDocumentFragmentMBS. |

# 212.25 class XMLProcessingInstructionMBS

## 212.25.1 class XMLProcessingInstructionMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The DOMProcessingInstruction interface represents a "processing instruction", used in XML as a way to keep processor-specific information in the text of the document.
**Notes:** Subclass of the XMLNodeMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 212.25.2 Methods

## 212.25.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.25.4 Properties

## 212.25.5 Data as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The content of this processing instruction.
**Notes:** This is from the first non white space character after the target to the character immediately preceding the ?<.

Can be set to put in new instruction.
(Read and Write property)

## 212.25.6 Target as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The target of this processing instruction.
**Notes:** XML defines this as being the first token following the markup that begins the processing instruction.
(Read only property)

## 212.26 class XMLSerializerFilterMBS

### 212.26.1 class XMLSerializerFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** XMLSerializerMBSFilter provide applications the ability to examine nodes as they are being serialized.
**Notes:** XMLSerializerMBSFilter lets the application decide what nodes should be serialized or not.
The XMLDocumentMBS, XMLDocumentTypeMBS, XMLNotationMBS, and XMLEntityMBS nodes are not passed to the filter.

### 212.26.2 Methods

### 212.26.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 212.26.4 Destructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The destructor.

### 212.26.5 Events

### 212.26.6 acceptNode(node as XMLNodeMBS) as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Test whether a specified node is visible in the logical view of a XMLTreeWalkerMBS or XMLNodeIteratorMBS.
**Notes:** This event will be called by the implementation of XMLTreeWalkerMBS and XMLNodeIteratorMBS; it is not normally called directly from user code. (Though you could do so if you wanted to use the same filter to guide your own application logic.)
node: The node to check to see if it passes the filter or not.

A constant to determine whether the node is accepted, rejected, or skipped, as defined above.

### 212.26.7 getWhatToShow as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: .

**Function:** Tells the XMLSerializerMBS what types of nodes to show to the filter.
**Notes:** See XMLNodeFilterMBS for definition of the constants. The constant SHOW_ATTRIBUTE is meaningless here, attribute nodes will never be passed to a XMLSerializerMBSFilter.

The constants of what types of nodes to show.
Default is ShowAll if event is not implemented.

### 212.26.8 Constants

Filter Results

| Constant | Value | Description |
|---|---|---|
| FilterAccept | 1 | Accept the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will return this node. |
| FilterReject | 2 | Reject the node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For XMLTreeWalkerMBS, the children of this node will also be rejected. XMLNodeIteratorMBSs treat this as a synonym for FilterSkip. |
| FilterSkip | 3 | Skip this single node. Navigation methods defined for XMLNodeIteratorMBS or XMLTreeWalkerMBS will not return this node. For both XMLNodeIteratorMBS and XMLTreeWalkerMBS, the children of this node will still be considered. |

# 212.27 class XMLSerializerMBS

## 212.27.1 class XMLSerializerMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** XMLSerializerMBS provides an API for serializing (writing) a DOM document out in an XML document.
**Notes:** The XML data is written to an output stream, the type of which depends on the specific language bindings in use. During serialization of XML data, namespace fixup is done when possible.

XMLSerializerMBS accepts any node type for serialization. For nodes of type Document or Entity, well formed XML will be created if possible. The serialized output for these node types is either as a Document or an External Entity, respectively, and is acceptable input for an XML parser. For all other types of nodes the serialized form is not specified, but should be something useful to a human for debugging or diagnostic purposes. Note: rigorously designing an external (source) form for stand-alone node types that don't already have one defined in seems a bit much to take on here.
Within a Document or Entity being serialized, Nodes are processed as follows Documents are written including an XML declaration and a DTD subset, if one exists in the DOM. Writing a document node serializes the entire document. Entity nodes, when written directly by write defined in the XMLSerializerMBS interface, output the entity expansion but no namespace fixup is done. The resulting output will be valid as an external entity. Entity References nodes are serializes as an entity reference of the form "&entityName;") in the output. Child nodes (the expansion) of the entity reference are ignored. CDATA sections containing content characters that can not be represented in the specified output encoding are handled according to the "split-cdata-sections" feature.If the feature is true, CDATA sections are split, and the unrepresentable characters are serialized as numeric character references in ordinary content. The exact position and number of splits is not specified. If the feature is false, unrepresentable characters in a CDATA section are reported as errors. The error is not recoverable - there is no mechanism for supplying alternative characters and continuing with the serialization. All other node types (XMLElementMBS, XMLTextMBS, etc.) are serialized to their corresponding XML source form.

Within the character data of a document (outside of markup), any characters that cannot be represented directly are replaced with character references. Occurrences of '<' and '&' are replaced by the predefined entities < and &amp. The other predefined entities (&gt, &apos, etc.) are not used; these characters can be included directly. Any character that can not be represented directly in the output character encoding is serialized as a numeric character reference.

Attributes not containing quotes are serialized in quotes. Attributes containing quotes but no apostrophes are serialized in apostrophes (single quotes). Attributes containing both forms of quotes are serialized in quotes, with quotes within the value represented by the predefined entity ". Any character that can not be represented directly in the output character encoding is serialized as a numeric character reference.

Within markup, but outside of attributes, any occurrence of a character that cannot be represented in the output character encoding is reported as an error. An example would be serializing the element with the encoding="us-ascii".

When requested by setting the normalize-characters feature on XMLSerializerMBS, all data to be serialized, both markup and character data, is W3C Text normalized according to the rules defined in . The W3C Text normalization process affects only the data as it is being written; it does not alter the DOM's view of the document after serialization has completed.
Namespaces are fixed up during serialization, the serialization process will verify that namespace declarations, namespace prefixes and the namespace URIs associated with Elements and Attributes are consistent. If inconsistencies are found, the serialized form of the document will be altered to remove them. The algorithm used for doing the namespace fixup while seralizing a document is a combination of the algorithms used for lookupNamespaceURI and lookupPrefix. previous paragraph to be defined closer here.
Any changes made affect only the namespace prefixes and declarations appearing in the serialized data. The DOM's view of the document is not altered by the serialization operation, and does not reflect any changes made to namespace declarations or prefixes in the serialized output.
While serializing a document the serializer will write out non-specified values (such as attributes whose specified is false) if the output-default-values feature is set to true. If the output-default-values flag is set to false and the use-abstract-schema feature is set to true the abstract schema will be used to determine if a value is specified or not, if use-abstract-schema is not set the specified flag on attribute nodes is used to determine if attribute values should be written out.
Ref to Core spec (1.1.9, XML namespaces, 5th paragraph) entity ref description about warning about unbound entity refs. Entity refs are always serialized as &foo;, also mention this in the load part of this spec.
When serializing a document the XMLSerializerMBS checks to see if the document element in the document is a DOM Level 1 element or a DOM Level 2 (or higher) element (this check is done by looking at the localName of the root element). If the root element is a DOM Level 1 element then the XMLSerializerMBS will issue an error if a DOM Level 2 (or higher) element is found while serializing. Likewise if the document element is a DOM Level 2 (or higher) element and the XMLSerializerMBS sees a DOM Level 1 element an error is issued. Mixing DOM Level 1 elements with DOM Level 2 (or higher) is not supported.
XMLSerializerMBSs have a number of named features that can be queried or set. The name of XMLSerializerMBS features must be valid XML names. Implementation specific features (extensions) should choose an implementation dependent prefix to avoid name collisions.
Here is a list of properties that must be recognized by all implementations.

"normalize-characters"

true: [ optional ] (default) Perform the W3C Text Normalization of the characters in document as they are written out. Only the characters being written are (potentially) altered. The DOM document itself is unchanged.
false: [ required ] do not perform character normalization.

"split-cdata-sections"

true: [ required ] (default) Split CDATA sections containing the CDATA section termination marker ' ] ] >' or characters that can not be represented in the output encoding, and output the characters using numeric character references. If a CDATA section is split a warning is issued.
false: [ required ] Signal an error if a CDATASection contains an unrepresentable character.

"validation"

true: [ optional ] Use the abstract schema to validate the document as it is being serialized. If valida-

tion errors are found the error handler is notified about the error. Setting this state will also set the feature use-abstract-schema to true.
false: [ required ] (default) Don't validate the document as it is being serialized.

"expand-entity-references"

true: [ optional ] Expand EntityReference nodes when serializing.
false: [ required ] (default) Serialize all EntityReference nodes as XML entity references.

"whitespace-in-element-content"

true: [ required ] ( default) Output all white spaces in the document.
false: [ optional ] Only output white space that is not within element content. The implementation is expected to use the isWhitespaceInElementContent flag on Text nodes to determine if a text node should be written out or not.

"discard-default-content"

true: [ required ] (default ) Use whatever information available to the implementation (i.e. XML schema, DTD, the specified flag on Attr nodes, and so on) to decide what attributes and content should be serialized or not. Note that the specified flag on Attr nodes in itself is not always reliable, it is only reliable when it is set to false since the only case where it can be set to false is if the attribute was created by a Level 1 implementation.
false: [ required ] Output all attributes and all content.

"format-canonical"

true: [ optional ] This formatting writes the document according to the rules specified in . Setting this feature to true will set the feature "format-pretty-print" to false.
false: [ required ] (default) Don't canonicalize the output.

"format-pretty-print"

true: [ optional ] Formatting the output by adding whitespace to produce a pretty-printed, indented, human-readable form. The exact form of the transformations is not specified by this specification. Setting this feature to true will set the feature "format-canonical" to false.
false: [ required ] (default) Don't pretty-print the result.

"byte-order-mark"

false: [ optional ] (default) Setting this feature to true will output the correct BOM for the specified encoding.
true: [ required ] Don't generate a BOM.

"space-first-level-elements"

true: [ optional ] (default) Setting this feature to true will add an extra line feed between the elements that are children of the document root.
false: [ required ] Don't add the extra line feed.

### 212.27.2 Methods

### 212.27.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The constructor.

### 212.27.4 writeToBuffer(Node as XMLNodeMBS, output as XMLOutputMBS) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Write out the specified node as described above in the description of XMLSerializerMBS.
**Example:**

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

// options
serializer.NewLine = EndOfLine.macOS

Dim output As New XMLOutputMBS
output.Encoding = "UTF-8"

// and output to string
Dim s As String = serializer.writeToBuffer(doc, output)
```

**Notes:** Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.
output: The output for the data to be written.

Returns XML if node was successfully serialized and false in case a failure occured and the failure wasn't canceled by the error handler.

We internally create a memory buffer to output to and return you the output.

### 212.27.5 writeToFile(Node as XMLNodeMBS, File as FolderItem) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Write out the specified node as described above in the description of XMLSerializerMBS.
**Example:**

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.xml")

// and output to string
Dim r As Boolean = serializer.writeToFile(doc, file)
```

**Notes:** Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.
uri: The destination for the data to be written.

Returns true if node was successfully serialized and false in case a failure occured and the failure wasn't canceled by the error handler.

### 212.27.6 writeToString(Node as XMLNodeMBS) as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Serialize the specified node as described above in the description of XMLSerializerMBS.
**Example:**

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

// options
serializer.NewLine = EndOfLine.macOS

// and output to string
Dim s As String = serializer.writeToString(doc)
```

**Notes:** The result of serializing the node is returned as a string. Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The node to be written.

Returns the serialized data, or "" in case a failure occured and the failure wasn't canceled by the error handler. The returned string is always marked as UTF-16.

### 212.27.7 writeToURI(Node as XMLNodeMBS, URI as String) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Write out the specified node as described above in the description of XMLSerializerMBS.
**Example:**

```
// parse it
Dim doc As New XMLDocumentMBS("<test id=""123""><f>1</f><f>2</f><f>3</f><f>4</f></test>")

// create serializer
Dim serializer As New XMLSerializerMBS

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.xml")

// and output to string
Dim r As Boolean = serializer.writeToURI(doc, file.NativePath)
```

**Notes:** Writing a Document or Entity node produces a serialized form that is well formed XML. Writing other node types produces a fragment of text in a form that is not fully defined by this document, but that should be useful to a human for debugging or diagnostic purposes.

node: The Document or Entity node to be written. For other node types, something sensible should be written, but the exact serialized form is not specified.
uri: The destination for the data to be written.

Returns true if node was successfully serialized and false in case a failure occured and the failure wasn't canceled by the error handler.

### 212.27.8 Properties

### 212.27.9 DOMConfig as XMLConfigurationMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLConfigurationMBS object used by the Serializer when serializing a DOM node.
**Notes:** (Read only property)

### 212.27.10 Filter as XMLSerializerFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The filter to decide which elements to output.
**Notes:** When the application provides a filter, the serializer will call out to the filter before serializing each Node. Attribute nodes are never passed to the filter. The filter implementation can choose to remove the node from the stream or to terminate the serialization early.

filter: The writer filter to be used.
(Read and Write property)

### 212.27.11 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.27.12 NewLine as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The end-of-line sequence of characters to be used in the XML being written out.
**Notes:** The only permitted values are these: ""
Use a default end-of-line sequence. DOM implementations should choose the default to match the usual convention for text files in the environment being used. Implementations must choose a default sequence that matches one of those allowed by 2.11 "End-of-Line Handling". However, Xerces-C++ always uses LF when this property is set to nil since otherwise automatic translation of LF to CR-LF on Windows for text files would result in such files containing CR-CR-LF. If you need Windows-style end of line sequences in your output, consider writing to a file opened in text mode or explicitly set this property to CR-LF.

The default value for this attribute is "" to use default.
(Read and Write property)

## 212.28 class XMLTextMBS

### 212.28.1 class XMLTextMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for a piece of XML text.
**Notes:** The XMLTextMBS interface inherits from XMLCharacterDataMBS and represents the textual content (termed character data in XML) of an XMLElementMBS or XMLAttributeMBS. If there is no markup inside an element's content, the text is contained in a single object implementing the XMLTextMBS interface that is the only child of the element. If there is markup, it is parsed into the information items (elements, comments, etc.) and XMLTextMBS nodes that form the list of children of the element.

When a document is first made available via the DOM, there is only one XMLTextMBS node for each block of text. Users may create adjacent XMLTextMBS nodes that represent the contents of a given element without any intervening markup, but should be aware that there is no way to represent the separations between these nodes in XML or HTML, so they will not (in general) persist between DOM editing sessions. The normalize() method on XMLNodeMBS merges any such adjacent XMLTextMBS objects into a single node for each block of text.
Subclass of the XMLCharacterDataMBS class.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Xojo Developer Magazine**

- 21.2, pages 68 to 69: XML for Beginners, Using XML with the MBS Plugin by Stefanie Juchmes

### 212.28.2 Methods

### 212.28.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.28.4 splitText(Offset as Integer) as XMLTextMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Breaks this node into two nodes at the specified offset, keeping both in the tree as siblings.
**Notes:** After being split, this node will contain all the content up to the offset point. A new node of the same type, which contains all the content at and after the offset point, is returned. If the original node had a parent node, the new node is inserted as the next sibling of the original node. When the offset is equal to the length of this node, the new node has no data.
offset: The 16-bit unit offset at which to split, starting from 0.

Returns the new node, of the same type as this node.

Raises exception in case of error.

### 212.28.5 Properties

### 212.28.6 IsElementContentWhitespace as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns whether this text node contains element content whitespace, often abusively called "ignorable whitespace".
**Notes:** The text node is determined to contain whitespace in element content during the load of the document or if validation occurs while using normalizeDocument().
(Read only property)

### 212.28.7 WholeText as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns all text of DOMText nodes logically-adjacent text nodes to this node, concatenated in document order.
**Notes:** When assigned, substitutes the a specified text for the text of the current node and all logically-adjacent text nodes.
(Read and Write property)

## 212.29 class XMLTreeWalkerMBS

### 212.29.1 class XMLTreeWalkerMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Allows you to walk over a xml tree.
**Notes:** XMLTreeWalkerMBS objects are used to navigate a document tree or subtree using the view of the document defined by their whatToShow flags and filter (if any). Any function which performs navigation using a XMLTreeWalkerMBS will automatically support any view defined by a XMLTreeWalkerMBS.
Omitting nodes from the logical view of a subtree can result in a structure that is substantially different from the same subtree in the complete, unfiltered document. Nodes that are siblings in the XMLTreeWalkerMBS view may be children of different, widely separated nodes in the original view. For instance, consider a XMLNodeFilterMBS that skips all nodes except for XMLTextMBS nodes and the root node of a document. In the logical view that results, all text nodes will be siblings and appear as direct children of the root node, no matter how deeply nested the structure of the original document.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- MBS Xojo Plugins in version 22.4
- New XML Plugin for Xojo

**Xojo Developer Magazine**

- 20.6, page 9: News

### 212.29.2 Methods

### 212.29.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

### 212.29.4 firstChild as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the first visible child of the current node, and returns the new node.
**Notes:** If the current node has no visible children, returns null, and retains the current node.
The new node, or null if the current node has no visible children in the XMLTreeWalkerMBS's logical view.

### 212.29.5 lastChild as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the last visible child of the current node, and returns the new node.
**Notes:** If the current node has no visible children, returns null, and retains the current node.
The new node, or null if the current node has no children in the XMLTreeWalkerMBS's logical view.

### 212.29.6 nextNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the next visible node in document order relative to the current node, and returns the new node.
**Notes:** If the current node has no next node, or if the search for nextNode attempts to step upward from the XMLTreeWalkerMBS's root node, returns null, and retains the current node.
The new node, or null if the current node has no next node in the XMLTreeWalkerMBS's logical view.

### 212.29.7 nextSibling as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the next sibling of the current node, and returns the new node.
**Notes:** If the current node has no visible next sibling, returns null, and retains the current node.
The new node, or null if the current node has no next sibling. in the XMLTreeWalkerMBS's logical view.

### 212.29.8 ParentNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves to and returns the closest visible ancestor node of the current node.
**Notes:** If the search for parentNode attempts to step upward from the XMLTreeWalkerMBS's root node, or if it fails to find a visible ancestor node, this method retains the current position and returns null.
The new parent node, or null if the current node has no parent in the XMLTreeWalkerMBS's logical view.

### 212.29.9 previousNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the previous visible node in document order relative to the current node, and returns the new node.
**Notes:** If the current node has no previous node, or if the search for previousNode attempts to step upward from the XMLTreeWalkerMBS's root node, returns null, and retains the current node.
The new node, or null if the current node has no previous node in the XMLTreeWalkerMBS's logical view.

### 212.29.10 previousSibling as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Moves the XMLTreeWalkerMBS to the previous sibling of the current node, and returns the new node.
**Notes:** If the current node has no visible previous sibling, returns null, and retains the current node.
The new node, or null if the current node has no previous sibling. in the XMLTreeWalkerMBS's logical view.

### 212.29.11 Properties

### 212.29.12 CurrentNode as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Return the node at which the XMLTreeWalkerMBS is currently positioned.
**Notes:** Can be assigned to move:
The node at which the XMLTreeWalkerMBS is currently positioned.
Alterations to the DOM tree may cause the current node to no longer be accepted by the XMLTreeWalkerMBS's associated filter. currentNode may also be explicitly set to any node, whether or not it is within the subtree specified by the root node or would be accepted by the filter and whatToShow flags. Further traversal occurs relative to currentNode even if it is not part of the current view, by applying the filters in the requested direction; if no traversal is possible, currentNode is not changed.
(Read and Write property)

### 212.29.13 Document as XMLDocumentMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The owning document.
**Notes:** (Read only property)

### 212.29.14 ExpandEntityReferences as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The value of this flag determines whether the children of entity reference nodes are visible to the XMLTreeWalkerMBS.
**Notes:** If false, these children and their descendants will be rejected. Note that this rejection takes precedence over whatToShow and the filter, if any. <br>To produce a view of the document that has entity references expanded and does not expose the entity reference node itself, use the whatToShow flags to hide the entity reference node and set expandEntityReferences to true when creating the XMLTreeWalkerMBS. To produce a view of the document that has entity reference nodes but no entity expansion, use the whatToShow flags to show the entity reference node and set expandEntityReferences to false.
(Read only property)

### 212.29.15 Filter as XMLNodeFilterMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The filter used to screen nodes.
**Notes:** (Read only property)

### 212.29.16 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.29.17 Root as XMLNodeMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The root node of the DOMTreeWalker, as specified when it was created.
**Notes:** (Read only property)

### 212.29.18 WhatToShow as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This attribute determines which node types are presented via the DOMTreeWalker.
**Notes:** The available set of constants is defined in the DOMNodeFilter interface. Nodes not accepted by whatToShow will be skipped, but their children may still be considered. Note that this skip takes precedence over the filter, if any.
Default is ShowAll.

(Read only property)

# 212.30 class XMLTypeInfoMBS

## 212.30.1 class XMLTypeInfoMBS

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The XMLTypeInfoMBS interface represent a type used by XMLElementMBS or XMLAttributeMBS nodes, specified in the schemas associated with the document.
**Notes:** The type is a pair of a namespace URI and name properties, and depends on the document's schema. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

## 212.30.2 Methods

## 212.30.3 Constructor

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.30.4 isDerivedFrom(typeNamespaceArg as String, typeNameArg as String, derivationMethod as Integer) as Boolean

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** This method returns if there is a derivation between the reference type definition, i.e. the XMLTypeInfoMBS on which the method is being called, and the other type definition, i.e. the one passed as parameters.
**Notes:** typeNamespaceArg: The namespace of the other type definition.
typeNameArg: The name of the other type definition.
derivationMethod: The type of derivation and conditions applied between two types, as described in the list of constants provided in this interface.

If the document's schema is a DTD or no schema is associated with the document, this method will always return false.
If the document's schema is an XML Schema, the method will true if the reference type definition is derived from the other type definition according to the derivation parameter. If the value of the parameter is 0 (no bit is set to 1 for the derivationMethod parameter), the method will return true if the other type definition can be reached by recursing any combination of { base type definition } , { item type definition } , or { member type definitions } from the reference type definition.

### 212.30.5 Properties

### 212.30.6 Handle as Integer

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The internal object reference.
**Notes:** (Read only property)

### 212.30.7 TypeName as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns The name of a type declared for the associated XMLElementMBS or XMLAttributeMBS, or "" if unknown.
**Notes:** (Read only property)

### 212.30.8 TypeNamespace as String

MBS XML Plugin, Plugin Version: 22.4, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The namespace of the type declared for the associated XMLElementMBS or XMLAttributeMBS or "" if the XMLElementMBS does not have declaration or if no namespace information is available.
**Notes:** (Read only property)

### 212.30.9 Constants

DerivationMethods

| Constant | Value | Description |
|---|---|---|
| DerivationExtension | 2 | If the document's schema is an XML Schema [ XML Schema Part 1 ] , this constant represents the derivation by extension. The reference type definition is derived by extension from the other type definition if the other type definition can be reached recursively following the { base type definition } property from the reference type definition, and at least one of the derivation methods involved is an extension. |
| DerivationList | 8 | If the document's schema is an XML Schema [ XML Schema Part 1 ] , this constant represents the list. The reference type definition is derived by list from the other type definition if there exists two type definitions T1 and T2 such as the reference type definition is derived from T1 by DerivationRestriction or DerivationExtension, T2 is derived from the other type definition by DerivationRestriction, T1 has { variety } list, and T2 is the { item type definition } . Note that T1 could be the same as the reference type definition, and T2 could be the same as the other type definition. |
| DerivationRestriction | 1 | If the document's schema is an XML Schema [ XML Schema Part 1 ] , this constant represents the derivation by restriction if complex types are involved, or a restriction if simple types are involved. The reference type definition is derived by restriction from the other type definition if the other type definition is the same as the reference type definition, or if the other type definition can be reached recursively following the { base type definition } property from the reference type definition, and all the derivation methods involved are restriction. |
| DerivationUnion | 4 | If the document's schema is an XML Schema [ XML Schema Part 1 ] , this constant represents the union if simple types are involved. The reference type definition is derived by union from the other type definition if there exists two type definitions T1 and T2 such as the reference type definition is derived from T1 by DerivationRestriction or DerivationExtension, T2 is derived from the other type definition by DerivationRestriction, T1 has { variety } union, and one of the { member type definitions } is T2. Note that T1 could be the same as the reference type definition, and T2 could be the same as the other type definition. |

## 212.31 class XMLValidatorMBS

### 212.31.1 class XMLValidatorMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the XML validator.
**Notes:** Using the validator in LibXML.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.4
- MBS Xojo Plugins, version 20.4pr9
- MBS Xojo Plugins, version 20.2pr5
- MBS Xojo Plugins in version 19.2
- MBS Xojo Plugins, version 19.2pr8
- New XML Validator class for Xojo

**Xojo Developer Magazine**

- 17.4, page 10: News

### 212.31.2 Methods

### 212.31.3 Constructor(File as FolderItem)

MBS Util Plugin, Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor taking file path to XML file.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("schema.txt")
Dim v As New XMLValidatorMBS(f)
```

**Notes:** May raise an XMLException if the XML can't be parsed or the validator can't be initialized.
XML should have unix line endings (char 10), be saved as UTF-8 and itself a valid XML, so we can parse it corectly.
See also:

- 212.31.4 Constructor(XMLSchema as String)

### 212.31.4 Constructor(XMLSchema as String)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The constructor taking XML text.
**Notes:** May raise an XMLException if the XML can't be parsed or the validator can't be initialized.

For MBS Plugin 20.2 this function accepts also a file name/path to initialize.
XML should have unix line endings (char 10), be saved as UTF-8 and itself a valid XML, so we can parse it corectly.
See also:

- 212.31.3 Constructor(File as FolderItem) 24000

### 212.31.5 Destructor

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

### 212.31.6 LoadIconvLibrary(path as String, byref Error as String) as boolean

MBS Util Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Loads the iconv library.
**Notes:** The XML classes may use libiconv for text encoding conversion.
If you explicitly need, you can load the library on start of solution.

MBS Plugin may try to load iconv.dll/dylib/so automatically when first iconv function is called.

### 212.31.7 Message(index as Integer) as XMLValidatorMessageMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a message by index.
**Notes:** Index from 0 to MessageCount-1.

### 212.31.8 Messages as XMLValidatorMessageMBS()

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array of messages recorded while validating.

### 212.31.9 SetCurrentWorkingDirectory(path as folderitem) as boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets current working directory for the application.
**Notes:** The library looks in current directory to find related files.
So if your schema or the XML file to check references other files, please set the diretory.

Returns true on success or false on failure.
See also:

- 212.31.10 SetCurrentWorkingDirectory(path as String) as boolean 24002

### 212.31.10 SetCurrentWorkingDirectory(path as String) as boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets current working directory for the application.
**Notes:** The library looks in current directory to find related files.
So if your schema or the XML file to check references other files, please set the diretory.

Returns true on success or false on failure.
See also:

- 212.31.9 SetCurrentWorkingDirectory(path as folderitem) as boolean 24002

### 212.31.11 ValidateFile(file as FolderItem) as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates XML file against a XML schema.
**Example:**

```
Dim f As FolderItem = SpecialFolder.Desktop.Child("schema.txt")
Dim v As New XMLValidatorMBS(f)

Dim t As FolderItem = SpecialFolder.Desktop.Child("test.xml")
Dim r As Integer = v.ValidateFile(t)
```

**Notes:** Validate a document tree in memory.
Returns 0 if the document is schemas valid, a positive error code number otherwise and -1 in case of internal

or API error.

See messages array for the logged error and warning messages.
Please pass in XML file path and a valid XSD schema.

Use SetCurrentWorkingDirectory with file.parent to set working directory if needed.

XML should have unix line endings (char 10), be saved as UTF-8 and itself a valid XML, so we can parse it corectly.
See also:

- 212.31.12 ValidateFile(path as string) as Integer 24003

### 212.31.12 ValidateFile(path as string) as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates XML file against a XML schema.
**Notes:** Validate a document tree in memory.
Returns 0 if the document is schemas valid, a positive error code number otherwise and -1 in case of internal or API error.

See messages array for the logged error and warning messages.
Please pass in XML file path and a valid XSD schema.

Use SetCurrentWorkingDirectory with file.parent to set working directory if needed.

XML should have unix line endings (char 10), be saved as UTF-8 and itself a valid XML, so we can parse it corectly.
See also:

- 212.31.11 ValidateFile(file as FolderItem) as Integer 24002

### 212.31.13 ValidateString(text as string) as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Validates XML text against a XML schema.
**Notes:** Validate a document tree in memory.
Returns 0 if the document is schemas valid, a positive error code number otherwise and -1 in case of internal or API error.

See messages array for the logged error and warning messages.

XML should have unix line endings (char 10), be saved as UTF-8 and itself a valid XML, so we can parse it corectly.

### 212.31.14 Properties

### 212.31.15 MessageCount as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries number of messages we recorded in validation.
**Notes:** (Read only property)

### 212.31.16 Events

### 212.31.17 Error(message as XMLValidatorMessageMBS)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The error event called for validation errors.

### 212.31.18 Warning(message as XMLValidatorMessageMBS)

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: .

**Function:** The warning event called for validation warnings.

# 212.32 class XMLValidatorMessageMBS

## 212.32.1 class XMLValidatorMessageMBS

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for an error or warning message in XML validator.
**Notes:** This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- New XML Validator class for Xojo

## 212.32.2 Methods

## 212.32.3 Constructor

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: Desktop only.

**Function:** The private constructor.

## 212.32.4 Destructor

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The destructor.

## 212.32.5 Properties

## 212.32.6 Code as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The error code.
**Notes:** (Read only property)

## 212.32.7 FileName as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The filename if available.
**Notes:** (Read only property)

### 212.32.8 IsError as Boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this was reported as error and not as warning.
**Notes:** (Read only property)

### 212.32.9 IsWarning as Boolean

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether this was reported as warning and not as error.
**Notes:** (Read only property)

### 212.32.10 Line as Integer

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The line number in the XML file if available.
**Notes:** (Read only property)

### 212.32.11 Message as String

MBS Util Plugin, Plugin Version: 19.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The message text.
**Notes:** (Read only property)

# 212.33 class XMLXPathResultMBS

## 212.33.1 class XMLXPathResultMBS

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The class for an XPath result.
**Notes:** The DOMXPathResult interface represents the result of the evaluation of an XPath 1.0 or XPath 2.0 expression within the context of a particular node. Since evaluation of an XPath expression can result in various result types, this object makes it possible to discover and manipulate the type and value of the result.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
**Blog Entries**

- News from the MBS Xojo Plugins Version 23.3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3
- MBS Xojo Plugins, version 23.3pr1

**Xojo Developer Magazine**

- 21.5, page 10: News

## 212.33.2 Methods

## 212.33.3 Constructor

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The private constructor.

## 212.33.4 iterateNext as Boolean

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Iterates and returns true if the current result is the next item from the sequence or false if there are no more items.
**Notes:** Returns True if the current result is the next item from the sequence or false if there are no more items.

Raises exception if ResultType is not ResultTypeUnorderedNodeIterator or ResultTypeOrderedNodeIterator (XPath 1.0) or if ResultType is not ResultTypeIteratorResult (XPath 2.0).

### 212.33.5 snapshotItem(size as Integer) as Boolean

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Sets the current result to the indexth item in the snapshot collection.
**Notes:** If index is greater than or equal to the number of items in the list, this method returns false. Unlike the iterator result, the snapshot does not become invalid, but may not correspond to the current document if it is mutated.

Returns true if the current result is the next item from the sequence or false if there are no more items.

Raises exception if ResultType is not ResultTypeUnorderedNodeSnapshot or ResultTypeOrderedNodeSnapshot (XPath 1.0) or if ResultType is not ResultTypeSnapshotResult (XPath 2.0).

### 212.33.6 Properties

### 212.33.7 BooleanValue as Boolean

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the boolean value of this result.
**Notes:** Raises exception if ResultType is not ResultTypeBoolean (XPath 1.0) or if current result cannot be properly converted to boolean (XPath 2.0).
Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

### 212.33.8 IntegerValue as Integer

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the integer value of this result (XPath 2 only).
**Notes:** The value of this integer result.
Raises exception if current result cannot be properly converted to int (XPath 2.0).
Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

### 212.33.9 InvalidIteratorState as Boolean

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Signifies that the iterator has become invalid.
**Notes:** True if ResultType is ResultTypeUnorderedNodeIterator or ResultTypeOrderedNodeIterator (XPath

1.0) or ResultTypeIteratorResult (XPath 2.0) and the document has been modified since this result was returned.

Raises exception if ResultType is not ResultTypeUnorderedNodeIterator or ResultTypeOrderedNodeIterator (XPath 1.0) or if ResultType is not ResultTypeIteratorResult (XPath 2.0).
(Read only property)

### 212.33.10 isNode as Boolean

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns true if the result has a current result and the value is a node (XPath 2 only).
**Notes:** This function is necessary to distinguish between a string value and a node of type string as returned by the TypeInfo() function.
(Read only property)

### 212.33.11 NodeValue as XMLNodeMBS

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the node value of this result.
**Notes:** The value of this node result, which may be nil.
Raises exception if ResultType is not ResultTypeAnyUnorderedNode, ResultTypeFirstOrderedNode, ResultTypeUnorderedNodeIterator, ResultTypeOrderedNodeIterator, ResultTypeUnorderedNodeSnapshot, or ResultTypeOrderedNodeSnapshot (XPath 1.0) or if current result is not a node (XPath 2.0). Raises exception if there is no current result in the result object.
(Read only property)

### 212.33.12 NumberValue as Double

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the number value of this result.
**Notes:** If the native double type of the DOM binding does not directly support the exact IEEE 754 result of the XPath expression, then it is up to the definition of the binding to specify how the XPath number is converted to the native binding number.
Raises exception if ResultType is not ResultTypeNumber (XPath 1.0) or if current result cannot be properly converted to double (XPath 2.0).
Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

### 212.33.13 ResultType as Integer

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the result type of this result.
**Notes:** A code representing the type of this result, as defined by the type constants.
(Read only property)

### 212.33.14 SnapshotLength as Integer

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** The number of items in the result snapshot.
**Notes:** Valid values for snapshotItem indices are 0 to snapshotLength-1 inclusive.

Raises exception if ResultType is not ResultTypeUnorderedNodeSnapshot or ResultTypeOrderedNodeSnapshot (XPath 1.0) or if ResultType is not ResultTypeSnapshotResult (XPath 2.0).
(Read only property)

### 212.33.15 StringValue as String

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the string value of this result.
**Notes:** The value of this string result.
Raises exception if ResultType is not ResultTypeString (XPath 1.0) or if current result cannot be properly converted to string (XPath 2.0).
Raises exception if there is no current result in the result object (XPath 2.0).
(Read only property)

### 212.33.16 TypeInfo as XMLTypeInfoMBS

MBS XML Plugin, Plugin Version: 23.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Returns the DOM type info of the current result node or value (XPath 2 only).
**Notes:** (Read only property)

### 212.33.17 Constants

Result Types

| Constant | Value | Description |
|---|---|---|
| ResultTypeAny | 0 | [ XPath 1.0 ] This code does not represent a specific type. An evaluatio an XPath expression will never produce this type. If this type is reques then the evaluation returns whatever type naturally results from evalua of the expression. If the natural result is a node set when ResultTypeA was requested, then ResultTypeUnorderedNodeIterator is always the resul type. Any other representation of a node set must be explicitly requested. |
| ResultTypeAnyUnorderedNode | 8 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 and wil accessed as a single node, which may be null if the node set is empty. Docum modification does not invalidate the node, but may mean that the result n no longer corresponds to the current document. This is a convenience t permits optimization since the implementation can stop once any node in resulting set has been found. If there is more than one node in the actual res the single node returned might not be the first in document order. |
| ResultTypeBoolean | 3 | [ XPath 1.0 ] The result is a boolean as defined by XPath 1.0. Docum modification does not invalidate the boolean, but may mean that reevalua would not yield the same boolean. |
| ResultTypeFirstOrderedNode | 9 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 and wil accessed as a single node, which may be null if the node set is empty. Docum modification does not invalidate the node, but may mean that the result n no longer corresponds to the current document. This is a convenience t permits optimization since the implementation can stop once the first nod document order of the resulting set has been found. If there are more than node in the actual result, the single node returned will be the first in docum order. |
| ResultTypeFirstResult | 100 | [ XPath 2.0 ] The result is a sequence as defined by XPath 2.0 and wil accessed as a single current value or there will be no current value if the quence is empty. Document modification does not invalidate the value, may mean that the result no longer corresponds to the current document. T is a convenience that permits optimization since the implementation can s once the first item in the resulting sequence has been found. If there is m than one item in the actual result, the single item returned might not be first in document order. |
| ResultTypeIteratorResult | 101 | [ XPath 2.0 ] The result is a sequence as defined by XPath 2.0 that wil accessed iteratively. Document modification invalidates the iteration. |
| ResultTypeNumber | 1 | [ XPath 1.0 ] The result is a number as defined by XPath 1.0. Docum modification does not invalidate the number, but may mean that reevalua would not yield the same number. |
| ResultTypeOrderedNodeIterator | 5 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 that wil accessed iteratively, which will produce document-ordered nodes. Docum modification invalidates the iteration. |
| ResultTypeOrderedNodeSnapshot | 7 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 that wil accessed as a snapshot list of nodes that will be in original document or Document modification does not invalidate the snapshot but may mean t reevaluation would not yield the same snapshot and nodes in the snapshot r have been altered, moved, or removed from the document. |
| ResultTypeSnapshotResult | 102 | [ XPath 2.0 ] The result is a sequence as defined by XPath 2.0 that will be cessed as a snapshot list of values. Document modification does not invalid the snapshot but may mean that reevaluation would not yield the same sn shot and any items in the snapshot may have been altered, moved, or remo from the document. |
| ResultTypeString | 2 | [ XPath 1.0 ] The result is a string as defined by XPath 1.0. Document m fication does not invalidate the string, but may mean that the string no lon corresponds to the current document. |
| ResultTypeUnorderedNodeIterator | 4 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 that wil accessed iteratively, which may not produce nodes in a particular order. D ument modification invalidates the iteration. This is the default type retur if the result is a node set and ResultTypeAny is requested. |
| ResultTypeUnorderedNodeSnapshot | 6 | [ XPath 1.0 ] The result is a node set as defined by XPath 1.0 that wil |

# Chapter 213

# XMP

## 213.1 class XMPAssertNotifyMBS

### 213.1.1 class XMPAssertNotifyMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** This class provides a way to get notified for Assertion.
**Notes:** Only one instance can be registered at a given time.
**Blog Entries**

- MBS Real Studio Plugins, version 12.5pr2

### 213.1.2 Events

### 213.1.3 Assert(text as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** An assertion was reported.
**Example:**

```
Sub Assert(text as string)
MsgBox text
End Sub
```

**Notes:** Display it to the user or just log it for debugging.

## 213.2 class XMPDateTimeMBS

### 213.2.1 class XMPDateTimeMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The expanded type for a date and time.
**Notes:** Dates and time in the serialized XMP are ISO 8601 strings. The XMPDateTimeMBS class allows easy conversion with other formats.

DateTime values are occasionally used in cases with only a date or only a time component. A date without a time has zeros in the XMPDateTimeMBS class for all time fields. A time without a date has zeros for all date fields (year, month, and day).

### 213.2.2 Methods

### 213.2.3 ClearTimeZone

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Resets the timezone by setting all time zone properties to zero.

### 213.2.4 Clone as XMPDateTimeMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of this date.
**Notes:** Not just a new reference to the same object, but a real copy.

### 213.2.5 Compare(other as XMPDateTimeMBS) as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compare the order of two date/time values.
**Notes:** Returns:
-1 if self is before other or other=nil
0 if self matches other
+1 if self is after other

### 213.2.6 Constructor

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain the current date and time.
**Notes:** The returned time is UTC, properly adjusted for the local time zone. The resolution of the time is not guaranteed to be finer than seconds.
See also:

- 213.2.7 Constructor(text as string) 24015

### 213.2.7 Constructor(text as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to date/time.
See also:

- 213.2.6 Constructor 24015

### 213.2.8 ConvertToLocalTime

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Make sure a time is local.
**Notes:** If the time zone is not the local zone, the time is adjusted and the time zone set to be local.

### 213.2.9 ConvertToUTCTime

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Make sure a time is UTC.
**Notes:** If the time zone is not UTC, the time is adjusted and the time zone set to be UTC.

### 213.2.10 IsDateOnly as Boolean

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether only the date is defined for this datetime object.

### 213.2.11 IsTimeOnly as Boolean

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether only the time is defined for this datetime object.

### 213.2.12 Operator_Convert as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from date/time to string.
See also:

- 213.2.13 Operator_Convert(text as string) 24016

### 213.2.13 Operator_Convert(text as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to date/time.
See also:

- 213.2.12 Operator_Convert as string 24016

### 213.2.14 SetTimeZone

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Set the local time zone.
**Notes:** Any existing time zone value is replaced, the other date/time fields are not adjusted in any way.

### 213.2.15 Str as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from date/time to string.

### 213.2.16 Properties

### 213.2.17 Day as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The day of the month in the range 1..31.
**Notes:** (Read and Write property)

### 213.2.18 hasDate as Boolean

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A property to tell if the date is defined in this object.
**Notes:** (Read and Write property)

### 213.2.19 hasTime as Boolean

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A property to tell if the time is defined in this object.
**Notes:** (Read and Write property)

### 213.2.20 hasTimeZone as Boolean

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Whether there is a time zone set.
**Notes:** (Read and Write property)

### 213.2.21 Hour as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The hour in the range 0..23.
**Notes:** (Read and Write property)

### 213.2.22 Minute as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The minute in the range 0..59.
**Notes:** (Read and Write property)

### 213.2.23 Month as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The month in the range 1..12.
**Notes:** (Read and Write property)

### 213.2.24 NanoSecond as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Nanoseconds within a second, often left as zero.
**Notes:** (Read and Write property)

### 213.2.25 Second as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The second in the range 0..59.
**Notes:** (Read and Write property)

### 213.2.26 TimezoneHour as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time zone hour in the range 0..23.
**Notes:** (Read and Write property)

### 213.2.27 TimezoneMinute as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The time zone minute in the range 0..59.
**Notes:** (Read and Write property)

### 213.2.28 TimezoneSign as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The "sign" of the time zone, 0 means UTC, -1 is west, +1 is east.
**Notes:** The "sign" of the time zone, kTimeIsUTC (0) means UTC, kTimeWestOfUTC (-1) is west, kTimeEastOfUTC (+1) is east.
(Read and Write property)

### 213.2.29 Year as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The year, can be negative.
**Notes:** (Read and Write property)

### 213.2.30 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kXMP_TimeEastOfUTC | 1 | One of the constants for the TimezoneSign property. UTC time. |
| kXMP_TimeIsUTC | 0 | One of the constants for the TimezoneSign property. Time zone is east of UTC. |
| kXMP_TimeWestOfUTC | -1 | One of the constants for the TimezoneSign property. Time zone is west of UTC. |

## 213.3 class XMPExceptionMBS

### 213.3.1 class XMPExceptionMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The exception class for the other XMP classes.
**Notes:** For current plugins (6.4): Windows and MachO works, Carbon/Classic PEF crashes on an exception. Linux not tested.

Nearly every method or function may raise this exception, so catch it!
Subclass of the RuntimeException class.

## 213.4 class XMPFilesMBS

### 213.4.1 class XMPFilesMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for access to the main (document-level) metadata in a file.
**Notes:** The Adobe XMP Toolkit's file handling component, XMPFiles, is a front end to a set of format-specific file handlers that support file I/O for XMP. The file handlers implement smart, efficient support for those file formats for which the means to embed XMP is defined in the XMP Specification. Where possible, this support allows:

* Injection of XMP where none currently exists

- Expansion of XMP without regard to existing padding
- Reconciliation of the XMP and other legacy forms of metadata.

TXMPFiles is designed for use by clients interested in the metadata and not in the primary file content; the Adobe Bridge application is a typical example. TXMPFiles is not intended to be appropriate for files authored by an application; that is, those files for which the application has explicit knowledge of the file format.

Supported file formats:
PDF, PostScript, EPS, JPEG, JPEG2K, TIFF, GIF, PNG, SWF, FLA, FLV, MOV, AVI, CIN, WAV, MP3, SES, CEL, MPEG, MPEG2, MPEG4, WMAV, AIFF, P2, XDCAM_FAM, XDCAM_SAM, XDCAM_EX, AVCHD, SonyHDV, HTML, XML, Text, Photoshop, Illustrator, InDesign, AEProject, AEProjTemplate, AEFilterPreset, EncoreProject, PremiereProject, PremiereTitle and UCF.

Based on the XMP-Toolkit-SDK from Adobe.

This constructor crashes on Linux with 14.0 plugins and Xojo 2011r1 and 2011r3. Some change in 2011r4 makes it work, so up to Xojo 2014 we don't see the crash.
**Blog Entries**

- Tip of the day: Change EXIF metadata
- MBS Real Studio Plugins, version 11.2pr9
- MBS Real Studio Plugins, version 11.2pr3
- MBS REALbasic Plugins, version 10.5pr5

### 213.4.2 Methods

### 213.4.3 CanPutXMP(xmpPacket as string) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CanPutXMP() reports whether this file can be updated with a specific XMP packet.
**Notes:** Use to determine if the file can probably be updated with a given set of XMP metadata. This depends on the size of the packet, the options with which the file was opened, and the capabilities of the handler for the file format. The function obtains the length of the serialized packet for the provided XMP, but does not keep it or modify it, and does not cause the file to be written when closed.
See also:

- 213.4.4 CanPutXMP(xmpPacket as XMPMetaMBS) as boolean 24022

### 213.4.4 CanPutXMP(xmpPacket as XMPMetaMBS) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:**

CanPutXMP() reports whether this file can be updated with a specific XMP packet,
passed in a string object.
See also:

- 213.4.3 CanPutXMP(xmpPacket as string) as boolean 24022

### 213.4.5 CheckFileFormat(path as string) as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CheckFileFormat() tries to determine the format of a file.
**Notes:** CheckFileFormat tries to determine the format of a file, returning an format value. It uses the same logic as OpenFile will use to select a smart handler.

path: The path for the file, appropriate for the local operating system. Passed as a UTF-8 string. The path is the same as would be passed to OpenFile.

Returns the file's format if a smart handler would be selected, otherwise kUnknownFile.

### 213.4.6 CheckPackageFormat(path as string) as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CheckPackageFormat() tries to determine the format of a "package" folder.
**Notes:** CheckPackageFormat tries to determine the format of a "package" given the name of the top level folder, returning an XMP_FileFormat value. Examples of recognized packages include the video formats P2, XDCAM, or Sony HDV. These packages contain collections of "clips", stored as multiple files in specific subfolders.

Path: The path for the top level folder, appropriate for the local operating
system. Passed as an UTF-8 string. The path is not the same as would be passed to OpenFile. For example the path passed to CheckPackageFormat might be ".../MyMovie", while the path passed to OpenFile would be ".../MyMovie/SomeClip".

Returns the package's format if a smart handler would be selected, otherwise kUnknownFile.

### 213.4.7 CloseFile(closeFlags as Integer)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** CloseFile() explicitly closes an opened file.
**Notes:** Performs any necessary output to the file and closes it. Files that are opened for update are written to only when closing.

If the file is opened for read-only access (passing kOpenForRead), the disk
file is closed immediately after reading the data from it; the XMPFiles object, however, remains in the open state. You must call CloseFile() when finished using it. Other methods, such as GetXMP(), can only be used between the OpenFile() and CloseFile() calls. The XMPFiles destructor does not call CloseFile(); if you call it without closing, any pending updates are lost.

If the file is opened for update (passing kOpenForUpdate), the disk file remains
open until CloseFile() is called. The disk file is only updated once, when CloseFile() is called, regardless of how many calls are made to PutXMP().

closeFlags: Option flags for optional closing actions. This bit-flag constant is
defined:

- kUpdateSafely - Write into a temporary file then swap for crash safety.

### 213.4.8 Constructor

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor initializes an object that is associated with no file.

**Notes:** The destructor does not call CloseFile(); pending updates are lost when the destructor is run.
See also:

- 213.4.9 Constructor(path as folderitem, format as Integer=&h20202020, OpenFlags as Integer=0) 24024
- 213.4.10 Constructor(path as string, format as Integer=&h20202020, OpenFlags as Integer=0) 24025

### 213.4.9 Constructor(path as folderitem, format as Integer=&h20202020, OpenFlags as Integer=0)

MBS XMP Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file for metadata access.
**Notes:** Opens a file for the requested forms of metadata access. Opening the file at a minimum causes the raw XMP packet to be read from the file. If the file handler supports legacy metadata reconciliation then legacy metadata is also read, unless kOpenOnlyXMP is passed. If the file handler supports native thumbnails and kOpenCacheTNail is passed, the native thumbnail is cached.
If the file is opened for read-only access (passing kOpenForRead), the disk file is closed immediately after reading the data from it; the XMPFiles object, however, remains in the open state. You must call CloseFile() when finished using it. Other methods, such as GetXMP(), can only be used between the OpenFile() and CloseFile() calls. The XMPFiles destructor does not call CloseFile(); if you call it without closing, any pending updates are lost.
If the file is opened for update (passing kOpenForUpdate), the disk file remains open until CloseFile() is called. The disk file is only updated once, when CloseFile() is called, regardless of how many calls are made to PutXMP().
Typically, the XMP is not parsed and legacy reconciliation is not performed until GetXMP() is called, but this is not guaranteed. Specific file handlers might do earlier parsing of the XMP. Delayed parsing and early disk file close for read-only access are optimizations to help clients implementing file browsers, so that they can access the file briefly and possibly display a thumbnail, then postpone more expensive XMP processing until later.

path: The path for the file, appropriate for the local operating system.
format: The format of the file. If the format is unknown (kUnknownFile) the format is determined from the file content. The first handler to check is guessed from the file's extension. Passing a specific format value is generally just a hint about what file handler to try first (instead of the one based on the extension). If kOpenStrictly is set, then any format other than kUnknownFile requires that the file actually be that format; otherwise an exception is thrown.
openFlags: A set of option flags that describe the desired access. By default (zero) the file is opened for read-only access and the format handler decides on the level of reconciliation that will be performed. A logical OR of these bit-flag constants:

- kOpenForRead - Open for read-only access.
- kOpenForUpdate - Open for reading and writing.

- kOpenOnlyXMP - Only the XMP is wanted, no reconciliation.
- kOpenCacheTNail - Cache thumbnail if possible, GetThumbnail will be called.
- kOpenStrictly - Be strict about locating XMP and reconciling with other forms. By default, a best effort is made to locate the correct XMP and to reconcile XMP with other forms (if reconciliation is done). This option forces stricter rules, resulting in exceptions for errors. The definition of strictness is specific to each handler, there might be no difference.
- kOpenUseSmartHandler - Require the use of a smart handler.
- kOpenUsePacketScanning - Force packet scanning, do not use a smart handler.

Throws an exception for serious problems.
See also:


- 213.4.8 Constructor 24023
- 213.4.10 Constructor(path as string, format as Integer=&h20202020, OpenFlags as Integer=0) 24025


### 213.4.10 Constructor(path as string, format as Integer=&h20202020, OpenFlags as Integer=0)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Alternate constructor associates the new XMPFiles object with a specific file.
**Notes:** Calls OpenFile() to open the specified file after performing a default construct.

path: The path for the file, specified as an UTF-8 string. (use FolderItem.NativePath)
format: A format hint for the file, if known.
openFlags: Options for how the file is to be opened (for read or read/write, for example). Use a logical OR of these bit-flag constants:

- kOpenForRead
- kOpenForUpdate
- kOpenOnlyXMP
- kOpenCacheTNail
- kOpenStrictly
- kOpenUseSmartHandler
- kOpenUsePacketScanning
- kOpenLimitedScanning

- kOpenInBackground

The destructor does not call CloseFile(); pending updates are lost when the destructor is run.
See also:

- 213.4.8 Constructor 24023
- 213.4.9 Constructor(path as folderitem, format as Integer=&h20202020, OpenFlags as Integer=0) 24024

### 213.4.11 GetFileInfo(byref path as string, byref openFlags as UInt32, byref format as UInt32, byref handlerFlags as UInt32) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetFileInfo() retrieves basic information about an opened file.
**Notes:** path: A buffer in which to return the path passed to OpenFile(). Can be null if value is not wanted.

openFlags: A variable in which to return the option flags passed to OpenFile.
format: A variable in which to return the file format.
handlerFlags: [ out ] A variable in which to return the handler's capability flags.

Returns true if the file object is in the open state; that is, OpenFile() has been called but CloseFile() has not. False otherwise. Even if the file object is open, the actual disk file might be closed in the host file-system sense; see OpenFile().

### 213.4.12 GetFormatInfo(format as Integer, byref handlerFlags as UInt32) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetFormatInfo() reports what features are supported for a specific file format.
**Example:**

```
dim flags as UInt32
if XMPFilesMBS.GetFormatInfo(XMPFilesMBS.kJPEGFile, flags) then

if BitwiseAnd(flags, XMPFilesMBS.kCanInjectXMP) <>0 then
MsgBox "Can inject first-time XMP into an existing file."
end if

if BitwiseAnd(flags, XMPFilesMBS.kCanExpand) <>0 then
```

```
MsgBox "Can expand XMP or other metadata in an existing file."
end if

if BitwiseAnd(flags, XMPFilesMBS.kCanRewrite) <>0 then
MsgBox "Can copy one file to another, writing new metadata (as in SaveAs)."
end if

if BitwiseAnd(flags, XMPFilesMBS.kCanReconcile) <>0 then
MsgBox "Supports reconciliation between XMP and other forms."
end if

if BitwiseAnd(flags, XMPFilesMBS.kAllowsOnlyXMP) <>0 then
MsgBox "Allows access to just the XMP, ignoring other forms."
end if

if BitwiseAnd(flags, XMPFilesMBS.kReturnsTNail) <>0 then
MsgBox "File handler returns native thumbnail information."
end if

if BitwiseAnd(flags, XMPFilesMBS.kReturnsRawPacket) <>0 then
MsgBox "File handler returns raw XMP packet information and string."
end if

end if
```

**Notes:** The file handlers for different file formats vary considerably in what features they support. Support depends on both the general capabilities of the format and the implementation of the handler for that format.

format: The file format whose support flags are desired.
handlerFlags: A variable in which to return a logical OR of option bit flags.
The following constants are defined:

- kCanInjectXMP - Can inject first-time XMP into an existing file.
- kCanExpand - Can expand XMP or other metadata in an existing file.
- kCanRewrite - Can copy one file to another, writing new metadata (as in SaveAs)
- kCanReconcile - Supports reconciliation between XMP and other forms.
- kAllowsOnlyXMP - Allows access to just the XMP, ignoring other forms.

This is only meaningful if kCanReconcile is set.

- kReturnsTNail - File handler returns native thumbnail information.

- kReturnsRawPacket - File handler returns raw XMP packet information and string.

Even if kReturnsRawPacket is set, the returned packet information might have an
offset of -1 to indicate an unknown offset. While all file handlers should be able to return the raw packet, some might not know the offset of the packet within the file. This is typical in cases where external libraries are used. These cases might not even allow return of the raw packet.

Returns true if the format has explicit "smart" support, false if the format is handled by the default packet scanning plus heuristics.

### 213.4.13 GetVersionInfo as XMPVersionInfoMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetVersionInfo() retrieves version information for the XMPFiles component.

### 213.4.14 GetXMP(byref xmp as XMPMetaMBS, byref xmppacket as string, byref PacketInfo as XMPPacketInfoMBS) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetXMP() retrieves the XMP metadata from an open file.
**Notes:** The function reports whether XMP is present in the file; you can choose to retrieve any or all of the parsed XMP, the raw XMP packet, or information about the raw XMP packet. The options provided when the file was opened determine if reconciliation is done with other forms of metadata.

xmp: An XMP object in which to return the parsed XMP metadata.
xmppacket: An string in which to return the raw XMP packet as stored in
the file. The encoding of the packet is given in the packetInfo. Returns an
empty string if the low level file handler does not provide the raw packet.
packetInfo: A packetinfo object in which to return the location and form of the raw XMP in the file. PacketInfo.charForm and PacketInfo.writeable reflect the
raw XMP in the file. The parsed XMP property values are always UTF-8. The writeable flag is taken from the packet trailer; it applies only to "format ignorant" writing. The PacketInfo object always reflects the state of the XMP in the file. The offset, length, and character form do not change as a result of calling PutXMP() unless the file is also written. Some file handlers might not return location or contents of the raw packet string. To determine whether one does, check the kReturnsRawPacket bit returned by GetFormatInfo(). If the low-level file handler does not provide the raw packet location, PacketInfo.offset and PacketInfo.length are both 0, PacketInfo.charForm is UTF-8, and PacketInfo.writeable is false.

### 213.4.15 OpenFile(path as folderitem, format as Integer=&h20202020, OpenFlags as Integer=0) as boolean

MBS XMP Plugin, Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Alternate constructor associates the new XMPFiles object with a specific file.
**Notes:** Calls OpenFile() to open the specified file after performing a default construct.

path: The path for the file, specified as folderitem.
format: A format hint for the file, if known.
openFlags: Options for how the file is to be opened (for read or read/write, for example). Use a logical OR of these bit-flag constants:

- kOpenForRead
- kOpenForUpdate
- kOpenOnlyXMP
- kOpenCacheTNail
- kOpenStrictly
- kOpenUseSmartHandler
- kOpenUsePacketScanning
- kOpenLimitedScanning
- kOpenInBackground

The destructor does not call CloseFile(); pending updates are lost when the destructor is run.
See also:

- 213.4.16 OpenFile(path as string, format as Integer=&h20202020, OpenFlags as Integer=0) as boolean 24029

### 213.4.16 OpenFile(path as string, format as Integer=&h20202020, OpenFlags as Integer=0) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Opens a file for metadata access.
**Notes:** Opens a file for the requested forms of metadata access. Opening the file at a minimum causes the raw XMP packet to be read from the file. If the file handler supports legacy metadata reconciliation then legacy metadata is also read, unless kOpenOnlyXMP is passed. If the file handler supports native thumbnails and kOpenCacheTNail is passed, the native thumbnail is cached.

If the file is opened for read-only access (passing kOpenForRead), the disk file is closed immediately after reading the data from it; the XMPFiles object, however, remains in the open state. You must call CloseFile() when finished using it. Other methods, such as GetXMP(), can only be used between the OpenFile() and CloseFile() calls. The XMPFiles destructor does not call CloseFile(); if you call it without closing, any pending updates are lost.
If the file is opened for update (passing kOpenForUpdate), the disk file remains open until CloseFile() is called. The disk file is only updated once, when CloseFile() is called, regardless of how many calls are made to PutXMP().
Typically, the XMP is not parsed and legacy reconciliation is not performed until GetXMP() is called, but this is not guaranteed. Specific file handlers might do earlier parsing of the XMP. Delayed parsing and early disk file close for read-only access are optimizations to help clients implementing file browsers, so that they can access the file briefly and possibly display a thumbnail, then postpone more expensive XMP processing until later.

path: The path for the file, specified as an UTF-8 string. (use FolderItem.NativePath)
format: The format of the file. If the format is unknown (kUnknownFile) the format is determined from the file content. The first handler to check is guessed from the file's extension. Passing a specific format value is generally just a hint about what file handler to try first (instead of the one based on the extension). If kOpenStrictly is set, then any format other than kUnknownFile requires that the file actually be that format; otherwise an exception is thrown.
openFlags: A set of option flags that describe the desired access. By default (zero) the file is opened for read-only access and the format handler decides on the level of reconciliation that will be performed. A logical OR of these bit-flag constants:

- kOpenForRead - Open for read-only access.
- kOpenForUpdate - Open for reading and writing.
- kOpenOnlyXMP - Only the XMP is wanted, no reconciliation.
- kOpenCacheTNail - Cache thumbnail if possible, GetThumbnail will be called.
- kOpenStrictly - Be strict about locating XMP and reconciling with other forms. By default, a best effort is made to locate the correct XMP and to reconcile XMP with other forms (if reconciliation is done). This option forces stricter rules, resulting in exceptions for errors. The definition of strictness is specific to each handler, there might be no difference.
- kOpenUseSmartHandler - Require the use of a smart handler.
- kOpenUsePacketScanning - Force packet scanning, do not use a smart handler.

Returns true if the file is succesfully opened and attached to a file handler. False for anticipated problems, such as passing kOpenUseSmartHandler but not having an appropriate smart handler. Throws an exception for serious problems.
See also:

- 213.4.15 OpenFile(path as folderitem, format as Integer=&h20202020, OpenFlags as Integer=0) as boolean

### 213.4.17 PutXMP(xmpPacket as string)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** PutXMP() updates the XMP metadata in this object without writing out the file,
**Notes:** Overloads the basic form of the function, allowing you to pass the metadata as a string object instead of an XMP object. It is otherwise identical; see details in the canonical form.
See also:

- 213.4.18 PutXMP(xmpPacket as XMPMetaMBS) 24031

### 213.4.18 PutXMP(xmpPacket as XMPMetaMBS)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** PutXMP() updates the XMP metadata in this object without writing out the file.
**Notes:** This function supplies new XMP for the file. However, the disk file is not written until the object is closed with CloseFile(). The options provided when the file was opened determine if reconciliation is done with other forms of metadata.
See also:

- 213.4.17 PutXMP(xmpPacket as string) 24031

### 213.4.19 Events

### 213.4.20 Abort as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** This event is called periodically to allow a user to cancel time-consuming operations.
**Notes:** The event should return true to signal an abort, which results in an
exception being thrown.

### 213.4.21 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAEFilterPresetFile | &h46465820 | One of the constants to specify a file type. |
| kAEProjectFile | &h41455020 | One of the constants to specify a file type. |
| kAEProjTemplateFile | &h41455420 | One of the constants to specify a file type.<br>After Effects Project Template |
| kAIFFFile | &h41494646 | One of the constants to specify a file type. |
| kAllowsOnlyXMP | &h00000020 | One of the option bit flags for GetFormatInfo<br>Allows access to just the XMP, ignoring other forms. |
| kAllowsSafeUpdate | &h00000200 | One of the option bit flags for GetFormatInfo<br>The file handler allows crash-safe file updates. |
| kArrayLastItem | -1 | The index constant for the last item. |
| kAVCHDFile | &h41564844 | One of the constants to specify a file type. |
| kAVIFile | &h41564920 | One of the constants to specify a file type.<br>Cineon |
| kCanExpand | 2 | One of the option bit flags for GetFormatInfo<br>Can expand XMP or other metadata in an existing file. |
| kCanInjectXMP | 1 | One of the option bit flags for GetFormatInfo<br>Can inject first-time XMP into an existing file. |
| kCanReconcile | &h00000010 | One of the option bit flags for GetFormatInfo<br>Supports reconciliation between XMP and other forms. |
| kCanRewrite | 4 | One of the option bit flags for GetFormatInfo<br>Can copy one file to another, writing new metadata. |
| kCELFile | &h43454C20 | One of the constants to specify a file type.<br>Audition loop |
| kChar16BitBig | 2 | One of the constants to define the character format.<br>16-bit big-endian |
| kChar16BitLittle | 3 | One of the constants to define the character format.<br>16-bit little-endian |
| kChar16BitMask | 2 | One of the constants to define the character format. |
| kChar32BitBig | 4 | One of the constants to define the character format.<br>32-bit big-endian |
| kChar32BitLittle | 5 | One of the constants to define the character format.<br>32-bit little-endian |
| kChar32BitMask | 4 | One of the constants to define the character format. |
| kChar8Bit | 0 | One of the constants to define the character format.<br>8-bit |
| kCharLittleEndianMask | 1 | One of the constants to define the character format. |
| kCharUnknown | 1 | One of the constants to define the character format.<br>Variable or not-yet-known cases |
| kCINFile | &h43494E20 | One of the constants to specify a file type. |
| kEncoreProjectFile | &h4E434F52 | One of the constants to specify a file type. |
| kEPSFile | &h45505320 | One of the constants to specify a file type.<br>encapsulated PostScript |
| kFLAFile | &h464C4120 | One of the constants to specify a file type. |
| kFLVFile | &h464C5620 | One of the constants to specify a file type. |
| kFolderBasedFormat | &h00001000 | One of the option bit flags for GetFormatInfo<br>The format is folder oriented, for example the P2 video format. |
| kGIFFile | &h47494620 | One of the constants to specify a file type. |
| kHandlerOwnsFile | &h00000100 | One of the option bit flags for GetFormatInfo<br>The file handler does the file open and close. |
| kHTMLFile | &h48544D4C | One of the constants to specify a file type. |
| kIllustratorFile | &h41492020 | One of the constants to specify a file type. |
| kInDesignFile | &h494E4444 | One of the constants to specify a file type. |
| kJPEG2KFile | &h4A505820 | One of the constants to specify a file type.<br>JPEG 2000, ISO 15444-1 |
| kJPEGFile | &h4A504547 | One of the constants to specify a file type. |
| kMOVFile | &h4D4F5620 | One of the constants to specify a file type.<br>Quicktime |
| kMP3File | &h4D503320 | One of the constants to specify a file type. |

## 213.5 class XMPIteratorMBS

### 213.5.1 class XMPIteratorMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XMPIteratorMBS class provides a uniform means to iterate over several XMP data structures, including the schema and properties within an XMP object plus global tables such as registered namespaces.
**Notes:** Note: Only XMP object iteration is implemented at this time. There are no table iterators yet.

Iteration over the schema and properties within an XMP object is the most important and complex use of XMPIteratorMBS. It is helpful to have a thorough understanding of the XMP data tree. One way to learn this is to create some complex XMP and examine the output of XMPMetaMBS.DumpObject. This is also described in the XMP Specification, in the XMP Data Model chapter.
The top of the XMP data tree is a single root node. This does not explicitly appear in the dump and is never visited by an iterator (that is, it is never returned from XMPIteratorMBS.Next). Beneath the root are schema nodes. These are just collectors for top level properties in the same namespace. They are created and destroyed implicitly. Beneath the schema nodes are the property nodes. The nodes below a property node depend on its type (simple, struct, or array) and whether it has qualifiers.

A XMPIteratorMBS constructor defines a starting point for the iteration and options that control how it proceeds. By default the iteration starts at the root and visits all nodes beneath it in a depth first manner. The root node is not visited, the first visited node is a schema node. You can provide a schema name or property path to select a different starting node. By default this visits the named root node first then all nodes beneath it in a depth first manner.

The XMPIteratorMBS.Next method delivers the schema URI, path, and option flags for the node being visited. If the node is simple it also delivers the value. Qualifiers for this node are visited next. The fields of a struct or items of an array are visited after the qualifiers of the parent.

The options to control the iteration are:

| | |
|---|---|
| kXMP_IterJustChildren | Visit just the immediate children of the root. Skip the root itself and all nodes below the immediate children. This omits the qualifiers of the immediate children, the qualifier nodes being below what they qualify. |
| kXMP_IterJustLeafNodes | Visit just the leaf property nodes and their qualifiers. |
| kXMP_IterJustLeafName | Return just the leaf component of the node names. The default is to return the full path name. |
| kXMP_IterIncludeAliases | Include aliases as part of the iteration. Since aliases are not actual nodes the default iteration does not visit them. |
| kXMP_IterOmitQualifiers | Do not visit the qualifiers of a node. |

### 213.5.2 Methods

### 213.5.3 Constructor

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Empty constructor which does nothing.
See also:


- 213.5.4 Constructor(meta as XMPMetaMBS, options as Integer=0) 24034
- 213.5.5 Constructor(meta as XMPMetaMBS, schemaNS as string, options as Integer=0) 24035
- 213.5.6 Constructor(meta as XMPMetaMBS, schemaNS as string, propName as string, options as Integer=0) 24035
- 213.5.7 Constructor(schemaNS as string, propName as string, options as Integer) 24036


### 213.5.4 Constructor(meta as XMPMetaMBS, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an iterator for the global tables of the XMP toolkit.
**Notes:** options: Option flags to control the iteration.

The available option flags are:

| | | |
|---|---|---|
| kXMP_IterJustChildren | = &h100 | Just visit the immediate children of the root, default is subtree. |
| kXMP_IterJustLeafNodes | = &h200 | Just visit the leaf nodes, default visits all nodes. |
| kXMP_IterJustLeafName | = &h400 | Return just the leaf part of the path, default is the full path. |
| kXMP_IterOmitQualifiers | = &h1000 | Omit all qualifiers. |

Note: Not yet implemented in the XMP SDK.
See also:


- 213.5.3 Constructor 24034
- 213.5.5 Constructor(meta as XMPMetaMBS, schemaNS as string, options as Integer=0) 24035
- 213.5.6 Constructor(meta as XMPMetaMBS, schemaNS as string, propName as string, options as Integer=0) 24035
- 213.5.7 Constructor(schemaNS as string, propName as string, options as Integer) 24036

### 213.5.5 Constructor(meta as XMPMetaMBS, schemaNS as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an iterator for the global tables of the XMP toolkit.
**Notes:** schemaNS: Optional schema namespace URI to restrict the iteration. Omitted (visit all schema) by passing "".
options: Option flags to control the iteration.

The available option flags are:

| | | |
|---|---|---|
| kXMP_IterJustChildren | = &h100 | Just visit the immediate children of the root, default is subtree. |
| kXMP_IterJustLeafNodes | = &h200 | Just visit the leaf nodes, default visits all nodes. |
| kXMP_IterJustLeafName | = &h400 | Return just the leaf part of the path, default is the full path. |
| kXMP_IterOmitQualifiers | = &h1000 | Omit all qualifiers. |

Note: Not yet implemented in the XMP SDK.
See also:


- 213.5.3 Constructor 24034
- 213.5.4 Constructor(meta as XMPMetaMBS, options as Integer=0) 24034
- 213.5.6 Constructor(meta as XMPMetaMBS, schemaNS as string, propName as string, options as Integer=0) 24035
- 213.5.7 Constructor(schemaNS as string, propName as string, options as Integer) 24036


### 213.5.6 Constructor(meta as XMPMetaMBS, schemaNS as string, propName as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an iterator for the global tables of the XMP toolkit.
**Notes:** schemaNS: Optional schema namespace URI to restrict the iteration. Omitted (visit all schema) by passing "".
propName: Optional property name to restrict the iteration. May be an arbitrary path expression. Omitted (visit all properties) by passing "". If not empty a schema URI must also be provided.
options: Option flags to control the iteration.

The available option flags are:

Note: Not yet implemented in the XMP SDK.
See also:

| | | |
|---|---|---|
| kXMP_IterJustChildren | = &h100 | Just visit the immediate children of the root, default is subtree. |
| kXMP_IterJustLeafNodes | = &h200 | Just visit the leaf nodes, default visits all nodes. |
| kXMP_IterJustLeafName | = &h400 | Return just the leaf part of the path, default is the full path. |
| kXMP_IterOmitQualifiers | = &h1000 | Omit all qualifiers. |


- 213.5.3 Constructor 24034
- 213.5.4 Constructor(meta as XMPMetaMBS, options as Integer=0) 24034
- 213.5.5 Constructor(meta as XMPMetaMBS, schemaNS as string, options as Integer=0) 24035
- 213.5.7 Constructor(schemaNS as string, propName as string, options as Integer) 24036


### 213.5.7 Constructor(schemaNS as string, propName as string, options as Integer)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an iterator for the properties within an XMP object.
**Notes:** On success handle is not 0.

schemaNS: Optional schema namespace URI to restrict the iteration. Omitted (visit all schema) by passing "".
propName: Optional property name to restrict the iteration. May be an arbitrary path expression. Omitted (visit all properties) by passing "". If not empty a schema URI must also be provided.
options: Option flags to control the iteration.

The available option flags are:

| | | |
|---|---|---|
| kXMP_IterJustChildren | = &h100 | Just visit the immediate children of the root, default is subtree. |
| kXMP_IterJustLeafNodes | = &h200 | Just visit the leaf nodes, default visits all nodes. |
| kXMP_IterJustLeafName | = &h400 | Return just the leaf part of the path, default is the full path. |
| kXMP_IterOmitQualifiers | = &h1000 | Omit all qualifiers. |

See also:


- 213.5.3 Constructor 24034
- 213.5.4 Constructor(meta as XMPMetaMBS, options as Integer=0) 24034
- 213.5.5 Constructor(meta as XMPMetaMBS, schemaNS as string, options as Integer=0) 24035
- 213.5.6 Constructor(meta as XMPMetaMBS, schemaNS as string, propName as string, options as Integer=0) 24035

### 213.5.8 NextItem() as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visit the next node in the iteration.
See also:


- 213.5.9 NextItem(byref schemaNS as string) as boolean 24037
- 213.5.10 NextItem(byref schemaNS as string, byref propPath as string) as boolean 24037
- 213.5.11 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string) as boolean 24038
- 213.5.12 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string, byref options as Integer) as boolean 24039


### 213.5.9 NextItem(byref schemaNS as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visit the next node in the iteration.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | A string that is assigned the schema namespace URI of the current property. |
| propPath | A string that is assigned the XPath name of the current property. |
| propValue | A string that is assigned the value of the current property. |
| options | An integer that is assigned the flags describing the current property. |

See also:


- 213.5.8 NextItem() as boolean 24037
- 213.5.10 NextItem(byref schemaNS as string, byref propPath as string) as boolean 24037
- 213.5.11 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string) as boolean 24038
- 213.5.12 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string, byref options as Integer) as boolean 24039


### 213.5.10 NextItem(byref schemaNS as string, byref propPath as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visit the next node in the iteration.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | A string that is assigned the schema namespace URI of the current property. |
| propPath | A string that is assigned the XPath name of the current property. |

See also:


- 213.5.8 NextItem() as boolean 24037
- 213.5.9 NextItem(byref schemaNS as string) as boolean 24037
- 213.5.11 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string) as boolean 24038
- 213.5.12 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string, byref options as Integer) as boolean 24039


### 213.5.11 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visit the next node in the iteration.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | A string that is assigned the schema namespace URI of the current property. |
| propPath | A string that is assigned the XPath name of the current property. |
| propValue | A string that is assigned the value of the current property. |

See also:


- 213.5.8 NextItem() as boolean 24037
- 213.5.9 NextItem(byref schemaNS as string) as boolean 24037
- 213.5.10 NextItem(byref schemaNS as string, byref propPath as string) as boolean 24037
- 213.5.12 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string, byref options as Integer) as boolean 24039

### 213.5.12 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Visit the next node in the iteration.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | A string that is assigned the schema namespace URI of the current property. |
| propPath | A string that is assigned the XPath name of the current property. |
| propValue | A string that is assigned the value of the current property. |
| options | An integer that is assigned the flags describing the current property. |

See also:


- 213.5.8 NextItem() as boolean 24037
- 213.5.9 NextItem(byref schemaNS as string) as boolean 24037
- 213.5.10 NextItem(byref schemaNS as string, byref propPath as string) as boolean 24037
- 213.5.11 NextItem(byref schemaNS as string, byref propPath as string, byref propValue as string) as boolean 24038


### 213.5.13 Skip(options as Integer)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Skip some portion of the remaining iterations.
**Notes:** The available option flags are:

| | | |
|---|---|---|
| kXMP_IterSkipSubtree | = 1 | Skip the subtree below the current node. |
| kXMP_IterSkipSiblings | = 2 | Skip the subtree below and remaining siblings of the current node. |

## 213.6 class XMPMetaMBS

### 213.6.1 class XMPMetaMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The main class for the Adobe XMP SDK.
**Blog Entries**

- Tip of the day: Change EXIF metadata
- MBS Real Studio Plugins, version 12.5pr2

### 213.6.2 Methods

### 213.6.3 AppendArrayItem(schemaNS as string, arrayName as string, arrayOptions as Integer, itemValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Appends an item to an array.
**Notes:** AppendArrayItem simplifies construction of an array by not requiring that you pre-create an empty array. The array that is assigned is created automatically if it does not yet exist. Each call to AppendArrayItem appends an item to the array. The corresponding parameters have the same use as SetArrayItem. The arrayOptions parameter is used to specify what kind of array. If the array exists, it must have the specified form.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the array. Has the same usage as in GetProperty. |
| arrayName | The name of the array. May be a general path expression, must not be null or the empty string. Has the same namespace prefix usage as propPath in GetProperty. |
| arrayOptions | Option flags describing the array form. The only valid bits are those that are part of kXMP_PropArrayFormMask: kXMP_PropValueIsArray (&h200), kXMP_PropArrayIsOrdered (&h400), kXMP_PropArrayIsAlternate (&h800), or kXMP_PropArrayIsAltText (&h1000). |
| itemValue | An UTF-8 string that is the value of the array item, if the array item has a value. Has the same usage as propValue in GetProperty. |
| itemOptions | Option flags describing the item. |

### 213.6.4 ApplyTemplate(WorkingXMP as XMPMetaMBS, template as XMPMetaMBS, actions as Integer)

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Applies an xmp template.

### 213.6.5 CatenateArrayItems(schemaNS as string, arrayName as string, separator as string, quotes as string, options as Integer) as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Create a single edit string from an array of strings.
**Notes:**

| | |
|---|---|
| xmpObj | The XMP object containing the array to be catenated. |
| schemaNS | The schema namespace URI for the array. Must not be an empty string. |
| arrayName | The name of the array. May be a general path expression, must not be an empty string. Each item in the array must be a simple string value. |
| separator | The string to be used to separate the items in the catenated string. Defaults to "; ", ASCII semicolon and space (U+003B, U+0020). |
| quotes | The characters to be used as quotes around array items that contain a separator. Defaults to '"', ASCII quote (U+0022). |
| options | Option flags to control the catenation. |

returns the string with the catenated array items.

### 213.6.6 Clone as XMPMetaMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates a copy of the XMPMeta Object.
**Notes:** Deep copy, not just a new reference.
Returns nil on any error.

### 213.6.7 ComposeArrayItemPath(schemaNS as string, arrayName as string, itemIndex as Integer) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the path expression for an item in an array.
**Notes:**

| | |
|---|---|
| schemaNS | The namespace URI for the array. Must not be null or the empty string. |
| arrayName | The name of the array. May be a general path expression, must not be an empty string. |
| itemIndex | The index of the desired item. Arrays in XMP are indexed from 1. The constant kXMP_ArrayLastItem always refers to the last existing array item. |

Returns the composed path. This will be of the form <tt>ns:arrayName [ i ] </tt>, where "ns" is the prefix for schemaNS and "i" is the decimal representation of itemIndex. If the value of itemIndex is kXMP_ArrayLastItem, the path is <tt>ns:arrayName [ last() ] </tt>.

### 213.6.8 ComposeFieldSelector(schemaNS as string, arrayName as string, fieldNS as string, fieldName as string, fieldValue as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the path expression to select an alternate item by a field's value.
**Notes:** The path syntax allows two forms of "content addressing" that may be used to select an item in an array of alternatives. The form used in ComposeFieldSelector lets you select an item in an array of structs based on the value of one of the fields in the structs. The other form of content addressing is shown in ComposeLangSelector.

For example, consider a simple struct that has two fields, the name of a city and the URI of an FTP site in that city. Use this to create an array of download alternatives. You can show the user a popup built from the values of the city fields. You can then get the corresponding URI as follows:

path=ComposeFieldSelector ( schemaNS, "Downloads", fieldNS, "City", chosenCity)
exists = GetStructField ( schemaNS, path, fieldNS, "URI", uri )

| | |
|---|---|
| schemaNS | The namespace URI for the array. Must not be null or the empty string. |
| arrayName | The name of the array. May be a general path expression, must not be an empty string. |
| fieldNS | The namespace URI for the field used as the selector. Must not be an empty string. |
| fieldName | The name of the field used as the selector. Must be a simple XML name, must not be an empty string. It must be the name of a field that is itself simple. |
| fieldValue | The desired value of the field. |

Returns the string with the composed path. This will be of the form <tt>ns:arrayName [ fNS:field-

Name='fieldValue' ] </tt>, where "ns" is the prefix for schemaNS and "fNS" is the prefix for fieldNS.

### 213.6.9 ComposeLangSelector(schemaNS as string, arrayName as string, langName as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the path expression to select an alternate item by language.
**Notes:** The path syntax allows two forms of "content addressing" that may be used to select an item in an array of alternatives. The form used in ComposeLangSelector lets you select an item in an alt-text array based on the value of its <tt>xml:lang</tt>qualifier. The other form of content addressing is shown in ComposeFieldSelector.

ComposeLangSelector does not supplant SetLocalizedText or GetLocalizedText.
They should generally be used, as they provide extra logic to choose the appropriate language and maintain consistency with the 'x-default' value. ComposeLangSelector gives you an path expression that is explicitly and only for the language given in the langName parameter.

| | |
|---|---|
| schemaNS | The namespace URI for the array. Must not be null or the empty string. |
| arrayName | The name of the array. May be a general path expression, must not be an empty string. |
| langName | The RFC 3066 code for the desired language. |

Returns the composed path. This will be of the form <tt>ns:arrayName [ \@xml:lang='langName' ] </tt>, where "ns" is the prefix for schemaNS.

### 213.6.10 ComposeQualifierPath(schemaNS as string, structName as string, qualNS as string, qualName as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the path expression for a qualifier.
**Notes:** schemaNS The namespace URI for the property to which the qualifier is attached. Must not be an empty string.
propName The name of the property to which the qualifier is attached. May be a general path expression, must not be an empty string.
qualNS The namespace URI for the qualifier. May be an empty string if the qualifier is in the XML empty namespace.
qualName The name of the qualifier. Must be a simple XML name, must not be an empty string.
Returns the composed path. This will be of the form <tt>ns:propName/?qNS:qualName</tt>, where "ns" is the prefix for schemaNS and "qNS" is the prefix for qualNS.

### 213.6.11 ComposeStructFieldPath(schemaNS as string, structName as string, fieldNS as string, fieldName as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Compose the path expression for a field in a struct.
**Notes:**

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Must not be null or the empty string. |
| structName | The name of the struct. May be a general path expression, must not be an empty string. |
| fieldNS | The namespace URI for the field. Must not be an empty string. |
| fieldName | The name of the field. Must be a simple XML name, must not be an empty string. |

Returns the composed path. This will be of the form <tt>ns:structName/fNS:fieldName</tt>, where "ns" is the prefix for schemaNS and "fNS" is the prefix for fieldNS.

### 213.6.12 Constructor

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor, creates an empty object.
See also:

- 213.6.13 Constructor(data as memoryblock, Offset as Integer, Size as Integer) 24044
- 213.6.14 Constructor(data as string) 24045

### 213.6.13 Constructor(data as memoryblock, Offset as Integer, Size as Integer)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an object and parse one buffer of RDF into it.
**Notes:** This constructor creates a new TXMPMeta object and populates it with metadata from a buffer containing serialized RDF. This buffer must be a complete RDF parse stream. Pass "" to construct an empty XMPMetaMBS object. The result of an actual parse is identical to creating an empty object then calling XMPMetaMBS.ParseFromBuffer. The RDF must be complete. If you need to parse with multiple buffers, create an empty object and use XMPMetaMBS.ParseFromBuffer.
See also:

- 213.6.12 Constructor 24044

- 213.6.14 Constructor(data as string) 24045


### 213.6.14 Constructor(data as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Construct an object and parse one buffer of RDF into it.
**Notes:** This constructor creates a new TXMPMeta object and populates it with metadata from a buffer containing serialized RDF. This buffer must be a complete RDF parse stream. Pass "" to construct an empty XMPMetaMBS object. The result of an actual parse is identical to creating an empty object then calling XMPMetaMBS.ParseFromBuffer. The RDF must be complete. If you need to parse with multiple buffers, create an empty object and use XMPMetaMBS.ParseFromBuffer.
See also:


- 213.6.12 Constructor 24044
- 213.6.13 Constructor(data as memoryblock, Offset as Integer, Size as Integer) 24044


### 213.6.15 ConvertFromBool(value as boolean) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from Boolean to string.

### 213.6.16 ConvertFromDate(value as XMPDateTimeMBS) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from date/time to string.

### 213.6.17 ConvertFromFloat(value as Double, format as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from floating point to string.
**Notes:** format: Optional C sprintf format for the conversion. Defaults to "%f".

### 213.6.18 ConvertFromInt(value as Integer, format as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from integer to string.
**Notes:** format: Optional C sprintf format for the conversion. Defaults to "%d".

### 213.6.19 ConvertFromInt64(value as Int64, format as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from integer to string.
**Notes:** format: Optional C sprintf format for the conversion. Defaults to "%d".

### 213.6.20 ConvertToBool(value as string) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to Boolean.

### 213.6.21 ConvertToDate(value as string) as XMPDateTimeMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to date/time.

### 213.6.22 ConvertToFloat(value as string) as Double

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to floating point.

### 213.6.23 ConvertToInt(value as string) as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to integer.

### 213.6.24 ConvertToInt64(value as string) as Int64

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from string to 64 bit integer.

### 213.6.25 CountArrayItems(schemaNS as string, arrayName as string) as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Counts array items of given array.
**Notes:** Returns 0 on any error.

### 213.6.26 CurrentDateTime as XMPDateTimeMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Current date and time as a XMPDateTimeMBS object.
**Notes:** Returns nil on any error.

### 213.6.27 DecodeFromBase64(text as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Decode from Base64 encoded string to raw data.
**Example:**

```
dim x as XMPMetaMBS
x=new XMPMetaMBS
MsgBox x.DecodeFromBase64("dGVzdA==") // test
```

**Notes:** This is a global method which does not need a valid handle.

### 213.6.28 DeleteArrayItem(schemaNS as string, arrayName as string, itemIndex as Integer)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteArrayItem deletes the given XMP subtree rooted at the given array item.
**Notes:** It is not an error if the array item does not exist.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the array. Has the same usage as in GetProperty. |
| arrayName | The name of the array. May be a general path expression, must not "". Has the same namespace prefix usage as propName in GetProperty. |
| itemIndex | The index of the desired item. Arrays in XMP are indexed from 1. The constant kXMP_ArrayLastItem (-1) always refers to the last existing array item. |

### 213.6.29 DeleteLocalizedText(schemaNS as string="", altTextName as string="", genericLang as string="", specificLang as string="")

MBS XMP Plugin, Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes localized text.

### 213.6.30 DeleteNamespace(namespaceURI as string)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Deletes a namespace from the registry.
**Notes:** Not implemented?

Does nothing if the URI is not registered, or if the parameter is null or the empty string.

namespaceURI: The URI for the namespace.

### 213.6.31 DeleteProperty(schemaNS as string, propName as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteProperty deletes the given XMP subtree rooted at the given property.
**Notes:** It is not an error if the property does not exist.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |

### 213.6.32 DeleteQualifier(schemaNS as string, structName as string, qualNS as string, qualName as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteQualifier deletes the given XMP subtree rooted at the given qualifier.
**Notes:** It is not an error if the qualifier does not exist.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| propName | The name of the property to which the qualifier is attached. Has the same usage as in GetProperty. |
| qualNS | The namespace URI for the qualifier. Has the same URI and prefix usage as the schemaNS parameter. |
| qualName | The name of the qualifier. Must be a single XML name, must not be "" Has the same namespace prefix usage as the propName parameter. |

### 213.6.33 DeleteStructField(schemaNS as string, structName as string, fieldNS as string, fieldName as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DeleteStructField deletes the given XMP subtree rooted at the given struct field.
**Notes:** It is not an error if the field does not exist.

Parameters:

### 213.6.34 DoesArrayItemExist(schemaNS as string, arrayName as string, itemIndex as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DoesArrayItemExist tells if the array item exists.
**Notes:** Returns true if the array item exists.

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| structName | The name of the struct. May be a general path expression, must not be "". Has the same namespace prefix usage as propName in GetProperty. |
| fieldNS | The namespace URI for the field. Has the same URI and prefix usage as the schemaNS parameter. |
| fieldName | The name of the field. Must be a single XML name, must not be "". Has the same namespace prefix usage as the structName parameter. |

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the array. Has the same usage as in GetProperty. |
| arrayName | The name of the array. May be a general path expression, must not be "". Has the same namespace prefix usage as propName in GetProperty. |
| itemIndex | The index of the desired item. Arrays in XMP are indexed from 1. The constant kXMP_ArrayLastItem (-1) always refers to the last existing array item. |

### 213.6.35 DoesPropertyExist(schemaNS as string, propName as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DoesPropertyExist tells if the property exists.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |

### 213.6.36 DoesQualifierExist(schemaNS as string, structName as string, qualNS as string, qualName as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DoesQualifierExist tells if the qualifier exists.
**Notes:** Returns true if the qualifier exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| propName | The name of the property to which the qualifier is attached. Has the same usage as in GetProperty. |
| qualNS | The namespace URI for the qualifier. Has the same URI and prefix usage as the schemaNS parameter. |
| qualName | The name of the qualifier. Must be a single XML name, must not be "". Has the same namespace prefix usage as the propName parameter. |

### 213.6.37 DoesStructFieldExist(schemaNS as string, structName as string, fieldNS as string, fieldName as string) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DoesStructFieldExist tells if the struct field exists.
**Notes:** Returns true if the field exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| structName | The name of the struct. May be a general path expression, must not be "". Has the same namespace prefix usage as propName in GetProperty. |
| fieldNS | The namespace URI for the field. Has the same URI and prefix usage as the schemaNS parameter. |
| fieldName | The name of the field. Must be a single XML name, must not be "". Has the same namespace prefix usage as the structName parameter. |

### 213.6.38 DumpNamespaces(output as XMPTextOutputMBS) as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DumpNamespaces dumps the list of registered namespace URIs and prefixes.
**Notes:** This is a global method which does not need a valid handle.
Returns status code. (0=success and -1=error)

### 213.6.39 DumpObject(output as XMPTextOutputMBS) as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** DumpObject dumps the content of an XMP object.
**Notes:** Returns status code. (0=success and -1=error)

### 213.6.40 DuplicateSubtree(dest as XMPMetaMBS, sourceNS as string, sourceRoot as string, destNS as string=””, destRoot as string=””, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Replicate a subtree from one XMP object into another, possibly at a different location.
**Notes:** Parameters:

| | |
|---|---|
| self | The source XMP object. |
| dest | The destination XMP object. |
| sourceNS | The schema namespace URI for the source subtree. |
| sourceRoot | The root location for the source subtree. May be a general path expression, must not be null or the empty string. |
| destNS | The schema namespace URI for the destination. Defaults to the source namespace. |
| destRoot | The root location for the destination. May be a general path expression. Defaults to the source location. |
| options | Option flags to control the separation. |

### 213.6.41 EncodeToBase64(text as string) as string

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Convert from raw data to Base64 encoded string.
**Example:**

```
dim x as XMPMetaMBS
x=new XMPMetaMBS
MsgBox x.EncodeToBase64(”test”) // dGVzdA==
```

**Notes:** This is a global method which does not need a valid handle.

### 213.6.42 Erase

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Restores the object to a "just constructed" state.

### 213.6.43 GetArrayItem(schemaNS as string, arrayName as string, itemIndex as Integer, byref itemValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetArrayItem provides access to items within an array.
**Notes:** The index is passed as an integer, you need not worry about the path string syntax for array items, convert a loop index to a string, etc.

Returns true if the array item exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the array. Has the same usage as in GetProperty. |
| arrayName | The name of the array. May be a general path expression, must not be "". Has the same namespace prefix usage as propName in GetProperty. |
| itemIndex | The index of the desired item. Arrays in XMP are indexed from 1. The constant kXMP_ArrayLastItem (-1) always refers to the last existing array item. |
| itemValue | A string that is assigned the value of the array item, if the array item has a value. Arrays and non-leaf levels of structs do not have values. |
| options | An integer variable that is assigned option flags describing the array item. |

### 213.6.44 GetLocalizedText(schemaNS as string, altTextName as string, genericLang as string, specificLang as string, byref actualLang as string, byref itemValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetLocalizedText returns information about a selected item in an alt-text array.
**Notes:** The array item is selected according to the rules given above.

Returns true if an appropriate array item exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the alt-text array. Has the same usage as in GetProperty. |
| altTextName | The name of the alt-text array. May be a general path expression, must not be "". Has the same namespace prefix usage as propName in GetProperty. |
| genericLang | The name of the generic language as an RFC 3066 primary subtag. May be "" if no generic language is wanted. |
| specificLang | The name of the specific language as an RFC 3066 tag. Must not be null or the empty string. |
| actualLang | A string that is assigned the language of the selected array item, if an appropriate array item is found. |
| itemValue | A string that is assigned the value of the array item, if an appropriate array item is found. |
| options | An integer variable that is assigned option flags describing the array item. |

### 213.6.45 GetNamespacePrefix(namespaceURI as string, byref namespacePrefix as string) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain the prefix for a registered namespace URI.
**Notes:** It is not an error if the namespace URI is not registered. The output namespacePrefix string is "" if the namespace URI is not registered.

Parameters:

| | |
|---|---|
| namespaceURI | The URI for the namespace. Must not be null or the empty string. |
| namespacePrefix | Returns the prefix registered for this URI, with a terminating ':'. |

Returns true if the namespace URI is registered.

This is a global method which does not need a valid handle.

### 213.6.46 GetNamespaceURI(namespacePrefix as string, byref namespaceURI as string) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Obtain the URI for a registered namespace prefix.
**Notes:** It is not an error if the namespace prefix is not registered. The output namespaceURI string is "" if the namespace prefix is not registered.

Parameters:

| | |
|---|---|
| namespacePrefix | The prefix for the namespace. Must not be "". |
| namespaceURI | Returns the URI registered for this prefix. |

Returns true if the namespace prefix is registered.

This is a global method which does not need a valid handle.

### 213.6.47 GetProperty(schemaNS as string, propName as string, byref propValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetProperty is the simplest property getter, mainly for top level simple properties or after using the path composition functions.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. May be an empty string if the first component of the propName path contains a namespace prefix. The URI must be for a registered namespace. |
| propName | The name of the property. May be a general path expression, must not be an empty string. Using a namespace prefix on the first component is optional. If present without a schemaNS value then the prefix specifies the namespace. The prefix must be for a registered namespace. If both a schemaNS URI and propName prefix are present, they must be corresponding parts of a registered namespace. |
| propValue | A string that is assigned the value of the property, if the property has a value. Arrays and non-leaf levels of structs do not have values. |
| options | An integer variable that is assigned option flags describing the property. |

### 213.6.48 GetPropertyBoolean(schemaNS as string, propName as string, byref propValue as boolean) as boolean

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyBoolean returns the value of a Boolean property as a boolean.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A boolean variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.49 GetPropertyBoolean(schemaNS as string, propName as string, byref propValue as boolean, byref options as Integer) as boolean 24056

### 213.6.49 GetPropertyBoolean(schemaNS as string, propName as string, byref propValue as boolean, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyBoolean returns the value of a Boolean property as a boolean.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A boolean variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.48 GetPropertyBoolean(schemaNS as string, propName as string, byref propValue as boolean) as boolean 24056

### 213.6.50 GetPropertyDate(schemaNS as string, propName as string, byref propValue as XMPDateTimeMBS, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetProperty_Date returns the value of a date/time property as an XMPDateTimeMBS object.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A XMPDateTimeMBS variable that is assigned the value of the property. |
| options | An integer variable that is assigned option flags describing the property. |

### 213.6.51 GetPropertyFloat(schemaNS as string, propName as string, byref propValue as Double) as boolean

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyFloat returns the value of a flaoting point property as a double value.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A double variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.52 GetPropertyFloat(schemaNS as string, propName as string, byref propValue as Double, byref options as Integer) as boolean 24057

### 213.6.52 GetPropertyFloat(schemaNS as string, propName as string, byref propValue as Double, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyFloat returns the value of a flaoting point property as a double value.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A double variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.51 GetPropertyFloat(schemaNS as string, propName as string, byref propValue as Double) as boolean 24057

### 213.6.53 GetPropertyInt64Double(schemaNS as string, propName as string, byref propValue as Double, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyInt64Double returns the value of a 64 bit integer property as a double value.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | A double variable that is assigned the value of the property. |
| options | An integer variable that is assigned option flags describing the property. |

### 213.6.54 GetPropertyInteger(schemaNS as string, propName as string, byref propValue as Integer) as boolean

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyInteger returns the value of an integer property as an integer.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | An integer variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.55 GetPropertyInteger(schemaNS as string, propName as string, byref propValue as Integer, byref options as Integer) as boolean 24059

### 213.6.55 GetPropertyInteger(schemaNS as string, propName as string, byref propValue as Integer, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetPropertyInteger returns the value of an integer property as an integer.
**Notes:** Returns true if the property exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | An integer variable that is assigned the value of the property. |
| options | Optional, an integer variable that is assigned option flags describing the property. |

See also:

- 213.6.54 GetPropertyInteger(schemaNS as string, propName as string, byref propValue as Integer) as boolean 24058

### 213.6.56 GetPropertyInteger64(schemaNS as string, propName as string, byref propValue as Int64, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves the value of an integer property as an Int64.
**Notes:** Reports whether a property exists, and retrieves its binary value and property type information.

schemaNS: The namespace URI; see GetProperty().
propName: The name of the property. Can be a general path expression, must not be empty string; see GetProperty() for namespace prefix usage.

propValue: A variable in which to return the binary value.

options: A variable in which to return the option flags describing the property, a logical OR of allowed bit-flag constants; see kPropValueIsStruct and following.

Returns true if the property exists.

### 213.6.57 GetQualifier(schemaNS as string, propName as string, qualNS as string, qualName as string, byref qualValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** GetQualifier provides access to a qualifier attached to a property.
**Notes:** The namespace for the qualifier is passed as a URI, you need not worry about the path string syntax. In many regards qualifiers are like struct fields.

The names of qualifiers should be XML qualified names, that is within an XML namespace. The path syntax for a qualified name uses the namespace prefix. This is unreliable since the prefix is never guaranteed. The URI is the formal name, the prefix is just a local shorthand in a given sequence of XML text.

Note: Qualifiers are only supported for simple leaf properties at this time. (in the XMP SDK)

Returns true if the qualifier exists.

Parameters:

### 213.6.58 GetStructField(schemaNS as string, structName as string, fieldNS as string, fieldName as string, byref itemValue as string, byref options as Integer) as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| propName | The name of the property to which the qualifier is attached. May be a general path expression, must not be an empty string. Has the same namespace prefix usage as in GetProperty. |
| qualNS | The namespace URI for the qualifier. Has the same URI and prefix usage as the schemaNS parameter. |
| qualName | The name of the qualifier. Must be a single XML name, must not be an empty string. Has the same namespace prefix usage as the propName parameter. |
| qualValue | A string variable that is assigned the value of the qualifier, if the qualifier has a value. Arrays and non-leaf levels of structs do not have values. |
| options | An integer variable that is assigned option flags describing the qualifier. |

**Function:** GetStructField provides access to fields within a nested structure.
**Notes:** The namespace for the field is passed as a URI, you need not worry about the path string syntax.

The names of fields should be XML qualified names, that is within an XML namespace. The path syntax for a qualified name uses the namespace prefix. This is unreliable since the prefix is never guaranteed. The URI is the formal name, the prefix is just a local shorthand in a given sequence of XML text.

Returns true if the field exists.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| structName | The name of the struct. May be a general path expression, must not be an empty string. Has the same namespace prefix usage as propName in GetProperty. |
| fieldNS | The namespace URI for the field. Has the same URI and prefix usage as the schemaNS parameter. |
| fieldName | The name of the field. Must be a single XML name, must not be an empty string. Has the same namespace prefix usage as the structName parameter. |
| fieldValue | An string variable that is assigned the value of the field, if the field has a value. Arrays and non-leaf levels of structs do not have values. |
| options | An integer variable that is assigned option flags describing the field. May be null if the flags are not wanted. |

### 213.6.59 GetVersionInfo as XMPVersionInfoMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Retrieves runtime version information.

### 213.6.60 Iterator(schemaNS as string, propName as string, options as Integer) as XMPIteratorMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an iterator for the properties within an XMP object.
**Notes:** Returns nil on failure.

schemaNS: Optional schema namespace URI to restrict the iteration. Omitted (visit all schema) by passing "".
propName: Optional property name to restrict the iteration. May be an arbitrary path expression. Omitted (visit all properties) by passing "". If not empty a schema URI must also be provided.
options: Option flags to control the iteration.

The available option flags are:

| | | |
|---|---|---|
| kXMP_IterJustChildren | = &h100 | Just visit the immediate children of the root, default is subtree. |
| kXMP_IterJustLeafNodes | = &h200 | Just visit the leaf nodes, default visits all nodes. |
| kXMP_IterJustLeafName | = &h400 | Return just the leaf part of the path, default is the full path. |
| kXMP_IterOmitQualifiers | = &h1000 | Omit all qualifiers. |

### 213.6.61 MergeFromJPEG(extendedXMP as XMPMetaMBS)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** merges standard and extended XMP retrieved from a JPEG file.
**Notes:** When an extended partition stores properties that do not fit into the JPEG file limitationof 64K bytes, this function integrates those properties back into the same XMP object with those from the standard XMP packet.

self: An XMP object which the caller has initialized from the standard XMP packet in a JPEG file. The extended XMP is added to this object.

extendedXMP: An XMP object which the caller has initialized from the extended XMP packet in a JPEG file.

### 213.6.62 PackageForJPEG(byref standardXMP as string, byref extendedXMP as string, byref extendedDigest as string)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** creates XMP serializations appropriate for a JPEG file.
**Notes:** The standard XMP in a JPEG file is limited to 64K bytes. This function serializes the XMP metadata in an XMP object into a string of RDF (see \c SerializeToBuffer) the data does not fit into the 64K byte limit, it creates a second packet string with the extended data.

self: The XMP object containing the metadata.
standardXMP: A string object in which to return the full standard XMP packet.

extendedXMP: A string object in which to return the serialized extended XMP, empty if not needed.

extendedDigest: A string object in which to return an MD5 digest of the serialized extended XMP, empty if not needed.

### 213.6.63 ParseFromBuffer(buffer as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** ParseFromBuffer parses RDF from a series of input buffers.
**Notes:** The buffers may be any length. The buffer boundaries need not respect XML tokens or even Unicode characters.

Parameters:

| | |
|---|---|
| buffer | Input data buffer. Termination of an input loop is convenient by passing kXMP_ParseMoreBuffers (2) for all real input, then having a final call with a zero length and kXMP_NoOptions. |
| options | Options controlling the parsing. |

The available options are:

| | | |
|---|---|---|
| kXMP_ParseMoreBuffers | = 2 | This is not the last buffer of input, more calls follow. |
| kXMP_RequireXMPMeta | = 1 | The x:xmpmeta XML element is required around rdf:RDF. |
| kXMP_StrictAliasing | = 4 | Do not reconcile alias differences, throw an exception. |

Note: The kXMP_StrictAliasing option is not yet implemented.

### 213.6.64 RegisterNamespace(namespaceURI as string, suggestedPrefix as string, byref registeredPrefix as string) as boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Register a namespace URI with a suggested prefix.
**Example:**

```
dim x as new XMPMetaMBS
dim registeredPrefix as string

call x.RegisterNamespace ("xwnv", "xwnv", registeredPrefix)

x.SetProperty "xwnv","MZSTID","test"

MsgBox x.SerializeToBuffer
```

**Notes:** It is not an error if the URI is already registered, no matter what the prefix is. If the URI is not registered but the suggested prefix is in use, a unique prefix is created from the suggested one. The actual registeed prefix is always returned. The function result tells if the registered prefix is the suggested one.

Parameters:

| | |
|---|---|
| namespaceURI | The URI for the namespace. Must be a valid XML URI. |
| suggestedPrefix | The suggested prefix to be used if the URI is not yet registered. Must be a valid XML name. |
| registeredPrefix | Returns the prefix actually registered for this URI. |

Returns true if the registered prefix matches the suggested prefix.

Note: No checking is presently done on either the URI or the prefix.

This is a global method which does not need a valid handle.

### 213.6.65 RemoveProperties(schemaNS as string="", propName as string="", options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Remove multiple properties from an XMP object.
**Notes:** RemoveProperties was created to support the File Info dialog's Delete button, and has been been generalized somewhat from those specific needs. It operates in one of three main modes depending on the schemaNS and propName parameters:
Non-empty schemaNS and propName - The named property is removed if it is an external property, or if the kXMPUI_DoAllProperties option is passed. It does not matter whether the named property is an actual property or an alias.
Non-empty schemaNS and empty propName - The all external properties in the named schema are removed. Internal properties are also removed if the kXMPUI_DoAllProperties option is passed. In addition, aliases from the named schema will be removed if the kXMPUI_IncludeAliases option is passed.
Empty schemaNS and empty propName - All external properties in all schema are removed. Internal properties are also removed if the kXMPUI_DoAllProperties option is passed. Aliases are implicitly handled because the associated actuals are.
It is an error to pass and empty schemaNS and non-empty propName.

| | |
|---|---|
| xmpObj | The XMP object containing the properties to be removed. |
| schemaNS | Optional schema namespace URI for the properties to be removed. |
| propName | Optional path expression for the property to be removed. |
| options | Option flags to control the deletion. The defined flags are: kXMPUI_DoAllProperties - Do internal properties in addition to external properties. kXMPUI_IncludeAliases - Include aliases in the "named schema" case above. |

### 213.6.66 SeparateArrayItems(schemaNS as string, arrayName as string, options as Integer, catedStr as string)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Separate a single edit string into an array of strings.
**Notes:** Parameters:

| | |
|---|---|
| xmpObj | The XMP object containing the array to be updated. |
| schemaNS | The schema namespace URI for the array. Must not be null or the empty string. |
| arrayName | The name of the array. May be a general path expression, must not an empty string. Each item in the array must be a simple string value. |
| options | Option flags to control the separation. |
| catedStr | The string to be separated into the array items. |

### 213.6.67 SerializeToBuffer(options as Integer, padding as Integer, newline as string, indent as string=””, baseIndent as Integer=0) as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SerializeToBuffer serializes an XMP object into a string as RDF.
**Notes:** Returns the serialized RDF.

Parameters:

| | |
|---|---|
| options | Option flags to control the serialization. |
| padding | The amount of padding to be added if a writeable XML packet is created. If zero is passed (the default) an appropriate amount of padding is computed. |
| newline | The string to be used as a line terminator. If empty it defaults to linefeed, U+000A, the standard XML newline. |
| indent | The string to be used for each level of indentation in the serialized RDF. If empty it defaults to two ASCII spaces, U+0020. |
| baseIndent | The number of levels of indentation to be used for the outermost XML element in the serialized RDF. This is convenient when embedding the RDF in other text. |

The available option flags are:

| | | |
|---|---|---|
| kXMP_OmitPacketWrapper | = &h10 | Do not include an XML packet wrapper. |
| kXMP_ReadOnlyPacket | = &h20 | Create a read-only XML packet wapper. |
| kXMP_UseCompactFormat | = &h40 | Use a highly compact RDF syntax and layout. |
| kXMP_WriteAliasComments | = &h400 | Include XML comments for aliases. |
| kXMP_IncludeThumbnailPad | = &h100 | Include typical space for a JPEG thumbnail in the padding if no xmp:Thumbnails property is present. |
| kXMP_ExactPacketLength | = &h200 | The padding parameter provides the overall packet length. The actual amount of padding is computed. An exception is thrown if the packet exceeds this length with no padding. |

The specified options must be logically consistent, an exception is thrown if not. You cannot specify both kXMP_OmitPacketWrapper along with kXMP_ReadOnlyPacket, kXMP_IncludeThumbnailPad, or kXMP_ExactPacketLength.
In addition, one of the following encoding options may be included:

See also:

- 213.6.68 SerializeToBuffer(options as Integer=0, padding as Integer=0) as string 

| | | |
|---|---|---|
| kXMP_EncodeUTF8 | = 0 | Encode as UTF-8, the default. |
| kXMP_EncodeUTF16Big | = 2 | Encode as big-endian UTF-16. |
| kXMP_EncodeUTF16Little | = 3 | Encode as little-endian UTF-16. |
| kXMP_EncodeUTF32Big | = 4 | Encode as big-endian UTF-32. |
| kXMP_EncodeUTF32Little | = 5 | Encode as little-endian UTF-32. |

### 213.6.68 SerializeToBuffer(options as Integer=0, padding as Integer=0) as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SerializeToBuffer serializes an XMP object into a string as RDF.
**Example:**

```
dim x as new XMPMetaMBS
dim registeredPrefix as string

call x.RegisterNamespace ("xwnv", "xwnv", registeredPrefix)

x.SetProperty "xwnv","MZSTID","test"

MsgBox x.SerializeToBuffer
```

**Notes:** Same as other SerializeToBuffer method, but with newline="", indent=0 and baseIndent=0.
See also:

- 213.6.67 SerializeToBuffer(options as Integer, padding as Integer, newline as string, indent as string="", baseIndent as Integer=0) as string 24066

### 213.6.69 SetArrayItem(schemaNS as string, arrayName as string, itemIndex as Integer, itemValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetArrayItem provides access to items within an array.
**Notes:** The index is passed as an integer, you need not worry about the path string syntax for array items, convert a loop index to a string, etc. The array passed to SetArrayItem must already exist. See also AppendArrayItem.

In normal usage the selected array item is modified. A new item is automatically appended if the index is the array size plus 1. A new item may be inserted before or after any item by using one of the following option flags:

Parameters:

| | | |
|---|---|---|
| kXMP_InsertBeforeItem | = &h4000 | Insert a new array item before the selected one. |
| kXMP_InsertAfterItem | = &h8000 | Insert a new array item after the selected one. |

| | |
|---|---|
| schemaNS | The namespace URI for the array. Has the same usage as in GetProperty. |
| arrayName | The name of the array. May be a general path expression, must not be an empty string. Has the same namespace prefix usage as propName in GetProperty. |
| itemIndex | The index of the desired item. Arrays in XMP are indexed from 1. The constant kXMP_ArrayLastItem always refers to the last existing array item. |
| itemValue | An UTF-8 string that is the value of the array item, if the array item has a value. Has the same usage as propValue in GetProperty. |
| options | Option flags describing the item. See the earlier description. |

### 213.6.70 SetLocalizedText(schemaNS as string, altTextName as string, genericLang as string, specificLang as string, itemValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetLocalizedText modifies the value of a selected item in an alt-text array.
**Notes:** Creates an appropriate array item if necessary, and handles special cases for the x-default item.

If the selected item is from a match with the specific language, the value of that item is modified. If the existing value of that item matches the existing value of the x-default item, the x-default item is also modified. If the array only has 1 existing item (which is not x-default), an x-default item is added with the given value.
If the selected item is from a match with the generic language and there are no other generic matches, the value of that item is modified. If the existing value of that item matches the existing value of the x-default item, the x-default item is also modified. If the array only has 1 existing item (which is not x-default), an x-default item is added with the given value.
If the selected item is from a partial match with the generic language and there are other partial matches, a new item is created for the specific language. The x-default item is not modified.
If the selected item is from the last 2 rules then a new item is created for the specific language. If the array only had an x-default item, the x-default item is also modified. If the array was empty, items are created for the specific language and x-default.

Parameters:

### 213.6.71 SetProperty(schemaNS as string, propName as string, propValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

| | |
|---|---|
| schemaNS | The namespace URI for the alt-text array. Has the same usage as in GetProperty. |
| altTextName | The name of the alt-text array. May be a general path expression, must not be an empty string. Has the same namespace prefix usage as propName in GetProperty. |
| genericLang | The name of the generic language as an RFC 3066 primary subtag. |
| specificLang | The name of the specific language as an RFC 3066 tag. Must not be an empty string. |
| itemValue | An UTF-8 string that is the new value for the appropriate array item. |
| options | Option flags, none are defined at present. |

**Function:** SetProperty is the simplest property setter, mainly for top level simple properties or after using the path composition functions.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | An UTF-8 string that is the value of the property, if the property has a value. Arrays and non-leaf levels of structs do not have values. |
| options | Option flags describing the property. |

### 213.6.72 SetPropertyBoolean(schemaNS as string, propName as string, propValue as boolean)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyBoolean sets the value of a Boolean property from a boolean.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The bool value to be assigned to the property. |
| options | An integer variable that is assigned option flags describing the property. |

See also:

- 213.6.73 SetPropertyBoolean(schemaNS as string, propName as string, propValue as boolean, options as Integer) 24070

### 213.6.73 SetPropertyBoolean(schemaNS as string, propName as string, propValue as boolean, options as Integer)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyBoolean sets the value of a Boolean property from a boolean.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The bool value to be assigned to the property. |
| options | An integer variable that is assigned option flags describing the property. |

See also:

- 213.6.72 SetPropertyBoolean(schemaNS as string, propName as string, propValue as boolean) 24069

### 213.6.74 SetPropertyDate(schemaNS as string, propName as string, propValue as XMPDateTimeMBS, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyDate sets the value of a date/time property from an XMPDateTimeMBS object.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The XMPDateTimeMBS object to be assigned to the property. |
| options | Option flags describing the property. |

### 213.6.75 SetPropertyFloat(schemaNS as string, propName as string, propValue as Double)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyFloat sets the value of a floating point property from a double.
**Notes:** Parameters:

See also:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The double float value to be assigned to the property. |
| options | Option flags describing the property. |


- 213.6.76 SetPropertyFloat(schemaNS as string, propName as string, propValue as Double, options as Integer) 24071


### 213.6.76 SetPropertyFloat(schemaNS as string, propName as string, propValue as Double, options as Integer)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyFloat sets the value of a floating point property from a double.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The double float value to be assigned to the property. |
| options | Option flags describing the property. |

See also:


- 213.6.75 SetPropertyFloat(schemaNS as string, propName as string, propValue as Double) 24070


### 213.6.77 SetPropertyInt64Double(schemaNS as string, propName as string, propValue as Double, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyInt64Double sets the value of a 64 bit integer property from a double.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The double value to be assigned to the property. |
| options | Option flags describing the property. |

### 213.6.78 SetPropertyInteger(schemaNS as string, propName as string, propValue as Integer)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyInteger sets the value of an integer property from an integer.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The long integer value to be assigned to the property. |
| options | Option flags describing the property. |

See also:

- 213.6.79 SetPropertyInteger(schemaNS as string, propName as string, propValue as Integer, options as Integer) 24072

### 213.6.79 SetPropertyInteger(schemaNS as string, propName as string, propValue as Integer, options as Integer)

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetPropertyInteger sets the value of an integer property from an integer.
**Notes:** Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the property. Has the same usage as in GetProperty. |
| propName | The name of the property. Has the same usage as in GetProperty. |
| propValue | The long integer value to be assigned to the property. |
| options | Option flags describing the property. |

See also:

- 213.6.78 SetPropertyInteger(schemaNS as string, propName as string, propValue as Integer) 24072

### 213.6.80 SetPropertyInteger64(schemaNS as string, propName as string, propValue as Int64, options as Integer=0)

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the value of an integer property using an Int64.
**Notes:** Sets a property with a binary value, creating it if necessary.

schemaNS: The namespace URI; see GetProperty().
propName: The name of the property. Can be a general path expression, must not be "" or the empty string; see GetProperty() for namespace prefix usage.
propValue: The new binary value.
options: Option flags describing the property; a logical OR of allowed bit-flag constants; see kPropValueIsStruct and following. Must match the type of a property that already exists.

### 213.6.81 SetQualifier(schemaNS as string, propName as string, qualNS as string, qualName as string, qualValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetQualifier provides access to a qualifier attached to a property.
**Notes:** The namespace for the qualifier is passed as a URI, you need not worry about the path string syntax. In many regards qualifiers are like struct fields. See the introductory discussion of qualified properties for more information.

The names of qualifiers should be XML qualified names, that is within an XML namespace. The path syntax for a qualified name uses the namespace prefix, which is unreliable because the prefix is never guaranteed. The URI is the formal name, the prefix is just a local shorthand in a given sequence of XML text.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| propName | The name of the property to which the qualifier is attached. Has the same usage as in GetProperty. |
| qualNS | The namespace URI for the qualifier. Has the same URI and prefix usage as the schemaNS parameter. |
| qualName | The name of the qualifier. Must be a single XML name, must not be an empty string. Has the same namespace prefix usage as the propName parameter. |
| qualValue | An UTF-8 string that is the value of the qualifier, if the qualifier has a value. Has the same usage as propValue in GetProperty. |
| options | Option flags describing the qualifier. |

### 213.6.82 SetStructField(schemaNS as string, structName as string, fieldNS as string, fieldName as string, fieldValue as string, options as Integer=0)

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** SetStructField provides access to fields within a nested structure.
**Notes:** The namespace for the field is passed as a URI, you need not worry about the path string syntax.

The names of fields should be XML qualified names, that is within an XML namespace. The path syntax for a qualified name uses the namespace prefix, which is unreliable because the prefix is never guaranteed. The URI is the formal name, the prefix is just a local shorthand in a given sequence of XML text.

Parameters:

| | |
|---|---|
| schemaNS | The namespace URI for the struct. Has the same usage as in GetProperty. |
| structName | The name of the struct. May be a general path expression, must not be an empty string. Has the same namespace prefix usage as propName in GetProperty. |
| fieldNS | The namespace URI for the field. Has the same URI and prefix usage as the schemaNS parameter. |
| fieldName | The name of the field. Must be a single XML name, must not be null or the empty string. Has the same namespace prefix usage as the structName parameter. |
| fieldValue | An UTF-8 string that is the value of the field, if the field has a value. Has the same usage as propValue in GetProperty. |
| options | Option flags describing the field. |

### 213.6.83 Sort

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sorts the data model tree of an XMP object.
**Notes:** Use this function to sort the data model of an XMP object into a canonical order. This can be convenient when comparing data models, (e.g. by text comparison of DumpObject output).

At the top level the namespaces are sorted by their prefixes. Within a namespace, the top level properties are sorted by name. Within a struct, the fields are sorted by their qualified name, i.e. their XML prefix:local form. Unordered arrays of simple items are sorted by value. Language Alternative arrays are sorted by the xml:lang qualifiers, with the "x-default" item placed first.

### 213.6.84 Properties

### 213.6.85 GlobalOptions as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets or retrieves the set of global option flags.
**Notes:** (Read and Write computed property)

### 213.6.86 Name as string

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The object name.
**Notes:** (Read and Write computed property)

### 213.6.87 Constants

Constants

| Constant | Value | Description |
|---|---|---|
| kAllowCommas | &h10000000 | One of the optic<br>Used by Catena |
| kArrayLastItem | -1 | The index const |
| kDeleteEmptyValues | 4 | One of the optic<br>Delete propertie |
| kDeleteExisting | &h20000000 | One of the cons<br>Used by SetXyz |
| kDoAllProperties | 1 | One of the optic<br>Do all propertie |
| kEncodeUTF16Big | 2 | One of the optic<br>Use UTF16 big- |
| kEncodeUTF16Little | 3 | One of the optic<br>Use UTF16 littl |
| kEncodeUTF32Big | 4 | One of the optic<br>Use UTF32 big- |
| kEncodeUTF32Little | 5 | One of the optic<br>Use UTF32 littl |
| kEncodeUTF8 | 0 | One of the optic<br>Use UTF8 enco |
| kEncodingMask | &h7 | One of the optic<br>Bit-flag mask fo |
| kExactPacketLength | &h200 | One of the optic<br>The padding pa |
| kImplReservedMask | &h70000000 | One of the cons |
| kIncludeAliases | &h800 | One of the optic<br>Include aliases, |
| kIncludeThumbnailPad | &h100 | One of the optic<br>Include a paddi |
| kInsertAfterItem | &h8000 | One of the cons<br>Insert a new ite |
| kInsertBeforeItem | &h4000 | One of the cons<br>Insert a new ite |
| kIterAliases | 1 | One of the const<br>Iterate the glob |
| kIterClassMask | &hFF | One of the const<br>The low 8 bits a |
| kIterIncludeAliases | &h800 | One of the const<br>Include aliases, |
| kIterJustChildren | &h100 | One of the const<br>Just do the imm |
| kIterJustLeafName | &h400 | One of the const<br>Return just the |
| kIterJustLeafNodes | &h200 | One of the const<br>Just do the leaf |
| kIterNamespaces | 2 | One of the const<br>Iterate the glob |
| kIterOmitQualifiers | &h1000 | One of the const<br>Omit all qualifie |
| kIterProperties | 0 | One of the const<br>Iterate the prop |
| kIterSkipSiblings | 2 | One of the cons<br>Skip the subtree |
| kIterSkipSubtree | 1 | One of the cons<br>Skip the subtree |
| kLittleEndianBit | 1 | One of the optic |
| kNoOptions | 0 | The constant to |
| kNS_AdobeStockPhoto | ”http://ns.adobe.com/StockPhoto/1.0/” | One of the XMI |
| kNS_ASF | ”http://ns.adobe.com/asf/1.0/” | One of the XMI |

## 213.7 class XMPPacketInfoMBS

### 213.7.1 class XMPPacketInfoMBS

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for information about a xmp packet.
**Blog Entries**

- Tip of the day: Change EXIF metadata

### 213.7.2 Properties

### 213.7.3 CharForm as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Character format using the values kChar8Bit, kChar16BitBig, etc.
**Notes:** (Read and Write property)

### 213.7.4 HasWrapper as Boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if there is a packet wrapper, the "<?xpacket...>" XML processing instructions.
**Notes:** (Read and Write property)

### 213.7.5 Length as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packet length in the file in bytes, -1 if unknown.
**Notes:** (Read and Write property)

### 213.7.6 Offset as Int64

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packet offset in the file in bytes, -1 if unknown.
**Notes:** (Read and Write property)

### 213.7.7 PadSize as Integer

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Packet padding size in bytes, zero if unknown.
**Notes:** (Read and Write property)

### 213.7.8 Writeable as Boolean

MBS XMP Plugin, Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if there is a packet wrapper and the trailer says writeable by dumb packet scanners.
**Notes:** (Read and Write property)

## 213.8 class XMPScannerMBS

### 213.8.1 class XMPScannerMBS

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class to scan any file stream for XMP data.
**Example:**

```
dim c,n,i,l as Integer
dim xs as XMPScannerMBS
dim xn as XMPSnipMBS
dim s as string
dim x as XMPMetaMBS
dim b as BinaryStream
dim source as FolderItem

// get file
source=GetOpenFolderItem("any")
if source=nil then Return

b=source.OpenAsBinaryFile(false)

if b=nil then Return

// read file to memory
l=b.Length
s=b.Read(l)

// scan for xmp blocks
MsgBox "Scanning "+str(lenb(s))+" of "+str(l)+" bytes."

xs=new XMPScannerMBS(l)
xs.Scan(s,0)

MsgBox "Found "+str(xs.Report)+" blocks"

n=xs.Report-1

c=0
for i=0 to n

xn=xs.Snip(i)

if xn.State=3 then // found
if xn.Length>50 then
try
b.Position=xn.Offset
```

```
s=b.Read(xn.Length)

// debug output xmp data
'WriteInputXMP dest,s

// try to parse
x=new XMPMetaMBS(s)

// work with xmp meta data
catch r as XMPExceptionMBS
MsgBox "ExtractXMP failed on: "+r.message
end try
else
MsgBox "Found small xmp block? "+str(xn.Length)
end if
end if
next
```

### 213.8.2 Methods

### 213.8.3 Constructor

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Default constructor doing nothing.
See also:

- 213.8.4 Constructor(StreamLength as Integer) 24080

### 213.8.4 Constructor(StreamLength as Integer)

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Constructor to create a XMPScanner which reads the given number of bytes.
See also:

- 213.8.3 Constructor 24080

### 213.8.5 Report as Integer

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Produces a report of what is known about the input stream.
**Notes:** The snipps found are saved in an array which you can access using the snip() function. Returns the number of entries in this array.

### 213.8.6 Scan(Buffer as string, Offset as Int64)

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Scans the given part of the input, incorporating it in to the known snips.
**Notes:** The Offset is the offset of this block of input relative to the entire stream.

### 213.8.7 Snip(index as UInt32) as XMPSnipMBS

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the snip with the given index.
**Notes:** index is zero based.
Returns nil on any error.
You must call Report before this method.

### 213.8.8 SnipCount as UInt32

MBS XMP Plugin, Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Number of snips found so far.

### 213.8.9 StreamAllScanned as boolean

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns true if all of the stream has been seen.

## 213.9 class XMPSnipMBS

### 213.9.1 class XMPSnipMBS

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The class for the XMP Snips found by the XMPScannerMBS class.

### 213.9.2 Properties

### 213.9.3 Access as Integer

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The read-only/read-write access from the end attribute.
**Notes:** (Read and Write property)

### 213.9.4 BytesAttr as Int64

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the bytes attribute, -1 if not present.
**Notes:** (Read only property)

### 213.9.5 CharForm as Integer

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** How the packet is divided into characters.
**Notes:** The values allow easy testing for 16/32 bit and big/little endian.

| | |
|---|---|
| eChar8Bit | = 0 |
| eChar16BitBig | = 2 |
| eChar16BitLittle | = 3 |
| eChar32BitBig | = 4 |
| eChar32BitLittle | = 5 |

(Read and Write property)

### 213.9.6 EncodingAttr as String

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The value of the encoding attribute, if any, with nulls removed.
**Notes:** (Read and Write property)

### 213.9.7 Length as Int64

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The length in bytes of this snip.
**Notes:** (Read only property)

### 213.9.8 Offset as Int64

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The byte offset of this snip within the input stream.
**Notes:** (Read only property)

### 213.9.9 OutOfOrder as Integer

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** If true, this snip was seen before the one in front of it.
**Notes:** (Read and Write property)

### 213.9.10 State as Integer

MBS XMP Plugin, Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The state of this snip.
**Notes:** constants:

(Read and Write property)

| | | |
|---|---|---|
| eNotSeenSnip | 0 | This snip has not been seen yet. |
| ePendingSnip | 1 | This snip is an input buffer being processed. |
| eRawInputSnip | 2 | This snip is raw input, it doesn't contain any part of an XMP packet. |
| eValidPacketSnip | 3 | This snip is a complete, valid XMP packet. |
| ePartialPacketSnip | 4 | This snip contains the start of a possible XMP packet. |
| eBadPacketSnip | 5 | This snip contains a complete, but semantically incorrect XMP packet. |

## 213.10 class XMPTextOutputMBS

### 213.10.1 class XMPTextOutputMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** An event class for text output.
**Notes:** You may want to make a subclass which collects all the strings into one string or write them to a file.

### 213.10.2 Events

### 213.10.3 Output(text as string) as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: .

**Function:** New text arrived.
**Notes:** You may get more than one event per line.
Return 0 for success or something else for failure.

## 213.11 class XMPVersionInfoMBS

### 213.11.1 class XMPVersionInfoMBS

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The XMP Version class.
**Example:**

```
dim v as XMPVersionInfoMBS
v=XMPMetaMBS.GetVersionInfo
MsgBox v.Message
```

**Notes:** Constructor sets values.

### 213.11.2 Properties

### 213.11.3 Build as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A rolling build number, monotonically increasing in a release.
**Notes:** (Read and Write property)

### 213.11.4 Flags as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Individual feature implementation flags.
**Notes:** (Read and Write property)

### 213.11.5 IsDebug as boolean

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** True if this is a debug build.
**Notes:** (Read and Write property)

### 213.11.6 Major as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The primary release number, the "1" in version "1.2.3".
**Notes:** (Read and Write property)

### 213.11.7 Message as String

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** A comprehensive version information string.
**Example:**

```
dim v as XMPVersionInfoMBS
v=XMPMetaMBS.GetVersionInfo
MsgBox v.Message
```

**Notes:** (Read and Write property)

### 213.11.8 Micro as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The tertiary release number, the "3" in version "1.2.3".
**Notes:** (Read and Write property)

### 213.11.9 Minor as Integer

MBS XMP Plugin, Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** The secondary release number, the "2" in version "1.2.3".
**Notes:** (Read and Write property)

# Chapter 214

# XojoRuntime

## 214.1 Globals

### 214.1.1 AllObjectsOfClassMBS(ClassName as String) as Variant()

MBS Util Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, Windows, iOS, Targets: All.

**Function:** Find all objects with given class using IsA operator.
**Example:**

```
Dim AllWindows() As Variant = AllObjectsOfClassMBS("Window")
Dim AllMenuItems() As Variant = AllObjectsOfClassMBS("MenuItem")
Dim AllDictionary() As Variant = AllObjectsOfClassMBS("Dictionary")

Break
```

**Notes:** Similar to using Runtime.IterateObjects directly, loop over all objects and do a check with ISA operator on each one. The plugin is a bit more efficient doing this and returns matching items as array of variant.

Raises exception if class name is empty or not a known class to the Xojo runtime.
**Blog Entries**

- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- MBS Xojo Plugins, version 21.1pr4

### 214.1.2 ArrayDoubleMBS(paramArray values as Double) as Double()

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an array with given values.
**Example:**

```
// works
Dim a() As Double = ArrayDoubleMBS(1, 2, 3)

// failes
Dim b() As Double = Array(1,2,3)
```

**Notes:** With picking the right array function (ArrayDoubleMBS, ArrayStringMBS, ArrayInt64MBS, ArrayVariantMBS or ArrayIntegerMBS), you define what type of array you like. The Array function determinates the type based on value types, so it often isn't what we want.

Pass as many parameters as needed, just like Array() function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

**Xojo Developer Magazine**

- 19.1, page 11: News

### 214.1.3 ArrayInt64MBS(paramArray values as Int64) as Int64()

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an array with given values.
**Example:**

```
// works
Dim a() As Int64 = ArrayInt64MBS(1, 2, 3.0)

// failes
Dim b() As Int64 = Array(1,2,3.0)
```

**Notes:** With picking the right array function (ArrayDoubleMBS, ArrayStringMBS, ArrayInt64MBS, ArrayVariantMBS or ArrayIntegerMBS), you define what type of array you like. The Array function determinates the type based on value types, so it often isn't what we want.

Pass as many parameters as needed, just like Array() function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

**Xojo Developer Magazine**

- 19.1, page 11: News

### 214.1.4 ArrayIntegerMBS(paramArray values as Integer) as Integer()

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an array with given values.
**Example:**

```
// works
Dim a() As Integer = ArrayIntegerMBS(1, 2, 3.0)

// failes
Dim b() As Integer = Array(1,2,3.0)
```

**Notes:** With picking the right array function (ArrayDoubleMBS, ArrayStringMBS, ArrayInt64MBS, ArrayVariantMBS or ArrayIntegerMBS), you define what type of array you like. The Array function determinates the type based on value types, so it often isn't what we want.

Pass as many parameters as needed, just like Array() function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

**Xojo Developer Magazine**

- 19.1, page 11: News

### 214.1.5 ArrayIsAMBS(v as Variant, ClassName as string) as boolean

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if variant contains an array of the given class type.
**Example:**

```
dim w() as MouseCursor
w.Append System.Cursors.ArrowEastWest
w.Append System.Cursors.ArrowNorthSouth

dim v as Variant = w

if ArrayIsAMBS(w, "MouseCursor") then
MsgBox "OK"
end if
```

**Notes:** If the variant contains an array of some class, variant or object and has at least one value, the plugin checks this first value for being of type of the same class. Like an ISA check.
This helps to solve feedback case 12213.
Returns false if variant has no array, if variant is nil, if array is not an array of objects or if first object is nil.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr11

### 214.1.6 ArrayStringMBS(paramArray values as String) as String()

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an array with given values.
**Example:**

```
Dim a() As String = ArrayStringMBS("Hello", "World")
```

**Notes:** With picking the right array function (ArrayDoubleMBS, ArrayStringMBS, ArrayInt64MBS, ArrayVariantMBS or ArrayIntegerMBS), you define what type of array you like. The Array function determinates the type based on value types, so it often isn't what we want.

Pass as many parameters as needed, just like Array() function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

### 214.1.7 ArrayVariantMBS(paramArray values as Variant) as Variant()

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Creates an array with given values.
**Example:**

```
Dim a() As Variant = ArrayVariantMBS(1, 2, 3.0, True, False)
```

**Notes:** With picking the right array function (ArrayDoubleMBS, ArrayStringMBS, ArrayInt64MBS, ArrayVariantMBS or ArrayIntegerMBS), you define what type of array you like. The Array function determinates the type based on value types, so it often isn't what we want.

Pass as many parameters as needed, just like Array() function.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr3

**Xojo Developer Magazine**

- 19.1, page 11: News

### 214.1.8 GetArrayAllocatedSizeMBS(v as variant) as integer

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries allocated array size in bytes.
**Example:**

```
Dim a() As Integer // 8 byte per integer in 64-bit

System.DebugLog "allocated: "+Str(GetArrayAllocatedSizeMBS(a))

Redim a(9) // changes to 80 bytes

System.DebugLog "allocated: "+Str(GetArrayAllocatedSizeMBS(a))

Redim a(19) // changes to 160 bytes

System.DebugLog "allocated: "+Str(GetArrayAllocatedSizeMBS(a))

a.Append 123

System.DebugLog "allocated: "+Str(GetArrayAllocatedSizeMBS(a))
// shows 288, adds space for 16 more values
```

**Notes:** This function uses internal knowledge of the array layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.

Stopped working on Windows in recent Xojo versions, so we deprecated it.

### 214.1.9 GetArrayDataPointerMBS(v as variant) as Ptr

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries base pointer for the array data.
**Notes:** The pointer changes when append/insert/redim allocates new memory block.

This function uses internal knowledge of the array layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.

### 214.1.10 GetAutoMemoryAddressMBS(o as auto) as integer

MBS Util Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries memory address of auto object.
**Example:**

```
Dim t As Auto = "Hello World"
Dim o As Auto = "Hello "

o = o + "World"

Dim s As Auto = t

Dim ta As Integer = GetAutoMemoryAddressMBS(t)
Dim oa As Integer = GetAutoMemoryAddressMBS(o)
Dim sa As Integer = GetAutoMemoryAddressMBS(s)

// s and t show same address, but o is different
MsgBox Hex(ta)+EndOfLine+Hex(oa)+EndOfLine+Hex(sa)

// and s and t show address in const segment in the app, while o is dynamically allocated and has an heap address
```

**Notes:** Allows you to compare if two variables refer same object.

### 214.1.11 GetDelegateParametersMBS(del as variant) as String

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries parameter signature of a delegate.
**Example:**

```
Dim aDelegate As ADelegate
aDelegate = AddressOf someFunction

Dim p As String = GetDelegateParametersMBS(aDelegate)
MsgBox p
```

**Notes:** This function uses internal knowledge of the delegate layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 20.3pr8
- Inside Delegates

### 214.1.12 GetDelegateTargetMBS(del as variant) as Variant

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries target object of a delegate.
**Example:**

```
Dim aDelegate As ADelegate
aDelegate = AddressOf someFunction

Dim target As Variant = GetDelegateTargetMBS(aDelegate)
MsgBox "target: "+Introspection.GetType(target).fullname
```

**Notes:** This function uses internal knowledge of the delegate layout in memory.
So this will break in case a future Xojo version changes the layout.

Please use only carefully for debugging.

See also Feedback case:
http://feedback.xojo.com/case/23305
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 20.3pr8
- Inside Delegates

### 214.1.13 GetDelegateWeakMBS(del as variant) as Boolean

MBS Util Plugin, Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries weak flag of a delegate.
**Example:**

```
Dim aDelegate As ADelegate
aDelegate = AddressOf someFunction

Dim weak As Boolean = GetDelegateWeakMBS(aDelegate)
MsgBox "weak: "+Str(weak)
```

**Notes:** This function uses internal knowledge of the delegate layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.
**Blog Entries**

- MBS Xojo Plugins, version 23.6pr1
- MBS Xojo Plugins, version 20.3pr8
- Inside Delegates

### 214.1.14 GetObjectMemoryAddressMBS(o as object) as integer

MBS Util Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries memory address of object.
**Example:**

```
Dim a As Integer = GetObjectMemoryAddressMBS(app)

// show address
```

MsgBox Hex(a)

**Notes:** Allows you to compare if two variables refer same object.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr8

### 214.1.15 GetObjectReferenceCountMBS(o as object) as integer

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries object reference count.
**Example:**

```
Dim o As Object = window1

System.DebugLog "Reference count: "+Str(GetObjectReferenceCountMBS(o))

dim k as Object = o

System.DebugLog "Reference count: "+Str(GetObjectReferenceCountMBS(o))

dim v as Variant = o

System.DebugLog "Reference count: "+Str(GetObjectReferenceCountMBS(o))

v = Nil
k = nil

System.DebugLog "Reference count: "+Str(GetObjectReferenceCountMBS(o))
```

**Notes:** This function uses internal knowledge of the object layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.

### 214.1.16 GetStringMemoryAddressMBS(s as string) as integer

MBS Util Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries memory address of string.
**Example:**

```
Dim t As String = "Hello World"
```

```
Dim o As String = "Hello "

o = o + "World"

Dim s As String = t

Dim ta As Integer = GetStringMemoryAddressMBS(t)
Dim oa As Integer = GetStringMemoryAddressMBS(o)
Dim sa As Integer = GetStringMemoryAddressMBS(s)

// s and t show same address, but o is different
MsgBox Hex(ta)+EndOfLine+Hex(oa)+EndOfLine+Hex(sa)

// and s and t show address in const segment in the app, while o is dynamically allocated and has an heap address
```

**Notes:** Allows you to compare if two variables refer same string.
**Blog Entries**

- MBS Real Studio Plugins, version 11.2pr8

### 214.1.17 GetStringReferenceCountMBS(s as string) as integer

MBS Util Plugin, Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries string reference count.
**Example:**

```
Dim a As String = "World"
Dim s As String = "Hello "+a // use + to make new string

System.DebugLog "Reference count: "+Str(GetStringReferenceCountMBS(s))

Dim k As String = s

System.DebugLog "Reference count: "+Str(GetStringReferenceCountMBS(s))

Dim v As Variant = s

System.DebugLog "Reference count: "+Str(GetStringReferenceCountMBS(s))

v = ""
k = ""

System.DebugLog "Reference count: "+Str(GetStringReferenceCountMBS(s))
```

**Notes:** This function uses internal knowledge of the string layout in memory.
So this will break in case a future Xojo version changes the layout.
Please use only carefully for debugging.

### 214.1.18 GetTextMemoryAddressMBS(s as text) as integer

MBS Util Plugin, Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

**Deprecated:** This item is deprecated and should no longer be used. **Function:** Queries memory address of text object.
**Example:**

```
Dim t As Text = "Hello World"
Dim n As Integer = GetTextMemoryAddressMBS(t)
MsgBox Hex(n)
```

**Notes:** Allows you to compare if two variables refer same text.

### 214.1.19 GetVariantArrayMBS(VariantContainingArray as Variant) as Variant()

MBS Util Plugin, Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a variant containing array for an array and returns it as an array of variant.
**Example:**

```
dim test() as Dictionary
test.Append new Dictionary

// this fails
Dim vv As Variant = test
Dim t() As Variant = vv

// this works!
dim v() as Variant = GetVariantArrayMBS(test)
dim dic as Dictionary = v(0)
Break
```

**Notes:** Works with all arrays of objects (any type).
Raises exception if the array can't be converted or the variant contains no array.

**Blog Entries**

- Variant Helper functions in MBS Xojo Plugins
- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0
- MBS Xojo / Real Studio Plugins, version 14.0pr4

**Xojo Developer Magazine**

- 12.2, page 10: News

### 214.1.20 GetVariantArrayUboundMBS(v as Variant) as Integer

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries array ubound for an array inside a variant.
**Notes:** If you have an array in the variant, you'd normally assign it to an array to query values from array. This function queries ubound directly.
Returns -3 if variant is nil and -2 if variant contains not an object array.
Updated in 13.5 plugins to raise exception is array is nil.
**Blog Entries**

- Variant Helper functions in MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 13.5pr8
- MBS Real Studio Plugins, version 13.0pr8

### 214.1.21 GetVariantArrayValueMBS(v as Variant, index as Integer) as Variant

MBS Util Plugin, Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries a variant from an array inside a variant.
**Example:**

```
// some part of app builds an array
dim a() as pair
a.Append 1:"Hello"
a.Append 2:"World"

// passes it as Variant somewhere else

dim v as Variant = a

// and later you may want to get values back without knowing the array type

// this raises TypeMismatchException
```

```
'dim o() as Object = v

// so use plugin to get objects:
dim v1 as Variant = GetVariantArrayValueMBS(v, 0)
dim v2 as Variant = GetVariantArrayValueMBS(v, 1)

// now you can check type and cast to the object type
dim p1 as pair = v1
dim p2 as pair = v2

MsgBox p1.Right+" "+p2.Right
```

**Notes:** This function is to allow getting objects from an array inside a variant without known the class used to declare array.
Returns nil on any error.

Updated in 13.5 plugins to raise exception is array is nil.

Also updated in v13.5 to work with object, variant, string, date, integer, double, single, boolean, Int64 arrays. Other array types will raise exception.
**Blog Entries**

- Variant Helper functions in MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 13.5pr8
- MBS Real Studio Plugins, version 13.0pr8

### 214.1.22 GetVariantAsDictionaryArrayMBS(v as variant) as Dictionary()

MBS Util Plugin, Plugin Version: 20.4, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Casts a variant to a dictionary array.
**Example:**

```
Dim d As New Dictionary
Dim v() As Variant
v.Append d
v.Append Nil

dim va as Variant = v
'Dim dic() As Dictionary = va // type mismatch exception
Dim dic() As Dictionary = GetVariantAsDictionaryArrayMBS(va) // works

Break
```

**Notes:** Raises exception if variant does not have an object/variant array.
If it contains a non-dictionary object, we raise an exception.
**Blog Entries**

- Variant Helper functions in MBS Xojo Plugins
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.4
- MBS Xojo Plugins, version 20.4pr7

### 214.1.23 GetVariantTypeMBS(va as variant) as Integer

MBS Util Plugin, Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Queries variant type.
**Example:**

```
Dim i As Int32 = 5
Dim u As UInt32 = 5
Dim vi As Variant = i
Dim vu As Variant = u
Dim ti As Integer = vi.Type // 2
Dim tu As Integer = vu.Type // 2
Dim mi As Integer = GetVariantTypeMBS(vi) // 2
Dim mu As Integer = GetVariantTypeMBS(vu) // 102

Break // check in debugger
```

**Notes:** Same as variant.type or VarType() function, but returns 102 for UInt32 and 103 for UInt64.
This way plugin functions internally can distinguish between variants with unsigned vs. signed data types.
**Blog Entries**

- News from the MBS Xojo Plugins Version 20.5
- The VariantTypeString function for Xojo
- MBS Xojo Plugins in version 20.5
- MBS Xojo Plugins, version 20.5pr2
- Variant Helper functions in MBS Xojo Plugins

**Xojo Developer Magazine**

- 19.1, page 11: News

### 214.1.24 ObjectIsAMBS(o as object, ClassName as string) as boolean

MBS Util Plugin, Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Checks if a given object is of a given class.
**Example:**

```
// you must know exact name of class

dim v as Variant = window1

if ObjectIsAMBS(v, "window1.window1") then
MsgBox "OK"
end if

v = System.Cursors.MagnifyLarger

if ObjectIsAMBS(v, "MouseCursor") then
MsgBox "OK"
end if
```

**Notes:** Like ISA operator, but with class name as string.
Returns false if o is nil.
**Blog Entries**

- MBS Real Studio Plugins, version 12.3pr11

### 214.1.25 SetVariantArrayValueMBS(v as Variant, index as Integer, value as Variant)

MBS Util Plugin, Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets an object from an array of objects inside a variant.
**Example:**

```
// some part of app builds an array
dim a() as pair

// passes it as Variant somewhere else

dim v as Variant = a

// and later you may want to put values in array without knowing object type for array

// this raises TypeMismatchException
'dim o() as Object = v
```

```
// so use plugin

SetVariantArrayValueMBS(v, 0, 1:"Hello")
SetVariantArrayValueMBS(v, 1, 2:"World")

MsgBox a(0).Right+" "+a(1).Right
```

**Notes:** This function is to allow setting objects in an array inside a variant without known the class used to declare array.
Also updated to work with object, variant, string, date, integer, double, single, boolean, Int64 arrays. Other array types will raise exception.
Be sure to only put objects of right class in the array! Else you risk crashes.

If index is 1 bigger than ubound, we append an element.
**Blog Entries**

- Variant Helper functions in MBS Xojo Plugins
- MBS Xojo / Real Studio Plugins, version 16.2pr3

### 214.1.26 GetEncodingOfStringMBS(s as string) as UInt32

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Returns the internal value for the encoding.
**Example:**

```
dim s as string = "Hello"

MsgBox hex(GetEncodingOfStringMBS(s)) // shows 8000100 for UTF8
```

**Notes:** Only useful on Xojo 4.5 and newer.
Some example values for encoding:

| | | |
|---|---|---|
| MacRoman | 0 | Also for ASCII or binary data used. |
| WindowsLatin1 | &h0500 | ANSI codepage 1252 |
| ISOLatin1 | &h0201 | ISO 8859-1 |
| NextStepLatin | &h0B01 | NextStep encoding |
| Unicode | &h0100 | 16 bit Unicode |
| UTF8 | &h08000100 | 8 bit Unicode |
| Invalid | &hFFFFFFFF | (Binary) |
| Invalid | &hFFFF | (Binary) |

Renamed from GetStringEncoding to GetEncodingOfString in MBS Plugin 3.1.
**Xojo Developer Magazine**

- 2.4, page 43: Cross platform streams, We write our own binary stream to save our data by Christian Schmitz

### 214.1.27 SetEncodingOfStringMBS(s as string, encoding as UInt32)

MBS Util Plugin, Platforms: macOS, Linux, Windows, Targets: All.

**Function:** Sets the internal value for the encoding of this string.
**Example:**

```
dim s as string = "√§√√º"
dim t as string = ConvertEncoding(s, encodings.UTF16)
dim m as MemoryBlock = t // memoryblock has bytes from UTF16 string without knowning the encoding
dim u as string = m // convert back to a string without encoding

MsgBox u // shows wrong characters
SetEncodingOfStringMBS u, 256 // set to UTF-16
MsgBox u
```

**Notes:** Only useful on Xojo 4.5 and newer.
Some example values for encoding:

| | | |
|---|---|---|
| MacRoman | 0 | Also for ASCII or binary data used. |
| WindowsLatin1 | &h0500 | ANSI codepage 1252 |
| ISOLatin1 | &h0201 | ISO 8859-1 |
| NextStepLatin | &h0B01 | NextStep encoding |
| Unicode | &h0100 | 16 bit Unicode |
| UTF8 | &h08000100 | 8 bit Unicode |
| Invalid | &hFFFFFFFF | (Binary) |
| Invalid | &hFFFF | (Binary) |

Renamed from SetStringEncoding to SetEncodingOfString in MBS Plugin 3.1.
**Xojo Developer Magazine**

- 2.4, page 43: Cross platform streams, We write our own binary stream to save our data by Christian Schmitz

## 214.2 class MemoryStatisticsMBS

### 214.2.1 class MemoryStatisticsMBS

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Class for Malloc memory statistics.
**Blog Entries**

- News from the MBS Xojo Plugins Version 21.1
- MonkeyBread Software Releases the MBS Xojo Plugins in version 21.1
- Understanding Memory Statistics
- MBS Xojo Plugins, version 21.1pr4

### 214.2.2 Methods

### 214.2.3 Compact

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Compacts memory.
**Notes:** Asks malloc to free empty pages to the OS.

### 214.2.4 Constructor

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** The constructor.
**Notes:** Initializes the properties.

### 214.2.5 MemoryStatistics as MemoryStatisticsMBS

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Queries statistics for malloc.

### 214.2.6 Properties

### 214.2.7 BytesFree as Integer

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Number of bytes free.
**Notes:** Memory used for objects, but now available for reuse with new objects.
And can't be freed usually as several objects share same memory page, so we keep the page.
(Read only property)

### 214.2.8 BytesTotal as Integer

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Total bytes allocated currently from OS.
**Notes:** Free and used blocks.
(Read only property)

### 214.2.9 BytesUsed as Integer

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Used bytes of memory.
**Notes:** Within total memory, the number of bytes currently in use.
This is what Xojo reports for Runtime.MemoryUsed.
(Read only property)

### 214.2.10 ChunksFree as Integer

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, Linux, iOS, Targets: All.

**Function:** Number of free chunks.
**Notes:** Could be freed.
(Read only property)

### 214.2.11 ChunksUsed as Integer

MBS MacOSX Plugin, Plugin Version: 21.1, Platforms: macOS, iOS, Targets: All.

**Function:** Number of chunks in use.

**Notes:** Not available on Linux.
(Read only property)

# Chapter 215

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# Chapter 216

# The FAQ

### 216.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):
**Example:**

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.

// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"

dim hours, minutes, seconds as Integer
dim hoursString, minutesString as string

hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60

if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

```
else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function
```

**Notes:** (from the rb mailinglist)

### 216.0.2 Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Since there is no plugin SDK for Android, we have no way to make a plugin for Android.
**Notes:** We support macOS, Windows, Linux and iOS.

### 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use functions from NSColor to get proper highlight color in RGB:
**Example:**

```
Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Dim theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibrate-
```

```
dRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function
```

**Notes:** As you see we convert color to Calibrated RGB for best results.
See also:


- 216.0.4 How to catch delete key? 24121
- 216.0.5 How to convert cmyk to rgb? 24122
- 216.0.6 How to delete a folder? 24123
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.8 How to query variant type string for a variant? 24125
- 216.0.9 How to refresh a htmlviewer on Windows? 24126


### 216.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** The following is the code in keydown event catches delete or backspace keys.
**Example:**

```
Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function
```

See also:


- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120

- 216.0.5 How to convert cmyk to rgb? 24122
- 216.0.6 How to delete a folder? 24123
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.8 How to query variant type string for a variant? 24125
- 216.0.9 How to refresh a htmlviewer on Windows? 24126


### 216.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

The following is the code to convert cmyk values to an RGB color datatype.
It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)
**Example:**

```
Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color
// converts c,m,y,k values (0-100) to color data type RGB
// place this in a method. Supply C,M,Y,K values-
// it returns color datatype


dim color_RGB as color
dim r, g, b as Integer

r=255-round(2.55*(c+k))
if r<0 then
r=0
end if
g=255-round(2.55*(m+k))
if g<0 then
g=0
end if
b=255-round(2.55*(y+k))
if b<0 then
b=0
end if

color_RGB=RGB(r,g,b)

return color_RGB

End Function
```

**Notes:**

(from the rb mailinglist)
See also:


- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120
- 216.0.4 How to catch delete key? 24121
- 216.0.6 How to delete a folder? 24123
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.8 How to query variant type string for a variant? 24125
- 216.0.9 How to refresh a htmlviewer on Windows? 24126


### 216.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** The following is the code deletes a folder recursively.
**Example:**

```
Sub deletefolder(f as folderitem)
dim files(-1) as FolderItem

if f=nil then Return

// delete single file
if f.Directory=false then
f.Delete
Return
end if

// get a list of all items in that folder
dim i,c as Integer
c=F.Count
for i=1 to c
files.Append f.TrueItem(i)
next

// delete each item
for each fo as FolderItem in files
if fo=nil then
' ignore
elseif fo.Directory then
deletefolder fo
fo.delete
else ' file
```

```
fo.Delete
end if
next

f.Delete
End Sub
```

See also:

- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120
- 216.0.4 How to catch delete key? 24121
- 216.0.5 How to convert cmyk to rgb? 24122
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.8 How to query variant type string for a variant? 24125
- 216.0.9 How to refresh a htmlviewer on Windows? 24126

### 216.0.7 How to detect if CPU if 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Via CPUID you can ask CPU:
**Example:**

```
dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

**Notes:** Should work on all intel compatible CPUs.
See also:

- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120
- 216.0.4 How to catch delete key? 24121
- 216.0.5 How to convert cmyk to rgb? 24122
- 216.0.6 How to delete a folder? 24123
- 216.0.8 How to query variant type string for a variant? 24125
- 216.0.9 How to refresh a htmlviewer on Windows? 24126

### 216.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

**Answer:** The following example function returns type string for variant.
**Example:**

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Dim type As Integer = GetVariantTypeMBS(v)

Dim IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

```
End If

// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function
```

See also:


- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120
- 216.0.4 How to catch delete key? 24121
- 216.0.5 How to convert cmyk to rgb? 24122
- 216.0.6 How to delete a folder? 24123
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.9 How to refresh a htmlviewer on Windows? 24126


### 216.0.9 How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can ask the browser to reload the website with this code line:
**Example:**

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:


- 216.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 24120
- 216.0.4 How to catch delete key? 24121
- 216.0.5 How to convert cmyk to rgb? 24122

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- 216.0.6 How to delete a folder? 24123
- 216.0.7 How to detect if CPU if 64bit processor? 24124
- 216.0.8 How to query variant type string for a variant? 24125

### 216.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Try this example inside the paint event of a window:
**Example:**

```
dim v as Group2D
dim r as RectShape
dim s as StringShape

const pi=3.14

s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0

r=new RectShape

r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50

v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150

g.DrawObject v
```

### 216.0.11 Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, the picture functions return pictures with no/default resolution values.
**Example:**

```
dim l as Picture = LogoMBS(500)

l.HorizontalResolution = 300
l.VerticalResolution = 300

dim r as Picture = l.Rotate90MBS

MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)

r.HorizontalResolution = l.HorizontalResolution
r.VerticalResolution = l.VerticalResolution

MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

**Notes:** So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

### 216.0.12 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** Fill a memoryblock like this:
**Example:**

```
Dim MB As Memoryblock
MB = NewMemoryBlock(8)
MB.Short(0) = window1.Top
MB.Short(2) = window1.Left
MB.Short(4) = window1.Height+window1.Top // bottom
MB.Short(6) = window1.Width+window1.Left // right
```

### 216.0.13 API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** If you get this exception message on SQLConnectionMBS.Connect, we may have a problem.
**Notes:** First case is that the given thing is not supported (e.g. MS SQL directly on Mac).
Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

### 216.0.14 Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

**Answer:** You can use ucanaccess to access databases created with Microsoft
**Example:**

```
dim options(-1) as string

// load all the jar files we have in a folder called java:

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <>Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
dim librery as string = Join(libjs, "")
dim vm as new JavaVMMBS(librery)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
dim d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Dim DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
dim j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://"+DbFile.NativePath)

// select and show values
dim r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") +" "+ r.getString("LastName")
wend

end if
```

```
Exception e as JavaExceptionMBS
MsgBox e.message+" errorcode: "+str(e.ErrorNumber)
```

**Notes:** see website:
http://ucanaccess.sourceforge.net/site.html

### 216.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, we have a graphics class integration for DynaPDF.
**Notes:** Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

### 216.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, but they run on the server, not on the client.
**Example:**

```
dim a as new AppleScriptMBS

// query my application name
a.Compile "tell application ""System Events"" to return name of current application"

// run
a.Execute

// show result
label1.text = a.Result

// shows something like "My Application.fcgi.debug"
```

**Notes:** This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

### 216.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Sorry, no. We can't provide a graphics subclass from plugin.
**Notes:** The is a feature request to allow graphics subclasses:
Feedback case 11391: feedback://showreport?report_id=11391

### 216.0.18 Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, but they run on the server, not on the client.
**Notes:** You can use HTTPSocket, SMTPSocket, POP3Socket, SMTPSecureSocket, SecurePOP3Socket, EasyTCPSocket, EasyUDPSocket, AutoDiscovery, our Bonjour classes or our CURL* classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using SMTPSocket may be a good idea for sending emails from the server like notifications.

### 216.0.19 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.
**Example:**

```
// The data for the pie chart
dim data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are choosen random to check font!
dim labels(-1) as string=array("Germany","Italy","France","Spain","UK","Poland","Russia")

// The colors to use for the sectors
dim colors(-1) as Integer

colors.Append &h66aaee
colors.Append &heebb22
colors.Append &hbbbbbb
colors.Append &h8844ff

if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype/msttcorefonts"
end if

// Create a PieChart object of size 360 x 300 pixels
dim c as new CDPieChartMBS(700, 600)
```

```
c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), &h0000cc, &h000044))
c.setRoundedFrame(&hffffff, 16)
dim tt as CDTextBoxMBS = c.addTitle("ChartDirector Demonstration", "timesbi.ttf", 18)
tt.setMargin(0, 0, 16, 0)
tt.setFontColor(&hFFFFFF)

// Set the center of the pie at (180, 140) and the radius to 100 pixels
c.setPieSize 350,300,150
// Set the sector colors
c.setColors(c.kDataColor, colors)

// Draw the pie in 3D with a pie thickness of 20 pixels
c.set3D(20)

dim t as CDTextBoxMBS = c.setLabelStyle("arialbd.ttf", 10, &h000000)
t.setBackground(CDPieChartMBS.kSameAsMainColor, CDPieChartMBS.kTransparent, CDPieChartMBS.soft-
Lighting(CDPieChartMBS.kRight, 0))
t.setRoundedCorners(8)

// Use local gradient shading for the sectors, with 5 pixels wide
// semi-transparent white (bbffffff) borders
c.setSectorStyle(CDPieChartMBS.kLocalGradientShading, &hbbffffff, 0)

// Set the pie data and the pie labels
c.setData data,labels
call c.setLabelStyle "arialbd.ttf",18

dim pic as picture = c.makeChartPicture
dim wp as new WebPicture(pic, Picture.FormatJPEG) // JPEG makes it smaller and faster

ImageView1.Picture=wp
```

**Notes:** Be aware that our plugin produces pictures for you, which you assign to ImageViews. Tranfserring those pictures takes time, so you can optimize that with using WebPicture class. There you can decide between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

### 216.0.20 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.
**Notes:** PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

### 216.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** No.

### 216.0.22 Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** There is nothing like an unique machine ID.
**Notes:** 1:
You can use the MAC IDs of the network interfaces.
This can be changed by the user with software tools.
And the list of network interfaces changes if user reorder the interfaces.

2:
You can use the system folder creation date/time.
This may stay equal after cloning machines or after migration to new PC.

3:
You can use the Mac Serialnumber.
Mac only and it can happen that a Mac does not have a serial number.

4:
You can use the x86 CPU ID.
This is x86 CPU only and does not avoid running on the same CPU in different PCs.

### 216.0.23 ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

**Answer:** ChartDirector: Alignment Specification
**Notes:** In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box boundary by using TextBox.setAlignment.

The ChartDirector API defines several constants for the alignment options.

| Constant | Value | Description |
|---|---|---|
| BottomLeft | 1 | The leftmost point on the bottom line. |
| BottomCenter | 2 | The center point on the bottom line. |
| BottomRight | 3 | The rightmost point on the bottom line. |
| Left | 4 | The leftmost point on the middle horizontal line. |
| Center | 5 | The center point on the middle horizontal line. |
| Right | 6 | The rightmost point on the middle horizontal line. |
| TopLeft | 7 | The leftmost point on the top line. |
| TopCenter | 8 | The center point on the top line. |
| TopRight | 9 | The rightmost point on the top line. |
| Bottom | 2 | The center point on the bottom line. Same as BottomCenter. |
| Top | 8 | The center point on the top line. Same as TopCenter. |
| TopLeft2 | 10 | An alternative top-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopLeft2 refers to refers to the left of the top side, while TopLeft refers to the top of the left side. The reverse applies for a horizontal axis. |
| TopRight2 | 11 | An alternative top-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopRight2 refers to refers to the right of the top side, while TopRight refers to the top of the right side. The reverse applies for a horizontal axis. |
| BottomLeft2 | 12 | An alternative bottom-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomLeft2 refers to refers to the left of the bottom side, while BottomLeft refers to the bottom of the left side. The reverse applies for a horizontal axis. |
| BottomRight2 | 13 | An alternative bottom-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomRight2 refers to refers to the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis. |

### 216.0.24 ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

**Answer:** ChartDirector: Color Specification
**Notes:** Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports col-

ors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports ”dynamic” colors. A dynamic color is a color that changes depending on the position of the pixels. The ”dynamic” colors that ChartDirector supports include ”pattern colors”, ”metal colors”, ”gradient colors”, ”zone colors” and ”dash line colors”.

ChartDirector supports specifying colors indirectly using ”palette colors”. When a ”palette color” is used, the color is specified as an index to a palette. The actual color is looked up from the palette.ARGB Color
ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AARRGGBB, where AA, RR, GG and BB are the alpha transparency, red, green and blue components.

Each component ranges from 00 - FF (0 - 255), representing its intensity. For example, pure red color is 00FF0000, pure green color is 0000FF00, and pure blue color is 000000FF. White color is 00FFFFFF, and black color is 00000000.

Most programming language requires you to put special prefix in front of hexadecimal characters. For C++, the prefix is ”0x”. For example, the syntax for the hexadecimal number 00FFFFFF is 0x00FFFFFF, or simply 0xFFFFFF.
For the alpha transparency component, a zero value means the color is not transparent all at. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the the color is partially transparent. The larger the alpha transparency, the more transparent the color will be. If a partially transparent color is used to draw something, the underlying background can still be seen.

For example, 80FF0000 is a partially transparent red color, while 00FF0000 is a non-transparent red color.

Note that ChartDirector’s ARGB color is web and HTML compatible. For example, red is FF0000, the same as in HTML. There are many resources on the web that provide tables in which you can click a color and it will show its HTML color code. These color codes can be used in ChartDirector.

If alpha transparency is FF (255), the color is totally transparent. That means the color is invisible. It does not matter what the RGB components are. So in ChartDirector, only one totally transparent color is used - FF000000. All other colors of the form FFnnnnnn are reserved to represent palette colors and dynamic colors, and should not be interpreted as the normal ARGB colors.

The totally transparent color FF000000 is often used in ChartDirector to disable drawing something. For example, if you want to disable drawing the border of a rectangle, you can set the border color to totally transparent.

For convenience, ChartDirector defines a constant called Transparent, which is equivalent to FF000000.Pattern Color

A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Pattern colors are created using BaseChart.patternColor, BaseChart.patternColor2, DrawArea.patternColor and DrawArea.patternColor2. The patternColor method creates pattern colors using an array of colors as a bitmap. The patternColor2 method creates pattern colors by loading the patterns from image files.

These methods return a 32-bit integer acting as a handle to the pattern color. The handle can be used in any ChartDirector API that expects a color as its input.Metal Color
A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface looks shiny and metallic. ChartDirector supports using any color as the base color of the metal color. In particular, using yellow and grey as the base colors will result in metal colors that look gold and silver.

Metal colors are most often used as background colors of charts. They are created using CDBaseChartMBS.metalColor, CDBaseChartMBS.goldColor and CDBaseChartMBS.silverColor. The first method allows you to specify an arbitrary base color. The second and third methods use yellow and grey as the base colors, resulting in gold and silver metal colors.

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any ChartDirector API that expects a color as its input.Gradient Color
A gradient color is a color that changes progressively across a direction.

Gradient colors are created using BaseChart.gradientColor, BaseChart.gradientColor2, DrawArea.gradientColor and DrawArea.gradientColor2. The gradientColor method creates a 2-point gradient color that changes from color A to color B. The gradientColor2 method creates a multi-point gradient colors that changes from color A to B to C ....

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any ChartDirector API that expects a color as its input.

One common use of multi-point gradient colors is to define colors that have metallic look and feel. Please refer to DrawArea.gradientColor2 for details.Dash Line Colors
A dash line color is a color that switches on and off periodically. When used to draw a line, the line will appear as a dash line.

Dash line colors are created using BaseChart.dashLineColor and DrawArea.dashLineColor. They accept a line color and a dash pattern code as arguments, and return a 32-bit integer acting as a handle to the dash line color. The handle can be used in any ChartDirector API that expects a color as its input.Zone Colors
A zone color is for XY charts only. It is a color that automatically changes upon reaching a data threshold value along the x-axis or y-axis. Zone colors are created using Layer.xZoneColor, Layer.yZoneColor, XYChart.xZoneColor or XYChart.yZoneColor.Palette Colors
Palette colors are colors of the format FFFFnnnn, where the least significant 16 bits (nnnn) are the index to the palette. A palette is simply an array of colors. For a palette color, the actual color is obtained by

looking up the palette using the index. For example, the color FFFF0001 is the second color in the palette (first color is index 0).

The colors in the palette can be ARGB colors or "dynamic" colors (pattern, gradient and dash line colors).

The first eight palette colors have special significance. The first three palette colors are the background color, default line color, and default text color of the chart. The 4th to 7th palette colors are reserved for future use. The 8th color is a special dynamic color that is equal to the data color of the "current data set".

The 9th color (index = 8) onwards are used for automatic data colors. For example, in a pie chart, if the sector colors are not specified, ChartDirector will automatically use the 9th color for the first sector, the 10th color for the second sector, and so on. Similarly, for a multi-line chart, if the line colors are not specified, ChartDirector will use the 9th color for the first line, the 10th color for the second line, and so on.

The ChartDirector API defines several constants to facilitate using palette colors.

| Constant | Value | Description |
|---|---|---|
| Palette | FFFF0000 | The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1). |
| BackgroundColor | FFFF0000 | The background color. |
| LineColor | FFFF0001 | The default line color. |
| TextColor | FFFF0002 | The default text color. |
| [ Reserved ] | FFFF0003 - FFFF0006 | These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance. |
| SameAsMainColor | FFFF0007 | A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color. |
| DataColor | FFFF0008 | The starting point for the automatic data color allocation. |

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

Constant Description

### 216.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

| | |
|---|---|
| defaultPalette | An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds). |
| whiteOnBlackPalette | An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds). |
| transparentPalette | An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent. |

**Answer:** ChartDirector: Font Specification
**Notes:** Font Name
In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information
In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "GillSans.dfont" file contains 6 fonts.

So in addition to the file name, an index is needed to determine the font. The index is specified by appending a " | " character to the font name, followed by the index number. For example, the third font in "GillSans.dfont" is denoted as "GillSans.dfont | 2". (Note: The first font starts at 0.) If no index number is provided, the first font is assumed.

ChartDirector also supports using Mac OS X Font Manager names. For example, one may use "Gill Sans Light Italic" instead of using "GillSans.dfont | 1" as the font name. However, the Mac OS X Font Manager is active only if someone has logged into the Mac GUI console, so this method is only recommended for developing applications that run on the GUI console.

The sample programs that come with ChartDirector are designed to run on all operating systems, so they use generic font file names (eg. "arial.ttf") instead of Mac OS X specific names. To allow them to run on Mac OS X, ChartDirector on Mac OS X has a built-in table to map common font file names to Mac OS X font names:

"arial.ttf", "arialbd.ttf", "ariali.ttf" and "arialbi.ttf" are mapped to "Arial | 0" (Arial), "Arial | 1" (Arial Bold), "Arial | 2" (Arial Italic) and "Arial | 3" (Arial Bold Italic)

"times.ttf", "timesbd.ttf", "timesi.ttf" and "timesbi.ttf" are mapped to "Times New Roman | 0" (Times New Roman), "Times New Roman | 1" (Times New Roman Bold), "Times New Roman | 2" (Times New Roman Italic) and "Times New Roman | 3" (Times New Roman Bold Italic)

"cour.ttf", "courbd.ttf", "couri.ttf" and "courbi.ttf" are mapped to "Courier New | 0" (Courier New), "Courier New | 1" (Courier New Bold), "Courier New | 2" (Courier New Italic) and "Courier New | 3" (Courier New Bold Italic)

Font Location

ChartDirector on Windows does not come with any font files. It relies on the operating system's font files in the " [ windows ] \Fonts" directory. To see what fonts are installed in your operating system and their file names, use the File Explorer to view that directory.

ChartDirector on Windows will also search for the font files in the "fonts" subdirectory (if it exists) under the directory where the ChartDirector DLL "chartdir.dll" is installed. This is useful for private fonts. Also, for some especially secure web servers, the web anonymous user may not have access to the " [ windows ] \Fonts" directory. In this case, you may copy the font files to the above subdirectory.

ChartDirector on Mac OS X relies on operating system font files in "/Library/Fonts" and "/System/Library/Fonts".

ChartDirector on Linux, FreeBSD and Solaris assume the fonts files are in the "fonts" subdirectory under the directory where the ChartDirector shared object "libchartdir.so" is installed. ChartDirector on Linux, FreeBSD and Solaris come with a number of font files in the "fonts" subdirectory.

To keep the download size small, ChartDirector on Linux, FreeBSD and Solaris only come with some commonly used fonts. You may download additional fonts from the Internet. In particular, the Microsoft fonts at
http://sourceforge.net/project/showfiles.php?group_id=34153&release_id=105355
is highly recommended. Please refer to
http://www.microsoft.com/typography/faq/faq8.htm
on how you could use the fonts legally in your system.

ChartDirector supports True Type fonts (.ttf), Type 1 fonts (.pfa and .pfb) and Windows bitmap fonts (.fon). On Mac OS X, ChartDirector also supports Font Suitcase and Datafork (.dfont) files. On Linux, FreeBSD and Solaris, ChartDirector also supports Portable Compiled Fonts (.pcf fonts).

If you want ChartDirector to search other directories for the font files, you may list the directories in an environment variable called "FONTPATH".

If you specify an absolute path name for the font file, ChartDirector will use the absolute path name and will not search other directories.Artificial Boldening and Italicizing

Whereas most popular font comes with different styles for "normal", "bold", "italic" and "bold italic", some fonts only come with one style (the normal style). For example, the Monotype Corsiva font that comes with MS Office only has the normal style (mtcorsva.ttf). For these cases, you may append the "Bold" and/or "Italic" words after the font file name (separated with a space) to ask ChartDirector to artificially bolden and/or italicize the font. For example, you may specify the font name as "mtcorsva.ttf Bold".Font List

Instead of specifying a single font file as the font name, you may specify a list of font files as the font name, separated by semi-colons. This is useful when using international characters that are only available in some fonts.

For example, if you would like to use the Arial font ("arial.ttf") for western characters, and the MingLiu font "mingliu.ttc" for Chinese characters (since the Arial font does not have Chinese characters), you may specify the font name as "arial.ttf;mingliu.ttc". In this case, ChartDirector will try the Arial font first. If it cannot find a certain character there, it will try the MingLiu font.Indirect Font Names
ChartDirector supports several special keywords for specifying the font name indirectly. When these keywords are used as font names, ChartDirector will look up the actual font names from a font table. The keywords are as follows:

KeywordsDescription

| | |
|---|---|
| "normal" | This default normal font, which is the first font in the font table. This is initially mapped to "arial.ttf" (Arial). |
| "bold" | The default bold font, which is the second font in the font table. This is initially mapped to "arialbd.ttf" (Arial Bold). |
| "italic" | The default italic font, which is the third font in the font table. This is initially mapped to "ariali.ttf" (Arial Italic). |
| "boldItalic" | The default bold-italic font, which is the fourth font in the font table. This is initially mapped to "arialbi.ttf" (Arial Bold Italic). |
| "fontN" | The (N + 1)th font in the font table (the first font is "font0"). |

The font table can be modified using BaseChart.setFontTable or DrawArea.setFontTable.

The advantage of using indirect font names is that you can change the fonts fonts in your charts in one place.Font Index
Most font files contain one font. However, it is possible a font file contains multiple fonts (that is, a font collection). For example, in True Type fonts, font files with extension ".ttc" may represent a font collection.

If a font file contains multiple font, the font index can be used to specify which font to use. By default, the font index is 0, which means the first font in the font file will be used.Font Size
The font size decides how big a font will appear in the image. The font size is expressed in a font unit called points. This is the same unit used in common word processors.

Instead of specifying font size, some ChartDirector API (eg. TextBox.setFontSize) allow you to specify font height and font width separately. You may use different point sizes for font height and font width to create special effects.Font Color
This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)Font Angle
This is the angle in degrees by which the font should be rotated anti-clockwise.Vertical Layout
By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use BaseChart.addText to add text that are laid out vertically. Vertical layout is common for

oriental languages such as Chinese, Japanese and Korean.

### 216.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

**Answer:** ChartDirector: Mark Up Language
**Notes:** ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text.Font Styles
You can change the style of the text by using CDML tags. For example, the line:

<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
will result in the following text rendered:

In general, all tags in CDML are enclosed by <* and *>. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include <* in text without being interpreted as CDML tags, use «* as the escape sequence.

The following table describes the supported font style attributes in CDML. See Font Specification for details on various font attributes.

AttributeDescription

Set the following text to be in superscript style. This attribute does not need to have a value. (You may use ”super” as the attribute instead of ”super=1”.)

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style

| | |
|---|---|
| font | Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use ”font” instead of ”font=arial.ttf”) to create a new style section without modifying the font name. |
| size | The font size. |
| width | The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute. |
| height | The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute. |
| color | The text color in hex format. |
| bgColor | The background color of the text in hex format. |
| underline | The line width of the line used to underline the following characters. Set to 0 to disable underline. |
| sub | Set the following text to be in subscript style. This attribute does not need to have a value. (You may use ”sub” as the attribute instead of ”sub=1”.) |
| super | Set the following text to be in superscript style. |

| | |
|---|---|
| xoffset | Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels. |
| yoffset | Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels. |
| advance | Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute. |
| advanceTo | Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved. |

section. You may use <*/font*>to terminate a style section, which will restore the font styles to the state before the style section.Blocks and Lines
In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters (”\n”) or with <*br*>. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO
will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters ” and ” in between. Each block in turn contains two lines. The blocks are defined using <*block*>as the start tag and

<*/*>as the end tag.

When a block ends, font styles will be restored to the state before entering the block.Embedding Images
CDML supports embedding images in text using the following syntax:

<*img=my_image_file.png*>
where my_image_file.png is the path name of the image file.

For example, the line:

<*size=20*>A <*img=sun.png*>day
will result in the following text rendered:

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath or DrawArea.setSearchPath on the directory that ChartDirector will search for the file.

The <*img*>tag may optionally contain width and height attributes to specify its pixel width and height. In this case, ChartDirector will stretch or compress the image if necessary to the required width and height.Blocks Attributes
CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported in the <*block*>tag to control the alignment and orientation of the sub-blocks. The <*img=my_image_file.png*>is treated as a block for layout purposes.

For example, the line:

<*block,valign=absmiddle*><*img=molecule.png*><*block*>Hydrazino\nMolecule<*/*><*/*>
will result in the following text rendered:

The the above starts <*block,valign=absmiddle*>which specifies its content should align with each others in the vertical direction using the absolute middle alignment. The block contains an image, followed by a space characters, and then another block which has two lines of text.

The following table describes the supported attributes inside <*block*>tag:

AttributeDescription

The value baseline means the baseline of sub-blocks should align with the baseline of the block. The baseline

| | |
|---|---|
| width | The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines. |
| height | The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block. |
| maxwidth | The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines. |
| truncate | The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...". |
| linespacing | The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used. |
| bgColor | The background color of the block in hex format. |
| valign | The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle. |

is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value top means the top line of sub-blocks should align with the top line of the block.

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

| | |
|---|---|
| halign | The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right. |

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

### 216.0.27 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

**Answer:** ChartDirector: Parameter Substitution and Formatting
**Notes:** ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.
Format Strings
In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

" { label } ( { percent } %)"

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

" { label } : US$ { value | 2 } K ( { percent } %)"

The sector label will then become something like "ABC: US$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

"USD { value } (Euro { = { value } *0.9 } )"

In the above, " { value } " will be substituted with the actual value of the sector. The expression " { = { value } *0.9 } " will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

| Parameter | Description |
|---|---|
| sector | The sector number. The first sector is 0, while the nth sector is (n-1). |
| dataSet | Same as { sector } . See above. |
| label | The text label of the sector. |
| dataSetName | Same as { label } . See above. |
| value | The data value of the sector. |
| percent | The percentage value of the sector. |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2. |

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers
The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers
The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis
The following table describes the parameters available for pie charts.

Number Formatting
For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2,. } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

{ [ param ] | [ a ] [ b ] [ c ] [ d ] }

where:

If this field starts with ”E” or ”e”, followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the ”E” or ”e” is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with ”G” or ”g”, followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following ”G” or ”g” also specifies the number of significant digits to use. If the ”G” or ”g” is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [ b ] [ c ] [ d ] . In this case, the default will be used.

Date/Time Formatting
For parameters that are dates/times, the formatting options can be specified using the following syntax:

{ [ param ] | [ datetime_format_string ] }

where [ datetime_format_string ] must start with an english character (A-Z or a-z) that is not ”G”, ”g”, ”E” or ”e”, and may contain any characters except ’ } ’. (If it starts with ”G”, ”g”, ”E” or ”e”, it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*>is a CDML tag to specify red text color). Note that the <*color=dd0000*>tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.
Escaping URL/HTML/CDML characters
Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&amps;#nn;" (eg. ">" will become "&amps;#62;".). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - " { escape_url } ", " { noescape_url } ", " { escape_html } ", " { noescape_html } ", " { escape_cdml } " and { noescape_cdml } ". These fields enable/disable the escape methods used in the template fields that follow them.

### 216.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

**Answer:** ChartDirector: Shape Specification
**Notes:** Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a ChartDirector method for parameterized shapes. For example, a circle is represented by an explicit constant CircleShape (=7). On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the PolygonShape method, passing in the number of sides as argument.

The following table illustrates the various ChartDirector shapes:

Custom Shapes

In ChartDirector, custom shapes are specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

ChartDirector will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various ChartDirector API.

As an example, the shape of the standard diamond shape in ChartDirector is represented as an array with 8 numbers:

0, 0, 500, 500, 0, 1000, -500, 500

### 216.0.29 Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** How to quickly copy styled text from one textarea to another?
**Example:**

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

**Notes:** The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

### 216.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can check the checksum to tell if a credit card number is not valid.
**Example:**

```
Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
If nValue <10 Then
nChecksum = nChecksum + nValue
Else
nChecksum = nChecksum + (nValue - 9)
End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
MsgBox("The credit card number looks valid")
Else
MsgBox("The credit card number is invalid")
End IF
```

**Notes:** Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

### 216.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

**Answer:** Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.
**Notes:** Please first go to X-Rite and get a SDK license.
Than we can talk about the plugin.

### 216.0.32 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Yes, the plugin can work with multiple recordsets.
**Notes:** You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk over all records in the first result set. Than you simply start again with FetchNext to get the second record set.
Even the RecordSet functions should work, just use them twice to get all records from both record sets.

### 216.0.33 Does the plugin home home?

Plugin Version: all, Platform: macOS.

**Answer:** Yes, we like to know who is using the plugin, so the plugin may contact our server.
**Example:**

none.

**Notes:** Please note that this does not affect your users as the plugin will only do this in the IDE and the relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and OS versions. This way we know what versions are used. We can return the version number of the current plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.
Blocking the transfer will not disable the plugin or change the features.
Or contact us for a plugin version which explicitly does not contain this feature.

### 216.0.34 folderitem.absolutepath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Paths on a Mac are not unique, so use them only to display them to the user.
**Example:**

```
Function AbsolutePath(f as FolderItem) As String
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + ":" + s
nf = nf.parent
wend
Return s
End Function
```

### 216.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

**Answer:** This code implements animations for a tabpanel change:
**Example:**

```
// in a tabpanel.change event:

dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
```

```
// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value
```

**Notes:** See CGS* classes for more details.

### 216.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** We support in general Mac OS X 10.5 and newer.
**Notes:** All the 64-bit plugins on Mac require OS X 10.7.
Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6.
Also for SQL Plugin the built in SQLite library requires 10.6.

### 216.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

**Answer:** Look on the CPU family returned by sysctl:
**Example:**

```
Function is64bit() As Boolean

#if TargetLittleEndian

dim m as MemoryBlock = NewMemoryBlock(8)
dim family as Integer
dim s as string

m=SystemControlNameToMIBMBS("hw.cpufamily")
m=SystemControlMBS(m)

if m<>nil then
m.LittleEndian=True
family=m.Long(0)

const CPUFAMILY_INTEL_6_14 = &h73d67300 //* "Intel Core Solo" and "Intel Core Duo" (32-bit Pentium-M with SSE3) */
const CPUFAMILY_INTEL_6_15 = &h426f69ef //* "Intel Core 2 Duo" */
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc //* Penryn */
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 //* Nehalem */

Select case family
case CPUFAMILY_INTEL_6_14
Return false
case CPUFAMILY_INTEL_6_15
Return true
case CPUFAMILY_INTEL_6_23
Return true
case CPUFAMILY_INTEL_6_26
Return true
// newer CPUs may be missing here
end Select

end if

#endif

Return false

Exception
Return false
End Function
```

**Notes:** This code is written for Mac OS X where you only have a limited number of possible CPUs.

### 216.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** The following code will remove the close item from the system menu of the window.
**Example:**

```
#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as
Integer
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif
```

**Notes:** The window may not be updated directly.

### 216.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Example:**

```
#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
```

```
loop until m.byte(n)=0
#endif
```

**Notes:** The MBS Plugin has an EnvironmentMBS class for this.

### 216.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

**Answer:** You need to get a media reservation.
**Example:**

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

**Notes:** Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.
See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

### 216.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Crossplatform you can use DynaPDF Pro.
**Notes:** On Mac OS X you can also use PDFKit for the same job.
While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

### 216.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** to get the text string from a doc file, use the NSAttributedStringMBS class.
**Notes:** The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the NSAttributedStringMBS.initWithDocFormat(data as string) as boolean method.

### 216.0.43 How can I get the item string for a given file creator?

Plugin Version: all.

**Answer:** Try this function:
**Example:**

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim ofs as Integer

Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, appSig-
nature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, doc-
Creator as OSType, kindString as ptr) as Short Inline68K("7016ABFC")

listBox1.deleteAllRows

m = newMemoryBlock(1024)
result = GetFileTypesThatAppCanNativelyOpen(Volume(0).MacVRefNum, aCREA, m)
if result <>0 then
listBox1.addRow "<Not found.>"
return
end if

do
if m.byte(ofs*4) = 0 then
exit
else
newType = m.OSTypeMBS(ofs*4)
listBox1.addRow newType
k = newMemoryBlock(64)
result = GetDocumentKindString(Volume(0).MacVRefNum, newType, aCREA, k)
if result = 0 then
listBox1.cell(ofs,1) = k.pString(0)
ofs = ofs + 1
else
listBox1.cell(ofs,1) = "(unknown)"
end if

end if
```

```
loop

End Sub
```

**Notes:** Change "Translation" to "CarbonLib" for Mac OS X.

### 216.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

**Answer:** Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):
**Example:**

```
Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—-") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

### 216.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

**Answer:** Please use the ldd command in the terminal.
**Notes:** You build an app on any platform, but for Linux.
For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter.
It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

```
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
```

```
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$
```

As you see all library have been found and their load address is printed behind the na,e.
If a library is missing, you usually see the address missing there or being zero.

### 216.0.46 How can I validate an email address?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can try this code:
**Example:**

```
Dim re As RegEx
re = New RegEx
Dim rm As RegExMatch

re.SearchPattern = " [ a-z0-9!#$ %&'*+/=?^_' { | }
textasciitilde - ] +(?:\. [ a-z0-9!#$ %&'*+/=?^_' { | }
textasciitilde - ] +)*@(?: [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?\.)+ [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?"
rm = re.Search(editField1.Text)

if rm = Nil Then
StaticText2.text = editField1.Text + " not valid email"
Else
StaticText2.Text = editField1.Text + " is valid"
End if
```

**Notes:** Adapted from:
http://www.regular-expressions.info/email.html

### 216.0.47 How do I decode correctly an email subject?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** The following code can be used to decode an email subject including several encodings including Base 64.
**Example:**

```
dim src as string // input

dim theRegex as Regex
dim theRegexMatch as RegexMatch
dim result, infoCharset, encodedPart as string
dim theStart as Integer

if instr(src, "=?") >0 then
theRegex = new Regex
theRegex.Options.Greedy = false
theRegex.searchPattern = "(.*)=\?(.+)\?(Q | B)\?(.+)\?="
theRegexMatch = theRegex.search(src)
```

```
while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)
end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result
```

**Notes:** May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

### 216.0.48 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

**Answer:** Use the TabpanelEnabledMBS method.
**Example:**

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

**Notes:** Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as

library.
For Cocoa, please use enabled property of NSTabViewItemMBS class.

### 216.0.49 How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Try this function:
**Example:**

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim root, dum as folderItem
if f <>nil then
root = f // f might be the volume
do
dum = root.parent
if dum <>nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function
```

### 216.0.50 How do I get the current languages list?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
dim p as new CFPreferencesMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFObjectMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages",".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim i,c as Integer
```

```
c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)
```

**Notes:** On Mac OS X you can get the list of current languages like this list:

```
de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko
```

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

### 216.0.51 How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
dim i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if
```

**Notes:** The MBS Plugin has a function SystemInformationMBS.OSVersionString for this.

### 216.0.52 How do I get the printer name?

Plugin Version: all.

**Answer:** For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.
**Example:**

```
dim s as String
dim i as Integer

s=app.ResourceFork.GetResource("STR ",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)

MsgBox s
end if
```

**Notes:** A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several years ago I played around with this same code if FutureBasic. I discovered that it did not and still doesn't provide the 'Printer Name', it does return the print driver name. If it returns 'LaserWriter 8' as the print driver you can look into this file and get the 'PAPA' resource #-8192 to get the actual Printer Name. Unfortunately this does not hold true for other printers. My Epson and HP Printers (the Epson has an Ethernet Card and the HP is USB) do not provide this info in their drivers. As far as I can tell it only returns the name by polling the printer itself.

### 216.0.53 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

**Answer:** The following declare turns any window on Mac OS X 10.2 or newer into a metal one.
**Example:**

```
declare sub ChangeWindowAttributes lib "Carbon" (win as windowptr, a as Integer, b as Integer)

ChangeWindowAttributes window1,256,0
```

**Notes:** May not look nice depending on the controls used.

### 216.0.54 How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

I'd like to show in a report some bars, which start with color A
and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have
255 different colors. If the bars are longer than 255 pixels, would
this look nice?
**Example:**

```
// Window.Paint:
Sub Paint(g As Graphics)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim p1,p2 as Double

c1=rgb(255,0,0) // start color
c2=rgb(0,255,0) // end color

w=g.Width
w1=w-1

for x=0 to w1
p1=x/w1
p2=1.0-p1
```

```
c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

g.ForeColor=c
g.DrawLine x,0,x,g.Height

next
End Sub
```

**Notes:**

Try the code above in a window paint event handler.

### 216.0.55 How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

**Answer:** Use CFPreferencesMBS class like in this example:
**Example:**

```
// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPreferencesMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CFObjectMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

// walk over all items in array
dim c as Integer = a.Count-1
for i as Integer = 0 to c

// get dictionary describing item
o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)
```

```
// and pick tile data dictionary
o = d.Value(tiledata)
if o isa CFDictionaryMBS then
d = CFDictionaryMBS(o)

// and pick there the file label
o = d.Value(filelabel)
if o isa CFStringMBS then
// and display it
dim name as string = CFStringMBS(o).str
List.AddRow name
end if
end if
end if

next

else
MsgBox "Failed to read dock preferences."
end if
```

**Notes:** You can use the CFPreferencesMBS.SetValue to change a value and CFPreferencesMBS.Synchronize to write the values to disc. You may need to restart the Dock.app if you modified things.

### 216.0.56 How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** In a binarystream you can set the length property to truncate.

### 216.0.57 How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
dim f as folderitem // some file
dim ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—-")=f
if not ae.send then
//something went wrong
```

```
end if
```

**Notes:** The folderitem.finderupdate from the MBS Plugin does something like this.

### 216.0.58 How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** First, it depends on the device.
**Notes:** Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the QTGrabberClassMBS
- Mass storage devices using the folderitem class.
- Serial devices using the System.SerialPort function.
- HID USB devices can be used with MacHIDMBS, WinHIDMBS or LinuxHIDInterface class.
- Any USB device may be used with MacUSBMBS or WinUSBMBS classes.

In general it is always the best to take the most high level access to have others do the work for the details.

### 216.0.59 How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use FolderItem.AddCustomIcon or NSWorkspaceMBS.setIcon functions.
**Notes:** Please close any open stream for the file you want to add an icon.

### 216.0.60 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

**Answer:** Using Apple Events you can use this code:
**Example:**

```
Function Computername() As string
```

```
dim theEvent as AppleEvent
dim err as boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function
```

**Notes:** Code above is for Mac OS 9!
Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

### 216.0.61 How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

**Answer:** You can run a build script on each build with this code:
**Example:**

```
Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")
```

**Notes:** This will set the NSHighResolutionCapable flag to YES.

### 216.0.62 How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

**Answer:** You can try this code on Mac OS X:
**Example:**

```
// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS
```

```
End Sub
```

**Notes:** With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the NSAutoreleasePools for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a objc_msgSend call.

### 216.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

**Answer:** For oracle the most important thing is to point the plugin to the libraries from oracle.
**Notes:** In environment variables, the paths like ORACLE_HOME must be defined.
On Mac OS X you also need to define DYLD_LIBRARY_PATH to point to the dylib files from oracle.

For that you need to modify /etc/launchd.conf for Mac OS X 10.8 and newer.
In older versions those variables in .MacOSX/environment.plist file in user's home.

Another way for the case you bundle things inside your app is to use the LSEnvironment key in info.plist.
In info.plist it looks like this:

```
<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>
```

### 216.0.64 How to avoid ___NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Platform: macOS.

**Answer:** You need to use your own NSAutoreleasePool on a thread like this:
**Example:**

```
sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil
```

```
end sub
```

**Notes:** For more details read here:
http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html

### 216.0.65 How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** On Mac you can use this code:
**Example:**

```
// First way:
app.FrontMostMBS = true

// second way:
dim p as new ProcessMBS
p.GetCurrentProcess
p.FrontProcess = true

// third way:
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)

// for Windows:
RemoteControlMBS.WinBringWindowToTop
```

**Notes:** This will bring a Mac app to the front layer.

### 216.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

**Answer:** This makes SimpleText (Code ttxt) to the frontmost application:
**Example:**

```
Dim A As AppleEvent
A = NewAppleEvent("misc","actv","")
If Not A.Send then
Beep
end if
```

**Notes:** (Code is Mac only)

### 216.0.67 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use SignalHandlerMBS class for this.
**Example:**

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

**Notes:** The signal is catched, a flag is set and you can ask later in your normal application flow for the result.

### 216.0.68 How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** Use this code to change the application menu name on Mac OS X:
**Example:**

```
dim mb as new MenubarMBS
dim m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

**Notes:** This code is for Carbon only.

### 216.0.69 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

**Answer:**

You mean it screws up if the file name of the bundle itself is different than the name of the executable file in the MacOS folder within the bundle? If so, you should find something like this within your Info.plist file (or the 'plst' resource that the RB IDE builds for you):

```
<key>CFBundleExecutable</key>
<string>Executable file name here</string>
```

Just make sure that file name matches.

However, if your question involves how you can change the name of the app that appears in the menu and the dock, that's different. You can make this name different from the file name by changing the CFBundleName key:

```
<key>CFBundleName</key>
<string>Name for menu here</string>
```

Note that if you use my free AppBundler program, this second part is taken care of for you – just fill in a custom name in the right field. You can find AppBundler (from Thomas Reed) at http://www.bitjuggler.com/products/appbundler/ .

### 216.0.70 How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use code like this to check all items in a folder:
**Example:**

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count

for i as Integer = 1 to c
dim item as FolderItem = folder.TrueItem(i)

if item<>Nil and item.Directory then
Return true
end if
```

```
next

End Function
```

**Notes:** We use trueitem() here to avoid resolving alias/link files.
Also we check for nil as we may not have permission to see all items.
And if one is a directory, we return without checking the rest.

### 216.0.71 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

**Answer:** Please use our IOPowerSourcesMBS class like this:
**Example:**

```
Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim s as string = CFStringMBS(o).str

'MsgBox s

if s = "AC Power" then
Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function
```

**Notes:** If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

### 216.0.72 How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:
**Example:**

```
Function OutlookInstalled() As Boolean
#if TargetWin32 then

try
dim r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

Return true

catch r as RegistryAccessErrorException
// not installed
Return false

end try

#else

// Windows only, so false on other platforms
Return false

#endif

End Function
```

### 216.0.73 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

**Answer:** The code below returns a country value.
**Example:**

```
dim result as Integer

IF TargetMacOS THEN
```

```
CONST smScriptLang = 28
CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" ( selector as Integer) as Integer
DECLARE FUNCTION GetScriptVariable LIB "Carbon" ( script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF
```

**Notes:** Returns values like:

For more values, check "Script.h" in the frameworks.

### 216.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

**Answer:** When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.
**Notes:** Please use the -f command line parameter with codesign utility to overwrite our MBS signature.
We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

```
cd <Path to folder of app>

xattr -cr <Appname>.app
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app
```

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder.
If you have helper apps you need to sign them first.
You can use a build step to automatically sign your app on build.

### 216.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

**Answer:** Use this function (Mac only):
**Example:**

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim wh as MemoryBlock

Declare Function CollapseWindow Lib "Carbon" (window as Integer,collapse as Integer) as Integer

IF CollapseStatus THEN
state = 1
ELSE
state = 0
END IF

err = CollapseWindow(w.MacWindowPtr, state)

End Sub
```

**Notes:** Also the MBS Plugin has a window.collapsedmbs property you can set.
For Windows the MBS Plugin has a window.isiconicmbs property.

### 216.0.76 How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can try this code:
**Example:**

```
Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim c1,c2 as color

h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth

if d1<>d2 then
Return 1
elseif w1<>w2 then
```

```
return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)
// 5 for different pixels (slow test)
end if
end if

Exception
Return -1
End Function
```

**Notes:** Remember that this only works on bitmap pictures, so the picture.BitmapMBS function may be useful.

### 216.0.77 How to compile PHP library?

Plugin Version: all, Platform: macOS.

**Answer:** You have to download the source code and compile a static version of the library.
**Notes:** This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.
- Download the source code archive. e.g. "php-5.2.6.tar.bz2"
- Expand that archive on your harddisc.
- Open terminal window
- change directory to the php directory. e.g. "cd /php-5.2.6"
- execute this two lines to define the supported CPU types and the minimum Mac OS X version:
- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- the command "./configure help" does show the configure options.
- use configure with a line like this:
- ./configure –enable-embed –with-curl -enable-ftp –enable-zip –enable-sockets –enable-static –enable-soap –with-zlib –with-bz2 –enable-exif –enable-bcmath –enable-calendar
- start the compilation with "make all"
- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.
- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;".
- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".

- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.
- If you installed some open source tools which compiled their own libraries, you can get into conflicts.
- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

### 216.0.78 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like this:
**Example:**

```
Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

### 216.0.79 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like this:
**Example:**

```
Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

### 216.0.80 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like this:
**Example:**

```
Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone
Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
```

```
Return "Macintosh"
case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

### 216.0.81 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

This code can help you althrough it's not perfect.
You need to set lc to the current color you use.
**Example:**

```
dim outstring as string
dim theMac, thePC as textencoding
dim Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear
```

**Notes:**

You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

### 216.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** We have this example code:
**Example:**

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0

if diff = 0.0 then
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds

diff = ts - d2
end if

dim d as new date
d.TotalSeconds = diff + ChartTime

Return d
End Function
```

**Notes:** As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

### 216.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

**Answer:** You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.
**Example:**

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim ot as TextOutputStream = TextOutputStream.Create(outputfile)

ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
```

wend

**Notes:** TextInputStream will read any input line endings and with delimiter property in TextOutputStream you can easily define your new delimiter.

### 216.0.84 How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use this plugin functions:
**Notes:** JPEG:

JPEGStringToPictureMBS(buf as string) as picture
JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture
PictureToJPEGStringMBS(pic as picture,quality as Integer) as string

PNG:

PictureToPNGStringMBS(pic as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PNGStringToPictureMBS(data as string, gamma as single) as picture
PNGStringToPNGPictureMBS(data as string, gamma as single) as PNGpictureMBS

Tiff:

TIFFStringToPictureMBS(data as string) as picture
TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS

BMP:

BMPStringtoPictureMBS(data as string) as picture
Picture.BMPDataMBS(ResolutionValueDPI as Integer=72) as string

GIF:

GifStringToGifMBS(data as string) as GIFMBS
GifStringToPictureMBS(data as string) as Picture

### 216.0.85 How to copy an array?

Plugin Version: all, Platform: macOS.

**Answer:** You can use a function like this to copy an array:
**Example:**

```
Function CopyArray(a() as Double) as Double()
dim r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

**Notes:** If needed make several copies of this method with different data types, not just double.
For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

### 216.0.86 How to copy an dictionary?

Plugin Version: all, Platform: macOS.

**Answer:** You can use a function like this to copy a dictionary:
**Example:**

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

**Notes:** If needed make several copies of this method with different data types, not just double.
For a deep copy of an dictionary of objects, you need to change code to also make a copy of those objects.

### 216.0.87 How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.
**Example:**

```
dim f as FolderItem
dim md as EditableMovie
dim ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))
```

**Notes:** If result is not 0, the method fails.

### 216.0.88 How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
```

```
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim calendars() as CalCalendarMBS = s.calendars

// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

**Notes:** This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

### 216.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the UUIDMBS class for this.

### 216.0.90 How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

**Answer:** You can use code like this one.
**Example:**

```
dim f As FolderItem
dim p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
```

```
if f=nil then Return

p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99

dim r As ResourceFork 'ResourceFork is needed for a clip file

// Please define a file type Any
r=f.CreateResourceFork("Any")

// get PICT data using plugin function
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")

dim m as new MemoryBlock(8)

m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height

r.AddResource(m,"RECT",256,"")

'Values taken from a sample file and irrelevant to the problem
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAAAAABUQ0lQAAAAA
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

**Notes:** In general Apple has deprecated this, but a few application still support clippings.

### 216.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Check our DynaPDF plugin and the examples.
**Notes:** An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X.
For Windows, we can only suggest our DynaPDF plugin.

### 216.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

**Answer:** You can use code like the one below:
**Example:**

```
Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
dim a as new EmailAttachment

a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMEType = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename

Return a
End Function
```

**Notes:** Compared to sample code from Xojo documentation, we set the mime type correct for PDF.
The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients.
"prvw" is the creator code for Apple's preview app.

### 216.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use DynaPDF like this:
**Example:**

```
Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight
as Integer) As Boolean
// have files?
If pdfFile = Nil Then Return False
If jpgFiles = Nil Then Return False

If jpgFiles.Ubound <0 Then Return False

// new DynaPDF
Dim pdf As New MyDynapdfMBS

// page width/height in MilliMeter
Dim pdfWidth as Integer = PageWidth * 72 / 25.4
Dim pdfHeight as Integer = PageHeight * 72 / 25.4
```

```
// put your license here
Call pdf.SetLicenseKey "Starter"

// create pdf
Call pdf.CreateNewPDF pdfFile

// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function
```

**Notes:** This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

### 216.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Below a few tips on how to translate command line CURL calls to plugin calls.
**Notes:** curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456 –data-binary @DocumentRegister.docx -H "Content-Type: application/msword"

- The option -v means verbose. You can use OptionVerbose and listen for messages in the DebugMessage

event.

- The option -X PUT means we want to do a HTTP PUT Request. So set OptionPut to true. Also you will want to set OptionUpload to true as you upload data.
- We have the URL which you put into OptionURL property.
- The –data-binary option tells CURL to pass the given data. With the @ before the data, it is intrepreted as a file name, so the data is read from the given file. You'll need to open this file and pass data with the Read event as needed. (See CURLS ftp file upload example project)
- The last option -H specifies an additional header for the upload. Pas this additional header with the SetOptionHTTPHeader method.

curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfcd4328001c59 -d ' { "type":"Product","description":"Application Serial","acronym":"AppSerial","dateAdded":"2011-03-21 14:57:36" } '

- Option -X PUT like above.
- Pass the URL again in OptionURL
- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

### 216.0.95 How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can set post/pre quotes to have ftp commands executed before or after the download/upload.
**Example:**

```
dim d as CURLMBS // your curl object

// delete file
dim ws() As String
ws.Append "DELE Temp.txt"

d.SetOptionPostQuote(ws)
```

**Notes:** Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.
The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use DELE and the file path.

### 216.0.96 How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** On Mac OS X simply listen for display changed notifications.
**Notes:** Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

### 216.0.97 How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use Window.BackingScaleFactorMBS to query the factor.
**Example:**

msgbox str(window1.BackingScaleFactorMBS)

### 216.0.98 How to disable force quit?

Plugin Version: all, Platform: macOS.

**Answer:**

Please visit this website and get the control panel for Mac OS 9 there:
http://www3.sk.sympatico.ca/tinyjohn/DFQ.html

For Mac OS X use the MBS Plugin with the SetSystemUIModeMBS method.
**Notes:**

Please use presentationOptions in NSApplicationMBS for Cocoa applications.

### 216.0.99 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

**Answer:** You can use this code in the htmlviewer open event:
**Example:**

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

**Notes:** This disables the error dialogs from Internet Explorer.

### 216.0.100 How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** On Mac OS X you can use CoreGraphics or PDFKit to display a PDF.
**Notes:** An alternative can be to load the PDF into a htmlviewer so the PDF plugin can display it.
On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

### 216.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Try this function:
**Example:**

```
Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next
```

```
' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub

Sub Open()
// Test it

dim za(0) as Integer ' the array of the numbers

lotto 49,6,za ' 6 of 49 in Germany


' and display them
staticText1.text=str(za(0))+chr(13)+str(za(1))+chr(13)+str(za(2))+chr(13)+str(za(3))+chr(13)+str(za(4))+chr(13)+str(za
End Sub
```

### 216.0.102 How to do an asycron DNS lookup?

Plugin Version: all, Platform: Windows.

**Answer:** use CFHostMBS class (Mac OS X only).
**Notes:** Xojo internal functions and plugin DNS functions are sycronized.
You can use DNSLookupThreadMBS class for doing them asyncron.

### 216.0.103 How to draw a dushed pattern line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can try this code:
**Example:**

```
// call like this: DrawDushedPatternLine g,0,0,width,height,10

Sub DrawDushedPatternLine(g as graphics,x1 as Integer,y1 as Integer,x2 as Integer,y2 as Integer, partlen
as Integer)
dim x,y,ox,oy as Double
dim dx,dy as Double
```

```
dim w,h,d as Double
dim b as Boolean

w=x2-x1
h=y2-y1

d=sqrt(w*w+h*h)

dx=w/d*partlen
dy=h/d*partlen

b=true
x=x1
while (x<x2) and (y<y2)
ox=x
oy=y

x=x+dx
y=y+dy

if b then
g.DrawLine ox,oy,x,y
end if

b=not b
wend


End Sub
```

**Notes:** It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

### 216.0.104 How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

This code can help you althrough it's not perfect.
You need to set lc to the current color you use.
**Example:**

```
Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as color)
```

```
dim intX, intY, count, n, xDiff, yDiff as Integer
dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
dim c as color

const st=1.0

xDiff=xe-xs
yDiff=ye-ys
count=max(abs(xDiff), abs(yDiff))
xStep=xDiff/count
yStep=yDiff/count
xx=xs
yy=ys
for n=1 to count
intX=xx
intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

End Sub
```

**Notes:**

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

### 216.0.105 How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.
**Notes:** For example show ResultSet class: javap -s java.sql.ResultSet

### 216.0.106 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use code like this function:
**Example:**

```
Function Duplicate(extends p as Picture) As Picture
#if RBVersion >= 2011.04 then
if p.HasAlphaChannel then

// create nw picture and copy content:
dim q as new Picture(p.Width, p.Height)
q.Graphics.DrawPicture p,0,0

Return q

end if
#endif

// create new picture
dim q as new Picture(p.Width, p.Height, 32)

// get mask
dim oldMask as Picture = p.mask(false)
if oldMask = nil then
// no mask, so simple copy
q.Graphics.DrawPicture p,0,0
Return q
end if

// remove mask
p.mask = nil

// copy picture and mask
q.Graphics.DrawPicture p, 0, 0
q.mask.Graphics.DrawPicture oldMask,0,0

// restore mask
```

```
p.mask = oldmask

Return q
End Function
```

**Notes:** Simply copy it to a module and call it like this: q = p.duplicate.
The code above works with old Xojo versions because of the #if even if your RS version does not support alpha channel pictures. This way it's future proof.

### 216.0.107 How to enable assistive devices?

Plugin Version: all, Platform: macOS.

**Answer:** You can use AppleScript code like below:
**Notes:**

```
tell application "System Events"
activate

set UI elements enabled to true

return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

### 216.0.108 How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use code like this:
**Example:**

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")

// read input
dim bi as BinaryStream = BinaryStream.Open(fi)
dim si as string = bi.Read(bi.Length)
bi.Close

// encrypt
dim so as string = BlowfishMBS.Encrypt("MyKey",si)
```

```
// write output
dim bo as BinaryStream = BinaryStream.Create(fo)
bo.Write so
bo.Close
```

**Notes:** Of course you can decrypt same way, just use Decrypt function and of course swap files.

### 216.0.109 How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:
**Example:**

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)

MsgBox text // shows: Gr√º√üe
```

**Notes:** You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.
DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √§.

### 216.0.110 How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Try this code:
**Example:**

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim item as folderitem = folder.trueitem(i)
if item = nil then
// ignore
elseif item.directory then
// folder
if item.count = 0 then
// found empty folder
```

```
end if
end if
next
```

### 216.0.111 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

**Answer:** You can try Launch Services.
**Example:**

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath
```

### 216.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

**Answer:** You can use our plugin to build a lookup table.
**Example:**

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
```

```
dim IPv4s() as string = n.IPv4s
dim IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>"" then
map.Value(n.MAC) = n.Name
end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
end if
next

End Function
```

**Notes:** The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

### 216.0.113 How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use code like this:
**Example:**

```
// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("","com.microsoft.Word","")

// open bundle
dim c as new NSBundleMBS(f)

// read info
```

```
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion","")
```

**Notes:** Older versions of Word can be found with creator code "MSWD".

### 216.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

**Answer:** You probably connect with SSL and you have no valid certificate.
**Example:**

```
dim d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

**Notes:** You can either use the code above to disable the SSL verification and have no security.
Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:
http://curl.haxx.se/ca/

### 216.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

**Answer:** You can use the FormatMBS function for this.
**Example:**

```
dim d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
```

```
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)
```

**Notes:** see FormatMBS for details.
In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

### 216.0.116 How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the WebSession.GMTOffset property.
**Example:**

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

### 216.0.117 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** This function returns a handle for the frontmost window:
**Example:**

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

### 216.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** Use code like this:
**Example:**

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianDateMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim x as Double = at.Value

MsgBox str(x)
```

**Notes:** As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

### 216.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the WebSession.RemoteAddress property.
**Example:**

```
Sub Open()
```

```
Title = Session.RemoteAddress
End Sub
```

### 216.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use the SetFontSearchPath method in the CDBaseChartMBS class to specify where your fonts are.
**Example:**

```
if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf","/usr/share/fonts/truetype/piboto/Pi
#EndIf
```

**Notes:** On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

### 216.0.121 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use the AddFontSearchPath method in the DynaPDFMBS class to specify where your fonts are.
**Example:**

```
dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
```

```
else
// on Mac and Windows we use system fonts.
end if
```

**Notes:** On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

### 216.0.122 How to get GMT time and back?

Plugin Version: all, Platform: macOS.

**Answer:** You can use the date class and the GMTOffset property.
**Example:**

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+" "+str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim f as new date

// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset

MsgBox d.ShortTime+" ("+str(d.GMTOffset)+") "+str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" ("+str(e.GMTOffset)+") "+str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" ("+str(f.GMTOffset)+") "+str(f.TotalSeconds,"0.0")
```

**Notes:** It's sometimes a bit tricky with the date class as setting one property often changes the others.

### 216.0.123 How to get good crash reports?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Check this website from the webkit website:
**Notes:** http://webkit.org/quality/crashlogs.html

### 216.0.124 How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use the runtime module like in this function:
**Example:**

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
dim t() as Thread

Dim o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

**Notes:** This returns an array of all thread objects currently in memory.
The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

### 216.0.125 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the Webpage.ParametersReceived event.
**Example:**

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->"+Variables.Value(key)
next
End Sub
```

**Notes:** The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

### 216.0.126 How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

**Answer:** Ask the appearance manager:
**Example:**

```
Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as Boolean, outColor as Ptr) as Integer

dim i as Integer
dim col as MemoryBlock

col = newMemoryBlock(6)

i = GetThemeTextColor(inColor, inDepth, inColorDev, col)

return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
End Function
```

**Notes:** The color for this is:

const kThemeTextColorDialogInactive = 2.

c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

### 216.0.127 How to get the current free stack space?

Plugin Version: all, Platform: macOS.

**Answer:** You can something like the code below:
**Example:**

```
Sub ShowStackSize()
dim threadid as Integer
```

```
dim size as Integer

declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
declare function ThreadCurrentStackSpace lib "Carbon" (threadid as Integer, byref size as Integer) as short

if GetCurrentThread(threadid)=0 then
if 0=ThreadCurrentStackSpace(threadid,size) then
MsgBox str(size)
end if
end if
End Sub
```

**Notes:** For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

### 216.0.128 How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:**

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.
Or code like below:
**Example:**

```
Function GMTOffsetInMinutes() as Integer
// Returns the offset of the current time to GMT in minutes.
// supports Mac OS and Windows, but not Linux yet (let me know if
// you have code for that, please)
//
// Note that the offset is not always an even multiple of 60, but
// there are also half hour offsets, even one 5:45h offset

// This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
// with a fix that should also make it work with future Intel Mac targets.
//
// Using code from various authors found on the RB NUG mailing list

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)
```

```
info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// – Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function
```

### 216.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

**Answer:** The code below returns the current window title for the frontmost window on Mac OS X if Accessibilty services are
**Example:**

```
Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
Return cs.str
end if
end if
end if
end if
End Function
```

### 216.0.130 How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

**Answer:** On Mac OS you can use GetCaretTime from the toolbox.
**Example:**

```
declare function GetCaretTime lib "Carbon" () as Integer

MsgBox str(GetCaretTime())+" ticks"
```

**Notes:** 60 ticks make one second.

### 216.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

**Answer:**

Use the AppleScript like this one:

```
tell application "finder"
return selection
end tell
```

Which translates into this AppleEvent:

```
Process("Finder").SendAE "core,getd,'—-':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() }
"
```

and as Xojo code it looks like this:
**Example:**

```
dim ae as appleevent
dim o1 as appleeventObjectSpecifier
dim f as folderItem
dim aList as appleeventdescList
dim i as Integer
dim dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—-")=o1

// send it
if ae.send then
// got the list
alist=ae.replyDescList
```

```
// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItemItem(i)

dateiname=f.name
// editfield1 with property "mulitline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
end if
```

### 216.0.132 How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

**Answer:** The following code queries the value and displays the version number:
**Example:**

```
dim first as Integer
dim second as Integer
dim third as Integer
dim l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+"."+str(Second)+"."+str(third)
else
msgbox "Mac OS "+str(First)+"."+str(Second)+"."+str(third)
end if
```

### 216.0.133 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
Dim s As String
Dim b As Boolean
Dim i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)
For i =Len(s)-1 DownTo 1
s=Left(s,i)+"."+Mid(s,i+1)
Next
MsgBox "Systemversion: Mac OS " + s
end if
```

**Notes:** The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

### 216.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Notes:** Use the Screen class with the available* properties.

### 216.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Notes:** Make yourself a class for the WindowRect with four properties:

```
Bottom as Integer
Left as Integer
Right as Integer
Top as Integer
```

Add the following method to your class:

```
Sub GetWindowRect(windowhandle as Integer)
dim err as Integer
dim mem as memoryBlock
#if targetwin32 then
```

```
Declare Function GetWindowRect Lib "user32.dll" (hwnd as Integer, ipRect As Ptr) as Integer

mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)
#endif
End Sub
```

Good to use for the MDI Master Window!

### 216.0.136 How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
// for Windows:

msgbox HTMLViewer1.IEHTMLTextMBS

// for MacOS with WebKit 2.x:

msgbox HTMLViewer1.WKWebViewMBS.HTMLText
```

### 216.0.137 How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You need to install some requuire packages.
**Notes:** You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

### 216.0.138 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Sometimes it may be better to use an extra application to process images.
**Notes:** A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

### 216.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like this function:
**Example:**

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event

Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
else
// forward
```

```
// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function
```

**Notes:** You call it from CellKeyDown event like this:

```
EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler
```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

### 216.0.140 How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:
**Example:**

```
Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
```

```
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub
```

**Notes:** No need to call the method.
Just having it in a window or app, will cause the compiler to hard link the framework.

### 216.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.
**Example:**

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)
```

**Notes:** See our Create PDF example for the Xojo Web Edition.

### 216.0.142 How to hide all applications except mine?

Platform: macOS.

**Answer:** The code below will on Mac OS hide all applications except your one:
**Example:**

```
dim p as new ProcessMBS

p.GetFirstProcess
do
```

```
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

### 216.0.143 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** Set Internet Explorer to silent mode with code like this:
**Example:**

```
htmlviewer1._ole.Content.value("Silent") = True
```

**Notes:** Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

### 216.0.144 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** If you want to hide something in a chart, simply assign the kTransparent constant as color.

### 216.0.145 How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Try this declare:
**Example:**

```
Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")

HideCursor
```

**Notes:** The MBS Plugin has this function and supports it on Windows, too.

### 216.0.146 How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** With NSTextViewMBS you can use this code to insert file:
**Example:**

```
// insert a file to textview

Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
// read to file
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

**Notes:** For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

## 216.0.147 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** You can use javascript to change the current window's location.
**Example:**

```
// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16"""
end if
```

### 216.0.148 How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.
**Example:**

```
Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function
```

### 216.0.149 How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.
**Notes:** If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

```
nohup /webapps/MyApp/MyApp &
```

you can simply have a second line saying this:

```
renice 20 $ !
```

which tells the system to lower priority to lowest value for the latest background process.

### 216.0.150 How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can kill a process (or application) by name if you loop over all the processes and kill the one you need.
**Example:**

```
dim p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
```

```
end if
loop until not p.GetNextProcess
```

**Notes:** You may want to check the result of killProcess function. Not every user is allowed to kill every application.

### 216.0.151 How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

**Answer:** Try this function:
**Example:**

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer

Return MPProcessors()
End Function
```

**Notes:** Your app will than need that library to launch on Classic. To avoid this the MBS plugin checks if this library is available and return 1 if it's not available.

### 216.0.152 How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** On Mac you can use a helper function like this this code:
**Example:**

```
Public Function CallingFunction() as string
// Query name of calling function of a function

#Pragma BreakOnExceptions false

try

// raise a dummy exception
dim r as new NilObjectException
raise r

catch x as NilObjectException
```

```
// get stack
dim stack() as string = x.Stack

// pick function name and return
dim name as string = stack(2)
Return name

end try
End Function
```

**Notes:** You need to include function names in your application.

### 216.0.153 How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

**Answer:** Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):
**Example:**

```
Dim a as AppleEvent
dim creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—-") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else

end if
```

### 216.0.154 How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use this code:
**Example:**

```
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("","com.apple.DiskUtility","")
```

```
if f<>Nil then
f.Launch
end if
```

**Notes:** This works even if people renamed the disc utility or moved it to another folder.

### 216.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You may try to embed your changes to the database between two transaction calls.
**Example:**

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

**Notes:** This can increase speed by some factors.

### 216.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

**Answer:** You can use code like this:
**Example:**

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
dim n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

**Notes:** The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size

in points.
You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

### 216.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this declares:
**Example:**

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).

Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H80880000

Dim styleFlags as Integer

#If TargetWin32 Then

Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer

styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )

#EndIf
```

### 216.0.158 How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
```

```
dim ev as AppleEvent
dim myResult as boolean
dim properties as AppleEventRecord

ev = NewAppleEvent("core","crel","MACS")
ev.MacTypeParam("kocl") = "alis"
ev.FolderItemParam("to ") = target
ev.FolderItemParam("insh") = folder

properties=new AppleEventRecord
properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub
```

**Notes:** Call it like this:
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"

Seems to not work on Mac OS X 10.6

### 216.0.159 How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

**Answer:** use "ignoring application responses" like in this example:
**Notes:** on run { fn,fpx,fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

### 216.0.160 How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

**Answer:**

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

```
dim doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDblTime Lib "Carbon" () as Integer
doubleClickTime = GetDblTime()
#endif

#if targetWin32 then
Declare Function GetDoubleClickTime Lib "User32.DLL" () as Integer
doubleClickTime = GetDoubleClickTime()/60 // convert to ticks from milliseconds
#endif

currentClickTicks = ticks
//if the two clicks happened close enough together in time
if (currentClickTicks - lastClickTicks) <= doubleClickTime then
//if the two clicks occured close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occured so call the event
end if
end if
lastClickTicks = currentClickTicks
lastClickX = X
lastClickY = Y
```

10. Now to test out your new DoubleClickCanvas, drag the class from the Project window to a window in your project to create an instance of it.

11. Double-click on the canvas you just added to your window to open the Code Editor. Notice that the canvas has a DoubleClick event handler. In this event handler, add the following code:

```
BEEP
```

### 216.0.161 How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

**Answer:** Just inform the Mac OS about some system activity with code like this:
**Example:**

```
Sub UpdateSystemActivity()

#if TargetCarbon
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short
```

```
const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */

dim e as Integer

e=myUpdateSystemActivity(UsrActivity)

// you may react on an error if e is not 0 after the call.

#endif
End Sub
```

**Notes:** You may use another constant if you prefer some different behavior.
Call it maybe every second.

### 216.0.162 How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

**Answer:** There are excellent articles about how to make a registratin code scheme, but you can also simply use our RegistrationEngineMBS class.
**Notes:** If you need a license text, why not use the one from Xojo as a starting point?

### 216.0.163 How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

**Answer:** You can try this code on Mac OS X:
**Example:**

```
'/*
'* Use the control's default drawing variant. This does not apply to
'* Scroll Bars, for which Normal is Large.
'*/
const kControlSizeNormal = 0

'/*
'* Use the control's small drawing variant. Currently supported by
'* the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
'* controls.
```

```
'*/
const kControlSizeSmall = 1

'/*
'* Use the control's small drawing variant. Currently supported by
'* the Indeterminate Progress Bar, Progress Bar and Round Button
'* controls.
'*/
const kControlSizeLarge = 2

'/*
'* Control drawing variant determined by the control's bounds. This
'* ControlSize is only available with Scroll Bars to support their
'* legacy behavior of drawing differently within different bounds.
'*/
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))
```

### 216.0.164 How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

**Answer:** You can run a build script on each build with this code:
**Example:**

```
Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")
```

**Notes:** This will set the NSUIElement flag to YES.

### 216.0.165 How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like below:
**Example:**

```
Function MoveToTrash(f as FolderItem) As Boolean
#if TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFileOperationDefaultOptions)

if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function
```

**Notes:** If you want to move a file to trash, you could use f.movefileto f.trashfolder, but that will overwrite existing files in the trash. You can use our MacFileOperationMBS class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use WindowsFileCopyMBS class.
Requires Mac OS X 10.5.

### 216.0.166 How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

**Answer:** This makes SimpleText (Code ttxt) to the frontmost application:
**Example:**

```
dim a as appleevent

a=newappleEvent("misc","actv","ttxt")

if a.send then
end if
```

**Notes:** (Code is Mac only)

### 216.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can set post/pre quotes to have ftp commands executed before or after the download/upload.
**Example:**

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"

d.SetOptionPostQuote(ws)
```

**Notes:** Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.
The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. So rename is two commands. First RNFR to tell where to rename from and second RNTO with the new file name. To delete use DELE and the file path.

### 216.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like below:

**Example:**

```
Function Normalize(t as string) As string
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)

Return m.str
End Function
```

**Notes:** This uses Apple's CFString functions to normalize unicode variants.

### 216.0.169 How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Try this declare:
**Example:**

```
Declare Sub ObscureCursor Lib "Carbon" ()

ObscureCursor
```

**Notes:** The MBS Plugin has this function, but it's not supported for Windows.

### 216.0.170 How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Use the NSImageMBS class like this:
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
dim n as new NSImageMBS(f)

window1.Backdrop = n.CopyPictureWithMask
```

### 216.0.171 How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

**Answer:** Try this code:
**Example:**

```
dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if
```

**Notes:** On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

### 216.0.172 How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

**Answer:** You can use our OpenMacOSXPreferencesPaneMBS function like this:
**Example:**

```
dim e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if
```

### 216.0.173 How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** We have functions for that in Cocoa and Carbon.
**Example:**

```
dim a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

**Notes:** For Cocoa, you can use orderFrontCharacterPalette method in NSApplicationMBS class.

Or simply for Carbon and Cocoa the ShowCharacterPaletteMBS method.

### 216.0.174 How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the WebPicture class.
**Notes:** Take your picture and create a WebPicture object. Store this WebPicture in a property of the WebPage, Session or app (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.
Having pictures in App or some module reuses the same picture for all sessions which reduces memory footprint.
This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our Map example.

### 216.0.175 How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use code like this:
**Example:**

```
dim s as string = "<test><test /></test>"

try
dim x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try
```

**Notes:** If you got an exception, you have a parse error.

### 216.0.176 How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use the HTML5 audio tag and control it with javscript.
**Notes:** This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```
audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"

audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"
```

Next in the open event of the webpage we have a PageSource control. The location is set to be before

content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

dim urlo as string = app.audioFileOGG.URL
dim urlm as string = app.audioFileM4V.URL
me.Source = ”<audio id=””mymusic”” preload=””auto””><source src=”””+urlo+””” type=””audio/ogg”” /><source src=”””+urlm+””” type=””audio/mpeg”” />Your browser does not support the audio element.</audio>”

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID ”mymusic” which is the ID of our audio tag above. Once we got the object, we call it’s play method to start playback.

me.ExecuteJavaScript(”document.getElementById(’mymusic’).play();”)

same for pause:

me.ExecuteJavaScript(”document.getElementById(’mymusic’).pause();”)

and finally for changing volume:

me.ExecuteJavaScript(”document.getElementById(’mymusic’).volume=”+str(me.Value/100.0)+”;”)

### 216.0.177 How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the XML Transform method with the right XLS.
**Notes:** Learn more here:
http://docs.xojo.com/index.php/XMLDocument.Transform

### 216.0.178 How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** This code below shows how to redirect printing to a PDF file on Mac OS X.
**Example:**

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```

**Notes:** And you can use normal graphics class for that.

### 216.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

**Answer:** You can use a MDItemMBS objec to query this value:
**Example:**

```
Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Dim xMDItem as New MDItemMBS(F)
Dim xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
```

```
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function
```

**Notes:** Thanks for Josh Hoggan for this example code.

### 216.0.180 How to quit windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Example:**

```
#if targetwin32 then
dim i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
end if

#endif
```

**Notes:** uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

### 216.0.181 How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:
**Example:**

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")

List.AddRow ""
dim u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

**Notes:** Please make sure you choose the right text encoding.

### 216.0.182 How to read the command line on windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Example:**

```
#if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

**Notes:** Newer Xojo versions have a system.commandline property.

### 216.0.183 How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

**Answer:** Try this code:
**Example:**

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask

next

end if
```

**Notes:** PDFKit works only on Mac OS X.

### 216.0.184 How to restart a Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Ask the Finder via Apple Events:
**Example:**

```
dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if
```

### 216.0.185 How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** CURL supports that and you simply need to set the right options.
**Notes:** First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value.
Don't forget to implement the read event and return data there as requested.

### 216.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** This code opens a PDF and draws the first page into a new PDF with 90¬∞ rotation.
**Example:**

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90¬∞
c.RotateCTM pi*1.5

// fix origin
```

```
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage

c = nil

// show in PDF viewer
destfile.Launch
```

**Notes:** This code is Mac only as it needs CoreGraphics.

### 216.0.187 How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

**Answer:** Use the code like the one below:
**Example:**

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
```

```
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

### 216.0.188 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Install 32 bit compatibility libraries.
**Notes:** The package is called ia32-libs for ubuntu (and others).
Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

### 216.0.189 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

**Answer:** You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.
**Example:**

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

// save html to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

**Notes:** You may want to reset options later.
This code is only for Mac OS X.

### 216.0.190 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** With NSTextViewMBS you can use this code to save to RTFD:
**Example:**

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtfd")

if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as NSFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

dim e as NSErrorMBS
if w.writeToFile(f, e) then

else
MsgBox e.LocalizedDescription
end if
```

**Notes:** For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

### 216.0.191 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** How to load PDF to htmlviewer on desktop?
**Example:**

```
Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Dim base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Dim dataURL As String = "data:application/pdf; base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub
```

**Notes:** This avoids a temporary file, which may also work.

For Web Apps, please use WebFile.

### 216.0.192 How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** For a proportional scaling, we calculate the new picture size relative to the target maximum size.
**Example:**

```
Function ProportinalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if


// return result
Return NewPic
End Function
```

**Notes:** This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

### 216.0.193 How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** For a proportional scaling, we calculate the new picture size relative to the target maximum size.
**Example:**

```
Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function
```

**Notes:** This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

### 216.0.194 How to scale/resize a CIImageMBS?

Plugin Version: all, Platform: Windows.

**Answer:** Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.
**Example:**

```
Dim pic As Picture = LogoMBS(500)
Dim image As CIImageMBS = CIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
```

```
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result
```

**Notes:** This is same code as our scaleTo convenience method.

### 216.0.195 How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

**Answer:** There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.
**Example:**

```
dim Original,Scaled as Picture

Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)
```

**Notes:** The plugin ways:
- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.
- CIImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:
- make a new picture and draw the old one with new size inside.

### 216.0.196 How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can specify unicode characters in search string with backslash x and digits.
**Example:**

```
dim r as RegExMbs
dim s as string
dim c as Integer

s="123 √§√√º ABC 456"

r=new RegExMBS
if r.Compile(".√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile(".\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if
```

### 216.0.197 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

**Answer:** Try this function:
**Example:**

```
Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim g as folderitem
```

```
If Left(F.Name,1)="." or not f.visible Then
Return True
End If

g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)
If S=F.name Then
Return True
End If
Next
end if
End if
End Function
```

### 216.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You use the pragma cache_size command on the database.
**Example:**

```
// set cache size to 20000 pages which is about 20 MB for default page size
dim db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"
```

**Notes:** Default cache size is 2000 pages which is not much.
You get best performance if whole database fits in memory.
At least you should try to have a cache big enough so you can do queries in memory.
You only need to call this pragma command once after you opened the database.

### 216.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

**Answer:** Try this declares:
**Example:**

```
window1.ModifiedMBS=true
```

### 216.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use a WebHTMLViewer control and load the
**Example:**

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL
```

**Notes:** See our Create PDF example for the Xojo Web Edition.

### 216.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

**Answer:** Use Xojo or AppleScript to launch the KeyboardViewerServer.app.
**Example:**

```
dim a as new AppleScriptMBS
dim text as string
dim lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer"""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-Support/KeyboardViewerServer.app"""
lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
```

```
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

text=join(lines,EndOfLine.macintosh)

a.Compile text
a.Execute
```

**Notes:** AppleScript code:

```
set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/KeyboardViewerServer.app"

set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15

ignoring application responses
tell application POSIXPath to run
end ignoring
```

### 216.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Try this declare:
**Example:**

```
Declare Sub ShowCursor Lib "Carbon" ()

ShowCursor
```

**Notes:** The MBS Plugin has this function and supports it on Windows, too.

### 216.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Ask the Finder via Apple Events:
**Example:**

```
dim ae as appleevent
ae=newappleEvent("FNDR","shut","MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if
```

**Notes:** Or toolbox call (Attention: This method will stop the computer immediataly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

### 216.0.204 How to sleep a Mac?

Plugin Version: all, Platform: macOS.

**Answer:** Ask the Finder via Apple Events:
**Example:**

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

### 216.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Here a few speed tips:
**Notes:**

- Use the DynaPDFRasterizerMBS function instead of our render functions.
- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.

- Import only the PDF pages you want to display.
- Let DynaPDF do zooming, rotating or other effects instead of you change it.

### 216.0.206 How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** The PDFlib plugin was discontinued in favor of our DynaPDF plugin.
**Notes:** If you need help to move, please contact us.

### 216.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Just double them.
**Example:**

msgbox "This String contains ""quotes""."

### 216.0.208 How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.
**Notes:** If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.
The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:
SetEnv SYBROOT /opt/sybase
SetEnv SYBASE_OCS /opt/sybase
SetEnv SYBASE /opt/sybase

### 216.0.209 How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

**Answer:**

I was saving a registration code for an app to the Preferencefolder.
People on the list have suggested that it would be better in
the ApplicationSupportFolder. How do I save the file called CWWPrefs
into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

```
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

**Example:**

```
dim folder,file as FolderItem

folder = createApplicationSupportFolderMBS(-32763)

if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if

file=folder.Child("CWWPrefs")

MsgBox file.NativePath
```

**Notes:**

You may not be able to write there with a normal user account!

### 216.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

**Answer:** You can use the following code which does this using the SoftDeclareMBS class.
**Example:**

```
Sub Open()
dim c as CFDateMBS
dim t as CFAbsoluteTimeMBS

// get current date
c=NewCFDateMBS
```

```
// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights
Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As cfarrayMBS
dim s as SoftDeclareMBS
dim m as MemoryBlock

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMCopyScheduledPowerEvents") then
if s.CallFunction(0,nil) then
Return NewCFArrayMBSHandle(s.Result,true)
else
MsgBox "Failed to Call IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOKit."
end if

Return nil
End Function

Function SchedulePowerEvent(time_to_wake as CFDateMBS, Type as CFStringMBS) as Integer
dim s as SoftDeclareMBS
dim m as MemoryBlock

'/*
'* Types of power event
'* These are potential arguments to IOPMSchedulePowerEvent().
```

```
'* These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaries
'* returned by IOPMCopyScheduledPowerEvents().
'*/
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
'*/
'#define kIOPMAutoWake "wake"
'
'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.
'*/
'#define kIOPMAutoPowerOn "poweron"
'
'/*!
'@define kIOPMAutoWakeOrPowerOn
'@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
'power on, whichever is necessary.
'*/
'
'#define kIOPMAutoWakeOrPowerOn "wakepoweron"
'/*!
'@define kIOPMAutoSleep
'@abstract Value for scheduled sleep.
'*/
'
'#define kIOPMAutoSleep "sleep"
'/*!
'@define kIOPMAutoShutdown
'@abstract Value for scheduled shutdown.
'*/
'
'#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

if s.CallFunction(3,m) then
Return s.Result
end if
```

```
end if
end if

End Function
```

**Notes:** Requires Mac OS X and to execute root rights.

### 216.0.211 How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:
**Example:**

```
Function IsGUID(guid as string) As Boolean
dim r as new RegEx

r.SearchPattern = "^(\{ { 0,1 } ( [ 0-9a-fA-F ] ) { 8 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 12 } \} { 0,1 } )$ "

Return r.Search(guid)<>nil
End Function
```

**Notes:** Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

### 216.0.212 How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use code like this one:
**Example:**

```
Sub Walk(folder as FolderItem)
dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0

dim currentFolder as FolderItem = folders.pop
```

```
dim c as Integer = currentFolder.Count
for i as Integer = 1 to c
dim item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then
// no permission
elseif item.Visible then // only visible

if item.Directory then
folders.Append item
else
// work with file here
end if

end if

next

wend
End Sub
```

**Notes:** As you see we go with a long loop which runs until we don't have more folders to process.
We ignore items we can't access due to permission limits.
And we only work visible items.
If you like, check folderitem.isBundleMBS on item to handle packages and applications better on Mac OS X.

### 216.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

**Answer:** The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.
**Notes:** We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

### 216.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** There are two main reasons.
**Notes:** 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.
On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.
In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the tempory files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check
textasciitilde /Library/Caches and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

### 216.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

**Answer:** You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.
**Example:**

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub

Sub DropObject(obj As DragItem)
dim s as string
```

```
dim f as folderItem
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim file as FolderItem

if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")

// Parse XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBSCFStringMBS(CFStringMBS(o),nil)

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if
```

```
end if
end if
End Sub
```

**Notes:** The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

### 216.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

**Answer:** If you draw this in a listbox cellbackground, you need to draw on the correct position
**Example:**

```
Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
dim f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function
```

**Notes:** Try this in a listbox. The Graphics object there has a cliping and an offset which the plugin doesn't know about.

### 216.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

**Answer:**

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.
**Notes:**

See Window.Transition functions.

### 216.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

**Answer:** Stand alone.
**Notes:** Xojo compiles all used plugins into the application binary.
Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdflib for some classes)

### 216.0.219 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

**Answer:** I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?
**Example:**

```
' Window.Open Event of a blank project:

dim i as Integer

for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found
```

**Notes:** This test application shows the keycode (decimal) 63 for the fn key.

### 216.0.220 Is there a case sensitive Dictionary?

Plugin Version: all.

**Answer:** The MBS Plugin has several classes which can work as a replacement.
**Notes:** First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.
If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

IntegerToIntegerHashMapMBS class
IntegerToIntegerOrderedMapMBS class

IntegerToStringHashMapMBS class
IntegerToStringOrderedMapMBS class
IntegerToVariantHashMapMBS class
IntegerToVariantOrderedMapMBS class
StringToStringHashMapMBS class
StringToStringOrderedMapMBS class
StringToVariantHashMapMBS class
StringToVariantOrderedMapMBS class

### 216.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can use the DirectorySizeMBS class for this as in the example below:
**Example:**

```
dim d as DirectorySizeMBS

d=new DirectorySizeMBS

// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

**Notes:** Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

### 216.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

**Answer:** Use the code below:
**Example:**

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

### 216.0.223 List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** We have a list of windows error codes on our website.
**Notes:** http://www.monkeybreadsoftware.de/xojo/winerror.shtml

### 216.0.224 Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** The issue is system related, not a problem with RB or the plugin.
**Notes:** Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

### 216.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

**Answer:** Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:
**Notes:** Just a list of checks to do for linux apache installations:

- You have 64bit linux? Than you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.
- The app file itself is executable? Set permissions to 755.
- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)
- You uploaded config.cfg file and made it writable? Set permissions to 666.
- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?
- You uploaded the app file and libraries as binary files? Upload as text breaks them.
- You did upload the libs folder?
- You don't have code in app.open, session.open and other events which crashes app right at launch?
- You don"t have a print command in your app.open event? (see feedback case 23817)
- You allowed htaccess file to overwrite permissions?

### 216.0.226 SQLDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Before you can use SQLDatabaseMBS, it must be initialized.
**Example:**

```
dim d as new SQLDatabaseMBS
```

**Notes:** This happens normally when you use "new SQLDatabaseMBS".
But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happend, yet.
So please simply add a line "dim d as new SQLDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

### 216.0.227 Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output.
This should be fixed with RB5.
**Notes:**

Xojo seems not to support Textconverters at all on Windows.

### 216.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

**Answer:** The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:
**Notes:** Cocoa NSObject to Variant:

nil ->nil
NSDictionary ->Dictionary
NSData ->MemoryBlock
NSString ->String
NSAttributedString ->NSAttributedStringMBS
NSDate ->Date
NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
NSURL ->String
NSValue with NSRect ->NSRectMBS
NSValue with NSPoint ->NSPointMBS
NSValue with NSSize ->NSSizeMBS
NSValue with NSRange ->NSRangeMBS
NSValue with QTTime ->QTTimeMBS
NSValue with QTTimeRange ->QTTimeRangeMBS
NSArray ->Array of Variant
QuartzFilter ->QuartzFilterMBS

- ->*MBS

Variant to Cocoa NSObject:

nil ->nil
Dictionary ->NSDictionary
Boolean ->NSNumber

Integer ->NSNumber
Color ->NSColor
Int64 ->NSNumber
Single ->NSNumber
Double ->NSNumber
Date ->NSDate
MemoryBlock ->NSData
String ->NSString
NSImageMBS ->NSImage
NSAttributedStringMBS ->NSAttributedString
NSColorMBS ->NSColor
NSRectMBS ->NSValue with NSRect
NSSizeMBS ->NSValue with NSSize
NSPointMBS ->NSValue with NSPoint
NSRangeMBS ->NSValue with NSRange
NSBurnMBS ->NSBurn
NSViewMBS ->NSView
NSFontMBS ->NSFont
NSParagraphStyleMBS ->NSParagraphStyle
NSAttributedStringMBS ->NSAttributedString
WebPolicyDelegateMBS ->WebPolicyDelegate
WebUIDelegateMBS ->WebUIDelegate
WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
NSIndexSetMBS ->NSIndexSet
QTTimeMBS ->QTTime
QTTimeRangeMBS ->QTTimeRange
Array of Variant ->NSArray
Array of String ->NSArray
CFStringMBS ->NSString
CFNumberMBS ->NSNumber
CFDataMBS ->NSData
CFURLMBS ->NSURL
CFArrayMBS ->NSArray
CFDictionaryMBS ->NSDictionary
CFBinaryDataMBS ->NSDate

Carbon CFTypeRef to Variant:

CFDictionaryRef ->Dictionary
CFStringRef ->String
CFDataRef ->String
CFURL ->String
CFNumber ->Integer/Double/Int64
CFArray ->Array
CFDate ->date
nil ->nil

CGColorSpace ->CGColorSpaceMBS
CGColor ->CGColorMBS
CGImage ->CGImageMBS
CF* ->CF*MBS

Variant to Carbon CFTypeRef:

Dictionary ->CFDictionaryRef
Boolean ->CFBooleanRef
Color ->CFNumberRef
Integer ->CFNumberRef
Int64 ->CFNumberRef
Single ->CFNumberRef
Double ->CFNumberRef
String ->CFStringRef
Color ->CGColorRef
Date ->CFDateRef
nil ->nil
Memoryblock ->CFDataRef
FolderItem ->CFURLRef
Dictionary ->CFDictionaryRef
Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
CGRectMBS ->CGRect as CFDataRef
CGSizeMBS ->CGSize as CFDataRef
CGPointMBS ->CGPoint as CFDataRef
CGColorMBS ->CGColor
CGColorSpaceMBS ->CGColorSpace
CGImageMBS ->CGImage
CGDataConsumerMBS ->CGDataConsumer
CGDataProviderMBS ->CGDataProvider
CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

### 216.0.229 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

**Answer:** If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

### 216.0.230 What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.
**Notes:** CarbonHotKeyMBS will also work fine in Cocoa apps.

### 216.0.231 What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** In order to get our plugins working on Linux systems without GUI, the plugin loads graphics libraries dynamically.
**Notes:** To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so"
- libgtk-x11-2.0.so.0"
- /usr/lib/libgtk-x11-2.0.so"
- /usr/lib32/libgtk-x11-2.0.so"
- /usr/lib/libgtk-x11-2.0.so.0"
- /usr/lib32/libgtk-x11-2.0.so.0"

gdk is loaded with this paths:

- libgdk-x11-2.0.so"
- libgdk-x11-2.0.so.0"
- /usr/lib/libgdk-x11-2.0.so"
- /usr/lib32/libgdk-x11-2.0.so"
- /usr/lib/libgdk-x11-2.0.so.0"
- /usr/lib32/libgdk-x11-2.0.so.0"

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

### 216.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

### 216.0.233 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

**Answer:**

Xojo 4.5 has a constant "SmallSystem" to use for a font name.
For older versions try this code:
**Example:**

```
Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef fontStyle as Integer)
dim err as Integer
dim theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub
```

### 216.0.234 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

**Answer:** Last Version with 10.4 support is version 15.4.
**Notes:** With version 15.4 you can build applications for OS X 10.4 and newer.
For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build a version of 16.x, but may need to charge for this by hour.

### 216.0.235 What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

**Answer:** Last Version with PPC is 15.4.
**Notes:** With version 15.4 you can build PPC applications for OS X 10.4 and newer.
For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but may need to charge for this by hour.

### 216.0.236 What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use version 23.0 or older.
**Notes:** We stopped including 32-bit code for macOS in version 23.1.
Please us older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

### 216.0.237 What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Time is server side and WebTimer client side.
**Notes:** Timer is the normal timer class in Xojo. It runs on the server. On the side the WebTimer runs on the client. It triggers a request to the server to perform the action. So a WebTimer is good to keep the connection running and the website updated regularly. A timer on the server is good to make regular jobs like starting a database backup every 24 hours.

### 216.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Below a list of function names known by LibXL.
**Notes:** LibXL parses the functions and writes tokens to the excel file. So even if Excel can do more functions, we can only accept the ones known by LibXL.

ABS, ABSREF, ACOS, ACOSH, ACTIVE.CELL, ADD.BAR, ADD.COMMAND, ADD.MENU, ADD.TOOLBAR, ADDRESS, AND, APP.TITLE, AREAS, ARGUMENT, ASC, ASIN, ASINH, ATAN, ATAN2, ATANH, AVEDEV, AVERAGE, AVERAGEA, BAHTTEXT, BETADIST, BETAINV, BINOMDIST, BREAK, CALL, CALLER, CANCEL.KEY, CEILING, CELL, CHAR, CHECK.COMMAND, CHIDIST, CHIINV, CHITEST, CHOOSE, CLEAN, CODE, COLUMN, COLUMNS, COMBIN, CONCATENATE, CONFIDENCE, CORREL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRITBINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAVERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COMMAND, DELETE.MENU, DELETE.TOOLBAR, DEREF, DEVSQ, DGET, DIALOG.BOX, DIRECTORY, DMAX, DMIN, DOCUMENTS, DOLLAR, DPRODUCT, DSTDEV, DSTDEVP, DSUM, DVAR, DVARP, ECHO, ELSE, ELSE.IF, ENABLE.COMMAND, ENABLE.TOOL, END.IF, ERROR, ERROR.TYPE, EVALUATE, EVEN, EXACT, EXEC, EXECUTE, EXP, EXPONDIST, FACT, FALSE, FCLOSE, FDIST, FILES, FIND, FINDB, FINV, FISHER, FISHERINV, FIXED, FLOOR, FOPEN, FOR, FOR.CELL, FORECAST, FORMULA.CONVERT, FPOS, FREAD, FREADLN, FREQUENCY, FSIZE, FTEST, FV, FWRITE, FWRITELN, GAMMADIST, GAMMAINV, GAMMALN, GEOMEAN, GET.BAR, GET.CELL, GET.CHART.ITEM, GET.DEF, GET.DOCUMENT, GET.FORMULA, GET.LINK.INFO, GET.MOVIE, GET.NAME, GET.NOTE, GET.OBJECT, GET.PIVOT.FIELD, GET.PIVOT.ITEM, GET.PIVOT.TABLE, GET.TOOL, GET.TOOLBAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, INDEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISERROR, ISLOGICAL, ISNA, ISNONTEXT, ISNUMBER, ISPMT, ISREF, ISTEXT, ISTHAIDIGIT, KURT, LARGE, LAST.ERROR, LEFT, LEFTB, LEN, LENB, LINEST, LINKS, LN, LOG, LOG10, LOGEST, LOGINV, LOGNORMDIST, LOOKUP, LOWER, MATCH, MAX, MAXA, MDETERM, MEDIAN, MID, MIDB, MIN, MINA, MINUTE, MINVERSE, MIRR, MMULT, MOD, MODE, MONTH, MOVIE.COMMAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORMSINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OPTIONS.LISTS.GET, OR, PAUSE, PEARSON, PERCENTILE, PERCENTRANK, PERMUT, PHONETIC, PI, PIVOT.ADD.DATA, PMT, POISSON, POKE, POWER, PPMT, PRESS.TOOL, PROB, PRODUCT, PROPER, PV, QUARTILE, RADIANS, RAND, RANK, RATE, REFTEXT, REGISTER, REGISTER.ID, RELREF, RENAME.COMMAND, REPLACE, REPLACEB, REPT, REQUEST, RESET.TOOLBAR, RESTART, RESULT, RESUME, RETURN, RIGHT, RIGHTB, ROMAN, ROUND, ROUNDBAHTDOWN, ROUNDBAHTUP, ROUNDDOWN, ROUNDUP, ROW, ROWS, RSQ, RTD, SAVE.DIALOG, SAVE.TOOLBAR, SCENARIO.GET, SEARCH, SEARCHB, SECOND, SELECTION, SERIES, SET.NAME, SET.VALUE, SHOW.BAR, SIGN, SIN, SINH, SKEW, SLN, SLOPE, SMALL, SPELLING.CHECK, SQRT, STANDARDIZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TERMINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREGISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

### 216.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

**Answer:** Use the SoftDeclareMBS class to load libraries dynamically.

### 216.0.240 What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.
**Notes:**

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

### 216.0.241 What to do with a NSImageCacheException?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** You need to add exception handlers for NSExceptionMBS in order to catch this exception.
**Notes:** You may also add code to write the stack of the exception into a log file for later locating the error source.

A NSImage has several image representations in memory. So basicly you pass in the base image and for whatever size an image is needed, the NSImage class will create a cache image representation of the requested size so on the next query it can use that cache for the same requested size.

### 216.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can get this error on MySQL if you have a recordset open while you create another one.

### 216.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

**Answer:** Please make sure the table and/or database fields have a text encoding set.
**Notes:** For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.
e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.
If encoding is set to none, it may get confused for non-ascii text.

### 216.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetActiveDisplayList.

### 216.0.245 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetDisplaysWithPoint.

### 216.0.246 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetDisplaysWithRect.

### 216.0.247 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetOnlineDisplayList.

### 216.0.248 Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Please use this replacement method:
**Example:**

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
```

```
Return t.FullName
End Function
```

**Notes:** GetObjectClassNameMBS was removed from the plugins.

### 216.0.249 Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** We removed NetworkAvailableMBS some versions ago. It was not working right and basicly it's not useful. If you want to check whether you have a network, than do a DNS resolve:
**Example:**

```
// two independend domain names
const domain1 = "www.google.com"
const domain2 = "www.macsw.de"

// resolve IPs
dim ip1 as string = DNSNameToAddressMBS(Domain1)
dim ip2 as string = DNSNameToAddressMBS(Domain2)

// if we got IPs and not the same IPs (error/login pages)
if len(ip1)=0 or len(ip2)=0 or ip1=ip2 then
MsgBox "no connection"
else
MsgBox "have connection"
end if
```

**Notes:** This way you can detect whether you got something from DNS. And you can make sure that a DNS redirection to a login page won't catch you.

### 216.0.250 Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

**Answer:** Use the function GetFTextHeight or GetFTextHeightEx.
**Notes:** Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

### 216.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

**Answer:** This class has been removed in favor of XLBookMBS class.
**Notes:** This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

### 216.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

Please visit this web page:
http://www.wotsit.org

### 216.0.253 Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

**Answer:**

Register at Apple:
http://developer.apple.com/dev/cftype/information.html

### 216.0.254 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

**Answer:** Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.
**Notes:** For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit
- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

### 216.0.255 Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

**Answer:** Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.
**Notes:** This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

### 216.0.256 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

**Answer:** Some RB versions require that you install DirectX from Microsoft on your Windows.

### 216.0.257 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

**Answer:** Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.
**Notes:** This bug is for several older Windows 95 editions.

### 216.0.258 Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

**Answer:** When the user presses a key, RB goes through all keydown event handlers till on returns true.
**Notes:** If no keydown event handler returns true for the key, a beep is performed.

### 216.0.259 Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.
**Notes:** A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

### 216.0.260 Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

### 216.0.261 Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

**Answer:** Please make sure libcairo is installed.
**Notes:** For accessing pictures on Linux, the MBS Plugin relays on the cairo library.
Please install the package if you don't have it already.
Our plugin looks for library called libcairo.so or libcairo.so.2.

### 216.0.262 Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

**Answer:** You have no data points visible, there may be several reasons:
**Notes:** For example one of the data values may be infinite or invalid.
Or the scaling may be out of range, so you simply see nothing.

### 216.0.263 Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

**Answer:** All plugins used by your application will be included in the application.
**Notes:** If you use no plugins, your application will not change size.
And if you use one class from the plugins, your application size will increase by a few kilobytes.
The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

### 216.0.264 XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

**Answer:** You have to download the source code and compile a static version of the library.
**Notes:** Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

#,###.00_); [ Red ] (#,###.00);0.00;"sales "@

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [ Color3 ] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.
Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condi-

tion in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.
[ Red ] [ <=100 ] ; [ Blue ] [ >100 ]
If the cell value does not meet any of the criteria, then pound signs ("#") are displayed across the width of the cell.
Dates and times

Examples

### 216.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

**Answer:** Please upgrade your Windows version.

### 216.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic. Why?

Plugin Version: all.

**Answer:**

You may check if the application has enough memory to be loaded.
RB should have on Mac OS Classic more than 20 MB of RAM.
I prefered to use 50 MB and for an application a 10 MB partition is a good way to start.

| Parameter | Description |
|---|---|
| x | The x value of the data point. For an enumerated x-axis (see Axis.setLabels on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1). |
| xLabel | The bottom x-axis label of the data point. |
| x2Label | The top x-axis label of the data point. |
| value | The value of the data point. |
| accValue | The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| totalValue | The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| percent | The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| accPercent | The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart. |
| gpercent | The percentage of the data point based on the total value of all data points in a layer. |
| dataSet | The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1). |
| dataSetName | The name of the data set to which the data point belongs. |
| dataItem | The data point number within the data set. The first data point is 0. The nth data point is (n-1). |
| dataGroup | The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1). |
| dataGroupName | The name of the data group to which the data point belongs. |
| layerId | The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1). |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2. |

| | |
|---|---|
| diFieldN | Same as fieldN. See above. |
| dsFieldN | Similar to fieldN, except that dsFieldN means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field. |
| dsdiFieldN | Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the (N + Q)th extra field. |

| Parameter | Description |
|---|---|
| zx | The symbol scale in the x dimension. Applicable for layers with symbol scales set by LineLayer.setSymbolScale. |
| zy | The symbol scale in the y dimension. Applicable for layers with symbol scales set by LineLayer.setSymbolScale. |
| z | The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by LineLayer.setSymbolScale. |

| Parameter | Description |
|---|---|
| slope | The slope of the trend line. |
| intercept | The y-intercept of the trend line. |
| corr | The correlation coefficient in linear regression analysis. |
| stderr | The standard error in linear regression analysis. |

| Parameter | Description |
|---|---|
| top | The value of the top edge of the box-whisker symbol. |
| bottom | The value of the bottom edge of the box-whisker symbol. |
| max | The value of the maximum mark of the box-whisker symbol. |
| min | The value of the minimum mark of the box-whisker symbol. |
| med | The value of the median mark of the box-whisker symbol. |

| Parameter | Description |
|---|---|
| high | The high value. |
| low | The low value. |
| open | The open value. |
| close | The close value. |

| Parameter | Description |
|---|---|
| dir | The direction of the vector. |
| len | The length of the vector. |

| Parameter | Description |
|---|---|
| radius | The radial value of the data point. |
| value | Same as { radius } . See above. |
| angle | The angular value of the data point. |
| x | Same as { angle } . See above. |
| label | The angular label of the data point. |
| xLabel | Same as { label } . See above. |
| name | The name of the layer to which the data point belongs. |
| dataSetName | Same as { name } . See above. |
| i | The data point number. The first data point is 0. The nth data point is (n-1). |
| dataItem | Same as { i } . See above. |
| z | The symbol scale. Applicable for layers with symbol scales set by PolarLayer.setSymbolScale. |
| fieldN | The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2. |
| diFieldN | Same as fieldN. See above. |
| dsFieldN | Similar to fieldN, except that dsFieldN means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field. |
| dsdiFieldN | Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)th extra field. |

| Parameter | Description |
|---|---|
| dir | The direction of the vector. |
| len | The length of the vector. |

| Parameter | Description |
|---|---|
| value | The axis value at the tick position. |
| label | The axis label at the tick position. |

| Parameter | Description |
|---|---|
| [ param ] | The name of the parameter |
| [ a ] | If this field a number, it specifies the number of decimal places (digits to the right of the decimal point). |

[ b ]

textasciitilde ' for no thousand separator. The default is '
textasciitilde ', which can be modified using BaseChart.setNumberFormat.

The thousand separator. Should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use '

[ c ]

The decimal point character. The default is '.', which can be modified using BaseChart.setNumberFormat.

[ d ]

textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat.

The negative sign character. Use '

| Parameter | Description |
|---|---|
| yyyy | The year in 4 digits (e.g. 2002) |
| yyy | The year showing only the least significant 3 digits (e.g. 002 for the year 2002) |
| yy | The year showing only the least significant 2 digits (e.g. 02 for the year 2002) |
| y | The year showing only the least significant 1 digits (e.g. 2 for the year 2002) |
| mmm | The month formatted as its name. The default is to use the first 3 characters of the english month name (Jan, Feb, Mar ...). The names can be configured using BaseChart.setMonthNames. |
| mm | The month formatted as 2 digits from 01 - 12, adding leading zero if necessary. |
| m | The month formatted using the minimum number of digits from 1 - 12. |
| MMM | The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| MM | The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| M | The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames. |
| dd | The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary. |
| d | The day of month formatted using the minimum number of digits from 1 - 31. |
| w | The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...). The names can be configured using BaseChart.setWeekDayNames. |
| hh | The hour of day formatted as 2 digits, adding leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12. |
| h | The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12. |
| nn | The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary. |
| n | The minute formatted using the minimum number of digits from 00 - 59. |
| ss | The second formatted as 2 digits from 00 - 59, adding leading zero if necessary. |
| s | The second formatted using the minimum number of digits from 00 - 59. |
| a | Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified using BaseChart.setAMPM. |

| Shape Id | Value | Description |
|---|---|---|
| SquareShape | 1 | Square shape. See (1, 1) above. |
| DiamondShape | 2 | Diamond shape. See (2, 1) above. |
| TriangleShape | 3 | Triangle shape pointing upwards. See (3, 1) above. |
| RightTriangleShape | 4 | Triangle shape pointing rightwards. See (4, 1) above. |
| LeftTriangleShape | 5 | Triangle shape pointing leftwards. See (5, 1) above. |
| InvertedTriangleShape | 6 | Triangle shape pointing downwards. See (1, 2) above. |
| CircleShape | 7 | Circle shape. See (2, 2) above. |
| StarShape | [ Method ] | Star shapes of various points. See (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5) above for stars with 3 to 10 points. |
| PolygonShape | [ Method ] | Polygon shapes symmetrical about a vertical axis with a vertex at the top center position. See (4, 1), (4, 3), (4, 5), (5, 1) for polygons of 5 to 8 sides. |
| Polygon2Shape | [ Method ] | Polygon shapes symmetrical about a vertical axis but without any vertex at the top center position. See (4, 2), (4, 4) for polygons of 5 and 6 sides. |
| CrossShape | [ Method ] | '+' shapes. See (5, 2), (5, 3), (5, 4), (5, 5), (6, 1), (6, 2), (6. 3) for '+' shape with arm width of 0.1 - 0.7. |
| Cross2Shape | [ Method ] | 'X' shapes. See (6, 4), (6, 5), (7, 1), (7, 2), (7, 3), (7, 4), (7, 5) for 'X' shapes with arm width of 0.1 - 0.7. |

| | | |
|---|---|---|
| langEnglish | 0 | Roman script |
| langFrench | 1 | Roman script |
| langGerman | 2 | Roman script |
| langItalian | 3 | Roman script |
| langDutch | 4 | Roman script |
| langSwedish | 5 | Roman script |
| langSpanish | 6 | Roman script |
| langDanish | 7 | Roman script |
| langPortuguese | 8 | Roman script |
| langNorwegian | 9 | Roman script |
| langHebrew | 10 | Hebrew script |
| langJapanese | 11 | Japanese script |
| langArabic | 12 | Arabic script |
| langFinnish | 13 | Roman script |
| langGreek | 14 | Greek script using smRoman script code |
| langIcelandic | 15 | modified smRoman/Icelandic script |
| langMaltese | 16 | Roman script |
| langTurkish | 17 | modified smRoman/Turkish script |
| langCroatian | 18 | modified smRoman/Croatian script |
| langTradChinese | 19 | Chinese (Mandarin) in traditional characters |
| langUrdu | 20 | Arabic script |
| langHindi | 21 | Devanagari script |
| langThai | 22 | Thai script |
| langKorean | 23 | Korean script |

| Nan | Meaning |
|---|---|
| 1 | Invalid square root (negative number, usually) |
| 2 | Invalid addition (indeterminate such as infinity + (-infinity)) |
| 4 | Invalid division (indeterminate such as 0/0) |
| 8 | Invalid multiplication (indeterminate such as 0*infinity) |
| 9 | Invalid modulo such as (a mod 0) |
| 17 | Try to convert invalid string to a number like val(”x7”) |
| 33 | Invalid argument in a trig function |
| 34 | Invalid argument in an inverse trig function |
| 36 | Invalid argument in a log function |
| 37 | Invalid argument in Pow function |
| 38 | Invalid argument in toolbox financial function |
| 40 | Invalid argument in hyperbolic function |
| 42 | Invalid argument in a gamma function |

| Symbol | Description and result |
|---|---|
| 0 | Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format #.00 |
| # | Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. For example, if the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed. |
| ? | Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column. |
| . (period) | Decimal point. |
| % | Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and adds the percentage symbol in the cell. |
| , (comma) | Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. For example, if the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed. |
| E- E+ e- e+ | Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed. |
| $ -+/():space | Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. For example, if the number format is (000), and the value 12 is in the cell, the number (012) is displayed. |
| \ | Display the next character in the format. The application shall not display the backslash. For example, if the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed. |
| * | Repeat the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. For example, if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column. |
| _ (underline) | Skip the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. For example, the number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses. |
| "text" | Display whatever text is inside the quotation marks. For example, the format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell. |
| @ | Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. For example, if the number format is "Bob "@" Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed. |

[ Black ] [ Green ] [ White ] [ Blue ] [ Magenta ] [ Yellow ] [ Cyan ] [ Red ]

| To display | As | Use this code |
|---|---|---|
| Months | 1-12 | m |
| Months | 01-12 | mm |
| Months | Jan-Dec | mmm |
| Months | January-December | mmmm |
| Months | J-D | mmmmm |
| Days | 1-31 | d |
| Days | 01-31 | dd |
| Days | Sun-Sat | ddd |
| Days | Sunday-Saturday | dddd |
| Years | 00-99 | yy |
| Years | 1900-9999 | yyyy |
| Hours | 0-23 | h |
| Hours | 00-23 | hh |
| Minutes | 0-59 | m |
| Minutes | 00-59 | mm |
| Seconds | 0-59 | s |
| Seconds | 00-59 | ss |
| Time | 4 AM | h AM/PM |
| Time | 4:36 PM | h:mm AM/PM |
| Time | 4:36:03 P | h:mm:ss A/P |
| Time | 4:36:03.75 | h:mm:ss.00 |
| Elapsed time | 1:02 | [ h ] :mm |
| Elapsed time | 62:16 | [ mm ] :ss |
| Elapsed time | 3735.80 | [ ss ] .00 |

| To display | As | Use this code |
|---|---|---|
| 1234.59 | 1234.6 | ####.# |
| 8.9 | 8.900 | #.000 |
| .631 | 0.6 | 0.# |
| 12 | 12.0 | #.0# |
| 1234.568 | 1234.57 | #.0# |
| 44.398 | 44.398 | ???.??? |
| 102.65 | 102.65 | ???.??? |
| 2.8 | 2.8 | ???.??? |
| 5.25 | 5 1/4 | # ??/?? |
| 5.3 | 5 3/10 | # ??/?? |
| 12000 | 12,000 | #,### |
| 12000 | 12 | #, |
| 12400000 | 12.4 | 0.0,, |